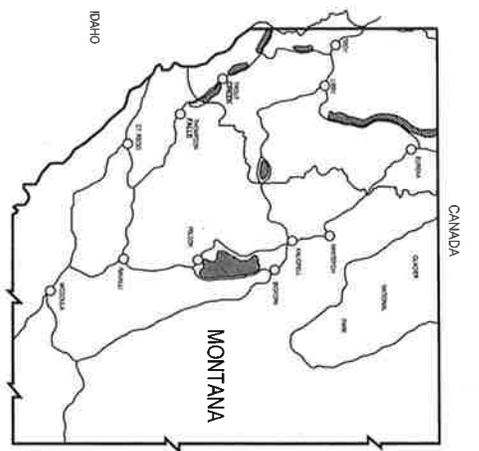
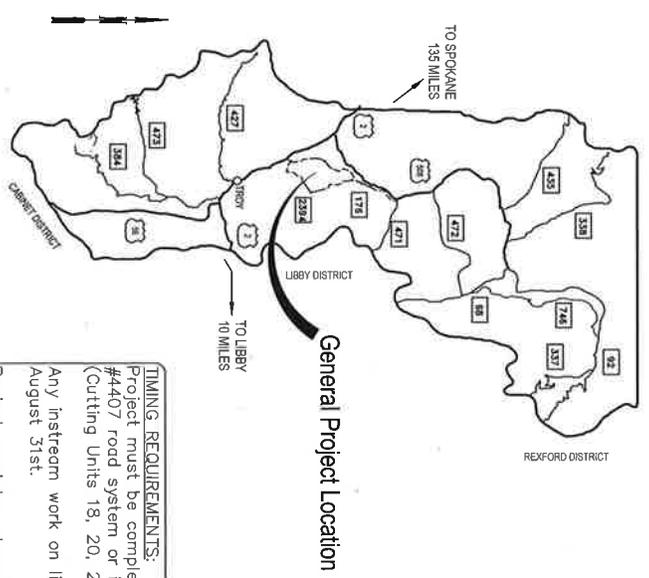


Appendix C, Project 03

UNITED STATES DEPARTMENT OF AGRICULTURE
 FOREST SERVICE - REGION ONE
 OLY MOLY STEWARDSHIP PLANS FOR
 MANDATORY ROAD STORAGE AND DECOMMISSIONING
 LINCOLN COUNTY, MONTANA
Road #4407B Storage & Decommissioning Project
 KOOTENAI NATIONAL FOREST
 THREE RIVERS RANGER DISTRICT



ROAD NO. 4407B ROAD NAME Yaak Mountain Lookout B LENGTH (ft) 7815



General Project Location

TIMING REQUIREMENTS:
 Project must be completed in conjunction with specified road work on the NFSR #4407 road system or in conjunction with harvest activities on Yaak Mountain (Cutting Units 18, 20, 21, 21A, and 21B)
 Any instream work on live, perennial streams must occur between July 15th to August 31st.
 Project must be done in a separate calendar year from Project 01.
 Project activities may not occur from April 1 to June 15.

PREPARED BY: _____ DATE _____
 DISTRICT HYDROLOGIST _____ DATE _____

REVIEWED BY: _____ DATE _____
 ZONE ENGINEERING TEAM LEADER _____ DATE _____

MULTIPLE RESOURCE REVIEW BY: _____ DATE _____
 DISTRICT RANGER _____ DATE _____

I certify that this project has been designed in accordance with sound engineering practices.
 FOREST ENGINEER _____ DATE _____

SHEET NUMBER	TOTAL SHEETS
1	7

Index & General Notes

SHEET DESCRIPTION	PAGE NO.
TITLE SHEET	1
DRAWING INDEX AND GENERAL NOTES	2
PROJECT MAPS	3
SUMMARY OF QUANTITIES	4
WORK LOG ROAD #4407B	5
CROSS DRAINAGE DETAILS	6
EARTH BERM & PATH CONSTRUCTION	7

Construction Staking: Stations will be flagged on the ground before work begins.

Project work identified in the Work Logs is stationed from the beginning of each road to the end, but work will generally be accomplished from the end of each road (last station) back to the beginning.

