

EXHIBIT "B"
FOREST ROAD SPECIFICATIONS

SUBGRADE WIDTH	SURFACED WIDTH	POINT TO POINT	STATION TO STATION	DITCH REQUIRED	OUTSLOPE
16 feet	12 feet	1A to 1B	0+00 to 14+40	YES	NO
16 feet	12 feet	1C to 1D	0+00 to 19+00	YES	NO
16 feet	12 feet	1E to 1F	0+00 to 20+00	YES	NO
16 feet	12 feet	1G to 1H	0+00 to 5+60	YES	NO
16 feet	12 feet	2A to 2B	0+00 to 24+40	YES	NO
14 feet	N/A	4B to 4C	0+00 to 2+00	NO	YES
14 feet	N/A	5A to 5B	0+00 to 45+15	NO	YES
14 feet	N/A	5C to 5D	0+00 to 11+60	NO	YES
14 feet	N/A	5E to 5F	0+00 to 24+90	NO	YES
14 feet	N/A	6A to 6B	0+00 to 7+80	NO	YES

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.

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 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 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 B.

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FOREST ROAD SPECIFICATIONS

EXCAVATION. 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

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, and as marked in the field.

Outslope. Road subgrade shall be outsloped at 4 to 6 percent.

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. Surface as shown on Exhibit B.

TURNAROUNDS. Increase subgrade width an additional 20 feet for a length of 20 feet at locations listed in Exhibit B, and/or as marked in the field.

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

EXHIBIT "B"

ROAD CONSTRUCTION INSTRUCTIONS

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, and on STATE land. Waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with Exhibit B.
- (2) Geotextile Road Fabric. Install fabric from 5+70 to 10+10 on 1E to 1F, in accordance with specifications in Exhibit F.
- (3) Ditch Armoring. Where ditch armoring is required, 4"-0" crushed rock will be used for surfacing the bottom and sides of the ditch, as directed by STATE.

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS:

<u>SEGMENT</u>	<u>STATION</u>	<u>WORK DESCRIPTION</u>
1A to 1B	0+60	Install gate in accordance with Exhibit J.
1E to 1F	0+60	Install gate in accordance with Exhibit J.
	5+70	Begin fabric installation
6+10		Culvert replacement. Utilize 20 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill.
7+50		Armor ditch right, Utilize 20 cubic yards of 4"-0" crushed rock for ditch armor.
10+10		End fabric Installation.
5A to 5B	8+65	Property Line.
	15+35	Junction, Point 5C.
	28+95	Begin road dip construction in accordance with Exhibit H. Utilize 50 cubic yards 4"-0" crushed rock for construction in accordance with Exhibit H. Remove all woody debris and haul to waste area at station 30+60 on 5A to 5B.
	30+60	Turnout right. Waste Area.
	40+40	Construct landing right.
5C to 5D	0+00	Utilize excess excavation material to develop approach and construct fill and landing at station 4+50.
	4+50	Construct landing right.

EXHIBIT "B"

ROAD IMPROVEMENT INSTRUCTIONS

GENERAL ROAD IMPROVEMENT INSTRUCTIONS:

- (1) 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. Markers shall meet specifications in Exhibit C. Excavated materials shall be placed in a stable location, as directed by STATE.
- (2) Equipment. All excavation shall be performed using a minimum 1½ cubic yard, track mounted excavator.
- (3) Subgrade Preparation.
 - (a) Cut out all chuckholed and/or washboarded sections from the existing surfacing.
 - (b) Grade the existing surfacing and provide for a 4 to 6 percent crown, where possible.

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS:

<u>SEGMENT</u>	<u>STATION</u>	<u>WORK DESCRIPTION</u>
I1 to I2	0+00	Begin road improvement.
	9+55	Unblock culvert, haul waste material to waste area.
	35+35	Begin removal of bank slough material from cutslope and ditch line, haul waste material to waste area.
	36+35	End removal of sloughed material from cutslope and ditch line, haul waste material to waste area.
	48+30	End road improvement.

