# *PART III: EXHIBITS*

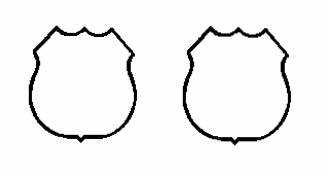


**OREGON DEPARTMENT OF FORESTRY**

**TIMBER SALE OPERATIONS PLAN**
(See Page 2 for instructions)

Date Received by STATE: _____

(5) State Brand Information (complete):



(1) Contract No.: 341-06-08

(2) Sale Name: Lost Fire Combination

(3) Contract Expiration Date: October 31, 2008 Project Completion Dates: October 31, 2006

(4) Purchaser: _____ _____

(6) Purchaser Representatives:

| | | | | |
|---|---|---|---|---|
| Projects: _____ | Phone: _____ | Cell/Other Phone: _____ | Home: _____ |
| Projects: _____ | Phone: _____ | Cell/Other Phone: _____ | Home: _____ |
| Projects: _____ | Phone: _____ | Cell/Other Phone: _____ | Home: _____ |
| Projects: _____ | Phone: _____ | Cell/Other Phone: _____ | Home: _____ |
| Logging: _____ | Phone: _____ | Cell/Other Phone: _____ | Home: _____ |
| Logging: _____ | Phone: _____ | Cell/Other Phone: _____ | Home: _____ |
| Logging: _____ | Phone: _____ | Cell/Other Phone: _____ | Home: _____ |
| Logging: _____ | Phone: _____ | Cell/Other Phone: _____ | Home: _____ |

(7) State Representatives:

| | | | |
|---|---|---|---|
| Projects: _____ | Phone: _____ | Cell/Other Phone: _____ | Home: _____ |
| Logging: _____ | Phone: _____ | Cell/Other Phone: _____ | Home: _____ |

(8) Name of Subcontractors & Starting Dates:

| | | | |
|---|---|---|---|
| Projects: No(s) _____-_____ | Date: _____ | Phone: _____ |
| No(s) _____-_____ | Date: _____ | Phone: _____ |
| No(s) _____-_____ | Date: _____ | Phone: _____ |
| No(s) _____-_____ | Date: _____ | Phone: _____ |
| Logging: Felling _____ | Date: _____ | Phone: _____ |
| Yarding: _____ | Date: _____ | Phone: _____ |

(9) Comments: _____

_____

_____

_____

_____

_____

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

EXHIBIT B

INSTRUCTION SHEET FOR OPERATIONS PLAN

**SUBMIT ONE COPY OF PLAN TO STATE**

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

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

(5) All sales require you to use a brand furnished by STATE. If the State brand has not been assigned when the plan is submitted, it will be furnished and assigned later. Complete drawing. If more than one brand is assigned to the sale, complete both drawings.

(6) The contract requires you to have a designated representative available on the sale area or work location who is authorized to receive in your behalf any notice or instruction given by STATE and to take action in regard to performance under the contract. If logging and project work is widely separated, a representative is required for each.

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

(8) Show names of subcontractors to be used for any or all phases of the operations. If subcontractors are not known, or are changed later, give notification to the STATE representative prior to commencement of work by subcontractor.

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

(10) The STATE representative will furnish extra copies of Exhibit A of the contract for your use in preparing the operations map. The map shall use the following legend and show:

1. Landing locations, approximate setting boundaries, and probable sequence of logging the settings. Number the settings in sequence.
2. Locations of spur roads planned for construction, other than those required by the timber sale contract. Provide spur road specifications.
3. Location of proposed tractor yarding roads. Show if and how marked on the ground.
4. Location of temporary stream crossings.
5. List the sequence of performing project work.
6. Location of rock sources - attach pit development plans.

| | |
|---|---|
| (1) | Cable landing, with numbers for sequence. |
| [A] | Tractor landing with alphabetical sequence. |
| _ _ _ _ _ | Approximate setting boundary. |
| - - - - - - - - | Spur truck roads. |
| ~~~ | Tractor yarding roads. |
| X | Temporary stream crossings. |

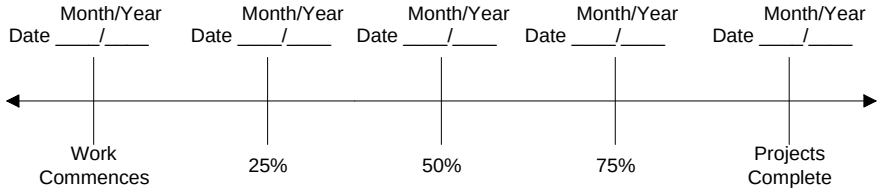
EXHIBIT B

OPERATIONS PLAN

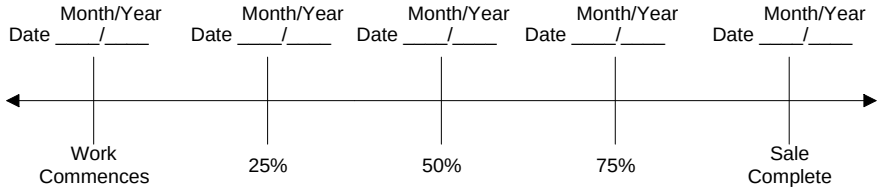
**Completion Timeline**

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

**Projects**




**Harvest & Other Requirements**




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

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

APPROVED: Date: _____

STATE OF OREGON - DEPARTMENT OF FORESTRY

_____

Title _____

SUBMITTED BY:
PURCHASER

_____

Title _____

Original: Salem
cc: District File
Purchaser

EXHIBIT C

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

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

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

(3) FROM: Astoria (04) Phone 503-325-5451
(State Forestry District)
Address 92219 Highway 202, Astoria, OR 97103

(4) PURCHASER: _____
Address _____

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

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

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

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

(8) PENCIL BUCK YES ☐ NO ☒
back to Minimum Scaling Diameter _____

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

| (10) **APPROVED SCALING LOCATIONS** | **Species** | **Yard** | **Truck** |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

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

_____
State Forester's Representative

(12) SALE NAME Lost Fire Combination
COUNTY Clatsop

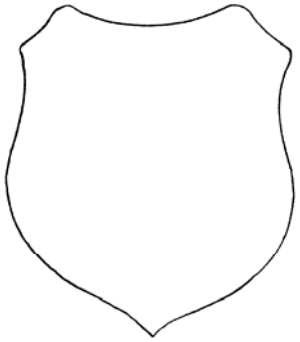
(13) STATE CONTRACT NUMBER 341-06-08

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

(15) STATE BRAND REGISTRATION NUMBER _____

(16) BUREAU BRAND CODE NUMBER _____

(17) STATE BRAND INFORMATION:
(COMPLETE)



(18) PAINT REQUIRED: YES ☒
COLOR Orange

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

(20) REMARKS: All hardwood logs shall be scaled as sawlogs unless they meet both of the following requirements: (1) contain less than 20 net board feet, and (2) are smaller than 8 inches in gross scaling diameter. All hardwood logs that meet both requirements shall be scaled as "Utility."

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

(21) SIGNATURES:

_____
Purchaser or Authorized Representative Date

_____
State Forester Representative Date

**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.**

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

EXHIBIT C

INSTRUCTIONS FOR FORM 343-307 (rev. 5/01)

(1) Check appropriate box. REVISION NUMBER requires comments. CANCELLATION requires Item (21). Complete date.

(2) Designate Third Party Scaling Organization (TPSO). Send 4 copies to TPSO, 1 to purchaser, 1 to Salem, and keep such copies as to district needs.

(3) State District office, address and phone.

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

(5) Minimum Scaling Specifications. Review Section 2040 or 2045, "Log Removal," of the Contract. Species, or combined species can be separate entries. Information serves as a basis for scaling (see also Items (13) thru (17)), and is required to show existence on the sale. **PerM** (per MBF). **SUM** (lump sum material). **SUB** (submerchantable material. SUB, as used by the State, references that material containing at least 10 bf (net) but less than the lower merchantable net volume limit or grade requirements for other merchantable (PerM) entries. PerM, SUM, and Sub must be indicated by checking the appropriate column. Species with the same specifications and value are combined into one entry. PerM and Sub require scaling therefore complete specifications. SUM need not be scaled, hence no specifications. Loads containing only SUM are to be ticketed if so instructed in Item (19). Mixed loads of SUM, PERM and/or subspecies will always be scaled.

(6) Westside -- actual taper segment scale. Check Yes or No. Special Service Rules on file with TPSO. See: Segment Scaling and Grading of Long Logs -- All Species -- State Forestry Department Scaling Practices (Westside).

(7) Eastside -- actual taper/taper table segment scale. Special Service Rules on file with TPSO. See: Segment Scaling and Grading of Long Logs -- All Species -- State Forestry Department Scaling Practices (Eastside). Items with * follow U.S. Forest Service Eastside rules.

(8) Pencil Buck. Check NO if a westside sale, optional for eastside sales.

(9) Add-Back Volume. Add-Back is normally checked YES. Scaler records deductions (sap rot, weather checks, etc.) caused by an abnormal delay in removal. Enter separately on scale ticket. TPSO provides State with summaries that include this as a net volume by species. Salvage sales and certain other circumstances may require that "NO" be checked.

(10) Show scaling locations only applicable to TPSO. Not necessary to list markets. If all species are scaled at same location, enter "ALL."

(11) When logging is complete, recall branding hammers, date and sign where indicated, check CANCELLATION box at top of form, and send to TPSO.

(12) Enter sale name and county.

(13) Enter sale Contract number.

(14) Check Westside or Eastside log scale. Cubic foot refers to Northwest Log Rules Cubic Foot Scale.

(15) Oregon Forest Products Brand Registry Number (optional).

(16) DO NOT USE -- TPSO will fill in when applicable.

(17) Show one brand only. Complete drawing. If more than one brand is assigned to the sale, (1) make separate form for each brand, and (2) on each form, explain and show other brand(s) under REMARKS, Item 19.

(18) Check YES and designate orange.

(19) Special Scales. These are the Special Scales that will be applied. If "Other" is indicated, please describe. Give comments in Item (19).

(20) Use this space to designate weight conversion factors, or any other explanations to clarify scaling requirements. If additional scaling locations are approved, prepare another form showing all (old and new) locations. Check REVISION box at top of form and explain under remarks. Route as indicated.

(21) Require purchaser to sign and date completed form.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

| SUBGRADE WIDTH | SURFACED WIDTH | POINT TO POINT | STA. TO STA. | DRAINAGE |
|---|---|---|---|---|
| 16 feet | 12 feet | 1A to 1B | 0+00 to 17+95 | Ditch |
| 14 feet | N/A Dirt | 1A to 1B | 17+95 to 31+65 | Outslope |
| 14 feet | N/A Dirt | 1C to 1D | 0+00 to 1+85 | Outslope |
| 16 feet | 12 feet | 1E to 1F | 0+00 to 16+45 | Ditch |
| 16 feet | 12 feet | 2A to 2B | 0+00 to 1+34 | Ditch |
| 16 feet | 12 feet | 3A to 3B | 0+00 to 21+83 | Ditch |
| 14 feet | 12 feet | 3C to 3D | 0+00 to 15+64 | Ditch |
| 14 feet | 12 feet | 3E to 3F | 0+00 to 10+00 | Ditch |
| 16 feet | 12 feet | 3G to 3H | 0+00 to 27+08 | Ditch |
| 16 feet | 12 feet | 3I to 3J | 0+00 to 10+85 | Ditch |
| 16 feet | 12 feet | I1 toI2 | 0+00 to 17+90 | Ditch |
| 16 feet | 12 feet | I3 to I4 | 0+00 to 15+20 | Ditch |
| 16 feet | 12 feet | I5 to I6 | 0+00 to 58+20 | Ditch |
| 16 feet | 12 feet | I7 to I8 | 0+00 to 6+80 | Ditch |
| 16 feet | 12 feet | I9 to I10 | 0+00 to 20+60 | Ditch |
| 16 feet | 12 feet | L1 to L2 | 0+00 to 86+67 | Ditch |
| 16 feet | 12 feet | L3 to L4 | 167+66 to 230+94 | 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.

Where clearing limits have not been staked, 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. Clearing debris shall not be placed or permitted to remain in or under any road embankment sections. Clearing debris shall not be left lodged against standing trees.

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

GRUBBING. This work shall consist of the removal or digging out of stumps and protruding objects.

All stumps shall be completely removed within the limits of required grubbing. Stumps overhanging cutslopes shall be removed. Grubbing debris shall not be placed or permitted to remain in or under any road embankment sections. Grubbing debris shall not be left lodged against standing trees. Grubbing classifications are as follows:

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

EXHIBIT D

FOREST ROAD SPECIFICATIONS

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. Scatter through openings in the timber outside of the cleared right-of-way, except where end-haul is required. In areas where end-haul is required, clearing and grubbing debris shall be fully contained and hauled to a designated waste area.

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

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

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

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

Excess excavation shall not be sidecast where material will enter a stream course or where material will accumulate in areas deemed a high landslide hazard location by STATE.

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

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

Curve Widening. Widen the inside shoulder of all curves as follows: 400 divided by the radius of the curve equals the amount of extra width, unless otherwise specified or as directed by STATE.

DRAINAGE

Ditch. Construct "V" ditch 3 feet wide and to a depth of 1 foot below subgrade. Subgrade shall be crowned at 4 to 6 percent. Construct ditch-outs away from subgrade at locations marked in the field.