Mobilization (Pay Item 15101): Mobilization cost includes tracking equipment from lowboy drop points to work areas and transporting equipment by lowboy between work areas. Possible drop points for equipment are shown on the project location map. It is the Contractor's responsibility to verify the suitability and accessibility of these locations or any other drop point sites selected.

Incidental work to this Pay Item includes removal of existing earth berms and light clearing unless shown otherwise in the work logs. Existing waterbars and recontoured stream crossings that require little modification for access will be restored to their original condition if altered or damaged by the Contractor, incidental to this Pay Item, unless shown otherwise in the work logs.

Roadway Clearing (Pay Item 20103): The roads in this contract have been closed to vehicle traffic for many years and have revegetated. Vegetation varies from light (scattered small brush) to heavy (dense 2-3' diameter alder and 4-8' diameter conifers). Logs and rocks in the roadway may need to be removed. Existing earth barriers will need to be removed (if reinstated they will be paid for under Pay Item 20427). Clearing and grubbing for all other required work is included in this pay item.

Cleaning Culvert Inlet/Outlets (Pay Items 60708): Where specified ditches and catch basins will be cleared of debris, grubbed of trees and brush and reshaped. This work may include reshaping ditch blocks at ditch relief culverts to allow bypass flow down the ditch. Soil and debris removed will be scattered on downhill side of the roadway and away from culvert outlets. Some culvert inlets and outlets will need to be cleaned by hand because they are beyond the reach of the equipment or cannot be easily cleaned without damaging the culvert. The Contractor will be responsible for repairs to culverts if they are damaged during performance of the work.

Equipment Rental (Pay Item 62201): Only excavators meeting Supplemental Specification 622.02 will be used for hourly work.

Application of Slash and Duff: Slash and duff application is incidental other pay items. Where slash placement on disturbed soils is required in the plans, use the excavator bucket to collect and scatter a layer of duff material evenly over disturbed soils before applying slash. Obtain duff from undisturbed areas and adjacent to the road above the top of the cut slope or below the toe of the fill slope. Smooth duff collection holes over by knocking down sharp edges and lightly raking adjacent material back into holes.

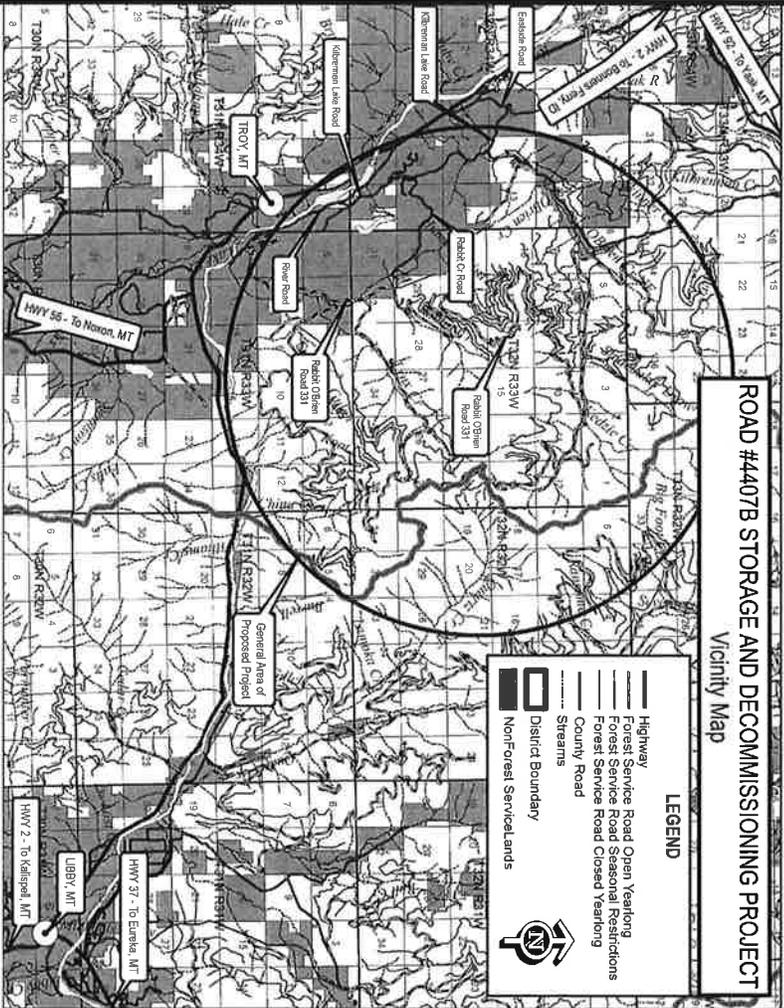
Seeding (Pay Item 62501): Areas where bare soil is exposed as a result of project activities will be hand seeded at a rate of approximately 25 pounds per acre using Government furnished seed. Seed will be applied uniformly and in a manner that allows supplied seed to cover the anticipated acreage.

