

EXHIBIT "B"
FOREST ROAD SPECIFICATIONS

SUBGRADE WIDTH	SURFACED WIDTH	POINT TO POINT	STATION TO STATION	DRAINAGE
16 feet	12 feet	1A to 1B	0+00 to 7+25	DITCH
16 feet	12 feet	3A to 3B	0+00 to 151+00	DITCH
14 feet	N/A	3A to 3B	151+00 to 171+40	OUTSLOPED
14 feet	N/A	3C to 3D	0+00 to 9+10	OUTSLOPED
14 feet	N/A	3E to 3F	0+00 to 11+00	OUTSLOPED
16 feet	12 feet	4A to 4B	0+00 to 10+00	DITCH
16 feet	12 feet	4D to 4E	0+00 to 2+90	DITCH
16 feet	12 feet	4F to 4G	0+00 to 1+50	DITCH
16 feet	12 feet	4H to 4I	0+00 to 1+20	DITCH
16 feet	12 feet	I1 to I2	0+00 to 38+30	DITCH
16 feet	12 feet	I2 to I3	0+00 to 17+00	DITCH
16 feet	12 feet	I3 to I4	0+00 to 78+60	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 5 feet out from the toe of the fill slope, or as directed by STATE. Clearing debris shall not be placed or permitted to remain in or under any road embankment sections. Clearing debris shall not be left lodged against standing trees.

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

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

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

CLEARING AND GRUBBING DISPOSAL. Scatter through openings in the timber outside of the cleared right-of-way, except between Stations 16+15 to 22+40 and 123+00 to 135+00 on Segment 3A to 3B where clearing and grubbing debris shall be end-hauled to a designated waste area.

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

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

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

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

Location: As marked in the field.

GRADING

	<u>Back Slopes</u>	<u>Fill Slopes</u>
Rock	Vertical to 1/4:1	Not steeper than 1½:1
Common - side slopes 50% and over	3/4:1	
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 marked in the field.

SEASONAL WINTERIZATION. All unrocked roads (Station 151+00 to 171+40 on 3A to 3B, 3C to 3D, and 3E to 3F) shall be waterbarred in accordance with the specifications in Exhibit I and blocked from vehicular traffic prior to October 1, annually, as directed by STATE.

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FOREST ROAD SPECIFICATIONS

GENERAL ROAD CONSTRUCTION INSTRUCTIONS

- (1) Excavated Materials. Excavated materials shall be utilized for road and fill construction and hauled in where necessary. Surplus excavation materials shall be hauled to the waste areas as marked in the field and/or designated on Exhibit A. Waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with Exhibit B.
- (2) Fill Armor and Energy Dissipator Construction. Where rock is used for fill armor, rock shall be placed and tamped at a 1½:1 slope, beginning at the fill toes. Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet, in accordance with Exhibit K.
- (3) Ditch Armoring. Where ditch armoring is required, 6"-0" pit-run rock will be hauled in and used for surfacing the bottom and sides of the ditch, as directed by STATE.
- (4) Free Draining Fill Construction. Where free draining fill construction is required, clean 6"-2" pit-run drain rock shall be hauled in and used for fill construction. 1½"-0" crushed rock shall be used for backfilling around culverts.

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
3A to 3B	0+00	Begin road fabric installation.
	2+50	Install 18"x32' culvert. Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator.
	16+90	Free Draining Fill Construction. Excavate existing material to provide for a uniform stream gradient of 5 percent. Haul excavated materials to an approved waste area. Install 36"x50' culvert. Install 36" Tee attachment to inlet. Install screens on the inlet and top of Tee attachment. Utilize 120 cubic yards of 1½"-0" crushed rock for bedding and backfill. Provide a minimum 12" crushed rock cover around the culvert. Utilize 456 cubic yards of 6"-2" pit-run drain rock to construct a free-draining fill. Fill slopes will be constructed at 1½: 1. Fill height will be at least 36" above the top of the culvert, measured at the culvert inlet. Finished subgrade width shall be 20 feet with a 12-foot running surface. Utilize 10 cubic yards of 24"-6" riprap for energy dissipator construction.
	37+00	End road fabric installation.
	53+55	Install 18"x34' culvert. Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator.
	59+20	Install 18"x34' culvert. Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator.
	63+20	Install 18"x34' culvert. Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator.
	65+50	Begin road fabric installation.

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SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
3A to 3B	67+50	End road fabric installation.
	66+30	Excavate to remove all woody debris and road fill and haul to waste area indicated on Exhibit A. Backfill excavation with soil from barrow pit as shown on Exhibit A and install an 18" x 60' culvert at a 10 percent gradient. Utilize 10 cubic yards of 24"-6" riprap rock for an energy dissipator.
	75+60	Install 18"x34' culvert. Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator.
	113+75	Begin road fabric installation.
	135+00	End road fabric installation.
	121+40	Install 18"x40' culvert. Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator.
	124+22	Begin ditch armoring with 12" lift of 6"-0" pit run rock.
	124+60	Install 18"x34' culvert. Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator.
	124+83	Begin 80' radius curve and turnout.
	124+88	Begin armoring fill embankments. Utilize 180 cubic yards of 24"-6" riprap rock.
	125+21	Construct ditchout. Continue ditch armoring at least 25' beyond beginning of ditchout.
	125+47	End 80' radius curve.
	125+76	Type F Stream Fill Construction. Specific requirements are shown on Exhibit F.
	126+36	Install 18"x30' culvert. Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator. Begin armoring ditch with 12" lift of 6"-0" pit run rock.
	126+86	End ditch armoring.
	126+93	End fill embankment armoring.
	127+20	Junction with private access road.
	130+70	Install 18"x34' culvert. Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator.
	149+10	Install 48"x56' culvert. Utilize 60 cubic yards of 1½"-0" crushed rock for bedding and backfill. Install culvert at a 5% gradient. Embed culvert 12" to provide for natural stream functions. Utilize 90 cubic yards of 24"-6" riprap rock for energy dissipator construction and fill armor.
	147+00	Begin road fabric installation.
	150+00	End road fabric installation.

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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) 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.
- (3) Culvert Replacement and Culvert Installation. All woody debris encountered during fill excavation shall be removed. All waste materials shall be hauled to nearby waste areas and shall be uniformly sloped and compacted for drainage. Fill construction backfill shall consist of select materials and be obtained from borrow pits, as directed by STATE. Backfill materials shall be hauled in where necessary and thoroughly compacted in accordance with Exhibit B. Crushed rock shall be used for backfilling excavation trenches less than 3 feet deep. Removed culverts shall be hauled to an approved refuse site off of STATE land.
- (4) 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.
- (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 K.
- (6) Ditch Armoring. Where ditch armoring is required, 6"-0" pit-run rock will be hauled in and used for surfacing the bottom and sides of the ditch, as directed by STATE.
- (7) Equipment. All excavation and riprap placement shall be performed using a minimum 1½ cubic yard, track-mounted excavator.
- (8) 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.
 - (b) For Roads I1 to I2 and I3 to I4, apply required 1 ½" – 0" leveling rock and compact in accordance with Exhibit B.
 - (c) Cut out all chuckholed and/or washboard sections from the existing surfacing.
 - (d) Apply required 1 1/2"-0" or 4"-0" base patching and leveling rock, as directed by STATE.
 - (e) Process (grade and mix) the existing surfacing and added base rock. Provide for a crown of 4 to 6 percent (½ inch per foot) and compact in accordance with Exhibit B.
 - (f) Upon completion of above required work, apply, process, and compact surfacing rock in accordance with specifications in Exhibit B.

