



TIMBER NOTICE OF SALE

SALE NAME: UPPER 5000

AGREEMENT NO: 30-104821

AUCTION: June 12, 2024 starting at 10:00 a.m., Olympic Region Office, Forks, WA

COUNTY: Clallam

SALE LOCATION: Sale located approximately 21 miles northwest of Forks, WA

PRODUCTS SOLD AND SALE AREA:

All timber, excluding downed red cedar, trees marked with a band of blue paint or bounded out by leave tree area tags; bounded by timber sale boundary tags, private timber and the D-5620.1 in Unit 1; timber sale boundary tags in Unit 2; timber sale boundary tags and the D-5009.6 in Unit 3.

All forest products above located on part(s) of Sections 22 and 27 all in Township 29 North, Range 15 West, Sections 32 all in Township 30 North, Range 14 West, Sections 35 all in Township 30 North, Range 15 West, W.M., containing 175 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:

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

MINIMUM BID: \$0.00

BID METHOD: Sealed Bids

PERFORMANCE SECURITY:

\$0.00

SALE TYPE: Lump Sum

EXPIRATION DATE: September 30, 2026

ALLOCATION: Export Restricted

BID DEPOSIT: \$0.00 or Bid Bond. Said deposit shall constitute an opening bid at the appraised price.

HARVEST METHOD: 85% Ground Cable 15% Forest products sold under this contract shall be harvested and removed using cable, cable-tethered, and ground based equipment. Cable-tethered equipment is limited to sustained slopes of 75 percent and less. Ground based equipment is limited to tracked equipment on sustained slopes that are 45 percent and less. Rubber tired skidders, shovel logging and cable assist/tethered logging must meet rutting and skidding requirements and a harvest plan must be submitted and approved by the Contract Administrator. Authority to use other equipment or to operate outside the equipment specifications detailed above must be approved in writing by the State.

Logs being yarded over inner gorge in unit 3 must be bucked to no longer than 40ft log lengths.

30' Equipment Limitations Zone on all typed water.



## TIMBER NOTICE OF SALE

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**ROADS:** 27.00 stations of optional reconstruction. 282.00 stations of optional prehaul maintenance. All roadwork activities including timber haul will not be allowed from October 15 through April 15 on the D-5095.5 (stations 0+00-33+90) D-5095.51 (stations 0+00-4+50) and the D-5095.52 (stations 0+00-6+15).

On the D-5095 (stations 0+00-25+50, 99+45-103+70) and the D-5095.5 (Stations 0+00-19+25) any road work, falling and yarding, rock pit operation or operation of heavy equipment performed during the marbled murrelet nesting season (April 1st through September 23rd), is restricted to, two hours after sunrise to two hours before sunset. This does not apply to hauling timber, rock, or equipment.

### ACREAGE DETERMINATION

**CRUISE METHOD:** Sale acreage was 100% GPS'd. Sale units were cruised using a variable plot sample.

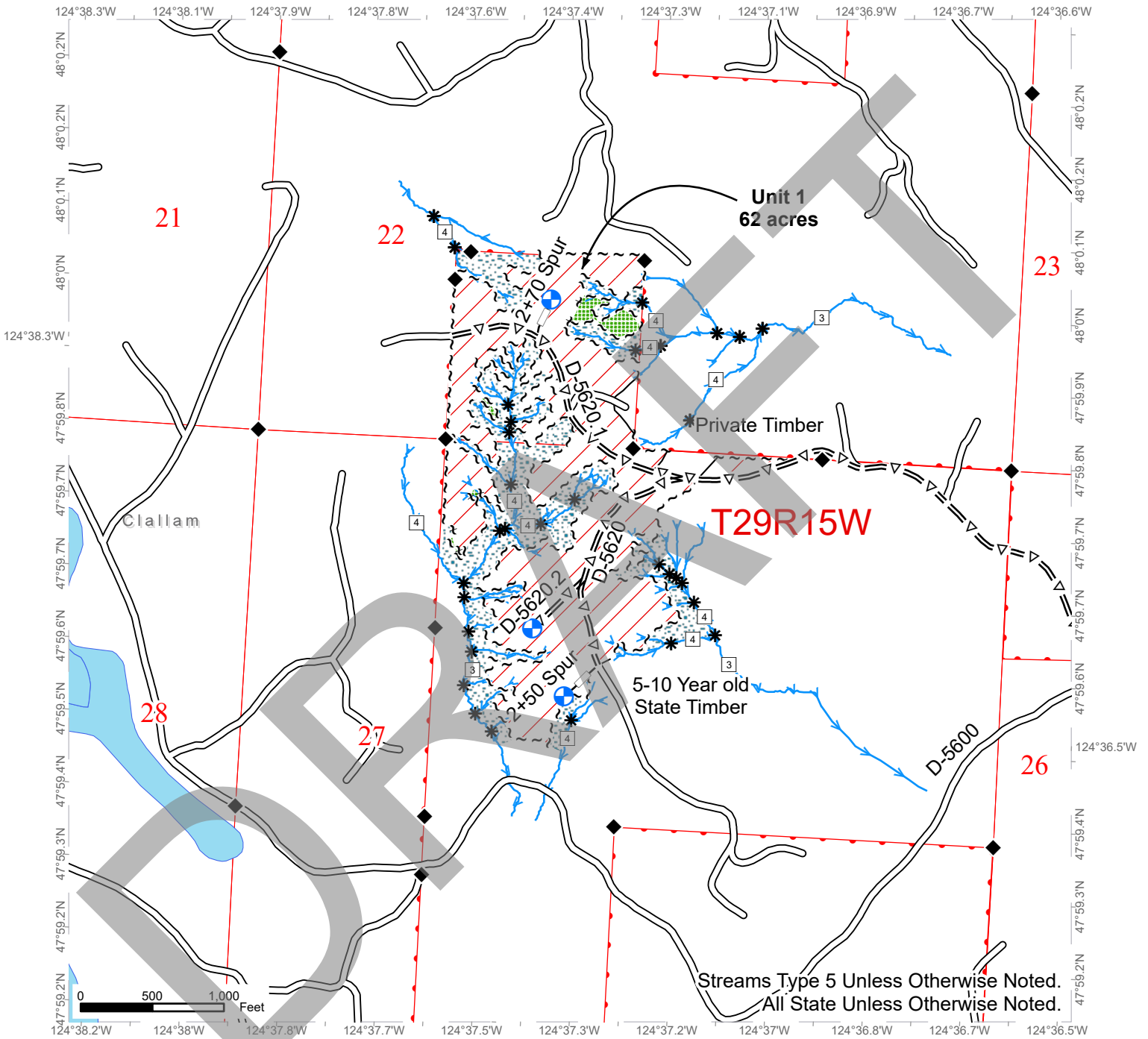
**FEES:** \$87,975.00 is due on day of sale. \$9.00 per MBF is due upon removal. These are in addition to the bid price.

**SPECIAL REMARKS:** Purchaser shall develop an existing rock source Mora Pit. (see road plan for details).

# TIMBER SALE MAP

**SALE NAME:** UPPER 5000  
**AGREEMENT #:** 30-104821  
**TOWNSHIP(S):** T29R15W, T30R15W, T30R14W  
**TRUST(S):** State Forest Transfer (1)

**REGION:** Olympic Region  
**COUNTY(S):** Clallam  
**ELEVATION RGE:** 100' - 790'

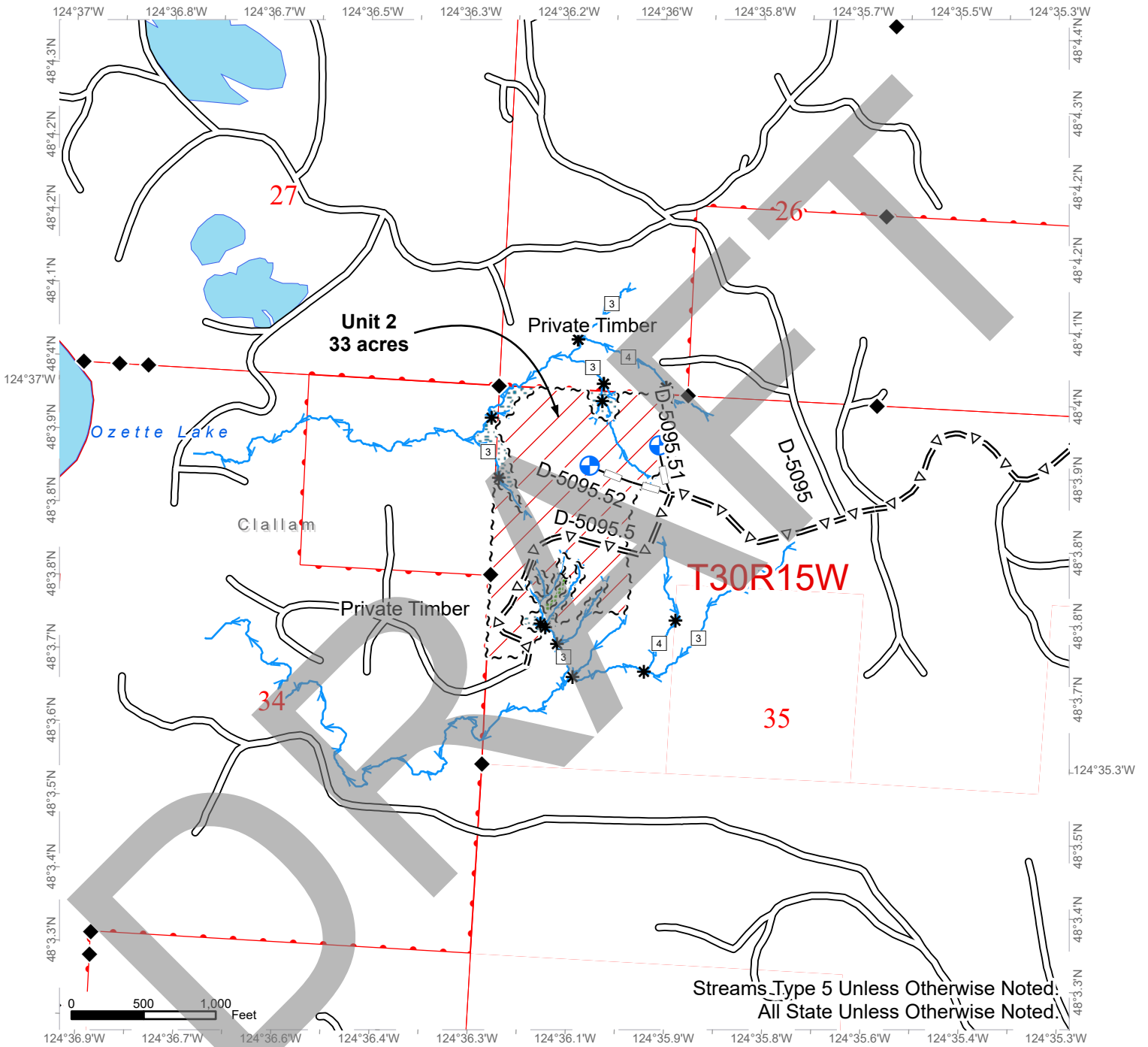


~ ~	Sale Boundary Tags	—	Streams	▨	Riparian Mgt Zone
+ +	Leave Tree Tags	□	Stream Type	▭	Public Land Survey Townships
—	Timber Type Change	*	Stream Type Break	▭	Public Land Survey Sections
—	Existing Roads	▨	Sale Area	▭	DNR Managed Lands
=Δ=	Optional Pre-Haul Maintenance	◆	Survey Monument	⊕	Proposed Landing
—	Optional Reconstruction	▨	Leave Tree Area		

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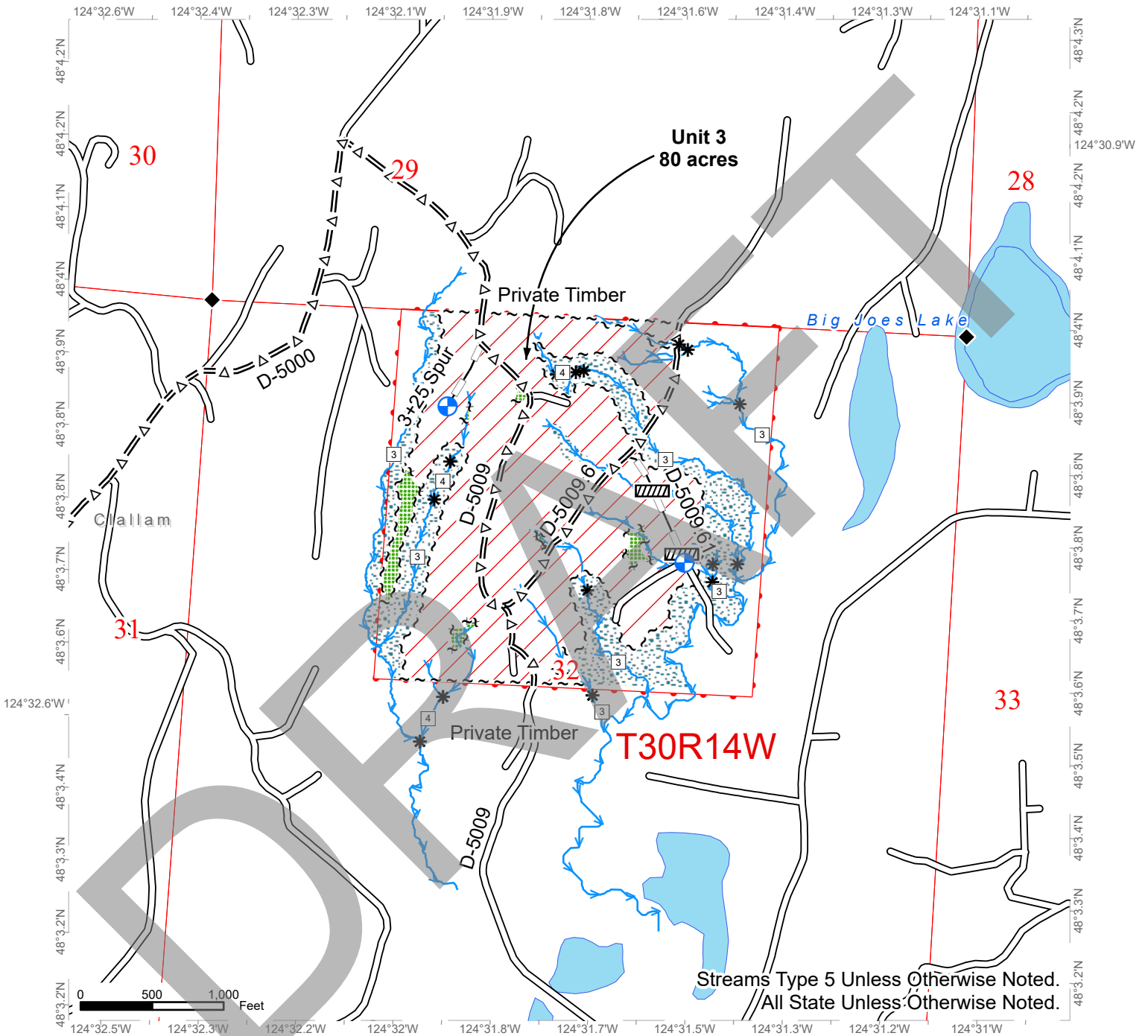
Streams\_Type 5 Unless Otherwise Noted:  
 All State Unless Otherwise Noted.