OLY ROAD STORAGE AND DECOMMISSIONING PROJECT

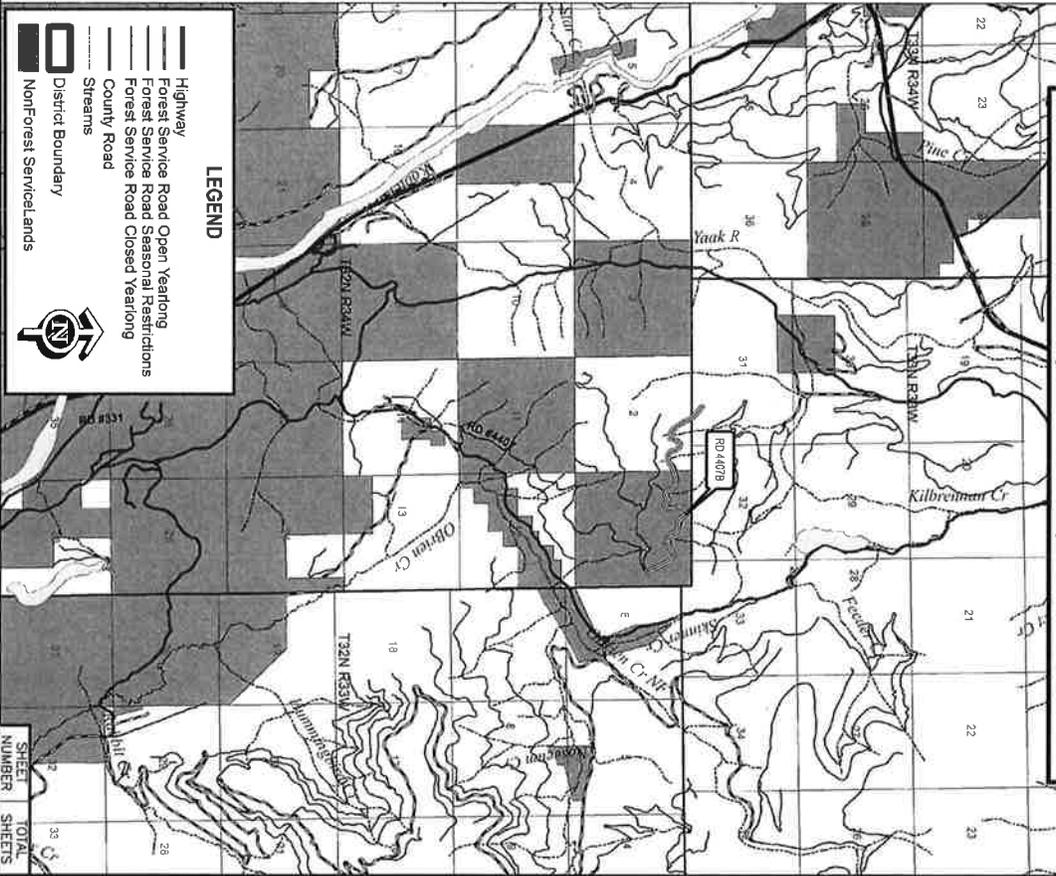
SHEET NUMBER	TOTAL SHEETS
2	7

Project Map

ROAD #4407B STORAGE AND DECOMMISSIONING PROJECT Vicinity Map



ROAD #4407B STORAGE AND DECOMMISSIONING PROJECT Project Location Map



ROAD #4407B STORAGE AND DECOMMISSIONING PROJECT

SHEET NUMBER	3	TOTAL SHEETS	7
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Summary of Quantities

