

EXHIBIT "B"

FOREST ROAD SPECIFICATIONS

SUBGRADE WIDTH	SURFACED WIDTH	POINT TO POINT	STA. TO STA.	DITCH REQ.	OUTSLOPE/WATERBAR
16 feet	12 feet	1A to 1B	0+00 to 13+00	Yes	No
16 feet	12 feet	2A to 2B	0+00 to 3+85	Yes	No
16 feet	12 feet	3A to 3B	0+00 to 18+15	Yes	No
16 feet	12 feet	3C to 3D	0+00 to 19+20	Yes	No
16 feet	12 feet	3E to 3F	0+00 to 25+15	Yes	No
16 feet	12 feet	3G to 3H	0+00 to 1+30	Yes	No
16 feet	12 feet	3I to 3J	0+00 to 10+00	Yes	No
14 feet	12 feet	3K to 3L	0+00 to 4+50	No	Yes
16 feet	12 feet	I1 to I2	0+00 to 88+50	Yes	No

CLEARING. This work shall consist of clearing, removing, and disposing of all trees, snags, down timber, brush, surface objects, and protruding obstructions within the clearing limits.

Where clearing limits have not been staked, the clearing limits shall extend 10 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.

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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 classifications are as follows:

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 through openings in the timber outside of the cleared right-of-way, except areas where end-haul is required.

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 in lifts not to exceed 8 inches in depth.

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-risk site by STATE.

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

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

Curve Widening. Widen the inside shoulder of all curves as follows: 400 divided by the radius of the curve equals the amount of extra width.

DRAINAGE

Ditches. Construct "V" ditch 3 feet wide and to a depth of 1 foot below subgrade. Subgrade shall be crowned at 4 to 6 percent.

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 a minimum 50 feet, or as staked on the ground, plus 25-foot approaches at each end.

Location: As marked in the field.

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FOREST ROAD SPECIFICATIONS

GRADING

Rock
 Common – side slopes 50% and over
 Common – side slopes less than 50%
 Common – turnpike (level) section

Back Slopes
 Vertical to 1/4:1
 3/4:1
 1:1
 2:1

Fill Slopes
 Not steeper
 than 1½:1

Top of cutslope shall be rounded.

LANDINGS. Landings shall be constructed 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 B.

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

SEASONAL WINTERIZATION. All unrocked or unfinished subgrade shall be waterbarred in accordance with specifications in Exhibit G, and blocked from vehicular traffic, prior to October 1, annually, and as directed by STATE.

UNDERGROUND POWER LINES. Contact Western Oregon Electric Company to locate underground power line prior to any road construction activity.

GENERAL ROAD CONSTRUCTION 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 B.
- (2) **Riprap Rock Use.** Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet.
- (3) **Grass Seed and Fertilize.** Grass seed and fertilize all areas of disturbed and/or bare soils according to the specifications in Exhibit H.

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
3A to 3B	1+60	Utilize 10 cubic yards of 24"– 6" riprap rock to construct an energy dissipator for culvert outlet.
	2+00	Begin full bench truck end haul. Utilize suitable fill material for fill construction between Stations 6+00 and 8+30.
	3+15	End full bench truck end haul.
3E to 3F	5+10	Utilize 10 cubic yards of 24"– 6" riprap rock to construct an energy dissipator for culvert outlet, and 10 cubic yards of 1½"-0" for culvert bedding.

