

EXHIBIT "B"
FOREST ROAD SPECIFICATIONS

SUBGRADE WIDTH	SURFACED WIDTH	POINT TO POINT	STATION TO STATION	DRAINAGE
14 feet	N/A	1A to 1B	0+00 to 4+85	OUTSLOPED
14 feet	N/A	4A to 4B	0+00 to 10+70	OUTSLOPED
16 feet	12 feet	11 to 12	0+00 to 320+95	DITCH
16 feet	12 feet	13 to 14	0+00 to 35+90	DITCH
14 feet	N/A	15 to 16	0+00 to 10+30	OUTSLOPED
16 feet	12 feet	17 to 18	0+00 to 5+45	DITCH

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

Where clearing limits have not been staked, the clearing limits shall extend 10 feet back of the top of the cutslope and 10 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. 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 by STATE.

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.

CLEARING AND GRUBBING DISPOSAL. Scatter 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.

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

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

All suitable excavated material shall be used where possible for the formation of fills, shoulders, and drainage structure backfill. Embankment materials shall be free of woody debris, brush, muck, sod, frozen material, and other deleterious materials. All fills and drainage structure backfill shall be machine compacted in lifts not to exceed 8 inches in depth, according to the specifications in Exhibit B.

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.

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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

Ditch. 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.

Ditchouts. Construct ditchouts as marked in the field or as directed by STATE.

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 or as marked in the field by STATE.

GRADING

	<u>Back Slopes</u>	<u>Fill Slopes</u>
Rock	Vertical to 1/4:1	Not steeper
Common – side slopes 50% and over	3/4:1	than 1½:1
Common – side slopes less than 50%	1:1	
Common – turnpike (level) section	2:1	

Top of cutslope shall be rounded.

LANDINGS. Landings shall be constructed 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. There are no landings to surface.

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 (1A to 1B, 4A to 4B, and I5 to I6) or unfinished subgrades shall be waterbarred in accordance with Specifications in Exhibit I, and blocked from vehicular traffic prior to November 1, annually, and as directed by STATE.

GENERAL ROAD CONSTRUCTION INSTRUCTIONS

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.

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FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
4A to 4B	0+00	Begin fill construction at junction using excess excavated material.
	2+00	End fill construction.
	3+44	Begin end haul of excess excavated material to fill area located between Station 0+00 to 2+00 on Road Segment 4A to 4B.
	5+16	End end haul of excess excavated material to fill area located between Station 0+00 to 2+00 on Road Segment 4A to 4B.

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FOREST ROAD SPECIFICATIONS

GENERAL ROAD IMPROVEMENT INSTRUCTIONS

- (1) Timber Removal. Remove all trees within the posted Right-of-Way Boundary, as specified in Section 55, "Designated Timber."
- (2) 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, installing the culvert at grade equal to or exceeding the drainage-channel or ditch-line grade, development of stream channels, and/or installing the culvert in different locations or depths. All woody debris encountered during fill excavation and unsuitable excavated material shall be removed. All such waste materials shall be hauled to nearby waste areas and shall be uniformly sloped and compacted for drainage. Fill reconstruction backfill shall consist both of select materials obtained from the Borrow Site shown on Exhibit A, and from suitable old fill material encountered during fill excavation. Borrowed fill material and suitable excavated old fill material shall be mixed 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 back filling excavation in trenches less than 3 feet deep. STATE may require 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) 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.
- (5) Fill Armor and Energy Dissipator Construction. Where rock is used for fill armor, rock shall be placed and tamped at a 1½:1 slope, beginning at the fill toes. Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet, in accordance with Exhibit G.
- (6) Equipment. All excavation and riprap placement shall be performed using a minimum 1½ cubic yard, track-mounted excavator.
- (7) Subgrade Preparation and Application of Surfacing Rock.
 - (a) Complete culvert installations, drainage ditches, and other specified work prior to the application of new surfacing rock. All work shall be in accordance with plans on file at the Astoria office.
 - (b) Cut out all chuckholed and/or washboard sections from the existing surfacing.
 - (c) Apply required base and leveling rock, as directed by STATE.
 - (d) Process (grade and mix) the existing surfacing and added base rock. Provide for a crown of 4 to 6 percent, and compact in accordance with Exhibit B.
 - (e) Upon completion of above required work, apply, process, and compact surfacing rock in accordance with specifications in Exhibit B.