Outslope. Road subgrade shall be outsloped at 4 to 6 percent.

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.

| GRADING | Back Slopes | Fill Slopes |
|---|---|---|
| Rock | Vertical to 1/4:1 | Not steeper |
| Common - side slopes 50% and over | 3/4:1 | than 1½:1 |
| Common - side slopes less than 50% | 1:1 | |
| Common - turnpike (level) section | 2:1 | |

Top of cutslope shall be rounded.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

LANDINGS. Landings shall be constructed no less than 50 feet wide and no more than 70 feet wide. Surface is to be crowned for drainage, with general grade no more than 3 percent. Surface as shown on Exhibit D.

TURNAROUNDS. Increase subgrade width an additional 20 feet for a length of 20 feet at locations listed in Exhibit D, and/or as marked in the field.

SEASONAL WINTERIZATION: All unrocked roads or unfinished subgrades shall be waterbarred in accordance with specifications in Exhibit L, and blocked to vehicular traffic, prior to November 1, annually, and as directed by STATE.

GENERAL ROAD CONSTRUCTION SPECIFICATIONS

(1) Excavated Material. All suitable excavated materials from the road construction and alignment shall be utilized for road and fill construction, and hauled in where necessary. Surplus excavated material and waste material shall be hauled to 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 Exhibit D.

(2) Geotextile Road Fabric. Install fabric in accordance with specifications in Exhibit I.

(3) Riprap Rock Use for Energy Dissipator. 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.

(4) Riprap Rock Use for Ditch Armoring. Where ditch armoring is required, 24”-6” riprap rock will be hauled in and used for surfacing the bottom and sides of the ditch, as directed by STATE.

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

SPECIFIC ROAD CONSTRUCTION INSTRUCTIONS

| Segment | Station | Work Description |
|---|---|---|
| 1A to 1B | 11+90 to 14+90 | Utilize 48 cubic yards of 24”-6” riprap rock to armor ditch. |
| 1E to 1F | 2+70 | Begin full bench. |
| | 6+40 | End full bench |
| | 9+10 | Begin full bench. |
| | 14+00 | End full bench. |
| 3A to 3B | 9+35 | Begin full bench. |
| | 10+85 | End full bench. |
| 3C to 3D | 0+00 to 15+64 | Install fabric in accordance to specifications in Exhibit I. |
| | 4+49 | Begin full bench. |
| | 7+84 | End full bench. |
| 3E to 3F | 0+00 to 10+00 | Install fabric in accordance to specifications in Exhibit I. |

EXHIBIT D

END-HAULING REQUIREMENTS

| POINT TO POINT | STA. TO STA. | WASTE AREA LOCATION | WASTE AREA TREATMENT |
|---|---|---|---|
| 1E to 1F | 2+70 to 6+40 | 1 | 1, 2 |
| 1E to 1F | 9+10 to 14+00 | 2 | 1, 2 |
| 3A to 3B | 9+35 to 10+85 | 3 | 1, 2 |
| 3C to 3D | 4+49 to 7+84 | 4 | 1, 2 |

End-Haul Areas General Requirements

Material shall not be intentionally side cast.

Clearing and grubbing debris shall be end-hauled.

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

Containment

Full containment: The amount of material lost over the outside edge of the road shall not exceed 6 inches in depth measured perpendicular to the natural ground slope. Pioneer excavation shall be removed by digging, loading, and hauling rather than by pushing or scraping methods.

Trees and stumps may have up to 12 inches of material directly above them. Any amount of material exceeding the containment requirements shall be removed by whatever means necessary and end-hauled to a designated waste area.

Waste Area Location

(1) Waste Area No. 1, as shown on Exhibit A, at Station 0+00 on 1E to 1F.

(2) Waste Area No. 2, as shown on Exhibit A, at Station 8+00 on 1E to 1F.

(3) Waste Area No. 3, as shown on Exhibit A, at Station 0+00 on 3A to 3B.

(4) Waste Area No. 4, as shown on Exhibit A, at Station 0+00 on 3C to 3D.

Waste Area Treatment

(1) Place excess excavated materials, end haul materials, and clearing and grubbing debris in the designated waste areas. All placed materials shall be deposited in stable locations as directed by STATE, spread evenly, compacted, and adequate drainage established. Pile woody debris on top of waste area.

(2) Mulch and seed all waste areas in accordance to Exhibit M.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

GENERAL ROAD IMPROVEMENT 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. Waste materials shall be sloped and compacted for drainage. Fills shall be thoroughly compacted in accordance with Exhibit D. In addition, all clearing and grubbing debris on road segments L1 to L2 and L3 to L4 shall be hauled to Lost Quarry and disposed of by burning.

(3) 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 pipe 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. All waste materials shall be hauled to nearby waste areas and shall be uniformly sloped and compacted for drainage. Waste materials shall be seeded and mulched in accordance with specifications in Exhibit M. Fill reconstruction 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 Exhibit D. Crushed rock shall be used for backfilling excavation trenches less than 3 feet deep. STATE may require the use of crushed rock for culvert bedding. Removed culverts shall be hauled to an approved refuse site off of STATE land.

(4) Stump Removal. Clear, grub and remove all stumps marked with and orange paint "R". Fill in stump holes located within the road shoulder with suitable excavated rock material or 4"-0" crushed rock.

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

(6) Riprap Rock Use. Where rock is specified for fill armor, rock shall be placed and tamped at a 1½:1 slope, beginning at the fill toes. Where rock is used for an energy dissipator, rock shall be placed below the culvert outlet and embedded for a minimum of 3 feet, as specified in Exhibit H.

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

(8) Sidecast Pullback. Excavate/pullback previously sidecast materials below the road at designated locations. Developed slopes shall be pulled back to a 1½:1 slope or to natural ground contours. The beginning position for sidecast pullback shall be no greater than 20 feet vertical distance from the existing road surface, in accordance with specifications in Exhibit J. Excavated materials shall be hauled to a designated waste area, as directed by STATE.

(9) Road Segments L1 to L2 and L3 to L4. Realign the road, widen, improve turnouts, and install and replace culverts in accordance with the plans on file at the Astoria District Office.

EXHIBIT D

FOREST ROAD SPECIFICATIONS

(10) Subgrade Preparation and Application of New Surfacing Rock.

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

(b) Cut out all chuckholed and/or washboarded sections from the existing surfacing.

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

(d) Process (grade and mix) the existing surface and added base rock. Provide for a crown of 4 to 6 percent (½ inch per foot in road width), and compact in accordance with Exhibit D.

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

(f) Apply Lignin Sulfonate (Palliative) on road segments L1 to L2 and L3 to L4, in accordance to specifications in Exhibit N.

(11) Controlled blasting. 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 road prism.

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

| Segment | Station | Work Description |
|---|---|---|
| I1 to I2 | 0+00 | Point I1. |
| | 2+20 | Replace existing culvert. Utilize 20 cubic yards of 1 ½”-0” crushed rock for culvert backfill. |
| | 8+00 | Install culvert. Utilize 20 cubic yards of 1 ½”-0” crushed rock for culvert backfill. |
| | 17+90 | Point I2. |
| I3 to I4 | 0+00 | Point I3. |
| | 3+90 | Install culvert. Utilize 12 cubic yards of 1 ½”-0” crushed rock for culvert backfill. |
| | 5+15 | Fill reconstruction and culvert placement. Finished subgrade width shall be 18 feet. Utilize 40 cubic yards of 1 ½”-0” crushed rock for culvert bedding and backfill. Utilize 30 Cubic yards of 24”-6” riprap rock for fill slope armor. Utilize 12 cubic yards 24”-6” riprap rock to construct an embedded energy dissipator. Utilize 30 cubic yards of 4”-0” crushed rock for base rock restoration. |
| | 6+50 | Fill reconstruction and culvert placement. Finished subgrade width shall be 18 feet. Utilize 40 cubic yards of 1 ½”-0” crushed rock for culvert bedding and backfill. Utilize 24 Cubic yards of 24”-6” riprap rock for fill slope armor. Utilize 12 cubic yards of 24”-6” riprap rock to construct an embedded energy dissipator. Utilize 30 cubic yards of 4”-0” crushed rock for base rock restoration. |
| | 11+30 | Install culvert. Utilize 24 cubic yards of 1 ½”-0” crushed rock for culvert backfill. |
| | 15+00 | Install culvert. Utilize 24 cubic yards of 1 ½”-0” crushed rock for culvert backfill. |

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

| Segment | Station | Work Description |
|---|---|---|
| I5 to I6 | 0+00 | Point I5. |
| | 2+35 | Replace existing culvert. Utilize 24 cubic yards of 1 ½”-0” crushed rock for culvert backfill. |
| | 2+97 | Begin curve widening. Utilize 24 cubic yards of 4”-0” base rock for alignment. |
| | 4+76 | End curve widening. |
| | 5+76 | Begin curve widening. Utilize 24 cubic yards of 4”-0” base rock for alignment. |
| | 8+00 | Install culvert. Utilize 24 cubic yards of 1 ½”-0” crushed rock for culvert backfill. |
| | 10+41 | End curve widening. |
| | 12+30 | Install culvert. Utilize 24 cubic yards of 1 ½”-0” crushed rock for culvert backfill. |
| | 13+90 | Begin curve widening. Utilize 24 cubic yards of 4”-0” base rock for alignment. |
| | 15+70 | End curve widening. |
| | 23+90 | Begin curve widening. Utilize 24 cubic yards of 4”-0” base rock for alignment. |
| | 25+95 | End curve widening. |
| | 25+95 | Junction with Point 3A. |
| | 28+50 | Junction with Point 3G. |
| | 30+25 | Replace existing culvert. Utilize 24 cubic yards of 1 ½”-0” crushed rock for culvert backfill. |
| | 34+35 | Replace existing culvert. Utilize 24 cubic yards of 1 ½”-0” crushed rock for culvert backfill. |
| | 40+25 | Remove existing culvert. Utilize 36 cubic yards of 1 ½”-0” crushed rock for backfill. |
| | 40 +45 | Install culvert. Utilize 24 cubic yards of 1 ½”-0” crushed rock for culvert backfill. |
| | 46+90 | Fill reconstruction and culvert placement. Finished subgrade width shall be 18 feet. Utilize 40 cubic yards of 1 ½”-0” crushed rock for culvert bedding and backfill. Utilize 30 Cubic yards of 24”-6” riprap rock for fill slope armor. Utilize 12 cubic yards of 24”-6” riprap rock to construct an embedded energy dissipator. Utilize 30 cubic yards of 4”-0” crushed rock for base rock restoration. Utilize 24 cubic yards of 1 ½”-0” crushed rock for surface rock. |
| | 51+75 | Begin ditch reconstruction. |
| | 52+20 | End ditch reconstruction. |

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

| Segment | Station | Work Description |
|---|---|---|
| I5 to I6 (cont.) | 54+40 | Install culvert. Utilize 24 cubic yards of 1 ½”-0” crushed rock for culvert backfill. |
| | 55+35 | Fill reconstruction and culvert replacement. Finished subgrade width shall be 18 feet. Utilize 40 cubic yards of 1 ½”-0” crushed rock for culvert bedding and backfill. Utilize 30 Cubic yards of 24”-6” riprap rock for fill slope armor. Utilize 12 cubic yards of 24”-6” riprap rock to construct an embedded energy dissipator. Utilize 30 cubic yards of 4”-0” crushed rock for base rock restoration. Utilize 24 cubic yards of 1 ½”-0” crushed rock for surface rock. |
| | 55+70 | Construct turnaround left. Utilize 24 cubic yards of 4”-0” crushed rock for base rock. |
| | 57+75 | Install culvert. Utilize 24 cubic yards of 1 ½”-0” crushed rock for culvert backfill. |
| | 58+20 | Point I6. |
| I7 to I8 | 0+00 | Point I7. Realign road 20 feet left to align with junction 1E to 1F. |
| | 0+60 | Begin sidecast pullback. Utilize 60 cubic yards of 24”-6” riprap for fill slope armor. |
| | 0+75 | Remove existing culvert. Utilize 24 cubic yards of 4”-0” crushed rock for backfill. |
| | 0+85 | Begin road realignment 2 feet right. |
| | 1+85 | End sidecast pullback. |
| | 2+10 | End road realignment right. |
| | 5+00 | Construct turn out left. Utilize 24 cubic yards of 4”-0” crushed rock for base rock. |
| | 6+80 | Point I8. Ditch out right. |

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

| Segment | Station | Work Description |
|---|---|---|
| L1 to L2 | 0+00 | Point L1. |
| | 4+56 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 7+33 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 13+23 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 17+39 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 20+03 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 21+55 | Drill and shoot exposed subgrade rock and/or remove exposed boulders. |
| | 30+54 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 35+72 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 41+80 | Point V4. |
| | 47+29 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 52+40 | Drill and shoot exposed subgrade rock and/or remove exposed boulders. |
| | 52+55 | Culvert replacement, install with a 30° skew and at a 10% gradient. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 62+67 | Waste Area for segment L1-L2 waste material. |
| | 76+24 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

| Segment | Station | Work Description |
|---|---|---|
| L1 to L2 (cont.) | 82+28 | Install culvert. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 Cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 86+67 | Point L2. |
| L3 to L4 | 167+66 | Point L3. |
| | 174+22 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. |
| | 177+59 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 178+05 | End moving centerline into hill. |
| | 179+81 | Point I5. |
| | 181+44 | Install culvert. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 184+12 | Install culvert. Remove all woody debris and unsuitable material encountered during the culvert installation and waste in old borrow pit. Haul in suitable fill replacement material from Station 215+20. Utilize 10 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. |
| | 187+13 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 196+44 | Install culvert. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipater construction. |
| | 203+00 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of riprap rock for energy dissipator construction. |
| | 207+23 | Culvert replacement. Utilize 20 cubic yards of ¾"-0" crushed rock for culvert bedding and backfill. Utilize 10 cubic yards of 24"-6" riprap rock for energy dissipator construction. |
| | 209+46 | Begin ripping and tilling of unused portion of existing road per Exhibit J. |
| | 211+90 | Remove existing culvert on old road. Install new culvert. |

