



TIMBER NOTICE OF SALE

SALE NAME: CABBAGE PATCH

AGREEMENT NO: 30-103592

AUCTION: December 17, 2024 starting at 10:00 a.m., COUNTY: Grays Harbor, Thurston South Puget Sound Region Office, Enumclaw, WA

SALE LOCATION: Sale located approximately 12 miles west of Olympia, WA.

PRODUCTS SOLD AND SALE AREA:

All timber, except trees bounded out by yellow leave tree area tags, all trees 60 inches or larger measured at diameter at breast height, 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-4500 Road in Units #1 and #2; white Timber Sale Boundary tags, BPA right-of-way, and the B-4500 and B-4000 roads in Unit #3; white Timber Sale Boundary tags, and the B-Line, KC-2100, and KC-3000 roads in Unit #4; white Timber Sale Boundary tags and the KC-Line in Unit #5;

All timber bounded by orange right of way tags in Unit #6, except title to the timber within the right of way boundary tags is not conveyed to the Purchaser unless the associated BPA-2674 Ext. Road is actually constructed.

All forest products above located on part(s) of Sections 22, 26, 27, 28, 29 and 32 all in Township 18 North, Range 4 West, W.M., containing 197 acres, more or less.

CERTIFICATION: This sale is certified under the Sustainable Forestry Initiative® program Standard (cert no: BVC-SFIFM-018227) and FSC 100% raw materials under the Forest Stewardship Council® Standard (cert no: BV-FM/COC-080501). Only Unit #5 is FSC Certified.

ESTIMATED SALE VOLUMES AND QUALITY:

Table with columns: Species, Avg DBH, Ring Count, Total MBF, and MBF by Grade (1P, 2P, 3P, SM, 1S, 2S, 3S, 4S, UT). Rows include Douglas fir, Hemlock, Red alder, Redcedar, Spruce, and Sale Total.

MINIMUM BID: \$3,165,000.00 BID METHOD: Sealed Bids

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

EXPIRATION DATE: May 31, 2027 ALLOCATION: Export Restricted

BID DEPOSIT: \$316,500.00 or Bid Bond. Said deposit shall constitute an opening bid at the appraised price.

HARVEST METHOD: Harvesting activities are estimated to be 38 percent cable and 62 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



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based equipment limited to sustained slopes of 45 percent or less. Rubber tired skidders not allowed, except 6-wheeled rubber tired skidders with over-the-tire tracks spanning both sets of rear tires are allowed in all units. Tracked skidders allowed in all units. Yarding may be restricted during wet weather if rutting becomes excessive, per clause H-017.

Falling and yarding in Units #2 and #6 will not be permitted from November 1 to April 30 unless authorized in writing by the Contract Administrator. Falling and yarding in all units will not be permitted on weekends or State recognized holidays unless authorized in writing by the Contract Administrator.

ROADS:

11.20 stations of required construction. 33.48 stations of optional construction. 771.56 stations of required prehaul maintenance. 29.48 stations of abandonment, if constructed. Purchaser maintenance on the BPA-2674 (KC-9800 intersection to BPA-2674 Ext. intersection), BPA-2674 Ext., KC-9700 (B-4500 intersection to KC-9800 intersection), KC-9800, B-4500, B-4580, B-4000 (within and directly adjacent to Unit #3), KC-2100 (within Unit #4), B-Line (directly adjacent to Unit #4), KC-Line (directly adjacent to Unit #5), KC-3000, and B-2700 (if used for mobile tailhold access) roads. Designated maintenance on all other roads used.

Rock for this proposal may be obtained from the Stinkfoot Quarry, and from the existing stockpile at the Stinkfoot Quarry per Road Plan clause 6-3, at no cost to the Purchaser or any commercial rock source at the Purchaser's expense. If rock development occurs in the Stinkfoot Quarry, Purchaser must conduct operations in accordance with the Stinkfoot Quarry Development Plan per Road Plan clause 6-10.

All road work activities (except for the streambed maintenance on the B-4000 as noted below) 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. In addition, the streambed maintenance on the B-4000 Road at station 40+70 will not be permitted from October 1 to July 14, unless authorized in writing by the **State**.

The hauling of forest products on the BPA-2674 Ext. will not be permitted from November 1 to April 30 unless authorized in writing by the Contract Administrator. If permission is granted to operate on the BPA-2674 Ext. from November 1 to April 30, preventative measures may be required to protect water, soil, roads, and other forest assets. In addition, hauling in all units will not be permitted on weekends or State recognized holidays unless authorized in writing by the Contract Administrator.

ACREAGE DETERMINATION

CRUISE METHOD: Acreage was determined by traversing boundaries by GPS in all units and length times width for existing roads in Units #3 and #4. GPS data files are available at DNR's website for timber sale auction packets. See cruise narrative for cruise method.

FEES: \$143,684.00 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.



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

There is required streambed maintenance within an existing pipe on the B-4000 at station 40+70. This involves removing 16 inches of material within the pipe, washing in fines into the remaining layer, and reinstalling 16 inches of mixed streambed material. See Road Plan clauses 1-25, 11-1, 11-2, 11-3, and 11-4 for full details.

Unit #6 (R/W) and a portion of the BPA-2674 Ext. Road cross through a Wetland Management Zone and requires mitigation (see Road Plan sections 3, 8, 9, and 11). The temporary pipe installed at the Type 4 stream crossing is allowed to overwinter for the life of the contract.

Yarding may be difficult in the southern portion of Unit #2 due to the location of non-tradeable leave tree clumps protecting unstable slopes. It may be necessary to pre-bunch logs when yarding in this area.

There are multiple recreation trails located in Unit #5. These are to be restored to original pre-harvest condition following harvest per Schedule A-Recreation Trail Clean Out and Repair.

Trees may not be used for tailholds within tailhold restriction areas adjacent to units or within non-tradeable leave tree areas inside the units to protect areas of potentially unstable slopes per clause H-141.

Purchaser shall abate dust on the B-Line from stations 638+35 to 647+00 per Contract Administrator discretion.

Purchaser must notify BPA and Contract Administrator a minimum of 5 calendar days prior to any timber harvest in Unit #3 and any road work activities on the BPA-2674 and KC-9800 roads due to close proximity to overhead powerlines.

The KC-Line gate (Master H-957) is to remain locked at all times except during periods of active haul.

There are residual blue painted trees from a previous thinning in Unit #5. Blue painted trees are take trees, unless located within tagged leave tree area clumps.

Sale area may be inaccessible due to snow at any time during winter operating period.

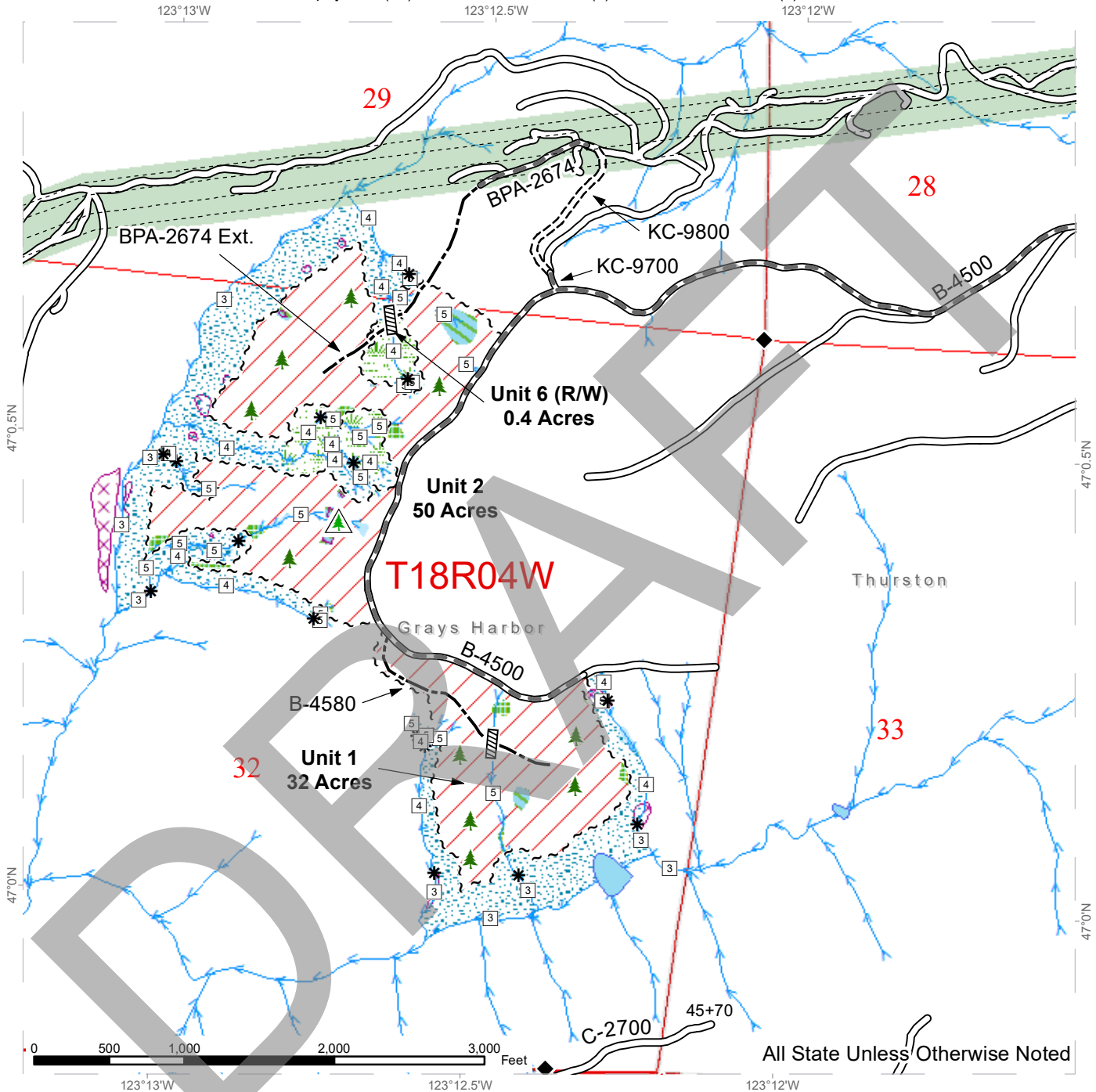
Note to cruisers and appraisers: Please refrain from leaving pink, orange, or blue flagging from your cruises in or around the sale area to avoid confusion with DNR's marking. Additionally, for the safety of the public, please remove from roads and trails all string from string boxes used during appraising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

TIMBER SALE MAP

SALE NAME: CABBAGE PATCH
AGREEMENT #: 30-103592
TOWNSHIP(S): T18R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 720-1960



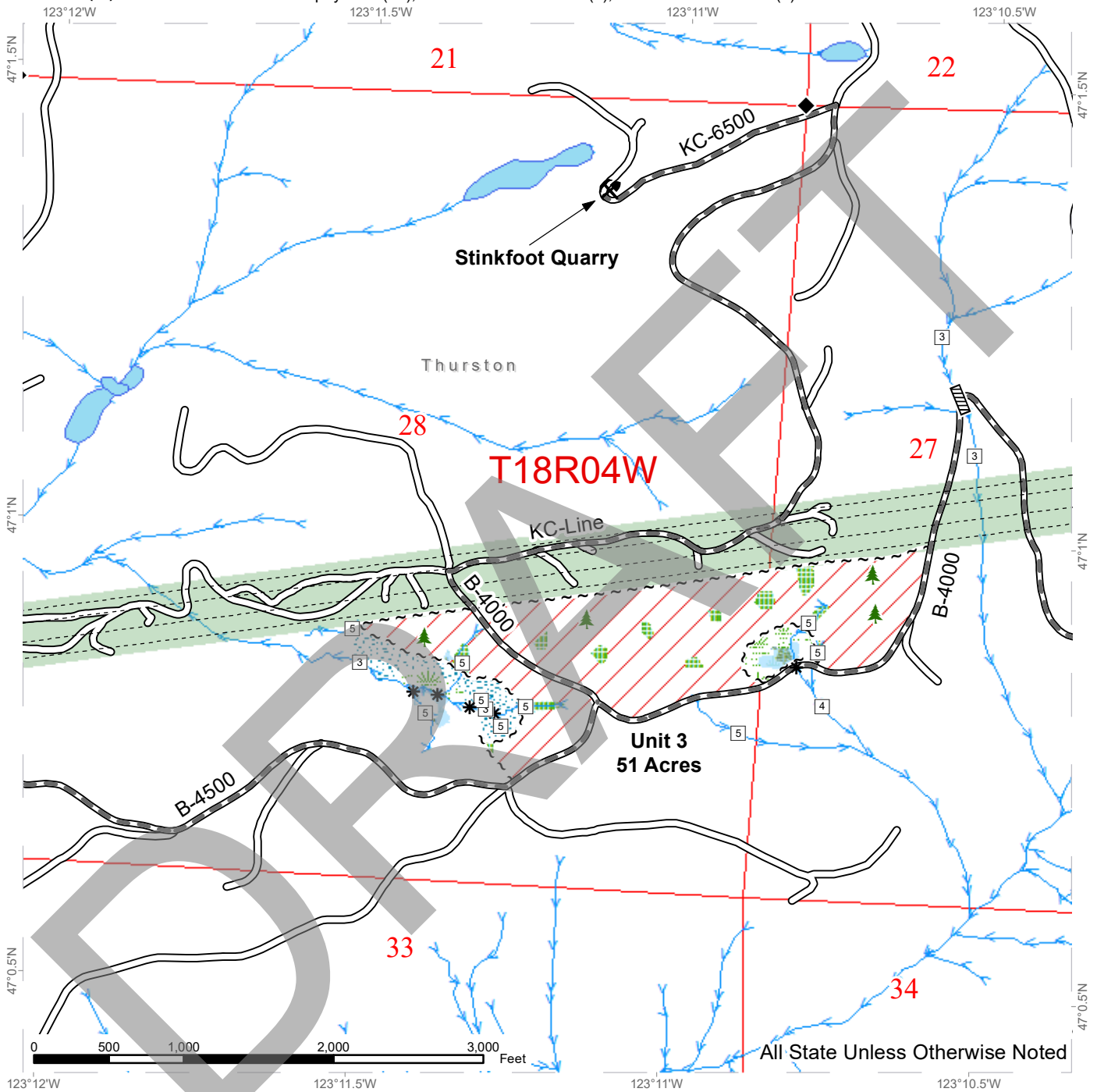
Sale Area	Stream Type	Non-Tradeable Leave Clump
Sale Boundary Tags	Stream Type Break	Leave Tree Area
Right of Way Tags	Survey Monument	Riparian Mgt Zone
Existing Roads	Culvert	Forested Wetland
Required Pre-Haul Maintenance	Leave Tree Area <1/4-acre	Wetland Mgt Zone
Required Construction	Non-Tradeable Leave Trees	Tailhold Restriction Area
Optional Construction	BPA Corridors	
Streams	BPA Transmission Lines	



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All State Unless Otherwise Noted

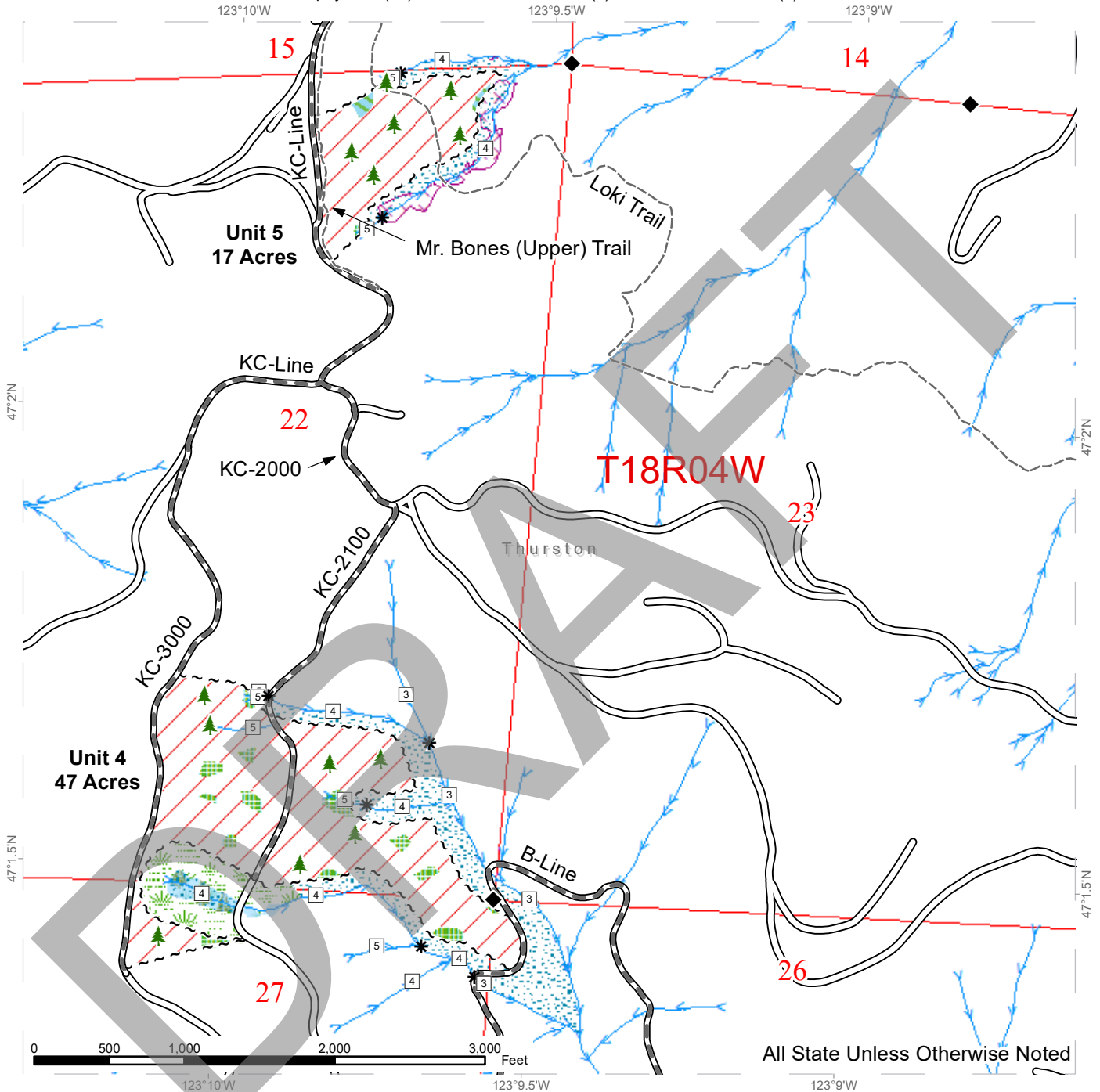
	Sale Area		Survey Monument		Riparian Mgt Zone
	Sale Boundary Tags		Culvert		Forested Wetland
	Existing Roads		Leave Tree Area <1/4-acre		Wetland Mgt Zone
	Required Pre-Haul Maintenance		Rock Pit		BPA Corridors
	Streams		BPA Transmission Lines		Leave Tree Area
	Stream Type				
	Stream Type Break				



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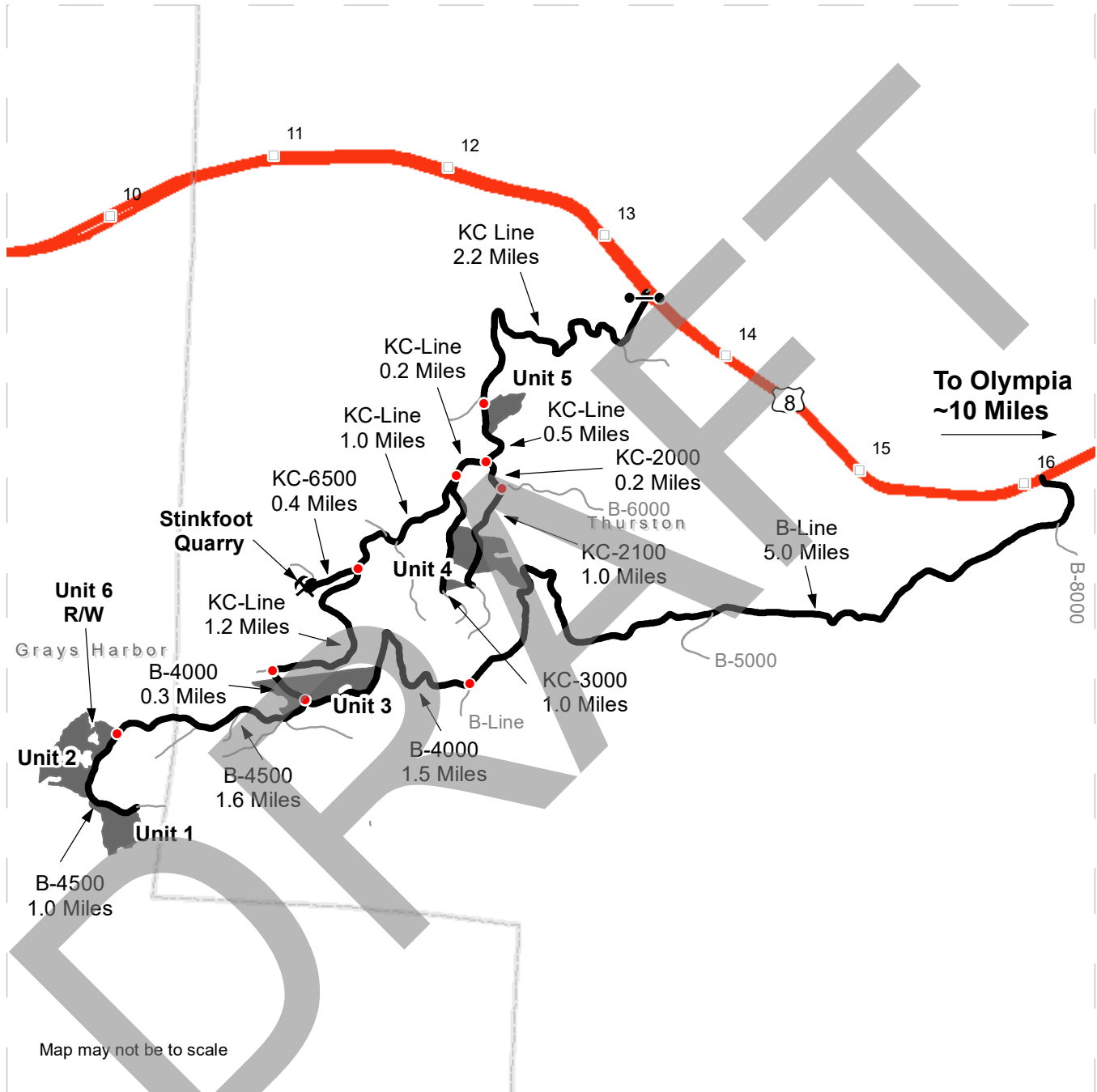


Sale Area	Survey Monument	Wetland Mgt Zone
Sale Boundary Tags	Leave Tree Area <1/4-acre	Tailhold Restriction Area
Existing Roads	Recreation Trails	
Required Pre-Haul Maintenance	Non-Tradeable Leave Clump	
Streams	Leave Tree Area	
Stream Type	Riparian Mgt Zone	
Stream Type Break	Forested Wetland	

DRIVING MAP

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

DRIVING DIRECTIONS:
 See attached driving directions.



DRIVING DIRECTIONS:

From US Highway 8 (west of milepost 14), turn south onto the KC-Line and travel past the gate 2.2 miles to Unit 5.

For Unit 4, continue 0.5 miles on the KC-Line. For the center of the unit, turn left onto the KC-2000 and continue 0.2 miles. Turn right (south) onto the KC-2100 and travel 1.0 miles to reach the unit. For the top of the unit, continue 0.2 miles on the KC-Line from the KC-Line/KC-2000 junction. Turn left onto the KC-3000 and continue 1.0 miles to the unit.

For Stinkfoot Quarry, continue 1.0 miles on the KC-Line from the KC-Line/KC-3000 junction, then turn right (west) onto the KC-6500. Continue 0.4 miles to reach the quarry.

For Unit 3, continue 1.2 miles on the KC-Line from the KC-Line/KC-6500 junction. Turn left (south) onto the B-4000, then travel 0.3 miles to the unit.

For Units 1, 2, and 6 (R/W), turn right (west) onto the B-4500 from the B-4000. Continue 1.6 miles on the B-4500 to reach Unit 2 and Unit 6 (R/W), and continue an additional 1.0 miles for Unit 1.

Timber Sale Cruise Report Cabbage Patch

Sale Name: CABBAGE PATCH

Sale Type: LUMP SUM

Region: SO PUGET

District: BLACK HILLS

Lead Cruiser: AMDouglas

Other Cruisers: BEWarnstadt, DBuchanan

Cruise Narrative:

Location:

Cabbage Patch is located in Capitol Forest approximately 10 miles west of Olympia, WA. Access via Route 8, KC-Line, and B-Line. All units have direct road access.

Cruise Design:

139 variable radius plots were used to tally 684 trees, 396 of which were measured. Diameters were recorded to the nearest whole inch. Bole heights were measured to a 5" top or estimated break point. Trees were segmented into lengths based on a preference for long logs and taking into account location of defect. Preferred length for conifers is 40'. Preferred length for hardwoods is 30'.

Timber Quality:

Cabbage Patch contains a mixed over-story of Douglas-fir and western hemlock with scattered pockets of red alder. Trace amounts of western red cedar and Sitka spruce can also be found in most units. Some Douglas-firs contain high quality segments. Observed defect includes kinks, sweep, and spike knots. Schweinitzii fungus was seen near the bases of a few trees.

Alder clumps mostly contain mature trees. The majority displays good form with straight, un-forked trunks. Rot appears minimal.

A modest amount of Douglas-fir and red cedar pole volume was picked up in this cruise.

Logging and Stand Conditions:

Understory conditions are brushy in most places. Projected harvesting method is 62% ground-based, 38% uphill-cable.

Timber Sale Notice Volume (MBF)

Sp	DBH	Rings/In	Age	MBF Volume by Grade					
				All	Spec Mill	2 Saw	3 Saw	4 Saw	Utility
DF	20.5	8.1		5,640	242	3,590	1,526	221	61
WH	21.5			2,057		1,578	391	70	19
RA	14.7			648		165	193	238	51
RC	23.8			95			85	10	
SS	33.0			13		11	2		
ALL	19.1	8.2		8,452	242	5,344	2,196	539	131

Timber Sale Notice Weight (tons)

Sp	Tons by Grade					
	All	Spec Mill	2 Saw	3 Saw	4 Saw	Utility
DF	40,295	1,363	23,632	12,746	2,033	521
WH	16,540		11,573	4,002	815	151
RA	5,435		1,216	1,453	2,351	415
RC	860			706	154	
SS	88		65	23		
ALL	63,219	1,363	36,485	18,930	5,353	1,087

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 (%)
265.0	3.4	161.9	1.7	42,880	3.9

Timber Sale Unit Cruise Design

Unit	Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
CABBAGE PATCH U1	B2C: VR, 2 BAF (62.5, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	31.7	32.6	24	13	0
CABBAGE PATCH U2	B1C: VR, 1 BAF (54.44) Measure/ Count Plots, Sighting Ht = 4.5 ft	49.6	52.4	35	19	0
CABBAGE PATCH U3	B2C: VR, 2 BAF (54.44, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	50.9	54.5	33	19	2
CABBAGE PATCH U4	B2C: VR, 2 BAF (54.44, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	47.3	51.2	32	14	1
CABBAGE PATCH U5	B2C: VR, 2 BAF (54.44, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	17.2	17.9	13	8	0
CABBAGE PATCH U6 RW	B1: VR, 1 BAF (46.94) Measure All, Sighting Ht = 4.5 ft	0.4	0.4	2	2	0
All		197.1	209.0	139	75	3

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	16.6	39	10,966	10,419	5.0	13,117.6	2,053.6
DF	LIVE	2 SAW	HQ-A	14.0	40	978	972	0.6	1,298.5	191.6

Sp	Status	Grade	Sort	Dia	Len	BF Gross	BF Net	Defect %	Tons	MBF Net
DF	LIVE	2 SAW	HQ-B	14.5	40	6,960	6,824	1.9	9,215.6	1,345.1
DF	LIVE	3 SAW	Domestic	8.5	39	5,874	5,743	2.2	9,824.2	1,132.0
DF	LIVE	3 SAW	HQ-B	10.7	40	2,027	1,997	1.5	2,921.6	393.6
DF	LIVE	4 SAW	Domestic	5.7	28	1,146	1,122	2.1	2,033.3	221.1
DF	LIVE	CULL	Cull	6.6	7	384	0	100.0	0.0	0.0
DF	LIVE	SPECIAL MILL	HQ-A	18.9	39	1,227	1,227	0.0	1,363.1	241.9
DF	LIVE	UTILITY	Pulp	6.2	22	308	308	0.0	521.2	60.8
RA	LIVE	2 SAW	Domestic	13.5	30	902	837	7.2	1,215.6	165.0
RA	LIVE	3 SAW	Domestic	10.7	30	1,029	981	4.7	1,453.1	193.3
RA	LIVE	4 SAW	Domestic	6.8	30	1,249	1,207	3.3	2,350.9	237.9
RA	LIVE	CULL	Cull	5.4	6	19	0	100.0	0.0	0.0
RA	LIVE	UTILITY	Pulp	5.5	22	261	261	0.0	415.3	51.4
RC	LIVE	3 SAW	Domestic	12.5	35	411	375	8.9	631.0	73.8
RC	LIVE	3 SAW	Pole	14.3	38	55	55	0.0	75.4	10.8
RC	LIVE	4 SAW	Domestic	6.1	27	47	44	6.0	131.9	8.6
RC	LIVE	4 SAW	Pole	5.0	35	8	8	0.0	21.6	1.6
RC	LIVE	CULL	Cull	10.6	4	23	0	100.0	0.0	0.0
SS	LIVE	2 SAW	Domestic	22.4	40	57	55	5.0	65.2	10.7
SS	LIVE	3 SAW	Domestic	10.8	39	10	9	8.1	23.3	1.9
WH	LIVE	2 SAW	Domestic	16.4	40	8,263	8,006	3.1	11,572.9	1,578.0
WH	LIVE	3 SAW	Domestic	9.4	38	2,022	1,983	1.9	4,001.7	390.8
WH	LIVE	4 SAW	Domestic	5.9	30	361	353	2.2	815.1	69.6
WH	LIVE	CULL	Cull	8.1	6	195	0	100.0	0.0	0.0
WH	LIVE	UTILITY	Pulp	5.7	20	94	94	0.0	150.8	18.6

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	5.7	20	209	0.0	303.7	41.2
DF	5 - 7	LIVE	Cull	5.9	6	0	100.0	0.0	0.0
DF	5 - 7	LIVE	Domestic	6.2	33	2,892	1.5	5,242.8	570.0
DF	8 - 11	LIVE	Pulp	8.9	30	99	0.0	217.5	19.6
DF	8 - 11	LIVE	Domestic	9.7	37	3,973	2.8	6,614.7	783.0
DF	8 - 11	LIVE	Cull	9.9	11	0	100.0	0.0	0.0
DF	8 - 11	LIVE	HQ-B	10.7	40	1,997	1.5	2,921.6	393.6
DF	12 - 19	LIVE	HQ-B	14.3	40	5,831	1.8	8,133.8	1,149.3
DF	12 - 19	LIVE	Domestic	15.0	39	5,978	4.1	8,098.8	1,178.3
DF	12 - 19	LIVE	HQ-A	15.1	39	1,641	0.3	2,068.2	323.5

Sp	Bin	Status	Sort	Dia	Len	BF Net	Defect %	Tons	MBF Net
DF	12 - 19	LIVE	Cull	19.2	40	0	100.0	0.0	0.0
DF	20+	LIVE	HQ-A	21.0	39	558	0.0	593.4	110.0
DF	20+	LIVE	HQ-B	21.8	40	993	2.5	1,081.8	195.7
DF	20+	LIVE	Cull	22.7	16	0	100.0	0.0	0.0
DF	20+	LIVE	Domestic	23.1	40	4,441	6.2	5,018.8	875.3
RA	5 - 7	LIVE	Pulp	5.1	22	216	0.0	348.7	42.7
RA	5 - 7	LIVE	Cull	5.3	6	0	100.0	0.0	0.0
RA	5 - 7	LIVE	Domestic	5.7	30	695	4.0	1,388.3	136.9
RA	8 - 11	LIVE	Domestic	9.8	30	1,493	3.9	2,415.6	294.3
RA	8 - 11	LIVE	Pulp	10.5	30	19	0.0	37.1	3.8
RA	12 - 19	LIVE	Pulp	12.0	15	25	0.0	29.5	5.0
RA	12 - 19	LIVE	Domestic	13.5	30	837	7.2	1,215.6	165.0
RC	5 - 7	LIVE	Pole	5.0	35	8	0.0	21.6	1.6
RC	5 - 7	LIVE	Cull	5.2	3	0	100.0	0.0	0.0
RC	5 - 7	LIVE	Domestic	5.6	28	40	15.5	157.5	7.9
RC	8 - 11	LIVE	Domestic	9.6	33	103	3.6	200.7	20.4
RC	12 - 19	LIVE	Pole	14.3	38	55	0.0	75.4	10.8
RC	12 - 19	LIVE	Domestic	15.6	32	200	6.1	306.5	39.5
RC	20+	LIVE	Domestic	21.6	32	75	17.0	98.2	14.7
RC	20+	LIVE	Cull	23.6	5	0	100.0	0.0	0.0
SS	8 - 11	LIVE	Domestic	10.8	39	9	8.1	23.3	1.9
SS	20+	LIVE	Domestic	22.4	40	55	5.0	65.2	10.7
WH	5 - 7	LIVE	Pulp	5.3	20	87	0.0	132.5	17.1
WH	5 - 7	LIVE	Domestic	5.8	33	469	2.0	1,153.5	92.4
WH	5 - 7	LIVE	Cull	6.3	5	0	100.0	0.0	0.0
WH	8 - 11	LIVE	Pulp	8.4	13	8	0.0	18.3	1.5
WH	8 - 11	LIVE	Cull	9.0	6	0	100.0	0.0	0.0
WH	8 - 11	LIVE	Domestic	9.7	37	1,867	2.0	3,663.3	367.9
WH	12 - 19	LIVE	Cull	13.3	7	0	100.0	0.0	0.0
WH	12 - 19	LIVE	Domestic	15.6	40	6,168	2.4	9,170.8	1,215.7
WH	20+	LIVE	Domestic	21.5	40	1,838	5.4	2,402.1	362.3
WH	20+	LIVE	Cull	28.1	20	0	100.0	0.0	0.0