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FOREST ROAD SPECIFICATIONS

GENERAL ROAD IMPROVEMENT INSTRUCTIONS

(8) Borrow Pit

- (a) Clearing limits shall be 10 feet back of the top of the cutslope, or as directed by STATE. Clearing and grubbing debris shall be neatly piled in the Borrow Site at the completion of borrow site usage.
- (b) Borrow Site cutslope shall be left at a 1½:1 slope at the completion of usage and free of overhanging stumps, roots or debris.
- (c) Ditch line shall be re-established at the completion of Borrow Site usage.
- (d) Existing road surface used during the loading and excavation of borrowed material shall be reshaped at the completion of Borrow Site usage.
- (e) Merchantable trees located within clearing limits shall be cut, decked, and removed as Designated Timber.
- (f) Non-merchantable trees containing firewood will be neatly decked as directed by STATE.

(9) Waste Areas

- (a) Material hauled to waste areas shall have woody debris separated from dirt with the woody debris piled neatly on the evenly spread and compacted dirt material.
- (b) Shall have adequate drainage established.
- (c) In the development of waste areas any suitable firewood that can be developed from trees removed during waste area development should be neatly piled to the side of the waste area.
- (d) Shall be seeded and mulched according to Exhibit H.

(10) Backslopes

Shall be sloped at 1½:1 where the road is moved into the hill on road segment I3 to I4 unless otherwise directed by STATE.

(11) Sidecast Pullback

- (a) Standing trees. Alder and conifer trees that contain firewood shall be separated from other pulled back vegetation and debris and decked for easy access at the designated waste area.
- (b) 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 edge of the road, in accordance with specifications in Exhibit F.
- (c) Waste Area. The designated waste area for sidecast pullback is Station 36+31 on Road Segment I3 to I4. Sidecast pullback material (soil) shall be separated from woody debris and standing trees and be spread evenly, compacted, and adequately drained. Pile woody debris on top of waste area and pile firewood neatly to the side.

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FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
I1 to I2	0+00	Begin road improvement.
	18+70	Culvert replacement. Utilize 30 cubic yards of 1½" –0" crushed rock for culvert bedding, backfill, and base rock replacement.
	58+60	Culvert replacement. Utilize 30 cubic yards of 1½" –0" crushed rock for culvert bedding, backfill, and base rock replacement.
	63+15	Culvert replacement. Utilize 30 cubic yards of 1½" –0" crushed rock for culvert bedding, backfill, and base rock replacement.
	307+00	Culvert replacement. Utilize 30 cubic yards of 1½" –0" crushed rock for culvert bedding, backfill, and base rock replacement.
	312+30	Culvert replacement. Utilize 30 cubic yards of 1½" –0" crushed rock for culvert bedding, backfill, and base rock replacement.
	317+15	Culvert replacement. Utilize 30 cubic yards of 1½" –0" crushed rock for culvert bedding, backfill, and base rock replacement.
	320+95	End road improvement.
I3 to I4	0+00	Begin road improvement.
	0+25	Culvert replacement. Utilize 30 cubic yards of 1½" –0" crushed rock for culvert bedding, backfill, and base rock replacement.
	8+42	Culvert replacement. Utilize 30 cubic yards of 1½" –0" crushed rock for culvert bedding, backfill, and base rock replacement.
	13+65	Culvert replacement. Utilize 30 cubic yards of 1½" –0" crushed rock for culvert bedding, backfill, and base rock replacement.
	23+41	Fill and culvert replacement. Utilize 48 cubic yards of 1½"-0" salvaged rock for culvert bedding and backfill. Utilize 36 cubic yards of 24"-6" riprap rock for fill armor and 10 cubic yards of 24"-6" riprap rock for an embedded energy dissipator. Install the culvert at a 17% gradient with the inlet 4.4' lower in elevation than the existing culvert inlet. The new culvert is located in a different bed location than that of the old culvert. Develop the stream channel for 20' on the inlet side of the fill. Waste materials shall be hauled to the Waste Area located at Point I3.