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FOREST ROAD SPECIFICATIONS

GENERAL ROAD IMPROVEMENT INSTRUCTIONS

- (1) Culvert Replacement and Culvert Installation. Existing culvert geometry shall be modified to provide for optimum drainage and culvert performance. Modifications may include, skewing the culvert and/or installing the pipe at gradients equal to or exceeding the drainage (or ditch) gradient. 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. Fill reconstruction backfill shall consist of select materials and be obtained from borrow pits, as directed by STATE. Backfill materials shall be hauled in where necessary and thoroughly compacted in accordance with Exhibit B. Crushed rock shall be used for backfilling excavation trenches less than 3 feet deep. Removed culverts shall be hauled to an approved refuse site off of STATE land.
- (2) 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.
- (3) 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. Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet.
- (4) Subgrade Preparation and Application of Surfacing Rock.
 - (a) Clear roadside brush between Points I1 and I2, in accordance with Exhibit F.
 - (b) Complete culvert installations, drainage ditches, and other specified work prior to the application of new surfacing rock.
 - (c) Cut out all chuckholed and/or washboard sections from the existing surfacing.
 - (d) Apply required 1½" – 0" or 4" – 0" base patching and leveling rock, as directed by STATE.
 - (e) Process (grade+mix) the existing surfacing and added base rock. Provide for a 6% crown, and compact in accordance with Exhibit B.
 - (f) Upon completion of above required work, apply, process, and compact surfacing rock in accordance with Exhibit B.

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FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
I1 to I2	4+06	Install culvert. Utilize 24 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill.
I1 to I2	7+50	Culvert replacement. Utilize 24 cubic yards 1½"-0" crushed rock for culvert bedding and backfill.
I1 to I2	8+50	Turnout construction, 50 feet.
I1 to I2	14+61	Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator for culvert outlet.
I1 to I2	18+66	Turnout construction, 50 feet.
I1 to I2	24+49	Culvert replacement. Utilize 12 cubic yards 1½"-0" crushed rock for culvert backfill.
I1 to I2	25+60	Remove existing culvert. Utilize 12 cubic yards 1½"-0" crushed rock for backfilling the trench.
I1 to I2	26+10	Turnout construction, 50 feet.
I1 to I2	26+46	Culvert replacement. Utilize 24 cubic yards 1½"-0" crushed rock for culvert bedding and backfill.
I1 to I2	30+01	Culvert replacement. Utilize 24 cubic yards 1½"-0" crushed rock for culvert bedding and backfill.
I1 to I2	30+81	Turnout construction, 50 feet.
I1 to I2	35+57	Culvert replacement. Utilize 24 cubic yards 1½"-0" crushed rock for culvert bedding and backfill.
I1 to I2	36+51	Turnout construction, 50 feet.
I1 to I2	41+00	Turnout construction, 50 feet.
I1 to I2	42+60	Culvert replacement. Utilize 24 cubic yards 1½"-0" crushed rock for culvert bedding and backfill.
I1 to I2	46+10	Turnout construction, 50 feet.
I1 to I2	49+55	Culvert replacement. Utilize 24 cubic yards 1½"-0" crushed rock for culvert bedding and backfill.

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SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
I1 to I2	53+70	Turnout construction, 50 feet.
I1 to I2	59+50	Turnout construction, 50 feet.
I1 to I2	60+00	Culvert replacement. Utilize 24 cubic yards 1½"-0" crushed rock for culvert bedding and backfill.
I1 to I2	64+75	Turnout construction, 50 feet.
I1 to I2	65+32	Culvert replacement. Utilize 24 cubic yards 1½"-0" crushed rock for culvert bedding and backfill.
I1 to I2	70+50	Turnout construction, 50 feet.
I1 to I2	70+90	Culvert replacement. Utilize 12 cubic yards 1½"-0" crushed rock for backfilling the trench.
I1 to I2	78+72	Remove existing culvert. Utilize 12 cubic yards 1½"-0" crushed rock for backfilling the trench.
I1 to I2	82+85	Culvert replacement. Utilize 24 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill.

