



TIMBER NOTICE OF SALE

SALE NAME: BROKE

AGREEMENT NO: 30-105211

AUCTION: October 29, 2024 starting at 10:00 a.m., **COUNTY:** Grays Harbor, Thurston
South Puget Sound Region Office, Enumclaw, WA

SALE LOCATION: Sale located approximately 8 miles east of Malone, WA.

PRODUCTS SOLD AND SALE AREA: All timber, except 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 and the B-1000 Road in Units #1, and #3; white Timber Sale Boundary tags and the B-1510 Road in Unit #2; white Timber Sale Boundary tags and the B-1500 Road in Unit #4; white Timber Sale Boundary tags and property line marked with white Carsonite posts in Unit #5.

All forest products above located on part(s) of Sections 1, 2, 3, 4, 9, 10 and 11 all in Township 17 North, Range 4 West, W.M., containing 190 acres, more or less.

CERTIFICATION: This sale is certified under the Sustainable Forestry Initiative® program Standard (cert no: BVC-SFIFM-018227)

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	18.7	8	4,704						2,505	1,799	389	11
Hemlock	17		1,550						883	565	102	
Noble fir	18.1		451						305	115	31	
Redcedar	13.4		184							114	70	
Red alder	13.5		131						23	32	76	
Sale Total			7,020									

MINIMUM BID: \$2,492,000.00 **BID METHOD:** Sealed Bids

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

EXPIRATION DATE: October 31, 2026 **ALLOCATION:** Export Restricted

BID DEPOSIT: \$249,200.00 or Bid Bond. Said deposit shall constitute an opening bid at the appraised price.

HARVEST METHOD: Harvesting activities are estimated to be 55 percent uphill cable, 9 percent downhill cable, and 36 percent ground based harvest. Cable and cable-tethered equipment allowed on all slopes. Non-tethered self-leveling equipment limited to sustained slopes of 55 percent or less, all other ground based equipment limited to tracked equipment and 6-wheeled rubber tired skidders with over-the-tire tracks spanning both sets of rear tires on sustained slopes that are 45 percent or less. Yarding may be restricted during wet weather if rutting becomes excessive, per clause H-017.

Falling and yarding in all units will not be permitted on weekends or State recognized holidays unless authorized in writing by the Contract Administrator. In addition, falling



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and yarding in Unit #5 will not be permitted from November 1 to April 30 unless authorized in writing by the **State**.

ROADS:

25.31 stations of required reconstruction. 5.20 stations of optional reconstruction. 1074.79 stations of required prehaul maintenance. 5.20 stations of abandonment, if reconstructed. Purchaser maintenance on the B-1000 adjacent to or within Units #1-#5, B-1500, B-1510, and C-4400 roads. Designated maintenance on all other roads used.

Rock for this proposal may be obtained from the Larch Pillar Quarry at no cost to the Purchaser or any commercial rock source at the Purchaser's expense. If rock development occurs in the Larch Pillar Quarry, Purchaser must conduct operations in accordance with the Larch Pillar Quarry Development Plan per Road Plan clause 6-10.

All road work activities will not be permitted from November 1 to April 30, nor on weekends or State recognized holidays, 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 may be required per Road Plan clause 1-26.

The hauling of forest products will not be permitted from November 1 to April 30, nor on weekends or State recognized holidays, 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:

Acres was determined by traversing boundaries by GPS in all units and length times width for existing roads in Units #1, #2, #4, and #5. GPS data files are available at DNR's website for timber sale auction packets. See cruise narrative for cruise method.

FEES:

\$119,340.00 is due on day of sale. \$9.00 per MBF is due upon removal. These are in addition to the bid price.

SPECIAL REMARKS:

This sale contains high quality Douglas-fir sawlogs and Douglas-fir and red cedar poles. See Cruise.

Purchaser shall cut all hardwood stems more than 6 feet tall within the harvest units, concurrently with felling operations, leaving a stump no more than 12 inches in height.

Non-tradeable leave tree areas are present in Units #1, #3, and #5 as shown on the Timber Sale and Logging Plan maps. All non-tradeable leave tree areas are marked with yellow Leave Tree Area tags and pink flagging.

See Schedule A for recreation trail clean out and repair.

A Road Use Permit (RUP), dated August 1, 2024 with Weyerhaeuser Company has been obtained for equipment for access to Unit #5 to facilitate harvest. All conditions and requirements of the RUP must be met by the Purchaser per clause G-380. This RUP expires July 31, 2026.

Known utilities are along the C-4000 and C-4400 Roads. Purchaser's responsibility pertaining to known and unknown utilities are stated in Road Plan 1-43.



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Sale area may be inaccessible due to snow intermittently from late November through March. If necessary, plowing may be permitted with an approved snow plowing agreement per Road Plan clause 1-33. Contact Sam Lake at (360) 628-3868 for current road conditions.

Note to cruisers and appraisers: Please refrain from leaving pink, orange or blue flagging from your cruises in or around the sale area to avoid confusion with DNR's marking. Additionally, for the safety of the public, please remove from roads and trails all string from string boxes used during appraising or cruising this sale.

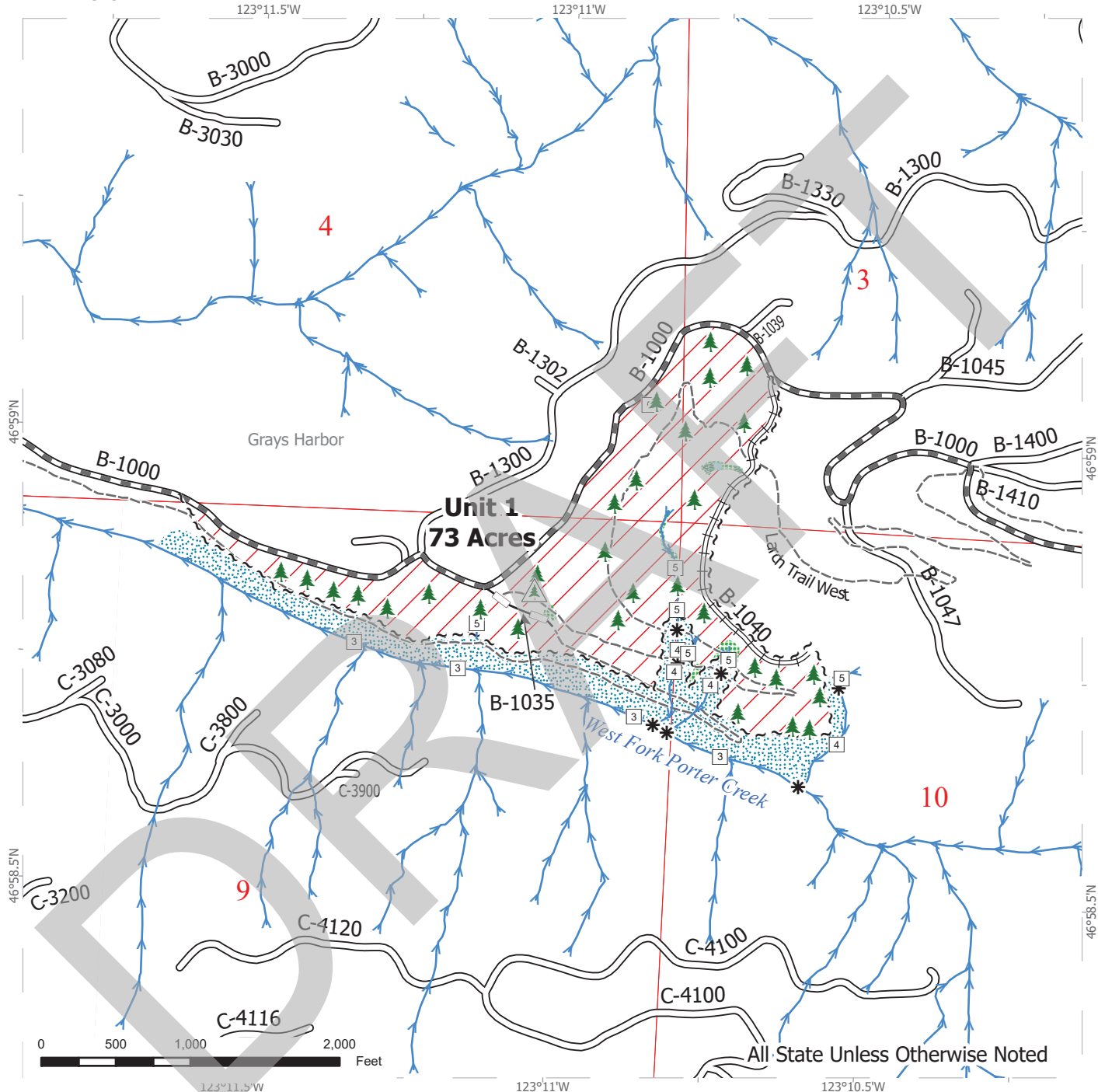
See map for gate locations. Gate keys may be obtained by contacting the South Puget Sound Region office at (360) 825-1631 or by contacting Sam Lake at (360) 628-3868.

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TIMBER SALE MAP

SALE NAME: BROKE
AGREEMENT #: 30-105211
TOWNSHIP(S): T17R4W
TRUST(S): Charitable/Educational/Peal & Reformatory Instit. (6), Common School and Indemnity (3), Scientific School (10), State Forest Purchase (2)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 1000-2520



All State Unless Otherwise Noted

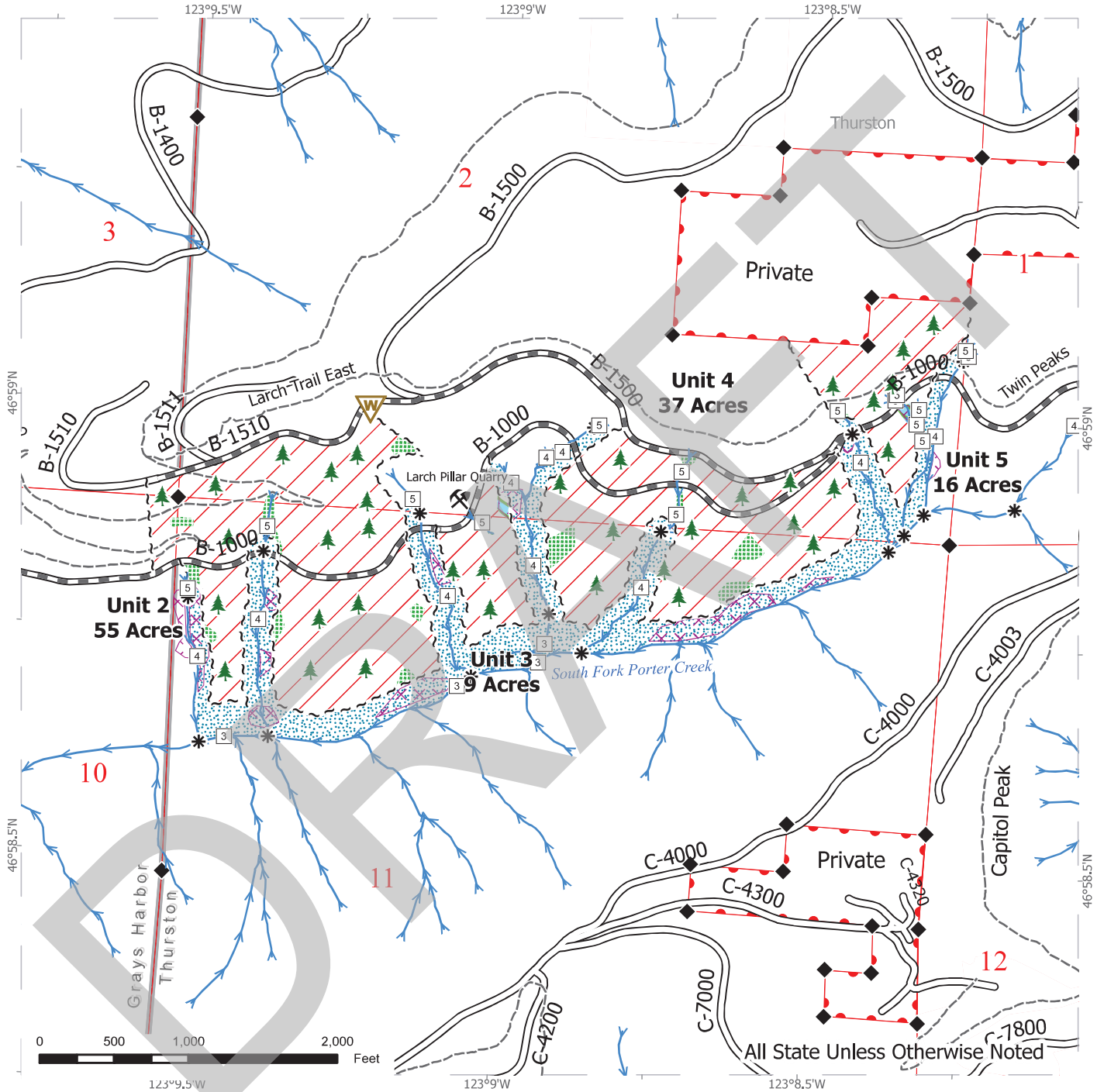
Sale Area	Existing Roads	Public Land Survey Townships
Sale Boundary Tags	Required Pre-Haul Maintenance	Public Land Survey Sections
Leave Tree Area	Required Reconstruction	Leave Tree Area <1/4-acre
Forested Wetland	Optional Reconstruction	Non-Tradeable Leave Trees
Riparian Mgt Zone	Trails	
	Streams	
	Stream Type	
	Stream Break	



