SUMMARY REPORT

EROSION CONTROL WORK PERFORMED ON THE M-6 ROAD NETWORK, BRIDGE CREEK UNIT 87-3

BY

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INTRODUCTION

Rehabilitation Unit 87-3 is located approximately eight miles upstream from Orick in the Bridge Creek watershed. It contains 240 acres and 2.3 miles of logging haul roads, including the M-6 (0.6 mi.), M-6-2 (0.6 mi.), M-6-2-1 (0.9 mi.) and the M-6-1 (0.2 mi.) roads (Maps A and B). The heavy equipment work was performed under a fixed-price contract. With the exception of three skid trail crossings, work was confined to haul road corridors. The majority of hillslope work was performed under rental agreement and is discussed in the summary report for Unit 87-4; M-6 Hillslopes.

The total rehabilitation cost including all preparatory work was $113,889. Of this total, heavy equipment and labor intensive erosion control work accounted for $98,640, or 86% of the total cost. A total of 2.3 miles of haul roads were removed, with 43,000 yds^3 of fill excavated from various worksites. W.K. Construction performed the heavy equipment work under the fixed-price contract IFB 8480-87-02 which was awarded for $92,245. Surveys, design, and contract preparation required a total of 494 person-hours to complete (Table 1).

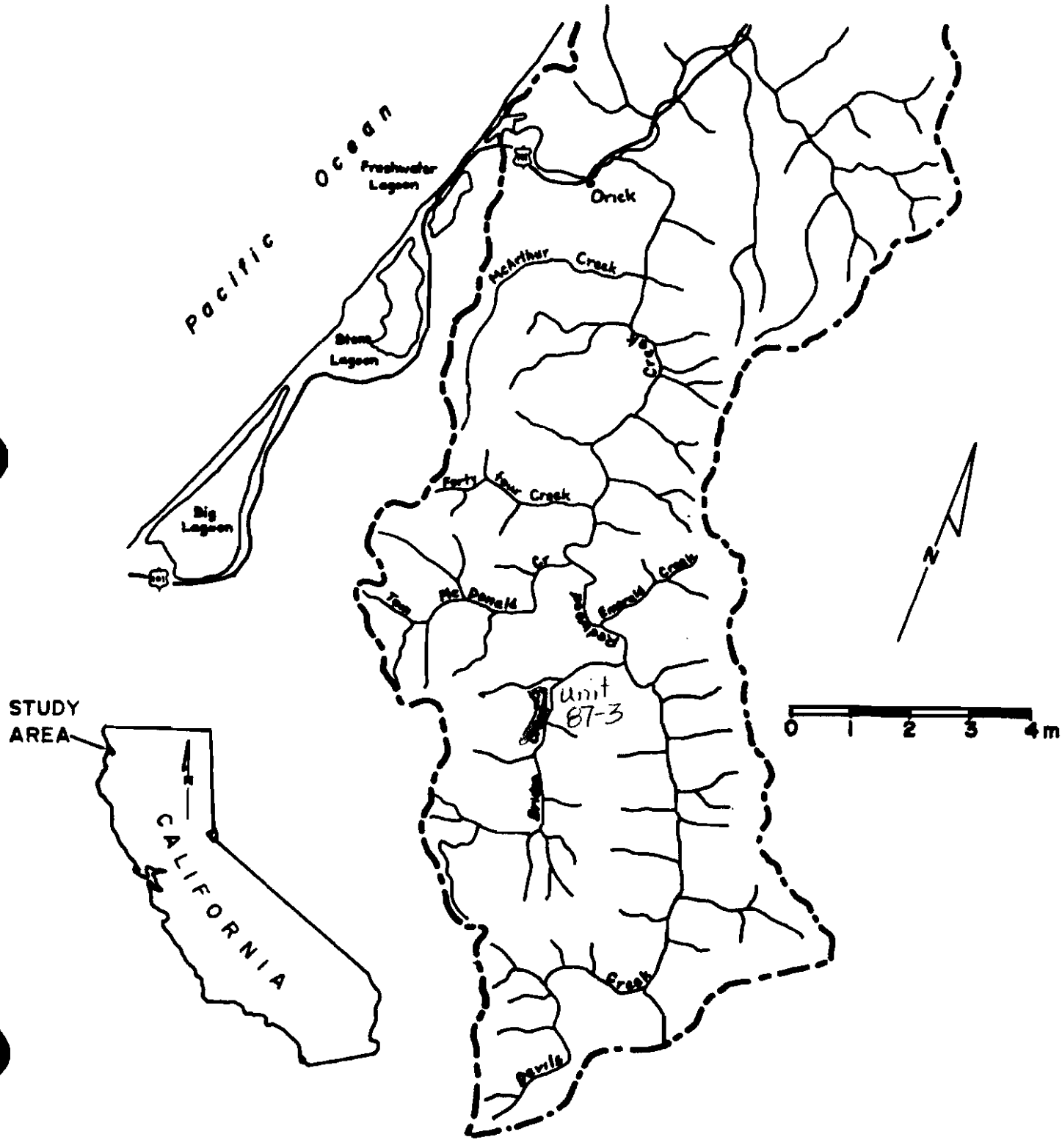
Description of Unit

Unit 87-3 occupies the lower quarter of the hillslope. Total relief is 800 ft. with elevations ranging from 400 ft. at the valley bottom to 1200 ft. at the M-Line. Hillslope gradients average 40%, but easily exceed 50% within the drainages. Both M-6-2 and M-6-2-1 roads are located immediately above the final break-in-slope into the main stem of Bridge Creek.

Seven intermittent, first-order streams and one perennial, second-order stream drain this unit. The first-order streams drain an average of 25 acres while the second-order stream drains approximately 150 acres. Above the M-6-2 and M-6-2-1 roads, streams have moderate (25%-30%) gradients and shallow incisions. Below these roads, streams have steeper (35%-40%) gradients and become more deeply incised. Organic debris appears to have been the primary channel armor in most of these streams.

