

**REPORT
of
PRELIMINARY INVESTIGATION
OREGON SKYLARK ROUTE
from
CRATER LAKE BOUNDARY
to
THREE FINGERED JACK
in the
STATE OF OREGON**

**E. R. Johnson
U.S. FOREST SERVICE
DISTRICT 6
July 10- October 10, 1920**

REPORT OF PRELIMINARY INVESTIGATION

OREGON SKYLINE ROUTE

From CRATER LAKE to THREE FINGERED JACK

From July 10 to October 10, 1920, a Preliminary Investigation was made of the proposed Oregon Skyline Road. The party consisted of Mr. F. W. Clester, from Lewis, Mr. F. B. Lenzie, from Graining, and Mr. E. R. Johnson, from Engineering. The route agreed upon by the party does not follow the most direct line but passes near most of the points of interest and would be of more value from all points of view than a more direct route.

The field work consisted of a careful examination of the country between Crater Lake and Minto Trail, about 3 miles north of Three Fingered Jack. The instruments used were an Aneroid Barometer, Abney Level, Compass and Camera. In most cases distances were paced. Wherever there was any doubt regarding grades an Abney line was actually run. A rough line was blazed for the first 40 miles, using the "Skyline blaze", which is a long blaze with a notch in the center. This line was not intended to be the route followed in the actual location but merely to be used as a guide to

give the Locating Engineer an idea of the points of interest to be touched. At this point the blazing was discontinued, as too much time was being used and the party agreed that the time could be spent to better advantage looking over more country and that the route could be described.

This route follows along the summit of the Oregon Cascades. The average elevation of the road would be about 5,300 feet and in a few cases the road would reach an elevation of 6,500 feet. On account of snow conditions the road could not be used for more than 3 months of the year.

The road would be used mostly for tourist travel but the Forest Service would use it some for fire protection and stockmen would use it to transport supplies to camps. Owing to the high altitude the country along this route would be of no value for agricultural purposes but would be used quite extensively for grazing.

There are two sections where the route may be changed. The first is from the summit near Taylor Lake to the South Sister. The route could be kept close along the summit, passing near Irish Mountain and ^{HORSE} Howe Lake. Using this route the road would be kept on higher ground and be a more direct line, which would be more in accordance with a Skyline Route but would miss Cultus Lake, Lava Lake and Elk Lake. There is already a road from Elk Lake to Crane Prairie, passing Lava Lake and Cultus Lake, and by connecting Elk Lake with the road near ^{HORSE} Howe Lake and Crane Prairie with the road near

Taylor Lake, tourists desiring to see those lakes could do so.

The second change would be from Elk Lake by Sparks Lake and going on the east side of the Three Sisters and Mt. Washington and coming back on the summit near Big Lake. This route would give an excellent view of eastern Oregon but would be more expensive to build.

The total length of the route looked out by the Forest Service is approximately 152 miles, extending from the Crater Lake Boundary to the Hinto Trail, about 3 miles north of Three Fingered Jack. Here we met the Bureau of Public Roads party which was making the Preliminary Investigation from Mt. Hood south.

In estimating the costs the route was broken up into short sections, using natural objects to determine the terminal points. Wherever practicable the sections were also broken at the Forest Boundaries.

This report is based upon the following considerations: Width of roadway 10 and 16 feet, exclusive of ditches; earth road; timber structures; maximum grade 5%.

A brief description of the route and the difficulties encountered is as follows:

Section 1. - Crater Lake Boundary to north end Diamond Lake.

The elevation at Crater Lake Boundary is approximately 5,300 feet and at Diamond Lake approximately 5,200 feet. The total length of this section is about eight miles with about three miles of this distance along the east shore of Diamond

Lake. The covering is a medium stand of lodgepole pine. The sideslopes average about 25% and the material is about 20% solid rock, 20% loose rock, and 60% common. The maximum grade should not be over 4%.

Section 2. - North end Diamond Lake to Umpqua River.

The elevation at the Umpqua River is approximately 4,200. The length of this section is about 11 miles. The covering is about 9 miles of a medium stand of lodgepole pine and 2 miles of heavy fir timber. The sideslopes average about 25% and the material is about 20% solid rock, 20% loose rock and 60% common. The maximum grade should not be over 4%.

