A.B.D.

Preliminary

Surveys

1

FIELD BOOK

364 S

F.B.106

KEUFFEL & ESSER C
DRAWING MATERIALS
AND
SURVEYING INSTRUMENTS.
NEW YORK.
CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

MICROFILMED
DEC 1964

TABLES FOR EXCAVATIONS AND EMBANKMENTS.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.
ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.
FOR SINGLE TRACK EXCAVATION.

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	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	0
1	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	1
2	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	2
3	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	3
4	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	4
5	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	5
6	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	6
7	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	7
8	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	8
9	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	9
10	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	10
11	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	11
12	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	12
13	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	13
14	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	14
15	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	15
16	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	16
17	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	17
18	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	18
19	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	19
20	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	20
21	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	21
22	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	22
23	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	23
24	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	24
25	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	25
26	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	26
27	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	27
28	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	28
29	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	29
30	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	30
31	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	31
32	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	32
33	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	33
34	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	34
35	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	35
36	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

For Keith's Railroad Curve Tabels see end of book.

#1

Datum 00.0 Gauge
= U.S.G.S. 1446.123

Pin by road = 9+16.6
elev 180.210 = 1626.333

Base line = N41°39'W
Azim = ~~41°39'~~

Bottom grade outlet
57.8 = 1503.923

37

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" " " "	38
" " " "	55

Inst

Checking adjustment

160			526	
				.073
155			453	
				73
			4145	
			73	
			4872	.01 in 320'

Read	Checking	Stadia	Interval
435	act. Dist		
Act.	read stadia		
425	435		
325	332		
225	229		
125	127		
25	24		

Stadia constant

= 1.025

Differential levels B.M. West side to top Harris dam

Harris Base Line 9+166					180.210
	0.30	180.51			
		985		11.17	169.34
	1.32	170.66			
		956		12.57	158.09
	3.01	161.10			
Hub on line		1325	2.70		158.40
			~~2.70~~	13.74	147.36
	0.49	147.85			
Hub on line		1215	8.03		139.82
				13.32	134.53
	1.17	135.70			
Hub on line		1163	9.21		126.49
				13.35	122.~~70~~ 35
	1.72	124.07 ~~123.42~~			
Iron pin By red flag			8.16		115.97 ~~115.32~~
				12.54	111.53 111.08
	0.95	112.48 112.03			
On rock				11.82	100.66 100.21
	2.30	102.96 102.51			
H & W				13.26	89.70 89.25
	0.92	90.62 90.17			
On rock				12.01	78.61 78.16
	0.52	79.13 78.68			
				12.67	66.46 ~~66.01~~
	~~12.40~~ 12.70			126.45	

126.45	180.210
12.70	113.75
113.75	66.46

Same Cont.

					66.46 ~~66.01~~
	0.97 ~~6.60~~	67.43 ~~66.98~~			
on rock by path				13.29	54.14 ~~53.69~~
	0.73	54.87 ~~54.42~~			
Anchor Pin for walk Stake			11.15		43.72 ~~43.27~~
				11.97 ~~12.42~~	42.90 ~~42.45~~
	0.57	43.47 ~~43.02~~			
Iron Pin				10.45	33.02 ~~32.57~~
	1.40	34.42 ~~33.97~~			
				~~13.13~~	21.29 ~~21.86~~
	3.67			13.05	21.37 ~~20.92~~
				48.76	
				3.67	
				45.09	
				21.92	
				67.01	
	47	26.00 ~~25.55~~			20.80
1st hole core Drill	45'	N 20° E		3.8	22.2
Base Line		S 47° 45' E			
		S 47° 40' E			

Marked 21.2

66.46
45.09
37

Curve - Upstream face of Dam.

Seton 9+16.6 of Harris Base Line
Deflect 63° Left measure
49 ft = B.C. curve 400' R.
= U.S. face dam. (O'Shaughnessy)
projection
Deflection of 43' for 10
gives practically 400' R.

5'	=	21½'
10	=	43'
20	=	1° 26'
30	=	2 09'
40	=	2 52'
50	=	3 35'
60	=	4 18'
70	=	5 1'
80	=	5 44'
90	=	6 27'
100	=	7° 10'

Traverse near upstream face O Shaughnessy dam

BM ~~94166~~	Baseline	Slope Dist	312° 20' Azim ~~227° 40'~~	S47° 40' E	vert ∠	360° 47° 40 / 312 20
A	A	97.75	253° 45' ~~169 41~~		20° 20	91.6
	94166		73° 45			
B	B	66.40	252° 57		18° 58	34 62.8
	A		72° 57			
C	C	68.10	256° 46 ~~68~~	N76° 40' E	28° 0'	60.2
	B					
D	D	93.2	291° 17'		30° 51	80.0
	C		111° 17			
E	E	81.15	291° 17	S68° 15' E	32° 3'	68.8
	D		111° 17'	(N0° 15' E)		
	Eside notch in dam	level 93.25	45° 50'			
	Sedge Wiergauge		18° 52'			
A	B		252° 57			
	PY 94166	45.4	99° 30'		+2.4° 10'	41.4
	B					

140'
40° R — 220

Levels along Traverse

A7 E		296	HH 24.25			21.29
	(29.8) 30.6	31'	109° 0	+24	∠ 1.0 +6° 30'	26.6
	(40.9) 42.9	53'	"	+198	∠ - 0.0 25° 50'	44.0
	(70.0) 71.7	94	"	343 ~~1350~~	∠ - 4.0 29° 7'	58.6
	(94.0) 96.4	124	"	+ 453	∠ - 5 28° 10'	69.6
	(145.0) 148.5	195	111° 44'	783 ~~1571~~	∠ - 5 29° 14'	102.6
A7 B						
	(59.7) 61.2	68'	136.7	34.1	∠ - 14.0 - 18° 30	
	(19.5) 20	20			125 rod	124.2
	00 00	0.0			4.4 "	132.3
	(62.8) 44.4 A	68		+ 138	∠ - 1.0 13° 18'	150.5
	(101.0) 103.5	11.2	+27.5		∠ - 1.0 15° 46'	164.2
	(157.4) 161.4 BM ~~9116.6~~	176		+43.5	∠ - 30 16° 45'	180.2

148.8

1191
1852

22

(60.2)

(62.8)

~~1645~~ 1544

Upstream face dam traverse cont.

E	292	24.21			21.29			
	913							
sside	309							
wiengage	128.2	18°52						
				+ to 00				
	128.2	291°16'		8°50½'			corrected Stadia method	Corrected Horiz. Stad.
	stadia							
	65	"		3.6	20.6		63.4	63.4
				GW = 2.0				
	85	"	+31	+10°0'	27.3		82.9	82.5
	105	"	+103	7.2	34.5		102.4	99.5
(H 126.5) F	(128.2)				+197.0			
	133°	"	S68°30'E	8°51'	43.91		129.7	(126.7)
1st Hole	55.8	88°10 (68.10)						
F								
E		111°16'	48.28					
	00			rod 4.37				
	10			24	145.9			
(44.6) G	(56 stadia) 49.50	306°48	S53°E	to 00 25°48'	+217.5 69.83		54.6	45.3
G								
F		126°48						
	105 stadia. ~~97.50~~		7303	rod 00 3.20			102.4	93.7
(93.0) H	tape 97.50	328°37	S31°15W	+17°16' 00				
Tunnel mouth	67'	319½		+				S47°E
pt.	43	328°37		+10°0' to 1.8	+54 78.4		41.9	40.7
H								
			105.68	35.85				
(95.0) G	~~97.50~~	148 37		2-00 -21°5'				
H	00			rod 3.75	101.93			
9+16.6		109°50'						
I 80.9	87.95	328°50	S31°15'E	+34.8 23°14'	140.48			

Upstream face dam

I		144.00			
H		148°38'			
00				rod. 3,5	140.48
A		115°17'	N64°30W	0°43'	151.1

Point	U.S face	D.S. face	
A	10'	4'	⊥
B	6'	18'	⊥
C	5' down	44' down	Bisect ∠
D	22' up	57	same level
E	30' up	E+20 85'	⊥ distant
F	7' up	67' D	∠
G	00	G+45 50' D	⊥
H	2' up	35' D	⊥
I	10' down	28' D	⊥

32' further to end.

Flagging outlines of Dam from traverse

15' below wind diversion dam.

63' " " " "

35' " E center " "

50 x 90

Traverse (cont).

1505

Plant Layout

100' from 9+16.6
then N 83½° W.

