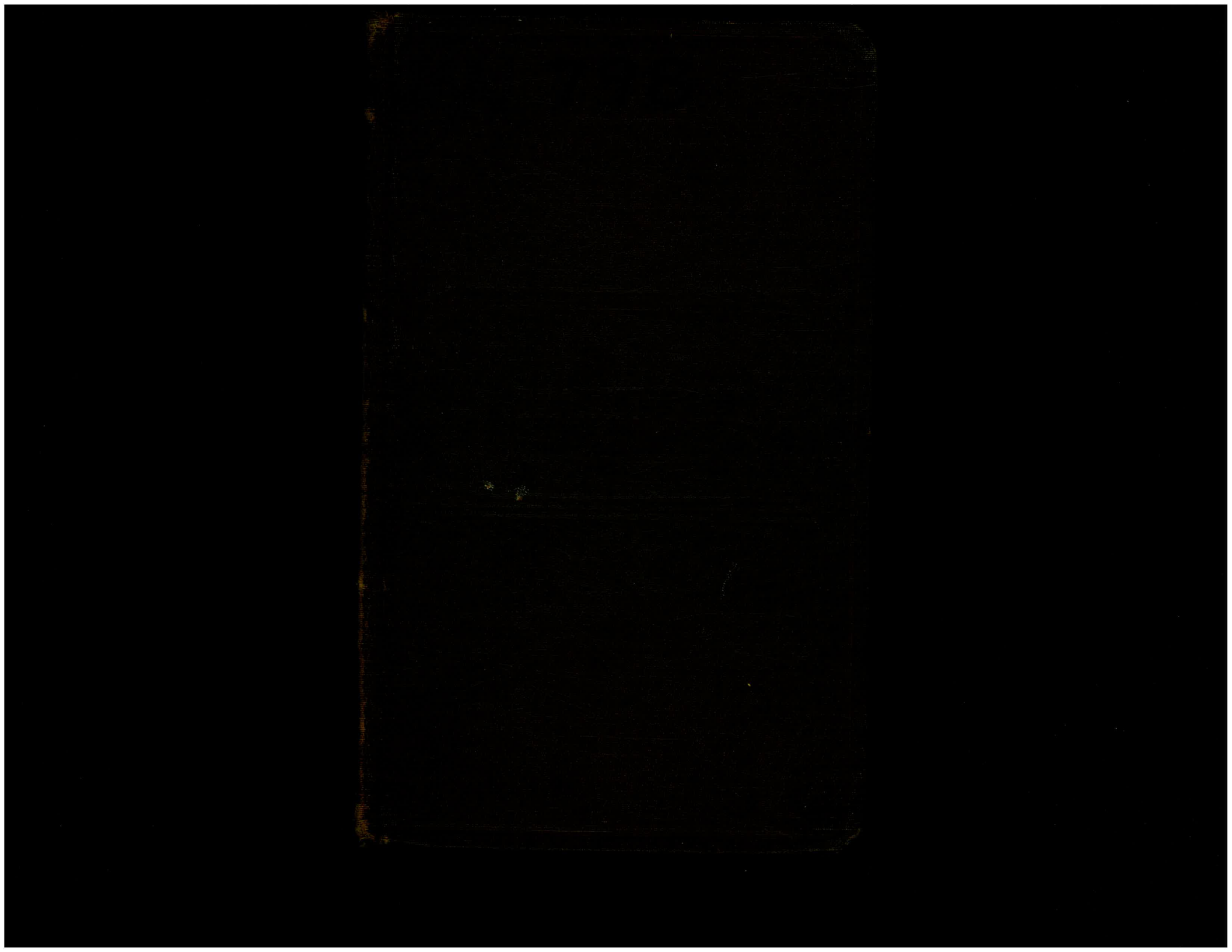

798

Sutherland
16/10-D
16 40-D pg 34-37
correction = 10'
from Les King
6/12/51 RM

? pg 56
L-850 76 Rt 2034.8
85 Rt 2035.3
90 Rt 2038.2
} ?

pg 62
L-850 71 Rt 2054.3
}

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ay, slope 1 to 1. If
ntry method in left
gives distance from
levation between the
Add this amount to
ht should cut target.

Table XIII—Corrections for Tangents and Externals

These corrections are to be added to the approximate values, found by dividing the tangent, or external, for a 1° curve (Table VIII) by the degree of curve, in order to obtain the true tangents, or externals. Intermediate values may be obtained by interpolation.

For Tangents Add

Central Angle	Degree of Curve													
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	03	.06	09	13	16	19	.22	.25	.28	.31	.34	38	42	.46
15°	04	10	14	19	24	.29	.34	.39	45	.51	.53	58	.63	.68
20°	06	.13	19	.26	.32	.39	.45	.51	.58	.65	.72	79	.84	.90
25°	.08	16	24	.33	40	49	.58	67	.75	.83	90	.99	1.06	1.14
30°	10	19	.29	39	49	.59	.69	79	.89	.99	1.09	1.20	1.29	1.39
35°	11	22	.34	47	.58	.69	.70	.81	.92	1.04	1.29	1.42	1.54	1.66
40°	13	.26	.40	.53	.67	.80	.93	1.06	1.20	1.34	1.49	1.64	1.79	1.94
45°	15	.30	44	60	76	91	1.06	1.21	1.37	1.52	1.70	1.87	2.04	2.21
50°	17	.34	.51	.68	.85	1.02	1.19	1.36	1.54	1.72	1.91	2.10	2.29	2.48
55°	19	38	.57	76	.95	1.14	1.32	1.52	1.72	1.92	2.14	2.35	2.56	2.77
60°	21	42	.63	.84	1.05	1.27	1.49	1.71	1.94	2.17	2.38	2.60	2.83	3.07
65°	23	46	.69	.93	1.16	1 40	1.64	1.88	2.13	2.38	2.63	2.88	3.13	3.39
70°	25	.51	76	1.02	1.28	1.54	1.80	2.06	2.33	2.60	2.88	3.16	3.44	3.72
75°	.27	.56	.83	1.12	1.40	1.69	1.98	2.27	2.57	2.87	3.16	3.47	3.78	4.09
80°	30	.61	.91	1.22	1.53	1.84	2.15	2.46	2 78	3.10	3.44	3.78	4.12	4.46
85°	33	66	1.00	1.33	1.68	2.02	2.36	2 70	3.05	3.40	3.77	4.14	4.55	4 89
90°	36	.72	1.09	1.45	1.83	2.20	2.57	2.94	3.32	3.70	4.10	4.50	4.91	5.32
95°	39	79	1.19	1.55	2.00	2.40	2.80	3.20	3.61	4.02	4.40	4.98	5.38	5.83
100°	43	.86	1.30	1.74	2.18	2.62	3.06	3.50	3.95	4.40	4.88	5.37	5.85	6.34
110°	51	1.03	1.56	2.08	2.61	3.14	3.67	4.21	4 76	5.31	5 86	6.43	7 01	7 60
120°	62	1.25	1 93	2.52	3.16	3.81	4 45	5.11	5.77	6 44	7 12	7.80	8.50	9 22

For Externals Add

Central Angle	Degree of Curve													
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.001	.003	.004	.006	.007	.008	.009	.011	.012	.014	.015	.017	.018	.020
15°	.003	.007	.010	.014	.018	.023	.027	.029	.032	.035	.039	.043	.047	.051
20°	.006	.011	.017	.022	.028	.034	.038	.045	.051	.057	.063	.070	.076	.083
25°	.009	.018	.027	036	.046	.056	.065	.074	.083	.093	.106	120	127	135
30°	.013	.025	.038	.051	.065	.078	.090	.103	.116	.129	.149	.170	.179	.188
35°	.018	.035	.054	.072	.086	.109	.131	.153	.175	.197	.213	.230	.247	.264
40°	.023	.046	.070	.093	.117	.141	.172	.203	.234	.265	.277	.290	.315	.341
45°	.030	.060	.093	.119	.153	.184	.216	.254	.289	.325	.351	.378	.411	.445
50°	.037	.075	.116	.151	.189	.227	.266	.305	.345	.384	.425	.467	.508	.550
55°	.046	.093	.142	.188	.236	.283	.332	.381	.420	.479	.530	.582	.641	.700
60°	.056	.112	.168	.225	.283	.340	.398	.457	.516	.575	.636	.697	.774	.851
65°	.067	.135	.204	.273	.343	.412	.483	.554	.625	.697	.711	.845	.922	1.01
70°	.080	.159	.240	.321	.403	.485	.568	.652	.735	.819	.906	.994	1.08	1.17
75°	.095	.182	.286	.383	.480	.578	.678	.777	.877	.977	1.07	1.18	1.29	1.39
80°	.110	.220	.332	.445	.558	.671	.787	.903	1.02	1.13	1.25	1.38	1.50	1.62
85°	.128	.259	.391	.524	.657	.790	.926	1.06	1.20	1.34	1.47	1.62	1.76	1.91
90°	.149	.299	.450	.603	.756	.910	1.07	1.22	1.38	1.54	1.70	1.87	2.03	2.20
95°	.174	.350	.522	.706	.985	1.06	1.25	1.43	1.62	1.80	1.99	2.18	2.38	2.58
100°	.200	.401	.604	.809	1.01	1.22	1.43	1.64	1.85	2.06	2.28	2.50	2.73	2.96
110°	.268	.536	.806	1.08	1.35	1.63	1.91	2.20	2.48	2.76	3.05	3.35	3.66	3.96
120°	.360	.721	1.08	1.45	1.82	2.19	2.57	2.95	3.33	3.72	4.11	4.50	4.91	5.32

Sutherland Dam: elev. upstream + downstream ends of Buttresses at grnd. + cutoff walls — 1

Elev. of Water & Gage ✓ 2 —

Elevs. depths etc. Core Drilling at Sutherland Dam 3-16

Levels Sutherland Dam ✓ 17-19

Profile Sludge Dam ✓ 20-21

Alignment Alvarado access Rd + Profile 22-24

X-Sects. Sutherland Dam D1548 - D1660 also 25-37 ✓

" " " D1660 D1890 38-51 ✓

" " " Spillway 52-63 ✓

Location steel - Abt H 7 64-69 ✓

Location Cutoff Wall - Abt 10-11 70 ✓

Profile for outlet Pipe D1611 - 71 also ✓

South - S.V.P.L. - Tunnel #2 - Levels to Core Drill Holes 72-73 ✓ also

1. Aug. 17, 1950 H.H. Rainey

	Downstream	Cutoff
Buttress #14	1994.2	1994.4
#13	1977.7	1976.4
#12	1966.7	1960.3
#11	1947.0	1946.0
#10	1925.0	1930.0
#9	1913.6	Not open
#8	1909.2	—

1. Elev. of Upstream and downstream ends of Buttresses at ground or cutoff wall Sutherland Dam

AUG. 31 1950
BEATTY, NEVADA
WEST & LEONARD G.

ELEV. OF WATER & GAGE

B.M.	0.22	1988.51		1988.29	B.M. at She-bolt hole BUTTRESS #13 So. Side.
"	0.10	1976.17	12.44	1976.07	
"	0.17	1963.44	12.90	1963.27	
"	0.25	1950.55	13.14	1950.30	
"	0.26	1937.94	12.87	1937.68	
"	1.43	1926.58	12.79	1925.15	
SET. B.M.			0.87	1925.71	NAIL IN 18" Sycamore 100' W. WATER HOLE
"			12.76	1913.82 = (1.25 GAGE)	WATER SURFACE ELEV 1:00 p.m. 8/31/50
				1912.57 = 0.0 GAGE	

2.

