

# PART III: EXHIBITS

State Timber Sale Contract  
No. 341-05-81  
Haynes Head

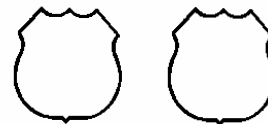
EXHIBIT B

Page 1 of 3  
629-Form 341-203  
Revised 06/97

## OREGON DEPARTMENT OF FORESTRY

### TIMBER SALE OPERATIONS PLAN

(See Page 2 for instructions)



Date Received by STATE: \_\_\_\_\_

(5) State Brand Information (complete):

(1) Contract No.: 341-05-81

(2) Sale Name: Haynes Head

(3) Contract Expiration Date: June 30, 2007

Project Completion Dates: \_\_\_\_\_

(4) Purchaser: \_\_\_\_\_

(6) Purchaser Representatives:

Projects: \_\_\_\_\_

Phone: \_\_\_\_\_

Cell/Other

Phone: \_\_\_\_\_

Home: \_\_\_\_\_

Projects: \_\_\_\_\_

Phone: \_\_\_\_\_

Cell/Other

Phone: \_\_\_\_\_

Home: \_\_\_\_\_

Projects: \_\_\_\_\_

Phone: \_\_\_\_\_

Cell/Other

Phone: \_\_\_\_\_

Home: \_\_\_\_\_

Projects: \_\_\_\_\_

Phone: \_\_\_\_\_

Cell/Other

Phone: \_\_\_\_\_

Home: \_\_\_\_\_

Logging: \_\_\_\_\_

Phone: \_\_\_\_\_

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Phone: \_\_\_\_\_

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Logging: \_\_\_\_\_

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Cell/Other

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Logging: \_\_\_\_\_

Phone: \_\_\_\_\_

Cell/Other

Phone: \_\_\_\_\_

Home: \_\_\_\_\_

Logging: \_\_\_\_\_

Phone: \_\_\_\_\_

Cell/Other

Phone: \_\_\_\_\_

Home: \_\_\_\_\_

(7) State Representatives:

Projects: \_\_\_\_\_

Phone: \_\_\_\_\_

Cell/Other

Phone: \_\_\_\_\_

Home: \_\_\_\_\_

Logging: \_\_\_\_\_

Phone: \_\_\_\_\_

Cell/Other

Phone: \_\_\_\_\_

Home: \_\_\_\_\_

(8) Name of Subcontractors & Starting Dates:

Projects: No(s) \_\_\_\_\_ - \_\_\_\_\_

Date: \_\_\_\_\_

Phone: \_\_\_\_\_

No(s) \_\_\_\_\_ - \_\_\_\_\_

Date: \_\_\_\_\_

Phone: \_\_\_\_\_

No(s) \_\_\_\_\_ - \_\_\_\_\_

Date: \_\_\_\_\_

Phone: \_\_\_\_\_

No(s) \_\_\_\_\_ - \_\_\_\_\_

Date: \_\_\_\_\_

Phone: \_\_\_\_\_

Logging: Felling \_\_\_\_\_

Date: \_\_\_\_\_

Phone: \_\_\_\_\_

Yarding: \_\_\_\_\_

Date: \_\_\_\_\_

Phone: \_\_\_\_\_

(9) Comments:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(10) Operations Map: Attach a copy of timber sale Exhibit A or other suitable map which plainly shows the items listed on the instruction sheet.

EXHIBIT B

INSTRUCTION SHEET FOR OPERATIONS PLAN

**SUBMIT ONE COPY OF PLAN TO STATE**



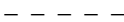
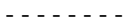


Operations shall be limited to the work shown in the plan until a revised plan or supplemental plan is submitted covering additional work. Compliance with this plan is not in lieu of compliance with any federal requirements related to the federal Endangered Species Act. If STATE has prepared a required Forest Practices Act (FPA) "Written Plan" for operations, PURCHASER shall comply with all provisions of the Written Plan.

