WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

TIMBER NOTICE OF SALE

***SALE NAME**: VW* ***AGREEMENT NO**: 30-103511*

AUCTION: December 18, 2024 starting at 10:00 a.m., Northwest Region Office, Sedro Woolley, WA **COUNTY:** Snohomish

SALE LOCATION: Sale located approximately 10 miles southeast of Granite Falls, WA.

PRODUCTS SOLD AND SALE AREA: All timber bounded by white timber sale boundary tags and adjacent young stands, except cedar salvage (cedar snags, preexisting dead and down cedar trees and cedar logs), trees marked with blue paint on the bole and root collar, and forest products tagged out by yellow leave tree area tags in Units #1, #2 and #3.

All timber bounded by white timber sale boundary tags, except cedar salvage (cedar snags, preexisting dead and down cedar trees and cedar logs), trees marked with blue paint on the bole and root collar, and forest products tagged out by yellow leave tree area tags in Unit #4.

All timber bounded by orange right-of-way tags, except that title to the timber within the right-of-way associated with areas of road construction (located outside of units) is not conveyed to the Purchaser unless the road segment is actually constructed.

All forest products above located on part(s) of Sections 6 all in Township 29 North, Range 8 East, Sections 31 all in Township 30 North, Range 8 East, Sections 36 all in Township 30 North, Range 7 East, W.M., containing 82 acres, more or less.

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

ESTIMATED SALE VOLUMES AND QUALITY:

	Avg	Ring	Total	MBF by Grade								
Species	DBH	Count	MBF	1P	2P	3P	SM	1S	2S	3S	4S	UT
Hemlock	18.1		3,939						2,311	1,236	248	144
Silver fir	21.9		88						59	25	4	
Douglas fir	27	10	55				11		39	5		
Cottonwood	14.7		38						31		7	
Redcedar	29.4		38							36	2	
Red alder	10.4		10								7	3
Maple	37		5						5			
Sale Total			4,173									

MINIMUM BID: $693,000.00 **BID METHOD:** Sealed Bids

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

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

BID DEPOSIT: $69,300.00 or Bid Bond. Said deposit shall constitute an opening bid at the appraised price.

TIMBER NOTICE OF SALE

HARVEST METHOD: Cable OR tethered equipment (See below for restrictions); shovel or feller-buncher, on sustained slopes 35% or less; self-leveling equipment on sustained slopes 55% or less (See below for restrictions).

Prior written approval of the Contract Administrator is required before tethered or self-leveling equipment may be used. If ground disturbance is causing excessive damage, as determined by the Contract Administrator, the use of this equipment will no longer be authorized. Falling and Yarding will not be permitted from November 1 to March 31 unless authorized in writing by the Contract Administrator (THIS PERTAINS TO GROUND-BASED EQUIPMENT ONLY) to reduce soil damage and erosion.

ROADS: 72.50 stations of optional construction. 458.70 stations of required prehaul maintenance.

Rock may be obtained from the following source(s) on State land at no charge to the Purchaser: PK+3104 Pit at station 19+30 of the PK-31 Road. PK-4322-00 Pit at station 3+20 of the PK-43322 Road. PK-16 Pit at station 84+50 of the PK-ML Road.

Development of existing rock sources will involve clearing, stripping, drilling, shooting, and processing rock to generate riprap, shot rock, and 3-inch-minus ballast rock.

An estimated total quantity of rock needed for this proposal: 185 cubic yards of riprap, 2,790 cubic yards of shot rock and 5,360 cubic yards of ballast rock.

Additional restrictions apply, see Remarks section below.

Road construction, rock hauling, or abandonment will not be permitted on the PK-4605 Road from stations 0+00 to 3+00 from November 1 to March 31 AND any event that causes overland flow through the rolling dip; this will not be waived. All remaining road work and the hauling of rock will not be permitted from November 1 to March 31 unless authorized in writing by the Contract Administrator to reduce soil damage and siltation. The hauling of forest products will not be permitted from November 1 to March 31 unless authorized in writing by the Contract Administrator to reduce soil damage and siltation.

ACREAGE DETERMINATION

CRUISE METHOD: Acres determined by GPS traverse. Cruise was conducted via variable plot sample type. See Cruise Narrative for further details. Shapefiles of units are available upon request, and on the DNR website after the BNR meeting in which the sale is presented.

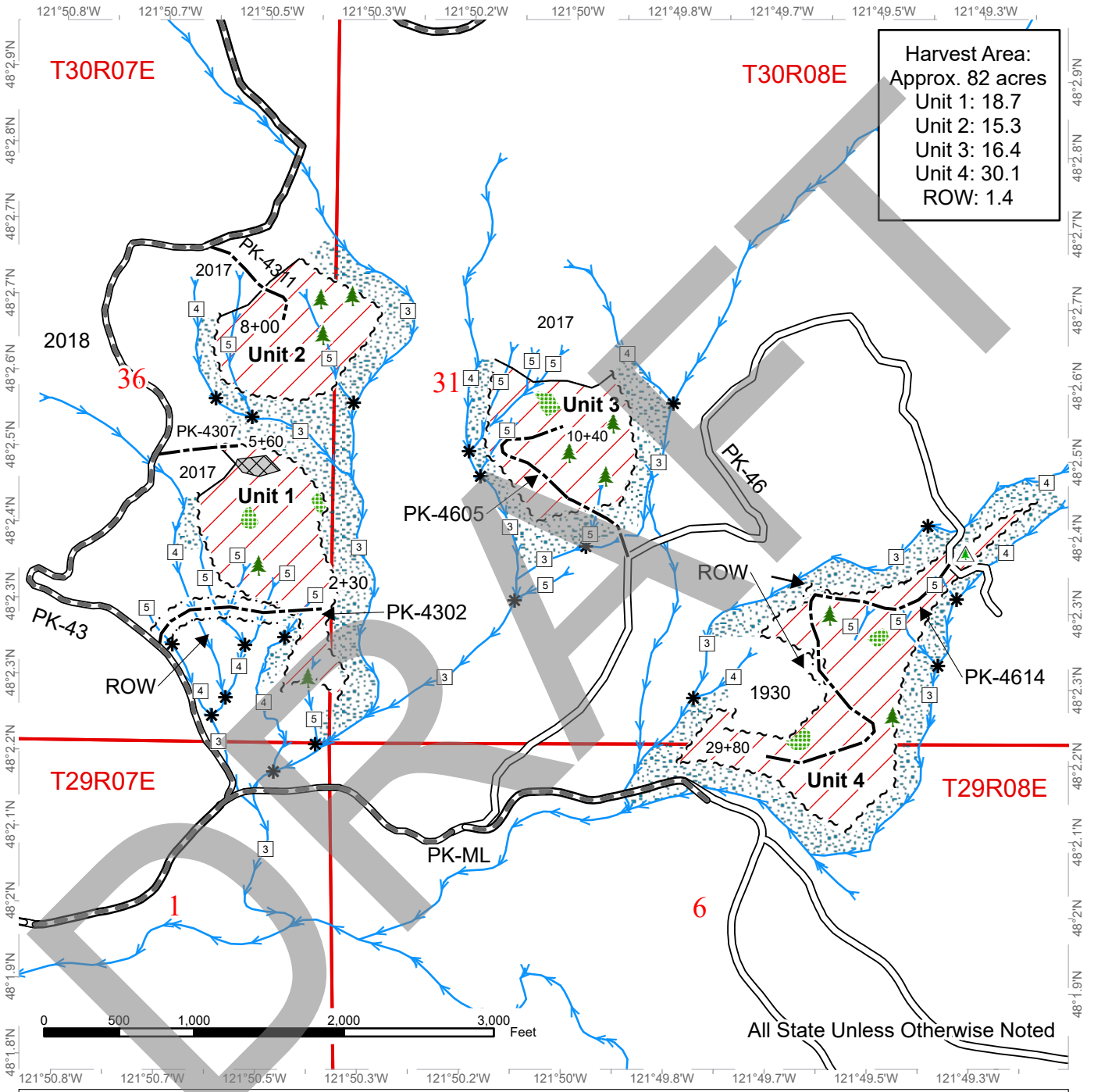
FEES: $70,941.00 is due on day of sale. $9.00 per MBF is due upon removal. These are in addition to the bid price.

SPECIAL REMARKS: 1. Road construction, rock hauling, or abandonment will not be permitted on the PK-4605 Road from stations 0+00 to 3+00 from November 1 to March 31 AND any event that causes overland flow through the rolling dip; this will not be waived.
2. HQ DF noted within the sale area. See cruise for further details.
3. Redcedar poles were noted within the sale area.

TIMBER SALE MAP

SALE NAME: VW
AGREEMENT #: 30-103511
TOWNSHIP(S): T29R8E, T30R7E, T30R8E
TRUST(S): Common School and Indemnity (3), State Forest Transfer (1)

REGION: Northwest Region
COUNTY(S): Snohomish
ELEVATION RGE: 840-1360



- Variable Retention Harvest
- Non-Tradeable Leave Clump
- Leave Tree Area
- Riparian Mgt Zone
- Sale Boundary Tags
- Right of Way Tags
- Timber Type Change
- Streams
- Existing Roads
- Required Pre-Haul Maintenance
- Optional Construction
- Stream Type
- Stream Type Break
- Leave Tree Area <1/4-acre
- Non-Tradeable Leave Trees

N

Prepared By: marm490
Accessed: 10/01/2024 14:32

Modification Date: jarm490 7/15/2024

DRIVING MAP

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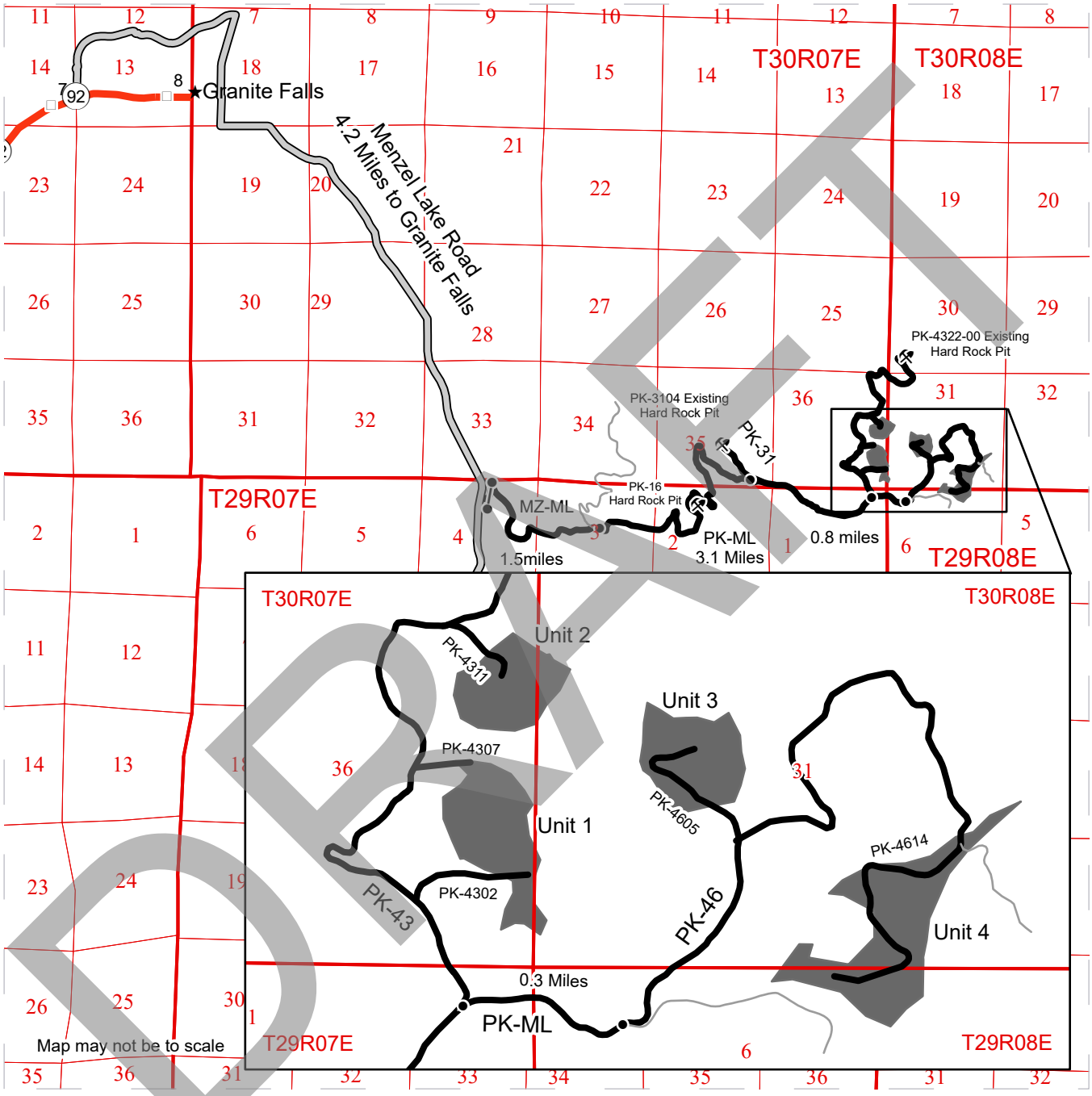


- Timber Sale Unit
- County Road
- Haul Route
- Other Road
- Highway
- Rock Pit
- Distance Indicator
- Gate (F1-3)
- Milepost Markers

DRIVING DIRECTIONS:

From Granite Falls, travel 4.2 miles south along Menzel Lake Road to the Menzel Lake Main Line/ New Pilchuck Mainline (PK-ML) where you will arrive at a gate.