Typical of west-side tributary basins, this rehabilitation unit lies within the Redwood Creek schist. Although there are only a few exposures, the bedrock appears relatively competent. Sheared or highly weathered bedrock is usually found in the stream valleys. Soil types and depths vary across this unit, but are dominated by the fairly deep, well drained Ahpah and Coppercreek soils. The interested reader is referred to the in-house report by Popenoe and Martin, 1985, "Soils on the M-6 Road Rehabilitation Unit."

87-3: M-6-2 & M-6-2-1 ROADS
WATERSHED REHABILITATION UNIT



87-3: M-6-2 & M-6-2-1 ROADS WATERSHED REHABILITATION UNIT

MAP B: TOPOGRAPHY

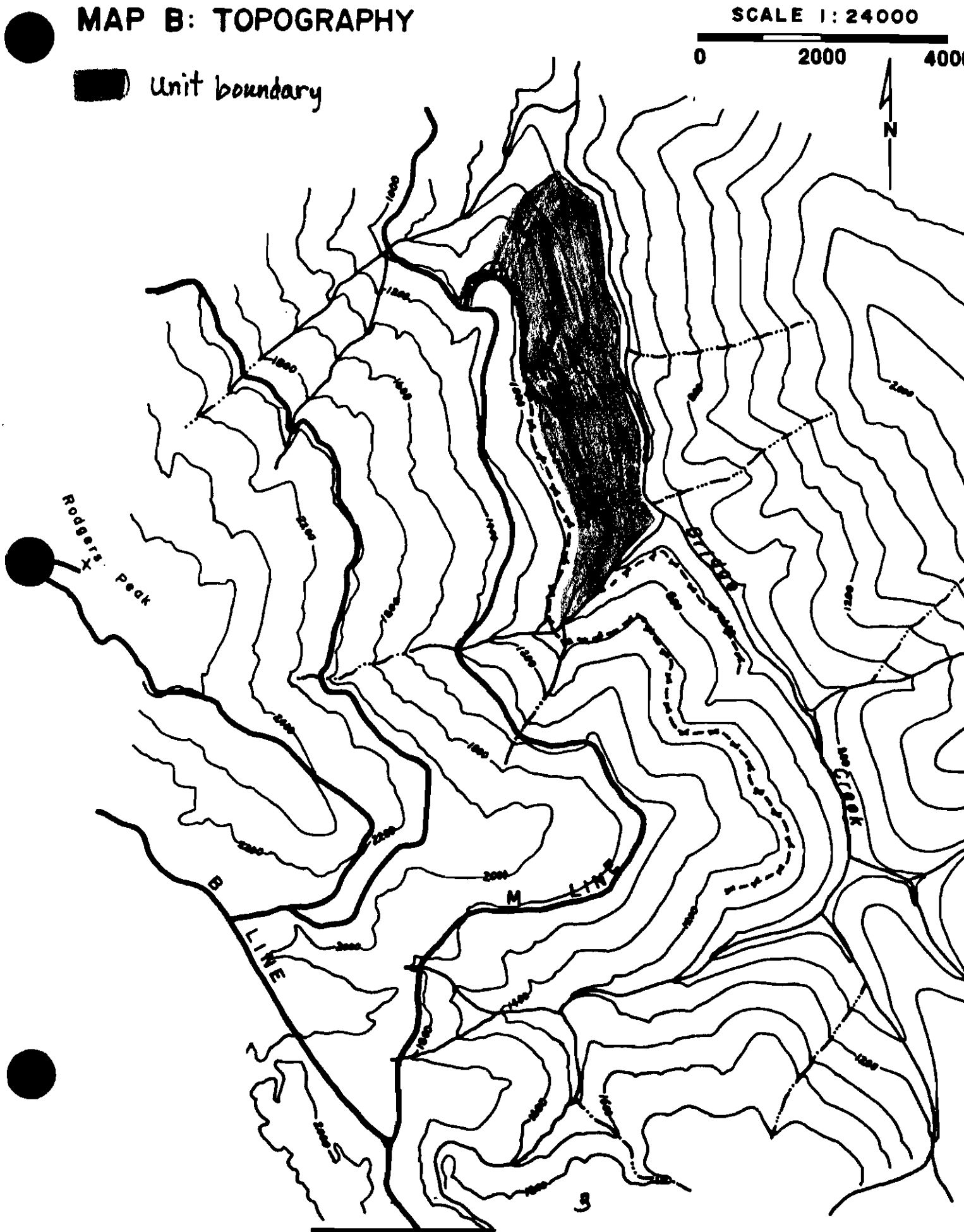


Table 1

REHABILITATION WORK COST SUMMARY

Unit 87-3; M-6 Roads

Treatment	Total Quantity	Total Cost	Average Unit Cost
HEAVY EQUIPMENT WORK[1]			
Primary Treatments			
Haul road crossings	20,170 yd^3	$40,138	$1.99/yd^3$
Skid trail crossings	690 yd^3	828	$1.20/yd^3$
Exported outslope	21,260 yd^3	42,307	$1.99/yd^3$
Deep drains	1,460 yd^3	2,905	$1.99/yd^3$
Inboard ditches	583 ft.	770	1.32/ft.
Ripping	1.9 mi.	1,500	789/mi.
Cross-road drains	1,130 ft.	747	0.66/ft.
Secondary Treatments			
Rock placement @ RX6	50 yd^3	included in RX6 bid price	
Miscellaneous Costs[2]	- -	$2,475	- -
TOTAL HEAVY EQUIPMENT COST =		$91,670	
LABOR INTENSIVE WORK:			
Primary Treatments	none		
Secondary Treatments			
Straw mulch[3]	719 bales	$5,732	$7.97/bale
MISCELLANEOUS			
Brush survey lines	10 sites	613	$61/site
Brush trails-access	1,500 ft.	445	$0.30/ft.
Place station lathe	2.1 mi.	180	$86/mi.
TOTAL LABOR INTENSIVE COST =		$6,970	

Table 1 (cont'd)

REHABILITATION WORK COST SUMMARY

Unit 87-3; M-6 Roads

Treatment	Total Quantity	Total Cost	Average Unit Cost
TECHNICAL WORK:			
Evaluation of Rehab. Unit			
Map Unit	240 acres	0 (mapped in previous yr.)	
Prescribe treatments	100 p-h	$1,317	-.-
Survey & design	344 p-h	$4,227	-.-
Contract prep.	150 p-h	$2,150	-.-
Supervision of Work			
Heavy equipment (C.O.R.)	330 p-h	$4,729	-.-
Documentation			
Photo points	110 p-h	$1,106	-.-
Summary report	120 p-h	$1,720	-.-
TOTAL TECHNICAL WORK =		$15,249	

TOTAL PROJECT COST = $113,889

[1]Heavy equipment work was performed by fixed price contract IFB-8480-87-02. This table reflects the contract costs to perform this work. Table 2 compares these costs with actual production costs (time). Appendix A contains the Abstract of Bid Data for this rehabilitation unit.