Levels - Sutherland Dam

Extreme Top Casings - Core Drilling

Lietz-level-S-1940 All Levels in this Book

KING-Notes Baker West T 11-3-50

Lietz-S1940

B.M.	1.39	1989.68			1988.29	So. End Abt. 13 - East Side - Painted on Wall
Abt. 13			12.68	1977.00		Top casing So. End - Upstream
T.P.	0.77	1977.42	13.03	1976.65		
Abt #12			10.24	1967.18		Top casing - No End Downstream
T.P.	0.23	1964.58	13.07	1964.35		
T.P.	0.36	1952.41	12.53	1952.05		
Abt. #11			6.84	1945.57		Top casing No. End Downstream
T.P.	0.67	1940.00	13.08	1939.33		
T.P.	0.74	1927.47	13.27	1926.73		
Abt. #10			2.12	1925.35		Top casing No. End Downstream
T.P.	0.65	1915.34	12.78	1914.69		

Sutherland Dam
Levels - Extreme Top Casings
Core Drilling

1915.34

Abt. #9			2.60	1912.74
Abt. #8			2.82	1912.52
T.B.m.			3.75	1911.59
T.P.	9.68	1920.18	4.84	1910.50
Abt. #8			3.05	1917.13
Abt. #9			4.78	1915.40
T.P.	13.16	1933.27	0.07	1920.11
Abt. #10			4.06	1929.21
T.P.	13.10	1945.83	0.54	1932.73
Abt. #11			0.69	1945.14

King Notes
West-T
Baker

4

Top casing - No. Side - Downstream

Top casing - No. Side - Downstream

Bottom - N.W. Cor. Abut. #8 - Downstream

Top casing - upstream

Top casing - upstream

Top casing - upstream

Top casing - upstream

Sutherland Dam
Levels - Extreme Top Casing
Core Drilling

KING: Notes
WEST - X
Baker

11-3-50

1945.83

T.P.	13.16	1958.79	0.20	1945.63
T.P.	11.25	1969.80	0.24	1958.55
Abt # 12			7.98	1961.82

Top CASING - Upstream

1980.59

T.P.	10.81	~~1977.59~~	0.02	1969.78
T.P.	12.13	1992.06	0.66	1979.93
T.P.	13.11	2004.23	0.94	1991.12
Abt. # 14			9.39	1994.84

Top CASING - Upstream

T.P.	13.19	2017.34	0.08	2004.15
#67. Footing #5			5.09	2012.25

T

T.P.	0.03	2004.68	12.69	2004.65
Abt # 14			10.78	1994.40

Top CASING - DOWNstream

King - Notes 11-3-50
West
Baker

Levels

Sutherland Dam
Extreme Top Casing
Core Drilling

2004.18

T.P	0.04	1991.79	12.93	1991.75	
Hbt. #13			13.35	~~1980.44~~ 1978.44	Top Casing - Downstream
T.P.	11.20	1990.17	12.82	1978.97	
B.M.			1.95	1988.22	1988.29

B.M. So. Side Hbt. #13

Sutherland Dam

Abt. # 15 -

1 hole drilled Vertical

5.8' South of Axis

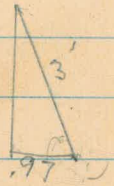
Depth of Hole	32.25'
Top casing-Conc.	0.4
Length casing	2.08
Elev. Top casing	2012.25

King
Baker
West

11-6-52

Sutherland Dam
Abt. 14
Downstream

Depth Hole	32.3'
Top casing - to Conc	0.72
Length casing	1.85
Elev. Top casing	1994.40



11-6-50
King
Baker
West

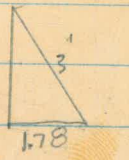
Abt. #14
Upstream

Depth Hole	42.3
Top casing - To Conc.	0.63
Length casing	2.24
Elev. Top casing	1994.84

Sutherland Dam

Hole #13
upstream

Depth Hole	31.0
Top casing - to Conc.	0.70
Length Casing	2.16
Elev. Top "	1978.44



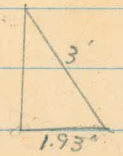
11-6-52
King
Baker
West

Hole #13
Downstream

Depth Hole	38.8
Top casing - to Conc	0.83
Length casing	1.91
Elev. Top "	1977.60

Sutherland Dam
Mt #12
Upstream

Depth Hole	34.5'
Top casing-to Conc	0.70
Length Casing	2.38
Elev. Top "	1961.82

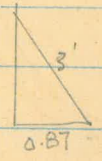


King 11-C-5E
West
Baker
Mt. 12
Downstream

Depth Hole	38.44
Top Casing - to Conc	0.75
Length Casing	2.56
Elev. Top Casing	1967.81

Sutherland Dam
Hole # 11
Upstream

Depth Hole	25.20'
Top casing to Conc	0.50
Length "	1.84
Elev. Top Casing	1945.14



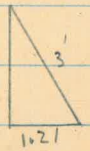
11-6-50
King
West
Baker

Hole # 11
Downstream

Depth Hole	28.15
Top casing to Conc.	0.97
Length "	2.72
Elev. Top casing	1945.57

Sutherland Dam
Abt. #10
Upstream

Depth Hole	25.4
Top Casing to Conc	0.89
Length "	2.50
Elev Top Casing	1925.21

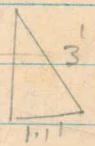


11-6-50
King
West
Baker

Abt #10
Downstream

12

	23.30
	0.71
	2.55
	El. 1925.35



Sutherland Dam
Abt. # 9
Upstream

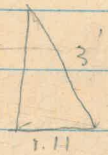
Depth Hole	20.78'
Top casing to Conc.	0.86
Length casing	2.50
Elev. Top casing	1915.40

King
Baker
West

7-6-50

Abt. # 9
Downstream

	~~X~~ 19.50
	0.90
	2.51
	1912.74



Sutherland
Hbt. #8
Upstream

Depth of Hole	19.4
Top Casing - to conc.	0.57
Length casing	2.50
Elev. Top casing	1917.13

11-6-50

King
Baker
West

Hbt. #8
Downstream

	25.61
	0.80
	2.45
	1912.58

Sutherland
Hbt. #7
Hole Vertical
OF Dam

2.3' No. Axis

Depth of Hole	17.6'
Top casing - conc.	1.0'
Length casing	2.3'
Elev. Top Casing	1917.84

Hbt. #7

Hole Vertical — 8.7' So. Axis - Dam

Depth of Hole	23.2'
Top casing - to conc.	0.45'
Length casing	2.51'
Elev. Top Casing	1918.97

King Baker West 11-6-50

Hbt. #7 - Hole Vertical - 70.9' So. of Axis

	23.7'
	0.31
	1.55
	1921.11

Sutherland
Hot. # 6

Hole Vertical - 12.5' So of Axis

Depth of Hole	21.75
Top casing to gr.	1.0
Length of Casing	~~5.5 7 (see King)~~
Elev. Top Casing	1933.64

11-8-50

King
Baker
West

Vertical Hole Between Hots. 3 & 4
49.5' So of Axis of Dam

	16.3
	0.9
	4.0
	2013.00

Sutherland
Levels 40 Core Holes

T.B.M.	9.34	1920.93			1911.59
Hb.#7			3.07	1917.86	
Hb.#7			1.96	1918.97	
T.P.	10.76	1931.55	0.14	1920.79	
Hb.#7			10.44	1921.11	
T.P.	12.61	1944.03	0.13	1931.42	
T.P.	8.44	1951.78	0.69	1943.34	
Hb.#6			18.14	1933.64	
T.P.	11.28	1962.98	0.08	1951.70	
T.P.	13.15	1975.37	0.76	1962.22	
T.P.	12.05	1987.42	0.00	1975.37	

11-10-50
King
Baker
West

1.7

Bottom N.W. Cor #6+8 (Page 4)

2.3 No. of Axis

8.7' So. of Axis

70.9' So. of Axis

Hole 12.5 So. Axis

11-10-50

Sutherland

Levels to Core Drill & Spillway

1987.42

King Baker A West

T.P.	13.16	2000.46	0.12	1987.30
T.P.	13.27	2013.45	0.28	2000.18
Between Hts. 3 & 4			0.45	2013.00
				Top Casing -49.5 So. Axis
T.P.	12.94	2026.17	0.22	2013.23
T.P.	13.24	2038.98	0.43	2025.74
T.P.	11.99	2050.22	0.75	2038.23
T.P.	7.14	2057.~~36~~ 16	0.20	2050.02
T.B.m.			5.61	2051.~~60~~ 55
				Top Flat Rock 35' No Axis - 50' East - West Edge Spillway
T.P.	12.26	2069.~~50~~ 40	0.02	2057.~~74~~ 14
T.P.	12.95	2081.~~40~~ 30	1.05	2068.~~45~~ 35
T.P.	6.~~24~~ 16	2087.24	0.42	2080.~~98~~ 88
B.m.	2.67	2086.~~81~~ 71	3.10	2084.~~74~~ 64
				Set-top Nail in Conc Mon - on Axis - 100' East Side Spillway
T.P.	0.46	2073.92 ~~2074.02~~	13.25	2073.~~46~~ 46

Sutherland
Levels to Spillway

2073.92
~~2074.02~~

T.P.	0.40	~~2060.53~~ 2061.43	12.99	2060.93 ~~2061.03~~	
T.P.	0.59	2050.62 ~~2050.72~~	11.30	2050.03	
T.P.	0.25	2037.92 ~~2038.02~~	12.95	2037.67 ~~2037.77~~	
T.P.	0.14	2024.88	13.18	2024.74 ~~2024.84~~	
T.P.	0.54	2013.78	11.64	2013.24	
			0.77	2013.01	2013.00

King 11-10-50
Baker T.
West

19

Top casing between T & Y

Profile - (cont.)
Alvarado Sludge P.L.
New alignment From sta 9+45

King
West
Thomas

1-3-50

T.B.M	2.90	516.90			514.0	
9+45 ℄			0.5			
④			0.4	516.5	510.27	6.2
10+00 ℄			4.1			
④			3.4	513.5	510.0	3.5
10+50			8.2	510.7		
④			5.5	511.4	508.2	3.2
10+68.13 ℄			6.8			
④			6.2	510.7	508.1	3.6
11+00			8.0			
④			7.3	509.6	508.0	1.6
11+50 ℄			7.2			
④			6.6	510.3	507.8	2.5
12+00			5.7			
④			5.5	511.4	507.6	3.8
12+50			6.3			
④			6.1	510.8	507.5	3.8
13+00			7.6 7.4			
④			7.4	509.5	507.4	2.1

Profile New Alignment
Alvarado Sludge Line

1-3-52

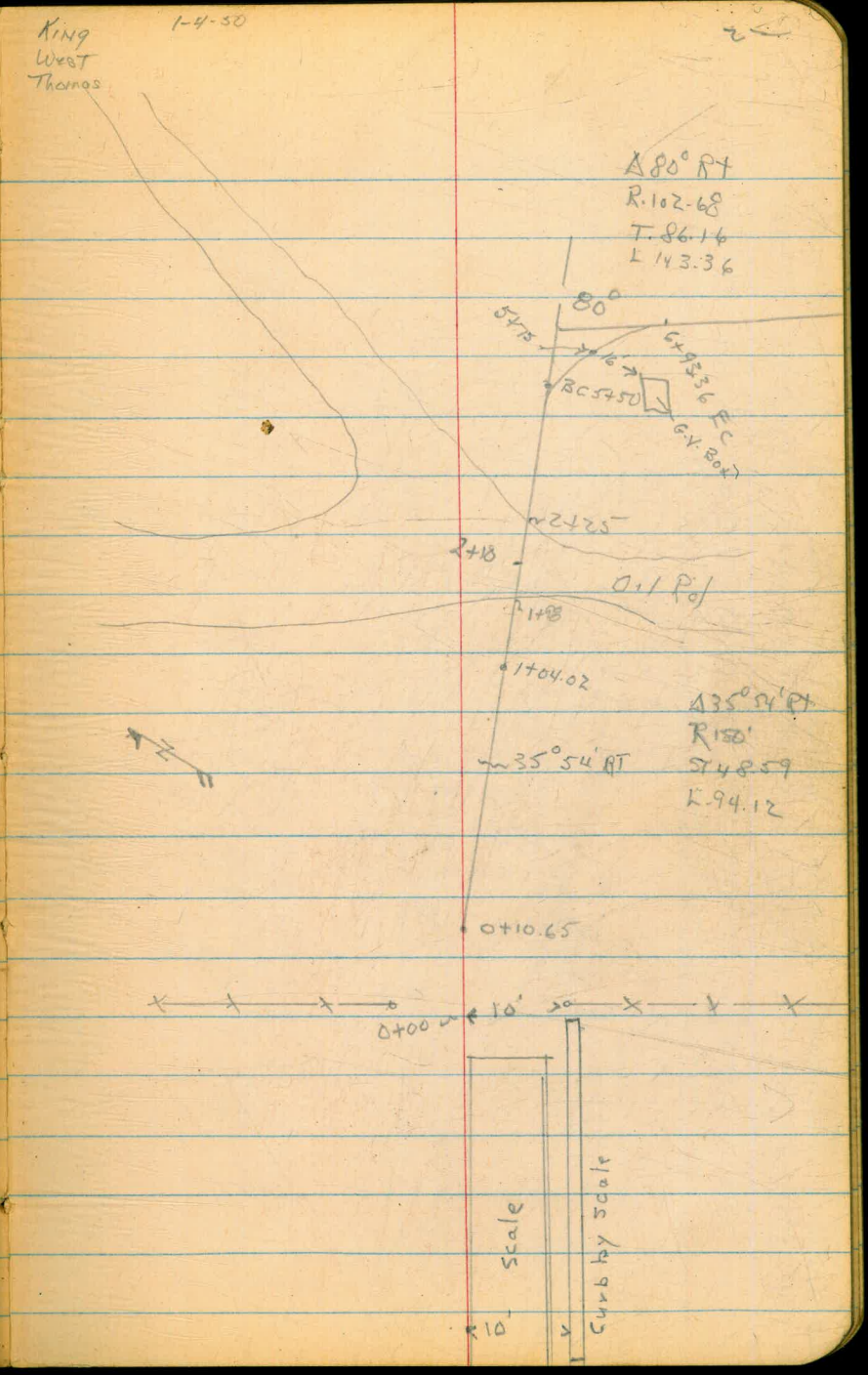
King
West
Thomas

13+50 ℄	9.3			
(4)	9.0	507.9	504.8 ~~498.2~~	3.1
14+00 ℄	10.7			
(4)	10.9	506.0	502.4	3.6
14+50	13.3			
(4)	13.2	503.7	500.0	3.7
15+00	18.0			
(4)	18.1	498.8	497.0	1.8
CK JBM	2.90			

Access Rd to Hi Navada Scales -

BM 4.20	550.78			546.58
0+00 ℄		4.7	46.1	
0+10.65 ℄		5.5	45.3	
11 N		5.3		F.05
11 S		5.3		F.05
0+50 ℄		7.8	43.0	
14 ± N		7.0		F.23
16 ± S		8.0		F.33
1+00 ℄		6.2	44.6	
11 ± N		5.6		F.08
14 ± S		6.8		F.21

See Next page



Alvarado Rd. to Seales

580.78

1+50		4.8	46.0	46.1
2+00		1.9	48.9	49.6
2+30				49.6
2+50		1.6	49.2	~~48.5~~ 49.0
3+00		1.4	49.4	~~48.0~~ 48.0
3+50		3.1	47.7	47.0
4+00		4.6	46.2	46.2
4+50		6.4	44.4	
5+00		8.6	42.2	
5+50		9.7	41.1	
6+00		9.8	41.0	

King West Thomas 1-9-50

All distances @

Lt.		Rt.		
		4.8	5.6 / 12'	
3.9 / 12	0.9 / 12		3.0 / 12	F2.2 / 14.4
C1.4 / 10	0.0 / 12		2.7 / 12	F0.8 / 11.6
C3.8 / 10	+0.5 / 12		2.8 / 12	C0.9 / 10
C2.0 / 10	1.7 / 12		4.0 / 12	0.0 / 10
C0.8 / 10	3.8 / 12		5.3 / 12	F0.5 / 12
C0.5 / 10	5.9 / 12		7.3 / 12	F0.8 / 11.6
C0.5	8.0 / 12		9.0 / 12	F0.6 / 1.2
C0.4 / 10	9.3 / 12		10.2 / 12	F0.4 / 11
C0.4	9.3 / 12		10.5 / 12	F0.7

Alvarado Rd

550.78

6+50		10.6	40.2
6+93		13.6	37.2

King
West
Thomas

1-4-52

24

	Lt.		Rt.	
C 00/10	10°/12		11.7/12	F 2.2/14.4

Sutherland Dam.

