EXHIBIT "B"

FOREST ROAD SPECIFICATIONS

SUBGRADE WIDTH	SURFACED WIDTH	POINT TO POINT	STA. TO STA.	DITCH REQ.	OUTSLOPE/ WATERBAR
16 feet	12 feet	1A to 1B	0+00 to 2+40	Yes	No
16 feet	12 feet	1C to 1D	0+00 to 74+85	Yes	No
16 feet	12 feet	1C to 1O	0+00 to 24+40	Yes	No
16 feet	12 feet	1E to 1F	0+00 to 17+50	Yes	No
16 feet	12 feet	1G to 1H	0+00 to 3+55	Yes	No
16 feet	12 feet	1I to 1J	0+00 to 2+60	Yes	No
16 feet	12 feet	1K to 1L	0+00 to 1+60	Yes	No
16 feet	12 feet	1M to 1N	0+00 to 6+25	Yes	No
16 feet	12 feet	2A to 2B	0+00 to 11+80	Yes	No
16 feet	12 feet	2C to 2D	0+00 to 9+00	Yes	No
16 feet	12 feet	2E to 2F	0+00 to 1+25	Yes	No
16 feet	12 feet	2G to 2J	0+00 to 20+70	Yes	No
16 feet	12 feet	2I to 2H	0+00 to 10+85	Yes	No
16 feet	12 feet	2K to 2L	0+00 to 2+45	Yes	No
16 feet	12 feet	2M to 2N	0+00 to 3+15	Yes	No
16 feet	12 feet	3A to 3B	0+00 to 24+50	Yes	No
16 feet	12 feet	3C to 3D	0+00 to 3+80	Yes	No
16 feet	12 feet	3E to 3F	0+00 to 28+80	Yes	No
16 feet	12 feet	3G to 3H	0+00 to 9+80	Yes	No
16 feet	12 feet	3I to 3J	0+00 to 2+35	Yes	No
16 feet	12 feet	4A to 4B	0+00 to 38+30	Yes	No
16 feet	12 feet	4C to 4D	0+00 to 15+35	Yes	No
16 feet	12 feet	4E to 4F	0+00 to 9+75	Yes	No
16 feet	12 feet	4G to 4H	0+00 to 5+85	Yes	No
16 feet	12 feet	4I to 4V	0+00 to 39+20	Yes	No
16 feet	12 feet	4K to 4 L	0+00 to 10+00	Yes	No
16 feet	12 feet	4M to 4N	0+00 to 5+75	Yes	No
16 feet	12 feet	4O to 4P	0+00 to 6+35	Yes	No

EXHIBIT "B"

FOREST ROAD SPECIFICATIONS

SUBGRADE WIDTH	SURFACED WIDTH	POINT TO POINT	STA. TO STA.	DITCH REQ.	OUTSLOPE/ WATERBAR
16 feet	12 feet	4Q to 4R	0+00 to 5+30	Yes	No
16 feet	12 feet	4S to 4T	0+00 to 5+60	Yes	No
16 feet	12 feet	4U to 4J	0+00 to 6+80	Yes	No
16 feet	12 feet	4W to 4X	0+00 to 23+65	Yes	No
16 feet	12 feet	4Y to 4Z	0+00 to 2+00	Yes	No
16 feet	12 feet	4AA to 4BB	0+00 to 3+55	Yes	No
16 feet	12 feet	4CC to 4DD	0+00 to 21+45	Yes	No
16 feet	12 feet	4EE to 4FF	0+00 to 1+50	Yes	No
16 feet	12 feet	6A to 6B	0+00 to 10+95	Yes	No
16 feet	12 feet	6C to 6D	0+00 to 2+70	Yes	No
16 feet	12 feet	I1 to I2	0+00 to 118+00	Yes	No
16 feet	12 feet	I2 to I3	118+00 to 167+30	Yes	No
16 feet	12 feet	I4 to I5	0+00 to 5+00	Yes	No
16 feet	12 feet	I5 to I6	5+00 to 8+50	Yes	No
16 feet	12 feet	I7 to I8	0+00 to 12+20	Yes	No

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

Where clearing limits have not been staked, the clearing limits shall extend 10 feet back of the top of the cutslope and 5 feet out from the toe of the fill slope, or as directed by STATE. Clearing debris shall not be placed or permitted to remain in or under any road embankment sections. Clearing debris shall not be left lodged against standing trees.

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

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.

EXHIBIT "B"

FOREST ROAD SPECIFICATIONS

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

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

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

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

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

Excess excavation shall not be sidecast where material will enter a stream course or where material will accumulate in areas deemed a high-risk site by STATE.

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

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

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

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

TURNOUTS. Increase roadbed width an additional 8 feet for both subgrade and surfacing. Length shall be a minimum 50 feet, or as staked on the ground, plus 25-foot approaches at each end.

Location: As marked in the field.

GRADING	Back Slopes	Fill Slopes
Rock	Vertical to ¼:1	Not steeper
Common – side slopes 50% and over	1:1	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 designated in Exhibit B, and/or marked in the field.

EXHIBIT "B"

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. Full bench road construction shall be performed in accordance with Exhibit B, page 8.

(2) Fill Armor and Energy Dissipator Construction. Where rock is used for fill armor, rock shall be placed and tamped at a 1 ½:1 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.

(3) Grass Seeding. All exposed excavation areas and waste materials shall be grass seeded as specified in Exhibit J.

(4) Road Surfacing Fabric Use. Install road surfacing fabric in accordance with specifications in Exhibit G.

(5) Drainage Blanket Construction. Where drainage blanket construction is required, 24"-6" riprap rock shall be used for subgrade and/or fill base construction for a height of 2 feet. Drainage fabric shall be used for separation of the free draining base rock blanket and common fill materials. Drainage fabric shall meet specifications in Exhibit H.

(6) Free Draining Fill Base Construction. Where free draining fill base construction is required, 24"-6" riprap rock shall be used for fill base construction (to specified heights) and common materials used for the construction of the remaining fill. 1½"-0" crushed rock shall be placed around the installed culvert to protect the pipe from damage. Drainage fabric shall be installed and used for separation of free draining base materials and common fill materials. Drainage fabric shall meet specifications in Exhibit H.

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

Segment	Station	Work Description
1C to 1D	0+60	Install culvert across existing road.
	8+15	Begin road surfacing fabric installation.
	9+50	End road surfacing fabric installation.
	18+85	Install culvert and utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
	22+30	Begin road surfacing fabric installation.
	23+00	End road surfacing fabric installation.
	38+55	Install culvert and utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
	44+35	Install culvert and utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
	47+75	Begin full bench construction/end haul.
	48+70	End full bench construction/end haul.

EXHIBIT "B"

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

Segment	Station	Work Description
1C to 1D	56+10	Install culvert and utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
	59+35	Begin 70 foot radius curve.
	60+80	End 70 foot radius curve.
	60+80	Begin full bench construction/end haul.
	62+45	End full bench construction/end haul.
	63+25	Install culvert and utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
	64+90	Begin 20 foot wide fill section.
	66+85	End 20 foot wide fill section.
2A to 2B	7+00	Install culvert and utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
2G to 2J	18+25	Begin road surfacing fabric installation.
	19+20	End road surfacing fabric installation.
2I to 2H	6+30	Begin road surfacing fabric installation.
	7+30	End road surfacing fabric installation.
3A to 3B	4+90	Install culvert and utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
	6+90	Utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator with culvert installation.
	19+50	Begin road surfacing fabric installation.
	20+50	End road surfacing fabric installation.
3E to 3F	2+30	Begin truck end-haul. Install culvert and utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
	3+80	End truck end-haul.