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SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
I3 to I4	29+61	Begin moving road into the hill.
	31+05	Begin construction of 50' radius curve.
	30+25	Begin sidecast pullback. Material pulled back will be hauled to the designated waste area located adjacent to point I4.
	31+25	End sidecast pullback.
	31+49	End moving into the hill.
	31+66	Fill and culvert replacement. Utilize 96 cubic yards of 1½"-0" salvaged rock for culvert bedding and backfill for the first of the two culverts installed in this fill. Utilize 60 cubic yards of 24"-6" riprap rock for fill armor and 10 cubic yards of 24"-6" riprap rock for an embedded energy dissipator. Install the culvert at a 9% gradient. The new culvert inlet will be moved downstream and the culvert outlet will be 3.9 feet deeper. Develop the stream channel on the inlet side of the fill for 20'. Waste materials shall be hauled to the Waste Area at Point I3 and shown on Exhibit A. Borrow material which is brought in will be mixed with the usable excavated material prior to its placement in the fill. Borrow material will come from the Borrow Site shown on Exhibit A.
	32+06	Fill and culvert replacement: Utilize 108 cubic yards of 1½"-0" salvaged rock for culvert bedding and backfill for the second of the two culverts installed in this fill. Utilize 60 cubic yards of 24"-6" riprap rock for fill armor and 10 cubic Yards of 24"-6" riprap rock for an embedded energy dissipator. Install the culvert at a 12% gradient. The new culvert inlet will be moved downstream. Develop the stream channel for 20' on the inlet of the fill. Waste materials shall be hauled to the Waste Area at Point I3.
	32+14	End construction of 50' radius curve. Begin construction of 60' radius curve.
	32+72	Begin sidecast pullback. Material pulled back will be hauled to the designated waste area located adjacent to point I4.
	32+74	End construction of 60' radius curve.
	34+00	End sidecast pullback.
	35+90	End road improvement.
	36+31	Waste Area

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SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
I5 to I6	0+00	Begin road improvement.
	10+30	End road improvement.
I7 to I8	0+00	Begin road improvement.
	3+40	Culvert replacement. Utilize 30 cubic yards of 1½" –0" crushed rock for culvert bedding, backfill, and base rock replacement.
	5+45	Culvert replacement. Utilize 30 cubic yards of 1½" –0" crushed rock for culvert bedding, backfill, and base rock replacement. End road improvement.

EXHIBIT "B"
ROAD SURFACING

ROAD SEGMENT: I1 to I2				POINT TO POINT		Sta. To Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I1 to I2		0+00 to 320+95		
				Volume (CY) per		Number of		
Culvert bedding	1½"-0" Crushed	18+70	N/A	Culvert	20	Culvert	1	20
Base rock replace	1½"-0" Crushed	18+70	N/A	Culvert	10	Culvert	1	10
Culvert bedding	1½"-0" Crushed	58+60	N/A	Culvert	20	Culvert	1	20
Base rock replace	1½"-0" Crushed	58+60	N/A	Culvert	10	Culvert	1	10
Culvert bedding	1½"-0" Crushed	63+15	N/A	Culvert	20	Culvert	1	20
Base rock replace	1½"-0" Crushed	63+15	N/A	Culvert	10	Culvert	1	10
Culvert bedding	1½"-0" Crushed	307+00	N/A	Culvert	20	Culvert	1	20
Base rock replace	1½"-0" Crushed	307+00	N/A	Culvert	10	Culvert	1	10
Culvert bedding	1½"-0" Crushed	312+30	N/A	Culvert	20	Culvert	1	20
Base rock replace	1½"-0" Crushed	321+30	N/A	Culvert	10	Culvert	1	10
Culvert bedding	1½"-0" Crushed	317+15	N/A	Culvert	20	Culvert	1	20
Base rock replace	1½"-0" Crushed	317+15	N/A	Culvert	10	Culvert	1	10
Subgrade leveling rock	1½"-0" Crushed	I1 to I2	N/A					1,600
Total rock for Road Segment:		I1 to I2						1,780
ROAD SEGMENT: I3 to I4				POINT TO POINT		Sta. To Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I3 to I4		0+00 to 35+90		
				Volume (CY) per		Number of		
Culvert bedding	1½"-0" Crushed	0+25	N/A	Culvert	20	Culverts	1	20
Base rock replace	1½"-0" Crushed	0+25	N/A	Culvert	10	Culverts	1	10
Culvert bedding	1½"-0" Crushed	8+42	N/A	Culvert	20	Culverts	1	20
Base rock replace	1½"-0" Crushed	8+42	N/A	Culvert	10	Culverts	1	10
Energy dissipator	24"-6" Riprap	8+42	N/A	Culverts	10	Culverts	1	10
Fill armor	24"-6" Riprap	8+42	N/A	Culvert	30	Culverts	1	30
Culvert bedding	1½"-0" Crushed	13+65	N/A	Culvert	20	Culverts	1	20
Base rock replace	1½"-0" Crushed	13+65	N/A	Culvert	10	Culverts	1	10
Energy dissipator	24"-6" Riprap	13+65	NA	Culverts	10	Culverts	1	10
Culvert bedding	1½"-0" Salvaged	23+41	N/A	Culverts	48	Culverts	1	48
Energy dissipator	24"-6" Riprap	23+41	N/A	Culverts	10	Culverts	1	10
Fill armor	24"-6" Riprap	23+41	N/A	Culverts	36	Culverts	1	36
Fill widening	4"-0 Crushed"	23+41	8	Fill	16	Fills	1	16
Base rock replace	4"-0 Crushed"	23+41 & 31+66	8	Station	50	Stations	3.63	182
Culvert bedding	1½"-0" Salvaged	31+66	N/A	Culverts	96	Culverts	1	96
Energy dissipator	24"-6" Riprap	31+66	N/A	Culverts	10	Culverts	1	10
Fill armor	24"-6" Riprap	31+66	N/A	Culverts	60	Culverts	1	60
Culvert bedding	1½"-0" Salvaged	32+06	N/A	Culverts	108	Culverts	1	108
Energy dissipator	24"-6" Riprap	32+06	N/A	Culverts	10	Culverts	1	10
Fill armor	24"-6" Riprap	32+06	N/A	Culverts	60	Culverts	1	60

