Oregon Department of Forestry
2600 State St Salem OR 97310
PART III: EXHIBITS

EXHIBIT B
TIMBER SALE OPERATIONS PLAN

(See page 2 for instructions)

Date Received by State: _____

(1) Contract Number: AT-341-2020-W00829-01

(2) Sale Name: Imperial Walker

(3) Contract Expiration Date: 10/31/2023

(4) Purchaser Name: _____

(5) State Brand Information (Complete)

(6) State Representatives:

Name	Circle One	Phone No.	Cell No.	Alt Phone
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			

(7) Purchaser Representatives:

Name	Circle One	Phone No.	Cell No.	Alt Phone
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			
	Logging Projects All			

(8) Name of Subcontractors and Start Dates:

Project No.	Subcontractor Name.	Start Date	Completion Date	Cell No.	Alt Phone

Subcontractor Name.	Start Date	Cell No.	Alt 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.

Oregon Department of Forestry
2600 State St Salem OR 97310
PART III: EXHIBITS

EXHIBIT B
INSTRUCTION SHEET FOR OPERATIONS PLAN

SUBMIT ONE COPY OF PLAN 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.

Explanation of 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.

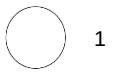
(7) The STATE representative will be designated when your plan is approved and is the person who will inspect and issue instructions regarding performance.

(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.

(9) 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 required by the timber sale contract. Provide spur road specifications
3. Locations of proposed tractor yarding roads. Show if and how marked on the ground.
4. Locations 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.

X

Temporary stream crossings.

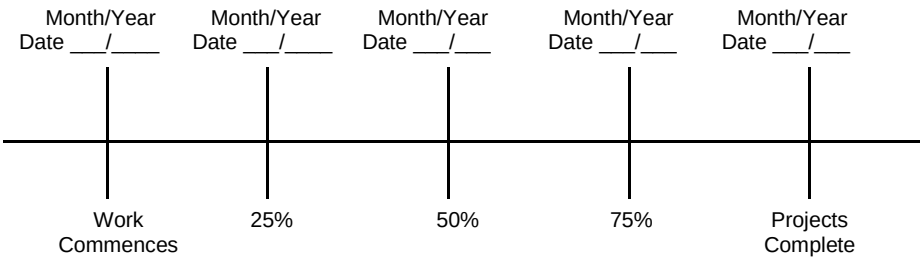
Oregon Department of Forestry
2600 State St Salem OR 97310
PART III: EXHIBITS

EXHIBIT B
OPERATIONS PLAN

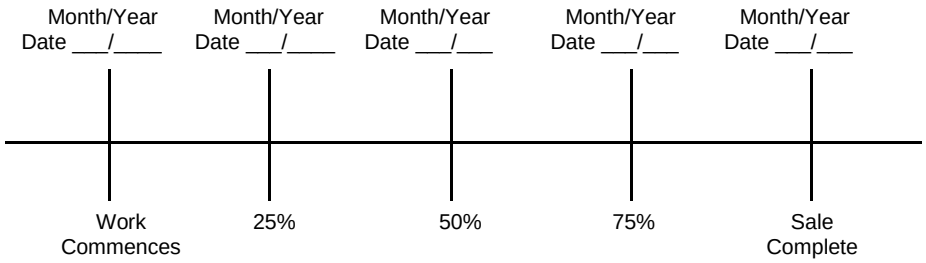
Completion Timeline

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, PURCHASER's 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: _____

STATE OF OREGON - DEPARTMENT OF FORESTRY

_____

Title _____

SUBMITTED BY:
PURCHASER

_____

Title _____

Oregon Department of Forestry
EXHIBIT C - SAWMILL GRADE (WESTSIDE SCALE)
SCALING INSTRUCTIONS - LOCATION APPROVAL - BRAND INFORMATION
Astoria - NWOA

(1) ORIGINAL REGISTRATION ☐ Date _____
REVISION NUMBER 000 ☐ Date _____
CANCELLATION ☐ Date _____

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

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

(4) PURCHASER: _____
Mailing Address: _____
Phone Number: _____

(5) **MINIMUM SCALING SPECIFICATIONS**

SPECIES	MINIMUM NET VOLUME
Conifers	10
Hardwoods	10

*Apply minimum volume test to whole logs over 40' Westside

(6) WESTSIDE SCALE:
Use Region 6 actual taper rule. Logs over 40'.

	YES	NO
(7) Weight Scale Sample	☐	☑

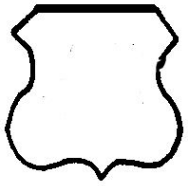
(8) **APPROVED SCALING LOCATIONS** (as shown on the ODF Approved Locations web-site)	Species	Yard	Truck	Weight

(9) **SALE NAME:** Imperial Walker
COUNTY: Clatsop

(10) **STATE CONTRACT NUMBER:**
AT-341-2020-W00829-01

(11) STATE BRAND REGISTRATION NUMBER: _____

(12) **STATE BRAND INFORMATION:**



(13) PAINT REQUIRED: YES ☑
COLOR: Orange

(14) **SPECIAL REQUESTS** (Check applicable)

PEELABLE CULL (all species)..... ☑
NO DEDUCTIONS ALLOWED FOR MECHANICAL DAMAGE..... ☑
ADD-BACK VOLUME - Deductions due to delay... ☑

OTHER :

(15) **REMARKS**

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

(16)

_____
Purchaser or Authorized Representative Date

_____
State Forester Representative Date

_____
State Forester Representative PRINT NAME

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.
General Distribution: TPSO, Approved Scaling Locations(s), Purchaser, Specific distribution instructions are outlined on the last page of this report: Instructions for Form

Oregon Department of Forestry
EXHIBIT C - SAWMILL GRADE
INSTRUCTIONS FOR FORM 343-307a (rev. 11/11)
Astoria - NWOA

(1) Check appropriate box. REVISION NUMBER requires comments. CANCELLATION requires logging and hauling to be complete, recall branding hammers, date and sign where indicated, write diagonally across page "CANCEL", and send to TPSO.

(2)

Columbia River Log Scaling & Grading Bureau
P.O.Box 7002, Eugene, OR 97401
Phone: (541) 342-6007 Fax: (541) 342-2631
Email: services@crls.com

Mountain Western Log Scaling & Grading Bureau
P.O.Box 580, Roseburg, OR 97470
Phone: (541) 673-5571 Fax: (541) 672-6381
Email: info@southernoregonlogscaling.com

Northwest Log Scalers Inc.
6137 NE 63rd St, Vancouver, WA, 98661
Phone: (360) 553-7212 ext. 4 Fax:(360) 553-7213
Email: info@nwlogscalers.com

Pacific Rim Log Scaling Bureau, Inc.
8288 28th Court North East, Lacey, WA 98516
Phone: (360) 528-8710 Fax: (360) 528-8718
Email: office@prlsb.com

Yamhill Log Scaling & Grading Bureau
P.O.Box 709, Forest Grove, OR 97116
Phone: (503) 359-4474 Fax: (503) 359-4476
Email: yamhilllog@frontier.com

Pacific Log Scaling & Grading Bureau, Inc.
P.O.Box 23939, Portland, OR 97281
Phone: (503) 684-5599 Fax: (503) 639-4880
Email: PacLogScale@sol.com

(3) State District office, address and phone.

(4) Enter Purchaser's business name, address, and phone number as it appears on the Contract.

(5) Minimum Scaling Specifications.

(6) Westside - Region 6 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) Weight Scale Sample - Check box if sale is to be a Weight Scale Sample. All specifies for handling, scaling and processing will be attached or explained in the Remarks section item (15).

(8) Show scaling locations only applicable to TPSO. Location name should appear as it does on the ODF Approved Scaling Location web site: http://www.odf.state.or.us/DIVISIONS/management/asset_management/ScalingLocation.asp Locations with scaling and processing directions specific to their location should be on a separate form. Species should be identified if not capable of receiving "all" species. Check appropriate box for either: yard, truck scale, or weight. Refer to the web site listed above for the locations approval status.

(9) Enter sale name and county.

(10) Enter sale Contract number.

(11) Enter Oregon's State Brand Registry Number (**REQUIRED**).

(12) Show brand assigned to timber sale. One brand only. If more than one brand is assigned to the sale: (1) make a separate form for each brand and (2) on each form, explain and show other brand(s) in the Remarks section item (15).

(13) Check yes for Paint Required and designate "Orange" for color. Non required removal volumes may sometimes require blue paint.

(14) Special Requests. These are requests that will be applied to ODF timber sales. All boxes applicable to the timber sales designated in the Exhibit C form must be "marked". If "Other" is indicated, it must contain a description and any necessary comments.

(15) Use this space to designate any weight conversion factors, per load volumes, weight scale sample instructions or any other explanations to clarify scaling, processing and/or mailing requirements. If additional scaling locations are approved, revise original or current form showing all (old and new) locations. Check REVISION box at top of form and explain under remarks. Route as indicated.

(16) Require purchaser to sign and date completed form in addition to State Forester Representative, sign and print name on the form.

Salem Distribution Instructions: Original will be mailed to Salem after it is electronically scanned and placed in the Salem transfer drive \\WPODFFILL01\\Transfer\ScalingInstructions or e-mailed directly to scaling@odf.state.or.us.
Scaling Instructions for each brand should be scanned separately, for each approved TPSO.

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.

General Distribution: TPSO, Approved Scaling Locations(s), Purchaser, Specific distribution instructions are outlined on the last page of this report: Instructions for Form

Oregon Department of Forestry
EXHIBIT C - PULP SORT
PROCESSING INSTRUCTIONS - LOCATION APPROVAL
BRAND INFORMATION
Astoria, NWOA

(1) ORIGINAL REGISTRATION ☐ Date _____
REVISION NUMBER 000 ☐ Date _____
CANCELLATION

(2) **(Approved Pulp Processing Facility)**

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

(4) PURCHASER: _____

(5) Scaling Bureau **(TPSO)** Processing Weight receipts:
_____
Mailing Address: _____
_____
Phone Number: _____

(6) **STATE Definition of Approved Pulp Sort:**
- Top portion of the tree (tops).
- All logs with a diameter (Big End) greater than 8 inches marked with blue paint.

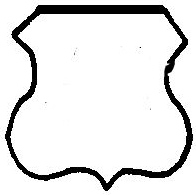
(7) PULP FACILITY PROCESSING INSTRUCTIONS:
- Pulp loads shall be weighed in lieu of scaling.
- One Ton = 2000 lbs(Short Ton).
- Pulp loads shall have a yellow Log Load Receipt attached.
- Gross weight and truck tare weight for each load shall be machine printed on the weight receipt.
- Weigher shall sign the weight receipt.
- Weigher shall record the Log Load Receipt number on the weight receipt.
- Weigher shall attach the Weight receipt to the Log Load Receipt and mail them weekly to the TPSO processing the Weight receipt.

(8) TPSO PROCESSING INSTRUCTIONS
- Submit data files daily (or each day of activity).
- Mail or deliver scale tickets weekly to ODF Headquarters in Salem.

(9) **SALE NAME:** Imperial Walker
COUNTY: Clatsop
STATE CONTRACT NUMBER:
AT-341-2020-W00829-01

(11) STATE BRAND REGISTRATION NUMBER: _____

(12) STATE BRAND INFORMATION:



(13) **REMARKS:**

Operator's Name (Optional inclusion by District):

(14) SIGNATURES:

Purchaser or Authorized Representative Date

State Forester Representative Date

State Forester Representative PRINT NAME

Notify the District within one hour when branding is inadequate for quick identification, the logs are marked with orange paint, the receipts are missing, not correctly or completely filled out, and/or logs do not meet the specifications of the STATE definition of Approved Pulp Sort.