EXHIBIT D

FOREST ROAD SPECIFICATIONS

SPECIFIC ROAD IMPROVEMENT INSTRUCTIONS

| Segment | Station | Work Description |
|---|---|---|
| L3 to L4 (cont.) | 216+59 | Begin side cast pull back. |
| | 217+55 | Culvert replacement. Utilize 10 cubic yards of 24”-6” riprap rock for construction of energy dissipator. Utilize 20 cubic yards of 24”-6” riprap rock for fill armor. |
| | 221+16 | Culvert replacement. |
| | 226+18 | Culvert replacement. |
| | 226+80 | End ripping and tilling of unused portion of existing road. |
| | 230+94 | Point L4. |

EXHIBIT D

ROAD SURFACING

| ROAD SEGMENT: 1A to 1B | | | | POINT TO POINT | | Sta. to Sta. | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 1A to 1B | | 0+00 to 17+95 | | TOTAL |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) |
| Base Rock | 4"-0" Crushed | 0+00 to 17+95 | 10 | station | 63 | stations | 17.95 | 1,131 |
| Turnouts | 4"-0" Crushed | 2+29, 11+90 | 10 | turnout | 28 | turnouts | 2 | 56 |
| Junction | 4"-0" Crushed | 7+71 | 10 | junction | 12 | junction | 1 | 12 |
| Curve Widening | 4"-0" Crushed | 0+54 to 3+11 | 10 | | 40 | stations | 1 | 40 |
| Curve Widening | 4"-0" Crushed | 5+05 to 7+14 | 10 | | 13 | stations | 1 | 13 |
| Ditch Armor | 24"-6" Riprap | 11+90 to 14+90 | N/A | | | | | 48 |
| Culvert Bedding | 1 1/2"- 0" Crushed | 5+60 | N/A | | | | | 36 |
| Traction Rock | 3/4"- 0" Crushed | 2+29 to 5+86 | 2 | station | 13 | stations | 3.57 | 46 |
| Traction Rock | 3/4"- 0" Crushed | 7+14 to 9+21 | 2 | station | 13 | stations | 2.07 | 27 |
| Traction Rock | 3/4"- 0" Crushed | 13+82 to 17+95 | 2 | station | 13 | stations | 4.13 | 54 |
| Total Rock for Road Segment: | | | 1A to 1B | | | | | 1,463 |

| ROAD SEGMENT: 1E to 1F | | | | POINT TO POINT | | Sta. to Sta. | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 1E to 1F | | 0+00 to 16+45 | | TOTAL |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) |
| Base Rock | 4"-0" Crushed | 0+00 to 16+45 | 8 | station | 50 | stations | 16.45 | 823 |
| Junction | 4"-0" Crushed | 0+00 | 8 | junction | 50 | junction | 1.00 | 50 |
| Turnout | 4"-0" Crushed | 8+30 | 8 | turnout | 22 | turnouts | 1 | 22 |
| Turnaround | 4"-0" Crushed | 15+00 | 8 | turnaround | 24 | T/A | 1 | 24 |
| Curve Widening | 4"-0" Crushed | 0+00 to 2+00 | 8 | | 34 | | 1 | 34 |
| Junction | 3/4"- 0" Crushed | 0+00 | N/A | junction | 24 | junction | 1 | 24 |
| Traction Rock | 3/4"- 0" Crushed | 2+02 to 10+27 | 2 | station | 13 | stations | 8.25 | 107 |
| Landing | 6"-0" Pit-Run | 16+45 | N/A | landing | 60 | landings | 1 | 60 |
| Total Rock for Road Segment: | | | 1E to 1F | | | | | 1,144 |

| ROAD SEGMENT: 2A to 2B | | | | POINT TO POINT | | Sta. to Sta. | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 2A to 2B | | 0+00 to 1+34 | | TOTAL |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) |
| Base Rock | 4"-0" Crushed | 0+00 to 1+34 | 8 | station | 50 | stations | 1.34 | 67 |
| Junction | 4"-0" Crushed | 0+00 | 8 | junction | 24 | junction | 1 | 24 |
| Junction | 3/4"- 0" Crushed | 0+00 | 2 | | 12 | | 1 | 12 |
| Landing | 6"-0" Pit-Run | 1+34 | N/A | landing | 60 | landings | 1 | 60 |
| Total Rock for Road Segment: | | | 2A to 2B | | | | | 163 |

EXHIBIT D

ROAD SURFACING

| ROAD SEGMENT: 3A to 3B | | | | POINT TO POINT | | Sta. to Sta. | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 3A to 3B | | 0+00 to 21+83 | | TOTAL |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) |
| Base Rock | 4"-0" Crushed | 0+00 to 21+83 | 8 | station | 50 | stations | 21.83 | 1,092 |
| Turnouts | 4"-0" Crushed | 3+35, 13+85 | 8 | turnout | 22 | turnouts | 2.00 | 44 |
| Turnouts | 4"-0" Crushed | 14+70, 18+72 | 8 | turnout | 22 | turnouts | 2 | 44 |
| Curve Widening | 4"-0" Crushed | 6+57 to 8+94 | 8 | | 12 | | 1 | 12 |
| Traction Rock | 3/4"- 0" Crushed | 1+79 to 8+30 | 2 | station | 13 | stations | 6.51 | 85 |
| Traction Rock | 3/4"- 0" Crushed | 10+85 to 21+83 | 2 | station | 13 | stations | 10.98 | 143 |
| Landing | 6"-0" Pit-Run | 14+70 | N/A | landing | 60 | landings | 1.00 | 60 |
| Total Rock for Road Segment: | | | 3A to 3B | | | | | 1,479 |
| **ROAD SEGMENT: 3C to 3D** | | | | **POINT TO POINT** | | **Sta. to Sta.** | | |
| | | | | 3C to 3D | | 0+00 to 15+64 | | TOTAL |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) |
| Base Rock | 4”-0” Crushed | 0+00 to 15+64 | 8 | station | 50 | stations | 15.64 | 782 |
| Turnouts | 4”-0” Crushed | 4+20, 11+04 | 8 | turnout | 22 | turnouts | 2 | 44 |
| Turnaround | 4”-0” Crushed | 14+24 | 8 | turnaround | 24 | T/A | 1 | 24 |
| Traction Rock | ¾”- 0” Crushed | 1+15 to 4+65 | 2 | station | 13 | stations | 3.50 | 46 |
| Landing | 6”-0” Pit-Run | 15+64 | N/A | landing | 60 | landings | 1 | 60 |
| Total Rock for Road Segment: | | | 3C to 3D | | | | | 956 |
| **ROAD SEGMENT: 3E to 3F** | | | | **POINT TO POINT** | | **Sta. to Sta.** | | |
| | | | | 3E to 3F | | 0+00 to 10+00 | | TOTAL |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) |
| Base Rock | 4"-0" Crushed | 0+00 to 10+00 | 8 | station | 50 | stations | 10.00 | 500 |
| Junction | 4"-0" Crushed | 0+00 | 8 | | 48 | | 1 | 48 |
| Turnouts | 4"-0" Crushed | 3+60, 9+40 | 8 | turnout | 22 | turnouts | 2 | 44 |
| Turnaround | 4"-0" Crushed | 7+70 | 8 | turnaround | 24 | T/A | 1 | 24 |
| Traction Rock | 3/4"- 0" Crushed | 0+00 to 3+60 | 2 | station | 13 | stations | 3.6 | 47 |
| Landing | 6"-0" Pit-Run | 10+00 | N/A | landing | 60 | landings | 1 | 60 |
| Total Rock for Road Segment: | | | 3E to 3F | | | | | 723 |

EXHIBIT D

ROAD SURFACING

| ROAD SEGMENT: 3G to 3H | | | | POINT TO POINT | | Sta. to Sta. | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 3G to 3H | | 0+00 to 27+08 | | TOTAL |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) |
| Base Rock | 4"-0" Crushed | 0+00 to 27+08 | 8 | station | 50 | stations | 27.08 | 1,354 |
| Turnouts | 4"-0" Crushed | 8+50, 21+10 | 8 | turnout | 22 | turnouts | 2.00 | 44 |
| Turnaround | 4"-0" Crushed | 26+50 | 8 | turnaround | 24 | T/A | 1 | 24 |
| Curve Widening | 4"-0" Crushed | 19+77 to 21+91 | 8 | | 32 | | | 32 |
| Traction Rock | 3/4"- 0" Crushed | 13+57 to22+71 | 2 | station | 13 | stations | 9.14 | 119 |
| Landing | 6"-0" Pit-Run | 21+10, 27+08 | N/A | landing | 60 | landings | 2 | 120 |
| Total Rock for Road Segment: | | | 3G to 3H | | | | | 1,693 |
| **ROAD SEGMENT: 3I to 3J** | | | | **POINT TO POINT** | | **Sta. to Sta.** | | |
| | | | | 3I to 3J | | 0+00 to 10+85 | | TOTAL |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) |
| Base Rock | 4”-0” Crushed | 0+00 to 10+85 | 8 | station | 50 | stations | 10.85 | 543 |
| Junction | 4”-0” Crushed | 0+00 | 8 | junction | 36 | junctions | 1 | 36 |
| Turnout | 4”-0” Crushed | 6+50 | 8 | turnout | 22 | turnouts | 1.00 | 22 |
| Turnaround | 4”-0” Crushed | 9+90 | 8 | turnaround | 24 | T/A | 1 | 24 |
| Traction Rock | ¾”- 0” Crushed | 2+11 to 7+49 | 2 | station | 13 | stations | 5.38 | 70 |
| Landing | 6”-0” Pit-Run | 10+85 | N/A | landing | 60 | landings | 1 | 60 |
| Total Rock for Road Segment: | | | 3I to 3J | | | | | 754 |
| **ROAD SEGMENT: I1 to I2** | | | | **POINT TO POINT** | | **Sta. to Sta.** | | |
| | | | | I1 to I2 | | 0+00 to 17+90 | | TOTAL |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) |
| Surface Rock | 1 1/2"-0" Crushed | 0+00 to 2+50 | 3 | station | 19 | stations | 2.5 | 48 |
| Junctions | 3/4"-0" Crushed | 0+00 | N/A | junction | 12 | junction | 1.00 | 12 |
| Leveling | 4"-0" Crushed | 0+00 to 17+90 | N/A | | | | | 200 |
| Culvert Backfill | 1 1/2"-0" Crushed | 2+20 | N/A | | | | | 24 |
| Culvert Backfill | 1 1/2"-0" Crushed | 8+00 | N/A | | | | | 24 |
| Landing | 6"-0" Pit-Run | 17+90 | N/A | | | | | 60 |
| Total Rock for Road Segment: | | | I1 to I2 | | | | | 368 |

EXHIBIT D

ROAD SURFACING

| **ROAD SEGMENT: I3 to I4** | | | | **POINT TO POINT** | | **Sta. to Sta.** | | |
|---|---|---|---|---|---|---|---|---|
| | | | **Depth of Rock (inches)** | I3 to I4 | | 0+00 to 15+20 | | **TOTAL VOLUME (CY)** |
| **Application** | **Rock Size and Type** | **Location** | | **Volume (CY) per** | | **Number of** | | |
| Junction | 4"-0" Crushed | 0+00 | N/A | junction | 20 | junctions | 1.00 | 20 |
| Junction | 3/4"-0" Crushed | 0+00 | N/A | junction | 12 | junctions | 1.00 | 12 |
| Culvert Backfill | 1 1/2"-0" Crushed | 3+90 | N/A | | | | | 12 |
| Culvert Bedding | 1 1/2"-0" Crushed | 5+15 | N/A | | | | | 36 |
| Dissipator | 24"-6" Riprap | 5+15 | N/A | | | | | 12 |
| Fill Armor | 24"-6" Riprap | 5+15 | N/A | | | | | 36 |
| Base Rock Restoration | 4"-0" Crushed | 5+15 | N/A | | | | | 36 |
| Culvert Bedding | 1 1/2"-0" Crushed | 6+50 | N/A | | | | | 40 |
| Dissipator | 24"-6" Riprap | 6+50 | N/A | | | | | 12 |
| Fill Armor | 24"-6" Riprap | 6+50 | N/A | | | | | 24 |
| Base Rock Restoration | 4"-0" Crushed | 6+50 | N/A | | | | | 36 |
| Culvert Backfill | 1 1/2"-0" Crushed | 11+30 | N/A | | | | | 24 |
| Culvert Backfill | 1 1/2"-0" Crushed | 15+00 | N/A | | | | | 24 |
| Leveling | 4"-0" Crushed | 15+20 | N/A | | | | | 36 |
| Leveling | 1 1/2"-0" Crushed | 0+00 to 15+20 | N/A | | | | | 150 |
| Surface Rock | 1 1/2"-0" Crushed | 0+00 to 15+20 | 3 | station | 19 | stations | 15 | 289 |
| Total Rock for Road Segment: | | | I3 to I4 | | | | | 799 |