~ ~	Sale Boundary Tags	□	Stream Type	▭	Public Land Survey Townships
+ +	Leave Tree Tags	*	Stream Type Break	▭	Public Land Survey Sections
—	Existing Roads	— / —	Sale Area	▭	DNR Managed Lands
= Δ =	Optional Pre-Haul Maintenance	◆	Survey Monument	⊕	Proposed Landing
— □ —	Optional Reconstruction	■	Leave Tree Area	■	Riparian Mgt Zone
—	Streams	■	Riparian Mgt Zone		

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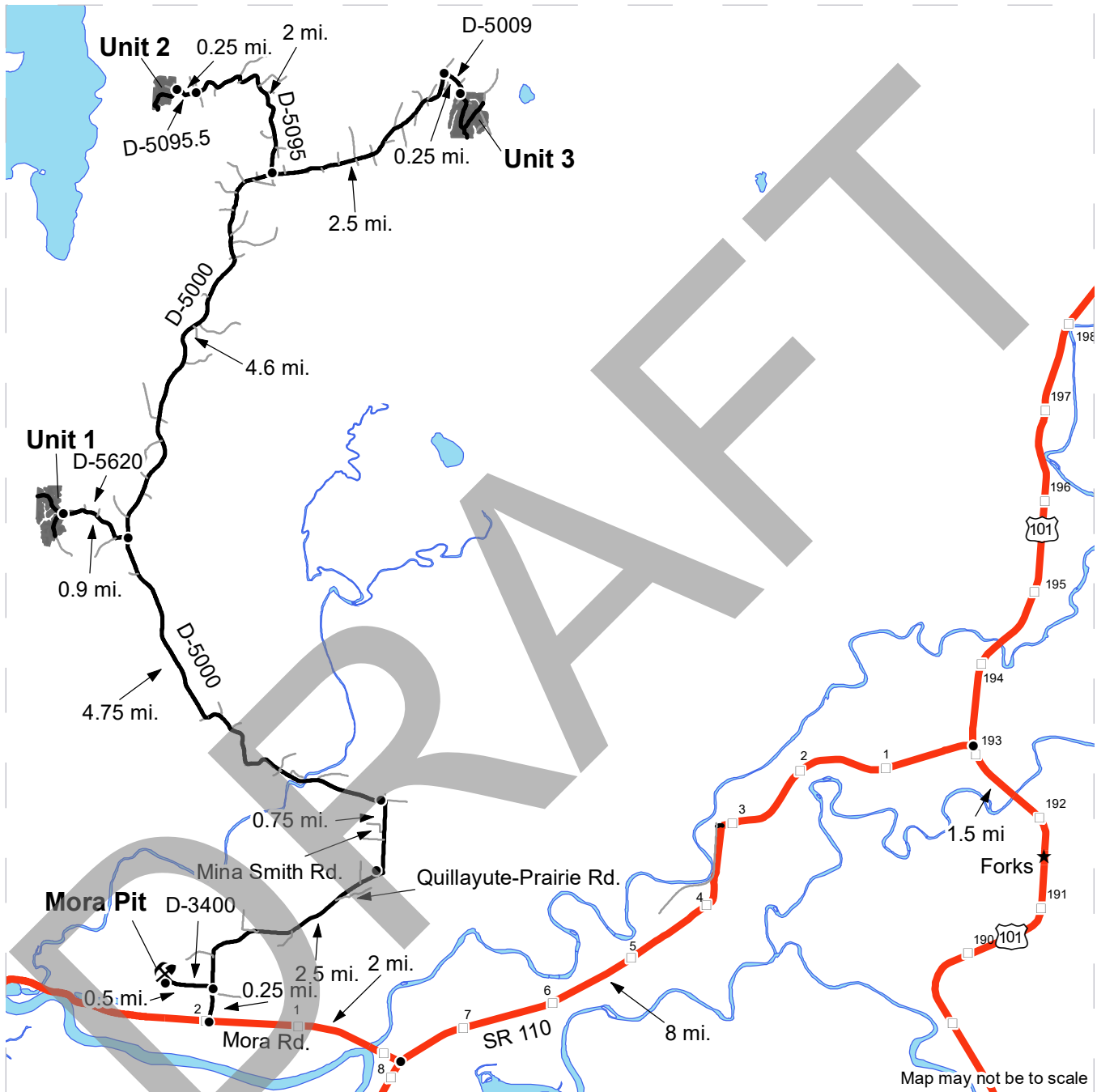
~ ~	Sale Boundary Tags	□	Stream Type	▭	Public Land Survey Townships
+ +	Leave Tree Tags	*	Stream Type Break	▭	Public Land Survey Sections
—	Existing Roads	— / —	Sale Area	▭	DNR Managed Lands
=Δ=	Optional Pre-Haul Maintenance	◆	Survey Monument	▨	Stream Crossing
—	Optional Reconstruction	■	Leave Tree Area	⊕	Proposed Landing
—	Streams	■	Riparian Mgt Zone		



# DRIVING MAP

**SALE NAME:** UPPER 5000  
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**TOWNSHIP(S):** T29R15W, T30R14W, T30R15W  
**TRUST(S):** State Forest Transfer (1)

**REGION:** Olympic Region  
**COUNTY(S):** Clallam  
**ELEVATION RGE:** 100'-790'



	Timber Sale Unit
	Highway
	Haul Route
	Other Road
	Milepost Markers

**DRIVING DIRECTIONS:**

**Unit 1:** From Forks, WA, drive north on U.S. 101 for 1.5 mi. Turn left onto SR 110. Continue on SR 110 for 8 mi. Turn right onto Mora Rd and continue for 2 mi. Turn left onto Quillayute-Prairie Rd. Continue for 2.75 mi. Turn left onto Mina Smith Rd. Continue on Mina Smith Rd for 0.75 mi. Turn left onto the D-5000. Continue on the D-5000 for 4.75 mi. Turn left on the D-5600 and immediately turn right onto the D-5620. Continue for 0.9 mi to reach unit 1.

**Unit 2:** From the intersection of the D-5600 and the D-5000, continue on the D-5000 for 4.6 mi. Turn left onto the D-5095. Continue for 2 mi. Turn left onto the D-5095.5. Continue for 0.25 mi to reach unit 2.

**Unit 3:** From the intersection of the D-5095 and the D-5000, continue on the D-5000 for 2.5 mi. Turn right onto the D-5009. Continue for 0.25 mi to reach unit 3.

**Mora Pit:** From the intersection of Mora Rd. and Quillayute-Prairie Rd., continue on Quillayute-Prairie Rd for 0.25 mi. Turn right on the D-3400. Continue on the D-3400 for 0.5 mi to arrive at Mora Pit.

## Timber Sale Cruise Report Upper 5000

**Sale Name:** UPPER 5000

**Sale Type:** LUMP SUM

**Region:** OLYMPIC

**District:** OZETTE

**Lead Cruiser:** Kevin Peterson

**Other Cruisers:**

**Cruise Narrative:**

**Location:**

This sale is located of the the D-5000 road system. Access is good to all units.

**Cruise Design:**

I used a 54.44/40 BAF combo for this sale. The 40 BAF was used to pick up RA. Merch height was determined at 40% of the diameter at 16'. All logs were cruised in 40' lengths.

**Timber Quality:**

This sale is a mixture of 40-50 year old DF, WH and SS; there is some patches of RA in the lower areas. Common defect are sweep and forked tops.

**Logging and Stand Conditions:**

This sale has some rolling terrain but is pretty easy to move through. It is 92% ground based harvest and 8% uphill cable.

### Timber Sale Notice Volume (MBF)

Sp	DBH	Rings/In	Age	MBF Volume by Grade				
				All	2 Saw	3 Saw	4 Saw	Utility
DF	14.1	5.8		2,455	644	1,247	475	89
WH	13.4	5.8		1,673	245	982	405	40
SS	16.3			899	334	390	176	
RA	11.6			148			148	
ALL	13.6	5.8		5,175	1,223	2,619	1,204	129

### Timber Sale Notice Weight (tons)

Sp	Tons by Grade				
	All	2 Saw	3 Saw	4 Saw	Utility
DF	23,282	6,052	12,135	4,311	784
WH	17,863	2,519	11,026	3,958	360
SS	8,356	2,736	3,887	1,732	
RA	1,520			1,520	
ALL	51,020	11,307	27,048	11,521	1,144

**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 (%)
304.1	2.5	97.3	1.8	29,573	3.1

**Timber Sale Unit Cruise Design**

Unit	Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
UPPER 5000 U1	B2C: VR, 2 BAF (54.44, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	62.0	64.5	31	10	0
UPPER 5000 U2	B2C: VR, 2 BAF (54.44, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	33.0	33.4	17	9	0
UPPER 5000 U3	B2C: VR, 2 BAF (54.44, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	80.0	83.8	40	13	0
All		175.0	181.8	88	32	0

**Timber Sale Log Grade x Sort Summary**

Sp	Status	Grade	Sort	Dia	Len	BF Gross	BF Net	Defect %	Tons	MBF Net
DF	LIVE	2 SAW	Domestic	13.3	40	4,030	3,679	8.7	6,051.9	643.8
DF	LIVE	3 SAW	Domestic	8.3	40	7,290	7,124	2.3	12,134.8	1,246.6
DF	LIVE	4 SAW	Domestic	5.1	25	2,780	2,716	2.3	4,311.3	475.2
DF	LIVE	UTILITY	Pulp	5.3	30	511	511	0.0	783.7	89.4
RA	LIVE	4 SAW	Domestic	6.0	33	872	845	3.2	1,520.1	147.8
SS	LIVE	2 SAW	Domestic	14.3	40	2,009	1,907	5.1	2,736.3	333.8
SS	LIVE	3 SAW	Domestic	9.1	40	2,283	2,229	2.4	3,887.4	390.1
SS	LIVE	4 SAW	Domestic	5.4	33	1,012	1,003	0.9	1,732.0	175.5
WH	LIVE	2 SAW	Domestic	14.1	40	1,595	1,403	12.0	2,519.0	245.5
WH	LIVE	3 SAW	Domestic	8.7	40	5,823	5,614	3.6	11,026.0	982.5
WH	LIVE	4 SAW	Domestic	5.1	29	2,331	2,314	0.7	3,957.6	405.0
WH	LIVE	UTILITY	Pulp	5.1	30	229	229	0.0	360.1	40.0

**Timber Sale Log Sort x Diameter Bin Summary**

Sp	Bin	Status	Sort	Dia	Len	BF Net	Defect %	Tons	MBF Net
DF	5 - 8	LIVE	Pulp	5.3	30	511	0.0	783.7	89.4
DF	5 - 8	LIVE	Domestic	6.0	30	6,882	2.1	11,805.8	1,204.4
DF	9 - 11	LIVE	Domestic	10.4	40	2,957	2.6	4,640.2	517.4



Sp	Bin	Status	Sort	Dia	Len	BF Net	Defect %	Tons	MBF Net
DF	12 - 14	LIVE	Domestic	13.1	40	3,061	5.9	5,061.7	535.7
DF	15 - 19	LIVE	Domestic	15.9	40	618	20.5	990.3	108.2
RA	5 - 8	LIVE	Domestic	5.9	33	806	2.8	1,449.2	141.1
RA	9 - 11	LIVE	Domestic	9.2	40	38	10.3	70.9	6.7
SS	5 - 8	LIVE	Domestic	5.9	34	1,593	2.2	2,959.8	278.8
SS	9 - 11	LIVE	Domestic	10.1	40	1,639	1.6	2,659.7	286.8
SS	12 - 14	LIVE	Domestic	13.0	40	907	3.7	1,398.5	158.8
SS	15 - 19	LIVE	Domestic	16.2	40	1,000	6.3	1,337.9	175.0
WH	5 - 8	LIVE	Pulp	5.1	30	229	0.0	360.1	40.0
WH	5 - 8	LIVE	Domestic	5.9	32	4,393	1.9	8,394.2	768.8
WH	9 - 11	LIVE	Domestic	10.1	40	3,535	3.8	6,589.5	618.6
WH	12 - 14	LIVE	Domestic	13.5	40	746	8.0	1,376.4	130.5
WH	15 - 19	LIVE	Domestic	15.3	40	657	16.3	1,142.6	115.0

## Cruise Unit Report UPPER 5000 U1

### Unit Sale Notice Volume (MBF): UPPER 5000 U1

Sp	DBH	Rings/In	Age	MBF Volume by Grade				
				All	2 Saw	3 Saw	4 Saw	Utility
DF	13.5	6.0		900	170	467	207	56
WH	13.6	6.0		634	103	360	171	
SS	14.0			183	71	64	48	
RA	11.4			58			58	
ALL	13.3	6.0		1,775	344	891	484	56

### Unit Cruise Design: UPPER 5000 U1

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	62.0	64.5	31	10	0

### Unit Cruise Summary: UPPER 5000 U1

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	22	89	2.9	1
WH	17	59	1.9	1
SS	5	18	0.6	0
RA	7	10	0.3	0
ALL	51	176	5.7	2

### Unit Cruise Statistics: UPPER 5000 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	156.3	78.3	14.1	92.9	20.6	4.4	14,513	80.9	14.7
WH	103.6	84.0	15.1	98.6	21.0	5.1	10,219	86.6	15.9
SS	31.6	212.2	38.1	93.3	17.6	7.9	2,949	212.9	38.9
RA	12.9	324.0	58.2	72.9	20.1	7.6	941	324.6	58.7
ALL	304.4	18.9	3.4	94.0	21.2	3.0	28,622	28.4	4.5

**Unit Summary: UPPER 5000 U1**

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	22	ALL	13.5	57	70	15,047	14,513	3.5	157.2	156.3	42.5	899.8
RA	LIVE	CUT	7	ALL	11.4	48	57	967	941	2.6	18.2	12.9	3.8	58.4
SS	LIVE	CUT	5	ALL	14.0	57	71	3,012	2,949	2.1	29.6	31.6	8.4	182.8
WH	LIVE	CUT	17	ALL	13.6	55	67	10,698	10,219	4.5	102.7	103.6	28.1	633.6
ALL	LIVE	CUT	51	ALL	13.5	56	69	29,723	28,622	3.7	307.7	304.4	82.9	1,774.6
ALL	ALL	ALL	51	ALL	13.5	56	69	29,723	28,622	3.7	307.7	304.4	82.9	1,774.6

## Cruise Unit Report UPPER 5000 U2

### Unit Sale Notice Volume (MBF): UPPER 5000 U2

Sp	DBH	Rings/In	Age	MBF Volume by Grade				
				All	2 Saw	3 Saw	4 Saw	Utility
DF	13.2	6.0		453	100	215	106	33
WH	13.3	6.0		345	65	181	100	
SS	14.0			99	38	35	26	
RA	11.4			40			40	
ALL	13.0	6.0		937	202	430	272	33

### Unit Cruise Design: UPPER 5000 U2

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	33.0	33.4	17	9	0

### Unit Cruise Summary: UPPER 5000 U2

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	21	47	2.8	1
WH	16	34	2.0	1
SS	5	10	0.6	0
RA	7	7	0.4	0
ALL	49	98	5.8	2

### Unit Cruise Statistics: UPPER 5000 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	150.5	74.0	18.0	91.3	21.2	4.6	13,740	77.0	18.5
WH	108.9	82.9	20.1	96.1	21.4	5.4	10,464	85.6	20.8
SS	32.0	170.6	41.4	93.3	17.6	7.9	2,987	171.5	42.1
RA	16.5	298.2	72.3	72.9	20.1	7.6	1,201	298.8	72.7
ALL	307.9	21.0	5.1	92.2	21.6	3.1	28,392	30.1	5.9

**Unit Summary: UPPER 5000 U2**

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	21	ALL	13.2	55	68	14,327	13,740	4.1	158.4	150.5	41.4	453.4
RA	LIVE	CUT	7	ALL	11.4	48	57	1,234	1,201	2.6	23.2	16.5	4.9	39.6
SS	LIVE	CUT	5	ALL	14.0	57	71	3,051	2,987	2.1	30.0	32.0	8.6	98.6
WH	LIVE	CUT	16	ALL	13.3	54	66	11,029	10,464	5.1	112.9	108.9	29.9	345.3
ALL	LIVE	CUT	49	ALL	13.2	55	67	29,642	28,392	4.2	324.5	307.9	84.7	936.9
ALL	ALL	ALL	49	ALL	13.2	55	67	29,642	28,392	4.2	324.5	307.9	84.7	936.9

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## Cruise Unit Report UPPER 5000 U3

### Unit Sale Notice Volume (MBF): UPPER 5000 U3

Sp	DBH	Rings/In	Age	MBF Volume by Grade				Utility
				All	2 Saw	3 Saw	4 Saw	
DF	14.9	5.5		1,102	374	565	162	
WH	13.2	5.5		694	78	442	135	40
SS	17.3			618	225	292	102	
RA	12.1			50			50	
ALL	14.1	5.5		2,464	677	1,298	448	40

### Unit Cruise Design: UPPER 5000 U3

Design	Cruise Acres	FMA Acres	N Plots	N Cruise Plots	N Void Plots
B2C: VR, 2 BAF (54.44, 40 for some species) Measure/Count Plots, Sighting Ht = 4.5 ft	80.0	83.8	40	13	0

### Unit Cruise Summary: UPPER 5000 U3

Sp	Cruised Trees	All Trees	Trees/Plot	Ring-Count Trees
DF	20	98	2.5	2
WH	25	63	1.6	2
SS	11	55	1.4	0
RA	8	9	0.2	0
ALL	64	225	5.6	4

### Unit Cruise Statistics: UPPER 5000 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	133.0	87.1	13.8	103.5	21.2	4.7	13,774	89.7	14.6
WH	85.4	103.2	16.3	101.6	18.3	3.7	8,675	104.8	16.7
SS	74.9	147.0	23.2	103.2	27.2	8.2	7,725	149.5	24.6
RA	9.0	408.7	64.6	69.2	15.7	5.5	623	409.0	64.9
ALL	302.3	27.3	4.3	101.9	22.8	2.9	30,797	35.6	5.2

**Unit Summary: UPPER 5000 U3**

Sp	Status	Rx	N	D	DBH	BL	THT	BF Gross	BF Net	Defect %	TPA	BA	RD	MBF Net
DF	LIVE	CUT	20	ALL	14.9	62	77	14,390	13,774	4.3	109.9	133.0	34.5	1,101.9
RA	LIVE	CUT	8	ALL	12.1	50	60	650	623	4.2	11.3	9.0	2.6	49.8
SS	LIVE	CUT	11	ALL	17.3	67	85	8,010	7,725	3.6	45.9	74.9	18.0	618.0
WH	LIVE	CUT	25	ALL	13.2	62	77	8,984	8,675	3.4	89.8	85.4	23.5	694.0
ALL	LIVE	CUT	64	ALL	14.7	62	77	32,035	30,797	3.9	256.9	302.3	78.5	2,463.8
ALL	ALL	ALL	64	ALL	14.7	62	77	32,035	30,797	3.9	256.9	302.3	78.5	2,463.8