Levels for topo. West side Dam

Above Elev. 2000

King
West
Williams

1-2.5 h clear-cool

T.B.M.	12.91	2025.16			2012.25
T.P	13.27	2037.44	0.99	2024.17	
T.P	12.58	2049.73	0.29	2037.15	
T.P	12.94	2061.78	0.89	2048.84	
	12.55	2073.95	0.38	2061.40	
	13.18	2085.95	1.18	2072.77	
	5.16	2090.92	0.19	2085.76	
			4.14	2096.78	

see page 7.

OK hub & Axis 2133.20 D.

2328.10 D.

D.S. = Downstream-Rt
U.T. = Upstream-Lt.

Sutherland Dam
X-Sects. - 1540 D - 1660 D
From Axis Up & Down Stream

King
West
Williams

2-6-51 Clear-Warm 26

T.B.M.	9.80	1922.54		1912.74
1540 - D.S. - 48'			10.7	1911.8
78' Rt.			9.9	1922.6
82' Rt.			7.4	1915.1
93' Rt			10.6	1911.9
115' Lt.			9.1	1913.4
160 Rt			11.5	1911.0
1550 - D - Axis			10.0	1912.5
20' Lt			9.1	1913.4
40' Lt			7.4	1915.1
80' Lt.			6.4	1916.1
100' Lt			5.4	1917.1
35' Rt			8.8	1913.7
72' Rt.			9.0	1913.5
81' Rt			5.4	1917.1
95' Rt			6.6	1915.9
115' Rt			5.4	1917.1
126 Rt			3.1	1919.4
140 Rt			11.1	1911.4
160 Rt			11.0	1911.5

Top casing Downstream # 9 - Page 13
against Abt. # 9

Top pile loose rock

" " " "

Sutherland Dam
X-Sects - 1570 D - 1660 D.

1922.52

1570-D-Axis	4.3	1918.2
32' Lt.	1.2	1921.3
47' Lt.	3.9	1918.6
67' Lt.	2.0	1920.5
80' Lt.	0.2	1922.3
1560 D - 50' Rt	7.8	1914.7
60' Rt.	7.8	1914.7
87' Rt	4.9	1917.6
120' Rt	4.4	1918.1
122' Rt	2.6	1919.9
135' Rt	2.5	1920.0
167 Rt	9.1	1913.4
187 Rt	9.2	1913.3
1570 D. Axis	+2.6	1924.5
20' Lt.	+10.0	1932.5
51' Lt.	+4.0	1926.5
71' Lt	+3.0	1925.5
1570 D 33' Rt	-4.5	1918.0
60 Rt	4.2	1918.3

King
West
Williams

1-6-51

Sutherland Dam
X-sect - 1590D - 1660D

1922.54

125' Rt		4.3	1918.2
130 Rt		2.3	1920.2
148 Rt		4.1	1918.4
155' Rt		7.9	1914.6
175' Rt		7.7	1914.8
T.P.	8.76	1929.18	2.12	1920.42
1580D - 20' Rt		5.4	1923.8
40' Rt		6.7	1923.5
60' Rt		8.0	1921.2
88' Rt		9.0	1920.2
123' Rt		6.7	1922.5
140' Rt		5.5	1923.7
160' Rt		8.5	1920.7
196 Rt		14.0	1915.2
1590 - D 30 Rt		6.3	1922.9
60' Rt		6.6	1922.6
85' Rt		8.3	1920.9

King
West
Williams

1-6.5-1

28

Loose Rock

" "

Sutherland Dam
X-Sects 1540 D - 1660 D

1929.18

125' Rt		6.6	1922.6
141' Rt		6.1	1923.1
150' Rt.		4.6	1924.6
165 Rt		5.4	1923.8
1600-D 41' Rt		4.7	1924.5
60' Rt		6.2	1923.0
74' Rt		4.3	1924.9
83' Rt.		4.3	1924.9
98' Rt		+0.3	1929.5
114' Rt		5.7	1923.5
124 Rt		4.2	1925.0
160' Rt		7.3	1921.9
185 Rt.		8.0	1921.2
T.P.	7.80	M 36.78	0.20 1928.98
1610-D - Axis		1.5	1935.3
12' Rt		5.5	1931.3
21' Rt		5.4	1931.4

King
West
Williams

1-6-31

39

Alt. #10 C + ground

Downstream = Rt.
Upstream = Lt.

Sutherland Dam
X-Sects -1540 D - 1660 D

1936.78

36' Rt		10.2	1926.6
45' Rt		10.1	1926.7
60' Rt		8.3	1928.5
65 Rt.		7.4	1929.4
84' Rt		6.0	1930.8
90' Rt		3.2	1933.6
100' Rt		2.9	1933.9
116' Rt		9.8	1927.0
160' Rt		14.6	1922.2
186' Rt.		15.4	1921.4
1620-D-Axis		+2.9	1939.7
10' Rt.		+0.1	1936.9
18 5/12 RT.	℄ I Beams	4.0	1932.8
19' RT.		5.9	1930.9
28' Rt		4.9	1931.9
39' Rt		6.7	1930.1
58' Rt		5.2	1931.6
60' Rt		5.6	1931.2
84 Rt		5.2	1931.6

King
West
Williams

1-6-51

52

5' x 2 5' Top Conc. Blk - 3 ℄ Top 2 - 12" I Beams

Sutherland Dam
Y-Sects. 1540-D - 1660-D.

1936.78

93' Rt			3.8		1933.0
111' Rt.			5.2		1931.6
145' Rt.			11.4		1925.4
170' Rt.			15.4		1921.4
T.P.	11.50	1945.64	2.64	1934.14	
1630-D Ahead			2.5		1943.1
5' Rt			2.6		1943.0
8' Rt.			15.7		1929.9
14' Rt.			12.6		1933.0
28' Rt.			11.8		1933.8
40 Rt			14.5		1931.1
60 Rt			12.1		1933.5
88 Rt			12.8		1932.8
88.5 Rt			11.8		1933.8
99' Rt			11.3		1934.3
113' Rt			13.6		1932.0
160' R			14.5		1931.1
175' R			16.7		1928.9

King
West
Williams

1-6-57

Sutherland Dam
X-sects - 1540 D - 1660 D.

1945.64

1660D Axis		40.3	1945.9
24'Rt		3.2	1942.4
36'Rt		5.1	1940.5
42'Rt		5.8	1939.8
52'Rt		7.4	1938.2
54Rt		8.0	1937.6
60Rt		8.6	1937.0
66Rt		6.8	1938.8
83'Rt		8.2	1937.4
92'Rt		7.4	1938.2
99'Rt		10.0	1935.6
160'Rt		5.4	1940.2
170'Rt		5.6	1940.0
1650-Axis		40.6	1946.2
4'Rt		0.0	1945.6
4'Rt		6.0	1939.6
14'Rt		6.0	1939.6
14Rt		0.1	1945.5
40'Rt		2.1	1943.5

King T
West
Williams

1-6-51

Sutherland Dome

X-Sects - 1540D - 1660D

1945.64

60' Rt			3.6		1942.0
64 Rt			0.5		1945.1
70' Rt			0.2		1945.4
82' Rt			5.3		1940.3
94' Rt			7.0		1938.6
129' Rt			9.1		1936.5
160' Rt			6.5		1939.1
175 Rt			6.0		1939.6
16600-35'	Rt		1.2		1944.4
60' Rt			0.6		1945.0
68' Rt			+2.0		1947.6
86' Rt			3.0		1942.6
117' Rt			3.4		1942.2
143 Rt			7.0		1938.6
166 Rt			6.8		1938.8
TBP			7.7		1937.9
T.P	2.63	1948.20	0.05	1945.59	1945.57
T.P	7.35	1952.98	7.57	1945.63	
		(over)			

King
West
Williams

1-6-51

Abt #11 + old ground intersection

Top casing Abt #11 Downstream

Downstream = Rt.

Sutherland Dam
X-sects - 1520D - 1660D

King & West Williams 1-6-51

34

195298

1610D-15' Lt	17.1	1935.9
24' Lt.	21.7	1931.3
34 Lt	26.2	1926.8
50' Lt	23.1	1929.9
50.5 Lt.	19.6	1933.4
55' Lt.	15.0	1938.0
97 ~~107~~ Lt	14.6	1938.4
104 ~~114~~ Lt.	17.8	1935.2
112 ~~122~~ Lt.	17.3	1935.7
113 ~~123~~ Lt	12.4	1940.6
128 ~~138~~ Lt	11.7	1941.3
1620D-28 Lt	11.8	1941.2
48 Lt.	9.2	1943.8
52 Lt.	10.0	1943.0
58 Lt	9.4	1943.6
67 Lt.	8.4	1944.6
90 Lt.	9.0	1944.0
96 ~~106~~ Lt	8.2	1944.8
131 ~~141~~ Lt.	7.2	1945.8

Sutherland Dam
Y-Seeds. 1540 D - 1660 D.

King T
West
Williams

1-7-51 Very Hot

35

1952.95

1630 D - 29 Lt.	6.3	1946.7
48' Lt	5.6	1947.4
57' Lt	5.7	1947.3
90' Lt.	4.6	1948.4
107' ~~117~~ Lt	5.2	1947.8
1640 D - 35 Lt	2.9	1950.1
53' Lt	3.4	1949.6
61 Lt.	1.9	1951.1
69 Lt	3.0	1950.0
90' Lt	2.6	1950.4
105' ~~115~~' Lt.	1.5	1951.5
1650 D - 2 Lt.	6.0	1947.0
8' Lt	2.3	1950.7
44' Lt	+1.5	1954.5
60' Lt.	+4.3	1957.3
95 ~~105~~' Lt.	+2.3	1955.3
98 ~~108~~' Lt	-0.2	1952.8
101 ~~111~~ Lt.	+2.3	1955.3
113 ~~123~~ Lt	+2.0	1955.0

Sutherland Dam
X-Sects - 1540 D - 1660 D

King
West
Williams

1-7-51 Very Warm

36

1952.98

	4.30	1944, 53	12.75	1940.23	1940.27	B.M. Rock —
1610-D 144 ~~154~~ Lt			16.4		1928.1	
146 ~~156~~ Lt			11.8		1932.7	
153 ~~163~~ Lt			11.6		1932.9	
1535 ~~1635~~ Lt.			5.6		1938.9	
167 ~~177~~ Lt			5.8		1938.7	
183 ~~193~~ Lt			9.9		1934.6	
216 ~~226~~ Lt.			10.7		1933.8	
1620 D 148 ~~158~~ Lt			4.8		1939.7	
153 ~~163~~ Lt			10.2		1934.3	
160 ~~170~~ Lt			9.8		1934.7	
162 ~~172~~ Lt			6.5		1938.0	
170 ~~180~~ Lt			7.0		1937.5	
180 ~~190~~ Lt			10.0		1934.5	
216 ~~226~~ Lt			10.5		1934.0	
1630 D 111 ~~121~~ Lt			7.4		1937.1	
128 ~~138~~ Lt			10.9		1933.6	
136 ~~146~~ Lt			6.6		1937.9	
160 ~~170~~ Lt			7.5		1937.0	

Sutherland Dam
X-sects - 1540D - 1660D

1945-3

177 +87'2 Lt		8.9	1935.6
189 +99 Lt.		6.4	1938.1
216 ~~226~~ Lt		10.0	1934.5
1640 D 111 +21 Lt		2.0	1942.5
130 +46 Lt		8.5	1936.0
131 +41 Lt		+8.0	1952.5
145 +55'2 Lt		4.3	1940.2
148 +58 Lt		4.3	1940.2
148' +58 Lt		5.8	1938.7
153 +63 Lt		5.8	1938.7
185 +95 Lt.		+1.0	1945.5
195 205 Lt.		+3.5	1948.0
216' ~~226~~ Lt		+3.3	1941.2
1650D 133 +43 Lt		0.6	1945.1
140 +50 Lt		2.7	1947.2
154 +64 Lt		0.0	1944.5
181 +91 Lt		+12.1	1956.6
216 ~~226~~ Lt.		+3.0	1947.5
		4.3w	1940.23 1940.27

King
West
Williams

1-7-51

Hot

37

Reduced & Checked pg. 25-37
4/6/51 R.A.M.