From the gate, drive 1.5 miles east, staying right at the fork to continue on the PK-ML. From this junction, travel 3.1 miles east along PK-ML to the Junction of PK-31 and PK-ML. Travel along PK-ML for 0.8 miles to the junction of PK-43 and PK-ML. Turn onto the PK-43 to access Units 1 and 2. Continue 0.3 miles on the PK-ML to the PK-46 to access Units 3 and 4.

N

Prepared By: marn490
Accessed: 10/01/2024 14:32

Modification Date: jarm490 7/15/2024

Timber Sale Cruise Report
VW - NW

Sale Name: VW

Sale Type: LUMP SUM

Region: NORTHWEST

District: CASCADE

Lead Cruiser: Matt Llobet

Other Cruisers:

Cruise Narrative:
VW is located south of Granite Falls off the Pilchuck Mainline. It consists of 4 VRH units and one Right of Way. Topography is mild with a gentle gradient in most areas.

My total net cruise volume for VW is 4,173 MBF. The VW Timber Sale consists of a Western Hemlock (94%) dominant sale with scattered DF, SF, RC, and hardwoods.

Most of the timber throughout VW is uniformly stocked WH & DF in the medium-large diameter range. The majority of the volume comes from WH 2saw and 3saw domestic grade. Common defects seen throughout the sale are spike knots, sway, crooks, and frost check.

For this cruise different basal area factors were selected based on stocking levels, tree sizes, and understory conditions. Sample points were generated in GIS and located in the field using Avenza Maps. Bole height was measured with a relaskop and taken to a 5" top or break point (40% of diameter at 16 feet). Trees were segmented into appropriate west-side log lengths and breakage was estimated accordingly at each cruise plot.

VW consists of 90% ground base harvest and 10% up-hill cable harvest - with very productive operator ground.

Timber Sale Notice Volume (MBF)

				MBF Volume by Grade					
Sp	DBH	Rings/In	Age	All	Spec Mill	2 Saw	3 Saw	4 Saw	Utility
WH	18.1			3,938		2,310	1,236	248	144
SF	21.9			88		59	25	4	
DF	27.0	10.0		55	11	40	5		
BC	14.7			38		31		7	
RC	29.4			38			36	2	
RA	10.4			10				7	3
MA	37.0			5		5			
ALL	18.2	10.0		4,173	11	2,444	1,303	268	147

Timber Sale Notice Weight (tons)

	Tons by Grade					
Sp	All	Spec Mill	2 Saw	3 Saw	4 Saw	Utility
WH	30,927		17,022	10,632	2,365	908

	Tons by Grade					
Sp	All	Spec Mill	2 Saw	3 Saw	4 Saw	Utility
SF	624		394	191	39	
DF	325	62	214	49		
BC	243		203		40	
RC	229			214	15	
RA	68				49	18
MA	66		66			
ALL	32,481	62	17,900	11,086	2,508	926

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 (%)
282.3	6.6	178.9	2.0	50,702	7.0

Timber Sale Unit Cruise Design

Unit	Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
VW U1	B2C: VR, 2 BAF (62.5, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	18.7	20.2	14	8	0
VW U2	B2C: VR, 2 BAF (62.5, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	15.3	15.6	12	6	1
VW U3	B2C: VR, 2 BAF (62.5, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	16.4	17.9	11	6	0
VW U4	B2C: VR, 2 BAF (54.44, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	30.0	30.5	23	12	1
VW ROW 1	FX: FR plots (20 tree / acre expansion)	1.9	1.4	2	2	0
All		82.3	85.6	62	34	2

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	7.1	40	381	375	1.5	202.7	30.9
BC	LIVE	4 SAW	Domestic	5.0	40	91	91	0.0	39.9	7.5
BC	LIVE	CULL	Cull	6.2	3	1	0	100.0	0.0	0.0
DF	LIVE	2 SAW	Domestic	17.7	38	427	427	0.0	181.2	35.2
DF	LIVE	2 SAW	HQ-B	14.9	40	62	60	2.8	33.1	5.0
DF	LIVE	3 SAW	Domestic	8.6	39	56	56	0.0	48.9	4.6
DF	LIVE	SPECIAL MILL	HQ-A	19.3	40	130	130	0.0	61.6	10.7

Sp	Status	Grade	Sort	Dia	Len	BF Gross	BF Net	Defect %	Tons	MBF Net
MA	LIVE	2 SAW	Domestic	19.2	30	78	55	30.0	66.4	4.5
MA	LIVE	CULL	Cull	9.9	14	5	0	100.0	0.0	0.0
RA	LIVE	4 SAW	Domestic	7.3	30	81	81	0.0	49.4	6.7
RA	LIVE	CULL	Cull	5.0	7	2	0	100.0	0.0	0.0
RA	LIVE	UTILITY	Pulp	5.2	30	37	37	0.0	18.4	3.1
RC	LIVE	3 SAW	Domestic	14.1	31	353	323	8.3	166.0	26.6
RC	LIVE	3 SAW	Pole	18.7	33	120	120	0.0	48.4	9.9
RC	LIVE	4 SAW	Domestic	7.7	21	15	15	0.0	10.1	1.2
RC	LIVE	4 SAW	Pole	9.8	21	6	6	0.0	4.9	0.5
RC	LIVE	CULL	Cull	21.4	10	39	0	100.0	0.0	0.0
SF	LIVE	2 SAW	Domestic	15.8	37	739	715	3.2	394.1	58.9
SF	LIVE	3 SAW	Domestic	9.8	38	311	307	1.2	191.2	25.3
SF	LIVE	4 SAW	Domestic	7.7	19	53	53	0.0	38.7	4.3
WH	LIVE	2 SAW	Domestic	15.4	38	28,970	28,068	3.1	17,022.5	2,310.0
WH	LIVE	3 SAW	Domestic	8.8	38	15,112	15,021	0.6	10,631.7	1,236.3
WH	LIVE	4 SAW	Domestic	6.1	25	3,042	3,016	0.9	2,364.8	248.2
WH	LIVE	CULL	Cull	7.9	8	1,078	0	100.0	0.0	0.0
WH	LIVE	UTILITY	Pulp	13.5	16	1,744	1,744	0.0	907.7	143.5

Timber Sale Log Sort x Diameter Bin Summary

Sp	Bin	Status	Sort	Dia	Len	BF Net	Defect %	Tons	MBF Net
BC	5+	LIVE	Cull	6.2	3	0	100.0	0.0	0.0
BC	5+	LIVE	Domestic	7.5	38	466	1.2	242.6	38.4
DF	8 - 11	LIVE	Domestic	8.6	39	56	0.0	48.9	4.6
DF	12 - 15	LIVE	HQ-B	14.9	40	60	2.8	33.1	5.0
DF	12 - 15	LIVE	Domestic	15.3	40	154	0.0	70.2	12.7
DF	16 - 19	LIVE	HQ-A	19.3	40	130	0.0	61.6	10.7
DF	20+	LIVE	Domestic	20.0	36	273	0.0	110.9	22.5
MA	5+	LIVE	Cull	9.9	14	0	100.0	0.0	0.0
MA	5+	LIVE	Domestic	19.2	30	55	30.0	66.4	4.5
RA	5+	LIVE	Cull	5.0	7	0	100.0	0.0	0.0
RA	5+	LIVE	Pulp	5.2	30	37	0.0	18.4	3.1
RA	5+	LIVE	Domestic	7.4	30	81	0.0	49.4	6.7
RC	5+	LIVE	Domestic	12.8	29	338	8.0	176.1	27.8
RC	5+	LIVE	Pole	15.7	29	126	0.0	53.2	10.4
RC	5+	LIVE	Cull	21.4	10	0	100.0	0.0	0.0
SF	5 - 7	LIVE	Domestic	6.3	30	50	0.0	35.9	4.1

Sp	Bin	Status	Sort	Dia	Len	BF Net	Defect %	Tons	MBF Net
SF	8 - 11	LIVE	Domestic	9.7	30	270	0.0	167.2	22.2
SF	12 - 15	LIVE	Domestic	13.9	36	390	0.9	222.8	32.1
SF	16 - 19	LIVE	Domestic	18.1	38	224	9.6	134.0	18.4
SF	20+	LIVE	Domestic	20.3	36	143	0.0	64.1	11.7
WH	5 - 7	LIVE	Pulp	5.0	13	83	0.0	31.1	6.8
WH	5 - 7	LIVE	Cull	5.3	9	0	100.0	0.0	0.0
WH	5 - 7	LIVE	Domestic	6.1	30	5,522	0.4	4,163.7	454.5
WH	8 - 11	LIVE	Cull	8.9	5	0	100.0	0.0	0.0
WH	8 - 11	LIVE	Domestic	9.6	36	11,841	0.8	8,414.6	974.5
WH	12 - 15	LIVE	Cull	12.9	8	0	100.0	0.0	0.0
WH	12 - 15	LIVE	Domestic	13.5	38	13,479	1.8	8,924.4	1,109.3
WH	12 - 15	LIVE	Pulp	14.5	17	521	0.0	312.6	42.9
WH	16 - 19	LIVE	Domestic	17.6	37	9,379	2.8	5,370.1	771.9
WH	16 - 19	LIVE	Cull	17.7	17	0	100.0	0.0	0.0
WH	16 - 19	LIVE	Pulp	19.1	22	584	0.0	300.6	48.0
WH	20+	LIVE	Pulp	22.2	15	557	0.0	263.5	45.8
WH	20+	LIVE	Domestic	22.3	39	5,884	6.3	3,146.1	484.3
WH	20+	LIVE	Cull	24.1	7	0	100.0	0.0	0.0

Cruise Unit Report
VW U1

Unit Sale Notice Volume (MBF): VW U1

				MBF Volume by Grade				
Sp	DBH	Rings/In	Age	All	2 Saw	3 Saw	4 Saw	Utility
WH	17.6			757	382	326	43	6
MA	37.0			5	5			
ALL	17.8			761	387	326	43	6

Unit Cruise Design: VW U1

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B2C: VR, 2 BAF (62.5, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	18.7	20.1	14	8	0

Unit Cruise Summary: VW U1

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
WH	28	53	3.8	0
MA	1	2	0.1	0
ALL	29	55	3.9	0

Unit Cruise Statistics: VW 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 (%)
WH	236.6	55.0	14.7	171.0	19.5	3.7	40,458	58.3	15.2
MA	5.7	254.2	67.9	42.2	0.0	0.0	241	254.2	67.9
ALL	242.3	51.2	13.7	168.0	24.1	4.5	40,700	56.6	14.4