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STATE OF WASHINGTON  
DEPARTMENT OF NATURAL RESOURCES

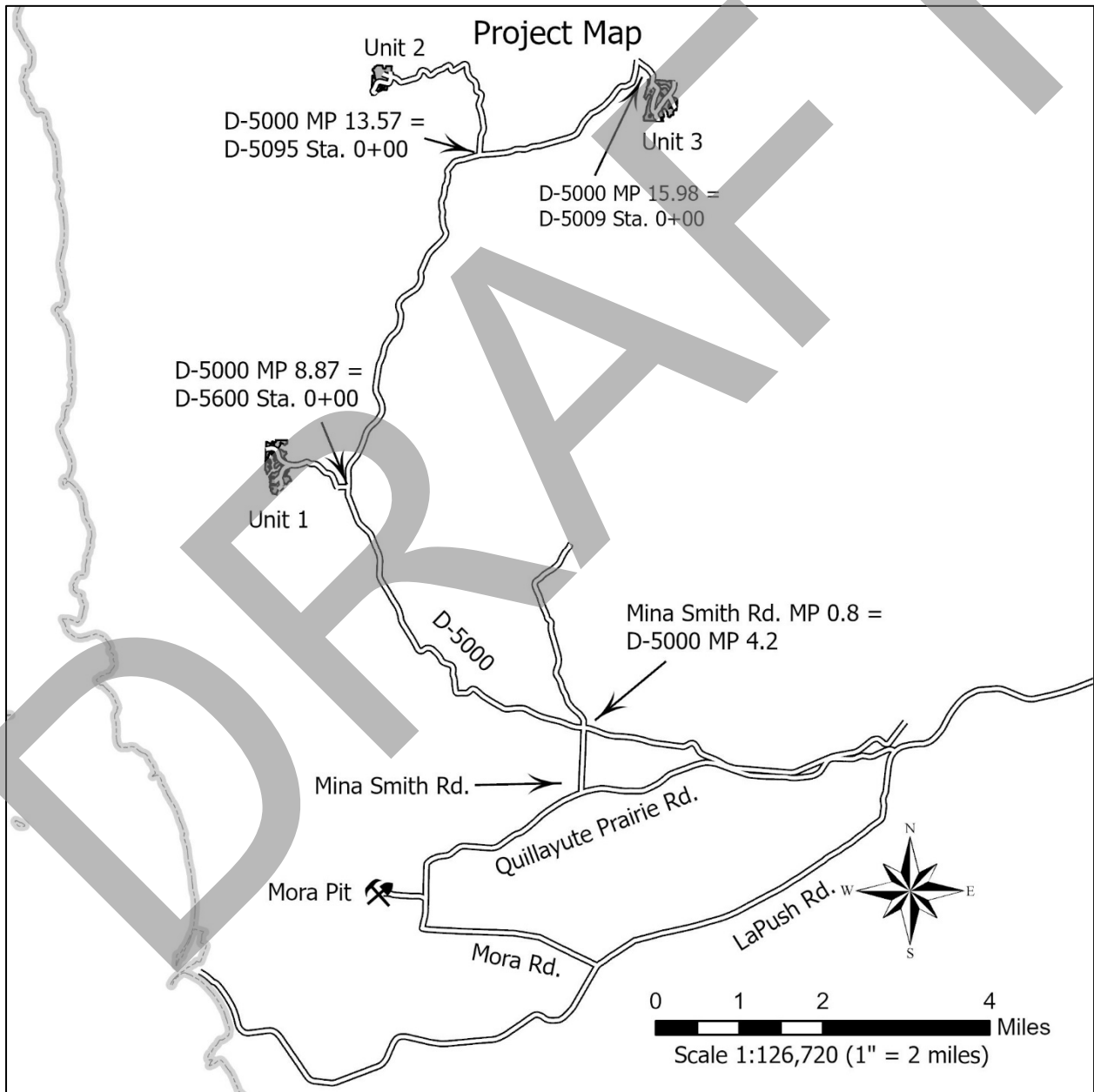
UPPER 5000 TIMBER SALE ROAD PLAN  
CLALLAM COUNTY  
COAST DISTRICT

AGREEMENT NO.: 30-104821

DISTRICT ENGINEER: BILL MEHL

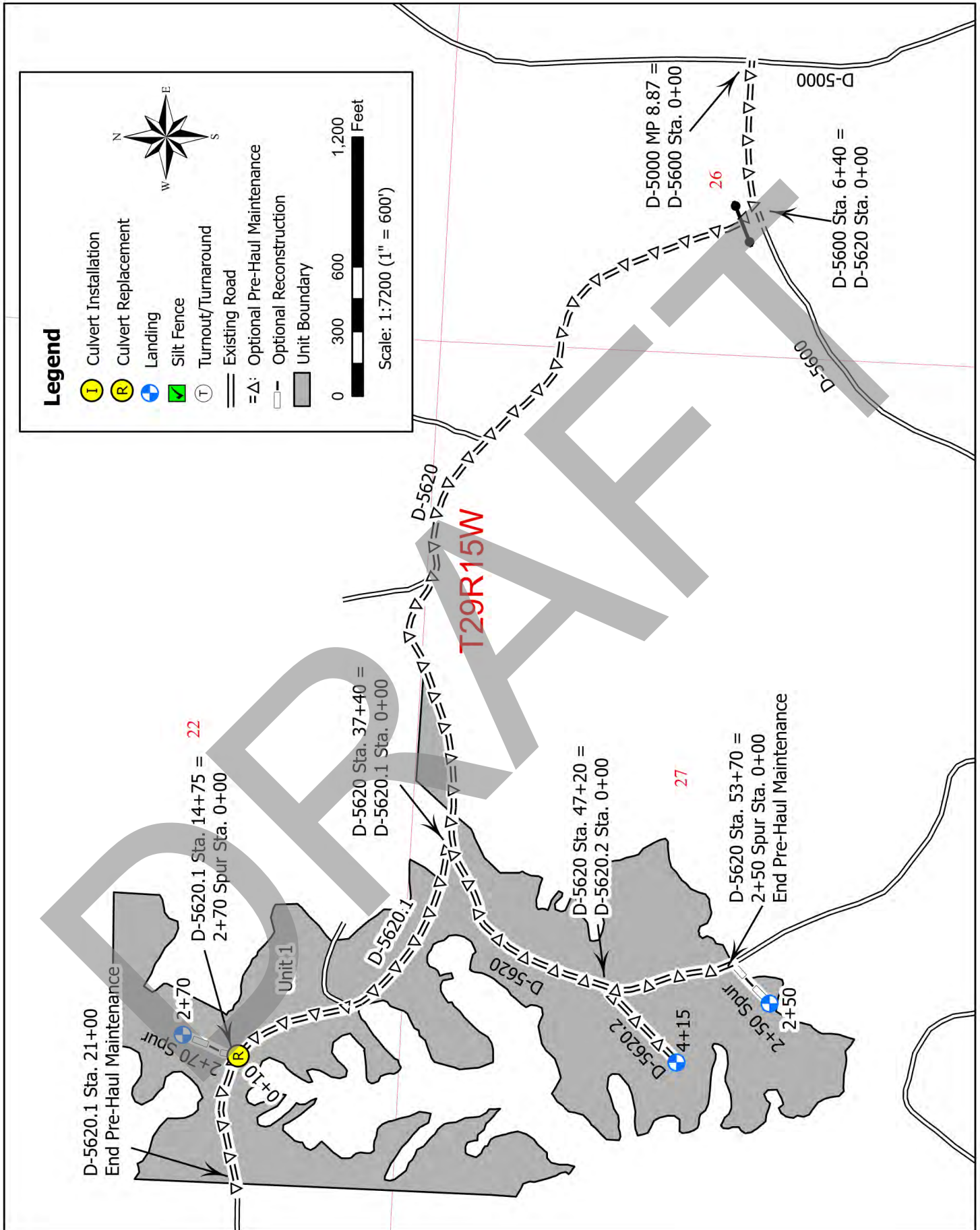
DATE: 10/31/2023

DRAWN & COMPILED BY: EMMA HEIN

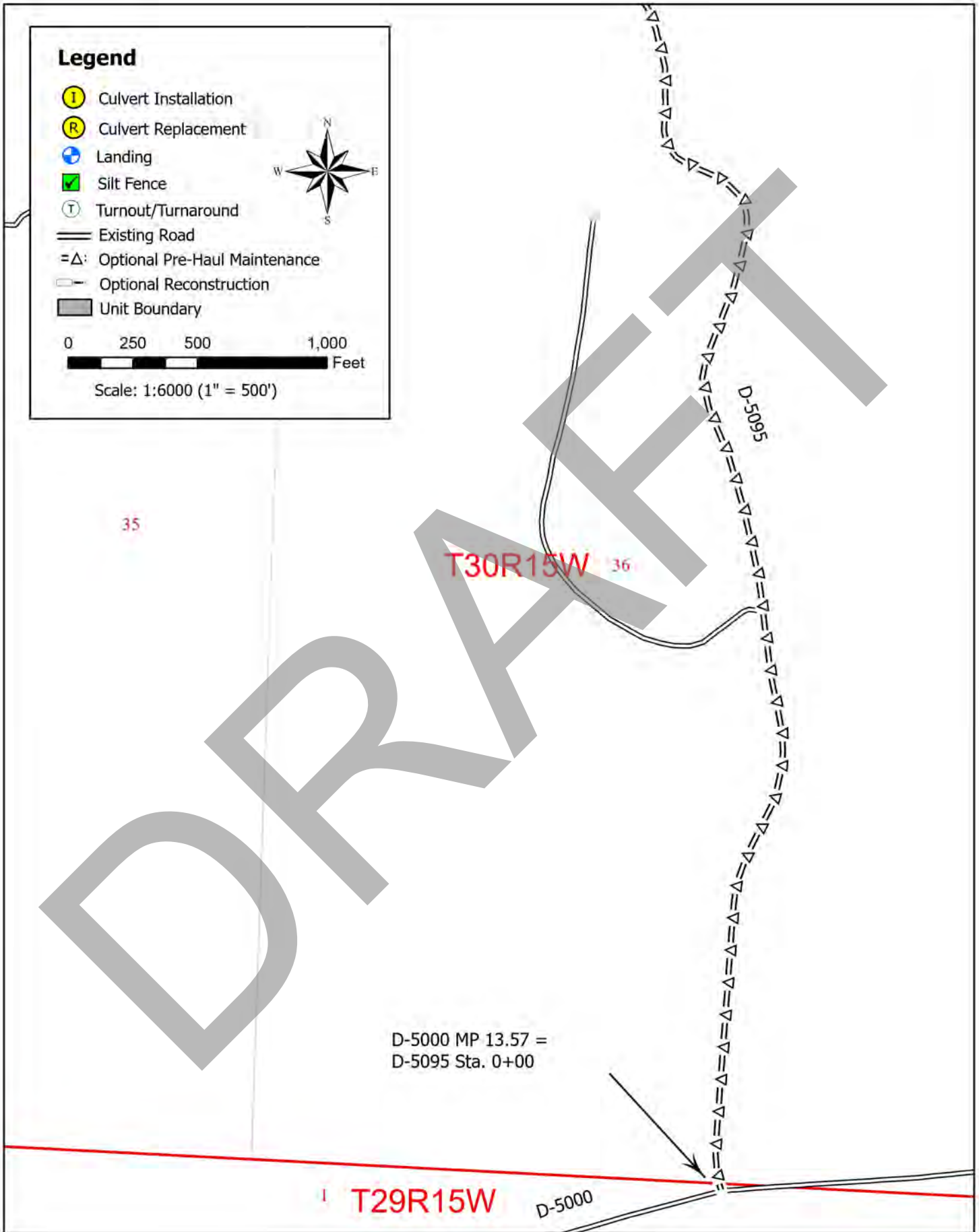




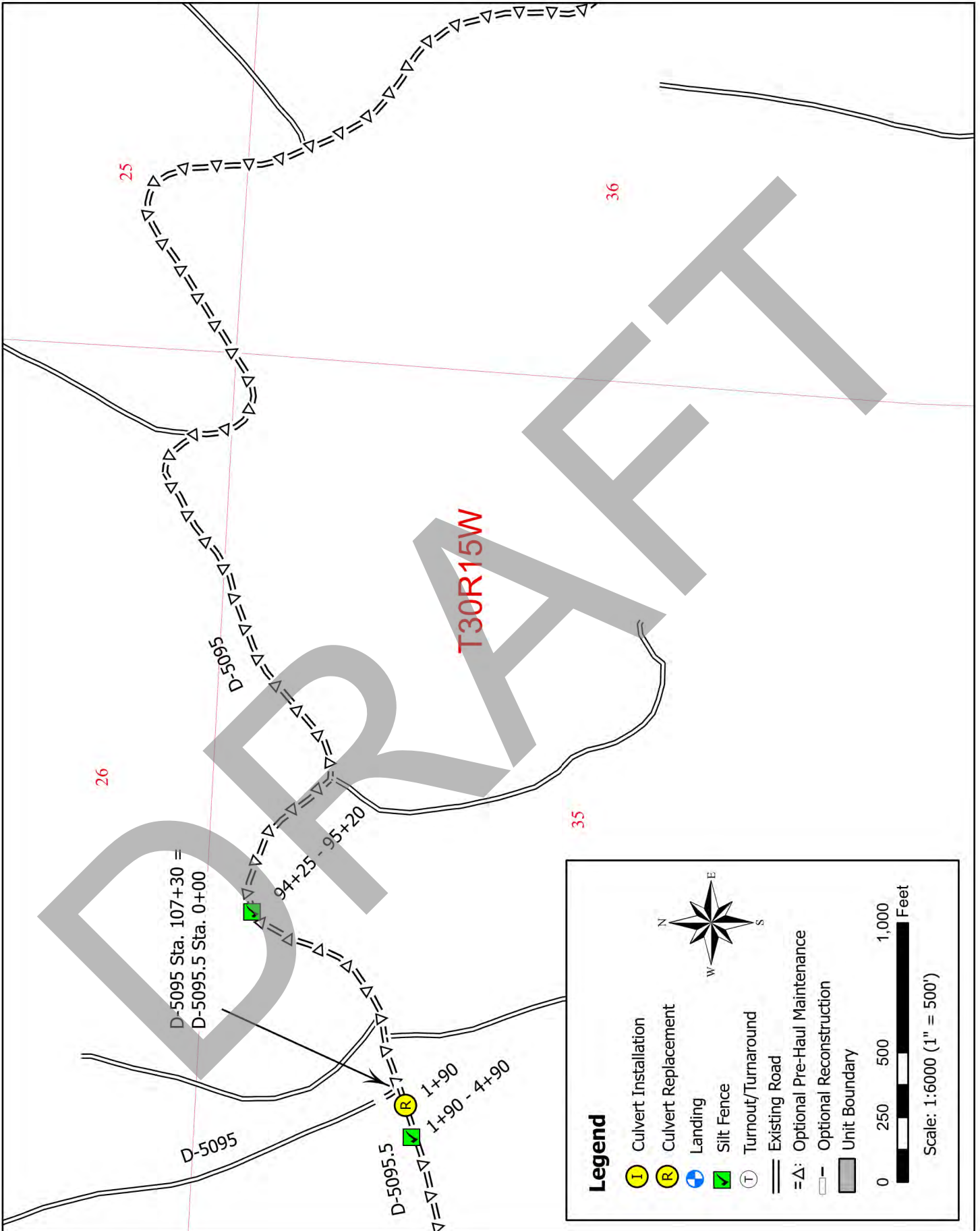
# Unit 1 Work Map



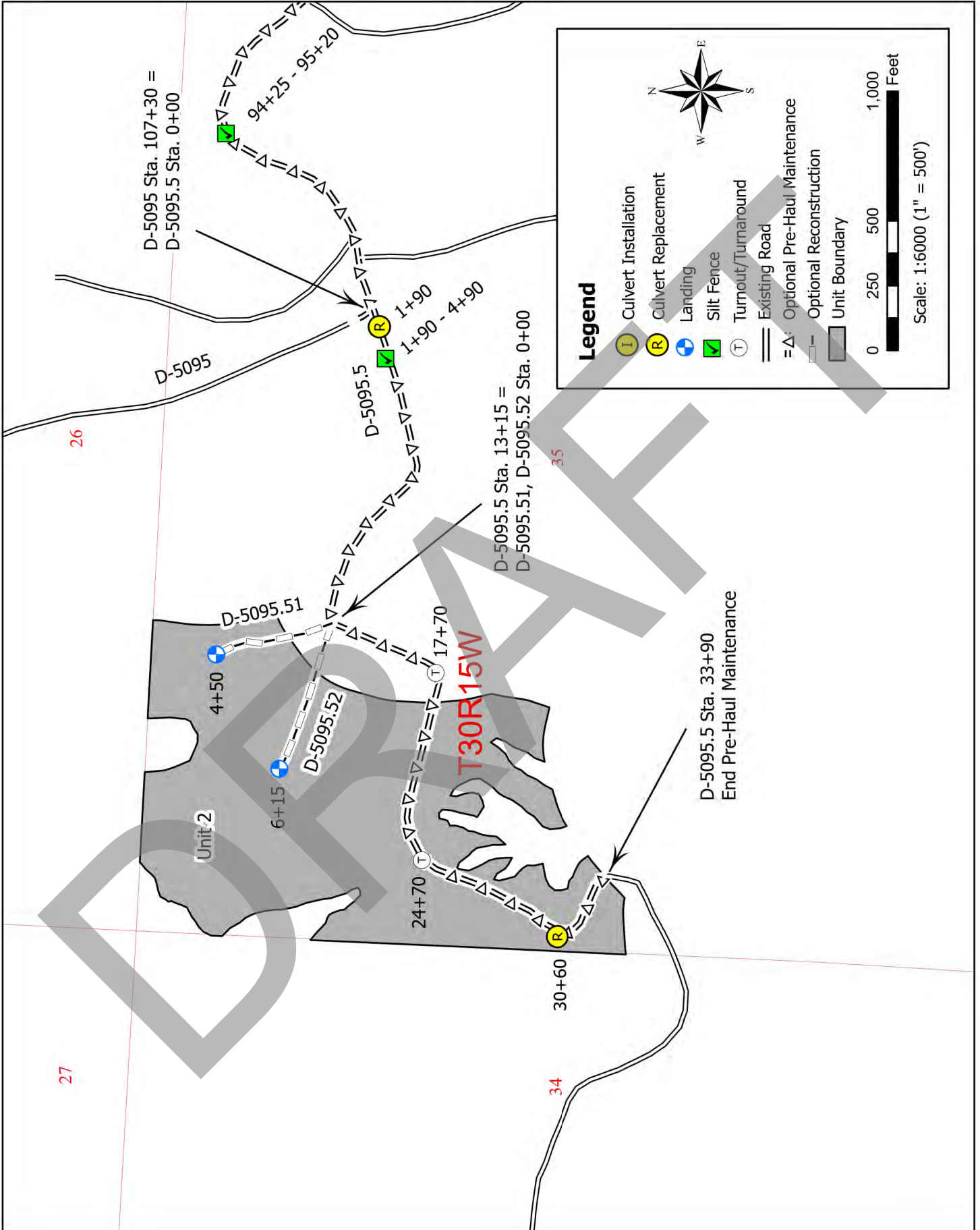
# D-5095 Work Map



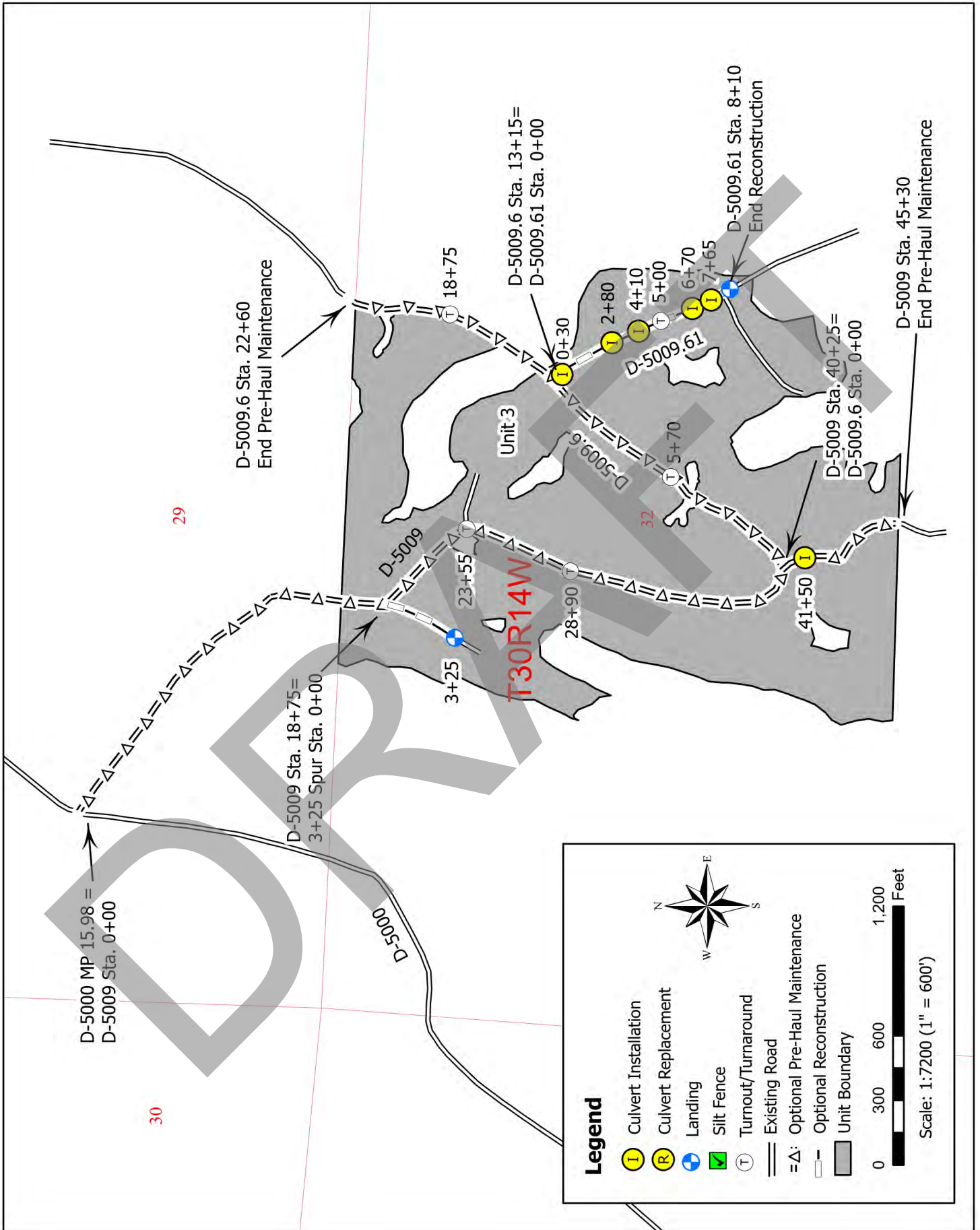
# D-5095 & D-5095.5 Work Map



# Unit 2 Work Map



# Unit 3 Work Map



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.

**0-3 OPTIONAL ROADS**

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

<u>Road</u>	<u>Stations</u>	<u>Type</u>
D-5009	0+00 – 45+30	Pre-Haul Maintenance
3+25 Spur	0+00 – 3+25	Reconstruction
D-5009.6	0+00 – 22+60	Pre-Haul Maintenance
D-5009.61	0+00 – 8+10	Reconstruction
D-5095	0+00 – 107+30	Pre-Haul Maintenance
D-5095.5	0+00 – 33+90	Pre-Haul Maintenance
D-5095.51	0+00 – 4+50	Reconstruction
D-5095.52	0+00 – 6+15	Reconstruction
D-5600	0+00 – 6+40	Pre-Haul Maintenance
D-5620	0+00 – 53+70	Pre-Haul Maintenance
D-5620.1	0+00 – 21+00	Pre-Haul Maintenance
2+70 Spur	0+00 – 2+70	Reconstruction
D-5620.2	0+00 – 4+15	Pre-Haul Maintenance
2+50 Spur	0+00 – 2+50	Reconstruction

**0-5 RECONSTRUCTION**

This project includes, but is not limited to the following reconstruction requirements:

<u>Road</u>	<u>Stations</u>	<u>Requirements</u>
3+25 Spur	0+00 – 3+25	See Below
D-5009.61	0+00 – 8+10	
D-5095.51	0+00 – 4+50	
D-5095.52	0+00 – 6+15	
2+50 Spur	0+00 – 2+50	
2+70 Spur	0+00 – 2+70	
Total Stations:	27.20	

Reconstruction includes, but is not limited to: Removal of all vegetative material with minimum loss of rock and dispose of in accordance with Clause 2-9 and Clause 3-23. Cleaning ditches and constructing ditches, constructing headwalls, cleaning culvert inlets and outlets in accordance with Clause 2-6 and Clause 2-7. Installing additional culverts and replacing culverts in accordance with the culvert list. Grading, shaping and compacting existing road surface, turnouts and turnaround in accordance with Clause 2-5, realigning road segments, spreading grass seed and hay, and the application of rock in accordance with the Rock List.

**0-6 PRE-HAUL MAINTENANCE**

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

<u>Road</u>	<u>Stations</u>	<u>Requirements</u>
D-5009	0+00 – 45+30	Grade, shape, and compact existing running surface in accordance with Clause 2-5. Brush road in accordance with Clause 3-1 and Brushing Detail. Replace/Install culverts in accordance with Clause 2-6 and Culvert List. Apply rock in accordance with Rock List.
D-5009.6	0+00 – 22+60	Grade, shape, and compact existing running surface in accordance with Clause 2-5. Brush road in accordance with Clause 3-1 and Brushing Detail. Apply rock in accordance with Rock List.
D-5095	0+00 – 103+70	Grade, shape, and compact existing running surface in accordance with Clause 2-5. Brush road in accordance with Clause 3-1 and Brushing Detail. Install erosion control structures in accordance with Clause 8-1. Apply rock in accordance with Rock List.
D-5095.5	0+00 – 33+90	Grade, shape, and compact existing running surface in accordance with Clause 2-5. Brush road in accordance with Clause 3-1 and Brushing Detail. Replace/Install culverts in accordance with Clause 2-6 and Culvert List. Install erosion control structures in accordance with Clause 8-1. Apply Rock in accordance with Rock List.
D-5600	0+00 – 6+40	Grade, shape, and compact existing running surface in accordance with Clause 2-5. Brush road in accordance with Clause 3-1 and Brushing Detail.
D-5620	0+00 – 53+70	Grade, shape, and compact existing running surface in accordance with Clause 2-5. Brush road in accordance with Clause 3-1 and Brushing Detail. Apply rock in accordance with Rock List.
D-5620.1	0+00 – 21+00	Grade, shape, and compact existing running surface in accordance with Clause 2-5. Brush road in accordance with Clause 3-1 and Brushing Detail. Apply rock in accordance with Rock List.
D-5620.2	0+00 – 4+15	Grade, shape, and compact existing running surface in accordance with Clause 2-5. Remove vegetation in accordance with Clause 2-9, brush road in accordance with

		Clause 3-1 and Brushing Detail. Apply Rock in accordance with Rock List.
Total Stations:	281.80	

Maintenance includes, but is not limited to: Brushing right-of-way, right-of-way debris disposal, cleaning ditches, constructing ditches, installing additional culverts, widening road segments, constructing headwalls, cleaning culvert inlets and outlets, cross drain culvert replacement, installing erosion control materials and sediment removal structures, spot rocking, grading and shaping existing road surface and turnouts, constructing additional turnouts, compaction of road surface, application of rock, acquisition and application of grass seed and hay.

**0-7 POST-HAUL MAINTENANCE**

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

**0-12 DEVELOP ROCK SOURCE**

The Purchaser shall develop an existing rock source called Mora Pit. Development will involve stripping approximately 1 acre to useable rock as determined by the Contract Administrator. Work for developing rock sources is listed in Section 6 ROCK AND SURFACING.

**0-13 STRUCTURES**

The Purchaser shall acquire and install all structures. Requirements for these structures are listed in Section 7 Structures.

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 shall be submitted, in writing, to the Contract Administrator for consideration. The State must approve the submitted plans before road work begins.

**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**

Unless controlled by construction stakes or design data (plan, profile, and cross-sections), road work shall be performed in accordance with the dimensions shown on the Typical Section Sheet and the specifications within this Road Plan.

**1-6 ORDER OF PRECEDENCE**

Any conflict or inconsistency in this Road Plan shall 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.

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**

The Purchaser is responsible for the repair or replacement of all materials, roadway infrastructure, and road components damaged during roadwork or operation activities. Repairs and replacements shall be directed by the Contract Administrator. Repairs to structural materials will be made according to the manufacturer's recommendation, and shall not begin without written approval from the Contract Administrator.

**1-9 DAMAGED METALLIC COATING**

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