**Item No. (from Page 1)**

- (5) All sales require you to use a brand furnished by STATE. If the State brand has not been assigned when the plan is submitted, it will be furnished and assigned later. Complete drawing. If more than one brand is assigned to the sale, complete both drawings.
- (6) The contract requires you to have a designated representative available on the sale area or work location who is authorized to receive in your behalf any notice or instruction given by STATE and to take action in regard to performance under the contract. If logging and project work is widely separated, a representative is required for each.
- (7) The STATE representative will be designated when your plan is approved and is the person who will inspect and issue instructions regarding performance.
- (8) Show names of subcontractors to be used for any or all phases of the operations. If subcontractors are not known, or are changed later, give notification to the STATE representative prior to commencement of work by subcontractor.

Show projected dates for commencement of both projects and logging. If projected dates need to be changed at a later date, notification must be given to the STATE representative by supplemental plan or otherwise, prior to commencement of such operations.

- (10) The STATE representative will furnish extra copies of Exhibit A of the contract for your use in preparing the operations map. The map shall use the following legend and show:
  1. Landing locations, approximate setting boundaries, and probable sequence of logging the settings. Number the settings in sequence.
  2. Locations of spur roads planned for construction, other than those required by the timber sale contract. Provide spur road specifications.
  3. Location of proposed tractor yarding roads. Show if and how marked on the ground.
  4. Location of temporary stream crossings.
  5. List the sequence of performing project work.
  6. Location of rock sources - attach pit development plans.

- |   |   |
|---|---|
|  | Cable landing, with numbers for sequence.   |
|  | Tractor landing with alphabetical sequence. |
|  | Approximate setting boundary.               |
|  | Spur truck roads.                           |
|  | Tractor yarding roads.                      |
|  | Temporary stream crossings.                 |

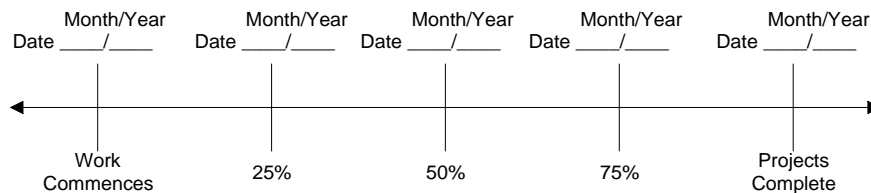
Original: Salem  
cc: District File  
Purchaser

EXHIBIT B  
OPERATIONS PLAN

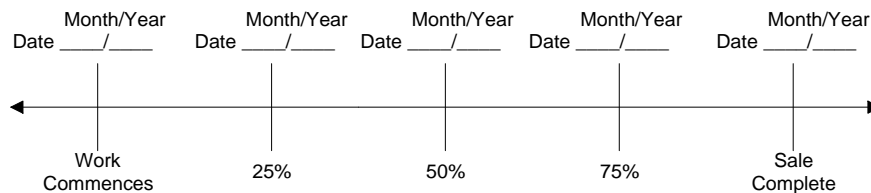
**Completion Timeline**

Indicate on the appropriate timeline below, the dates by which you plan to complete the work as required under this contract. The purpose of this section is to develop a plan that will ensure you complete the work as required, and meet the interim completion date(s) and contract expiration date. This plan is incorporated and made a part of the contract. When, in the opinion of STATE, operations are not commencing in a manner that meets the intent of this plan, you may be placed in violation of contract and your operations suspended until an amended plan is submitted and approved by STATE.

