



TIMBER NOTICE OF SALE

SALE NAME: THUNDERSTRUCK

AGREEMENT NO: 30-097289

AUCTION: December 17, 2019 starting at 10:00 a.m., **COUNTY:** Thurston
South Puget Sound Region Office, Enumclaw, WA

SALE LOCATION: Sale located approximately 9 miles west of Littlerock.

**PRODUCTS SOLD
AND SALE AREA:**

All timber, except leave trees bounded out by yellow leave tree area tags, snags, and down timber existing more than 5 years from the day of sale, bounded by the following: white Timber Sale Boundary tags in Unit #1; white Timber Sale Boundary tags and the D-4700 Road in Unit #2; white Timber Sale Boundary tags, timber type change marked with pink flagging, and the D-4700, D-4705, D-4000, D-4000A, and D-4800 roads in Unit #3;

All timber, except leave trees bounded out by yellow leave tree area tags, trees marked with blue paint, snags, and down timber existing more than 5 years from the day of sale, bounded by the following: white Timber Sale Boundary tags and the D-4600 Road in Unit #4; white Timber Sale Boundary tags, the D-4630 Road, and timber type change marked with pink flagging in Unit #5;

All timber bounded by white Timber Sale Boundary tags and the Greenline Quarry in Unit #6;

All timber bounded by orange right of way tags in Unit #7, except that title to the timber within the right of way boundary tags is not conveyed to the Purchaser unless the associated D-4706.5 Road is actually constructed;

All forest products above located on part(s) of Sections 19, 20, 29 and 30 all in Township 17 North, Range 3 West, Sections 25 all in Township 17 North, Range 4 West, W.M., containing 169 acres, more or less.

CERTIFICATION: This sale is certified under the Sustainable Forestry Initiative® program Standard (cert no: PwC-SFIFM-513)

ESTIMATED SALE VOLUMES AND QUALITY:

Species	Avg DBH	Ring Count	Total MBF	MBF by Grade								
				1P	2P	3P	SM	1S	2S	3S	4S	UT
Douglas fir	23	6	8,969				913		6,701	979	337	39
Hemlock	12.5	7	579						404	65	61	49
Red alder	17.2		216						132	44	35	5
Red cedar	23		209							190	19	
Maple	20.2		93						58	18	17	
Sale Total			10,066									

MINIMUM BID: \$3,052,000.00 **BID METHOD:** Sealed Bids

PERFORMANCE SECURITY: \$100,000.00 **SALE TYPE:** Lump Sum

EXPIRATION DATE: October 31, 2022 **ALLOCATION:** Export Restricted



TIMBER NOTICE OF SALE

BID DEPOSIT: \$305,200.00 or Bid Bond. Said deposit shall constitute an opening bid at the appraised price.

HARVEST METHOD: Harvesting activities are estimated to be 30 percent cable, and 70 percent ground based harvest. Cable, tethered, and tracked ground based equipment with cable-tethered equipment limited to sustained slopes 70 percent or less, non-tethered self-leveling equipment limited to sustained slopes 65 percent or less, and shovels limited to sustained slopes 45 percent and less. Tracked skidders and rubber tired skidders will only be allowed on designated skid trail within Unit #3 limited to sustained slopes 35 percent and less. Additionally, tracked skidders may be used for pole removal limited to sustained slopes 35 percent or less. Yarding may be restricted during wet weather if rutting becomes excessive, per clause H-017.

The use of rubber tired skidders to be used on the designated skid trail marked with orange flagging within Unit #3 will not be permitted from November 1 to April 30 unless authorized in writing by the Contract Administrator. If operations are permitted during the restriction period, preventative measures may be required for further protection of soils, water, roads and other forest assets at the Purchaser's expense.

ROADS: 38.38 stations of optional construction. 20.63 stations of optional reconstruction. 926.70 stations of required prehaul maintenance. 12.84 stations of optional prehaul maintenance. 27.29 stations of abandonment, if constructed. 5.71 stations of abandonment, if reconstructed. 10.60 stations of closure, if prehailed. Purchaser maintenance on the D-4000A, D-4000A1, D-4080, D-4085, D-4086, D-4087, D-4088, D-4600A, D-4630, D-4630.1, D-4630.11, D-4700, D-4700A, D-4705, D-4706, D-4706.5, D-4707, and D-4800 roads. Designated maintenance on all other roads used.

Rock for this proposal may be obtained from the State owned Greenline Quarry at no cost to the Purchaser or any commercial rock source at the Purchaser's expense. Rock exploration is required in the Greenline Quarry per Road Plan clause 6-13.

The construction, reconstruction, and/or prehaul maintenance of any roads will not be permitted from November 1 to April 30, unless authority to do so is granted, in writing, by the Contract Administrator. If permission is granted to operate from November 1 to April 30, a maintenance plan is required per Road Plan clause 1-26.

The hauling of forest products will not be permitted from November 1 to April 30 unless authorized in writing by the Contract Administrator. If permission is granted to operate from November 1 to April 30, preventative measures may be required to protect water, soil, roads and other forest assets.

ACREAGE DETERMINATION

CRUISE METHOD: Unit acreage was determined by traversing boundaries by GPS in all units, and length times width was used to determine existing road acres in Units #1 and #3. GPS data files are available at DNR's website for timber sale auction packets. See cruise narrative for cruise method.

FEES: \$171,122.00 is due on day of sale. \$9.00 per MBF is due upon removal. These are in addition to the bid price.



TIMBER NOTICE OF SALE

SPECIAL REMARKS: See map for gate locations. Gate keys may be obtained by contacting the South Puget Sound Region office at (360) 825-1631 or by contacting the Tumwater work center at (360) 902-1449.

Within Units #1-#5, all hardwood stems over 2 inches shall be felled, leaving a stump no more than 12 inches in height, per contract clause H-250.

This sale includes the installation of one 24 inch by 50 feet stream culvert, plus multiple 18 inch crossdrain culverts. See culvert list in the Road Plan for additional information.

Tailhold locations are restricted due to protection of potentially unstable slopes. Trees shall not be used as tailholds within non-tradable leave tree clumps within the sale area or locations identified as Slope Stability Mitigation Zone on the Logging Plan Map. Stringing cables through and suspending cables over these areas may be allowed. Tailhold locations and cable corridors for Units #1-#5 shall be identified in a harvest plan by the Purchaser and approved in writing by the Contract Administrator prior to the start of operations.

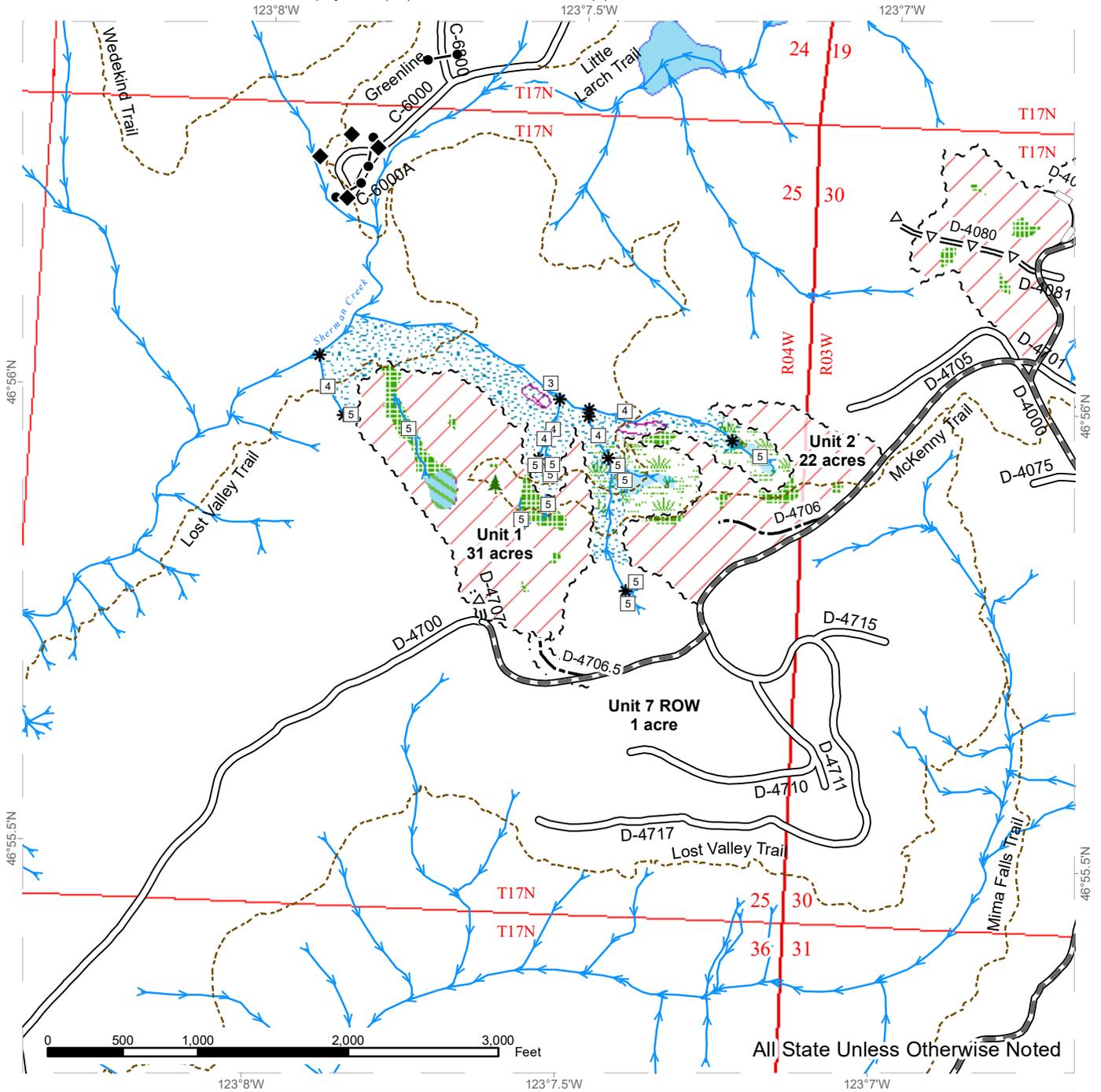
This proposal is in close proximity to utilities. Purchaser is responsible for identifying any utilities and all notifications, per Road Plan clause 1-43.

Intermediate supports may be necessary in Unit #1. Profiles are available upon request.

TIMBER SALE MAP

SALE NAME: THUNDERSTRUCK
AGREEMENT #: 30-097289
TOWNSHIP(S): T17R3W, T17R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2)

REGION: South Puget Sound Region
COUNTY(S): Thurston
ELEVATION RGE: 524-1733



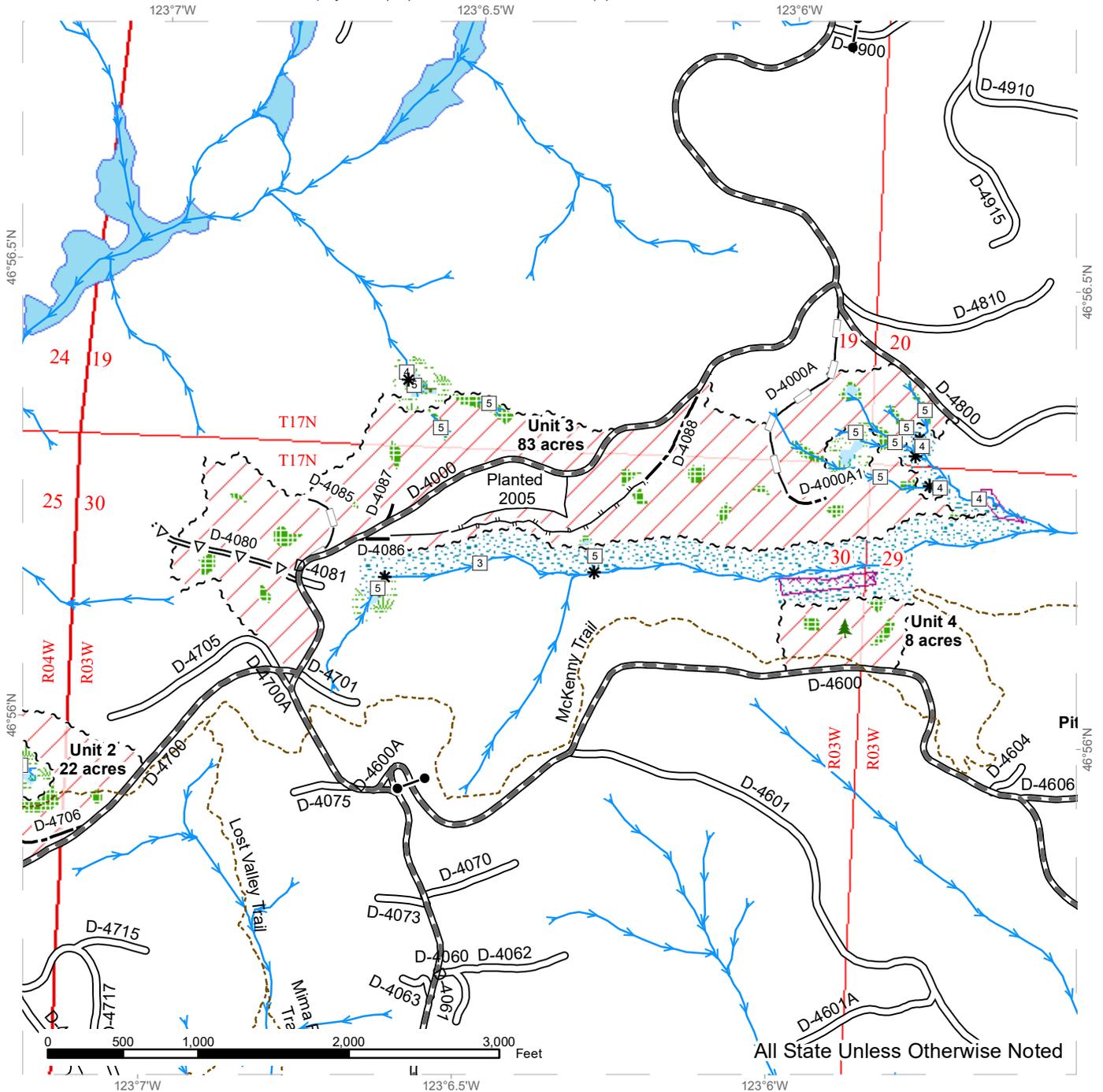
All State Unless Otherwise Noted

	Variable Retention Harvest		Existing Roads		Streams
	Riparian Mgt Zone		Required Pre-Haul Maintenance		Stream Type
	Leave Tree Area		Optional Construction		Stream Type Break
	Non-Tradeable Leave Trees		Optional Reconstruction		Leave Tree Area <1/4 acre
	Forested Wetland		Optional Pre-Haul Maintenance		Gate (<<H-957>>)
	Wetland Mgt Zone		Trails		Survey Monument
	Slope Stability Mitigation Zone		Sale Boundary Tags		
			Right of Way Tags		

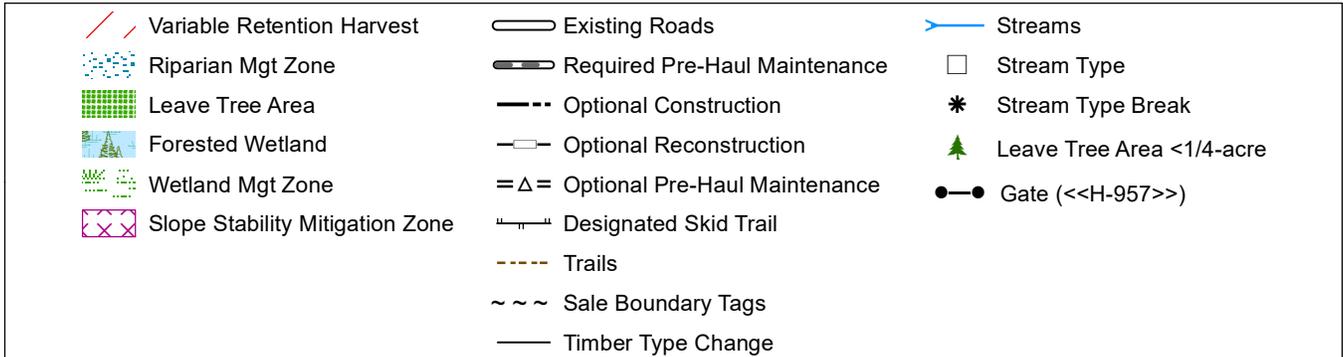
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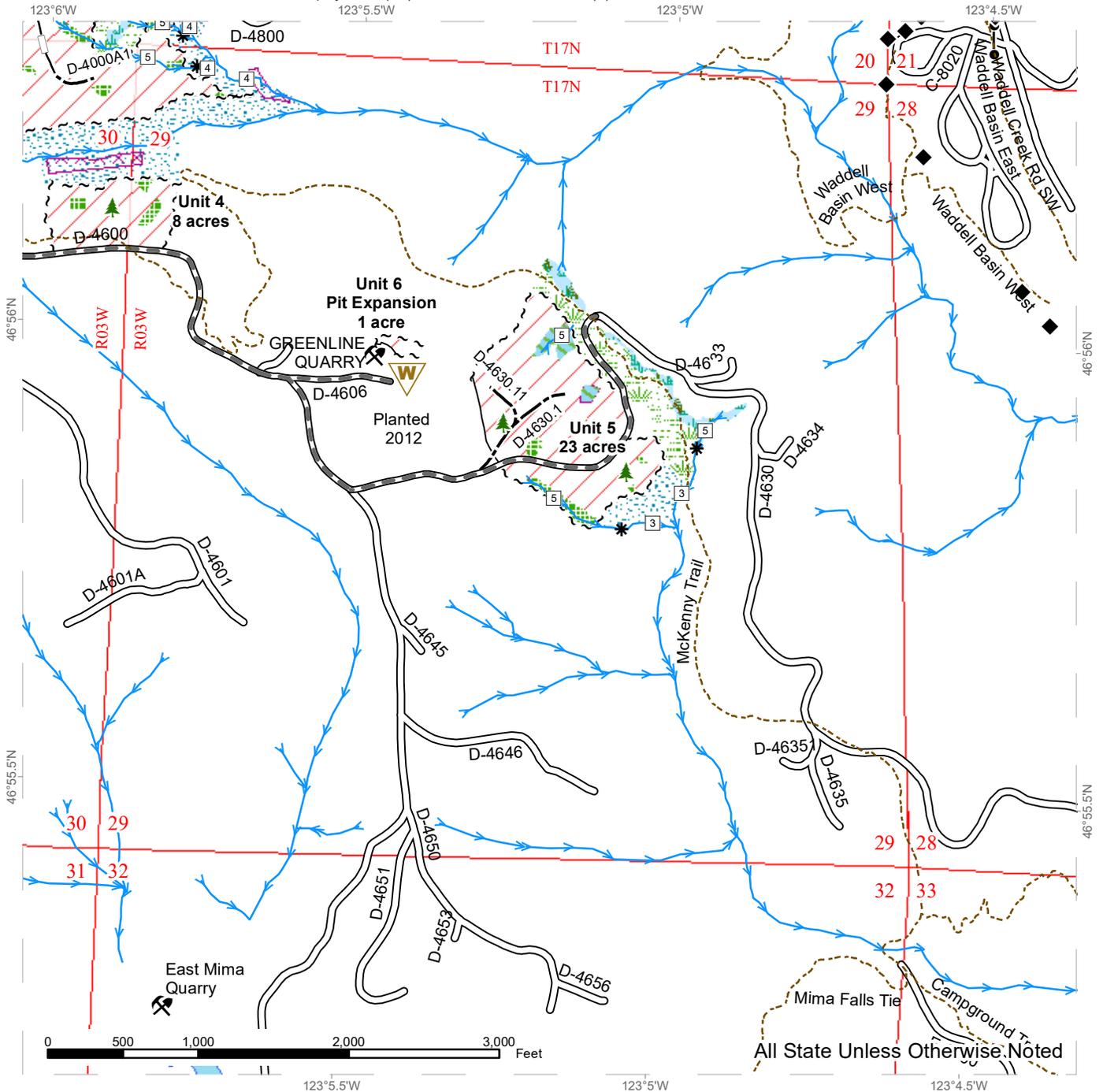
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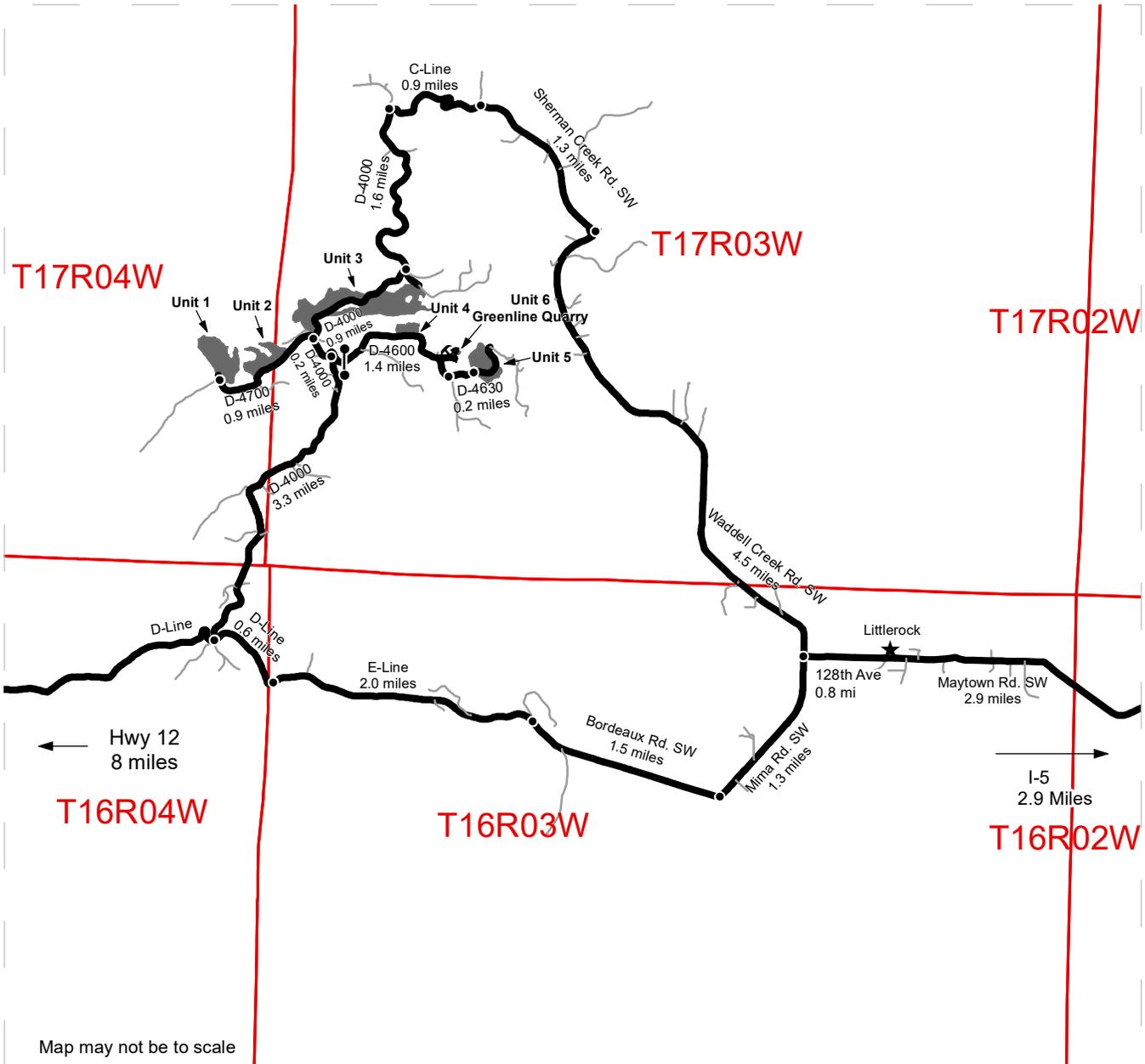
Variable Retention Harvest	Existing Roads	Streams
Riparian Mgt Zone	Required Pre-Haul Maintenance	Stream Type
Leave Tree Area	Optional Construction	Stream Type Break
Non-Tradeable Leave Trees	Optional Reconstruction	Leave Tree Area <1/4-acre
Forested Wetland	Trails	Waste Area
Wetland Mgt Zone	Sale Boundary Tags	Gate (<<H-957>>)
Slope Stability Mitigation Zone	Timber Type Change	Rock Pit
		Survey Monument



DRIVING MAP

SALE NAME: THUNDERSTRUCK
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Map may not be to scale

	Timber Sale Unit
	Haul Route
	Other Road
	Distance Indicator
	Town
	Gate (<<H-957>>)
	Rock Pit

DRIVING DIRECTIONS

From I-5, take exit 95, turn east and follow Maytown Rd SW for 2.9 miles to Littlerock. Continue for 0.8 miles on 128th Ave SW.

From the South:

Turn left onto Mima Rd SW, follow for 1.3 miles. Turn right onto Bordeaux Rd SW, follow for 1.5 miles. Continue onto the E-Line for 2 miles. Turn right onto the D-Line, follow for 0.6 miles, turn right at the intersection onto the D-4000 and follow for 3.3 miles. To reach Units 1 & 2, turn left onto the D-4000 for 0.2 miles. Turn left onto the D-4700 and follow for 0.9 miles. To reach Unit 3, turn left onto the D-4000 for 0.2 miles. Turn right onto the D-4000 and follow for 0.9 miles. To reach Units 4, 6 and the Greenline Quarry, turn right onto D-4600, follow for 1.4 miles. To reach Unit 5, turn left on D-4630, and continue for 0.2 miles.

From the North:

Turn right onto Waddell Creek Rd SW, follow for 4.5 miles. Turn left onto Sherman Rd. SW, follow for 1.3 miles. Turn left onto the C-Line, and follow for 0.9 miles. Turn left onto the D-4000 and follow for 1.6 miles. To reach Units 1 & 2, turn right onto the D-4000 and follow for 0.9 miles. Turn right onto the D-4700 and follow for 0.9 miles. To reach Unit 3, turn right onto the D-4000 and follow for 0.9 miles. Or turn left onto the D-4800 for 1.3 miles. To reach Units 4, 6 and the Greenline Quarry, turn right onto the D-4000 and follow for 0.9 miles. Turn left onto the D-4000, follow for 0.2 miles. Turn left onto the D-4600, follow for 1.4 miles. To reach Unit 5, turn left on D-4630, and continue for 0.2 miles.

From Highway 12, between mileposts 32 and 33, turn onto the D-Line and follow for 8 miles. Turn left onto the D-4000, follow for 3.3 miles. Proceed to units, using same directions as above for I-5 "From the South".



**STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES**

**BILL OF SALE AND CONTRACT FOR
FOREST PRODUCTS**

Export Restricted Lump Sum AGREEMENT NO. 30-097289

SALE NAME: THUNDERSTRUCK

**THE STATE OF WASHINGTON DEPARTMENT OF NATURAL
RESOURCES, HEREINAFTER ACTING SOLELY, IN ITS PROPRIETARY
CAPACITY, STATE, AND PURCHASER, AGREE AS FOLLOWS:**

Section G: General Terms

G-001 Definitions

The following definitions apply throughout this contract;

Bill of Sale and Contract for Forest Products: Contract between the Purchaser and the State, which sets forth the procedures and obligations of the Purchaser in exchange for the right to remove forest products from the sale area. The Bill of Sale and Contract for Forest Products may include a Road Plan for any road construction or reconstruction, where applicable.

Contract Administrator: Region Manager's designee responsible for assuring that the contractual obligations of the Purchaser are met.

Forest Product: Any material derived from the forest for commercial use.

Purchaser: The company or individual that has entered into a Bill of Sale and Contract for Forest Products with the State for the right to harvest and remove forest products from the timber sale area.

Road Construction: Includes building new and maintaining existing forest roads and associated work that may be optional or required as described in the Road Plan.

State: The Washington State Department of Natural Resources, landowner and seller of Forest Products from the timber sale area. The State is represented by the Region Manager as designated on the contract signature page. Contractual obligations to the State are enforced by the Region Manager or the designated Contract Administrator.

Subcontractor: Individual or company employed by the Purchaser to perform a portion or all of the services required by The Bill of Sale and Contract for Forest Products. The Purchaser is responsible for independently negotiating, procuring and paying for all subcontracted services rendered.

G-011 Right to Remove Forest Products and Contract Area

Purchaser was the successful bidder on December 17, 2019 and the sale was confirmed on _____. The State, as owner, agrees to sell to Purchaser, and Purchaser agrees to purchase as much of the following forest products as can be cut and removed during the term of this contract: All timber, except leave trees bounded out by yellow leave tree area tags, snags, and down timber existing more than 5 years from the day of sale, bounded by the following: white Timber Sale Boundary tags in Unit #1; white Timber Sale Boundary tags and the D-4700 Road in Unit #2; white Timber Sale Boundary tags, timber type change marked with pink flagging, and the D-4700, D-4705, D-4000, D-4000A, and D-4800 roads in Unit #3;

All timber, except leave trees bounded out by yellow leave tree area tags, trees marked with blue paint, snags, and down timber existing more than 5 years from the day of sale, bounded by the following: white Timber Sale Boundary tags and the D-4600 Road in Unit #4; white Timber Sale Boundary tags, the D-4630 Road, and timber type change marked with pink flagging in Unit #5;

All timber bounded by white Timber Sale Boundary tags and the Greenline Quarry in Unit #6;

All timber bounded by orange right of way tags in Unit #7, except that title to the timber within the right of way boundary tags is not conveyed to the Purchaser unless the associated D-4706.5 Road is actually constructed;

All forest products above located, located on approximately 169 acres on part(s) of Sections 19, 20, 29, and 30 all in Township 17 North, Range 3 West, Section 25 in Township 17 North, Range 4 West W.M. in Thurston County(s) as designated on the sale area and as shown on the attached timber sale map.

All forest products described above from the bole of the tree that meet or exceed 2 inches diameter inside bark on the small end are eligible for removal. Above ground components of a tree that remain as by-products after the manufacture of logs, including but not limited to tree tops, branches, limbs, needles, leaves, stumps, are not eligible for removal under the terms of this contract.

Forest products purchased under a contract that is designated as export restricted shall not be exported until processed. Forest products purchased under a contract that is designated as exportable may be exported prior to processing.

G-020 Inspection By Purchaser

Purchaser hereby warrants to the State that they have had an opportunity to fully inspect the sale area and the forest products being sold. Purchaser further warrants to the State that they enter this contract based solely upon their own judgment of the value of the forest products, formed after their own examination and inspection of both the timber sale area and the forest products being sold. Purchaser also warrants to the State that they enter this contract without any reliance upon the volume estimates, acreage estimates, appraisals, pre-bid documentation, or any other representations by the State Department of Natural Resources.

G-025 Schedules

The following attached schedules are hereby incorporated by reference:

Schedule	Title
A	Recreation Trail Clean Out and Repair

G-031 Contract Term

Purchaser shall complete all work required by this contract prior to October 31, 2022.

G-040 Contract Term Adjustment - No Payment

Purchaser may request an adjustment in the contract term. A claim must be submitted in writing and received by the State within 30 days after the start of interruption or delay. The claim must also indicate the actual or anticipated length of interruption or delay. The State may grant an adjustment without charge only if the cause for contract term adjustment is beyond Purchaser's control. The cause must be one of the following and the adjustment may be granted only if operations or planned operations under this contract are actually interrupted or delayed:

- a. Road and bridge failures which deny access.
- b. Access road closures imposed by road owner.
- c. Excessive suspensions as provided in clause G-220.
- d. Regulatory actions not arising from Purchaser's failure to comply with this contract which will prevent timber harvest for a period less than 6 months.

G-051 Contract Term Extension - Payment

Extensions of this contract term may be granted only if, in the judgment of the State, Purchaser is acting in good faith and is endeavoring to remove the forest products conveyed. The term of this contract may be extended for a reasonable time by the State if all of the following conditions are satisfied:

- a. A written request for extension of the contract term must be received prior to the expiration date of the contract.
- b. Completion of all required roads and compliance with all contract and regulatory requirements.
- c. For the first extension, not to exceed 1 year, payment of at least 25 percent of the total contract price.

For the second extension, not to exceed 1 year, payment of at least 90 percent of the total contract price.

The payments shall not include the initial deposit which shall be held according to the provisions of RCW 79.15.100.

- d. Payment of an amount based on 12 percent interest per annum on the unpaid portion of the total contract price.

All payments, except the initial deposit, will be deducted from the total contract price to determine the unpaid portion of the contract.

- e. Payment of \$953.00 per acre per annum for the acres on which an operating release has not been issued in the harvest area.
- f. In no event will the extension charge be less than \$200.00.
- g. Extension payments are non-refundable.

G-053 Surveys - Sensitive, Threatened, Endangered Species

Whenever the State determines that a survey for sensitive, threatened, or endangered species is prudent, or when Purchaser determines a survey is prudent and the State agrees, Purchaser shall perform such surveys at Purchaser's expense and to the standards required by the State. The survey information shall be supplied to the State.

G-060 Exclusion of Warranties

The PARTIES AGREE that the IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE and ALL OTHER WARRANTIES EXPRESSED OR IMPLIED ARE EXCLUDED from this transaction and shall not apply to the goods sold. For example, THE FOLLOWING SPECIFIC MATTERS ARE NOT WARRANTED, and are EXCLUDED from this transaction:

- a. The MERCHANTABILITY of the forest products. The use of the term "merchantable" in any document is not intended to vary the foregoing.
- b. The CONDITION of the forest products. The forest products will be conveyed "AS IS."

- c. The ACREAGE contained within any sale area. Any acreage descriptions appearing in the timber notice of sale, timber sale contract, or other documents are estimates only, provided solely for administrative and identification purposes.
- d. The VOLUME, QUALITY, OR GRADE of the forest products. The State neither warrants nor limits the amount of timber to be harvested. The descriptions of the forest products to be conveyed are estimates only, made solely for administrative and identification purposes.
- e. The CORRECTNESS OF ANY SOIL OR SURFACE CONDITIONS, PRE-SALE CONSTRUCTION APPRAISALS, INVESTIGATIONS, AND ALL OTHER PRE-BID DOCUMENTS PREPARED BY OR FOR THE STATE. These documents have been prepared for the State's appraisal purposes only.
- f. THAT THE SALE AREA IS FREE FROM THREATENED OR ENDANGERED SPECIES or their habitat. The State is not responsible for any interference with forestry operations that result from the presence of any threatened or endangered species, or the presence of their habitat, within the sale area.
- g. THAT THE FORESTRY OPERATIONS to be performed under this contract WILL BE FREE FROM REGULATORY ACTIONS by governmental agencies. The State is not responsible for actions to enforce regulatory laws, such as the Washington Forest Practices Act (chapter 76.09 RCW), taken by the Department of Natural Resources or any other agency that may affect the operability of this timber sale.
- h. Items contained in any other documents prepared for or by the State.

G-062 Habitat Conservation Plan

The State has entered into a Habitat Conservation Plan (HCP) with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (the Services) to address state trust land management issues relating to compliance with the Federal Endangered Species Act. The activities to be carried out under this contract are located within the State's HCP area and are subject to the terms and conditions of the HCP, and the Services' Incidental Take Permit Nos. 812521 and 1168 (collectively referred to as ITP), or as amended hereafter by the Services. The ITP authorizes the incidental take of certain federally listed threatened and endangered species, as specified in the ITP conditions. All HCP materials, including the ITP, are available for review at the State's Regional Offices and the administrative headquarters in Olympia, Washington.

By signing this contract, Purchaser agrees to comply with the terms and conditions of the ITP, and the HCP, which shall become terms of this contract. The State agrees to authorize the lawful activities of the Purchaser carried out pursuant to this contract, PROVIDED the Purchaser remains in compliance with the terms and conditions of both

the HCP and ITP. The requirements set forth in this contract are intended to comply with the terms and conditions of the HCP and ITP. Accordingly, non-compliance with the terms and conditions of the HCP and ITP will render the authorization provided in this paragraph void, be deemed a breach of the contract and may subject Purchaser to liability for violation of the Endangered Species Act.

Any modifications to the contract shall be proposed in writing by Purchaser, shall continue to meet the terms and conditions of the HCP and ITP, and shall require the prior written approval of the Region Manager before taking effect.

G-063 Incidental Take Permit Notification Requirements

- a. Purchaser shall immediately notify the Contract Administrator of new locations of permit species covered by the Incidental Take Permits (ITP) that are discovered within the area covered by the State's Habitat Conservation Plan (HCP), including, but not limited to: locations of occupied murrelet habitat; spotted owl nest sites; wolves; grizzly bears; nests, communal roosts, or feeding concentrations of bald eagles; peregrine falcon nests; Columbian white-tailed deer; Aleutian Canada geese; Oregon silverspot butterflies; and additional stream reaches found to contain bull trout. Purchaser is required to notify the Contract Administrator upon discovery of any fish species found in streams or bodies of water classified as non-fish bearing. In all circumstances, notification must occur within a 24 hour time period.
- b. Upon locating any live, dead, injured, or sick specimens of any permit species covered by the ITP, Purchaser shall immediately notify the Contract Administrator. Purchaser shall notify the Contract Administrator if there is any doubt as to the identification of a discovered permit species. Purchaser may be required to take certain actions to help the Contract Administrator safeguard the well-being of any live, injured or sick specimens of any permit species discovered, until the proper disposition of such specimens can be determined by the Contract Administrator. Any such requirements will be explained to Purchaser by the Contract Administrator during the Pre-Work Conference. In all circumstances, notification must occur within a 24 hour time period.
- c. Purchaser shall refer to a specific ITP number, PRT-812521 or ITP 1168 (copies which are located in the region office) in all correspondence and reports concerning permit activities.
- d. Provisions and requirements of the ITP shall be clearly presented and explained to Purchaser by Contract Administrator during the Pre-Work Conference as per contract clause G-330. All applicable provisions of the ITP and this schedule must be presented and clearly explained by Purchaser to all authorized officers, employees, contractors, or agents of Purchaser conducting authorized activities in the timber sale area. Any questions Purchaser may have about the ITP should be directed to the Contract Administrator.

G-064 Permits

Purchaser is responsible for obtaining any permits not already obtained by the State that relate to Purchaser's operation. Forest Practice Application / Hydraulic Project Approval permits obtained by the State shall be transferred to Purchaser. Purchaser is responsible for all permits, amendments and renewals.

G-065 Regulatory Disclaimer

The State disclaims any responsibility for, or liability relating to, regulatory actions by any government agency, including actions pursuant to the Forest Practices Act, Ch. 76.09 RCW that may affect the operability of the timber sale.

G-066 Governmental Regulatory Actions

a. Risk

Purchaser shall be responsible for any increased operational costs arising from any applicable foreign or domestic governmental regulation or order that does not cause contract performance to become commercially impracticable or that does not substantially frustrate the purpose of the contract. If impracticability or frustration results from Purchaser's failure to comply with this contract, Purchaser shall remain responsible for payment of the total contract price notwithstanding the impracticability or frustration.

b. Sale Area

When portions of the sale area become subject to a foreign or domestic governmental regulation or order that will likely prevent timber harvest for a period that will exceed the expiration date of this contract, and Purchaser has complied with this contract, the following shall apply:

i. RCW 79.15.140 shall govern all adjustments to the contract area.

c. Adjustment of Price

The State shall adjust the total contract price by subtracting from the total contract price an amount determined in the following manner: The State shall cause the timber sale area subject to governmental regulation or order to be measured. The State shall calculate the percentage of the total sale area subject to the governmental regulation or order. The State shall reduce the total contract price by that calculated percentage. However, variations in species, value, costs, or other items pertaining to the affected sale area will be analyzed and included in the adjustment if deemed appropriate by the State. The State will further reduce the total contract price by the reasonable cost of unamortized roads Purchaser constructed but was unable to fully use for removing timber. A reduction in total contract price terminates all of the Purchaser's rights to purchase and remove the timber and all other interest in the affected sale area.

G-070 Limitation on Damage

In the event of a breach of any provision of this contract by the State, the exclusive remedy available to Purchaser will be limited to a return of the initial deposit, unapplied payments, and credit for unamortized improvements made by Purchaser. The State shall not be liable for any damages, whether direct, incidental or consequential.

G-080 Scope of State Advice

No advice by any agent, employee, or representative of the State regarding the method or manner of performing shall constitute a representation or warranty that said method, manner or result thereof will conform to the contract or be suitable for Purchaser's purposes under the contract. Purchaser's reliance on any State advice regarding the method or manner of performance shall not relieve Purchaser of any risk or obligation under the contract. Purchaser retains the final responsibility for its operations under this contract and State shall not be liable for any injuries resulting from Purchaser's reliance on any State advice regarding the method or manner of performance.

G-091 Sale Area Adjustment

The Parties may agree to adjustments in the sale area boundary. The cumulative changes to the sale area during the term of the contract shall not exceed more than four percent of the original sale area. If the sale area is increased, the added forest products become a part of this contract. The State shall determine the volume added and shall calculate the increase to the total contract price using the rates set forth in clause G-101, G-102, or G-103. If the sale area is reduced, the State shall determine the volume to be reduced. The State shall calculate the reduction to the total contract price using the rates set forth in clause G-101, G-102, or G-103.

G-101 Forest Products Not Designated

Any forest products not designated for removal, which must be removed in the course of operations authorized by the State, shall be approved and designated by the Contract Administrator. Added forest products become a part of this contract and the Scribner log scale volume, as defined by the Northwest Log Rules Advisory Group, shall be determined by the Contract Administrator. Added forest products shall be paid for at the following contract payment rates per Mbf Scribner log scale.

The pricing schedule has not been set for the sale.

G-111 Title and Risk of Loss

Title to the forest products under this contract passes to the Purchaser after they are removed from the sale area, if adequate advance payment or payment security has been provided to the State under this contract. Purchaser bears all risk of loss of, or damage to, and has an insurable interest in, the forest products described in this contract from the time the sale is confirmed under RCW 79.15.120. Breach of this contract shall have no effect on this provision.

G-116 Sustainable Forestry Initiative® (SFI) Certification

Forest products purchased under this contract are certified as being in conformance with the Sustainable Forestry Initiative program Standard under certificate number: BV-SFIS-US09000572.

Purchaser shall have at least one person regularly on-site during active operations that have completed training according to the requirements outlined within the SFI® program Standard. Purchaser shall designate in writing the name(s) of the individual(s) who will be on-site and provide proof of their successful completion of an approved training program prior to active operations.

G-120 Responsibility for Work

All work, equipment, and materials necessary to perform this contract shall be the responsibility of Purchaser. Any damage to improvements, except as provided in clause G-121 or unless the State issues an operating release pursuant to clause G-280, shall be repaired promptly to the satisfaction of the State and at Purchaser's expense.

G-121 Exceptions

Exceptions to Purchaser's responsibility in clause G-120 shall be limited exclusively to the following. These exceptions shall not apply where road damage occurs due to Purchaser's failure to take reasonable precautions or to exercise sound forest engineering and construction practices.

Road is defined as the road bed, including but not limited to its component parts, such as subgrade, ditches, culverts, bridges, and cattle guards.

For the purposes of this clause, damage will be identified by the State and is defined as:

1. Failure of (a) required improvements or roads designated in clause C-050, or (b) required or optional construction completed to the point that authorization to haul has been issued;
2. Caused by a single event from forces beyond the control of Purchaser, its employees, agents, or invitees, including independent contractors; and
3. Includes, but is not limited to natural disasters such as earthquakes, volcanic eruptions, landslides, and floods.

The repair work identified by the State shall be promptly completed by Purchaser at an agreed price. The State may elect to accomplish repairs by means of State-provided resources. The State will bear the cost to repair damages caused by a third party. In all other cases, the Purchaser shall bear responsibility for the costs as described below.

For each event, Purchaser shall be solely responsible for the initial \$5,000 in repairs. For repairs in excess of \$5,000, the parties shall share equally the portion of costs

between \$5,000 and \$15,000. The State shall be solely responsible for the portion of the cost of repairs that exceed \$15,000.

Nothing contained in clauses G-120 and G-121 shall be construed as relieving Purchaser of responsibility for, or damage resulting from, Purchaser's operations or negligence, nor shall Purchaser be relieved from full responsibility for making good any defective work or materials. Authorization to haul does not warrant that Purchaser built roads are free from material defect and the State may require additional work, at Purchasers expense regardless of cost, to remedy deficiencies at any time.

G-140 Indemnity

To the fullest extent permitted by law, Purchaser shall indemnify, defend and hold harmless State, agencies of State and all officials, agents and employees of State, from and against all claims arising out of or resulting from the performance of the contract. "Claim" as used in this contract means any financial loss, claim, suit, action, damage, or expense, including but not limited to attorneys' fees, attributable for bodily injury, sickness, disease or death, or injury to or destruction of tangible property including loss of use resulting therefrom. Purchasers' obligations to indemnify, defend, and hold harmless includes any claim by Purchasers' agents, employees, representatives, or any subcontractor or its employees. Purchaser expressly agrees to indemnify, defend, and hold harmless State for any claim arising out of or incident to Purchasers' or any subcontractors' performance or failure to perform the contract. Purchasers' obligation to indemnify, defend, and hold harmless State shall not be eliminated or reduced by any actual or alleged concurrent negligence of State or its agents, agencies, employees and officials. Purchaser waives its immunity under Title 51 RCW to the extent it is required to indemnify, defend and hold harmless State and its agencies, officials, agents or employees.

G-150 Insurance

Purchaser shall, at its cost and expense, buy and maintain insurance of the types and amounts listed below. Failure to buy and maintain the required insurance may result in a breach and/or termination of the contract at State's option. State may suspend Purchaser operations until required insurance has been secured.

All insurance and surety bonds should be issued by companies admitted to do business within the State of Washington and have a rating of A-, Class VII or better in the most recently published edition of Best's Reports. If an insurer is not admitted, all insurance policies and procedures for issuing the insurance policies must comply with Chapter 48.15 RCW and 284-15 WAC.

The State of Washington, Department of Natural Resources region office of sale origin shall be provided written notice before cancellation or non-renewal of any insurance referred to therein, in accord with the following specifications:

1. Insurers subject to Chapter 48.18 RCW (admitted and regulated by the Insurance Commissioner): The insurer shall give the State 45 days advance

notice of cancellation or non-renewal. If cancellation is due to non-payment of premium, the State shall be given 10 days advance notice of cancellation.

2. Insurers subject to Chapter 48.15 RCW (surplus lines): The State shall be given 20 days advance notice of cancellation. If cancellation is due to non-payment of premium, the State shall be given 10 days advance notice of cancellation.

Before starting work, Purchaser shall furnish State of Washington, Department of Natural Resources with a certificate(s) of insurance, executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements specified in the contract. Insurance coverage shall be obtained by the Purchaser prior to operations commencing and continually maintained in full force until all contract obligations have been satisfied or an operating release has been signed by the State.

Purchaser shall include all subcontractors as insured under all required insurance policies, or shall furnish separate certificates of insurance and endorsements for each subcontractor. Subcontractor(s) must comply fully with all insurance requirements stated herein. Failure of subcontractor(s) to comply with insurance requirements does not limit Purchaser's liability or responsibility.

The State of Washington, Department of Natural Resources, its elected and appointed officials, agents and employees shall be named as an additional insured via endorsement on all general liability, excess, umbrella, and property insurance policies.

All insurance provided in compliance with this contract shall be primary as to any other insurance or self-insurance programs afforded to or maintained by State. Purchaser waives all rights against State for recovery of damages to the extent these damages are covered by general liability or umbrella insurance maintained pursuant to this contract.

By requiring insurance herein, State does not represent that coverage and limits will be adequate to protect Purchaser and such coverage and limits shall not limit Purchaser's liability under the indemnities and reimbursements granted to State in this contract.

The limits of insurance, which may be increased as deemed necessary by State of Washington, Department of Natural Resources, shall not be less than as follows:

Commercial General Liability (CGL) Insurance. Purchaser shall maintain general liability (CGL) insurance, and, if necessary, commercial umbrella insurance with a limit of not less than \$1,000,000.00 per each occurrence. If such CGL insurance contains aggregate limits, the General Aggregate limit shall be at least twice the "each occurrence" limit. CGL insurance shall have products-completed operations aggregate limit of at least two times the "each occurrence" limit. CGL coverage shall include a Logging and Lumbering Endorsement (i.e. Logger's Broad-Form) to cover the events that include, but are not limited to, fire suppression expenses, accidental timber

trespasses, and wildfire property damage with limits of not less than \$2,000,000.00 each occurrence.

CGL insurance shall be written on Insurance Services Office (ISO) occurrence form CG 00 01 (or a substitute form providing equivalent coverage). All insurance shall cover liability arising out of premises, operations, independent contractors, products completed operations, personal injury and advertising injury, and liability assumed under an insured contract (including the tort liability of another party assumed in a business contract), and contain separation of insured (cross liability) condition.

Employer's Liability "Stop Gap" Insurance. Purchaser shall buy employers liability insurance, and, if necessary, commercial umbrella liability insurance with limits not less than \$1,000,000.00 each accident for bodily injury by accident or \$1,000,000.00 each employee for bodily injury by disease.

Workers' Compensation Coverage. Purchaser shall comply with all State of Washington workers' compensation statutes and regulations. Workers' compensation coverage shall be provided for all employees of Purchaser and employees of any subcontractor or sub-subcontractor. Coverage shall include bodily injury (including death) by accident or disease, which exists out of or in connection with the performance of this contract. Except as prohibited by law, Purchaser waives all rights of subrogation against State for recovery of damages to the extent they are covered by workers' compensation, employer's liability, commercial general liability, or commercial umbrella liability insurance.

If Purchaser, subcontractor or sub-subcontractor fails to comply with all State of Washington workers' compensation statutes and regulations and State incurs fines or is required by law to provide benefits to or obtain coverage for such employees, Purchaser shall indemnify State. Indemnity shall include all fines, payment of benefits to Purchaser or subcontractor employees, or their heirs or legal representatives, and the cost of effecting coverage on behalf of such employees.

Business Auto Policy (BAP). Purchaser shall maintain business auto liability and, if necessary, commercial umbrella liability insurance with a limit not less than \$1,000,000.00 per accident. Such insurance shall cover liability arising out of "Any Auto". Business auto coverage shall be written on ISO form CA 00 01, or substitute liability form providing equivalent coverage. If necessary the policy shall be endorsed to provide contractual liability coverage and cover a "covered pollution cost or expense" as provided in the 1990 or later editions of CA 00 01. Purchaser waives all rights against State for the recovery of damages to the extent they are covered by business auto liability or commercial umbrella liability insurance.

G-160 Agents

The State's rights and duties will be exercised by the Region Manager at Enumclaw, Washington. The Region Manager will notify Purchaser in writing who is responsible for administering the contract. The Region Manager has sole authority to waive, modify, or amend the terms of this contract in the manner prescribed in clause G-180.

No agent, employee, or representative of the State has any authority to bind the State to any affirmation, representation, or warranty concerning the forest products conveyed beyond the terms of this contract.

Purchaser is required to have a person on site during all operations who is authorized to receive instructions and notices from the State. Purchaser shall inform the State in writing who is authorized to receive instructions and notices from the State, and any limits to this person's authority.

G-170 Assignment and Delegation

No rights or interest in this contract shall be assigned by Purchaser without prior written permission of the State. Any attempted assignment shall be void and ineffective for all purposes unless made in conformity with this paragraph. Purchaser may perform any duty through a delegate, but Purchaser is not thereby relieved of any duty to perform or any liability. Any assignee or delegate shall be bound by the terms of the contract in the same manner as Purchaser.

G-180 Modifications

Waivers, modifications, or amendments of the terms of this contract must be in writing signed by Purchaser and the State.

G-190 Contract Complete

This contract is the final expression of the Parties' agreement. There are no understandings, agreements, or representations, expressed or implied, which are not specified in this contract.

G-200 Notice

Notices required to be given under the following clauses shall be in writing and shall be delivered to Purchaser's authorized agent or sent by certified mail to Purchaser's address of record:

G-210 Violation of Contract

G-220 State Suspends Operations

All other notices required to be given under this contract shall be in writing and delivered to the authorized agent or mailed to the Party's post office address. Purchaser agrees to notify the State of any change of address.

G-210 Violation of Contract

- a. If Purchaser violates any provision of this contract, the Contract Administrator, by written notice, may suspend those operations in violation. If the violation is capable of being remedied, Purchaser has 30 days after receipt of a suspension notice to remedy the violation. If the violation cannot be remedied (such as a violation of WAC 240-15-015) or Purchaser fails to remedy the violation within 30 days after receipt of a suspension notice, the State may terminate the rights of Purchaser under this contract and collect damages.

- b. If the contract expires pursuant to clause G-030 or G-031 without Purchaser having performed all its duties under this contract, Purchaser's right to operate is terminated and Purchaser shall not have the right to remedy the breach. This provision shall not relieve Purchaser of any payment obligations.
- c. The State has the right to remedy the breach in the absence of any indicated attempt by Purchaser or if Purchaser is unable, as determined by the State, to remedy the breach. Any expense incurred by the State shall be charged to Purchaser and shall be paid within 30 days of receipt of billing.
- d. If Purchaser's violation is a result of a failure to make a payment when due, in addition to a. and b. above, interest shall accrue on the unpaid balance at 12 percent per annum, beginning the date payment was due.

G-220 State Suspends Operation

The Contract Administrator may suspend any operation of Purchaser under this contract when the State is suffering, or there is a reasonable expectation the State will suffer environmental, monetary, or other damage if the operation is allowed to continue.

Purchaser shall be in breach of this contract if the operation continues after the suspension notice or if the operation resumes without prior approval and notice from the Contract Administrator.

Purchaser may request a modification of a suspension within 30 days of the start of suspension through the dispute resolution process in clause G-240. If this process results in a finding that the suspension exceeded the time reasonably necessary to stop or prevent damage to the State, Purchaser is entitled to request a contract term adjustment under clause G-040.

If it reasonably appears that the damage that the State is suffering, or can reasonably be expected to suffer if the operation is allowed to continue, will prevent harvest for a period that will exceed 6 months, and Purchaser has complied with this contract, the provisions of clause G-066 shall govern just as if the harvest was prevented by an applicable foreign or domestic governmental regulation or order.

G-230 Unauthorized Activity

Any cutting, removal, or damage of forest products by Purchaser, its employees, agents, or invitees, including independent contractors, in a manner inconsistent with the terms of this contract or State law, is unauthorized. Such activity may subject Purchaser to liability for triple the value of said forest products under RCW 79.02.320 or RCW 79.02.300 and may result in prosecution under RCW 79.02.330 or other applicable statutes.

G-240 Dispute Resolution

The following procedures apply in the event of a dispute regarding interpretation or administration of this contract and the parties agree that these procedures must be followed before a lawsuit can be initiated.

- a. In the event of a dispute, Purchaser must make a written request to the Region Manager for resolution prior to seeking other relief.
- b. The Region Manager will issue a written decision on Purchaser's request within ten business days.
- c. Within ten business days of receipt of the Region Manager's decision, Purchaser may make a written request for resolution to the Deputy Supervisor - Uplands of the Department of Natural Resources.
- d. Unless otherwise agreed, a conference will be held by the Deputy Supervisor - Uplands within 30 calendar days of the receipt of Purchaser's request for review of the Region Manager's written decision. Purchaser and the Region Manager will have an opportunity to present their positions. The Deputy Supervisor - Uplands will issue a decision within a reasonable time of being presented with both Parties' positions.

G-250 Compliance with All Laws

Purchaser shall comply with all applicable statutes, regulations and laws, including, but not limited to; chapter 27.53 RCW, chapter 68.50 RCW, WAC 240-15 and WAC 296-54. Failure to comply may result in forfeiture of this contract.

G-260 Venue

This contract shall be governed by the laws of the State of Washington. In the event of a lawsuit involving this contract, venue shall be proper only in Thurston County Superior Court.

G-270 Equipment Left on State Land

All equipment owned or in the possession of Purchaser, its employees, agents, or invitees, including independent contractors, shall be removed from the sale area and other State land by the termination date of this contract. Equipment remaining unclaimed on State land 60 days after the expiration of the contract period is subject to disposition as provided by law. Purchaser shall pay to the State all costs of moving, storing, and disposing of such equipment. The State shall not be responsible for any damages to or loss of the equipment or damage caused by the moving, storing or disposal of the equipment.

G-280 Operating Release

An operating release is a written document, signed by the State and Purchaser, indicating that Purchaser has been relieved of certain rights or responsibilities with regard to the entire or a portion of the timber sales contract. Purchaser and State may agree to an operating release for this sale, or portion of this sale, prior to the contract

expiration, when all contract requirements pertaining to the release area have been satisfactorily completed. Upon issuance of a release, Purchaser's right to cut and remove forest products on the released area will terminate.

G-310 Road Use Authorization

Purchaser is authorized to use the following State roads and roads for which the State has acquired easements and road use permits; the C-Line, D-Line, D-4000, D-4000A, D-4000A1, D-4080, D-4085, D-4086, D-4087, D-4088, D-4600, D-4600A, D-4606, D-4630, D-4630.1, D-4630.11, D-4700, D-4700A, D-4705, D-4706, D-4706.5, D-4707, D-4800, and E-Line roads. The State may authorize in writing the use of other roads subject to fees, restrictions, and prior rights.

G-330 Pre-work Conference

Purchaser shall arrange with the Contract Administrator to review this contract and to examine the sale area before beginning any operations. A plan of operations shall be developed and agreed upon by the Contract Administrator and Purchaser before beginning any operations. To the extent that the plan of operations is inconsistent with the contract, the terms of the contract shall prevail. State's acceptance and approval of Purchaser's plan of operations shall not be construed as any statement or warranty that the plan of operations is adequate for Purchaser's purposes or complies with applicable laws.

G-340 Preservation of Markers

Any legal land subdivision survey corners and witness objects are to be preserved. If such are destroyed or disturbed, the Purchaser shall, at the Purchaser's own expense, re-establish them through a licensed land surveyor in accordance with U.S. General Land Office standards. Corners and/or witness objects that must be disturbed or destroyed in the process of road construction or logging shall be adequately referenced and/or replaced in accordance with RCW 58.24.040(8). Such references must be approved by the Contract Administrator prior to removal of said corners and/or witness objects.

G-360 Road Use Reservation

The State shall have the right to use, without charge, all existing roads and any road constructed or reconstructed on State lands by Purchaser under this contract. The State may extend such rights to others. If the State grants such rights to others, the State shall require performance or payment, as directed by the State, for their proportionate share of maintenance based on their use.

G-370 Blocking Roads

Purchaser shall not block the C-Line, D-Line, D-4000, D-4600, D-4606 and E-Line roads, unless authority is granted in writing by the Contract Administrator.

G-380 Road Easement and Road Use Permit Requirements

Purchaser agrees to comply with the terms and conditions of the attached:

Easement #55-000753 entered into between the State of Washington Department of Natural Resources and Mason County Logging Company, dated April 13, 1942.

G-430 Open Fires

Purchaser shall not set, or allow to be set by Purchaser's employees, agents, invitees and independent contractors, any open fire at any time of the year without first obtaining permission, in writing, from the Contract Administrator.