Cruise Unit Report CABBAGE PATCH U1

Unit Sale Notice Volume (MBF): CABBAGE PATCH U1

Sp	DBH	Rings/In	Age	MBF Volume by Grade					
				All	Spec Mill	2 Saw	3 Saw	4 Saw	Utility
DF	20.0	8.0		981	22	671	241	44	4
RA	12.9			80			20	33	27
WH	17.8			62		39	15	7	
RC	27.0			3			3	0	
ALL	17.4	8.0		1,126	22	710	279	85	30

Unit Cruise Design: CABBAGE PATCH U1

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B2C: VR, 2 BAF (62.5, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	31.7	32.6	24	13	0

Unit Cruise Summary: CABBAGE PATCH U1

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	35	78	3.3	1
RA	17	18	0.8	0
WH	6	6	0.3	0
RC	1	1	0.0	0
ALL	59	103	4.3	1

Unit Cruise Statistics: CABBAGE PATCH 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	201.3	48.7	9.9	153.7	24.8	4.2	30,939	54.6	10.8
RA	30.0	205.2	41.9	84.0	35.1	8.5	2,521	208.2	42.8
WH	15.6	212.6	43.4	125.3	35.5	14.5	1,957	215.6	45.8
RC	1.7	489.9	100.0	53.8	0.0	0.0	90	489.9	100.0
ALL	248.5	33.1	6.8	142.9	33.7	4.4	35,507	47.2	8.0

Unit Summary: CABBAGE PATCH U1

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	35	ALL	20.0	82	105	31,926	30,939	3.1	92.2	201.3	45.0	980.8
RA	LIVE	CUT	17	ALL	12.9	46	62	2,564	2,521	1.7	33.1	30.0	8.4	79.9
RC	LIVE	CUT	1	ALL	27.0	53	60	99	90	8.9	0.4	1.7	0.3	2.8
WH	LIVE	CUT	6	ALL	17.8	67	84	2,012	1,957	2.7	9.0	15.6	3.7	62.1
ALL	LIVE	CUT	59	ALL	18.4	72	93	36,600	35,507	3.0	134.7	248.5	57.4	1,125.6
ALL	ALL	ALL	59	ALL	18.4	72	93	36,600	35,507	3.0	134.7	248.5	57.4	1,125.6

DRAFT

Cruise Unit Report CABBAGE PATCH U2

Unit Sale Notice Volume (MBF): CABBAGE PATCH U2

Sp	DBH	Rings/In	Age	MBF Volume by Grade					
				All	Spec Mill	2 Saw	3 Saw	4 Saw	Utility
DF	18.4	7.7		1,772	100	905	635	91	41
RA	15.0			298		86	110	103	
WH	19.9			176		118	48	8	1
RC	22.2			11			10	1	
ALL	17.8	7.7		2,257	100	1,109	803	203	42

Unit Cruise Design: CABBAGE PATCH 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	49.6	52.4	35	19	0

Unit Cruise Summary: CABBAGE PATCH U2

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	70	130	3.7	2
RA	17	35	1.0	0
WH	10	13	0.4	0
RC	3	3	0.1	0
ALL	100	181	5.2	2

Unit Cruise Statistics: CABBAGE PATCH 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	202.2	55.6	9.4	176.7	23.3	2.8	35,722	60.3	9.8
RA	54.4	159.0	26.9	110.4	21.0	5.1	6,011	160.4	27.4
WH	20.2	173.8	29.4	176.0	23.3	7.4	3,558	175.4	30.3
RC	4.7	331.4	56.0	46.6	118.3	68.3	217	351.9	88.4
ALL	281.5	26.7	4.5	161.6	31.0	3.1	45,509	41.0	5.5

Unit Summary: CABBAGE PATCH U2

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	70	ALL	18.4	90	116	37,044	35,722	3.6	109.5	202.2	47.1	1,771.8
RA	LIVE	CUT	17	ALL	15.0	62	78	6,443	6,011	6.7	44.4	54.4	14.1	298.2
RC	LIVE	CUT	3	ALL	22.2	49	59	248	217	12.5	1.7	4.7	1.0	10.8
WH	LIVE	CUT	10	ALL	19.9	83	104	3,727	3,558	4.5	9.4	20.2	4.5	176.5
ALL	LIVE	CUT	100	ALL	17.7	82	104	47,463	45,509	4.1	165.0	281.5	66.7	2,257.2
ALL	ALL	ALL	100	ALL	17.7	82	104	47,463	45,509	4.1	165.0	281.5	66.7	2,257.2

DRAFT

Cruise Unit Report CABBAGE PATCH U3

Unit Sale Notice Volume (MBF): CABBAGE PATCH U3

Sp	DBH	Rings/In	Age	MBF Volume by Grade					
				All	Spec Mill	2 Saw	3 Saw	4 Saw	Utility
DF	20.7	8.0		1,304	77	826	335	49	16
WH	24.3			1,059		877	158	22	2
RA	14.5			119		17	28	56	18
RC	23.2			52			46	6	
ALL	20.5	8.0		2,534	77	1,720	567	134	36

Unit Cruise Design: CABBAGE PATCH U3

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B2C: VR, 2 BAF (54.44, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	50.9	54.5	33	19	2

Unit Cruise Summary: CABBAGE PATCH U3

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	46	94	2.8	1
WH	32	68	2.1	0
RA	15	20	0.6	0
RC	8	8	0.2	0
ALL	101	190	5.8	1

Unit Cruise Statistics: CABBAGE PATCH 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	155.1	66.3	11.5	165.2	34.1	5.0	25,619	74.6	12.6
WH	112.2	119.5	20.8	185.5	22.6	4.0	20,811	121.6	21.2
RA	24.2	154.0	26.8	96.5	16.5	4.3	2,340	154.9	27.1
RC	9.7	372.3	64.8	104.9	26.7	9.5	1,017	373.2	65.5
ALL	301.2	46.7	8.1	165.3	33.8	3.4	49,787	57.7	8.8

Unit Summary: CABBAGE PATCH U3

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	46	ALL	20.7	84	109	27,316	25,619	6.2	66.4	155.1	34.1	1,304.0
RA	LIVE	CUT	15	ALL	14.5	55	72	2,388	2,340	2.0	21.1	24.2	6.4	119.1
RC	LIVE	CUT	8	ALL	23.2	71	85	1,169	1,017	13.0	3.3	9.7	2.0	51.8
WH	LIVE	CUT	32	ALL	24.3	92	116	21,993	20,811	5.4	34.8	112.2	22.8	1,059.3
ALL	LIVE	CUT	101	ALL	21.0	81	104	52,865	49,787	5.8	125.6	301.2	65.2	2,534.2
ALL	ALL	ALL	101	ALL	21.0	81	104	52,865	49,787	5.8	125.6	301.2	65.2	2,534.2

DRAFT

Cruise Unit Report CABBAGE PATCH U4

Unit Sale Notice Volume (MBF): CABBAGE PATCH U4

Sp	DBH	Rings/In	Age	MBF Volume by Grade					
				All	Spec Mill	2 Saw	3 Saw	4 Saw	Utility
DF	20.7	8.3		1,066	26	742	264	34	
WH	18.4			596		421	138	26	11
RA	15.6			132		57	34	35	6
SS	33.0			13		11	2		
RC	34.2			9			9	0	
ALL	18.9	8.3		1,816	26	1,231	447	95	17

Unit Cruise Design: CABBAGE PATCH U4

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B2C: VR, 2 BAF (54.44, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	47.3	51.2	32	14	1

Unit Cruise Summary: CABBAGE PATCH U4

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	36	75	2.3	1
WH	24	46	1.4	0
RA	18	21	0.7	0
SS	1	1	0.0	0
RC	2	2	0.1	0
ALL	81	145	4.5	1

Unit Cruise Statistics: CABBAGE PATCH 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	127.6	74.8	13.2	176.7	31.7	5.3	22,543	81.2	14.2
WH	78.3	132.2	23.4	161.1	24.3	5.0	12,604	134.4	23.9
RA	26.3	303.8	53.7	106.2	21.7	5.1	2,788	304.6	53.9
SS	1.7	565.7	100.0	156.7	0.0	0.0	267	565.7	100.0
RC	2.5	565.7	100.0	79.4	53.8	38.1	198	568.2	107.0
ALL	236.3	43.4	7.7	162.5	32.8	3.6	38,399	54.4	8.5

Unit Summary: CABBAGE PATCH U4

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	36	ALL	20.7	87	112	23,436	22,543	3.8	54.6	127.6	28.0	1,066.3
RA	LIVE	CUT	18	ALL	15.6	56	69	2,945	2,788	5.4	19.8	26.3	6.6	131.9
RC	LIVE	CUT	2	ALL	34.2	65	82	219	198	9.4	0.4	2.5	0.4	9.4
SS	LIVE	CUT	1	ALL	33.0	81	103	282	267	5.5	0.3	1.7	0.3	12.6
WH	LIVE	CUT	24	ALL	18.4	65	86	13,070	12,604	3.6	42.4	78.3	18.2	596.2
ALL	LIVE	CUT	81	ALL	19.2	74	95	39,953	38,399	3.9	117.5	236.3	53.7	1,816.3
ALL	ALL	ALL	81	ALL	19.2	74	95	39,953	38,399	3.9	117.5	236.3	53.7	1,816.3

DRAFT

Cruise Unit Report CABBAGE PATCH U5

Unit Sale Notice Volume (MBF): CABBAGE PATCH U5

Sp	DBH	Rings/In	Age	MBF Volume by Grade					
				All	Spec Mill	2 Saw	3 Saw	4 Saw	Utility
DF	28.3	10.0		511	16	444	49	2	
WH	18.1			163		123	30	6	4
RC	20.9			20			17	3	
RA	14.5			13		5		7	1
ALL	21.7	10.0		707	16	572	97	18	5

Unit Cruise Design: CABBAGE PATCH U5

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B2C: VR, 2 BAF (54.44, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	17.2	17.9	13	8	0

Unit Cruise Summary: CABBAGE PATCH U5

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	22	30	2.3	1
WH	14	16	1.2	0
RC	6	6	0.5	0
RA	3	3	0.2	0
ALL	45	55	4.2	1

Unit Cruise Statistics: CABBAGE PATCH 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	125.6	75.9	21.0	236.6	19.8	4.2	29,723	78.4	21.5
WH	67.0	115.6	32.1	141.5	35.3	9.4	9,478	120.9	33.4
RC	18.5	143.0	39.7	63.1	56.5	23.1	1,165	153.8	45.9
RA	9.2	259.6	72.0	80.9	38.3	22.1	747	262.4	75.3
ALL	220.3	49.0	13.6	186.6	43.3	6.5	41,114	65.4	15.0

Unit Summary: CABBAGE PATCH U5

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	22	ALL	28.3	106	146	31,005	29,723	4.1	28.8	125.6	23.6	511.2
RA	LIVE	CUT	3	ALL	14.5	49	61	810	747	7.8	8.0	9.2	2.4	12.9
RC	LIVE	CUT	6	ALL	20.9	48	59	1,272	1,165	8.4	7.7	18.5	4.0	20.0
WH	LIVE	CUT	14	ALL	18.1	58	81	9,828	9,478	3.6	37.5	67.0	15.7	163.0
ALL	LIVE	CUT	45	ALL	22.2	73	100	42,916	41,114	4.2	82.0	220.3	45.8	707.2
ALL	ALL	ALL	45	ALL	22.2	73	100	42,916	41,114	4.2	82.0	220.3	45.8	707.2

DRAFT

Cruise Unit Report CABBAGE PATCH U6 RW

Unit Sale Notice Volume (MBF): CABBAGE PATCH U6 RW

Sp	DBH	Rings/In	Age	MBF Volume by Grade				
				All	2 Saw	3 Saw	4 Saw	Utility
RA	13.0			6		1	4	
DF	19.0			5	3	2	1	0
ALL	14.6			11	3	4	5	0

Unit Cruise Design: CABBAGE PATCH U6 RW

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B1: VR, 1 BAF (46.94) Measure All, Sighting Ht = 4.5 ft	0.4	0.4	2	2	0

Unit Cruise Summary: CABBAGE PATCH U6 RW

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
RA	6	6	3.0	0
DF	4	4	2.0	0
ALL	10	10	5.0	0

Unit Cruise Statistics: CABBAGE PATCH U6 RW

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 (%)
RA	140.8	94.3	66.7	101.2	3.6	1.5	14,245	94.3	66.7
DF	93.9	0.0	0.0	145.6	24.2	12.1	13,667	24.2	12.1
ALL	234.7	56.6	40.0	118.9	25.9	8.2	27,912	62.2	40.8

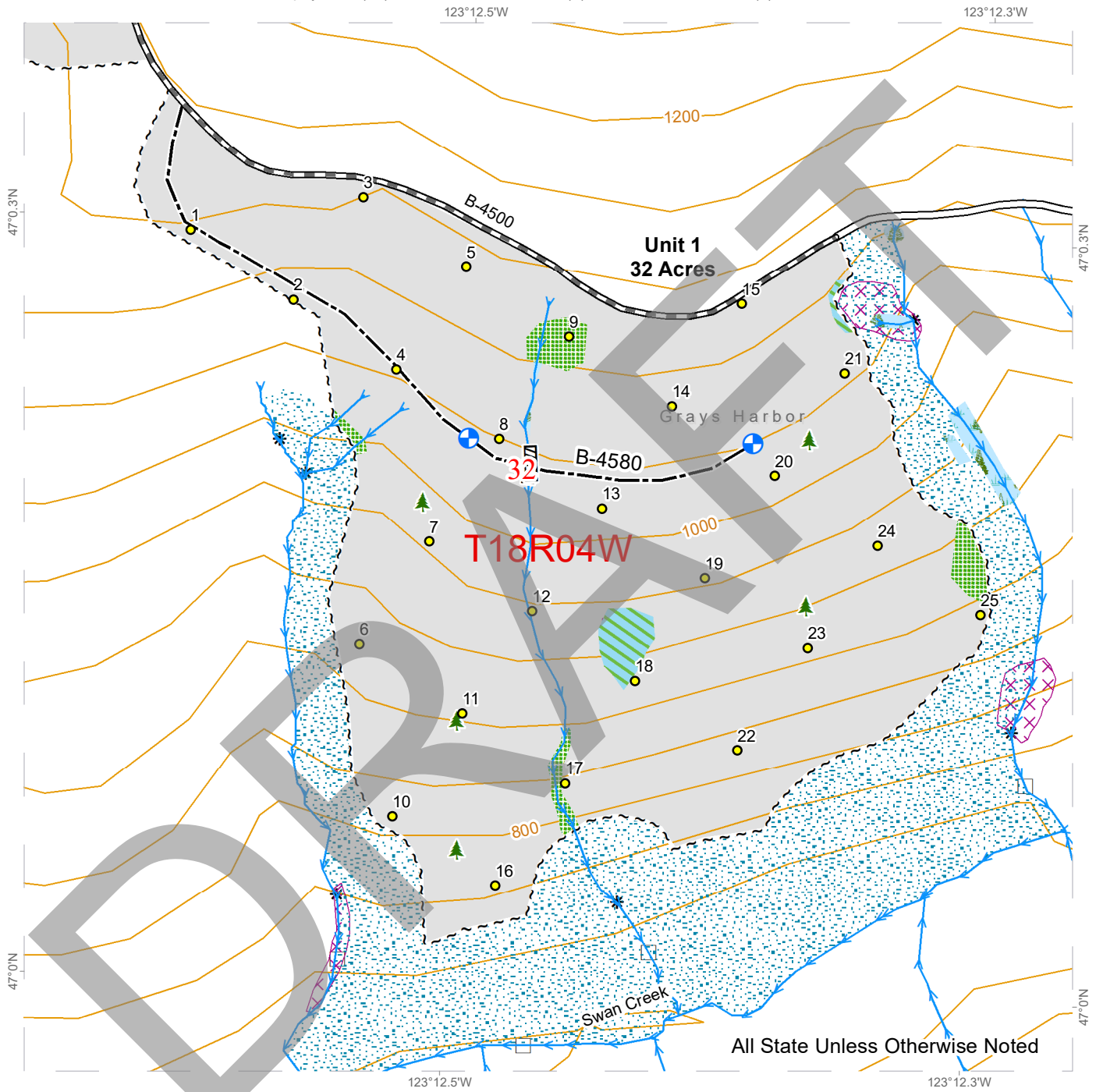
Unit Summary: CABBAGE PATCH U6 RW

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	4	ALL	19.0	85	108	14,462	13,667	5.5	47.7	93.9	21.5	5.5
RA	LIVE	CUT	6	ALL	13.0	63	78	15,439	14,245	7.7	152.8	140.8	39.1	5.7
ALL	LIVE	CUT	10	ALL	14.7	68	85	29,901	27,912	6.7	200.5	234.7	60.6	11.2
ALL	ALL	ALL	10	ALL	14.7	68	85	29,901	27,912	6.7	200.5	234.7	60.6	11.2

CRUISE MAP

SALE NAME: Cabbage Patch
AGREEMENT#: 30-103592
TOWNSHIP(S): T18R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 720-1960



All State Unless Otherwise Noted

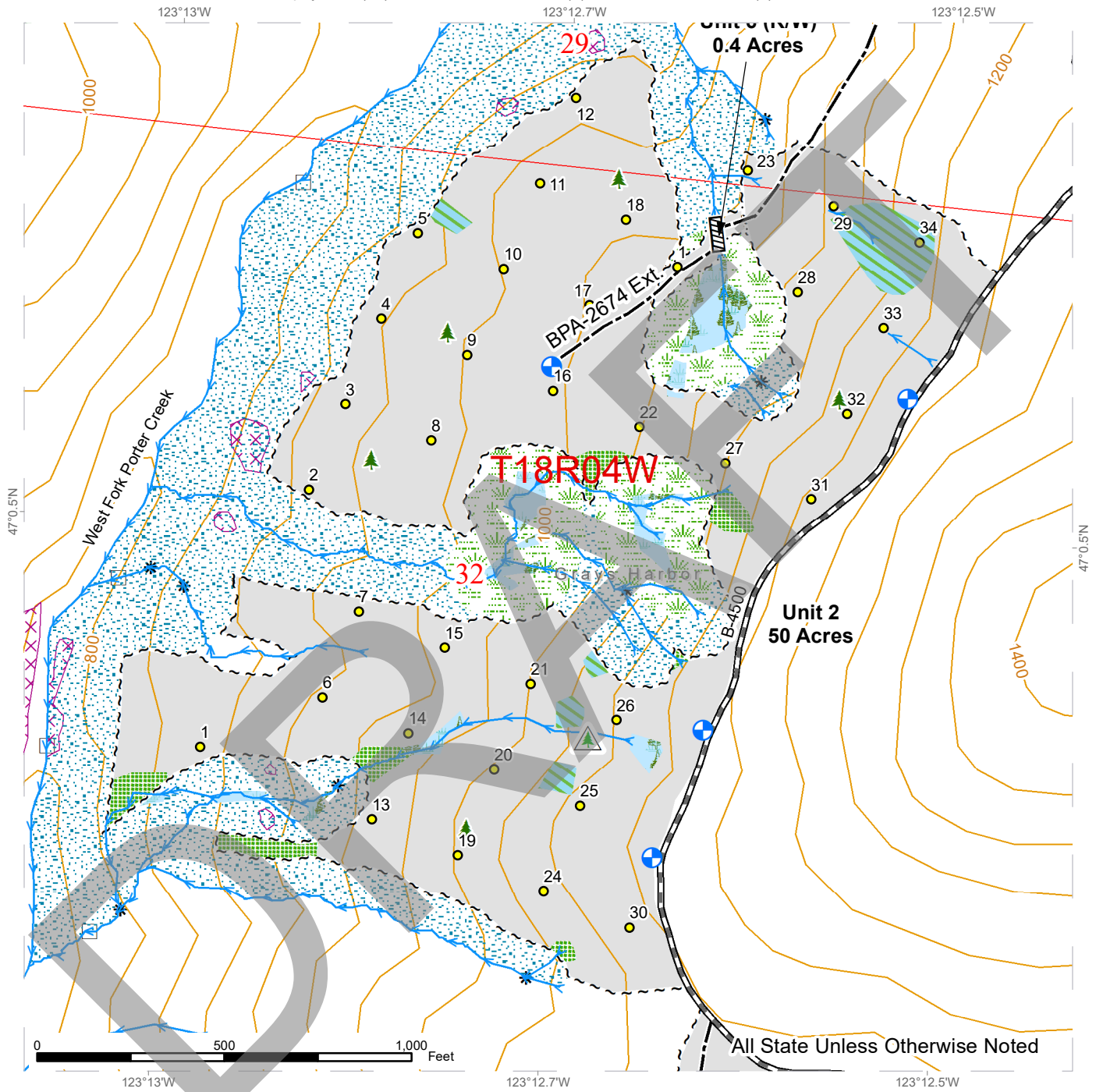
Variable Retention Harvest	Leave Tree Area	Landing - Proposed
Existing Roads	Riparian Mgt Zone	Leave Tree Area <1/4-acre
Required Pre-Haul Maintenance	Tailhold Restriction Area	Stream Type
Optional Construction	Sale Boundary Tags	Stream Type Break
Non-Tradeable Leave Clump	Streams	
Forested Wetland	Culvert	



CRUISE MAP

SALE NAME: Cabbage Patch
AGREEMENT#: 30-103592
TOWNSHIP(S): T18R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 720-1960



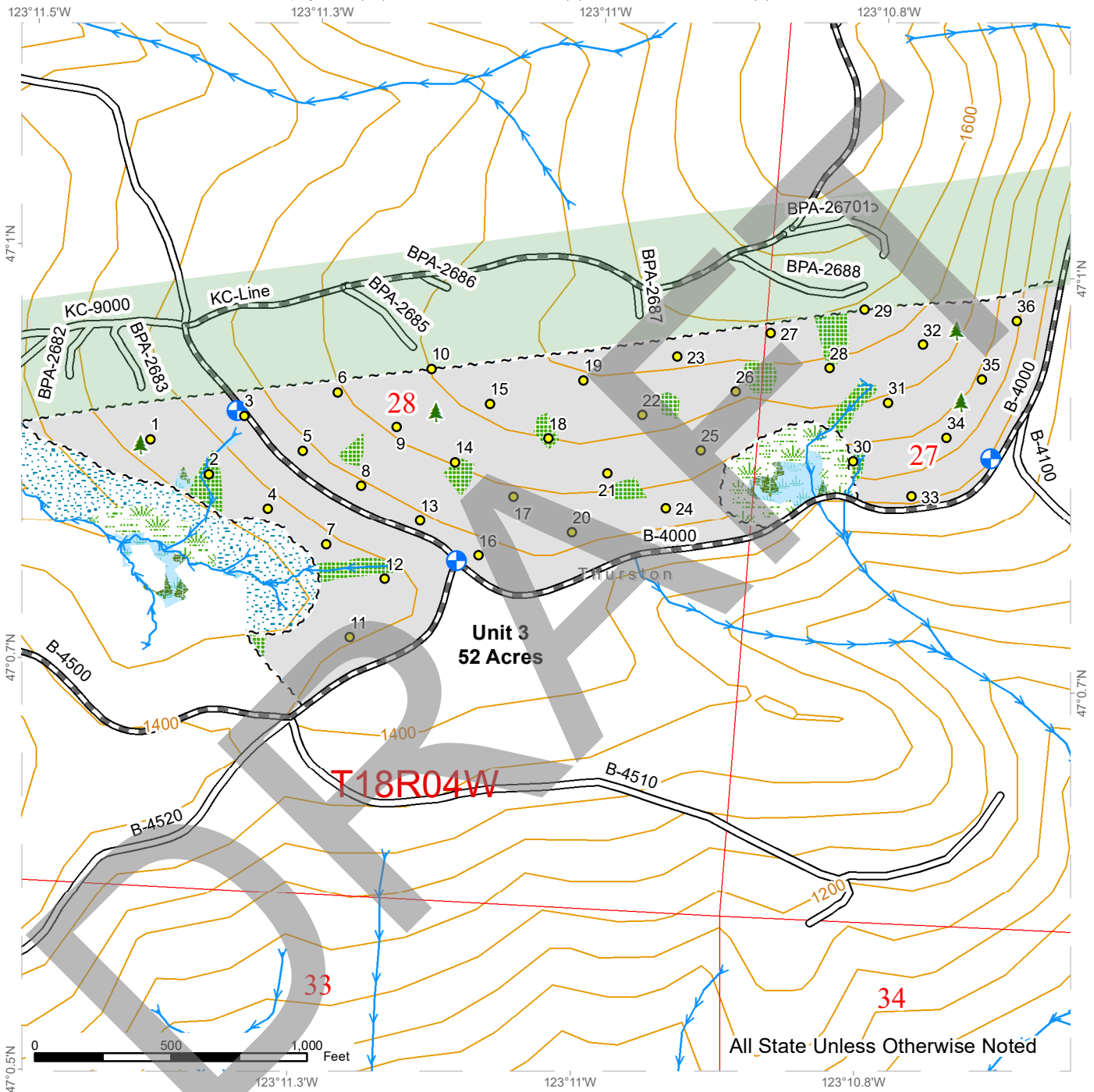
	Variable Retention Harvest		Wetland Mgt Zone		Leave Tree Area <1/4-acre
	Required Pre-Haul Maintenance		Tailhold Restriction Area		Non-Tradeable Leave Trees
	Optional Construction		Sale Boundary Tags		Stream Type
	Non-Tradeable Leave Clump		Right of Way Tags		Stream Type Break
	Forested Wetland		Streams		BPA Corridors
	Leave Tree Area		Culvert		
	Riparian Mgt Zone		Landing - Proposed		



CRUISE MAP

SALE NAME: Cabbage Patch
AGREEMENT#: 30-103592
TOWNSHIP(S): T18R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
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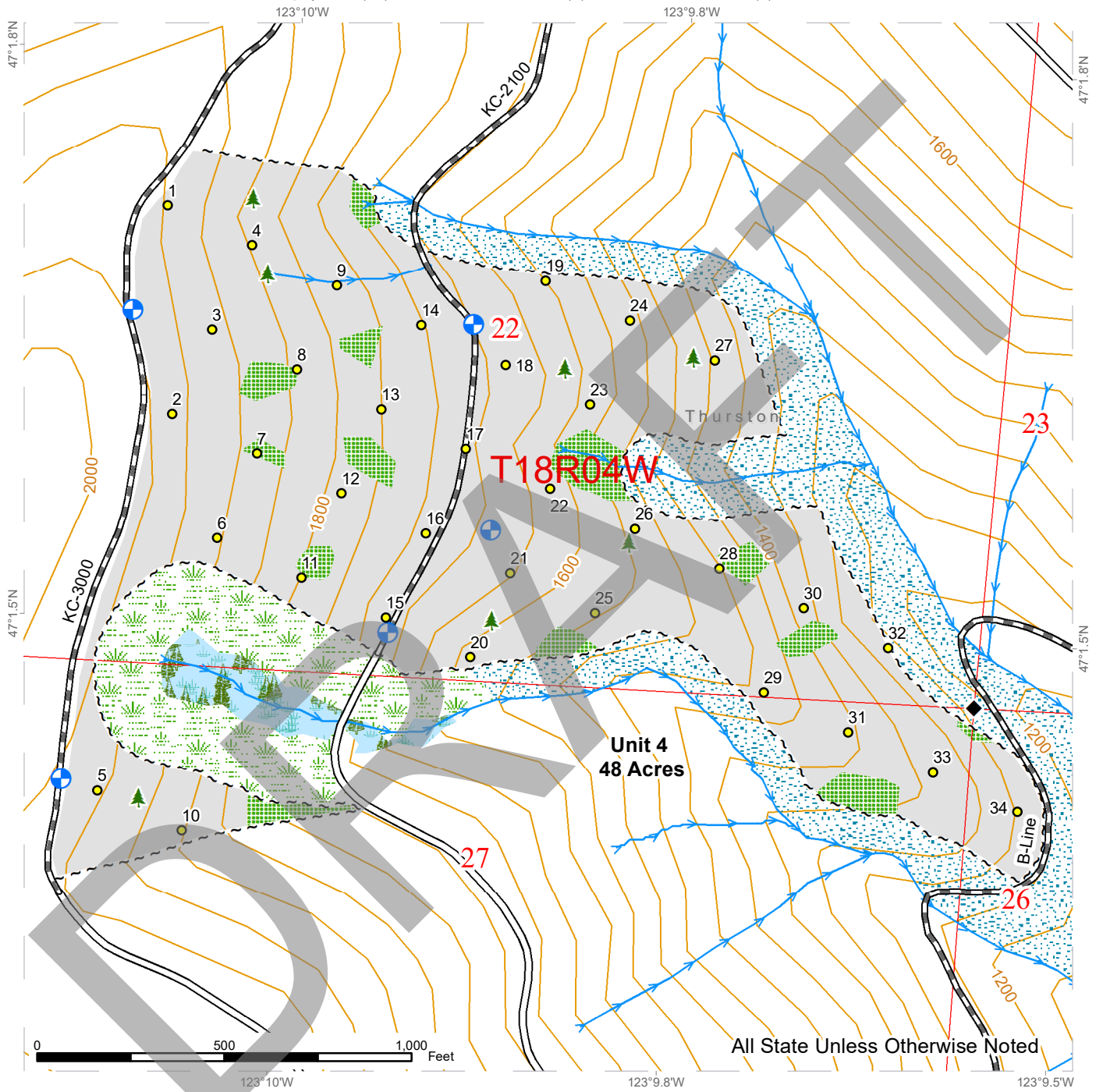
	Variable Retention Harvest		Wetland Mgt Zone
	Existing Roads		Sale Boundary Tags
	Required Pre-Haul Maintenance		Streams
	Forested Wetland		Landing - Proposed
	Leave Tree Area		Leave Tree Area <1/4-acre
	Riparian Mgt Zone		BPA Corridors



CRUISE MAP

SALE NAME: Cabbage Patch
AGREEMENT#: 30-103592
TOWNSHIP(S): T18R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 720-1960



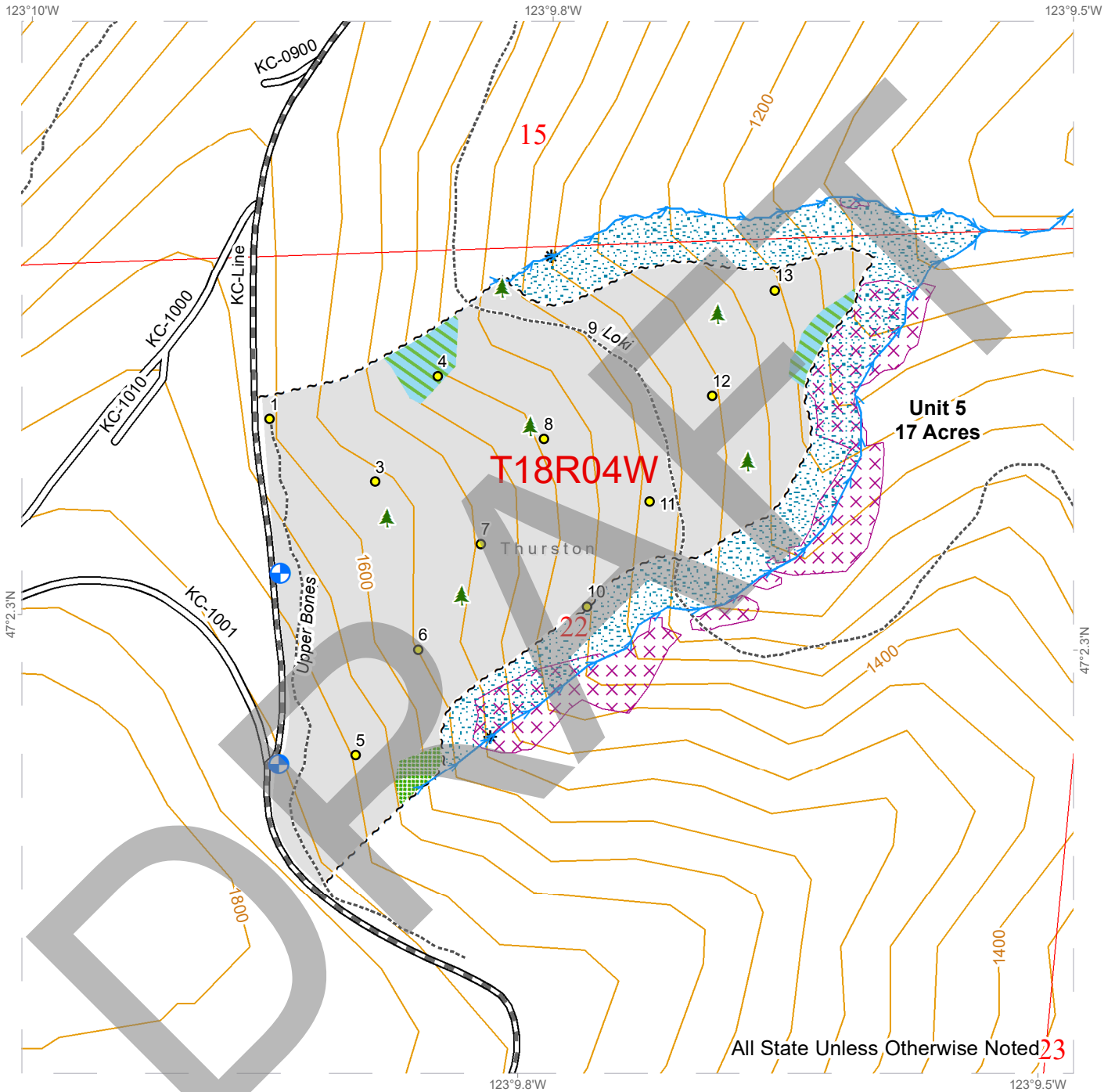
	Variable Retention Harvest		Wetland Mgt Zone
	Existing Roads		Sale Boundary Tags
	Required Pre-Haul Maintenance		Streams
	Forested Wetland		Landing - Proposed
	Leave Tree Area		Leave Tree Area <1/4-acre
	Riparian Mgt Zone		Survey Monument



