Alberni Valley

Community Forest

ROAD DEVELOPMENT REPORT

Cutblocks: B11 and B12

Prepared By: Andrew Kenyon, RPF

Reviewed By: Darin Brown, RFT

Date: April 11, 2013

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B11 and B12 Road Development Report

Contents

List of Tables

Introduction

The following report summarizes the road construction criteria required to build Roads B11-S1 and B11-S2 for cutblocks B11 and B12.

All new roads are marked with printed black on pink "Road Centerline" ribbon. Stations are marked with double pink ribbons, white ribbons, pink road tags and metal tags at reference point stations. Culverts are marked with pink "Culvert" ribbon on the high and low sides of right of way.

Detailed road designs have been completed for all of the proposed roads, see Appendix 3. There are two shorter pitches of steep grades greater than 18% on B11-S1. A switchback is to be built at the beginning of B11-S2. Ballast material will need to be trucked in for sections of new construction. All culverts will require armouring with rock ballasting as seen in the best practice recommendations for road works in a community watershed that are contained in the AVCF FSP and Appendix 6 of this report.

Safety Highlights

Steep Road Grades

Two road segments with gradients greater than 18% exists on B11-S1, stations 0+010 to 0+040 and 1+050 to 1+075 (see Appendix 3 - Road Profiles). Prior to commencing log hauling operations the contractor must perform a risk assessment of the current conditions and adjust hauling activities to fit the traction conditions. Hauling for B11 and B12 will not be permitted when ice and or snow is on the logging roads leading to or in the given setting (very low traction level). This has been determined using FERRIC steep grade decent guidelines. The Ministry of Transportation guidelines are to be followed once hauling on the highway.

Rainfall Shutdown

Cutblocks B11 and B12 are within Rainfall Shutdown Area "5"

Shutdown Criteria: Activities must shut down if: The total rainfall reaches 36 mm in 24 hours. Onsite rain gages should be used and monitored daily. Start-Up Criteria: Activities may start-up when: The total rainfall is equal to or less than 30 mm in 24 hours. Refer to the Return to Work Guide in the tender document for more information. Adequate recovery time should be given before building operations commence after a shutdown (see Appendix 5 for more details).

Falling of Snags and Danger Trees

Due to the infestation of root rot in the area there are snags and danger trees in B11 and B12. The following instructions are to be followed if dealing with snags and danger trees:

In accordance with the Cutting Permit Authority and Work Safe BC Regulations, all snags and danger trees that endanger workers within a distance of 50m outside the cutblock boundaries, or within one and a half tree lengths, (whichever is greater), are approved for falling under these harvest instructions. All danger trees and snags outside the cutblock boundaries that are required to be felled must be recorded on a map and provided to AVCF once falling has been completed. AVCF will be notified immediately if danger trees and/or snags are identified in groups and removal will result in the cutblock boundary being substantially impacted. Felled snags and danger trees up to 50m outside of the falling boundary meeting utilization specifications will be recovered.

EXCEPTION- Wildlife Tree Retention Area (WTRA) - Snags or danger trees can be felled within a WTRA for safety reasons although only the portion of the felled snag or danger tree that falls outside the WTRA can be recovered.

Recreational Use

Road B11-S1 is being constructed on the current recreational trail (Lookout Trail) up to road station 1+269 at which time the proposed road leaves the trail. The trail is active and currently being used as an ATV route. Adequate signs are to be posted to inform the public user groups of active blasting, logging and hauling during operations. All harvesting and road operations are to ensure no danger trees, snags or debris is left on or surrounding the trails and proposed roads.

Road Construction

Two roads are to be constructed, B11-S1 and B11-S2. See Table 1 below for construction details. The majority of road B11-S1 is on an old grade from stations 0+000 to 1+269 and will be treated as road reactivation. The grade has been washed out in multiple sections and will need ditching, road widening and surfacing, see Table 1 for details. TB11-S2 is all new construction. Road measure up will be necessary post road construction to ensure the correct ground types and percentage of drilling or blasting is assigned. Excess road material from 0+444-to 0+540 on B11-S1 is not to be side casted due to a RMA infringement, see Appendix 1 for details. Shorter sections of TR exist along B11-S1. B11-S2 will require some hauled graveled/rock ballast.

The suitability of native material for road construction is uncertain. Potential quarries exist at approximately 0+650 and 1+675 on B11-S1 where rock is present at the surface. Other potential quarry locations may be identified during road construction.

All stream crossings for the proposed roads are to be armoured with coarse rock material to minimize sedimentation. In addition B11-S1 ditch line from 0+ 366 to 0+406 is to be armoured with coarse rock material. This is to maintain the natural drainage pattern of stream 2 and ensure sedimentation is minimized within the Sproat Lake Watershed.

Table 1: B11 and B12 Construction Summary

Road	Start Station	End Station	Total (m)	Construction Type	Comments
B11-S1	0+000	0+366	366	OMPR Reactivation Case 1	Start of old grade. Reactivation requires new culvert installation, road re- surfacing, widening, ditch cleaning, and brushing. Steep road grades 0+010 to 0+040.
	0+366	0+406	40	OMRB Reactivation Case 1	Reactivation requires rock ballasting in ditch line for Creek 2. Road is washed out and will require surfacing.
	0+406	0+498	92	OMPR Reactivation Case 1	Reactivation requires new culvert installation, road re-surfacing, widening, ditch cleaning, and brushing.
	0+498	0+540	42	TR Reactivation Case 2	Reactivation requires cut and fill construction to widen road. Drilling or blasting anticipated.
	0+540	1+051	511	OMPR Reactivation Case 1	Reactivation requires new culvert installation, road re-surfacing, ditch cleaning, and brushing. Possible quarry at 0+650.

	1+051	1+076	25	TR Reactivation Case 2	Reactivation requires cut and fill construction to widen road. Drilling or blasting anticipated. Steep road grade 1+050 to 1+075.
	1+076	1+269	193	OMPR Reactivation Case 1	Reactivation requires surfacing, road widening, and minor cut and fill construction to establish ditch line. End of old grade.
	1+269	1+362	93	OMLB New Construction	Cut and fill construction, local material for surfacing.
	1+362	1+476	114	TR New Construction	Cut and fill construction. Drilling or blasting anticipated.
	1+476	1+597	121	OMLB New Construction	Cut and Fill construction, local material for surfacing.
	1+597	1+724	127	TR New Construction	Cut and fill construction. Drilling or blasting anticipated. Possible quarry at 1+675.
B11-S2	0+000	0+072	72	TR New Construction	Cut and fill construction. Drilling or blasting anticipated.
	0+072	0+142	70	OMLB New Construction	Cut and fill construction. Local material for surfacing
	0+142	0+241	99	OMPR New Construction	Cut and fill construction, surfacing required.
	0+241	0+289	48	OMPR New Construction	Cut and fill construction, surfacing required.
	0+289	0+325	36	OMLB New Construction	Cut and fill construction, local material for surfacing
	0+325	0+614	289	OMPR New Construction	Cut and fill construction, surfacing required.
Total Case 1					1202m
Total Case 2					67m
Total New Road					1069m
Total Road Construction					2338m

Table 2: B11 and B12 Culvert Summary

Road Name	Station (m)	Riparian Class	Culvert/WBC Size (mm)
B11-S1	0+121	-	600
	0+312	-	600
	0+365	S4	800
	0+449	-	600
	0+624	-	600
	0+759	-	600
	0+931	S4	900
	1+137	S4	900
	1+212	-	600
	1+540	-	600
B11-S2	0+100	-	600
	0+396	-	600
	0+512	S4	600
	0+557	-	600
Total CMP's			14

Riparian Management Area Infringements

Table 3: RMA Infringements

Case	Road	Sections	Stream and Stream Class	RMA	Infringement
1	B11-S1	0+365	Stream 2 (S4)	30	Crossing
2	B11-S1	0+449 to 0+540	Stream 1 (S2)	50	91m
3	B11-S1	0+931	Stream 3 (S4)	30	Crossing
4	B11-S1	1+137	Stream 3 (S4)	30	Crossing
5	B11-S2	0+100	Stream 2 (S4)	30	Crossing
6	B11-S2	0+512	Stream 2 (S4)	30	Crossing

RMA Infringement Rationale

Case 2, RMA infringement on B11-S1 cannot be avoided as the proposed road is running along an existing old grade. It would be impracticable to move the road. All other RMA infringements are stream crossings on old grades that are to be reactivated.

Required Permits and Notifications

Affected water licensees or affected water purveyors must be notified at least 48 hours before commencement of road construction, re-activation or deactivation in a community watershed.

All of the roads described in this report are to be submitted for permit by April 12, 2013.

B11 and B12 Road Development Report

Appendices

Appendix 1: Road Instruction Map

Due Diligence

Two falling corners and/or road stations must be referenced in the field with the release map on a continual basis before, and during the felling of any timber within this setting. If you are unsure of your location, Stop Work and call a supervisor.

Forest and Range Practices Act

How to follow plan:

1) Always read and understand your plans and maps.
2) Always match your plan and map to what you find on the ground and then check that you can do the work.
3) Stop and ask if you cannot follow the plan and map.
4) Know your responsibilities. Ask if you are unsure.

Due Dilligence means following these steps.

Timbermarking requirements:

All decked timber must be sufficiently marked (at least 10%) when the setting is inactive.

Riparian Class	RMZ	RRZ
S1	20	50
S2	20	30
S3	20	20
S4	30	0
S5	30	0
S6	20	0
W1	40	10
W2	20	10
W3	30	0
W4	30	0
W5	40	10
L1	0	10
L2	20	10
L3	30	0
L4	30	0

Field Marking Standards:

Activity	Ribbon	Paint
Falling Boundary	FALLING BOUNDARY	●
Internal Boundaries	FALLING BOUNDARY	●
Reconnaissance Lines		
Traverse Stations (All)		
Cruise Strips / Plots		
Road Location	ROAD LOCATION	●
Culturally Modified Tree	CMT	
Landings / Tower Settings		
Deflection Lines		
Streams		
Reserve Zones (All)	FALLING BOUNDARY	●
Management Zones (All)		
Reserve Trees (Painted)	L	●

RMA Infringements:
Avoid Sidecast within these locations.
End Haul any material outside the RMA areas.

B11-S1
0+449 to 0+540

HAZARD ALERT

2) Hauling Hazard - Steep road grades.
Review the Steep Grade Assessment on the back of the release map for hauling limitations.

SAFETY COORDINATES:
Lat: 49° 17' 31"
Long: 125° 02' 26"

TIMBERMARK	Ha of R/W	VOLUME
K2D/0R1	4.7	1617
TOTAL		
CRUISE VOL/HA (m3)		462
ENG VOL/HA (m3)		500
HAUL DISTANCE		
SPROAT SORT		21.9km
Distance to Post Office Port Alberni		23.5km
Travel Time from Port Alberni		25min

CULVERTS		
SIZE	TYPE	NUMBER
600	CMP	11
800	CMP	1
900	CMP	2
TOTAL		14

ROAD NAME	START	END	TOTAL
B11-S1	1269	1724	455
B11-S2	0	614	614
TOTAL NEW ROAD			1069
B11-S1	0	1269	1269
TOTAL REACTIVATION			1269
Field Work:	MFS		Feb-13
Checked By:	AVCF		
AVCF:	PHASE		DATE
CONTRACTOR:	PHASE		DATE

SPECIES	%
Mb	7
Hw	12
Ced	2
Dr	1
Fd	78
Sp	
Pw	
OG	
SG	100%

PROFESSIONAL SEAL AND SIGNATURE

REGISTERED PROFESSIONAL FORESTER PROVINCE OF BRITISH COLUMBIA ANDREW KENYON NO. 4778

Andrew Kenyon 2013.04.16 14:58:37 -07'00'

I certify that I have reviewed this document, and while I did not personally supervise the work described, I have determined that this work has been done to the standards expected of a member of the Association of British Columbia Forest Professionals.

DATE

ALBERNI VALLEY COMMUNITY FOREST

ROAD INSTRUCTIONS MAP

Cutblock: B11, B12

Forest Region: Coast
Forest District: South Island
Land District: Barclay
Cascades: West C
Tenure: K2D
Geographic Coordinates:
Lat: 49° 17' 31"
Long: 125° 02' 26"
Author: B. Bayley
Map Date: 13-Feb-2013

Scale: 1:5,000

N

Datum: NAD83
Mapsheet: 92F.025
Map Revision: 1b
Revised Date: 16-Apr-2013

See Instructions on reverse

MAP LEGEND

Boundary Features:
Falling Boundary
Heli Splitline
Adjacent Block-Planned
Harvested
Legal Boundary
Pruning
Feathering

Road Features:
Built Road
Deactivated Road
Proposed Road
Backspar Trail
Access Trail
Bridge
Road Station
Existing Culvert
New Culvert
Culvert to be replaced

Natural Features:
Windthrow
Snag
Swamp
Slide
Rock Bluff/Outcrop
Karst Feature

Resource Features:
Hazard
Single Tree Retention
Monumental Cedar
Archaeological Feature/CMT
Quarry/Gravel Pit
Bear Den/Bird Nest
Helipad/Service Landing
Index Contour
Intermediate Contour

Riparian Features:
Fish Streams (S1-S4)
Non Fish streams (S5, S6)
Unclassified Creek
Non Classified Drainage
Gully
FSZ Stream
Reach Break/Fish Barrier
Stream ID

Lakes/Wetlands:
Lakes Class 1, 2, 3, 4
Wetlands Class 1, 2, 3, 4, 5

Sensitive and Designated Areas:
Wildlife Tree Retention Area
Timber Leave Area
Special Management Zone

Road Construction:
Steep Grade
Full Bench EndHaul
Full Bench Partial EndHaul
Spoil Site
RMA Infringement

Road Reactivation:
Case 1
Case 2
Case 3
Case 4
Additional Works. See Comments.

Prepared By:
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MAP 1 of 1 | **Cutting Permit: 005** | **Road Permit: R18553** | **B11 - Bookhout Creek**

Appendix 2: Road Instructions

ROAD INSTRUCTIONS – OPENINGS #B11 and B12

ACCESS ROAD: TF31E **CUTTING PERMIT: N0. 5** **TIMBERMARK: K2D 0R1**

RAINFALL SHUTDOWN CRITERIA

Cutblock B11 and B12 are within Rainfall Shutdown Area "5"
Shutdown Criteria: Activities must shut down if: The total rainfall reaches 36 mm in 24 hours. Onsite rain gages should be used and monitored daily.
Start-Up Criteria: Activities may start-up when: The total rainfall is equal to or less than 30 mm in 24 hours. Refer to the Return to Work Guide in the tender document for more information.
Adequate recovery time should be given before building operations commence after a shutdown.

ROAD NAME	START STATION	END STATION	TYPE OF WORK/COMMENTS
B11-S1	0+000	0+498	Reactivation Case 1 (widening up to 2m with no rock, removal of vegetation and sloughing material from the road prism, re-ditching and cleaning of culverts).
B11-S1	0+498	0+540	Reactivation Case 2 (widening up to 2m with drilling or blasting required, removal of vegetation and sloughing material from the road prism, re-ditching and cleaning of culverts).
B11-S1	0+540	1+051	Reactivation Case 1 (widening up to 2m with no rock, removal of vegetation and sloughing material from the road prism, re-ditching and cleaning of culverts).
B11-S1	1+051	1+076	Reactivation Case 2 (widening up to 2m with drilling or blasting required, removal of vegetation and sloughing material from the road prism, re-ditching and cleaning of culverts).
B11-S1	1+076	1+269	Reactivation Case 1 (widening up to 2m with no rock, removal of vegetation and sloughing material from the road prism, re-ditching and cleaning of culverts).
B11-S1	1+269	1+724	New Construction
B11-S2	0+000	0+614	New Construction

ROAD NAME	STATION	RIPARIAN ID	RIPARIAN CLASS	DEBRIS TRANSPORT POTENTIAL	CULVERT / BRIDGE SIZE	DESIGNED PEAK FLOW	Special instructions for operations within or adjacent to RMA
B11-S1	0+121	-	-	-	600	X-Drain	OPENINGS B11 AND B12 LIE WITHIN THE SPROAT LAKE COMMUNITY WATERSHED. ALL STREAM CROSSINGS ARE TO BE ARMORED WITH COARSE ROCK MATERIAL TO MINIMIZE THE TRANSPORT OF FINES DOWN STREAM.
B11-S1	0+312	-	-	-	600	X-Drain	
B11-S1	0+365	2	S4	Low	800	Q-100	
B11-S1	0+449	-	-	-	600	X-Drain	
B11-S1	0+624	-	-	-	600	X-Drain	
B11-S1	0+759	-	-	-	600	X-Drain	
B11-S1	0+931	3	S4	Low	900	Q-100	
B11-S1	1+137	3	S4	Low	900	Q-100	
B11-S1	1+212	-	-	-	600	X-Drain	
B11-S1	1+633	-	-	-	600	X-Drain	
B11-S2	0+100	-	-	-	600	X-Drain	
B11-S2	0+396	-	-	-	600	X-Drain	
B11-S2	0+512	2	S4	Low	600	X-Drain	
B11-S2	0+577	-	-	-	600	X-Drain	

GENERAL INSTRUCTIONS

All employees, supervisors and contractors associated with these Harvest Instructions shall be fully advised of their contents and requirements.
All litter including cable, oil buckets, grease tubes, newspapers, and lunch garbage is to be placed in appropriate garbage containers and removed from the site for proper disposal concurrent with all operations.

ADDITIONAL INSTRUCTIONS

[1] R/W clearing widths to be 25 meters unless a larger width is required for safety or otherwise prescribed.
[2] Prior approval must be obtained from AVCF if falling beyond right-of-way clearing is required for spoil sites or quarries.
[3] Proposed cross-drain culvert locations are approximate. Site specific installation to within ±25m is acceptable. Installation beyond this distance constitutes a 'change of plan' and requires prior approval from AVCF.
[4] Equipment must not be fuelled or serviced within the riparian management area (RMA) of a stream, lake or wetland. Do not park any equipment within an RMA overnight.
[5] Ensure that licensed water works are notified of road activities 48 hours prior to activity.
RMA distances: STREAMS: S1 - 70 meters, S2 – 50 meters, S3 – 40 meters, S4 – 30 meters, S5 – 30 meters, S6 – 20 meters, LAKES: L1 – 10 meters, L3 – 30 meters, WETLANDS: W1, W5 – 50meters, W3 – 30 meters.
[6] Avoid quarry locations within the RMA of any stream; where avoidance is not practical, quarries may be located within the RMA of a S6 stream if no impacts (i.e. increased sedimentation) will occur to the stream. All other streams (i.e. S1 to S5) require prior approval from AVCF before a quarry may be located within its RMA. Do not deck or process wood within RMA's.
[7] Cultural Resources: If an unidentified cultural heritage resource is encountered within the cutblock during any harvesting phase, operations will cease in the immediate vicinity of the feature and AVCF shall be notified immediately.
[8] Wildlife Resources: In the event any unidentified bear dens or raptor nest trees are encountered during falling, but before the tree has been cut, the faller will go elsewhere for the day and report this potential wildlife tree to a AVCF Supervisor. Fallers are not to return to the vicinity of the wildlife tree until notification from AVCF has been given. If the discovery of a bear den or potential nest tree occurs while the tree is being felled, the decision to proceed is at the faller's discretion in regards to safety and Worksafe BC requirements. If it is unsafe to leave the tree partially cut, the faller will complete falling the tree and report the incident to AVCF.
[9] Fish Streams: Due to the close proximity of fish streams, ensure a high level of diligence is maintained regarding stream bank protection, in-stream woody debris disturbance and protection of stream banks at designated crossings.
[10] Invasive Plants: Broom occurs along sections of the highway on route to the block. Follow FSP measures for invasive plants. Cut and remove plants in association with road reactivation, clean machinery as required. Monitor and treat broom and other invasive species during early establishment. Grass seed exposed soil on or adjacent to roads, trails, and landing sites as soon as possible following harvest.

FALLING of SNAGS and DANGER TREES

In accordance with the Cutting Permit Authority and WorkSafe BC Regulations, all snags and danger trees that endanger workers within a distance of 50m outside the cutblock boundaries, or within one and a half tree lengths, (whichever is greater), are approved for falling under these harvest instructions. All danger trees and snags outside the cutblock boundaries that are required to be felled must be recorded on a map and provided to AVCF once falling has been completed. AVCF will be notified immediately if danger trees and/or snags are identified in groups and removal will result in the cutblock boundary being substantially impacted. Felled snags and danger trees up to 50m outside of the falling boundary meeting utilization specifications will be recovered.
EXCEPTION- Wildlife Tree Patch (WTP) areas - Snags or danger trees can be felled within a WTP for safety reasons although only the portion of the felled snags or danger trees that fall outside the WTP can be recovered.

CUTBLOCK BOUNDARY TREATMENTS

All marked boundary trees except snags and danger trees must remain standing during and after the completion of harvesting. Trees located along and adjacent to the cutblock edges (i.e. within the harvest boundary) that must be felled outside the harvest area must be recovered unless a physical, safety or environmental issue exists (e.g. deep gullies, steep breaks, fish creek, etc.). Trees that cannot be recovered may be left standing, if they are safe to leave, as wildlife trees. These trees must be recorded on a map and provided to AVCF once falling is complete; If unsure how to proceed, contact AVCF.

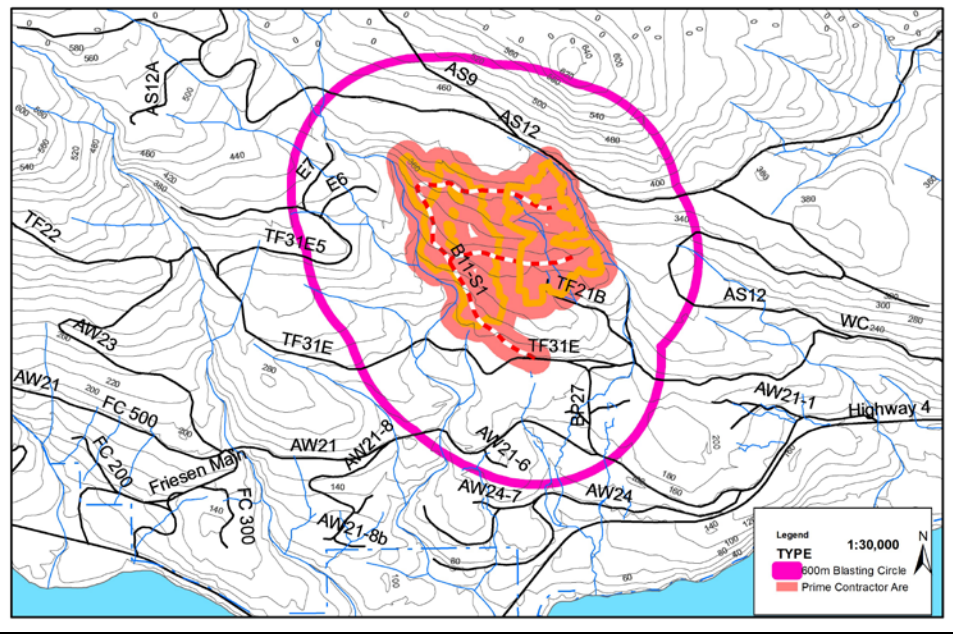
SAFETY

Road and in-block safety hazards associated with B11 and B12 have been identified on the harvest and road instruction map. In the event additional in-block safety hazards (temporary or permanent) are encountered or develop during road construction or harvesting phases, a plan must be developed to address the hazard. Any identified permanent hazards must be reported back to AVCF (using Hazard/Issue Report Form).

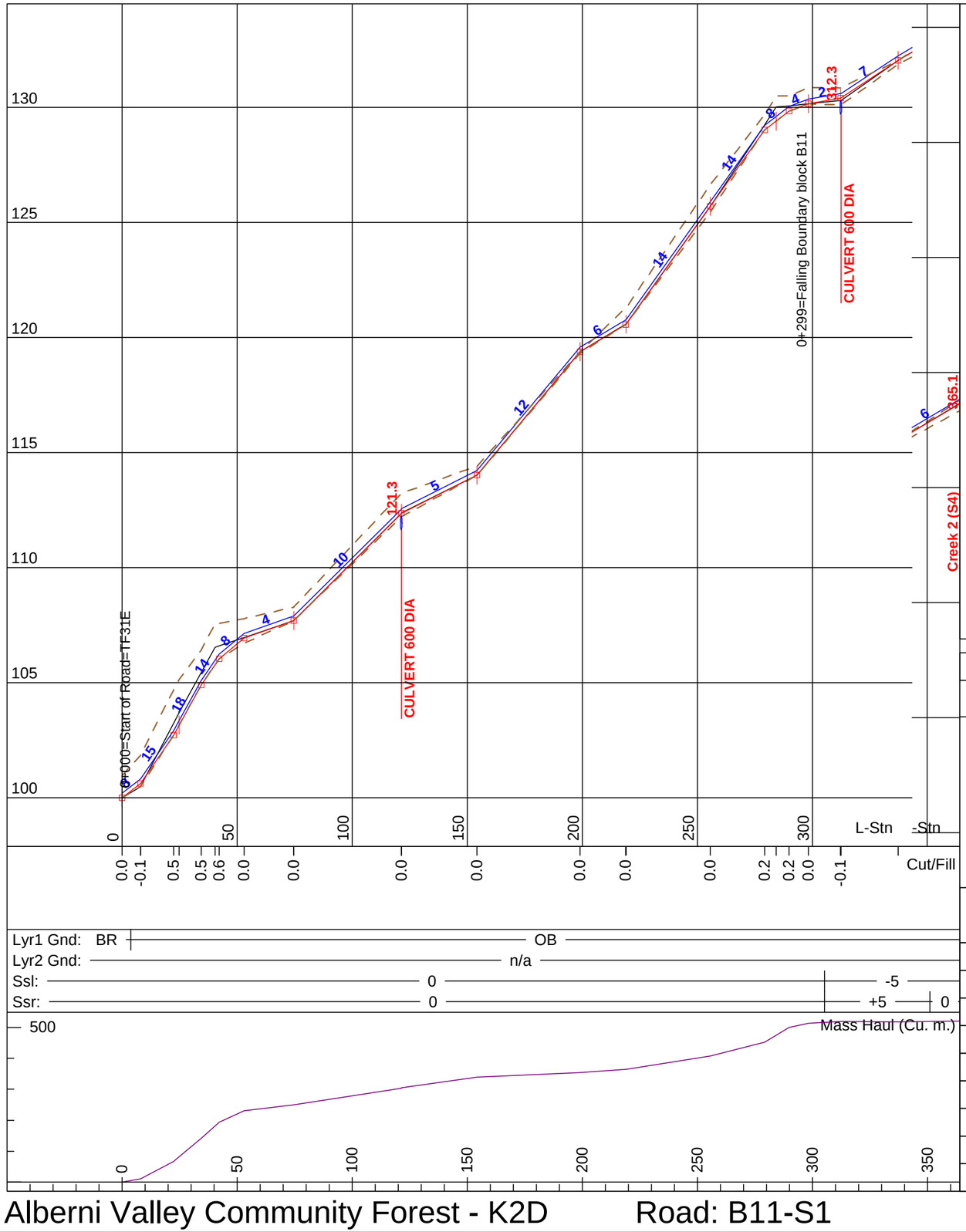
STEEP GRADES

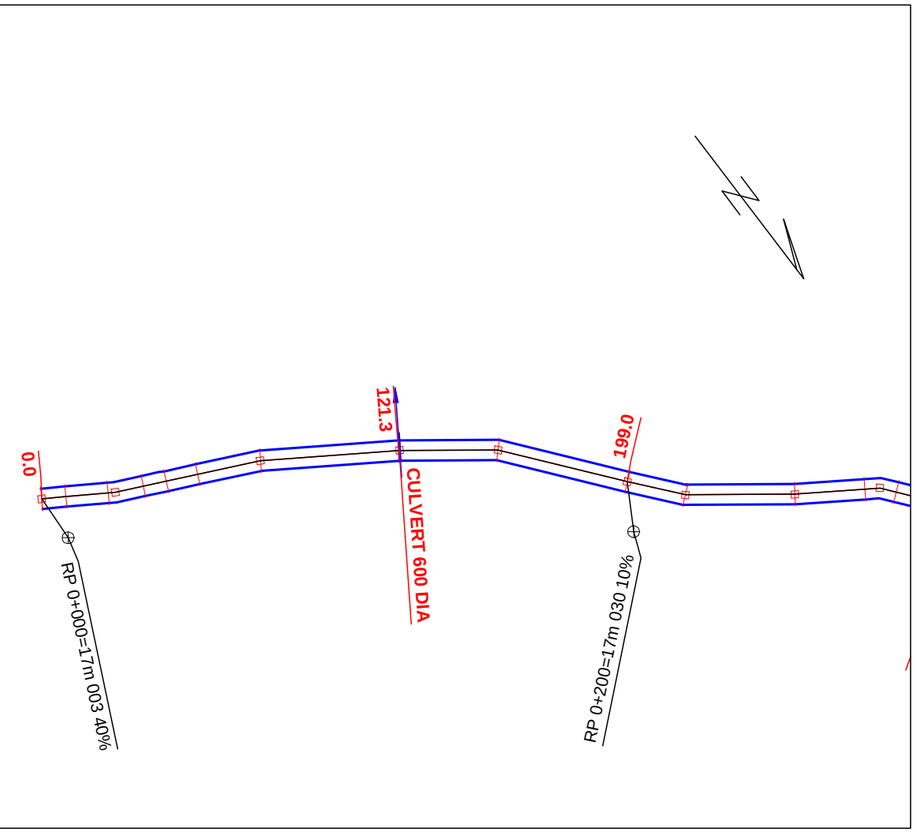
Road segments with gradients > 18% have been identified on the Harvest and Road instruction Plan Map. Prior to commencing log hauling operations the contractor must perform a risk assessment of the current conditions and adjust hauling activities to suit the traction conditions. Hauling for B11 and B12 will not be permitted when ice and or snow is on the logging roads leading to or in the given setting (very low traction level). This has been determined using FERRIC step grade decent guidelines. The Ministry of Transportation guidelines are to be followed once on the highway.