G-450 Encumbrances

This contract and Purchaser's activities are subject to the following:

Easement, including the terms and provisions thereof,

For: Railroad

In Favor of: Mason County Logging Company

Disclosed by Application No.: 50-041441

Granted: 2/12/1937

Expires: Indefinite

Easement, including the terms and provisions thereof,

For: Trail

In Favor of: DNR

Disclosed by Application No.: 50-070357

Granted: 4/13/1998

Expires: 1/31/2047

Lease, including the terms and provisions thereof,

For: Land Use License

In Favor of: Washington Department of Fish & Wildlife

Disclosed by Application No.: 60-095576

Granted: 5/2/2017

Expires: 6/30/2022

Lease, including the terms and provisions thereof,

For: Land Use License

In Favor of: Washington Department of Fish & Wildlife

Disclosed by Application No.: 60-096820

Granted: 4/23/2018

Expires: 6/30/2022

Region Encumbrances

Lease, including the terms and provisions thereof,

For: Minor Forest Products

In Favor of: DNR – South Puget Sound

Disclosed by Application No.: 35-SPSTCO1

Granted: 1/1/2015

Expires: Indefinite

Lease, including the terms and provisions thereof,
 For: Land Use License
 In Favor of: Washington University
 Disclosed by Application No.: 60-WS1038
 Granted: 4/1/2019
 Expires: 12/31/2019

Lease, including the terms and provisions thereof,
 For: Land Use License
 In Favor of: State Department of Health
 Disclosed by Application No.: 60-WS0948
 Granted: 4/2/2018
 Expires: 12/31/2020

Special Notations

Located within the Medicine Creek Treaty area. Intergovernmental agreements for vehicle access with Squaxin Island Tribe (92-095269), Puyallup Tribe (92-095272), Muckleshoot Tribe (92-095267), and Nisqually Indian Tribe (92-097198).

Section P: Payments and Securities

P-011 Initial Deposit

Purchaser paid DATA MISSING initial deposit, which will be maintained pursuant to RCW 79.15.100(3). If the operating authority on this contract expires without Purchaser's payment of the full amount specified in Clause P-020, the initial deposit will be immediately forfeited to the State, and will be offset against Purchaser's remaining balance due. Any excess initial deposit funds not needed to ensure full payment of the contract price, or not needed to complete any remaining obligations of the Purchaser existing after contract expiration, will be refunded to the Purchaser.

P-020 Payment for Forest Products

Purchaser agrees to pay the total, lump sum contract price of \$261,716.00. The total contract price consists of a \$0.00 contract bid price plus \$261,716.00 in fees. Fees collected shall be retained by the state unless the contract is adjusted via the G-066 clause. Purchaser shall be liable for the entire purchase price, and will not be entitled to any refunds or offsets unless expressly stated in this contract.

THE PURCHASE PRICE SHALL NOT BE AFFECTED BY ANY FACTORS, INCLUDING: the amount of forest products actually present within the contract area, the actual acreage covered by the contract area, the amount or volume of forest products actually cut or removed by purchaser, whether it becomes physically impossible or uneconomic to remove the forest products, and whether the subject forest products have been lost or damaged by fire or any other cause. The only situations Purchaser may not be liable for the full purchase price are governed by clause G-066, concerning governmental regulatory actions taken during the term of the contract.

P-045 Guarantee of Payment

Purchaser will pay for forest products prior to cutting or will guarantee payment by posting an approved payment security. The amount of cash or payment security shall be determined by the State and shall equal or exceed the value of the cutting proposed by Purchaser.

P-050 Billing Procedure

The State will compute and forward to Purchaser statements of charges provided for in the contract. Purchaser shall deliver payment to the State on or before the date shown on the billing statement.

P-080 Payment Account Refund

Advance payments made under P-045 or P-045.2 remaining on account above the value for the charges shall be returned to Purchaser within 30 days following the final report of charges. Refunds not made within the 30 day period will accrue interest at the interest rate, as established by WAC 332-100-030, computed on a daily basis until paid.

P-090 Performance Security

Purchaser agrees to furnish, within 30 days of the confirmation date, security acceptable to the State in the amount of \$100,000.00. The Security provided shall guarantee performance of all provisions of this contract and payment of any damages caused by operations under this contract or resulting from Purchaser's noncompliance with any rule or law. Acceptable performance security may be in the form of a performance bond, irrevocable letter of credit, cash, savings or certificate of deposit account assignments, and must name the State as the obligee or beneficiary. A letter of credit must comply with Title 62A RCW, Article 5. Performance security must remain in full force over the duration of the contract length. Surety bonds issued shall conform to the issuance and rating requirements in clause G-150. The State shall retain the performance security pursuant to RCW 79.15.100. Purchaser shall not operate unless the performance security has been accepted by the State. If at any time the State decides that the security document or amount has become unsatisfactory, Purchaser agrees to suspend operations and, within 30 days of notification, to replace the security with one acceptable to the State or to supplement the amount of the existing security.

P-100 Performance Security Reduction

The State may reduce the performance security after an operating release has been issued if the State determines that adequate security exists for any remaining obligations of Purchaser.

Section H: Harvesting Operations**H-013 Reserve Tree Damage Definition**

Reserve trees are trees required and designated for retention within the sale boundary. Purchaser shall protect reserve trees from being cut, damaged, or removed during operations.

Reserve tree damage exists when one or more of the following criteria occur as a result of Purchaser's operation, as determined by the Contract Administrator:

- a. A reserve tree has one or more scars on its trunk exposing the cambium layer, which in total exceeds 100 square inches.
- b. A reserve tree top is broken or the live crown ratio is reduced below 30 percent.
- c. A reserve tree has more than 1/3 of the circumference of its root system injured such that the cambium layer is exposed.

If the Contract Administrator determines that a reserve tree has been cut or damaged, the Purchaser shall provide a replacement reserve tree of like condition, size, and species within the sale unit containing the damaged leave tree, as approved by the Contract Administrator. Purchaser may be required to pay liquidated damages for Excessive Reserve Tree Damage as detailed in clause D-041.

Removal of designated reserve trees from the sale area is unauthorized, and may invoke the use of the G-230 'Trespass and Unauthorized Activity' clause. Purchaser is required to leave all cut or damaged reserve trees on site.

H-017 Preventing Excessive Soil Disturbance

Operations may be suspended when soil rutting exceeds 12 inches as measured from the natural ground line. To reduce soil damage, the Contract Administrator may require water bars to be constructed, grass seed to be placed on exposed soils, or other mitigation measures. Suspended operations shall not resume unless approval to do so has been given, in writing, by the Contract Administrator.

H-035 Fall Trees Into Sale Area

Trees shall be felled into the sale area unless otherwise approved by the Contract Administrator.

H-040 Purchaser Harvest Plan

Purchaser shall, as part of the plan of operations, prepare an acceptable harvest plan for entire sale area. The plan shall address the felling, yarding, landing locations, slash operations, tailhold, cable corridor locations, and skid trail location in Unit #3, which are part(s) of this contract. The harvest plan shall be approved by the Contract Administrator prior to beginning the harvest operation. Purchaser shall not deviate from the harvest plan without prior written approval by the Contract Administrator.

H-051 Branding and Painting

Purchaser shall provide a State of Washington registered log brand, acceptable to the State, unless the State agrees to furnish the brand. All purchased timber shall be branded in a manner that meets the requirements of WAC 240-15-030(2)(a)(i). All timber purchased under a contract designated as export restricted shall also be painted in a manner that meets the requirements of WAC 240-15-030(2)(a)(ii).

For pulp loads purchased under a contract designated as export restricted, Purchaser shall brand at least 3 logs with legible brands at one end. Also, 10 logs shall be painted at one end with durable red paint.

H-060 Skid Trail Locations

Locations of skid trails must be marked by Purchaser and approved by the Contract Administrator prior to the felling of timber.

H-080 Snags Not to be Felled

Snags not required to be felled for safety reasons may be left standing. Snags felled for safety reasons shall not be removed and must remain where felled.

H-120 Harvesting Equipment

Forest products sold under this contract shall be harvested and removed using cable, tethered, and tracked ground based equipment with cable-tethered equipment limited to sustained slopes 70 percent or less, non-tethered self-leveling equipment limited to sustained slopes 65 percent or less, and shovels limited to sustained slopes 45 percent and less. Tracked skidders and rubber tired skidders will only be allowed on designated skid trail within Unit #3 limited to sustained slopes 35 percent and less. Additionally, tracked skidders may be used for pole removal limited to sustained slopes 35 percent or less. Authority to use other equipment or to operate outside the equipment specifications detailed above must be approved in writing by the State.

H-125 Log Suspension Requirements

Lead-end suspension is required for all yarding activities.

H-126 Tailholds on State Land

If Purchaser tailholds on State land, methods to minimize damage to live trees outside the sale area shall be employed and must be approved in writing by the Contract Administrator.

H-130 Hauling Schedule

The hauling of forest products will not be permitted from November 1 to April 30 unless authorized in writing by the Contract Administrator.

H-140 Special Harvest Requirements

Purchaser shall accomplish the following during the harvest operations:

General

- a. Any existing downed trees or logs (dead for more than 5 years) yarded to the landing, will be returned to their original locations.
- b. No equipment shall operate, or trees felled or damaged, outside the timber sale boundary.

- c. The Purchaser shall notify all employees and contractors working on this sale that any danger tree marked or unmarked may be felled. Any marked danger tree will be replaced with a suitable tree of similar size and species as approved by the Contract Administrator.
- d. To facilitate proper reforestation in areas of high slash concentrations, purchaser shall, in concurrence with ground based yarding, clear plantable spots at an 11.5 foot by 11.5 foot spacing.
- e. Designated haul roads have been designed to allow for the transport of poles 60 feet in length or less. If the Purchaser chooses to remove poles greater than 60 feet in length, a haul plan must be submitted in writing to the Contract Administrator, which details the desired haul route, additional reconstruction needs, and mitigation for damage, which is a result of hauling oversize material. If approved in writing by the Contract Administrator, all work shall be at the Purchaser's expense.

Stream Protection

- a. Equipment limitation zones are required within 30 feet of Type 5 streams.
- b. Crossings of Type 5 streams may be allowed at locations approved in writing by the Contract Administrator. Purchaser shall place a culvert or log puncheon at crossing locations (when water is present) to protect the stream bank and prevent sedimentation. All materials placed in and/or over the stream at these crossings shall be removed immediately upon completion of yarding on that skid trail.
- c. Any and all operations associated with this sale may be temporarily suspended when, in the opinion of the Contract Administrator, there is the potential for delivery to typed water.
- d. Purchaser shall take measures throughout operations to control soil erosion, water channelization, and prevent sediment delivery to streams or wetlands. Methods may include construction of water bars, "sweeping" with logs, silt traps, or other measures on skid trails, yarding corridors and haul roads.

Skid Trail Requirements

- a. The use of rubber tired skidders, to be used on the designated skid trail marked with orange flagging within Unit 3, will not be permitted from November 1 - April 30 unless authorized in writing by the Contract Administrator.
- b. Purchaser shall not have more than two skid trails open to active skidding at any one time.
- c. Skid trail closure will occur immediately upon completion of yarding all tributary timber. Closure shall consist of creating plantable spots, creating

water bars or other methods as directed by the Contract Administrator to prevent water accumulation and sediment movement.

- d. In the event operations become inactive for long periods of time, skid trails shall be water barred prior to completion of yarding tributary timber to prevent water accumulation and sediment movement, if required by the Contract Administrator.
- e. Once a skid trail is closed, the Purchaser shall not reopen a skid trail unless approved in writing by the Contract Administrator.

Permission to do otherwise must be granted in writing by the Contract Administrator.

H-141 Additional Harvest Requirements

Purchaser shall accomplish the following during the harvest operations:

- a. Purchaser shall leave 2 down logs per acre. A log is defined as having a minimum diameter of 12 inches on the small end of the log and a minimum length of 20 feet or at least 100 board feet.
- b. Tailhold locations are restricted due to protection of potentially unstable slopes. Trees shall not be used as tailholds within non-tradable leave tree clumps within the sale area or locations identified as Slope Stability Mitigation Zones on the Logging Plan Map. Stringing cables through and suspending cables over these areas may be allowed with approval by the Contract Administrator. Tailhold locations and cable corridors for Units 1-5 shall be identified in a harvest plan by the Purchaser and approved in writing by the Contract Administrator prior to the start of operations.

Permission to do otherwise must be granted in writing by the State.

H-190 Completion of Settings

Operations begun on any setting of the sale area shall be completed before any operation begins on subsequent settings unless authorized in writing by the Contract Administrator.

H-220 Protection of Residual or Adjacent Trees

Unless otherwise specified by this contract, the Contract Administrator shall identify damaged adjacent or leave trees that shall be paid for according to clause G-230.

H-230 Tops and Limbs Outside the Sale Boundary

Tops and limbs outside the sale boundary as a result of Purchaser's operation shall be removed concurrently with the yarding operation unless otherwise directed by the Contract Administrator.

H-250 Additional Falling Requirements

Within Units #1-#5, all hardwood stems over 2 inches, shall be felled. Remaining stump shall be no more than 12 inches in height. Areas of young or immature timber may be excluded from this requirement by the Contract Administrator. Trees will be cut below the lowest live limb and cut completely free of the stump. Cut tree must be on the ground and not "hung up" or leaning against live trees.

Section C: Construction and Maintenance**C-040 Road Plan**

Road construction and associated work provisions of the Road Plan for this sale, dated 10/25/2018 are hereby made a part of this contract.

C-050 Purchaser Road Maintenance and Repair

Purchaser shall perform work at their own expense on the D-4000A, D-4000A1, D-4080, D-4085, D-4086, D-4087, D-4088, D-4600A, D-4630, D-4630.1, D-4630.11, D-4700, D-4700A, D-4705, D-4706, D-4706.5, D-4707, and D-4800 roads. All work shall be completed to the specifications detailed in the Road Plan.

C-060 Designated Road Maintainer

If required by the State, Purchaser shall perform maintenance and replacement work as directed by the Contract Administrator on all other roads used not covered in clause C-050. Purchaser shall furnish a statement in a form satisfactory to the State showing the costs incurred while performing this work. Costs shall be based on the rates set forth in the equipment rate schedule on file at the Region office or Engineering Division in Olympia. The State shall reimburse Purchaser for said costs within 30 days of receipt and approval of the statement.

C-080 Landing Locations Approved Prior to Construction

Landings shall be marked by Purchaser and approved by the Contract Administrator prior to construction.

C-140 Water Bars

Purchaser shall, as directed by the Contract Administrator, construct water bars across haul roads, skid trails and fire trails as necessary to control soil erosion and water pollution.

Section S: Site Preparation and Protection**S-001 Emergency Response Plan**

An Emergency Response Plan (ERP) shall be provided to the Contract Administrator containing but not limited to, valid contact numbers and procedures for medical emergencies, fire, hazardous spills, forest practice violations and any unauthorized or unlawful activity on or in the vicinity of the sale area. The Contract Administrator and the State shall be promptly notified whenever an incident occurs requiring an emergency response.

The ERP must be presented for inspection at the prework meeting and kept readily available to all personnel, including subcontractors, on site during active operations.

S-010 Fire Hazardous Conditions

Purchaser acknowledges that operations under this Contract may increase the risk of fire. Purchaser shall conduct all operations under this agreement following the requirements of WAC 332-24-005 and WAC 332-24-405 and further agrees to use the highest degree of care to prevent uncontrolled fires from starting.

In the event of an uncontrolled fire, Purchaser agrees to provide equipment and personnel working at the site to safely and effectively engage in first response fire suppression activity.

Purchaser's failure to effectively engage in fire-safe operations is considered a breach and may result in suspension of operations.

S-035 Logging Debris Clean Up

Slash and debris created from harvest activities shall be treated in a manner approved in writing by the Contract Administrator.

S-050 Cessation of Operations for Low Humidity

When the humidity is 30 percent or lower on the sale area, all operations must cease unless authority to continue is granted by the State in writing.

S-060 Pump Truck or Pump Trailer

Purchaser shall provide a fully functional pump truck or pump trailer equipped to meet the specifications of WAC 332-24-005 and WAC 332-24-405 during the "closed season" or as extended by the State and shall provide trained personnel to operate this equipment on the sale area during all operating periods.

S-100 Stream Cleanout

Slash or debris which enters Type 5 streams as a result of operations under this contract and which is identified by the Contract Administrator shall be removed and deposited in a stable position. Removal of slash or debris shall be accomplished in a manner that avoids damage to the natural stream bed and bank vegetation.

S-110 Resource Protection

No equipment may operate within the Riparian or Wetland Management Zones unless authority is granted in writing by the Contract Administrator.

S-120 Stream Protection

No timber shall be felled into, across, or yarded through Type 3 and Type 4 streams.

S-130 Hazardous Materials

a. Hazardous Materials and Waste - Regulatory Compliance

Purchaser is responsible for understanding and complying with all applicable local, state, and federal hazardous material/waste laws and regulations for

operations conducted under this contract. Such regulations pertain to, but may not be limited to, hazardous material storage, handling and transport, personnel protection, release notification and emergency response, cleanup and waste disposal. Purchaser shall be responsible for restoring the site in the event of a spill.

b. Hazardous Materials Spill Prevention

All operations shall be conducted in a manner that avoids the release of hazardous materials, including petroleum products, into the environment (water, air or land).

c. Hazardous Materials Spill Containment, Control and Cleanup

If safe to do so, Purchaser shall take immediate action to contain and control all hazardous material spills. Purchaser shall ensure that enough quick response spill kits capable of absorbing 10 gallons of oil, coolant, solvent or contaminated water are available on site to quickly address potential spills from any piece of equipment at all times throughout active operations. If large quantities of bulk fuel/other hazardous materials are stored on site, Purchaser must be able to effectively control a container leak and contain & recover a hazmat spill equal to the largest single on site storage container volume. (HAZWOPER reg. 29CFR 1910.120 (j) (1) (vii)).

d. Hazardous Material Release Reporting

Releases of oil or hazardous materials to the environment must be reported according to the State Department of Ecology (ECY). It is the responsibility of the Purchaser to have all emergency contact information readily available and a means of remote communication for purposes of quick notification. In the event of a spill, the Purchaser is responsible for notifying the following:

Appropriate Department of Ecology regional office (contact information below).

DNR Contract Administrator

ECY - Northwest Region:

1-425-649-7000

(Island, King, Kitsap, San Juan, Skagit, Snohomish, and Whatcom counties)

ECY - Southwest Region:

1-360-407-6300

(Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, and Wahkiakum counties)

ECY - Central Region:

1-509-575-2490

(Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, and Yakima counties)

ECY - Eastern Region:

1-509-329-3400

(Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, and Whitman counties)

S-131 Refuse Disposal

As required by RCW 70.93, All Purchaser generated refuse shall be removed from state lands for proper disposal prior to termination of this contract. No refuse shall be burned, buried or abandoned on state forest lands. All refuse shall be transported in a manner such that it is in compliance with RCW 70.93 and all loads or loose materials shall be covered/secured such that these waste materials are properly contained during transport.

Section D: Damages

D-013 Liquidated Damages or Failure to Perform

The following clauses provide for payments by Purchaser to the State for breaches of the terms of this contract other than failure to perform. These payments are agreed to as liquidated damages and not as penalties. They are reasonable estimates of anticipated harm to the State, which will be caused by Purchaser's breach. These liquidated damages provisions are agreed to by the State and Purchaser with the understanding of the difficulty of proving loss and the inconvenience or infeasibility of obtaining an adequate remedy. These liquidated damages provisions provide greater certainty for the Purchaser by allowing the Purchaser to better assess its responsibilities under the contract.

Clause P-020 governs Purchaser's liability in the event Purchaser fails to perform any of the contract requirements other than the below liquidated damage clauses without written approval by the State. Purchaser's failure to pay for all or part of the forest products sold in this contract prior to expiration of the contract term results in substantial injury to the State. Therefore, Purchaser agrees to pay the State the full lump sum contract price in P-020 in the event of failure to perform.

D-041 Reserve Tree Excessive Damage

When Purchaser's operations exceed the damage limits set forth in clause H-013, Reserve Tree Damage Definition, and when the Contract Administrator determines that a suitable replacement for a damaged reserve tree is not possible, the damaged trees result in substantial injury to the State. The value of the damaged reserve trees at the time of the breach is not readily ascertainable. Therefore, the Purchaser agrees to pay the State as liquidated damages at the rate of \$1,000.00 per tree for all damaged reserve trees that are not replaced in all units.

DRAFT

DRAFT

DRAFT

IN WITNESS WHEREOF, the Parties hereto have entered into this contract.

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

Purchaser

Print Name

Date: _____

Address:

Scott Sargent

South Puget Sound Region Manager

Date: _____

CORPORATE ACKNOWLEDGEMENT
(Required for both LLC and Inc. Entities)

STATE OF _____)

COUNTY OF _____)

On this _____ day of _____, 20____, before me personally appeared _____

_____ to me known to be the _____ of the corporation that executed the within and foregoing instrument and acknowledged said instrument to be the free and voluntary act and deed of the corporation, for the uses and purposes therein mentioned, and on oath stated that (he/she was) (they were) authorized to execute said instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

Notary Public in and for the State of

My appointment expires _____

Schedule A
Recreation Trail Clean Out and Repair

This schedule applies to the McKenny and Lost Valley trails.

Closure

- Purchaser is responsible for closing trails at locations designated by the Contract Administrator (CA) to provide for public safety during active operations. Trails shall be closed with orange construction barricade netting and posting trail closure signs provided by DNR.
- The Purchaser is responsible for providing notification to the CA at least five days prior to trail closure.

Clean out

- Purchaser is responsible for locating and marking the recreation trail within the sale boundary on the ground prior to harvest as approved by the CA.
- If needed, upon completion of harvest activities Purchaser shall locate the original recreation trail with pink fluorescent flagging. The CA will then approve the trail location in writing and repair/clean out can begin.

Recreation trail repair/clean out shall occur within 2 weeks of completion of harvest within 200 feet of the trail. The CA may require cleanout of the trail prior to completion of harvest, if there is a delay in harvesting activities. Clean out and repair shall consist of the following:

- Remove all logging debris from the recreation trail and the area on each side of the trail within 5 feet of the travel path.
- Trail will be repaired where holes or ruts resulted due to logging damage. The trail will be returned to its original width on mineral soils and free of organic debris.
- Existing drainage control measures shall be returned to pre-harvest condition.
- Any damaged Geoweb structures damaged during the logging operation will be replaced or repaired to pre-harvest condition.

All work described above shall be done as determined by the CA. The logging release for the unit will not be issued until repair and clean out is completed and approved in writing by the CA.



WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

FOREST EXCISE TAX ROAD SUMMARY SHEET

Region: South Puget Sound

Timber Sale Name: Thunderstruck

Application Number: 30- 097289

EXCISE TAX APPLICABLE ACTIVITIES

Construction: 1,109 linear feet
Road to be constructed (optional and required) but not abandoned

Reconstruction: 1492 linear feet
Road to be reconstructed (optional and required) but not abandoned

Abandonment: 0 linear feet
Abandonment of existing roads not reconstructed under the contract

Decommission: 0 linear feet
Road to be made undriveable but not officially abandoned.

Pre-Haul Maintenance: 93954 linear feet
Existing road to receive maintenance work (optional and required) prior to haul

EXCISE TAX EXEMPT ACTIVITIES

Temporary Construction: 2729 linear feet
Roads to be constructed (optional and required) and then abandoned

571 linear feet
Temporary Reconstruction:
Roads to be reconstructed (optional and required) and then abandoned

All parties must make their own assessment of the taxable or non-taxable status of any work performed under the timber sale contract. The Department of Revenue bears responsibility for determining forest road excise taxes. The Department of Natural Resources developed this form to help estimate the impact of forest excise taxes. However, the information provided may not precisely calculate the actual amount of taxes due. The Department of Revenue is available for consultation by calling 1.800.548.8829.

(Revised 9/18)

PRE-CRUISE NARRATIVE

Sale Name: Thunderstruck	Region: South Puget Sound
Agreement #: 30-097289	District: Black Hills
Contact Forester: KelliAnne Ricks	Phone/ Location: (360) 480-9702 Ext: /
Alternate Contact: Derwood Duncan III	Phone/ Location: (360) 280-3113 Ext: /

Type of Sale (lump sum, mbf scale, tonnage scale or contract harvest): **Lump Sum**

Required or Optional removal of utility as pulp: **N/A**

Evaluated for RFRS Implementation?: **Yes**

Percentage cable (specify downhill vs uphill): **30 uphill**

Percentage ground based: **70**

Species Onsite: RC, DF, WH, RA, BC, BLM, NF, SF, SS, Other:(Please List)

UNIT ACREAGES* AND METHOD OF DETERMINATION:

Unit #	Harvest R/W or RMZ WMZ	Legal Description Sec/Twp/Rng	Grant	Gross Traversed Acres	Deductions from Gross Acres (No harvest acres)			Net Harvest Acres	Acreage Determination (List method, dimensions and error of closure if applicable)	
					RMZ/WMZ Acres	Leave Tree Acres	Existing Road Acres			Other Acres (describe)
1 (VRH)		Sec 25/ T 17N/ R 04 W		36.3	0	4.8	0.2	0	31.3	GPS (Garmin and Trimble), D-4707 220'x35'
2 (VRH)		Sec 25/ T 17N/ R 03&04 W		24.0	0	1.7	0	0	22.3	GPS (Garmin and Trimble),
3 (VRH)		Sec 19&20&29&30/ T 17N/ R 03 W		89.9	0	5.1	1.7	0	83.1	GPS (Garmin and Trimble), D-4000 500'x50', D-4080 860'x35', D-4085 450'x
4 (VRH)		Sec 29&30/ T 17N/ R 03 W		8.6	0	0.6	0	0	8.0	GPS (Garmin and Trimble)
5 (VRH)		Sec 29/ T 17N/ R 03 W		24.8	0	1.3	0.7	0	22.8	GPS (Garmin and Trimble)
6 (PIT)		Sec 29/ T 17N/ R 03 W		0.6	0	0	0	0	0.6	GPS (Garmin and Trimble)
7 (ROW)		Sec 25/ T 17N/ R 04 W		0.7	0	0	0	0	0.7	GPS (Garmin and Trimble)
TOTAL ACRES				184.9	0	13.5	2.6	0	168.8	

HARVEST PLAN AND SPECIAL CONDITIONS:

Unit #	Harvest Prescription: (Mark leave, take, paint color, tags, flagging etc.)	Special Management areas:	Other conditions (# leave trees, etc.)
1 (VRH)	Variable Retention Harvest: Boundaries are marked with white "Timber Sale Boundary" tags and pink flagging. Clumped leave trees are marked with yellow "Leave Tree Area" tags and pink flagging.	N/A	8 leave trees per acre

2 (VRH)	Variable Retention Harvest: Boundaries are marked with white "Timber Sale Boundary" tags and pink flagging, and D-4700 road. Clumped leave trees are marked with yellow "Leave Tree Area" tags and pink flagging.	N/A	8 leave trees per acre
3 (VRH)	Variable Retention Harvest: Boundaries are marked with white "Timber Sale Boundary" tags and pink flagging, D-4000, D-4000A, D-4700, D-4705 and D-4800 roads. Clumped leave trees are marked with yellow "Leave Tree Area" tags and pink flagging.	N/A	8 leave trees per acre
4 (VRH)	Variable Retention Harvest: Boundaries are marked with white "Timber Sale Boundary" tags and pink flagging, D-4600 road. Clumped leave trees are marked with yellow "Leave Tree Area" tags and pink flagging, and scattered individual leave trees are marked with a band of blue paint.	N/A	8 leave trees per acre
5 (VRH)	Variable Retention Harvest: Boundaries are marked with white "Timber Sale Boundary" tags and pink flagging, and D-4630 road. Clumped leave trees are marked with yellow "Leave Tree Area" tags and pink flagging, and scattered individual leave trees are marked with a band of blue paint.	N/A	8 leave trees per acre
6 (ROCK PIT)	Rock Pit Expansion Harvest: Boundaries are marked with white "Timber Sale Boundary" tags and pink flagging, and the Greenline Quarry.	N/A	100% removal
7 (ROW)	Right-of-way marked with orange "Right of way" tags and orange flagging.	N/A	100% removal

OTHER PRE-CRUISE INFORMATION:

Unit #	Estimated Volume	Access information (Gates, locks, etc.)	Photos, traverse maps required
1 (VRH)	See Cruise	N/A	Traverse maps with contours, roads and leave trees. Photo (Scale 1" to 400')
2 (VRH)	See Cruise	N/A	Traverse maps with contours, roads and leave trees. Photo (Scale 1" to 400')
3 (VRH)	See Cruise	N/A	Traverse maps with contours, roads and leave trees. Photo (Scale 1" to 400')
4 (VRH)	See Cruise	N/A	Traverse maps with contours, roads and leave trees. Photo (Scale 1" to 400')

5 (VRH)	See Cruise	N/A	Traverse maps with contours, roads and leave trees. Photo (Scale 1" to 400')
6 (ROCK PIT)	See Cruise	N/A	Traverse maps with contours, roads and leave trees. Photo (Scale 1" to 400')
7 (ROW)	See Cruise	N/A	Traverse maps with contours, roads and leave trees. Photo (Scale 1" to 400')

REMARKS:

This is a 5 unit VRH harvest with about 30% cable yarding. There are new construction roads in units 1, 3 and 5. There is one pit expansion unit (unit 6), and one exterior ROW (unit 7) to the south of Unit 1, from the D-4000 to the boundary line (see map).

Prepared By: KelliAnne Ricks Date: 10/25/2018	Title: Forester NRS 1	CC:
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Revised 2/23/2007 (PSLD)

Cruise Narrative

Sale Name: Thunderstruck	Region: South Puget Sound
Agree. #: 30-097289	District: Black Hills
Lead cruiser: John Piety	Completion date: 12-17-2018
Other cruisers on sale: none Check cruised by D. Richards 10-10-19	

Unit acreage specifications:

Unit #	Cruised acres	Cruised acres agree with sale acres? Yes/No	If acres do not agree explain why.
1	31.3	Yes	
2	22.3	Yes	
3	83.1	Yes	
4	8	Yes	
5	22.8	Yes	
6 pit	0.6	Yes	
7 ROW	0.7	Yes	
Total	168.8		

Unit cruise specifications:

Unit #	Sample type (VP, FP, ITS,100%)	Expansion factor (BAF, full/half)	Sighting height (4.5 ft, 16 ft.)	Grid size (Plot spacing or % of area)	Plot ratio (cruise:count)	Total number of plots
1	VP	54.4 BAF	4.5	290' X 290'	1:1	16
2	VP	54.4 BAF	4.5	290' X 290'	1:1	33
3	VP	54.4 BAF	4.5	290' X 290'	1:1	39
4	VP	54.4 BAF	4.5	200' X 200'	1:1	8
5	VP	54.4 BAF	4.5	290' X 290'	1:1	12
6 Pit	VP	20.0 BAF	4.5	200' X 200'	100%	2
7 ROW	VP	27.78 BAF	4.5	200' X 200'	100%	2

Sale/Cruise Description:

Minor species cruise intensity:	100% up to 5 trees per species
Minimum cruise spec:	HA - Logs meeting the following criteria: Surface characteristics for a high quality A sort will have sound tight knots not to exceed 1 1/2" in diameter, numbering not more than an average of one per foot of log length. May

	<p>include logs with not more than two larger knots. Knots and knot indicators 1/2" in diameter and smaller shall not be a determining factor. Logs will have a growth ring count of 6 or more rings per inch in the outer third top end of the log. (High Quality sort. Grades SM, 2S, 3S. Lengths 16ft-40ft, 2ft multiples min TDIB 8". Max butt 27")</p> <p>HB - Logs meeting the following criteria: Surface characteristics for an Intermediate B sort will have sound tight knots not to exceed 1 1/2" in diameter. May include logs with not more than two larger knots up to 2 1/2" in diameter. Logs will have a growth ring count of 6 or more rings per inch in the outer third to end of the log. (Intermediate sort. Grades 2S, 3S. . Lengths 16ft-40ft, 2ft multiples min TDIB 8". Max butt 27").</p> <p>D - Domestic quality logs that do not meet high quality or intermediate definitions. (Domestic sort. Grades 2S, 3S, 4S and utility. Lengths 16ft-40ft, min TDIB 2in.)</p> <p>O- Logs exceeding 27" on the large end. (Oversize sort. Grade 2S. Lengths 16ft-40ft, 2ft multiples butt diameter min dia. 27 in. +)</p> <p>R - Logs meeting the following criteria: Surface characteristics for a rough log sort will not meet the requirements for a domestic 2S, but still be in limitations for a domestic 3S. Meaning logs will contain excessive knots in excess of 2 1/2" and not exceeding 3" with a recovery of less than 65% of the net scale and greater than 33% of the gross scale. (Rough oversize sort. Grade 3S. Lengths 16ft-40ft, 2ft multiples TDIB 12"+)</p>						
Avg ring count by sp:	<table border="1"> <tr> <td>DF =</td> <td>6</td> <td>WH =</td> <td>7</td> <td></td> <td></td> </tr> </table>	DF =	6	WH =	7		
DF =	6	WH =	7				
Leave/take tree description:	Leave trees are tagged out with yellow leave tree tags.						
Other conditions							

Field observations:

These units are dominated by oversized DF. A small percentage of high-grade logs, a couple poles were seen. There is some decent RC and a small amount of RA and BM. The defect seen are sweep, forks, and spikes. The pit and ROW is younger trees. High percentage of ground based with some directional falling and tower ground mostly unit 1 and 4. Lots of hand falling due to oversized trees.

Grants: 42

Prepared by:

John Piety

Title:

Check Cruiser

CC:

TC		PSPCSTGR		Species, Sort Grade - Board Foot Volumes (Project)																					
<div style="border: 1px solid black; padding: 5px;"> T17N R03W S25 Ty0002 THRU T17N R04W S30 Ty0004 </div>				Project: THUNDERS										Page 1											
				Acres 168.80										Date 10/10/2019 Time 11:27:44AM											
Spp	S T	So rt	Gr ad	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent of Net Board Foot Volume								Average Log				Logs Per /Acre				
					Def%	Gross	Net		Log Scale Dia.				Log Length				Ln Ft	Dia In	Bd Ft	CF/ Lf					
									4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99									
DF	HA	SM		2	1.3	1,532	1,512	255										100			40	18	531	2.52	2.8
DF	HA	2S		3	3.7	1,675	1,613	272										100			40	14	283	1.53	5.7
DF	HA	3S		1		460	460	78			100										40	11	167	0.90	2.8
DF	HB	2S		13	1.7	7,078	6,958	1,175					48	52				100			40	15	358	1.78	19.4
DF	HB	3S		3		1,167	1,167	197			100										40	10	146	0.78	8.0
DF	D	2S		32	2.2	17,227	16,850	2,844				47	53		0	0	0	99			40	15	372	1.83	45.3
DF	D	3S		7	.4	4,142	4,124	696		0	100				2	8	7	83			36	9	111	0.81	37.0
DF	D	4S		4		1,992	1,992	336		33	67				21	13	6	60			29	6	41	0.40	48.3
DF	D	UT		1	19.2	271	219	37		55			45		9	46		45			18	6	27	0.42	8.1
DF	OS	SM		7	2.0	3,977	3,898	658										100			40	23	886	4.04	4.4
DF	OS	2S		26	3.6	14,451	13,937	2,353				1	99				1	99			40	22	860	4.12	16.2
DF	RO	2S		1	12.3	151	132	22										15	85		38	15	269	1.96	.5
DF Totals				89	2.3	54,123	52,862	8,923		1	13	25	60		1	2	1	96			36	12	266	1.52	198.5
DF	P	HA	2S	56		100	100	17										100			40	17	460	2.11	.2
DF	P	HB	2S	30		52	52	9										100			40	13	240	1.25	.2
DF	P	D	3S	11		19	19	3			100										40	8	90	0.64	.2
DF	P	D	4S	3		4	4	1		100								100			16	5	20	0.24	.2
DF Totals				0		175	175	30		2	11	30	57		2			98			34	11	202	1.20	.9
DF	S	D	2S	61	20.8	79	62	11										100			40	13	190	1.45	.3
DF	S	D	3S	29	40.0	49	29	5										100			40	10	90	0.73	.3
DF	S	D	UT	10		10	10	2		100								100			30	5	30	0.34	.3
DF Totals				0	26.2	138	102	17		10	29	61						10			37	9	103	0.89	1.0
WH	D	2S		35	4.5	1,292	1,233	208					70	30	4	20		76			36	15	285	1.79	4.3
WH	D	3S		12	1.9	395	387	65										100			36	10	119	0.98	3.2
WH	D	4S		10		359	359	61		49	51				27	41	3	29			24	6	35	0.44	10.4
WH	D	UT		6		191	191	32		100					28	72					14	5	11	0.14	18.1
WH	OS	2S		29	8.8	1,111	1,014	171										100			40	21	692	3.70	1.5
WH	OS	UT		3	39.6	167	101	17										100			24	29	550	6.25	.2
WH	RO	2S		5	2.9	151	147	25										100			40	20	680	2.80	.2
WH Totals				6	6.4	3,665	3,432	579		11	17	25	48		6	18	4	71			22	7	91	0.95	37.9
RA	D	2S		61	.7	786	780	132										100			34	13	202	1.43	3.9
RA	D	3S		20		258	258	44										100			32	10	126	0.88	2.1
RA	D	4S		16		208	208	35		61	39				12	48	15	24			29	5	34	0.48	6.1
RA	D	UT		3		32	32	5		27					73			73			23	8	62	0.61	.5
RA Totals				2	.4	1,284	1,278	216		11	26	63			4	42	12	42			31	9	102	0.88	12.5
RC	D	3S		38		476	476	80										100			36	12	180	1.48	2.6
RC	D	4S		9		110	110	19		59	41				9	38		53			33	6	39	0.49	2.8
RC	OS	3S		53		649	649	110										100			38	19	613	4.78	1.1
RC Totals				2		1,236	1,236	209		5	18	24	53		1	20		79			35	10	190	1.66	6.5
BM	D	2S		51	1.5	289	285	48										100			29	15	239	1.96	1.2
BM	D	3S		19		106	106	18										100			36	11	154	1.00	.7
BM	D	4S		19	5.1	108	102	17										100			35	9	97	0.80	1.0
BM	OS	2S		11	9.1	64	58	10										100			22	19	300	2.97	.2

Species, Sort Grade - Board Foot Volumes (Project)

T17N R03W S25 Ty0002
 THRU
 T17N R04W S30 Ty0004

Project: THUNDERS
Acres 168.80

Page 2
Date 10/10/2019
Time 11:27:44AM

S Spp	So T	Gr rt ad	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent of Net Board Foot Volume								Average Log				Logs Per /Acre
				Def%	Gross	Net		Log Scale Dia.				Log Length				Ln Ft	Dia In	Bd Ft	CF/ Lf	
								4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99					
BM Totals			1	2.8	566	551	93	38	45	17	53	9	38	32	12	176	1.34	3.1		
Totals				2.5	61,186	59,634	10,066	2	14	26	57	1	4	1	93	33	11	229	1.44	260.4

TC PSTATS		PROJECT STATISTICS							PAGE	1		
		PROJECT THUNDERS							DATE	10/10/2019		
TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt		
17N	03	25	THUNDERST	0002	THR	168.80	112	550	S	W		
17N	04W	30	THUNDERST	0004								
			PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES					
TOTAL			112	550	4.9							
CRUISE			56	247	4.4	19,521	1.3					
DBH COUNT												
REFOREST												
COUNT			55	283	5.1							
BLANKS			1									
100 %												
STAND SUMMARY												
			SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
DOUG FIR			182	72.3	23.0	103	43.4	207.9	54,123	52,862	10,781	10,781
DOUG FIR-P			1	.2	23.1	140	0.1	.6	175	175	35	35
DOUG FIR-S			1	.3	19.6	113	0.2	.7	138	102	32	32
WHEMLOCK			23	29.5	12.5	48	7.1	25.0	3,665	3,432	812	812
R ALDER			15	6.9	17.2	62	2.7	11.2	1,284	1,278	335	335
BL MAPLE			10	2.9	20.2	64	1.4	6.4	566	551	134	134
WR CEDAR			15	3.5	23.0	68	2.1	10.1	1,236	1,236	379	379
TOTAL			247	115.6	20.4	84	58.0	262.0	61,186	59,634	12,509	12,509
CONFIDENCE LIMITS OF THE SAMPLE												
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR												
CL	68.1	COEFF		SAMPLE TREES - BF			# OF TREES REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR		70.6	5.2	1,003	1,058	1,114						
DOUG FIR-P												
DOUG FIR-S												
WHEMLOCK		108.8	23.2	370	482	594						
R ALDER		43.3	11.6	162	183	205						
BL MAPLE		39.9	13.3	193	223	253						
WR CEDAR		75.1	20.1	514	643	772						
TOTAL		82.6	5.3	842	888	935	273	68	30			
CL	68.1	COEFF		SAMPLE TREES - CF			# OF TREES REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR		63.6	4.7	200	210	220						
DOUG FIR-P												
DOUG FIR-S												
WHEMLOCK		97.4	20.8	90	114	137						
R ALDER		43.5	11.6	42	48	54						
BL MAPLE		32.5	10.8	48	53	59						
WR CEDAR		68.4	18.3	158	194	229						
TOTAL		73.4	4.7	175	183	192	215	54	24			
CL	68.1	COEFF		TREES/ACRE			# OF PLOTS REQ.		INF. POP.			
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR		89.6	8.5	66	72	78						
DOUG FIR-P		1058.3	99.9	0	0	0						
DOUG FIR-S		1058.3	99.9	0	0	1						
WHEMLOCK		287.1	27.1	22	30	38						
R ALDER		326.8	30.9	5	7	9						
BL MAPLE		468.9	44.3	2	3	4						
WR CEDAR		467.6	44.1	2	4	5						
TOTAL		89.9	8.5	106	116	125	322	81	36			

PROJECT STATISTICS
PROJECT THUNDERS

TWP	RGE	SC	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
17N	03	25	THUNDERST	0002	THR	168.80	112	550	S	W
17N	04W	30	THUNDERST	0004						

CL	68.1	COEFF	BASAL AREA/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR		70.2	6.6	194	208	222			
DOUG FIR-P		1058.3	99.9	0	1	1			
DOUG FIR-S		1058.3	99.9	0	1	1			
WHEMLOCK		208.9	19.7	20	25	30			
R ALDER		336.0	31.7	8	11	15			
BL MAPLE		434.7	41.0	4	6	9			
WR CEDAR		384.5	36.3	6	10	14			
TOTAL		<i>59.0</i>	<i>5.6</i>	<i>247</i>	<i>262</i>	<i>277</i>	<i>139</i>	<i>35</i>	<i>15</i>

CL	68.1	COEFF	NET BF/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR		75.4	7.1	49,100	52,862	56,623			
DOUG FIR-P		1058.3	99.9	0	175	351			
DOUG FIR-S		1058.3	99.9	0	102	203			
WHEMLOCK		215.5	20.3	2,733	3,432	4,130			
R ALDER		359.2	33.9	845	1,278	1,711			
BL MAPLE		444.9	42.0	319	551	782			
WR CEDAR		384.7	36.3	787	1,236	1,684			
TOTAL		<i>66.7</i>	<i>6.3</i>	<i>55,879</i>	<i>59,634</i>	<i>63,390</i>	<i>178</i>	<i>44</i>	<i>20</i>

CL	68.1	COEFF	NET CUFT FT/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR		73.7	7.0	10,030	10,781	11,531			
DOUG FIR-P		1058.3	99.9	0	35	71			
DOUG FIR-S		1058.3	99.9	0	32	64			
WHEMLOCK		209.3	19.8	651	812	972			
R ALDER		353.7	33.4	223	335	447			
BL MAPLE		440.2	41.6	79	134	190			
WR CEDAR		382.0	36.1	242	379	516			
TOTAL		<i>63.7</i>	<i>6.0</i>	<i>11,757</i>	<i>12,509</i>	<i>13,261</i>	<i>162</i>	<i>41</i>	<i>18</i>

CL	68.1	COEFF	V BAR/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR				236	254	272			
DOUG FIR-P		1058.3	99.9	0	278	556			
DOUG FIR-S		1058.3	99.9	0	148	296			
WHEMLOCK		137.1	12.9	109	137	165			
R ALDER		310.9	29.4	75	114	152			
BL MAPLE		414.1	39.1	50	86	123			
WR CEDAR		376.6	35.6	78	122	166			
TOTAL		<i>66.5</i>	<i>6.3</i>	<i>213</i>	<i>228</i>	<i>242</i>	<i>177</i>	<i>44</i>	<i>20</i>

T17N R03W S25 T0002										T17N R03W S25 T0002				
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt					
17N	03W	25	THUNDERST	0002	22.30	33	44	S	W					

Spp	S T	So rt	Gr ad	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent Net Board Foot Volume								Average Log				Logs Per /Acre
									Log Scale Dia.				Log Length				Ln	Dia	Bd	CF/ Lf	
									4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99	Ft	In	Ft	Lf	
DF	HB	2S		12	1.1	7,774	7,690	171			16	84				100	40	16	438	2.15	17.5
DF	HB	3S		1		783	783	17		100						100	40	11	180	1.12	4.4
DF	DM	2S		41	2.6	26,584	25,906	578			47	53				100	40	16	396	1.95	65.4
DF	DM	3S		6	.6	4,198	4,174	93	2	98			5	12	19	63	34	8	89	0.80	46.9
DF	DM	4S		2		680	680	15	16	84			42		20	38	21	6	33	0.43	20.4
DF	DM	UT				44	44	1	100				100				4	7	5	0.17	9.4
DF	OS	SM		3	2.8	2,316	2,251	50								100	40	23	867	4.00	2.6
DF	OS	2S		35	3.3	22,451	21,715	484								100	40	23	896	4.24	24.2
DF	Totals			92	2.4	64,831	63,243	1,410	0	9	21	70	1	1	1	97	35	13	331	1.93	190.9
WH	DM	2S		62	4.4	2,721	2,600	58			57	43	15			85	37	15	306	1.93	8.5
WH	DM	3S		13	9.4	601	544	12		100						100	39	8	96	0.81	5.7
WH	DM	4S		7		290	290	6	42	58			25	42	33		23	6	36	0.45	8.1
WH	OS	2S		18	2.9	755	734	16								100	40	20	680	3.38	1.1
WH	Totals			6	4.6	4,367	4,167	93	3	17	35	45	11	3	2	83	33	11	179	1.32	23.3
RC	DM	3S		14		107	107	2		100			41			59	36	9	116	1.33	.9
RC	OS	3S		86		629	629	14								100	39	20	683	5.57	.9
RC	Totals			1		735	735	16		14		86	6			94	37	15	399	3.55	1.8
RA	DM	4S		38	.0	151	151	3		100						100	30	9	70	0.83	2.2
RA	DM	UT		62		242	242	5	27		73		73	27			23	8	62	0.61	3.9
RA	Totals			1		393	393	9	16	38	45		45	55			25	8	65	0.70	6.1
Type Totals					2.5	70,325	68,538	1,528	1	9	22	68	2	1	2	95	34	13	309	1.86	222.2

T17N R03W S29 T0005										T17N R03W S29 T0005				
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt					
17N	03W	29	THUNDERST	0005	22.80	12	25	S	W					

Spp	S T	So rt	Gr ad	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent Net Board Foot Volume								Average Log				Logs Per /Acre	
					Def%	Gross	Net		Log Scale Dia.				Log Length				Ln Ft	Dia In	Bd Ft	CF/ Lf		
									4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99						
DF		HB	2S	12	3.9	6,236	5,992	137		78	22					100	40	13	246	1.44	24.4	
DF		HB	3S	3		1,127	1,127	26	100							100	40	10	150	0.89	7.5	
DF		DM	2S	39	3.0	18,491	17,936	409		48	52	2			98	39	16	375	1.88	47.8		
DF		DM	3S	13		6,062	6,062	138	100					5	6	89	39	9	115	0.74	52.5	
DF		DM	4S	6		3,151	3,151	72	28	72				23	9	4	65	28	6	41	0.39	77.6
DF		DM	UT	2	34.5	1,116	731	17								100	40	14	190	1.73	3.8	
DF		OS	2S	25	2.3	11,611	11,340	259								100	40	23	931	4.32	12.2	
DF	Totals			96	3.0	47,793	46,339	1,057	2	20	30	47	2	1	1	96	35	11	205	1.24	225.9	
BM		DM	2S	31		559	559	13								100	30	15	270	1.82	2.1	
BM		DM	3S	34		577	577	13	100							100	40	11	180	1.12	3.2	
BM		DM	4S	10		184	184	4	100							100	30	7	50	0.67	3.7	
BM		OS	2S	25	9.1	470	428	10								100	22	19	300	2.97	1.4	
BM	Totals			4	2.4	1,791	1,748	40	44	32	24					67	32	11	168	1.27	10.4	
RA		DM	2S	89		353	353	8								100	24	14	170	1.52	2.1	
RA		DM	4S	11		42	42	1	100							100	20	6	20	0.56	2.1	
RA	Totals			1	.0	395	395	9	11	89						11	22	10	95	1.08	4.2	
Type Totals					3.0	49,978	48,482	1,105	2	21	31	46	2	4	1	93	35	11	202	1.24	240.4	

T17N R03W S29 T6PIT										T17N R03W S29 T6PIT				
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt	BdFt				
17N	03W	29	THUNDERSTR	6PIT	.60	2	9	S	W	W				

Spp	Sp	T	So	Gr	ad	%	Net	Percent Net Board Foot Volume								Average Log				Logs					
								Bd. Ft. per Acre				Total	Log Scale Dia.				Log Length				Ln Dia Bd CF/				
								Def%	Gross	Net	Net MBF		4-5	6-11	12-16	17+	12-20	21-30	31-35		36-99	Ft	In	Ft	Lf
DF			DM	4S		72	3,287	3,287	2	82	18			18	82	35	5	40	0.44	82.1					
DF			DM	UT		28	1,220	1,220	1	100				100		26	5	30	0.30	40.7					
DF	Totals					100	4,507	4,507	3	87	13			40	60	32	5	37	0.40	122.7					
Type Totals							4,507	4,507	3	87	13			40	60	32	5	37	0.40	122.7					

T17N R03W S30 T0003 **T17N R03W S30 T0003**
 Twp Rge Sec Tract Type Acres Plots Sample Trees CuFt BdFt
 17N 03W 30 THUNDERSTR 0003 83.10 39 99 S W

S Sp	So T	Gr rt ad	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent Net Board Foot Volume								Average Log				Logs Per /Acre		
				Def%	Gross	Net		Log Scale Dia.				Log Length				Ln Ft	Dia In	Bd Ft	CF/ Lf			
								4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99							
DF	HA	SM	5	1.3	3,112	3,070	255											40	18	531	2.52	5.8
DF	HA	2S	5	3.7	3,402	3,276	272				100							40	14	283	1.53	11.6
DF	HA	3S	2		935	935	78			100								40	11	167	0.90	5.6
DF	HB	2S	16	1.5	9,050	8,914	741				55	45						40	15	360	1.76	24.8
DF	HB	3S	3		1,851	1,851	154			100								40	10	142	0.74	13.1
DF	DM	2S	27	1.7	15,900	15,627	1,299				46	54	0	0	99			40	15	361	1.78	43.2
DF	DM	3S	7	.7	4,190	4,160	346			100			1	5	5	88		37	9	117	0.81	35.7
DF	DM	4S	4		2,319	2,319	193	33	67				14	17	6	63		31	6	45	0.40	52.0
DF	DM	UT			24	24	2	100										8	5	10	0.17	2.4
DF	OS	SM	8	1.5	4,902	4,830	401											40	23	952	4.24	5.1
DF	OS	2S	22	3.1	13,070	12,661	1,052											40	23	886	4.13	14.3
DF	RO	2S	1	18.3	205	168	14											37	16	290	2.20	.6
DF	Totals		90	1.9	58,961	57,837	4,806	1	15	27	57		1	1	1	97		37	12	270	1.48	214.1
DF	S	DM	2S	61	20.8	160	126	11				100						40	13	190	1.45	.7
DF	S	DM	3S	29	40.0	100	60	5			100							40	10	90	0.73	.7
DF	S	DM	UT	10		20	20	2	100						100			30	5	30	0.34	.7
DF S	Totals		0	26.2	280	206	17	10	29	61			10		90		37	9	103	0.89	2.0	
WH	DM	2S	28	6.3	1,316	1,233	102				63	37			41	59		34	15	283	1.80	4.4
WH	DM	3S	14		585	585	49			100			6		46	48		34	10	127	1.04	4.6
WH	DM	4S	7		301	301	25	71	29				16	84				23	6	32	0.31	9.5
WH	DM	UT	6		255	255	21	100					12	88				13	5	9	0.13	29.9
WH	OS	2S	33	11.9	1,620	1,428	119											40	21	728	4.01	2.0
WH	OS	UT	5	39.6	338	205	17											24	29	550	6.25	.4
WH	RO	2S	7	2.9	307	298	25											40	20	680	2.80	.4
WH	Totals		7	8.8	4,723	4,305	358	11	16	18	56		3	28	6	64		20	7	84	0.96	51.2
RC	DM	3S	26		358	358	30								9	91		38	12	202	1.56	1.8
RC	DM	4S	8		116	116	10	53	47				17	53	30			30	6	36	0.50	3.2
RC	OS	3S	66		896	896	74								9	91		39	20	666	5.04	1.3
RC	Totals		2		1,370	1,370	114	4	9	21	65		1	12		86		34	10	217	1.94	6.3
RA	DM	2S	53		319	319	27											38	13	230	1.45	1.4
RA	DM	3S	28		169	169	14											40	11	180	1.03	.9
RA	DM	4S	19		112	112	9	18	82						18	31	50	35	6	48	0.45	2.3
RA	Totals		1		600	600	50	3	43	53					3	6	91	37	9	129	0.89	4.7
BM	DM	2S	26	6.3	61	57	5											22	14	150	2.38	.4
BM	DM	4S	74	6.7	168	157	13											40	10	140	0.89	1.1
BM	Totals		0	6.6	229	214	18								27	73		35	11	143	1.12	1.5
Type Totals				2.5	66,162	64,532	5,363	2	15	27	56		1	3	1	95		34	11	231	1.41	279.7

T17N R04W S25 T7ROW										T17N R04W S25 T7ROW				
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt					
17N	04W	25	THUNDERSTR	7ROW	.70	2	11	S	W					

Spp	S	So	Gr	T	rt	ad	%	Net	Percent Net Board Foot Volume								Average Log				Logs				
									Bd. Ft. per Acre		Total	Log Scale Dia.				Log Length				Ln		Dia	Bd	CF/	Per
									Def%	Gross		Net	4-5	6-11	12-16	17+	12-20	21-30	31-35						
DF		DM	3S				20	2,015	2,015	1	100							40	8	90	0.75	22.4			
DF		DM	4S				68	6,513	6,513	5	57	43			12		88	37	5	45	0.41	146.2			
DF		DM	UT				12	1,106	1,106	1	100			20	80			18	5	17	0.21	66.5			
DF	Totals						100	9,634	9,634	7	50	50		2	18		80	32	5	41	0.42	235.0			
Type	Totals							9,634	9,634	7	50	50		2	18		80	32	5	41	0.42	235.0			

T17N R04W S30 T0004										T17N R04W S30 T0004				
Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt					
17N	04W	30	THUNDERST	0004	8.00	8	20	S	W					

Spp	S T	So rt	Gr ad	% Net BdFt	Bd. Ft. per Acre			Total Net MBF	Percent Net Board Foot Volume								Average Log				Logs Per /Acre
					Def%	Gross	Net		Log Scale Dia.				Log Length				Ln Ft	Dia In	Bd Ft	CF/ Lf	
									4-5	6-11	12-16	17+	12-20	21-30	31-35	36-99					
DF		HB	2S	16	2.0	6,201	6,079	49		36	64				100	40	16	388	1.97	15.7	
DF		DM	2S	28	1.5	10,760	10,597	85			53	47			100	40	14	305	1.58	34.7	
DF		DM	3S	12		4,385	4,385	35	100					4	96	39	9	123	0.81	35.6	
DF		DM	4S	2		775	775	6	54	46			50	20	30	22	6	28	0.39	27.6	
DF		OS	2S	42	2.3	15,615	15,252	122			100				100	40	21	716	3.50	21.3	
DF	Totals			80	1.7	37,736	37,087	297	1	13	21	65	1	1	1	97	36	12	275	1.60	134.9
BM		DM	2S	86	1.4	3,875	3,821	31		79	21			43	28	28	30	15	250	1.94	15.3
BM		DM	3S	14		595	595	5	100					100		30	10	110	0.73	5.4	
BM	Totals			10	1.2	4,469	4,415	35	13	68	18		51	24	25	30	14	213	1.62	20.7	
WH		DM	2S	25	4.2	745	714	6		100					100	40	13	230	1.78	3.1	
WH		DM	3S	21		584	584	5	100						100	40	9	120	1.01	4.9	
WH		DM	4S	4		93	93	1	100					100		26	5	30	0.53	3.1	
WH		DM	UT	50		1,379	1,379	11	100				59	41		19	5	19	0.18	71.4	
WH	Totals			6	1.1	2,801	2,770	22	53	21	26		29	24	47	22	5	34	0.40	82.4	
RA		DM	3S	69		1,287	1,287	10	100					100		30	10	110	0.85	11.7	
RA		DM	4S	31		554	554	4	63	37			37	63		23	5	25	0.37	21.8	
RA	Totals			4		1,841	1,841	15	19	81			11	89		26	7	55	0.57	33.5	
Type Totals					1.6	46,847	46,113	369	5	16	25	54	3	11	3	84	30	10	170	1.23	271.6

TC TSTATS				STATISTICS				PAGE	1	
PROJECT				THUNDERS				DATE	10/10/2019	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
17N	03W	25	THUNDERST	0002	22.30	33	173	S	W	
			TREES	ESTIMATED	PERCENT					
			PER PLOT	TOTAL	SAMPLE					
			PLOTS	TREES	TREES	TREES				
TOTAL		33	173	5.2						
CRUISE		11	44	4.0	1,618		2.7			
DBH COUNT										
REFOREST										
COUNT		22	125	5.7						
BLANKS										
100 %										
STAND SUMMARY										
	SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET
	TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC
DOUG FIR	35	58.0	27.9	116	46.6	245.8	64,831	63,243	12,795	12,795
WHEMLOCK	5	9.7	21.7	82	5.3	24.7	4,367	4,167	1,014	1,014
WR CEDAR	2	.9	36.2	77	1.1	6.6	735	735	245	245
R ALDER	2	3.9	15.2	65	1.3	4.9	393	393	108	108
TOTAL	44	72.6	26.7	108	54.6	282.1	70,325	68,538	14,163	14,162
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										
CL:	68.1 %	COEFF	SAMPLE TREES - BF				# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR	46.9	7.9		1,210	1,314	1,418				
WHEMLOCK	53.1	26.4		411	558	705				
WR CEDAR	4.4	4.2		762	795	828				
R ALDER				100	100	100				
TOTAL	56.9	8.6		1,051	1,150	1,248	129	32	14	
CL:	68.1 %	COEFF	SAMPLE TREES - CF				# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR	40.4	6.8		243	260	278				
WHEMLOCK	46.4	23.1		102	133	164				
WR CEDAR	12.3	11.5		238	269	300				
R ALDER	27.3	25.6		20	27	34				
TOTAL	48.3	7.3		219	236	253	93	23	10	
CL:	68.1 %	COEFF	TREES/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR	48.1	8.4		53	58	63				
WHEMLOCK	158.5	27.6		7	10	12				
WR CEDAR	274.9	47.8		0	1	1				
R ALDER	422.8	73.5		1	4	7				
TOTAL	39.2	6.8		68	73	78	61	15	7	
CL:	68.1 %	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR	47.0	8.2		226	246	266				
WHEMLOCK	165.8	28.8		18	25	32				
WR CEDAR	273.4	47.6		3	7	10				
R ALDER	422.8	73.5		1	5	9				
TOTAL	37.8	6.6		264	282	301	57	14	6	
CL:	68.1 %	COEFF	NET BF/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR	48.3	8.4		57,931	63,243	68,554				
WHEMLOCK	176.8	30.8		2,886	4,167	5,449				
WR CEDAR	275.6	47.9		383	735	1,088				
R ALDER	422.8	73.5		104	393	682				

