WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

TIMBER NOTICE OF SALE

***SALE NAME**: SYLVAN PEARL* ***AGREEMENT NO**: 30-103620*

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

SALE LOCATION: Sale located approximately 16 miles east of Cumberland, WA

PRODUCTS SOLD AND SALE AREA: All timber, except trees marked with blue paint or 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, timber type change marked with pink flagging and the 5470 Road in Unit #1; white timber sale boundary tags, and the 5470 Road in Units #2, #3, and #4; white timber sale boundary tags, the 5470, and 5470-5 roads in Unit #5; white timber sale boundary tags, timber type change marked with pink flagging, and the 5470 Alt., 5476, Shoofly, and 5477 roads in Unit #6; white timber sale boundary tags and the 5476 Road in Unit #7;

All timber bounded by orange right of way tags, except that title to timber within the right of way tags is not conveyed to the Purchaser unless the road segment is actually constructed in right of way Unit #8;

All forest products above located on part(s) of Sections 19, 20, 29 and 30 all in Township 21 North, Range 9 East, Sections 25 and 36 all in Township 21 North, Range 8 East, W.M., containing 164 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).

ESTIMATED SALE VOLUMES AND QUALITY:

Species	Avg DBH	Ring Count	Total MBF	MBF by Grade 1P	2P	3P	SM	1S	2S	3S	4S	UT
Douglas fir	18.2	8	3,164						1,514	1,335	288	26
Hemlock	14.4		1,651						298	992	332	30
Silver fir	14.8		790						273	394	113	10
Noble fir	19		517						302	179	35	
Redcedar	18.3		92							78	13	
Red alder	14.4		29							6	20	3
Maple	18		5							5		
Cottonwood	30		3						3			
Sale Total			6,251									

MINIMUM BID: $1,789,000.00 **BID METHOD:** Sealed Bids

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

EXPIRATION DATE: October 31, 2027 **ALLOCATION:** Export Restricted

BID DEPOSIT: $178,900.00 or Bid Bond. Said deposit shall constitute an opening bid at the appraised price.

TIMBER NOTICE OF SALE

HARVEST METHOD: Harvest activities are estimated to be 27 percent uphill cable and 73 percent ground based harvest. Cable and ground based equipment, with cable-tethered equipment limited to sustained slopes of 75 percent or less, self-leveling equipment limited to sustained slopes of 65 percent or less, and all other ground based equipment limited to sustained slopes of 45 percent or less. Yarding may be restricted during wet weather if rutting becomes excessive, per clause H-017.

ROADS: 44.64 stations of optional construction. 664.95 stations of required prehaul maintenance. 51.30 stations of optional prehaul maintenance. 33.58 stations of abandonment, if constructed. Purchaser maintenance on all roads used.

Rock for this proposal can be obtained from the State owned Load N Go Pit and the Fir Sure Pit at no cost to the Purchaser or any commercial rock source at the Purchaser's expense. Rock source development is to be completed per Section 6 of the Road Plan and according to the Rock Source Development Plan if rock is obtained from the Load N Go Pit or the Fir Sure Pit.

Purchaser shall stockpile 3,000 cubic yards of 2 inch minus at the Load N Go Pit, as shown on the Load N Go Pit Development Plan, which is included in the Road Plan.

ACREAGE DETERMINATION

CRUISE METHOD: Acreage for Units #1, #2, #3, #4, #7 and #8 were determined by traversing boundaries by GPS. Acreage for Units #5 and #6 were determined by traversing boundaries by GPS and by multiplying length times width for road deductions. GPS data files are available at DNR's website for timber sale packets. See cruise narrative for cruise method.

FEES: $106,267.00 is due on day of sale. $9.00 per MBF is due upon removal. These are in addition to the bid price.

SPECIAL REMARKS: The sale area is typically inaccessible from late November to early May due to snow conditions. Contact Nick Chicano for current conditions at 360-509-1079.

This sale contains high quality Douglas-fir sawlogs and Douglas-fir poles. See cruise.

To access this timber sale you must go through the City of Tacoma's gate on the Headworks Road. All entrants must check in and out with the gate attendant at the Headworks Gate, provide their company name, show a copy of the timber sale prospectus, show valid driver's license and proof of vehicle insurance. The use of a CB is required while on the watershed mainline. A CB will be available for checkout at the gate house. A copy of the MOU between the State and City of Tacoma referenced in clause G-400 is available upon request from the South Puget Sound Region office.

Cut all vine maple within the harvest unit(s), leaving a stump no more than 12 inches in height.

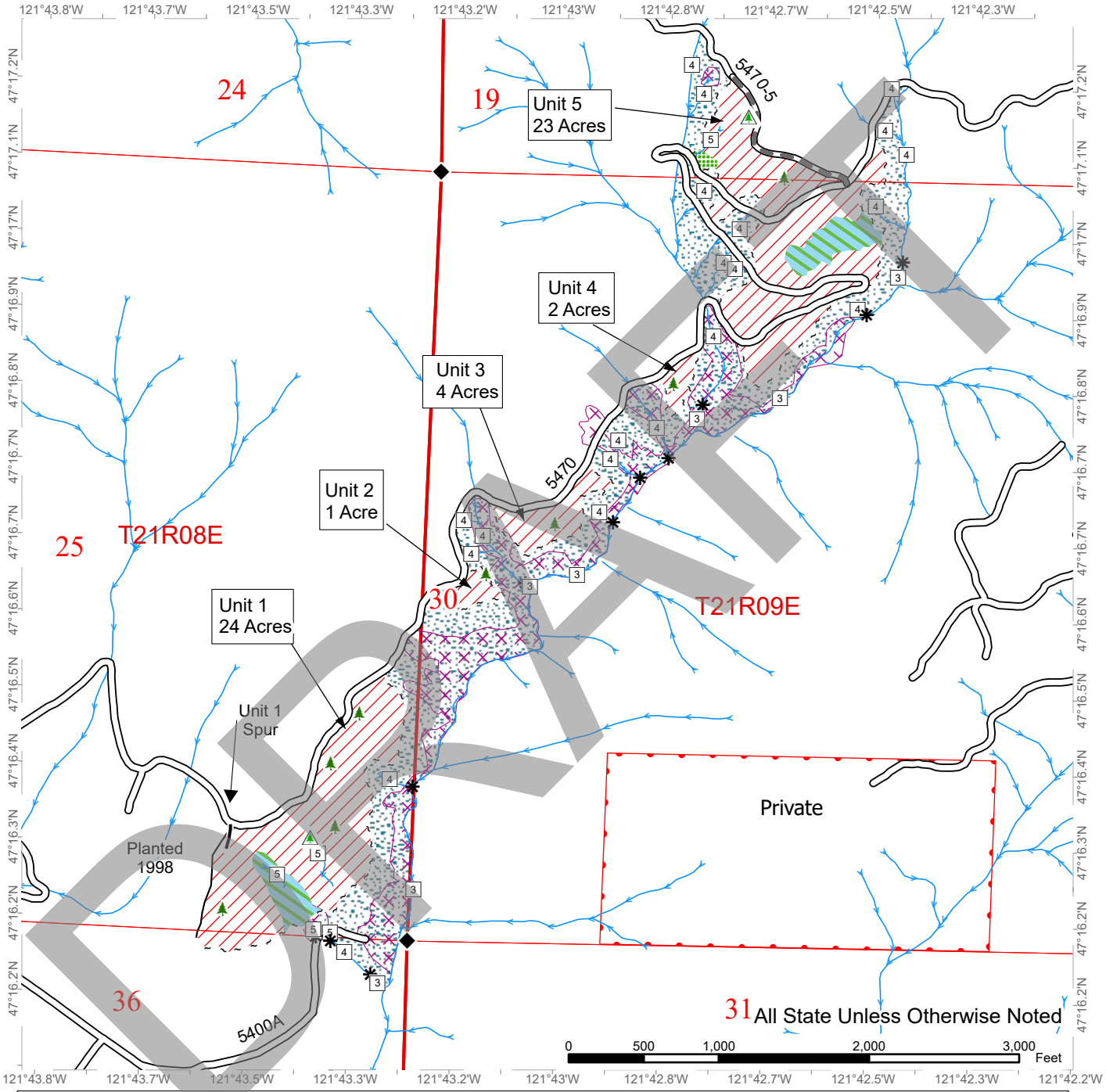
On the 5500 Road speeds are limited to 35 mph from stations 0+00 to 627+00.

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 all string from string boxes used during appraising or cruising this sale.

TIMBER SALE MAP

SALE NAME: SYLVAN PEARL
AGREEMENT #: 30-103620
TOWNSHIP(S): T21R8E, T21R9E
TRUST(S): Common School and Indemnity (3), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): King
ELEVATION RGE: 1320-3280



Sale Area
Sale Boundary Tags
Timber Type Change
Tailhold Restriction Area
Non-Tradeable Leave Tree Area
Leave Tree Area
Riparian Mgt Zone
Existing Roads
Required Pre-Haul Maintenance
Optional Construction
Leave Tree Area <1/4-acre
Non-Tradeable Leave Trees
Streams
Stream Type
Stream Type Break
Survey Monument
Property Line

N

Prepared By: nyon490
Accessed: 10/01/2024 14:40

Modification Date: kfry490 4/4/2024

TIMBER SALE MAP

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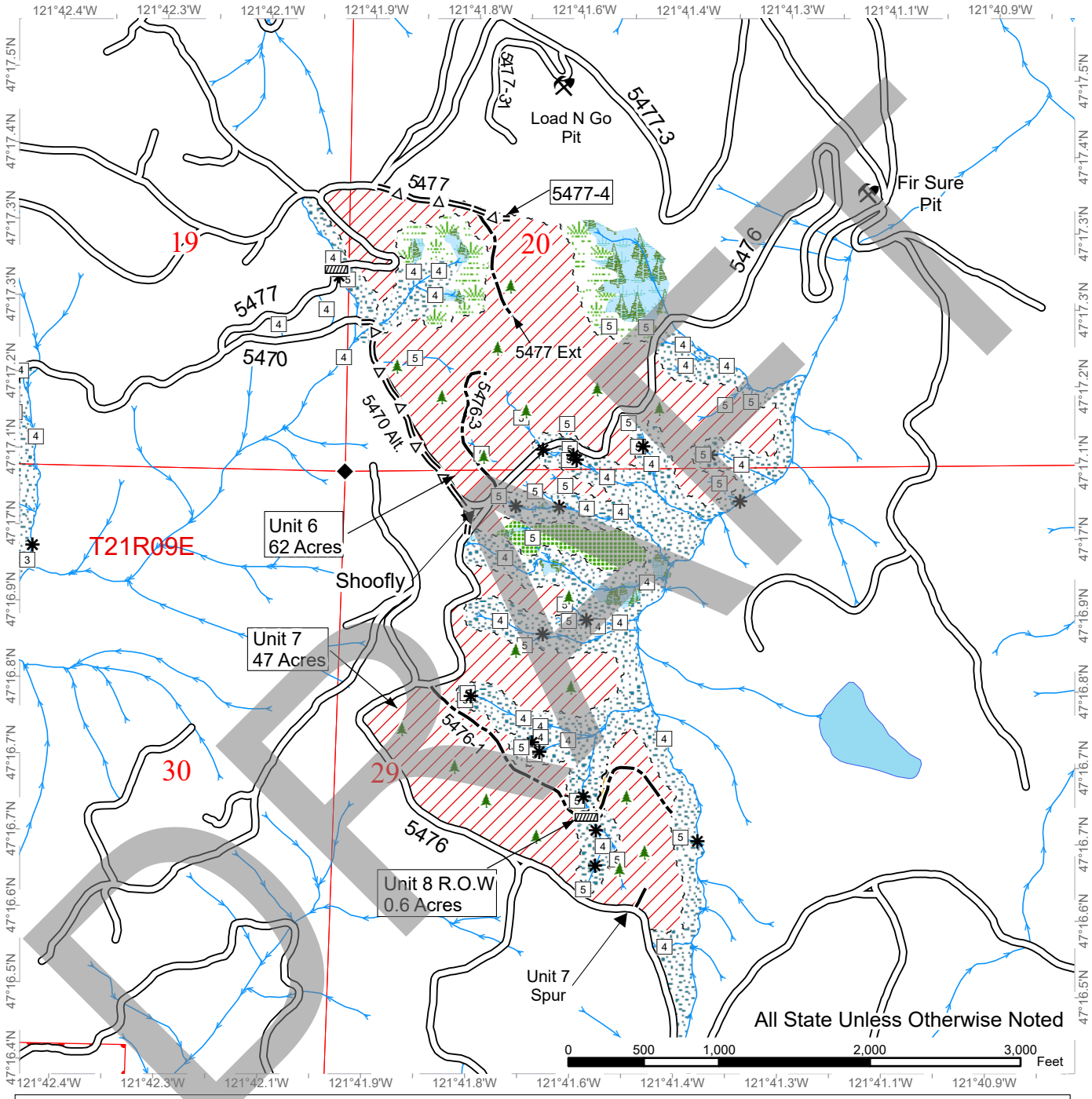

- Sale Area
- Right Of Way
- Sale Boundary Tags
- Right of Way Tags
- Timber Type Change
- Non-Tradeable Leave Tree Area
- Leave Tree Area
- Riparian Mgt Zone
- Forested Wetland
- Wetland Mgt Zone
- Existing Roads
- Optional Pre-Haul Maintenance
- Optional Construction
- Culvert
- Leave Tree Area <1/4-acre
- Rock Pit
- Streams
- Stream Type
- Stream Type Break
- Survey Monument
- Property Line

N

Prepared By: nyon490
Accessed: 10/01/2024 14:40

Modification Date: kfry490 4/4/2024

DRIVING MAP

Accessed: 10/01/2024 14:40

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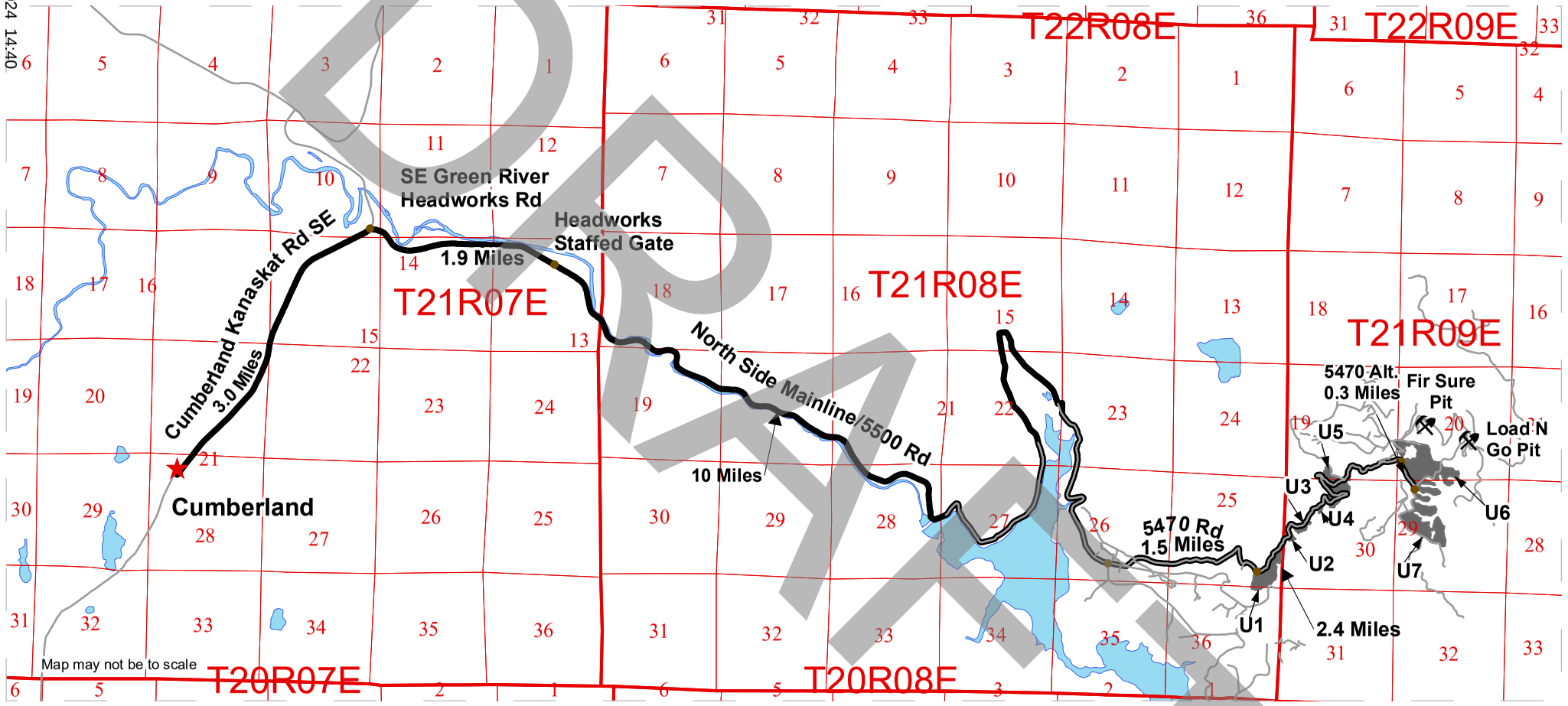
AGREEMENT#: 30-103620
TOWNSHIP(S): T21R8E, T21R9E
TRUST(S): Common School and Indemnity (3), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): King
ELEVATION RGE: 1320-3280



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- Sale Area
- Haul Route
- County Road
- Town
- Distance Indicator
- Rock Pit

From Cumberland, go north approximately 3 miles then turn right on the SE Green River Headworks Road for 1.9 miles. After passing through the staffed Headworks gate, continue on the North Side Mainline/5500 Road for 10 miles. Veer left onto the 5470 Road for 1.5 miles to reach Unit 1. Continue another 2.4 miles down the 5470 Road to reach Units 2, 3, 4, 5, and 6. Continue on the 5470 Alternate Road for 0.3 miles to reach Unit 7.

N

Prepared By: nvon490

Modification Date: kfry490 4/4/2024

Timber Sale Cruise Report
Sylvan Pearl

Sale Name: SYLVAN PEARL

Sale Type: LUMP SUM

Region: SO PUGET

District: RAINIER

Lead Cruiser: Aaron Coleman

Other Cruisers:n/a

Cruise Narrative:
This sale consists of 7 variable retention harvest (VRH) units and 1 right-of-way (R/W) unit located off the 5470 road in the Green River Watershed. No keys were needed for access, though you must check-in at the northside mainline gate. All roads are in good condition.

The primary species for this sale are:
Douglas-fir (50%) with an average diameter of 18 inches.
Western Hemlock (26%) with an average diameter of 14 inches.
Pacific Silver Fir (13%) with an average diameter of 14 inches.
Noble Fir (8%) with an average diameter of 19 inches.

The DF in the higher elevation units (5 thru 7) is rough with many broken/forked tops and spike knots. The lower units (1 thru 4) contain more HQ DF with less overall defect, but root rot pockets, especially in unit 1, affect stocking levels and log quality. Pole-quality DF present in the lower units, but were not cruised as such due to the steepness of the units. The WH, SF, and NF are a mixed bag. Some portions of each unit contain clean boles while others show a lot of frost check.

Most commonly observed defect was broken/forked tops, spike knots, frost check in the white wood.

Timber Sale Notice Volume (MBF)

				MBF Volume by Grade				
Sp	DBH	Rings/In	Age	All	2 Saw	3 Saw	4 Saw	Utility
DF	18.2	7.7		3,165	1,515	1,335	288	26
WH	14.4			1,651	298	992	332	30
SF	14.8			790	273	394	113	10
NF	19.0			517	302	179	35	
RC	18.3			92		78	13	
RA	14.4			29		6	20	3
MA	18.0			5		5		
BC	30.0			3	3			
ALL	16.1	7.7		6,251	2,391	2,989	802	68

Timber Sale Notice Weight (tons)

	Tons by Grade				
Sp	All	2 Saw	3 Saw	4 Saw	Utility
DF	24,025	10,289	10,840	2,733	163
WH	15,920	2,710	9,523	3,472	216
SF	6,851	2,132	3,534	1,105	80
NF	4,324	2,202	1,751	371	
RC	941		821	120	
RA	260		60	178	22
MA	37		37		
BC	19	19			
ALL	52,377	17,351	26,565	7,979	482

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 (%)
287.0	2.9	135.2	1.8	38,021	3.6

Timber Sale Unit Cruise Design

Unit	Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
SYLVAN PEARL U1	B1C: VR, 1 BAF (54.44) Measure/ Count Plots, Sighting Ht = 4.5 ft	24.3	26.3	16	8	0
SYLVAN PEARL U2	B1: VR, 1 BAF (54.44) Measure All, Sighting Ht = 4.5 ft	1.3	1.3	2	2	0
SYLVAN PEARL U3	B1C: VR, 1 BAF (54.44) Measure/ Count Plots, Sighting Ht = 4.5 ft	4.2	4.3	4	2	0
SYLVAN PEARL U4	B1: VR, 1 BAF (54.44) Measure All, Sighting Ht = 4.5 ft	1.5	1.5	2	2	0
SYLVAN PEARL U5	B1C: VR, 1 BAF (54.44) Measure/ Count Plots, Sighting Ht = 4.5 ft	23.0	28.5	17	11	0
SYLVAN PEARL U6	B1C: VR, 1 BAF (54.44) Measure/ Count Plots, Sighting Ht = 4.5 ft	62.4	68.9	43	23	0
SYLVAN PEARL U7	B1C: VR, 1 BAF (54.44) Measure/ Count Plots, Sighting Ht = 4.5 ft	47.1	47.1	31	15	0
SYLVAN PEARL U8 ROW	B1: VR, 1 BAF (40) Measure All, Sighting Ht = 4.5 ft	0.6	0.6	1	1	0
All		164.4	178.4	116	64	0

Timber Sale Log Grade x Sort Summary

Sp	Status	Grade	Sort	Dia	Len	BF Gross	BF Net	Defect %	Tons	MBF Net
BC	LIVE	2 SAW	Domestic	19.7	40	18	18	0.0	18.9	2.9
DF	LIVE	2 SAW	Domestic	14.7	38	6,723	6,575	2.2	7,267.9	1,080.9
DF	LIVE	2 SAW	HQ-B	14.6	39	2,797	2,642	5.5	3,020.8	434.4
DF	LIVE	3 SAW	Domestic	9.5	37	7,039	6,873	2.4	9,348.7	1,129.9
DF	LIVE	3 SAW	HQ-B	10.1	38	1,257	1,250	0.5	1,491.3	205.6
DF	LIVE	4 SAW	Domestic	5.7	29	1,842	1,754	4.8	2,733.3	288.4
DF	LIVE	CULL	Cull	11.1	5	85	0	100.0	0.0	0.0
DF	LIVE	UTILITY	Pulp	8.5	13	155	155	0.0	163.5	25.5
MA	LIVE	3 SAW	Domestic	13.3	20	34	31	9.9	37.2	5.1
NF	LIVE	2 SAW	Domestic	14.8	40	2,005	1,838	8.4	2,201.7	302.1
NF	LIVE	3 SAW	Domestic	9.1	40	1,224	1,091	10.9	1,751.0	179.3
NF	LIVE	4 SAW	Domestic	5.6	30	229	214	6.4	370.9	35.2
RA	LIVE	3 SAW	Domestic	10.8	36	35	35	0.0	59.6	5.7
RA	LIVE	4 SAW	Domestic	8.3	29	124	121	2.5	177.9	19.8
RA	LIVE	UTILITY	Pulp	11.0	12	20	20	0.0	22.4	3.3
RC	LIVE	3 SAW	Domestic	10.1	32	507	477	5.9	820.8	78.4
RC	LIVE	4 SAW	Domestic	5.8	26	90	81	9.8	119.7	13.4
RC	LIVE	CULL	Cull	10.4	6	5	0	100.0	0.0	0.0
SF	LIVE	2 SAW	Domestic	13.4	37	1,778	1,663	6.5	2,132.0	273.4
SF	LIVE	3 SAW	Domestic	9.2	40	2,549	2,394	6.1	3,534.1	393.6
SF	LIVE	4 SAW	Domestic	5.3	27	707	688	2.8	1,105.4	113.0
SF	LIVE	UTILITY	Pulp	6.5	30	59	59	0.0	79.7	9.7
WH	LIVE	2 SAW	Domestic	13.1	40	1,925	1,811	5.9	2,709.8	297.7
WH	LIVE	3 SAW	Domestic	9.0	39	6,254	6,032	3.5	9,522.5	991.7
WH	LIVE	4 SAW	Domestic	5.5	30	2,067	2,018	2.4	3,472.0	331.8
WH	LIVE	CULL	Cull	9.1	2	5	0	100.0	0.0	0.0
WH	LIVE	UTILITY	Pulp	7.3	15	181	181	0.0	216.2	29.7

Timber Sale Log Sort x Diameter Bin Summary

Sp	Bin	Status	Sort	Dia	Len	BF Net	Defect %	Tons	MBF Net
BC	16 - 19	LIVE	Domestic	19.7	40	18	0.0	18.9	2.9
DF	5 - 7	LIVE	Cull	5.2	19	0	100.0	0.0	0.0
DF	5 - 7	LIVE	Pulp	5.3	14	45	0.0	50.7	7.5
DF	5 - 7	LIVE	Domestic	5.9	31	2,803	2.6	4,319.5	460.9
DF	8 - 11	LIVE	Pulp	8.0	14	9	0.0	14.0	1.4
DF	8 - 11	LIVE	Domestic	9.9	37	5,580	3.0	7,482.3	917.3

Sp	Bin	Status	Sort	Dia	Len	BF Net	Defect %	Tons	MBF Net
DF	8 - 11	LIVE	HQ-B	10.1	39	1,250	0.5	1,491.3	205.6
DF	8 - 11	LIVE	Cull	10.7	3	0	100.0	0.0	0.0
DF	12 - 15	LIVE	Pulp	12.3	12	58	0.0	55.5	9.6
DF	12 - 15	LIVE	Cull	13.0	5	0	100.0	0.0	0.0
DF	12 - 15	LIVE	Domestic	13.6	36	3,640	1.3	4,264.5	598.4
DF	12 - 15	LIVE	HQ-B	13.7	39	1,848	4.4	2,148.0	303.7
DF	16 - 19	LIVE	Pulp	16.9	14	43	0.0	43.2	7.1
DF	16 - 19	LIVE	Domestic	17.0	39	2,544	4.1	2,692.1	418.2
DF	16 - 19	LIVE	HQ-B	17.4	40	795	8.1	872.7	130.7
DF	20+	LIVE	Domestic	21.8	40	635	0.0	591.4	104.4
MA	12 - 15	LIVE	Domestic	13.3	20	31	9.9	37.2	5.1
NF	5 - 7	LIVE	Domestic	5.9	32	382	5.2	660.4	62.8
NF	8 - 11	LIVE	Domestic	9.9	40	923	12.1	1,461.5	151.7
NF	12 - 15	LIVE	Domestic	13.8	40	1,140	8.4	1,402.5	187.5
NF	16 - 19	LIVE	Domestic	17.3	40	697	8.3	799.2	114.6
RA	5 - 7	LIVE	Domestic	5.0	21	12	0.0	14.8	2.0
RA	8 - 11	LIVE	Domestic	9.2	31	143	2.1	222.7	23.6
RA	8 - 11	LIVE	Pulp	11.0	12	20	0.0	22.4	3.3
RC	5 - 7	LIVE	Domestic	6.1	28	132	6.3	241.0	21.6
RC	8 - 11	LIVE	Domestic	10.3	31	345	3.8	557.6	56.8
RC	8 - 11	LIVE	Cull	10.4	6	0	100.0	0.0	0.0
RC	12 - 15	LIVE	Domestic	13.6	29	81	16.9	142.0	13.4
SF	5 - 7	LIVE	Pulp	5.0	19	11	0.0	12.9	1.8
SF	5 - 7	LIVE	Domestic	5.6	30	1,051	6.1	1,790.2	172.8
SF	8 - 11	LIVE	Pulp	8.0	40	48	0.0	66.8	7.9
SF	8 - 11	LIVE	Domestic	10.2	40	2,031	5.0	2,849.3	333.8
SF	12 - 15	LIVE	Domestic	13.3	37	1,510	7.1	1,982.1	248.2
SF	16 - 19	LIVE	Domestic	17.2	40	153	0.0	149.9	25.1
WH	5 - 7	LIVE	Pulp	5.0	15	41	0.0	40.8	6.8
WH	5 - 7	LIVE	Domestic	5.7	33	2,941	2.0	5,005.8	483.4
WH	8 - 11	LIVE	Cull	9.1	2	0	100.0	0.0	0.0
WH	8 - 11	LIVE	Pulp	9.7	15	139	0.0	175.4	22.9
WH	8 - 11	LIVE	Domestic	9.8	38	5,110	4.0	7,988.7	840.1
WH	12 - 15	LIVE	Domestic	13.1	40	1,698	4.3	2,514.7	279.1
WH	16 - 19	LIVE	Domestic	16.0	40	114	25.0	195.1	18.7

Cruise Unit Report
SYLVAN PEARL U1

Unit Sale Notice Volume (MBF): SYLVAN PEARL U1

				MBF Volume by Grade			
Sp	DBH	Rings/In	Age	All	2 Saw	3 Saw	4 Saw
DF	21.4			826	595	199	32
WH	10.4			51		24	26
NF	16.0			25		21	4
RA	13.0			10			10
MA	18.0			5		5	
ALL	16.6			916	595	249	72

Unit Cruise Design: SYLVAN PEARL U1

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B1C: VR, 1 BAF (54.44) Measure/Count Plots, Sighting Ht = 4.5 ft	24.3	26.3	16	8	0

Unit Cruise Summary: SYLVAN PEARL U1

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	24	49	3.1	0
WH	6	6	0.4	0
NF	1	3	0.2	0
RA	1	1	0.1	0
MA	1	1	0.1	0
ALL	33	60	3.8	0

Unit Cruise Statistics: SYLVAN PEARL 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	166.7	59.0	14.7	203.8	26.8	5.5	33,973	64.8	15.7
WH	20.4	191.7	47.9	102.2	19.2	7.9	2,087	192.6	48.6
NF	10.2	400.0	100.0	100.3	0.0	0.0	1,023	400.0	100.0
RA	3.4	400.0	100.0	119.3	0.0	0.0	406	400.0	100.0
MA	3.4	400.0	100.0	61.7	0.0	0.0	210	400.0	100.0
ALL	204.2	54.7	13.7	184.7	36.3	6.3	37,700	65.6	15.1

Unit Summary: SYLVAN PEARL U1

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	24	ALL	21.4	102	130	35,410	33,973	4.1	66.8	166.7	36.0	825.5
MA	LIVE	CUT	1	ALL	18.0	72	87	233	210	9.9	1.9	3.4	0.8	5.1
NF	LIVE	CUT	1	ALL	16.0	64	80	1,023	1,023	0.0	7.3	10.2	2.6	24.9
RA	LIVE	CUT	1	ALL	13.0	63	82	406	406	0.0	3.7	3.4	0.9	9.9
WH	LIVE	CUT	6	ALL	10.4	55	68	2,087	2,087	0.0	34.6	20.4	6.3	50.7
ALL	LIVE	CUT	33	ALL	18.1	84	106	39,160	37,700	3.7	114.3	204.2	46.7	916.1
ALL	ALL	ALL	33	ALL	18.1	84	106	39,160	37,700	3.7	114.3	204.2	46.7	916.1

Cruise Unit Report
SYLVAN PEARL U2

Unit Sale Notice Volume (MBF): SYLVAN PEARL U2

				MBF Volume by Grade				
Sp	DBH	Rings/In	Age	All	2 Saw	3 Saw	4 Saw	Utility
DF	16.8			55	24	26	5	0
WH	9.0			3			3	
ALL	15.3			58	24	26	8	0

Unit Cruise Design: SYLVAN PEARL U2

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B1: VR, 1 BAF (54.44) Measure All, Sighting Ht = 4.5 ft	1.3	1.3	2	2	0

Unit Cruise Summary: SYLVAN PEARL U2

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	11	11	5.5	0
WH	1	1	0.5	0
ALL	12	12	6.0	0

Unit Cruise Statistics: SYLVAN PEARL 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	299.4	64.3	45.5	142.5	18.8	5.7	42,653	67.0	45.8
WH	27.2	141.4	100.0	83.8	0.0	0.0	2,280	141.4	100.0
ALL	326.6	47.1	33.3	137.6	22.3	6.4	44,932	52.2	33.9

Unit Summary: SYLVAN PEARL U2

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	11	ALL	16.8	85	103	43,163	42,653	1.2	194.5	299.4	73.1	55.4
WH	LIVE	CUT	1	ALL	9.0	50	61	2,280	2,280	0.0	61.6	27.2	9.1	3.0
ALL	LIVE	CUT	12	ALL	15.3	77	93	45,443	44,932	1.1	256.1	326.6	82.1	58.4
ALL	ALL	ALL	12	ALL	15.3	77	93	45,443	44,932	1.1	256.1	326.6	82.1	58.4

Cruise Unit Report
SYLVAN PEARL U3

Unit Sale Notice Volume (MBF): SYLVAN PEARL U3

				MBF Volume by Grade			
Sp	DBH	Rings/In	Age	All	2 Saw	3 Saw	4 Saw
DF	14.9			141	42	77	22
ALL	14.9			141	42	77	22

Unit Cruise Design: SYLVAN PEARL U3

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B1C: VR, 1 BAF (54.44) Measure/Count Plots, Sighting Ht = 4.5 ft	4.2	4.3	4	2	0

Unit Cruise Summary: SYLVAN PEARL U3

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	10	17	4.3	0
ALL	10	17	4.3	0

Unit Cruise Statistics: SYLVAN PEARL 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	231.4	52.2	26.1	144.7	30.7	9.7	33,468	60.5	27.8
ALL	231.4	52.2	26.1	144.7	30.7	9.7	33,468	60.5	27.8

Unit Summary: SYLVAN PEARL U3

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	10	ALL	14.9	76	96	33,468	33,468	0.0	191.1	231.4	59.9	140.6
ALL	LIVE	CUT	10	ALL	14.9	76	96	33,468	33,468	0.0	191.1	231.4	59.9	140.6
ALL	ALL	ALL	10	ALL	14.9	76	96	33,468	33,468	0.0	191.1	231.4	59.9	140.6

Cruise Unit Report
SYLVAN PEARL U4

Unit Sale Notice Volume (MBF): SYLVAN PEARL U4

				MBF Volume by Grade			
Sp	DBH	Rings/In	Age	All	2 Saw	3 Saw	4 Saw
DF	16.3			69	30	35	5
NF	16.0			4		4	0
ALL	16.3			73	30	38	5

Unit Cruise Design: SYLVAN PEARL U4

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B1: VR, 1 BAF (54.44) Measure All, Sighting Ht = 4.5 ft	1.5	1.4	2	2	0

Unit Cruise Summary: SYLVAN PEARL U4

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	10	10	5.0	0
NF	1	1	0.5	0
ALL	11	11	5.5	0

Unit Cruise Statistics: SYLVAN PEARL 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	272.2	0.0	0.0	169.3	27.6	8.7	46,082	27.6	8.7
NF	27.2	141.4	100.0	96.7	0.0	0.0	2,632	141.4	100.0
ALL	299.4	12.9	9.1	162.7	30.4	9.2	48,714	33.0	12.9