EXHIBIT "B"
 ROAD SURFACING

TYPE OF ROCK	SIZE OF ROCK	CUBIC YARDS PER STA.	COMPACTED DEPTH (INCHES)	POINT TO POINT	STATION TO STATION	TOTAL TRUCK MEASURE VOLUME (CY)
Crushed	4"-0"	50	8"	1A to 1B	0+00 to 13+00	650
Crushed	4"-0"	50	8"	2A to 2B	0+00 to 3+85	193
Crushed	4"-0"	50	8"	3A to 3B	0+00 to 18+15	907
Crushed	¾"-0"	19	3"	3A to 3B	0+00 to 18+15	345
Crushed	4"-0"	50	8"	3C to 3D	0+00 to 19+20	960
Crushed	¾"-0"	19	3"	3C to 3D	0+00 to 19+20	365
Crushed	4"-0"	50	8"	3E to 3F	0+00 to 25+15	1,258
Crushed	¾"-0"	19	3"	3E to 3F	13+50 to 21+00	142
Crushed	4"-0"	50	8"	3G to 3H	0+00 to 1+30	65
Crushed	4"-0"	50	8"	3I to 3J	0+00 to 10+00	500
Crushed	¾"-0"	19	3"	3I to 3J	0+00 to 7+50	143
Crushed	4"-0"	50	8"	3K to 3L	0+00 to 4+50	225
Crushed	1½"-0"	19	3"	I1 to I2	0+00 to 88+50	1,681
TURNOUTS:		CUBIC YARDS PER T.O.		NO. OF T.O.	POINT TO POINT	
Crushed	4"-0"	22	8"	2	1A to 1B	44
Crushed	4"-0"	22	8"	6	3A to 3B	132
Crushed	¾"-0"	10	3"	6	3A to 3B	60
Crushed	4"-0"	22	8"	6	3C to 3D	132
Crushed	¾"-0"	10	3"	6	3C to 3D	60
Crushed	4"-0"	22	8"	5	3E to 3F	110
Crushed	¾"-0"	10	3"	2	3E to 3F	20
Crushed	4"-0"	22	8"	2	3I to 3J	44
Crushed	¾"-0"	10	3"	2	3I to 3J	20
Crushed	4"-0"	22	8"	1	3K to 3L	22
Crushed	4"-0"	22	8"	11	I1 to I2	242
Crushed	1½"-0"	10	3"	11	I1 to I2	110
TURNAROUNDS:		CUBIC YARDS PER T.A.		NO. OF T.A.		
Crushed	4"-0"	30	8"	1	1A to 1B	30
Crushed	4"-0"	30	8"	1	3A to 3B	30
Crushed	4"-0"	30	8"	1	3C to 3D	30
Crushed	4"-0"	30	8"	1	3E to 3F	30
Crushed	4"-0"	30	8"	1	3I to 3J	30
JUNCTIONS:		CUBIC YARDS PER JCT.		NO. OF JCT.		
Crushed	4"-0"	30	8"	1	1A to 1B	30
Crushed	1½"-0"	10	8"	1	1A to 1B	10
Crushed	4"-0"	30	8"	1	2A to 2B	30
Crushed	1½"-0"	10	8"	1	2A to 2B	10
Crushed	4"-0"	30	8"	1	3A to 3B	30
Crushed	¾"-0"	20	3"	1	3A to 3B	20
Crushed	4"-0"	30	8"	1	3C to 3D	30
Crushed	¾"-0"	20	3"	1	3C to 3D	20
Crushed	4"-0"	30	8"	1	3E to 3F	30
Crushed	¾"-0"	10	3"	1	3E to 3F	10
Crushed	4"-0"	30	8"	1	3G to 3H	30
Crushed	4"-0"	30	8"	1	3I to 3J	30
Crushed	4"-0"	30	8"	1	3K to 3L	30
Crushed	¾"-0"	20	3"	2	I1 to I2	40