Unit Summary: VW U1

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
MA	LIVE	CUT	1	ALL	34.2	46	55	367	241	34.2	0.9	5.7	1.0	4.5
WH	LIVE	CUT	28	ALL	18.5	90	116	41,445	40,458	2.4	126.8	236.6	55.0	756.6
ALL	LIVE	CUT	29	ALL	18.7	89	116	41,811	40,700	2.7	127.7	242.3	56.0	761.1
ALL	ALL	ALL	29	ALL	18.7	89	116	41,811	40,700	2.7	127.7	242.3	56.0	761.1

Cruise Unit Report
VW U2

Unit Sale Notice Volume (MBF): VW U2

				MBF Volume by Grade				
Sp	DBH	Rings/In	Age	All	2 Saw	3 Saw	4 Saw	Utility
WH	18.7			751	445	258	35	12
SF	21.9			88	59	25	4	
RC	30.0			10		10	1	
ALL	19.3			850	504	293	40	12

Unit Cruise Design: VW U2

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B2C: VR, 2 BAF (62.5, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	15.3	15.6	12	6	1

Unit Cruise Summary: VW U2

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
WH	27	53	4.4	0
SF	6	6	0.5	0
RC	1	1	0.1	0
ALL	34	60	5.0	0

Unit Cruise Statistics: VW 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 (%)
WH	276.0	50.6	14.6	177.8	21.9	4.2	49,070	55.1	15.2
SF	31.3	248.6	71.8	185.1	14.1	5.7	5,783	249.0	72.0
RC	3.3	346.4	100.0	204.0	0.0	0.0	680	346.4	100.0
ALL	310.6	43.5	12.6	178.8	20.3	3.5	55,534	48.0	13.0

Unit Summary: VW U2

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
RC	LIVE	CUT	1	ALL	30.0	90	115	680	680	0.0	0.7	3.3	0.6	10.4
SF	LIVE	CUT	6	ALL	21.9	94	121	5,931	5,783	2.5	11.9	31.3	6.7	88.5

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
WH	LIVE	CUT	27	ALL	18.8	85	110	51,421	49,070	4.6	143.2	276.0	63.7	750.8
ALL	LIVE	CUT	34	ALL	19.1	85	111	58,032	55,534	4.3	155.8	310.6	71.0	849.7
ALL	ALL	ALL	34	ALL	19.1	85	111	58,032	55,534	4.3	155.8	310.6	71.0	849.7

Cruise Unit Report
VW U3

Unit Sale Notice Volume (MBF): VW U3

				MBF Volume by Grade				
Sp	DBH	Rings/In	Age	All	2 Saw	3 Saw	4 Saw	Utility
WH	17.1			1,006	585	254	75	92
RC	44.4			7		7		
ALL	17.3			1,012	585	261	75	92

Unit Cruise Design: VW U3

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B2C: VR, 2 BAF (62.5, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	16.4	17.9	11	6	0

Unit Cruise Summary: VW U3

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
WH	22	60	5.5	0
RC	1	1	0.1	0
ALL	23	61	5.5	0

Unit Cruise Statistics: VW 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 (%)
WH	340.9	52.7	15.9	179.9	29.3	6.2	61,314	60.3	17.1
RC	3.6	331.7	100.0	114.1	0.0	0.0	415	331.7	100.0
ALL	344.5	52.9	16.0	179.2	29.7	6.2	61,729	60.7	17.1

Unit Summary: VW U3

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
RC	LIVE	CUT	1	ALL	44.4	100	120	610	415	32.0	0.3	3.6	0.5	6.8
WH	LIVE	CUT	22	ALL	17.1	84	105	66,121	61,314	7.3	213.8	340.9	82.4	1,005.6
ALL	LIVE	CUT	23	ALL	17.2	84	105	66,731	61,729	7.5	214.1	344.5	83.0	1,012.4
ALL	ALL	ALL	23	ALL	17.2	84	105	66,731	61,729	7.5	214.1	344.5	83.0	1,012.4

Cruise Unit Report
VW U4

Unit Sale Notice Volume (MBF): VW U4

				MBF Volume by Grade					
Sp	DBH	Rings/In	Age	All	Spec Mill	2 Saw	3 Saw	4 Saw	Utility
WH	18.8			1,416		894	397	91	34
DF	27.0	10.0		55	11	40	5		
RC	24.3			21			20	1	
BC	10.0			14		8		6	
RA	10.0			8				5	3
ALL	18.5	10.0		1,514	11	943	421	102	37

Unit Cruise Design: VW U4

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B2C: VR, 2 BAF (54.44, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	30.0	30.5	23	12	1

Unit Cruise Summary: VW U4

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
WH	47	106	4.6	0
DF	2	3	0.1	1
RC	3	3	0.1	0
BC	1	1	0.0	0
RA	1	1	0.0	0
ALL	54	114	5.0	1

Unit Cruise Statistics: VW 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 (%)
WH	250.9	53.8	11.2	188.1	19.4	2.8	47,190	57.2	11.6
DF	7.1	350.9	73.2	260.2	7.0	5.0	1,848	351.0	73.3
RC	5.2	350.9	73.2	134.3	26.9	15.5	701	351.9	74.8
BC	2.4	479.6	100.0	194.4	0.0	0.0	460	479.6	100.0
RA	1.7	479.6	100.0	146.7	0.0	0.0	255	479.6	100.0
ALL	267.3	53.2	11.1	188.7	21.1	2.9	50,453	57.3	11.5

Unit Summary: VW U4

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
BC	LIVE	CUT	1	ALL	10.0	82	142	460	460	0.0	4.3	2.4	0.7	13.8
DF	LIVE	CUT	2	ALL	27.0	119	153	1,852	1,848	0.3	1.8	7.1	1.4	55.4
RA	LIVE	CUT	1	ALL	10.0	64	100	255	255	0.0	3.2	1.7	0.5	7.7
RC	LIVE	CUT	3	ALL	24.3	79	101	781	701	10.3	1.6	5.2	1.1	21.0
WH	LIVE	CUT	47	ALL	17.6	89	116	48,495	47,190	2.7	148.5	250.9	59.8	1,415.7
ALL	LIVE	CUT	54	ALL	17.5	88	117	51,844	50,453	2.7	159.4	267.3	63.5	1,513.6
ALL	ALL	ALL	54	ALL	17.5	88	117	51,844	50,453	2.7	159.4	267.3	63.5	1,513.6

Cruise Unit Report
VW ROW 1

Unit Sale Notice Volume (MBF): VW ROW 1

				MBF Volume by Grade			
Sp	DBH	Rings/In	Age	All	2 Saw	3 Saw	4 Saw
BC	17.3			25	23		2
WH	12.1			9	4	2	3
RA	12.0			2			2
ALL	14.3			36	26	2	7

Unit Cruise Design: VW ROW 1

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
FX: FR plots (20 tree / acre expansion)	1.9	1.4	2	2	0

Unit Cruise Summary: VW ROW 1

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
BC	5	5	2.5	0
WH	7	7	3.5	0
RA	1	1	0.5	0
ALL	13	13	6.5	0

Unit Cruise Statistics: VW ROW 1

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 (%)
BC	81.9	2.0	1.4	158.1	13.9	6.2	12,940	14.1	6.4
WH	56.2	41.3	29.2	87.8	43.5	16.4	4,940	60.0	33.5
RA	7.9	141.4	100.0	138.8	0.0	0.0	1,090	141.4	100.0
ALL	146.0	22.4	15.8	130.0	38.0	10.5	18,970	44.1	19.0

Unit Summary: VW ROW 1

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
BC	LIVE	CUT	5	ALL	17.3	81	102	13,220	12,940	2.1	50.1	81.9	19.7	24.6
RA	LIVE	CUT	1	ALL	12.0	70	95	1,160	1,090	6.0	10.0	7.9	2.3	2.1
WH	LIVE	CUT	7	ALL	12.1	43	58	5,010	4,940	1.4	70.4	56.2	16.2	9.4
ALL	LIVE	CUT	13	ALL	14.3	60	78	19,390	18,970	2.2	130.5	145.9	38.1	36.0

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
ALL	ALL	ALL	13	ALL	14.3	60	78	19,390	18,970	2.2	130.5	145.9	38.1	36.0