Distribution: ORIGINAL: Salem/ COPIES: TPSO, Approved Pulp Processing Location, Purchaser, District, Mgmt. Unit

Oregon Department of Forestry
EXHIBIT C - PULP SORT
Instructions for Form 343-307b

Astoria, NWOA

(1) **Must Complete.** Check appropriate box. REVISION NUMBER requires comments in the Remarks Section(13). CANCELLATION requires logging and hauling to be complete, recall branding hammers, date and sign where indicated, write diagonally across page "CANCEL", and send to TPSO.

(2) **Must Complete.** Approved Pulp Processing Facility. Write in as written in the Approved Log Delivery Location http://www.odf.state.or.us/DIVSIONS/management/asset_management/ScalingLocation.asp

(3) **Must Complete.** State Forestry District and District Phone Number.

(4) **Must Complete.** Purchaser's business name as it appears on the Contract.

(5) **Must Complete.** Third Party Scaling Organization that will be processing the weight tickets, mailing address, and phone number.

Columbia River Log Scaling & Grading Bureau
P.O.Box 7002, Eugene, OR 97401
Phone: (541) 342-6007 Fax: (541) 342-2631
Email: services@crls.com

Mountain Western Log Scaling & Grading Bureau
P.O.Box 580, Roseburg, OR 97470
Phone: (541) 673-5571 Fax: (541) 672-6381
Email: info@southernoregonlogscaling.com

Northwest Log Scalers Inc.
6137 NE 63rd St, Vancouver, WA, 98661
Phone: (360) 553-7212 ext. 4 Fax:(360) 553-7213
Email: info@nwlogscalers.com

Pacific Rim Log Scaling Bureau, Inc.
8288 28th Court North East, Lacey, WA 98516
Phone: (360) 528-8710 Fax: (360) 528-8718
Email: office@prlsb.com

Yamhill Log Scaling & Grading Bureau
P.O.Box 709, Forest Grove, OR 97116
Phone: (503) 359-4474 Fax: (503) 359-4476
Email: yamhilllog@frontier.com

Pacific Log Scaling & Grading Bureau, Inc.
P.O.Box 23939, Portland, OR 97281
Phone: (503) 684-5599 Fax: (503) 639-4880
Email: PacLogScale@sol.com

Must Complete. Big end log not to exceed _____ inches. Big end of log is not to exceed 2 inches greater than the minimum removal specifications in the contract. Example: Minimum removal specifications 6 inches and 20 board feet, then the Big end of log not to exceed 8 inches. When conifer and hardwood removal specifications are different, use the smaller removal diameter to determine this specification.

(7) **Must Complete.** Enter sale name and county. If more than one county write in all the counties that the sale is located in.

(8) **Must Complete.** Enter sale Contract number.

(9) **Must Complete.** Enter Oregon's State Brand Registry Number **(REQUIRED).**

(10) **Must Complete.** Show brand assigned to timber sale. One brand only, if more than one brand is assigned to the sale: (1) make a separate form for each brand and (2) on each form, explain and show other brand(s) in the Remarks section Item(13).

(11) Use this section to list any special instructions or the reason for any revisions in section item(1).

(12) **Must Complete.** Purchaser required to sign and date completed form in addition to State Forester Representative, sign and print name on the form.

Salem Distribution Instructions: Original will be mailed to Salem after it is electronically scanned and placed in the Salem transfer drive \\WPODFFILL01\Transfer\ScalingInstructions or e-mailed directly to scaling@odf.state.or.us. Scaling instructions for each brand should be scanned separately, for each approved TPSO.

Distribution(See specific instructions on pg.2): ORIGINAL: Salem/ COPIES: TPSO, Approved Pulp Processing Location, Purchaser, District, Mgmt. Unit

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SUBGRADE WIDTH	SURFACED WIDTH	POINT TO POINT	STATION TO STATION	DRAINAGE
16 feet	12 feet	1A to 1B	0+00 to 14+50	Crowned/Ditch
16 feet	12 feet	1C to 1D	0+00 to 8+00	Crowned/Ditch
16 feet	12 feet	1E to 1F	0+00 to 1+00	Crowned/Ditch
16 feet	12 feet	2A to 2B	0+00 to 40+25	Crowned/Ditch
16 feet	12 feet	2C to 2D	0+00 to 11+50	Crowned/Ditch
16 feet	12 feet	2E to 2F	0+00 to 1+00	Crowned/Ditch
16 feet	12 feet	3A to 3B	0+00 to 23+00	Crowned/Ditch
16 feet	12 feet	I1 to I2	0+00 to 244+00	Crowned/Ditch
16 feet	12 feet	I3 to I4	0+00 to 19+50	Crowned/Ditch

CLEARING. This work shall consist of clearing, removing, and disposing of all trees, Snags, Down Timber, brush, surface objects, and protruding obstructions within the clearing limits.

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

CLEARING CLASSIFICATION.

New Construction - Where clearing limits have not been marked, the clearing limits shall extend 5 feet back of the top of the cutslope and 5 feet out from the toe of the fill slope, or as directed by STATE.

Improvement - (Where clearing limits have not been marked, the clearing limits shall extend 5 feet back of the top of the cutslope and 10 feet out from the toe of the fill slope, or as directed by STATE.)

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 cut slopes shall be removed. Grubbing debris shall not be placed or permitted to remain in or under any road embankment sections.

GRUBBING CLASSIFICATION.

New construction - from the top of the cut slope 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.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

CLEARING AND GRUBBING DISPOSAL. Clearing and grubbing debris shall not be placed or permitted to remain in or under any road embankment sections. Clearing and grubbing debris shall be left in a stable location, and not left lodged against standing trees. Clearing and grubbing debris may be scattered through openings in the timber outside of the cleared right-of-way, except for the following areas where debris shall be fully contained and hauled to a designated waste area:

- Where end-haul is required
- On side slopes exceeding 50 percent
- On unstable areas
- In any stream channel (Type F, N or D) or where material may enter the stream channel.

Clearing, grubbing, and associated disposal shall be completed prior to subgrade approval.

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-specified lines, grades, dimensions, and plans when provided. Plans are provided between points 2A to 2B, 2C to 2D, and 3A to 3B.

Unless road 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.

Suitable excavated material shall be used 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.

Sidecast includes any road generated excess excavation material which is not essential as part of the road prism, is not compacted, and is below the roadway. Sidecast shall not be placed where it will enter a stream course. Leaving sidecast below the road is only permissible if specifically allowed in “Full Bench and End Haul Requirements” in this Exhibit.

All fills shall be machine compacted according to the “Compaction and Processing Requirements” in this Exhibit.

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 specified in the plans or as follows: 400 divided by the radius of the curve equals the amount of extra width.

DRAINAGE

Subgrade. Subgrade shall be crowned, outsloped, or insloped at 4 to 6 percent as shown on the “Forest Road Specifications” table in this Exhibit.

Ditch. Construct V shaped ditch 3 feet wide and to a depth of 1 foot below subgrade.

Ditchouts. Construct ditchouts to drain away from subgrade at locations marked in the field or as directed by STATE.

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

Location: Intervisible but not greater than 750 feet apart and as marked in the field.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SLOPES	Cut Slopes	Fill Slopes
Solid Rock	Vertical to ¼ :1	
Fractured Rock	½ :1	
Soil - side slopes 50% and over	¾ :1	1½:1
Soil - side slopes less than 50%	1 :1	1½:1Top of cut slope shall be rounded.

LANDINGS. Landings shall be constructed as posted in the field, no less than 50 feet wide and no more than 70 feet wide unless otherwise approved by STATE. Surface is to be crowned for drainage with general grade no more than 3 percent. Surface as shown in the “Road Surfacing” table in this Exhibit.

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

SEASONAL WINTERIZATION. All unsurfaced roads or unfinished subgrades shall be waterbarred in accordance with the specifications in Exhibit I, and blocked from vehicular traffic prior to October 1, annually and as directed by STATE.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

GENERAL ROAD CONSTRUCTION INSTRUCTIONS:

(1) Timber Removal. Remove all trees within posted Right-of-Way Boundary as specified in Section 2210, Designated Timber.

(2) Excavated Materials. Excavated materials shall be utilized for road 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. Surplus excavated materials and waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with this Exhibit. Excess excavated material not used for embankment shall be end hauled to waste areas as shown on Exhibit A and marked in the field.

(3) Drainage Ditches. Construct ditchlines, including ditchouts, as directed by STATE. Cut slopes of ditchlines and ditchouts shall not exceed a 1:1 slope. Construct culvert sediment basins. Waste materials from drainage ditches and sediment basins shall be placed in nearby waste areas and uniformly sloped and compacted for drainage, as directed by STATE.

(4) Culvert Installation. Culverts in live streams shall be installed with the inlet and outlet on grade with the stream bottom, unless otherwise specified in writing. Fill construction backfill shall consist of select materials and may be obtained from borrow pits, as directed by STATE. Backfill materials shall be hauled in where necessary and thoroughly compacted in accordance with this Exhibit. STATE may require the use of crushed rock for culvert bedding.

(5) Fill Armor and Energy Dissipator Construction. Where rock is specified for fill armor, rock shall be machine placed and tamped at a 1½:1 slope, beginning at the toe of the fill. Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet, in accordance with Exhibit H.

(6) Equipment. All excavation and riprap placement shall be performed using a minimum 1½ cubic-yard, track-mounted excavator.

(7) Subgrade Preparation and Application of Surfacing Rock.

(a) Complete culvert installations, drainage ditches, ditchouts, fill construction, and other specified work prior to the application of surfacing rock.

(b) Subgrade shall be crowned, outsloped, or insloped at 4 to 6 percent.

(c) Upon completion of above required work, apply, process, and compact surfacing rock in accordance with specifications in the “Compaction and Processing Requirements” in this Exhibit. Final road surface shall be crowned, outsloped, or insloped at 4 to 6 percent.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

Segment	Station	Work Description
1A to 1B	4+50	Begin traction rock
	11+00	End traction rock
2A to 2B	2+10	Begin 7 foot inside curve widening
	2+20	Construct junction with road 3A to 3B
	3+60	End 7 foot inside curve widening
	9+70	End-haul approximately 125 cubic yard of material to use in fill at 12+30
	11+40	Begin 2 foot curve widening
	12+00	Construct ditchout right
	12+50	Construct ditchout right
	13+20	End 2 foot inside curve widening
	14+25	Begin 3 foot inside curve widening
	14+55	End-haul approximately 55 cubic yards of material to use at 20+45
	15+00	End 3 foot inside curve widening
	15+45	Begin 2 foot inside curve widening
	16+20	End 2 foot inside curve widening
	16+70	Begin 2 foot inside curve widening
	17+30	End-haul approximately 235 cubic yard of material to use in fill at 20+00
	17+40	End 2 foot inside curve widening
	21+60	Construct ditchout right
	22+60	End-haul approximately 60 cubic yard of material to use in fill at 27+10
	23+25	End-haul approximately 220 cubic yard of material to use in fill at 25+60
	23+25	Begin 5 foot inside curve widening
	24+20	End 5 foot inside curve widening
	26+35	Begin 4 foot inside curve widening
	26+70	Construct junction with road 2C to 2D
	27+00	End 4 foot inside curve widening
	31+10	Construct junction with road 2E to 2F
	31+65	Begin 5 foot inside curve widening

EXHIBIT D

FOREST ROAD SPECIFICATIONS

	33+15	End-haul approximately 360 cubic yard of material to use in fill at Station 37+35
	34+75	End 5 foot inside curve widening
	37+40	Begin 3 foot inside curve widening
	38+15	End 3 foot inside curve widening
	39+00	Begin cutslope rounding
	40+00	End cutslope rounding
2C to 2D	1+40	Begin traction rock
	2+70	Construct ditchout left
	3+20	End traction rock
	3+60	Begin 4 foot inside curve widening
	4+20	Construct ditchout right
	4+60	End 4 foot inside curve widening
	4+70	Begin 4 foot inside curve widening
	4+90	Construct ditchout left
	5+60	Construct ditchout left
	5+85	End 4 foot inside curve widening
	6+50	Begin 1 foot inside curve widening
	6+80	Begin traction rock
	7+00	End 1 foot inside curve widening
	8+00	Begin 2 foot inside curve widening
	8+80	Construct ditchout right, end 2 foot inside curve widening
	9+20	End traction rock
	9+80	Construct truck turnaround left
	10+50	Construct ditchout left
3A to 3B	1+50	Begin traction rock
	7+00	Begin 2 foot curve widening
	8+70	End 2 foot curve widening
	12+50	End traction rock
	20+00	Begin traction rock
	22+00	End traction rock

EXHIBIT D

FOREST ROAD SPECIFICATIONS

GENERAL ROAD IMPROVEMENT INSTRUCTIONS:

(1) Timber Removal. Remove all trees within posted Right-of-Way Boundary as specified in Section 2210, Designated Timber.