**1-12 SURVEY MONUMENTS**

At no time during construction, reconstruction, or maintenance shall survey monuments, witness trees, or bearing trees be disturbed or damaged. If damaged or disturbed, Purchaser shall hire a licensed land surveyor to repair, replace, and/or reset them.

**1-13 LOG LOADING**

At no time shall the loading of logs occur on the D-5000. In addition, no debris from harvesting operations shall be allowed on this road.

**SUBSECTION ROAD MARKING**

**1-15 ROAD MARKING**

Road work must be in accordance with the State's marked location. All road work is marked as follows:

- Orange ribbon and paint for construction centerlines.
- Construction stakes for everything else.

**1-18 REFERENCE POINT DAMAGE**

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

**SUBSECTION TIMING**

**1-20 COMPLETE BY DATE**

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

**1-21 HAUL APPROVAL**

The Purchaser shall not use roads under this Road Plan without written approval from the Contract Administrator.

**1-22 WORK NOTIFICATIONS**

On all roads, the Purchaser shall notify the Contract Administrator a minimum of 3 calendar days before work begins.

**1-23 ROAD WORK PHASE APPROVAL**

Written approval by Contract Administrator needs to be given at these phases of road work:

- Subgrade approval
- Drainage installation
- Subgrade compaction
- Rock application
- Rock compaction

**SUBSECTION RESTRICTIONS**

**1-25 ACTIVITY TIMING RESTRICTION**

On the following road(s), the specified activities are not permitted during the listed closure period(s) unless authorized in writing by the Contract Administrator.

<u>Road</u>	<u>Stations</u>	<u>Activity</u>	<u>Closure Period</u>
D-5095.5	0+00 – 33+90	All roadwork activities including Timber Haul	October 15 <sup>th</sup> – April 15 <sup>th</sup>
D-5095.51	0+00 – 4+50	All roadwork activities including Timber Haul	October 15 <sup>th</sup> – April 15 <sup>th</sup>
D-5095.52	0+00 – 6+15	All roadwork activities including Timber Haul	October 15 <sup>th</sup> – April 15 <sup>th</sup>

**1-26 OPERATING DURING CLOSURE PERIOD**

If permission is granted to operate during a closure period listed in Clause 1-25 Activity Timing Restriction, the Purchaser shall provide a maintenance plan to include further protection of State resources. The Contract Administrator must approve the maintenance plan in writing, and preventative measures shall be put in place before operation in the closure period. The Purchaser shall be 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 shall be developed. All parties shall follow this plan.

**1-27 LIMITED OPERATING PERIOD FOR MARBLED MURRELET**

On the following road(s), any road work, right-of-way timber falling and yarding, rock pit operations, or operation of heavy equipment must be performed during the limited operating period if implemented during the nesting season. The limited operating period runs from two hours after sunrise to two hours before sunset between April 1 through September 23. This restriction does not apply to the hauling of timber, rock, or equipment.

<u>Road</u>	<u>Stations</u>
D-5095	0+00 – 25+50, 99+45 – 103+70
D-5095.5	0+00 – 19+25

**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 shall suspend road work or hauling of right-of-way timber, forest products, or rock under the following conditions:

- 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, the Purchaser will be required to cease operations, or perform corrective maintenance or repairs, subject to specifications within this Road Plan. Before and during any suspension, the Purchaser shall protect the work from damage or deterioration.

**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, as approved in writing by Contract Administrator, shall be used.

If tracked equipment is used on bridge or asphalt surfaces, Purchaser shall immediately cease all road work and hauling operations. Any dirt, rock, or other material tracked or spilled on bridge or asphalt surface(s) shall be removed immediately. Any damage to the surface(s) shall be repaired at the Purchaser's expense as directed by the Contract Administrator.

**1-33 SNOW PLOWING RESTRICTION**

On all roads, snow plowing shall be permitted only after the execution of a Snow Plowing Agreement, which is available from the Contact Administrator upon request. Purchaser shall request a Snow Plowing Agreement each time plowing occurs. If damage occurs while plowing, further permission to plow may be revoked by the Contract Administrator.

SUBSECTION OTHER INFRASTRUCTURE

**1-40 ROAD APPROACHES TO COUNTY ROADS AND STATE HIGHWAYS**

At existing road approaches to county roads and state highways, any mud, dirt, rock or other material tracked or spilled on the asphalt surface shall be removed immediately by the Purchaser.

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

The following county roads and state highways are affected by this sale:

<u>Road Name</u>
Mina Smith Rd.
Quillayute Prairie Rd.

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.

**C-060 Designated Roads**

<u>Road</u>	<u>Stations</u>
D-5000	MP 4.2 to 15.9
D-3400	0+00 – 27+75

**2-4 PASSAGE OF LIGHT VEHICLES**

Purchaser shall maintain all roads in a condition that will allow the passage of light administrative vehicles.

**2-5 MAINTENANCE GRADING – EXISTING ROAD**

On the following road(s), a grader shall be used to shape the existing surface.

<u>Road</u>	<u>Stations</u>	<u>Requirements</u>
D-5009	0+00 – 45+30	Grade, shape, compact and remove shoulder vegetation as required by contract administrator
D-5009.6	0+00 – 22+60	Grade, shape, compact and remove shoulder vegetation as required by contract administrator
D-5095	0+00 – 103+70	Grade, shape, compact and remove shoulder vegetation as required by contract administrator
D-5095.5	0+00 – 33+90	Grade, shape, compact and remove shoulder vegetation as required by contract administrator
D-5600	0+00 – 6+40	Grade, shape, compact and remove shoulder vegetation as required by contract administrator
D-5620	0+00 – 53+70	Grade, shape, compact and remove shoulder vegetation as required by contract administrator
D-5620.1	8+95 – 21+00	Grade, shape, compact and remove shoulder vegetation as required by contract administrator
D-5620.2	0+00 – 4+15	Grade, shape, compact and remove shoulder vegetation as required by contract administrator

**2-9 REMOVING VEGETATIVE MATERIAL**

On the following road(s), Purchaser shall remove all vegetative material, dirt, mud, and other debris on the existing road surface with a minimum loss of rock. Material removed shall be disposed of in accordance with Clause 3-21 through Clause 3-25 and Clause 4-36 through Clause 4-38. Roads to be shaped in accordance with Typical Sheet specifications.