EXHIBIT "B"
ROAD SURFACING

ROAD SEGMENT: 1A to 1B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	1A to 1B		0+00 to 14+40		
				Volume (CY) per		Number Of		
Base Rock	6"-0" Pit-run		10	station	63	stations	14.40	907
Junctions	6"-0" Pit-run	1A	10	junction	20	junctions	1	20
Junctions	1 1/2"-0" Crushed	1A	N/A	junction	20	junctions	1	20
Curve Widening	6"-0" Pit-run	1+00 to 3+00	10		15		2	30
Turn-Arounds	6"-0" Pit-run	14+00	N/A	TA	20	TAs	1	20
Landings	6"-0" Pit-run	1B	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			1A to 1B					1,057
ROAD SEGMENT: 1C to 1D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	1C to 1D		0+00 to 19+00		
				Volume (CY) per		Number of		
Base Rock	6"-0" Pit-run		10	station	63	stations	19.00	1,197
Junctions	6"-0" Pit-run	1C	10	junction	20	junctions	1	20
Turn-Arounds	6"-0" Pit-run	9+50	10	TA	20	TAs	1	20
Turn Outs	6"-0" Pit-run	5+30	10	TO	28	TOs	1	28
Landings	6"-0" Pit-run	10+80, 14+50, 1D	N/A	Landing	60	Landings	3	180
Total Rock for Road Segment:			1C to 1D					1,445
ROAD SEGMENT: 1E to 1F				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	1E to 1F		0+00 to 20+00		
				Volume (CY) per		Number of		
Base Rock	6"-0" Pit-run	0+00-5+70, 10+00-20+00	10	station	63	stations	15.70	989
Base Rock	4"-0" Crushed	5+70- 10+00	8	station	50	stations	4.30	215
Turn Outs	6"-0" Pit-run	4+00	10	turnout	28	turnouts	1	28
Turn-Arounds	6"-0" Pit-run	19+30	N/A	TA	20	TAs	1	20
Junctions	6"-0" Pit-run	1E	10	junction	20	junctions	1	20
Junctions	1 1/2"-0" Crushed	1E	N/A	junction	20	junctions	1	20
Culvert Bedding	1 1/2"-0" Crushed	6+10	N/A		20		1	20
Ditch Armor	4"-0" Crushed	7+50-8+50	N/A		20		1	20
Landings	6"-0" Pit-run	1F	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			1E to 1F					1,392
ROAD SEGMENT: 1G to 1H				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	1G to 1H		0+00 to 5+60		
				Volume (CY) per		Number of		
Base Rock	6"-0" Pit-run		10	station	63	stations	5.60	353
Turn Outs	6"-0" Pit-run	4+20	10	TO	28	TOs	1	28
Junctions	6"-0" Pit-run	1G	10	junction	20	junctions	1	20
Landings	6"-0" Pit-run	1H	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:			1G to 1H					461

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ROAD SURFACING

ROAD SEGMENT: 1I				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	1I		N/A		
				Volume (CY) per		Number of		
Junctions	1½"-0" Crushed	1I	N/A	junction	20	junctions	1	20
Landings	6"-0" Pit-run	1I	N/A	Landing	80	Landings	1	80
Total Rock for Road Segment:		1I						100
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		0+00 to 24+40		
				Volume (CY) per		Number of		
Base Rock	6"-0" Pit-run		10	station	63	stations	24.40	1,537
Turn Outs	6"-0" Pit-run	9+40, 17+60	10	TO	28	TOs	2	56
Turn-Arounds	6"-0" Pit-run	21+70	N/A	TA	20	TAs	1	20
Junctions	6"-0" Pit-run	2A	10	junction	20	junctions	1	20
Landings	6"-0" Pit-run	2B	N/A	Landing	60	Landings	1	60
Total Rock for Road Segment:		2A to 2B						1,693
ROAD SEGMENT: 3A				POINTS		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	3A		N/A		
				Volume (CY) per		Number of		
Junctions	1½"-0" Crushed	1I	N/A	junction	20	junctions	1	20
Landings	6"-0" Pit-run	6N, 6O	N/A	Landing	80	Landings	1	80
Total Rock for Road Segment:		3A						100
ROAD SEGMENT: 5A to 5B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	5A to 5B		0+00 to 45+15		
				Volume (CY) per		Number of		
Road Dip	4"-0" Crushed	28+95	N/A	50	Dips	1		50
Total Rock for Road Segment:		5A to 5B						50

ROCK TOTALS (CY)	24"-6"	6"-0"	4"-0"	1 1/2"-0"	3/4"-0"
6,298	0	5,913	285	100	0

Additional rock for curve widening is required and has been included in the volume estimates.

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.

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.