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SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
Point I2 to I3	0+00	Point I2. Begin fabric.
	4+17	Install culvert. Utilize 10 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 20 cubic yards of 24"-6" riprap rock for armor and energy dissipator construction.
	9+19	Begin End-haul. Haul end-haul material to the designated waste area.
	9+40	Begin Utilizing 6"-0" pit-run rock for any fill material necessary to construct the road per STATE design.
	8+79	Begin ditch armoring with pit-run rock.
	9+86	Culvert replacement. Utilize 10 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for armor and energy dissipator construction.
	10+13	End utilization of 6"-0"pit-run rock for fill construction.
	11+68	Culvert replacement. Utilize 10 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for armor and energy dissipator. End ditch armoring.
	14+07	Culvert replacement. Utilize 10 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for armor and energy dissipator.
	15+44	Culvert replacement. Utilize 10 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for armor.
17+00	Point I3. End fabric.	
Point I3 to I4	13+00	Install 18"x40' culvert. Utilize 10 cubic yards of 24"-6" riprap rock to construct an energy dissipator.

EXHIBIT "B"

END-HAULING REQUIREMENTS

POINT TO POINT	STA. TO STA.	CONTAINMENT	WASTE AREA LOCATION	WASTE AREA TREATMENT
I2 to I3	9+19 to 17+00	See Below	1, 2	See Below

End-Haul Areas General Requirements

Material shall not be intentionally side cast.

Clearing and grubbing debris shall be end-hauled.

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

Containment

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.

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

Waste Area Location

- (1) At Station 19+15 on Road Segment I1 to I2.
- (2) In a stable location as directed by STATE.

Waste Area Treatment

Deposit at waste area, spread evenly, compact, and provide adequate drainage. Pile woody debris separate from other waste material.

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 7+25		
				Volume (CY) per		Number of		
Base Rock	6"-0" Pit-run		10	station	63	stations	7.25	457
Traction Rock	¾"-0"Crushed	0+00 to 6+50	3	station	19	stations	6.50	124
Turn Outs	6"-0" Pit-run		10	turnout	28	turnouts	1	28
Junctions	1½ "-0" Crushed	0+00	3	junction	24	junctions	1	24
Junctions	6"-0" Pit-run	1A	10	junction	30	junctions	1	30
Turnarounds	6"-0" Pit-run		10	TA	30	TA's	1	30
Landings	6"-0" Pit-run	1B	N/A	landing	80	landings	1	80
Total Rock for Road Segment:				1A to 1B				772
ROAD SEGMENT: 3A to 3B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	3A to 3B		0+00 to 151+00		
				Volume (CY) per		Number of		
Base Rock	4"-0" Crushed	0+00 to 135+00	10	station	63	stations	135.00	8,505
Base Rock	6"-0" Pit-run	135+00 to 151+00	8	station	50	stations	16.00	800
Traction Rock	¾"-0"Crushed	26+50 to 38+00	3	station	19	stations	11.50	219
Traction Rock	¾"-0"Crushed	51+00 to 67+00	3	station	19	stations	16.00	304
Traction Rock	¾"-0"Crushed	86+50 to 105+50	3	station	19	stations	19.00	361
Traction Rock	¾"-0"Crushed ¹	112+50 to 135+00	3	station	19	stations	22.50	428
Turn Outs	4"-0" Crushed		10	turnout	28	turnouts	23	644
Turn Outs	6"-0" Pit-run		8	turnout	22	turnouts	3	66
Turn Outs	¾"-0"Crushed		3	turnout	10	turnouts	13	130
Junctions	1½ "-0" Crushed	0+00	3	junction	24	junctions	1	24
Junctions	4"-0" Crushed	0+00	10	junction	30	junctions	2	60
Turnarounds	4"-0" Crushed		10	TA	30	TA's	2	60
Curve widening	4"-0" Crushed		10		N/A			550
Curve widening	¾"-0"Crushed		3		N/A			180
Culvert Bedding	1½ "-0" Crushed	16+90	N/A		N/A			100
Culvert Bedding	1½ "-0" Crushed	25+75	N/A		N/A			120
Culvert Bedding	1½ "-0" Crushed	149+10	N/A		N/A			65
Landings	6"-0" Pit-run	4C	N/A	landing	130	landings	1	130
Free Drain Fill	6"-2" Pit-run ²	16+90	N/A		N/A			456
Energy Dissipaters	24"-6" Riprap		N/A		N/A			120
Fill Armor	24"-6" Riprap	125+75	24		N/A			180
Fill Armor	24"-6" Riprap	149+10	24		N/A			80
Total Rock for Road Segment:				3A to 3B				13,581

¹ ¾"- 0" traction rock for Stations 112+00 to 135+00 is to be obtained from the Flat Iron Stockpile.

² 6"- 2" pit run drain rock for Station 16+90 is to be obtained from the Sterling Quarry.

EXHIBIT "B"
 ROAD SURFACING

ROAD SEGMENT: 4A to 4B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	4A to 4B		0+00 to 10+00		
				Volume (CY) per		Number of		
Base Rock	6"-0" Pit-run		8	station	50	stations	10.00	500
Turn Outs	6"-0" Pit-run		8	turnout	24	turnouts	1	24
Turnarounds	6"-0" Pit-run		8	TA	24	TAs	1	24
Junctions	6"-0" Pit-run		8	junction	24	junctions	1	24
Landings	6"-0" Pit-run	4A & 4B	N/A	landing	80	landings	2	160
Total Rock for Road Segment:				4A to 4B				732
ROAD SEGMENT: 4D to 4E				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	4D to 4E		0+00 to 2+90		
				Volume (CY) per		Number of		
Base Rock	6"-0" Pit-run		8	station	50	stations	2.90	145
Junctions	6"-0" Pit-run		8	junction	24	junctions	1	24
Landings	6"-0" Pit-run	4E	N/A	landing	80	landings	1	80
Total Rock for Road Segment:				4D to 4E				249
ROAD SEGMENT: 4F to 4G				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	4F to 4G		0+00 to 1+50		
				Volume (CY) per		Number of		
Base Rock	6"-0" Pit-run		8	station	50	stations	1.50	75
Junctions	6"-0" Pit-run		8	junction	24	junctions	1	24
Landings	6"-0" Pit-run	4G	N/A	landing	80	landings	1	80
Total Rock for Road Segment:				4F to 4G				179
ROAD SEGMENT: 4H to 4I				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	4H to 4I		0+00 to 1+20		
				Volume (CY) per		Number of		
Base Rock	6"-0" Pit-run		8	station	50	stations	1.20	60
Junctions	6"-0" Pit-run		8	junction	24	junctions	1	24
Landings	6"-0" Pit-run	4I	N/A	landing	80	landings	1	80
Total Rock for Road Segment:				4H to 4I				164
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 38+30		
				Volume (CY) per		Number of		
Subgrade Leveling	1½ "-0" Crushed	N/A	N/A					550
Total Rock for Road Segment:				I1 to I2				550