**Projects**



**Harvest & Other Requirements**



**The Federal Endangered Species Act (ESA) prohibits a person from taking any federally listed threatened or endangered species. Taking under the federal ESA may include alteration of habitat. STATE's approval of this plan does not certify that PURCHASER's operation under the plan is lawful under the federal ESA. As provided in the timber sale contract, PURCHASERS must comply with all applicable state, federal, and local laws.**

**PURCHASER's compliance with this plan is not in lieu of compliance with any federal requirements related to the federal Endangered Species Act.**

APPROVED: Date: \_\_\_\_\_

SUBMITTED BY:  
PURCHASER

STATE OF OREGON - DEPARTMENT OF FORESTRY

\_\_\_\_\_  
Title \_\_\_\_\_

\_\_\_\_\_  
Title \_\_\_\_\_

EXHIBIT C

**SCALING INSTRUCTIONS -- LOCATION APPROVAL -- BRAND INFORMATION**

(1) ORIGINAL REGISTRATION  Date \_\_\_\_\_  
 REVISION NUMBER \_\_\_\_\_  Date \_\_\_\_\_  
 CANCELLATION  Date \_\_\_\_\_

(2) TO: \_\_\_\_\_  
 (Third Party Scaling Organization)

(3) FROM: Western Lane (03) Phone 541-935-2283  
 (State Forestry District)  
 Address PO Box 157, Veneta, OR 97487

(4) PURCHASER: \_\_\_\_\_  
 Address \_\_\_\_\_

(12) SALE NAME Haynes Head

COUNTY Lane

(13) STATE CONTRACT NUMBER 341-05-81

(14) SCALE: westside  eastside  cubic foot

(15) STATE BRAND REGISTRATION NUMBER \_\_\_\_\_

(16) BUREAU BRAND CODE NUMBER \_\_\_\_\_

(17) STATE BRAND INFORMATION:

(COMPLETE) 

(5) MINIMUM SCALING SPECIFICATIONS			CLASS		
SPECIES	SCALING DIAMETER INCHES	*NET SCALE VOLUME	PER MBF	** SUM	SUB
Conifers	--	10	X		
Hardwoods				X	

\* Apply minimum volume test to whole logs over 40' Westside; 20' Eastside.  
 \*\* Sum (if indicated): see instructions and explain in Item (20).

(6) WESTSIDE SCALE: YES  NO   
 Actual taper all logs over 40' scaling length

(7) EASTSIDE SCALE: YES  NO   
 \*Actual taper butt logs over 40' scaling length

(8) PENCIL BUCK YES  NO   
 back to Minimum Scaling Diameter \_\_\_\_\_

(9) ADD-BACK VOLUME -- YES  NO   
 Deductions due to delay

(18) PAINT REQUIRED: YES   
 COLOR Orange

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

(10) APPROVED SCALING LOCATIONS	Species	Yard	Truck

(20) REMARKS: Loads containing only SUM material need not be accounted for by scale ticket.

Operator's Name (Optional inclusion by District): \_\_\_\_\_

(11) NOTICE OF CANCELLATION OF BRAND:  
 Effective Date: \_\_\_\_\_  
 \_\_\_\_\_  
 State Forester's Representative

(21) SIGNATURES:  
 \_\_\_\_\_ Date  
 Purchaser or Authorized Representative  
 \_\_\_\_\_ Date  
 State Forester Representative

**Notify the District within one hour when branding or painting is inadequate for quick identification, the receipts are missing, not correctly or completely filled out, and/or when logs presented for scaling are impossible to scale accurately.**

EXHIBIT C

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 2040 or 2045, "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 subspecies 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.

EXHIBIT D  
 FOREST ROAD SPECIFICATIONS

SUBGRADE WIDTH	SURFACED WIDTH	ROAD	STATION TO STATION	DRAINAGE
16 feet	12 feet	Knapp Extension	0+00 to 44+11	Ditched
16 feet	12 feet	Knapp Nose	0+00 to 36+25	Ditched
16 feet	N/A	Spur 1	0+00 to 11+55	Outsloped
16 feet	N/A	Spur 1a	0+00 to 4+13	Outsloped
16 feet	12 feet	Spur 2	0+00 to 15+58	Ditched
16 feet	12 feet	Spur 3	0+00 to 6+08	Ditched
16 feet	12 feet	Spur 4	0+00 to 9+97	Ditched
16 feet	12 feet	Spur 5	0+00 to 16+87	Ditched
16 feet	12 feet	Spur 5a	0+00 to 1+05	Ditched

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.

