WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES

TIMBER NOTICE OF SALE

***SALE NAME**: NORTH WILLIAMS* ***AGREEMENT NO**: 30-094595*

AUCTION: March 30, 2017 starting at 10:00 a.m., **COUNTY:** Grays Harbor
Pacific Cascade Region Office, Castle Rock, WA

SALE LOCATION: Sale located approximately 14 miles west of Oakville

PRODUCTS SOLD AND SALE AREA: All timber, except leave trees marked with blue paint, trees bound out by yellow Leave Tree Area tags and all down timber existing 5 years prior to the day of sale, bound by the following: white "Timber Sale Boundary" tags with pink flagging and the T-Line in units 1 and 2; White "Timber Sale Boundary" tags with pink flagging and reprod in unit 3; and white "Timber Sale Boundary" tags with pink flagging and the T-3200 in unit 4. on part(s) of Sections 23, 24, 25 and 26 all in Township 16 North, Range 6 West, W.M., containing 172 acres, more or less.

CERTIFICATION: This sale is certified under the Sustainable Forestry Initiative® program Standard (cert no: BV-SFIS-US09000572)

ESTIMATED SALE VOLUMES AND QUALITY:

Species	Avg DBH	Ring Count	Total MBF	MBF by Grade 1P	2P	3P	SM	1S	2S	3S	4S	UT
Douglas fir	24.6	7	6,135			16			4,990	750	133	21
Red alder	15.3		584					22	168	69	267	58
Maple	15.4		323					9	77	60	98	80
Hemlock	17.1	7							94	35	18	
Red cedar	20.2		76							69	7	
Sale Total			7,265									

MINIMUM BID: $0. **BID METHOD:** Sealed Bids

PERFORMANCE SECURITY: $0.00 **SALE TYPE:** Lump Sum

EXPIRATION DATE: October 31, 2019 **ALLOCATION:** Export Restricted

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

HARVEST METHOD: Cable and Shovel. Harvesting activities are estimated to be 95% uphill cable harvesting, and 5% ground-based harvesting equipment. Ground-based harvesting equipment shall be restricted to slopes of 40% and less during dry soil conditions. Unit 1 was designed with a minimum tower height of 100 feet on all cable settings. Intermediate support may be required to prevent soil rutting in unit 1, off Spur A. A detailed felling and yarding plan shall be required prior to any harvest activities and approved in writing by the Contract Administrator. See clause H-140 for further harvest requirements.

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TIMBER NOTICE OF SALE

ROADS: 94.40 stations of optional construction. 328.00 stations of required pre-haul maintenance. Rock for construction, and pre-haul maintenance under this contract shall be obtained from any commercial rock source at the Purchaser's expense. Rock amounts used in accordance with the quantities on the ROCK LIST. Rock sources are subject to written approval by the Contract Administrator before their use. The hauling of forest products will not be permitted from November 1 to May 1 unless authorized in writing by the Contract Administrator.

ACREAGE DETERMINATION

CRUISE METHOD: The sale acres were determined by GIS delineation. Cruise was completed using variable plot cruise methods.

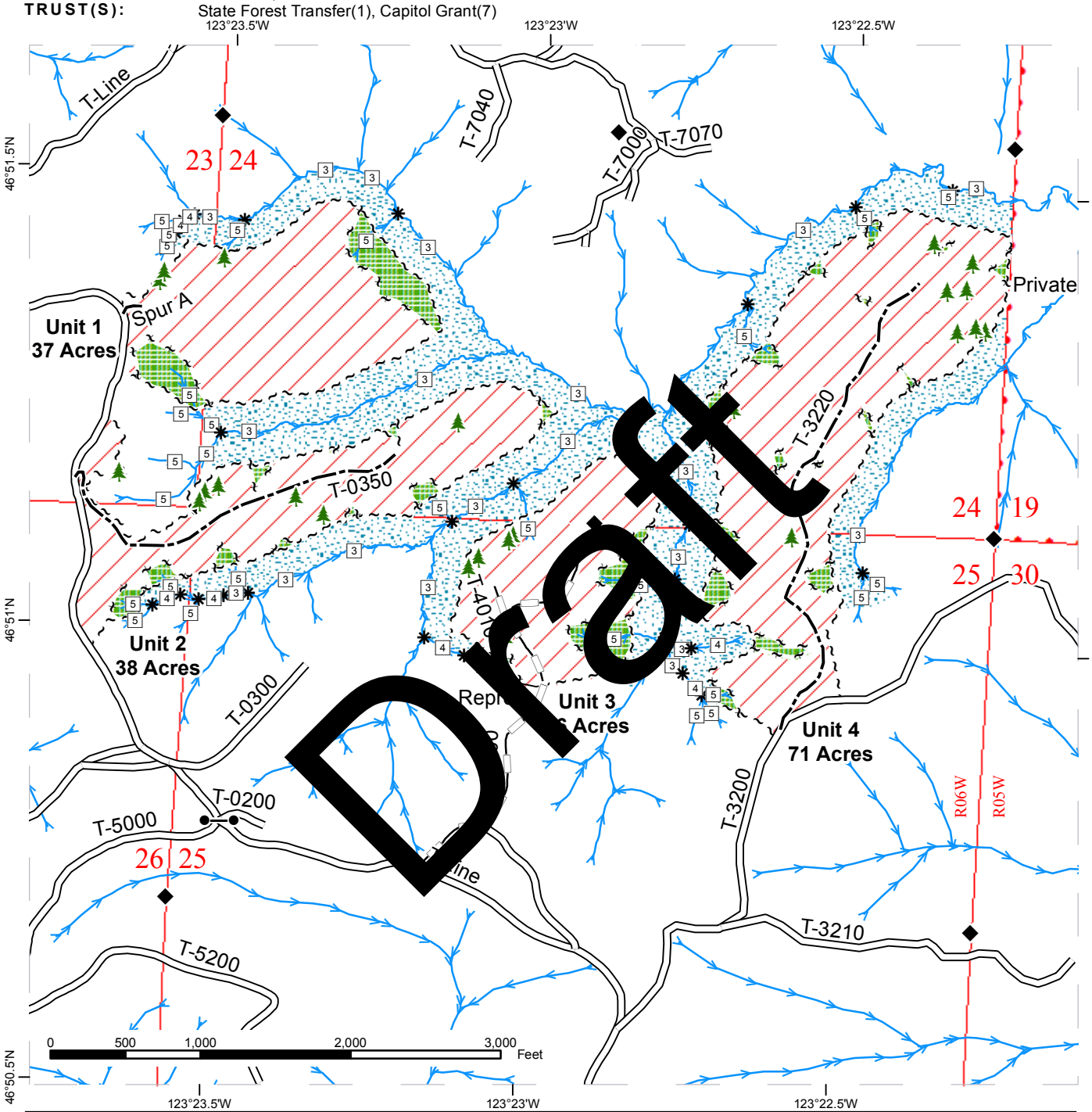
FEES: $129,000.00 is due on day of sale. $9.00 per MBF is due upon removal. These are in addition to the bid price.

SPECIAL REMARKS: This sale contains an estimated 1,845 MBF of h quality DF 2 saw logs, and 170 MBF of higher quality DF 3 saw logs. S during l for gate locations. PCP 1-1 gate keys may be obtained from the Pacific Ca de Region ffice.

TIMBER SALE MAP

SALE NAME: NORTH WILLIAMS
AGREEMENT #: None
TOWNSHIP(S): T16R05W, T16R06W
TRUST(S): State Forest Transfer(1), Capitol Grant(7)

REGION: Pacific Cascade Region
COUNTY(S): 211-815
ELEVATION RGE: GRAYS HARBOR



- Variable Retention Harvest
- Leave Tree Area
- Riparian Mgt Zone
- Sale Boundary Tags
- Leave Tree Tags
- Reprod
- Existing Roads
- Optional Construction
- Optional Reconstruction
- Streams
- Stream Type
- Stream Type Break
- Monumented Corners
- Leave Trees
- Gate (PCP 1-1)

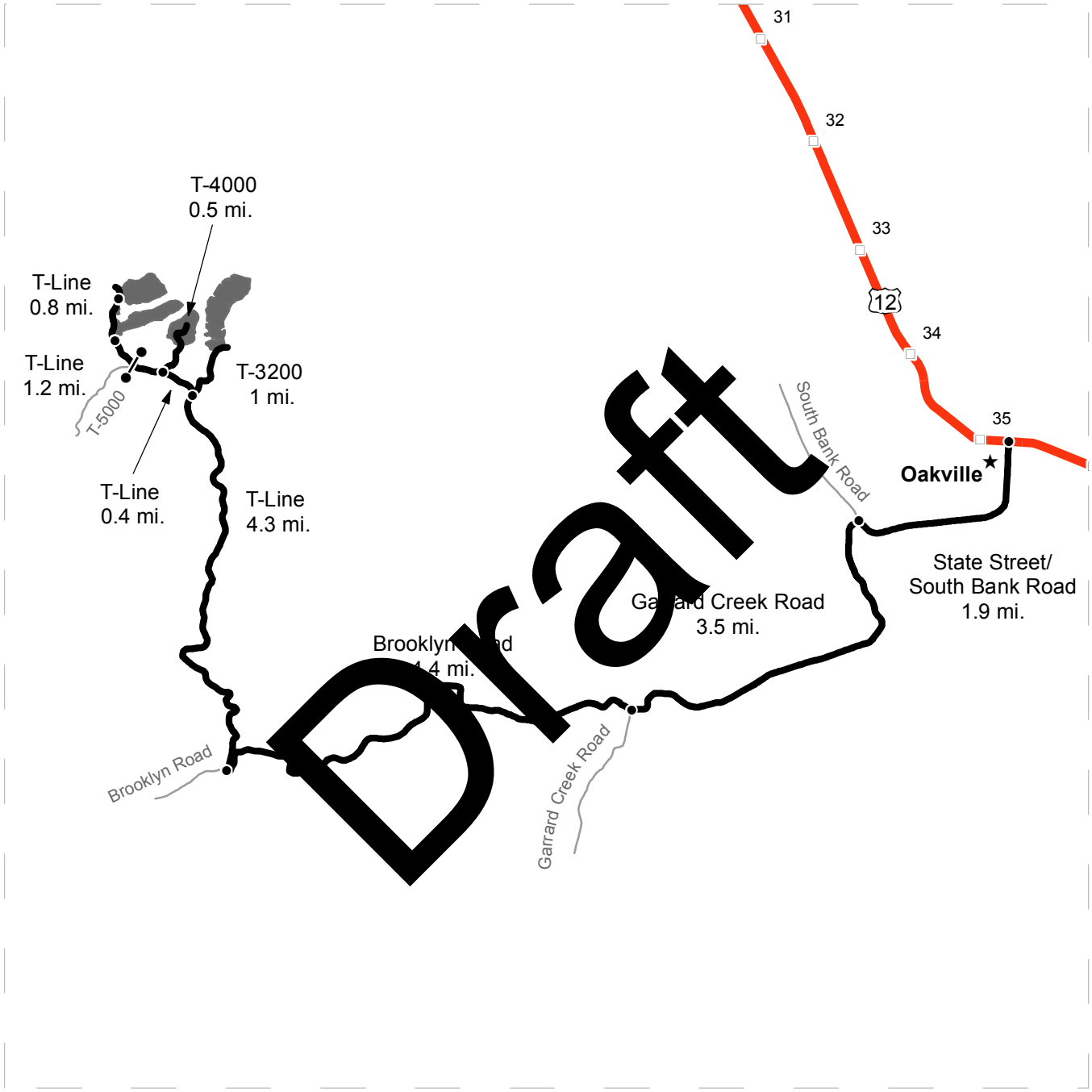
N

Prepared By: mlan490 Creation Date: 11/16/2015 Modification Date: 8/24/2016

DRIVING MAP

SALE NAME: NORTH WILLIAMS
AGREEMENT#: None
TOWNSHIP(S): T16R05W, T16R06W
TRUST(S): State Forest Transfer(1), Capitol Grant(7)

REGION: Pacific Cascade Region
COUNTY(S): GRAYS HARBOR
ELEVATION RGE: 211-815



Timber Sale Unit
Highways
Haul Route
Other Route
Milepost Markers
Distance Indicator
PCP 1-1

DRIVING DIRECTIONS:

From US Highway 12 (milepost 35) turn south onto State Street which becomes South Bank Road; follow for 1.9 miles over the Chehalis River bridge.
Turn left on to Garrard Creek Road; follow for 3.5 miles to Brooklyn Road.
Turn Right on Brooklyn Road; follow for 4.4 miles to the T-Line.
Turn right on the T-Line; follow for 4.3 miles to the T-3200 for Unit 4;
or continue on the T-Line for 0.4 miles to the T-4000 for Unit 3;
or continue on the T-Line through the gate for 1.2 miles for Unit 2;
or continue on the T-Line for 0.8 miles for Unit 1.

N

Prepared By: mlan490 Creation Date: 11/16/2015 Modification Date: 8/24/2016

Cruise Narrative

Sale Name: North Williams	**Region:** Pacific Cascade
App. #: 30-94595	**District: Lewis**
Lead Cruiser: Eric Carlson	**Completion date:** 10-10-2016
Other Cruisers: Allan Herman , Kalvin Bailey	

Unit acreage specifications:

Unit #	Cruised acres	Cruised acres agree with sale acres? Yes/No	If acres do not agree explain why.
1	37.2	Yes	
2	38.2	Yes	
3	25.8	Yes	
4	71.2	Yes	
Total	172.4	Yes	

Unit cruise specifications:

Unit #	Sample type (VP, FP, ITS,100%)	Expansion factor (BAF, full/ half)	Sighting height (4.5 ft, 16 ft.)	Grid size (Plot spacing & % area)	Plot ratio (Cru./Tally)	Total number of plots
1	VP	54.44	4.5 ft.	220’ x 220’	1:1	33
2	VP	46.94	4.5 ft.	220’ x 220’	1:1	34
3	VP	54.44	4.5 ft.	220’ x 220’	1:1	23
4	VP	46.94	4.5 ft.	250’ x 250’	1:1	49

Sale/Cruise Description:

Minor species cruise intensity:	Cruised all appropriate plots.					
Minimum cruise spec:	40% Form- Factor at 16 feet D.O.B or 5 inch Top, and merchantable top.					
Avg. ring count by sp:	**DF** =	7	**WH** =	7	**SS** =	n/a
Leave/take tree description:	Leave tree clumps are bounded with yellow “Leave Tree Area” tags and pink flagging, individual leave trees are marked with a single band of blue paint.					

	HA– Logs meeting the following criteria: Surface characteristics for a high quality A sort will have sound tight knots not to exceed 1 ½" in diameter, numbering not more than an average of one per foot of log length. May include logs with not more than two larger knots. Knots and knot indicators ½" in diameter and smaller shall not be a determining factor. Logs will have a growth ring count of 6 or more rings per inch in the outer third top end of the log. (min dia 8".) **HB** – Logs meeting the following criteria: Surface characteristics for a B sort will have sound tight knots not to exceed 1 ½" in diameter. May include logs with not more than two larger knots up to 2 ½" in diameter. Logs will have a growth ring count of 6 or more rings per inch in the outer third to end of the log. (min dia 8".) **R** – Logs meeting the following criteria: Gross diameter of 12 inches or greater, excessive knots greater than 2 ½ inches with recovery less than 65% of the net scale.
Status Description:	**P** – Logs classified as pole volume. **D** – Logs classified as merchantable standing dead.

Field observations:

North Williams - consists of 4 units for a total of 172.4 acres and **6,265 mbf**. All 4 units are VRH units.

Unit 1 is located east of the T-Line and is accessible by hiking in from the road. This unit consisted of 90% Douglas-fir but there were also small amounts of Red Alder, Western Hemlock and Big Leaf Maple. Douglas-fir had a 23.4" average DBH and 108' bole height. Defect was 5.6% for the Douglas-fir, consisting of sweep and spike-knots. Unit 1 is 37.2 acres and holds **1,513 mbf** of timber for an average per-acre volume of 40,683 bdft.

Unit 2 is located east of the T-Line and is accessible from the road. This unit consisted of mainly Douglas-fir at 81% but there was also small amounts of Red Alder, Western Hemlock, Big Leaf Maple and Western Red Cedar. Douglas-fir had a 26.4" average DBH and 111' bole height. Defect was 4.7% for the Douglas-fir, and consisted mostly of sweep and spike-knots with a few hooks and butts here and there. Unit 2 is 38.2 acres and holds **1,747 mbf** of timber for an average per-acre volume of 45,738 bdft.

Unit 3 is located northeast of the T-Line. This unit consisted mainly of Douglas-fir with 91% but there was also small amounts of Red Alder, Big Leaf Maple and Western Red Cedar. Douglas-fir had a 20.3" average DBH and 102' bole height. Defect was 6% for the Douglas-fir and consisted of sweep and spike-knots. Unit 3 is 25.8 acres and has a total volume of **1,330 mbf** and was running 51,635 bdft average per acre volume.

Unit 4 is located to the north of the 3200 and accessible by hiking from the road. This unit consisted of mainly Douglas-fir with 78% but there was small amounts of Red Alder, Big Leaf Maple, Western Red Cedar and Western Hemlock. Douglas-fir had a 22" average DBH and 115' bole height. Defect was at 3.8% for the Douglas-fir and consisted of sweep and spike-knots. Unit 4 is 71.2 acres and has a total volume of **2,673 mbf** and has an average per acre volume of 37,536 bdft.

Access to all the units is relatively easy as they are all located off the roads. It should be noted that these units run along ridges and are easiest to hike in along the ridgetops.
The harvest system is 95% uphill cable and 5% ground based.

Grant: 01, 07 **Prepared by: Eric Carlson** **Title: Timber Cruiser**

TC PSPCSTGR

Species, Sort Grade - Board Foot Volumes (Project)

T16N R06W S23 Ty00U1
THRU
T16N R06W S23 Ty00U4

Project: NORTHWIL
Acres 172.40

Page 1
Date 10/10/2016
Time 2:36:04PM

Spp	S T	So Gr rt ad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent of Net Board Foot Volume: Log Scale Dia. 5-7	8-11	12-15	16+	Log Length 12-20	21-30	31-35	36-99	Average Log: Ln Ft	Dia In	Bd Ft	CF/ Lf	Logs Per /Acre
DF		CU CU		100.0	21											1	10		0.00	14.0
DF		HA 2S	1	2.1	423	414	71			100					100	39	15	319	1.73	1.3
DF		HA 3S			27	27	5		100						100	40	9	120	0.76	.2
DF		HB 2S	29	2.0	10,501	10,290	1,774			36	64		1	1	98	39	16	408	2.13	25.2
DF		HB 3S	3	1.6	974	958	165		100						100	38	10	141	0.86	6.8
DF		D 3P			93	93	16				100				100	40	24	1010	4.54	.1
DF		D SM	4		1,308	1,308	225				100				100	39	18	539	2.63	2.4
DF		D 2S	51	5.2	19,155	18,165	3,132			18	82	1	1	4	94	38	18	505	2.67	36.0
DF		D 3S	9	2.4	3,337	3,258	562	17	83			2	7	21	70	35	9	97	0.73	33.6
DF		D 4S	2		750	750	129	89	11			22	30	6	42	26	6	33	0.33	22.8
DF		D UT	1		97	97	17	38	14	49		100				15	7	30	0.39	3.2
DF	**Totals**		84	3.6	36,685	35,359	6,096	4	11	[illegible]	63	1	2	4	92	32	12	243	1.61	145.5
DF	D	CU CU		100.0	8											14	5		0.00	.5
DF	D	D 2S	33	12.9	88	76	13				[illegible]				100	40	19	505	2.86	.2
DF	D	D 3S	48	15.5	126	106	18		100						100	40	9	113	0.89	.9
DF	D	D 4S	11		25	25	4	100						54	46	37	5	40	0.29	.6
DF	D	D UT	8		18	18	3		[illegible]				100			30	9	70	0.55	.3
DF	**Totals**		1	14.6	263	225	39	[illegible]	55	[illegible]	34		8	6	86	33	8	90	0.76	2.5
RA		CU CU		100.0	4											2	7		0.00	2.4
RA		D UT	10		339	339	[illegible]	82	[illegible]			34	66			20	5	26	0.35	12.9
RA		D 1S	3	5.6	133	125	[illegible]				100		100			30	16	283	2.36	.4
RA		D 2S	29	6.7	1,044	[illegible]	168			100			96		4	30	14	201	1.75	4.8
RA		D 3S	12	6.5	[illegible]	402	69		100				84		16	31	10	114	1.03	3.5
RA		D 4S	24	4.8	[illegible]	818	[illegible]		100				63		37	33	9	83	0.80	9.8
RA		D 4S	22	.4	[illegible]	727	[illegible]	100				4	51	9	36	30	6	42	0.49	17.2
RA	**Totals**		8	4.3	3,538	[illegible]	[illegible]	30	38	29	4	4	74	2	20	27	7	66	0.73	51.1
WH		CU CU															6		0.00	2.6
WH		D 2S	63	5.9	577	543	94			17	83				100	40	17	436	2.63	1.2
WH		D 3S	24	3.5	212	204	35	22	78					10	90	38	8	95	0.84	2.2
WH		D 4S	13	2.1	108	106	18	98	2			24		9	68	29	5	31	0.37	3.4
WH	**Totals**		2	4.9	897	853	147	17	19	11	53	3		4	94	25	8	90	1.02	9.5
BM		CU CU		100.0	24											4	10		0.00	4.9
BM		D UT	24		462	462	80	94	6			40	19	21	19	22	6	27	0.45	17.4
BM		D 1S	3	20.0	68	55	9				100				100	40	16	320	2.82	.2
BM		D 2S	24	5.3	469	444	77			100		12	62		26	30	13	165	1.69	2.7
BM		D 3S	18	5.6	370	349	60		100			8	70		22	29	11	111	1.39	3.1
BM		D 4S	24	9.4	490	444	77		100			8	54	16	21	31	9	81	0.92	5.5
BM		D 4S	7	6.3	129	121	21	100					57	11	32	31	6	43	0.63	2.8
BM	**Totals**		4	6.8	2,012	1,875	323	30	44	24	3	16	49	10	25	23	8	51	0.80	36.5
RC		D 3S	90	3.9	419	403	69		30		70				100	37	14	334	2.53	1.2
RC		D 4S	10		43	43	7	100				17		83		28	5	34	0.38	1.3
RC	**Totals**		1	3.5	463	446	77	10	27		63	2		8	90	32	9	180	1.58	2.5

TC PSPCSTGR

Species, Sort Grade - Board Foot Volumes (Project)

T16N R06W S23 Ty00U1
THRU
T16N R06W S23 Ty00U4

Project: NORTHWIL
Acres 172.40

Page 2
Date 10/10/2016
Time 2:36:04PM

Spp	S T	So Gr rt ad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent of Net Board Foot Volume: Log Scale Dia. 5-7	8-11	12-15	16+	Log Length 12-20	21-30	31-35	36-99	Average Log: Ln Ft	Dia In	Bd Ft	CF/ Lf	Logs Per /Acre
Totals				3.9	43,858	42,142	7,265	7	15	21	57	2	10	4	83	29	10	170	1.32	247.6

TC PSTATS

PROJECT STATISTICS

PROJECT NORTHWIL

DATE 10/10/2016

TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt
16N	06	23	NORTHWIL	00U1	THR	172.40	139	655	S	W
16N	06W	23	NORTHWIL	00U4						

	PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES
TOTAL	139	655	4.7		
CRUISE	71	320	4.5	17,631	1.8
DBH COUNT					
REFOREST					
COUNT	65	321	4.9		
BLANKS	3				
100 %					

STAND SUMMARY

	SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
DOUG FIR	206	45.6	24.6	109	30.4	150.6	36,685	35,359	7,432	7,427
DOUG FIR-D	4	.9	17.0	93	0.4	1.[illegible]	263	225	64	61
R ALDER	47	28.0	15.3	54	9.2	35.[illegible]	3,538	3,385	1,008	1,007
BL MAPLE	42	21.8	15.4	41	7.2	28.3	2,012	1,875	662	656
WHEMLOCK	17	4.2	17.1	67	1.6	6.[illegible]	897	853	238	238
WR CEDAR	4	1.8	20.2	55	0.9	[illegible]	469	446	127	127
TOTAL	*320*	*102.3*	*20.2*	*77*	*50.5*	*226.[illegible]*	*43,85[illegible]*	*42,142*	*9,531*	*9,516*

CONFIDENCE LIMITS OF THE SAMPLE

68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITH[illegible] THE SA[illegible]E ERRO[illegible]

CL 68.1 SD: 1.0	COEFF VAR.%	S.E.%	SAMPLE TREES - [illegible] LOW	AVG	HIGH	# OF TREES REQ. 5	10	INF. POP. 15
DOUG FIR	61.6	4.3	1,0[illegible]	1,142	1,[illegible]			
DOUG FIR-D	118.1	67.5	132	405	[illegible]78			
R ALDER	51.8	7.[illegible]	[illegible]49	161	173			
BL MAPLE	59.0		[illegible]	[illegible]	133			
WHEMLOCK	81.7	[illegible]0.4	3[illegible]	4[illegible]	523			
WR CEDAR	140.9	[illegible]5	65	335	605			
TOTAL	*90.9*	[illegible]	*765*	*806*	*847*	*330*	*83*	*37*

CL 68.1 SD: 1.0	COEFF VAR.%	S.E.%	SAMPLE TREES - CF [illegible]	AVG	HIGH	# OF TREES REQ. 5	10	INF. POP. 15
DOUG FIR	55.1	3.9	225	234	243			
DOUG FIR-D	104.9	60.0	41	103	165			
R ALDER	49.6	7.2	44	48	51			
BL MAPLE	56.7	8.8	40	44	47			
WHEMLOCK	76.1	19.0	92	114	136			
WR CEDAR	133.3	76.2	22	94	166			
TOTAL	*79.7*	*4.5*	*164*	*172*	*179*	*254*	*63*	*28*

CL 68.1 SD: 1.0	COEFF VAR.%	S.E.%	TREES/ACRE LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	113.5	9.6	41	46	50			
DOUG FIR-D	631.7	53.5	0	1	1			
R ALDER	224.3	19.0	23	28	33			
BL MAPLE	252.4	21.4	17	22	26			
WHEMLOCK	363.7	30.8	3	4	5			
WR CEDAR	642.9	54.5	1	2	3			
TOTAL	*79.0*	*6.7*	*95*	*102*	*109*	*249*	*62*	*28*

CL 68.1 SD: 1.0	COEFF VAR.%	S.E.%	BASAL AREA/ACRE LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	82.1	7.0	140	151	161			
DOUG FIR-D	586.3	49.7	1	1	2			
R ALDER	189.9	16.1	30	36	42			
BL MAPLE	226.5	19.2	23	28	34			

TC PSTATS

PROJECT STATISTICS

PROJECT NORTHWIL

DATE 10/10/2016

TWP	RGE	SC	TRACT	TYPE		ACRES	PLOTS	TREES	CuFt	BdFt
16N	06	23	NORTHWIL	00U1	THR	172.40	139	655	S	W
16N	06W	23	NORTHWIL	00U4						

CL 68.1 SD: 1.00

BASAL AREA/ACRE

	COEFF VAR.	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
WHEMLOCK	331.1	28.1	5	7	9			
WR CEDAR	412.6	35.0	3	4	5			
TOTAL	*49.5*	*4.2*	*217*	*227*	*236*	*98*	*24*	*11*

CL 68.1 SD: 1.0

NET BF/ACRE

	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	81.0	6.9	32,931	35,359	37,787			
DOUG FIR-D	611.6	51.8	108	225	341			
R ALDER	185.1	15.7	2,854	3,385	3,916			
BL MAPLE	221.8	18.8	1,522	1,875	2,227			
WHEMLOCK	358.9	30.4	594	853	1,113			
WR CEDAR	415.9	35.2	289	446	603			
TOTAL	*61.2*	*5.2*	*39,957*	*42,142*	*44,328*	*150*	*37*	*17*

CL 68.1 SD: 1.0

NET CUFT FT/ACRE

	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	81.1	6.9	6,917	7,427	7,9			
DOUG FIR-D	595.3	50.5	30	61	92			
R ALDER	184.6	15.6	850	1,007	1,1			
BL MAPLE	226.5	19.2	530	656	7			
WHEMLOCK	347.2	29.4	168	238	3			
WR CEDAR	411.9	34.9	82	127	171			
TOTAL	*55.2*	*4.7*	*9,071*	*9,516*	*9,9*	*122*	*30*	*14*

CL 68.1 SD: 1.0

V BAR/ACE

	COEFF VAR.%	S.E.%	LOW	AV	GH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR			219	235	251			
DOUG FIR-D	611.6	51.8		151	2			
R ALDER	91.4	7.7	80	94	9			
BL MAPLE	146.4	12.4	54	66	79			
WHEMLOCK	331.2			7	166			
WR CEDAR	165.5	4.0		1	153			
TOTAL	*62.3*	3	*176*	*186*	*195*	*155*	*39*	*17*

T TSPCSTGR

Species, Sort Grade - Board Foot Volumes (Type)

Project: NORTHWIL

Page 1
Date 10/10/2016
Time 2:36:05PM

T16N R06W S23 T00U1

Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt
16N	06W	23	NORTHWIL	00U1	37.20	33	74	S	W

T16N R06W S23 T00U1

Spp	ST	Sort	Grade	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent Net Board Foot Volume: Log Scale Dia. 5-7	8-11	12-15	16+	Log Length 12-20	21-30	31-35	36-99	Average Log Ln Ft	Dia In	Bd Ft	CF/ Lf	Logs Per /Acre
DF		CU	CU														2	15		0.00	10.7
DF		HB	2S	42	2.1	16,001	15,664	583			38	62				100	39	16	408	2.13	38.4
DF		HB	3S	5	1.6	1,853	1,824	68		100						100	37	10	133	0.81	13.8
DF		DM	SM	8		2,734	2,734	102				100				100	40	18	524	2.51	5.2
DF		DM	2S	31	6.0	12,385	11,643	433			34	66	2			98	39	16	371	2.02	31.4
DF		DM	3S	11	.9	3,959	3,922	146	15	85			2	9	10	79	35	8	89	0.71	43.9
DF		DM	4S	2		770	770	29	100				8	60		32	28	6	36	0.35	21.5
DF		DM	UT	1		99	99	4	58	42			100				16	6	24	0.32	4.1
DF		**Totals**		90	3.0	37,801	36,656	1,364	4	14		9	1	2	1	95	33	12	217	1.39	169.0
RA		CU	CU		100.0	20											4	6		0.00	3.6
RA		DM	UT	11		323	323	12	100				29	71			22	5	26	0.45	12.4
RA		DM	1S	7	10.0	206	185	7				1		100			30	16	270	2.27	.7
RA		DM	2S	53	2.5	1,518	1,481	55			0			87		13	31	13	176	1.50	8.4
RA		DM	3S	13	4.7	371	354	13		100				100			30	10	113	0.99	3.1
RA		DM	4S	12		334	334	12		100				100			30	9	70	0.78	4.8
RA		DM	4S	4	11.8	104	91	3	100					100			30	6	35	0.49	2.6
RA		**Totals**		7	3.8	2,875	2,768	103	15			7	3	89		7	25	8	78	0.91	35.6
BM		CU	CU		100.0	66											6	10		0.00	9.4
BM		DM	UT	17			180	7		49			69	31			20	7	31	0.48	5.9
BM		DM	2S	25	10.0	1	253	9			100		44	56			22	12	108	1.66	2.3
BM		DM	3S	58	4.4	6	574	21		100			22	78			24	10	93	1.19	6.2
BM		**Totals**		2	10.7	1,128	1,007	37	9	66	25		36	64			16	9	42	0.84	23.8
WH		CU	CU															5		0.00	2.1
WH		DM	3S	50		126	126	5	100							100	36	7	60	0.53	2.1
WH		DM	4S	50		126	126	5	100				33			67	29	5	30	0.38	4.2
WH		**Totals**		1		252	252	9	100				17			83	23	6	30	0.44	8.4
Type Totals					3.3	42,056	40,683	1,513	5	16	29	50	2	10	1	87	30	11	172	1.28	236.8

T TSPCSTGR

Species, Sort Grade - Board Foot Volumes (Type)

Project: NORTHWIL

Page 1
Date 10/10/2016
Time 2:36:05PM

T16N R06W S23 T00U2

Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt
16N	06W	23	NORTHWIL	00U2	38.20	34	68	S	W

T16N R06W S23 T00U2

Spp	ST	So rt	Gr ad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent Net Board Foot Volume: Log Scale Dia. 5-7	8-11	12-15	16+	Log Length 12-20	21-30	31-35	36-99	Average Log Ln Ft	Dia In	Bd Ft	CF/ Lf	Logs Per /Acre
DF		CU	CU														0	10		0.00	14.8
DF		HB	2S	23	2.6	8,783	8,552	327			38	62				100	40	16	402	2.13	21.3
DF		HB	3S	1	4.0	740	711	27		100						100	40	9	129	0.82	5.5
DF		DM	2S	65	5.5	25,242	23,851	911			19	81	0	2	3	95	38	18	534	2.80	44.7
DF		DM	3S	9	5.4	3,549	3,357	128	8	92			2	9	38	51	34	9	105	0.80	32.0
DF		DM	4S	2		663	663	25	88	12			20	29	17	33	25	6	30	0.37	22.0
DF Totals				81	4.7	38,978	37,134	1,419	2	10	21	66	1	2	6	91	32	13	265	1.78	140.3
DF	D	DM	3S	63	22.2	135	105	4		100						100	40	8	70	0.63	1.5
DF	D	DM	4S	37		60	60	2	100						100		35	5	40	0.24	1.5
DF D Totals				0	15.4	195	165	6	36	64					36	64	38	7	55	0.45	3.0
WH		CU	CU															6		0.00	9.8
WH		DM	2S	69	6.4	2,408	2,254	86			10	90				100	40	17	455	2.74	4.9
WH		DM	3S	20	2.9	662	643	25		94					9	91	39	9	116	0.98	5.6
WH		DM	4S	11	3.0	335	325	12		4			13		13	74	32	5	33	0.37	9.9
WH Totals				7	5.4	3,405	3,222	123	11		7	63	1		3	96	24	8	107	1.20	30.2
BM		CU	CU															8		0.00	6.1
BM		DM	UT	6		106	106		100				100				14	5	13	0.32	8.2
BM		DM	2S	24		377		14			100			100			30	14	210	1.52	1.8
BM		DM	4S	56	10.0	2	893	34		100				81	19		30	9	84	0.98	10.6
BM		DM	4S	14	14.4	2	218	8	100					100			29	7	40	0.67	5.5
BM Totals				3	7.9	1,730	594	61	20	56	24		7	82	11		20	8	50	0.83	32.2
RA		DM	2S	33	11.1	775	6	26			100			100			30	15	240	1.80	2.9
RA		DM	4S	23	9.1	544	494	19		100				100			30	10	100	0.97	4.9
RA		DM	4S	44		902	902	34	100				14	16		69	29	6	43	0.56	20.7
RA Totals				5	6.1	2,220	2,085	80	43	24	33		6	64		30	29	7	73	0.76	28.5
RC		DM	3S	100	4.6	1,612	1,538	59		17		83				100	38	18	520	3.71	3.0
RC Totals				3	4.6	1,612	1,538	59		17		83				100	38	18	520	3.71	3.0
Type Totals					5.0	48,140	45,738	1,747	5	14	20	61	1	8	5	86	29	11	193	1.51	237.2

T TSPCSTGR

Species, Sort Grade - Board Foot Volumes (Type)

Project: NORTHWIL

Page 1
Date 10/10/2016
Time 2:36:05PM

T16N R06W S23 T00U3

Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt
16N	06W	23	NORTHWIL	00U3	25.80	23	70	S	W

T16N R06W S23 T00U3

Spp	ST	Sort	Grad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent Net Board Foot Volume: Log Scale Dia. 5-7	8-11	12-15	16+	Log Length 12-20	21-30	31-35	36-99	Average Log Ln Ft	Dia In	Bd Ft	CF/ Lf	Logs Per /Acre
DF		CU	CU		100.0	93											2	9		0.00	29.2
DF		HA	2S	4	3.1	1,968	1,907	49			100					100	39	14	304	1.70	6.3
DF		HA	3S			182	182	5		100						100	40	9	120	0.76	1.5
DF		HB	2S	32	2.1	15,409	15,083	389			42	58				100	40	15	356	1.90	42.3
DF		HB	3S	4	.9	2,018	1,999	52		100						100	38	10	151	0.89	13.2
DF		DM	3P	1		621	621	16				100				100	40	24	1010	4.54	.6
DF		DM	SM	7		3,103	3,103	80				100				100	39	20	640	3.03	4.8
DF		DM	2S	34	4.1	16,767	16,073	415			23	77		2	4	94	39	17	454	2.37	35.4
DF		DM	3S	12	1.2	5,841	5,772	149	21	79			3	6	18	74	36	9	100	0.70	57.7
DF		DM	4S	5		2,288	2,288	59	93	7			18	21		61	27	6	34	0.28	67.1
DF		DM	UT	1		160	160	4	100								13	5	14	0.19	11.3
DF	**Totals**			91	2.6	48,449	47,188	1,217	7	15			2		4	92	30	10	175	1.22	269.6
RA		CU	CU															5		0.00	6.4
RA		DM	UT	13		519	519	13	1					68			21	5	24	0.30	22.1
RA		DM	2S	8	9.5	339	306	8			100			100			30	14	190	1.87	1.6
RA		DM	3S	30	5.8	1,278	1,204							65		35	33	10	118	1.04	10.2
RA		DM	4S	42	2.2	1,640	1,604	41						32		68	35	9	88	0.74	18.2
RA		DM	4S	7	.0	273		7	100					70	30		30	5	34	0.38	8.0
RA	**Totals**			8	3.5	4,0	3,906	101	20	72	8		4	55	2	39	26	7	59	0.66	66.5
BM		CU	CU		100.0	8											12	8		0.00	1.4
BM		DM	UT	11		42		1	100					100			22	6	30	0.63	1.4
BM		DM	2S	48	7.1	196	182	5			100		100				20	14	130	1.65	1.4
BM		DM	3S	41		154	4	4		100				100			26	11	110	1.53	1.4
BM	**Totals**			1	10.0	421	379	10	11	41	48		48	52			20	10	67	1.08	5.6
RC		DM	3S	100		162	162	4		100						100	36	10	140	1.16	1.2
RC	**Totals**			0		162	162	4		100						100	36	10	140	1.16	1.2
Type Totals					2.7	53,081	51,635	1,332	8	19	24	48	2	7	3	88	29	10	151	1.12	342.9

T TSPCSTGR

Species, Sort Grade - Board Foot Volumes (Type)

Project: NORTHWIL

Page 1
Date 10/10/2016
Time 2:36:05PM

T16N R06W S23 T00U4

Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt
16N	06W	23	NORTHWIL	00U4	71.20	49	108	S	W

T16N R06W S23 T00U4

Spp	ST	Sort	Grad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent Net Board Foot Volume: Log Scale Dia. 5-7	8-11	12-15	16+	Log Length 12-20	21-30	31-35	36-99	Average Log Ln Ft	Dia In	Bd Ft	CF/ Lf	Logs Per /Acre
DF		CU	CU		100.0	17											1	10		0.00	9.7
DF		HA	2S	1		312	312	22			100					100	40	15	360	1.82	.9
DF		HB	2S	22	1.4	6,772	6,679	476			28	72		4	2	94	39	17	470	2.41	14.2
DF		HB	3S	1		261	261	19		100						100	40	11	180	1.03	1.4
DF		DM	SM	2		614	614	44				100				100	38	17	439	2.36	1.4
DF		DM	2S	66	5.0	20,292	19,279	1,373			11	89	1	1	6	92	37	19	569	3.03	33.9
DF		DM	3S	6	2.2	1,991	1,946	139	23	77			4	3	20	73	35	9	95	0.74	20.5
DF		DM	4S	1		228	228	16	58	42			67	13	20		17	7	29	0.45	7.7
DF		DM	UT	1		124	124	9		8	9		00				17	12	86	0.96	1.4
DF Totals				78	3.8	30,610	29,442	2,096	2	6	5	7	2	2	6	91	31	14	323	2.11	91.2
DF	D	CU	CU		100.0	18											14	5		0.00	1.3
DF	D	DM	2S	40	12.9	212	185	13				1				100	40	19	505	2.86	.4
DF	D	DM	3S	44	13.4	232	201	14								100	40	10	136	1.03	1.5
DF	D	DM	4S	6		27	27	2	1							100	40	5	40	0.34	.7
DF	D	DM	UT	10		43	43	3		100				100			30	9	70	0.55	.6
DF D Totals				1	14.4	533	456	32	6			40		9		91	31	8	103	0.89	4.4
RA		CU	CU														2	11		0.00	1.6
RA		DM	UT	10		463	463	3	69	31			36	64			20	6	28	0.34	16.7
RA		DM	1S	5	3.3		206	15				100		100			30	16	290	2.40	.7
RA		DM	2S	27	7.6	6	1,104	79			100			100			30	14	213	1.95	5.2
RA		DM	3S	8	8.3	3	352	25		100				100			30	11	110	1.04	3.2
RA		DM	4S	23	5.9	1,020	960	68		100				65		35	33	9	80	0.81	12.1
RA		DM	4S	27		1,130	0	80	100					63	11	26	31	6	43	0.47	26.3
RA Totals				11	4.3	4,406	4,210	300	34	35	26	5	4	78	3	15	27	7	64	0.70	65.7
BM		CU	CU		100.0	14											3	14		0.00	3.1
BM		DM	UT	31		953	953	68	98	2			35	18	25	23	23	6	28	0.45	34.2
BM		DM	1S	4	20.0	165	132	9				100				100	40	16	320	2.82	.4
BM		DM	2S	23	5.6	716	675	48			100			59		41	33	13	177	1.75	3.8
BM		DM	3S	16	6.9	525	489	35		100				62		38	33	11	127	1.50	3.9
BM		DM	4S	20	8.9	653	596	42		100			15	33	14	38	31	9	79	0.87	7.5
BM		DM	4S	6		175	175	12	100					29	18	54	33	6	46	0.60	3.8
BM Totals				8	5.7	3,202	3,020	215	37	36	22	4	14	37	12	38	25	7	53	0.77	56.7
RC		DM	3S	46		91	91	6		100						100	36	9	100	1.01	.9
RC		DM	4S	54		105	105	7	100				17		83		28	5	34	0.38	3.1
RC Totals				1		196	196	14	54	46			9		44	46	30	6	49	0.55	4.0
WH		DM	2S	51		105	105	7			100					100	40	14	290	1.85	.4
WH		DM	3S	41	8.5	92	84	6	26	74					26	74	38	8	74	0.75	1.1
WH		DM	4S	8		16	16	1	100				100				16	5	20	0.24	.8

T TSPCSTGR

Species, Sort Grade - Board Foot Volumes (Type)

Project: NORTHWIL

Page 2
Date 10/10/2016
Time 2:36:05PM

T16N R06W S23 T00U4

Twp	Rge	Sec	Tract	Type	Acres	Plots	Sample Trees	CuFt	BdFt
16N	06W	23	NORTHWIL	00U4	71.20	49	108	S	W

T16N R06W S23 T00U4

Spp	S T	So rt	Gr ad	% Net BdFt	Bd. Ft. per Acre Def%	Gross	Net	Total Net MBF	Percent Net Board Foot Volume: Log Scale Dia. 5-7	8-11	12-15	16+	Log Length 12-20	21-30	31-35	36-99	Average Log Ln Ft	Dia In	Bd Ft	CF/ Lf	Logs Per /Acre
WH	**Totals**			1	3.7	213	205	15	18	30	51		8		11	82	31	8	90	0.89	2.3
Type Totals					4.1	39,160	37,536	2,673	9	13	17	62	3	13	6	78	28	10	167	1.35	224.3

TC TSTATS

STATISTICS

PAGE 1

PROJECT NORTHWIL

DATE 10/10/2016

TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
16N	**06W**	**23**	**NORTHWIL**	**00U1**	37.20	33	127	S	W

	PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES
TOTAL	33	127	3.8		
CRUISE	18	74	4.1	3,101	2.4
DBH COUNT					
REFOREST					
COUNT	14	53	3.8		
BLANKS	1				
100 %					

STAND SUMMARY

	SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
DOUG FIR	53	54.6	23.4	108	33.7	163.[illegible]	37,801	36,656	7,882	7,881
R ALDER	13	16.0	17.9	58	6.6	28.[illegible]	2,875	2,768	807	803
BL MAPLE	6	8.5	17.9	49	3.5	14.8	1,128	1,007	339	320
WHEMLOCK	2	4.2	12.0	54	1.0	[illegible]	252	252	86	86
TOTAL	*74*	*83.4*	*21.5*	*90*	*45.2*	[illegible]	*42[illegible]*	*40,683*	*9,113*	*9,089*

CONFIDENCE LIMITS OF THE SAMPLE

68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE [illegible]E ERROR

CL: 68.1 %	COEFF		**SAMPLE TREES - BF**			# OF TREES REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR	47.8	6.6	798	855	911			
R ALDER	38.0	10.9	1[illegible]	193	21[illegible]			
BL MAPLE	24.6	11.0	108	122	[illegible]			
WHEMLOCK	47.1	44.1	34	60	86			
TOTAL	*71.3*			*[illegible]7*	*712*	*203*	*51*	*23*

CL: 68.1 %	COEFF		**SAMPLE TREES - CF**			# OF TREES REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR	44.1	6.[illegible]	170	181	192			
R ALDER	33.5	9.7	[illegible]	56	61			
BL MAPLE	43.4	19.3	[illegible]3	40	48			
WHEMLOCK	13.7	12.8	18	20	23			
TOTAL	*63.7*	*7.4*	*133*	*143*	*154*	*162*	*40*	*18*

CL: 68.1 %	COEFF		**TREES/ACRE**			# OF PLOTS REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR	87.4	15.2	46	55	63			
R ALDER	183.1	31.9	11	16	21			
BL MAPLE	294.0	51.1	4	9	13			
WHEMLOCK	399.8	69.5	1	4	7			
TOTAL	*59.6*	*10.4*	*75*	*83*	*92*	*142*	*35*	*16*

CL: 68.1 %	COEFF		**BASAL AREA/ACRE**			# OF PLOTS REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR	76.8	13.4	141	163	185			
R ALDER	182.4	31.7	19	28	37			
BL MAPLE	293.8	51.1	7	15	22			
WHEMLOCK	399.8	69.5	1	3	6			
TOTAL	*52.8*	*9.2*	*190*	*210*	*229*	*111*	*28*	*12*