CRUISE MAP

SALE NAME: Cabbage Patch
AGREEMENT#: 30-103592
TOWNSHIP(S): T18R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 720-1960



All State Unless Otherwise Noted ²³

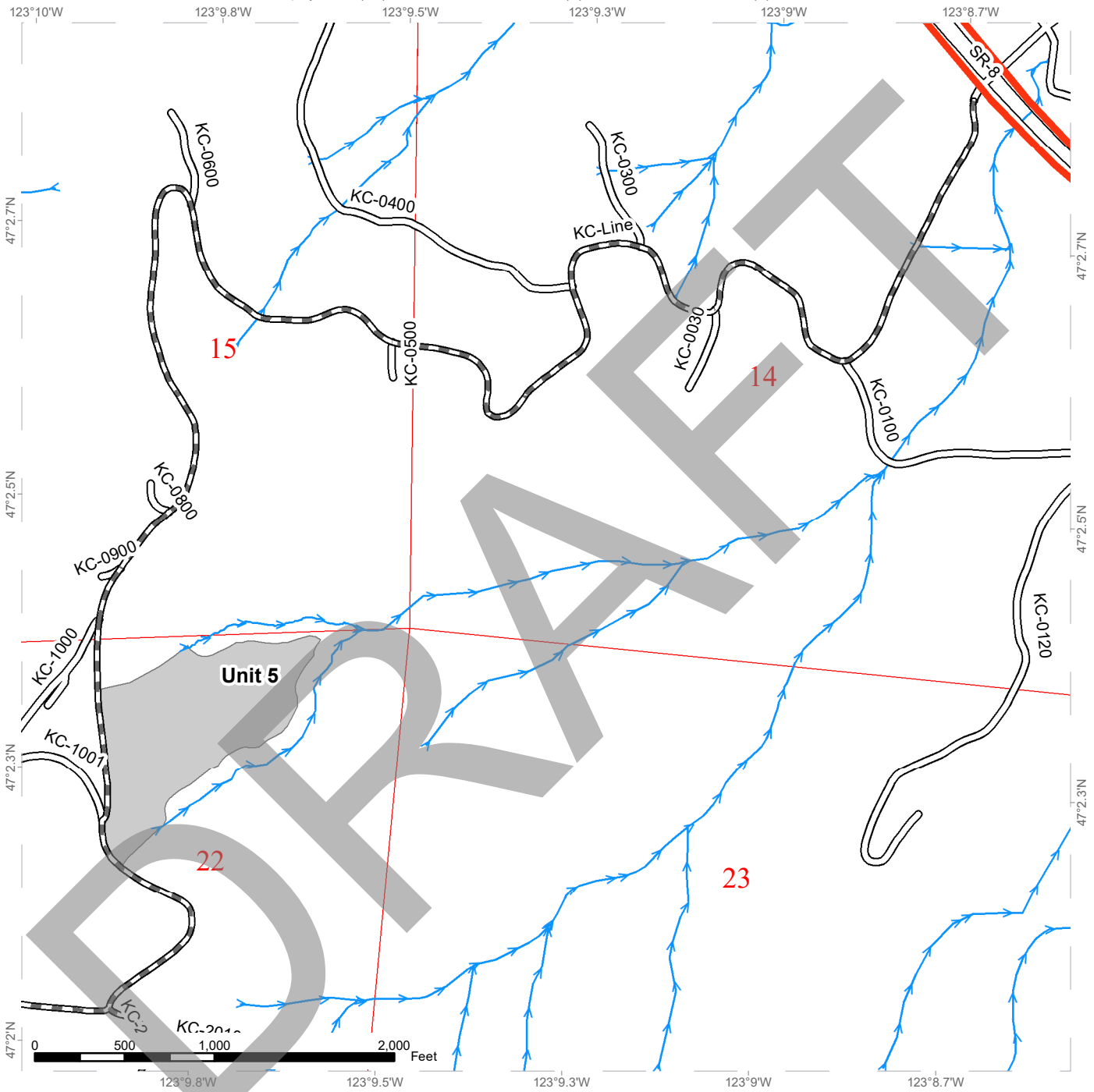
	Variable Retention Harvest		Sale Boundary Tags
	Existing Roads		Recreation Trails
	Required Pre-Haul Maintenance		Streams
	Non-Tradeable Leave Clump		Landing - Proposed
	Leave Tree Area		Leave Tree Area <1/4-acre
	Riparian Mgt Zone		Stream Type
	Tailhold Restriction Area		Stream Type Break



ROAD WORK MAP 1 OF 6

SALE NAME: Cabbage Patch
AGREEMENT#: 30-103592
TOWNSHIP(S): T18R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 720-1960



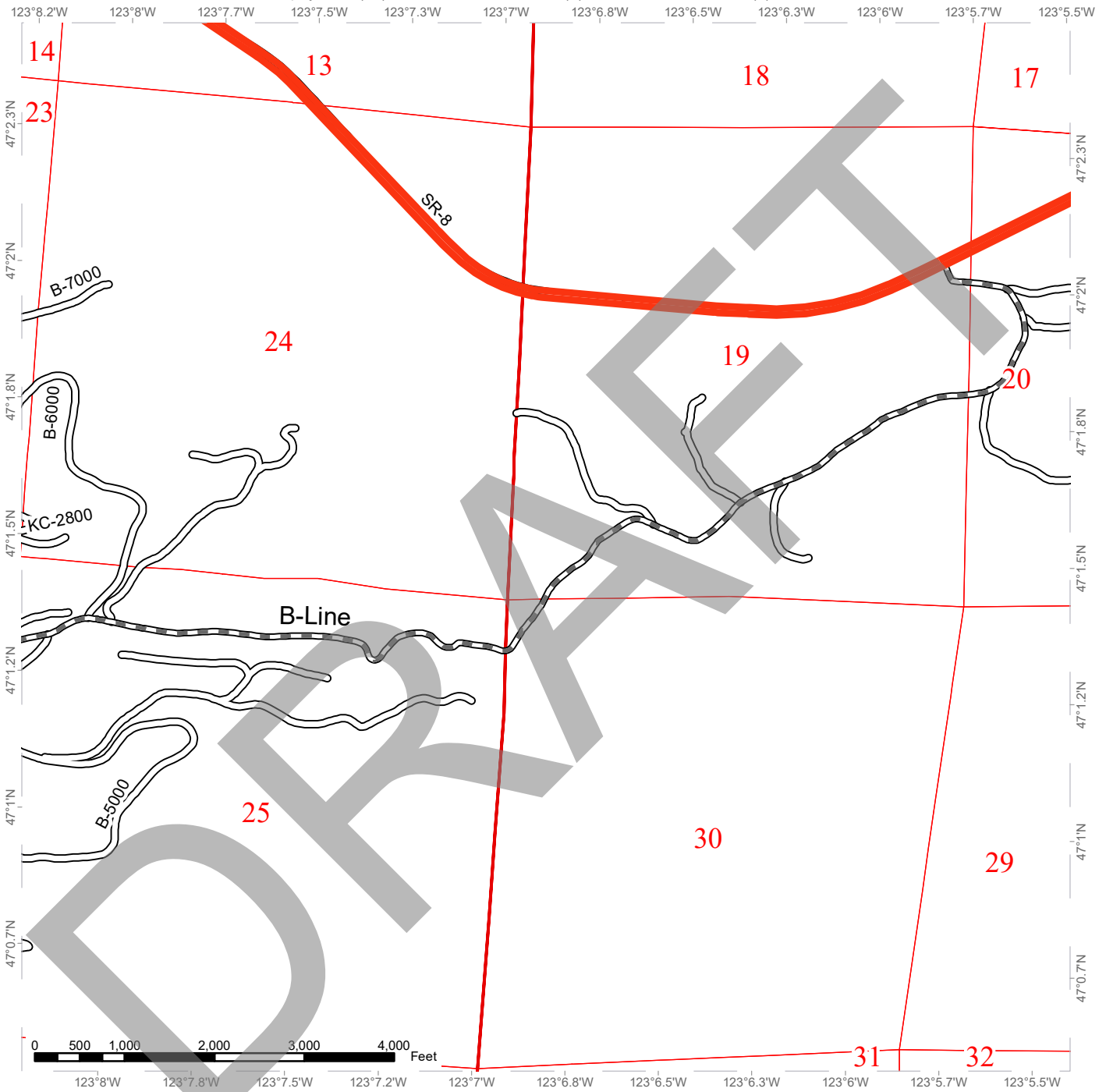
	Existing Roads
	Required Pre-Haul Maintenance
	Highway
	Streams
	Timber Sale Unit



ROAD WORK MAP 2 OF 6

SALE NAME: Cabbage Patch
AGREEMENT#: 30-103592
TOWNSHIP(S): T18R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 720-1960

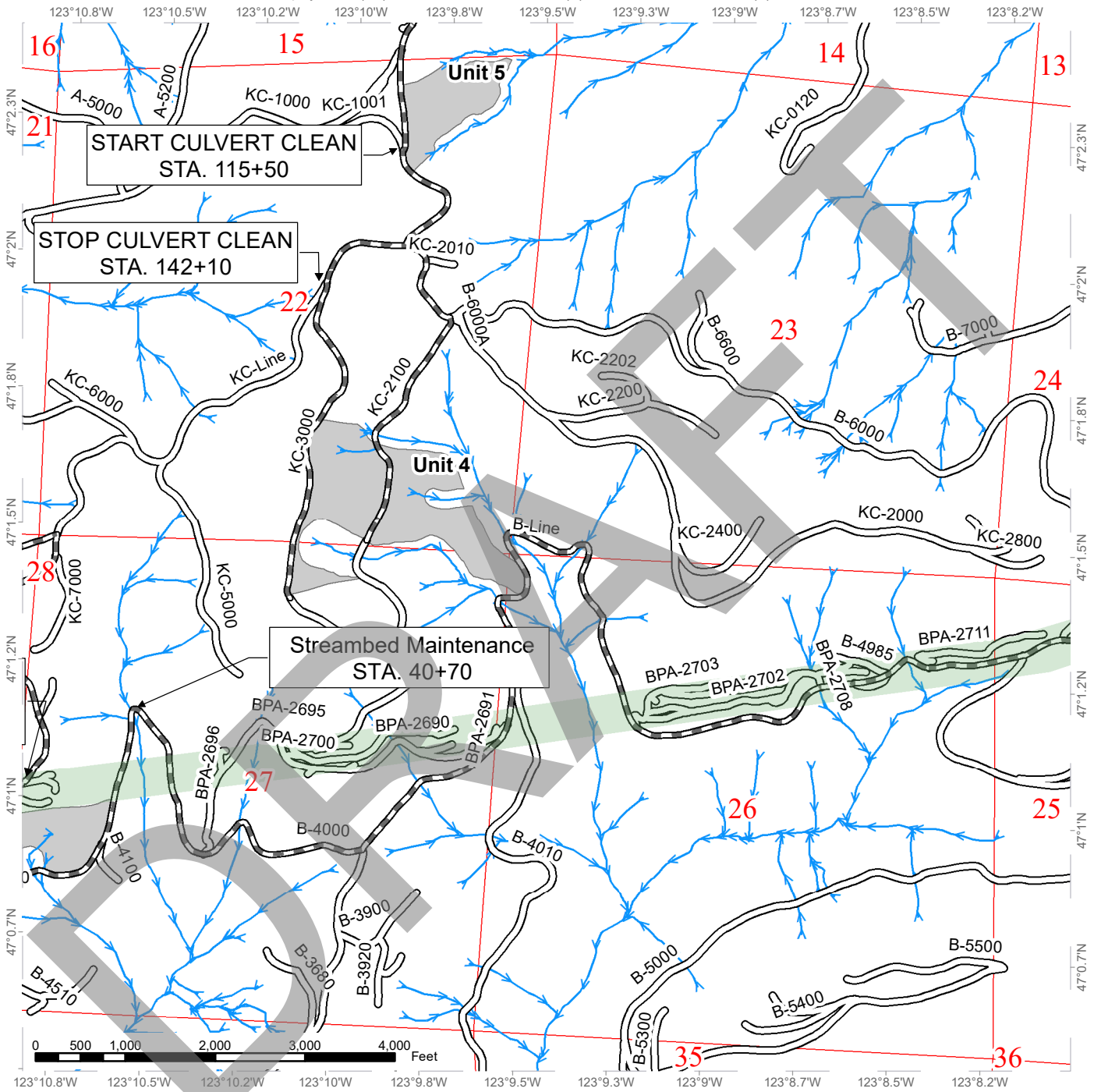


	Existing Roads
	Required Pre-Haul Maintenance
	Highway

ROAD WORK MAP 3 OF 6

SALE NAME: Cabbage Patch
AGREEMENT#: 30-103592
TOWNSHIP(S): T18R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 720-1960

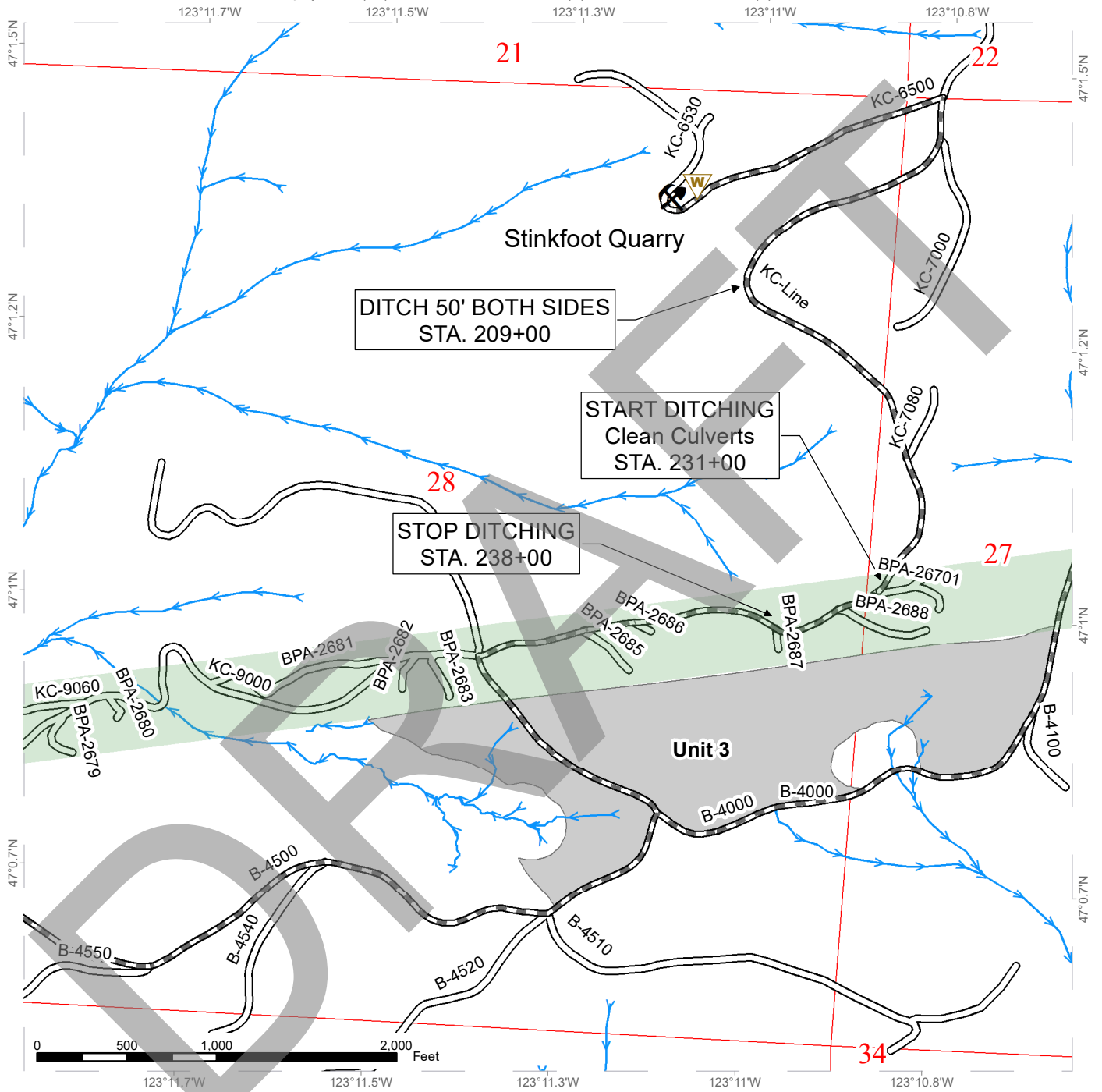


	Existing Roads
	Required Pre-Haul Maintenance
	Streams
	Timber Sale Unit
	BPA Corridors

ROAD WORK MAP 4 OF 6

SALE NAME: Cabbage Patch
AGREEMENT#: 30-103592
TOWNSHIP(S): T18R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 720-1960



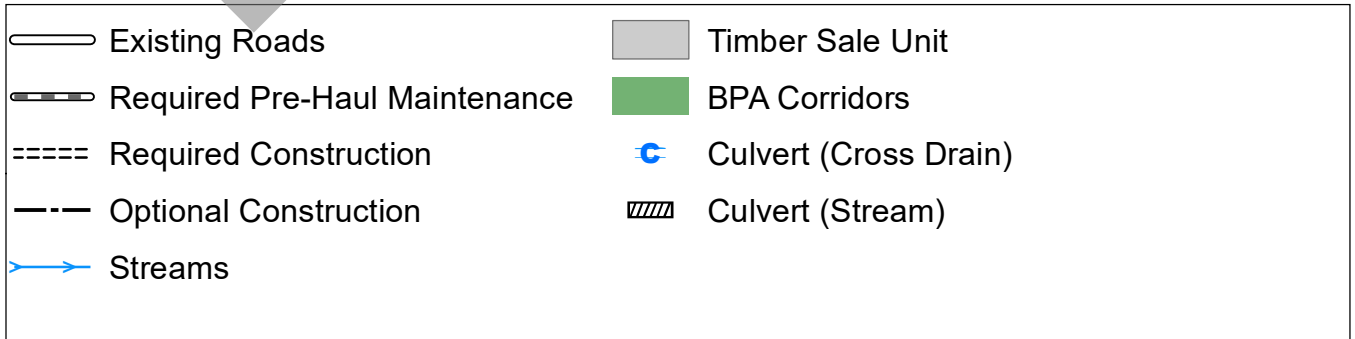
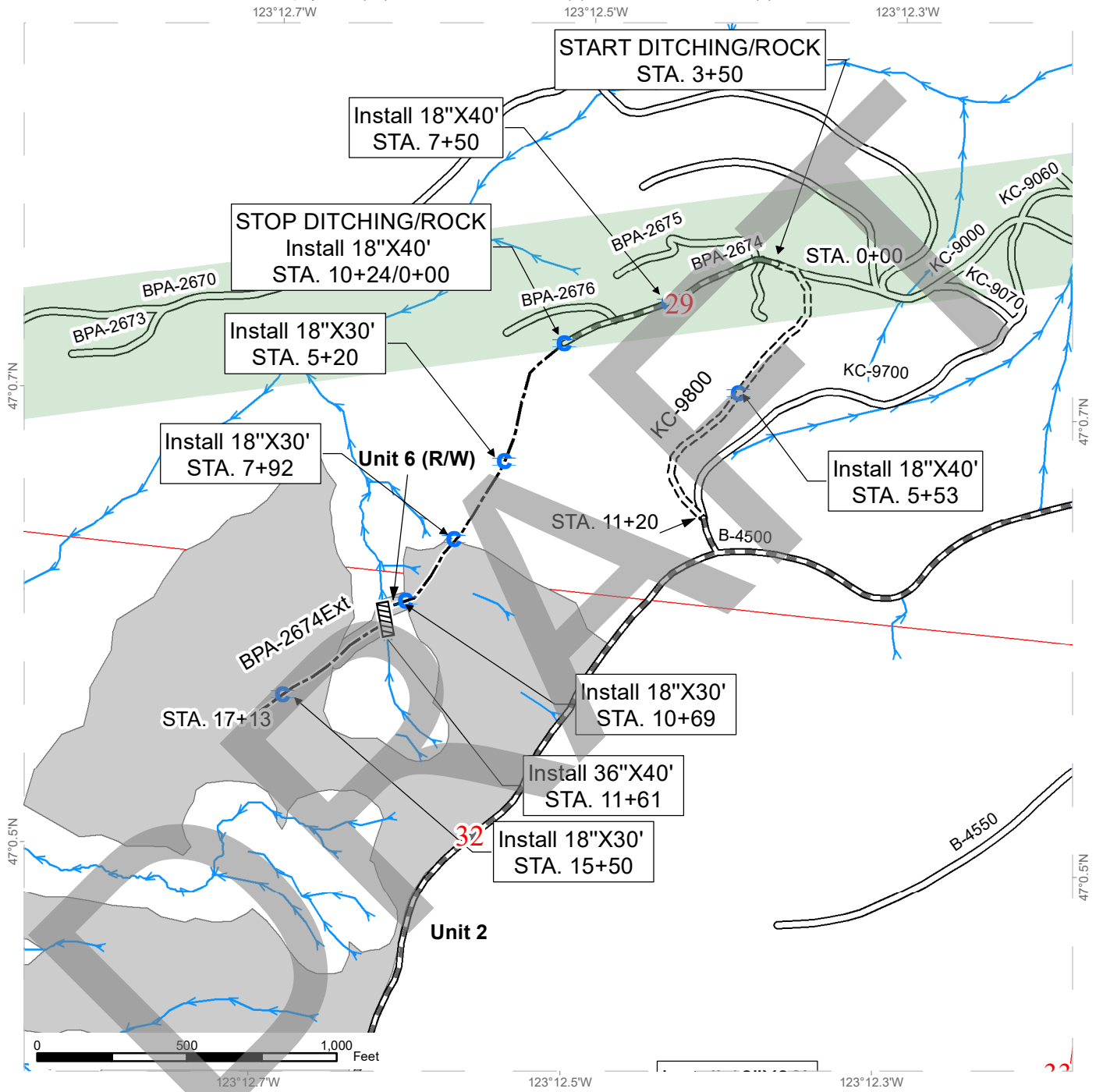
	Existing Roads		Waste Area
	Required Pre-Haul Maintenance		Rock Pit
	Streams		
	Timber Sale Unit		
	BPA Corridors		



ROAD WORK MAP 5 OF 6

SALE NAME: Cabbage Patch
 AGREEMENT#: 30-103592
 TOWNSHIP(S): T18R4W
 TRUST(S): Forest Board Repayment (42), State Forest Purchase (2), State Forest Transfer (1)

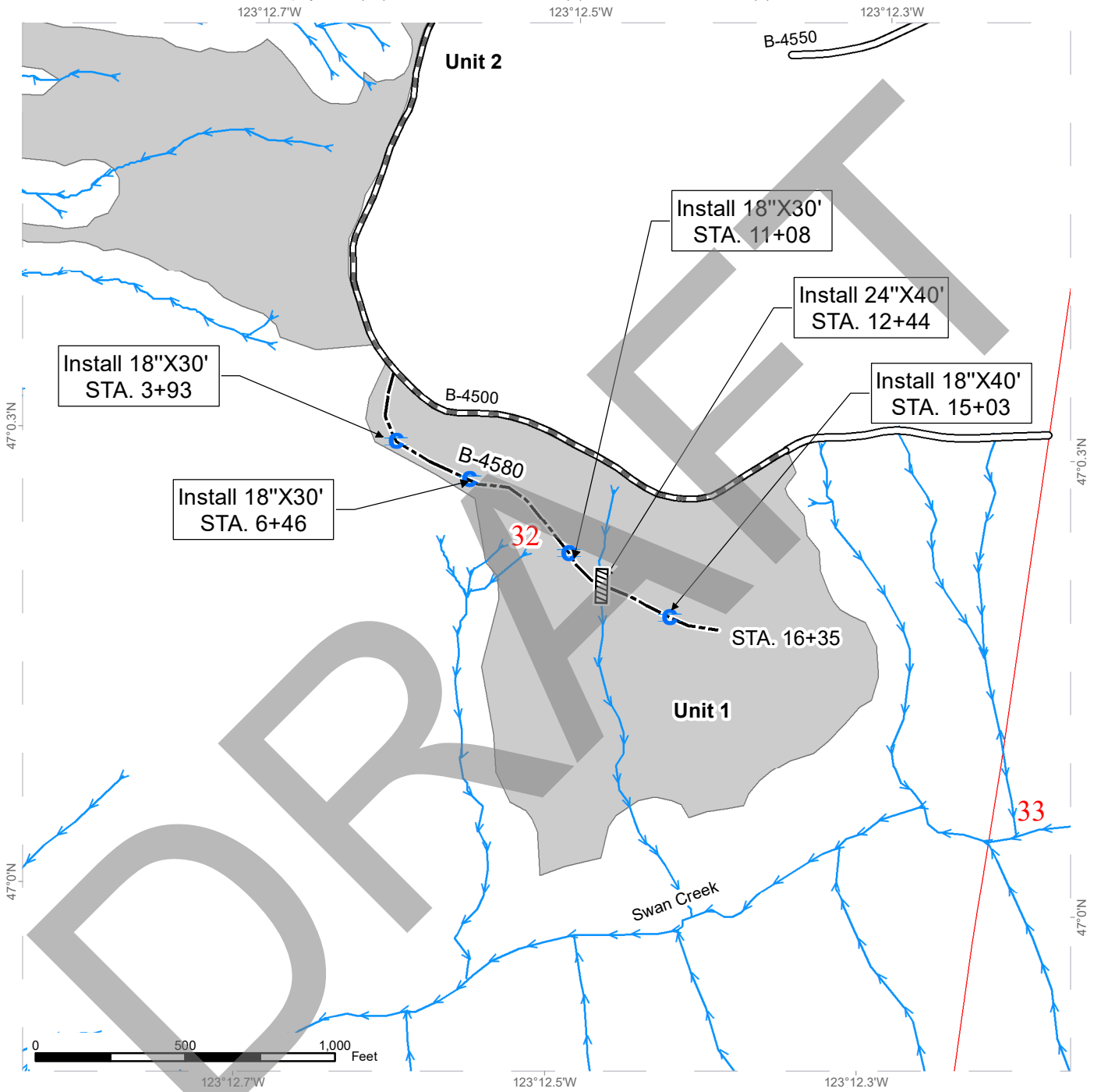
REGION: South Puget Sound Region
 COUNTY(S): Grays Harbor, Thurston
 ELEVATION RGE: 720-1960



ROAD WORK MAP 6 OF 6

SALE NAME: Cabbage Patch
AGREEMENT#: 30-103592
TOWNSHIP(S): T18R4W
TRUST(S): Forest Board Repayment (42), State Forest Purchase (2), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): Grays Harbor, Thurston
ELEVATION RGE: 720-1960



	Existing Roads		Culvert (Cross Drain)
	Required Pre-Haul Maintenance		Culvert (Stream)
	Optional Construction		
	Streams		
	Timber Sale Unit		



STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

CABBAGE PATCH TIMBER SALE ROAD PLAN
GRAYS HARBOR & THURSTON COUNTY
DELPHI UNIT
BLACK HILLS DISTRICT

AGREEMENT NO.: 30-103592

STAFF ENGINEER: JACOB GROSS

DATE: AUGUST 1, 2023

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>
B-Line	418+50 to 685+10	Pre-Haul Maintenance
B-4000	0+00 to 93+57	Pre-Haul Maintenance
B-4500	0+00 to 103+70	Pre-Haul Maintenance
B-4580	4+00 to 16+35	Abandonment, if constructed
BPA-2674	3+50 to 10+24	Pre-Haul Maintenance
BPA-2674Ext	0+00 to 17+13	Abandonment, if constructed
KC-Line	0+00 to 142+10	Pre-Haul Maintenance
KC-Line	192+50 to 254+65	Pre-Haul Maintenance
KC-2000	0+00 to 11+00	Pre-Haul Maintenance
KC-2100	0+00 to 28+50	Pre-Haul Maintenance
KC-3000	0+00 to 38+70	Pre-Haul Maintenance
KC-6500	0+00 to 17+00	Pre-Haul Maintenance
KC-9700	17+26 to 18+76	Pre-Haul Maintenance
KC-9800	0+00 to 11+20	Construction

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-4580	0+00 to 16+35	Construction
BPA-2674Ext	0+00 to 17+13	Construction

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
- Acquisition and installation of drainage structures
- Stream culvert installation
- 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
- Streambed maintenance See Section 11 and attached design

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:

- 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.

<u>Road</u>	<u>Type</u>
Construction	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.

1-22 WORK NOTIFICATIONS

On the following road(s), Purchaser shall notify the Contract Administrator a minimum of 5 calendar days before work begins.

<u>Road</u>	<u>Stations</u>
B-4000	40+70

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

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

<u>Road</u>	<u>Stations</u>	<u>Activity</u>	<u>Closure Period</u>
B-4000	40+70	Streambed Maintenance	October 1 to July 14

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. Purchaser shall notify the Bonneville Power Administration 5 calendar days’ before starting road work.

<u>Road</u>	<u>Stations</u>	<u>Utility</u>	<u>Utility Contact</u>
BPA-2674	3+50 to 10+24	BPA Transmission Lines	Cody Smith 360-742-6887 Or Jason Hunt 253-880-4112
KC-9800	0+00 to 4+00	BPA Transmission Lines	

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>
B-Line	418+50 to 685+10
B-4000	0+00 to 93+57
B-4500	0+00 to 103+70
BPA-2674	3+50 to 10+24
KC-Line	0+00 to 142+10
KC-Line	192+50 to 254+65
KC-2000	0+00 to 11+00
KC-2100	0+00 to 28+50
KC-3000	0+00 to 38+70
KC-6500	0+00 to 17+00
KC-9700	17+26 to 18+76

2-6 CLEANING CULVERTS

On the following roads, Purchaser shall clean the inlets and outlets of all culverts:

<u>Road</u>	<u>Stations</u>	<u>Comments</u>
KC-Line	115+50 to 142+10, Marked in Field	Clean Inlet & Outlet, Organic Debris/Soil

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>
BPA-2674	3+50 to 10+24
KC-Line	209+00 to 209+50
KC-Line	231+00 to 238+00

SECTION 3 – CLEARING, GRUBBING, AND DISPOSAL

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.

3-12 STUMP PLACEMENT

On the following road(s), Purchaser may place grubbed stumps adjacent to the road shoulder, within the clearing limits, and outside the right of way tags. Stumps placed outside the right-of-way tags must be positioned upright, with root wads in contact with the forest floor. Stumps placed within the right-of-way tags shall be used for road abandonment.

<u>Road</u>	<u>Stations</u>
BPA-2674Ext	10+00 to 13+50

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.

4-37 WASTE AREA LOCATION

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

<u>Road</u>	<u>Waste Area Location</u>	<u>Comments</u>	<u>Volume</u>
KC-6500	See Quarry Plan	Stinkfoot Quarry	1000 cy

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 10-23.

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 10-23.

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 2 - 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>
Stinkfoot Quarry	NE ¼ Sec. 28, T18N, R04W	2 Inch Crushed, 4 Inch Jaw, 4 Inch In-Place, Select Pit Run, Quarry Spalls.

6-3 ROCK SOURCE STATE LAND, EXISTING STOCKPILE

Rock used in accordance with the quantities on the ROCK LIST may be obtained from the following existing stockpile(s) on state land at no charge to the Purchaser. Purchaser shall not remove additional yardage without prior written approval from the Contract Administrator.

<u>Source</u>	<u>Location</u>	<u>Rock Type</u>	<u>Quantity</u>
Stinkfoot Quarry	See Quarry Plan	2 Inch Crushed	500 CY

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>
Stinkfoot Quarry	NE ¼ Sec. 28, T18N, R04W

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-4580	0+00 to 16+35
BPA-2674Ext	0+00 to 17+13

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-INCH MINUS CRUSHED ROCK

% Passing 2" square sieve	100%
% Passing 1" 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.

6-44 STREAMBED ROCK

Streambed rock must be manufactured on site or in a rock pit by mixing the components shown below with an excavator or front-end loader from Streambed Rock Mix material in 6-52.

- 2 parts Streambed Cobbles
- 1 parts Streambed Sediment

6-52 STREAMBED ROCK MIX

Purchaser shall provide and install streambed material consisting of rock meeting the quality requirements of WSDOT Section 9-13 and the gradation requirements of WSDOT Section 9-0.3.11(1), Streambed Sediment, augmented with WSDOT Section 9-0.3.11(2), Streambed Cobbles, or with material reclaimed from the streambed within the pipe structure being replaced in order to obtain a well graded mix, prior to placement, as shown on the design and listed in Clause 6-44.

The rock shall be hard, sound, and durable material, free from seams, cracks and other defects that tend to destroy its resistance to weather, and may contain broken and/or processed rock.

Streambed Sediment in accordance with WSDOT Section 9-0.3.11(1)

Sieve Size	Percent Passing by Weight
2 ½ inch square	99% - 100%
2 inch square	65% - 95%
1 inch square	50% - 85%
No. 4	26% - 44%
No. 40	16% max.
No. 200	5% - 9%

Streambed Cobbles in accordance with WSDOT Section 9-0.3.11(2)

Approximate Size	Percent Passing	
	6" Cobbles	12" Cobbles
12"		99% - 100%
10"		70% - 90%
8"		
6"	99% - 100%	
5"	70% - 90%	30% - 60%
4"		
3"		
2"	30% - 60%	
1 ½"		
¾"	10% max.	10% max.