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.

CLEARING AND GRUBBING DISPOSAL. Scatter through openings in the timber outside of the cleared right-of-way, except in areas where sidecast of excavated dirt and rock is prohibited.

GRADES. Grades on the Knapp Extension Road shall not exceed 13 percent and shall not exceed 17 percent on the Knapp Nose Road.

CURVES. Minimum curve radius is 70 feet on the Knapp Extension and Knapp Nose Roads.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

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

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

All suitable excavated material shall be used where possible for the formation of fills, shoulders, and drainage structure backfills. Embankment materials shall be free of woody debris, brush, muck, sod, frozen material, and other deleterious materials. All fills and drainage structure backfills shall be machine compacted according to the specifications in Exhibit 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 on slopes over 50 percent.

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 and sloped 2:1 from shoulder to ditch bottom.

Ditched Roads. Road subgrade and surface shall both be crowned at 6 percent.

Outsloped Roads. Road subgrade shall be outsloped at least 6 percent.

TURNOUTS. Increase roadbed width an additional 12 feet for both subgrade and surfacing. Length shall be at least 35 feet, or as staked on the ground, plus 25-foot approaches at each end.

Location: As marked in the field.

GRADING

Shot Rock  
Common - side slopes 50% and over  
Common - side slopes less than 50%  
Common - turnpike (level) section

Back Slopes

Vertical to 1/4:1  
1/2:1  
3/4:1  
2:1

Fill Slopes

Not steeper  
than 1 1/3:1

EXHIBIT D

ADDITIONAL ROAD IMPROVEMENT INSTRUCTIONS

Nelson Divide Re-Alignment

The Knapp Nose approach to the Nelson Divide Road will undercut the Nelson Divide Road. Approximately 1½ stations of the Nelson Divide Road must be re-aligned by cutting into the bank.

The centerline of the re-alignment is referenced in the field.

On Station 0+00 to 1+63 of the Knapp Nose Road, the backslope shall be sloped at 1:1.

The re-aligned Nelson Divide Road shall have a 16-foot-wide subgrade with 3-foot-wide ditches and have ¾:1 backslopes.

8 inches (compacted depth) of 3" minus is required.



EXHIBIT D  
END-HAULING REQUIREMENTS

ROAD	STATION TO STATION
Knapp Extension	6+89 to 24+81
Knapp Extension	31+10 to 35+93
Knapp Nose	0+00 to 12+62
Knapp Nose	16+16 to 23+22
Knapp Nose	31+47 to 34+46
Spur 2	0+00 to 3+77
Spur 2	10+28 to 14+45
Spur 3	1+49 to 5+51
Spur 4	0+00 to 6+75
Spur 5	5+21 to 6+35

End-Haul Areas General Requirements

Waste dirt and rock may not be sidecast in the areas shown above, or any other slopes over 50 percent.

Woody debris may be sidecast.

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

Containment

Average 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.

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 marked in the field and shown on Exhibit A, or other areas approved by STATE.

Waste Area Treatment

Deposit at waste area, spread evenly, compact, and provide adequate drainage. Waste areas do not need to be cleared of stumps and slash before use.

