6

1005

#6

FIELD BOOK
360

KEUFFEL & ESSER CO.

DRAWING MATERIALS
AND
SURVEYING INSTRUMENTS.
NEW YORK.

CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

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.

	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.

Eugene Schaub
Logan Utah

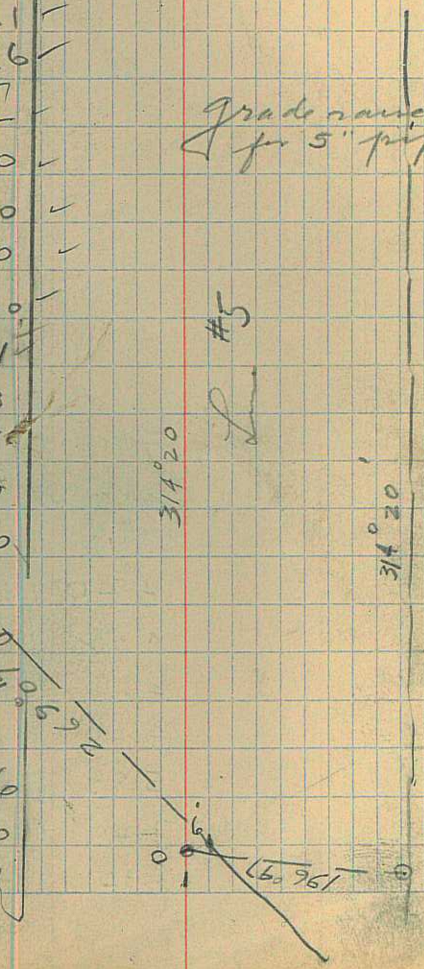
No Smithfield note
in here.

Logan Land Drainage Co

31 20
90
22 20

⊼ - Sta	BS	FS	im	Ele	HI	RR on grade	Cut
22	5.85	4.22	4.22	105.07	109.9	9.08 BS 7.450	3.23
21			4.55	104.76		7.55	3.00
20			5.12	104.19		7.65	2.53
19			4.55	104.76		7.75	3.20
18			4.80	104.51		7.85	3.05
17			4.74	104.57		7.95	3.21
16			4.79	104.52		8.05	3.26
15			4.88	104.43		8.15 for 5" 8.20	3.27 3.32
14			4.80	104.51		8.30	3.50
13			5.10	104.21		8.40	3.30
12			5.00	104.31		8.50	3.50
11			4.40	104.91	109-31	8.60	4.20
10	4.50	5.10 hub		104.81	109-31	9.310	4*21
9			5.38	104.53		9.41	4.03
8			5.70	104.21		9.51	3.81
7			5.82	104.09		9.61	3.80
6			5.70	104.21		9.71	4.00
5			5.68	104.23		9.81	4.13
4			4.61	105.30		9.91	5.30
3			5.16	104.75		10.01	4.85
2^{+81}						Ditch 101	
2			5.35	104.56		10.11	4.76
1			5.40	104.51		10.21	4.80
			5.18	hub 104.73			
0 -	9.91 on pipe				109.91	10.31	5.13

grade raised 5/100 ... for 5" pipe



31	4.17	4.17	106.77 ✓	100.94	8.23	4.06 ✓	
30		3.98	106.96 ✓		8.40	4.42 ✓	
29		420	106.74	✓	8.57	437	
28		4.32 ✓	106.62	✓	8.44	4.42 ✓	
27		466	106.28	✓	8.91	4.25	
26		4.20	106.74	✓	9.08	4.88	
25		5.83	105.11	✓	9.25 ✓	3.42 ✓	
24		7.20	103.74	✓	9.42 ✓	2.22 ✓	
23		6.92	109.02	✓	9.50	2.58	

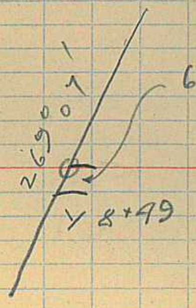
31		4.17	4.17	106.77 ✓ and	100.94
30			3.98	106.96 ✓	
29			420	106.74 ✓	
28			4.32 ✓	106.62 ✓	
27			466	106.28 ✓	
26			4.20	106.74 ✓	
25			5.83	105.11 ✓	
24			7.20	103.74 ✓	
23			6.92	109.02 ✓	

Dunbar M
548-M
Richard Stender 799-M

Line #5 Cen.

RR m grde	Cut
8.18	4.01 ✓
8.28	4.30 ✓
8.38	4.18 ✓
8.48	4.16 ✓
8.58	3.92 ✓
8.68	4.48 ✓
8.78	2.95 ✓
8.88	1.68 ✓
8.98	2.06 ✓

note at 5.40 400' to 26.NE



#4

π-	Pt	Az	Vert		Stadia
	15	272°14	31′ S −33°21		
14					
	14	272°14	21½′		
3 -					
	12	270°			
4.					
	4				
3-					
	3				
	1		V angle		
	11	191°28	18°50	5	5.29
	10	317°25	-2°30	4	7.1
	9	317°	-3°27	9	6.3
	8	313°26	-5°30	5	6.40
	7	301°20′	-8°45	6.1	6.93
	6	260°04	-16°30	6	6.45
	- 5	202°05	-13°06	6	6.58
2 -					
1 -					

6. 658

G

Benson-Bear Lake Irrigation Co
10/10/16

83
157
240

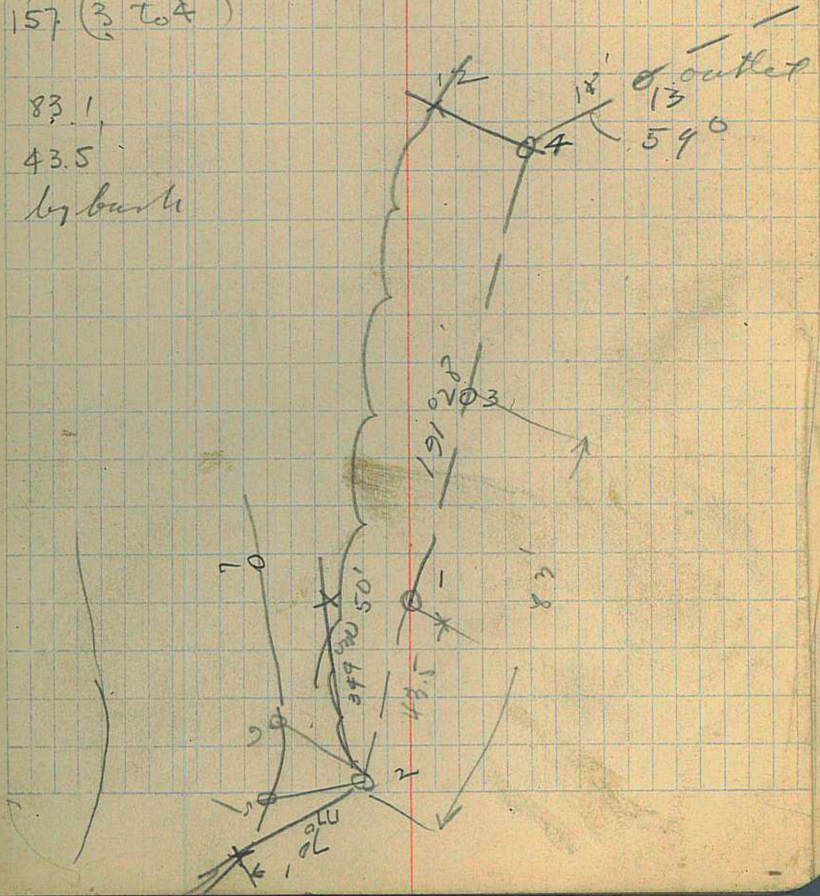
-33°21

27 RR at 14 - 4.57. HI at 14 - 4.55
HI 4.8

27′ to brass label

157 (3 to 4)

83.1′
43.5′
by bush



10/10/16

	BS	FS	[illegible]	Ele	HI
	10.89			100.00	110.89
	10.40	0.74		110.15	120.55
2			5.80	114.75	
BM			2.42	118.13	
1		1.03	~~119.52~~	119.52 ✓	
1	11.45			1	130.97
3			8.5	122.47 ✓	
4		4.85		126.12 ✓	

on Bear River [illegible]

on stake

on stake by post blazed

Π - Pt	Az	Vert	∠	Stadia	
20	269°35'		6.94	7.12	
19	303	0		10.60	11.32
18	323°07	0	7.35	7.93	
17	347°45	0	6.90	7.95	
16	6°	0	5.85	6.43	
15					

0 6.43 5.85

Benson-Bear Lake Alligator

2

20
15
166
26
3,00

Water edge

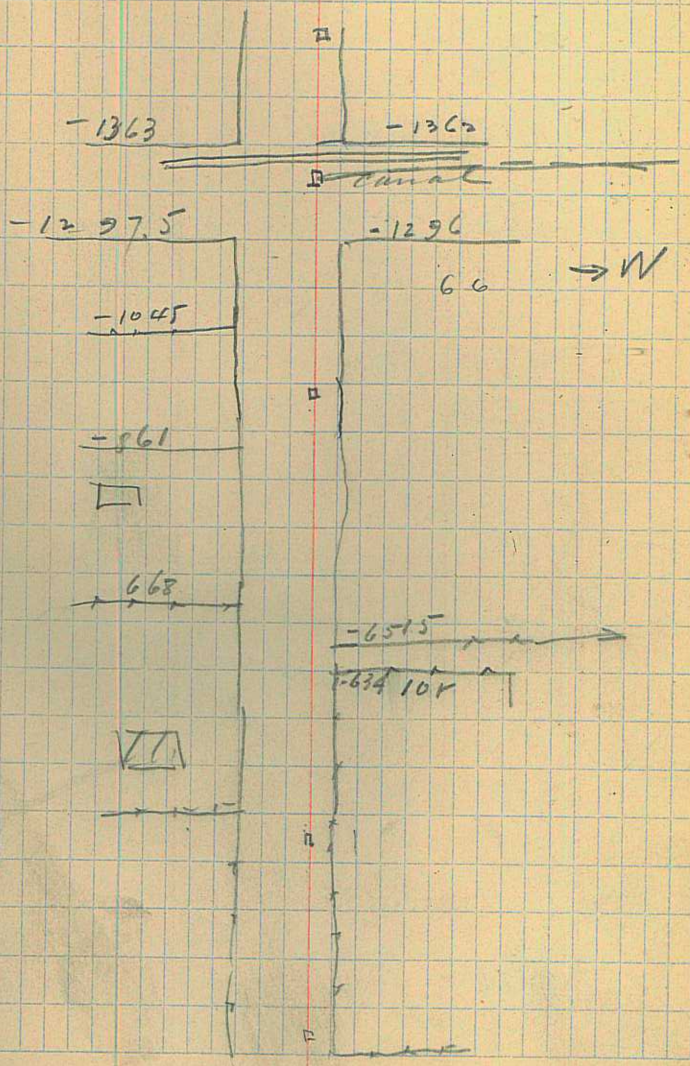
H

Topo. Surv. Benson - B.L. Jr

Λ-Pt	Dist
Y-	1490
Y-	1344
Y-1000	
Y-473	
0-0,	

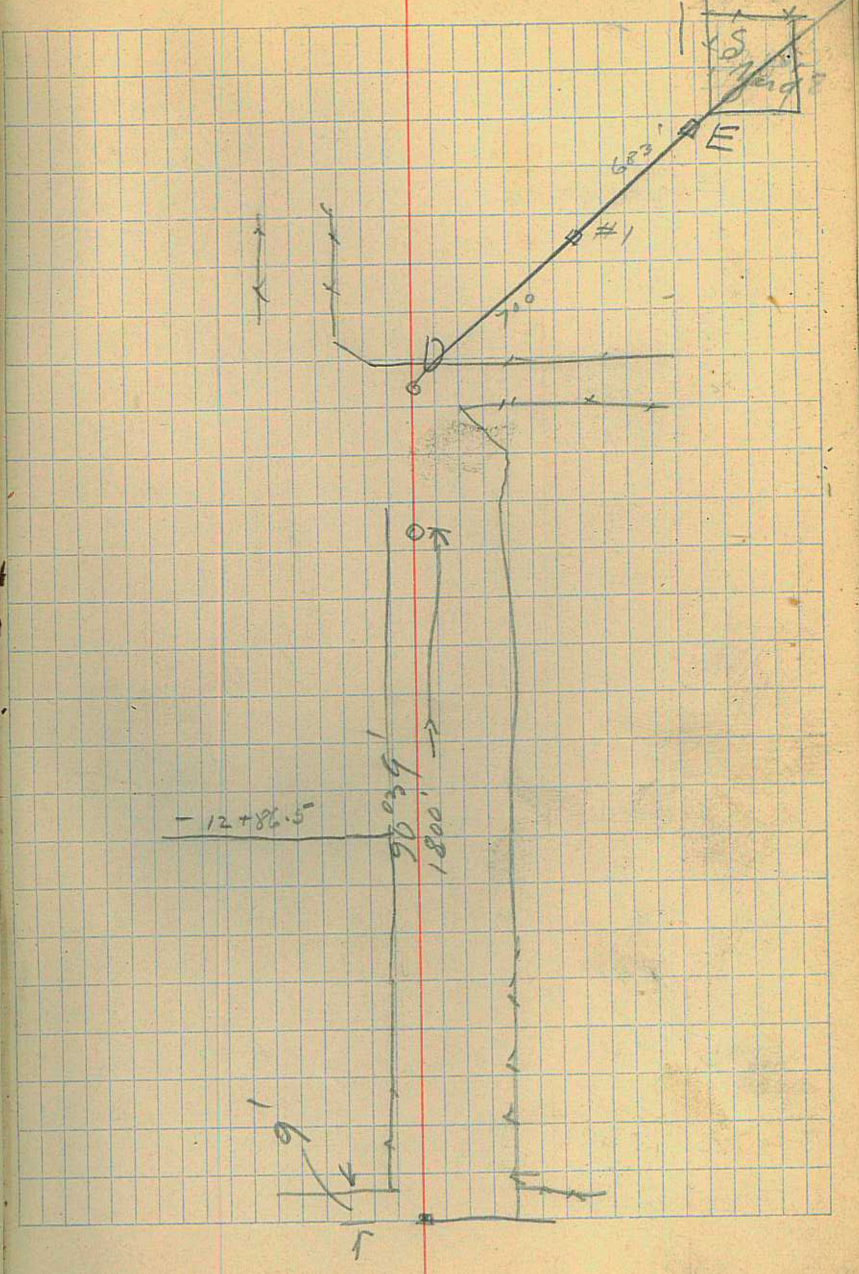
11/13/16

56

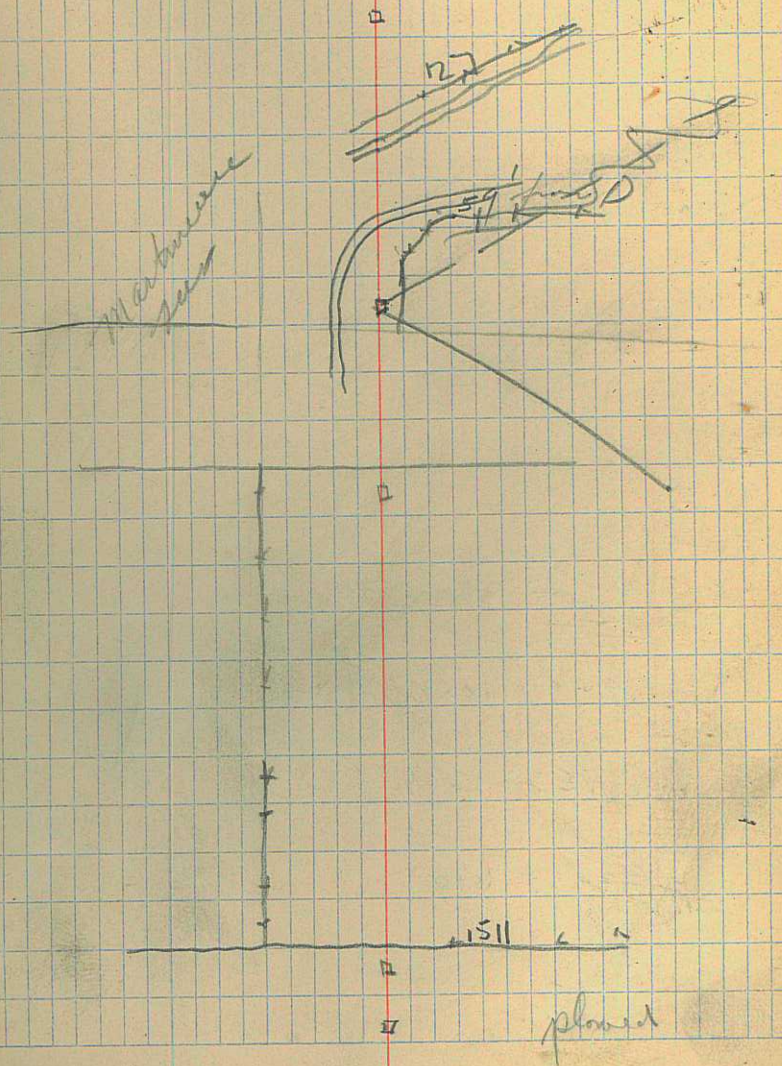


	# or letter	Az	Dist
	3		1000
	2	180°	500
E			
	E		1383
	1	130°18'	700
D-			
	D	90°39	2897
	C	90°39	1800'
		90°39	
Y-1344—			

1383
700
683



⊼ - Pt	Az	Dist
F	359°48'	200
	359°48'	
D-		
9	180	4175
8		3560
7	180	3000
	~~18~~	
6	180	2500
5	180	2000
4	180°	1508
3	180°	1000