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ROAD SEGMENT: I2 to I3				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size and Type	Location	Depth of Rock (inches)	I2 to I3		0+00 to 17+00		
				Volume (CY) per		Number of		
Base Rock	4"-0" Crushed	0+00 to 17+00	10	station	63	stations	17	1,071
Surface Rock	¾"-0"Crushed	0+00 to 17+00	3	station	19	stations	17	323
Turn Outs	4"-0" Crushed		10	turnout	28	turnouts	3	84
Turn Outs	¾"-0"Crushed		3	turnout	10	turnouts	3	30
Curve widening	4"-0" Crushed		10		N/A			172
Curve widening	¾"-0"Crushed		3		N/A			36
Culvert Bedding	¾"-0"Crushed	4+17	N/A					10
Energy Dissipator	24"-6" Riprap	4+17	N/A					10
Fill Armor	24"-6" Riprap	4+17	24		N/A			10
Fill Material	6"-0" Pit-run	9+40 to 10+13	N/A					132
Ditch Armor	6"-0" Pit-run	8+79 to 11+68	N/A					60
Culvert Bedding	¾"-0"Crushed	9+86	N/A					10
Energy Dissipator	24"-6" Riprap	9+86	N/A					10
Culvert Bedding	¾"-0"Crushed	11+68	N/A					10
Energy Dissipator	24"-6" Riprap	11+68	N/A					10
Culvert Bedding	¾"-0"Crushed	14+07	N/A					10
Energy Dissipator	24"-6" Riprap	14+07	N/A					10
Culvert Bedding	¾"-0"Crushed	15+44	N/A					10
Energy Dissipator	24"-6" Riprap	15+44	N/A					10
Total Rock for Road Segment:				I2 to I3				2,012
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 78+60		
				Volume (CY) per		Number of		
Subgrade Leveling	1½ "-0" Crushed	N/A	N/A					350
Culvert Bedding	¾"-0"Crushed	13+00	N/A					10
Energy Dissipator	24"-6" Riprap	13+00	N/A					10
Total Rock for Road Segment:				I3 to I4				370

ROCK TOTALS (CY)	24"-6"	6"-2"	6"-0"	4"-0"	1 1/2"-0"	3/4"-0"
	450	456	3,137	11,146	1,233	2,195

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 except for Station 151+00 to 171+40 on 3A to 3B, 3C to 3D, and 3E to 3F.	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 6 inches in depth. When more than 1 layer is required, each shall be shaped and compacted before the succeeding layer is placed. Any irregularities or depressions that develop during compaction of the top layer shall be corrected by loosening the material at these places and adding or removing material until the surface is smooth and uniform. Each layer shall be compacted with a minimum of 3 passes over the entire width and length of the road. A pass is defined as traveling a road section in one direction and then back over that same section again. Compaction shall be accomplished by using one or more of the approved equipment options listed below:

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

EXHIBIT "B"

COMPACTION AND PROCESSING REQUIREMENTS

Pit-Run Rock. The rock shall be uniformly mixed and spread in layers on the approved roadbed. Each layer of pit-run 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 or 5

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

EXHIBIT "C"

CULVERT SPECIFICATIONS

All culvert materials shall be furnished and installed by PURCHASER, unless otherwise specified in the contract. Culverts shall be constructed of corrugated, double-walled polyethylene, except for culvert Nos. 5, 21, and 24, unless use of other culvert materials with an equivalent life expectancy is approved in writing by STATE. Pipe and fittings shall be made of polyethylene compounds which meet or exceed the requirements of Type III, Category 4 or 5, Grade P33 or P34, Class C per ASTM D-1248 with the applicable requirements defined in ASTM D-1248. Double-walled polyethylene pipe shall meet the requirements of AASHTO M-294-901, Type S. This specification applies to high density polyethylene corrugated pipe with an integrally formed smooth interior.

Culvert No. 5 shall be constructed of 12 gauge corrugated aluminized steel, culvert No. 21 shall be constructed of 10 gauge corrugated aluminized steel and culvert No. 24 shall be constructed of 14 gauge corrugated aluminized steel.

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.

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.

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

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.

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

The foundation and trench walls for all culverts shall be free from logs, stumps, limbs, stones over 3 inches, and other objects which would dent or damage the pipe during installation or use. If tamping is required, the trench shall be excavated wide enough to permit working on each side of pipe. Bedrock shall be excavated as required to provide a uniform foundation for the full length of the culvert.

A bedding of granulated material or job-excavated soil shall be placed to provide a wide band of support and to transmit the load from above evenly over the entire length of the pipe.

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

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

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.

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

EXHIBIT "C"
 CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	ROAD SEGMENT POINT TO POINT	STATION
1	18	34	1A to 1B	2+35
2	18	32	3A to 3B	2+50
3	18	40	3A to 3B	9+70
4	18	40	3A to 3B	16+15
5	36	50	3A to 3B	16+90
6	18	30	3A to 3B	20+20
7	18	40	3A to 3B	22+40
8	18	40	3A to 3B	24+85
9	18	40	3A to 3B	31+95
10	18	34	3A to 3B	53+55
11	18	34	3A to 3B	59+20
12	18	34	3A to 3B	63+20
13	18	60	3A to 3B	66+30
14	18	32	3A to 3B	70+70
15	18	34	3A to 3B	75+60
16	18	34	3A to 3B	109+35
17	18	30	3A to 3B	113+10
18	18	34	3A to 3B	117+80
19	18	34	3A to 3B	121+40
20	18	34	3A to 3B	124+60
21	117"x 79"	48	3A to 3B	125+76
22	18	30	3A to 3B	126+36
23	18	34	3A to 3B	130+70
24	48	56	3A to 3B	149+10
25	18	34	3A to 3B	149+90
26	18	40	4H to 4I	0+00

EXHIBIT "C"
CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	ROAD SEGMENT POINT TO POINT	STATION
27	18	44	I2 to I3	4+17
28	18	34	I2 to I3	9+86
29	18	34	I2 to I3	11+68
30	18	42	I2 to I3	14+07
31	36	32	I2 to I3	15+44
32	18	40	I3 to I4	13+00

Culvert No 21 (117" x 79", 10 gage, aluminized steel pipe arch culvert) requires step beveling on both the inlet and outlet.

All culverts 36" in diameter or larger shall have 1:1 beveled inlets with the exception of Culvert No. 5 which shall not be beveled to accommodate installation of Tee attachment. (Free Draining Fill)

Culvert No. 5 – Install an aluminized steel, 12 gage, Tee attachment on the inlet. The Tee attachment shall have the following dimensions: 36" diameter X 72" length, with a 36" diameter X 30" riser. Both the riser and inlet will have a debris screen attached to allow water passage, but prevent wood and debris from entering the culvert. Drawings are on file at the District Office.

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

EXHIBIT "D"

ROCK PIT DEVELOPMENT AND USE

- (1) PURCHASER shall prepare a written development plan for both the Sterling Ranch Quarry and the Spruce Run Quarry for the area to be used to extract riprap and pit-run material. The plan shall be submitted to the STATE for approval prior to conducting any operation in the pit area. The plan shall include, but not be limited to:
 - (a) Location of benches and roads to benches.
 - (b) Disposal site for debris and overburden.
 - (c) Time lines for rock quarry use.
 - (d) Erosion Control measures.
- (2) 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 submit 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.
- (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.
- (4) Benches shall be constructed at intervals of 40 feet or less in height and shall be a minimum of 20 feet in width. Any gravel or talus slopes shall be left with a working face at an angle of 60 degrees or less. There shall be a minimum of 1 bench with an access road to it. Said bench shall be easily accessible with tractors.
- (5) Pit face shall be developed in a uniform manner.
- (6) The pit site shall be left in a condition free from overburden and debris. Access roads to the pit, and the pit floor, shall be cleared at the termination of use. Overburden shall be removed for a distance of 20 feet beyond the developed rock source.
- (7) The quarry floor shall be developed to provide for drainage away from the quarry. All quarry and stockpile site drainage ditches shall be maintained. Quarry access roads shall be cleared and blocked upon completion of quarry use as directed by STATE.
- (8) Proper winterization and storm-water control measures such as water barring, 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) PURCHASER shall notify STATE 5 days prior to the start of quarry development activities.
- (10) Clear and grub the rock source area. All woody debris, including stumps and slash shall be hauled, and piled at the waste area, as directed by STATE.

PURCHASER shall coordinate use with PURCHASER of other STATE timber sales with required quarry use. The STATE contract requiring quarry use is, as follows:

Osweg Combination Timber Sale No. 341-04-36. Requires the removal of approximately 3,000 cubic yards of 6"-0" pit-run rock. Expected quarry use during the Summer of 2004.