EXHIBIT D

ROAD SURFACING

| ROAD SEGMENT: I5 to I6 | | | | POINT TO POINT | | Sta. to Sta. | | |
|---|---|---|---|---|---|---|---|---|
| | | | | I5 to I6 | | 0+00 to 58+20 | | TOTAL VOLUME (CY) |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | |
| Leveling Rock | 1 1/2"-0" Crushed | 0+00 to 58+20 | N/A | | | | | 300 |
| Base Rock for Alignment | 4"-0" Crushed | 2+97 to 4+76 | 8 | | | | | 24 |
| Base Rock for Alignment | 4"-0" Crushed | 5+76 to 10+41 | 8 | | | | | 24 |
| Base Rock for Alignment | 4"-0" Crushed | 13+90 to 15+70 | 8 | | | | | 24 |
| Base Rock for Alignment | 4"-0" Crushed | 23+90 to 25+95 | 8 | | | | | 24 |
| Junctions | 3/4"-0" Crushed | 0+00 | N/A | junction | 24 | junctions | 1 | 24 |
| Junctions | 1 1/2"-0" Crushed | 26+95 | N/A | junction | 24 | junctions | 1 | 24 |
| Junctions | 1 1/2"-0" Crushed | 28+50 | N/A | junction | 24 | junctions | 1 | 24 |
| Culvert Backfill | 1 1/2"-0" Crushed | 2+35 | N/A | | | | | 24 |
| Culvert Backfill | 1 1/2"-0" Crushed | 8+00 | N/A | | | | | 24 |
| Culvert Backfill | 1 1/2"-0" Crushed | 12+30 | N/A | | | | | 24 |
| Culvert Backfill | 1 1/2"-0" Crushed | 30+25 | N/A | | | | | 24 |
| Culvert Backfill | 1 1/2"-0" Crushed | 34+35 | N/A | | | | | 24 |
| Culvert Backfill | 1 1/2"-0" Crushed | 40+25 | N/A | | | | | 36 |
| Culvert Backfill | 1 1/2"-0" Crushed | 40+45 | N/A | | | | | 24 |
| Culvert Backfill | 1 1/2"-0" Crushed | 54+40 | N/A | | | | | 24 |
| Culvert Backfill | 1 1/2"-0" Crushed | 57+75 | N/A | | | | | 24 |
| Culvert Bedding | 1 1/2"-0" Crushed | 46+90 | N/A | | | | | 36 |
| Dissipator | 24"-6" Riprap | 46+90 | N/A | | | | | 12 |
| Fill Armor | 24"-6" Riprap | 46+90 | N/A | | | | | 36 |
| Base Rock Restoration | 4"-0" Crushed | 46+90 | N/A | | | | | 36 |
| Surface Rock | 1 1/2"-0" Crushed | 46+90 | N/A | | | | | 24 |
| Culvert Bedding | 1 1/2"-0" Crushed | 55+35 | N/A | | | | | 36 |
| Dissipator | 24"-6" Riprap | 55+35 | N/A | | | | | 12 |
| Fill Armor | 24"-6" Riprap | 55+35 | N/A | | | | | 36 |
| Base Rock Restoration | 4"-0" Crushed | 55+35 | N/A | | | | | 36 |
| Surface Rock | 1 1/2"-0" Crushed | 55+35 | N/A | | | | | 24 |
| Turnaround | 4"-0" Crushed | 55+70 | N/A | | | | | 24 |
| Total Rock for Road Segment: | | | I5 to I6 | | | | | 1,008 |

EXHIBIT D

ROAD SURFACING

| **ROAD SEGMENT: I7 to I8** | | | | **POINT TO POINT** | | **Sta. to Sta.** | | |
|---|---|---|---|---|---|---|---|---|
| | | | **Depth of Rock (inches)** | I7 to I8 | | 0+00 to 6+80 | | **TOTAL VOLUME (CY)** |
| **Application** | **Rock Size and Type** | **Location** | | **Volume (CY) per** | | **Number of** | | |
| Junction | 4"-0" Crushed | 0+00 | 8" | junction | 36 | junctions | 1.00 | 36 |
| Junction | 1 1/2"-0" Crushed | 0+00 | N/A | junction | 12 | junctions | 1 | 12 |
| Base Rock | 4"-0" Crushed | 0+00 to 0+60 | 8" | station | 50 | stations | 0.6 | 30 |
| Base Rock for alignment | 4"-0" Crushed | 0+60 to 2+10 | 8" | | | | | 24 |
| Culvert Backfill Rock | 4"-0" Crushed | 0+75 | | | | | | 24 |
| Leveling Rock | 1 1/2"-0" Crushed | 0+60 to 2+53 | | | | | | 36 |
| Leveling Rock | 4"-0" Crushed | 2+53 to 6+80 | | | | | | 120 |
| Turnout | 4"-0" Crushed | 5+00 | 8" | | | | | 24 |
| Armor Rock | 24"-6" Riprap | 0+60 to 1+85 | | | | | | 60 |
| Landing Rock | 6"-0" Pit-Run | 6+80 | | | | | | 60 |
| Total Rock for Road Segment: | | | I7 to I8 | | | | | 426 |
| **ROAD SEGMENT: I9 to I10** | | | | **POINT TO POINT** | | **Sta. to Sta.** | | |
| | | | **Depth of Rock (inches)** | I9 to I10 | | 0+00 to 20+60 | | **TOTAL VOLUME (CY)** |
| **Application** | **Rock Size and Type** | **Location** | | **Volume (CY) per** | | **Number of** | | |
| Leveling Rock | 3/4"-0" Crushed | 0+00 to 20+60 | | station | 10 | stations | 20.60 | 206 |
| Total Rock for Road Segment: | | | I9 to I10 | | | | | 206 |

EXHIBIT D

ROAD SURFACING

| ROAD SEGMENT: L1 to L2 | | | | POINT TO POINT | | Sta. to Sta. | | |
|---|---|---|---|---|---|---|---|---|
| | | | | L1 to L2 | | 0+00 to 86+67 | | TOTAL |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | VOLUME (CY) |
| Base Rock | 4"-0" Crushed | 2+40 to 7+30 | 8 | station | 24 | stations | 4.90 | 118 |
| Base Rock | 4"-0" Crushed | 11+58 to 13+65, | 8 | station | 50 | stations | 2.07 | 104 |
| Base Rock | 4"-0" Crushed | 31+56 to 39+59 | 8 | station | 13 | stations | 8.03 | 104 |
| Base Rock | 4"-0" Crushed | 40+64 to 55+40 | 8 | station | 29 | stations | 14.76 | 428 |
| Base Rock | 4"-0" Crushed | 55+40 to 56+81 | 8 | station | 50 | stations | 1.41 | 71 |
| Base Rock | 4"-0" Crushed | 56+81 to 57+92 | 8 | station | 11 | stations | 1.11 | 12 |
| Base Rock | 4"-0" Crushed | 60+09 to 63+31 | 8 | station | 50 | stations | 3.22 | 161 |
| Base Rock | 4"-0" Crushed | 65+99 to 68+41 | 8 | station | 5 | stations | 2.42 | 12 |
| Base Rock | 4"-0" Crushed | 72+26 to 73+29 | 8 | station | 11 | stations | 1.03 | 11 |
| Base Rock | 4"-0" Crushed | 78+50 to 81+27 | 8 | station | 17 | stations | 2.77 | 47 |
| Fill Widening | 4"-0" Crushed | 55+40 to 56+81 | 8 | station | 8 | stations | 1.41 | 11 |
| Fill Widening | 4"-0" Crushed | 60+09 to 63+31 | 8 | station | 8 | stations | 3.22 | 26 |
| Turnouts (50') | 4"-0" Crushed | 2+00, 5+10 | 8 | turnout | 22 | turnouts | 2 | 44 |
| Turnouts (50') | 4"-0" Crushed | 25+75, 28+17 | 8 | turnout | 22 | turnouts | 2 | 44 |
| Turnouts (50') | 4"-0" Crushed | 30+57, 41+14 | 8 | turnout | 22 | turnouts | 2 | 44 |
| Turnouts (50') | 4"-0" Crushed | 48+45, 72+48 | 8 | turnout | 22 | turnouts | 2 | 44 |
| Turnouts (50') | 4"-0" Crushed | 79+07 | 8 | turnout | 22 | turnouts | 1 | 22 |
| Turnouts (100') | 4"-0" Crushed | 66+03, | 8 | turnout | 37 | turnouts | 1 | 37 |
| Turnout Improve | 4"-0" Crushed | 57+96 to 59+40 | 8 | n/a | | n/a | 1 | 100 |
| Curve Widening | 4"-0" Crushed | 2+60 to 3+63 | 8 | curve | 12 | curves | 1 | 12 |
| Curve Widening | 4"-0" Crushed | 3+80 to 7+06 | 8 | curve | 24 | curves | 1 | 24 |
| Surface Course | 3/4"-0" Crushed | | 4 | station | 25 | stations | 86.67 | 2,167 |
| Turnouts (50') | 3/4"-0" Crushed | | 4 | turnout | 11 | turnouts | 21 | 231 |
| Turnouts (100') | 3/4"-0" Crushed | 66+03, 85+23 | 4 | turnout | 19 | turnouts | 2 | 38 |
| Turnouts (150') | 3/4"-0" Crushed | 57+96 | 4 | turnout | 23 | turnouts | 1 | 23 |
| Curve Widening | 3/4"-0" Crushed | | 4 | curve | | curves | 23 | 144 |
| Junctions | 3/4"-0" Crushed | | 4 | junction | 25 | junctions | 3 | 75 |
| Fill Widening | 3/4"-0" Crushed | 55+40 to 56+81 | 4 | station | 4 | stations | 1.41 | 6 |
| Fill Widening | 3/4"-0" Crushed | 60+09 to 63+31 | 4 | station | 4 | stations | 3.22 | 13 |
| Culvert Bedding | 3/4"-0" Crushed | 4+56, 7+33 | | culvert | 20 | culverts | 2 | 40 |
| Culvert Bedding | 3/4"-0" Crushed | 13+23, 17+39 | | culvert | 20 | culverts | 2 | 40 |
| Culvert Bedding | 3/4"-0" Crushed | 20+03, 30+54 | | culvert | 20 | culverts | 2 | 40 |
| Culvert Bedding | 3/4"-0" Crushed | 35+72, 47+29 | | culvert | 20 | culverts | 2 | 40 |
| Culvert Bedding | 3/4"-0" Crushed | 52+55,76+24 | | culvert | 20 | culverts | 2 | 40 |
| Culvert Bedding | 3/4"-0" Crushed | 82+28 | | culvert | 20 | culverts | 1 | 20 |
| Leveling Rock | 3/4"-0" Crushed | | | | | | | 192 |
| Energy Dissipators | 24"-6" Riprap | | | culvert | 10 | culvets | 11 | 110 |
| Total Rock for Road Segment: | | | L1 to L2 | | | | | 4,694 |