T - Pt	∠	h Dist
13		
12	334°53 ✓	1800
11	339°53 ✓	1200
10	339°53 ✓	600
F -		

6488
188

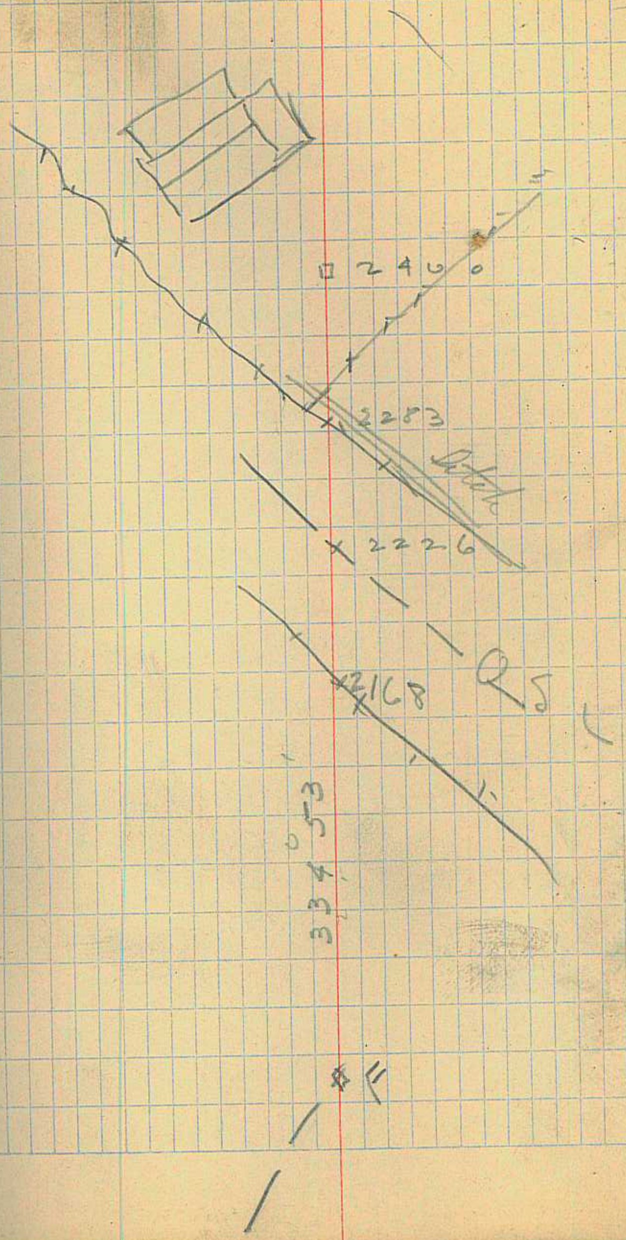
9 / 7235 60 / 4300 88

334 53
270
64 53

✓

24.5 00 9/550

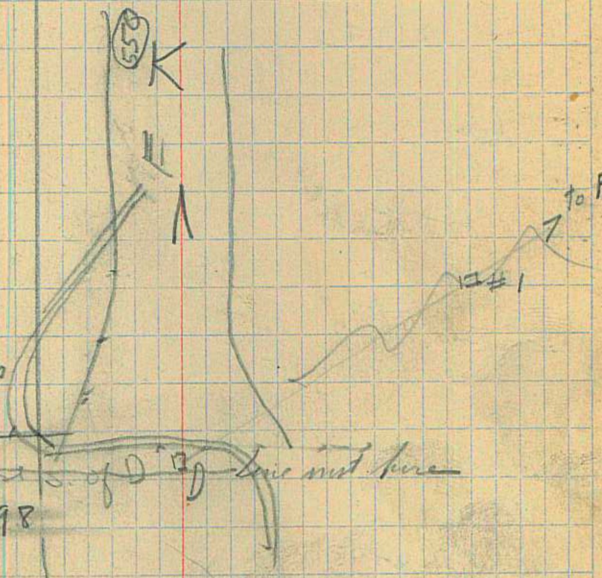
365 51
70 10
295 41



			Center	Stadia	
⊼	Az	BS. FS	F.M	L	U
1200			4.90		
	176		3.80		6.3
1095	×		5.80		
	153°35		5.00		8.80
D1467– 1.0 00		6.27 6.26 4.12			
	228°10		3.5		7.30
806	90+		3.8		
	223°15		2.90		6.2
600	90°39+		5.20		
483	90°39		4.85	4.50	
	213		4.6		7.5
D	199°50		4.5		7.1
	186°45		4.6	~~8~~	8.00
367'	~~186°~~		6.2		
	165°30		5.2	3.8	
	156°10		6.1	3 4	
	147°15		4.5	1.6	
	139°30		6.00	2.85	
61'			6.6		
32			5.00		
32	131°		5.75	2.0	
D			1.00		
–D550–	–0.1 m BM				

D_b = Base instrument

Ele	HI
116.24	
117.34	
115.34	
116.14	
114.87	121.14
115.48	
115.18	
116.08	
113.78	
114.13	
114.38	
114.48	
114.38	
112.78	
113.78	
112.88	
114.48	
112.98	
112.38	
i ¼ swamp	
113.98	
Cama	
113.23	
BM on nail in Post S. of D — Line ends here	
117.98	
119.08	118.98



4763

⊼	Az	BS	FS	Center or 1 M	L	V	Ele	H.I.
100	~~205~~ 285°20			3.5		5.8	123.87	
G39				3.9			123.47	
	221°45			1.9		4.6	125.47	
go West called G0	269°50			2.50			124.87	
		2.46	3.89					
at Y473 = ℄		2.45	3.90				124.91	127.37
G2380 Y1000				4.92			123.88 from	
				3		4.95	125.80	
Y1344	0			5.92			122.88 mea	2895
	136°45			6.4		7.5	122.40	
		4.81	1.69					12880
	15°44 →	4.80	1.70				123.99	
							120.48 bot canal	
? ~~Y1000~~	202°35			5.20		7.9		
	201°40			2.80		5.50	122.88	
2764				4.80			120.88	
2600				4.1			121.58	
2400				5.40			120.28	
	158°10			5.75		8.45	119.93	
2200				5.5			120.18	
	138°20'			6.8	4.4		118.88	
D2464 2000		7.16 7.15	2.62 2.63				118.52	125.68
	219			3		6.1	118.14	
1864	90+			2.2			118.94	
1800				3.8			117.34	
	203°45			2.1		4.9	119.04	
1600				5.10			116.04	
D1400				5.00			116.14	

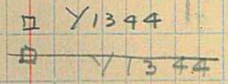
Cor. values

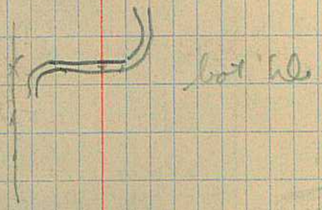
Beg at Y41 — west az

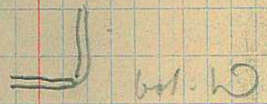
cy az. 89°50'

x 5' — level to road in road

Y1000 3 0 slope -15 to 0.5 along road

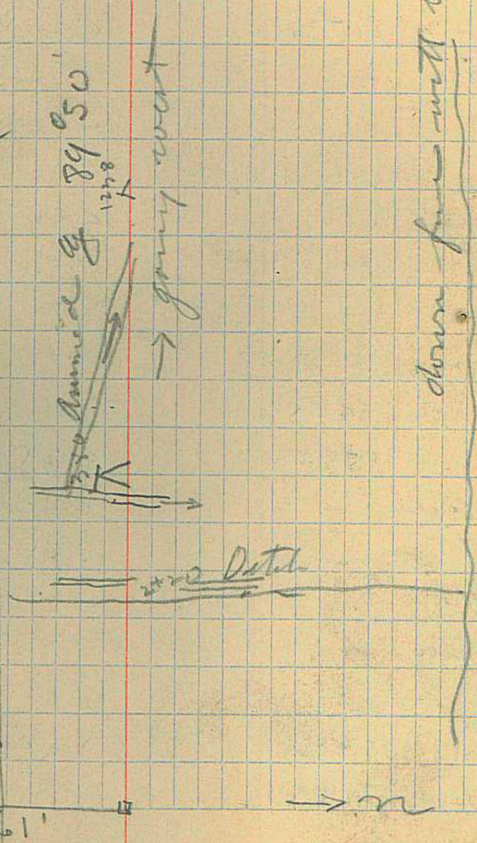




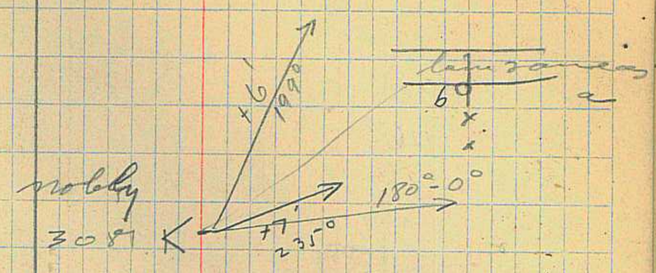


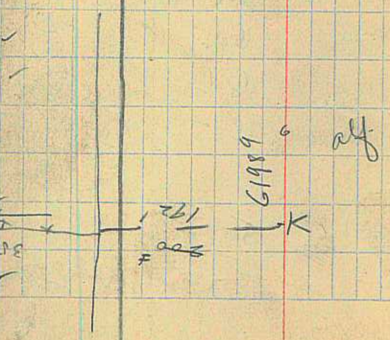
⊼	∠	BS	FS	I	L	U
109	226°30	3.81 3.80		3.5		6.60
G 1989 G 1600			8.48 8.49			
				7.5	5.1	
G 1400	155°			6.6		
108	177°45			6.1	4.00	
G 1200	269 50			4.6		
107	195°50			5.25		7.50
S.D 1153				4.3 gr 5.16 m bot		
106	209°15			6.95	4.5	
G1000	269 50			5.50		
105	227°10	3.43 3.42	5.99 6.00	5.9		8.80
G 1238 — G 800				6.800		
G 778 D				7.00 m D		
104	136°30			8.5	5.5	
G 600				5.60		
103	148°30			7.6	5.1	
G 400	~~148°30~~ 0 89°50			5.20		
G 393 D	89°50			6.2		
102	167°			6.50		8.7
224 D				3.70		
F 220						
G200	269+			3.90		
101	191°			5.25		7.3
G168	269+			5.30		

Ele	HI
116.64	120.14
116.33	
117.31	
118.21 going	w
118.71	
120.21	
119.56	
120.51 119.71	124.78
117.86	
119.31	
118.91	
121.38	124.81
120.57	127.36
120.37	
118.87	
121.77	
119.77	
122.17	
121.17	127.36
120.87	
123.67	
123.47	
122.12	127.36
122.07	Y473



Δ	∢	BS FS	C or I m	∟	∪	Ele	HI
120	149°30		5.2		8.0	113.21	
3400	89°50		5.40			113.01	
119	159°10		6.9	4.3		111.51	
G3200	89°50		5.80			112.61	
118	178°15		6.5	4.1		111.91	
117	193°10		5.90		8.2	112.51	
G3000			3.800			114.61	
116b	204°35		3.5		6.1	114.91	
115	215°30		4.40		7.2	114.01	
2888							
2863 F			~~4.40~~		~~7.2~~		
114	226°35		3.70		7.00	114.71	
G2800			4.80			113.61	
113	233°35		5.90	5.40	9	113.01	
G3081		4.86 4.85 4 6.59 660					118.144
2600	89°50					113.55	
112	141°50		6.1	3.30	?	114.04	
111	155°20		4.25		6.80	115.89	
2400			6.60			113.54	
	missed		5.25		7.50	114.89	
2200			6.6			113.54	
G2000	89°50		4.9			115.24	
			2.80		5.20	117.34	
G1800	269°50		4.00			116.14	
110	219°40		4.75		7.50	115.39	





Δ	∡	BS	FS	C ∡ In	L	V
	130					
	116°					
	7°					
	34°50					
	68°07					
	90°					
E						

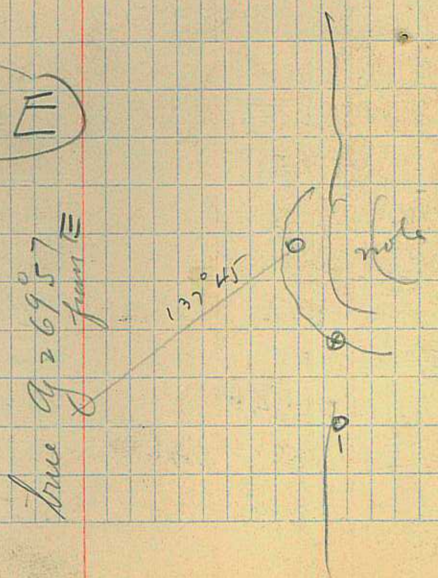
---

on BM by D		6710	1.200 4.14 4.15			
on #1				3.91		
		3.39 3.38	4.09 4.10			
3950						
125	118°			6.00	1.30	
3870	89 50			3.8±		
124	124°50			6.6	2.50	
3800	89°50			6.6		
123	130°15			6.5	2.80	~~2.~~
122	137°45			3.8		7.00
3600	89°50	$1		5.8		
121	142°			7.15	4 ✓	

Ele	HI		Slope
		for 2000'	-18'
			-14
			-3'
			-9'
		to ℄ of Carlson Ech	-13'
			-14'

Ele	HI
✓ 119.08	
113.57	120.28
113.80	
	117.71
114.32	
112.4	
114.61	
entering [illegible]	
111.81	
111.81	
111.91	
114.61	
112.61	
111.26	

also E

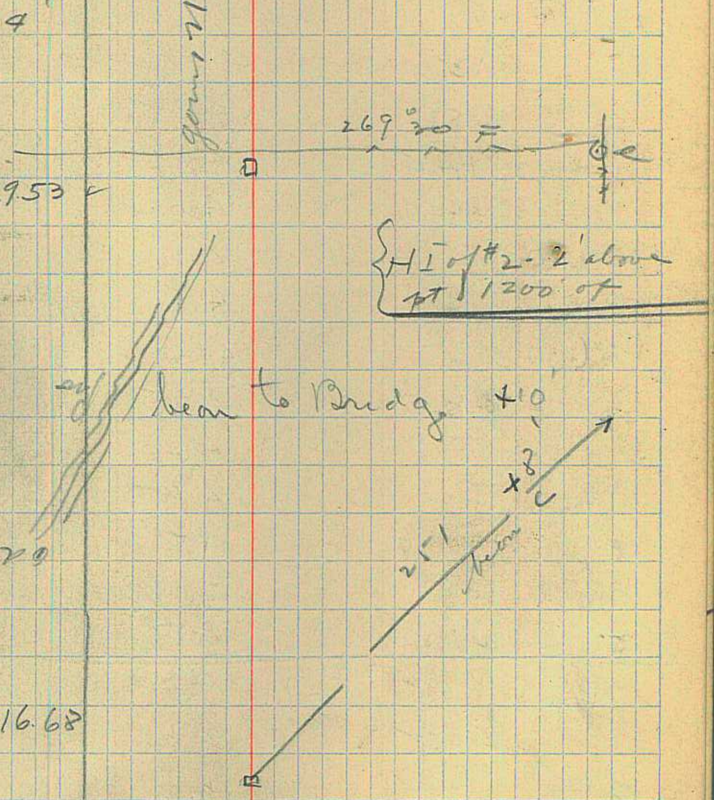


	Ang	BS	FS	C & Im	L	J
E1600				5.30		
	89°30					
	245°50			0.VL		
				3		
#4 R				4.80		
	255°20'			6.00		
E1400	0°			4.9		
	263°20			4.00	~~1~~	~~6.2~~
E 1200	~~263°20~~			5.00		
L	273			2 (5+47)	~~R~~	7.5
	273°			6.7	1.5	
λ	16°45			4.00		8
4 —	from 4 282°3			5.30	0	
3	180	5.06	2.21	~~2.21~~		
	166°					
E800				2.400		
E600	180°			3.5		
	240°30'			3.2		9.00
L	251°			2.10		7.70
2				4.9		
E400				4.3		
	257°			3		8.50
E 200	0°			2.00		
	266°40			1.9		7.2
E		2.36				
2 —						

1 6.5
1

7.8
1
6.80
13.60

Ele	HI	
114.23	✓	
		−39'
116.53	✓	
(1360)		slope Be +9'
114.73	✓	
113.53	✓	
(1100)	✓	slope beam +9'
114.63	✓	
115.53	✓	
(1040)		slope beam +8'
114.5		
118.85		
slope	+4'	
112.73	✓	
115.53	✓	
114.23	✓	
	11,9.53 ✓	
114.47	✓	
114.28	✓	
113.18	✓	
113.48	✓	
114.58	✓	
111.78		
112.38	+9	
113.68		
114.68	✓	
114.78	✓	
114.32	116.68	



{HI of #2 - 2' above pt 1200 of

⊼ —	g ~~BS FS~~ BS FS		c Im	L	J
#8			4.85		
	277°05		4.00		9.2
3400			4.20		
	286°30'		3.80		9
	314°40'				
E3200	0°		4.500		
	274°25		2.30		8.1
#8—					
E3000 #7		4.60 4.40	'		
	135°				
	83°				
	114°15				
	246°40		4.00		
E2800			4.1		
			4.1		
E2600			4.60		
6 = E2500			4.75		
Q			4.20		
E2400			4.9		
	273°15		1.5		
E2200			5.100		
#6—	286°14'		0.8		
~~on #5~~ = E2000		4.90 7.1			
	240°55		4.30		
E1800	180°		6.70		

8.c
3
562
2
1126

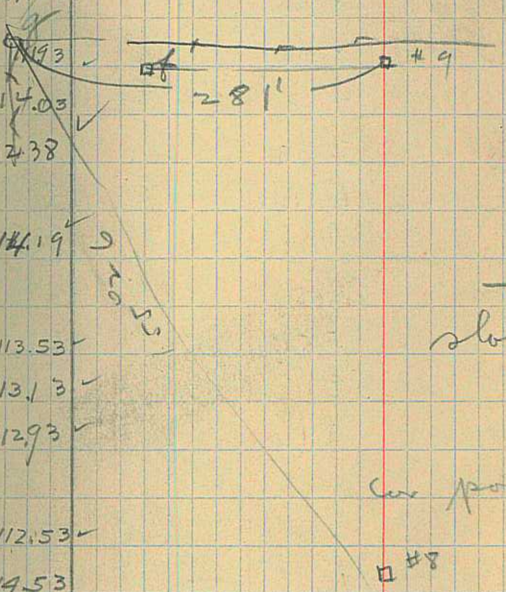
112.68	-		
113.53	✓		
113.33	—		
113.73	✓ —		S= beam +11
			+5 to CR
113.03			
115.23			slope beam — +12
112.93	117.53 -		
			-8'
			-20
			-20
113.33		1120	+10 beam
113.23		~~1120~~	
113.23	✓	1100'	slope +10'
112.73	-		
112.58	✓		
113.13	✓	1080 to 420	slope beam +12
112.43			
115.83	✓	1060	Slope — to Road + 12'
112.23	-		
116.53	-	1100'	+ 9' beam to Co. Rd. Slope
112.43	- 117.33		
115.23		1000'	
112.83			

⊼	∡	BS	FS	C or 1m	L	R	Ele	H.I.
	205°			7.7	4.3		109.83	
	103°20'							
	218°06			4.9		8.6	112.63	
	343°00							
	227°15			4.1		7.6	113.43	
	231°05'			3.0		7.9	114.53	
	236°30'			2.0		7.6	115.53	
q	155°26			6.45			111.08	
‡ f	161°56			5.60			1[illegible]93	
	239°09							
				3.5		8.5	114.03	
#9 E 4174			5.15				112.38	
				4.00 5=+2		9.50	114.19	
	151°53'							
	255°30'			4.00		9.00	113.53	
E 4000				4.40			113.13	
E 3800				4.600			112.93	
	155°26							
E 3600	180°			5.00			112.53	
	266°55			3.0		8.3	114.53	
	277°05			2.05	2.62		115.98	
	277°05							

-13 over Wat[illegible]

To Bairn + 3' near OSL

tie on M. Sem



-8'

slope 2000 +10'