EXHIBIT "B"
 ROAD SURFACING

TYPE OF ROCK	SIZE OF ROCK	VOLUME PER LANDING	LOCATION	NO. OF LANDINGS	TOTAL CUBIC VOLUME
LANDINGS:					
Pit-run	6" - 0"	80	1B, 2B, 3B, 3D, 3F, 3H, 3J, 3L	8	640
MISCELLANEOUS:		USE	POINT TO POINT	APPROX. CUBIC VOLUME (TRUCK MEAS.)	
Crushed	4" - 0"	Curve Widening	3A to 3B	100	
Crushed	¾" - 0"	Curve Widening	3A to 3B	40	
Crushed	4" - 0"	Curve Widening	3C to 3D	100	
Crushed	¾" - 0"	Curve Widening	3C to 3D	40	
Crushed	4" - 0"	Curve Widening	3E to 3F	70	
Crushed	¾" - 0"	Curve Widening	3E to 3F	20	
Crushed	1½" - 0"	Curve Widening	I1 to I2	100	
Crushed	1½" - 0"	Subgrade Leveling	I1 to I2	340	
Crushed	1½" - 0"	Culvert Bedding	3E to 3F	10	
Crushed	1½" - 0"	Culvert Backfill/Bedding	I1 to I2	288	
Riprap	24" - 6"	Energy Dissipator	3A to 3B	10	
Riprap	24" - 6"	Energy Dissipator	3E to 3F	10	
Riprap	24" - 6"	Energy Dissipator	I1 to I2	10	

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

ROCK SUMMARY

ROCK SIZE	APPROX. TOTAL TRUCK MEASURE VOLUME (CY)
¾" - 0"	1,345
1½" - 0"	2,549
4" - 0"	6,144
6" - 0"	640
24" - 6"	30
TOTAL	10,708

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ROCK ACCOUNTABILITY

The rock shall meet the quality and size specifications in Exhibit E. A sample of the rock must be supplied to STATE for testing and approval prior to rocking. Subgrades must be approved by STATE prior to rocking. Rocking must be done only when weather conditions are acceptable to STATE, and must be suspended when muddy water could enter streams from runoff.

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

Rock Checking. All rock spreading shall be done only when a STATE representative is present. STATE shall issue a receipt for each load delivered, and rock shall be measured without allowance for shrinkage or shakedown during hauling. Total truck measure volume for each road segment shall be as shown on Exhibit B. Deliver at least 600 cubic yards per 8-hour shift, unless otherwise approved by STATE. A penalty of \$10.00 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 B. 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 B. 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.

COMPACTION AND PROCESSING REQUIREMENTS

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

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
All road segments	1

EXHIBIT "B"

COMPACTION AND PROCESSING REQUIREMENTS

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." A minimum of 3 passes shall be made over the entire width and length of each layer. A pass is defined as traveling a fill layer in one direction and then back over that same layer again.

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

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

Crushed Rock. The rock shall be uniformly mixed and spread in layers on the approved roadbed. Each layer of crushed rock shall be moistened or dried to a uniform moisture content suitable for maximum compaction and compacted in layers not to exceed 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

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
All road segments	1

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 around culverts. The tamper shoe dimensions shall be a minimum of 10" X 13" and capable of a centrifugal force of 2,250 pounds.

EXHIBIT "C"

CULVERT SPECIFICATIONS

All culvert materials shall be furnished and installed by PURCHASER, unless otherwise specified in the contract. All culverts shall be constructed of corrugated, double-walled polyethylene. Pipe and fittings shall be made of polyethylene compounds which meet or exceed the requirements of Type III, Category 4 or 5, Grade P33 or P34, Class C per ASTM D-1248 with the applicable requirements defined in ASTM D-1248. Double-walled polyethylene pipe shall meet the requirements of AASHTO M-294-901, Type S.

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

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. If tamping is required, the trench shall be excavated wide enough to permit working on each side of pipe. Bedrock shall be excavated as required to provide a uniform foundation for the full length of the culvert.

A bedding of granulated material or job-excavated soil 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.

Transporting of the pipe shall be done carefully. Dragging or allowing free fall from trucks or into trenches shall not be permitted. Damage to bituminous coating shall be repaired before the pipe is covered.

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.

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

Tamping shall be done in 8-inch lifts, 1 pipe diameter each side of the pipe to 85 percent density or over, and to the minimum fill height as specified below. Additional fill shall be embankment material.

