PART III: EXHIBITS

OREGON DEPARTMENT OF FORESTRY

TIMBER SALE OPERATIONS PLAN
(See Page 2 for instructions)

Date Received by STATE: _____

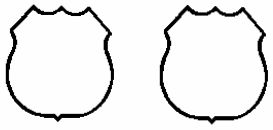
(1) Contract No.: 341-09-25

(2) Sale Name: Rising Tide

(3) Contract Expiration Date: October 31, 2010

(4) Purchaser: _____

(5) State Brand Information (complete):



Project Completion Dates: Project Nos. 1, 2, 3, 4, and 6 - Prior to October 31, 2009; Project No. 5: V4 to V5 and V6 to V7 – Prior to October 31, 2009, Project No. 5: V1 to V2, V3 to V3, and V8 to V9 – Prior to October 31, 2010, Project No. 7 – Prior to October 31, 2010.

(6) Purchaser Representatives:

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

(7) State Representatives:

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

OPERATIONS PLAN
INSTRUCTION SHEET

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.

Plan No.

(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.

(8) 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.

①, (1)	Cable landing, with numbers for sequence.
A	Tractor landing with alphabetical sequence.
_ _ _ _ _	Approximate setting boundary.
- - - - - - - -	Spur truck roads.
	Tractor yarding roads.
X	. Temporary stream crossings

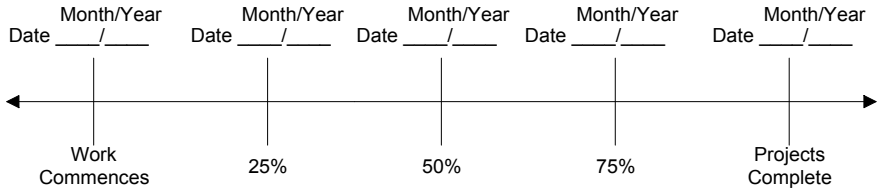
EXHIBIT B

OPERATIONS PLAN

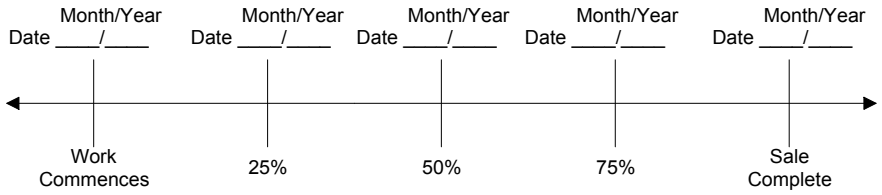
Completion Timeline

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
All Conifers	--	10	X		
All Hardwoods	--	10	X		

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

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

(7) EASTSIDE SCALE: YES ☐ NO ☒
*Actual taper butt logs over 40' scaling length

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

(9) ADD-BACK VOLUME -- YES ☒ NO ☐
Deductions due to delay

(10) **APPROVED SCALING LOCATIONS**	**Species**	**Yard**	**Truck**

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

_____
State Forester's Representative

(12) SALE NAME Rising Tide
COUNTY Clatsop

(13) STATE CONTRACT NUMBER 341-09-25

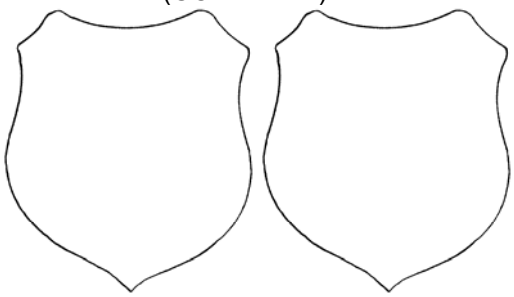
(14) SCALE: westside ☒ eastside ☐ cubic foot ☐

(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 **less** than **30** board feet shall be scaled as **"Utility"**. Hardwood logs greater than or equal to 30 net board feet shall be scaled as a sawlog.

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

(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, Jewell 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
14 feet	N/A	1A to 1B	0+00 to 18+00	OUTSLOPE
14 feet	N/A	1C to 1D	0+00 to 6+25	OUTSLOPE
16 feet	12 feet	2A to 2B	0+00 to 0+75	DITCH
16 feet	12 feet	3A to 3B	0+00 to 1+70	DITCH
16 feet	12 feet	4A to 4B	0+00 to 23+80	DITCH
16 feet	12 feet	4C to 4D	0+00 to 1+60	DITCH
16 feet	12 feet	4E to 4F	0+00 to 1+75	DITCH
16 feet	12 feet	4G to 4H	0+00 to 2+30	DITCH
16 feet	12 feet	4I to 4J	0+00 to 1+40	DITCH
16 feet	12 feet	A to B	0+00 to 3+70	DITCH
16 feet	12 feet	C to D	0+00 to 14+30	DITCH
16 feet	12 feet	E to F	0+00 to 4+33	DITCH
16 feet	12 feet	G to H	0+00 to 12+20	DITCH
16 feet	12 feet	I to J	0+00 to 38+67	DITCH
16 feet	12 feet	K to L	0+00 to 5+10	DITCH
16 feet	12 feet	I1 to I2	0+00 to 70+22	DITCH
16 feet	12 feet	I2 to I3	0+00 to 59+92	DITCH
16 feet	12 feet	I5 to I6	0+00 to 21+10	DITCH
16 feet	12 feet	I7 to I8	0+00 to 3+95	DITCH
16 feet	12 feet	I9A to I9	0+00 to 3+00	DITCH
16 feet	12 feet	I9 to I10	0+00 to 50+00	DITCH
16 feet	12 feet	I9 to I11	0+00 to 28+75	DITCH
16 feet	12 feet	I12 to I13	0+00 to 22+80	DITCH
16 feet	12 feet	I14 to I15	0+00 to 15+90	DITCH
16 feet	12 feet	I15 to I16	0+00 to 7+00	DITCH
16 feet	12 feet	I17 to I18	0+00 to 118+80	DITCH
16 feet	12 feet	I19 to I20	0+00 to 60+00	DITCH

EXHIBIT D

FOREST ROAD SPECIFICATIONS

CLEARING. This work shall consist of clearing, removing, and disposing of all trees, Snags, Down Timber, brush, surface objects, and protruding obstructions within the clearing limits.

Where clearing limits have not been marked, the clearing limits shall extend 5 feet back of the top of the cutslope and 5 feet out from the toe of the fill slope, or as directed by STATE. Clearing debris shall not be placed or permitted to remain in or under any road embankment sections. Clearing debris shall not be left lodged against standing trees.

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

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

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

GRUBBING CLASSIFICATION.

New construction - From the top of the cutslope to the toe of the fill.

Improvements and reconstructions - 4 feet back from the shoulder of the subgrade or ditch, whichever is widest, or as marked in the field.

CLEARING AND GRUBBING DISPOSAL. Scatter in stable locations through openings in the timber outside of the cleared right-of-way, except areas where end-haul is required. In areas where end-haul is required, clearing and grubbing debris shall be fully contained and hauled to a designated waste area. Do not place clearing and grubbing debris on side slopes exceeding 50 percent. Grubbing debris shall be left in a stable location, and not left lodged against standing trees.

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

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

All suitable excavated material shall be used where possible for the formation of fills, shoulders, and drainage structure backfills. Embankment materials shall be free of woody debris, brush, muck, sod, frozen material, and other deleterious materials. All fills and drainage structure backfills shall be machine compacted according to the specifications in Exhibit D.

Unless road design plans show otherwise, all roads shall be on a balanced cross section, except when the slope is over 50 percent, the road shall be on full bench for the width specified.

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

ROAD WIDTH LIMITATIONS. PURCHASER shall obtain advance written approval from STATE to construct the road to a greater width than specified. Extra subgrade width shall be required for:

Fill Widening. Add to each fill shoulder 1 foot for fills 3 feet to 6 feet high; 2 feet for fills over 6 feet high.

Curve Widening. Widen the inside shoulder of all curves as follows: 400 divided by the radius of the curve equals the amount of extra width, unless otherwise specified in specific instructions.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

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 ¼ :1	Not steeper
Common - side slopes 50% and over	¾ :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.

GENERAL ROAD CONSTRUCTION INSTRUCTIONS:

(1) Excavated Materials. Excavated materials shall be utilized for road construction and hauled in where necessary. Surplus excavation materials shall be hauled to the waste areas as marked in the field and/or designated on Exhibit A. Surplus excavated materials and waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with Exhibit D.

(2) Fill Armor and Energy Dissipator Construction. Where rock is specified for fill armor, rock shall be placed and tamped at a 1½:1 slope, beginning at the fill toes. Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet, in accordance with Exhibit I.

(3) Geotextile Road Fabric: Install woven fabric on Road Segment K to L and C to D in accordance with the specifications in Exhibit P, and as directed by STATE.

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

EXHIBIT D
FOREST ROAD SPECIFICATIONS

(5) Subgrade Preparation and Application of Surfacing Rock.

(a) Complete culvert installations, drainage ditches, ditchouts, fill construction, and other specified work prior to the application of surfacing rock.

(b) Subgrade shall be crowned at 4 to 6 percent (½ inch per foot).

(c) Upon completion of above required work, apply, process, and compact surfacing rock in accordance with specifications in Exhibit D. Final road surface shall be crowned at 4 to 6 percent (½ inch per foot).

(d) When rock source is specified as Tidewater Loop Stockpile, such rock shall only be used for those portions, unless otherwise approved in writing by STATE.

(e) Free Draining Base Fill Construction. Where free draining fill construction is required, clean 24"-6" riprap rock shall be hauled in and used for fill construction. 1½" - 0" crushed rock shall be used for backfilling around culverts. Free draining fills shall be constructed in accordance with Exhibit O.

(f) Controlled Blasting. Controlled blasting techniques shall be utilized for any blasting operations, and shall be accomplished using timing devises, delayed charges, low intensity shots, or other suitable means to contain as much material as possible within the road prism.

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

Segment	Station	Work Description:
A to B	3+70	Install gate at property line on Weyerhaeuser ownership at Point B. Gate shall be obtained from Station 15+30, V1 to V2.
C to D	0+86	Curve widening 6 feet.
	3+80	Begin road fabric.
	4+80	Curve widening 2 feet.
	4+82	Install 24" x 40' culvert. Develop stream channel.
	9+20	Install 72" x 55' culvert. Utilize 62 cubic yards of 1 ½"-0" for culvert bedding and backfill. Embed culvert 2 feet at inlet and outlet. Utilize 10 cubic yards of 24"-6" to construct dissipator. Utilize 350 cubic yards of 24"-6" riprap to construct free draining fill. See Exhibit O for free draining fill specifications. Utilize 196 cubic yards of 24"-6" riprap to armor fill slopes.
	10+35	Curve widening 6 feet.
	11+00	Install 18" x 40' culvert.
	13+25	End road fabric.
	13+60	Construct a pickup passable, shallow "V" waterbar on the old spur road where the new construction joins it.
E to F	2+80	Install 18" x 32' culvert.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

Segment	Station	Work Description:
G to H	0+55	Curve widening 8 feet.
	2+05	Curve widening 5 feet.
	3+00	Begin thru-cut widening 2 feet both sides. Utilize excavation for fill construction at station 9+20. Haul remaining excavation to waste area.
	4+10	End thru-cut widening 2 feet both sides.
	4+65	Install 18” x 34’ culvert.
	7+20	Install 18” x 40’ culvert.
	8+15	Curve widening 4 feet.
	9+20	Install 48” x 90’ culvert. Utilize 100 cubic yards of 1 ½”-0” for culvert bedding and backfill. Develop stream channel. Utilize 720 cubic yards of 24”-6” riprap to construct free draining fill. See Exhibit O for free draining fill specifications. Utilize 200 cubic yards of 24”-6” to armor fill slopes.
	9+95	Curve widening 3 feet.
	10+55	Curve widening 4 feet.
	11+40	Curve widening 4 feet.
I to J	0+70	Install 18” x 40’ culvert. Utilize 10 cubic yards 24”-6” riprap to construct dissipator.
	2+75	Curve widening 6 feet.
	8+70	Install 18” x 34’ culvert.
	11+40	Curve widening 4 feet.
	12+65	Install 18” x 34’ culvert. Utilize 10 cubic yards 24”-6” riprap to construct dissipator.
	14+40	Curve widening 5 feet.
	18+35	Curve widening 2 feet.
	23+60	Curve widening 2 feet.
	28+70	Curve widening 4 feet.
	31+95	Curve widening 2 feet.
	33+25	Install 18” x 34’ culvert.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

Segment	Station	Work Description:
I to J	36+10	Curve widening 2 feet.
.	36+65	Install 18" x 50' culvert.
K to L	0+00	Begin application of 4"-0" base and 1"-0" surface course crushed rock.
	0+52	Begin excavating into the cutslope and moving centerline into the hill.
	0+80	Begin Fabric application in accordance with Exhibit P.
	1+03	Install 18" x 30' culvert.
	1+12	Begin sidecast pullback, aggregate recovery, and vacating of the old road as directed by STATE.
	1+60	Begin construction of free draining fill. Utilize 206 cubic yards of 24" – 6" riprap to construct free draining fill. See Exhibit O for free draining fill specifications. Utilize 60 cubic yards of 24" – 6" to armor fill slopes.
	2+00	Utilize recovered aggregate as subgrade reinforcement as directed by STATE.
	2+15	End construction of free draining fill.
	2+60	Install 18" x 32' culvert. Utilize 10 cubic yards 24" – 6" riprap to construct dissipator.
	3+30	Waste area. Placed material will be spread, compacted, and sloped to drain as directed by STATE.
	3+50	Begin construction of turnout right.
	4+50	End construction of turnout right.
	4+60	End sidecast pullback, aggregate recovery, and vacating.
	5+10	End application of 4"-0" base and 1"-0" surface course crushed rock.

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 culvert at gradients equal to or exceeding the drainage (or ditch) gradient. Where fill reconstruction or culvert replacement is specified, fills shall be excavated to natural stream course levels. All woody debris encountered during fill excavation shall be removed. All waste materials shall be hauled to nearby waste areas and shall be uniformly sloped and compacted for drainage. Waste materials shall be seeded and mulched in accordance with specifications in Exhibit M. Fill reconstruction backfill shall consist of select materials and may be obtained from borrow pits, as directed by STATE. Backfill materials shall be hauled in where necessary and thoroughly compacted in accordance with 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) Riprap Rock Use: Where rock is used for fill armor, rock shall be placed and tamped at a 1½:1 slope, beginning at the fill toes. When used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet, in accordance with Exhibit I.

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

GENERAL ROAD IMPROVEMENT INSTRUCTIONS:

(6) Subgrade Preparation and Application of Surfacing Rock.

(a) Roadside Brushing. Conduct roadside brushing as specified in Project No. 6 and Exhibit N.

(b) Complete culvert installations, drainage ditches, fill reconstruction, ditchouts, and other specified work prior to the application of new surfacing rock.

(c) Cut out all potholes and/or washboard sections from the existing surfacing.

(d) Apply required patching and leveling rock, as directed by STATE.

(e) When rock source is specified as Tidewater Loop Stockpile, such rock shall only be used for those portions, unless otherwise approved in writing by STATE.