Cur post Mart. Sem

33 4 53
270
64 88 3
18
0 8

9
72 10

365 51
72 10
293 41

365 51
293 25
72 26

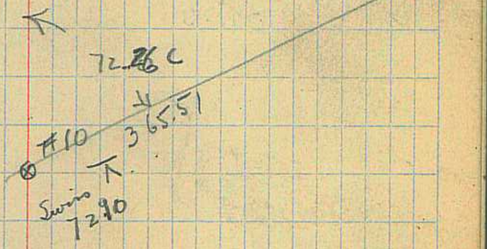
⊼	Az	BS	FS	C or im	L	U	Ele	H.I.
ab	128°05			3.85		6.50	115.97	
103 – 10-2	90	5.80			3.2			119.82 from 2 pt
~~10~~ 10-2			7.00	8.30	4.50	11.5	114.02	
Dm	156°35			5.8		8.8	115.22	
#11	164°14			0.95		3.75	120.07	
	56°54			6.90	4.1		114.12	
TP	90			7.10	4.57	~~4~~	113.92	
ab	171°34			1.95		3.60	119.07	
	40°26			7.75	5.2		113.27	
	90°			8.32	7.3	~~7.3~~	112.70	
	90°			8.3		8.5	112.72	
	21°34			8.2		11.00	112.82	
	270°			4.12	4.02		116.90	
10	270°			5.30	4.80	5.80	115.72	
	196°25			6.10		6.80	114.92	
	335°50			8.90		11.3	112.12	
	319°45			2.15		3.70	118.87	
	334°30			5.50		8.50	115.52 w edge swamp	
#9	326°58			3.10		6.32	117.92	
	330°30			2.70		5.80	118.32	
Bm 10		1.94					119.08	121.02
10-1-								

Note ass. N pt here

Jong E line #10

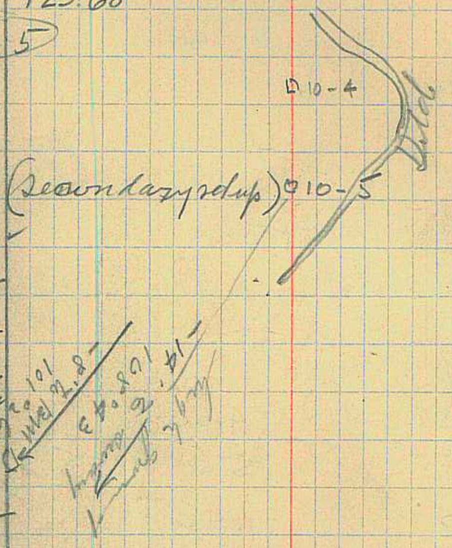
~~275~~

assumed 270°



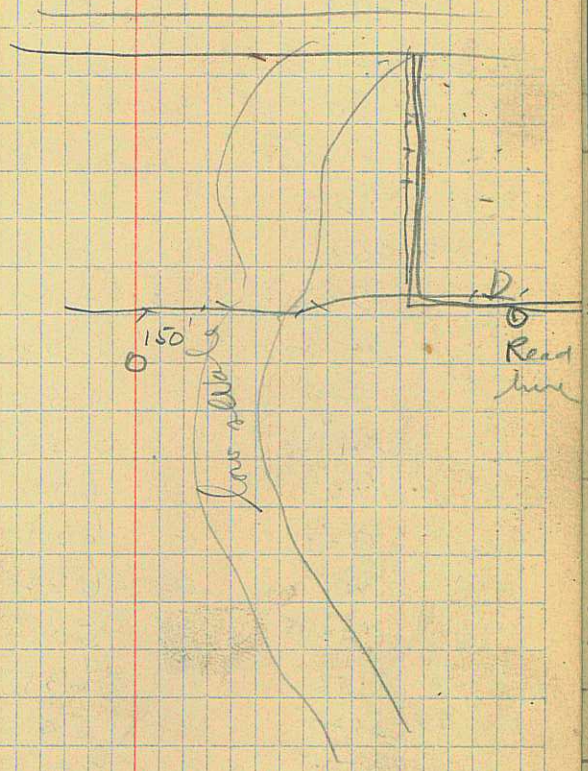
X̄ –	g	BS	FS	C or m	L	U		
ct	187°25'			2.00		4.75	121.68	
	19°15'			7.2		10.23	116.48	
	166°			5.00		7.70	118.68	
	90°			4.32		5.01	119.36	
hlm	26°55			9.65	6.30		114.03	
	153°24			5.00		7.95	118.6.8	
10-4	90	6.55		6.55	5.41		#1-8	123.68
10-6-							HI 5	
10-4	90°			6.33	5.50			
10-5								
10-4 T.P.			2.695			5.58	117.13	
	213°50'			4.00		7.00	115.82	
hlm	338°10			6.10		9.2	113.72	
	201°35'			2.30		4.95	117.52	
ditch	270			2.08		3.9	117.740	
	270°			1.25		2.92	118.57	
hlm	352°37'			6.00		8.9	113.82	
	179°20'			3.10		5.30	116.72	
a	270°			3.		3.62	116.82	
ab	162°45			3.75		5.95	116.07	
	21°40			6.2		9.2	113.62	
	149°35			4.95		7.2	114.87	
	90°			6.35	4.65		113.47	119.82
hlm	31°20			7.9		11.2	111.92	

(second days setup)



(see over)

⊼	∠	BS	FS	C m	L	U	Ele	H.I.
TP	216°40	3.00				6.35		119.33
10-7								
TP	321°10		7.35			11.2	116.33	
	226°40			4.00		7.1	123.21 Mot	+25'
	270°			5.00	1.55		118.68	
[illegible]	325°23			7.40		11.00	116.28	
	212°35'			4.00		6.70	122.5 Mot	+18'
	270°			3.48		6.12	119.70	
	338°15			8.25		11.5	115.43	
	270°			7.80	6.2	6.2	115.88	
ab	204°05'			4.00		16.5	122.00 Mot	+ 16'
	270°			8.40		9.06	115.28	
[illegible]	353°			5.25		8.2	118.43	



⊼	g	BS	FS	C or Int	L	U
	90°			0.35		2.3
	352°20			10		12.85
	90°			6.30	5.22	
	333°			4.65		7.75
	320°10'			5		8.6
	270			4.02		4.5
25	263			5.20		7.3
10-9T 10-8T	270°	5.84			4.35	
10-8T	90		5.00			8.61
	41°15			4.60		5.5
	2°10			5.20		8.20
23	357°41'			4.60		7.60
	90°			4.40		6.80
	345°30			6.30		9.55
in ditch	90°			4.40		6.65
	337°08			5.20		8.6
	90			6.70	4.95	~~1~~
	322°10'			6.30		10.9
	90°			6.62	5.26	~~5~~
22	319°45			5.8		10
21	315°53			6.35		11.0
20	125			6.4		7.7
	270°			4.86		5.70
h	270°			4.55		7.60
g	177°50			4.00		8.3
10-7T						

119.82

116.15 +3 120.17

113.87

115.52

116.39 +6

116.15

114.83

120.17

114.33

114.73

114.13

114.73

114.93

113.03

114.93

5 wide

114.13

112.63

113.03 119.33

112.71

113.53

112.98

112.93

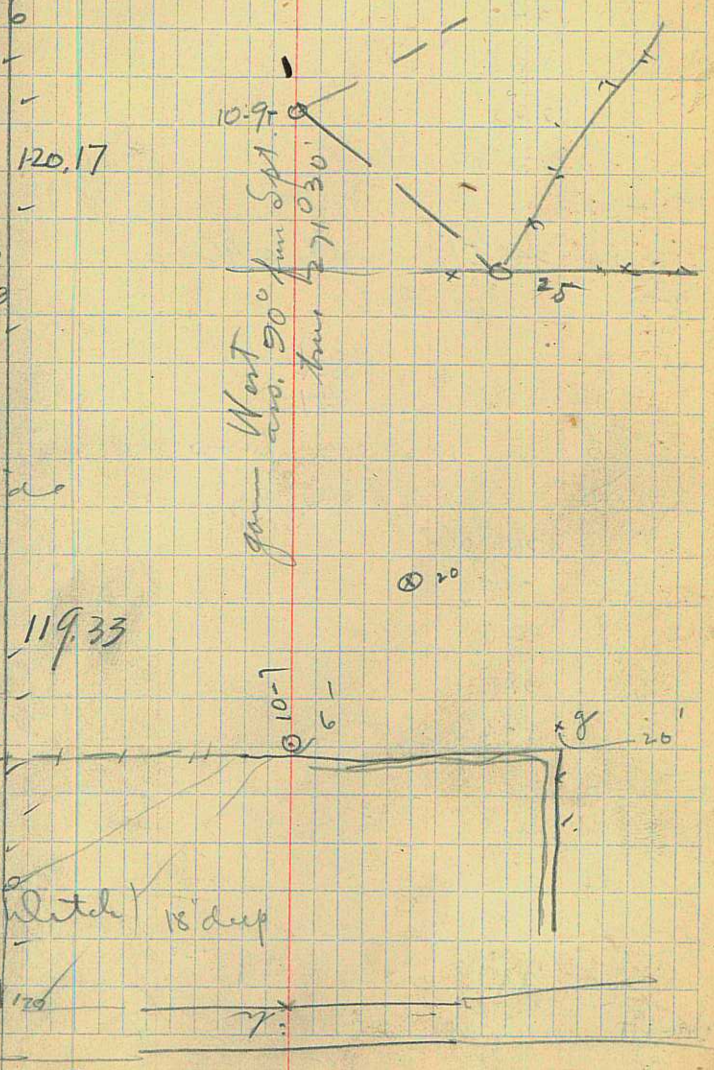
114.47

114.78 (in ditch) 18' deep

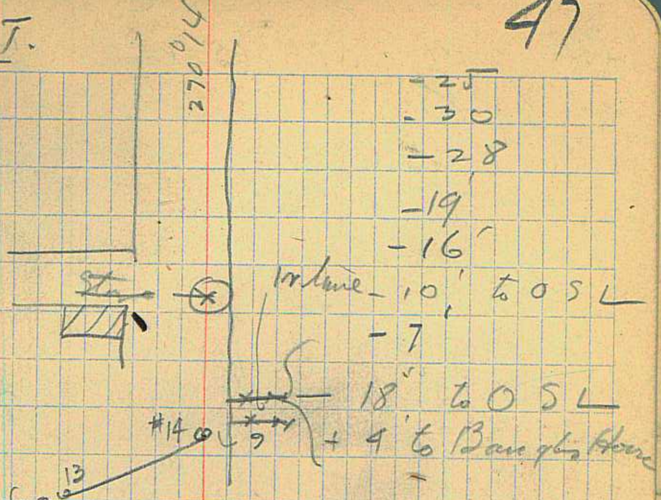
115.33

8.60

119.33

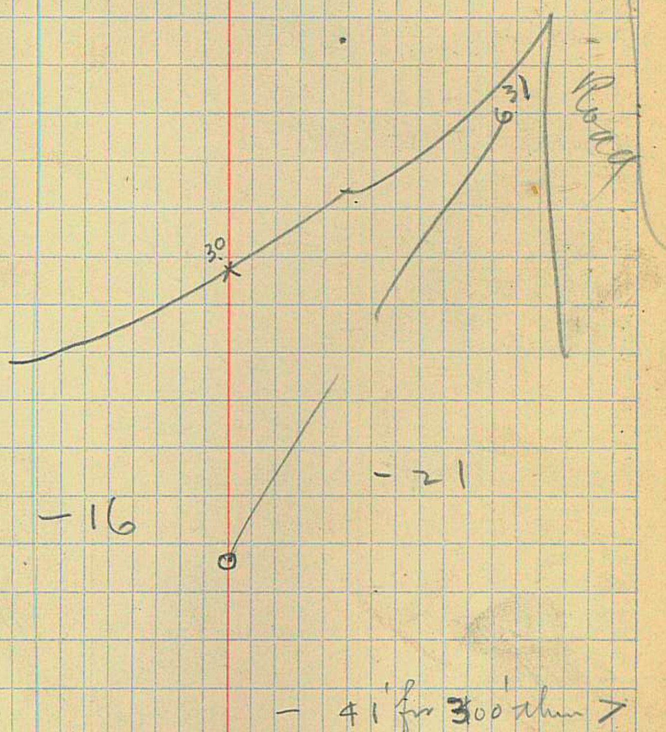


⊼—	Az	BS	FS	C or im	L	D	Ele	H.I.
	69 92°30							
	19°							
	6°							
	348°							
	284							
	323°							
	270°14							
14—								
14	348°56 ✓		4.96	4.96		6.40	122.64	122.60
13—		5.00					H I	5.00
								122.60
#11			353 ~~361~~				120.07	123.60
#13				6.00		9.00	117.60	~~117.60~~
~~#~~		~~3~~						
	300°30'							
	7°53'							
	26°							
	329°30							
	359°42 ✓							
#12—								123.60
		3.73	0.30				119.87	
# above 12				+10' 3.00		5.40	118.56+10	
	10°			9 +38		11.9	117.60 +38'	
10-9T								



to west side O.S.L ROW
-11'
-4'
-13'
-21'
0°
-12'

$\bar{\lambda}$ –	ʒ	BS FS	C or im	L	∪
31	107°				
30	90°				
<u>10</u> –					
	93°				
<u>12</u> –					



Ob on D 11/15/16

+⊙

⑪

	Az	vert L	time
Direct	35°11'	22°	2.40
Invert	36°03	21°22'	
mean	3537	21 41	
D	35°47	21°43	
I	36°41	21°02	
mean	36 14	21°22'30"	
D	36°23	21°25	
I	37°20	20°45'	
mean	36°51'30"	21 05	

Σ mean 36°14'10" 21°22'50" cor. fr δ = 21 20 25 21°20'3

Sub. 12' from all azimuths.

$$\delta = \begin{array}{r} -18^\circ\ 28\ \ 59.2 \\ -7\ \ 2.7 \\ \hline -18^\circ.36\ \ 26.2 \end{array} = \delta$$

$$Z = \begin{array}{r} 89\ 59\ 60 \\ 21\ 20\ 30 \\ \hline 68.39\ 30 \end{array} = Z$$

$$\sin \tfrac{1}{2} a = \sqrt{\frac{\cos \tfrac{1}{2}(z+\phi+\delta) \sin \tfrac{1}{2}(z+\phi-\delta)}{\sin Z \cos \phi}}$$

$$\phi = 41^\circ 47'$$

$$\begin{array}{r} 68\,39\,30 \\ 41\,47 \\ \hline 109\,86\,30 \\ 18\,36\,26 \\ \hline 2)\,91\,50\,04 \\ \hline 45\,55\,02 \end{array}$$

122

$$\begin{array}{r} 109\,86\,30 \\ 18\,36\,26 \\ \hline 2)\,129\,02\,56 \\ \hline 64\,31\,28 \end{array}$$

log cos 4555 = T. 842424

log sin 643130 = T 955578

T. 798002

log sin 68°39'30" T. 969148

T. 828854

log cos 41°47 T. 872547

2)T. 956307

T 978153

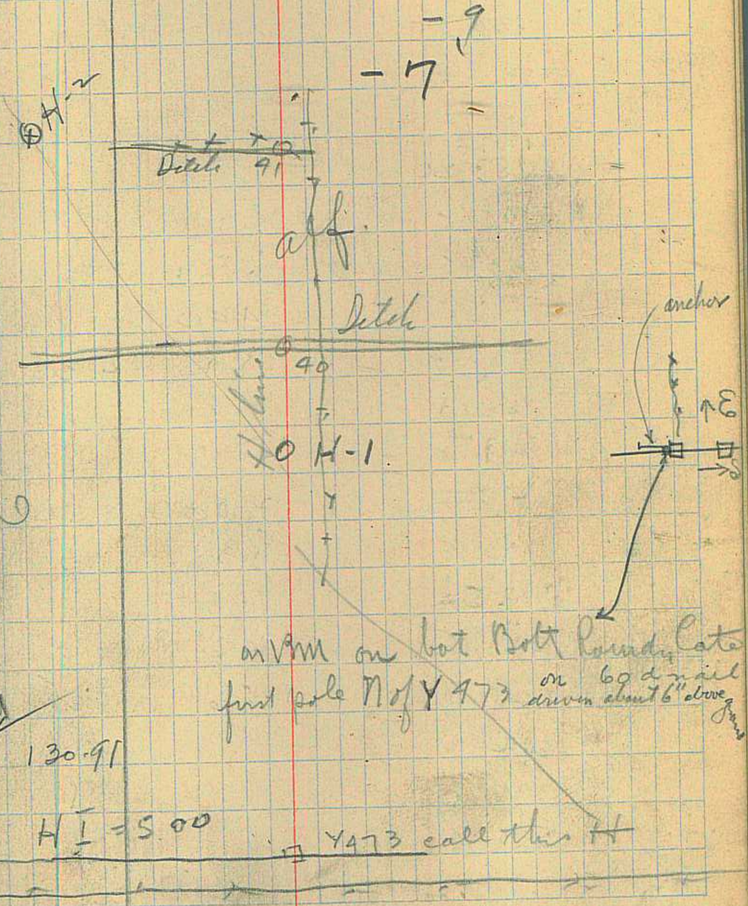
δ 3602W

$$\begin{array}{r} 17\,96\,0 \\ 71\,5\,9 \\ \hline 10\,80\,1 \\ 2 \\ \hline 21\,6\,02 \end{array}$$

= 71 59

⊼ Pt	Ag F→	BS	FS	C or Ch	L	( )	Ele	HI
H-2	243°35'	4.900	6.50			8.62	124.41	129.31 130.91
	270°			7.42	5.56		123.49 pump	
	327°			6.25		9.50	124.66 × 4	
	339°50'			6.1		8.95	124.81	
	220°15'			6.8	3.5		124.11	
	192°							
	179°15'							
	212°			5.10		7.95	125.81	
	356°12'			6.05		8.70	124.86	
	192°10'			6.1		8.6	124.81	
	22°10'			5.00	2.15		125.91	
	174°30'			6.00		8.50	124.91	
41	270°'			8.1	6.32	~~6~~	122.81	
	161°25'			5.8		8.3	125.11	
	270°			5.55		6.62	125.36	
40	270°'			6.78		6.1	124.13 bollard	
	27°02'			6.9		9.85	124.01	
	152°55'			5.10		7.80	125.81	
				4.54			126.37	
				5.69			125.22 on BM	
Y473	90	6.00			4.62		124.91	130.91

H-1



on BM on bot Bolt Roundy Cate first pole N of Y 473 on 60 d nail driven about 6" above ground

⊼ –	q	BS	FS	C or in	L	J	Ele	HT
	~66°25			4.46		6.12	124.83	129.29
	134°40			2.75		5.35	126.54 –	
	282°30			3.9		5.0	125.39 –	
	153°35			5.10		8.00	124.19 –	
	147°42							
	172°08			3.60		7.45	125.69 ✓	
	333°10'			4.67		5.22	129.62	
H/3								
H-3	1°07'0	4.93	4.95		1.90	8.60	124.36	129.31
46	157 20							
	325°05'			6.60	–	10.5	122.71 ✓	
	243°35			10.00	8.00		119.31 ✓	
	326°25'			4.40		8.85	124.91	
	229°30'			8.00	4.30		118.71	
	243°35'			7.6	8	8.9	121.71	
	226°30'							
	216°10'			7.00	4.50		122.31	
	243°35'			8.38	7.33	7	120.93 ✓	
	337°50'			7.65		11.65	121.66	
	263°15			9.2	8.18		120.11 ✓	
in bot 44	198°20			8.6	7.25		120.91	
	344°42'			9.9	6.00		119.41 ✓	
	335°20'			9.5	8.1		119.81	129.31
	352°39			6		9.6	123.31	
H-2								

To Co. Road – 6

HI 4.93

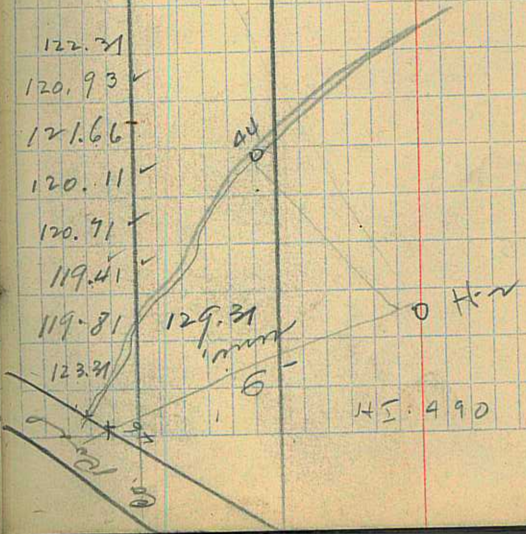
–11

– 9

–12'

–23'?