Approximate size can be determined by taking the average dimension of the three axes of the rock, Length, Width, and Thickness is the second longest axis, and thickness is the shortest axis.

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-4580	4+00 to 16+35
BPA-2674Ext	0+00 to 17+13

SECTION 7 – STRUCTURES

SUBSECTION GATE CLOSURE

7-70 GATE CLOSURE

On the following road(s), Purchaser shall keep gates closed and locked except during periods of haul. All gates that remain open during haul must be locked or securely fastened in the open position. All gates must be closed at termination of use.

<u>Road</u>	<u>Station</u>	<u>Gate No.</u>
KC-Line	1+96	1260

SECTION 8 – EROSION CONTROL

8-2 PROTECTION FOR EXPOSED SOIL

Purchaser shall provide and evenly spread a 6-inch layer of straw to all exposed soils within 50 feet of a stream or wetland. Soils must be covered before the first anticipated storm event.

<u>Road</u>	<u>Location</u>	<u>Coverage</u>	<u>Type</u>	<u>Comments</u>
B-4580	11+00 to 14+00	70%	Weed Free Straw	Straw exposed soils concurrently with native plant mixture.
BPA-2674Ext	10+00 to 13+50			

SUBSECTION REVEGETATION

8-15 REVEGETATION

On the following road(s), Purchaser shall spread seed on all exposed soils within the grubbing limits.

<u>Road</u>	<u>Location</u>	<u>Type</u>	<u>Comments</u>
B-4580	11+00 to 14+00	Native Plant Mix	Seed Wetland crossing
BPA-2674Ext	10+00 to 13+50		

8-17 REVEGETATION TIMING

On the following roads, Purchaser shall revegetate immediately following the completion of the activity listed below.

<u>Road</u>	<u>Revegetation Type</u>	<u>Comments</u>
B-4580	Plant Mix and Straw Mulch	See Road Plan Clause 9-23
BPA-2674Ext	Plant Mix and Straw Mulch	See Road Plan Clause 9-23

8-18 PROTECTION FOR SEED

Purchaser shall provide a protective cover for seed. The protective cover may consist of weed free straw mulch. Seed must be covered before the first anticipated storm event.

SUBSECTION SEED, FERTILIZER, AND MULCH

8-25 SEED MIXTURE

Purchaser shall evenly spread the seed mixture listed below on all exposed soil at a rate of 50-70 pounds per acre of exposed soil. Grass seed must meet the following specifications:

1. Weed seed may not exceed 0% 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.

Drought to Moist Conditions	
<u>Kind and Variety of Seed in Mixture</u>	<u>% by Weight</u>
Annual Ryegrass	50
Oats	30
Perennial Ryegrass	10
Austrian Winter Pea	10

Saturated in Midsummer Conditions	
<u>Kind and Variety of Seed in Mixture</u>	<u>% by Weight</u>
Annual Ryegrass	50
Oats	30
Barley	15
Austrian Winter Pea	5

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-4580	4+00
BPA-2674Ext	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.

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>	<u>Type</u>
B-4580	0+00 to 11+00 and 14+00 to 16+35	Road Plan Clause 9-22
BPA-2674Ext	0+00 to 4+09 and 13+50 to 17+13	Road Plan Clause 9-22
B-4580	11+00 to 14+00	See Clause 9-23 Forested Wetland Abandonment
BPA-2674Ext	10+00 to 13+50	

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 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 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.

9-23 FORESTED WETLAND 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.
- DO NOT APPLY NORMAL GRASS SEED, see site specific clause 8-25 SEED MIXTURE
- Silt barriers shall be installed as a failsafe to protect area from sediment delivery until vegetation is established.
- Rock shall be removed from the wetland area.
- Rootwads removed from the right-of-way during construction shall be retained and placed on the abandoned road prism.

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

SECTION 11 SPECIAL NOTES

11-1 STREAMBED MAINTENANCE

Before completion of contract, Purchaser shall replace streambed within the fish culvert in accordance with FPA Requirements, B-4000 Culvert NO. T18R04W-112, STREAMBED MAINTENANCE DETAILS design drawings and construction notes on the following road.

<u>Road</u>	<u>Stations</u>
B-4000	40+70

11-2 STREAM PROTECTION

Disturbance of the streambed, banks, and riparian vegetation shall be limited to that necessary to construct the project. Project activities shall not degrade water quality downstream to the detriment of fish life. Equipment working in and around streams shall be free of external petroleum-based products or leaks. Equipment shall be checked daily for leaks and any necessary repairs shall be completed at an upland location prior to use in or near the water. Upon completion of the in-stream work, all materials used for temporary silt fences, check dams or other temporary in-stream structures shall be removed and the stream returned to pre-project conditions or better.

11-3 SETTLING POND AND PUMP

On the following roads, Purchaser shall reconstruct the streambed inside fish passage culvert. Streambed maintenance shall be in accordance with the FPA, Settling Pond and Pump Detail and Live Stream Culvert Procedure unless authorized in writing by the Contract Administrator.

<u>Road</u>	<u>Stations</u>
B-4000	40+70

11-4 STREAMBED MAINTENANCE

Streambed maintenance consists of channel excavation and placement of streambed material.

1. Remove top layer (approximately 16") per design.
2. Install streambed sediment, filling all voids, and apply water until flow is atop streambed along entire pipe.
3. Install streambed mix (cobbles and sediment) per plans, filling all voids with streambed sediment, and apply water until flow is atop streambed along entire pipe. Additional streambed sediment may need to be applied with water to fill voids and achieve stream flow atop the streambed.
4. Reconstructed stream channel shall be cleaned of surface fine sediment before re-introduction of stream flow. Channels shall be washed down with pressurized water. Sediment laden effluent shall be collected and pumped to a vegetated upland location for filtration away from any natural stream channels. Sediment laden water shall not be allowed to enter natural stream flow.
5. All waste associated with this project shall utilize approved waste areas in accordance with road plan clause 4-37, WASTE AREA LOCATION.

11-5 SEDIMENT RESTRICTION

On the following road, Purchaser shall not allow silt-bearing runoff to enter any WMZ. Contract Administrator may require the use of silt-fencing, jute mesh, coconut mat, or other means to eliminate silt-bearing runoff. All materials used shall be removed from State Land prior to road abandonment approval.

<u>Road</u>	<u>Stations</u>
BPA-2674Ext	10+00 to 13+50

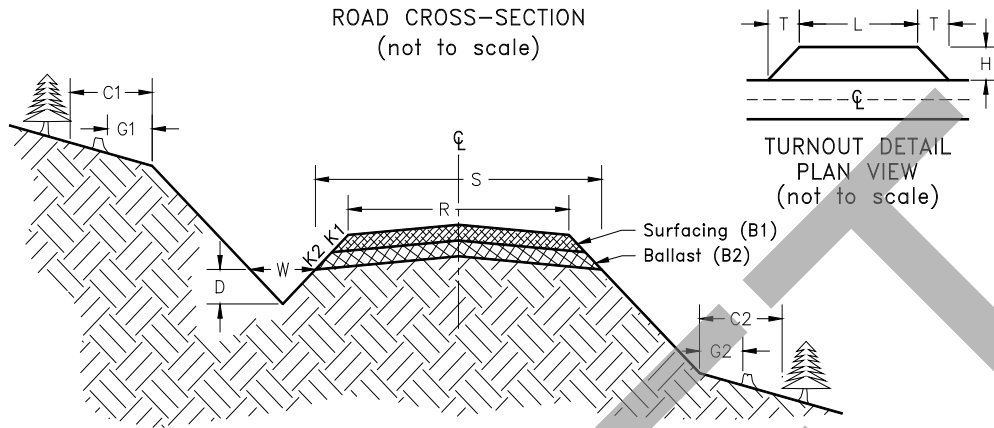
11-6 STUMPS

On the following road, Purchaser is not required to remove stumps if they are cut flush with the ground.

<u>Road</u>	<u>Stations</u>
BPA-2674Ext	10+00 to 13+50

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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
B-Line	418+50	685+10	A		14	3	1	4	-	-	-	-	4-5	4-6
B-2700	0+00	45+70	C	16	12	3	1	4	-	-	-	-	4-5	4-6
B-4000	0+00	93+57	B		12	3	1	4	-	-	-	-	4-5	4-6
B-4500	0+00	103+70	C	16	12	3	1	4	-	-	-	-	4-5	4-6
B-4580	0+00	4+00	C	16	12	3	1	4	3	3	5	5	4-5	4-6
B-4580	4+00	16+35	C	16	12	3	1	4	0	0	0	0	4-5	4-6
BPA-2674	3+50	10+24	B	16	12	3	1	4	3	3	5	5	4-5	4-6
BPA-2674Ext	0+00	10+00	B	16	12	3	1	4	0	0	5	5	4-5	4-6
BPA-2674Ext	0+00	13+50	B	16	12	3	1	4	0	0	TAGS	TAGS	4-5	4-6
BPA-2674Ext	13+50	17+13	B	16	12	3	1	4	0	0	0	0	4-5	4-6
KC-Line	0+00	142+10	A		14	3	1	4	-	-	-	-	4-5	4-6
KC-Line	192+50	254+65	A		14	3	1	4	-	-	-	-	4-5	4-6
KC-2000	0+00	11+00	B	16	12	3	1	4	-	-	-	-	4-5	4-6
KC-2100	0+00	28+50	B	16	12	3	1	4	-	-	-	-	4-5	4-6
KC-3000	0+00	38+70	B	16	12	3	1	4	-	-	-	-	4-5	4-6
KC-6500	0+00	17+00	B	16	12	3	1	4	-	-	-	-	4-5	4-6
KC-9700	17+26	18+76	B	16	12	3	1	4	-	-	-	-	4-5	4-6
KC-9800	0+00	11+20	B	16	12	3	1	4	3	3	5	5	4-5	4-6

*Tags are orange "Right-of-Way Boundary" tags

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 Jaw				
KC-9800	0+00	11+20	1 ½ :1	12	56	11.20	628	Stinkfoot Quarry/Stockpile, Commercial Source	
BPA-2674	3+50	10+24	1 ½ :1	12	56	6.74	378		
4 Inch In Place/4 Inch Jaw									
B-4580	0+00	4+00	1 ½ :1	12	56	4.00	224		
B-4580*	4+00	16+35	1 ½ :1	12	56	12.35	692		
BPA-2674Ext*	0+00	17+13	1 ½ :1	12	56	17.13	960		
4 Inch In Place/Select Pit Run									
Landing Rock*							750		
Streambed Cobbles									
B-4000	40+70	40+70	NA	NA	-	-	36		See Sec 11 & Detail for final mixture.
Quarry Spalls									
Culvert Headwalls and Dissapaters							42	See CULVERT AND DRAINAGE LIST	

4 Inch In Place/4 Inch Jaw Total 3,632 Cubic Yards
 Quarry Spalls Total 42 Cubic Yards
 Streambed Cobbles 36 Cubic Yards
 Ballast Total 3,710 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		
			K1	B1	2 Inch Crushed				CW	TO	TA
B-4000	30+70	50+70	1 ½ :1	6	24	2	48	Stinkfoot Quarry/Stockpile, Commercial Source	Surface rock following streambed sediment replacement		
KC-9800	0+00	11+20	1 ½ :1	6	24	11.20	295		Includes CW Rock		
BPA-2674	3+50	10+24	1 ½ :1	6	24	6.74	162				
					Streambed Sediment						
B-4000	40+70	40+70	NA	NA	-	-	45		See Sec 11 & Detail for final mixture.		

2 1/2 Inch Minus Crushed Total 505 Cubic Yards
 Streambed Sediment 45 Cubic Yards
 Surface Total 550 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

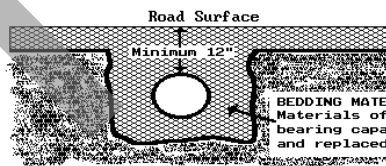
Road Number	Location	Culvert		Length (ft)			Armoring (C.Y.)			Backfill Material*	Placement Method*	Const. Staked *	Remarks
		Dia. (in)	Type	Culvert	Downspt	Flume	Inlet	Outlet	Type				
B-4000	40+70	-	-	-	-	-	-	-	-	-	-	-	See Attached Details
B-4580	3+93	18	PD	30	-	-	1	1.5	QS	NT			Install Cross Drain
	6+46	18	TEMP	30	-	-	1	1.5	QS	NT			Install Cross Drain
	11+08	18	TEMP	30	-	-	1	1.5	QS	NT			Install Cross Drain
	12+44	24	TEMP	40	-	-	2	2.5	QS	NT			Stream Install
	15+03	18	TEMP	40	-	-	1	1.5	QS	NT			Replace Cross Drain
BPA-2674	7+50	18	PD	40	-	-	1	1.5	QS	NT			Replace Cross Drain
	10+24	18	PD	40	-	-	1	1.5	QS	NT			Install Cross Drain
BPA-2674Ext	5+20	18	TEMP	30	-	-	1	1.5	QS	NT			Install Cross Drain
	7+92	18	TEMP	30	-	-	1	1.5	QS	NT			Install Cross Drain
	10+69	18	TEMP	30	-	-	1	1.5	QS	NT			Install Cross Drain
	11+61	36	TEMP	40	-	-	2	2.5	QS	NT			Stream Install
	15+50	18	TEMP	30	-	-	1	1.5	QS	NT			Install Cross Drain
KC-9800	5+53	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	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

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

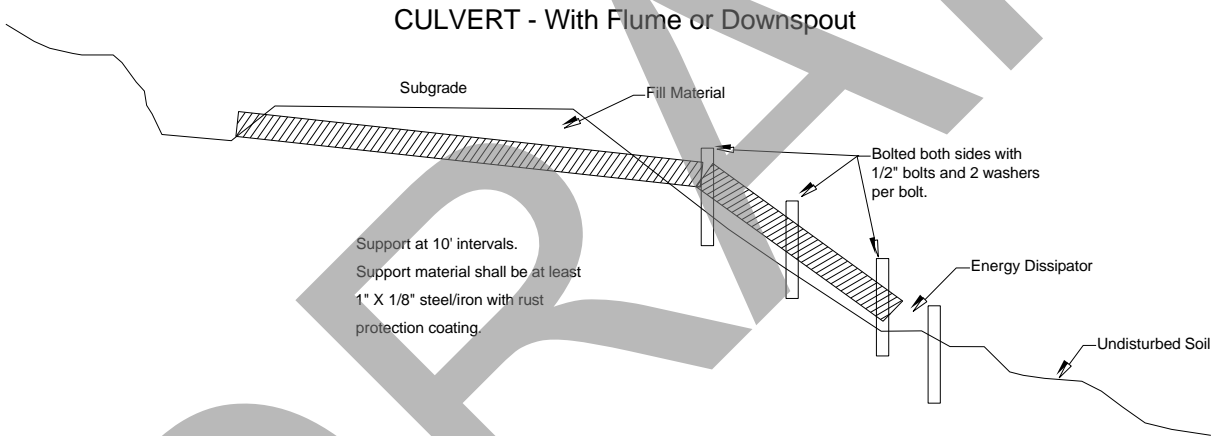
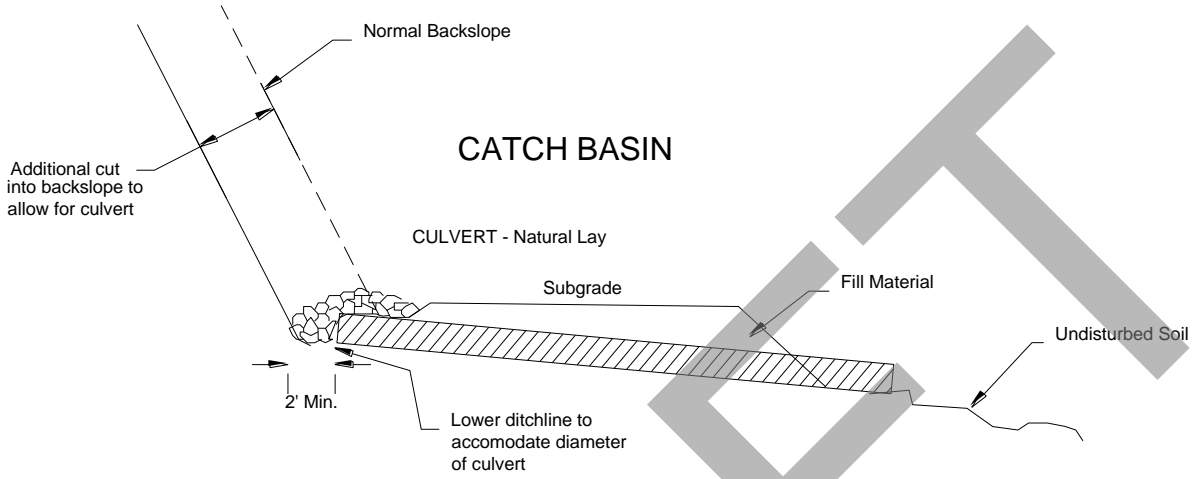


Key:

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

CULVERT AND DRAINAGE SPECIFICATION DETAIL

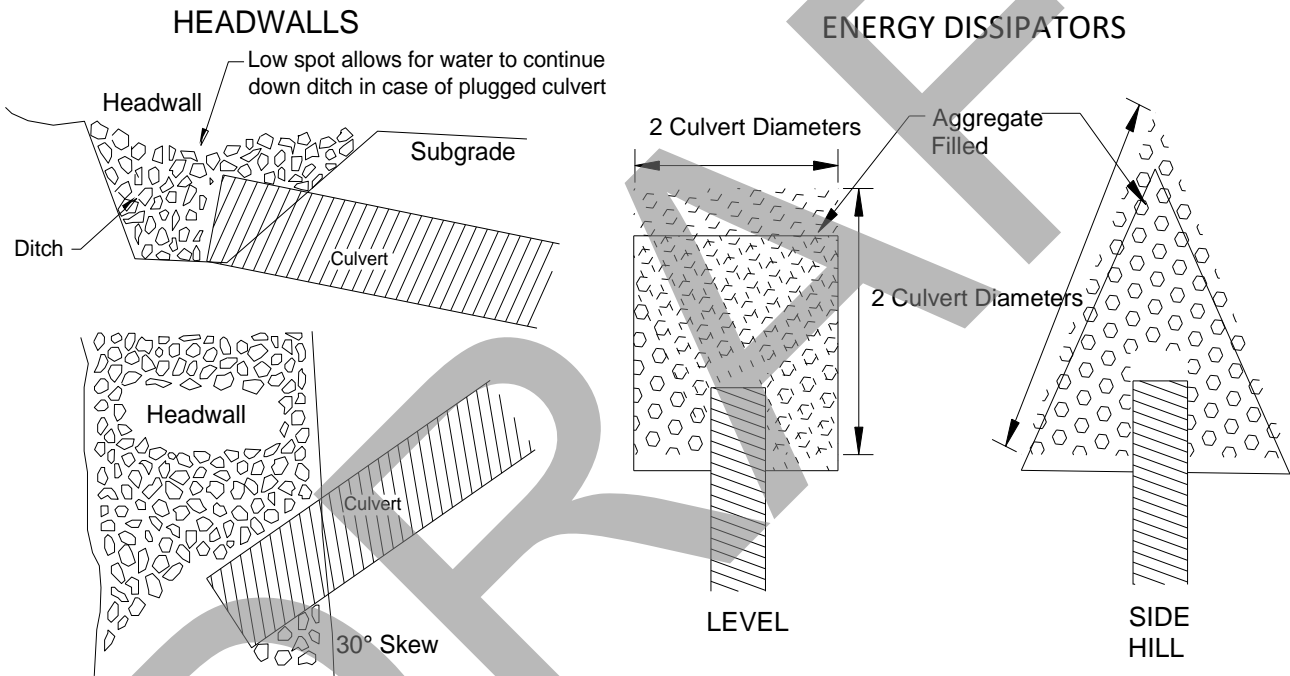
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CULVERT AND DRAINAGE SPECIFICATION DETAIL

(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

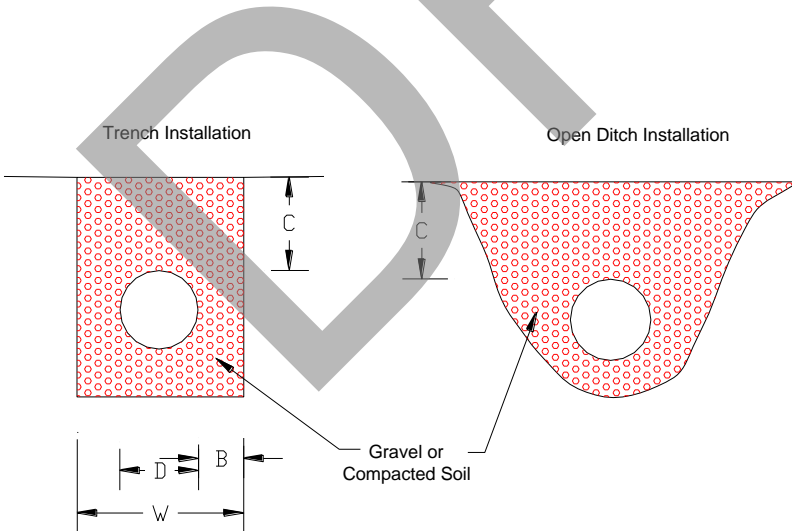
(Page 3 of 3)

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"
6"	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

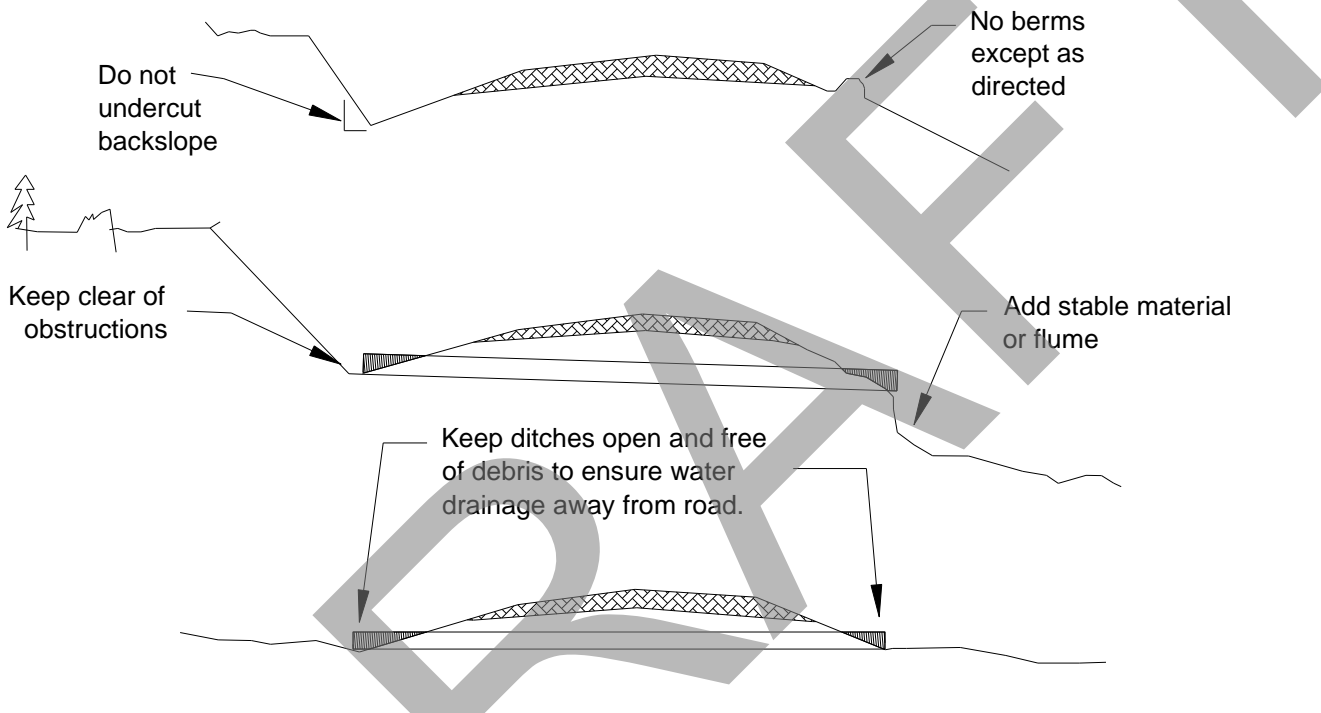
(Sheet 2 of 2)

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.



LIVE STREAM CULVERT STREAMBED MAINTENANCE PROCEDURE

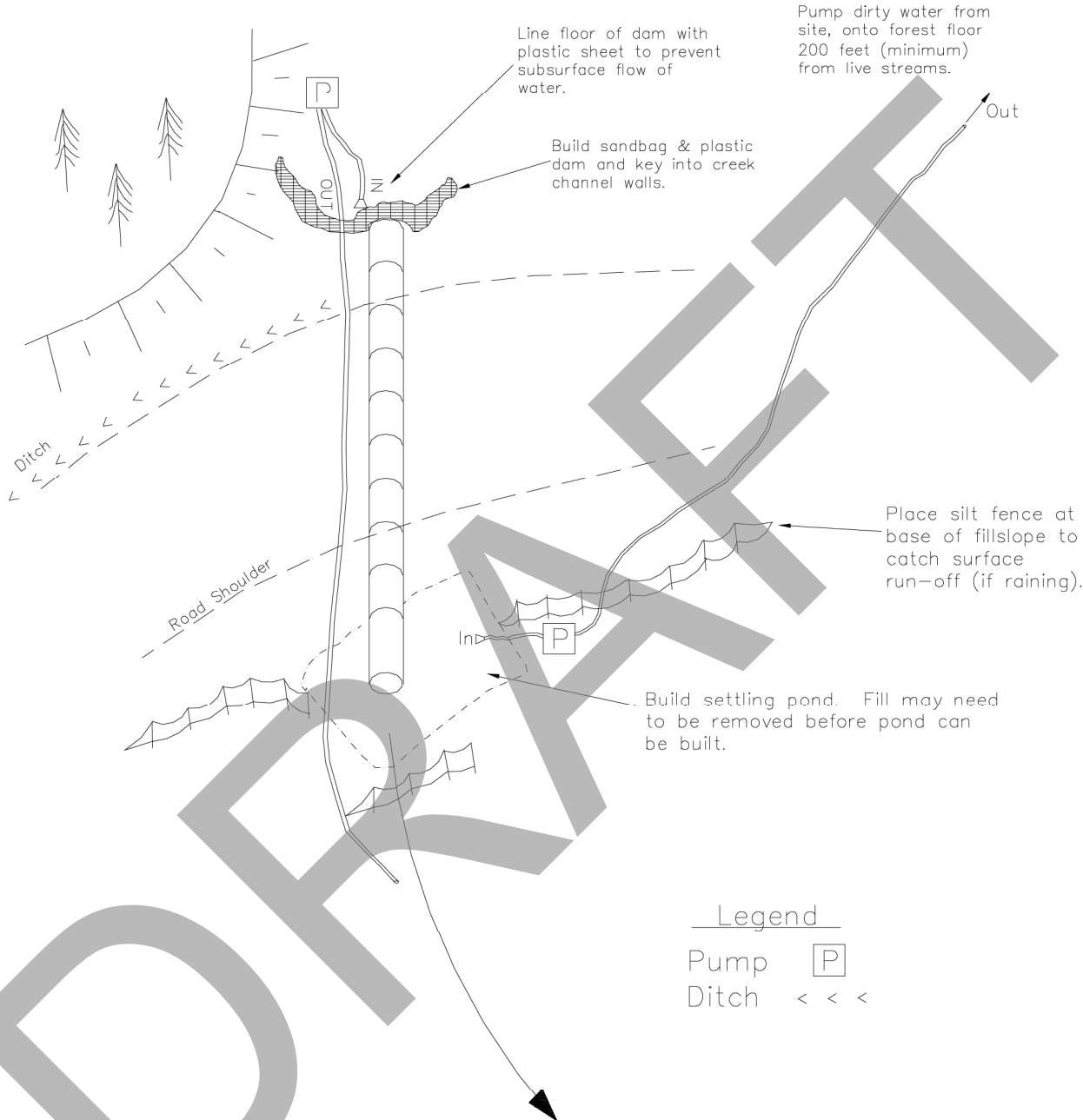
Order of work is as follows, deviations such as stream diversions shall be approved, in writing, by the Contract Administrator.

- 1) Purchaser shall notify the Contract Administrator of intent to start project, and a pre-work conference shall be held before move in of equipment. State will designate a representative that will inspect site when work is being performed in creek channel.
- 2) Assemble the items on the Materials List onsite before proceeding.
- 3) Set up pumps (2 required, with one as backup).
- 4) Dam up stream with sandbags and line floor of dam with plastic (to prevent sub-surface water flow), place clean rock on plastic to hold in place, and key leading edge of plastic into channel bottom - see **SETTLING POND AND PUMP DETAIL**. Build a settling pond at culvert outlet. Fill may need to be removed before the settling pond installation due to space limitations. Pump clean water at catch basin around work site and back into stream. Dirty water shall be pumped away from site and onto forest floor a minimum of 200 feet from live streams.
- 5) Reconstruct streambed per plans.
- 6) Backfill settling pond.

Materials List:

- 3 pumps. The clean water pump (dam at culvert catch basin), dirty water pump (settling pond) and the backup pump shall each have a minimum capacity to keep pace with current and anticipated flows.
- 240 square feet plastic sheet;
- 10 bales of straw;

SETTLING POND AND PUMP DETAIL



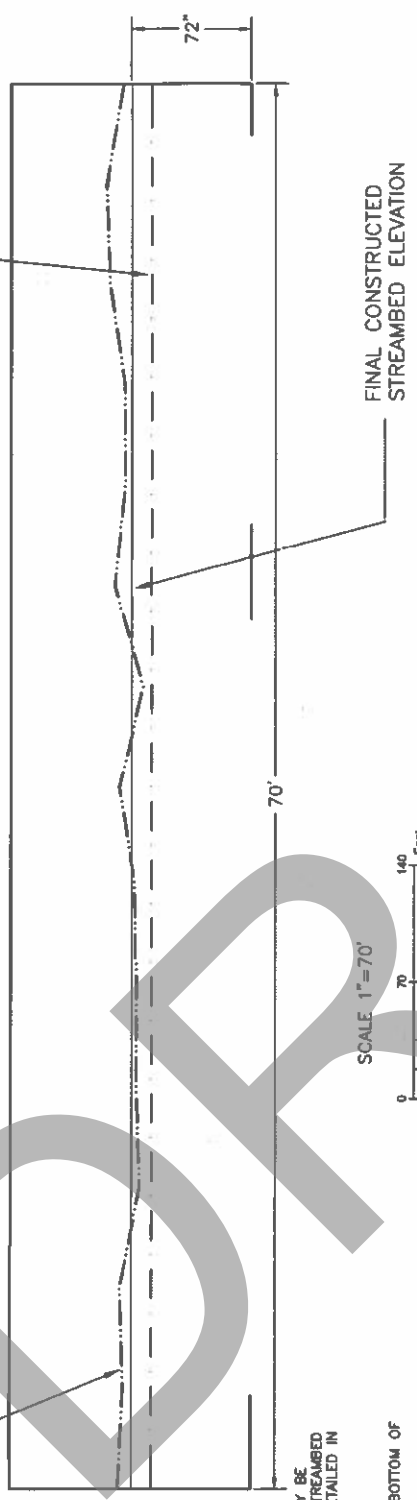
Legend

- Pump [P]
- Ditch < < <

FISH PIPE STREAM PROFILE

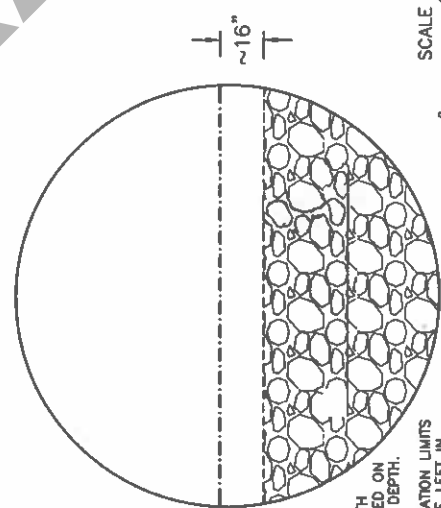
APPROX. EXISTING STREAMBED

STREAMBED MATERIAL EXCAVATION LIMITS



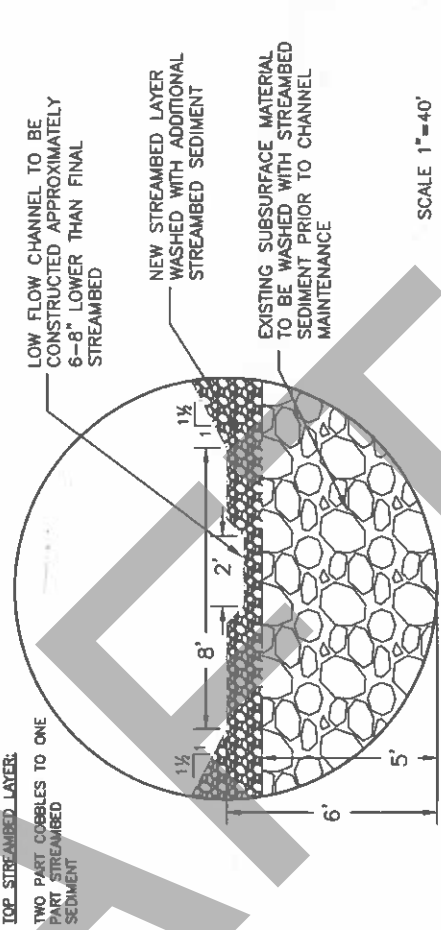
- CONSTRUCTION NOTES:**
- 1 EXISTING STREAMBED MATERIAL MAY BE REUSED AFTER MIXING TO MEET STREAMBED COBBLE MIX REQUIREMENTS AS DETAILED IN THE ROAD PLAN
 - 2 FINAL STREAMBED CHANNEL TO BE CONSTRUCTED AT 72" FROM TOP/BOTTOM OF EXISTING STRUCTURE.
 - 3 EXISTING PIPE LAY AND STREAM GRADIENT NOT SHOWN IN PROFILE. EXISTING LAY NOT TO BE CHANGED

EXISTING MATERIAL TYPICAL SECTION



- CONSTRUCTION NOTES:**
- 1 16" AVERAGE EXCAVATION DEPTH EXCAVATION DEPTH VARIES BASED ON EXISTING STREAMBED MATERIAL DEPTH.
 - 2 IF ENCOUNTERED WITHIN EXCAVATION LIMITS LARGE ROCK BANDS ARE TO BE LEFT IN PLACE.