State Timber Sale Contract
No. 341-04-07
Rotorwash

EXHIBIT "E"

PIT-RUN AND RIPRAP ROCK SPECIFICATIONS

Grading Requirements

<u>For 6"-0" Pit-Run</u>	Passing	10" sieve	100%
	Passing	6" sieve	65%
<u>For 6"-2" Pit-Run</u>	Passing	10" sieve	100%
<u>Drain Rock</u>	Passing	6" sieve	65%

The material shall be clean, well graded, and free of 2"-0" fines. Control of gradation shall be by visual inspection by STATE.

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.

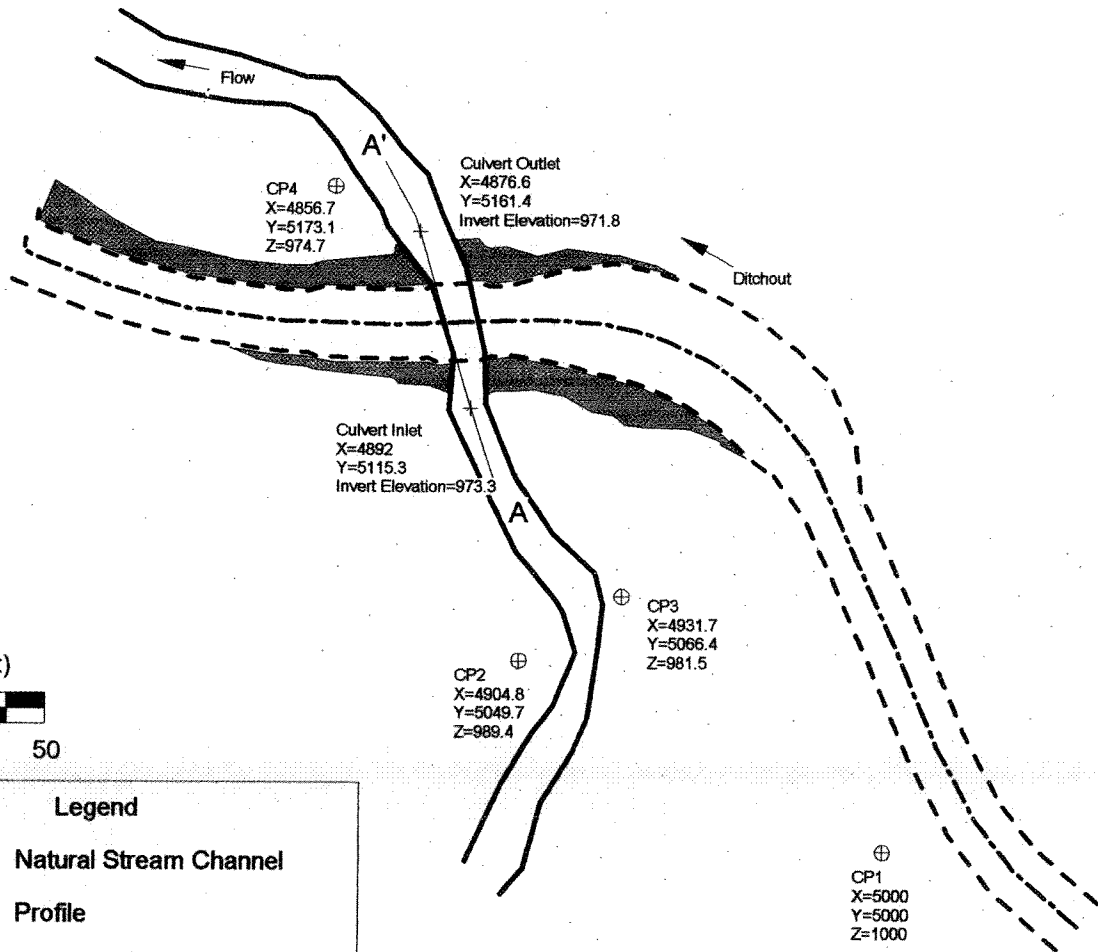
EXHIBIT "F"

TYPE F CROSSING SPECIFICATIONS

Specifications for Type F stream construction located on road segment 3A to 3B, Station 125+76

- (1) Type F stream construction must allow free passage of fish as provided in the Oregon Forest Practice Rules.
- (2) Work shall be conducted only during periods of low water flows and between July 1 and September 15, annually. STATE shall be notified a minimum of 48 hours prior to beginning work. STATE has prepared a "Written Plan" for this work.
- (3) A minimum 1½ cubic yard, track-mounted backhoe shall be used for all excavation, stream development/preparation, and riprap placement. Use of an on site hydraulic rock hammer may be required for the breaking of rock strata encountered during the development of the culvert bed.
- (4) Excavated debris and soil materials unsuitable for fill construction shall be placed at stable locations and/or end-hauled to "Waste Areas", as directed by STATE.
- (5) Waste materials shall be sloped for drainage and stability, as directed by STATE. Grass seed and straw mulch shall be applied to all exposed areas, bare soils, and waste materials according to specifications in Exhibit N. Applied mulch shall be a minimum of 3 inches deep and provide a uniform cover.
- (6) De-watering of the work site shall be accomplished prior to the excavation of fill material for the development of the culvert bed and stream channel. The work site shall be de-watered by the use of cofferdams, temporary diversion ditches, or drainage structures and/or damming and pumping.
- (7) Remove all fill and logs or woody debris for the development of the culvert bed. The location of the culvert will be calculated by using control points set in the field. The inlet of the pipe will be set by referencing to Control Point 3 (HD= 62.99 feet at an Azimuth = 320 degrees and a Vertical Offset of 8.2 feet). The outlet end of the culvert will be set by referencing to Control Point 4 (HD = 23.09 feet at an Azimuth = 120 degrees and a Vertical Offset of 2.9 feet. Utilize 110 cubic yards of 1½"-0" crushed rock for the culvert bed and for backfill.
- (8) Develop the stream channel for a distance of 25 feet upstream of the culvert inlet, and as directed by STATE. The stream channel width will be at least 10 feet and stream channel banks shall be sloped at 1½:1.
- (9) Native (excavated) stream sediment materials shall be placed in the culvert barrel to a depth of 18 inches. Excavated boulders or riprap rock shall be placed and embedded at the outlet of the new culvert to allow additional stream sediment materials to settle in the barrel of the culvert.
- (10) Fill construction backfill shall consist of select materials from designated borrow areas, as directed by STATE. Utilize 120 cubic yards of 1½"-0" crushed rock for culvert bedding and backfill. Fill depth will be a minimum of 24 inches above the top of the culvert, measured at the culvert inlet, as directed by STATE. Backfill materials shall be hauled in where necessary and thoroughly compacted in accordance with Exhibit B. Utilize 180 CY of 24"-6" riprap for armoring fill slopes and energy dissipator construction, in accordance with Exhibit K. The riprap rock shall be placed and tamped at a 1½:1 slope for a minimum thickness of 2 feet beginning at the toes. Finished sub-grade width shall be 20-feet with a 16-foot running surface.