CL: 68.1 %	COEFF		**NET BF/ACRE**			# OF PLOTS REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR	76.8	13.4	31,762	36,656	41,551			
R ALDER	180.1	31.3	1,900	2,768	3,635			
BL MAPLE	293.8	51.1	493	1,007	1,522			
WHEMLOCK	422.8	73.5	67	252	437			
TOTAL	*63.8*	*11.1*	*36,172*	*40,683*	*45,195*	*162*	*41*	*18*

STATISTICS

PROJECT NORTHWIL

TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
16N	06W	23	NORTHWIL	00U1	37.20	33	127	S	W

CL: 68.1 % COEFF VAR.
SD: 1.0

NET CUFT FT/ACRE

S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15

CL: 68.1 % COEFF VAR.%
SD: 1.0

NET CUFT FT/ACRE

	VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	76.7	13.3	6,829	7,881	8,932			
R ALDER	181.5	31.6	549	803	1,056			
BL MAPLE	295.6	51.4	156	320	485			
WHEMLOCK	401.8	69.9	26	86	146			
TOTAL	*59.7*	*10.4*	*8,145*	*9,089*	*10,034*	*142*	*36*	*16*

CL: 68.1 % COEFF VAR.%
SD: 1.0

V-BAR/ACRE

	VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR			194	224	254			
R ALDER	159.3	27.7	68	99	130			
BL MAPLE	255.6	44.4	33	68	103			
WHEMLOCK	422.8	73.5	20	76	133			
TOTAL	*189.8*	*33.0*	*173*	*194*	*216*	*1,438*	*360*	*160*

TC TSTATS

STATISTICS

PROJECT NORTHWIL

PAGE 1

DATE 10/10/2016

TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
16N	06W	23	NORTHWIL	00U2	38.20	34	173	S	W

	PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES
TOTAL	34	173	5.1		
CRUISE	16	68	4.3	3,347	2.0
DBH COUNT					
REFOREST					
COUNT	18	105	5.8		
BLANKS					
100 %					

STAND SUMMARY

	SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
DOUG FIR	44	41.6	26.4	111	30.9	158.8	38,978	37,134	7,871	7,870
DOUG FIR-D	1	1.5	13.0	84	0.4	1.4	195	165	51	50
WHEMLOCK	13	12.7	18.4	72	5.5	23.5	3,405	3,222	874	874
BL MAPLE	6	16.1	16.4	45	5.8	23	1,730	1,594	543	543
R ALDER	3	14.3	16.3	63	5.1	20.7	2,220	2,085	632	630
WR CEDAR	1	1.5	37.0	78	1.8	11	612	1,538	417	417
TOTAL	*68*	*87.6*	*22.4*	*85*	*50.5*		*48*	*45,738*	*10,388*	*10,385*

CONFIDENCE LIMITS OF THE SAMPLE

68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE [illegible] ERROR

SAMPLE TREES - BF

CL: 68.1 % / SD: 1.0	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF TREES REQ. 5	10	INF. POP. 15
DOUG FIR	60.0	9.1	1,181	1,300	1,418			
DOUG FIR-D								
WHEMLOCK	67.7	19.5	422	524	[illegible]			
BL MAPLE	65.9	29.3	79	112	144			
R ALDER	64.3	[illegible]	[illegible]	[illegible]	250			
WR CEDAR								
TOTAL	*81.6*	*[illegible]*	*874*	*971*	*1,067*	*266*	*67*	*30*

SAMPLE TREES - CF

CL: 68.1 % / SD: 1.0	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF TREES REQ. 5	10	INF. POP. 15
DOUG FIR	53.2	8.1	[illegible]	267	288			
DOUG FIR-D								
WHEMLOCK	63.8	18.4	111	136	161			
BL MAPLE	40.4	18.0	30	36	43			
R ALDER	50.9	35.2	33	50	68			
WR CEDAR								
TOTAL	*71.1*	*8.7*	*190*	*208*	*226*	*202*	*51*	*22*

TREES/ACRE

CL: 68.1 % / SD: 1.0	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	92.0	15.8	35	42	48			
DOUG FIR-D	583.1	99.9	0	1	3			
WHEMLOCK	212.1	36.3	8	13	17			
BL MAPLE	270.7	46.4	9	16	24			
R ALDER	257.7	44.2	8	14	21			
WR CEDAR	235.3	40.3	1	1	2			
TOTAL	*61.8*	*10.6*	*78*	*88*	*97*	*153*	*38*	*17*

BASAL AREA/ACRE

CL: 68.1 % / SD: 1.0	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	76.3	13.1	138	159	180			
DOUG FIR-D	583.1	99.9	0	1	3			
WHEMLOCK	179.2	30.7	16	23	31			
BL MAPLE	266.3	45.6	13	23	34			
R ALDER	256.9	44.0	12	21	30			
WR CEDAR	235.3	40.3	7	11	15			

TC TSTATS

STATISTICS

PAGE 2

PROJECT NORTHWIL

DATE 10/10/2016

TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
16N	**06W**	**23**	**NORTHWIL**	**00U2**	38.20	34	173	S	W

CL: 68.1 %
SD: 1.0

BASAL AREA/ACRE

	COEFF VAR.	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
TOTAL	*40.0*	*6.9*	*222*	*239*	*255*	*64*	*16*	*7*

CL: 68.1 %
SD: 1.0

NET BF/ACRE

	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	75.6	13.0	32,324	37,134	41,944			
DOUG FIR-D	583.1	99.9	0	165	329			
WHEMLOCK	188.6	32.3	2,181	3,222	4,264			
BL MAPLE	263.7	45.2	874	1,594	2,314			
R ALDER	257.1	44.1	1,166	2,085	3,003			
WR CEDAR	235.3	40.3	918	1,538	2,159			
TOTAL	*51.9*	*8.9*	*41,674*	*45,738*	*49,803*	*107*	*27*	*12*

CL: 68.1 %
SD: 1.0

NET CUFT FT/ACRE

	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	75.7	13.0	6,850	7,870	8,891			
DOUG FIR-D	583.1	99.9	0	50	100			
WHEMLOCK	185.2	31.7	597	874	1,152			
BL MAPLE	265.1	45.4	296	543	[illegible]			
R ALDER	256.9	44.0	353	630	[illegible]08			
WR CEDAR	235.3	40.3	249	417	[illegible]			
TOTAL	*46.3*	*7.9*	*9,562*	*10,385*	*11,[illegible]*	[illegible]	*21*	*9*

CL: 68.1 %
SD: 1.0

V-BAR/ACRE

	COEFF VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR			204	[illegible]	[illegible]			
DOUG FIR-D	583.1	99.9	0	[illegible]	239			
WHEMLOCK	168.2	28.8	93	[illegible]	182			
BL MAPLE	112.1	19.2	37	68	99			
R ALDER			[illegible]	101	[illegible]			
WR CEDAR			83	139	195			
TOTAL	*271.1*	*46.[illegible]*	*[illegible]74*	*[illegible]91*	*209*	*2,935*	*734*	*326*

TC TSTATS

STATISTICS

PROJECT NORTHWIL

DATE 10/10/2016

TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
16N	06W	23	NORTHWIL	00U3	25.80	23	126	S	W

	PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES
TOTAL	23	126	5.5		
CRUISE	12	70	5.8	3,269	2.1
DBH COUNT					
REFOREST					
COUNT	10	49	4.9		
BLANKS	1				
100 %					

STAND SUMMARY

	SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
DOUG FIR	57	92.7	20.3	102	46.2	208.2	48,449	47,188	10,035	10,012
R ALDER	10	30.1	15.4	62	9.9	38.8	4,049	3,906	1,146	1,147
BL MAPLE	2	2.8	20.0	42	1.4	6.1	421	379	130	122
WR CEDAR	1	1.2	18.0	53	0.5	2	162	162	48	48
TOTAL	*70*	*126.7*	*19.2*	*91*	*58.2*	*255.1*	*53,081*	*51,635*	*11,359*	*11,328*

CONFIDENCE LIMITS OF THE SAMPLE

68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE SAMP POR

CL: 68.1 % COEFF

SD: 1.0 VAR.%

SAMPLE TREES

	S.E.%	LOW	AVG	HIGH	# OF TREES REQ. 5	10	INF. POP. 15
DOUG FIR	7.9	862					
R ALDER	10.7	122		152			
BL MAPLE	24.5	102	135	168			
WR CEDAR							
TOTAL	*9.1*	*712*	*783*		*225*	*56*	*25*

CL: 68.1 % COEFF

SD: 1.0 VAR.%

SAMPL REES - CF

	S	LOW	A	HIGH	# OF TREES REQ. 5	10	INF. POP. 15
DOUG FIR	7.2	18	19	208			
R ALDER	4	36	41	45			
BL MAPLE	1	39	43	48			
WR CEDAR							
TOTAL	*8.1*		*165*	*178*	*180*	*45*	*20*

CL: 68.1 % COEFF

SD: 1.0 VAR.%

TREES/ACRE

	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	22.5	72	93	113			
R ALDER	31.0	21	30	39			
BL MAPLE	56.2	1	3	4			
WR CEDAR	102.2		1	2			
TOTAL	*14.8*	*108*	*127*	*145*	*202*	*51*	*22*

CL: 68.1 % COEFF

SD: 1.0 VAR.%

BASAL AREA/ACRE

	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	16.3	174	208	242			
R ALDER	30.8	27	39	51			
BL MAPLE	56.2	3	6	10			
WR CEDAR	102.2		2	4			
TOTAL	*11.7*	*225*	*255*	*285*	*126*	*31*	*14*

CL: 68.1 % COEFF

SD: 1.0 VAR.%

NET BF/ACRE

	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	15.6	39,807	47,188	54,570			
R ALDER	31.5	2,677	3,906	5,135			
BL MAPLE	57.0	163	379	595			
WR CEDAR	102.2		162	327			
TOTAL	*13.4*	*44,732*	*51,635*	*58,537*	*164*	*41*	*18*

STATISTICS

PROJECT NORTHWIL

TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
16N	06W	23	NORTHWIL	00U3	25.80	23	126	S	W

CL: 68.1 % COEFF VAR.
SD: 1.0

NET CUFT FT/ACRE

S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15

CL: 68.1 % COEFF VAR.%
SD: 1.0

NET CUFT FT/ACRE

	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	15.7	8,438	10,012	11,586			
R ALDER	31.0	791	1,147	1,502			
BL MAPLE	56.4	53	122	190			
WR CEDAR	102.2		48	97			
TOTAL	*12.7*	*9,893*	*11,328*	*12,764*	*148*	*37*	*16*

CL: 68.1 % COEFF VAR.%
SD: 1.0

V-BAR/ACRE

	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR		191	227	262			
R ALDER	18.8	69	101	132			
BL MAPLE	45.1	27	62	97			
WR CEDAR	102.2		79	160			
TOTAL	*40.2*	*175*	*202*	*229*	*1,490*	*372*	*166*

TC TSTATS

STATISTICS

PROJECT NORTHWIL

DATE 10/10/2016

TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
16N	06W	23	NORTHWIL	00U4	71.20	49	229	S	W

	PLOTS	TREES	TREES PER PLOT	ESTIMATED TOTAL TREES	PERCENT SAMPLE TREES
TOTAL	49	229	4.7		
CRUISE	25	108	4.3	7,915	1.4
DBH COUNT					
REFOREST					
COUNT	23	114	5.0		
BLANKS	1				
100 %					

STAND SUMMARY

	SAMPLE TREES	TREES /ACRE	AVG DBH	BOLE LEN	REL DEN	BASAL AREA	GROSS BF/AC	NET BF/AC	GROSS CF/AC	NET CF/AC
DOUG FIR	52	26.0	29.0	115	22.1	118.8	30,610	29,442	6,019	6,015
DOUG FIR-D	3	1.5	18.9	98	0.7	2.9	533	456	127	122
R ALDER	21	40.8	14.5	49	12.3	46.9	4,406	4,216	1,266	1,266
BL MAPLE	28	38.7	14.8	39	12.0	46.[illegible]	3,202	3,020	1,088	1,085
WR CEDAR	2	3.1	13.1	49	0.8	2.9	196	196	66	66
WHEMLOCK	2	1.1	17.5	64	0.5	1.[illegible]	213	205	63	63
TOTAL	*108*	*111.2*	*19.0*	*62*	*50.3*	*[illegible]*	*3[illegible]*	*37,536*	*8,627*	*8,617*

CONFIDENCE LIMITS OF THE SAMPLE

68.1 TIMES OUT OF 100 THE VOLUME WILL BE WITHIN THE [illegible]E ERROR

CL: 68.1 %	COEFF		SAMPLE TREES - BF			# OF TREES REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR	53.6	7.4	1,408	1,521	1,634			
DOUG FIR-D	106.1	73.4	1[illegible]	503	87[illegible]			
R ALDER	64.7	14.5	130	151	[illegible]			
BL MAPLE	66.2	13.0	107	123	139			
WR CEDAR	70.7	6[illegible]	[illegible]	[illegible]0	133			
WHEMLOCK	78.6	[illegible].6	[illegible]	2[illegible]	391			
TOTAL	*109.3*	*[illegible].6*	*733*	*820*	*907*	*477*	*119*	*53*

CL: 68.1 %	COEFF		SAMPLE TREES - CF			# OF TREES REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR	48.0	6.7	[illegible]3	303	323			
DOUG FIR-D	94.8	65.6	43	126	209			
R ALDER	64.0	14.3	39	46	52			
BL MAPLE	62.3	12.2	40	46	52			
WR CEDAR	72.3	67.7	9	27	45			
WHEMLOCK	65.7	61.5	25	66	107			
TOTAL	*95.2*	*9.2*	*157*	*173*	*189*	*362*	*90*	*40*

CL: 68.1 %	COEFF		TREES/ACRE			# OF PLOTS REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR	106.7	15.2	22	26	30			
DOUG FIR-D	436.1	62.2	1	1	2			
R ALDER	194.9	27.8	29	41	52			
BL MAPLE	175.9	25.1	29	39	48			
WR CEDAR	517.4	73.8	1	3	5			
WHEMLOCK	522.8	74.6	0	1	2			
TOTAL	*80.9*	*11.5*	*98*	*111*	*124*	*261*	*65*	*29*

CL: 68.1 %	COEFF		BASAL AREA/ACRE			# OF PLOTS REQ.		INF. POP.
SD: 1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
DOUG FIR	92.7	13.2	103	119	135			
DOUG FIR-D	395.6	56.5	1	3	4			
R ALDER	167.1	23.8	36	47	58			
BL MAPLE	159.4	22.7	36	46	56			
WR CEDAR	517.4	73.8	1	3	5			
WHEMLOCK	489.8	69.9	1	2	3			

TC TSTATS

STATISTICS

PROJECT NORTHWIL

DATE 10/10/2016

TWP	RGE	SECT	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
16N	06W	23	NORTHWIL	00U4	71.20	49	229	S	W

CL: 68.1 % COEFF

SD: 1.0

BASAL AREA/ACRE

	VAR.	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
TOTAL	*47.7*	*6.8*	*204*	*219*	*234*	*91*	*23*	*10*

CL: 68.1 % COEFF

SD: 1.0

NET BF/ACRE

	VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	91.6	13.1	25,594	29,442	33,291			
DOUG FIR-D	408.2	58.3	190	456	721			
R ALDER	164.4	23.5	3,227	4,216	5,205			
BL MAPLE	154.3	22.0	2,355	3,020	3,685			
WR CEDAR	517.4	73.8	51	196	342			
WHEMLOCK	504.1	72.0	58	205	353			
TOTAL	*64.3*	*9.2*	*34,093*	*37,536*	*40,978*	*165*	*41*	*18*

CL: 68.1 % COEFF

SD: 1.0

NET CUFT FT/ACRE

	VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR	92.1	13.1	5,225	6,015	6,806			
DOUG FIR-D	399.4	57.0	52	122	191			
R ALDER	162.7	23.2	972	1,266	1,560			
BL MAPLE	157.4	22.5	842	1,085	[illegible]			
WR CEDAR	517.4	73.8	17	66	[illegible]14			
WHEMLOCK	493.4	70.4	19	63	[illegible]			
TOTAL	*55.6*	*7.9*	*7,934*	*8,617*	*9[illegible]*	[illegible]	*31*	*14*

CL: 68.1 % COEFF

SD: 1.0

V-BAR/ACRE

	VAR.%	S.E.%	LOW	AVG	HIGH	# OF PLOTS REQ. 5	10	INF. POP. 15
DOUG FIR			215	[illegible]	[illegible]			
DOUG FIR-D	408.2	58.3	66	[illegible]	251			
R ALDER	64.1	9.2	69	[illegible]	111			
BL MAPLE	95.1	13.6	51	66	80			
WR CEDAR	460.6	65.7	[illegible]	68	[illegible]			
WHEMLOCK	504.1	72.0	30	107	184			
TOTAL	*249.3*	*35.[illegible]*	*[illegible]55*	*[illegible]71*	*187*	*2,482*	*620*	*276*

TC PSPCTLTCM

Species Summary - Trees, Logs, Tons, CCF, MBF

T16N R06W S23 Ty00U	37.2
T16N R06W S23 Ty00U	38.2
T16N R06W S23 Ty00U	71.2

Project NORTHWIL
Acres 172.40

Page No 1
Date: 10/10/2016
Time 2:36:06PM

Species	ST	Total Trees	Total Logs	Total Tons	Net Cubic Ft/ Tree	Net Cubic Ft/ Log	CF/ LF	Total CCF Gross	Total CCF Net	Total MBF Gross	Total MBF Net
DOUG FIR		7,863	22,683	36,518	162.84	56.45	1.63	12,813	12,804	6,325	6,096
R ALDER		4,821	8,398	4,780	36.02	20.68	0.73	1,738	1,737	610	584
BL MAPLE		3,758	5,458	3,024	30.09	20.72	0.81	1,141	1,131	347	323
WHEMLOCK		721	1,176	1,314	56.95	34.91	1.02	411	411	155	147
WR CEDAR		306	428	513	71.34	51.08	1.57	218	218	80	77
DOUG FIR	D	162	338	312	65.20	31.34	0.82	110	106	45	39
Totals		17,631	38,480	46,462	93.05	42.64	1.33	16,431	16,406	7,561	7,265

Wood Type Species	Total Trees	Total Logs	Total Tons	Net Cubic Ft/ Tree	Net Cubic Ft/ Log	CF/ LF	Total CCF Gross	Total CCF Net	Total MBF Gross	Total MBF Net
C	9,052	24,624	38,657	149.56	[illegible]	[illegible]59	13,552	13,539	6,604	6,359
H	8,579	13,856	7,805	33.42	[illegible]0	[illegible]	2,880	2,867	957	907
Totals	17,631	38,480	46,462	93.05	42.[illegible]	1.33	[illegible]16,431	16,406	7,561	7,265

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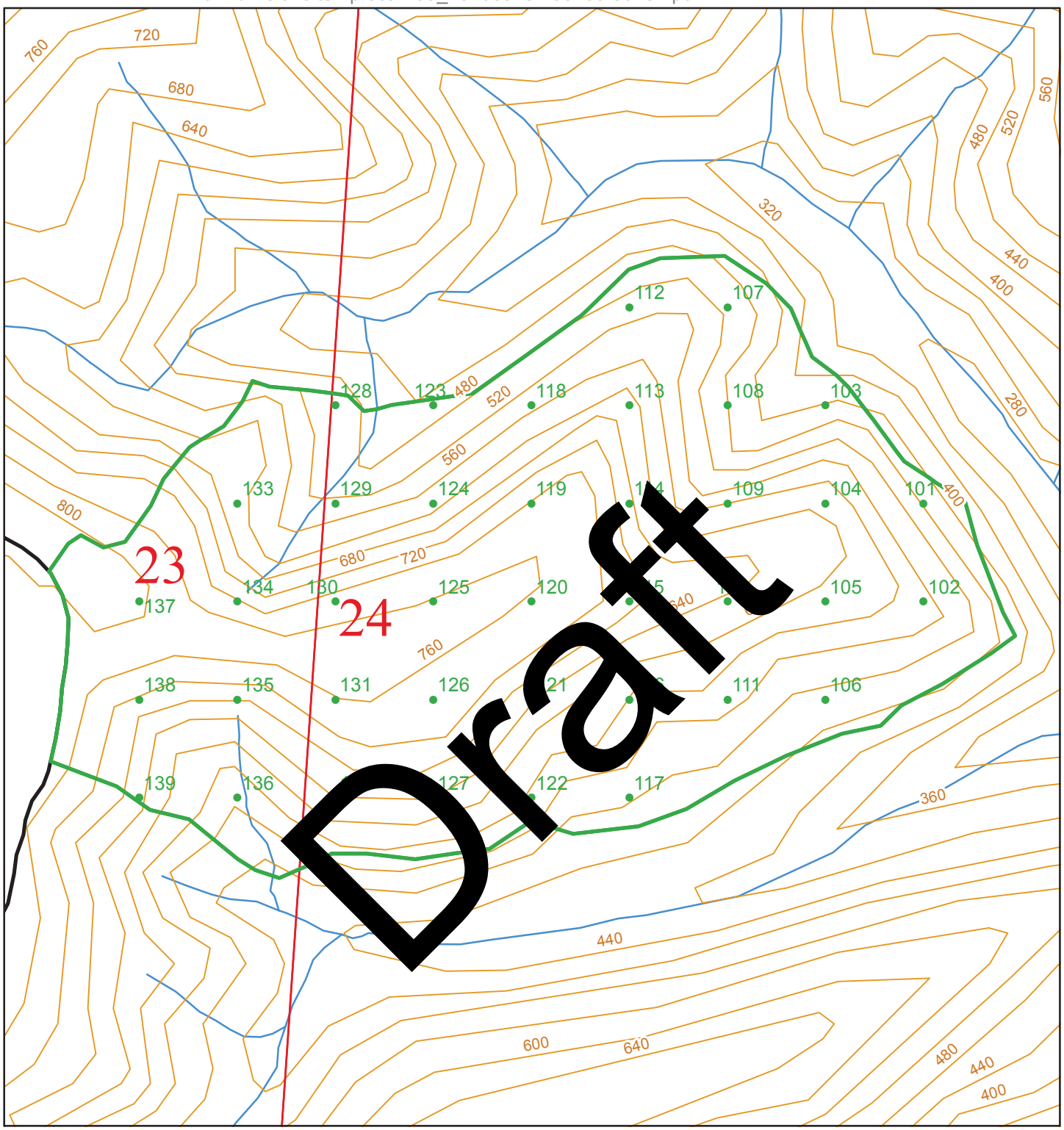

FMU POLYGON AND SAMPLE POINT INFORMATION

FMU_NM:	NORTH WILLIAMS U1	Township:	T16R06W
FMU_ID:	86782	DNR Region:	PACIFIC CASC
Acres:	44	Total Sample Points:	39
County:	GRAYS HARBOR	Spacing Between Points:	Width: 220 Height: 220
		Point Rotation Degrees:	0

N

0 110 220 440 660 880 Feet

Scale 1:3,800

Legend

- Sample Points
- FMU polys
- Public Land Survey Sections
- Contours 40-foot

Washington State Department of Natural Resources
Peter Goldmark, Commissioner of Public Lands