(2) Excavated Materials. Excavated materials shall be utilized for road and fill construction and hauled in where necessary. Surplus excavation materials shall be hauled to the waste areas as marked in the field and/or designated on Exhibit A. Surplus excavated materials and waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with this Exhibit.

(3) Bank Slough Removal. Excavate all bank slough. Bank slough material shall not be pulled across existing surfacing rock. Excavated material shall be hauled to the designated waste areas as marked in the field and/or designated on Exhibit A.

(4) Culvert Replacement, Culvert Installation, Fill Reconstruction, and Fill Removal. Existing culvert geometry shall be modified to provide for optimum drainage and culvert performance. Modifications may include, skewing the culvert and/or installing the culvert at gradients equal to or exceeding the drainage (or ditch) gradient. Where fill reconstruction or culvert replacement is specified, fills shall be excavated to natural stream course levels. All woody debris encountered during fill excavation shall be removed. Fill reconstruction backfill shall consist of select materials and may be obtained from borrow pits, as directed by STATE. Unsuitable backfill material shall be hauled to the designated waste areas as marked in the field and/or designated on Exhibit A. Backfill materials shall be hauled in where necessary and thoroughly compacted in accordance with this Exhibit.

(5) Culvert Cleaning and Repairs. Remove all debris from inside all existing culverts on the road improvement segment, 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.

(6) 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.

(7) Rock Ditch Filter. Construct rock ditch filters as directed by STATE. Excavate a one foot deep, tapered sump on the upslope side, adjacent to the rock ditch filter. Excavated material shall be hauled to the designated waste areas as marked in the field and/or designated on Exhibit A. Construct each rock ditch filter with clean drain rock (6”-4” pit-run rock) and placed at a 2:1 slope within the specified ditch. Construct the center of the rock ditch filter at least 6 inches lower than the ends, to act as a spillway for runoff and to prevent water from flowing around the filter. Space the filters so that the bottom elevation of the upper filter is the same as the top center elevation of the next filter. Rock ditch filter dimensions shall be as shown on the “Typical Rock Ditch Filter” exhibit or as directed by STATE. Locations of the filters shall be determined by STATE.

(8) Fill Armor and Energy Dissipator Construction. Where rock is specified for fill armor, rock shall be machine placed and tamped at a 1½:1 slope, beginning at the toe of the fill. Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet, in accordance with Exhibit H..

(9) Equipment. All excavation and riprap placement shall be performed using a minimum 1½ cubic yard, track-mounted excavator.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

(10) Waste areas shall be uniformly sloped and compacted for drainage. Designated Waste materials shall be seeded and mulched in accordance with specifications in Exhibit J.
State Timber Sale Contract

(11) Subgrade Preparation and Application of Surfacing Rock.

(a) Complete culvert installations, drainage ditches, fill reconstruction, ditchouts, and other specified work prior to the application of new surfacing rock.

(b) Cut out all potholes and/or washboard sections from the existing surfacing.

(c) Apply required patching and leveling rock, as directed by STATE.

(d) Process (grade and mix) the existing surface and added base rock. Provide for a crown, outslope, or inslope of 4 to 6 percent, and compact in accordance to the "Compaction and Processing Requirements" in this Exhibit.

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

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

Segment	Station	Work Description
I1 to I2	2+40	Install rock ditch filter left
	3+05	Install rock ditch filter right
	40+95	Repair culvert inlet
	43+10	Install rock ditch filter left
	43+70	Project No. 5
	45+00	Install rock ditch filter left
	55+00	Repair culvert inlet and outlet
	69+80	Install rock ditch Filter
	70+00	Repair culvert inlet
	70+20	Install rock ditch filter left
	74+10	Install rock ditch filter right
I3 to I4	0+00	Widen junction 5 feet right

EXHIBIT D

FULL BENCH AND END-HAUL REQUIREMENTS

POINT TO POINT	STA. TO STA.	CONTAINMENT - SIDECAST
2A to 2B	9+30 to 9+90, 14+20 to 14+50, 16+60 to 17+50, 21+45 to 23+10, 32+55 to 33+40	2

Full Bench and End-Haul Areas General Requirements

Sidecast includes any road generated excess excavation material which is not essential as part of the road prism, is not compacted, and is below the roadway. Material shall not be sidecast unless specified above.

Clearing and grubbing debris shall be end-hauled.

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

Containment/Sidecast

(1) Full: No excavated material remains below the road.

(2) Normal/Incidental: The amount of excavated material lost over the outside edge of the road shall not exceed 1 foot in depth.

(3) Sidecast: Material shall be spread evenly below the road so that it does not build up behind trees, snags or other debris, and shall not exceed 3 feet in depth.

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.
- Setback from slope break shall be a minimum of 20 feet horizontal measurement.

Waste Area Treatment

- Deposit at waste area, spread evenly, compact, and provide adequate drainage.
- Pile woody debris separate from other waste material.
- Mulch and seed all waste areas in accordance with Exhibit J.

EXHIBIT D

TYPICAL ROCK DITCH FILTER

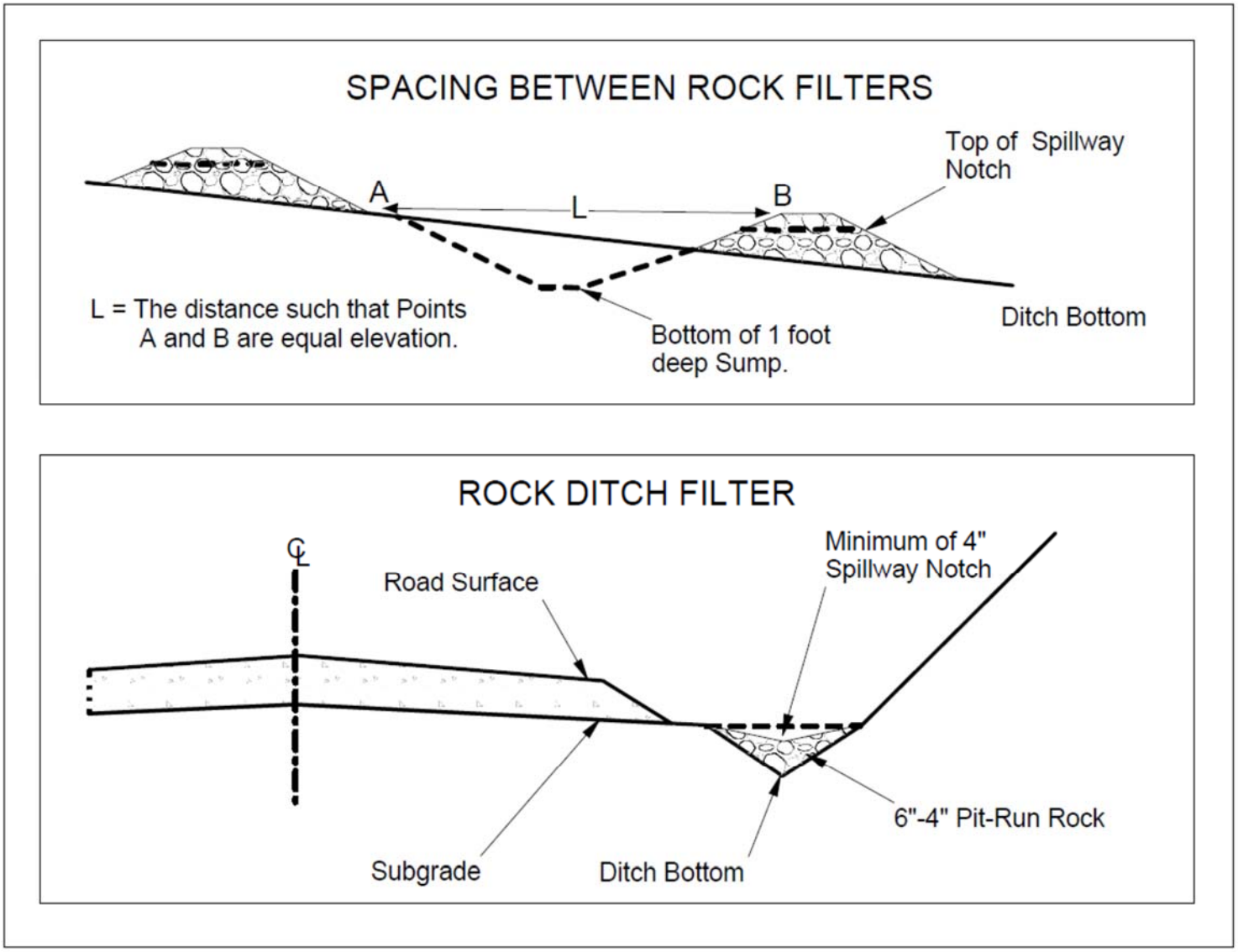


EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: 1A to 1B				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	1A to 1B **Volume (CY) Per**		0+00 to 14+50 **Number of**		
Junction Rock	5"-0" crushed	0+00	n/a	junction	33	junctions	1.00	33
Base Rock	5"-0" crushed	0+00 to 13+50	10	station	63	stations	14.50	914
Turnouts	5"-0" crushed	1+00, 4+00, 11+00	n/a	turnout	22	turnouts	3	66
Traction Rock	1 1/2"-0" crushed	5+50 -12+00	2	station	13	stations	6.5	85
Culvert Bedding/Backfill	1 1/2"-0" crushed	10+50	n/a	culvert	11	culverts	1	11
Landings	12"-0" pit-run	8+50, 13+50	n/a	landing	77	landings	2	154
Total Rock for Road Segment:			1A to 1B					1,262
ROAD SEGMENT: 1C to 1D				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	1C to 1D **Volume (CY) Per**		0+00 to 8+00 **Number Of**		
Junction Rock	5"-0" crushed	0+00	n/a	junction	11	junctions	1	11
Base Rock	5"-0" crushed	0+00 to 13+50	10	station	63	stations	8.00	504
Turnouts	5"-0" crushed	4+20	n/a	turnout	22	turnouts	1	22
Landing	12"-0" pit-run	2+50, 8+00	n/a	landing	77	landings	2	154
Total Rock for Road Segment:			1C to 1D					691
ROAD SEGMENT: 1E to 1F				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size and Type**	**Location**	**Depth of Rock (inches)**	1E to 1F **Volume (CY) Per**		0+00 to 1+00 **Number of**		
Junction Rock	5"-0" crushed	0+00	n/a	junction	11	junctions	1	11
Base Rock	5"-0" crushed	0+00 to 1+00	10	station	63	stations	1.00	63
Landings	12"-0" pit-run	1+00	n/a	landing	77	landings	1	77
Total Rock for Road Segment:			1E to 1F					151