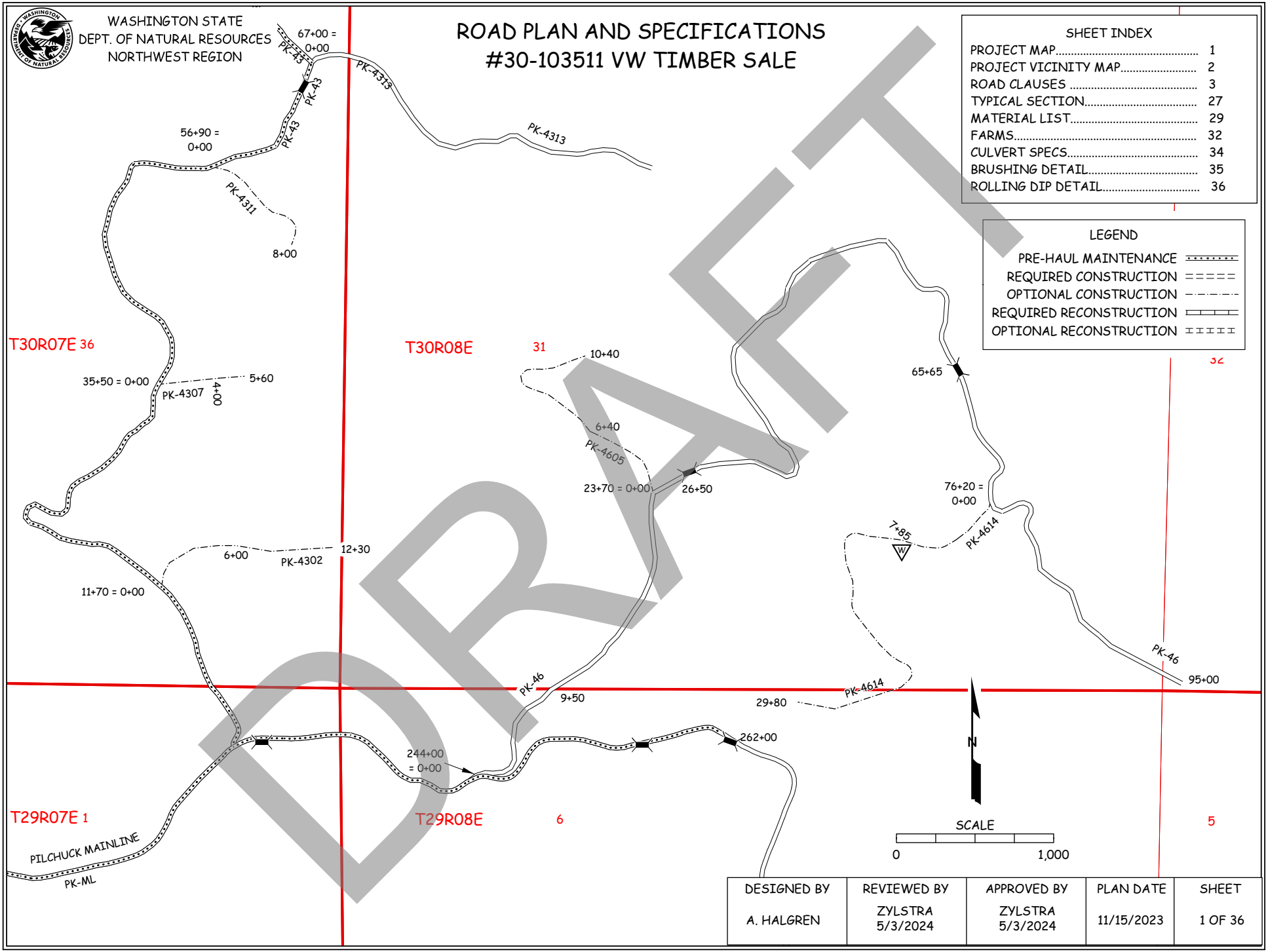
WASHINGTON STATE
DEPT. OF NATURAL RESOURCES
NORTHWEST REGION

ROAD PLAN AND SPECIFICATIONS
#30-103511 VW TIMBER SALE

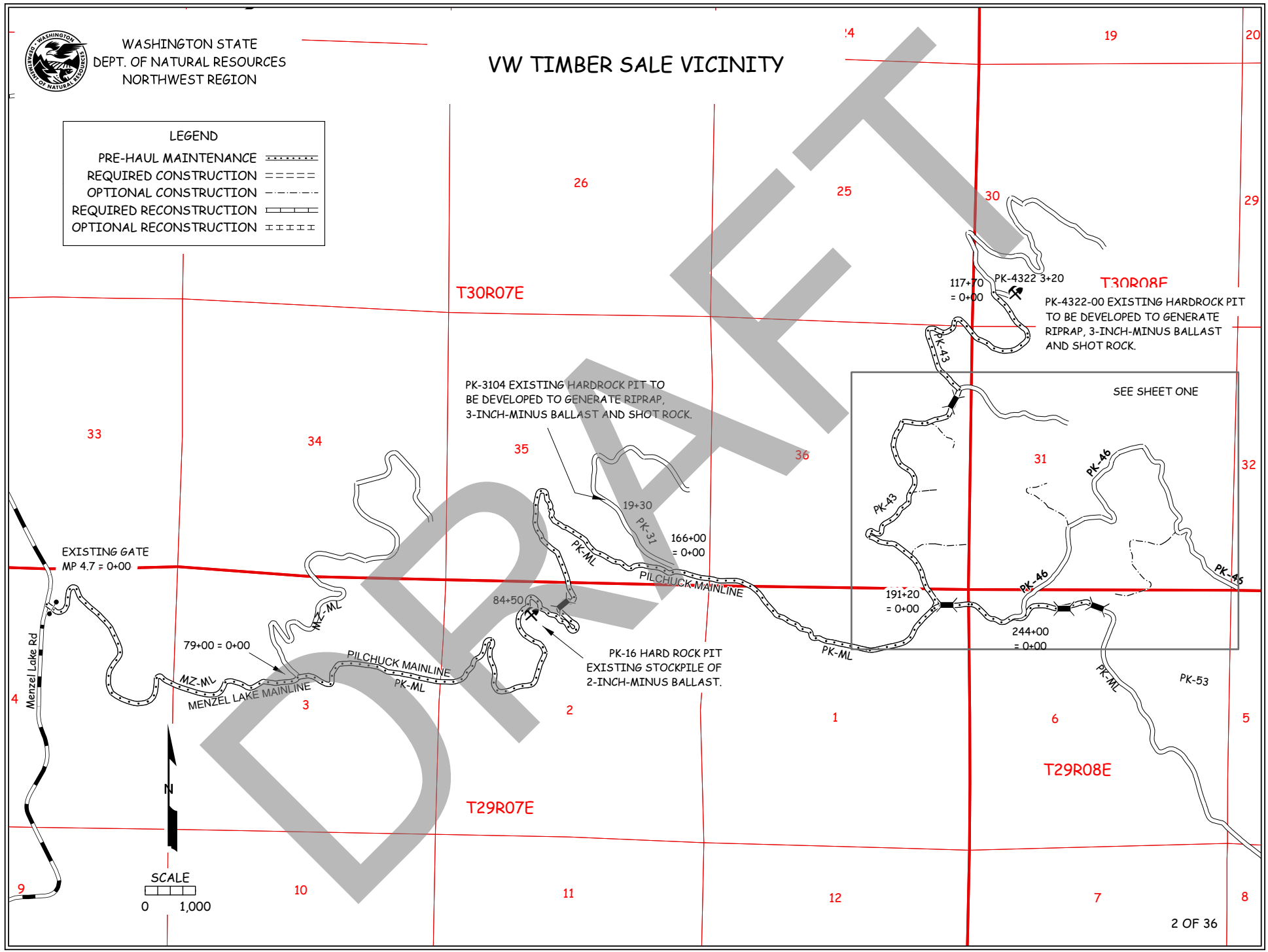
SHEET INDEX

LEGEND

- PRE-HAUL MAINTENANCE
- REQUIRED CONSTRUCTION
- OPTIONAL CONSTRUCTION
- REQUIRED RECONSTRUCTION
- OPTIONAL RECONSTRUCTION



DESIGNED BY	REVIEWED BY	APPROVED BY	PLAN DATE	SHEET
A. HALGREN	ZYLSTRA 5/3/2024	ZYLSTRA 5/3/2024	11/15/2023	1 OF 36



STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

VW TIMBER SALE ROAD PLAN
SNOHOMISH COUNTY
CASCADE DISTRICT
NORTHWEST REGION

AGREEMENT NO.: 30-103511 STAFF ENGINEER: A. HALGREN

DATE: NOVEMBER 15, 2023

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
MZ-ML	0+00 TO 79+00	MAINTENANCE
PK-ML	0+00 TO 262+00	MAINTENANCE
PK-43	0+00 TO 117+70	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
PK-4302	0+00 TO 12+30	CONSTRUCTION
PK-4307	0+00 TO 5+60	CONSTRUCTION
PK-4311	0+00 TO 8+00	CONSTRUCTION
PK-4605	0+00 TO 16+80	CONSTRUCTION
PK-4614	0+00 TO 29+80	CONSTRUCTION

0-4 CONSTRUCTION

Construction includes, but is not limited to clearing, grubbing, excavation and embankment to sub-grade, full bench sidecast, full bench end-haul, landing and turnout construction, culvert installation, geotextile installation, drill and shoot, application of shot rock and 3-inch-minus ballast rock.

0-6 PRE-HAUL MAINTENANCE

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

0-7 POST-HAUL MAINTENANCE

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

0-10 ABANDONMENT

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

0-12 DEVELOP ROCK SOURCE

Purchaser may develop existing rock sources. Rock source development will involve clearing, stripping, drilling, shooting, and processing rock to generate riprap, shot rock, and 3-inch-minus ballast. Work for developing rock sources is listed in Section 6 ROCK AND SURFACING.

SECTION 1 – GENERAL

1-1 ROAD PLAN CHANGES

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

1-2 UNFORESEEN CONDITIONS

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

1-3 ROAD DIMENSIONS

Purchaser shall perform road work in accordance with the dimensions shown on the TYPICAL SECTION SHEET and the specifications within this road plan.

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
Bridge Elevation (feet)	±0.25	->	->

1-5 DESIGN DATA

Switchback design data is available upon request at the Department of Natural Resources Northwest Region Office in Sedro Woolley, WA.

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. Road Plan maps.

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

1-7 TEMPORARY ROAD CLOSURE

Purchaser shall notify the Contract Administrator a minimum of 5 business days before the closure of any road. Construction may not close any road for more than 7 consecutive calendar days.

1-8 REPAIR OR REPLACEMENT OF DAMAGED MATERIALS

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

1-9 DAMAGED METALLIC COATING

Any 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.

1-18 REFERENCE POINT DAMAGE

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

1-21 HAUL APPROVAL

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

1-25 ACTIVITY TIMING RESTRICTION

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

Road	Stations	Activity	Closure Period
ALL		Rock hauling, construction, maintenance, or abandonment	November 1 to March 31
PK-4605	0+00 TO 3+00	Rock hauling, construction, or abandonment	November 1 to March 31*, AND any event that causes overland flow through the rolling dip*

*Not to be waived by the contract administrator.

1-26 OPERATING DURING CLOSURE PERIOD

If permission is granted to operate during a closure period listed in Claus 1-25 ACTIVITY TIMING RESTRICTION, Purchaser shall provide a mainenance plan to include further protection of state resources. Purchaser shall obtain written approval from the Contract Administrator for the maintenance plan, and shall put preventative measures in place before operating during the closure period. Purchaser is required to maintain all haul roads at their own expense including those listed in Contract Clause C-060 DESIGNATED ROAD MAINTAINER. If other operators are using, or desire to use these designated maintainer roads, a joint operating plan must be developed. All parties shall follow this plan.

1-29 SEDIMENT RESTRICTION

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

1-30 CLOSURE TO PREVENT DAMAGE

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

- Wheel track rutting exceeds 4 inches on crushed rock roads.
- Surface or base stability problems persist.
- Weather is such that satisfactory results cannot be obtained in an area of operations.
- When, in the opinion of the Contract Administrator excessive road damage or rutting may occur.

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.

1-32 BRIDGE SURFACE RESTRICTION

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

If tracked equipment is used on concrete or wood-deck bridge 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 surface(s) and have surface(s) evaluated by the District 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

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.

SECTION 2 – MAINTENANCE

2-1 GENERAL ROAD MAINTENANCE

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

2-2 ROAD MAINTENANCE – PURCHASER MAINTENANCE

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

2-3 ROAD MAINTENANCE – DESIGNATED MAINTAINER

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

SECTION 3 – CLEARING, GRUBBING, AND DISPOSAL

3-1 BRUSHING

Purchaser shall cut vegetative material up to 6 inches in diameter, including limbs, as shown on the BRUSHING DETAIL. Brushing must be achieved by mechanical cutting of brush, trees, and branches. Root systems and stumps of cut vegetation may not be disturbed unless directed by the Contract Administrator. Purchaser shall remove brushing debris from the road surface, ditchlines, and culvert inlets and outlets.

3-5 CLEARING

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

3-8 PROHIBITED DECKING AREAS

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

- Within the grubbing limits.
- Within 50 feet of any stream.
- In locations that interfere with the construction of the road prism.
- In locations that impede drainage.
- On slopes greater than 40%.
- 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.

3-12 STUMP PLACEMENT

On the following road(s), Purchaser shall place grubbed stumps adjacent to the road shoulder. Stumps must be positioned on stable locations.

Road	Stations	Comments
PK-4614	10+70 to 11+80	Place grubbed stumps between outer switchback shoulder and type 3 stream.

3-13 STUMPS FOR PUNCHEON MATERIAL

On the following road(s), stumps from within the grubbing limits may be overturned and driven flush with the ground surface for use as subgrade puncheon material.

Road	Stations
PK-4302	6+00 to 12+30
PK-4614	22+20 to 29+80

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 clearing limits as shown on the TYPICAL SECTION SHEET.

3-21 DISPOSAL COMPLETION

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

3-22 DESIGNATED WASTE AREA FOR ORGANIC DEBRIS

Waste areas for organic debris are located within the cleared right-of-way or in natural openings as designated or at areas approved in writing by the Contract Administrator.

3-23 PROHIBITED DISPOSAL AREAS

Purchaser shall not place organic debris in the following areas:

- Within 50 feet of a cross drain culvert.
- Within 100 feet of a live stream, or wetland, unless used to comply with the specifications detailed in the Riparian Strategy, Clause 3-6 CLEARING WITHIN RIPARIAN AREA AT TYPE 1-3 STREAM CROSSING, and Clause 3-11 GRUBBING WITHIN RIPARIAN AREA AT TYPE 1-3 STREAM CROSSING.
- On road subgrades, or excavation and embankment slopes.
- On slopes greater than 50%.
- 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 unless otherwise detailed in this road plan.

SECTION 4 – EXCAVATION

4-2 PIONEERING

Pioneering may not extend past construction that will be completed during the current construction season. Pioneering may not extend more than 500 feet beyond completed construction unless approved in writing by the Contract Administrator. 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:

- Grade and alignment must have smooth continuity, without abrupt changes in direction.
- Maximum grades may not exceed 18 percent favorable and 15 percent adverse.
- Minimum curve radius is 60 feet at centerline.
- Maximum grade change for sag vertical curves is 5% in 100 feet.
- Maximum grade change for crest vertical curves is 4% in 100 feet.

Grade limitations and alignment are modified as follows:

Road	Stations	Minimum Curve Radius (ft)	Maximum Grade (%) Favorable	Adverse	Comments
PK-4605	11+10 to 14+05	60	14	-	-
PK-4614	9+90 to 11+80	65	-	10	-
PK-4614	20+60 to 22+90	60	-	6	-

4-4 SWITCHBACK STANDARDS

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

- Maximum adverse grades for switchbacks is 10% of the curve radius unless otherwise specified in this plan.
- Maximum favorable grades for switchbacks is 14% unless otherwise specified in this plan.
- Maximum transition grades entering and leaving switchbacks is a 6% grade change.
- Transition grades required to meet switchback grade limitations must be constructed on the tangents preceding and departing from the switchbacks.

