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-341-2024-W01053-01

(2) Sale Name: D.R. Chopper

(3) Contract Expiration Date: 10/31/2027

(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
FELLING				
YARDING				

(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 including without limitation PURCHASER'S independent obligation to avoid take of a T&E species and PURCHASER'S obligation to comply with terms and conditions of any incidental take Permit(s) that include required minimization and mitigation measures in any applicable Habitat Conservation Plan. 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.

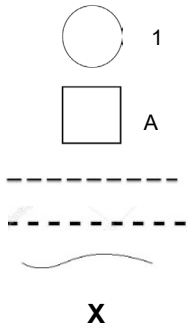
(7) The STATE representative will be designated when your plan is approved and is the person who will inspect and issue instructions regarding performance.

(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.

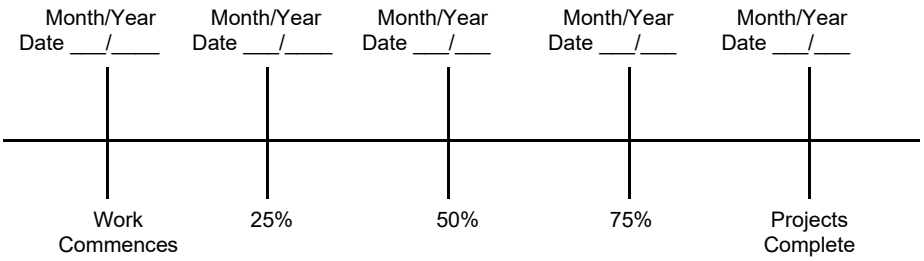
Temporary stream crossings.

Oregon Department of Forestry
2600 State St Salem OR 97310
PART III: EXHIBITS
EXHIBIT B
OPERATIONS PLAN

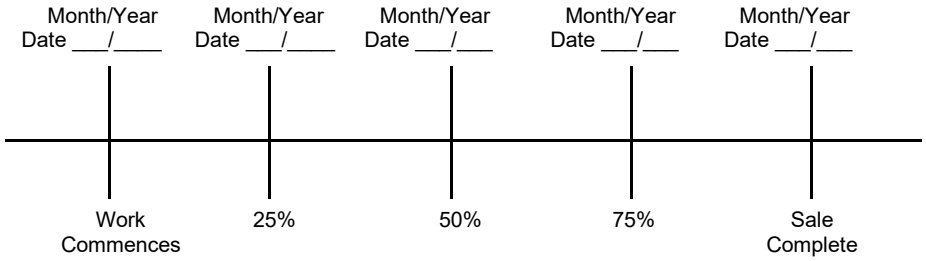
Completion Timeline

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 or that the plan is consistent with the terms and conditions of any applicable incidental take Permit(s) including any required minimization and mitigation measures proposed in the applicable Habitat Conservation Plan. As provided in the timber sale contract, PURCHASER's must comply with all applicable state, federal, and local laws, including without limitation any Permit(s) issued thereunder.

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	☐	☑

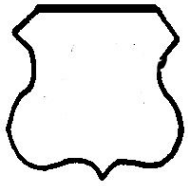
(8) **APPROVED SCALING LOCATIONS** (as shown on the ODF Approved Locations web-site)	**Species**	**Yard**	**Truck**	**Weight**

(9) **SALE NAME:** D.R. Chopper
COUNTY: Clatsop

(10) **STATE CONTRACT NUMBER:**
AT-341-2024-W01053-01

(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:**

"Mule Trains"
1. Loads are required to have load tickets for each set of bunks.
2. If truck and pup are to be weighed, weigh and process separately for gross and tare weights.

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

(16) SIGNATURES:

_____
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 and Purchaser.

Oregon Department of Forestry
EXHIBIT C - SAWMILL GRADE
INSTRUCTIONS FOR EXHIBIT C
Astoria - NWOA

(1) Check appropriate box. REVISION NUMBER requires comments. CANCELLATION requires logging and hauling to be complete, recall branding hammers.

(2) Designate Third Party Scaling Organization (TPSO).

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
2560 NW Medical Park Drive, OR 97471
Phone: (541) 673-5571 Fax: (541) 672-6381
Email: info@mwlsgb.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

(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: https://apps.odf.oregon.gov/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 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. Signatures not required on revisions.

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 ☐ Date _____

(2) TO: _____

(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: _____

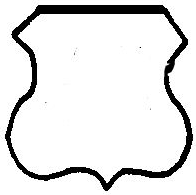
(9) **SALE NAME:** D.R. Chopper

COUNTY: Clatsop

(10) **STATE CONTRACT NUMBER:**
AT-341-2024-W01053-01

(11) STATE BRAND REGISTRATION NUMBER: _____

(12) STATE BRAND INFORMATION:



(13) **REMARKS:**

"Mule Trains"

1. Loads are required to have load tickets for each set of bunks.
2. Truck and pup are to be weighed and processed separately for gross and tare weights.

(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.

Operator's Name (Optional inclusion by District):

(14) SIGNATURES:

Purchaser or Authorized Representative Date

State Forester Representative Date

State Forester Representative PRINT NAME

(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.

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.

General Distribution: TPSO, Approved Scaling Locations and Purchaser.

Oregon Department of Forestry
EXHIBIT C - PULP SORT
INSTRUCTIONS FOR EXHIBIT C

Astoria, NWOA

(1) Check appropriate box. REVISION NUMBER requires comments. CANCELLATION requires logging and hauling to be complete, recall branding hammers.

(2) Approved Pulp Processing Facility. Write in as written in the Approved Log Delivery Location
https://apps.odf.oregon.gov/Divisions/management/asset_management/scalinglocation.asp

(3) State District office, address and phone.

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

(5) 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

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

Mountain Western Log Scaling & Grading Bureau
2560 NW Medical Park Drive, Roseburg, OR 97471
Phone: (541) 673-5571 Fax: (541) 672-6381
Email: info@mwlsgb.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

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

(6) 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.

(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 (13).