9+16.6	(86.5)		215.0			
	93.8	318°21		-22°48		
B.M.	105 st		348 208 140	-11°39'		hor.
	1024	353°22		L-140	180.2	98°
T.P. ①				2.1	212.9	
J	13.5'	138°21'		G.S. 0.3	214.7	
J						
9+16.6		318°21				
T.P. ①			219.1	rod 6.28		
				+9°42'		
~~K~~	~~47.9~~	~~83°30'~~	~~N83°30W~~	to 00		
K	46.5 H 48.1	96°30'	N83°30'W	+122 14°39'	231.3	
K						(stake
J		276°30				
			234.7			(230.6)
	00			3.48	~~230~~	stake 0.7 high)
	34'			7.1	227.6	
	60		+34	100 26	238.1	
L	95.3 98.3	96°30'	N83°30W	+13°31' to 00	+229 257.6	
L						
K		276°30				
	00		261.3	3.7		stake 0.6 hi
	41.1 tape 43.4		+13.9	18°43'	275.2	
M	86.1 tape 90.6		+28°	to 00 18°0'	289.3	
M	stadia 100°		+27.9	to 2.0 18°53	289.2	

Profile & Traverse ℄ Plant

M						
L		276°30'	292.7			
-	00			rod 3.7	289.3	Top stake 289.0 0.3 high edge road
Face rock	34'		+16	+7°45' to 3.0	294.3	
	254 (S)		80.2 ~~73.8~~	∠ -4.0 -17°56'	212.5 ~~218.9~~	
From ✓ run 276°30' 75' then 302°50'						
✓						
Base line	P	318°21				
	00	~~276°30~~	219.0	43	214.7	
edge bank	38.1 43		174	-24°30	201.6	
N	75.5 82.05	276°30	N83°15W	-23°8'	-32.5 186.5	
N	3					
✓		96°30'				
edge road	32	96°30		58		
	00		190.35	3.85	186.5	Top stake 0.6 high
S edge stk. O	84.4 98.2	302°50		30°36'	49.95 140.4	top stake
O						
N		122°50				
	00		144.0	3.6		0.8 hi
B	23	(287°?) 297°0		115	132.5	132.3
P	50.2	302°50				

465
953
861
22.79

2475

Profile 4

P						
	O	46.45 47.9	122°50'		+14°33' -12.1 40.00	140.4
		00		128.3	38	
	Q	43 63.2	302°50'		-30°44' 32.3 +.00	96.0
Q						
		00		100.3	43	
	R	50.5 70.5	302°50'		-49.3 -44°15'	51.1
S						
	R	95° top 98.4	122°50'	-26.0	+15°21' 40.00	
		82	~~310°~~	25.4	13	23.8
	Water surf	63	310°50'		67	18.4
	B.M	60	98°50'		42	20.9
		00			4.6	20.5
		24.9 25.1/2			13° +5.7	30.8
		50.2 52.2			15°25' +3.8	38.9
	U	68.2 74'	302°50'		+22°50' +14.7	53.8

Traverse ℄ Plant 11

08hi.

Keelmark ~~—~~.
on rock.

Tieing in Core drill holes No 546. Johnson & Stebbins
June 10 - 1919.

Set up at Hole No 4
Plate set by magnetic bearing

H.I 250	Cor Wier	67'	100°10'	-3°37'	423	21.25	2543 / 2584	254	
	E	79'	180°5'	-3°08'	455	21.29			
	Point 1	80'	292°0'	+21°21'12"			Mag Bear S 68° E	29.1	74 9
Set up at Point 1									
H.I 573	Hole 4	00	3.25 above Point 1			540		3.25	
	Hole 5	44.	185°0'				Top casing	4.00	
	Point 2	47½	282°47	(4.00 +23°4			S 75° 45 E	18.6	437½
Point 2			H.I 759						
H.I 759	00	4.0							
	Hole 6	33'	315°10'	L-4.0 +15°0'	+45	804		85	31 9
	G	Nov 4 59	224°25	L-4.0 -2°1'		698	N 45° E		594

Note, This No 6 hole lost trig moved 5' down canon

Levels top Harris Dam to lower damsite

Stebbins Johnson

Top old dam	550	69.6	-4°36' 4.4 8d	rod 48.4	21.2		
Sand below Harris Dam	520		-6°54' 3.3 12	65.7	03.9		
T.P.	505		-4°36' 4.3 8d	44.7	24.9		
TP	153	02.0	+11°30' to 7.7 200	306 -22.9		Corrected Elev	
Stream bed Lower Site.				5.1	96.9		Top of Upper
" below Wall				12.7	89.3		Concrete wall = Harris Dam
on Wall	150		60 20	+7.0	09.0	09.6	= 21.2
upstream face of wall	147	S12°15'W		4.7	97.3	97.9	River bed below
	80'	N16°30'E		3.2	98.8	99.4	Harris dam 03.9
	100	S1°E	03.2	4.4			River bed above
	130	N9°W		2.6	00.6	01.2	lower wall 97.9
	175	S30°45'W	05.8	5.2			Top of wall
Below Harris dam.	270			2.5	03.3	03.9	Lower Site = 09.6
							(09.8) in
	902	+30 93.2					old book

9.6
1446.1
1435.7

039
1446.1

June 10 - 1919

Staking Crushers Plant.

A+M			
=0+34			1735.4
	34 1738.8		
0+50		8.8	1730.0
0+81.5		18.6	1720.2
			1703.7
	37 1707.4		
1+00		+3.8	1711.2

Quarry floor 1730'
0+50 - drops to 1717'
0+81.5 ℄ No 8C elev 1713.7
Level 5' more.
℄ of No 4 & 5 crushers
Sta 1+00 Base 1696.9
Crushers 12' c-c + 32' overall
Top of 4X4 stringer
14.3 on conveyor abt 1696.9 at 1+00
1+22.4 = 1701.65
2+35 = 1730.0

Quarry 1730'

Staking Plant
Rock + Sand Storage

Setup at J

K		96°30'		
	27.6 +12°			
2+35	26.9	96°30'		
End of S-R. Bulkhead	60'	145°0'	+22°40	
End S- Bulkhead	70'	171°30'	73' +	16°40'
Discharge from Sand Bin	41'	233°30'		
Cor. Sand Bulkhead	60'	244°30		
Cor. S+R Bulkhead	38'	267°30		
Rock Discharge	17'	302°		
Cor Rock Bin	38'	338°30	36'	15°10
Cor. Rock Bin	51'	34°		
End Rock Bulkhead	91'	78°36'		
			∠ 7010	
	104		+12°5.5"	
			∠ 7010	
	97'	78°20	12°40'	

Conveyor to Storage Discharge

Staking Plant
Mixing Plant + Bins.
Concrete Towers

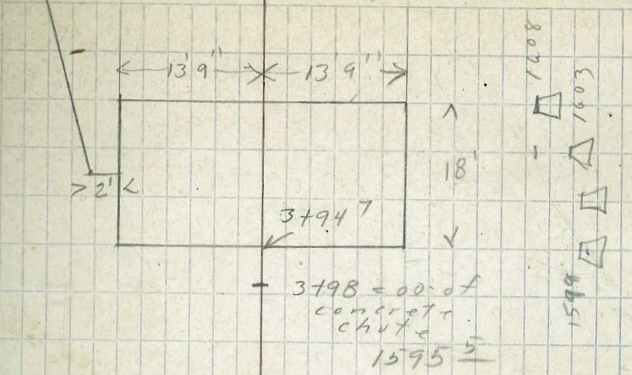
N = 3+37.4
3+94.7 57.3' 66.4 3° 30'

G.S 12.2 1597.9 1585.7
+0.2 1598.1

5+73
92
6+65

95.9 +16° = 92' horiz

Top Bins = Elev 16
Top Measuring Bin = El. 1620



℄ Concrete towers at
5+63 and 6+81

June 28. Locate holes No 7 & 8.

Ins. @ ΔE S.38°45'E True Needle bearing
H.I. = E+4'-0" Vert Angle to top
of casing = 21°10' up

Ins on Hole No 7 H.I. Top of casing + 3.6'
N 44°0'W to hole No 6
Vert Angle 24°11' down to top Casing hole 6
S 69°0'E to point I
up 22°17' 68.4' Slop measure to
Top of Stake I + 2'
Vert angle down 24°11' 87.8' slope meas
ure to top of casing hole No 6

See Core Drill Log book page 11

+13.95			✓	112.60	Top Casing hole No 7
	126.65	-0.10		126.55	
+12.8					
+13.25	139.35	-0.6	1	138.75	
	152.0	-	-11.5	140.5	Top Stake I.
			+0.75	152.75	Top of Casing 9" above H.I.

June 28. Locat holes 6, 7, + 8, also well for temporary water supply

Ins at △E. N57°00'E 95' to cased well

" at △I N69°00'W to Hole #7

" " " H.I. = I + 3.75'

down 26°26' to Top casing Hole #7.

" at △I up 11°17' 58.9' Slope meas. to top of Casing hole #8 + 3'

Ins @ △I N.30°30'W to well for Temp. Watersupply

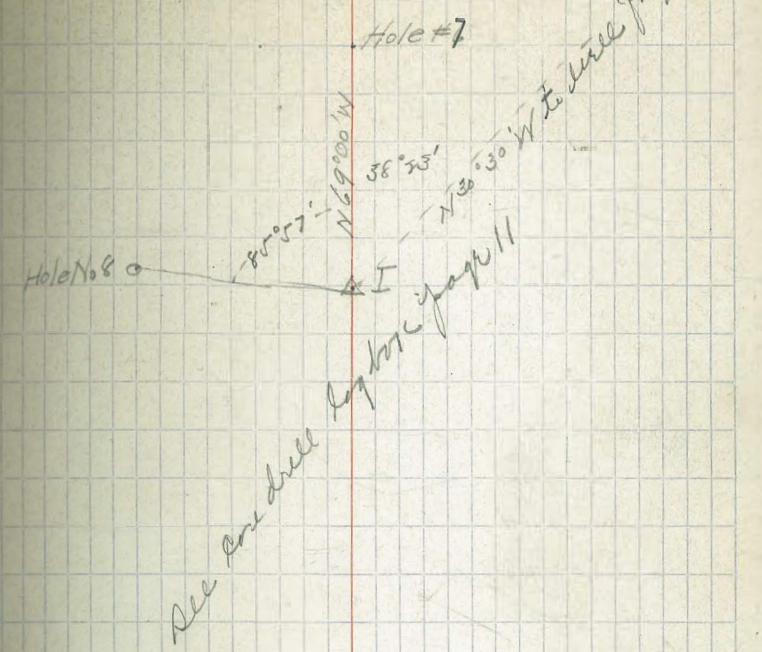
down 20°57' to top of well casing

Ins at Hole #7. H.I. = Top Casing + 3.92

down 24°20' to Top of casing hole #6

N.44°30'W. to Hole #6

N.22°30'W to Temporary well.