<u>Road</u>	<u>Stations</u>
3+25 Spur	0+00 – 3+25
D-5009.61	0+00 – 8+10
D-5095.51	0+00 – 4+50
D-5095.52	0+00 – 6+15
D-5620.2	0+00 – 4+15
2+50 Spur	0+00 – 2+50
2+70 Spur	0+00 – 2+70

**SECTION 3 – CLEARING, GRUBBING, AND DISPOSAL**

**SUBSECTION BRUSHING**

**3-1 BRUSHING**

On the following road(s), vegetative material up to 5 inches in diameter, including limbs, shall be cut as shown on the Brushing Detail. Brushing shall be achieved by mechanical cutting of brush, trees, and branches. Root systems and stumps of cut vegetation shall not be disturbed unless directed by the Contract Administrator.

<u>Road</u>	<u>Stations</u>
D-5009	0+00 – 45+30

D-5009.6	0+00 – 22+60
D-5095	0+00 – 103+70
D-5095.5	0+00 – 33+90
D-5600	0+00 – 6+40
D-5620	0+00 – 53+70
D-5620.1	8+95 – 21+00
D-5620.2	0+00 – 4+15

**3-2 BRUSHING RESTRICTION**

Pulling, digging, pushing over, and other non-cutting methods used for vegetation removal shall not be used for brushing. Excavator buckets, log loaders and similar equipment shall not be used for brushing.

**3-3 BRUSH REMOVAL**

Remove brushing debris from the road surface, ditchlines, and culvert inlets and outlets. Brush should be disposed of so that it will not fall back onto the road prism.

**SUBSECTION CLEARING**

**3-5 CLEARING**

Purchaser shall fall all vegetative material larger than 5 inches DBH or over 15 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.

**3-7 RIGHT-OF-WAY DECKING**

Deck all merchantable right-of-way timber. Decks shall be parallel to the road centerline and placed within the cleared right-of-way. Decks shall be free of dirt, limbs and other right-of-way debris, and removable by standard log loading equipment.

**3-8 PROHIBITED DECKING AREAS**

Right-of-way timber shall not be decked 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 unless approved by the Contract Administrator.

**SUBSECTION GRUBBING**

**3-10 GRUBBING**

Remove all stumps between the grubbing limits specified on the Typical Section Sheet. Those stumps outside the grubbing limits but with undercut roots shall also be removed. Stump removal shall be accomplished using a hydraulic mounted excavator unless authorized, in writing, by the Contract Administrator. Grubbing shall be completed before starting excavation and embankment.

### **3-12 STUMP PLACEMENT**

Grubbed stumps shall be placed outside of the clearing limits, as directed by the Contract Administrator and in compliance with all other clauses in this road plan. Stumps shall be positioned upright with root wads in contact with the forest floor and on stable locations.

## **SUBSECTION ORGANIC DEBRIS**

### **3-20 ORGANIC DEBRIS DEFINITION**

Organic debris is defined as all vegetative material not eligible for removal by Contract Clauses 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 Typical Section Sheet.

### **3-21 DISPOSAL COMPLETION**

All disposal of organic debris shall be completed before the application of rock.

### **3-23 PROHIBITED DISPOSAL AREAS**

Organic debris shall not be deposited in the following areas:

- Within 5 feet of a cross drain culvert.
- Within 50 feet of a live stream, or wetland.
- On road subgrades road prism excavation and embankment slopes.
- On slopes greater than 45%.
- Within the operational area for cable landings where debris may shift or roll.
- On locations where brush will fall into the ditch or onto the road surface.
- Against standing timber.

### **3-24 BURYING ORGANIC DEBRIS RESTRICTED**

Organic debris shall not be buried unless otherwise stated in this Road Plan.

### **3-25 SCATTERING ORGANIC DEBRIS**

Organic debris shall be scattered outside of the grubbing limits in accordance with Clause 3-23 unless otherwise detailed in this Road Plan and as directed by the Contract Administrator.

## **SUBSECTION PILE**

### **3-31 PILING**

Organic debris shall be piled no closer than 20 feet from standing timber. Piles shall be free of rock and soil.

## **SECTION 4 – EXCAVATION**

### **4-1 EXCAVATOR CONSTRUCTION**

All roads shall be constructed, reconstructed, and maintained using a track mounted hydraulic excavator unless stated otherwise within this Road Plan, or permission to do otherwise is granted in writing by the Contract Administrator.

**4-2 PIONEERING**

Pioneering shall not extend past construction that will be completed during the current construction season. Pioneering shall not extend more than 1000 feet beyond completed construction unless approved in writing by the Contract Administrator. In addition, the following actions shall be taken as pioneering progresses:

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

**4-3 ROAD GRADE AND ALIGNMENT STANDARDS**

The following road grade and alignment standards shall be followed:

- Grade and alignment shall have smooth continuity, without abrupt changes in direction.
- Maximum grade shall not exceed 18 percent favorable and 16 percent adverse.
- Minimum curve radius is 60 feet at centerline.
- Sag vertical curves shall not have a grade change greater than 5% in 100 feet.
- Crest vertical curves shall not have a grade change greater than 4% in 100 feet.

**4-4 SWITCHBACK STANDARDS**

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

- Adverse grades on switchbacks shall not exceed 10%.
- Favorable grades through switchbacks shall not exceed 12%.
- Transition grades entering and leaving switchbacks shall not exceed a 5% grade change.
- Transition grades required to meet switchback grade limitations shall be constructed on the tangents preceding and departing from the switchbacks.

**4-5 CUT SLOPE RATIO**

Unless construction staked or designed excavation slopes shall be constructed no steeper than shown on the following table:

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

**4-6 EMBANKMENT SLOPE RATIO**

Unless construction staked or designed embankment slopes shall be constructed no steeper than shown on the following table:

<u>Material Type</u>	<u>Embankment Slope Ratio</u>	<u>Embankment Slope Percent</u>
Sandy Soils	2:1	50



Common Earth and Rounded Gravel	1½:1	67
Angular Rock	1¼:1	80

**4-7 SHAPING CUT AND FILL SLOPE**

Excavation and embankment slopes shall be constructed 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.

Embankment widening shall be applied equally to both sides of the road to achieve the required width.

**SUBSECTION INTERSECTIONS, TURNOUTS AND TURNAROUNDS**

**4-21 TURNOUTS**

Turnouts shall be intervisible with maximum of 1,000 feet between turnouts unless shown otherwise on drawings. Locations shall be adjusted to fit the final subgrade alignment and sight distances. Turnout locations shall be subject to written approval by the Contract Administrator.

**4-22 TURNAROUNDS**

Turnarounds shall be no larger than 50 feet long and 30 feet wide. Locations shall be subject to written approval by the Contract Administrator.

**SUBSECTION DITCH CONSTRUCTION**

**4-25 DITCH CONSTRUCTION AND RECONSTRUCTION**

The Purchaser shall construct ditches into the subgrade as specified on the Typical Section Sheet. Excavated slopes shall be consistent with Clause 4-5 Cut Slope Ratio. Ditches shall be constructed concurrently with construction of the subgrade.

**4-27 DITCH WORK – MATERIAL USE PROHIBITED**

On all roads, pulling ditch material across the road or mixing in with the road surface will not be allowed. Excavated material shall be disposed of as specified in Clause 4-38.

**4-28 DITCH DRAINAGE**

Ditches must drain to cross-drain culverts or ditchouts.

## SUBSECTION WASTE MATERIAL (DIRT)

### 4-35 WASTE MATERIAL DEFINITION

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

### 4-36 DISPOSAL OF WASTE MATERIAL

Purchaser may sidecast waste material on side slopes up to 45% if the waste material is compacted and free of organic debris. On side slopes greater than 45%, all waste material must be end hauled or pushed to the designated embankment sites.

### 4-38 PROHIBITED WASTE DISPOSAL AREAS

Waste material shall not be deposited in the following areas:

- Within 5 feet of a cross drain culvert.
- Within 50 feet of a live stream or wetland.
- Within a riparian management zone.
- On side slopes steeper than 45%.
- In locations that interfere with the construction of the road prism.
- In locations that impede drainage.
- Within the operational area for cable landings.
- Against standing timber.

## SUBSECTION BORROW

### 4-47 NATIVE MATERIAL

Native material shall be excavated material free of organic debris, trash, and rocks greater than 12" in any dimension.

## SUBSECTION SHAPING

### 4-55 ROAD SHAPING

The road subgrade and surface shall be shaped as shown on the Typical Section Sheet. The subgrade and surface shape shall ensure runoff in an even, un-concentrated manner, and shall be uniform, firm, and rut-free.

### 4-56 DRY WEATHER SHAPING

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

## SUBSECTION COMPACTION

### 4-60 FILL COMPACTION

Purchaser shall compact all embankment and waste material in accordance with the Compaction List by routing equipment over the entire width of each lift. A plate

compactor must be used for areas specifically requiring keyed embankment construction, and embankment segments too narrow to accommodate equipment.

**4-61 SUBGRADE COMPACTION**

Purchaser shall compact constructed and reconstructed 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 placement of rock.

**4-62 DRY WEATHER COMPACTION**

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

**4-63 EXISTING SURFACE COMPACTION**

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

**4-64 WASTE MATERIAL COMPACTION**

All waste material shall be compacted by running equipment over it or bucket tamping.

**4-65 CULVERT BACKFILL COMPACTION**

Culvert backfills shall be accomplished by using a jumping jack compactor, performing at least 2 passes per lift, in lifts not to exceed 8 inches.

**4-66 COMPACTION BY METHOD**

Compaction shall consist of three complete passes over the entire width of each lift with a vibratory drum roller weighing a minimum of 6,000 pounds at a maximum operating speed of 3 mph. For embankment segments too narrow to accommodate a drum roller, a plate compactor shall be used.

**SUBSECTION SUBGRADE REINFORCEMENT**

**5-4 PUNCHEON RESTRICTED**

At no time shall puncheon be used in the subgrade, unless approved by the Contract Administrator.

**SUBSECTION CULVERTS**

**5-5 CULVERTS**

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

**5-11 UNUSED MATERIALS STATE PROPERTY**

On required roads, any materials listed on the Culvert List and Rock List that are not installed shall become the property of the State. Purchaser shall stockpile materials as directed by the Contract Administrator.

**5-12 CONTINGENCY CULVERTS**

The following culverts will be supplied by the Purchaser and will be available for installation on any road listed in the TYPICAL SECTION SHEET as directed by the Contract Administrator. Unused pipes will be located at Olympic Region Headquarters in Forks or as directed by C/A prior to contract expiration.

<u>Road</u>	<u>Size</u>
As Directed	1 18" x 30' culvert
By CA	1 18" culvert band

**SUBSECTION CULVERT INSTALLATION**

**5-15 CULVERT INSTALLATION**

Installation shall be in accordance with the Typical Cross Drain Culvert Installation Detail, Typical Type Ns Np Culvert Installation Detail, 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". Corrugated Polyethylene pipe shall be installed in a manner consistent with the manufacturer's recommendations.

**5-17 CROSS DRAIN SKEW AND SLOPE**

Cross drains on road grades in excess of 3% shall 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. Where the cross drain is at the low point in the road, culverts shall not be skewed. Cross drain culverts shall 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 shall be installed with a depth of cover of not less than 18 inches of compacted depth over the top of the culvert at the shallowest point. Stream crossing culverts shall be installed with a depth of cover specified in the Engineer's design, Type Ns Np Typical Detail Sheet, or to the minimum depth recommended by the culvert manufacturer for the type of cover material over the pipe, whichever is greater.

**5-20 ENERGY DISSIPATERS**

Energy dissipaters shall be installed to prevent erosion and are subject to approval by the Contract Administrator. Rock shall weigh at least 10 pounds and be placed by zero-drop-height method. Energy dissipater shall extend a minimum of 3/4 foot to each side of the culvert at the outlet and a minimum of 2 feet beyond the outlet.

**5-21 DOWNSPOUTS AND FLUMES**

Downspouts and flumes longer than 10 feet shall be staked on both sides at maximum intervals of 10 feet with 6-foot heavy-duty steel posts or 1 1/2" X 3/16" angle iron, and fastened securely to the posts with No. 10 galvanized smooth wire, or bolted using

minimum 5/16" bolts and 2 washers per bolt, in accordance with the Culvert Installation Typical Details Page.

**SUBSECTION CATCH BASINS, HEADWALLS, AND ARMORING**

**5-25 CATCH BASINS**

Catch basins shall be constructed to resist erosion. Approximate dimensions are 1-2 feet deep, 1-2 feet wide, and 2-4 feet long.

**5-26 HEADWALLS FOR CROSS DRAIN CULVERTS**

Headwalls shall be constructed in accordance with the Typical Cross Drain Culvert Installation Detail at all cross drain culverts that specify the placement of rock. Rock used for headwalls shall consist of oversize or quarry spall material. Rock shall be placed on shoulders, slopes, and around culvert inlets and outlets. Rock shall not restrict the flow of water into culvert inlets or catch basins. No end dumping of rock is allowed.

**SECTION 6 – ROCK AND SURFACING**

**SUBSECTION ROCK SOURCE**

**6-2 ROCK SOURCE ON STATE LAND**

Rock used in accordance with the quantities on the Rock List may be obtained from the following source(s) on state land at no charge to the Purchaser. Use of material from any other source must have prior written approval from the Contract Administrator. If other operators are using, or desire to use, the rock source(s), a joint operating plan shall be developed. All parties shall follow this plan. The Purchaser shall notify the Contract Administrator a minimum of 5 calendar days before starting any operations in the listed locations.

<u>Source</u>	<u>Location</u>	<u>Rock Type</u>
Mora Pit	T28N R15W Sec 23, 24	Pit Run Rock

**6-3 ROCK SOURCE STATE LAND, EXISTING STOCKPILE**

Rock used in accordance with the quantities on the Rock List may be obtained from the following existing stockpile(s) on state land at no charge to the Purchaser. Purchaser shall remove no more than 450 cubic yards of 1 1/2" minus crushed rock, unless authorized by the Contract Administrator.

<u>Source</u>	<u>Location</u>	<u>Quantity (yd<sup>3</sup>)</u>
Mora Pit	T28N R15W Sec 23, 24	450yd <sup>3</sup>

**6-5 ROCK FROM COMMERCIAL SOURCE**

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

SUBSECTION ROCK SOURCE DEVELOPMENT

**6-10 ROCK SOURCE DEVELOPMENT PLAN BY STATE**

All rock source development and use shall be in accordance with a written Rock Source Development and Reclamation Plan prepared by the State and included in this Road Plan. Rock source operations shall be conducted as directed by the Contract Administrator and in accordance with the plan. Upon completion of operations, the rock source shall be left in the condition specified in the Rock Source Development and Reclamation Plan, and approved in writing by the Contract Administrator. The Purchaser shall notify the Contract Administrator a minimum of 5 calendar days before starting any operations in the rock source.

**6-12 ROCK SOURCE SPECIFICATIONS**

Rock sources shall be in accordance with the following unless otherwise specified in Rock Source Development and reclamation plan:

- Pit walls shall not be undermined or over-steepened. The maximum slope of the walls shall 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 shall be maintained in a condition to minimize the possibility of the walls sliding or failing.
- The width of pit benches shall be a minimum of 1.5 times the maximum length of the largest machine used.
- The surface of pit floors and benches shall be uniform and free-draining at a minimum 2% outslope gradient.
- All operations shall 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.
- Block all vehicle access to the top of the pit faces.

**6-15 REQUIRED ROCK SOURCE WORK**

The following rock source work is required. Work is to be done according to the approved Rock Source Development and Reclamation Plan and as directed by the Contract Administrator.

<u>Site</u>	<u>Requirements</u>
Mora Pit	Strip approximately 1 acre

**SUBSECTION ROCK GRADATIONS**

**6-29 1 ½-INCH MINUS CRUSHED ROCK**

% Passing 1 ½" square sieve	100%
% Passing 1" square sieve	50 - 85%
% Passing U.S. #4 sieve	30 - 50%
% Passing U.S. #40 sieve	16% maximum
% Passing U.S. #200 sieve	5% maximum

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

**6-52 OVERSIZE**

% Passing 8" square sieve	100%
% Passing 4" square sieve	0%

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

**SUBSECTION ROCK MEASUREMENT**

**6-55 ROCK APPLICATION MEASURED BY COMPACTED DEPTH**

Measurement of specified rock depths are defined as the compacted depth(s) using the compaction methods required in this Road Plan. Estimated quantities specified in the Rock List are estimated truck yards. Purchaser shall apply adequate amounts of rock to meet the specified rock depths. Specified rock depths are minimum requirements and are not subject to reduction.

**SUBSECTION ROCK APPLICATION**

**6-70 APPROVAL BEFORE ROCK APPLICATION**

Subgrade drainage installation including grading and compaction, shall be completed and approved in writing by the Contract Administrator, before rock application.