Unit Summary: SYLVAN PEARL U4

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	10	ALL	16.3	98	109	46,965	46,082	1.9	187.8	272.2	67.4	69.1
NF	LIVE	CUT	1	ALL	16.0	127	127	5,244	2,632	49.8	19.5	27.2	6.8	3.9
ALL	LIVE	CUT	11	ALL	16.3	100	110	52,209	48,714	6.7	207.3	299.4	74.2	73.1
ALL	ALL	ALL	11	ALL	16.3	100	110	52,209	48,714	6.7	207.3	299.4	74.2	73.1

Cruise Unit Report
SYLVAN PEARL U5

Unit Sale Notice Volume (MBF): SYLVAN PEARL U5

				MBF Volume by Grade				
Sp	DBH	Rings/In	Age	All	2 Saw	3 Saw	4 Saw	Utility
DF	18.6			678	391	244	37	6
WH	13.6			130	56	32	34	9
SF	17.8			59	33	23	3	
RC	18.4			45		40	6	
RA	18.0			6		6		
ALL	17.6			918	480	345	79	14

Unit Cruise Design: SYLVAN PEARL U5

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B1C: VR, 1 BAF (54.44) Measure/Count Plots, Sighting Ht = 4.5 ft	23.0	28.5	17	11	0

Unit Cruise Summary: SYLVAN PEARL U5

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	35	57	3.4	0
WH	7	16	0.9	0
SF	3	6	0.4	0
RC	8	9	0.5	0
RA	1	1	0.1	0
ALL	54	89	5.2	0

Unit Cruise Statistics: SYLVAN PEARL 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	182.5	52.7	12.8	161.5	26.0	4.4	29,474	58.7	13.5
WH	51.2	115.6	28.0	110.3	21.8	8.3	5,652	117.6	29.2
SF	19.2	198.9	48.2	133.7	10.7	6.2	2,568	199.2	48.6
RC	28.8	135.5	32.9	68.5	24.5	8.7	1,973	137.7	34.0
RA	3.2	412.3	100.0	77.5	0.0	0.0	248	412.3	100.0
ALL	285.0	36.7	8.9	140.1	35.7	4.9	39,916	51.2	10.1

Unit Summary: SYLVAN PEARL U5

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	35	ALL	18.6	92	112	30,062	29,474	2.0	96.7	182.5	42.3	677.9
RA	LIVE	CUT	1	ALL	18.0	75	93	248	248	0.0	1.8	3.2	0.8	5.7
RC	LIVE	CUT	8	ALL	18.4	69	77	2,110	1,973	6.5	15.6	28.8	6.7	45.4
SF	LIVE	CUT	3	ALL	17.8	83	97	2,568	2,568	0.0	11.1	19.2	4.6	59.1
WH	LIVE	CUT	7	ALL	13.6	64	77	5,789	5,652	2.4	50.8	51.2	13.9	130.0
ALL	LIVE	CUT	54	ALL	17.2	81	98	40,778	39,916	2.1	176.0	285.0	68.2	918.1
ALL	ALL	ALL	54	ALL	17.2	81	98	40,778	39,916	2.1	176.0	285.0	68.2	918.1

Cruise Unit Report
SYLVAN PEARL U6

Unit Sale Notice Volume (MBF): SYLVAN PEARL U6

				MBF Volume by Grade				
Sp	DBH	Rings/In	Age	All	2 Saw	3 Saw	4 Saw	Utility
DF	17.4	7.7		827	285	433	102	7
SF	14.6			721	241	371	110	
WH	15.8			429	142	206	70	12
NF	19.2			425	266	135	24	
RC	17.0			15		14	1	
RA	14.0			12			9	3
ALL	16.5	7.7		2,430	933	1,159	315	22

Unit Cruise Design: SYLVAN PEARL U6

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	62.4	68.9	43	23	0

Unit Cruise Summary: SYLVAN PEARL U6

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	48	81	1.9	3
SF	36	78	1.8	0
WH	19	47	1.1	0
NF	29	39	0.9	0
RC	3	3	0.1	0
RA	2	2	0.0	0
ALL	137	250	5.8	3

Unit Cruise Statistics: SYLVAN PEARL U6

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	102.5	94.3	14.4	129.3	21.9	3.2	13,261	96.8	14.7
SF	98.8	109.8	16.7	117.0	31.1	5.2	11,553	114.1	17.5
WH	59.5	130.6	19.9	115.6	21.2	4.9	6,880	132.3	20.5
NF	49.4	182.9	27.9	137.8	26.0	4.8	6,803	184.8	28.3
RC	3.8	369.5	56.3	64.4	22.4	13.0	245	370.2	57.8

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	2.5	458.1	69.9	77.2	2.6	1.8	195	458.1	69.9
ALL	316.5	25.0	3.8	123.0	27.5	2.4	38,937	37.2	4.5

Unit Summary: SYLVAN PEARL U6

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	48	ALL	17.4	81	98	13,823	13,261	4.1	62.1	102.5	24.6	827.5
NF	LIVE	CUT	29	ALL	19.2	83	102	7,498	6,803	9.3	24.6	49.4	11.3	424.5
RA	LIVE	CUT	2	ALL	14.0	69	85	204	195	4.1	2.4	2.5	0.7	12.2
RC	LIVE	CUT	3	ALL	17.0	69	73	245	245	0.0	2.4	3.8	0.9	15.3
SF	LIVE	CUT	36	ALL	14.6	66	77	12,318	11,553	6.2	84.9	98.8	25.8	720.9
WH	LIVE	CUT	19	ALL	15.8	76	87	7,410	6,880	7.1	43.7	59.5	15.0	429.3
ALL	LIVE	CUT	137	ALL	16.2	74	88	41,497	38,937	6.2	220.1	316.5	78.3	2,429.7
ALL	ALL	ALL	137	ALL	16.2	74	88	41,497	38,937	6.2	220.1	316.5	78.3	2,429.7

Cruise Unit Report
SYLVAN PEARL U7

Unit Sale Notice Volume (MBF): SYLVAN PEARL U7

				MBF Volume by Grade				
Sp	DBH	Rings/In	Age	All	2 Saw	3 Saw	4 Saw	Utility
WH	14.1			1,032	98	727	198	9
DF	15.3			569	149	320	87	13
NF	19.1			63	36	20	7	
RC	18.9			31		24	7	
SF	13.0			10				10
ALL	14.7			1,704	283	1,091	299	31

Unit Cruise Design: SYLVAN PEARL U7

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	47.1	47.1	31	15	0

Unit Cruise Summary: SYLVAN PEARL U7

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
WH	57	105	3.4	0
DF	22	53	1.7	0
NF	4	5	0.2	0
RC	5	5	0.2	0
SF	1	1	0.0	0
ALL	89	169	5.5	0

Unit Cruise Statistics: SYLVAN PEARL U7

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 (%)
WH	184.4	48.6	8.7	118.8	17.2	2.3	21,901	51.6	9.0
DF	93.1	60.8	10.9	129.7	24.9	5.3	12,074	65.7	12.1
NF	8.8	324.0	58.2	153.1	20.1	10.0	1,344	324.6	59.1
RC	8.8	231.8	41.6	75.2	20.1	9.0	660	232.7	42.6
SF	1.8	556.8	100.0	117.2	0.0	0.0	206	556.8	100.0
ALL	296.8	26.7	4.8	121.9	22.4	2.4	36,185	34.9	5.4

Unit Summary: SYLVAN PEARL U7

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	22	ALL	15.3	84	94	12,521	12,074	3.6	72.9	93.1	23.8	568.7
NF	LIVE	CUT	4	ALL	19.1	98	107	1,442	1,344	6.8	4.4	8.8	2.0	63.3
RC	LIVE	CUT	5	ALL	18.9	80	84	748	660	11.7	4.5	8.8	2.0	31.1
SF	LIVE	CUT	1	ALL	13.0	82	82	206	206	0.0	1.9	1.8	0.5	9.7
WH	LIVE	CUT	57	ALL	14.1	76	85	22,470	21,901	2.5	170.1	184.4	49.1	1,031.6
ALL	LIVE	CUT	89	ALL	14.6	79	88	37,387	36,185	3.2	253.8	296.8	77.4	1,704.3
ALL	ALL	ALL	89	ALL	14.6	79	88	37,387	36,185	3.2	253.8	296.8	77.4	1,704.3

Cruise Unit Report
SYLVAN PEARL U8 ROW

Unit Sale Notice Volume (MBF): SYLVAN PEARL U8 ROW

				MBF Volume by Grade			
Sp	DBH	Rings/In	Age	All	2 Saw	3 Saw	4 Saw
WH	19.0			6	2	4	1
BC	30.0			3	3		
RA	14.0			1			1
ALL	18.5			10	5	4	2

Unit Cruise Design: SYLVAN PEARL U8 ROW

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B1: VR, 1 BAF (40) Measure All, Sighting Ht = 4.5 ft	0.6	0.6	1	1	0

Unit Cruise Summary: SYLVAN PEARL U8 ROW

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
WH	2	2	2.0	0
BC	1	1	1.0	0
RA	1	1	1.0	0
ALL	4	4	4.0	0

Unit Cruise Statistics: SYLVAN PEARL U8 ROW

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 (%)
WH	80.0	0.0	0.0	133.4	7.6	5.4	10,671	7.6	5.4
BC	40.0	0.0	0.0	122.3	0.0	0.0	4,890	0.0	0.0
RA	40.0	0.0	0.0	44.9	0.0	0.0	1,796	0.0	0.0
ALL	160.0	0.0	0.0	108.5	39.7	19.9	17,357	39.7	19.9

Unit Summary: SYLVAN PEARL U8 ROW

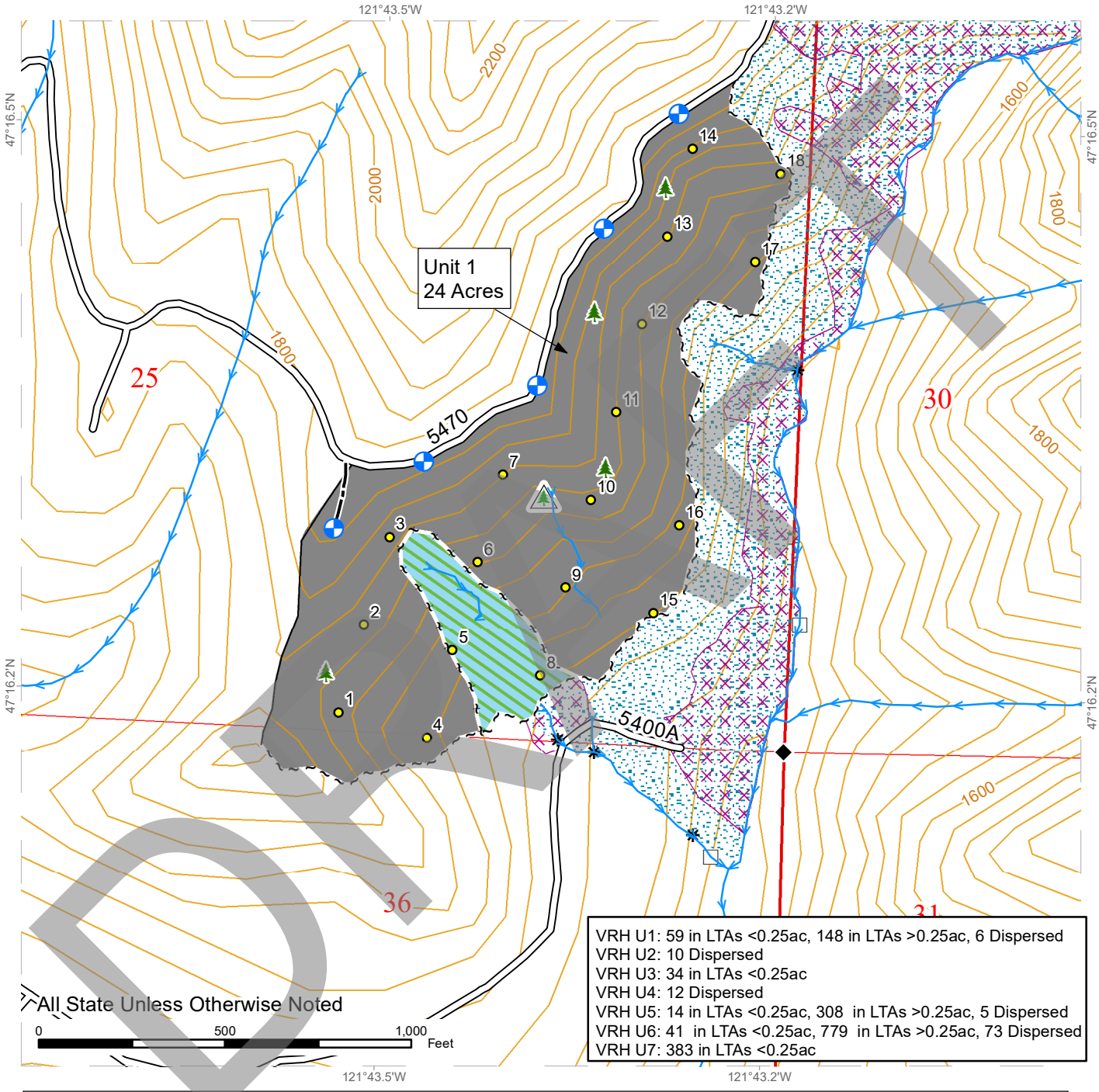
Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
BC	LIVE	CUT	1	ALL	30.0	110	138	4,890	4,890	0.0	8.1	40.0	7.3	2.9
RA	LIVE	CUT	1	ALL	14.0	69	85	1,796	1,796	0.0	37.4	40.0	10.7	1.1
WH	LIVE	CUT	2	ALL	19.0	83	105	12,128	10,671	12.0	40.6	80.0	18.4	6.4

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
ALL	LIVE	CUT	4	ALL	18.4	80	99	18,814	17,357	7.7	86.1	160.0	36.3	10.4
ALL	ALL	ALL	4	ALL	18.4	80	99	18,814	17,357	7.7	86.1	160.0	36.3	10.4

CRUISE MAP

SALE NAME: SYLVAN PEARL
AGREEMENT#: 30-103620
TOWNSHIP(S): T21R8E, T21R9E
TRUST(S): Common School and Indemnity (3), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): King
ELEVATION RGE: 1320-3280



- Variable Retention Harvest
- Sale Boundary Tags
- Timber Type Change
- Leave Tree Tags
- Existing Roads
- Optional Construction
- Tailhold Restriction Area
- Non-Tradeable Leave Clump
- Riparian Mgt Zone
- Stream Type
- Stream Type Break
- Streams
- Survey Monument
- Landing - Proposed
- Leave Tree Area <1/4-acre
- Non-Tradeable Leave Trees
- Contours 40-foot
- Public Land Survey Sections

N

Prepared By: nyon490
Accessed: 10/01/2024 14:40

Modification Date: acol490 10/10/2023

CRUISE MAP

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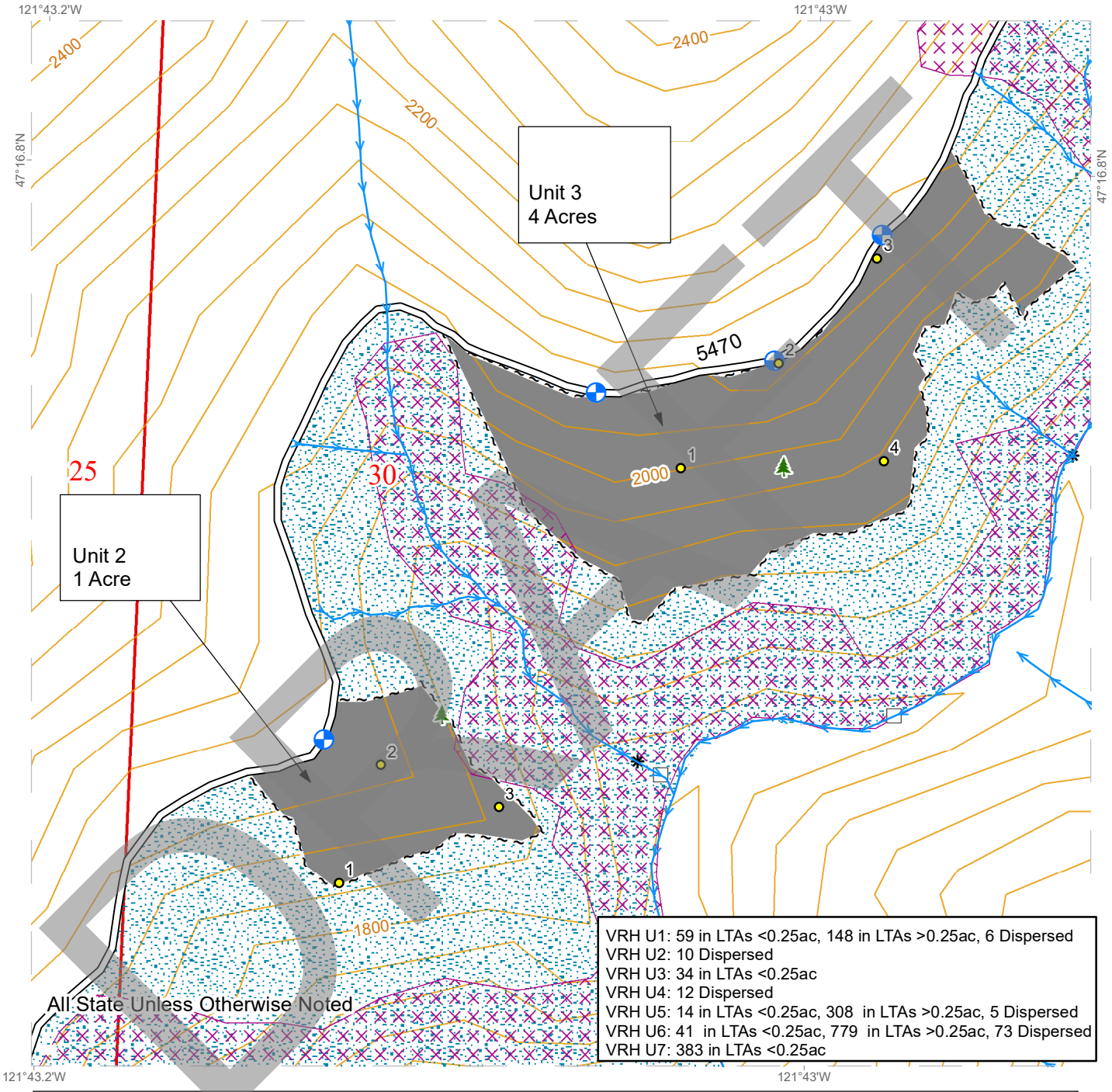

- Variable Retention Harvest
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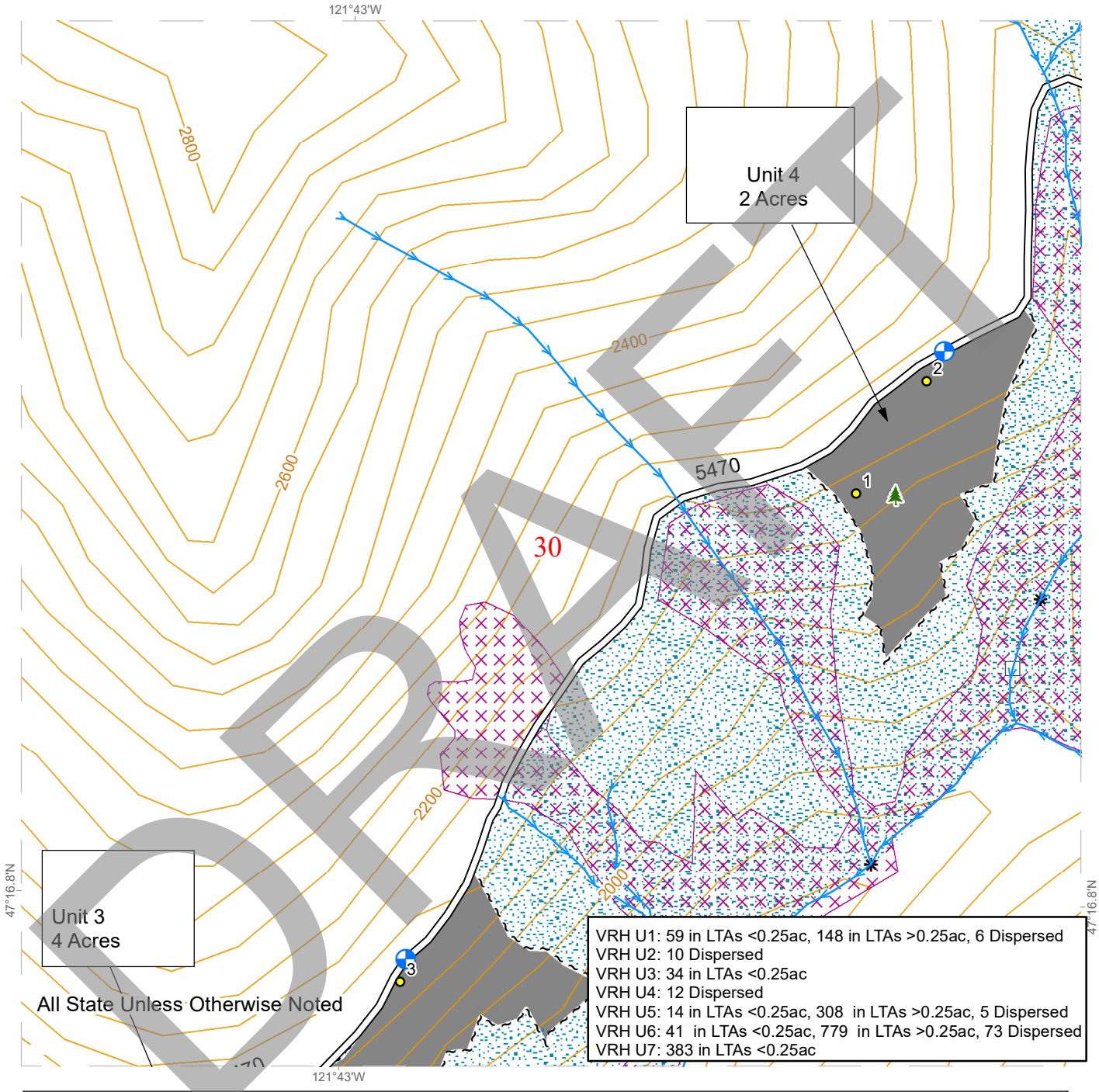

- Variable Retention Harvest
- Sale Boundary Tags
- Existing Roads
- Tailhold Restriction Area
- Riparian Mgt Zone
- Stream Type
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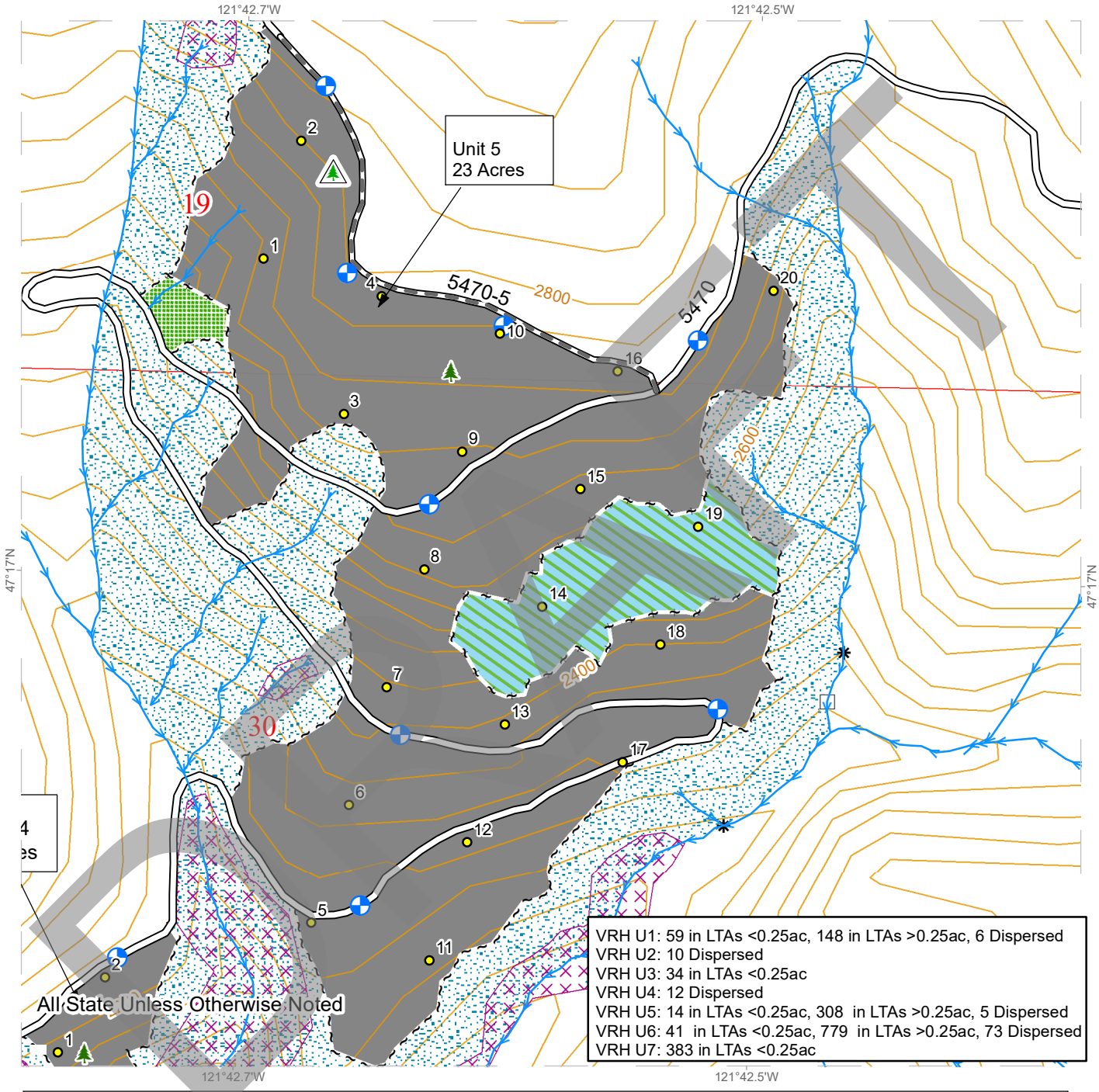

- Variable Retention Harvest
- Sale Boundary Tags
- Leave Tree Tags
- Existing Roads
- Required Pre-Haul Maintenance
- Tailhold Restriction Area
- Non-Tradeable Leave Clump
- Riparian Mgt Zone
- Leave Tree Area
- Stream Type
- Stream Type Break
- Streams
- Landing - Proposed
- Leave Tree Area <1/4-acre
- Non-Tradeable Leave Trees
- Contours 40-foot
- Public Land Survey Sections

N

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CRUISE MAP

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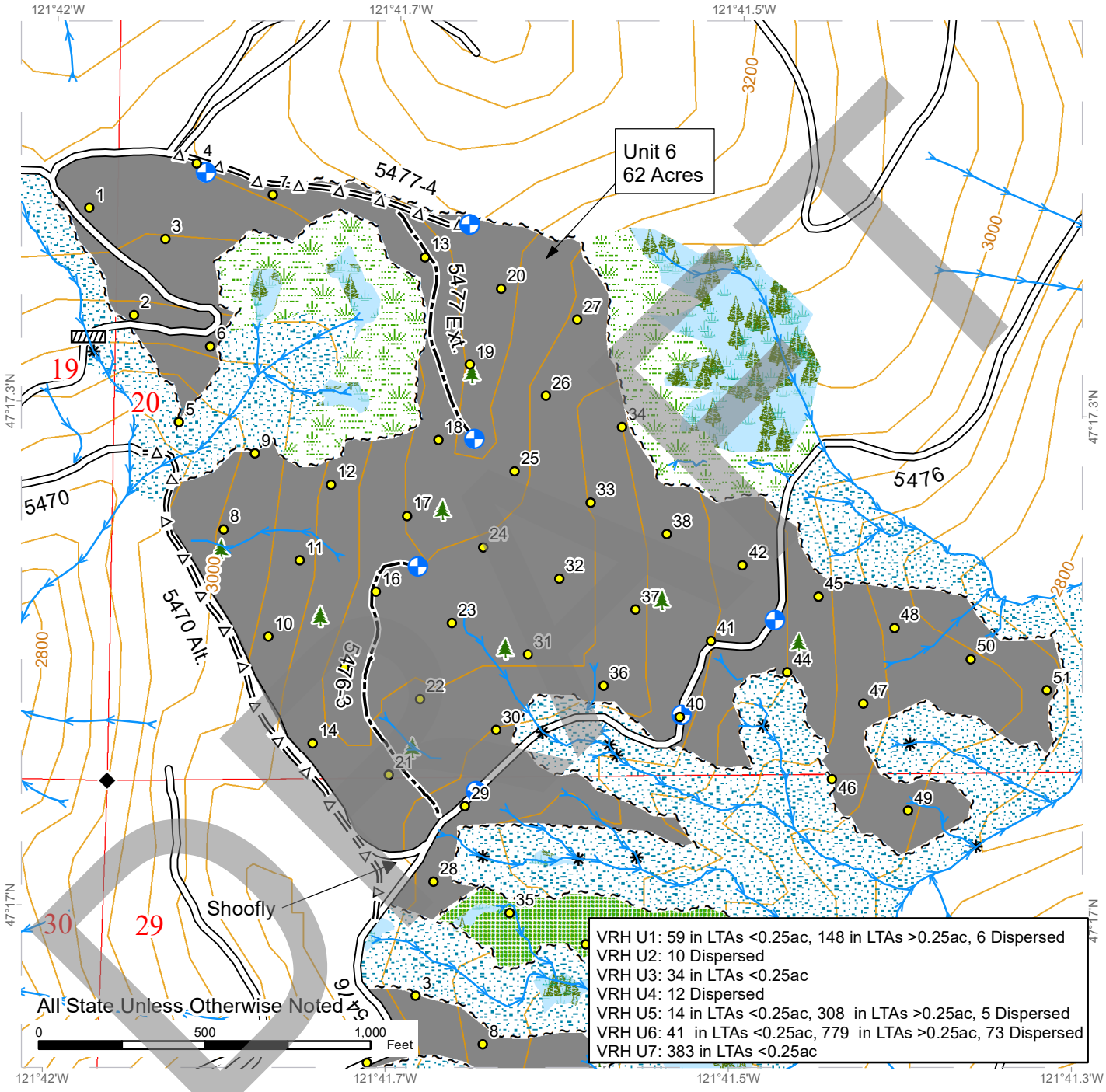
REGION: South Puget Sound Region
COUNTY(S): King
ELEVATION RGE: 1320-3280



- Variable Retention Harvest
- Sale Boundary Tags
- Timber Type Change
- Leave Tree Tags
- Existing Roads
- Optional Pre-Haul Maintenance
- Optional Construction
- Wetland Mgt Zone
- Forested Wetland
- Riparian Mgt Zone
- Leave Tree Area
- Stream Type Break
- Streams
- Survey Monument
- Culvert
- Landing - Proposed
- Leave Tree Area <1/4-acre
- Contours 40-foot
- Public Land Survey Sections

N

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CRUISE MAP

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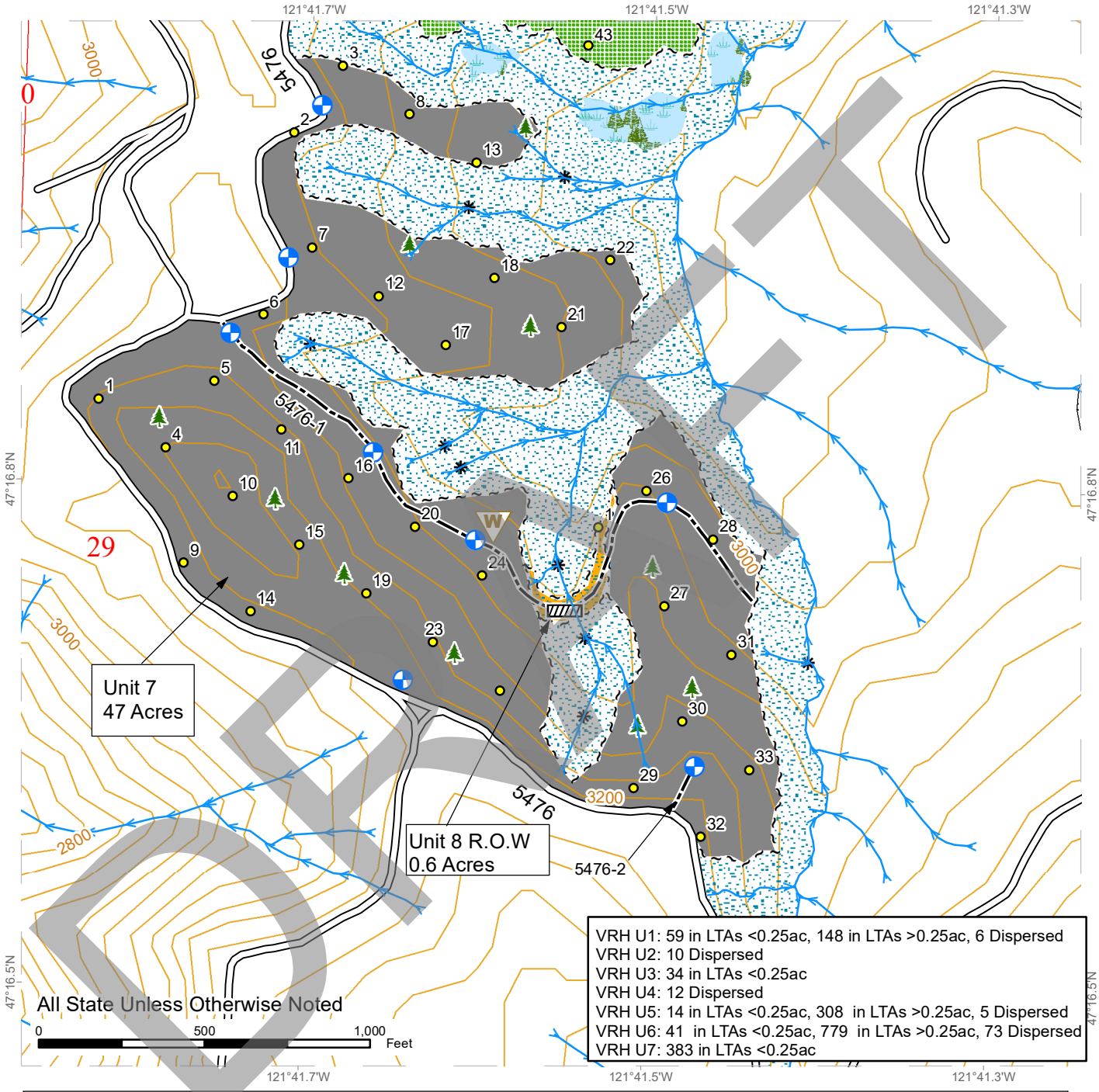


- Variable Retention Harvest
- Right Of Way
- Sale Boundary Tags
- Right of Way Tags
- Existing Roads
- Optional Construction
- Forested Wetland
- Riparian Mgt Zone
- Leave Tree Area
- Stream Type Break
- Streams
- Culvert
- Landing - Proposed
- Leave Tree Area <1/4-acre
- Waste Area
- Contours 40-foot
- Public Land Survey Sections

