EXHIBIT "B"

FOREST ROAD SPECIFICATIONS

SUBGRADE WIDTH	SURFACED WIDTH	POINT TO POINT	STATION TO STATION	DRAINAGE
14 feet	12 feet	A to B	0+00 to 54+30	Ditch
14 feet	12 feet	A to B	54+30 to 55+60	Outslope
14 feet	12 feet	A to B	55+60 to 103+00	Ditch
14 feet	12 feet	A to B	103+00 to 105+05	Outslope
14 feet	12 feet	A to B	105+05 to 149+80	Ditch
14 feet	12 feet	A to B	149+80 to 151+55	Outslope
14 feet	12 feet	A to B	151+55 to 210+60	Ditch
14 feet	12 feet	A to B	210+60 to 261+60	Outsloped
14 feet	12 feet	C to D	0+00 to 3+70	Ditch
14 feet	12 feet	E to F	0+00 to 2+90	Ditch
14 feet	12 feet	G to H	0+00 to 30+80	Outsloped
14 feet	12 feet	I to J	0+00 to 7+80	Outsloped
14 feet	12 feet	K to L	0+00 to 8+30	Outsloped
14 feet	12 feet	M to N	0+00 to 7+35	Ditch
14 feet	12 feet	M to N	7+35 to 10+80	Outslope
14 feet	12 feet	O to P	0+00 to 8+95	Outslope
14 feet	12 feet	Q to R	0+00 to 6+40	Outslope

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 marked, the “Road Brushing Specifications” in Exhibit B shall apply. 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.

EXHIBIT "B"

FOREST ROAD SPECIFICATIONS

Grubbing classifications are as follows:

New construction - From the top of the cutslope to the toe of the fill.

Improvements and reconstructions - 4 feet back from the shoulder of the subgrade or ditch, whichever is widest, or as marked in the field.

Trees outside the clearing limits shall not be felled unless approved in writing by STATE.

Sidecast pullback – From top of pullback to toe of pullback.

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 according to the specifications in Exhibits C and E .

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.

Bank excavation and sidecast pullback on a project road segment shall be completed prior to subgrade approval.

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. All through-cuts on ditched road segments shall have a ditch on both road edges. Construct ditchouts away from subgrade at locations specified in Exhibit B.

Outslope. Road subgrade shall be outsloped at 4 to 6 percent. All through-cuts on outsloped road segments shall have a ditch on the lower road edge only. Construct ditchouts away from subgrade at locations specified in Exhibit B.

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.

EXHIBIT "B"

FOREST ROAD SPECIFICATIONS

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

JUNCTIONS. Increase roadbed width as marked in the field.

GRADING	Back Slopes	Fill Slopes
Rock	Vertical to 1/4:1	Not steeper
Common	3/4:1	than 1½:1
Common - turnpike (level) section	2:1	

Top of cutslope shall be rounded.

LANDINGS. Landings shall be constructed no more than 70 feet wide. Surface shall be crowned for drainage.

JUNCTIONS. Increase roadbed width as marked in field.

EXHIBIT "B"

ADDITIONAL ROAD IMPROVEMENT INSTRUCTIONS

A to B (Sam Downs Road and Blowout Ridge Road):

- Construct a sediment catch basin at the following stations according to the specifications in Exhibit K and as marked in the field: 4+25, 39+60, 40+75, 55+85, 120+95, and 129+40.
- Construct a ditchout to the left at Stations 98+10, 100+25, 101+10, and 108+20.
- Construct a ditchout to the right at Stations 144+10 and 201+20.
- Widen road subgrade 3 feet to the right between the following Stations: 53+25 to 55+40 and 59+90 to 64+30.
- Widen road subgrade to the left as marked in the field between Stations 155+50 and 158+05.
- Widen road subgrade to the right as marked in the field between Stations 215+95 and 221+35.
- Remove berm on outside edge of road to a slope of at least 4 to 6 percent, away from the road, between Stations 40+75 to 47+15, 101+25 to 105+05, 140+60 to 144+10, 144+75 to 153+25, and 172+25 to 181+00.
- Retrieve sidecast material between Stations 247+55 and 248+75 according to the specifications in Exhibit G, and as marked in the field.
- Remove existing culvert from STATE land and backfill trench with local granular material at Station 61+10.
- Remove and salvage existing culvert and Half Rounds at Station 44+25. Backfill trench with local granular material. Reinstall culvert and Half Rounds at Station 44+85.
- Place a culvert marker at the inlet of existing culverts at Stations 11+75, 16+70, 47+15, 47+40, 138+20, 151+55, and 192+30.
- Install a Half Round stake for the culvert at Station 151+55.
- Repair fill slope failure between Stations 128+90 to 129+40 according to the specifications in Exhibits C and J.
- Remove log fill and existing culvert in stream channel at Station 116+40 and reconstruct fill according to the specifications in Exhibits C, E, and J.
- Remove Half Round from existing culvert at Station 66+65 and haul to the culvert storage facility at the Tillamook District Office.
- Construct Rubber Water Diverters at Stations 39+60 and 41+00 according to the specifications in Exhibit L.
- Repair inlet of existing culvert at Station 138+20 to restore to the original open area.
- Install 25 feet of Culvert Sleeve on culvert outlet at Station 147+45. Culvert sleeving shall have the following Specifications:
- **Material:** Polyvinyl Chloride Flexible Calendered Sheeting Compound, Union Carbide's KDA 2558 or equivalent.
- **Thickness – Weight:** Material thickness shall be at least 0.020 inches.
- **Connecting Devices:** Conduit strapping, stainless hose clamps, or culvert bands shall be used to connect sleeving to culvert.

EXHIBIT "B"

ADDITIONAL ROAD IMPROVEMENT INSTRUCTIONS

A to B (Sam Downs Road and Blowout Ridge Road) (cont.):

- PURCHASER shall comply with the following requirements when installing the culverts at Stations 110+30 and 120+30:
    - Notify STATE 24 hours prior to removal of existing culvert.
    - Obtain STATE approval of culvert beds prior to installation.
    - Divert “live water” around the installation site.
    - Place a one foot deep layer of pit-run inside culverts over entire length.
    - Installation shall be as specified in Exhibit E.

C to D (Coast Range Road North):

- Retrieve sidecast material between Stations 0+40 and 2+40 according to the specifications in Exhibit G, and as marked in the field.
- Widen road subgrade 8 feet to the right to improve alignment between Stations 0+00 and 3+70.

E to F (Coast Range Road North):

- Retrieve sidecast material between Stations 0+55 and 2+45 according to the specifications in Exhibit G, and as marked in the field.
- Widen road subgrade 8 feet to the right to improve alignment between Stations 0+00 and 2+90.

G to H:

- Retrieve sidecast material between Stations 0+00 and 6+30 according to the specifications in Exhibit G, and as marked in the field.
- Widen road subgrade 6 feet to the left to improve alignment between Stations 0+00 and 6+30.
- Widen road subgrade 5 feet to the left to improve alignment between Stations 6+30 and 17+80.
- Construct a landing at Station 30+80.
- Construct four road dips, as marked in the field, according to the specifications in Exhibit “F”.

I to J:

- Retrieve sidecast material between Stations 4+50 and 6+60 according to the specifications in Exhibit G, and as marked in the field.
- Widen road subgrade 4 feet to the right to improve alignment between Stations 4+50 and 6+60.
- Construct a landing at Station 7+80.

K to L:

- Construct a landing at Station 8+30.

M to N:

- Construct a landing at Station 10+80.
- Construct a road dip at Station 8+75 according to the specifications in Exhibit “F”.

O to P:

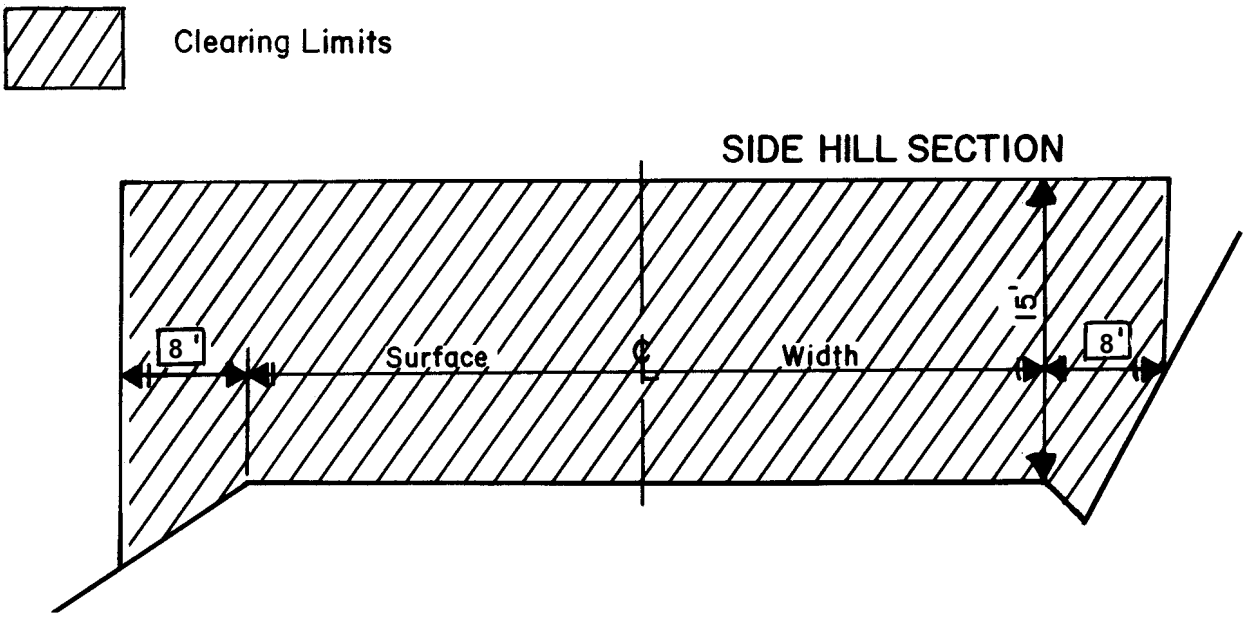
- Construct a road dip at Stations 4+25 and 6+70 according to the specifications in Exhibit “F”.