PRIME CONTRACTOR – Workplace Area of Responsibility
Blasting Circle



Appendix 3: Road Profiles





Alberni Valley Community Forest K2D Sproat Unit

Cutblock: B11
Road: B11-S1

Road Design

0+000 to 1+724

Notes:
(1) Side slopes are derived from an average of the first slope % measured off of centerline in 20m segments.

(2) Watch for Rockfall in steep areas.

(3) Follow AVCF Rainfall Shutdown Guidelines.

(4) Background information is approximate. Refer closely to Contruction and Harvest maps.

CULVERT SUMMARY

L-Stn m.	Cul DIA mm.	Cul Len m.	Lyr1 Gnd	Ssl %	Ssr %	Mass H. Cu. m.
121.3	600	10.0	OB	0	0	304.1

SOIL TYPE LEGEND

Symbol	Material Type	Cut Slope	Fill Slope
LB	Local Ballast	100%	67%
PR	Pit Run Ballast	100%	67%
RB	Rock Ballast	100%	67%
TR	Toe Rock	200%	67%
MR	Medium Rock	400%	100%
HR	High Rock	400%	100%
XR	Heavy Rock	400%	100%
XX	Extra Heavy Rock	400%	100%

LEGEND

- Profile Finished Grade
- Profile Subgrade
- Profile/Plan P-line Topography
- Profile/Plan Slope Stakes
- Plan Road Edges
- Culverts
- ⊕ Reference Points (RP)

Designed By: Meridian Forest Services Ltd.

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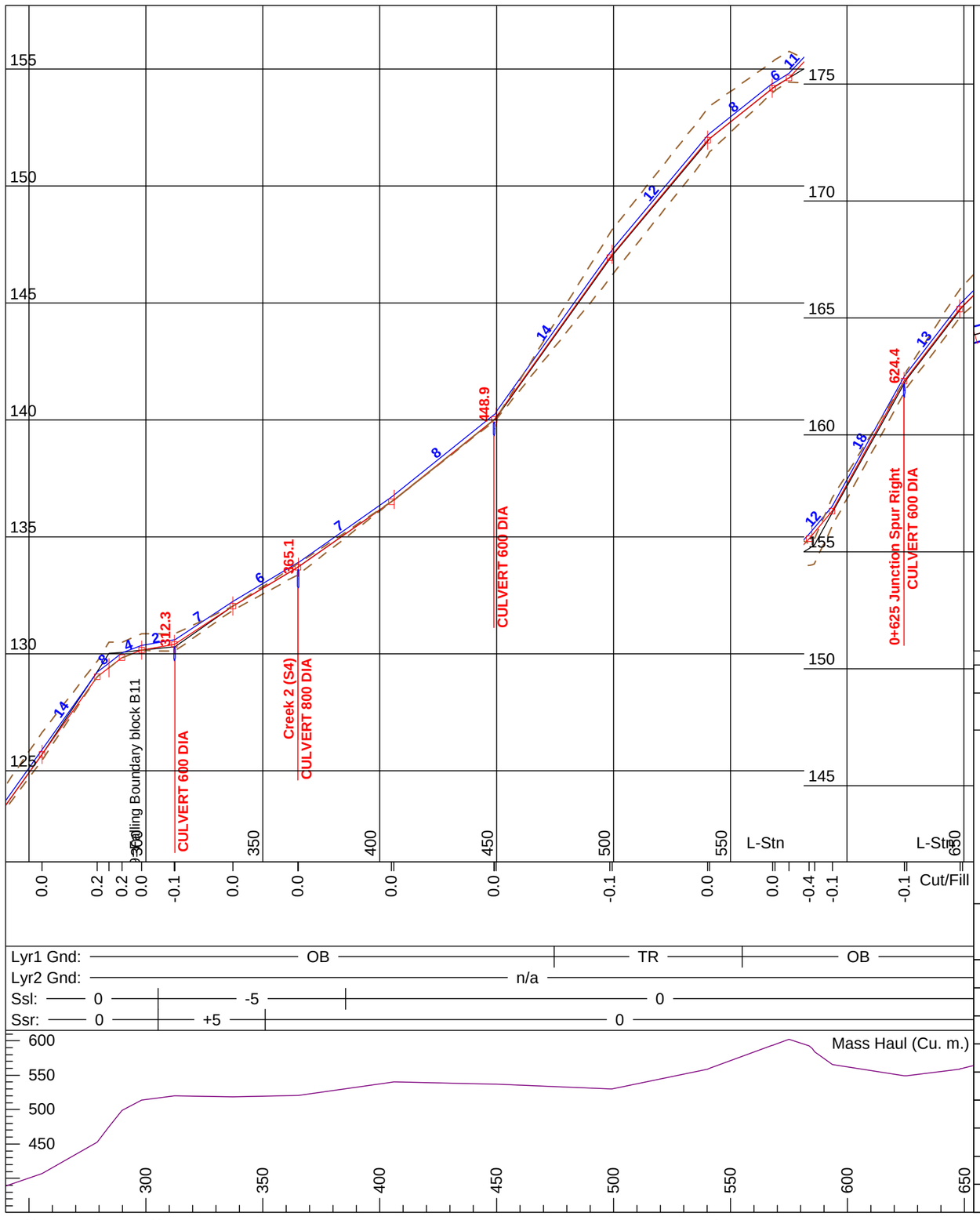
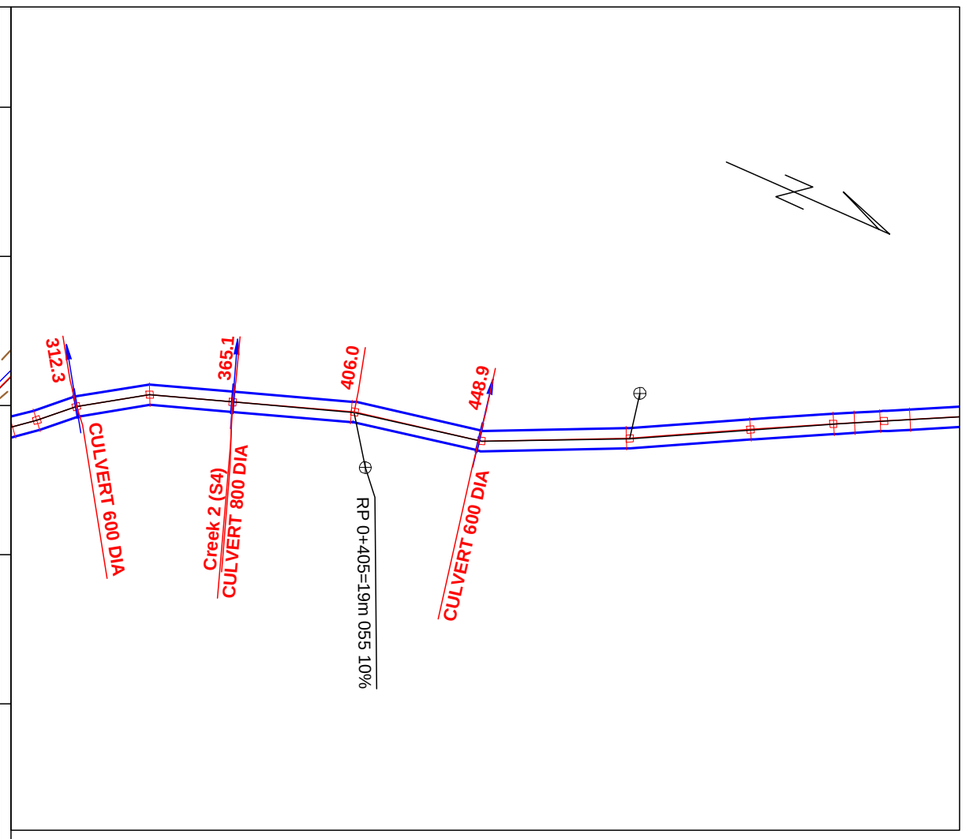




Alberni Valley Community Forest K2D
Sproat Unit

Cutblock: B11
Road: B11-S1

Road Design

0+000 to 1+724

Notes:
(1) Side slopes are derived from an average of the first slope % measured off of centerline in 20m segments.

(2) Watch for Rockfall in steep areas.

(3) Follow AVCF Rainfall Shutdown Guidelines.

(4) Background information is approximate. Refer closely to Contruction and Harvest maps.

CULVERT SUMMARY

L-Stn m.	Cul DIA mm.	Cul Len m.	Lyr1 Gnd	Ssl %	Ssr %	Mass H. Cu. m.
312.3	600	10.0	OB	-5	5	519.7
365.1	800	10.0	OB	-5	0	520.7
448.9	600	10.0	OB	0	0	537.2

SOIL TYPE LEGEND

Symbol	Material Type	Cut Slope	Fill Slope
LB	Local Ballast	100%	67%
PR	Pit Run Ballast	100%	67%
RB	Rock Ballast	100%	67%
TR	Toe Rock	200%	67%
MR	Medium Rock	400%	100%
HR	High Rock	400%	100%
XR	Heavy Rock	400%	100%
XX	Extra Heavy Rock	400%	100%

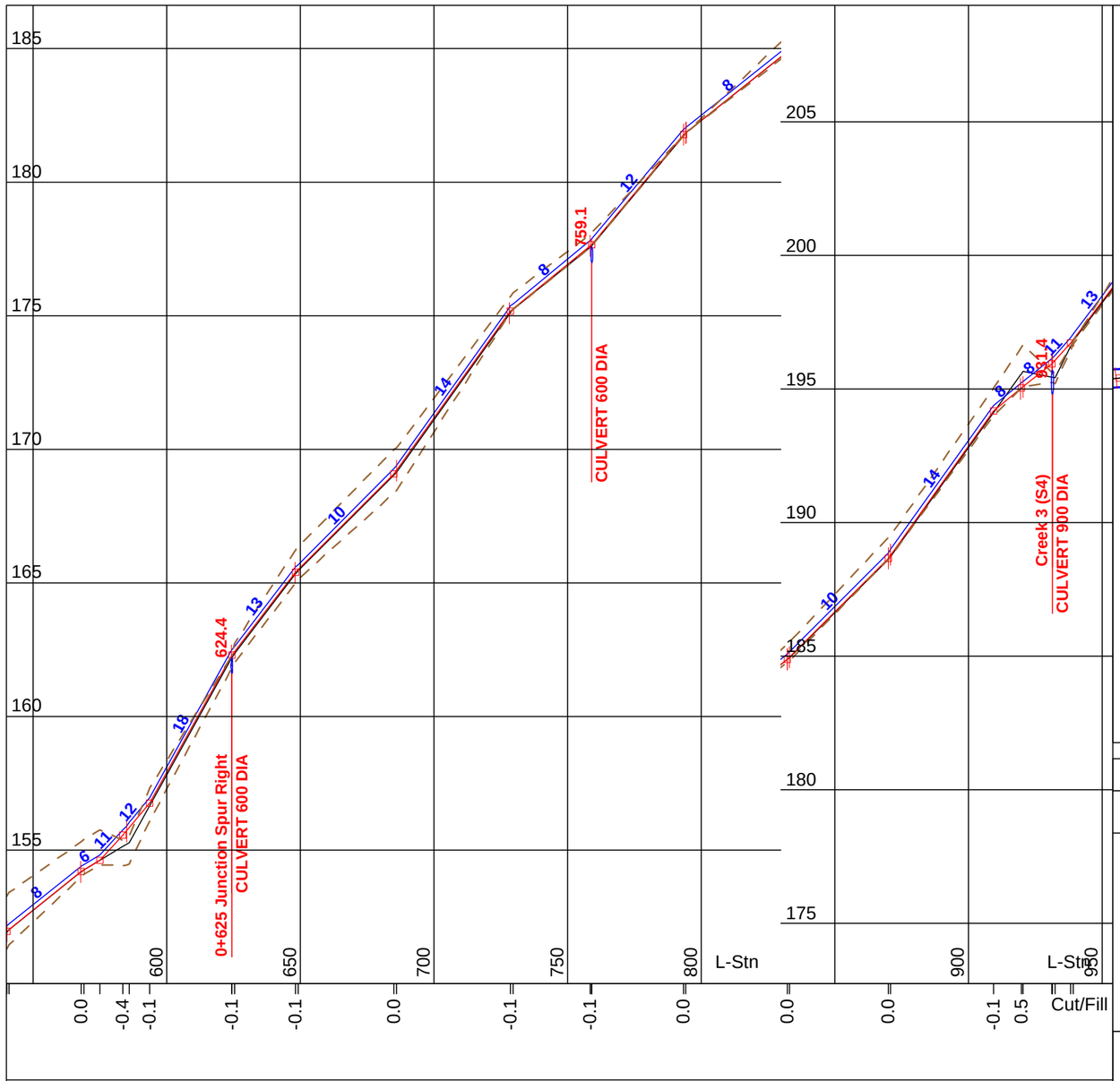
LEGEND

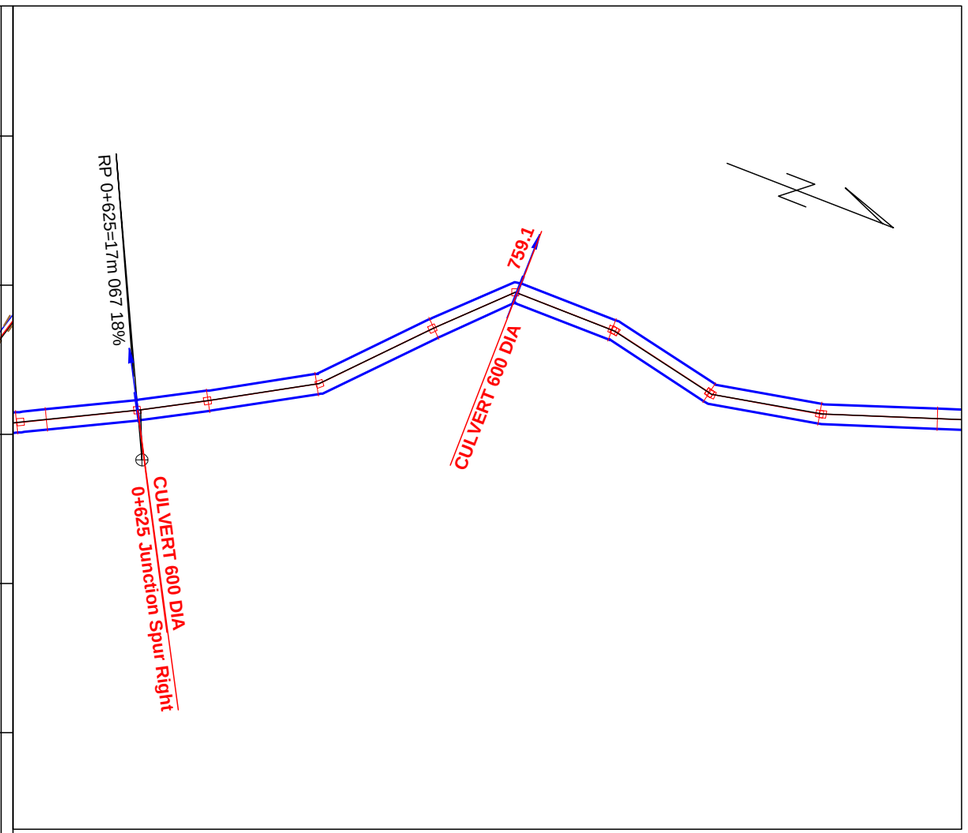
- Profile Finished Grade
- Profile Subgrade
- Profile/Plan P-line Topography
- Profile/Plan Slope Stakes
- Plan Road Edges
- Culverts
- Reference Points (RP)

Designed By: Meridian Forest Services Ltd.

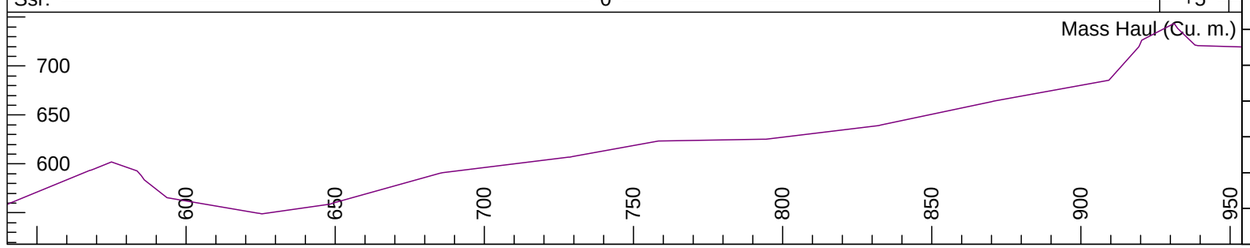
MERIDIAN Forest Services Ltd.
PO Box 275
#15-1010 Shearme Road
Coombs, BC V0R 1M0
www.meridianforest.ca

M:\Alberni Valley Community Forest Corp\Cutblocks\Sproat Unit\B11_old_W16\GIS_Data\Road_Eng_Files\B11_RDS_Combined\B11-S1_combined.dsn





Lyr1 Gnd: OB
Lyr2 Gnd: n/a
Ssl: 0 -5
Ssr: 0 +5



Alberni Valley Community Forest K2D Sproat Unit

Cutblock: B11
Road: B11-S1

Road Design

0+000 to 1+724

Notes:
(1) Side slopes are derived from an average of the first slope % measured off of centerline in 20m segments.

(2) Watch for Rockfall in steep areas.

(3) Follow AVCF Rainfall Shutdown Guidelines.

(4) Background information is approximate. Refer closely to Contruction and Harvest maps.

CULVERT SUMMARY

L-Stn m.	Cul DIA mm.	Cul Len m.	Lyr1 Gnd	Ssl %	Ssr %	Mass H. Cu. m.
624.4	600	10.0	OB	0	0	549.4
759.1	600	10.0	OB	0	0	623.7

SOIL TYPE LEGEND

Symbol	Material Type	Cut Slope	Fill Slope
LB	Local Ballast	100%	67%
PR	Pit Run Ballast	100%	67%
RB	Rock Ballast	100%	67%
TR	Toe Rock	200%	67%
MR	Medium Rock	400%	100%
HR	High Rock	400%	100%
XR	Heavy Rock	400%	100%
XX	Extra Heavy Rock	400%	100%

LEGEND

- Profile Finished Grade
- Profile Subgrade
- Profile/Plan P-line Topography
- Profile/Plan Slope Stakes
- Plan Road Edges
- Culverts
- Reference Points (RP)

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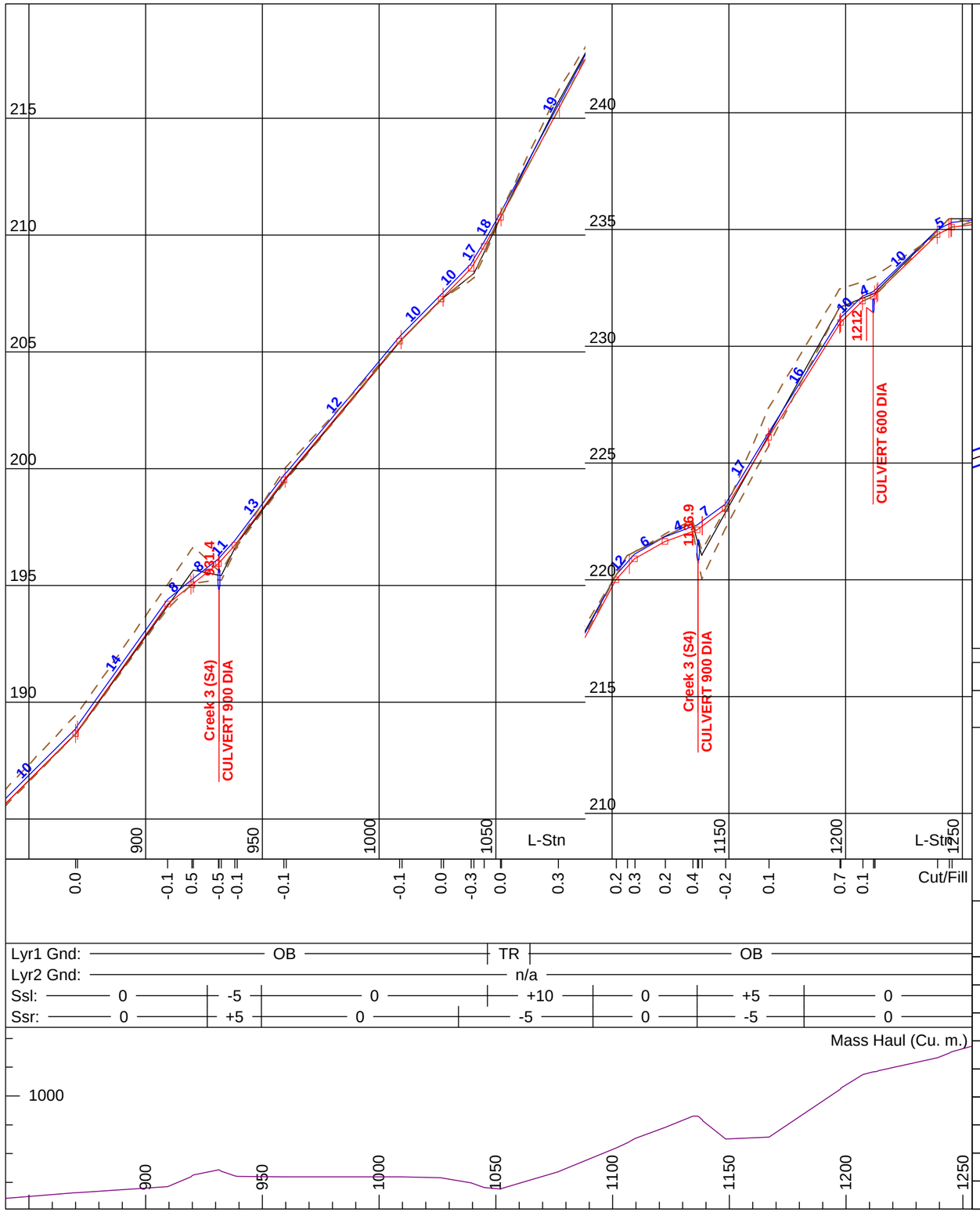
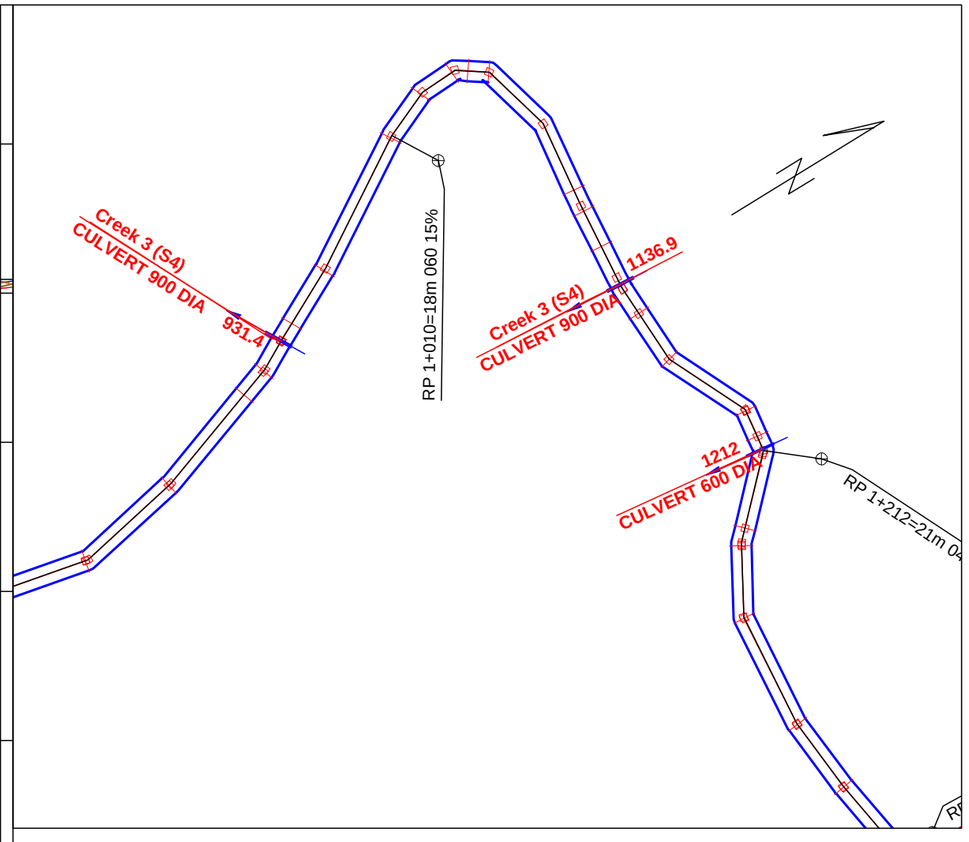
M:\Alberni Valley Community Forest Corp\Cutblocks\Sproat Unit\B11_old_W16\GIS_Data\Road_Eng_Files\B11_RDS_Combined\B11-S1_combined.dsn





Alberni Valley Community Forest K2D Sproat Unit

Cutblock: B11
Road: B11-S1

Road Design

0+000 to 1+724

Notes:
(1) Side slopes are derived from an average of the first slope % measured off of centerline in 20m segments.