(f) Process (grade and mix) the existing surface and added base rock. Provide for a crown of ½ inch per foot in road width (4 to 6 percent), and compact in accordance to Exhibit D.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

GENERAL ROAD IMPROVEMENT INSTRUCTIONS:

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

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

Segment	Station	Work Description
I1 to I2	0+00	Begin blade, shape, and compaction of existing road. Apply leveling rock as directed by STATE.
	33+37	Junction with road segment K-L. Stop Improvement of I1-I2.
	38+47	Continue improvement of I1-I2.
	70+22	End improvement.
I2 to I3	0+00	Begin blade, shape, and compaction of existing road. Apply leveling rock as directed by STATE.
	4+82	Remove and dispose of existing culvert. The removed culvert, shall be hauled to an approved refuse site off of STATE and Weyerhaeuser land.
	4+97	Culvert replacement, install with a 30° skew and at a 3% gradient. Utilize 20 cubic yards of 1½”-0” crushed rock for culvert bedding and backfill. Utilize 12 cubic yards of 24”-6” riprap rock for energy dissipator construction.
	9+88	Install culvert with a 30° skew and at a 3% gradient. Utilize 20 cubic yards of 1½”-0” crushed rock for culvert bedding and backfill. Utilize 12 cubic yards of 24”-6” riprap rock for energy dissipator construction.
	12+93	Begin slump repair. Pull back existing crushed rock surfacing for later use. Shape Subgrade to seal road cracks. Process and compact pulled back Surfacing. Utilize and process 40 cubic yards of 1½”-0” crushed rock surfacing to bring road surfacing up to a uniform grade as directed by STATE.
	13+63	Remove and dispose of existing culvert. The removed culvert shall be hauled to an approved refuse site off of STATE and Weyerhaeuser land.
	14+83	End slump repair.
	15+63	Install culvert with a 30° skew and at a 3% gradient. Utilize 20 cubic yards of 1½”-0” crushed rock for culvert bedding and backfill. Utilize 12 cubic yards of 24”-6” riprap rock for energy dissipator construction.
	41+00	Begin application of 4”-0” base rock and 1½”-0” surface rock.
	41+47	Unplug culvert outlet. Dispose of waste material as directed by STATE.
	53+00	Construct ditchouts right and left as directed by STATE. Remaining ditchouts to be constructed will be located after the clearing has been completed.
	59+92	End improvement.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

Segment	Station	Work Description
I5 to I6	0+00	Install new culvert. Utilize 20 cubic yards 1½"-0" crushed rock for bedding and backfill.
	2+80	Fill reconstruction and culvert replacement. Re-align and place culvert on natural stream channel. Utilize 50 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill. Utilize 40 cubic yards of 6"-0" pit- run for fill reconstruction. Utilize 50 cubic yards of 4"-0" rock for base rock replacement, 24 cubic yards of 1½"-0" crushed rock for surfacing rock, 80 cubic yards of 24"-6" riprap for fill armor, and 10 cubic yards of 24"-6" riprap for an energy dissipator.
	10+40	Fill reconstruction and culvert replacement. Place culvert in natural stream channel. Utilize 50 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill. Utilize 60 cubic yards of pit-run for fill reconstruction. Utilize 70 cubic yards of 4"-0" rock for base rock replacement, 24 cubic yards of 1½"-0" crushed rock for surfacing rock, 100 cubic yards of 24"-6" riprap for fill armor, and 10 cubic yards of 24"-6" riprap for an energy dissipator.
	14+78	Install new culvert. Utilize 20 cubic yards 1½"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards 24"-6" riprap for an energy dissipator.
	15+00	Begin application of 4"-0" crushed base rock and 1½"-0" Crushed surface rock associated with the Concrete Open Box Culvert installation.
	15+40	Install a Concrete Open Box Culvert with a 12 foot span and 10 foot rise according to the specifications in Exhibit H.
	16+00	End application of 4"-0" crushed base rock and 1½"-0" Crushed surface rock associated with the Concrete Open Box Culvert installation.
	20+05	Replace existing culvert. Backfill old culvert location with 20 cubic yards of 1½"-0" crushed rock. Install new culvert as referenced in field. Utilize 20 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill, and 10 cubic yards of 24"-6" riprap for an energy dissipator.
I7 to I8	0+90	Replace existing culvert. Utilize 20 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill.
I9 to I11	10+25	Replace existing culvert. Utilize 20 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

Segment	Station	Work Description
I9 to I11	11+80	Fill reconstruction and culvert replacement. Re-align and place culvert on natural stream channel. Utilize 40 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill. Utilize 40 cubic yards of pit-run for fill reconstruction. Utilize 40 cubic yards of 4"-0" rock for base rock replacement, 24 cubic yards of 1½"-0" crushed rock for surfacing rock, 40 cubic yards of 24"-6" riprap for fill armor, and 10 cubic yards of 24"-6" riprap for an energy dissipator.
	24+75	Fill reconstruction and culvert replacement. Re-align and place culvert on natural stream channel. Utilize 90 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill. Utilize 80 cubic yards of pit-run for fill reconstruction. Utilize 80 cubic yards of 4"-0" rock for base rock replacement, 36 cubic yards of 1½"-0" crushed rock for surfacing rock, 160 cubic yards of 24"-6" riprap for fill armor, and 10 cubic yards of 24"-6" riprap for an energy dissipator.
I12 to I13	0+50	Fill reconstruction and culvert replacement. Re-align and place culvert on natural stream channel. Utilize 40 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill. Utilize 50 cubic yards of pit-run for fill reconstruction. Utilize 40 cubic yards of 4"-0" rock for base rock replacement, 24 cubic yards of 1½"-0" crushed rock for surfacing rock, 50 cubic yards of 24"-6" riprap for fill armor, and 10 cubic yards of 24"-6" riprap for an energy dissipator.
	4+00	Install new culvert as referenced in field. Utilize 20 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill.
	5+05	Fill reconstruction and culvert replacement. Re-align and place culvert on natural stream channel. Utilize 60 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill. Utilize 50 cubic yards of pit-run for fill reconstruction. Utilize 70 cubic yards of 4"-0" rock for base rock replacement, 24 cubic yards of 1½"-0" crushed rock for surfacing rock, 60 cubic yards of 24"-6" riprap for fill armor, and 10 cubic yards of 24"-6" riprap for an energy dissipator.
	8+45	Fill reconstruction and culvert replacement. Re-align and place culvert on natural stream channel. Utilize 60 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill. Utilize 40 cubic yards of pit-run for fill reconstruction. Utilize 60 cubic yards of 4"-0" rock for base rock replacement, 24 cubic yards of 1½"-0" crushed rock for surfacing rock, and 20 cubic yards of 24"-6" riprap for fill armor.
	13+00	Install new culvert. Utilize 20 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill. Utilize 20 cubic yards of 24"-6" riprap for an energy dissipator.
	16+35	Replace existing culvert. Backfill old culvert location with 20 cubic yards of 1½"-0" crushed rock. Install new culvert as referenced in field. Utilize 20 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

Segment	Station	Work Description
I12 to I13	22+50	Fill reconstruction and culvert replacement. Re-align and place culvert on natural stream channel. Utilize 40 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill. Utilize 20 cubic yards of pit-run for fill reconstruction. Utilize 40 cubic yards of 4"-0" rock for base rock replacement, 24 cubic yards of 1½"-0" crushed rock for surfacing rock, and 20 cubic yards of 24"-6" riprap for fill armor.
I17 to I18	1+70	Remove existing culvert and fill. Install 96" x 50' culvert according to the specifications in Exhibit H.
	3+00	Install culvert. Utilize 20 cubic yards 1½ "-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap for an energy dissipator.

EXHIBIT D

END-HAULING REQUIREMENTS

POINT TO POINT	STA. TO STA.	CONTAINMENT	WASTE AREA LOCATION	WASTE AREA TREATMENT
2A to 2B	0+00 to 0+75	1	1	1, 2, and 3
G to H	3+00 to 4+10	1	2	4

End-Haul Areas General Requirements

Material shall not be intentionally side cast.

Clearing and grubbing debris shall be end-hauled.

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

Containment

Average containment: The amount of material lost over the outside edge of the road shall not exceed 12 inches in depth measured perpendicular to the natural ground slope.

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

Waste Area Location

(1) As shown on Exhibit A and as marked in the field.

(2) G to H – utilize material for road construction on segment G to H.

Waste Area Treatment

(1) Compact fills according to Exhibit D specifications.

(2) Deposit at waste area, spread evenly, compact, and provide adequate drainage.

(3) Mulch and seed all waste areas in accordance with Exhibit M.

(4) Utilize material for road construction and compact in accordance with specifications in Exhibit D.

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: A to 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 3+70 Number of		
Base Rock	4"-0" Crushed	A-B	10	Station	54	Stations	3.70	200
Traction Rock	1½"-0" Stockpile	0+00 to 3+70	2	Station	11	Stations	3.70	41
Turnout	1½"-0" Stockpile		2	Turnout	10	Turnouts	1	10
Turnout	4"-0" Crushed		10	Turnout	24	Turnouts	1	24
Total Rock for Road Segment:			A to B					275
ROAD SEGMENT: C to D				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	C to D **Volume (CY) Per**		0+00 to 14+30 **Number of**		
Base Rock	4"-0" Crushed	0+00 to 14+30	9	Station	49	Stations	14.3	701
Fill Widening	4"-0" Crushed	3+00 to 4+00	9	Fill	7	Fills	1	7
Fill Widening	4"-0" Crushed	9+50 to 10+50	9	Fill	14	Fills	1	14
Turnout	4"-0" Crushed	0+75 and 7+50	9	TO	19	Tos	2	38
Curve Widening	4"-0" Crushed	0+24 to 1+48	9	Curve	24	Curves	1	24
Curve Widening	4"-0" Crushed	3+98 to 5+62	9	Curve	10	Curves	1	10
Curve Widening	4"-0" Crushed	9+65 to 11+06	9	Curve	28	Curves	1	28
Surfacing	1½"-0" Crushed	0+00 to 14+30	4	Station	27	Stations	14.3	386
Fill Widening	1½"-0" Crushed	3+00 to 4+00	4	Fill	3	Fills	1	3
Fill Widening	1½"-0" Crushed	9+50 to 10+50	4	Fill	6	Fills	1	6
Turnout	1½"-0" Crushed	0+75 and 7+50	4	Turnout	10	Turnouts	2	20
Curve Widening	1½"-0" Crushed	0+24 to 1+48	4	Curve	12	Curves	1	12
Curve Widening	1½"-0" Crushed	3+98 to 5+62	4	Curve	5	Curves	1	5
Curve Widening	1½"-0" Crushed	9+65 to 11+06	4	Curve	14	Curves	1	14
Culvert bedding	1½"-0" Stockpile	9+65	N/A	Fill	62	Fills	1	62
Fill Armor	24"-6" Riprap	9+65	N/A	Fill	556	Fills	1	556
Total Rock for Road Segment:			C to D					1,886
ROAD SEGMENT: E to F				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	E to F **Volume (CY) Per**		0+00 to 4+33 **Number Of**		
Base Rock	4"-0" Crushed	0+00 to 4+33	9	Station	49	Stations	4.33	212
Turnout	4"-0" Crushed	1+60	9	Turnout	19	Turnouts	1	19
Junctions	4"-0" Crushed		9	Junction	10	Junctions	2	20
Surfacing	1½"-0" Stockpile	0+00 to 4+33	4	Station	22	Stations	4.33	95
Turnout	1½"-0" Stockpile	1+60	4	Turnout	10	Turnouts	1	10
Junctions	1½"-0" Stockpile		4	Junction	10	Junctions	2	20
Total Rock for Road Segment:			3C to 3D					376

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: G to H				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	G to H **Volume (CY) Per**		0+00 to 12+20 **Number of**		
Base Rock	4"-0" Crushed	0+00 to 12+20	9	Station	49	Stations	12.2	598
Fill Widening	4"-0" Crushed		9	Fill	14	Fills	1.00	14
Curve Widening	4"-0" Crushed		9	Curve	N/A	Curves	6	115
Thru-cut Widening	4"-0" Crushed		9	Thru-cut	14	Thru-cuts	1	14
Turnouts	4"-0" Crushed	2+00, 6+00, 11+00	9	Turnout	22	Turnouts	3	66
Junctions	4"-0" Crushed		9	Junction		Junctions	2	30
Surfacing	1½"-0" Crushed	0+00 to 12+20	4	Station	22	Stations	12.2	268
Fill Widening	1½"-0" Crushed		4	Fill	5	Fills	1	5
Curve Widening	1½"-0" Crushed		4	Curve	N/A	Curves	6	51
Thru-cut Widening	1½"-0" Crushed		4	Thru-cut	5	Thru-cut	1	5
Turnouts	1½"-0" Crushed		4	Turnout	10	Turnouts	3	30
Junctions	1½"-0" Crushed		4	Junction	15	Junctions	2	30
Culvert Bedding/Backfill	1½"-0" Stockpile	9+20		Culvert	100	Culverts	1	100
Fill Armor/Free Draining	24"-6" Riprap	9+20		Fill	920	Fills	1	920
Total Rock for Road Segment:			G to H					2,246

ROAD SEGMENT: I to J				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	I to J **Volume (CY) Per**		0+00 to 38+67 **Number Of**		
Base Rock	4"-0" Crushed	0+00 to 38+67	9	Station	49	Stations	38.67	1,895
Turnouts	4"-0" Crushed	2+30, 11+35, 14+25, 18+40, 23+70, 28+50, 31+60, 36+10	9	Turnout	22	Turnouts	8	176
Curve Widening	4"-0" Crushed		9	Curve	-	Curves	8	192
Fill Widening	4"-0" Crushed		9	Fill	-	Fills	-	34
Junctions	4"-0" Crushed		9	Junction	10	Junctions	2	20
Surfacing	1½"-0" Stockpile		4	Station	22	Stations	38.67	851
Turnouts	1½"-0" Stockpile	2+30, 11+35, 14+25, 18+40, 23+70, 28+50, 31+60, 36+10	4	Turnout	10	Turnouts	8	80
Curve Widening	1½"-0" Stockpile		4	Curve	-	Curves	8	86
Fill Widening	1½"-0" Stockpile		4	Fill	-	Fills	-	16
Junctions	1½"-0" Stockpile		4	Junction	10	Junctions	2	20
Dissipator	24"-6" Riprap							20
Total Rock for Road Segment:			I to J					3,390

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: K to L				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	K to L **Volume (CY) Per**		0+00 to 5+10 **Number of**		
Base Rock	4"-0" Stockpile		10	Station	54	Stations	5.10	275
Turnouts	4"-0" Stockpile		10	Turnout	24	Turnouts	1	24
Curve Widening	4"-0" Stockpile		10	Curve	n/a	Curves	5	30
Surface Rock	1"-0" Stockpile		4	Station	22	Stations	5	112
Turnouts	1"-0" Stockpile		4	Turnout	10	Turnouts	1	10
Curve Widening	1"-0" Stockpile		4	Curve	n/a	Curves	5	15
Free Draining Rock	24"-6" Riprap							206
Fill Armor	24"-6" Riprap							60
Dissipator Rock	24"-6" Riprap							10
Total Rock for Road Segment:			K to L					742
ROAD SEGMENT: 2A to 2B				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	2A to 2B **Volume (CY) Per**		0+00 to 0+75 **Number Of**		
Base Rock	6"-0" Pit-run	2A-2B	8	Station	43	Stations	.50	22
Junction	1"-0" Stockpile	2A	3	Junction	24	Junctions	1	24
Landing	6"-0" Pit-run	2B	N/A	Landing	80	Landings	1	50
Total Rock for Road Segment:			2A to 2B					96
ROAD SEGMENT: 3A to 3B				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	3A to 3B **Volume (CY) Per**		0+00 to 1+70 **Number of**		
Base Rock	6"-0" Pit-run	3A-3B	12	Station	65	Stations	1.70	111
Turn-Around	6"-0" Pit-run		12	TA	24	TAs	1	24
Landing	6"-0" Pit-run	3B	N/A	Landing	80	Landings	1	80
Total Rock for Road Segment:			3A to 3B					215
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 23+80 **Number Of**		
Base Rock	4"-0" Crushed	4A-4B	10	Station	54	Stations	23.80	1,285
Traction Rock	1½"-0" Stockpile	0+00 to 23+80	2	Station	13	Stations	23.80	309
Turnouts	1½"-0" Stockpile		2	Turnout	10	Turnouts	3	30
Turnouts	4"-0" Crushed		10	Turnout	24	Turnouts	3	72
Turn-Around	4"-0" Crushed		10	TA	24	TAs	1	24
Junction	4"-0" Crushed	4B, 4C, 4E, 4G, 4I	10	Junction	24	Junctions	5	120
Landing	6"-0" Pit-run	4+30, 9+25	N/A	Landing	50	Landings	2	100
Total Rock for Road Segment:			4A to 4B					1,941

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: 4C to 4D				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	4C to 4D		0+00 to 1+60		
				Volume (CY) Per		**Number of**		
Base Rock	6"-0" Pit-run	4C-4D	12	Station	65	Stations	1.60	104
Landing	6"-0" Pit-run	4D	N/A	Landing	50	Landings	1	50
Total Rock for Road Segment:				4C to 4D				154
ROAD SEGMENT: 4E to 4F				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	4E to 4F		0+00 to 1+75		
				Volume (CY) Per		**Number Of**		
Base Rock	6"-0" Pit-run	4E to 4F	12	Station	65	Stations	1.75	114
Landing	6"-0" Pit-run	2F	N/A	Landing	50	Landings	1	50
Total Rock for Road Segment:				4E to 4F				164
ROAD SEGMENT: 4G to 4H				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	4G to 4H		0+00 to 2+30		
				Volume (CY) Per		**Number Of**		
Base Rock	6"-0" Pit-run	4G-4H	12	Station	65	Stations	2.30	150
Turn-Around	6"-0" Pit-run		12	TA	24	TA	1	24
Landing	6"-0" Pit-run	2F	N/A	Landing	80	Landings	1	80
Total Rock for Road Segment:				4G to 4H				254
ROAD SEGMENT: 4I to 4J				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	4I to 4J		0+00 to 1+40		
				Volume (CY) Per		**Number Of**		
Base Rock	6"-0" Pit-run	4I-4J	12	Station	65	Stations	1.40	91
Total Rock for Road Segment:				4I to 4J				91
ROAD SEGMENT: I1 to I2 (Tidewater Mainline)				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I1 to I2		0+00 - 33+37, 38+47 - 70+22		
				Volume (CY) Per		**Number Of**		
Leveling	1"-0" Stockpile			Station		Stations		100
Total Rock for Road Segment:				I1 to I2				100