N

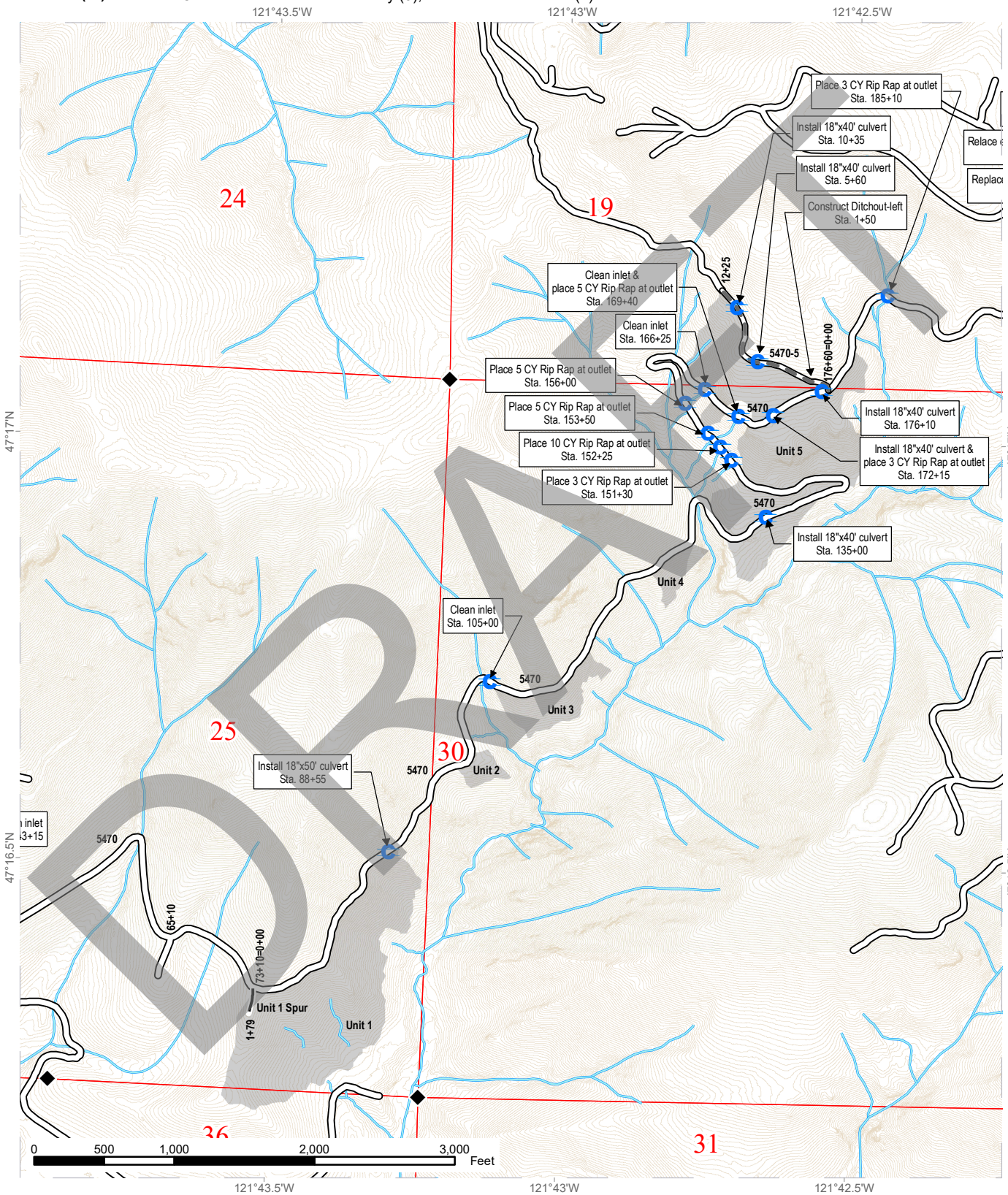
Prepared By: nyon490
Accessed: 10/01/2024 14:40

Modification Date: acol490 10/10/2023

ROAD WORK MAP 1 of 5

SALE NAME: SYLVAN PEARL
AGREEMENT #: 30-103620
TOWNSHIP(S): T21R8E, T21R9E
TRUST(S): Common School and Indemnity (3), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): King
ELEVATION RGE: 1320-3280



Existing Roads
Required Pre-Haul Maintenance
Optional Pre-Haul Maintenance
Optional Construction
Old Grades/Trails
Culvert Work
Rock Pit
Mainline MileMarkers
Streams
Contours 10 ft
Waste Area
Timber Sale Units
Public Land Survey Sections
Survey Monument

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Prepared By: gard490
Accessed: 10/01/2024 14:40
09/25/2024

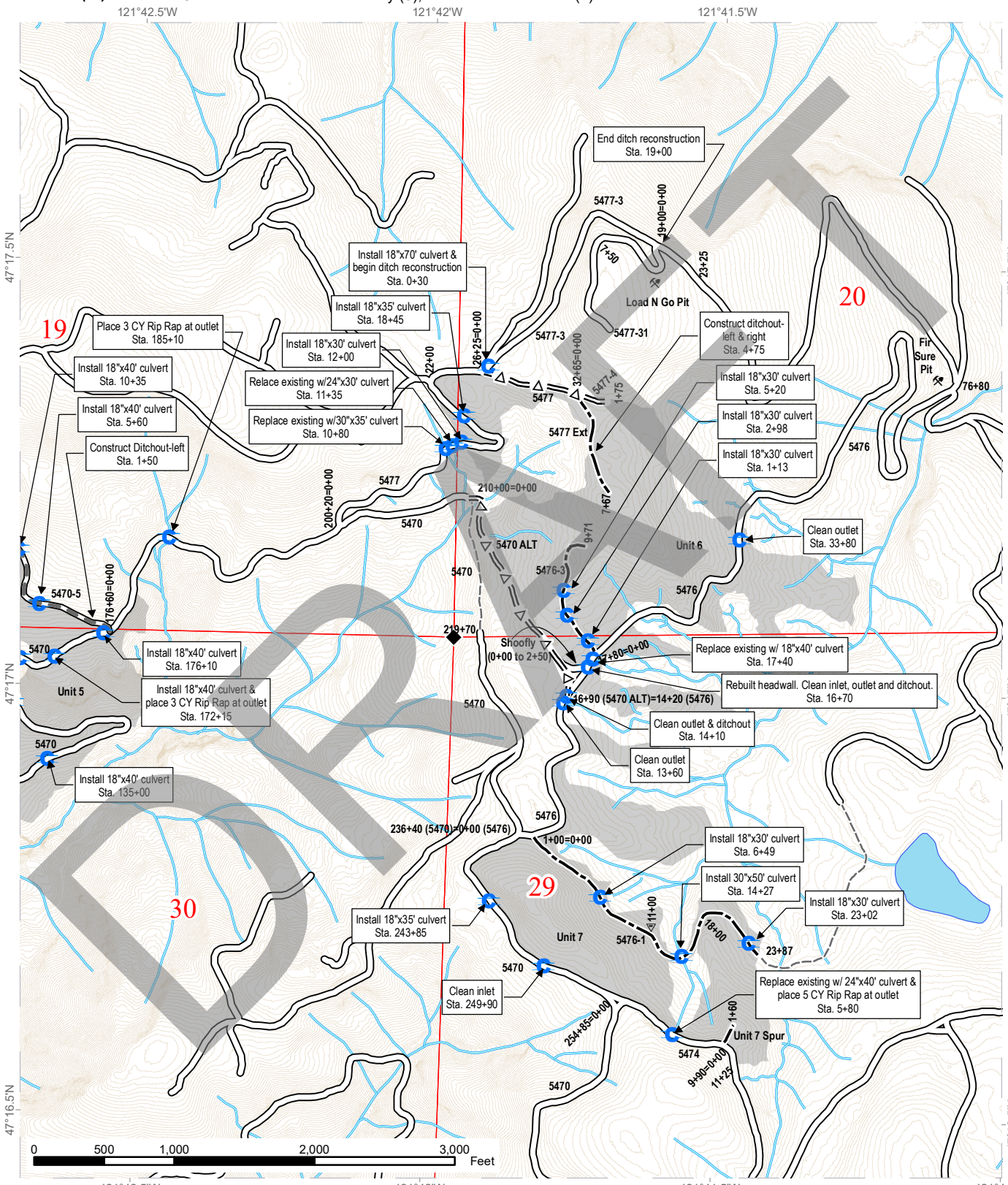
Modification Date: gard490 8/25/2023

30-103620

ROAD WORK MAP 2 of 5

SALE NAME: SYLVAN PEARL
AGREEMENT #: 30-103620
TOWNSHIP(S): T21R8E, T21R9E
TRUST(S): Common School and Indemnity (3), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): King
ELEVATION RGE: 1320-3280



Prepared By: gard490
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09/25/2024

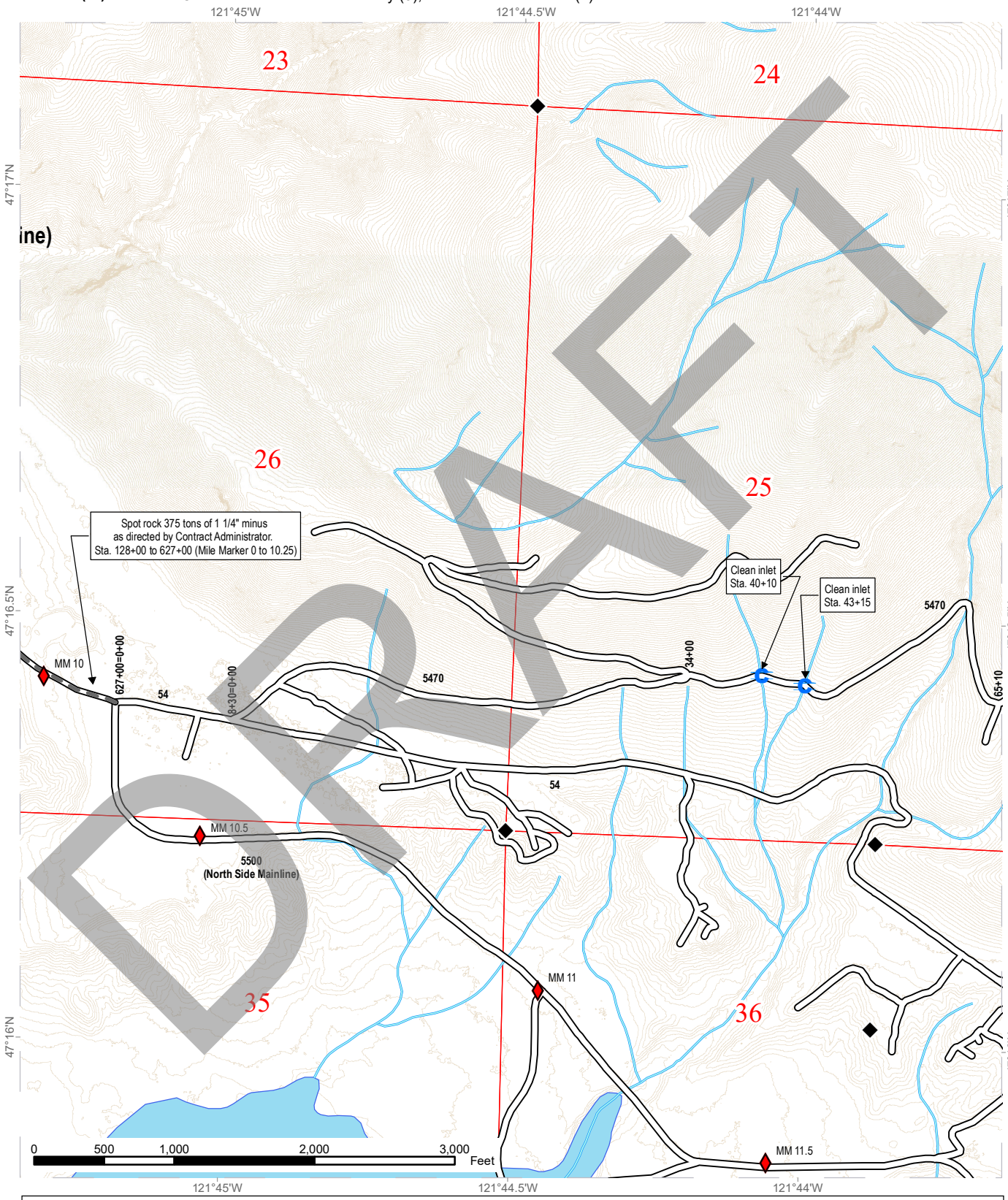
Modification Date: gard490 8/25/2023

30-103620

ROAD WORK MAP 3 of 5

SALE NAME: SYLVAN PEARL
AGREEMENT #: 30-103620
TOWNSHIP(S): T21R8E, T21R9E
TRUST(S): Common School and Indemnity (3), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): King
ELEVATION RGE: 1320-3280

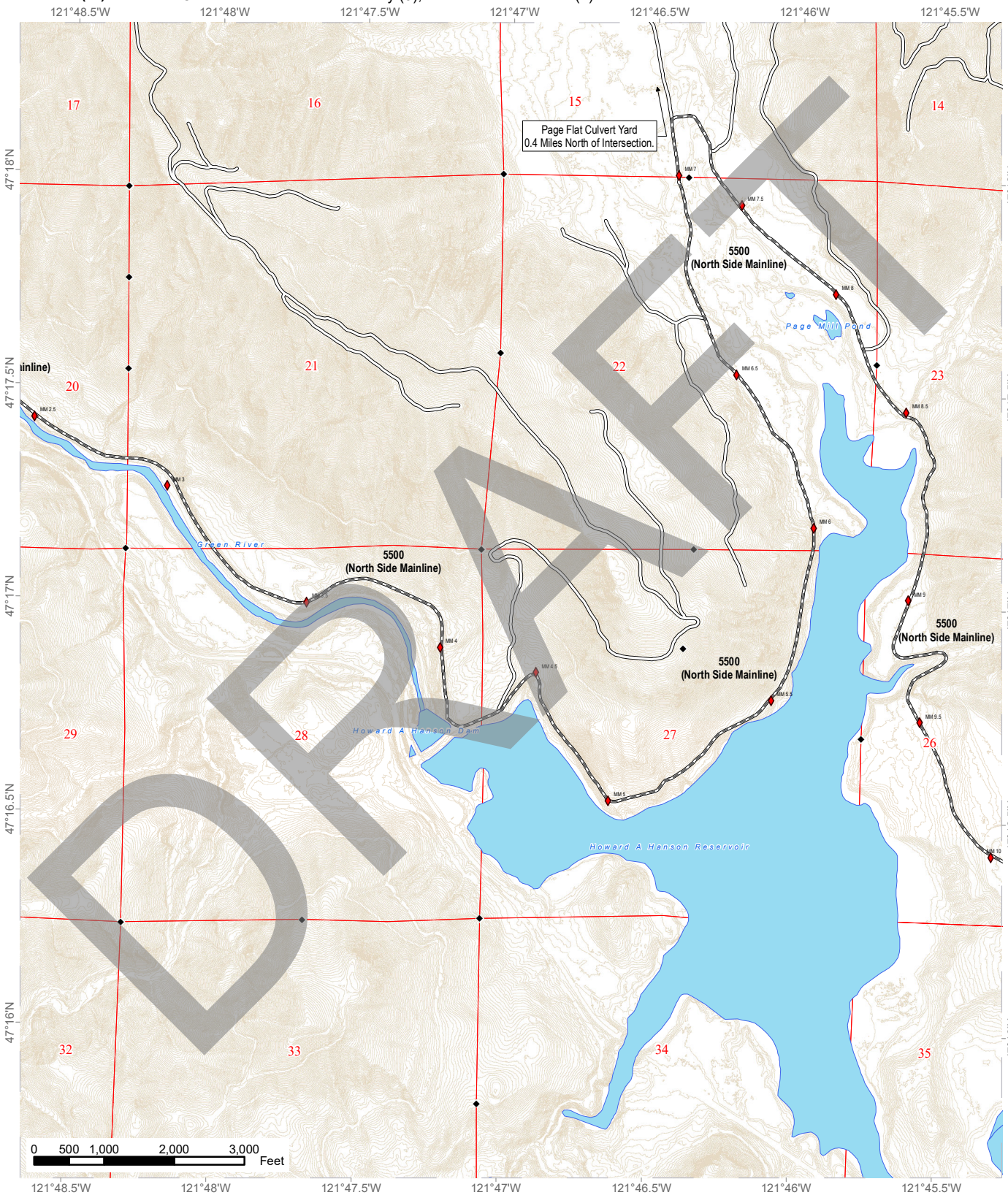


Existing Roads
Required Pre-Haul Maintenance
Optional Pre-Haul Maintenance
Optional Construction
Old Grades/Trails
Culvert Work
Rock Pit
Mainline MileMarkers
Streams
Contours 10 ft
Waste Area
Timber Sale Units
Public Land Survey Sections
Survey Monument

ROAD WORK MAP 4 of 5

SALE NAME: SYLVAN PEARL
AGREEMENT #: 30-103620
TOWNSHIP(S): T21R8E, T21R9E
TRUST(S): Common School and Indemnity (3), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): King
ELEVATION RGE: 1320-3280



Existing Roads
Required Pre-Haul Maintenance
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Old Grades/Trails
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Prepared By: gard490
Accessed: 10/01/2024 14:40
09/25/2024

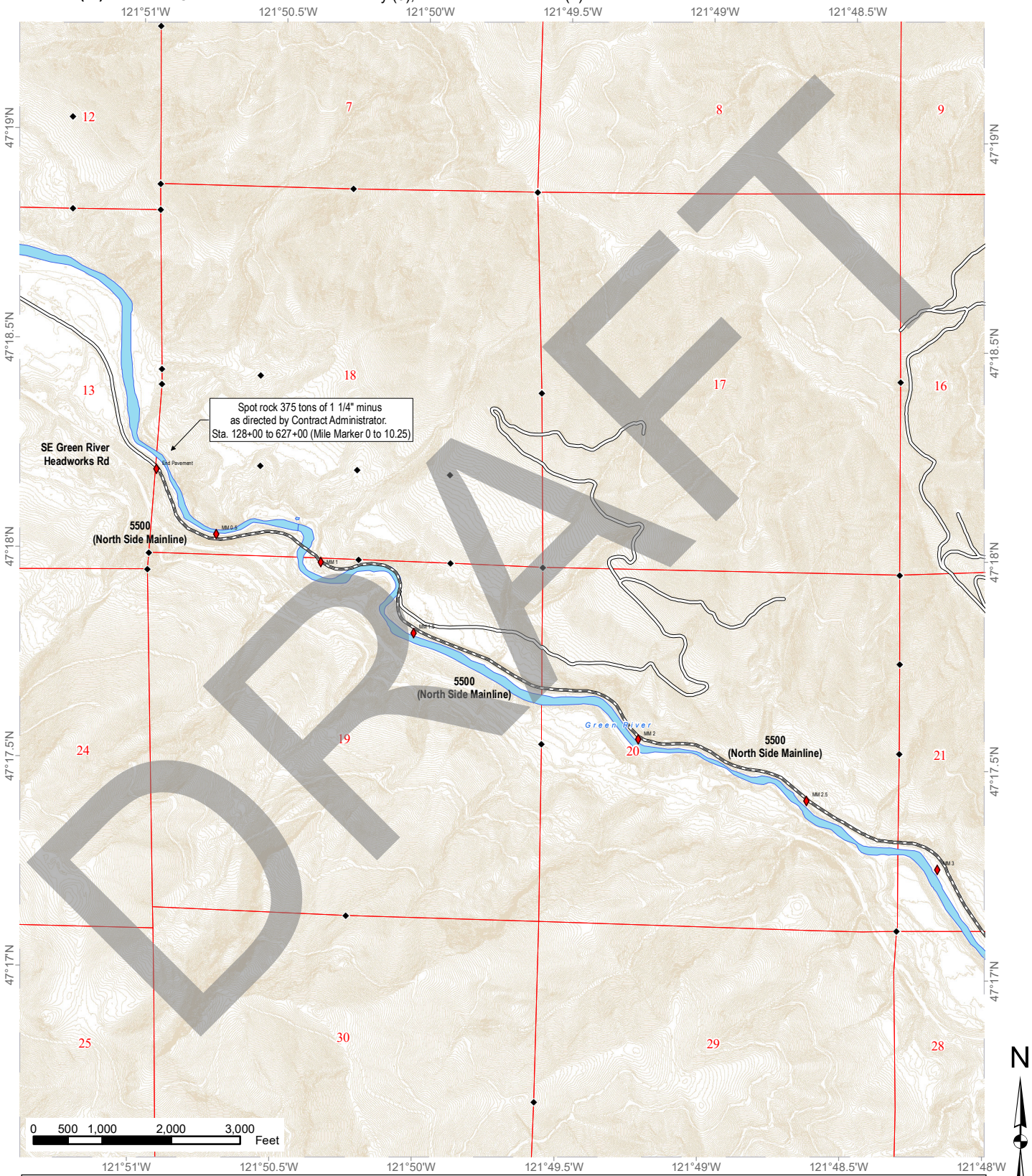
Modification Date: gard490 8/25/2023

30-103620

ROAD WORK MAP 5 of 5

SALE NAME: SYLVAN PEARL
AGREEMENT #: 30-103620
TOWNSHIP(S): T21R8E, T21R9E
TRUST(S): Common School and Indemnity (3), State Forest Transfer (1)

REGION: South Puget Sound Region
COUNTY(S): King
ELEVATION RGE: 1320-3280



Existing Roads
Required Pre-Haul Maintenance
Optional Pre-Haul Maintenance
Optional Construction
Old Grades/Trails
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Contours 10 ft
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Survey Monument

Prepared By: gard490
Accessed: 10/01/2024 14:40
09/25/2024

Modification Date: gard490 8/25/2023

30-103620

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

SYLVAN PEARL TIMBER SALE ROAD PLAN
KING COUNTY
BLACK DIAMOND UNIT
SOUTH PUGET SOUND REGION

AGREEMENT NO.: 30-103620

DATE: 01 SEPTEMBER 2023 DRAWN & COMPILED BY: J. GARDNER

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.

Road	Stations	Type
5500	0+00 to 627+00	Pre-haul maintenance
5470	40+05 to 40+15	Pre-haul maintenance
5470	43+10 to 43+20	Pre-haul maintenance
5470	88+30 to 88+80	Pre-haul maintenance
5470	104+95 to 105+05	Pre-haul maintenance
5470	134+75 to 135+25	Pre-haul maintenance
5470	151+25 to 151+35	Pre-haul maintenance
5470	152+20 to 152+30	Pre-haul maintenance
5470	153+45 to 153+55	Pre-haul maintenance
5470	155+95 to 156+05	Pre-haul maintenance
5470	166+20 to 166+30	Pre-haul maintenance
5470	169+35 to 169+45	Pre-haul maintenance
5470	171+90 to 172+40	Pre-haul maintenance
5470	175+85 to 176+35	Pre-haul maintenance
5470	185+05 to 185+15	Pre-haul maintenance
5470	243+60 to 244+10	Pre-haul maintenance
5470	249+85 to 249+95	Pre-haul maintenance
5470-5	0+00 to 12+25	Pre-haul maintenance
5474	5+55 to 6+05	Pre-haul maintenance
5476	13+55 to 13+65	Pre-haul maintenance
5476	14+05 to 14+15	Pre-haul maintenance

5476	16+65 to 16+75	Pre-haul maintenance
5476	17+15 to 17+65	Pre-haul maintenance
5476	33+75 to 33+85	Pre-haul maintenance
5476-1	0+00 to 23+87	Abandonment – if constructed
5476-3	0+00 to 9+71	Abandonment – if constructed
5477	10+55 to 12+25	Pre-haul maintenance
5477-3	0+00 to 19+00	Pre-haul maintenance

0-3 OPTIONAL ROADS

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

Road	Stations	Type
5470 Alt	0+00 to 16+90	Pre-haul maintenance
5476-1	0+00 to 23+87	Construction
5476-3	0+00 to 9+71	Construction
5477	0+00 to 32+65	Pre-haul maintenance
5477 Ext	0+00 to 7+67	Construction
5477-4	0+00 to 1+75	Pre-haul maintenance
Unit 1 Spur	0+00 to 1+79	Construction
Unit 7 Spur	0+00 to 1+60	Construction

0-4 CONSTRUCTION

Construction includes, but is not limited to.

- Clearing;
- Grubbing;
- Right-of-way debris disposal;
- Excavation and/or embankment to subgrade;
- Acquisition and installation of drainage structures;
- Acquisition, manufacture, and application of rock.

0-6 PRE-HAUL MAINTENANCE

Pre-haul maintenance includes, but is not limited to.

- Clearing roads of brush and sub-mature trees;
- Ditch construction/reconstruction;
- Rip Rap energy dissipator placement;
- Culvert maintenance;
- Acquisition and installation of drainage structures;
- Acquisition, manufacture, and application of rock.

0-7 POST-HAUL MAINTENANCE

This project includes post-haul road maintenance listed in Clause 9-5 POST-HAUL MAINTENANCE9-5 .

0-10 ABANDONMENT

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

0-12 DEVELOP ROCK SOURCE

Purchaser may develop existing rock sources. 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 the submitted 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 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.

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

1-6 ORDER OF PRECEDENCE

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

1. Addenda.
2. Designs or Plans. On designs and plans, figured dimensions shall take precedence over scaled dimensions.
3. Road Plan Clauses.
4. Typical Section Sheet.

5. Standard Lists.
6. Standard Details.
7. Road Work maps.

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

1-8 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.

1-9 DAMAGED METALLIC COATING

Any cut ends, or 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 or cold galvanizing compound.

1-15 ROAD MARKING

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

- Construction: Orange ribbon tied at eye-height along centerline, with orange pin flags marking centerline.

1-21 HAUL APPROVAL

Purchaser shall not use roads under this road plan for timber 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 7 calendar days before work begins.

Road	Stations
5500	0+00 to 627+00

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:

- Subgrade construction
- Haul approval

1-29 SEDIMENT RESTRICTION

Purchaser shall not allow silt-bearing runoff to enter any streams.

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:

- Surface or base stability problems persist.
- Weather is such that satisfactory results cannot be obtained in an area of operations.

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. Before and during any suspension, Purchaser shall protect the work from damage or deterioration.

1-31 SPEED LIMITS

On the following road, speeds are limited to 35 mph.

Road	Stations
5500	0+00 to 627+00

1-32 BRIDGE AND ASPHALT SURFACE RESTRICTION

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

If tracked equipment is used on bridge or asphalt surfaces, Purchaser shall immediately cease all road construction and hauling operations. Purchaser shall remove any dirt, rock, or other material tracked or spilled on the bridge or asphalt surface(s) and have surface(s) evaluated by the Unit Engineer or their designee 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

On all except the following road(s), snowplowing will be allowed after the execution of a SNOW PLOWING AGREEMENT, which is available from the Contact Administrator upon request. If damage occurs while plowing, further permission to plow may be revoked by the Contract Administrator.

Road	Stations
5500	0+00 to 627+00

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.

2-4 PASSAGE OF LIGHT VEHICLES

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

Road	Stations
5500	0+00 to 627+00
54	0+00 to 8+30

2-5 MAINTENANCE GRADING – EXISTING ROAD

On the following road(s), Purchaser shall use a grader to shape the existing surface before the application of rock. Purchaser shall accomplish all grading using a motor grader with a minimum of 175 horsepower.

Road	Stations	Requirements
5470-5	0+00 to 12+25	Grade existing road prior to the application of rock.

2-6 CLEANING CULVERTS

On the following road(s), Purchaser shall clean the inlets and/or outlets of the listed culverts before timber haul.

Road	Stations
5470	40+10, 43+15, 105+00, 166+25,169+40, & 249+90
5476	13+60, 14+10, 16+70, & 33+80

2-8 MAINTAINING EROSION CONTROL STRUCTURES

On the following road(s), Purchaser shall clean and maintain all erosion control structures. Work must be completed before timber haul. Excavated material must be scattered outside the grubbing limits.

Road	Stations	Comments
5470	151+30	Place 3 CY of Rip Rap at outlet
5470	152+25	Place 10 CY of Rip Rap at outlet
5470	153+50	Place 5 CY of Rip Rap at outlet
5470	156+00	Place 5 CY of Rip Rap at outlet
5470	169+40	Place 5 CY of Rip Rap at outlet
5470	172+15	Place 3 CY of Rip Rap at outlet
5470	185+10	Place 3 CY of Rip Rap at outlet
5470-5	1+50	Construct ditchout-left
5474	5+80	Place 5 CY of Rip Rap at outlet
5476	14+10	Steepen and extend ditchout-right to provide for positive drainage
5476	16+70	Steepen and extend ditchout-right to provide for positive drainage. Rebuild headwall.

SECTION 3 – CLEARING, GRUBBING, AND DISPOSAL

3-3 BRUSHING ALTERNATIVE

On the following road(s), Purchaser may remove vegetative material up to 4 inches in diameter, including limbs, as shown on the BRUSHING DETAIL. Cutting, pulling, digging, pushing over, and other non-cutting methods of vegetation removal may be used for brushing. Excavator buckets, log loaders, dozers and similar equipment may be used. Purchaser shall remove brushing debris from the road surface, ditchlines, and culvert inlets and outlets.

Road	Stations
5470 Alt	0+00 to 16+90
5477	26+25 to 32+65
5477-4	0+00 to 1+75

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 and within waste and debris areas, or if not marked in the field, between the clearing limits specified on the TYPICAL SECTION SHEET. Clearing must be completed before starting excavation and embankment.

3-8 PROHIBITED DECKING AREAS

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

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

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.

3-20 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 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 50 feet of a live stream, or wetland.
- On road subgrades, or excavation and embankment slopes.
- On slopes greater than 40%.
- Within the operational area for cable landings where debris may shift or roll.
- On locations where brush can fall into the ditch or onto the road surface.
- Against standing timber.

3-24 BURYING ORGANIC DEBRIS RESTRICTED

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

3-25 SCATTERING ORGANIC DEBRIS

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

SECTION 4 – EXCAVATION

4-2 PIONEERING

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

- Drainage must be provided on all uncompleted construction.
- Road pioneering operations may not undercut the final cut slope or restrict drainage.
- Culverts at live stream crossings must be installed during pioneering operations prior to embankment.

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 12 percent adverse.
- Minimum curve radius is 60 feet at centerline.
- Maximum grade change for sag vertical curves is 5% in 100 feet.
- Maximum grade change for crest vertical curves is 4% in 100 feet.

4-5 CUT SLOPE RATIO

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

Material Type	Excavation Slope Ratio	Excavation Slope Percent
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, unless construction staked or designed:

Material Type	Embankment Slope Ratio	Embankment Slope Percent
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 2 to 6 feet.
- 4 feet for embankment heights at centerline of greater than 6 feet.

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

4-22 TURNAROUNDS

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

4-25 DITCH CONSTRUCTION AND RECONSTRUCTION

On the following road(s), 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.

Road	Stations
5476-1	18+00 to 23+87
5476-3	0+00 to 9+71
5477 Ext	0+00 to 7+67
5477-3	0+30 to 19+00
Unit 7 Spur	0+00 to 1+60

4-27 DITCH WORK – MATERIAL USE PROHIBITED

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

4-28 DITCH DRAINAGE

Ditches must drain to cross-drain culverts or ditchouts.

4-29 DITCHOUTS

Purchaser shall construct ditchouts as identified in the table below and as needed. 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. L or R denotes ditchout left or ditchout right oriented as if facing in the direction of stationing increasing.

Road	Stations	L or R
5470-5	1+50	L
5476-3	1+13	R
5476-3	5+20	R
5477 Ext	4+75	L & R

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. On side slopes greater than 45%, all waste material must be end hauled or pushed to the designated embankment sites and waste areas identified in Clause 4-37 WASTE AREA LOCATION.

4-37 WASTE AREA LOCATION

Purchaser shall deposit waste material in areas identified or approved by the Contract Administrator. Additional waste areas may also be identified or approved by the Contract Administrator.

Road	Waste Area Location	Comments
5476-1	11+00	On downhill (north) side of road

4-38 PROHIBITED WASTE DISPOSAL AREAS

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

- Within 50 feet of a cross drain culvert.
- Within 100 feet of a live stream or wetland.
- Within a riparian management zone.
- Within a wetland management zone.
- On side slopes steeper than 45%.
- In locations that interfere with the construction of the road prism.
- On road prisms or turn-arounds
- In locations that impede drainage.
- Within the operational area for cable landings.
- Against standing timber.

4-48 NATIVE MATERIAL

Native material consists of naturally occurring material that is free of organic debris, trash, and rocks greater than 4 inches in any dimension.

4-55 ROAD SHAPING

Purchaser shall shape 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.

4-60 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. A plate compactor must be used for embankment segments too narrow to accommodate equipment. 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. Purchaser shall obtain written approval from the Contract Administrator for subgrade compaction before application of rock.

SECTION 5 – DRAINAGE

5-1 REMOVAL OF SHOULDER BERMS

Purchaser shall remove berms from road shoulders. The construction of ditchouts is required where ponding could result from the effects of sidecast debris.

5-5 CULVERTS

Purchaser shall install culverts as part of this contract. Culverts must be installed concurrently with subgrade work and must be installed before subgrade compaction and rock application. Culvert locations and the minimum requirements for culvert length and diameter are designated on the CULVERT AND DRAINAGE LIST. Culvert, downspout, and flume lengths may be adjusted to fit as-built conditions and may not terminate directly on unprotected soil. Culverts must be new material and meet the specifications in Clauses 10-15 through 10-24.

5-6 CULVERT TYPE

Purchaser shall install culverts made of plastic in accordance with Clauses 10-15 through 10-24.

5-7 USED CULVERT MATERIAL

On the following road(s), Purchaser may install used culverts. All other roads must have new culverts installed. Purchaser may install culverts made of steel, aluminum**,** or plastic in accordance with Clauses 10-15 through 10-24.

Road	Stations
5476-1	0+00 to 23+87
5476-3	0+00 to 9+71

5-12 UNUSED MATERIALS STATE PROPERTY

On required roads, any materials listed on the CULVERT AND DRAINAGE LIST that are not installed will become the property of the state. Purchaser shall stockpile materials at the Page Flats Culvert Yard Pit (SE¼ NW¼ Section 05 T21R08E).

5-13 CONTINGENCY CULVERTS

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

Road	Size
On any portion of road used for timber or rock haul.	18” x 30’ culvert
	18” x 30’ culvert
	18” culvert band

5-15 CULVERT INSTALLATION

Culvert installation must be in accordance with the CULVERT AND DRAINAGE SPECIFICATION DETAIL. Corrugated Polyethylene pipe must be installed in a manner consistent with the manufacturer’s recommendations. Culverts shall be banded using lengths of no less than 10 feet, and no more than one length less than 16 feet**.** Shorter section of banded culvert shall be installed at the inlet end.

5-17 CROSS DRAIN SKEW AND SLOPE

Cross drains, on road grades in excess of 3%, must be skewed at least 30 degrees from perpendicular to the road centerline, except where the cross drain is at the low point in the road culverts will not be skewed. Cross drain culverts must be installed at a slope steeper than the incoming ditch grade, but not less than 3% or more than 10%.

5-18 CULVERT DEPTH OF COVER

All 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.

5-20 ENERGY DISSIPATERS

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

The type of energy dissipater and the amount of material must be consistent with the specifications listed on the CULVERT AND DRAINAGE LIST. Energy dissipaters must extend a minimum of 1 foot to each side of the culvert at the outlet and a minimum of 2 feet beyond the outlet.