EXHIBIT D

ROAD SURFACING

| ROAD SEGMENT: L3 to L4 | | | | POINT TO POINT | | Sta. to Sta. | | |
|---|---|---|---|---|---|---|---|---|
| | | | | L3 to L4 | | 167+66 to 230+94 | | TOTAL VOLUME (CY) |
| Application | Rock Size and Type | Location | Depth of Rock (inches) | Volume (CY) per | | Number of | | |
| Base Course | 4"-0" Crushed | 169+00 to 170+20 | 8 | station | 21 | stations | 1.20 | 25 |
| Base Course | 4"-0" Crushed | 175+15 to184+63 | 8 | station | 50 | stations | 9.48 | 474 |
| Base Course | 4"-0" Crushed | 185+50 to 189+64 | 8 | station | 15 | stations | 4.14 | 62 |
| Base Course | 4"-0" Crushed | 192+33 to 196+44 | 8 | station | 50 | stations | 4.11 | 206 |
| Base Course | 4"-0" Crushed | 205+90 to 228+45 | 8 | station | 50 | stations | 22.55 | 1,128 |
| Turnouts (50') | 4"-0" Crushed | 170+80,176+26 | 8 | turnout | 22 | turnouts | 2 | 44 |
| Turnouts (50') | 4"-0" Crushed | 212+81,220+07 | 8 | turnout | 22 | turnouts | 2 | 44 |
| Turnouts (50') | 4"-0" Crushed | 224+56,226+56 | 8 | turnout | 22 | turnouts | 2 | 44 |
| Turnouts (100') | 4"-0" Crushed | 178+25,182+93 | 8 | turnout | 37 | turnouts | 2 | 74 |
| Turnouts (100') | 4"-0" Crushed | 209+80 | 8 | turnout | 37 | turnouts | 1 | 37 |
| Curve Widening | 4"-0" Crushed | 176+18 to 177+41 | 8 | curve | 48 | curves | 1 | 48 |
| Curve Widening | 4"-0" Crushed | 179+92 to 181+94 | 8 | curve | 24 | curves | 1 | 24 |
| Curve Widening | 4"-0" Crushed | 187+67 to 188+60 | 8 | curve | 12 | curves | 1 | 12 |
| Curve Widening | 4"-0" Crushed | 207+15 to 208+22 | 8 | curve | 48 | curves | 1 | 48 |
| Curve Widening | 4"-0" Crushed | 210+11 to 211+00 | 8 | curve | 24 | curves | 1 | 24 |
| Curve Widening | 4"-0" Crushed | 211+70 to 212+23 | 8 | curve | 24 | curves | 1 | 24 |
| Curve Widening | 4"-0" Crushed | 217+14to 218+18 | 8 | curve | 48 | curves | 1 | 48 |
| Curve Widening | 4"-0" Crushed | 218+32 to 218+74 | 8 | curve | 12 | curves | 1 | 12 |
| Curve Widening | 4"-0" Crushed | 219+87 to 220+64 | 8 | curve | 12 | curves | 1 | 12 |
| Curve Widening | 4"-0" Crushed | 220+93 to 221+46 | 8 | curve | 12 | curves | 1 | 12 |
| Curve Widening | 4"-0" Crushed | 223+79 to 224+51 | 8 | curve | 12 | curves | 1 | 12 |
| Curve Widening | 4"-0" Crushed | 224+81 to 225+75 | 8 | curve | 24 | curves | 1 | 24 |
| Curve Widening | 4"-0" Crushed | 226+58 to 227+07 | 8 | curve | 12 | curves | 1 | 12 |
| Fill in Stump Holes | 4"-0" Crushed | | | hole | 12 | holes | 4 | 48 |
| Surface Course | 3/4"-0" Crushed | | 4 | station | 25 | stations | 63.28 | 1,582 |
| Turnouts (50') | 3/4"-0" Crushed | | 4 | turnout | 11 | turnouts | 8 | 88 |
| Turnouts (75') | 3/4"-0" Crushed | | 4 | turnout | 15 | turnouts | 1 | 15 |
| Turnouts (100') | 3/4"-0" Crushed | | 4 | turnout | 19 | turnouts | 4 | 76 |
| Curve Widening | 3/4"-0" Crushed | | 4 | | | | | 168 |
| Culvert Bedding | 3/4"-0" Crushed | 174+22,177+59 | | culvert | 20 | culverts | 2 | 40 |
| Culvert Bedding | 3/4"-0" Crushed | 181+44,184+12 | | culvert | 20 | culverts | 2 | 40 |
| Culvert Bedding | 3/4"-0" Crushed | 187+13,196+44 | | culvert | 20 | culverts | 2 | 40 |
| Culvert Bedding | 3/4"-0" Crushed | 203+00,207+23 | | culvert | 20 | culverts | 2 | 40 |
| Junctions | 3/4"-0" Crushed | | 4 | junction | 25 | junctions | 1 | 25 |
| Leveling Rock | 3/4"-0" Crushed | | | | | | | 96 |
| Energy Dissipators | 24"-6" Riprap | | | culvert | 10 | culverts | 7 | 70 |
| Fill Armor | 24"-6" Riprap | | | fill | 20 | fills | 1 | 20 |
| Total Rock for Road Segment: | | | L3 to L4 | | | | | 4,797 |

EXHIBIT D

ROAD SURFACING

| ROCK TOTALS | 24"-6" | 6"-0" | 4"-0" | 1½"-0" | 3/4"-0" |
|---|---|---|---|---|---|
| 20,671 | 488 | 600 | 11,782 | 1,450 | 6,351 |

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

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

ROCK ACCOUNTABILITY

Subgrades must be approved by STATE prior to rocking. Rocking must be done only when weather conditions are acceptable to STATE, and must be suspended when muddy water could enter streams from runoff.

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

Rock Checking. All rock spreading shall be done only when a STATE representative is present. STATE shall issue a receipt for each load delivered, and rock shall be measured without allowance for shrinkage or shakedown during hauling. Total truck measure volume for each road segment shall be as shown on Exhibit D. Deliver at least 700 cubic yards per 8-hour shift, unless otherwise approved by STATE. A penalty of $10.00 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. If additional rock is required because of insufficient depth, it shall be added by truck measure to those areas that were slighted. The conversion from compacted yardage to truck yardage is 1.3 multiplied by the compacted yardage equals truck yardage.

The depth of compacted aggregates shall not vary more than 1 inch from the depth specified in Exhibit D. The average depth for each road segment shall be the specified depth or greater. Surfacing areas shall be staked by STATE.

Load Records. Notify STATE before spreading the rock and maintain a record of all rock delivered for spreading. Make the record available for STATE inspection. A report listing the amount of rock delivered the prior month must be submitted no later than the 15th of each month.

EXHIBIT D

COMPACTION AND PROCESSING REQUIREMENTS

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

| ROAD SEGMENT | COMPACTION EQUIPMENT OPTIONS |
|---|---|
| All Road Segments that Require Rock Surfacing | 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 or, in the case of a sheepsfoot roller, the roller "walks out." A minimum of 3 passes shall be made over the entire width and length of each layer. A pass is defined as traveling a fill layer in one direction and then back over that same layer again.

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

| ROAD SEGMENT | COMPACTION EQUIPMENT OPTIONS |
|---|---|
| All Road Segments | 1 or 2 or 3; and 4 |

Crushed Rock. The rock shall be uniformly mixed and spread in layers on the approved roadbed. Each layer of crushed rock shall be moistened or dried to a uniform moisture content suitable for maximum compaction and compacted in layers not to exceed 8 inches in depth except where installation of road fabric is required. When more than 1 layer is required, each shall be shaped and compacted before the succeeding layer is placed. Any irregularities or depressions that develop during compaction of the top layer shall be corrected by loosening the material at these places and adding or removing material until the surface is smooth and uniform. Each layer shall be compacted with a minimum of 3 passes over the entire width and length of the road. A pass is defined as traveling a road section in one direction and then back over that same section again. Compaction shall be accomplished by using one or more of the approved equipment options listed below:

| ROAD SEGMENT | COMPACTION EQUIPMENT OPTIONS |
|---|---|
| All Road Segments that Require Crushed 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) Tampingfoot Compactors. Tampingfoot or sheepsfoot compactors shall exert a minimum pressure of 250 pounds per square inch on the ground area in contact with the tamping feet. The compactor shall cover a minimum width of 60 inches per pass and weigh a minimum of 16,000 pounds.

(3) 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 surface comes into contact with the tires. Skidders with oversized tires (high floatation) are not acceptable for compaction.

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

# EXHIBIT E

## CULVERT SPECIFICATIONS

All culvert materials shall be furnished and installed by PURCHASER, unless otherwise specified in the Contract. Culverts shall conform to the material and fabricating requirements of Section 2410 and 2420 of the "Standard Specifications for Highway Construction" prepared by the Highway Division of the Oregon State Department of Transportation. All culverts shall be constructed with double-walled polyethylene. Double-walled polyethylene pipe shall meet the requirements of AASHTO M-294-901, Type S. Corrugation types and shapes other than those meeting the above minimum Highway requirements, shall be approved in writing by STATE. This specification applies to high density polyethylene corrugated pipe with an integrally formed smooth interior. Clean reworked material may be used.

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

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

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

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

A bedding of granulated material or crushed rock as specified shall be placed to provide a wide band of support and to transmit the load from above evenly over the entire length of the pipe.

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

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

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

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

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

Fill heights, if not shown on a road plan and profile, shall be in accordance with those in drawing No. 2094, “Fill Height Tables,” prepared by the Highway Division of the Oregon State Department of Transportation. Any deviation must be approved by STATE.

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” and 18” for culverts 42” to 96” (add 6" for roads which will not be rocked). Minimum vertical cover for other designs shall be as specified by STATE.

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

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

Construct lead-off ditches away from culvert outlets where slope gradients restrict the free flow of water.

All coupling band designs shall be in accordance with the minimum requirements of the Highway Division (Drawing Nos. 2091-A and B), or as approved by STATE.

Polyethylene culverts between 3" to 10" in diameter shall meet the requirements of AASHTO M-252-851. Polyethylene culverts between 10" to 36" in diameter shall be double walled and meet the requirements of AASHTO M-294-901, Type S.

The intake ends of culverts 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 be a minimum of 2½ inches in width, with the spade driven 2 feet into the ground.

All removed culverts shall be hauled to an approved refuse site off of STATE land.

All culverts 24 inches in diameter or greater shall have 1:1 beveled inlets.

CULVERT LIST

| CULVERT NO. | DIAMETER (Inches) | LENGTH (Feet) | ROAD SEGMENT POINT TO POINT | STATION |
|---|---|---|---|---|
| 1 | 18 | 30 | 1A to 1B | 1+90 |
| 2 | 18 | 30 | 1A to 1B | 5+00 |
| 3 | 24 | 40 | 1A to 1B | 5+60 |
| 4 | 18 | 40 | 1A to 1B | 8+60 |
| 5 | 18 | 30 | 1A to 1B | 15+90 |
| 5 | 18 | 35 | 1E to 1F | 3+70 |
| 7 | 18 | 30 | 1E to 1F | 8+60 |
| 8 | 18 | 30 | 1E to 1F | 11+89 |
| 9 | 18 | 30 | 3A to 3B | 0+30 |
| 10 | 18 | 30 | 3A to 3B | 4+00 |

EXHIBIT E

CULVERT LIST

| CULVERT NO. | DIAMETER (Inches) | LENGTH (Feet) | ROAD SEGMENT POINT TO POINT | STATION |
|---|---|---|---|---|
| 11 | 18 | 30 | 3A to 3B | 13+85 |
| 12 | 18 | 30 | 3A to 3B | 17+35 |
| 13 | 18 | 30 | 3A to 3B | 20+25 |
| 14 | 18 | 50 | 3C to 3D | 0+50 |
| 15 | 18 | 30 | 3C to 3D | 8+60 |
| 16 | 18 | 30 | 3C to 3D | 12+24 |
| 17 | 18 | 30 | 3E to 3F | 5+72 |
| 18 | 18 | 30 | 3G to 3H | 1+65 |
| 19 | 18 | 30 | 3G to 3H | 3+50 |
| 20 | 18 | 30 | 3G to 3H | 6+00 |
| 21 | 18 | 30 | 3G to 3H | 13+50 |
| 22 | 18 | 30 | 3G to 3H | 18+00 |
| 23 | 18 | 30 | 3I to 3J | 5+50 |
| 24 | 18 | 25 | I1 to I2 | 2+20 |
| 25 | 18 | 30 | I1 to I2 | 8+00 |
| 26 | 18 | 30 | I3 to I4 | 3+90 |
| 27 | 24 | 40 | I3 to I4 | 5+15 |
| 28 | 24 | 40 | I3 to I4 | 5+50 |
| 29 | 18 | 30 | I3 to I4 | 11+30 |
| 30 | 18 | 35 | I3 to I4 | 15+00 |
| 31 | 18 | 30 | I5 to I6 | 2+35 |
| 32 | 18 | 30 | I5 to I6 | 8+00 |
| 33 | 18 | 30 | I5 to I6 | 12+30 |
| 34 | 18 | 30 | I5 to I6 | 30+25 |
| 35 | 18 | 30 | I5 to I6 | 34+35 |
| 36 | 18 | 30 | I5 to I6 | 40+45 |
| 37 | 24 | 40 | I5 to I6 | 46+90 |
| 38 | 18 | 30 | I5 to I6 | 54+40 |
| 39 | 24 | 40 | I5 to I6 | 55+35 |

EXHIBIT E

CULVERT LIST

| CULVERT NO. | DIAMETER (Inches) | LENGTH (Feet) | ROAD SEGMENT POINT TO POINT | STATION |
|---|---|---|---|---|
| 40 | 18 | 30 | I5 to I6 | 57+75 |
| 41 | 18 | 32 | L1 to L2 | 4+56 |
| 42 | 18 | 40 | L1 to L2 | 7+33 |
| 43 | 18 | 48 | L1 to L2 | 13+23 |
| 44 | 18 | 42 | L1 to L2 | 17+39 |
| 45 | 18 | 34 | L1 to L2 | 20+03 |
| 46 | 18 | 44 | L1 to L2 | 30+54 |
| 47 | 18 | 40 | L1 to L2 | 35+72 |
| 48 | 18 | 32 | L1 to L2 | 47+29 |
| 49 | 18 | 32 | L1 to L2 | 52+55 |
| 50 | 18 | 44 | L1 to L2 | 76+24 |
| 51 | 18 | 42 | L1 to L2 | 82+28 |
| 52 | 18 | 42 | L3 to L4 | 174+22 |
| 53 | 18 | 42 | L3 to L4 | 177+59 |
| 54 | 18 | 36 | L3 to L4 | 181+44 |
| 55 | 18 | 58 | L3 to L4 | 184+12 |
| 56 | 18 | 32 | L3 to L4 | 187+13 |
| 57 | 18 | 32 | L3 to L4 | 196+44 |
| 58 | 18 | 36 | L3 to L4 | 203+00 |
| 59 | 18 | 44 | L3 to L4 | 207+23 |
| 60 | 18 | 34 | L3 to L4 | 211+90 |
| 61 | 18 | 40 | L3 to L4 | 217+55 |
| 61 | 18 | 44 | L3 to L4 | 221+16 |
| 63 | 18 | 32 | L3 to L4 | 226+18 |

EXHIBIT F

ROCK QUARRY DEVELOPMENT AND USE

(1) PURCHASER shall prepare a written development plan for the pit area. The plan shall be submitted to STATE for approval prior to conducting any operation in pit 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 STATE contracts requiring quarry or stockpile usage.