Camp Location

Traverse along Road

0	74.7	chained
A1	165.9	Distances
2	99.4	between
3	137.9	traverse
4	127.3	points.
5	164.7	
6	132.4	
7	107.1	
8	166.1	
9	252.5	
10	228.0	
11	174.6	
12	101.4	
13	224.9	
14	177.7	
15	246.3	
16	89.5	
17	125.8	
18	132.8	
19	96.0	
20		
	1	
	2951.0	

Johnson - Ahern. 19

July 29-19

0 to 9+16.6 66.5

Johnson Ketchum

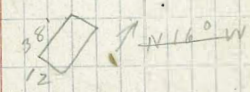
Stadia Survey along road toward Wilson Creek from Barrett damsite

Setup at		Traverse of A Line Dist Hams BL	Azim					
J		9+16.6	318°21	S41°15'E				
	A1	118° (S)	235°30					
	A2	280'	225°33	N45°45'E				
	O		276°30'					
A2				HI 1648.2				
	J		45°33					
	A1	170 165.9	38°45'	S39°15'W				
	A3	102 99.4	179°33	N0°0'W				
A3				HI 1651.2				
	A2							
1		29'	78°15	L-00 +40°50		+2.4	1653.6	E Cor BH 16' Wide
2		72'	118°15	L-1 +30°0'		+2.8	1654.0	N " " " "
3		57'	66°30'	L-00 +12°20'		+16.3	67.5	
4		27'	166°30		5.1		46.1	S cor office
5		68'	157'		5.2		46.0	22 wide W cor office
6		43'	210°30'	L-14.0 -2°45'		16.0	35.2	S cor M.H. 30' wide 11 to other house
7		153 ~~153~~	254°5	L-14 -14°40' ~~L-14~~		51.5	15 99.7	S cor BH -14' wide line of end 8' N of mark
8		~~153~~	239°45					intersect end house
9		122	271°45'	L-14 -20°0'		52.5 ~~53.1~~	98.7 ~~98.1~~	105'
A4				HI 1650.6				
	A3	140 137.9	328°15'		S31°30'E			
		53	10°30		5.1		45.5	Bud in road!
		97'	12°30'		L-to 0 +9°25	+14.9	16 66.5	Corner of excavation

cont. from P20

	Dist	Azim	Mag Bear	∠ or rot	Elev DE		
				1650.6			
3	200'	26° 0'		∠-00 16° 20'	54.0	1704.6	Top of ridge
4	135	74°		∠-0 20° 38'	+44.3 ~~27~~	95.1 ~~78~~	Bottom draw
5	121	112°		∠-00 20° 52'	40.3	90.9	Top ridge
6	44	340°		49		45.7	Cor fence
7	39'	317'		∠-14.0 -3° 30'	16.4	34.2	Bottom draw
8	65'	262°		∠-14.0 14° 37'	29.9	20.7	" "
9	145'	268° 50		∠-14.0 -5° 46'	28.5	22.1	Top of ridge by buggy
A 5	130' 127.3	165° 30	N14° 20' W	5.45		45.1	
Δ 5			H.I. 1650.2				
A 4		346° 0					H.I. 4.95 above nail H.I. 1650.2
a	150'	112°		∠-4 +4° 56	8.8	59.0	By tel pole near barn
b	118	132° 30'		5.2		45.0	Edge road
c	118	145° 30'		∠-14.0 -2° 5'	18.2	32.0	Ecor barn
d	130	168° 10		∠-14.0 -8° 53	33.8	16.4	Fence corner
e	72	217° 15		∠-14 -15° 28	32.5	17.7	On fence & top ridge
f	177	257°		∠-14 -20° 50	73°	1577.2	Bottom of draw
A 6		121° 30'					
Δ 6			H.I. 1651.6				
A 5	169 164.7	301° 20'					3584.0
	140'	19° 30		∠-10.0 +27° 30'	47.3	98.9 ~~1584.3~~	Top ridge
	400'	78° 40'		∠-10.0 +5° 10'	91°	1742.6	Open patch
	625	93° 30'		∠-10.0 +14° 31'	+142°	1993.6	Top of ridge
A 7	137 132.4	98° 30'	N81° 30' W	53			

Note 00 A2 set with needle zero set top



Levels along
stadia traverse
See P 22

BM.	8.8	1635.1		1626.3
A 1			+1.2	1636.3
	11.65	1647.95		
A 3			1.80	1646.15
	4.5	1650.65		
A 5			5.45	1645.2
	6.4	1651.6		
A 7			5.3	1646.3
	5.0	1651.3		
T.P A 10			-1.1	1652.4
	6.3	1658.7		
A 12			1.6	1657.1
	7.0	1664.7		
A 14			-.03	1664.7
	7.3	1671.7		
A 16			7.4	1664.3
	4.5	68.8		
△ 18			2.8	1664.0
	7.5	71.5		
△ 20			2.9	1668.9

at A 6

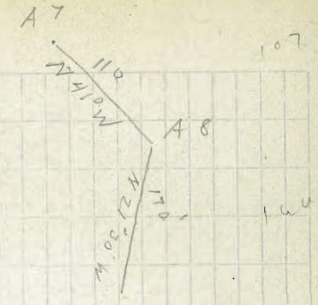
Road 935+85

1668.9 By Road Forks

A 9 H.I 1651.3

A 7	276	330°30'	S29°30'E	14-13.5			
	335	315°			16.9	34.5	Cor fence
	310	301°20		L-0.0 7°30'	40.1	11.2	Cor outhouse
	255			L-14.0 -11°22'	63.3	158.8	bottom draw
		63°	slope 21° for 100'		33.5	161.7	
		88°15'					tel pole A
A 8	170	338°		4.8		46.5	
	75'	269°		L-0.0 -26°15'	+ 30°	81.3	top ridge
		203°	slope	34°45'			~~top ridge~~ ~~at 100~~ contours. 7 feet apart.
	155	138°20		L-14.0 -14°11'	51.0	160.3	
		160°30					Top ridge across draw
	175	125°		L-14 -07°10'	35.6	15.7	
T.P. A 11	410	102°30'	N77°30'W	-1.1		1652.4	
Δ 10	252½	H.I 1654.3					
A 9	260	283°35	S76°15'E				
	135'	323°		L-10 +17°54	+ 295 16	83.8	Base of big rock 18' higher 5' farther
		294°15		L-00 +4°45'			tel pole 8.22 x dist
	115	45°45		L-2 +20°34'	+ 36°	1690.3	edge brush
	50'	206		L-00 -31°		24.3	guessed dist
T.P. A 11 146	150'	99°50	N80°10'W	1.9		52.4	
Δ 11			H.I 1658.7				
Δ 10 228	235	278°10'	S80°40'E				
	175'	354°		L-10.0 30°21'	77°	1735.7	
		188°45		L-00 -3°0'			Pt on ridge.
	165	67°35'		L-4.0 +23°43	+ 56.7	1715.4	

cont. from P 20



Cont. from P20

P24

A 11							
		155°	Slope	24°	10'		contours 11 ft apart
A 12	174.6 180	106°20'	N73°45'W				
A 12			H.I. 1662.0				
A 11	180'	286°35'	S73°15E				
	90'	30°0'		∠-00 +27°	+ 36.4	98.4	guessed dist
	100	181°30		∠-14.0 -21°30	48.1	13.9	
A 13	101.4 109'	92°0'	N88°W				
A 13			H.I. 1664.1				
A 12	104	272°25	S87°31E				
	210	20°		∠-00 +25°30'	+ 82°	1746.1	on rock face
	280	65°		∠-10.0 +23°45	+ 93°	1757.1	
	50	187°30'		∠-14.0 -24°30'	32.9	31.2	
	110	186°20'		∠-14.0 -19°38'	48.7	1615.4	
	135	155°		∠-14.0 -15°40'	49°	1615.1	
A 14	224.9 230	108°15'	N71°45W	-0.3		1664.4	
A 14			H.I. = 1669.3				44.4 49
A 13	230	287°0'	S72°45E				
	150'	32°		∠-7.0 +32°35'			straight up hill
	180	74°		∠-10.0 +23°10'	+ 55.0	1724.3	
A 13	177.1 182	115°20	N64°30'W	2.5			152
	180	145°30'		∠-14.0 -12°22'	51.6	1618	172 draw
	247	146°		∠-14.0 -8°16'	49.1	1620	243 on rock ledge
	430	122°50'		∠-10 +8°10'	50°	1719	425
		219°15'					pt on ridge across valley
	370	117°45'		∠-10.0 +7°28'	+ 37.8	1707	364 draw

A 14	300'	109°30		∠-10.0 +110°43'	+447	1714
△ 15						
A 14	177± 183'	296°0'	S64°E	7.3		
A 16	246± 255'	155°45'	N24°15W	7.4		
		213°				
		25-0				
A 16		H.I. = 1669±				
△ 15	253'	~~335°~~ 50	S24°E			
	148	72°		∠-5.0 +26°18'	+540	1723
		230°		-31°30'	-445	1625
	170	96°30'		∠-10.0 +15°0'	+325	1702
	250'	138°		∠-1.0 +22°10'	+860	1755 ~~1583~~
	300'	163°30'		∠-1.0 +19°34'	+850	1754 ~~1584~~
	310	180°15'		∠-5.0 +14°55'	+720	1741 ~~1571~~
△ 17						
△ 14	89± 92	303°35	S56°30E	45		
△ 14	125± 128	225°6'	N45°E	2.8		
△ 19	~~135~~		1671±			
18	132± 135	45°45'	S45°45W			
		290°		-35°0'		
A 20	94± 98	201°30'	N21°30'E	2.9	1668	6

Tie to Sect Cor		16 | 15 / 21 | 22	
A 10	N 37°30 W		
	213 / 218 ~~205~~	-16°	

290' top ridge

line of draw 12' W

draw abt 158' away

" " 130 "

119 near top ridge

bottom draw abt 85'

159 " " near water supply spring

214 ~~Top~~ boulder.