Sutherland Dam

10' X-Sects - Rt. of Axis

Began D = 1060

	FS	HI		El. FP.	B
B.M.	12.30	2062.32			2050.02
T.P.	5.09	2066.55	0.86	2061.46	
D = 1060			6.3		2060.3
D = 1070			4.0		2062.6
D = 1080			6.8		2059.8
T.P.	0.38	2056.55	10.38	2058.17	
D = 1090			1.1		2055.5
D = 1100			4.7		2051.9
D = 1110			8.2		2048.4
T.P.	1.55	2049.56	8.54	2048.01	

King
West
Williams

1-2451 Elev-Cool

38

500 TH

Up

Lt. Axis

Dam

NORTH

Down

Rt. Axis

Top Rock 50' West Base Line Spillway 2060.6

2064.8 2060.6 2057.8 2063.3 2063.4
2064.7 2061.1 2058.2
1.9 1.8 5.5 6.0 8.4 8.8 5.3 3.2
30 22 18 15 12.5 35 5 20

2052.1 2061.2 2063.3 2060.6 2058.4
2050.9 2060.4
15.7 14.3 6.2 5.4 3.3 6.0 7.2
62 51 30 34 23 7 30

2051.3 2058.5 2062.3
2049.6 2058.1 2060.3 2061.4 2057.6 2057.1
17.0 15.3 8.5 8.1 6.3 4.3 5.2 9.0 9.5
71 52 41 32 25 10 3 8 35

2050.9 2056.3 2052.9
2049.6 2056.8
10.0 5.7 0.8 0.3 2054.4 3.7
81 48 37.5 25 2.2 40
11

2044.3 2050.0 2051.6 2053.0 2049.4 2048.1
12.3 6.6 3.0 3.6 7.5 8.5
70 61 44 25 30 53

2041.5 2049.5 2051.3 2049.8 2046.2 2044.8 2044.6
15.1 7.1 5.3 6.8 10.4 11.8 12.0
91 56 40 35 60 35 45

Sutherland Dam
X-Sects. - Rt. of Axis
From - D=1060 - West

2049.56

D= 1120			4.9		2044.7
D= 1130			8.4		2041.2
T.P	0.00	2037.98	11.58	2037.98	
D= 1140			0.4		2037.6
D= 1150			5.1		2032.9
D= 1160			8.5		2029.5
T.P	0.62	2025.93	12.67	2025.31	
D= 1170			3.1		2022.8
D= 1180			7.9		2018.0
D= 1190	11.??		7.9		2018.0

2-21-51

59

RING

WEST

SOUTH

LT.

2.375

RT.

2043.4 2045.3 2045.9 2043.7 2038.5 2039.1 2043.3
6.3 4.3 3.7 5.9 12.1 10.5 6.3
64 43 33 24 22 11 9

2043.0 2043.3
6.6 6.3
26 37

2034.7 2040.1 2041.8 2043.5
14.9 9.5 7.8 6.1
93 65 36 23

2039.4 2038.4
10.2 11.2
26 40

2034.7 2040.4 2041.8 2034.4
3.3 +2.1 +3.8 3.6
10 42 41 13

2035.9 2034.5
2.1 3.5
20 40

2027.3 2030.2 2035.3 2035.0 2035.7
10.7 7.8 2.7 3.0 <3
98 83 45 32 10

2032.2 2031.7
5.8 6.8
15 40

2026.4 2029.9 2031.5 2031.5
11.6 8.1 6.5
90 63 24

2027.2 2026.7
10.8 11.3
26 46

2024.2 2027.6? 2024.7 2024.9
1.7 +1.2 1.2 1.0
99 61 51 27

2023.1 2025.3
2.8 +0.6
30 46

2020.0 2023.7 2023.2 2021.3 2021.3 2018.3 2018.7
5.9 3.7 2.7 4.6 4.8 2.6 4.2
74 72 66 38 35 31 20

2018.4 2021.6 2020.7
7.5 4.3 5.2
20 37 48

2013.3 2020.6 2021.5 2020.4
12.6 5.3 4.4 5.5
104 57 33 28

2016.8 2013.7
9.1 10.2
29 58

Sutherland Dam
X-Sects (cont'd)

2025.93

T.P	3.36	2018.97	10.32	2015.61	
D=1200			4.5		2014.5
D=1210			8.5		2010.5
T.P.	3.83	2011.99	10.81	2008.16	
D=1220			5.3		2006.7
D=1230	ON Side OF Excav.		9.3		2002.7
T.P.	0.67	1999.79	12.87	1999.12	
D=1240			13.1		1986.7
D=1250			6.1		1993.7
D=1260			7.1		1992.7

King-Water West x — 2-21-51 — clear-cool

40

UP

2007.3 2010.0 2015.3 2017.7 2019.5 2015.7
11.7 9.0 3.7 1.3 +0.5 3.3
121 105 74 46 24 12

2004.1 2013.3 2013.7
14.9 5.7 5.3
124 55 30

1999.7 2002.9 2009.4 2008.8
12.3 9.1 2.6 3.2
134 111 78 17

1995.7 2001.1 2005.5 1998.0
16.3 10.9 6.5 14.0
143 103 75 65

1995.8 1996.2 1997.9 1994.0 1990.2 1989.6
4.0 3.6 1.9 5.8 9.6 10.2
133 86 80 66 46 24

1993.3 1994.5 1995.2
6.0 5.3 4.6
138 100 44

1991.8 1993.1 1994.1 1994.6
8.0 6.7 5.7 5.2
138 100 74 35

Down

2012.5 2011.7
6.5 7.3
18 46

2007.2 2006.7
11.5 12.3
29 46

2003.4 2002.9
8.6 9.1
30 45

2000.4 1998.9
11.6 13
30 40

1987.6 1992.3 1991.9
12.2 7.5 7.9
26 29 45

1992.9 1992.8
6.9 7.0
20 40

1991.8
8.0
40

Sutherland Dam
X-Sects (Cony)

1999.79

D=1270			7.8	1992.0
D=1280			10.7	1989.1
T.P.	0.83	1988.08	11.54	1988.25
T.P.	0.68	1978.20	11.56	1977.52
T.B.M.	5.71	1976.61	7.30	1970.90
P=1290	on Side Steep Bank		0.0	1976.6
D=1300			12.2	1964.4
D=1310			7.4	1969.2
D=1320			7.0	1969.6
D=1330			6.9	1969.7

Cont. Page 46

King-Notes
West ↑
Williams ⊕

2-21-50

4.

1987.19 1992.99 1992.29 1993.5 1994.7 1994.4

12.6 68 2.3 6.3 5.1 5.4
142' 123 111 103 75 46

1990.6 1991.0 1985.7 1994.6 1994.2

9.2 8.8 14.1 5.2 5.6 ∠ Along Edge of
127 124 112 100 68 Vertical Bank

1983.4
16.2
140

Rt.

1985.3 1980.3 1987.8 1987.8

14.5 19.5 12' 12°
6.5 19 30 43'

1979.5 1975.4 1980.5 1979.4

20.3 24.2 19 20.4
28 30 35 45'

Rock between #6+.5 & 40'± Sta. 0 = 1338±

1978.01 ? 1987.11 ? 1984.11 ? 1985.61 ?
1975.2 1966.1 1969.1 1967.6
+1.4 +10.5 +2.5 +9.0
150' 124 116' 86

1971.0 1970.1 1970.6
54 65
30 40 60
50'

1960.6 1981.7 1981.6 1973.5 1968.0 1967.8 1963.3 1965.8 1969.6 1970.2

16.0 +4.6 +5.0 3.1 8.6 8.8 13.3 10.8 7.6 6.2
150' 130' 110 102 74 31 18' 38 39 52

1973.3 ?
1969.3 ?
1975.8 1972.1 1974.0 1971.2 1970.4 1969.5 1969.6 1969.6

8.3 0.8 4.5 2.6 5.4 6.2 7.1 7.0 2.0
150 125 118 110 100 83 54 30 50

1965.9 1972.7 1971.1 1974.9 1970.1 1970.1 1969.1 1969.4 1969.7

10.9 3.9 5.5 1.7 6.5 6.0 7.0 1.7 6.9
155 140 124 108 87 85 33 27 33

1969.0 1969.5 1967.0 1972.2 1969.9 1970.3 1968.9 1985.4

7.6 7.1 9.6 4.4 6.7 6.3 1.7 11.2
142 132 130 124 100 55 37 50'

Sutherland Dam
x-sects Cont.

B.M.	+2.98	2025.23		2012.25	
D = 1910			7.5	2018.7	8.7/100 3.6/91
D = 1920			0.0	2025.2	5.8/100 4.1/89
T.P.	9.86	2034.03	1.06	2024.17	
D = 1930			5.6	2029.4	
D = 1940			3.4	2030.6	
T.P.	3.49	2036.54	0.98	2033.05	
D = 1950			3.5	2033.0	
D = 1960			8.1	2028.4	
T.P.	11.02	2045.07	2.49	2034.05	

King
West
Williams

2-26-51 - Cold Rain

42

	Lt.	Rt.
	Top casing #15	
	7.5/80 9.1/69 14.4/64 14.4/60 8.8/50 6.0/41 7.4/25	3.7/18 3.8/26 +0.5/39
	19.5/79 20.0/70 22/67 0.4/56	1.0/11 +0.5/18 +0.1/32 +1.0/47
	12.7/100 10.9/80 39.2/78 39.8/70 9.5/61 6.9/24	6.5/25 7.8/33 7.6/50
	10.7/100 9.1/77 19.1/75 19.2/70 8.0/64 5.8/48	3.2/23 7.5/33 7.6/50
	10.4/100 7.9/69 14.9/67 14.6/60 6.1/47 5.9/25	2.7/21 8.7/32 10.0/50
2025.8	7.7/100 2031.3 5.2/49 2024.0 12.5/43 2024.7 11.8/10	2024.5 12.0/13.0 2037.5 +1.0/15 2037.5 +1.0/20 2027.9 8.6/45

Sutherland Dam
Y-Sects (cont'd)

2045.07

D = 1970			5.8		2039.3
D = 1980			3.2		2041.9
T.P.	9.30	2053.91	0.44	2044.61	
D = 1990			8.8		2045.1
D = 2000			6.1		2047.8
D = 2010			4.7		2049.2
T.P.	11.92	2060.12	5.71	2048.20	
D = 2020			11.2		2048.9
D = 2030			8.5		2051.6
T.P.	7.39	2066.68	0.81	2059.31	

King
West
Williams

Z-26-51

Cold Rain

43

12.1 12.3 18.0 18.5 9.8 5.2 17.3
100 63 56 50 43 28 44

11.8 10.3 16.3 16.0 8.0 1.6
85 68 67 60 53 40

18.4 17.2 21.0 22.3 15.3 7.3
85 63 60 57 52 42

16.5 14.1 20.2 20.4 12.9 9.0 3.2 3.0
85 57 35 31 47 28 35 40

14.2 11.2 16.5 15.0 8.0 1.3 0.2
85 60 47 40 33 21 40

2041.1 2046.2 2043.1 2042.2 2045.9 2050.4 2055.6 2054.9
19.0 2056.5 13.6 17.1 17.9 11.2 9.7 4.5 3.2
P.T. 35 32 5 4 10 20 50

17.3 12.8 7.1 15.0 0.0
85 36 13 20 46

Sutherland Dam
(x-sect & cont)

2066.68

D=2040			7.6		2059.1
T.P.	6.80	2068.92	4.56	2062.12	
D=2050			7.3		2061.6
D=2060			4.6		2064.3
D=2070			3.6		2065.3
T.P	11.95	2074.37	6.50	2062.42	
D=2080	(14' Test Hole below ℄)		9.0		2065.4
D=2090			6.5		2067.9
T.P.	6.32	2078.77	1.92	2072.45	
D=2100				3.6	2075.2

King
West
Williams

B-5=5-1

44

Lt. Rt.

18.8 16.8 5.6 4.1
85 52 18 48

2048.4 2058.4 2064.2
20.5 10.5 4.7
78 25 25

2050.3 2058.9 2067.3
18.6 10.0 1.6
70 30 25

2053.2 2058.9 2062.2 2068.9
15.7 10.0 6.7 0.0
70 32 22 25

2062.2
2055.2 2056.4 2071.2 2072.2
19.2 18.0 12.2 3.2 2.2
70 57 25 14 32

2064.7
2056.0 2056.1 2060.2 2073.8 2075.9
18.4 18.3 14.2 9.7 0.6 +1.5
70 60 50 32 18 25

2057.6 2065.1 2075.4
16.8 9.3 +1.9
50 20 19

Sutherland Dam
(x-secys Cont.)

King West
W. Miami

3-5-51

Cold

RY.