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: 2A to 2B				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	2A to 2B Volume (CY) Per		0+00 to 40+25 Number Of		
Base Rock	5"-0" crushed	0+00 to 40+42	10	station	63	stations	40.25	2,536
Turnouts	5"-0" crushed	3+65, 8+80, 14+55, 21+20, 29+15, 33+25, 40+30	10	turnout	28	turnouts	7	196
Junction Rock	5"-0" crushed	2+20, 26+70, 31+10	n/a	junction	11	junctions	3	33
Curve Widening	5"-0" crushed		n/a	load	11	loads	32	352
Surface Rock	1 1/2"-0" crushed	0+00 to 40+20	4	station	25	stations	40.25	1,006
Turnouts	1 1/2"-0" crushed	3+65, 8+80, 14+55, 21+20, 29+15, 33+25, 39+30	n/a	turnout	11	turnouts	7	77
Turnaround	5"-0" crushed	0+00	n/a	turnout	11	turnouts	1	11
Turnaround	1 1/2"-0" crushed	0+00	n/a	turnout	11	turnouts	1	11
Junction Rock	1 1/2"-0" crushed	2+20, 26+70, 31+10	n/a	junction	11	junctions	3	33
Curve Widening	1 1/2"-0" crushed		n/a	junction	11	junctions	13	143
Landing	12"-0" pit-run	1+20	n/a	landing	77	landings	1	77
Total Rock for Road Segment:			2A to 2B					4,475
ROAD SEGMENT: 2C to 2D				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	2C to 2D **Volume (CY) Per**		0+.00 to 11+50 **Number Of**		
Base Rock	5"-0" crushed	0+00, 11+50	10	station	63	stations	11.50	725
Turnouts	5"-0" crushed	3+50, 7+50	n/a	turnout	28	turnouts	2	56
Turnaround	5"-0" crushed	9+80	n/a	turnaround	17	turnarounds	1	17
Curve Widening	5"-0" crushed		10	load	11	loads	10	110
Traction Rock	1 1/2"-0" crushed		2	station	13	stations	4.20	55
Turnouts	1 1/2"-0" crushed	7+50	2	turnout	11	turnouts	1	11
Curve Widening	1 1/2"-0" crushed		2	load	11	loads	1	11
Landings	12"-0" pit-run	11+50	N/A	landing	77	landings	1	77
Landings				Landing		Landings		
Total Rock for Road Segment:2C to 2D			0+00 to 11+50					1,061

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: 2E to 2F				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	2E to 2F Volume (CY) Per		0+00 to 1+00 Number Of		
Base Rock	5"-0" crushed	0+00 to 1+00	10	station	63	stations	1.00	63
Landings	12"-0" pit-run	1+00	N/A	landing	77	landings	1	77
Total Rock for Road Segment:			2E to 2F					140
ROAD SEGMENT: 3A to 3B				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	3A to 3B **Volume (CY) Per**		0+00 to 23+00 **Number Of**		
Base Rock	5"-0" crushed	0+00 to 24+20	10	station	63	stations	23.00	1,449
Turnouts	5"-0" crushed	7+80, 12+70, 19+00	n/a	turnouts	22	turnouts	3	66
Turnaround	5"-0" crushed	22+30	n/a	turnouts	22	turnouts	1	22
Curve Widening	5"-0" crushed	7+00 to 8+70	n/a	culvert	11	culverts	1	11
Culvert Bedding/Backfill	1 1/2"-0" crushed	13+90	n/a	culvert	11	culverts	1	11
Traction Rock	1 1/2"-0" crushed	3+50 to 12+50, 20+00 to 22+00	n/a	station	13	stations	11	143
Subgrade Reinforcement	12"-0" pit-run	22+00 to 23+00	8	station	50	stations	2	100
Landing	12"-0" pit-run	1+20	n/a	landing	77	landings	1	77
Total Rock for Road Segment:			3A to 3B					1,879

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: I1 to I2				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	I1 to I2		0+00 to 244+00		
				Volume (CY) Per		Number Of		
Surfacing	5"-0" crushed	0+00 to 104+00	4	station	25	stations	104.00	2,600
Surfacing	5"-0" crushed	130+80 to 244+00	4	station	25	stations	113.20	2,830
Surfacing	5"-0" crushed	104+00 to 130+80	12	station	75	stations	26.80	2,010
Surfacing	1 1/2"-0" crushed	1+50 to 3+05	2	station	13	stations	1.55	20
Traction Rock	1 1/2"-0" crushed	238+50 to 244-00	2	station	13	stations	5.50	72
Subgrade Leveling	5"-0" crushed	n/a`	n/a	load	11	loads	30	330
Turnouts	5"-0" crushed	20+80, 22+55, 30+65, 39+15, 41+90, 45+60, 53+00, 60+80, 64+60, 67+10, 78+60, 88+60, 98+70, 102+00, 108+25, 117+90, 123+25, 133+85, 153+40, 166+80, 171+35, 177+50, 182+30, 187+00, 190+70, 195+17, 210+25, 235+25, 242+20	n/a	turnout	11	turnouts	29	319
Junctions	5"-0" crushed	0+00, 10+40, 48+40, 60+80, 81+40(x2), 83+05, 100+50, 104+00, 109+75, 138+80, 138+50, 144+70, 148+50	n/a	junction	22	junctions	14	308
Turnaround	5"-0" crushed	113+50	n/a	turnaround	11	turnarounds	1	11
Culvert Bedding and Backfill	1 1/2"-0" crushed	1+00, 62+00	n/a	culvert	22	culverts	2	44
Base Rock Replacement	5"-0" crushed	1+00, 62+00	n/a	culvert	11	culverts	2	22
Rock Ditch Filters	12"-0" pit-run	2+40, 3+05, 43+10, 45+00, 69+80, 70+20, 74+10	n/a	3 filter series	11	3 filter series	7	77
Total Rock for Road Segment:			I1 to I2					8,643

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT	Project No. 5			POINT TO POINT		Sta. to Sta.		
			Depth of	Project No. 5		I1 to I2, 43+70		TOTAL
Application	Rock Size and Type	Location	Rock (inches)	Volume (CY) per		Number of		VOLUME (CY)
Culvert Bedding and Backfill	1 1/2"-0" Stockpile	43+70	N/A	load	11	loads	19	209
Culvert Bedding Reinforcement	12"-0" Pit-Run	43+70	N/A	load	11	loads	3	33
Stream Bed Retention	24"-6" Riprap	43+70	N/A	load	11	loads	3	33
Inlet / Outlet Channel Armor	24"-6" Riprap	43+70	N/A	load	11	loads	6	66
Inside Pipe Seeding	18"-6" Pit-Run	43+70	N/A	load	11	loads	3	33
Fill Armor	24"-6" Riprap	43+70	N/A	load	11	loads	55	605
Road Base Reconstruction	4"-0" Stockpile	43+70	8	station	50	stations	1.5	75
Total Rock for Road Segment:			Project No. 5					1,054

ROAD SEGMENT: I3 to I4				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
				I3 to I4		0+00 to 19+50		
Application	Rock Size And Type	Location	Depth of Rock (inches)	Volume (CY) Per		Number Of		
Subgrade Leveling Rock	5"-0" crushed	n/a	n/a	load	11	loads	12	132
Traction Rock	1 1/2"-0" crushed	9+00 to 19+50	n/a	load	11	loads	8	88
Turnouts	5"-0" crushed	n/a	n/a	turnout	33	turnouts	2	66
Junction	5"-0" crushed	n/a	n/a	junction	44	Junctions	1	44
Total Rock for Road Segment:			I3 to I4					330

ROCK TOTALS (CY)	24”-6”	18”-6”	12”-0”	5”-0”	4”-0”	1 1/2”-0”
19,654	704	33	870	15,942	75	2,030

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

EXHIBIT D

ROCK ACCOUNTABILITY

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 sediment will not enter streams. Additional surfacing needed because of construction season or construction practice is not included in the preceding ROAD SURFACING table, and shall be furnished at PURCHASER expense.

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 D. Deliver at least 600 cubic yards per 8-hour shift, unless otherwise approved by STATE. A penalty of $10 for each 10 cubic yards which are not delivered during a single shift shall be billed, and payment shall be required prior to final acceptance of the project by STATE.

Depth Measurement. Rock shall be spread and compacted according to the depths specified in Exhibit D. 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. The depth of compacted aggregates shall not vary more than 1 inch from the depth specified in the "Road Surfacing" table in Exhibit D. The average depth for each road segment shall be the specified depth or greater. If additional rock is required because of insufficient depth, the locations and volumes to be added shall be determined 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.

Stockpile Measurement. Purchaser shall construct stockpiles according to the dimensions determined by STATE and included in the Rock Pit development plan required by Exhibit G. Dimensions will consist of the length and width of the base, length and width of the top, and height of all four corners. The finished stockpile surface shall be smooth, uniform, and all corners filled in. All stakes and reference points shall be protected until stockpile measurements are accepted by STATE.)

EXHIBIT D

COMPACTION AND PROCESSING REQUIREMENTS

Moisture Content: Compaction must take place when moisture content of the materials being compacted is favorable for effective compaction as determined by STATE.

Compaction Pass: A pass is defined as traveling a road section forward and then backward over that same section.

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 the surface is smooth and hard and visible deformation ceases. At least 3 passes shall be made over the entire width and length of the road. Compaction shall be accomplished by using one or more of the approved equipment options listed below:

Subgrade shall be crowned, outsloped, or insloped at 4 to 6 percent as specified in the "Forest Roads Specifications" table in Exhibit D.

ROAD SEGMENT	SUBGRADE COMPACTION OPTIONS
All road segments	1

Fills. Embankments and fills shall be placed in (approximately) horizontal layers not more than 8 inches in depth. Each layer shall be separately, and thoroughly, compacted. Compaction equipment shall be operated over the entire width of each layer until visible deformation of the layers ceases. At least 3 passes shall be made over the entire width and length of each layer.

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	FILLS COMPACTION OPTIONS
All road segments	1, 2, 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 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, compacted, and approved by STATE 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 until the surface is smooth and hard and visible deformation ceases. Compaction shall be accomplished by using one or more of the approved equipment options listed below:

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, outsloped, or insloped at 4 to 6 percent as specified in the "Forest Roads Specifications" table in Exhibit D.

EXHIBIT D

COMPACTION AND PROCESSING REQUIREMENTS

ROAD SEGMENT	CRUSHED COMPACTION OPTIONS
All road segments requiring crushed rock.	1

Pit-Run Rock. The rock shall be uniformly mixed and spread in layers on the approved roadbed. Each layer of pit-run rock shall be moistened or dried to uniform moisture content suitable for maximum compaction and compacted in layers not to exceed 8 inches in depth. When more than 1 layer is required, each shall be shaped and compacted before the succeeding layer is placed. Any irregularities or depressions that develop during compaction of the top layer shall be corrected by loosening the material at these places and adding or removing material until the surface is smooth and uniform. Each layer shall be compacted with a minimum of 3 passes over the entire width and length of the road. Compaction shall be accomplished by using one or more of the approved equipment options listed below:)

Rock shall be crowned, outsloped, or insloped at 4 to 6 percent as specified in the “Forest Roads Specifications” table in Exhibit D.

ROAD SEGMENT	PIT-RUN COMPACTION OPTIONS
All road segments requiring pit-run rock	1

EXHIBIT D

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

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

EXHIBIT E

CULVERT SPECIFICATIONS

All culvert materials shall be furnished and installed by PURCHASER, unless otherwise specified in the Contract.

Culverts 36 inches in diameter and smaller shall be constructed of corrugated polyethylene, unless otherwise specified in the Contract. Culverts larger than 36 inches in diameter shall be constructed of corrugated aluminized Type 2 steel, unless otherwise specified in the Contract. Polyethylene culverts shall be double-walled and meet the requirements of AASHTO M-294-11, Type S, or ASTM F2648. Aluminized (Type 2) steel culverts shall meet the requirements of AASHTO M-36-03[1]."

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

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 specified in special instructions.

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

Culverts in live streams shall be installed with the inlet and outlet on grade with the stream bottom, unless otherwise specified in writing.

Cross Drain Culverts

Cross drain culverts on road grades in excess of 3 percent shall be skewed at least 30 degrees from perpendicular to the road centerline, except that cross drain culverts at the low point of dips in roads shall not be skewed. Cross drains shall be skewed to fit the required culvert length to the road prism.