FINAL STREAMBED CROSS SECTION



TOP STREAMBED LAYER:
TWO PART COBBLES TO ONE PART STREAMBED SEDIMENT

LOW FLOW CHANNEL TO BE CONSTRUCTED APPROXIMATELY 6-8" LOWER THAN FINAL STREAMBED

NEW STREAMBED LAYER WASHED WITH ADDITIONAL STREAMBED SEDIMENT

EXISTING SUBSURFACE MATERIAL TO BE WASHED WITH STREAMBED SEDIMENT PRIOR TO CHANNEL MAINTENANCE

1.0" VERIFY SCALE
If bar does not measure 1.0", adjust scales accordingly

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LAT & LONG: 47.019416 -123.175772
LANDOWNER: WA-DNR

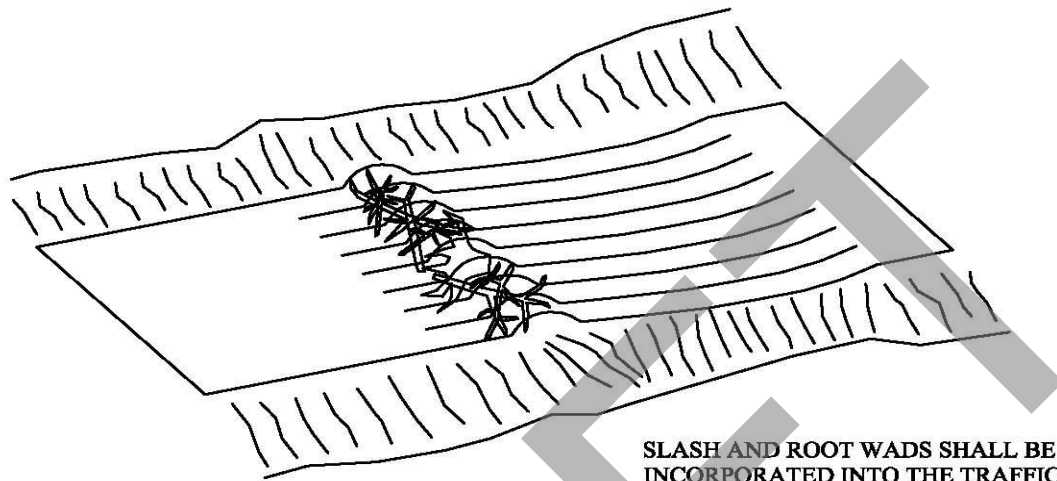
DESIGN BY: J. GROSS
DRAWN BY: J. GROSS
CHECKED BY: S. SHAFER
DATE: Nov. 19, 22

B-4000 STA. 40+70
CULVERT NO. T18R04W-112
STREAMBED MAINTENANCE DETAILS

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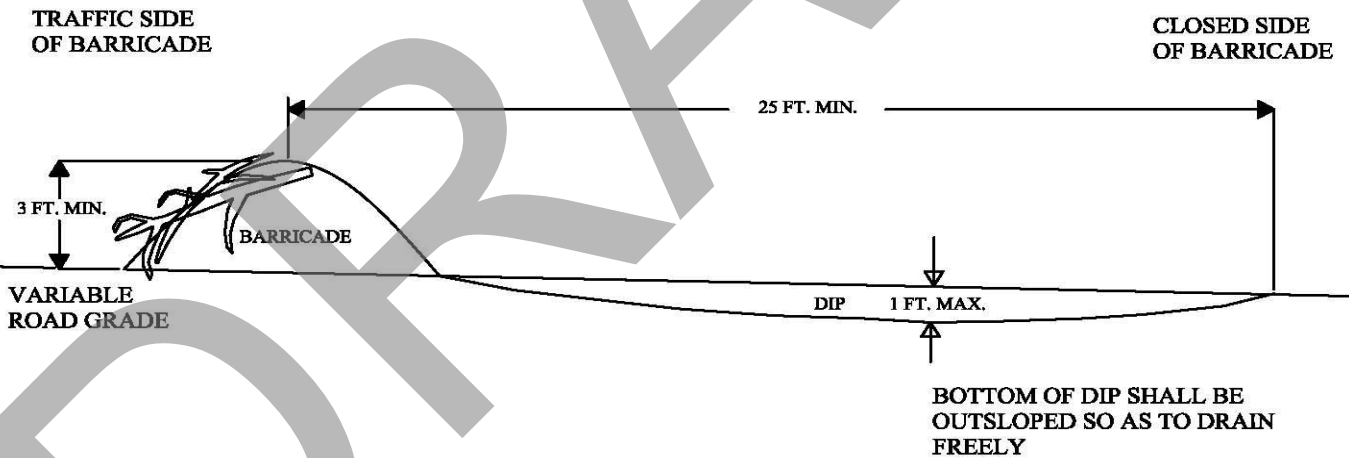
SHEET 1 OF 1

BARRICADE DETAIL



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

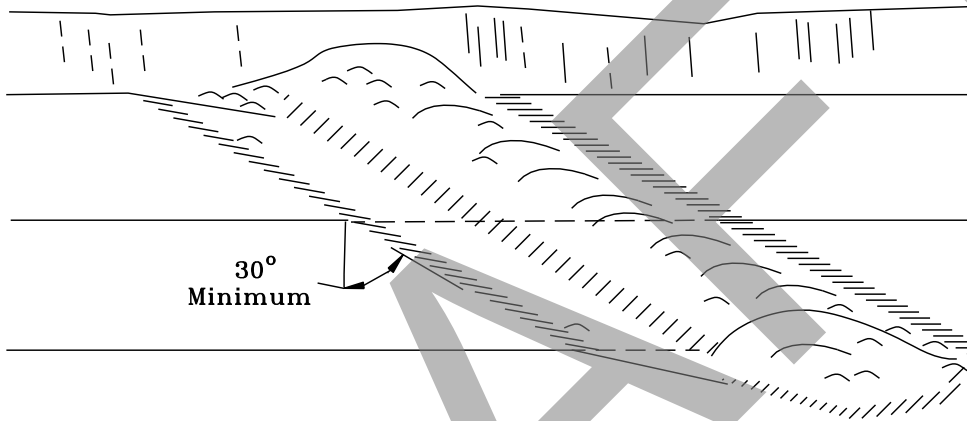
PLAN VIEW



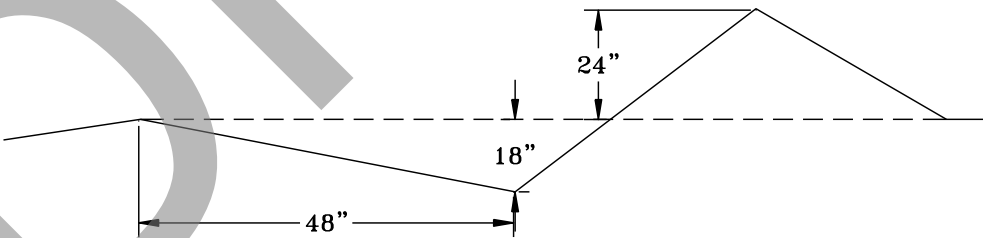
PROFILE VIEW

Non-Drivable Water Bar Detail

Cross Ditch



Cross Section at Centerline



Water Bar Detail

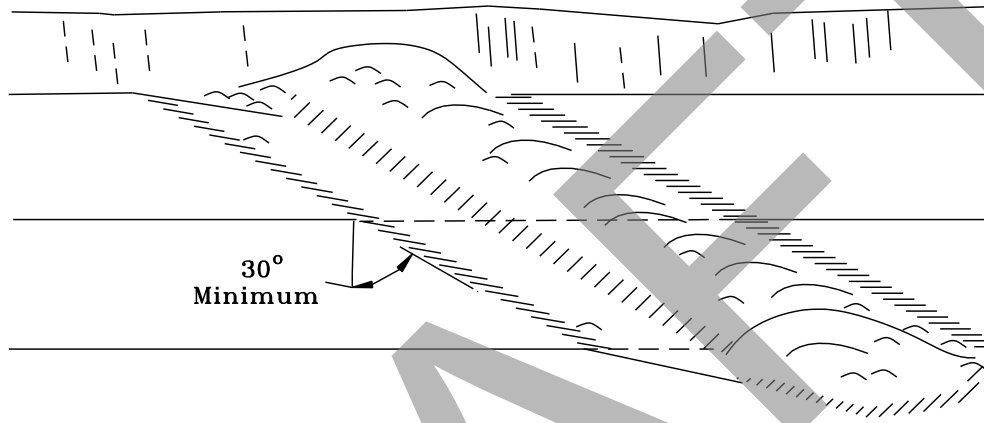
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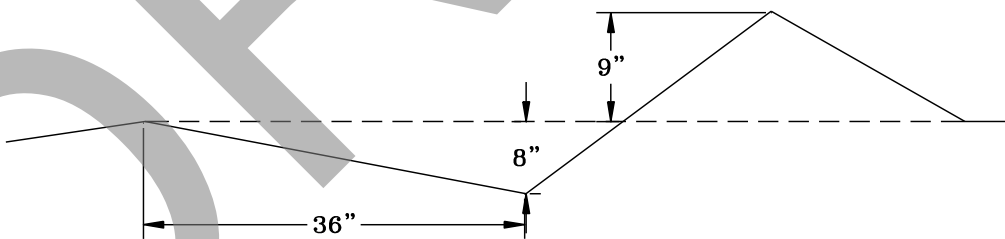
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NATURAL RESOURCES

Drivable Water Bar Detail

Cross Ditch



Cross Section at Centerline



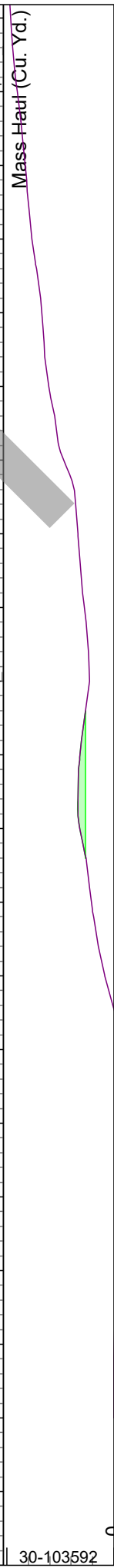
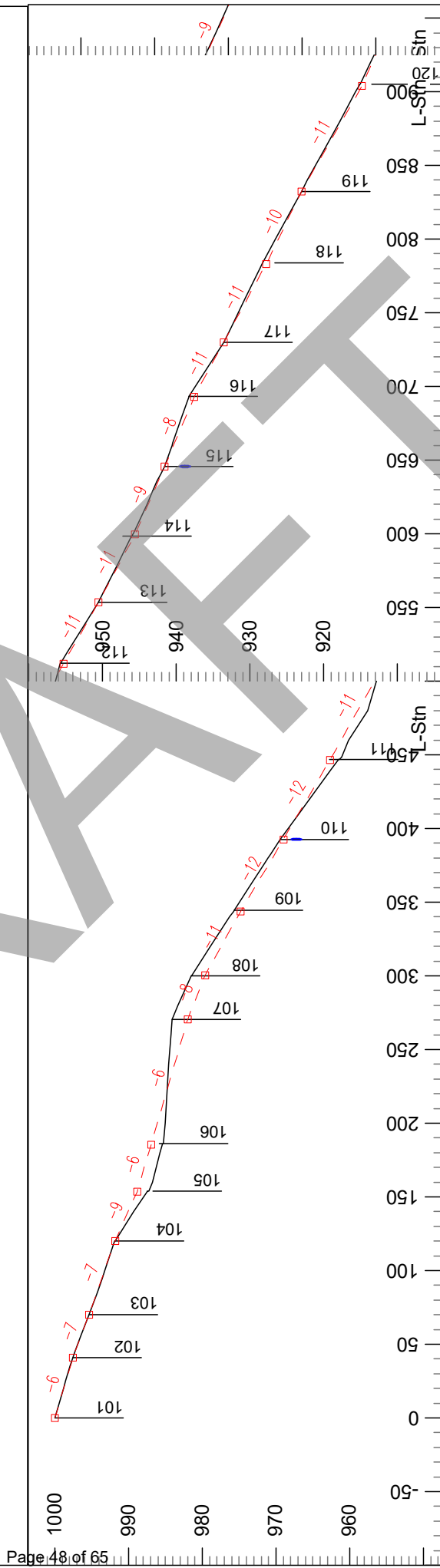
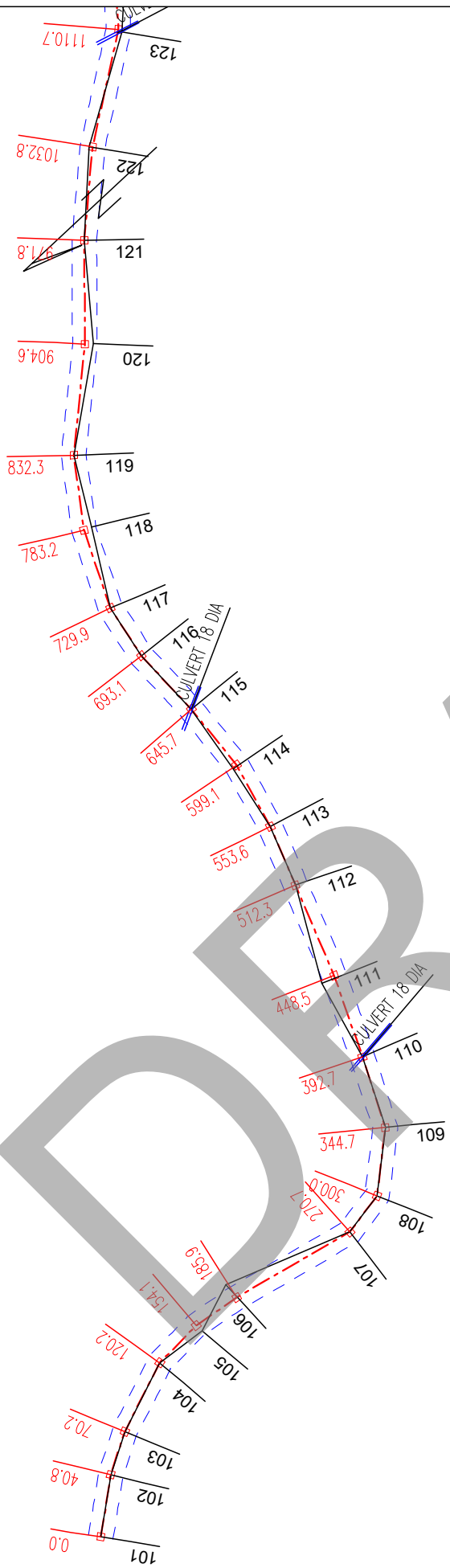
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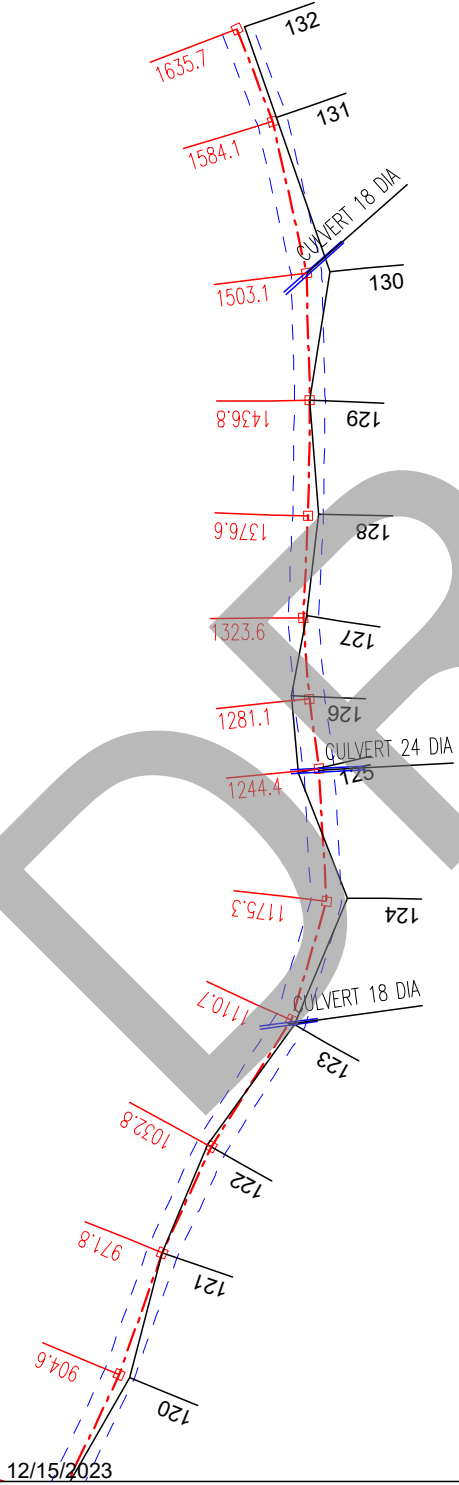


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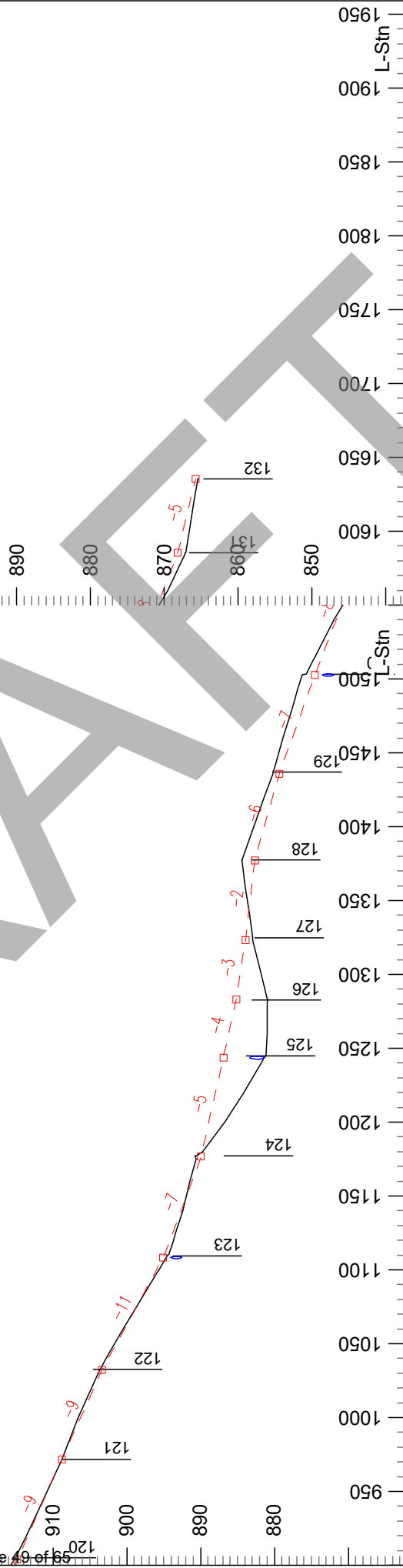
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		Profile Vert Scale 1:240 Profile Horz Scale 1:1200	23/08/07
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B-4580 Road
Contract#: 30-103592

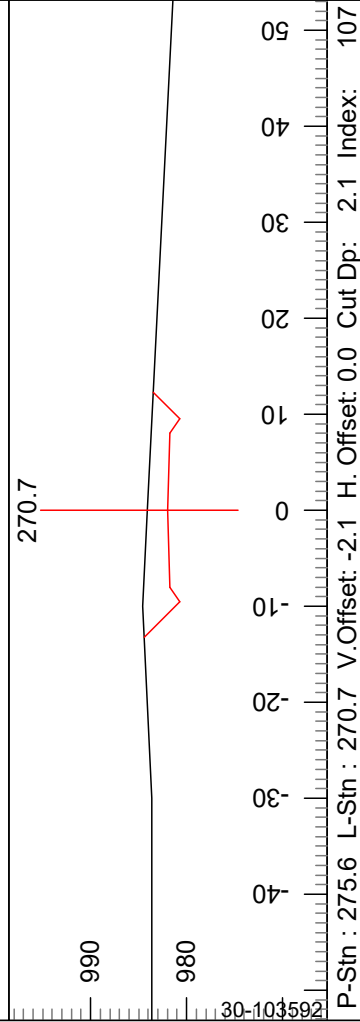
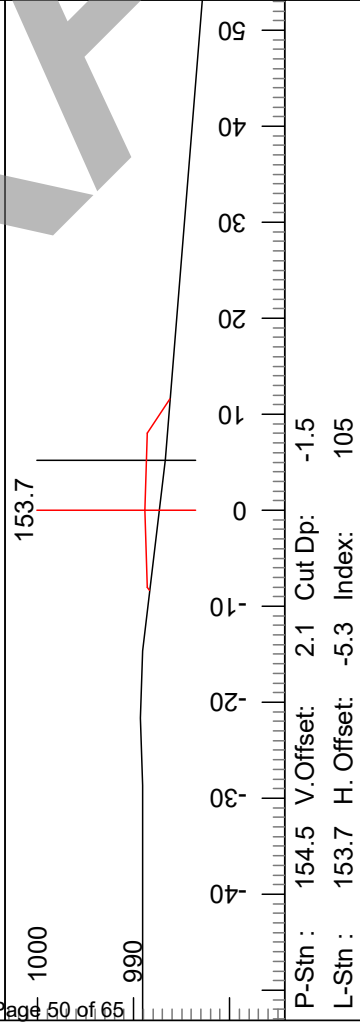
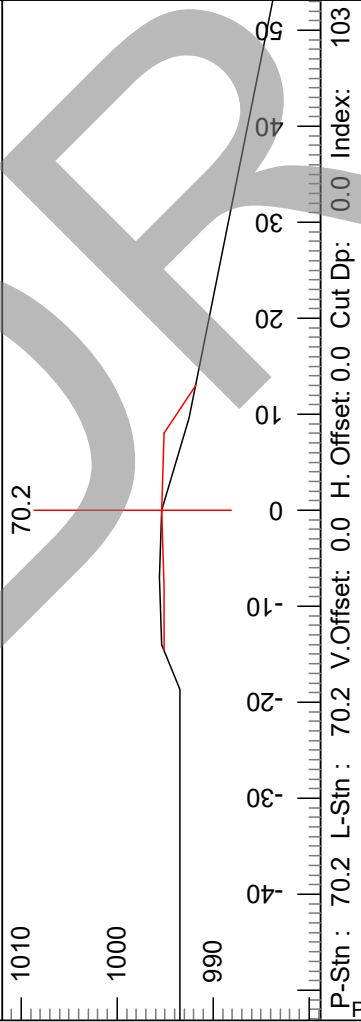
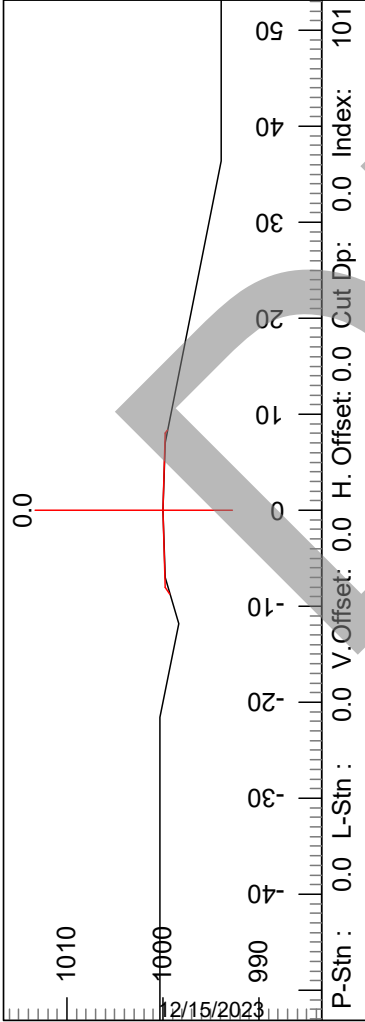
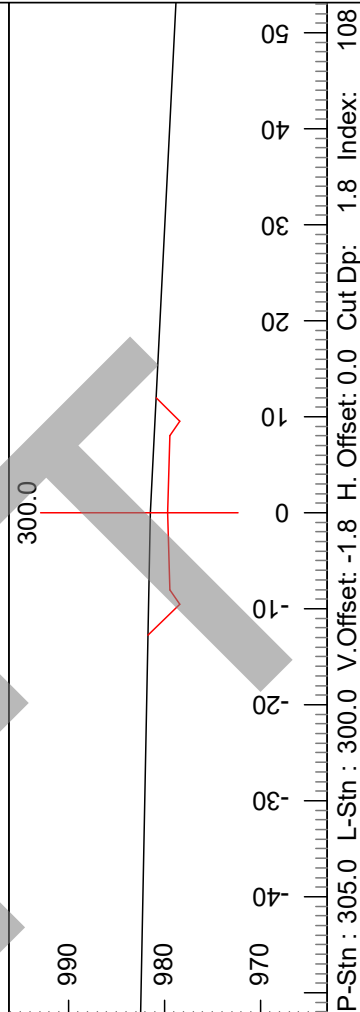
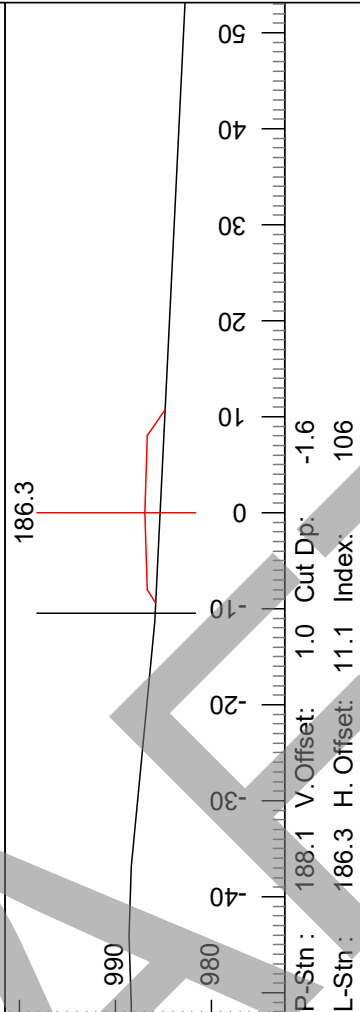
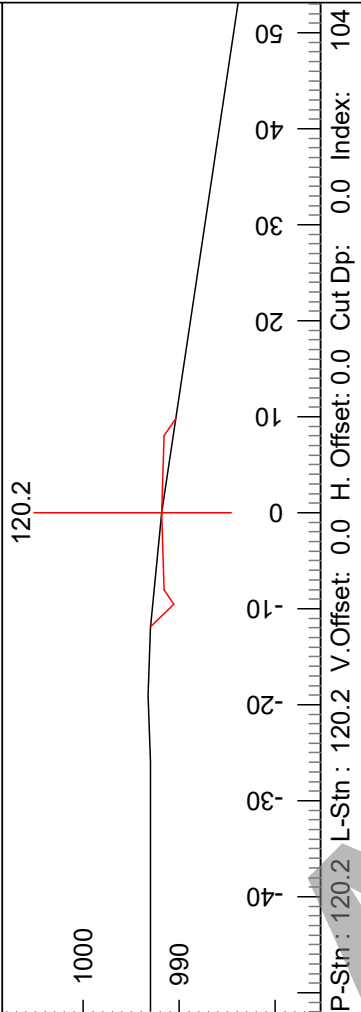
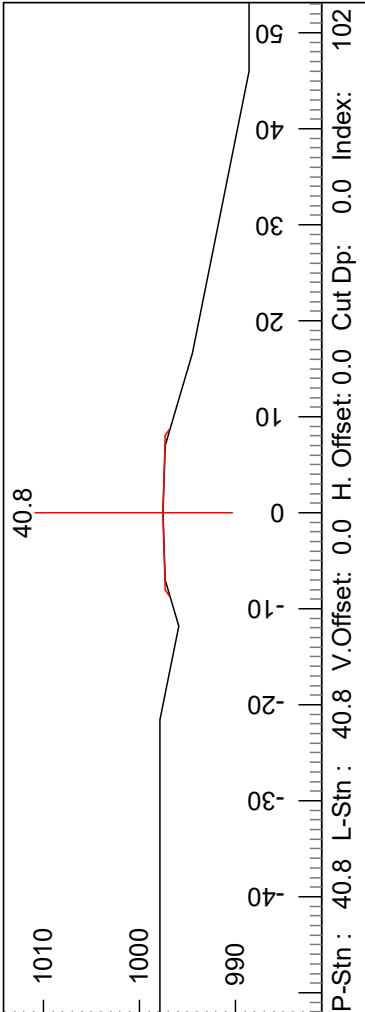