(3) Pit site shall be left in a condition free from overburden and debris. Access roads to the pit, and the pit floor, shall be cleared at the termination of use. Overburden shall be removed for a distance of 20 feet beyond the developed rock source. Trees removed for Quarry development will be felled, bucked, and decked at a site acceptable to the STATE adjacent to the quarry.

(4) 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. 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.

(5) PURCHASER shall conduct the operation relative to the disposal of waste material in such manner that silt, rock, debris, dirt, or clay shall not be washed, conveyed, or otherwise deposited in any stream.

(6) Strip overburden from the rock source area. All overburden and reject material shall be hauled or pushed to the designated waste area. Waste material shall be spread evenly on the site, sloped for drainage, and compacted as directed by STATE.

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

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

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

(10) Oversized material that is produced or encountered during development shall be broken down and utilized for crushing or riprap rock, as directed by the STATE.

(11) Proper winterization and storm-water control measures such as water barring, drainage, utilization of filter bales, mulching and/or blocking access shall be utilized and such measures maintained to protect the watershed and project work, as directed by STATE.

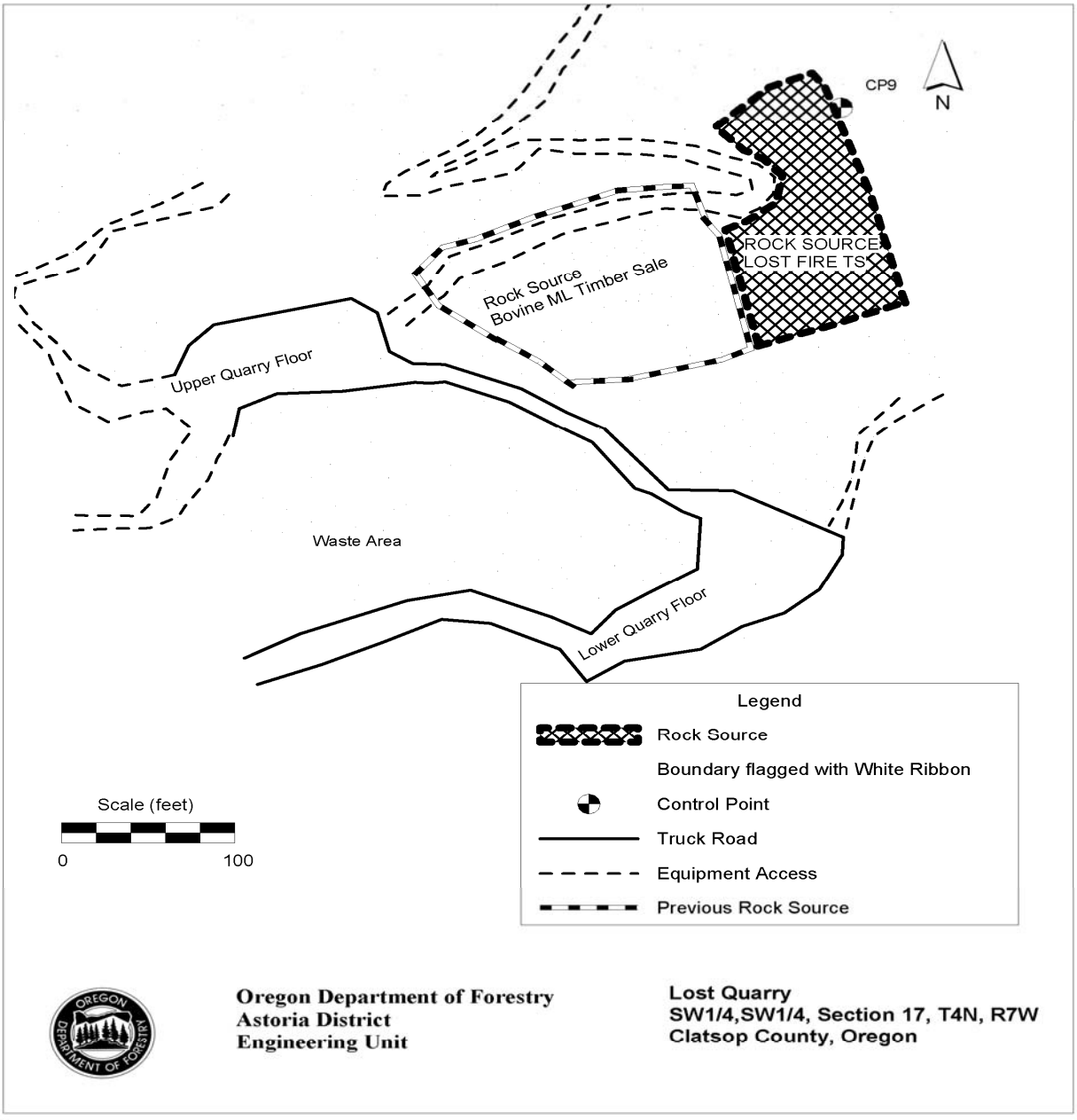
(12) PURCHASER shall notify STATE 5 days prior to the start of quarry development activities.

(13) All quarry backslopes shall be left in a stable condition.

(14) The quarry floor shall be developed to provide for drainage away from the quarry. All quarry and stockpile site drainage ditches shall be maintained. Quarry access roads shall be cleared and blocked upon completion of quarry use as directed by STATE.

EXHIBIT F

ROCK QUARRY DEVELOPMENT AND USE



State Timber Sale Contract
No. 341-06-08
Lost Fire Combination

EXHIBIT G

## CRUSHED ROCK SPECIFICATIONS

Materials. The material shall be fragments of rock or other hard, durable particles crushed to the required size and a filler of finely crushed stone, sand, or other finely divided mineral matter. The material shall be free from vegetation and lumps of clay. State may require screening and/or rejecting of materials utilized for production of crushed rock for the purpose of removing excess fines or dirt.

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

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

Hardness - Test Method AASHTO T 96 35% Maximum

Durability - Test Method OSHD Standard
Passing No. 20 Sieve: 30% Maximum
Sediment Height: 3" Maximum

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

Of the fraction passing ¼" sieve, 40% to 60% shall pass the No. 10 sieve.

| | | | |
|---|---|---|---|
| For 1½"-0" | Passing | 2" sieve | 100% |
| | Passing | 1½" sieve | 95-100% |
| | Passing | 3/4" sieve | 60-90% |
| | Passing | 1/4" sieve | 35-50% |

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

| | | | |
|---|---|---|---|
| For 4"-0" | Passing | 5" sieve | 100% |
| | Passing | 4" sieve | 90-100% |
| | Passing | 2" sieve | 60-90% |
| | Passing | 1/4" sieve | 15-35% |

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

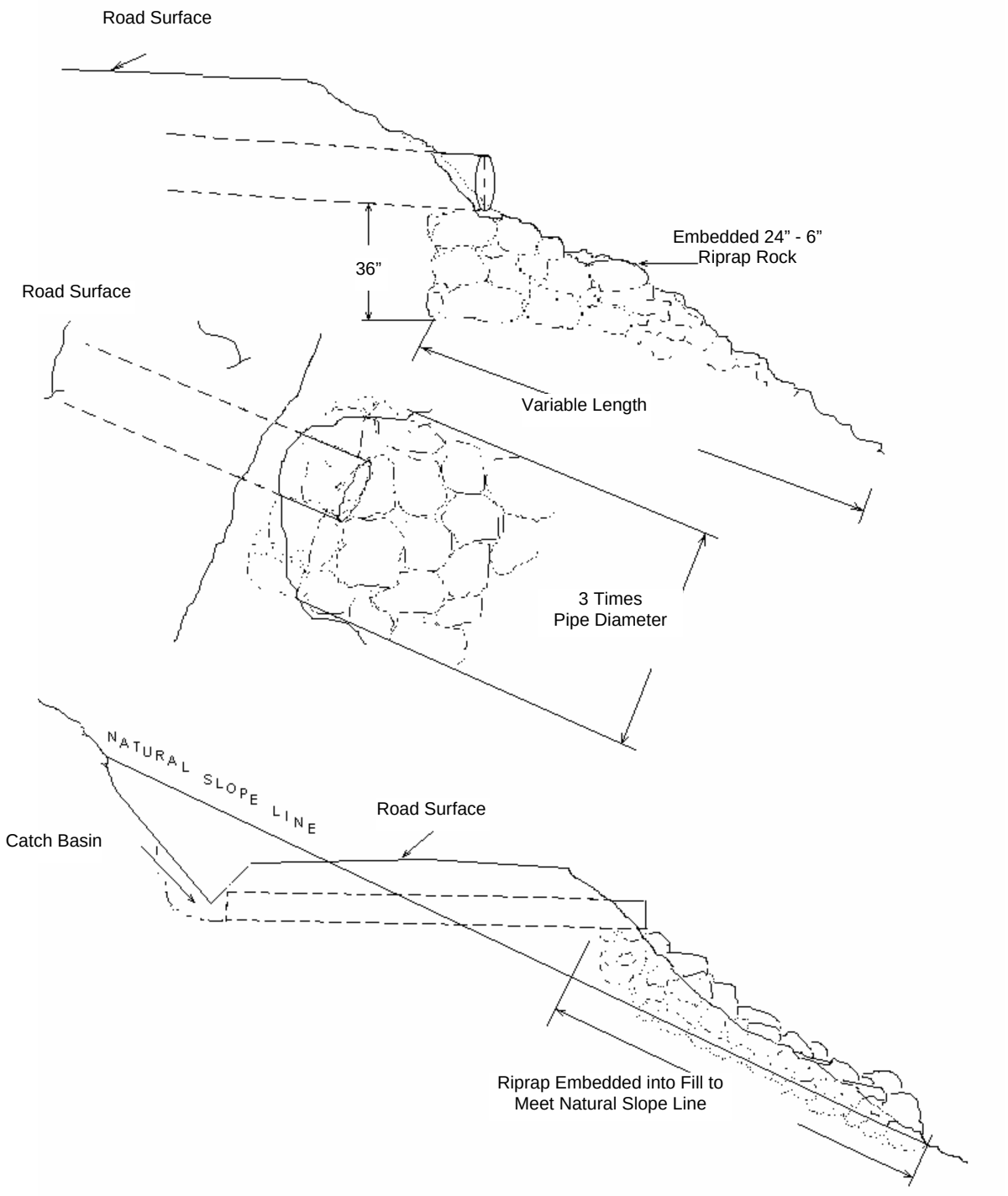
For 24"-6" Riprap — A minimum of 50 percent of the material shall measure a minimum of 24 inches, measured in one dimension. Material shall be clean, well graded, and free of 2"-0" fines.

Control of gradations shall be by visual inspection by STATE.

State Timber Sale Contract
No. 341-06-08
Lost Fire Combination

EXHIBIT H

TYPICAL ENERGY DISSIPATOR



State Timber Sale Contract
No. 341-06-08
Lost Fire Combination

EXHIBIT I

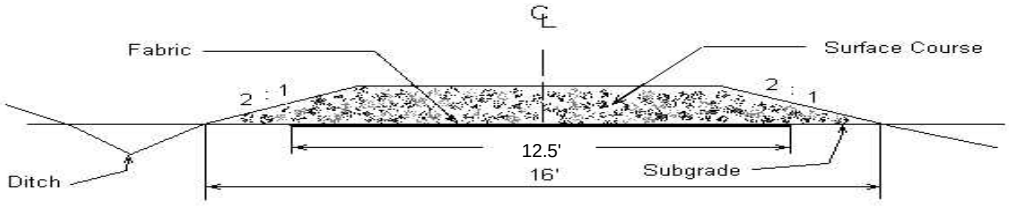
FABRIC SPECIFICATIONS

FABRIC SPECIFICATIONS - shall be woven fabric designed for forest road subgrade surfacing purposes and shall meet or exceed the following requirements, unless otherwise approved in writing by STATE:

| | | | |
|---|---|---|---|
| (1) | Grab Tensile Strength | 300 lbs. | ASTM D4632 |
| (2) | Puncture Strength | 110 lbs. | ASTM D4833 |
| (3) | Mullen Burst | 600 lbs. | ASTM D3786 |
| (4) | Width | 12.5 feet | |

INSTALLATION REQUIREMENTS - fabric shall be installed according to the following requirements:

(1) Typical cross section:




(2) Subgrade surface shall be leveled and smoothed to remove humps and depressions which exceed 6 inches in height and depth. Small pieces of woody debris shall be removed or pushed below subgrade surface. Light vegetation (grass, weeds, leaves, and fine woody debris) may be left in place.

(3) Fabric shall be installed directly on the prepared surface. Longitudinal and traverse joints shall be overlapped at least 3 feet.

(4) Surfacing course material shall be placed to the designated thickness in one lift and spread in the direction of fabric overlap. Hauling and spreading equipment shall not be operated on the fabric until the total thickness of surfacing course material is placed.

(5) Torn, punctured, or separated sections of the fabric shall be repaired, by installing a fabric patch over the break prior to placing the surfacing course material. The patch shall be at least 4 feet larger in horizontal dimensions than the break to be repaired.