		2078.97			
T.P	12.97	2084.39	5.35	2078.42	
D=2110			8.1		2078.3
D=2120			4.1		2082.3
D=2130			0.0		2086.4
D=2140			+0.4		2086.8
T.P.	4.23	2090.53	0.09	2086.30	
T.B.M			3.75	2086.78	2086.78
		END.			

HUB ON AXIS D = 2133.7

2066.1	2071.5		2085.6	
20.3	14.9		0.8	
54	25		23	
2067.9	2075.8	2086.0	2085.8	
18.5	10.6	0.4	0.6	
47	16	13	25	
2075.0	2077.6	2086.4	2086.1	
11.4	8.8	0.0	0.3	
36	16	2	25	
2075.8	2077.8	2086.8	2086.4	
10.6	8.6	+0.4	0.0	
48	16	2	25	

Sutherland Dam
(X-sects Cont.)
From Page 41

3-5-51 - cold Cloudy

46

King
West
Williams

		1976.61			
D=1340			10.2	1966.4	
T.P.	0.37	1965.10	11.88	1964.73	
T.P.	0.03	1952.38	12.75	1952.35	
T.P.	6.56	1953.84	5.10	1947.28	
D=1350			1.0	1952.8	
D=1360			22.6	1931.2	
D=1370			7.1	1946.7	
D=1380			6.8	1947.0	
D=1390			8.7	1945.1	
T.P.	3.64	1951.19	6.29	~~1947.55~~	
D=1400			11.7	1939.5	

LT

1963.3	1970.6	1970.0	1972.3	1968.4	1965.5
13.3	6.0	6.6	4.3	8.2	4.1
131	116	92	58	38	20

RT

1958.5	1958.4
18.1	18.0
44	58

Unable to take along side of steep bank

1951.6	1950.7	1945.9	1944.7	1941.8	1939.0	1935.8	1933.3	1936.7	1947.3	1953.8
2.8	3.1	7.9	9.1	12.0	14.8	18.6	20.5	17.1	6.5	0.0
149	126	120	100	85	45	14	26	37	41	54

1951.6	1946.8	1949.4	1949.3	1948.9	1947.0	1946.5	1949.9	
2.3	7.0	4.3	4.5	4.9	6.8	7.3	3.7	
138	132	122	89	13	31	46	37	

1945.4	1940.4	1948.5	1950.4	1948.5	1947.5		1946.5	1944.7
8.4	19.4	5.3	3.4	5.3	6.3		7.3	9.1
155	147	140	130	77	26		28	51

1924.4	1932.8	1944.8	1950.8	1948.5	1943.3	1944.6	1942.5	
14.4	21.0	9.0	3.0	5.3	10.5	9.7	11.3	
162	160	145	125	72	34	18	50	

1944.4	1940.3	1943.2	1937.9	1936.8	1935.2	1940.4	1932.6	
6.8	10.9	8.0	13.3	14.4	16.0	10.8	18.6	
137	120	85	77	55	21	13	50	

Sutherland Dam
X-Sects Contd

1951.19

D=1410 — 17.7 — 19335 — 1921.4 / 20.0 / 165

T.P. — 0.26 — 1938.15 — 13.30 — 1937.89

T.P. — 4.51 — 1930.48 — 12.18 — 1925.97

9.35 — 1921.13 — 1921.11

D=1414.20

D=1430

D=1440

D=1450

D=1460

D=1470

9.35 — 1921.13

3-5-51 — Cold-Cloudy — 47

King
West-T
Williams

1926.7 — 1921.2 — 1921.2 — 1936.6 — 1930.9 — 1932.9 — 1931.2 — 1938.5 — 1925.8

24.5 / 30.1 / 30.0 — 14.7 / 20.3 / 18.3 / 20.0 — 17.7 / 25.4

155 / 154 / 144 — 90 / 77 / 53 / 21 — 10 / 3547

Pg 38-41 + 46 & 47
Reduced & Checked 7/26/51
VLC

Top pipe #47. #7

1931.5 — 1930.5 — 1928.0 — 1926.3 — 1920.9 — 1920.6

14.0 / 0.0 / 2.5 / 4.2 / 9.6 / 9.9

170 / 165 / 161 / 156 / 155 / 143

1924.3 — 1921.9 — 1921.1 — 1924.1 — 1925.9

6.2 / 8.6 / 9.4 / 6.4 / 4.6

184 / 167 / 152 / 156 / 143

1922.0 — 1920.6 — 1923.6 — 1922.3

8.5 / 9.9 / 6.9 / 8.2

183 / 168 / 153 / 143

1920.4 — 1918.4 — 1920.5

10.1 / 12.3 / 10.0

186 / 172 / 143

1919.6 — 1917.8 ? — 1915.8 ? — 1916.4

10.9 / 12.7 / 14.1

186 / 161 / 143

1919.5 — 1919.1 — 1915.5 — 1919.9 — 1914.6

11.0 / 11.4 / 15.0 / 10.6 / 15.7

186 / 173 / 165 / 156 / 143

Sutherland Dam
X-Sects. (Abts 11-12)

King
West
Williams

3-7-51

Clear

40

Lt.

T.B. III 9.04 197086 1961.82

Top pipe Abt. 12 - upstream

D = 1670

1966.9 1966.8 1964.4 1949.3 1949.3 1958.1 1958.3 1958.1 1958.5 1959.5
11.0 4.1 6.3 21.6 21.6 12.8 12.6 12.8 11.7 11.4
140 132 144 136 CONC. 126 CONC. 123 114 105 104 100

1964.5 1964.2

D = 1680

1970.1 1969.1 1966.2 1951.7 1951.7 1954.5 1954.2
0.8 1.8 4.7 19.2 19.2 6.4 6.1
160 151 145 143 136 123.5 100
CONC. CONC.

D = 1690

1970.1 1969.1 1967.3 1954.0 1954.0 1966.6 1967.0 1967.7
0.8 1.8 3.6 16.9 16.9 4.3 3.9 3.2
160 148 145 141 135 123 118 102
CONC CONC.

D = 1700

0.9 1.2 9.3 12.5 13.2 1.6 1.7 0.9
150 146 139 134 131 118 109 100

D = 1710

0.0 0.2 2.0 7.5 9.8 12.2 4.8 0.1 0.1
146 140 133 126 122.5 104 103 100

9.04 196182

Sutherland Dam
(X-Sects Contd) #6+12-13

+5.

T.B.M. 8.12 1986.56

1978.44

D=1730

D=1740

D=1750

D=1760

D=1770

8.13 1978.43

King
West T
Williams

3-7-51 clear

49

2+ 4x3

#4.3

Top casing upstream #6+.13

1974.9	1975.2	1971.3	1967.8	1966.2	1968.0	1976.7	1976.8
11.7	11.4	15.3	18.8	20.4	18.6	9.9	9.8
140	137	133	128	121	115	100	91
			CONC.	CONC			

9.3	9.8	16.8	12.4	7.7	7.3	
143	135	128	124	108	91	

2.5	7.6	13.2	13.5	5.6	3.7	
145	131	123	121	111	91	

4.2	5.1	7.4	10.4	11.0	3.1	1.6
145	127	120	116	113	106	91

2.3	6.2	8.0	9.4	9.4	1.7	1.2
118	126	110	107	104	93	91

0.6
145

Sutherland Dam
(X-Contd) Alt. 13-14

King
West
Williams

7-7-51

clear

50

T.B.M. 9.65 2004.49

1994.84

Top casing Alt. 14 - Upstream

1988.4	1987.5	1981.7	1981.5	1985.0	1987.4	1992.3
16.1	17.0	22.8	23.0	19.5	17.1	12.2
135	106	104	99 CONC.	92	70	61

D = 1790

14.0	13.3	20.0	20.9	11.4	9.5	6.6
137 Loose Rock	122	118	116	95	78	61

D = 1800

10.5	10.7	17.9	8.5	3.0	+0.2	
124	114	108	94	81	61	

D = 1810

5.5
130
Spoil

+0.5	7.5	7.4	13.6	15.1	15.4	5.8	1.0	0.3
120	115	110.5	105	104	101	90	77	61

File
Spoil

D = 1820

+4.0	3.2	4.2	11.8	13.3	13.3	3.3	3.1
120	110	101	98	94	92	75	61

D = 1830

Spoil
File

9.65 1974.84

Sutherland Dam
X-secys - Abt 14-15

JS HI =S

T.B.M. 5.44 2017, 69

D = 1850

D = 1860

D = 1870

D = 1880

D = 1890

5.44 2.012.25

2.012.25

Spoil 4.5 120

2010.8 2007.3
6.9 10.2
123 110

Spoil

42.0 8.0
115 105

King
West
Williams

3-7-51 . Clear

51

Top Casing Abt #15

5.0 12.3 12.5 22.1 22.3 14.4 14.6 13.5
113 100 91 90 83 75 66 55

2007.2 1998.4 1997.2 2009.3 2010.3 2010.4
10.5 19.3 20.5 8.4 7.4 7.3
97 96 90 CONC. 79 67 55

2.0 7.2 16.6 17.1 6.3 4.8 3.7
121 97 94 89 80 70 55

6.2 15.4 15.2 5.1 3.8 2.4
93 90 85 76 63 55

3.3 3.7 11.7 11.3 3.1 2.8
105 84 82 72 62 55

17 27

Sutherland Dam
X-Sects. Spillway
Base Line: D=1000 : L=1000

B.M.	10.51	2062.06		2051.55
L 1000-8			12.1	2050.0
40 L			11.3	2050.8
47 L			5.4	2056.7
55 L			10.1	2052.0
75 L			9.3	2052.8
86 L			3.0	2059.1
99 L			2.4	2059.7
113 L			1.6	2060.5
126 L	(cont)		+6.9	2069.0
39' R			12.9	2049.2
60' R			1.7	2060.4
67 R	End.		0.6	2061.5
L=1050 ℄			9.9	2052.2
50 L			10.1	2052.0
87 L			10.0	2052.1
100 L.			8.7	2053.4
119 L	(cont)		3.8	2058.3

King ↑
West
Williams

3-8-51 · clear Warm

52

Top Flat Rock. -35' No. D=1000-L=1000 Page 18

Maps other X-Sects

Sutherland Dam
Spillway X-Sects.

King
West
Williams

3-8-51

2062.06

L=1050 - 40'R			10.4		2051.7
30'R			8.3		2053.8
74 R	(End)		10.3		2051.8
T.P.	1.15	2050.75	12.46	2049.60	
L=1100 ℄			5.6		2045.2
29' L			7.4		2043.4 ~~2042.4~~ ?
59' L			6.8		2044.0
100' L			5.8		2045.0
128' L			6.3		2044.5
140' L			0.0		2050.8
149' L			3.2		2047.6
180' L	End		1.5		2049.3 ~~2048.3~~ ?
47 R			5.0		2045.8
66 R			6.4		2043.4
90 R			8.4		2042.4
160 R	End		25.5		2025.3

Sutherland Dam
Spillway

2050.75

T.P	278	2042.86	10.67	2040.08	
L=1150 ℄			4.6		2038.3
50' L			4.9		2038.0
100' L			3.9		2039.0
135' L			4.8		2038.1
180' L	Encl		3.4		2039.5
24' R			5.1		2037.8
50' R			6.1		2036.8
100 R			8.0		2034.9
135 R			10.6		2032.3
160' R	Encl		27.5		2015.4
T.P.	11.94	2054.40	0.40	2042.46	
TBM	0.37	2051.92	2.85	2051.55	2051.55 Top Flat Rock
L=950 ℄			6.7		2045.2
39' L			4.5		2047.4
50' L			4.3		2047.6

King
West
Williams

38-51

Sutherland Dam Spillway

3-8-51

King
West
Williams

2051.92

L 950 ~ 100' L			3.0	2048.9
110 L			1.8	2050.1
133 L	CONT		+4.9	2056.8
41' R			6.7	2045.2
52 R.	CONT		0.0	2051.9
L = 900 ℄			11.3	2040.6
28' L			8.3	2043.6
56 L			7.7	2044.2
103' L			6.2	2045.7
115 L			+0.4	2052.3
123 L			+8.2	2060.1
135' L	CONT		+13.2	2065.1
44' R			11.8	2040.1
56' R	CONT.		4.6	2047.3
T. R	4.59	20 43 51	13.00	2038.92

Sutherland Dam
Spillway

2043.51

L=850 - ℄			8.1		2035.4
29' L.			6.2		2037.3
57' L			4.9		2038.6
67 L			3.9		2039.6
84' L	cont		+1.0		2044.5
76' R			9.2		2034.3
85' R			8.2		2035.3
90' R	cont		5.3		2038.2
T.P.	6.86	2037.52	12.85	2030.66	
L=800 - ℄			7.7		2029.8
30' L.			6.3		2031.2
50' L			6.1		2031.4
60' L	cont		2.3		2035.2
14' R			8.7		2028.8
25' R			7.5		2030.0
45' R			7.4		2030.1
57 R	cont		5.0		2032.5

King
West
Williams

3-8-57

52

Sutherland Dam
Spillway

2037.52

King
West
Williams

3-8-51

T.P.	3.59	2029.43	11.68	2025.84	
L=750 - ℄			6.1		2023.3
31' L.			4.4		2025.0
73' L			2.4		2027.0
95' L.	CONT		+8.0		2037.4
20' R			6.5		2022.9
58 R			5.6		2023.8
81 R			5.1		2024.3
137 R			7.7		2021.7
160 R	END		20.4		2009.0
L=700' ℄			6.6		2022.8
25' L			6.6		2022.8
50' L.			6.6		2022.8
90' L			6.6		2022.8
105' L	CONT		+1.0		2030.4
34' R			10.8		2018.6
63 R			20.0		2009.4