4-5 CUT SLOPE RATIO

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

4-12 FULL BENCH CONSTRUCTION

On the following road(s), and where side slopes exceed 50% Purchaser shall use full bench construction for the entire subgrade width If designated, Purchaser shall end haul waste material to the location specified in Clause 4-37 WASTE AREA LOCATION.

Road	Full Bench Location	Comments
PK-4605	6+85 to 7+40	-
PK-4605	12+40 to 12+60, and 13+00 to 14+05	Full bench throughcut necessary to achieve grade. Switchback adjacent to T5 stream.
PK-4614	15+80 to 17+00	-

4-21 TURNOUTS

Purchaser shall construct turnouts intervisible with a maximum distance of 1,000 feet between turnouts unless otherwise shown on drawings. Locations may be adjusted to fit the final subgrade alignment and sight distances. Locations are subject to written approval by the Contract Administrator. Minimum dimensions are shown on the TYPICAL SECTION SHEET.

4-25 DITCH CONSTRUCTION AND RECONSTRUCTION

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

4-28 DITCH DRAINAGE

Ditches must drain to cross-drain culverts or ditchouts.

4-29 DITCHOUTS

Purchaser shall construct ditchouts as identified on the MATERIALS LIST and as needed **or** as directed by the Contract Administrator. Ditchouts must be constructed in a manner that diverts ditch water onto the forest floor and must have excavation backslopes no steeper than a 1:1 ratio.

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 50% if the waste material is compacted and free of organic debris. On side slopes greater than 50%, 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 the listed designated areas**.** Additional waste areas may also be identified or approved by the Contract Administrator. The amount of material allowed in a waste area is as listed**.**

Road	Waste Area Location	Volume (CY)
PK-4614	7+85 to 9+90	1100

4-38 PROHIBITED WASTE DISPOSAL AREAS

Purchaser shall not deposit waste material in the following areas:

- Within 50 feet of a cross drain culvert.
- Within 100 feet of a live stream or wetland.
- Within a riparian management zone.
- On side slopes steeper than 50%.except as otherwise specified in this plan.
- In locations that interfere with the construction of the road prism.
- In locations that impede drainage.
- Against standing timber.
- Outside the clearing limits.

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 by routing equipment over the entire width of each lift.

4-61 SUBGRADE COMPACTION

Purchaser shall compact constructed and reconstructed subgrades by routing equipment over the entire width

4-70 SUBGRADE REINFORCEMENT

On the following road(s), Purchaser shall provide and install geotextile fabric. Subgrade reinforcement must be installed to a width that is 2 feet more than the subgrade width, including turnouts. Geotextile fabric must overlap by a minimum of 2 feet at all joints. The geotextile fabric must be covered with a minimum of 12 inches of compacted 3-inch-minus ballast rock/gravel ballast. Purchaser shall apply rock in one-foot lift(s) over the geotextile in accordance with the manufacturer's specifications. Geotextile fabric must meet the specifications in Clause 10-3 GEOTEXTILE FOR STABILIZATION.

Road	Stations
PK-4302	6+00 to 12+30

SECTION 5 – DRAINAGE

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 MATERIALS 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 EXCEPT AS OTHERWISE SPECIFIED IN THIS PLAN and meet the specifications in Clauses 10-15 through 10-24.

5-7 USED CULVERT MATERIAL

On temporary roads, Purchaser may install used culverts. All other roads must have new culverts installed. Purchaser shall obtain approval from the Contract Administrator for the quality of the used culverts before installation. Culverts must meet the specifications in Clauses 10-15 through 10-24

5-8 TEMPORARY STREAM CULVERT INSTALLATION

Purchaser shall install temporary culverts as shown in the MATERIALS LIST. Temporary stream culverts must be located in the natural channel of the stream. Temporary culverts must be removed as indicated in Clause 9-21 ROAD ABANDONMENT.

5-12 UNUSED MATERIALS STATE PROPERTY

On required roads, any materials listed on the MATERIALS LIST that are not installed will become the property of the state. Purchaser shall stockpile materials as directed by the Contract Administrator.

5-13 CONTINGENCY CULVERTS

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

Count	Size
3	18x36
1	24x36
1	24x40

5-15 CULVERT INSTALLATION

Culvert installation must be in accordance with the CULVERT AND DRAINAGE SPECIFICATION DETAIL and the National Corrugated Metal Pipe Association's "Installation Manual for Corrugated Steel Drainage Structures" and the Corrugated Polyethylene Pipe Association's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings".

5-16 APPROVAL FOR LARGER CULVERT INSTALLATION

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

5-17 CROSS DRAIN SKEW AND SLOPE

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

5-18 CULVERT DEPTH OF COVER

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

5-20 ENERGY DISSIPATERS

Purchaser shall install energy dissipaters in accordance with the CULVERT AND DRAINAGE SPECIFICATION DETAIL. Energy dissipater installation is subject to approval by the Contract Administrator.

The type of energy dissipater and the amount of material must be consistent with the specifications listed on the CULVERT AND DRAINAGE SPECIFICATION DETAIL.

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 CROSS DRAIN CULVERTS

Purchaser shall construct headwalls in accordance with the CULVERT AND DRAINAGE SPECIFICATION DETAIL at all cross drain culverts. Rock used for headwalls must weigh at least 50 pounds. 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. No placement by end dumping or dropping of rock is allowed.

5-27 ARMORING FOR STREAM CROSSING CULVERTS

At the following culvert(s), Purchaser shall place rip rap in conjunction with construction of the embankment. Rock must be placed on shoulders, slopes, and around culvert inlets and outlets as designated on the MATERIALS LIST and CULVERT AND DRAINAGE SPECIFICATIONS or as directed by the Contract Administrator. Rock may not restrict the flow of water into culvert inlets or catch basins. Rock must be set in place by machine. Placement must be with a zero-drop-height only. No placement by end dumping or dropping of rock is allowed. Rip rap must meet the specifications in Clause 6-50 LIGHT LOOSE RIP RAP and 6-50 HEAVY LOOSE RIP RAP

Road	Stations
PK-4302	1+50, 3+50, 5+30, 6+00, 7+90, 11+30
PK-4311	2+80
PK-4605	1+00

5-31 ROLLING DIP CONSTRUCTION

Purchaser shall construct rolling dips in accordance with the ROLLING DIP DETAIL and as specified on the MATERIALS LIST. Rolling dips must be installed concurrently with construction of the subgrade and must be maintained in an operable condition. Purchaser shall install rolling dips using a dozer. Use of other equipment is not allowed without written approval of the Contract Administrator.

6-2 ROCK SOURCE ON STATE LAND

Rock used in accordance with the quantities on the TYPICAL SECTION and MATERIALS 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.

Source	Location	Rock Type
PK-3104	STA 19+30 of the PK-31 road	Hard Rock
PK-4322-00	STA 3+20 of the PK-4322 road	Hard Rock

6-3 ROCK SOURCE STATE LAND, EXISTING STOCKPILE

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

Source	Location	Rock Type	Comments
PK-16	STA 84+50 of the PK-ML	Hard Rock, 2-inch minus ballast	This source may be used only for surfacing on permanent roads.

6-5 ROCK FROM COMMERCIAL SOURCE

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

6-11 ROCK SOURCE DEVELOPMENT PLAN BY PURCHASER

Purchaser shall conduct rock source development and use at the sources listed in 6-2 ROCK SOURCE STATE LAND, in accordance with a written ROCK SOURCE DEVELOPMENT PLAN to be prepared by the Purchaser. The plan is subject to written approval by the Contract Administrator before any rock source operations. Upon completion of operations, the rock source must be left in the condition specified in the ROCK SOURCE DEVELOPMENT PLAN, and approved in writing by the Contract Administrator.

Rock source development plans prepared by the Purchaser must show the following information:

- Rock source location.
- Rock source overview showing access roads, development areas, stockpile locations, waste areas, and floor drainage.
- Rock source profiles showing development areas, bench locations including widths, and wall faces including heights.

6-12 ROCK SOURCE SPECIFICATIONS

Rock sources must be in accordance with the following specifications:

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

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

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

6-14 DRILL AND SHOOT

Rock drilling and shooting must meet the following specifications:

- No oversize material is allowed to remain in the rock source at the termination of this timber sale.
- Oversize material is defined as rock fragments too large to be converted by the Purchaser to a size that will meet specifications used for the roads in this sale.
- Purchaser shall notify the Contract Administrator a minimum of 7 working days before blasting operations.
- 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 and trails before blasting operations.

6-23 ROCK GRADATION TYPES

Purchaser shall provide rock in accordance with the types and amounts listed in the TYPICAL SECTION and MATERIALS LIST. Rock must meet the following specifications for gradation and uniform quality when placed in hauling vehicles or during manufacture and placement into a stockpile. The exact point of evaluation for conformance to specifications will be determined by the Contract Administrator.

6-34 3-INCH MINUS BALLAST ROCK

Ballast rock must be 100% equal to, or smaller than, 3 inches in at least one dimension.

Rock may contain no more than 5 percent organic debris, dirt, and trash. All percentages are by weight.

6-42 CLEAN ROCK, SHOT BALLAST

No more than 10 percent of the rock by visual inspection may exceed 8 inches in any dimension and no rock may be larger than 12 inches in any dimension. Shot Ballast rock may not contain more than 5 percent by weight of organic debris, dirt, and trash.

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 80%	50 lbs. to 500 lbs. (8”- 18”)
10% to 20%	3 inch to 50 lbs. (3”- 8”)

6-51 HEAVY LOOSE RIP RAP

Heavy 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. Heavy loose rip rap must be free of rock fines, soil, organic debris or other extraneous material, and must meet the following requirements:

Quantity	Size Range
30% to 90%	1 ton to 2 ton (28”- 36”)
30% to 70%	500 lbs. to 1 ton (18”- 28”)
20% 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 TYPICAL SECTION are loose 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.

6-70 APPROVAL BEFORE ROCK APPLICATION

Purchaser shall obtain written approval from the Contract Administrator for culvert installation, ditch construction, ditch reconstruction, headwall construction, and headwall reconstruction before rock application.

6-71 ROCK APPLICATION

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

6-73 ROCK FOR WIDENED PORTIONS

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

8-2 PROTECTION FOR EXPOSED SOIL

Purchaser shall provide and evenly spread a 4-inch layer of straw to all exposed soils at culvert installations**.** Soils must be covered before the first anticipated storm event. Soils may not sit exposed during any rain event.

8-5 CHECK DAM

On the following road(s), Purchaser shall construct rock check dams not less than every 4 vertical feet in the ditch. Check dams must be built with 3-inch minus crushed rock to a depth of 8 inches and a length of 4 feet.

Road	Stations	Minimum Count
PK-4302	1+50 to 7+00	8
PK-4302	11+30 to 12+30	2
PK-4605	13+00 to 14+05	4

8-15 REVEGETATION

Purchaser shall spread seed and fertilizer on all exposed soils within the grubbing limits resulting from road work activities. Cover all exposed soils using manual dispersal of grass seed and fertilizer. Other methods of covering must be approved in writing by the Contract Administrator.

8-16 REVEGETATION SUPPLY

The Purchaser shall provide the grass seed and fertilizer as directed in clauses 8-25 GRASS SEED and 8-27 FERTILIZER.

8-17 REVEGETATION TIMING

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

8-18 PROTECTION FOR SEED

Purchaser shall provide a protective cover for seed if revegetation occurs between July 1 and March 31. The protective cover may consist of dispersed straw, jute matting, or clear plastic sheets. The protective cover requirement may be waived in writing by the Contract Administrator if Purchaser is able to demonstrate a revegetation plan that will result in the establishment of a uniform dense crop (at least 50% coverage) of 3-inch tall grass by October 31

8-19 ASSURANCE FOR SEEDED AREA

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

8-25 GRASS SEED

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

1. Weed seed may not exceed 0.5% by weight.
2. All seed species must have a minimum 90% germination rate, unless otherwise specified.
3. Seed must be certified.
4. Seed must be furnished in standard containers showing the following information:
    a. Common name of seed
    b. Net weight
    c. Percent of purity
    d. Percentage of germination
    e. Percentage of weed seed and inert material
5. Seed must conform to the following mixture unless a comparable mix is approved in writing by the Contract Administrator.