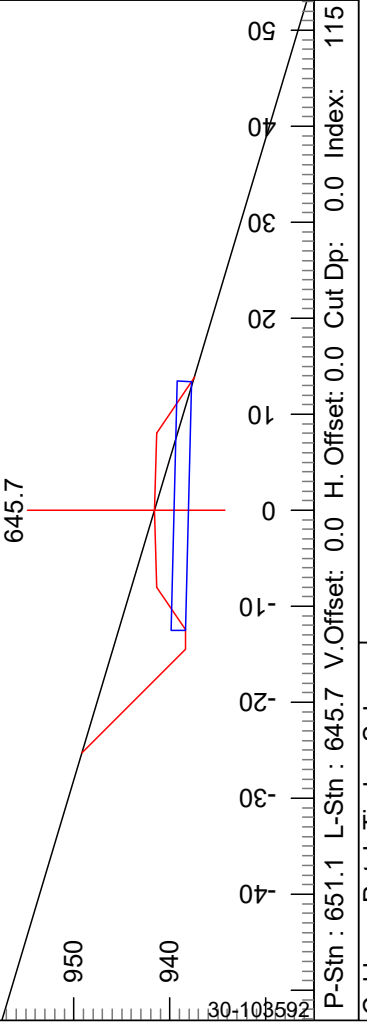
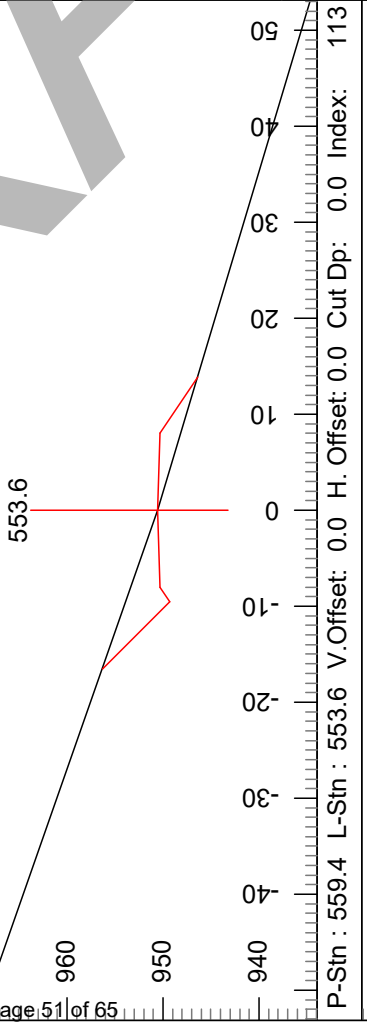
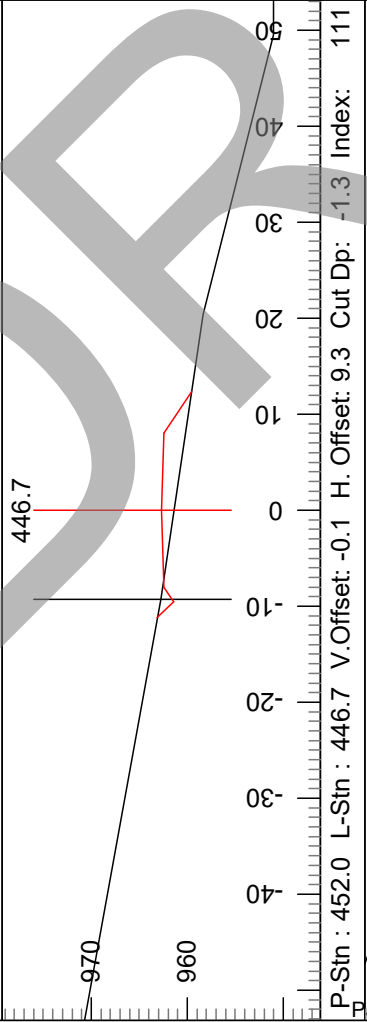
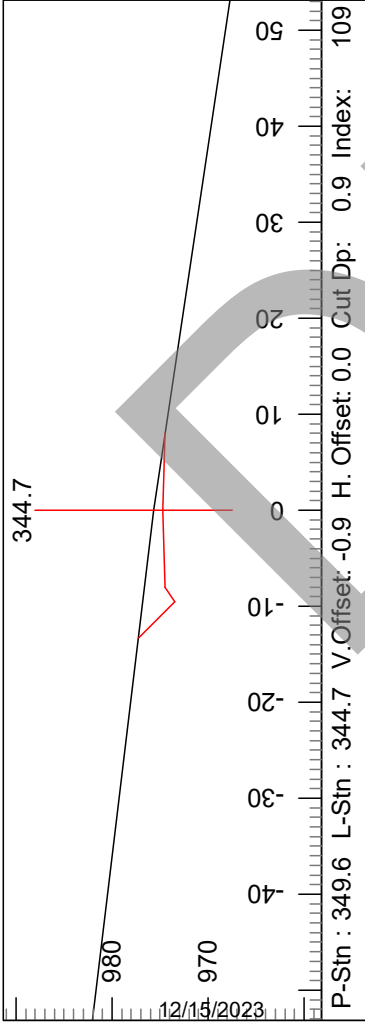
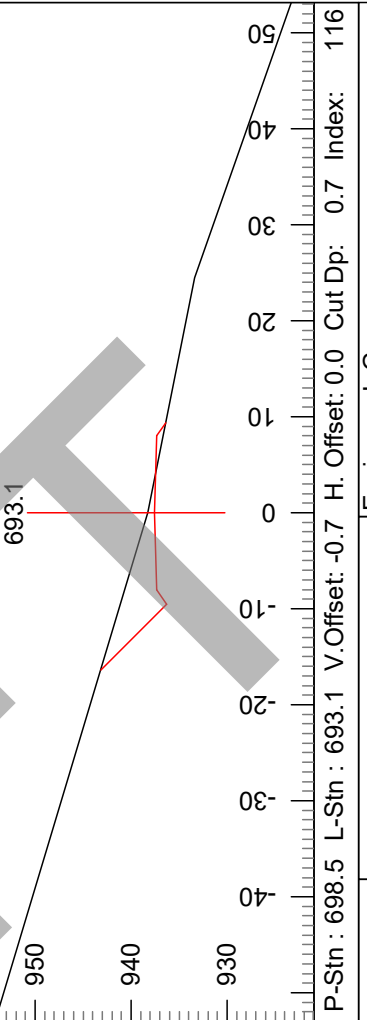
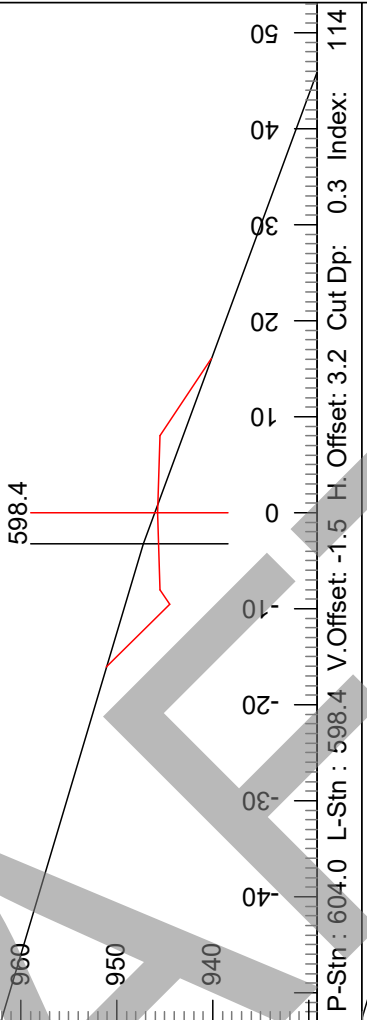
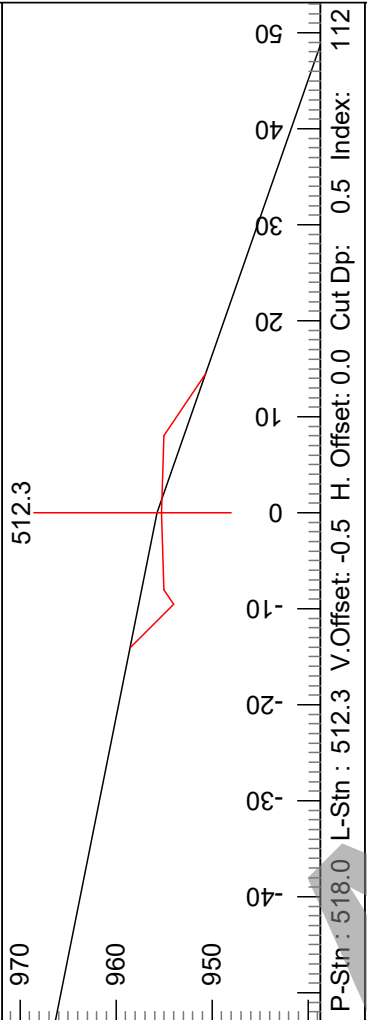
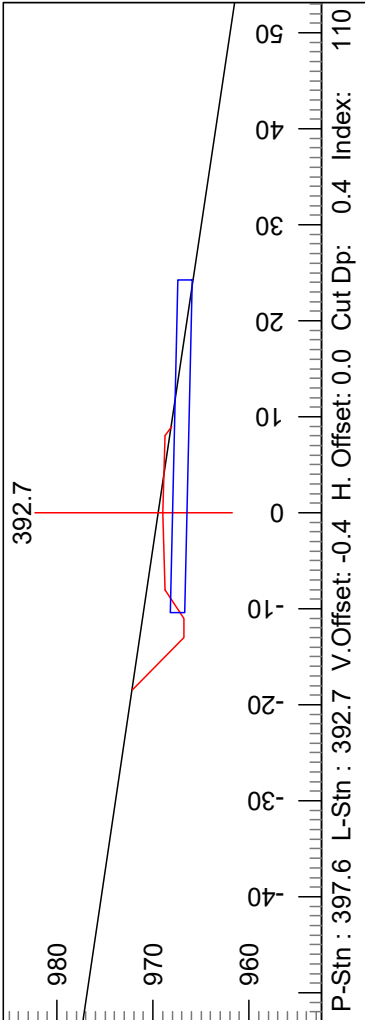
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South Puget Sound Region

Plan Scale 1:1200
Profile Vert Scale 1:240
Profile Horz Scale 1:1200

Engineer: J. Gross
23/08/07

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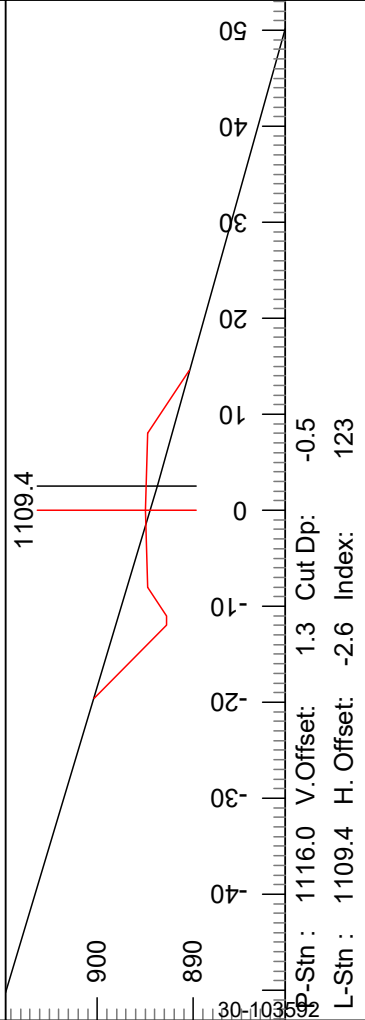
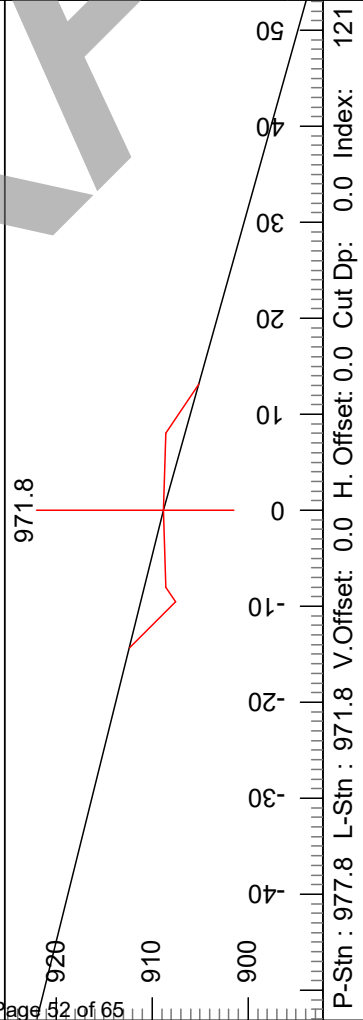
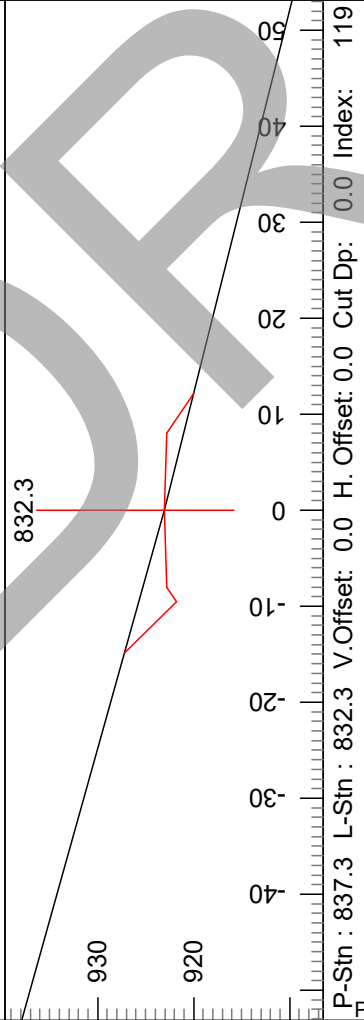
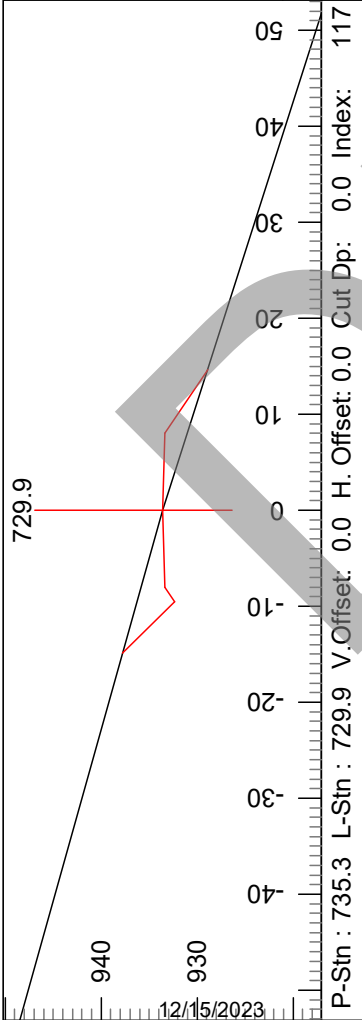
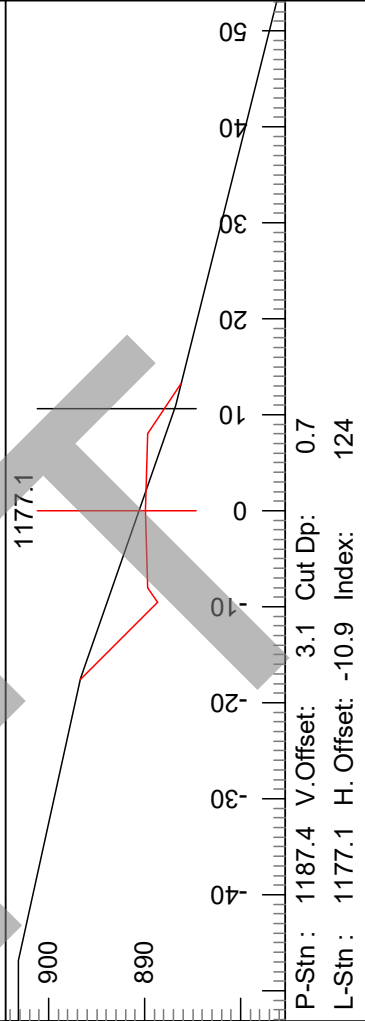
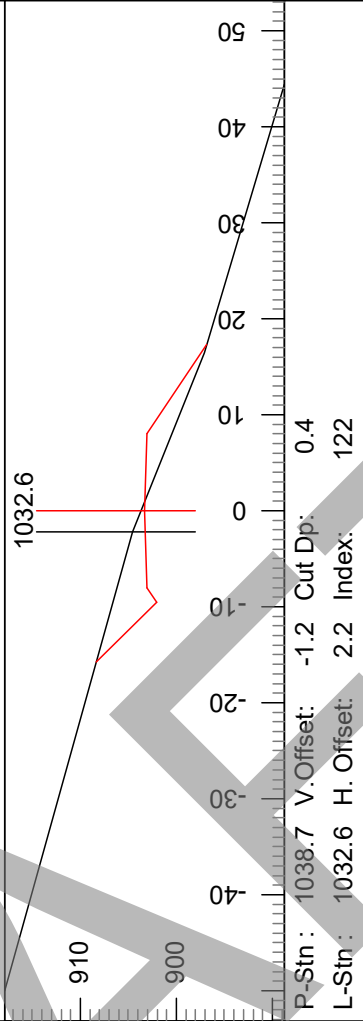
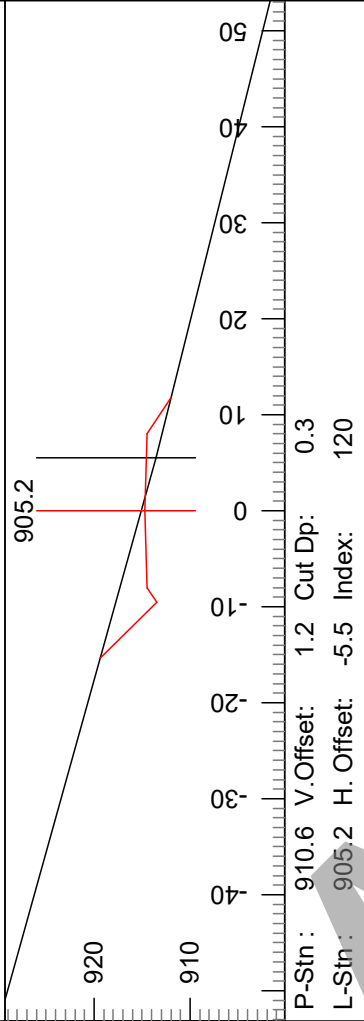
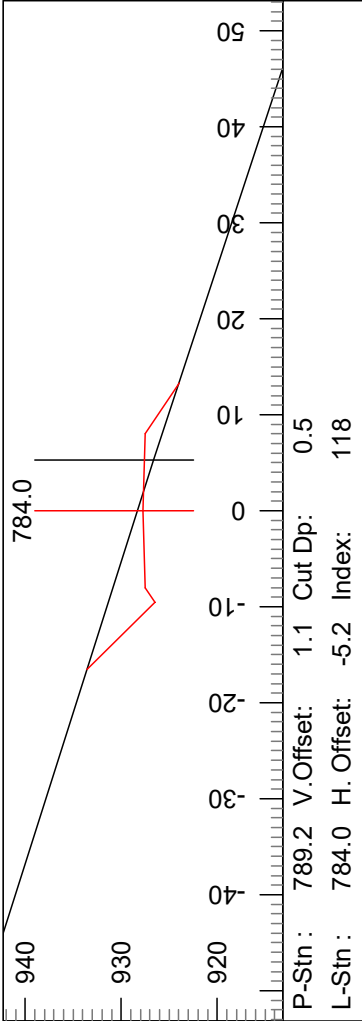
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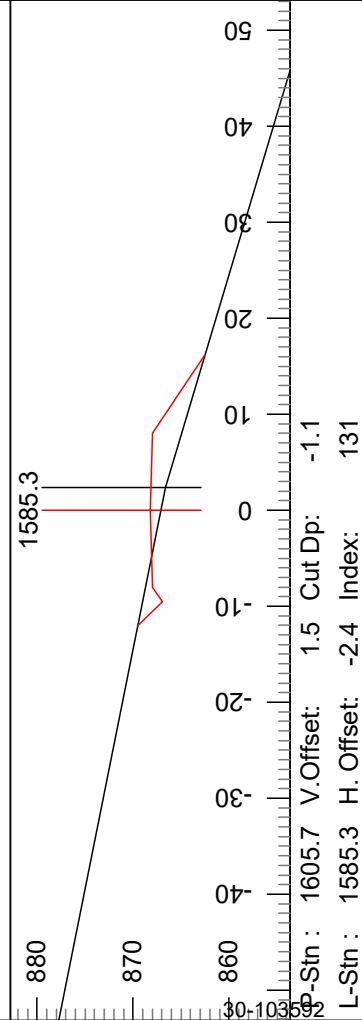
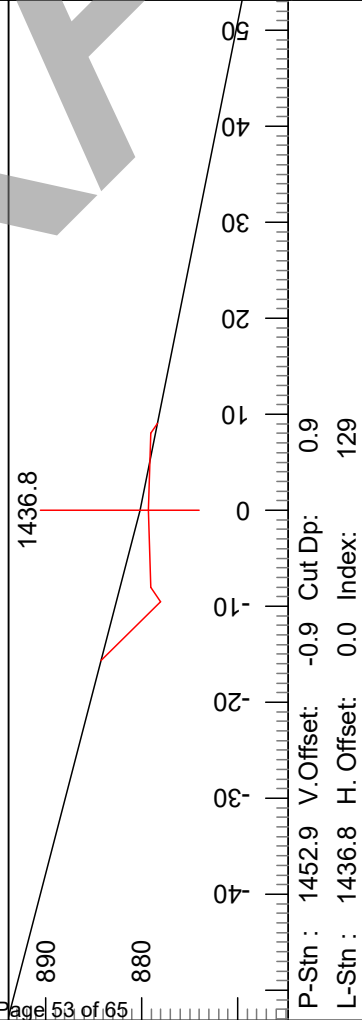
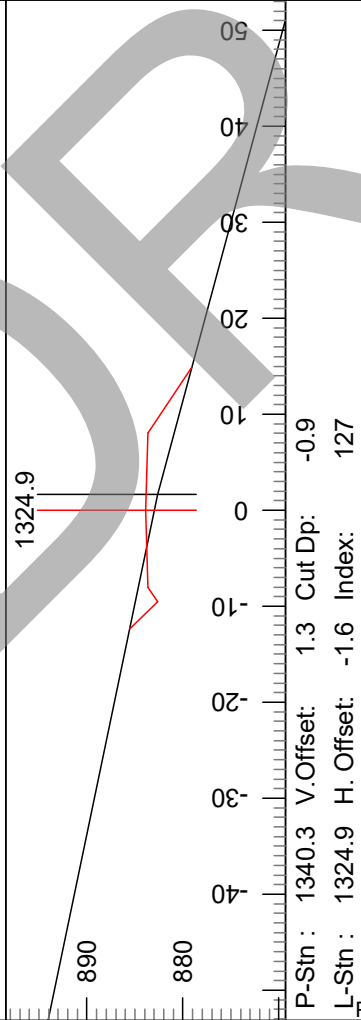
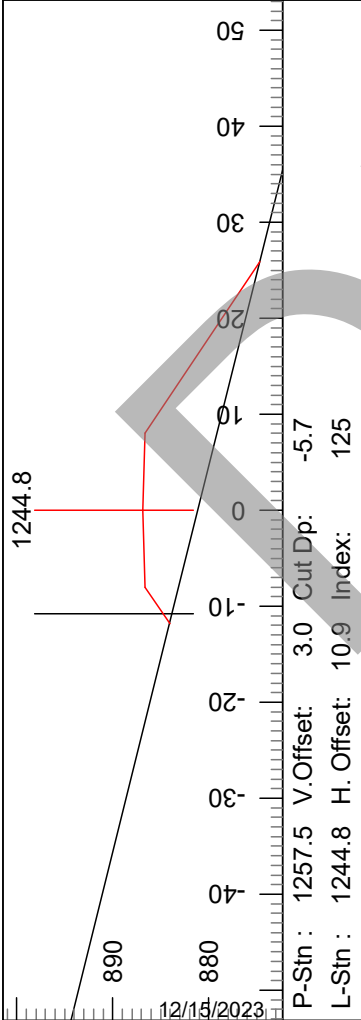
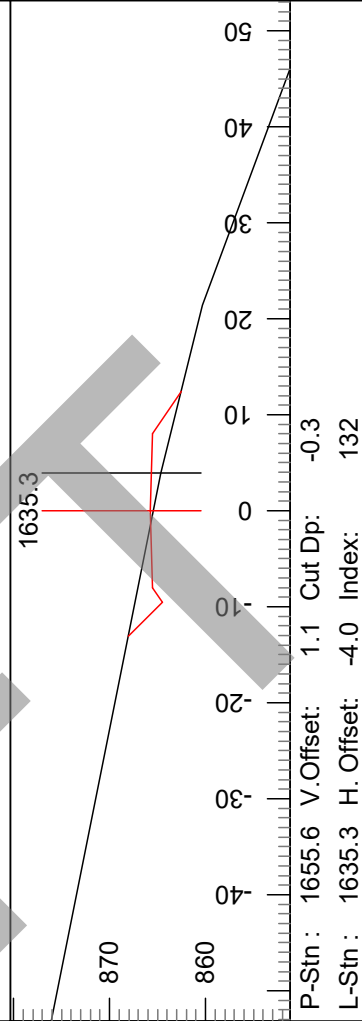
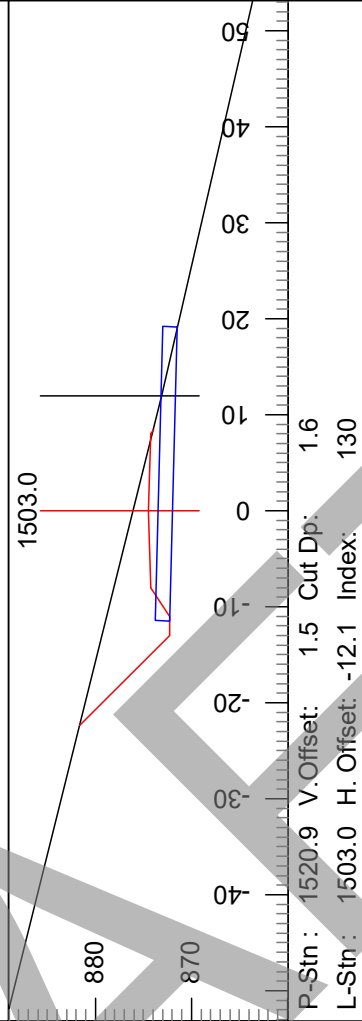
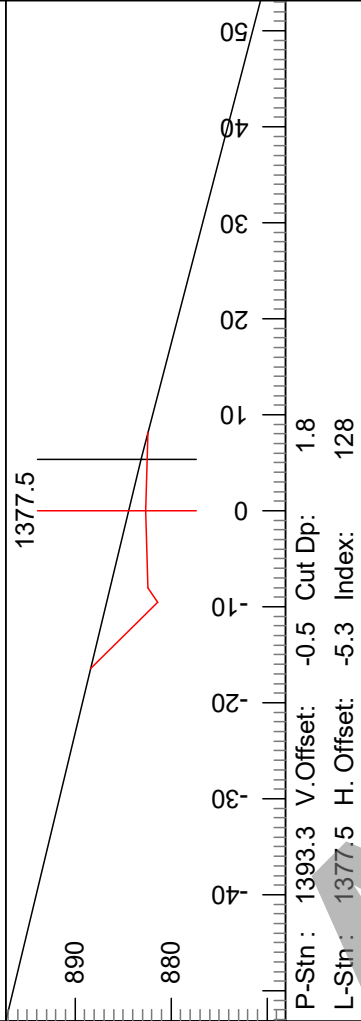
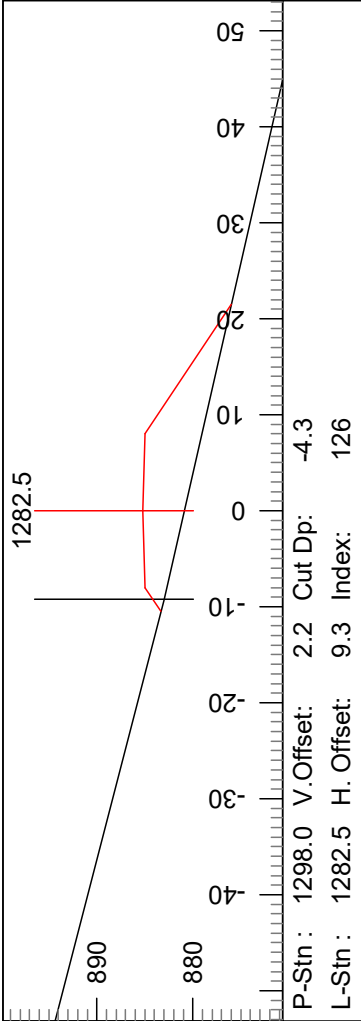
Cabbage Patch Timber Sale
 B-4580 Road
 Contract#: 30-103592



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	<p>Cabbage Patch Timber Sale B-4580 Road Contract#: 30-103592</p>		