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: I2 to I3 (Tidewater Mainline)				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I2 to I3 **Volume (CY) Per**		0+00 - 59+92 **Number Of**		
Leveling	1"-0" Stockpile		N/A				41	100
Surface Rock	1½"-0" Stockpile		3	Station	16	Stations	18.92	303
Culvert Bedding/Backfill	1½"-0" Stockpile		N/A	Culvert	20	Culverts	3	60
Turnouts	1½"-0" Stockpile		3	Turnout	7	Turnouts	3	21
Removed culvert Back Fill	1½"-0" Stockpile							24
Base Rock	4"-0" Crushed		6	Station	33	Stations	18.92	624
Turnouts	4"-0" Crushed		6	Turnout	14	Turnouts	3	42
Removed culvert Back Fill	4"-0" Crushed							24
Dissipator Rock	24"-6" Riprap		N/A	Culvert	12	Culverts	3	36
Total Rock for Road Segment:			I2 to I3					1,234
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 21+10 **Number Of**		
Subgrade Leveling	1½"-0" Crushed	I5 to I6	N/A					100
Surface Rock	1½"-0" Crushed	I5 to I6	4	Station	22	Stations	21.10	464
Turnouts	1½"-0" Crushed	I5 to I6	4	Turnout	10	Turnouts	4	40
Junctions	1½"-0" Crushed	I5 to I6	N/A	Junction	10	Junctions	1	10
Curve Widening	1½"-0" Crushed	I5 to I6	4	Curve	N/A	Curves		30
Culvert Bedding	1½"-0" Stockpile	0+00, 14+78, 20+05	N/A	Culvert	20	Culverts	3	60
Energy Dissipators	24"-6" Riprap	14+78, 20+05	N/A	Dissipator	10	Dissipators	2	20
Fill Construction	6"-0" Pit-run	2+80	N/A	Fill	40	Fills	1	40
Culvert Bedding	1½"-0" Stockpile	2+80	N/A	Culvert	50	Fills	1	50
Base Rock	4"-0" Crushed	2+80	10	Fill	50	Fills	1	50
Surface Rock	1½"-0" Crushed	2+80	4	Fill	24	Fills	1	24
Fill Armor/Dissipator	24"-6" Riprap	2+80	N/A	Fill	90	Fills	1	90
Fill Construction	6"-0" Pit-run	10+40	N/A	Fill	60	Fills	1	60
Culvert Bedding	1½"-0" Stockpile	10+40	N/A	Culvert	50	Culverts	1	50
Base Rock	4"-0" Crushed	10+40	10	Fill	70	Fills	1	70
Surface Rock	1½"-0" Crushed	10+40	4	Fill	24	Fills	1	24
Fill Armor/Dissipator	24"-6" Riprap	10+40	N/A	Fill	110	Fills	1	110
Box Culvert footing	1½"-0" Stockpile	15+40	N/A	Box-culvert	15	Box-culverts	1	15
Box Culvert footing	24"-6" Riprap	15+40	N/A	Box-culvert	36	Box-culverts	1	36
Fill Armor	24"-6" Riprap	15+40	N/A	Fill	324	Fills	1	324
Base Rock	4"-0" Crushed	15+40	N/A	Fill	37	Fills	1	37
Surface Rock	1½"-0" Crushed	15+40	N/A	Fill	20	Fills	1	20
Total Rock for Road Segment:			I5 to I6					1,724

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: I7 to I8				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I7 to I8		0+00 to 3+95		
				Volume (CY) Per		**Number Of**		
Subgrade Leveling	1½"-0" Stockpile	I7 to I8	N/A					20
Surface Rock	1½"-0" Stockpile	I7 to I8	N/A	Station	22	Stations	3.95	87
Culvert Bedding	1½"-0" Stockpile	0+90	N/A	Culvert	20	Culverts	1	20
Total Rock for Road Segment:			I7 to I8					127
ROAD SEGMENT: I9A to I9				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I9A to I9		0+00 to 3+00		
				Volume (CY) Per		**Number Of**		
Subgrade Leveling	1½"-0" Stockpile		N/A					20
Total Rock for Road Segment:			I9A to I9					20
ROAD SEGMENT: I9 to I10				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I9 to I10		0+00 to 50+00		
				Volume (CY) Per		**Number Of**		
Subgrade Leveling	1½"-0" Stockpile	I9 to I10	N/A					200
Total Rock for Road Segment:			I9 to I10					200
ROAD SEGMENT: I9 to I11				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I9 to I11		0+00 to 28+75		
				Volume (CY) Per		**Number Of**		
Subgrade Leveling	1½"-0" Crushed	I9 to I11	N/A					250
Culvert Bedding	1½"-0" Stockpile	10+25	N/A	Culvert	20	Culverts	1	20
Fill Construction	6"-0" Pit-run	11+80	N/A	Fill	40	Fills	1	40
Culvert Bedding	1½"-0" Stockpile	11+80	N/A	Culvert	40	Culverts	1	40
Base Rock	4"-0" Crushed	11+80	10	Fill	40	Fills	1	40
Surface Rock	1½"-0" Crushed	11+80	4	Fill	24	Fills	1	24
Fill Armor/Dissipator	24"-6" Riprap	11+80	N/A	Fill	50	Fills	1	50
Fill Construction	6"-0" Pit-run	24+75	N/A	Fill	80	Fills	1	80
Culvert Bedding	1½"-0" Stockpile	24+75	N/A	Culvert	90	Culverts	1	90
Base Rock	4"-0" Crushed	24+75	10	Fill	80	Fills	1	80
Surface Rock	1½"-0" Crushed	24+75	4	Fill	36	Fills	1	36
Fill Armor/Dissipator	24"-6" Riprap	24+75	N/A	Fill	170	Fills	1	170
Total Rock for Road Segment:			I9 to I11					920

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: I12 to I13				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I12 to I13		0+00 to 22+80		
				Volume (CY) Per		Number Of		
Subgrade Leveling	1½"-0" Crushed	I12 to I13	N/A					100
Surface Rock	1½"-0" Crushed	I12 to I13	4	Station	22	Stations	22.80	502
Turnouts	1½"-0" Crushed	I12 to I13	4	Turnout	10	Turnouts	3	30
Junctions	1½"-0" Crushed	I12 to I13	N/A	Junction	10	Junctions	1	10
Curve Widening	1½"-0" Crushed	I12 to I13	N/A	Curve	N/A	Curves	N/A	30
Culvert Bedding	1½"-0" Stockpile	13+00, 16+35	N/A	Culvert	40	Culverts	2	80
Culvert Bedding	1½"-0" Stockpile	4+00	N/A	Culvert	20	Culverts	1	20
Energy Dissipators	24"-6" Riprap	13+00	N/A	Dissipator	20	Dissipators	1	20
Fill Construction	6"-0" Pit-run	0+50	N/A	Fill	50	Fills	1	50
Culvert Bedding	1½"-0" Stockpile	0+50	N/A	Culvert	40	Culverts	1	40
Base Rock	4"-0" Crushed	0+50	10	Fill	40	Fills	1	40
Surface Rock	1½"-0" Crushed	0+50	4	Fill	24	Fills	1	24
Fill Armor/Dissipator	24"-6" Riprap	0+50	N/A	Fill	60	Fills	1	60
Fill Construction	6"-0" Pit-run	5+05	N/A	Fill	50	Fills	1	50
Culvert Bedding	1½"-0" Stockpile	5+05	N/A	Culvert	60	Fills	1	60
Base Rock	4"-0" Crushed	5+05	10	Fill	70	Fills	1	70
Surface Rock	1½"-0" Crushed	5+05	4	Fill	24	Fills	1	24
Fill Armor/Dissipator	24"-6" Riprap	5+05	N/A	Fill	70	Culverts	1	70
Fill Construction	6"-0" Pit-run	8+45	N/A	Fill	40	Dissipator	1	40
Culvert Bedding	1½"-0" Stockpile	8+45	N/A	Culvert	60	Culverts	1	60
Base Rock	4"-0" Crushed	8+45	10	Fill	60	Fills	1	60
Surface Rock	1½"-0" Crushed	8+45	4	Fill	24	Culverts	1	24
Fill Armor/Dissipator	24"-6" Riprap	8+45	N/A	Fill	20	Fills	1	20
Fill Construction	6"-0" Pit-run	22+50	N/A	Fill	20	Fills	1	20
Culvert Bedding	1½"-0" Stockpile	22+50	N/A	Culvert	40	Culverts	1	40
Base Rock	4"-0" Crushed	22+50	10	Fill	40	Fills	1	40
Surface Rock	1½"-0" Crushed	22+50	4	Fill	24	Fills	1	24
Fill Armor/Dissipator	24"-6" Riprap	22+50	N/A	Fill	20	Fills	1	20
Total Rock for Road Segment:			I12 to I13					1,628
ROAD SEGMENT: I14 to I15				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I14 to I15		0+00 to 15+90		
				Volume (CY) Per		**Number Of**		
Subgrade Leveling	1½"-0" Stockpile	I14 to I15	N/A					100
Total Rock for Road Segment:			I14 to I15					100
ROAD SEGMENT: I15 to I16				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I15 to I16		0+00 to 7+00		
				Volume (CY) Per		**Number Of**		
Subgrade Leveling	1½"-0" Stockpile	I15 to I16	N/A					20
Total Rock for Road Segment:			I15 to I16					20

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: I17 to I18 (Swede Road)				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I17 to I18		0+00 – 118+80		
				Volume (CY) Per		Number Of		
Subgrade Leveling	1”-0" Stockpile	I17 to I18	N/A					250
Surface Rock	1”-0" Stockpile	0+00 to 26+40	2	Station	11	Stations	26.40	290
Turnouts	1”-0" Stockpile	I17 to I18	N/A	Turnout	10	Turnouts	1	10
Base Rock	4”-0” Stockpile	1+70 (Fish Pipe)	9	Station	49	Stations	1	49
Fill Widening	4”-0” Stockpile	1+70 (Fish Pipe)	9	Fill	14	Fills	1	14
Surface Rock	1”-0" Stockpile	1+70 (Fish Pipe)	4	Station	22	Stations	1	22
Fill Widening	1”-0" Stockpile	1+70 (Fish Pipe)	4	Fill	6	Fills	1	6
Culvert Bedding	1”-0" Stockpile	1+70 (Fish Pipe)	N/A	Fill	146	Fills	1	146
Fill Armor/Dissipator	24"-6" Riprap	1+70 (Fish Pipe)	N/A	Fill	112	Fills	1	112
Dissipator	24"-6" Riprap	3+00	N/A	Fill	10	Fills	1	10
Culvert Bedding	1”-0" Stockpile	3+00	N/A	Culvert	20	Culverts	1	20
Total Rock for Road Segment:			I17 to I18					929
ROAD SEGMENT: I19 to I20 (Wooden Road)				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	I9 to I20		0+00 – 60+00		
				Volume (CY) Per		**Number Of**		
Junctions	1”-0" Stockpile	0+00	N/A	Junction	20	Junctions	1	20
Total Rock for Road Segment:			I19 to I20					20

ROCK TOTALS (CY)	24"-6"	6"-0"	4"-0"	1 1/2"-0"	1"-0"
18,791	2,920	1,430	7,521	5,795	1,125

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

EXHIBIT D

ROCK ACCOUNTABILITY

PURCHASER shall obtain subgrade approval from STATE prior to rocking. Rocking shall be limited to periods when weather conditions are acceptable to STATE and when sediments will not enter streams.

Rock accountability shall be determined by the following methods, as directed by STATE. STATE shall be given 24 hours' notice prior to rocking.

Rock Checking. All rock spreading shall be done only when a STATE representative is present. STATE shall issue a receipt for each load delivered, and rock shall be measured without allowance for shrinkage or shakedown during hauling. Total truck measure volume for each road segment shall be as shown on Exhibit D. Deliver at least 600 cubic yards per 8-hour shift, unless otherwise approved by STATE. A penalty of $10 for each 10 cubic yards which are not delivered during a single shift shall be billed, and payment shall be required prior to final acceptance of the project by STATE.

Depth Measurement. Rock shall be spread and compacted according to the depths specified in Exhibit D. Truck measure volumes are given, but shall not limit the amount of rock spread.

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

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

Load Records. Notify STATE before spreading the rock and maintain a record of all rock delivered for spreading. Make the record available for STATE inspection. A report listing the amount of rock delivered the prior month must be submitted no later than the 15th of each month.

EXHIBIT D

COMPACTION AND PROCESSING REQUIREMENTS

Subgrade. Subgrade surfaces of the road segments listed below shall be graded and compacted prior to rocking. Compaction shall be accomplished by traveling all surfaces from shoulder to shoulder until visible deformation ceases, or in the case of a sheepsfoot roller, the roller "walks out." At least 3 passes shall be made over the entire width and length of the road. A pass is defined as traveling a road section in one direction and then back over that same section again. Compaction shall be accomplished by using one or more of the approved equipment options listed below:

Subgrade shall be crowned at 4 to 6 percent unless otherwise specified.

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
All road segments that require rock surfacing.	1

Fills. Embankments and fills shall be placed in (approximately) horizontal layers not more than 8 inches in depth. Each layer shall be separately, and thoroughly, compacted. Compaction equipment shall be operated over the entire width of each layer until visible deformation of the layers ceases or, in the case of a sheepsfoot roller, the roller "walks out." At least 3 passes shall be made over the entire width and length of each layer. A pass is defined as traveling a fill layer in one direction and then back over that same layer again.

Placing individual rocks or boulders with more depth than the allowed layer thickness shall be Permitted, provided the embankment will accommodate them. Such rocks and boulders shall be at least 6 inches below the subgrade. They shall be carefully distributed and the voids filled with finer material, forming a dense and compacted mass. Compaction shall be accomplished by using one or more of the approved equipment options listed below:

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
All road segments.	1, 2, or 3; and 4

Crushed Rock. The rock shall be uniformly mixed and spread in layers on the approved roadbed. Each layer of crushed rock shall be moistened or dried to uniform moisture content suitable for maximum compaction and compacted in layers not to exceed 6 inches in depth. When more than 1 layer is required, each shall be shaped and compacted before the succeeding layer is placed. Any irregularities or depressions that develop during compaction of the top layer shall be corrected by loosening the material at these places and adding or removing material until the surface is smooth and uniform. Each layer shall be compacted with a minimum of 3 passes over the entire width and length of the road. 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
All road segments requiring pit-run rock.	1, 5, 6

EXHIBIT D

COMPACTION EQUIPMENT OPTIONS

(1) Vibratory Rollers. The drum shall have a smooth surface, a diameter not less than 48 inches, a width not less than 58 inches, and a turning radius of 15 feet or less. Vibration frequency shall be regulated in steps to 1400, 1500, and 1600 VPM, corresponding to engine speeds of 1575, 1690, and 1800 RPM. The centrifugal force developed shall be 7 tons at 1600 VPM. It shall be activated by a power unit of not less than 25 horsepower. The vibratory roller shall be self-propelled and operated at speeds ranging from 0.9 miles to 1.8 miles per hour, as directed by STATE.

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

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

(4) Vibratory Hand-Operated or Backhoe-Mounted Tamper. Vibratory hand-held or hydraulic tampers shall be used for compaction of backfill materials around culverts (and/or bridge approach embankment materials around abutments). The tamper shoe dimensions shall be a minimum of 10" X 13" and capable of a centrifugal force of 2,250 pounds.

(5) Vibratory Grid Compactors. The roller shall have a grid surface and have an operating weight of 32,000 pounds or more. The rock shall be worked with a grader weighing at least 20,000 pounds during the grid rolling process. All rock shall come in contact with the vibratory grid compactor.

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

EXHIBIT E

CULVERT SPECIFICATIONS

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

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

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

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

Tamping is required.

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

The intake ends of culverts in fills less than 3 feet shall be marked by driving white fiberglass posts within 6 inches of the downgrade side. Posts shall be a minimum of 6 feet long and 2 ½ inches wide, with the spade driven 2 feet into the ground.

EXHIBIT E

CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	MATERIAL TYPE	ROAD SEGMENT POINT TO POINT	STATION
1	24	40	CPP	C to D	4+82
2	72	55	ALCSP 12ga.	C to D	9+20
3	18	40	CPP	C to D	11+00
4	18	32	CPP	E to F	2+80
5	18	34	CPP	G to H	4+65
6	18	40	CPP	G to H	7+20
7	48	90	ALCSP 12ga.	G to H	9+20
8	18	40	CPP	I to J	0+70
9	18	34	CPP	I to J	8+70
10	18	34	CPP	I to J	12+65
11	18	34	CPP	I to J	33+25
12	18	50	CPP	I to J	36+65
13	18”	40’	CPP	K to L	1+03
14	18”	40’	CPP	K to L	2+60
15	18”	36’	CPP	I2 to I3	4+97
16	18”	40’	CPP	I2 to I3	9+88
17	18”	40’	CPP	I2 to I3	15+63
18	18”	40’	CPP	I5 to I6	0+00
19	24”	60’	ALCSP 14ga.	I5 to I6	2+80
20	24”	60’	ALCSP 14ga.	I5 to I6	10+40
21	18”	40’	CPP	I5 to I6	14+78
22	10’ x 12’	20’	Concrete	I5 to I6	15+40
23	18”	40’	CPP	I5 to I6	20+05
24	18”	30”	CPP	I7 to I8	0+90
25	18”	30’	CPP	I9 to I11	10+25
26	24”	50’	ALCSP 14ga.	I9 to I11	11+80
27	36”	80’	ALCSP 14ga.	I9 to I11	24+75

EXHIBIT E

CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	MATERIAL TYPE	ROAD SEGMENT POINT TO POINT	STATION
28	24”	50’	ALCSP 14ga.	I12 to I13	0+50
29	18”	30	CPP	I12 to I13	4+00
30	24”	50’	ALCSP 14ga.	I12 to I13	5+05
31	36”	60’	ALCSP 14ga.	I12 to I13	8+45
32	18”	35’	CPP	I12 to I13	13+00
33	18”	30’	CPP	I12 to I13	16+35
34	24”	35’	ALCSP 14ga.	I12 to I13	22+50
35	96”	50’	ALCSP 10ga.	I17 to I18	1+70
36	18”	30’	CPP	I17 to I18	3+00

ALCSP = Aluminized, CPP = Polyethylene

EXHIBIT F

ROCK QUARRY DEVELOPMENT AND USE

(1) PURCHASER shall prepare a written development plan for the quarry area. The plan shall be submitted to STATE for approval prior to conducting any operation in the quarry area. The plan shall include, but not be limited to:

(a) Location of benches and roads to benches.
(b) Disposal site for debris and overburden.
(c) Time lines for rock quarry use.
(d) Erosion Control measures.

An on-site meeting shall be required to discuss the written development plan prior to approval.

(2) PURCHASER shall schedule and coordinate quarry and stockpile usage with other existing or planned activity requiring quarry or stockpile usage. PURCHASER shall notify STATE 5 days prior to the start of quarry development activities.