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

EXHIBIT "C"

CULVERT SPECIFICATIONS

Minimum height of cover over top of culvert to subgrade when road is to be rocked shall be 12 inches for polyethylene culverts (add 6" for roads which will not be rocked). Minimum vertical cover for other steel or aluminum designs shall be as specified by STATE.

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

The ends of each culvert shall be free of logs and debris which would restrict the free flow of water. Culverts in Type F streams must allow free passage of fish as provided in the Oregon Forest Practice Rules. 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 into waters of the State shall be provided with a downspout or other approved slope protection device.

This specification applies to high density polyethylene corrugated pipe with an integrally formed smooth interior.

The intake ends of culverts that could be reached by a grader blade shall be marked by driving or placing 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. Culverts intakes that can not be reached by a grader blade do not need culvert markers.

All culverts shall be constructed of corrugated, double-walled polyethylene.

Tamping is required.

All culverts 24" in diameter or larger shall have 1:1 beveled inlets.

EXHIBIT "C"
 CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	ROAD SEGMENT POINT TO POINT	STATION
1	18	40	1A to 1B	2+40
2	18	30	1A to 1B	6+70
3	18	30	1A to 1B	11+45
4	18	34	2A to 2B	0+80
5	18	40	3A to 3B	1+60
6	18	30	3A to 3B	12+60
7	18	30	3A to 3B	16+00
8	18	40	3C to 3D	0+40
9	18	30	3C to 3D	16+50
10	18	30	3E to 3F	1+25
11	18	30	3E to 3F	5+10
12	18	30	3E to 3F	12+10
13	18	34	3E to 3F	19+85
14	18	30	3E to 3F	22+90
15	18	40	3I to 3J	0+00
16	18	30	3I to 3J	9+00
17	18	34	I1 to I2	4+06
18	18	32	I1 to I2	7+50
19	24	30	I1 to I2	24+49
20	18	38	I1 to I2	26+46
21	18	32	I1 to I2	30+01
22	18	32	I1 to I2	35+57
23	18	32	I1 to I2	42+60
24	18	32	I1 to I2	49+55
25	18	32	I1 to I2	60+00
26	18	32	I1 to I2	65+32
27	18	30	I1 to I2	70+90
28	18	32	I1 to I2	82+85

EXHIBIT "D"

ROCK PIT DEVELOPMENT AND USE

- (1) 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. All waste shall be deposited at an approved "waste disposal site."
- (2) Pit face shall be developed in a uniform manner.
- (3) Oversized material that is produced or encountered during development shall be piled in a designated area adjacent to the pit, as directed by STATE.
- (4) The pit site shall be left in a condition free from overburden and debris. Access roads to the pit, and the pit floor, shall be cleared at the termination of use.
- (5) Purchaser shall schedule and coordinate quarry and stockpile use with other existing contracts requiring rock pit and stockpile use.

State Timber Sale Contract
No. 341-03-01
Saint Nick Thinning

EXHIBIT "E"