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

(14) Require purchaser to sign and date completed form in addition to State Forester Representative, sign and print name on the form. Signatures not required on revisions.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SUBGRADE WIDTH	SURFACED WIDTH	POINT TO POINT	STATION TO STATION	DRAINAGE
16 feet	12 feet	2A to 2B	0+00 to 2+25	Crowned/Ditch
16 feet	12 feet	2C to 2D	0+00 to 3+60	Crowned/Ditch
16 feet	12 feet	2E to 2F	0+00 to 8+00	Crowned/Ditch
16 feet	12 feet	2G to 2H	0+00 to 8+20	Crowned/Ditch
16 feet	12 feet	3A to 3B	0+00 to 4+00	Crowned/Ditch
16 feet	12 feet	3C to 3D	0+00 to 2+00	Crowned/Ditch
16 feet	12 feet	4A to 4B	0+00 to 18+25	Crowned/Ditch
16 feet	12 feet	I1 to I2	0+00 to 49+00	Crowned/Ditch
16 feet	12 feet	I3 to I4	0+00 to 17+90	Crowned/Ditch
16 feet	12 feet	I5 to I6	0+00 to 144+50	Crowned/Ditch
16 feet	12 feet	I7 to I8	0+00 to 2+00	Crowned/Ditch
16 feet	12 feet	I9 to I10	0+00 to 1+50	Crowned/Ditch
16 feet	12 feet	I11 to I12	0+00 to 22+80	Crowned/Ditch
16 feet	12 feet	I13 to I14	0+00 to 2+50	Crowned/Ditch
16 feet	12 feet	I15 to I16	0+00 to 100+90	Crowned/Ditch
16 feet	12 feet	I17 to I18	0+00 to 26+50	Crowned/Ditch
16 feet	12 feet	I19 to I20	0+00 to 1+40	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.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

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.

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.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

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

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

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.

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	1½:1

Top 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 H 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 or individually marked with an orange “C”, 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 or pushed 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. 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. Waste materials shall be sloped and compacted for drainage. Construct each rock ditch filter with clean drain rock (6”-0” jaw-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.

5. 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.

6. 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 G.

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

8. Subgrade Preparation and Application of Surfacing Rock.

    a. Complete culvert installations, drainage ditches, 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

GENERAL SALE ACCESS ROAD IMPROVEMENT, SURFACE ROCK REPLACEMENT, AND ROAD MAINTENANCE INSTRUCTIONS:

1. Timber Removal. Remove all trees within posted Right-of-Way Boundary or individually marked with an orange "C", 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. Excess excavated material not used for embankment shall be end hauled or pushed to waste areas as shown on Exhibit A and marked in the field.

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"-0" jaw-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. Sod Removal. Remove/separate sod from crushed rock surfacing as directed by STATE. Sod material shall be scattered in stable locations through openings in the timber outside of the cleared right-of-way. In areas where sod cannot be scattered in a stable location, material shall be end hauled to designated waste areas as shown on Exhibit A, or other stable locations as directed by STATE.

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

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 I.

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 SALE ACCESS ROAD IMPROVEMENT, SURFACE ROCK REPLACEMENT, AND ROAD MAINTENANCE INSTRUCTIONS

Segment	Station	Work Description
I1 to I2		
	14+85	Install disconnect culvert, utilize 33 cubic yards of 1 ½"-0" crushed rock for bedding and backfill. Install culvert marker.
	15+70	Replace existing culvert, utilize 44 cubic yards of 1 ½"-0" crushed rock for bedding and backfill, 22 cubic yards of 24"-6" riprap for energy dissipator, and 66 cubic yards of 24"-6" riprap for fill armor. Install culvert marker.
	23+00	Install culvert marker and repair culvert outlet.
	31+45	Replace existing culvert, utilize 55 cubic yards of 1 ½"-0" crushed rock for bedding and backfill. Install culvert marker.
	41+20	Install a series of three ditch filters utilizing 6"-0" jaw-run.
I3 to I4		
	6+25	Install a series of three ditch filters utilizing 6"-0" jaw-run.
	16+40	Install a series of three ditch filters utilizing 6"-0" jaw-run.
I11 to I12		
	0+00	Begin junction realignment. Shift existing road left to establish a 50' radius curve with 4 feet of inside curve widening.
	1+00	Install culvert, utilize job-excavated soil for bedding and backfill.
	2+80	End junction realignment.
	20+25	Install a series of three ditch filters utilizing 6"-0" jaw-run.