Kind and Variety of Seed in Mixture	% by Weight
Creeping Red Fescue	50
Elf Perennial Rye Grass	25
Highland Colonial Bentgrass	15
White Clover	10
Inert and Other Crop	0.5

8-27 FERTILIZER

Purchaser shall evenly spread the fertilizer listed below on all exposed soil inside the grubbing limits at a rate of 200 pounds per acre of exposed soil. Fertilizer must meet the following specifications:

Chemical Component	% by Weight
Nitrogen	16
Phosphorous	16
Potassium	16
Sulphur	3
Inerts	49

SECTION 9 – POST-HAUL ROAD WORK

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.

9-10 LANDING DRAINAGE

Purchaser shall provide for drainage of the landing surface.

9-21 ROAD ABANDONMENT

Purchaser shall abandon the following before the termination of this contract**:**

Road	Stations	Type
PK-4302	0+00 TO 12+30	ABANDONMENT
PK-4307	0+00 TO 5+60	ABANDONMENT
PK-4311	0+00 TO 8+00	ABANDONMENT
PK-4605	0+00 TO 16+80	ABANDONMENT
PK-4614	0+00 TO 29+80	ABANDONMENT

*See special abandonment requirements in section 11-1 CMZ Restoration

9-22 ABANDONMENT

- Remove all ditch relief culverts. The resulting slopes must be 1:1 or flatter. Place and compact the removed fill material in a location that will not erode into any Type 1 through 5 waters or wetlands.
- Remove all culverts in natural drainages. The resulting slopes must be 1.5:1 or flatter. Strive to match the existing native stream bank gradient. The natural streambed width must be re-established. Place and compact the removed fill material in a location that will not erode into any Type 1 through 5 waters or wetlands.
- Transport all removed culverts off site. All removed culverts are the property of the Purchaser.
- Construct non-drivable waterbars at natural drainage points and at a spacing that will produce a vertical drop of no more than 20 feet between waterbars and with a maximum horizontal spacing of 400 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.
- Inslope or outslope the road as appropriate.
- Remove bridges and other structures.
- Pull back unstable fill that has potential of failing and entering any Type 1 through 5 waters or wetlands. Place and compact removed material in a stable location.
- Remove berms except as designed.
- Block the road by constructing an aggressive barrier of dense interlocked large woody debris (logs, stumps, root wads, etc.) so that four wheel highway vehicles cannot pass the point of abandonment. Typical barrier dimensions are 10 feet high by 20 feet deep, spanning the entire road prism from top of cutslope to toe of fillslope. Long term effectiveness is the primary objective. If necessary construct a vehicular turn-around near the point of abandonment.
- Apply grass seed to all exposed soils resulting from the abandonment work and in accordance with Section 8 EROSION CONTROL.

10-3 GEOTEXTILE FOR STABILIZATION

Geotextiles must meet the following minimum requirements for strength and property qualities, and must be designed by the manufacturer to be used for stabilization or reinforcement, and filtration. Material must be free of defects, cuts, and tears.

	ASTM Test	Requirements
Type	--	Woven
Apparent opening size	D 4751	No. 40 max
Water permittivity	D 4491	0.10 sec^{-1}
Grab tensile strength	D 4632	315 lb
Grab tensile elongation	D 4632	50%
Puncture strength	D 6241	620 lb
Tear strength	D 4533	112 lb
Ultraviolet stability	D 4355	50% retained after 500 hours of exposure

10-15 CORRUGATED STEEL CULVERT

Metallic coated steel culverts must meet AASHTO M-36 (ASTM A-760) specifications. Culverts must be galvanized (zinc coated meeting AASHTO M-218).

10-16 CORRUGATED ALUMINUM CULVERT

Aluminum culverts must meet AASHTO M-196 (ASTM A-745) specifications.

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.

10-18 CORRUGATED STEEL STRUCTURAL PLATE

Structural plate culverts must be galvanized steel meeting AASHTO M-167 (ASTM A-761) specifications.

10-19 CORRUGATED ALUMINUM STRUCTURAL PLATE

Structural plate culverts must be aluminum alloy meeting AASHTO M-219 (ASTM A-746) specifications.

10-20 FLUME AND DOWNSPOUT

Downspouts and flumes must meet the AASHTO specification designated for the culvert. Plastic downspouts and flumes must be Type C – corrugated single walled pipe.

10-21 METAL BAND

Metal coupling and end bands must meet the AASHTO specification designated for the culvert and must have matching corrugations. Culverts 24 inches and smaller must have bands with a minimum width of 12 inches. Culverts over 24 inches must have bands with a minimum width of 24 inches.

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.

10-24 GAUGE AND CORRUGATION

Unless otherwise stated in the engineer's design, metal culverts must conform to the following specifications for gage and corrugation as a function of diameter.

Diameter	Gage	Corrugation
18"	16 (0.064")	$2\ ^{2}/_{3}$" X $^{1}/_{2}$"
24" to 48"	14 (0.079")	$2\ ^{2}/_{3}$" X $^{1}/_{2}$"
54" to 96"	14 (0.079")	3" X 1"

SECTION 11 SPECIAL NOTES

11-1 RMZ RESTORATION

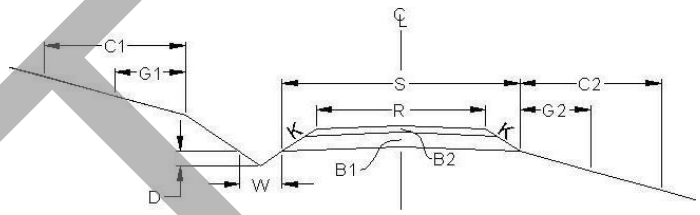
In addition to work listed in 9-22 ABANDONMENT, the following work is required during abandonment of the PK-4605 road:

- Conduct an on-site road abandonment pre-work with the Purchaser's designated operator, the Contract Administrator, and the District Engineer, within 14 days prior to abandonment of the PK-4605 road.
- Reestablish a berm across the full width of the PK-4605 Right-of-Way from STA 0+20 to STA 0+40. Approximate dimensions shall be 60' long x 20' deep x 4' high at the highest point. The berm shall be composed of approximately 170 cubic yards of cobble reclaimed from the PK-4605 road surface, STA 0+70 to 3+00. Place the woody debris barrier required in clause 9-22 on top of this berm. The intention is to mimic the natural deposit that formed a berm at this location prior to construction of the orphaned road grade and to diminish the opportunity for stream avulsion on to the PK-46 road.

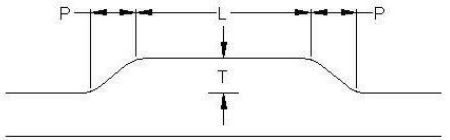
ROAD #		MZ-ML	PK-ML	PK-43	PK-4302[A]	PK-4302
REQUIRED / OPTIONAL		REQUIRED	REQUIRED	REQUIRED	OPTIONAL	OPTIONAL
CONSTRUCT / RECONSTRUCT		MAINTAIN	MAINTAIN	MAINTAIN	CONSTRUCT	CONSTRUCT
TOLERANCE CLASS (A/B/C)		C	C	C	C	C
STATION / MP TO		0+00	0+00	0+00	0+00	6+00
STATION / MP		79+00	262+00	117+70	6+00	12+30
ROAD WIDTH	R	12	12	12	12	12
CROWN (INCHES @ C/L)		-	-	-	3	3
DITCH WIDTH	W	-	-	-	2	2
DITCH DEPTH	D	-	-	-	1	1
TURNOUT LENGTH	L	-	-	-	25	25
TURNOUT WIDTH	T	-	-	-	10	10
TURNOUT TAPER	P	-	-	-	25	25
GRUBBING	G1	-	-	-	5	5
	G2	-	-	-	5	5
CLEARING	C1	-	-	-	10	10
	C2	-	-	-	10	10
ROCK FILLSLOPE	K:1	-	-	-	1 ½	1 ½
❖ SHOT ROCK DEPTH	B1	-	-	-	-	12
CUBIC YARDS / STATION		-	-	-	-	72
➢ TOTAL CY SHOT ROCK		-	-	-	-	460
❖ BALLAST DEPTH	B2	-	-	-	12	6
CUBIC YARDS / STATION		-	-	-	72	34
➢ TOTAL CY BALLAST		200*	1800*	-	440	220
➢ TOTAL CUBIC YARDS		200*	1800*	-	440	680
SUBGRADE WIDTH	S	-	-	-	15.0	16.5
BRUSHCUT (Y/N)		Y	Y	Y	N/A	N/A
BLADE, SHAPE, & DITCH (Y/N)		Y*	Y*	N	N/A	N/A

*Blade, shape, & ditch only to be required where spot rock application is directed by the Contract Administrator.

TYPICAL SECTION



TURNOUT DETAIL (PLAN VIEW)



SYMBOL NOTES

❖ Specified Rock Depth is FINISHED COMPACTED DEPTH in inches.

➢ Specified Rock Quantity is LOOSE MEASURE (Truck Cubic Yards) needed to accomplish specified FINISHED COMPACTED DEPTH. Rock quantities include volume for turnouts, curve widening and landings.

[A]Proposed road is located on an existing abandoned or orphaned grade.
[B]Rock volumes provided are intended for a leveling course
[C]See clause 6-44 STREAM SIMULATION ROCK

Rock Totals Summary

Type	Quantity (Cubic Yards)
Shot Rock	2790
Ballast	5360
Rip Rap	185

ROAD #		PK-4307[A]	PK-4307	PK-4311	PK-4605[A]	PK-4605[A]*	PK-4605[A]	PK-4605	PK-4614
REQUIRED / OPTIONAL		OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL	OPTIONAL
CONSTRUCT / RECONSTRUCT		CONSTRUCT	CONSTRUCT	CONSTRUCT	CONSTRUCT	CONSTRUCT	CONSTRUCT	CONSTRUCT	CONSTRUCT
TOLERANCE CLASS (A/B/C)		C	C	C	C	C	C	C	C
STATION / MP TO		0+00	4+00	0+00	0+00	0+70	3+00	6+40	0+00
STATION / MP		4+00	5+60	8+00	0+70	3+00	6+40	16+80	29+80
ROAD WIDTH	R	12	12	12	12	12	12	12	12
CROWN (INCHES @ C/L)		3	3	3	3	3	3	3	3
DITCH WIDTH	W	2	2	2	2	2	2	2	2
DITCH DEPTH	D	1	1	1	1	1	1	1	1
TURNOUT LENGTH	L	25	25	25	25	25	25	25	25
TURNOUT WIDTH	T	10	10	10	10	10	10	10	10
TURNOUT TAPER	P	25	25	25	25	25	25	25	25
GRUBBING	G1	5	5	5	5	5	5	5	5
	G2	5	5	5	5	5	5	5	5
CLEARING	C1	10	10	10	10	10	10	10	10
	C2	10	10	10	10	10	10	10	10
ROCK FILLSLOPE	K:1	1 ½	1 ½	1 ½	1 ½	1 ½	1 ½	1 ½	1 ½
❖ SHOT ROCK DEPTH	B1	-	12	-	12	-	-	-	12
CUBIC YARDS / STATION		-	72	-	72	-	-	-	72
➢ TOTAL CY SHOT ROCK		-	120	-	60	-	-	-	2150
❖ BALLAST DEPTH	B2	6	6	12	-	18*	12	12	6
CUBIC YARDS / STATION		34	34	72	-	72*	72	72	34
➢ TOTAL CY BALLAST		140	60	560	-	170*		750	1020
➢ TOTAL CUBIC YARDS		140	180	560	60	170*		750	3170
SUBGRADE WIDTH	S	13.5	16.5	15.0	15.0	15.0	15.0	15.0	16.5
BRUSHCUT (Y/N)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BLADE, SHAPE, & DITCH (Y/N)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