PIT-RUN AND RIPRAP ROCK SPECIFICATIONS

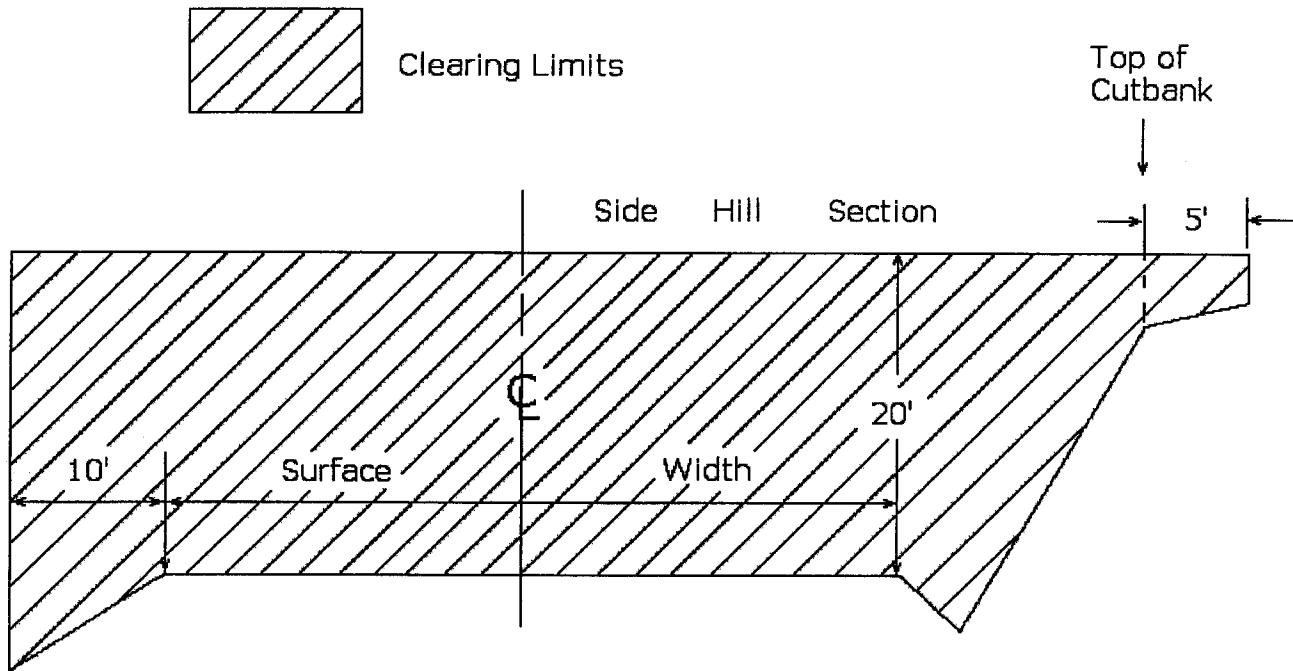
Grading Requirements

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

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

Control of gradation shall be by visual inspection by STATE.

EXHIBIT "F"
LOGGING ROAD BRUSHING SPECIFICATIONS



REQUIREMENTS

Clear roadside brush between Points I1 and I2.

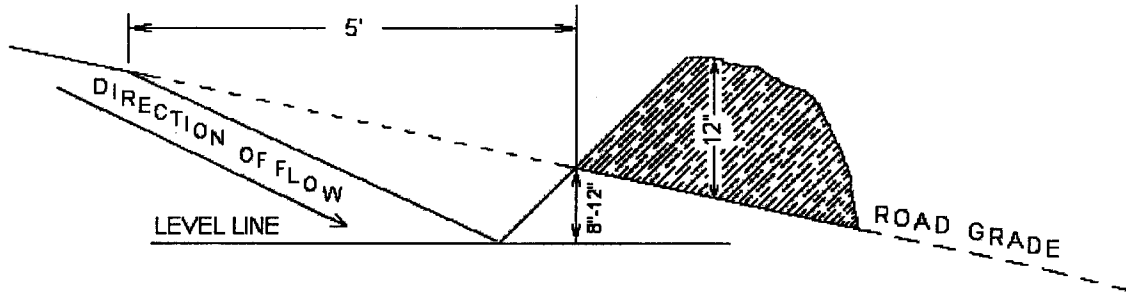
The minimum height of clearing shall be 20 feet from the road surface, and the minimum width of clearing on the outslope side(s) of the road shall be 15 feet horizontal distance from the shoulder of the road, 5 feet beyond the top of the cutbank, and 10 feet horizontal on the down slope side from the road shoulder.

Brush and trees shall be cut to a maximum height of 6 inches above the ground surface or obstructions such as rocks or existing stumps.