(2) Watch for Rockfall in steep areas.

(3) Follow AVCF Rainfall Shutdown Guidelines.

(4) Background information is approximate. Refer closely to Contruction and Harvest maps.

CULVERT SUMMARY

L-Stn m.	Cul DIA mm.	Cul Len m.	Lyr1 Gnd	Ssl %	Ssr %	Mass H. Cu. m.
931.4	900	10.0	OB	-5	5	743.0
1136.9	900	10.0	OB	5	-5	928.7

SOIL TYPE LEGEND

Symbol	Material Type	Cut Slope	Fill Slope
LB	Local Ballast	100%	67%
PR	Pit Run Ballast	100%	67%
RB	Rock Ballast	100%	67%
TR	Toe Rock	200%	67%
MR	Medium Rock	400%	100%
HR	High Rock	400%	100%
XR	Heavy Rock	400%	100%
XX	Extra Heavy Rock	400%	100%

LEGEND

- Profile Finished Grade
- Profile Subgrade
- Profile/Plan P-line Topography
- Profile/Plan Slope Stakes
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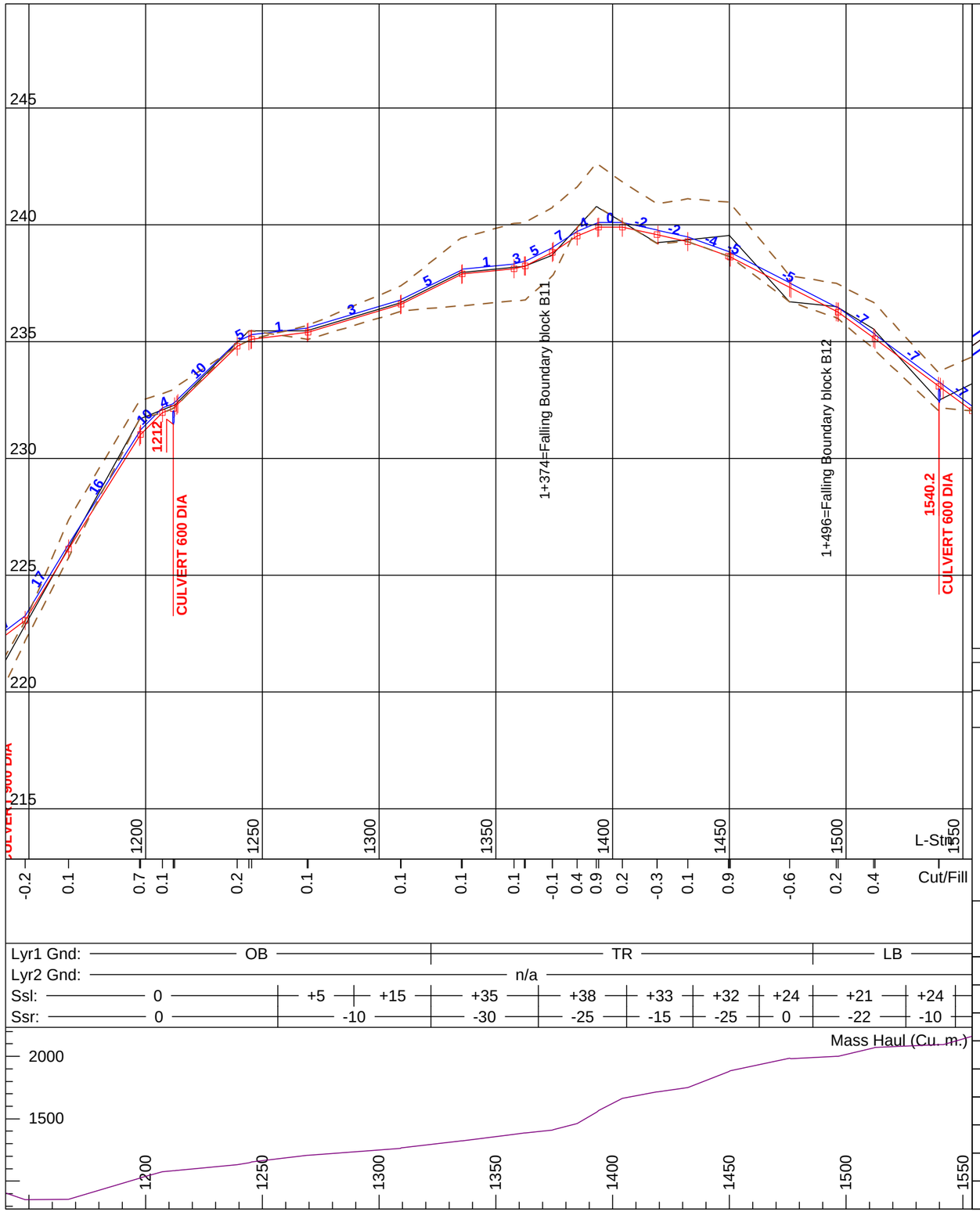

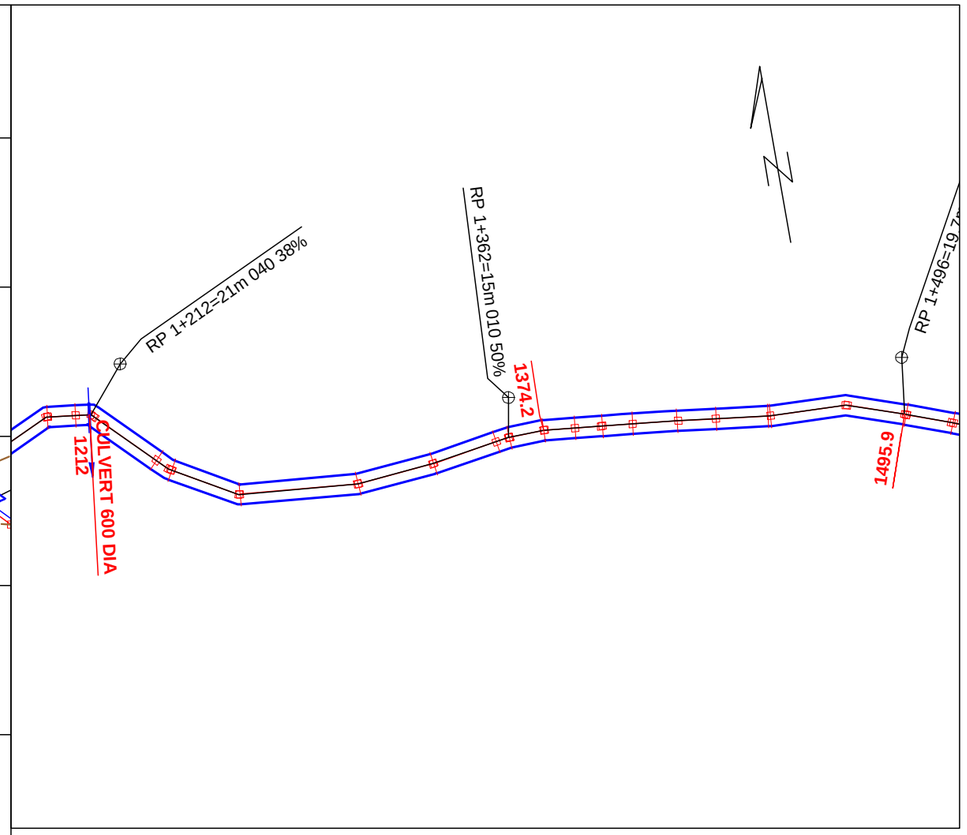

Alberni Valley Community Forest K2D Sproat Unit

Cutblock: B11
Road: B11-S1

Road Design

0+000 to 1+724

Notes:
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(2) Watch for Rockfall in steep areas.

(3) Follow AVCF Rainfall Shutdown Guidelines.

(4) Background information is approximate. Refer closely to Contruction and Harvest maps.

CULVERT SUMMARY

L-Stn m.	Cul DIA mm.	Cul Len m.	Lyr1 Gnd	Ssl %	Ssr %	Mass H. Cu. m.
1211.9	600	10.0	OB	0	0	1083.8

SOIL TYPE LEGEND

Symbol	Material Type	Cut Slope	Fill Slope
LB	Local Ballast	100%	67%
PR	Pit Run Ballast	100%	67%
RB	Rock Ballast	100%	67%
TR	Toe Rock	200%	67%
MR	Medium Rock	400%	100%
HR	High Rock	400%	100%
XR	Heavy Rock	400%	100%
XX	Extra Heavy Rock	400%	100%

LEGEND

- Profile Finished Grade
- Profile Subgrade
- Profile/Plan P-line Topography
- Profile/Plan Slope Stakes
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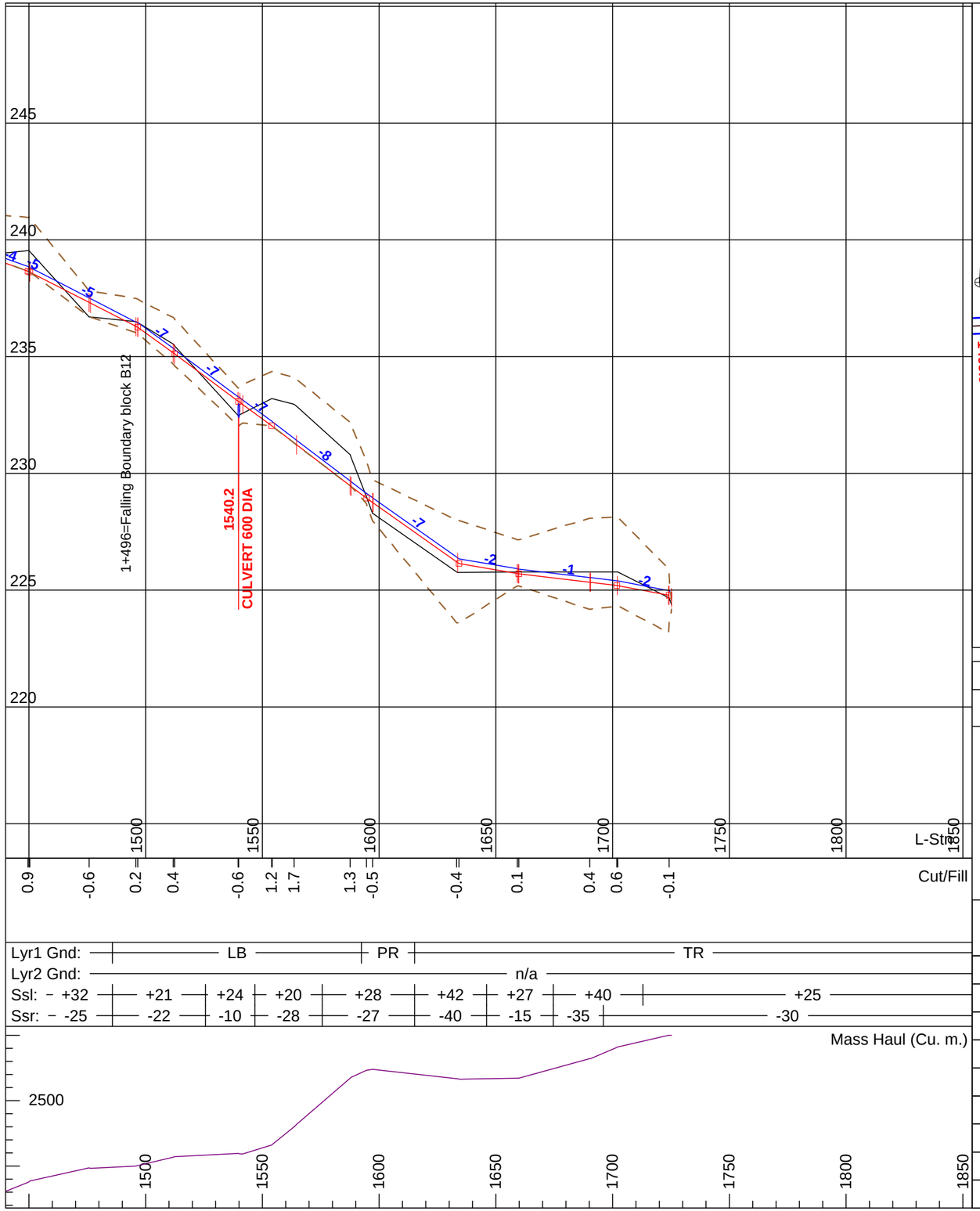

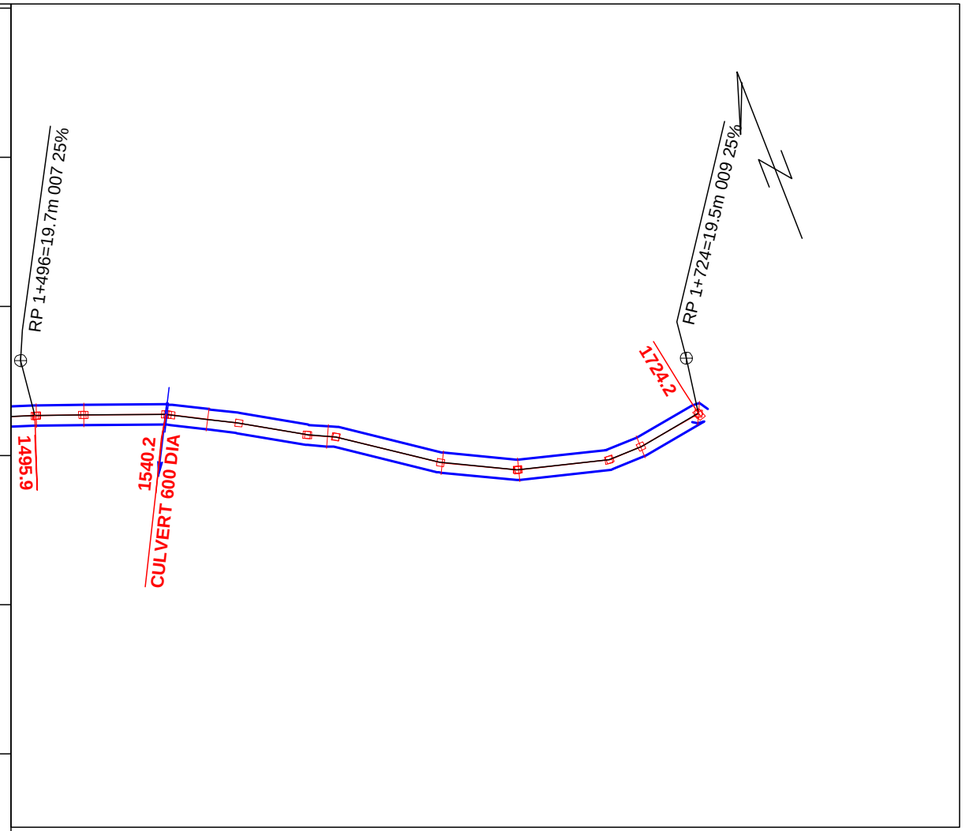

Alberni Valley Community Forest K2D Sproat Unit

Cutblock: B11
Road: B11-S1

Road Design

0+000 to 1+724

Notes:
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(2) Watch for Rockfall in steep areas.

(3) Follow AVCF Rainfall Shutdown Guidelines.

(4) Background information is approximate. Refer closely to Contruction and Harvest maps.

CULVERT SUMMARY

L-Stn m.	Cul DIA mm.	Cul Len m.	Lyr1 Gnd	Ssl %	Ssr %	Mass H. Cu. m.
1539.9	600	10.0	LB	24	-10	2095.4

SOIL TYPE LEGEND

Symbol	Material Type	Cut Slope	Fill Slope
LB	Local Ballast	100%	67%
PR	Pit Run Ballast	100%	67%
RB	Rock Ballast	100%	67%
TR	Toe Rock	200%	67%
MR	Medium Rock	400%	100%
HR	High Rock	400%	100%
XR	Heavy Rock	400%	100%
XX	Extra Heavy Rock	400%	100%

LEGEND

- Profile Finished Grade
- Profile Subgrade
- Profile/Plan P-line Topography
- Profile/Plan Slope Stakes
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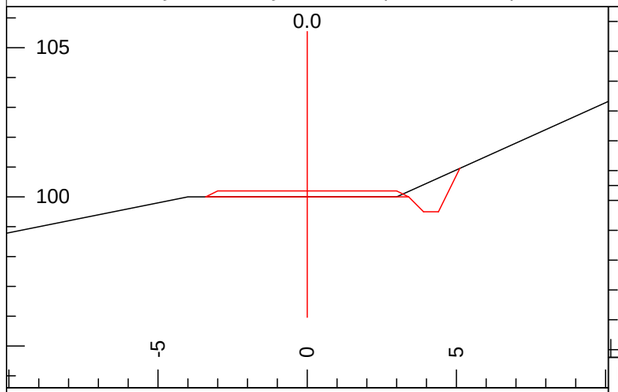
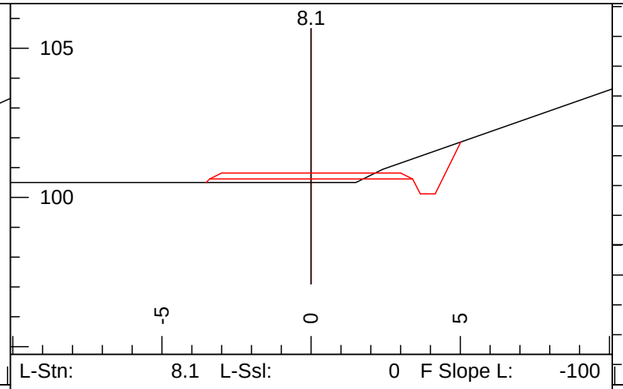
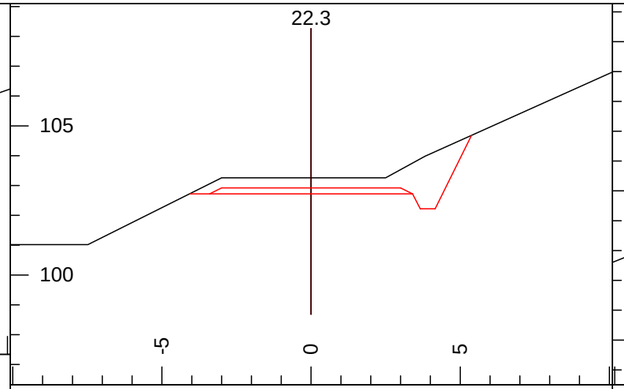
ROADENG Section	Scale 1:200	P. 1
M:\Alberni Valley Community Forest Corp\Cutblocks\Sproat Unit\B11_old_W16\GIS_Data\Road_Eng_Files\B11_RDS_Combined\B11-S1_combined		13/04/12



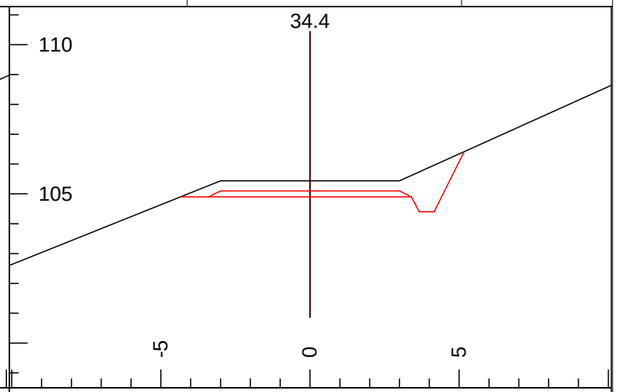
L-Stn:	0.0	Grd.Lst:	n/a	Super L:	0	F Slope R:	200
P-Stn:	0.0	L-Ssl:	0	Super R:	0	Cut Dp:	0.0
Grd.Nxt.:	8	L-Ssr:	0	F Slope L:	0		



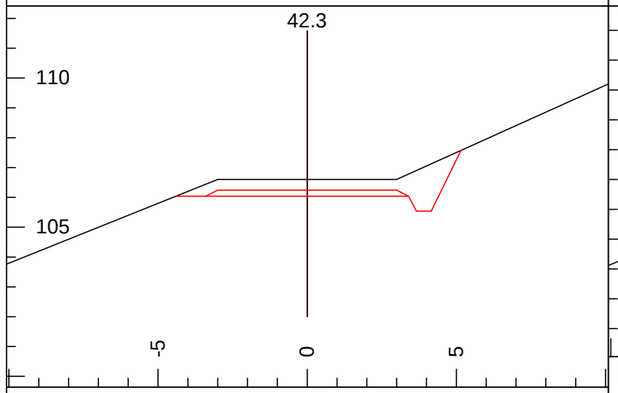
L-Stn:	8.1	L-Ssl:	0	F Slope L:	-100		
P-Stn:	8.1	L-Ssr:	0	F Slope R:	200		
Grd.Nxt.:	15	Super L:	0	Cut Dp:	-0.1		
Grd.Lst:	8	Super R:	0				



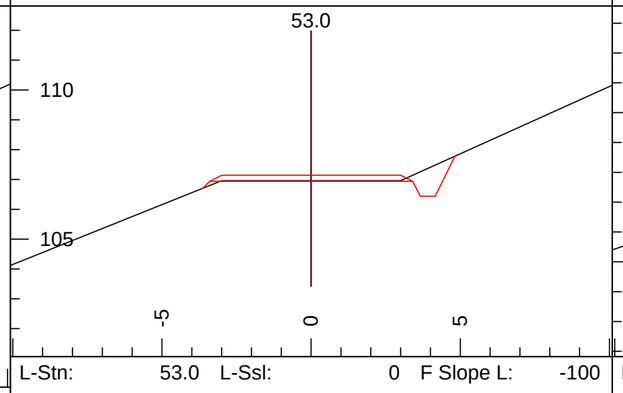
L-Stn:	22.3	Grd.Lst:	15	Super L:	0	F Slope R:	200
P-Stn:	22.3	L-Ssl:	0	Super R:	0	Cut Dp:	0.5
Grd.Nxt.:	18	L-Ssr:	0	F Slope L:	0		



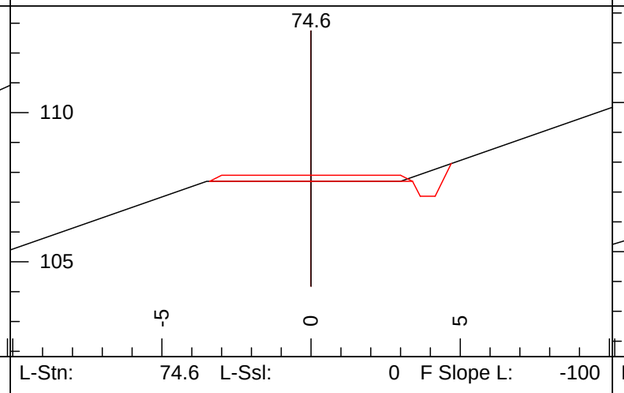
L-Stn:	34.4	Grd.Lst:	18	Super L:	0	F Slope R:	200
P-Stn:	34.4	L-Ssl:	0	Super R:	0	Cut Dp:	0.5
Grd.Nxt.:	14	L-Ssr:	0	F Slope L:	0		



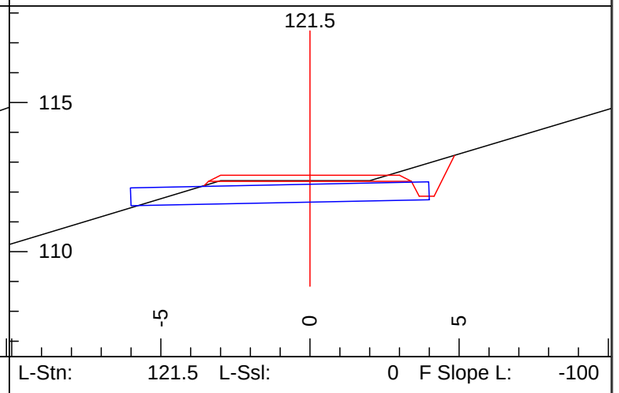
L-Stn:	42.3	Grd.Lst:	14	Super L:	0	F Slope R:	200
P-Stn:	42.3	L-Ssl:	0	Super R:	0	Cut Dp:	0.6
Grd.Nxt.:	8	L-Ssr:	0	F Slope L:	0		



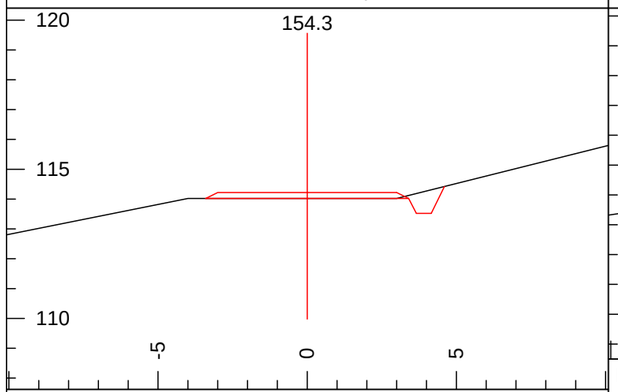
L-Stn:	53.0	L-Ssl:	0	F Slope L:	-100		
P-Stn:	53.0	L-Ssr:	0	F Slope R:	200		
Grd.Nxt.:	4	Super L:	0	Cut Dp:	0.0		
Grd.Lst:	8	Super R:	0				



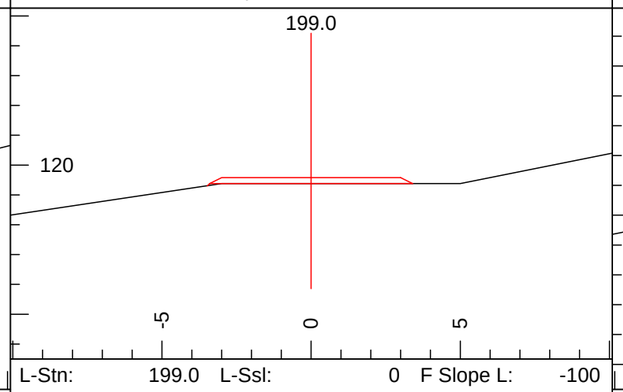
L-Stn:	74.6	L-Ssl:	0	F Slope L:	-100		
P-Stn:	74.6	L-Ssr:	0	F Slope R:	200		
Grd.Nxt.:	10	Super L:	0	Cut Dp:	0.0		
Grd.Lst:	4	Super R:	0				



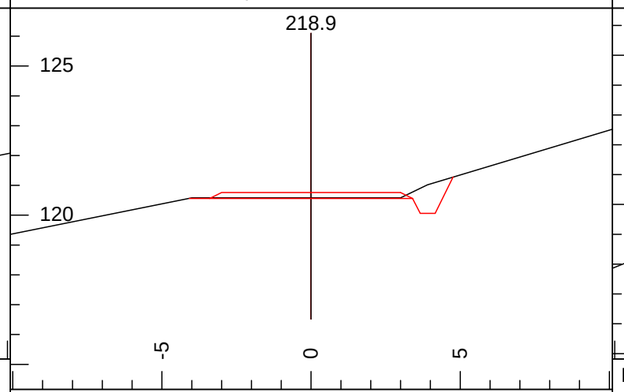
L-Stn:	121.5	L-Ssl:	0	F Slope L:	-100		
P-Stn:	121.5	L-Ssr:	0	F Slope R:	200		
Grd.Nxt.:	5	Super L:	0	Cut Dp:	0.0		
Grd.Lst:	10	Super R:	0				