Q to R:

- Construct a road dip at Stations 1+25 and 3+10 according to the specifications in Exhibit “F”.

EXHIBIT "B"

ROAD BRUSHING SPECIFICATIONS



REQUIREMENTS

Project No. 1. - All brush and all trees shall be cut to a height of 6 inches or less above the ground surface or obstructions such as rocks or existing stumps.

Project No. 5. - All brush and all trees less than 8 inches DBH shall be cut to a height of 6 inches or less above the ground surface or obstructions such as rocks or existing stumps. Trees 8 inches DBH or larger shall not be felled unless otherwise approved in writing by STATE.

Debris resulting from the brushing operation shall be removed from the roadway, cutslope, ditches, and water courses within 72 hours and may be scattered downslope from the road or placed in other stable locations, unless otherwise approved in writing by STATE.

Trees outside the clearing limits shall not be felled unless approved in writing by STATE.

EXHIBIT "B"

END-HAULING REQUIREMENTS

POINT TO POINT	STATION TO STATION
A to B	40+75 to 47+15
A to B	53+25 to 64+30
A to B	101+25 to 105+05
A to B	110+30 to 120+30
A to B	140+60 to 158+05
A to B	172+25 to 181+00
A to B	215+95 to 221+35
A to B	247+55 to 248+75
C to D	0+00 to 3+70
E to F	0+00 to 2+90
G to H	0+00 to 21+95
I to J	4+50 to 6+60
M to N	0+00 to 1+55
O to P	0+00 to 8+95
Q to R	0+00 to 6+40

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 and to reduce likelihood of fracturing rock to remain.

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.

EXHIBIT "B"

END-HAULING REQUIREMENTS

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

As shown on Exhibit A and as marked in the field.

Waste Area Treatment

Deposit at waste area, spread evenly, compact, and provide adequate drainage.

Pile woody debris separate from other waste material.

Upon completion of use, access roads for waste area shall be blocked as directed by STATE.

EXHIBIT "C"

ROAD SURFACING

TYPE OF ROCK	SIZE OF ROCK	COMPACTED DEPTH	POINT TO POINT	STATION TO STATION	APPROX. TOTAL TRUCK MEASURE VOLUME
Crushed	1½"-0"	6"	A to B	0+00 to 76+95	2,666 CY
Crushed	1½"-0"	4"	A to B	76+95 to 156+40	1,835 CY
Pit-Run	---	9"	A to B	156+40 to 210+60	2,846 CY
Pit-Run	---	12"	A to B	215+95 to 221+35	380 CY
Crushed	2½"-0"	6"	C to D	0+00 to 3+70	122 CY
Crushed	2½"-0"	6"	E to F	0+00 to 2+90	96 CY
Pit-Run	---	12"	G to H	0+00 to 30+80	2,126 CY
Pit-Run	---	12"	I to J	0+00 to 6+40	404 CY
Pit-Run	---	12"	K to L	0+00 to 8+30	427 CY
Pit-Run	---	8"	M to N	0+00 to 10+80	536 CY*
Crushed	1½"-0"	4"	M to N	0+00 to 6+85	156 CY
Pit-Run	---	8"	O to P	0+00 to 8+95	445 CY*
Crushed	1½"-0"	4"	O to P	0+00 to 8+95	204 CY
Pit-Run	---	8"	Q to R	0+00 to 6+40	318 CY*
Crushed	1½"-0"	4"	Q to R	0+00 to 6+40	146 CY
TURNOUTS:				**STATIONS**	
Crushed	1½"-0"	6"	A to B	19+50, 33+40, 51+25, 57+95, & 71+30	55 CY
Pit-Run	---	9"	A to B	161+40, 174+80, 181+00, & 199+35	68 CY
Crushed	1½"-0"	4"	A to B	78+90, 91+65, 106+20, & 111+55	28 CY
Pit-Run	---	12"	A to B	225+60 & 231+40	44 CY
Pit-Run	---	12"	G to H	17+80 & 21+95	44 CY

EXHIBIT "C"

ROAD SURFACING

TYPE OF ROCK **TURNAROUNDS:**	SIZE OF ROCK	COMPACTED DEPTH	POINT TO POINT	STATIONS	APPROX. TOTAL TRUCK MEASURE VOLUME
Pit-Run	---	12"	G to H	23+25	22 CY
Pit-Run	---	9”	I to J	7+80	17 CY
Pit-Run	---	9”	K to L	8+30	17 CY
Crushed	1½”-0”	4"	M to N	5+75	7 CY
Pit-Run	---	8"	M to N	5+75 & 10+15	30 CY*
JUNCTIONS:					
Crushed	1½”-0”	4"	A to B	76+95 & 156+40	14 CY
Pit-Run	---	9”	A to B	202+05, 210+60, 237+20, & 249+60	68 CY
Pit-Run	---	8”	A to B	215+95 & 243+80	30 CY*
Crushed	1½”-0”	4”	A to B	215+95 & 243+80	14 CY
MISCELLANEOUS:			**USE**	**LOCATION**	
Crushed	1½”-0”	---	Bedding/ Backfill	A to B 4+00, 32+40, 37+15, 61+25, 110+30, 116+40, 120+30, & 128+90	360 CY
Riprap	24”-12”	---	Fill Armor	A to B 110+30, 116+40, & 120+30	155 CY
Riprap	48”-24”	---	Slope Stabilization	A to B 128+90 to 129+40	130 CY
Riprap	48”-24”	---	Fill Slope Stabilization/ Energy Dissipater	A to B 4+00, 32+40, 37+15, 66+65, & 116+40	65 CY

EXHIBIT "C"

ROAD SURFACING

TYPE OF ROCK MISCELLANEOUS:	SIZE OF ROCK	COMPACTED DEPTH	USE	LOCATION	APPROX. TOTAL TRUCK MEASURE VOLUME
Pit-Run	---	---	Spot Rock	A to B 2+70, 4+00, 13+50, 18+80, 32+40, 37+15, 44+85, 61+25, 110+30, 116+40, 120+30, 128+90, 147+45, 165+10, 174+05, 177+45, & 186+35	240 CY*
Pit-Run	---	---	Fish Culvert Backfill (Interior)	A to B 110+30 & 120+30	130 CY

* Obtain approval from STATE for Pit-Run rocking prior to spreading crushed rock.

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

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

Turnouts, turnarounds, landings, and junctions shall be rocked concurrently with road.

End-dumping of riprap shall not be allowed unless approved in writing by STATE.

EXHIBIT "C"

CRUSHED ROCK SPECIFICATIONS

Materials. The material shall be fragments of rock or other hard, durable particles crushed to the required size and a filler of finely crushed stone, sand, or other finely divided mineral matter. The material shall be free from vegetation and lumps of clay.

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

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

Hardness - Test Method AASHTO T 96 35% Maximum

Durability - Test Method ODOT TM 208
Passing No. 20 Sieve: 30% Maximum
Sediment Height: 3" Maximum

The rock crusher shall be calibrated to produce rock as specified in Exhibit C. Prior to the commencement of production crushing, PURCHASER shall sample, test, and provide rock test results meeting STATE specifications. STATE may then sample and test crushed rock for approval to proceed. PURCHASER shall take one sample of each 1,000 cubic yards of crushed rock material produced thereafter, using approved AASHTO sampling procedures. PURCHASER shall submit samples to a certified laboratory or shall perform testing for gradation requirements using AASHTO T 11 and AASHTO T 27 testing procedures. Prior to testing, each sample shall be split, making one-half of the sample, with proper identification, available for testing by STATE. Each sample and the results of PURCHASER testing shall be made available to STATE within 24 hours of sampling. Any rock crushed prior to STATE approval to proceed shall not be credited to the required rock quantity. Any subsequent rock tests not meeting STATE specifications shall be reason for rejection of that portion of crushed rock produced after that test and shall not be credited to the required rock quantity. STATE may sample the crushed rock at any time during the operation. Results of STATE's tests shall prevail over all other test results.

Grading Requirements

For 1½"-0"	Passing	2" sieve	100%
	Passing	1½" sieve	95-100%
	Passing	3/4" sieve	55-75%
	Passing	1/4" sieve	35-50%

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

EXHIBIT "C"

CRUSHED ROCK SPECIFICATIONS

For 6"-0" Pit-Run	Passing	10" sieve	100%
	Passing	6" sieve	60-85%
	Passing	3" sieve	30-50%
	Passing	1/4" sieve	10% maximum

For 24”-12” Riprap — 50% or more of the rock shall be at least four cubic feet in volume. 100% of the rock shall be at least one half cubic foot in volume.