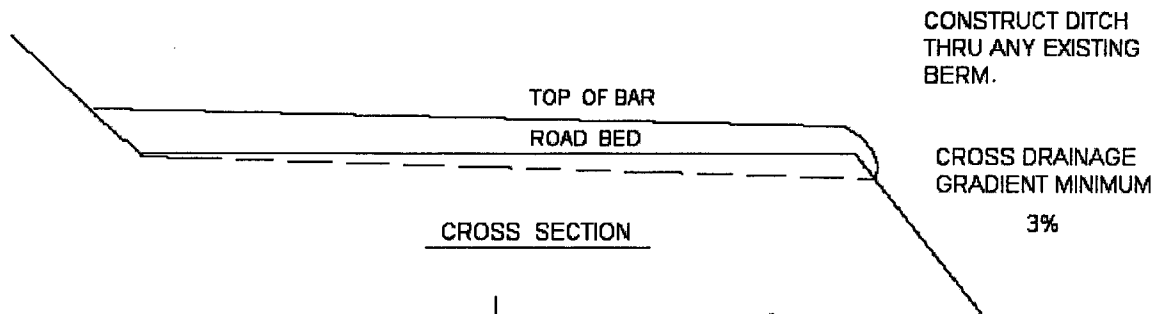
Debris resulting from the brushing operation shall be removed from the roadway, cutslope, ditches, and water courses and may be scattered downslope from the road or placed in other stable locations. Large debris, 6 inches or larger in diameter, shall be cut into lengths of 6 feet or less to facilitate rapid decay, unless otherwise approved by STATE.

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

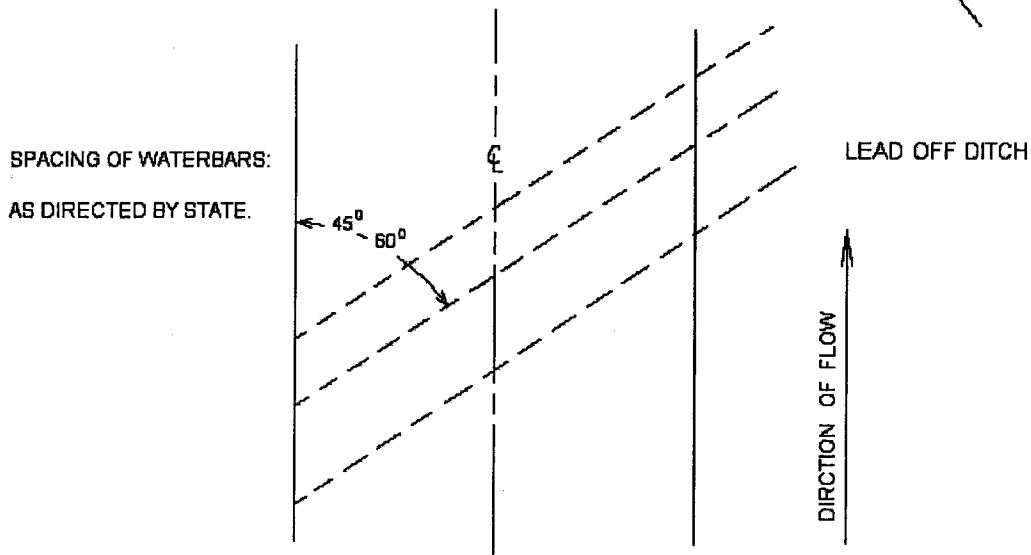
EXHIBIT "G"
WATERBAR SPECIFICATIONS



PROFILE



CROSS SECTION



PLAN VIEW

State Timber Sale Contract
No. 341-03-01
Saint Nick Thinning

EXHIBIT "H"

GRASS SEEDING, FERTILIZING, AND MULCHING

This work shall consist of furnishing and placing required grass seed and fertilizer, and straw mulch.

Seeding Seasons. Seeding shall be performed only from March 1 through June 15 and August 15 through October 31. Seeding materials shall not be applied during windy weather or when the ground is excessively wet or frozen. Work shall be performed during each specified seeding season on all completed and previously untreated sections. PURCHASER shall notify STATE 24 hours prior to seeding.

Application Methods for Grass Seed

Dry Method. Hand-operated seeding devices may be used when seed is applied in dry form.