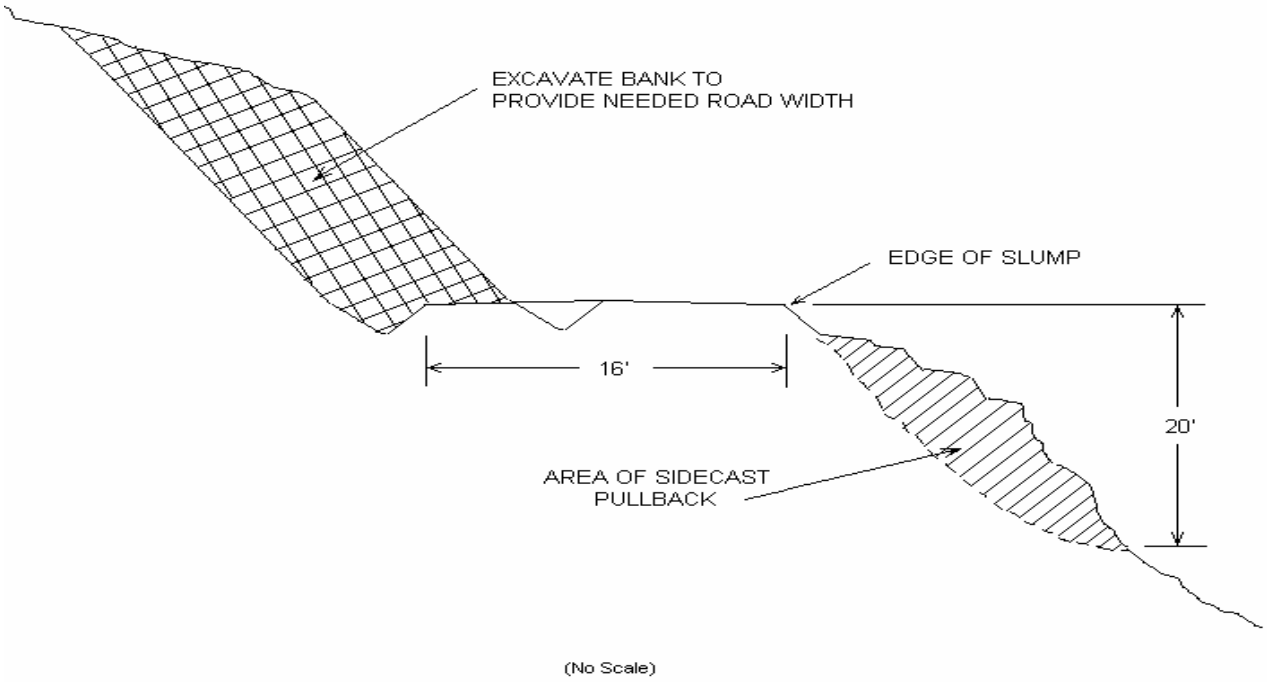
(6) Fabric failures resulting after rock placement and as evidenced by subgrade pumping or roadbed distortion shall be corrected. Correction measures shall consist of: (1) removing at least three-quarters the depth of surfacing course material in the affected area, (2) placing a fabric patch over the affected area with a minimum 4-foot overlap around the circumference of the area, and (3) replacing enough rock to cover the patch and blend in with the rest of the road.

(7) Should STATE determine that installation of fabric on roads or portions of roads is not necessary, PURCHASER shall deliver an equivalent amount of road fabric to STATE.

(8) Install fabric at the following locations: 3C to 3D 0+00 to 15+64 and 3E to 3F 0+00 to 10+00.

EXHIBIT J

TYPICAL CROSS SECTION VIEW OF SIDECAST PULLBACK AND ROAD REALIGNMENT




(No Scale)

Rip and Till Subgrade. Rip and till the compacted subgrade soils to a minimum depth of 18 inches for portions of road segment L3 to L4 that require ripping and tilling.

Culvert Removal. Remove all existing culverts in road segment L3 to L4 that are not part of the final road subgrade.

EXHIBIT K

ROAD VACATING, SIDECAST REMOVAL, AND FILL REMOVAL SPECIFICATIONS
V1 to V2, V3, and V4 to V5

PROJECT REQUIREMENTS AND GENERAL SPECIFICATIONS

(1) Timber Removal. Remove all trees within posted Right of Way Boundary or individually marked with an orange "X", as specified in Section 2210, "Designated Timber."

(2) Culvert Removal. Remove drainage structures and culverts. Removed culverts shall be hauled to an approved refuse site off of STATE land.

(3) Fill Removal and Stream Channel Development. Remove fills to the natural stream course level(s). Stream channel(s) shall be excavated/developed to specified widths, or restored to natural contours, as directed by STATE. Developed stream banks shall be sloped at natural contours or no steeper than 1½:1, as directed by STATE.

(4) Sidecast Pullback. Excavate/pullback previously sidecast materials below the road at designated locations. Developed slopes shall be pulled back to a 1½:1 slope or to natural ground contours. The beginning position for sidecast pullback shall be no greater than 20 feet vertical distance from the existing road surface.

(5) Use of Excavated Materials.

(a) Fill Excavation. Excavated materials shall be placed on the interior (cut) side of the road a minimum of 10 feet from the top of the developed stream bank, and utilized to restore the cutslope to natural contours, or to a minimum 10% outsloped surface for drainage. Any excess material will be hauled to a designated waste area, as directed by STATE.

(b) Sidecast Pullback. Excavated materials shall be placed on the interior (cut) side of the road, and utilized to restore the cut slope to natural contours or to a minimum 10% out slope for drainage, or hauled to designated waste areas per specific instructions as directed by STATE.

(c) Woody Debris may be incorporated in embankment material, and/or placed on the surface of the compacted embankment material.

(d) Designated Waste Areas. Waste areas for vacated material not utilized on site are Station 55+70 on road segment I5 to I6 and Stations 12+33 and 19+82 on road segment V1 to V2.

(e) Block Roads. Use excavated material from fill removals to block roads from vehicle access, as directed by STATE.

(6) Erosion Control. Erosion control shall be completed in a progressive manner. Grass seed and straw mulch shall be applied for every 500 feet of road vacated, prior to continuing work. All excavated material and bare soil shall utilize grass seed and straw mulch approved by STATE and in accordance with the specifications in Exhibit M. Applied mulch shall be a minimum of 2 inches deep and provide a uniform cover.

(7) Construct Waterbars as directed by STATE. Construct waterbars according to the specifications in Exhibit L.

(9) Equipment. A minimum 1½ cubic-yard, track mounted excavator shall be used for all excavation, culvert removal, streambed preparation, road blocking, and waterbarring, unless otherwise approved in writing by STATE.

(10) Dry Conditions. All work shall be performed during dry conditions acceptable to STATE.

EXHIBIT K

ROAD VACATING, SIDECAST REMOVAL, AND FILL REMOVAL SPECIFICATIONS
V1 to V2, V3, and V4 to V5

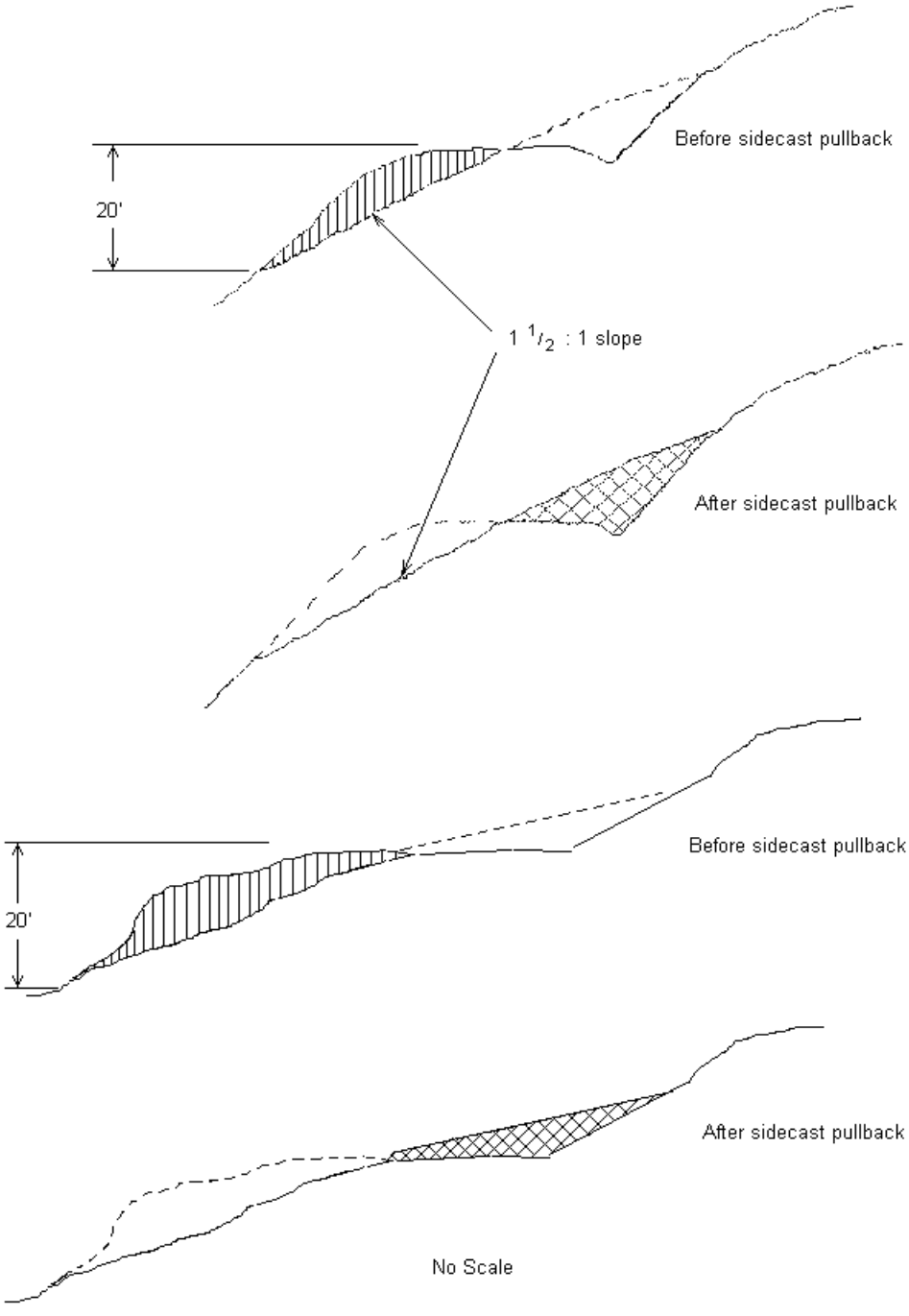
SPECIFIC INSTRUCTIONS

| Segment | Station | Work Description |
|---|---|---|
| V1 to V2 | 0+00 | Point V1. |
| | 5+02 | Begin sidecast pull back. Haul excess pull back material not utilized to restore the cut slope to designated waste area on road segment I5 to I6. |
| | 5+82 | Remove fill and woody material. Develop 3-foot stream channel. Haul fill and woody material to designated waste area on road segment I5 to I6. |
| | 6+64 | End sidecast pull back. |
| | 11+67 | Begin sidecast pull back. Haul excess pull back material not utilized to restore the cut slope to designated waste areas at Stations 12+33 and 19+82. |
| | 12+33 | Designated waste area to be used as specified. |
| | 13+26 | Remove fill and woody material. Develop 6-foot stream channel. Haul fill and woody material to designated waste area at Station 12+33. |
| | 14+29 | Remove fill and woody material. Develop 6-foot stream channel. Haul fill and woody material to designated waste area at Station 19+82. |
| | 14+65 | End sidecast pull back. |
| | 18+70 | Begin sidecast pull back. Haul excess pull back material not utilized to restore the cut slope to designated waste area at Station 19+82. |
| | 19+16 | Remove fill and woody material. Develop 3-foot stream channel. Haul fill and woody material to designated waste area at Station 19+82. End sidecast pull back. |
| | 19+82 | Waste Area. |
| | 22+36 | Remove fill and woody material. Develop 8-foot stream channel. Haul excess fill material not utilized to restore the cut slope and woody material to designated waste area at Station 19+82. End sidecast pull back. |
| | 27+30 | Point V2. |
| Point V3 | | Remove fill and woody material. Develop 6-foot stream channel. |
| V4 to V5 | 0+00 | Point V4. Block road with 24 cubic yards of 24”-6” riprap rock. |
| | 22+74 | Point V5. |