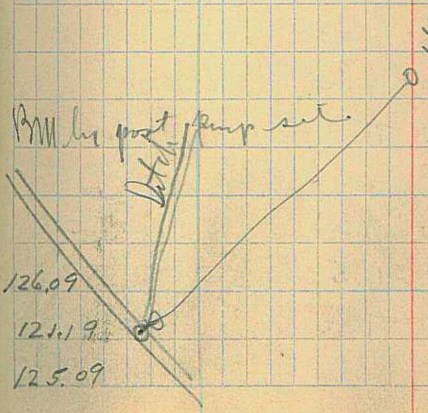
–23'



⊼	Z	BS FS	@ or cm	L	U
	270				
Y134V					
		10.01			
" ∆	243°35	1.35 2.50			4.4
# ∆ of pump	243°35		3.2		5.1
	108°48		8.1		11
	121°52		4.2		6.9

level

BM by post pump set.



Ele	HI
118.13	128.14
126.79	129.29
126.10	

∧ -	Z	BS FS Ele	C + m	∟	∪
	5°50'				
3pm	19°55'				
9pm					
		99.95	10.60		
	315°50	101.05	9.50	8.50	
	315°40	102.70	7.85		8.3
	325°40	101.51	9.04	8.02	
	310°12	103.36	7.19		7.4
	316	102.75	7.8		7.95
	349	102.85	7.7		7.2
	5°22'	104.05	6.5	5.70	
	176°50	103.55	7.00		7.50
15-					

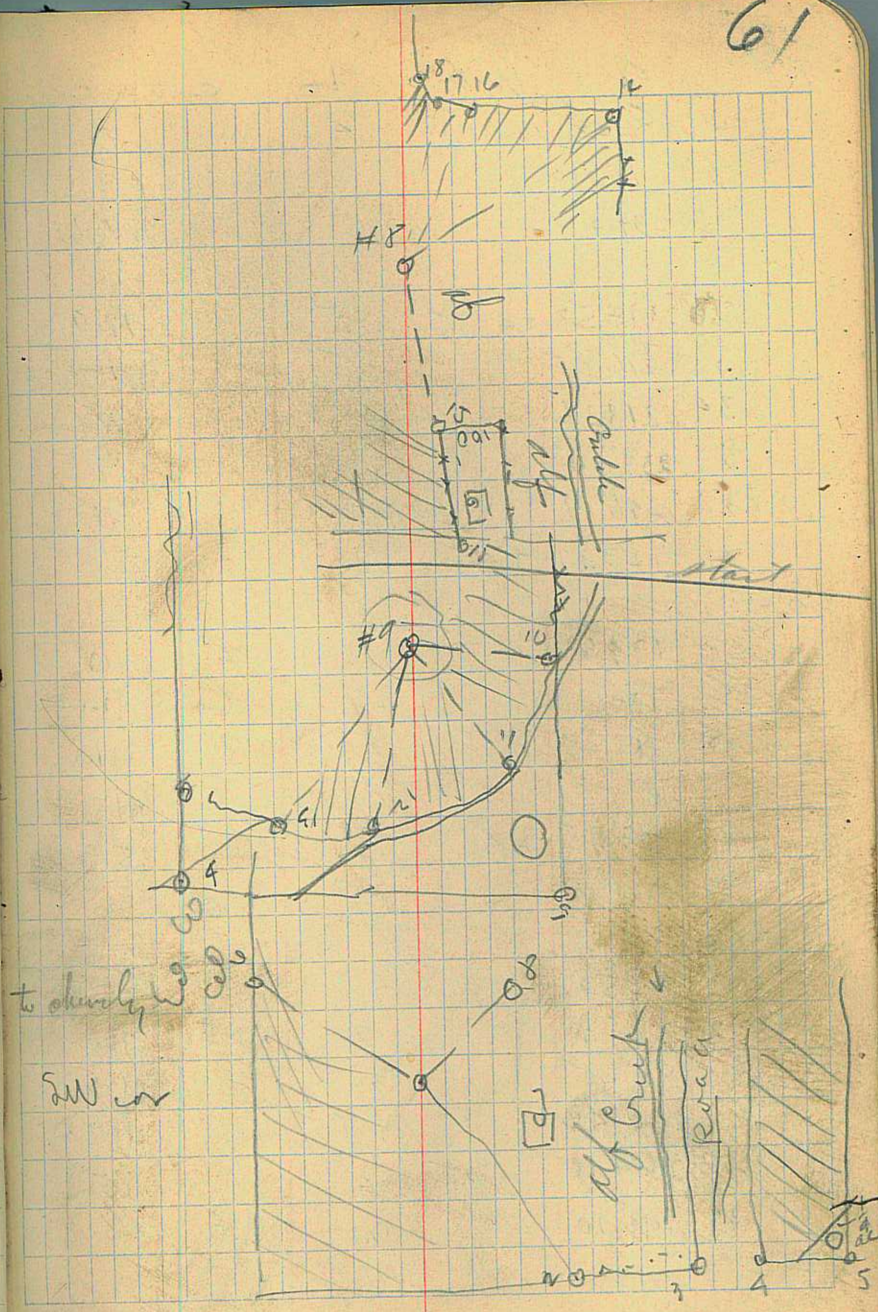
– 18' to Berry Barn

BS to H-4
on River

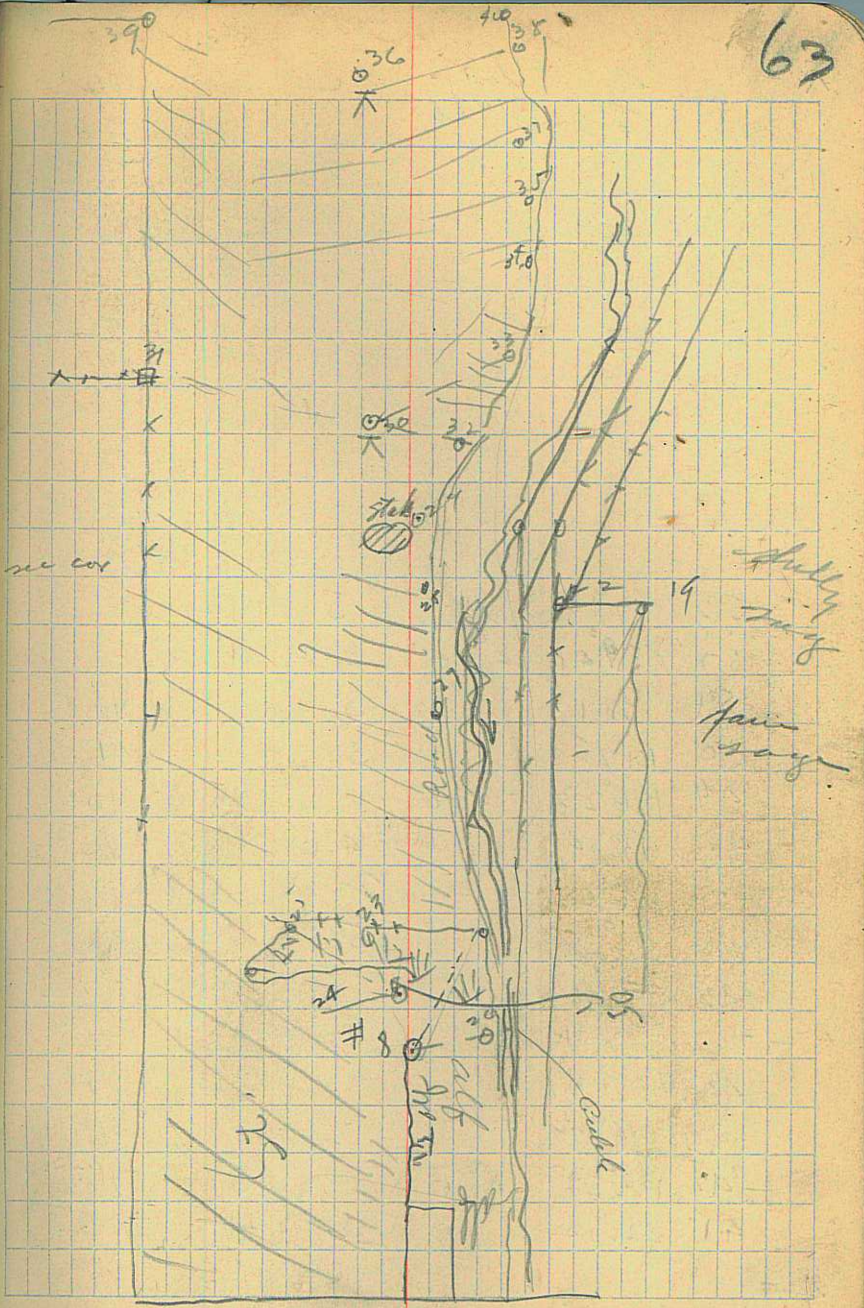
of pump stn H I 9.85

Survey for Gibbs near Arimo Idaho

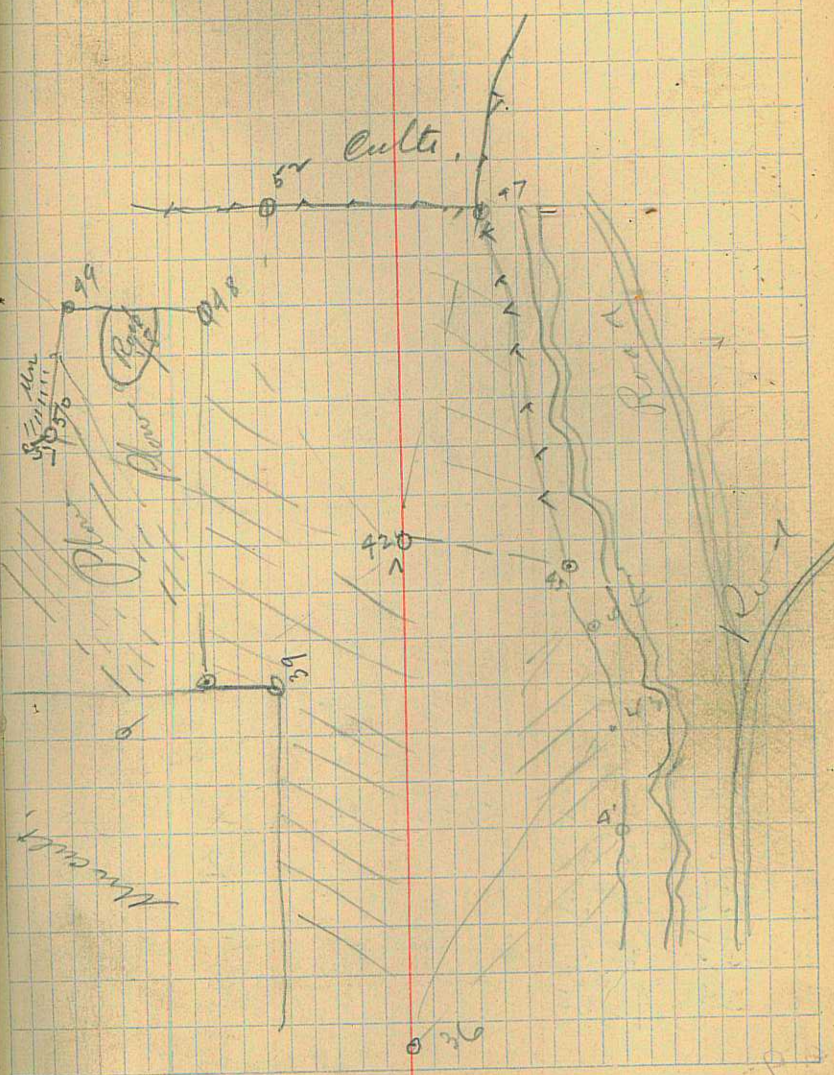
⊼ –	az	Vert ∠	∠	Stadia C	○
18	201°05		4		11.7
17	211°22		2		10
16	217°12		2		11.1
15	354°30				
14	224°08		1		11.3
8 –					
13	23°45		8		11.3
12	4°06		8		11.1
11	337°28	-6°30	10		12
10	272°	-6°50	10		11.54
9 –					
9	291°32'		5		11.1
8 –	x				
8	265°55	-6°20	8		11.52
7	316°53 -				
6	107°41	7°10	9		~~10.7~~ 11.7
5	298°30	2°50		5	11.3
4	310°18	-5°40	2		11.15
3	311°52	5°50'	3		11.9
2	318°20	-6°30	4		11.7
1 –					



				Stad	
⊼-	g	Vert	L	c	U
210	228°		4		11.0
39	155°18		1		11.0
38	234°40		5		11.6
36-					
36	174°58	+4°15'	5		11.9
37 35	211° 216°05		3 5		11.5 11.1
34	218°26		7		11.12
33	238°84		8		11.5
32	296°19		9		11.7
31	123°39	4°55	2		7.96
30-					
30	174°58			2	10
29	181°10'			6	11.15
28	182°48			8	11.6
27	189°55'		5		11.1
26	97°05	+8°	3		5.3
25	133°30		2		5.7
24-					
24	174°58		4		5.15
23	168°30'		8		11.1
22	184°45			6	11.5
21	200°40		9		11.9
20	264°10	-12°35	4		5.7
19	191°30		6	11.60	
8-					



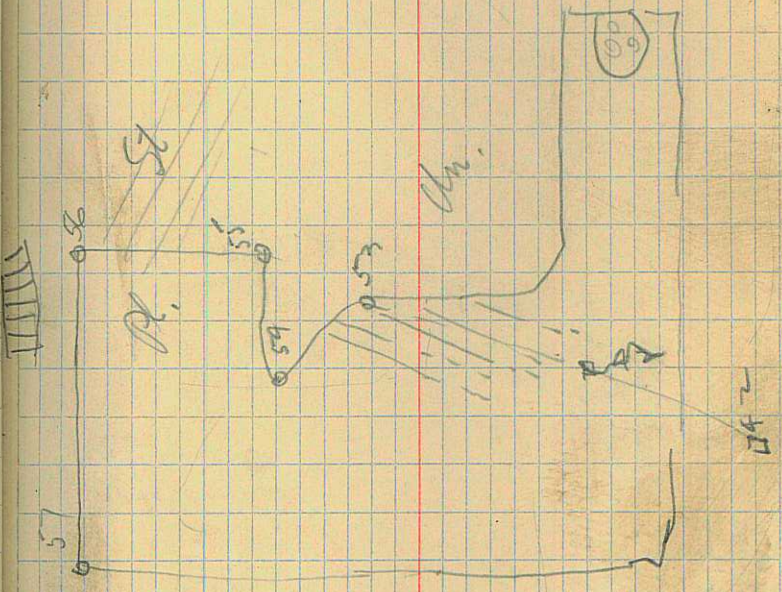
				Stadia	
⊼ -	Z	Vert	⌣	c	◡
53	97°10		5	11.2	
ne cur 52	159°41	2°30	6.00	11.22	
51	98°19'		3		11.7
50	101°25'		3		11.1
49	126°23	+2°30		5	10
48	138°04		4.0		11.5
47	186°08'	-2°45'	2		11.9
46	48°55'		5		11.25
45	~~45~~ 296°44	-6°		9	12
42 -					
44	209°30'			6	11.2
43	219°5'		2		11.4
⊼42	179°58	+2°10		5	11.7
41	221°12		3	4	11.5
36 -			~~3~~	~~11.5~~	

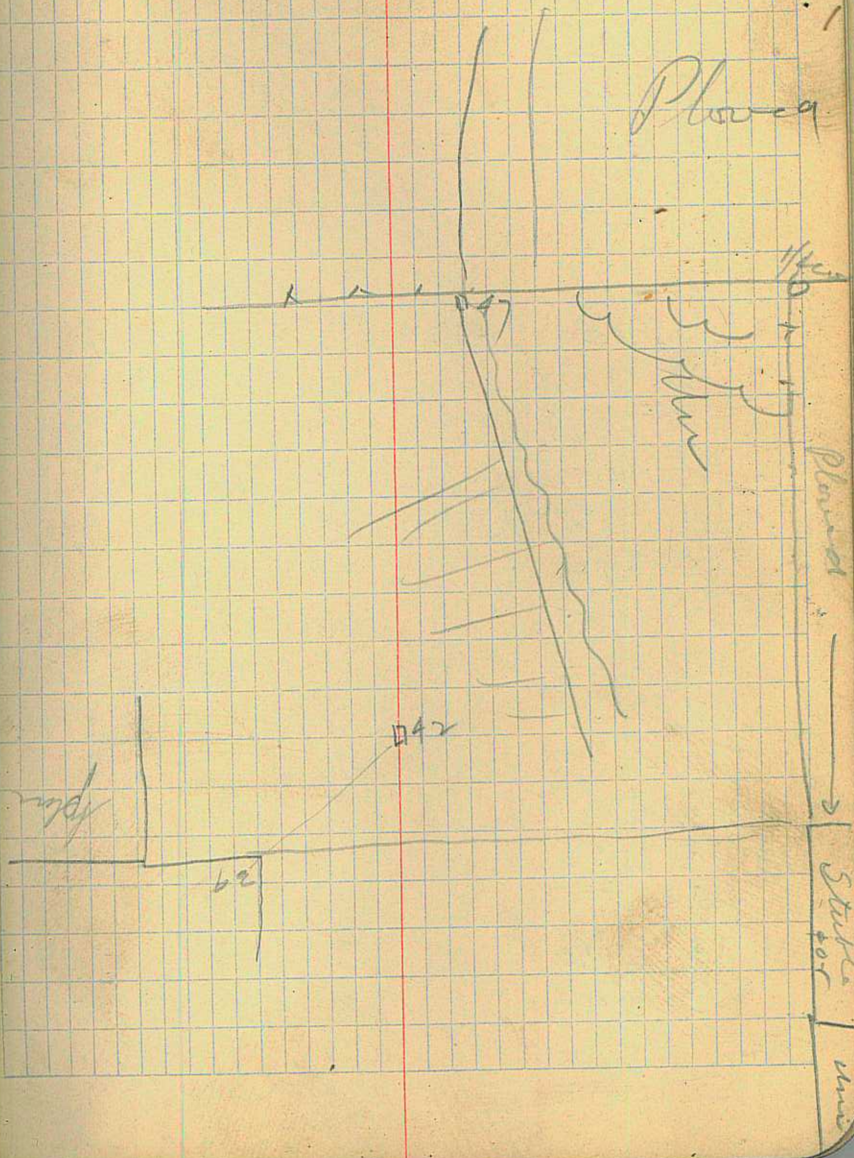


58-

x 58	120°14'	+3°50	4	~~4~~ 11.7	~~11.7~~
57	74°40			2	10
56	99°12			2	11.0
55	96°37			5	12.4
54	92°05			2	9.0°