**6-71 ROCK APPLICATION**

Rock shall be applied in accordance with the specifications and quantities shown on the Rock List. Rock shall be spread, shaped, and compacted full-width concurrent with rock hauling operations. Rock shall be compacted in accordance with Compaction List, in lifts not to exceed 6 inches.

**6-72 ROCK APPLICATION AFTER HAULING**

On the following road(s), upon completion of all hauling operations, Purchaser shall apply 1 ½" minus crushed rock in accordance with the quantities shown on the Rock List.

<u>Road</u>	<u>Stations</u>	<u>Amount</u>
D-5095	0+00 – 103+70	250 yd <sup>3</sup>

**6-73 ROCK FOR WIDENED PORTIONS**

Turnarounds, turnouts, and areas with curve widening shall have rock applied to the same depth and specifications as the traveled way.

**6-78 ROCK FOR SPOT PATCHING**

Rock for spot patching shall be applied before any grading is done and before any rock lifts are applied. Once applied, spot patches shall be graded into the existing running surface.

**SECTION 7 – STRUCTURES**

**SUBSECTION STREAM CROSSING STRUCTURES GENERAL**

**7-5 STRUCTURE DEBRIS**

The Purchaser shall ensure that debris from the installation or removal of structures does not enter any stream. Components removed from the existing structures(s) shall be placed at designated site(s), as directed in writing by the Contract Administrator. The Purchaser is responsible for maintaining a clean jobsite, with all materials stored away from any high water mark or other area presenting a risk of the materials entering a stream. Debris entering any stream shall be removed immediately and placed in the site(s) designated for stockpiling or disposal. The Purchaser is responsible for retrieving all material carried downstream from the jobsite by the stream current.

**7-6 STREAM CROSSING INSTALLATION**

Installation of stream crossing structures shall be in accordance with the manufacturer's requirements, and as directed by the District Engineer or their designee.

**7-7 BANK PROTECTION FOR STREAM CROSSING STRUCTURES**

Bank protection shall be designed and constructed to prevent the undermining of the structure.

**SECTION 8 – EROSION CONTROL**

**8-1 SEDIMENT CONTROL STRUCTURES**

On the following road(s), Purchaser shall install sediment control structures as listed below.

<u>Road</u>	<u>Stations</u>	<u>Comments</u>
D-5095	94+25 – 95+20	Silt Fence in Ditch L,R
D-5095.5	1+90 – 4+90	Silt Fence in Ditch L,R

**8-2 PROTECTION FOR EXPOSED SOIL**

Purchaser shall furnish and evenly spread a 3-inch layer of straw to all exposed soils at stream culvert installations. Soils shall not be allowed to sit exposed during any rain event.



SUBSECTION REVEGETATION

**8-15 REVEGETATION**

Purchaser shall grass seed and hay mulch all exposed soils including, but not limited to, stream culverts, waste areas, sidecast pull back areas, stream crossing removals, bridge installations, and other areas directed by the Contract Administrator. Revegetation of exposed soils shall be accomplished by manual dispersal of grass seed unless otherwise detailed in this Road Plan. Other methods of revegetation must be approved in writing by the Contract Administrator.

**8-16 REVEGETATION SUPPLY**

All seed, mulch, hay, matting, etc. will be provided by the Purchaser.

**8-17 REVEGETATION TIMING**

Purchaser shall perform revegetation during the first available opportunity. Soils shall not be allowed to sit exposed for longer than one month without receiving revegetation treatment unless otherwise approved in writing by the Contract Administrator. Soils shall not be allowed to sit exposed during any rain event.

**8-18 PROTECTION FOR SEED**

Purchaser shall provide a protective cover over the revegetated area. The protective cover may consist of, but not be limited to, such items as dispersed hay mulch 3" thick or jute matting.

**8-19 ASSURANCE FOR SEEDED AREA**

The Purchaser shall be responsible to ensure a uniform and dense crop of grass. The Purchaser shall reapply the seed and/or mulch in areas that have been damaged through any cause before approval from the Contract Administrator. The Purchaser shall restore eroded or disturbed areas, clean up and properly dispose of eroded materials, and reapply the seed and/or mulch at no additional cost to the state.

SUBSECTION SEED, FERTILIZER, AND MULCH

**8-25 GRASS SEED**

Purchaser shall evenly spread the seed mixture listed below on all exposed soils at a rate of 60 pounds per acre of exposed soil.

<u>Seed Species</u>	<u>% by Weight</u>
• Perennial Ryegrass	40.00
• Creeping Red Fescue	40.00
• White Dutch Clover	10.00
• Colonial Bentgrass	10.00

Grass seed shall 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

SECTION 9 – POST-HAUL ROAD WORK

SUBSECTION POST-HAUL MAINTENANCE

**9-5 POST-HAUL MAINTENANCE**

Post-haul maintenance shall be performed in accordance with the Forest Access Road Maintenance Specifications and as specified below.

<u>Road</u>	<u>Stations</u>	<u>Additional Requirements</u>
All	All	Clean culverts, clean ditches, grade road shape and compact as directed by the Contract Administrator.
D-5095	0+00 – 103+70	Apply post haul rock per Clause 6-72.

SUBSECTION POST-HAUL LANDING MAINTENANCE

**9-10 LANDING DRAINAGE**

On all roads, Purchaser shall provide for drainage of the landing surface as approved in writing by the Contract Administrator.

**9-11 LANDING EMBANKMENT**

On all roads, landing embankments shall be sloped to original construction specifications.

SECTION 10 MATERIALS

SUBSECTION GEOTEXTILES

**10-6 GEOTEXTILE FOR TEMPORARY SILT FENCE**

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

	<u>ASTM Test</u>	<u>Requirements</u>
Type	--	Unsupported between posts
Apparent opening size	D 4751	No. 30 max., No. 100 min.

Water permittivity	D 4491	0.02 sec <sup>-1</sup>
Grab tensile strength	D 4632	180 lb in machine direction, 100lb in cross-machine direction
Grab tensile elongation	D 4632	30% max. at 180 lb or more
Ultraviolet stability	D 4355	70% retained after 500 hours of exposure

## SUBSECTION CULVERTS

### 10-17 CORRUGATED PLASTIC CULVERT

Polyethylene culverts shall meet AASHTO M-294 specifications. Culverts shall be Type S – double walled with a corrugated exterior and smooth interior.

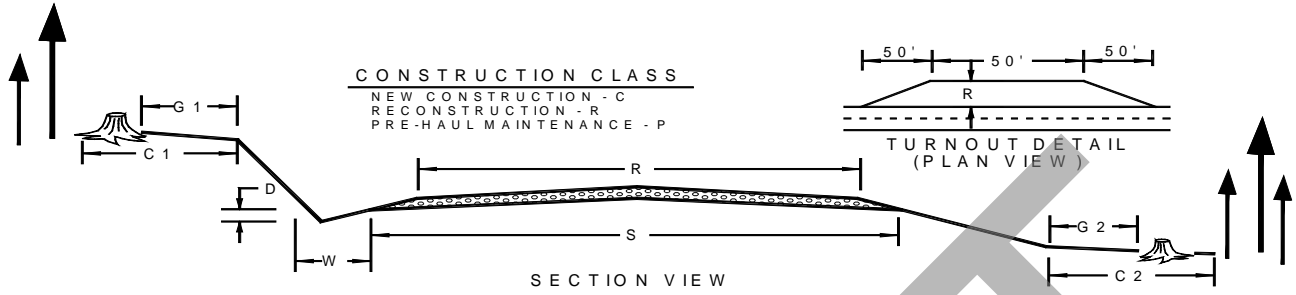
### 10-20 FLUME AND DOWNSPOUT

Downspouts and flumes shall meet the AASHTO specification designated for the culvert. Plastic downspouts and flumes shall be Type S – double walled with a corrugated exterior and smooth interior.

### 10-22 PLASTIC BAND

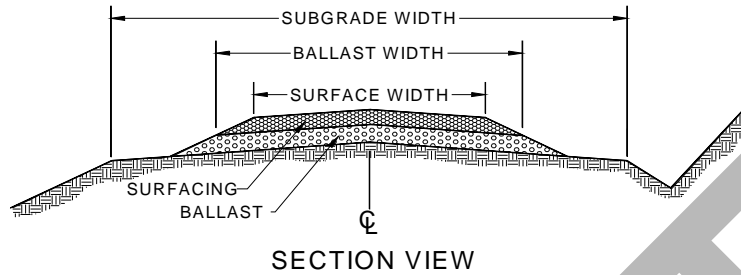
Plastic coupling and end bands shall meet the AASHTO specification designated for the culvert. Only fittings supplied or recommended by the culvert manufacturer shall be used. Couplings shall be split coupling band. Split coupling bands shall have a minimum of four corrugations, two on each side of the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

# TYPICAL SECTION SHEET



ROAD NAME	START STATION	END STATION	CONSTRUCTION CLASS	SUBGRADE WIDTH (S)	ROAD WIDTH (R)	CROWN AT CL (in)	DITCH WIDTH (W)	DITCH DEPTH (D)	GRUBBING CUT BANK (G1)	GRUBBING FILL TOE (G2)	ROAD CUT CLEARING (C1)	ROAD FILL CLEARING (C2)
D-5009	0+00	45+30	P		12'	3"	3'	1'				
3+25 Spur	0+00	3+25	R	17'	12'	3"	3'	1'	5'	5'	10'	5'
D-5009.6	0+00	22+60	P		12'	3"	3'	1'				
D-5009.61	0+00	8+10	R	17'	12'	3"	3'	1'	5'	5'	10'	5'
D-5095	0+00	103+70	P		12'	3"	3'	1'				
D-5095.5	0+00	33+90	P		12'	3"	3'	1'				
D-5095.51	0+00	4+50	R	17'	12'	3"	3'	1'	5'	5'	10'	5'
D-5095.52	0+00	6+15	R	17'	12'	3"	3'	1'	5'	5'	10'	5'
D-5600	0+00	6+40	P		12'	3"	3'	1'				
D-5620	0+00	53+70	P		12'	3"	3'	1'				
D-5620.1	8+95	21+00	P		12'	3"	3'	1'				
2+70 Spur	0+00	2+70	R	17'	12'	3"	3'	1'	5'	5'	10'	5'
D-5620.2	0+00	4+15	P		12'	3"	3'	1'				
2+50 Spur	0+00	2+50	R	17'	12'	3"	3'	1'	5'	5'	10'	5'

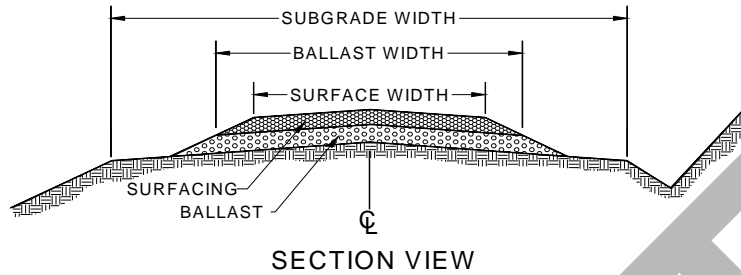
## ROCK LIST SHEET



1. Rock quantities, subtotals and totals are "truck measure" estimates. Rock shall be applied to at least the depths listed.
2. All depths are compacted depths.
3. Rock slopes shall be 1½ (H) : 1 (V).
4. All rock sources are subject to approval by the Contract Administrator.
5. Pitrun is defined as pitrun or ballast per Line 6. Crushed is defined as any crushed rock from ¼" minus to 4" minus per Line 6. Oversize is defined as oversize, quarry spalls, light loose rip rap, or heavy loose rip rap per Line 6.
6. Rock sources: 1— Mora Pit Pit Run 2: Commercial 1 ½" Minus

ROAD NAME	START STATION	END STATION	SUBGRADE WIDTH (ft)	Pitrun SOURCE	Pitrun WIDTH (ft)	Pitrun DEPTH (in)	Pitrun Quantity(yd³/sta)	Pitrun SUBTOTAL(yd³)	Crushed SOURCE	Crushed WIDTH (ft)	Crushed DEPTH (in)	Crushed Quantity(yd³/sta)	Crushed Subtotal(yd³)	Oversize/Rip rap Source	Oversize/Rip Rap Quantity(yd³)
<b>D-5009</b>															
Spot Patch	0+00	45+30							2				100		
Lift	16+80	45+30		1	12	6	40	1140							
Turnaround	23+55			1				50							
Turnout	28+90			1				30							
Culvert Install	41+50			1				20							
Turnaround	42+20			1				50							
<b>3+25 Spur</b>															
Lift	0+00	3+25	17	1	12	12	70	230							
Landing	3+25			1				50							
<b>D-5009.6</b>															
Lift	0+00	22+60		1	12	6	40	900							
Turnout	5+70			1				30							
Turnaround	18+75			1				50							
<b>D-5009.61</b>															
Lift	0+00	8+10	17	1	12	12	70	570							
Culvert Install	0+30			1				20							
Culvert Install	2+80			1				20							
Culvert Install	4+10			1				20							
<b>Totals:</b>								<b>1: 3180</b>					<b>2: 100</b>		

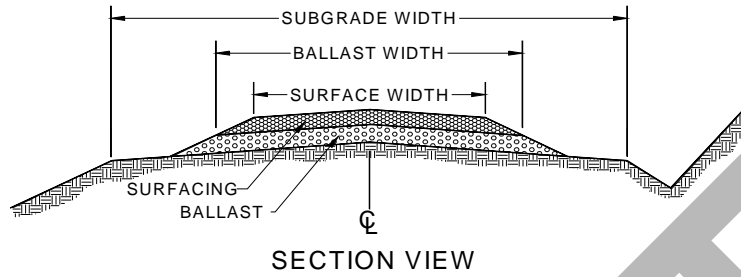
## ROCK LIST SHEET CONTINUED



1. Rock quantities, subtotals and totals are "truck measure" estimates. Rock shall be applied to at least the depths listed.
2. All depths are compacted depths.
3. Rock slopes shall be 1½ (H) : 1 (V).
4. All rock sources are subject to approval by the Contract Administrator.
5. Pitrun is defined as pitrun or ballast per Line 6. Crushed is defined as any crushed rock from ¼" minus to 4" minus per Line 6. Oversize is defined as oversize, quarry spalls, light loose rip rap, or heavy loose rip rap per Line 6.
6. Rock sources: 1 -- Mora Pit Pit Run 2: Commercial 1 ½" Minus

ROAD NAME	START STATION	END STATION	SUBGRADE WIDTH (ft)	Pitrun SOURCE	Pitrun WIDTH (ft)	Pitrun DEPTH (in)	Pitrun Quantity(yd³/sta)	Pitrun SUBTOTAL(yd³)	Crushed SOURCE	Crushed WIDTH (ft)	Crushed DEPTH (in)	Crushed Quantity(yd³/sta)	Crushed Subtotal(yd³)	Oversize/ Rip rap Source	Oversize/Rip Rap Quantity(yd³)
<b>D-5009.61</b>															
Turnaround	5+00			1			50								
Culvert Install	6+70			1			20								
Culvert Install	7+65			1			20								
Landing	8+10			1			50								
<b>D-5095</b>															
Spot Patch	0+00	103+70							2				100		
Post-Haul	0+00	103+70							2				250		
<b>D-5095.5</b>															
Lift	0+00	33+90		1	12	6	40	1360							
Culvert Replace	1+90			1			20								
Turnout	17+70			1			30								
Turnaround	24+70			1			50								
Culvert Replace	30+60			1			20								
<b>D-5095.51</b>															
Lift	0+00	4+50	17	1	12	12	70	320							
Landing	4+50			1			50								
<b>D-5095.52</b>															
Lift	0+00	6+15	17	1	12	12	70	430							
Landing	6+15			1			50								
<b>Totals:</b>								<b>1: 2470</b>					<b>2: 350</b>		

# ROCK LIST SHEET CONTINUED



1. Rock quantities, subtotals and totals are “truck measure” estimates. Rock shall be applied to at least the depths listed.
2. All depths are compacted depths.
3. Rock slopes shall be 1½ (H) : 1 (V).
4. All rock sources are subject to approval by the Contract Administrator.
5. Pitrun is defined as pitrun or ballast per Line 6. Crushed is defined as any crushed rock from ¼” minus to 4” minus per Line 6. Oversize is defined as oversize, quarry spalls, light loose rip rap, or heavy loose rip rap per Line 6.
6. Rock sources: 1 – Mora Pit Pit Run 2: Commercial 1 ½” Minus

ROAD NAME	START STATION	END STATION	SUBGRADE WIDTH (ft)	Pitrun SOURCE	Pitrun WIDTH (ft)	Pitrun DEPTH (in)	Pitrun Quantity(yd <sup>3</sup> /sta)	Pitrun SUBTOTAL(yd <sup>3</sup> )	Crushed SOURCE	Crushed WIDTH (ft)	Crushed DEPTH (in)	Crushed Quantity(yd <sup>3</sup> /sta)	Crushed Subtotal(yd <sup>3</sup> )	Oversize/ Rip Rap Source	Oversize/Rip Rap Quantity(yd <sup>3</sup> )
<b>D-5620</b>															
Lift	37+40	53+70		1	12	6	40	650							
<b>D-5620.1</b>															
Lift	8+95	21+00		1	12	6	40	480							
<b>2+70 Spur</b>															
Lift	0+00	2+70	17	1	12	12	70	190							
Culvert Replace	0+10			1				20							
Landing	2+70			1				50							
<b>D-5620.2</b>															
Lift	0+00	4+15	17	1	12	12	70	290							
Landing	4+15			1				50							
<b>2+50 Spur</b>															
Lift	0+00	2+50	17	1	12	12	70	180							
Landing	2+50			1				50							
Totals:								1: 1960							
Grand Totals:								1: 7610					2: 450		

## CULVERT LIST

ROAD NAME	STATION	CULVERT DIAMETER (in)	CULVERT LENGTH (ft)	FLUME LENGTH (ft)	DOWNPOUT LENGTH (ft)	RIP RAP - INLET (cy)	RIP RAP - OUTLET (cy)	BACKFILL MATERIAL	NOTES
D-5009	41+50	18	30					PR	Culvert Install
D-5009.61	0+30	18	30					PR	Culvert Install
D-5009.61	2+80	18	30					PR	Culvert Install
D-5009.61	4+10	24	30					PR	Culvert Install*
D-5009.61	6+70	18	30					PR	Culvert Install
D-5009.61	7+65	24	30					PR	Culvert Install*
D-5095.5	1+90	18	40					PR	Culvert Replacement
D-5095.5	30+60	18	40					PR	Culvert Replacement
2+70 Spur	0+10	18	30					PR	Culvert Replacement
Contingency		18	30					NT	See Clause 5-12

**All rip rap shall be Oversize unless specified in the Rock List, or in the field.**  
**All backfill shall be native material (NT) unless specified otherwise. CR= 1 ¼"- crushed rock,**  
**PR = pit run. \* Indicates live stream culvert**



## COMPACTION LIST

Road	Stations	Type	Max Depth per Lift (In)	Equipment Type	Equipment Weight (lbs)	Minimum Number of Passes	Maximum Operating Speed (mph)
Construction/ Reconstruction	All	Culvert Backfills	6	Jumping Jack	N/A	3	N/A
Construction/ Reconstruction	All	Subgrade, Embankment	6	Vibratory Smooth Drum Roller	6,000	3	3
Construction/ Reconstruction	All	Rock Placement	6				
Pre-Haul Maintenance	All	Existing Pre-haul Surface	6				
Pre-Haul Maintenance, Post-Haul Maintenance	All	Rock Lifts	6				
Pre-Haul Maintenance	All	Culvert Backfills	6	Jumping Jack	N/A	3	N/A
Waste Areas	See Clause 4-37	Waste Material	24	Excavation Equipment	See Clause 4-39		

## Typical Type Ns, Np Culvert Installation Detail Sheet.

-Water shall be diverted away from the work site before any "in stream" work begins, and shall continue until culvert installation is complete.