EXHIBIT "B"

ROCK ACCOUNTABILITY

The rock shall meet the quality and size specifications as shown in Exhibit E. A sample must be supplied to STATE for testing and/or approval prior to road rocking.

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 500 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.

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
1A to 1B, 1C to 1D, 1E to 1F, 1G to 1H, 2A to 2B	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." 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 Construction and Road Improvement Segments	1 or 2 or 3 and 5

Pit-Run Rock. Rock spreading shall begin at the nearest point from the rock source and progress towards the end of the project, unless otherwise approved in writing by STATE. Compaction shall be accomplished by using one or more of the approved equipment options listed below:
A minimum of 3 passes shall be made with the grader and vibratory compactor over the entire length of the road, unless STATE requires fewer passes.

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
1A to 1B, 1C to 1D, 1E to 1F, 1G to 1H, 2A to 2B	1 or 4

EXHIBIT "B"

COMPACTION AND PROCESSING REQUIREMENTS

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 except where installation of road fabric is required. 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 Construction and Road Improvement 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) 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.
- (3) 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 surface comes into contact with the tires. Skidders with oversized tires (high floatation) are not acceptable for compaction.
- (4) 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.
- (5) 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 pound.

EXHIBIT "B"

END-HAULING REQUIREMENTS

POINT TO POINT	STA. TO STA.	CONTAINMENT	WASTE AREA LOCATION	WASTE AREA TREATMENT
5A to 5B	0+00 to 8+65	1	1	1, 2
5A to 5B	28+90 to 30+40	2	2	2
I1 to I2	9+55 to 36+35	1	3	1

End-Haul Areas General Requirements

Material shall not be intentionally sidecast.

Clearing and grubbing debris shall be end-hauled.

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

Containment

- (1) Full containment: The amount of material lost over the outside edge of the road shall not exceed 6 inches in depth measured perpendicular to the natural ground slope. Pioneer excavation shall be removed by digging, loading, and hauling rather than by pushing or scraping methods.
- (2) Remove woody debris from road subgrade, material shall be removed by digging loading, and hauling rather than by pushing or scraping methods.

Trees and stumps may have up to 12 inches of material directly above them. Any amount of material exceeding the containment requirements shall be removed by operator from the slope, by whatever means necessary, and end-hauled to a designated waste area.

Waste Area Location

- (1) Between Stations 8+65 to 15+35 on Road 5A to 5B.
- (2) Waste Area located at 30+60 on 5A to 5B.
- (3) Waste Area located west of Point I2 in Area 4.

Waste Area Treatment

- (1) Use suitable excavated material for use in road construction on Road 5A to 5B.
- (2) Unsuitable materials and/or surplus materials shall be deposited at the waste area(s), spread evenly, compacted and adequately drained. Woody debris shall be piled on top of the waste materials.

EXHIBIT "C"

CULVERT SPECIFICATIONS

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. All culverts shall be constructed with of double-walled polyethylene. 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.

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.

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.

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 as specified in Exhibit B 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.

Minimum height of cover over top of culvert to subgrade when road is to be rocked shall be as follows: 12" for aluminized steel culverts 18" to 36", 18" for aluminized steel culverts 42" to 96", and 12" for polyethylene culverts (add 6" for roads which will not be rocked). Minimum vertical cover for other steel 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.

EXHIBIT "C"

CULVERT SPECIFICATIONS

All coupling band designs shall be in accordance with the minimum requirements of the Highway Division (Drawing Nos. 2091-A and B), or as approved by STATE.

Polyethylene culverts between 3" to 10" in diameter shall meet the requirements of AASHTO M-252-851. Polyethylene culverts between 10" to 36" in diameter shall be double walled and meet the requirements of AASHTO M-294-901, Type S.

The intake ends of culverts 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 be a minimum of 2½ inches in width, with the spade driven 2 feet into the ground.

Tamping is required.