EXHIBIT "B"
ROAD SURFACING

ROAD SEGMENT: I3 to I4				POINT TO POINT		Sta. To Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I3 to I4		0+00 to 35+90		
				Volume (CY) per		Number of		
Fill widening	4"-0 Crushed"	31+66 & 32+06	8	Fill	16	Fills	1	16
Curve widening	4"-0 Crushed"	31+66 & 32+06	8	Curve	50	Curves	1	50
Fill widening	1½"-0" Crushed	23+41	3	Fill	6	Fills	1	6
Surface replace	1½"-0" Crushed	31+66 & 32+06	3	Station	19	Stations	3.63	69
Curve widening	1½"-0" Crushed	31+66 & 32+06	3	Curve	19	Curves	1	19
Fill widening	1½"-0" Crushed	31+66 & 32+06	3	Fill	6	Fills	1	6
Subgrade leveling rock	1½"-0" Crushed	I3 to I4						250
Total rock for Road Segment:		I3 to I4						1,192
ROAD SEGMENT: I7to 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 5+45		
				Volume (CY) per		Number of		
Culvert bedding	1 ½"-0" Crushed	3+40	N/A	Culvert	20	Culverts	1	20
Base rock replace	1 ½"-0" Crushed	3+40	N/A	Culvert	10	Culverts	1	10
Culvert bedding	1 ½"-0" Crushed	5+45	N/A	Culvert	20	Culverts	1	20
Base rock replace	1 ½"-0" Crushed	5+45	N/A	Culvert	10	Culverts	1	10
Subgrade leveling	1 ½"-0" Crushed	I7 to I8	N/A					50
Total rock for Road Segment:		I7 to I8						110

Total Rock Project No. 1

24"-6"	6"-0"	4"-0"	1 1/2"-0"	Salvaged 1 1/2"-0"	TOTAL
236	0	264	2,330	252	3,082

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

EXHIBIT "B"

ROCK ACCOUNTABILITY

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

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

Rock Checking. All rock spreading shall be done only when a STATE representative is present. STATE shall issue a receipt for each load delivered, and rock shall be measured without allowance for shrinkage or shakedown during hauling. Total truck measure volume for each road segment shall be as shown on Exhibit B. 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 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.

EXHIBIT "B"

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 that require rock surfacing.	1

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

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

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

Crushed Rock. The rock shall be uniformly mixed and spread in layers on the approved roadbed. Each layer of crushed rock shall be moistened or dried to a uniform moisture content suitable for maximum compaction and compacted in layers not to exceed 8 inches in depth. When more than 1 layer is required, each shall be shaped and compacted before the succeeding layer is placed. Any irregularities or depressions that develop during compaction of the top layer shall be corrected by loosening the material at these places and adding or removing material until the surface is smooth and uniform. Each layer shall be compacted with a minimum of 3 passes over the entire width and length of the road. A pass is defined as traveling a road section in one direction and then back over that same section again. Compaction shall be accomplished by using one or more of the approved equipment options listed below:

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

EXHIBIT "B"