EXHIBIT D

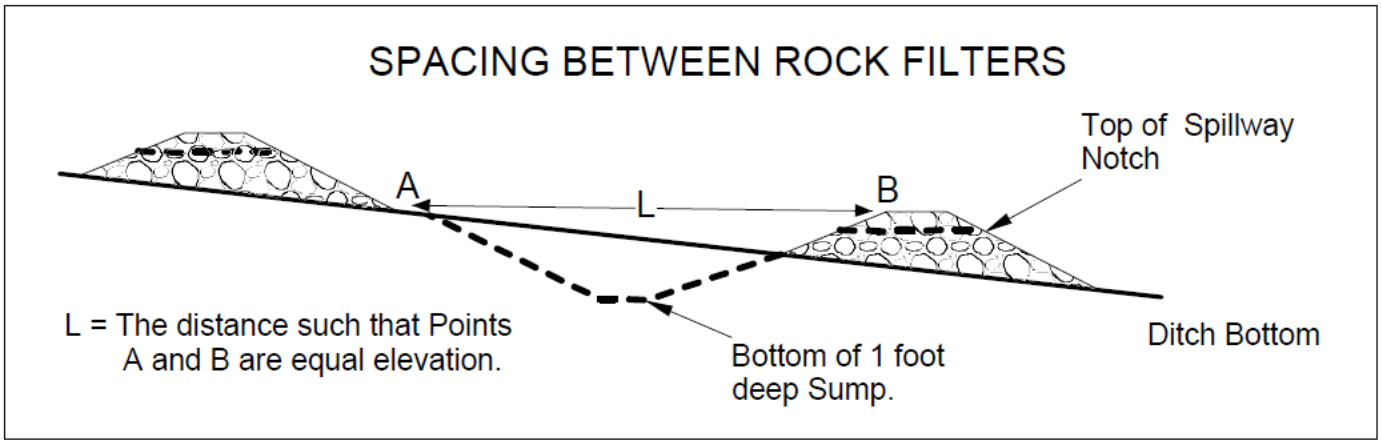
FOREST ROAD SPECIFICATIONS

SPECIFIC SALE ACCESS ROAD IMPROVEMENT, SURFACE ROCK REPLACEMENT, AND ROAD MAINTENANCE INSTRUCTIONS

Segment	Station	Work Description
I17 to I18		
	5+25	Install culvert, utilize 33 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
	15+10	Replace existing culvert, utilize 33 cubic yards of 1 ½”-0” crushed rock for bedding and backfill. Install culvert marker.
Project No. 4		Project No. 4. Waterhole Improvement. Utilize equipment to deepen and enlarge existing waterhole. Apply 44 cubic yards of 4”-0” crushed rock in improve road to waterhole and utilize 44 cubic yards of 24”-6” rip rap to provide a safety barrier along edge of waterhole. End haul materials to waste area identified on Exhibit A.

EXHIBIT D

TYPICAL ROCK DITCH FILTER



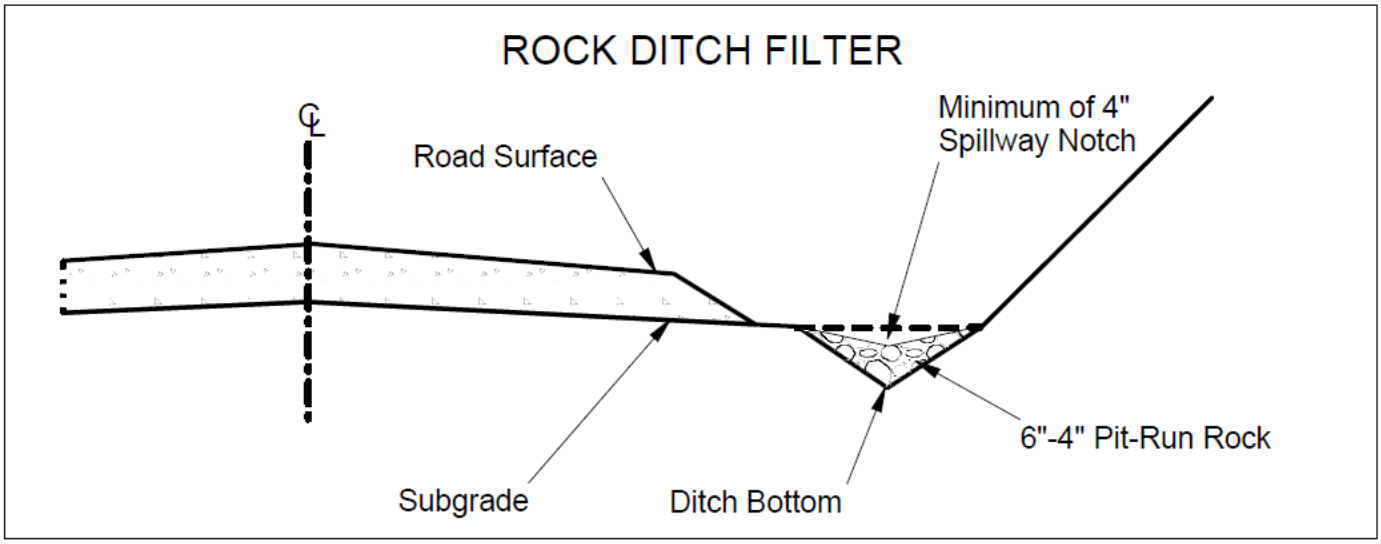


EXHIBIT D

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		0+00 to 2+25		
				Volume (CY) Per		Number of		
Junction Rock	6"-0" jaw-run	0+00	10	junctions	33	junctions	1	33
Base Rock	6"-0" jaw-run	0+00 to 2+25	10	station	63	stations	2.25	142
Landings	6"-0" jaw-run	2+25	N/A	landing	88	landings	1	88
Total Rock for Road Segment:			2A to 2B					263
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		0+00 to 3+60		
				Volume (CY) Per		**Number Of**		
Traction Rock	1 1/2"-0" crushed	0+00 to 2+00	2	station	13	stations	2	26
Junction Rock	6"-0" jaw-run	0+00	10	junctions	33	junctions	1	33
Base Rock	6"-0" jaw-run	0+00 to 3+60	10	station	63	stations	3.60	227
Turnaround	6"-0" jaw-run	2+30	10	turnaround	22	turnarounds	1	22
Landings	6"-0" jaw-run	3+60	N/A	landing	88	landings	1	88
Total Rock for Road Segment:			2C to 2D					396
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		0+00 to 8+00		
				Volume (CY) Per		**Number of**		
Junction Rock	6"-0" jaw-run	0+00	10	junctions	33	junctions	1	33
Base Rock	6"-0" jaw-run	0+00 to 8+00	10	station	63	stations	8	504
Turnout Rock	6"-0" jaw-run	3+00,5+95	10	turnout	33	turnouts	2	66
Turnaround	6"-0" jaw-run	5+95	10	turnaround	22	turnarounds	1	22
Landings	6"-0" jaw-run	3+40,8+00	N/A	landing	88	landings	2	176
Total Rock for Road Segment:			2E to 2F					801
ROAD SEGMENT: 2G to 2H				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	2G to 2H		0+00 to 8+20		
				Volume (CY) Per		**Number Of**		
Junction Rock	6"-0" jaw-run	0+00	10	junctions	33	junctions	1	33
Base Rock	6"-0" jaw-run	0+00 to 1+00	10	station	63	stations	1	63
Total Rock for Road Segment:			2G to 2H					96
ROAD SEGMENT: 3A to 3B				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	3A to 3B		0+00 to 4+00		
				Volume (CY) Per		**Number Of**		
Traction Rock	1 1/2"-0" crushed	0+00 to 2+00	2	station	13	stations	2	26
Junction Rock	6"-0" jaw-run	0+00	10	junctions	33	junctions	1	33
Base Rock	6"-0" jaw-run	0+00 to 4+00	10	station	63	stations	4	252
Turnaround	6"-0" jaw-run	1+90	10	turnaround	22	turnarounds	1	22
Landings	6"-0" jaw-run	4+00	N/A	landing	88	landings	1	88
Total Rock for Road Segment:			3A to 3B					421