MATERIALS LIST

LOCATION		CULVERT			DWNSPT		RIPRAP			FILL TYPE	TOLERANCE	REMARKS
ROAD #	STATION	DIAMETER	LENGTH	TYPE	LENGTH	TYPE	INLET	OUTLET	TYPE			**Note: Galvanized metal culverts shall conform to the following specifications for gage and corrugation as a function of the diameter:** **Diameter / Gage / Corrugation** **18" / 16 / 2 2/3" x 1/2"** **24" – 48" / 14 / 2 2/3" x 1/2"** **54" – 96" / 14 / 3" x 1"**
PK-4302	**1+50**	**30**	**32**	**XX**			**3**	**5**	**L/H**	**NT**	**C**	**Type 5 stream**, start check dams (see clause 8-5).
	3+50	**48**	**40**	**GM**			**7**	**14**	**L/H**	**NT**	**C**	**Type 4 stream**
	6+00	-	-	-			-	-	-	-	-	Start geotextile (see clause 4-70)
	5+30	**30**	**32**	**XX**			**3**	**5**	**L/H**	**NT**	**C**	**Type 5 stream**
	6+00	**30**	**32**	**XX**			**3**	**5**	**L/H**	**NT**	**C**	**Type 5 stream**, begin optional puncheon (see clause 3-13).
	7+00	18	32	XX			2	3	L	NT	C	End check dams
	7+90	**30**	**32**	**XX**			**3**	**5**	**L/H**	**NT**	**C**	**Type 5 stream**
	8+30	18	32	XX			2	3	L	NT	C	
	11+30	**24**	**36**	**XX**			**3**	**5**	**L/H**	**NT**	**C**	**Type 5 stream**, start check dams
	12+30	-	-	-			-	-	-	-	-	End check dams, end puncheon, end geotextile.
PK-4307	4+00	18	36	XX			2	3	L	NT	C	
	5+60	-	-	-			-	-	-	-	-	Ditchout
PK-4311	2+10	24	36	XX			3	5	L/H	NT	C	
	2+80	**24**	**44**	**XX**			**5**	**7**	**L/H**	**NT**	**C**	**Type 5 stream**
	4+40	18	36	XX			2	3	L	NT	C	
	6+80	18	36	XX			2	3	L	NT	C	
	8+00	-	-	-			-	-	-	-	-	Ditchout

GM – Galvanized Metal PS – Polyethylene Pipe Single Wall PD – Polyethylene Pipe Dual Wall AM – Aluminized Metal C – Concrete XX – PD or GM
H – Heavy Loose Riprap L – Light Loose Riprap SR – Shot Rock NT – Native (Bank Run) QS – Quarry Spalls

MATERIALS LIST

LOCATION		CULVERT			DWNSPT		RIPRAP			FILL TYPE	TOLERANCE	REMARKS
ROAD #	STATION	DIAMETER	LENGTH	TYPE	LENGTH	TYPE	INLET	OUTLET	TYPE			Note: Galvanized metal culverts shall conform to the following specifications for gage and corrugation as a function of the diameter: Diameter / Gage / Corrugation 18" / 16 / 2 2/3" x 1/2" 24" – 48" / 14 / 2 2/3" x 1/2" 54" – 96" / 14 / 3" x 1"
PK-4605	0+70	-	-	-			-	-	-	-	-	See timing restrictions, start rolling dip, cobble fill (see clauses 1-25, 5-31, 6-44)
	3+00	18	36	XX			2	3	L	NT	C	End rolling dip, end cobble fill.
	4+50	18	40	XX			3	5	L	NT	C	
	6+85	-	-	-			-	-	-	-	-	Start full bench construction (see clause 4-12)
	7+40	**24**	**36**	**XX**			**3**	**7**	**L**	**NT**	**C**	**Type 5 stream.** End full bench construction.
	10+10	18	40	XX			3	5	L	NT	C	
	11+10	-	-	-			-	-	-	-	-	Start grade and alignment restrictions (see clause 4-3)
	11+90	-	-	-			-	-	-	-	-	Begin stump placement (see clause 3-12)
	12+40	-	-	-			-	-	-	-	-	Start full bench construction (see clause 4-12)
	12+60	-	-	-			-	-	-	-	-	End full bench construction
	13+00	-	-	-			-	-	-	-	-	Start full bench (see clause 4-12). End stump placement.
	14+05	-	-	-			-	-	-	-	-	End full bench. End grade and alignment restrictions.
	14+60	18	36	XX			2	3	L	NT	C	

GM – Galvanized Metal PS – Polyethylene Pipe Single Wall PD – Polyethylene Pipe Dual Wall AM – Aluminized Metal C – Concrete XX – PD or GM
H – Heavy Loose Riprap L – Light Loose Riprap SR – Shot Rock NT – Native (Bank Run) QS – Quarry Spalls

MATERIALS LIST

LOCATION		CULVERT			DWNSPT		RIPRAP			FILL TYPE	TOLERANCE	REMARKS
ROAD #	STATION	DIAMETER	LENGTH	TYPE	LENGTH	TYPE	INLET	OUTLET	TYPE			**Note: Galvanized metal culverts shall conform to the following specifications for gage and corrugation as a function of the diameter:** **Diameter / Gage / Corrugation** **18" / 16 / 2 2/3" x 1/2"** **24" – 48" / 14 / 2 2/3" x 1/2"** **54" – 96" / 14 / 3" x 1"**
PK-4614	4+30	18	36	XX			2	3	L	NT	C	
	6+40	24	36	XX			3	5	L	NT	C	
	9+90	-	-	-	-	-	-	-	-	-	-	Start grade and alignment restrictions (See clause 4-3)
	10+70	-	-	-	-	-	-	-	-	-	-	Ditchout. Begin stump placement (see clause 3-12).
	11+80	-	-	-	-	-	-	-	-	-	-	End grade and alignment restrictions. End stump placement.
	13+10	18	36	XX			2	3	L	NT	C	
	14+90	18	36	XX			2	3	L	NT	C	
	15+80	-	-	-	-	-	-	-	-	-	-	Start full bench construction (see clause 4-12)
	17+00	-	-	-	-	-	-	-	-	-	-	End full bench construction.
	17+60	18	36	XX			2	3	L	NT	C	
	20+60	-	-	-	-	-	-	-	-	-	-	Start grade and alignment restrictions (See clause 4-3)
	21+10	18	36	XX			2	3	L	NT	C	
	22+90	-	-	-	-	-	-	-	-	-	-	End grade and alignment restrictions.
	22+20	-	-	-	-	-	-	-	-	-	-	Begin optional puncheon (see clause 3-13).
	24+80	18	36	XX			2	3	L	NT	C	Start geotextile.
	27+40	18	36	XX			2	3	L	NT	C	
	29+80	-	-	-	-	-	-	-	-	-	-	End puncheon. End geotextile. Ditchout

GM – Galvanized Metal PS – Polyethylene Pipe Single Wall PD – Polyethylene Pipe Dual Wall AM – Aluminized Metal C – Concrete XX – PD or GM
H – Heavy Loose Riprap L – Light Loose Riprap SR – Shot Rock NT – Native (Bank Run) QS – Quarry Spalls

FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS

Cuts and Fills

- Maintain slope lines to a stable gradient compatible with the construction materials. Remove slides from ditches and the roadway. Repair fill-failures, in accordance with Clause 4-6 EMBANKMENT SLOPE RATIO, 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. Inslope or outslope as directed 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

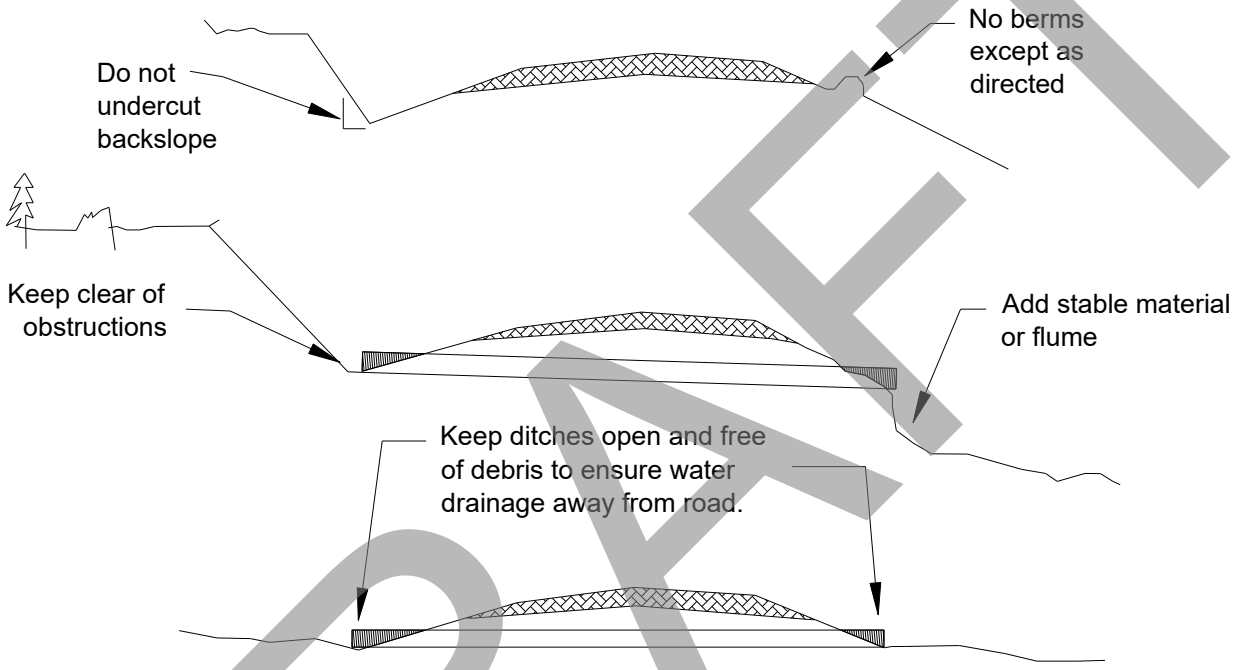
- Perform preventative maintenance work to safeguard against storm damage, such as blading to ensure correct runoff, ditch and culvert cleaning, and waterbar maintenance.

Termination of Use or End of Season

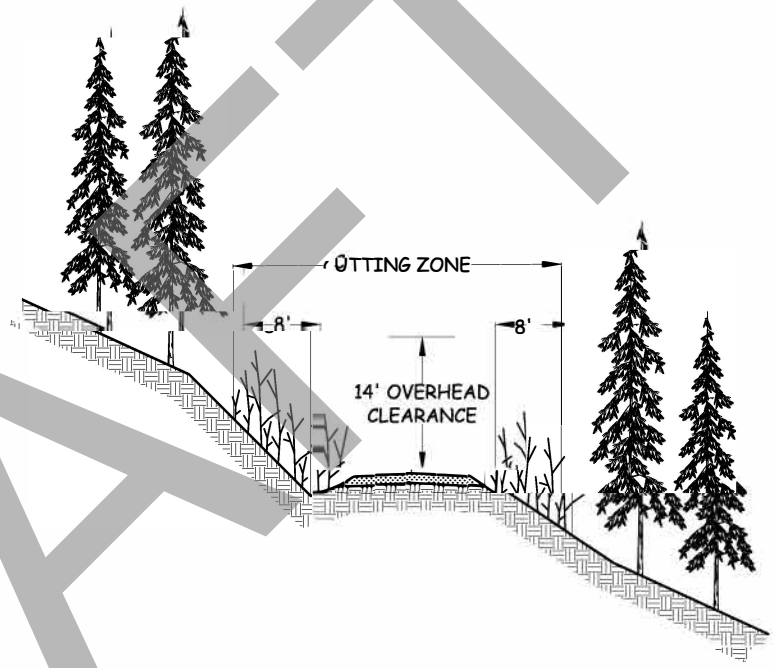
- At the conclusion of logging operations, ensure all conditions of these specifications have been met.