EXHIBIT "B"

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

Segment	Station	Work Description
3E to 3F	19+10	Install culvert and utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
	22+75	Install culvert and utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
	22+95	Begin 50 foot radius curve.
	24+20	End 50 foot radius curve.
	24+75	Begin truck end-haul.
	25+75	End truck end-haul.
4A to 4B	9+00	Install culvert and utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
	14+35	Install culvert and utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
	20+55	Begin full bench construction/end haul.
	21+10	End full bench road construction/end haul. Begin construction of drainage blanket. Utilize 96 cubic yards of 24" – 6" riprap rock for drainage blanket construction. Finished subgrade width shall be 18 feet.
	21+55	End drainage blanket construction.
	21+85	Fill construction. Utilize 240 cubic yards of 24" – 6" riprap rock for construction of free draining fill base for a height of 3 feet in accordance with Exhibit H. Then utilize common material for a total fill height of approximately 8 feet. Utilize 36 cubic yards of 24" – 6" riprap rock for fill armor. Install 48" X 70' culvert and utilize 96 cubic yards of 1½"-0" rock for culvert backfill/bedding. Utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
	28+40	Fill construction. Utilize 132 cubic yards of 24" – 6" riprap rock for construction of free draining fill base for a height of 2 feet in accordance with Exhibit H. Then utilize common material for a total fill height of approximately 5 feet. Utilize 24 cubic yards of 24" – 6" riprap rock for fill armor. Install 36" X 50' culvert and utilize 36 cubic yards of 1½"-0" rock for culvert backfill/bedding. Utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
4CC to 4DD	2+25	Begin road surfacing fabric installation.
	3+15	End road surfacing fabric installation.

EXHIBIT "B"

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

Segment	Station	Work Description
4W to 4X	5+95	Begin full bench construction/end haul.
	7+60	End full bench construction/end haul.
	11+15	Begin full bench construction/end haul.
	11+75	End full bench construction/end haul.
	13+25	Begin full bench construction/end haul. Install culvert and utilize 12 cubic yards of 24"– 6" riprap rock to construct an energy dissipator.
	14+05	End full bench construction/end haul.

EXHIBIT "B"

END-HAULING REQUIREMENTS

POINT TO POINT	STA. TO STA.	WASTE AREA LOCATION	WASTE AREA TREATMENT
1C to 1D	47+75 to 48+70	1, 3	1, 3
1C to 1D	60+80 to 62+45	2, 3	2, 3
4A to 4B	20+55 to 21+10	3, 5	3, 5
4W to 4X	5+95 to 7+60	3, 4, 6	3, 4, 6
4W to 4X	11+15 to 11+75	3, 6	3, 6
4W to 4X	13+25 to 14+05	3, 6	3, 6

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

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 operator from the slope, by whatever means necessary, and end-hauled to a designated waste area.

Waste Area Location

(1) Between Stations 49+50 to 50+75 on Road 1C to 1D.

(2) Between Stations 64+90 to 66+85 on Road 1C to 1D.

(3) Station 0+00 on Road 4W to 4X.

(4) Station 23+30 on Road 3E to 3F (Pt. 3G).

(5) Between Stations 21+70 to 22+00 on Road 4A to 4B.

(6) Between Stations 8+00 to 11+00 on Road 4W to 4X.

EXHIBIT "B"

END-HAULING REQUIREMENTS

Waste Area Treatment

(1) Use suitable excavated material for use in fill construction between Stations 49+50 to 50+75 on Road 1C to 1D.

(2) Use suitable excavated material for use in fill construction between Stations 64+90 to 66+85 on Road 1C to 1D.

(3) Use suitable excavated fill material for use in junction construction at Station 0+00 on Road 4W to 4X. All unsuitable fill material, including clearing and grubbing debris, shall be deposited adjacent to Station 0+00 on Road 4W to 4X in posted waste area, spread evenly, compacted, and adequate drainage shall be established. Pile woody debris on top of waste area.

(4) Use suitable excavated fill material for use in junction construction at Station 23+30 on Road 3E to 3F (Pt. 3G).

(5) Use suitable excavated fill material for use in fill construction between Stations 21+70 to 22+00 on Road 4A to 4B.

(6) Use suitable excavated fill material for use in fill construction between Stations 8+00 to 11+00 on Road 4A to 4B.

EXHIBIT "B"

FOREST ROAD SPECIFICATIONS

GENERAL ROAD IMPROVEMENT INSTRUCTIONS

(1) 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 reconstruction backfill shall consist of select materials and be obtained from borrow pits, as directed by STATE. Backfill materials shall be hauled in where necessary and thoroughly compacted in accordance with Exhibit B. Crushed rock shall be used for backfilling excavation trenches less than 3 feet deep. Removed culverts shall be hauled to an approved refuse site off of STATE land.

(2) Drainage Ditches. Restore or construct ditchlines, including ditchouts, as directed by STATE. Clean out all culvert inlets and outlets for a 10-foot radius. Re-establish or construct culvert sediment basins. Waste materials from drainage ditches and sediment basins shall not be pulled across existing surfacing rock, but shall be placed in nearby waste areas and uniformly sloped and compacted for drainage, as directed by STATE. Damaged culvert inlets and/or outlets shall be repaired by opening them with a hydraulic jack, or cutting off the culvert end to allow for free passage of water at peak flow levels. Install a culvert marker at each newly installed culvert and at each existing culvert that is missing a marker that could be reached by a grader blade.

(3) Riprap Rock Use. Where rock is used for fill armor, rock shall be placed and tamped at a 1 ½:1 slope, beginning at the fill toes. Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet.

(4) Grass Seed and Mulch. All exposed soil and waste materials shall be grass seeded and mulched a minimum of 2 inches in depth, in accordance with Exhibit J.

(5) 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) Cut out all chuckholed and/or washboard sections from the existing surfacing.

(c) Apply required 1½" – 0" or 4" – 0" base patching and leveling rock, as directed by STATE.

(d) Process (grade+mix) the existing surfacing and added base rock. Provide for a crown of ½ inch per foot, and compact in accordance with Exhibit B.

(e) Upon completion of above required work, apply, process, and compact surfacing rock in accordance with Exhibit B.

EXHIBIT "B"

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

Segment	Station	Work Description
I1 to I2	1+05	Culvert replacement/fill reconstruction. Utilize 12 cubic yards 1 ½"-0" crushed rock for culvert bedding. Utilize 12 cubic yards of 24" – 6" riprap rock to construct an energy dissipator. Utilize 24 cubic yards of 24" – 6" riprap rock for fill armor.
I1 to I2	6+10	Culvert replacement/fill reconstruction. Utilize 12 cubic yards 1 ½"-0" crushed rock for culvert bedding.
I1 to I2	16+65	Culvert replacement/fill reconstruction. Utilize 12 cubic yards 1 ½"-0" crushed rock for culvert bedding.
I1 to I2	19+85	Culvert replacement. Place inlet of new culvert at existing culvert inlet location. Outlet of new culvert shall be skewed approximately 10 feet east of existing outlet location.
I1 to I2	31+00	Culvert replacement/fill reconstruction. Utilize 12 cubic yards 1 ½"-0" crushed rock for culvert bedding.
I1 to I2	38+95	Culvert replacement/fill reconstruction. Utilize 24 cubic yards 1 ½"-0" crushed rock for culvert bedding. Utilize 12 cubic yards of 24" – 6" riprap rock to construct an energy dissipator. Utilize 60 cubic yards of 24" – 6" riprap rock for fill armor. Finished subgrade shall be 20 feet wide.
I4 to I5	5+00	Install culvert. Utilize 12 cubic yards of 24" – 6" riprap rock to construct an energy dissipator.