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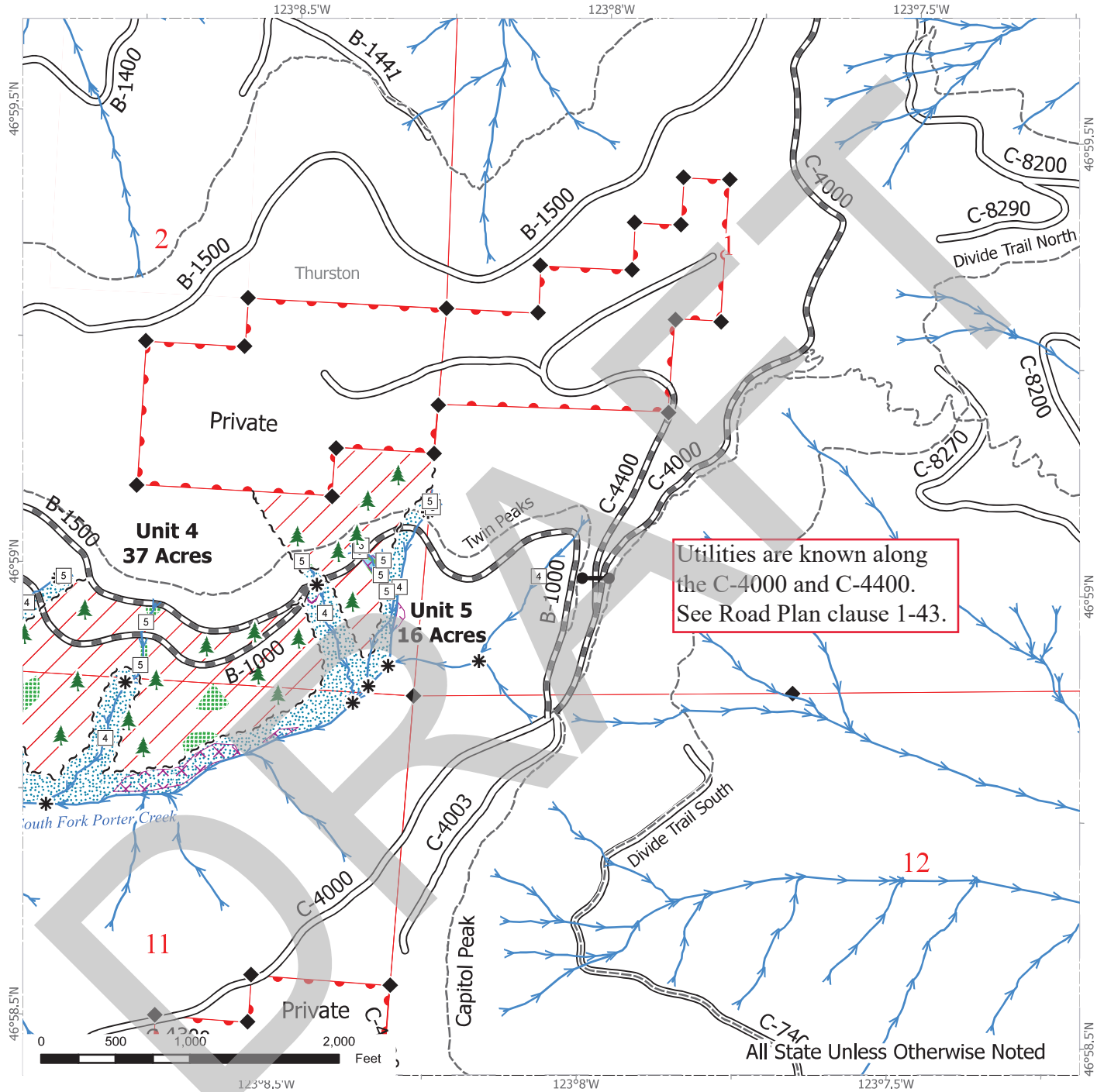


Sale Area	Existing Roads	Survey Monument
Sale Boundary Tags	Required Pre-Haul Maintenance	Public Land Survey Townships
Leave Tree Area	Trails	Public Land Survey Sections
Non-Tradeable Leave Tree Area	Streams	Property Line
Riparian Mgt Zone	Stream Type	Leave Tree Area < 1/4-acre
Tailhold Restriction Area	Stream Break	Larch Pillar Quarry
		Waste Area

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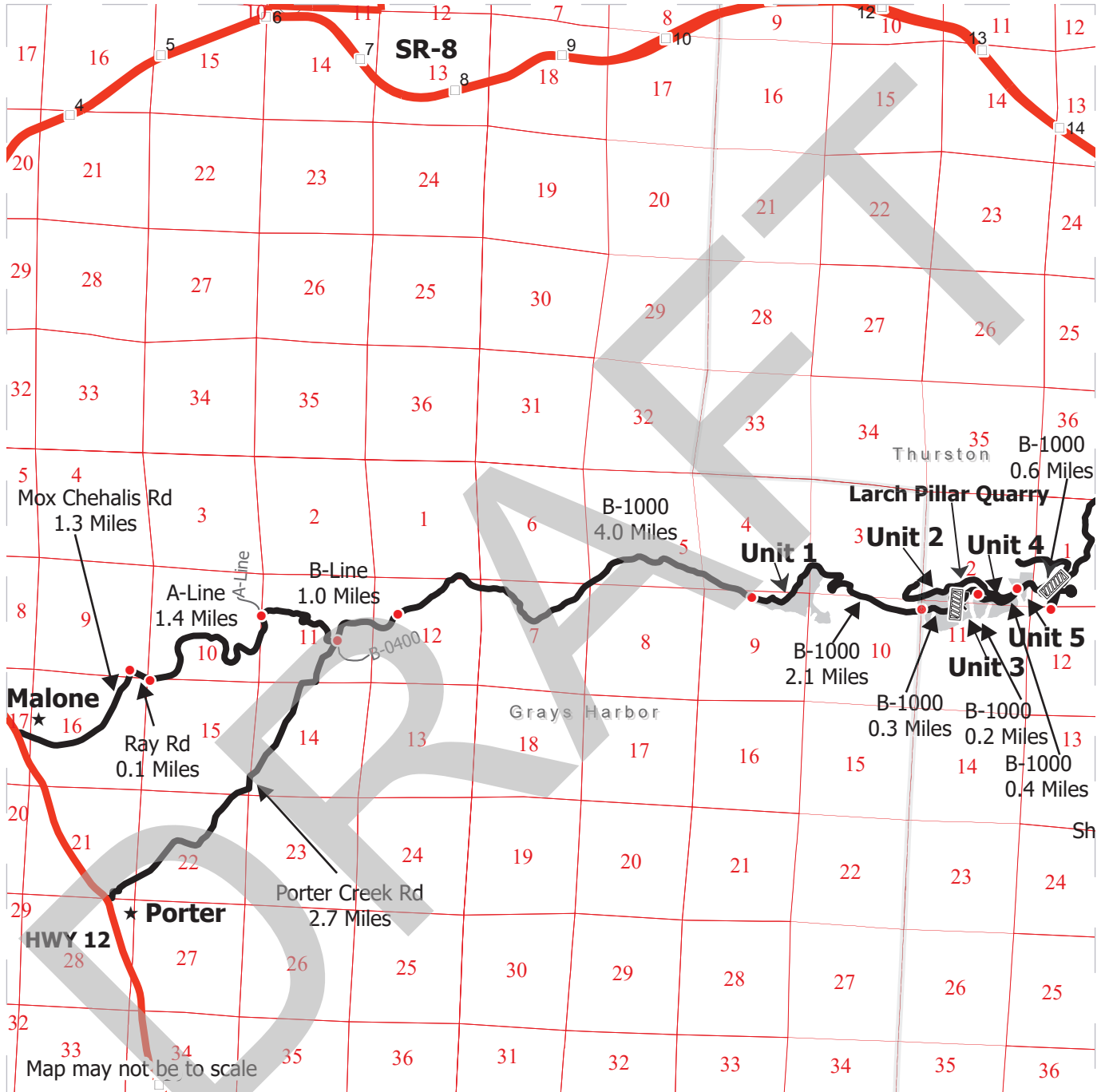
Sale Area	Existing Roads	Survey Monument
Sale Boundary Tags	Required Pre-Haul Maintenance	Public Land Survey Townships
Leave Tree Area	Trails	Public Land Survey Sections
Non-Tradeable Leave Tree Area	Streams	Property Line
Riparian Mgt Zone	Stream Type	Leave Tree Area <1/4-acre
Tailhold Restriction Area	Stream Break	Gate



DRIVING MAP

SALE NAME: BROKE
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TOWNSHIP(S): T17R4W
TRUST(S): Charitable/Educational/Penal & Reformatory Instit. (6), Common School and Indemnity (3), Scientific School (10), State Forest Purchase (2)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 1000-2520



Sale Area	Town
Haul Route	County Boundaries
Other Road	Highway
Distance Indicator	Milepost Markers
Gate (H-957)	
Culvert	
Rock Pit	

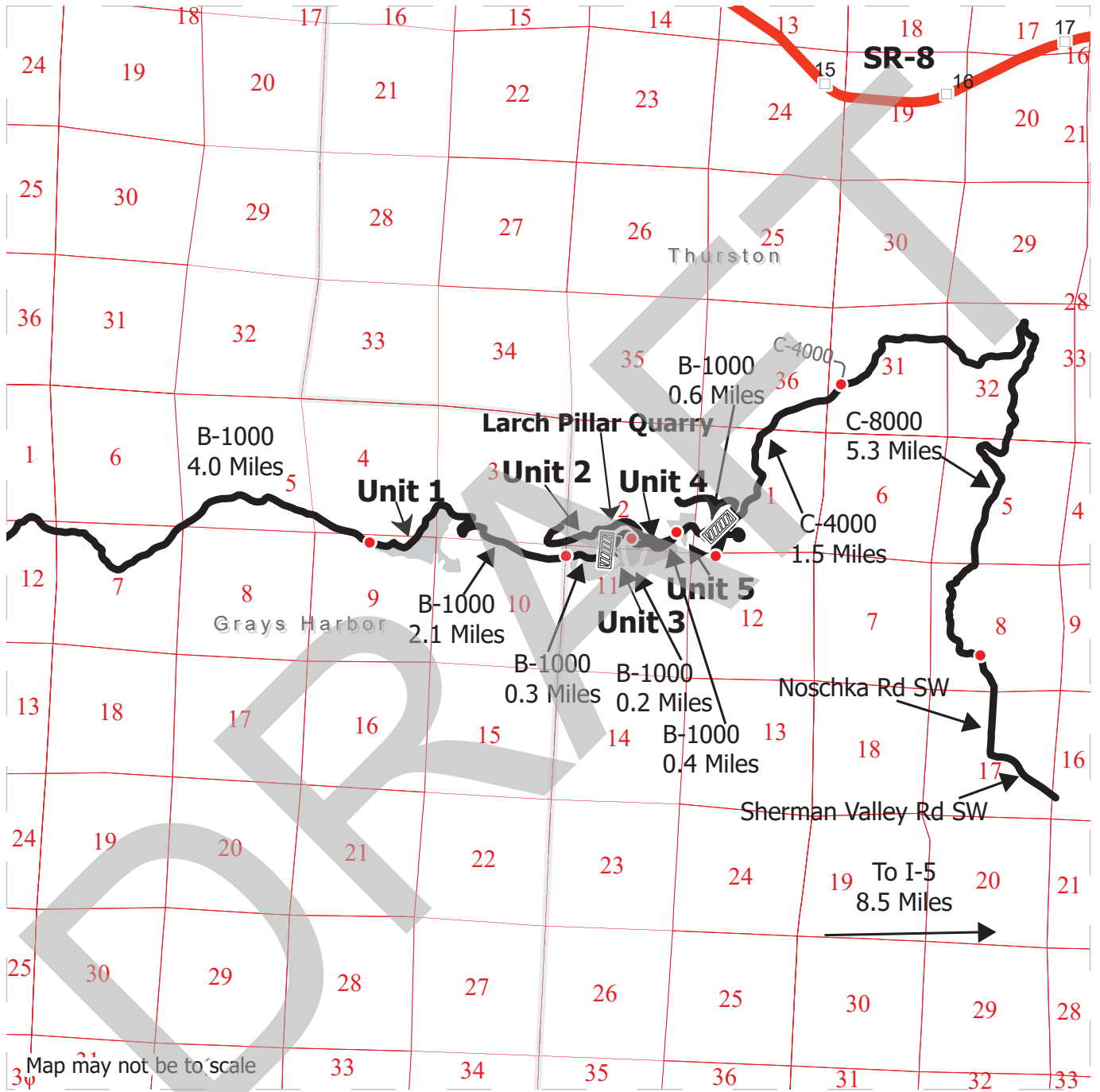
DRIVING DIRECTIONS:
See Attached Driving Directions



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Sale Area	County Boundaries
Haul Route	Highway
Other Road	Milepost Markers
Distance Indicator	
Gate (H-957)	
Culvert	
Rock Pit	

DRIVING DIRECTIONS:
 See Attached Driving Directions



Broke Driving Directions

From Highway 12 in Malone:

Turn east onto Mox Chehalis Rd, and continue for 1.3 miles.

Turn right (east) onto Ray Rd and continue for 0.1 miles to the A-Line.

Continue on the A-Line for 1.4 miles, then turn right (east) onto the B-Line and travel 1.0 miles.

Continue straight onto B-Line and travel 1.0 miles.

Turn right onto the B-1000 and continue for 4.0 miles to reach Unit 1.

To reach Unit 2, continue on the B-1000 for 2.1 miles.

To reach Unit 3 and Larch Pillar Quarry, continue on the B-1000 for 0.3 miles.

To reach Unit 4, continue on the B-1000 for 0.2 miles.

To reach Unit 5, continue on the B-1000 for 0.4 miles.

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Timber Sale Cruise Report Broke

Sale Name: BROKE

Sale Type: LUMP SUM

Region: SO PUGET

District: BLACK HILLS

Lead Cruiser: Alan Douglas

Other Cruisers: Aaron Coleman

Cruise Narrative:

This sale consists of 5 variable retention harvest (VRH) units located along the B-1000 road in the Capitol State Forest. No keys were need for access. Many of the roads were in need of post-haul maintenance due to various other harvest activities at the time of this cruise.

The primary species for this sale is:

Douglas-fir (66%) with an average diameter of 18 inches.

Western hemlock (22%) with an average diameter of 17 inches.

Noble fir (6%) with an average diameter of 18 inches.

Unit 1 is vastly different in species composition, age and stand structure compared to units 2 - 5. Unit 1 is an older "mixed bag" DF/WH cohort with RC spread throughout. Units 2 - 5 are mostly thinned DF with a smattering of NF. "Natural DF poles," which were captured on VP plots, are present in each unit; while some "natural RC poles" were cruised in Unit 1.

This is a mix of shovel and cable ground along a mainline road. Most commonly observed defect was broken/forked tops, crooks and frost check.

edited on 5/22/2024 by AC: changed cruise acres

Timber Sale Notice Volume (MBF)

Sp	DBH	Rings/In	Age	MBF Volume by Grade				
				All	2 Saw	3 Saw	4 Saw	Utility
DF	18.7	8.0		4,704	2,504	1,799	389	11
WH	17.0			1,550	884	565	102	
NF	18.1			451	305	115	31	
RC	13.4			184		114	70	
RA	13.5			131	23	32	76	
ALL	17.0	8.0		7,020	3,716	2,625	668	11

Timber Sale Notice Weight (tons)

Sp	Tons by Grade				
	All	2 Saw	3 Saw	4 Saw	Utility
DF	36,143	17,090	15,334	3,649	71
WH	13,662	7,033	5,531	1,098	
NF	3,463	2,119	1,061	284	

Tons by Grade					
Sp	All	2 Saw	3 Saw	4 Saw	Utility
RC	1,661		1,078	583	
RA	1,076	162	231	683	
ALL	56,005	26,404	23,234	6,297	71

Timber Sale Overall Cruise Statistics

BA (sq ft/acre)	BA SE (%)	V-BAR (bf/sq ft)	V-BAR SE (%)	Net Vol (bf/acre)	Vol SE (%)
259.4	3.0	139.8	1.7	36,851	3.6

Timber Sale Unit Cruise Design

Unit	Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
BROKE U1	B1C: VR, 1 BAF (54.44) Measure/Count Plots, Sighting Ht = 4.5 ft	73.4	77.6	51	26	0
BROKE U2	B1C: VR, 1 BAF (54.44) Measure/Count Plots, Sighting Ht = 4.5 ft	54.8	57.6	39	19	0
BROKE U3	B1C: VR, 1 BAF (54.44) Measure/Count Plots, Sighting Ht = 4.5 ft	8.9	9.2	10	7	1
BROKE U4	B1C: VR, 1 BAF (54.44) Measure/Count Plots, Sighting Ht = 4.5 ft	37.3	40.9	27	14	0
BROKE U5	B1C: VR, 1 BAF (54.44) Measure/Count Plots, Sighting Ht = 4.5 ft	16.1	17.0	18	12	0
All		190.5	202.2	145	78	1