Debris

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



ROAD BRUSHING DETAILS



SPECIFICATIONS

BRUSH SHALL BE CUT ON THE ROAD SURFACE AND 8 ft. BACK FROM ROAD DITCH AND OUTSIDE EDGE OF RUNNING SURFACE.

ON THE INSIDE OF SWITCHBACKS AND TIGHT CURVES, BRUSH SHALL BE CUT BACK 16 ft. FOR VISIBILITY.

ON TRUCK TURNOUTS, BRUSH SHALL BE CUT 8 ft. BACK FROM OUTSIDE EDGE.

BRUSH SHALL BE CUT TO PROVIDE AN OVERHEAD CLEARANCE OF 14 ft. ABOVE THE ROAD RUNNING SURFACE.

BRUSH SHALL BE CUT TO WITHIN 6 in. OF THE GROUND.

SLASH SHALL BE REMOVED FROM CUT SLOPES ABOVE THE ROAD AND SCATTERED ON EMBANKMENT SLOPES.

DITCHES SHALL BE CLEARED OF WOODY DEBRIS.

CULVERT INLETS AND OUTLETS SHALL BE CLEANED A MINIMUM DISTANCE OF TWO PIPE DIAMETERS AWAY.

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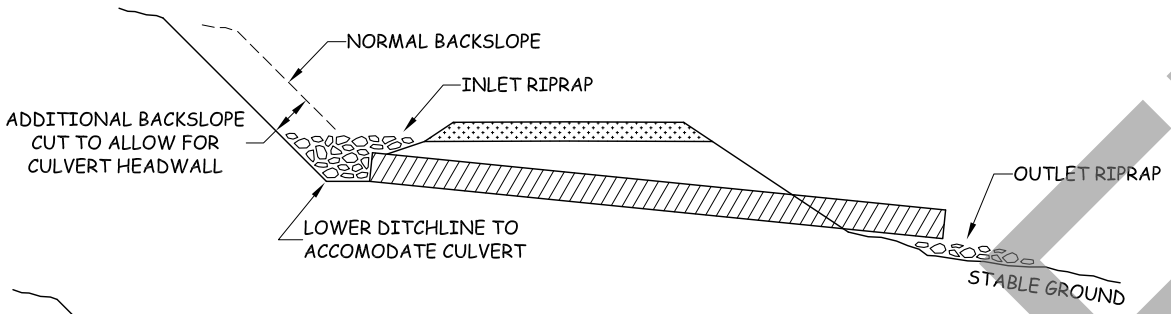
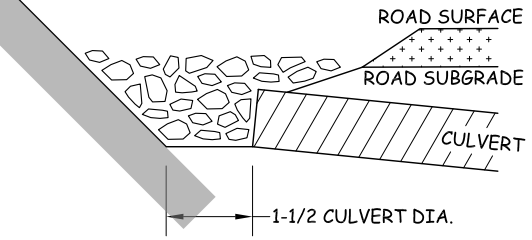
CULVERT AND DRAINAGE SPECIFICATIONS

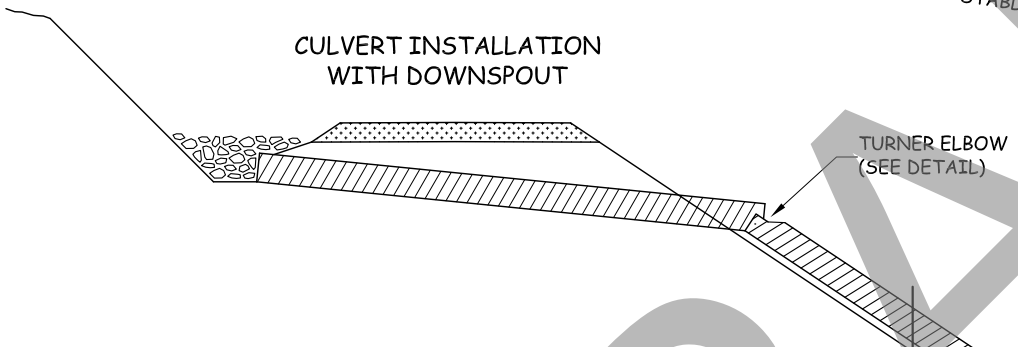
CULVERT INSTALLATION (TYPICAL)



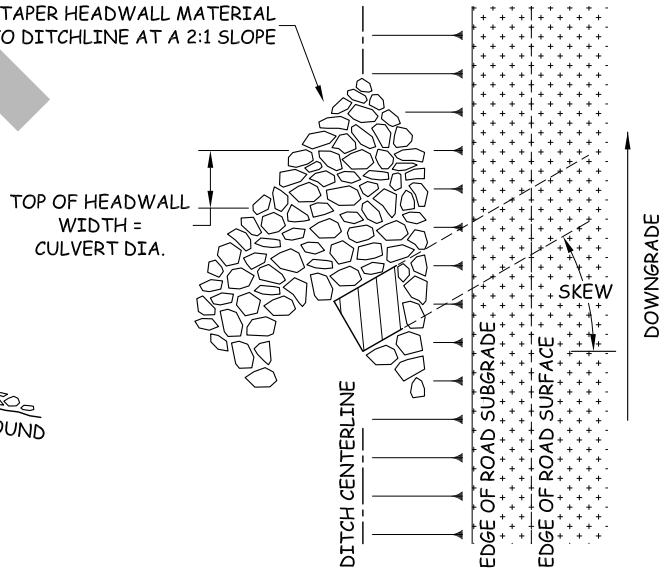
CULVERT HEADWALL - SECTION VIEW



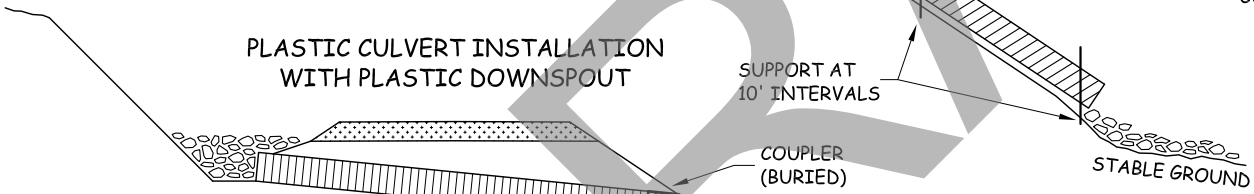
CULVERT INSTALLATION WITH DOWNSPOUT



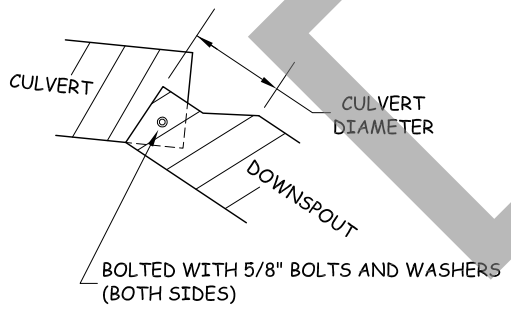
CULVERT HEADWALL - PLAN VIEW

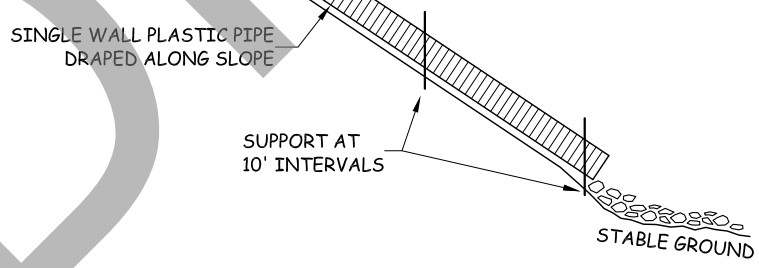


PLASTIC CULVERT INSTALLATION WITH PLASTIC DOWNSPOUT



TURNER ELBOW





HEADWALL NOTE:

HEADWALL TO BE CONSTRUCTED OF IMPERVIOUS MATERIAL THAT WILL RESIST EROSION AND ARMORED WITH RIPRAP QUANTITY SPECIFIED IN ROAD PLAN.

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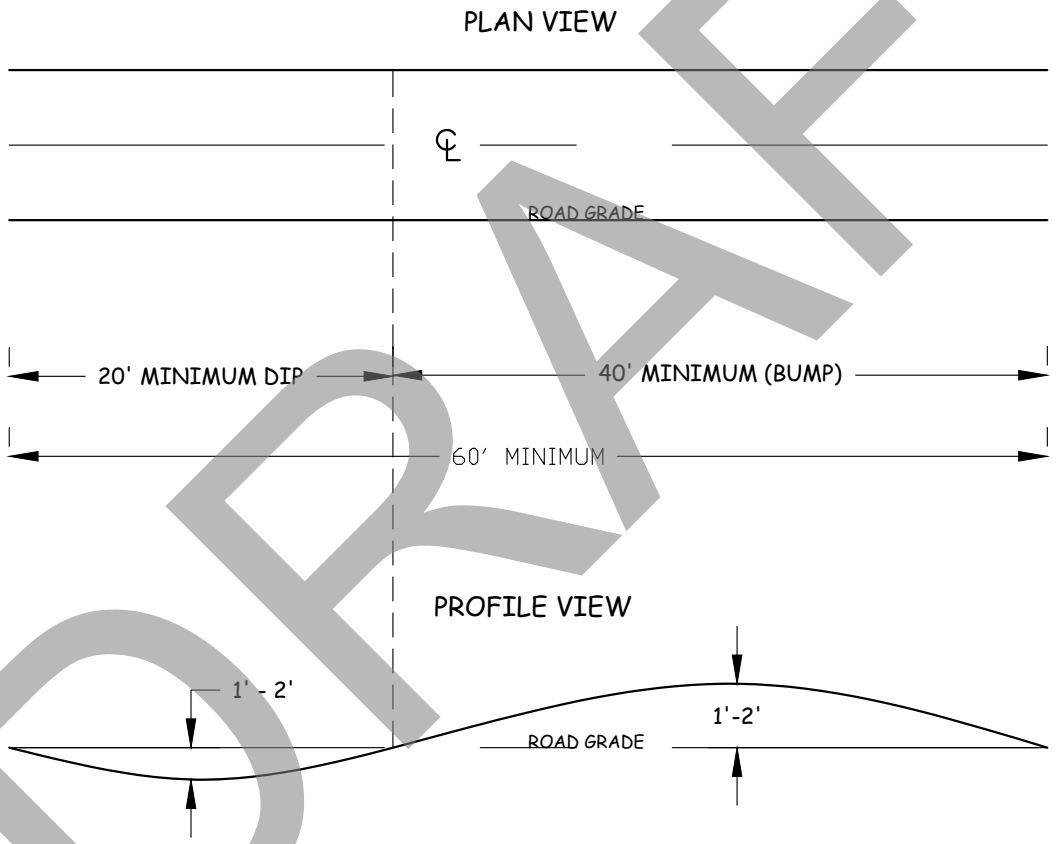
ROLLING DIP DETAIL



CONTRACT #	PROJECT	SHEET
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SUMMARY - Road Development Costs

REGION: Northwest
DISTRICT: Cascade

SALE/PROJECT NAME: VW Timber Sale CONTRACT #: 30-103511

ROAD NUMBERS: -

ROAD STANDARD:	Construction	Reconstruction	Maintenance
NUMBER OF STATIONS:	72.50	0.00	458.70
CLEARING & GRUBBING:	$9,617	$0	$0
EXCAVATION AND FILL:	$38,850	$0	$0
MISC. MAINTENANCE:	$630	-	$17,856
ROAD ROCK:	$83,980	$0	$22,239
ROCK STOCKPILE PROD:	-	-	-
CULVERTS AND FLUMES:	$23,166	$0	$0
STRUCTURES:	$0	$0	$0
MOBILIZATION:	$8,235	$0	$575
TOTAL COSTS:	$164,478	$0	$40,670
COST PER STATION:	$2,269	N/A	$89

ROAD DEACTIVATION & ABANDONMENT COSTS: $9,474

TOTAL (All Roads)	=	$214,623	
SALE VOLUME MBF	=	3950	Pre-cruise Estimate
TOTAL $/MBF	=	$54	

Compiled by: A. HALGREN Date: 5/3/2024