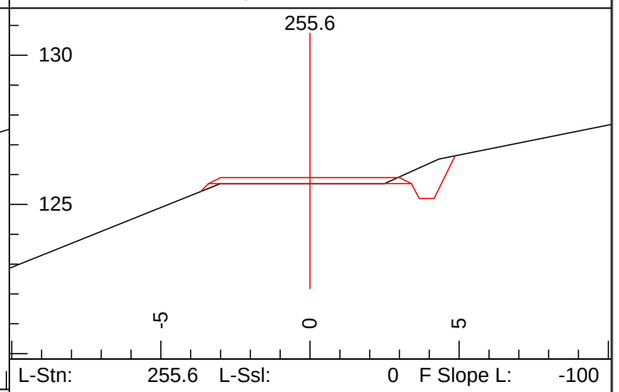
L-Stn:	154.3	Grd.Lst:	5	Super L:	0	F Slope R:	200
P-Stn:	154.3	L-Ssl:	0	Super R:	0	Cut Dp:	0.0
Grd.Nxt.:	12	L-Ssr:	0	F Slope L:	0		



L-Stn:	199.0	L-Ssl:	0	F Slope L:	-100		
P-Stn:	199.0	L-Ssr:	0	F Slope R:	0		
Grd.Nxt.:	6	Super L:	0	Cut Dp:	0.0		
Grd.Lst:	12	Super R:	0				

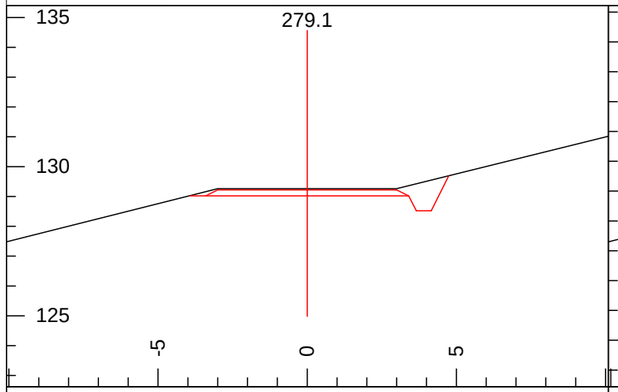


L-Stn:	218.9	Grd.Lst:	6	Super L:	0	F Slope R:	200
P-Stn:	218.9	L-Ssl:	0	Super R:	0	Cut Dp:	0.0
Grd.Nxt.:	14	L-Ssr:	0	F Slope L:	0		

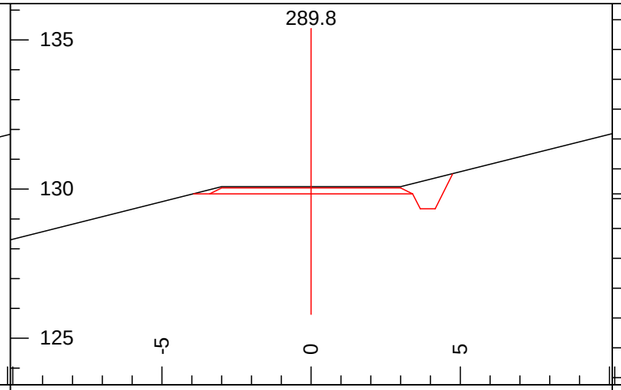


L-Stn:	255.6	L-Ssl:	0	F Slope L:	-100		
P-Stn:	255.6	L-Ssr:	0	F Slope R:	200		
Grd.Nxt.:	14	Super L:	0	Cut Dp:	0.0		
Grd.Lst:	14	Super R:	0				

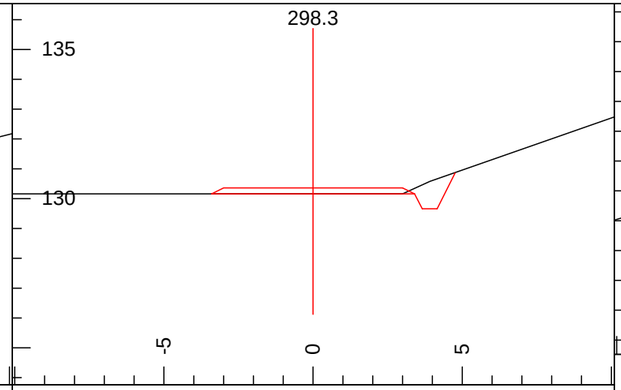
ROADENG Section	Scale 1:200	P. 2
M:\Alberni Valley Community Forest Corp\Cutblocks\Sproat Unit\B11_old_W16\GIS_Data\Road_Eng_Files\B11_RDS_Combined\B11-S1_combined		13/04/12



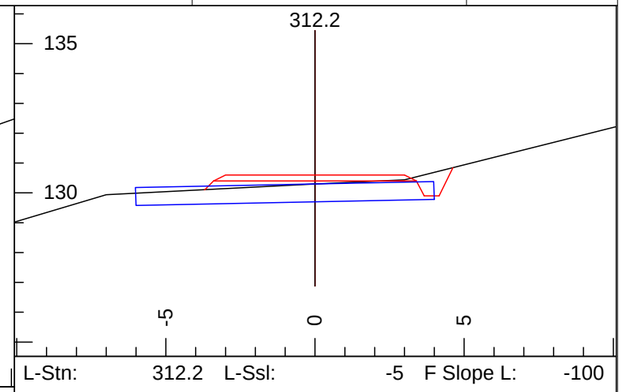
L-Stn:	279.1	Grd.Lst:	14	Super L:	0	F Slope R:	200
P-Stn:	279.1	L-Ssl:	0	Super R:	0	Cut Dp:	0.2
Grd.Nxt.:	8	L-Ssr:	0	F Slope L:	0		



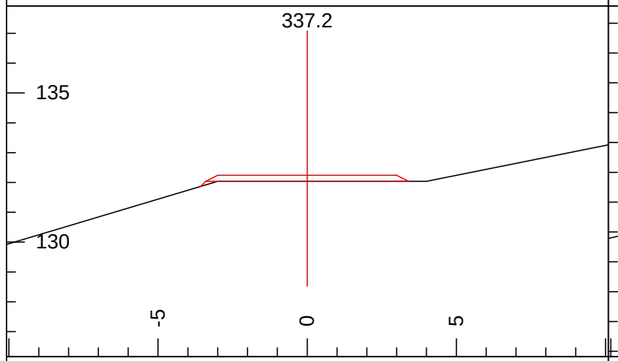
L-Stn:	289.8	Grd.Lst:	8	Super L:	0	F Slope R:	200
P-Stn:	289.8	L-Ssl:	0	Super R:	0	Cut Dp:	0.2
Grd.Nxt.:	4	L-Ssr:	0	F Slope L:	0		



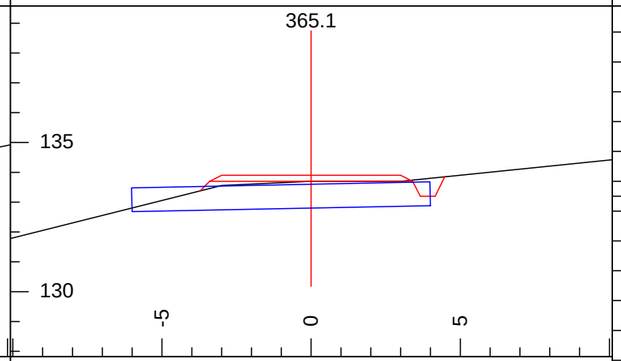
L-Stn:	298.3	Grd.Lst:	4	Super L:	0	F Slope R:	200
P-Stn:	298.3	L-Ssl:	0	Super R:	0	Cut Dp:	0.0
Grd.Nxt.:	2	L-Ssr:	0	F Slope L:	0		



L-Stn:	312.2	L-Ssl:	-5	F Slope L:	-100		
P-Stn:	312.3	L-Ssr:	5	F Slope R:	200		
Grd.Nxt.:	7	Super L:	0	Cut Dp:	-0.1		
Grd.Lst:	2	Super R:	0				



L-Stn:	337.2	L-Ssl:	0	F Slope L:	-100		
P-Stn:	337.2	L-Ssr:	0	F Slope R:	0		
Grd.Nxt.:	6	Super L:	0	Cut Dp:	0.0		
Grd.Lst:	7	Super R:	0				



L-Stn:	365.1	L-Ssl:	-5	F Slope L:	-100		
P-Stn:	365.1	L-Ssr:	0	F Slope R:	200		
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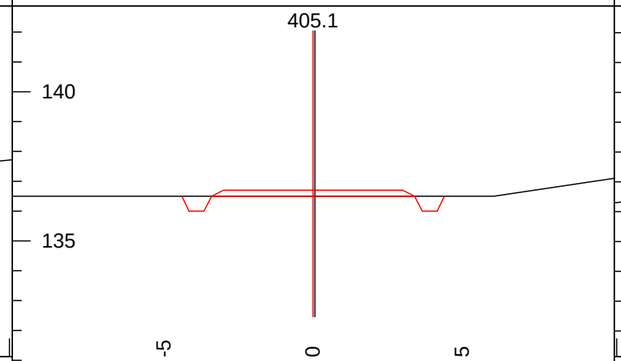
Grd.Lst:	6	Super R:	0				



L-Stn:	405.1	Grd.Lst:	7	Super L:	0	F Slope R:	200
P-Stn:	405.1	L-Ssl:	0	Super R:	0	Cut Dp:	0.0
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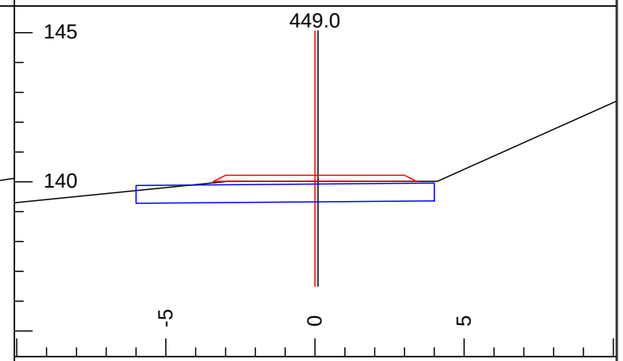
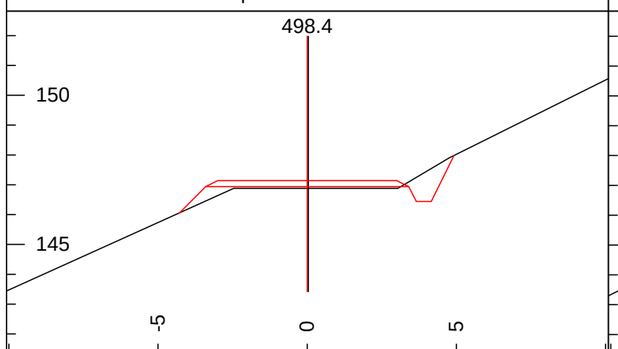
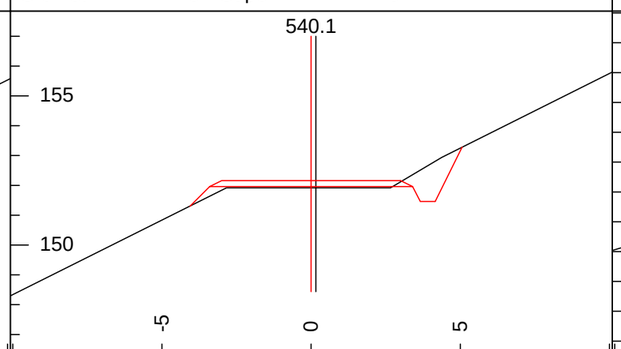


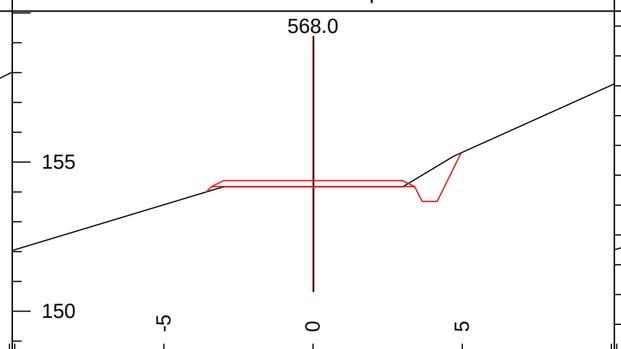
L-Stn:	449.0	L-Ssl:	0	F Slope L:	-100		
P-Stn:	449.0	L-Ssr:	0	F Slope R:	-100		
Grd.Nxt.:	14	Super L:	0	Cut Dp:	0.0		
Grd.Lst:	8	Super R:	0				



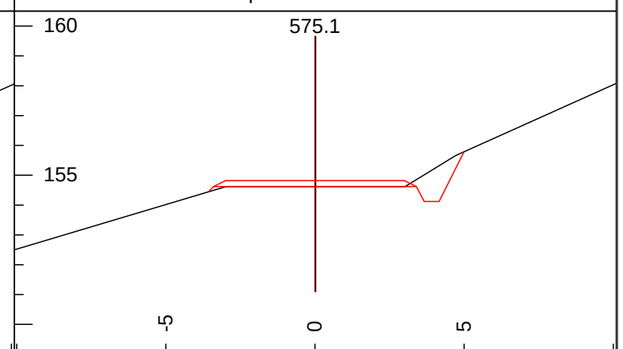
L-Stn:	498.4	L-Ssl:	0	F Slope L:	-100		
P-Stn:	498.4	L-Ssr:	0	F Slope R:	200		
Grd.Nxt.:	12	Super L:	0	Cut Dp:	-0.1		
Grd.Lst:	14	Super R:	0				



L-Stn:	540.1	L-Ssl:	0	F Slope L:	-100		
P-Stn:	540.1	L-Ssr:	0	F Slope R:	200		
Grd.Nxt.:	8	Super L:	0	Cut Dp:	0.0		
Grd.Lst:	12	Super R:	0				

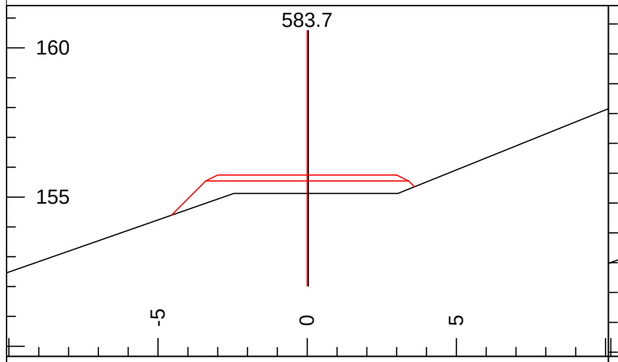


L-Stn:	568.0	L-Ssl:	0	F Slope L:	-100		
P-Stn:	568.0	L-Ssr:	0	F Slope R:	200		
Grd.Nxt.:	6	Super L:	0	Cut Dp:	0.0		
Grd.Lst:	8	Super R:	0				

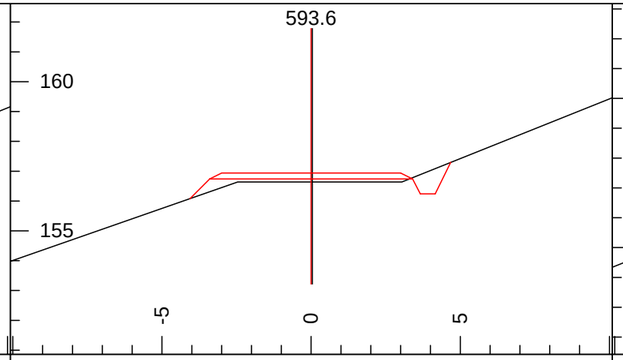


L-Stn:	575.1	L-Ssl:	0	F Slope L:	-100		
P-Stn:	575.1	L-Ssr:	0	F Slope R:	200		
Grd.Nxt.:	11	Super L:	0	Cut Dp:	0.0		
Grd.Lst:	6	Super R:	0				

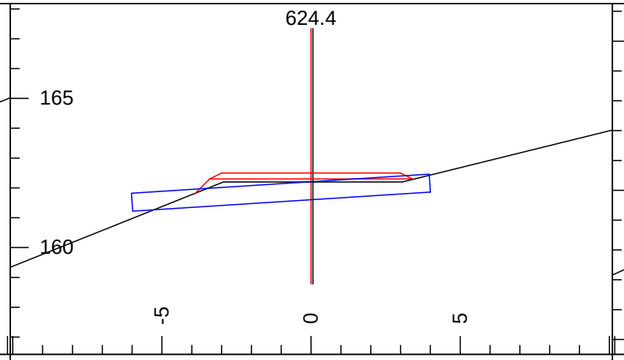
ROADENG Section	Scale 1:200	P. 3
M:\Alberni Valley Community Forest Corp\Cutblocks\Sproat Unit\B11_old_W16\GIS_Data\Road_Eng_Files\B11_RDS_Combined\B11-S1_combined		13/04/12



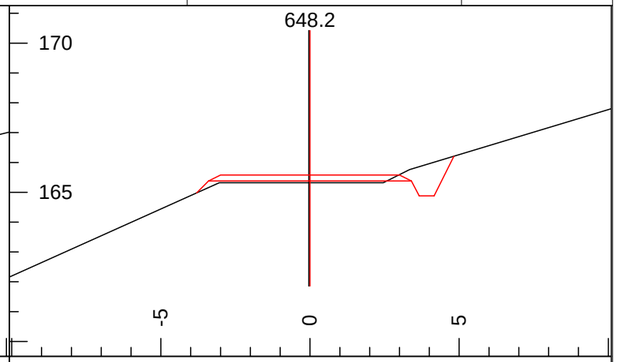
L-Stn:	583.7	L-Ssl:	0	F Slope L:	-100
P-Stn:	583.7	L-Ssr:	0	F Slope R:	-100
Grd.Nxt.:	12	Super L:	0	Cut Dp:	-0.4
Grd.Lst:	11	Super R:	0		



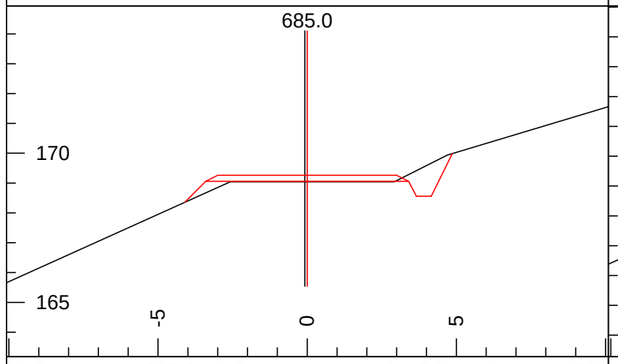
L-Stn:	593.6	L-Ssl:	0	F Slope L:	-100
P-Stn:	593.7	L-Ssr:	0	F Slope R:	200
Grd.Nxt.:	18	Super L:	0	Cut Dp:	-0.1
Grd.Lst:	12	Super R:	0		



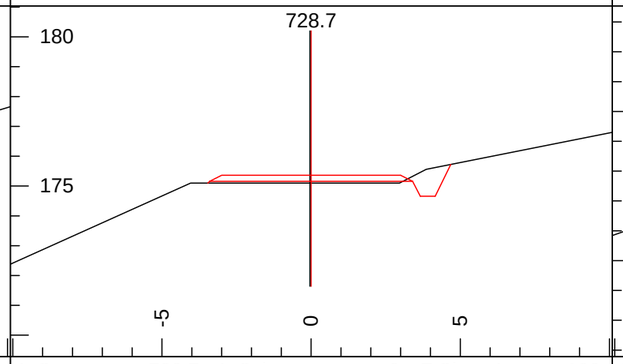
L-Stn:	624.4	L-Ssl:	0	F Slope L:	-100
P-Stn:	624.4	L-Ssr:	0	F Slope R:	-100
Grd.Nxt.:	13	Super L:	0	Cut Dp:	-0.1
Grd.Lst:	18	Super R:	0		



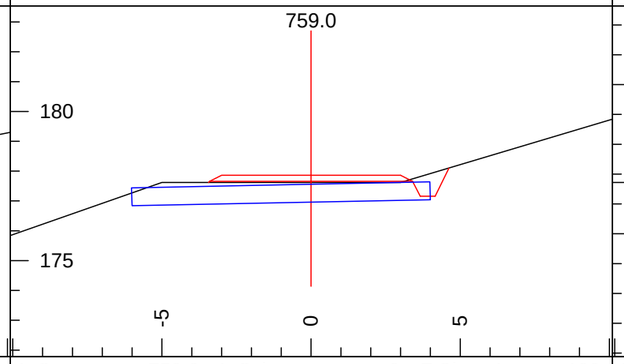
L-Stn:	648.2	L-Ssl:	0	F Slope L:	-100
P-Stn:	648.2	L-Ssr:	0	F Slope R:	200
Grd.Nxt.:	10	Super L:	0	Cut Dp:	-0.1
Grd.Lst:	13	Super R:	0		



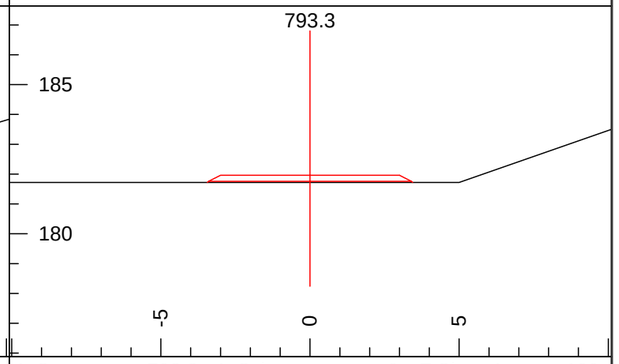
L-Stn:	685.0	L-Ssl:	0	F Slope L:	-100
P-Stn:	685.1	L-Ssr:	0	F Slope R:	200
Grd.Nxt.:	14	Super L:	0	Cut Dp:	0.0
Grd.Lst:	10	Super R:	0		



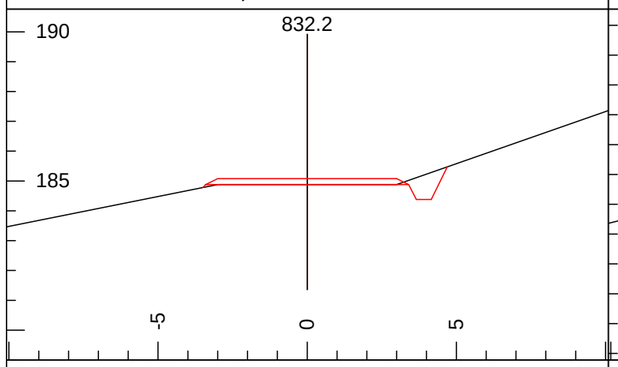
L-Stn:	728.7	L-Ssl:	0	F Slope L:	-100
P-Stn:	728.7	L-Ssr:	0	F Slope R:	200
Grd.Nxt.:	8	Super L:	0	Cut Dp:	-0.1
Grd.Lst:	14	Super R:	0		



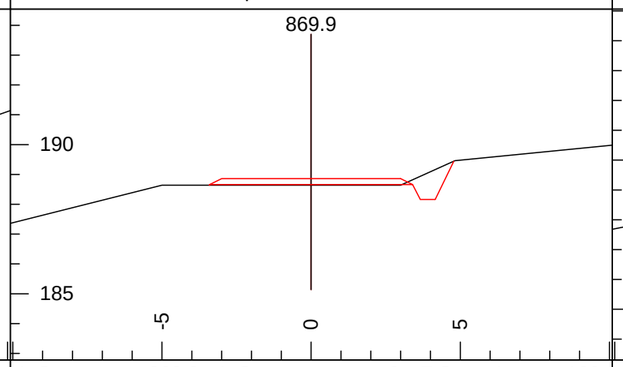
L-Stn:	759.0	L-Ssl:	0	F Slope L:	-100
P-Stn:	759.0	L-Ssr:	0	F Slope R:	200
Grd.Nxt.:	12	Super L:	0	Cut Dp:	0.0
Grd.Lst:	8	Super R:	0		



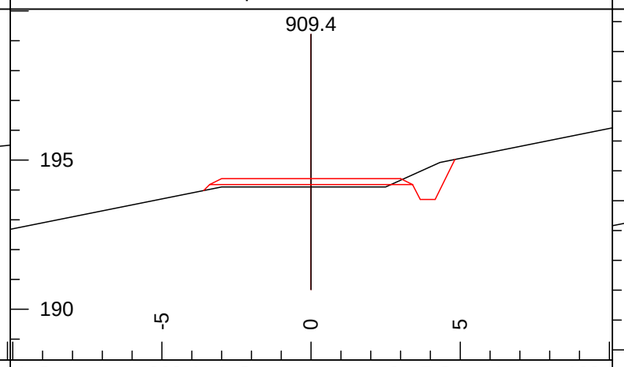
L-Stn:	793.3	L-Ssl:	0	F Slope L:	-100
P-Stn:	793.3	L-Ssr:	0	F Slope R:	-100
Grd.Nxt.:	8	Super L:	0	Cut Dp:	0.0
Grd.Lst:	12	Super R:	0		



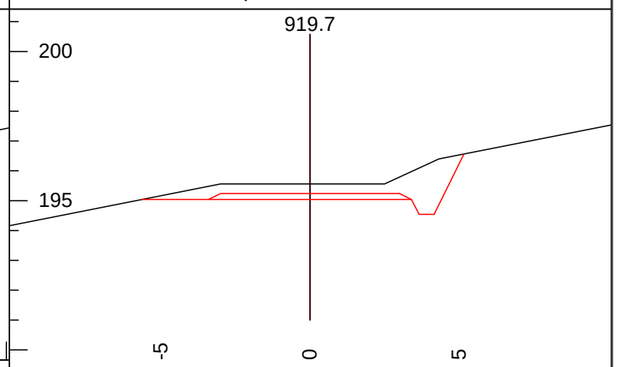
L-Stn:	832.2	L-Ssl:	0	F Slope L:	-100
P-Stn:	832.2	L-Ssr:	0	F Slope R:	200
Grd.Nxt.:	10	Super L:	0	Cut Dp:	0.0
Grd.Lst:	8	Super R:	0		



L-Stn:	869.9	L-Ssl:	0	F Slope L:	-100
P-Stn:	869.9	L-Ssr:	0	F Slope R:	200
Grd.Nxt.:	14	Super L:	0	Cut Dp:	0.0
Grd.Lst:	10	Super R:	0		



L-Stn:	909.4	L-Ssl:	0	F Slope L:	-100
P-Stn:	909.4	L-Ssr:	0	F Slope R:	200
Grd.Nxt.:	8	Super L:	0	Cut Dp:	-0.1
Grd.Lst:	14	Super R:	0		

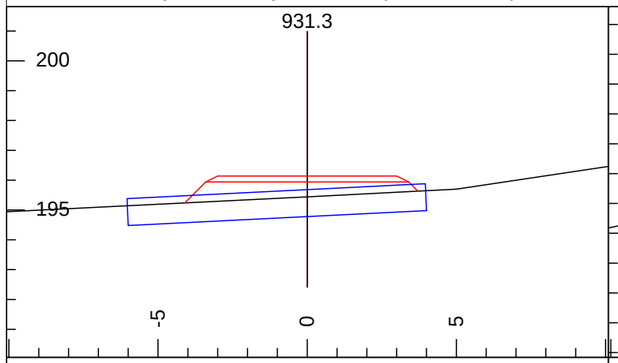


L-Stn:	919.7	Grd.Lst:	8	Super L:	0
P-Stn:	919.7	L-Ssl:	0	Super R:	0
Grd.Nxt.:	8	L-Ssr:	0	F Slope L:	0