EXHIBIT "F"
 STREAM CROSSING



Scale (feet)



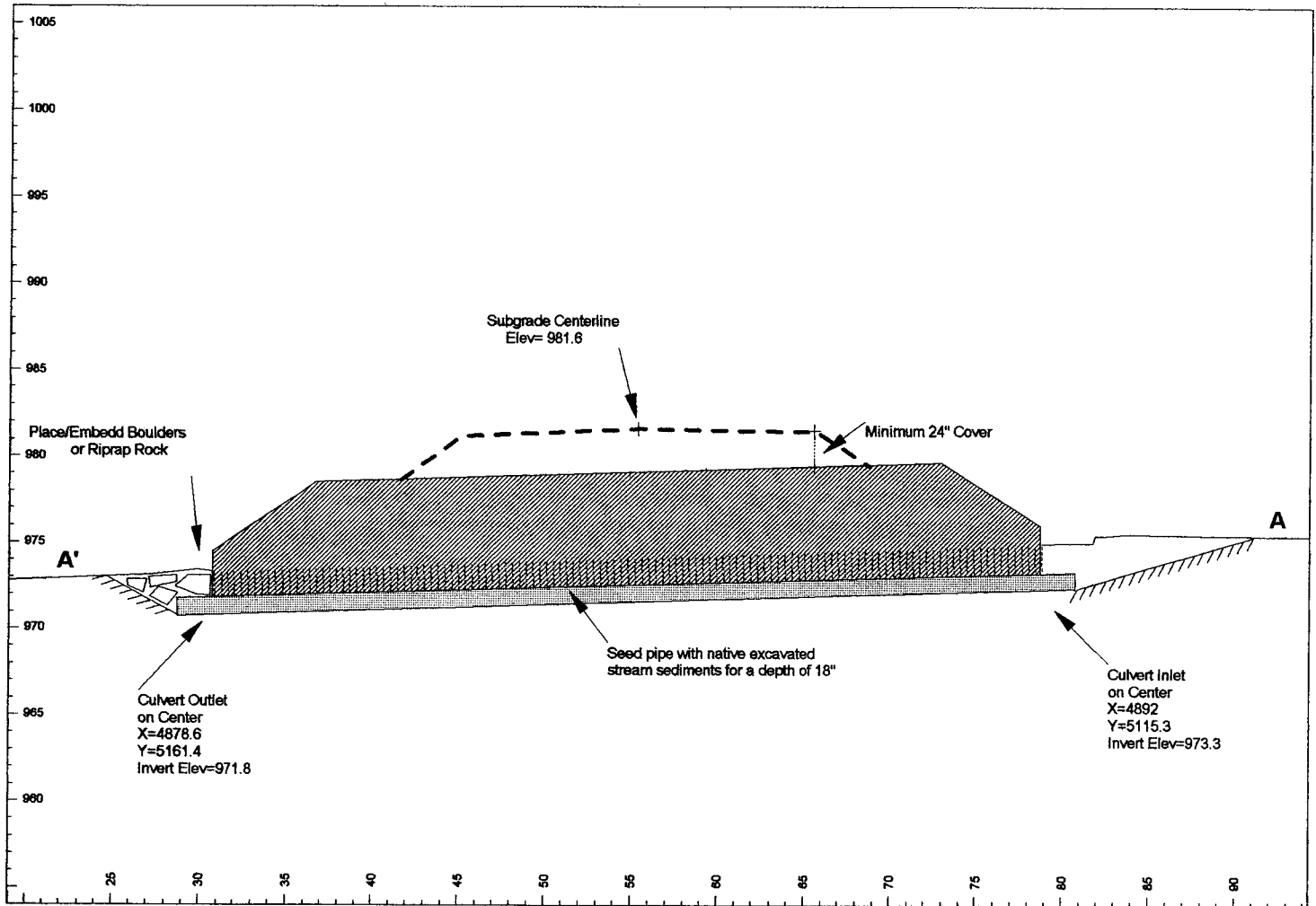
Legend	
	Natural Stream Channel
	Profile
	Designed Road Centerline
	Designed Road Width
	Designed Embankment





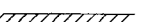



Oregon Department of Forestry
 Astoria District
 Engineering Unit

Point 3A to 3B
 Station 125+76
 Quartz Creek Tributary
 NE 1/4, Sec. 9, T4N, R7W, W.M.
 Clatsop County, Oregon

EXHIBIT "F"
 STREAM CROSSING



Legend	
	Existing Stream Bottom
	Designed Embankment
	Pipe Arch
	Crushed Bedding Rock (Min. 1 foot of Depth)
	Excavated Stream Bottom
	Pipe Seeding With Native Material (18" depth)



Oregon Department of Forestry
 Astoria District
 Engineering Unit

Point 3A to 3B
 Station 125+76
 Quartz Creek Tributary
 NE 1/4, Sec. 9, T4N, R7W, W.M.
 Clatsop County, Oregon

EXHIBIT "G"

ROAD VACATING AND FILL REMOVAL SPECIFICATIONS
V1 to V2

PURCHASER shall vacate August Fire Road between Point V1 and V2. Specific objectives for this project include:

- Salvage and stockpile existing crushed surfacing rock.
- Culvert removal.
- Rehabilitate compacted subgrade soils by ripping and tilling.
- Restoration of natural contours by outsloping of the road prism.
- Minimize disturbance of existing vegetation.

GENERAL ROAD VACATING INSTRUCTIONS

- (1) Tree Removal. Cut or remove all trees necessary to access the project area and to facilitate vacating operations, as directed by STATE. All timber shall be removed as designated timber.
- (2) Rock Salvage. Remove, salvage, and stockpile the existing crushed surfacing rock. Salvaged rock shall be stockpiled at the stockpile location in the NW ¼ Section 16, T4N, R7W, as shown on Exhibit A, "Stockpile Site," as directed by STATE.
- (3) Culvert Removal. Remove drainage structures and culverts. Removed culverts shall be hauled to an approved refuse site off of STATE Land.
- (4) Rip and Till Subgrade. Rip and till the compacted subgrade soils to a minimum depth of 18 inches, in accordance with Exhibit H.
- (5) Outslope Road. Outslope road to restore natural contours or establish a minimum of 10% slope for drainage
- (6) Use of Excavated Materials. Excavated materials shall be placed on the interior (cut) side of the road, and utilized to restore the cutslope to natural contours, or to a minimum 10% outsloped surface for drainage. Any excess material will be hauled to a designated waste area, as directed by STATE.
- (7) Equipment. A minimum 1½ cubic yard, track-mounted excavator shall be used for all ripping and tilling unless otherwise approved in writing by STATE.
- (8) Dry Conditions. All work shall be performed during dry conditions acceptable to STATE.

EXHIBIT "G"

ROAD VACATING AND FILL REMOVAL SPECIFICATIONS
V1 TO V2

SPECIFIC ROAD VACATING INSTRUCTIONS

<u>Segment</u>	<u>Station</u>	<u>Work Description</u>
V1 to V2	0+00	Begin rock salvage, ripping, tilling, and outsloping.
	4+70	Remove culvert.
	10+25	Remove culvert.
	11+16	End rock salvage, ripping, tilling, and outsloping.

EXHIBIT "H"