ITEM NO	ITEM DESCRIPTION	METHOD OF MEASURE	UNIT OF MEASURE	4407B
15101	MOBILIZATION	LSQ	LS	ALL
20103	CLEARING AND GRUBBING	CQ	LF	7815
20420	DRAINAGE EXCAVATION, CROSS CHANNEL	AQ	EA	1
20427	DOUBLE EARTH BERM	AQ	EA	1
60708	CLEANING CULVERTS INLET/OUTLET	AQ	EA	1
62201	EQUIPMENT RENTAL, HYDRAULIC EXCAVATOR WITH THUMB	AQ	HR	2

ROAD #4407B STORAGE AND DECOMMISSIONING PROJECT

SHEET NUMBER	TOTAL SHEETS
4	7

Road Storage and Decommissioning Log

Road #4407B

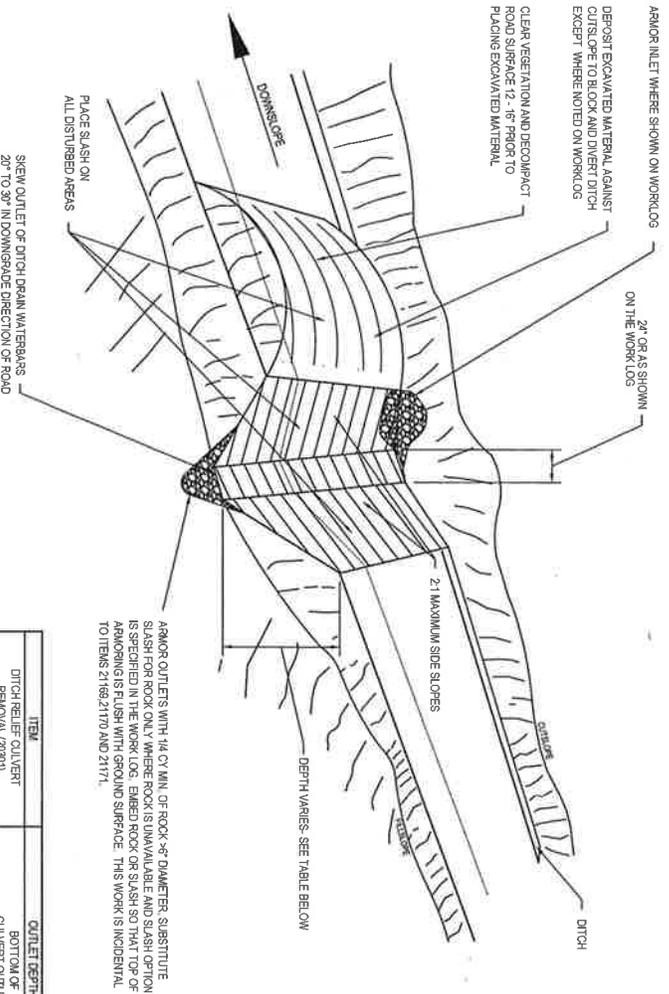
Station or Mile Post	Pay Item Number	Description of Work	Station or Mile Post	Pay Item Number	Description of Work
ROAD #4407B STA 0+00		BEGIN ROAD #4407B WORK. JUNCTION WITH ROAD #4407 (2.9 MILES FROM JUNCTION OF ROAD #4470 & #2394).			
STA 1+05	20427 20103	REMOVE AND REPLACE DOUBLE EARTH BERM (APPROXIMATELY 5 HOURS) BEGIN ROADWAY CLEARING. LIGHT SMALL BRUSH AND A FEW SMALL LOGS ACROSS THE ROAD. REMOVE ONLY WHAT IS NECESSARY FOR ACCESS. PLACE SLASH ON THE GROUND ON THE DOWNHILL SIDE BELOW THE ROAD. DO NOT COVER OR BLOCK CULVERT OUTLETS.			
STA 69+65	20103	NATIONAL FOREST BOUNDARY ROADWAY CLEARING BECOME MODERATE TO HEAVY CLEARING OF BRUSH, SMALL TREES, AND LOGS. PLACE SLASH ON THE GROUND ON DOWNHILL SIDE OF ROAD TO THE EXTENT POSSIBLE WITHOUT RE- MOVING TREES THAT ARE OFF THE ROADWAY.			
STA 76+55	60708	CLEAN 18" CULVERT OUTLET. CMP IS COMPLETELY BURIED AND MOST LIKELY HAND WORK WILL BE RE- QUIRED DUE TO BEING BEYOND REACH OF EQUIPMENT.			
STA 77+10	20420	CONSTRUCT CROSS CHANNEL AND ARMOR FOR SMALL PERENNIAL STREAM. ALLOW 4' CHANNEL BOTTOM WIDTH. DRAIN TOWARDS CHANNEL BELOW 18" CMP AT STA 76+55. ESTIMATED 45' LONG AND 8" DEEP AT OUTLET. DO NOT EXCAVATE AT TOE OF CUTI SLOPE.			
	62201	BEGIN CONSTRUCTION OF A 2' x 2' WIDE BOTTOM DITCH ALONG INSIDE EDGE OF ROAD. GRADE INTO EXISTING DITCH.			
STA 78+15	62201 20103	END CONSTRUCTION OF 2' x 2' FLAT BOTTOM DITCH. GRADE INTO EXISTING DITCH. END ROADWAY CLEARING (TOTAL 78+15). END ROAD #4407B WORK.			