48” – 24” Riprap — 50% or more of the rock shall be at least one cubic yard in volume. 100% of the rock shall be at least four cubic feet in volume.

Control of riprap and pit-run gradation shall be by visual inspection by STATE. Pit-run shall be reasonably free of organic material and shall not contain an excessive amount of oversized (cobbles or boulders) or undersized (clay, silt or sand) particles.

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.

EXHIBIT "C"

ROCK ACCOUNTABILITY

The rock shall meet the quality and size specifications in Exhibit C. A sample of the rock shall be supplied to STATE for testing and approval prior to rocking. PURCHASER shall obtain subgrade approval from STATE prior to rocking. Rocking shall be limited to periods when weather conditions are acceptable to STATE and when sediments will not enter streams.

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

Depth Measurement. Road rock shall be spread and compacted according to the depths specified in Exhibit C. 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 C. The average depth for each road segment shall be the specified depth or greater.

Junctions shall have a surfaced area, as marked in the field, at the compacted depths specified in Exhibit C.

Turnouts shall have a surfaced area of at least 44 square yards each at the depths shown in Exhibit C.

Turnarounds shall have a surfaced area of at least 44 square yards each at the depths shown in Exhibit C.

Load Records. Notify STATE before placing the riprap, culvert bedding/backfill (including interior backfill), and spot rock and maintain a record of all rock delivered for placing. Make the record available for STATE inspection.

Curve Surfacing. Extra surface width shall be required for the inside of all curves as follows: 400 divided by the radius of the curve equals the amount of extra width to be surfaced at the depths shown in Exhibit C.

EXHIBIT "C"

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." At least 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 the approved equipment listed below or others approved by STATE:

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
All	Vibratory Roller

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 the approved equipment listed below or others approved by STATE:

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
All	Tamping Foot Compactor

Pit-Run Rock. Pit-run surfacing rock shall be spread on roads with a crawler tractor and continuously walked-in. Rock spreading shall begin at nearest point from the rock source and progress toward the end of the project, unless otherwise approved in writing by STATE. Compaction shall be accomplished by using the approved equipment listed below or others approved by STATE:

Rock shall be compacted and processed during the same project period it is spread, unless otherwise approved in writing by STATE.

Rock shall be crowned at 4 to 6 percent unless otherwise specified.

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
All	Vibratory Grid Compactor

EXHIBIT "C"

COMPACTION AND PROCESSING REQUIREMENTS

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

Rock shall be compacted and processed during the same project period it is spread, unless otherwise approved in writing by STATE.

Rock shall be crowned at 4 to 6 percent unless otherwise specified.

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
All	Vibratory Roller

COMPACTION EQUIPMENT OPTIONS

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.

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.

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.

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. A minimum of 10 passes shall be made with the grader and vibratory grid compactor over the entire length of the road, unless STATE requires fewer passes.

State Timber Sale Contract
No. 341-05-20
Klahnberry

EXHIBIT "D"

ROCK PIT DEVELOPMENT AND USE

(1) PURCHASER shall conduct the operations relative to the disposal of waste material in such manner that silt, rock, debris, dirt, or clay shall not be washed, conveyed, or otherwise deposited in any stream. All waste shall be deposited at an approved "waste disposal site."

(2) Where overburden removal limits have not been staked, they shall extend for a distance of at least 20 feet beyond the developed rock source. Overburden and woody debris shall be hauled to a designated waste area. Overburden shall be spread evenly, grass seeded, and compacted at the waste area and woody debris stacked separately. Prior to drilling or rock removal, completion of overburden removal shall be approved in writing by STATE.

(3) The rock pit floor shall be developed to provide drainage away from the rock pit. Rock pit drainage ditches shall be developed and maintained. 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.

(4) Blasting shall be accomplished using timing devices, delay charges, low intensity shots, or other suitable means to contain as much material as possible in the rock pit prism.

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

(6) Oversized material that is produced shall be piled in a designated area adjacent to the pit. It shall not be wasted.

(7) 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.

(a) Disposal site for debris and overburden.

(8) Upon completion of use, the pit site and access roads shall be left in a condition free from overburden and debris. Rock pit roads shall be waterbarred to provide drainage as specified in Exhibit F and be blocked as directed by STATE.

EXHIBIT "E"

CULVERT SPECIFICATIONS

All culvert materials shall be furnished and installed by PURCHASER, unless otherwise specified in the contract. Culverts shall be constructed of corrugated aluminized steel. Corrugated polyethylene culverts may be used for sizes up to 36 inches in diameter. All culverts shall conform to the material and fabricating requirements of Sections 2410 or 2420 of the "Standard Specifications for Highway Construction" prepared by the Highway Division of the Oregon State Department of Transportation. Corrugation types and shapes other than those meeting the above minimum Highway requirements, shall be approved in writing by STATE.

Watertight joints with gaskets are required for all arch pipe culverts. Required gasket materials shall be in accordance with the minimum requirements of the Oregon Department of Transportation Drawing RD326, or as approved in writing by STATE.

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

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

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

Culverts less than 36 inches in diameter shall be installed with the lock seam on the inlet end placed within 45 to 60 degrees from the bottom of the trench, measured counter clockwise, facing the inlet.

The foundation and trench walls for all culverts shall be free from logs, stumps, limbs, stones, and other objects which would dent or damage the pipe. The culvert trench shall be excavated 3 pipe diameters wide to permit compaction and working on each side of the pipe. Tamping shall be done in 6-inch lifts, 1 pipe diameter each side of the pipe to 95 percent density or over. Bedrock shall be excavated as required to provide a uniform foundation for the full length of the culvert. Minimum bedding depth shall be 6 inches.

A bedding of granulated material or crushed rock as specified 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, crushed rock, or job-excavated soil free of stumps, limbs, rocks, or other objects which would damage the pipe.

Transporting of the pipe shall be done carefully. Dragging or allowing free fall from trucks or into trenches shall not be permitted.

Joining shall be done with bands of like material and corrugations. Manufacturers' instructions shall be followed for prefabricated pipe assembly.

Polyethylene 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.

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 "E"

CULVERT SPECIFICATIONS

Minimum height of cover over top of culvert to subgrade when road is to be rocked shall be as follows: 12" for culverts 18” to 36”, 18” for aluminized steel arch pipe 95”x 67”, and 24” for aluminized steel arch pipe 142”x 91” (add 6" for roads which will not be rocked). Minimum vertical cover for other designs shall be as specified by STATE.

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

The ends of each culvert shall be free of logs and debris which would restrict the free flow of water. The intake end of relief culverts shall be provided with a sediment catching basin 3 feet in diameter at the bottom. The outlet end of any culvert which would allow water to erode embankment soil shall be provided with a half round or other approved slope protection device. Construct the lead-off ditch away from the culvert outlet where the slope gradient restricts the free flow of water.

Following are the minimum standard gauges for pipe and coupling bands.

	Steel Pipe Gauge		Band Widths (")			Hugger Band Widths (")	
Dia.	Aluminized	Band Gauges	Annular	Helical	Dimpled	Annular	Helical
18-36	16	16	12	12	12	13 1/8	10 1/2
95”x 67”	14	16	NA	NA	24	NA	NA
142”x 91”	10	16	NA	NA	24	NA	NA

The aluminized steel arch pipes shall have 3” x 1” corrugations.

EXHIBIT "E"

CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	ROAD SEGMENT POINT TO POINT	STATION
1	18	28	A to B	2+70
Half Round	21	20	A to B	2+70
2	24	34	A to B	4+00
3	18	26	A to B	18+80
Half Round	21	20	A to B	18+80
4	24	30	A to B	32+40
5	36	34	A to B	37+15
Half Round	21	10	A to B	58+10
6	24	26	A to B	61+25
Half Round	30	20	A to B	61+25
7	142 x 91	82	A to B	110+30
8	24	40	A to B	116+40
9	95 x 67	52	A to B	120+30
10	24	44	A to B	128+90
11	18	38	A to B	147+45
12	18	28	A to B	158+05
Half Round	21	20	A to B	158+05
13	18	28	A to B	165+10
Half Round	21	20	A to B	165+10
14	18	28	A to B	174+05
Half Round	21	20	A to B	174+05
15	18	30	A to B	177+45
Half Round	21	20	A to B	177+45
16	18	30	A to B	186+35
Half Round	21	20	A to B	186+35
17	18	32	A to B	243+80
18	24	48	G to H	6+30

The intake end of culverts smaller than 48 inches in diameter shall be marked by installing a 5 foot long, painted steel fence post two feet into the ground, within 6 inches of the inlet on the downgrade side.

Culverts 36 inches in diameter or larger shall have 1:1 beveled inlets.

EXHIBIT "E"

CULVERT LIST

Tamping is required on all culverts. Backfills on culverts over 24 inches in diameter shall be compacted with a vibratory hand-operated or Backhoe mounted tamper.

All metal culverts scheduled for replacement shall become property of PURCHASER and be removed from State land in the same project period in which replacement occurred.

Half rounds shall be installed within 72 hours of culvert installation, unless otherwise approved in writing by STATE. Steel posts used with half round installation shall be painted with rust preventative paint.