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: 3C to 3D				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	3C to 3D		0+00 to 2+00		
				Volume (CY) Per		Number Of		
Junction Rock	6"-0" jaw-run	0+00	10	junctions	33	junctions	1	33
Base Rock	6"-0" jaw-run	0+00 to 2+00	10	station	63	stations	2	126
Landings	6"-0" jaw-run	4+00	N/A	landing	88	landings	1	88
Total Rock for Road Segment:			3C to 3D					247
ROAD SEGMENT: 4A to 4B				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	4A to 4B		0+00 to 18+25		
				Volume (CY) Per		**Number Of**		
Traction Rock	1 1/2"-0" crushed	5+30 to 9+30	2	station	13	stations	4	52
Junction Rock	6"-0" jaw-run	0+00	10	junctions	33	junctions	1	33
Base Rock	6"-0" jaw-run	0+00 to 18+25	10	station	63	stations	18.25	1,150
Turnout Rock	6"-0" jaw-run	3+15,14+00	10	turnout	33	turnouts	2	66
Turnaround	6"-0" jaw-run	3+15,14+00	10	turnaround	22	turnarounds	1	22
Landings	6"-0" jaw-run	5+30,7+75, 15+30,18+25	N/A	landing	66	landings	4	264
Total Rock for Road Segment:			4A to 4B					1,587
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 49+00		
				Volume (CY) Per		**Number Of**		
Surfacing	1 1/2"-0" crushed	0+00 to 31+45	2	station	13	stations	31.45	409
Turnouts	1 1/2"-0" crushed	3+30,7+75, 11+35,18+75 , 20+95,23+85	2	turnout	11	turnouts	6	66
Junctions	1 1/2"-0" crushed	0+00	2	junction	11	junctions	1	11
Culvert Bedding and Backfill	1 1/2"-0" crushed	14+85,15+70 , 31+45	N/A	culvert	See Specific Instr.	culverts	See Specific Instr.	132
Surfacing Base	5"-0" crushed	31+45 to 49+00	4	station	25	stations	17.55	439
Turnouts	5"-0" crushed	32+80,38+90	4	turnout	22	turnouts	2	44
Turnaround	5"-0" crushed	33+85	4	turnaround	22	turnarounds	1	22
Turnaround	5"-0" crushed	33+85,41+70	4	turnaround	55	turnarounds	1	55
Rock Ditch Filters	6"-0" jaw-run	41+20	N/A	3 filter series	11	3 filter series	1	11
Landings	6"-0" jaw-run	49+00	N/A	landing	55	landings	1	55
Culvert Fill Armor	24"-6" riprap	15+70	N/A	fill	66	fills	1	66
Culvert Energy Dissipator	24"-6" riprap	14+85,15+70	N/A	dissipator	See Specific Instr.	dissipators	See Specific Instr.	33
Total Rock for Road Segment:			I1 to I2					1,343

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: I3 to I4				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	I3 to I4 Volume (CY) Per		0+00 to 17+90 Number Of		
Subgrade Leveling Rock	5"-0" crushed		N/A	load	11	loads	10	110
Turnaround	5"-0" crushed	7+70	8	turnaround	33	turnarounds	1	33
Rock Ditch Filters	6"-0" jaw-run	6+25,16+40	N/A	3 filter series	11	3 filter series	2	22
Landings	6"-0" jaw-run	17+90	N/A	landing	55	landings	1	55
Total Rock for Road Segment:			I3 to I4					220
ROAD SEGMENT: I5 to I6				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	I5 to I6 **Volume (CY) Per**		0+00 to 144+50 **Number Of**		
Surfacing	3/4"-0" crushed	125+25 to 144+50	2	station	13	stations	19.25	250
Junctions	3/4"-0" crushed	127+95,136+75, 139+15	2	junction	11	junctions	3	33
Surfacing	1 1/2"-0" crushed	0+00 to 58+80, 97+95 to 125+25	2	station	13	stations	86.1	1,119
Turnouts	1 1/2"-0" crushed	8+40,23+10, 31+00,35+55, 43+30,51+80, 55+70,81+45, 89+45,93+05, 97+95,101+35, 106+35,109+80, 188+30	2	turnout	11	turnouts	15	165
Junctions	1 1/2"-0" crushed	0+00,102+90, 125+25	2	junction	11	junctions	3	33
Curve Widening	1 1/2"-0" crushed	74+00,108+90	2	curve	22	curves	2	44
Surfacing Base	5"-0" crushed	58+80 to 70+55	4	station	25	stations	11.75	294
Turnouts	5"-0" crushed	61+35,67+75	4	turnout	22	turnouts	2	44
Total Rock for Road Segment:			I5 to I6					1,982
ROAD SEGMENT: I7 to I8				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	I7 to I8 **Volume (CY) Per**		0+00 to 2+00 **Number Of**		
Junctions	6"-0" jaw-run	0+00	2	junction	11	junctions	1	11
Junctions	6"-0" jaw-run	0+00	10	junction	22	junctions	1	22
Surfacing Base	6"-0" jaw-run	0+00 to 2+00	10	station	63	stations	2	126
Total Rock for Road Segment:			I7 to I8					159