COMPACTION EQUIPMENT OPTIONS

- (1) Vibratory Rollers. The drum shall have a smooth surface, a diameter not less than 48 inches, a width not less than 58 inches, and a turning radius of 15 feet or less. Vibration frequency shall be regulated in steps to 1400, 1500, and 1600 VPM, corresponding to engine speeds of 1575, 1690, and 1800 RPM. The centrifugal force developed shall be 7 tons at 1600 VPM. It shall be activated by a power unit of not less than 25 horsepower. The vibratory roller shall be self-propelled and operated at speeds ranging from 0.9 mile to 1.8 miles per hour, as directed by STATE.
- (2) Rubber-Tired Skidders. A rubber-tired skidder weighing a minimum of 20,000 pounds shall be operated over the fill layers so that the entire layered surface comes in contact with the tires. Skidders with oversized tires (high flotation) are not acceptable for compaction.
- (3) Tampingfoot Compactors. Tampingfoot or sheepsfoot compactors shall exert a minimum pressure of 250 pounds per square inch on the ground area in contact with the tamping feet. The compactor shall cover a minimum width of 60 inches per pass and weigh a minimum of 16,000 pounds.
- (4) Vibratory Hand-Operated or Backhoe-Mounted Tamper. Vibratory hand-held or hydraulic tampers shall be used for compaction of backfill materials around culverts (and/or bridge approach embankment materials around abutments). The tamper shoe dimensions shall be a minimum of 10" X 13" and capable of a centrifugal force of 2,250 pounds.

EXHIBIT "C"

CULVERT SPECIFICATIONS

All culverts shall be constructed with/of double-walled polyethylene except for Culvert Nos. 11 and 12. All culvert materials shall be furnished and installed by PURCHASER, unless otherwise specified in the contract. Culverts shall conform to the material and fabricating requirements of Sections 2410 and 2420 of the "Standard Specifications for Highway Construction" prepared by the Highway Division of the Oregon State Department of Transportation. Double-walled polyethylene pipe shall meet the requirements of AASHTO M-294-901, Type S. Corrugation types and shapes other than those meeting the above minimum Highway requirements, shall be approved in writing by STATE. This specification applies to high density polyethylene corrugated pipe with an integrally formed smooth interior. Clean, reworked material may be used.

Culvert No. 11 (36" X 86', round pipe) shall be constructed of 14 gauge, corrugated aluminized steel. Culvert No. 12 (42" X 70', round pipe,) shall be constructed of 14 gauge, corrugated aluminized steel.

Culverts shall be located according to the alignment and grade as shown on the Plan and Profile, and/or as staked in the field, or as stipulated in special instructions.

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

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

The foundation and trench walls for all culverts shall be free from logs, stumps, limbs, stones over 3 inches, and other objects which would dent or damage the pipe during installation or use. 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.

Backfill shall consist of granulated material 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. Damage to bituminous coating shall be repaired before the pipe is covered.

On new installations, joining shall be done with bands of like material and corrugations. Manufacturers' instructions shall be followed for prefabricated pipe assembly.

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 is required and 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.

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.

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

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

Minimum height of cover over top of culvert to subgrade when road is to be rocked shall be 12 inches for polyethylene culverts. 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. 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.

CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	MATERIAL TYPE	ROAD SEGMENT POINT TO POINT	STATION
1	18	30	CPP	I1 to I2	18+70
2	18	36	CPP	I1 to I2	58+60
3	18	38	CPP	I1 to I2	63+15
4	18	60	CPP	I1 to I2	307+00
5	18	40	CPP	I1 to I2	312+30
6	18	40	CPP	I1 to I2	317+15
7	18	32	CPP	I3 to I4	0+25
8	18	46	CPP	I3 to I4	8+42
9	18	34	CPP	I3 to I4	13+65
10	24	64	CPP	I3 to I4	23+41
11	36	86	CSP	I3 to I4	31+66
12	42	70	CSP	I3 to I4	32+06
13	18	40	CPP	I7 to I8	3+40
14	18	40	CPP	I7 to I8	5+45

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.

Culvert Nos. 10, 11, and 12 require 1:1 beveling on the inlet end.

EXHIBIT "D"