Timber Sale Log Grade x Sort Summary

Sp	Status	Grade	Sort	Dia	Len	BF Gross	BF Net	Defect %	Tons	MBF Net
DF	LIVE	2 SAW	Domestic	16.7	40	8,312	7,941	4.5	10,088.2	1,512.8
DF	LIVE	2 SAW	HQ-B	14.5	40	4,666	4,572	2.0	6,153.6	870.9
DF	LIVE	2 SAW	Pole	13.6	40	634	634	0.0	848.0	120.7
DF	LIVE	3 SAW	Domestic	8.5	38	5,052	4,931	2.4	8,562.2	939.3
DF	LIVE	3 SAW	HQ-B	9.8	40	3,872	3,853	0.5	5,790.7	733.9
DF	LIVE	3 SAW	Pole	9.3	40	661	661	0.0	980.7	126.0
DF	LIVE	4 SAW	Domestic	5.6	29	2,074	2,041	1.6	3,648.7	388.7
DF	LIVE	CULL	Cull	6.5	7	76	0	100.0	0.0	0.0
DF	LIVE	UTILITY	Pulp	5.0	17	60	60	0.0	70.8	11.4
NF	LIVE	2 SAW	Domestic	16.2	40	1,747	1,600	8.4	2,118.6	304.7
NF	LIVE	3 SAW	Domestic	8.7	39	627	605	3.5	1,060.6	115.2

Sp	Status	Grade	Sort	Dia	Len	BF Gross	BF Net	Defect %	Tons	MBF Net
NF	LIVE	4 SAW	Domestic	6.0	28	176	164	6.7	284.2	31.2
NF	LIVE	CULL	Cull	8.2	6	10	0	100.0	0.0	0.0
RA	LIVE	2 SAW	Domestic	13.5	30	126	120	4.7	162.1	22.8
RA	LIVE	3 SAW	Domestic	10.7	32	171	168	1.5	230.9	32.1
RA	LIVE	4 SAW	Domestic	7.1	27	415	397	4.4	682.6	75.7
RA	LIVE	CULL	Cull	5.0	7	10	0	100.0	0.0	0.0
RC	LIVE	3 SAW	Domestic	9.8	36	395	366	7.3	721.8	69.8
RC	LIVE	3 SAW	Pole	12.9	33	231	231	0.0	356.4	44.0
RC	LIVE	4 SAW	Domestic	5.5	24	338	335	0.8	517.1	63.9
RC	LIVE	4 SAW	Pole	7.1	19	34	34	0.0	65.5	6.5
RC	LIVE	CULL	Cull	17.1	5	56	0	100.0	0.0	0.0
WH	LIVE	2 SAW	Domestic	14.6	40	4,877	4,642	4.8	7,033.1	884.3
WH	LIVE	3 SAW	Domestic	8.7	39	3,063	2,963	3.2	5,530.6	564.5
WH	LIVE	4 SAW	Domestic	5.6	27	555	533	4.0	1,098.4	101.5
WH	LIVE	CULL	Cull	7.2	7	17	0	100.0	0.0	0.0

Timber Sale Log Sort x Diameter Bin Summary

Sp	Bin	Status	Sort	Dia	Len	BF Net	Defect %	Tons	MBF Net
DF	5 - 7	LIVE	Pulp	5.0	17	60	0.0	70.8	11.4
DF	5 - 7	LIVE	Cull	5.6	7	0	100.0	0.0	0.0
DF	5 - 7	LIVE	Domestic	6.0	32	3,745	1.5	6,698.4	713.5
DF	5 - 7	LIVE	Pole	7.0	40	60	0.0	90.8	11.5
DF	8 - 11	LIVE	Cull	8.3	5	0	100.0	0.0	0.0
DF	8 - 11	LIVE	Domestic	9.6	37	3,180	2.9	5,448.1	605.9
DF	8 - 11	LIVE	Pole	9.6	40	601	0.0	889.9	114.5
DF	8 - 11	LIVE	HQ-B	9.9	40	3,853	0.5	5,790.7	733.9
DF	12 - 15	LIVE	HQ-B	13.3	40	3,062	1.1	4,333.0	583.3
DF	12 - 15	LIVE	Domestic	13.7	40	2,904	3.0	4,268.5	553.1
DF	12 - 15	LIVE	Pole	13.7	40	634	0.0	848.0	120.7
DF	12 - 15	LIVE	Cull	14.0	4	0	100.0	0.0	0.0
DF	16 - 19	LIVE	Domestic	17.5	40	2,190	2.7	2,639.6	417.2
DF	16 - 19	LIVE	HQ-B	17.5	40	1,395	4.1	1,691.4	265.7
DF	20+	LIVE	HQ-B	21.7	40	115	0.0	129.1	21.9
DF	20+	LIVE	Domestic	22.5	40	2,893	7.0	3,244.5	551.2
NF	5 - 7	LIVE	Domestic	5.9	31	311	4.3	542.4	59.2
NF	5 - 7	LIVE	Cull	7.3	10	0	100.0	0.0	0.0
NF	8 - 11	LIVE	Cull	8.9	4	0	100.0	0.0	0.0

Sp	Bin	Status	Sort	Dia	Len	BF Net	Defect %	Tons	MBF Net
NF	8 - 11	LIVE	Domestic	10.0	36	458	4.1	802.4	87.3
NF	12 - 15	LIVE	Domestic	13.7	40	610	8.1	899.2	116.2
NF	16 - 19	LIVE	Domestic	17.9	40	732	3.3	873.6	139.4
NF	20+	LIVE	Domestic	21.5	40	258	21.1	345.8	49.1
RA	5 - 7	LIVE	Cull	5.0	7	0	100.0	0.0	0.0
RA	5 - 7	LIVE	Domestic	5.9	26	173	4.8	306.0	32.9
RA	8 - 11	LIVE	Domestic	9.6	30	393	3.0	607.5	74.8
RA	12 - 15	LIVE	Domestic	13.5	30	120	4.7	162.1	22.8
RC	5 - 7	LIVE	Cull	5.0	11	0	100.0	0.0	0.0
RC	5 - 7	LIVE	Domestic	5.5	25	341	0.7	538.8	65.0
RC	5 - 7	LIVE	Pole	7.1	19	34	0.0	65.5	6.5
RC	8 - 11	LIVE	Domestic	9.5	35	263	5.7	516.8	50.0
RC	12 - 15	LIVE	Domestic	12.9	36	98	11.7	183.3	18.6
RC	12 - 15	LIVE	Pole	12.9	33	231	0.0	356.4	44.0
RC	16 - 19	LIVE	Cull	19.5	2	0	100.0	0.0	0.0
RC	20+	LIVE	Cull	23.2	3	0	100.0	0.0	0.0
WH	5 - 7	LIVE	Domestic	6.1	32	1,421	2.3	2,860.2	270.6
WH	5 - 7	LIVE	Cull	6.6	8	0	100.0	0.0	0.0
WH	8 - 11	LIVE	Cull	8.2	5	0	100.0	0.0	0.0
WH	8 - 11	LIVE	Domestic	10.1	38	2,076	4.1	3,768.8	395.4
WH	12 - 15	LIVE	Domestic	13.7	40	2,837	5.4	4,542.7	540.5
WH	16 - 19	LIVE	Domestic	17.3	40	1,805	4.0	2,490.4	343.8

Cruise Unit Report BROKE U1

Unit Sale Notice Volume (MBF): BROKE U1

Sp	DBH	Rings/In	Age	MBF Volume by Grade			
				All	2 Saw	3 Saw	4 Saw
DF	22.0	8.0		1,738	1,405	281	52
WH	17.0			1,550	884	565	102
RC	13.4			184		114	70
RA	13.5			131	23	32	76
NF	13.9			48	17	25	6
ALL	17.0	8.0		3,651	2,329	1,017	306

Unit Cruise Design: BROKE U1

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B1C: VR, 1 BAF (54.44) Measure/Count Plots, Sighting Ht = 4.5 ft	73.4	77.6	51	26	0

Unit Cruise Summary: BROKE U1

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	57	110	2.2	1
WH	58	133	2.6	0
RC	20	36	0.7	0
RA	15	16	0.3	0
NF	4	4	0.1	0
ALL	154	299	5.9	1

Unit Cruise Statistics: BROKE U1

Sp	BA (sq ft/acre)	BA CV (%)	BA SE (%)	V-BAR (bf/sq ft)	V-BAR CV (%)	V-BAR SE (%)	Net Vol (bf/acre)	Vol CV (%)	Vol SE (%)
DF	117.4	76.1	10.7	201.7	21.9	2.9	23,684	79.2	11.0
WH	142.0	80.1	11.2	148.8	30.3	4.0	21,122	85.6	11.9
RC	38.4	163.5	22.9	65.3	24.6	5.5	2,510	165.3	23.5
RA	17.1	288.6	40.4	104.1	22.2	5.7	1,779	289.4	40.8
NF	4.3	714.1	100.0	152.7	31.8	15.9	652	714.9	101.3
ALL	319.2	35.1	4.9	155.9	39.1	3.2	49,747	52.6	5.8

Unit Summary: BROKE U1

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	57	ALL	22.0	92	114	24,718	23,684	4.2	44.5	117.4	25.0	1,738.4
NF	LIVE	CUT	4	ALL	13.9	74	94	652	652	0.0	4.1	4.3	1.1	47.9
RA	LIVE	CUT	15	ALL	13.5	60	77	1,875	1,779	5.1	17.2	17.1	4.6	130.6
RC	LIVE	CUT	20	ALL	13.4	44	55	2,737	2,510	8.3	39.2	38.4	10.5	184.2
WH	LIVE	CUT	58	ALL	17.0	75	94	22,091	21,122	4.4	90.1	142.0	34.4	1,550.3
ALL	LIVE	CUT	154	ALL	17.3	71	89	52,073	49,747	4.5	195.1	319.2	75.8	3,651.4
ALL	ALL	ALL	154	ALL	17.3	71	89	52,073	49,747	4.5	195.1	319.2	75.8	3,651.4

DRAFT

Cruise Unit Report BROKE U2

Unit Sale Notice Volume (MBF): BROKE U2

Sp	DBH	Rings/In	Age	MBF Volume by Grade			
				All	2 Saw	3 Saw	4 Saw
DF	16.2			1,575	473	892	210
NF	23.8			108	83	20	5
ALL	16.7			1,683	556	912	216

Unit Cruise Design: BROKE U2

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B1C: VR, 1 BAF (54.44) Measure/Count Plots, Sighting Ht = 4.5 ft	54.8	57.5	39	19	0

Unit Cruise Summary: BROKE U2

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	66	153	3.9	0
NF	7	7	0.2	0
ALL	73	160	4.1	0

Unit Cruise Statistics: BROKE U2

Sp	BA (sq ft/acre)	BA CV (%)	BA SE (%)	V-BAR (bf/sq ft)	V-BAR CV (%)	V-BAR SE (%)	Net Vol (bf/acre)	Vol CV (%)	Vol SE (%)
DF	213.6	38.1	6.1	134.6	20.6	2.5	28,741	43.3	6.6
NF	9.8	458.6	73.4	202.4	17.5	6.6	1,978	458.9	73.7
ALL	223.3	32.5	5.2	137.5	25.2	2.9	30,719	41.1	6.0

Unit Summary: BROKE U2

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	66	ALL	16.2	82	102	29,136	28,741	1.4	149.2	213.6	53.1	1,575.0
NF	LIVE	CUT	7	ALL	23.8	99	127	2,106	1,978	6.1	3.2	9.8	2.0	108.4
ALL	LIVE	CUT	73	ALL	16.4	82	103	31,242	30,719	1.7	152.4	223.3	55.1	1,683.4
ALL	ALL	ALL	73	ALL	16.4	82	103	31,242	30,719	1.7	152.4	223.3	55.1	1,683.4

Cruise Unit Report BROKE U3

Unit Sale Notice Volume (MBF): BROKE U3

Sp	DBH	Rings/In	Age	MBF Volume by Grade			
				All	2 Saw	3 Saw	4 Saw
DF	17.8			219	117	88	14
NF	16.6			28	17	10	1
ALL	17.6			247	135	98	15

Unit Cruise Design: BROKE U3

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B1C: VR, 1 BAF (54.44) Measure/Count Plots, Sighting Ht = 4.5 ft	8.9	9.2	10	7	1

Unit Cruise Summary: BROKE U3

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	21	32	3.2	0
NF	4	4	0.4	0
ALL	25	36	3.6	0

Unit Cruise Statistics: BROKE U3

Sp	BA (sq ft/acre)	BA CV (%)	BA SE (%)	V-BAR (bf/sq ft)	V-BAR CV (%)	V-BAR SE (%)	Net Vol (bf/acre)	Vol CV (%)	Vol SE (%)
DF	174.2	46.1	14.6	141.3	20.9	4.6	24,611	50.6	15.3
NF	21.8	210.8	66.7	145.5	7.1	3.5	3,169	210.9	66.8
ALL	196.0	49.3	15.6	141.7	19.2	3.8	27,780	53.0	16.1

Unit Summary: BROKE U3

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	21	ALL	17.8	81	102	25,001	24,611	1.6	100.8	174.2	41.3	219.0
NF	LIVE	CUT	4	ALL	16.6	79	100	3,874	3,169	18.2	14.5	21.8	5.3	28.2
ALL	LIVE	CUT	25	ALL	17.7	81	102	28,875	27,780	3.8	115.3	196.0	46.6	247.2
ALL	ALL	ALL	25	ALL	17.7	81	102	28,875	27,780	3.8	115.3	196.0	46.6	247.2

Cruise Unit Report BROKE U4

Unit Sale Notice Volume (MBF): BROKE U4

Sp	DBH	Rings/In	Age	MBF Volume by Grade				
				All	2 Saw	3 Saw	4 Saw	Utility
DF	17.7			818	404	341	66	7
NF	16.8			224	168	44	12	
ALL	17.6			1,042	572	385	78	7

Unit Cruise Design: BROKE U4

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B1C: VR, 1 BAF (54.44) Measure/Count Plots, Sighting Ht = 4.5 ft	37.3	40.9	27	14	0

Unit Cruise Summary: BROKE U4

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	52	91	3.4	0
NF	8	22	0.8	0
ALL	60	113	4.2	0

Unit Cruise Statistics: BROKE U4

Sp	BA (sq ft/acre)	BA CV (%)	BA SE (%)	V-BAR (bf/sq ft)	V-BAR CV (%)	V-BAR SE (%)	Net Vol (bf/acre)	Vol CV (%)	Vol SE (%)
DF	183.5	44.4	8.6	119.4	20.7	2.9	21,917	49.0	9.0
NF	44.4	140.5	27.0	135.7	29.1	10.3	6,017	143.5	28.9
ALL	227.8	32.5	6.3	122.6	22.3	2.9	27,934	39.4	6.9

Unit Summary: BROKE U4

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	52	ALL	17.7	69	89	22,519	21,917	2.7	107.4	183.5	43.6	817.5
NF	LIVE	CUT	8	ALL	16.8	54	78	6,581	6,017	8.6	28.8	44.4	10.8	224.4
ALL	LIVE	CUT	60	ALL	17.5	66	87	29,100	27,934	4.0	136.2	227.8	54.4	1,041.9
ALL	ALL	ALL	60	ALL	17.5	66	87	29,100	27,934	4.0	136.2	227.8	54.4	1,041.9

Cruise Unit Report BROKE U5

Unit Sale Notice Volume (MBF): BROKE U5

Sp	DBH	Rings/In	Age	MBF Volume by Grade				
				All	2 Saw	3 Saw	4 Saw	Utility
DF	16.1			354	106	197	47	4
NF	16.3			42	19	17	6	
ALL	16.1			396	125	214	53	4