(3) The quarry site shall be left in a condition free from overburden and debris. Access roads to the quarry, and the quarry floor, shall be cleared at the termination of use. Overburden shall be removed for a distance of 20 feet beyond the developed rock source.

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

(5) At Tidewater Loop Quarry, fall all timber within the flagged boundary and remove all merchantable timber if determined to be necessary upon approval of the written development plan for the quarry area.

(6) Clear and grub the rock source areas. All woody debris, including stumps and Slash shall be hauled to the designated waste areas and piled and disposed of by burning as directed by STATE.

(7) PURCHASER shall obtain a FPA Burn Permit prior to debris disposal for the Tidewater Loop Quarry.

(8) Strip overburden from the rock source area. Overburden materials shall be hauled to the waste area. Waste material shall be spread evenly at the waste areas, sloped and compacted for drainage, as directed by STATE.

(9) 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.

(10) Controlled blasting techniques shall be utilized for any blasting operations, and shall be accomplished using timing devices, delayed charges, low intensity shots, or other suitable means to contain as much material as possible within the quarry development area. 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. Blasting for Project No. 4 shall not be allowed from April 1 through September 15, unless otherwise approved in writing by STATE.

(11) 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.

EXHIBIT F

ROCK QUARRY DEVELOPMENT AND USE

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

(13) Oversized material that is produced or encountered during development shall be broken down and utilized for crushing, or utilized as required in Exhibit D.

(14) 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.

(15) 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.

(16) Apply seed and mulch to the waste areas, as specified in Exhibit M.

TIDEWATER LOOP QUARRY

(17) Salvage useable rock encountered during overburden removal and excavation as directed by STATE. Useable rock shall be stored on-site, or utilized as required in Exhibit D.

(18) Rock Source #1 – To be utilized for rock crushing. STATE shall determine when pre-screening of material prior to rock crushing shall begin. Pre-screening plans shall be included in the written development plan.

(19) Rock Source #2 – To be utilized for Pit-Run and Riprap rock only.

(20) Rock Source #3 – Reduce existing oversize rock and salvage available riprap. Riprap shall be utilized as required in Exhibit D.

(21) Rock Source #4 – Salvage available riprap and utilized as required in Exhibit D. Upon salvaging existing rock, this site may be utilized as an additional waste area if needed.

(22) Utilize 400 cubic yards of 6”-0” as needed to facilitate removal of rock from rock source areas.

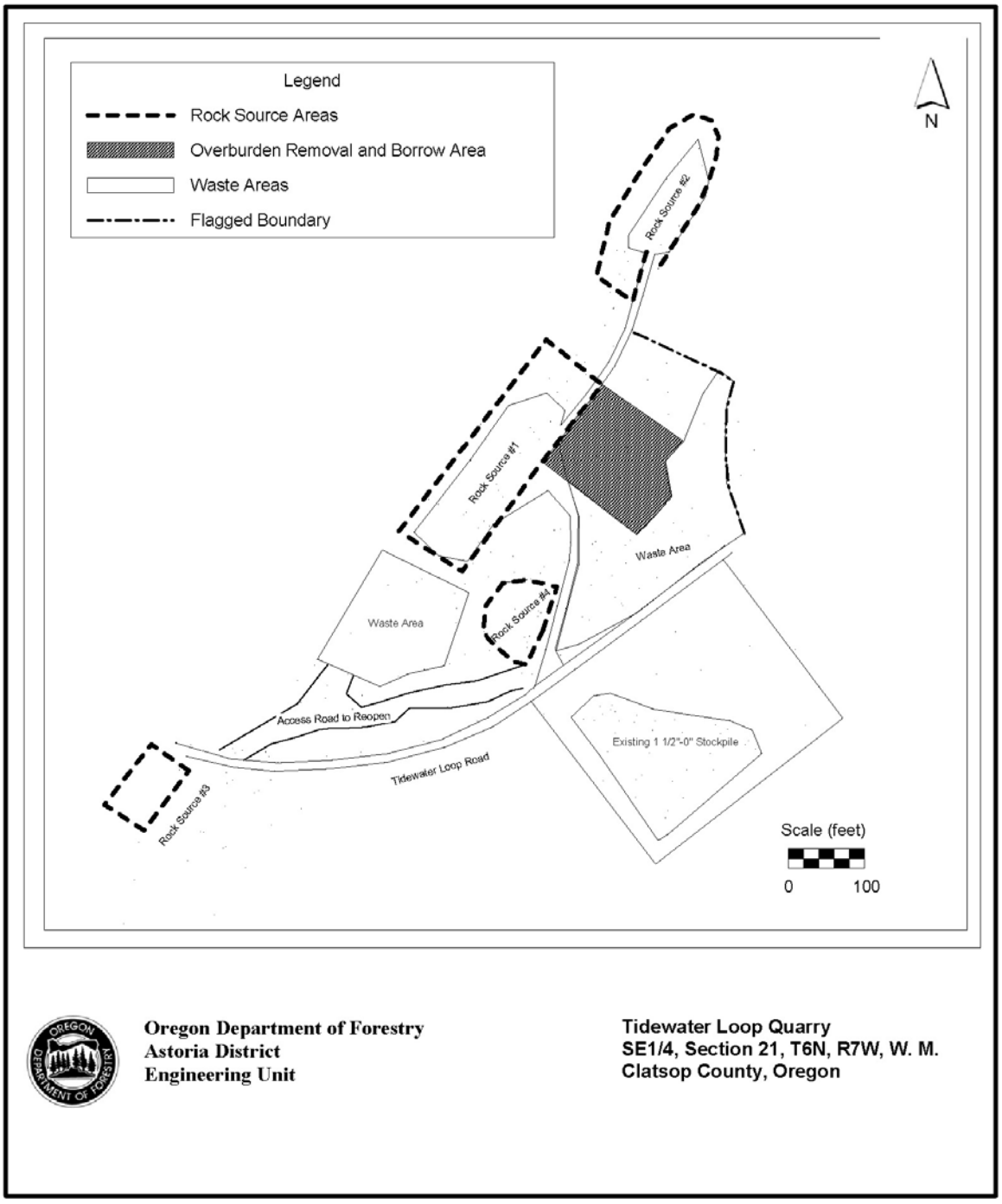
OLD TIDEWATER QUARRY

(23) Develop and utilize all available riprap in the old quarry location.

(24) Woody debris that is encountered during development of riprap shall be placed in stables locations, as directed by STATE.

EXHIBIT F

ROCK QUARRY DEVELOPMENT AND USE



Oregon Department of Forestry
Astoria District
Engineering Unit

Tidewater Loop Quarry
SE1/4, Section 21, T6N, R7W, W. M.
Clatsop County, Oregon

EXHIBIT G

CRUSHED ROCK SPECIFICATIONS

Materials. The material shall be fragments of rock or other hard, durable particles crushed to the required size and a filler of finely crushed stone, sand, or other finely divided mineral matter. The material shall be free from vegetation and lumps of clay. STATE may require screening and/or rejecting of materials utilized for production of crushed rock for the purpose of removing excess fines or dirt. Rock crushing shall be limited to periods when weather conditions are acceptable to STATE.

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

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

Hardness - Test Method AASHTO T 96 35% Maximum

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

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

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

EXHIBIT G

CRUSHED ROCK SPECIFICATIONS

Grading Requirements

For 1½"-0"	Passing	2" sieve	100%
	Passing	1½" sieve	95-100%
	Passing	3/4" sieve	70-90%
	Passing	1/4" sieve	40-60%
	Passing	#10 sieve	30-50%
	Passing	#40 Sieve	10-20%

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.

For 4"-0"	Passing	4" sieve	95-100%
	Passing	2" sieve	70-90%
	Passing	1" sieve	50-80%
	Passing	1/4" sieve	30-50
	Passing	#10 sieve	20-40
	Passing	#40 sieve	5-15%

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

Control of gradation shall be by visual inspection by STATE.

EXHIBIT H

TYPE F STREAM CROSSING STRUCTURE SPECIFICATIONS

PURCHASER shall install two Type F structures. One will be a PURCHASER designed open box concrete slab culvert, and the other will be an Aluminized steel culvert.

GENERAL TYPE F CONSTRUCTION SPECIFICATIONS

(a) Must allow free passage of fish as provided in the Oregon Forest Practice Rules. Modifications of the existing culvert geometry and existing stream channel may be required to allow free passage of fish.

(b) 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 the work. STATE has prepared a FPA "Written Plan" for this work.

(c) Remove the existing embankment and culvert to accommodate the work area for stream crossing construction. Existing embankment(s) shall be excavated to the natural stream course level. All woody debris encountered during excavation shall be removed.

(d) Excavated debris and materials unsuitable for embankment construction shall be end hauled to the designated waste area, as directed by STATE. The existing, removed culverts, shall be hauled to an approved refuse site off of STATE land.

(e) 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.

(f) Oil spill response materials shall be on site before the work begins.

(g) A minimum 2 cubic-yard, track-mounted 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 or footing foundations.

(h) 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.

(i) De-watering of the work site shall be accomplished according to PURCHASER's STATE approved plan and prior to the removal of any additional fill material for the development of the culvert bed, footing pad, and stream channel. The work site shall be de-watered by the use of cofferdams, pumps, temporary diversion ditches and/or drainage structures.

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

EXHIBIT H

TYPE F STREAM CROSSING STRUCTURE SPECIFICATIONS

CONCRETE OPEN BOX CULVERT CONSTRUCTION INSTRUCTIONS

PURCHASER shall design and construct an open bottom concrete slab culvert that is sufficient to provide a natural stream channel width of 12 feet on Road Segment I5 to I6 (Station 15+40).

These specifications require a fully engineered prefabricated concrete slab deck culvert of pre-cast conventionally reinforced concrete construction. Structural members shall be designed in accordance with AASHTO LRFD Bridge Design Specifications, 1998 (Modified). Welding and weld procedure qualification tests shall conform to the provisions of ANSI/AWS D1.1 "Structural Welding Code", 1996 Edition and/or CWB – CSA W59.
The structure shall be designed for HS25 vehicle loads with occasional U80 vehicle overload allowance, and 26 inches of crushed rock loading on the deck. The design shall be prepared by a Professional Engineer licensed in Oregon and approved by STATE.

The stream crossing structure shall maintain the existing road alignment and provide for a road width running surface of 16 feet. STATE has performed a site survey for the purposes of displaying the road and stream locations, elevations, Footing plan, and Armor/Riprap plan shown on pages 4, 5, 6, and 7.
Retaining curbs shall be designed to accommodate and retain roadway embankments. Footings shall extend a minimum of 2 feet below the predicted natural stream bottom elevations and prevent the scour of any substructure, footing or roadway embankment. Riprap rock shall be utilized to armor and protect road approach embankments.

PROJECT PLANS. PURCHASER shall submit plans to STATE for approval, prior to commencement of any work on the project. The plans shall include design calculations, scaled drawings, elevations and section drawings for the structure, including sizes and dimensions of components. The plans shall also include a description of special tools, equipment, the required lifting capacity and the general process to install and connect the components. Plans must contain erosion control measures, site de-watering measures and all information necessary for the administration and inspection of the project by STATE. The plans shall be stamped and signed by a professional engineer licensed in Oregon.

SPECIFIC CONSTRUCTION INSTRUCTIONS (Hamilton Creek Tributary)

(a) Construct stable foundation bases for footings and back walls by utilizing a minimum of 15 cubic yards of 1½"-0" crushed rock, and 36 cubic yards of 24"-6" riprap rock enclosed in geotextile fabric and compacted.

(b) Utilize a minimum of 324 cubic yards of 24"-6" riprap rock for embankment armor and stream bank riprap. Riprap rock shall be placed and tamped at a 1½:1 slope for a minimum thickness of 2 feet, beginning at the fill toes. Armor shall be placed on the open box culvert deck as directed by STATE.

(c) Utilize a minimum of 34 cubic yards of on site cobble to construct new stream channel approaching the box culvert, through the box culvert, and leaving the box culvert. When available cobble has been utilized any remaining material needed will be 4"-0" crushed rock.

(d) As directed by STATE, apply, process, and compact surfacing rock in accordance with Exhibit D. Utilize a minimum of 37 cubic yards of 4"-0" crushed base course rock and 20 cubic yards of 1½"-0" crushed surface course rock to provide for a minimum road surface width of 16 feet and to provide for a smooth and uniform transition from the existing roadway across the structure. Base and surface course crushed rock will be place for 1+00 station of road and box culvert deck.

(e) Construct the concrete open bottom slab culvert and the approach embankments in accordance with approved plans. The approach embankments shall consist of 4"-0" crushed rock and/or select materials, hauled in where necessary. Embankment materials shall be thoroughly compacted in accordance with Exhibit D.

EXHIBIT H

TYPE F STREAM CROSSING STRUCTURE SPECIFICATIONS

SPECIFIC CONSTRUCTION INSTRUCTIONS CONTINUED

(f) Develop the stream channel for a distance of 50 feet upstream of the inlet of the open box culvert and 25 feet down stream of the outlet, as directed by STATE. Stream channel width shall be 12 feet.

(g) Fill reconstruction backfill shall consist of select materials and 4”-0” crushed rock as directed by STATE. Backfill shall be compacted as specified in Exhibit D.

(h) All joints of the concrete members shall be sealed and filled with a construction sealant to prevent material from entering the stream.

(i) Engineer shall supervise and inspect the construction work and issue STATE written certification upon completion of the project.

(j) Engineer shall use EDM type survey instrument to establish the location of the Box Culvert footings

(k) Engineer shall be onsite to establish footing elevations consistent with approved plans prior to the placement of Box Culvert sections.

SPECIFIC ROUND CULVERT INSTALLATION INSTRUCTIONS

(a) All work shall be conducted in accordance with Exhibit E.

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

(c) Develop the stream channel for a distance of 30 feet upstream of the inlet of the culvert and 15 feet downstream of the outlet, as directed by STATE. The stream channel width will be 8 feet and stream channel banks shall be sloped at 1½:1.

(d) Native (excavated) stream sediment material shall be placed in the culvert barrel to a minimum depth of 38 inches to simulate and form the stream bed as directed by STATE. Utilize 12 cubic yards of 24”-6” riprap rock (streambed retention material) placed and embedded at the outlet of the new culvert to establish the stream channel elevation and allow additional stream sediment materials to settle in the barrel of the pipe.

(e) Fill reconstruction backfill shall consist of select materials and 4”-0” crushed rock as directed by STATE. Backfill shall be compacted as specified in Exhibit D. Riprap rock shall be placed and tamped at a 1½:1 slope for a minimum thickness of 2 feet beginning at the toes.

(f) Utilize 26 cubic yards 1”-0” crushed rock bedding reinforcement material, and 120 cubic yards of 1”-0” crushed rock backfill material.

(g) Utilize 112 cubic yards of 24”-6” riprap rock for fill and stream bank armor material placed and tamped at a 1½:1 slope for a minimum thickness of 2 feet beginning at the toes.

Finished fill subgrade width is 20 feet. Finished fill surface width is 16 feet. Utilize 49 cubic yards of 4”-0” crushed base course rock and 22 cubic yards of 1½”-0” crushed surface course rock to provide for a smooth and uniform transition from the existing roadway across the fill. Applied crushed rock shall be processed and compacted as specified in Exhibit D.