266

280

143' between 10' contours

angle of slope for 200'

Staking Road
Quarry Floor to Barn

M. 00	36'	S27°W	11.2 1746.3		1735.1
0+36	00			4.7	1741.6
1+72	136	N46°30'E	140=45 150	70	1739.3
~~1+72~~	~~146 150~~	~~S51°30'W~~	~~1722.8~~	~~-16.5~~	
~~2+18~~	~~00~~				
1+72	112 ~~115~~	S37°15'W	400 40 52 1739.0.6		
2+84	00			4.6	35.3
4+70	186 190	N3°15'W		12.2	1727.7
4+70	61 62'	S26°30'E	200=48 -7.4	1720.1	
5+31	00			45	1715.6
5+72	41 ~~42~~	N33°W	10d -140 47 1c	182	1701.9
5+72	98 ~~100~~	S64°E	200 62 -13.8	1688.1	
6+70	00			4.4	1683.7
7+40	70 ~~72~~	N87°30'W		11.1	1677.0
7+40	53 ~~54~~	S9°30'E	09 09	1677.9	
7+93	00			4.5	1673.4
8+53	60 62	N15°E	6d 12.8	16.5	1661.4
8+53	88 ~~90~~	S0°30'W	+20 45	-13.5	
9+41	00		1647.9	45	43.4
A 9	147	N27°W		5.45	1642.4

Quarry floor 1730

grade 1750 or 1750 with uncrushed storage

1747 288

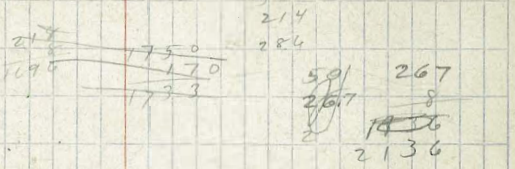
1736.2 8% grade 172 8 1370

50 214 284

~~218 8 1696~~ ~~1750 170 1733~~

501 267 ~~267~~ 8 ~~1436~~ 2136

286 298 172 470 @10% 1703 470



122 48

1696.9

1692.8

196

grade 830 760

372

Staking Road from Quarry floor To Barn

9+41	00				
A 7				5.2	16427
Set up at 9+41 A7			5.2	1651.5	16463
A9	143 ~~147~~	N27°W		~~∠-9.6 9°12'~~	
pt by tel post	312 ~~320~~	S87°40'E		∠-9.6 -9°-12'	60.8 15907
	546 ~~560~~	S18°45'E	-98'	∠-27 +10°21'	
	00		1492.6	80.8	
a	68 70	S14½°W		+3.8	corrected clear 15030
b	110 113	S76°W		0.4	1499
c	205 210	N89½°W		3.3	1494
d	222 228	N60°W		13.9	1485
e	24 24'	S87°E			
f	169 173	N45°W		13.9	1485
g	69 71	S35°E		9.0	1490
h	177 181	N15°10'E		12.4	1487
i	190 195	N55°30'E		11.8	1487
j	212 217	S88°E		9.7	1490
k	263 270	S58°E		3.5	1494
l	103 106	S45°E		21	1497
Stable Road 0+00	135	N40°30'W		13.4	1479.2
0+00	224 ~~230~~	S38°W	4d-11.3 92	205	
2+24	00		1499.7	4.9	1494.8
4+04	180 ~~185~~	N42¼ W	30 55	00	1499.7

319 16 9 8 9 72 8 9 12

end quarry road 320 16 192 32 512 96 60

463

Stadia survey near proposed barns

180 27 56 18 448 56 100.8 27

Tel line is 4' west
edge
east side flume
edge clear
creek bottom
cow barn 21' 12' S82½°E
Creek bottom & ℄ flume
edge clearing
" "

add 6.6 to elevations

Road from stable to connect with Barrett Camp road

~~Staking Road from Quarry floor to Barn~~ Barns to Barnett Camps Road.

4+04	193 ~~198~~			12.5	1499.7
5+97	00	S16°45'E	1512.2		
edge conduit	8'	West		72	
10+26	429 ~~440~~	N31°30'W		6.7	1505.5
10+26	317 ~~325~~	S5°E		6.4	
13+43	00	00	1511.9		
	17	S48°W		46	1507.3
	310 ~~318~~	N19°20'W	4d-77	20.4	1491.5
Line from Wilson creek				9%	
	278 285	N9½°W	9d 7.1	32.1	1497.2
	00		1529.2		
	361 ~~370~~	S6°45'W	90 3.7	+ 28.7	1557.9
	61 ~~63~~	N29°E	9d 34	+ 89	
	00		1566.8		
	180 ~~185~~	S48°W	90 8.7	+ 75	1574.3
	266 ~~273~~	N53°W	9d 6.7	30.6	
	00		1604.9		
	61 ~~63~~	S16½W	90 38	+17	1606.6

add 6.6 to elevations

200' of 6' wide to be built up

1513.9 on concrete bridge marked 9.8 above bottom grade outlet

127 near oak at Wilson Xing

Road from Wilson Creek to top of ridge on 9% grade

278 9 2502

2.1 high

3.4 high

361 9 324

61 9 5.5

1.8 high

1.9 low

18 9 162

266 9 239.4

0.2 low

1.0 hi old 822 + 23

00 = A 37+01

~~Staking Road from Quarry the~~
~~To Barns~~

Road from Barns to connect with Barnett Canyon Road.

125 ~~128~~	N88°30'E	1618.8	122	1606.6
50 ~~51~~	N44°E		51	16137
156 ~~160~~	S49¼E	16d - 5.7	30.7	15881
300 ~~308~~	S35°E	16d 0.2	48.2	15706
51 ~~54~~	N77°W	10v 47	-04	15704
00		1570.2		
108 ~~111~~	N29°30'E	10d 6.1	16.9	15533
136 ~~140~~	S14°W	18o 5.4	-19.1	
00		1534.2		
131 ~~134~~	N83°E	8d 11.8	22.3	1511.9
29 ~~30~~	N3°30'W		50	
00		1516.9		
114 ~~117~~	S32°E		103	1506.6 ~~1496~~

Traverse of old road top of ridge to proposed barns.

rld 822+25

Pt triangulated to across cover on old road 00 = Zero of road.

E line from top ridge to Barn.

Sta 4+04 of first line from barns

concrete Bridge	414 ~~425~~	S9°30'W	70.12.2 —	−16.8	1513.9
	00		1497.1		
center Wilson Crk Bridg	20	S20°E		5.8	
2+73	273 ~~280~~	S54°E		5.0	1492.1
2+73	247 ~~253~~	N62°W		7.0	
5+20			1499.1		
7+93	273 ~~280~~	S42°15'E		−0.1	1499.2
7+93	82 ~~84~~	N28°W		7.3	
8+75			1506.5		
11+77	302 ~~310~~	S1°45'E		3.6	1502.9
11+77	232 ~~238~~	N13°50'W	10.23	00	
14+09			1502.9		
14+84	75 ~~77~~	S5°15'W		7.6	1495.3
14+84 ~~16+21~~	137 ~~140~~	N12°30'W		−0.1	
16+21	00		1495.2		
19+26	305 ~~313~~	S39°15'E		8.0	1487.2
19+26	152 156	N47°50'W		8.6	
20+78	00		1495.8		
23+36	258 ~~265~~	S64°E	180 8.5	+37.9	1533.7

414
7
2878

290
122
168

Road from Wilson Creek Bridge across Cottonwood Creek and South to Damsite and Cableway Towers.