[2]Miscellaneous costs include: paid breaks, access, travel, discussion time, recordkeeping, lowboy charges and bid item #6 (misc.).

[3]Straw mulch includes the cost of the bales, delivery and placement (bid item #4), and application of straw. Straw was purchased at $3.09 / bale.

TIMBER HARVEST AND EROSION HISTORY

The entire M-6 Road network was constructed between 1969-1971 to provide access to timber below the M-Line. Timber harvest was concurrent with road construction and, by the end of 1975, only a few small patches of old growth timber remained (Map C). Tractor yarded units were seed-tree leave cuts, and were re-entered within two years of the initial entry. As was typical for this era, tractor use was indiscriminate with little or no concern for soil or water resources. Numerous skid trail crossings had been constructed across every stream channel. Cable yarded units were clear cut with initial entry.

The haul road stream crossings on the M-6 Road network were the most significant, potential sediment sources on this rehabilitation unit. At the time of treatment, all road crossings were intact but, because the roads had been constructed with a steady 5%-7% grade, most road crossings had very high diversion potentials. Additionally, road crossings (RX) #3, #5 and #9 had no culverts. Stream flow from these crossings had been diverted into neighboring drainages by existing inboard ditches. The aerial photographs taken immediately after the March, 1972 flood clearly show RX's 1,2,4,7-9 completely buried with sediment that had eroded from the upper hillslopes. The fill from these crossings eroded to varying degrees; all streams had diverted causing extensive gully erosion to adjacent road segments and hillslope areas. Map D shows the location of various road stream crossings and rehabilitation treatments.