EXHIBIT "E"

TYPICAL HALF ROUND CULVERT INSTALLATION

(no scale)

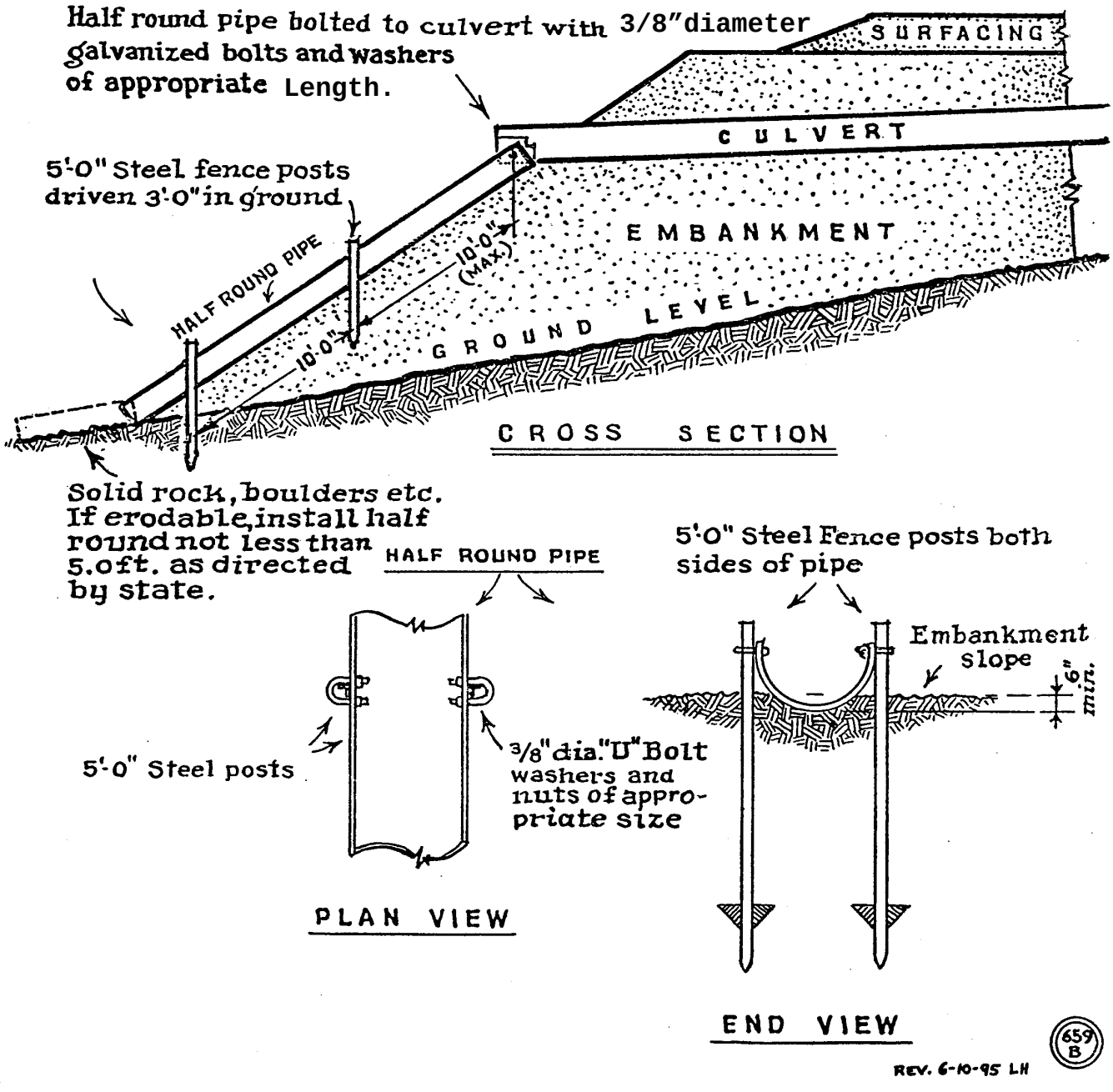


EXHIBIT "E"

TYPICAL EMBEDDED ENERGY DISSIPATOR

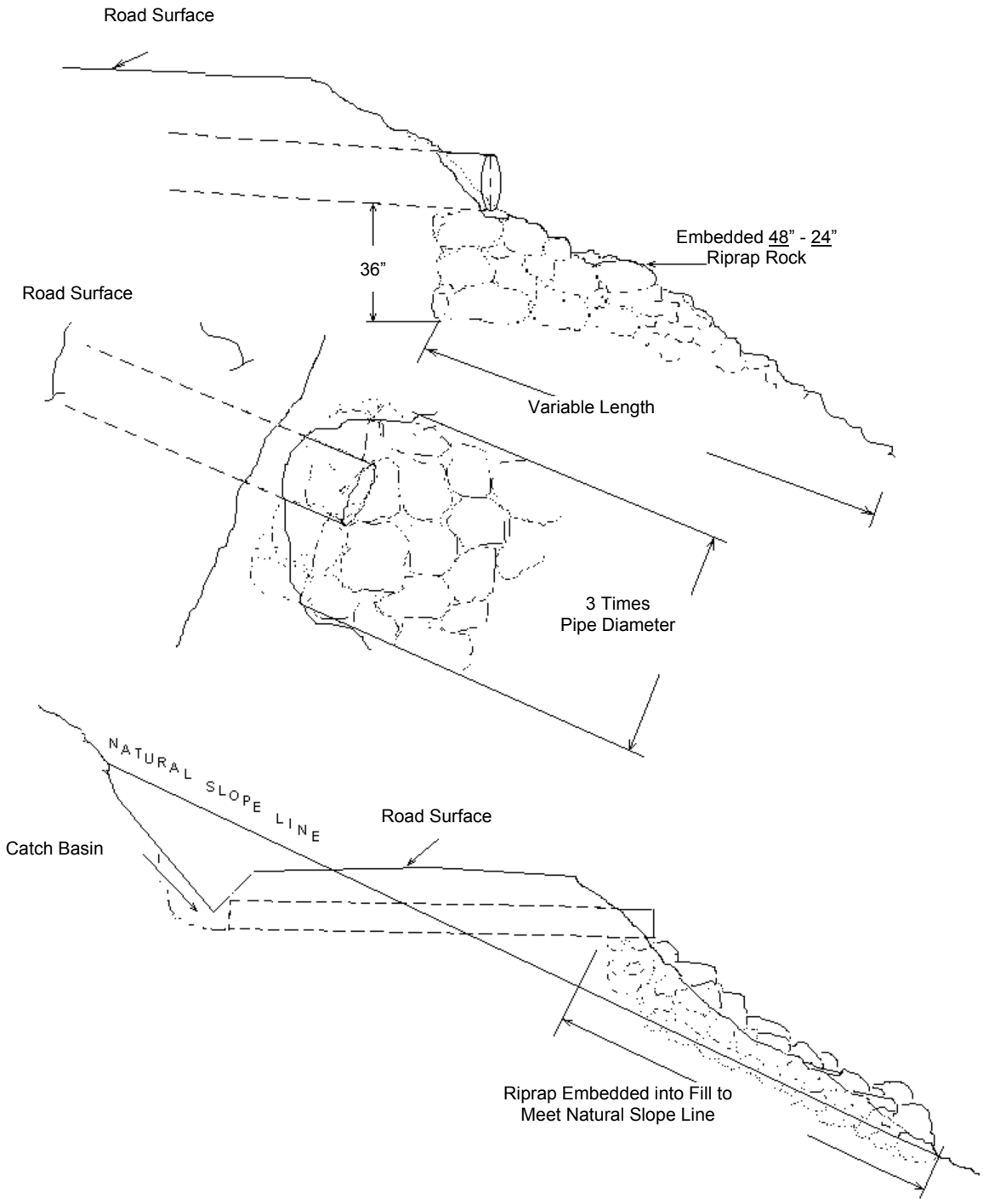
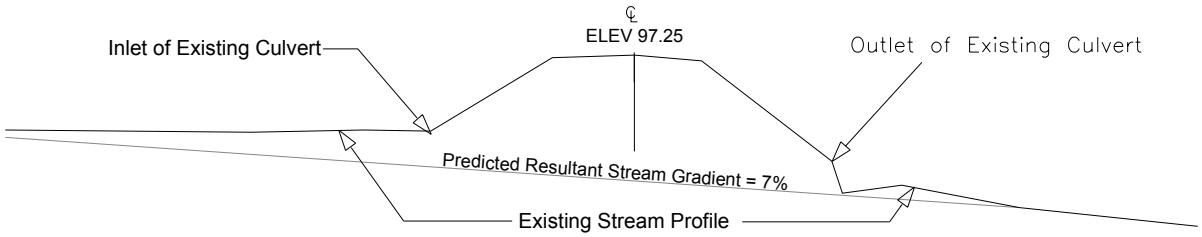


EXHIBIT "E"