EXHIBIT "B"

ROAD SURFACING

TYPE OF ROCK	SIZE OF ROCK	CUBIC YARDS PER STA.	COMPACTED DEPTH	POINT TO POINT	STATION TO STATION	TOTAL TRUCK MEASURE VOLUME (CY)
Crushed	4"-0"	50	8	1A to 1B	0+00 to 2+40	120
Crushed	4"-0"	63	10	1C to 1D	0+00 to 74+85	4,716
Crushed	3/4"-0"	19	3	1C to 1D	0+00 to 74+85	1,422
Crushed	4"-0"	63	10	1C to 1O	0+00 to 24+40	1,537
Crushed	3/4"-0"	19	3	1C to 1O	0+00 to 10+00	190
Crushed	3/4"-0"	19	3	1C to 1O	19+50 to 21+70	42
Crushed	4"-0"	63	10	1E to 1F	0+00 to 17+50	1,103
Crushed	3/4"-0"	19	3	1E to 1F	8+75 to 16+65	150
Crushed	4"-0"	50	8	1G to 1H	0+00 to 3+55	178
Crushed	4"-0"	50	8	1I to 1J	0+00 to 2+60	130
Crushed	4"-0"	50	8	1K to 1L	0+00 to 1+60	80
Crushed	4"-0"	50	8	1M to 1N	0+00 to 6+25	313
Crushed	3/4"-0"	19	3	1M to 1N	0+00 to 2+00	38
Crushed	4"-0"	50	8	2A to 2B	0+00 to 11+80	590
Crushed	3/4"-0"	19	3	2A to 2B	6+70 to 8+80	40
Crushed	4"-0"	50	8	2C to 2D	0+00 to 9+00	450
Crushed	4"-0"	63	10	2E to 2F	0+00 to 1+25	79
Crushed	4"-0"	63	10	2G to 2J	0+00 to 20+70	1,304
Crushed	3/4"-0"	19	3	2G to 2J	1+70 to 6+20	85
Crushed	3/4"-0"	19	3	2G to 2J	8+60 to 9+80	23
Crushed	4"-0"	63	10	2I to 2H	0+00 to 10+85	684
Crushed	4"-0"	50	8	2K to 2L	0+00 to 2+45	123
Crushed	4"-0"	50	8	2M to 2N	0+00 to 3+15	158
Crushed	4"-0"	63	10	3A to 3B	0+00 to 24+50	1,544
Crushed	3/4"-0"	19	3	3A to 3B	1+20 to 2+40	24
Crushed	3/4"-0"	19	3	3A to 3B	5+30 to 9+00	70
Crushed	3/4"-0"	19	3	3A to 3B	19+55 to 22+15	49
Crushed	4"-0"	50	8	3C to 3D	0+00 to 3+80	190
Crushed	4"-0"	63	10	3E to 3F	0+00 to 28+80	1,814
Crushed	3/4"-0"	19	3	3E to 3F	12+40 to 13+55	22
Crushed	3/4"-0"	19	3	3E to 3F	17+25 to 20+90	69
Crushed	4"-0"	50	8	3G to 3H	0+00 to 9+80	490

EXHIBIT "B"

ROAD SURFACING

TYPE OF ROCK	SIZE OF ROCK	CUBIC YARDS PER STA.	COMPACTED DEPTH	POINT TO POINT	STATION TO STATION	TOTAL TRUCK MEASURE VOLUME (CY)
Crushed	4"-0"	50	8	3I to 3J	0+00 to 2+35	118
Crushed	4"-0"	63	10	4A to 4B	0+00 to 38+30	2,413
Crushed	3/4"-0"	19	3	4A to 4B	0+00 to 25+60	486
Crushed	4"-0"	63	10	4C to 4D.	0+00 to 15+35	967
Crushed	4"-0"	50	8	4E to 4F	0+00 to 9+75	488
Crushed	4"-0"	50	8	4G to 4H	0+00 to 5+85	293
Crushed	4"-0"	63	10	4I to 4V	0+00 to 39+20	2,470
Crushed	3/4"-0"	19	3	4I to 4V	0+00 to 32+75	622
Crushed	4"-0"	50	8	4K to 4L	0+00 to 10+00	500
Crushed	4"-0"	50	8	4M to 4N	0+00 to 5+75	288
Crushed	4"-0"	50	8	4O to 4P	0+00 to 6+35	318
Crushed	4"-0"	50	8	4Q to 4R	0+00 to 5+0	265
Crushed	4"-0"	50	8	4S to 4T	0+00 to 5+60	280
Crushed	4"-0"	50	8	4U to 4J	0+00 to 6+80	340
Crushed	3/4"-0"	19	3	4U to 4J	0+00 to 5+55	105
Crushed	4"-0"	63	10	4W to 4X	0+00 to 23+65	1,490
Crushed	3/4"-0"	19	3	4W to 4X	11+15 to 18+25	135
Crushed	4"-0"	50	8	4Y to 4Z	0+00 to 2+00	100
Crushed	4"-0"	50	8	4AA to 4BB	0+00 to 3+55	178
Crushed	4"-0"	63	10	4CC to 4DD	0+00 to 21+45	1,351
Crushed	3/4"-0"	19	3	4CC to 4DD	11+80 to 16+45	88
Crushed	4"-0"	50	8	4EE to 4FF	0+00 to 1+50	75
Crushed	4"-0"	50	8	6A to 6B	0+00 to 10+95	548
Crushed	4"-0"	50	8	6C to 6D	0+00 to 2+70	135
Crushed	3/4"-0"	25	4	I1 to I2	0+00 to 118+00	2,950
Crushed	4"-0"	38	6	I1 to I2	41+50 to 55+00	513
Crushed	11/2"-0"	25	4	I4 to I5	0+00 to 5+00	125
Crushed	4"-0"	38	6	I5 to I6	0+00 to 3+50	133

EXHIBIT "B"