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: I9 to I10				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	I9 to I10 Volume (CY) Per		0+00 to 1+50 Number Of		
Junctions	1 1/2"-0" crushed	0+00	2	junction	11	junctions	1	11
Junctions	6"-0" jaw-run	0+00	10	junction	22	junctions	1	22
Surfacing Base	6"-0" jaw-run	0+00 to 1+50	10	station	63	stations	1.5	95
Landings	6"-0" jaw-run	1+50	N/A	landing	55	landings	1	55
Total Rock for Road Segment:			I9 to I10					183
ROAD SEGMENT: I11 to I12				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	I11 to I12 **Volume (CY) Per**		0+00 to 22+80 **Number Of**		
Junctions	3/4"-0" crushed	0+00	2	junction	11	junctions	1	11
Traction Rock	1 1/2"-0" crushed	12+25 to 20+25	2	station	13	stations	8	104
Junctions	5"-0" crushed	0+00	8	junction	22	junctions	1	22
Turnouts	5"-0" crushed	4+80,13+65, 16+60	4	turnout	22	turnouts	3	66
Turnaround	5"-0" crushed	20+25	4	turnaround	22	turnarounds	1	22
Surfacing Base	5"-0" crushed	0+00 to 2+80	8	station	50	stations	2.8	140
Curve Widening	5"-0" crushed	0+50	8	curve	22	curves	1	22
Surfacing Base	5"-0" crushed	2+80 to 22+80	4	station	25	stations	20	500
Rock Ditch Filters	6"-0" jaw-run	20+25	N/A	3 filter series	11	3 filter series	1	11
Landings	6"-0" jaw-run	22+00	N/A	landing	55	landings	1	55
Total Rock for Road Segment:			I11 to I12					953
ROAD SEGMENT: I13 to I14				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	I13 to I14 **Volume (CY) Per**		0+00 to 2+50 **Number Of**		
Junctions	5"-0" crushed	0+00	4	junction	22	junctions	1	22
Surfacing Base	5"-0" crushed	0+00 to 2+50	4	station	25	stations	2.5	63
Landings	6"-0" jaw-run	2+50	N/A	landing	55	landings	1	55
Total Rock for Road Segment:			I13 to I14					140

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: I15 to I16				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	I15 to I16 Volume (CY) Per		0+00 to 100+90 Number Of		
Surfacing	3/4"-0" crushed	0+00 to 12+00, 69+25 to 97+55	2	station	13	stations	40.3	524
Junctions	3/4"-0" crushed	0+00,78+25, 82+30,87+00	2	junction	11	junctions	4	44
Turnouts	3/4"-0" crushed	72+40,74+25, 91+75	2	turnout	11	turnouts	3	33
Surfacing	1 1/2"-0" crushed	12+00 to 69+25, 97+55 to 100+90	2	station	13	stations	60.6	788
Turnouts	1 1/2"-0" crushed	21+95,26+60, 31+55,36+50, 39+50,46+00, 51+20,55+10, 57+65,62+40	2	turnout	11	turnouts	10	110
Junctions	1 1/2"-0" crushed	15+65,44+90, 97+55	2	junction	11	junctions	3	33
Curve Widening	1 1/2"-0" crushed	49+75	2	curve	22	curves	1	22
Total Rock for Road Segment:			I15 to I16					1554
ROAD SEGMENT: I17 to I18				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	I17 to I18 **Volume (CY) Per**		0+00 to 26+50 **Number Of**		
Junctions	1 1/2"-0" crushed	0+00	2	junction	11	junctions	1	11
Culvert Bedding and Backfill	1 1/2"-0" crushed	5+25,15+10	N/A	culvert	33	culverts	2	66
Junctions	5"-0" crushed	0+00	4	junction	22	junctions	1	22
Turnouts	5"-0" crushed	3+50,5+85, 14+35,22+00	4	turnout	22	turnouts	4	88
Turnaround	5"-0" crushed	24+40	4	turnaround	22	turnarounds	1	22
Surfacing Base	5"-0" crushed	0+00 to 26+50	4	station	25	stations	26.5	663
Jump up Landing	6"-0" jaw-run	18+90, 22+00	N/A	landing	55	landings	2	110
Landings	6"-0" jaw-run	5+85	N/A	landing	100	landings	1	100
Total Rock for Road Segment:			I17 to I18					1082
ROAD SEGMENT: I19 to I20				**POINT TO POINT**		**Sta. to Sta.**		**TOTAL VOLUME (CY)**
Application	**Rock Size And Type**	**Location**	**Depth of Rock (inches)**	I19 to I20 **Volume (CY) Per**		0+00 to 1+40 **Number Of**		
Junctions	1 1/2"-0" crushed	0+00	2	junction	11	junctions	1	11
Junctions	5"-0" crushed	0+00	4	junction	22	junctions	1	22
Surfacing Base	5"-0" crushed	0+00 to 1+40	4	station	25	stations	1.4	35
Landings	6"-0" jaw-run	2+50	N/A	landing	55	landings	1	55
Total Rock for Road Segment:			I19 to I20					123

EXHIBIT D

ROAD SURFACING

ROAD SEGMENT: Project No. 4				POINT TO POINT		Sta. to Sta.		TOTAL VOLUME (CY)
Application	Rock Size And Type	Location	Depth of Rock (inches)	Project No. 4 Volume (CY) Per		Number Of		
Surfacing Base	5"-0" crushed		N/A	station	n/a	stations	n/a	44
Safety Barrier	24"-6" riprap		N/A	barrier	44	barriers	1	44
Total Rock for Road Segment:			Project No. 4					88

ROCK TOTALS (CY)	5”-0”	1½”-0”	¾”-0”	24”-6”	6”-0”
11,636	2793	3,239	895	143	4,566

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 500 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.

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. 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

Jaw-Run Rock. The rock shall be uniformly mixed and spread in layers on the approved roadbed. Each layer of jaw-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
Segments requiring jaw-run rock	1 or 5

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. The tamper shoe dimensions shall be a minimum of 10" X 13" and capable of a centrifugal force of 2,250 pounds.