Unit Cruise Design: BROKE U5

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B1C: VR, 1 BAF (54.44) Measure/Count Plots, Sighting Ht = 4.5 ft	16.1	17.0	18	12	0

Unit Cruise Summary: BROKE U5

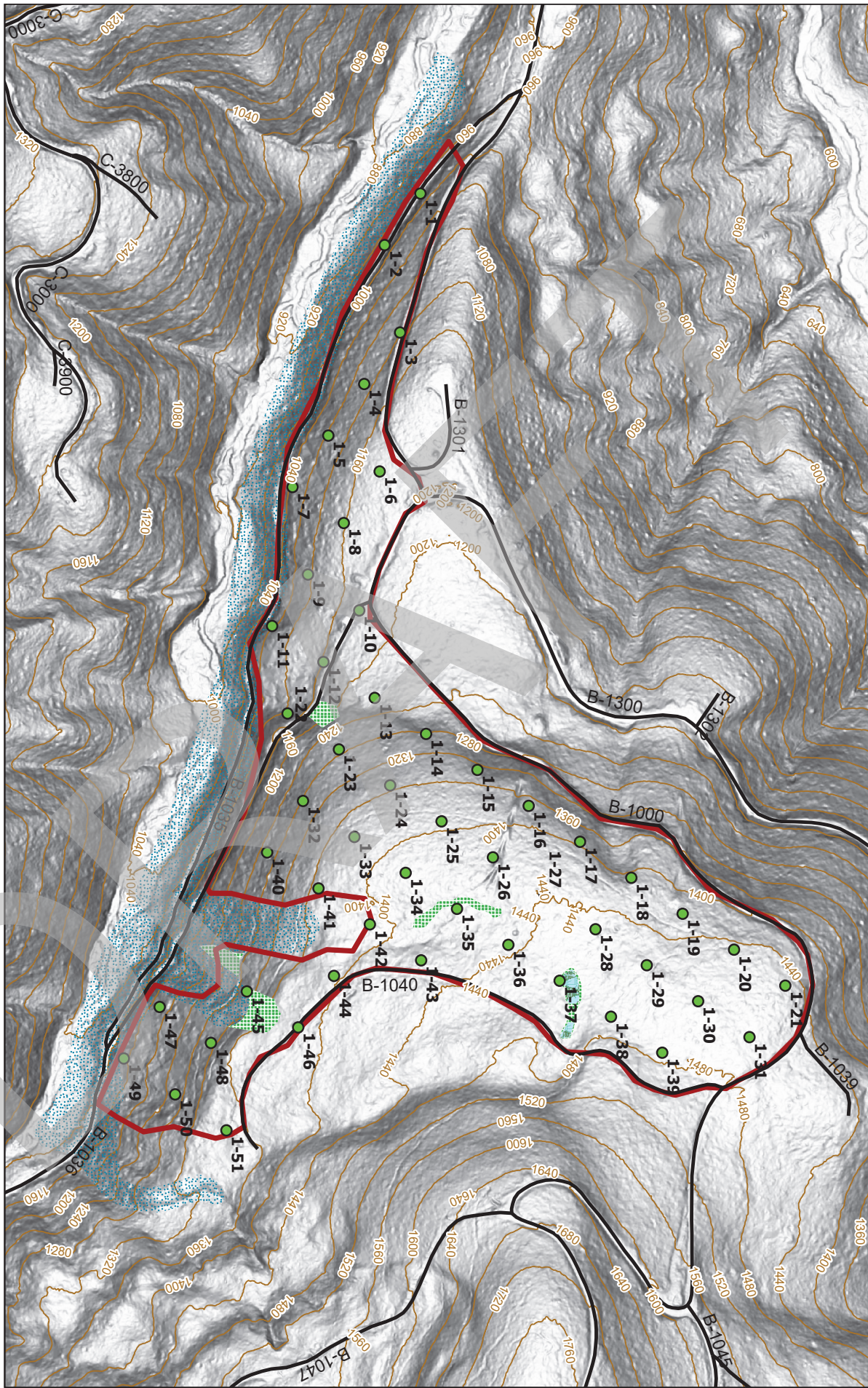
Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	45	64	3.6	0
NF	8	8	0.4	0
ALL	53	72	4.0	0

Unit Cruise Statistics: BROKE U5

Sp	BA (sq ft/acre)	BA CV (%)	BA SE (%)	V-BAR (bf/sq ft)	V-BAR CV (%)	V-BAR SE (%)	Net Vol (bf/acre)	Vol CV (%)	Vol SE (%)
DF	193.6	32.3	7.6	113.5	23.8	3.5	21,977	40.1	8.4
NF	24.2	280.6	66.1	108.6	19.3	6.8	2,626	281.3	66.5
ALL	217.8	30.9	7.3	113.0	23.1	3.2	24,603	38.6	7.9

Unit Summary: BROKE U5

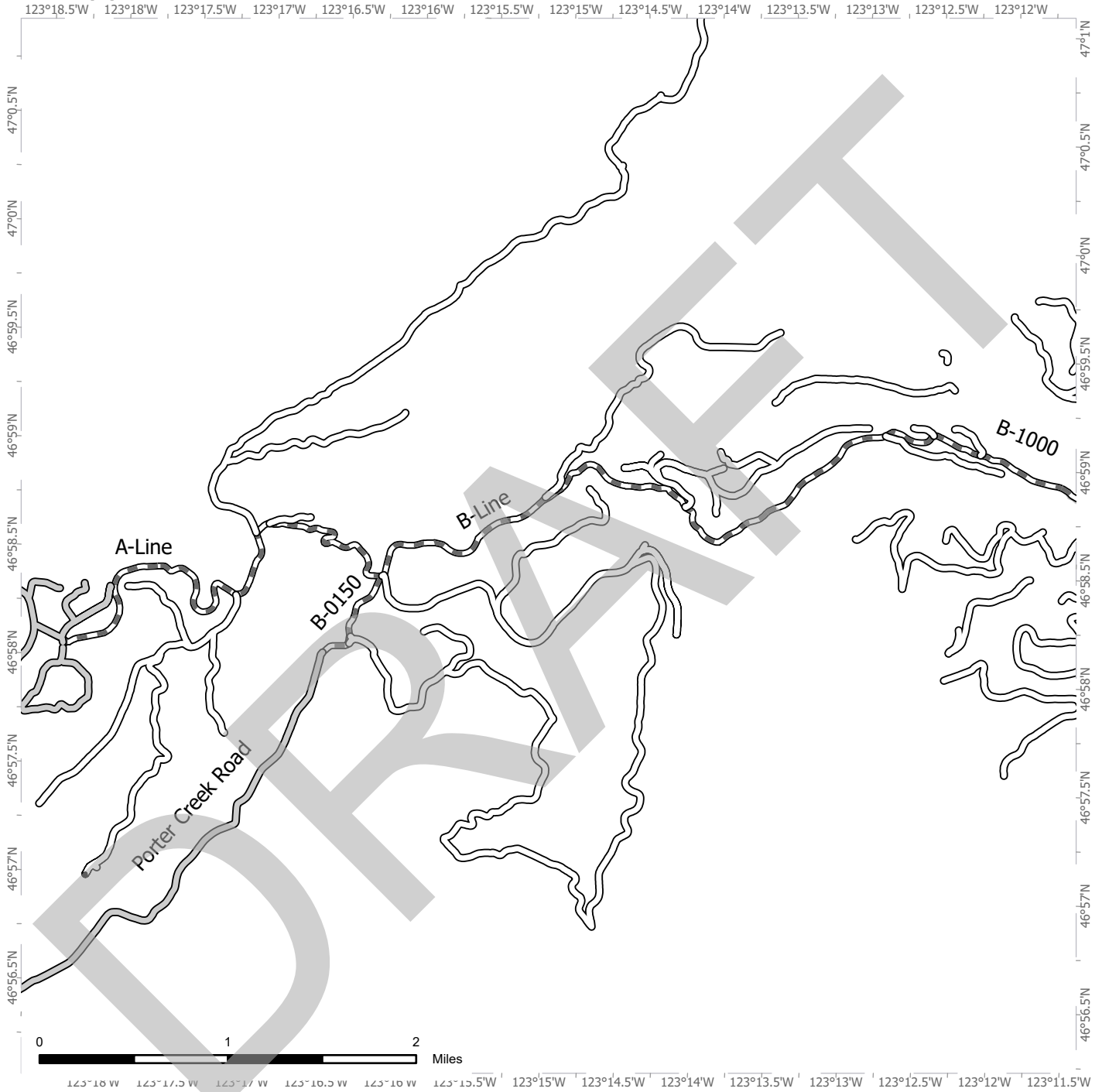
Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	45	ALL	16.1	64	84	22,778	21,977	3.5	136.9	193.6	48.2	353.8
NF	LIVE	CUT	8	ALL	16.3	59	77	2,747	2,626	4.4	16.7	24.2	6.0	42.3
ALL	LIVE	CUT	53	ALL	16.1	64	83	25,526	24,603	3.6	153.6	217.8	54.2	396.1
ALL	ALL	ALL	53	ALL	16.1	64	83	25,526	24,603	3.6	153.6	217.8	54.2	396.1




ROAD PLAN MAP 1 OF 6

SALE NAME: BROKE
AGREEMENT#: 30-105211
TOWNSHIP(S): T17R4W
TRUST(S): Charitable/Educational/Penal & Reformatory Instit. (6), Common School and Indemnity (3), Scientific School (10), State Forest Purchase (2)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 1000-2520



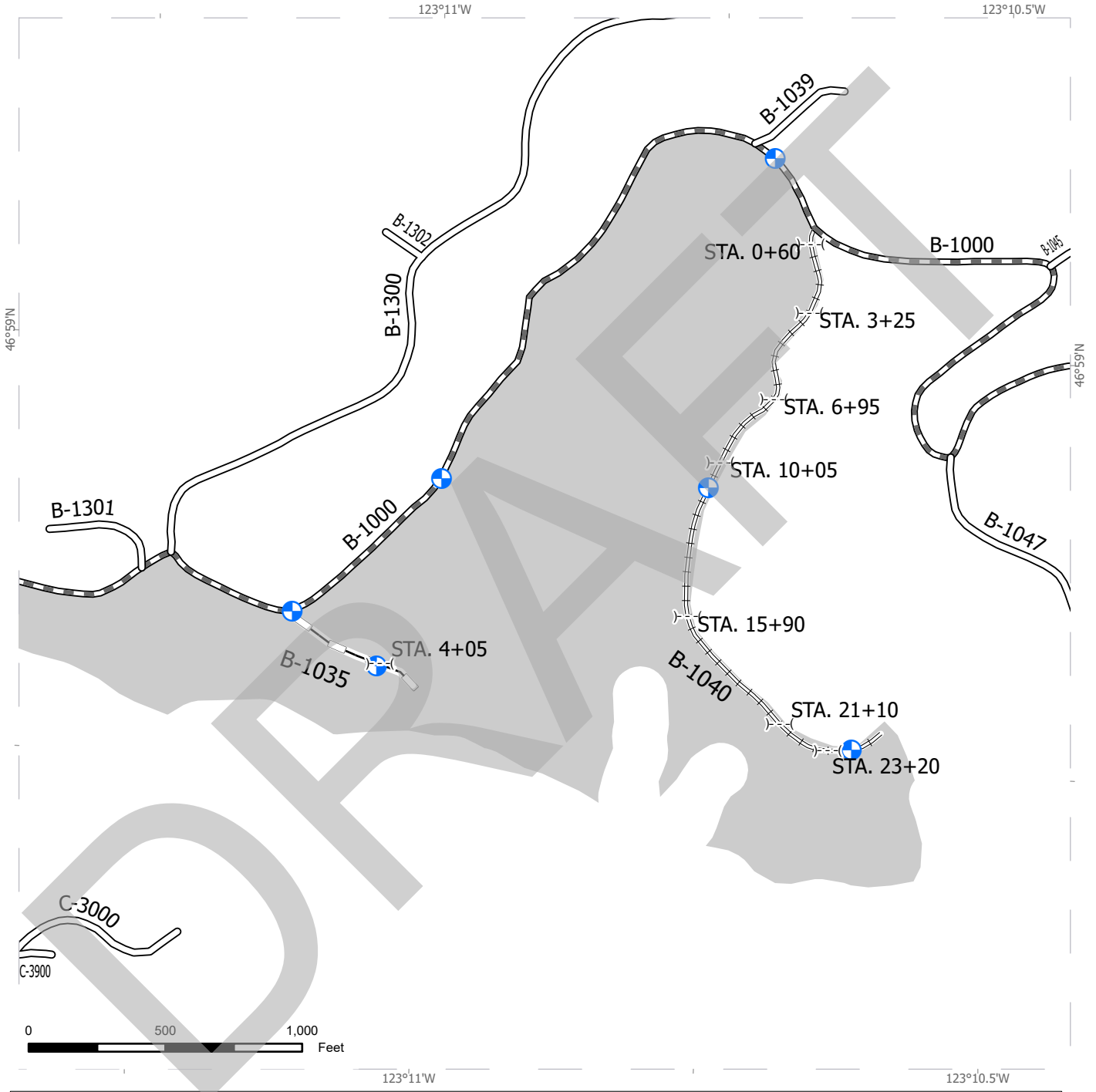
	County Road
	Existing Roads
	Required Pre-Haul Maintenance



ROAD PLAN MAP 2 OF 6

SALE NAME: BROKE
AGREEMENT #: 30-105211
TOWNSHIP(S): T17R4W
TRUST(S): Charitable/Educational/Penal & Reformatory Instit. (6), Common School and Indemnity (3), Scientific School (10), State Forest Purchase (2)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 1000-2520