ROAD SURFACING

TYPE OF ROCK	SIZE OF ROCK	VOLUME/T.O.	COMPACTED DEPTH	NO. OF T.O.	POINT TO POINT	TOTAL TRUCK MEASURE VOLUME (CY)
TURNOUTS:						
Crushed	4"-0"	28	10	7	1C to 1D	196
Crushed	3/4"-0"	8	3	7	1C to 1D	56
Crushed	4"-0"	28	10	2	1C to 1O	56
Crushed	3/4"-0"	8	3	1	1C to 1O	8
Crushed	4"-0"	28	10	1	1E to 1F	28
Crushed	4"-0"	28	10	2	2G to 2J	56
Crushed	4"-0"	28	10	2	3A to 3B	56
Crushed	4"-0"	28	10	2	3E to 3F	56
Crushed	4"-0"	22	8	1	3G to 3H	22
Crushed	4"-0"	28	10	4	4A to 4B	112
Crushed	3/4"-0"	8	3	3	4A to 4B	24
Crushed	4"-0"	28	10	2	4C to 4D	56
Crushed	4"-0"	28	10	4	4I to 4V	112
Crushed	3/4"-0"	8	3	3	4I to 4V	24
Crushed	4"-0"	28	10	2	4W to 4X	56
Crushed	3/4"-0"	8	3	1	4W to 4X	8
Crushed	4"-0"	28	10	2	4CC to 4DD	56
Crushed	3/4"-0"	8	3	1	4CC to 4DD	8
Crushed	4"-0"	22	8	1	6A to 6B	22
Crushed	4"-0"	24	—	3	I1 to I2	72
Crushed	3/4"-0"	12	—	18	I1 to I2	216
TURNAROUNDS:		CY PER T.A.		NO. OF T.A.		
Crushed	4"-0"	17	10	1	1C to 1D	17
Crushed	4"-0"	17	10	1	1C to 1O	17
Crushed	4"-0"	17	10	1	1E to 1F	17
Crushed	4"-0"	13	8	1	2A to 2B	13
Crushed	4"-0"	13	8	1	2C to 2D	13
Crushed	4"-0"	17	10	1	2G to 2J	17
Crushed	4"-0"	17	10	1	3A to 3B	17
Crushed	4"-0"	17	10	1	3E to 3F	17

EXHIBIT "B"

ROAD SURFACING

TYPE OF ROCK	SIZE OF ROCK					
TURNAROUNDS:		**CY PER T.A.**	**COMPACTED DEPTH**	**NO. OF T.A.**	**POINT TO POINT**	**TOTAL TRUCK MEASURE VOLUME (CY)**
Crushed	4"-0"	13	8	1	3G to 3H	13
Crushed	4"-0"	17	10	1	4A to 4B	17
Crushed	4"-0"	13	8	1	4K to 4L	13
Crushed	4"-0"	17	10	1	4CC to 4DD	17
Crushed	4"-0"	13	8	1	6A to 6B	13
JUNCTIONS:		**CY PER JUNCTION**	**COMPACTED DEPTH**	**NO. OF JCTS.**	**POINT(S)**	
Crushed	4"- 0"	30	8"	1	1A	30
Crushed	4"- 0"	40	10"	7	1C, 1C, 1E, 1G, 1I, 1K, 1M	280
Crushed	¾"- 0"	12	3"	1	1C	12
Crushed	4"- 0"	30	8"	4	2A, 2C, 2E, 2M	120
Crushed	4"- 0"	40	10"	3	2G, 2I, 2K	120
Crushed	¾"- 0"	12	3"	1	2G, 2I, 2K	36
Crushed	4"- 0"	40	10"	4	3A, 3C, 3E, 3G	160
Crushed	4"- 0"	30	8"	1	3I	30
Crushed	4"- 0"	40	10"	13	4A, 4C, 4I, 4K, 4M, 4O,4Q, 4S, 4U, 4W, 4Y, 4CC, 4EE	520
Crushed	4"- 0"	30	8"	3	4E, 4G, 4AA	90
Crushed	¾"- 0"	12	3"	7	4I, 4K, 4M, 4O, 4Q, 4S, 4EE	84
Crushed	4"- 0"	30	8"	2	6A, 6C	60
Crushed	¾"- 0"	12	---	8	I1 to I2	96
Crushed	¾"- 0"	36	---	1	I2	36

EXHIBIT "B"

ROAD SURFACING

TYPE OF ROCK	SIZE OF ROCK	VOLUME/ LANDING	NUMBER OF LANDINGS	LOCATION OF LANDINGS	TOTAL VOLUME
Pit-run	6"-0"	80	38	Points 1B, 1D, 1O, 1H, 1J, 1L, 1N,2B, 2D, 2F, 2J, 2H, 2L, 2N, 3B, 3D, 3F, 3H, 3J, 4B, 4D, 4F, 4H, 4V, 4L, 4N, 4P, 4R, 4T, 4J, 4X, Station 19+30 of 4W to 4X, 4Z, 4BB, 4DD, 4FF, 6B, 6D	3,040
Pit-run	6"-0"	115	1	1E to 1F	115
		USE		POINT TO POINT	
Crushed	4"-0"	Curve Widening		1C to 1D	180
Crushed	3/4"-0"	Curve Widening		1C to 1D	34
Crushed	4"-0"	Curve Widening		1E to 1F	40
Crushed	3/4"-0"	Curve Widening		1E to 1F	8
Crushed	4"-0"	Curve Widening		1G to 1H	28
Crushed	4"-0"	Curve Widening		2A to 2B	23
Crushed	4"-0"	Curve Widening		2G to 2J	74
Crushed	4"-0"	Curve Widening		3A to 3B	26
Crushed	4"-0"	Curve Widening		3E to 3F	46
Crushed	3/4"-0"	Curve Widening		I1 to I2	450
Crushed	11/2"-0"	Sub Grade Leveling		I1 to I2	600
Crushed	3/4"-0"	Sub Grade Leveling		I2 to I3	250
Crushed	11/2"-0"	Sub Grade Leveling		I4 to I5	48
Crushed	11/2"-0"	Sub Grade Leveling		I7 to I8	72
Crushed	3/4"-0"	Culvert Backfill		1C to 1D	12
Crushed	11/2"-0"	Culvert Backfill/Bedding		4A to 4B	132
Crushed	11/2"-0"	Culvert Backfill/Bedding		I1 to I2	96
Crushed	11/2"-0"	Culvert Backfill		I4 to I5	24
Crushed	4"-0"	Surfacing Base Rock for Fill Reconstruction		I1 to I2	204
Riprap	24"-6"	Free-Draining Fill Rock		4A to 4B	468
Riprap	24"-6"	Energy Dissipator		1C to 1D	60
Riprap	24"-6"	Energy Dissipator		2A to 2B	12
Riprap	24"-6"	Energy Dissipator		3A to 3B	24
Riprap	24"-6"	Energy Dissipator		3E to 3F	36
Riprap	24"-6"	Energy Dissipator		4A to 4B	24

EXHIBIT "B"

ROAD SURFACING

TYPE OF ROCK	SIZE OF ROCK	USE	POINT TO POINT	TOTAL VOLUME
Riprap	24"-6"	Energy Dissipator	4W to 4X	12
Riprap	24"-6"	Energy Dissipator	I1 to I2	24
Riprap	24"-6"	Energy Dissipator	I4 to I5	12
Riprap	24"-6"	Fill Armor	4A to 4B	60
Riprap	24"-6"	Fill Armor	I1 to I2	84

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

ROCK SUMMARY FOR PROJECT NO. 1

ROCK SIZE	APPROX. TOTAL TRUCK MEASURE VOLUME (CY)
¾"-0"	7,960
1½"-0"	1,109
4"-0"	32,054
6"-0"	3,155
24"- 6"	816
TOTAL	45,094

EXHIBIT "B"

ROCK ACCOUNTABILITY

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

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

Rock Checking. All rock spreading shall be done only when a STATE representative is present. STATE shall issue a receipt for each load delivered, and rock shall be measured without allowance for shrinkage or shakedown during hauling. Total truck measure volume for each road segment shall be as shown on Exhibit B. Deliver at least 750 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.