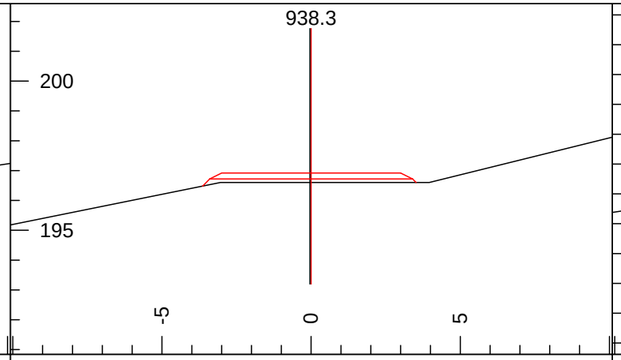
F Slope R:	200		
Cut Dp:	0.5		

ROADENG Section | Scale 1:200 | P. 4

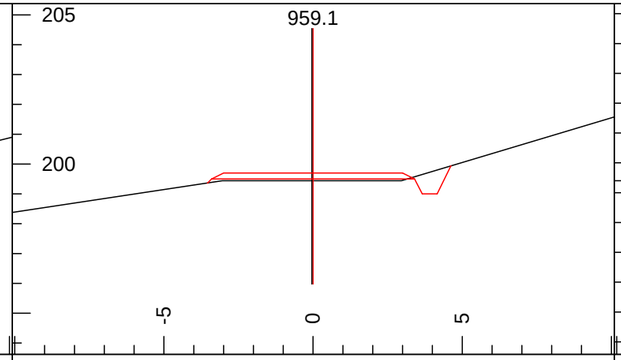
M:\Alberni Valley Community Forest Corp\Cutblocks\Sproat Unit\B11_old_W16\GIS_Data\Road_Eng_Files\B11_RDS_Combined\B11-S1_combined | 13/04/12



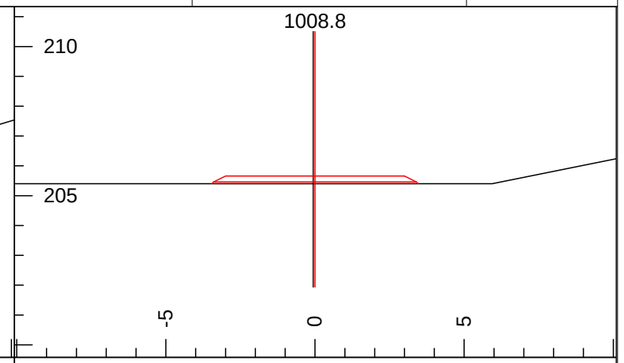
L-Stn:	931.3	L-Ssl:	-5	F Slope L:	-100
P-Stn:	931.3	L-Ssr:	5	F Slope R:	-100
Grd.Nxt.:	11	Super L:	0	Cut Dp:	-0.5
Grd.Lst:	8	Super R:	0		



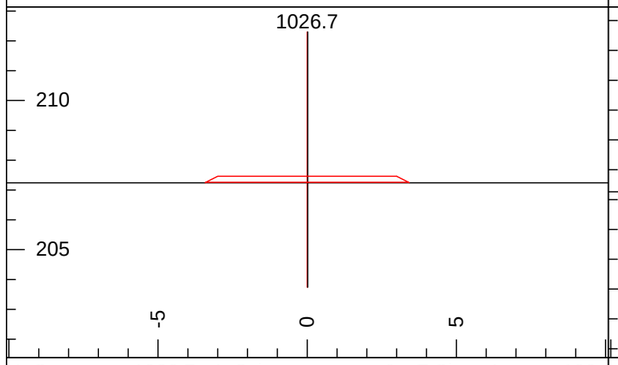
L-Stn:	938.3	L-Ssl:	0	F Slope L:	-100
P-Stn:	938.3	L-Ssr:	0	F Slope R:	-100
Grd.Nxt.:	13	Super L:	0	Cut Dp:	-0.1
Grd.Lst:	11	Super R:	0		



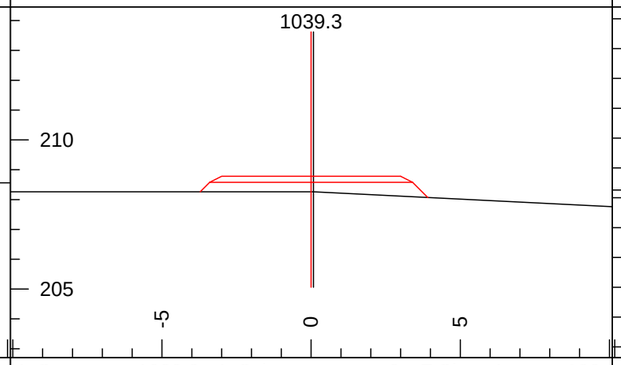
L-Stn:	959.1	L-Ssl:	0	F Slope L:	-100
P-Stn:	959.1	L-Ssr:	0	F Slope R:	200
Grd.Nxt.:	12	Super L:	0	Cut Dp:	-0.1
Grd.Lst:	13	Super R:	0		



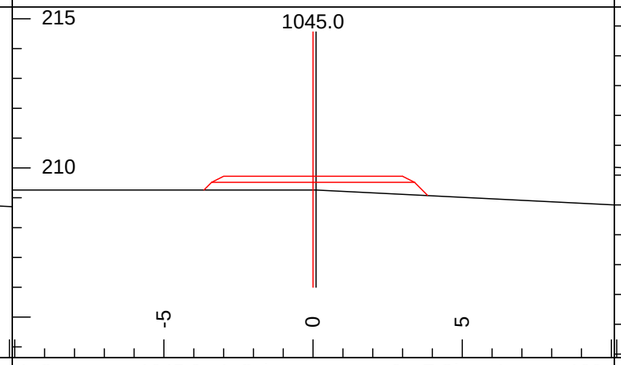
L-Stn:	1008.8	L-Ssl:	0	F Slope L:	-100
P-Stn:	1008.7	L-Ssr:	0	F Slope R:	-100
Grd.Nxt.:	10	Super L:	0	Cut Dp:	-0.1
Grd.Lst:	12	Super R:	0		



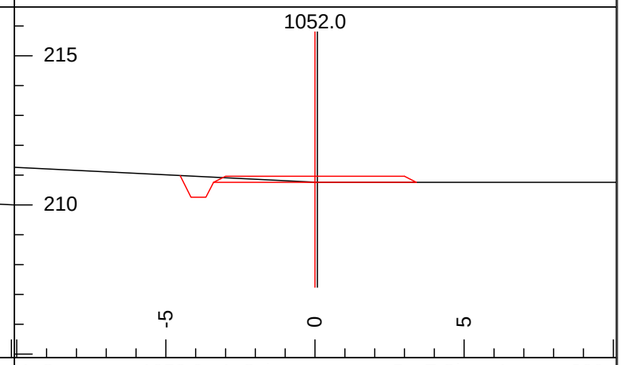
L-Stn:	1026.7	L-Ssl:	0	F Slope L:	-100
P-Stn:	1026.7	L-Ssr:	0	F Slope R:	-100
Grd.Nxt.:	10	Super L:	0	Cut Dp:	0.0
Grd.Lst:	10	Super R:	0		



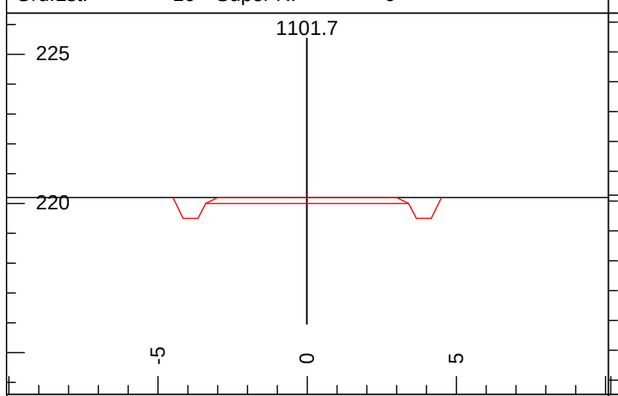
L-Stn:	1039.3	L-Ssl:	0	F Slope L:	-100
P-Stn:	1039.4	L-Ssr:	-5	F Slope R:	-100
Grd.Nxt.:	17	Super L:	0	Cut Dp:	-0.3
Grd.Lst:	10	Super R:	0		



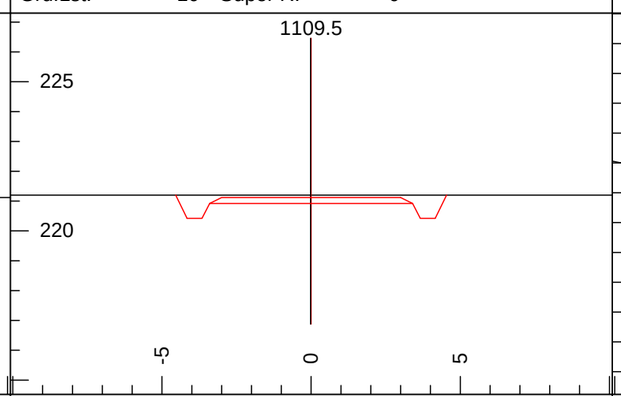
L-Stn:	1045.0	L-Ssl:	0	F Slope L:	-100
P-Stn:	1044.9	L-Ssr:	-5	F Slope R:	-100
Grd.Nxt.:	18	Super L:	0	Cut Dp:	-0.3
Grd.Lst:	17	Super R:	0		



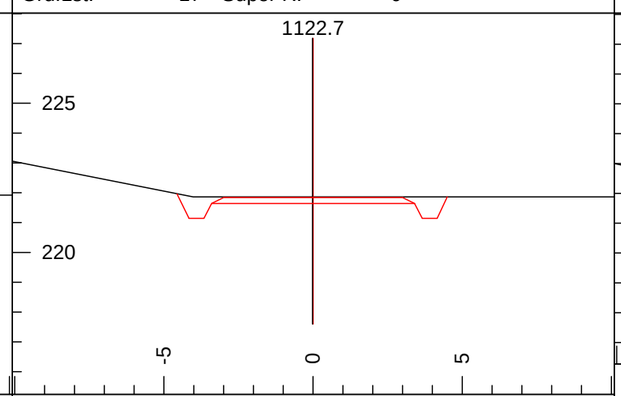
L-Stn:	1052.0	L-Ssl:	5	F Slope L:	200
P-Stn:	1052.0	L-Ssr:	0	F Slope R:	-100
Grd.Nxt.:	19	Super L:	0	Cut Dp:	0.0
Grd.Lst:	18	Super R:	0		



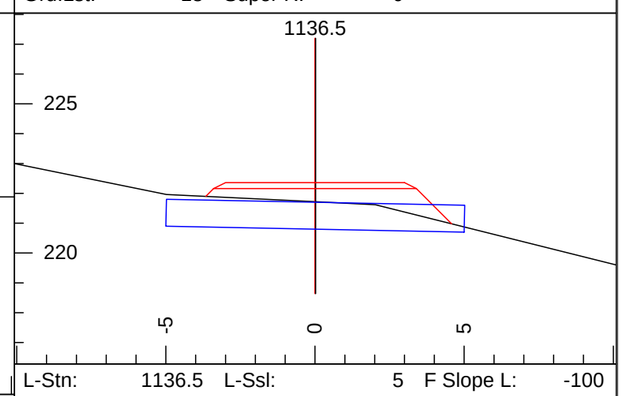
L-Stn:	1101.7	Grd.Lst:	19	Super L:	0	F Slope R:	200
P-Stn:	1101.7	L-Ssl:	0	Super R:	0	Cut Dp:	0.2
Grd.Nxt.:	12	L-Ssr:	0	F Slope L:	200		



L-Stn:	1109.5	Grd.Lst:	12	Super L:	0	F Slope R:	200
P-Stn:	1109.6	L-Ssl:	0	Super R:	0	Cut Dp:	0.3
Grd.Nxt.:	6	L-Ssr:	0	F Slope L:	200		

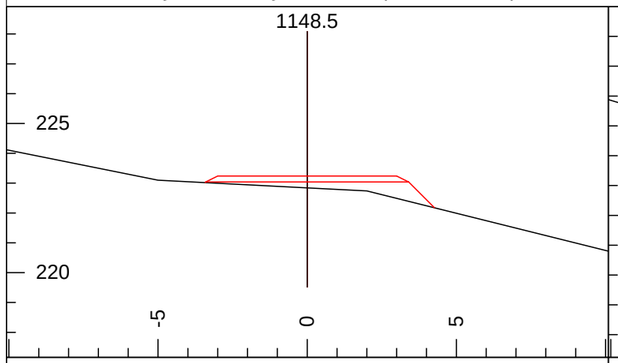


L-Stn:	1122.7	Grd.Lst:	6	Super L:	0	F Slope R:	200
P-Stn:	1122.7	L-Ssl:	0	Super R:	0	Cut Dp:	0.2
Grd.Nxt.:	4	L-Ssr:	0	F Slope L:	200		

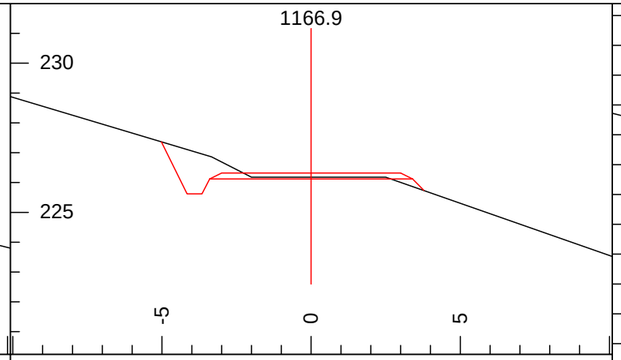


L-Stn:	1136.5	L-Ssl:	5	F Slope L:	-100
P-Stn:	1136.5	L-Ssr:	-5	F Slope R:	-100
Grd.Nxt.:	7	Super L:	0	Cut Dp:	-0.4
Grd.Lst:	4	Super R:	0		

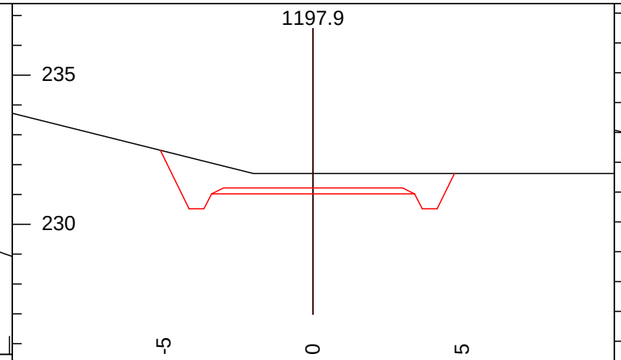
ROADENG Section	Scale 1:200	P. 5
M:\Alberni Valley Community Forest Corp\Cutblocks\Sproat Unit\B11_old_W16\GIS_Data\Road_Eng_Files\B11_RDS_Combined\B11-S1_combined		13/04/12



L-Stn:	1148.5	L-Ssl:	5	F Slope L:	-100
P-Stn:	1148.5	L-Ssr:	-5	F Slope R:	-100
Grd.Nxt.:	17	Super L:	0	Cut Dp:	-0.2
Grd.Lst:	7	Super R:	0		

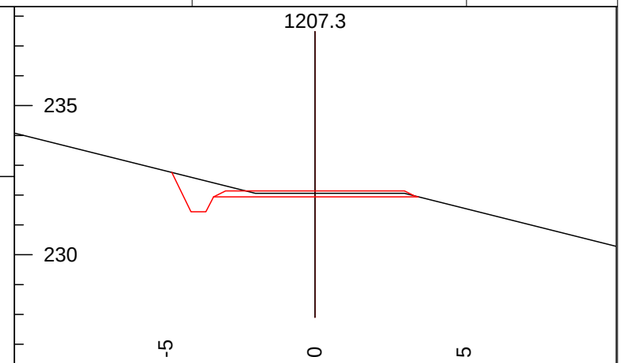


L-Stn:	1166.9	L-Ssl:	0	F Slope L:	200
P-Stn:	1166.9	L-Ssr:	0	F Slope R:	-100
Grd.Nxt.:	16	Super L:	0	Cut Dp:	0.1
Grd.Lst:	17	Super R:	0		



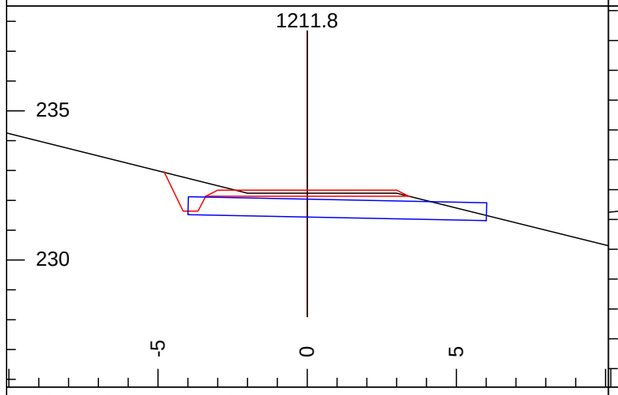
L-Stn:	1197.9	Grd.Lst:	16	Super L:	0
P-Stn:	1197.9	L-Ssl:	0	Super R:	0
Grd.Nxt.:	10	L-Ssr:	0	F Slope L:	200

F Slope R:	200
Cut Dp:	0.7



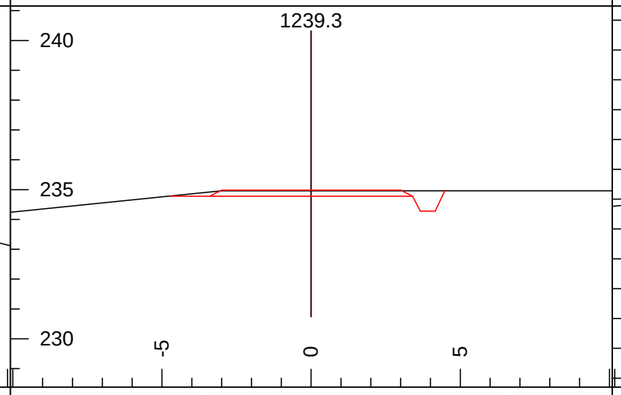
L-Stn:	1207.3	Grd.Lst:	10	Super L:	0
P-Stn:	1207.3	L-Ssl:	0	Super R:	0
Grd.Nxt.:	4	L-Ssr:	0	F Slope L:	200

F Slope R:	0
Cut Dp:	0.1



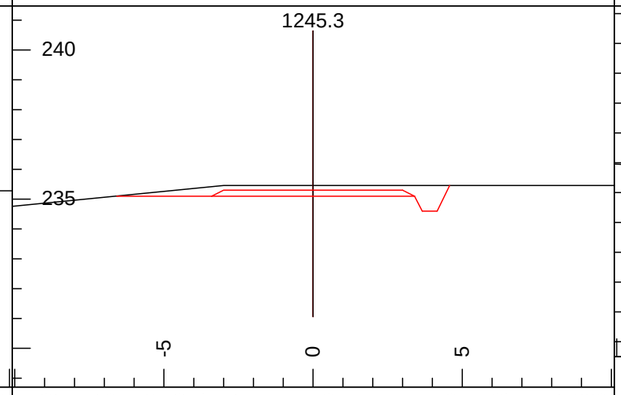
L-Stn:	1211.8	Grd.Lst:	4	Super L:	0
P-Stn:	1211.8	L-Ssl:	0	Super R:	0
Grd.Nxt.:	10	L-Ssr:	0	F Slope L:	200

F Slope R:	0
Cut Dp:	0.1



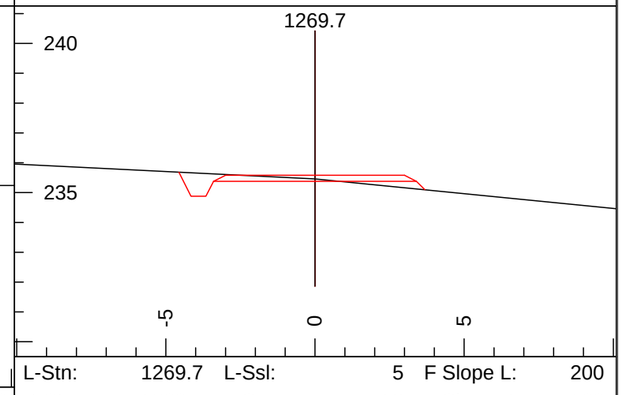
L-Stn:	1239.3	Grd.Lst:	10	Super L:	0
P-Stn:	1239.3	L-Ssl:	0	Super R:	0
Grd.Nxt.:	5	L-Ssr:	0	F Slope L:	0

F Slope R:	200
Cut Dp:	0.2

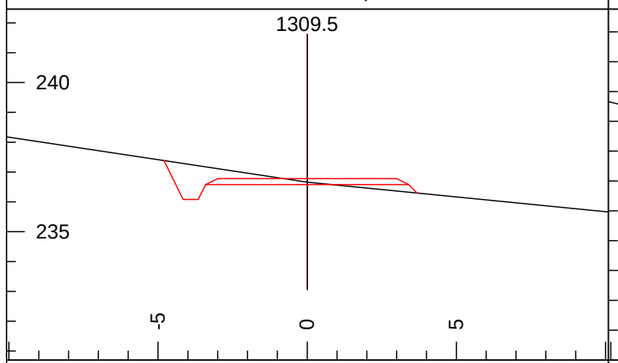


L-Stn:	1245.3	Grd.Lst:	5	Super L:	0
P-Stn:	1245.4	L-Ssl:	0	Super R:	0
Grd.Nxt.:	1	L-Ssr:	0	F Slope L:	0

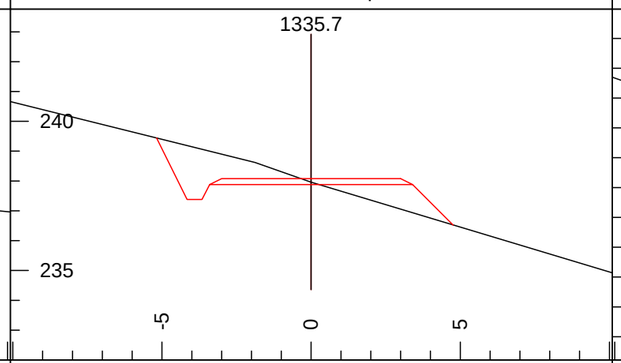
F Slope R:	200
Cut Dp:	0.4



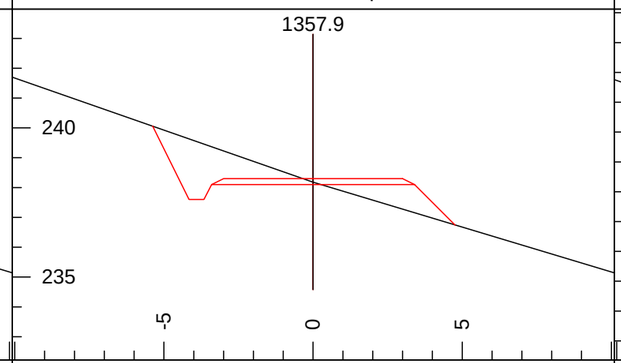
L-Stn:	1269.7	L-Ssl:	5	F Slope L:	200
P-Stn:	1269.7	L-Ssr:	-10	F Slope R:	-100
Grd.Nxt.:	3	Super L:	0	Cut Dp:	0.1
Grd.Lst:	1	Super R:	0		



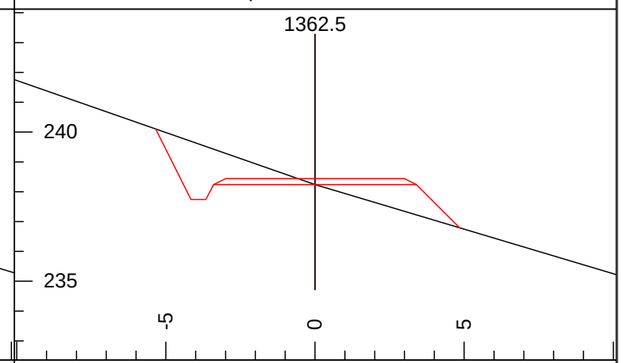
L-Stn:	1309.5	L-Ssl:	15	F Slope L:	200
P-Stn:	1309.5	L-Ssr:	-10	F Slope R:	-100
Grd.Nxt.:	5	Super L:	0	Cut Dp:	0.1
Grd.Lst:	3	Super R:	0		



L-Stn:	1335.7	L-Ssl:	35	F Slope L:	200
P-Stn:	1335.7	L-Ssr:	-30	F Slope R:	-100
Grd.Nxt.:	1	Super L:	0	Cut Dp:	0.1
Grd.Lst:	5	Super R:	0		

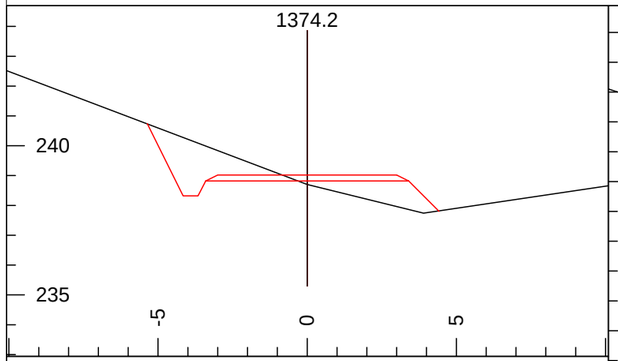


L-Stn:	1357.9	L-Ssl:	35	F Slope L:	200
P-Stn:	1357.9	L-Ssr:	-30	F Slope R:	-100
Grd.Nxt.:	3	Super L:	0	Cut Dp:	0.1
Grd.Lst:	1	Super R:	0		

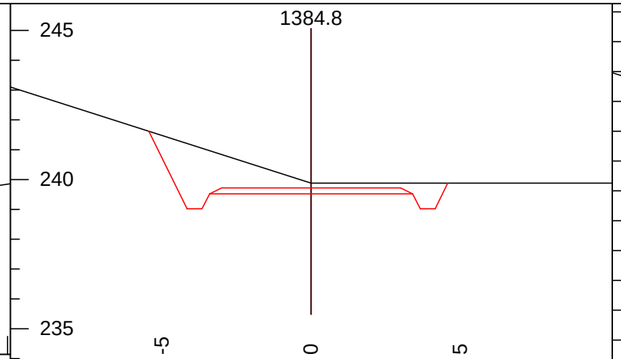


L-Stn:	1362.5	L-Ssl:	35	F Slope L:	200
P-Stn:	1362.5	L-Ssr:	-30	F Slope R:	-100
Grd.Nxt.:	5	Super L:	0	Cut Dp:	0.0
Grd.Lst:	3	Super R:	0		

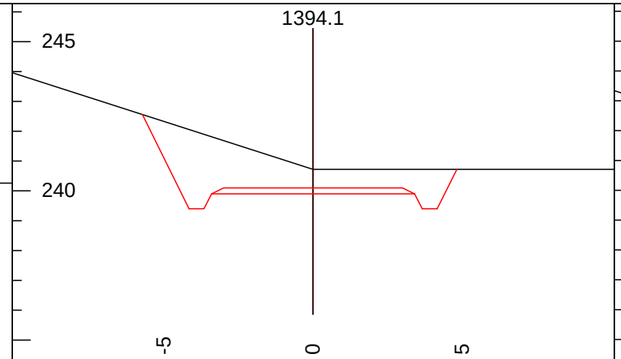
ROADENG Section	Scale 1:200	P. 6
M:\Alberni Valley Community Forest Corp\Cutblocks\Sproat Unit\B11_old_W16\GIS_Data\Road_Eng_Files\B11_RDS_Combined\B11-S1_combined		13/04/12