Section 3. - Umpqua River to the Summit between the Umpqua and Deschutes Forests.

The elevation at the summit is approximately 5,700 feet. The length of this section is about 6 miles. The covering is a medium stand of lodgepole pine. The sideslopes for the first 3 miles average about 50% and the material is about 40% solid rock and 60% common. The sideslopes for the last 3 miles average about 25% and the material is about 35% solid rock and 65% common. An Abney line was run over this section and the maximum grade was 5%.

Section 4. - Summit between Umpqua and Deschutes Forests to East and Crescent Lake.

The elevation at Crescent Lake is approximately 4,800 feet. The length of this section is about 16 miles. The covering varies from a medium stand of lodgepole pine to heavy fir timber. The sideslopes average about 25% and the material

is about 20% solid rock and 80% common. The maximum grade should not be over 4%.

Section 5. - Crescent Lake to Odell Lake.

The elevation at Odell Lake is approximately 4,800 feet. The length of this section is about 5 miles. The covering is a medium stand of lodgepole pine. The sideslopes average about 20% and the material is about 20% solid rock and 80% common. The maximum grade should not be over 3%.

Section 6. - Odell Lake to the Summit between Deschutes and Cascade Forests.

The elevation at the summit is about 5,150 feet. The length of this section is about 6 miles. This route follows along the northeast shore of Odell Lake for about 4½ miles and then ascends on an even grade to the summit. The covering is a heavy stand of fir and hemlock timber. The sideslopes average about 40% and the material is about 40% solid rock and 60% common. The maximum grade should not be over 4%.

Section 7. Summit between Deschutes and Cascade Forests to Summit near Taylor Lake.

The elevation at the summit near Taylor Lake is approximately 5,900 feet. The route follows along the railroad location line of the Klamath Outcrop for approximately 10 miles to the south side of Waldo Lake, then along the east shore of the lake for 6 miles and then follows generally along the present wagon road to the summit. The covering is a medium stand of lodgepole pine, hemlock and fir. The sideslopes for the first 3 miles average about 45% and the material is about 30% solid

rock and 70% common. The sideslopes for the last 18 miles average about 20% and the material is about 30% solid rock and 70% common. The maximum grade should not be over 4%.

Section 8. - Summit near Taylor Lake to Lava Lake.

The elevation at Lava Lake is approximately 4,800 feet. The length of this section is about 20 miles. The covering is a medium stand of lodgepole pine. The sideslopes average about 25% and the material is about 30% solid rock and 70% common. The maximum grade should not be over 4%.

Section 9. - Lava Lake to Elk Lake.

A road has recently been constructed over this section.

Section 10. - Elk Lake to the Summit near the South Sister.

The elevation at the summit is approximately 8,500 feet. The route extends west from Elk Lake about 5 miles to the summit and then follows along the summit to the lava flow near the South Sister. The covering is a medium stand of lodgepole pine. The sideslopes average about 20% and the material is about 20% solid rock and 80% common. The maximum grade should not be over 5%.

Section 11. - Summit near South Sister to McKenzie Highway.

The elevation at the Fole Bridge on the McKenzie Highway is approximately 4,900 feet. From the summit the route descends on a grade of 5% for approximately 200 feet in order to go under a large lava flow and then ascends on a 5% grade to an elevation of about 6,500 feet and then follows at about this elevation to Obsidian Cliffs. From here the road descends on a 5% grade crossing the White Branch and approximately one-quarter mile of

lava and descends to the McKensie Highway. The covering is a medium stand of lodgepole pine, hemlock and fir. The sideslopes for 4 miles average about 40% and the material is about 80% solid rock and 20% common. On the remaining 14 miles the sideslopes average about 25% and the material is about 25% solid rock and 75% common.

Section 12. - McKensie Highway to Santiam Road.

This section is most difficult along the entire route, as it is necessary to cross approximately 4 miles of lava. By a careful location the route can cross several islands and miss the heavier lava and still have a fairly direct route. In order to completely miss this lava the road would have to go several miles to the west and while the cost per mile would be less the additional length would probably bring the total cost to as much as a direct route. The covering is a medium stand of hemlock and fir timber. The sideslopes on 5 miles of this section average about 35% and the material is about 100% lava. The sideslopes on the remaining nine miles average about 25% and the material is about 25% solid rock, 25% loose rock and 50% common. The maximum grade on this section should not be over 4%.