Sep 15, 2016 03:33 PM

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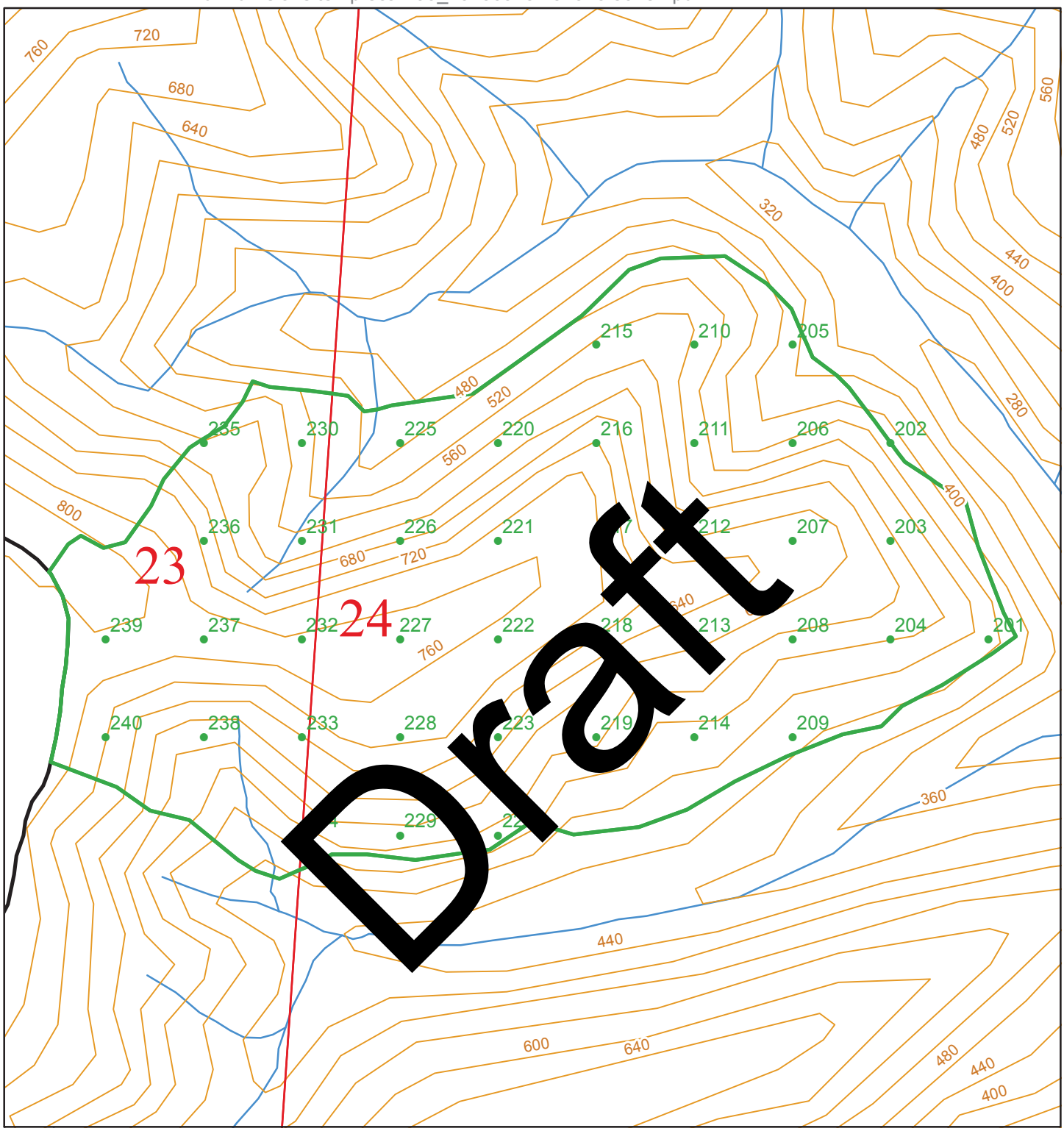

FMU POLYGON AND SAMPLE POINT INFORMATION

FMU_NM:	NORTH WILLIAMS U1	Township:	T16R06W
FMU_ID:	86782	DNR Region:	PACIFIC CASC
Acres:	44	Total Sample Points:	40
County:	GRAYS HARBOR	Spacing Between Points:	Width: 220 Height: 220
		Point Rotation Degrees:	0

N

0 110 220 440 660 880 Feet

Scale 1:3,800

Legend

- Sample Points
- FMU polys
- Public Land Survey Sections
- Contours 40-foot

Washington State Department of Natural Resources
Peter Goldmark, Commissioner of Public Lands

Sep 15, 2016 03:29 PM

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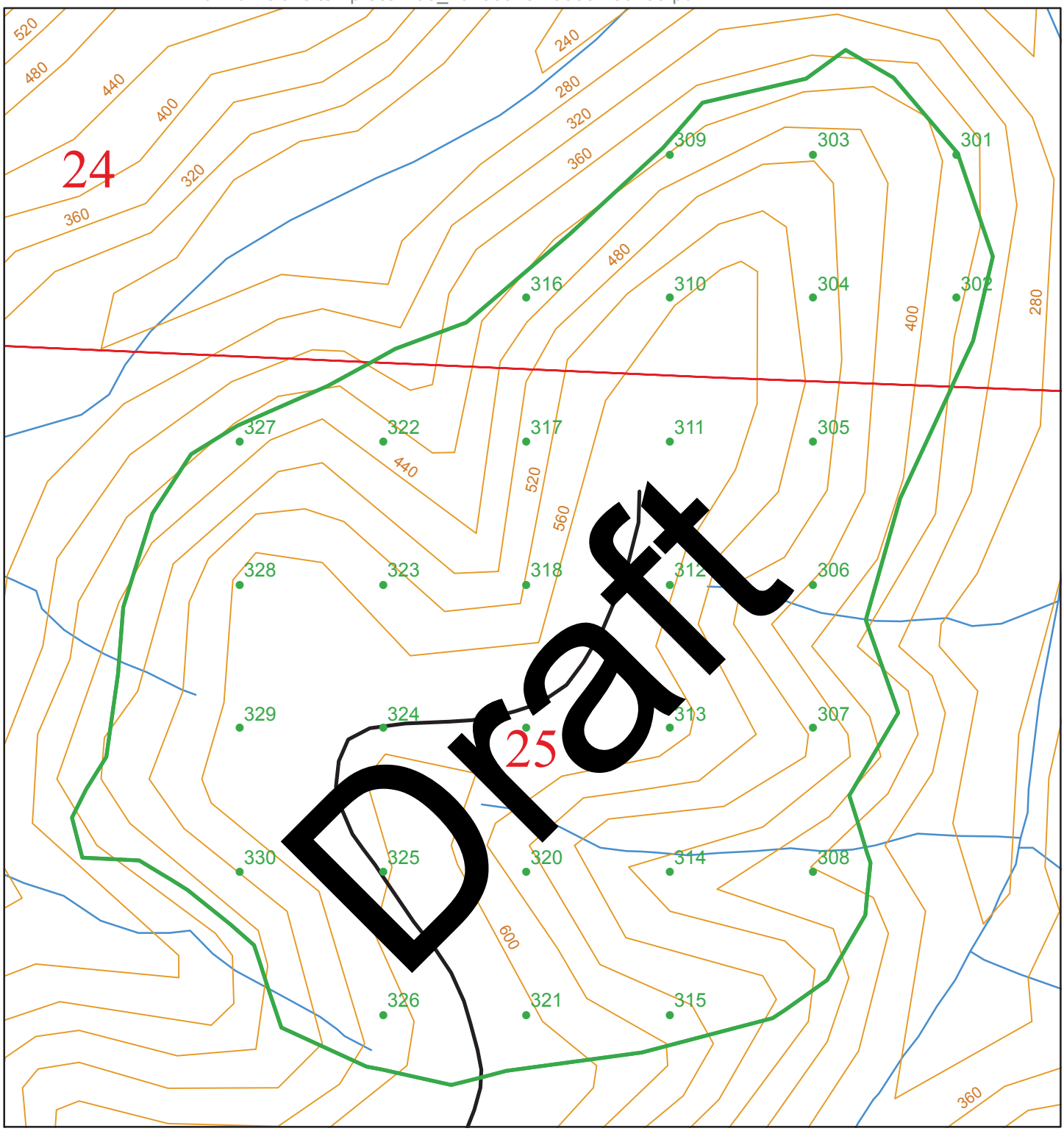

FMU POLYGON AND SAMPLE POINT INFORMATION

FMU_NM:	NORTH WILLIAMS U3	Township:	T16R06W
FMU_ID:	86783	DNR Region:	PACIFIC CASC
Acres:	32	Total Sample Points:	30
County:	GRAYS HARBOR	Spacing Between Points:	Width: 220 Height: 220
		Point Rotation Degrees:	0

N

0 75 150 300 450 600 Feet

Scale 1:2,600

Legend
- Sample Points
- FMU polys
- Public Land Survey Sections
- Contours 40-foot

Washington State Department of Natural Resources
Peter Goldmark, Commissioner of Public Lands

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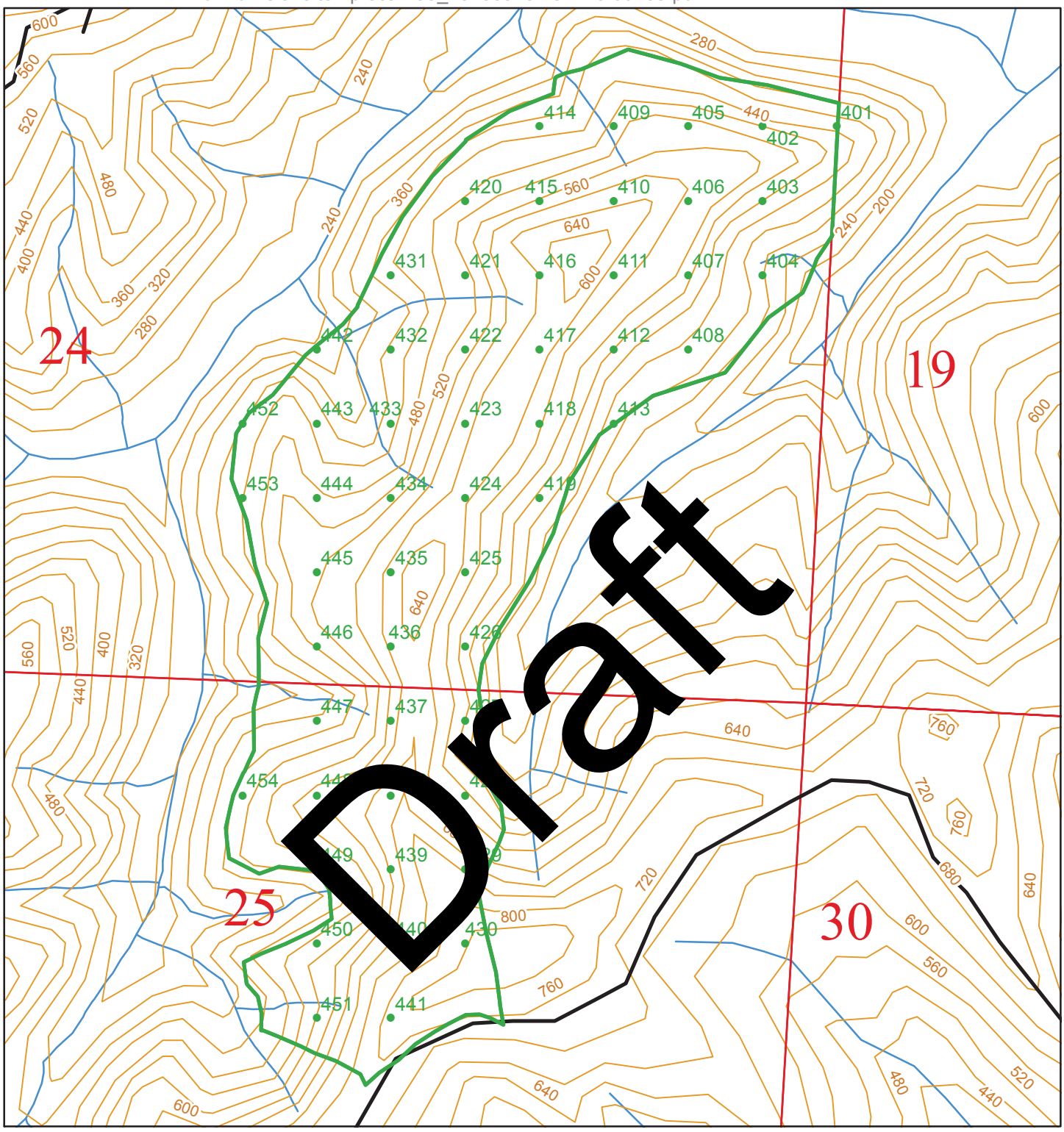

FMU POLYGON AND SAMPLE POINT INFORMATION

FMU_NM:	NORTH WILLIAMS U4	Township:	T16R06W
FMU_ID:	66765	DNR Region:	PACIFIC CASC
Acres:	77	Total Sample Points:	54
County:	GRAYS HARBOR	Spacing Between Points:	Width: 250 Height: 250
		Point Rotation Degrees:	0

N

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Scale 1:5,700

Legend

- Sample Points
- FMU polys
- Public Land Survey Sections
- Contours 40-foot

Washington State Department of Natural Resources
Peter Goldmark, Commissioner of Public Lands

Sep 15, 2016 03:43 PM

NORTH WILLIAMS

ROAD PLAN MAP

Map page 1 of 5

NORTH WILLIAMS

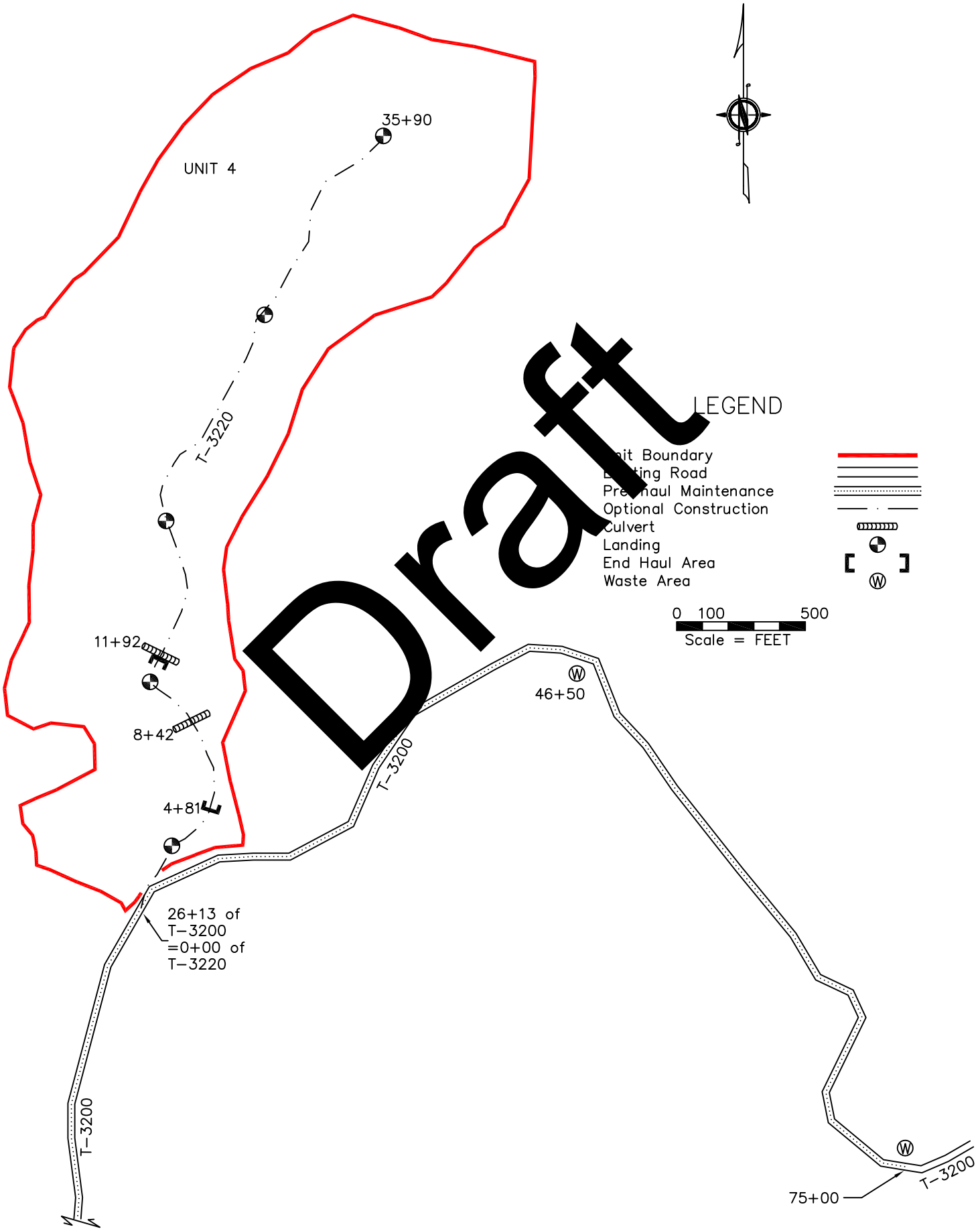
ROAD PLAN MAP

Map page 2 of 5

NORTH WILLIAMS

ROAD PLAN MAP

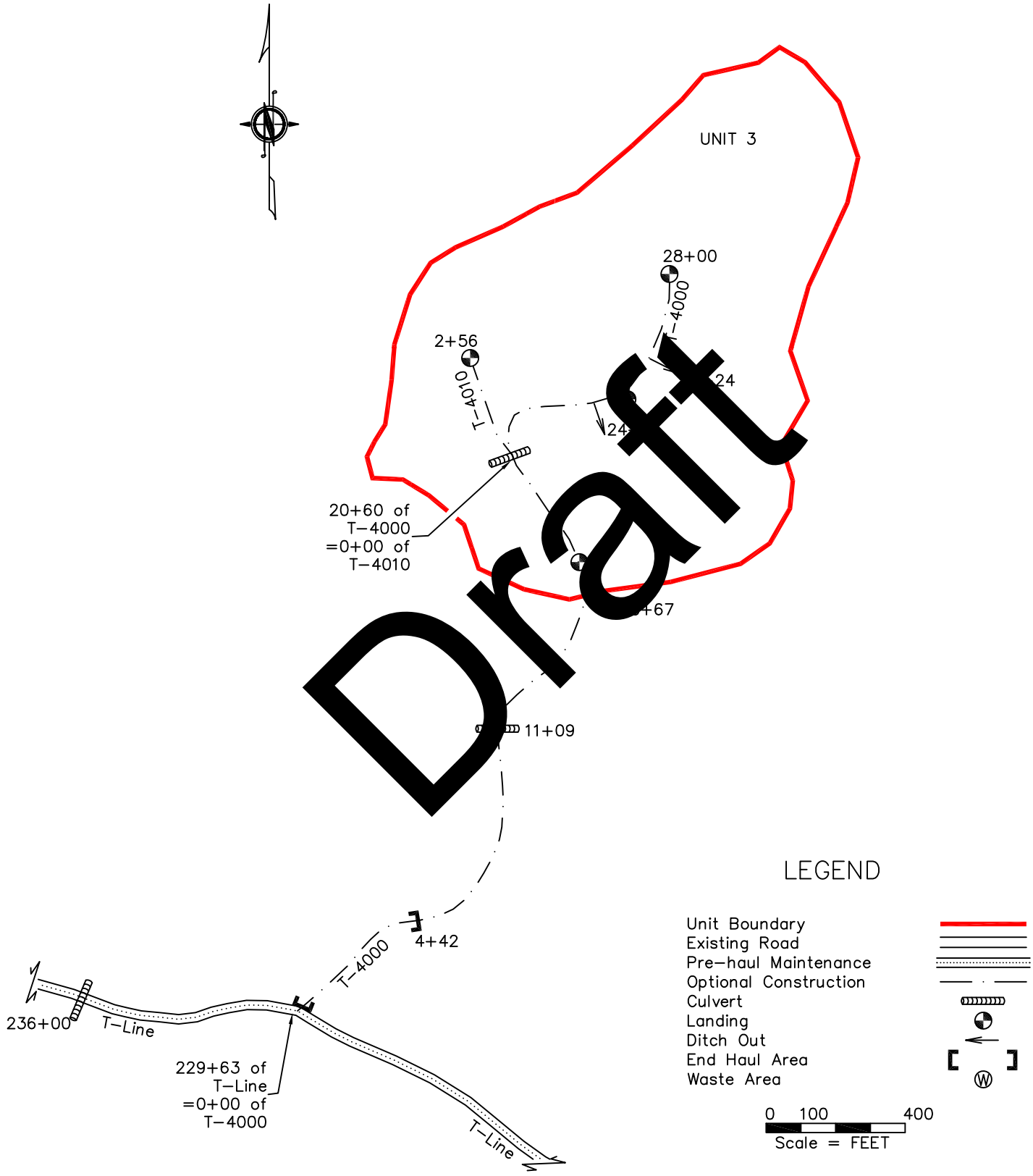
Map page 3 of 5



NORTH WILLIAMS

ROAD PLAN MAP

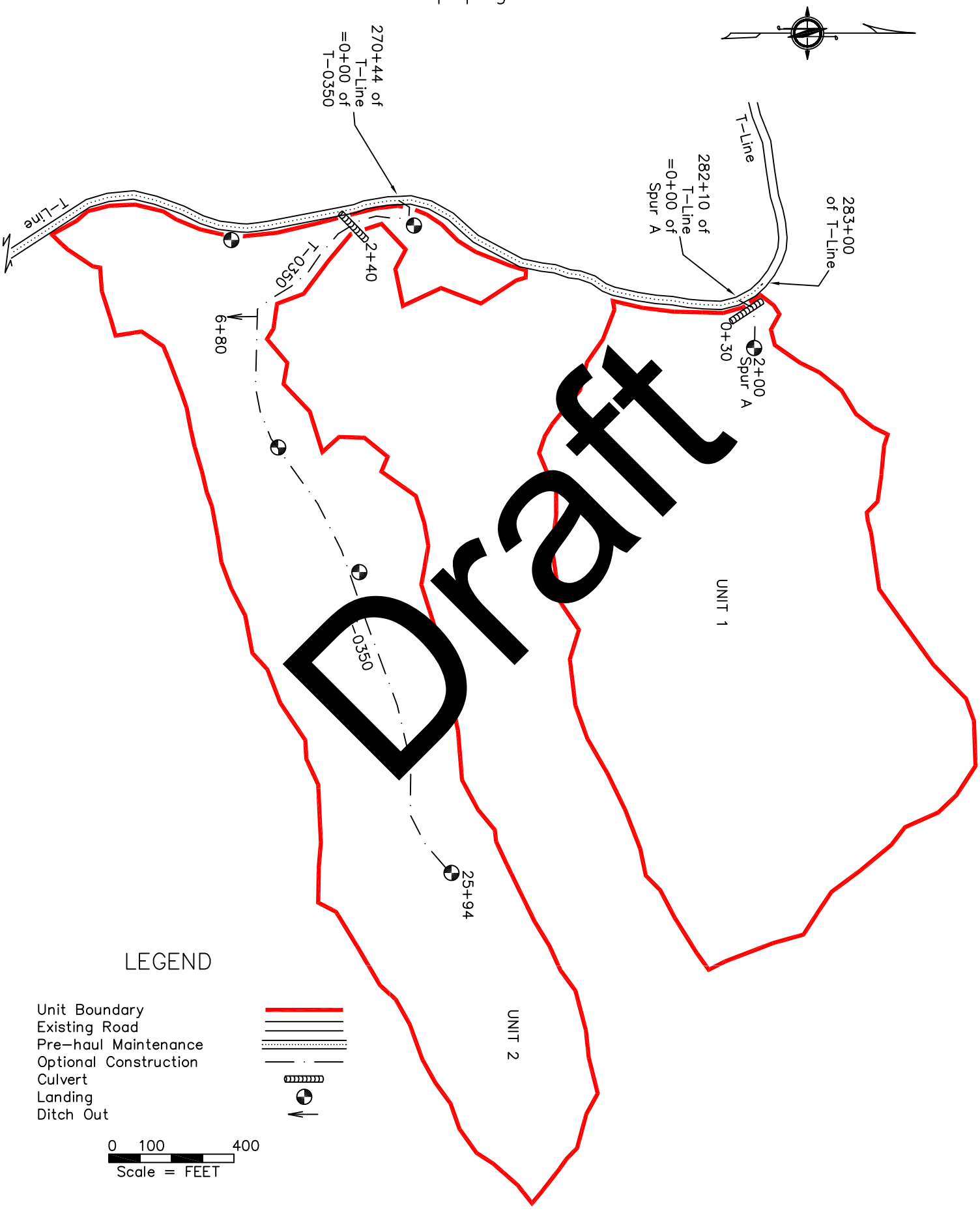
Map page 4 of 5



NORTH WILLIAMS

ROAD PLAN MAP

Map page 5 of 5



STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

NORTH WILLIAMS TIMBER SALE ROAD PLAN
GRAYS HARBOR COUNTY
LEWIS DISTRICT

AGREEMENT NO.: 30-094595 STAFF ENGINEER: CHRIS WERNER

DATE: 09/13/2016 DRAWN & COMPILED BY: ALICIA COMPTON
MODIFIED DATE: 11/02/2016

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
T-Line	0+00 to 283+00	Pre-haul Maintenance
T-3200	0+00 to 75+00	Pre-haul Maintenance

0-3 OPTIONAL ROADS

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

Road	Stations	Type
T-3220	0+00 to 32+90	Construction
T-4000	0+00 to 28+00	Construction
T-4010	0+00 to 2+56	Construction
T-0350	0+00 to 25+94	Construction
Spur A	0+00 to 2+00	Construction

0-4 CONSTRUCTION

Construction includes, but is not limited to clearing, grubbing, right-of-way debris disposal, excavation and/or embankment to subgrade, ditch construction, ditch-out construction, landing construction, acquisition and installation of drainage structures; acquisition, processing and application of rock and grass seeding.