258
18
2064
258
464
8
37.9

23+36	448 ~~460~~	N41°50'W	12d 39	57.7	1533.7
27+84		N'	1591.4		
29+30	146 ~~150~~	S8°E	14u 64	+16.0	1607.4
29+30	361 ~~370~~	N4°W	7d 5.6	30.9	
32+91	00		1638.3		
cor bend.	179 184	N4°W	7d 41	14.6	1621.7
"	110 113	N39°E		11.3	1627.0
"	112 115	S2°15'E	1u 00		1639.4
36+24	333 ~~342~~	S25°30'W	6u 21	+17.9	1656.2
36+24	148 ~~152~~	N13°E		10.1	
37+72	00		1666.3		
H Base Line 9+16		N88°30'W			
39+83	211 ~~216~~	S54°W	14u 54	+24.1	1690.4
~~43+88~~	405 ~~415~~	N31°E	8d 50	37.4	
43+88	00		1727.8		
H B.L. 9+16		N49°W			
C4+05 BM on upper road		N53°25'W	-7°13'		
	405 ~~415~~	N48°E	10u 73	+33.2	1761.0
45+93	205 ~~210~~	S1°15'E		00	1727.8
	191 ~~196~~	N0°W	1740.5	12.7	
47+84	00		~~17~~		
	124 127	S30°E	10u 79		1745

448 / 12 / 896 / 448 / 5376

538 / 39 / 577

146 / 14 / 584 / 146 / 204 / 64 / 160

361 / 7 / 2527

253 / 56 / 309

333 / 6 / 1998

200 / 21

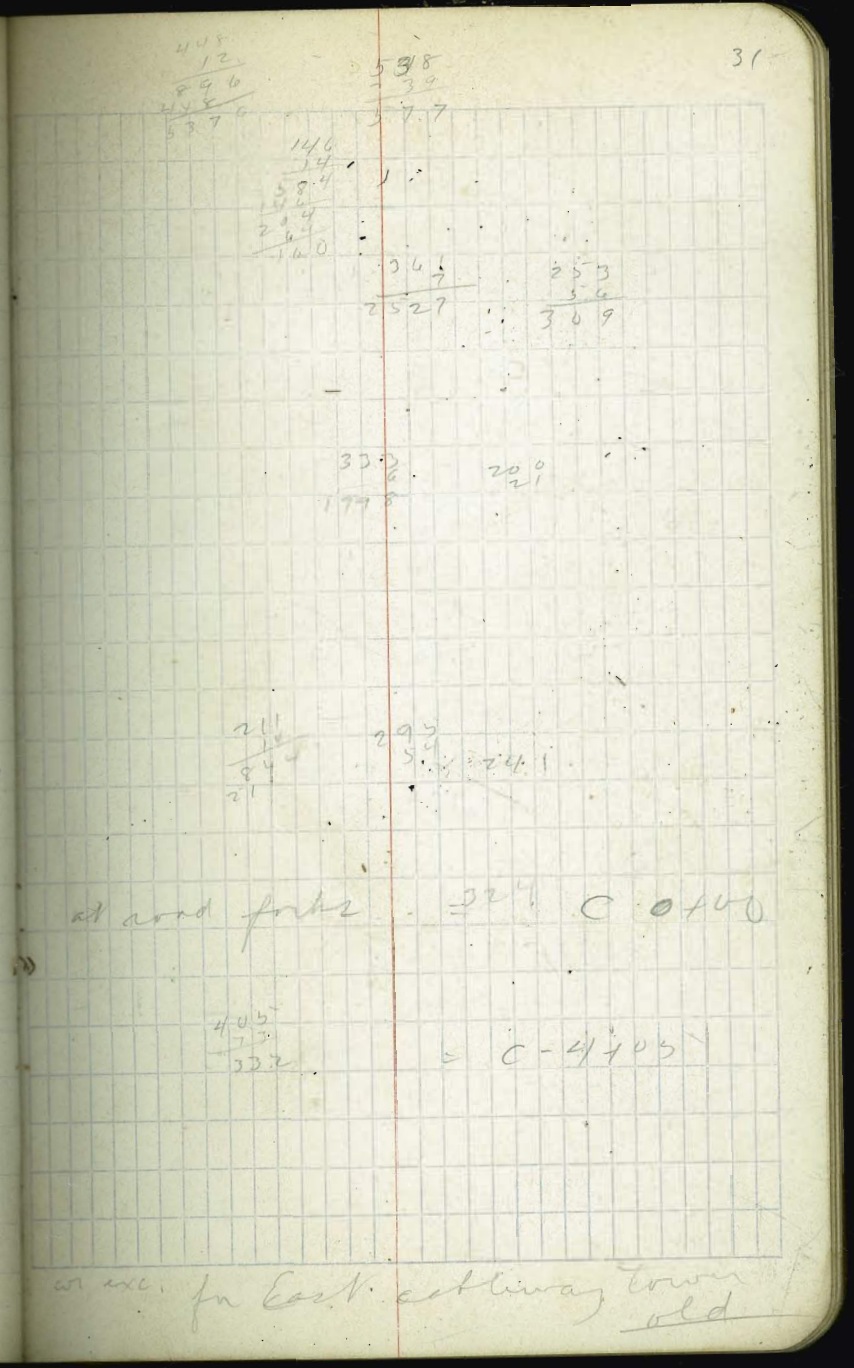
211 / 14 / 844 / 21

295 / 54 / 24.1

at road forks = 324 C 0+00

405 / 73 / 33.2 = C-4+05

cor exc. for East cabliway tower old



			17405		
	177				
X	~~182~~	S24°E	10v 14.2	+3.5	1744
	205				
	~~210~~	S5°E	4v 5.1	+3.1	1744
		N80°20'W			
	244		4v 8.1		
	~~250~~	S23°15'W		+17	1742
	180		2v 4.0		
	~~185~~	S23°W		6H	1740
	102				
	~~105~~	S14°W		2.0	17385
1 Telpole under cableway Pole No2		N85°W	-8°54'	1385	16020
		N64°30'W	-7°36'	1365	1604
3		N53°30'W	-6°43'	1280	1612
4		N41°W	-6°1'	1145	1626
			~~-7°36'~~		
	On upper road				
C4+05					
Tel Pole 4		N81°30'W			
		S89°W			
		S79°15'W			
1		S63°20'W			
C4+05	249				
	~~255~~	S72°W	7v 9.2	26.6	17610
C6+54	ov		17874		
	99				
C7+53	102	N49°30E	6v 3.5	+25	1790'
	421				
C7+57	~~432~~	S41°45'W	1v 2.2	-20	
11+74	ov		17881		
	270	S23°15'W		19.5	
C13+86	~~217~~	N42°E	6v 11.6	+11.1	17892

end of exc.
~~end~~ & sheave West cableway

end of exc.
& Cableway

13+86	317 ~~325~~	S 62° W	30 10.2	0.7	1789.2
			1789.9		
	113 ~~116~~	S 37° W		5.3	1784.6
17+03	00				
17+75	72 ~~74~~	N 69° 45' E		70.1	1790.0
17+75	234 ~~240~~	N 87° 45' W	6d 12.5	26.5	
bend.	78	S 37° 30' W	~~1816.5~~	12.2	
20+09			1816.5		
21+84	175 ~~180~~	N 60° E		46	1811.9
21+84	253 ~~260~~	S 51° 15' W	2d 12.8	17.9	
	170	S 29° 30' W	4d 12.5	19.1	1810.7
24+37	00		1829.8		
C 27+57 ~~25-04~~ Equation for bends in road C27+57 = C28+81	320 ~~328~~	N 73° E	~~14.9~~	14.9	1814.9
C 24+37					
D 0+00			1829.8		
D 1+56	156 ~~160~~	S 57° 30' W	10d 8.4	24.0	1805.8
	126 130	S 88° 30' E	10d 13.1	4.5	
D 2+82	00	S	1806.3		
	151 ~~155~~	N 62° 30' W	12d 4.9	23.0	1783.3
	299 ~~307~~	N 82° 30' W	12d 5.1	41.0	1765.3
D 7+79	497 ~~510~~	S 89° W	12d 5.8	65.4	1740.9

95
102

234
6
1404

5.0
12.8

Barrett summit or saddle.

East of saddle on road

497
12
994
497
596

596
58
654

7+79	527 ~~540~~	N75° E	180 11.2	-83.7	1740.9
13+0.6	00		1657.2		
14+28	122 ~~125~~	S29½ W		70	1650.2
14+28	166 ~~170~~	S44°30' E	20 v 78	-25.4	
on road.	00		1624.8		
c 29+30	180 ~~185~~	N2° W	4d 10.6	182	1606.6

527
18
4216
527 . 949
112

Top rock side draw -

332
78
254

76
166

old 1607.4

175 Contour

Setting Flags on

BM:	6.48	186.69			180.210	
H.B.L 9+16.6	285 ~~292~~	S34° W		1345	173.24	Red Flag.
	00 246 ~~250~~	N12½° E		1107	175.62	Top Stake below cookhouse
	373 383	S42½° E		596		
			181.58			below Barn 12' from fence
	373 ~~383~~	N54° W		640	175.18	
	1043 ~~1070~~	S30° 30' E	181.58	640		
	716 ~~730~~	S14° 15' W		560	175.98	(vert ∠ -21° to bottom creek straight [illegible])
	756	S56° W		670	174.88	
A:20	575 ~~590~~		80 3.5	+425	224.1	44 35 224.1 1446 1670 2
	22'	N57° E		661	175.0	on point on bank no side road
	249 255	S88° E	60 61	21.0	160.6	old 822+25 24.9 6 1494 1606.7
	558	N2½° E		600	175.58	Top of stake

Aug 1 - 1919

Johnson - Ketchum

B	17 ~~18~~	N16°15'W		0.2
P.I.	~~30~~ ~~34~~	N24°45E	✓	
	~~60~~ ~~62~~	N8°E		
	285	S79½°W		
	325	S73¼E		
G	374			
	365	S68°30E	✓	
	402	S61°30E	✓	
	439 ✓	58°30'	✓	
	476	54°	✓	
	512	50	✓	
	502	49°	✓	
	461	52°		
	392	55°30'		
	315	58°30'		
E	91 ~~95~~	N37°E		3.8
	34 ~~35~~	S29½E	✓	

		At # ⊡ 1			
P-Line 2+71.75	Fill 0.4	5.72	25.47		19.75
			grade Dist	5.32	20.15
0-0 31-5 2+71.75	88.9				N 35°-0 E
Point of Rock	57.2				S 12-45 W
⊡ #2	381.0		~~350'~~		S 8°-0 W
Hub on ⊡ #2		4.43	27.97	1.93	23.54
End of Level section = 0.0				7.82	20.15
		At ⊡ #2			
Begining 1 o/o 0-0	274.0 N				N-3°-0 E
	grade				
0+25	7.57				N 2°-0 E
0+50	7.32				N 0-40 E
0+75	7.07				N 0-45 W
1+00	6.82				N 0-45 W
1+25	6.57 ✓				N 1°-30 W
1+50	6.32 ✓				N-2°-15' W
1+75	6.07 ✓				N 4°-10' W
2+10	5.72 ✓				N 18°-15-W
2+25	5.57 ✓				N 23°-30 W
2+50	5.32 ✓				N 16°-0 W
2+75	5.07				N 19°-0 W
⊡ #3	212.0				S 1°-30 E
		4.52	29.52	2.97	25.00

Void

12/19/19 Continuation Quarry Road (OR)

grade

El Floor Quarry 1737.0

El = Road 1740.0

32' back from Cut.