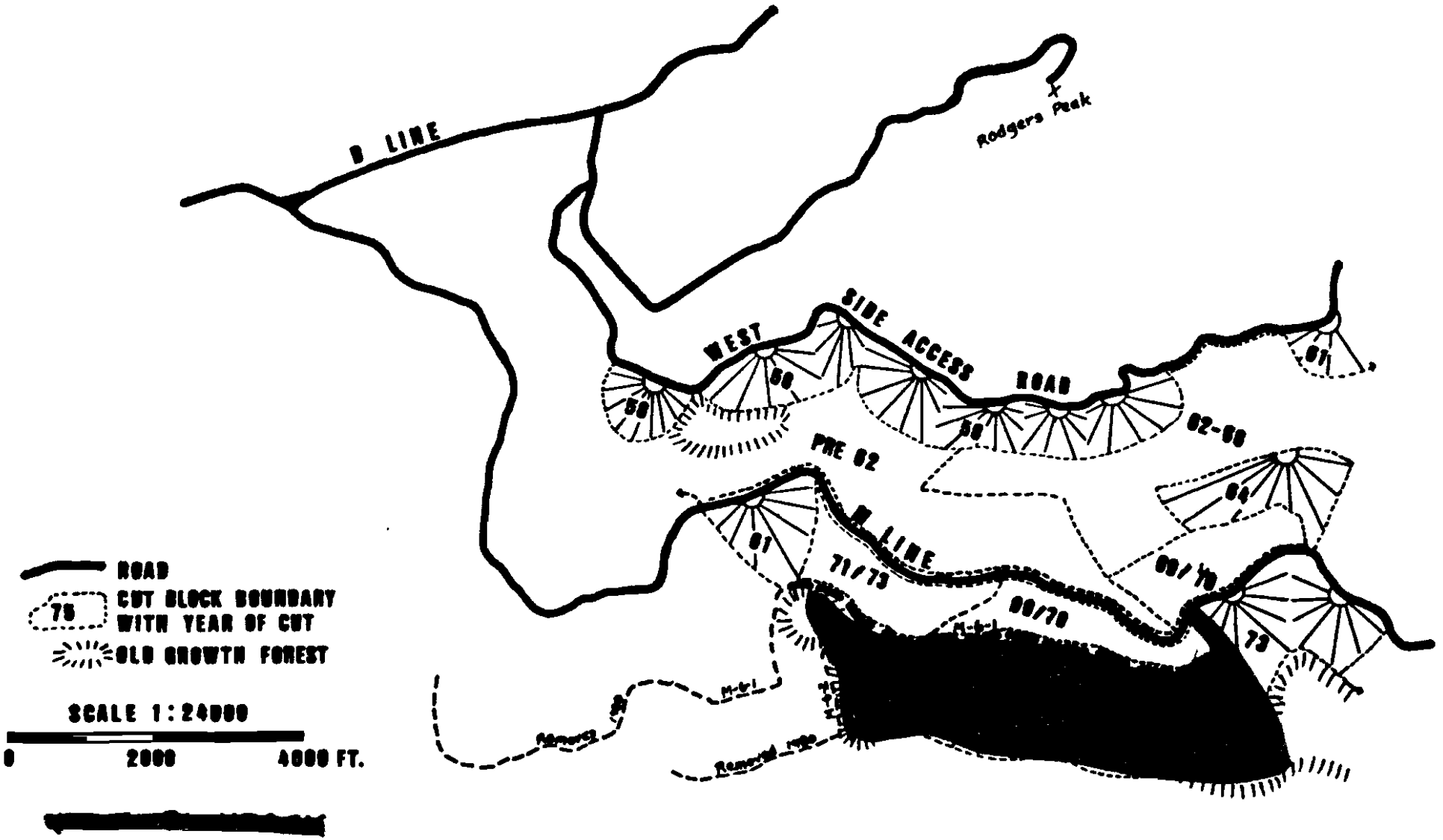
EROSION CONTROL REHABILITATION WORK

Preparatory Work

In 1985, the entire M-6 Road network was viewed as a single rehabilitation unit. Because of this, the entire hillslope and road network, totalling 300 acres was mapped between December, 1985 and February, 1986, requiring nearly 40 person-days to complete. This cost is assigned to the M-6-1 Road, Unit 86-4 because of the difficulty in dividing hours between the two units. The majority of mapping was performed on the hillslopes which were treated within the boundaries of Unit 86-4. The other costs associated with treatment prescription, surveys and design, and contract preparation are summarized in Table 1. These tasks were performed between November, 1986 and March, 1987. The contract was submitted on March, 31 and awarded on May 21, 1987. The "Abstract of Bids Data" is contained in Appendix A. Greg Bundros was project supervisor for this unit.

87-3: M-6-2 M-6-2-1 ROADS
WATERSHED REHABILITATION UNIT

MAP C: Logging History



MAP D: REHABILITATION TREATMENTS

UNIT 87-3

M-6 ROADS

SCALE 1:6000

0 500 1000
in feet

N

rehabilitated rock pit

M-LINE

M-6-1
(REMOVED 1986)

M-6-2

M-6

M-6-2-1

LEGEND

- RX HAUL ROAD STREAM CROSSING
- SX SKID TRAIL STREAM CROSSING
- DD DEEP DRAIN
- FILL OUTSLOPE
- EXPORTED OUTSLOPE
- OUTSLOPE
- CROSS ROAD DRAIN
- INBOARD DITCH IMPROVEMENT

KMG

Heavy Equipment Work

Heavy equipment work was performed and supervised by Whitey Brown from W.K. Construction. Work began on July 26 and was completed by October 5, 1987. The contractor utilized a D8 ripper dozer, a Case 1450 dozer with winch, and a Case 980 B (1 yd^3) hydraulic excavator. This equipment was operated by Bill Campbell, Whitey Brown, and Rob French, respectively. All three were experienced, capable operators who were very familiar with this type of work. Utilizing the actual hours worked to complete all work tasks, Table 2 compares contract costs with heavy equipment costs had this work been performed by rental agreement.

Since the streams along the M-6-2 Road were still flowing, equipment began its work on the M-6-2-1 Road where the streams were dry. Once completed, the equipment relocated to the end of the M-6-2 Road and worked to the M-Line. In general, there was nothing unusually difficult about any of this work. A total of 43,580 yd^3 of fill were excavated from various worksites. Of this total, haul road stream crossings accounted for 21,170 yds^3 and unstable road reaches accounted for 21,260 yds^3. Skid trail stream crossings and deep drain excavations accounted for the balance of 2,150 yds^3. Tables 3 through 9 summarize and detail specific costs for individual worksites.

For this combination of equipment, the contractor employed standard/customary techniques to complete the work. In most cases, the D8R performed the dual function of excavating material while, at the same time, pushed the hydraulic excavator's spoil to the fillsite. Utilizing this approach, the D8R excavated roughly 50%-60% of the total volume from each worksite. The 1450 was undersized for this work and, more often then not, simply increased the contractor's cost at many worksites. This can be seen in the data for the M-6-2-1 Road in Table 6. The 1450 was not utilized for some of this work, and it was here that the lowest and most representative unit costs were generated. With the exception of a few instances where fillsites were more than 250 ft. from a worksite, the 1450 was really not needed. Although it reduced the work load for the D8R, the 1450 unnecessarily increased overall costs.

Labor Intensive Work

Labor intensive work was performed primarily by Redwood National Park and Redwoods United labor crews, with minor assistance from the Youth Conservation Corps. During the winter months, RNP labor crews brushed survey lines and skid trails, and placed station lathes to assist with contract development. Concurrent with the heavy equipment work, all three labor groups spread straw onto the completed worksites. The total labor costs for this rehabilitation unit was $6,970 or 6.1% of the total project cost. Their work and associated costs are summarized in Table 10.

Table 2

A COMPARISON OF CONTRACT

VS. HERE HEAVY EQUIPMENT COSTS

Unit 87-3; M-6 Roads

Treatment	Number of Worksites	Total Quantity	Total Costs		Government Savings(+) or Losses(-)	Average Unit Costs	
			Contract	HERE[1]		Contract	HERE
Haul Road crossings	10	20,170 yd^3	$40,138	$29,578	-$10,560	$1.99/$yd^3$	$1.47/$yd^3$
Skid trail crossings	3	690 yd^3	828	1,408	+580	$1.20/$yd^3$	$2.03/$yd^3$
Exported outslope	12	21,260 yd^3	42,307	21,846	-20,461	$1.99/$yd^3$	$1.03/$yd^3$
Deep drains	7	1,460 yd^3	2,905	2,058	-847	$1.99/$yd^3$	$1.41/$yd^3$
Other treatments	See Table 8		3,017	2,451	-566	-.-	-.-
Miscellaneous cost	See Table 9		2,475	10,885	+8,410	-.-	-.-
TOTALS	-.-	-.-	$91,670[2]	$68,226	-$23,444	-.-	-.-

[1]HERE- Heavy Equipment Rental Equivalent - actual hours spent for each task utilizing the following hourly rates: D8 @ $88; 980B @ $94; 1450 @ $60.

[2]Non-heavy equipment bid item #4 totals $575 .. the total contract cost was $92,245.