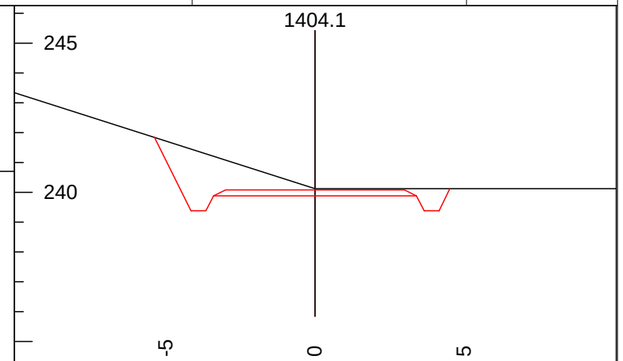
L-Stn:	1374.2	L-Ssl:	38	F Slope L:	200
P-Stn:	1374.2	L-Ssr:	-25	F Slope R:	-100
Grd.Nxt.:	7	Super L:	0	Cut Dp:	-0.1
Grd.Lst:	5	Super R:	0		



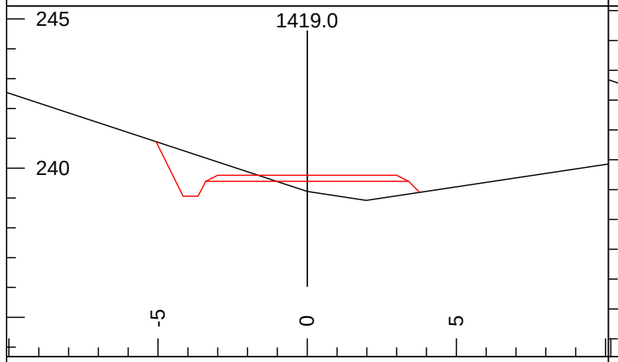
L-Stn:	1384.8	Grd.Lst:	7	Super L:	0	F Slope R:	200
P-Stn:	1384.9	L-Ssl:	32	Super R:	0	Cut Dp:	0.4
Grd.Nxt.:	4	L-Ssr:	0	F Slope L:	200		



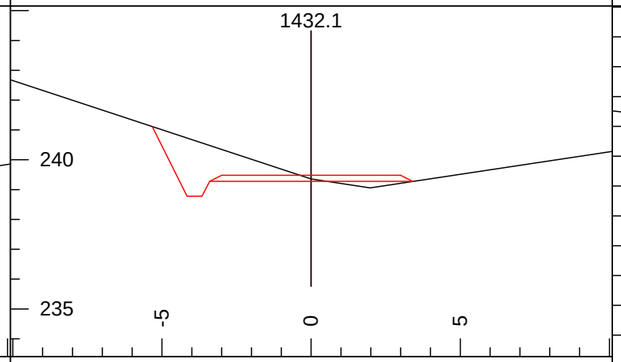
L-Stn:	1394.1	Grd.Lst:	4	Super L:	0	F Slope R:	200
P-Stn:	1394.1	L-Ssl:	32	Super R:	0	Cut Dp:	0.8
Grd.Nxt.:	0	L-Ssr:	0	F Slope L:	200		



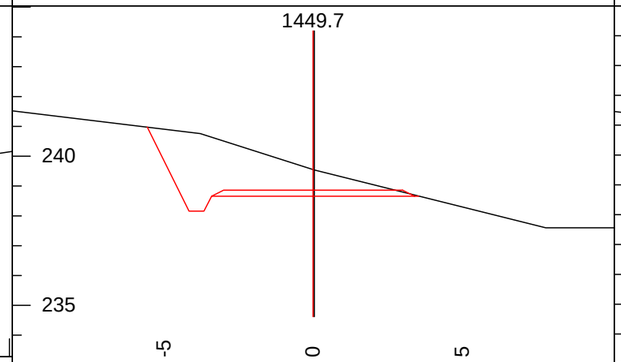
L-Stn:	1404.1	Grd.Lst:	0	Super L:	0	F Slope R:	200
P-Stn:	1404.1	L-Ssl:	32	Super R:	0	Cut Dp:	0.2
Grd.Nxt.:	-2	L-Ssr:	0	F Slope L:	200		



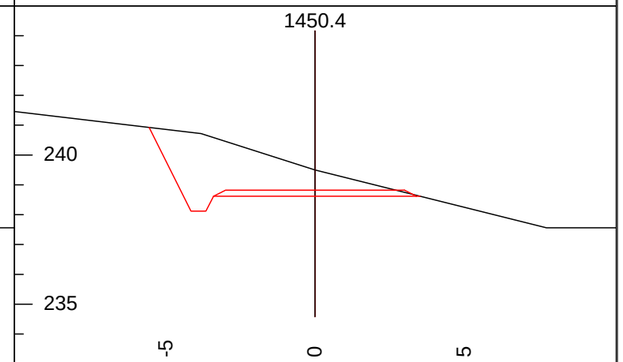
L-Stn:	1419.0	L-Ssl:	33	F Slope L:	200
P-Stn:	1419.1	L-Ssr:	-15	F Slope R:	-100
Grd.Nxt.:	-2	Super L:	0	Cut Dp:	-0.3
Grd.Lst:	-2	Super R:	0		



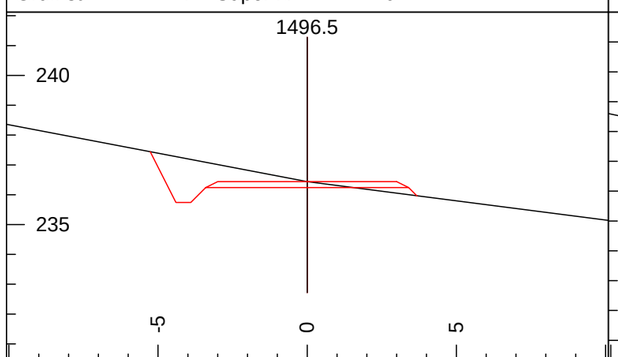
L-Stn:	1432.1	L-Ssl:	33	F Slope L:	200
P-Stn:	1432.1	L-Ssr:	-15	F Slope R:	-100
Grd.Nxt.:	-4	Super L:	0	Cut Dp:	0.1
Grd.Lst:	-2	Super R:	0		



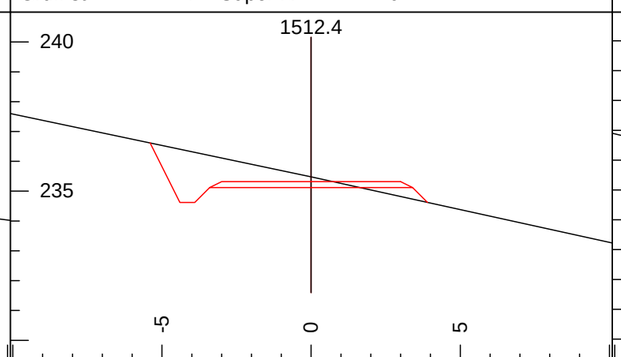
L-Stn:	1449.7	Grd.Lst:	-4	Super L:	0	F Slope R:	0
P-Stn:	1449.7	L-Ssl:	32	Super R:	0	Cut Dp:	0.9
Grd.Nxt.:	-5	L-Ssr:	-25	F Slope L:	200		



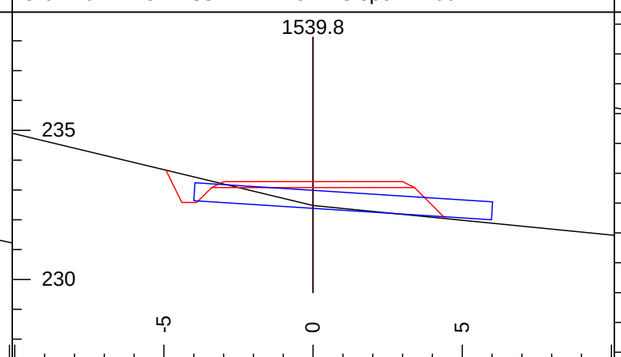
L-Stn:	1450.4	Grd.Lst:	-5	Super L:	0	F Slope R:	0
P-Stn:	1450.5	L-Ssl:	32	Super R:	0	Cut Dp:	0.9
Grd.Nxt.:	-5	L-Ssr:	-25	F Slope L:	200		



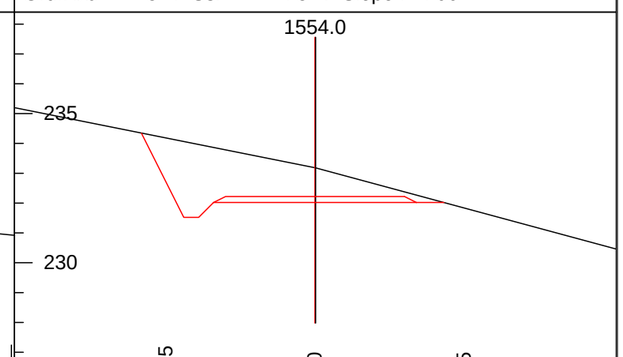
L-Stn:	1496.5	L-Ssl:	19	F Slope L:	200
P-Stn:	1496.5	L-Ssr:	-13	F Slope R:	-100
Grd.Nxt.:	-7	Super L:	0	Cut Dp:	0.2
Grd.Lst:	-5	Super R:	0		



L-Stn:	1512.4	L-Ssl:	21	F Slope L:	200
P-Stn:	1512.4	L-Ssr:	-22	F Slope R:	-100
Grd.Nxt.:	-7	Super L:	0	Cut Dp:	0.4
Grd.Lst:	-7	Super R:	0		

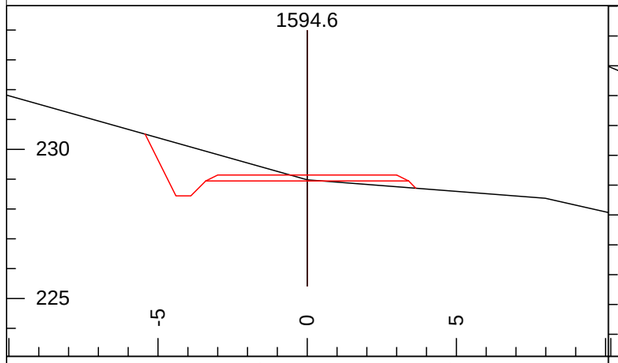


L-Stn:	1539.8	L-Ssl:	24	F Slope L:	200
P-Stn:	1539.8	L-Ssr:	-10	F Slope R:	-100
Grd.Nxt.:	-7	Super L:	0	Cut Dp:	-0.6
Grd.Lst:	-7	Super R:	0		

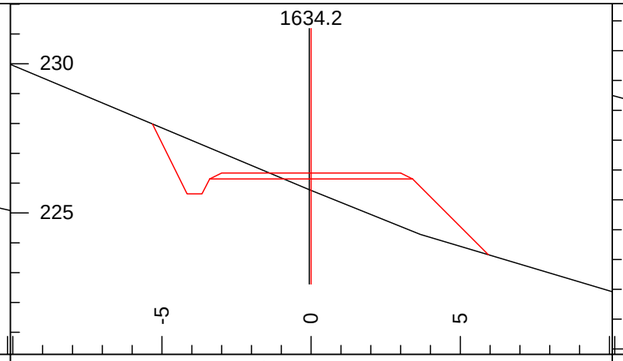


L-Stn:	1554.0	Grd.Lst:	-7	Super L:	0	F Slope R:	0
P-Stn:	1554.0	L-Ssl:	20	Super R:	0	Cut Dp:	1.2
Grd.Nxt.:	-8	L-Ssr:	-27	F Slope L:	200		

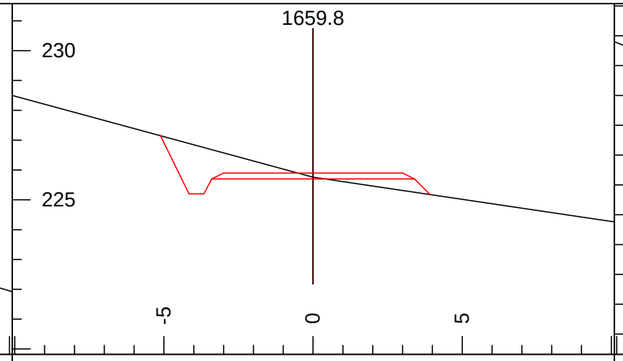
ROADENG Section	Scale 1:200	P. 7
M:\Alberni Valley Community Forest Corp\Cutblocks\Sproat Unit\B11_old_W16\GIS_Data\Road_Eng_Files\B11_RDS_Combined\B11-S1_combined		13/04/12



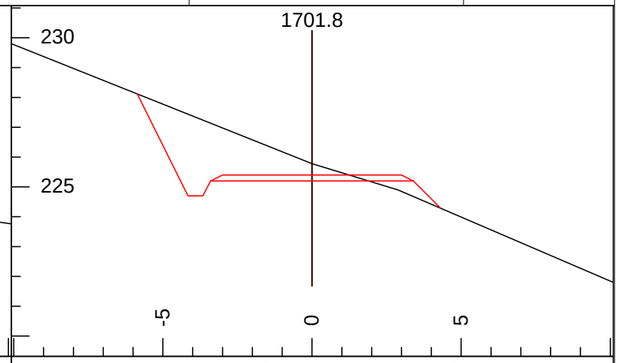
L-Stn:	1594.6	L-Ssl:	28	F Slope L:	200
P-Stn:	1594.6	L-Ssr:	-8	F Slope R:	-100
Grd.Nxt.:	-7	Super L:	0	Cut Dp:	0.0
Grd.Lst:	-8	Super R:	0		



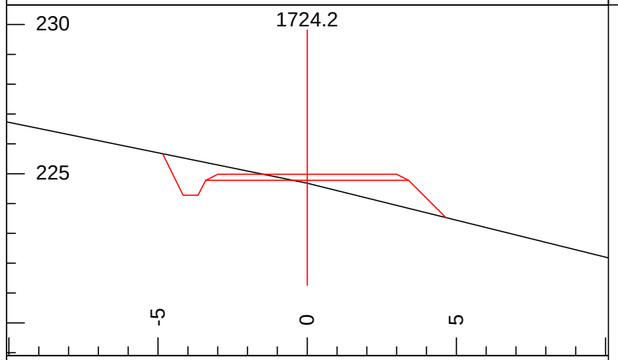
L-Stn:	1634.2	L-Ssl:	42	F Slope L:	200
P-Stn:	1634.2	L-Ssr:	-40	F Slope R:	-100
Grd.Nxt.:	-2	Super L:	0	Cut Dp:	-0.4
Grd.Lst:	-7	Super R:	0		



L-Stn:	1659.8	L-Ssl:	27	F Slope L:	200
P-Stn:	1659.8	L-Ssr:	-15	F Slope R:	-100
Grd.Nxt.:	-1	Super L:	0	Cut Dp:	0.1
Grd.Lst:	-2	Super R:	0		



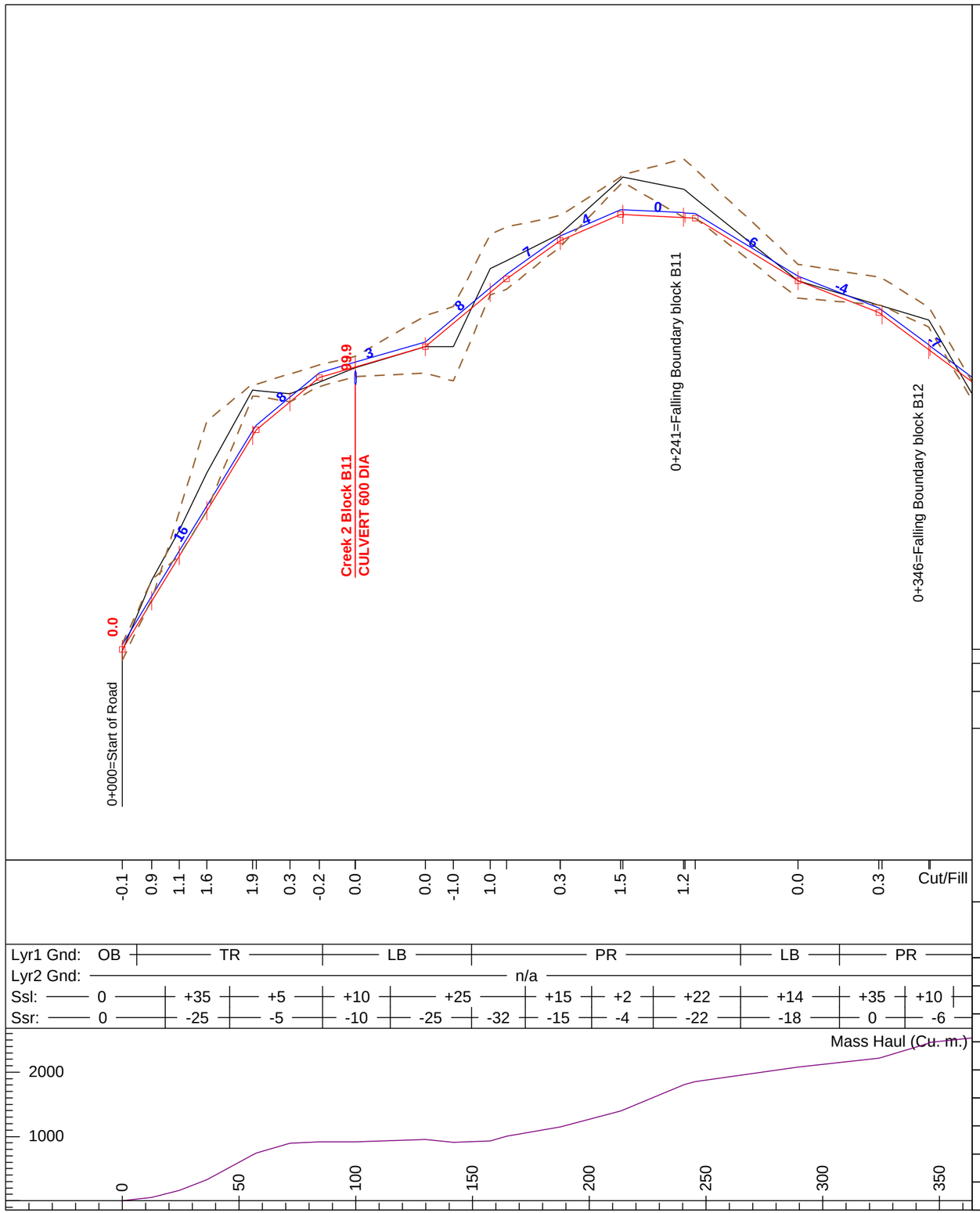
L-Stn:	1701.8	L-Ssl:	40	F Slope L:	200
P-Stn:	1701.8	L-Ssr:	-30	F Slope R:	-100
Grd.Nxt.:	-2	Super L:	0	Cut Dp:	0.6
Grd.Lst:	-1	Super R:	0		

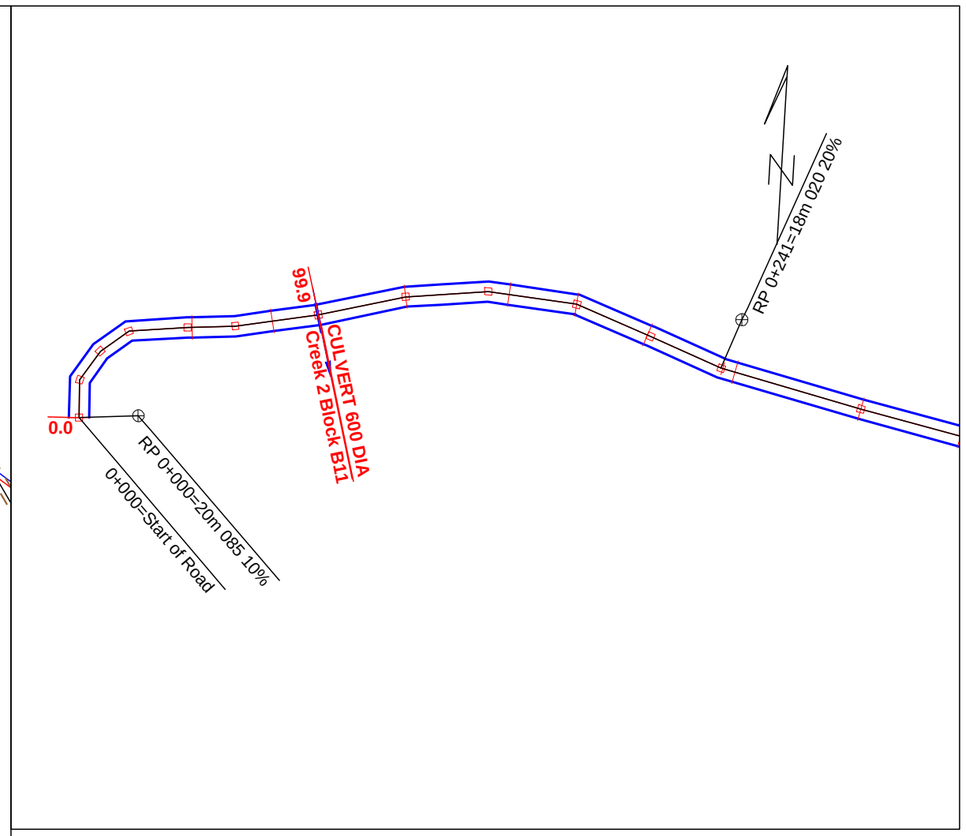


L-Stn:	1724.2	L-Ssl:	20	F Slope L:	200
P-Stn:	1724.2	L-Ssr:	-25	F Slope R:	-100
Grd.Nxt.:	n/a	Super L:	0	Cut Dp:	-0.1
Grd.Lst:	-2	Super R:	0		

L-Stn m.	Cul DIA mm.	Cul Len m.	Lyr1 Gnd	Ssl %	Ssr %	Mass H. Cu. m.
0.0			BR	0	0	0.0
8.1			OB	0	0	10.8
22.3			OB	0	0	66.7
34.4			OB	0	0	140.9
42.3			OB	0	0	193.7
53.0			OB	0	0	230.6
74.6			OB	0	0	250.2
121.3	600	10.0	OB	0	0	519.7
154.3			OB	0	0	708.3
199.0			OB	0	0	722.6
218.9			OB	0	0	733.2
255.6			OB	0	0	776.5
279.1			OB	0	0	822.0
289.8			OB	0	0	868.4
298.3			OB	0	0	883.0
312.3	600	10.0	OB	-5	5	861.6
337.2			OB	0	0	812.2
365.1	800	10.0	OB	-5	0	790.4
405.1			OB	0	0	774.7
448.9	600	10.0	OB	0	0	519.0
498.4			TR	0	0	220.4
540.1			TR	0	0	249.2
568.0			OB	0	0	284.1
575.1			OB	0	0	292.8
583.7			OB	0	0	283.5
593.6			OB	0	0	256.3
624.4	600	10.0	OB	0	0	336.2
648.2			OB	0	0	414.8
685.0			OB	0	0	446.3
728.7			OB	0	0	462.6
759.1	600	10.0	OB	0	0	402.2
793.3			OB	0	0	317.3
832.2			OB	0	0	331.1
869.9			OB	0	0	355.7
909.4			OB	0	0	377.5
919.7			OB	0	0	414.0
931.4	900	10.0	OB	-5	5	428.0
938.3			OB	0	0	402.7
959.1			OB	0	0	400.0
1008.8			OB	0	0	399.8
1026.7			OB	0	0	396.2
1039.3			OB	0	-5	379.2
1045.0			OB	0	-5	362.9
1052.0			TR	5	0	358.5
1101.7			OB	0	0	500.6
1109.5			OB	0	0	532.4
1122.7			OB	0	0	571.8
1136.9	900	10.0	OB	5	-5	593.7
1148.5			OB	5	-5	502.4
1166.9			OB	0	0	507.9
1197.9			OB	0	0	677.9
1207.3			OB	0	0	725.4
1211.9	600	10.0	OB	0	0	731.0
1239.3			OB	0	0	756.5
1245.3			OB	0	0	776.2
1269.7			OB	5	-10	830.9
1309.5			OB	15	-10	888.1
1335.7			TR	35	-30	945.6
1357.9			TR	35	-30	1000.1
1362.5			TR	35	-30	1011.0
1374.2			TR	38	-25	1033.7
1384.8			TR	32	0	1085.6
1394.1			TR	32	0	1188.1
1404.1			TR	32	0	1286.1
1419.0			TR	33	-15	1340.5
1432.1			TR	33	-15	1372.5
1449.7			TR	32	-25	1499.0
1450.4			TR	32	-25	1507.0

L-Stn m.	Cul DIA mm.	Cul Len m.	Lyr1 Gnd	Ssl %	Ssr %	Mass H. Cu. m.
1450.4			TR	32	-25	1507.0
1496.5			LB	19	-13	1624.9
1512.4			LB	21	-22	1693.8
1539.9	600	10.0	LB	24	-10	1717.8
1554.0			LB	20	-27	1783.7
1594.6			PR	28	-8	2355.6
1634.2			TR	42	-40	2287.5
1659.8			TR	27	-15	2294.9
1701.8			TR	40	-30	2529.4
1724.2			TR	25	-30	2621.9





Alberni Valley Community Forest K2D Sproat Unit

Cutblock: B11
Road: B11-S2

Road Design

0+000 to 0+614

Notes:
(1) Side slopes are derived from an average of the first slope % measured off of centerline in 20m segments.

(2) Watch for Rockfall in steep areas.

(3) Follow AVCF Rainfall Shutdown Guidelines.

(4) Background information is approximate. Refer closely to Contruction and Harvest maps.