ROAD #4407B STORAGE AND DECOMMISSIONING PROJECT

SHEET NUMBER	TOTAL SHEETS
5	7

Cross Drainage Details

ITEM 204420, DRAINAGE EXCAVATION, CROSS CHANNEL



ITEM	OUTLET DEPTH*
DITCH RELIEF CULVERT REMOVAL (20901)	BOTTOM OF CULVERT OUTLET
CROSS CHANNEL (20420)	TOE OF ROAD FILL
DITCH DRAIN WATER BAR (20420)	MINIMUM 12" LOWER THAN INLET DEPTH

*UNLESS SHOWN OTHERWISE IN WORK LOG

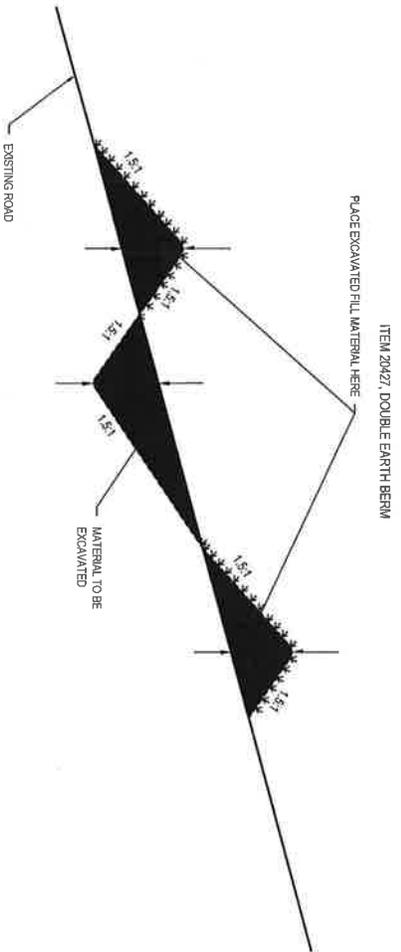
ROAD #4407B STORAGE AND DECOMMISSIONING PROJECT

SHEET TOTAL
NUMBER SHEETS

6

7

Double Earth Berm



ROAD #4407B STORAGE AND DECOMMISSIONING PROJECT

SHEET NUMBER	TOTAL SHEETS
7	7

Road #4407B Storage and Decommissioning Project - Government Cost Estimate 6/22/2016 (Modified by HPerrine)

Pay Item No.	Pay Item Description	Method of Measure	Pay Unit	Total Quantity	Unit Price	Amount
15101	Mobilization	LSQ	LS	1	2012.48	2012.48
20103	Clearing and Grubbing	AQ	LF	7815	0.75	5861.25
20420	Drainage Excavation, Cross Channel	AQ	EA	1	240.00	240.00
20427	Double Earth Berm	AQ	EA	1	187.00	187.00
60708	Cleaning Culverts Inlet/Outlet	AQ	EA	1	140.00	140.00
62201	Equipment Rental, Hydraulic Excavator w/ Thumb	AQ	HR	2	140.00	280.00
TOTAL						8720.73