0-6 PRE-HAUL MAINTENANCE

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

Road	Stations	Requirements
T-Line	0+00 to 283+00	Grade, shape and compact. Apply spot rock per ROCK LIST.
T-3200	0+00 to 75+00	Grade, shape and compact. Add Curve Widening as directed by the Contact Administrator. Apply spot rock per ROCK LIST.

0-7 POST-HAUL MAINTENANCE

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

SECTION 1 – GENERAL

1-1 ROAD PLAN CHANGES

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

1-2 UNFORESEEN CONDITIONS

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

1-3 ROAD DIMENSIONS

Purchaser shall perform road work in accordance with the dimensions shown on the TYPICAL SECTION SHEET and the specifications within this road plan, unless controlled by construction stakes or design data (plan, profile, and cross-sections).

1-4 ROAD TOLERANCES

Purchaser shall perform road work within the tolerances listed below. The tolerance class for each road is listed on the TYPICAL SECTION SHEET.

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

1-5 DESIGN DATA

Design data is available upon request at the Department of Natural Resources Pacific Cascade Region Office in Castle Rock, 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. 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.

1-7 TEMPORARY ROAD CLOSURE

Purchaser shall notify the Contract Administrator a minimum of 5 days before the closure of any road. Construction may not close any road for more than 21 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 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.

1-10 WSDOT STANDARD SPECIFICATION REFERENCE

References in this road plan to "WSDOT Standard Specifications" mean the Washington State Department of Transportation's Standard Specifications for Road, Bridge, and Municipal Construction 2012 (M41-10).

1-15 ROAD MARKING

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

- Road centerline marked with wooden stakes, orange flagging, orange paint and RP's.
- Slope Stakes marked with wooden stakes, orange flagging, orange paint and RP's.

1-16 CONSTRUCTION STAKES SET BY STATE

Purchaser shall perform work on the following road(s) in accordance with the construction stakes set in the field for grade and alignment.

Road	Stations	Type
T-4000	0+00 to 4+42	Slope Stakes
T-3220	4+81 to 11+92	Slope Stakes

1-18 REFERENCE POINT DAMAGE

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

1-20 COMPLETE BY DATE

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

1-21 HAUL APPROVAL

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

1-22 WORK NOTIFICATIONS

Purchaser shall notify the Contract Administrator a minimum of 14 calendar days before work begins.

1-23 ROAD WORK PHASE APPROVAL

Purchaser shall obtain written approval from the Contract Administrator upon completion of each of the following phases of road work:

- Subgrade construction
- Drainage installation
- Rock application

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. Restrictions for hauling forest products are specified in Contract Clause H-130 HAULING SCHEDULE.

Road	Stations	Activity	Closure Period
All Roads	All Stations	All Road Work	November 1 to May 1

1-26 OPERATING DURING CLOSURE PERIOD

If permission is granted to operate during a closure period listed in Clause 1-25 ACTIVITY TIMING RESTRICTION or Contract Clause H-130 HAULING SCHEDULE, Purchaser shall provide a maintenance 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 6 inches on jaw run roads.
- 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 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 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 surfaces evaluated for any damage caused by transporting equipment. Any damage to the surfaces shall 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. 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.

1-40 ROAD APPROACHES TO COUNTY ROADS AND STATE HIGHWAYS

Purchaser shall immediately remove any mud, dirt, rock, or other material tracked or spilled on to county roads and state highways.

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

SECTION 2 – MAINTENANCE

2-1 GENERAL ROAD MAINTENANCE

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

2-2 ROAD MAINTENANCE – PURCHASER MAINTENANCE

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

2-3 ROAD MAINTENANCE – DESIGNATED MAINTAINER

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

2-4 PASSAGE OF LIGHT VEHICLES

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

2-5 MAINTENANCE GRADING – EXISTING ROAD

Purchaser shall use a grader to shape the existing surface before rock application. Purchaser shall accomplish all grading using a motor grader with a minimum of 175 horsepower.

SECTION 3 – CLEARING, GRUBBING AND DISPOSAL

3-5 CLEARING

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

3-7 RIGHT-OF-WAY DECKING

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

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 45%.
- Against standing trees unless approved by the Contract Administrator.

3-10 GRUBBING

Purchaser shall remove all stumps between the grubbing limits specified on the TYPICAL SECTION SHEET. Purchaser shall also remove stumps with undercut roots outside the grubbing limits. Purchaser shall remove stumps using a hydraulic mounted excavator unless authorized in writing by the Contract Administrator. Stumps over 24 inches diameter must be split. Stumps over 40 inches must be quartered. Grubbing must be completed before starting excavation and embankment.

3-12 STUMP PLACEMENT

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

3-14 STUMPS WITHIN DESIGNATED WASTE AREAS

Purchaser is not required to remove stumps within waste areas if they are cut flush with the ground.

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 as shown on the TYPICAL SECTION SHEET.

3-22 DESIGNATED WASTE AREA FOR ORGANIC DEBRIS

Waste areas for organic debris are located as listed below or at areas approved in writing by the Contract Administrator.

Road	Distance Location
[illegible]	220+00
T-3200	46+50
T-3200	75+00

3-23 PROHIBITED DISPOSAL AREAS

Purchaser shall not place organic debris in the following areas:

- Within 50 feet of a cross drain culvert.
- Within 100 feet of a live stream, or wetland
- On road subgrades, or excavation and embankment slopes.
- On slopes greater than 45%.
- 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 and as directed by the Contract Administrator. Where natural openings are unavailable or restrictive, alternate debris disposal methods are subject to the written approval of the Contract Administrator.

3-32 END HAULING ORGANIC DEBRIS

On the following road(s), and on slopes greater than 45%, Purchaser shall end haul organic debris to the designated waste areas specified in Clause 3-22 DESIGNATED WASTE AREA FOR ORGANIC DEBRIS or to a waste area located by the Contract Administrator.

Road	Stations
T-4000	0+00 to 4+42
T-3220	4+81 to 11+92

SECTION 4 – EXCAVATION

4-1 EXCAVATOR CONSTRUCTION

Purchaser shall use a track mounted hydraulic excavator for construction work, unless authorized in writing by the Contract Administrator.

4-2 PIONEERING

Pioneering may not extend more than 1000 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.

4-3 ROAD GRADE AND ALIGNMENT STANDARDS

Purchaser shall follow these standards for road grade and alignment except as designed:

- Grade and alignment must have smooth continuity, without abrupt changes in direction.
- Maximum grades must not exceed 12 percent favorable and 18 percent adverse.
- Minimum curve radius is 60 feet at centerline.
- Maximum grade change for sag vertical curves is 5% in 100 feet.
- Maximum grade change for crest vertical curves is 4% in 100 feet.

4-4 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 12%.
- Maximum favorable grades for switchbacks is 14%.
- Maximum transition grades entering and leaving switchbacks is a 5% 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	1:1	100
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	½:1	67
Angular Rock	¼:1	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 feet radius.
- 4 feet for curves of 50 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.

4-12 FULL BENCH CONSTRUCTION

On the following road(s), and where side slopes exceed 45%, Purchaser shall use full bench construction for the entire subgrade width except as construction staked or designed. Purchaser shall end haul waste material to the location specified in Clause 4-37 WASTE AREA LOCATION.

Road	Full Bench Location	Comments
T-4000	0+00 to 4+42	Slope Staked
T-3220	4+81 to 11+92	Slope Staked

4-13 DAYLIGHT EXCAVATION ON EXISTING ROADS

Where directed by the Contract Administrator, Purchaser shall excavate the outside shoulder to daylight.

4-21 TURNOUTS

Purchaser shall construct turnouts intervisible with a maximum distance of 1,000 feet between turnouts. 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.

4-22 TURNAROUNDS

Purchaser shall construct turnarounds as designated on the ROCK LIST. Turnarounds must be no larger than 40 feet long and 40 feet wide. Locations are subject to written approval by the Contract Administrator

4-25 DITCH CONSTRUCTION AND RECONSTRUCTION

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

4-27 DITCH WORK – MATERIAL USE PROHIBITED

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

4-28 DITCH DRAINAGE

Ditches must drain to cross-drain culverts or ditchouts.

4-29 DITCHOUTS

Purchaser shall construct ditchouts as identified below and as directed by the Contract Administrator. Ditchouts must be constructed in a manner that diverts ditch water onto the forest floor and must have excavation backslopes no steeper than a 1:1 ratio. Locations may not be changed without written approval from the Contract Administrator. L or R denotes ditchout left or ditchout right.

Road	Stations	L or R
T-40[illegible]	1[illegible]67, 24+16, 26+24	R
T-0350	6+80	R

4-35 WASTE MATERIAL DEFINITION

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

4-36 DISPOSAL OF WASTE MATERIAL

Purchaser may sidecast waste material on side slopes up to 45% if the waste material is compacted and free of organic debris. On side slopes greater than 45%, all waste material must be end hauled or pushed to the designated embankment sites and waste areas identified in Clause 4-37 WASTE AREA LOCATION.

4-37 WASTE AREA LOCATION

Purchaser shall deposit waste material in 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 below and at the discretion of the Contract Administrator.

Road	Waste Area Location	Volume (yds^3)
T-Line	220+00	5,000
T-3200	46+50	22,000
T-3200	75+00	15,000

4-38 PROHIBITED WASTE DISPOSAL AREAS

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

- Within 50 feet of a cross drain culvert.
- Within 100 feet of a live stream or wetland.
- Within a riparian management zone.
- 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.

4-47 NATIVE MATERIAL

Native material consists of naturally occurring material that is free of organic debris, trash, and rocks greater than 6 inches in any dimension.

4-55 ROAD SHAPING

Purchaser shall shape the subgrade and surface as shown on the TYPICAL SECTION SHEET. The subgrade and surface shape must ensure runoff in an even, un-concentrated manner, and must be uniform, firm, and rut-free.

4-56 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.

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.

4-61 SUBGRADE COMPACTION

Purchaser shall compact constructed subgrades deeper than 5 feet at the road shoulder 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 rock application.

4-62 DRY WEATHER COMPACTION

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

4-63 EXISTING SURFACE COMPACTION

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

SECTION 5 – DRAINAGE

5-5 CULVERTS

Purchaser shall install culverts as part of this contract. Culverts must be installed concurrently with subgrade work and must be installed before subgrade compaction and rock application. Culvert locations and the minimum requirements for culvert length and diameter are designated on the CULVERT LIST. Culvert, downspout, and flume lengths may be adjusted to fit as-built conditions and may not terminate directly on unprotected soil. Culverts must be new material and meet the specifications in Clauses 10-15 through 10-23.

5-11 UNUSED MATERIALS STATE PROPERTY

Any materials listed on the CULVERT LIST that are not installed will become the property of the state. Purchaser shall stockpile materials as directed by the Contract Administrator.

5-15 CULVERT INSTALLATION

Culvert installation must be in accordance with the CULVERT AND DRAINAGE SPECIFICATION DETAIL and the Corrugated Polyethylene Pipe Association's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings". Corrugated Polyethylene pipe must 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%, 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.

5-20 ENERGY DISSIPATERS

Purchaser shall install energy dissipaters in accordance with the CULVERT AND DRAINAGE SPECIFICATION DETAIL at all culverts on the CULVERT LIST that specify the placement of rock. Energy dissipater installation is subject to approval by the Contract Administrator.

The type of energy dissipater and the amount of material must be consistent with the specifications listed on the CULVERT LIST. Rock must be set in place by machine. Placement must be by zero-drop-height method only.

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 culverts on the CULVERT LIST that specify the placement of rock. Rock may not restrict the flow of water into culvert inlets or catch basins. Rock must be set in place by machine. Placement must be by zero-drop-height method only.

SECTION 6 – ROCK AND SURFACING

6-5 ROCK FROM COMMERCIAL SOURCE

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

Possible Source	Location
Northwest Rock	6801 State Route 12, Oakville, WA 98568

6-20 ROCK GRADATION TYPES

Purchaser shall provide rock in accordance with the types and amounts listed in the ROCK LIST. Rock must meet the following specifications for gradation and uniform quality when placed in hauling vehicles. Purchaser shall provide a sieve analysis upon request from the Contract Administrator.

6-22 FRACTURE REQUIREMENT FOR ROCK

A minimum of 50% by visual inspection of coarse aggregate must have at least one fractured face. Coarse aggregate is the material greater than 1/4-inch in size.

6-30 2-INCH MINUS CRUSHED ROCK

% Passing 2” square sieve	100%
% Passing 1” square sieve	50 - 85%
% Passing U.S. #4 sieve	30 - 50%
% Passing U.S. #40 sieve	16% maximum
% Passing U.S. #200 sieve	5% maximum

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

6-37 4-INCH JAW RUN ROCK

% Passing 4” square sieve	95%
% Passing U.S. #40 sieve	16% maximum
% Passing U.S. #200 sieve	5% maximum

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

6-43 QUARRY SPALLS

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

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

6-55 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 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.

6-57 ROCK MEASUREMENT BY TRUCK SCALE

Measurement of SPOT ROCK, TURNOUTS, TURNAROUNDS, CURVE WIDENING, INTERSECTIONS, LANDINGS, CULVERT ROCK is on scaled truck volume. Purchaser shall provide scaled volume using a commercial scale. Purchaser shall provide the Contract Administrator with all scale sheets.

6-70 APPROVAL BEFORE ROCK APPLICATION

Purchaser shall obtain written approval from the Contract Administrator for Compaction before rock application.

6-71 ROCK APPLICATION

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

6-73 ROCK FOR WIDENED POSITIONS

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

SECTION 7 – STRUCTURES

7-71 GATE CLOSURE DURING HAUL

Purchaser shall keep gates closed and locked except for passing vehicles. If Purchaser elects to use an alternate plan for gate security, Purchaser shall submit a detailed plan to the Contract Administrator for written approval.

SECTION 8 – EROSION CONTROL

8-2 PROTECTION FOR EXPOSED SOIL

Purchaser shall provide and evenly spread a 6-inch layer of straw to all exposed soils within 50 feet of a stream or wetland and at all waste areas. Soils must be covered before the first anticipated storm event. Soils may not sit exposed during any rain event.

8-3 EROSION CONTROL MATTING

On the following road(s), Purchaser shall install biodegradable erosion control matting to provide full coverage of embankment slopes. Matting must be natural fiber matting made of jute or coconut, or an erosion control blanket made of wood excelsior. Installation must be in accordance with the manufacturer's recommendations.

Road	Stations
T-3220	7+00 to 12+00

8-15 REVEGETATION

Purchaser shall spread grass seed on all exposed soils resulting from road work activities. Cover all exposed soils using manual dispersal. Other methods of covering must be approved in writing by the Contract Administrator. Required seed not spread by the termination of this contract will become the property of the state.

Road	Location	Qty (lbs)*	Type
All Roads	All Stations	200	Grass Seed

*Quantities are estimates only. Actual quantities may vary and are the responsibility of the Purchaser.

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 on exposed soils within 50 feet of streams or wetlands if revegetation occurs between June 1 and March 31. The protective cover may consist of straw. Seed must be covered before the first anticipated storm event. Seed may not be allowed to sit exposed during any rain event. 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 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 grass seed at no addition 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 40 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.

Kind and Variety of Seed in Mixture	% by Weight
Perennial Rye	35-45
Red Fescue	30-40
Highland Bent	5
White Clover	10-2
Inert and Other Crop	0.5

SECTION 9 – POST-HAUL ROAD WORK

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.

9-11 LANDING EMBANKMENT

Purchaser shall slope landing embankments to the original construction specifications.

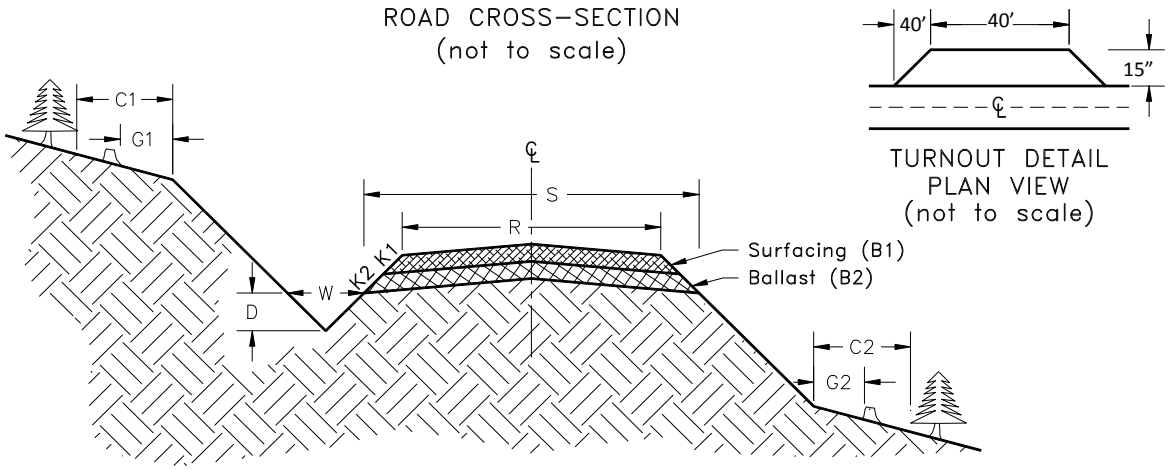
10-17 CORRUGATED PLASTIC CULVERT

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.

10-22 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.

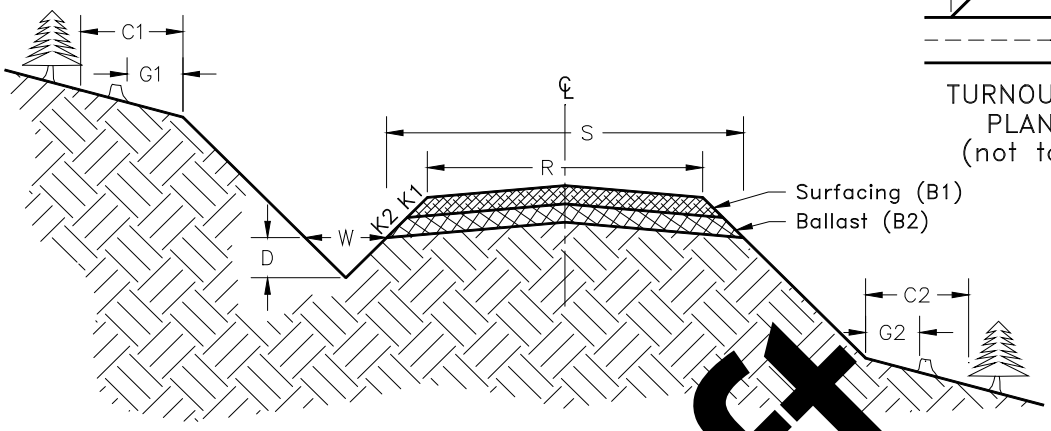
TYPICAL SECTION SHEET

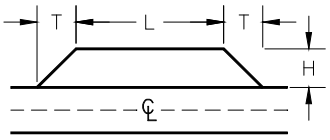


Road Number	From Station	To Station	Tolerance Class	Subgrade Width	Road Width	Ditch Width	Ditch Depth	Crown in. @ CL	Grubbing Limits		Clearing Limits	
				S	R	W	D		G1	G2	C1	C2
T-Line	0+00	283+00	A	18′	15′			4″				
T-3200	0+00	75+00	A	17′	12′			4″				
T-3220	0+00	35+90	B	17′	12′	3′	1′	4″	5′	5′	10′	10′
T-4000	0+00	28+00	B	16′	12′	3′	1′	4″	5′	5′	10′	10′
T-4010	0+00	2+56	C	16′	12′	3′	1′	4″	5′	5′	10′	10′
T-0350	0+00	25+94	C	16′	12′	3′	1′	4″	5′	5′	10′	10′
Spur A	0+00	2+00	C	16′	12′	3′	1′	4″	5′	5′	10′	10′

ROCK LIST
(Page 1 of 2)

ROAD CROSS–SECTION
(not to scale)





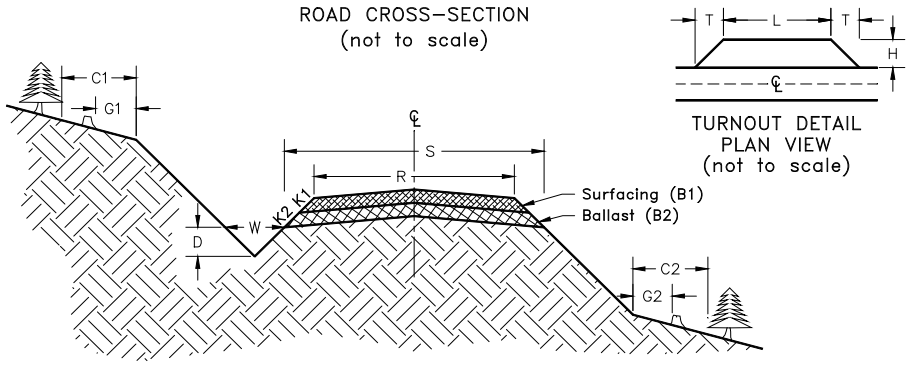
TURNOUT DETAIL
PLAN VIEW
(not to scale)