5-25 CATCH BASINS

Purchaser shall construct catch basins 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 AND DRAINAGE LIST. Rock must be placed on shoulders, slopes, and around culvert inlets and outlets. Minimum specifications require that rock be placed at a width of one culvert diameter on each side of the culvert opening, and to a height of one culvert diameter above the top of the culvert. Rock may not restrict the flow of water into culvert inlets or catch basins.

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 15 feet between waterbars or between natural drainage paths, and with a maximum spacing of 300 feet.

SECTION 6 – ROCK AND SURFACING

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

Source	Location	Rock Type
Load N Go Pit	SE¼ NW¼ Section 20 T21R09E	2-Inch Minus, 4-Inch In Place
Fir Sure Pit	NW¼ SE¼ Section 20 T21R09E	Quarry Spalls, Light Loose Rip Rap

6-5 ROCK FROM COMMERCIAL SOURCE

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

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 PIT DEVELOPMENT PLAN(s) 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 PIT DEVELOPMENT PLAN(s), and approved in writing by the Contract Administrator.

Source	Location
Load N Go Pit	SE¼ NW¼ Section 20 T21R09E
Fir Sure Pit	NW¼ SE¼ Section 20 T21R09E

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.
- Pit walls must be maintained in a condition to minimize the possibility of the walls sliding or failing.
- All vehicle access to the top of the pit faces must be blocked.

6-14 DRILL AND SHOOT

Rock drilling and shooting must meet the following specifications:

- Purchaser shall notify the Contract Administrator a minimum of 7 calendar days before blasting operations.
- Purchaser shall submit an informational drilling and shooting plan to the Contract Administrator 7 calendar days before any drilling.
- 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.

6-20 ROCK CRUSHING OPERATIONS

Rock crushing operations must conform to the following specifications:

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.
- Purchaser shall produce sieve analysis for crushing operations every 500 yards for 2-INCH MINUS.
- Purchaser may use a commercial testing lab to produce sieve analyses.

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.

6-22 FRACTURE REQUIREMENT FOR ROCK

A minimum of 75% by visual inspection of coarse aggregate must have at least one fractured face. Coarse aggregate is the material greater than 1/4-inch in size.

6-23 ROCK GRADATION TYPES

Purchaser shall provide or 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 prior to haul approval being issued.

6-28 1 ¼-INCH MINUS CRUSHED ROCK

% Passing 1 ¼” square sieve	100%
% Passing 5/8” square sieve	50 - 80%
% Passing U.S. #4 sieve	25 - 45%
% Passing U.S. #40 sieve	3 - 18%
% Passing U.S. #200 sieve	7.5% max.

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.

6-30 2-INCH MINUS CRUSHED ROCK

% Passing 2” square sieve	100%
% Passing 1” square sieve	65 - 85%
% Passing U.S. #4 sieve	26 - 39%
% 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 8 inches in any dimension and no rock may be larger than 12 inches in any dimension.

6-43 QUARRY SPALLS

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

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

6-50 LIGHT LOOSE RIP RAP

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

Quantity	Approximate Size Range
20% to 90%	500 lbs. to 1 ton (18”- 28”)
15% to 50%	50 lbs. to 500 lbs. (8”- 18”)
10% to 20%	3 inch to 50 lbs. (3”- 8”)

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, unless otherwise stated in Clause 6-75 OPTIONAL ROCK EXCEPTION. Rock specified in Clause 6-76 MAINLINE REPLACEMENT ROCK will be complied by load ticket.

6-65 ROCK STOCKPILE LOCATION

Purchaser shall stockpile rock as listed below. Rock stockpiles must be in accordance with Clause 6-67 ROCK STOCKPILE SPECIFICATIONS.

Rock Source	Rock Type	Quantity (c.y.)	Stockpile Location
Load N Go	2-Inch Minus	3000	As shown on Load N Go Development Plan

6-67 ROCK STOCKPILE SPECIFICATIONS

Rock stockpiles listed in Clause 6-65 ROCK STOCKPILE LOCATION must meet the following specifications:

Before placing aggregates upon the stockpile site, the site must be cleared of vegetation, trees, stumps, brush, rocks, or other debris and the ground leveled to a smooth, firm, uniform surface. When completed, the stockpile must be neat and regular in shape.

6-70 APPROVAL BEFORE ROCK APPLICATION

Purchaser shall obtain written approval from the Contract Administrator for subgrade compaction on new roads and road grading on existing roads 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. 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.

6-75 OPTIONAL ROCK EXCEPTION

On the following roads, Purchaser may provide and place less rock than shown on the ROCK LIST.

Road	Stations
5476-1	0+00 to 13+27 & 15+27 to 23+87
5476-3	0+00 to 9+71
5477 Ext	0+00 to 7+67
Unit 1 Spur	0+00 to 1+79
Unit 7 Spur	0+00 to 1+60

6-76 MAINLINE ROCK REPLACEMENT

On the following road(s), Purchaser shall apply 1-1/4 Inch Minus spot rock in accordance with the quantities shown on the ROCK LIST as directed by Contract Administrator. Purchaser shall provide load tickets to the Contract Administrator.

Road	Location	Rock Type
5500 (North Side Mainline)	0+00 (MM 0) to 627+00 (MM 10¼)	1-1/4 Inch Minus

SECTION 7 – STRUCTURES

7-5 STRUCTURE DEBRIS

Purchaser shall not allow debris from the installation or removal of structures to enter any stream. Components removed from existing structures(s) must be removed from state land. Purchaser shall maintain a clean jobsite, with all materials stored away from the high water mark or other area presenting a risk of the materials entering a stream. Debris entering any stream must be removed immediately, and placed in the site(s) designated for stockpiling or disposal. Purchaser shall retrieve all material carried downstream from the jobsite.

7-57 CULVERT SHAPE CONTROL

Purchaser shall monitor the culvert shape during backfill and compaction. Special attention must be paid to maintaining the structure's rise dimensions, concentricity, and smooth uniform curvature. If compaction methods are resulting in peaking or deflection of the culvert, Purchaser shall modify the compaction method to achieve the appropriate end result.

SECTION 8 – EROSION CONTROL

8-15 REVEGETATION

On the following road(s), Purchaser shall spread grass seed and a layer of straw on all exposed soils resulting from road work activities. Purchaser shall revegetate during the first available opportunity after road work is completed.

Road	Location	Quantity	Type
5474	5+55 to 6+05	50 lbs/acre	Pasture Mix
5476-1	13+87 to 14+67	50 lbs/acre	Pasture Mix
5477	10+40 to 12+15	50 lbs/acre	Pasture Mix

8-16 REVEGETATION SUPPLY

The Purchaser shall provide the Pasture Mix grass seed and straw.

SECTION 9 – POST-HAUL ROAD WORK

9-1 EARTHEN BARRICADES

Purchaser shall construct barricades in accordance with the EARTHEN BARRICADE DETAIL.

Road	Stations
5476-1	0+00
5476-3	0+00

9-2 CULVERT REMOVAL FROM LIVE STREAM

If constructed, on the following road(s), Purchaser shall remove culvert from live streams and leave the resulting channel open with excavation slope and excavated channel width as specified. End haul excavated material to waste area designated in Clause 4-37 WASTE AREA LOCATION**.**

Road	Stations	Excavated Channel Width	Slope Ratio
5476-1	14+27	16 feet	2H:1V

9-3 CULVERT MATERIAL REMOVED FROM STATE LAND

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

9-5 POST-HAUL MAINTENANCE

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

Road	Stations	Additional Requirements
5470	73+10 to 89+25, 96+75 to 98+45, 105+00 to 113+50, 121+25 to 124+90, 129+00 to 150+00, 154+00 to 154+70, 163+60 to 180+00, 236+40 to 254+85	Purchaser shall clean/reshape ditches, headwalls, and catchbasins. Work must be completed after timber haul is finished and must be done in accordance with the dimensions on the TYPICAL SECTION SHEET. All logging debris shall be removed. Pulling ditch material across the road or mixing in with the road surfaces is not allowed.
5470 Alt	1+60 to 16+90	
5470-5	0+00 to 12+25	
5051	0+00 to 3+50	
5474	0+00 to 11+25	
5476	0+00 to 35+00	
5477	12+10 to 32+65	
5477 Ext	0+00 to 7+67	
5477-4	0+00 to 1+75	
Shoofly	0+00 to 2+50	
Unit 1 Spur	0+00 to 1+79	
Unit 7 Spur	0+00 to 1+60	

9-10 LANDING DRAINAGE

Purchaser shall provide for drainage of the landing surface.

9-21 ROAD ABANDONMENT

If built, Purchaser shall abandon the following roads before the termination of this contract.

Road	Stations
5476-1	0+00 to 23+87
5476-3	0+00 to 9+71

9-22 ABANDONMENT

- Construct non-drivable waterbars according to the attached NON-DRIVABLE WATERBAR DETAIL at a maximum spacing that will produce a vertical drop of no more than 10 feet between waterbars or between natural drainage paths and with a maximum spacing of 200 feet.
- Skew waterbars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3 percent grade.
- Key waterbars into the cut-slope to intercept the ditch. Waterbars must be outsloped to provide positive drainage. Outlets must be on stable locations.
- Block roads with earthen barricades in accordance with the attached EARTHEN BARRICADE DETAIL.
- Remove stream culverts.
- Remove ditch cross drain culverts and leave the resulting trench open.
- Slope all trench walls and approach embankments no steeper than 1.5:1.
- Apply grass seed concurrently with abandonment and in accordance with Section 8 EROSION CONTROL.

SECTION 10 MATERIALS

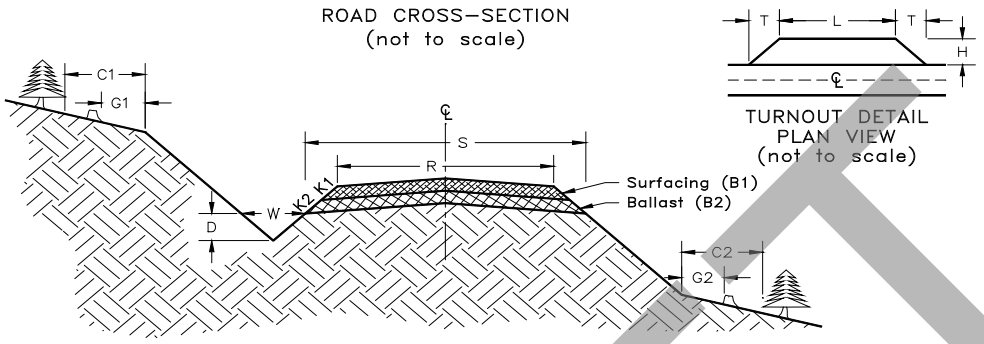
10-17 CORRUGATED PLASTIC CULVERT

Polyethylene culverts must meet AASHTO M-294 specifications, or ASTM F-2648 specifications for recycled polyethylene. Culverts must be Type S – double walled with a corrugated exterior and smooth interior.

10-22 PLASTIC BAND

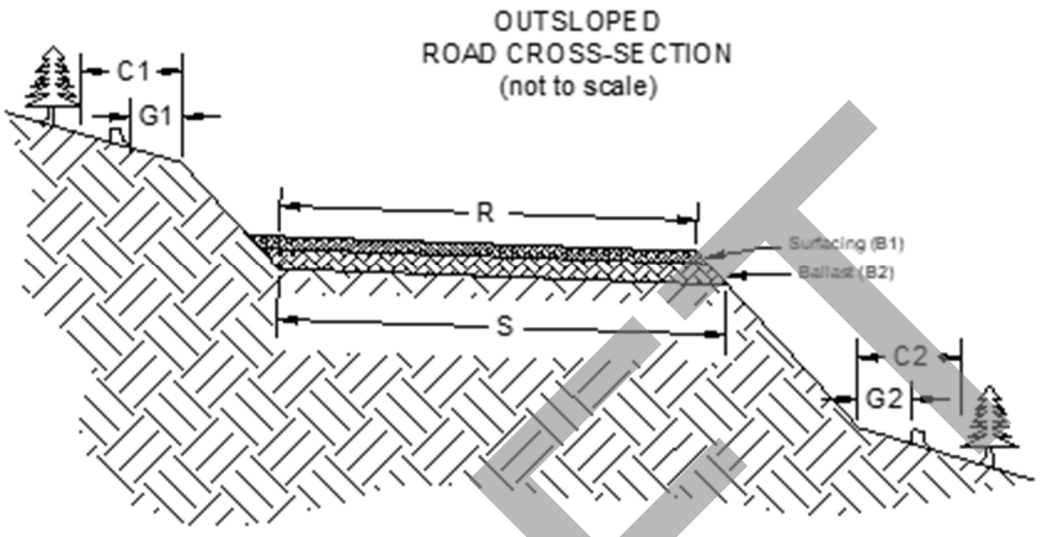
Plastic coupling and end bands must meet the AASHTO specification designated for the culvert. Only fittings supplied or recommended by the culvert manufacturer may be used. Split coupling bands must have a minimum of four corrugations, two on each side of the pipe joint.

TYPICAL SECTION SHEET



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)							
				S	R	W	D		G1	G2	C1	C2	Clause	Clause
5500 (North Side Mainline)	0+00	627+00	A	-	18	3	1	4	-	-	-	-	4-5	4-6
54	0+00	8+30	C	-	16	3	1	4	-	-	-	-	4-5	4-6
5470	0+00	210+00	A	-	14	3	1	4	-	-	-	-	4-5	4-6
5470	236+40	254+85	A	-	14	3	1	4	-	-	-	-	4-5	4-6
5470 Alt	0+00	16+90	A	-	14	3	1	4	-	-	-	-	4-5	4-6
5470-5	0+00	12+25	C	-	14	3	1	4	-	-	-	-	4-5	4-5
5474	0+00	11+25	A	-	14	3	1	4	-	-	-	-	4-5	4-6
5476	0+00	76+80	A	-	14	3	1	4	-	-	-	-	4-5	4-6
5476-1	14+00	14+50	C	17	14	3	1	4	2	2	tags	tags	4-5	4-6
5476-1	18+00	23+87	C	17	14	3	1	4	2	2	5	5	4-5	4-6
5476-3	0+00	9+71	C	17	14	3	1	4	2	2	5	5	4-5	4-6
5477	0+00	32+65	C	-	14	3	1	4	-	-	-	-	4-5	4-6
5477 Ext	0+00	7+67	C	17	14	3	1	4	2	2	5	5	4-5	4-6
5477-3	0+00	23+25	A	-	14	3	1	4	-	-	-	-	4-5	4-6
5477-31	0+00	7+50	A	-	14	3	1	4	-	-	-	-	4-5	4-6
5477-4	0+00	1+75	C	-	14	3	1	4	-	-	-	-	4-5	4-6
Shoofly	0+00	2+50	C	-	14	3	1	4	-	-	-	-	4-5	4-6
Unit 1 Spur	0+00	1+79	C	17	14	3	1	4	-	-	-	-	4-5	4-6
Unit 7 Spur	0+00	1+60	C	17	14	3	1	4	-	-	-	-	4-5	4-6

TYPICAL SECTION SHEET



Road Number	From Station	To Station	Tolerance Class	Subgrade Width (feet)	Road Width (feet)	Ditch Width (feet)	Ditch Depth (feet)	Crown in. @ CL	Grubbing Limits (feet)		Clearing Limits (feet)		Cut Slope Ratio	Fill Slope Ratio
				S	R	W	D		G1	G2	C1	C2	Clause	Clause
5476-1	0+00	13+10	C	16	14	-	-	outslope	2	2	5	5	4-5	4-6
5476-1	13+10	14+00	C	16	14	-	-	outslope	2	2	5	5	tags	tags
5476-1	14+50	16+05	C	16	14	-	-	outslope	2	2	5	5	tags	tags
5476-1	16+05	18+00	C	16	14	-	-	outslope	2	2	5	5	4-5	4-6

ROCK LIST (page 1 of 2)

BALLAST

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout		
									Length	Width	Taper
			K2	B2	4-Inch In-Place				L	H	T
5476-1*	0+00	13+27	1 ½:1	12"	62	13.27	823				
5476-1	13+27	15+27	1 ½:1	12"	62	2.00	124				
5476-1*	15+27	23+87	1 ½:1	12"	62	8.60	533				
5476-3*	0+00	9+71	1 ½:1	12"	62	9.71	602				
5477 Ext*	0+00	7+67	1 ½:1	12"	62	7.67	476				
Unit 1 Spur*	0+00	1+79	1 ½:1	12"	62	1.79	111				
Unit 7 Spur*	0+00	1+60	1 ½:1	12"	62	1.60	99				
Landing Rock*							4000				
					Quarry Spalls & Rip Rap						
Culvert Headwalls and Dissipaters							45				
Light Loose Rip Rap							48				

4-Inch In-Place Total__6768__Cubic Yards
Quarry Spalls & Rip Rap Total__93__Cubic Yards
Ballast Total__6861__Cubic Yards

* Optional Rock: Purchaser is allowed the following rock depths from State owned rock sources, but application of rock is 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.**

ROCK LIST (page 2 of 2)

SURFACE

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	CY Subtotal	Rock Source
			K1	B1	1 ¼ INCH MINUS			
5500 (North Side Mainline)	0+00	627+00	1 ½:1	Spot Rock as per Clause 6-76.			375 Tons	Commercial
					2 INCH MINUS			
5470	88+30	88+80	1 ½:1				10	
5470	134+75	135+25	1 ½:1				10	
5470	171+90	172+40	1 ½:1				10	
5470	175+85	176+35	1 ½:1				10	
5470	243+60	244+10	1 ½:1				20	
5470-5	0+00	12+25	1 ½:1	6”	28	12.25	343	
5474	5+55	6+05	1 ½:1				20	
5476	17+15	17+65	1 ½:1				20	
5477	10+55	12+25	1 ½:1	6”	28	1.70	48	
5477-3	0+05	0+55	1 ½:1				30	
Stockpile							3000	Load N Go Pit

1¼ Inch Minus 375 Tons
2-Inch Minus __3521_ Cubic Yard

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.**

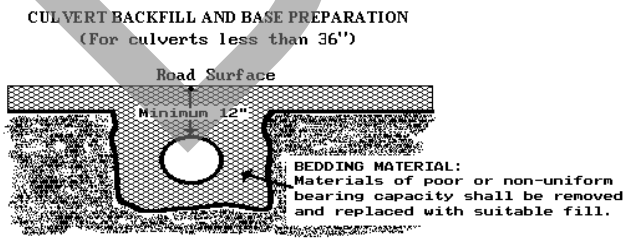
COMPACTION LIST

Road	From Station	To Station	Type	Max Depth Per Lift (inches)	Equipment Type	Equipment Weight (lbs)	Minimum Number of Passes	Maximum Operating Speed (mph)
5500 (North Side Mainline)	0+00	627+00	Surfacing	4”	Smooth Drum Vibratory Roller	14,000	3 low freq. vibe on	3.5
5470	0+00	210+00	Surfacing	6”	Smooth Drum Vibratory Roller	14,000	3 low freq. vibe on	3.5
5470	236+40	254+85	Surfacing,	6”	Smooth Drum Vibratory Roller	14,000	3 low freq. vibe on	3.5
5470-5	0+00	12+25	Subgrade,	6”	Smooth Drum Vibratory Roller	14,000	3 low freq. vibe on	3.5
5474	0+00	11+25	Surfacing	6”	Smooth Drum Vibratory Roller	14,000	3 low freq. vibe on	3.5
5476	0+00	76+80	Surfacing	6”	Smooth Drum Vibratory Roller	14,000	3 low freq. vibe on	3.5
5476-1	0+00	23+87	Subgrade, Surfacing	12”	Smooth Drum Vibratory Roller	14,000	3 low freq. vibe on	3.5
5476-3	0+00	9+71	Subgrade, Surfacing	12”	Smooth Drum Vibratory Roller	14,000	3 low freq. vibe on	3.5
5477	0+00	32+65	Subgrade, Surfacing	6”	Smooth Drum Vibratory Roller	14,000	3 low freq. vibe on	3.5
5477 Ext	0+00	7+67	Subgrade, Surfacing	12”	Smooth Drum Vibratory Roller	14,000	3 low freq. vibe on	3.5
5477-3	0+00	23+25	Surfacing	6”	Smooth Drum Vibratory Roller	14,000	3 low freq. vibe on	3.5

CULVERT AND DRAINAGE LIST (page 1 of 3)

Road Number	Location	Culvert Dia. (in)	Culvert Type	Length (ft) Culvert	Length (ft) Downspt	Length (ft) Flume	Riprap (C.Y.) Inlet	Riprap (C.Y.) Outlet	Riprap (C.Y.) Type	Backfill Material*	Placement Method*	Const. Staked*	Remarks
5470	40+10	36											Clean Inlet T4 Stream
5470	43+15	36						3	LL				Clean Inlet T4 Stream
5470	88+55	18	PD	50			1	1.5	QS	NT			
5470	105+00	18											Clean Inlet
5470	135+00	18					1	1.5	QS	NT			
5470	151+30	24						3	LL				Place Rip Rap at outlet as Energy Dissipator
5470	152+25	24						10	LL				Place Rip Rap at outlet as Energy Dissipator
5470	153+50	24						5	LL				Place Rip Rap at outlet as Energy Dissipator
5470	156+00	24						5	LL				Place Rip Rap at outlet as Energy Dissipator
5470	166+25	18											Clean Inlet
5470	169+40	18						5	LL				Clean Inlet & Place Rip Rap at outlet as Energy Dissipator
5470	172+15	18	PD	30			1	3	QS-inlet LL-outlet	NT			Place Rip Rap at outlet as Energy Dissipator

PD = Polyethylene Pipe Dual Wall AASHTO No. M294 Type S or ASTM F2648
AS10 = Aluminized Steel AASHTO No. M274, 10 Gauge
TEMP = Temporary Culvert

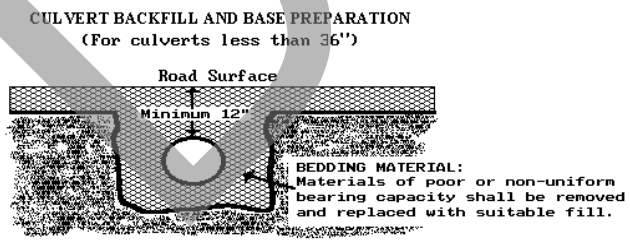


Key:
QS - Quarry Spalls
SR - Shot Rock
NT - Native (bank run)
SPR - Select Pit Run
LL - Light Loose Rip Rap
HL - Heavy Loose Riprap
Flume - Half round pipe
Downspout - Full round pipe

CULVERT AND DRAINAGE LIST (page 2 of 3)

Road Number	Location	Culvert Dia. (in)	Culvert Type	Length (ft) Culvert	Length (ft) Downspt	Length (ft) Flume	Riprap (C.Y.) Inlet	Riprap (C.Y.) Outlet	Riprap (C.Y.) Type	Backfill Material*	Placement Method*	Const. Staked*	Remarks
5470	176+10	18	PD	40			1	1.5	QS	NT			
5470	185+10	24						3	LL				Place Rip Rap at outlet as Energy Dissipator
5470	243+85	18	PD	35			1	1.5	QS	NT			
5470	249+90	18											Clean Inlet
5470-5	1+50												Construct Ditchout-left
5470-5	5+60	18	PD	40			1	1.5	QS	NT			
5470-5	10+35	18	PD	40			1	1.5	QS	NT			
5474	5+80	24	PD	40			1	5	QS-inlet LL-outlet	NT			Replace Existing. Place Rip Rap at outlet as Energy Dissipator
5476	13+60	18											Clean Outlet
5476	14+10	18											Clean Outlet & Ditchout
5476	16+70	18											Rebuilt Headwall & Clean: Inlet, Oulet and Ditchout
5476	17+40	18	PD	40			1	1.5	QS	NT			Replace Existing.
5476	33+80	18											Clean Outlet

PD = Polyethylene Pipe Dual Wall AASHTO No. M294 Type S or ASTM F2648
AS10 = Aluminized Steel AASHTO No. M274, 10 Gauge
TEMP = Temporary Culvert



Key:
QS - Quarry Spalls
SR - Shot Rock
NT - Native (bank run)
SL - Select Fill
LL - Light Loose Rip Rap
HL - Heavy Loose Riprap
Flume - Half round pipe
Downspout - Full round pipe

CULVERT AND DRAINAGE LIST (page 3 of 3)

Road Number	Location	Culvert Dia. (in)	Culvert Type	Length (ft) Culvert	Downspt	Flume	Riprap (C.Y.) Inlet	Outlet	Type	Backfill Material*	Placement Method*	Const. Staked*	Remarks
5476-1	6+49	18	TEMP	30			1	1.5	QS	NT			
5476-1	14+27	30	TEMP	50			3	3	LL	NT			T4 Stream
5476-1	23+02	18	TEMP	30			1	1.5	QS	NT			
5476-3	1+13	18	TEMP	30			1	1.5	QS	NT			Construct Ditchout
5476-3	2+98	18	TEMP	30			1	1.5	QS	NT			
5476-3	5+20	18	TEMP	30			1	1.5	QS	NT			Construct Ditchout
5477	10+80	30	PD	35			1	1.5	QS	NT			Replace Existing T4 Stream
5477	11+35	24	PD	30			1	1.5	QS	NT			Replace Existing
5477	12+00	18	PD	30			1	1.5	QS	NT			
5477	18+45	18	PD	35			1	1.5	QS	NT			
5477-3	0+30	18	PD	70			1	1.5	QS	NT			
		18	PD	30			1	1.5	QS	NT			
As directed by CA		18	PD	30									Contingency Culverts & Band
		18	Polly	Band									

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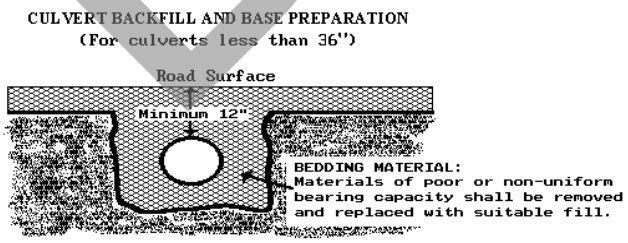
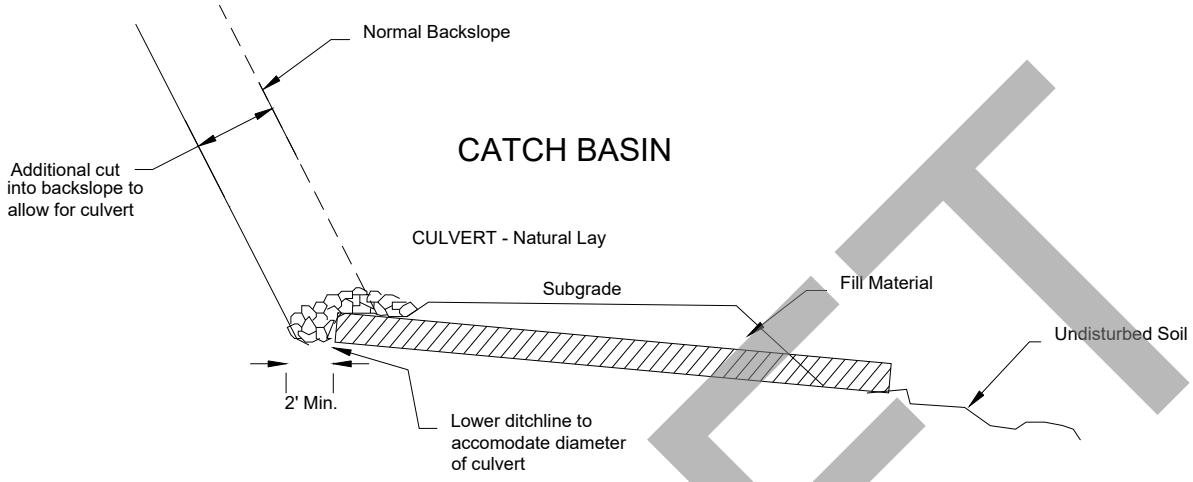
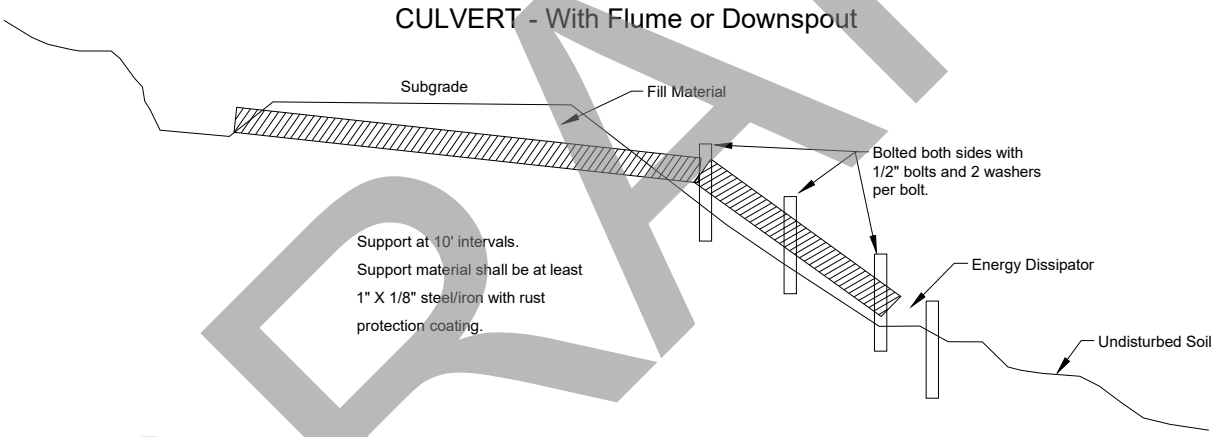


CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 1 of 3)

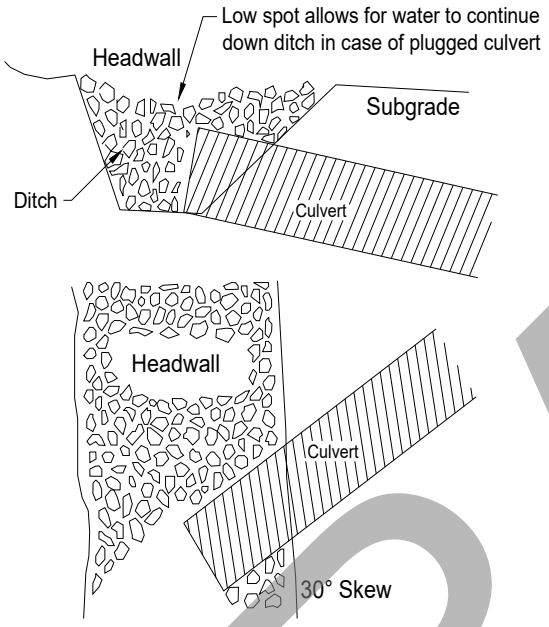




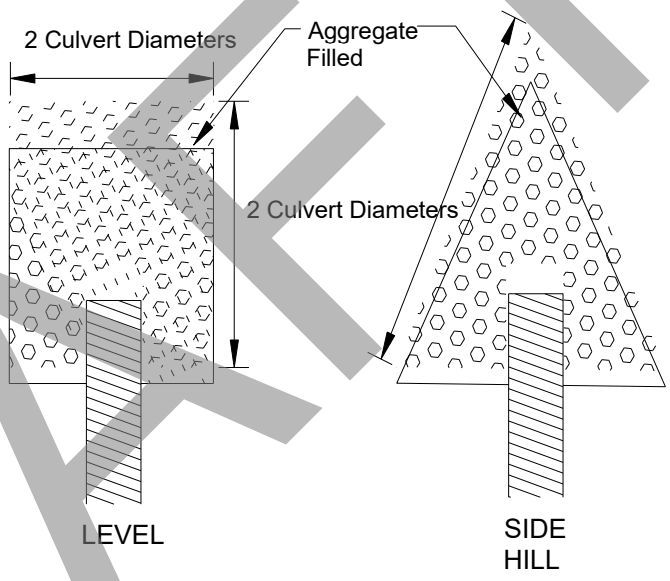
CULVERT AND DRAINAGE SPECIFICATION DETAIL

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



ENERGY DISSIPATORS



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.

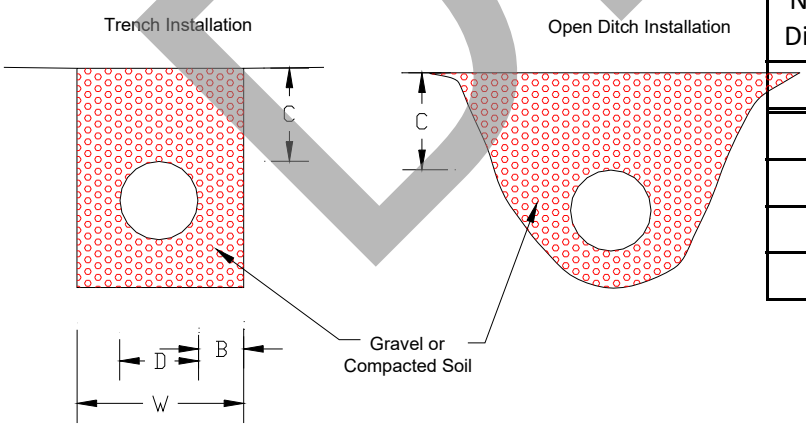
3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.

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"

Cuts and Fills

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

Surface

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

Drainage

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

Preventative Maintenance

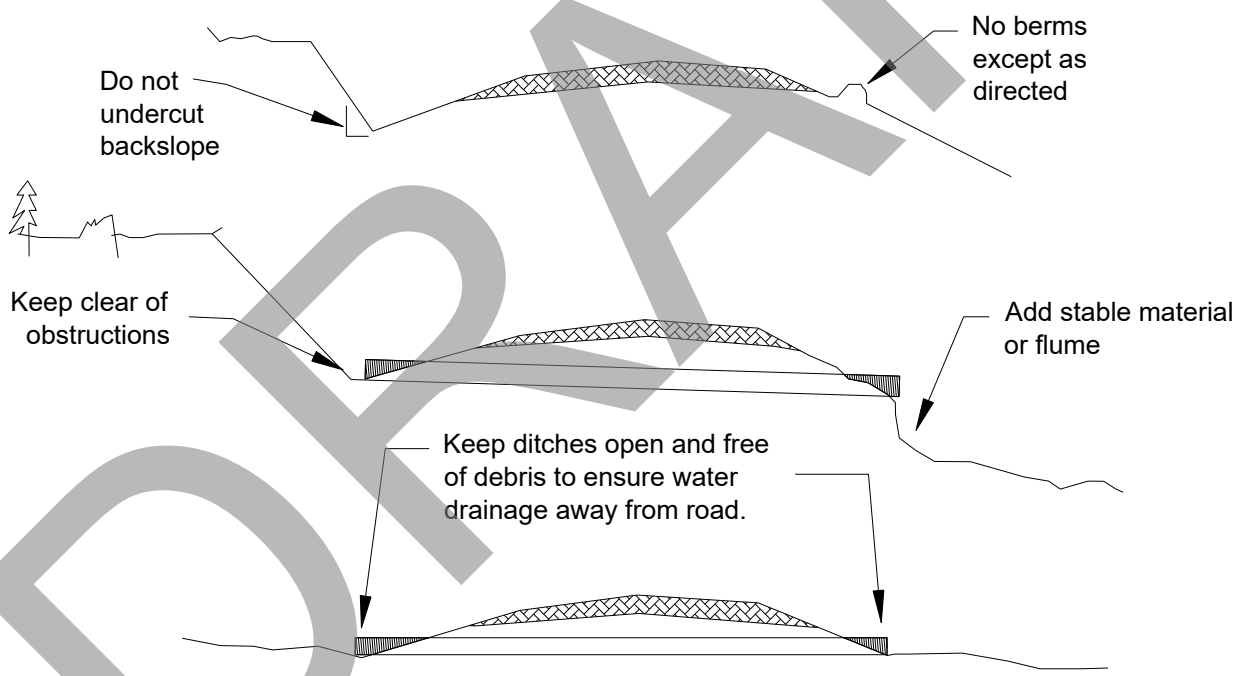
- Perform preventative maintenance work to safeguard against storm damage, such as blading to ensure correct runoff, ditch and culvert cleaning, and waterbar maintenance.