EXHIBIT H

SITE PLAN

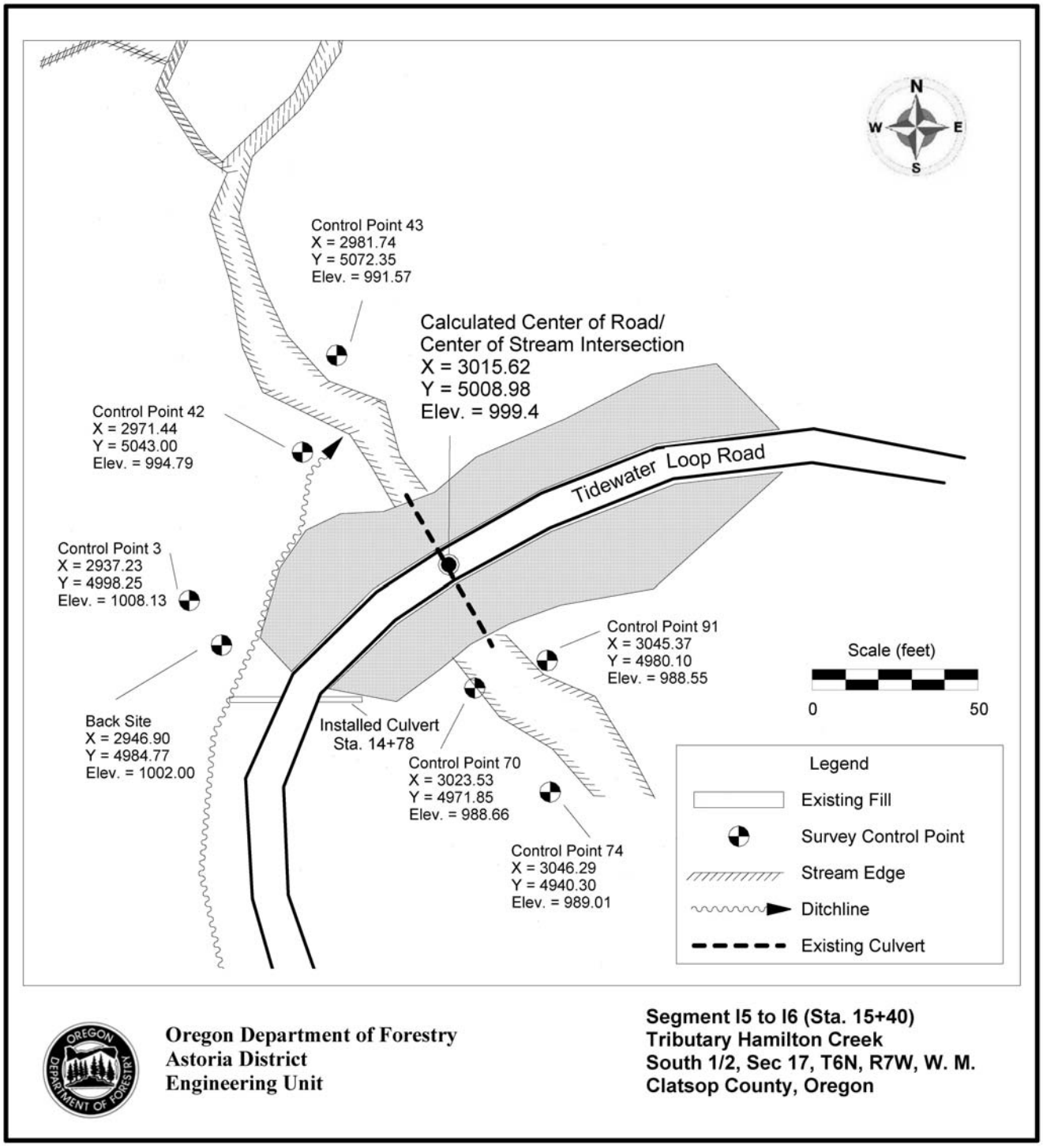


EXHIBIT H

PROFILE VIEW

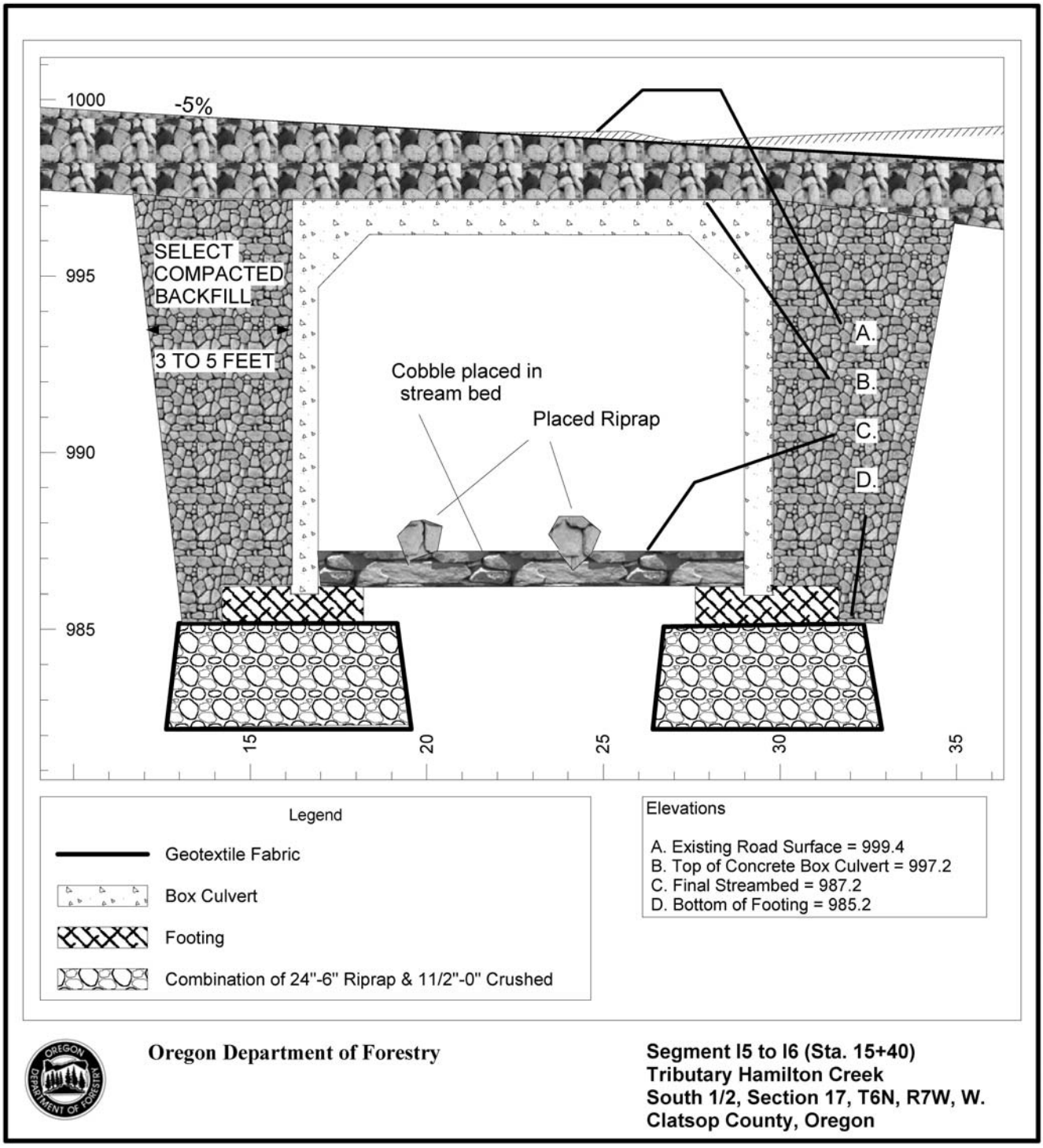


EXHIBIT H

FOOTING PLAN

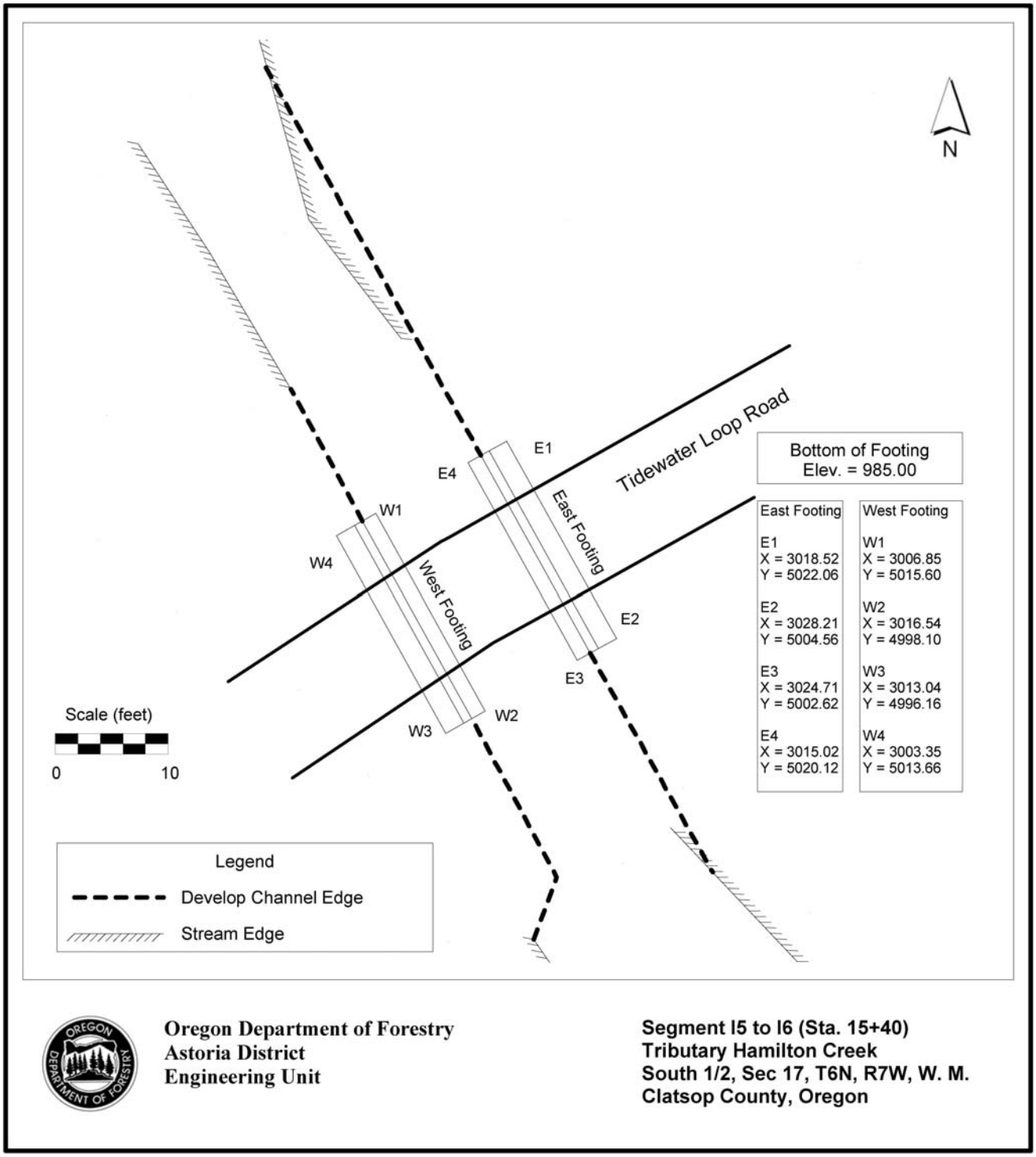
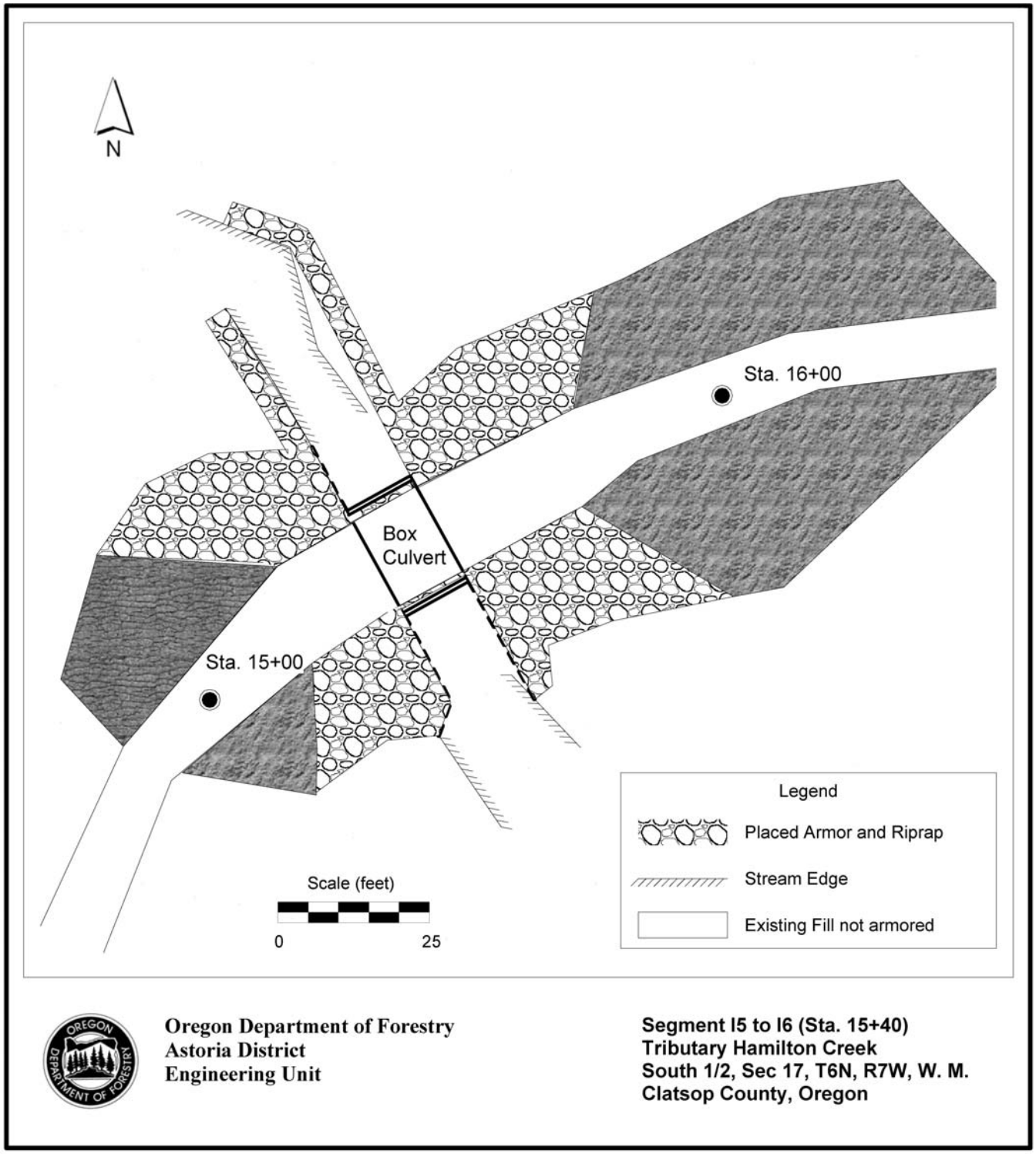


EXHIBIT H

ARMOR RIPRAP PLAN



Oregon Department of Forestry
Astoria District
Engineering Unit

Segment I5 to I6 (Sta. 15+40)
Tributary Hamilton Creek
South 1/2, Sec 17, T6N, R7W, W. M.
Clatsop County, Oregon

EXHIBIT H

PLAN VIEW

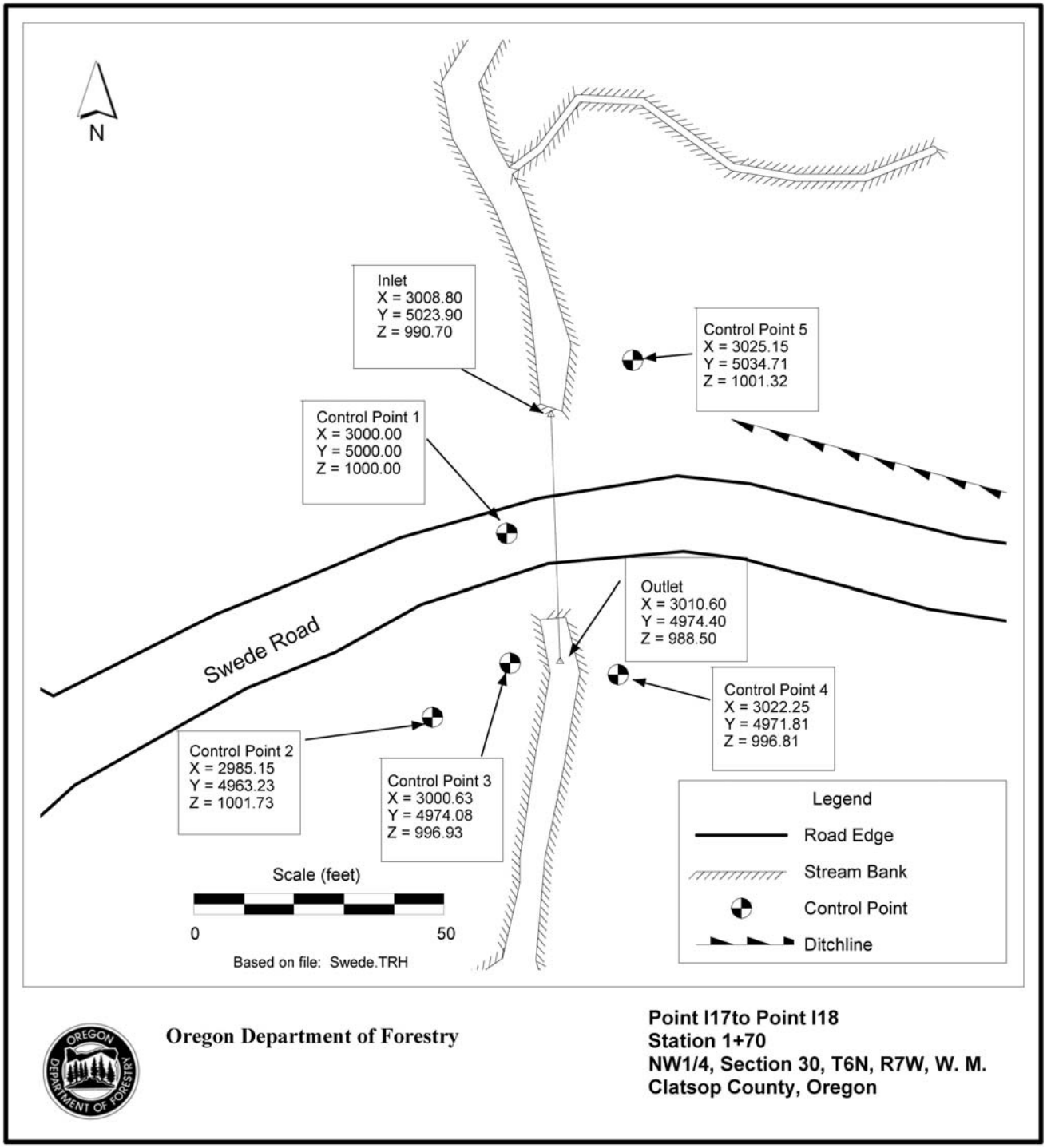
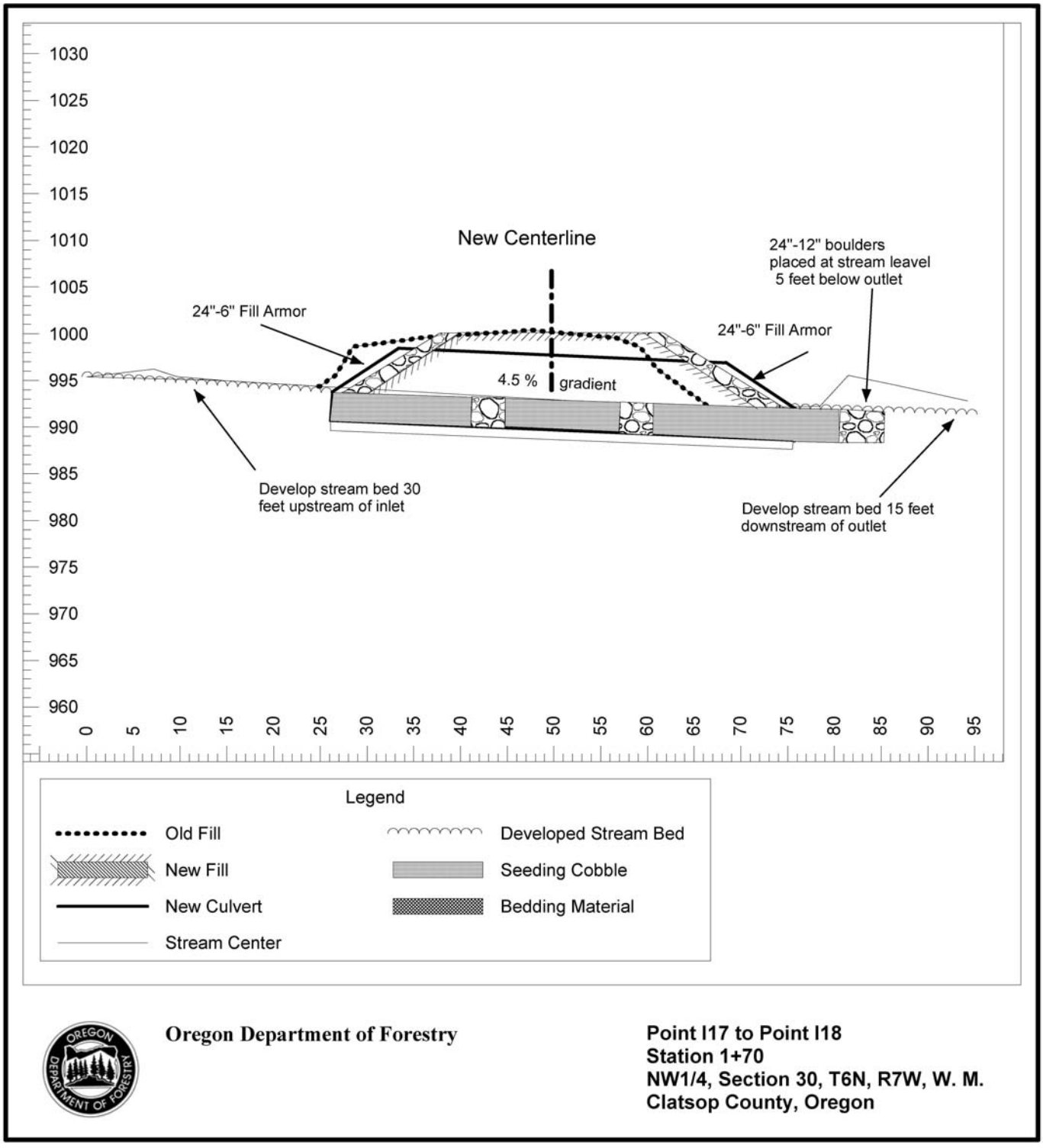