BALLAST

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source
			K	B2	**4" JAW RUN**			
T-3220	0+00		½ : 1	12"	63	35.90	2260	Commercial
T-4000	0+00	28+00	1	15"	81	28.00	2270	Commercial
T-4010	0+00	2+56	1 ½	12"	63	2.56	160	Commercial
T-0350	0+00	25+94	1 ½ :	12"	63	25.94	1635	Commercial
Spur A	0+00	2+00	1 ½ :	15"	81	2.00	160	Commercial
LANDINGS					100	16	1600	Commercial
INTERSECTIIONS					100	5	500	Commercial
TURNAROUNDS					50	14	700	Commercial
TURNOUTS					50	10	500	Commercial
CURVE WIDENING							925	Commercial

BALLAST TOTAL **10,710** Cubic Yards

ROCK LIST
(Page 2 of 2)



SURFACE

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Total	Rock Source
			K1	B1	**QUARRY SPALLS**			
T-Line	0+00	283+00	1 ½ : 1	10	[illegible] SPOT R[illegible]			Commercial
T-3200	0+00	75+00	1 ½ : 1	[illegible]	yd³ SPOT ROCK			Commercial
T-3220	0+00	35+90	1 ½ : 1	[illegible]	30	35.90	1075	Commercial
T-4000	0+00	28+00	1 ½ : 1	250 yd³ SPOT ROCK				Commercial
T-0350	0+00	25+94	1 ½ : 1	6”	30	25.94	775	Commercial

SURFACE ROCK TOTAL **3,600** Cubic Yards

QUARRY SPALLS

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Total	Rock Source
			K1	B1	**QUARRY SPALLS**			
CULVERTS					1	16	16	Commercial

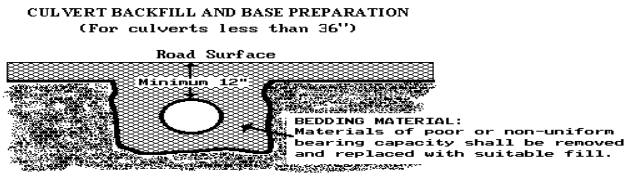
QUARRY SPALLS TOTAL **16** Cubic Yards

CULVERT LIST

Road Number	Location	Culvert Dia.	Culvert Gauge	Length (ft) Culvert	Length (ft) Downspt	Length (ft) Flume	Quarry Spalls (C.Y.) Inlet	Quarry Spalls (C.Y.) Outlet	Quarry Spalls (C.Y.) Type	Backfill Material	Placement Method
T-Line	107+00	18"		30			.5	.5	QS	NT	ZDH
T-Line	115+00	18"		30			.5	.5	QS	NT	ZDH
T-Line	141+50	18"		30			.5	.5	QS	NT	ZDH
T-Line	150+00	18"		40			.5	.5	QS	NT	ZDH
T-Line	184+00	18"		30			.5	.5	QS	NT	ZDH
T-Line	203+50	18"		40			.5	.5	QS	NT	ZDH
T-Line	215+00	18"		40			.5	.5	QS	NT	ZDH
T-Line	216+50	18"		30			.5	.5	QS	NT	ZDH
T-Line	236+00	18"		30			.5	.5	QS	NT	ZDH
T-Line	242+50	18"		30			.5	.5	QS	NT	ZDH
T-3220	8+42	18"		40			.5	.5	QS	NT	ZDH
T-3220	11+92	18"		30			.5	.5	QS	NT	ZDH
T-4000	11+09	18"		60			.5	.5	QS	NT	ZDH
T-4000	15+67										
T-4000	20+60	18"		40			.5	.5	QS	NT	ZDH
T-4000	24+16						DOR				
T-4000	26+24						DOR				
T-0350	2+40	18"		40			.5	.5	QS	NT	ZDH
T-0350	6+80						DOR				
Spur A	0+30	18"		40			.5	.5	QS	NT	ZDH

Key:

QS - Quarry Spalls
NT - Native (bank run)
SL - Select Fill
ZDH - Zero Drop Height
LL - Light Loose Riprap
Downspout - Full round pipe

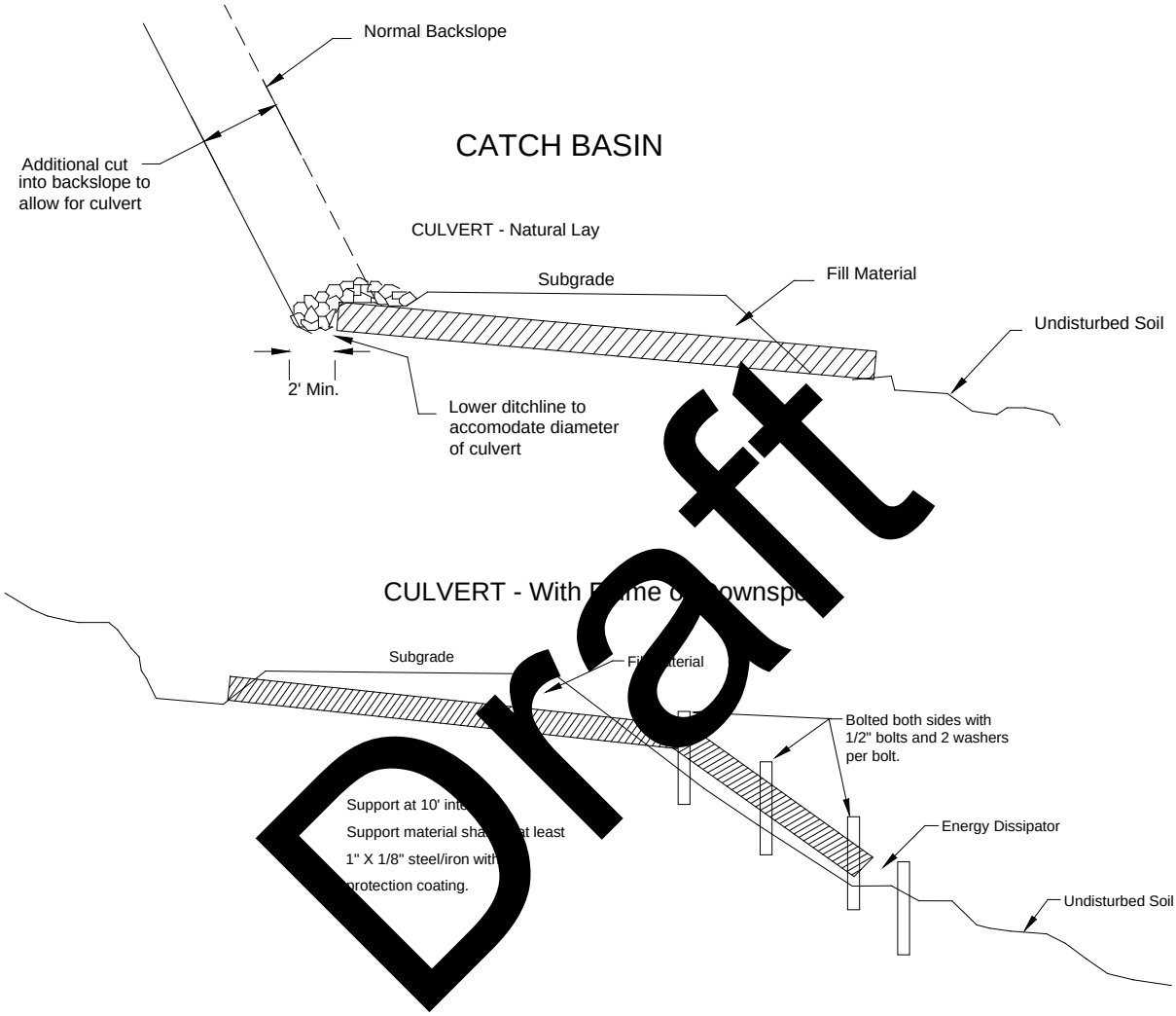


COMPACTION LIST

Road	From Station	To Station	Type	Max Depth Per Lift (inches)	Equipment Type	Equipment Weight (lbs)	Minimum Number of Passes	Maximum Operating Speed (mph)
T-Line	0+00	283+00	Pre-haul Surface		Vibratory Smooth Drum	14000	3	4
T-3200	0+00	75+00	Pre-haul Surface		Vibratory Smooth Drum	14000	3	4
T-3220	0+00	35+90	Subgrade/Rock	8”	Vibratory Smooth Drum	14000	3	4
T-4000	0+00	28+00	Subgrade/Rock	8”	Vibratory Smooth Drum	14000	3	4
T-4010	0+00	2+56	Subgrade/Rock	8”	Vibratory Smooth Drum	14000	3	4
T-0350	0+00	25+94	Subgrade/Rock	8”	Vibratory Smooth Drum	14000	3	4
Spur A	0+00	2+00	Subgrade/Rock	8”	Vibratory Smooth Drum	14000	3	4
Waste Area Embankment					Vibratory Smooth Drum	14000	3	4

CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 1 of 3)

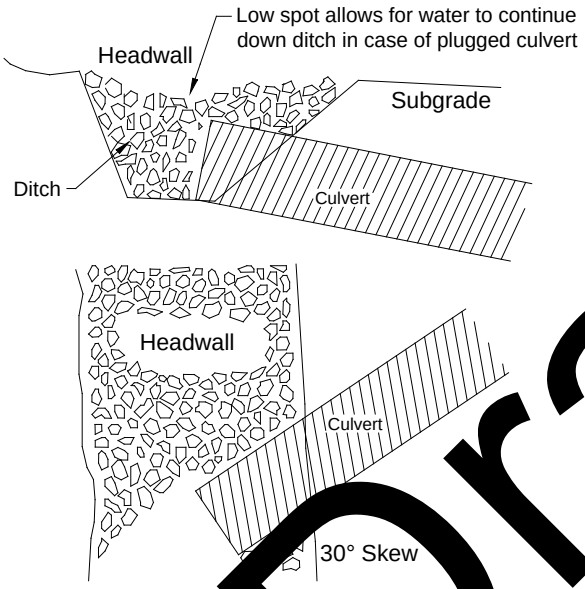


CULVERT AND DRAINAGE SPECIFICATION DETAIL

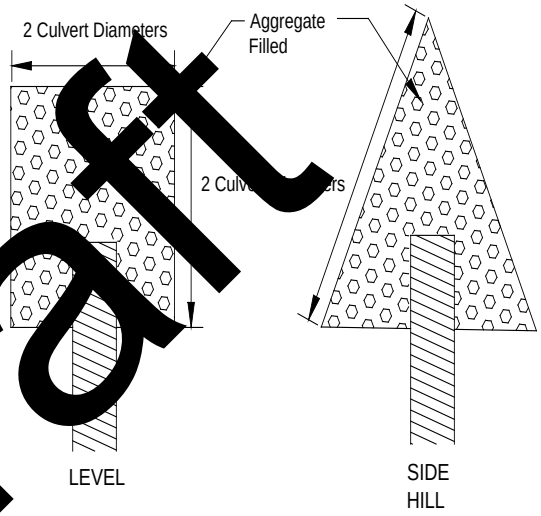
(Page 2 of 3)

Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.

HEADWALLS



ENERGY DISSIPATORS



Headwalls to be constructed of material that will resist erosion.

Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 3 of 3)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.

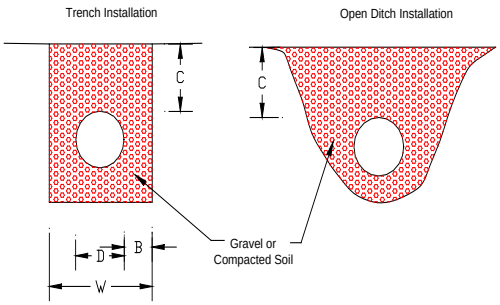
2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.

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

4. Site conditions and availability of bedding materials often dictate the type of installation method used.

5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% is required. This minimum compaction can be achieved by either hand or mechanical tamping.

MINIMUM DIMENSIONS
Trench or Open Ditch Installation



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

FOREST ACCESS ROAD MAINTENANCE SPECIFICATIONS
Page 1 of 2

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 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, shape, and compact the road surface, cutbanks, and shoulders to the original shape on the TYPICAL SECTION SHEET to provide a smooth, reinforced 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

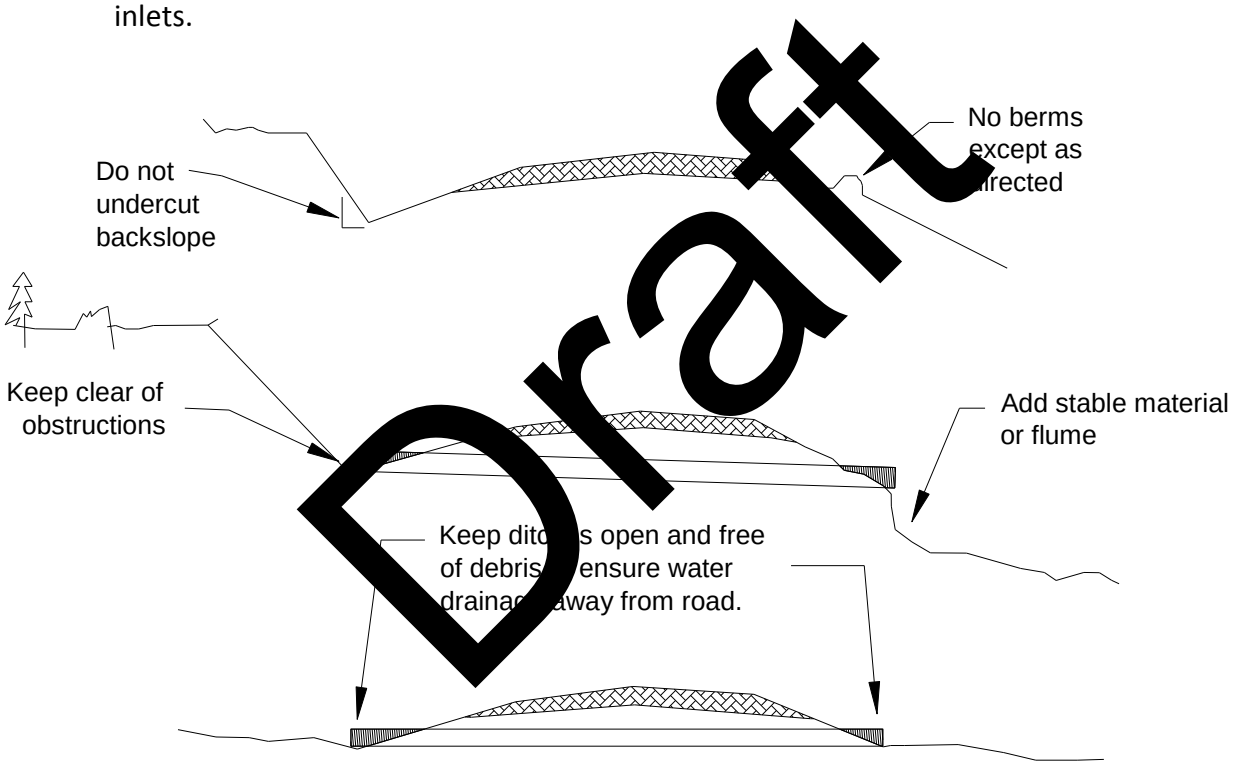
- Perform preventative maintenance work to safeguard against storm damage, such as blading to ensure correct runoff, ditch and culvert cleaning, and waterbar maintenance.

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.



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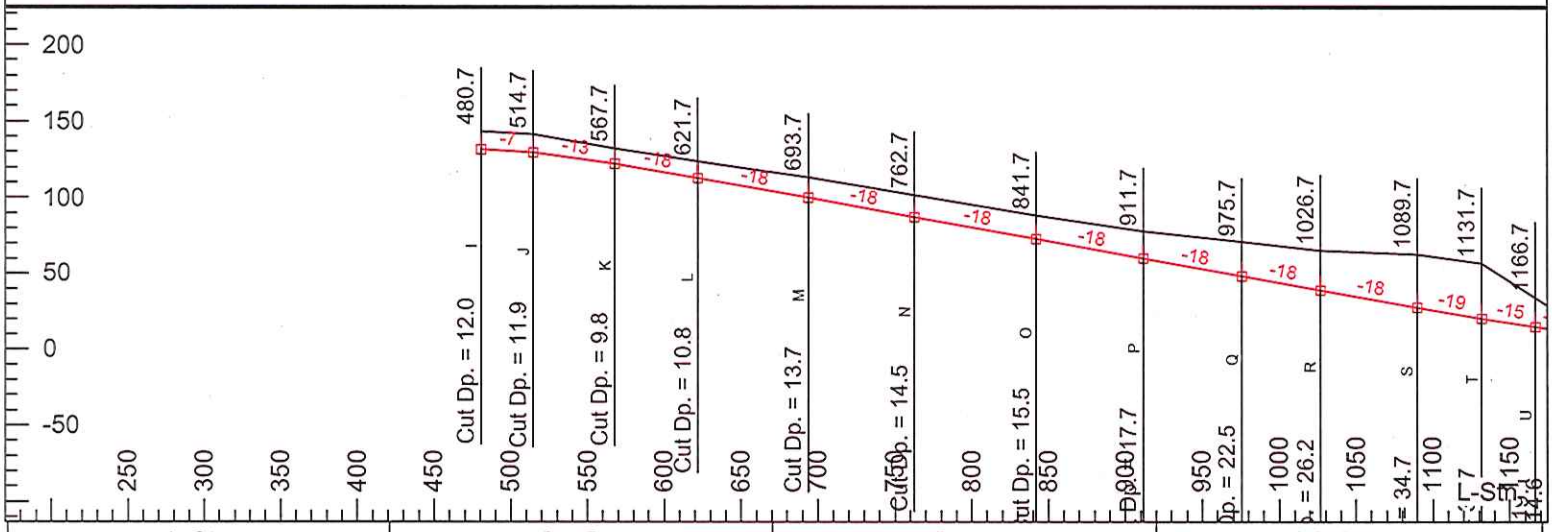
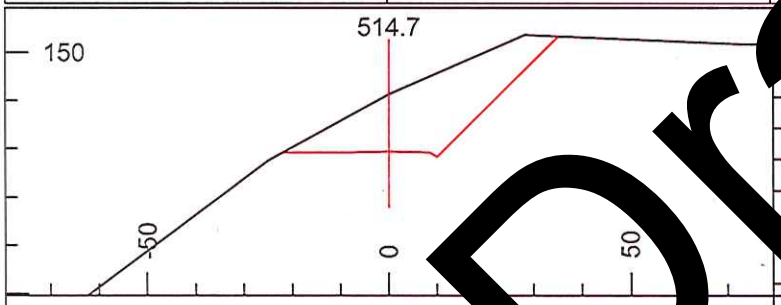
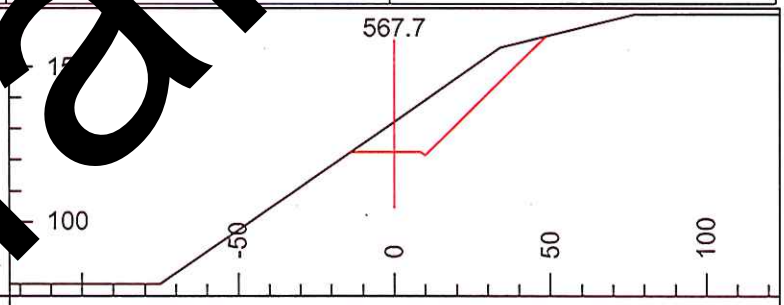


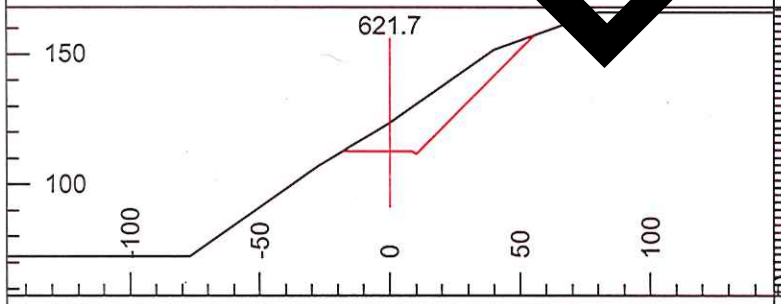
L-Stn ft.	Cut Dp. ft.	Grade %	SG Cut V. Cu. Yd.
480.7	12.0		
514.7	11.9	-6.6	796.7
567.7	9.8	-13.1	1563.7
621.7	10.8	-17.9	1919.1
693.7	13.7	-18.0	2196.5
762.7	14.5	-18.2	1613.1
841.7	15.5	-18.2	2158.9
911.7		-18.2	2456.7



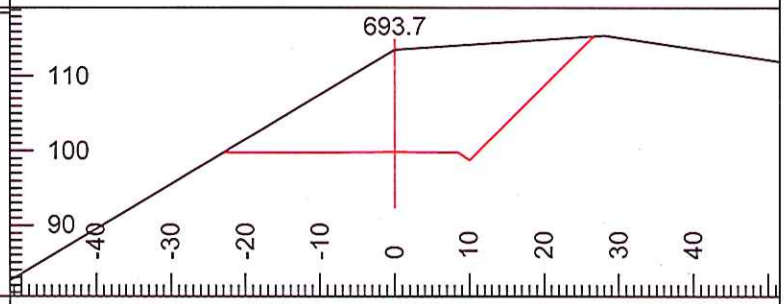
L-Stn: 514.7 Grd.Lst: -6.6 CL Elev: 129.4 Stk R: 37.0
Grd.Nxt.: -13.1 Cut Dp: 11.9 Stk L: [illegible]



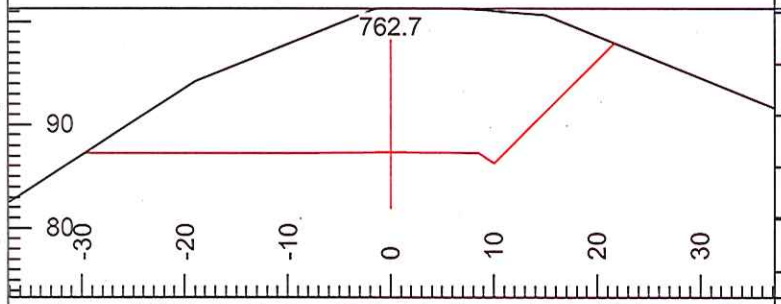
L-Stn: 567.7 Grd.Lst: -13.1 CL Elev: 122.5 Stk R: 55.4
Grd.Nxt.: -17.9 Cut Dp: 9.8 Stk L: 17.2



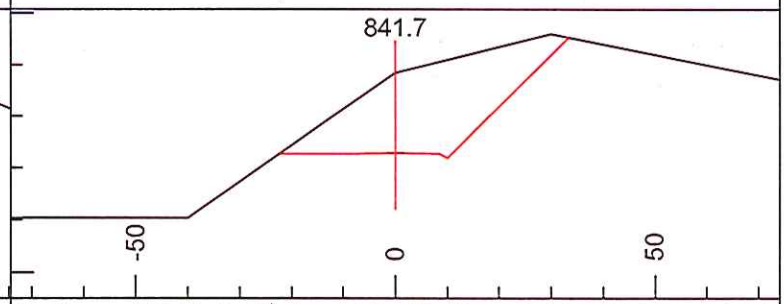
L-Stn: 621.7 Grd.Lst: -17.9 CL Elev: 112.9 Stk R: 64.8
Grd.Nxt.: -18.0 Cut Dp: 10.8 Stk L: 21.2