Sutherland Dam
Spillway

King
West
Williams

3-8-51

58

		2029.43			
L=700 83'R			10.6		2018.8
160'R	End		11.7		2017.7
T. P.	12.04	2041.47	0.00	2029.43	
T.P.	11.52	2052.69	0.30	2041.17	
T. B.M.	6.00	2057 ~~2056.55~~	1.18	2051.51	2051.55
L=850-92 L.			3.1		2054.5
114 L			2.8		2054.8
135L	Cont.		+2.0		2059.6
L-800-83'L			5.0		2052.6
96'L			5.4		2052.2
104'L			2.3		2055.3
121'L			1.5		2056.1
136'L	Cont		+5.0		2062.6
L-756-110'L			2.6		2055.0
124'L	Cont.		0.2		2057.4
L-700-118L			4.4		2053.2
126'L			2.4		2055.2
159'L			0.4		2057.2

5 P

Sutliersland Dam

King
West
Williams

3-8-51

2029.43 H.I From Page 58.

L=665	℄		18.7	2010.7
	47R		31.0	1998.4
	60R.		34.0	1995.4
	50'L		6.6	2022.8
	85'L		6.2	2023.2
	95'L		+2.0	2031.4

old ground

" "

" "

Sutherland Dam

King
West
William S

3-8-57

60

T.B.M.	6.00	2057.55 ~~2056.55~~		2051.55	
T.P	13.15	70 ~~20~~ 2049.30	0.40	2057 ~~2056~~ .15	
L = 1050 - 1332			0.6		2069.7
- 180 L	End		2.4		2067.9
T.P.	13.27	2082 ~~2081~~ .83	0.74	2069 ~~2068~~ .56	
T.P	11.77	2092.95	1.65	2081.18 ~~2080.18~~	
L = 1000 - 740 L			9.2		2083.8
180 L	End		8.7		2084.3
T.P.	12.65	2103.66	1.94	2091.01	
L 950 - 1511 L			5.3		2098.4
180 L	End		3.5		2100.2
T.P.	11.46	2114.40 ~~38~~	0.72	2102.94	

Sutherland Dam -

		2114.40 ~~38~~			
L-900-153L			6.0		2108.4
180L	End		4.3		2110.1
L-850-160L			9.8		2104.6
180L	End		6.6		2107.8
T.P.	0.62	2102.98 ~~94~~	12.04	2102.36 ~~34~~	
L=800-153L			12.4		2090.6
180L	End		8.1		2094.9
T.P.	0.08	2089.76 ~~74~~	13.30	2089.68 ~~66~~	
T.P.	0.37	2077.39	12.72	2077.02	
L=750-145L			5.8		2071.6
180L			0.0		2077.4
T.P.	0.55	2066.10 ~~08~~	11.86	2065.55 ~~53~~	

King
West
Williams

3-8-3-1

61

Sutherland Dam

King William's West

3-8-51

12

		2066.10			
L-700/80L			4.1		2062.0
T.P.	4.27	2060.15	10.22	2055.88	
T.B.M	12.81	2064.36	8.60	2051.55	2051.55
L=950-64R.			1.7		2062.7
76R.			6.5		2057.9
98'R			13.0		2051.4
135R			26.0		2038.4
160'R			34.3		2030.1
L-900 64R			8.11		2056.3
80R			15.4		2049.0
160R			37.0		2027.4
L 850-71R			10.1		2054.3
105R			11.4		2053.0
124R			24.1		2040.3
160R			45.5		2018.9
			12.81	2051.55	

Sutherland Dam
Spillway

2037.52 H.I. Page 56

L=800 63R	+2.5	2040.02	~~2066.9~~
78R	+2.4	2039.92	~~2066.0~~
115R	-2.7	2034.82	~~2061.7~~
136R	15.7	2021.82	~~2048.7~~
160R	33.7	2003.82	~~2020.7~~

King
West
Williams

3-8-51

67

Checked & Reduced pg. 37-63 5/9/51 R.A.M.

Sutherland Dam
Location Steel Abt: #4

Steel goes into Side Step IN Concrete

2-1¼" Steel - 15.8' Horizontal going down Stream from Step

King
Leonard
Williams
Boyd

6-7-51

All Distances ℄ to ℄

Distance Axis	1" Steel		1" Steel	Dist. From Axis
30.0	1.4	Long	1.1 Long	30.10
28.0	1.1	"	4.6' "	27.80
25.9	1.0'	"	4.5' "	25.75
23.7	4.2	"	3.9' "	23.60
21.7'	4.0	"	3.9 "	21.70
19.6'	4.1	"	3.8' "	19.50
17.3'	3.7'	"	3.6 "	16.95
15.4'	3.8	"	3.6' "	15.15
13.0'	3.5	"	3.4' "	12.90
10.7'	3.2	"	3.2' "	10.35
8.7'	3.2	"	3.3' "	8.7
6.6'	3.6	"	3.3' "	6.95
6.4'	5.2	"	5.6' "	6.55
4.5'	6.1	"	4.8' "	4.0
2.5'	6.2	"	4.7' "	1.60

1.8' (18" ℄)

7 Steps at 7.8' = 54.6'

3.9 3.9

8.6'L □ 6.5'L.
Axis Dam.
5.5'
8.4L — □ 5.5'
8.0L — □ 6.8'
8.4L — □ 6.8'
8.0L □ 6.8'
9.0 □
□ —

7/16" mat shown RM

1½" Steel

□ 4.4' □ 1.0' □ 5.5'
1½" Steel
6.0L
7.0L
7.5L
6.8L
□ — 7.1L

Sutherland Dam.
Location Steel #64-7

1 1/8" Steel top of Step.

1 1/2" Steel - 1.6' Above other 2-1 1/8" Steel on side of Step.

1 1/8" Steel - Horizontal to Foundation on side of Step.

1 1/8" Steel - Horizontal to Foundation - on side of Step.

End of 1" Steel

King
Leonard
Williamson
Proud

6-7-51

#11 Distances P - P

Distance #45

65.3	0.2	Long	4.4 Long 65.30
65.3	2.3	"	0.8 " 65.30
65.3	0.7		2.8 " 65.30
65.3	2.5	"	6.0 " 65.30
64.0	1.7	"	1.1' " 64.20
61.9	0.8		0.5' " 63.10
59.8	0.4	"	0.8' " 59.95
57.2	1.2	"	5.1' " 57.75
55.9	1.1	"	1.3' " 55.25
53.4	1.0	"	1.3' " 53.25
51.4	1.1	"	1.1 " 51.45
49.3	0.8	"	0.8' " 49.70
47.0	1.5	"	1.2' " 47.25
45.0	0.9	"	4.4' " 45.0
43.0	0.8	"	2.6' " 42.9
40.9	0.9	"	1.1' " 41.0
38.5	5.3	"	1.5 " 38.40
36.4	1.1	"	1.5' " 36.40
34.3	0.9	"	1.2' " 34.15
32.2	1.0	"	1.1' " 32.10

6.6' (1 1/4") On top Foot plate

1 1/2" Steel

7.8 L 55.9 4.9'

6.1 L 54.4

5.7 L 53.4

6.0 L 52.2

6.4 L 51.2

1 1/2" Steel

Up stream

Dist. #47

Distance #45

1 1/2" Steel

6.5 L 55.35

7.7 L 53.20

7.7 L 53.20

6.7 L 51.9

6.6 L 50.7

Sutherland
Alt #7
Contd

11.3L
11.0L
11.1L

King-Notes
Williams
Leonard
Boyd

6-7-51

Alt.

#11 Distances ℄ - ℄

66

Distance to Stake

Distance to Hills

1084
1075
1122
1066

1087
1073
1060

1078 3.7 Long — 5.3 Long — 107.80
4.5
106. 3.9 " — 4.3 " — 105.85
103.9 4.3 " — 4.0 " — 103.55
101.7 4.0 " — 4.5 " — 101.65
99.7 4.2 " — 4.3 " — 99.60
97.2 4.1 " — 3.6 " — 97.30
95.3 3.7 " — 4.2 " — 95.0
93.3 3.7 " — 4.2 " — 93.0
91.1 3.8' " — 4.5 " — 91.0
89.0 4.2 " — 4.2 " — 88.80
87.0 4.0 " — 3.8 " — 86.60
84.9 3.6 " — 4.3 " — 84.50
82.3 3.2 " — 4.4' " — 82.30
80.3 3.0 " — 4.0' " — 80.40
78.6 3.0 " — 4.2 " — 78.10
76.0 4.2 " — 3.4' " — 76.30
73.9 3.5 " — 3.3' " — 73.24
71.9 4.1 " — 3.9' " — 71.70
69.7 3.2 " — 3.3' " — 69.50
67.5 5.7' " — 5.0' " — 67.40

(1 1/2" ℄)

96'

(1 1/8" ℄)

Upstream

Alt #7

Sutherland

Abt. 7

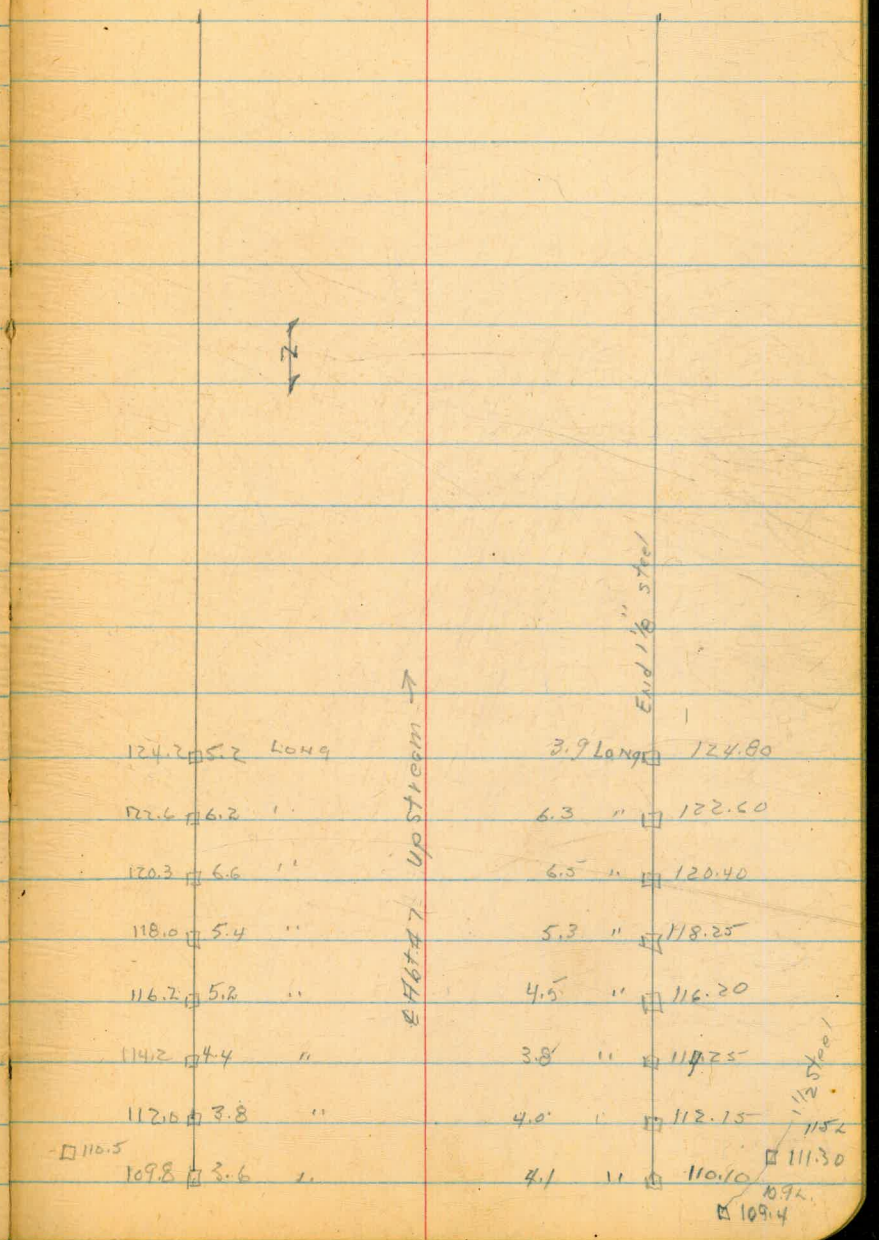
Contd

King
Leonard
Williams
Boyd

6-7-51

67

All Distances E-L



11.2

Steel 14

Sutherland Dam
Mat. #9.