(5) Dozer. A dozer/track-type tractor weighing a minimum of 45,000 pounds as directed by STATE shall be operated over the pit-run rock so that the entire surface comes in contact with the tracks.

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 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 for all culverts on road improvement segments).

Backfill shall consist of crushed rock on improvement segments and 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.

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". Minimum vertical cover for other designs shall be as specified by STATE.

EXHIBIT E

CULVERT SPECIFICATIONS

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.

Culverts 24 inches in diameter or larger shall have 1:1 step beveled inlets.

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 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

Culverts larger than 60” in diameter shall have (3” x 1”) corrugations.

EXHIBIT E

CULVERT LIST

CULVERT NO.	DIAMETER (Inches)	LENGTH (Feet)	MATERIAL TYPE	GAUGE	ROAD SEGMENT POINT TO POINT	STATION
1	18	30	CPP	N/A	2E to 2F	4+00
2	18	30	CPP	N/A	4A to 4B	4+10
3	18	30	CPP	N/A	4A to 4B	13+00
4	18	30	CPP	N/A	4A to 4B	14+75
*5	18	30	CPP	N/A	I1 to I2	14+85
6	30	40	ACSP	N/A	I1 to I2	15+70
7	18	50	CPP	N/A	I1 to I2	31+45
8	18	30	CPP	N/A	I11 to I12	1+00
9	18	30	CPP	N/A	I17 to I18	5+25
10	18	30	CPP	N/A	I17 to I18	15+10

TOTAL LENGTHS BY DIAMETER		
18 INCH		30 INCH
290		40

ACSP = Aluminized, CPP = Polyethylene

(* = Ditch Disconnect Culvert)

EXHIBIT F

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. At the Green Mountain No.1 Quarry, fall all timber within the flagged boundary and remove all merchantable timber. All woody debris, including stumps and Slash shall be hauled to the designated disposal areas, piled and disposed of by burning as directed by STATE.

4. 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.

5. Construct outsloped access road from Green Mountain Stockpile Site to the top of Green Mountain No. 1 Quarry to remove overburden. Road shall be built to accommodate off road truck access to top of Quarry and waste area.

6. 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.

7. PURCHASER shall obtain a FPA Burn Permit prior to debris disposal for the Green Mountain No.1 Quarry.

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

9. 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.

10. 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.

11. 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.

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

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

14. The quarry site shall be left in a condition free from overburden and debris. Access roads to the quarry, and the quarry floor, shall be cleared at the termination of use. Dirt, overburden, and reject material shall be hauled to designated waste area.

15. 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.

16. 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 F

CRUSHED ROCK SPECIFICATIONS

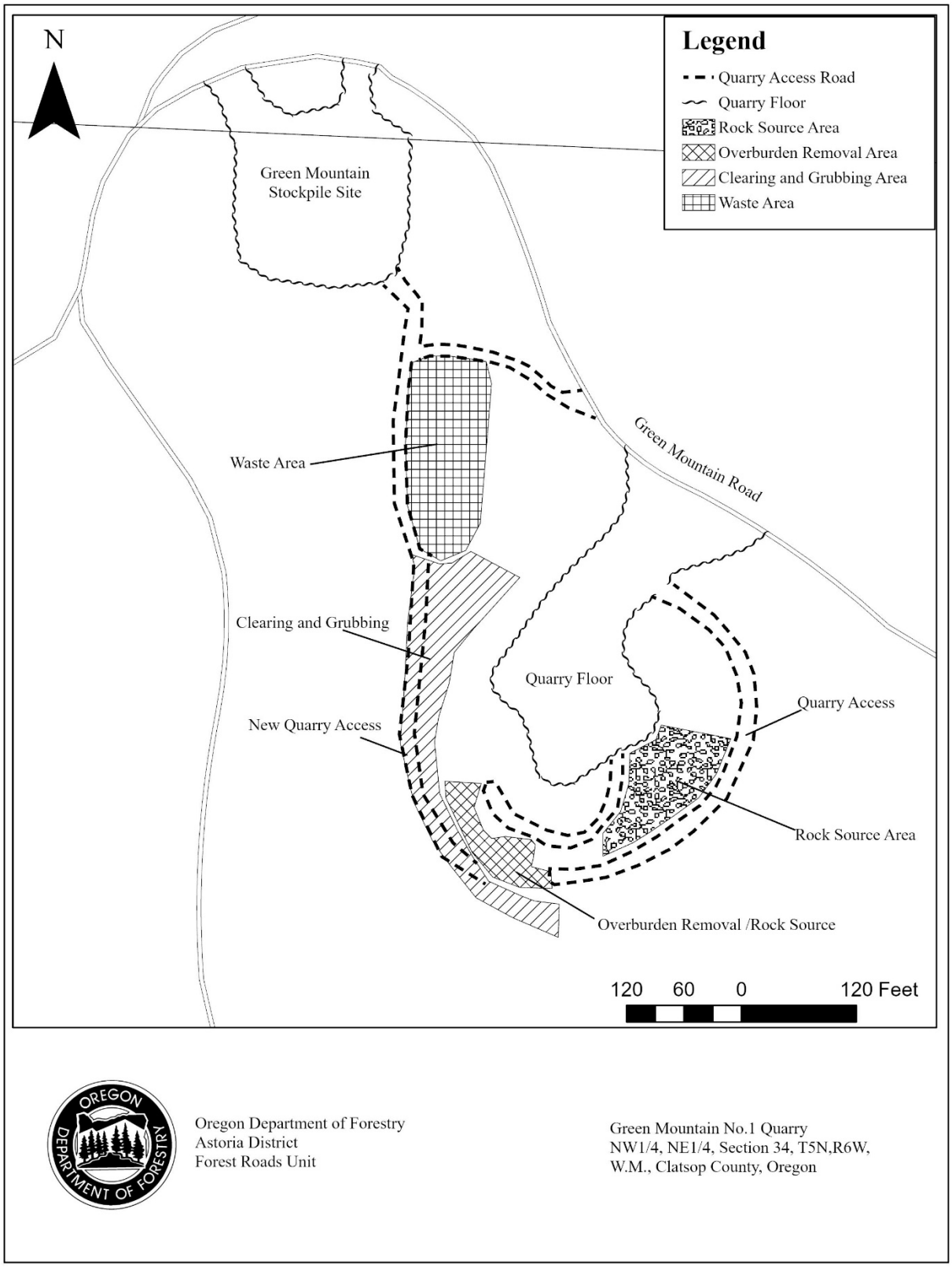


EXHIBIT F

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 5”-0” rock specified under the projects in Section 2610, “Project Work,” PURCHASER shall utilize a two-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 F