42

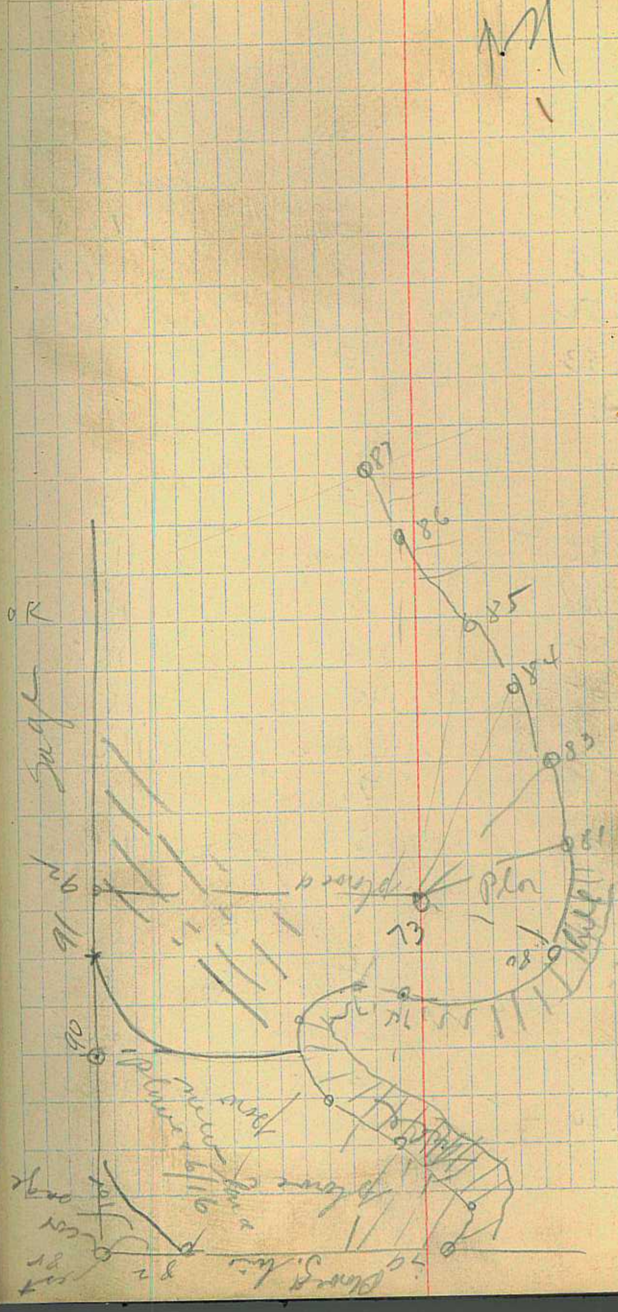



Plowed
047
Plowed
042
62
Stubble

⊼ -	Az	Vert ∠	∠	Sta ◡	◡
73 -					
73	90°20'	+4°20		7.00	11.35
72	73°39			6	11.0
71	68°25		2		12.1
70	61°52		2		11.9
69	72°48		5		11.3
68	39°30		3		11.9
67	107°15		1.0		5.70
66	29°			8	11.5
65	117°13'		7.0		11.0
64	43°50'		6		11.3
63	131°35		9		11.3
62	31°55		7.		11.4
61	165		10		11
60	29°30		2		5.25
59	3°40		3		5.2
58-					
58	120°14				

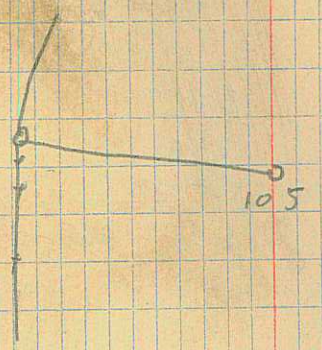
				Stadia	
⊼	Az	Vert	L	C	J
93	172°17			2	11.50
92	76°30		4		11.9
91	46°30		2		11.3
90	35°53			6	11.5
89	179°			4.	10
88	174°		1.0		11.2
87	170°50		5		11.9
86	175°50		7		11.7
85	193°20			9	11.0
84	213°30'		9.		11.95
83	235°07		8		11.1
82	21°40			5.5	12.0
81	250°20		3		5.2
80	292°25		10		11.75
79	337°10			4	11.55
78	339°35'			5	11.00
77	27°41'		7.00		11.50
76	37°50'		8		11.52
75	32°55'		10.0		11.65
74	358°25		10		11.0

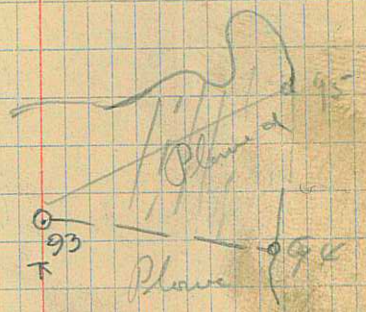
73 –



	92°35		8		11.38
	119°35		8		11.0
sec cor	161°50	-2°10		7.0	11.75
107	138°43		9		11.7
106	167		9		11.3
			~~8~~		
105					
⊼105	93°46	✓	8		11.1
104	133°30		8		11.36
103	157°54'		10		11.8
102	186°45		10		11.10
101	234°36		10.00		11.62
100	272°36		9.		11.0
99	282°44		9		11.85
98	281°11'		6		11.0
97	266°39'			9.	11.9
96	258°17'		5	~~5~~	11.30
			~~4~~		~~11.2~~
95	258°10'		4		11.2
94	283°20'	-5°	8	11.70	
93-					
93	172°17'				

27.5
5
1.375





needle N 9°30 E

11/29/16 Survey for Jim Baugh
on Preston Farm

6.30 5 6.35
5.7
60
75

⊼ –	Az	BS FS	C Ovr m	L	Stadia U	Ele	H I
(cor 2 post)	265°50						
	8°34'		6.95		10.9	119.69	
	8°10' ~~10.8~~		7.00		10.8	119.14	
	9°		6.59		9.80	119.55	
	16°		6.70	~~9.75~~	9.75	119.44	
	19°44		6.70	3.90		119.44	
	39°		6.70	4.60		119.44 ✓	
	58°30'		6.95	5.15		119.19	
	79°		6.65	4.45		119.49	
	96°23		6.30	4.10		119.84 ✓	
	57°40'		6.20	7.85		119.94 ✓	
	47°30						
	41°50'		5.85	6.9		120.29	
	33°25'		6.30	7.25		119.84 ✓	
	28°45		5.42	4.52		120.72	
			5.90	5.15		120.~~84~~	
	353 23		5.30	5.99		120.84	
	334°45		4.75	5.42		121.39	
	311°18'		4.06	4.70		122.08	
	266°03		5.700	4.65		120.44	
1 Ð –							

assumed ele for detail wr
to Canan E dam

H I = 126.14

105.70

on ~ Surface

⊼	az	BS	F	C or m	Ll	Lt	Ele
	303°07						
	89°15			5.		6.0	122.89
	141°50'			6.00	2/5	9.8 11.2	121.89
2 Post	168°28			7.00			120.89
	189°18'			7.00		8.95	120.89
	252°15'			5.50		7.05	122.39
	283°20			5.84		8.2	122.05
	306°19			5.52		8.2	122.37
	324°48'			5.80		7.45	122.09
6B ⊼							
~~6B~~ 2 Post	176°40						
11 6B	192°05'			6.75°0	4	7.85	121.14
4B -	295°	(300 from 6B)		9.50°0	11	+6°23 11.13 13	
4B	269°18		2.05	2.05		5.2	124.89'
5B	146°			6.90			120.04
	89°18			0° = 7.30	5.00	6.43	119.64
	93°10			7.26	6.30		119.68
(Post 2)	211°37			6.00		11.60±	120.94
	89°18				6		121.94
3B -							101.50
3B ⊼	~~3~~356°08		4.10	~~4.10~~	2	11.00	~~[illegible]~~
	285°30			4.25		5.50	121.99 120.44 W
	266°03			5.60		6.65	
1B							

11/29/16

HI =

James Baugh
of Benson

6.3
5
6

106.50
99.2
7.3

77

To AC spire

7.80 feet

(82 - 5.52) =

SE cor of Cannels
99±

HI 4.95±

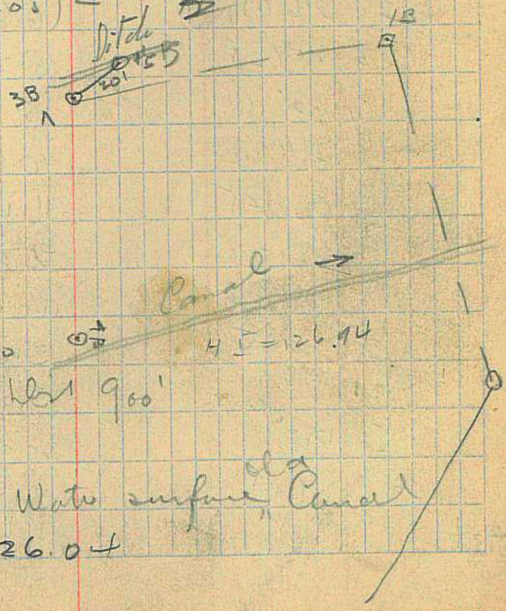
= 3.85'

HI = 4.80

HI 127.89

D = (5.20 - 2.05)²

Wdt 193'



106.50

HI 5.00

HI = 126.94

5.00 = HI

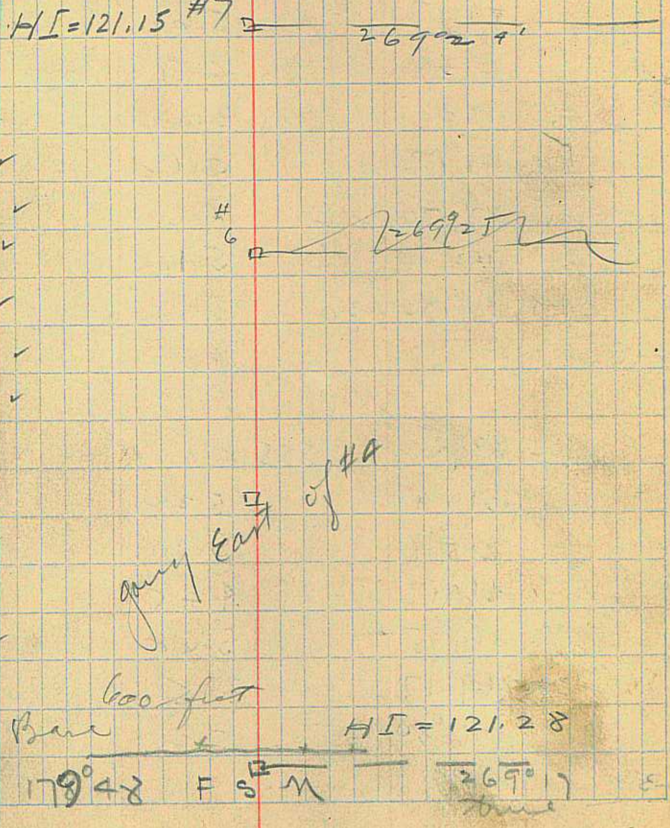
Wdt 900'

Water surface, old Canal

~~HI 105.60~~ 126.04

Surv for Bu B T U Co

Δ	Az	BS	FS	Int or C	L	U	Elevation
	354°25			6.3		9.4	114.85
43	ʻ			5.00			116.15
	176°48			5.22		8.30	115.93
	89°17			8.2		9.8	112.95
	89°17			7.3		9.8	113.85
	33°45			6.2		10.08	114.95
	143°17			6.7		10.5	119.45
4.2	89°17	7.82				10.95	
4-3/1	~~89~~	~~7.82~~				~~10.95~~	
4-2			7.95			10.8	113.33
15	221°48			5.70		9.8	115.58
14	314°10			7.00		11.2	114.28
13	316°05			6.9		10.8	114.38
12	201°25			8.2		11.5	113.08
11	335°10			8.30		11.7	112.98
10	269°17			10.65		11.30	110.63
9	203°45			11.1	9.2		110.18
8	357°08			9.70	6.8		111.58
7	180°40			11.00	8.1		110.28
6	10°15			5.00		8	116.28
4-1				5.00			116.28
5	170°			6.00		9.00	115.28
4	89°17	6.55					114.73
4-4							



	Ch	BS	F	M or C	L	d	Elevation	
	146°10			4.1		8.3	121.67 ✓	
4-6	89°17	574				7.48		HI = 125.77
4-7								
4-6	269°17		1.57			3.05	120.03 ✓	
	335 30			2.00		5.35	119.60	
	269°17			2 65		3.58	118.95 ✓	
	351°14			3.10		6.2	118.50 ✓	
4.5				5.00			116.60 ✓	
	171°22			1.30		4.80	120.30 ✓	
	89°17			5.67		6.35	115.93 ✓	
	6°36			4.9		7.95	116.70 ✓	
	155°			3.20		7.00	118.40 ✓	
	89°17			5.60		7.8	116.00	
	27°50			4.60		8.00	117.00 ✓	
	192°10			5.00		9.2	116.50 ✓	
4-4	89°17	630				9.75		HI = 121.60
4-5								
4-4	269°17		5.85			8.47	115.30 ✓	
	313°47			5.20		9.50	115.95 ✓	
	215°			5.70		9.8	115.45	
	26917			4.45		5.84	116.70 ✓	
	334°15			5.00		8.3	116.15 ✓	
	269°17			3.15		3.93	118.00 ✓	
	196°30			5.2		8.6	115.95	
4-3								

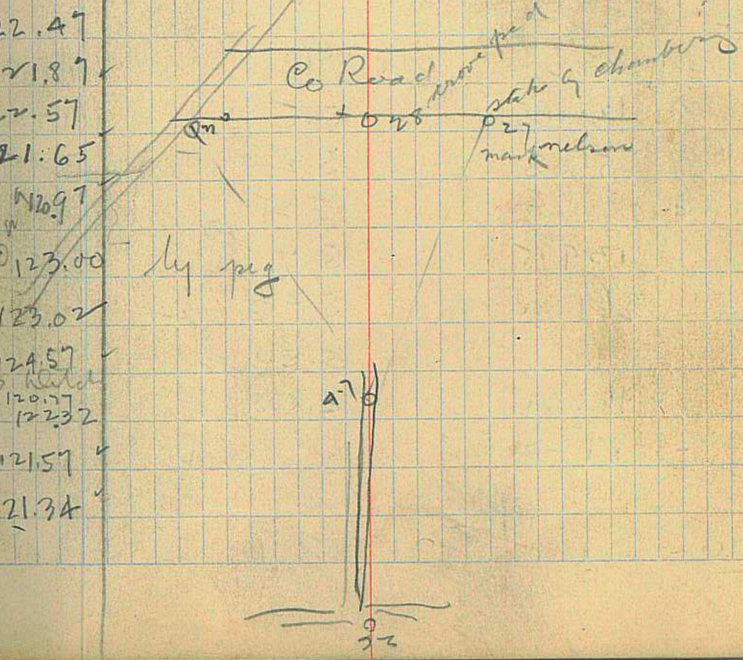
⊼	az	BS	FS	m ~	L	O	Elevation
	50°05			10.3	6.8		115489 ✓
	145°15			7.5		11.1	117.69 —
	34°30			10.1	7.3		115.09 —
	176°32			5.1		8.00	120.09 —
7-9.							
7	89°23						
7-9	197°30		6.55			9.20	120.390 —
	338°21						
	89°07						
3B.		5.00					
3B	118°42		545			9.25	121.94
4-8		4.92					
4-8	173°25		3.30			6.60	122.47
30	241°53			3.9		5.85	121.87 ✓
29	191°08			3.2		7.2	122.57 ✓
28 BM				4.12		5.99	121.65
28	269°19'			4.80		6.65	N 120.97
27	299°19			2.78		4.80	123.00
~~27~~	171°06			2.75		6.90	123.02 ✓
	346°30			1.2		4.5	124.57 ✓
4-6				5.00			to [illegible] 120.77
4-6				3.45			122.32
	12°			4.2		7.5	121.57 ✓
26	89°17			4.4		565	121.34 ✓
4-7				4.			