TC TSTATS		STATISTICS							PAGE	2
		PROJECT THUNDERS							DATE	10/10/2019
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
17N	03W	25	THUNDERST	0002	22.30	33	173	S	W	
CL:	68.1 %	COEFF	NET BF/ACRE			# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.	S.E.%	LOW	AVG	HIGH	5	10	15	
TOTAL		42.2	7.3	63,511	68,538	73,565	71	18	8	
CL:	68.1 %	COEFF	NET CUFT FT/ACRE			# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		47.9	8.3	11,730	12,795	13,860				
WHEMLOCK		170.7	29.7	713	1,014	1,316				
WR CEDAR		273.6	47.6	128	245	361				
R ALDER		422.8	73.5	29	108	188				
TOTAL		40.7	7.1	13,160	14,162	15,164	66	17	7	
CL:	68.1 %	COEFF	V-BAR/ACRE			# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR				236	257	279				
WHEMLOCK		100.4	17.5	117	168	220				
WR CEDAR		182.8	31.8	58	111	165				
R ALDER		375.4	65.3	21	79	138				
TOTAL		434.9	75.6	225	243	261	7,553	1,888	839	

TC TSTATS		STATISTICS								PAGE	1
		PROJECT THUNDERS								DATE	10/10/2019
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
17N	03W	29	THUNDERST	0005	22.80	12	50	S	W		
		PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES					
TOTAL		12	50	4.2							
CRUISE		6	25	4.2	2,146	1.2					
DBH COUNT REFOREST COUNT		6	25	4.2							
BLANKS 100 %											
STAND SUMMARY											
SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC		
DOUG FIR	20	81.7	21.2	104	43.4	199.5	47,793	46,339	9,937	9,935	
BL MAPLE	4	10.4	20.0	63	5.1	22.7	1,791	1,748	423	423	
R ALDER	1	2.1	20.0	52	1.0	4.5	395	395	99	99	
TOTAL	25	94.1	21.0	99	49.4	226.7	49,978	48,482	10,459	10,457	
CONFIDENCE LIMITS OF THE SAMPLE											
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR											
CL: 68.1 %	COEFF	SAMPLE TREES - BF				# OF TREES REQ.		INF. POP.			
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR	79.4	18.2	766	936	1,106						
BL MAPLE	56.1	32.1	136	200	264						
R ALDER											
TOTAL	92.3	18.8	640	788	937	355	89	39			
CL: 68.1 %	COEFF	SAMPLE TREES - CF				# OF TREES REQ.		INF. POP.			
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR	67.1	15.4	160	189	218						
BL MAPLE	41.9	24.0	35	46	57						
R ALDER											
TOTAL	79.2	16.2	135	161	187	261	65	29			
CL: 68.1 %	COEFF	TREES/ACRE				# OF PLOTS REQ.		INF. POP.			
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR	53.3	16.1	69	82	95						
BL MAPLE	241.4	72.7	3	10	18						
R ALDER	346.4	104.3		2	4						
TOTAL	38.2	11.5	83	94	105	63	16	7			
CL: 68.1 %	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.			
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR	55.0	16.5	166	199	232						
BL MAPLE	216.1	65.1	8	23	37						
R ALDER	346.4	104.3		5	9						
TOTAL	42.0	12.6	198	227	255	77	19	9			
CL: 68.1 %	COEFF	NET BF/ACRE				# OF PLOTS REQ.		INF. POP.			
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR	61.6	18.6	37,739	46,339	54,939						
BL MAPLE	217.1	65.4	605	1,748	2,891						
R ALDER	346.4	104.3		395	807						
TOTAL	55.5	16.7	40,373	48,482	56,590	134	34	15			
CL: 68.1 %	COEFF	NET CUFT FT/ACRE				# OF PLOTS REQ.		INF. POP.			
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15			
DOUG FIR	58.4	17.6	8,189	9,935	11,681						
BL MAPLE	222.1	66.9	140	423	706						
R ALDER	346.4	104.3		99	202						
TOTAL	51.2	15.4	8,843	10,457	12,071	114	29	13			

TC TSTATS				STATISTICS				PAGE	2	
				PROJECT THUNDERS				DATE	10/10/2019	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
17N	03W	29	THUNDERST	0005	22.80	12	50	S	W	
CL:	68.1 %	COEFF		V-BAR/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.	S.E.%	LOW	AVG	HIGH	5	10	15	
CL:	68.1 %	COEFF		V-BAR/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR				189	232	275				
BL MAPLE		204.7	61.6	27	77	128				
R ALDER		346.4	104.3		87	178				
TOTAL		228.2	68.7	178	214	250	2,265	566	252	

TC TSTATS				STATISTICS				PAGE	1	
PROJECT				THUNDERS				DATE	10/10/2019	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
17N	03W	29	THUNDERSTR	6PIT	0.60	2	9	S	W	
				TREES	ESTIMATED	PERCENT				
				PER PLOT	TOTAL	SAMPLE				
					TREES	TREES				
TOTAL		2	9	4.5						
CRUISE		2	9	4.5	74		12.2			
DBH COUNT										
REFOREST										
COUNT										
BLANKS										
100 %										
STAND SUMMARY										
	SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET
	TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC
DOUG FIR	9	122.7	11.6	39	26.4	90.0	4,507	4,507	1,567	1,567
TOTAL	9	122.7	11.6	39	26.4	90.0	4,507	4,507	1,567	1,567
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										
CL: 68.1 %	COEFF	SAMPLE TREES - BF					# OF TREES REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	25.7	9.1	34	38	41					
TOTAL	25.7	9.1	34	38	41	30	7	3		
CL: 68.1 %	COEFF	SAMPLE TREES - CF					# OF TREES REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	43.8	15.5	13	15	17					
TOTAL	43.8	15.5	13	15	17	86	22	10		
CL: 68.1 %	COEFF	TREES/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	38.4	35.9	79	123	167					
TOTAL	38.4	35.9	79	123	167	103	26	11		
CL: 68.1 %	COEFF	BASAL AREA/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	15.7	14.7	77	90	103					
TOTAL	15.7	14.7	77	90	103	17	4	2		
CL: 68.1 %	COEFF	NET BF/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	16.6	15.5	3,808	4,507	5,205					
TOTAL	16.6	15.5	3,808	4,507	5,205	19	5	2		
CL: 68.1 %	COEFF	NET CUFT FT/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	7.6	7.1	1,456	1,567	1,678					
TOTAL	7.6	7.1	1,456	1,567	1,678	4	1	0		
CL: 68.1 %	COEFF	V-BAR/ACRE					# OF PLOTS REQ.		INF. POP.	
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR	16.6	15.5	42	50	58					
TOTAL	16.6	15.5	42	50	58	19	5	2		

TC TSTATS		STATISTICS							PAGE	1
		PROJECT THUNDERS							DATE	10/10/2019
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
17N	03W	30	THUNDERSTR	0003	83.10	39	190	S	W	
		PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES				
TOTAL		39	190	4.9						
CRUISE		20	99	4.9	9,850	1.0				
DBH COUNT										
REFOREST										
COUNT		18	86	4.8						
BLANKS		1								
100 %										
STAND SUMMARY										
	SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
DOUG FIR	76	69.0	24.0	119	44.2	216.2	58,961	57,837	11,675	11,675
DOUG FIR-S	1	.7	19.6	113	0.3	1.4	280	206	65	65
WHEMLOCK	10	41.2	11.4	47	8.7	29.3	4,723	4,305	970	970
WR CEDAR	7	3.8	23.2	58	2.3	11.2	1,370	1,370	416	416
R ALDER	3	2.3	18.2	79	1.0	4.2	600	600	151	151
BL MAPLE	2	1.5	18.5	59	0.6	2.8	229	214	60	60
TOTAL	99	118.5	20.2	90	58.9	265.0	66,162	64,532	13,337	13,337
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										
CL:	68.1 %	COEFF	SAMPLE TREES - BF				# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		62.4	7.2	1,111	1,197	1,283				
DOUG FIR-S										
WHEMLOCK		104.5	34.8	427	655	883				
WR CEDAR		75.0	30.5	576	829	1,081				
R ALDER		6.7	4.6	248	260	272				
BL MAPLE		4.9	4.6	138	145	152				
TOTAL		71.5	7.2	982	1,058	1,134	204	51	23	
CL:	68.1 %	COEFF	SAMPLE TREES - CF				# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		56.0	6.4	219	234	249				
DOUG FIR-S										
WHEMLOCK		96.4	32.1	101	149	197				
WR CEDAR		68.0	27.7	175	241	308				
R ALDER		10.5	7.2	61	66	71				
BL MAPLE		27.2	25.4	33	44	55				
TOTAL		63.7	6.4	202	216	229	162	41	18	
CL:	68.1 %	COEFF	TREES/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		54.3	8.7	63	69	75				
DOUG FIR-S		624.5	99.9	0	1	1				
WHEMLOCK		226.3	36.2	26	41	56				
WR CEDAR		413.1	66.1	1	4	6				
R ALDER		624.5	99.9	0	2	5				
BL MAPLE		488.9	78.2	0	1	3				
TOTAL		74.3	11.9	104	119	133	220	55	24	
CL:	68.1 %	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		48.8	7.8	199	216	233				
DOUG FIR-S		624.5	99.9	0	1	3				
WHEMLOCK		180.0	28.8	21	29	38				
WR CEDAR		338.8	54.2	5	11	17				
R ALDER		624.5	99.9	0	4	8				
BL MAPLE		435.7	69.7	1	3	5				

TC TSTATS				STATISTICS				PAGE	2	
PROJECT				THUNDERS				DATE	10/10/2019	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
17N	03W	30	THUNDERSTR	0003	83.10	39	190	S	W	
CL:	68.1 %	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.	S.E.%	LOW	AVG	HIGH	5	10	15	
TOTAL		35.3	5.6	250	265	280	50	12	6	
CL:	68.1 %	COEFF	NET BF/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		52.2	8.4	53,004	57,837	62,670				
DOUG FIR-S		624.5	99.9	0	206	413				
WHEMLOCK		174.5	27.9	3,104	4,305	5,507				
WR CEDAR		340.5	54.5	624	1,370	2,116				
R ALDER		624.5	99.9	1	600	1,200				
BL MAPLE		483.6	77.4	48	214	379				
TOTAL		41.7	6.7	60,222	64,532	68,842	70	17	8	
CL:	68.1 %	COEFF	NET CUFT FT/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		50.7	8.1	10,728	11,675	12,622				
DOUG FIR-S		624.5	99.9	0	65	130				
WHEMLOCK		174.8	28.0	699	970	1,241				
WR CEDAR		338.4	54.1	191	416	642				
R ALDER		624.5	99.9	0	151	303				
BL MAPLE		460.8	73.7	16	60	103				
TOTAL		38.6	6.2	12,513	13,337	14,161	60	15	7	
CL:	68.1 %	COEFF	V-BAR/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR				245	268	290				
DOUG FIR-S		624.5	99.9	0	148	296				
WHEMLOCK		97.8	15.6	106	147	188				
WR CEDAR		331.2	53.0	56	123	190				
R ALDER		624.5	99.9	0	143	287				
BL MAPLE		483.6	77.4	17	77	136				
TOTAL		191.6	30.7	227	243	260	1,466	366	163	

TC TSTATS		STATISTICS								PAGE	1
		PROJECT THUNDERS								DATE	10/10/2019
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt		
17N	04W	25	THUNDERSTR	0001	31.30	16	81	S	W		
				TREES	ESTIMATED		PERCENT				
				PER PLOT	TOTAL		SAMPLE				
					TREES		TREES				
TOTAL		16	81	5.1							
CRUISE		10	39	3.9	4,451		.9				
DBH COUNT											
REFOREST											
COUNT		6	34	5.7							
BLANKS											
100 %											
STAND SUMMARY											
	SAMPLE	TREES	AVG	BOLE	REL	BASAL	GROSS	NET	GROSS	NET	
	TREES	/ACRE	DBH	LEN	DEN	AREA	BF/AC	BF/AC	CF/AC	CF/AC	
DOUG FIR	22	87.6	19.6	66	41.5	183.6	44,393	42,933	8,703	8,703	
DOUG FIR-P	1	1.2	23.1	140	0.7	3.4	946	946	191	191	
R ALDER	6	21.3	18.0	63	8.8	37.4	4,291	4,260	1,133	1,133	
WHEMLOCK	4	24.0	15.3	40	7.8	30.6	3,400	3,400	899	899	
WR CEDAR	6	8.2	21.4	79	4.4	20.4	2,503	2,503	766	766	
TOTAL	39	142.2	18.8	62	63.4	275.4	55,533	54,041	11,692	11,692	
CONFIDENCE LIMITS OF THE SAMPLE											
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR											
CL:	68.1 %	COEFF	SAMPLE TREES - BF				# OF TREES REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR		53.9	11.8	1,072	1,215	1,358					
DOUG FIR-P											
R ALDER		29.9	13.3	185	213	242					
WHEMLOCK		119.5	68.3	105	330	555					
WR CEDAR		57.9	25.8	280	377	474					
TOTAL		81.7	13.1	722	831	939	267	67	30		
CL:	68.1 %	COEFF	SAMPLE TREES - CF				# OF TREES REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR		49.4	10.8	216	242	268					
DOUG FIR-P											
R ALDER		31.7	14.1	49	57	65					
WHEMLOCK		101.1	57.8	34	81	127					
WR CEDAR		49.7	22.1	88	113	138					
TOTAL		70.5	11.3	155	175	195	198	50	22		
CL:	68.1 %	COEFF	TREES/ACRE				# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR		90.7	23.4	67	88	108					
DOUG FIR-P		400.0	103.2		1	2					
R ALDER		144.7	37.3	13	21	29					
WHEMLOCK		135.0	34.8	16	24	32					
WR CEDAR		237.7	61.3	3	8	13					
TOTAL		48.4	12.5	124	142	160	100	25	11		
CL:	68.1 %	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR		50.6	13.1	160	184	208					
DOUG FIR-P		400.0	103.2		3	7					
R ALDER		137.7	35.5	24	37	51					
WHEMLOCK		129.3	33.4	20	31	41					
WR CEDAR		215.0	55.5	9	20	32					
TOTAL		31.8	8.2	253	275	298	43	11	5		
CL:	68.1 %	COEFF	NET BF/ACRE				# OF PLOTS REQ.		INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15		
DOUG FIR		53.6	13.8	36,994	42,933	48,872					

TC TSTATS				STATISTICS			PAGE	2		
PROJECT				THUNDERS			DATE	10/10/2019		
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
17N	04W	25	THUNDERSTR	0001	31.30	16	81	S	W	
CL:	68.1 %	COEFF		NET BF/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR-P		400.0	103.2		946	1,923				
R ALDER		132.6	34.2	2,803	4,260	5,717				
WHEMLOCK		163.8	42.3	1,963	3,400	4,836				
WR CEDAR		207.4	53.5	1,164	2,503	3,841				
TOTAL		40.0	10.3	48,460	54,041	59,623	68	17	8	
CL:	68.1 %	COEFF		NET CUFT FT/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		53.2	13.7	7,507	8,703	9,898				
DOUG FIR-P		400.0	103.2		191	388				
R ALDER		131.3	33.9	749	1,133	1,517				
WHEMLOCK		152.7	39.4	545	899	1,253				
WR CEDAR		210.7	54.4	350	766	1,182				
TOTAL		35.8	9.2	10,613	11,692	12,772	55	14	6	
CL:	68.1 %	COEFF		V-BAR/ACRE			# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR				201	234	266				
DOUG FIR-P		400.0	103.2		278	565				
R ALDER		69.9	18.0	75	114	153				
WHEMLOCK		110.0	28.4	64	111	158				
WR CEDAR		207.4	53.5	57	123	188				
TOTAL		218.4	56.3	176	196	216	2,032	508	226	

TC TSTATS				STATISTICS				PAGE	1	
PROJECT				THUNDERS				DATE	10/10/2019	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
17N	04W	25	THUNDERSTR	7ROW	0.70	2	11	S	W	
		PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES				
TOTAL		2	11	5.5						
CRUISE		2	11	5.5	149	7.4				
DBH COUNT										
REFOREST										
COUNT										
BLANKS										
100 %										
STAND SUMMARY										
	SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
DOUG FIR	11	212.7	11.5	41	45.1	152.8	9,634	9,634	3,152	3,152
TOTAL	11	212.7	11.5	41	45.1	152.8	9,634	9,634	3,152	3,152
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										
CL:	68.1 %	COEFF	SAMPLE TREES - BF				# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		48.8	15.4	45	54	62				
TOTAL		48.8	15.4	45	54	62	105	26	12	
CL:	68.1 %	COEFF	SAMPLE TREES - CF				# OF TREES REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		49.0	15.5	15	18	21				
TOTAL		49.0	15.5	15	18	21	105	26	12	
CL:	68.1 %	COEFF	TREES/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		32.9	30.8	147	213	278				
TOTAL		32.9	30.8	147	213	278	76	19	8	
CL:	68.1 %	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		12.9	12.0	134	153	171				
TOTAL		12.9	12.0	134	153	171	12	3	1	
CL:	68.1 %	COEFF	NET BF/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		6.7	6.3	9,028	9,634	10,239				
TOTAL		6.7	6.3	9,028	9,634	10,239	3	1	0	
CL:	68.1 %	COEFF	NET CUFT FT/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		5.8	5.5	2,980	3,152	3,324				
TOTAL		5.8	5.5	2,980	3,152	3,324	2	1	0	
CL:	68.1 %	COEFF	V-BAR/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		6.7	6.3	59	63	67				
TOTAL		6.7	6.3	59	63	67	3	1	0	

TC TSTATS		STATISTICS							PAGE	1
		PROJECT THUNDERS							DATE	10/10/2019
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
17N	04W	30	THUNDERST	0004	8.00	8	36	S	W	
		PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES				
TOTAL		8	36	4.5						
CRUISE		5	20	4.0	1,234	1.6				
DBH COUNT REFOREST COUNT		3	13	4.3						
BLANKS		100 %								
STAND SUMMARY										
	SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
DOUG FIR	9	42.7	25.3	118	29.7	149.6	37,736	37,087	7,780	7,780
BL MAPLE	4	15.3	22.1	70	8.7	40.8	4,469	4,415	1,013	1,013
WHEMLOCK	4	74.5	9.1	49	11.2	34.0	2,801	2,770	704	704
R ALDER	3	21.8	13.1	41	5.6	20.4	1,841	1,841	486	486
TOTAL	20	154.3	17.1	69	59.3	244.8	46,847	46,113	9,984	9,984
CONFIDENCE LIMITS OF THE SAMPLE										
68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMPLE ERROR										
CL:	68.1 %	COEFF	SAMPLE TREES - BF				# OF TREES REQ.	INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		42.6	15.0	873	1,028	1,182				
BL MAPLE		12.3	7.0	265	285	305				
WHEMLOCK		106.2	60.7	42	108	173				
R ALDER		69.3	47.9	52	100	148				
TOTAL		95.1	21.8	435	556	677	380	95	42	
CL:	68.1 %	COEFF	SAMPLE TREES - CF				# OF TREES REQ.	INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		36.8	13.0	184	212	239				
BL MAPLE		19.4	11.1	58	65	73				
WHEMLOCK		114.8	65.6	12	34	56				
R ALDER		61.2	42.4	15	26	37				
TOTAL		85.8	19.7	96	119	142	309	77	34	
CL:	68.1 %	COEFF	TREES/ACRE				# OF PLOTS REQ.	INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		92.0	34.7	28	43	58				
BL MAPLE		198.4	74.8	4	15	27				
WHEMLOCK		152.0	57.3	32	74	117				
R ALDER		185.8	70.1	7	22	37				
TOTAL		59.9	22.6	119	154	189	163	41	18	
CL:	68.1 %	COEFF	BASAL AREA/ACRE				# OF PLOTS REQ.	INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		86.4	32.6	101	150	198				
BL MAPLE		198.4	74.8	10	41	71				
WHEMLOCK		169.7	64.0	12	34	56				
R ALDER		198.4	74.8	5	20	36				
TOTAL		23.8	9.0	223	245	267	26	6	3	
CL:	68.1 %	COEFF	NET BF/ACRE				# OF PLOTS REQ.	INF. POP.		
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		90.0	33.9	24,501	37,087	49,673				
BL MAPLE		198.4	74.8	1,112	4,415	7,718				
WHEMLOCK		177.9	67.1	912	2,770	4,628				
R ALDER		249.2	94.0	111	1,841	3,571				
TOTAL		56.7	21.4	36,262	46,113	55,964	146	37	16	

TC TSTATS				STATISTICS				PAGE	2	
PROJECT				THUNDERS				DATE	10/10/2019	
TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt	
17N	04W	30	THUNDERST	0004	8.00	8	36	S	W	
CL:	68.1 %	COEFF	NET CUFT FT/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.	S.E.%	LOW	AVG	HIGH	5	10	15	
CL:	68.1 %	COEFF	NET CUFT FT/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR		88.9	33.5	5,171	7,780	10,388				
BL MAPLE		198.4	74.8	255	1,013	1,771				
WHEMLOCK		184.6	69.6	214	704	1,195				
R ALDER		235.3	88.7	55	486	918				
TOTAL		<i>50.8</i>	<i>19.2</i>	<i>8,071</i>	<i>9,984</i>	<i>11,897</i>	<i>117</i>	<i>29</i>	<i>13</i>	
CL:	68.1 %	COEFF	V-BAR/ACRE				# OF PLOTS REQ.		INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15	
DOUG FIR				164	248	332				
BL MAPLE		170.9	64.4	27	108	189				
WHEMLOCK		167.3	63.1	27	81	136				
R ALDER		249.2	94.0	5	90	175				
TOTAL		<i>227.8</i>	<i>85.9</i>	<i>148</i>	<i>188</i>	<i>229</i>	<i>2,360</i>	<i>590</i>	<i>262</i>	

Species Summary - Trees, Logs, Tons, CCF, MBF

T17N R03W S25 Ty000	22.3
T17N R03W S29 Ty000	22.8
T17N R04W S30 Ty000	8.0

Project THUNDERS
Acres 168.80

Page No 1
Date: 10/10/2019
Time 11:30:57AM

Species	s T	Total	Total	Total	Net Cubic Ft/		CF/	Total CCF		Total MBF	
		Trees	Logs	Tons	Tree	Log	LF	Gross	Net	Gross	Net
DOUG FIR		12,199	33,511	51,866	149.18	54.30	1.55	18,199	18,198	9,136	8,923
WHEMLOCK		4,987	6,397	4,384	27.48	21.42	0.95	1,370	1,370	619	579
R ALDER		1,168	2,114	1,557	48.46	26.78	0.88	566	566	217	216
WR CEDAR		592	1,100	1,505	108.13	58.21	1.61	640	640	209	209
BL MAPLE		484	527	602	46.94	43.09	1.34	227	227	96	93
DOUG FIR	P	37	146	170	163.58	40.90	1.20	60	60	30	30
DOUG FIR	S	55	166	154	97.38	32.46	0.88	54	54	23	17
Totals		19,521	43,961	60,237	108.16	48.03	1.45	21,116	21,115	10,328	10,066

Wood Type Species	Total	Total	Total	Net Cubic Ft/		CF/	Total CCF		Total MBF	
	Trees	Logs	Tons	Tree	Log	LF	Gross	Net	Gross	Net
C	17,869	41,320	58,078	113.73	49.18	1.48	20,322	20,322	10,016	9,758
H	1,652	2,641	2,159	48.01	30.04	0.98	793	793	312	309
Totals	19,521	43,961	60,237	108.16	48.03	1.45	21,116	21,115	10,328	10,066



Forest Practices Application/Notification Notice of Decision

FPA/N No: 2421152

Effective Date: 9/6/2019

Expiration Date: 9/6/2022

Shut Down Zone: 651 N

EARR Tax Credit: Eligible Non-eligible

Reference: Thunderstruck #30-097289

Decision

- Notification** Operations shall not begin before the effective date.
- Approved** This Forest Practices Application is subject to the conditions listed below.
- Disapproved** This Forest Practices Application is disapproved for the reasons listed below.
- Closed** Applicant has withdrawn FPA/N.

EPA/N Classification

Class II Class III Class IVG Class IVS

Number of Years Granted on Multi-Year Request

4 years 5 years

Conditions on Approval / Reasons for Disapproval

Issued By: Matt Brady

Region: South Puget Sound

Title: Resource Protection Forester

Date: 9/6/2019

Copies to: Landowner, Timber Owner and Operator.

Issued in person: Landowner Timber Owner Operator By: 

AEM

Appeal Information

You have thirty (30) days to appeal this Decision and any related State Environmental Policy Act determinations to the Pollution Control Hearings Board in writing at the following addresses: /

Physical address: 1111 Israel Rd. SW, Ste 301, Tumwater, WA 98501

Mailing address: P.O. BOX 40903, OLYMPIA, WA 98504-0903

Information regarding the Pollution Control Hearings Board can be found at: <http://www.eluho.wa.gov/>

At the same time you file an appeal with the Pollution Control Hearings Board, also send a copy of the appeal to the Department of Natural Resources' region office and the Office of the Attorney General at the following addresses:

Office of the Attorney General
Natural Resources Division
1125 Washington Street SE
PO Box 40100
Olympia, WA 98504-0100

And

Department Of Natural Resources
South Puget Sound Region
950 Farman Ave N
Enumclaw, WA 98022

Other Applicable Laws

Operating as described in this application/notification does not ensure compliance with the Endangered Species Act, or other federal, state, or local laws.

Transfer of Forest Practices Application/Notification (WAC 222-20-010)

Use the "Notice of Transfer of Approved Forest Practices Application/Notification" form. This form is available at region offices and on the Forest Practices website: <http://www.dnr.wa.gov/businesspermits/forestpractices>.

Notify DNR of new Operators within 48 hours.

Continuing Forest Land Obligations (RCW 76.09.060, RCW 76.09.070, RCW 76.09.390, and WAC 222-20-055)

Obligations include reforestation, road maintenance and abandonment plans, conversions of forest land to non-forestry use and/or harvest strategies on perennial non-fish habitat (Type Np) waters in Eastern Washington.

Before the sale or transfer of land or perpetual timber rights subject to continuing forest land obligations, the seller must notify the buyer of such an obligation on a form titled "Notice of Continuing Forest Land Obligation". The seller and buyer must both sign the "Notice of Continuing Forest Land Obligation" form and send it to the DNR Region Office for retention. This form is available at DNR region offices.

If the seller fails to notify the buyer about the continuing forest land obligation, the seller must pay the buyer's costs related to continuing forest land obligations, including all legal costs and reasonable attorneys' fees incurred by the buyer in enforcing the continuing forest land obligation against the seller.

Failure by the seller to send the required notice to the DNR at the time of sale will be prima facie evidence in an action by the buyer against the seller for costs related to the continuing forest land obligation prior to sale.

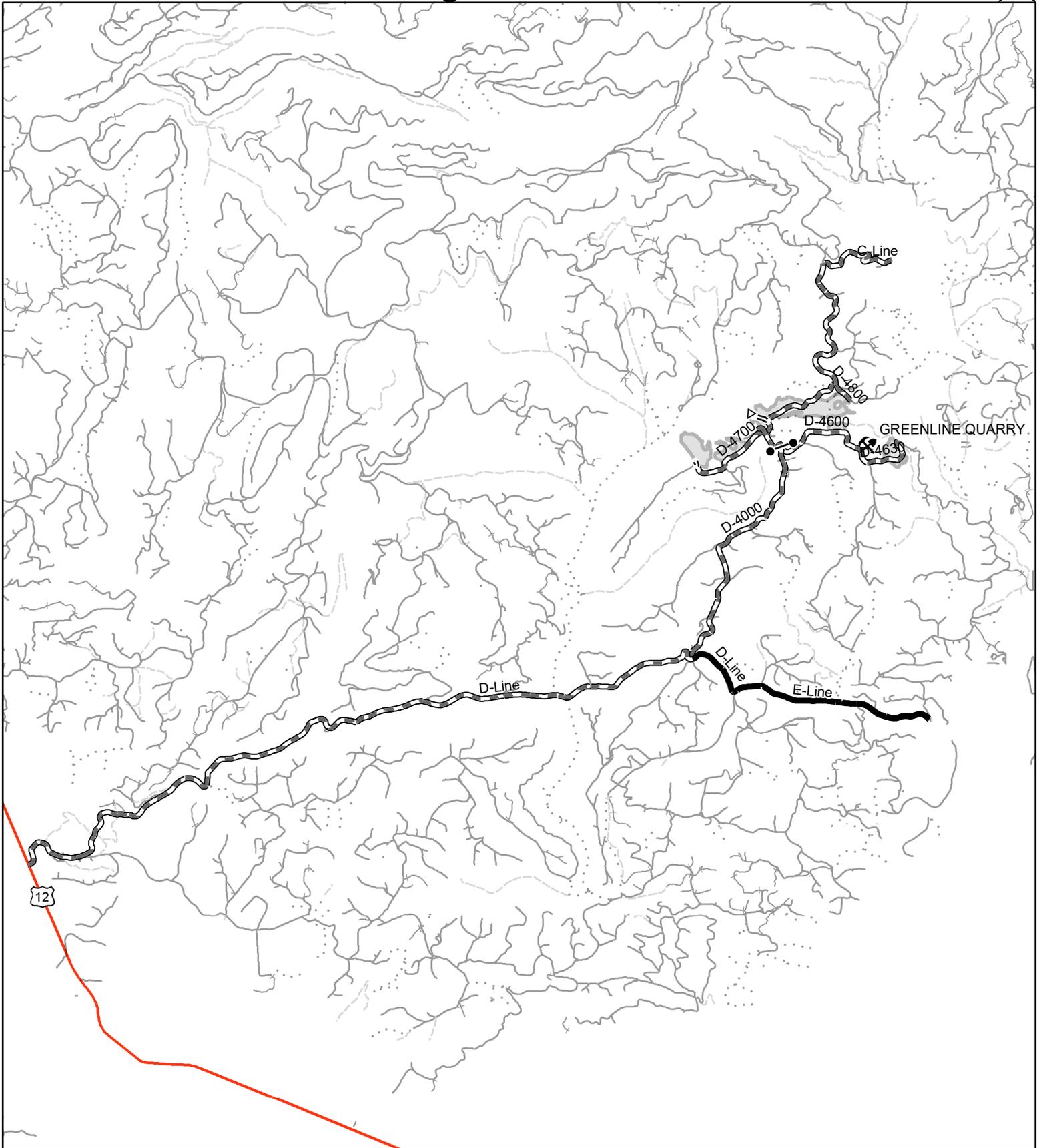
DNR affidavit of mailing:

On this day <u>9/6/2019</u>	<i>hand delivered</i>	I placed in the United States mail at <u>Enumclaw</u>	, WA,
(date)		(post office location)	
postage paid, a true and accurate copy of this document. Notice of Decision FPA #2421152			
<u>Betty Burton</u>	<i>Betty Burton</i>		
(Printed name)	(Signature)		

Thunderstruck Vicinity Map

Page 1 of 10

N

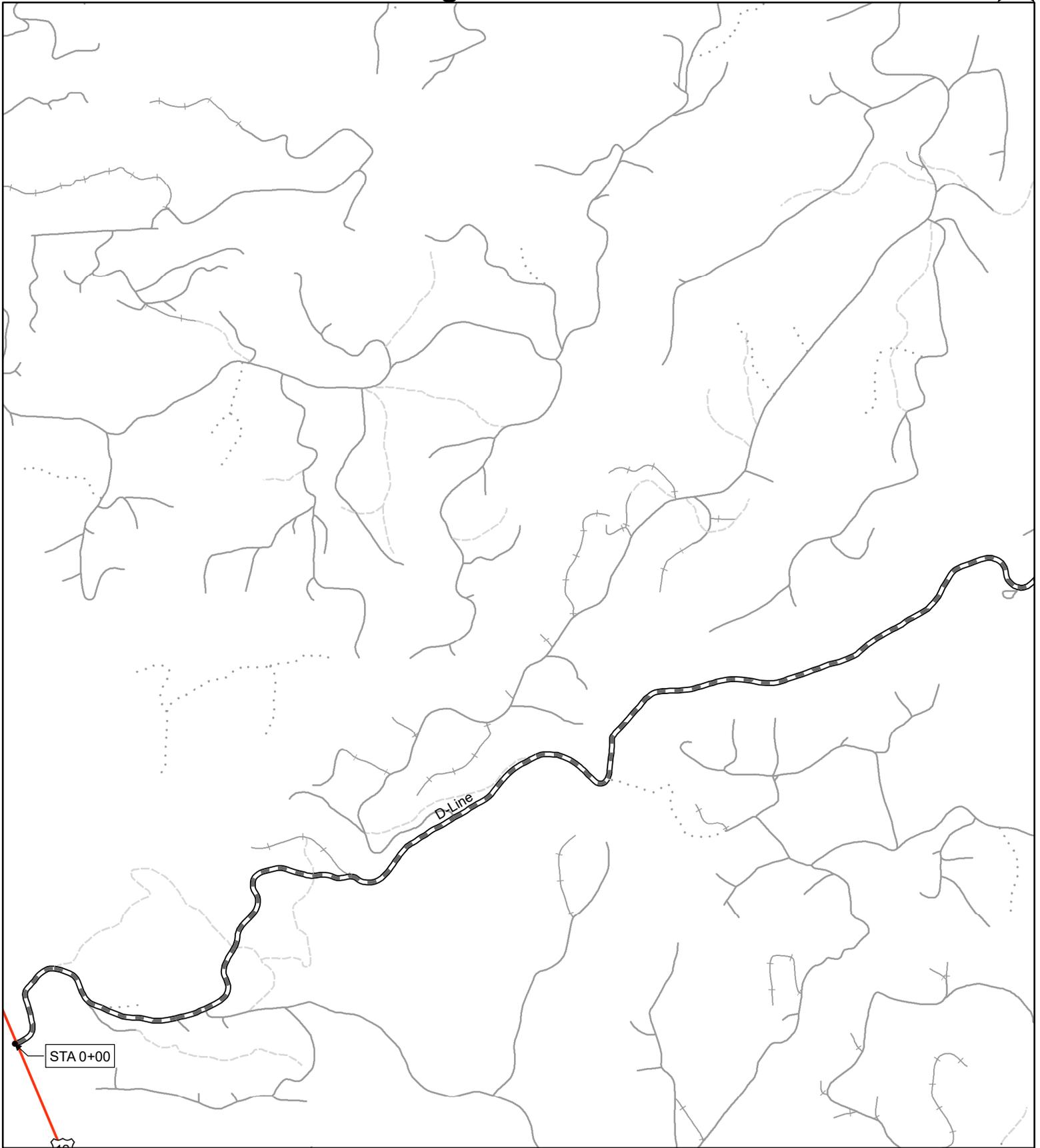


Legend

- | | | | |
|------------|------------------------------|----------------|---------------|
| Gates | Optional Prehaul Maintenance | Decommissioned | Sale Boundary |
| Rockpit | Required Prehaul Maintenance | FP Abandoned | 12 |
| Haul_Route | Active | Orphaned | U.S. |

Thunderstruck Detail Maps

N

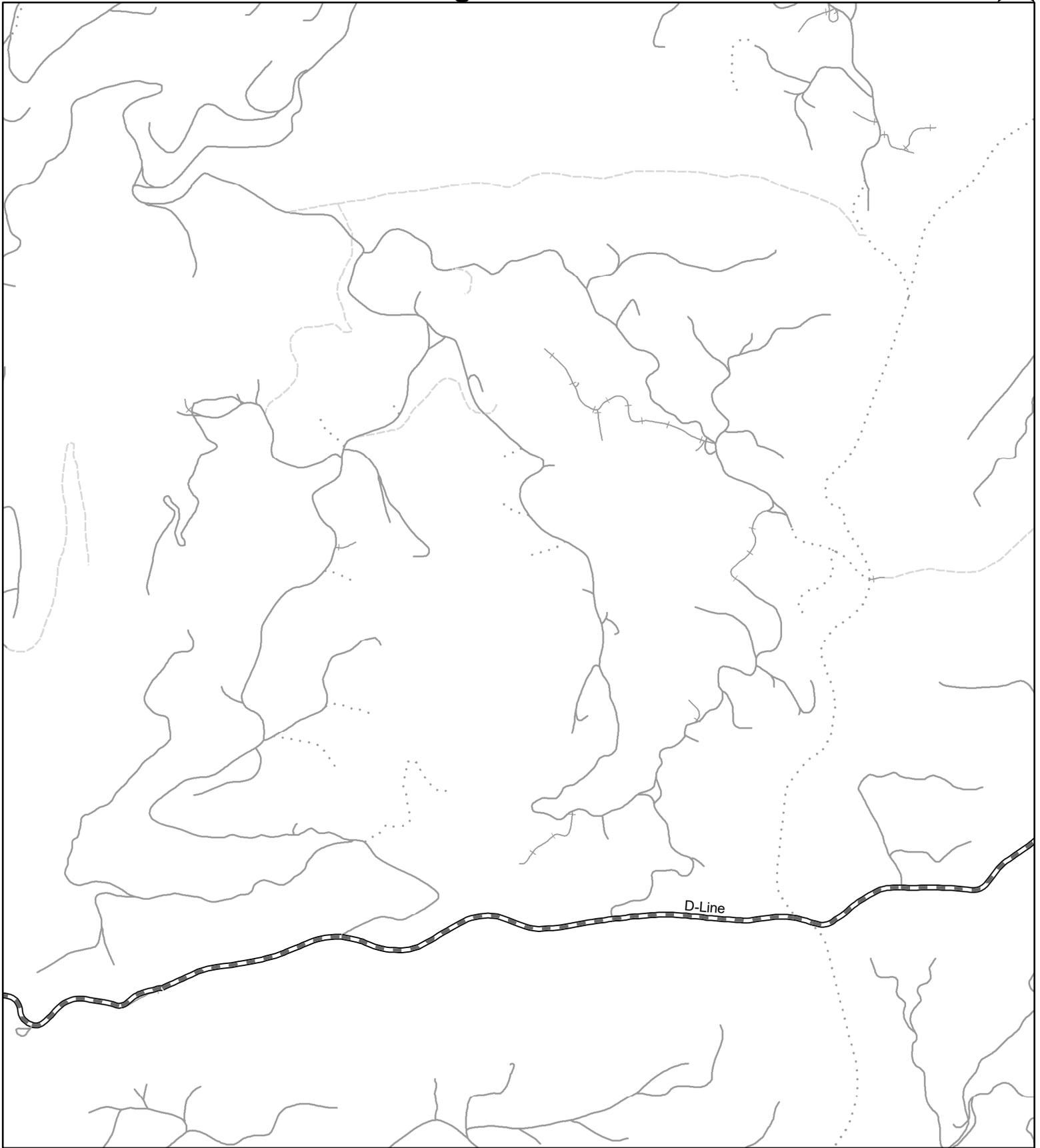


Legend

- Station
- U.S.
- Active
- FP Abandoned
- 12 12
- Required Prehaul Maintenance
- Decommissioned
- Orphaned

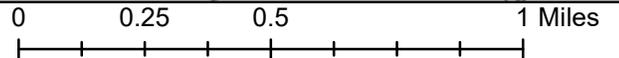
Thunderstruck Detail Maps

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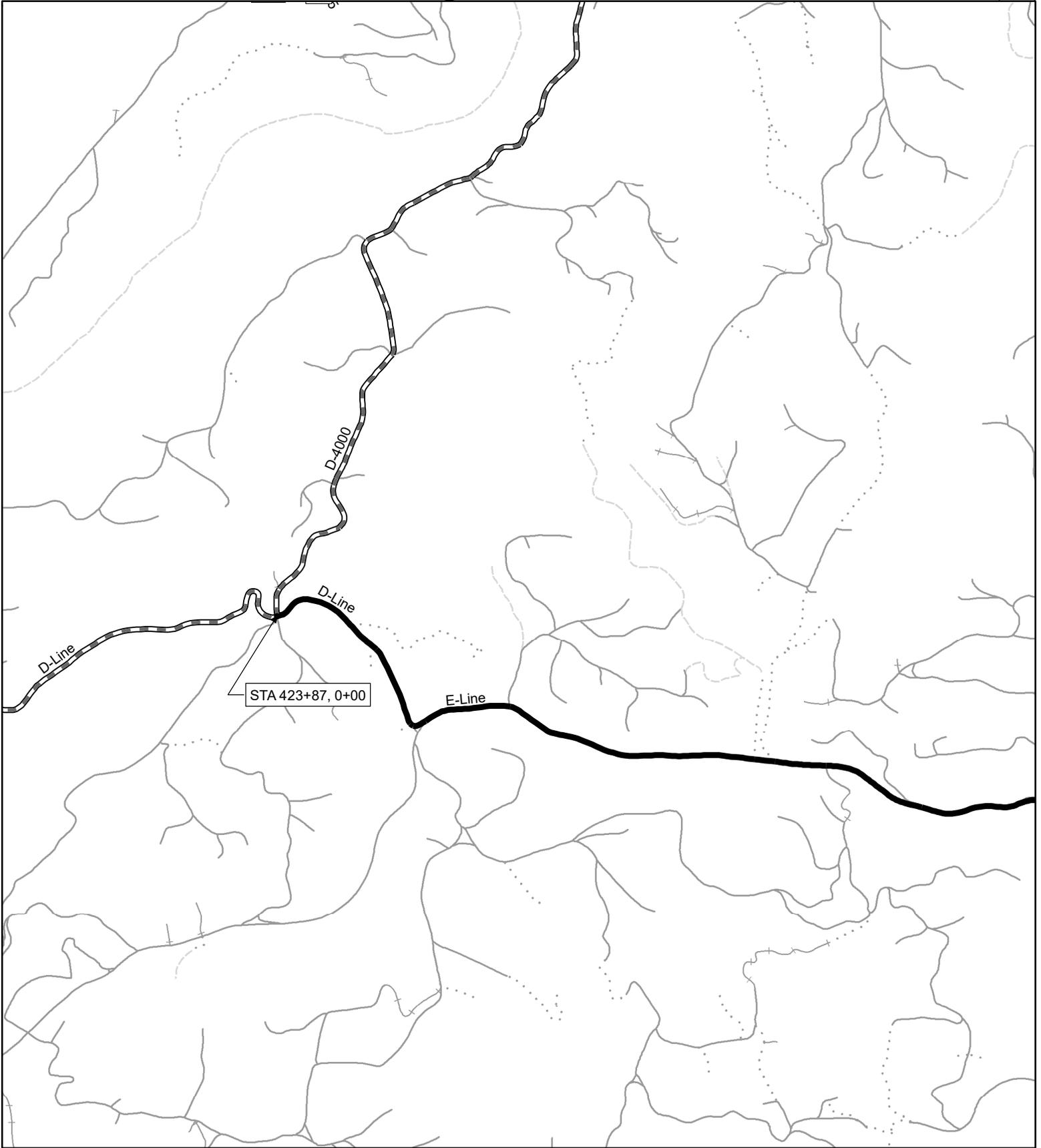
Legend

- Required Prehaul Maintenance
- Decommissioned
- Orphaned
- Active
- FP Abandoned



Thunderstruck Detail Maps

N

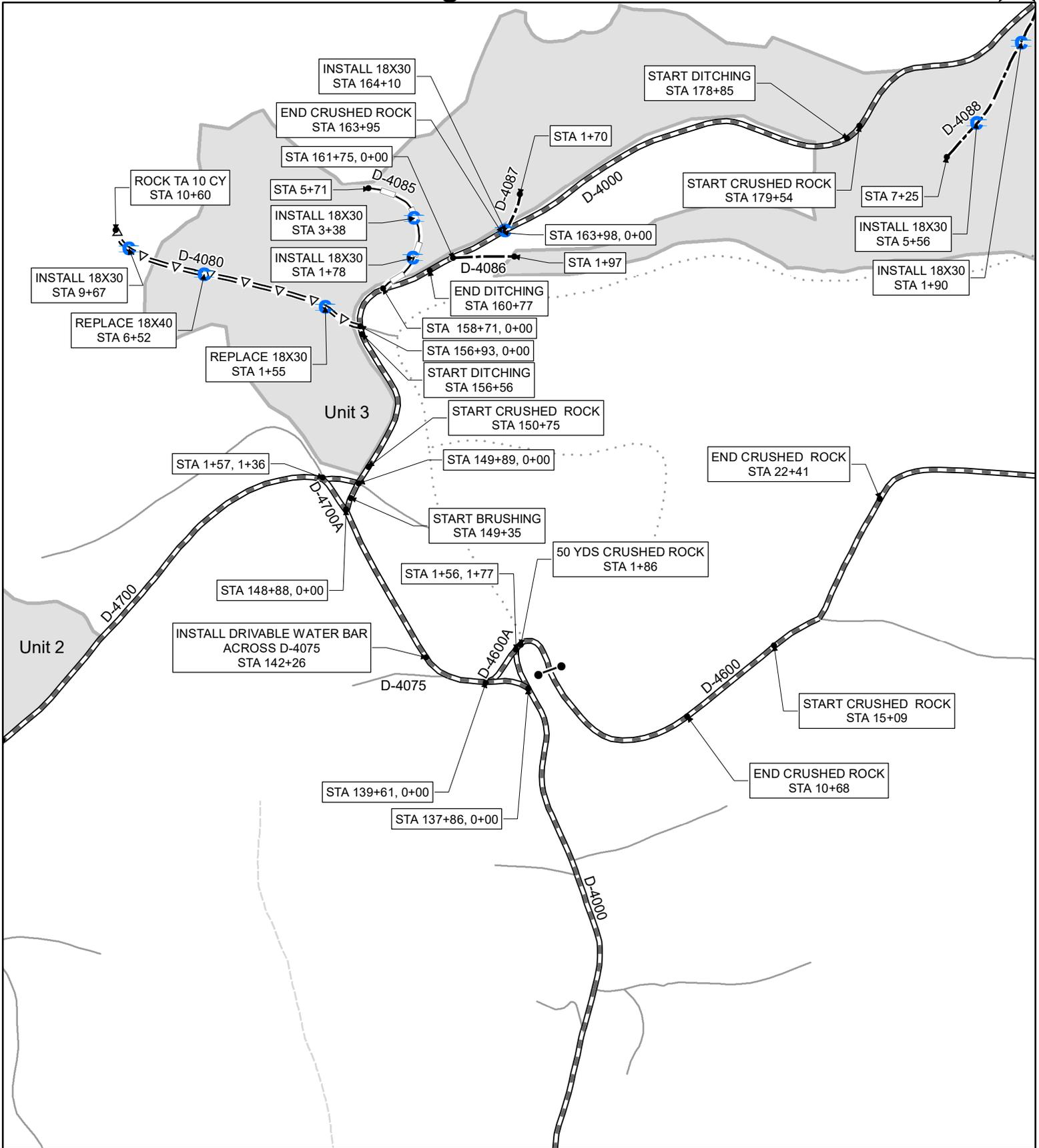


Legend

- Station
 - Required Prehaul Maintenance
 - Active
 - Haul Route
 - Decommissioned
 - Orphaned
 - FP Abandoned
- 0 0.25 0.5 1 Miles
- 10/21/2019 4 of 85 30-097289

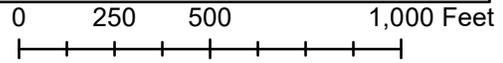
Thunderstruck Detail Maps

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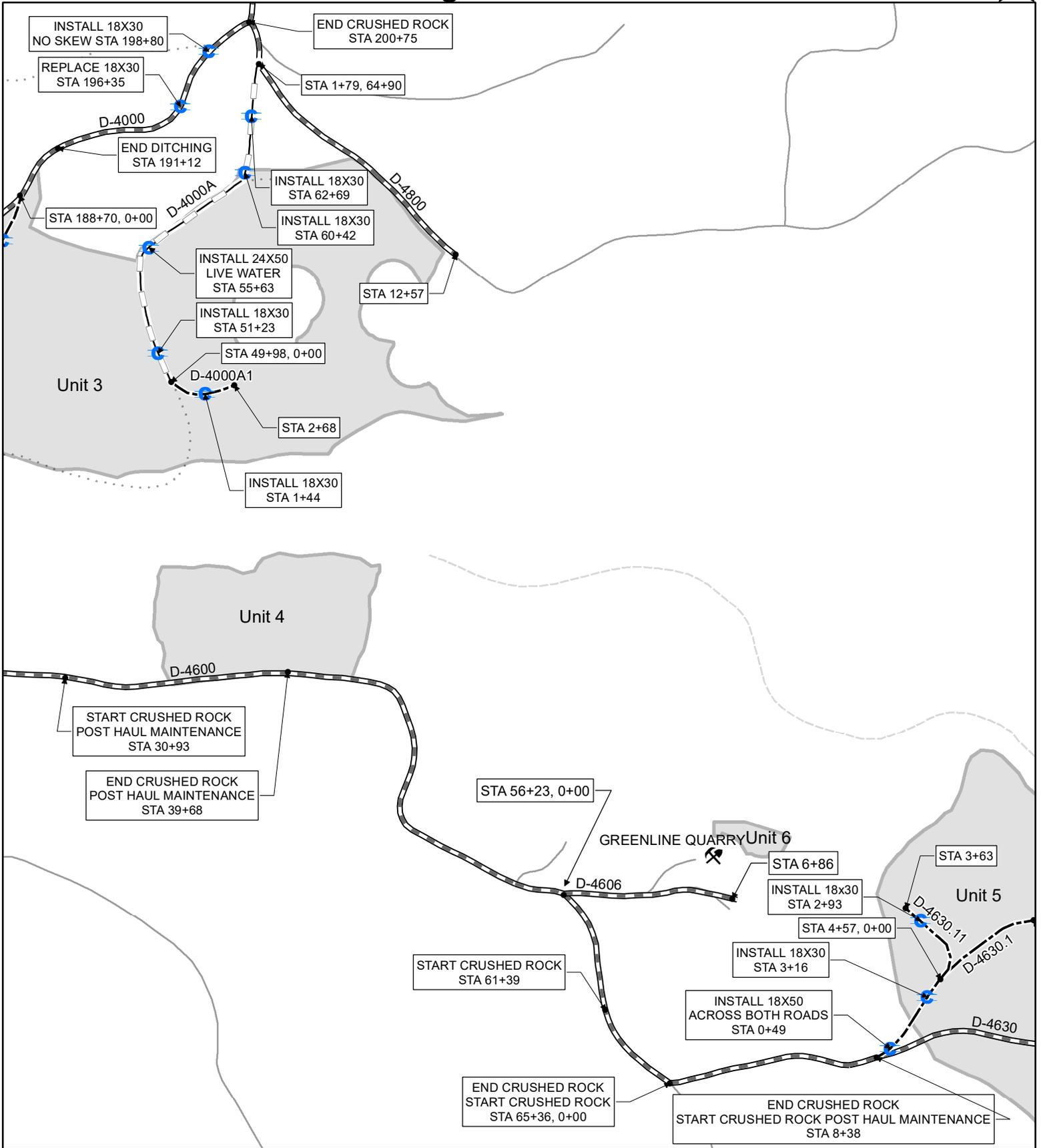
Legend

- | | | | |
|-------------|--------------------------------|--------------------------------|-----------------|
| ●—● Gates | ● Station | --- Optional Construction | ⋯ FP Abandoned |
| ⊕ Culvert | — Optional Reconstruction | ▬ Required Prehaul Maintenance | --- Orphaned |
| ● Road Work | ⊔ Optional Prehaul Maintenance | — Active | █ Sale Boundary |



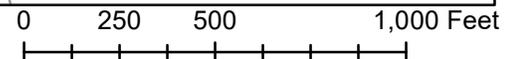
Thunderstruck Detail Maps

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Legend

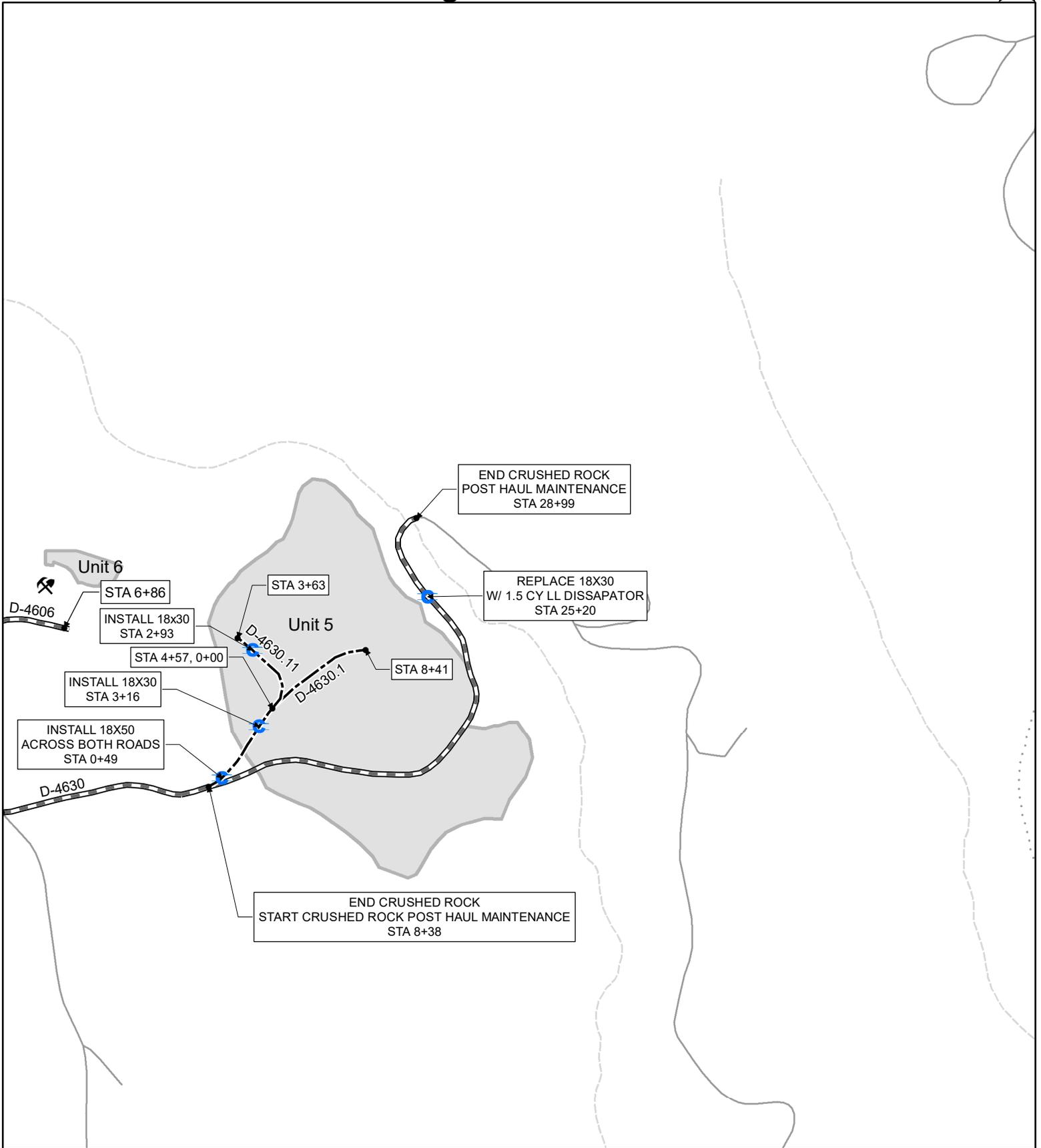
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- Culvert
- Road Work
- Station
- Optional Reconstruction
- Optional Construction
- Required Prehaul Maintenance
- Active
- FP Abandoned
- Orphaned
- Sale Boundary



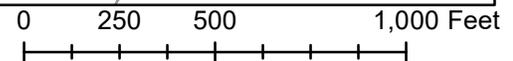
Thunderstruck Detail Maps

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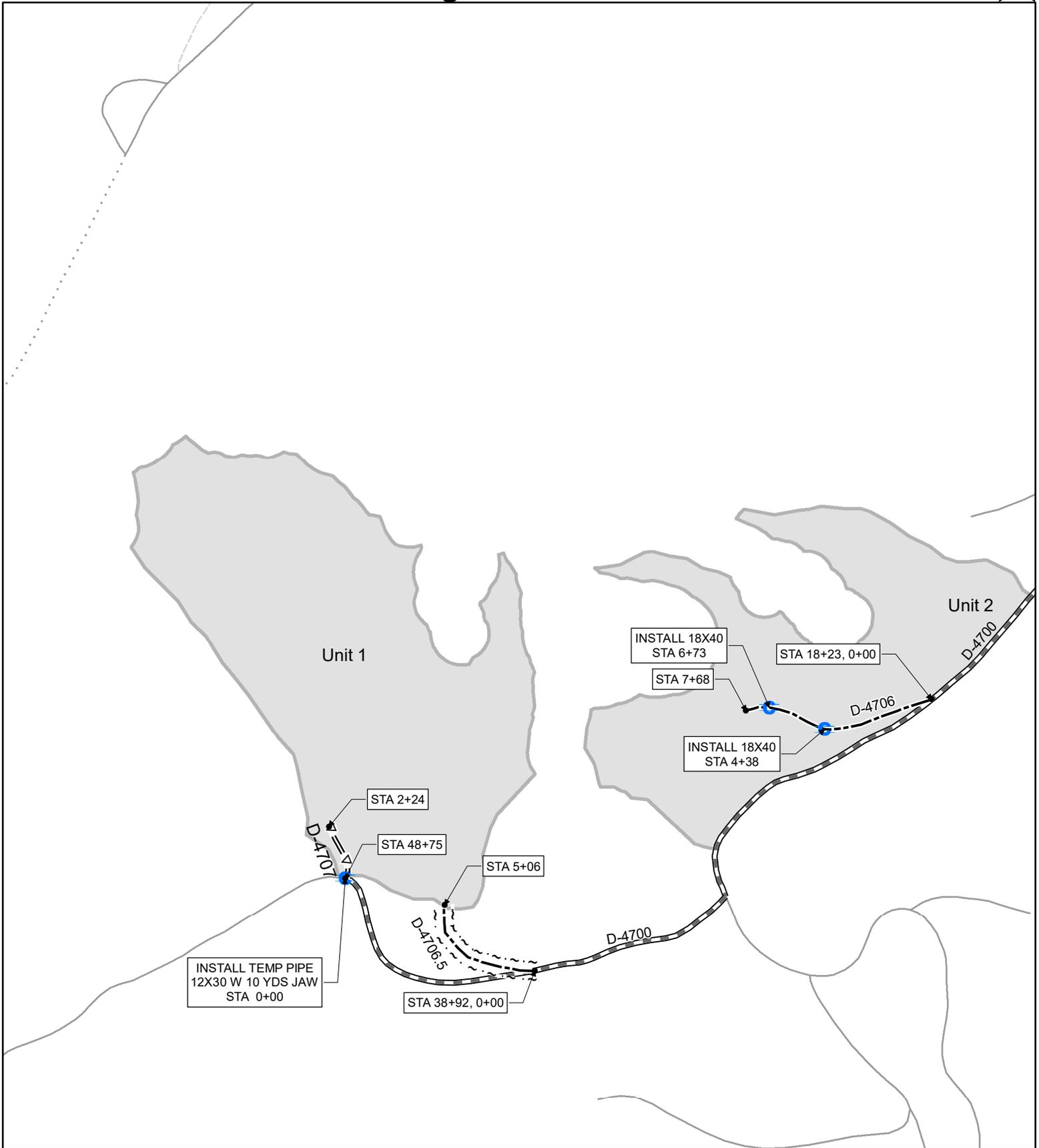