Oly Road Storage and Decommissioning Project - Cost Estimate

Pay Item No.	Pay Item Description	Method of Measurement	Pay Unit	Total Quantity	Unit Price	Amount	Basis for Estimate
15101	Mobilization	LSQ	LS	1	6337.00	6569.39	10% of project cost
20301	Culvert and Gate Disposal	AQ	EA	7	152.00	1064.00	Avg. for low 3 bidders - Madge
20401	Structural Excavation & Backfill	DQ	CY	350	20.00	7000.00	Heath's Estimate
21160	Roadway Clearing and Grubbing	AQ	LF	18990	0.50	9495.00	Add for Rd 4433/Sta. 51+70?
21161	Stream Channel Excavation - Category I	AQ	EA	5	942.00	4710.00	Avg. for low 3 bidders - Madge
21162	Stream Channel Excavation - Category II	AQ	EA	3	2193.00	6579.00	Based on estimated hours at the three crossings.
21165	Full Road Recontour	AQ	LF	60	4.50	270.00	Estimated 50% more work than partial
21166	Partial Road Recontour, 3:1 Outslope	AQ	LF	315	3.00	945.00	Avg. for low 3 bidders - Madge
21167	Road Decompaction	AQ	LF	2080	0.53	1102.40	Avg. for low 3 bidders - Madge
21169	Ditch Relief Culvert Removal	AQ	EA	1	400.00	400.00	SWAG based on Cross Channel bid.
21170	Cross Channel	AQ	EA	1	240.00	240.00	Avg. for low 3 bidders - Madge
21171	Ditch Drain Waterbar	AQ	EA	16	81.00	1296.00	Avg. for low 3 bidders - Madge
21172	Surface Waterbar	AQ	EA	66	44.33	2925.78	Avg. for low 3 bidders - Madge
21174	Double Earth Berm	AQ	EA	5	187.00	935.00	Avg. for low 3 bidders - Madge
25170	Deliver and Place Class 2 Riprap	DQ	CY	20	146.54	2930.80	Assumed similar to Class II?
25171	Deliver and Place Class 3 Riprap (Inlet)	DQ	CY	5	146.54	732.70	Heath's Estimate
25172	Deliver and Place Rock 16" - 20" (Outlet)	DQ	CY	10	171.54	1715.40	Heath's Estimate

Pay Item No.	Pay Item Description	Method of Measurement	Pay Unit	Total Quantity	Unit Price	Amount	Amount Basis for Estimate
25173	Deliver 16" - 20" Rock (Rd 1998)	AQ	EA	52	56.00	2912.00	See detail
30370	Road Reconditioning - Ditch Improvements	AQ	LF	415	1.43	593.45	Avg. for low 3 bidders - Madge
30371	Road Reconditioning - Culvert Inlet/Outlet Cleaning	AQ	EA	17	140.00	2380.00	Avg. for low 3 bidders - Madge
60201	Install 57" x 38" CMP with Beveled Inlet, Compaction Method B	AQ	LF	62	92.00	5704.00	Heath's Estimate
62201	Excavator - Large	AQ	HR	64	140.00	8960.00	Avg. for low 3 bidders - Madge
62501	Seeding - Gov't Furnished?	DQ	AC	5.2	242.00	1258.40	See detail
64803	Stream Grade-Control Structure	AQ	EA	3	515.00	1545.00	Heath's Estimate
TOTAL						72263.32	

Item No.	Descrip	Road 4433	Road 4433A	Road 4433B	Road 1998	Road 1998A	Road 2380	Road 14347	Road 14349	Road 4650/4651	Road 4419/4420/4420A	Road 4429F	Total Quantity		
15101	Drive - Lowboy Hr	4	0	0	3		3			3	4	3	20		
	Walk - Excav Hr	3					3					3	9		
	Incid - Excav Hr				2	1	2			1	1		7		
21162	Excav								16		18		47		
30370	Ditch/Culv Clean -	80 min =	25 min =	50 min =									2.6		
	Excav (18 sites)	1.33 hr	0.42 hr	0.83 hr										x 140/hr = \$364	
	Hand (7 sites)		480 min = 8 hr	30 min = 0.5 hr											/18 sites = \$20/each
													x45/hr = =\$382	/7 sites = \$55/each	\$29.80 Wt Avg
62201	Excav Hr	8	0	4	36	6	1	2	3	3	3	2	68		
62501	Seed Ac	0.5	0.3	0.5	1	0.2	0.1	0.2	0.5	0.5	1.2	0.2	5.2		
	Labor Hr	4	2	4	3	2	1	2	3	2	4	1	28		