ROCK PIT DEVELOPMENT AND USE

- (1) PURCHASER shall prepare a written development plan for the pit area. The plan shall be submitted to STATE for approval prior to conducting any operation in the pit area. The plan shall include, but not be limited to:
- (2) Location of benches and roads to benches.
 - (a) Disposal site for debris and overburden.
 - (b) Time lines for rock quarry use.
 - (c) Erosion Control measures.
- (3) PURCHASER shall schedule and coordinate quarry usage with other existing or planned STATE contracts requiring quarry usage.
- (4) 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. Overburden shall be removed for a distance of 20 feet beyond the developed rock source. Trees removed for Quarry development will be felled, bucked, and decked at a site acceptable to the STATE adjacent to the quarry.
- (5) 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.
- (6) PURCHASER shall conduct the operation relative to the disposal of waste material in such manner that silt, rock, debris, dirt, or clay shall not be washed, conveyed, or otherwise deposited in any stream.
- (7) Benches shall be constructed at intervals of 40 feet or less in height and shall be a minimum of 20 feet in width. Any gravel or talus slopes shall be left with a working face at an angle of 60 degrees or less. Said bench shall be easily accessible with tractors.
- (8) Pit face shall be developed in a uniform manner
- (9) Oversized material that is produced or encountered during development shall be stored on site as directed by the STATE.
- (10) Proper winterization and storm-water control measures such as water barring, drainage, utilization of filter bales, mulching and/or blocking access shall be utilized and such measures maintained to protect the watershed and project work, as directed by STATE.
- (11) PURCHASER shall notify STATE 5 days prior to the start of quarry development activities.
- (12) The quarry floor shall be developed to provide for drainage away from the quarry. All quarry drainage ditches shall be maintained. Quarry bench access road shall be cleared, water barred and blocked upon completion of quarry use as directed by STATE.

State Timber Sale Contract
No. 341-05-11
Crawford Ridge Thinning

EXHIBIT "E"

RIPRAP ROCK SPECIFICATION

For 24"-6" Riprap Rock. 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.

SALVAGED CRUSHED ROCK SPECIFICATION

For Salvaged Culvert Bedding Crushed Rock. Salvaged crushed rock shall be free of vegetative material. Trees and vegetative matter removed from the stockpiles salvaged crushed rock shall be neatly piled to the side of where the salvaged rock was removed.