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| Rockpit | Road Work | Optional Construction | Active | Orphaned |
| Culvert | Station | Required Prehaul Maintenance | FP Abandoned | Sale Boundary |

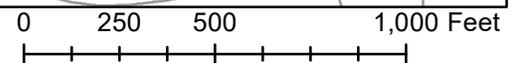
Thunderstruck Detail Maps

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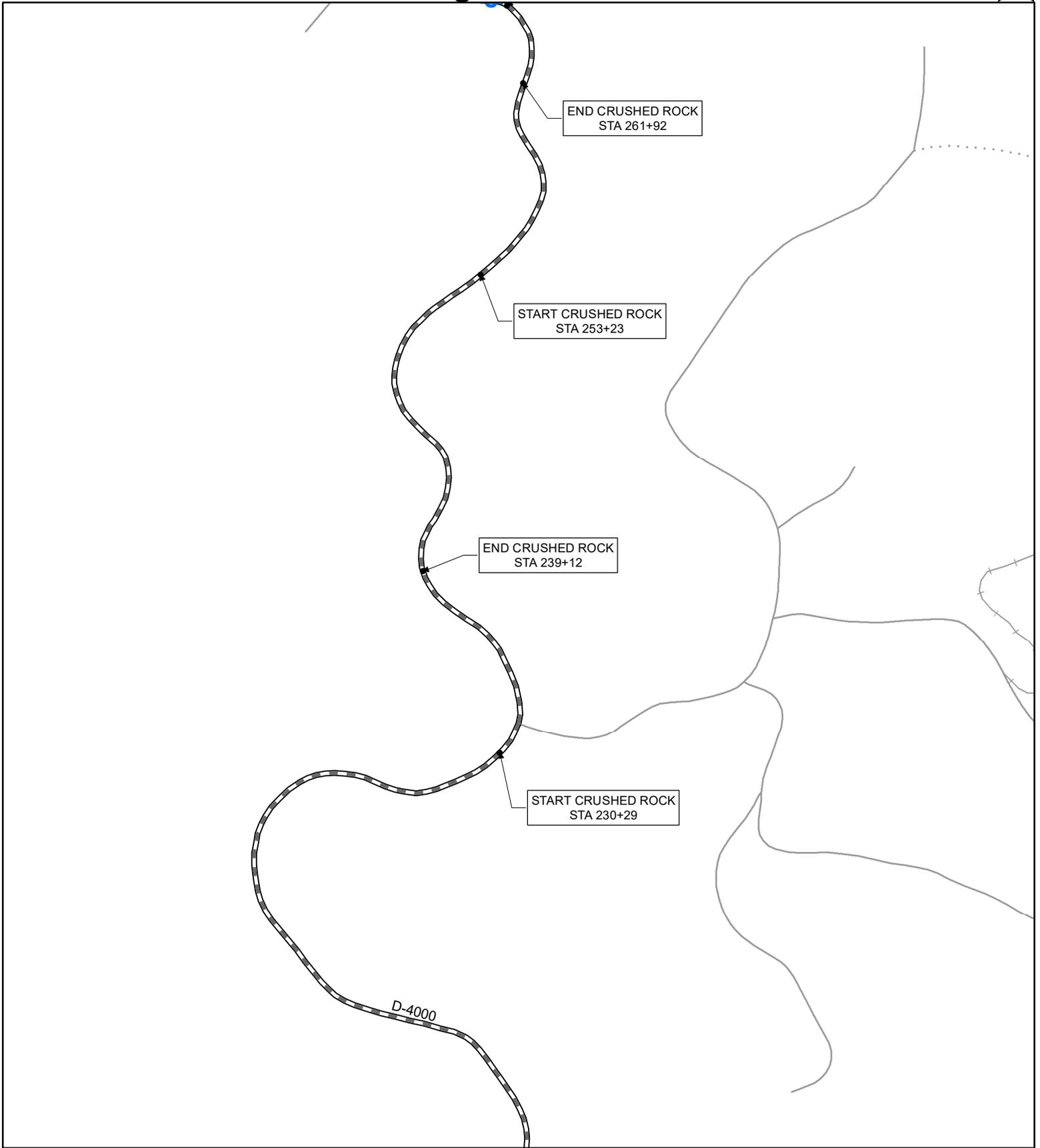
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- Culvert
- ROW
- Optional Prehaul Maintenance
- Required Prehaul Maintenance
- FP Abandoned
- Sale Boundary
- Station
- Optional Construction
- Active
- Orphaned

Thunderstruck Detail Maps

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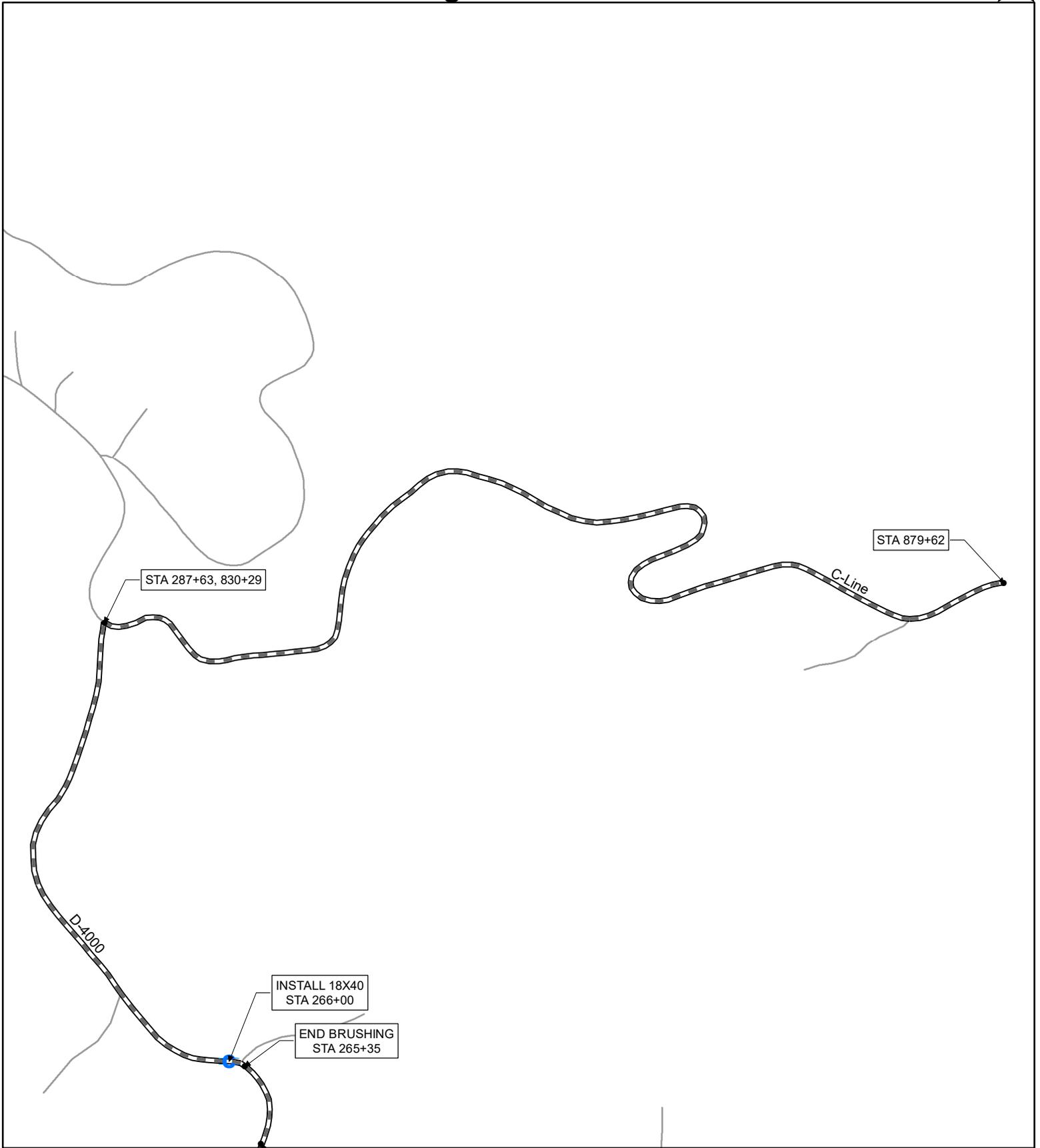
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- Culvert
- Required Prehaul Maintenance
- Decommissioned
- Road Work
- Active
- FP Abandoned

Thunderstruck Detail Maps

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Legend

- Culvert
- Station
- Active
- Road Work
- Required Prehaul Maintenance

0 250 500 1,000 Feet

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

THUNDERSTRUCK TIMBER SALE ROAD PLAN
THURSTON AND GRAY'S HARBOR COUNTY
LITTLE ROCK UNIT
BLACK HILLS DISTRICT

AGREEMENT NO.:30-097289

STAFF ENGINEER: CHAD VANDEHEY

DATE: 25 OCTOBER 2018

DRAWN & COMPILED BY: CHAD VANDEHEY

SECTION 0 – SCOPE OF PROJECT

0-1 ROAD PLAN SCOPE

Clauses in this road plan apply to all road related work, including landings and rock source development, unless otherwise noted.

0-2 REQUIRED ROADS

The specified work on the following roads is required.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
C-Line	830+29 to 879+62	Prehaul Maintenance
D-Line	0+00 to 423+87	Prehaul Maintenance
D-4000	0+00 to 287+63	Prehaul Maintenance
D-4080	0+00 to 10+60	Closure (If Prehauled)
D-4085	0+00 to 5+71	Abandonment (If Reconstructed)
D-4086	0+00 to 1+97	Abandonment (If Constructed)
D-4087	0+00 to 1+70	Abandonment (If Constructed)
D-4088	0+00 to 7+25	Abandonment (If Constructed)
D-4600	0+00 to 65+36	Prehaul Maintenance
D-4600A	0+00 to 1+77	Prehaul Maintenance
D-4606	0+00 to 6+86	Prehaul Maintenance
D-4630	0+00 to 28+99	Prehaul Maintenance
D-4630.11	0+00 to 3+63	Abandonment (If Constructed)
D-4700	0+00 to 48+75	Prehaul Maintenance
D-4700A	0+00 to 1+57	Prehaul Maintenance
D-4706	0+00 to 7+68	Abandonment (If Constructed)
D-4706.5	0+00 5+06	Abandonment (If Constructed)
D-4800	0+00 to 12+57	Prehaul Maintenance

0-3 OPTIONAL ROADS

The specified work on the following roads is not required. Any optional roads built by the Purchaser must meet all the specifications in the road plan.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
D-4000A	49+98 to 64+90	Reconstruction
D-4000A1	0+00 to 2+68	Construction
D-4080	0+00 to 10+60	Prehaul Maintenance
D-4085	0+00 to 5+71	Reconstruction
D-4086	0+00 to 1+97	Construction
D-4087	0+00 to 1+70	Construction
D-4088	0+00 to 7+25	Construction
D-4630.1	0+00 to 8+41	Construction
D-4630.11	0+00 to 3+63	Construction
D-4706	0+00 to 7+68	Construction
D-4706.5	0+00 to 5+06	Construction
D-4707	0+00 to 2+24	Prehaul Maintenance

0-4 CONSTRUCTION

Construction includes, but is not limited to:

- Clearing;
- Grubbing;
- Right-of-way debris disposal;
- Excavation and/or embankment to subgrade;
- Turnout and turnaround construction;
- Landing construction;
- Curve widening;
- Acquisition and installation of drainage structures;
- Acquisition, manufacture, and application of rock;

0-5 RECONSTRUCTION

Reconstruction includes, but is not limited to:

- Clearing;
- Grubbing;
- Right-of-way debris disposal;
- Excavation and/or embankment to subgrade;
- Landing construction;
- Acquisition and installation of drainage structures;
- Acquisition and application of rock;
- Installation of culvert inlet/outlet armoring;

0-6 PRE-HAUL MAINTENANCE

This project includes, but is not limited to the following pre-haul maintenance requirements:

<u>Road</u>	<u>Stations</u>	<u>Requirements</u>
C-Line	830+29 to 879+62	Grade
D-Line	0+00 to 423+87	Clean Culverts
D-4000	0+00 to 287+63	Grade, Clean Culverts, Brush, Spot Rock, Ditching, Install/Replace Culverts
D-4080	0+00 to 10+60	Grade, Clean Culverts, Brush, Install/Replace Culverts, Optional Rock
D-4600	0+00 to 65+36	Grade, Clean Culverts, Spot Rock
D-4600A	0+00 to 1+77	Grade, Clean Culverts
D-4606	0+00 to 6+86	Grade
D-4630	0+00 to 28+99	Grade, Clean Culverts, Spot Rock, Install Culvert
D-4700	0+00 to 48+75	Grade, Clean Culverts
D-4700A	0+00 to 1+57	Grade, Clean Culverts
D-4707	0+00 to 2+24	Grade, Brush, Ditch, Install Temp Pipe
D-4800	0+00 to 12+57	Grade, Brush

0-7 POST-HAUL MAINTENANCE

This project includes post-haul road maintenance listed in Clause 9-5 POST-HAUL MAINTENANCE.

0-8 CLOSURE

This project includes road closure listed in Clause 9-16 ROAD CLOSURE.

0-10 ABANDONMENT

This project includes abandonment listed in Clause 9-21 ROAD ABANDONMENT.

0-12 DEVELOP ROCK SOURCE

Purchaser may develop an existing rock source. Rock source development will involve reducing oversize material, Clearing, Stripping, Drilling, Blasting, Crushing, and exploratory drilling. Work for developing rock sources is listed in Section 6 ROCK AND SURFACING.

SECTION 1 – GENERAL

1-1 ROAD PLAN CHANGES

If the Purchaser desires a change from this road plan including, but not limited to, relocation, extension, change in design, or adding roads; a revised road plan must be submitted in writing to the Contract Administrator for consideration. Before work begins, Purchaser shall obtain approval from the State for any submitted plan that changes the scope of work or environmental condition from the original road plan.

1-2 UNFORESEEN CONDITIONS

Quantities established in this road plan are minimum acceptable values. Additional quantities required by the state due to unforeseen conditions, or Purchaser's choice of construction season or techniques will be at the Purchaser's expense. Unforeseen conditions include, but are not limited to, solid subsurface rock, subsurface springs, saturated ground, and unstable soils.

1-3 ROAD DIMENSIONS

Purchaser shall perform road work in accordance with the dimensions shown on the TYPICAL SECTION SHEET and the specifications within this road plan, unless controlled by construction stakes or design data (plan, profile, and cross-sections).

1-4 ROAD TOLERANCES

Purchaser shall perform road work within the tolerances listed below. The tolerance class for each road is listed on the TYPICAL SECTION SHEET.

<u>Tolerance Class</u>	<u>A</u>	<u>B</u>	<u>C</u>
Road and Subgrade Width (feet)	+1.5	+1.5	+2.0
Subgrade Elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

1-6 ORDER OF PRECEDENCE

Any conflict or inconsistency in the road plan will be resolved by giving the documents precedence in the following order:

1. Addenda.
2. Designs or Plans. On designs and plans, figured dimensions shall take precedence over scaled dimensions.
3. Road Plan Clauses.
4. Typical Section Sheet.
5. Standard Lists.
6. Standard Details.
7. Road Work Maps

In case of any ambiguity or dispute over interpreting the road plan, the Contract Administrator's or designee's decision will be final.

1-7 TEMPORARY ROAD CLOSURE

Purchaser shall notify the Contract Administrator a minimum of 3 calendar days before the closure of any road. Construction may not close the following roads for more than the specified number of hours.

<u>Road</u>	<u>Number of Allowable Closed Hours</u>
C-Line	4 consecutive hours
D-Line	4 consecutive hours
D-4000	4 consecutive hours
D-4600	4 consecutive hours
D-4606	4 consecutive hours
E-Line	4 consecutive hours

1-8 REPAIR OR REPLACEMENT OF DAMAGED MATERIALS

Purchaser shall repair or replace all materials, roadway infrastructure, and road components damaged during road work or operation activities. The Contract Administrator will direct repairs and replacements. Repairs to structural materials must be made in accordance with the manufacturer’s recommendation, and may not begin without written approval from the Contract Administrator.

1-9 DAMAGED METALLIC COATING

Any damaged galvanized or aluminized coating on existing or new bridge components, culverts, downspouts, and flumes must be cleaned and treated with a minimum of two coats of zinc rich paint.

1-10 WSDOT STANDARD SPECIFICATION REFERENCE

References in this road plan to “WSDOT Standard Specifications” mean the Washington State Department of Transportation’s Standard Specifications for Road, Bridge, and Municipal Construction 2012 (M41-10).

SUBSECTION ROAD MARKING

1-15 ROAD MARKING

Purchaser shall perform road work in accordance with the state’s marked location. All road work is marked as follows:

- Pre-haul activities: 2 in. x 48 in. wooden lath with station and activity
- Construction: Orange ribbon tied eye-height along centerline, w/orange pin flags or wooden lath marking centerline

1-16 CONSTRUCTION STAKES SET BY STATE

Purchaser shall perform work in accordance with the construction stakes and/or reference points set in the field for grade and alignment. Reconstruction of existing road grades must conform to the original location except where construction staked or designed.

1-18 REFERENCE POINT DAMAGE

Purchaser shall reset reference points (RPs) that were moved or damaged at any time during construction to their original locations. Excavation and embankment may not proceed on road segments controlled by said RPs until Purchaser resets all moved or damaged RPs.

SUBSECTION TIMING

1-20 COMPLETE BY DATE

Purchaser shall complete pre-haul road work before the start of timber haul.

1-21 HAUL APPROVAL

Purchaser shall not use roads under this road plan for any hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

1-22 WORK NOTIFICATIONS

Purchaser shall notify the Contract Administrator a minimum of 3 working days before work begins.

1-23 ROAD WORK PHASE APPROVAL

Purchaser shall obtain written approval from the Contract Administrator upon completion of each of the following phases of road work:

- Drainage installation
- Subgrade compaction
- Rock compaction

SUBSECTION RESTRICTIONS

1-25 ACTIVITY TIMING RESTRICTION

The specified activities are not allowed during the listed closure period(s) unless authorized in writing by the Contract Administrator.

<u>Activity</u>	<u>Closure Period</u>
The construction, reconstruction and/or prehaul maintenance of any roads	November 1 to April 30

1-26 OPERATING DURING CLOSURE PERIOD

If permission is granted to operate during a closure period listed in Clause 1-25 ACTIVITY TIMING RESTRICTION or Contract Clause H-130 HAULING SCHEDULE, Purchaser shall provide a maintenance plan to include further protection of state resources. Purchaser shall obtain written approval from the Contract Administrator for the maintenance plan, and shall put preventative measures in place before operating

during the closure period. Purchaser is required to maintain all haul roads at their own expense including those listed in Contract Clause C-060 DESIGNATED ROAD MAINTAINER. If other operators are using, or desire to use these designated maintainer roads, a joint operating plan must be developed. All parties shall follow this plan.

1-29 SEDIMENT RESTRICTION

Purchaser shall not allow silt-bearing runoff to enter any streams. Purchaser shall accomplish sediment removal through silt traps, silt fences, settling ponds, or other methods as approved, in writing by the Contract Administrator.

1-30 CLOSURE TO PREVENT DAMAGE

In accordance with Contract Clause G-220 STATE SUSPENDS OPERATION, the Contract Administrator will suspend road work or hauling right-of-way timber, forest products, or rock under the following conditions:

- Wheel track rutting exceeds 6 inches on jaw run roads.
- Wheel track rutting exceeds 4 inches on crushed rock roads.
- Surface or base stability problems persist.

Operations must stop unless authority to continue working or hauling is granted in writing by the Contract Administrator. In the event that surface or base stability problems persist, Purchaser shall cease operations, or perform corrective maintenance or repairs, subject to specifications within this road plan.

1-32 BRIDGE AND ASPHALT SURFACE RESTRICTION

The use of metal tracked equipment is not allowed on bridge or asphalt surfaces at any time. If Purchaser must run equipment on bridge or asphalt surfaces, then rubber tired equipment or other methods, approved in writing by Contract Administrator, must be used.

If tracked equipment is used on bridge or asphalt surfaces, Purchaser shall immediately cease all operations. Purchaser shall remove any dirt, rock, or other material tracked or spilled on the bridge or asphalt surface(s) and have surface(s) evaluated for any damage caused by transporting equipment. Any damage to the surface(s) will be repaired, at the Purchaser's expense, as directed by the Contract Administrator.

1-33 SNOW PLOWING RESTRICTION

Snowplowing will be allowed after the execution of a SNOW PLOWING AGREEMENT, which is available from the Contact Administrator upon request. Purchaser shall request a SNOW PLOWING AGREEMENT each time plowing occurs. If damage occurs while plowing, further permission to plow may be revoked by the Contract Administrator.

SUBSECTION OTHER INFRASTRUCTURE

1-40 ROAD APPROACHES TO COUNTY ROADS AND STATE HIGHWAYS

Purchaser shall immediately remove any mud, dirt, rock, or other material tracked or spilled on to county roads and state highways.

If additional damage to the surface, signs, guardrails, etc. occurs then the damage will be repaired, at the Purchaser's expense, as directed by the Contract Administrator when authorized by the county or WSDOT.

1-43 ROAD WORK AROUND UTILITIES

Road work is in close proximity to a utility or utilities. Known utilities are listed, but it is the Purchaser's responsibility to identify any utilities not listed. It is the Purchaser's responsibility to identify any utilities. Purchaser shall work in accordance with all applicable laws or rules concerning utilities. Purchaser is responsible for all notification, including "call before you dig", and liabilities associated with the utilities and their rights-of-way.

<u>Road</u>	<u>Stations</u>
C-Line	830+29 to 879+62

SECTION 2 – MAINTENANCE

2-1 GENERAL ROAD MAINTENANCE

Purchaser shall maintain all roads used under this contract in accordance with the FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS for the entire term of this contract. Maintenance is required even during periods of inactivity.

2-2 ROAD MAINTENANCE – PURCHASER MAINTENANCE

Purchaser shall perform maintenance on roads listed in Contract Clause C-050 PURCHASER ROAD MAINTENANCE AND REPAIR in accordance with FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS.

2-3 ROAD MAINTENANCE – DESIGNATED MAINTAINER

Purchaser may be required to perform maintenance on roads listed in Contract Clause C-060 DESIGNATED ROAD MAINTAINER as directed by the Contract Administrator. Purchaser shall maintain roads in accordance with FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS.

2-4 PASSAGE OF LIGHT VEHICLES

Purchaser shall maintain the following road(s) in a condition that will allow the passage of light administrative vehicles.

<u>Road</u>	<u>Stations</u>
C-line	830+29 to 879+62
D-Line	0+00 to 458+83
D-4000	0+00 to 287+63
D-4600	0+00 to 65+36
D-4606	0+00 to 6+86
D-4700	0+00 to 48+75

2-5 MAINTENANCE GRADING – EXISTING ROAD

On the following road(s), Purchaser shall use a grader to shape the existing surface before rock application, if rock application is required. If rock application is not required, Purchaser shall use a grader to shape the existing surface before hauling of timber. Purchaser shall accomplish all grading using a motor grader. Desoding the road may be required.

<u>Road</u>	<u>Stations</u>
C-Line	830+29 to 879+62
D-4000	0+00 to 287+63
D-4080	0+00 to 10+60
D-4600	0+00 to 65+36
D-4600A	0+00 to 1+77
D-4606	0+00 to 6+86
D-4630	0+00 to 28+99
D-4700	0+00 to 48+75
D-4700A	0+00 to 1+57
D-4707	0+00 to 2+24
D-4800	0+00 to 12+57

2-6 CLEANING CULVERTS

On the following road(s), Purchaser shall clean the inlets and outlets of all culverts :

<u>Road</u>	<u>Stations</u>
D-Line	0+00 to 423+87
D-4000	137+32 to 287+63
D-4080	0+00 to 10+60
D-4600	56+37 to 65+36
D-4600A	0+00 to 1+77
D-4630	0+00 to 28+99
D-4700	0+00 to 48+75
D-4700A	0+00 to 1+57

SECTION 3 – CLEARING, GRUBBING, AND DISPOSAL

SUBSECTION CLEARING

3-1 BRUSHING

On the following road(s), Purchaser shall cut vegetative material up to 4 inches in diameter, including limbs, as shown on the BRUSHING DETAIL. Brushing must be achieved by manual or mechanical cutting of brush, trees, and branches. Root systems and stumps of cut vegetation may not be disturbed unless directed by the Contract Administrator. Purchaser shall remove brushing debris from the road surface, ditchlines, and culvert inlets and outlets.

<u>Road</u>	<u>Stations</u>
D-4000	149+35 to 265+35
D-4080	0+00 to 10+60
D-4707	0+00 to 2+24
D-4800	0+00 to 12+57

3-5 CLEARING

Purchaser shall fall all vegetative material larger than 2 inches DBH or over 5 feet high between the marked right-of-way boundaries or if not marked in the field, between the clearing limits specified on the TYPICAL SECTION SHEET. Clearing must be completed before starting excavation and embankment.

3-8 PROHIBITED DECKING AREAS

Purchaser shall not deck right-of-way timber in the following areas:

- Within the grubbing limits.
- Within 50 feet of any stream.
- In locations that interfere with the construction of the road prism.
- In locations that impede drainage.
- Against standing trees unless approved by the Contract Administrator.

SUBSECTION GRUBBING

3-10 GRUBBING

Purchaser shall remove all stumps between the grubbing limits specified on the TYPICAL SECTION SHEET and within waste and debris areas. Purchaser shall also remove stumps with undercut roots outside the grubbing limits. Grubbing must be completed before starting excavation and embankment.

SUBSECTION ORGANIC DEBRIS

3-20 ORGANIC DEBRIS DEFINITION

Organic debris is defined as all vegetative material not eligible for removal by Contract Clause G-010 PRODUCTS SOLD AND SALE AREA or G-011 RIGHT TO REMOVE FOREST

PRODUCTS AND CONTRACT AREA, that is larger than one cubic foot in volume within the grubbing limits as shown on the TYPICAL SECTION SHEET.

3-21 DISPOSAL COMPLETION

Purchaser shall remove organic debris from the road surface, ditchlines, and culvert inlets and outlets. Purchaser shall complete all disposal of organic debris, before the application of rock and/or timber haul.

3-23 PROHIBITED DISPOSAL AREAS

Purchaser shall not place organic debris in the following areas:

- Within 50 feet of a cross drain culvert.
- Within 100 feet of a live stream, or wetland.
- On road subgrades, or excavation and embankment slopes.
- On slopes greater than 55%.
- Within the operational area for cable landings where debris may shift or roll.
- On locations where brush can fall into the ditch or onto the road surface.
- Against standing timber.

3-24 BURYING ORGANIC DEBRIS RESTRICTED

Purchaser shall not bury organic debris unless otherwise stated in this plan.

3-25 SCATTERING ORGANIC DEBRIS

Purchaser shall scatter organic debris outside of the clearing limits in natural openings. Where natural openings are unavailable or restrictive, alternate debris disposal methods are subject to the written approval of the Contract Administrator.

SECTION 4 – EXCAVATION

4-2 PIONEERING

Pioneering may not extend past construction that will be completed during the current construction season. In addition, the following actions must be taken as pioneering progresses:

- Drainage must be provided on all uncompleted construction as approved, in writing, by the Contract Administrator.
- Road pioneering operations may not undercut the final cut slope, deposit excavated material outside the grubbing limits, or restrict drainage.
- Culverts at live stream crossings must be installed during pioneering operations

4-3 ROAD GRADE AND ALIGNMENT STANDARDS

Purchaser shall follow these standards for road grade and alignment except as designed:

- Grade and alignment must have smooth continuity, without abrupt changes in direction.

- Maximum grades may not exceed 18 percent favorable and 15 percent adverse.
- Minimum curve radius is 60 feet at centerline.
- Maximum grade change for sag vertical curves is 5% in 100 feet.
- Maximum grade change for crest vertical curves is 4% in 100 feet.

4-4 SWITCHBACK STANDARDS

A switchback is defined as a curved segment of road between a beginning and end of the same curve, where the change of traffic travel direction is greater than 90 degrees. Purchaser shall follow these standards for switchbacks:

- Maximum adverse grades for switchbacks is 12%.
- Maximum favorable grades for switchbacks is 14%.
- Maximum transition grades entering and leaving switchbacks is a 5% grade change.
- Transition grades required to meet switchback grade limitations must be constructed on the tangents preceding and departing from the switchbacks.

4-5 CUT SLOPE RATIO

Purchaser shall construct excavation slopes no steeper than shown on the following table:

<u>Material Type</u>	<u>Excavation Slope Ratio</u>	<u>Excavation Slope Percent</u>
Common Earth (on side slopes up to 55%)	1:1	100
Common Earth (56% to 70% side slopes)	¾:1	133
Common Earth (on slopes over 70%)	½:1	200
Fractured or loose rock	½:1	200
Hardpan or solid rock	¼:1	400

4-6 EMBANKMENT SLOPE RATIO

Purchaser shall construct embankment slopes no steeper than shown on the following table:

<u>Material Type</u>	<u>Embankment Slope Ratio</u>	<u>Embankment Slope Percent</u>
Sandy Soils	2:1	50
Common Earth and Rounded Gravel	1½:1	67
Angular Rock	1¼:1	80

4-7 SHAPING CUT AND FILL SLOPE

Purchaser shall construct excavation and embankment slopes to a uniform line and left rough for easier revegetation.

4-8 CURVE WIDENING

The minimum widening placed on the inside of curves is:

- 6 extra feet for curves of 60 to 79 feet radius.
- 4 extra feet for curves of 80 to 100 feet radius.

4-9 EMBANKMENT WIDENING

The minimum embankment widening is:

- 2 feet for embankment heights at centerline of less than 6 feet.
- 4 feet for embankment heights at centerline of 6 feet or greater.

Purchaser shall apply embankment widening equally to both sides of the road to achieve the required width.

4-12 FULL BENCH CONSTRUCTION

Where side slopes exceed 45%, Purchaser shall use full bench construction for the entire subgrade width except as construction staked or designed. Purchaser shall end haul waste material to the location specified in Clause 4-37 WASTE AREA LOCATION.

4-21 TURNOUTS

Purchaser shall construct turnouts as designated on the TURNOUT LIST. Locations may be adjusted to fit the final subgrade alignment and sight distances. Minimum dimensions are shown on the TURNOUT LIST.

4-22 TURNAROUNDS

Turnarounds must be no larger than 30 feet long and 30 feet wide.

SUBSECTION DITCH CONSTRUCTION

4-25 DITCH CONSTRUCTION AND RECONSTRUCTION

Purchaser shall construct or reconstruct ditches into the subgrade as specified on the TYPICAL SECTION SHEET. Ditches must be constructed concurrently with construction of the subgrade.

4-27 DITCH WORK – MATERIAL USE PROHIBITED

Purchaser shall not pull ditch material across the road or mix in with the road surface. Excavated material must be scattered outside the grubbing limits.

4-28 DITCH DRAINAGE

Ditches must drain to cross-drain culverts or ditchouts.

4-29 DITCHOUTS

Purchaser shall construct ditchouts as identified in maps, in field, and as directed by the Contract Administrator. Ditchouts must be constructed in a manner that diverts ditch

water onto the forest floor and must have excavation backslopes no steeper than a 1:1 ratio.

SUBSECTION WASTE MATERIAL (DIRT)

4-35 WASTE MATERIAL DEFINITION

Waste material is defined as all dirt, rock, mud, or related material that is extraneous or unsuitable for construction material. Waste material, as used in Section 4 EXCAVATION, is not organic debris.

4-36 DISPOSAL OF WASTE MATERIAL

Purchaser may sidecast waste material on side slopes up to 55% if the waste material is compacted and free of organic debris.

4-37 WASTE AREA LOCATION

Purchaser shall deposit waste material in areas identified or approved by the Contract Administrator. The amount of material allowed in a waste area is at the discretion of the Contract Administrator.

4-38 PROHIBITED WASTE DISPOSAL AREAS

Purchaser shall not deposit waste material in the following areas, except as otherwise specified in this plan:

- Within 50 feet of a cross drain culvert.
- Within 100 feet of a live stream or wetland.
- On side slopes steeper than 55%.
- In locations that interfere with the construction of the road prism.
- In locations that impede drainage.
- Within the operational area for cable landings.
- Against standing timber.

SUBSECTION BORROW

4-46 COMMON BORROW

Common borrow consists of soil, and/or aggregate that is non-plastic and contains no more than 5% clay, organic debris, or trash by volume. The material is considered non-plastic if the fines in the sample cannot be rolled, between the hand and a smooth surface, into a thread at any moisture content.

4-47 NATIVE MATERIAL

Native material consists of naturally occurring material that is free of organic debris, trash, and rocks greater than 6 inches in any dimension.

4-48 BORROW MATERIAL

Borrow material may not contain more than 5% organic debris, or trash by volume.

4-49 BORROW SOURCE

Purchaser shall obtain borrow material from borrow sources identified or approved by the Contract Administrator. Development of the borrow source must be in accordance with a written BORROW SOURCE DEVELOPMENT PLAN to be submitted by the Purchaser and approved in writing by the Contract Administrator.

SUBSECTION SHAPING

4-55 ROAD SHAPING

Purchaser shall shape each lift of the subgrade and surface as shown on the TYPICAL SECTION SHEET. The subgrade and surface shape must ensure runoff in an even, un-concentrated manner, and must be uniform, firm, and rut-free.

4-56 DRY WEATHER SHAPING

At any time of year, the Contract Administrator may require the application of water to facilitate shaping activities. The method of water application is subject to written approval by the Contract Administrator.

SUBSECTION COMPACTION

4-60 FILL COMPACTION

Purchaser shall compact all embankment and waste material in accordance with the COMPACTION LIST by routing equipment over the entire width of each lift. Waste material may be placed by end-dumping or sidecasting until sufficiently wide enough to support the equipment.

4-61 SUBGRADE COMPACTION

Purchaser shall compact constructed subgrades in accordance with the COMPACTION LIST by routing equipment over the entire width except ditch. On fills deeper than 5 feet at the road shoulder Purchaser shall compact fill material in lifts no greater than 18 inches. Purchaser shall obtain written approval from the Contract Administrator for subgrade compaction before rock application.

4-62 DRY WEATHER COMPACTION

At any time of year, the Contract Administrator may require the application of water to facilitate compaction activities. The method of water application is subject to written approval by the Contract Administrator.

4-63 EXISTING SURFACE COMPACTION

Purchaser shall compact maintained road surfaces in accordance with the COMPACTION LIST by routing equipment over the entire width.

SECTION 5 – DRAINAGE

5-1 REMOVAL OF SHOULDER BERMS

Purchaser shall remove berms from road shoulders to permit escape of runoff.

SUBSECTION CULVERTS

5-5 CULVERTS

Purchaser shall install culverts as part of this contract. Culverts must be installed concurrently with subgrade work and must be installed before subgrade compaction and rock application. Culvert locations and the minimum requirements for culvert length and diameter are designated on the CULVERT AND DRAINAGE LIST. Culvert, downspout, and flume lengths may be adjusted to fit as-built conditions and may not terminate directly on unprotected soil. Culverts must be new material and meet the specifications in Clauses 10-15 through 10-23 except as provided in clause 5-6 USED CULVERT MATERIAL.

5-7 USED CULVERT MATERIAL

On the following road(s), Purchaser may install used culverts. All other roads must have new culverts installed.

<u>Road</u>	<u>Stations</u>
D-4085	0+00 to 5+71
D-4088	0+00 to 7+25
D-4630.11	0+00 to 3+63
D-4706	0+00 to 7+68
D-4707	0+00 to 2+24

5-10 CULVERT MARKER INSTALLATION

Purchaser shall install culvert markers in accordance with the CULVERT MARKER DETAIL at all newly installed permanent culverts.

5-12 UNUSED MATERIALS STATE PROPERTY

On required roads, any materials listed on the CULVERT LIST and materials listed in Clause 5-13 CONTINGENCY CULVERTS that are not installed will become the property of the state. Purchaser shall stockpile materials at Mima Mounds Pit (SW ¼ NW ¼ Section 10, T16R03W).

5-13 CONTINGENCY CULVERTS

The following culverts will be supplied by the Purchaser and are available for installation as directed by the Contract Administrator.

<u>Road</u>	<u>Size</u>
On any portion of road used for timber or rock haul.	18" x 30' culvert
	18" culvert band
	18" culvert band

SUBSECTION CULVERT INSTALLATION

5-15 CULVERT INSTALLATION

Culvert, downspout, flume and energy dissipator installation must be in accordance with the CULVERT AND DRAINAGE SPECIFICATION DETAIL and the Corrugated Polyethylene Pipe Association's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings". Culverts shall be banded using lengths of no less than 10 feet, and no more than one length less than 16 feet. Shorter section of banded culvert shall be installed at the inlet end.

5-17 CROSS DRAIN SKEW AND SLOPE

Cross drains, on road grades in excess of 3%, must be skewed at least 30 degrees from perpendicular to the road centerline, except where the cross drain is at the low point in the road culverts will not be skewed. Cross drain culverts must be installed at a slope steeper than the incoming ditch grade, but not less than 3% or more than 12%.

5-18 CULVERT DEPTH OF COVER

Cross drain culverts must be installed with a depth of cover of not less than 1 foot of compacted subgrade over the top of the culvert at the shallowest point. Stream crossing culverts must be installed with a depth of cover recommended by the culvert manufacturer for the type and size of the pipe.

SUBSECTION ENERGY DISSIPATERS

5-20 ENERGY DISSIPATERS

Purchaser shall install energy dissipaters in accordance with the CULVERT AND DRAINAGE SPECIFICATION DETAIL at all culverts on the CULVERT LIST that specify the placement of rock. Energy dissipater installation is subject to approval by the Contract Administrator.

The type of energy dissipater and the amount of material must be consistent with the specifications listed on the CULVERT LIST. Placement must be by zero-drop-height

method only. No placement by end dumping or dropping of rock is allowed. LIGHT, LOOSE RIP RAP shall meet the specifications in Clause 6-50.

SUBSECTION CATCH BASINS, HEADWALLS, AND ARMORING

5-25 CATCH BASINS

Purchaser shall construct catch basins to resist erosion in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL. Minimum dimensions of catch basins are 2 feet wide and 4 feet long.

5-26 HEADWALLS FOR CULVERTS

Purchaser shall construct headwalls in accordance with the CULVERT AND DRAINAGE SPECIFICATION DETAIL at all culverts on the CULVERT LIST that specify the placement of rock.

5-27 ARMORING FOR STREAM CROSSING CULVERTS

At the following culvert(s), Purchaser shall place rock in conjunction with or immediately following construction of the embankment. Rock must be placed on shoulders, slopes, and around culvert inlets and outlets as designated on the ROCK LIST. Rock may not restrict the flow of water into culvert inlets or catch basins.

<u>Road</u>	<u>Station</u>
D-4000A	55+63

SUBSECTION SURFACE DRAINAGE

5-30 DRIVABLE WATERBAR CONSTRUCTION

Purchaser shall construct drivable waterbars in accordance with the drivable waterbar detail and as specified in the CULVERT AND DRAINAGE LIST. Drivable waterbars must be installed concurrently with construction of the subgrade and must be maintained in an operable condition.

SECTION 6 – ROCK AND SURFACING

SUBSECTION ROCK SOURCE

6-2 ROCK SOURCE ON STATE LAND

Rock used in accordance with the quantities on the ROCK LIST may be obtained from the following source(s) on state land at no charge to the Purchaser. Purchaser shall obtain written approval from the Contract Administrator for the use of material from any other source. If other operators are using, or desire to use the rock source(s), a joint operating plan must be developed. All parties shall follow this plan. Purchaser shall notify the

Contract Administrator a minimum of 3 working days before starting any operations in the listed locations.

<u>Source</u>	<u>Location</u>
Greenline Quarry	T17N R3W S29

6-5 ROCK FROM COMMERCIAL SOURCE

Rock used in accordance with the quantities on the ROCK LIST may be obtained from any commercial source at the Purchaser's expense. Rock sources are subject to written approval by the Contract Administrator before their use.

SUBSECTION ROCK SOURCE DEVELOPMENT

6-10 ROCK SOURCE DEVELOPMENT PLAN BY STATE

Purchaser shall conduct rock source development and use at the following sources, in accordance with the written ROCK SOURCE DEVELOPMENT PLAN prepared by the state and included in this road plan. Upon completion of operations, the rock source must be left in the condition specified in the ROCK SOURCE DEVELOPMENT PLAN, and approved in writing by the Contract Administrator. Purchaser shall notify the Contract Administrator a minimum of 3 working days before starting any operations in the rock source.

<u>Source</u>	<u>Rock Type</u>
Greenline Quarry	2 Inch Minus, 4 Inch Jaw, Quarry Spalls, Pit Run, Light Loose Riprap.

6-12 ROCK SOURCE SPECIFICATIONS

Rock sources must be in accordance with the following specifications , unless otherwise specified in the ROCK SOURCE DEVELOPMENT PLAN:

- Pit walls may not be undermined or over steepened. The maximum slope of the walls must be consistent with recognized engineering standards for the type of material being excavated in accordance with the following table:

Material	Maximum Slope Ratio (Horiz. :Vert.)	Maximum Slope Percent
Sand	2:1	50
Gravel	1.5:1	67
Common Earth	1:1	100
Fractured Rock	0.5:1	200
Solid Rock	0:1	vertical

- Pit walls must be maintained in a condition to minimize the possibility of the walls sliding or failing.
- The width of pit benches must be a minimum of 1.5 times the maximum length of the largest machine used.
- The surface of pit floors and benches must be uniform and free-draining at a minimum 2% outslope gradient.
- All operations must be carried out in compliance with all regulations of the Regulations and Standards Applicable to Metal and Nonmetal Mining and Milling Operations (30 CFR) U.S. Department of Labor, Mine Safety and Health Administration and Safety Standards for Construction Work (296-155 WAC), Washington Department of Labor and Industries.
- All vehicle access to the top of the pit faces must be blocked.

6-13 ROCK EXPLORATION

Purchaser shall provide an air track drill with operator for up to 450 vertical feet of exploratory drilling for rock.

<u>Site</u>	<u>Location</u>	<u>Vertical Feet of Drilling</u>
Greenline Quarry	See Greenline Quarry Development Plan	450

6-14 DRILL AND SHOOT

Rock drilling and shooting must meet the following specifications:

- Oversize material remaining in the rock source at the conclusion of the timber sale may not exceed 600 cubic yards.
- Oversize material is defined as rock fragments larger than two feet in any dimension.
- Oversized rock that exceeds the maximum allowable amount must be reduced to a smaller size within the rock source.
- Purchaser shall notify the Contract Administrator a minimum of 3 working days before blasting operations.
- Purchaser shall submit an informational drilling and shooting plan to the Contract Administrator 3 working days before any drilling. The drilling and shooting plan must include, at a minimum, the mapped location and spacing of all holes to be loaded, the type of blasting agent used, the powder factor calculated and the units of same, stem amount held per hole. After drilling, the type of rock encountered while drilling e.g. hard black, soft brown, etc shall be amended to submitted plan.
- All operations must be carried out in compliance with the Regulations and Standards Applicable to Metal and Nonmetal Mining and Milling Operations (30 CFR) U.S. Department of Labor, Mine Safety and Health Administration and the Safety Standards for Construction Work (296-155 WAC), Washington Department of Labor and Industries.
- Purchaser shall block access roads before blasting operations.

SUBSECTION ROCK MANUFACTURE

6-20 ROCK GRADATION TYPES

Purchaser shall manufacture rock in accordance with the types and amounts listed in the ROCK LIST. Rock must meet the following specifications for gradation and uniform quality when placed in hauling vehicles. Purchaser shall provide a sieve analysis upon request from the Contract Administrator.

6-23 ROCK CRUSHING OPERATIONS

Rock crushing operations must conform to the following specifications:

- Operations and placement of oversize material must be conducted in or near the rock source site, as approved in writing by the Contract Administrator.
- The crushing operation must be concluded within 30 working days from the time it begins.

SUBSECTION ROCK GRADATION

6-30 2-INCH MINUS CRUSHED ROCK

% Passing 2" square sieve	100%
% Passing 1" square sieve	55 - 75%
% Passing U.S. #4 sieve	20 - 45%

Of the fraction passing the No. 4 sieve, 40% to 60% must pass the No. 10 sieve.

The portion of aggregate retained on the No. 4 sieve may not contain more than 0.2 percent organic debris and trash. All percentages are by weight.

6-37 4-INCH JAW RUN ROCK

% Passing 4" square sieve	95%
% Passing U.S. #40 sieve	16% maximum
% Passing U.S. #200 sieve	5% maximum

The portion of aggregate retained on the No. 4 sieve may not contain more than 0.2 percent organic debris and trash. All percentages are by weight.

6-41 PIT RUN ROCK

No more than 50 percent of the rock may be larger than 8 inches in any dimension and no rock may be larger than 12 inches in any dimension. Pit Run rock may not contain more than 5 percent by weight of organic debris, dirt, and trash. Rock may require processing to meet this specification.

6-43 QUARRY SPALLS

% Passing 8" square sieve	100%
% Passing 3" square sieve	40% maximum
% Passing 3/4" square sieve	10% maximum

Rock may not contain more than 5 percent vegetative debris or trash. All percentages are by weight.

6-50 LIGHT LOOSE RIP RAP

Rip rap must consist of angular, hard, sound, and durable stone. It must be free from segregation, seams, cracks, and other defects. Light loose rip rap must be free of rock fines, soil, organic debris or other extraneous material, and must meet the following requirements:

<u>At Least/Not More Than</u>	<u>Size Range</u>
20% / 90%	20" - 36"
80% / --	12" - 30"
10% / 20%	3" - 8"

SUBSECTION ROCK MEASUREMENT

6-55 ROCK APPLICATION MEASURED BY COMPACTED DEPTH

Measurement of specified rock depths, are defined as the compacted depth(s) using the compaction methods required in this road plan. Estimated quantities specified in the ROCK LIST are compacted yards. Purchaser shall apply adequate amounts of rock to meet the specified rock depths. Specified rock depths are minimum requirements and are not subject to reduction.

SUBSECTION ROCK APPLICATION

6-70 APPROVAL BEFORE ROCK APPLICATION

Purchaser shall obtain written approval from the Contract Administrator for subgrade including: ditches, headwalls, catch basins, culverts, energy dissipaters, ditch-outs, subgrade shaping and compacting before rock application.

6-71 ROCK APPLICATION

Purchaser shall apply rock in accordance with the specifications and quantities shown on the ROCK LIST. Rock must be spread, shaped, and compacted full width concurrent with rock hauling operations. The Contract Administrator will direct locations for rock that is to be applied as spot patching. Road surfaces must be compacted in accordance with the COMPACTION LIST by routing equipment over the entire width.

6-73 ROCK FOR WIDENED PORTIONS

Purchaser shall apply rock to turnarounds, turnouts, and areas with curve widening to the same depth and specifications as the traveled way.

6-75 OPTIONAL ROCK EXCEPTION

On the following roads, Purchaser may place less rock than shown on the ROCK LIST, when approved in writing by the Contract Administrator.

If less rock is applied, Purchaser shall submit a written plan, for approval, describing how these roads will be constructed, used, maintained, and treated post-haul. Purchaser shall meet post-haul specifications in Section 9 POST-HAUL ROAD WORK, the FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS, or other conditions of the approved plan.

<u>Road</u>	<u>Stations</u>
D-4080	0+00 to 10+60
D-4086	0+00 to 1+97
D-4087	0+00 to 1+70
D-4088	0+00 to 7+25
D-4630.11	0+00 to 3+63
D-4706	0+00 to 7+68
D-4706.5	0+00 to 5+06

SECTION 7 – STRUCTURES

SUBSECTION STREAM CROSSING STRUCTURES GENERAL

7-6 STREAM CROSSING INSTALLATION

Purchaser shall install stream crossing structures in accordance with the manufacturer's requirements.

SECTION 8 – EROSION CONTROL

8-1 SEDIMENT CONTROL STRUCTURES

Sediment control shall be accomplished using sediment traps, silt fence, or other methods as approved in writing by the Contract Administrator.

8-2 PROTECTION FOR EXPOSED SOIL

On the following road(s), Purchaser shall provide and evenly spread a layer of straw to all exposed soils. Soils may not sit exposed during any rain event.

<u>Road</u>	<u>Location</u>
D-4000A	55+63

SUBSECTION REVEGETATION

8-15 REVEGETATION

On the following road(s), Purchaser shall spread grass seed on all exposed soils resulting from road work activities. Cover all exposed soils using hand method. Other methods of covering must be approved in writing by the Contract Administrator.

<u>Road</u>	<u>Location</u>
D-4000A	49+98 to 64+90
D-4000A1	0+00 to 2+68
D-4630.1	0+00 to 8+41

8-16 REVEGETATION SUPPLY

The Purchaser shall provide the seed mixture.

8-17 REVEGETATION TIMING

Purchaser shall revegetate immediately after road work is completed unless alternative plan approved in writing by the Contract Administrator. Soils may not be allowed to sit exposed for longer than one month without receiving revegetation treatment unless otherwise approved in writing by the Contract Administrator.

8-18 PROTECTION FOR SEED

Purchaser shall provide a protective cover for seed on all exposed soils within 50 feet of streams or wetlands.

8-19 ASSURANCE FOR SEEDED AREA

Purchaser shall ensure the growth of a uniform and dense crop (at least 50% coverage) of 3-inch tall grass. Purchaser shall reapply the grass seed in areas that have failed to germinate or have been damaged through any cause. Restore eroded or disturbed areas, clean up and properly dispose of eroded materials, and reapply the grass seed at no addition cost to the state.

8-25 GRASS SEED

Purchaser shall evenly spread the seed mixture listed below on all soil specified in CLAUSE 8-15 REVEGETATION at a rate of 50 pounds per acre of exposed soil. Grass seed must meet the following specifications:

1. Weed seed may not exceed 0.5% by weight.

2. All seed species must have a minimum 90% germination rate, unless otherwise specified.
3. Seed must be certified.
4. Seed must be furnished in standard containers showing the following information:
 - a. Common name of seed.
 - b. Net weight.
 - c. Percent of purity.
 - d. Percentage of germination.
 - e. Percentage of weed seed and inert material.
5. Seed must conform to the following mixture unless a comparable mix is approved in writing by the Contract Administrator.
- 6.

<u>Kind and Variety of Seed in Mixture</u>	<u>% by Weight</u>
Perennial Rye	35-45
Red Fescue	35-45
Highland Bent	5-15
White Clover	5-15
Inert and Other Crop	0.5

SECTION 9 – POST-HAUL ROAD WORK

SUBSECTION STRUCTURES

9-1 BARRICADE DETAIL

On the following road(s), Purchaser shall construct barricades in accordance with the BARRICADE DETAIL.

<u>Road</u>	<u>Station</u>
D-4080	0+00
D-4085	0+00
D-4086	0+00
D-4087	0+00
D-4088	0+00
D-4630.11	0+00
D-4706	0+00
D-4706.5	0+00

9-3 CULVERT MATERIAL REMOVED FROM STATE LAND

Culverts removed from roads become the property of the Purchaser and must be removed from state land.

SUBSECTION POST-HAUL MAINTENANCE

9-5 POST-HAUL MAINTENANCE

Purchaser shall perform post-haul maintenance in accordance with the FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS and as specified below.

<u>Road</u>	<u>Stations</u>	<u>Additional Requirements</u>
D-4600	30+93 to 39+68	Rock Section After Logging
D-4630	8+38 to 28+99	Rock Section After logging

SUBSECTION POST-HAUL LANDING MAINTENANCE

9-10 LANDING DRAINAGE

Purchaser shall provide for drainage of the landing surface.

9-15 ROAD CLOSURE

Purchaser shall close the following roads before the termination of this contract.

<u>Road</u>	<u>Stations</u>
D-4080	0+00 to 10+60

9-16 CLOSURE

At a minimum, closure consists of:

- Maintain road according to the FOREST ACCESS ROAD SPECIFICATIONS.
- Block roads with barricade in accordance with the attached BARRICADE DETAIL.

9-21 ROAD ABANDONMENT

Purchaser shall abandon the following roads (if built) before the termination of this contract.

<u>Road</u>	<u>Stations</u>
D-4085	0+00 to 5+71
D-4086	0+00 to 1+97
D-4087	0+00 to 1+70
D-4088	0+00 to 7+25
D-4630.11	0+00 to 3+63
D-4706	0+00 to 7+68
D-4706.5	0+00 to 5+06

9-22 ABANDONMENT

- Construct non-drivable waterbars according to the attached NON-DRIVABLE WATERBAR DETAIL at a maximum spacing that will produce a vertical drop of no more than 10 feet between waterbars or between natural drainage paths and with a maximum spacing of 100 feet, or as marked in the field.
- Skew waterbars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3 per cent grade.

- Key waterbars into the cut-slope to intercept the ditch. Waterbars must be outsloped to provide positive drainage. Outlets must be on stable locations.
- Remove culverts from State Land.
- Remove ditch cross drain culverts and leave the resulting trench open.
- Slope all trench walls and approach embankments no steeper than 1.5:1.
- Apply grass seed concurrently with abandonment at a rate of 50 lbs/acre.
- Construct barricade per clause 9-1 BARRICADE DETAIL.

SECTION 10 MATERIALS

SUBSECTION GEOTEXTILES

10-6 GEOTEXTILE FOR TEMPORARY SILT FENCE

Geotextiles must meet the following minimum requirements for strength and property qualities, and must be designed by the manufacturer to be used for filtration. Woven slit-film geotextiles are not allowed. Material must be free of defects, cuts, and tears.

	<u>ASTM Test</u>	<u>Requirements</u>
Type	--	Unsupported between posts
Apparent opening size	D 4751	No. 30 max., No. 100 min.
Water permittivity	D 4491	0.02 sec ⁻¹
Grab tensile strength	D 4632	180 lb in machine direction, 100lb in cross-machine direction
Grab tensile elongation	D 4632	30% max. at 180 lb or more
Ultraviolet stability	D 4355	70% retained after 500 hours of exposure

SUBSECTION CULVERTS

10-17 CORRUGATED PLASTIC CULVERT

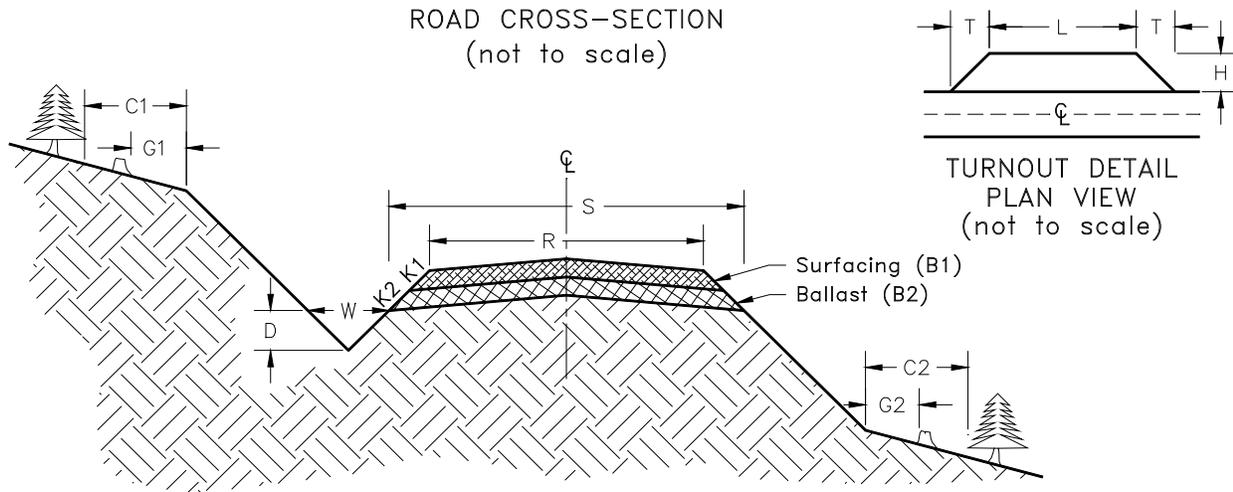
Polyethylene culverts must meet AASHTO M-294 specifications, or ASTM F-2648 specifications for recycled polyethylene. Culvert segments not specifically labeled as downspouts must be Type S – double walled with a corrugated exterior and smooth interior.

10-22 PLASTIC BAND

Plastic coupling and end bands must meet the AASHTO specification designated for the culvert. Only fittings supplied or recommended by the culvert manufacturer may be used. Couplings must be split coupling band. Split coupling bands must have a minimum of four corrugations, two on each side of the pipe joint.