RIPPING, TILLING, AND OUTSLOPING

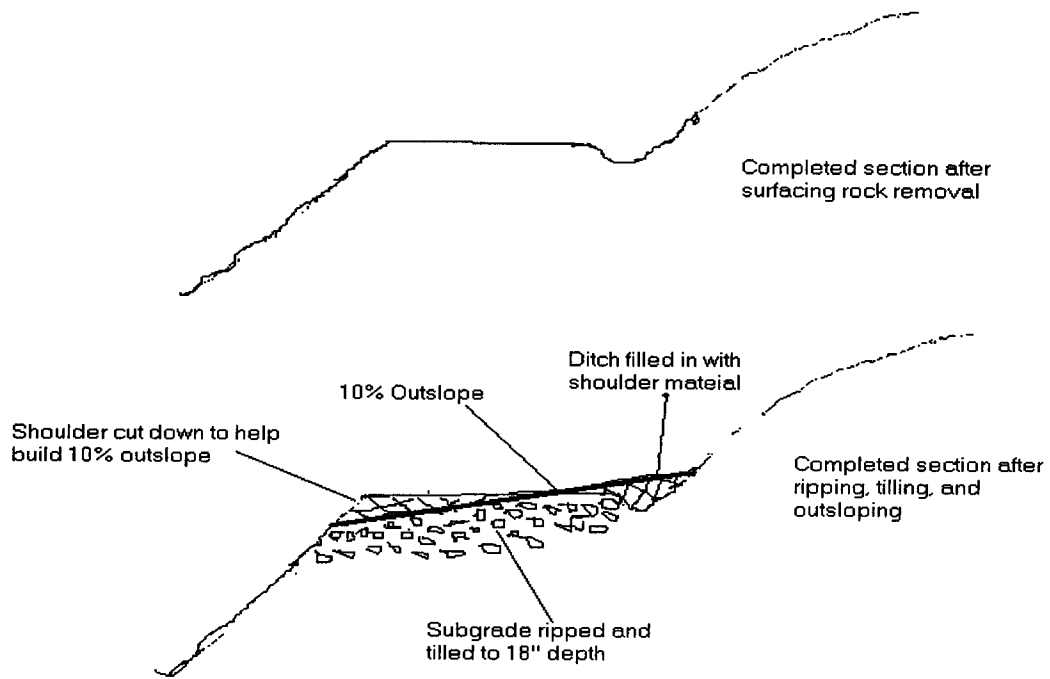


EXHIBIT "I"
WATERBAR SPECIFICATIONS

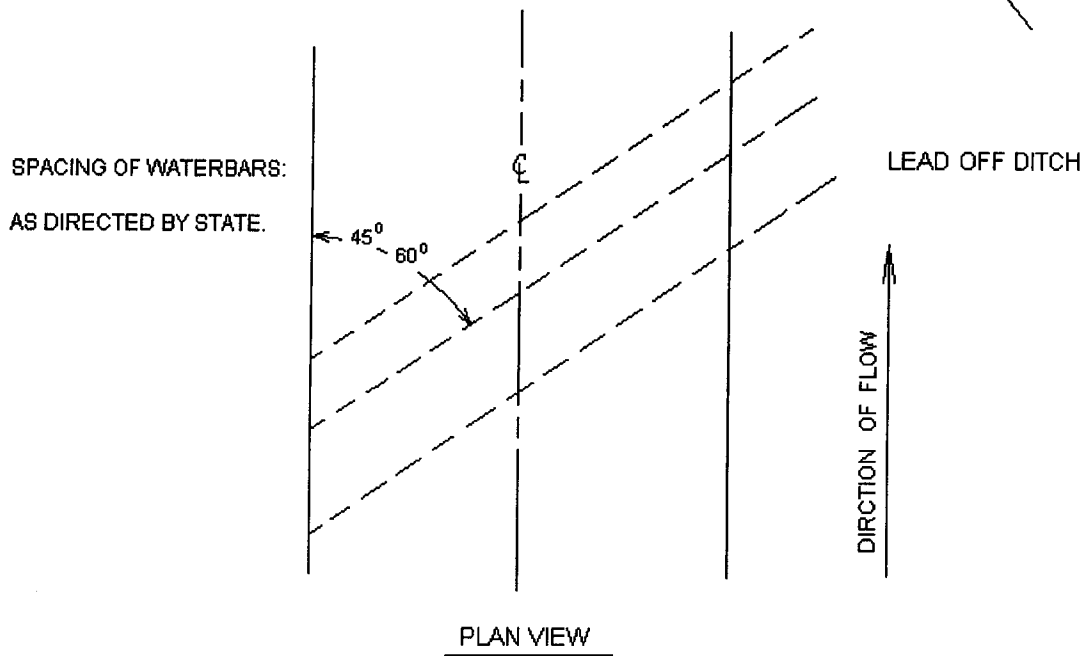
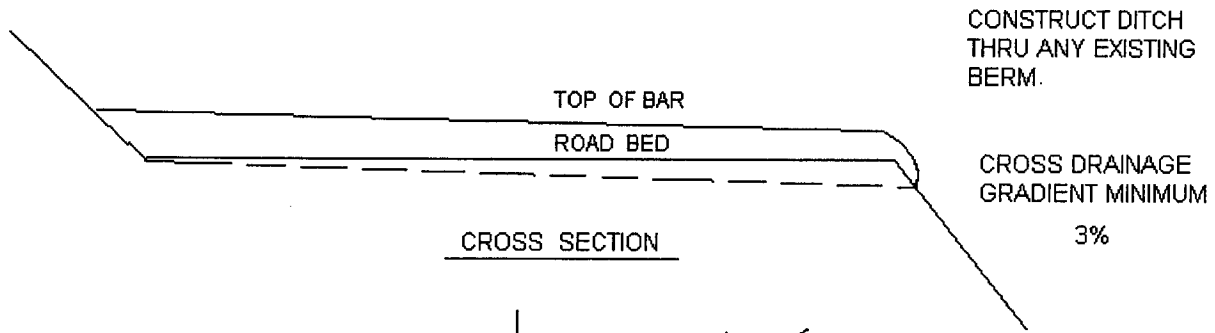
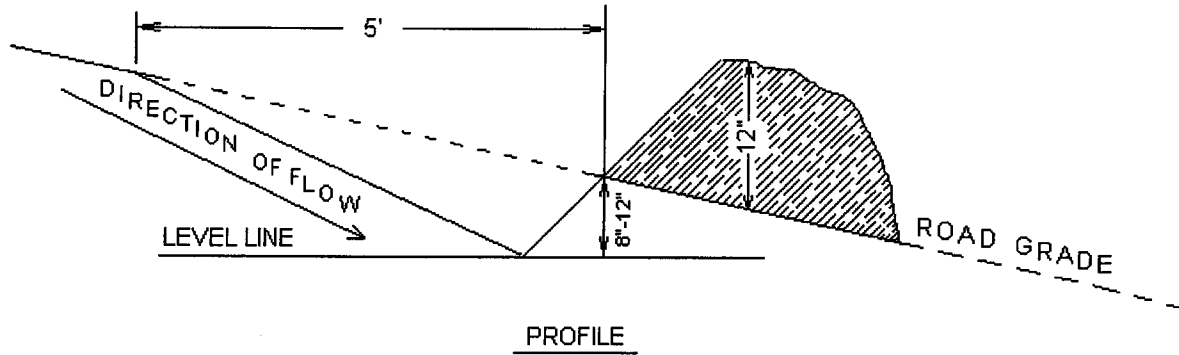


EXHIBIT "J"

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 122+90 on 3A to 3B.

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

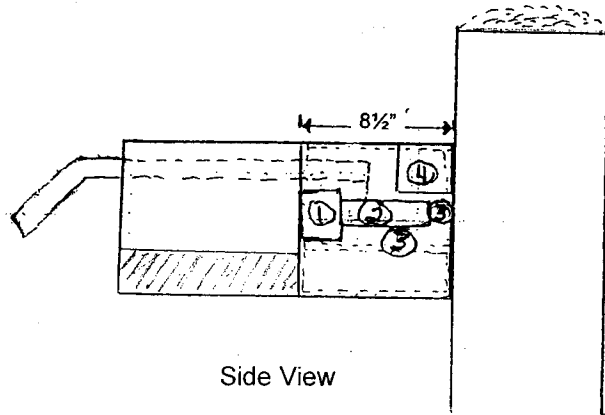
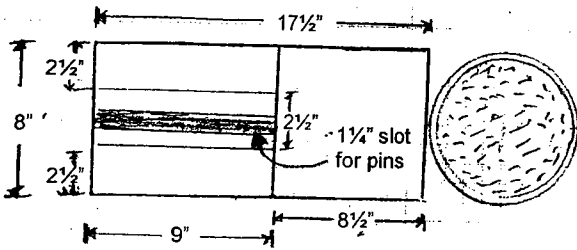
PROJECT REQUIREMENTS AND MINIMUM SPECIFICATIONS:

- (1) Coordinate site visitation, preliminary designs, final designs, construction, and installation of gate with STATE.
- (2) Site visitation to determine the direction of swing and widths for gate.
- (3) 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:
 - (a) The gate shall be a counter balanced swing gate.
 - (b) The gate opening shall be a minimum of 18 feet.
 - (c) The gate must be constructed with a minimum of 1/4" x 4" x 4" steel tubing. The support post and attachment post shall be constructed with a minimum of 8" schedule 40 steel pipe.
 - (d) 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.
 - (e) All posts shall be embedded in concrete. Fill all posts with concrete. Posts shall have devices attached to prevent lifting out of the concrete.
 - (f) 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 J for "Miami" type lock box design drawings.)
 - (g) 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.
- (4) 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.
- (5) Construct the gate as to the specifications above and to the approved final design.
- (6) Install the gate at the proper location and as approved by STATE.