State Timber Sale Contract
No. 341-05-11
Crawford Ridge Thinning

EXHIBIT "F"
SIDECAST PULLBACK

TYPICAL CROSS SECTION VIEW OF SIDECAST PULLBACK AND ROAD REALIGNMENT

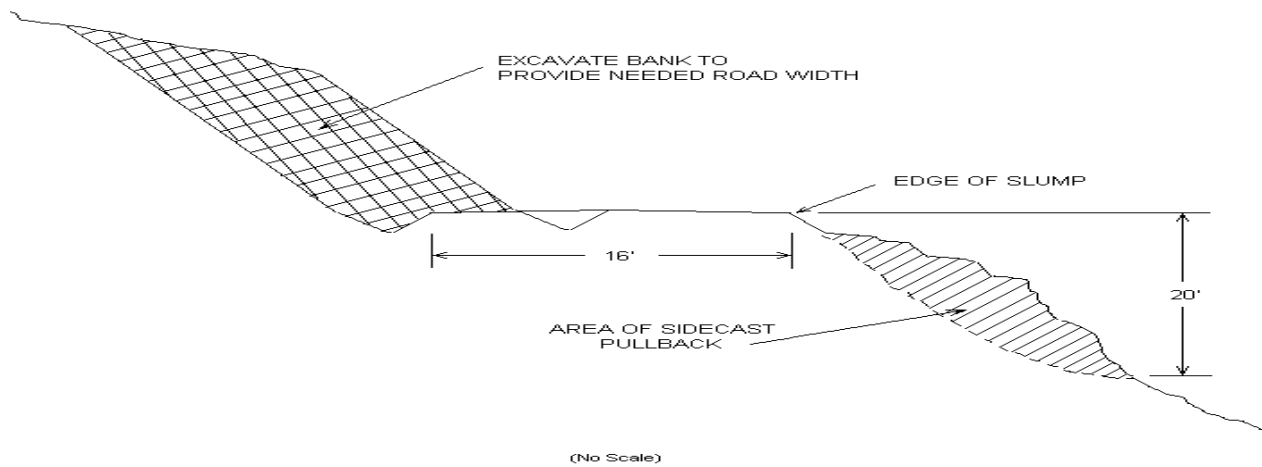
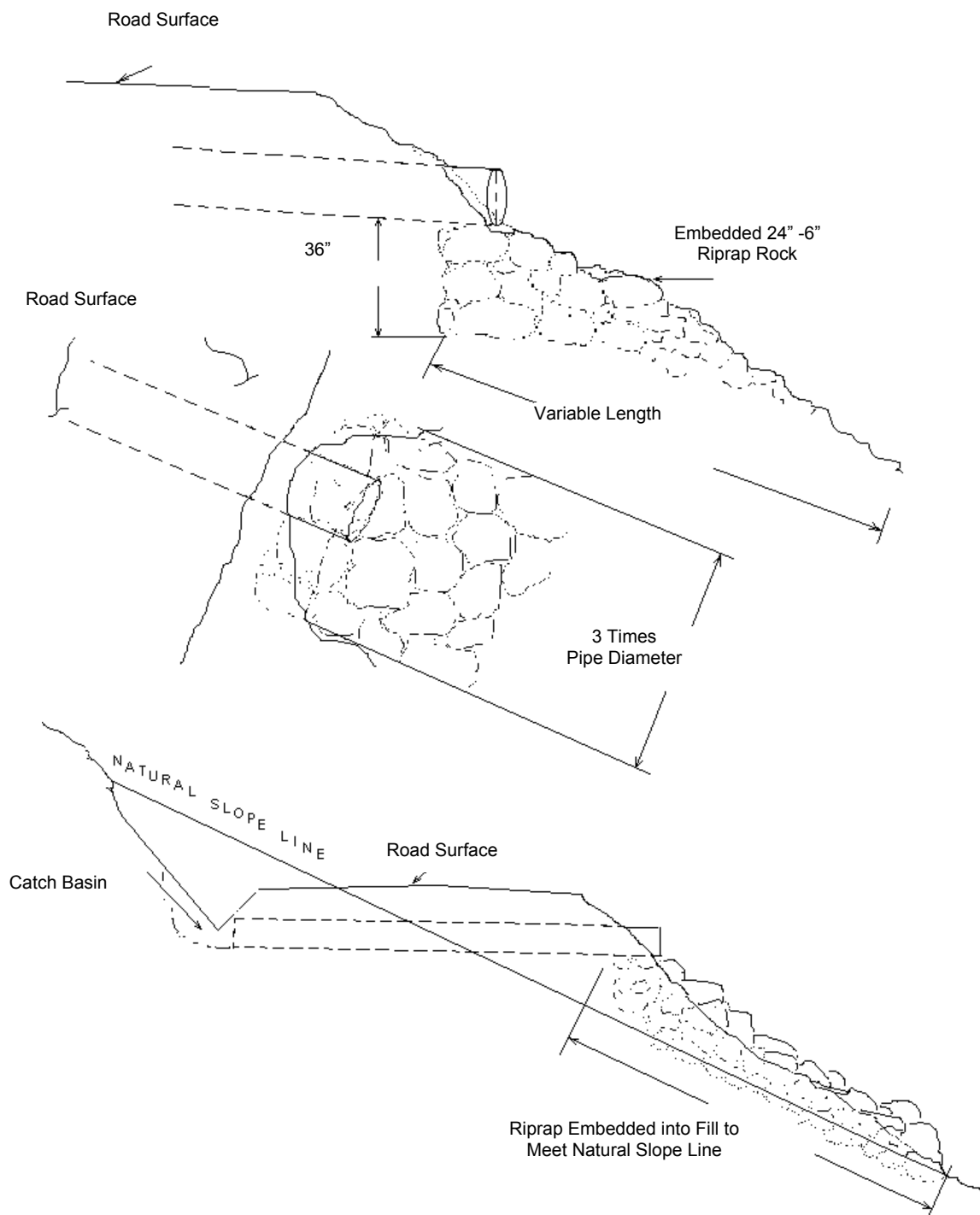


EXHIBIT "G"

TYPICAL EMBEDDED ENERGY DISSIPATOR



State Timber Sale Contract
No. 341-05-11
Crawford Ridge Thinning

EXHIBIT "H"

GRASS SEEDING AND MULCHING

This work shall consist of furnishing and placing required grass seed, 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	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 Trifol	07%	95%	0	>90%
Red Clover	06%	95%	0	>90%
Alsike Clover	04%	95%	0	>90%

Seeding and Mulching. Apply grass seed and straw mulch to all waste areas, and bare soils resulting from Project No. 1. Applied straw mulch shall be a minimum of 2 inches deep and provide a uniform cover.

EXHIBIT "I"