Section 13. - Santiam Road to Hinto Trail about 3 miles north of Three Fingered Jack.

This section follows closely along the summit, passing to the west of Three Fingered Jack. No difficulties were encountered along this section. At the Hinto Trail the two parties met and from here on north to Mt. Hood the Bureau of

Public Roads made the Preliminary Investigation. The covering along this section is a medium stand of hemlock and fir. The sideslopes average about 25% and the material is about 30% solid rock, 20% loose rock and 50% common. The maximum grade should not be over 4%.



Surveyor-Draftsman

ESTIMATE
Sec. 1

Crater Lake Boundary to North end Diamond Lake - Length 8 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
21.36	Acres	Clearing & Grubbing	\$300.00	\$6408.00
2200	Cu. Yds.	Solid Rock	3.00	6600.00
2200	" "	Loose Rock	2.00	4400.00
6640	" "	Common	1.00	6640.00
<u>Bridges, Culverts, Etc..</u>				2000.00
				\$26,048.00
10% Engineering				2,604.80
5% Contingencies				1,302.40
Total				\$29,955.20

Width 10 Ft. & ditches
Length 8 miles
Cost per mile \$3,744.40

ESTIMATE
Sec. 1

Diamond Lake to Dureau River - Length 11 Miles.

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
5.37	Acres	Clearing & Grubbing	\$400.00	\$2148.00
24.00	"	" "	300.00	7200.00
3040	Cu. Yds.	Solid Rock	3.00	9120.00
3040	Cu. Yds.	Loose Rock	2.00	6080.00
9100	" "	Common	1.00	9100.00
<u>Bridges, Culverts, Etc..</u>				2750.00
				\$36,398.00
10% Engineering				3,639.80
5% Contingencies				1,819.90
Total				\$41,857.70

Width 10 Ft. & Ditches
Length 11 miles
Cost per mile \$3,805.24

ESTIMATE
Sec. 3

Dapuna River to Summit between Dapuna and Deschutes Forests
Length 6 Miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
16.02	Acres	Clearing & Grubbing	\$500.00	\$4306.00
6720	Cu. Yds.	Solid Rock	3.00	20160.00
12120	" "	Common	1.00	12120.00
Bridges, Culverts, Etc.,				1500.00
				\$38,586.00
10% Engineering				3,858.60
5% Contingencies				1,929.30
Total				\$44,373.90
Width 10 Ft. + Ditches				
Length 6 miles				
Cost per mile \$7,395.65				

ESTIMATE
Sec. 4

Summit between Dapuna and Deschutes Forests to East end
Crescent Lake -- Length 16 Miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
11.00	Acres	Clearing & Grubbing	\$400.00	\$4400.00
22.00	" "	" "	300.00	6600.00
4400	Cu. Yds.	Solid Rock	3.00	13200.00
17680	" "	Common	1.00	17680.00
Bridges, Culverts, Etc.,				4000.00
				48,880.00
10% Engineering				4,888.00
5% Contingencies				2,444.00
Total				\$56,212.00
Width 10 Ft. + ditches				
Length 16 miles				
Cost per mile \$3,513.25				

ESTIMATE
Sec. 5

Crescent Lake to Odell Lake -- Length 5 Miles.

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
13.40	Acres	Clearing & Grubbing	\$300.00	\$4020.00
980	Cu. Yds.	Solid Rock	3.00	2940.00
3920	" "	Common	1.00	3920.00
Bridges, Culverts, etc..				1250.00
				\$12,130.00
10% Engineering				1,213.00
5% Contingencies				606.50
Total				\$13,949.50

Width 10 Ft. + ditches
Length 5 miles
Cost per mile \$2,789.90

ESTIMATE
Sec. 8.