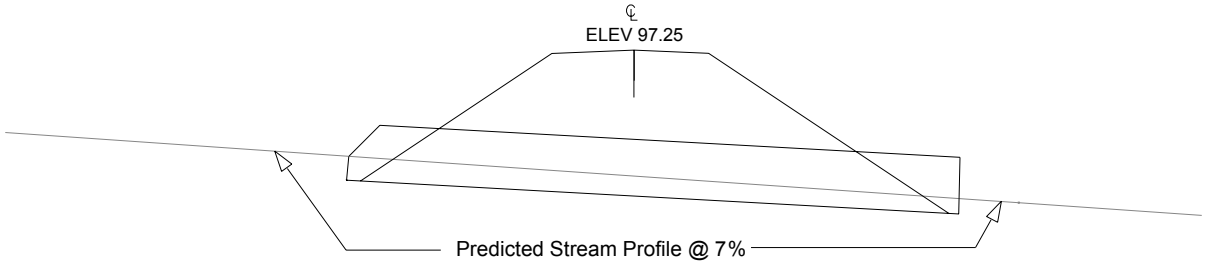
KLAHNBERRY TIMBER SALE
FISH PASSAGE CULVERT DESIGN
A to B - Station 110+30

Scale: 1" = 20'

EXISTING CONDITION



INSTALLATION DESIGN



Drainage Area = 177 acres
= 0.28 sq mi
Mean Elevation = 1400 feet
Q_{100} = 88 cfs
Drainage Area Required = 15.9 sq ft
Round Culvert Equivalent = 54"

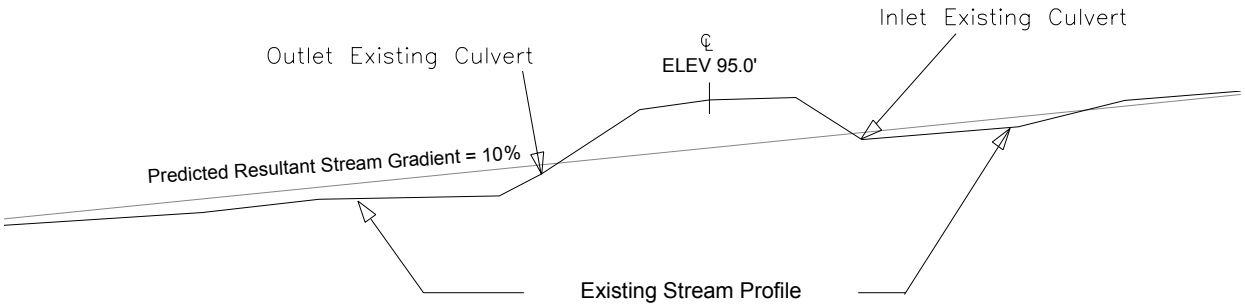
Install 142" span x 91" rise x 82' length Aluminized Pipe Arch Culvert at 5.5% gradient
Countersink 2 feet at outlet (Elev 75.87')
Countersink 3.1 feet at inlet (Elev 80.38')
Resultant Drainage Area = 44.8 sq ft
Average Active Channel Width = 11.5 feet
Channel Width in Culvert = 11.4 feet

RP on 15.5" fir stump bears N56E 56.0' from CL - Elev 97.25'

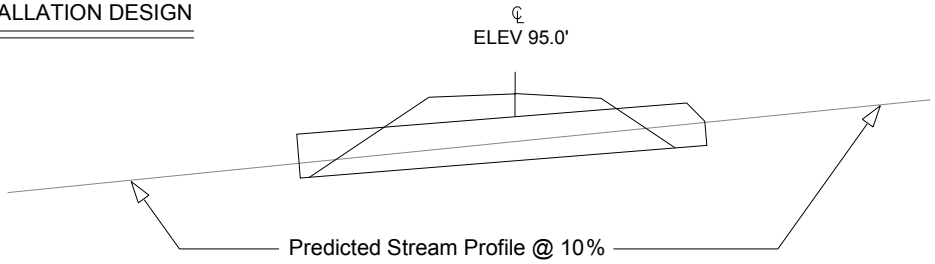
EXHIBIT "E"
KLAHNBERRY TIMBER SALE
FISH PASSAGE CULVERT DESIGN
A to B - Station 120+30

Scale: 1" = 20'

EXISTING CONDITION



INSTALLATION DESIGN



Drainage Area = 49 acres
= 0.08 sq mi
Mean Elevation = 1480 feet
Q_{100} = 25.9 cfs
Drainage Area Required = 5.9 sq ft
Round Culvert Equivalent = 33"

Install 95" span x 52" rise x 52' length Aluminized Pipe Arch Culvert at 8% gradient
Countersink 2.0 feet at outlet (Elev 83.8')
Countersink 3.19 feet at inlet (Elev 88.0')
Resultant Drainage Area = 15.3 sq ft
Average Active Channel Width = 7 feet
Channel Width in Culvert = 7.5 feet

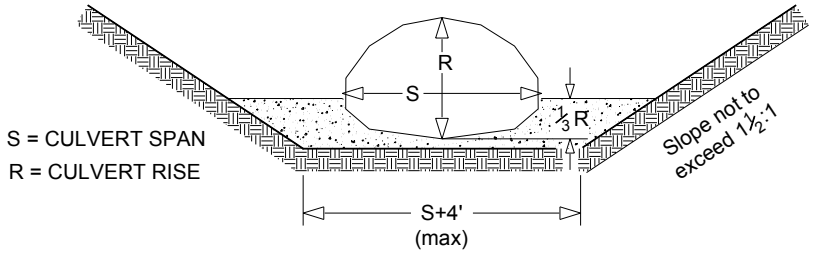
RP on 12" Alder bears S20E from CL Elev 95.0'

EXHIBIT "E"

KLAHNBERRY TIMBER SALE
FISH PASSAGE CULVERT DESIGN
INSTALLATION DETAILS

NO SCALE

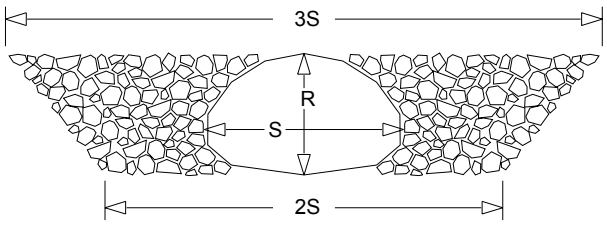
BEDDING DETAILS



END VIEW

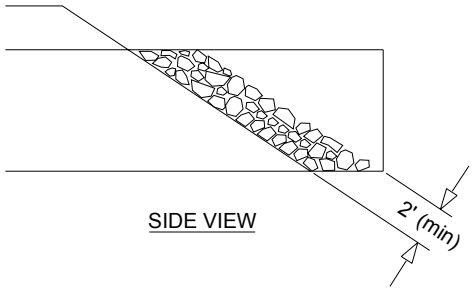
Culverts shall be bedded using crushed rock no larger than 1½"-0. Rock shall be machine compacted. Depth under the culvert may vary but shall be a minimum of 8" deep.
Culverts shall be backfilled using crushed rock no larger than 1½"-0 to a depth equaling ⅓ of the culvert rise. All voids under the culvert haunches shall be filled, and the rock shall be machine compacted.

RIP RAP DETAILS



END VIEW

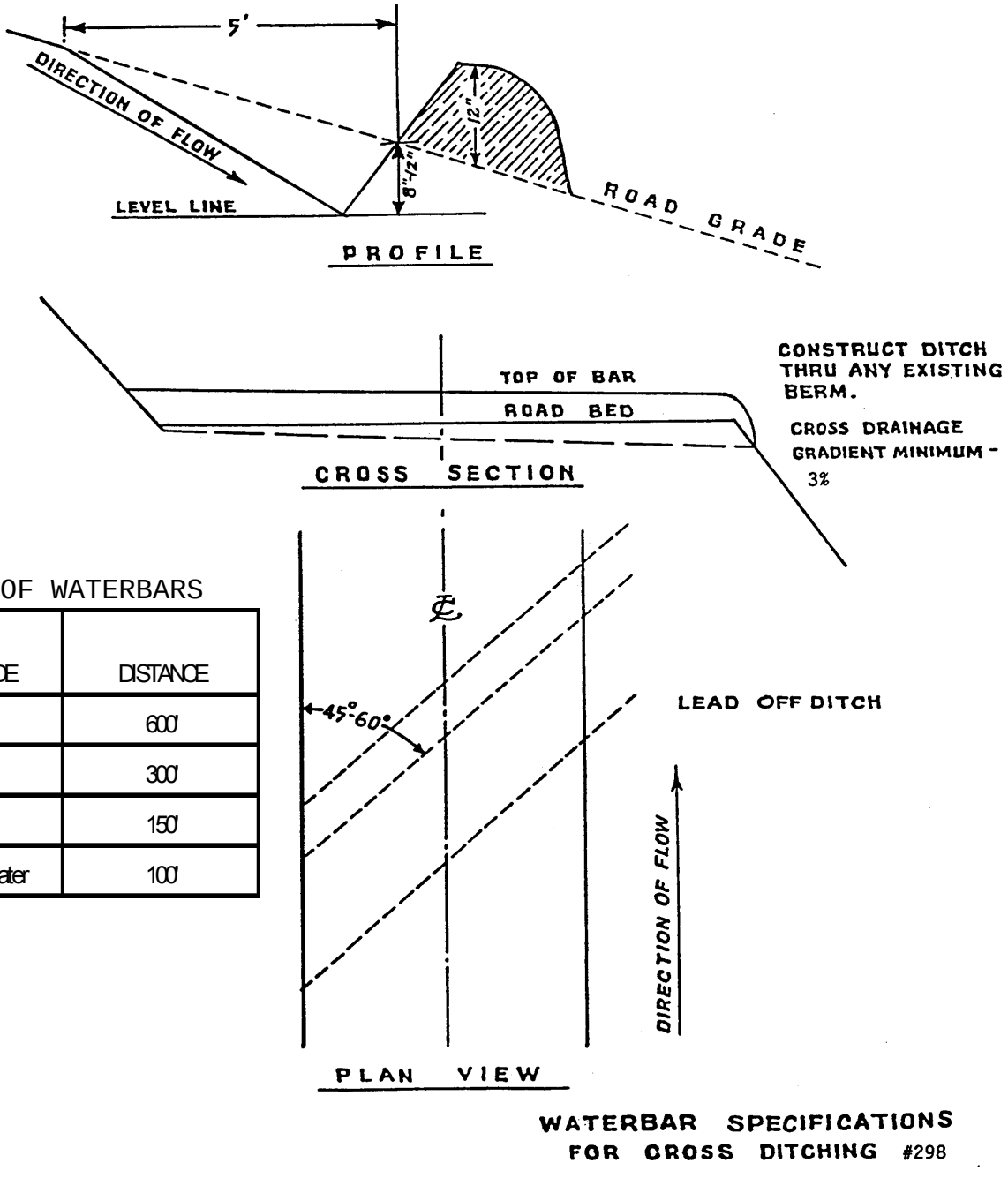
Culverts shall be armored at both the inlet and outlet ends by machine placing specified rip rap as shown. In narrow channels adjust width to fit original stream banks.