3+07 P Line	7.58	1742.52		1734.94
17400			Rod 2.52	
P Line ℄ 2+71.75	5.88	1725.63	-	1719.75
1740 = Rod + 14.37				
Fill	20.5		- 6.1	
Fill	27.5		13.1	
Fill	24.7		10.3	
Fill	25.1		10.7	
Fill	24.1		9.7	
Fill	19.4		5.0	
	10.88	1750.88		1740.00

0+00 =	10.88 ✓
0+25	10.63 ✓
0+50	10.38 ✓
0+75	10.13 ✓
1+00	9.88 ✓
1+25	9.63 ✓
1+50	9.38 ✓
1+75	9.13 ✓
2+0	8.88 ✓
2+25	8.63
2+44	8.44

1742.44

Hole No 6	82 ~~84~~	N51°E	4d 1285	16.1	1526.5
10	11	S34°30'E	1542.6	2.0	1540.6
11	87 ~~89~~	S28°45'E	L-3.0 +22°48	+30.7	1573.3
	~~34~~ ~~35~~	~~S29½E~~			

AT ⊡ #3 BI 2952 Void

3+10	6.27				N 4°-00W
3+25	6.12				N 4°-45W
3+50	5.87				N 8°-20'W
3+75	5.62				N 8°-50'W
4+00	5.37				N 8°-30'W
4+25	5.12				N 8°-30
4+55	4.82				N 17°-15W
4+75	4.62				N 22°-15W
5+00	4.37				S 21°-0E
5+25	4.12			1.01	S 22-15E
5+50	3.87				S 29-30W
⊡ #4	58.3				S-25-15W
		4.40	32.91	1.01	28.51
5+75	7.01				S 9°-0E
6+00	6.76				S 28-45

continued page 55

804
1446.1
1526.5
16.1
1542.6

33
28

2.13
.29
2.24

80.1 dist

9.0 above G.S.

12/19/19 Continuation Quarry Road-

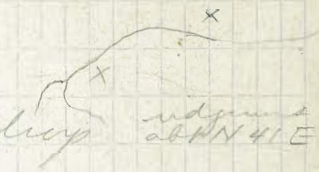
1750.88 OK

	9.36	48.83	11.41	1739.47
	Rod			
2+44 Rod	6.39			1742.44
2+90	5.93			1742.90
3+00	5.83			1743.00
3+25	5.58			43.25
3+50	5.33			43.50
3+75	5.08			43.75
	6.01	1751.15	3.69	45.14
4+00	44.00		7.15	
	11.44	1752.05	10.54	1740.61
4+25	44.25	C-3.0	7.80	
4+50	44.50		7.55	
4+75	44.75		7.30	
5+00	45.00		7.05	
5+25	45.25		6.80	
5+50	45.50		6.55	
5+75	45.75		6.30	

Cont- page 55

M	150 155	S24°W	L-14° -6°49'	32.0	1735.1
on rock	00 124 127	N28¾E	1767.1 4020	+2.6	1769.7
	169 ~~173~~	S56°30E		15.5	
	00		1785.2		
	52	S74°E		13.1	1772.1
	5'	N0°W		13.0	1772.2
	91 ~~93~~	S7½°W	200 98	+8.4	1793.6
	draw runs N30°W				to
	181 ~~186~~	S34¾°W	200 106	+ 25.6	1810.8
	195 ~~200~~	S79°30W	100 142	+ 5.3	1790.5
H 168	~~177~~ ~~182~~	N40°W	-18°10' to 100	65.1	1720.1
	00		1774.3	4.6	1769.7
	45	N47°W		0.5	1773.8
	14 ~~18~~	S43°W	L-14 -7°30'	16.3	1758.0
	18'	S40°E	to	17.60	
	31	S86°E	10d 137	16.8	1757.5
	31	N10°E		14.2	1660.1

46



10' below rock outcrop — ridgeline abt N41E

below rock

Top ridge

intersection with other draw

36

Bottom draw

Top ridge

Along Lyons Valley Road

A20	307 ~~315~~	S45°30'W	11.8	1680.4	1668.6
	00				
Bend in road.	325	N12°W	20 4.3		
Top Tel pole		N29°30'W	+9° 43		
TP	530 ~~544~~	N26°45'E	20 1.9	+8.7	1689.1
	344 ~~353~~	S51°E	4.8	1693.9	
	00				
	917 ~~940~~	N68°15'W		5.8	1688.1
	468 ~~480~~	S64°E	5.5	1693.6	
	00				
	1053 ~~1080~~	N57°30'W	20 3.3	+17.8	1711.4
	912 ~~935~~	S53°15'E	3.0	1714.4	
	00				
	543 ~~557~~	N68°30'W	20 31	+ 7.8	1722.2
	916 ~~940~~	S65°50'E	12.6	1734.8	
	00				
	314 ~~322~~	N56°30'W		8.6	1726.2
	297	S67°45'E	4.9	1731.1	
	00				
	188	N88°30'W		5.2	1725.9

Johnson 40
Stebbins

E S road
S side r

10.6
1.9

21.1
3.3 +1 Pt 70' E of gate

9.3

10.9

46.5
47

217 223	S52°10'E	4.9	1730.8	1725.9
00 239 245	N66°15W	1.8		1729.6
410 421	S49°15E	4d 12.2	28.6	
00 190 195	N53°45W	1757.6 140 65	+20.1	1777.7
96 98	N28°45E	1d 13.9	14.9	
241 247	S62°30W	1792.6 20 00	+4.8	1797.4
456 468	N72°45E	4d 9.9	28.1	
00 247 253	N77°15W	1825.5 40 3.4	+ 6.5	1832.0
327 335	S45°E	2d 12.1	18.6	
00 748 788	N71°10W	18506	+3.5	1854.1
348 357	S59°45E	20 42	=2.8	
366 375	N53°15W	18513	00	1851.3
64 65	N39°E		1.2	
87 89	S39°45W	1852.5 12d 12.5	22.9	1829.6

Pile rocks opposite fireplace

Tie to Transformer Sta.

At	222		L-3.0
A1	~~228~~	N26°15W	+21°35
	206 horizontal		

Measurement of Water in Wilson Creek abt 600' below ~~x~~ of fireplace.

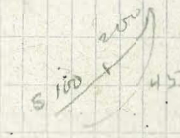
Creek filled canteen in seven seconds. Canteen holds $\frac{22}{16}$ gallons.

$\frac{22}{16} \times \frac{60}{7} \times \frac{60}{1} \times \frac{24}{1} = 17{,}000$

17,000 Gallons per day

Road to Guest House

AG 90+50			1651.6	5.0	1646.6
			6v = 2.5		
1+00	50	S49°E	10v 8.0	+0.5	
2+00	150	S47°E		+7.0	1658.6
	273		6d 5.5	21.9	
	~~280~~	N12°30'W	6d 5.5		
	180	N12°W	6d 5.5		
	80	N23°45'W			
	00			1680.5	
	20	S1°W			
	70	S20°45'W	6v 5.5		
	25	S22°E		13.3	
	54	S37°W		10.2	



Set up on P7 U

East Cableway Tower		S 27° E
Tel Post A1	-4° 8'	S 15° 13' W
2		S 27° 30' W
4		S 22° W
Center Cableway Tower		S 29° 30' W
ground under cable	+4° 56'	S 28° 45' W
aft ~~west~~ end dam		S 6½° W
east under cableway		S 1° 45' W

Electric Power line

Bearing of N 34° 15' W

Set up on A1

1636-3

10/5/20

Occupy 18-488-Sight

C18 for - Zero Chained ~~to~~ 17 25
toward Center = 18-470.75
Nail in Rock —

16608 Chained ~~to~~ 14 17 North
+765
48
7420

Nail in Rock = 18-502 17

Topog

Johnson
Stebbins

	241 ~~247~~	N27°10E	8d 11.4 193 [illegible]	30.7	1467.3
	00		1498.0		
	105 ~~108~~	S10°30'W		5.2	1492.8
	91 ~~93~~	N11°10'W		10.0	
			1502.8		
	31 ~~32~~	S56°E		2.8	1500.1
	52 ~~53~~	S41°E		4.2	1498.6
	95 ~~97~~	S12°30'E		4.0	1498.8
	171 ~~175~~	N35°15'E		12.4	
			1511.2		
	125 ~~128~~	N41°30'E		11.1	1500.1
	108 ~~110~~	N50°30'E		10.9	1500.3
	103 ~~106~~	N67°45'E		12.1	1499.1
	65 ~~67~~	N60°E		14.0	97.2
	49 ~~50~~	N71°30'E		10.1	01.1
Sta 9+16.6		N3°15'W			
Tel Pole		S78°W			
	12	N1°W		13.2	98.0
	17	S5°W		13.7	97.5
	47 ~~48~~	S6°30'E		11.6	99.6
	72 ~~74~~	S30°30'W		11.8	99.4
	89 ~~91~~	S34°45'W		11.1	00.0
T.P.	92 ~~94~~	S37°W		15.9	1495.3

East Edge Weir in Old Harris Dam

45

241
8
1928

212
1446.8
1467.3

Bottom Draw
6' up - 4' higher

B18-303-

edge cut.