CULVERT SUMMARY

P-Stn m.	Cul DIA mm.	Cul Len m.	Lyr1 Gnd	Ssl %	Ssr %	Mass H. Cu. m.
99.9	600	10.0	LB	10	-10	915.7

SOIL TYPE LEGEND

Symbol	Material Type	Cut Slope	Fill Slope
LB	Local Ballast	100%	67%
PR	Pit Run Ballast	100%	67%
RB	Rock Ballast	100%	67%
TR	Toe Rock	200%	67%
MR	Medium Rock	400%	100%
HR	High Rock	400%	100%
XR	Heavy Rock	400%	100%
XX	Extra Heavy Rock	400%	100%

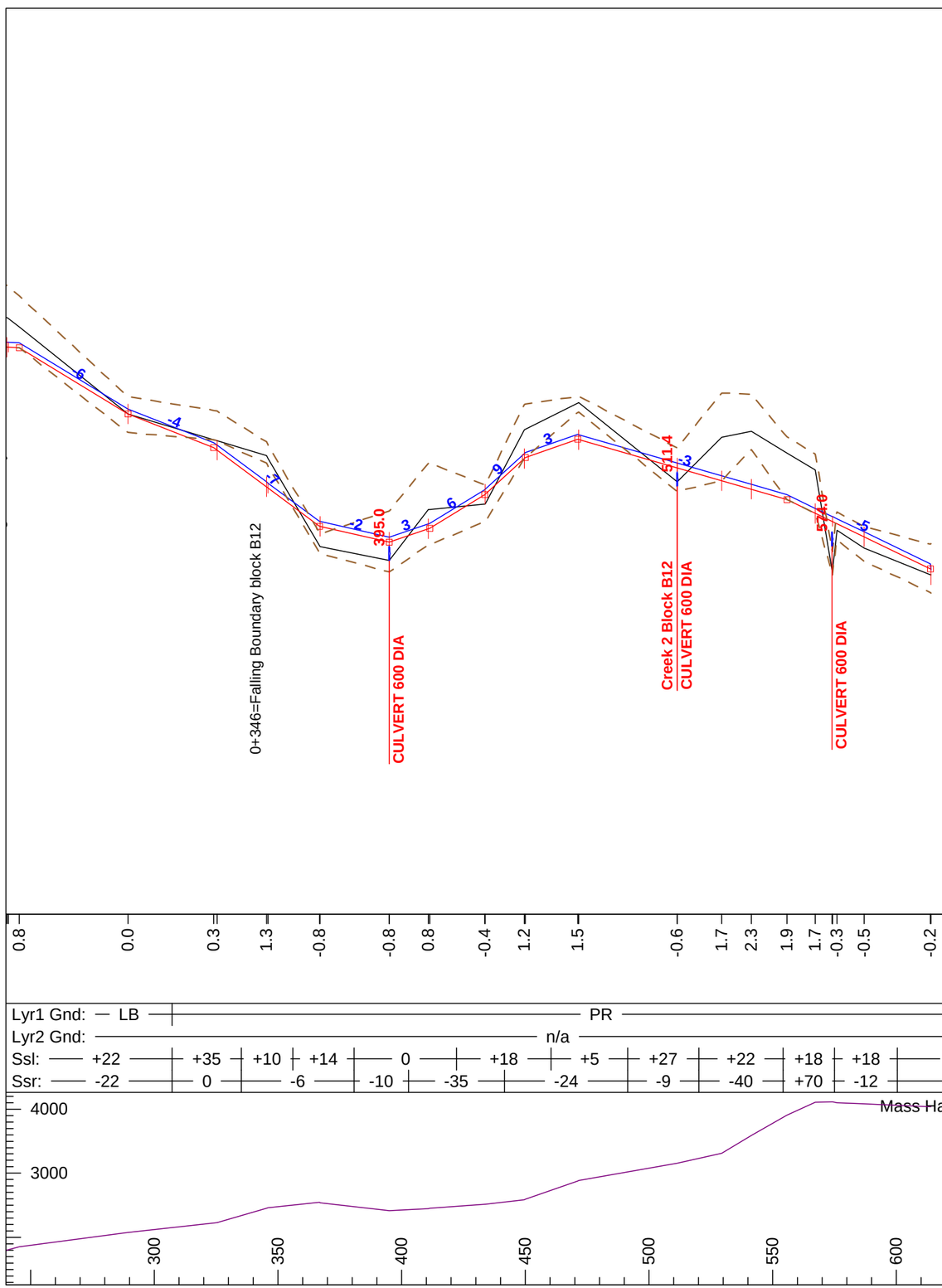
LEGEND

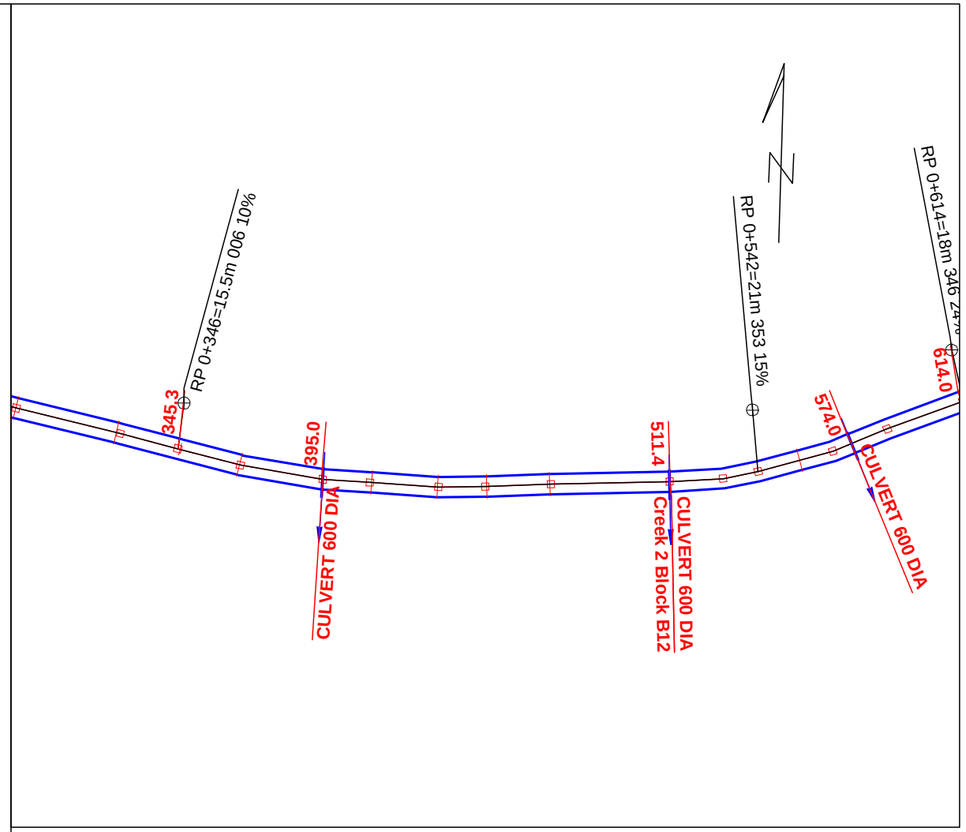
- Profile Finished Grade
- Profile Subgrade
- Profile/Plan P-line Topography
- Profile/Plan Slope Stakes
- Plan Road Edges
- Culverts
- Reference Points (RP)

Designed By: Meridian Forest Services Ltd.

MERIDIAN Forest Services Ltd.
PO Box 275
#15-1010 Shearme Road
Coombs, BC V0R 1M0
www.meridianforest.ca

M:\Alberni Valley Community Forest Corp\Cutblocks\Sproat Unit\B11_old_W16\GIS_Data\Road_Eng_Files\B11_RDS_Combined\B11-S2_combined.dsn





Alberni Valley Community Forest K2D Sproat Unit

Cutblock: B11
Road: B11-S2

Road Design

0+000 to 0+614

Notes:
(1) Side slopes are derived from an average of the first slope % measured off of centerline in 20m segments.

(2) Watch for Rockfall in steep areas.

(3) Follow AVCF Rainfall Shutdown Guidelines.

(4) Background information is approximate. Refer closely to Contruction and Harvest maps.

CULVERT SUMMARY

P-Stn m.	Cul DIA mm.	Cul Len m.	Lyr1 Gnd	Ssl %	Ssr %	Mass H. Cu. m.
395.0	600	10.0	PR	0	-10	2415.4
511.4	600	10.0	PR	27	-9	3156.0
574.0	600	10.0	PR	18	70	4113.9

SOIL TYPE LEGEND

Symbol	Material Type	Cut Slope	Fill Slope
LB	Local Ballast	100%	67%
PR	Pit Run Ballast	100%	67%
RB	Rock Ballast	100%	67%
TR	Toe Rock	200%	67%
MR	Medium Rock	400%	100%
HR	High Rock	400%	100%
XR	Heavy Rock	400%	100%
XX	Extra Heavy Rock	400%	100%

LEGEND

- Profile Finished Grade
- Profile Subgrade
- Profile/Plan P-line Topography
- Profile/Plan Slope Stakes
- Plan Road Edges
- Culverts
- Reference Points (RP)

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Coombs, BC V0R 1M0
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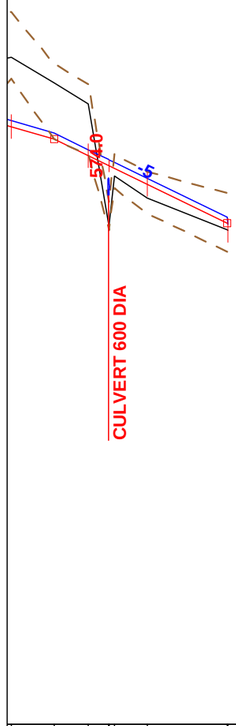

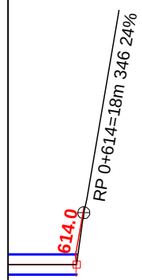

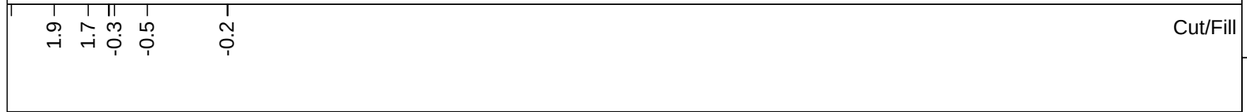

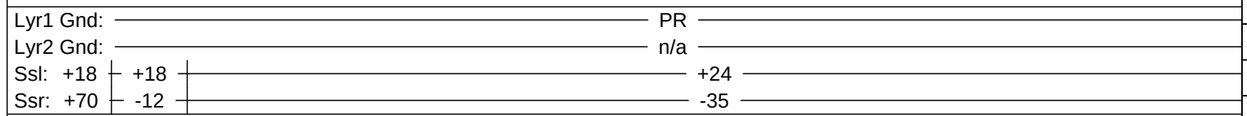

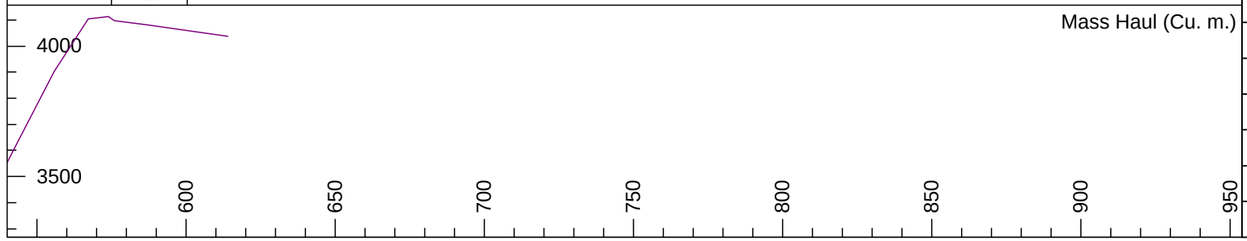

Alberni Valley Community Forest K2D Sproat Unit

Cutblock: B11
Road: B11-S2

Road Design

0+000 to 0+614

Notes:
(1) Side slopes are derived from an average of the first slope % measured off of centerline in 20m segments.

(2) Watch for Rockfall in steep areas.

(3) Follow AVCF Rainfall Shutdown Guidelines.

(4) Background information is approximate. Refer closely to Contruction and Harvest maps.

CULVERT SUMMARY

SOIL TYPE LEGEND

Symbol	Material Type	Cut Slope	Fill Slope
LB	Local Ballast	100%	67%
PR	Pit Run Ballast	100%	67%
RB	Rock Ballast	100%	67%
TR	Toe Rock	200%	67%
MR	Medium Rock	400%	100%
HR	High Rock	400%	100%
XR	Heavy Rock	400%	100%
XX	Extra Heavy Rock	400%	100%

LEGEND

- Profile Finished Grade
- Profile Subgrade
- Profile/Plan P-line Topography
- Profile/Plan Slope Stakes
- Plan Road Edges
- Culverts
- Reference Points (RP)

Designed By: Meridian Forest Services Ltd.

MERIDIAN Forest Services Ltd.
PO Box 275
#15-1010 Shearme Road
Coombs, BC V0R 1M0
www.meridianforest.ca

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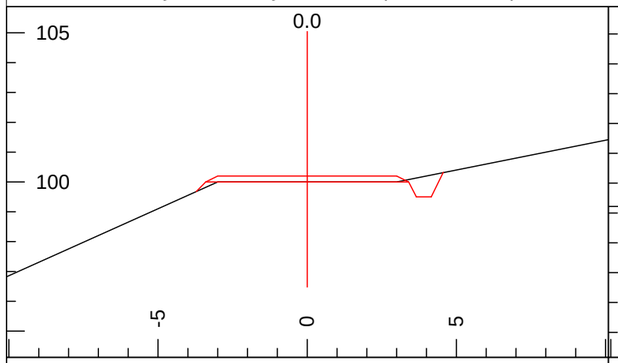
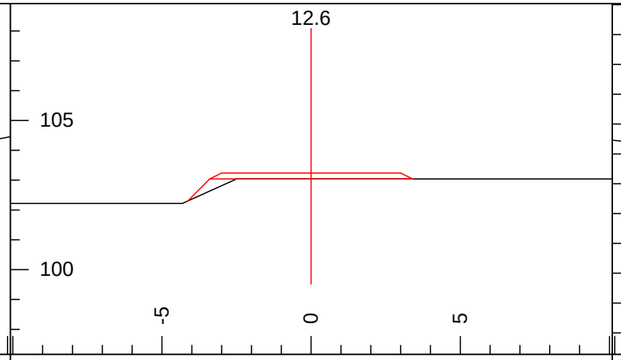
ROADENG Section	Scale 1:200	P. 1
M:\Alberni Valley Community Forest Corp\Cutblocks\Sproat Unit\B11_old_W16\GIS_Data\Road_Eng_Files\B11_RDS_Combined\B11-S2_combined		13/04/12



L-Stn:	0.0	L-Ssl:	0	F Slope L:	-100
P-Stn:	0.0	L-Ssr:	0	F Slope R:	200
Grd.Nxt.:	24	Super L:	0	Cut Dp:	0.0
Grd.Lst:	n/a	Super R:	0		



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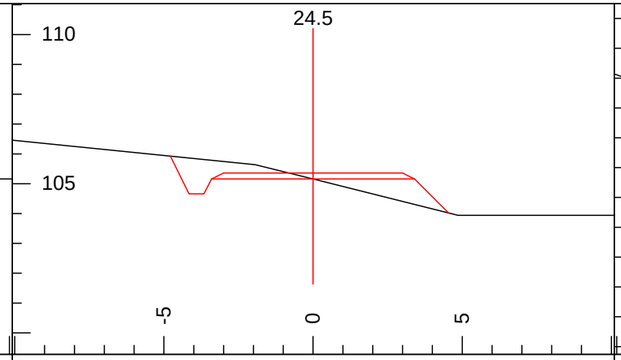
P-Stn:	12.6	L-Ssr:	0	F Slope R:	0
Grd.Nxt.:	18	Super L:	0	Cut Dp:	0.0
Grd.Lst:	24	Super R:	0		



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P-Stn:	24.5	L-Ssr:	-25	F Slope R:	-100
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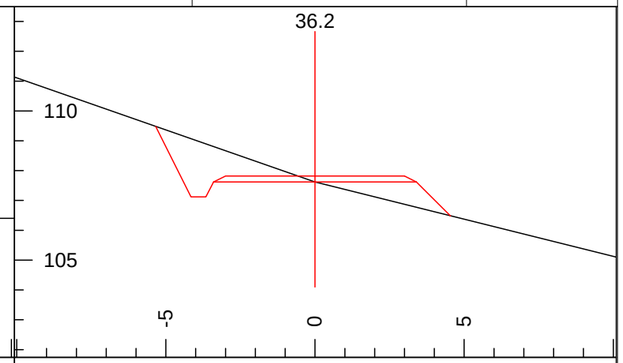
Grd.Lst:	18	Super R:	0		



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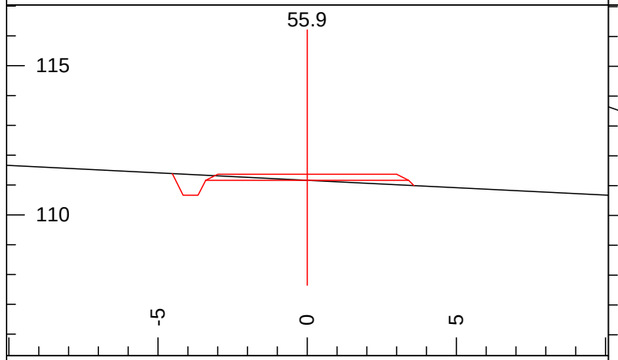
P-Stn:	36.2	L-Ssr:	-25	F Slope R:	-100
Grd.Nxt.:	18	Super L:	0	Cut Dp:	0.0
Grd.Lst:	21	Super R:	0		



L-Stn:	55.9	L-Ssl:	5	F Slope L:	200
P-Stn:	55.9	L-Ssr:	-5	F Slope R:	-100
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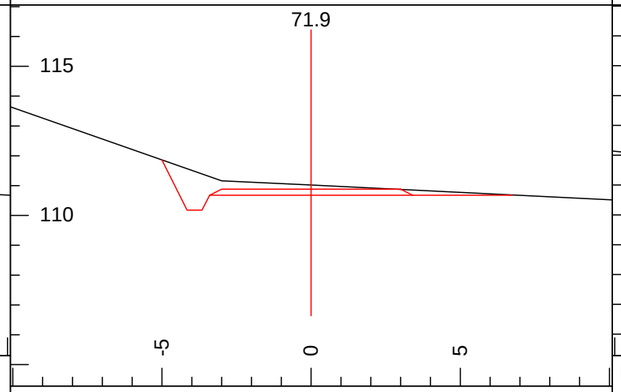
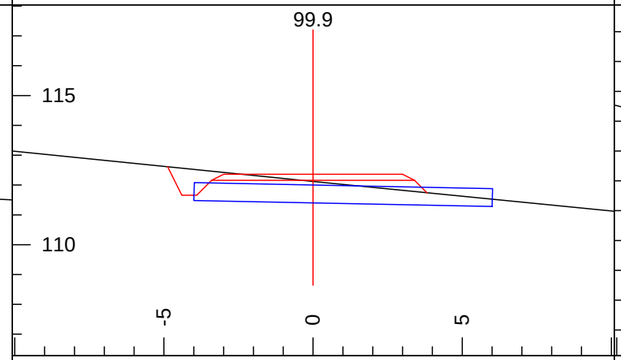
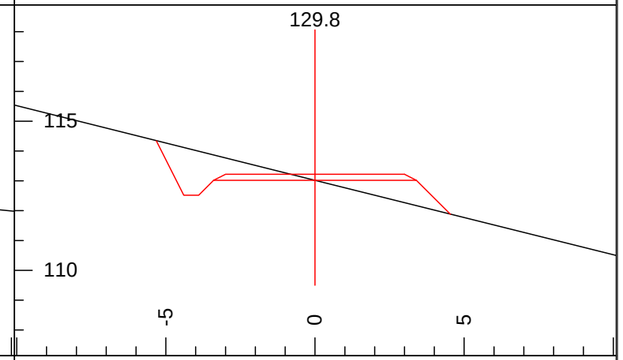
Grd.Lst:	18	Super R:	0		



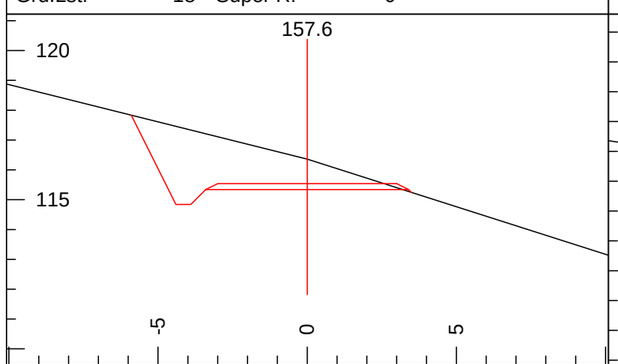
L-Stn:	71.9	Grd.Lst:	8	Super L:	0	F Slope R:	0
P-Stn:	71.9	L-Ssl:	5	Super R:	0	Cut Dp:	0.3
Grd.Nxt.:	8	L-Ssr:	-5	F Slope L:	200		



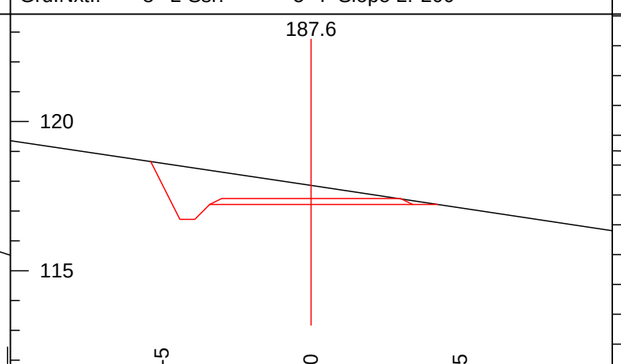
L-Stn:	99.9	L-Ssl:	10	F Slope L:	200
P-Stn:	99.9	L-Ssr:	-10	F Slope R:	-100
Grd.Nxt.:	3	Super L:	0	Cut Dp:	0.0
Grd.Lst:	3	Super R:	0		



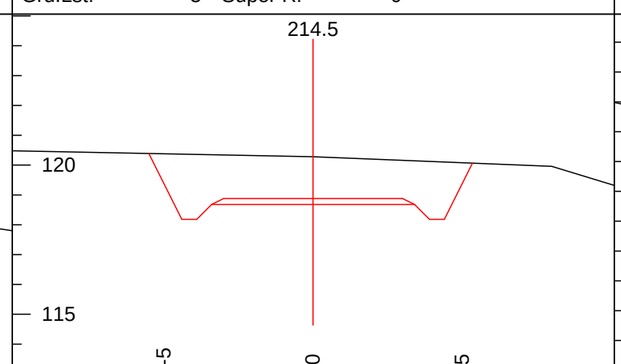
L-Stn:	129.8	L-Ssl:	25	F Slope L:	200
P-Stn:	129.8	L-Ssr:	-25	F Slope R:	-100
Grd.Nxt.:	8	Super L:	0	Cut Dp:	0.0
Grd.Lst:	3	Super R:	0		



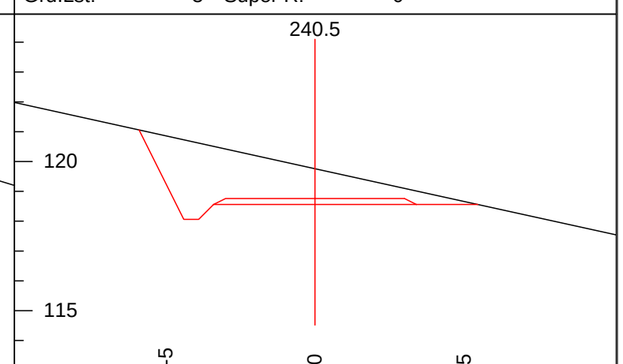
L-Stn:	157.6	L-Ssl:	25	F Slope L:	200
P-Stn:	157.6	L-Ssr:	-32	F Slope R:	-100
Grd.Nxt.:	8	Super L:	0	Cut Dp:	1.0
Grd.Lst:	8	Super R:	0		



L-Stn:	187.6	Grd.Lst:	6	Super L:	0	F Slope R:	0
P-Stn:	187.6	L-Ssl:	15	Super R:	0	Cut Dp:	0.6
Grd.Nxt.:	6	L-Ssr:	-15	F Slope L:	200		



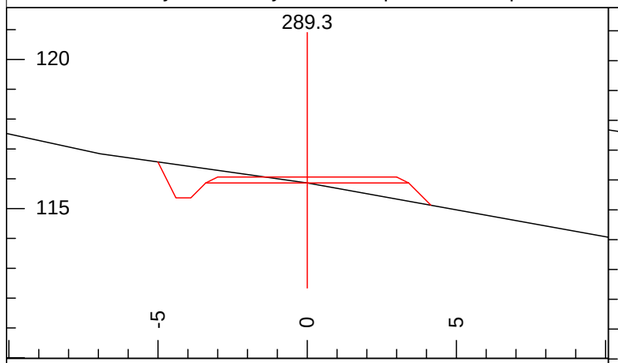
L-Stn:	214.5	Grd.Lst:	0	Super L:	0	F Slope R:	200
P-Stn:	214.5	L-Ssl:	2	Super R:	0	Cut Dp:	1.6
Grd.Nxt.:	0	L-Ssr:	-4	F Slope L:	200		



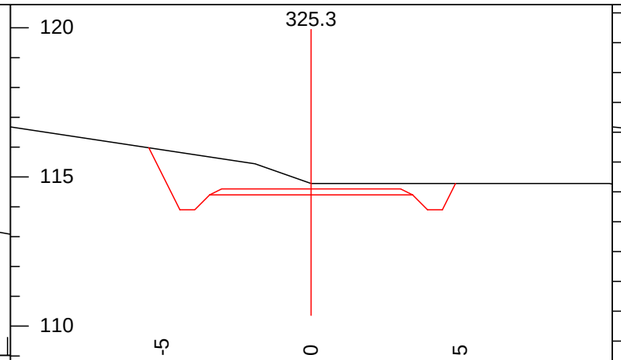
L-Stn:	240.5	Grd.Lst:	0	Super L:	0	F Slope R:	0
P-Stn:	240.5	L-Ssl:	22	Super R:	0	Cut Dp:	1.2
Grd.Nxt.:	0	L-Ssr:	-22	F Slope L:	200		

ROADENG Section | Scale 1:200 | P. 2

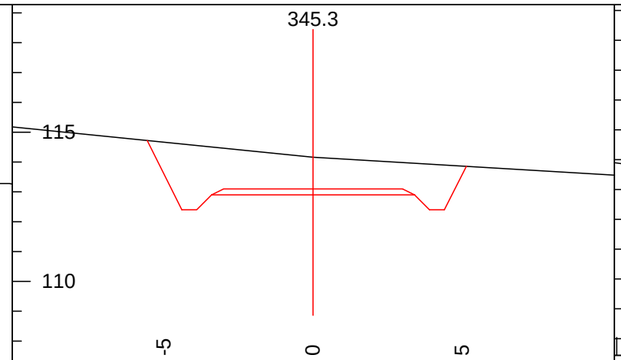
M:\Alberni Valley Community Forest Corp\Cutblocks\Sproat Unit\B11_old_W16\GIS_Data\Road_Eng_Files\B11_RDS_Combined\B11-S2_combined | 13/04/12



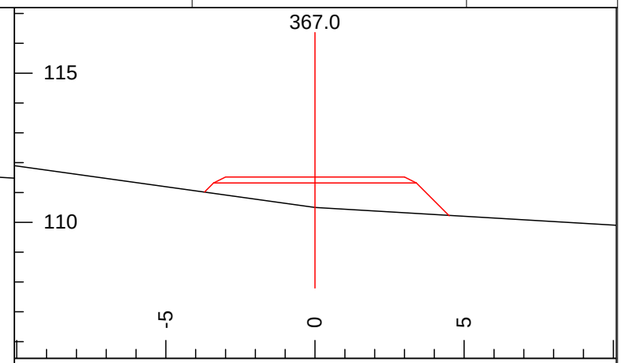
L-Stn:	289.3	L-Ssl:	14	F Slope L:	200
P-Stn:	289.3	L-Ssr:	-18	F Slope R:	-100
Grd.Nxt.:	-4	Super L:	0	Cut Dp:	0.0
Grd.Lst:	-6	Super R:	0		