TYPICAL SECTION SHEET

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Road Number	From Station	To Station	Tolerance Class	Subgrade Width (feet)	Road Width (feet)	Ditch		Crown in. @ CL	Grubbing Limits (feet)		Clearing Limits (feet)		Cut Slope Ratio	Fill Slope Ratio
						Width (feet)	Depth (feet)		G1	G2	C1	C2		
				S	R	W	D		G1	G2	C1	C2	Clause	Clause
C-line	830+29	879+62	A	-	16	3	1	4	-	-	-	-	4-5	4-6
D-Line	0+00	458+83	A	-	16	3	1	4	-	-	-	-	4-5	4-6
D-4000	0+00	287+63	A	-	16	3	1	4	-	-	-	-	4-5	4-6
D-4000A	49+98	64+90	C	16	12	3	1	4	2	2	5	5	4-5	4-6
D-4000A1	0+00	2+68	C	16	12	3	1	4	2	2	5	5	4-5	4-6
D-4080	0+00	10+60	A	16	12	3	1	4	2	2	5	5	4-5	4-6
D-4085	0+00	5+71	A	16	12	3	1	4	2	2	5	5	4-5	4-6
D-4086	0+00	1+97	C	16	12	3	1	4	0	0	0	0	4-5	4-6
D-4087	0+00	1+70	C	16	12	3	1	4	0	0	0	0	4-5	4-6
D-4088	0+00	7+25	C	16	12	3	1	4	0	0	0	0	4-5	4-6
D-4600	0+00	65+36	A	16	12	3	1	4	-	-	-	-	4-5	4-6
D-4600A	0+00	1+77	A	-	12	3	1	4	-	-	-	-	4-5	4-6
D-4606	0+00	6+86	A	-	12	3	1	4	-	-	-	-	4-5	4-6
D-4630	0+00	28+99	A	16	12	3	1	4	-	-	-	-	4-5	4-6
D-4630.1	0+00	8+41	C	16	12	3	1	4	2	2	5	5	4-5	4-6
D-4630.11	0+00	3+63	C	16	12	3	1	4	0	0	0	0	4-5	4-6
D-4700	0+00	48+75	A	-	12	3	1	4	-	-	-	-	4-5	4-6

TYPICAL SECTION SHEET
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Road Number	From Station	To Station	Tolerance Class	Subgrade Width (feet)	Road Width (feet)	Ditch		Crown in. @ CL	Grubbing Limits (feet)		Clearing Limits (feet)		Cut Slope Ratio	Fill Slope Ratio
						Width (feet)	Depth (feet)		G1	G2	C1	C2		
				S	R	W	D						Clause	Clause
D-4700A	0+00	1+57	A	-	12	3	1	4	-	-	-	-	4-5	4-6
D-4706	0+00	7+68	C	16	12	3	1	4	0	0	0	0	4-5	4-6
D-4706.5	0+00	5+06	C	16	12	3	1	4	0	0	0	0	4-5	4-6
D-4707	0+00	2+24	A	16	12	3	1	4	2	2	5	5	4-5	4-6
D-4800	0+00	12+57	A	-	12	3	1	4	-	-	-	-	4-5	4-6

TURNOUT and TURNAROUND LIST

Road Number	Begin L- Station	End L- Station	Turnout Width (H)	Full Width Length (L)	Taper Length (T)	Comments
D-4000A1	2+38	2+68	30	30	30	Turnaround Right
D-4088	6+95	7+25	30	30	25	Turnaround Left
D-4630.1	6+70	7+00	30	30	30	Turnaround Right
D-4706	7+38	7+68	30	30	23	Turnaround Right
D-4706.5	4+76	5+06	30	30	25	Turnaround Right

COMPACTION LIST

Page 1 of 2

Road	From Station	To Station	Type	Max Depth Per Lift (inches)	Equipment Type	Equipment Weight (lbs)	Minimum Number of Passes	Maximum Operating Speed (mph)
C-Line	830+29	879+62	After Grading,	-	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4000	0+00	287+63	After Grading, Spot Rocking	6"	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4000A	0+00	64+90	Reconstruction	12"	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4000A1	0+00	2+68	Construction	12"	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4080	0+00	10+60	After Grading, Rock Lift	12"	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4085	0+00	5+71	Reconstruction	12"	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4086	0+00	1+97	Construction	12"	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4087	0+00	1+70	Construction	12"	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4088	0+00	7+25	Construction	12"	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4600	0+00	65+36	After Grading, Spot Rock	6"	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4600A	0+00	1+77	After Grading	-	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4606	0+00	6+86	After Grading	-	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4630	0+00	28+99	After Grading, Spot Rock	6"	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4630.1	0+00	8+41	Construction	12'	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
D-4630.11	0+00	3+63	Construction	12"	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5

COMPACTION LIST

Page 2 of 2

Road	From Station	To Station	Type	Max Depth Per Lift (inches)	Equipment Type	Equipment Weight (lbs)	Minimum Number of Passes	Maximum Operating Speed (mph)
D-4700	0+00	48+75	After Grading	-	Smooth Drum Vibratory Roller	Equipment Weight (lbs)	Minimum Number of Passes	Maximum Operating Speed (mph)
D-4700A	0+00	1+57	After Grading	-	Smooth Drum Vibratory Roller	14,000	2 low freq. vibration	3.5
D-4705	0+00	4+89	After Grading, Culvert Replacement	-	Smooth Drum Vibratory Roller	14,000	2 low freq. vibration	3.5
D-4706	0+00	7+68	Construction	12"	Smooth Drum Vibratory Roller	14,000	2 low freq. vibration	3.5
D-4706.5	0+00	5+06	Construction	12"	Smooth Drum Vibratory Roller	14,000	2 low freq. vibration	3.5
D-4707	0+00	2+24	After Grading, Pipe Install	-	Smooth Drum Vibratory Roller	14,000	2 low freq. vibration	3.5
D-4800	0+00	12+57	After Grading	-	Smooth Drum Vibratory Roller	14,000	2 low freq. vibration	3.5

ROCK LIST Ballast

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Comments		
									CW	TO	TA
			K2	B2							
4 Inch Jaw Run											
D-4000A	49+98	64+90	1½ : 1	12"	52	14.92	776	Greenline Quarry			
D-4000A1	0+00	2+68	1½ : 1	12"	52	2.68	228	Greenline Quarry			48
D-4080*	0+00	10+60	1½ : 1	8"	35	10.60	381	Greenline Quarry			10
D-4086*	0+00	1+97	1½ : 1	12'	52	1.97	103	Greenline Quarry			
D-4087*	0+00	1+70	1½ : 1	12"	52	1.70	89	Greenline Quarry			
D-4088*	0+00	7+25	1½ : 1	12"	52	7.25	452	Greenline Quarry	26		49
D-4630.1	0+00	8+41	1½ : 1	12"	52	8.41	538	Greenline Quarry	43		56
D-4630.11*	0+00	3+63	1½ : 1	12"	52	3.63	238	Greenline Quarry	49		
D-4706*	0+00	7+68	1½ : 1	12"	52	7.68	481	Greenline Quarry	35		47
D-4706.5*	0+00	5+06	1½ : 1	12"	52	5.06	387	Greenline Quarry	76		48
Quarry Spalls											
All Permanent Culverts Except Live Stream					2.5 per culvert	15	48	Greenline Quarry			
Live Stream Culverts					5 per culvert	1	5	Greenline Quarry			
Pit Run											
Landings					50 per landing	20	1000	Greenline Quarry			
Light Loose Riprap											
Armoring					Assume 1 ft depth	1	15	Greenline Quarry	Assume 15 CY Per Crossing, Unless specified In CULVERT AND DRAINAGE LIST		
Dissapators					Place at Outlet	2	3	Greenline Quarry	See CULVERT AND DRAINAGE LIST		

4 Inch Jaw Total 3,673 Cubic Yards
 Quarry Spalls Total 53 Cubic Yards
 Light Loose Riprap Total 18 Cubic Yards
 Pit Run Total 1,000 Cubic Yards
 Ballast Total 4,744 Cubic Yards

Included in C.Y. Subtotal

CW- Curve Widening
 TO- Turn Out
 TA- Turn Around

*Optional Rock: If Purchaser elects to haul on optional rock roads in wet weather, the depth listed above is recommended but not required

** Post Haul Rock

ROCK LIST

Surfacing

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Comments		
									CW	TO	TA
			K1	B1	2 Inch Minus						
D-4000	150+75	163+95	1½ : 1	6"	26	13.20	344	Greenline Quarry			
	179+54	200+75	1½ : 1	6"	26	21.21	552	Greenline Quarry			
	230+29	239+12	1½ : 1	6"	26	8.83	230	Greenline Quarry			
	253+23	261+92	1½ : 1	6"	26	8.69	226	Greenline Quarry			
D-4086*	0+00	1+97	1½ : 1	6"	26	1.97	52	Greenline Quarry			
D-4600	0+00	10+68	1½ : 1	6"	26	10.68	278	Greenline Quarry			
	15+09	22+41	1½ : 1	6"	26	7.32	191	Greenline Quarry			
	** 30+93	** 39+68	1½ : 1	6"	26	8.75	228	Greenline Quarry			
	61+39	65+36	1½ : 1	6"	26	3.97	104	Greenline Quarry			
D-4600A	1+86		1½ : 1				50	Greenline Quarry			
D-4630	0+00	8+38	1½ : 1	6"	26	8+38	218	Greenline Quarry			
D-4630**	8+38	28+99	1½ : 1	6"	26	20.61	536	Greenline Quarry			
D-4706*	0+00	7+68	1½ : 1	6"	26	7.68	241	Greenline Quarry	18		23
Prehaul Culverts					10 Per Culvert	14	140	Greenline Quarry	Includes Contingency Culverts		

2 Inch Minus Total 3,390 Cubic Yards
Surfacing Total 3,390 Cubic Yards

NOTE: Yardages are estimated on a compacted (In-Place) basis. Compliance of required rock will be based on compacted depth measurement. **Apply appropriate factors to determine loose amounts for estimating purposes.** Roads and rock quantities are designed for dry weather use. If Purchaser elects to haul in wet weather additional rock may be obtained from the rock pits listed in Section 6 at the Purchaser's expense and with prior written approval from the Contract Administrator.

Included in C.Y. Subtotal

CW- Curve Widening

TO- Turn Out

TA- Turn Around

*Optional Rock: If Purchaser elects to haul on optional rock roads in wet weather, the depth listed above is recommended but not required

** Post Haul Rock

CULVERT AND DRAINAGE LIST

Page 1 of 2

Road Number	Location	Culvert		Length (ft)			Riprap (C.Y.)			Backfill Material *	Placement Method*	Const. Staked*	Remarks
		Dia. (in)	Type	Culvert	Downspt	Flume	Inlet	Outlet	Type				
D-4000	142+26	-	-	-			-	-	-	-			Install Drivable Water Barr Across D-4075
	164+10	18	PD	30			1	1.5	QS	NT			Install
	196+35	18	PD	30			1	1.5	QS	NT			Replace
	198+80	18	PD	30			1	1.5	QS	NT	No Skew		Replace
	266+00	18	PD	40			1	1.5	QS	NT			Install
D-4000A	51+23	18	PD	30			1	1.5	QS	NT			Install
	55+63	24	PD	50			2	3	QS	NT			Install Live Water
	60+62	18	PD	30			1	1.5	QS	NT			Install
	62+69	18	PD	30			1	1.5	QS	NT			Install
D-4000A1	1+44	18	PD	30			1	1.5	QS	NT			Install
D-4080	1+55	18	PD	30			1	1.5	QS	NT			Replace
	6+52	18	PD	40			1	1.5	QS	NT			Replace
	9+67	18	PD	30			1	1.5	QS	NT			Install
D-4085	1+78	18	Temp	30			-	-	-	NT			Install
	3+38	18	Temp	30			-	-	-	NT			Install
D-4088	1+90	18	Temp	30			-	-	-	NT			Install
	5+56	18	Temp	30			-	-	-	NT			Install
D-4630	25+20	18	PD	30			1	1.5	QS	NT			Install W/ 1.5 CY LL Dissapator
D-4630.1	0+49	18	PD	50			1	1.5	QS	NT	Across Both Roads		Install
	3+16	18	PD	30			1	1.5	QS	NT			Install
D-4630.11	2+93	18	Temp	30			-	-	-	NT			Install
D-4706	4+38	18	Temp	40			-	-	-	NT			Install
	6+73	18	Temp	40			-	-	-	NT			Install
D-4707	0+00	12	Temp	30			-	-	-	NT	Across D-4707 Intersection		Install
Contingency Culverts		18	PD	30			1	1.5	QS	NT			At CA Discretion
		18	PD	30			1	1.5	QS	NT			
		18	PD	30			1	1.5	QS	NT			
		18	PD	30			1	1.5	QS	NT			
		18	PD	Band			-	-	-	-			
	18	PD	Band			-	-	-	-				

CULVERT AND DRAINAGE LIST

Page 2 of 2

* SEE CULVERT AND DRAINAGE SPECIFICATION DETAIL

PD = Polyethylene Pipe Dual Wall AASHTO No. M294 Type S or ASTM F2648

TEMP = Temporary Culvert

Key:

QS - Quarry Spalls

LL - Light Loose Riprap

SR - Shot Rock

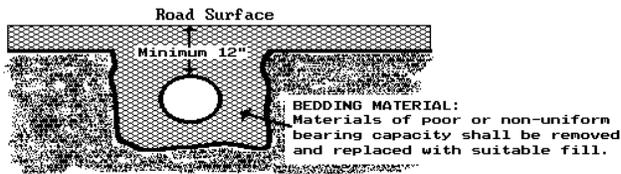
NT - Native (bank run)

SL - Select Fill

Flume - Half round pipe

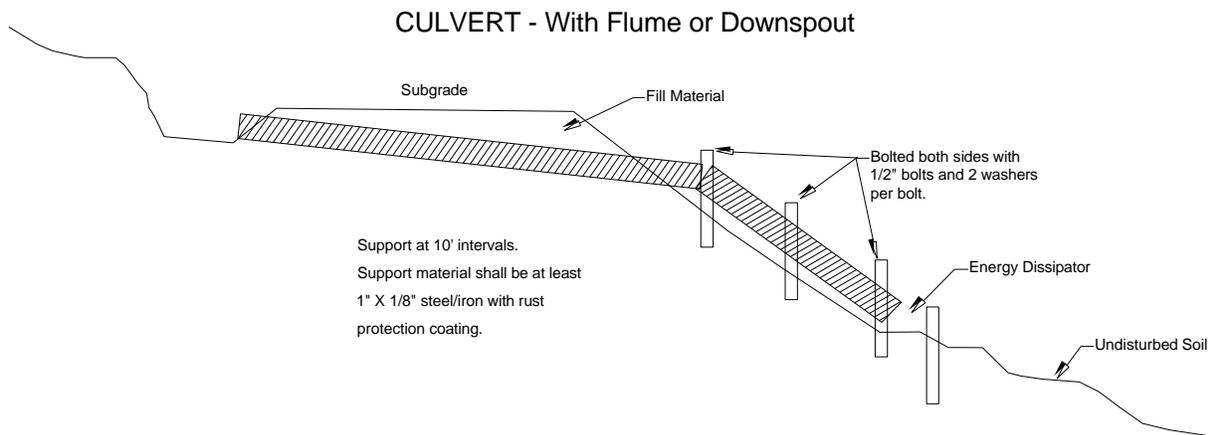
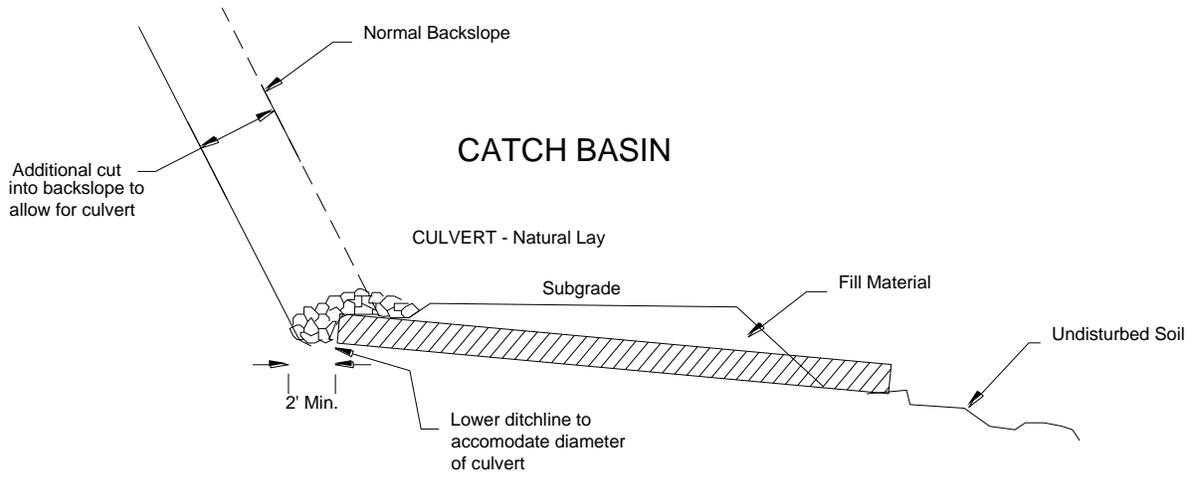
Downspout - Full round pipe

CULVERT BACKFILL AND BASE PREPARATION
(For culverts less than 36")



CULVERT AND DRAINAGE SPECIFICATION DETAIL

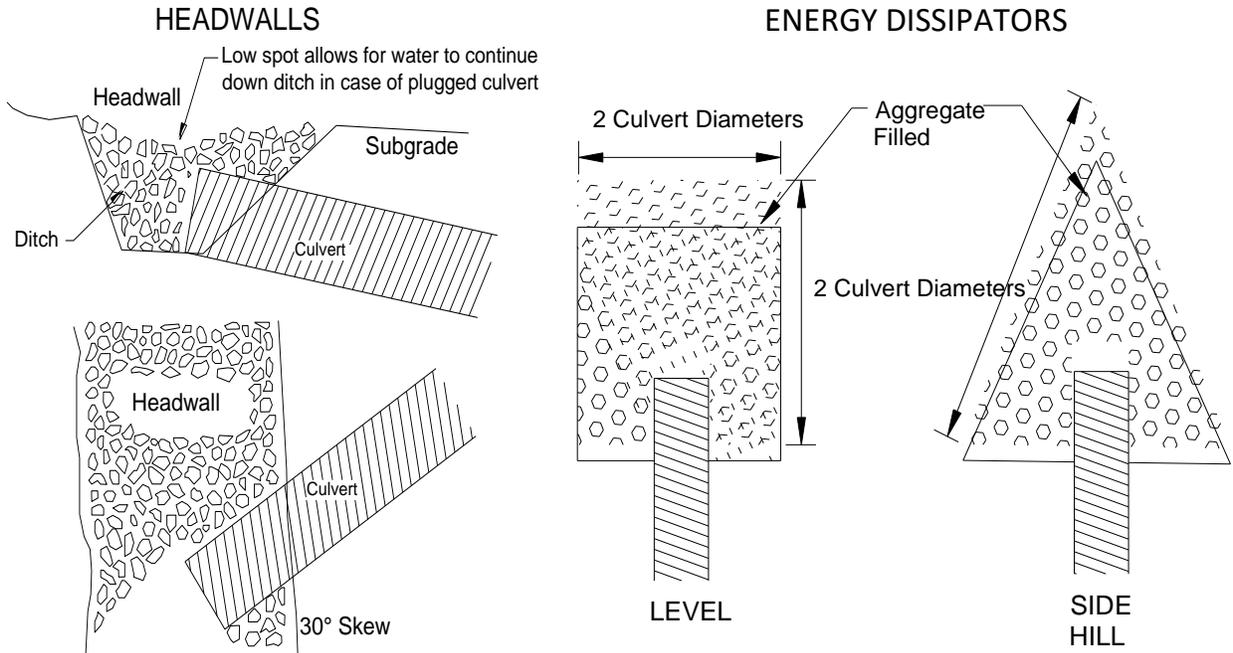
(Page 1 of 3)



CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 2 of 3)

Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.



Headwalls to be constructed of material that will resist erosion.

Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

CULVERT AND DRAINAGE SPECIFICATION DETAIL

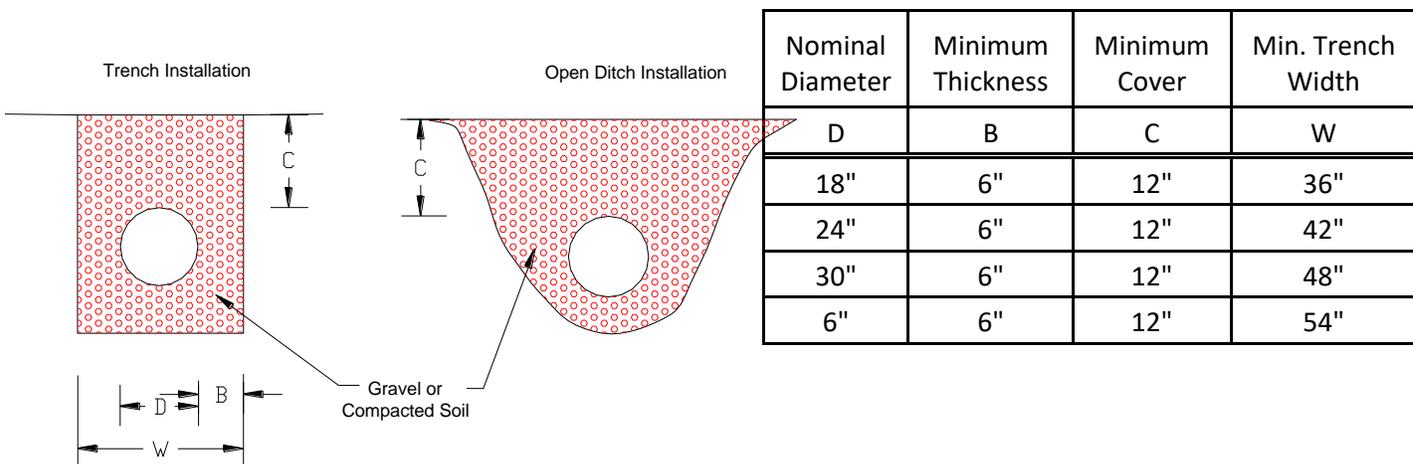
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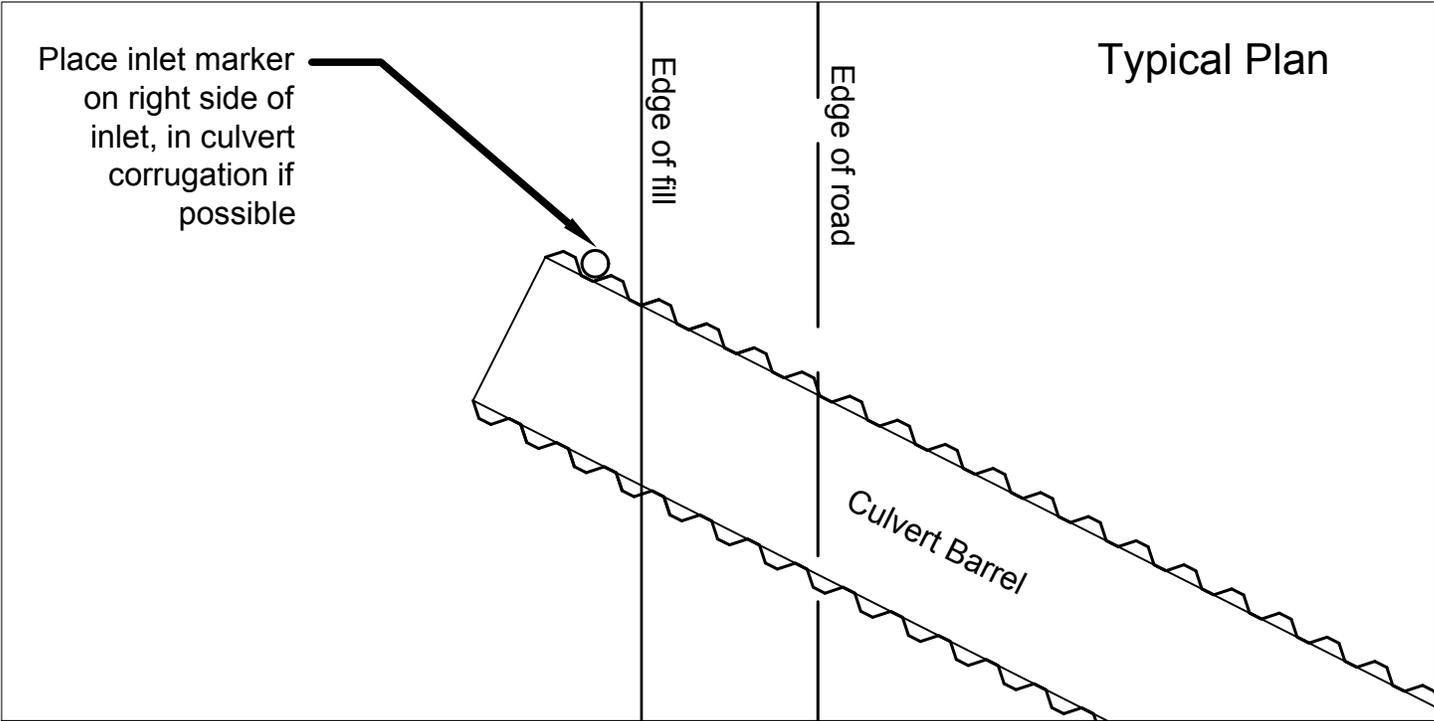
POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

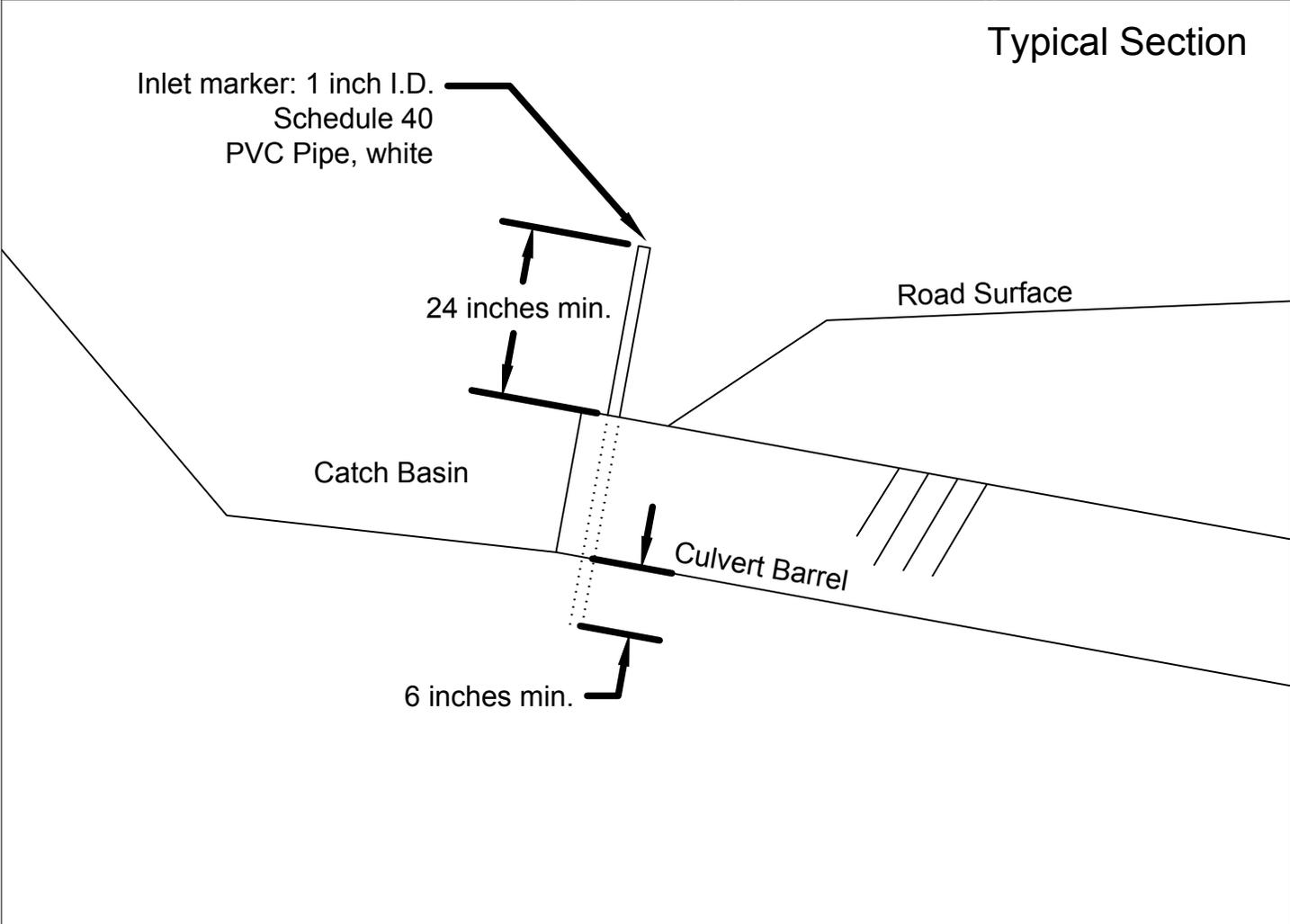
1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.
2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.
3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.
4. Site conditions and availability of bedding materials often dictate the type of installation method used.
5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% is required. This minimum compaction can be achieved by either hand or mechanical tamping.

MINIMUM DIMENSIONS Trench or Open Ditch Installation





Typical Plan



Typical Section

CULVERT MARKER DETAIL (INLET SHOWN)



WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES

Drawn by: WP Hoskins

FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS

Page 1 of 2

Cuts and Fills

- Maintain slope lines to a stable gradient compatible with the construction materials. Remove slides up to 100 cubic yards in volume from ditches and the roadway. Repair fill-failures with selected material or material approved by the Contract Administrator. Remove overhanging material from the top of cut slopes.
- Waste material from slides or other sources shall be placed and compacted in stable locations identified in the road plan or approved by the Contract Administrator, so that sediment will not deliver to any streams or wetlands.
- Slide material and debris shall not be mixed into the road surface materials, unless approved by the Contract Administrator.

Surface

- Grade and shape the road surface, turnouts, and shoulders to the original shape on the TYPICAL SECTION SHEET to provide a smooth, rut-free traveled surface and maintain surface water runoff in an even, unconcentrated manner.
- Blading shall not undercut the backslope or cut into geotextile fabric on the road.
- If required by the Contract Administrator, water shall be applied as necessary to control dust and retain fine surface rock.
- Surface material shall not be bladed off the roadway. Replace surface material when lost or worn away, or as directed by the Contract Administrator.
- Remove shoulder berms, created by grading, to facilitate drainage, except as marked or directed by the Contract Administrator.
- For roads with geotextile fabric: spread surface aggregate to fill in soft spots and wheel ruts (barrel spread) to prevent damage to the geotextile fabric.

Drainage

- Prevent silt bearing road surface and ditch runoff from delivering sediment to any streams or wetlands.
- Maintain rolling dips and drivable waterbars as needed to keep them functioning as intended.
- Maintain headwalls to the road shoulder level with material that will resist erosion.
- Maintain energy dissipaters at culvert outlets with non-erodible material or rock.
- Keep ditches, culverts, and other drainage structures clear of obstructions and functioning as intended.
- Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This shall be done even during periods of inactivity.

FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS

Page 2 of 2

Preventative Maintenance

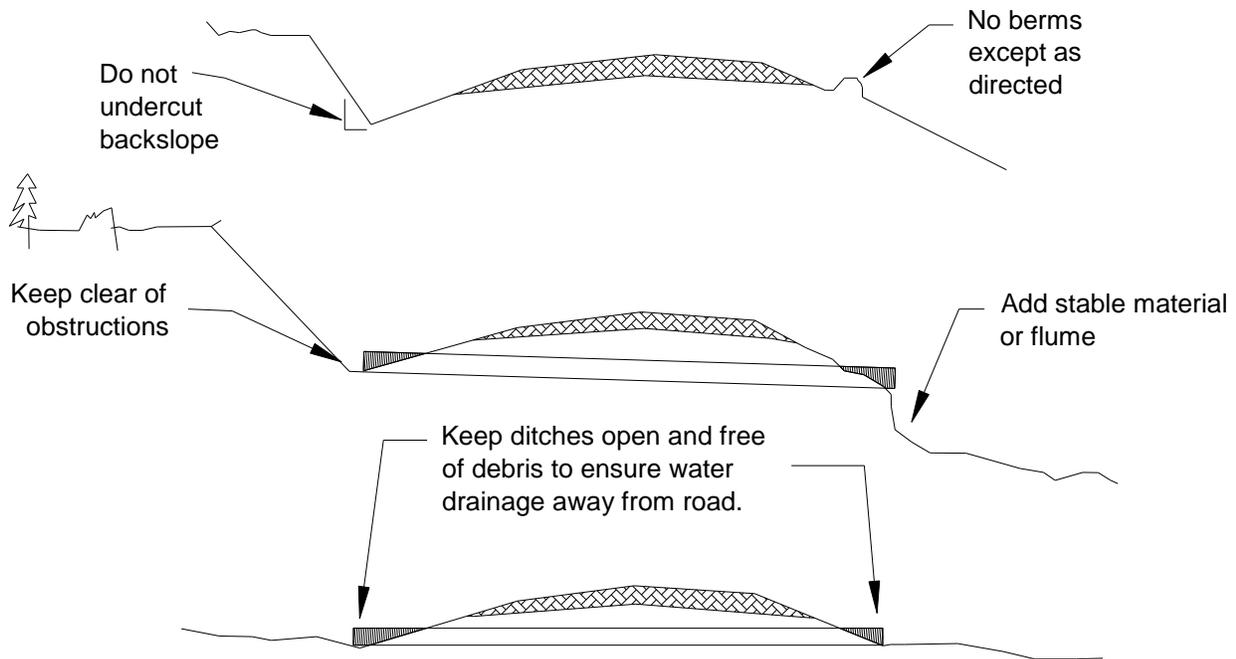
- Perform preventative maintenance work to safeguard against storm damage, such as blading to ensure correct runoff, ditch and culvert cleaning, and waterbar maintenance.

Termination of Use or End of Season

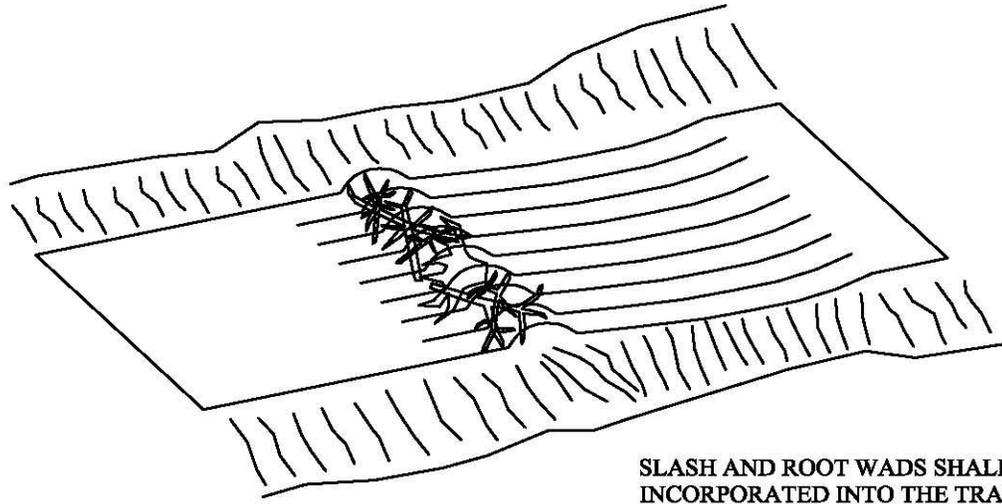
- At the conclusion of logging operations, ensure all conditions of these specifications have been met.

Debris

- Remove fallen timber, limbs, and stumps from the slopes, roadway, ditchlines, and culvert inlets.



BARRICADE DETAIL

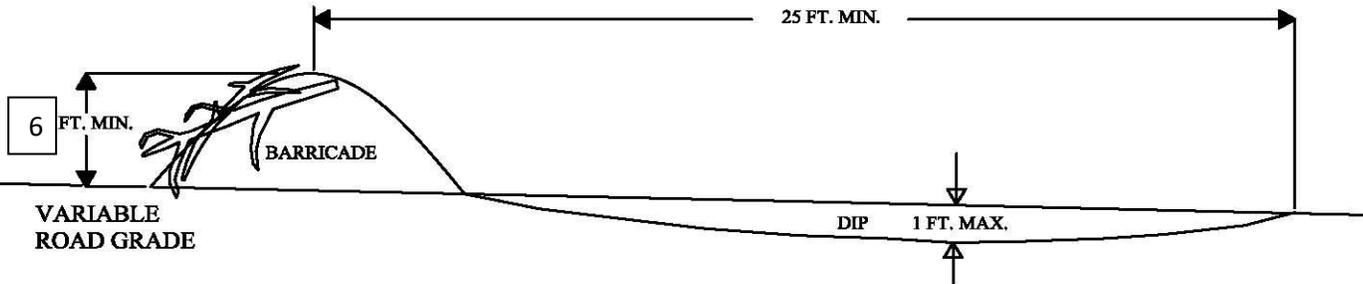


SLASH AND ROOT WADS SHALL BE INCORPORATED INTO THE TRAFFIC SIDE OF THE BARRICADE.

PLAN VIEW

TRAFFIC SIDE OF BARRICADE

CLOSED SIDE OF BARRICADE

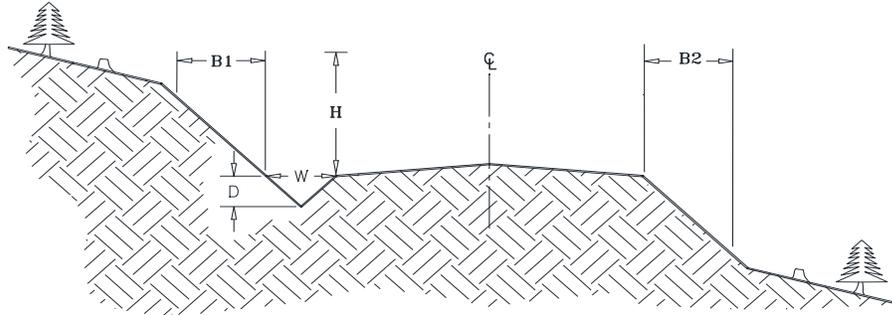


BOTTOM OF DIP SHALL BE OUTSLOPED SO AS TO DRAIN FREELY

PROFILE VIEW

BRUSHING DETAIL

(not to scale)



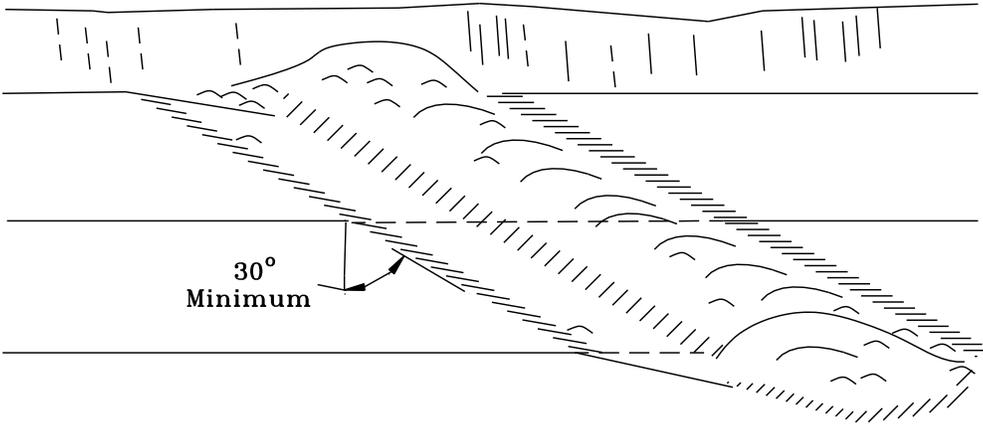
BRUSHING LIST

Road Number	From station	To station	Road Width (feet)	Ditch		Height (feet)	Brushing Limits (feet)		Remarks <u>In addition to brushing...</u>
				Width (feet)	Depth (feet)		B1	B2	
				W	D		B1	B2	
D-4000	149+35	265+35	Varies	Varies	Varies	14	8	8	
D-4080	0+00	10+60	Varies	Varies	Varies	14	8	8	
D-4707	0+00	2+24	Varies	Varies	Varies	14	8	8	
D-4800	0+00	12+57	Varies	Varies	Varies	14	8	8	

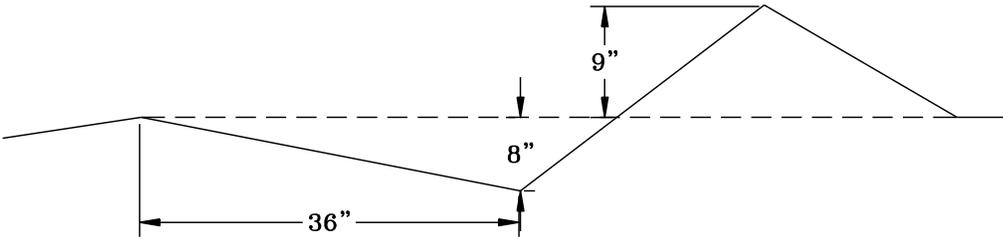
B1 extends horizontally the specified distance in feet from the back of the ditch. **B2** extends horizontally the specified distance in feet from the outside edge of the running surface. Brush is defined as all non-merchantable vegetative material found within the specified limits. Brush that is cut shall be removed to the downhill side of the road and placed such that it will not block ditches, ditch-outs, or drainage structures. Signs, culvert location markers, or any other identification features damaged by brushing shall be replaced at the Purchasers expense.

Drivable Water Bar Detail

Cross Ditch



Cross Section at Centerline

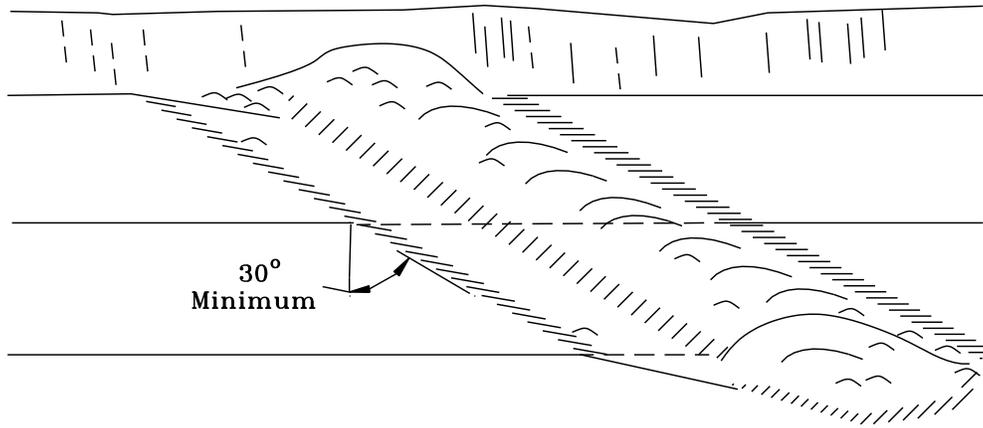


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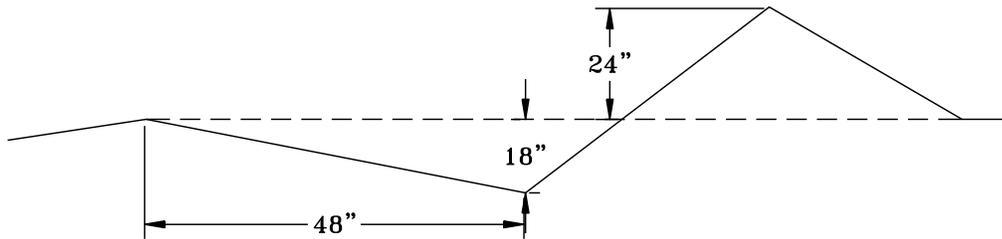
Water Bar Detail	
	WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES
<small>SPS REGION</small>	

Non-Drivable Water Bar Detail

Cross Ditch



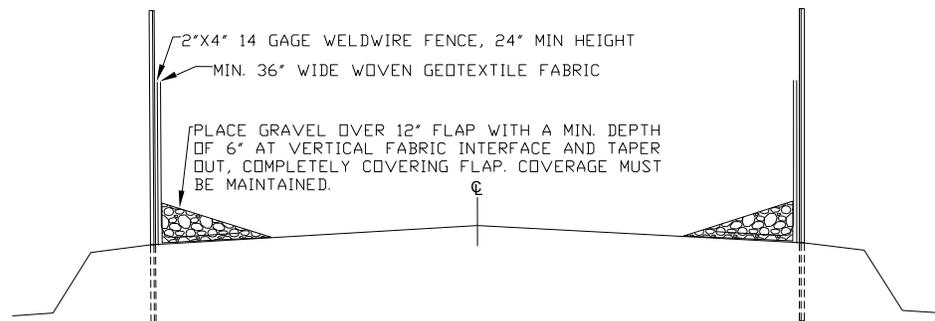
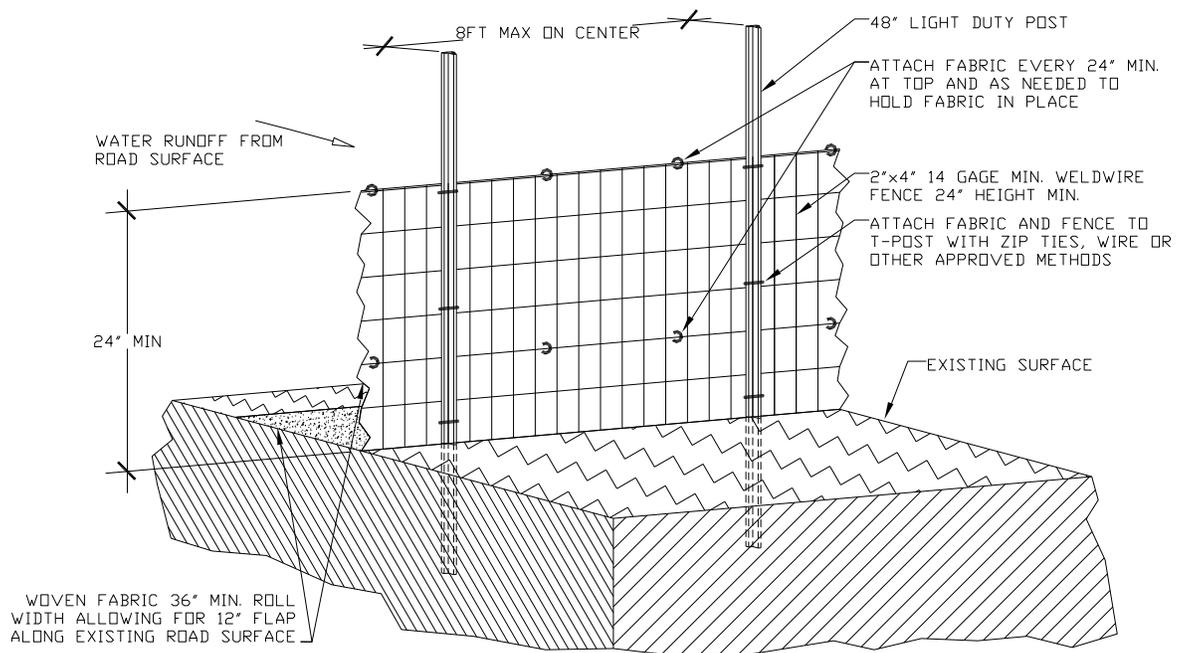
Cross Section at Centerline



Date:
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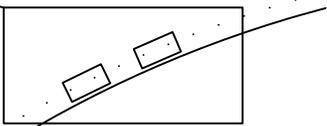
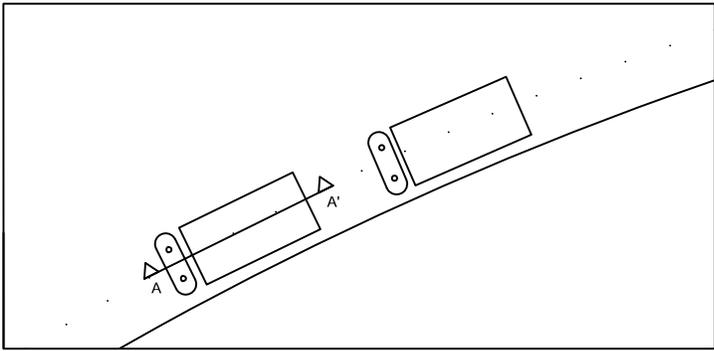
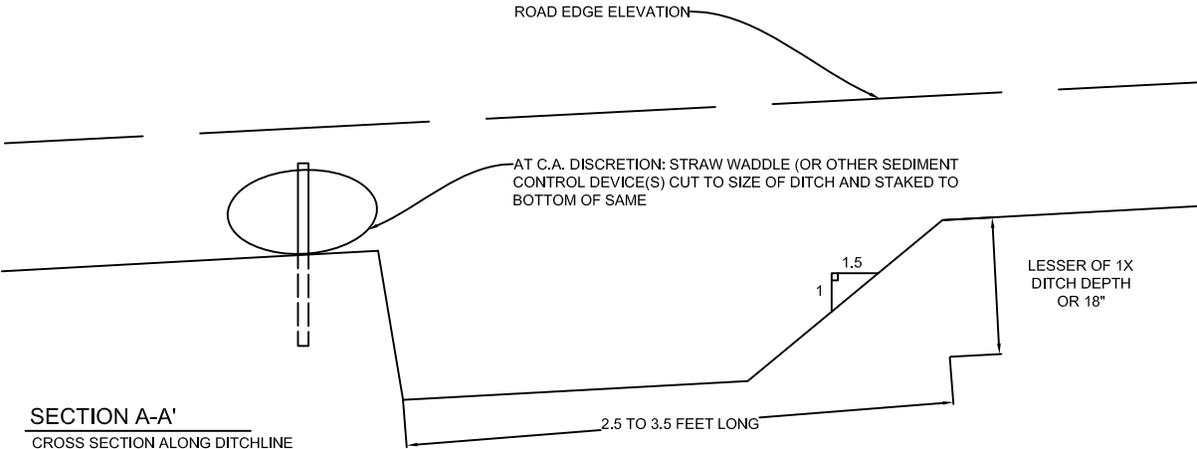
Water Bar Detail	
	WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES
<small>SPS REGION</small>	

SILT FENCE DETAIL



1. Silt fence shall be installed with Contract Administrator approval prior to haul.
2. Silt fence shall be installed with a minimum of 6" of cover starting at fabric/weldwire and tapering toward road centerline. Coverage of fabric shall be maintained.
3. Light Duty T-Posts shall be placed on the down slope side of the fabric/weldwire. If conditions exist that a taller silt fence is required, such as splash, longer T-Posts, wider fabric rolls and taller fence maybe necessary or other methods as approved by the Contract Administrator.
4. When a silt fence is continued from another run, the end T-Posts shall be connected together and not overlapped.
5. If runoff of silt laden water flows around the sides and additional fence may be used, realignment of the fence, removal of built up sediment and/or other BMP's such as ditch filters shall be used until controlled. Until under control haul shall be suspended.
6. FABRIC SPECS - min tensile strength: 120lbs, min puncture strength: 50lbs, min tear strength: 40lbs, min burst strength: 200lbs, min permittivity: 0.1 sec-1, UV resistance: 70%.

SEDIMENT TRAP DETAIL



NOTES:

CONSTRUCT SEDIMENT TRAPS IN SETS GREATER THAN ONE, WHENEVER POSSIBLE.

IF SEDIMENT TRAPS FILL WITH SEDIMENT DURING HAUL OPERATIONS, REMOVING SEDIMENT FROM TRAPS IS CONSIDERED ROUTINE MAINTENANCE.

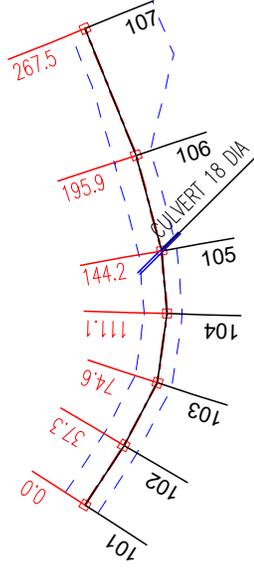
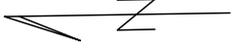
ADDITIONAL SEDIMENT CONTROL DEVICES, SUCH AS HAY BALES, STRAW WADDLES OR OTHERS MAY BE REQUIRED AS SHOWN IF IN THE OPINION OF THE CONTRACT ADMINISTRATOR, SEDIMENT TRAP ALONE DOES NOT APPEAR TO BE EFFECTIVE.