CRUSHED ROCK SPECIFICATIONS

Grading Requirements

For 5"-0"	Passing	6” sieve	100%
	Passing	5" sieve	90-100%
	Passing	4" sieve	80-90%
	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

JAW-RUN AND RIPRAP ROCK SPECIFICATIONS

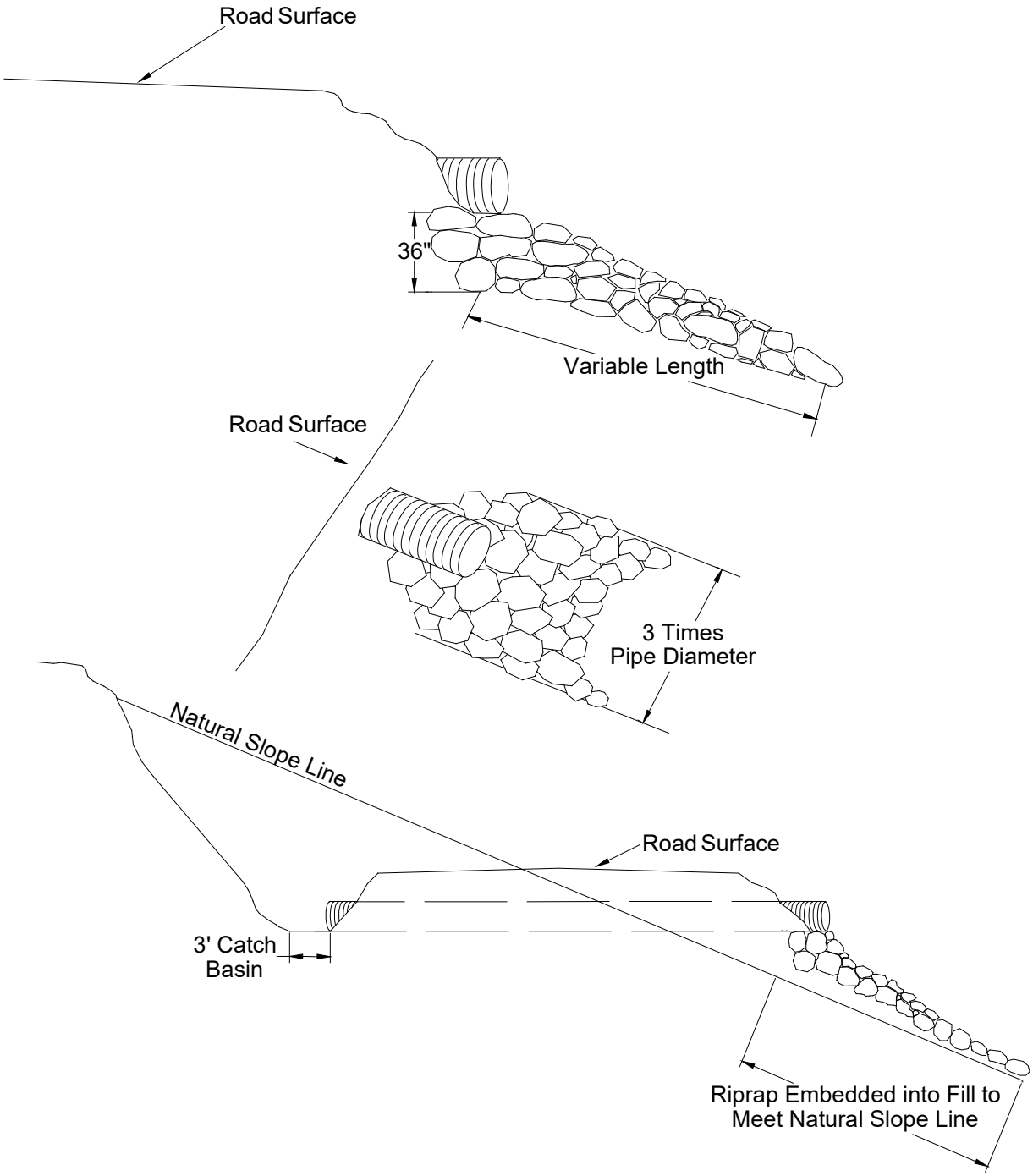
For 6”-0 Jaw-Run	Passing	6" sieve	100%
	Passing	3" sieve	45-65%
	Passing	¼" sieve	0-10%

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 G

TYPICAL EMBEDDED ENERGY DISSIPATOR



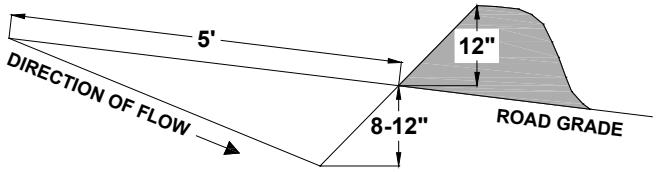
Dissipator shall be installed prior to the installation of the culvert, unless approved by STATE.