Odell Lake to Summit between Deschutes and Cascade Forests

Length - 6 Miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
16.00	Acres	Clearing and grubbing.	\$400.00	\$6400.00
8160	Cu. Yds.	Solid Rock	3.00	24480.00
12240	" "	Common	1.00	12240.00
Bridges, Culverts, etc..				1500.00
				\$44,620.00
10% Engineering				4,462.00
5% Contingencies				2,231.00
Total				\$51,313.00

Width 10 ft. + ditches
Length 6 miles
Cost per mile \$8,552.17

ESTIMATE
Sec. 7

Summit between Deschutes and Cascade Forests to
Summit near Taylor Lake - Length 22 Miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
58.74	Acres	Clearing and Grubbing	\$300.00	\$17622.00
10000	Cu. Yds.	Solid Rock	3.00	30000.00
23250	" "	Common	1.00	23250.00
Bridges, Culverts, etc.,				5500.00
				\$76,372.00
10% Engineering				7,637.20
5% Contingencies				3,818.60
Total				\$87,827.80

Width 10 ft. -+ ditches
Length 22 miles
Cost per mile \$3,992.17

ESTIMATE
Sec. 8

Summit near Taylor Lake to Lava Lake - - Length 20 Miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
53.40	Acres	Clearing & Grubbing	\$300.00	\$16020.00
8400	Cu. Yds.	Solid Rock	3.00	25200.00
19600	" "	Common	1.00	19600.00
Bridges, Culverts, etc.,				5000.00
				\$65,820.00
10% Engineering				6,582.00
5% Contingencies				3,291.00
Total				\$75,693.00

Width 10 ft. + ditches
Length 20 miles
Cost per mile \$3,784.65

SECTION 9

Lava Lake to Elk Lake

6 Miles

The route follows along the present wagon road.

ESTIMATE

Sec. 10

Elk Lake to Summit near South Sister -Length 8 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
21.36	Acres	Clearing & Grubbing	\$300.00	\$6408.00
1170	Cu. Yds.	Solid Rock	3.00	3510.00
4690	" "	Common	1.00	4690.00
		Bridges, Culverts, etc.,		2000.00
				\$15,608.00
		10% Engineering		1,660.80
		5% Contingencies		830.40
		Total		\$19,099.20

Width 10 ft. + ditches
Length 8 Miles
Cost per mile \$2,387.40

ESTIMATE

Sec. 11

Summit near South Sister to McKenzie Highway -Length 16 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
42.72	Acres	Clearing & Grubbing	\$300.00	\$12,816.00
15080	Cu. Yds.	Solid Rock	3.00	45,240.00
15320	" "	Common	1.00	15,320.00
		Bridges, Culverts, etc.,		4,000.00

				\$77,376.00
		10% Engineering		7,737.60
		5% Contingencies		3,868.80
		Total		\$88,982.40

Width 10 ft. + ditches
Length 16 miles
Cost per mile \$5,561.40

ESTIMATE

Sec. 12

McKenzie Highway to Santiam Road - Length 14 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
38.70	Acres	Clearing & Grubbing	\$500.00	\$11,814.00
16370	Cu. Yds.	Solid Rock	3.00	49,110.00
5470	" "	Loose Rock	2.00	6,940.00
6950	" "	Gravel	1.00	6,950.00
Bridges, Culverts, etc.,				3,500.00
				\$77,714.00
10% Engineering				7,771.40
5% Contingencies				3,885.70
Total				\$89,371.10

Width 10 ft. + ditches
Length 14 miles
Cost per mile \$6,383.65

ESTIMATE

Sec. 13.

Santiam Road to Minto Trail near Three Fingered Jack

Length 14 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
37.38	Acres	Clearing & Grubbing	\$500.00	\$11,814.00
5838	Cu. Yds.	Solid Rock	3.00	17,514.00
3892	" "	Loose Rock	2.00	7,784.00
9730	" "	Gravel	1.00	9,730.00
Bridges, Culverts, etc.,				3,500.00
				\$49,742.00
10% Engineering				4,974.20
5% Contingencies				2,487.10

Width 10 ft. + ditches
Length 14 miles
Cost per mile \$4,085.95

Total \$57,203.50

TOTAL ESTIMATE

Crater Lake Boundary to Hinto Trail

Length 146 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
32.37	Acres	Clearing and Grubbing	\$400.00	\$12,948.00
357.76	"	" " "	300.00	107,328.00
82,358	Cu. Yds.	Solid Rock	3.00	247,074.00
12,602	" "	Loose Rock	2.00	25,204.00
141,240	" "	Gravel	1.00	141,240.00
		Bridges, Culverts, etc..		36,500.00
				\$570,294.00
		10% Engineering		57,029.40
		5% Contingencies		28,514.70
		Total		\$655,838.10