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 Drawn by: WPH
 Sheet 1 of 1

SEDIMENT TRAP DETAIL

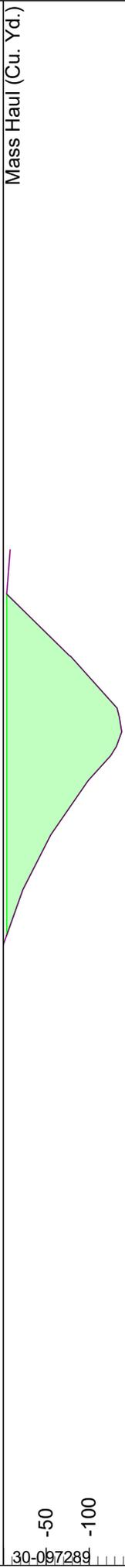
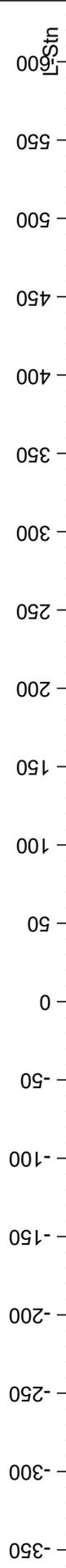
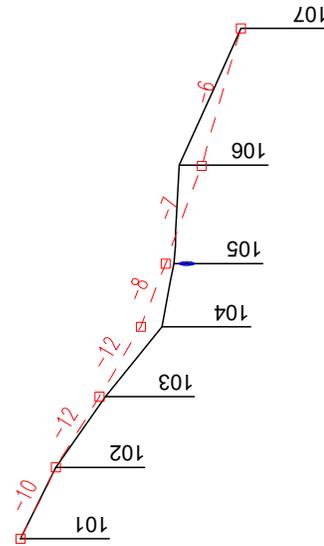


WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES

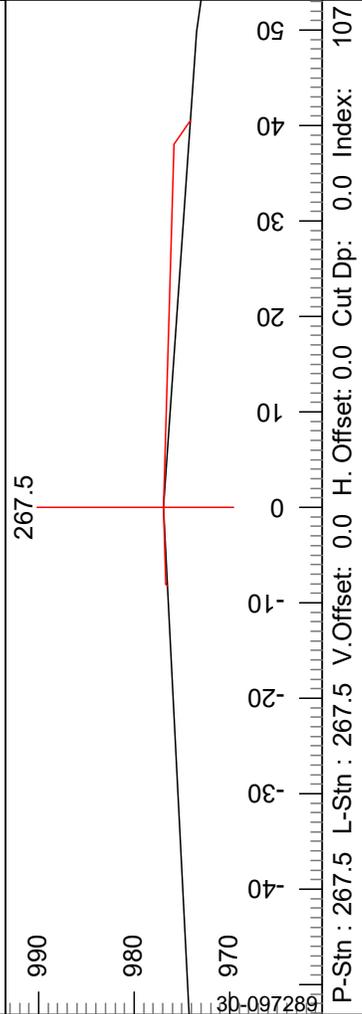
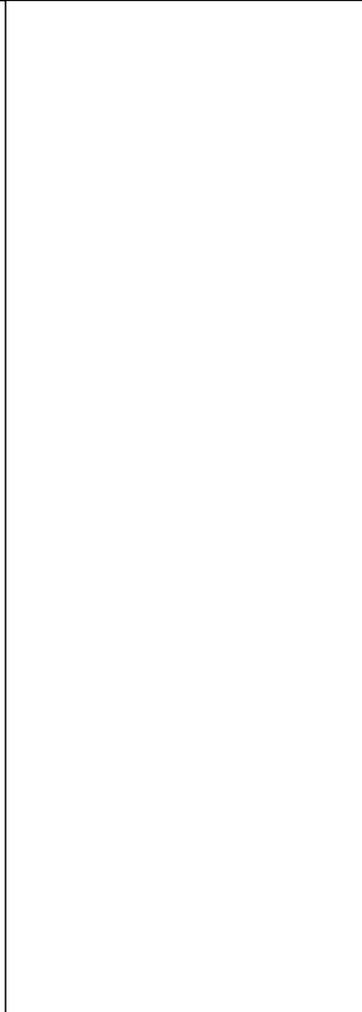
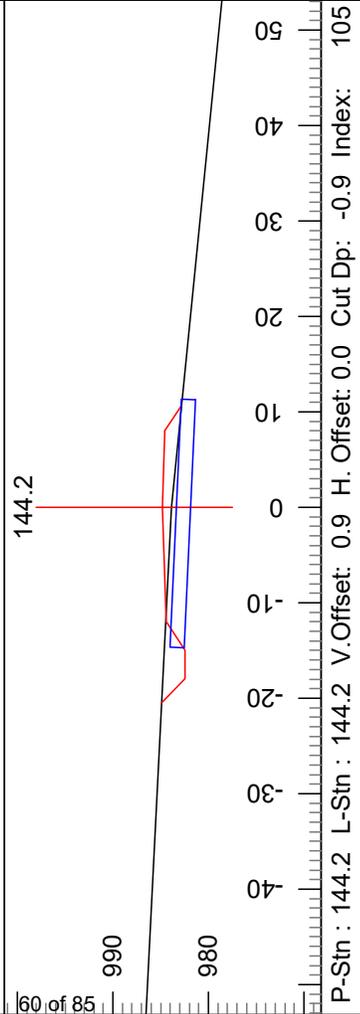
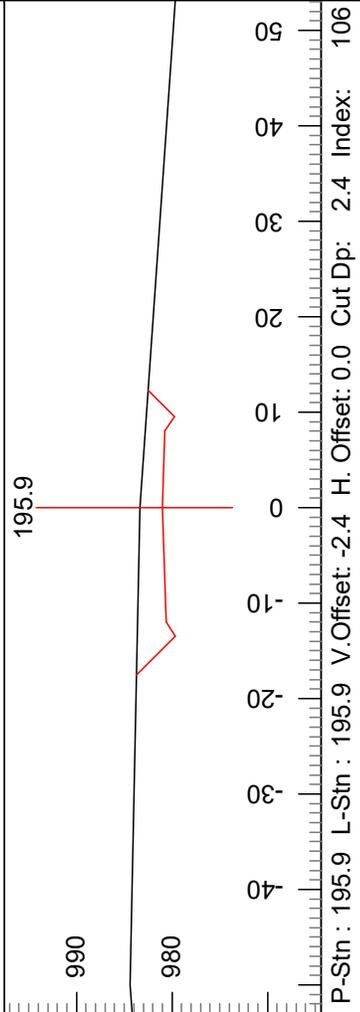
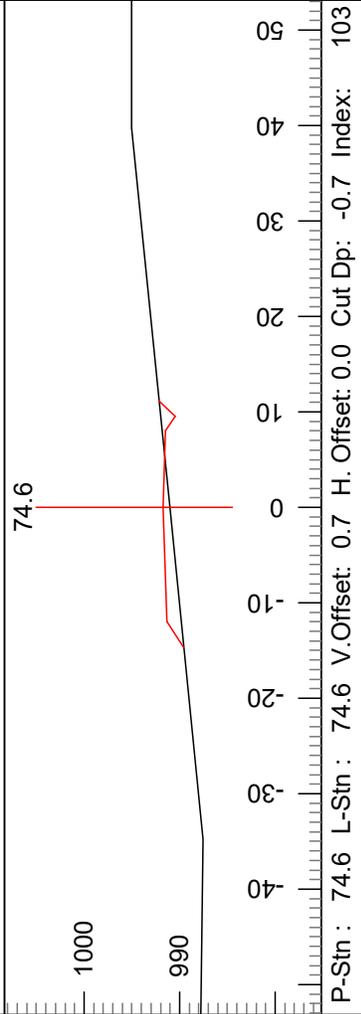
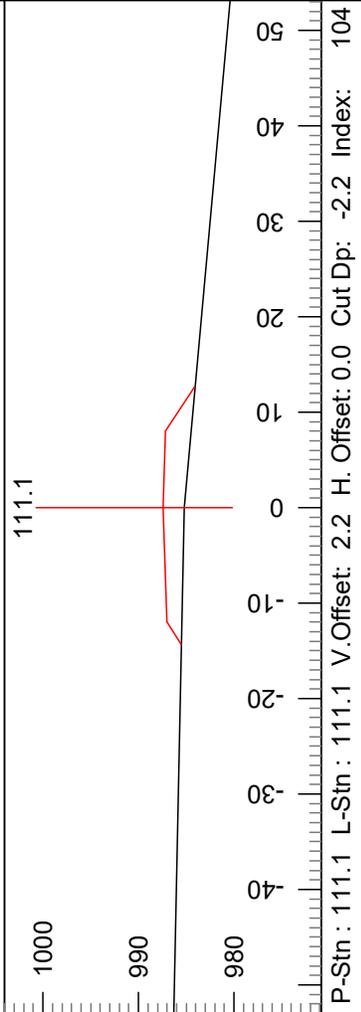
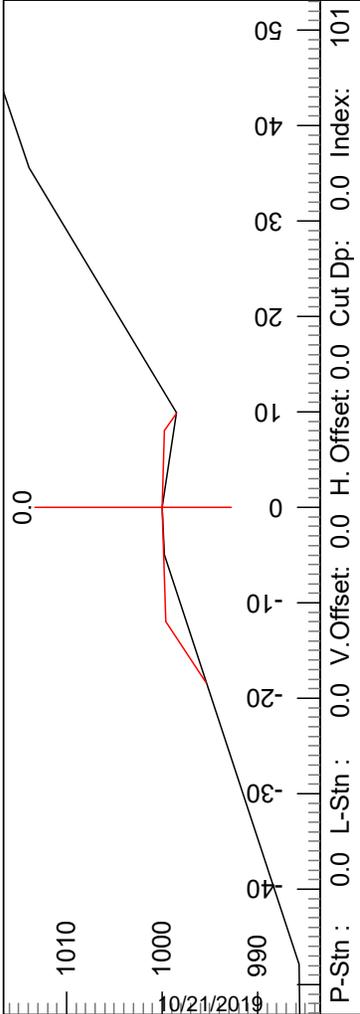
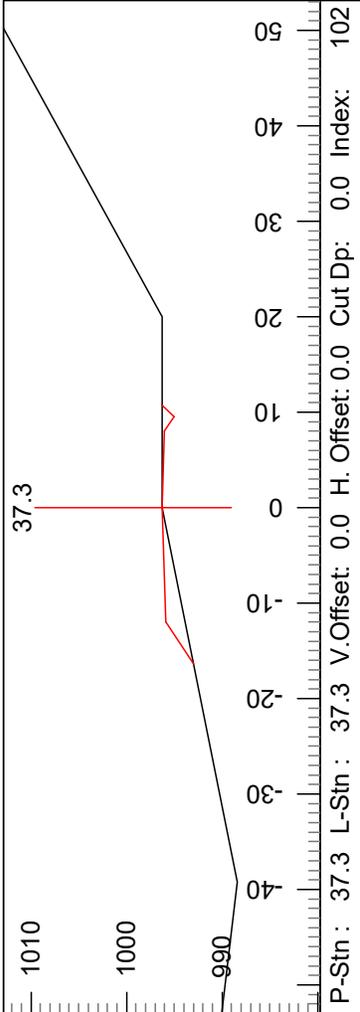


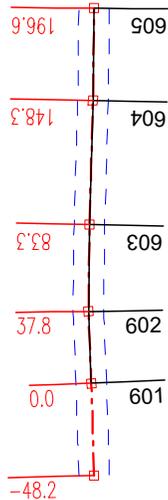
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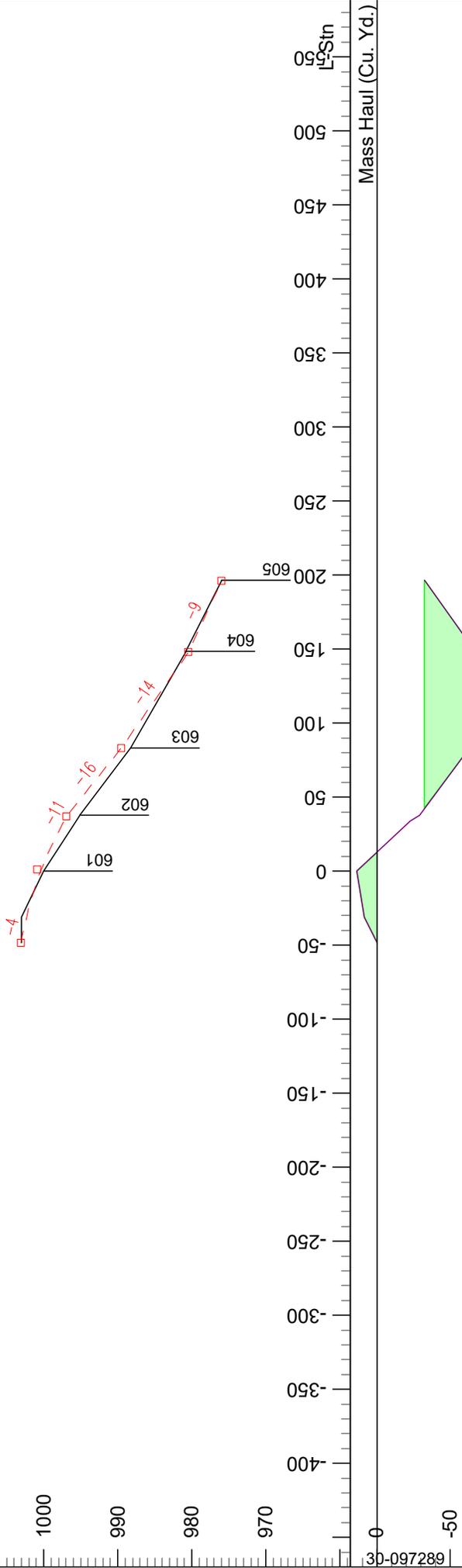
Thunderstruck Timber Sale D-4000A1 Contract#: 30-097289	Washington State Department of Natural Resources South Puget Sound Region		Plan Scale 1:1200 Profile Vert Scale 1:240 Profile Horz Scale 1:1200	Engineer: C. Vandehey 18/11/08	Page 1 of 2
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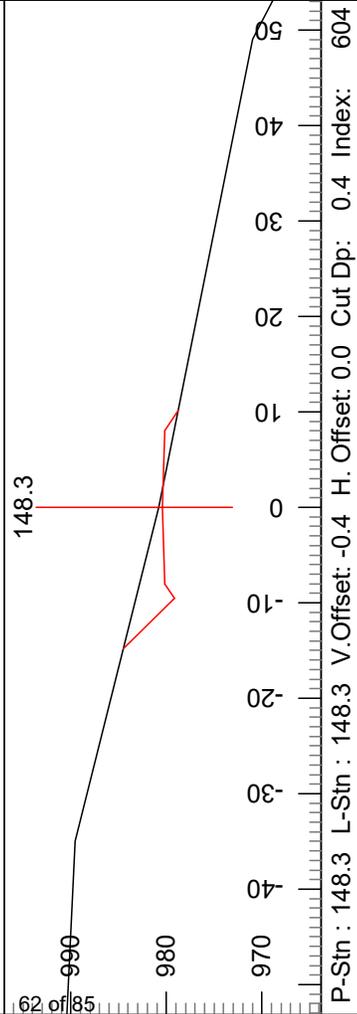
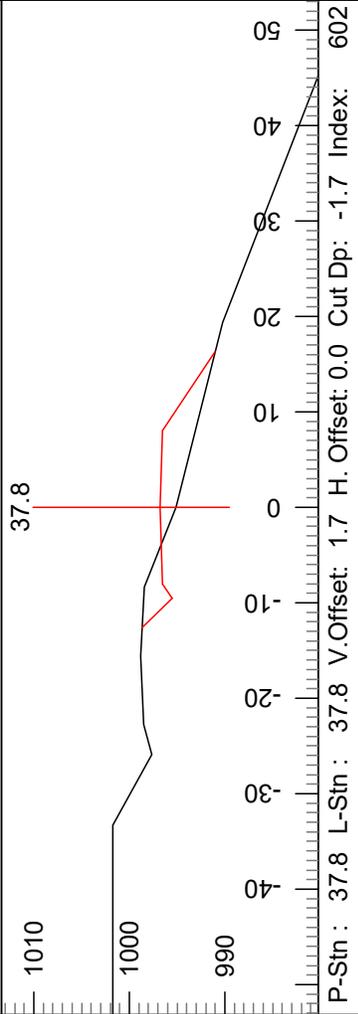
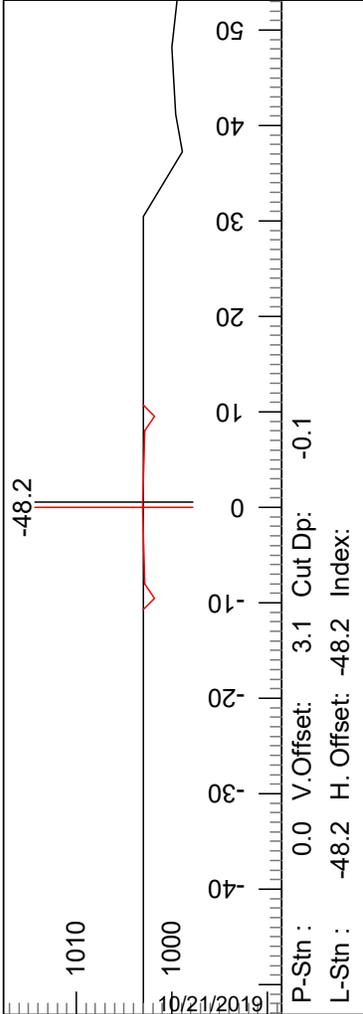
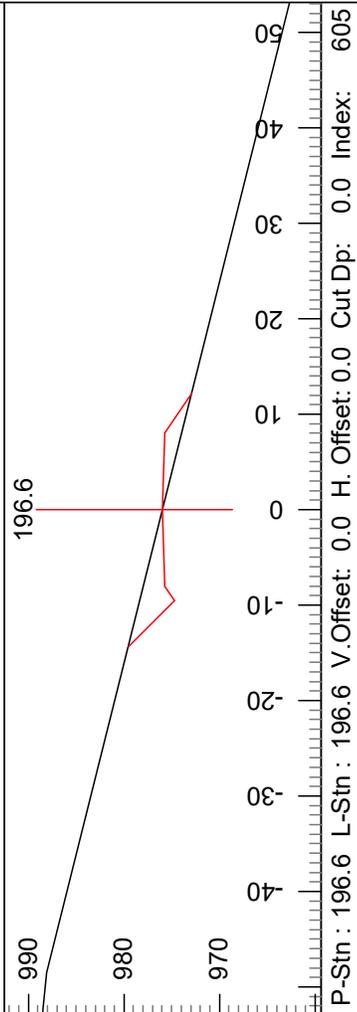
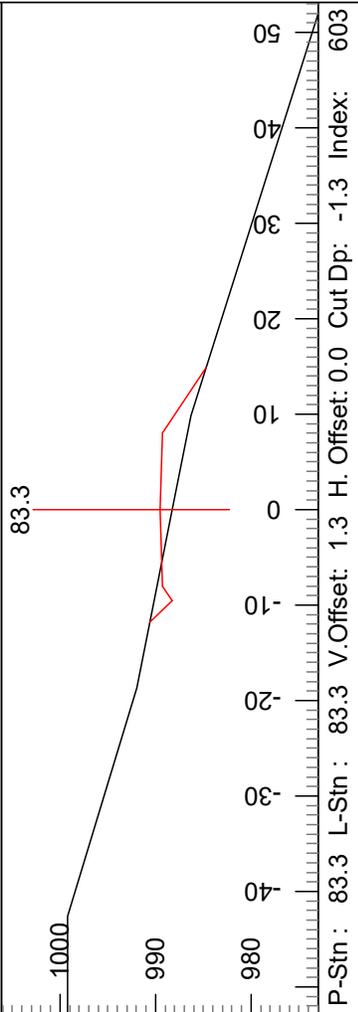
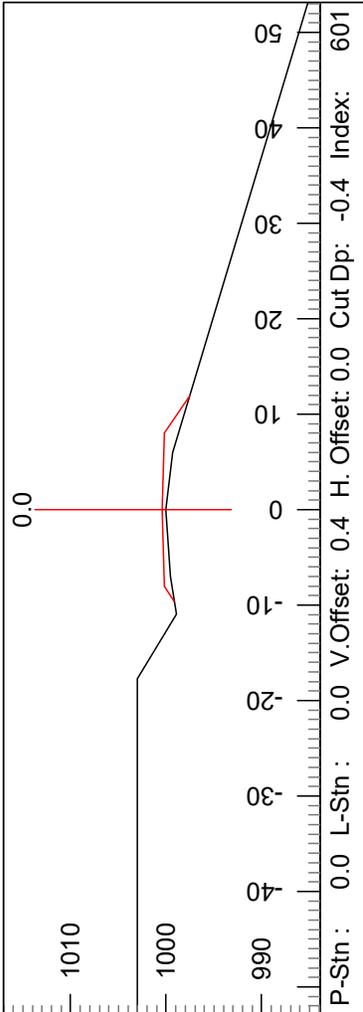


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<p>Washington State Department of Natural Resources South Puget Sound Region</p>	<p>Plan Scale 1:1200</p>	<p>Engineer: C. Vandehey</p>
	<p>Profile Vert Scale 1:240</p>	<p>18/11/08</p>
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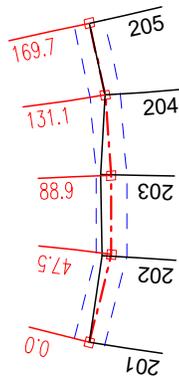


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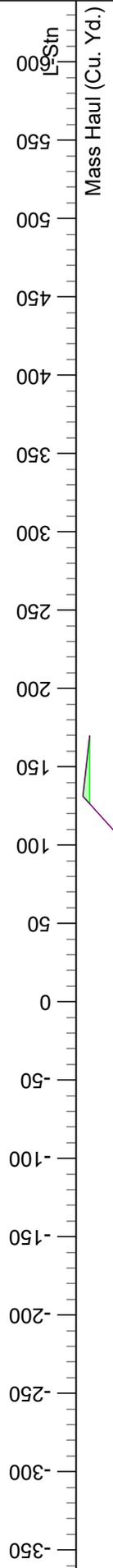
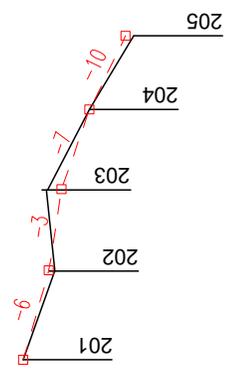
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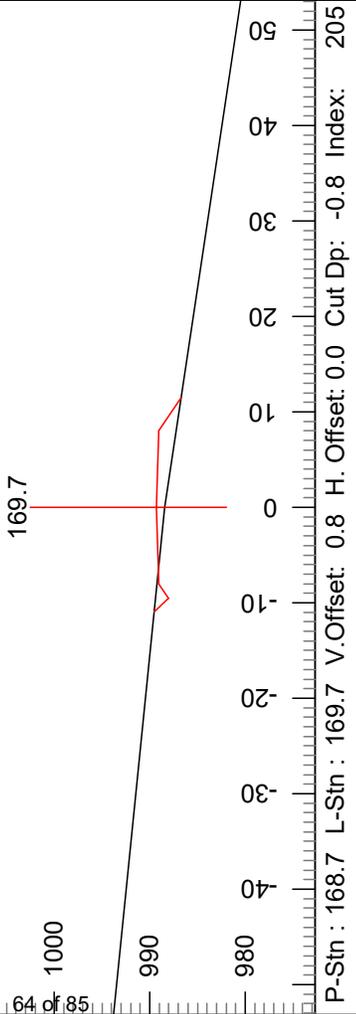
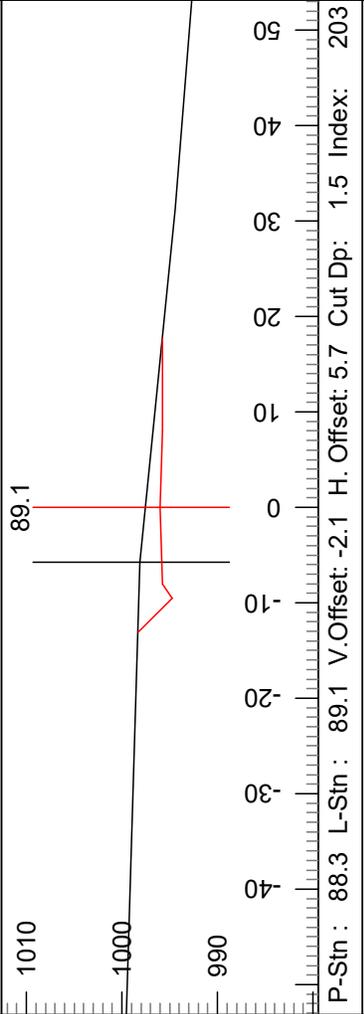
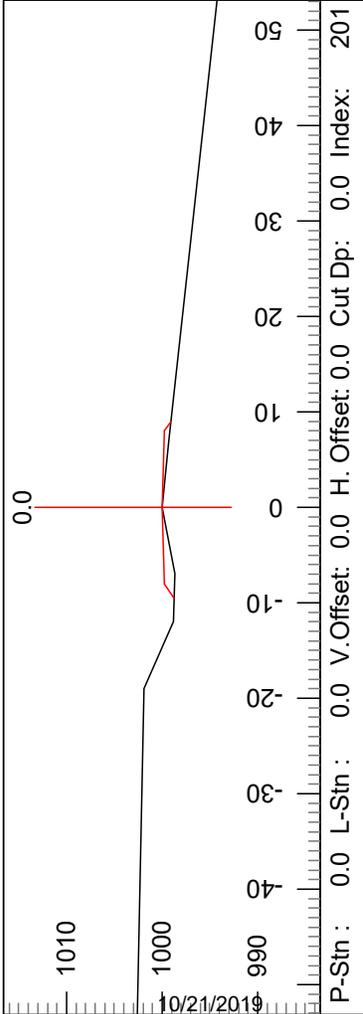
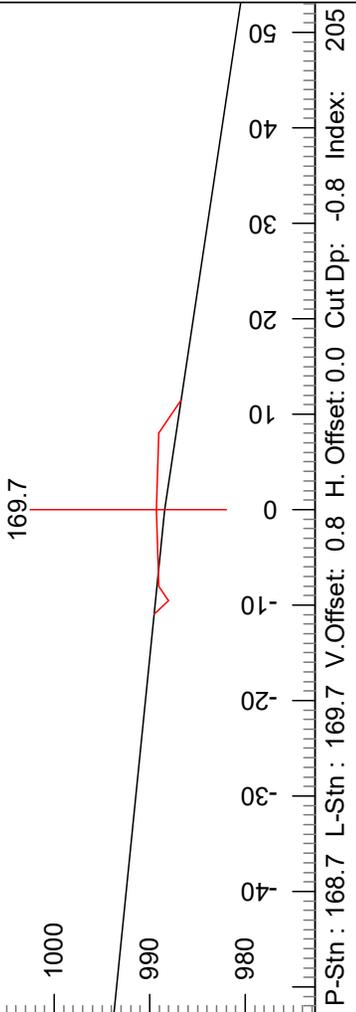
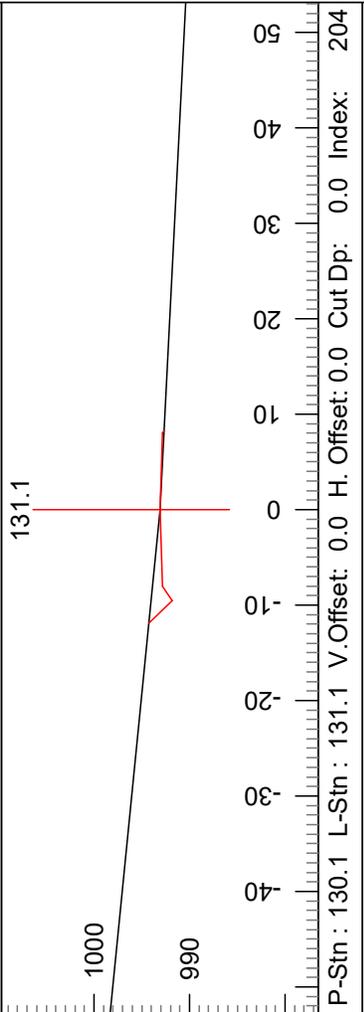
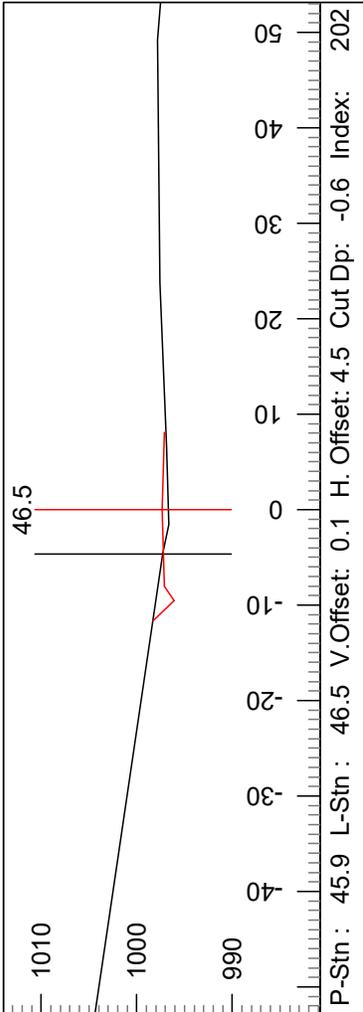
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<p>Thunderstruck Timber Sale D-4086 Contract#: 30-097289</p>	<p>Washington State Department of Natural Resources South Puget Sound Region</p>		<p>Section Scale 1:240</p>	<p>Engineer: C. Vandehey</p>	<p>18/11/08</p>	<p>Page 2 of 2</p>
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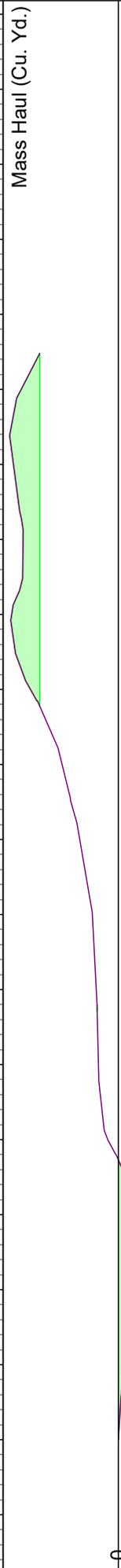
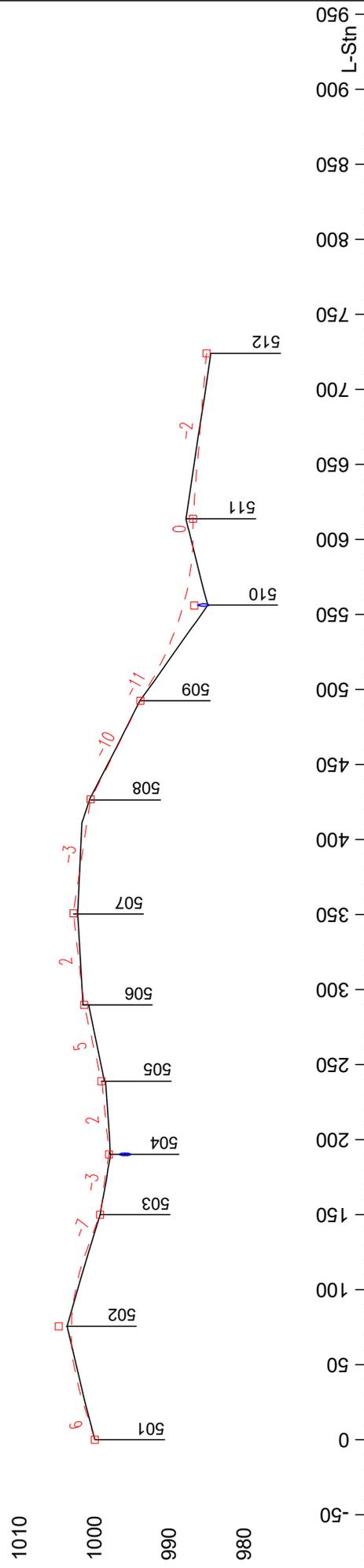
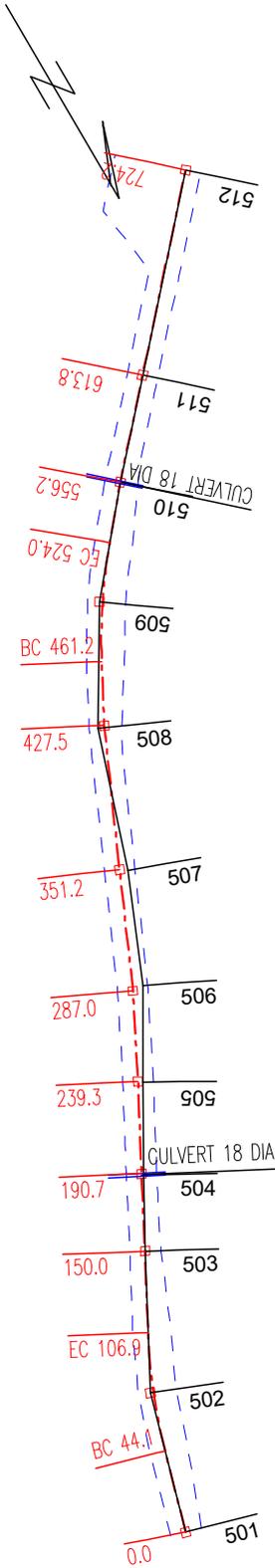


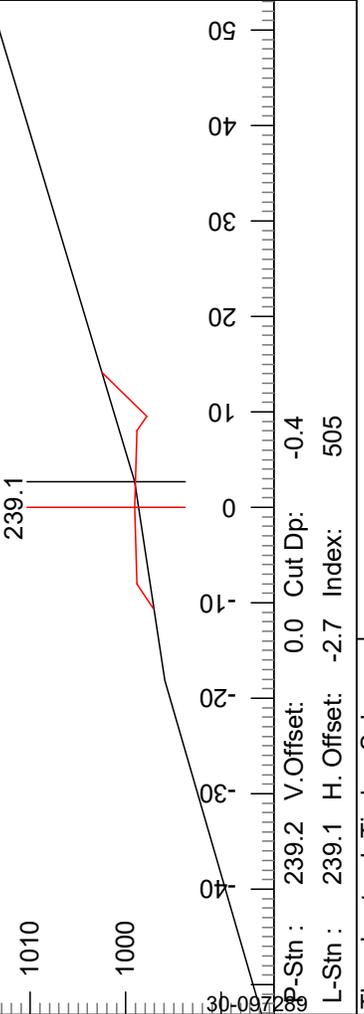
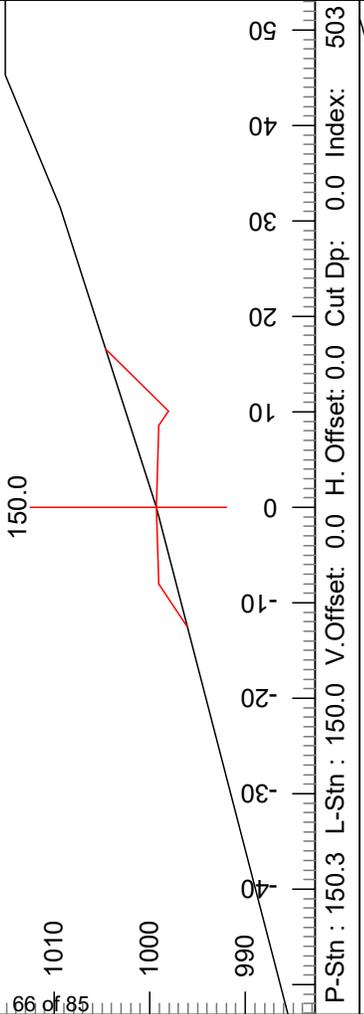
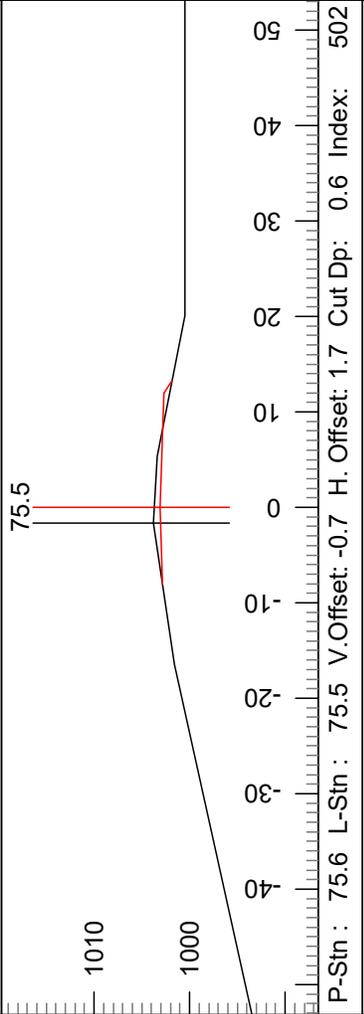
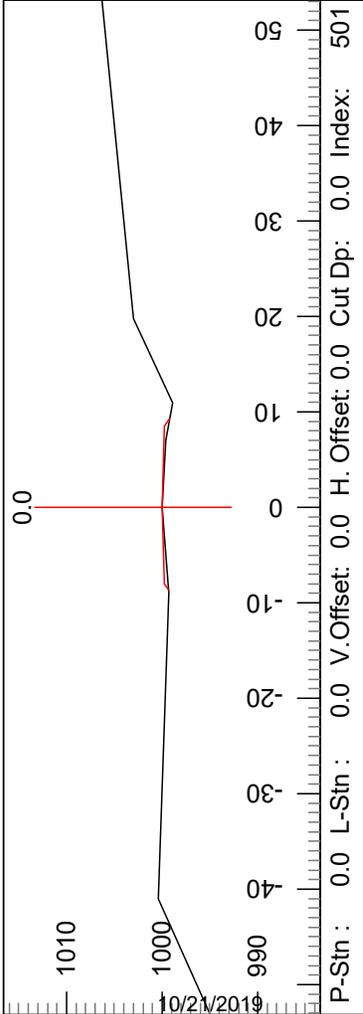
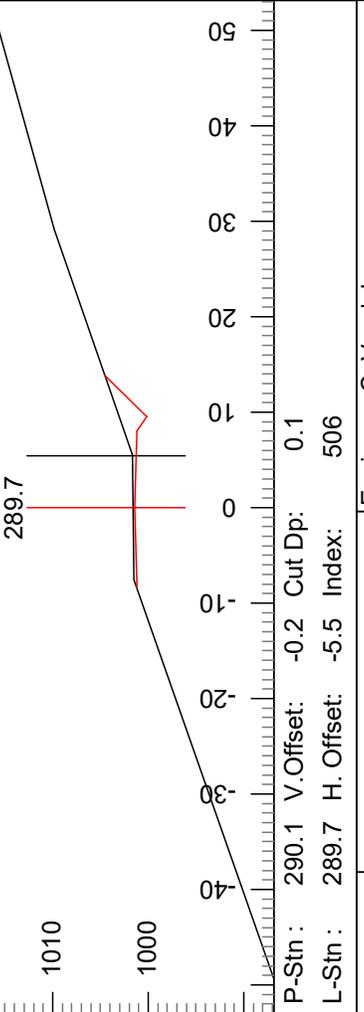
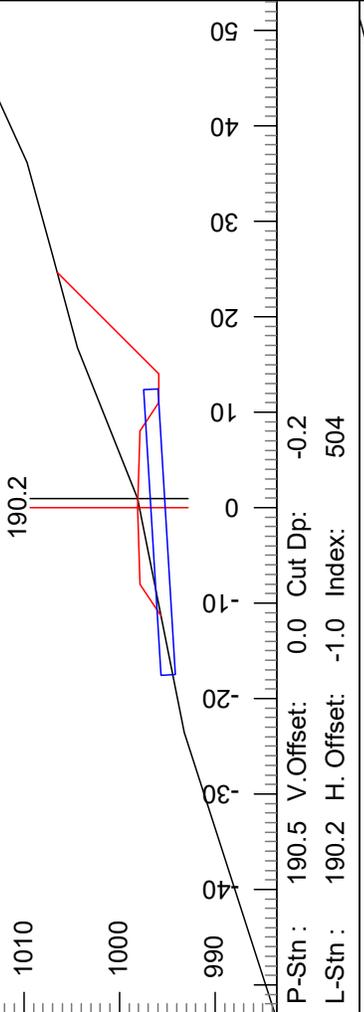
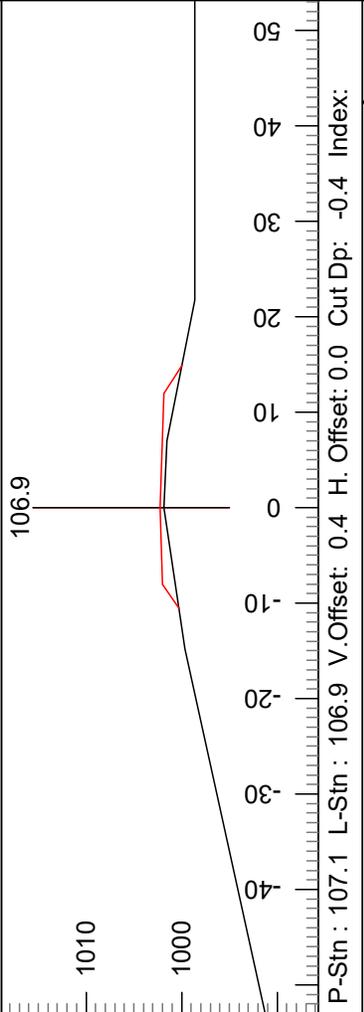
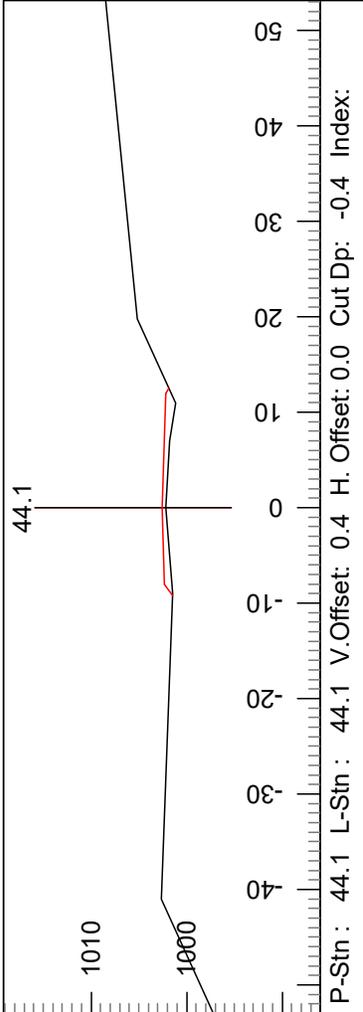


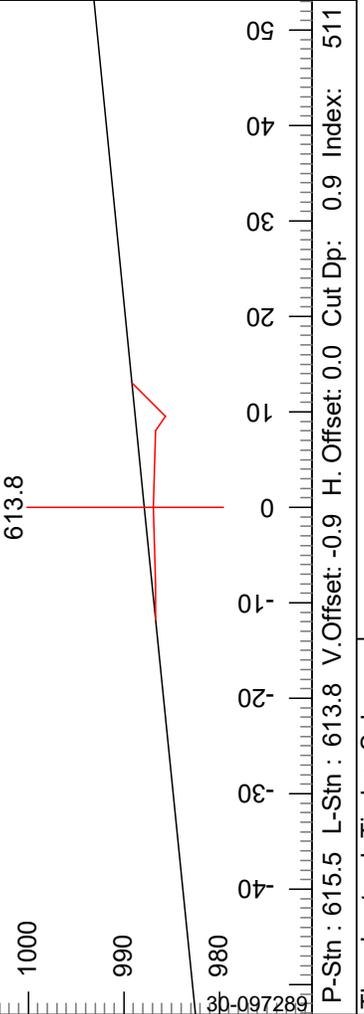
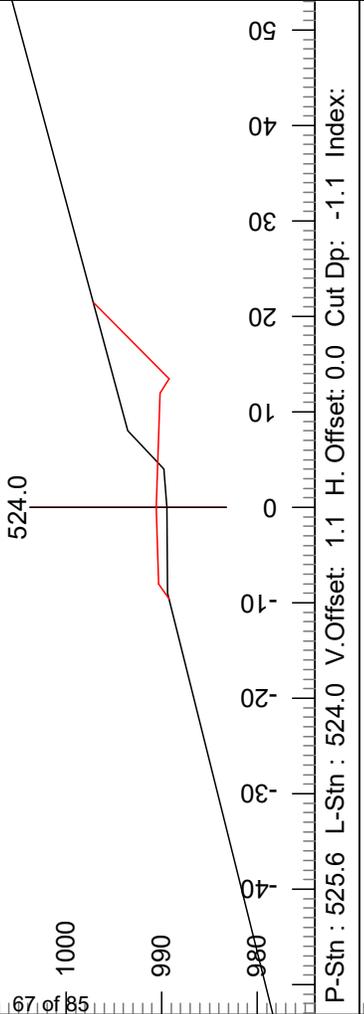
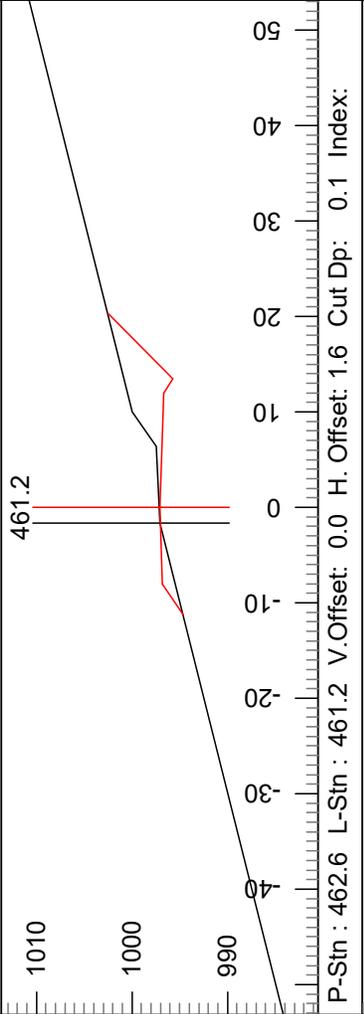
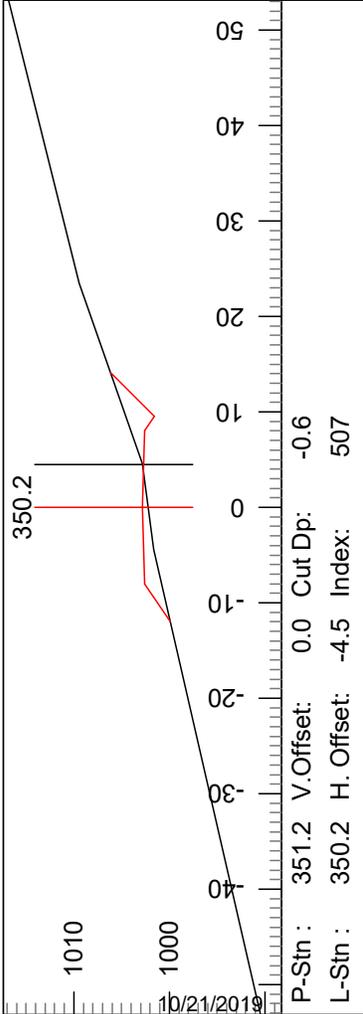
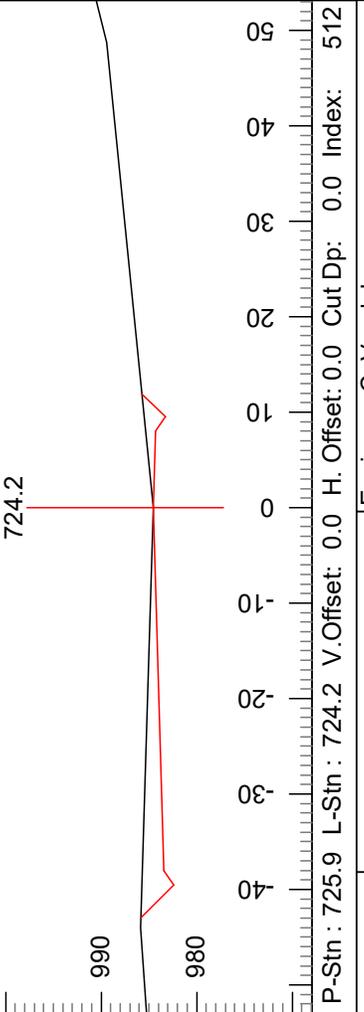
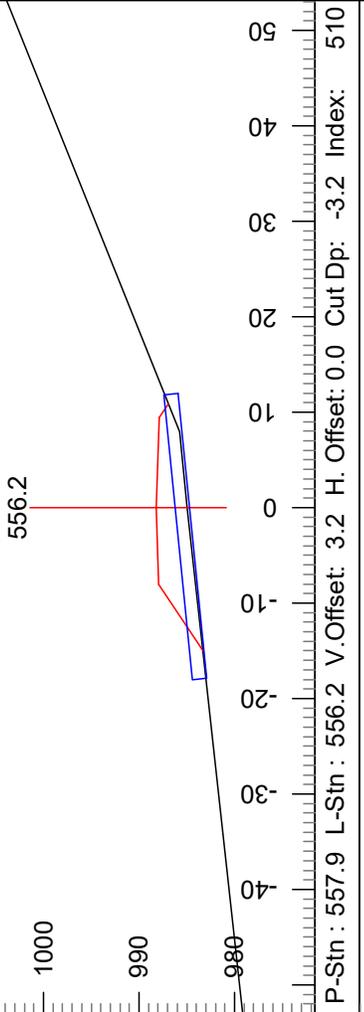
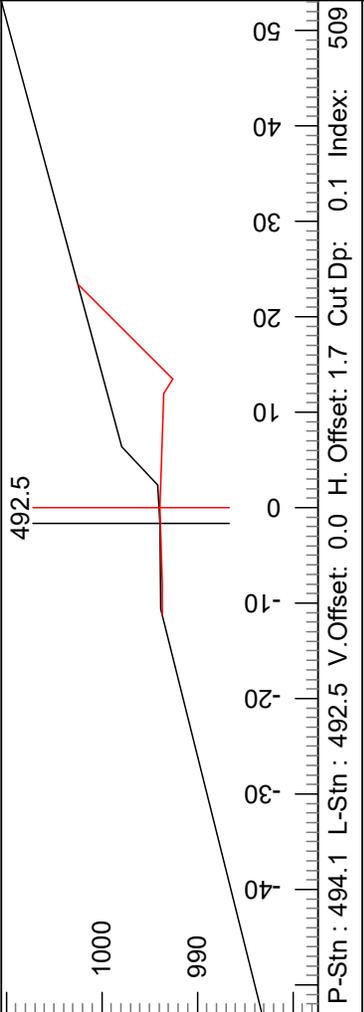
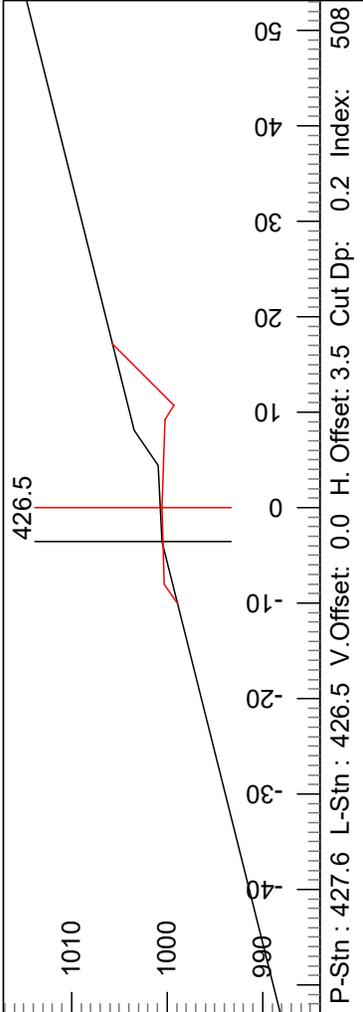
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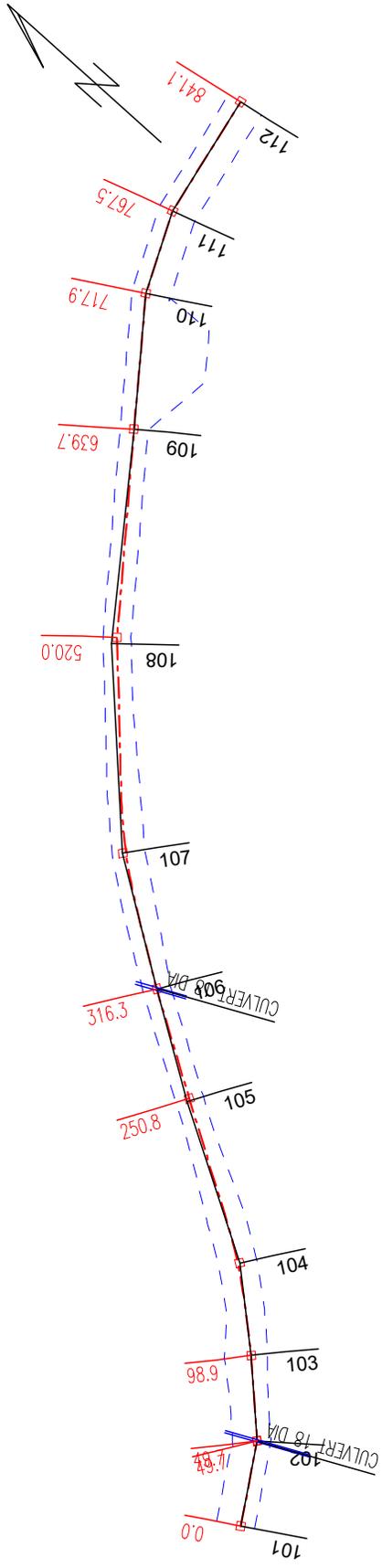
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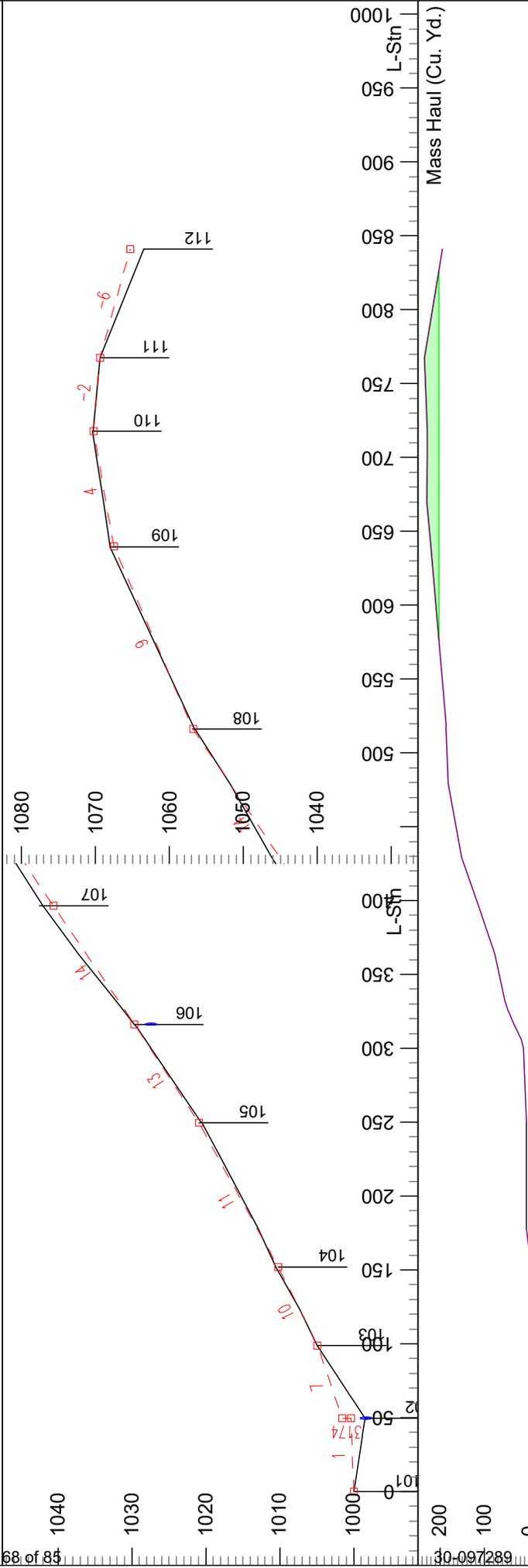






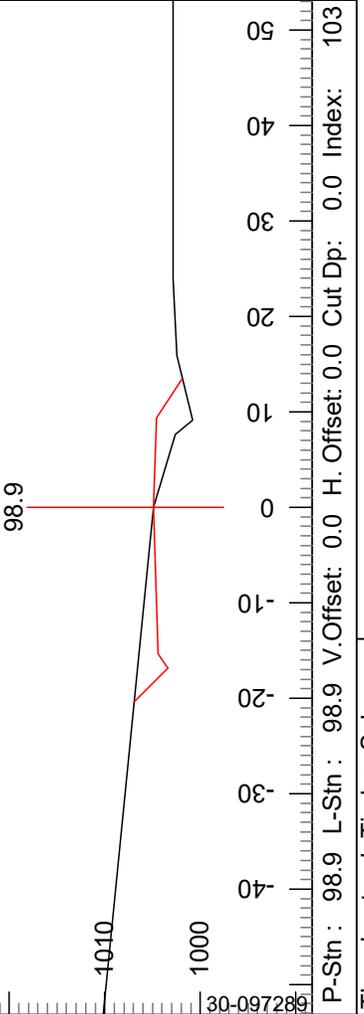
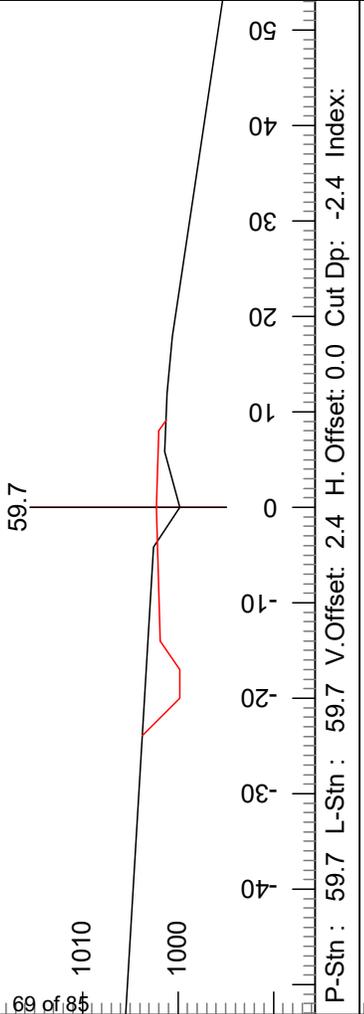
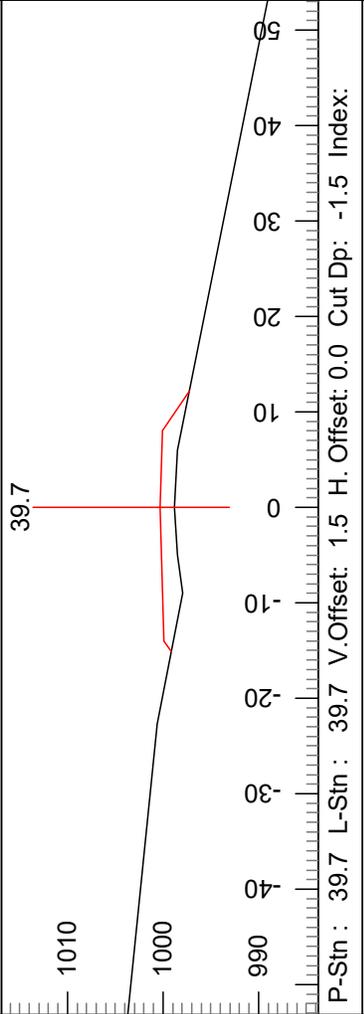
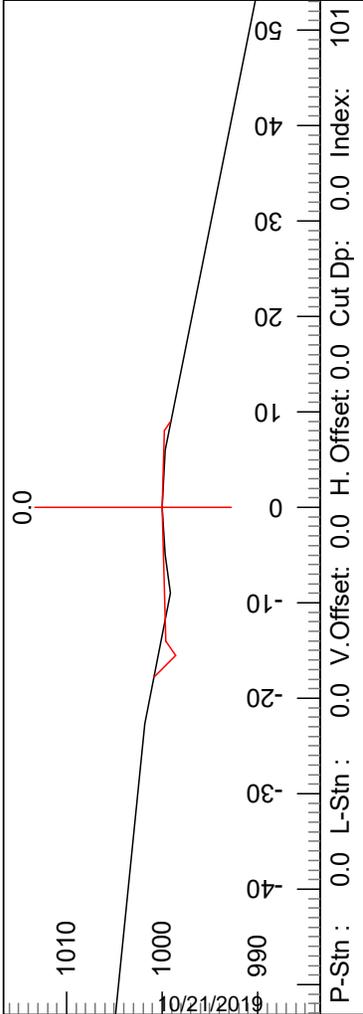
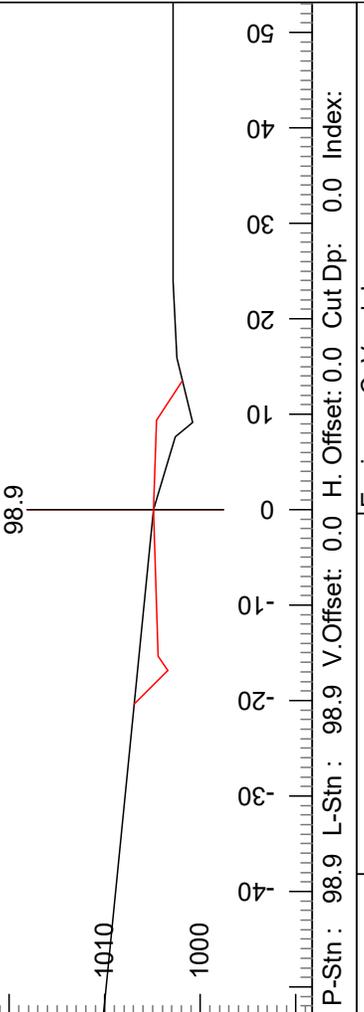
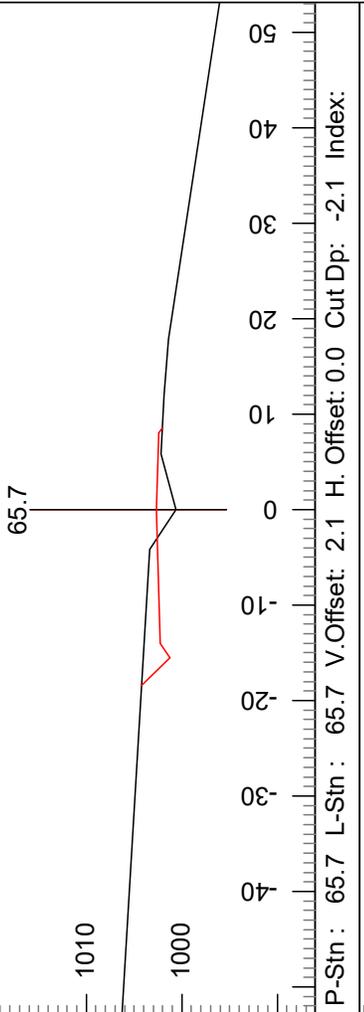
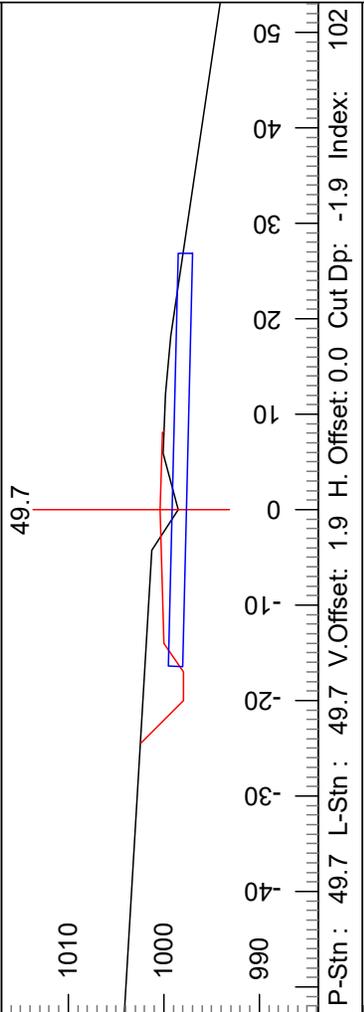
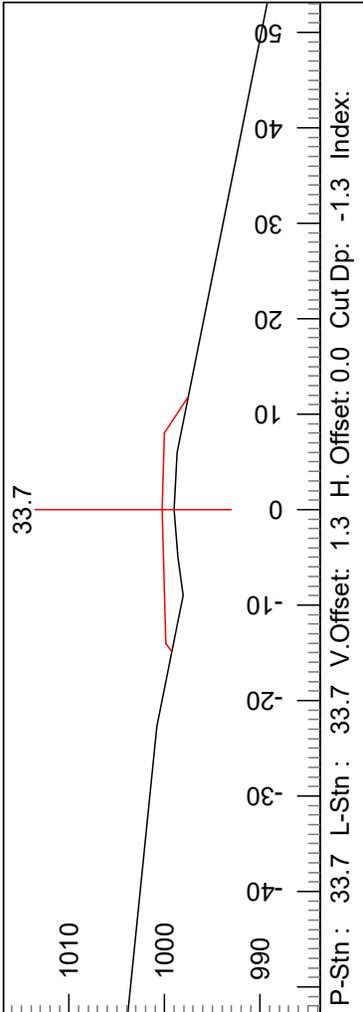