EXHIBIT "J"

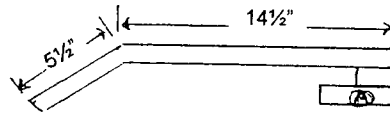
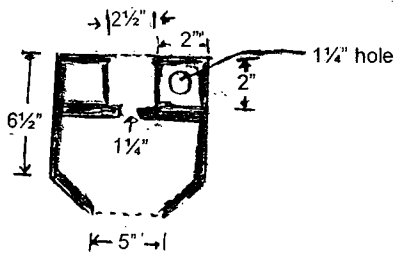
FOREST ROAD GATE DESIGN, CONSTRUCTION, AND INSTALLATION

"MIAMI" LOCK BOX

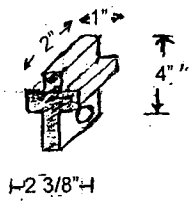


Locking Arm

- 1) = 2 1/2"
- 2) = 4 1/2"
- 3) = 1 1/2"
- 4) = 2" sq.



Slide Pin
 A) 4" x 2" x 1"



15/16" Round Stock
 Locking Handle

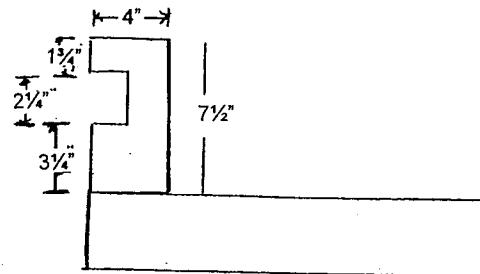


EXHIBIT "K"

TYPICAL EMBEDDED ENERGY DISSIPATER

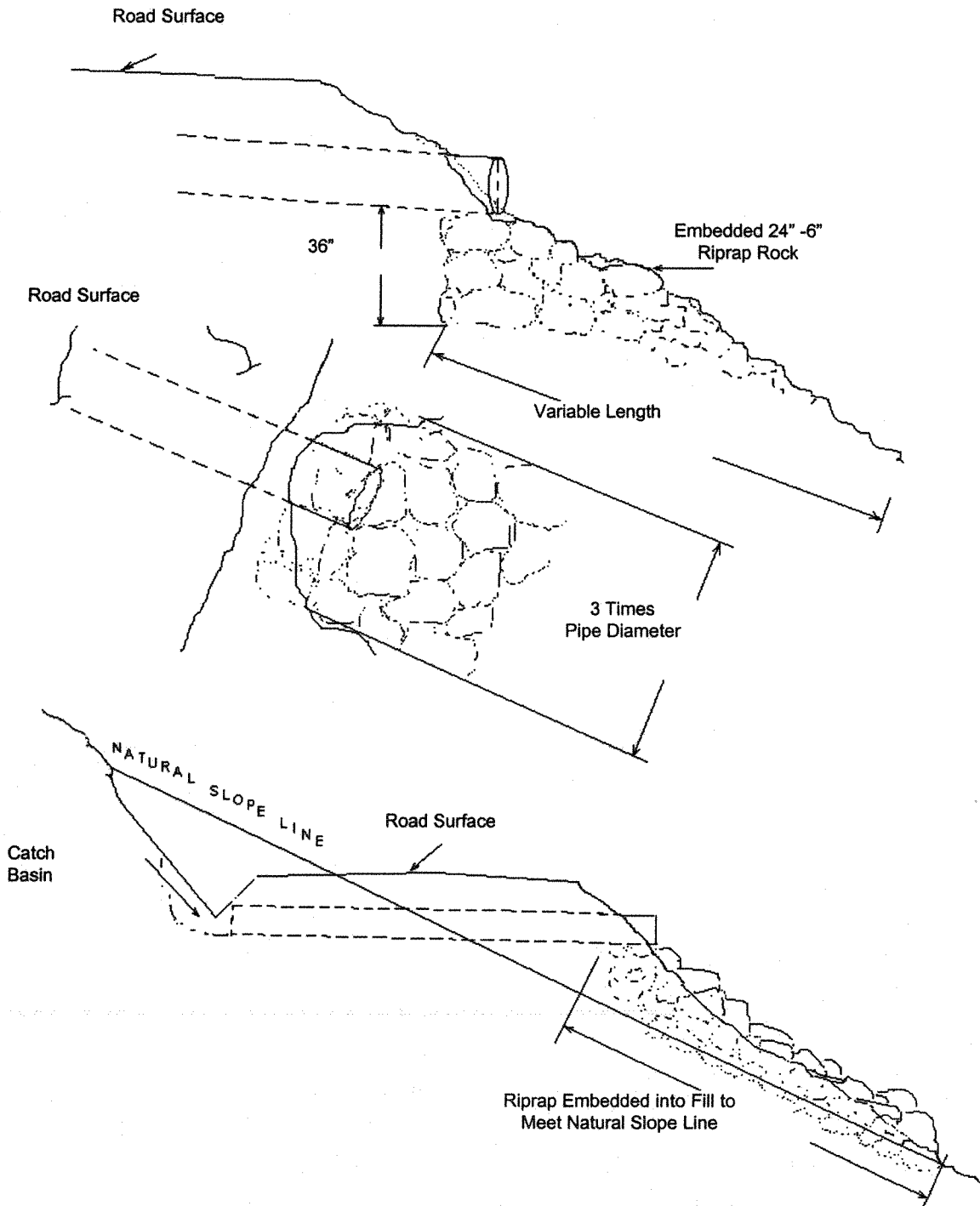


EXHIBIT "L"