King
Leonard
Williams

6-11-51

Dist. from Axis	Lt.		Rt.		Dist. from Axis
31.6	4.3	LONG	2.2	LONG	33.4
29.6	4.1	"	4.4	"	31.5
27.8	4.8	"	4.3	"	29.6
26.0	5.5	"	5.5	"	27.4
23.7	5.0	"	5.7	"	25.3
21.6	5.8	"	1.5	"	23.4
19.7	1.1	"	2.0	"	21.2
17.8	1.3	"	1.8	"	19.0
15.7	1.6	"	2.2	"	17.0
13.3	1.5	"	1.7	"	14.9
10.9	1.4	"	1.4	"	12.6
8.6	~~2.0' 1.99~~		1.3	"	10.4
6.3'	2.0' ~~1.7~~		1.2	"	8.2
4.5'	2.0' ~~1.70'~~		1.5'	"	6.3
2.2'	5.3'	"	1.3'	"	4.4
0.2'	5.5	"	6.2'	"	1.9'
Axis	Dam				

(1" = 5')

(1/8" = 1')

DOWNSTREAM

6' LONG = 0.3'

N

Steel in Hat #7

Sutherland Dam

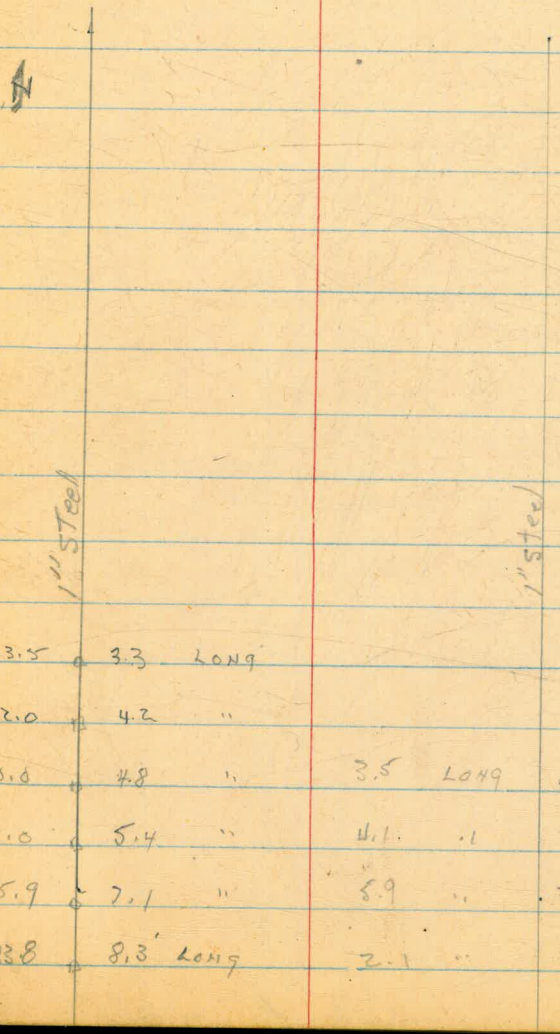
King
Heonard
Williams

6-11-57

69

24.

24.

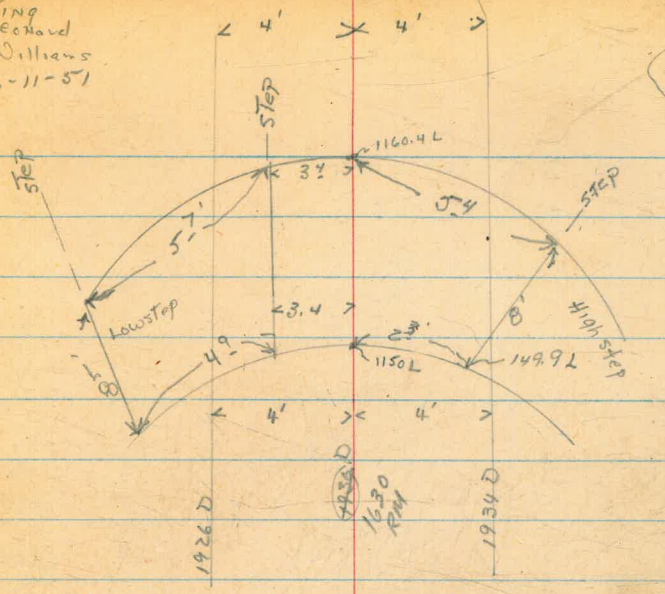


43.5	3.3	LONG		
42.0	4.2	"		
40.0	4.8	"	3.5 LONG	41.9
38.0	5.4	"	4.1 "	39.9
35.9	7.1	"	8.9 "	37.8
33.8	8.3	LONG	2.1 "	35.6

Sutherland Dam
Cut-off Wall
A61-10-061-11

B.M.	3.10	A43.37			1940.27
Low step			7.75		1935.62
Middle step			6.43		1936.94
High step			4.95		1938.42
			3.10	A43.37	

King
Leonard
Williams
6-11-51



Profile — Sutherland Dam Outlet Pipe - 1611 D

T.B.M.	10.52	1935.87			1925.35
Solid Poison oak - towards #X13					
960 L			8.9		1927.0
940 L			6.8		1929.1
936 L			6.2		1929.7
921 L			6.1		1929.8
911 L			2.9		1933.0
899 L			2.4		1933.5
886 L			8.6		1927.3
873 L			9.5		1926.4
T.P.	1.85	1926.16	11.56	1924.31	
840 L			4.4		1921.8
814 L			4.9		1921.3
812 L			3.7		1922.5
800 L			7.2		1919.0
790 L			6.8		1919.4
T.B.M.			13.40	1912.76	1932.04

6-11-51

Lt. — Top casing D. Stream #10

1923.1
3.1
16'

1921.5 — 4.7 — 18
1919.6 — 6.6 — 11
Toe of Bank →
1923.0 — 3.2 — 18
1920.8 — 5.4 — 13

Top casing D. Stream #9

Rt.

1923.6
1921.3 — 4.9 — 6'
1924.4 — 1.8 — 9'
2.6 — 17'
1914.8 — 11.9 — 27'

1917.6
1919.6 — 6.6 — 4
8.6 — 17
1913.2 — 13.0 — 15'
1918.9 — 7.3 — 5
1915.2 — 11.0 — 10

Checked & Reduced
7-31-51 EAM

Levels - to Core Drill Holes
Tunnel #2 - Sutherland S.V.P.L.

1-2-52
King
West
Williams

T.B.M	12.46	1953.46			1941.00
T.P.	12.80	1964.93	1.33	1952.13	
T.P	12.61	1976.24	1.30	1963.63	
T.P	12.36	1988.38	0.22	1976.02	
T P	12.57	2000.46	0.49	1987.89	
169+50 T.B.M.	12.77	~~2010.25~~	2.98	~~1997.48~~	
T.P	13.12	2023.12	0.25	2010.00	
T.P	12.91	2035.94	0.09	2023.03	
T.P	12.65	2048.34	0.23	2035.71	
T.P	13.13	2060.41	1.08	2047.28	
T.P	8.97	2069.33	0.05	2060.36	
164+25 T.B.M.	11.93	2076.61	4.65	2064.68	
T.P	12.29	2088.63	0.27	2076.34	
T.P	12.99	2101.05	0.57	2088.06	
T.P	10.62	2110.86	0.81	2100.24	
	12.58	2123.30	0.14	2110.72	
	11.39	2133.11	1.58	2121.72	
	12.91	2145.84	0.18	2132.93	
	3.87	2149.62	0.09	2145.75	

Top hub Sta. 171+38 55

El. 1962.1

Changed to 170+92±

10' So. of 169+52 - 9 in Hey 9 guard stake

10' So. 164+25 - 9 in Hey 9 guard stake

Levels - For Core Drilling
Tunnel #2 - Sutg - S.V. P.L.

1-2-51 - cold - clear

53

King
West
Williams

2149.62

T.P.	066	2144.46	5.82	2143.80
	3.21	2138.08	9.59	2134.87
150+60 T.B.M.			5.62	2132.46

Set gunney & ground stake 16' No. 150+60

Used target on All T.P.s.

Checked 150+60 See Bk 236 : Page 5 — 2132.2 - Outs - 2132.3 So. Edge Rd.

Slope Chain - Over

Tunnel Portal #2
From Sta. 144+19.19 - No. Portal
To Sta. 172+78.55 Now So. Portal

3-17-52
King
West
Williams

Sta.	Slope Dis.	Corr. Dist	Slope ∠	286. Pull	300' chain
P.O.T. 144+19.19	125.68	118.45	19°32'		
145+37.64	296.42	279.30	19°34'		
P.O.T. 148+16.94		76.37	0°		
148+93.31	299.78	279.90	20°59'		
P.O.T. 151+73.21	63.57	60.78	17°02		
P.O.T. 152+33.99		32.49	0°		
152+66.48	291.92	282.54	14°34'		
155+49.02		249.20	0°		
157+98.22	300.90	299.82	4°23'		
160+98.04		83.43	0°		
161+81.47	245.56	243.21	7°32'		
164+24.68		189.29	0°		
P.O.T. 165+13.97	243.03	239.31	10°02'		
168+53.28	249.64	242.07	14°09'		
170+95.35	289.82	283.38	12°06		
P.O.T. 173+78.73				173+78.55	Office Sta.
171+87.72	95.58	92.37	14°54	171+87.55	"

Weather - cold - cloudy Av. Temp - 57°

No. Tunnel Portal - 2x2 H&T.

1x1 hub & T. chain Pt.

2x2 H&T.

1x1 H&T

2x2 H&T

2x2 H&T - Extreme top hill

1x1 H&T.

1x1 H&T

1x1 H&T

1x1 H&T.

1x1 H&T

1x1 H&T.

2x2 H&T.

2x2 H&T

Conc. Mon. L&T. So. Edge Rd. 1' deep

2x2 H&T. So. Tunnel Portal - Office Loc.

2x2 H&T old Tunnel Portal

Note: P.O.T.s to be replaced by Conc. Mon. L&T.

Sixth P.L. - No. Portal Tunnel #2

Profiled x-Sects. 138+00 - 145+00

Note - Sta 138+13 8+50 taken on same line as Tunnel

B.M.	0.41	1916.31			1915.9
T.P.	0.54	1905.05	11.80	1904.51	
x-sec. 138+00			18.1	1887.0	
138+09			18.2	1886.9	
138+20			15.3	1889.8	
138+40			20.0	1885.1	
x-sec. 138+50			16.1	1889.0	
138+57			13.9	1891.2	
138+62			11.6	1893.5	
138+70			11.0	1894.1	

4-2-52

King
West
Williams

Cloudy

>5

24.

R +

old hub - 144+19.19 New Tunnel Portal

1913.0	1900	1891.2	1877	1876.1	1878	1888.9	1888.0
+26.0	+13.0	+4.2	-10.0	-10.9	0.0	+1.9	+1.0
53'	23'	8'	16'	21	35	50	60

1915.0	1902.0	1889.9	1902.0	1915.1
+26.0	+13'	0.9	+13.0	+26.1
50.	23	5'	19'	55'

Sutg. P.L. No. Tunnel Portal #2
Profiles & X-sects.

1905.05

138+79			7.6	1997.5
T.P.	12.85	1916.83	1.07	1903.98
139+00			9.7	1907.1
BK. 139+26.45 = AH. 144+19.19	EQ.		0.9	1915.9
T.P.	13.17	1929.08	0.92	1915.91
144+32			5.7	1923.64
144+50			1.1	1928.0
T.P.	13.08	1941.98	0.18	1928.90
144+75			6.5	1935.5

4-2-52 clear. Hot.
King

76

Lt. ℄

1922.4 +15.3 48'
1911.3 +4.2 30'
1900.1 -7.0 12'

1927.9 +12.0 58'
1909.2 -6.7 29'
1906.6 -9.3 21'
1906.6 -9.3 15'

1929.3 +1.3 50'
1915.0 -13.0 26'
1914.7 -13.3 18'

Rt ℄

1918.1 +11.0 25'
1930.6 +23.5 60'

1944.4 +28.5 64'

1957.8 +29.8 63'

Suth. P.L. No. Tunnel Portal #2
Profile - X Sects. - 138 - 145

1941.98

145+00			+2.0	1943.98	
T.P	0.40	1931.22	11.16	1930.82	
T.P	0.08	1921.30	10.00	1921.22	
T.B.M.			5.38	1915.92	1915.90

checked & Reduced 4 APRIL 52
By VLC.
Reduction Corrected 9 APRIL 52
By VLC.

4-2-52 Clear Hot
King
West
Bu20

77

Lt. ℄ 1925.1
948.0 0.0 -18.9
60' 32

Rt. ℄
+27.5 1971.3
5°30'

Note
Spring - Water
disappears in ground

145+00 - End X-Sect -

℄ Tunnel

144+19.19 HA -
139+26.45 BR =

Creek

Tunnel Portal

+ 9°23'30" Lt.