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

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

CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	ROAD SEGMENT POINT TO POINT	STATION
1	18	40	1A to 1B	0+00
2	18	30	1A to 1B	11+50
3	18	40	1C to 1D	0+00
4	18	30	1D to 1D	8+90
5	18	30	1C to 1D	12+80
6	18	40	1E to 1F	0+00
7	18	30	1E to 1F	5+30
8	24	40	1E to 1F	6+10
9	18	30	1E to 1F	9+00
10	18	40	1G to 1H	0+00
11	18	30	1G to 1H	3+50
12	18	30	2A to 2B	1+60
13	18	30	2A to 2B	4+70
14	18	30	5C to 5D	9+10

EXHIBIT "D"

ROCK QUARRY DEVELOPMENT AND USE

- (1) Purchaser shall schedule and coordinate STATE quarry and stockpile use with other existing STATE contracts and planned STATE contracts requiring quarry and stockpile use.
- (2) 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 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) Designate "Timeline" for quarry use.
 - (d) Erosion control measures.
- (3) 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."
- (4) All overburden shall be hauled to the designated waste area as directed by STATE.
- (5) Quarry face shall be developed in a uniform manner.
- (6) Oversized material that is produced shall be piled in a designated area adjacent to the quarry. It shall not be wasted.
- (7) The quarry site and access roads 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. Rock quarry access roads shall be blocked upon completion of rock quarry use as directed by STATE. Rock quarry roads shall be waterbarred to provide drainage, as specified in Exhibit G and blocked as directed by STATE.
- (8) 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.
- (9) All quarry backslopes shall be left in a stable condition.

EXHIBIT "E"

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.

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

The material from which base material is produced or manufactured shall conform to the general requirements of Section 2630 of the "Standard Specifications for Highway Construction" prepared by the Highway Division, Oregon Department of Transportation, and shall meet the following test requirements:

Hardness - Test Method AASHTO T 96 35% Maximum

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

<u>For 3/4"-0"</u>	Passing	1" sieve	100%
	Passing	3/4" sieve	90-100%
	Passing	3/8" sieve	55-75%
	Passing	1/4" sieve	40-60%

Of the fraction passing 1/4" sieve, 40% to 60% shall pass the No. 10 sieve.

<u>For 1 1/2"-0"</u>	Passing	2" sieve	100%
	Passing	1 1/2" sieve	95-100%
	Passing	3/4" sieve	60-90%
	Passing	1/4" sieve	35-50%

Of the fraction passing 1/4" sieve, 40% to 60% shall pass the No. 10 sieve.

<u>For 4"-0"</u>	Passing	5" sieve	100%
	Passing	4" sieve	90-100%
	Passing	2" sieve	60-90%
	Passing	1/4" sieve	15-35%

The referenced sieve shall have square openings as set forth in AASHTO M 92, Woven Cloth Series. The determinations of size and gradings shall be as set forth in AASHTO T 27.

PIT-RUN AND RIPRAP ROCK SPECIFICATIONS

<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"

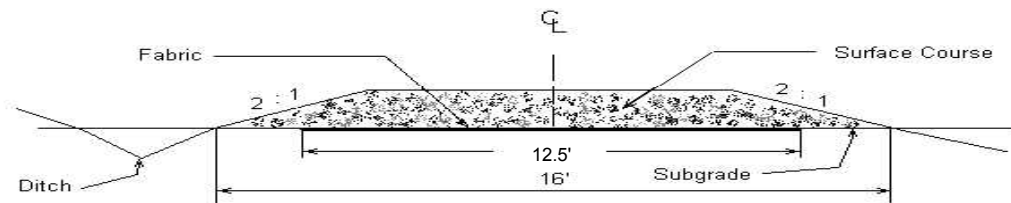
FABRIC SPECIFICATIONS

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 feet | | |

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

- (1) Typical cross section:



- (2) Subgrade surface shall be leveled and smoothed to remove humps and depressions which exceed 6 inches in height and depth. Small pieces of woody debris shall be removed or pushed below subgrade surface. Light vegetation (grass, weeds, leaves, and fine woody debris) may be left in place.
- (3) Fabric shall be installed directly on the prepared surface. Longitudinal and traverse joints shall be overlapped at least 3 feet.
- (4) Surfacing course material shall be placed to the designated thickness in one lift and spread in the direction of fabric overlap. Hauling and spreading equipment shall not be operated on the fabric until the total thickness of surfacing course material is placed.
- (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 fabric on roads or portions of roads is not necessary, PURCHASER shall deliver an equivalent amount of road fabric to STATE.
- (8) Install fabric at the following locations: Sta. 5+70 to 10+10 on 1E to 1F.