SIDE VIEW

EXHIBIT "F"

WATERBAR SPECIFICATIONS



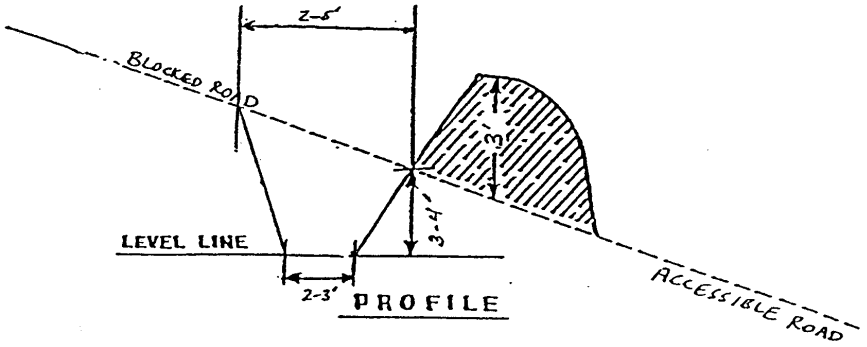
SPACING OF WATERBARS

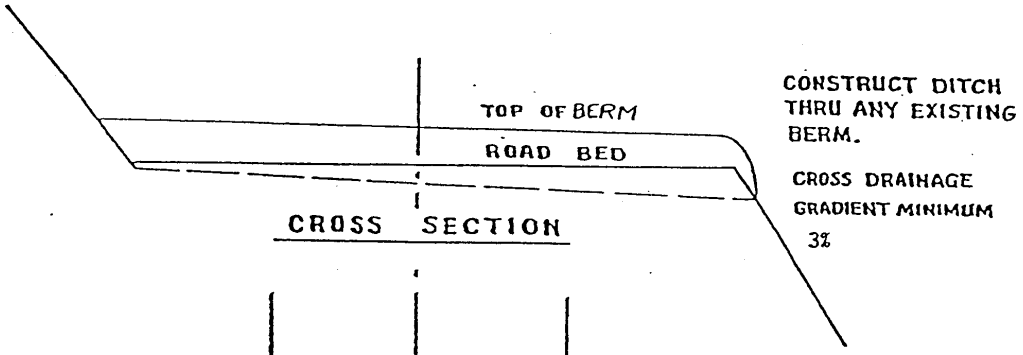
ROAD GRADE	DISTANCE
≤5%	600'
6-10%	300'
11-15%	150'
16-20% or greater	100'

WATERBAR SPECIFICATIONS
FOR CROSS DITCHING #298

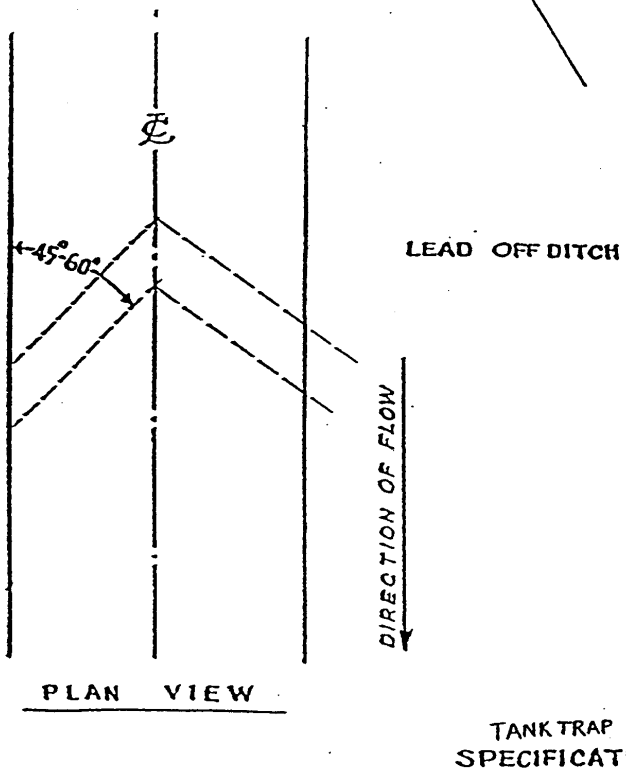
EXHIBIT "F"

TANK TRAP SPECIFICATIONS



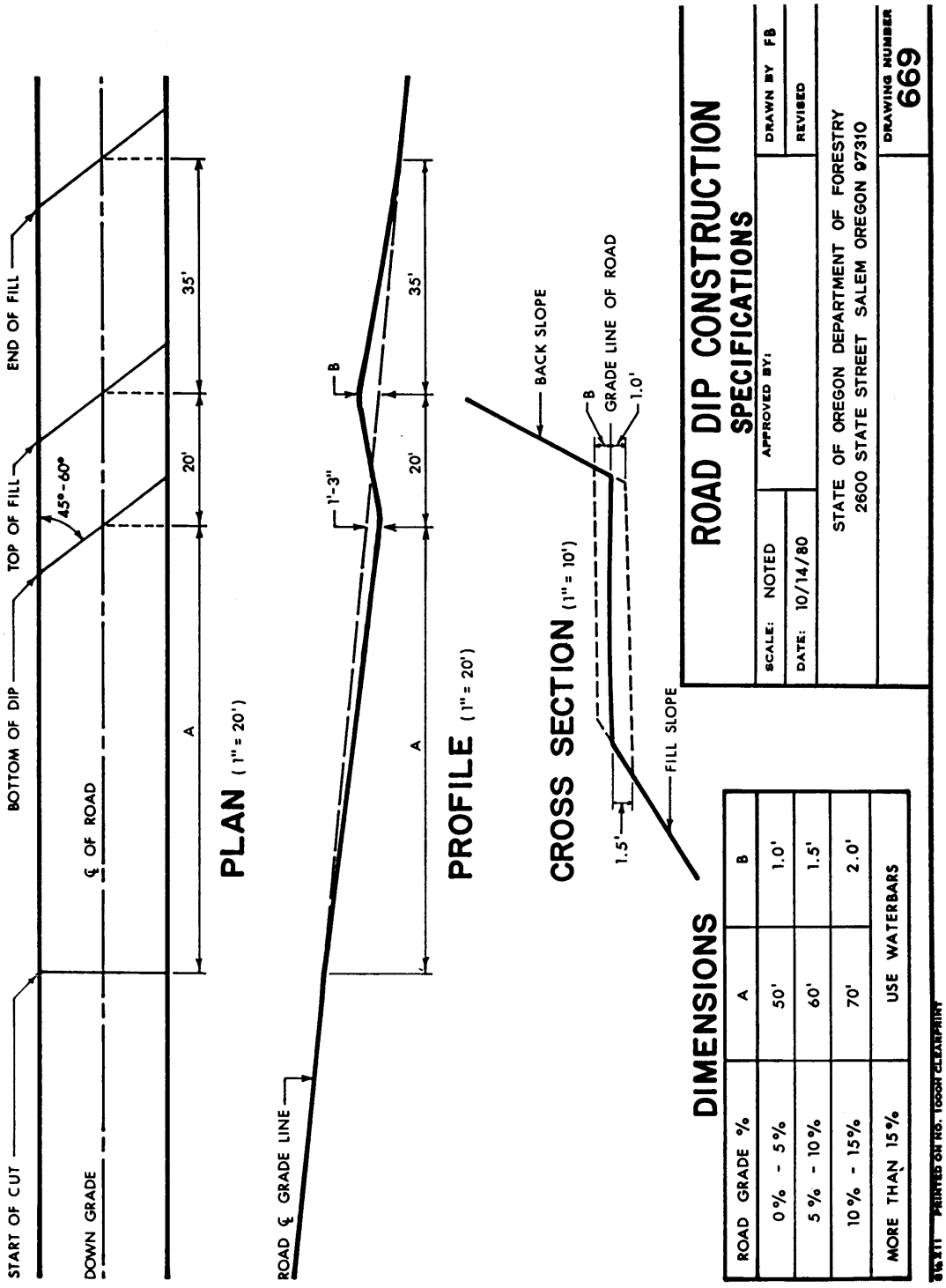


Tank trap shall be installed in a "V" shape. It should be sloped to drain with a relief ditch through the down slope edge of the road. The trench shall be behind the berm for approaching traffic.