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3 percent or greater than 10 percent.

Disconnect Culverts

The culvert inlet shall be located as close to the channel that it is disconnecting, while the culvert outlet shall be located as far from the channel as possible; discharge culvert outflow on the forest floor, allowing for filtration before the water enters the disconnected channel.

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 culvert. The culvert trench shall be excavated 3 culvert diameters wide to permit compaction and working on each side of the culvert. Tamping shall be done in 6-inch lifts, 1 culvert diameter each side of the culvert. Bedrock shall be excavated as required to provide a uniform foundation for the full length of the culvert.

A bedding of crushed rock or rock crusher reject 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 culvert.

Backfill shall consist of crushed rock on improvement segments and crushed rock, rock crusher reject or job-excavated soil free of stumps, limbs, rocks, or other objects which would damage the culvert on new construction segments.

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

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” 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 shortest culvert section length shall be placed at the inlet end.

The ends of each culvert shall be free of logs and debris which would restrict the free flow of water.

The intake end of cross drain and disconnect 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 an energy dissipator, 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.

Compaction by tamping utilizing a Vibratory Hand-Operated or Backhoe-Mounted Tamper is required for all culverts.

All culverts scheduled for replacement shall become property of the PURCHASER and be removed from STATE land and hauled to an approved refuse site in the same project period in which replacement occurred. 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.

The intake ends of culverts in fills less than 3 feet to the top of the culvert shall be marked by driving white fiberglass posts within 6 inches of the downgrade side. Posts shall be a minimum of 6 feet long and 2½ inches wide, with the spade driven 2 feet into the ground. Install a culvert marker at each existing culvert that is missing a marker that could be reached by a grader blade.

Energy Dissipators Setting Ponds 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.)

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

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

	Steel Culvert	Thickness			Band Widths (")	
Dia.	Gauge	Uncoated	Coated	Band Gauges	Annular	Helical
18-36	16	(0.0598")	(0.064”)	16	12	12
60-84	12	(0.1046")	(0.109”)	16	24	24
90-120	12	(0.1046")	(0.109”)	16	26	26

EXHIBIT E

CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	MATERIAL TYPE	GAUGE	ROAD SEGMENT POINT TO POINT	STATION
1	18	30	CPP		1A to 1B	10+50
2	18	30	CPP		2A to 2B	7+00
3	18	30	CPP		2A to 2B	18+20
4	18	30	CPP		2A to 2B	34+80
5	18	40	CPP		2A to 2B	37+90
6	18	30	CPP		2C to 2D	0+00
7	18	30	CPP		2C to 2D	7+00
8	18	30	CPP		3A to 3B	13+90
9	18	30	CPP		I1 to I2	1+00
10	72	95	ACSP	12	I1 to I2	43+70
11	18	30	CPP		I1 to I2	62+00

TOTAL LENGTHS BY DIAMETER	
18 INCH	72 INCH
310	95

CPP = Polyethylene
ACSP = Aluminized, CPP = Polyethylene

EXHIBIT F

TYPE F STREAM CROSSING STRUCTURE

PURCHASER shall install one fish passable Type F structure.

GENERAL TYPE F CONSTRUCTION SPECIFICATIONS

(a) New culvert shall be a 72" diameter, 12 gauge aluminized corrugated steel round pipe, 95 feet in length and shall be high beveled on the inlet side at a 1:1 ratio.

(b) Work shall be conducted only during periods of low water flows and between July 1 and August 31, annually. STATE shall be notified a minimum of 48 hours prior to beginning the work. STATE has prepared a FPA "Written Plan" for this work.

(c) Remove the existing embankment and culvert to accommodate the work area for stream crossing construction. Existing embankment(s) shall be excavated to the design stream course level. All woody debris encountered during excavation shall be removed.

(d) Salvage onsite existing riprap material for reuse as riprap for the new structure.

(e) Excavated debris and materials unsuitable for embankment construction shall be end hauled to the designated waste area, as directed by STATE. The existing, removed culvert, shall be hauled to an approved refuse site off of STATE land.

(f) Waste materials shall be sloped for drainage and stability, as directed by STATE. Prior to hauling waste materials, the waste area shall be cleared of large woody debris. The debris shall be piled adjacent to the waste area. All exposed excavation areas and waste materials shall be seeded and mulched as specified by Exhibit L. Applied mulch shall be a minimum of 2 inches deep and provide a uniform cover. Large woody debris shall be redistributed over the waste area after all waste materials have been hauled.

(g) Oil spill response materials shall be on site before the work begins.

(h) A minimum 2 cubic-yard, track-mounted excavator shall be used for all excavation, stream channel development, and riprap placement.

(i) Grass seed and straw mulch shall be applied to all exposed areas, bare soils and waste materials as directed by STATE in accordance with Exhibit J.

(j) De-watering of the work site shall be accomplished according to PURCHASER's STATE approved plan and prior to the removal of any additional fill material for the development of the culvert bed, and stream channel. The work site shall be de-watered by the use of cofferdams, pumps, temporary diversion ditches and/or drainage structures.

(k) Remove existing fill, culvert, and any logs or woody debris.

(l) Type "F" stream fill reconstruction must allow free passage of fish as provided in the Oregon Forest Practice Rules. Modifications of the existing culvert geometry shall be required to allow free passage of fish.

(m) Use of an on-site hydraulic rock hammer may be required for the breaking of rock strata encountered during the development of the culvert bed.

EXHIBIT F

TYPE F STREAM CROSSING STRUCTURE

GENERAL TYPE F CONSTRUCTION SPECIFICATIONS

(n) Remove additional fill and logs or woody debris for the development of the new culvert bed. The new culvert bed will be different horizontally and vertically from the existing culvert bed. The new culvert inlet and outlet coordinates are designated in this exhibit.

(o) Site survey and design information, including survey control point coordinates are available upon request.

SPECIFIC CULVERT INSTALLATION SPECIFICATIONS

Road Segment I1 to I2, Station 43+70.

(a) Develop the stream channel for a distance of 50 feet upstream of the new culvert inlet and 50 feet downstream of the new culvert outlet, as directed by STATE. The stream channel width shall be 4.6 feet and stream channel banks shall be sloped at 1½:1. Utilize 24”-6” riprap rock to armor the developed stream channel, as directed by STATE.

(b) The new culvert position shall be different horizontally and vertically from the existing culvert, as shown on this exhibit and as directed by STATE. The new culvert inlet shall be approximately N25°E, 12.1 feet horizontal distance, and cut 4.2 feet from the existing inlet. The new culvert outlet shall be approximately S16°E, 16.6 feet horizontal distance, and cut 7.0 feet from the existing outlet. The excavation to trench bottom from road surface at center of new pipe is approximately 26 feet deep.

(c) Reusable excavated material shall be stage onsite. Excavated waste material unsuitable for embankment construction shall be hauled to the Buster Quarry Waste Area. Material used for fill reconstruction shall be recovered onsite material or 4”-0” stockpiled rock hauled from the Buster Quarry Stockpile Site as directed by STATE. Backfill shall be compacted as specified in Exhibit D.

(d) Final stream grade shall be -6.4%. New culvert shall be countersunk to a -4.9% grade. New culvert outlet shall be sunk 2.4 feet below final stream grade. New culvert inlet shall be sunk 3.8 feet below final stream grade.

(e) Utilize 6”-0” pit-run rock for culvert bedding reinforcement. Utilize 1 1/2”-0”crushed rock for culvert bedding material. Utilize 1 1/2”-0”crushed rock for culvert backfill around culvert haunches and to cover the top of the culvert. The 1 1/2”-0”crushed rock used for culvert bedding and backfill shall be hauled from the remnant stockpiles at the Buster Stockpile Site as directed by STATE. Bedding and top cover shall be a minimum of 12” compacted depth.

(f) At the culvert outlet, utilize 24”-6” riprap rock for riprap and streambed retention for a minimum distance downstream of 3 times the culvert diameter, or as directed by STATE. Placed and embed material at the outlet of the new culvert to establish the stream channel elevation and allow stream sediment materials to settle in the barrel of the pipe.

(g) Utilize recovered stream cobble on both the inlet and outlet to assist in the formation of a new stream bed. At the culvert inlet taper cobble into the barrel of the culvert as directed by STATE. At the outlet inter-mingle the cobble with the 24”-6” riprap as directed by STATE.

EXHIBIT F

TYPE F STREAM CROSSING STRUCTURE

SPECIFIC CULVERT INSTALLATION SPECIFICATIONS

Road Segment I1 to I2, Station 43+70.

(h) Utilize 18”-6” pit-run rock and/or onsite material approved by STATE to seed inside of new pipe. Begin seeding at outlet for a depth of 2.4 feet. Taper seeding thought pipe to depth of 1.0 feet at inlet.

(i) Utilize 24”-6” riprap rock for fill armor material placed and tamped at a 1½:1 slope for a minimum thickness of 2 feet beginning at the toes.

(j) Finished subgrade shall be at least 20 feet in width.

(k) Finished road base rock reconstruction shall be a new 8 inch lift (50 cy per station) of 4”-0” stockpile rock from the Buster Stockpile Site, as directed by STATE. Road base reconstruction subgrade shall be graded and shaped and new rock base shall be processed and compacted in accordance with Exhibit D.

PROJECT NO. 5		
Application	**Rock Size and Type**	**VOLUME (CY)**
Culvert Bedding and Backfill	1 1/2"-0" Stockpile	209
Culvert Bedding Reinforcement	12"-0" Pit-Run	33
Stream Bed Retention	24"-6" Riprap	33
Inlet / Outlet Channel Armor	24"-6" Riprap	66
Inside Pipe Seeding	18"-6" Pit-Run	33
Fill Armor	24"-6" Riprap	605
Road Base Reconstruction	4"-0" Stockpile	75
Total Rock for Road Segment:		1,054