H I 4-8 = 125.19

To Rounding Bin
west along Baughs S line

HI = 126.94

HI = 127.34



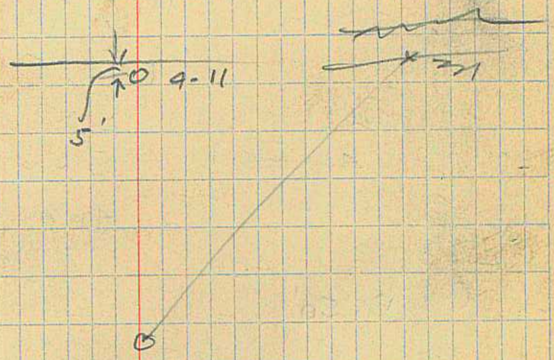
Δ	Az	BS FS	C in		U	
	126° 56°43'		7.00 5.90	1.8	10.00	113.09 114.19
#7			7.100		11.1	112.99 ✓
	133°37		6.00		10.5	114.09 ✓
	89°26		5.70		9.0	114.39 ✓
	51°30		5.00	~~8~~	8.50	115.09 ✓
	89°24		10.8	8.00		109.29
	145°14		8.5	4.7		111.59
	44°42		10.3	7.3		109.99 ✓
4.12	269°24 269°24		5.00 4.85 5.64		5.54 6.36	115.24 ✓ 114.45 ✓
	346°10		4.80		6.90	115.29 ✓
	180°45		5.80		9.00	114.29 ✓
4-11	269°29	6.35			7.65	113.74
4-12						
4-11	89°24	6.65			10.9	113.74 ✓
31	126°05		5.5		10.8	114.89 ✓
	51°05		5.2		8.7	115.19 ✓
4-10			5.25			114.14 ✓
	139°15		5.4		9.5	114.99 ✓
	269°24		5.43		6.65	114.96 ✓
	18°		5.50		7.9	114.89 ✓
	165°31		4.80		8.00	115.59 ✓
7-9	89°24	0.00±		1	5.9	12039

4-10 -

on Base

on ground
on [illegible]

120.09



(HI=120.39) 640 + 22'

40 ⊼ –	184°22 ∠	BS FS	Ui or C	3 L	6.00	cor. Co Road Elevation
	~~169°~~ 445°12		4.60 2.60		8.7 44	122.00 124.00
	135°56		4.66		4.99	121.94 ✓
	133°44		3.2		7.50	123.40
	200°36		4.5		6.25	122.10 ✓
Baugh post ½	155°12					
	128°20′		3.00		6.25	123.60 ✓
	237°14		4.31		6.25	122.30 ✓
	113°05		3.5		5.60	123.10 ✓
	268°40		6.10		8.60	120.50
	76°34		4.15		5.50	122.45
	287°46		5.00		8.60	121.60 ✓
C-2			4.90			121.70 ✓
	301°47		4.00		8.20	122.60
	2°27		{ 6.75		9.20	119.85
			5.25			121.35 ✓
	326°17		3.80		8.00	122.80 ✓
mon 28	4°		5.00			121.600 ✓
	351°24′		4.00		7.40	122.60
C-2		4.90				
C-2	178°50′			2.20	11.700	
C-1		4.90 ✓ ~~8.700~~				
C-1	183°47	8.700		3	11.50	121.70 ✓
	185°42	~~5.80~~	5.80		8.15	124.60
		5.18				125.22
0-0						

{ S.E. cor Boundy's
cor ~~Baugh's~~
west [illegible] Road

−7′ to post

near canal & bank

on H2O

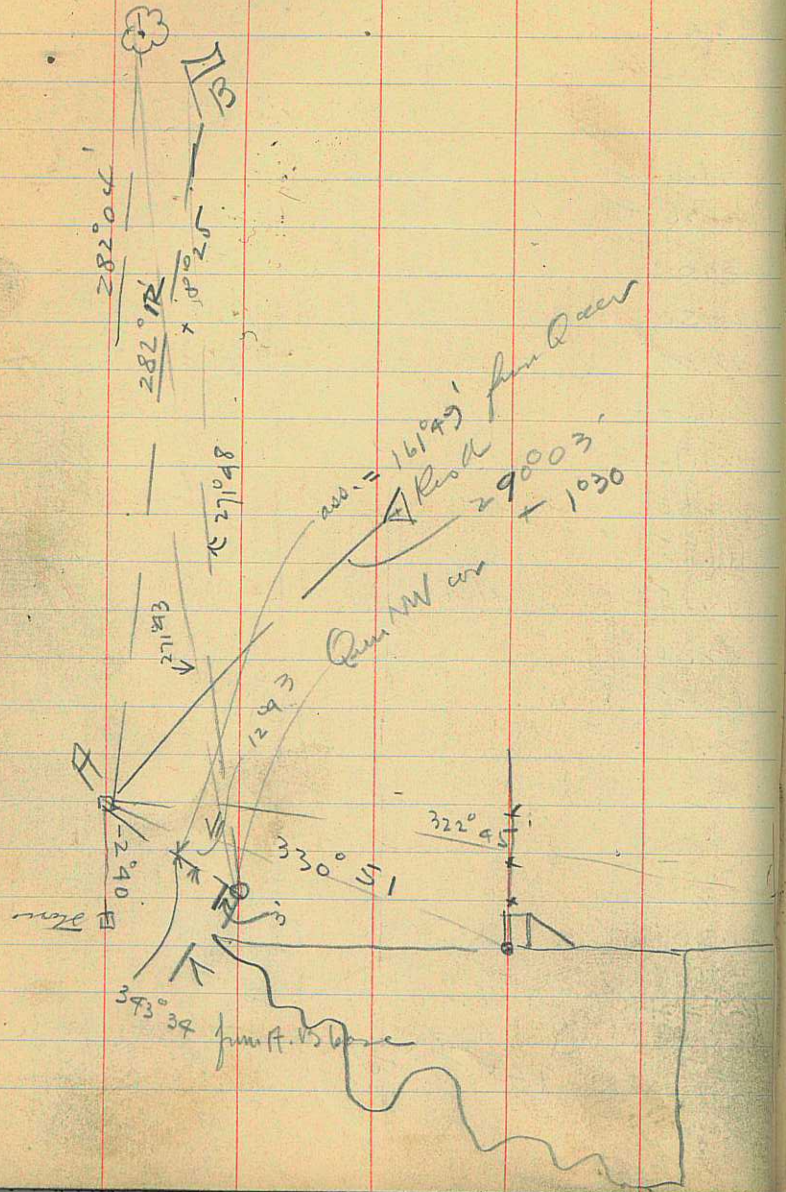
BM

HI = 126.60

125.22 HI = 130.40
on BM nail by Y473
set 179°48

telephone pole

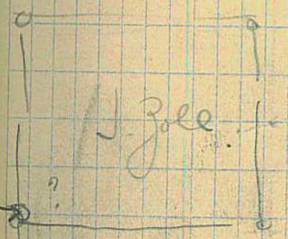
342 04
330 51
12 43



Survey for Three Pine. P.89
Spr. Co. of River Heights
E. D. McCombs
Pres.

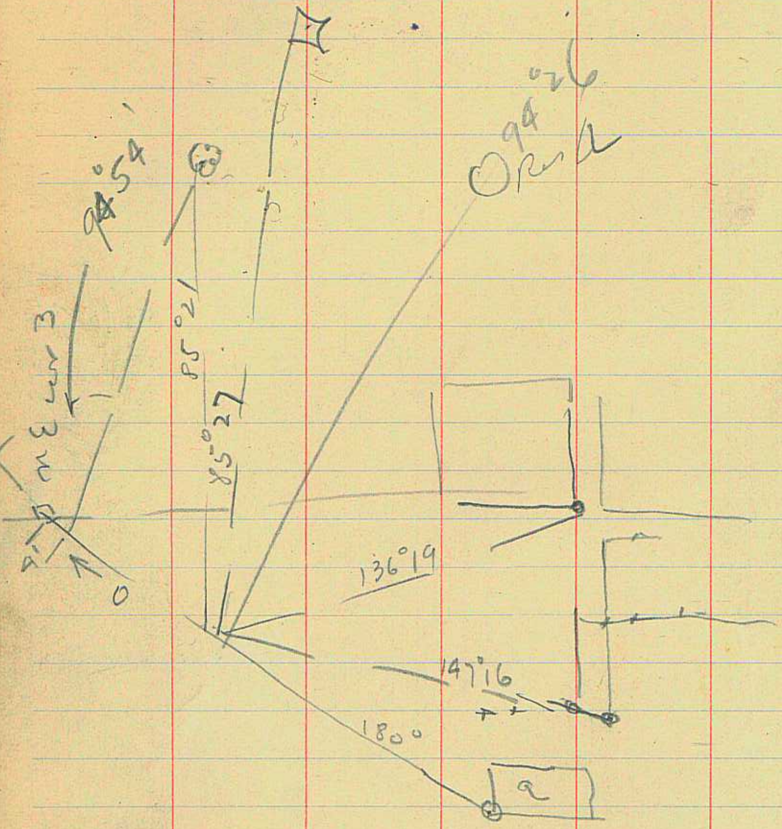
DEC 14 1916

from A +35 to C. sec 2



DEC 6 1916

Indexed



Three Pines Spr. Co

E. W. McCoombs

DEC 14 1916

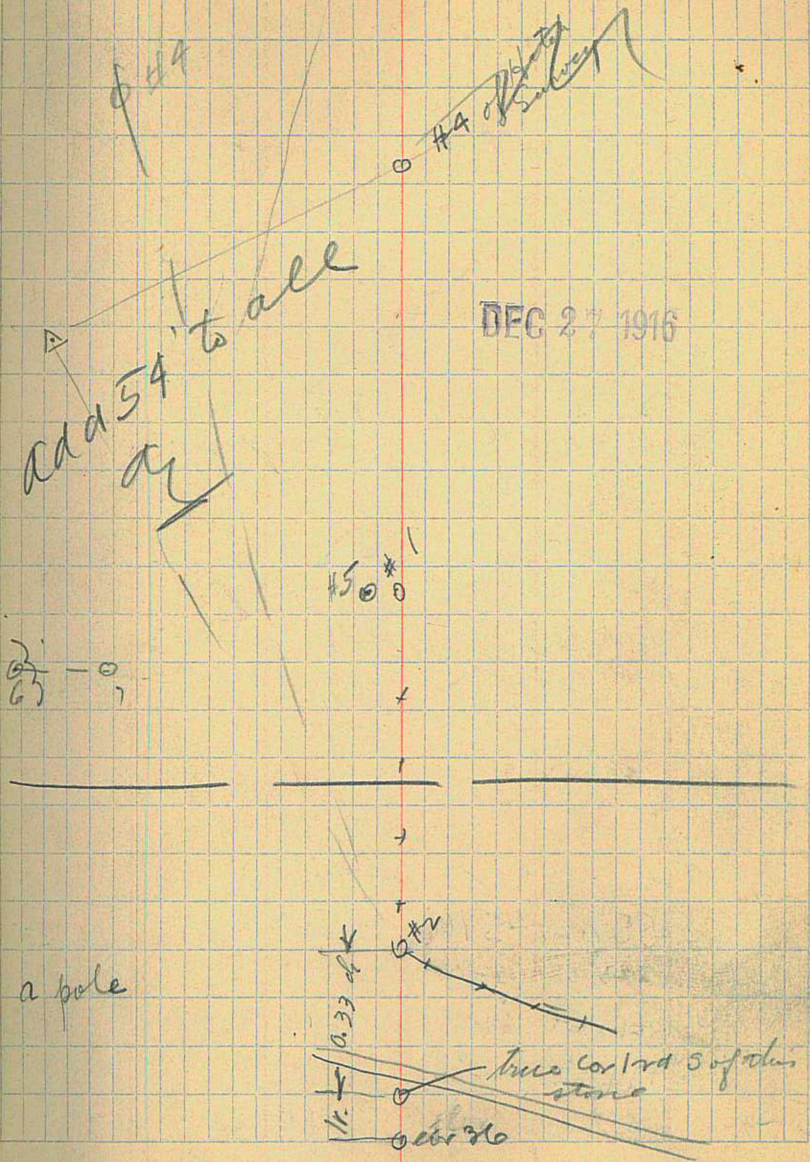
Herman Johnson

21	319°52	-8°25	11		12.05
20	285°48	-7°12'	9		10.95
19	280°40'	-4°38' ak	10		12.72
18	266°41'	-4°	9		11.97
17	262°42		9		12.28
16	261°33'		8		11.7
15	262°49	-3°	6		10.2
14	258°34'			10	12.50
13	247°05	-1°	6		11.21
12	248°20		8		11.20
11	248°20'	-3°30'	9		11.70
10	248°32'	-5°02	10		12.05
⊼ 5	37°24	-2°19'	1.5		11.65
8	263°46'	-8°50'	10.00		11.46
7	277°08	-11°20	10.00		11.21
6.					

5	357°35		51°30'E
4	331°02	18.495ch	
△3	314°20'		
2	358°53	0.58ch	
1	358°53		
cor 36 –			

~~11/26/16.~~

tie to spr. for application



add 54' to all

a pole

trees cor 1rd S of this stone

	55°40	-5°16'	2		12.35
	223°30'	+50'			
6	217°24'				
cor 36 stone	177°36'	+4°9'	1		4.86
5~					

~~Herman Johnson~~

NE cor house

add 54' to all azth

DEC 29 1916

T-	#	Cut	L	C	J	HJ
				~~F~~		
		0.2'		7.50	10.50	
		4'-4"		3.40	6.00	
		3'-6"		4.25	5.90	
		3'-6½"		4.15	5.40	
		3'-10½		3.80	4.65	
		3'-8¼"		4.02	4.48	
2-						
	2			3.35	5.73	
		4'-1½	✓	3.30	5.50	
		4'-5"	✓	2.97	4.90	
		4'-00'	✓	3.40	4.95	
		4'-10½	✓	2.58	3.78	
		5'-1½"	✓	2.32	3.10	✓
		4'-~~8½~~	2¼	2.73	3.06	
1-						3.42

G

DEC 29 1916

4.46
2 6
2 3 6
2
5 7 2

7.70
3 22
4 48

7.70
2 65
5 05

1.70
2 9
4 80

4 9
3.2
1 x 7

L 600

3.70
3 75
3.9

4.50
3 50

6.75
4.50
2 25

3.66
4 1

7.42
2 73
4.69

4 9
2
2 40

4 9
3 4
1.5

7.42
2 32
5.10

3 50

End

7.70
3.40
4.30

8.00
3 64

7.70
4 25
3.45

7.70
4 05
3.65

7.70
3 80
3.90

(7.70)

7.70
4 02
3-68

7.42
2 58
4 84

5.73
3 35
2 38

480
500

4 99
4 3

7.42
3 302
4 1

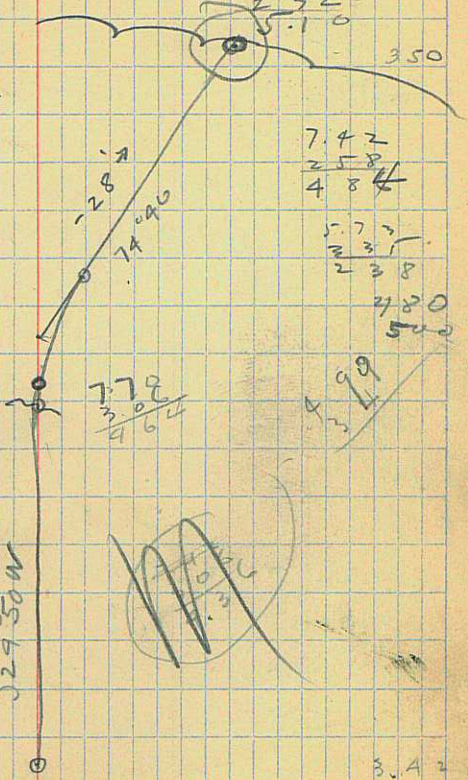
7.42
2 97
4.45

7.42
3 4
4.00

7.42
2 58
4-84

7.78
3 04
4 64

(7.42 Grade)



3.42

Umatra

4.9RR

7.42
4 9
2.52

43
12

Benson - B L Drive

⊼ - Pt	Ang		BS	Fs	ini	Ele
				12.25		
			2.23			
check						
#4					2.98	126.13
Sta 0					3.30	125.81
Sta 1					5.10	124.01
Sta 2					10.1	119.01
BM			10.98			118.13
					6.90	101.67
2+50					4.60	104
			0.45	12.68		
2+50						
2+26						
2+26					5.10	115.7
BM			2.67			
2+26						
2+26						
2+00		2000				
1		100				
0-						
0	108°30	20'				
4-						

12.68 55
2 67 12

4

249.89
178 27
620
623

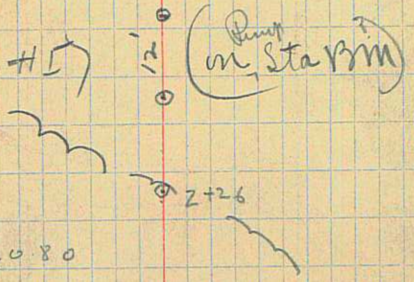
BM by pump house 12.25
2.23
10.02

118.13
2 67
120.80
12.68
108.12

120.80
5 1
115.7

118.13 H.I = 129.11
on Ice

108.12 ✓ (108.57 H.I)



118.13
2.67

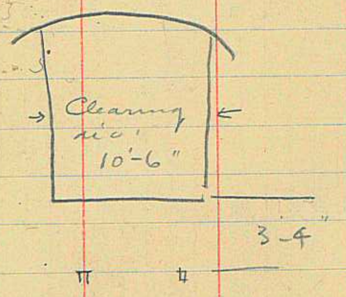
108.12
45
108.57
26
103.97

118.13 H.I - 120.80

Set 191° 43

Slope of floor run from East room

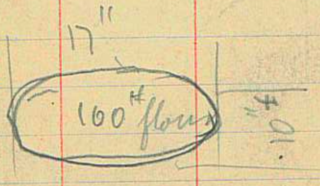
$\frac{10\frac{1}{4}''}{18''}$

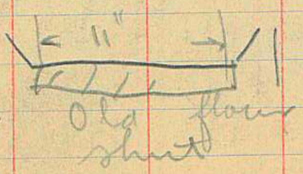


Available slope

mat = 3'-10" in 10'

and 3'-3" - in 10'

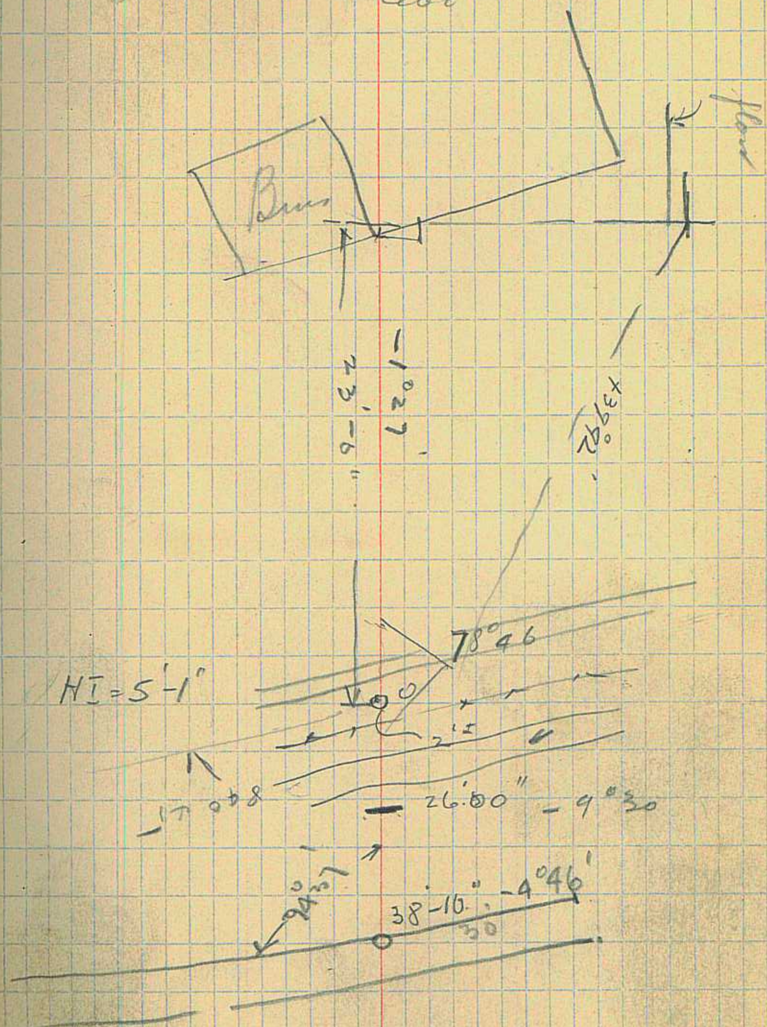




.20

3.23
6
19.38
2
21.4
180
340
400

66'
3.56



$\frac{125}{48}$ - tan

$\frac{24}{98}$ flower 2400 $\frac{980}{2}$

$\frac{23}{100}$ Brown

Levels at Benson Pumping plant 2/27/17

Sta	B S	F S	[illegible]	Ele	
Bm.	2.12			118.13	120.25
		12.18		108.07	
	2.52				110.59
1			3.17	107.42	
2			7.30	103.29	
#3			8.03	102.56	
#4			13.95	96.64	
5			7.25	103.34	
			8.55	102.04	
6					
6			11.14	99.45	
#7			14.23	96.36	
8			13.16±		

Jim Thiam's pump Bear Run

8/22/16-11.75' from nail to water:
water may go. 2 or 3' lower
May 9-1917 same nail high H2O mark
4.95'
same day meas. 6.1 feet
in B. B. L. Pump had
been 2' higher.