COMPACTION AND PROCESSING REQUIREMENTS

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

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
All road segments	1

EXHIBIT "B"

COMAPACTION AND PROCESSING REQUIREMENTS

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

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

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

Crushed Rock. The rock shall be uniformly mixed and spread in layers on the approved roadbed. Each layer of crushed rock shall be moistened or dried to a uniform moisture content suitable for maximum compaction and compacted in layers not to exceed 6 inches in depth except where installation of road fabric is required. Where installation of road fabric is required, base surfacing course material shall be placed to the designated thickness in one lift and spread in the direction of fabric overlap, as specified in Exhibit G. 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 rock	1

COMPACTION EQUIPMENT OPTIONS

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

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

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

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

EXHIBIT "C"

CULVERT SPECIFICATIONS

All culvert materials shall be furnished and installed by PURCHASER, unless otherwise specified in the contract. All culverts, except for culvert Nos. 44 (48" x 70') and 46 (36" x 50'), shall be constructed of corrugated, double-walled polyethylene, unless use of other culvert materials with an equivalent life expectancy is approved in writing by STATE. Culvert Nos. 44 and 46 shall be constructed of 10 gauge corrugated aluminized steel. Pipe and fittings shall be made of polyethylene compounds which meet or exceed the requirements of Type III, Category 4 or 5, Grade P33 or P34, Class C per ASTM D-1248 with the applicable requirements defined in ASTM D-1248. Double-walled polyethylene pipe shall meet the requirements of AASHTO M-294-901, Type S.

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

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

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

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

Joints shall be made with split couplings, corrugated to engage the pipe corrugations, and shall engage a minimum of 4 corrugations, 2 on each side of the pipe joint.

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

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

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

EXHIBIT "C"

CULVERT SPECIFICATIONS

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

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

The ends of each culvert shall be free of logs and debris which would restrict the free flow of water. Culverts in Type F streams must allow free passage of fish as provided in the Oregon Forest Practice Rules. The intake end of relief culverts shall be provided with a sediment catching basin 3 feet in diameter at the bottom. The outlet end of any culvert which would allow water to erode embankment soil into waters of the State shall be provided with a downspout or other approved slope protection device.

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

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.

EXHIBIT "C"

CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	ROAD SEGMENT POINT TO POINT	STATION
1	18	30	1A to 1B	0+24
2	18	30	1C to 1D	0+60
3	18	36	1C to 1D	3+40
4	18	30	1C to 1D	8+70
5	18	34	1C to 1D	9+50
6	18	30	1C to 1D	15+05
7	18	34	1C to 1D	18+85
8	18	30	1C to 1D	22+75
9	18	40	1C to 1D	28+80
10	18	32	1C to 1D	38+55
11	18	30	1C to 1D	44+35
12	18	30	1C to 1D	50+00
13	18	40	1C to 1D	56+10
14	18	30	1C to 1D	59+90
15	18	32	1C to 1D	63+25
16	18	40	1C to 1O	0+75
17	18	30	1C to 1O	3+85
18	18	30	1C to 1O	7+00
19	18	30	1E to 1F	4+00
20	18	30	1E to 1F	11+00
21	18	30	1E to 1F	15+50
22	18	32	2A to 2B	7+00
23	18	38	2C to 2D	4+65
24	18	64	2G to 2J	1+20
25	18	30	2G to 2J	18+90
26	24	30	2I to 2H	1+70
27	18	30	2I to 2H	7+05
28	18	50	3A to 3B	0+00

EXHIBIT "C"

CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	ROAD SEGMENT POINT TO POINT	STATION
29	18	34	3A to 3B	4+90
30	18	36	3A to 3B	6+90
31	18	30	3A to 3B	10+90
32	18	30	3A to 3B	14+40
33	18	32	3A to 3B	19+00
34	18	30	3E to 3F	2+30
35	18	38	3E to 3F	7+50
36	18	30	3E to 3F	16+20
37	18	38	3E to 3F	19+10
38	18	42	3E to 3F	22+75
39	18	40	3G to 3H	0+00
40	18	30	4A to 4B	2+30
41	18	30	4A to 4B	9+00
42	18	34	4A to 4B	14+35
43	18	30	4A to 4B	18+35
44	48	70	4A to 4B	21+85
45	18	34	4A to 4B	24+25
46	36	50	4A to 4B	28+40
47	18	38	4A to 4B	35+45
48	18	30	4C to 4D	8+25
49	18	30	4C to 4D	9+45
50	18	30	4C to 4D	13+05
51	18	30	4G to 4H	4+30
52	18	30	4I to 4V	2+95
53	18	30	4I to 4V	20+55
54	18	30	4I to 4V	26+25
55	18	30	4I to 4V	32+35
56	18	30	4K to 4L	5+85
57	18	30	4M to 4N	0+75

EXHIBIT "C"

CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	ROAD SEGMENT POINT TO POINT	STATION
58	18	36	4O to 4P	1+90
59	18	60	4W to 4X	0+15
60	18	30	4W to 4X	3+70
61	18	30	4W to 4X	9+60
62	18	50	4W to 4X	10+75
63	18	34	4W to 4X	13+00
64	18	70	4CC to 4DD	0+00
65	18	50	4CC to 4DD	2+70
66	18	30	4CC to 4DD	20+30
67	18	30	6A to 6B	1+80
68	18	30	6A to 6B	7+90
69	18	30	6C to 6D	0+90
70	24	46	I1 to I2	1+05
71	18	36	I1 to I2	6+10
72	18	36	I1 to I2	16+65
73	18	40	I1 to I2	19+85
74	18	36	I1 to I2	31+00
75	24	60	I1 to I2	38+95
76	18	60	I4 to I5	5+00

* Indicates culverts that do not require culvert markers.

The intake ends of culverts in fills less than 3 feet shall be marked by driving or placing white fiberglass posts within 6 inches of the downgrade side. Posts shall be a minimum of 6 feet long and 2 ½ inches wide, with the spade driven 2 feet into the ground. Culverts in fills over 3 feet in height do not need culvert markers.

All culverts, except for culvert Nos. 44 (48" x 70') and 46 (36" x 50'), shall be constructed of corrugated, double-walled polyethylene, unless use of other culvert materials with an equivalent life expectancy is approved in writing by STATE. Culvert Nos. 44 and 46 shall be constructed of 10 gauge corrugated aluminized steel.

Tamping is required.

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

EXHIBIT "D"

ROCK PIT DEVELOPMENT AND USE

(1) PURCHASER shall schedule and coordinate Sterling Ridge 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 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.

(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) Clear and grub the rock source area. All woody debris, including stumps and slash shall be hauled, piled and disposed of by burning at the waste area, as directed by STATE.

(5) PURCHASER shall obtain a FPA Burn Permit prior to debris disposal.

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

(7) Benches shall be constructed at intervals of 40 feet or less in height and shall be a minimum of 20 feet in width. Any gravel or talus slopes shall be left with a working face at an angle of 60 degrees or less. There shall be a minimum of 1 bench with an access road to it. Said bench shall be easily accessible with tractors.

(8) Pit face shall be developed in a uniform manner.