EXHIBIT F

TYPE F STREAM CROSSING STRUCTURE

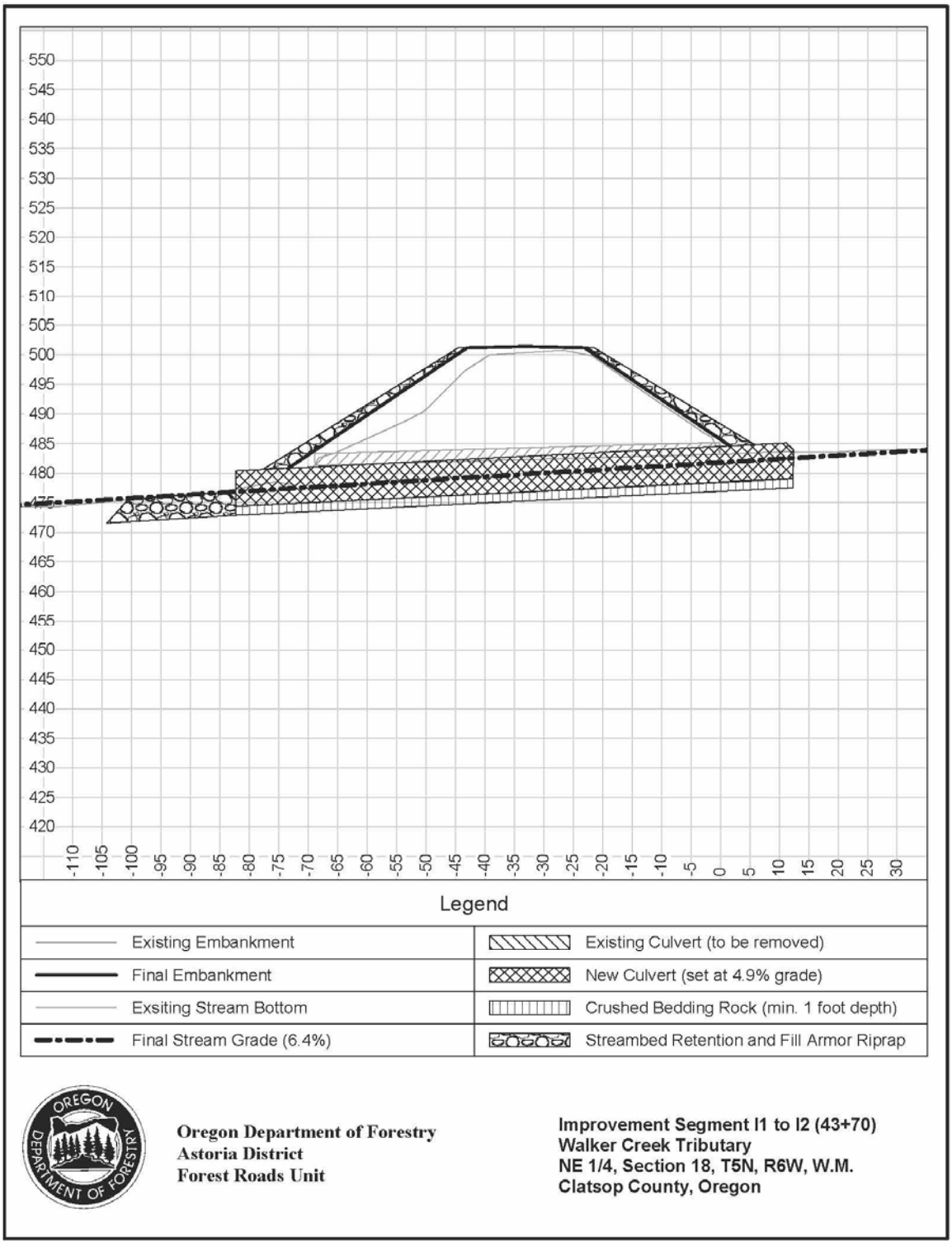


EXHIBIT F

TYPE F STREAM CROSSING STRUCTURE

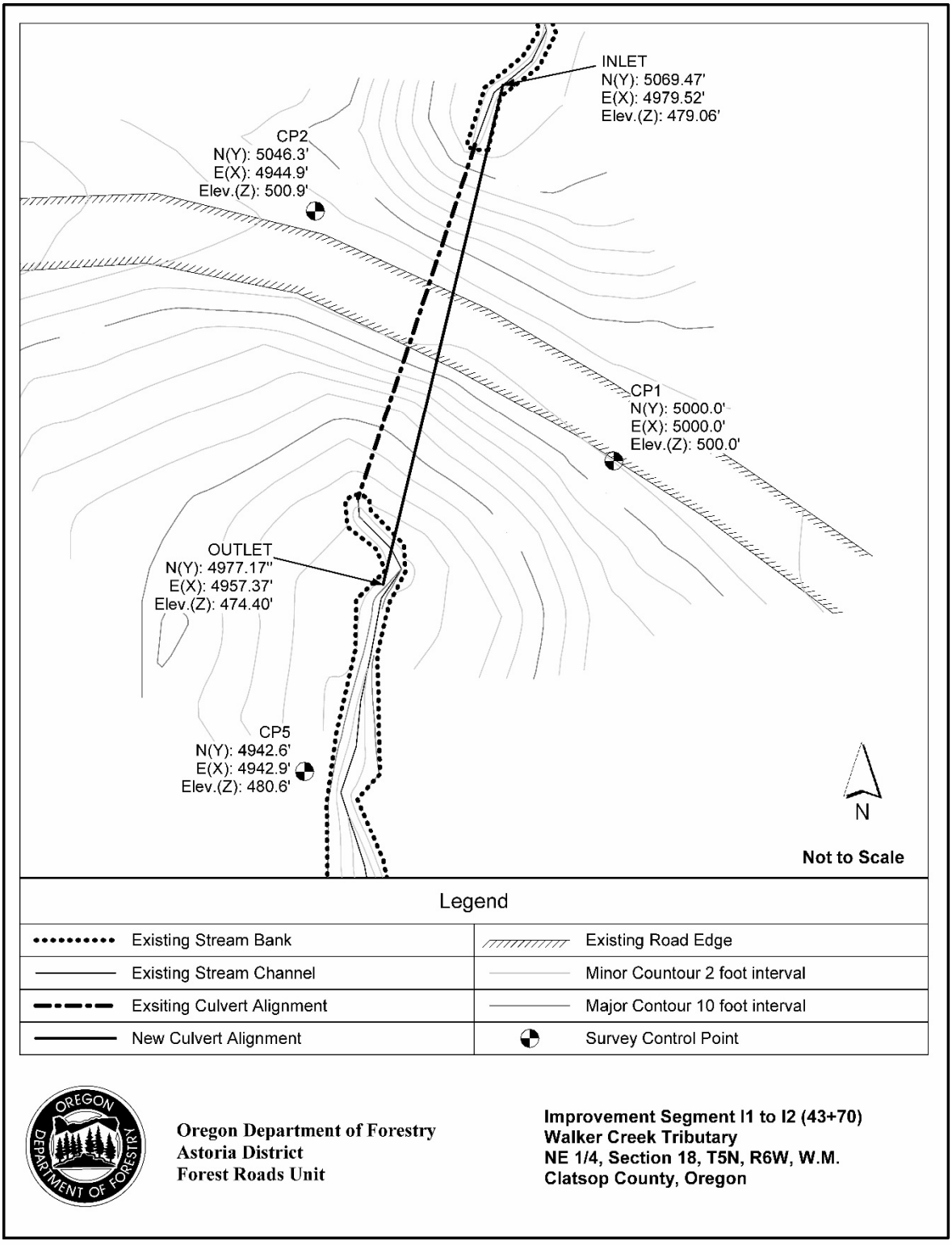


EXHIBIT G

ROCK QUARRY DEVELOPMENT AND USE

1. PURCHASER shall prepare a written development plan for the quarry area. The plan shall be submitted to STATE for approval prior to conducting any operation in quarry area. The plan shall include, but not be limited to:

   (a) Location of benches and roads to benches.
   (b) Disposal site for woody debris, overburden and reject material.
   (c) Time lines for rock quarry use.
   (d) Erosion Control measures.

2. PURCHASER shall schedule and coordinate quarry and stockpile usage with other existing or planned activity requiring quarry or stockpile usage. PURCHASER shall notify STATE 5 days prior to the start of quarry development activities.

3. Overburden shall be removed for a distance of 20 feet beyond the developed rock source. All overburden and reject material shall be hauled to the designated waste area as directed by STATE.

4. PURCHASER shall conduct the operations relative to the disposal of waste material in such manner that sediment, rock, or debris shall not be washed, conveyed, or otherwise deposited in any stream.

5. Blasting shall not be allowed from March 1 through July 7.

6. The STATE shall be notified 24 hours prior to the beginning of blasting operations.

7. Purchaser shall identify a Blaster in Charge (BIC) for all blasting operations. The BIC will be qualified by experience to oversee all phases of the blasting operations. The BIC shall provide direct supervision at all times when blasting and explosives handling activities are occurring on STATE LANDS.

8. Controlled blasting techniques shall be utilized for any blasting operations, and shall be accomplished using timing devices, delayed charges, low intensity shots, or other suitable means to contain as much material as possible within the quarry development area. Each shot shall also have a “tattle-tale” end cap so that it is known if all charges were detonated. The PURCHASER shall detonate or remove all non-detonated explosives from STATE LANDS. PURCHASER shall maintain a comprehensive blasting log that contains all pertinent data for all blasting operations. The blasting log shall be submitted to the STATE after the completion of all blasting activity. The blasting log is intended for STATE record keeping purposes only.

9. Benches shall be maintained/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 percent or less. There shall be a minimum of one bench with an access road to it. Said bench shall be easily accessible with tractors.

10. Quarry face shall be developed in a uniform manner. All quarry backslopes shall be left in a stable condition.

11. Oversized material that is produced or encountered during development shall be broken down and utilized for crushing.

EXHIBIT G

ROCK QUARRY DEVELOPMENT AND USE

12. The quarry floor shall be developed to provide for drainage away from the quarry. All quarry and stockpile site drainage ditches shall be maintained. Ditches, culverts, waterbars and other direct conveyances of water from the quarry or stockpile site(s) shall be constructed to drain to the forest floor in locations that will provide filtration. Quarry access roads shall be cleared and blocked upon completion of quarry use as directed by STATE.

13. 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 G
ROCK QUARRY DEVELOPMENT AND USE

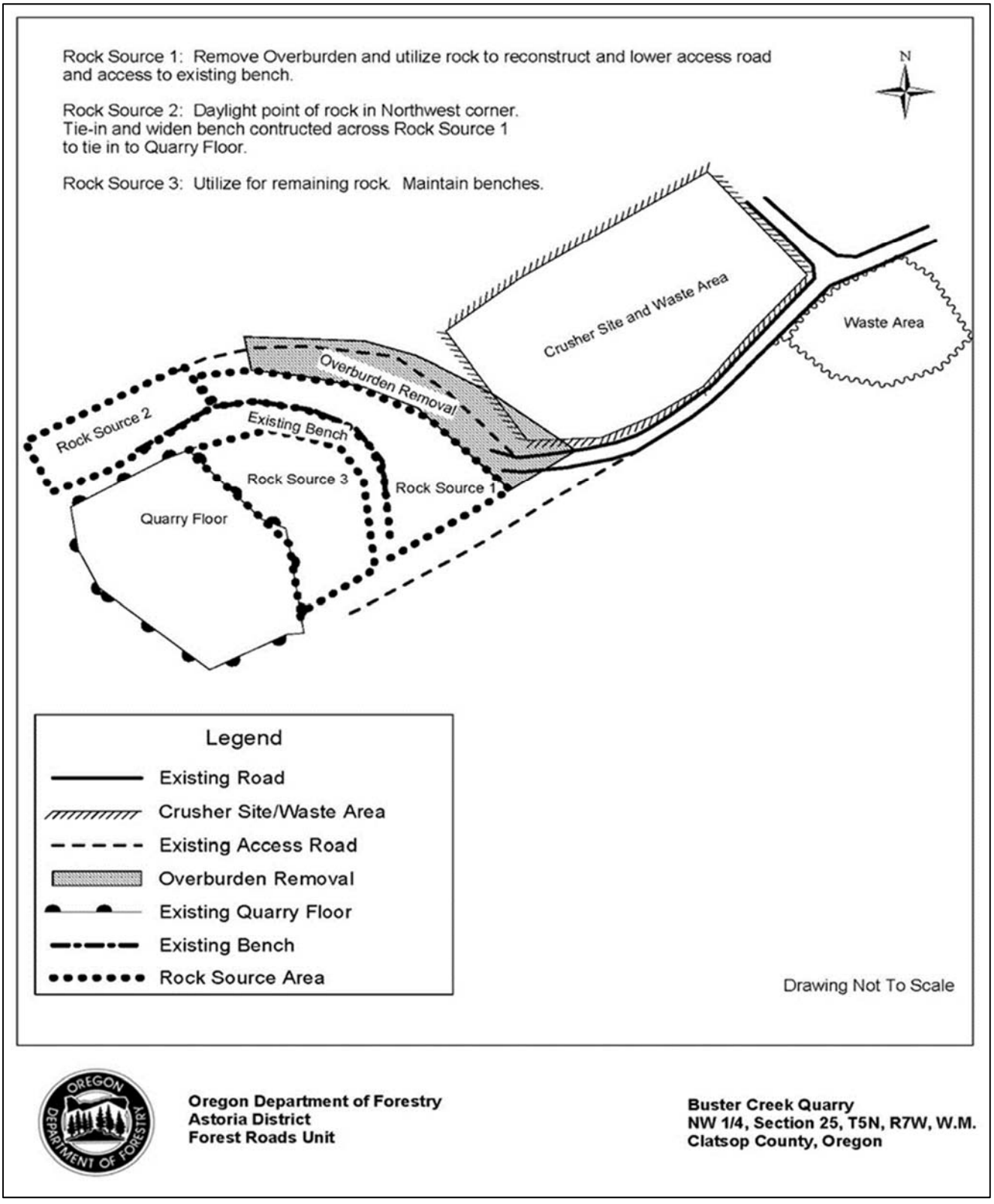


EXHIBIT G

CRUSHED ROCK SPECIFICATIONS

Materials. The material shall be fragments of rock crushed to the required size. The material shall be free from vegetation and lumps of clay. STATE may require screening and/or rejecting of materials utilized for production of crushed rock for the purpose of removing excess fine material. Excess fines are present, when greater than (*5) percent of a total rock sample weight, passes a #200 sieve. Rock crushing shall be limited to periods when weather conditions are acceptable to STATE.