EXHIBIT "G"

WATERBAR SPECIFICATIONS

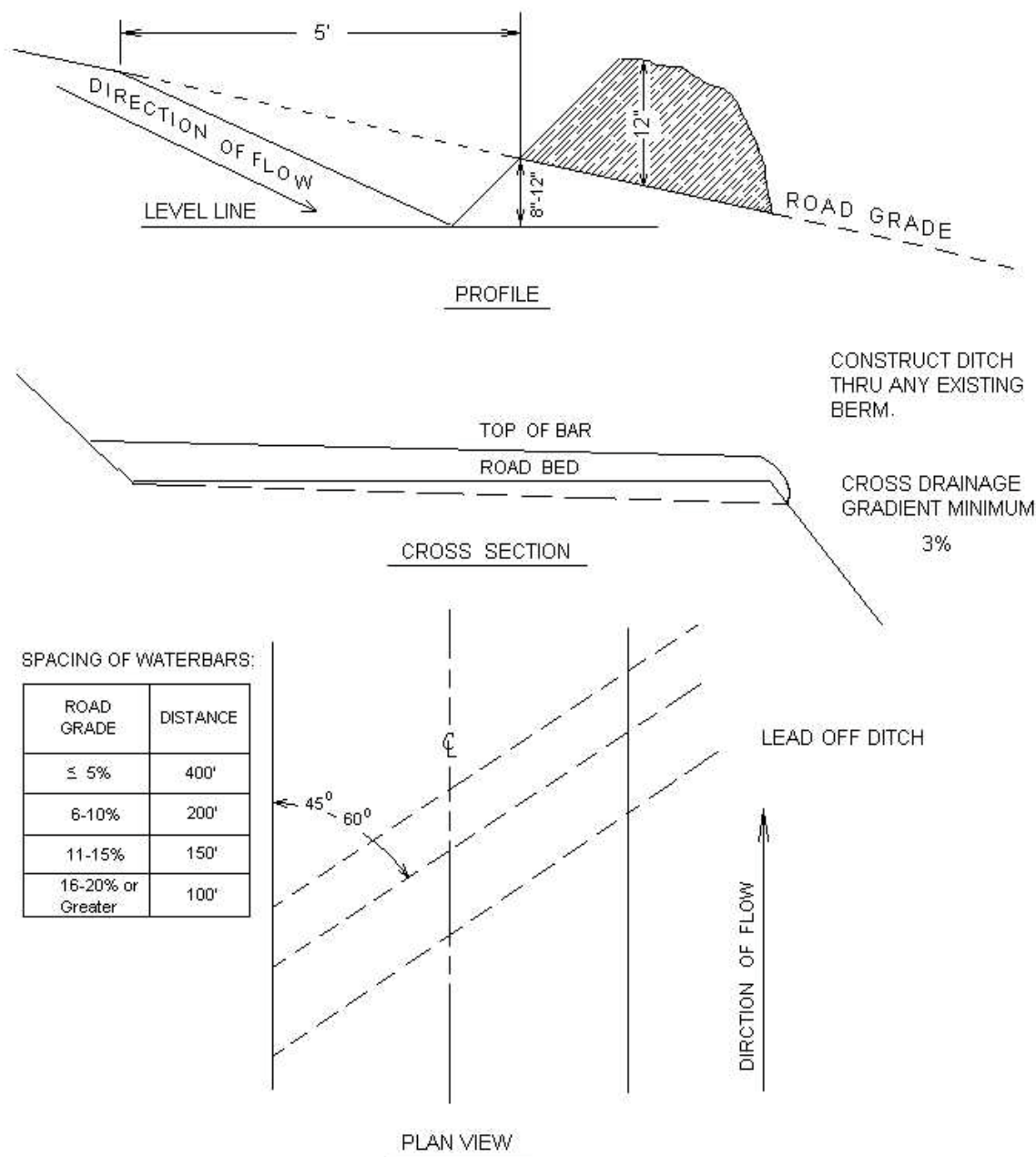
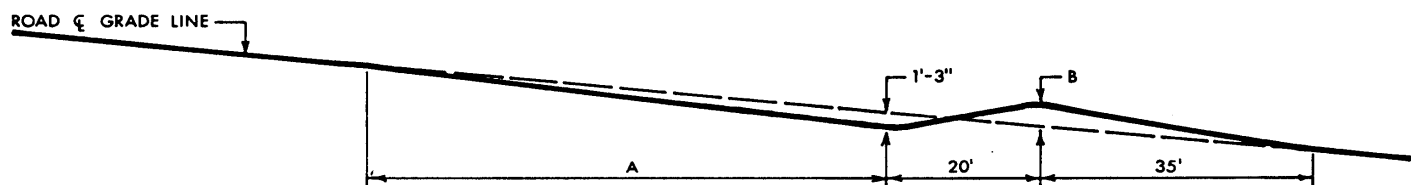
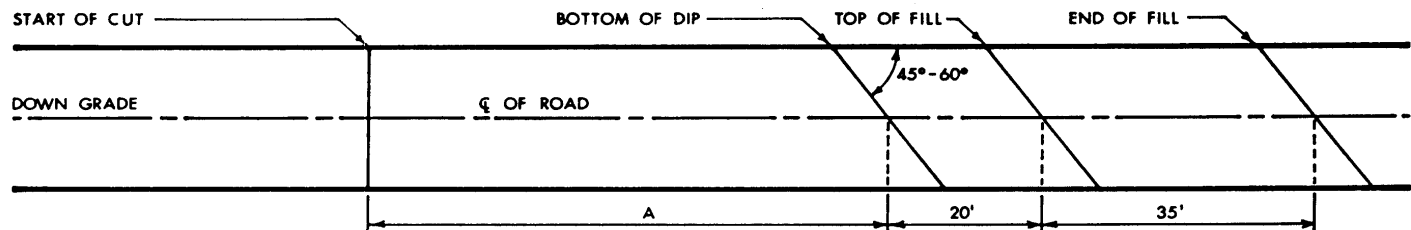
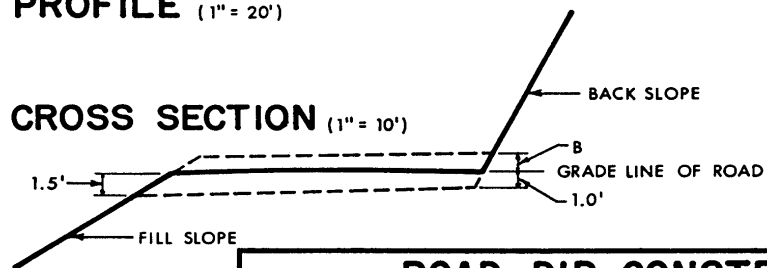