-Culvert lay shall match stream gradient up to 5%.

-Flumes longer than 10ft shall be staked on both sides at maximum intervals of 10ft with 6ft heavy duty steel fence posts, and fastened securely to the posts with No. 10 galvanized smooth wire or bolted to the fence posts.

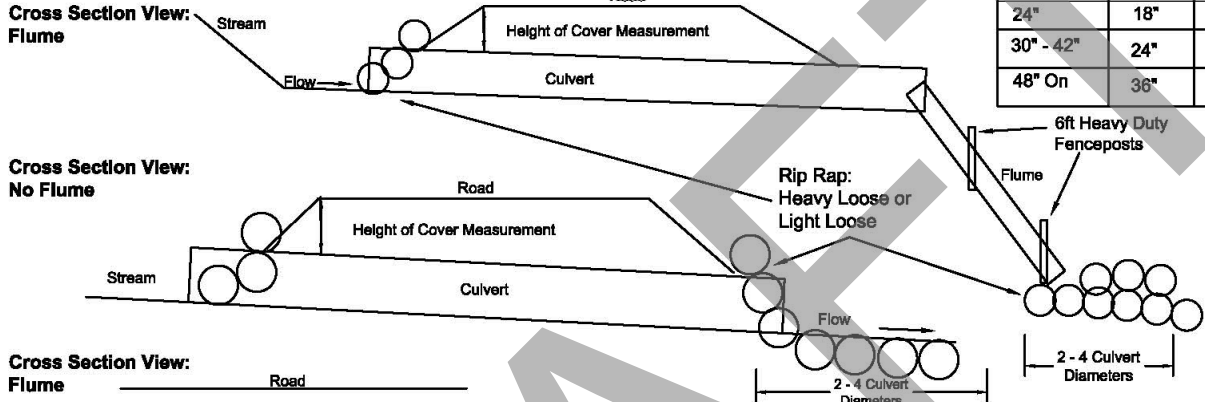
-Rip rap shall be placed using a "zero height drop method", and shall be set in conjunction with the culvert installation.

-Rip rap shall be placed at headwalls, along the fill at the inlet, and at the end of flumes in accordance with this Detail. On culverts with no flume rip rap shall be placed along the fill at the outlet, unless there is stream drop or it is called for in the Road Plan, at which point it will be installed as an energy dissipater at the end of the culvert as specified in this Detail. All rip rap distance to be determined by the Contract Administrator or the District Engineer.

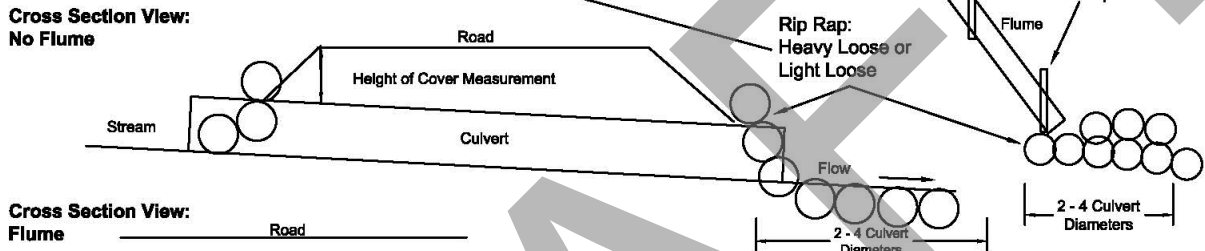
-Backfill compaction shall be achieved using a jumping jack, walk behind vibratory roller, or plate compactor on lifts not to exceed 8in. 3 complete passes per lift is required for compaction. Backfill shall be placed and compacted evenly on both sides of the culvert. Care shall be taken to ensure adequate compaction of backfill material under the haunches of the pipe. Excavation trench width shall be at least culvert diameter plus 3 times the width of the compactor footprint used.

Culvert Minimum Cover		
Diameter	Steel	Plastic
24"	18"	24"
30" - 42"	24"	24"
48" On	36"	36"

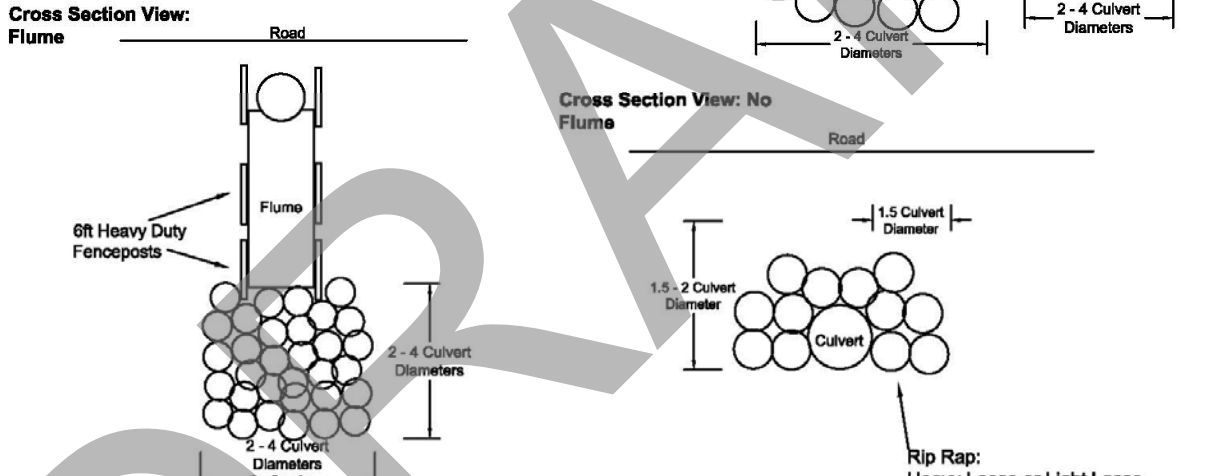
**Cross Section View: Flume**



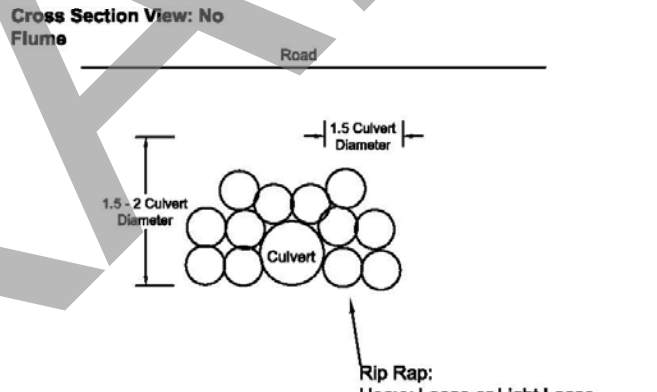
**Cross Section View: No Flume**



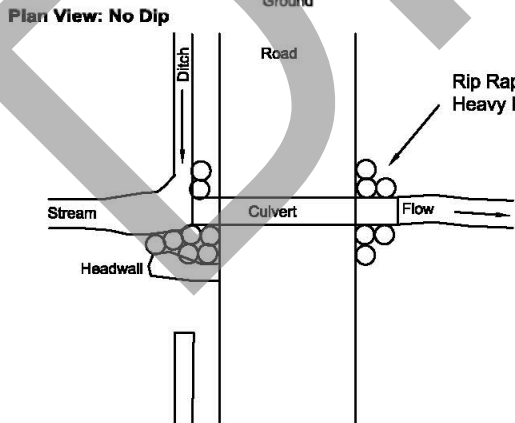
**Cross Section View: Flume**



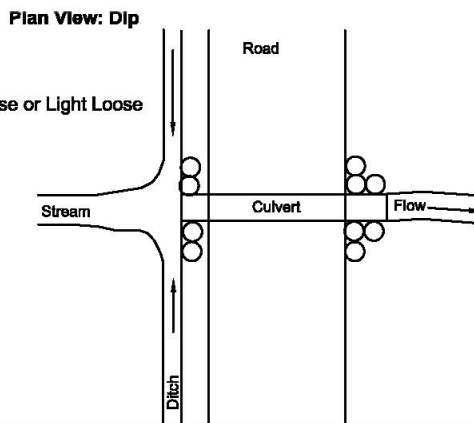
**Cross Section View: No Flume**



**Plan View: No Dip**



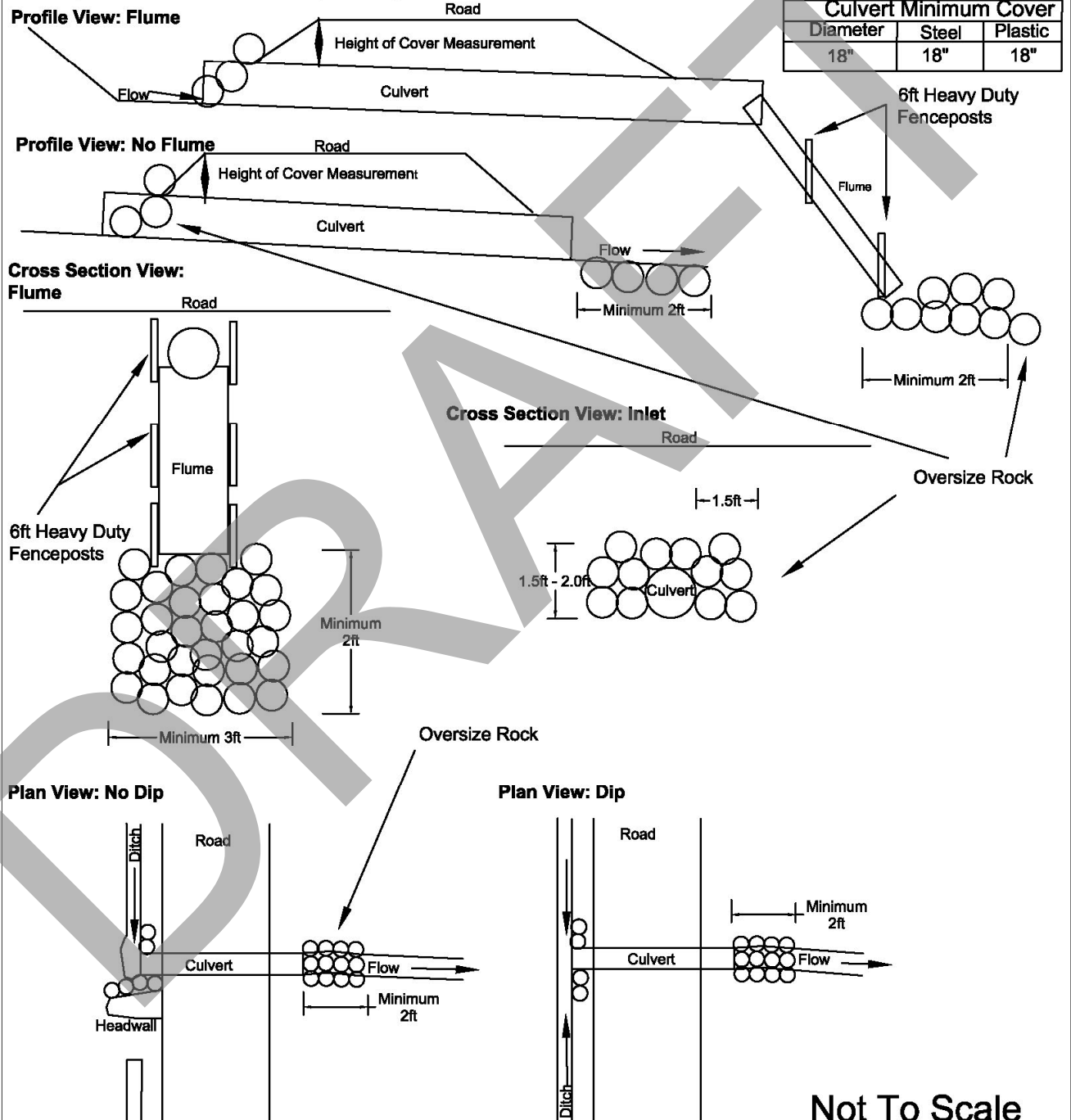
**Plan View: Dip**



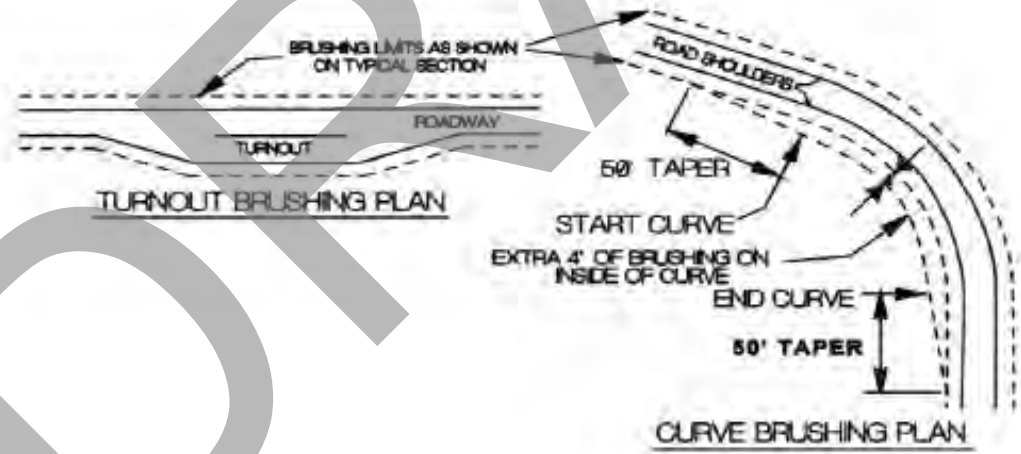
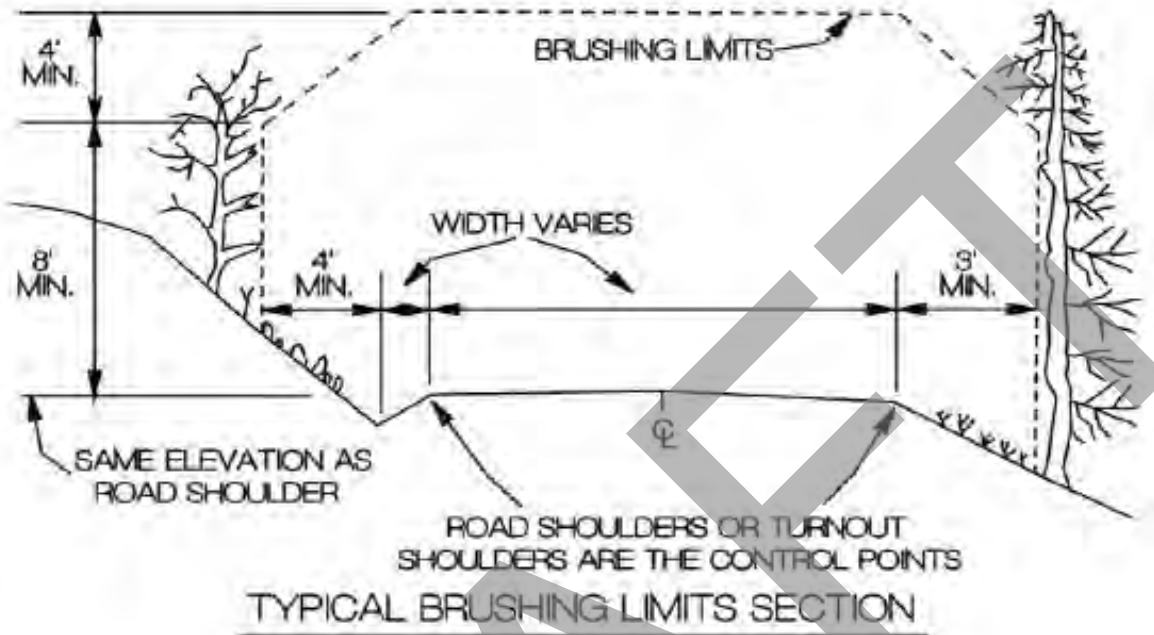
**Not To Scale**

# Typical Cross Drain Culvert Installation Detail Sheet

- Culvert lay shall not exceed 10%.
- Flumes longer than 10ft shall be staked on both sides at maximum intervals of 10ft with 6ft heavy duty steel fence posts, and fastened securely to the posts with No. 10 galvanized smooth wire or bolted to the fence posts.
- Oversize shall be placed using a "zero height drop method", and shall be set in conjunction with the culvert installation.
- Oversize shall be placed at headwalls, along the fill at the inlet, and at the end off flumes in accordance with this Detail. On culverts with no flume oversize shall be placed at the outlet as an energy dissipater as specified in this Detail. All oversize distance to be determined by the Contract Administrator.
- Backfill compaction for installations on existing roads shall be achieved using a jumping jack, or plate compactor on lifts not to exceed 8in. 3 complete passes per lift is required for compaction. Backfill shall be placed and compacted evenly on both sides of the culvert. Care shall be taken to ensure adequate compaction of backfill material under the haunches of the pipe. Excavation trench width shall be at least culvert diameter plus at least the width of the compactor footprint used..