WATERBAR SPECIFICATIONS

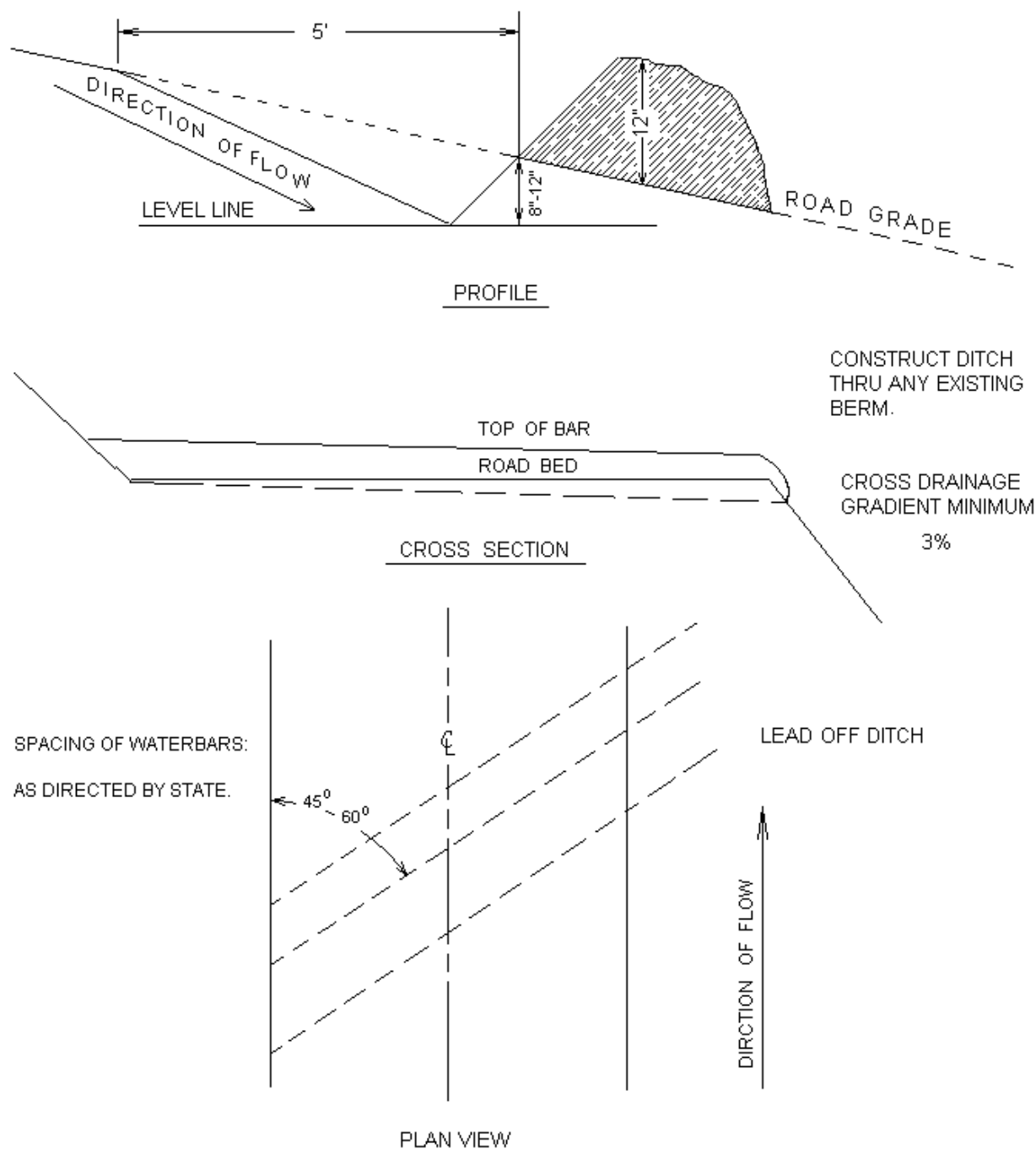


EXHIBIT "J"
OREGON DEPARTMENT OF FORESTRY

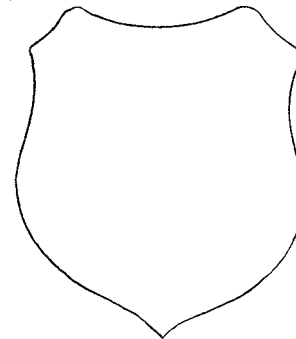
SCALING INSTRUCTIONS -- LOCATION APPROVAL -- BRAND INFORMATION

- (1) ORIGINAL REGISTRATION ☐ Date _____
REVISION NUMBER _____ ☐ Date _____
CANCELLATION ☐ Date _____
- (2) TO: _____
(Third Party Scaling Organization)
- (3) FROM: Astoria (04) Phone (503) 325-5451

(State Forestry District)
Address 92219 Highway 202, Astoria, OR 97103
- (4) PURCHASER: _____
Address _____

- (12) SALE NAME Crawford Ridge Thinning
COUNTY Clatsop
- (13) STATE CONTRACT NUMBER 341-05-11
- (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): _____

(21) SIGNATURES:

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

Purchaser or Authorized Representative _____ Date _____

State Forester Representative _____ Date _____

State Forester's Representative _____

EXHIBIT "J"

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.