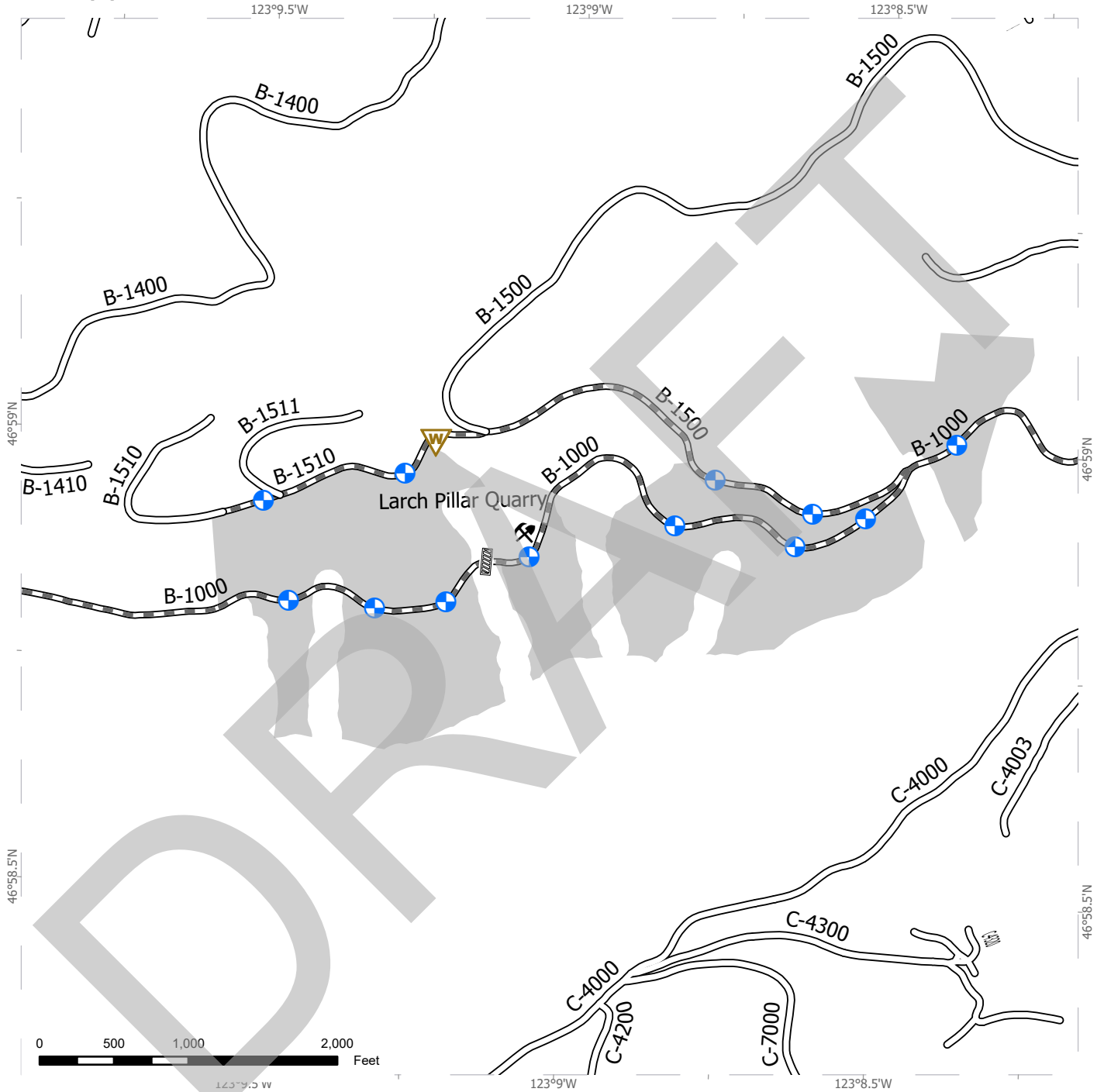


Existing Roads	Landing - Proposed	Harvest Unit
Required Pre-Haul Maintenance	Cross Drain	
Required Reconstruction		
Optional Reconstruction		

ROAD PLAN MAP 3 OF 6

SALE NAME: BROKE
AGREEMENT#: 30-105211
TOWNSHIP(S): T17R4W
TRUST(S): Charitable/Educational/Penal & Reformatory Instit. (6), Common School and Indemnity (3), Scientific School (10), State Forest Purchase (2)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 1000-2520



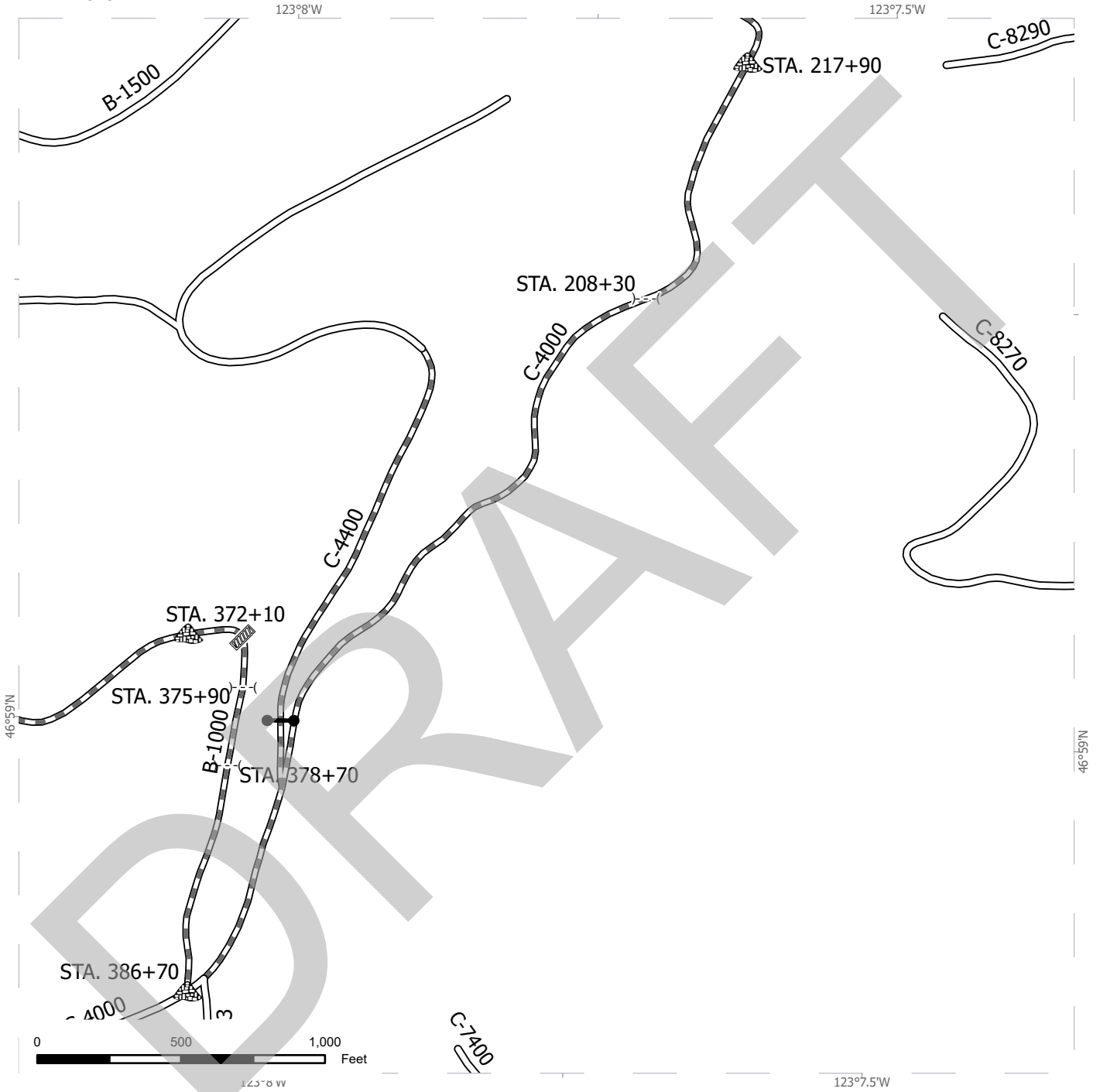
Harvest Unit	Culvert
Existing Roads	Rock Pit
Required Pre-Haul Maintenance	Landing - Proposed
	Waste Area



ROAD PLAN MAP 4 OF 6

SALE NAME: BROKE
AGREEMENT #: 30-105211
TOWNSHIP(S): T17R4W
TRUST(S): Charitable/Educational/Penal & Reformatory Instit. (6), Common School and Indemnity (3), Scientific School (10), State Forest Purchase (2)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 1000-2520



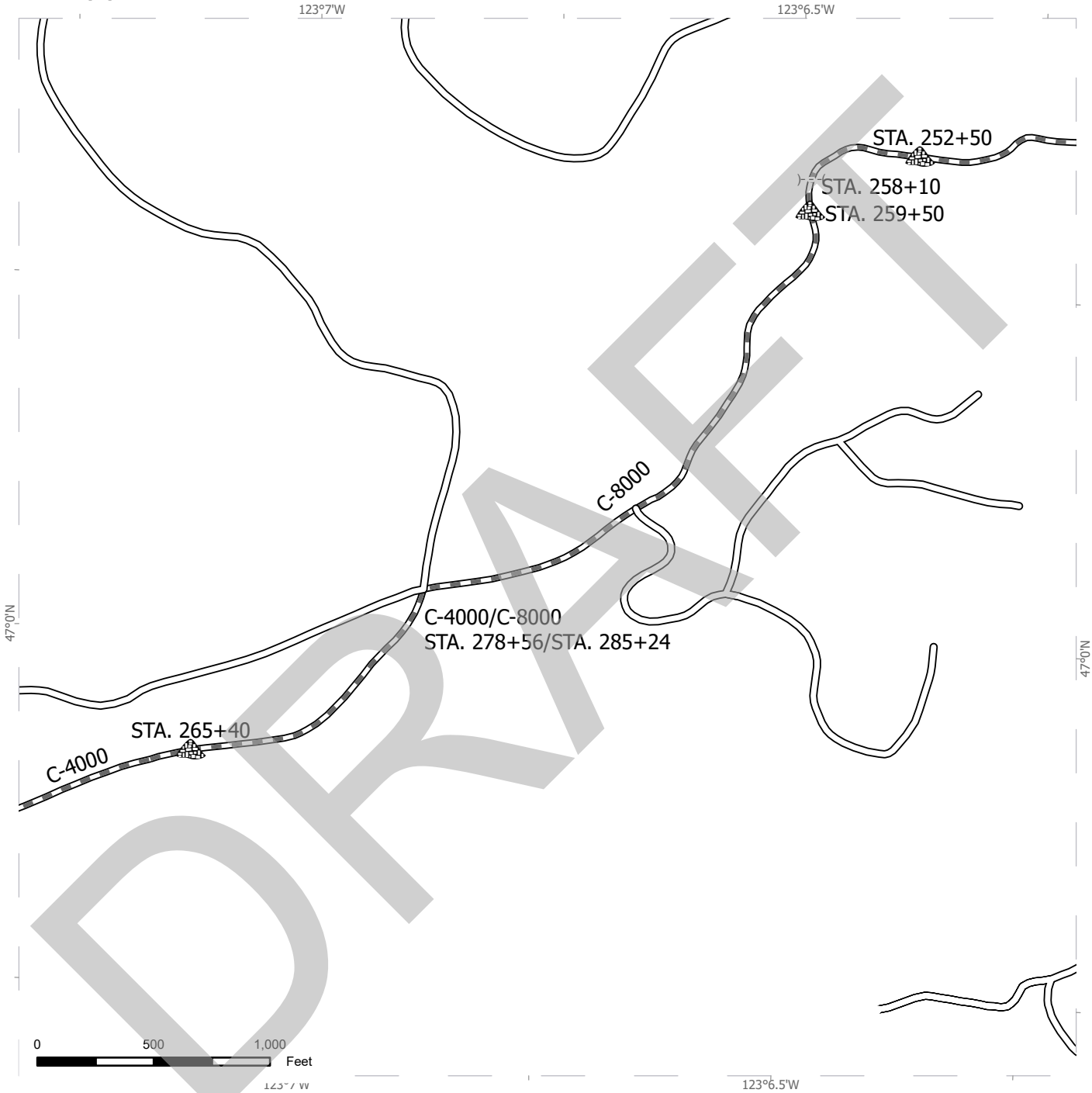
Existing Roads	Culvert
Required Pre-Haul Maintenance	Gate
Rock Start OR Stop	
Cross Drain	



ROAD PLAN MAP 5 OF 6

SALE NAME: BROKE
AGREEMENT#: 30-105211
TOWNSHIP(S): T17R4W
TRUST(S): Charitable/Educational/Penal & Reformatory Instit. (6), Common School and Indemnity (3), Scientific School (10), State Forest Purchase (2)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 1000-2520



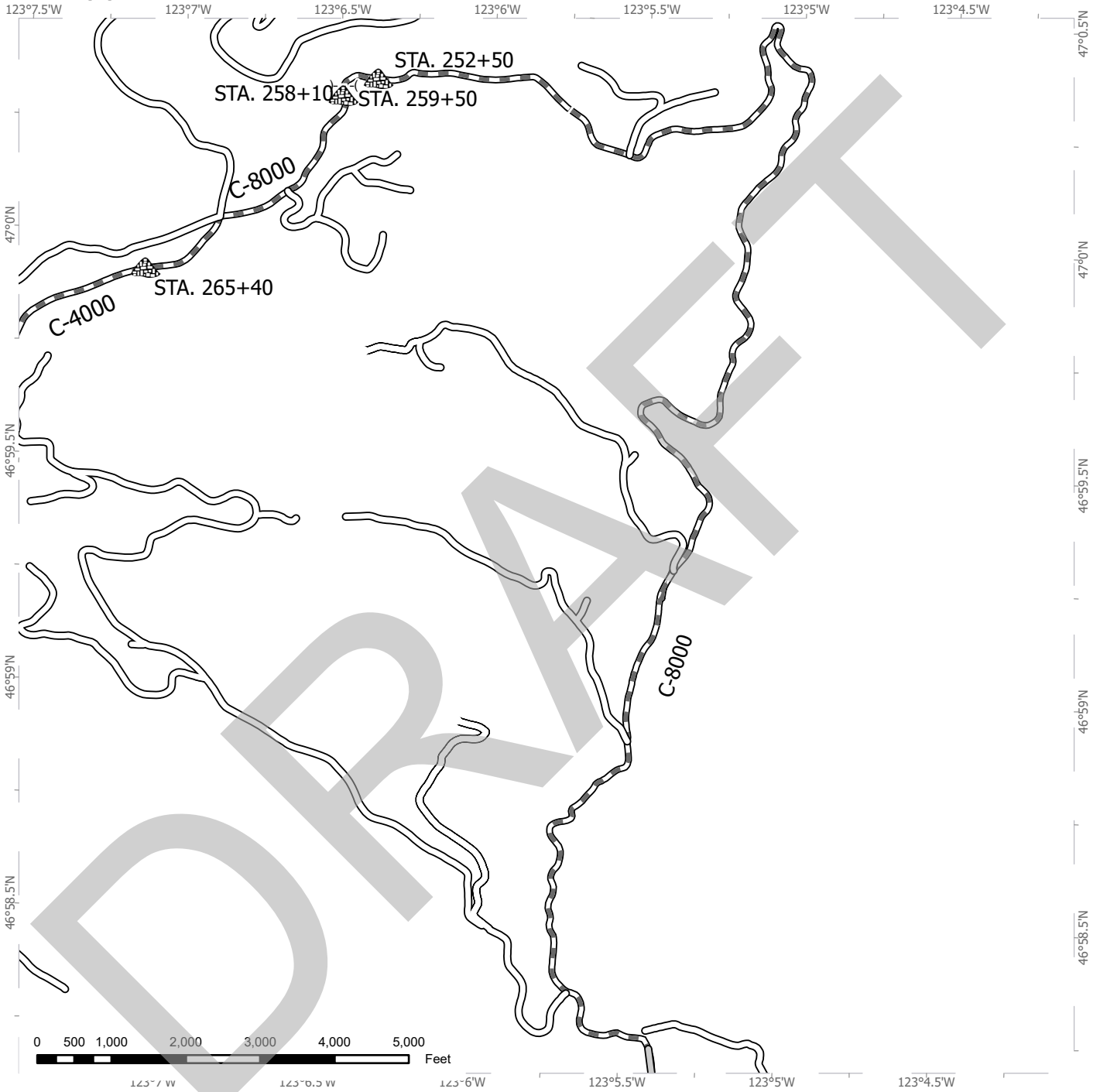
Existing Roads	Rock Start OR Stop
Required Pre-Haul Maintenance	Cross Drain



ROAD WORK MAP 6 OF 6

SALE NAME: BROKE
AGREEMENT #: 30-105211
TOWNSHIP(S): T17R4W
TRUST(S): Charitable/Educational/Penal & Reformatory Instit. (6), Common School and Indemnity (3), Scientific School (10), State Forest Purchase (2)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 1000-2520



County Road	Rock Start OR Stop
Existing Roads	Cross Drain
Required Pre-Haul Maintenance	



STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

BROKE TIMBER SALE ROAD PLAN
THURSTON COUNTY
DELPHI UNIT
BLACK HILLS DISTRICT

AGREEMENT NO.: 30-105211

STAFF ENGINEER: JACOB GROSS

DATE: APRIL 15, 2024

DRAWN & COMPILED BY: JACOB GROSS

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>
A-Line	0+00 to 102+26	Pre-Haul Maintenance
B-Line	0+00 to 109+10	Pre-Haul Maintenance
B-0150	0+00 to 22+58	Pre-Haul Maintenance
B-1000	0+00 to 386+71	Pre-Haul Maintenance
B-1035	0+00 to 5+20	Abandonment, if reconstructed
B-1040	0+00 to 25+31	Reconstruction
B-1500	0+00 to 33+15	Pre-Haul Maintenance
B-1510	0+00 to 19+42	Pre-Haul Maintenance
C-4000	178+82 to 278+56	Pre-Haul Maintenance
C-4400	0+00 to 16+59	Pre-Haul Maintenance
C-8000	0+00 to 285+24	Pre-Haul 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>
B-1035	0+00 to 5+20	Reconstruction

0-5 RECONSTRUCTION

Construction includes, but is not limited to:

- Clearing
- Grubbing
- Right-of-way debris disposal
- Excavation and/or embankment to subgrade
- Turnout and turnaround construction
- Cross Drain Installation
- Landing construction
- Acquisition, manufacture, and application of rock

0-6 PRE-HAUL MAINTENANCE

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

- Cleaning ditches
- Cleaning culverts, and catchbasins
- Ditch reconstruction
- Reconstructing headwalls
- Constructing catchbasin and headwall
- Acquisition, manufacture and application of rock
- Cross drain culvert replacement/installation
- Grading and shaping existing road surface and turnouts
- Stream Crossing Replacement

0-7 POST-HAUL MAINTENANCE

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

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 may involve, Clearing, Stripping, Drilling, and blasting. 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 Plan Maps.