	~~80~~ 78	S29°45W		485	1495.3	76 / 4 / 304
			1500.1			
	~~78~~ 74	S50°15W	4914.0	17.0	1483.1	
	~~87~~ 85	S35°15W		11.8		
			1494.9			
	102	S37°W		14.6	80.3	edge drift
	45	S24°W		14.6	80.3	
	37	S9°30'W		14.8	80.1	bottom draw 504 / 1446 / 965
	19	N20°W		16.2	78.7	abt 10' in to cont pt
	86	N59°45E		13.6	81.3	Bottom draw
	102	N44°E		15.0	79.9	
	142	N39°E		14.7	80.2	
	187	N29°30'E		16.3	78.6	
	~~186~~ 181	N17½°E		14.1	1480.8	
	59	N32°30'W		2.7		
			1483.5			
	50	N67°30'W		13.1	1470.4	
	22	S90°W		13.5	70.0	bottom draw
	65	S64°30'W		13.7	69.8	
	90	S54°W		13.9	69.6	
	100	S37°W		13.7	69.8	bottom draw
Tel pole		S62°15W				
"		N24°45W				

			14835			
	115	S44°W		12.8	70.5	
	~~130~~ 127	S44°15W		11.9	1471.6	
	~~95~~ 93	N32°15E	2052	3.3	~~80~~	
			14749			18.6 1.9
	53	N31°15E		4.7	70.2	on pt
	34	N54E		5.6	69.3	bottom draw
T.P.	27	S53°W		14.6	1460.3	
	116	N37°30E		0.5		
			14608			Set up on old dam 13' wide
	78	N48°E		1.1	59.7	
	53	N62°E		0.8	60.0	
	40	S82°E		0.9	59.9	
	39	S69°30'E		4.6	56.2	Center dam E edge
	23	"		17.0	1443.8	" " bottom break
T.P.	49	N75°30'W		4.8	1456.0	Iron pin S edge dam
	56	N43°30E		15.0	45.8	
	106	N25°E		15.2	45.6	
	~~173~~ 169	N22°15E		15.0	1445.8	
	93	S6°W		4.8	56.0	
			14506			
	11	S83°E		1.4	49.2	

		1450.6			
	37	S83°E	20v 22	+ 5.2	1455.8
	67	S85°E	20v 1.1	+ 12.3	1462.5
	20	N83½W		1.9	48.7
	~~36~~ 35	"	10v 28	10.7	51.3
	~~69~~ 67	"	10v 15	+ 5.2	1455.8
	106	N1°W		3.9	1446.7
	118	S16°45'E		10.7	39.9
			1457.4 ~~1466.5~~		
	75	S36°E		8.4	49.0
	66	N86°30'E		8.0	49.4
	33	N41°E		6.7	50.7
	96	N36°30'E	10v 140	+ 6.4 ~~8.0~~	1451.0 ~~1460.1~~
	34	S25°W		7.2	50.2
	40	S10°E		6.5	50.9
	58	S8½E		6.5	50.9
7r	82	S28°E		8.1	1449.3 ~~1458.4~~
	~~126~~ 123	N50°30'E	4d 192 49	19.1	
	~~73~~		1468.4 ~~1477.5~~		
	73	N31°30'E		16.0	1452.4
	23	N50°E		12.2	56.2
	20	S12°30'E		4.6	1463.8 ~~1472.9~~

46 92

bottom slope 20' E

~~abt 8' to cent. 1 ft of slope~~

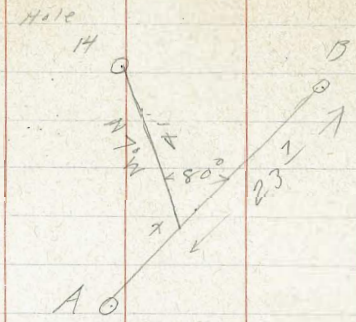
against boulder

	61 ~~63~~	N11°30'E	1478.1 ~~1487.2~~	14.3	1463.8 ~~1472.9~~
	37	S14°E		10.1	1468.0 ~~1477.1~~
	90	N6°45'E	4053 1469.7 ~~1478.8~~	17	
	45	N25°E		9.2	605
	11	S49°E		8.8	609
Old	56	S5½W		10.9	58.8 1455.9
T.P.	99	S10°W		13.8	650

foot of slope.

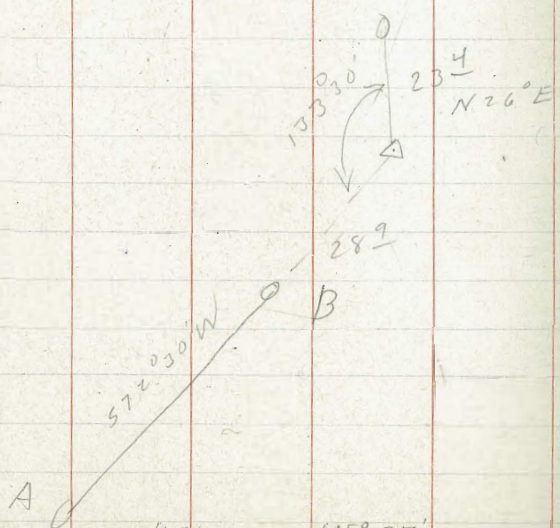
09.8 elev given in old book
1446.1
1455.9

Tie Hole 14



Set up at X.1 PT B 14	10.4	1588.8	+10.9' ≈ -0.2	+1.0	1578.4 / 1589.8

Top Casing

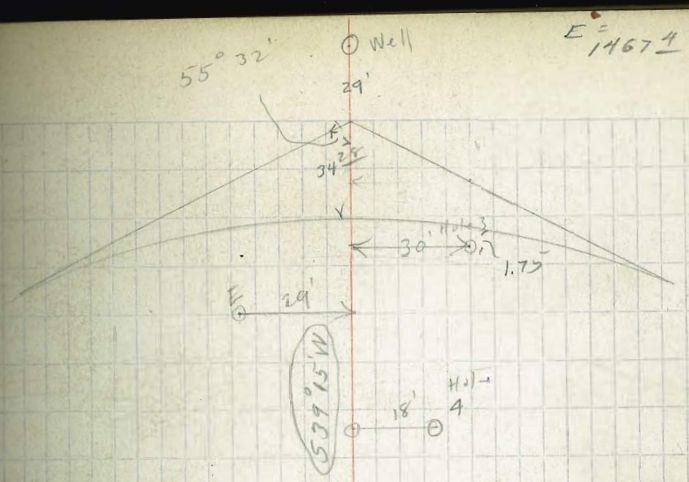


Top Stake B Hole 15	Hor Dist 28.9	+15° 37' -8.1 9.8	1570.3	1578.4 / 1560.5	

Staking Curtain No

E.	3.9	1471.3	Dist		1467.4
0			9.8	13	70.1
20				45	66.8
40				47	66.6
60				36	67.7
80				00	71.3
100				16.6	67.9

		C 3.0			C 3.0
00	Rock 1467	5.3	C 3.0 8.6		16.3
0+20	43	C 24.0 3.80			24.0 50.2
0+40	"	C 24.0 380			C 24.0 502
0+60	145.2	C 15 24	C 16		C 15.0 36.0
0+80	1465	C 6.0 1.0	C 4		C 6.0 22.0
1+00	1472	C 5.9 0.5	C 5.9		C 9. 11.3



110	7° 52.7'	10	43'
120	8° 35.6	20	1° 26'
130	9° 18.6	30	2° 09'
140	10° 1.6	40	2° 52'
150	10° 44.6	50	3° 35'
160	11° 27.5	60	4° 18'
		70	5° 01'
		80	5° 44'
		90	6° 27'
		100	7° 10'

6) 430
42
10

Ry Track E side
canon to dump below
suspension bridge

Top Wall	13.0	1480.3			1467
T.P.				6.9	1473.3
1.25' dist.	11.4	1484.8			

Setting Grades

1+00	Grade Rod			1.8	
1+44				2.7	
2+25				4.3	
3+08				5.7	
T.P.				2.8	1482.0

66'	12.2	1494.2			1479.7
2+88	DIST 72				
2+72	56			17.0	1477.2
2+56	40'			22.5	1471.7
2+40	24	S33°10' W		19.2	1475.0
2+24	8			3.0	1491.2
2+08	8'	N33°10' E		4.7	1489.5
1+92	24'			6'	1488.1
1+76	42			11.8	1482.4
1+60	58'			14.7	1479.5
1+44	74		-1°23' to 20°	21.8	1472.4
1+28	90			12.0	1482.2
1+12	106		6d 115	17.9	1476.3
0+96	122			12.0	1482.2
0+80	138			11.0	1483.2