EXHIBIT K

ROAD VACATING, SIDECAST REMOVAL, AND FILL REMOVAL SPECIFICATIONS
V1 to V2, V3, and V4 to V5

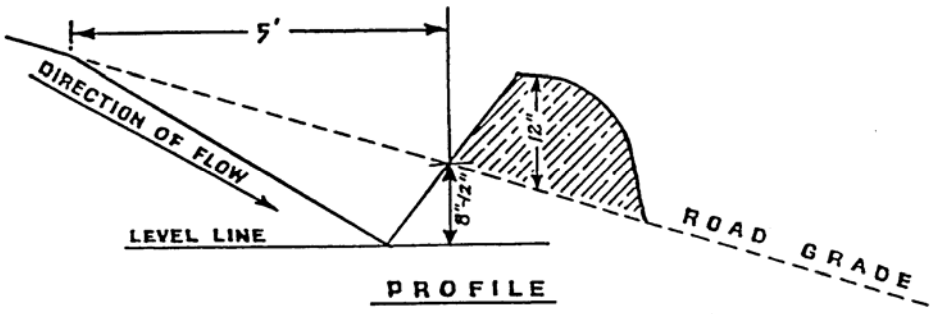
TYPICAL CROSS SECTION VIEW OF ROAD VACATING SIDECAST PULLBACK

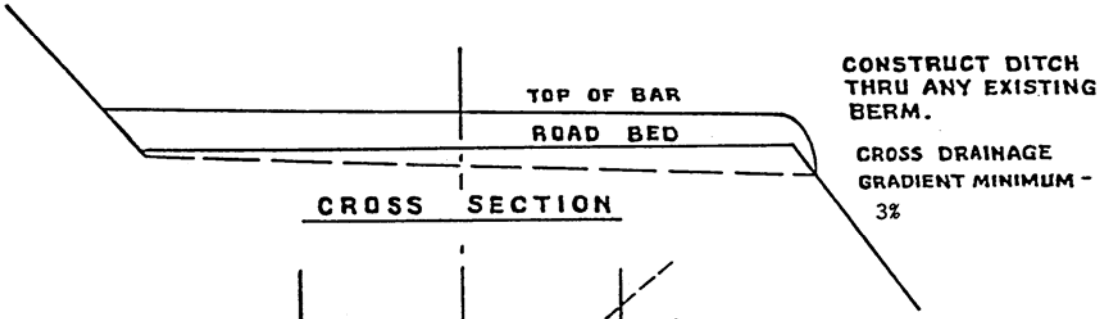


State Timber Sale Contract
No. 341-06-08
Lost Fire Combination

EXHIBIT L

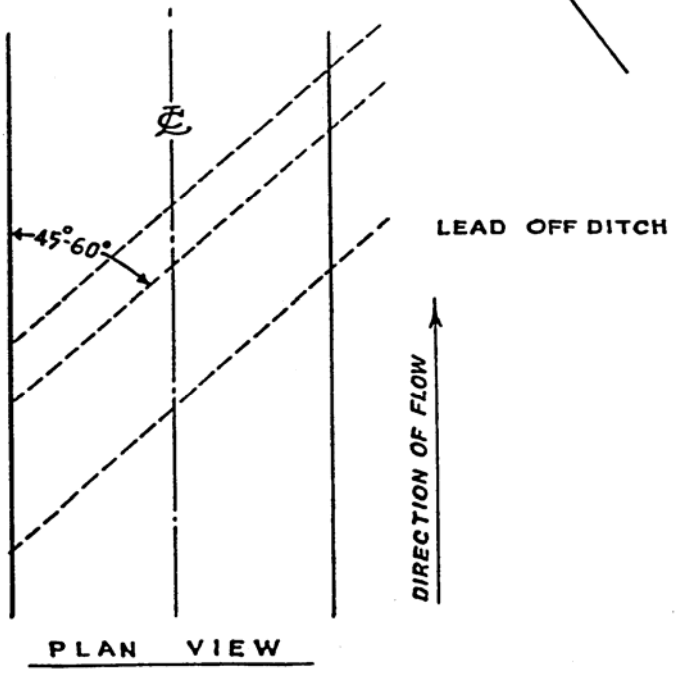
WATERBAR SPECIFICATIONS




**SPACING OF WATERBARS**

| ROAD GRADE | DISTANCE |
|---|---|
| ≤ 5% | 400' |
| 6-10% | 200' |
| 11-15% | 150' |
| 16-20%or greater | 100' |




WATERBAR SPECIFICATIONS
FOR CROSS DITCHING #298

State Timber Sale Contract
No. 341-06-08
Lost Fire Combination

EXHIBIT M

GRASS SEEDING AND MULCHING

This work shall consist of furnishing and placing required grass seed and straw mulch.

Seeding Seasons. Seeding shall be performed only from 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. Work shall be performed during each specified seeding season on all completed and previously untreated sections. PURCHASER shall notify STATE 24 hours prior to seeding.

Application Methods for Grass Seed

Dry Method. Hand-operated seeding devices may be used when seed is applied in dry form.

Application Rates for Seed

Seed listed below shall be applied at the following rate per acre: 100 lbs.

| SPECIES | MIXTURE | PURE LIVE SEED | POISON AND/OR REPELLENT | GERMINATION |
|---|---|---|---|---|
| Annual Rye | 33% | 95% | 0 | >90% |
| Orchard Grass | 33% | 95% | 0 | >90% |
| Perennial Rye | 34% | 95% | 0 | >90% |

Seeding and Mulching. Apply grass seed and straw mulch to all waste areas. In addition, apply grass seed and mulch to all waste areas and bare soils resulting from Project No. 5. Applied straw mulch shall be a minimum of 2 inches deep and provide a uniform cover.

# EXHIBIT N

## DUST ABATEMENT AND ROAD STABILIZATION SPECIFICATIONS

### Surface Course Preparation

(1) Complete all road improvement and subgrade preparation.

(2) Haul crushed surface course rock for roadway, turnouts, and fill and curve widening as specified in Exhibit D.

(3) Keep applied crushed surfacing rock well watered to prevent aggregate segregation.

(4) Grade crushed surface course into a uniform windrow.

**(5) For road maintenance application only (Project No. 6):**

- (a) Keep road surface wet with the use of water during the grading process to minimize aggregate segregation.
- (b) Cut out potholes and repair road surface defects.
- (c) Apply necessary patching and maintenance rock.
- (d) Grade the top 2 inches of surface course material into a uniform windrow.

### Application of Lignin Sulfonate (Palliative)

#### ROADS IMPROVED WITH NEW LIFT OF ROCK (Project No. 3)

(1) Consult with palliative manufacturer for suggested application procedure of palliative.

(2) Apply palliative according to manufacturers recommendation. Application method is to be approved by STATE.

(3) The total applied surface course is to be treated with palliative.

(4) Treat road surface material with 1 gallon per square yard of palliative with a total volume of 66 tons of palliative.

(5) Mix road surface material and palliative so that palliative is mixed completely and uniformly with the applied surface course.

(6) Compact the treated road surface in accordance with Exhibit D.

(7) Dust palliative shall not be applied in a manner that spatters or mars adjacent structures or trees, or placed across bridges. Discharge dust abatement material only on roads approved by STATE.

(8) Applied product shall be 50% lignin sulfonate and 50% water.

(9) Discharge dust palliative material only in approved areas and do not allow it to flow into ditches or stream courses.

#### ROADS RECEIVING PALLIATIVE MAINTENANCE ONLY (Project No. 6)

(1) Consult with palliative manufacturer for suggested application procedure of palliative.

(2) Apply palliative according to manufacturers recommendation. Application method is to be approved by STATE.

(3) Treat crushed surface course with 0.5 gallons per square yard (30 tons) of palliative.

(4) Grade windrowed crushed rock across road surface mixing the aggregate and palliative.

(5) Mix road surface material and palliative so that palliative is mixed completely and uniformly with the surface course material.

(6) Compact the treated road surface in accordance with Exhibit D.

EXHIBIT N

DUST ABATEMENT AND ROAD STABILIZATION SPECIFICATIONS

Lignin Sulfonate Specifications

(1) Furnish lignin sulfonate from the residue produced by the acid-sulfite pulping of wood. Ensure that its base cation is ammonium, calcium, or sodium, and supply it as a uniform mixture that is miscible with an equal weight of water and meets the following requirements:

(a) Undiluted lignin sulfonate:

i. pH, AASHTO T 200…….. 4.5 MIN.
ii. Viscosity at 25° C, AASHTO T 202…… 20.5 poise max.
iii. Total lignin solids concentration[1] ..... 48% min.

(b) Solids:
i. Lignin sulfonate …….. 50% min.
ii. Reducing sugars …… 25% max.

(c) Temperature during application …….. 5° C to 60° C
(41º F to 140º F)

(d) Certification:

**Certification with shipments.** When each load of dust palliative is delivered, furnish the STATE with one copy of the Bill of Lading and a fully executed Certificate of Compliance with above specifications.

[1] Use test method R1-412/LS for total lignin solids concentration

Equipment

(1) Minimum grader specifications are 180 horsepower and an operating weight of 40,500 pounds.

(2) Vibratory roller shall meet the specifications of Exhibit D. STATE may require the roller to be equipped with a mister.

(3) Distribution equipment:

(a) Applies dust palliative uniformly on variable widths of road surface. The maximum allowable variation from the specified rate is ± 10 percent of the specified rate for individual distributor loads, and ± 2 percent of the specified rate over the total project.

(b) Spray pattern from each nozzle on the spray bar is uniform across the spray bar.

(c) Application at controlled rates from 0.1 to 0.5 pounds per square yard with uniform pressure and application.

(d) Provide distribution equipment that includes accurate volume measuring devices or a calibrated tank; a thermometer for measuring temperatures of tank contents; and a hose and nozzle attachment for applying material to areas inaccessible to the spray bar.

EXHIBIT N

DUST ABATEMENT AND ROAD STABILIZATION SPECIFICATIONS

Weather Limitations. Application during a light rain is acceptable, provided the palliative penetrates the road surface and does not flow to low areas or off the road surface. Apply palliative when the ambient temperature is 41° F or higher and the ground is not frozen.

Compaction. Compaction will be in accordance with Exhibit D. Begin compaction as soon as the dust palliative has penetrated enough to prevent pickup of material. Operate roller(s) over the full width of each layer until visual displacement ceases.

Road Use. Do not permit traffic on dust palliative treatment until the treatment has penetrated and cured enough to prevent excessive pickup under traffic.

EXHIBIT O

SPECIFICATIONS FOR BRUSH AND SLASH SHOVEL PILING

Description of Work to be Done

Areas designated for work under the contract shall be treated according to the specifications given below:

Clearing - Brush, logging slash, and other debris shall be cleared from planting sites and piled in windrows or piled so that 80 percent or more of the soil organic layer is exposed. All woody vegetation (other than conifer trees) is defined as brush in this exhibit.

Piles - shall be located at least 75 feet apart and shall be no more than 75 feet long. Piles shall be located inside the project area designated for piling and shall be more than 75 feet from any edge or standing conifer tree. Piles shall be built to a height of 3 to 4 feet and then covered to prevent water from reaching the slash. STATE shall supply the materials used for covering the slash. Additional slash shall be piled on top of the covered piles to complete the piling, as directed by STATE. Logs and chunks which are suitable for firewood shall be piled separately from slash, near roads and landings and alongside the road in locations designated by STATE.

Conifer Trees - shall be saved, unless otherwise directed by STATE.

Skid Trails - shall be ripped to a depth of 12 inches.

Residual Logs – An average of at least 700 cubic feet of hard conifer logs per acre, where conifer logs are available, to be selected by PURCHASER. Logs shall contain a minimum of 10 cubic feet of volume and be no shorter than 6 feet in length. At least 2 of the selected down logs must be 24 inches in diameter at the large end, where available. Hard conifer logs must be in decay class 1 or 2, as indicated by intact bark and original wood color. Down logs shall be well distributed across the area.

Protective Measures - shall comply with Oregon Forest Practice Rules issued per ORS 527.610 to 527.992. Examples of protective measures are: (1) waterbarring tractor trails where necessary to prevent runoff toward streams; (2) not windrowing in streams or streamways; and (3) leaving stream buffers along designated streams.

Work specifications may be modified or waived only upon written notice from STATE.

EXHIBIT O

SPECIFICATIONS FOR BRUSH AND SLASH SHOVEL PILING

Equipment Type, Equipment Operation, and Conduct of Work

The specifications given below are requirements for equipment type, equipment operation, and conduct of work under the contract.

Shovel - shall be a track-mounted machine with a ground-pressure rating of not more than 6.8 PSI and a net horsepower of 85 or more. The machine shall be capable of a minimum horizontal reach of 26 feet and a minimum vertical reach of 16 feet.

- Excavator-shovel: Bucket shall be a hydraulically controlled, 4 to 5-foot wide, "clamshell-style bucket with rake arms," with a 360-degree continuous rotation, and tooth length on rake arm shall be greater than 14 inches long, unless otherwise approved in writing by STATE. “Clamshell-style bucket with rake arms” shall be hydraulically controlled to operate bucket in a horizontal position (**fixed position: positive control**) for piling slash.

- Log Loader – shovel: Bucket shall be a hydraulically controlled, 4 to 5 foot wide, “clamshell-style bucket with rake arms,” with a 360-degree continuous rotation, and tooth length on rake arm shall be greater than 14 inches long, unless other wise approved in writing by STATE. “Clamshell-style bucket with rake arms” shall be hydraulically controlled to operate bucket in a vertical position (**free swinging**) for piling slash.

| Equipment | Rate | Hours | Appraised Value |
|---|---|---|---|
| Excavator | $ 120.00 / hour | 123.0 | $ 14,760.00 |
| Log Loader | $ 87.50 / hour | 168.7 | $ 14,760.00 |

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

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

Work Scheduling - work shall be accomplished only during dry weather conditions, and started within 14 calendar days after completion of yarding activities on Areas 1 and 5. Operations shall provide for continual operation until contract work is completed, unless interrupted by poor weather, fire closures, or other uncontrollable circumstances. Equipment breakdowns shall be repaired without undue delay, and provision shall be made for replacement of equipment to prevent prolonged delays. Operations shall not be allowed as described in Section 2580, “Seasonal Restrictions,” of the Contract, or during any other period when Operations might damage sites or affect stream flows. Any exception to these instructions must be authorized in writing by STATE.

STATE Representative - shall provide directions for the conduct of work according to specifications.