EXHIBIT H

PROFILE VIEW



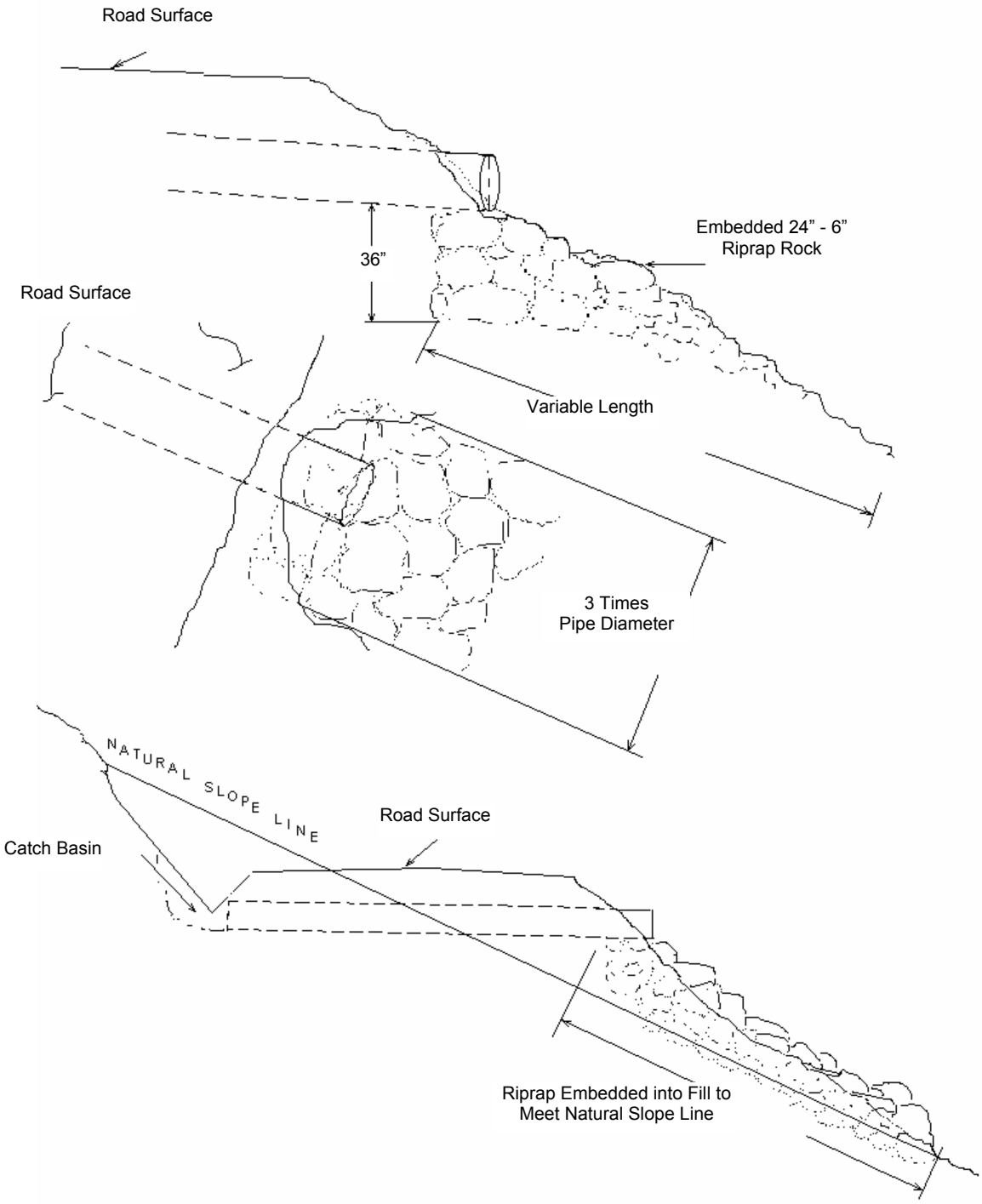
Oregon Department of Forestry

Point I17 to Point I18
Station 1+70
NW1/4, Section 30, T6N, R7W, W. M.
Clatsop County, Oregon

State Timber Sale Contract
No. 341-09-25
Rising Tide

EXHIBIT I

TYPICAL EMBEDDED ENERGY DISSIPATOR



State Timber Sale Contract
No. 341-09-25
Rising Tide

EXHIBIT J

WATERBAR SPECIFICATIONS

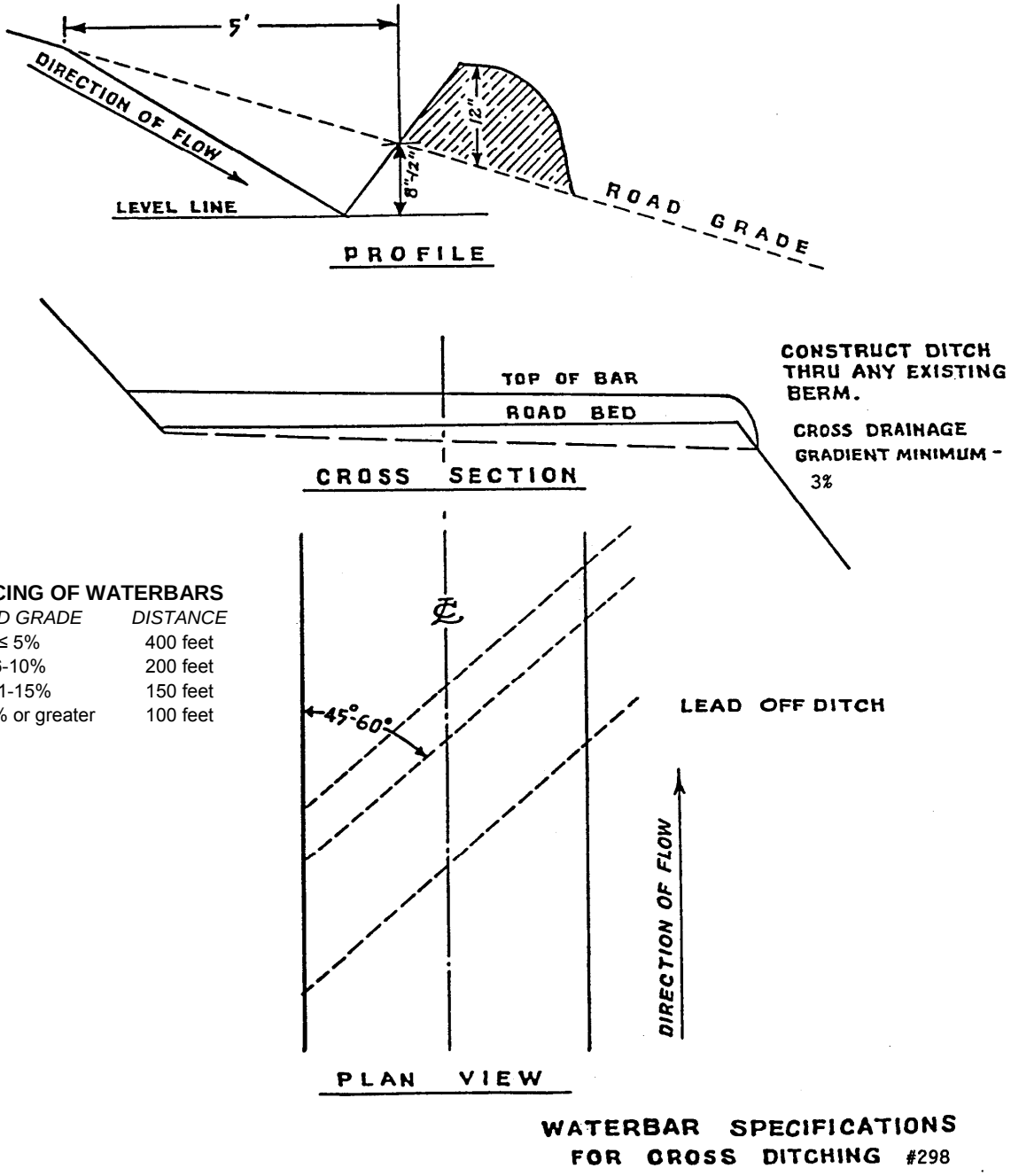


EXHIBIT K

TYPICAL CROSS SECTION VIEW OF ROAD VACATING SIDECAST PULLBACK

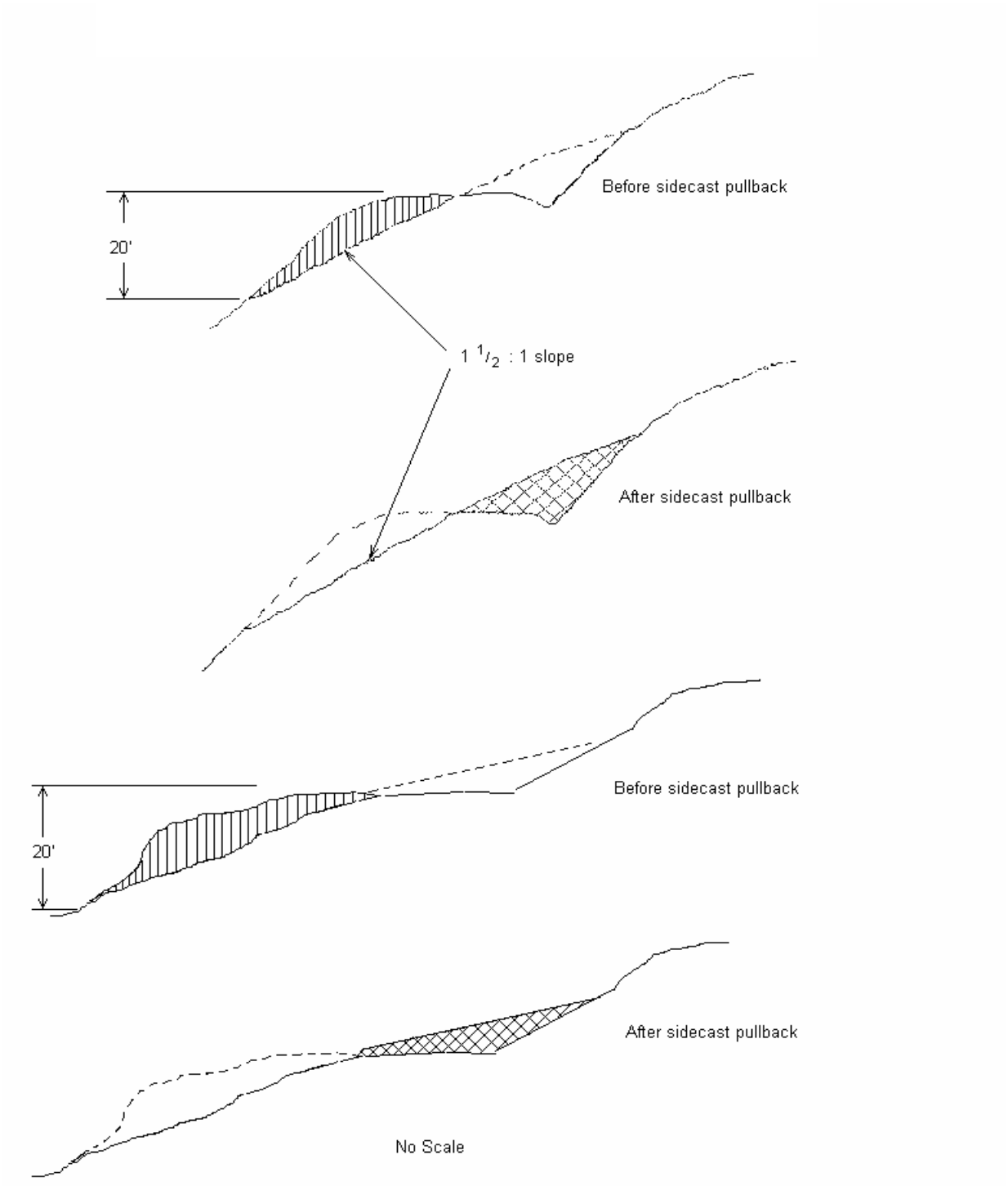


EXHIBIT L

ROAD VACATING SPECIFICATIONS

PURCHASER shall vacate between the following points: V1 to V2, V2 to V3, V4 to V5, and V6 to V7, and V8 to V9. Specific objectives for this project include:

A. Salvage suitable rock from road prism and fills.
B. Fill removal and stream channel development.
C. Culvert removal.
D. Restoration of natural contours by outsloping of the road prism.
E. Sidecast pullback.
F. Minimize disturbance of existing vegetation.
G. A total project cost not exceeding $52,658

PROJECT REQUIREMENTS AND GENERAL SPECIFICATIONS

(1) Tree Removal. Cut or remove all trees necessary to access the project area and to facilitate vacating operations, as directed by STATE.

(2) Rock Salvage. Remove, salvage, and stockpile the existing crushed surfacing rock on roads and useable rock encountered during fill excavation including, but not limited to fill armoring, dissipator and free draining fill material. Salvaged rock shall be stockpiled at the location shown on Exhibit L Map, Rock Salvage Stockpile Area and as directed by STATE.

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

(4) Culvert Removal. Remove drainage structures and culverts. Removed culverts shall be hauled to an approved refuse site off of STATE and WEYERHAEUSER land.

(5) Outslope Road. Outslope road to restore natural contours or establish a minimum of 10% slope for drainage at designated locations. If the road grade exceeds 10%, outslope of the road shall be 2% greater than the road grade.

(6) Sidecast Pullback. Excavate/pullback previously sidecast materials below the road at designated locations. Developed slopes shall be pulled back to a 1½:1 slope or to natural ground contours. The beginning position for sidecast pullback shall be no greater than 20 feet vertical distance from the existing road surface, in accordance with Exhibit K.

(7) Use of Excavated Materials.

(a) Fill Excavation and Sidecast Pullback. Excavated materials shall be placed on the interior (cut) side of the road a minimum of 10 feet from the top of the developed stream bank, and utilized to restore the cutslope to natural contours, or to a minimum 10% outsloped surface for drainage. Any excess material shall be hauled to a designated waste area, as directed by STATE.

(b) Woody Debris shall be placed in stable locations and may be placed on top of compacted embankment material, as directed by STATE.