Quality and Grading Requirements. The base material shall be rock. River gravel shall not be used. Crushed rock shall meet the grading requirements that follow:

Hardness - Aggregate Hardness - Test Method AASHTO T 96: 30% Maximum

Durability – Test Method ODOT TM 208
Passing No. 20 Sieve: 30% Maximum

For the purpose of crushing rock specified under the projects in Section 2610, “Project Work,” PURCHASER shall utilize a three-stage rock crusher, or equivalent, unless otherwise approved by STATE.

The rock crusher shall be calibrated to produce rock as specified in this exhibit. 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 2,000 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.

EXHIBIT G

CRUSHED ROCK SPECIFICATIONS

Grading Requirements

For 5”-0”	Passing	6" sieve	100%
	Passing	5" sieve	90-100%
	Passing	4" sieve	90-100%
	Passing	2" sieve	50-80%
	Passing	3/4" sieve	15-50%
	Passing	1/4" sieve	0-20%

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

PIT-RUN AND RIPRAP ROCK SPECIFICATIONS

For Pit-Run	Passing	10" sieve	100%
	Passing	6" sieve	60-85%
	Passing	3" sieve	30-50%
	Passing	¼" sieve	0-10%

For 6"-4" Pit-Run A minimum of 50 percent of the material shall measure a minimum of 5 inches, measured in one dimension. Material shall be clean, well graded, and free of 3"-0" fines.

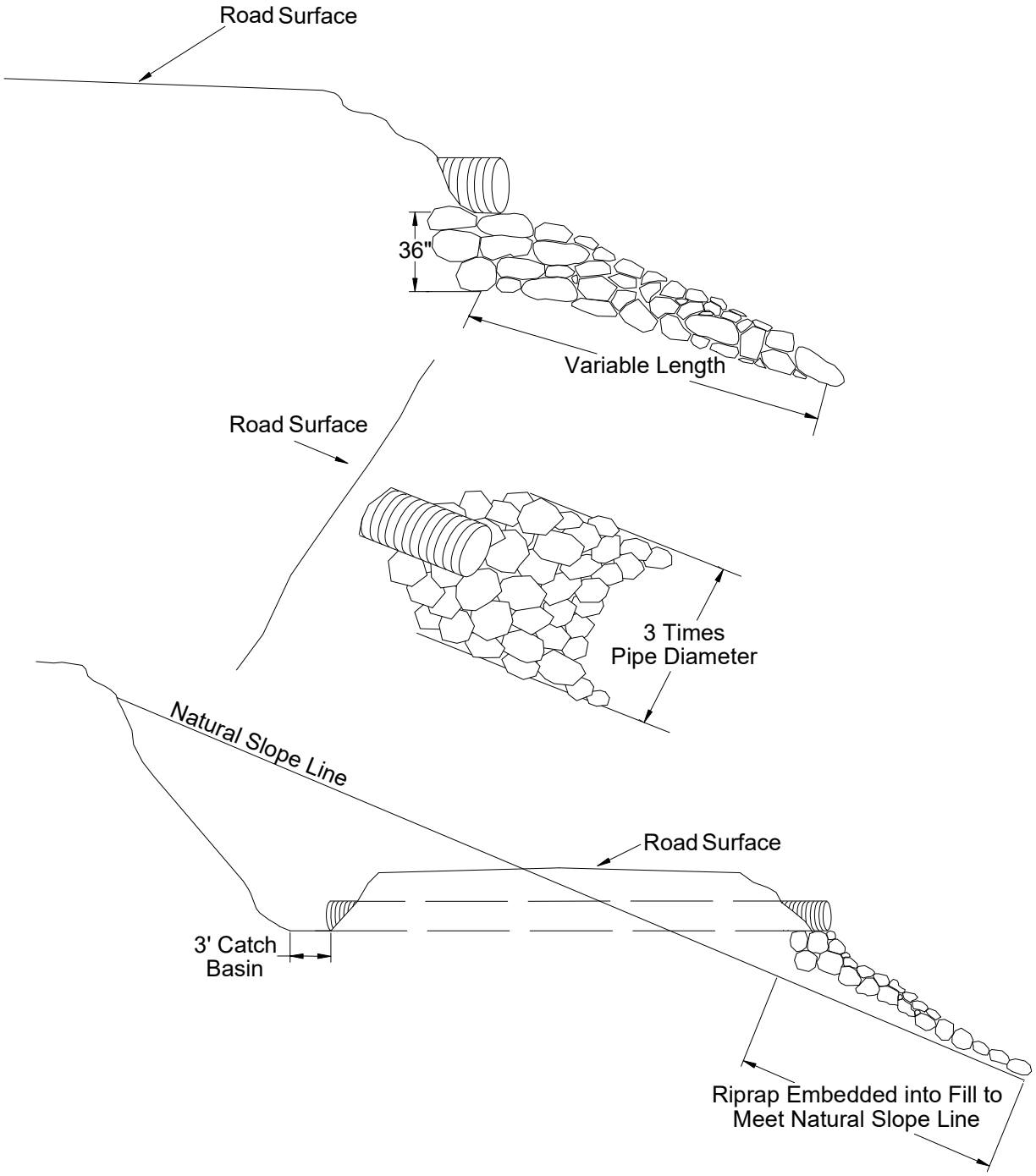
For 24"-0" Riprap A minimum of 50 percent of the material shall measure a minimum of 12 inches, measured in one dimension. Material shall be clean, well graded, and free of 2"-0" fines.

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

Control of gradation shall be by visual inspection by STATE.

EXHIBIT H

TYPICAL EMBEDDED ENERGY DISSIPATOR



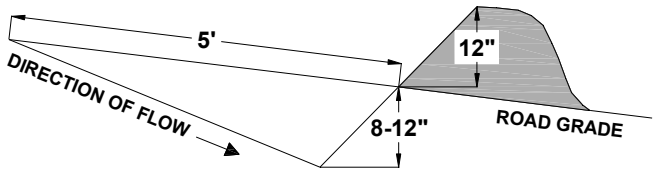
Dissipator shall be installed prior to the installation of the culvert, unless approved by STATE.

EXHIBIT I

WATERBAR SPECIFICATIONS

PROFILE

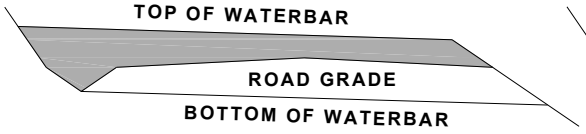
DITCHED AND OUTSLOPED



SPACING OF WATERBARS	
ROAD GRADE	DISTANCE
< 6 %	400'
6 - 10 %	200'
11 - 15 %	150'
> 15 %	100'

CROSS SECTION

DITCHED



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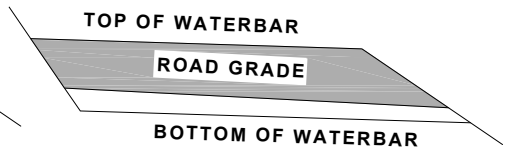
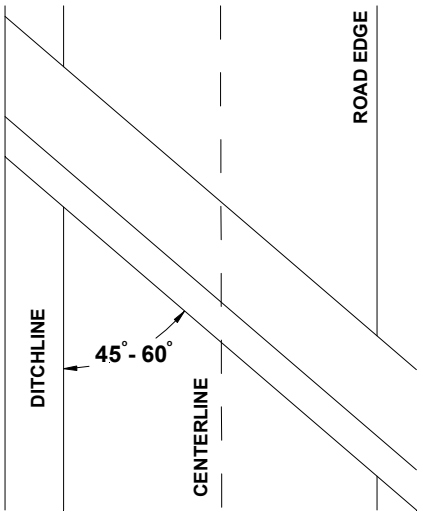


CONSTRUCT DITCHOUT THRU ANY EXISTING BERM.
CROSS DRAINAGE GRADIENT MINIMUM 3%.

PLAN VIEW

DITCHED



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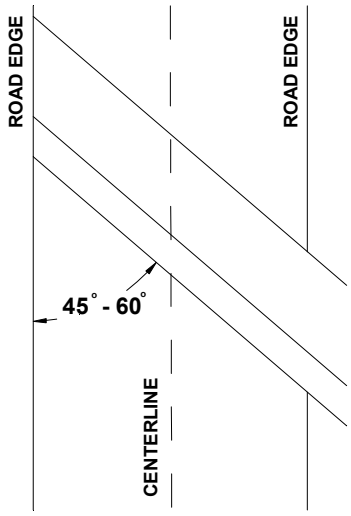

EXHIBIT J

SEEDING AND MULCHING

This work shall consist of preparing seedbeds and furnishing and placing required seed, fertilizer, and straw mulch. Straw mulch shall consist of straw that is free of noxious weeds. Apply seed, fertilizer, and straw mulch to all waste areas and bare soils resulting from Project No. 1, 2, and 5.

Seeding Seasons. Seeding shall be performed only from March 1 through June 15 and August 15 through October 31. Seeding materials shall not be applied during windy weather or when the ground is excessively wet or frozen. Areas of disturbed soil shall be seeded by the end of the project period in which work was started. PURCHASER shall notify STATE within 24 hours of seeding and fertilizer application.

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

The seed mixture listed below shall be applied at 100 lbs. per acre. The seed mixture shall be comprised of the following:

SPECIES	MIXTURE	PURE LIVE SEED	GERMINATION
Annual Rye	33%	95%	>90%
Orchard Grass	33%	95%	>90%
Perennial Rye	34%	95%	>90%

Fertilizer: Chemical analysis shall be 16-20-0 and shall be applied at the rate of 200 pounds per acre. Fertilizer shall not be applied within 100 feet of streams.

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 1½ to 2½ inches. This rate requires between 2 and 3 tons of dry mulch per acre.

EXHIBIT K

STREAM ENHANCEMENT INSTRUCTIONS

General Instructions:

(a) STATE shall be notified a minimum of 48 hours prior to beginning work. STATE has prepared the required FPA "Written Plan" for this work.

(b) Trees required for stream enhancement work shall be conifers obtained from the sale area.

Specific Instructions:
Fall 25 trees from the into the stream in Unit 3 , between points SE1 and SE 2 in accordance with the following specifications, unless otherwise approved by STATE.

Specific Instructions:

(a) 5 Trees shall be felled at each location Locations shall be at least 100 feet apart.

(b) Trees shall be at least 20 inches in diameter at the large end and at least 50 feet in length;

(c) Trees will be obtained from within the stream buffers where excess conifer basal area exist.

(d) Notify STATE at least 2 days prior to conducting any tree and/or log placement;

(e) Minimize stream disturbance as specified in Section 2415 "Protection of Watershed," and as specified in the Written Plan.

(f) Trees should be placed in a complex configuration with at least one end on the stream banks as to simulate a natural log jam.

In the event STATE determines that all or a portion of the tree and/ or log placement cannot be completed, then PURCHASER shall reimburse STATE $125 per tree and/or log.

Such payment shall be made to STATE within 10 days upon written notice by STATE. Drawings of typical structures are on file at the Department of Forestry Astoria District office.