EXHIBIT "H"

ROLLING DIP CONSTRUCTION SPECIFICATIONS



CROSS SECTION (1" = 10')



DIMENSIONS

ROAD GRADE %	A	B
0% - 5%	50'	1.0'
5% - 10%	60'	1.5'
10% - 15%	70'	2.0'
MORE THAN 15%	USE WATERBARS	

ROAD DIP CONSTRUCTION
 SPECIFICATIONS

SCALE: NOTED	APPROVED BY:	DRAWN BY FB
DATE: 10/14/80		REVISED
STATE OF OREGON DEPARTMENT OF FORESTRY 2600 STATE STREET SALEM OREGON 97310		
		DRAWING NUMBER 669

EXHIBIT "I"

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

- (1) Culvert Removal. Remove drainage structures and culverts. Removed culverts shall be hauled to an approved refuse site off State Land.
- (2) 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, or restored to natural contours, as directed by STATE. Developed stream banks shall be sloped at natural contours or no steeper than 1½:1, as directed by STATE.
- (3) Use of Excavated Materials.
 - (a) Fill Excavation. Excavated materials shall be placed and compacted on the roadway a minimum of 10 feet from the top of the developed stream bank. Any excess material shall be placed in a designated waste area, as directed by STATE
 - (b) Woody Debris may be incorporated in embankment material and/or placed on the surface of compacted embankment material.
- (4) Construct Waterbars at designated locations and as directed by STATE. Construct waterbars according to the specifications in Exhibit G, and as directed by STATE.
- (5) Block Roads. Use excavated material from fill removal areas to block roads from vehicle access, as directed by STATE.
- (6) Erosion Control. Erosion control shall be completed in a progressive manner. All exposed excavation areas and waste materials shall be mulched with a straw mulch approved by STATE. Applied straw mulch shall be a minimum of 2 inches deep and provide a uniform cover.
- (7) 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. All work shall be performed during dry conditions acceptable to STATE.