Table 3

AVERAGE HAUL ROAD CROSSING EXCAVATION COSTS

Unit 87-3; M-6 Roads

Size Category (yd^3)	Number of Work Sites	Range of Volumes (yd^3)	Equipment[1] Percent	Actual Equipment Hours	Total Cost ($)	Total Volume (yd^3)	Average Unit Cost ($/$yd^3$)	Average Exc. Rate (yd^3/pc-hr)
Small 1-400	1	315	Bulldozer 89%	6.25	580	315	1.84	45
			Excavator 11%	0.75				
Medium 400-800	3	595-670	Bulldozer 66%	23.75	3000	1865	1.61	52
			Excavator 34%	12.0				
Large 800-2000	3	1150-1610	Bulldozer 61%	54.75	7641	3960	1.93	44
			Excavator 39%	35.25				
Extra Large >2000	3	2940-6370	Bulldozer 67%	152.25	18,357	14,030	1.31	62
			Excavator 33%	74.5				
TOTALS	10 Worksites	315-6370yd^3	Bulldozer 64%	237	$29,578	20,170yd^3	$1.47/$yd^3$	$\frac{55 yd^3}{pc\text{-}hr}$
			Excavator 36%	132.5				

[1]Bulldozer time includes both D8 and 1450. The 1450 was not used at every site. Refer to Table 4 and text for details.

Table 4

HAUL ROAD CROSSING EXCAVATION COSTS

Unit 87-3; M-6 Roads

Worksite	Actual Equipment Hours: D8R	980B	1450	HERE[1] Cost ($)	Volume (yd^3)	Unit Price ($/$yd^3$)	Excavation Rate (yd^3/pc-hr)	Average Push Distance to Fillsite (ft.)
M-6-2 Road:								
RX1 @ 16+75	21.75	19.5	20.75	4992	2940	1.70	47	425
RX2 @ 20+42	30	23	23	6182	4720	1.31	62	220
RX7 @ 30+00	27.5	32	29.25	7183	6370	1.13	72	225
RX8 @ 35+50	8	8.5	12.25	2238	1610	1.39	56	150
RX9 @ 38+58	3.75	3.75	5.25	997	600	1.66[2]	47	80
RX10 @ 43+60	4.25	3.75	0.75	771	595	1.30	68	150
M-6-2-1 Road:								
RX 3 @ 14+58	9.75	11	0	1892	1150	1.65	55	270
RX4 @ 35+65	19.5	15.75	5.25	3511	1200	2.93[3]	30	315
RX5 @ 38+90	8	4	1.75	1232	670	1.84[2]	47	90
RX6 @ 41+30	4.75	0.75	1.50	580	315	1.84	83	100
	137.25	122	99.75	$29,578	20,170yd^3	$1.47/$yd^3$	55yd^3/pc-hr.	
	TOTAL HOURS = 359							
			CONTRACT BID:	$40,138	20,170yd^3	$1.99/$yd^3$	- -	

[1]HERE - Heavy Equipment Rental Equivalent - actual hours worked for each task using hourly rental rates of $88 for D8R (ripper), $94 for 980B excavator. Unless footnoted, there is nothing unusual about these worksites.

[2]Deep, narrow excavation with difficult organics at bottom of excavation.

[3]Deep, steep, narrow excavation with long push. Instead of a preliminary excavation, the D8R filled the lower end of this worksite (buried all organics) to set-up the excavator.

Table 5

SKID TRAIL CROSSING EXCAVATION COSTS

Unit 87-3; M-6 Roads

Worksite	Actual Equipment Hours: D8R	980B	1450	HERE[1] Cost ($)	Volume (yd^3)	Unit Price ($/$yd^3$)	Excavation Rate (yd^3/pc-hr)	Average Push Distance to Fillsite (ft.)
SX1	0	2.25	0	211	190	1.11	84	50
SX2	3.75	4.0	0	706	350	2.02[2]	45	100
SX3	1.5	2.5	2	487	150	3.25[2,3]	25	50
TOTALS	5.25	8.75	2.0	$1404	690yd^3	$2.03/$yd^3$	43yd^3/pc-hr	
Total Hours =		16.0						
			CONTRACT BIDS:	$828	690yd^3	$1.20/$yd^3$		

[1]HERE- Heavy Equipment Rental Equivalent - actual hours worked for each task utilizing the following hourly rental rates: $88 for D8R; $94 for 980B excavator; $60 for 1450.

[2]A deep, steep, narrow excavation site.

[3]Fill contained several, large rootwads and logs; minimal workspace available.

Table 6
EXPORTED (BLADE ENDHAULED) OUTSLOPE ROAD EXCAVATION COSTS
Unit 87-3; M-6 Roads

Worksite	Actual Equipment Hours: D8R	980B	1450	HERE[1] Cost ($)	Volume (yd^3)	Unit Price ($/yd^3$)	Excavation Rate (yd^3/pc-hr)	Average Push Distance to Fillsite (ft.)	Excav/ ft. of Road (yd^3/ft)
M-6-2 Road:									
00+00	5.25	6.25	1.25	1124	840	1.34	66	87	9.3
04+60	11.0	9.5	4.5	2131	2200	0.97	92	220	13.5
17+40	7.5	13.0	13.25	2677	1415	1.89[2]	43	200	6.2
23+80	14.25	14.75	10.75	3285	1895	1.73[3]	48	170	11.1
65+00	20.0	17.75	16.5	4418	3120	1.42[3]	58	240	13.0
M-6-2-1 Road:									
00+21	6.25	4.75	0	996	2250	0.44	204	100	10.9
13+25	3.75	1.0	0	424	750	0.56	158	170	4.4
14+90	11.75	6.75	0	1668	2350	0.71	127	160	14.7
18+60	9.25	7.5	0	1519	2200	0.70	131	170	12.9
27+70	11.25	10.25	0	1953	2510	0.78	117	150	16.7
38+20	8.5	8.0	0	1500	1480	1.01	90	330	4.5
39+62	0.5	0.5	1	151	250	0.60	125	60	4.2
TOTALS	109.25	100.0	47.25	$21,846	21,260yd^3	$1.03/$yd^3$	83yd/pc-hr		

Total Hours = 256.5

CONTRACT BID: $42,307 21,260$yd^3$ $1.99/$yd^3$

[1]HERE - Heavy Equipment Rental Equivalent - actual hours worked for each task using hourly rates of $88 for D8R, $94 for 980B excavator, $60 for 1450. Unless noted, there were no unusual conditions at these worksites. Road surfaces averaged 30 feet wide.

[2]Poor access to deep, steep cuts along a landing; 1450 undersized for task.

[3]1450 undersized for task.