EXHIBIT H

WATERBAR SPECIFICATIONS

PROFILE

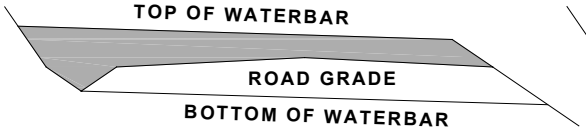
DITCHED AND OUTSLOPED



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

CROSS SECTION

DITCHED



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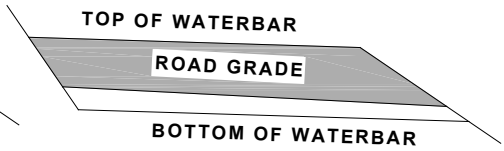
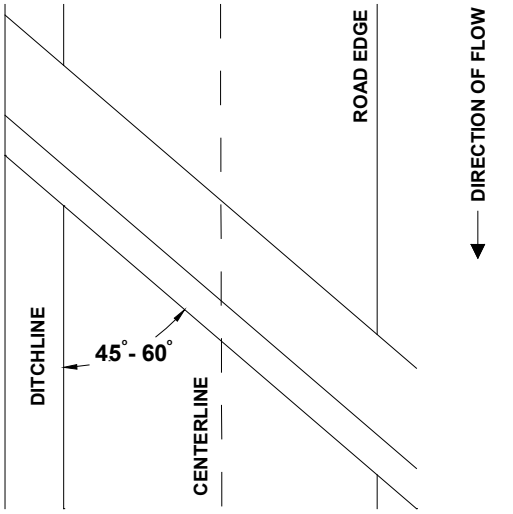


CONSTRUCT DITCHOUT THRU ANY EXISTING BERM.
CROSS DRAINAGE GRADIENT MINIMUM 3%.

PLAN VIEW

DITCHED



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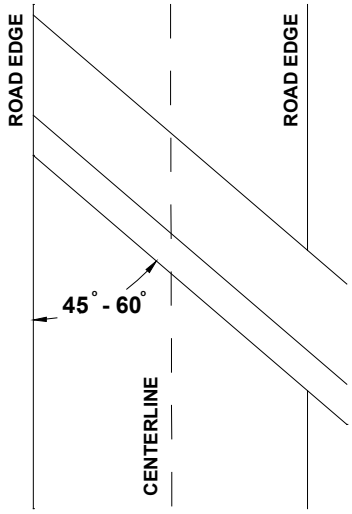

EXHIBIT I

SEEDING AND MULCHING

This work shall consist of preparing seedbeds and furnishing and placing required seed and straw mulch. Straw mulch shall consist of straw that is free of noxious weeds. Apply seed and straw mulch to all waste areas resulting from Project No. 1, 2, 3, and 4.

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 application.

APPLICATION METHODS FOR SEED

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

APPLICATION RATES FOR SEED

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%

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

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.

Application Locations:

Road Segment	Location
Project Nos. 1, 2, 3, and 4	All Designated Waste Areas
Project No. 4	Bare Soils at Project Site

Forest Practices Act
"WRITTEN PLAN"
Pump Chance/Waterhole Construction
D.R. Chopper

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

Protected Resources:

1. Waterhole Improvement. A small Type N stream. Located in the SW¼, Section 27, T5N, R6W, W.M., Clatsop County, Oregon.

A written plan is required for construction on pump chances or waterholes that will be part of a stream as specified in ORS 629-625-0100(2)(a).

Situation:

Waterhole Construction Improvement. The Oregon Department of Forestry has identified an opportunity to improve an existing waterhole on State managed forestland.

The location offers road-based access to the pump chance/waterhole for fire suppression and road water needs. The location is desirable since it is located higher up in the transportation system. Other water sources are located near Buster Creek.

Practices:

- All excavation and fill removal will be performed using a track-mounted excavator.
- Work will be performed only during dry weather periods, low water stream flows, and between April 1 and October 31, annually.
- Disturbance to existing vegetation, machine activity in the stream, and entry of sediment in the stream will be minimized.
- Excavated materials will be hauled and placed in approved waste areas and left in a stable condition.
- Disturbance to and alteration of the stream channel will be kept to the absolute minimum necessary to provide the water source required for firefighting and road use needs.
- Rock will be placed to provide stable road-based access and to minimize sediment delivery to the stream.
- All bare soils shall be seeded and mulched.

I, the undersigned, submit this written plan in compliance with the requirements in the Forest Practices Act regarding the operation of equipment near waters of the State. I agree to the protection measures listed on this plan:

Submitted: _____ Date: _____
Purchaser/Operator Contract Representative

Enclosure: Exhibit A

FOREST PRACTICES ACT "WRITTEN Plan"
Constructing a permanent Stream Crossing in a Type N Stream

Type N Stream Crossing is located in Section 27 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 Type N tributary of Selders Creek

Road Segments:
I1 to I2 (Sta. 15+70) crosses an unnamed Type N tributary of Selders Creek, located in the SW 1/4 of Section 27, T5N, R6W, W.M., Clatsop County, Oregon. A written plan is required when constructing a permanent stream crossing fill in a Type N stream, as specified in ORS 629-625-0100(2)(b)(d).

Situation:
The current structure is in a deteriorated condition.

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

Drainage Area and Structure Design:
Segment I1 to I2 (Sta. 15+70), the existing stream crossing structure will be replaced with a 30" diameter, 40' long, 14 gage aluminized steel round culvert pipe.

Road segment:	I1 to I2
Station	15+70
Size of Watershed:	32 acres
50 Year Peak Flow/Mi.^{2}:	150 cfs
100 Year Peak Flow:	9 cfs
Flow Capacity of New Structure:	20 cfs

Resource Protection Measures:

- In water work will be conducted between April 1 and October 31 during dry weather and low flow periods.
- Machine activity in stream channel shall be minimized.
- All fill excavation, backfilling, stream channel development, and riprap placement shall be performed using a minimum 2 cubic yard track mounted excavator.
- 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.
- Riprap rock shall be used to protect the structure, road approaches/embankments, and stream banks from 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 when, constructing a permanent stream crossing fill in a Type N stream. I agree to the protection measures listed on this plan.

Submitted _____ _____
Purchaser/Operator Date

Attachments: Exhibit A
Original: Salem
Copies: Operator, Purchaser, District File, Forest Roads Unit, 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: (___) _____

OREGON DEPARTMENT of FISH and WILDLIFE

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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: (___) _____