SPECIFIC INSTRUCTIONS/SPECIFICATIONS:

<u>SEGMENT</u>	<u>STATION</u>	<u>WORK DESCRIPTION</u>
V1 to V2	0+00	Point V1. Block road.
	3+85	Point V2. Remove fill. Develop a 3 foot stream channel.
V3 to V4	0+00	Point V3. Block Road.
	5+70	Remove culvert.
	13+16	Remove culvert.
	18+45	Remove culvert.

EXHIBIT "I"

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

SPECIFIC INSTRUCTIONS/SPECIFICATIONS:

<u>SEGMENT</u>	<u>STATION</u>	<u>WORK DESCRIPTION</u>
V3 to V4 (Cont.)	20+10	Remove Fill. Develop a 3 foot stream channel.
	20+75	Remove Fill. Develop a 3 foot stream channel.
	22+70	Point V4
V5	N/A	Access fill as shown on Exhibit "A". Remove fill. Develop 3 foot stream channel.
V6	N/A	Access fill as shown on Exhibit "A". Remove fill. Develop 3 foot stream channel.

EXHIBIT "J"

FOREST ROAD GATE DESIGN, CONSTRUCTION, AND INSTALLATION

Counter Balanced Swing Gate - with a Miami Lock Box

PURCHASER shall design, construct, and install one counter balanced swing gate at 0+60 on 1A to 1B and 0+60 on 1E to 1F.

The project requires site visitation, preliminary design and approval, final design and approval, gate construction (including painting), and installation on above locations.

PROJECT REQUIREMENTS AND MINIMUM SPECIFICATIONS:

- (a) Coordinate site visitation, preliminary designs, a final design, construction, and installation of gate with STATE.
- (b) Site visitation to determine the direction of swing and width for gate.
- (c) A preliminary detailed design proposal shall be submitted to STATE of the proposed gate to be installed and obtain written approval by STATE. STATE is responsible for timely review of preliminary designs, selection of the preferred design, and giving approval to prepare a final design. The design shall meet the following specifications:
 - (1) The gate shall be a counter balanced swing gate.
 - (2) The gate opening shall be a minimum of 18 feet.
 - (3) The gate must be constructed with a minimum of ¼" x 4" x 4" steel tubing. The support post and attachment post shall be constructed with a minimum of 8" schedule 40 steel pipe.
 - (4) A blocking post shall be installed beside the road in the direction of the swing and have a three foot chain attached for securing the gate in the open position. The blocking post shall be constructed with a minimum of 4" schedule 40 steel pipe.
 - (5) All posts shall be embedded in concrete. Fill all posts with concrete. Posts shall have devices attached to prevent lifting out of the concrete.
 - (6) The gate must utilize a "Miami" type lock box capable of four locks. Supply four 2" pins, two 4" pins and two 2" "dead" pins. (Refer to page 2 of Exhibit H for "Miami" type lock box design drawings)
 - (7) Prior to painting, gate and posts shall be cleaned and free of rust scale. Paint with a rust resistant primer coat and a topcoat of a rust resistant high visibility yellow paint.
- (d) The final detailed design shall be submitted to STATE for written approval before construction. STATE is responsible for timely review of the final design and giving approval to proceed with construction.
- (e) Construct the gate as to the specifications above and to the approved final design.
- (f) Install the gate at the proper location and as approved by STATE.
- (g) Place root wads or jetty rock to block vehicular access around each gate as approved by STATE.

EXHIBIT "J"