Width 10 ft. + ditches

Length 146 miles

Cost per mile \$4,492.04

ESTIMATE

Sec. 1

Crater Lake Boundary to North end Diamond Lake - Length 8 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
21.36	Acres	Clearing & Grubbing	\$300.00	\$6,408.00
5080	Cu. Yds.	Solid Rock	3.00	15,240.00
5080	" "	Loose Rock	2.00	10,160.00
15240	" "	Common	1.00	15,240.00
Bridges, Culverts, etc.,				2,000.00
				\$49,048.00
10% Engineering				4,904.80
5% Contingencies				2,452.40
Total				\$56,405.20
Width 16 ft. + ditches				
Length 8 miles				
Cost per mile \$7,050.65				

ESTIMATE

Sec. 2

Diamond Lake to Umpqua River - - - Length 11 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
5.37	Acres	Clearing & Grubbing	\$400.00	\$2,148.00
24.00	"	" " "	300.00	7,200.00
7000	Cu. Yds.	Solid Rock	3.00	21,000.00
7000	" "	Loose Rock	2.00	14,000.00
21000	" "	Common	1.00	21,000.00
Bridges, Culverts, etc.,				2,750.00
				\$68,098.00
10% Engineering				6,809.80
5% Contingencies				3,404.90
Total				\$78,312.70
Width 16 ft. + ditches				
Length 11 miles				
Cost per mile \$7,119.34				

ESTIMATE
Sec. 3

Ompqua River to Summit between Ompqua and Deschutes Forests
Length 6 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
16.02	Acres	Clearing & Grubbing	\$300.00	\$4,806.00
17260	Cu. Yds.	Solid Rock	3.00	51,780.00
25980	" "	Common	1.00	25,980.00
Bridges, Culverts, etc.				1,500.00
				\$83,966.00
10% Engineering				8,396.60
5% Contingencies				4,198.30
Total				\$96,560.90

Width 16 ft. + ditches
Length 6 miles
Cost per mile \$16,093.48

ESTIMATE
Sec. 4

Summit between Ompqua and Deschutes Forests to East end
Crescent Lake Length 16 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
11.00	Acres	Clearing & Grubbing	\$400.00	\$4,400.00
32.00	" "	" "	300.00	9,600.00
10120	Cu. Yds.	Solid Rock	3.00	30,360.00
40700	" "	Common	1.00	40,700.00
Bridges, Culverts, etc.,				4,000.00
				\$89,240.00
10% Engineering				8,924.00
5% Contingencies				4,462.00
Total				\$102,626.00

Width 16 ft. + ditches
Length 16 miles
Cost per mile \$6,414.12

ESTIMATE
Sec. 8

Crescent Lake to Odell Lake

Length 5 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
13.40	Acres	Clearing & Grubbing	\$300.00	\$4,020.00
2280	Cu. Yds.	Solid Rock	3.00	6,840.00
9120	" "	Common	1.00	9,120.00
Bridges, Culverts, etc..				1,250.00
				\$21,230.00
10% Engineering				2,123.00
5% Contingencies				1,061.50
Total				\$24,414.50

Width 16 ft. + ditches
Length 5 miles
Cost per mile \$4,882.90

ESTIMATE
Sec. 8

Odell Lake to Summit between Deschutes and Cascade Forests
Length 6 Miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
16.00	Acres	Clearing & Grubbing	\$400.00	\$6,400.00
17600	Cu. Yds.	Solid Rock	3.00	52,800.00
26600	" "	Common	1.00	26,600.00
Bridges, Culverts, etc.				1,500.00
				\$87,900.00
10% Engineering				8,790.00
5% Contingencies				4,395.00
Total				\$101,085.00

Width 16 ft. + ditches
Length 6 miles
Cost per mile \$16,847.50

ESTIMATE

Sec. 7

Summit between Deschutes and Cascade Forests to Summit near
Taylor Lake Length 22 Miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
58.74	Acres	Clearing & Grubbing	\$300.00	\$17,622.00
22530	Cu. Yds.	Solid Rock	3.00	67,590.00
52570	" "	Common	1.00	52,570.00
Bridges, Culverts, etc..				5,500.00