FREE DRAIN FILL SPECIFICATIONS

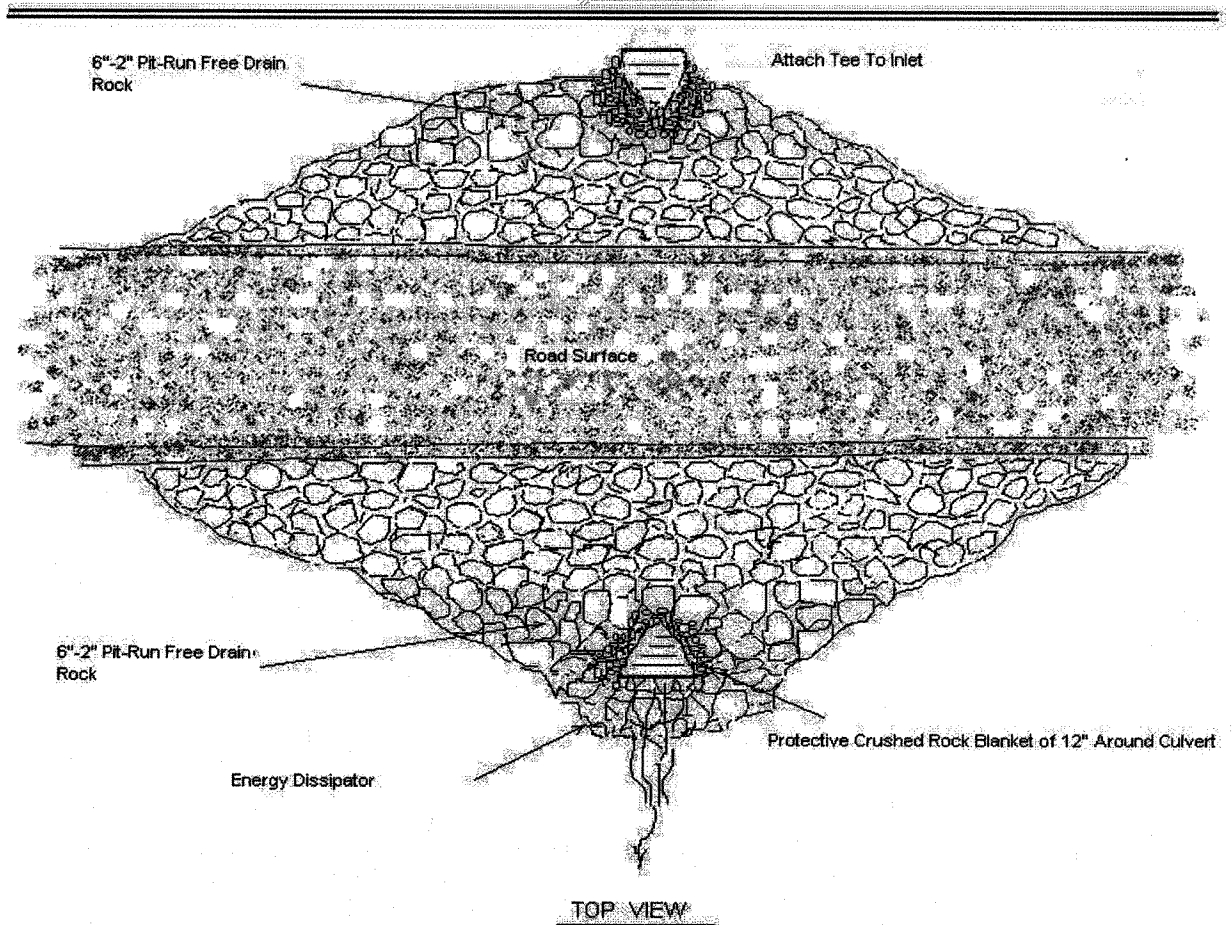
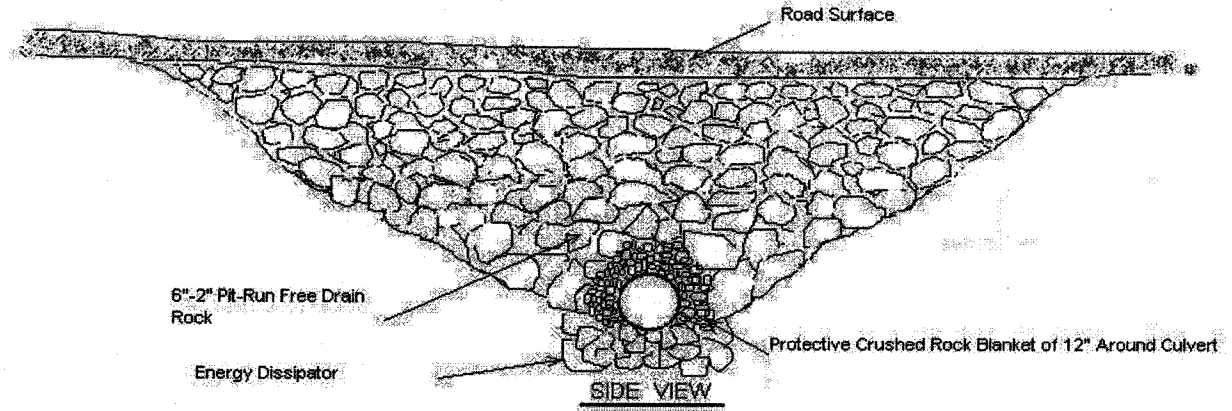


EXHIBIT "M"

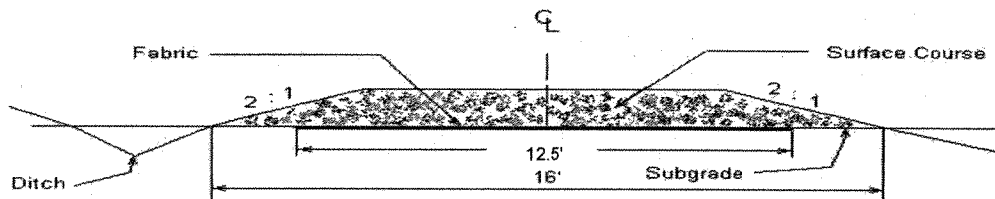
FABRIC SPECIFICATIONS

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

- | | | | |
|-----|--------------------------------|----------|------------|
| (1) | Grab Tensile | 300 lbs. | ASTM D1682 |
| (2) | Modulus Load at 10% Elongation | 140 lbs. | ASTM D1682 |
| (3) | Mullen Burst | 600 lbs. | ASTM D751 |
| (4) | Width - 12.5 feet | | |

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.

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.

EXHIBIT "N"

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. Apply grass seed to all waste areas, and bare soils resulting from fill reconstruction/removals in Project No. 1 and all bare soils resulting from road construction activities from Station 0+00 to Station 24+85 on Road Segment 3A to 3B.

EXHIBIT "O"

SPECIFICATIONS FOR BRUSH AND SLASH SHOVEL PILING

Description of Work to be Done

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

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

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

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

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

Residual Logs - An average of 300 cubic feet of hard conifer logs per acre. Log shall contain a minimum of 10 cubic feet of volume and be no shorter than 6 feet in length. Two logs per acre shall be at least 24 inches in diameter, on the large end, where available. Hard conifer logs must be in decay class one or two as indicated by intact bark and original wood color. Trees or logs shall be left well distributed across the unit.

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

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

EXHIBIT "O"

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	217	\$ 20,615
Log Loader	\$ 70.00 / hour	295	\$ 20,615

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

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

Work Scheduling - work shall be accomplished only during dry weather conditions, and started within 14 calendar days after completion of yarding activities on Areas 1, 2, 3, and 4. Operations shall provide for continual operation until contract work is completed, unless interrupted by poor weather, fire closures, or other uncontrollable circumstances. Equipment breakdowns shall be repaired without undue delay, and provision shall be made for replacement of equipment to prevent prolonged delays. Piling operation shall not be allowed when operations might damage sites or affect stream flows. Any exception to these instructions must be authorized in writing by STATE.

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

EXHIBIT "P"
OREGON DEPARTMENT OF FORESTRY

SCALING INSTRUCTIONS -- LOCATION APPROVAL -- BRAND INFORMATION

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

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

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

(4) PURCHASER: _____
 Address _____

(12) SALE NAME Rotorwash

COUNTY Clatsop

(13) STATE CONTRACT NUMBER 341-04-07

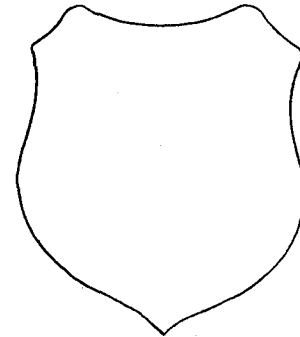
(14) SCALE: westside eastside cubic foot

(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:

 Purchaser or Authorized Representative Date

 State Forester Representative Date

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

 State Forester's Representative

EXHIBIT "P"

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.