FOREST ROAD GATE DESIGN, CONSTRUCTION, AND INSTALLATION

"MIAMI" LOCK BOX

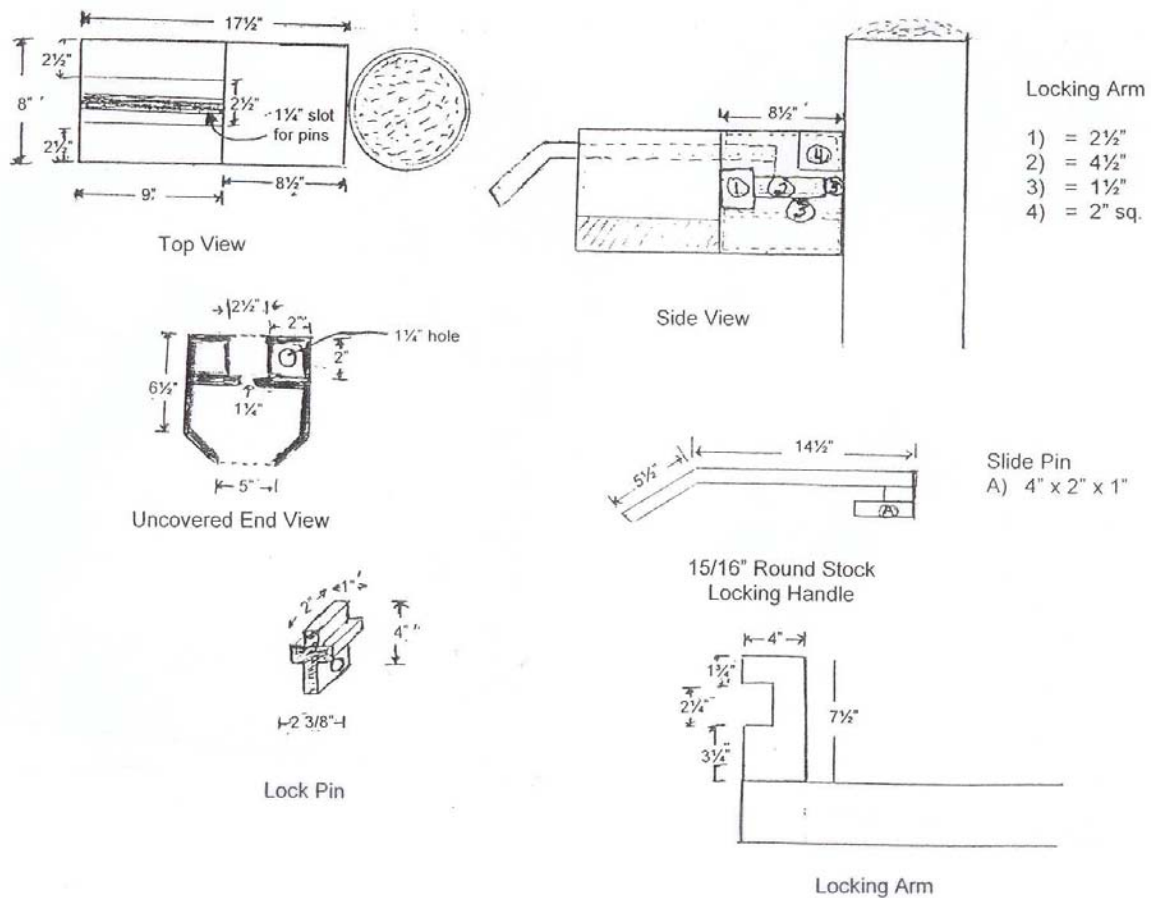


EXHIBIT "K"

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 – Within conifer portions of Areas 3, 4, 5, and 6, an average of 600 cubic feet of hard conifer logs per acre. Logs shall contain a minimum of 10 cubic feet of volume, and be no shorter than 6 feet in length, to be selected by the PURCHASER. Two logs per acre shall be at least 24 inches in diameter, at 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 and/or logs shall be well distributed across the conifer portions of the sale areas.

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

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

EXHIBIT "K"

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	\$ 95.00 / hour	147.0	\$ 13,965
Log Loader	\$ 70.00 / hour	199.5	\$ 13,965

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

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

Work Scheduling - work shall be accomplished only during dry weather conditions, and started within 14 calendar days after completion of yarding activities on Areas 3, 4, 5, and 6. Operations shall provide for continual operation until contract work is completed, unless interrupted by poor weather, fire closures, or other uncontrollable circumstances. Equipment breakdowns shall be repaired without undue delay, and provision shall be made for replacement of equipment to prevent prolonged delays. Piling operation shall not be allowed when operations might damage sites or affect stream flows. Any exception to these instructions must be authorized in writing by STATE.

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

EXHIBIT "L"
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 West Green Mountain Combination

COUNTY Clatsop

(13) STATE CONTRACT NUMBER 341-05-35

(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: ☐ ☒
*Actual taper butt logs over 40' scaling length

(8) PENCIL BUCK ☐ ☒
back to Minimum Scaling Diameter _____

(9) ADD-BACK VOLUME -- ☒ ☐
Deductions due to delay

(10) APPROVED SCALING LOCATIONS	Species	Yard	Truck

(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: Hardwood logs less than 8 inches scaling diameter and containing less than 20 board feet shall be scaled as "Utility."

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

(21) SIGNATURES:

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

State Forester's Representative

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.

EXHIBIT "L"

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.