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

1-8 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.

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:

- 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.

<u>Road</u>	<u>Type</u>
Reconstruction	Reference Points
Pre-Haul Maintenance	Construction Stakes

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

On the following road(s), Purchaser shall complete road work by the specified date and before the start of timber haul.

<u>Road</u>	<u>Comments</u>
All pre-haul maintenance	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.

1-23 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. The operation of road construction equipment is also not allowed on weekends or state recognized holidays, unless authorized in writing by the Contract Administrator

<u>Activity</u>	<u>Closure Period</u>
All road work activities	November 1 to April 30

1-26 OPERATING DURING CLOSURE PERIOD

If permission is granted to operate during a seasonal closure period listed in Clause 1-25 ACTIVITY TIMING RESTRICTION and Contract Clause H-130, the Purchaser shall comply with a maintenance plan, when a plan is determined necessary by the Contract Administrator, 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 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.

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 Contract 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. Known utilities are listed, but it is the Purchaser’s responsibility to identify any utilities not listed. 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>	<u>Utility</u>	<u>Utility Contact</u>
C-4000	178+82 to 186+00	Power	Dial 811
C-4400	0+00 to 16+59	Power	Dial 811

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.

2-5 MAINTENANCE GRADING – EXISTING ROAD

On the following roads, Purchaser shall use a grader to shape the existing surface before rock application and/or timber haul.

<u>Road</u>	<u>Stations</u>
A-Line	0+00 to 102+26
B-Line	0+00 to 109+10
B-0150	0+00 to 22+58
B-1000	0+00 to 386+71
B-1500	0+00 to 33+15
B-1510	0+00 to 19+42
C-4000	178+82 to 278+56
C-4400	0+00 to 16+59
C-8000	0+00 to 285+24

2-7 CLEANING DITCHES, HEADWALLS, AND CATCH BASINS

On the following road(s), Purchaser shall clean ditches, headwalls, and catchbasins. Work must be completed before timber haul and must be done in accordance with the TYPICAL SECTION SHEET. Pulling ditch material across the road or mixing in with the road surface is not allowed.

<u>Road</u>	<u>Stations</u>
C-8000	252+50 to 256+50

SUBSECTION CLEARING

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 state owned standing trees.

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 State owned 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 6% in 100 feet.
- Maximum grade change for crest vertical curves is 4% in 100 feet.

4-5 CUT SLOPE RATIO

Purchaser shall construct excavation slopes no steeper than shown on the following table, unless construction staked or designed:

<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 feet for curves of 50 to 79 feet radius.
- 4 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.

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.

4-28 DITCH DRAINAGE

Ditches shall be constructed concurrently with construction of the subgrade. 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 45% if the waste material is compacted and free of organic debris.

4-38 PROHIBITED WASTE DISPOSAL AREAS

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

- Within 25 feet of a cross drain culvert outlet.
- Within 100 feet of a live stream or wetland.
- On side slopes steeper than 45%.
- 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 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 10-24.

5-7 USED CULVERT MATERIAL

On temporary roads, Purchaser may install used culverts. All other roads must have new culverts installed. Culverts must meet the specifications in Clauses 10-15 through 10-24.

5-12 UNUSED MATERIALS STATE PROPERTY

On required roads, any materials listed on the CULVERT AND DRAINAGE 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 Mound Pit, located at 46.888952N, 123.054728W.

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.	Quantity 3 - 18"X30' Culvert Quantity 2 - 18" Culvert band

SUBSECTION CULVERT INSTALLATION

5-15 CULVERT INSTALLATION

Culvert, downspout, flume and energy dissipater 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.

5-16 APPROVAL FOR LARGER CULVERT INSTALLATION

Purchaser shall obtain written approval from the Contract Administrator for the installation of culverts 36 inches in diameter and over before backfilling.

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. QUARRY SPALLS shall meet the specifications in Clause 6-43.

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

Purchaser shall place inlet and outlet protection 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 CULVERT LIST. Rock may not restrict the flow of water into culvert inlets or catch basins. Rock must be set in place by machine. Placement must be by zero-drop-height method only.

5-33 NATIVE SURFACE ROADS

If overwintered, native surface roads must be waterbarred by November 1. Purchaser shall construct waterbars according to the attached DRIVABLE WATERBAR DETAIL at a maximum spacing that will produce a vertical distance of no more than 10 feet between waterbars or between natural drainage paths, and with a maximum spacing of 300 feet.

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 5 calendar days before starting any operations in the listed locations.

<u>Source</u>	<u>Location</u>	<u>Rock Type</u>
Larch Pillar Quarry	SW ¼, Sec. 2, T17N, R04 W	2 ½ Inch Crushed, 4 Inch Jaw, 4 Inch In-Place, Select Pit Run, Quarry Spalls.

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 5 calendar days before starting any operations in the rock source.

<u>Source</u>	<u>Location</u>
Larch Pillar Quarry	SW ¼, Sec. 2, T17N, R04 W

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 at the end of operations.

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 200 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 5 calendar days before blasting operations.
- Purchaser shall submit an informational drilling and shooting plan to the Contract Administrator 5 calendar 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 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.

6-21 IN-PLACE PROCESSING

Purchaser may use in-place processing, such as a grid roller or other method, if suitable crushing can be demonstrated to meet the surfacing size-specified in Clause 6-38 4-INCH IN-PLACE ROCK. Purchaser shall remove any existing organic debris before the start of in-place crushing operations. The use of in-place processing methods is subject to written approval by the Contract Administrator.

<u>Road</u>	<u>Stations</u>
B-1035	0+00 to 5+20

6-23 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.

SUBSECTION ROCK GRADATIONS

6-32 2 ½ INCH MINUS CRUSHED ROCK

% Passing 2 ½" square sieve	100%
% Passing 1 ¼" square sieve	50 – 85%
% Passing U.S. #4 sieve	30 – 50%
% Passing U.S. #40 sieve	16% maximum
% Passing U.S. #200 sieve	8% maximum

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.

6-38 4-INCH IN-PLACE ROCK

4-inch in-place rock must have a minimum of 90 percent of the top 4 inches of the running surface pass a 4-inch square opening.

In-place rock may not contain more than 5 percent by weight of organic debris and trash. No more than 50 percent of rock may be larger than 6 inches in any dimension and no rock may be larger than 8 inches in any dimension.

6-41 SELECT PIT RUN ROCK

No more than 50 percent of the rock may be larger than 6 inches in any dimension and no rock may be larger than 10 inches in any dimension. Pit Run rock may not contain more than 5 percent by weight of organic debris, 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.

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, the Purchaser may place less rock than shown on the ROCK LIST. The Purchaser shall meet post-haul specifications in Section 9 POST-HAUL ROAD WORK.

<u>Road</u>	<u>Stations</u>
B-1035	0+00 to 5+20

SECTION 9 – POST-HAUL ROAD WORK

SUBSECTION STRUCTURES

9-1 BARRICADES

Purchaser shall construct barricades in accordance with the BARRICADE DETAIL.

<u>Road</u>	<u>Stations</u>
B-1035	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.

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>
B-1000	175+50 to 227+50, 294+30 to 360+00	Ditch along Harvest Units, apply spot rock from rock list as directed by CA
B-1040	0+00 to 25+31	

SUBSECTION POST-HAUL LANDING MAINTENANCE

9-10 LANDING DRAINAGE

Purchaser shall provide for drainage of the landing surface.

SUBSECTION DECOMMISSIONING AND ABANDONMENT

9-21 ROAD ABANDONMENT

If constructed/reconstructed, Purchaser shall abandon the following roads before the termination of this contract.

<u>Road</u>	<u>Stations</u>
B-1035	0+00 to 5+20

9-22 ABANDONMENT

- Remove road shoulder berms except as directed.
- 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 percent 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 ditch cross drain culverts and leave the resulting trench open.
- Remove used culvert material from State Land.
- Construct earth barricade as per clause 9-1 BARRICADES.

SECTION 10 MATERIALS

SUBSECTION CULVERTS

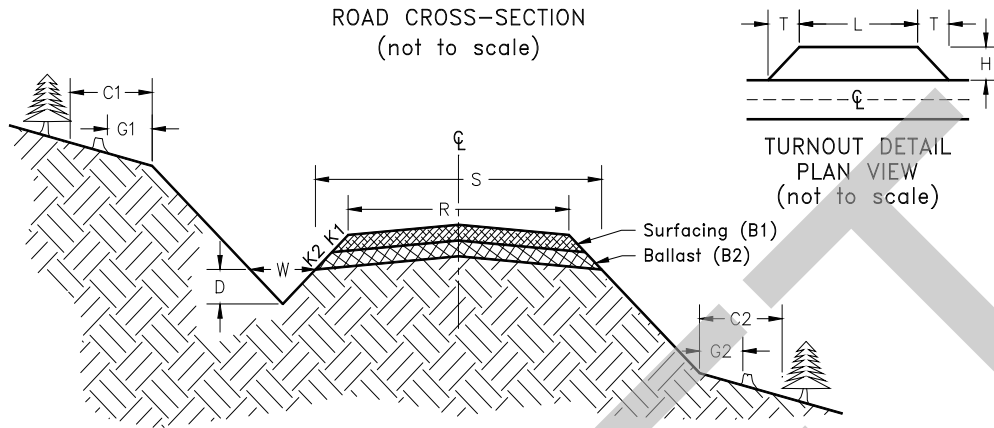
10-17 CORRUGATED PLASTIC CULVERT

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 (pg 1 of 1)



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
A-Line	0+00	102+26	A		14	3	1	4	-	-	-	-	4-5	4-6
B-Line	0+00	109+10	B		12	3	1	4	-	-	-	-	4-5	4-6
B-0150	0+00	22+58	B	16	12	3	1	4	-	-	-	-	4-5	4-6
B-1000	0+00	386+71	B	16	12	3	1	4	-	-	-	-	4-5	4-6
B-1035	0+00	5+20	C	16	12	3	1	4	0	0	0	0	4-5	4-6
B-1040	0+00	25+31	C	16	12	3	1	4	3	3	5	5	4-5	4-6
B-1500	0+00	33+15	B	16	12	3	1	4	-	-	-	-	4-5	4-6
B-1510	0+00	19+42	B	16	12	3	1	4	-	-	-	-	4-5	4-6
C-4000	178+82	278+56	B	16	12	3	1	4	-	-	-	-	4-5	4-6
C-4400	0+00	16+59	B	16	12	3	1	4	-	-	-	-	4-5	4-6
C-8000	0+00	285+24	B	16	12	3	1	4	-	-	-	-	4-5	4-6

ROCK LIST

BALLAST

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth (inches)	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Comments
			K2	B2	4 Inch In Place				
B-1035*	0+00	5+20	1 ½ :1	12	56	5.20	292	Larch Pillar Quarry, Commercial Source	
					4 Inch In Place/Select Pit Run				
Landing Rock*							1000		
					4 Inch Jaw				
B-1040					56	25.31	1418		
					Quarry Spalls				
Culvert Headwalls and Dissapaters							47	See CULVERT AND DRAINAGE LIST	

4 Inch In Place/4 Inch Jaw Total 2710 Cubic Yards
 Quarry Spalls Total 47 Cubic Yards
 Ballast Total 2,757 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.

SURFACE

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth (inches)	C.Y. Station	# of Stations	C.Y. Subtotal	Rock Source	Comments		
									CW	TO	TA
			K1	B1	2 ½ Inch Crushed						
B-1000	374+30	386+70	1 ½ :1	6	24	12.4	298	Larch Pillar Quarry, Commercial Source			
C-4000	217+90	265+40	1 ½ :1	6	24	47.5	1140				
C-8000	252+50	259+50	1 ½ :1	6	24	7	168				
Post Haul Spot Rock	-	-			-	20	400			Spot Rock to be used near units during Post Haul as directed by CA.	

2 ½ Inch Minus Crushed Total 2,006 Cubic Yards
Surface Total 2,006 Cubic Yards

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

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.