TANK TRAP SPECIFICATIONS

EXHIBIT "F"
ROAD DIP SPECIFICATIONS



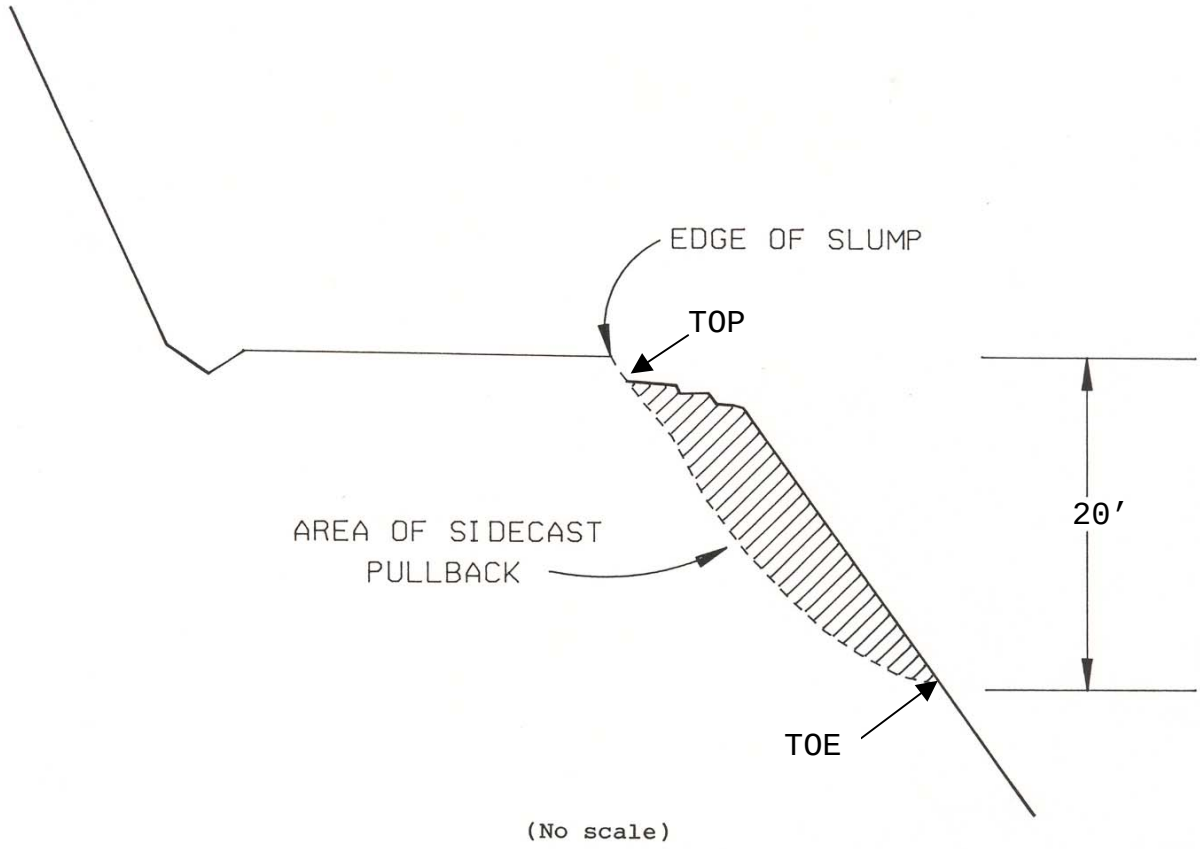
DIMENSIONS

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

State Timber Sale Contract
No. 341-05-20
Klahnberry

EXHIBIT "G"

TYPICAL CROSS SECTION VIEW OF SIDECAST PULLBACK AND ROAD REALIGNMENT



Bank Excavation and sidecast pullback shall be completed prior to subgrade approval.

State Timber Sale Contract
No. 341-05-20
Klahnberry

EXHIBIT "H"

SEEDING AND FERTILIZING

This work shall consist of preparing seedbeds and furnishing and placing required seed and fertilizer.

Seeding Seasons. Seeding shall be performed only from March 1 through June 15 and August 15 through October 15. Seeding materials shall not be applied during windy weather or when the ground is excessively wet or frozen. Areas of disturbed soil shall be seeded by the end of the project period in which work was started. PURCHASER shall notify STATE 24 hours prior to seeding.

Soil Preparation. Areas to be seeded that have been damaged by erosion or other causes shall be restored prior to seeding. All areas to be seeded shall be finished and then cultivated to provide a reasonably firm, but friable seedbed. A minimum of 1/2 inch of surface soil shall be in a loose condition.

Application Methods for Seed and Fertilizer

Dry Method. Mechanical seeders, seed drills, landscape seeders, cultipacker seeders, fertilizer spreaders, or other approved mechanical seeding equipment shall be used to apply the seed and fertilizer in the amounts and mixtures specified. Hand-operated seeding devices may be used when seed and fertilizer are applied in dry form.

Application Rates for Seed and Fertilizer

Seed listed below shall be applied at the following rates per acre:

SPECIES	LB./ACRE	MIXTURE	PURE LIVE SEED	POISON AND/OR REPELLENT
Fine Fescue	12	40%	98%	0
Annual Ryegrass	6	20%	98%	0
Perennial Ryegrass	9	30%	98%	0
White Dutch Clover	3	10%	98%	0

Fertilizer: Chemical analysis shall be 16-20-0 and shall be applied at the rate of 300 pounds per acre.

Seeding will be considered acceptable when all other specified requirements in Exhibits H and I have been completed and a healthy, uniform, close stand of grass has been established, unless otherwise approved in writing by STATE.

State Timber Sale Contract
No. 341-05-20
Klahnberry

EXHIBIT "I"

MULCHING

This work shall consist of furnishing and placing required mulch. Mulch shall consist of straw that is free of noxious weeds.

Mulching Period. Straw mulch shall be applied within 24 hours of spreading grass seed and fertilizer.

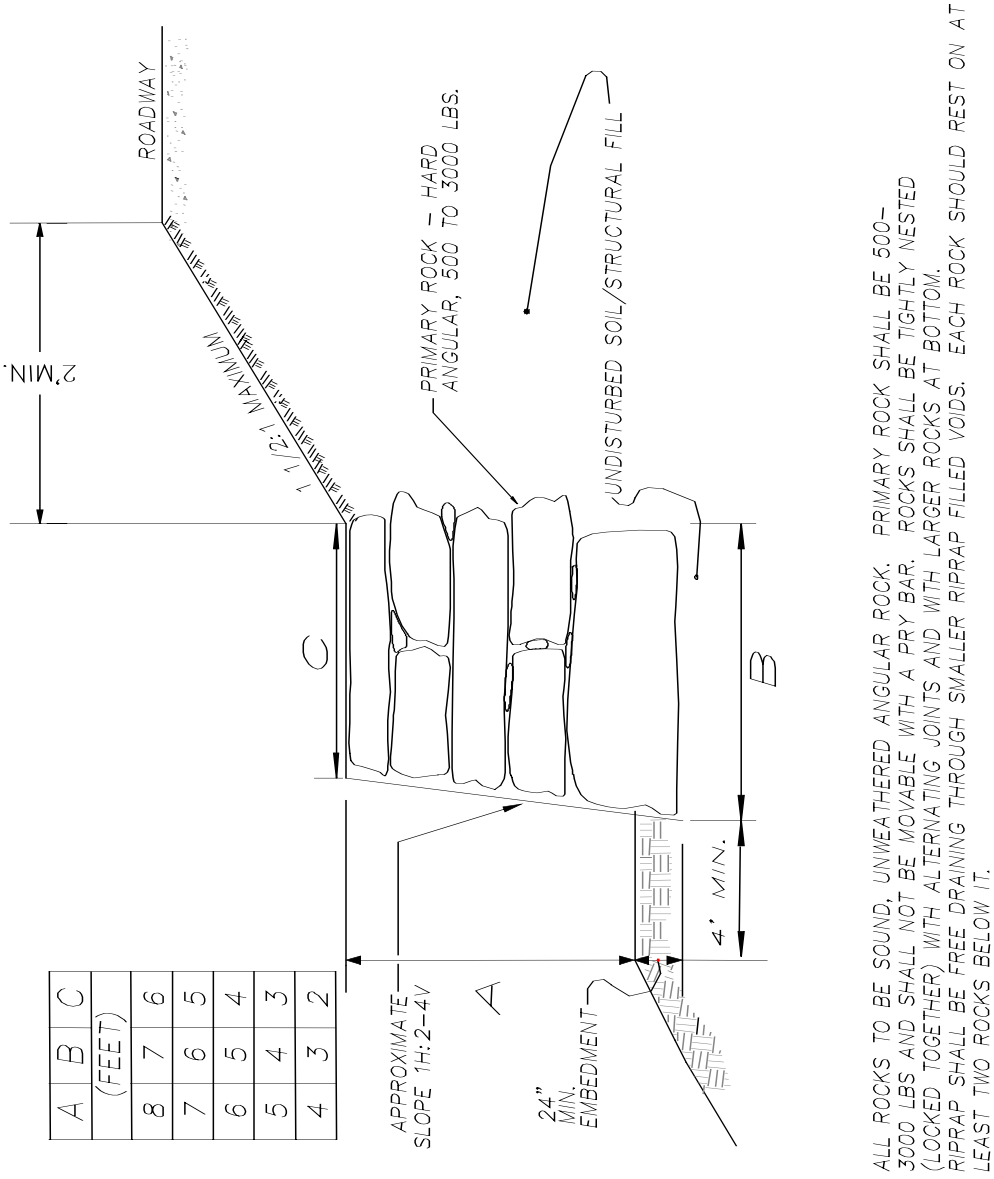
Application Rates for Mulch

Place straw mulch to a reasonably uniform thickness of ¾ to 1¼ inches. This rate requires between 1 and 1½ tons of dry mulch per acre.