L-Stn: 693.7 Grd.Lst: -18.0 CL Elev: 99.9 Stk R: 26.7
Grd.Nxt.: -18.2 Cut Dp: 13.7 Stk L: 26.7

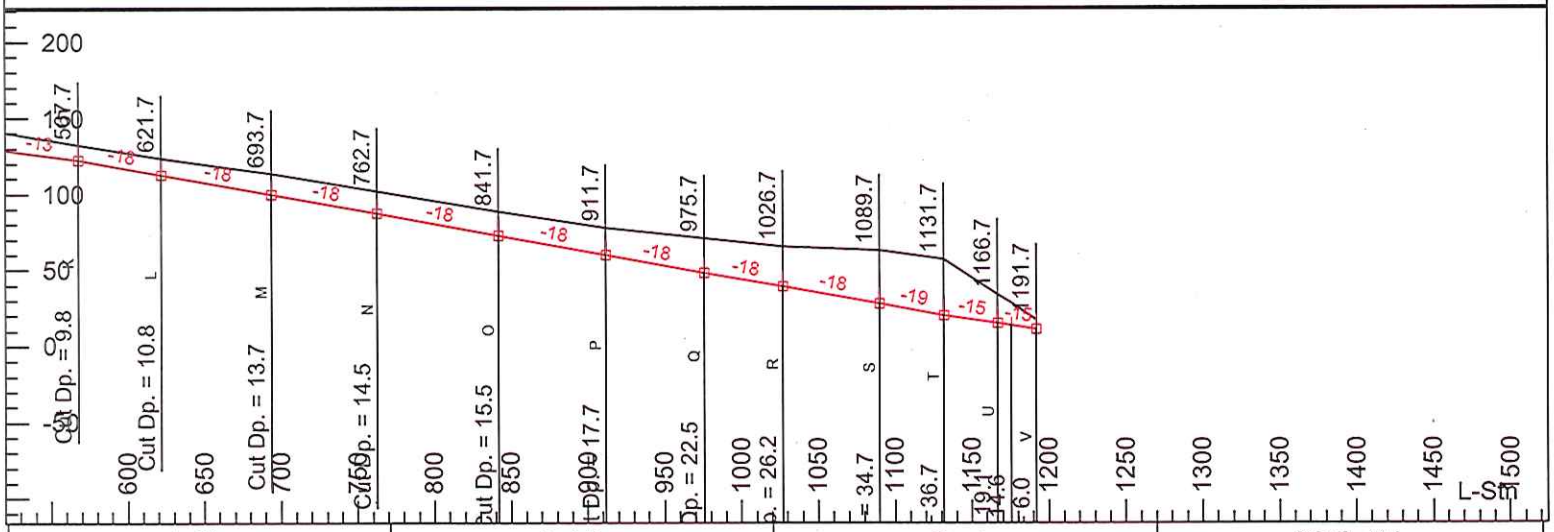


L-Stn: 762.7 Grd.Lst: -18.2 CL Elev: 87.3 Stk R: 22.0
Grd.Nxt.: -18.2 Cut Dp: 14.5 Stk L: 33.1

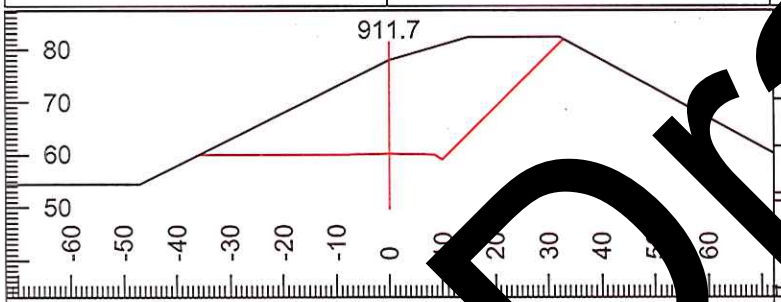


L-Stn: 841.7 Grd.Lst: -18.2 CL Elev: 72.9 Stk R: 34.1
Grd.Nxt.: -18.2 Cut Dp: 15.5 Stk L: 27.1

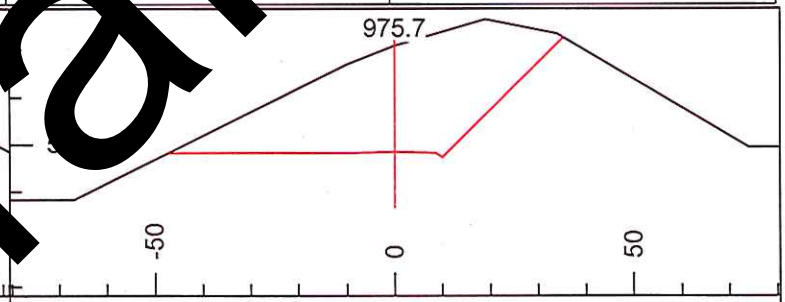
T-3220



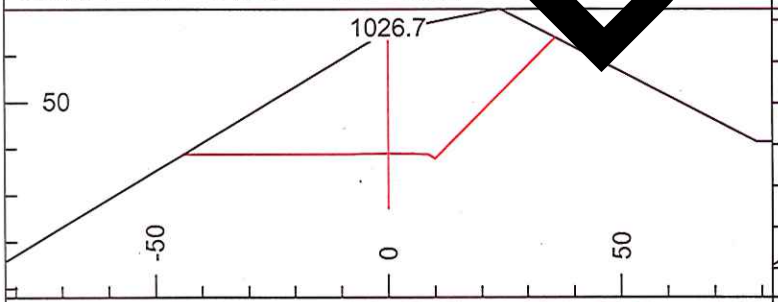
L-Stn ft.	Cut Dp. ft.	Grade %	SG Cut V. Cu. Yd.
911.7	17.7	-18.5	3221.1
975.7	22.5	-18.2	3239.5
1026.7	26.2	-17.6	5241.4
1089.7	34.7	-18.6	4481.1
1131.7	36.7	-14.9	3003.1
1166.7	19.1	-14.5	878.5
1191.7	6.0		



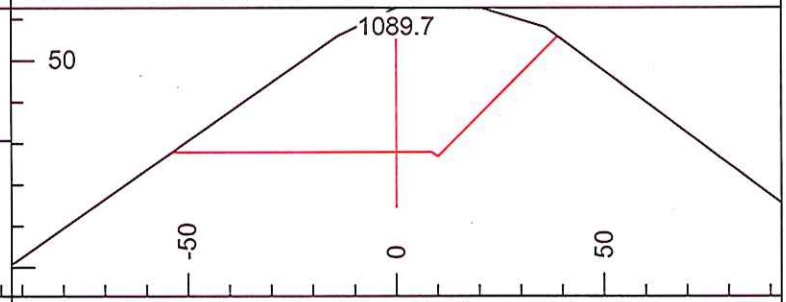
L-Stn: 911.7 Grd.Lst: -18.2 CL Elev: 60.2 Stk R: 33.1
Grd.Nxt.: -18.5 Cut Dp: 17.7 Stk L: 7



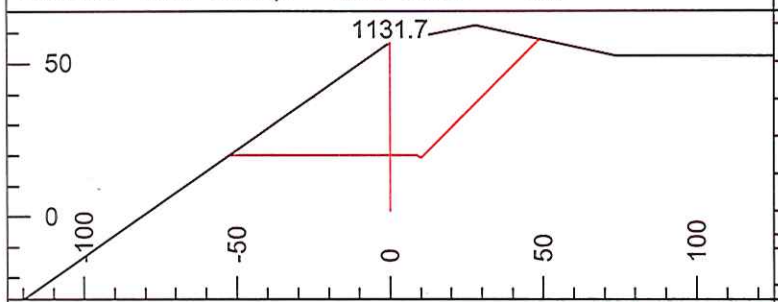
L-Stn: 975.7 Grd.Lst: -18.5 CL Elev: 48.4 Stk R: 35.3
Grd.Nxt.: -18.2 Cut Dp: 22.5 Stk L: 52.2



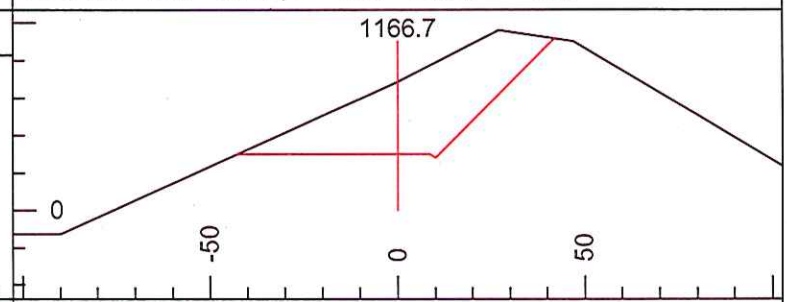
L-Stn: 1026.7 Grd.Lst: -18.2 CL Elev: 39.1 Stk R: 35.9
Grd.Nxt.: -17.6 Cut Dp: 26.2 Stk L: 51.0



L-Stn: 1089.7 Grd.Lst: -17.6 CL Elev: 28.0 Stk R: 39.5
Grd.Nxt.: -18.6 Cut Dp: 34.7 Stk L: 64.0

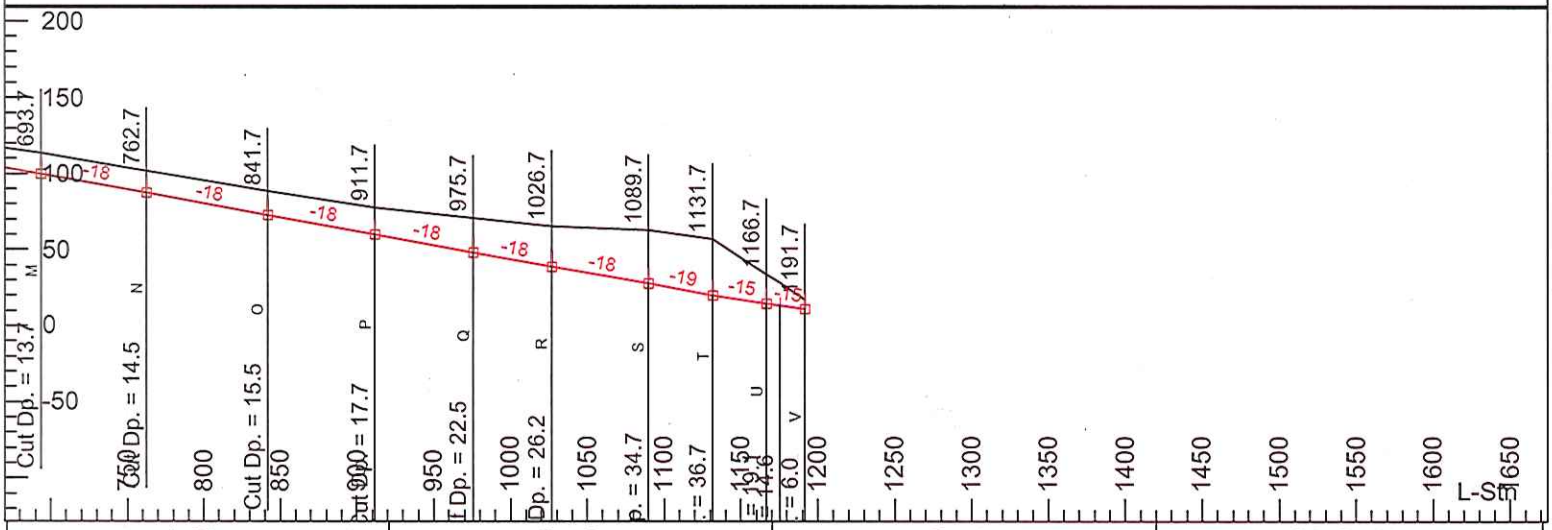


L-Stn: 1131.7 Grd.Lst: -18.6 CL Elev: 20.2 Stk R: 48.8
Grd.Nxt.: -14.9 Cut Dp: 36.7 Stk L: 64.1

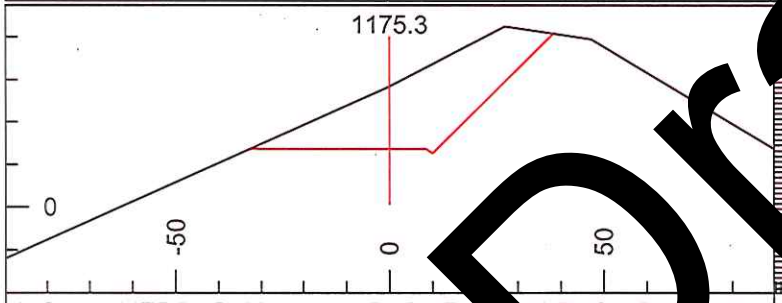


L-Stn: 1166.7 Grd.Lst: -14.9 CL Elev: 15.0 Stk R: 43.6
Grd.Nxt.: -14.5 Cut Dp: 19.1 Stk L: 46.8

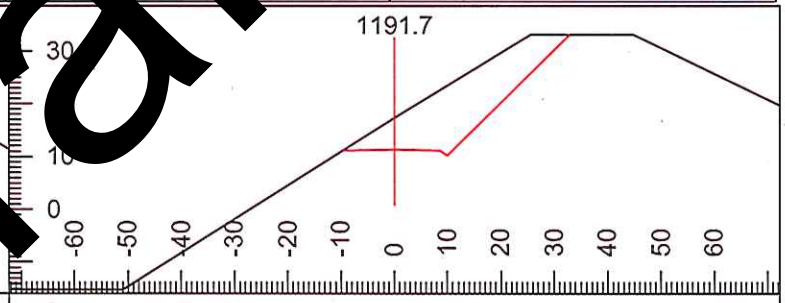
T-3220



L-Stn ft.	Cut Dp. ft.	Grade %	SG Cut V. Cu. Yd.
1191.7	6.0		

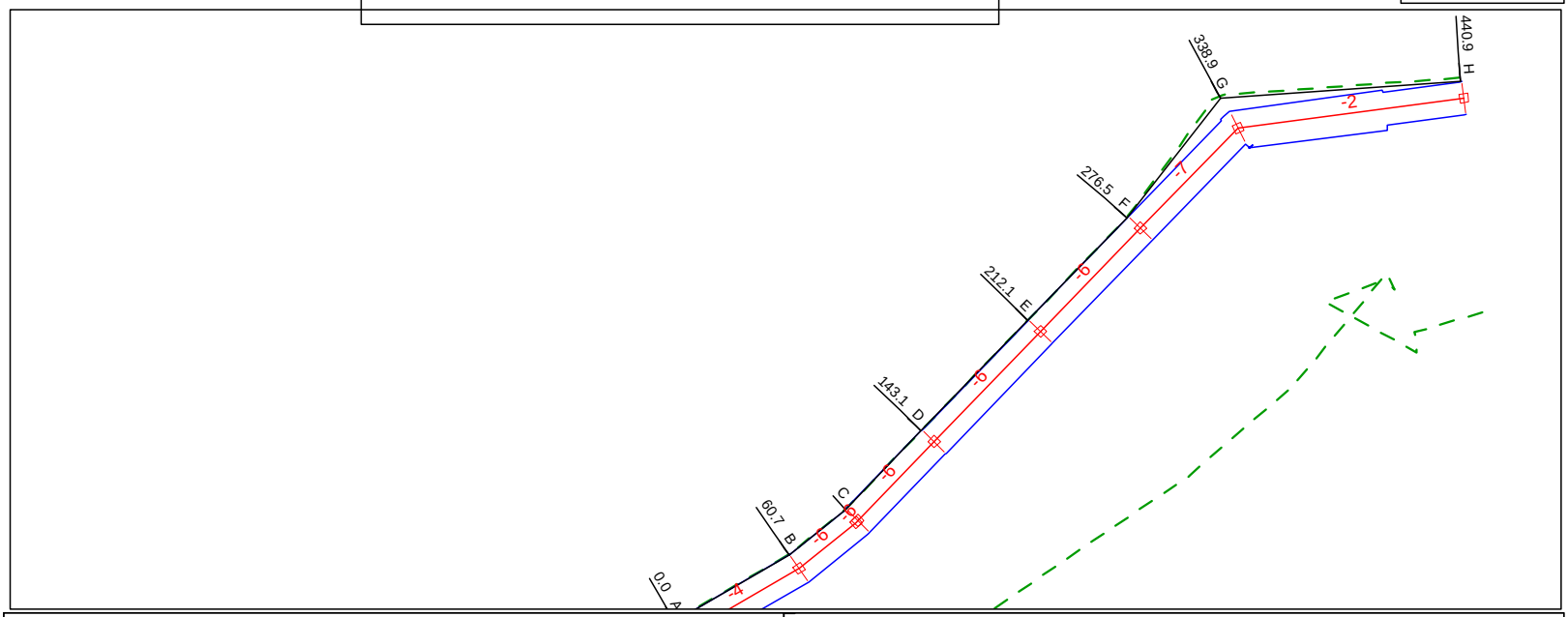


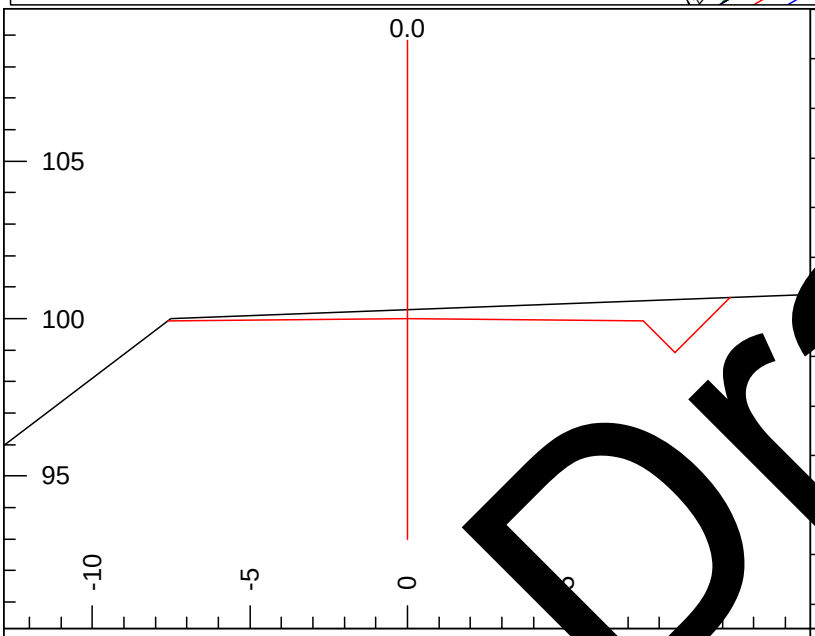
L-Stn: 1175.3 Grd.Lst: -14.5 CL Elev: 13.7 Stk R: 40.0
Grd.Nxt.: -14.5 Cut Dp: 14.6 Stk L:



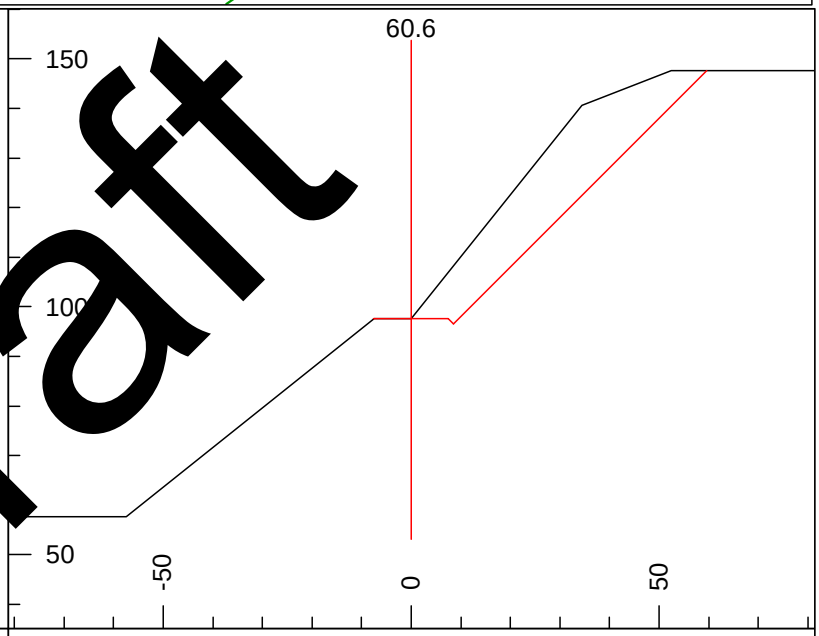
L-Stn: 1191.7 Grd.Lst: -14.5 CL Elev: 11.4 Stk R: 36.4
Grd.Nxt.: n/a Cut Dp: 6.0 Stk L: 11.3

T-4000

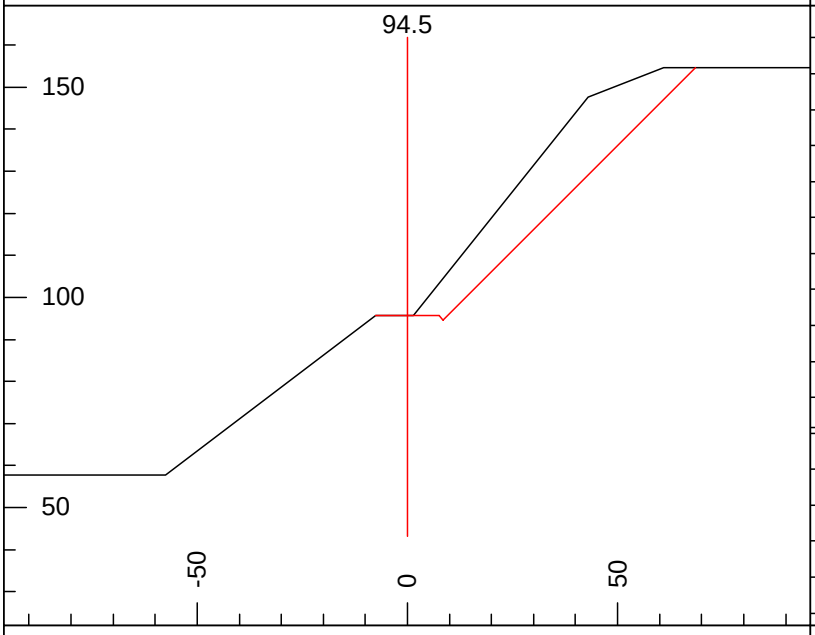




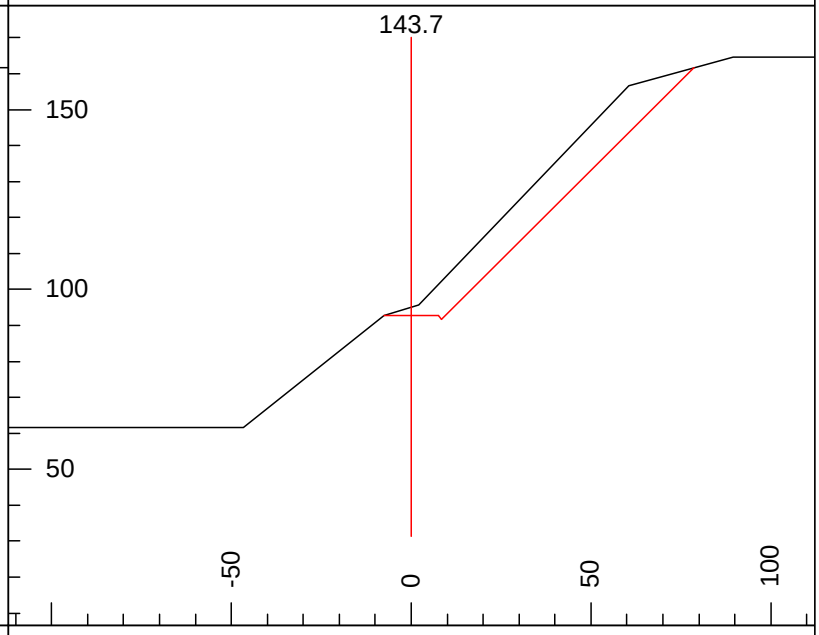
L-Stn: 0.0 Grd.Lst: n/a CL Elev: 100.0 H. Offset: 7.5
Grd.Nxt.: -4 Cut Dp: 0.3 F Slope R: 100