Lowboy	150/hr
Excav	140/hr
Dump Tr	120/hr
Labor	45/hr

Description	Calculation	Cost
Purchase cost from Noble	52 rocks = 6.5 CY x \$10/CY = \$65	65
Avg. rock size	16-20" Rock (avg = 18" cubed = 1.5 feet cubed = 3.375 cf/27 = 0.125 CY/rock	
Rocks / dump truck load	12 yd truck/0.125 CY/rock = 96 rocks packed perfectly Assume 50% voids = 48 rocks, therefore 2 RT loads for 52 rocks.	
Dump truck haul cost	2 RT x 4 hours/RT x \$120/hr = \$960 for haul of 52 rocks	960
Excav haul cost to 54+00	Pack 4 rocks at a time with excavator from 51+00 to 54+00. 0.2 hr RT 38 rocks/4 per bucket load = 9.5 RT = 9.5 hours x \$140/hr = \$1330	1330
Excav haul cost to 81+00	Pack 4 rocks at a time with excavator from 51+00 to 81+00. 1 hr RT 14 rocks/4 per bucket load = 4 RT = 4 hours x \$140/hr = \$560	560
Total Cost		2915
Cost per rock	\$2915/52 rocks = \$56/rock	56

North Lynx Creek Culvert Replacement Cost Estimate

Item No. Item Description

15101 MOBILIZATION (10% of sum of all other line items)

15713 SOIL EROSION/POLLUTION CONTROL

20102 CLEARING & GRUBBING

20301 REMOVAL OF EXISTING 24" ROUND CMP

20401 STRUCTURAL EXCAVATION & BACKFILL

25101 RIPRAP CLASS 3

25201 CHANNEL ROCK CLASS 1

60202 INSTALL 57" x 38" Squash CMP, COMPACTION METHOD B

62501 Seeding

64803 STREAM STRUCTURES

Method of Measure	Units	Quantities	Unit Price	Amount
LSQ	LS	1	\$1,653.25	\$1,653.25
LSQ	LS	1	\$1,000.00	\$1,000.00
DQ	Acre	0.25	\$3,465.00	\$866.25
AQ	Ea	1	\$303.98	\$303.98
DQ	CY	350	\$20.00	\$7,000.00
DQ	CY	5	\$146.54	\$732.69
DQ	CY	5	\$171.54	\$857.69
AQ	Ft	62	\$91.99	\$5,703.13
DQ	Acre	0.25	\$275.00	\$68.75
AQ	Ea	3	\$514.61	\$1,543.84
Total=				\$18,185.73

Volume= Extra light (0-5 MBF/Acre)
\$/Acre= 2310
Topo Factor= 1.2
Slash/Cleanup Factor= 1.25

Total Cost= \$3,465.00

Approximate time to remove culvert with machinery (hrs)= 2.5
Caterpillar 312C (5 years old) \$/hr= 72.1
Excavator Operator (Montana Zone 3) \$/hr= 49.49

Total Cost= \$303.98

Estimated quantity of excavation (CY)= 350

Costs \$/CY= 20

Total Cost= \$7,000.00

Fixed Cost (\$/CY)= 0.83 (12 CY End Dump)
Haul Miles from Libby, MT= 60 (Round Trip)
Variable Cost (\$/CY/mi)= 1.25 (Average Speed=25 mph; 12 CY End Dump)

Machine Placed-Labor 20%= 1.06
Riprap - Assume Base Cost (\$/CY)= 75
Channel Rock - Assume Base (\$/CY)= 100

Riprap Total Cost/CY= \$146.54
Channel Rock Total Cost/CY= \$171.54

Approximately CY of Rock Per Structure= 3
Channel Structure Cost/ea= \$514.61

Length of pipe (ft)=	62	
Number of Bands=	2	
Convert bands to equivalent feet (ft)=	2	
2.66" x .5" Corrugations, .109 gauge (\$/ft)=	68.25	(For 48" Round Pipe)
Between 30'-100' of arched (squash) factor=	1.25	
Beveled end treatment for 48" equivalent \$=	72.5	

Total Cost= \$5,703.13