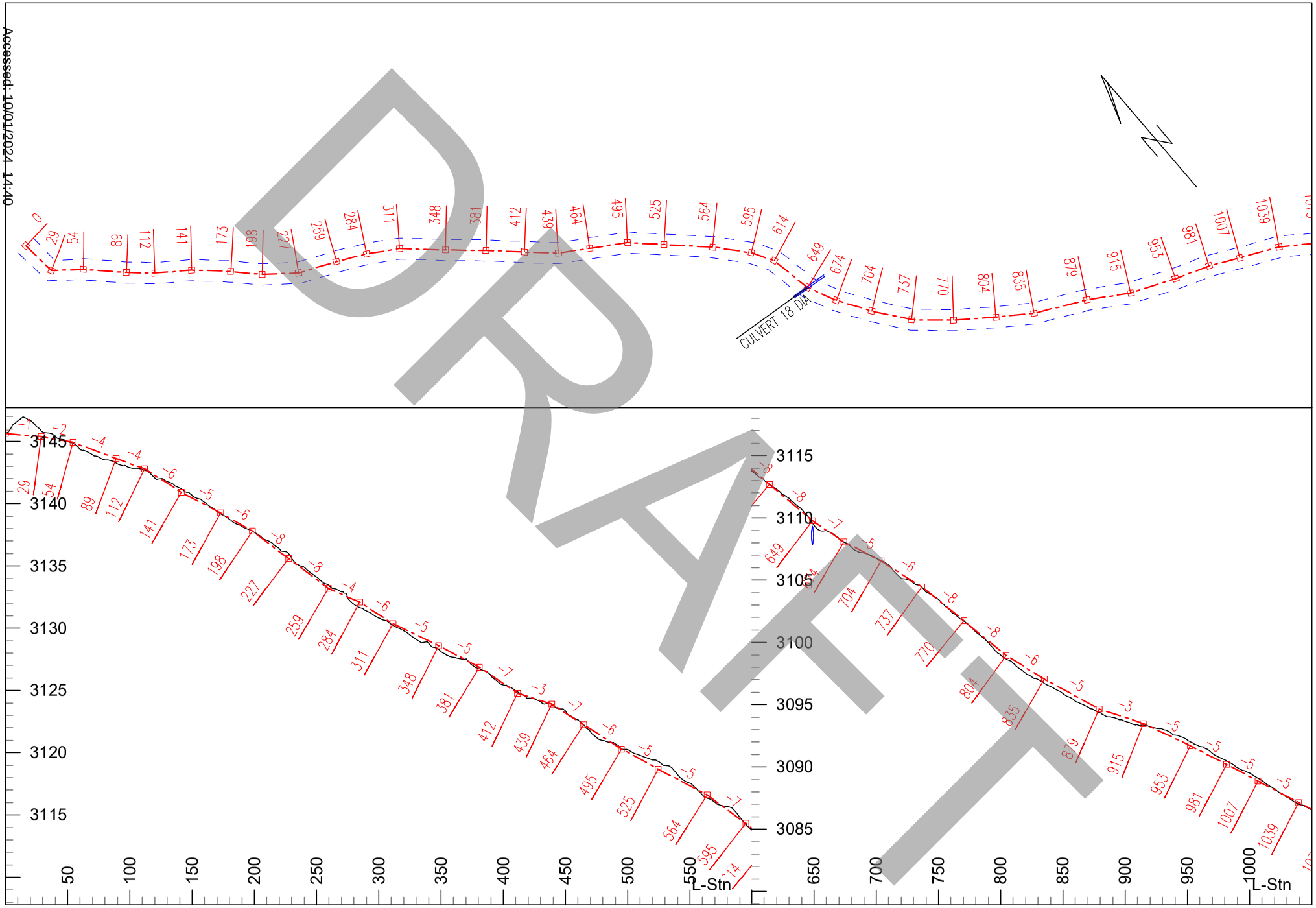
Termination of Use or End of Season

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

Debris

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



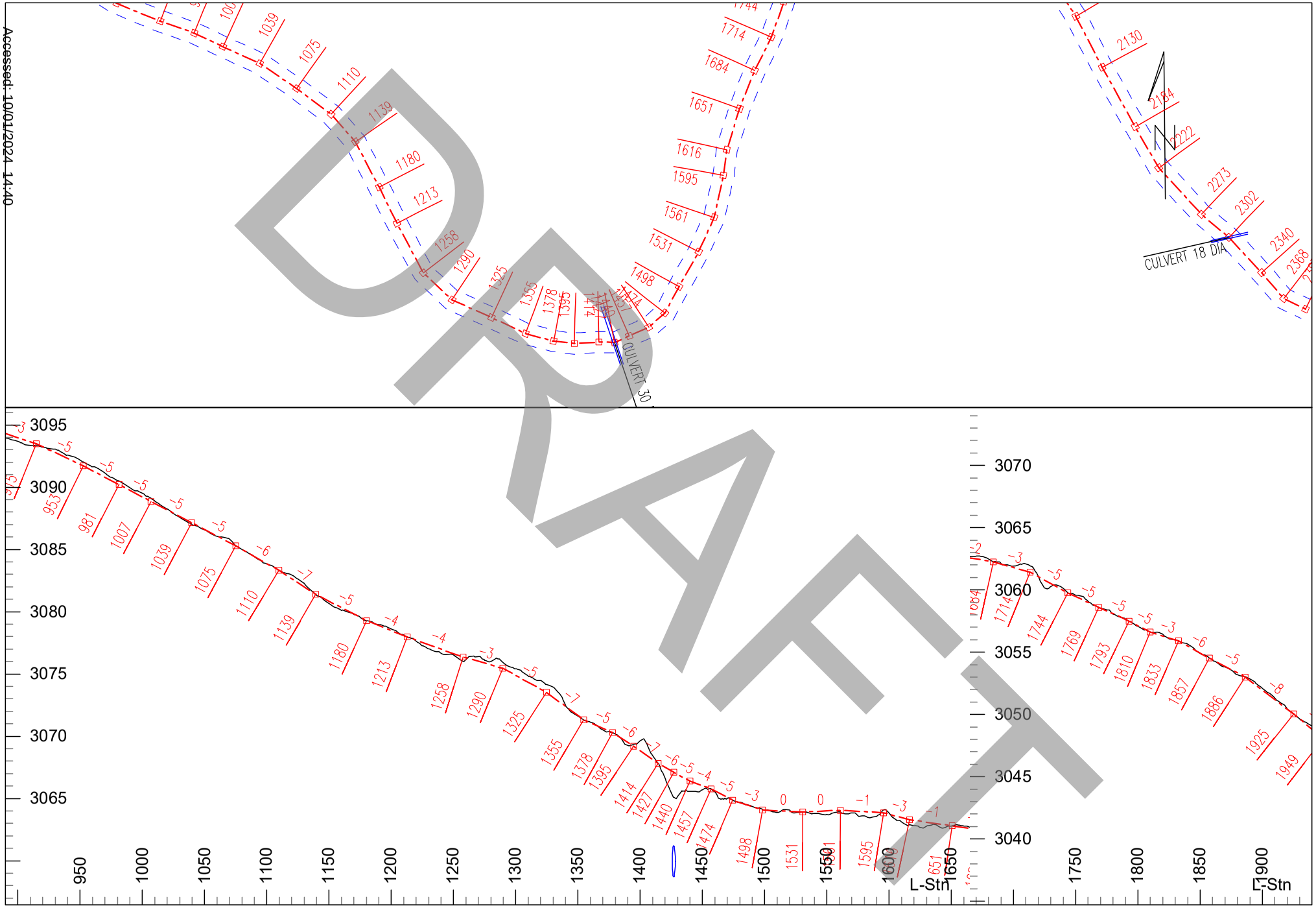


Sylvan Pearl Timber Sale
5476-1
Contract #: 30-103620
Remote design using LiDAR data

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

Plan Scale 1:1200
Profile Vert Scale 1:120
Profile Horz Scale 1:1200

Engineer: J. Gardner
23/08/18



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Plan Scale 1:1200
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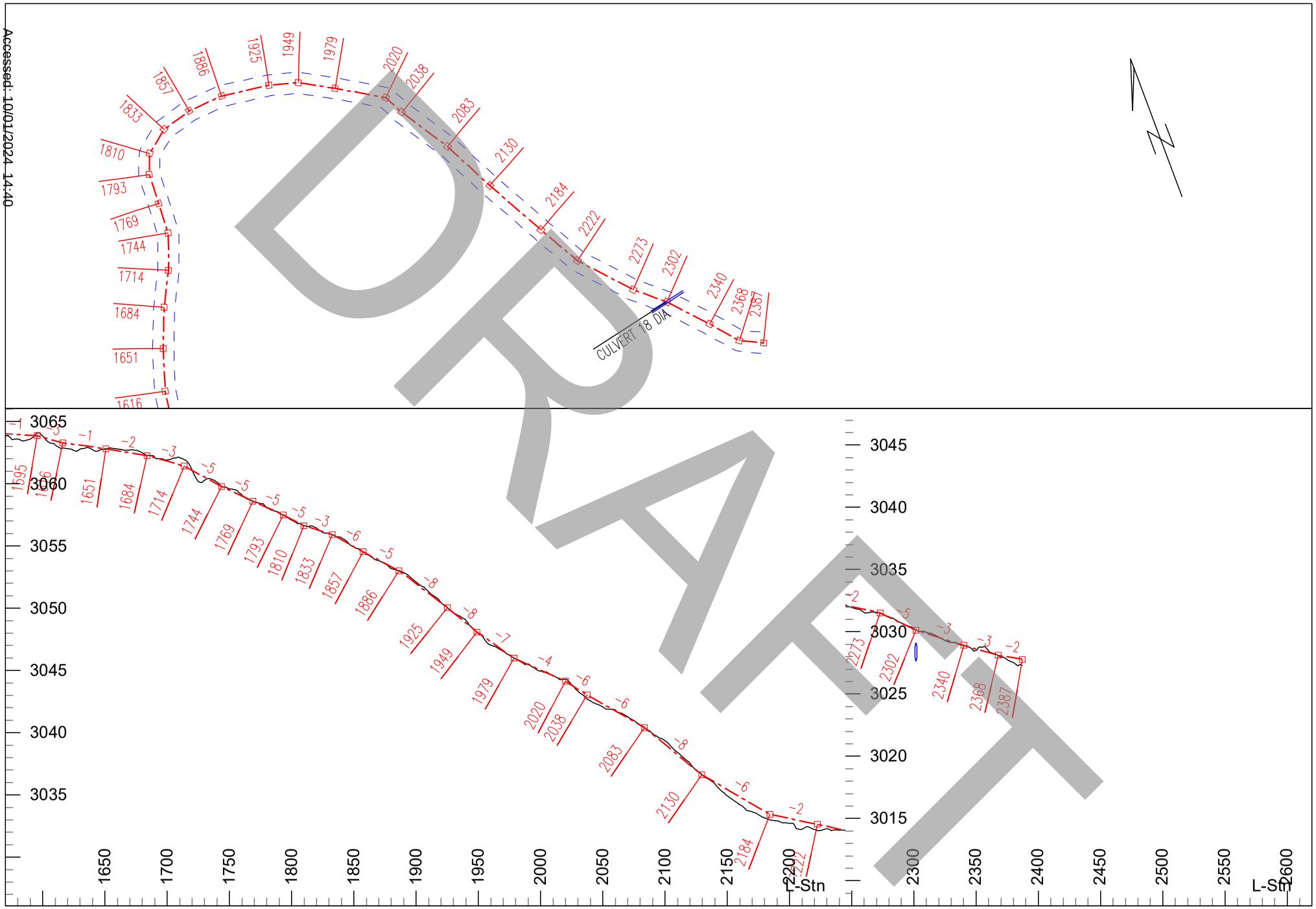
Engineer: J. Gardner
23/08/18



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Sylvan Pearl Timber Sale
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WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

Plan Scale 1:1200
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Engineer: J. Gardner
23/08/18

Softree Section	Scale 1:240	P. 1
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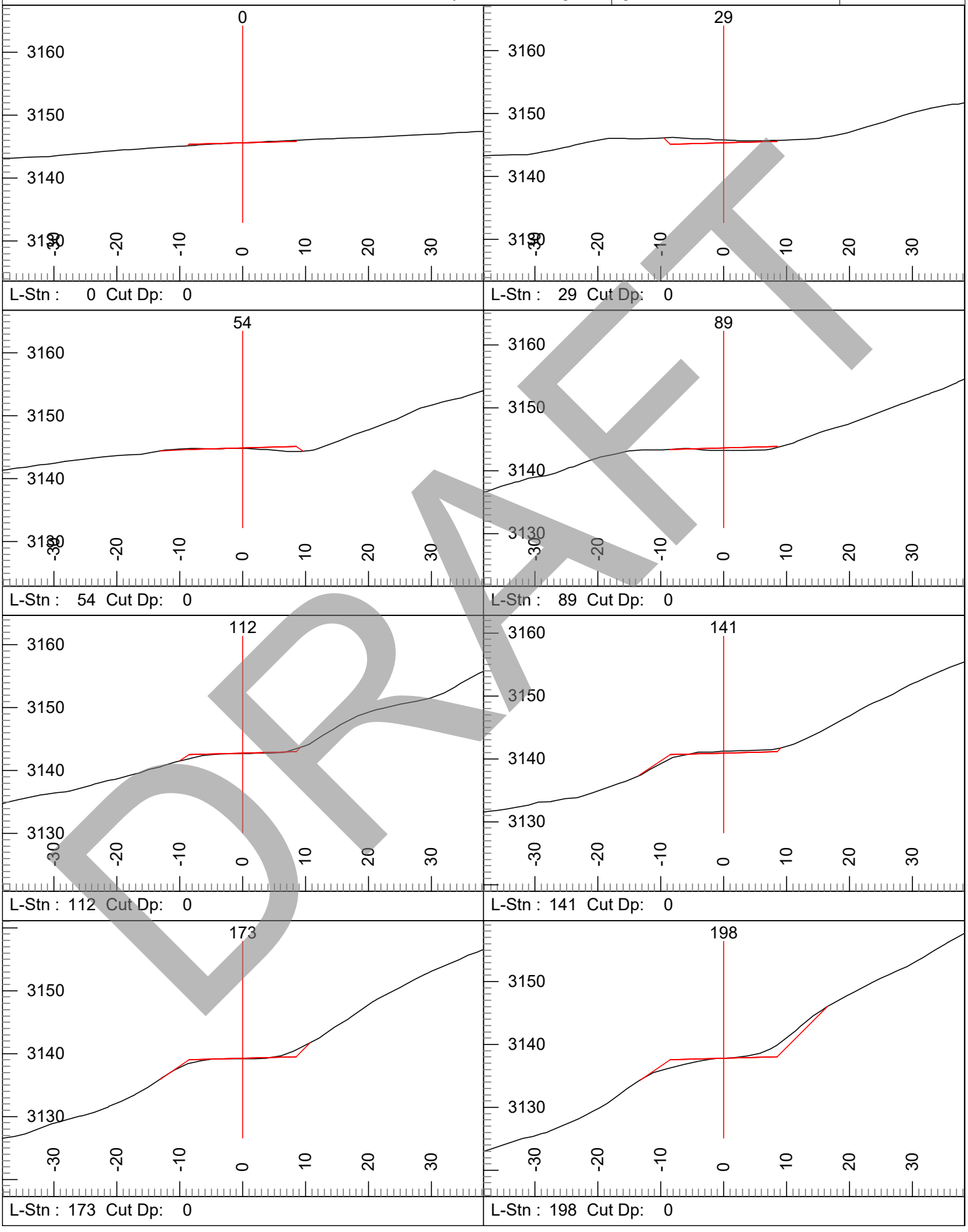

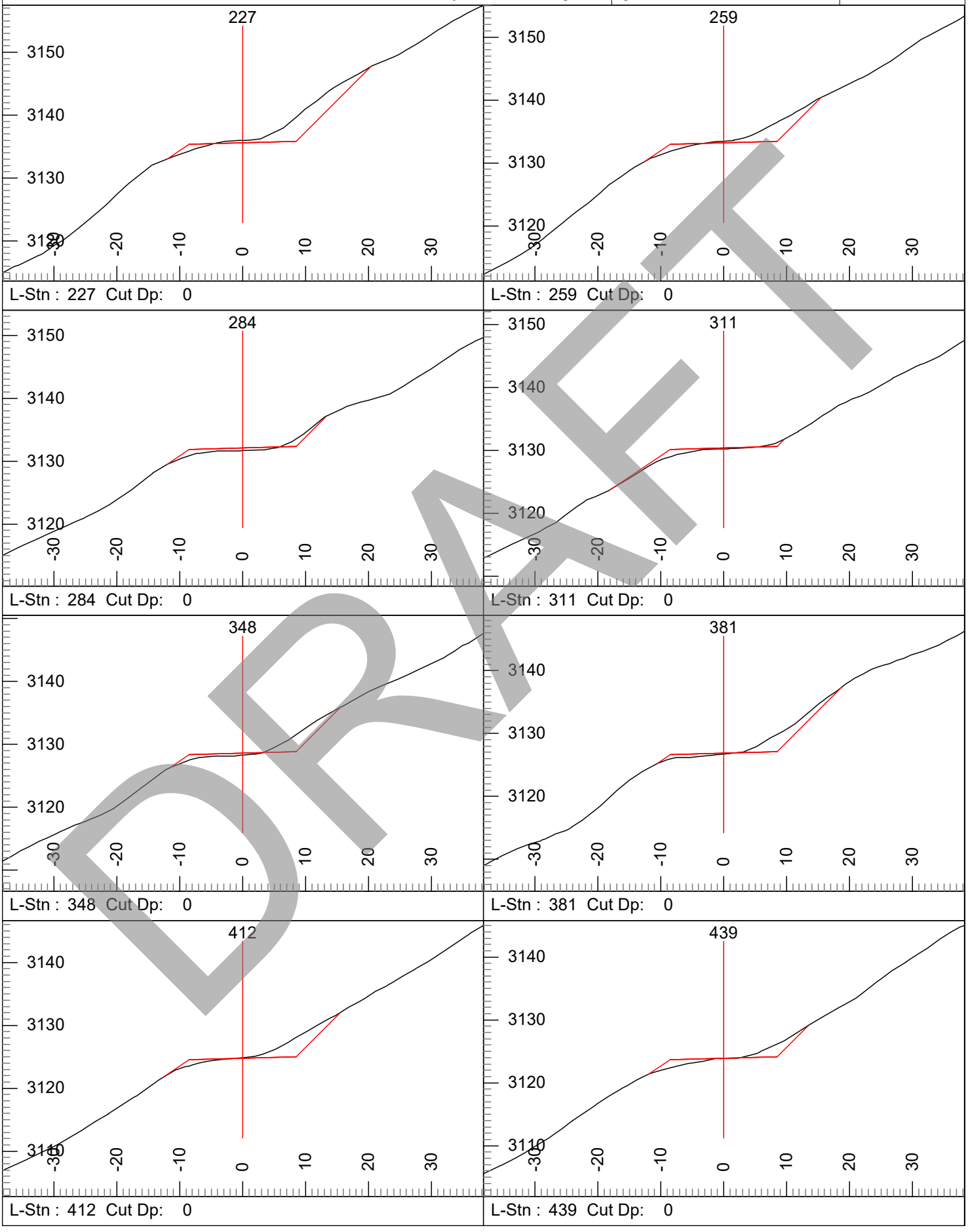
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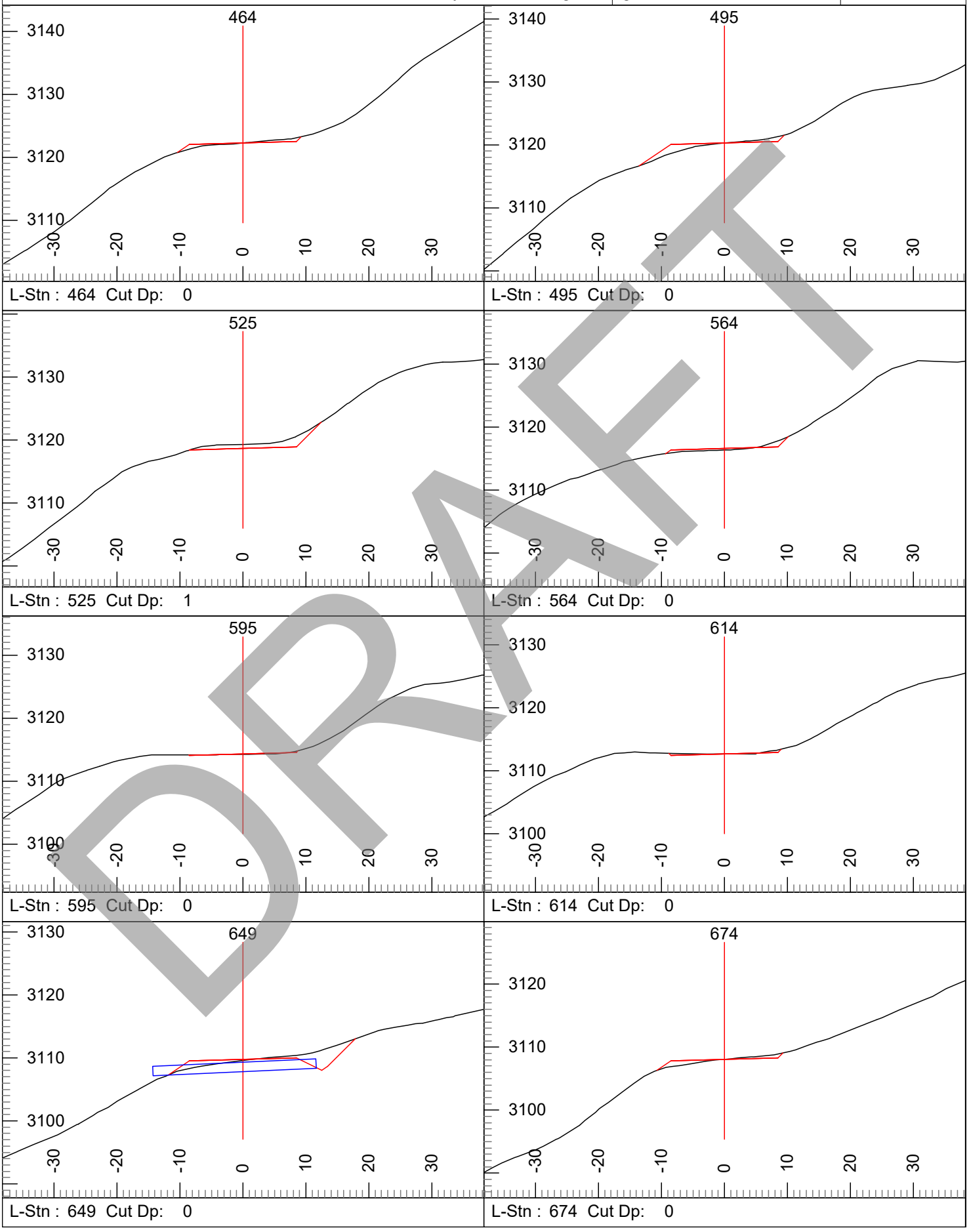
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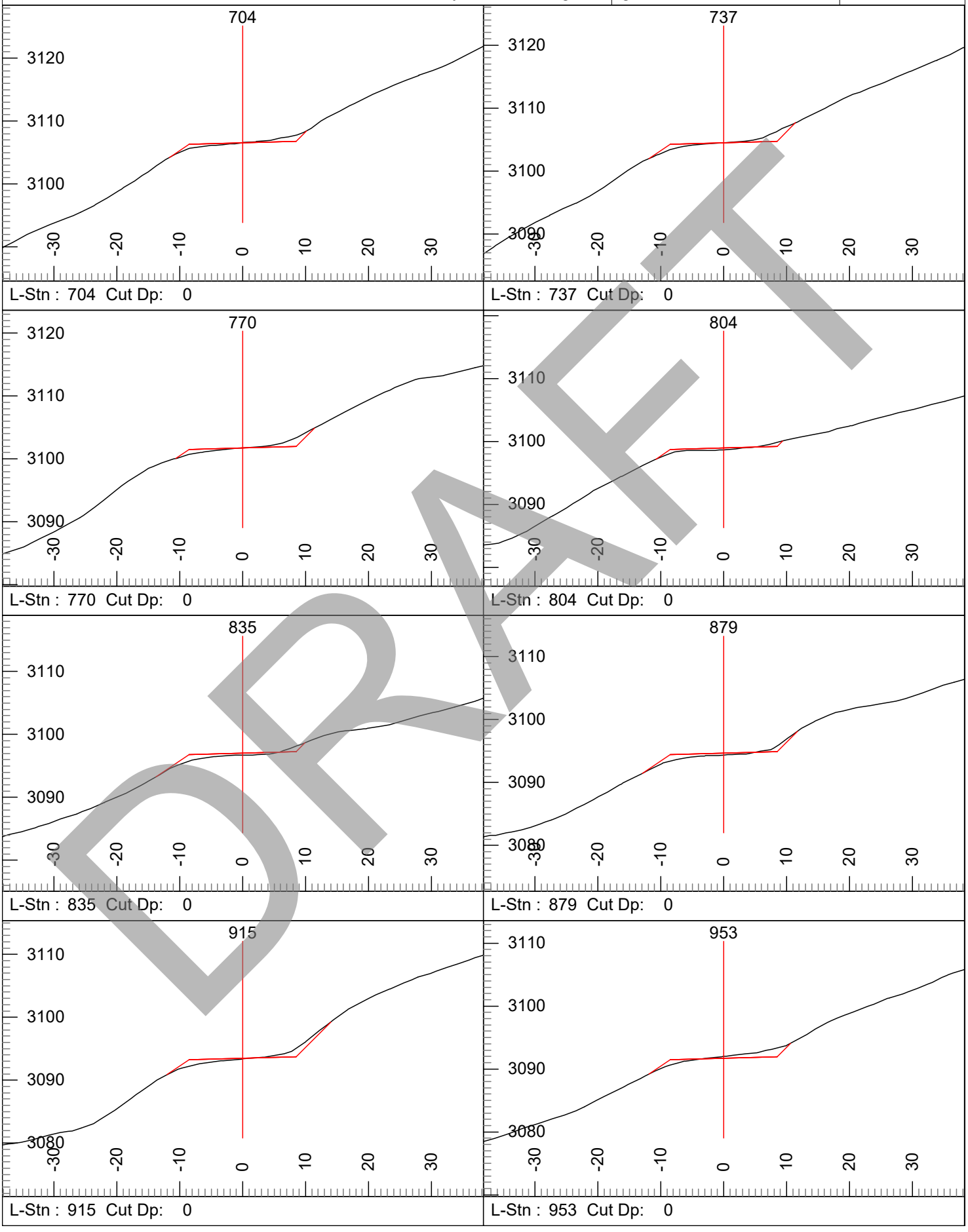
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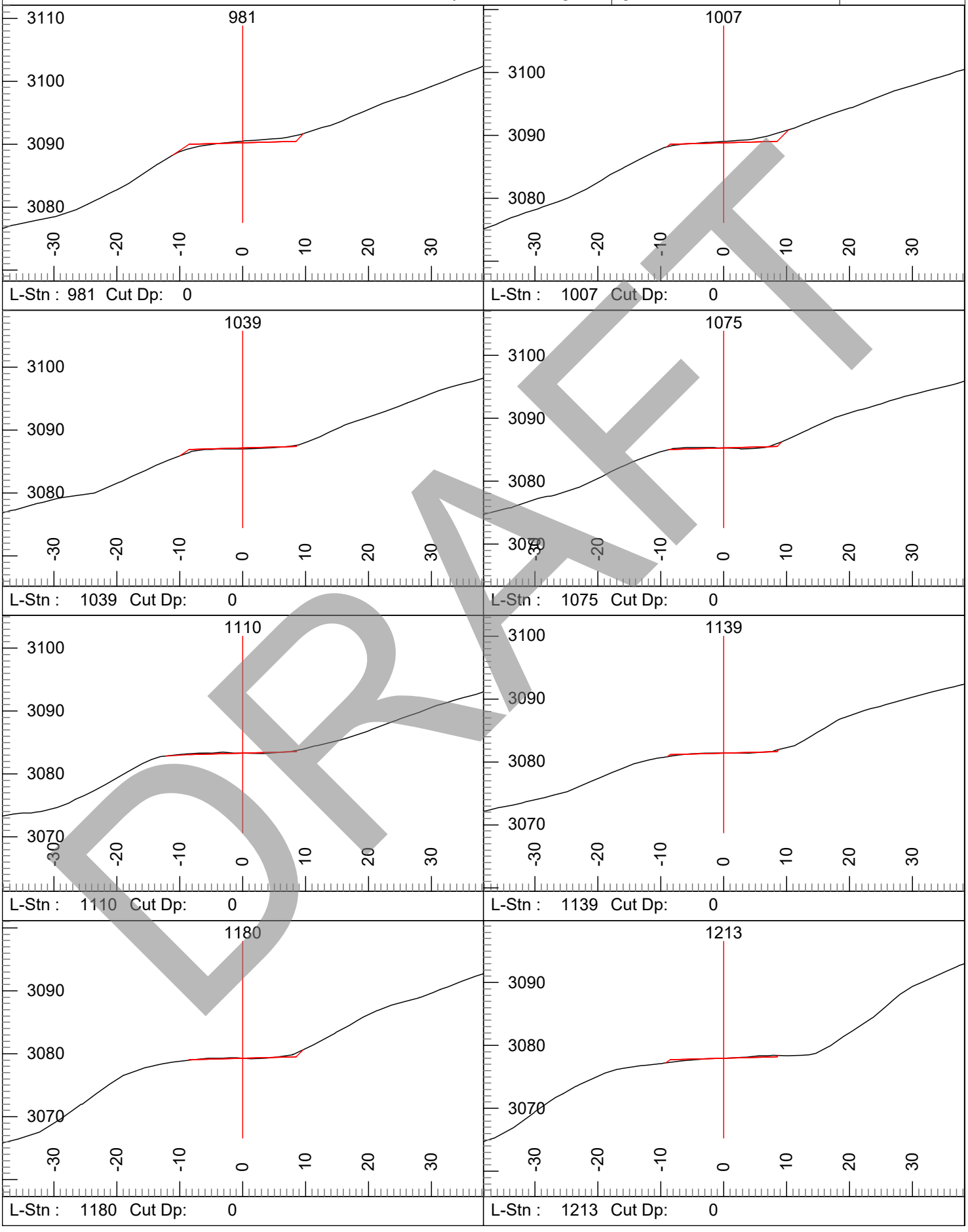
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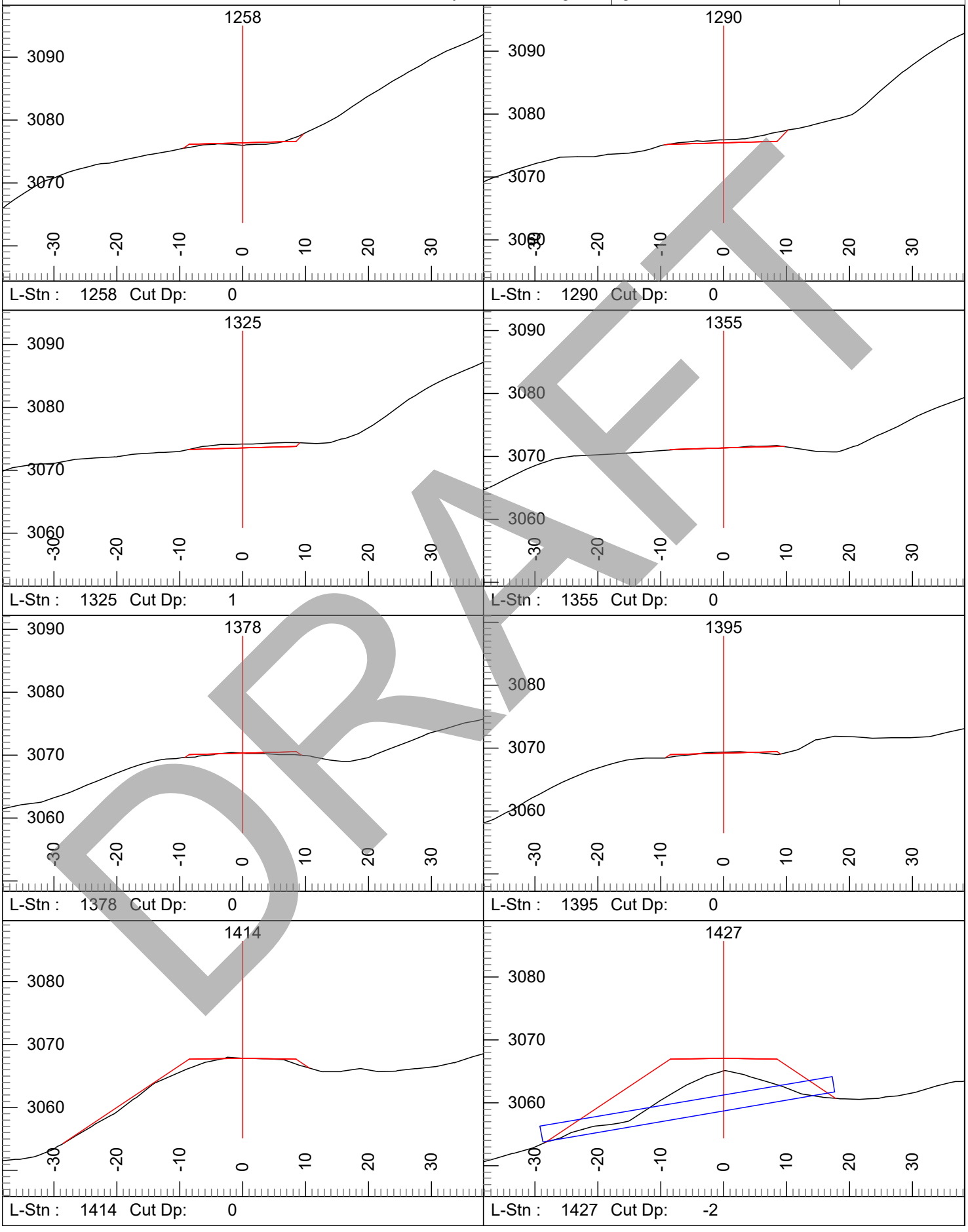
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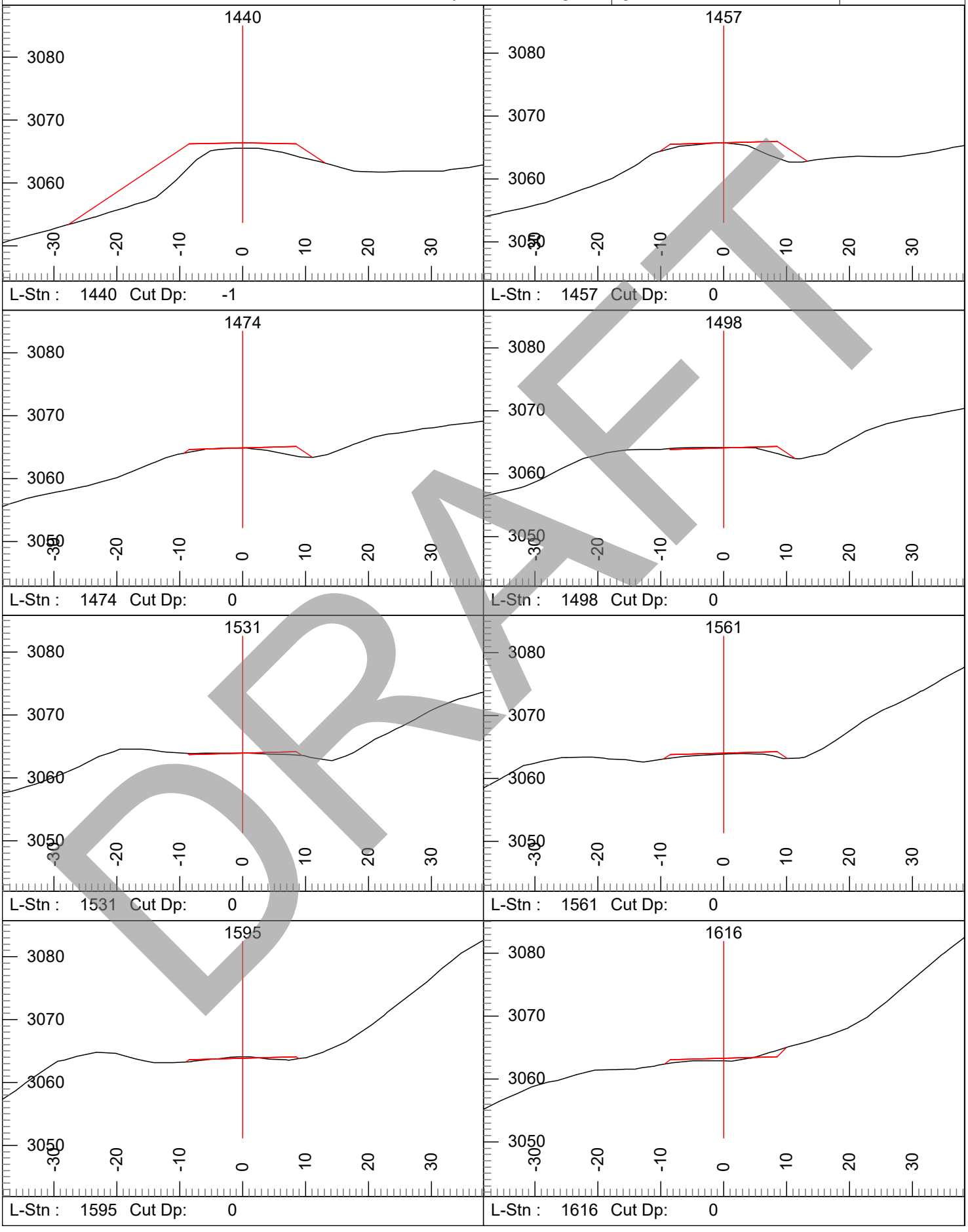