L-Stn: 60.6 Grd.Lst: -4 CL Elev: 97.6 H. Offset: 7.5
Grd.Nxt.: -6 Cut Dp: 0.0 F Slope R: 100

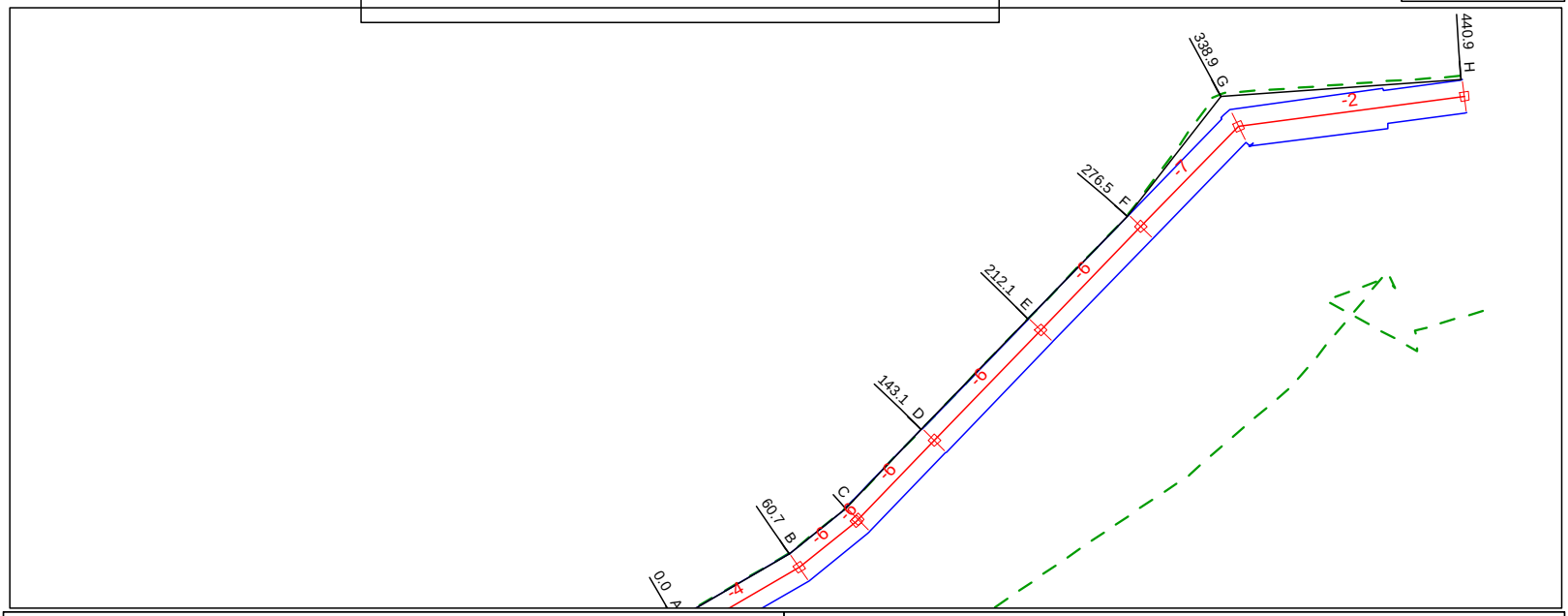


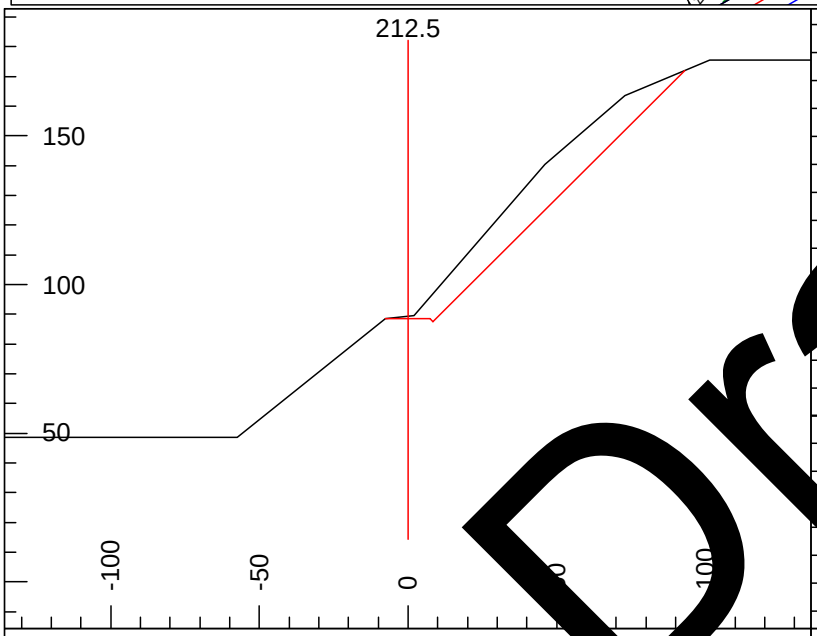
L-Stn: 94.5 Grd.Lst: -6 CL Elev: 95.7 H. Offset: 7.5
Grd.Nxt.: -6 Cut Dp: 0.0 F Slope R: 100



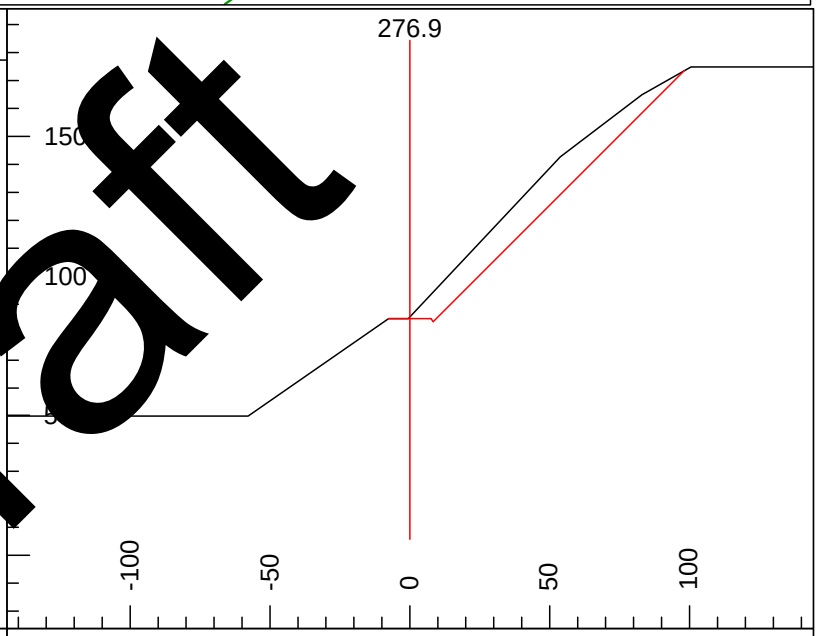
L-Stn: 143.7 Grd.Lst: -6 CL Elev: 92.7 H. Offset: 7.5
Grd.Nxt.: -6 Cut Dp: 2.3 F Slope R: 100

T-4000

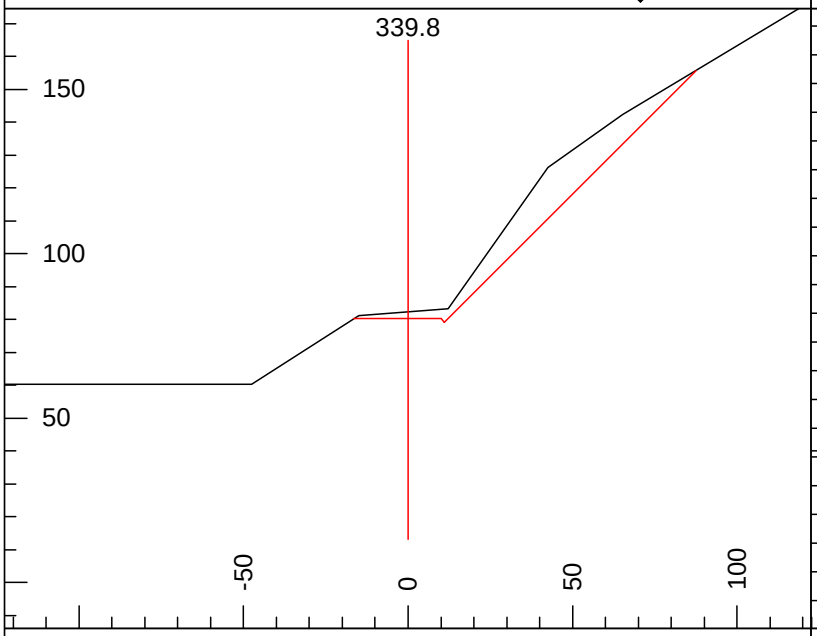




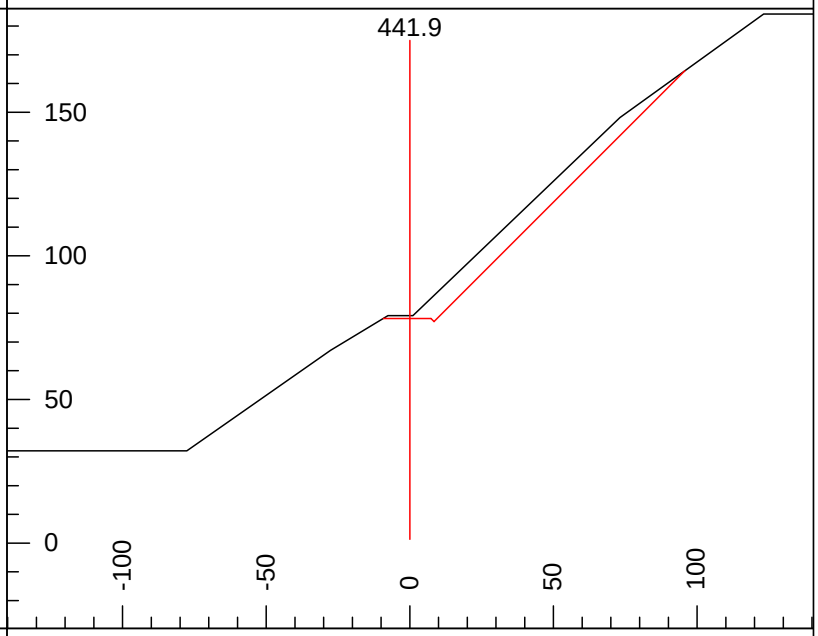
L-Stn: 212.5 Grd.Lst: -6 CL Elev: 88.[illegible] H. Offset: 7.5
Grd.Nxt.: -6 Cut Dp: 0.8 F Slope R: 100



L-Stn: 276.9 Grd.Lst: -6 CL Elev: 84.8 H. Offset: 7.5
Grd.Nxt.: -7 Cut Dp: 0.6 F Slope R: 100



L-Stn: 339.8 Grd.Lst: -7 CL Elev: 80.3 H. Offset: 13.8
Grd.Nxt.: -2 Cut Dp: 2.0 F Slope R: 100



L-Stn: 441.9 Grd.Lst: -2 CL Elev: 78.2 H. Offset: 7.5
Grd.Nxt.: n/a Cut Dp: 1.0 F Slope R: 100

DEPARTMENT OF NATURAL RESOURCES

SUMMARY - Road Development Costs

REGION: PACIFIC CASCADE

DISTRICT: LEWIS

SALE/PROJECT NAME: North Williams TBS CONTRACT NUMBER: 30-094595

LEGAL DESCRIPTION: T16R06W

ROAD NUMBER:

Required: T-Line, T-3200

Optional: T-3220, T-4000, T-4010, T-0350, Spur A

ROAD STANDARD:	Construction	Reconstruction	Pre-haul maintenance
NUMBER OF STATIONS:	94.40		358.00
SIDESLOPE:	30%		20%
CLEARING AND GRUBBING:	$21,982		
EXCAVATION AND FILL:	$112,766		
MISC. MAINTENANCE:	$600		$2,964
ROCK TOTALS:			
Required:	$336,819		$41,544
Optional:	$0		$0
Total:	$336,819		$41,544
CULVERTS AND FLUMES:	$4,880		$6,660
MISCELLANIOUS	$10,000		$5,000
GENERAL EXPENSES:	$43,834		$5,046
MOBILIZATION:	$1,568		$1,568
TOTAL COSTS:	$532,448		$62,681
COST PER STATION:	$5,640		$175

ROAD DEACTIVATION AND ABANDONMENT COSTS: _____

NOTE: Profit and risk are included in equipment rates used for this appraisal.

TOTAL (All Roads) = **$595,129**

TOTAL w/o Optional Rock (All Roads) = **$595,129**

SALE VOLUME MBF = **7,781**

TOTAL COST PER MBF = **$76.48**

TOTAL COST PER MBF w/o Optional Rock = **$76.48**

Compiled by: Chris Werner Date: 09/22/16

Plans to be furnished by:

PACIFIC CASCADE REGION - ROAD COST ESTIMATE - CONSTRUCTION

SALE NAME: North Williams TBS CONTRACT NUMBER: 30-094595 Road No. 0 Stations: 94.4 Date: 09/22/16

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
T-3220	35	45.0	1.00	5.28	$45	1.00	35.90	$8,530
T-4000	30	45.0	1.00	5.28	$45	1.00	28.00	$6,653
T-4010	20	45.0	1.00	3.10	$45	1.00	2.56	$357
T-0350	35	45.0	1.00	5.28	$45	1.00	25.94	$6,163
Spur A	10	45.0	1.00	3.10	$45	1.00	2.00	$279

II

Total Stations= 94.40

Required Stations= Required Clear and Grub Sub-total=
Optional Stations= 94.40 Optional Clear and Grub Sub-total= $21,982
Total Stations = 94.40 Clear and Grub TOTAL = $ 21,982.10

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
T-3220	35	3.0	3.00	$90	1.00	35.90	$29,079
T-4000	30	1.5	2.50	$90	1.00	28.00	$9,450
T-4010	20	1.0	2.00	$90	1.00	2.56	$461
T-0350	35	1.5	3.00	$90	1.00	25.94	$10,506
Spur A	10	1.0	1.50	$90	1.00	2.00	$270

Total Stations=

IV. CULVERTS AND FLUMES:

*End Haul, Over Haul, Large Fills/Cuts

	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul	42000	21	$3,000	$63,000
Large Fills/ Cuts				$0

Required Stations= Required Excavation Sub-total=
Optional Stations= Optional Excavation Sub-total= $1
Excavation TOTAL = $ 112,

Required

Description	Qty.	Gauge	Diameter	No/Length	Installed Cost/ft	Sub-total
CPP	2		18	30	$20.00	0
	3		18	40	$20.00	00
	1		18	60	$20.00	
						$0
						$0
Bands & Gaskets	4				$20.00	$80

Required Culvert Subtotal = $4,880

Optional

Description	Qty.	Gauge	Diameter	No/Length	Installed Cost/ft	Sub-total
CPP						$0
						$0
						$0
						$0
						$0
						$0
Bands & Gaskets						$0

Optional Culvert Subtotal = $0

Culvert Total = $4,880

V

Description	Type	Width	Length	Cost/ft.	Sub-total
Erosion Mat		40	500	$0.50	$10,000
					$0
					$0

Structure Total = $10,000

Required		
Pounds	$/lb	Sub-total
200	$3.00	$600

Optional		
Pounds	$/lb	Sub-total
	$3.00	$0

III. BALLAST AND SURFACING :

Required Rock

Ballast source:	Commercial
Surface source:	Commercial
Landing source	Commercial
Culvert source	Commercial
TO/TA/Inter	Commercial
CW	Commercial
R.T. Miles =	25.0
Ave. Speed =	30
Delay (Hrs.)=	0.4
Cost / Hour =	$100.00
CY / Load =	10

UNIT COSTS	Ballast	Surfacing	Landing	Culvert	TO/TA/Inter/CW
Drill & Shoot					
Dig and load					
Crushing					
Purchase	$9.65	$10.65	$9.65	$11.30	$9.65
Haul *	$12.33	$12.33	$12.33	$12.33	$12.33
Spread	$1.00	$1.00	$1.00	$1.00	$1.00
Compact	$1.00	$1.50	$1.00		$1.00
Strip					
Reclamation					
Use tax	$0.08	$0.08	$0.08	$0.08	$0.08
TOTAL ($/cy)	$25.90	$27.52	$25.90	$26.60	$25.90

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

Item	Description	Cubic Yards
Ballast	4" Jaw Run	6,485
Surfacing	2" minus	2,100
Landings	4" Jaw Run	1,600
Culverts	Quarry	6
TO/TA/Inter	Jaw R	1,700
CW	4" Jaw Ru	925

Total Rock=

Ballast	6485	Cu. yds @	$25.90	/cu. yd = $167,951
Surfacing	2100	Cu. yds @	$27.52	/cu. yd = $57,789
Landings	1600	Cu. yds @	$25.90	/cu. yd = $41,437
Culverts	6	Cu. yds @	$26.60	/cu. yd = $160
TO/TA/Inter	1700	Cu. yds @	$25.90	/cu. yd = $44,027
CW	925	Cu. yds @	$27.52	/cu. yd = $25,455

Required Rock total = $336,819

Optional Rock

Ballast source:	
Surface source:	
Landing source	
Culvert source	
Riprap source	
Stockpile source	
R.T. Miles =	3.5
Ave. Speed =	19
Delay (Hrs.)=	0.2
Cost / Hour =	$90.00
CY / Load =	10

UNIT COSTS	Ballast	Surfacing	Landing	Culvert	Riprap
Drill & Shoot					
Dig and load	$2.50		$2.50	$3.00	
Crushing					
Purchase					
Haul *	$3.46		$3.46	$3.46	
Spread	$2.00		$2.00	$2.00	
Compact	$1.50		$1.50		
Strip	$1.00		$1.00		
Reclamation					
Use tax					
TOTAL ($/cy)	$10.46	$0.00	$10.46	$8.46	$0.00

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

Item	Description	Cubic Yards
Ballast		
Surfacing		
Landings		
Culverts		
Turn Arounds		
Stockpile		

Total Rock= 0

Ballast	0	Cu. yds @	$10.46	/cu. yd = $0
Surfacing	0	Cu. yds @	$0.00	/cu. yd = $0
Landings	0	Cu. yds @	$10.46	/cu. yd = $0
Culverts	0.0	Cu. yds @	$8.46	/cu. yd = $0.00
Turn Arounds	0	Cu. yds @	$10.46	/cu. yd = $0
Stockpile	0	Cu. yds @	$0.00	/cu. yd = $0

Optional Rock total = $0

Rock Total= $336,819

Required Construction= $14,880
Optional Construction= $135,348
Required Rock= $336,819
Optional Rock= $0

Required Sub-total= $351,699
Optiona Sub-total= $ 135,347.60
Sub-TOTAL = $487,046

VI. GENERAL EXPENSES:

Overhead & General Exp. Add 9% $43,834

VII. MOBILIZATION:

Total Mobilization = $3,135 Mobilization sub-total = $1,567.50

SHEET TOTAL = $532,448

PACIFIC CASCADE REGION - ROAD COST ESTIMATE - PRE-HAUL MAINTENANCE

SALE NAME: North Williams TBS CONTRACT NUMBER: 30-094595

Total stations Pre-Haul Maintenance = 358.00

I. MISC. MAINTENANCE ITEMS:

	Cost/ Station	Total Stations	Sub Total
mechanical brushing ($/sta) =			$0
hand brushing =			$0
ditch cleaning ($/sta) =			$0
Sediment Traps (ea.) =			$0
grading ($/sta) =	6.00	358.00	$2,148
compacting ($/sta) =	2.00	358.00	$716

Misc TOTAL = $2,864

III. BALLAST AND SURFACING :

Ballast source:
Surface source:
Riprap source :

UNIT COSTS	Ballast	Surfacing	Quarry Spalls
Drill & Shoot			
Dig & Load			
Crush			
Purchase		$10.65	$11.30
Haul	$12.33	$12.33	$12.33
Spread		$1.00	$1.00
Compact		$1.50	
Screen			
Reclamation			
Use tax	$0.08	$0.08	$0.08
TOTAL ($/cu. yd)	$13.32	$27.52	$26.60

Description	cu.yds/sta x stations =	cubic yards
Ballast (4" Jaw Run)		0
Surfacing (2"-)		0
Stockpile (2 1/2"-)		

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	25.0
Ave. Speed =	30
Delay (Hrs.)=	0.4
Cost / Hour =	$100.00
CY / Load =	10

Ballast (4" Jaw Run)	Cu. yds @	$13.32	/cu. yd =	$0
Surfacing (2"-)	1500 Cu. yds @	$27.52	/cu. yd =	$41,278
Quarry Spalls	10 Cu. yds @	$26.60	/cu. yd =	$266

Rock total = $41,544

IV. CULVERTS AND FLUMES:

Description	Gauge	Diameter	No/Length (ft)	Installed Cost/ft	Sub-total
CPP	7	18	30	$20.00	$4,200
	3	18	40	$20.00	$2,400
					$0
					$0
					$0
Bands & Gaskets	3			$20.00	$60

Culvert total = $6,660

Description	Type	Yds³	Cost/yd.	Sub-total
	Curve Widening	1,000	$5.0	$5,000
				$0
				$0

Curve Widening total = $5,000

Sub-TOTAL = $56,068

VI. GENERAL EXPENSES: Overhead & General Exp. Add 9% $5,046

VII. MOBILIZATION: Total Mobilization = $3,135 Mobilization sub-total = $1,567.50

Road No. 0
Standard: Pre-haul maintenance
Stations: 358.00
By: Chris Werner

SHEET TOTAL = $62,681

Date: 09/22/16

PACIFIC CASCADE REGION - ROAD COST ESTIMATE - MOBILIZATION

VII. MOBILIZATION:	Description	$ per Move	# of Moves	Sub-total
	Dump Trucks	300	3	$900
* Move in costs	Grader	160	1	$160
are averaged over	Compactor	450	1	$450
all three sheets.	Excavator	450	2	$900
	Dozer (D8)	450	1	$450
	Front end loader		1	$0
	Rock crusher		1	$0
	Drill		1	$0
	Dozer (D5)	$275	1	$275

Construction Mobilization sub-total = [illegible]
Reconstruction Mobilization sub-total = [illegible]
Pre-haul Mobilization sub-total = [illegible]67.50
Total Mobilization = [illegible]