10% Engineering \$143,282.00
5% Contingencies 14,328.20
7,164.10

Total \$184,774.30

Width 16 ft. + ditches
Length 22 miles
Cost per mile \$7,489.74

ESTIMATE

Sec. 8

Summit near Taylor Lake to Lava Lake -- Length 20 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
55.40	Acres	Clearing & Grubbing	\$300.00	\$16,620.00
18800	Cu. Yds.	Solid Rock	3.00	56,400.00
43800	" "	Common	1.00	43,800.00
Bridges, Culverts, etc..				5,000.00

10% Engineering \$181,220.00
5% Contingencies 12,122.00
6,061.00

Total \$199,403.00

Width 16 ft. + ditches
Length 20 miles
Cost per mile \$6,970.15

SECTION 9

Lava Lake to Elk Lake - - - - - Length 6 miles.

The route follows along the present wagon road.

ESTIMATE
Sec. 10

Elk Lake to Summit near South Sister - - Length 8 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
21.36	Acres	Clearing & Grubbing	\$300.00	\$6,408.00
2700	Cu. Yds.	Solid Rock	3.00	8,100.00
10000	" "	Common	1.00	10,800.00
Bridges, Culverts, etc..				2,000.00

10% Engineering	\$27,308.00
5% Contingencies	2,730.80
	<u>1,365.40</u>

Width 16 ft. + ditches	Total	\$31,404.20
Length 8 miles		
Cost per mile \$3,925.52		

ESTIMATE
Sec. 11

Summit near South Sister to McKenzie Highway - Length 16 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
42.72	Acres	Clearing and Grubbing	\$300.00	\$12,816.00
32860	Cu. Yds.	Solid Rock	3.00	98,580.00
34040	" "	Common	1.00	34,040.00
Bridges, Culverts, etc..				4,000.00

10% Engineering	\$149,436.00
5% Contingencies	14,943.60
	<u>7,471.80</u>

Width 16 ft. + ditches	Total	\$171,851.40
Length 16 miles		
Cost per mile \$10,740.71		

ESTIMATE

Sec. 12

McKenzie Highway to Santiam Road -- -- Length 14 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
37.38	Acres	Clearing and Grubbing	\$300.00	\$11,214.00
33250	Cu. Yds.	Solid Rock	3.00	99,750.00
7825	" "	Loose Rock	2.00	15,650.00
15650	" "	Gravel	1.00	15,650.00
Bridges, Culverts, etc.,				3,500.00

10% Engineering \$145,764.00
5% Contingencies 14,576.40
7,288.20

TOTAL \$167,628.60

Width 16 ft. + ditches
Length 14 miles
Cost per mile \$11,973.47

ESTIMATE

Sec. 13

Santiam Road to Minto Trail near Three Fingered Jack
Length 14 Miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
37.38	Acres	Clearing and Grubbing	\$300.00	\$11,214.00
13146	Cu. Yds.	Solid Rock	3.00	39,438.00
8764	" "	Loose Rock	2.00	17,528.00
21910	" "	Gravel	1.00	21,910.00
Bridges, Culverts, etc.,				3,500.00

10% Engineering \$23,590.00
5% Contingencies 9,359.00
4,679.50

TOTAL \$107,628.50

Width 16 ft. + ditches
Length 14 miles
Cost per mile \$7,687.75

TOTAL ESTIMATE

Crater Lake to Minto Trail

Length 146 miles

<u>Quantity</u>	<u>Unit</u>	<u>Item</u>	<u>Unit Price</u>	<u>Amount</u>
32.37	Acres	Clearing and Grubbing	\$400.00	\$ 12,948.00
357.76	"	"	300.00	107,328.00
182,886	Cu.Yds.	Solid Rock	3.00	548,658.00
28,669	" "	Loose Rock	2.00	57,338.00
317,310	" "	Gravel	1.00	317,310.00
		Bridges, Culverts, etc.,		36,500.00
				\$1,080,082.00
		10% Engineering		108,008.20
		5% Contingencies		54,004.10
		Total		\$1,242,094.30

Width 16 ft. + ditches

Length 146 Miles

Cost per mile \$8,507.49