Table 7

DEEP DRAIN EXCAVATION COSTS

Unit 87-3; M-6 Roads

Worksite	Actual Equipment Hours: D8R	980B	1450	HERE[1] Cost ($)	Volume (yd^3)	Unit Price ($/yd^3$)	Excavation Rate (yd^3/pc-hr)	Average Push Distance to Fillsite (ft.)
M-6-2 Road:								
DD1 @ 03+05	3.0	3.75	3.25	692	470	1.47[2]	47	125
DD2 @ 06+34	2.75	3.0	0	524	475	1.10	83	215
DD3 @ 16+75	0	1.25	1.25	192	90	2.14[2]	36	200
DD8 @ 40+55	2.25	1.5	0	339	280	1.21	75	150
M-6-2-1 Road:								
DD4 @ 19+25	0.5	0.5	0	91	30	3.03[3]	30	100
DD5 @ 36+08	0.25	0.25	0	45	30	1.52[3]	60	135
DD7 @ 32+60	0	0.75	1.75	175	85	2.06[3]	34	50
TOTALS	8.75	11.0	6.25	$2058	1460yd^3	$1.41/$yd^3$	56yd^3/pc-hr	-.-
CONTRACT BID =				$2905	1460yd^3	$1.99/$yd^3$		

[1]HERE - Heavy Equipment Rental Equivalent - actual hours worked for each task using hourly rental rates of $88 for D8R, $94 for 980B, $60 for 1450.

[2]1450 undersized for task, or should not have been utilized.

[3]Questionable data, or a time resolution problem.

Table 8

OTHER HEAVY EQUIPMENT TREATMENT COSTS

Unit 87-3; M-6 Roads

Treatment	Actual Equipment Hours: D8R	980B	1450	Contract Cost ($)	HERE[1] Cost ($)	Quantity	Unit Cost
IBD	1.25	4.0	0	770	486	583 ft.	$0.83/ft.
Ripping	13.75	0	0	1500	1210	1.9 mi.	$637/mi.
Cross-road drains	2.0	6.0	0.25	747	755	1130 ft.	$0.67/ft.
Rock @ RX6[2]	0	1.75	1.0	-.-	224	50 yd^3	$4.48/$yd^3$
TOTALS	17.0	11.75	1.25	$3017	$2451	-.-	-.-

[1]HERE - Heavy Equipment Rental Equivalent - actual hours worked for each task using the following hourly rental rates: D8R @ $88; 980B excavator @ $94; 1450 @ $60.

[2]The rock supply was provided by the government and placed approximately 60 feet from this worksite.

Table 9

MISCELLANEOUS COSTS

Unit 87-3; M-6 Roads

Category	Actual Equipment Hours			Cost	
	D8R	980B	1450	Contract/ ($)	HERE[1] ($)
Paid Breaks	16.5	16	11.25	-.-	3631
Access	9.0	9.25	0	-.-	1662
Travel	1.0	6.25	1.0	-.-	736
Maintenance	7.50	10.0	7.75	-.-	2065
Discussion	6.75	5.5	3.0	-.-	1291
Lowboys	-.-	-.-	-.-	2100	1500
Recordkeeping				75	0
Miscellaneous	-.-	-.-	-.-	300	0
TOTALS	40.75	47.0	23.0	$2475	$10,885

[1]HERE - Heavy Equipment Rental Equivalent - actual hours worked using the following hourly rental rates: D8R @ $88; 980B excavator @ $94; 1450 @ $60.

Table 10

SUMMARY OF AVERAGE LABOR COSTS

Unit 87-3; M-6 Roads

Treatments	Type of Labor	Total Person Hours	Avg. Cost Per Hour	Total Cost	Quantity	Avg.Unit Cost
Primary Treatments - none						
Secondary Treatments						
Materials	-.-	-.-	-.-	$2,222	719 bales	$3.09/bale
Distribute straw - contract bid item 4				575	719 bales	$0.80/bale
Spread straw	RNP	101	$11.06	2,935	719 bales	$4.08/bale
	RU	174	7.71			
	YCC	144	3.35			
	Total Secondary Treatment =			$5,732		
Miscellaneous						
Brush survey lines	RNP	48	12.77	613	10 sites	$61/site
Brush skid trails	RNP	40	11.12	445	1500 ft.	$0.30/ft.
Place station lathe	RNP	16	11.25	180	2.1 mi.	$36/mi.
		Total Miscellaneous =		$1,238.00		
		Total Labor Cost =		$6,970.00		

RNP - Redwood National Park employees
RU - Redwood United, Inc. employees
YCC - Youth Conservation Corp employees

SUMMARY

With the exception of a few minor and major equipment breakdowns, the heavy equipment work and contract progressed smoothly. The crew from W.K. Construction is well versed in Redwood National Park's rehabilitation techniques and, as usual, was a pleasure to work with.

The contractor utilized his Case 1450 dozer at the majority of worksites. With the exception of a few instances where fillsites were more than 250 ft. from the worksite, the Case 1450 was really not needed. Most of the work contained in this contract was well suited to a D8 and hydraulic excavator combination. Although time is assigned to the 1450 for various work tasks, in many cases the 1450 is running but, is idle, and not assisting with the excavation. The net result is that the 1450 increased both unit and total costs, and decreased excavation rates for heavy equipment rental equivalents (HERE). To what extent this occurred is not discernible, but had this work been performed by rental agreement, a second crawler tractor would not have been utilized.

Based upon actual equipment hours, roughly $23,000 could have been saved had this work been performed by rental agreement instead of by fixed-price contract. In addition to this savings, roughly one-half of the survey and design cost ($2,100) and all of the contract preparation cost ($2,150) could also have been saved for a total saving of $27,250. When considering the personnel time (322 person-hours) associated with the two latter costs, another 240 acre rehabilitation unit could have been mapped in detail in the same amount of time.