104.56
96.
8.

8.0
6.95

120.13
108.12
12.01

120.25
12.18
108.07

96.6
13.

118.13
2.12
120.25
12.52
107.43

10

108.12

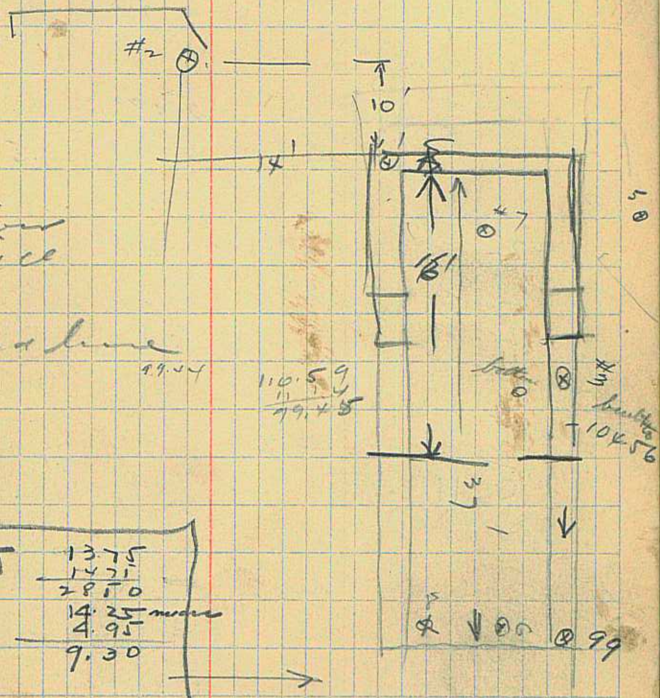
9.07
5.2

By post.

on stake by Pump house (BM)

110.59
3.17
107.42

108.07
2.52
110.59



on old River ice

on ground line
99.44

110.59
11.14
99.45

11.75
13.75
14.71
28.50
14.25 mean
4.95
9.30

water was ::
about 8' deep
according to this
Water would be
1.3 feet below
B.B.L. ~~low water~~.

Power Station Mulbrit

Stadia

37

Λ –	B.S	FS	M	U	L		HI
	13.10					On	113.10
		0.25	~~0.250~~				23.34
	10.49						
			2.940				
			5.18				
ϕ –		~~2.80~~		~~5.40~~		S 38° E	
-2		2.80		5.40			
-2	9.95				7.20	N 37° W	130.49
4			8.60			S 70° W	
3 –							
5		4.20		7.05		S 21°30	
5	11.20			6.22		N 7°45	137.49
6							
7			4.00	4.50		42° 48	
8			10.00				
9			9.05	9.85		355°	
-10		0.30		3.35		Az 5°26	
-10	12.25				7.80		49.37
	56.94		5.45		5.22	(3°) Am	
	19.90 +	12.35			11.22	(260°3	
	37.0	19.9°					

Power Study Millbri

Stadia

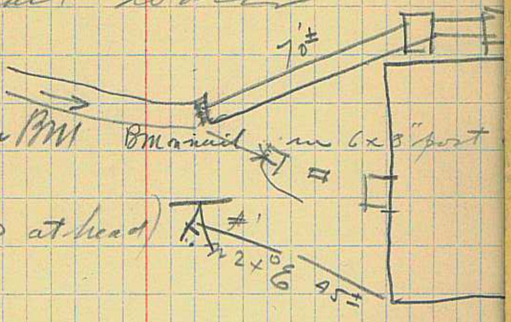
⊼ –	BS	FS	M	U	L	
	13.10					
		0.25	~~0.250~~			
	10.49					
			2.940			
			5.18			
ϕ –		~~2.80~~		5.40		S 38° E
-2		2.80		5.40		
-2	9.95				7.20	N 37° W
4			8.60			S 70° W
3 –						
5		4.20		7.05		S 21°30' E
5	11.20			6.22		N 7°45' E
6						
7			4.00	450		Az 2°48 S 2°48' W
8			10.00			
9			9.05	9.85		355°
-10		0.30		3.35		Az 5°26 S 5°26' W
-10	12.20				7.80	
	56.94		5.45		5.22	(3°) BM B
	19.90 +	12.35			11.22	(260°30 To Clutch
	37.0	19.90				

3/22/17

13.10
.25
12.85

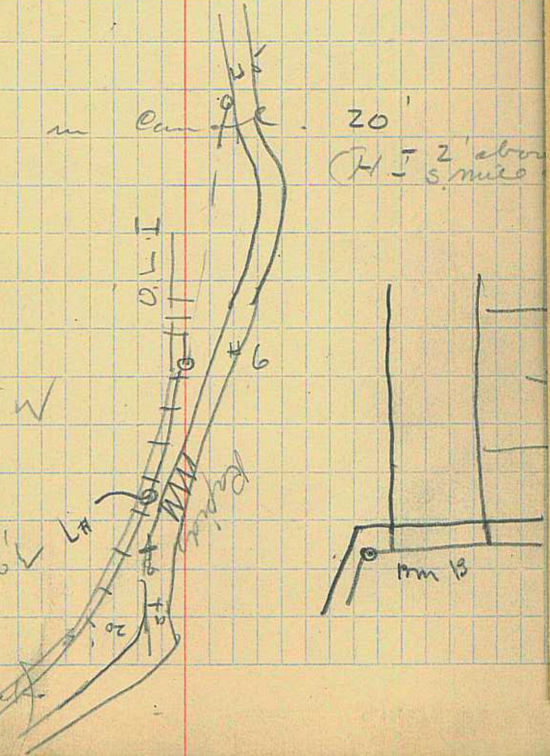
10.49
5.18
5.31

On Tail water



(A) on BM BM nail in 6 x 8" post

(H2O at head)



Pre survey on Providence Canal for Power 3/26/17

	BS	FS	IM	Ele	
	7.00			100.00	107.00
40+38			6.35		
	5.250	3.500			
	4.90	6.000		102.75	107.65
		2.750		104.90	
	4.80				109.70
b	12.78			155.70	168.48 2.35
	11.82	2.35		166.13	177.95
		8.30		169.65	

```
107.00
  3.35
100.65
  1.25
101.90
  3

107.00
  3.50
103.50
  5.25
108.75
  6
102.75
  4.90
107.65
  2.75
104.90
  4.8
109.70

155.7
 12.78
168.48
 11.82
180.30

166.13
 11.82
177.95
  8.30
169.65     166.
```

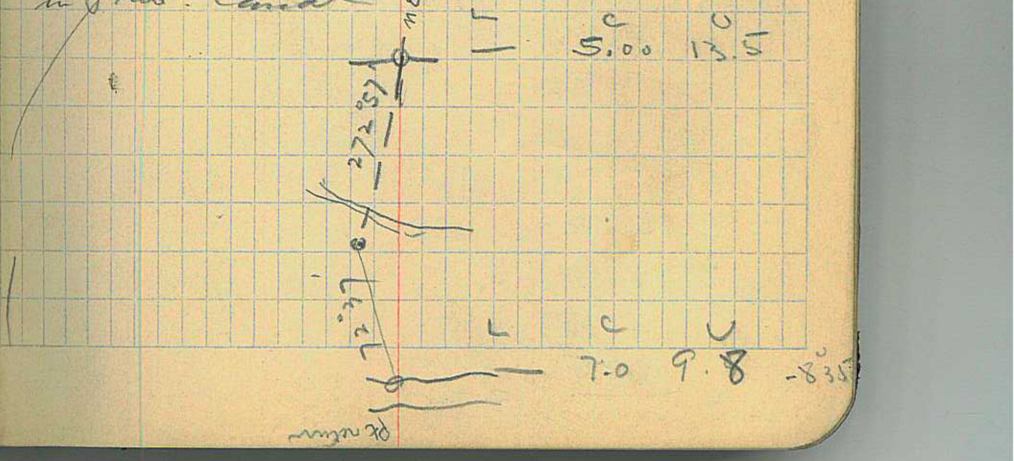
In bottom Hyrum Canal
millvalle pipe line line
cos² R

a ‖

b #16°30 ‖ 12.05 13.1 from HI a

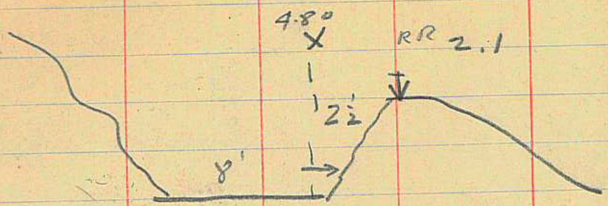
note this HI is approx 4' below top res wall

in Prov. Canal



Slope of canal

~~10'~~ 9'



near head
Gravely clay

4.9

Slope .8/10m 220
near head

Levels from the head of the Providence Canal to tail water of Hyrum plant.

BS	FS	m
11,40		
		6.52
	6.96	
5:26		
		10.10
4.00	3.38	
8.05	12.12	
	~~13.50~~	13.50
	35.96	(on over)

on tail Race of Hyrum plant

5.18
4.08
110

220

3.38
12.12
13.50
29.00
22
715

10.10
4.00
8.05
22.15

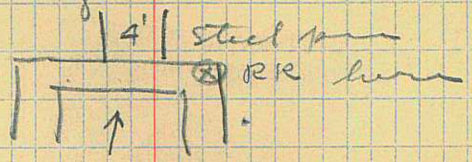
m Providence canal
{on top concrete wall west end
{at head gate

{Elev Prov Canal at spill directly
{opp. Hyrum Plant.

BS	FS	m
		4.72
10.12	0.00	
		2.26
	4.03	

on approx foundation of Water Wheel

on rack of old turbine



on Head [illegible]

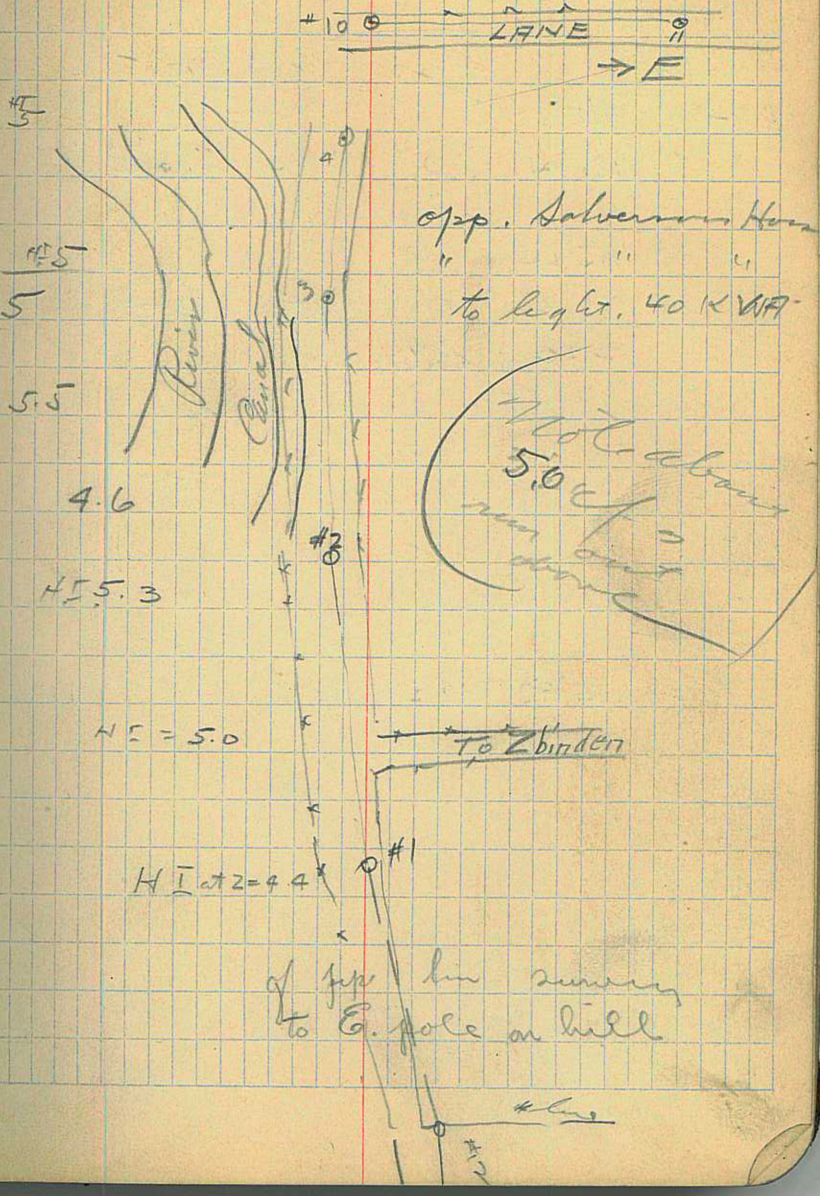
Survey for Proposed Power Continued.

	Ele
2+42	167.25
40+00	125.00

on ground by Sta 2+42 of pipe line
of pipe line

		313°				
	-11	269°35'	+19'	3.00		9.08
10 —						
	10	285°31	+1°20'	9.00	11.75	
9 —						
	-9	331°30'	+47'	1.35	7.5?	13.5
8 —						
	-8	320°58	+28'	3.0		9.85
7 —						
	-7	292°13	+25'	4.0		6.59
6 —						
	-6	299°54	+34'	2.5		6.28
5 —						
	-5	333°23	+35		6.35	13.5
4 —						
	4	350°53'	+28'	3.0		6.62
3						
	-3	348°52'	+51'	6.0		11.35
2 —						
	-2	339°16'	+50'	4.0	7.45	10.85
	12	133°34'	-23'	3.0	6.50	10.00
		342°06'				
1 —						

{to Smoke stack near
U.P. Purge tank, E. of [illegible]
Ordnance



opp. Salvermans Hou
" " "
to light. 40 KWA

Not above 5.0 [illegible] near [illegible]

of pipe line running
to E. pole on hill

⊼ — Pt	Az	Vert ∠	∠	Ele	H I
16			Close 7		
8 – 1	295°24				
8	151°14'	0°	8.20	11.45 230.4	
1.8					243.8
8	115°24				
18	71°13'	0°	7.50	10.2 235.8	
	220°	400' to River			
Pt D 17	248°05	150'			
16 –					
–16	141°29	0°	6.30	9.00 241.00	11.7
15	240°	– 16°		250	235.00
14 –				250.00	
–14	125°48'	–22'	6		12.6
13	130°41	—	3.0		7.55
11 –					

6.55 7
6.5
1.65
21°20 20.5

115°24
180

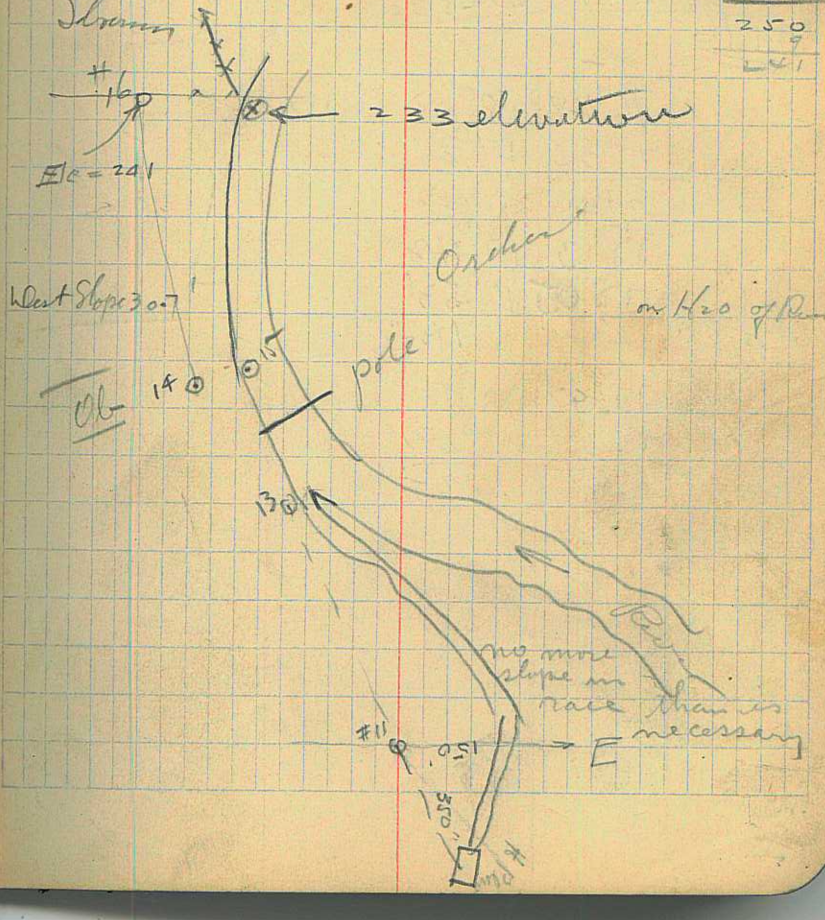
Leave bearing as they are

.27 6
30.7
19 3 2
8 2 8
8.4 7 3 2
7
15.0 0

241
6.55
247.55

HI = 6.00

250
9
241



Mar 28 - 1917

	at	(14)	
	Hor A	Vert L	
Mer	4416	42°07	2:42 P
On.	45°24	41°25	
mean	4450	4146	
	4503	41°44	
	46°03	4107	
mean	45°33'	41 25'	
Σ mean	45 21 30'	41°45'30'	
at 16			
	76°48	18°08	5:10
	77°34	17°24	
	77 11	17 48	
	77°13	17°42	
	78°05	16°53'	
Mn 77°25 Σ	7734'	17°17'30"	17°32'45
	77°47	17°07	
	78°34	16°23	
	78°10'30"	16 45'	

?