EXHIBIT L

ROAD VACATING SPECIFICATIONS

(c) Block Roads. Use excavated material from fill removals to block roads from vehicle access, as directed by STATE.

(8) Erosion Control. Erosion control shall be completed in a progressive manner. Grass seed and straw mulch shall be applied to each vacating segment, prior to continuing work.

(a) Apply seed and straw mulch to excavated material and bare soils, in accordance with the specifications in Exhibit M. Applied mulch shall be a minimum of 2 inches deep and provide a uniform cover.

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

(10) Equipment. A minimum 1½ cubic-yard, track mounted excavator shall be used for all excavation, culvert removal, streambed preparation, road blocking, and waterbarring, unless otherwise approved in writing by STATE.

(11) 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. All in-stream work shall be conducted between July 1 and August 31, annually.

Credit for Project Work. The final credit for Project No. 5 shall not exceed $52,658 per Section 2630, "Credit for Project Work," in the Timber Sale Contract. STATE may adjust the credit in Section 2630 in the event that the work is completed prior to using all available credit rates.

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

(1)	C325 excavator, or equivalent, and operator.	$ 130 per operating hour
(2)	C330 excavator, or equivalent, and operator.	$ 138 per operating hour
(3)	D7 dozer, or equivalent, and operator.	$ 120 per operating hour
(4)	D8 dozer, or equivalent, and operator.	$ 132 per operating hour
(5)	C966 front end loader, or equivalent, and operator.	$ 74 per operating hour
(6)	C12G grader, or equivalent, and operator.	$ 65 per operating hour
(7)	C14G grader, or equivalent, and operator.	$ 90 per operating hour
(8)	Heavy Equipment transport and operator. (For secondary mobilization of equipment for the project.)	$ 125 per operating hour
(9)	10-12 cubic yard dump truck and operator.	$ 73 per operating hour
(10)	25 cubic yard, Off-Road dump truck and operator.	$ 125 per operating hour
(11)	Laborer(s) (Application of mulch only)	$ 37 per operating hour
(12)	Straw Mulch (Includes transport and staging of material at job site)	$ 10 per bale
(13)	Grass Seed	$ 2 per pound

EXHIBIT L

ROAD VACATING SPECIFICATIONS

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

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

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

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

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

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

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

SPECIFIC INSTRUCTIONS/SPECIFICATIONS :

Segment	Station	Work Description
V1 to V2	0+00	Point V1. Begin vacating. Block road.
	2+40	Construct waterbar.
	4+30	Remove culvert and fill. Develop a minimum 5 foot stream channel and restore to natural contours.
	10+20	Remove culvert and fill. Restore to natural contours and provide for positive drainage.
11+00 to	12+60	Waste area.
	12+60	Construct waterbar.
	13+00	Remove culvert and fill. Develop a minimum 4 foot stream channel and restore to natural contours.
	13+40	Begin road slide cleanup. Excavation and woody debris shall be placed in stable locations, or hauled to a designated waste area.

EXHIBIT L

ROAD VACATING SPECIFICATIONS

SPECIFIC INSTRUCTIONS/SPECIFICATIONS :

Segment	Station	Work Description
V1 to V2		
	13+70 to 14+25	Remove culvert, road fill and slide material. Develop stream channel to natural contours. Place woody debris in stable location.
	15+00	End road slide cleanup.
	15+30	Remove existing gate and accessories. Gate and accessories shall be hauled and staged at, or near Point B of new road construction. Construct waterbar.
	15+80	Point V2. Pullback and stabilize slopes of the existing fill and widen stream channel at the downstream end of the fill. End vacating.
V2 to V3	0+00	Point V2. Begin vacating. Pullback and stabilize slopes of the existing fill and widen stream channel at the downstream end of the fill.
	0+80	Construct waterbar.
	2+20	Construct waterbar.
	11+10	Begin sidecast pullback. Establish positive drainage across the road prism.
	12+60	End sidecast pullback.
	17+90	Remove culvert and fill. Develop a minimum 9 foot stream channel and restore to natural contours.
	19+15	Remove culvert and fill. Develop a minimum 6 foot stream channel and restore to natural contours.
	19+50	Begin sidecast pullback.
	21+30	End sidecast pullback.
	26+40 to 27+00	Remove road fill to establish positive drainage.
	29+40	Remove culvert and fill and restore to natural contours.
	30+00	Begin sidecast pullback.
	31+00	Point V3. End sidecast pullback. Block road. End vacating.

EXHIBIT L

ROAD VACATING SPECIFICATIONS

SPECIFIC INSTRUCTIONS/SPECIFICATIONS :

Segment	Station	Work Description
V4 to V5	0+00	Point V4. Begin vacating. Block road. Begin rock salvage. Begin road fill removal. Excavated material shall be hauled to a designated waste area.
	2+50	Remove culvert and fill. Develop a minimum 10 foot stream channel and restore to natural contours. Fill and culvert removal shall restore fish passage as directed by STATE.
	3+30	Point V5. End rock salvage. Block road. End vacating.
V6 to V7	0+00	Point V6. Block road. Begin rock salvage.
	2+00	Begin sidecast pullback.
	3+70	End sidecast pullback. Remove culvert and fill. Develop a minimum 8 foot stream channel and restore to natural contours. Develop stream channel upstream and downstream from culvert to restore the natural stream channel.
	5+40	Remove culvert and fill. Develop a minimum 10 foot stream channel and restore to natural contours. Fill and culvert removal shall restore fish passage as directed by STATE. Develop stream channel upstream and downstream from culvert to restore the natural stream channel. Begin sidecast pullback.
	10+30	Point V7. End sidecast pullback. End rock salvage. Block road. End vacating.
V8 to V9	0+00	Point V8. Begin vacating. Begin sidecast pullback. Establish drainage away from fill being vacated at Station 3+70 on V6 to V7.
	2+80	Point V9. End sidecast pullback. Construct waterbar. Block road. End vacating.

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, 4, 5 and 7.

Seeding Seasons. Seeding shall be performed only from March 1 through June 15 and August 15 through October 31. Seeding materials shall not be applied during windy weather or when the ground is excessively wet or frozen. Areas of disturbed soil shall be seeded by the end of the project period in which work was started.

APPLICATION METHODS FOR SEED AND FERTILIZER

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

APPLICATION RATES FOR SEED AND FERTILIZER

The seed mixture listed below shall be applied at 100 lbs. per acre. The seed mixture shall be comprised of the following:

SPECIES	MIXTURE	PURE LIVE SEED	POISON AND/OR REPELLENT	GERMINATION
Annual Rye	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. Fertilizer shall not be applied within 100 feet of streams.

Mulching Period. Straw mulch shall be applied within 24 hours of spreading grass seed and fertilizer.

APPLICATION RATES FOR MULCH

Place straw mulch to a reasonably uniform thickness of 1½ to 2½ inches. This rate requires between 2 and 3 tons of dry mulch per acre.

APPLICATION LOCATIONS:

Apply seed, fertilizer, and straw mulch to all waste areas, and bare soils resulting from Project Nos. 1, 2, 3, 4, and 5. Apply seed and straw mulch only to bare soils resulting from project 7.

EXHIBIT N

ROAD BRUSHING SPECIFICATIONS

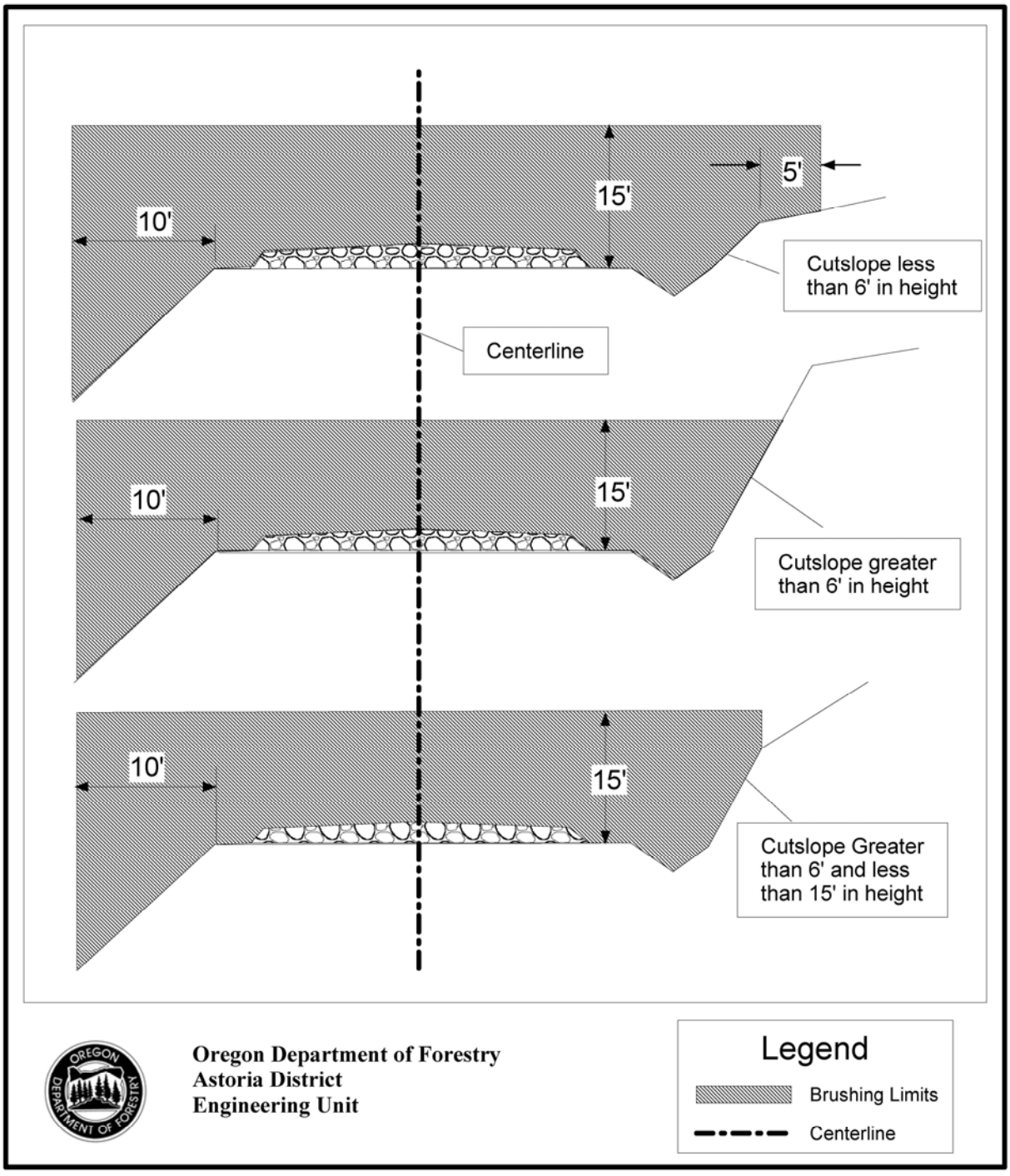


EXHIBIT N

ROAD BRUSHING SPECIFICATIONS

REQUIREMENTS

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

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/outlets, and sediment catch basins. Debris shall be mulched or scattered downslope from the road or placed in other stable locations. Large debris, 6 inches or larger in diameter, shall be mulched or cut into lengths 6 feet or less to facilitate rapid decay, unless otherwise approved by STATE.

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

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

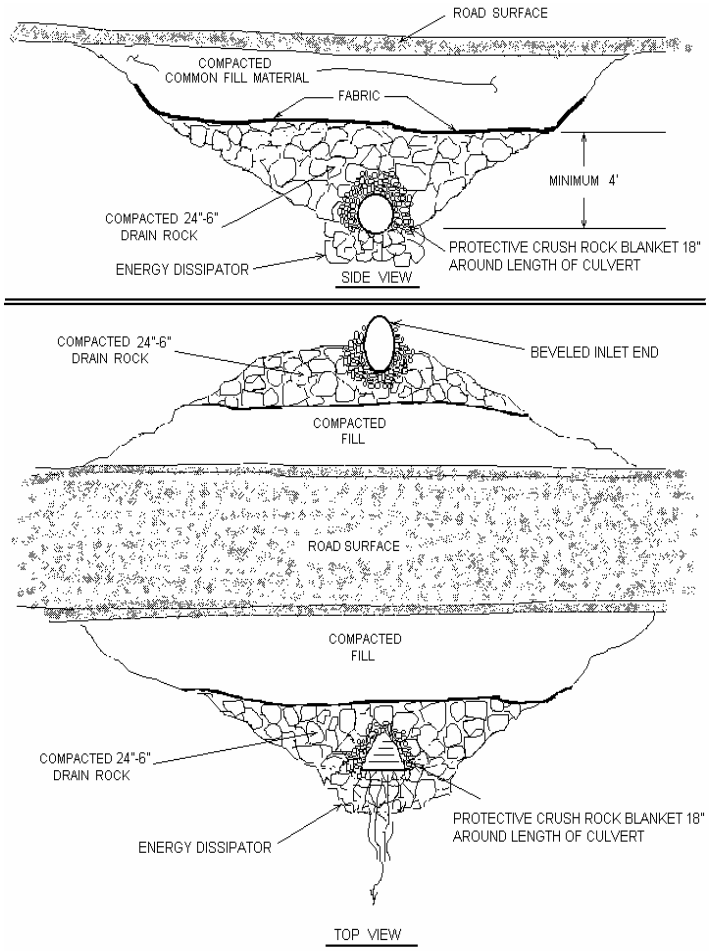
Merchantable blown down trees encountered shall be bucked in lengths as directed by STATE, and placed in locations acceptable to STATE, or pushed out of the road prism.

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

CULVERT AND ROAD MARKER DAMAGES. Culvert and road markers damaged, or any portion of a marker damaged from PURCHASER activities shall be assessed a $25 per marker damage fee.

EXHIBIT O

FREE DRAIN FILL SPECIFICATIONS



Drainage Fabric Specifications:
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

Free Draining Fill Locations and Specifications:

Road Segment	Location	Minimum Free Drain Fill Height
C to D	10+20	2 feet
G to H	9+20	4 feet
K to L	1+60 to 2+15	3 feet

EXHIBIT P

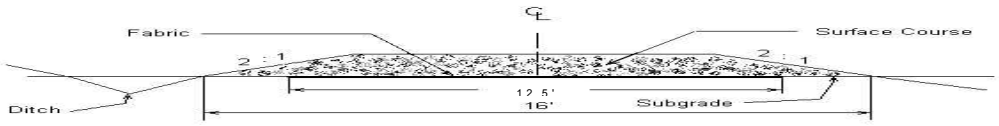
FABRIC SPECIFICATIONS

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

(1)	Grab Tensile	300 lbs.	ASTM D1682
(2)	Modulus Load at 10% Elongation	140 lbs.	ASTM D1682
(3)	Mullen Burst	600 lbs.	ASTM D751
(4)	Width – 12.5 feet, and 16 feet as directed by STATE		

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

(1) Typical cross section:



(2) Subgrade surface shall be leveled and smoothed to remove humps and depressions which exceed 6 inches in height and depth. Small pieces of woody debris shall be removed or pushed below subgrade surface. Light vegetation (grass, weeds, leaves, and fine woody debris) may be left in place.

(3) Fabric shall be installed directly on the prepared surface. Longitudinal and traverse joints shall be overlapped at least 3 feet.

(4) Surfacing course material shall be placed to the designated thickness in one lift and spread in the direction of fabric overlap. Hauling and spreading equipment shall not be operated on the fabric until the total thickness of surfacing course material is placed.

(5) Torn, punctured, or separated sections of the fabric shall be repaired by installing a fabric patch over the break prior to placing the surfacing course material. The patch shall be at least 4 feet larger in horizontal dimensions than the break to be repaired.

(6) Fabric failures resulting after rock placement and as evidenced by subgrade pumping or roadbed distortion shall be corrected. Correction measures shall consist of: (1) removing at least three-quarters the depth of surfacing course material in the affected area, (2) placing a fabric patch over the affected area with a minimum 4-foot overlap around the circumference of the area, and (3) replacing enough rock to cover the patch and blend in with the rest of the road.

(7) Should STATE determine that installation of woven fabric on roads or portions of roads is not necessary, PURCHASER shall deliver an equivalent amount of woven road fabric to STATE.

(8) Fabric locations:

Segment	Location
C to D	3+80 to 13+25
K to L	2+80 to 4+60

EXHIBIT Q

RISING TIDE 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 shall 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 shall be on site before work begins.

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

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

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

(f) 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 shall 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: Three trees with a DBH of at least 20 inches and at least 50 foot long with attached root wads, and three 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 west bank between alders. Wedge the top of the third tree between conifer and alders on east bank with the root wad in mid-channel. Place the three tree tops between and around the three previously placed trees.
Site No. 2	Materials: Five trees with a DBH of at least 20 inches and at least 50 foot long with attached root wads, and five tree tops at least 30 feet long. Place the root wad end of one tree against the east bank with the opposite end angled downstream behind the alders on the west bank. Place the root wad of the second tree against the west ban with the top wedged into alders on the east bank. Place the root wad of the third tree against the east bank immediately upstream of the second tree with the top extending onto the west bank. Place the root wad of the fourth tree against the east bank with the top angled downstream onto the west bank. Place the root wad of the fifth tree in mid channel with the top onto the east bank between alders. Place the five tree tops between and around the three previously placed trees.