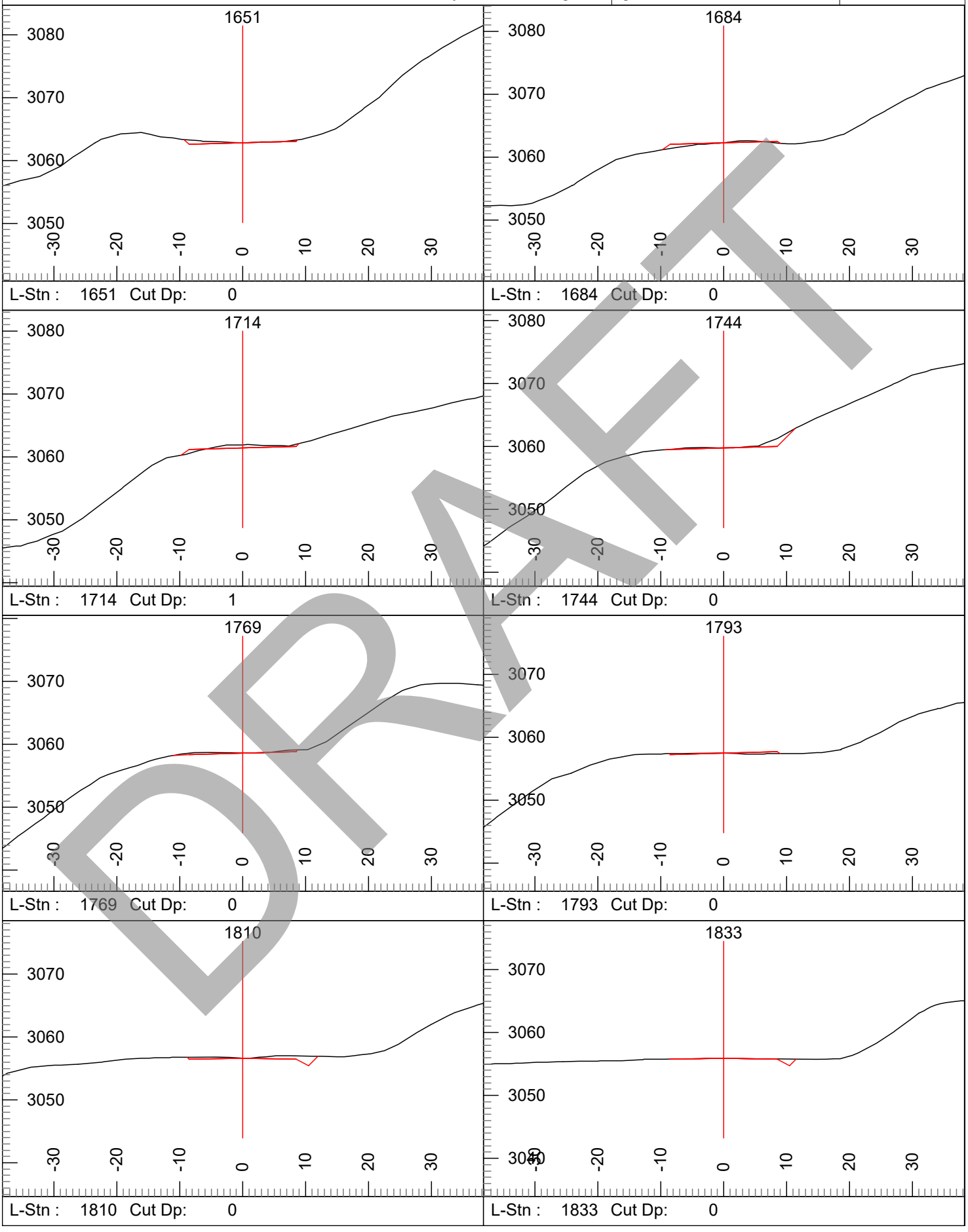
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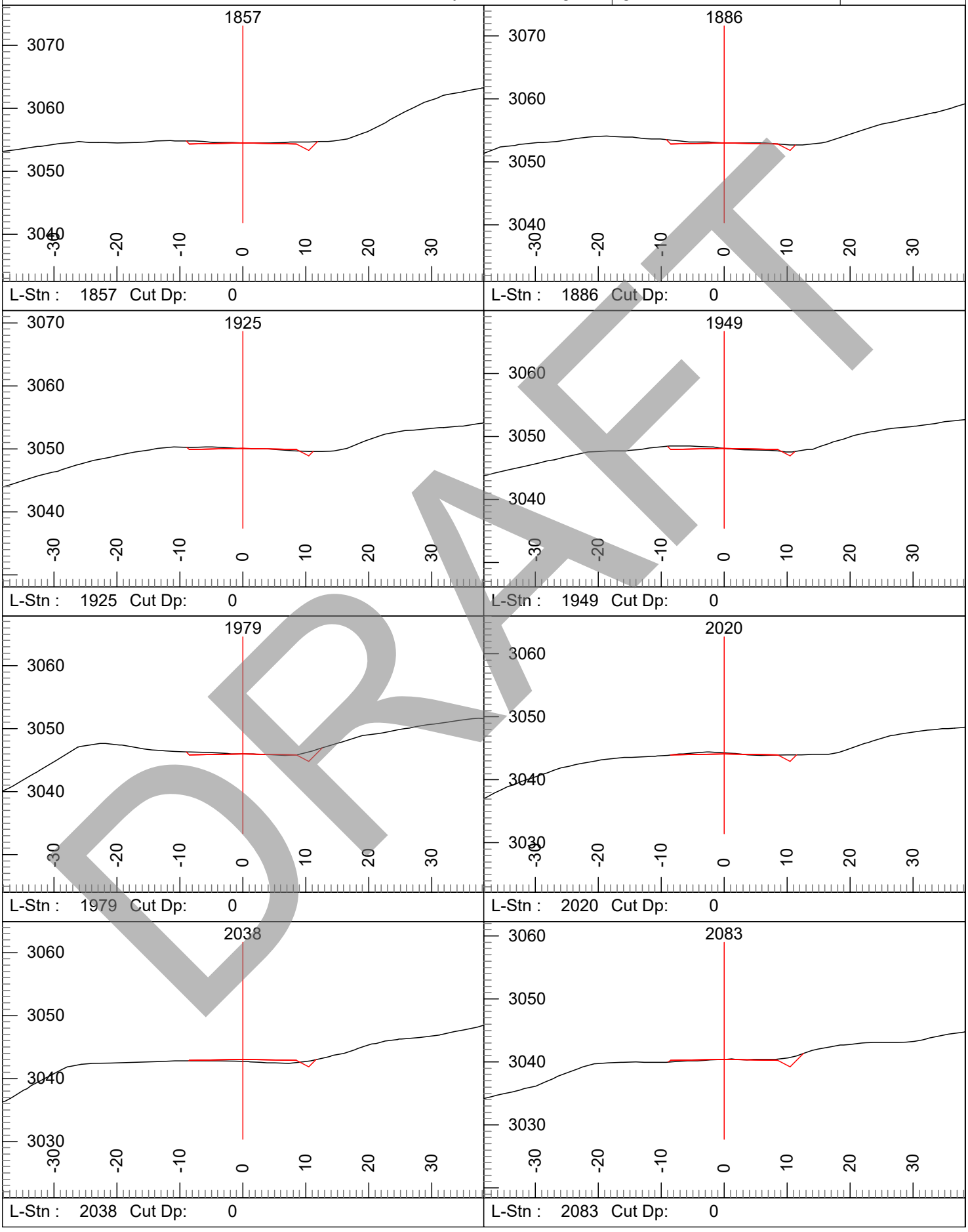
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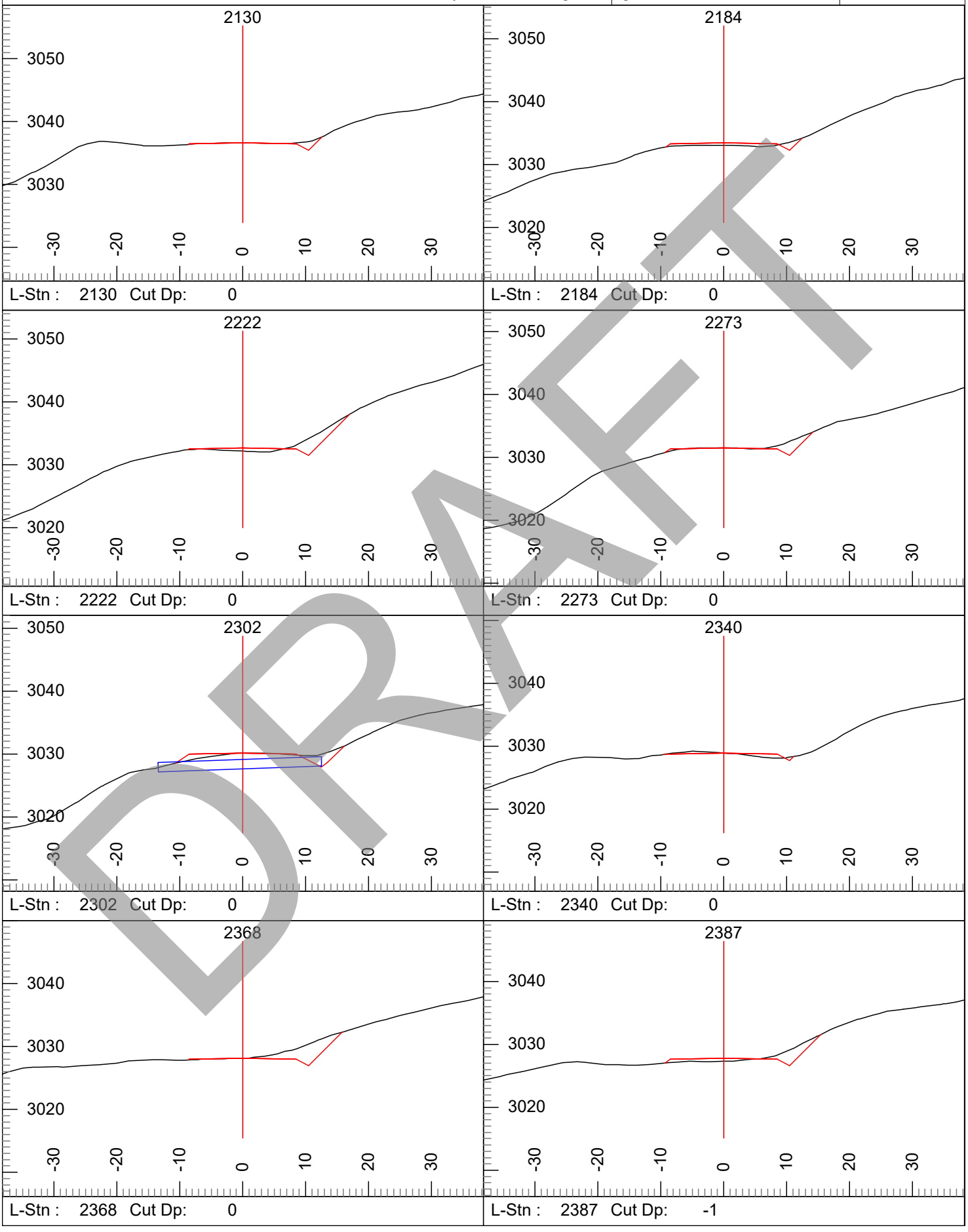
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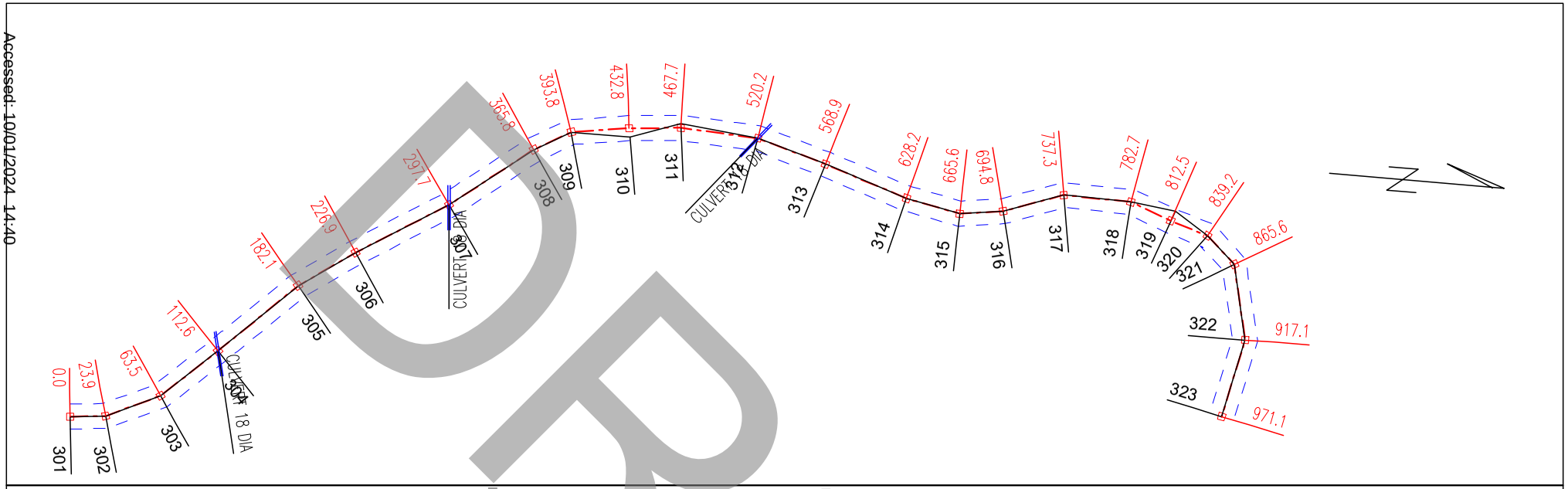

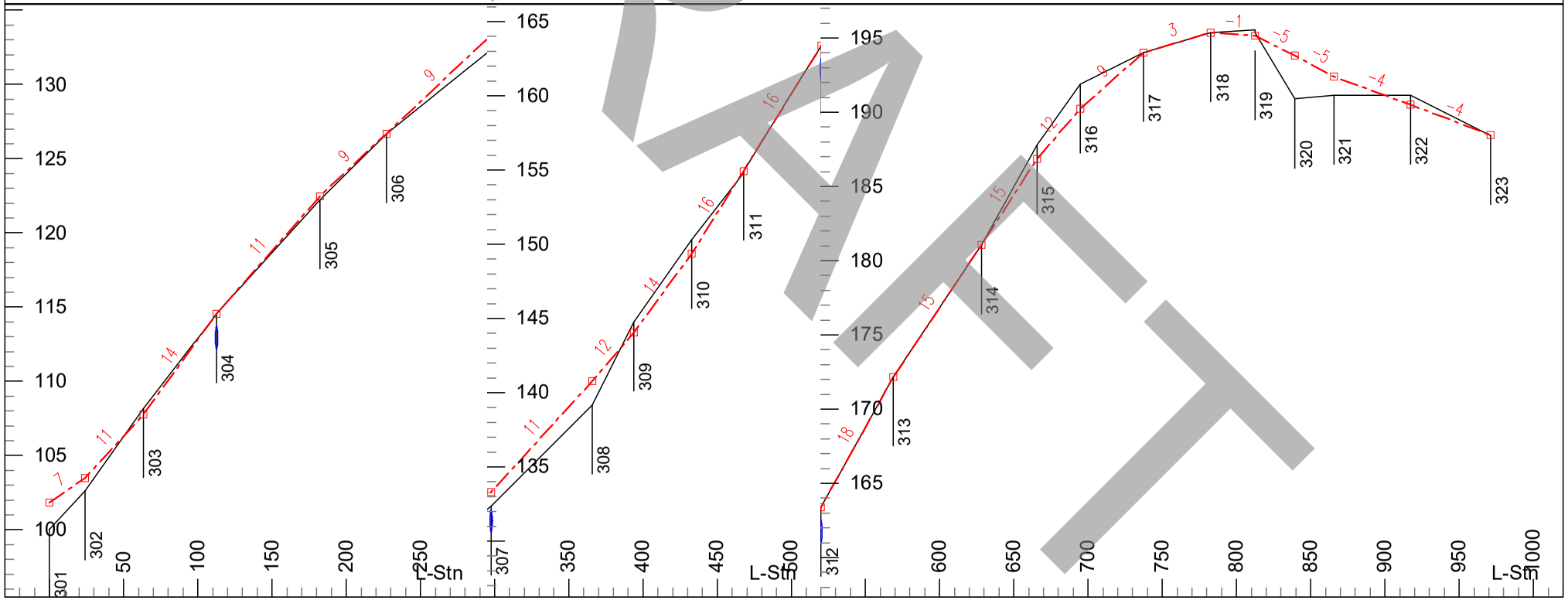

Sylvan Pearl Timber Sale
5476-3
Contract #: 30-103620

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

Plan Scale 1:1200
Profile Vert Scale 1:120
Profile Horz Scale 1:1200

Engineer: J. Gardner
23/08/18

Softree Section	Scale 1:240	P. 1
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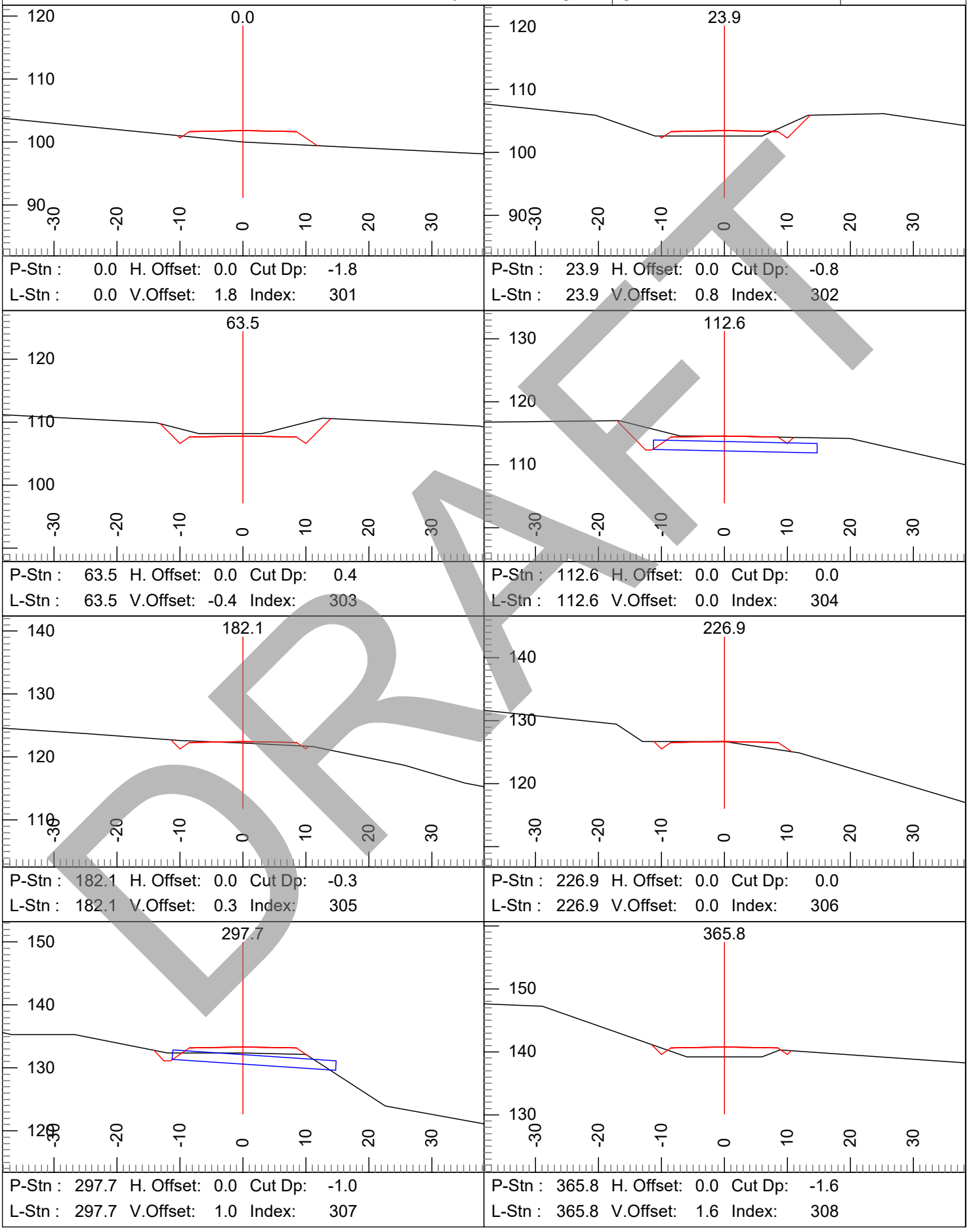

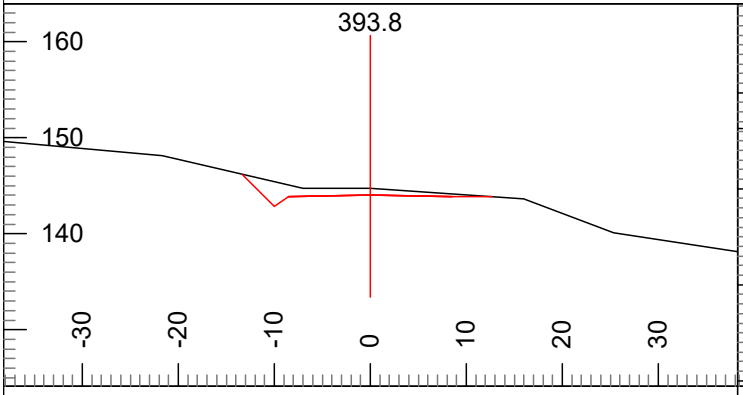

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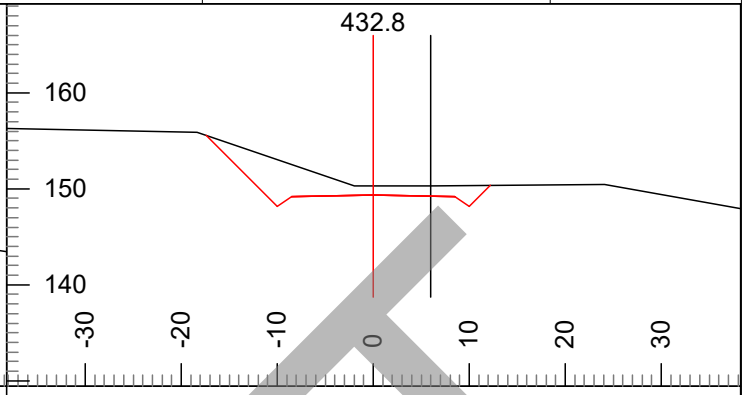

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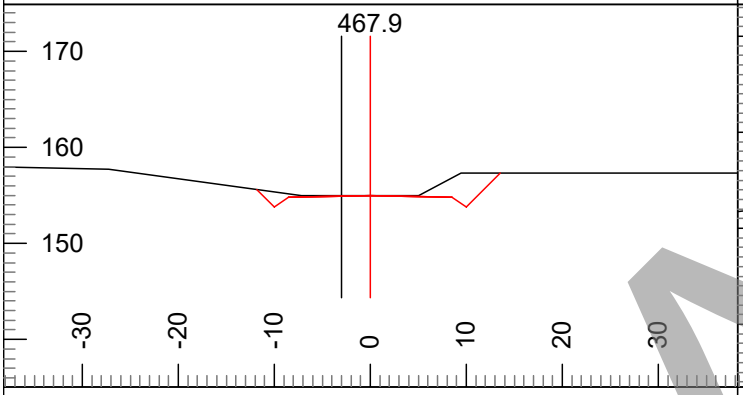
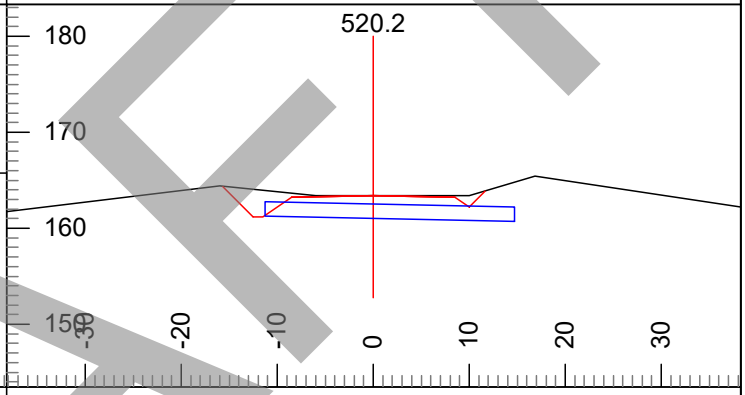
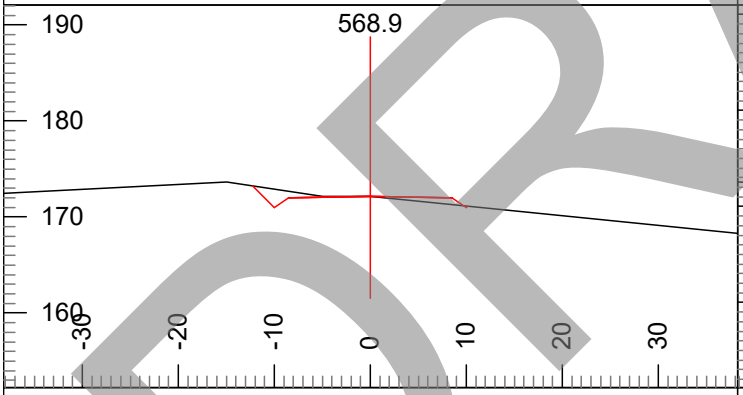


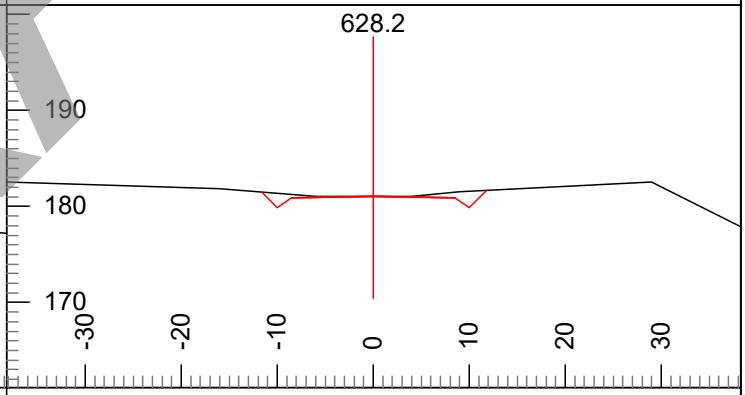
P-Stn : 469.1 H. Offset: 3.0 Cut Dp: 0.0
L-Stn : 467.9 V.Offset: 0.0 Index: 311



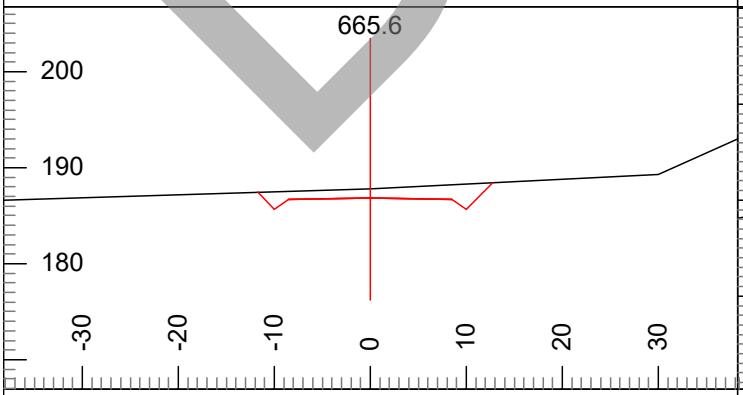
P-Stn : 521.9 H. Offset: 0.0 Cut Dp: 0.0
L-Stn : 520.2 V.Offset: 0.0 Index: 312



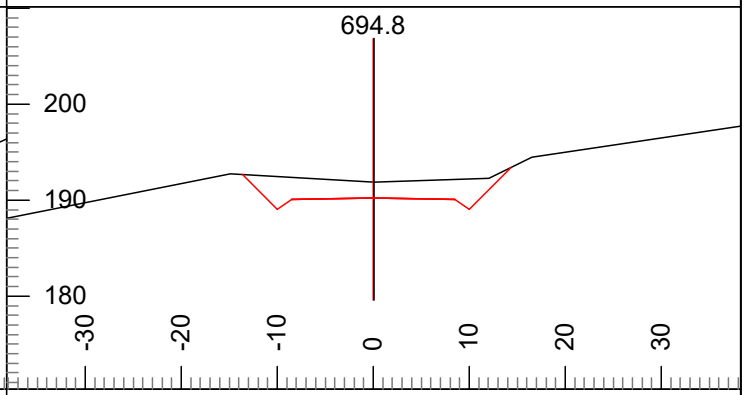
P-Stn : 570.7 H. Offset: 0.0 Cut Dp: 0.0
L-Stn : 568.9 V.Offset: 0.0 Index: 313



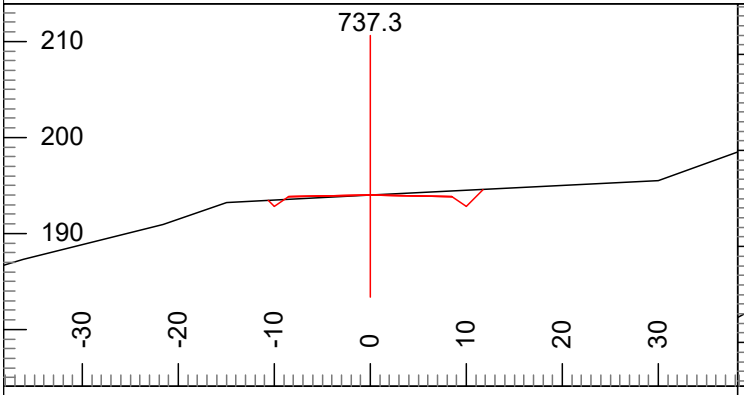
P-Stn : 630.0 H. Offset: 0.0 Cut Dp: 0.0
L-Stn : 628.2 V.Offset: 0.0 Index: 314



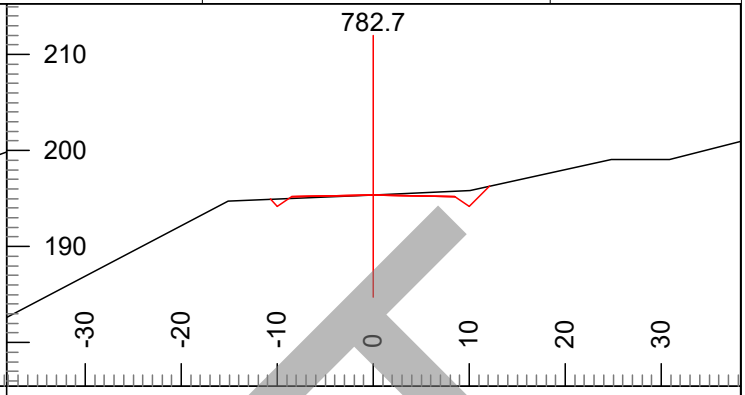
P-Stn : 667.4 H. Offset: 0.0 Cut Dp: 0.9
L-Stn : 665.6 V.Offset: -0.9 Index: 315