State Timber Sale Contract
No. 341-05-20
Klahnberry

EXHIBIT "J"

FILL SLOPE STABILIZATION

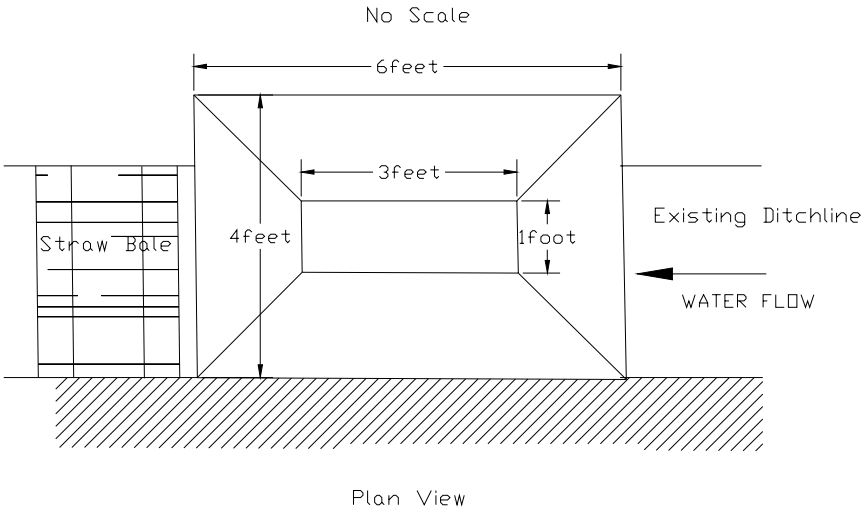


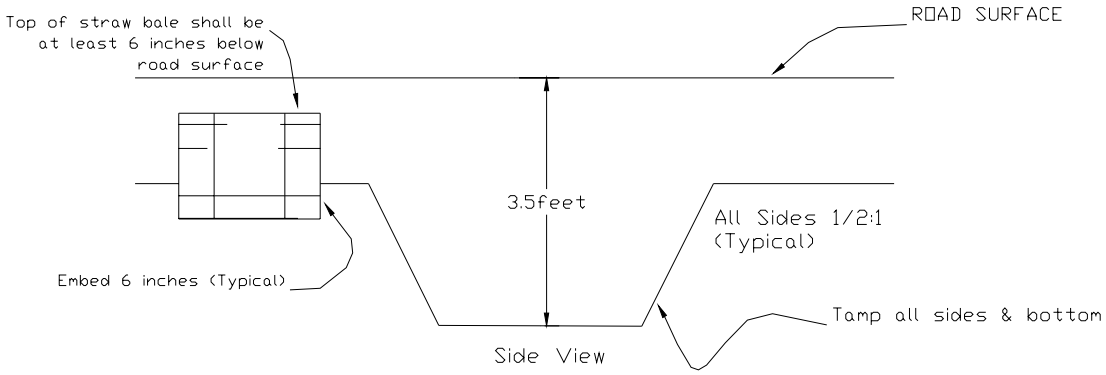
A	B	C
(FEET)		
8	7	6
7	6	5
6	5	4
5	4	3
4	3	2

State Timber Sale Contract
No. 341-05-20
Klahnberry

EXHIBIT "K"

SEDIMENT CATCH BASIN (TYPICAL)





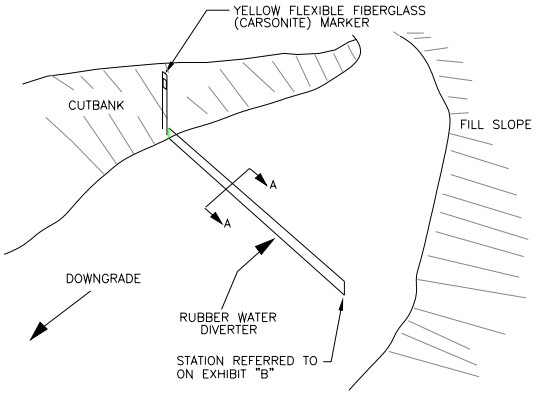
State Timber Sale Contract
No. 341-05-20
Klahnberry

EXHIBIT "L"

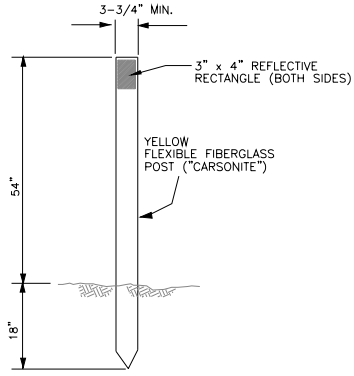
RUBBER WATER DIVERTER

GENERAL NOTES

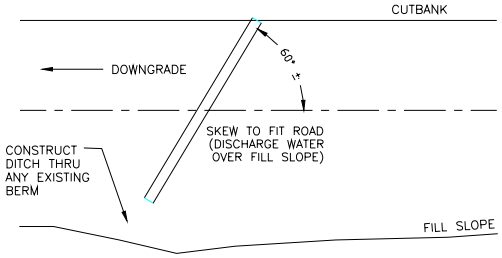
1. CONVEYOR BELTING: 3 OR 5 PLY, 600 Lb. TENSILE STRENGTH PER INCH OF WIDTH, NYLON FABRIC, 3/8" x 1/8" COVERING, 12" x 16'.
2. TIMBER: (4" x 8") nom. x 16'
   TIMBER SHALL BE PRESSURE TREATED (GROUND CONTACT TYPE).
   4" SIDE OF TIMBER SHALL BE INSTALLED VERTICALLY AS ILLUSTRATED IN SECTION A–A.
3. GALVANIZED LAG SCREWS: 3/8" x 3" (8 EACH) WITH 3/8" GALVANIZED WASHERS (23" SPACING FOR SCREWS).
4. MARKER: 72" LONG CARSONITE MODEL CRM–375 WITH 3" x 4" REFLECTOR ON EACH SIDE OR APPROVED EQUIVALENT.
5. BACKFILL MATERIAL SHALL BE PLACED IN 4" COMPACTED LIFTS, DENSITY SHALL EXCEED THE DENSITY OF THE SURROUNDING ROAD SURFACE MATERIAL.

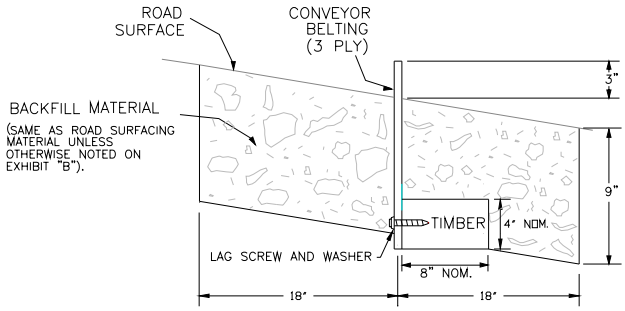


INSTALLATION DETAIL



MARKER





State Timber Sale Contract
No. 341-05-20
Klahnberry

EXHIBIT "M"

SPECIFICATIONS FOR ROAD VACATING

Rip subgrade to a depth of one foot across entire subgrade width. Construct waterbars so that water is carried across the road and deposited on stable locations. Waterbars shall be angled across the road, deep enough to intercept water from any road ditchline and carry it across the road, and spaced as shown in Exhibit F.

PURCHASER shall close roads by constructing a tank trap as specified in Exhibit F as marked in the field. Barrier shall make the road impassable to vehicular traffic.

EXHIBIT "N"
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: Tillamook (06) Phone (503) 842-2545
(State Forestry District)
Address 5005 3rd St., Tillamook, OR 97141

(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 (20).

	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 Klahnberry
COUNTY Tillamook

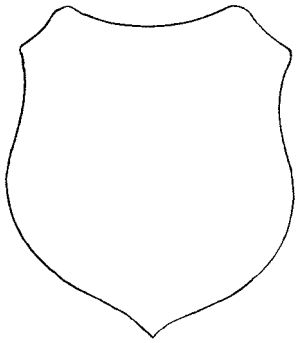
(13) STATE CONTRACT NUMBER 341-05-20

(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, Mgmt. Unit

EXHIBIT “N”

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.