EXHIBIT E  
 ROAD SURFACING

EXH

TYPE OF ROCK	SIZE OF ROCK	COMPACTED DEPTH	ROAD	STATION TO STATION	APPROX. TOTAL TRUCK MEASURE VOLUME
Crushed Quarry	3"-0"	8"	Knapp Extension	0+00 to 44+11	1,941 CY
Crushed Quarry	¾"-0"	3"	Knapp Extension	0+00 to 35+49	603 CY
Crushed Quarry	3"-0"	8"	Knapp Nose	0+00 to 36+25	1,595 CY
Crushed Quarry	3"-0"	8"	Spur 2	0+00 to 15+58	686 CY
Crushed Quarry	¾"-0"	3"	Spur 2	0+00 to 3+77	64 CY
Crushed Quarry	¾"-0"	3"	Spur 2	8+98 to 12+31	57 CY
Crushed Quarry	3"-0"	8"	Spur 3	0+00 to 6+08	268 CY
Crushed Quarry	¾"-0"	3"	Spur 3	0+00 to 5+51	94 CY
Crushed Quarry	3"-0"	8"	Spur 4	0+00 to 9+97	439 CY
Crushed Quarry	¾"-0"	3"	Spur 4	1+77 to 6+75	85 CY
Crushed Quarry	3"-0"	8"	Spur 5	0+00 to 16+87	742 CY
Crushed Quarry	¾"-0"	3"	Spur 5	0+99 to 3+67	46 CY
Crushed Quarry	¾"-0"	3"	Spur 5	9+44 to 12+20	47 CY
Crushed Quarry	3"-0"	8"	Spur 5a	0+00 to 1+05	46 CY
Crushed Quarry	3"-0"	8"	Nelson Divide Re-alignment	0 to 1+40	62 CY
<b>TURNOUTS:</b>				<b>STATION</b>	
Crushed Quarry	3"-0"	8"	Knapp Road	4, as marked in field	48 CY
Crushed Quarry	3"-0"	8"	Knapp Extension	3+04, 5+68, 14+94, 20+82, 24+81, 28+18, 35+93	168 CY
Crushed Quarry	3"-0"	8"	Knapp Nose	6+86, 10+38, 23+94, 30+52	96 CY
Crushed Quarry	3"-0"	8"	Spur 2	5+62	24 CY
Crushed Quarry	3"-0"	8"	Spur 4	6+75	24 CY
<b>TURNAROUNDS:</b>					
Crushed Quarry	3"-0"	8"	Knapp Extension	24+81	44 CY
<b>CURVE WIDENING:</b>					
Crushed Quarry	3"-0"	8"	Knapp Extension	5+97, 30+37	24 CY
Crushed Quarry	3"-0"	8"	Knapp Nose	10+84	12 CY
Crushed Quarry	3"-0"	8"	Spur 5	0+68, 8+41, 13+81	36 CY

Roads shall be uniformly graded and approved by STATE prior to rocking.

EXHIBIT E

CRUSHED ROCK SPECIFICATIONS

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

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

The material from which base material is produced or manufactured shall 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

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

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

<u>For 3"-0"</u>	Passing	3 1/2" sieve	100%
	Passing	3" sieve	95-100%
	Passing	1 1/2" sieve	55-75%
	Passing	1/4" sieve	30-45%

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

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 E

ROCK ACCOUNTABILITY

The rock shall meet the quality and size specifications in Exhibit E. A sample of the rock shall be supplied to STATE for testing and approval prior to spreading or stockpiling. 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 depth measurement. STATE shall be given 24 hours' notice prior to rocking.

Depth Measurement. Surfacing rock shall be spread and compacted according to the depths specified in Exhibit E. Approximate truck measure volumes are given for ideal conditions, 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 E. The average depth for each road segment shall be the specified depth or greater.

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 E.

EXHIBIT E

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:

Subgrade shall be crowned at 6 percent unless otherwise specified.

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
All roads to be rocked	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 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 roads	D-7 Cat or larger

Crushed Rock. The rock shall be uniformly mixed and spread in layers on the approved roadbed. Each layer of crushed rock shall be moistened or dried to a uniform moisture content suitable for maximum compaction and compacted in layers not to exceed 6 inches in depth. When more than 1 layer is required, each shall be shaped and compacted before the succeeding layer is placed. Any irregularities or depressions that develop during compaction of the top layer shall be corrected by loosening the material at these places and adding or removing material until the surface is smooth and uniform. Each layer shall be compacted with a minimum of 3 passes over the entire width and length of the road. A pass is defined as traveling a road section in one direction and then back over that same section again. Compaction shall be accomplished by using the approved equipment listed below or others approved by STATE:

Rock shall be crowned at 6 percent unless otherwise specified.