APPENDIX A

ABSTRACT OF BIDS

TIME OPENED: 2:00 p.m. | DATE: May 21, 1987 | PLACE: Redwood N.P. Library, Headquarters

FOR: Watershed Rehabilitation/Erosion Control on M-6-2 Road

INVITATION NO. IFB-8480-87-02

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	BID NO. 1 Bidders Name: NALLY ENT 1/		BID NO. 2 Bidders Name: WK CONST 1/		BID NO 3 Bidders Name: 2 PARKS 1/		BID NO. 4 Bidders Name: 1/		BID NO. 5 Bidders Name: 1/		GOVERNMENT ESTIMATE ☐ Hired Labor Estimate ☐ Estimate w/o Profit ☐ Estimate With Profit
				2/ UNIT PRICE	TOTAL AMOUNT	2/ UNIT PRICE	TOTAL AMOUNT	2/ UNIT PRICE	TOTAL AMOUNT	2/ UNIT PRICE	TOTAL AMOUNT	2/ UNIT PRICE	TOTAL AMOUNT	UNIT PRICE / TOTAL AMOUNT
1.	Move In		LS		$ 2,500.00		$ 1,050.00		$ 3,000.00					LS $ 750.00
2.	Move Out		LS		2,500.00		1,050.00		2,000.00					LS 750.00
3.	Record Keeping		LS		1,000.00		75.00		1,000.00					LS 0
4.	Straw Delivery & Placement		LS		2,049.15		575.00		2,000.00					LS 2,157.00
5.	Ripping		LS		10,296.00		1,500.00		6,000.00					LS 1,500.00
6.	Miscellaneous		LS		10,000.00		300.00		3,000.00					LS 10,000.00
7.	00+00 - 01+90		LS		2,931.60		1,671.60		2,730.00					LS 1,220.00
8.	03+05		LS		1,640.30		935.30		470.00					LS 880.00
9.	04+06 - 06+23		LS		9,878.00		4,378.00		7,150.00					LS 5,500.0-
10.	05+10 - 06+25		LS		57.50		151.80		115.00					LS 100.00
11.	06+35		LS		1,657.75		945.25		950.00					LS 1,400.00
12.	06+35 - 07+30		LS		47.50		125.40		95.00					LS 100.00
13.	15+70		LS		30.00		36.00		60.00					LS 100.00
14a.	16+75	3110	CY	$4.49	13,963.90	$1.99	6,188.90	$1.00	3,110.00					UP 9,175.00
14b.	16+75		LS		359.10		179.10		180.00					LS 277.00
15.	17+40 N.A.		LS		5,645.85		2,815.85		7,075.00					LS 2,193.00
16.	20+42	4550	CY	$4.49	20,205.00	$1.99	8,955.00	$1.00	4,500.00					UP 13,275.00
17.	23+00 - 25+46		LS		7,561.05		3,771.05		3,790.00					LS 4,733.00

1/ For Supply Invitation give discount--for Construction Invitation give deposit amount.

2/ For Supply Invitation give delivery time--for Construction Invitation give type of deposit.

90-14

ABSTRACT OF BIDS

TIME OPENED: 2:00 PM | DATE: May 21, 1987 | PLACE: Redwood N.P.H.Q. Library

FOR: Watershed Rehabilitation/Erosion Control, M-6-2 Roads

INVITATION NO. IFB-8480-87-02

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	BID NO. 1 Bidders Name: NALLY		BID NO. 2 Bidders Name: WK CONS.		BID NO. 3 Bidders Name: 2 PARKS		BID NO. 4 Bidders Name:		BID NO. 5 Bidders Name:		GOVERNMENT ESTIMATE ☐ Hired Labor Estimate ☐ Estimate w/o Profit ☐ Estimate With Profit	
				1/		1/		1/		1/		1/			
				2/ UNIT PRICE	TOTAL AMOUNT	2/ UNIT PRICE	TOTAL AMOUNT	2/ UNIT PRICE	TOTAL AMOUNT	2/ UNIT PRICE	TOTAL AMOUNT	2/ UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT
18.	00+20 - N.A		LS		$ 8,977.50		$ 4,477.50		$ 11,250.00					LS	$ 3,375.00
19.	04+40 - 08+40		LS		80.00		96.00		160.00					LS	100.00
20.	13+25 - 14+20		LS		2,992.50		1,492.50		1,875.00					LS	2,090.00
21.	14+58		LS		5,163.50		2,288.50		2,875.00					LS	3,040.00
22.	14+90 - 18+17		LS		9,376.50		4,676.50		4,700.00					LS	4,700.00
23A.	18+60 - 21+65		LS		8,778.00		4,378.00		5,500.00					LS	3,740.00
23B.	19+25		LS		104.70		59.70		60.00					LS	100.00
23C.	19+25 - 19+50		LS		12.50		33.00		25.00					LS	50.00
24.	23+00		LS		22.50		27.00		45.00					LS	35.00
25.	24+50		LS		225.00		36.00		45.00					LS	100.00
26.	26+00		LS		17.50		21.00		35.00					LS	35.00
27.	27+70 - 30+15		LS		10,014.90		4,994.90		6,275.00					LS	4,393.00
28.	31+15		LS		663.10		228.00		350.00					LS	600.00
29A.	38+20 - 36+18		LS		5,905.20		2,945.20		3,700.00					LS	4,860.00
29B.	36+08 - 37+00		LS		54.00		142.56		108.00					LS	100.00
30.	36+08		LS		89.70		59.70		60.00					LS	460.00
31.	35+65	895	CY	$3.99	3,571.05	$1.99	1,781.05	$1.00	895.00					UP	32.85
32.	31+75		LS		200.00		32.00		40.00					LS	100.00

1/ For Supply invitation give discount--for Construction invitation give deposit amount.

2/ For Supply invitation give delivery time--for Construction invitation give type of deposit.