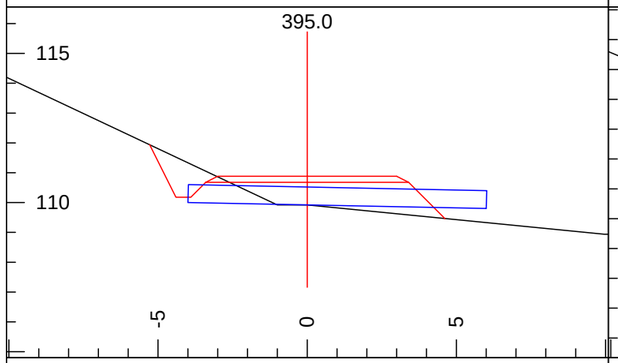
L-Stn:	325.3	Grd.Lst:	-7	Super L:	0	F Slope R:	200
P-Stn:	325.3	L-Ssl:	35	Super R:	0	Cut Dp:	0.4
Grd.Nxt.:	-7	L-Ssr:	0	F Slope L:	200		



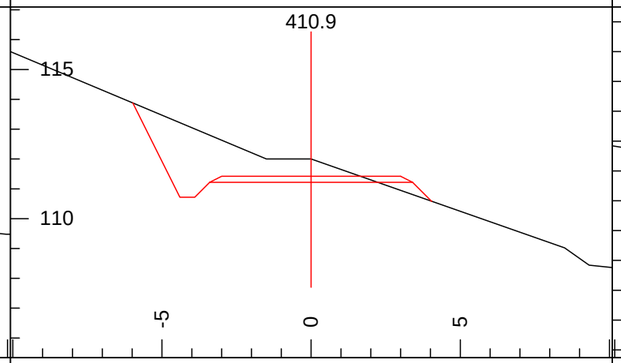
L-Stn:	345.3	Grd.Lst:	-7	Super L:	0	F Slope R:	200
P-Stn:	345.3	L-Ssl:	10	Super R:	0	Cut Dp:	1.3
Grd.Nxt.:	-7	L-Ssr:	-6	F Slope L:	200		



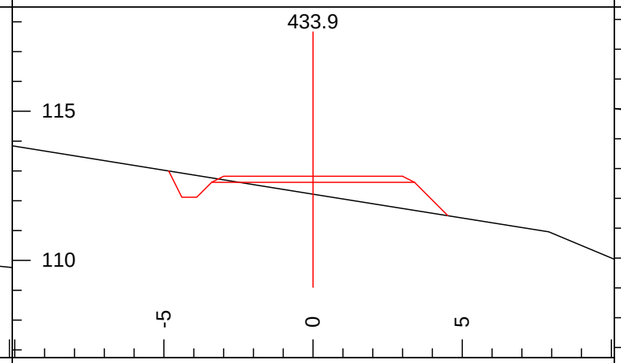
L-Stn:	367.0	L-Ssl:	14	F Slope L:	-100
P-Stn:	367.0	L-Ssr:	-6	F Slope R:	-100
Grd.Nxt.:	-2	Super L:	0	Cut Dp:	-0.8
Grd.Lst:	-2	Super R:	0		



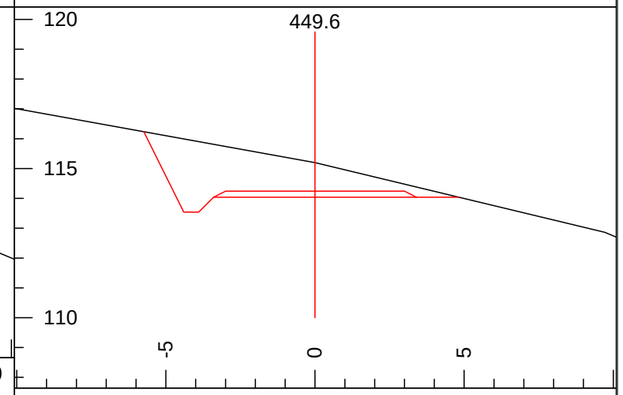
L-Stn:	395.0	L-Ssl:	0	F Slope L:	200
P-Stn:	395.0	L-Ssr:	-10	F Slope R:	-100
Grd.Nxt.:	-2	Super L:	0	Cut Dp:	-0.8
Grd.Lst:	-2	Super R:	0		



L-Stn:	410.9	L-Ssl:	0	F Slope L:	200
P-Stn:	410.9	L-Ssr:	-35	F Slope R:	-100
Grd.Nxt.:	3	Super L:	0	Cut Dp:	0.8
Grd.Lst:	3	Super R:	0		

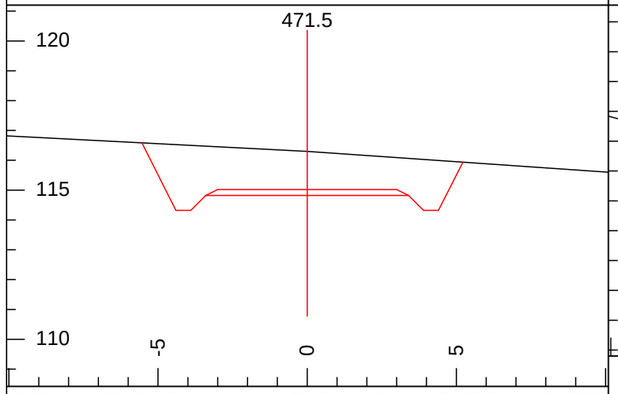


L-Stn:	433.9	L-Ssl:	16	F Slope L:	200
P-Stn:	433.9	L-Ssr:	-16	F Slope R:	-100
Grd.Nxt.:	9	Super L:	0	Cut Dp:	-0.4
Grd.Lst:	9	Super R:	0		

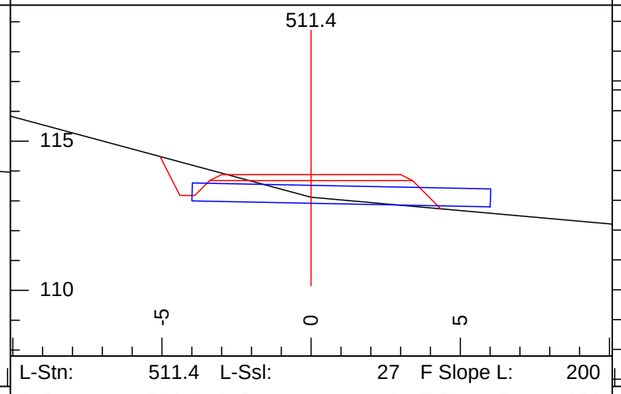


L-Stn:	449.6	Grd.Lst:	9	Super L:	0
P-Stn:	449.6	L-Ssl:	18	Super R:	0
Grd.Nxt.:	9	L-Ssr:	-24	F Slope L:	200

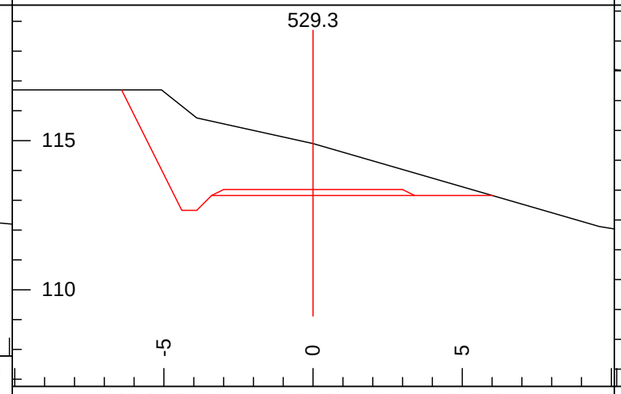
F Slope R:	0
Cut Dp:	1.2



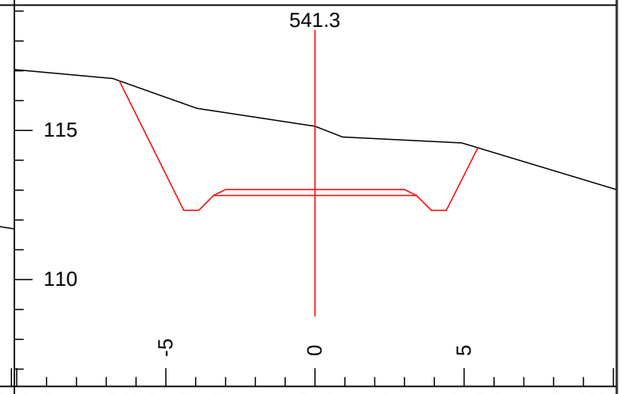
L-Stn:	471.5	Grd.Lst:	-3	Super L:	0	F Slope R:	200
P-Stn:	471.5	L-Ssl:	5	Super R:	0	Cut Dp:	1.5
Grd.Nxt.:	-3	L-Ssr:	-7	F Slope L:	200		



L-Stn:	511.4	L-Ssl:	27	F Slope L:	200		
P-Stn:	511.4	L-Ssr:	-9	F Slope R:	-100		
Grd.Nxt.:	-3	Super L:	0	Cut Dp:	-0.6		
Grd.Lst:	-3	Super R:	0				

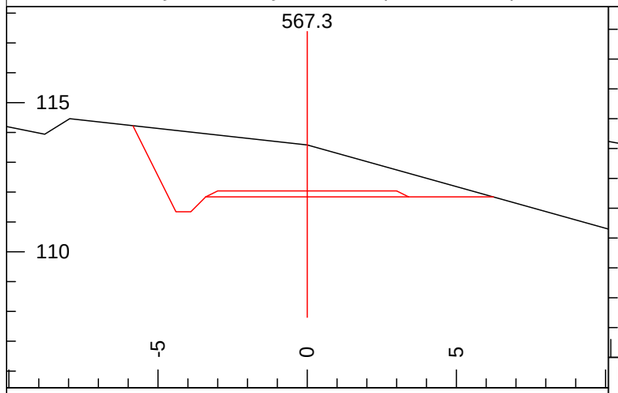


L-Stn:	529.3	Grd.Lst:	-3	Super L:	0	F Slope R:	0
P-Stn:	529.3	L-Ssl:	22	Super R:	0	Cut Dp:	1.7
Grd.Nxt.:	-3	L-Ssr:	-29	F Slope L:	200		

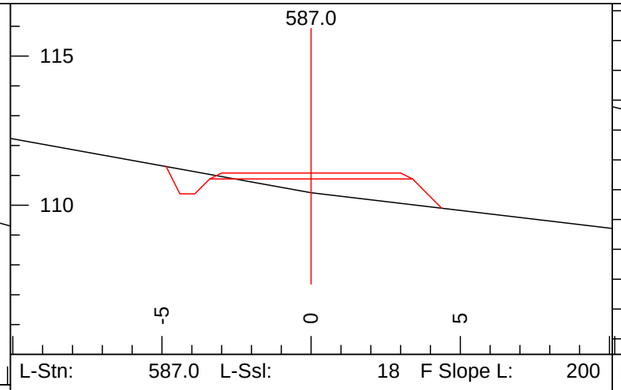


L-Stn:	541.3	Grd.Lst:	-3	Super L:	0	F Slope R:	200
P-Stn:	541.3	L-Ssl:	15	Super R:	0	Cut Dp:	2.3
Grd.Nxt.:	-3	L-Ssr:	-40	F Slope L:	200		

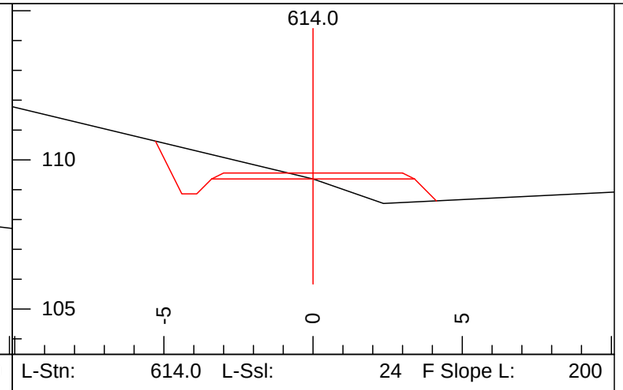
ROADENG Section	Scale 1:200	P. 3
M:\Alberni Valley Community Forest Corp\Cutblocks\Sproat Unit\B11_old_W16\GIS_Data\Road_Eng_Files\B11_RDS_Combined\B11-S2_combined		13/04/12



L-Stn:	567.3	Grd.Lst:	-5	Super L:	0	F Slope R:	0
P-Stn:	567.3	L-Ssl:	11	Super R:	0	Cut Dp:	1.7
Grd.Nxt.:	-5	L-Ssr:	-28	F Slope L:	200		



L-Stn:	587.0	L-Ssl:	18	F Slope L:	200
P-Stn:	587.0	L-Ssr:	-12	F Slope R:	-100
Grd.Nxt.:	-5	Super L:	0	Cut Dp:	-0.5
Grd.Lst:	-5	Super R:	0		



L-Stn:	614.0	L-Ssl:	24	F Slope L:	200
P-Stn:	614.0	L-Ssr:	-35	F Slope R:	-100
Grd.Nxt.:	n/a	Super L:	0	Cut Dp:	0.0
Grd.Lst:	-135	Super R:	0		

L-Stn m.	Cul DIA mm.	Cul Len m.	Lyr1 Gnd	Ssl %	Ssr %	Mass H. Cu. m.
0.0			OB	0	0	0.0
57.3			TR	5	-5	741.1
84.4			TR	5	-5	916.4
99.9	600	10.0	LB	10	-10	915.7
129.8			LB	25	-25	949.4
164.6			PR	25	-32	1002.5
187.6			PR	15	-15	1145.8
213.4			PR	2	-4	1396.0
245.3			PR	22	-22	1856.1
289.3			LB	14	-18	2077.7
324.0			PR	35	0	2220.6
366.7			PR	14	-6	2545.3
395.0	600	10.0	PR	0	-10	2415.4
411.4			PR	0	-35	2456.1
433.5			PR	16	-16	2518.6
450.1			PR	18	-24	2595.9
471.2			PR	5	-7	2877.6
511.4	600	10.0	PR	27	-9	3156.0
555.7			PR	11	-28	3903.6
574.0	600	10.0	PR	18	70	4113.9
613.8			PR	24	-35	4037.3

Appendix 4: Culvert List Discharge Calculation

Culvert List Discharge Calculation

Block #: B11

Block Name: B11-S1 Bookhout Creek

Instructions: Enter stream dimensions, enter culvert size (pipe or box) that exceeds area of stream at prescribed return period Q equivalent area

Road Name and Station	Stream # & Class or X-drain	average width at crossing	average HWM depth at crossing	Q2 A	Q10 Ac	Q100 Ac	Round Pipe Culvert Installed	Round Pipe Culvert Installed End Area	Wood Box Culvert Installed		Wood Culvert Installed End Area
									HEIGHT	LENGTH	
(m)		(m)		(m2)	(m2)	(m2)	(mm)	(m2)	(m)	(m)	(m2)
B11-S1											
0+121	X-drain	-	-	0.00	0.00	0.00	600	0.28			0.00
0+312	X-drain	-	-	0.00	0.00	0.00	600	0.28			0.00
0+365	2 S-4	1.00	0.10	0.10	0.20	0.30	800	0.50			0.00
0+449	X-drain	-	-	0.00	0.00	0.00	600	0.28			0.00
0+624	X-drain	-	-	0.00	0.00	0.00	600	0.28			0.00
0+759	X-drain	-	-	0.00	0.00	0.00	600	0.28			0.00
0+931	3 S-4	1.30	0.10	0.13	0.26	0.39	900	0.64			0.00
1+137	3 S-4	1.30	0.10	0.13	0.26	0.39	900	0.64			0.00
1+212	X-Drain	-	-	0.00	0.00	0.00	600	0.28			0.00
1+540	X-Drain	-	-	0.00	0.00	0.00	600	0.28			0.00
B11-S2											
0+100	NCD	-	-	0.00	0.00	0.00	600	0.28			0.00
0+396	X-drain	-	-	0.00	0.00	0.00	600	0.28			0.00
0+512	2 S-4	0.80	0.05	0.04	0.08	0.12	600	0.28			0.00
0+577	X-drain	-	-	0.00	0.00	0.00	600	0.28			0.00

ALL STREAM CROSSINGS ARE TO BE ARMORED WITH COARSE ROCK MATERIAL TO MINIMIZE THE TRANSPORT OF FINES DOWN STREAM.

RPF SIGNATURE AND SEAL

Prepared By: Andrew Kenyon (Name (Printed))

Signing RPF: Andrew Kenyon (RPF Name (Printed))

19/03/2013 (Date Signed (dd/mm/yy))

4739 (RPF Number)

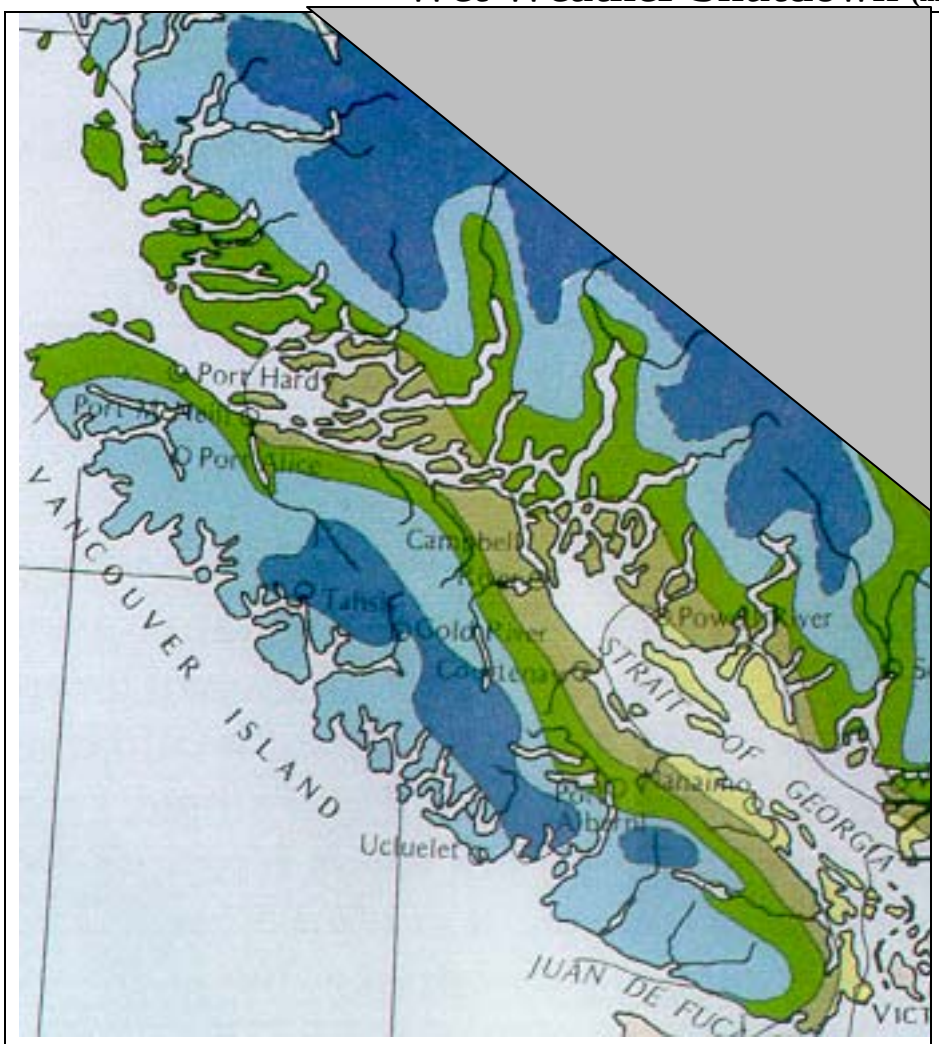
Andrew Kenyon 2013.04.16 14:59:17 -07'00'

"I certify that I have reviewed this document and, while I did not personally supervise the work described, I have determined that this work has been done to the standards expected of a member of the Association of British Columbia Forest Professionals."

Appendix 5: Wet Weather Shutdown Guidelines

Wet Weather Shutdown (modified Nov 7, 2006)

BCTS
BC Timber Sales
Strait of Georgia



Zone	Mean Annual Precip (mm)	Shutdown Threshold (mm/24 hours)
1	750	20
2	1500	40
3	2500	60
4	3000	75
5	3500	90

TABLE B Local Soil Type	Multiplier Factor
Very Erodible (e.g. lacustrine)	0.4
Erodible (e.g. organics, sands)	0.6
Least Erodible (e.g. colluvium, till)	0.8
Bedrock	1.0

TABLE C Slope Modifier	Multiplier Factor
0% - 57	1.0
57% - 70%	0.9
71% - 88%	0.8
89% +	0.7

Instructions:

1) Use base shutdown threshold from Table A
2) Multiply by Soil Type Modifier from Table B
3) Multiply result by Slope Modifier from Table C

Result is rainfall shutdown threshold in millimeters in a 24 hour period

Example

Zone¤	Table·A:·Mean·Annual·¤	Shutdown· Threshold¤
°¤	Precipitation·(mm)¤	(mm/24·hours)¤
1¤	750¤	20¤
2¤	1500¤	40¤
3¤	2500¤	60¤
4¤	3000¤	75¤
5¤	3500¤	90¤

TABLE·B·Local·Soil·Type¤	Multiplier¤
°¤	Factor¤
Very·Erodible·(e.g.· lacustrine)¤	0.4¤
Erodible·(e.g.·organics,· sands)¤	0.6¤
Least·Erodible·(e.g.· colluvium,·till)¤	0.8¤
Bedrock¤	1.0¤

TABLE·C·Slope·Modifier¤	Multiplier¤
°※	Factor¤
0%·-·57¤	1.0¤
·57%·-·70%¤	0.9¤
71%·-·88%¤	0.8¤
89%·+¤	0.7¤

For Dark Blue Zone 5; 24 Hr Shutdown Criteria = 90 x 0.8 x 0.8 = 58 mm

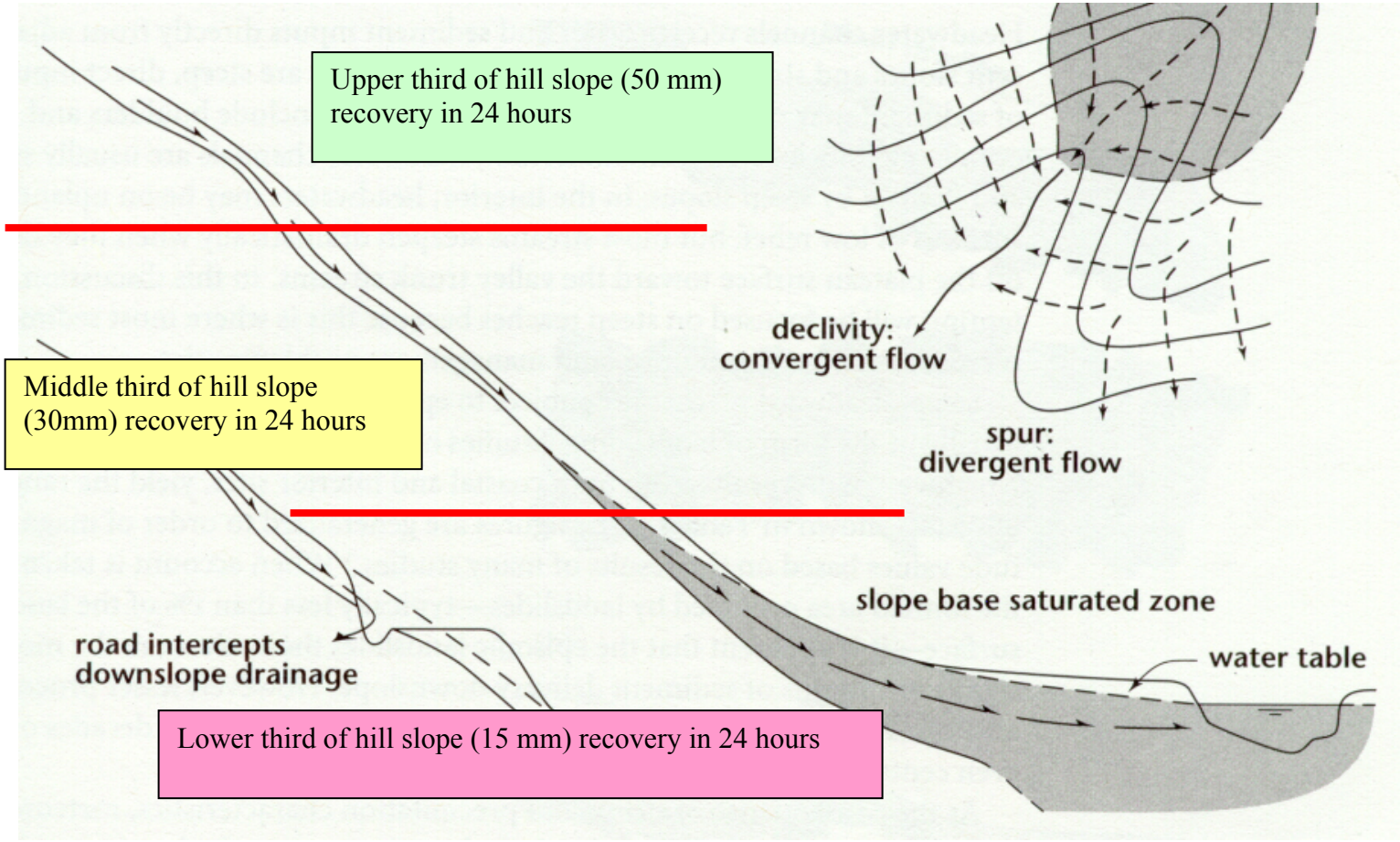
Return to Work Estimation Guide

Water balance returns to normal after a heavy rainfall period subject to a number of variables

- -slope position
- -slope gradient
- -soil type and depth (or proximity to bedrock)

Where a road is located above the worksite, interception by ditch lines may have the effect of increasing the recovery rate for lower slope positions

Using the following sketch as a guide, identify the slope position of the planned activity (upper, middle and lower thirds)
In an **average** situation precipitation input is reduced in a 24 hour period by the indicated values based on slope position



Appendix 6: Best Management Practices for a Community Watershed

(Practices Derived from Econ Forest Consulting Roads Report June 2011 and Sproat Lake CWAP Report 2008)

Best Management Practices for Community Watersheds

Refer also to Section 5.2.4 of the AVCF FSP.

Ditch Cleaning: where needed, ditches are to be cleaned when conditions are dry. Ditch spoil is not to be windrowed along the road shoulder. On moderate slopes, the ditch spoil could be thinly spread on the slope below the road, but not heaped or piled against trees. Where the road is on steep slopes, the ditch spoil should be end hauled to a suitable spoil site.

Culvert replacement: Where required culvert replacements are to be done during dry weather (except for emergency repairs or replacements). The inlet and outlet areas on new culverts, and the adjacent fill slopes, are to be armoured to prevent erosion or sloughing into the creek.

Rock Ballasting of road surface: For new road construction, where the road is close to a stream channel, the road surface is to be ballasted with clean rock. The road surface is also to be rock ballasted for 30 meters either side of stream culverts.

Road grading practices: grading is to be avoided during heavy rain.

Shutdown or harvest completion: In preparation for a shutdown for a period longer than 30 days or at a harvest completion, the following measures will be taken:

> No excavated or end hauled material will be left piled in such a way as to become unstable during the shutdown period. Spoil sites, piles and fills will be sloped uniformly to prevent instability.
>
> Ditches and culverts will be left clear and functional, with adequate inlet basins to minimize the potential for plugging.
>
> On sections of steep grades, cross ditches and back-up swales will be constructed where needed to minimize ditch erosion.
>
> If road construction has reached a drainage course but a drainage structure has not been installed prior to shutdown, the drainage course will be left open and unimpeded.
>
> Where exposed silty soils could erode and enter surface streams or ditches connected to streams, silt fences, hay bales or erosion blankets will be applied as needed for temporary protection.