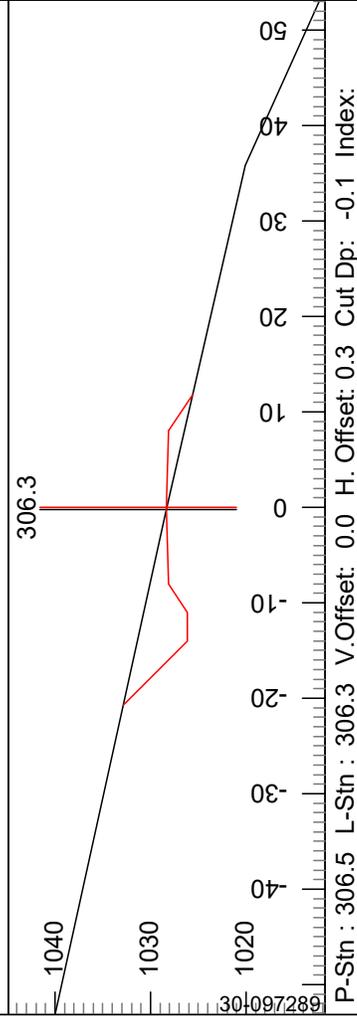
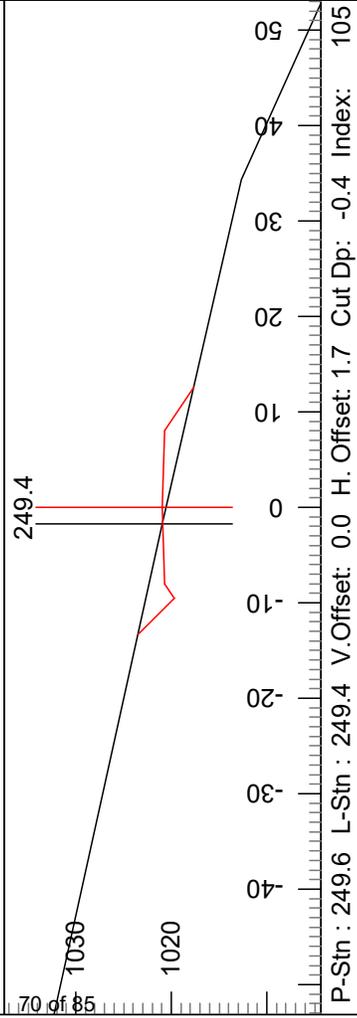
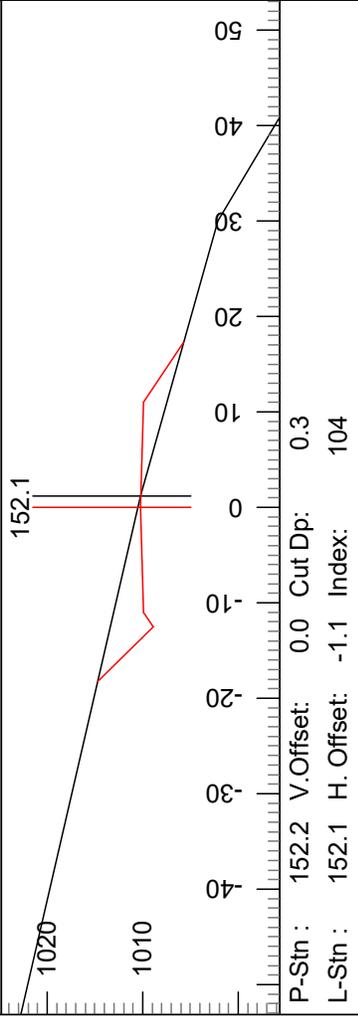
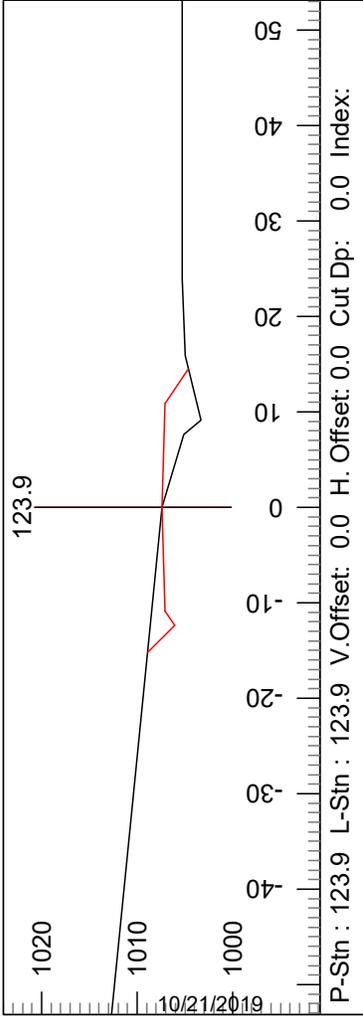
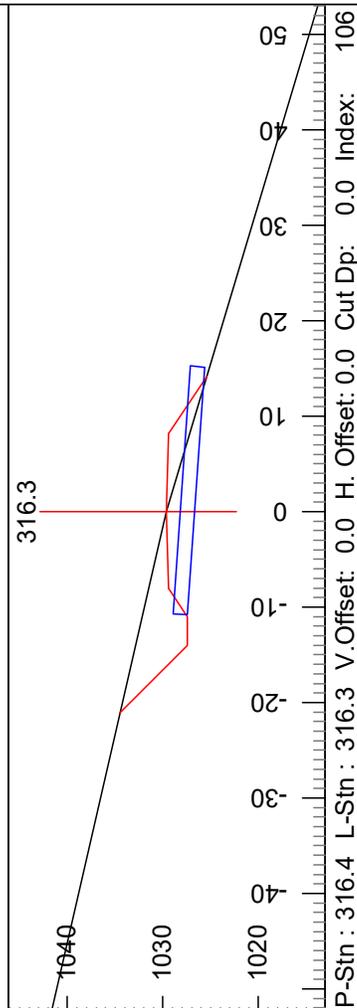
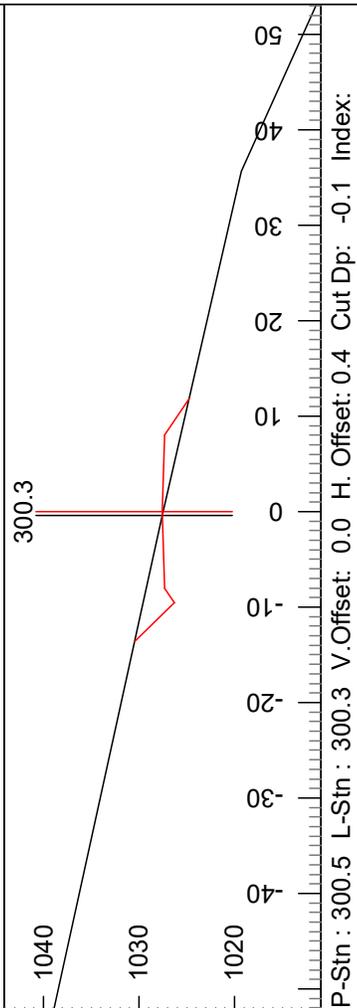
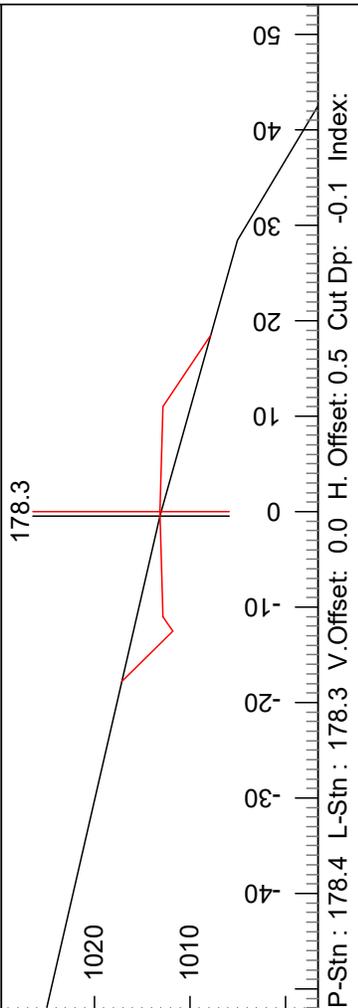
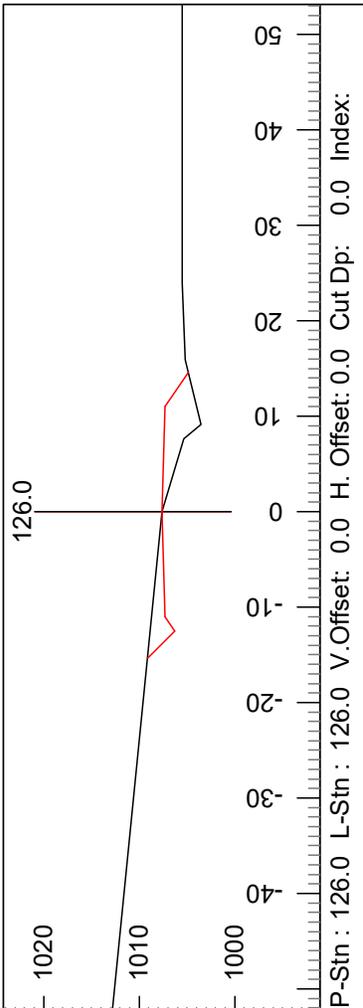
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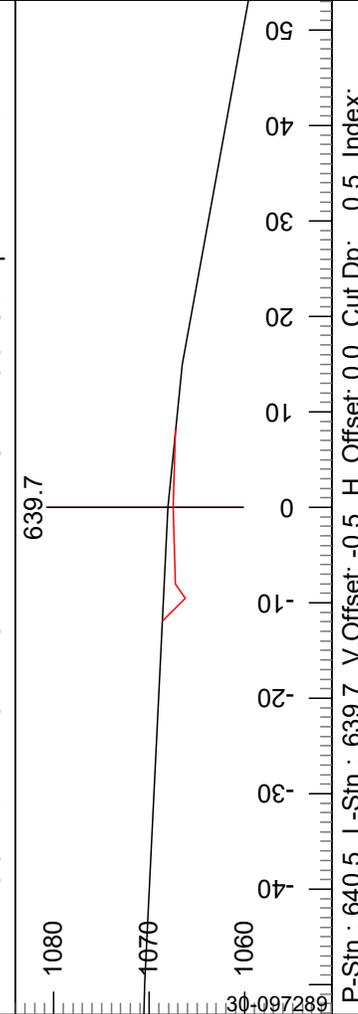
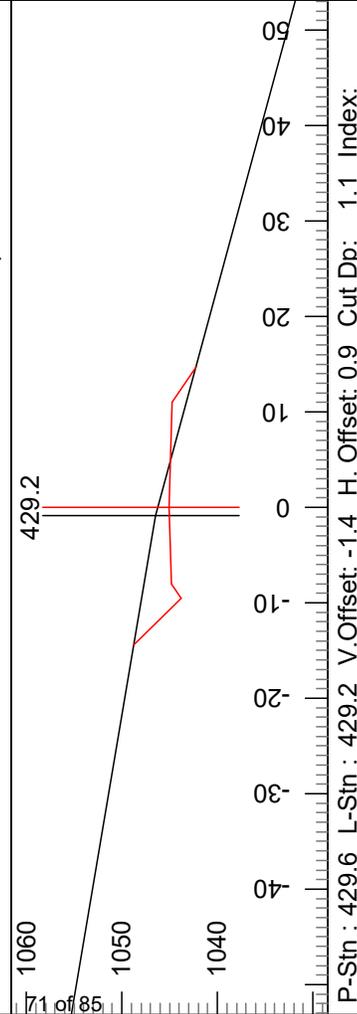
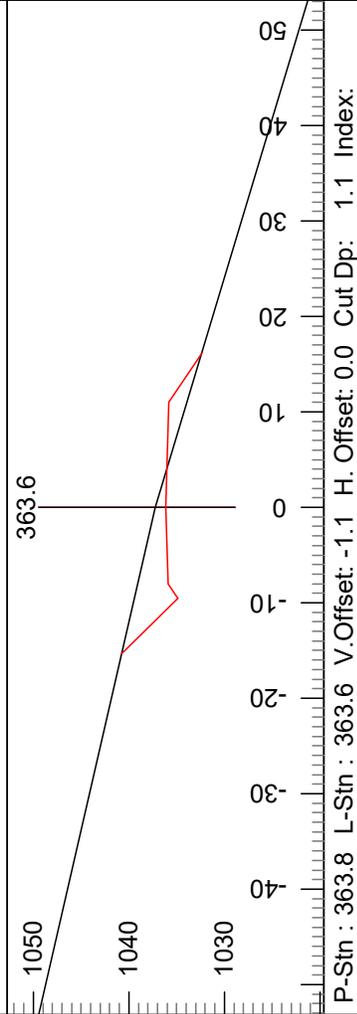
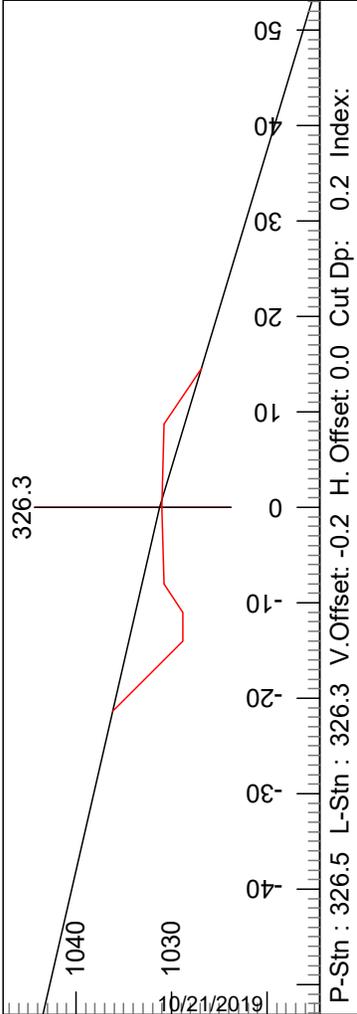
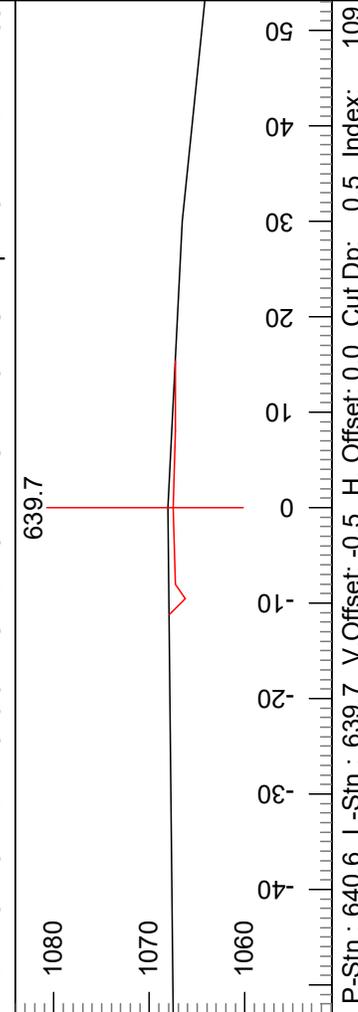
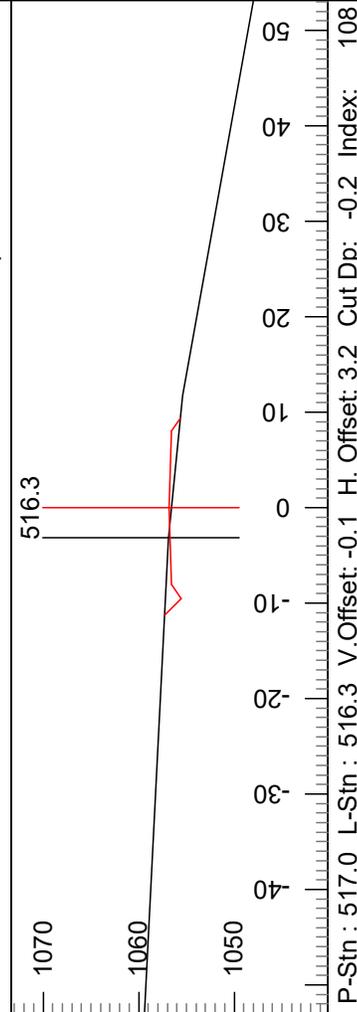
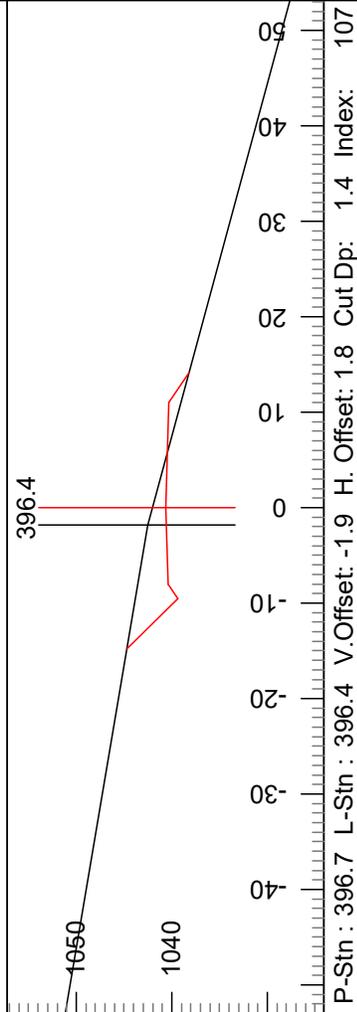
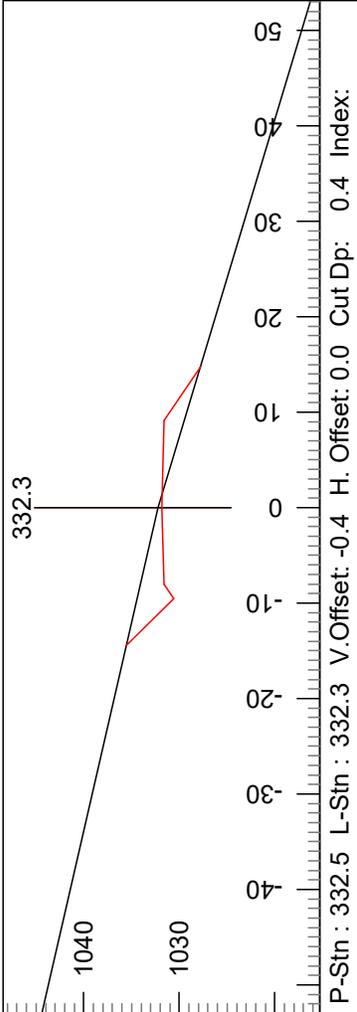
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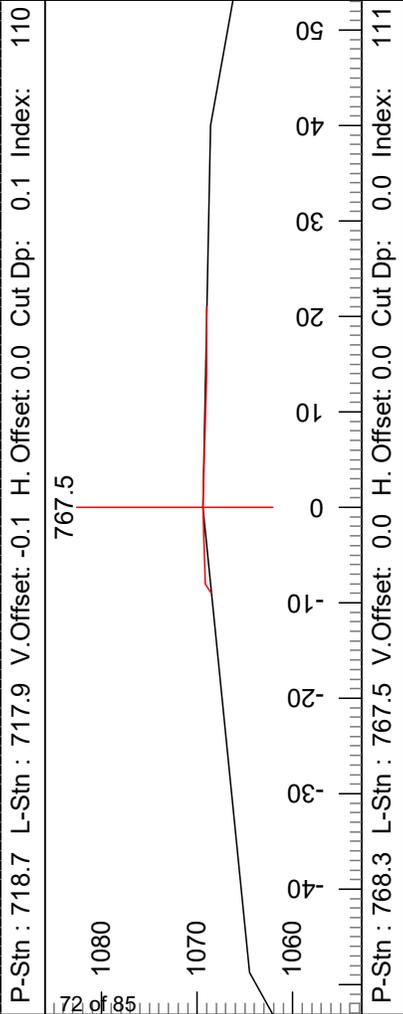
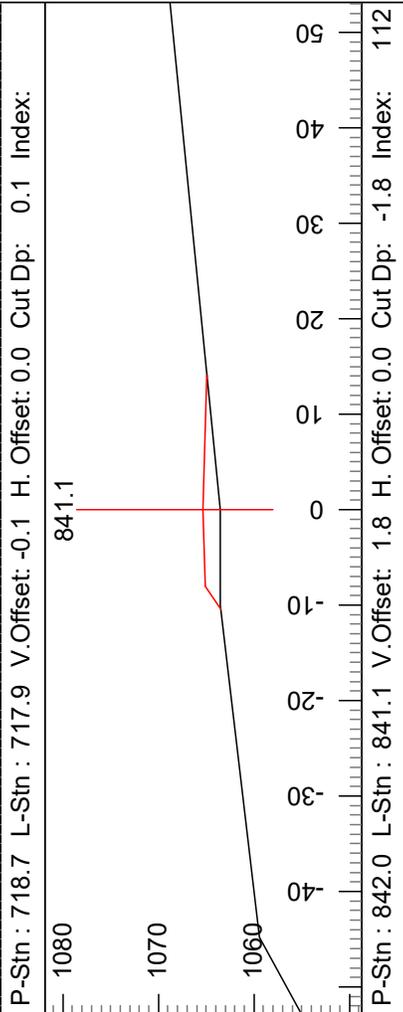
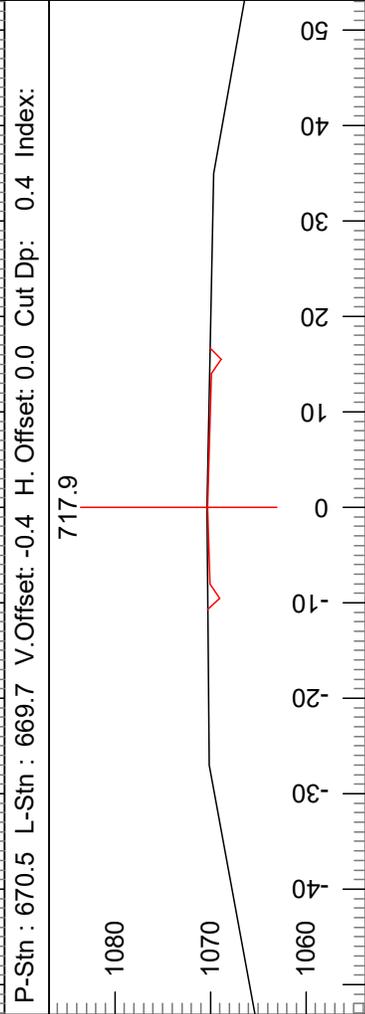
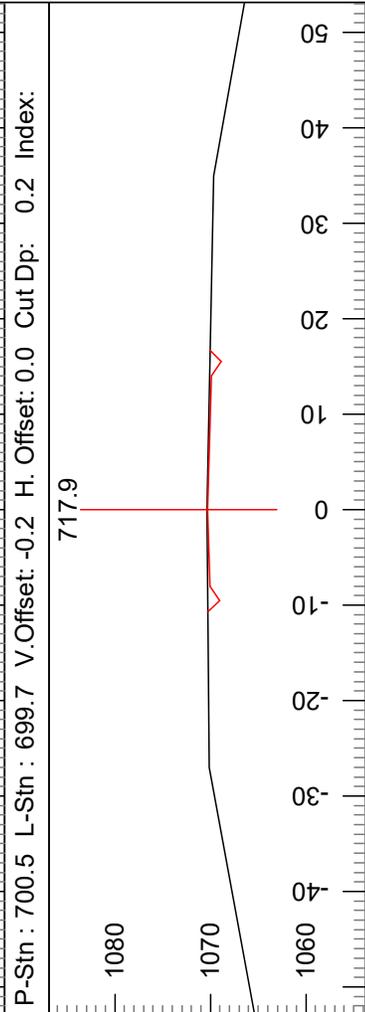
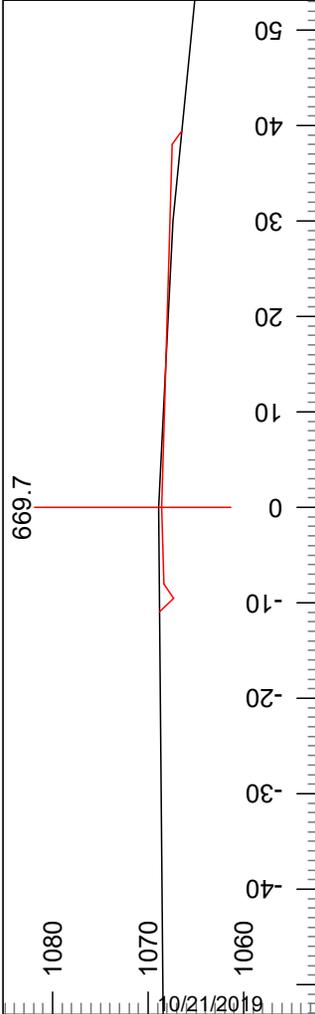
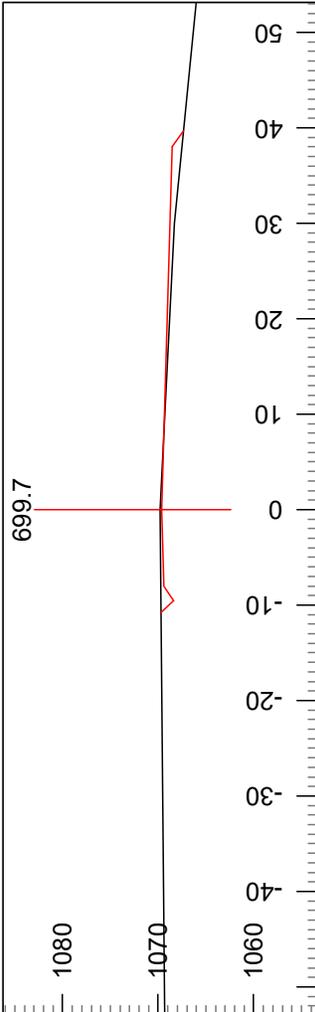
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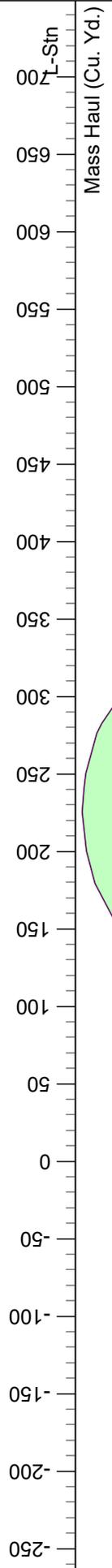
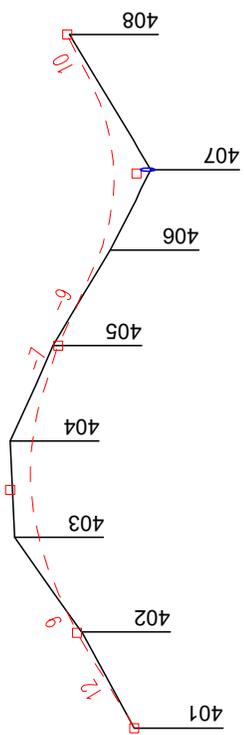
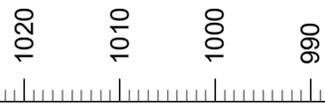
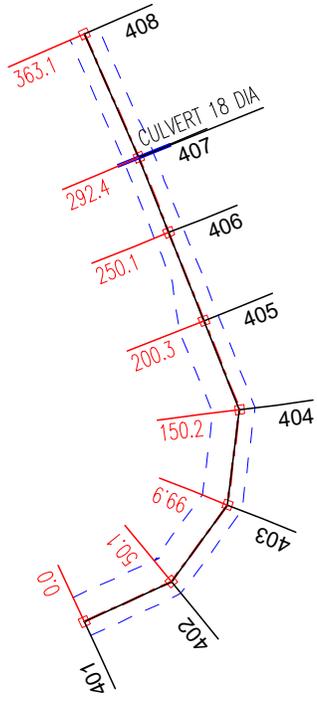


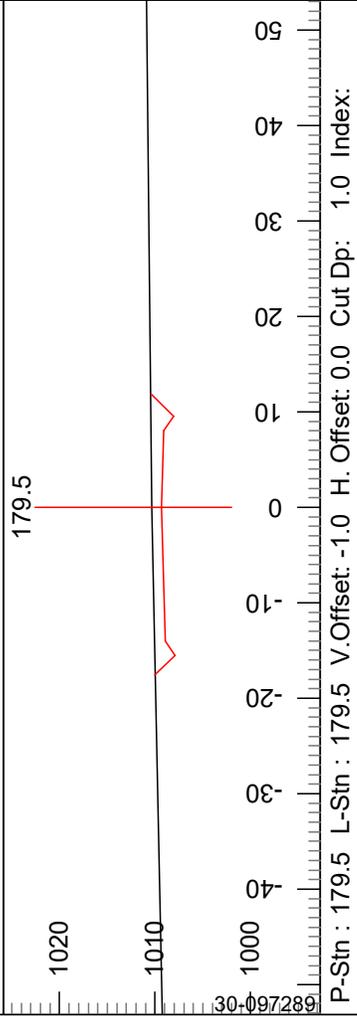
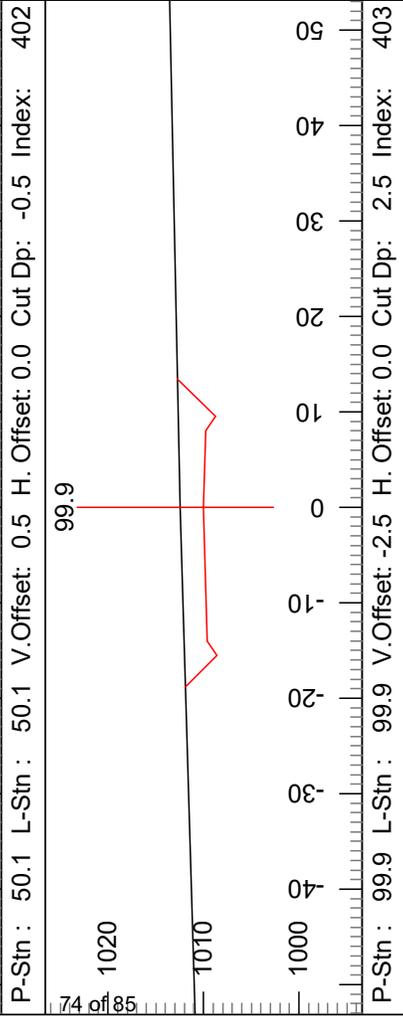
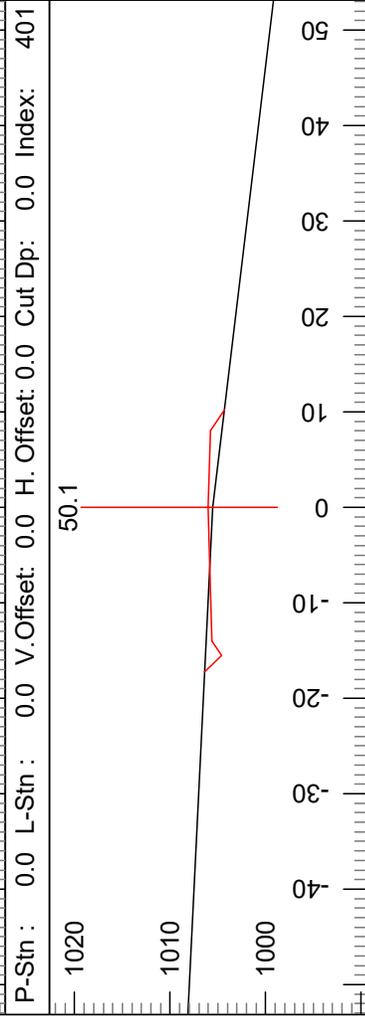
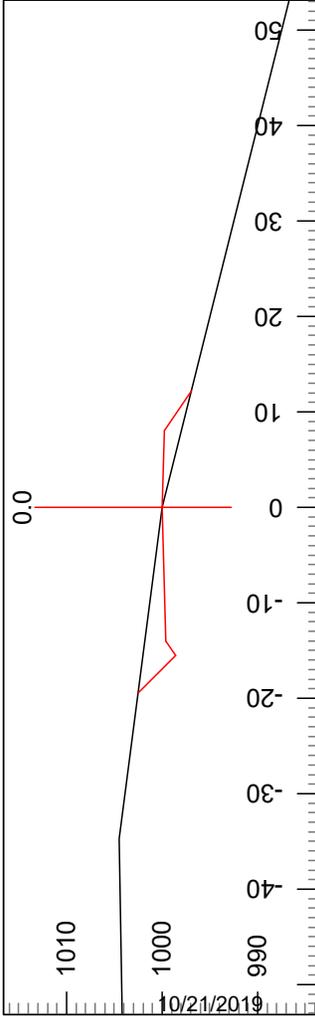
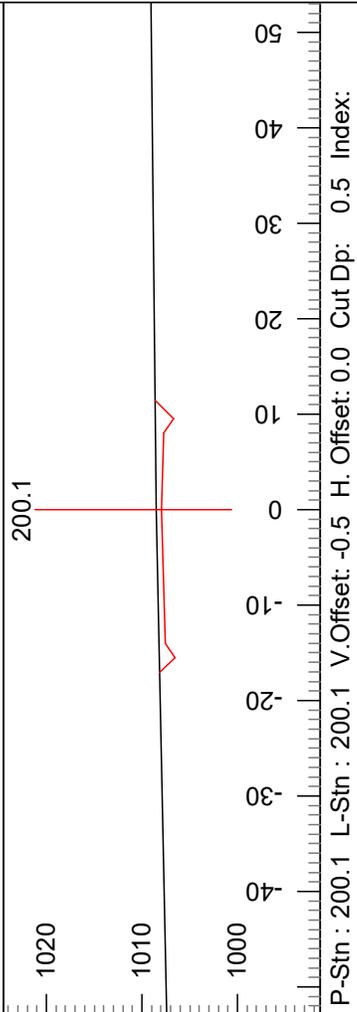
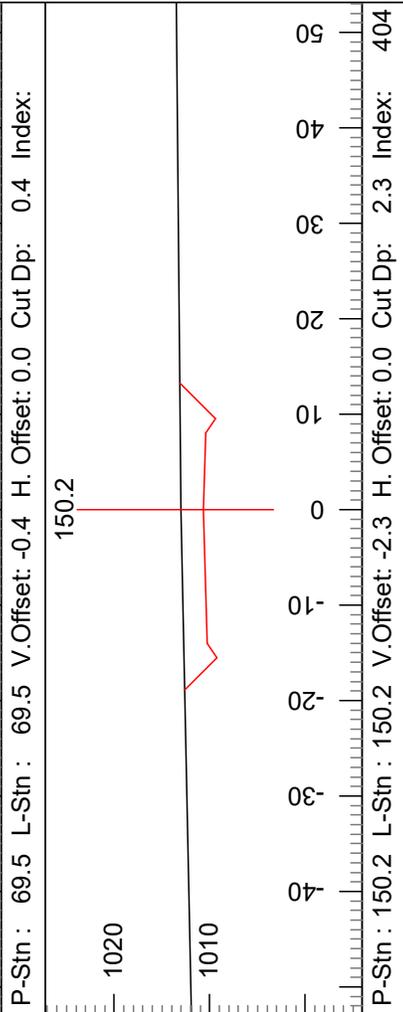
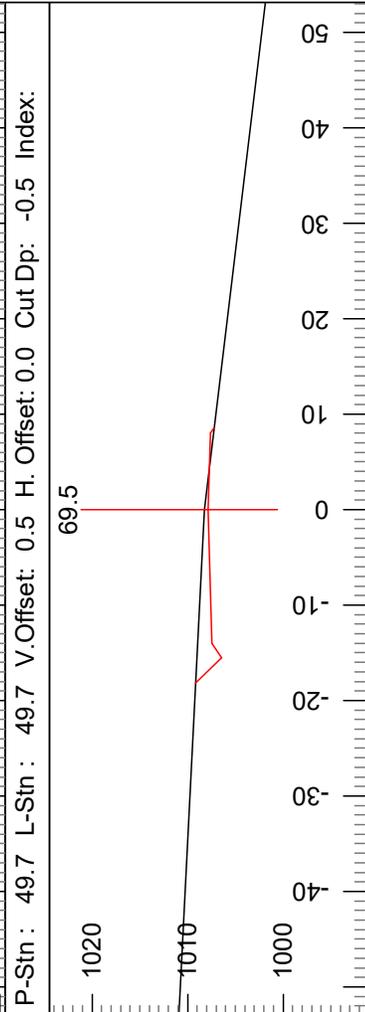
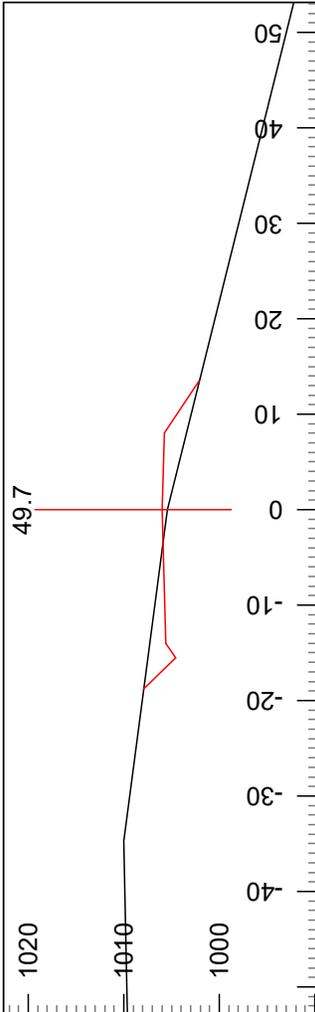


	Washington State Department of Natural Resources South Puget Sound Region	Engineer: C. Vandehey 18/11/08
Thunderstruck Timber Sale D-4630.1 Contract#: 30-097289	Section Scale 1:240	Page 3 of 5









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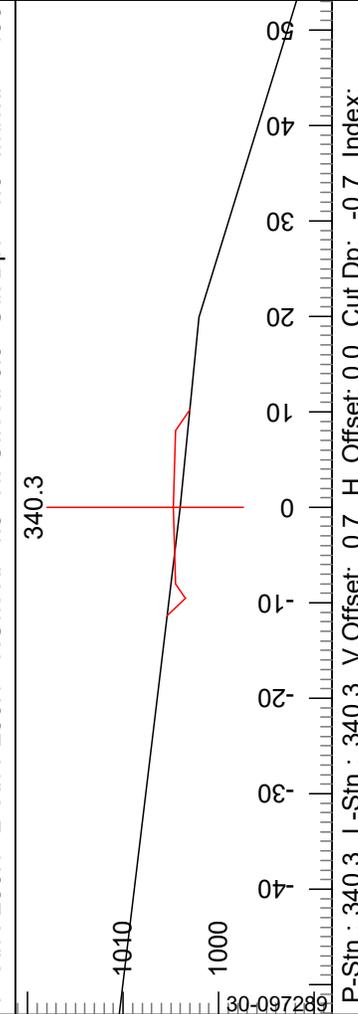
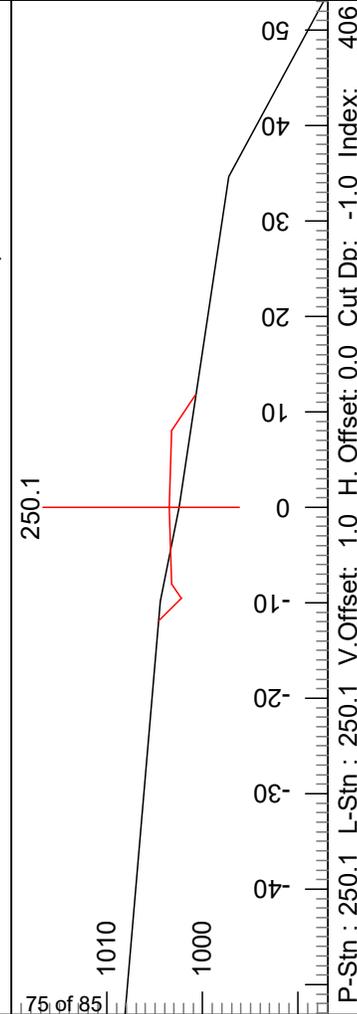
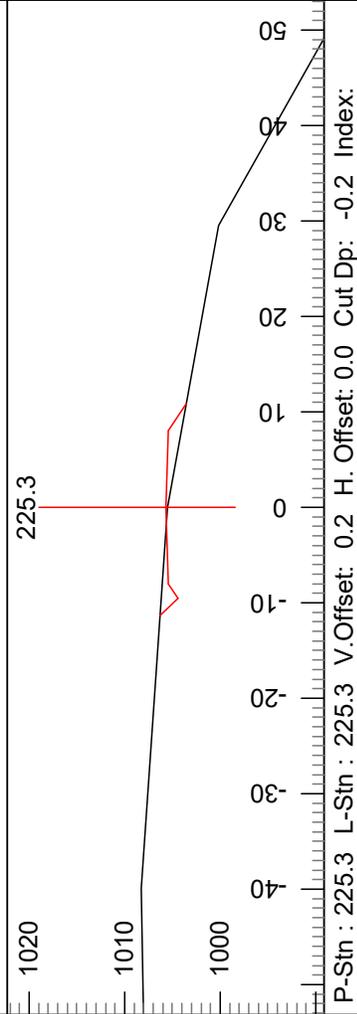
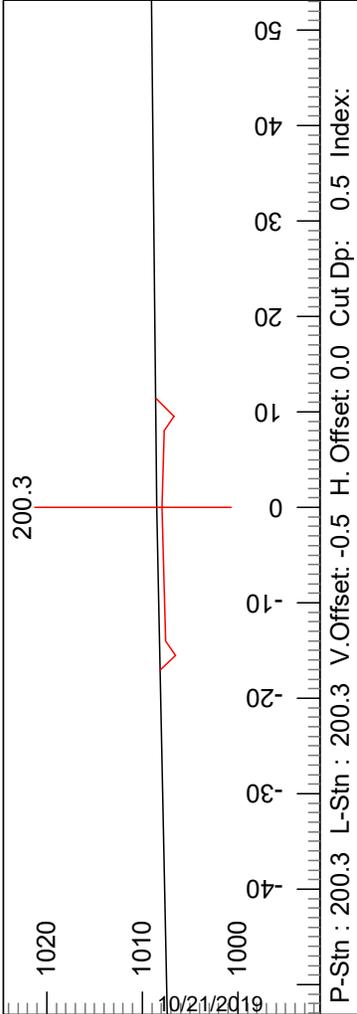
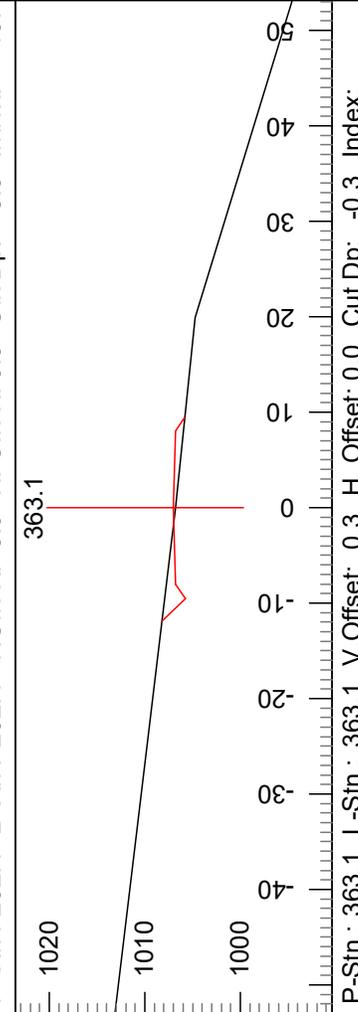
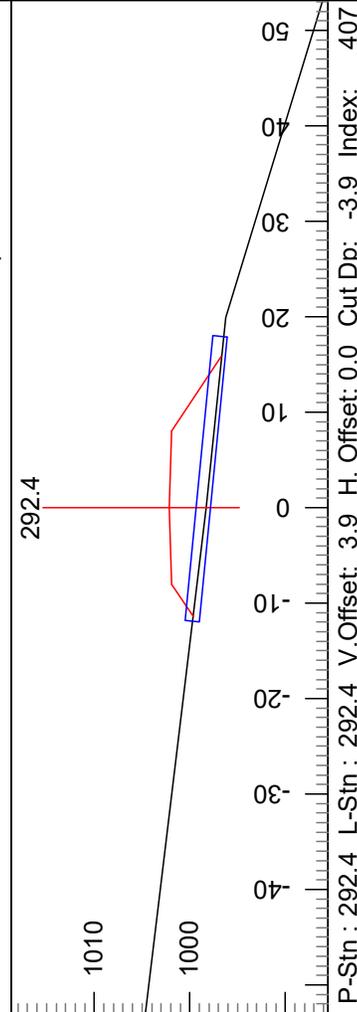
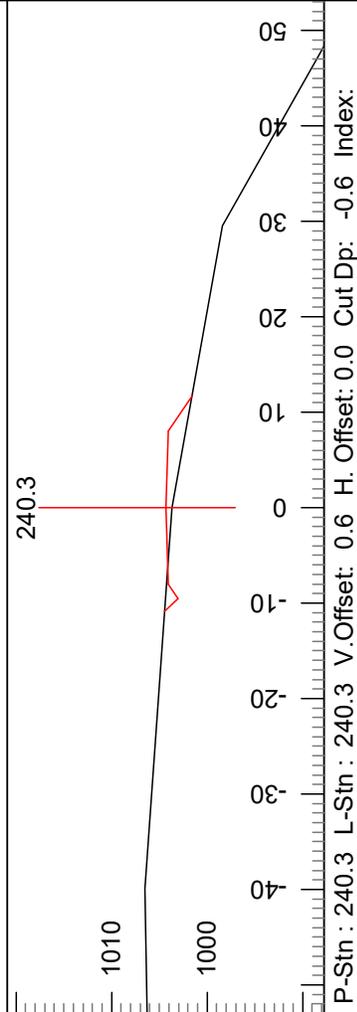
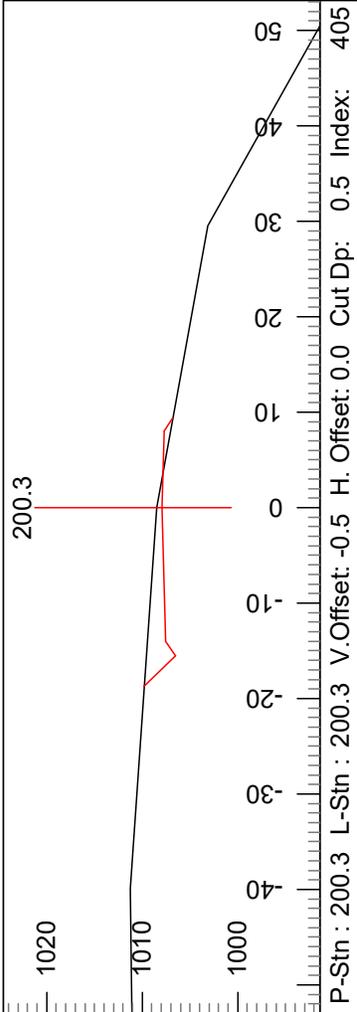
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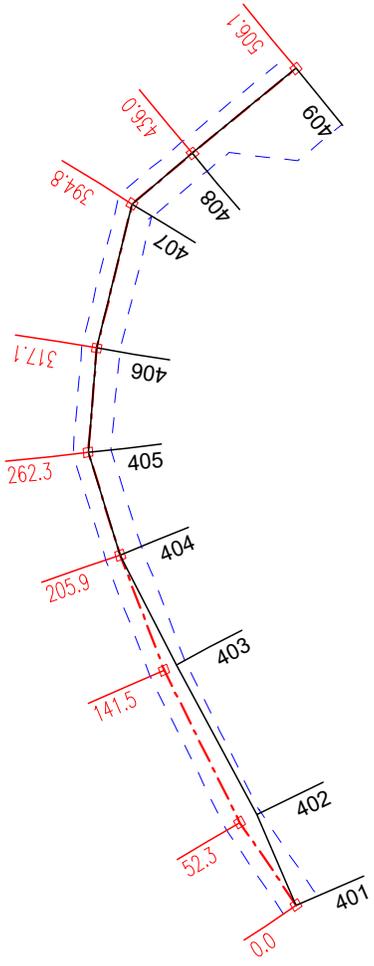
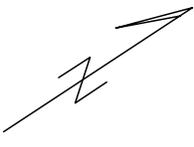
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	Section Scale 1:240	18/11/08

Thunderstruck Timber Sale
 D-4630.11
 Contract#: 30-097289
 Washington State Department of Natural Resources
 South Puget Sound Region

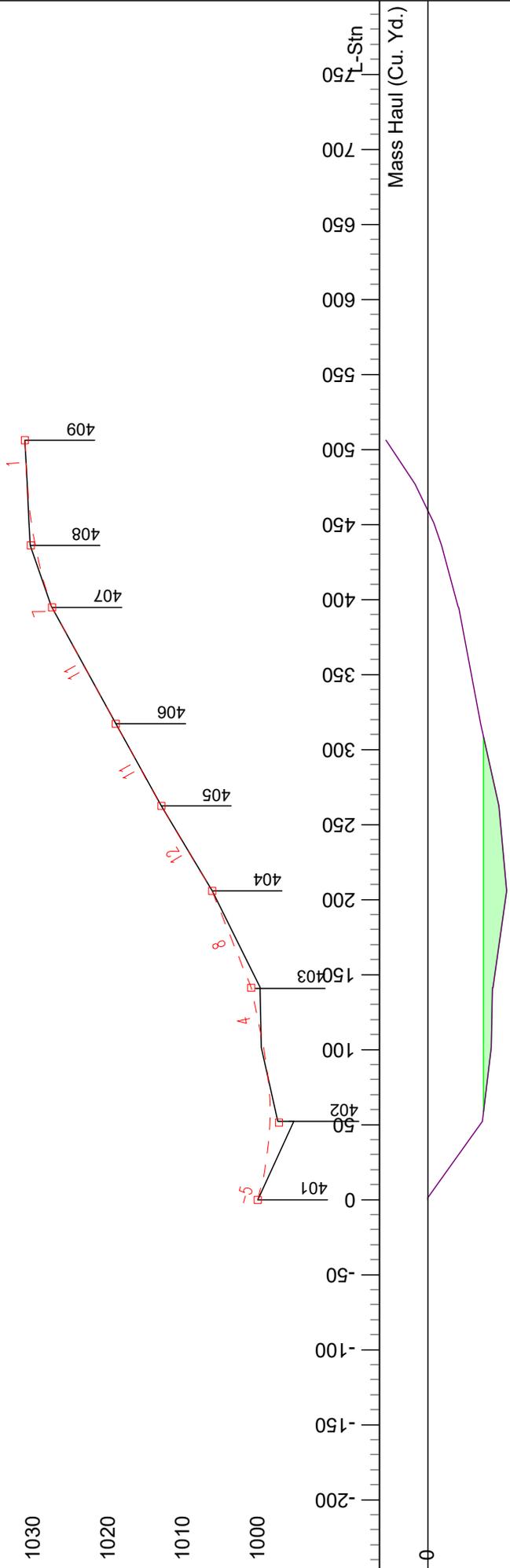


		Engineer: C. Vandehey 18/11/08	Page 3 of 3
Washington State Department of Natural Resources South Puget Sound Region		Section Scale 1:240	
Thunderstruck Timber Sale D-4630.11 Contract#: 30-097289			



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30-097289

Admired Timber Sale
D-4706.5
Contract#: 30-097289

Washington State Department of Natural Resources
South Puget Sound Region

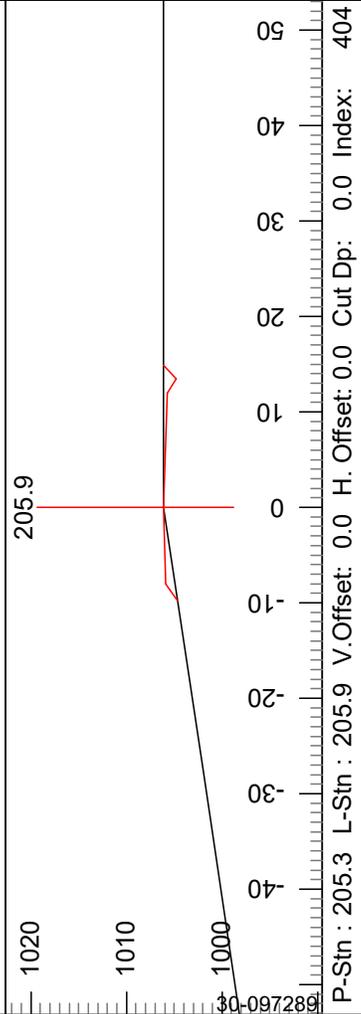
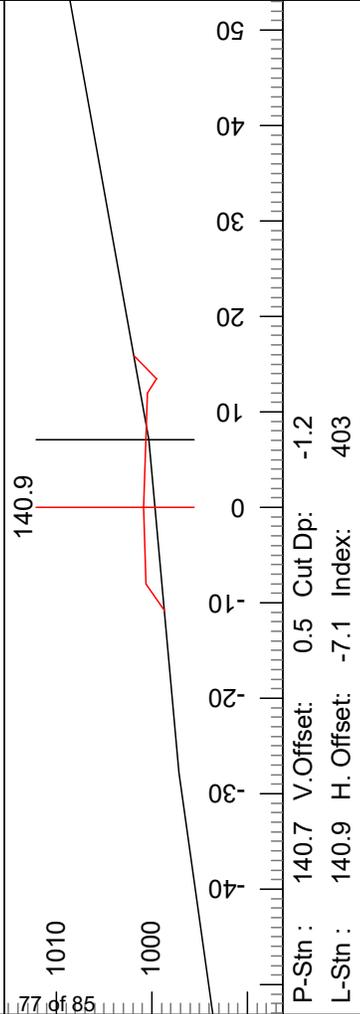
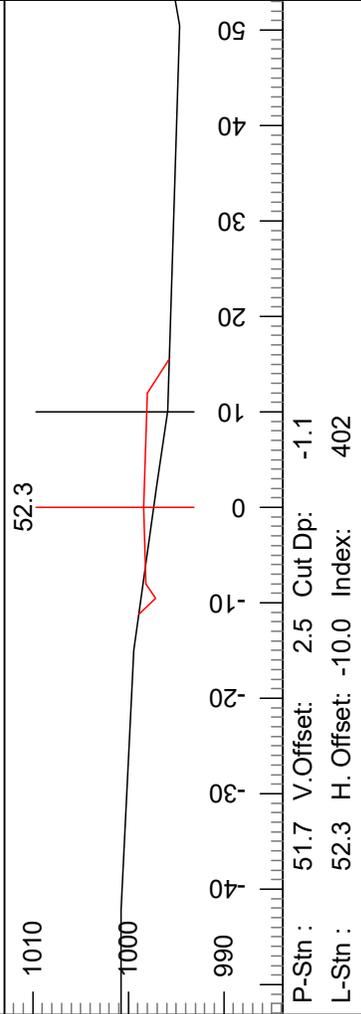
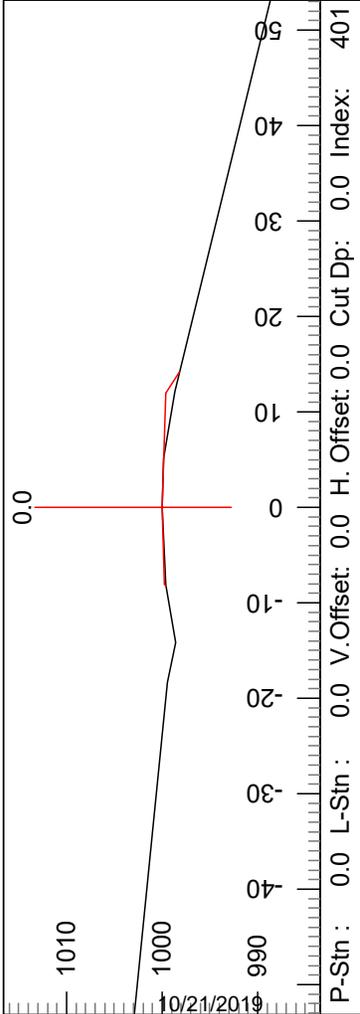
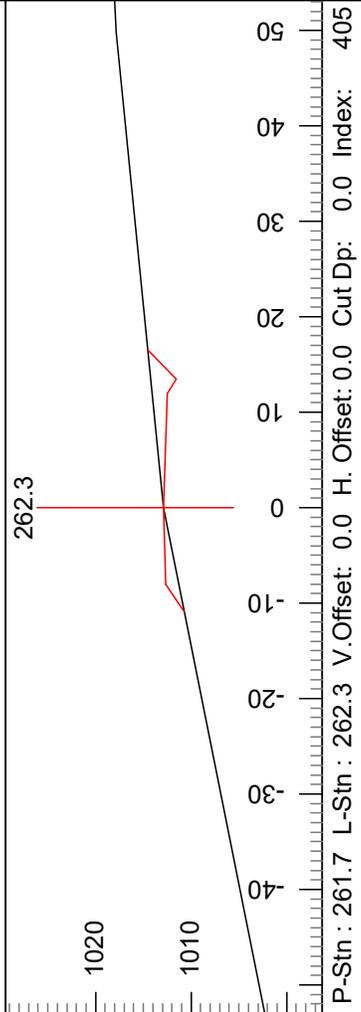
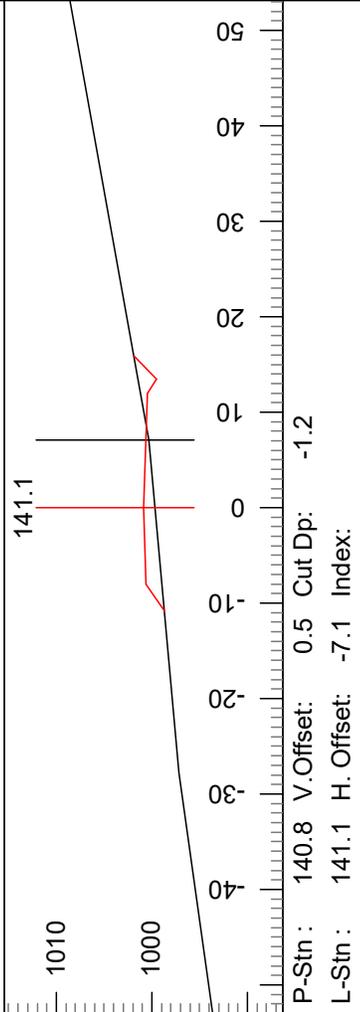
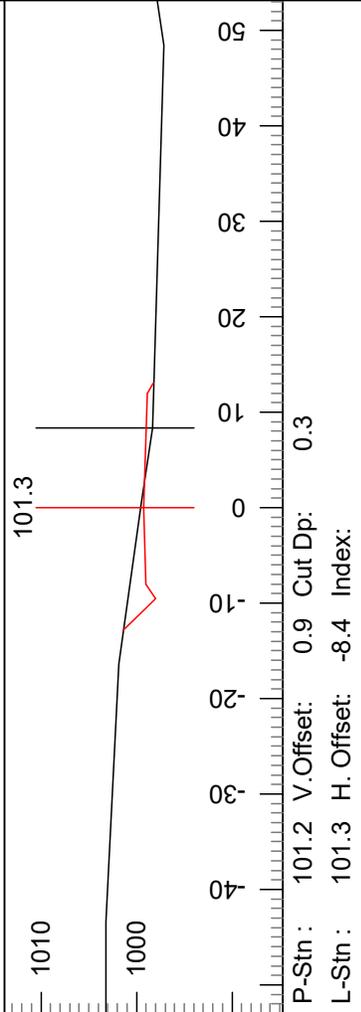
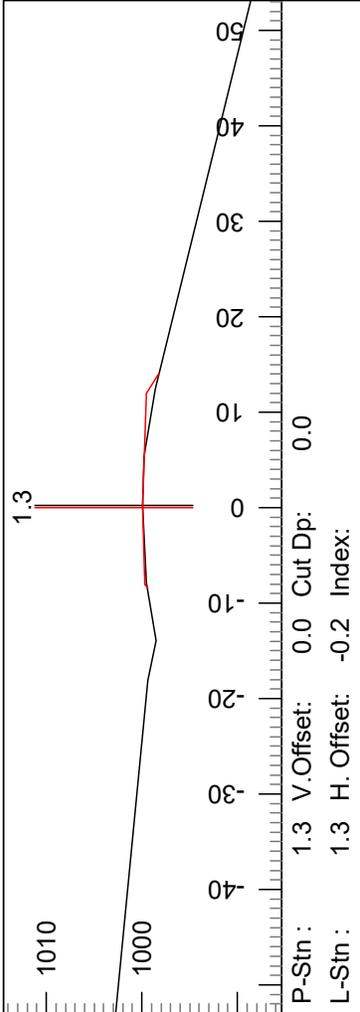