ROAD SEGMENT	COMPACTION EQUIPMENT OPTIONS
All rocked roads	Vibratory Roller

EXHIBIT E

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 miles to 1.8 miles per hour, as directed by STATE.

Crawler Tractors. D-7 Caterpillar or equivalent or larger.

## EXHIBIT F

### CULVERT SPECIFICATIONS

All culvert materials shall be furnished and installed by PURCHASER, unless otherwise specified in the Contract. Culverts shall be constructed of corrugated galvanized or aluminized steel. Corrugated polyethylene may be used for sizes up to 36 inches in diameter. All culverts shall conform to the material and fabricating requirements 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.

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 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 degrees of the bottom of the trench.

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.

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 F

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" and 18" for culverts 42" to 96" (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 lead-off ditches away from culvert outlets where the slope gradients restrict the free flow of water.

Following are the minimum standard gauges for pipe and coupling bands. Some culverts may require different gauges and may be found in the culvert listing.

Dia.	Steel Pipe Gauge	Band Gauges	Band Widths (")			Hugger Band Widths (")	
			Annular	Helical	Dimpled	Annular	Helical
18-24	16	16	12	12	12	13 1/8	10 1/2
30-36	16	16	12	12	12	13 1/8	10 1/2
42	14	16	12	12	NA	13 1/8	10 1/2
48	14	16	24	24	NA	13 1/8	10 1/2
54	14	16	24	24	NA	13 1/8	10 1/2
60	12	16	24	24	NA	13 1/8	10 1/2
66-72	12	16	24	24	NA	13 1/8	10 1/2
78	12	16	24	24	NA	13 1/8	10 1/2
84	12	16	24	24	NA	14 3/4	10 1/2
90-120	12	16	26	26	NA	NA	NA



EXHIBIT F  
 CULVERT LIST

DIAMETER (Inches)	CULVERT GAUGE	CULVERT LENGTH (Feet)	HALF ROUND LENGTH	MATERIAL TYPE	ROAD	STATION
18	*	--	10'	**	Knapp Road	0.11 mi.
18	*	28	--	**	Knapp Extension	4+02
18	*	28	--	**	Knapp Extension	11+03
18	*	28	--	**	Knapp Extension	22+20
18	*	36	--	**	Knapp Extension	44+11
18	*	28	--	**	Knapp Nose	23+22
18	*	28	--	**	Knapp Nose	27+34
18	*	28	10'	**	Spur 2	0+50
18	*	28	10'	**	Spur 3	0+88
18	*	28	--	**	Spur 4	4+37
18	*	28	--	**	Spur 4	6+75

\* Default gauges used if no choice is made

\*\* Galvanized

The intake ends of culverts shall be marked by driving or placing steel posts within 6 inches of the downgrade side. Posts shall be painted with a rust-resistant paint and be a minimum of 5 feet long, with the spade driven 2 feet into the ground.