EXHIBIT Q

RISING TIDE STREAM ENHANCEMENT INSTRUCTIONS

Site No. 3 Materials: Five trees with a DBH of at least 20 inches and at least 50 foot long with attached root wads, and five tree tops at least 30 feet long. Place the root wads of two trees against the east bank at the sharp bend of the stream with the tops angled downstream and wedged into the alders on the west bank. Place the root wad of the third tree against the west bank with the trunk lying parallel to bank at sharp bend in creek. Place the root wad ends of two trees over the small end of the previously placed tree and the tops angled upstream into small alders on the east bank. Place the five tree tops between and around the three previously placed trees.

Site No. 4 Note: Site number four is located in the tributary stream approximately ¼ mile downstream of site #1 downstream of the bridge.
Materials: Four trees with a DBH of at least 20 inches and at least 50 foot long with attached root wads, one existing log, and four tree tops at least 30 feet long.
Place the root wad of the first tree in mid channel with top extending downstream. Place the root wad of the second tree against the west bank with the top wedged into alders on east bank. Place the root wad of the third tree against east bank with the top wedged into alders on west bank. Place the root wad of the fourth tree against the west bank with the top extending into channel of the small tributary. Place one end of the log onto the west bank with the opposite end extending into mid channel. Place the four tree tops between and around the three previously placed trees.

EXHIBIT R

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.

Covering / Piles – Purchaser shall supply covering for Slash piling as specified 4 MIL Clear Polyethylene Plastic.

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 R

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	115.5	$ 13,860.00
Log Loader	$ 87.50 / hour	159.3	$ 13,860.00

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

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

Work Scheduling - work shall be accomplished only during dry weather conditions, and started within 14 calendar days after completion of yarding activities on Areas 1, 2, 3 and 4. 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.

State Timber Sale Contract
No. 341-09-25
Rising Tide

PART IV: OTHER INFORMATION

FOREST PRACTICES ACT "WRITTEN Plan"
Rising Tide Timber Sale Operating within 100 feet of Type F Streams

Portions of Sections 17, 20, 28, 29, and 32 of T6N, R7W, W.M., Clatsop County, Oregon.

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

Protected Resources:

1. Hamilton Creek
2. Tributaries of Hamilton Creek

Specific Site Characteristics:

1. Hamilton Creek (Large, Type F) – This stream flows along the eastern boundary of Area 2 for approximately 600 feet, and along the southern boundary of Area 3 for approximately 1,600.

2. Tributaries of Hamilton Creek (Large, Medium Type F) – These streams flow along the eastern boundary of Area 4 for approximately 1,500 feet, along the western boundary of Area 3 for approximately 1,050, and along the eastern boundary of Area 3 for approximately 950 feet.

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

MODIFIED CLEARCUT (Areas 1, 2, 3 and 4)
All posted Type F buffers along sale areas meet or exceed 100 feet. No trees within the FPA defined RMA will be felled, except in cable corridors. Cables lines may extend over and/or through these buffers.

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

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

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

Submitted: _____ Date: _____
Purchaser/Operator Contract Representative

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

FOREST PRACTICES ACT "WRITTEN Plan"
Rising Tide Timber Sale New Road Construction and Fill Re-Construction

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

Protected Resources:

Road Segment C to D (Sta. 9+65): A tributary of Hamilton creek, a small Type F fisheries resource, located in the Northeast ¼, Section 20, T6N, R7W., W.M., Clatsop County, Oregon

Road Segment G to H (Sta. 9+20): A tributary of Hamilton creek, a small type N stream, located in the Southwest ¼, Section 16, T6N, R7W., W.M., Clatsop County, Oregon

Road Improvement Segment I9 to I11 (Sta. 24+75): A tributary of Hamilton creek, a small Type F stream, located in the Northwest ¼, Section 21, T6N, R7W., W.M., Clatsop County, Oregon

A written plan is required for construction of a fill over 15 feet and work within 100 feet of a Type F stream.

Situation:

Road Segment C to D (Sta. 9+65**):** A new segment of road will be constructed above a large beaver pond that conflicts with the current road location. A waiver has been granted by the Oregon Department of Fish and Wildlife to allow a stream crossing not conforming to fish passage guidelines. Resource management objectives for this stream crossing project include providing cost effective long-term access, providing for hydraulic stream flow, and protection of water quality and riparian areas.

Road Segment G to H (Sta. 9+20): Transportation planning has located an alternate road location that provides an opportunity to vacate two large fills, one a Type F crossing, in another location. This new road segment will have a stream crossing with a fill 19 feet in height.

Road Improvement Segment I9 to I11 (Sta. 24+75): A galvanized-steel-culvert stream crossing located on Tidewater Loop Road is deteriorating. A waiver has been granted by the Oregon Department of Fish and Wildlife to allow a stream crossing not conforming to fish passage guidelines. Resource management objectives for this stream crossing project include providing cost effective long-term access, providing for hydraulic stream flow, and protection of water quality and riparian areas.

Drainage Area and Structure Design:

Road Segment C to D (Sta. 9+65): The stream crossing structure will be a 72" X 55', 12 gauge aluminized steel round culvert, embedded 24", with both ends step beveled.

Road Segment G to H (Sta. 9+20)**:** A 48" x 12 gauge aluminized steel culvert, with a step beveled inlet will be installed. Drainage basin calculations require a minimum 42" culvert to handle the 50-year Peak Flow. To protect the fill against embankment failure, or downstream movement of fill material, a free draining fill will be constructed and the fill slopes will be armored with riprap rock.

Road Improvement Segment I9 to I11 (Sta. 24+75): A 36" x 14 gauge aluminized steel culvert, with a step beveled inlet will be installed. Drainage basin calculations require a minimum 30" culvert to handle the 50-year Peak Flow.

FOREST PRACTICES ACT "WRITTEN Plan"
Rising Tide Timber Sale New Road Construction and
Fill Re-Construction

Resource Protection Measures:

- 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.
- Machine activity in stream channels will be minimized.
- In-stream work, including, excavation, culvert placement, and riprap rock placement for G to H will be conducted from April 1 to October 31.
- In-stream work, including, excavation, culvert removal, culvert installation, and riprap rock placement for segment I9 to I11 will be conducted from July 1 to August 31.
- Waste materials will be hauled to an approved waste areas and left in a stable condition.
- (Road Segment G to H) A free draining fill will be constructed in accordance with Exhibit O.
- Fill slopes shall be armored with riprap rock placed and tamped at a 1½:1 slope, beginning at the fill toes

I, the undersigned, submit this written plan in compliance with the requirements in the Forest Practices Act regarding construction of a fill over 15 feet in height. I agree to the protection measures listed on this plan.

Submitted _____ _____
Purchaser/Operator/Contract Representative Date

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

FOREST PRACTICES ACT "WRITTEN Plan"
Rising Tide Timber Sale Type F Stream Crossings

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

Protected Resources:

Road Segment I5 to I6, (Sta.15+40): A tributary of Hamilton creek, a medium Type F fisheries resource, located in the South ½, Section 17, T6N, R7W, W.M., Clatsop County, Oregon.

Road Segment I17 to I18 (Sta.1+70): A tributary of Fishhawk creek, a small Type F fisheries resource, located in the Northwest ¼, Section 30, T6N, R7W, W.M., Clatsop County, Oregon

A written plan is required for any activity within 100 feet of any Type F stream.

Situation:

Road Segment I5 to I6 (Sta. 15+40)**:** A galvanized-steel-culvert stream crossing located on Tidewater Loop Road is deteriorating, undersized, and 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.

Road Segment I17 to I18 (Sta. 1+70)**:** A galvanized-steel-culvert stream crossing located on Swede Road is deteriorating, undersized, and 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 (Road Segment I5 to I6) (Sta. 15+40)**:** The stream crossing structure will be an open-bottom concrete-slab culvert which will provide a 12 foot wide waterway under the structure.

Existing Stream Gradient:	3%
Size of Watershed:	222 acres
Minimum Stream Width:	9.6 feet
Stream Bed Material:	Cobble, Sand, Gravel
50-Year Peak Flow/Mi.^{2} :	300 cfs
50-Year Peak Flow:	104 cfs
Flow Capacity of Existing Structure:	64 cfs
Flow Capacity of New Structure:	1016 cfs
	105 ft^2 wetted cross sectional area
	41.5 ft wetted perimeter (w/ 3 ft clearance)

Drainage Area and Structure Design (Road Segment I17 to I18) (Sta. 1+70)**:** The stream crossing structure will be a 96" X 50', 10 gauge aluminized steel round culvert, embedded 38", with both ends step beveled. The stream crossing strategy will simulate natural streambed the entire length of the culvert.

Existing Stream Gradient:	4.5%
Size of Watershed:	116.5 acres
Minimum Stream Width:	7 feet for a 637 foot stream reach
Stream Bed Material:	Cobble, Sand, Gravel
50-Year Peak Flow/Mi.^{2}:	300 cfs
50-Year Peak Flow	54.6 cfs
Flow Capacity of Existing Structures:	31 cfs
Flow Capacity of New Structure:	174 cfs

FOREST PRACTICES ACT "WRITTEN Plan"
Rising Tide Timber Sale Type F Stream Crossings

Resource Protection Measures:

- Machine activity in stream channels will be minimized. All existing fill, existing culvert removal, and rip rap rock placement will be performed using a minimum 2 cubic-yard track-mounted excavator.
- 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.
- In-stream work, including, excavation, culvert removal, culvert installation, Box culvert installation, and riprap rock placement will be conducted from July 1 to August 31.
- An erosion-control plan, approved by STATE but developed by PURCHASER, will be followed to prevent sediment from entering the stream during construction work. The work site shall be de-watered by the use of cofferdams, pumps, temporary diversion ditches and/or drainage structures.
- Waste materials will be hauled to approved waste areas and left in a stable condition.
- A combination of pre-cast open-bottom concrete-slab culvert components and/or riprap rock will be used to construct back walls, and stream deflectors to protect the structure, road approaches/embankments, and stream banks from erosion.
- For the box culvert, use of pre-cast concrete components will prevent contamination of water from mixing and pouring concrete on site.
- Oil spill response materials shall be on site before the work begins.

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

Submitted _____ _____
Purchaser/Operator/Contract Representative Date

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

FOREST PRACTICES ACT "WRITTEN Plan"
Rising Tide Timber Sale Road Vacating

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

Protected Resources:

1. **Vacating Segment V4 to V5:** A tributary of Hamilton creek, a small Type F fisheries resource, located in the Northeast ¼, Section 20, T6N, R7W., W.M., Clatsop County, Oregon

2. **Vacating Segment V6 to V7:** A tributary of Hamilton creek, a small Type F fisheries resource, located in the Northwest ¼, Section 21, T6N, R7W., W.M., Clatsop County, Oregon

A written plan is required for any activity within 100 feet of any Type F stream.

Situation:

1. **Vacating Segment V4 to V5:** A galvanized-steel-culvert stream crossing located on Tidewater Loop Road is deteriorating, undersized, and a partial blockage to fish. This fill will be removed and the stream channel restored.

2. **Vacating Segment V6 to V7:** A galvanized-steel-culvert stream crossing located on Tidewater Loop Road is deteriorating, undersized, and a partial blockage to fish. This fill will be removed and the stream channel restored. At risk sidecast material within 20 feet of the outside edge of the road prism will be pulled back and re-sloped as shown in Exhibit K.

Resource Protection Measures:

- Machine activity in stream channels will be minimized. All excavation and fill removal will be performed using a minimum 1 ½ cubic-yard track-mounted excavator.
- 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.
- 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.
- Excavated fill materials will be used for recontouring slopes or placed in approved waste areas and left in a stable condition.
- Bare soils shall be grass seeded and/or mulched with straw mulch approved by STATE. Applied mulch shall be a minimum of 2 inches deep and provide a uniform cover.
- Disturbance to existing vegetation will be minimized.

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

Submitted _____ _____
Purchaser/Operator/Contract Representative Date

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

FOREST PRACTICES ACT "WRITTEN Plan"
Rising Tide Timber Sale Road Vacating

Landowner: Weyerhaeuser Company
PO Box 998
Seaside, OR 97138
(503) 738-6351

Protected Resources:

1. **Vacating Segment V1 to V2:** Upper reaches of Hamilton creek, a small Type F fisheries resource, located in the Southeast ¼, Section 18, T6N, R7W, W.M., Clatsop County, Oregon.

2. **Vacating Segment V2 to V3:** Upper reaches of Hamilton creek, a small Type F fisheries resource, located in the Southeast ¼, Section 18, T6N, R7W, W.M., Clatsop County, Oregon.

A written plan is required for any activity within 100 feet of any Type F stream.

Situation:

1. **Vacating Segment V1 to V2:** Transportation and harvest planning have identified an alternate road location on a nearby ridge top location. In cooperation with the Weyerhaeuser Company, a portion of this road will be vacated and put to bed. A fill that was previously vacated will have additional pullback conducted, remnants of a debris flow blocking the road will be cleaned up and one fill will be removed and stream channel restored.

2. **Vacating Segment V2 to V3:** A fill that was previously vacated will have additional pullback conducted and approximately 200 feet of road parallel to the stream will be waterbarred and blocked.

Resource Protection Measures:

- 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.
- Machine activity in stream channels will be minimized. All excavation and fill removal will be performed using a minimum 1 ½ cubic-yard track-mounted excavator.
- Excavated fill materials will be used for recontouring slopes or placed in approved waste areas and left in a stable condition.
- Bare soils shall be grass seeded and/or mulched with straw mulch approved by STATE. Applied mulch shall be a minimum of 2 inches deep and provide a uniform cover.
- Disturbance to existing vegetation will be minimized.

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

Submitted _____ _____
Purchaser/Operator/Contract Representative Date

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

FOREST PRACTICES ACT "WRITTEN Plan"
Rising Tide Timber Sale
Stream Enhancement

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

Protected Resources:
The following streams are located in Sections 28 and 29 of T6N, R7W, W.M., Clatsop County, Oregon.

Hamilton Creek which is designated as a large Type F stream is 10 feet to 25 feet wide at the project sites. Stream Enhancement projects are planned at four locations west of Hamilton Creek Road near the vacated fill site.

Unnamed Tributary of Hamilton Creek designated as a large Type F stream is 10 feet to 20 feet wide at the project site. There are plans for a stream enhancement project at one location west of the Hamilton Creek Road Bridge.

Specific Site Characteristics:
The streambed is approximately 10 to 25 feet wide where it parallels Hamilton Creek Road in places. The stream has a meandering pattern with a relatively low stream gradient. A broad flood plain accompanies the streams active channel. The stream banks are relatively gentle and riparian vegetation is alder with some mixed conifer salmonberry, and grasses.

Tree and Vegetation Retention:
No harvesting is being planned along Hamilton Creek. Logs and trees used for the stream enhancement will be taken from off-site locations nearby, but not within the stream buffers.

Practices:
Four stream enhancement structures will be constructed using ground based equipment at points SE1 – SE4. The approximate locations are shown on the Exhibit A map.

Each Stream Enhancement structure must be created by the PURCHASER for stream improvement as recommended by ODFW fisheries biologist. Each structure will be created by placing conifer logs (approximately 20 inches DBH and 50 feet long with root wads attached) in the Type F stream. Structures shall be at least 100 feet apart. The logs will be placed with a log loader or excavator into the stream at locations specified by STATE, and with consultation from an ODFW fisheries biologist. All conifer logs will be taken from locations outside of the RMA. This work will take place during the instream work period (July 1 – August 31) if possible. If the work cannot be done during the designated instream work period an ODFW fisheries biologist will be consulted to field verify any fish habitat concerns and approve any work to be conducted outside the designated period. No excavation will be conducted during the stream enhancement.

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

Submitted: _____ Date: _____
Purchaser/Operator Contract Representative

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

OREGON DEPARTMENT of FISH and WILDLIFE

FISH SCREENING PROGRAM

SMALL PUMP SCREEN SELF CERTIFICATION

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

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

Screen material open area must be at least 27% of the total wetted screen area.

Perforated plate: Openings shall not exceed 3/32 or 0.0938 inches (2.38 mm).
Mesh/Woven wire screen: Square openings shall not exceed 3/32 or 0.0938 inches (2.38mm) in the narrow direction, e.g., 3/32 inch x 3/32 inch open mesh.
Profile bar screen/Wedge wire: Openings shall not exceed 0.0689 inches (1.75 mm) in the narrow direction.

Screen area must be large enough to cause fish impact. Wetted screen area depends on the water flow rate and the water approach velocity. **Approach velocity** is the water velocity perpendicular to and approximately three inches in front of any part of the screen face.

An Active pump screen is a self cleaning screen that has a proven cleaning system. The **screen approach velocity for active pump screens** shall not exceed 0.4 fps (feet per second) or 0.12 mps (meters per second). The wetted screen area in square feet is calculated by dividing the maximum water flow rate in cubic feet per second (1 cfs = 449 gpm) by 0.4 fps.

A Passive pump screen is a screen that has no cleaning system other than periodic manual cleaning. **Screen approach velocity for passive pump screens** shall not exceed 0.2 fps or 0.06 mps. The wetted screen area in square feet is calculated by dividing the maximum water flow rate by 0.2 fps.

For further information on fish screening please contact:

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

As evidence of having met fish screen installation requirements, please sign the certification and send to: Oregon Water Resources Department, Water Rights Section, 725 Summer St. NE, Suite A, Salem, OR 97301-1271

Certification: I certify that my small pumped diversion of less than 225 gpm meets fish screening criteria, and that I will maintain it to comply with regulatory criteria. I also understand that should fish screening standards change, I may be required to modify my installation to meet applicable standards.

Applicant Signature:_____ Date:___ / ___/ __WRD File #

Printed Name and Address: _____

Phone: (___)_____ Fax: (___)_____

bmk
3/11/99
PUMPCERT.doc

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