212
1446.1
1467.3

Grad

1467
18
1485

grade 00 = 1485

1483
1482.1
1480.5

grade		Cut
79.24	2+25	2+81 C 0.5
79.56		F 2.4
79.88		F 8.2
1480.20		F 5.2
1480.52		C 10.7
80.84		C 8.7
81.16		C 6.9
81.48		C 0.9
81.80		F 2.3
82.12	1° 57' 28 2.3	F 9.7
82.44		F 0.2
82.76		F 6.5
83.08		F 0.9
83.40		F 0.2

	Dist	4.65	HT		Top Wall
~~0+80~~	~~85~~		14720		14673
0+80	85			2.1	14699
0+64	69			2.1	14699
0+48	53			2.7	14693
0+32	37			4.1	14679
0+16	21			3.9	14681
0+00	5			4.8	14672

1485.40
83.72
84.04
84.36
84.68
1485.0

F138
F14.7 or 2% grade
F16.5
F16.6
F17.8
Grade at 0+00 = 1485

Bent No	Left			Rt. = West of ℄
①	0+00	+5.5 / 115	F17.8 00	-0.3 / 10
②	0+16	+5.5 / 130	F16.6 00	-1.5 / 10
③	0+32	+5.5 / 117	F16.5 00	-1.4 / 10
④	0+48	+5.5 / 97	F14.7 00	-2.6 / 10
⑤	0+64	~~+5.5~~ / 97	F13.8 00	-2.5 / 10
⑥	0+80	+20 / 100	+20 / 3 F02 00	-80 / 8 -14.0 / 10
⑦	0+96	+3.7 / 10	+5.7 / 5.0 F04.9 00	-8.0 / 5 -8.0 / 1.0
⑧	1+12	00 / 50	F05.00 00 / 5	-1.5 / 7
⑨	1+28	On Boulder. good for	FOR	

4 feet off
foundation by shooting top of boulder

(10)	1+44	+10.2 / 9.0	+0.9 / 40	F9.7 / 0	-6.5 / 100	
(11)	1+60	edge of boulder to shoot off	0.0 / 30	F2.3 / 0.0	-1.2 / 50	
(12)	1+76	+2.2 / 70	C0.9 / 0.0	-2.3 / 50	-4.8 / 80	
(13)	1+92	dirt +0.8 / 100	C6.9	-5.1 / 5	-7.2 / 100	
(14)	2+08	0.0 / 10	C8.7 / 0.0	-5.8 / 100		
(15)	2+24	+4.8 / 12.0	C10.7 / 0.0	-6.6 / 10.0		
(16)	2+40	+5.0 / 5.0	F5.2 / 0.0	-10.0 / 8	-11.3 / 100	
(17)	2+56	+8.4 / 5.0	+5.5 / 2.0	+0.8 / 2.0	F8.2	-2.8 / 8	-6.1 / 100
(18)	2+72	+5.5 / 11.0	F2.4	-1.2 / 40	-7.2 / 7	-7.2 / 10
(19)	2+88	+4.5 / 70	C0.5	-2.5 / 50		

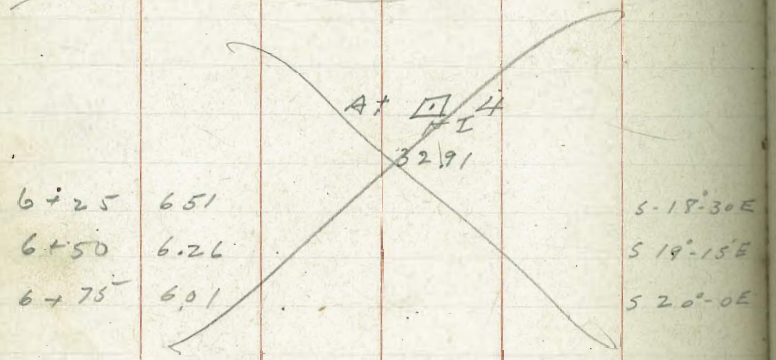
Boulder 8' diam broken will make another 16' of roadbed

Dirt & loose Rock

abt 25% loose rock

Grade for flume thru Halus Dam

	Rod	Dist
Sandmpace at coffer dam	2.9	170
Top West edge weir	2.7	48



6+25	6.51	S-18°-30E
6+50	6.26	S 19°-15E
6+75	6.01	S 20°-0E

Bottom flume ± 18
G. Rod.

6.9

8.0 + 1.33 to bottom stringers
= 9.33 G.R.
2.7
6.63

1752.05

12.05 52.66 11.44 1740.61

6+50	46.00	6.64
+25	46.25	6.41
+50	46.50	6.16
+75	46.75	5.91
7+00	47.00	5.66
7+25	47.25	5.41

Adjustment of Transit

Lag Screw Base
~~Pt of~~ Tel Pole
75' S of office

				5.365	
				~~5.4~~	
				5.410	045
				6.115	
				6160	0.45

Hand level Cot. Ck to Conduit

Pine & Cott

W.S.	68				
				4.1	2.7
	130	15.7			
				1.1	146
	8.1	22.7			
				2.0	20 7

6.03
45
5.985

5.960
45
5.915

12/15/13 Road & Landing to Storehouse

Bub-Fisher	Grade	+	~~+~~	−	Ele
Floor of Store House	+ 5% Grade to S. House	2.25	1653.60 ~~1702.25~~		1651.35 ~~1700.0~~
Floor of Landing				5.75	1647.85
20'				6.75	46.85
40'				7.75	45.85
60'				8.75	44.85
Butt in Tele. pole 75's of office		1.58	1646.88 ~~1695.53~~	8.30	1645.30 ~~1693.95~~
T.P.		2.15	1638.65 ~~1687.30~~	10.38	1636.50 ~~1685.15~~
00-429				8.09	1630.56 ~~1677.21~~
					30.56

Elev of stakes along travers of upstream line of dam

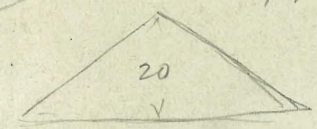
Sta	Stake Marked	Top Stake Elev		Ground Surface elev
0+00	A	150.5	1596.6	
0+62.8	B	132.3	1578.4	
0+82.3		124.2	1570.3	
1+23.0	C	102.6	1548.7	
1+74		69.6	1515.7	
2+03.0	D	58.6	1504.7	
2+32.1		44.0	1490.1	
2+43.2		26.6	1472.7	
2+71.8	E	21.3	1467.4	
3+36.8		20.6	1466.7	
3+56.8		27.3	1473.4	
3+76.8		34.5	1480.6	
3+98.3	F	43.9	1490.0	
4+08.3		45.9	1492.0	
4+42.9	G	69.8	1515.9	
4+86	H	78.4	1524.5	
5+35.9	H	101.9	1548.0	
6+16.8	I	140.5	1586.6	

Sta	℄ Plant Elev G.S	℄ Plant Elev Top Stake	Sea level Elevation Elev GS	Sea level Elevation Datum Top Stake
0+00	294^{3}		1740^{4}	
M 0+34.0	289^{0}	289^{3}	1735.1	
0+79	275^{2}		1722.3	
L 1+20.1	257^{0}	257^{6}	1703.1	
$1+55^{4}$	238^{1}		1684.2	
$1+81^{4}$	227^{6}		1673.7	
K $2+15^{4}$	230^{6}	231^{3}	1676.7	
J $2+61^{9}$	214^{7}	G.S.	1660.8	
3+00	201^{6}		1647.7	
$3+05^{4}$	185^{1}		1631.2	
N $3+37^{4}$	185^{9}	186^{5}	1632^{0}	
O $4+21^{8}$	139^{6}	(knocked out) 140^{4}	1585^{7}	
P 4+68.2	123^{7}	124^{5}	1569^{8}	
Q $5+22^{5}$	96^{0}	Keel on mark rock	1542^{1}	
R $5+73^{0}$	49^{5}	Top iron pin 51^{1} by trail	1495^{6}	
$5+86$	23^{8}		1469^{9}	
6+05	18^{4}		1464^{5}	
S 6+68	20^{5}		1466^{6}	
$6+92^{9}$	30^{8}		1476^{9}	
$7+18^{2}$	38^{9}		1485^{0}	
U $7+36^{2}$	~~53^{8}~~	53^{8}	~~1499^{9}~~	1499^{9}

Page 4 X

8% = 1 9 / 4° 30'

488 00
1725 4°
47 0 75



488
1 x 17
5 0 7

$\frac{1}{3} \cdot h \cdot r$

Base = $\pi r^2 \cdot \frac{2}{9} r$

$h = \frac{2}{3} r$ $\quad \frac{2}{9} \pi r^3$

$\frac{22}{7} \cdot \frac{2}{9} = \frac{44}{63} \cdot r^3$

$\frac{2}{3} r^3$

$r = 10$

$\frac{2}{3} r^3 = 5000$ $\quad$ 1000

$r^3 = 7500$

20
20
400
20
880

20

4-455

18-303
4-330
0-330

0-28

0-429.

El Rhany
Floor

1/140

Page 37

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1½ TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44 2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

MADE IN GERMANY.