COMPACTION LIST

Road	From Station	To Station	Type	Max Depth of Lift (inches)	Equipment Type	Equipment Weight (lbs)	Minimum Number of Passes	Maximum Operating Speed (mph)
All new rock for pre-haul/post-haul maintenance			Pre/Post-haul rock	6	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
All new construction and reconstruction			Subgrade, rock	12, 6	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5
All pre-haul maintenance roads			After pre-haul grading	6	Smooth Drum Vibratory Roller	14,000	2 low freq. vibrate on	3.5

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CULVERT AND DRAINAGE LIST, pg 1 of 1

Road Number	Location	Culvert		Length (ft)			Armoring (C.Y.)			Backfill Material*	Placement Method*	Const. Staked *	Remarks
		Dia. (in)	Type	Culvert	Downspt	Flume	Inlet	Outlet	Type				
B-1000	314+30	24	PD	50	-	-	2	2.5	QS	NT		Replace T5 Stream Culvert	
	374+30	24	PD	60	-	-	2	2.5	QS	NT		Replace T5 Stream Culvert	
	375+90	18	PD	40	-	-	1	1.5	QS	NT		Install Cross Drain	
	378+70	18	PD	40	-	-	1	1.5	QS	NT		Install *No Skew* Cross Drain	
B-1035	4+05	18	TEMP	30	-	-	1	1.5	QS	NT		Install Cross Drain	
B-1040	0+60	18	PD	30	-	-	1	1.5	QS	NT		Install Cross Drain	
	3+25	18	PD	30	-	-	1	1.5	QS	NT		Install Cross Drain	
	6+95	18	PD	30	-	-	1	1.5	QS	NT		Install *No Skew* Cross Drain	
	10+05	18	PD	30	-	-	1	1.5	QS	NT		Install Cross Drain	
	15+90	18	PD	30	-	-	1	1.5	QS	NT		Install Cross Drain	
	21+10	18	PD	30	-	-	1	1.5	QS	NT		Install Cross Drain	
	23+20	18	PD	30	-	-	1	1.5	QS	NT		Install Cross Drain	
C-4000	208+30	18	PD	30	-	-	1	1.5	QS	NT		Install *No Skew* Cross Drain	
C-8000	258+10	18	PD	40	-	-	1	1.5	QS	NT		Install Cross Drain	
As Directed by C.A.		18	PD	30	-	-	1	1.5	QS	NT		Contingency	
		18	PD	30	-	-	1	1.5	QS	NT		Contingency	
		18	PD	30	-	-	1	1.5	QS	NT		Contingency	
		18	PD	BAND	-	-						Contingency	
		18	PD	BAND	-	-						Contingency	

* SEE CULVERT AND DRAINAGE SPECIFICATION DETAIL

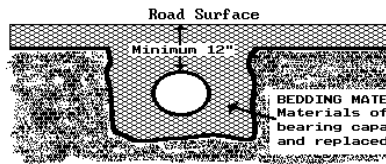
PD = Polyethylene Pipe Dual Wall AASHTO No. M294 Type S or ASTM F2648

TEMP = Temporary Culvert

Key:

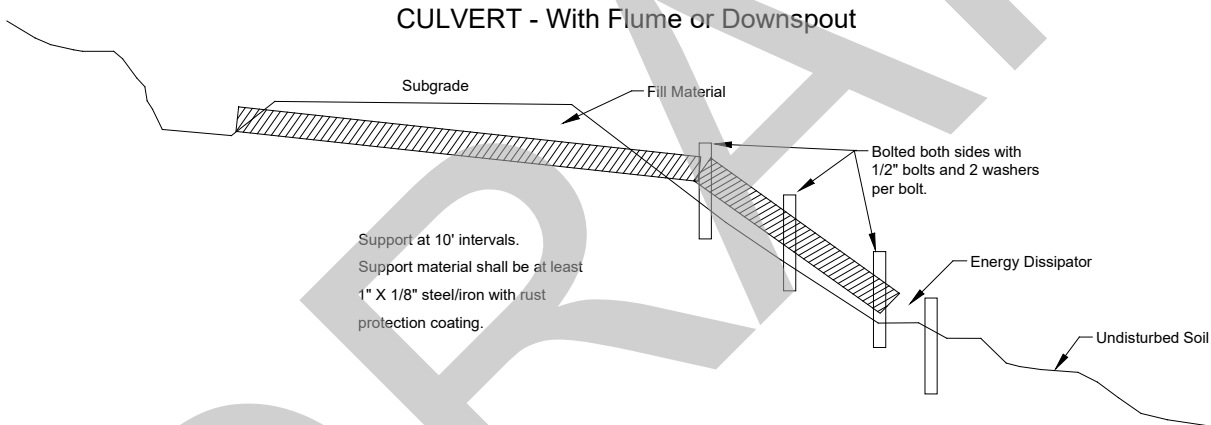
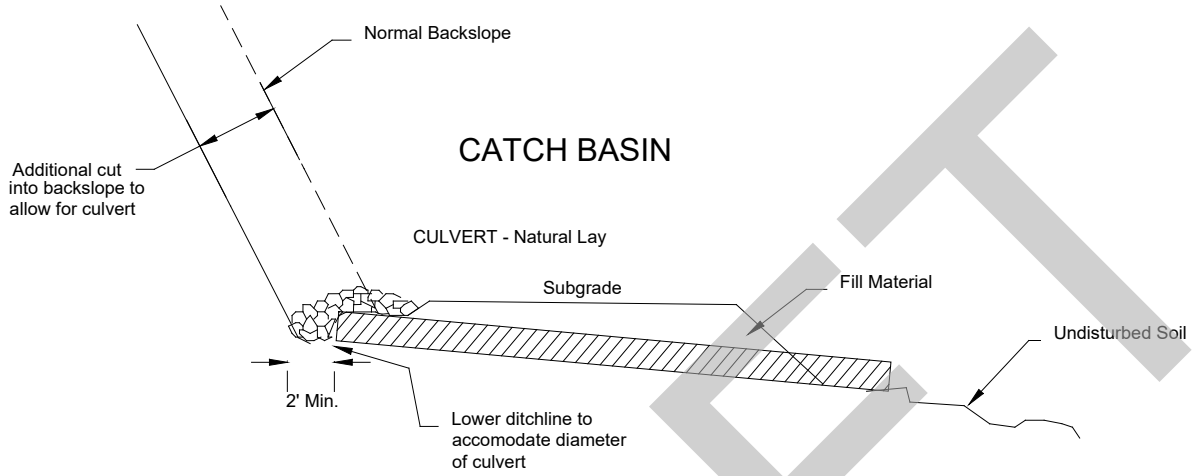
- QS - Quarry Spalls
- LL - Light Loose Riprap
- SR - Shot Crushed Rock
- NT - Native (bank run)
- SL - Select Fill
- Flume - Half round pipe
- Downsput - Full round pipe

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



CULVERT AND DRAINAGE SPECIFICATION DETAIL

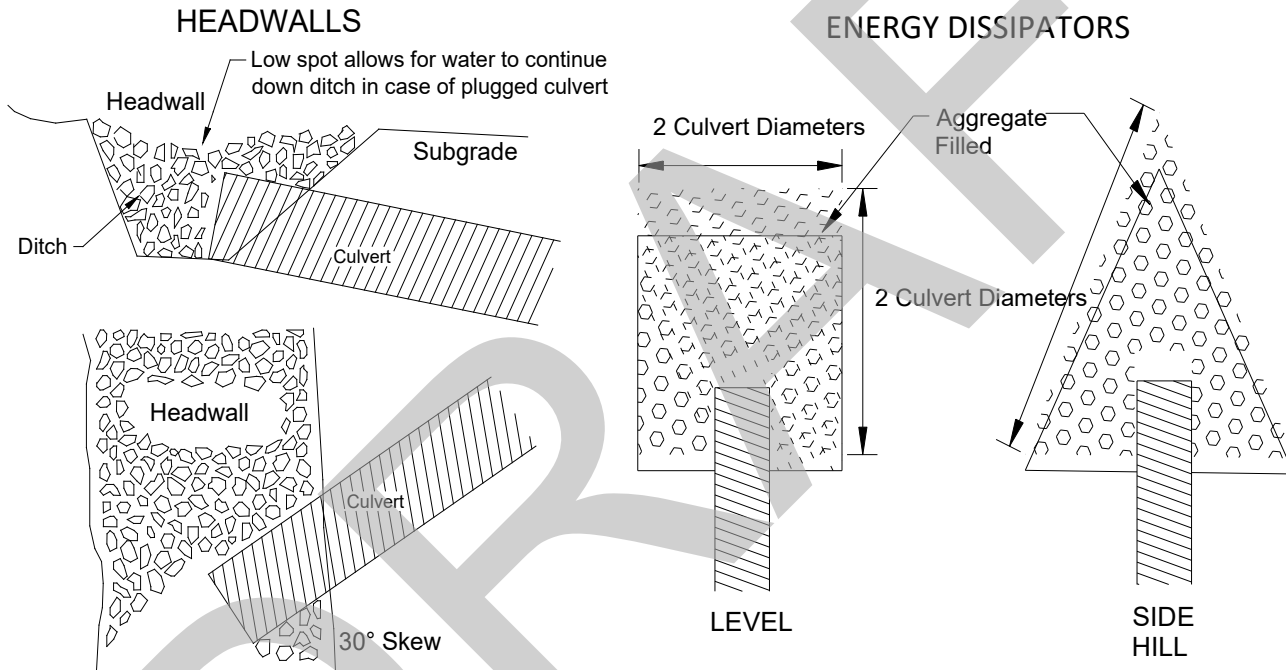
(Page 1 of 3)



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

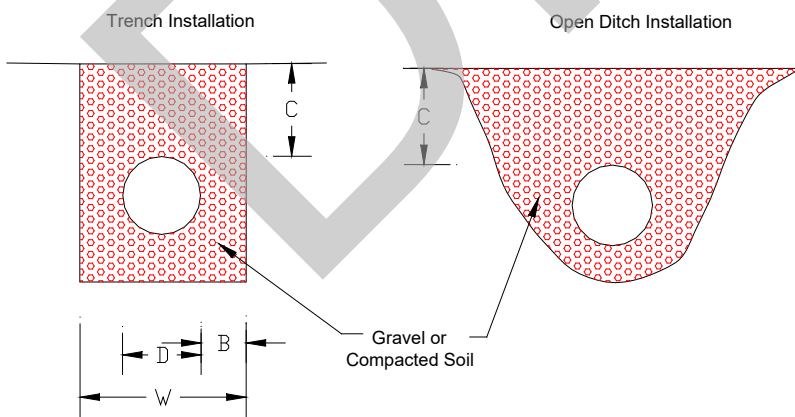
(Page 3 of 3)

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



Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS

(Sheet 1 of 2)

Cuts and Fills

- Maintain slope lines to a stable gradient compatible with the cut slope/fill slope ratios. 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

- 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.
- 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.

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.

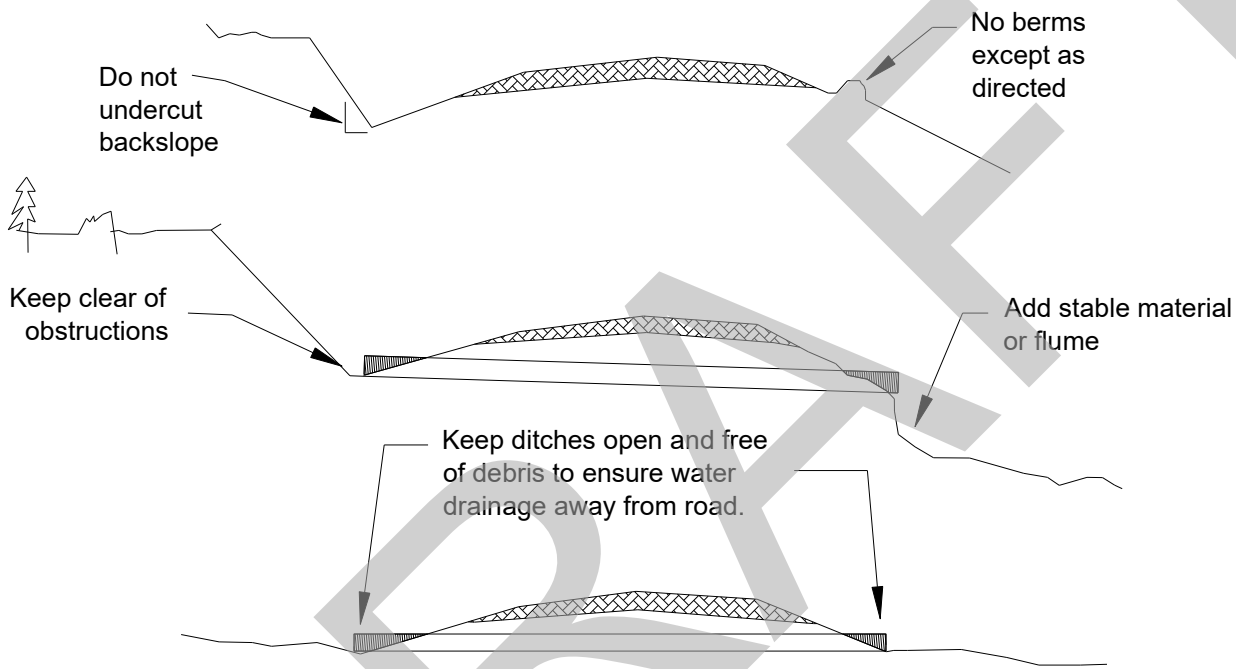
**FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS
(Sheet 2 of 2)**

Termination of Use or End of Season

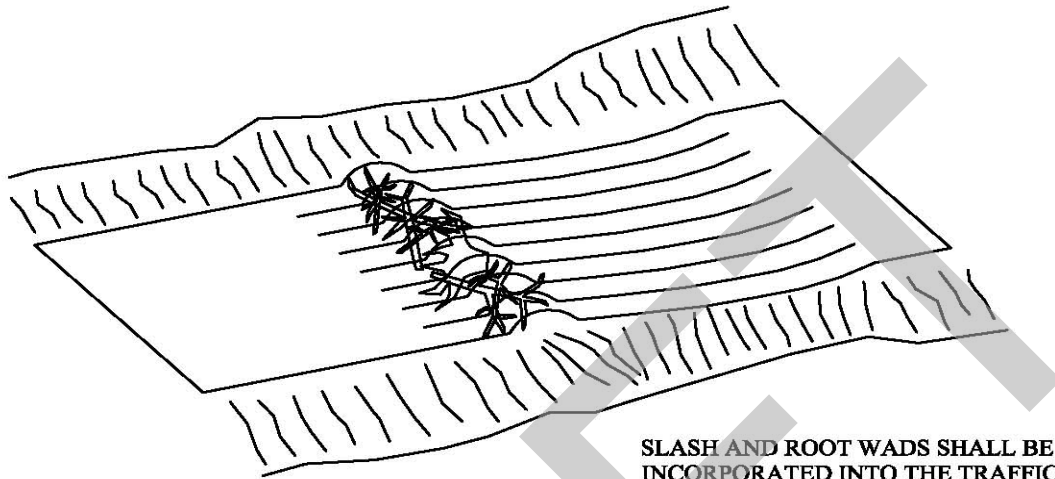
- At the conclusion of logging operations, ensure all conditions of these specifications have been met.