ABSTRACT OF BIDS

TIME OPENED 2:00 PM | DATE May 21, 1987 | PLACE Redwood N.P.H.Q. Library

FOR: Watershed Rehabilitation/Erosion Control, M-6-2 Road

INVITATION NO. IFB-8480-87-02

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	BID NO. 1 Bidders Name: NALLY		BID NO. 2 Bidders Name: WK CON.		BID NO. 3 Bidders Name: 2 PARKS		BID NO 4 Bidders Name:		BID NO. 5 Bidders Name:		GOVERNMENT ESTIMATE ☐ Hired Labor Estimate ☐ Estimate w/o Profit ☐ Estimate With Profit	
				1/		1/		1/		1/		1/			
				2/ UNIT PRICE	TOTAL AMOUNT	2/ UNIT PRICE	TOTAL AMOUNT	2/ UNIT PRICE	TOTAL AMOUNT	2/ UNIT PRICE	TOTAL AMOUNT	2/ UNIT PRICE	TOTAL AMOUNT	UNIT PRICE	TOTAL AMOUNT
33.	31+00		LS		$ 30.00		$ 36.00		$ 60.00					LS	$ 35.00
34A.	32+60 - SX-2	210	CY	$2.99	627.90	$1.20	252.00	$1.00	210.00					UP	725.00
34B.	Eliminated by Amendment No. 1 dated 05/11/87													UP	224.00
35.	32+60		LS		254.15		169.15		170.00					LS	100.00
36.	32+60		LS		448.50		180.00		300.00					LS	740.00
37.	38+90	570	CY	$3.49	1,989.30	$1.99	1,134.30	$1.00	570.00					UP	1,482.00
38.	38+90 - 39+30		LS		- 20.00		52.80		40.00					LS	50.00
39.	39+62 - 40+40		LS		872.50		497.50		625.00					LS	400.00
40.	41+30		LS		1,099.35		626.85		787.50					LS	1,460.00
41.	43+26 - 45+10		LS		37.50		45.00		75.00					LS	70.00
42.	34+50		LS		30.00		36.00		60.00					LS	70.00
43.	33+00 - 35+00		LS		100.00		264.00		200.00					LS	200.00
44.	02+50 04+00		LS		70.00		84.00		140.00					LS	70.00
45A.	30+00	6000	CY	$4.49	26,940.00	$1.99	11,940.00	$1.00	6,000.00					UP	16,800.00
45B.	30+00		LS		90.00		108.00		180.00					LS	90.00
46.	34+50		LS		35.00		42.00		70.00					LS	35.00
47.	41+00 - 43+00		LS		35.00		42.00		70.00					LS	100.00
48.	35+50	1780	CY	$3.49	6,212.20	$1.99	3,542.20	$1.00	1,780.00					UP	4,094.00

1/ For Supply Invitation give discount--for Construction Invitation give deposit amount.

2/ For Supply Invitation give delivery time--for Construction Invitation give type of deposit.

GPO 871 952

ABSTRACT OF BIDS

TIME OPENED: 2:00 PM | DATE: May 21, 1987 | PLACE: Redwood N.P.HQ Library

FOR: Watershed Rehabilitation/Erosion Control M-6-2 Road

INVITATION NO. IFB-8480-87-02

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	BID NO. 1 Bidders Name: NALLY UNIT PRICE 1/ 2/	BID NO. 1 TOTAL AMOUNT	BID NO. 2 Bidders Name: WK CONS UNIT PRICE 1/ 2/	BID NO. 2 TOTAL AMOUNT	BID NO. 3 Bidders Name: 2 PARKS UNIT PRICE 1/ 2/	BID NO. 3 TOTAL AMOUNT	BID NO. 4 Bidders Name: UNIT PRICE 1/ 2/	BID NO. 4 TOTAL AMOUNT	BID NO. 5 Bidders Name: UNIT PRICE 1/ 2/	BID NO. 5 TOTAL AMOUNT	GOVERNMENT ESTIMATE ☐ Hired Labor Estimate ☐ Estimate w/o Profit ☐ Estimate With Profit UNIT PRICE	GOVERNMENT ESTIMATE TOTAL AMOUNT
49.	38+58	590	CY	$3.49	$ 2,059.10	$1.99	$ 1,174.10	$1.00	$ 590.00					UP	1,829.00
50.	40+55		LS		837.20		557.20		560.00					LS	480.00
51.	43+60	595	CY	3.49	2,076.55	$1.99	1,184.05	$1.00	595.00					UP	1,785.00
52.	46+30 - 56+60		LS		87.50		105.00		175.00					LS	120.00
53.	65+00 - 60+50		LS		12,488.80		6,208.80		7,800.00					LS	9,360.00
	TOTAL				$ 204,971.40		$ 90,753.31		$106,280.50						$125,597.00

1/ For Supply Invitation give discount--for Construction Invitation give deposit amount.

2/ For Supply Invitation give delivery time--for Construction Invitation give type of deposit.

GPO 871 952



Unit: 87-3 Date:6-4-1987, PP3A, M-6-2, STA 7+100, DD2+EOS D.S.



Unit: 87-3 Date: 9-15-1987, PP3A, STA 7000, DD2+EOS D.S., (GB+DAS)



Unit: 87-3 Date: 9-20-1988, PP3A, DLD, 35mm



Unit: 87-3 Date: 6-4-1987, PP16, M-6-2, STA 30+70, DSTA RX-7, 87-3



Unit: 87-3 Date: 10-29-1987, PP16, M-6-2, STA 30+70, DSTA RX-8, 35mm, (GB+DAS)



Unit: 87-3 Date: 7-21-1988, PP16, DLD, 35mm



Unit: 87-3 Date: 6-4-87, PP21, M-6-2, STA 36+65, DSTA RX-8



Unit: 87-3 Date: 10-29-1987, PP21, M-6-2, STA 36+65, DSTA RX-8, 35mm, (GB+DAS)



Unit: 87-3 Date: 7-25-1988, PP21, DLD, 35mm



Unit: 87-3 Date: 6-4-1987, PP29B, M-6, STA 60+30, 50mm, (JW)



Unit: 87-3 Date: 10-29-1987, PP29B, M-6-2, STA 60+30, up STA, 50mm, (GB+DAS)



Unit: 87-3 Date: 7-25-1988, PP29B, DLD, 50mm



Unit: 87-3 Date: 6-4-1987, PP36A M-6-2-1, EOS 38+20, 35mm (JW)



Unit: 87-3 Date: 10-19-1987, STA 38+40, View d. STA EOS, 35mm (GB+JW)



Unit: 87-3 Date: 7-21-1988, L, PP36A, DLD, 35mm