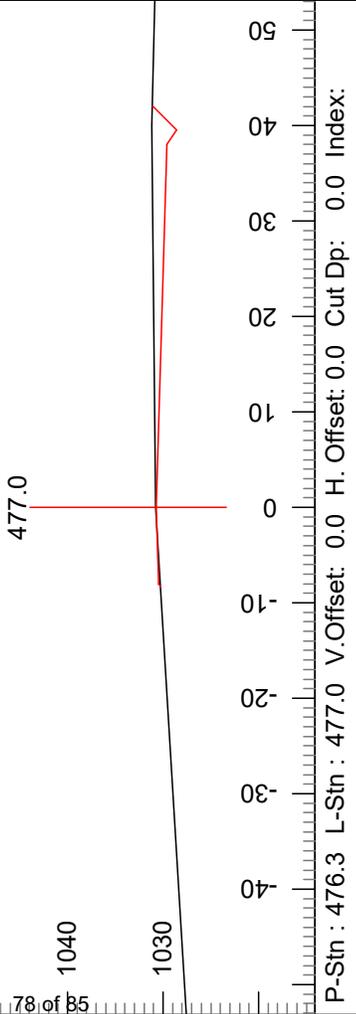
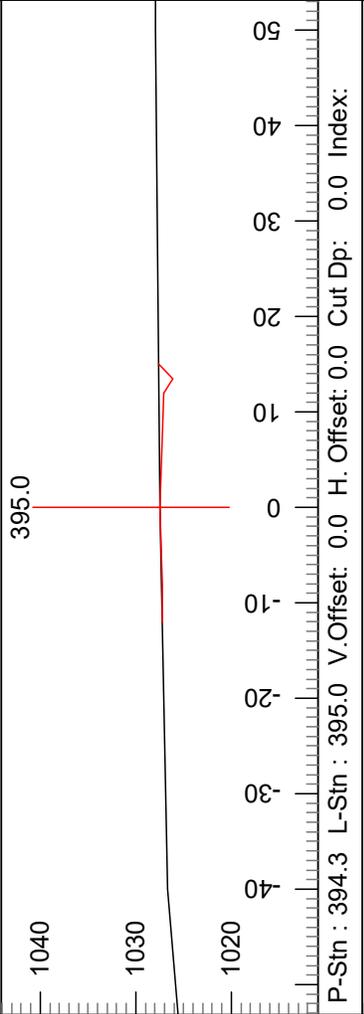
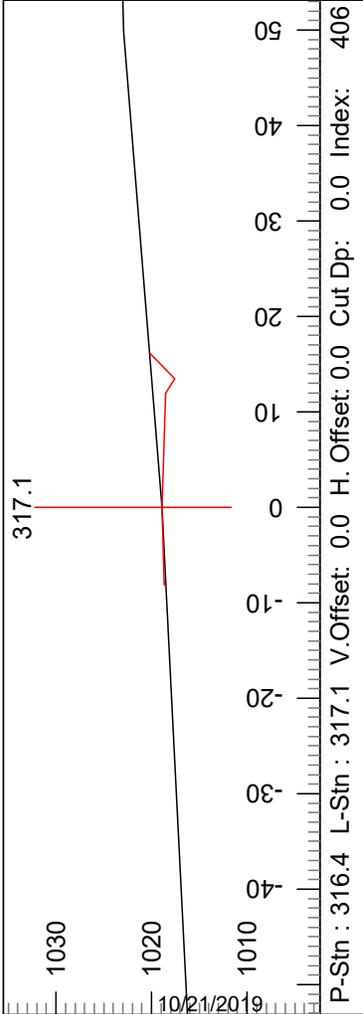
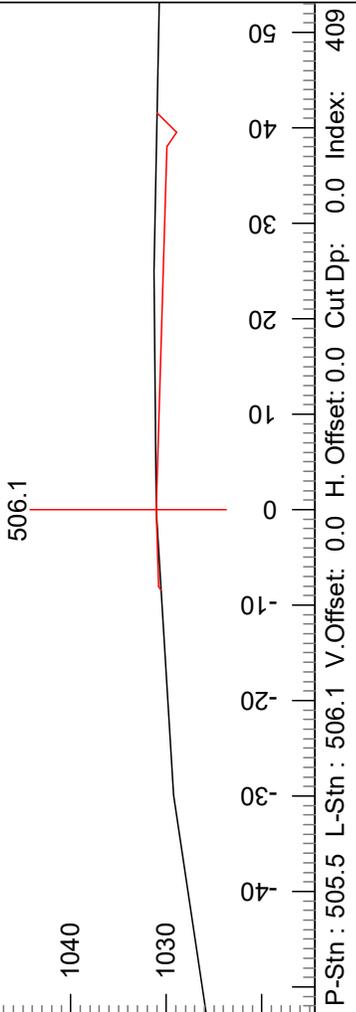
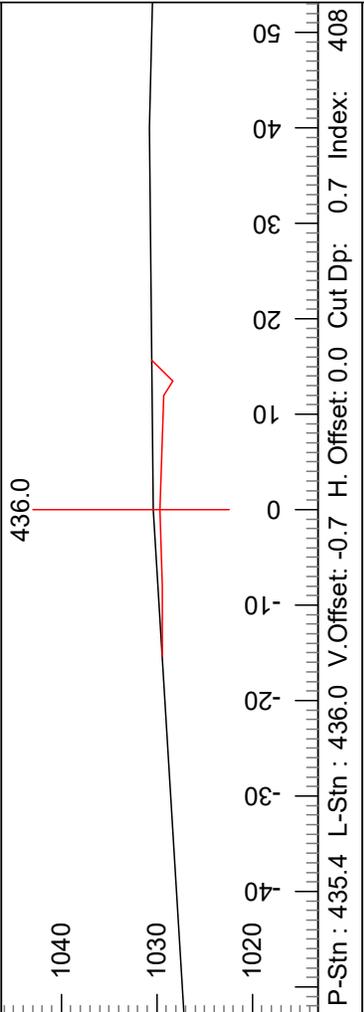
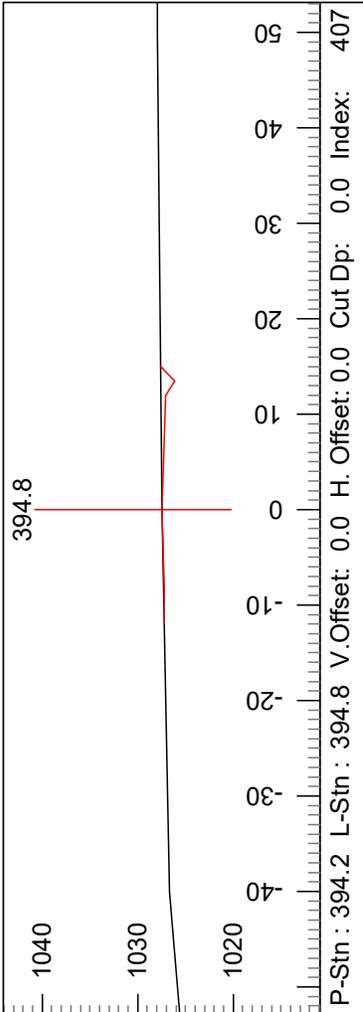
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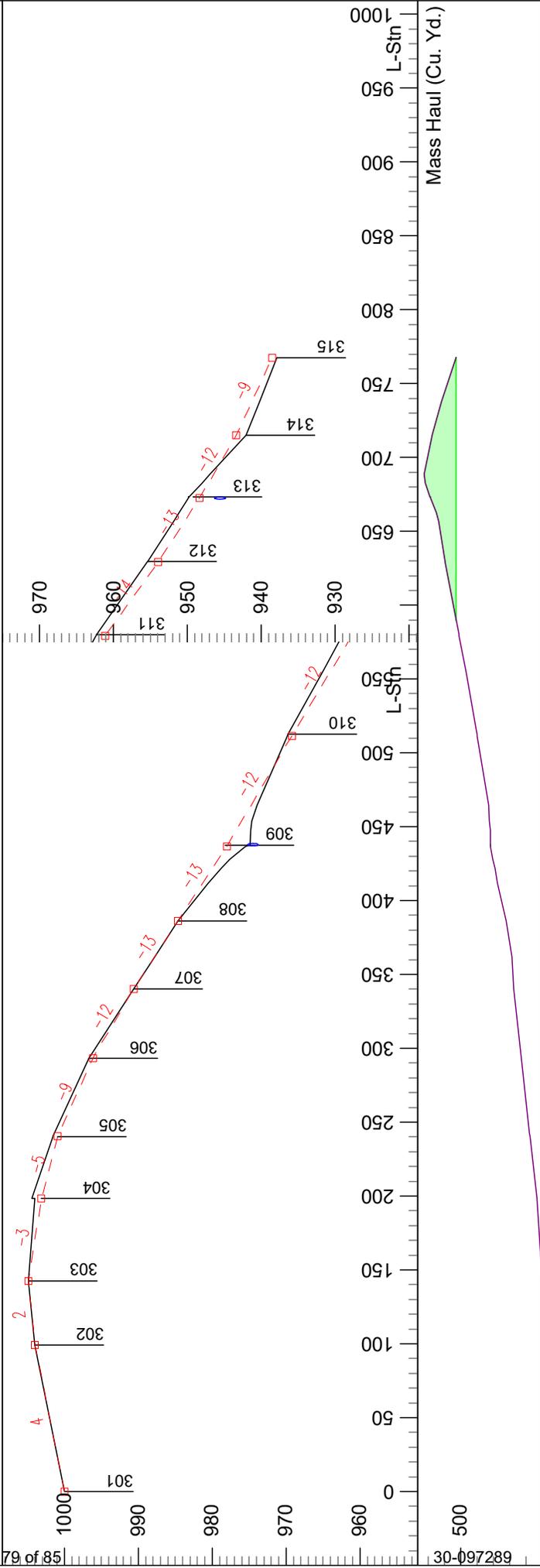
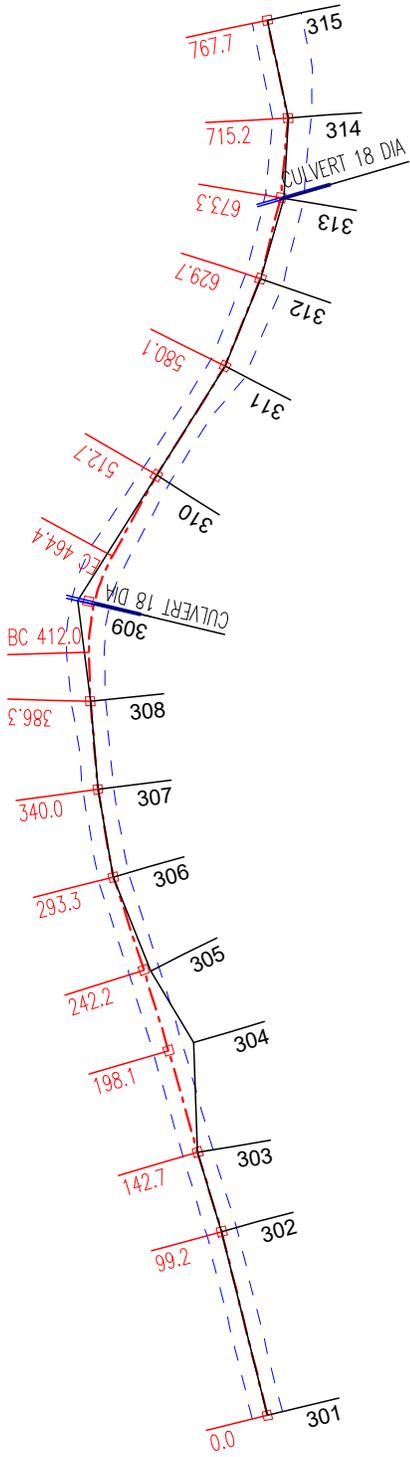
Engineer: C. Vandehey

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682-097289-30

Thunderstruck Timber Sale
 D-4706
 Contract#: 30-097289

Washington State Department of Natural Resources
 South Puget Sound Region

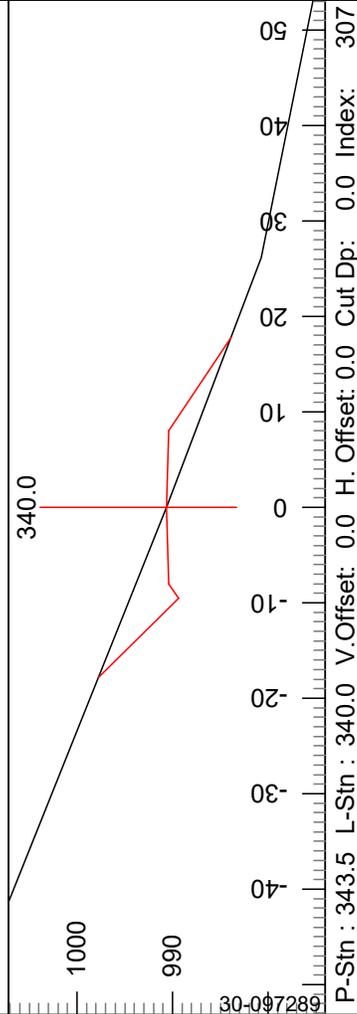
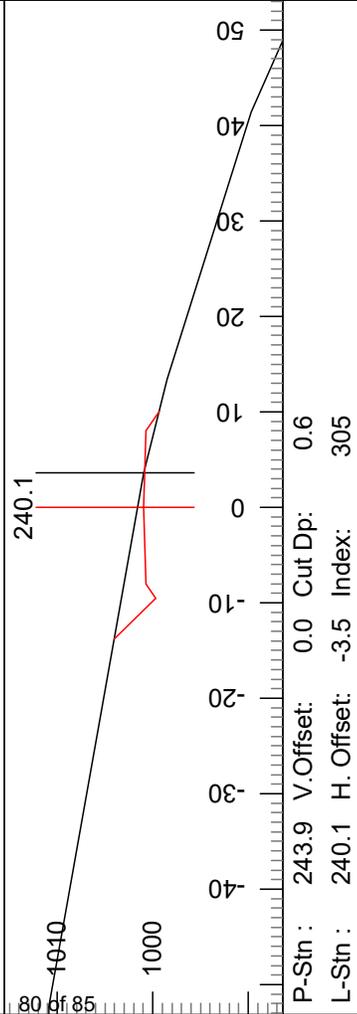
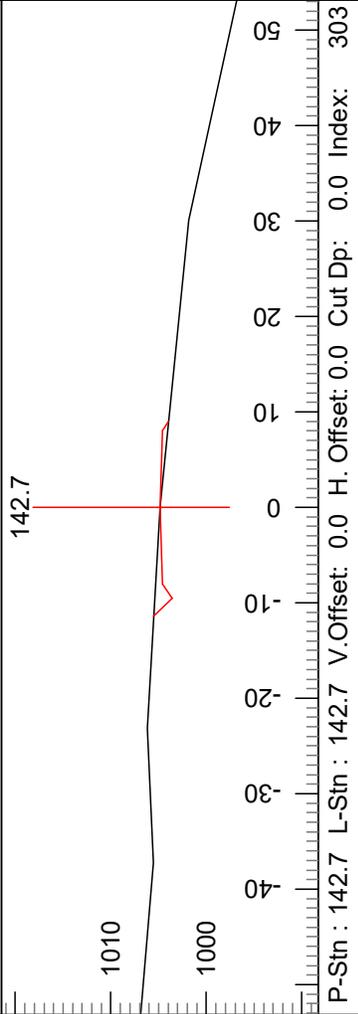
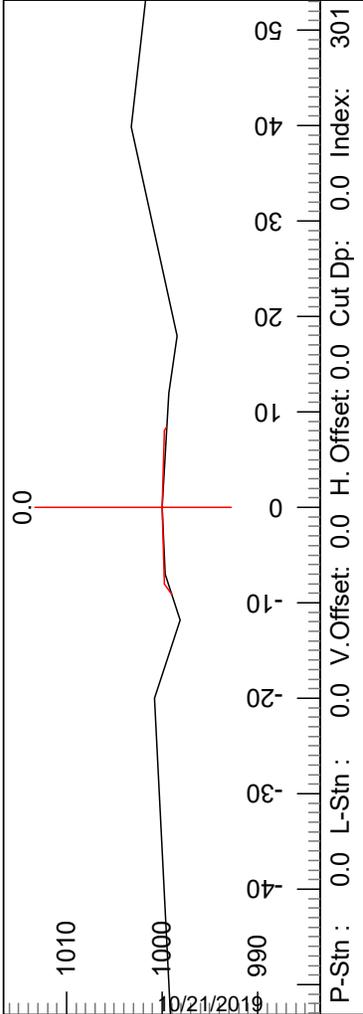
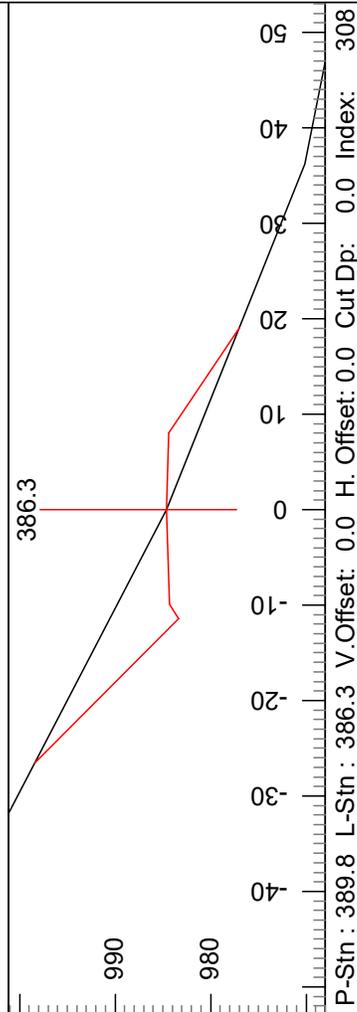
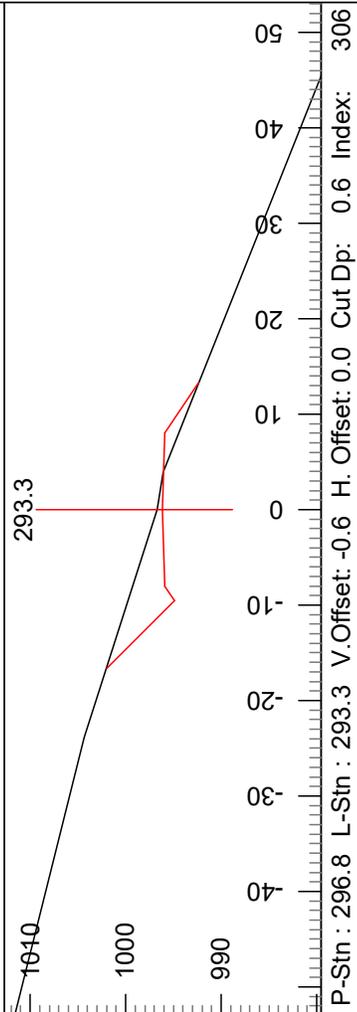
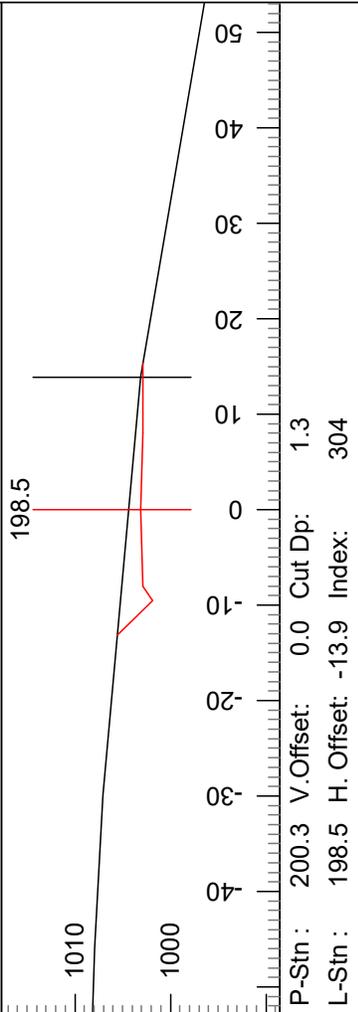
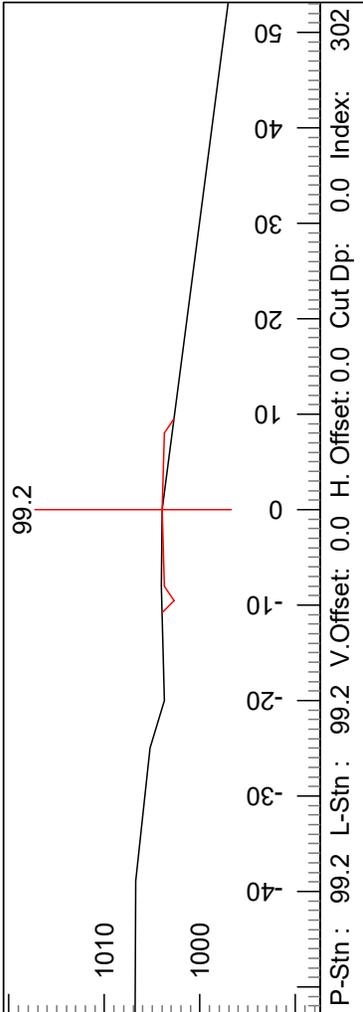


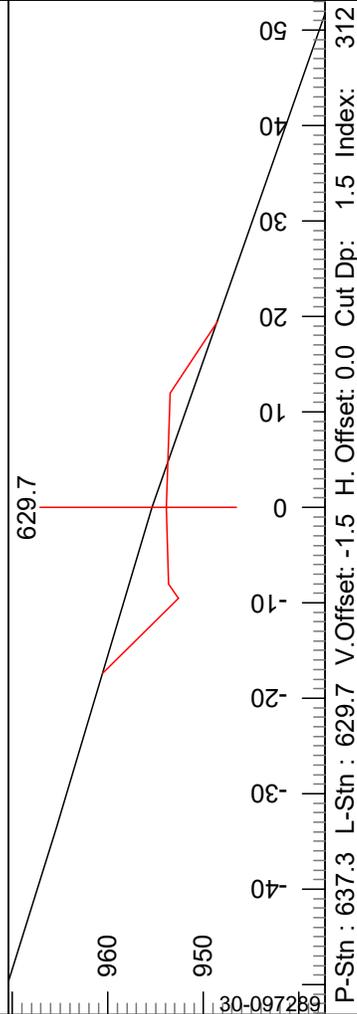
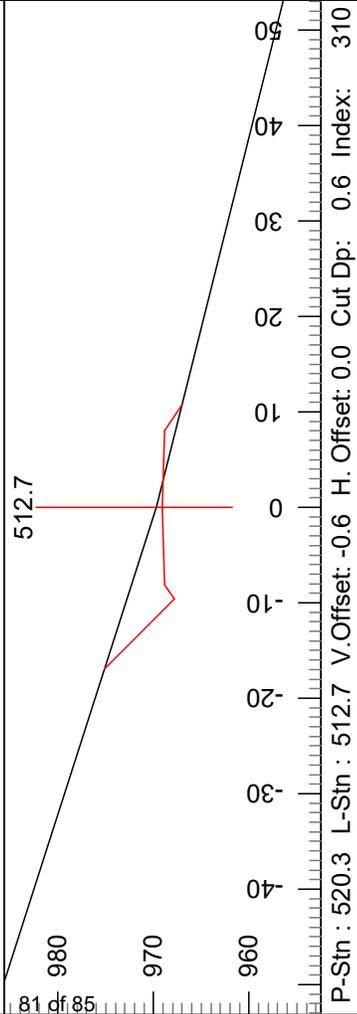
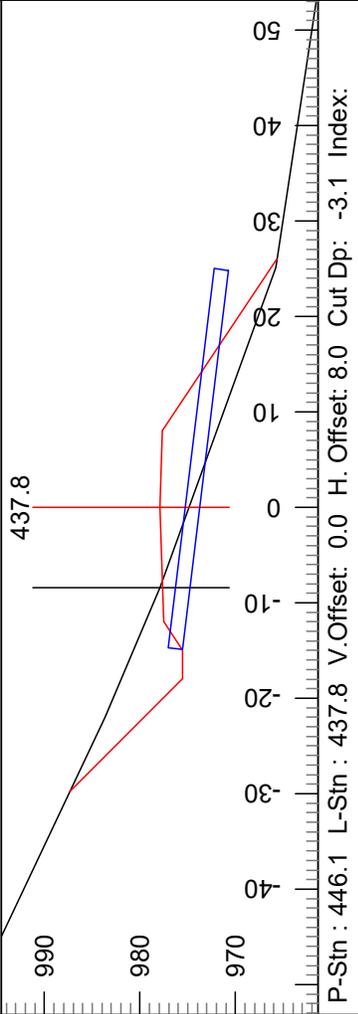
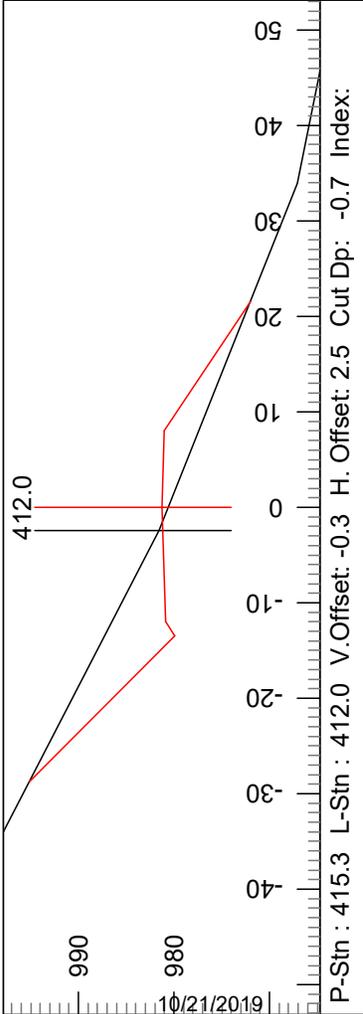
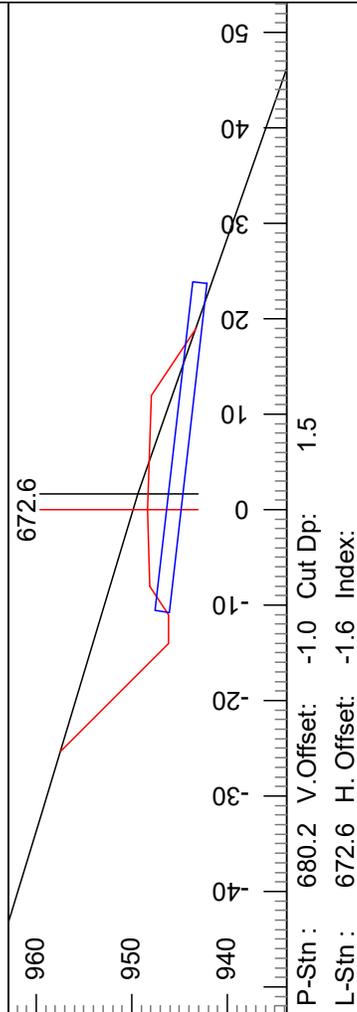
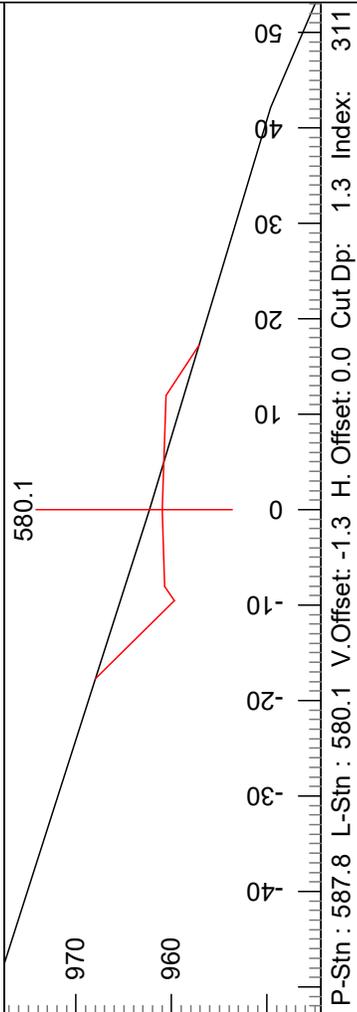
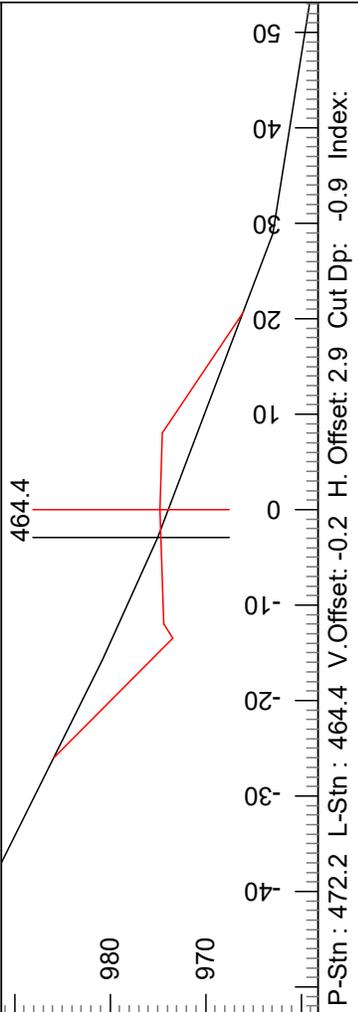
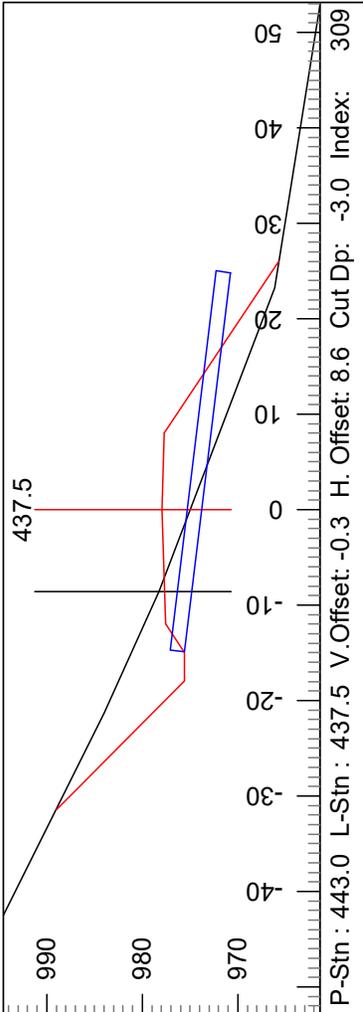
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Engineer: C. Vandehey

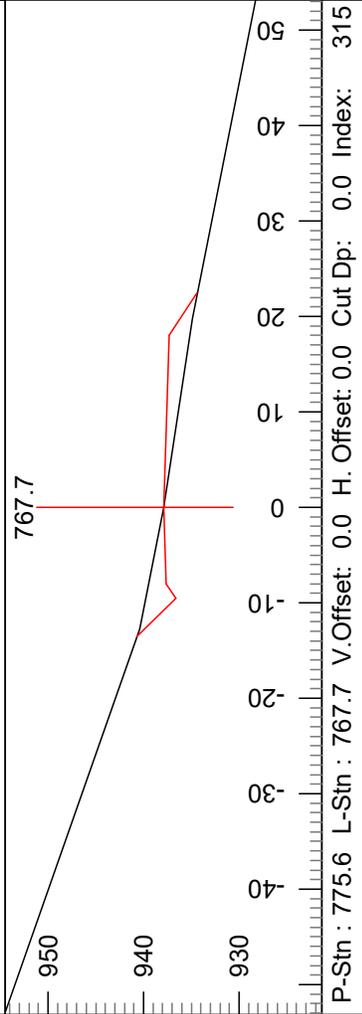
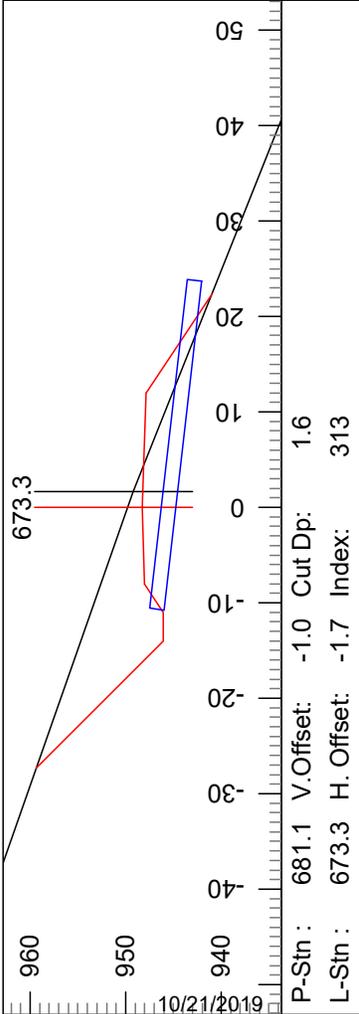
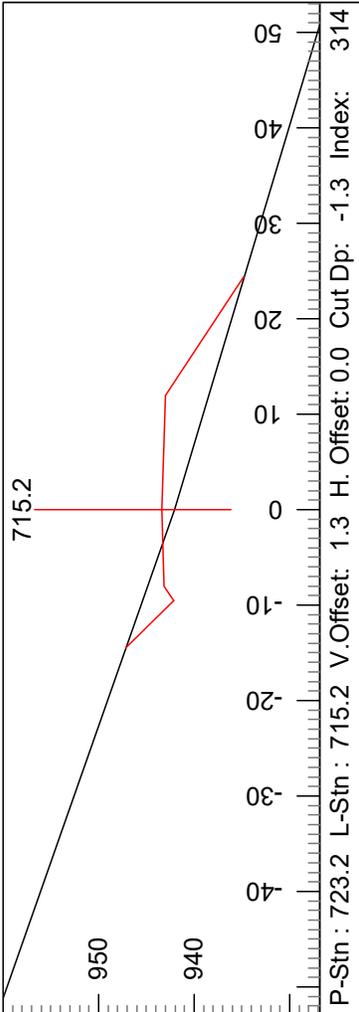
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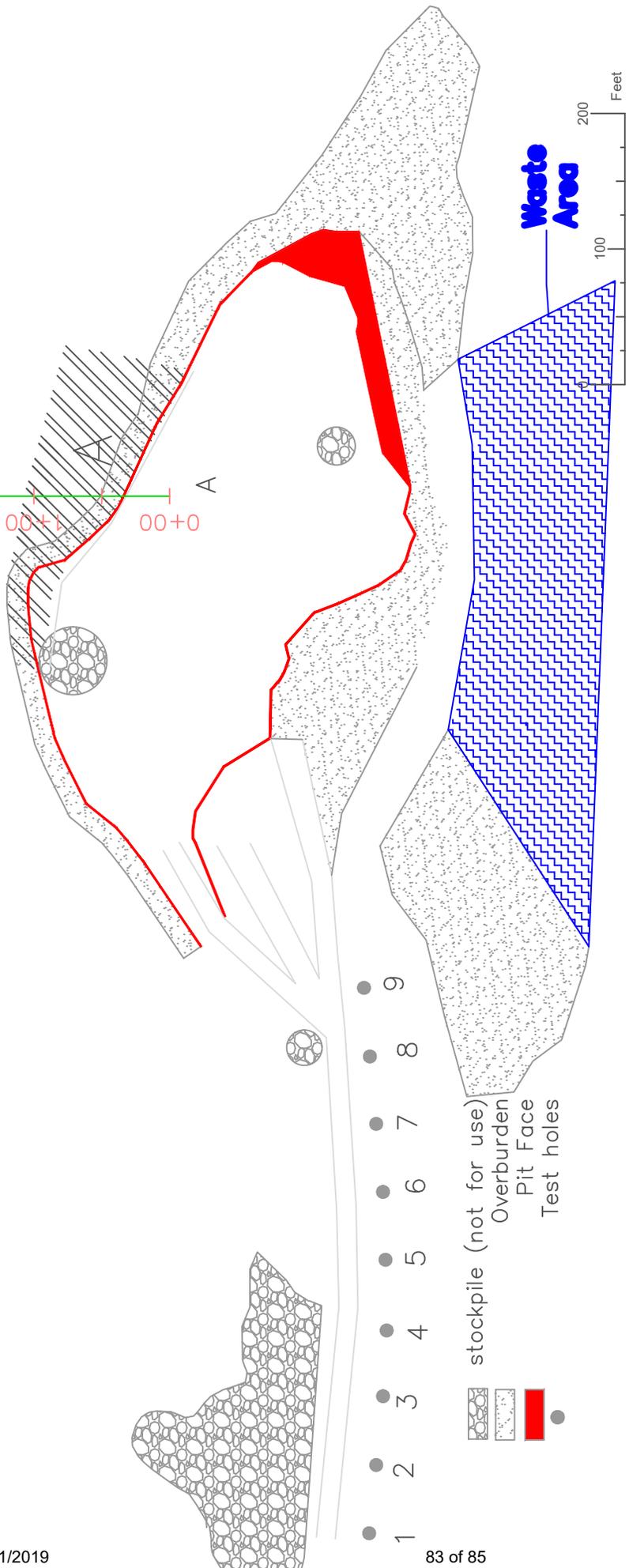
	Engineer: C. Vandehey	Page 3 of 4
	Section Scale 1:240	18/11/08
Washington State Department of Natural Resources South Puget Sound Region		
Thunderstruck Timber Sale D-4706 Contract#: 30-097289		



Greenline Quarry Page 1 of 3 Plan View

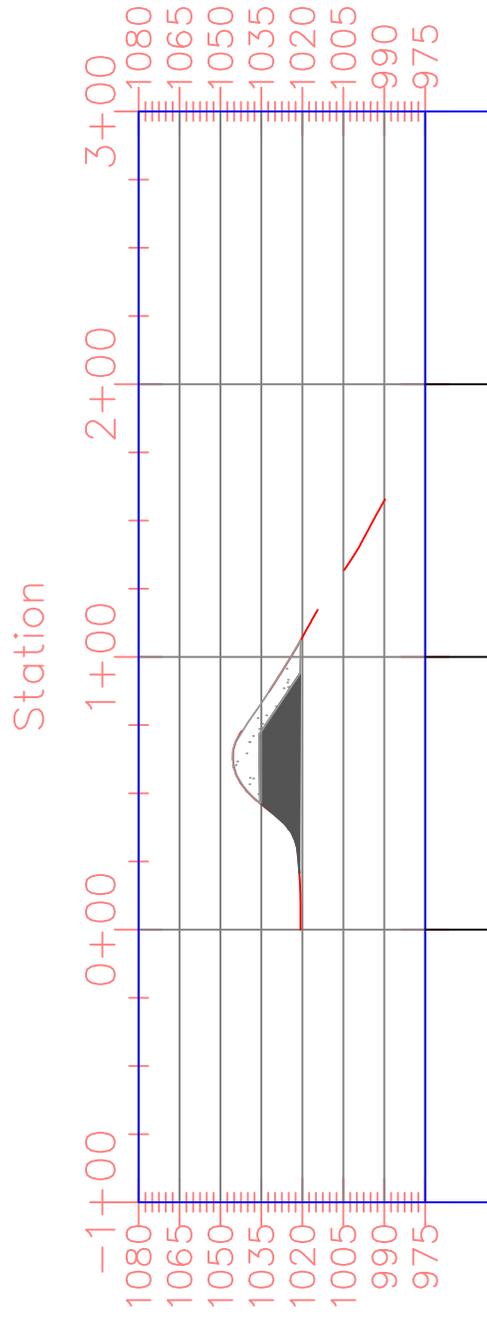


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Profile View



Elevation

Drawn by C. Vandehey 11/7/2018
 Test Hole locations will be marked
 in the field with orange flagging.
 Test Hole drill data will be
 collected by the Contract
 Administrator.
 Thunderstruck Timber Sale

30-097289

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
SOUTH PUGET SOUND REGION

GREENLINE QUARRY DEVELOPMENT PLAN

SE 1/4, NW 1/4, Section 29, Township 17 North, Range 03 West, W.M.
(Page 2 of 3)

1. Purchaser shall perform exploratory drilling before any pit operations. Waste area location will be established after exploratory drilling.
2. Purchaser shall move overburden in Area A and Area B to established waste area.
3. Development for crushed surfacing rock shall begin in Area A. Development for jaw run and riprap shall occur in Area A. Once Area A is depleted and developed, purchaser shall work in Area B, Which will be designated by the Contract Administrator.
4. Existing oversize material may be utilized for crushing.
 - a. Oversize material is defined as rock fragments larger than two feet in any direction. At the conclusion of the operation, oversize material left in the quarry shall be placed as directed by the contract administrator.
5. Quarry development shall proceed by extending the pit floor in a northern direction at a suitable elevation to not create a working face over 35ft, as shown on the quarry development map.
6. All vegetation including stumps shall be cleared a minimum of 20 feet beyond the top of all working faces. Trees shall be cleared to a minimum of $\frac{3}{4}$ of the height of the tallest tree adjacent to the pit.
7. All exposed soil and waste areas shall be treated for erosion control in accordance to the road plan clauses listed under Section 8 – Erosion Control.
8. The quarry floor shall have continuity of slope, providing drainage to the ditch-out located on the north side of the quarry area at a minimum of 2%, as shown on the quarry development map.
9. The working face shall not exceed 35 feet in height with a back slope no steeper than $\frac{1}{2}$:1.
10. The working bench width shall be a minimum of 35 feet.
11. Any access roads shall be berm'd or blocked with oversize rock to keep traffic a minimum of 10 feet from the face.
12. Faces and walls shall be scaled and cleared of loose and overhanging material.
13. All operations shall be carried out in compliance with all regulations of:
 - a. "Regulations and Standards Applicable to Metal and Nonmetal Mining and Milling Operations"

GREENLINE QUARRY DEVELOPMENT PLAN

SE 1/4, NW 1/4, Section 29, Township 17 North, Range 03 West, W.M.
(Page 3 of 3)

- b. (30 CFR) U. S. Department of Labor, Mine Safety and Health Administration.
 - c. "Safety Standards for Construction Work" (296-155 WAC), Washington Department of Labor and Industries.
14. The Operator shall submit an informational drilling and shooting plan to the Contract Administrator five (3) working days prior to any drilling (Form #M-126PAC).
 15. The pit area shall be left in a condition that allows future operations to proceed in an orderly manner.
 16. The site shall be cleared of all temporary structures, equipment and rubbish, and shall be left in a neat and presentable condition at completion of operations.
 17. See Specific Rock Source Work Requirements for additional information.
 18. Contract Administrator shall provide written approval of final rock source condition.

Specific Rock Source Work Requirements:

Points are shown on Greenline quarry plan view, pg. 1 of 3

Exploratory Drilling point	Depth
1	50
2	50
3	50
4	50
5	50
6	50
7	50
8	50
9	50

Updated 11/07/2018 by C. Vandehey

DEPARTMENT OF NATURAL RESOURCES - SOUTH PUGET SOUND REGION

FORM 9-87(Rev. 01-09)

Road Development Cost Estimate

(For internal DNR use only. Costs are estimates only & are not guaranteed by the State or part of the Road Plan.)

REGION: SPS

UNIT: Littlerock

SALE/PROJECT NAME: Thunderstruck

CONTRACT NUMBER: 30-097289

LEGAL DESCRIPTION: 0

ROAD NUMBER:	D-4000A1, D-4086, D-4087, D-4088, D-4630.1, D-4630.11, D-4706, D-4706.5	D-4000A, D-4085	C-Line, D-line, D-4000, D-4080, D-4600, D-4600A, D-4606, D-4630, D-4700, D-4700A, D-4707, D-4800
ROAD STANDARD:	Construction	Reconstruction	Pre-haul Maintenance
NUMBER OF STATIONS:	38.38	20.63	939.54
SIDESLOPE:	0-55%	0	0-60%
CLEARING AND GRUBBING:	\$8,435	\$3,576	
EXCAVATION AND FILL:	\$36,288	\$5,069	
MISC. MAINTENANCE:			\$11,540
ROCK TOTALS (Cu. Yds.):			
2" Minus:	3574 \$5,266	\$0	\$53,168
Light Loose	19 \$0	\$169	\$45
Quarry Spalls	50 \$79	\$119	\$294
4" Jaw	3,663 \$ 42,069	\$ 12,975	\$6,167
Pit Run	1,000 \$ 11,249	\$ -	0
Pavement	0 \$ -		0
CULVERTS AND FLUMES:	\$5,200	\$4,699	\$8,184
STRUCTURES:	\$0	\$0	\$0
GENERAL EXPENSES:	\$8,687	\$2,395	\$7,146
MOBILIZATION:	\$4,707	\$4,707	\$4,707
TOTAL COSTS:	\$121,979	\$33,708	\$91,249
COST PER STATION:	\$3,178	\$1,634	\$97

ROAD DEACTIVATION AND ABANDONMENT COSTS: \$16,863

NOTE¹: This appraisal has no allowance for profit and risk.

NOTE²: This appraisal does not account for all optional rock.

TOTAL (All Roads) = \$263,800

SALE VOLUME MBF = 10,066

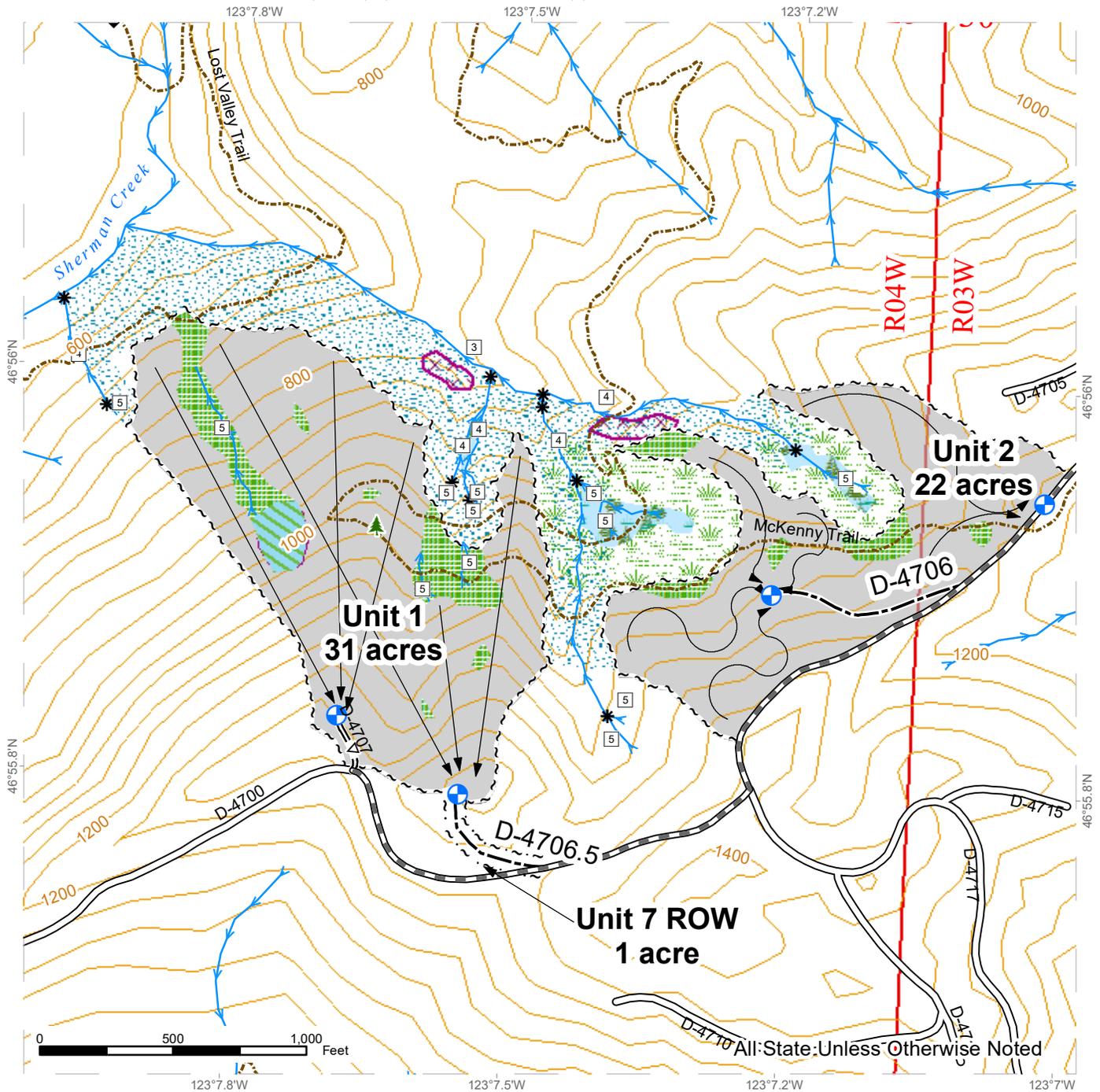
TOTAL COST PER MBF = \$26.21

Date: 10/25/18

LOGGING PLAN MAP

SALE NAME: THUNDERSTRUCK
AGREEMENT#: 30-097289
TOWNSHIP(S): T17R3W, T17R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2)

REGION: South Puget Sound Region
COUNTY(S): Thurston
ELEVATION RGE: 524-1733



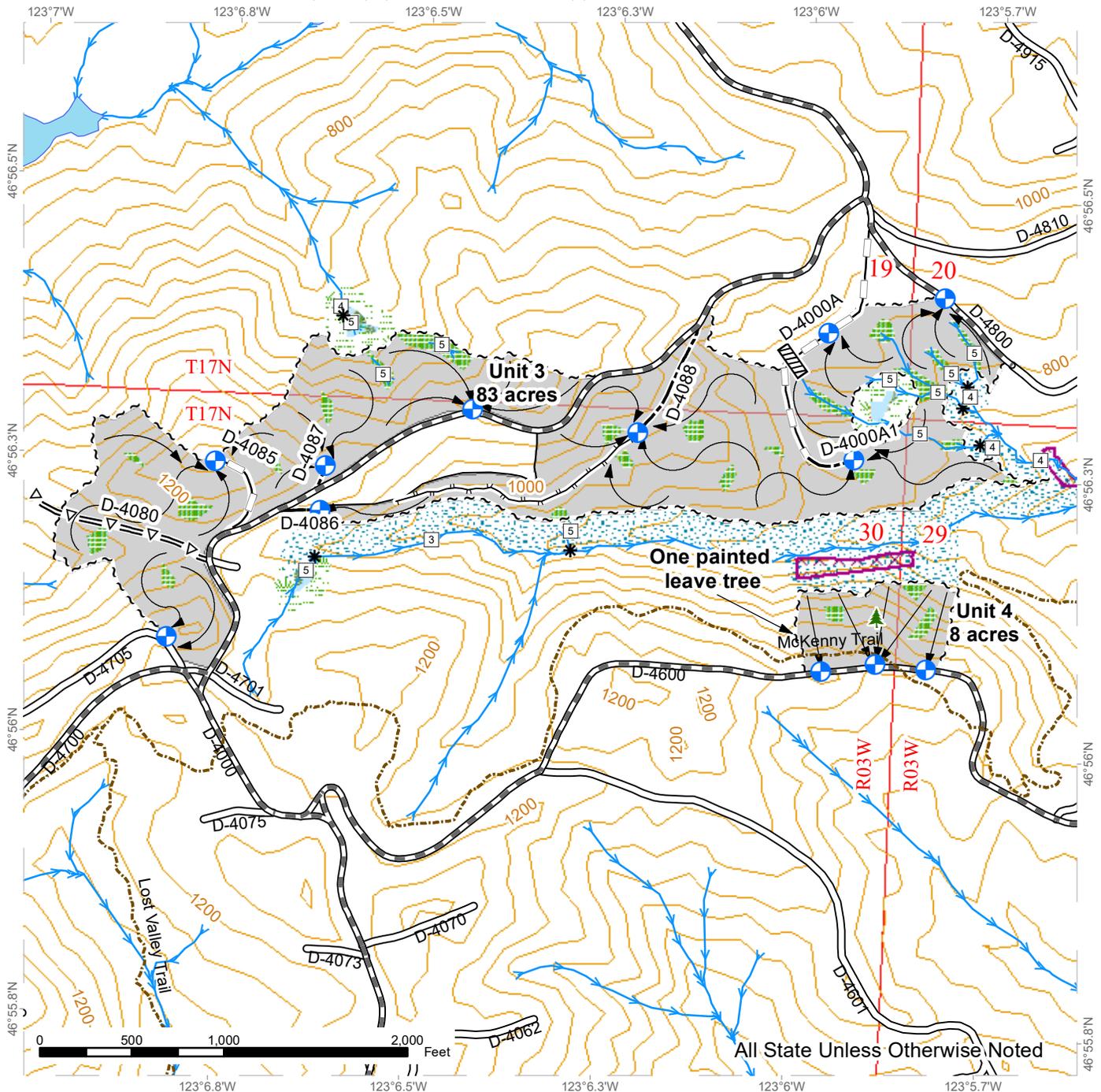
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Riparian Mgt Zone	Optional Construction	Cable Harvest
Leave Tree Area	Required Pre-Haul Maintenance	Streams
Non-Tradeable Leave Trees	Optional Pre-Haul Maintenance	Stream Type
Forested Wetland	Trails	Stream Type Break
Wetland Mgt Zone	Sale Boundary Tags	Landing - Proposed
Slope Stability Mitigation Zone	Right of Way Tags	Leave Tree Area <1/4-acre
		Survey Monument



LOGGING PLAN MAP

SALE NAME: THUNDERSTRUCK
AGREEMENT#: 30-097289
TOWNSHIP(S): T17R3W, T17R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2)

REGION: South Puget Sound Region
COUNTY(S): Thurston
ELEVATION RGE: 524-1733



All State Unless Otherwise Noted

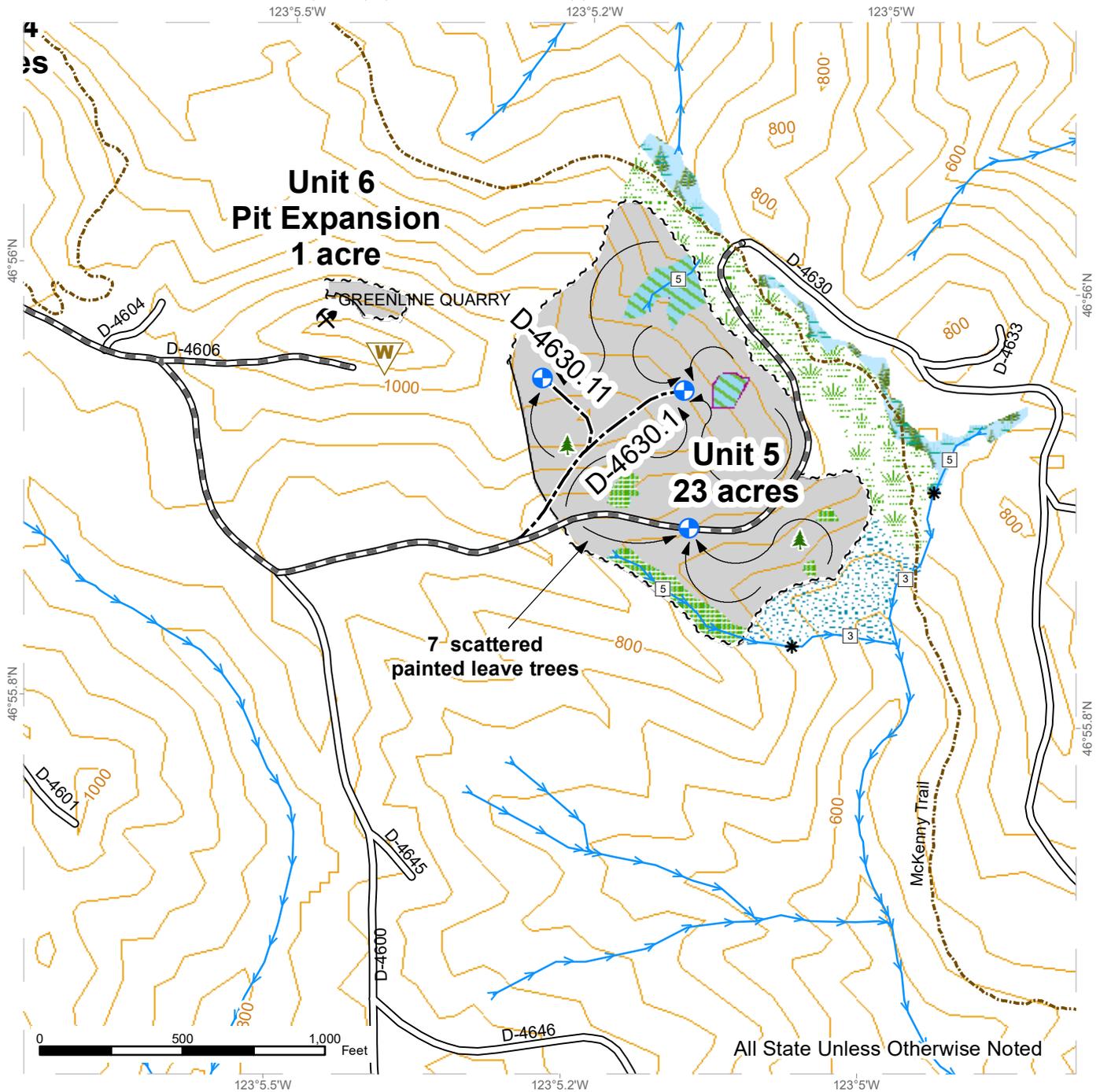
Sale Area	Existing Roads	Ground Harvest
Riparian Mgt Zone	Optional Construction	Cable Harvest
Leave Tree Area	Optional Reconstruction	Streams
Forested Wetland	Required Pre-Haul Maintenance	Stream Type
Wetland Mgt Zone	Optional Pre-Haul Maintenance	Stream Type Break
Slope Stability Mitigation Zone	Designated Skid Trail	Culvert
	Trails	Landing - Proposed
	Sale Boundary Tags	Leave Tree Area <1/4-acre
	Timber Type Change	



LOGGING PLAN MAP

SALE NAME: THUNDERSTRUCK
AGREEMENT#: 30-097289
TOWNSHIP(S): T17R3W, T17R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2)

REGION: South Puget Sound Region
COUNTY(S): Thurston
ELEVATION RGE: 524-1733



All State Unless Otherwise Noted

Sale Area	Existing Roads	Ground Harvest
Riparian Mgt Zone	Optional Construction	Streams
Leave Tree Area	Required Pre-Haul Maintenance	Stream Type
Non-Tradeable Leave Trees	Trails	Stream Type Break
Forested Wetland	Sale Boundary Tags	Rock Pit (Corporate)
Wetland Mgt Zone	Timber Type Change	Landing - Proposed
Slope Stability Mitigation Zone		Leave Tree Area <1/4-acre
		Waste Area