Debris

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

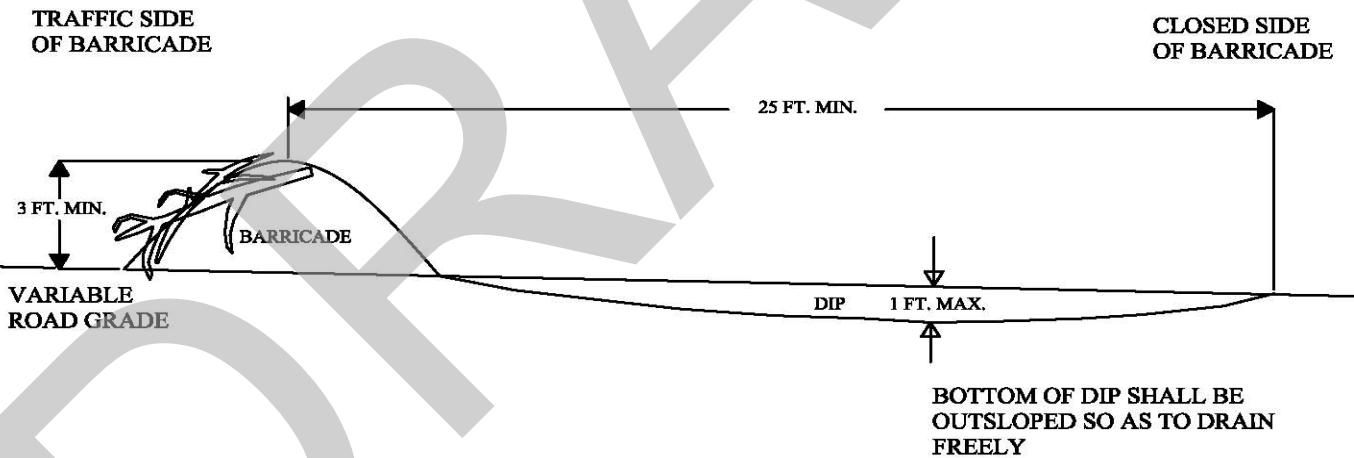


BARRICADE DETAIL



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

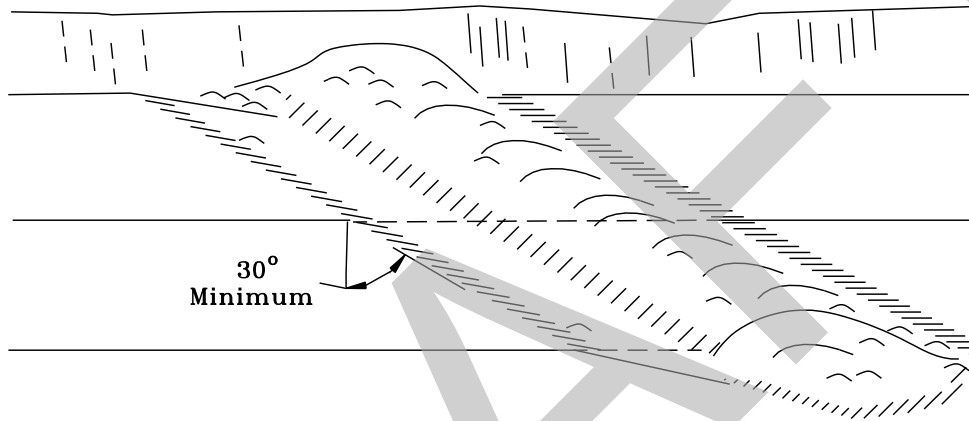
PLAN VIEW



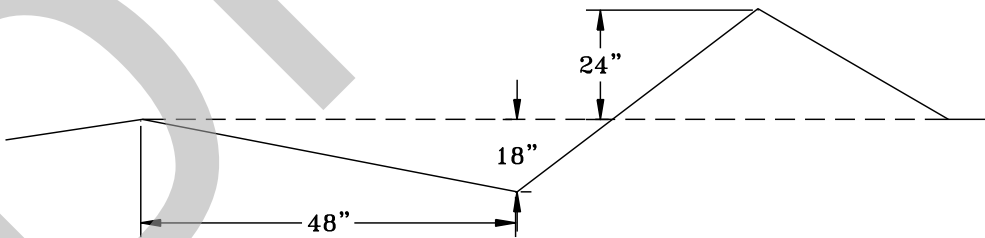
PROFILE VIEW

Non-Drivable Water Bar Detail

Cross Ditch



Cross Section at Centerline



Water Bar Detail

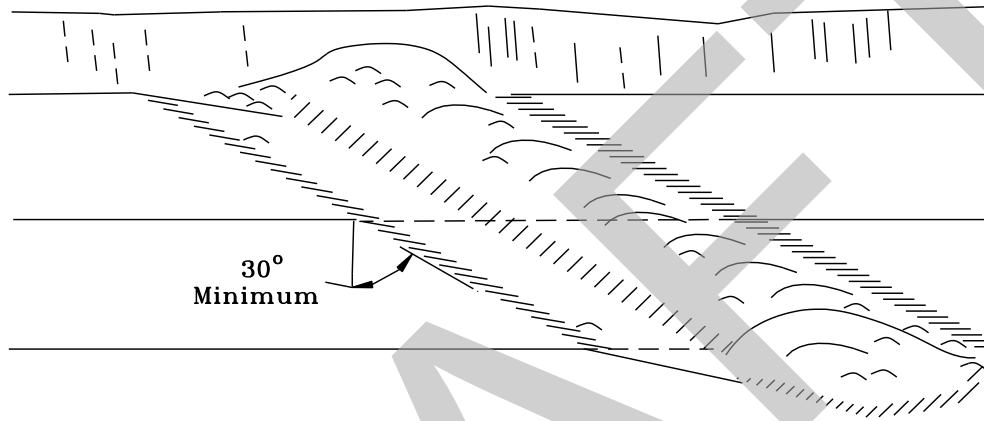
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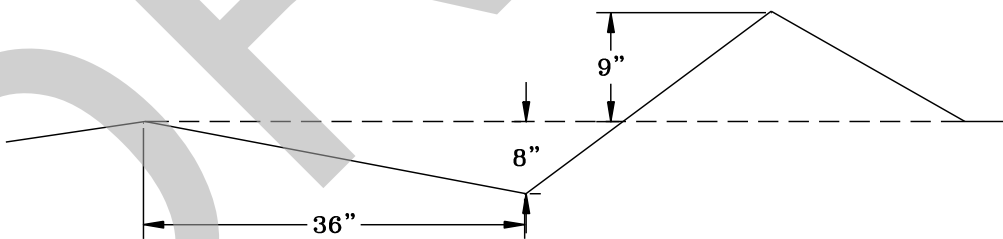
WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES

Drivable Water Bar Detail

Cross Ditch



Cross Section at Centerline



Water Bar Detail

Date:
Scale : None
App#
Drawn by: M.A.D.



WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
SOUTH PUGET SOUND REGION

LARCH PILLAR QUARRY DEVELOPMENT PLAN

SW ¼, Section 2, Township 17 North, Range 04 West, W.M.
(Page 1 of 3)

1. All rock may be obtained from Area A.
2. All vegetation including stumps shall be cleared a minimum of 30 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.
3. Root wads and organic debris larger than one cubic foot in volume shall be separated from overburden material and piled in the designated waste area.
4. Quarry faces shall not exceed 30 feet in height and shall be sloped no steeper than 1/4:1.
5. Working bench width shall be a minimum of 30 feet.
6. The quarry floor shall have continuity of slope be left in a smooth and neat condition, providing drainage to the south at a minimum of 2 percent. All knobs, bumps, or extrusions shall be removed to the designated floor level by excavation or drill and shoot techniques. No sediment shall enter live water.
7. The location and amount of material to be placed in a stockpile are subject to approval of the Contract Administrator. All stock piled material shall be maintained in a neat and useable condition.
8. Oversize material remaining in the rock source at the conclusion of use shall not exceed 2 percent of the total volume mined during that operation. Oversize material is defined as rock fragments larger than two feet in any direction. At the conclusion of operations, oversize material shall be placed as directed by the Contract Administrator.
9. At the end of operations, quarry faces and walls shall be scaled and cleared of loose and overhanging material, benches shall have safety berms constructed or access blocked to highway vehicles.
10. Reclamation will not be required following use.
11. 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 (30 CFR) U.S. Department of Labor, Mine Safety and Health Administration.
 - b. "Safety Standards for Construction Work" (296-155 WAC), Washington Department of Labor and Industries.

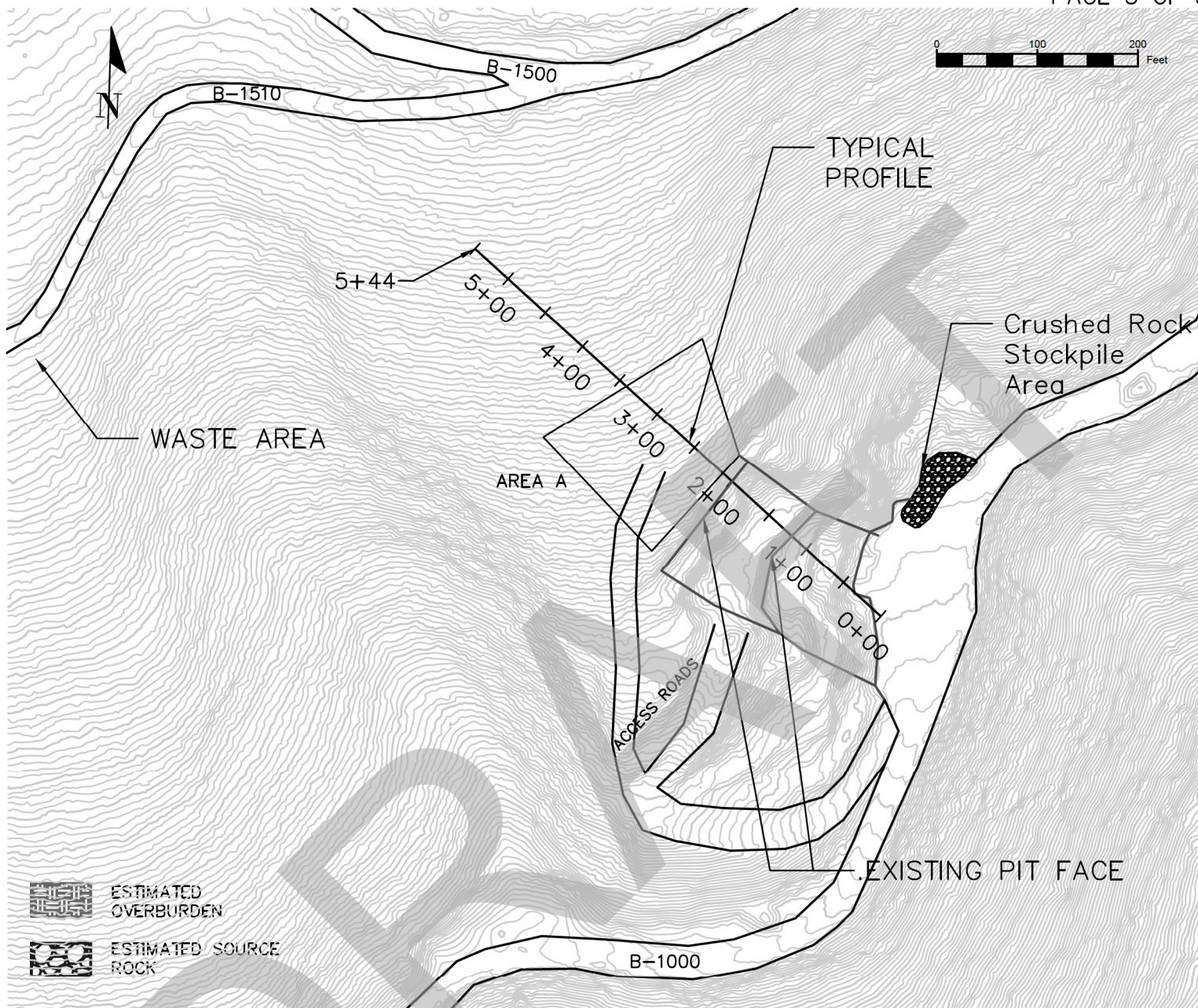
LARCH PILLAR QUARRY DEVELOPMENT PLAN

SW ¼, Section 2, Township 17 North, Range 04 West, W.M.
(Page 2 of 3)

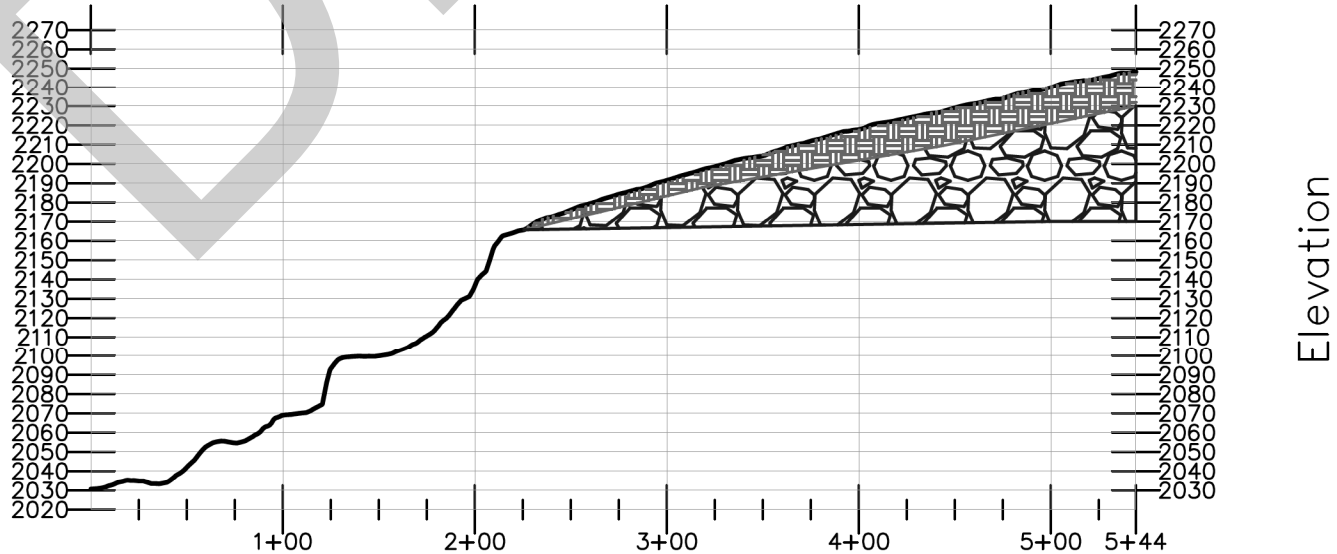
12. The Operator shall submit an informational drilling and shooting plan to the Contract Administrator 5 calendar days prior to any drilling.
13. At the completion of rock source operations, Purchaser shall ask Contract Administrator for written approval of final rock source condition and compliance with the terms of this plan.
14. The quarry area shall be worked and left in a condition that future operations may proceed in an orderly manner.
15. Upon completion of operations, the site shall be cleared of all temporary structures, equipment and rubbish, and shall be left in a neat and presentable condition.

DRAFT

LARCH PILLAR QUARRY DETAIL PLAN



TYPICAL PROFILE



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: Delphi

SALE/PROJECT NAME: Broke Timber Sale
 LEGAL DESCRIPTION: 0

CONTRACT NUMBER: 30-105211

		B-1035, B-1040	A-Line, B-Line, B-0150, B-1000, B-1500, B-1510, C-4000, C-4400, C-8000
ROAD NUMBER:		B-1035, B-1040	A-Line, B-Line, B-0150, B-1000, B-1500, B-1510, C-4000, C-4400, C-8000
ROAD STANDARD:		Reconstruction	Pre-haul maintenance
NUMBER OF STATIONS:	0.00	30.51	1074.79
SIDESLOPE:	0	25%	0%
CLEARING AND GRUBBING:	\$0	\$2,441	
EXCAVATION AND FILL:	\$0	\$6,041	
MISC. MAINTENANCE:			\$19,186
ROCK TOTALS (Cu. Yds.):			
Ballast	3521	\$0	\$72,157
Crushed Rock	2607	\$0	\$59,137
CULVERTS AND FLUMES:	\$0	\$6,960	\$9,328
STRUCTURES:	\$0	\$0	\$0
GENERAL EXPENSES:	\$0	\$7,008	\$7,012
MOBILIZATION:	\$0	\$6,715	\$6,715
TOTAL COSTS:	\$0	\$101,321	\$101,379
COST PER STATION:	\$0	\$3,321	\$94
ROAD DEACTIVATION AND ABANDONMENT COSTS:		\$10,139	
NOTE ¹ : This appraisal has no allowance for profit and risk.		TOTAL (All Roads) =	\$212,838
		SALE VOLUME MBF =	7,020
		TOTAL COST PER MBF =	\$30.32

Date: 05/22/24