State Timber Sale Contract
No. 341-219—W00734-01
Imperial Walker

FOREST PRACTICES ACT "WRITTEN Plan"
For Logging Operations within 100 feet of Type F Stream

Timber Sale Area is located in Section 9, 10, 15, and 16 of T5N, R6W, W.M., Clatsop County, Oregon.

Landowner: Oregon Department of Forestry
92219 Hwy 202
Astoria, OR 97103
(503) 325-5451

Protected Resources:
1. Walker Creek and Unnamed tributaries of Walker Creek
2. Buster Creek and Unnamed tributaries of Buster Creek

Specific Site Characteristics:
1. Walker Creek (small, Type F) flows along the North side of Unit 2 for approximately 900 feet. Two additional unnamed tributaries (Small, Type F) flow along the west and east boundaries of Unit 2 for approximately 620 feet and 400 feet.
2. Buster Creek (small, Type F) flows along the east side of Unit 1 for approximately 3,300 feet. An unnamed tributary (medium, Type F) of Buster Creek flows along the east side of Unit 3 for approximately 3,000 feet, as well as the north side for approximately 640 feet.

Tree and Vegetation Retention:
Vegetation within the buffers consists of a combination of conifers, hardwoods, and shrubs.

The Type F Streams in Unit 1, 2, and 3 are outside of the sale area. If trees need to be felled within FPA defined stream buffers (RMA's) to allow for cable corridors, trees cut within 100 feet will not be removed. Cable lines may extend over and/or through these buffers.

Resource Protection Practices:
Along all of the above mentioned streams, as well as any other streams, the following practices are required under the timber sale contract, to protect the streams and streamside areas:

- No trees will be felled within stream buffers (RMA's), except as necessary in cable corridors.
- Trees that fall or slide into Type F RMA's shall not be removed without prior approval from STATE.
- Trees adjacent to the stream buffers (RMA's) will be felled away from or parallel to the streams to prevent trees from entering the aquatic areas.
- When cable logging is conducted nearby the RMA's, logging lines may cross, but will not be lowered into the RMA's during yarding, except during rigging. During rigging the lines must be pulled out of the RMA's when changing corridors.
- Logs shall be fully suspended when yarding across all stream buffers (RMA's).
- Cable corridors must be at least 100 feet apart where they cross the RMA's.

I, the undersigned, submit this written plan in compliance with the requirements in the Forest Practices Act regarding the operations conducted within 100 feet of Type F and D streams. I agree to the protection measures listed on this plan:

Submitted: _____ Date: _____
Purchaser/Operator Contract Representative

Original: Salem
CC: Operator, Purchaser, District file, Marketing Unit

State Timber Sale Contract
No. 341-20-W00829-01
Imperial Walker

FOREST PRACTICES ACT "WRITTEN PLAN"
For Type F crossing and constructing a permanent stream crossing fill over 15 feet deep

NE 1/4, Section 18, T5N, R6W, W.M. Clatsop County, Oregon.

Landowner: Oregon Department of Forestry
92219 Hwy 202
Astoria, OR 97103
(503) 325-5451

Protected Resources:
A small Type F Tributary of Walker Creek crosses with a fill which is over 15 feet deep. A "written plan" is required for a Type F crossing and construction/reconstruction of any stream crossing fill over 15 feet deep.

Specific Site Characteristics:
The tributary of Walker Creek (small, Type F) fisheries resource. The existing 24" culvert located at station 43+70 on road I1 to I2 (approx. mile 1, Walker Creek Road) is in a deteriorating condition and needs replacement. This culvert is located in a section of road with a fill over 15 feet deep. The existing structure will be replaced with a fish passage design structure.

Situation:
The current structure is in failing condition, and is a partial blockage to fish passage upstream.

Solution:
Design a crossing structure that meets or exceeds the need of this particular stream crossing site and FPA requirements for Type F stream crossings.

Road Segment I1 to I2, Station 43+70. Drainage Area and Structure Design:
Current FPA guidelines were used to design the new fish passage structure. The drainage area is 30 acres (0.05 square miles) determined from LiDAR data. The 50 year peak flow for this drainage is 200 cfs per square mile determined from the Peak Flow 50 Year Recurrence Interval isoline data. Therefore the 50 year peak flow for this stream crossing is 10 cfs. Table 1 from ODF Forest Practices Technical Note Number 5 (effective May 10, 2002) lists a maximum flow of 11 cfs from a 24" diameter culvert.
The stream crossing will utilize a streambed simulation strategy and preserve a natural stream channel with a minimum of 4.6 feet width. A countersunk 72" diameter x 100' length culvert constructed of aluminized corrugated steel will be installed at the Type F stream crossing. The 72" culvert will be embedded 3.8 feet at the inlet leaving an effective opening of 790 square inches giving an effective flow capacity of 34 cfs, exceeding the 10 cfs requirement. The culvert design includes a 1:1 beveled inlet opening to improve culvert efficiency. The culvert barrel will be seeded with on-site stream cobble if available. The design life of this culvert is a minimum of 50 years. The fill slopes will be armored with pit-run rock to minimize surface erosion.

New Stream Gradient:	6.4%
Size of Watershed:	30 acres
Average Stream Width:	4.6 feet
Streambed material:	Cobble, Gravel, Fines/Sand
50 Year Peak Flow/Mi.^{2}:	200 cfs
50 Year Peak Flow:	10 cfs
Flow Capacity of New Structure:	34 cfs

State Timber Sale Contract
No. 341-20-W00829-01
Imperial Walker

FOREST PRACTICES ACT "WRITTEN PLAN"
For Type F crossing and constructing a permanent stream crossing fill over 15 feet deep

NE 1/4, Section 18, T5N, R6W, W.M. Clatsop County, Oregon.

Resource Protection Practices:

- Machine activity in stream channel shall be minimized.
- All fill excavation, backfilling, stream channel development, and riprap placement shall be performed using a minimum two cubic yard track mounted excavator.
- In-stream work, including de-watering, excavation, culvert installation, and riprap placement shall be conducted during dry weather periods, low water stream flows and from July 1 to August 31, annually.
- A dewatering plan shall be developed and followed from the start of excavation until the structure is in place and water flowing.
- An erosion control plan shall be developed and followed to prevent sediment from entering the stream during construction work.
- Clearing debris, and excavation material shall be hauled to a designated waste area and left in a stable condition.
- Selected native earth materials free from woody debris will be used for back filling. Fill material will be thoroughly compacted with specialized compaction equipment.
- Reconstructed fill slopes will not exceed 1 ½:1.
- Riprap rock shall be used to protect the structure, road approaches/embankments, and stream banks from erosion.
- Pit-run rock will be used to armor both the inlet and outlet fill slopes to minimize erosion.
- All bare soils and waste areas will be mulched and seeded to prevent erosion.
- Oil spill response materials shall be on site before work begins.

I, the undersigned, submit this written plan in compliance with the requirements in the Forest Practices Act regarding the operations conducted within Type F streams and constructing a permanent stream crossing fill over 15 feet deep. I agree to the protection measures listed on this plan.

Submitted _____ _____
Purchaser/Operator Date

Attachments: Exhibit A and F
Original: Salem
Copies: Operator, Purchaser, District File, Roads Unit, Marketing Unit

State Timber Sale Contract
No. 341-20-W00829-01
Imperial Walker

FOREST PRACTICES ACT "WRITTEN Plan"
For Stream Enhancement Operations within 100 feet of Type F Stream

Timber Sale Area is located in Section 9, 10, 15, and 16 of T5N, R6W, W.M., Clatsop County, Oregon.

Landowner: Oregon Department of Forestry
92219 Hwy 202
Astoria, OR 97103
(503) 325-5451

Protected Resources:
Unnamed tributary of Buster Creek

Specific Site Characteristics:
1. Buster Creek (small, Type F) flows along the east side of Unit 1 for approximately 3,300 feet. An unnamed tributary (medium, Type F) of Buster Creek flows along the east side of Unit 3 for approximately 3,000 feet, as well as the north side for approximately 640 feet.

Tree and Vegetation Retention:
FPA defines the RMA width of a large Type F stream as 100 feet. The timber sale boundary for Unit 3 is posted at least 100 feet from the Type F stream. The RMA is dominated by red alder and salmonberry and lacks sufficient conifer presence suitable for the recruitment of woody debris.

Practices:
Five stream enhancement structures will be created by felling trees between points SE 1 and SE 2. The approximate locations are shown on Exhibit "A" and work to be done is described as follows:

> Structures shall be at least 100 feet apart and have a minimum of five conifer trees at each location. Trees shall be at least 20 inches in diameter and 100 feet in length. Trees will be fell from within the Type F Buffer Area.

Stream Enhancement structures must be created by the PURCHASER for stream improvement as recommended by ODFW fisheries biologist. The trees will be fell into the stream at locations specified by STATE, and with consultation from an ODFW fisheries biologist. This work will take place during the instream work period for Warner Creek (July 1 – August 31). If the work cannot be done during the designated instream work period an ODFW fisheries biologist will be consulted to field verify any fish habitat concerns and approve any work to be conducted outside the designated period.

I, the undersigned, submit this written plan in compliance with the requirements in the Forest Practices Act regarding the operations conducted within 100 feet of Type F and D streams. I agree to the protection measures listed on this plan:

Submitted: _____ Date: _____
Purchaser/Operator Contract Representative

Original: Salem
CC: Operator, Purchaser, District file, Marketing Unit

OREGON DEPARTMENT of FISH and WILDLIFE

FISH SCREENING PROGRAM

SMALL PUMP SCREEN SELF

CERTIFICATION

The Oregon Water Resources Department in coordination and cooperation with the Oregon Department of Fish and Wildlife includes screen requirements on pumps to protect fish as a condition of many surface water and/or reservoir water right permits. This is done in accordance with ORS 537.153.

The Oregon Department of Fish and Wildlife does not usually inspect small pump screens at **pumped diversions less than 225 gpm** (gallons per minute), but furnishes the following fish screening criteria information to the water right permit holder:

Screen material open area must be at least 27% of the total wetted screen area.

Perforated plate: Openings shall not exceed 3/32 or 0.0938 inches (2.38 mm).

Mesh/Woven wire screen: Square openings shall not exceed 3/32 or 0.0938 inches (2.38 mm) in the narrow direction, e.g., 3/32 inch x 3/32 inch open mesh.

Profile bar screen/Wedge wire: Openings shall not exceed 0.0689 inches (1.75 mm) in the narrow direction.

Screen area must be large enough not to cause fish impact. Wetted screen area depends on the water flow rate and the water approach velocity. **Approach velocity** is the water velocity perpendicular to and approximately three inches in front of any part of the screen face.

An Active pump screen is a self-cleaning screen that has a proven cleaning system. The **screen approach velocity for active pump screens** shall not exceed 0.4 fps (feet per second) or 0.12 mps (meters per second). The wetted screen area in square feet is calculated by dividing the maximum water flow rate in cubic feet per second (1 cfs = 449 gpm) by 0.4 fps.

A Passive pump screen is a screen that has no cleaning system other than periodic manual cleaning. **Screen approach velocity for passive pump screens** shall not exceed 0.2 fps or 0.06 mps. The wetted screen area in square feet is calculated by dividing the maximum water flow rate by 0.2 fps.

For further information on fish screening please contact:

Oregon Department of Fish and Wildlife, Statewide Fish Screening Coordinator: 503.947.6229
Oregon Department of Fish and Wildlife, Screening Program Administrative Specialist: 503.947.6224

As evidence of having met fish screen installation requirements, please sign the certification and send to: **Oregon Water Resources Department, Water Rights Section, 725 Summer Street NE, Suite A, Salem, OR 97301-1271.**

Certification: I certify that my small pumped diversion of less than 225 gpm meets fish screening criteria, and that I will maintain it to comply with regulatory criteria. I also understand that should fish screening standards change, I may be required to modify my installation to meet applicable standards.

Applicant Signature: _____ Date: __/__/___ WRD File #: _____

Printed Name and Address: _____

Phone: (___)_____ Fax: (___) _____