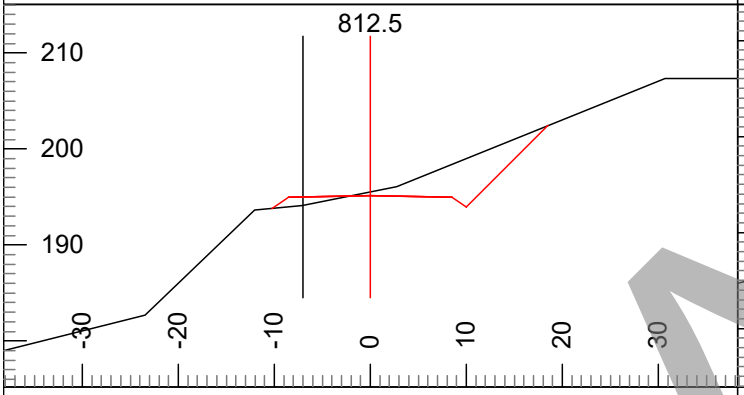
P-Stn : 696.6 H. Offset: -0.1 Cut Dp: 1.7
L-Stn : 694.8 V.Offset: -1.7 Index: 316



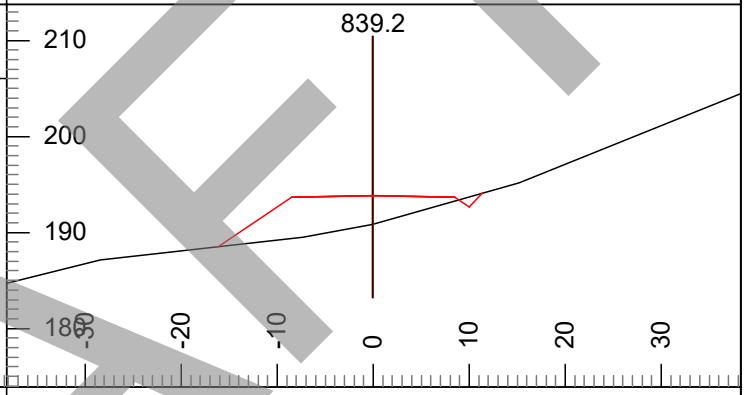
P-Stn : 739.0 H. Offset: 0.0 Cut Dp: 0.0
L-Stn : 737.3 V.Offset: 0.0 Index: 317



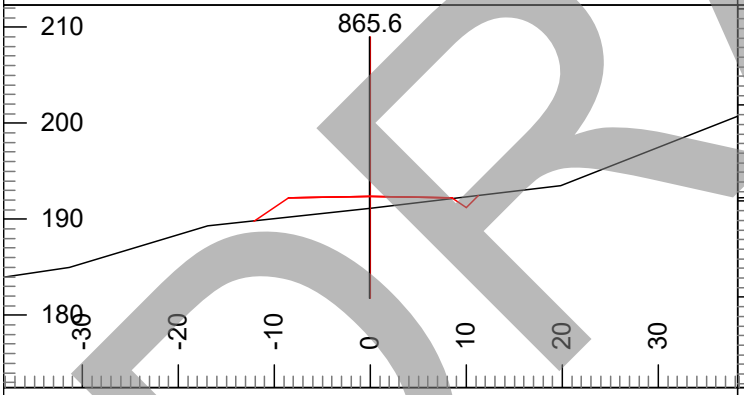
P-Stn : 784.5 H. Offset: 0.0 Cut Dp: 0.0
L-Stn : 782.7 V.Offset: 0.0 Index: 318



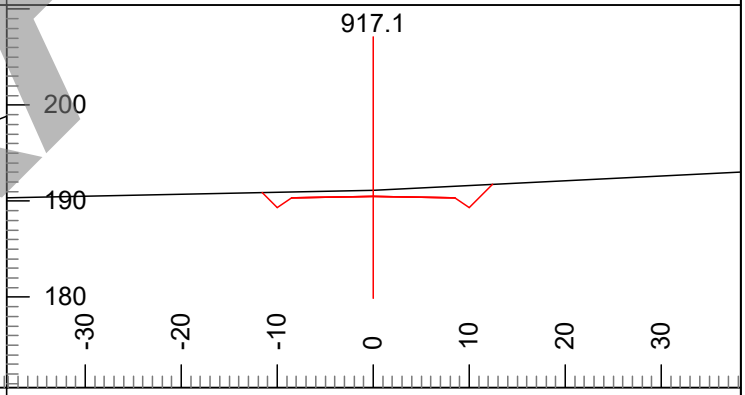
P-Stn : 815.0 H. Offset: 7.1 Cut Dp: 0.4
L-Stn : 812.5 V.Offset: 1.0 Index: 319



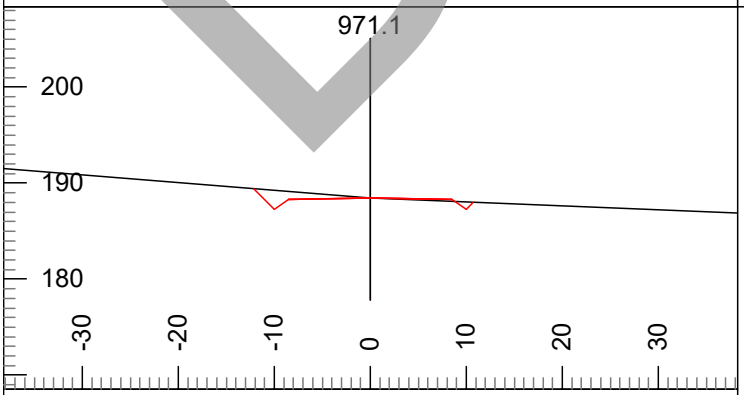
P-Stn : 842.3 H. Offset: 0.0 Cut Dp: -2.9
L-Stn : 839.2 V.Offset: 3.0 Index: 320



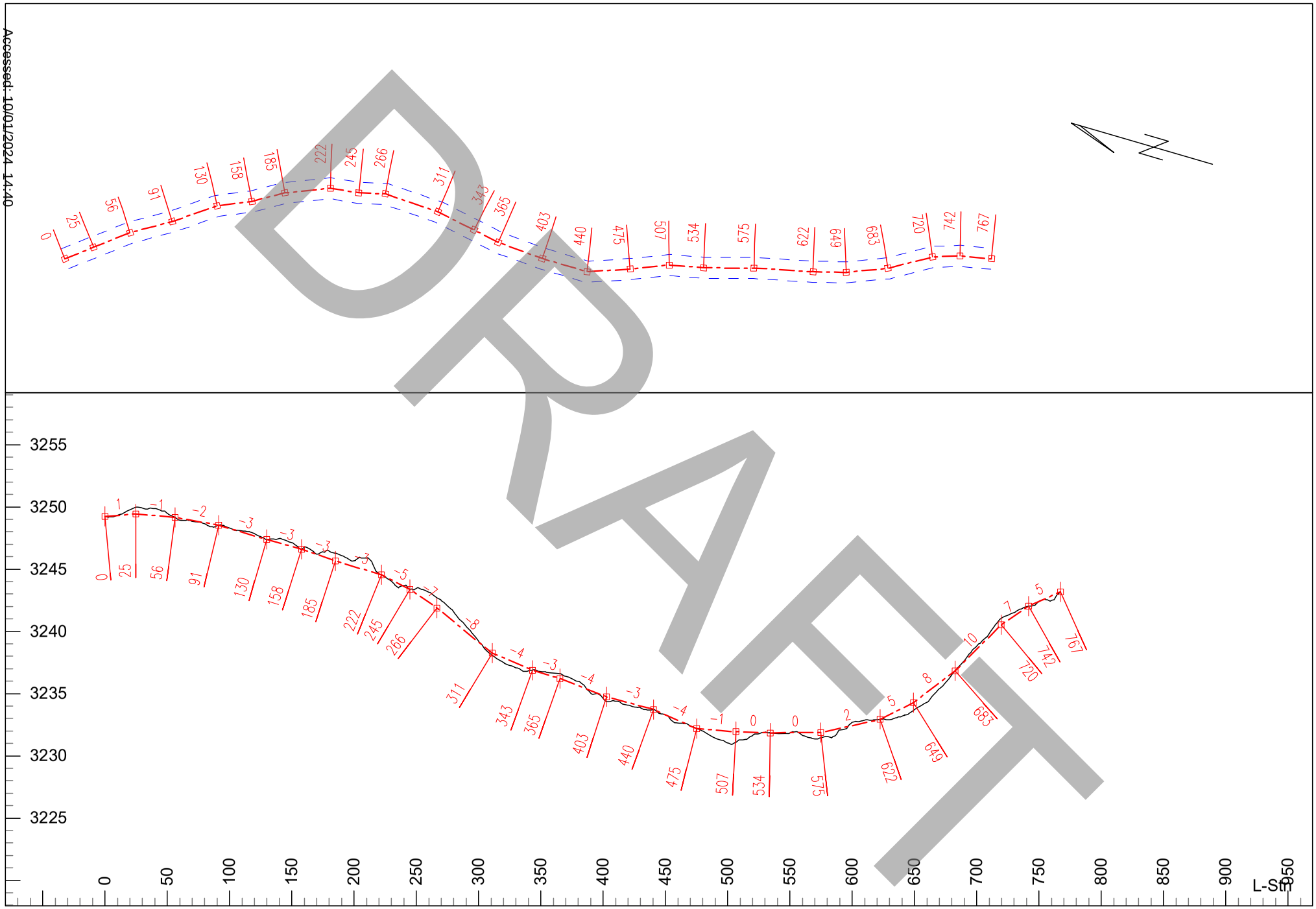
P-Stn : 868.8 H. Offset: 0.0 Cut Dp: -1.2
L-Stn : 865.6 V.Offset: 1.2 Index: 321



P-Stn : 920.3 H. Offset: 0.0 Cut Dp: 0.6
L-Stn : 917.1 V.Offset: -0.6 Index: 322



P-Stn : 974.2 H. Offset: 0.0 Cut Dp: 0.0
L-Stn : 971.1 V.Offset: 0.0 Index: 323



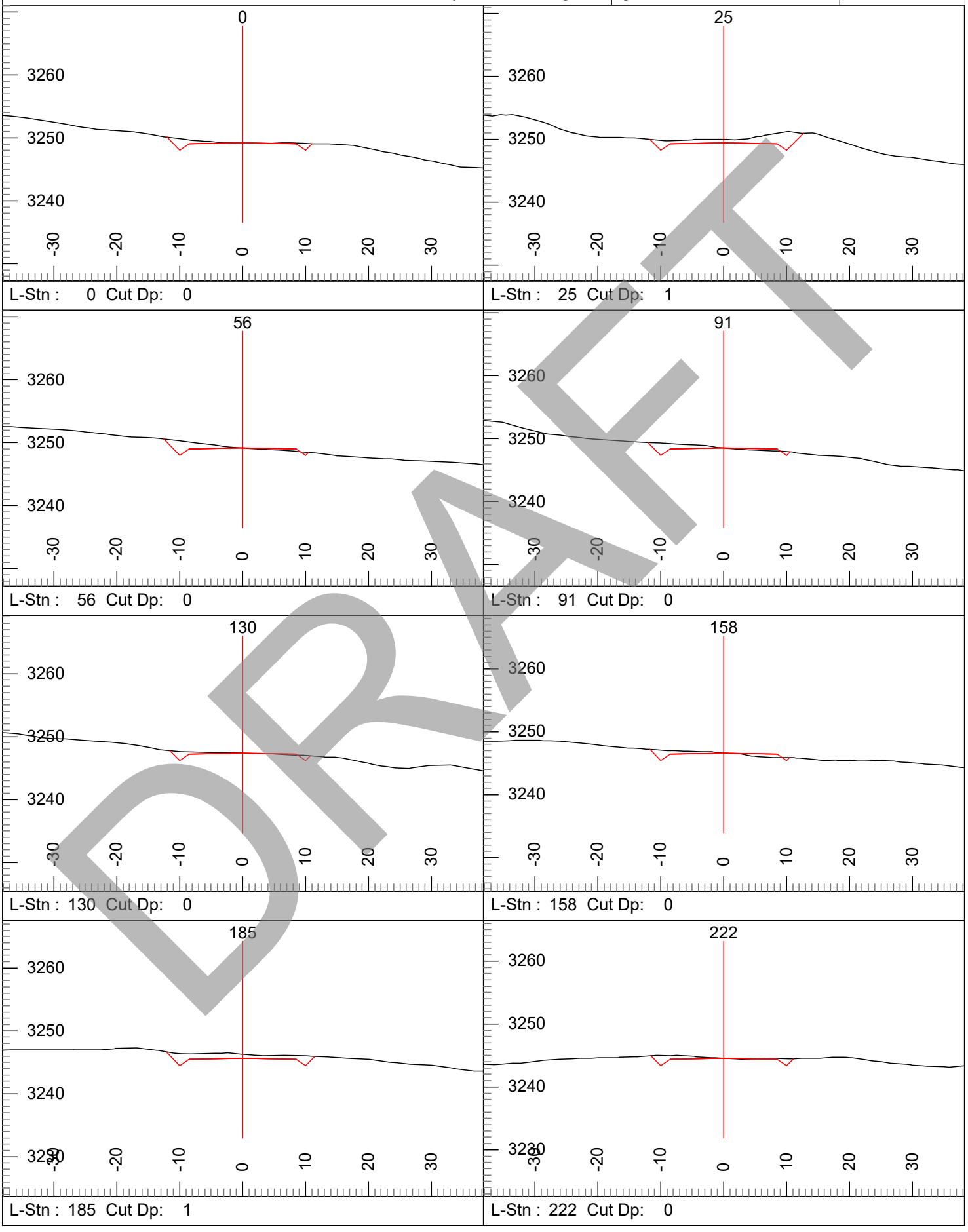
Sylvan Pearl Timber Sale
5477 Ext
Contract #: 30-103620
Remote design using LiDAR data

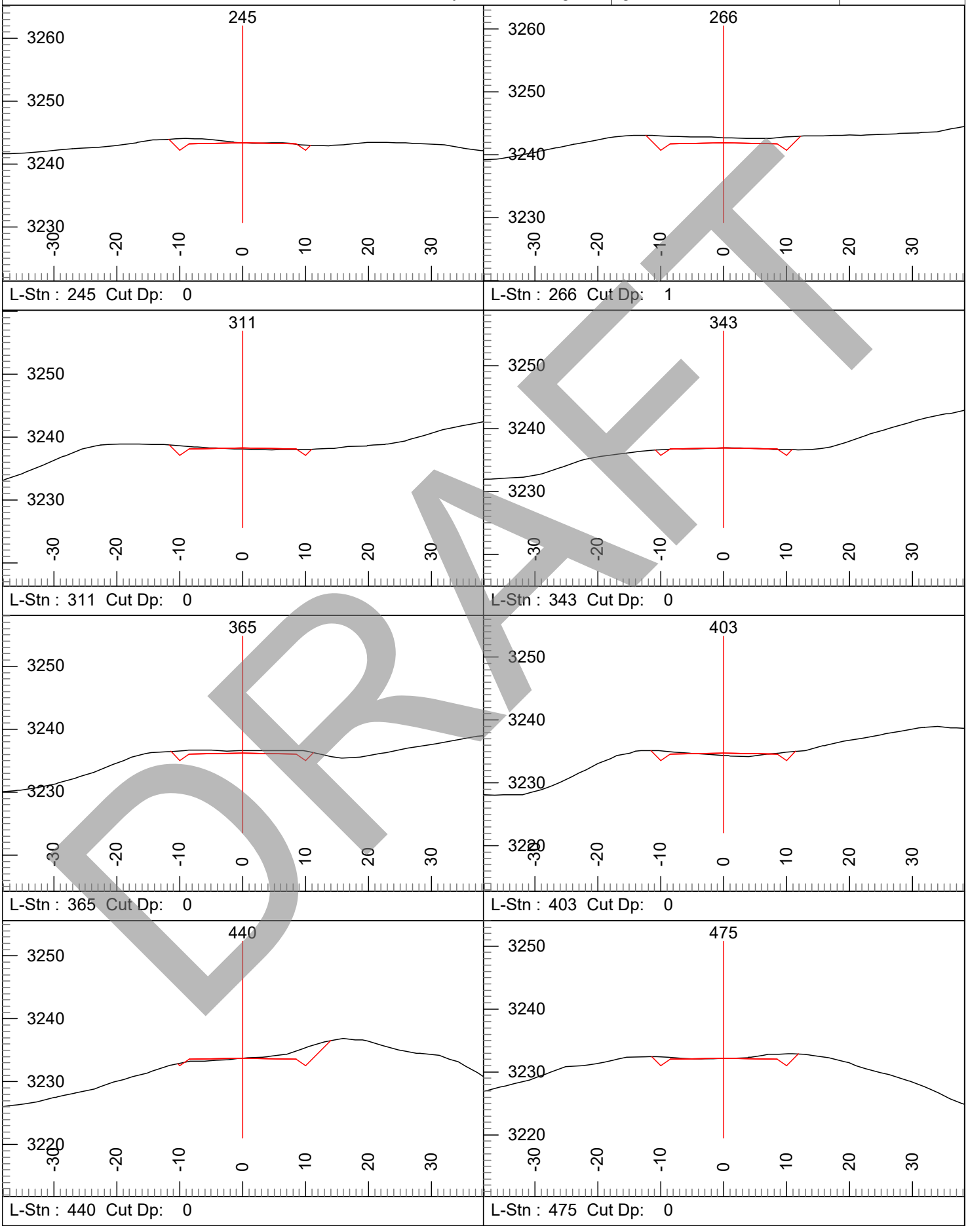
WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

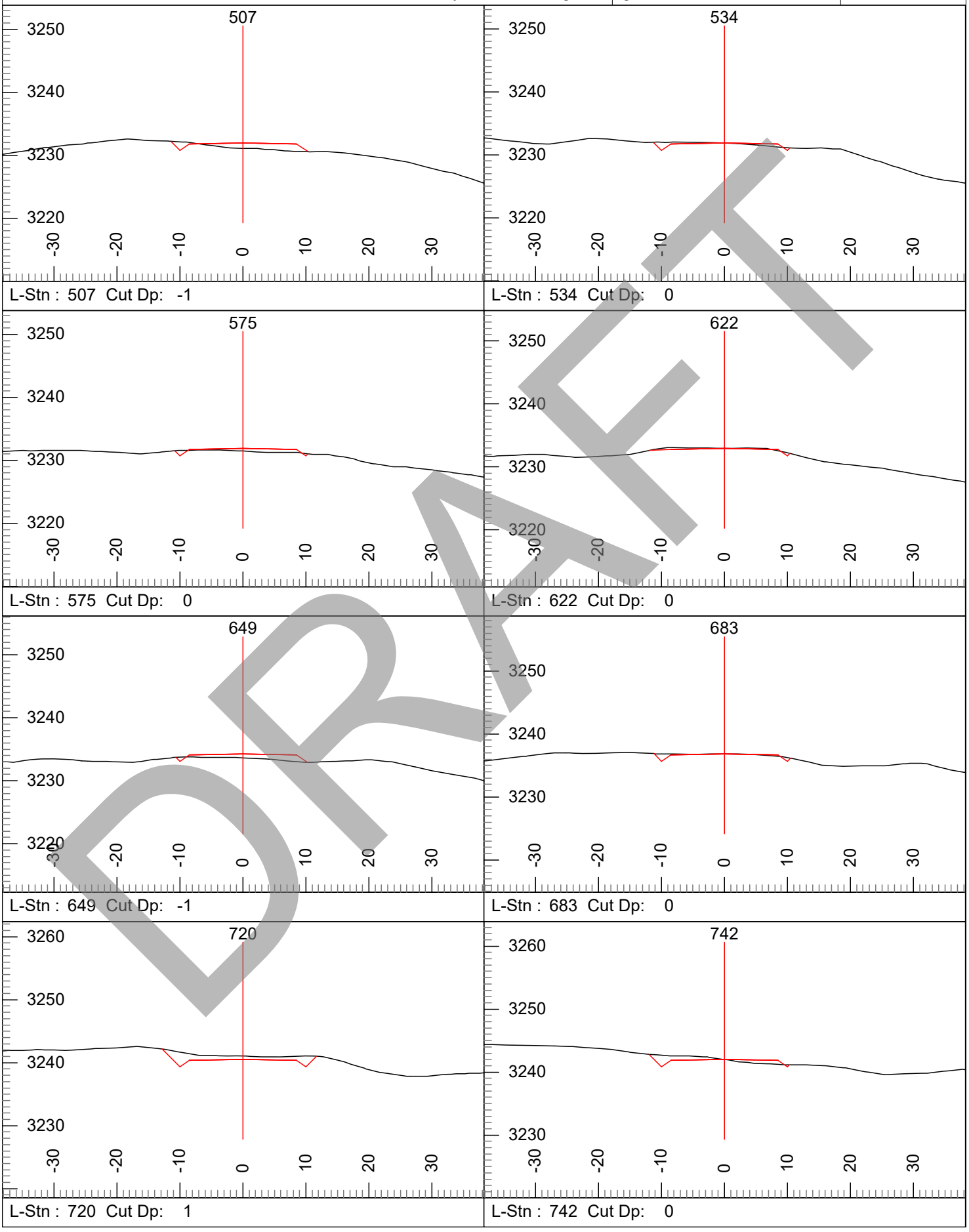
Plan Scale 1:1200
Profile Vert Scale 1:120
Profile Horz Scale 1:1200

Engineer: J. Gardner
23/08/18

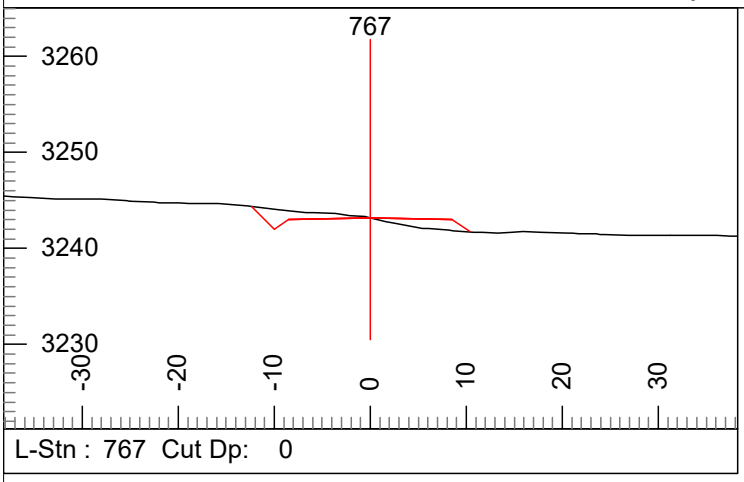
Softree Section	Scale 1:240	P. 1
J:\SHARED\TimberSales\Black Diamond\NORTH FORK\Sylvan Pearl\Engineering\RoadENG\5477Ext		23/08/18

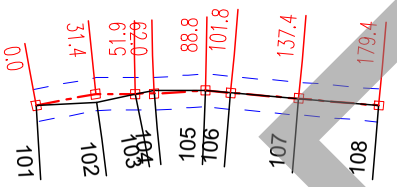


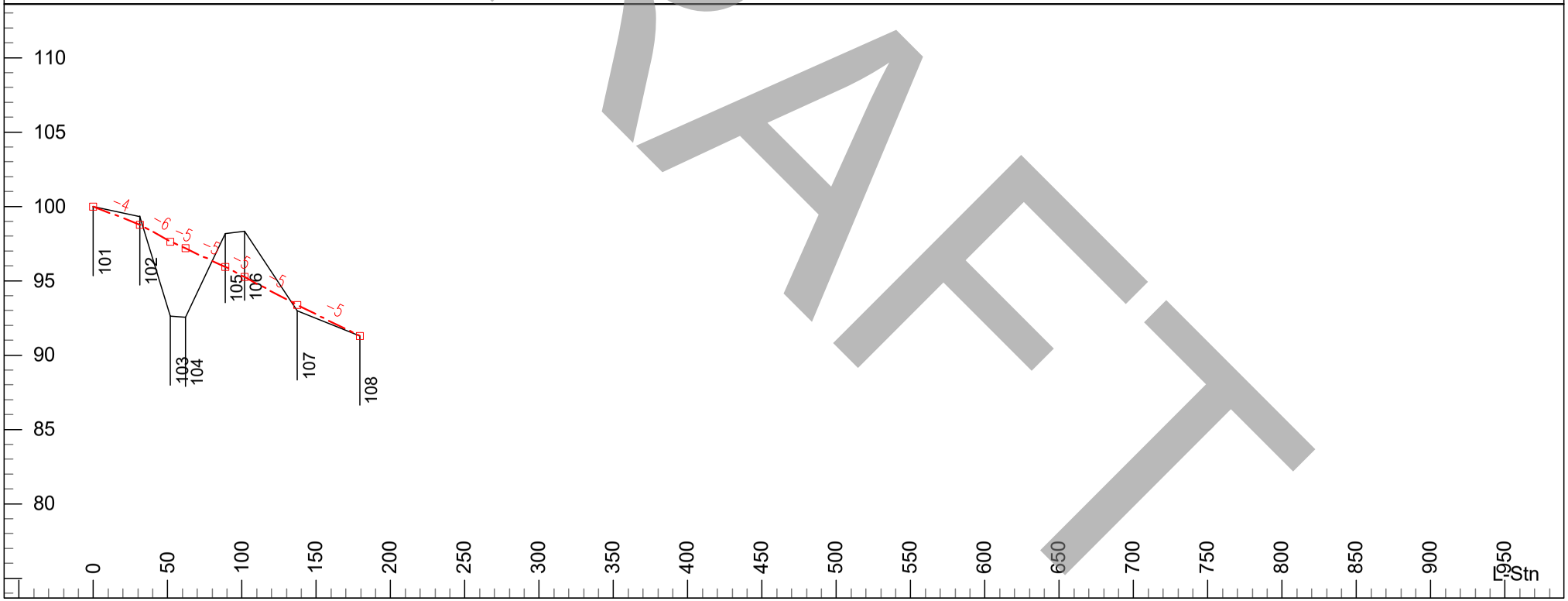

245
3260
3250
3240
3230
-30 -20 -10 0 10 20 30
L-Stn : 245 Cut Dp: 0
266
3260
3250
3240
3230
-30 -20 -10 0 10 20 30
L-Stn : 266 Cut Dp: 1
311
3250
3240
3230
-30 -20 -10 0 10 20 30
L-Stn : 311 Cut Dp: 0
343
3250
3240
3230
-30 -20 -10 0 10 20 30
L-Stn : 343 Cut Dp: 0
365
3250
3240
3230
-30 -20 -10 0 10 20 30
L-Stn : 365 Cut Dp: 0
403
3250
3240
3230
3220
-30 -20 -10 0 10 20 30
L-Stn : 403 Cut Dp: 0
440
3250
3240
3230
3220
-30 -20 -10 0 10 20 30
L-Stn : 440 Cut Dp: 0
475
3250
3240
3230
3220
-30 -20 -10 0 10 20 30
L-Stn : 475 Cut Dp: 0


507
534
575
622
649
683
720
742
3250
3240
3230
3220
3260
-30
-20
-10
0
10
20
30
L-Stn : 507 Cut Dp: -1
L-Stn : 534 Cut Dp: 0
L-Stn : 575 Cut Dp: 0
L-Stn : 622 Cut Dp: 0
L-Stn : 649 Cut Dp: -1
L-Stn : 683 Cut Dp: 0
L-Stn : 720 Cut Dp: 1
L-Stn : 742 Cut Dp: 0

Softree Section	Scale 1:240	P. 4
J:\SHARED\TimberSales\Black Diamond\NORTH FORK\Sylvan Pearl\Engineering\RoadENG\5477Ext		23/08/18





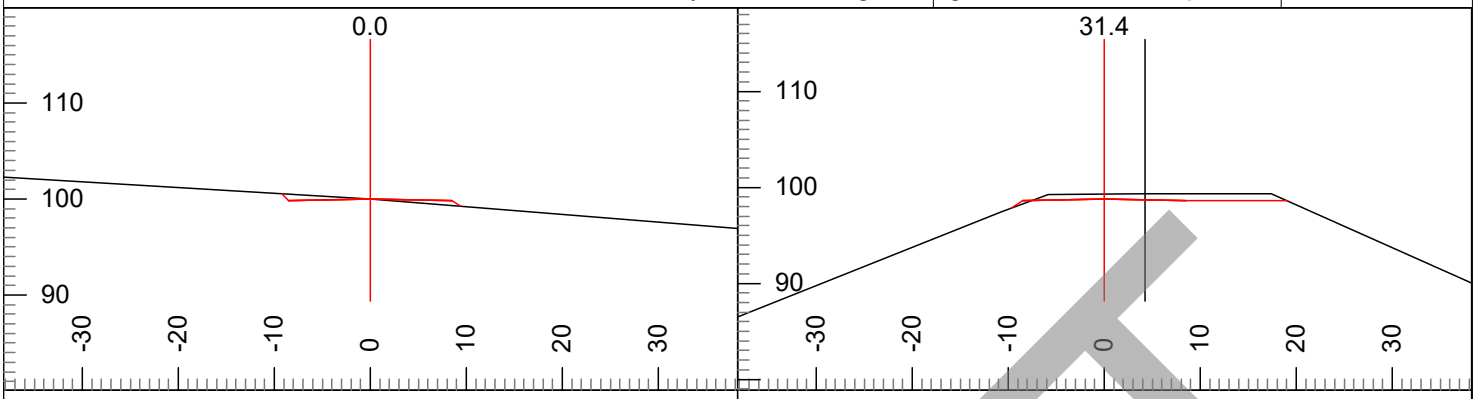


Sylvan Pearl Timber Sale
Unit 1 Spur
Contract #: 30-103620

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

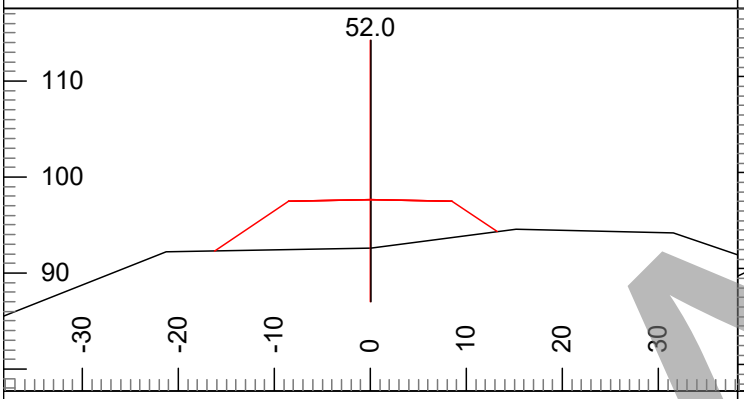
Plan Scale 1:1200
Profile Vert Scale 1:120
Profile Horz Scale 1:1200

Engineer: J. Gardner
23/08/18

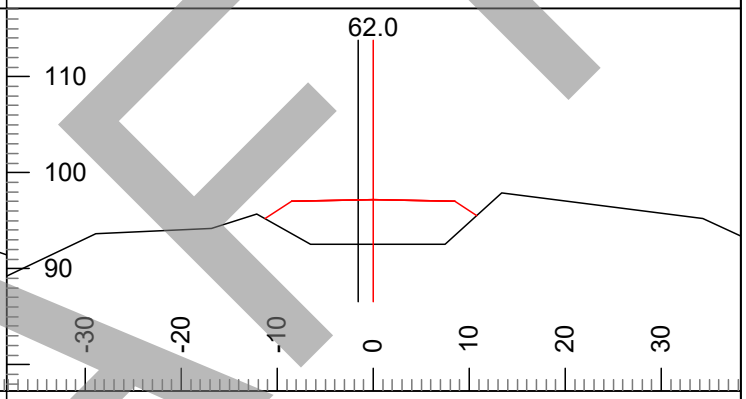


P-Stn : 0.0 H. Offset: 0.0 Cut Dp: 0.0
L-Stn : 0.0 V.Offset: 0.0 Index: 101

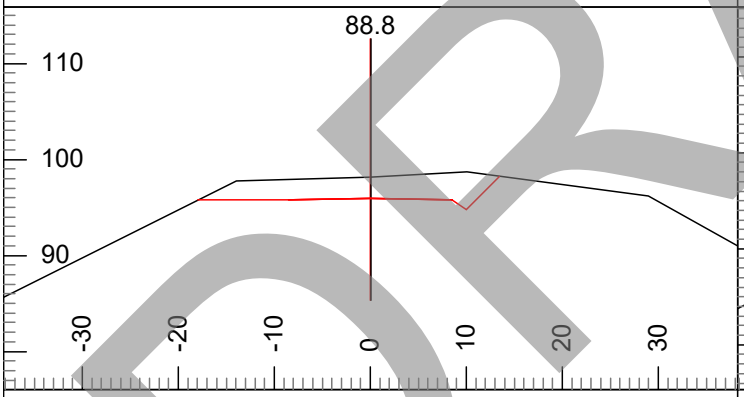
P-Stn : 31.5 H. Offset: -4.2 Cut Dp: 0.5
L-Stn : 31.4 V.Offset: -0.6 Index: 102



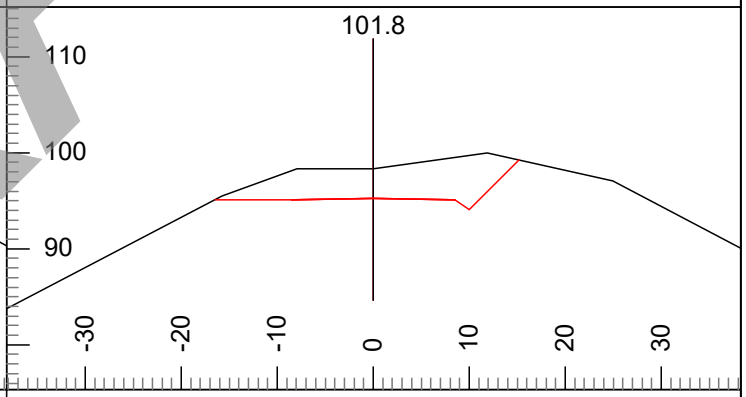
P-Stn : 51.9 H. Offset: -0.1 Cut Dp: -5.0
L-Stn : 52.0 V.Offset: 5.0 Index: 103



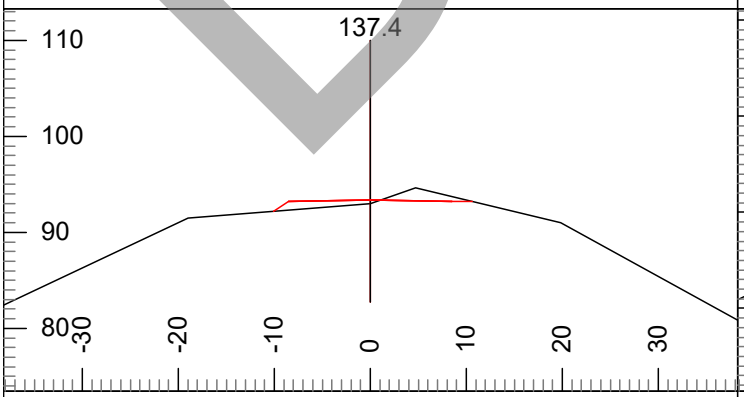
P-Stn : 61.9 H. Offset: 1.6 Cut Dp: -4.6
L-Stn : 62.0 V.Offset: 4.6 Index: 104