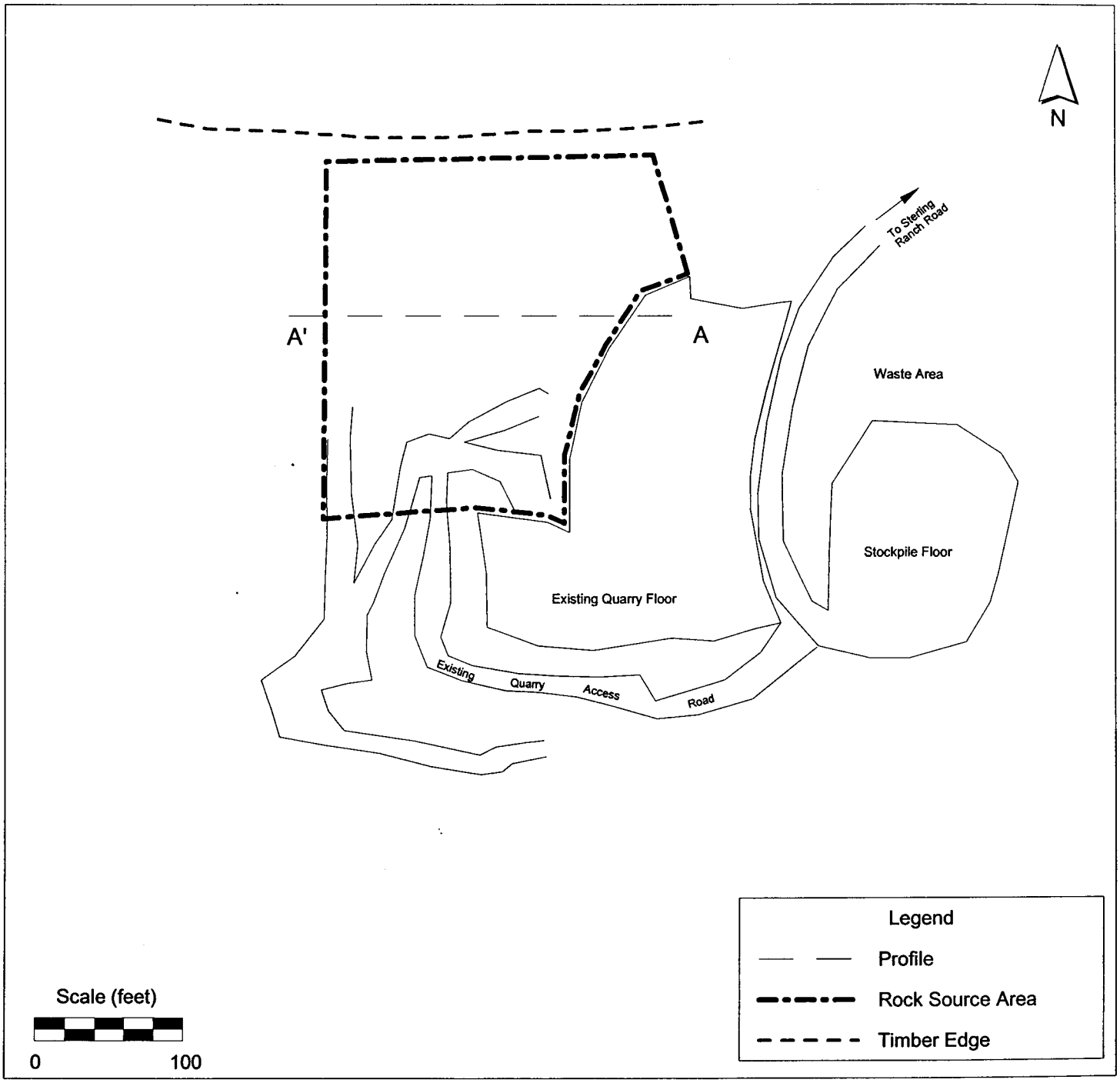
(9) Oversized material that is produced or encountered during development shall be broken down and utilized for crushing or for required riprap rock.

(10) 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.

(11) 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.

(12) 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.

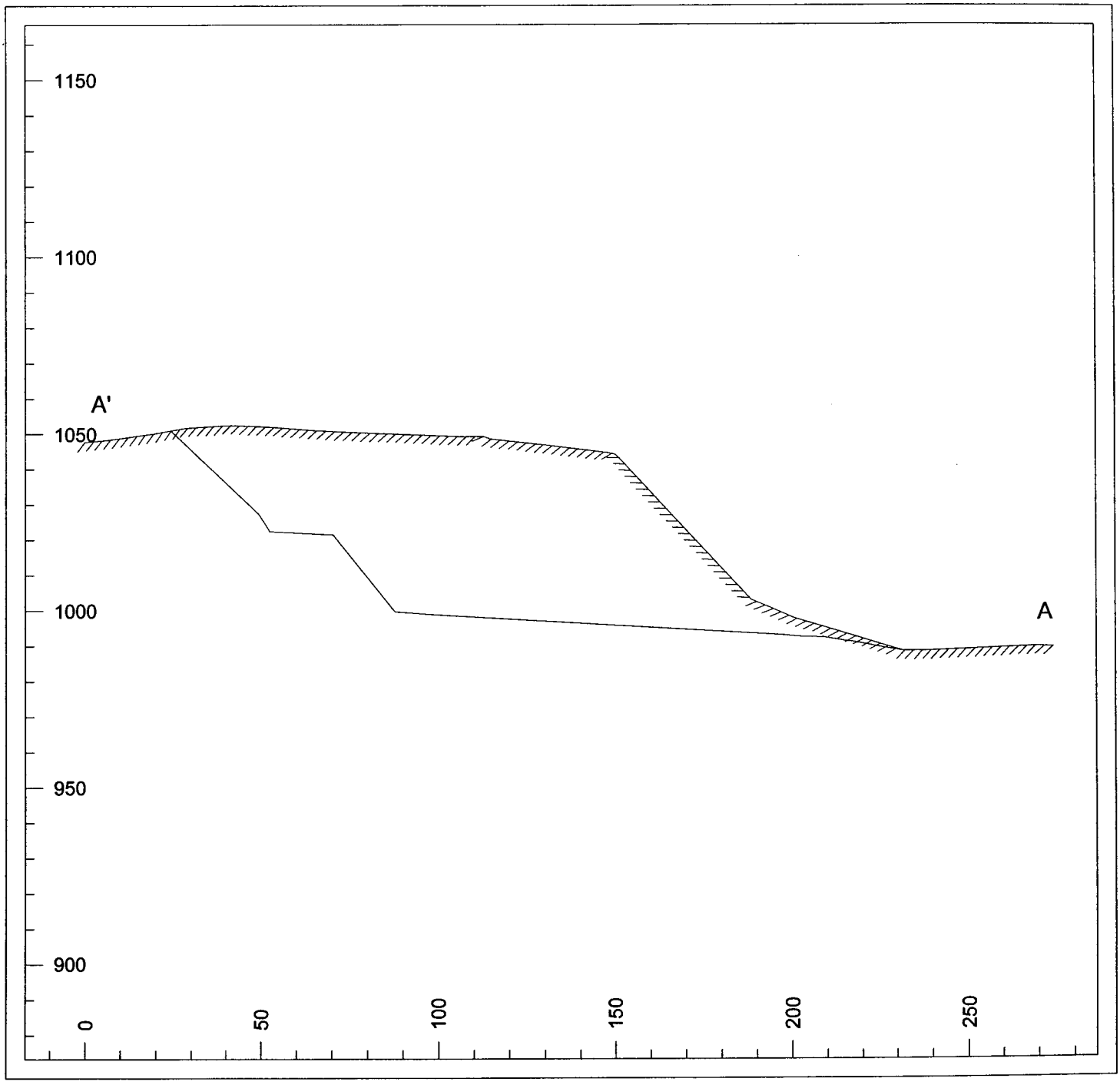
EXHIBIT "D"
ROCK PIT DEVELOPMENT AND USE



Oregon Department of Forestry
Astoria District
Engineering Unit

Sterling Quarry
SW1/4, Section 23, T4N, R7W, W. M.
Clatsop County, Oregon

EXHIBIT "D"
ROCK PIT DEVELOPMENT AND USE



Oregon Department of Forestry
Astoria District
Engineering Unit

Sterling Quarry
SW1/4, Section 23, T4N, R7W, W. M.
Clatsop County, Oregon

State Timber Sale Contract
No. 341-02-11
Quartz Creek Combination

EXHIBIT "E"

ROAD 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. Prior to entering the rock crusher, materials used for crushing ¾"-0" and 1½"-0" rock shall be screened, and all materials less than one inch in size shall be rejected.