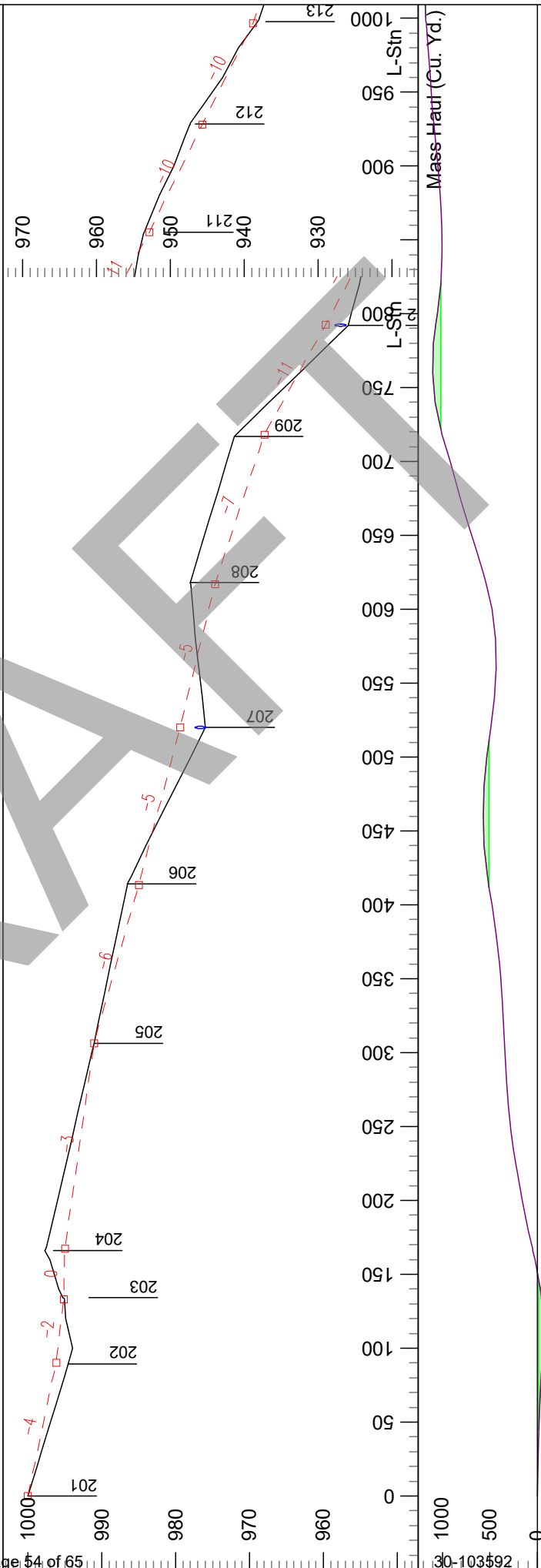
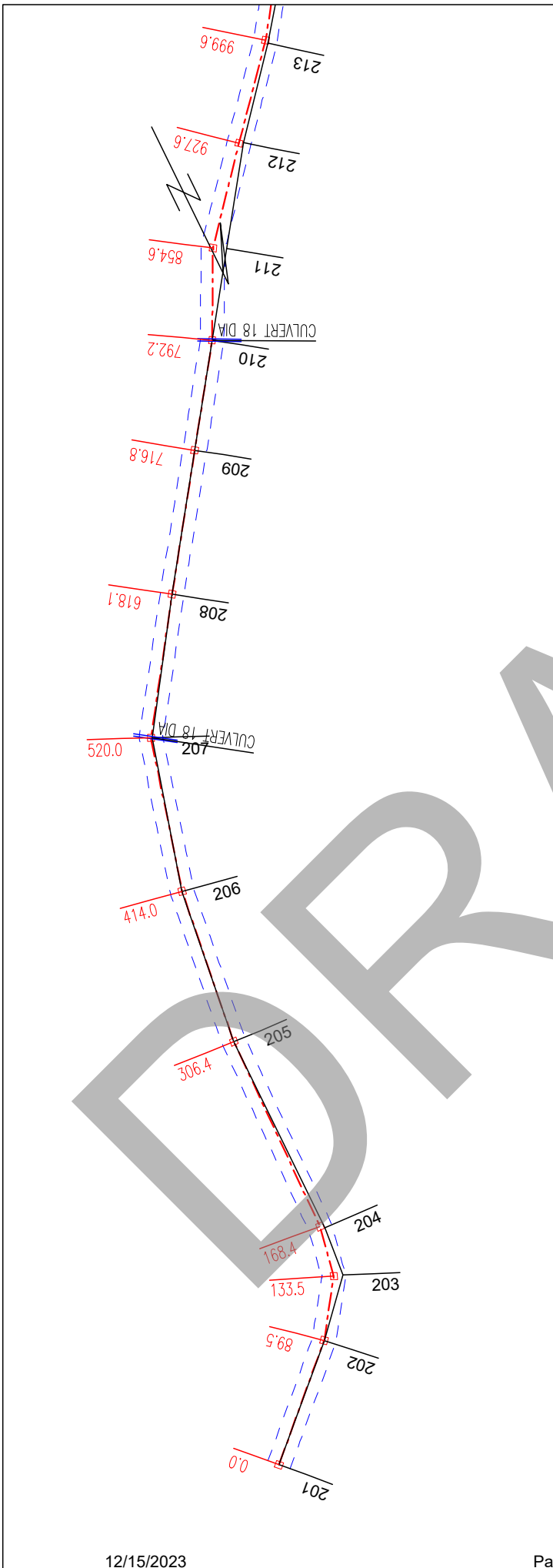
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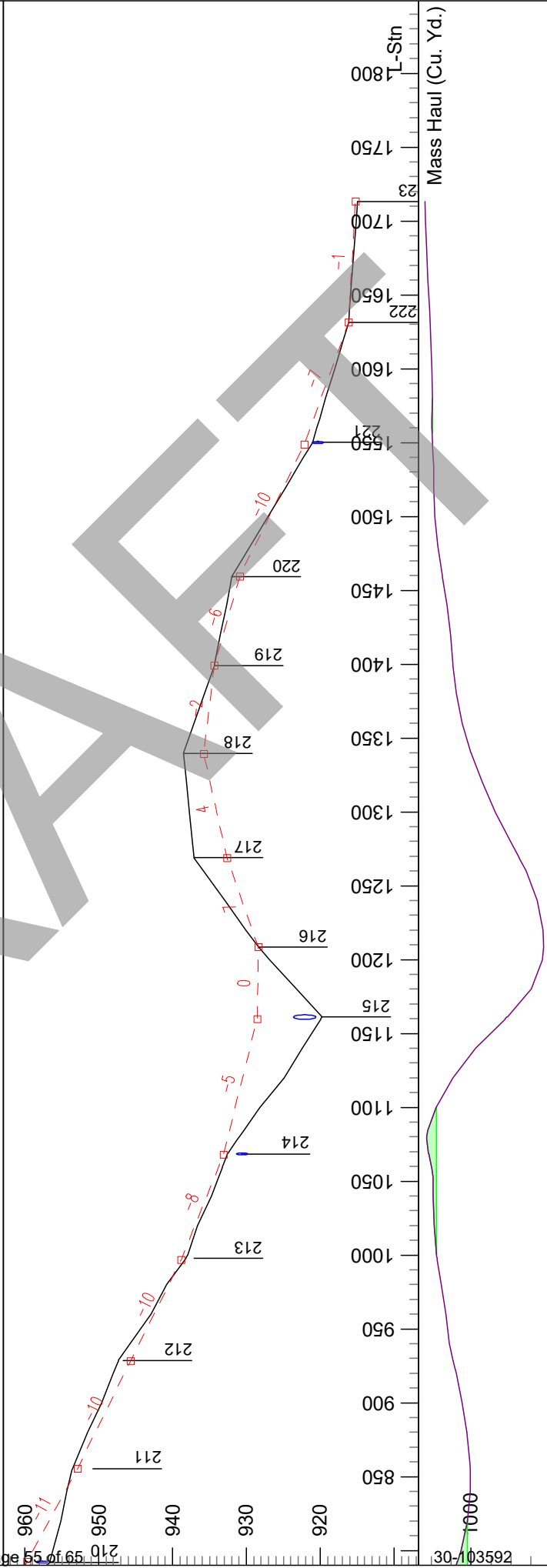
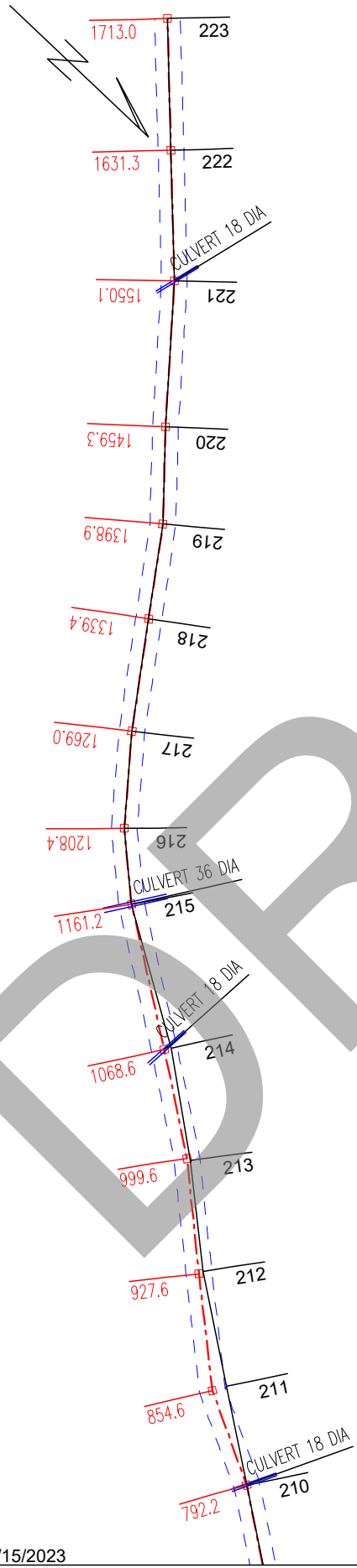
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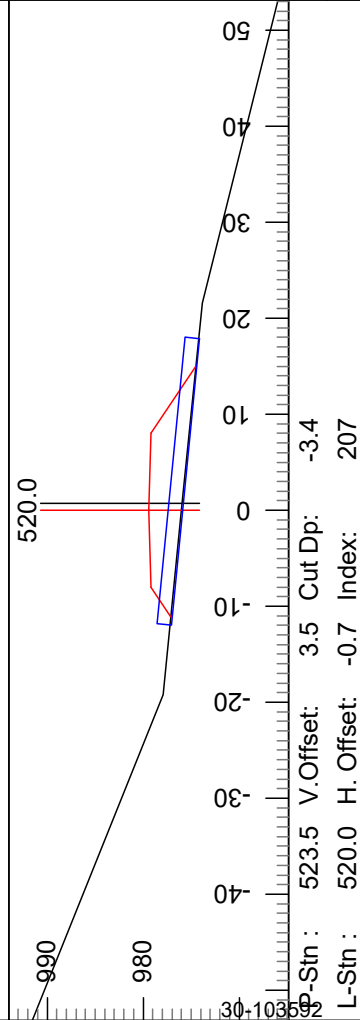
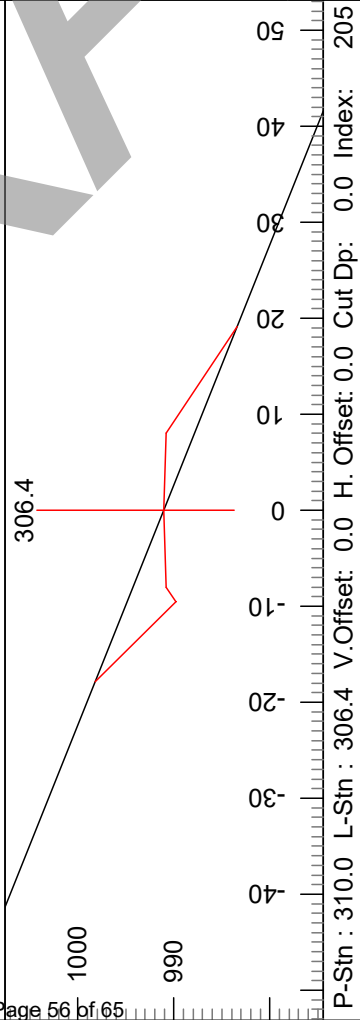
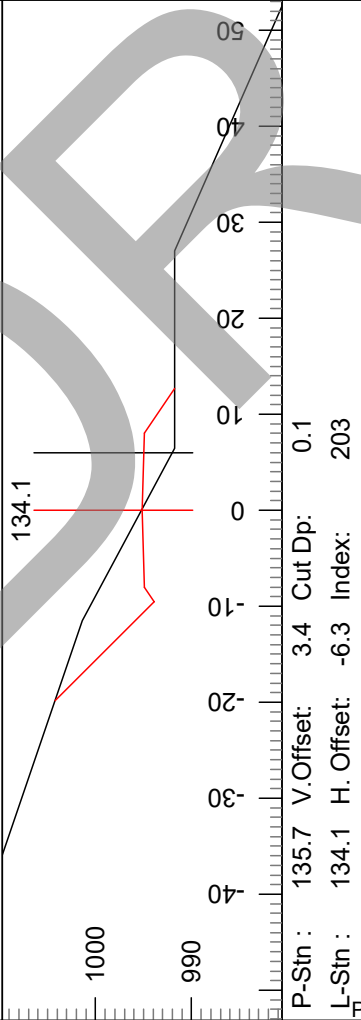
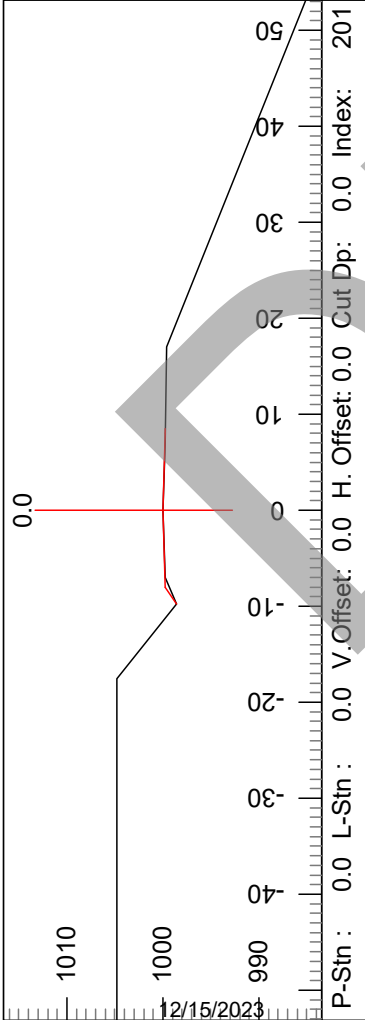
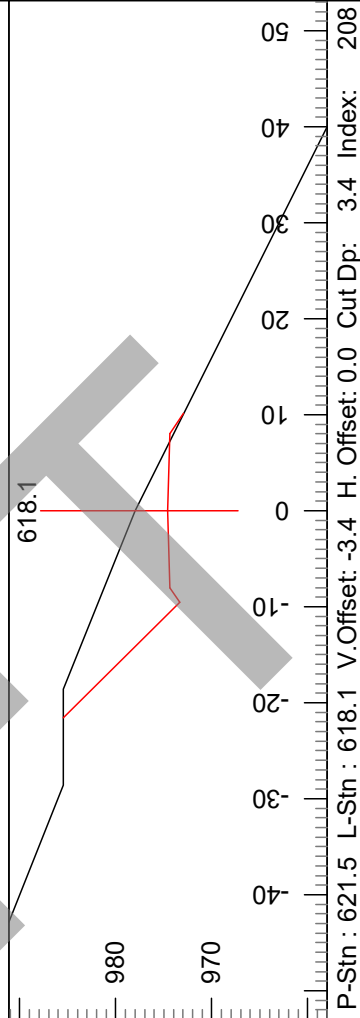
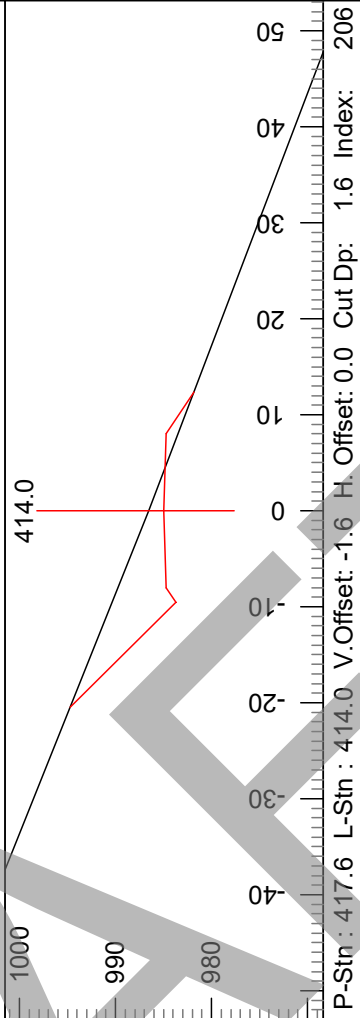
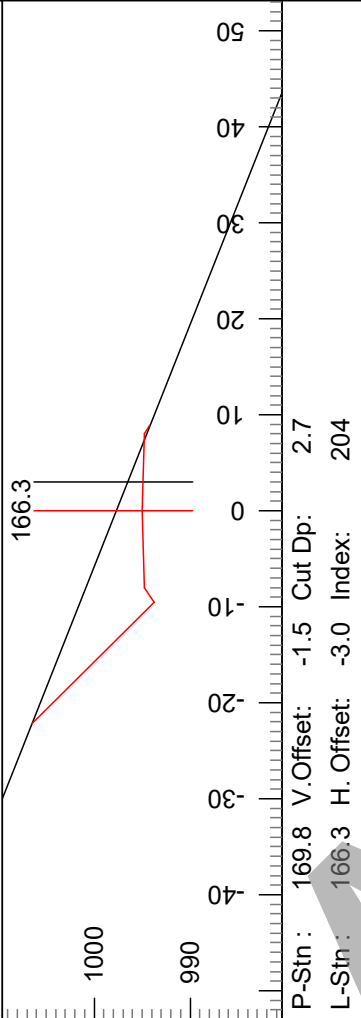
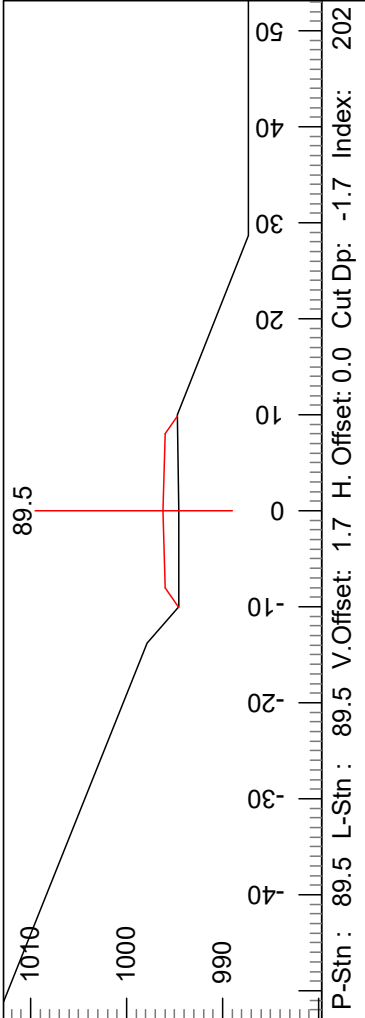
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	<p>Engineer: J. Gross</p>		

Cabbage Patch Timber Sale
B-4580 Road
Contract#: 30-103592



<p>Engineer: J. Gross</p>	<p>Plan Scale 1:1200</p>		<p>Washington State Department of Natural Resources South Puget Sound Region</p>
<p>Page 1 of 5</p>	<p>23/08/07</p>	<p>Profile Vert Scale 1:240</p>	<p>Profile Horz Scale 1:1200</p>
<p>Cabbage Patch Timber Sale BPA-2674Ext Road Contract#: 30-103592</p>		<p>30-103592</p>	



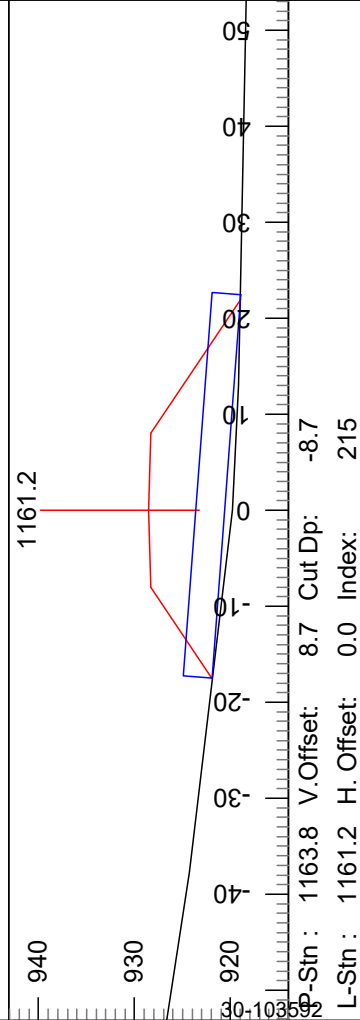
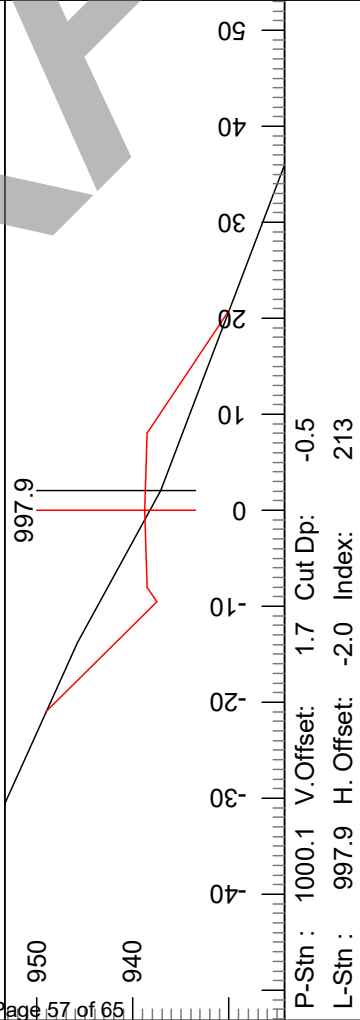
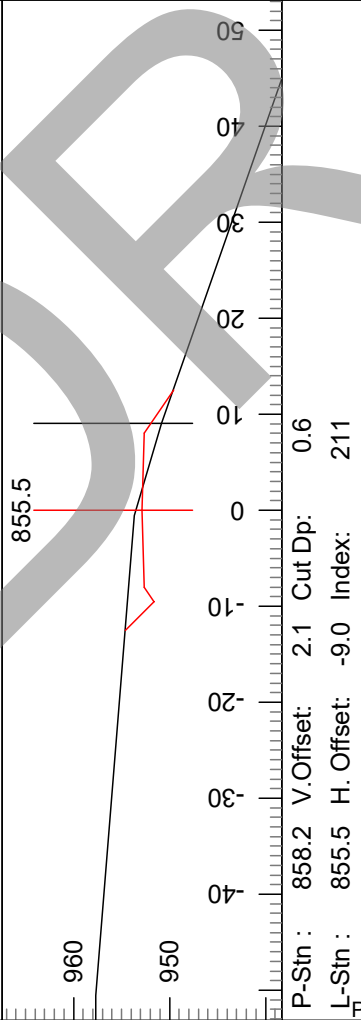
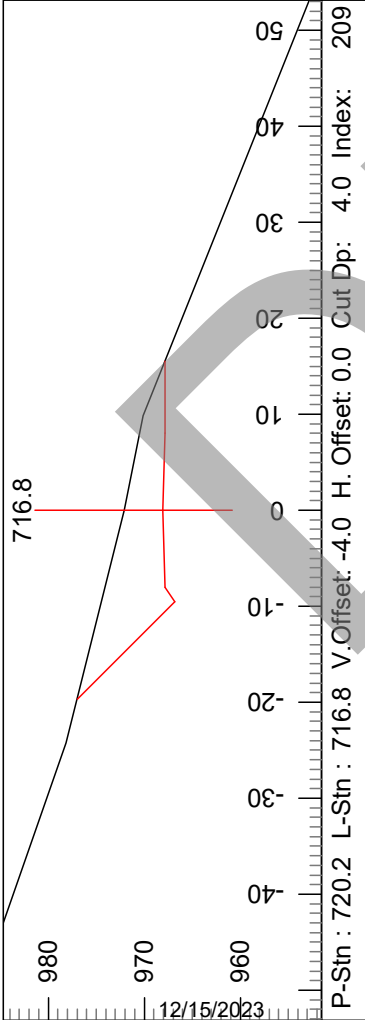
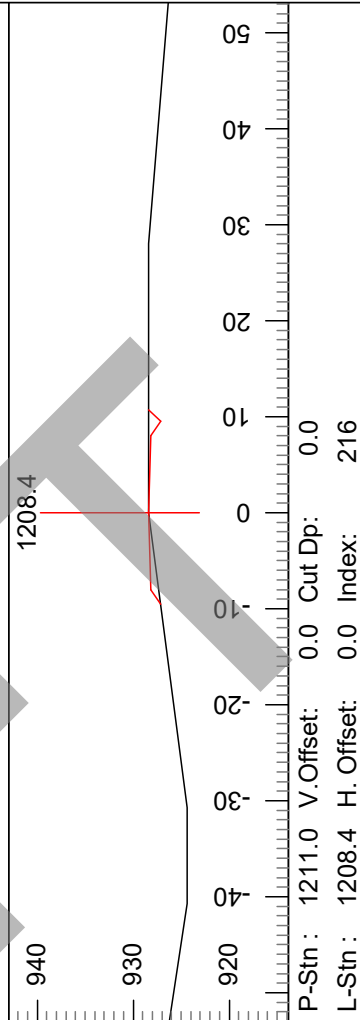
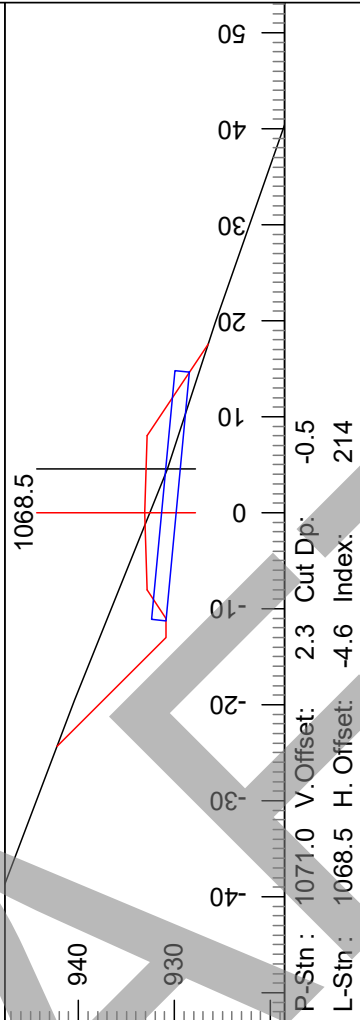
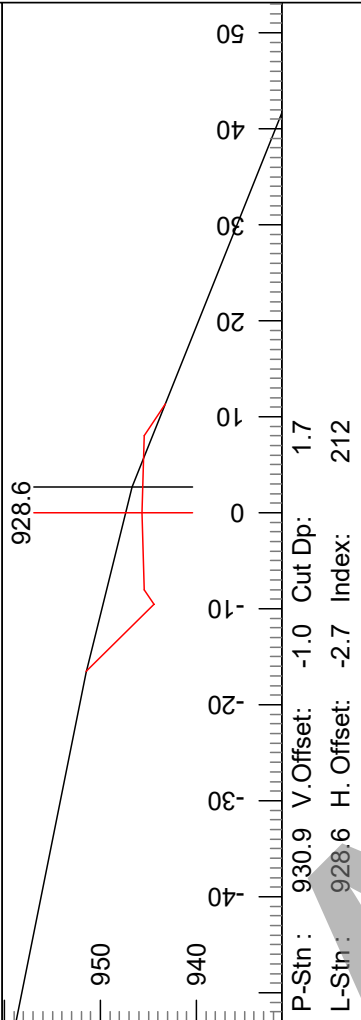
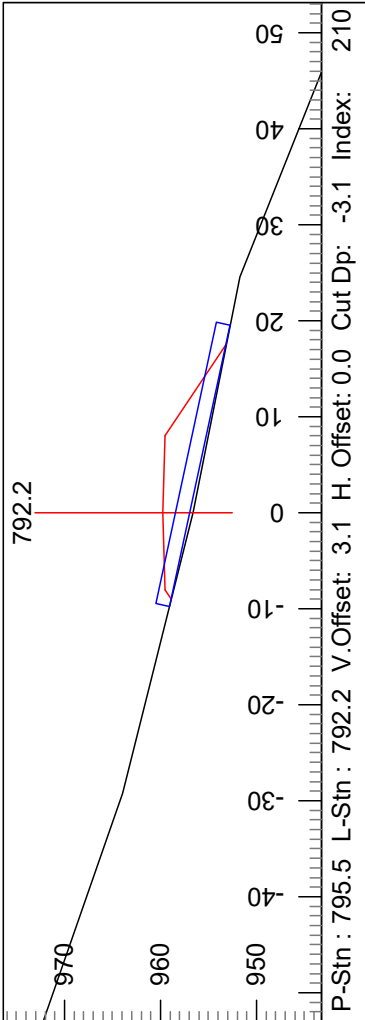


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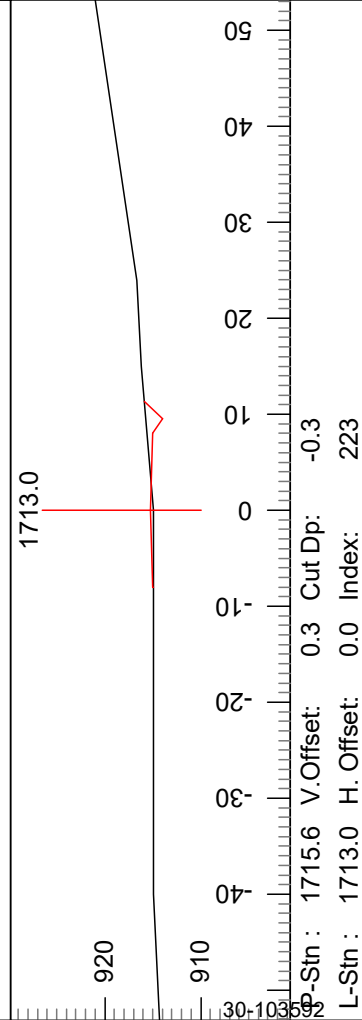
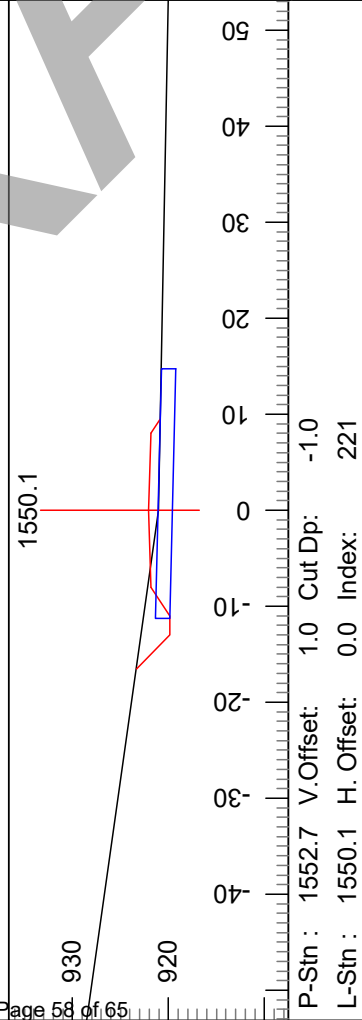
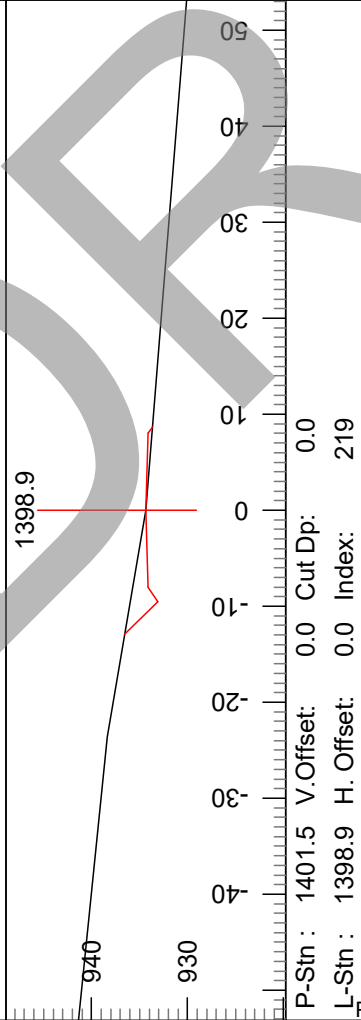
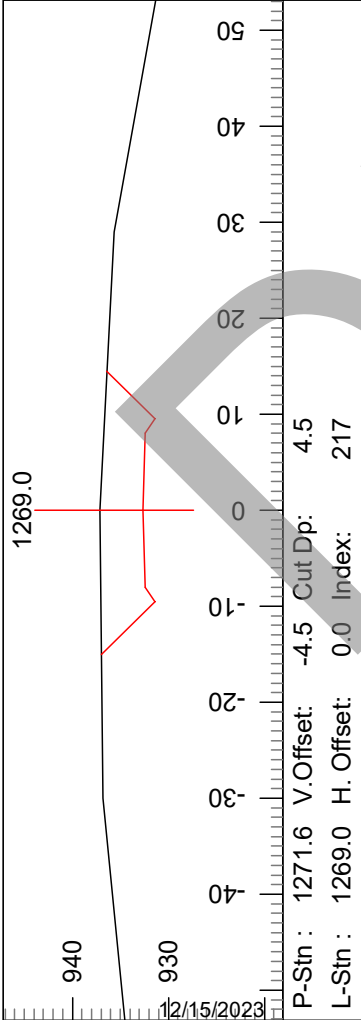
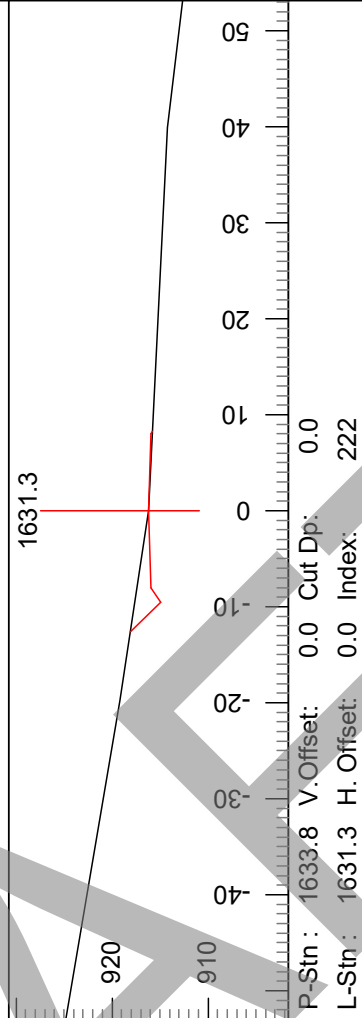
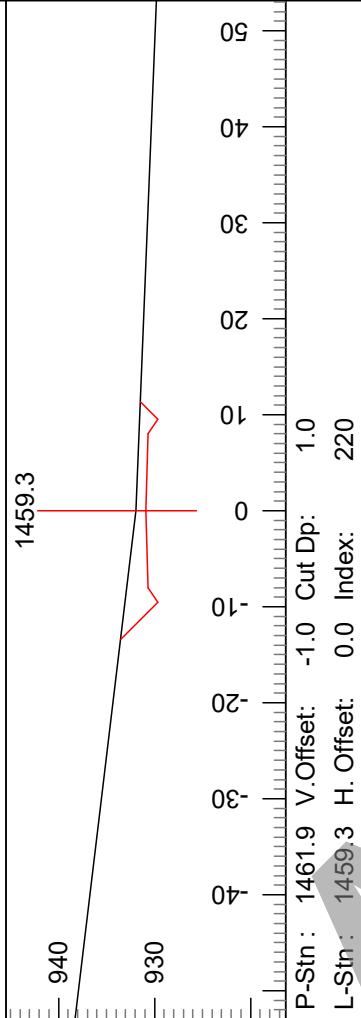
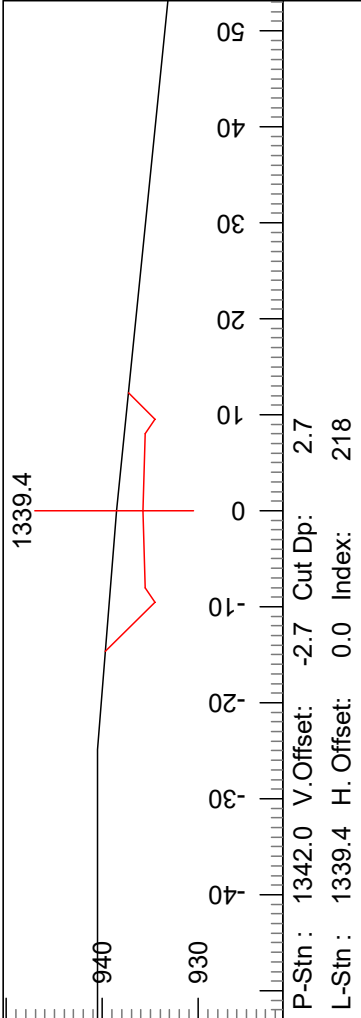
	Washington State Department of Natural Resources South Puget Sound Region	Engineer: J. Gross 23/08/07	Page 3 of 5
	Cabbage Patch Timber Sale BPA-2674Ext Road Contract#: 30-103592	Section Scale 1:240	

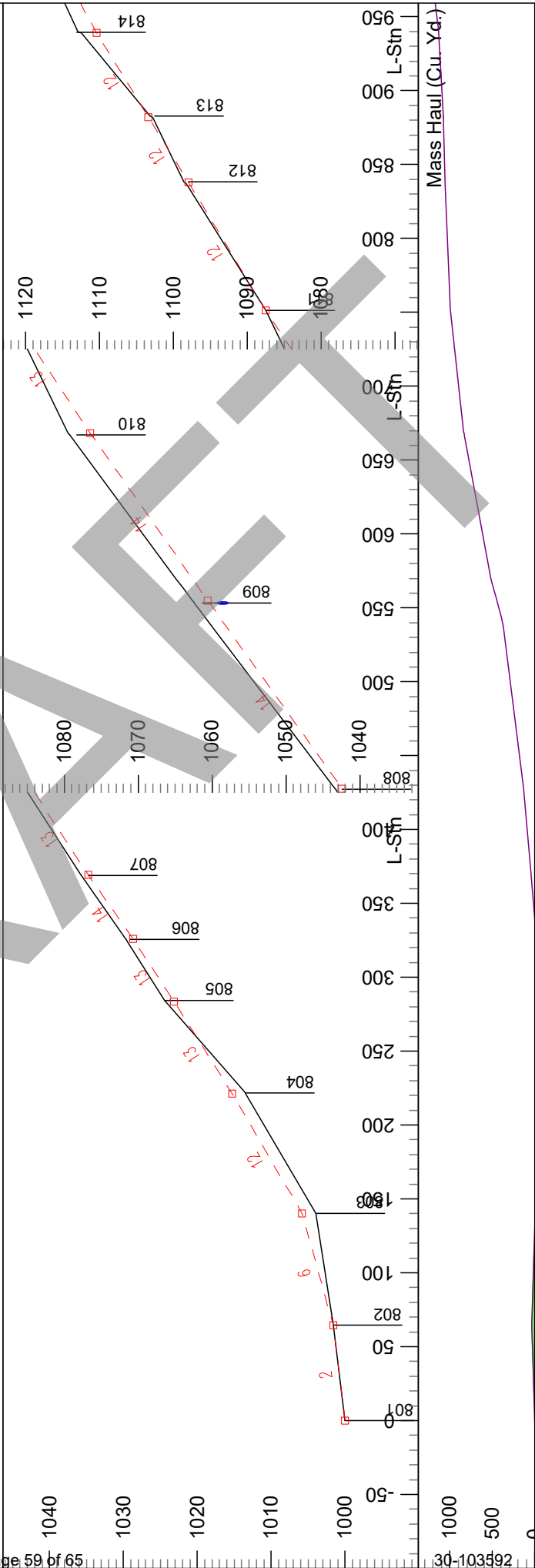
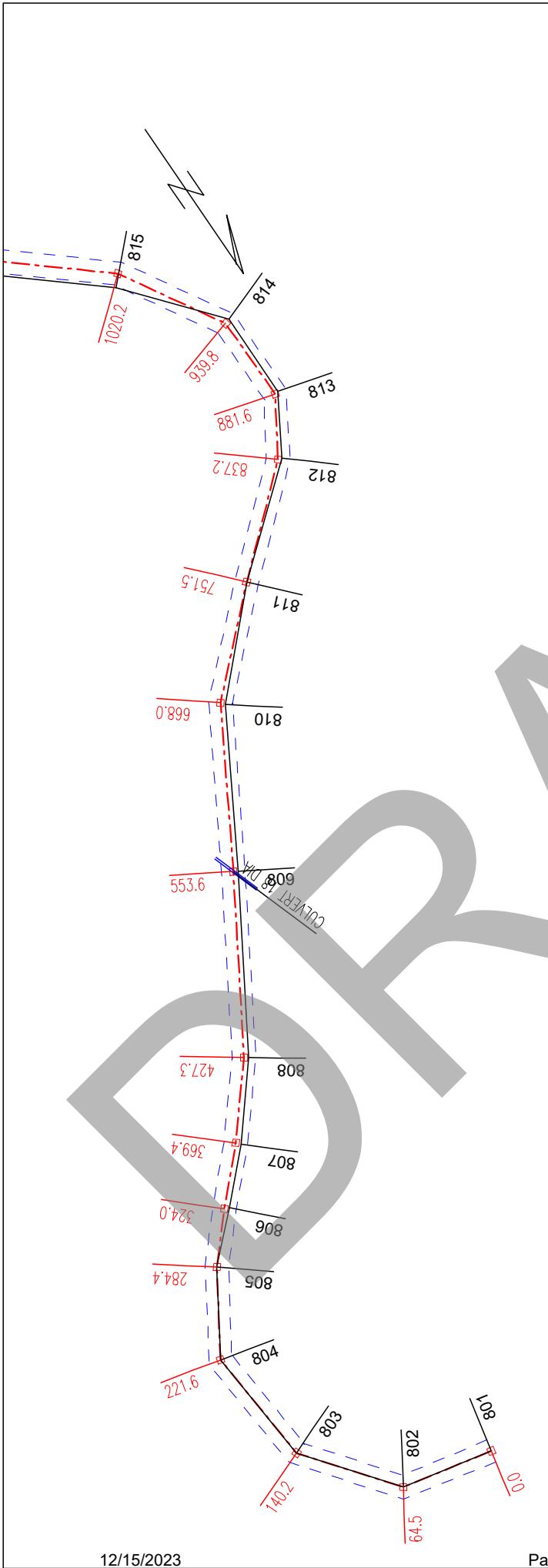