Application Rates for Seed

Seed listed below shall be applied at the following rate per acre: 100 lbs.

SPECIES	MIXTURE	PURE LIVE SEED	POISON AND/OR REPELLENT	GERMINATION
Annual Rye	33%	95%	0	>90%
Orchard Grass	33%	95%	0	>90%
Perennial Rye	34%	95%	0	>90%

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

Seeding and Fertilizing. Apply grass seed and fertilizer to all disturbed and/or bare soils resulting from road and landing construction for Project No. 1.

Seeding and Mulching. Apply grass seed and straw mulch to all waste areas and bare soils resulting from fill vacating in Project No. 2. Applied straw mulch shall be a minimum of 2 inches deep and provide a uniform cover.

EXHIBIT "I"

FILL VACATING SPECIFICATIONS: POINTS V1 AND V2

- (1) Fill Removal and Stream Channel Development. Remove fills to the natural stream course level(s). Stream channels shall be excavated/developed to minimum 4 foot width. Developed stream banks shall be sloped at natural contours or no steeper than 1 1/2:1, as directed by STATE.
- (2) Use of Excavated Materials
 - (a) Fill Excavation. Excavated materials shall be placed on the old road subgrade located on both sides of the fill. This material shall be "keyed" into the cutbank a minimum of 10 feet from the top of the developed stream bank, then compacted to natural slope contours
 - (b) Woody Debris may be incorporated in embankment material and/or placed on the surface of compacted embankment material.
- (3) Erosion Control. All exposed excavation areas and waste materials shall be grass seeded, and mulched with a straw mulch approved by STATE. Applied mulch shall be a minimum of 2 inches deep and provide a uniform cover, in accordance with Exhibit H.

EXHIBIT "J"

SPECIFICATIONS FOR BRUSH AND SLASH SHOVEL PILING

Description of Work to be Done

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

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

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

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

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

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

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

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

EXHIBIT "J"

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. For shovel piling, the 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.

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 4 and 5. Operations shall provide for continual operation until contract work is completed, unless interrupted by poor weather, fire closures, or other uncontrollable circumstances. Equipment breakdowns shall be repaired without undue delay, and provision shall be made for replacement of equipment to prevent prolonged delays. Piling operation shall not be allowed when operations might damage sites or affect stream flows. Any exception to these instructions must be authorized in writing by STATE.

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

EXHIBIT "K"
OREGON DEPARTMENT OF FORESTRY

SCALING INSTRUCTIONS -- LOCATION APPROVAL -- BRAND INFORMATION

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

(2) TO: _____
 (Third Party Scaling Organization)

(3) FROM: Astoria Phone (503) 325-5451
 (State Forestry District)
 Address 92219 Hwy. 202, Astoria, OR 97103

(4) PURCHASER: _____
 Address _____

(12) SALE NAME Saint Nick Thinning

COUNTY Clatsop

(13) STATE CONTRACT NUMBER 341-03-01

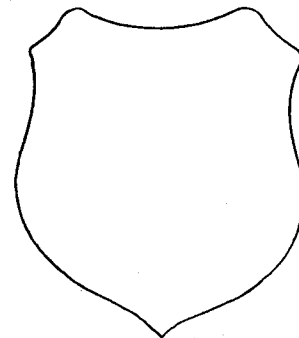
(14) SCALE: westside eastside cubic foot

(15) STATE BRAND REGISTRATION NUMBER _____

(16) BUREAU BRAND CODE NUMBER _____

(17) STATE BRAND INFORMATION:

(COMPLETE) ↓



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

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

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

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

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

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

(18) PAINT REQUIRED: YES
 COLOR Orange

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

(10) APPROVED SCALING LOCATIONS	Species	Yard	Truck

(20) REMARKS: _____

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

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

(21) SIGNATURES:

 Purchaser or Authorized Representative Date

 State Forester's Representative

 State Forester Representative Date

EXHIBIT "K"

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 45, "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 SUB species 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.