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

For 3/4"-0"	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.

For 1½"-0"	Passing	2" sieve	100%
	Passing	1½" sieve	95-100%
	Passing	3/4" sieve	55-80%
	Passing	1/4" sieve	35-50%

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

For 4"-0"	Passing	4" sieve	100%
	Passing	2" sieve	60-90%
	Passing	1/4" sieve	20-35%

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.

For 6"-0" Pit-Run	Passing	10" sieve	100%
	Passing	6" sieve	65%

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

Control of gradation shall be by visual inspection by STATE.

State Timber Sale Contract
No. 341-02-11
Quartz Creek Combination

EXHIBIT "F"

ROCK QUARRY TEST DRILLING REQUIREMENTS

(1) PURCHASER shall notify STATE a minimum of 48 hours prior to beginning any operations. A STATE Representative shall be present during test drilling to monitor results, issue instructions, determine test hole locations and depths. The representative also shall certify hours of operation or acceptance of work when required under contract.

(2) Work scheduling 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. Testing operations shall not be allowed from November 1 to April 30, or during any other period when operations might damage sites or affect stream flows. Any exception to these instructions must be authorized in writing by STATE.

(3) The hydraulic rock drill shall be a crawler-type in the 40,000 pound class or greater, with a minimum penetration rate of 120 feet per hour while drilling a 4"-6" bore hole, in overburden, fractured rock and solid rock.

(4) The operator must be experienced in operating hydraulic rock drills on rock test drilling operations, be able to operate the drill proficiently, and operate in the area as directed by STATE.

(5) 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.

(6) Test holes shall be drilled to determine mass attitudes of rock strata, rates of drill advancement, depths of overburden and other pertinent information.

(7) Each test hole shall be staked and assigned an individual number. Test holes shall be drilled for a maximum distance of 60 feet in vertical, horizontal and/or other directions, as directed by STATE.

(8) STATE may elect to change the test drilling locations at the quarry sites. However, no more than a total of 20 hours of hydraulic rock drill time will be utilized. Should STATE determine that not all hours are needed, PURCHASER shall pay to STATE $225 per hour for each hour not used.

(9) Access road construction may be required. Access roads shall be constructed by the PURCHASER using a tractor with a blade limited to 10 feet in width. All routes and location of access roads shall be flagged and approved by STATE prior to construction. Cutting of trees may be necessary for access for test drilling. Trees shall be approved by STATE, properly accounted for prior to felling, decked as directed by STATE, and shall remain the property of the STATE.

(10) Upon completion of test drilling at each quarry, waterbar all tractor and test equipment access roads and reestablish drainage ditches, as directed by STATE.

State Timber Sale Contract
No. 341-02-11
Quartz Creek Combination

EXHIBIT "G"

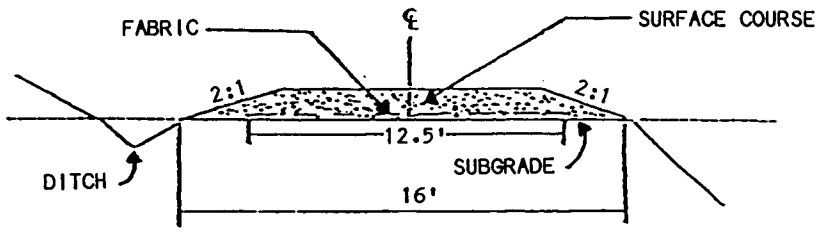
ROAD SURFACING FABRIC SPECIFICATIONS

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 on Road 1C to 1D Station 8+15 to Station 9+50, Station 22+30 to Station 23+00, Road 2G to 2J Station 18+25 to Station 19+20, Road 2I to 2H, Station 6+30 to Station 7+30, Road 3A to 3B Station 19+50 to Station 20+50, and Road 4CC to 4DD Station 2+25 to Station 3+15.

(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.

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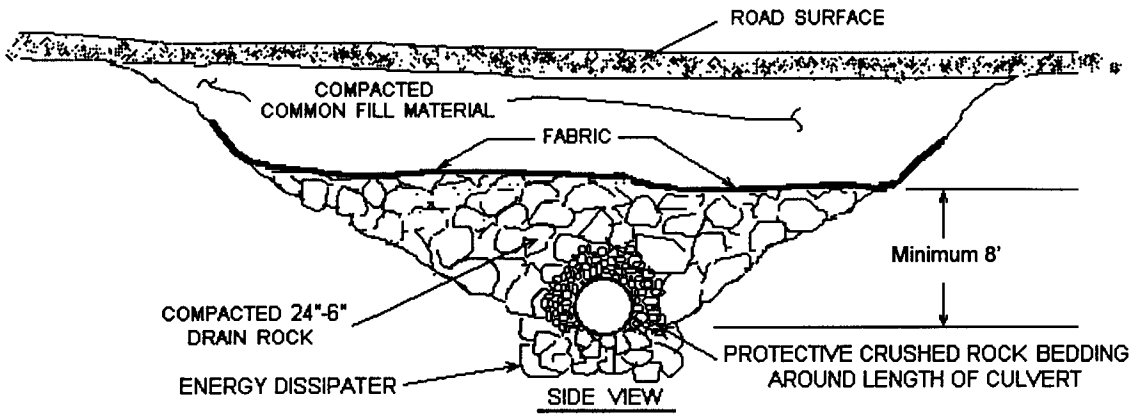
EXHIBIT "H"

TYPICAL FREE DRAINING FILL BASE SPECIFICATIONS



Drainage Fabric Specifications:
Use nonwoven fabric designed for subsurface drain purposes, which meets or exceeds the following requirements:

		Test Method	Properties
1.	Water Flow Rate	ASTM D 4491	85 gal/min/ft^2
2.	Water Permeability	ASTM D 4491	0.30 cm/sec
3.	Grab Tensile Strength	ASTM D 4632	250 lb
4.	Mullen Burst Test	ASTM D 3766	460 lb
5.	Mass	ASTM D 4533	10 oz/yd^2
6.	Thickness	ASTM D 5199	100 mills
7.	UV Resistance	ASTM D 4355 Xenon Arc	70% retained