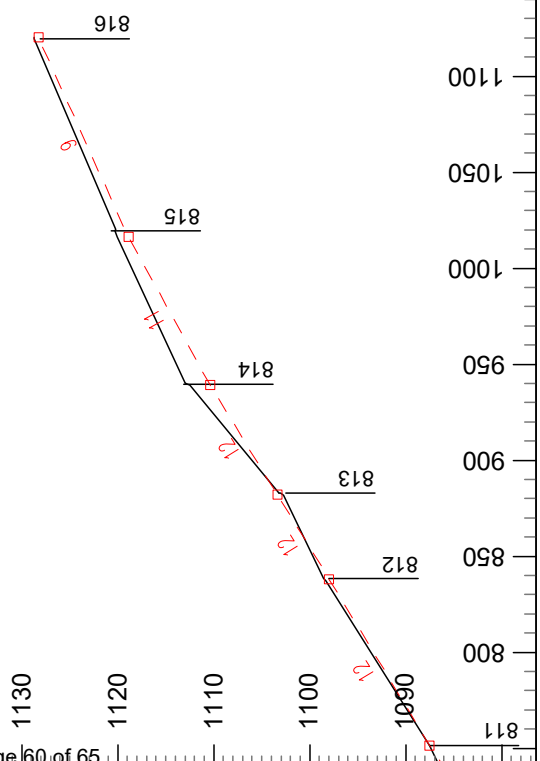
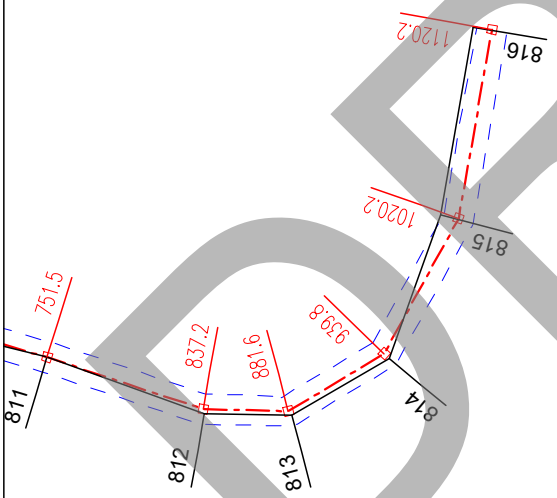
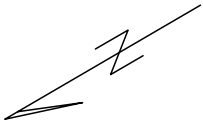
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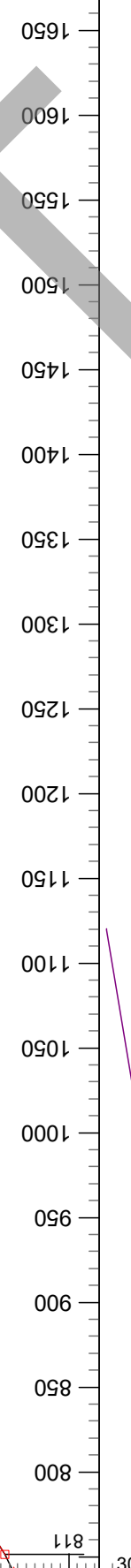
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	Cabbage Patch Timber Sale BPA-2674Ext Road Contract#: 30-103592	Engineer: J. Gross		

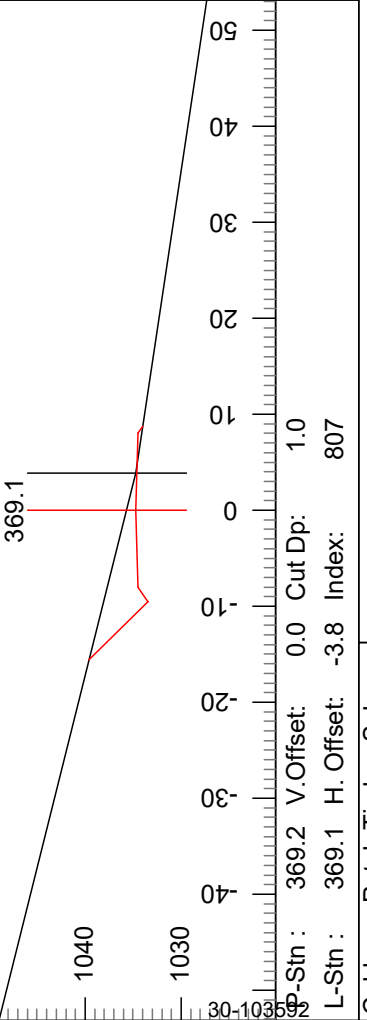
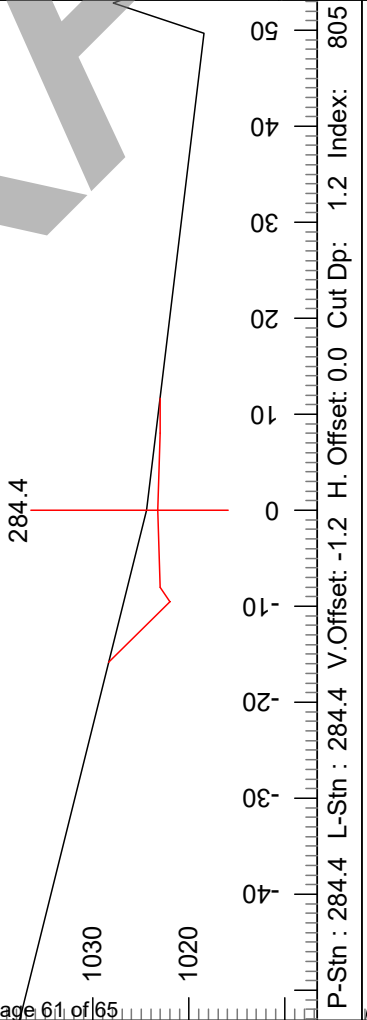
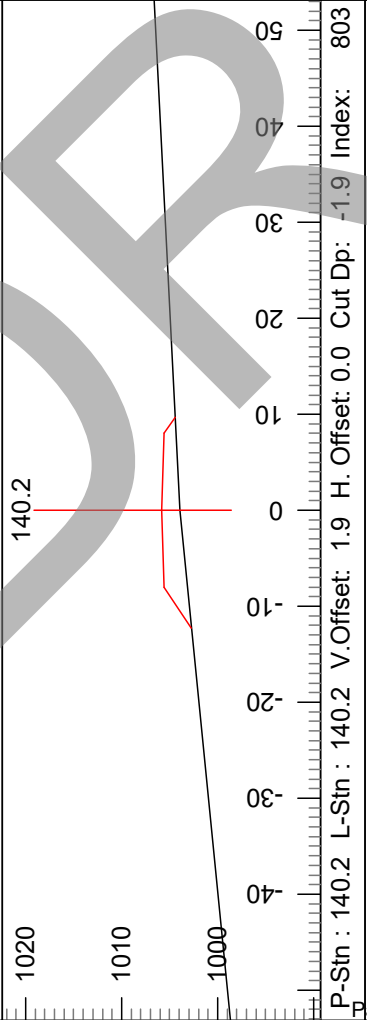
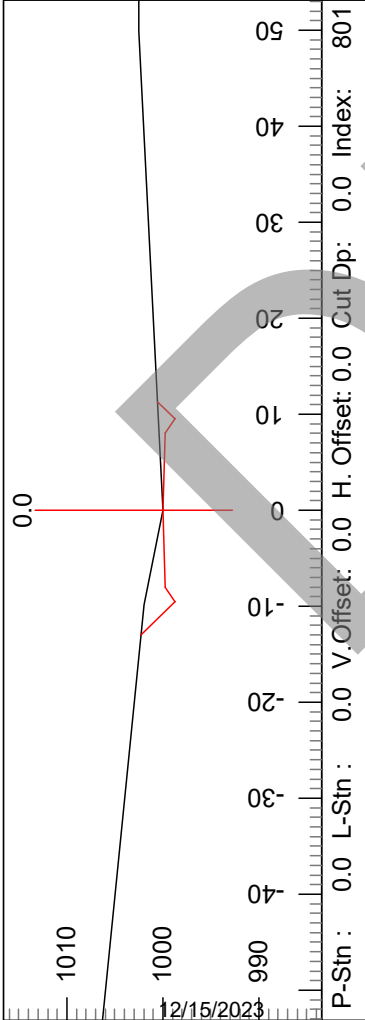
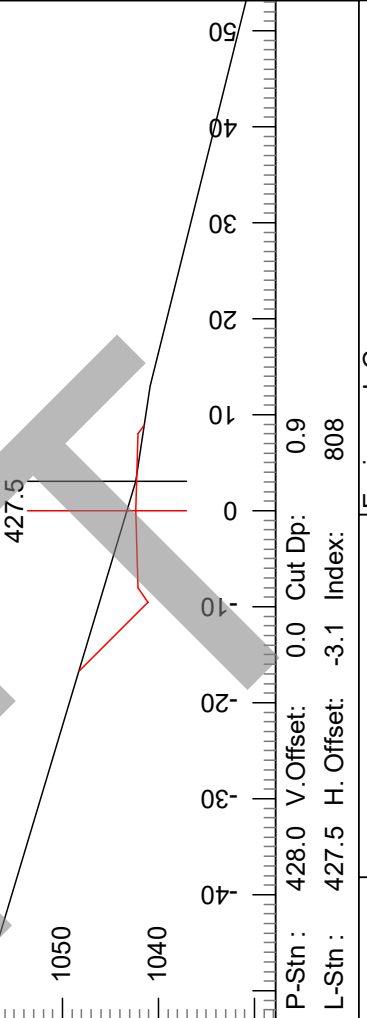
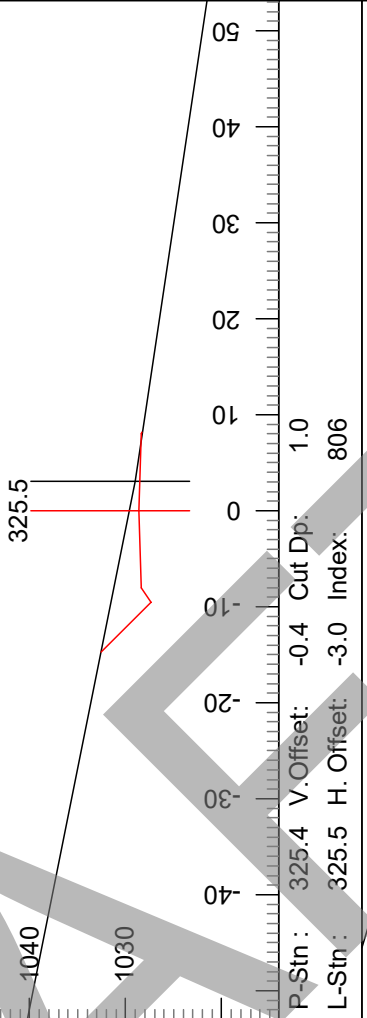
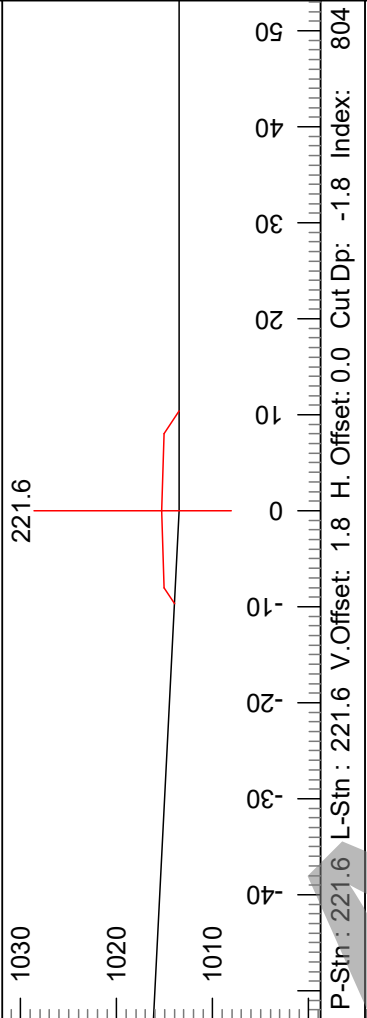
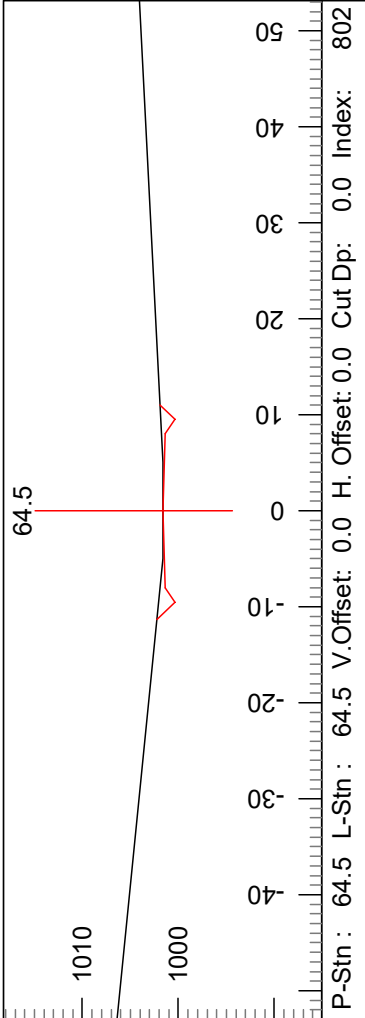






Mass Haul (Cu. Yd.)



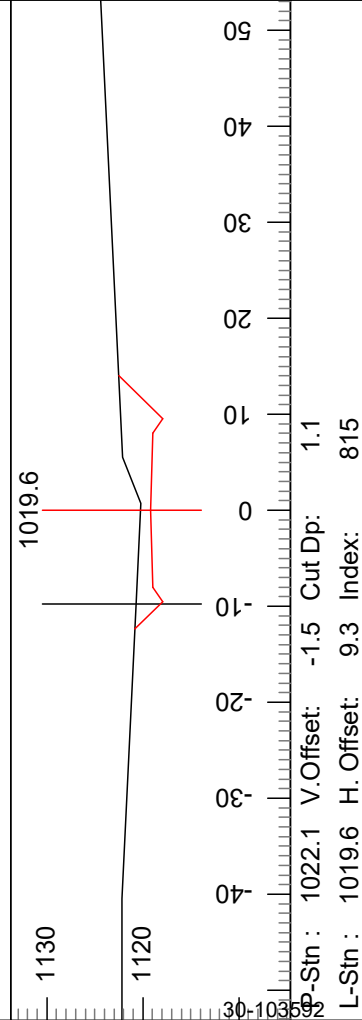
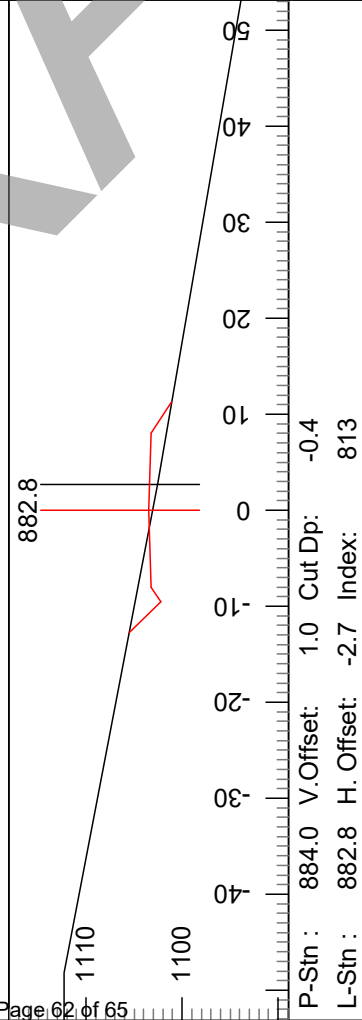
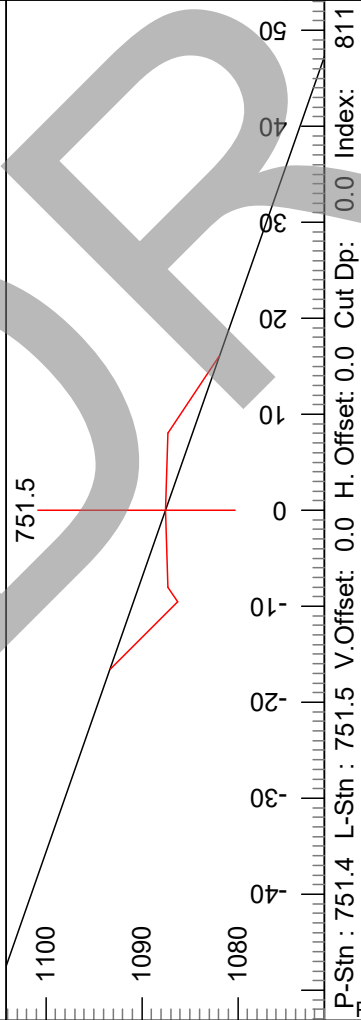
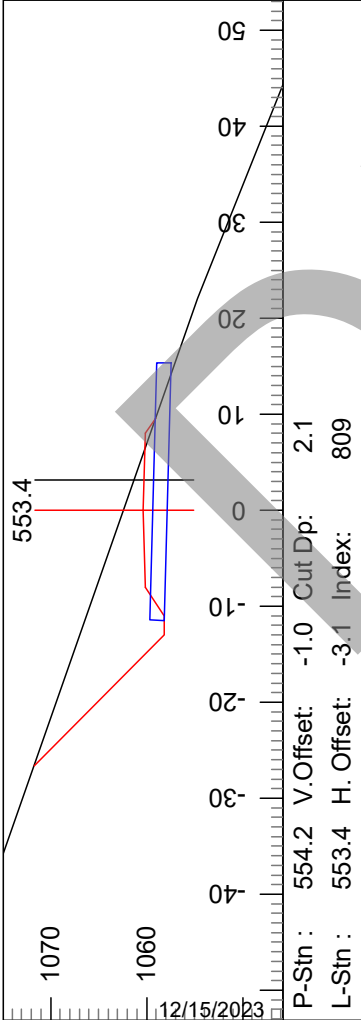
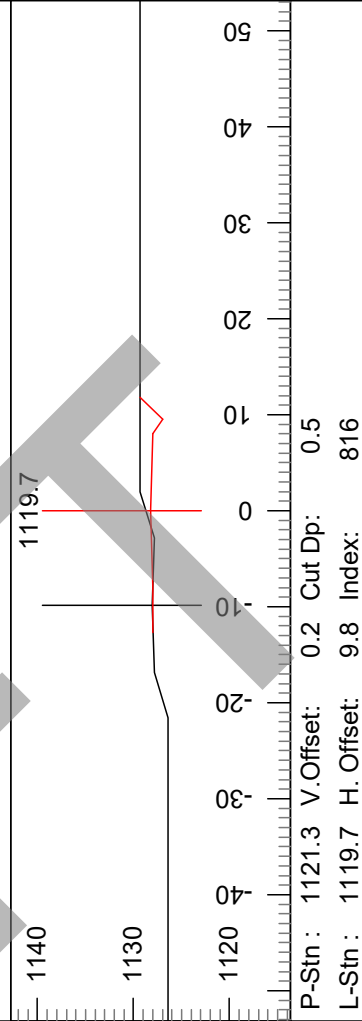
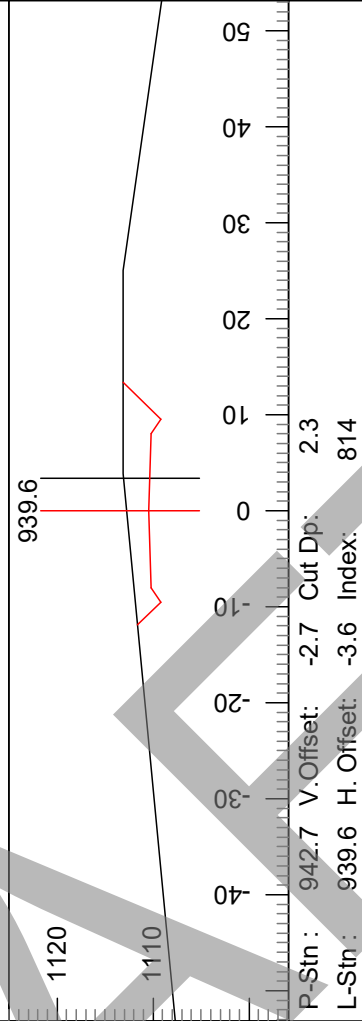
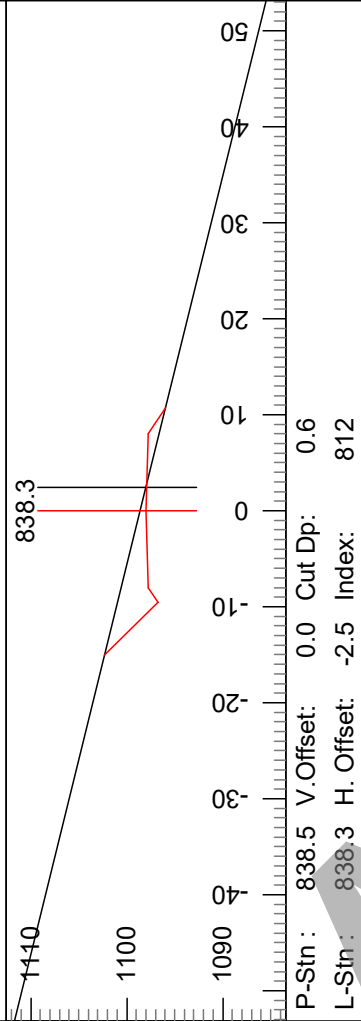
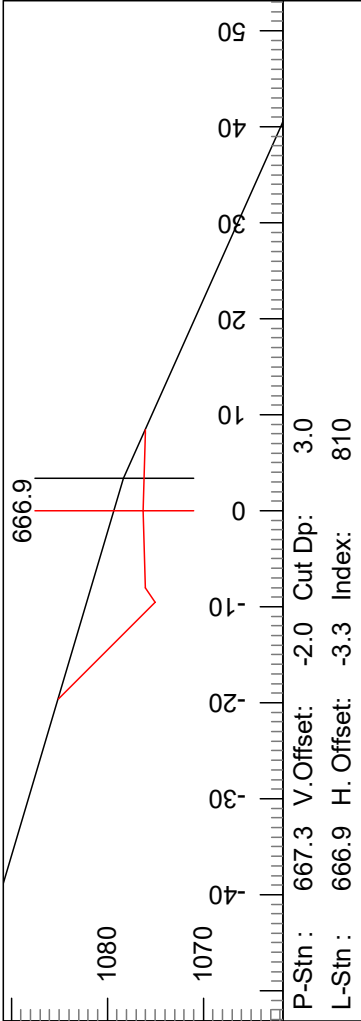


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 <p>Washington State Department of Natural Resources South Puget Sound Region</p>	<p>Section Scale 1:240</p>	<p>23/08/07</p>	<p>Page 3 of 4</p>
	<p>Engineer: J. Gross</p>		

Cabbage Patch Timber Sale
KC-9800 Road
Contract#: 30-103592



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Cabbage Patch Timber Sale
KC-9800 Road
Contract#: 30-103592

Washington State Department of Natural Resources
South Puget Sound Region



Section Scale 1:240

Engineer: J. Gross

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STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
SOUTH PUGET SOUND REGION

STINKFOOT QUARRY DEVELOPMENT PLAN
NE ¼ NE ¼ Sec.28, T18N, R04W W.M.
Page 1 of 3

1. Rock for manufacture shall be obtained from Area A and Area B, in that order of precedence.
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 ½ of the height of the tallest tree adjacent to the pit. A minimum 25 foot wide stripped area shall be maintained from working faces at all times.
3. Overburden shall be end hauled or pushed to the overburden waste area and compacted. Minimal acceptable compaction is achieved by placing waste material in 2 foot or shallower lifts and routing excavation equipment over the entire width of the lift. Final slope shall not exceed 1 ½ (H):1 (V). If overburden is pushed across the KC-6500, not less than 60 cubic yards of 2" minus crushed rock shall be placed, graded, and compacted over the contaminated segment of road. This rock will be in addition to that shown on the ROCK LIST. The ditch line of the KC-6500 below the quarry site shall be re-established to the specification shown on the TYPICAL SECTION SHEET.
4. Final placement of waste material shall be approved in writing by the Contract Administrator. Final stockpile location shall be as shown on the quarry development map or as approved in writing by the Contract Administrator.
5. Root wads and organic debris larger than one cubic foot in volume shall be separated from overburden material and piled separately in an organic waste area. Organic debris placement must be approved in writing by the Contract Administrator.
6. Quarry faces shall not exceed 30 feet in height and shall have a slope no steeper than ¼ (H):1 (V).
7. The width of any pit benches shall be a minimum of 1.5 times the maximum length of the largest machine used.
8. The surface of pit floors and benches shall be uniform and free-draining at a minimum 2% outslope gradient.
9. Oversize material remaining in the quarry shall not exceed 3% of the total volume mined in the source. Oversize material is defined as rock fragments larger than two feet in any direction. Oversize material shall be placed adjacent to the southwest face or as approved in writing by the Contract Administrator.
10. At the end of operations, pit faces and walls shall be scaled and cleared of loose and overhanging material, benches shall have safety berms constructed, and all access blocked to recreational vehicles.

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
SOUTH PUGET SOUND REGION

STINKFOOT QUARRY DEVELOPMENT PLAN
NE ¼ NE ¼ Sec.28, T18N, R04W W.M.
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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.
12. The quarry area shall be worked and left in a condition such that future operations may proceed in an orderly manner.
13. The quarry site shall be cleared of all temporary structures, equipment, and rubbish upon completion of rock source operations. The quarry site shall be left in a neat and presentable condition.
14. At the completion of rock source operations, Purchaser shall obtain written approval of final rock source condition and compliance with the terms of this plan from the Contract Administrator.
15. Quantity and quality of material are not guaranteed by the state.

Stinkfoot Quarry

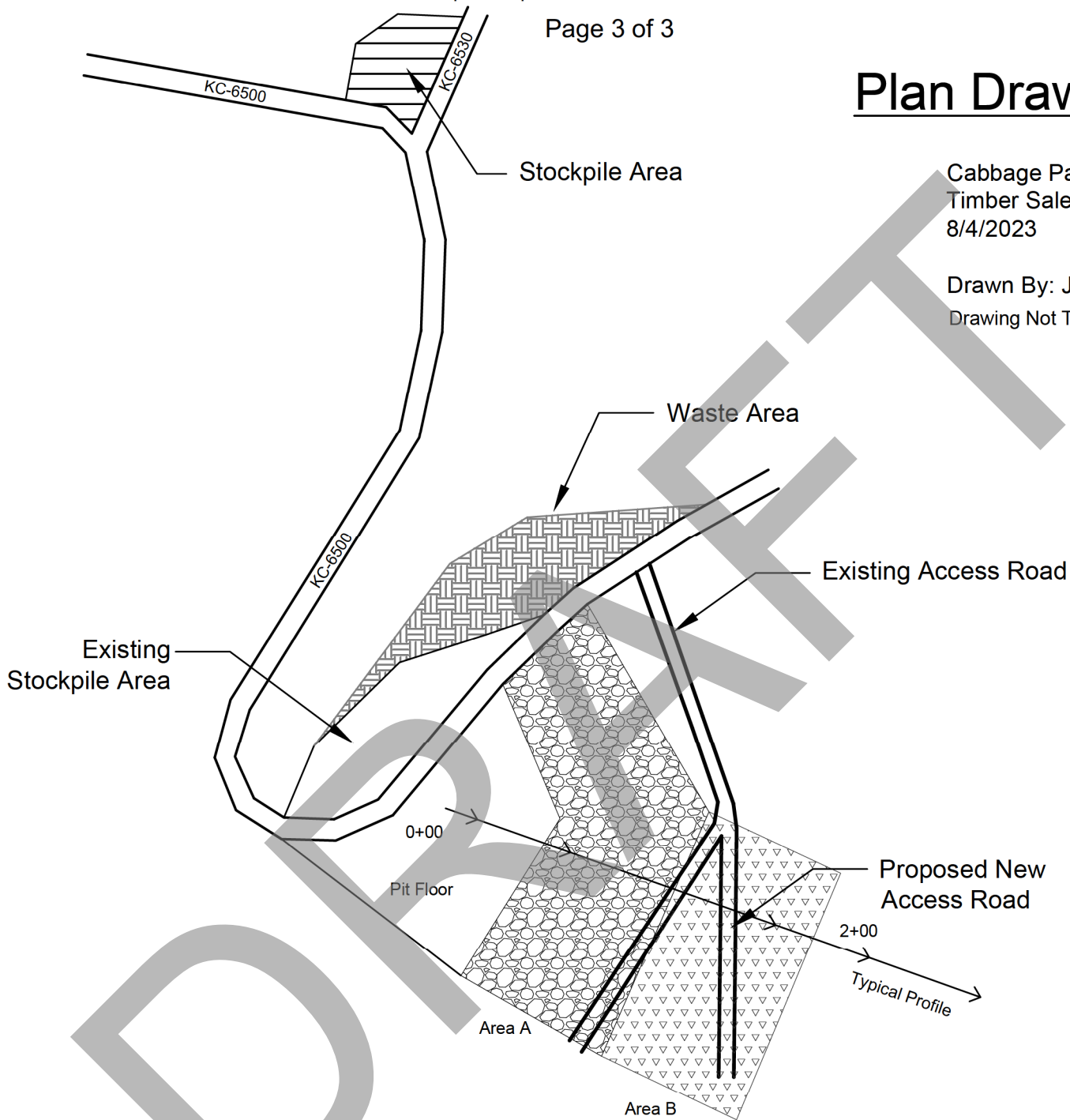
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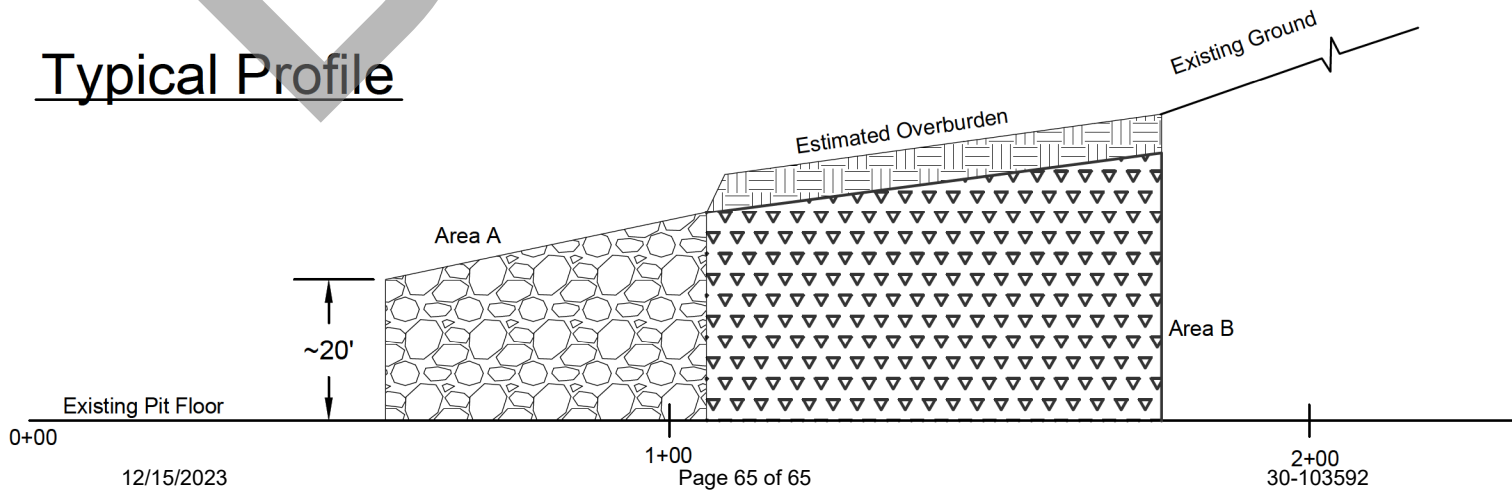
Plan Drawing

Cabbage Patch
Timber Sale
8/4/2023

Drawn By: J. Gross
Drawing Not To Scale



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: Cabbage Patch Timber Sale
 LEGAL DESCRIPTION: 0

CONTRACT NUMBER: 30-103592

	Construction	Reconstruction	Pre-haul maintenance
ROAD NUMBER:	B-4580, BPA-2674Ext, KC-9800		B-Line, B-4000, B-4500, BPA-2674, KC-Line, KC-2000, KC-2100, KC-3000, KC-6500, KC-9700
ROAD STANDARD:	Construction	Reconstruction	Pre-haul maintenance
NUMBER OF STATIONS:	44.68	0.00	771.56
SIDESLOPE:	20-40	30%	0%
CLEARING AND GRUBBING:	\$9,705	\$0	
EXCAVATION AND FILL:	\$14,128	\$0	
MISC. MAINTENANCE:			\$39,720
ROCK TOTALS (Cu. Yds.):			
Ballast	4228	\$90,817	\$0
Crushed Rock	622	\$0	\$3,346
CULVERTS AND FLUMES:	\$7,735	\$0	\$3,214
STRUCTURES:	\$0	\$0	\$0
GENERAL EXPENSES:	\$9,791	\$0	\$4,165
MOBILIZATION:	\$6,340	\$0	\$6,340
TOTAL COSTS:	\$138,517	\$0	\$56,786
COST PER STATION:	\$3,100	\$0	\$74

ROAD DEACTIVATION AND ABANDONMENT COSTS: \$10,787

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

TOTAL (All Roads) = \$206,089
 SALE VOLUME MBF = 8,452
 TOTAL COST PER MBF = \$24.38

Date: 08/08/23