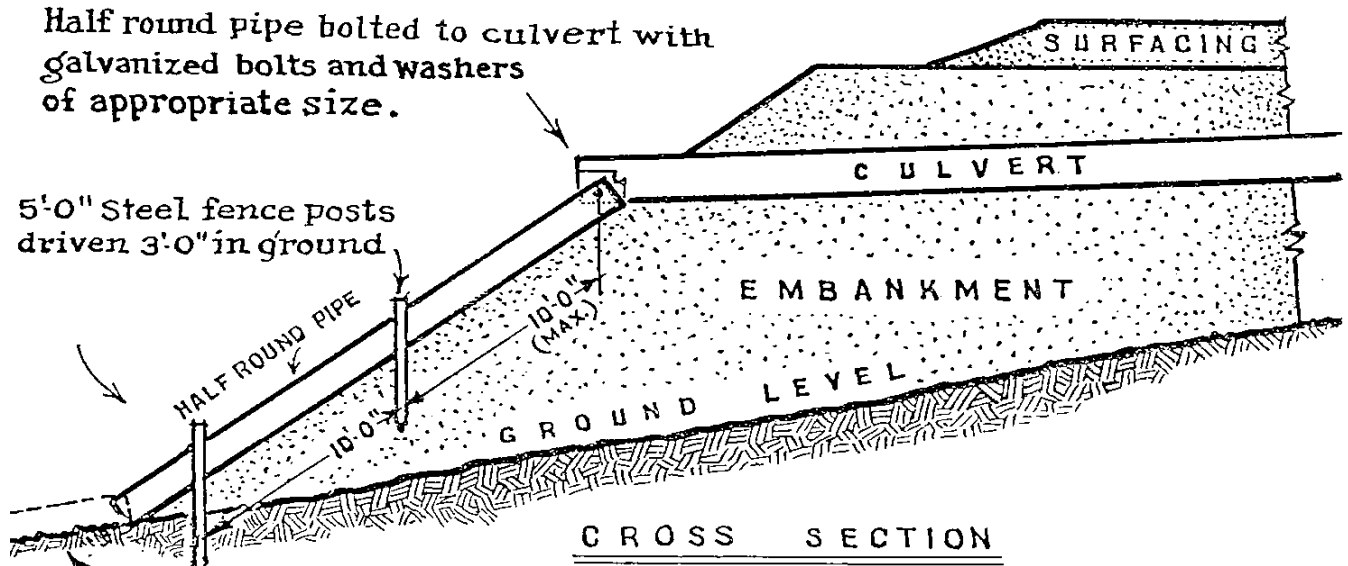
Tamping is required.

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 F

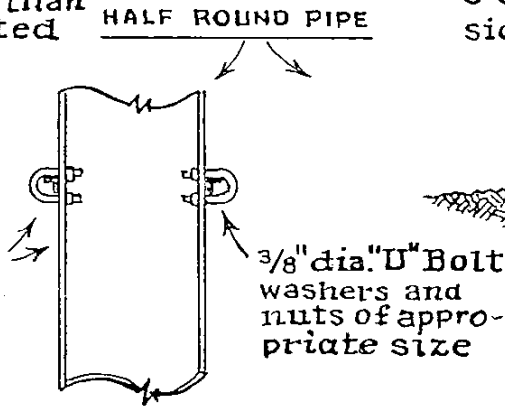
TYPICAL HALF ROUND CULVERT INSTALLATION

(no scale)



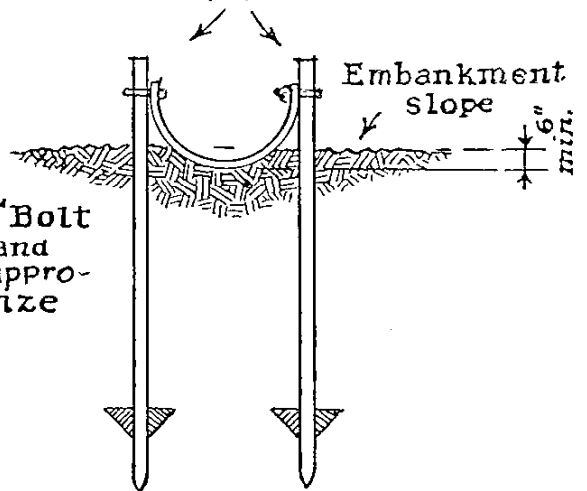
Solid rock, boulders etc.  
If erodable, install half  
round not less than  
5.0ft. as directed  
by state.