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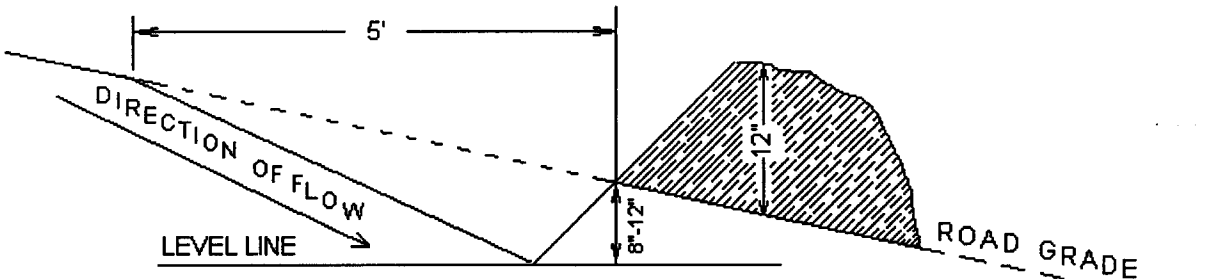
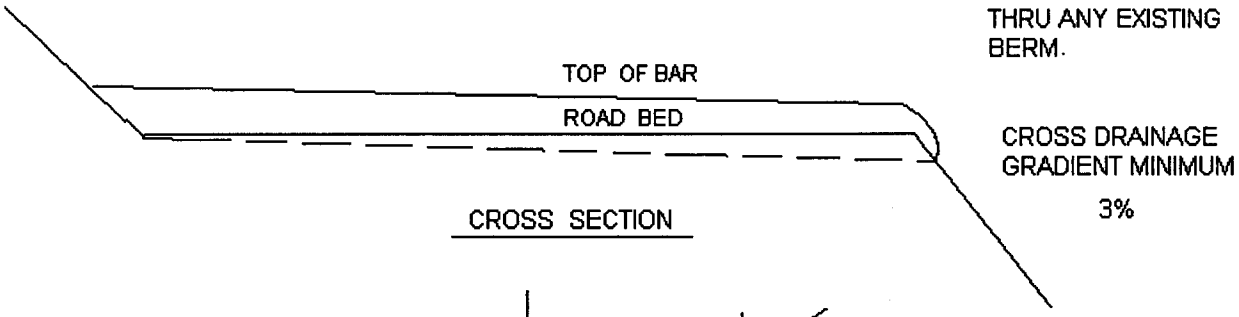
EXHIBIT "I"

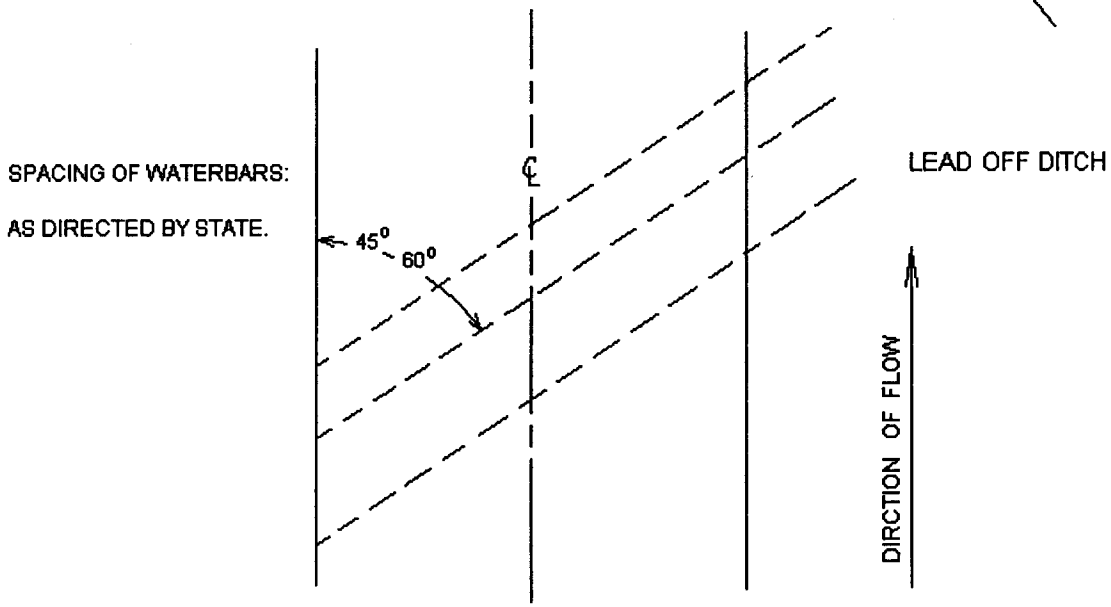
WATERBAR SPECIFICATIONS



PROFILE



CROSS SECTION



PLAN VIEW

WATERBAR SPECIFICATIONS
FOR CROSS DITCHING #298

State Timber Sale Contract
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EXHIBIT "J"

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 May 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

SPECIES	MIXTURE	PURE LIVE SEED	POISON AND/OR REPELLENT	GERMINATION
Annual Rye	26%	95%	0	>90%
Orchard Grass	25%	95%	0	>90%
New Zealand White Clover	17%	95%	0	>90%
Perennial Rye	15%	95%	0	>90%
Birdsfoot Trifoil	07%	95%	0	>90%
Red Clover	06%	95%	0	>90%
Alsike Clover	04%	95%	0	>90%

Seeding. Apply grass seed to all waste areas, and bare soils resulting from fill removals in Project No. 1.

Mulching. In addition to seeding requirements, apply straw mulch to all waste areas, and bare soils resulting from Project No. 1 Fill Reconstruction. Applied straw mulch shall be a minimum of 2 inches deep and provide a uniform cover.

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 – In Areas 5 and 6, an average of 650 cubic feet of hard conifer logs per acre shall be left. Logs shall contain a minimum of 10 cubic feet of volume and be no shorter than 6 feet in length, to be selected by PURCHASER. 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 well distributed across the area.

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. For shovel piling, the bucket shall be a hydraulically controlled, 4 to 5-foot wide, "clamshell-style bucket with rake arms," with a 360-degree continuous rotation, and tooth length on rake arm shall be greater than 14 inches long, unless otherwise approved in writing by STATE.

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

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

Work Scheduling - work shall be accomplished only during dry weather conditions, and started within 14 calendar days after completion of yarding activities on Areas I, III, and V. 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.

FORM 629.343-307
Rev. 3/01

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 Phone (503) 325-5451
(State Forestry District)
Address 92219 Highway 202, Astoria, OR 97103

(4) PURCHASER: _____
Address _____

(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 (19).

	YES	NO
(6) WESTSIDE SCALE: 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

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

_____
State Forester's Representative

(12) SALE NAME Quartz Creek Combination
COUNTY Clatsop

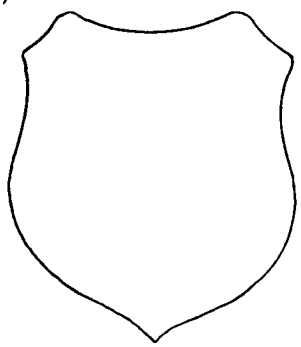
(13) STATE CONTRACT NUMBER 341-02-11

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

(15) STATE BRAND REGISTRATION NUMBER _____

(16) BUREAU BRAND CODE NUMBER _____

(17) STATE BRAND INFORMATION:
(COMPLETE)



(18) PAINT REQUIRED: YES ☒
COLOR Orange

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

(20) REMARKS: _____

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

(21) SIGNATURES:

_____
Purchaser or Authorized Representative Date

_____
State Forester Representative Date

Distribution: ORIGINAL: Salem / COPIES: TPSO (4), Purchaser, Operator, District, Jewell Unit

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.