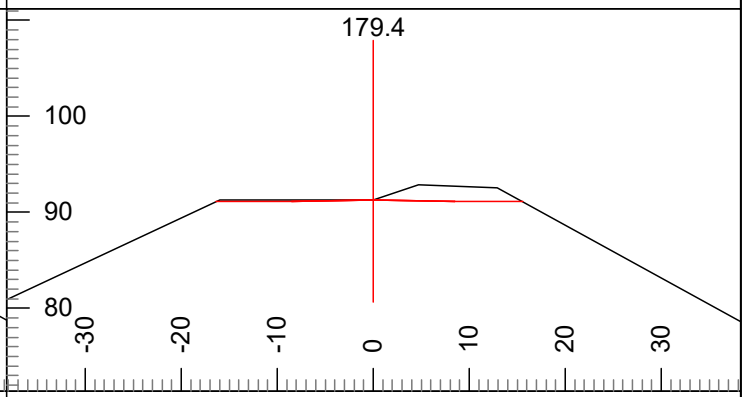
P-Stn : 88.8 H. Offset: -0.1 Cut Dp: 2.2
L-Stn : 88.8 V.Offset: -2.2 Index: 105



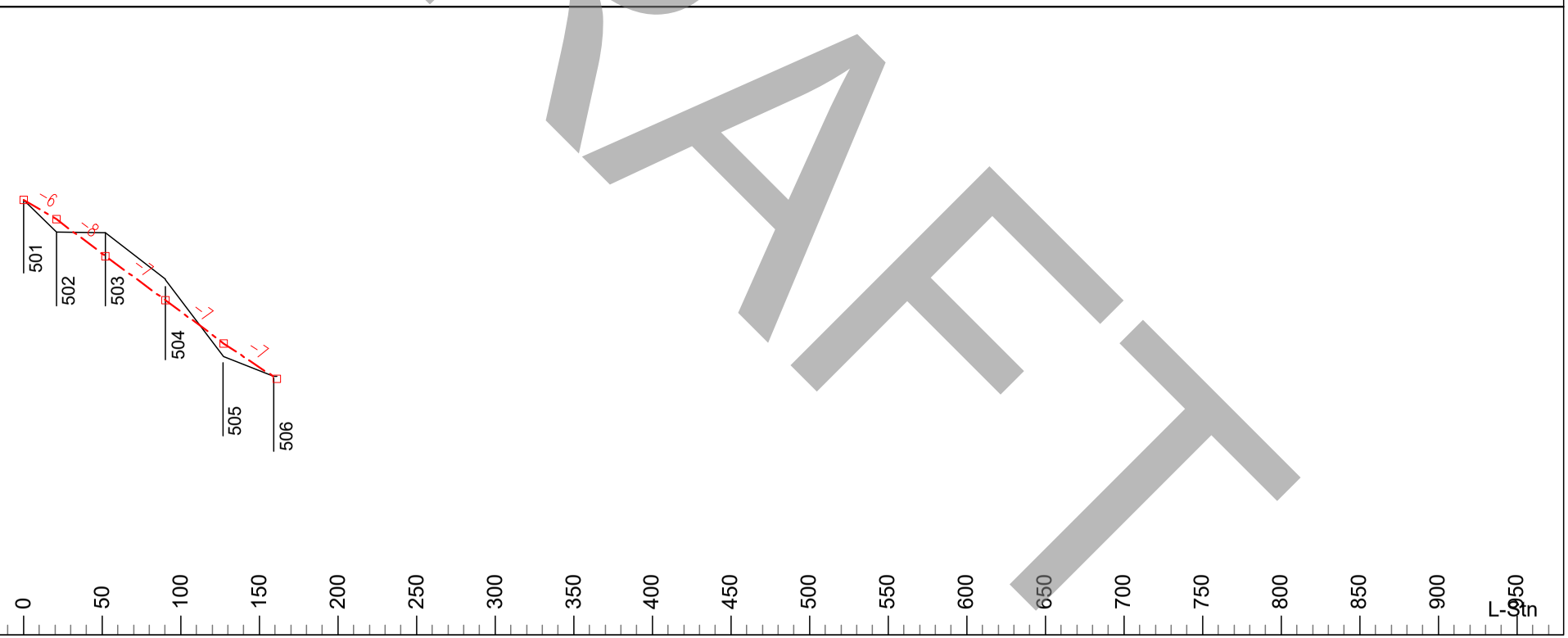
P-Stn : 101.8 H. Offset: 0.0 Cut Dp: 3.1
L-Stn : 101.8 V.Offset: -3.1 Index: 106

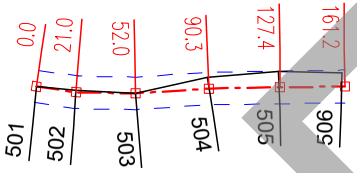


P-Stn : 137.4 H. Offset: 0.0 Cut Dp: -0.4
L-Stn : 137.4 V.Offset: 0.4 Index: 107



P-Stn : 179.4 H. Offset: 0.0 Cut Dp: 0.0
L-Stn : 179.4 V.Offset: 0.0 Index: 108





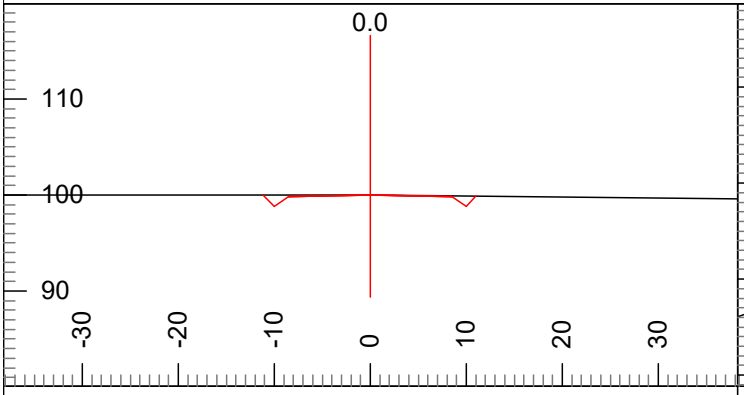
Sylvan Pearl Timber Sale
Spur 7 Spur
Contract #: 30-103620

WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

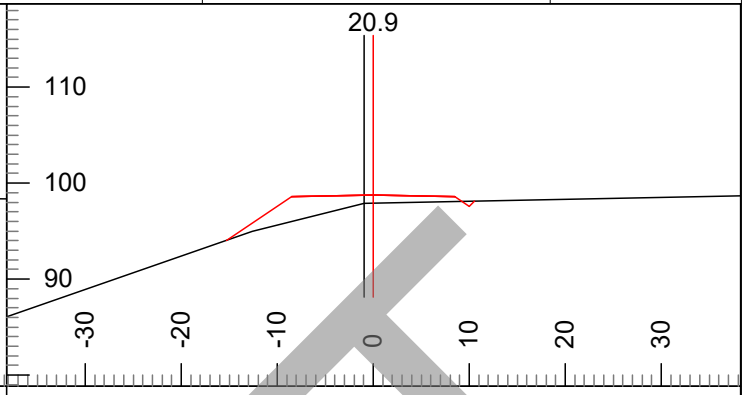
Plan Scale 1:1200
Profile Vert Scale 1:120
Profile Horz Scale 1:1200

Engineer: J. Gardner
23/08/18

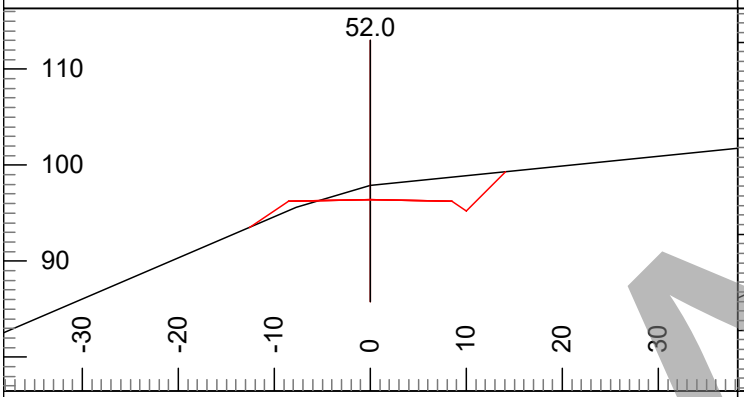
Softree Section	Scale 1:240	P. 1
J:\SHARED\TimberSales\Black Diamond\NORTH FORK\Sylvan Pearl\Engineering\RoadENG\Unit 7 Spur		23/08/18



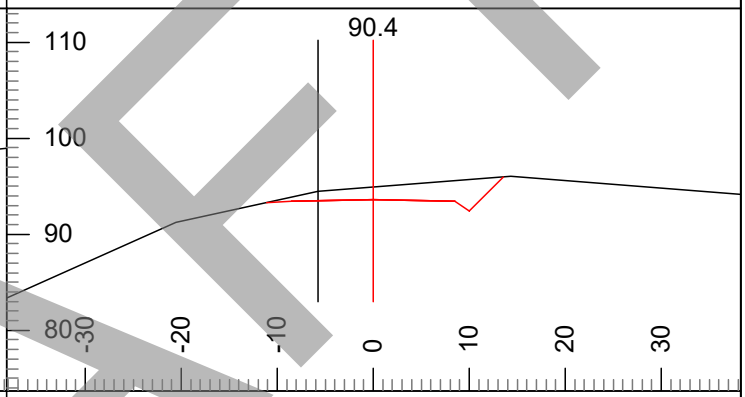
P-Stn : 0.0 H. Offset: 0.0 Cut Dp: 0.0
L-Stn : 0.0 V.Offset: 0.0 Index: 501



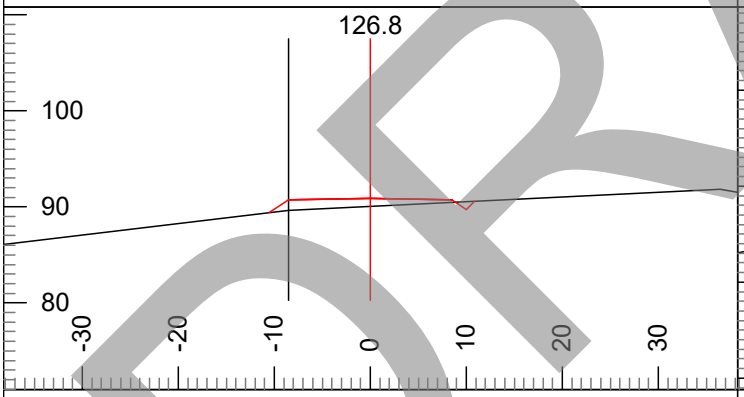
P-Stn : 20.9 H. Offset: 0.9 Cut Dp: -0.8
L-Stn : 20.9 V.Offset: 0.8 Index: 502



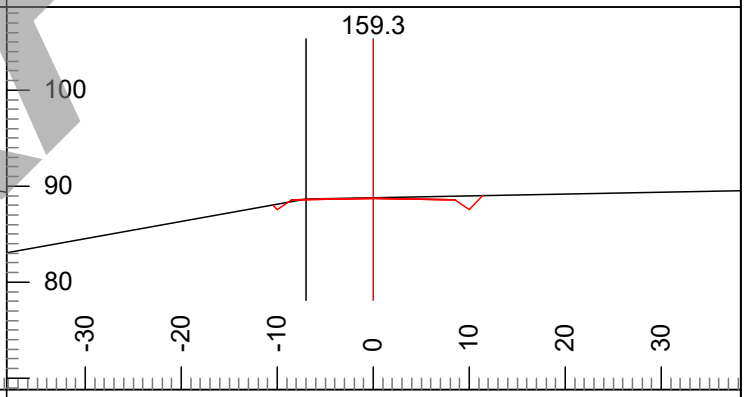
P-Stn : 51.9 H. Offset: 0.0 Cut Dp: 1.5
L-Stn : 52.0 V.Offset: -1.5 Index: 503



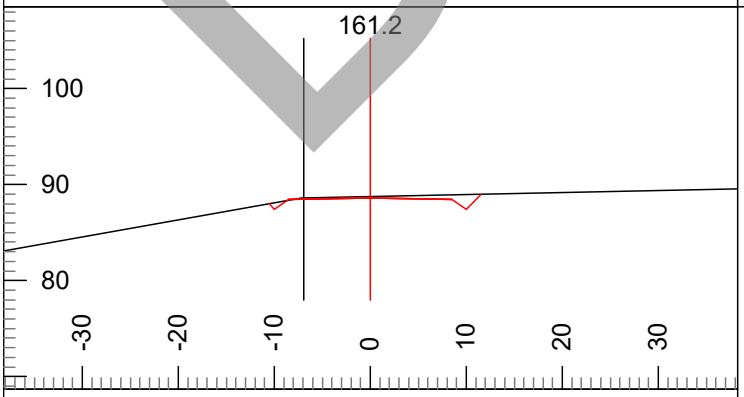
P-Stn : 90.2 H. Offset: 5.7 Cut Dp: 1.3
L-Stn : 90.4 V.Offset: -0.9 Index: 504



P-Stn : 127.4 H. Offset: 8.5 Cut Dp: -0.8
L-Stn : 126.8 V.Offset: 1.3 Index: 505



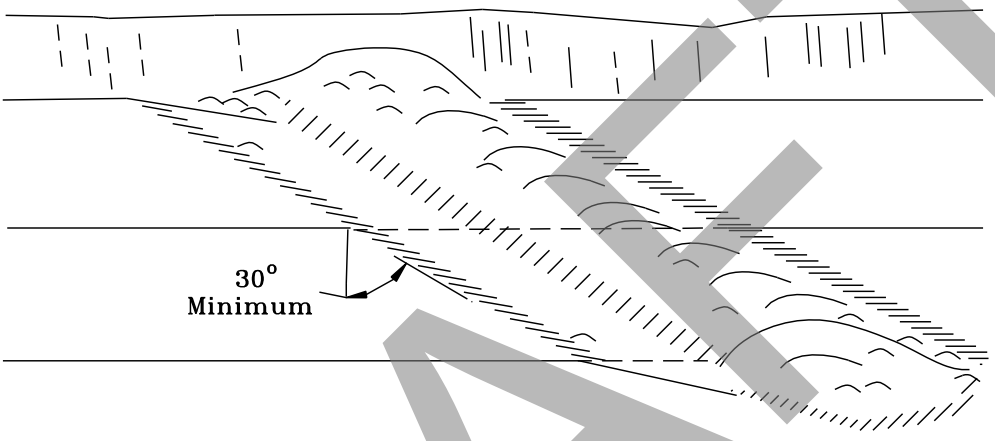
P-Stn : 160.4 H. Offset: 7.0 Cut Dp: 0.0
L-Stn : 159.3 V.Offset: 0.1 Index: 506



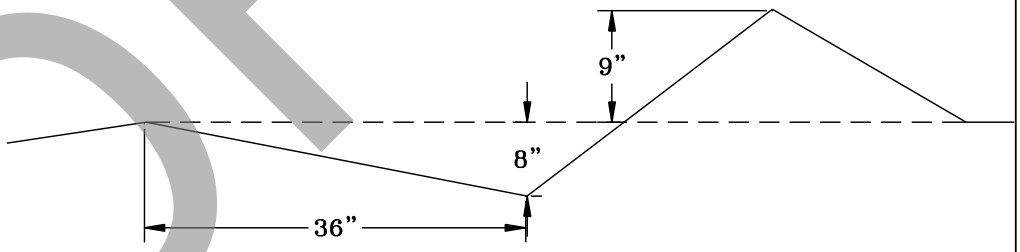
P-Stn : 160.4 H. Offset: 7.2 Cut Dp: 0.2
L-Stn : 161.2 V.Offset: 0.0 Index:

Drivable Water Bar Detail

Cross Ditch



Cross Section at Centerline

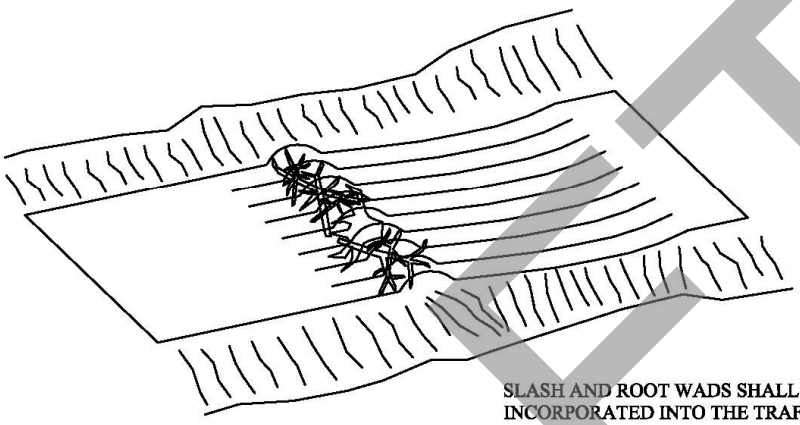


Date:
Scale : None
App#
Drawn by: M.A.D.

Water Bar Detail

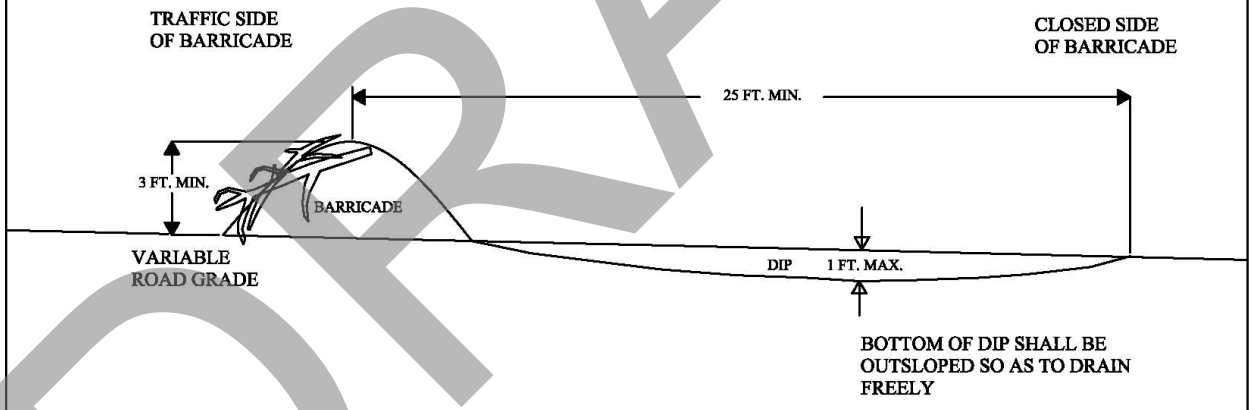
WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES
SPS REGION

BARRICADE DETAIL



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

PLAN VIEW

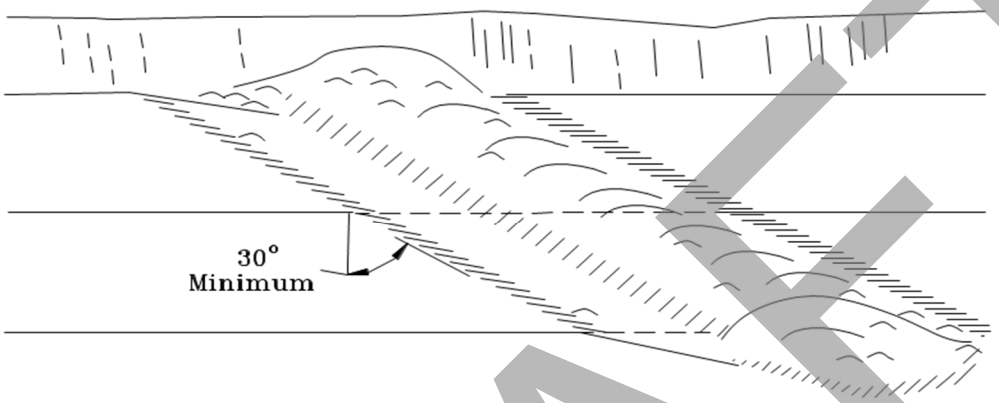


BOTTOM OF DIP SHALL BE OUTSLOPED SO AS TO DRAIN FREELY

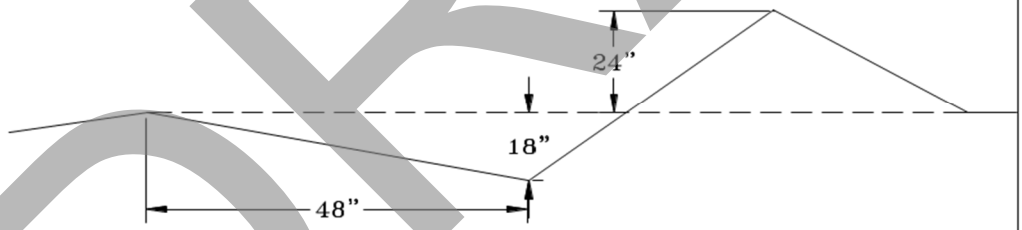
PROFILE VIEW

Non-Drivable Water Bar Detail

Cross Ditch



Cross Section at Centerline

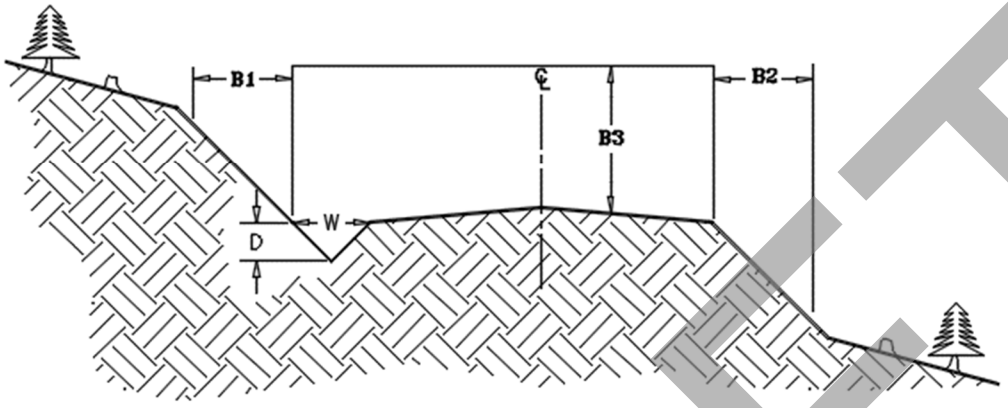


Date:
Scale : None
App#
Drawn by: M.A.D.

Water Bar Detail
WASHINGTON STATE DEPARTMENT OF Natural Resources

BRUSHING DETAIL

(not to scale)



BRUSHING LIST

Road Number	Stations	Road Width (feet)	Ditch		Brushing Limits (feet)			Remarks
			Width (feet)	Depth (feet)				In addition to brushing…
			W	D	B1	B2	B3	
5470 Alt	0+00 to 16+90	variable	3	1	5	5	14	Remove brush an extra 16 feet on the inside of curves to provide extra visibility on switchbacks and curves
5477	26+25 to 32+65	variable	3	1	5	5	14	
5477-4	0+00 to 1+75	variable	3	1	5	5	14	

B1 extends horizontally the specified distance in feet from the back of the ditch. B2 extends horizontally the specified distance in feet from the outside edge of the running surface. Brush is defined as all non-merchantable vegetative material found within the specified limits. Brush must be cut to a height of 3 inches above the ground. Brush that is cut shall be removed to the downhill side of the road and placed such that it will not block ditches, ditch-outs, or drainage structures. Signs, culverts, culvert location markers, or any other identification features damaged by brushing shall be replaced at the Purchasers expense.

Load N Go Pit
Rock Source Development Plan
SE ¼ NW ¼ Sec. 20 T21R09E

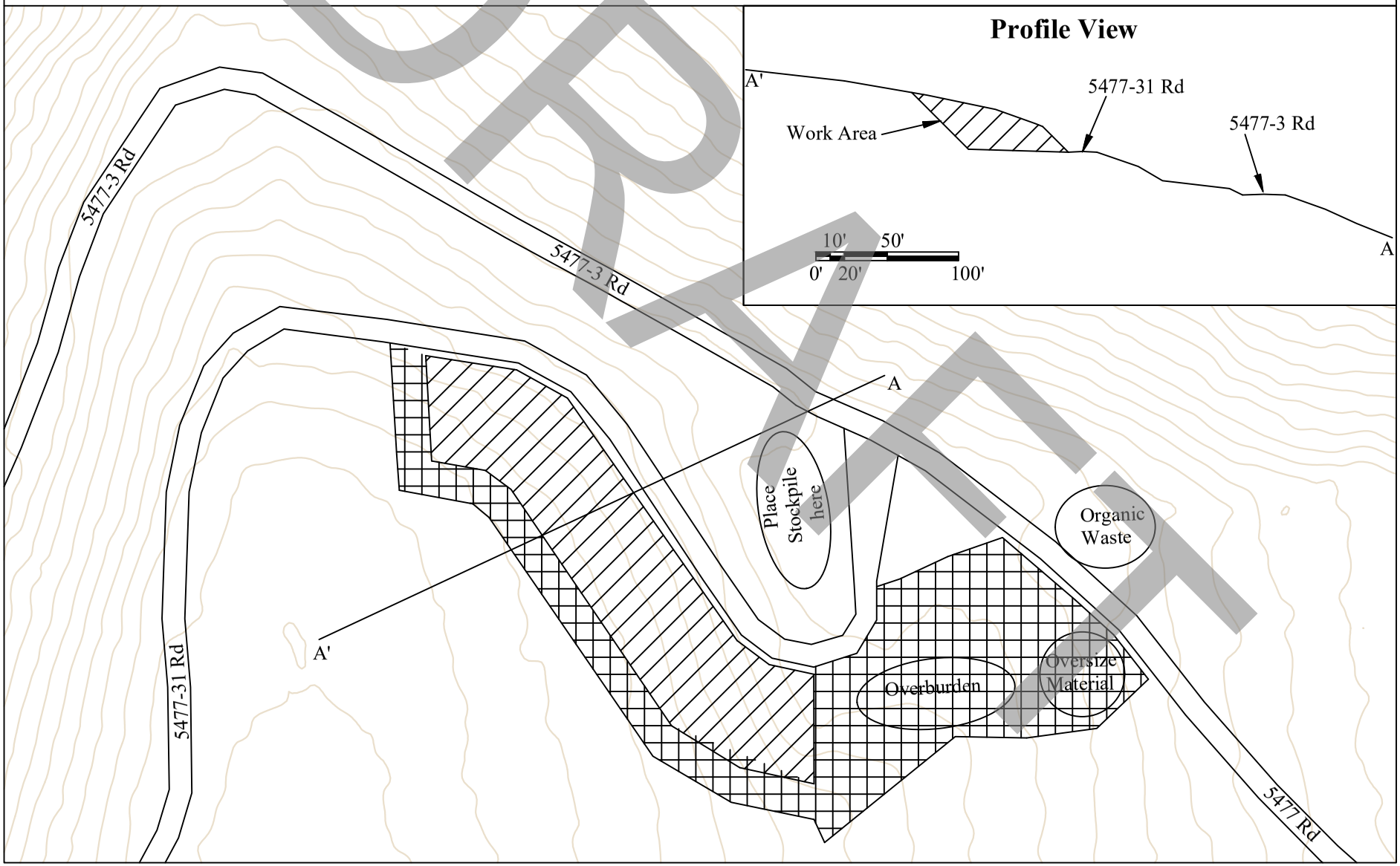
20' 100' 250'
0' 50' 150'

10' Contours

Area to Clear and Grub

Working Area

Drawn By: J. Gardner
August 15, 2018



LOAD N GO PIT DEVELOPMENT PLAN
SE ¼, NW ¼, Section 20, Township 21 North, Range 09 East, W.M.

1. All vegetation including stumps shall be cleared a minimum of 25 feet beyond the top of all working faces and piled as shown on drawing.

2. All dirt shall be stripped for a minimum of 25 feet from working faces.

3. Quarry faces shall not have a slope steeper than 1/4(H):1(V).

4. The width of the pit benches shall be a minimum of 1.5 times the maximum length of the largest machine used.

5. The surface of the pit floors and benches shall be uniform and free-draining at a minimum 2% outslope gradient. No ponding will be allowed.

6. Oversized material remaining in the rock source at the conclusion of the timber sale may not exceed 10% of the total volume mined in that source. Oversize material is defined as rock fragments larger than two feet in any direction. Oversize material will be piled as shown on drawing.

7. At the end of operations, pit faces and walls shall be scaled and cleared of loose and overhanging material. No pit face shall be more than 30 vertical feet tall.

8. At the end of operations, the Load N Go Pit Road shall be left in a condition that allows highway vehicle access through the pit area.

9. 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.

10. At the completion of rock source operations, Purchaser shall ask Contract Administrator for written approval of final rock source condition and compliance with the terms of this plan.

11. Upon completion of rock source operations, the quarry site shall be cleared of temporary structures, equipment and rubbish and left in a neat and presentable condition.

12. Quantity and Quality of rock is not guaranteed by the State.

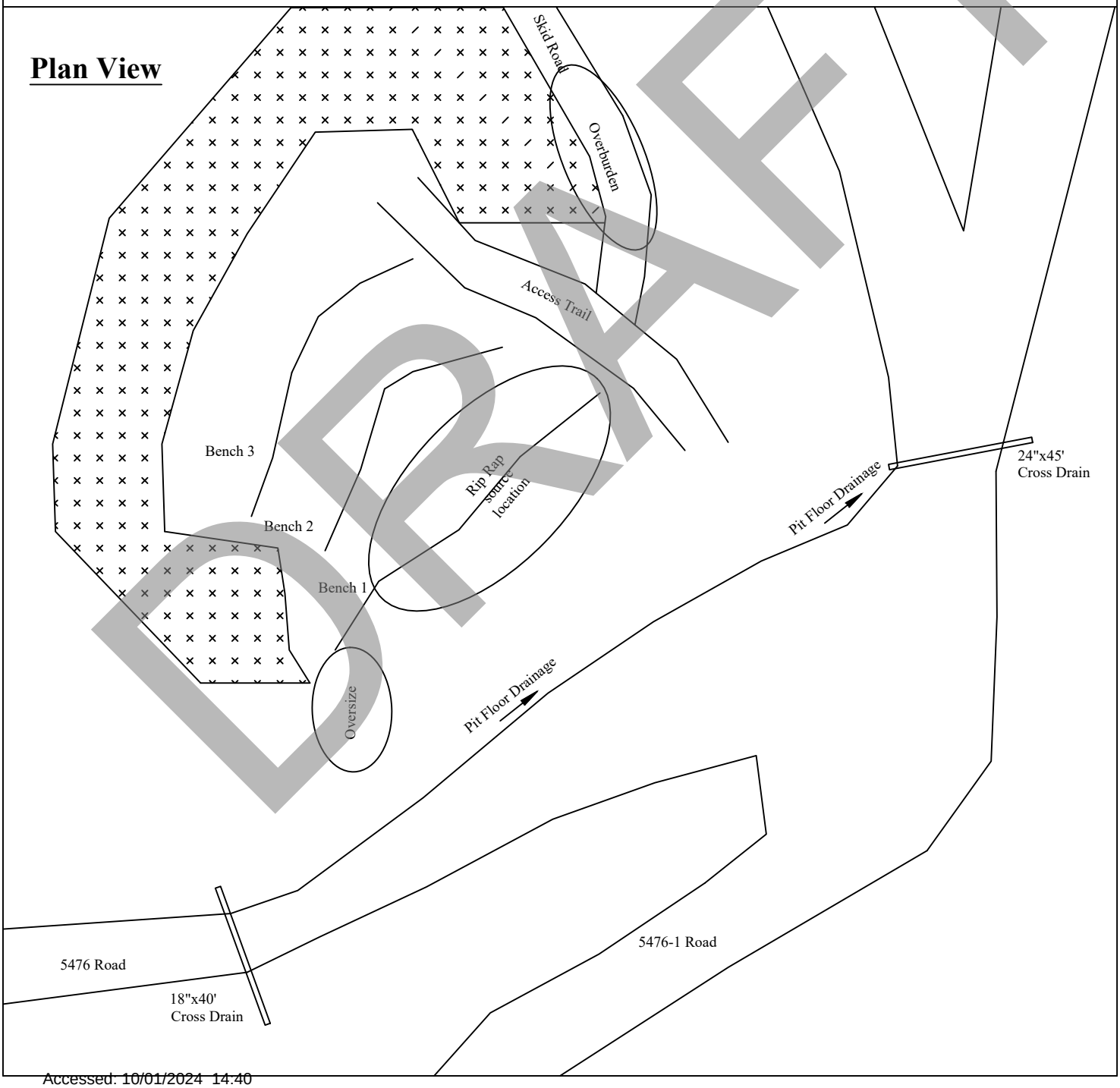
Fir Sure Pit
Rock Source Development Plan
NW ¼ SE ¼ Sec. 20 T21R09E

= Cleared and Grubbed Area.

0' 10' 30' 100'
5' 20' 50'

Drawn By: J. Gardner
August 18, 2023

Plan View



FIR SURE PIT DEVELOPMENT PLAN
NW ¼, SE ¼, Section 20, Township 21 North, Range 09 East, W.M.

1. Light Loose Rip Rap may be developed from pit floor to the top of Bench 2, by picking through existing loose pit run material.

2. Quarry faces shall not have a slope steeper than 1/4(H):1(V).

3. The width of the pit benches shall be a minimum of 1.5 times the maximum length of the largest machine used.

4. The surface of the pit floors and benches shall be uniform and free-draining at a minimum 2% outslope gradient. No ponding will be allowed.

5. Oversized material remaining in the rock source at the conclusion of the timber sale may not exceed 10% of the total volume mined in that source. Oversize material is defined as rock fragments larger than two feet in any direction. Oversize material will be piled as shown on drawing.

6. At the end of operations, pit faces and walls shall be scaled and cleared of loose and overhanging material.

7. At the end of operations, the 5476 Road shall be left in a condition that allows highway vehicle access through the pit area.

8. 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.

9. At the completion of rock source operations, Purchaser shall ask Contract Administrator for written approval of final rock source condition and compliance with the terms of this plan.

10. Upon completion of rock source operations, the quarry site shall be cleared of temporary structures, equipment and rubbish and left in a neat and presentable condition.

11. Quantity and Quality of rock is not guaranteed by the State.

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: Black Diamond

SALE/PROJECT NAME: Sylvan Pearl CONTRACT NUMBER: 30-103620

LEGAL DESCRIPTION: Sects 19,20,29&30 T21R09E, Sects 18,19,20,21,22,23,25,26,27&28 T21R08E

ROAD NUMBER:	5476-1,5476-3,5477Ext,Unit 1 Spur,Unit 7 Spur		na	5500,5470,5470-5,5474,5476,5477,5477-3,5477-4
ROAD STANDARD:		Construction	Reconstruction	Pre-haul maintenance
NUMBER OF STATIONS:		44.64	0.00	716.25
SIDESLOPE:		0-50%	na	0-70%
CLEARING AND GRUBBING:		$6,584	$0	
EXCAVATION AND FILL:		$24,366	$0	
MISC. MAINTENANCE:				$3,692
ROCK TOTALS (Cu. Yds.):				
1.25" Minus	258	$0	$0	$6,589
2" Minus	3677	$0	$0	$35,962
4" In-Place	677	$6,032	$0	$0
RipRap/QS	93	$567	$0	$2,198
Landing Rock	4,000	$55,241		
CULVERTS AND FLUMES:		$5,009	$0	$11,686
STRUCTURES:		$0	$0	$0
GENERAL EXPENSES:		$7,824	$0	$5,411
MOBILIZATION:		$8,225	$0	$8,225
TOTAL COSTS:		$113,847	$0	$73,763
COST PER STATION:		$2,550	$0	$103

POST HAUL COSTS: $15,590

NOTE[1]: This appraisal has no allowance for profit and risk.

TOTAL (All Roads) = $203,200

SALE VOLUME MBF = 6,251

TOTAL COST PER MBF = $32.51

Date: 09/01/23