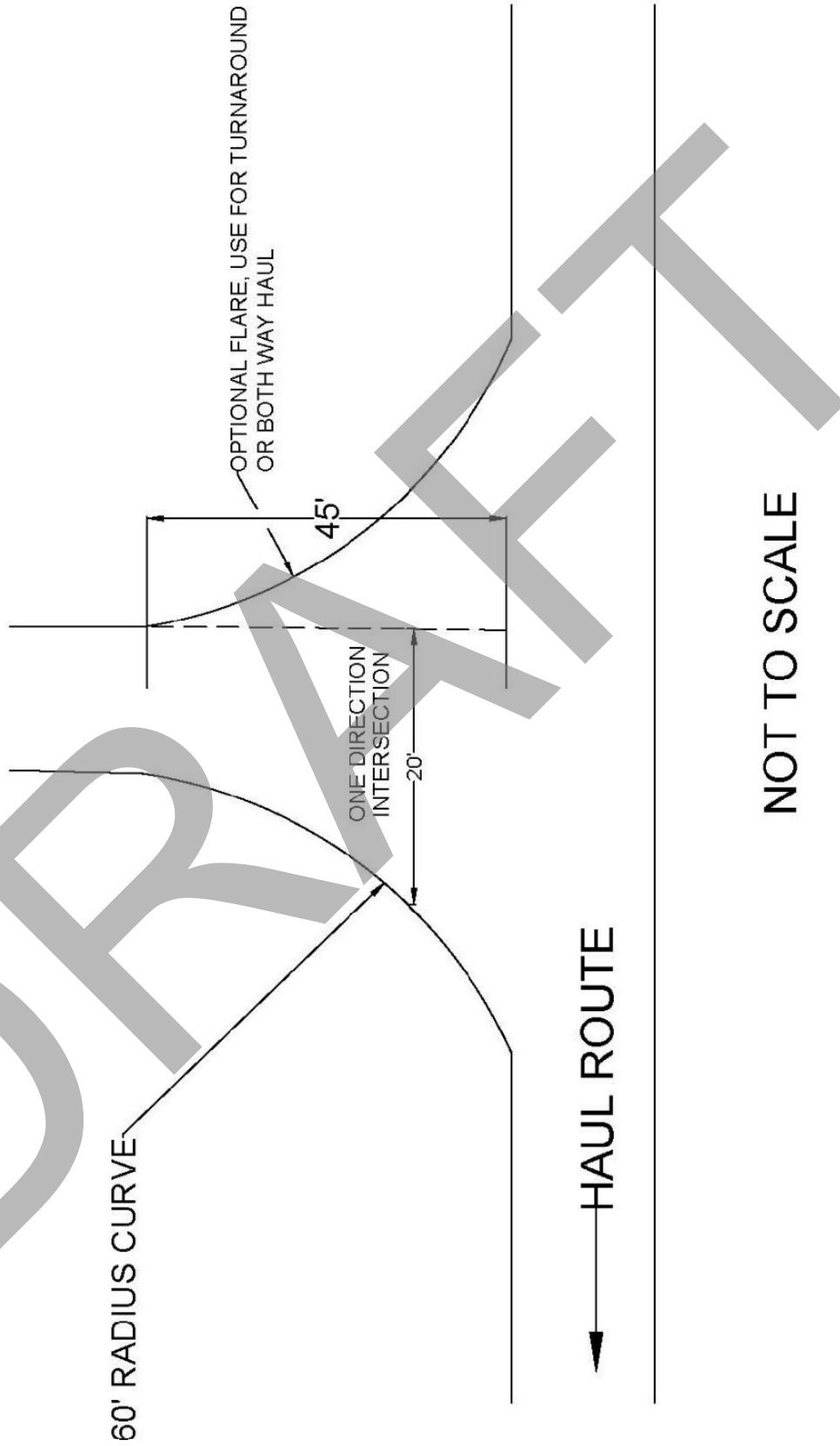


# BRUSHING DETAIL



- 1) ALL VEGETATION WITHIN THE BRUSHING LIMITS SHALL BE CUT TO WITHIN 8" OF THE GROUND, UNLESS OTHERWISE DIRECTED BY THE CONTRACT ADMINISTRATOR.
- 2) ALL BRUSH, TREES, LIMBS, ETC. SHALL BE REMOVED FROM THE ROAD SURFACE.
- 3) ALL BRUSH, TREES, LIMBS, ETC. THAT MAY RESTRICT THE FLOW OF WATER SHALL BE REMOVED FROM THE DITCH LINE.
- 4) ALL DEBRIS THAT MAY ROLL OR MIGRATE INTO THE DITCH-LINE SHALL BE REMOVED.

# TYPICAL INTERSECTION



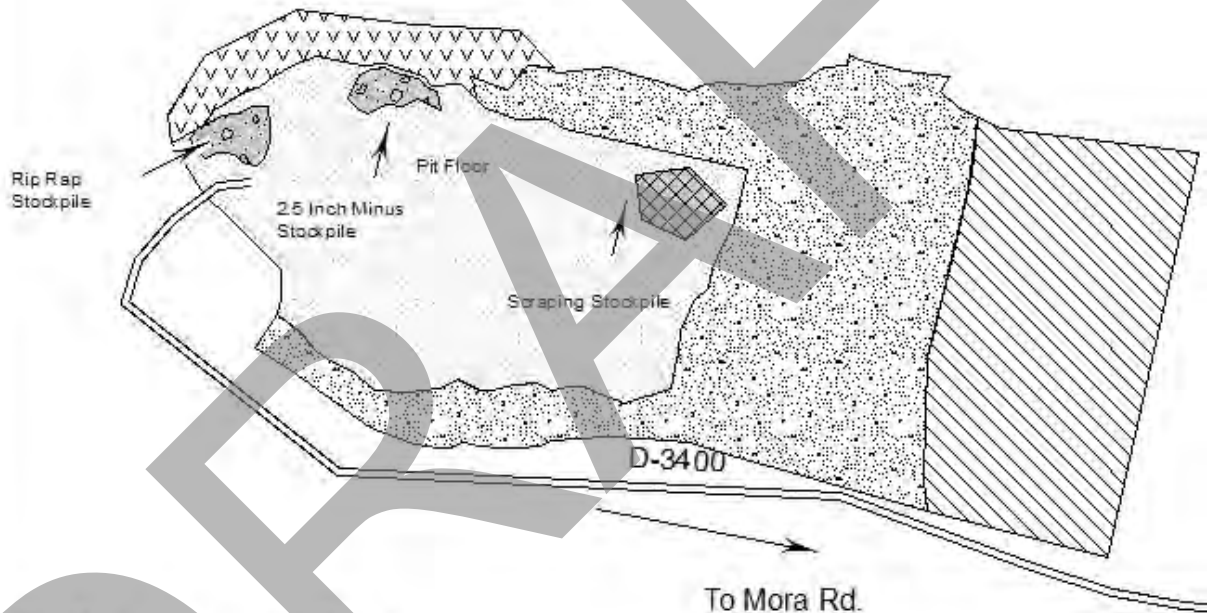
NOT TO SCALE

# Mora Pit Plan

## Sec. 23 & 24, T28N, R15W

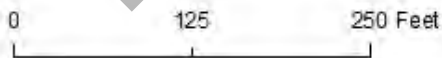


Legend	
	Approach Road
	Future Stripping Area
	Crushed Rock Stock
	New Scraping Stockpile
	Pit Floor
	Reclaimed Area
	Rip Rap Stockpile
	Stripped Area



### Pit Development Plan

1. Areas to be developed as directed by the Contract Administrator.
2. Working face height shall not exceed 15 feet.
3. Waste material and oversize material shall be placed as directed by the Contract Administrator. Segregate soil & wood.
4. Pit face shall not be mined to within 15' of any unstripped area.
5. 4' shall be scalped off of stripped area before use on D3400.1 road. Scalped material is to be stockpiled on pit floor away from overburden and may be used on other roads.



Kerschner, 6/23

SUMMARY - Road Development Costs												
SALE NAME:	Upper 5000	CONTRACT#:	30-104821	REGION:	Olympic	DISTRICT: Coast						TOTAL:
LEGAL DESCRIPTION:	0											
ROAD NAME:	3+25 Spur	D-5009.61	D-5095.51	D-5095.52	2+50 Spur	2+70 Spur	D-5009	D-5009.6	D-5095	D-5095.5	D-5600	TOTAL:
ROAD TYPE:	Recon.	Recon.	Recon.	Recon.	Recon.	Recon.	Prehaul	Prehaul	Prehaul	Prehaul	Prehaul	TOTAL:
NUMBER OF STATIONS:	3.25	8.10	4.50	6.15	2.50	2.70	45.30	22.60	103.70	33.90	6.40	239.10
SIDESLOPE:	25%	25%	25%	25%	25%	25%	0%	0%	0%	0%	0%	150%
CLEARING AND GRUBBING:	\$278	\$693	\$385	\$526	\$214	\$231	\$0	\$0	\$0	\$0	\$0	\$2,326
ROAD BRUSHING:	\$59	\$146	\$81	\$111	\$45	\$49	\$815	\$407	\$1,867	\$610	\$115	\$4,304
EXCAVATION AND FILL:	\$826	\$2,059	\$1,144	\$1,564	\$636	\$686	\$0	\$0	\$0	\$0	\$0	\$6,916
ROAD GRADING:	\$21	\$53	\$29	\$40	\$16	\$18	\$294	\$147	\$674	\$220	\$42	\$1,554
DITCH CLEANING/CONSTRUCTION:	\$127	\$0	\$176	\$240	\$98	\$105	\$0	\$0	\$0	\$0	\$0	\$745
ROCK TOTALS (Cu. Yds./)ROCK COSTS:												
Ballast:	280	770	370	480	230	260	1,290	980	0	1,480	0	6139
Surface:	450	\$6,286	\$15,685	\$8,140	\$3,788	\$4,274	\$29,038	\$22,560	\$0	\$32,412	0	\$132,751
Oversize:	0	\$0	\$0	\$0	\$0	\$0	\$2,176	\$0	\$2,003	\$0	\$0	200
CULVERTS AND FLUMES:	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
STRUCTURES:	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
MISC. EXPENSES:	\$19	\$47	\$26	\$36	\$15	\$16	\$265	\$132	\$607	\$198	\$37	\$1,399
OVERHEAD:	\$685	\$2,128	\$898	\$1,178	\$433	\$567	\$2,755	\$1,860	\$412	\$2,872	\$16	\$13,804
TOTAL COSTS:	\$8,301	\$25,767	\$10,879	\$14,262	\$5,244	\$6,870	\$37,192	\$25,105	\$5,562	\$38,777	\$210	\$178,169
COST PER STATION:	\$2,554	\$3,181	\$2,418	\$2,319	\$2,098	\$2,545	\$821	\$1,111	\$54	\$1,144	\$33	\$745
MOBILIZATION:												
ROAD DEACTIVATION AND ABANDONMENT COSTS:												
Pit Work		\$20,000										
TOTAL (All Roads) =												\$246,522
SALE VOLUME/MBF =												5.175
TOTAL COST PER MBF =												\$47.64
TOTAL COST PER STATION =												\$398.90
Compiled by:	Emma Hein											
Date:	10/19/2023											

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

Sheet 1 of 3

Plans to be furnished by:

SUMMARY - Road Development Costs													
SALE NAME:	Upper 5000	CONTRACT#:	30-104821	REGION:	Olympic	DISTRICT:	Coast						
LEGAL DESCRIPTION:	0												
ROAD NAME:	D-5620	D-5620.2	D-5620.1	3+25 Spur	D-5009.61	D-5095.51	D-5095.52	2+50 Spur	2+70 Spur	D-5009	D-5009.6	D-5095	D-5095.5
ROAD TYPE:	Prehaul	Prehaul	Prehaul	Posthaul	Posthaul	Posthaul	Posthaul	Posthaul	Posthaul	Posthaul	Posthaul	Posthaul	Posthaul
NUMBER OF STATIONS:	54	4	12	3	8	5	6	3	3	45	23	104	34
SIDESLOPE:	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEARING AND GRUBBING:	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
ROAD BRUSHING:	\$967	\$75	\$217	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
EXCAVATION AND FILL:	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
ROAD GRADING:	\$349	\$27	\$78	\$21	\$53	\$29	\$40	\$16	\$18	\$294	\$147	\$674	\$220
DITCH CLEANING/CONSTRUCTION:	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
ROCK TOTALS (Cu. Yds./)ROCK COS	0	0	0	0	0	0	0	0	0	0	0	0	0
Ballast:	650	340	480	0	0	0	0	0	0	0	0	0	0
	\$11,349	\$5,561	\$7,834	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Surface:	0	0	0	0	0	0	0	0	0	0	0	250	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,003	\$0
Oversize:	0	0	0	0	0	0	0	0	0	0	0	0	0
	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
CULVERTS AND FLUMES:	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
STRUCTURES:	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
MISC. EXPENSES:	\$314	\$24	\$70	\$19	\$47	\$26	\$36	\$15	\$16	\$265	\$132	\$607	\$198
OVERHEAD:	\$1,038	\$455	\$656	\$4	\$11	\$6	\$8	\$3	\$4	\$62	\$31	\$691	\$46
TOTAL COSTS:	\$14,017	\$6,142	\$8,855	\$45	\$111	\$62	\$84	\$34	\$37	\$621	\$310	\$6,974	\$465
COST PER STATION:	\$261	\$1,480	\$735	\$14	\$14	\$14	\$14	\$14	\$14	\$14	\$14	\$67	\$14



SUMMARY - Road Development Costs			
SALE NAME: Upper 5000	CONTRACT#: 30-104821	REGION: Olympic	DISTRICT: Coast
LEGAL DESCRIPTION	0		
ROAD NAME:	D-5600	D-5620	D-5620.1
ROAD TYPE:	Posthaul	Posthaul	Posthaul
NUMBER OF STATIONS:	6	54	4
SIDESLOPE:	0%	0%	12
			0%
CLEARING AND CRUBBING:	\$0	\$0	\$0
ROAD BRUSHING:	\$0	\$0	\$0
EXCAVATION AND FILL:	\$0	\$0	\$0
ROAD GRADING:	\$42	\$349	\$27
DITCHING:	\$0	\$0	\$0
ROCK TOTALS (Cu. Yds.)/ROCK COS	0	0	0
Ballast:	0	0	0
Surface:	0	0	0
Oversize:	0	0	0
CULVERTS AND FLUMES:	\$0	\$0	\$0
STRUCTURES:	\$0	\$0	\$0
MISC. EXPENSES:	\$37	\$314	\$24
OVERHEAD:	\$9	\$73	\$6
TOTAL COSTS:	\$88	\$736	\$57
COST PER STATION:	\$14	\$14	\$14

## FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS

### Cuts and Fills

- Maintain slope lines to a stable gradient compatible with the cut slope/fill slope ratios. Remove slides from ditches and the roadway. Repair fill-failures in accordance with Clause 4-6 Embankment Slope Ratio, and with 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, shape, and compact 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 culvert headwalls to a level slightly below the road shoulder with material that will resist erosion. This is to allow for culverts that are overtopped to keep the water in the ditchline.
- 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.