138+76.45 -

138+40

138+00 Begin - X Sects for Profile
on same line as Tunnel

℄ Pipe - Corrugated

135+30 ℄

T.P	4.148	2090.26		2086.78
T.P	0.20	2080.10	11.36	2079.90
T.P	4.46	2078.84	5.72	2074.38
T.P	5.66	72.91	11.59	67.25
T.P	5.55	70.51	7.95	64.96
T.P	4.19	78.57		2074.38
T.P	2.94	74.37	5.14	71.43

Rock

Buttress 7. Existing steel, East side from North to South

Contractors Lengths, Checked by WSK & CWB 11-7-52

1" S.B.	1" S.B.	7/8" S.B	1" S.B.	1" S.B.	1 1/8" S.B.
3'10"	1'5"	6'0"	4'1"	1'2"	1'1"
3'8"	1'4"	5'11"	4'1"	4 1/2"	3"
5'1"	50' 111"	6'2"	4'1 1/2"	9 1/2"	5'-10 1/2"
6'4 1/2		6'5"	1' 1/2"	26'108 1/2"	3' 1/2"
2'2"		5'3 1/2"	1' 1/2"		4'2"
2'1 1/2"		3'6"	1' 6"		3'6"
4'4"		3'2"	11"		4'5"
4'5"		3'2 1/2"	10 1/2"		3'3"
5'6"		3'4 1/2"	1'2 1/2"		3'4 1/2"
5'9 1/2"		3'8 1/2"	5'6 1/2"		3'1 1/2"
1'7"		3'9"	10 1/2"		3'8"
1'11"		46'54"	10"		4'1 1/2"
1'9"			10"		4'3"
2'2"			1'5"		40'48 1/2"
1'8 1/2"			11 1/2"		
1'5"			1'3 1/2"		
1'5"			1' 1/2"		
1'3"			1' 1/2"		

Pilasters

1 1/4" S.B.	③ ~~4~~	② ~~2~~	① ~~3~~
3'9 1/2"	1 1/4 SB	1 1/4 SB	1 1/4 SB
3'9"	8'6"	6'8"	12'3"
3'9"	8'0"	6'3 1/2"	12'1 1/2"
4'1/2"	8'6"	6'0"	12'7"
4'3 1/2"	8'1"	6'2 1/2"	12'2 1/2"
4'2 1/2"	8'6"	7'11"	48'14"
4'3 1/2"	8'7"	31'25"	
3'11 1/2"	48'26"		
3'8"	Horizontal		
3'7 1/2"	~~8~~ 1916.36	~~2~~ 1918.46	~~3~~ 1931.16
3'9 1/2"	12'9"	15'4 1/2"	2'4"
4'4 1/2"			1'11"
5'1 1/2"			9"
5'7 1/2"			2'6"
6'6"			5'30"
6'2"			
5'1 1/2"			
68' 97"			

#14-E

14 - 3/4"

15 - 1"

#32-2'6" (27") 11"

(4") 14½"

#34 - 48½"

33 - "

32 - 13½" - cut

31 - 49"

30 - 50"

29 - 48"

28 - 48½

27 - 50"

26 - 49"

25 - 47½"

24 - 49

23 - 50"

22 - 49"

21 - 48½

20 - 49

19 - 48

18 - 48

17 - 47½

16 - 47½

15 - 47½

14 - 47½"

13 - 47

12 - 48

11 - 48

10 - 46½

9 - 47

8 - 48

7 - 48

6 - 48

5 - 47½

4 - 48

3 - 48

2 - 47

1 - 48

-6.2 / 50 / 31.00 / 2.7 / 33.7

1950 — 3 — 37

1904 — 12 — 23

46 — 2 — 12

14

9775 / 22 / 19550 / 19550 / 39100

E
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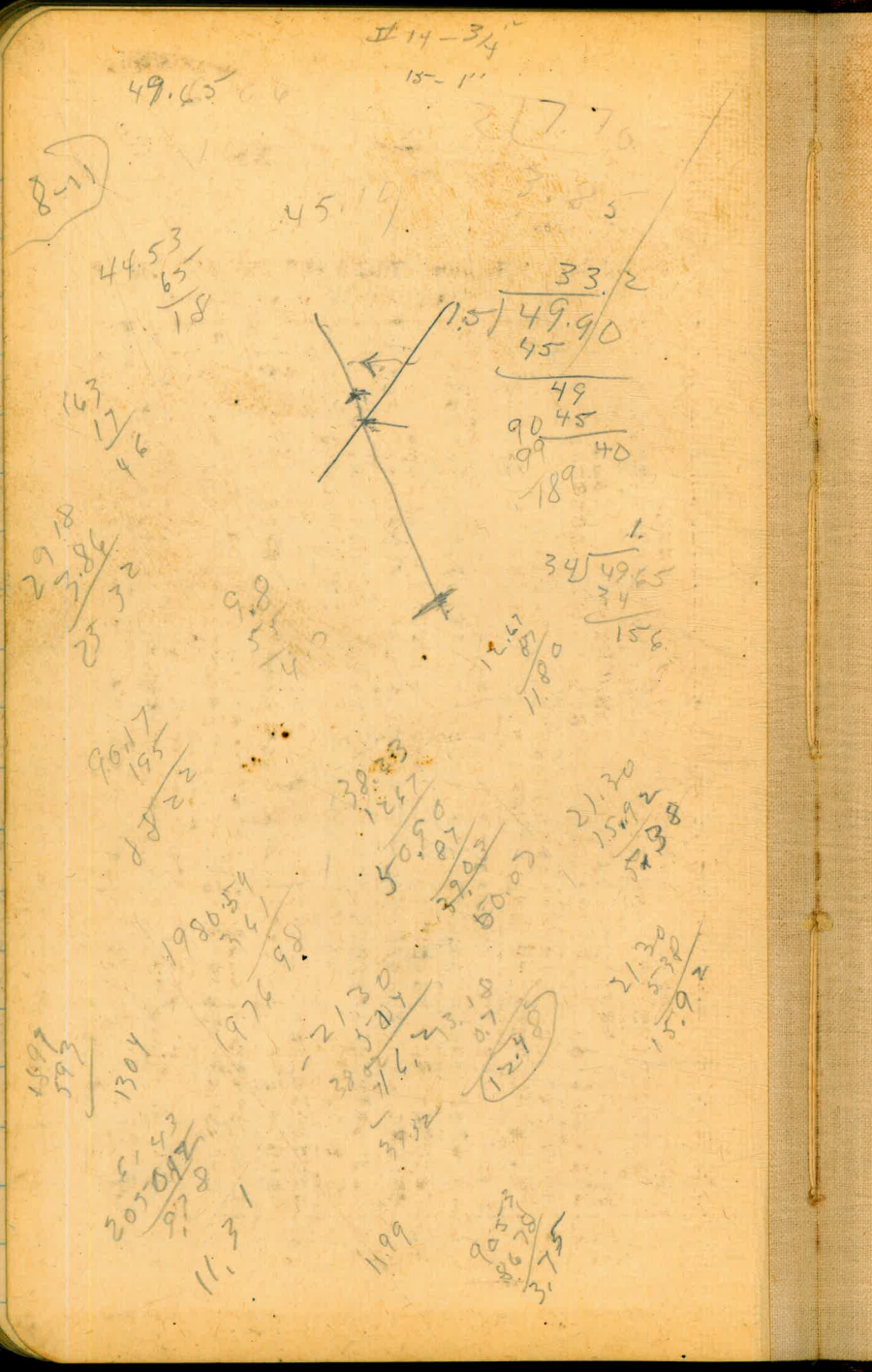
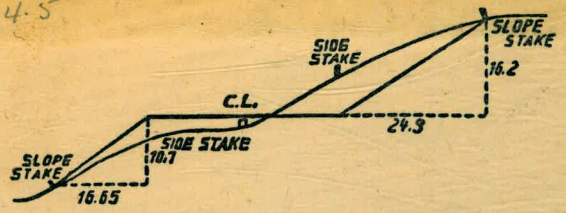
NING.

.9	
1.35	0
2.85	1
4.35	2
5.85	3
7.35	4
8.85	5
10.35	6
11.85	7
13.35	8
14.85	9
16.35	10
17.85	11
19.35	12
20.85	13
22.35	14
23.85	15
25.35	16
26.85	17
28.35	18
29.85	19
31.35	20
32.85	21
34.35	22
35.85	23
37.35	24
38.85	25
40.35	26
41.85	27
43.35	28
44.85	29
46.35	30
47.85	31
49.35	32
50.85	33
52.35	34
53.85	35
55.35	36
56.85	37
58.35	38
59.85	39
61.35	40
62.85	41
64.35	42
65.85	43
67.35	44
68.85	45
70.35	46
71.85	47
73.35	48
74.85	49
76.35	50



1994.5



DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE 1½ TO 1. ROADWAY OF ANY WIDTH.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.00	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	0
1	1.50	1.65	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	1
2	3.00	3.15	3.30	3.45	3.60	3.75	3.90	4.05	4.20	4.35	2
3	4.50	4.65	4.80	4.95	5.10	5.25	5.40	5.55	5.70	5.85	3
4	6.00	6.15	6.30	6.45	6.60	6.75	6.90	7.05	7.20	7.35	4
5	7.50	7.65	7.80	7.95	8.10	8.25	8.40	8.55	8.70	8.85	5
6	9.00	9.15	9.30	9.45	9.60	9.75	9.90	10.05	10.20	10.35	6
7	10.50	10.65	10.80	10.95	11.10	11.25	11.40	11.55	11.70	11.85	7
8	12.00	12.15	12.30	12.45	12.60	12.75	12.90	13.05	13.20	13.35	8
9	13.50	13.65	13.80	13.95	14.10	14.25	14.40	14.55	14.70	14.85	9
10	15.00	15.15	15.30	15.45	15.60	15.75	15.90	16.05	16.20	16.35	10
11	16.50	16.65	16.80	16.95	17.10	17.25	17.40	17.55	17.70	17.85	11
12	18.00	18.15	18.30	18.45	18.60	18.75	18.90	19.05	19.20	19.35	12
13	19.50	19.65	19.80	19.95	20.10	20.25	20.40	20.55	20.70	20.85	13
14	21.00	21.15	21.30	21.45	21.60	21.75	21.90	22.05	22.20	22.35	14
15	22.50	22.65	22.80	22.95	23.10	23.25	23.40	23.55	23.70	23.85	15
16	24.00	24.15	24.30	24.45	24.60	24.75	24.90	25.05	25.20	25.35	16
17	25.50	25.65	25.80	25.95	26.10	26.25	26.40	26.55	26.70	26.85	17
18	27.00	27.15	27.30	27.45	27.60	27.75	27.90	28.05	28.20	28.35	18
19	28.50	28.65	28.80	28.95	29.10	29.25	29.40	29.55	29.70	29.85	19
20	30.00	30.15	30.30	30.45	30.60	30.75	30.90	31.05	31.20	31.35	20
21	31.50	31.65	31.80	31.95	32.10	32.25	32.40	32.55	32.70	32.85	21
22	33.00	33.15	33.30	33.45	33.60	33.75	33.90	34.05	34.20	34.35	22
23	34.50	34.65	34.80	34.95	35.10	35.25	35.40	35.55	35.70	35.85	23
24	36.00	36.15	36.30	36.45	36.60	36.75	36.90	37.05	37.20	37.35	24
25	37.50	37.65	37.80	37.95	38.10	38.25	38.40	38.55	38.70	38.85	25
26	39.00	39.15	39.30	39.45	39.60	39.75	39.90	40.05	40.20	40.35	26
27	40.50	40.65	40.80	40.95	41.10	41.25	41.40	41.55	41.70	41.85	27
28	42.00	42.15	42.30	42.45	42.60	42.75	42.90	43.05	43.20	43.35	28
29	43.50	43.65	43.80	43.95	44.10	44.25	44.40	44.55	44.70	44.85	29
30	45.00	45.15	45.30	45.45	45.60	45.75	45.90	46.05	46.20	46.35	30
31	46.50	46.65	46.80	46.95	47.10	47.25	47.40	47.55	47.70	47.85	31
32	48.00	48.15	48.30	48.45	48.60	48.75	48.90	49.05	49.20	49.35	32
33	49.50	49.65	49.80	49.95	50.10	50.25	50.40	50.55	50.70	50.85	33
34	51.00	51.15	51.30	51.45	51.60	51.75	51.90	52.05	52.20	52.35	34
35	52.50	52.65	52.80	52.95	53.10	53.25	53.40	53.55	53.70	53.85	35
36	54.00	54.15	54.30	54.45	54.60	54.75	54.90	55.05	55.20	55.35	36
37	55.50	55.65	55.80	55.95	56.10	56.25	56.40	56.55	56.70	56.85	37
38	57.00	57.15	57.30	57.45	57.60	57.75	57.90	58.05	58.20	58.35	38
39	58.50	58.65	58.80	58.95	59.10	59.25	59.40	59.55	59.70	59.85	39
40	60.00	60.15	60.30	60.45	60.60	60.75	60.90	61.05	61.20	61.35	40
41	61.50	61.65	61.80	61.95	62.10	62.25	62.40	62.55	62.70	62.85	41
42	63.00	63.15	63.30	63.45	63.60	63.75	63.90	64.05	64.20	64.35	42
43	64.50	64.65	64.80	64.95	65.10	65.25	65.40	65.55	65.70	65.85	43
44	66.00	66.15	66.30	66.45	66.60	66.75	66.90	67.05	67.20	67.35	44
45	67.50	67.65	67.80	67.95	68.10	68.25	68.40	68.55	68.70	68.85	45
46	69.00	69.15	69.30	69.45	69.60	69.75	69.90	70.05	70.20	70.35	46
47	70.50	70.65	70.80	70.95	71.10	71.20	71.40	71.55	71.70	71.85	47
48	72.00	72.15	72.30	72.45	72.60	72.75	72.90	73.05	73.20	73.35	48
49	73.50	73.65	73.80	73.95	74.10	74.25	74.40	74.55	74.70	74.85	49
50	75.00	75.15	75.30	75.45	75.60	75.75	75.90	76.05	76.20	76.35	50

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