5'0" Steel posts



PLAN VIEW

5'0" Steel Fence posts both  
sides of pipe



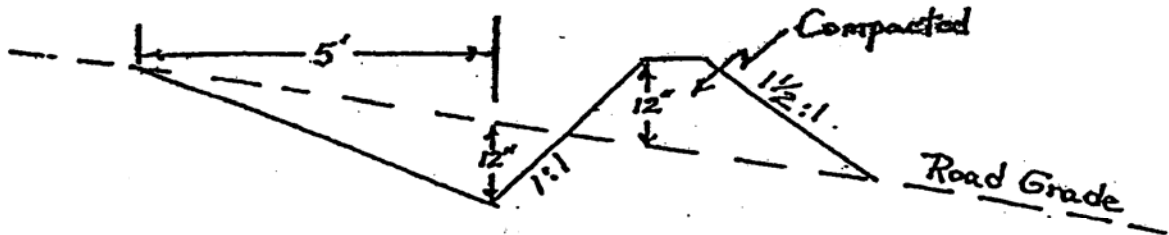
END VIEW

REV. 6-10-95 LH

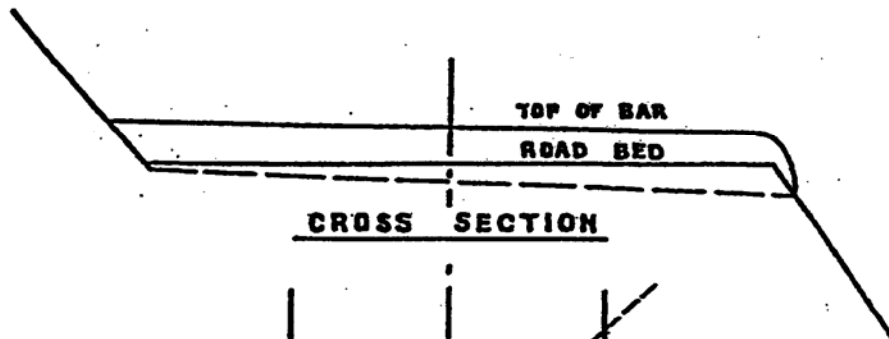


EXHIBIT G  
 WATERBAR SPECIFICATIONS

Spurs 1 and 1a

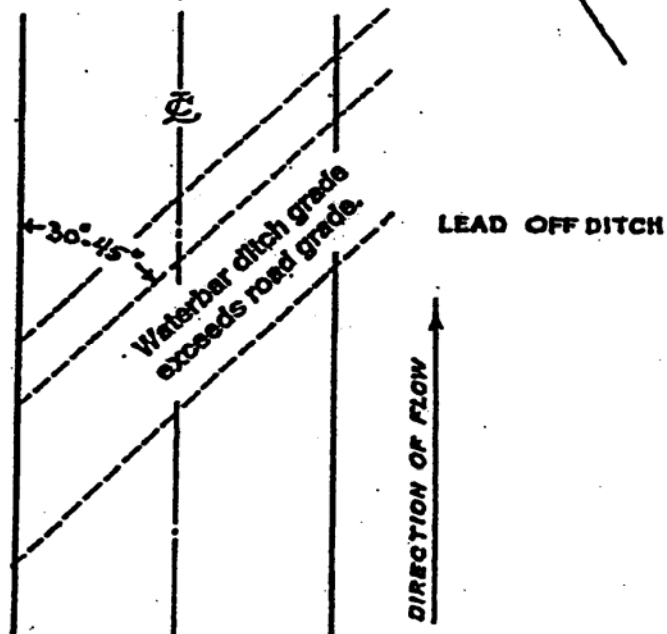


**PROFILE**



**CROSS SECTION**

Extend the waterbar ditch as far as necessary outside the right-of-way to keep water from flowing back onto the road.



**PLAN VIEW**

SPACING OF WATERBARS	
ROAD GRADE	DISTANCE
≤ 5%	200'
6-10%	200'
11-15%	130'
16-20% or greater	100'

**WATERBAR SPECIFICATIONS  
 FOR CROSS DITCHING #298**