11'27=152

Near Sta 37 level contour
N 60° E

	BS	FS	m
#8	2.90		
		7.00	
	3.30		
		9.600	
	3.400		
		13.50	
	1.450		
		8.00	
	1.950		
			4.56
			9.50±
		10.55	
	2.20		
		12.50	
	1.80		
			5.30
		10.95	
	3.95		
	Σ 20.05		
		4.70	
		76.80	
		26.05	
		56.95	
		7	
		27	
		90.75	91

Levels from #8
and down 3/28/17

on ℄ of downstream wall of culvert over Hopson Canal near S. line sec 34

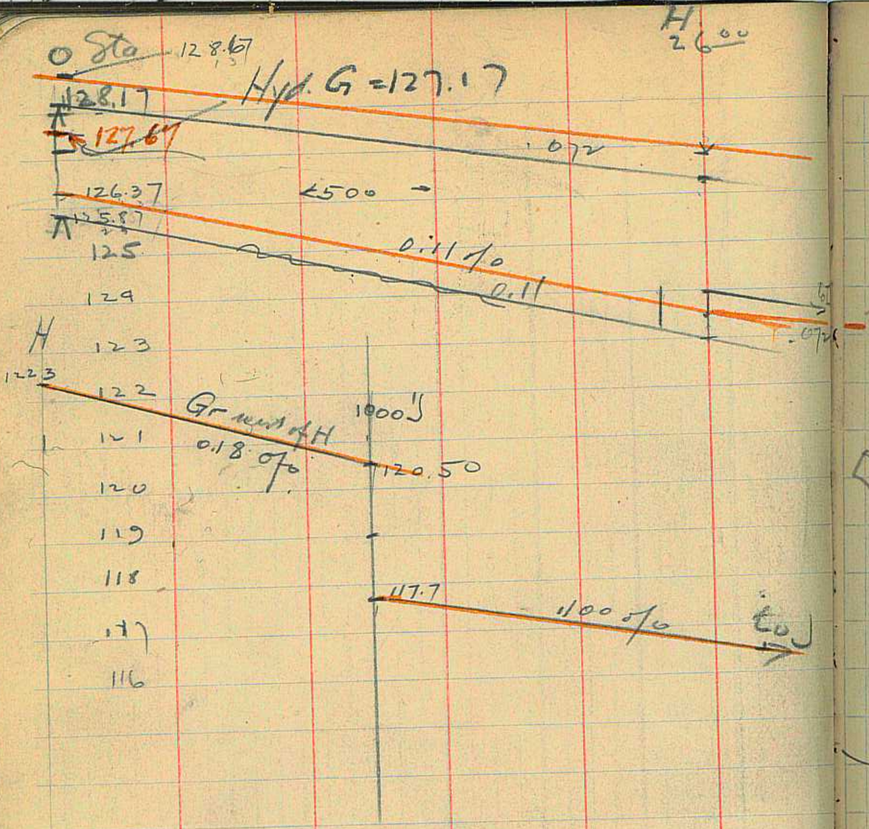
in bottom canal

On Taylor's front cement steps about 1000' N of 1320 N of S line 34. House is east of road.

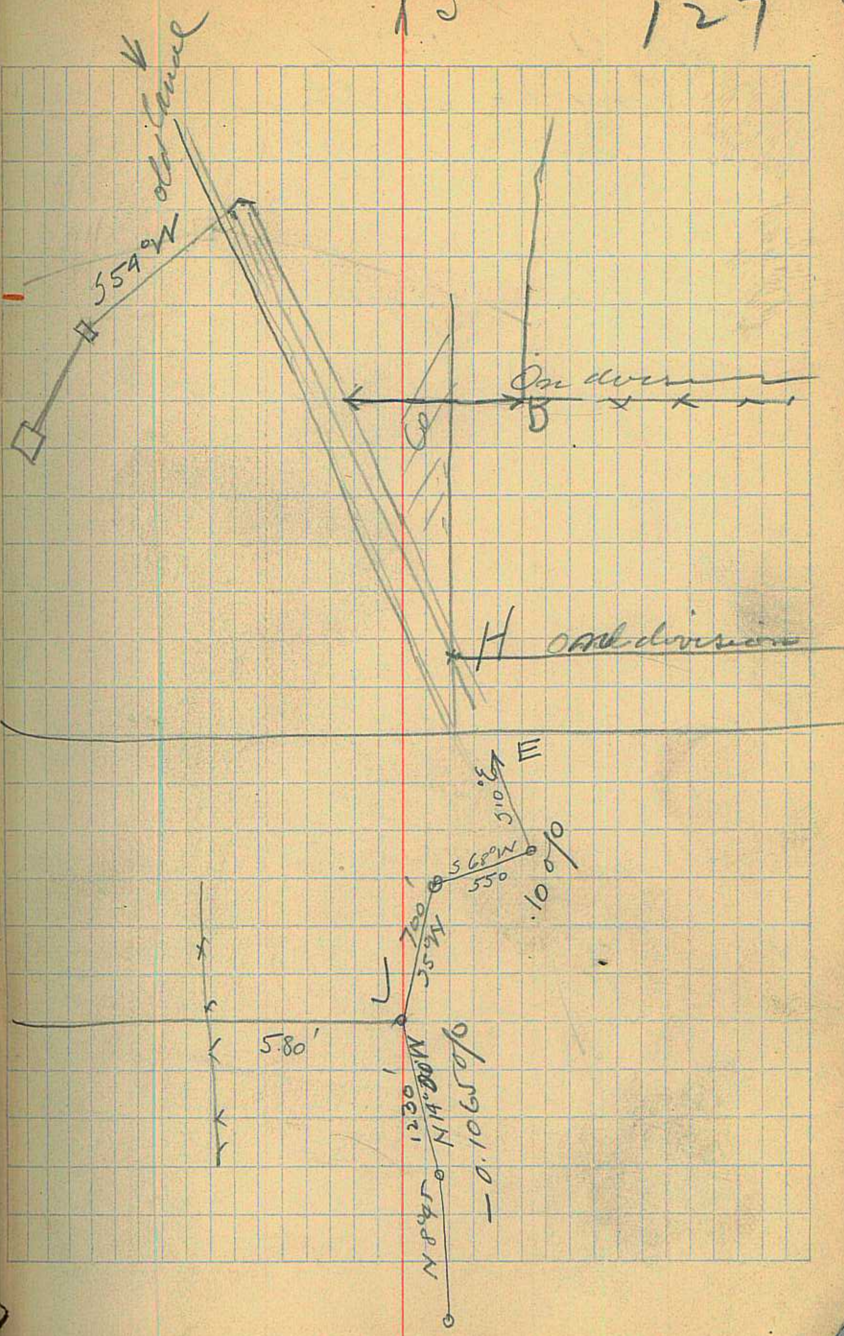
near Sta 11+27 on flume Millvale H2O Works pipe line

Static Head 92 feet
Effective head 82 at
max load.

Sta	BS	FS	Elev	H.I.	L	Point Rod rea Center grade	Ban	R	– Cut, + Fill L	C	R	Slope of grade
0			125.87			9.26	1.93					0.11 per 100
			128.17									Slope bank 0.07
1						4.37	2.00					grade
												Top bank



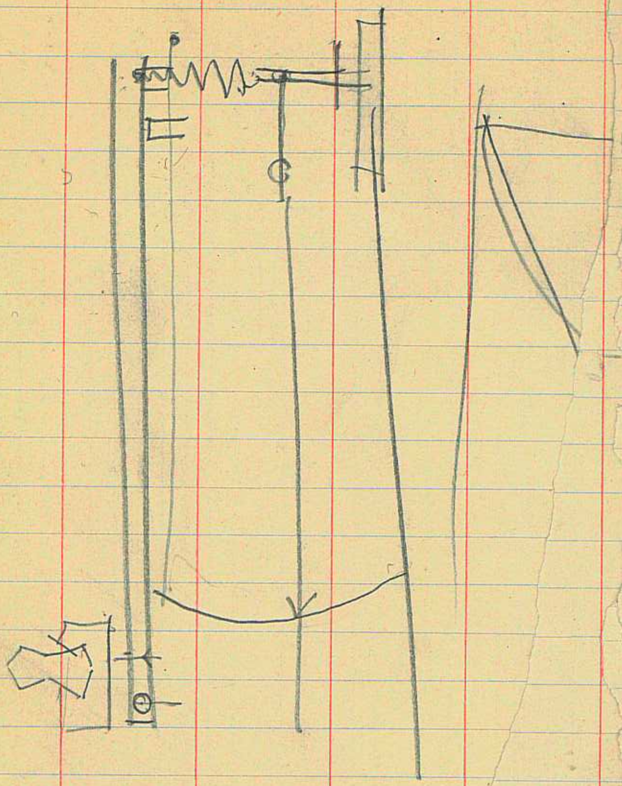
0 Sta
128.67
Hyd. G =127.17
H
26⁰⁰
128.17
127.67
.072
126.37
<500 →
125.87
125
0.11 %
0.11
124
H
123
1223
122
Gr west of H
0.18 %
1000 J
121
120.50
120
119
118
117.7
.100 %
to J
117
116
.072



S
old Canal
S54°W
Old divis
B
H
Old division
E
S10°E
S68°W
550
10 %
700'
N35°W
L
5.80'
1230'
N14°30W
-0.1065 %
N54°W

0 Sta 0 127.67 Hydr bank 128.60

Grade bottom



237
238

131
11
2.10
92
420
1890
193.20
57.9

152
57.7
209.7
7
216.9

217
125
92

20.5
.36
1230
615
7.380
7
14.4

959

96
.96
576
864
.9216

57

58

109.70
58
167.70
12
155.70
103
52.70

247.55
14
233

237

241
5
246
10.2
235.8
8
~~243.8~~
~~11.4~~
~~232.4~~

235.8
6
241.8
11.4
230.4

BS	FS
-0.1	
6.26	4.12
7.15	2.63
4.80	1.70
2.45	3.90
3.42	6.00
3.80	8.49
4.85	6.60
3.38	4.10
6.70 +3	4.15
	1.20
+42.81	-42.89
	-42.99
	+42.81
	-.18

60 2.5
58 2.4
104 .8
1.92

24
2
48

TH'S RAILROAD CURVE TABLES.

ublished by KEUFFEL & ESSER CO., New York.

HOW TO USE KEITH'S TABLES.

EXAMPLE.

Vanted a Curve with an Ext. of about 12 ft. Angle
rsection or I. P.=23° 20′ to the R. at Station

in Tab. IV opposite 23° 20′=120.87
7÷12=10.07. Say a 10° Curve.

ab. IV opp. 23° 20′=1183.1
1183.1÷10=118.31.

on for A. 23° 20′ for a 10° Cur.=0.16
.16=118.47=corrected Tangent.

Ext. is required find in same way)
3° 20′=23.33°÷10=2.3333=L. C.

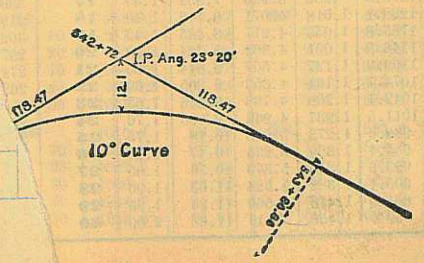
or sta.	542	I. P.=sta.	542+72
" "	+50	Tan.=	1.18.47
" ‘.	543	B. C.=sta.	541+53.53
" "	+50	L. C.=	2.33.33
" "	543+	E. C.=sta.	543+86.86
	86.86		

=46.47×3′(def. for 1 ft. of 10° Cur.)=139.41′=
2° 19½″=def. for sta. 542.

Def. for 50 ft.=2° 30′ for a 10° Curve.

for 36.86 ft.=1° 50½′ for a 10° Curve

tables are published in Field Books of
EL & Esser Co., New York, N. Y.)



2057

Natural Tangents

DEG.	0′	10′	20′	30′	40′	50′	DEG.	DEG.	0′	10′	20′	30′	40′	50′	DEG.
0	0000	0029	0058	0087	0116	0145	89	40	8391	8441	8491	8541	8591	8642	49
1	0175	0204	0233	0262	0291	0320	88	41	8693	8744	8796	8847	8899	8952	48
2	0349	0378	0407	0437	0466	0495	87	42	9004	9057	9110	9163	9217	9271	47
3	0524	0553	0582	0612	0641	0670	86	43	9325	9380	9435	9490	9545	9601	46
4	0699	0729	0758	0787	0816	0846	85	44	9657	9713	9770	9827	9884	9942	45
5	0875	0904	0934	0963	0992	1022	84	45	1.0000	1.0058	1.0117	1.0176	1.0235	1.0295	44
6	1051	1080	1110	1139	1169	1198	83	46	1.0355	1.0416	1.0477	1.0533	1.0599	1.0661	43
7	1228	1257	1287	1317	1346	1376	82	47	1.0724	1.0786	1.0850	1.0913	1.0977	1.1041	42
8	1405	1435	1465	1495	1524	1554	81	48	1.1106	1.1171	1.1237	1.1303	1.1369	1.1436	41
9	1584	1614	1644	1673	1703	1733	80	49	1.1504	1.1571	1.1640	1.1708	1.1778	1.1847	40
10	1763	1793	1823	1853	1883	1914	79	50	1.1918	1.1988	1.2059	1.2131	1.2203	1.2276	39
11	1944	1974	2004	2035	2065	2095	78	51	1.2349	1.2423	1.2497	1.2572	1.2647	1.2723	38
12	2126	2156	2186	2217	2247	2278	77	52	1.2799	1.2876	1.2954	1.3032	1.3111	1.3190	37
13	2309	2339	2370	2401	2432	2462	76	53	1.3270	1.3351	1.3452	1.3514	1.3597	1.3680	36
14	2493	2524	2555	2586	2617	2648	75	54	1.3764	1.3848	1.3934	1.4019	1.4106	1.4193	35
15	2679	2711	2742	2773	2805	2836	74	55	1.4281	1.4370	1.4460	1.4550	1.4641	1.4733	34
16	2867	2899	2931	2962	2994	3026	73	56	1.4826	1.4919	1.5013	1.5108	1.5204	1.5301	33
17	3057	3089	3121	3153	3185	3217	72	57	1.5399	1.5497	1.5597	1.5697	1.5798	1.5900	32
18	3249	3281	3314	3346	3378	3411	71	58	1.6003	1.6107	1.6212	1.6319	1.6426	1.6534	31
19	3443	3476	3508	3541	3574	3607	70	59	1.6643	1.6753	1.6864	1.6977	1.7090	1.7205	30
20	3640	3673	3706	3739	3772	3805	69	60	1.7321	1.7437	1.7556	1.7675	1.7797	1.7917	29
21	3839	3872	3906	3939	3973	4006	68	61	1.8040	1.8165	1.8291	1.8418	1.8546	1.8676	28
22	4040	4074	4108	4142	4176	4210	67	62	1.8807	1.8940	1.9074	1.9210	1.9347	1.9486	27
23	4245	4279	4314	4348	4383	4417	66	63	1.9626	1.9768	1.9912	2.0057	2.0204	2.0353	26
24	4452	4487	4522	4557	4592	4628	65	64	2.0503	2.0655	2.0809	2.0965	2.1123	2.1283	25
25	4663	4699	4734	4770	4806	4841	64	65	2.1445	2.1609	2.1775	2.1943	2.2113	2.2286	24
26	4877	4913	4950	4986	5022	5059	63	66	2.2460	2.2637	2.2817	2.2998	2.3183	2.3369	23
27	5095	5132	5169	5206	5243	5280	62	67	2.3559	2.3750	2.3945	2.4142	2.4342	2.4545	22
28	5317	5354	5392	5430	5467	5505	61	68	2.4751	2.4960	2.5172	2.5386	2.5605	2.5826	21
29	5543	5581	5619	5658	5696	5735	60	69	2.6051	2.6279	2.6511	2.6746	2.6985	2.7228	20
30	5774	5812	5851	5890	5930	5969	59	70	2.7475	2.7725	2.7980	2.8239	2.8502	2.8770	19
31	6009	6048	6088	6128	6168	6208	58	71	2.9042	2.9319	2.9600	2.9887	3.0178	3.0475	18
32	6249	6289	6330	6371	6412	6453	57	72	3.0777	3.1084	3.1397	3.1716	3.2041	3.2371	17
33	6494	6536	6577	6619	6661	6703	56	73	3.2709	3.3052	3.3402	3.3759	3.4124	3.4495	16
34	6745	6787	6830	6873	6916	6959	55	74	3.4874	3.5261	3.5656	3.6059	3.6470	3.6891	15
35	7002	7046	7089	7133	7177	7221	54	75	3.7321	3.7760	3.8208	3.8657	3.9136	3.9617	14
36	7265	7310	7355	7400	7445	7490	53	76	4.0108	4.0611	4.1126	4.1653	4.2193	4.2747	13
37	7536	7581	7627	7673	7720	7766	52	77	4.3315	4.3897	4.4494	4.5107	4.5736	4.6382	12
38	7813	7860	7907	7954	8002	8050	51	78	4.7046	4.7729	4.8430	4.9152	4.9894	5.0658	11
39	8098	8146	8195	8243	8202	8342	50	79	5.1446	5.2257	5.3093	5.3955	5.4845	5.5764	10
DEG.	60′	50′	40′	30	20′	10′	DEG.	DEG.	60′	50′	40′	30′	20′	10′	DEG.

DEG.	0′	10′	20′	30′	40′	50′	DEG.
80	5.6713	5.7694	5.8708	5.9758	6.0844	6.1970	9
81	6.3138	6.4348	6.5606	6.6912	6.8269	6.9682	8
82	7.1154	7.2687	7.4287	7.5958	7.7704	7.9530	7
83	8.1443	8.3450	8.5555	8.7769	9.0098	9.2553	6
84	9.5144	9.7882	10.078	10.385	10.711	11.059	5
85	11.430	11.826	12.250	12.706	13.197	13.727	4
86	14.300	14.924	15.605	16.350	17.169	18.075	3
87	19.081	20.206	21.470	22.903	24.542	26.432	2
88	28.636	31.242	34.368	38.189	42.964	49.104	1
89	57.290	68.750	85.940	114.588	171.885	343.77	0
DEG.	60′	50′	40′	30′	20′	10′	DEG.

Natural Cotangents

Locate lines South East from

Sta 0-2+83 8.

5 6 6

" 8+49 "

5 6 6

" 14+15

5 6 6

" 19+81

849. - 1981 = 6"

5" to end

Take Grade elev. from top of tile.

Make Grade elev. of laterals 0.4ft below top of tile at Sta 2+83 + 8+49 and 0.2 ft below top of tile at 14+15 and 19+

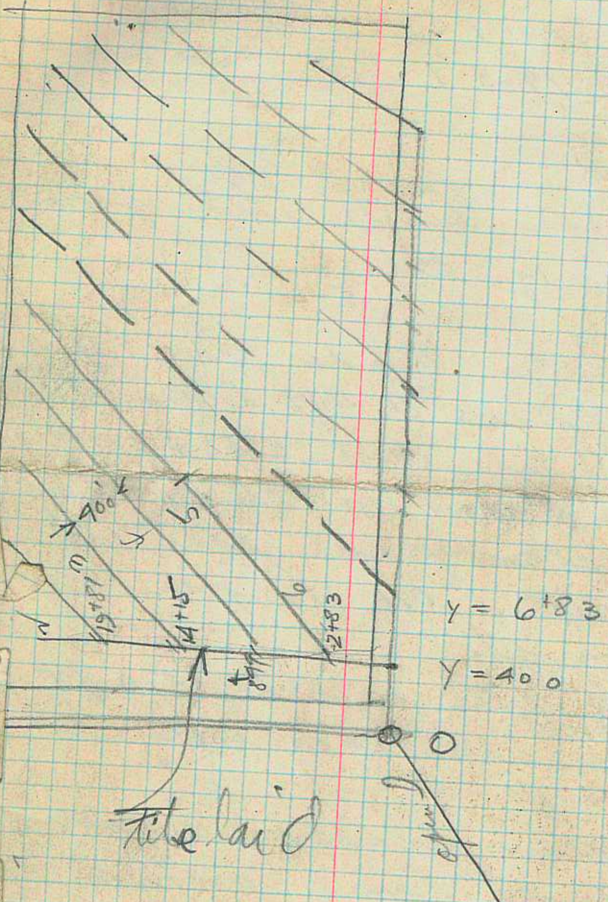
Make grade rate at least 0.1 ft. per 100 ft.

If cuts exceed 5.0 ft. increase this rate.

Make grades uniform over as long distances as possible

X

283
283
566



DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

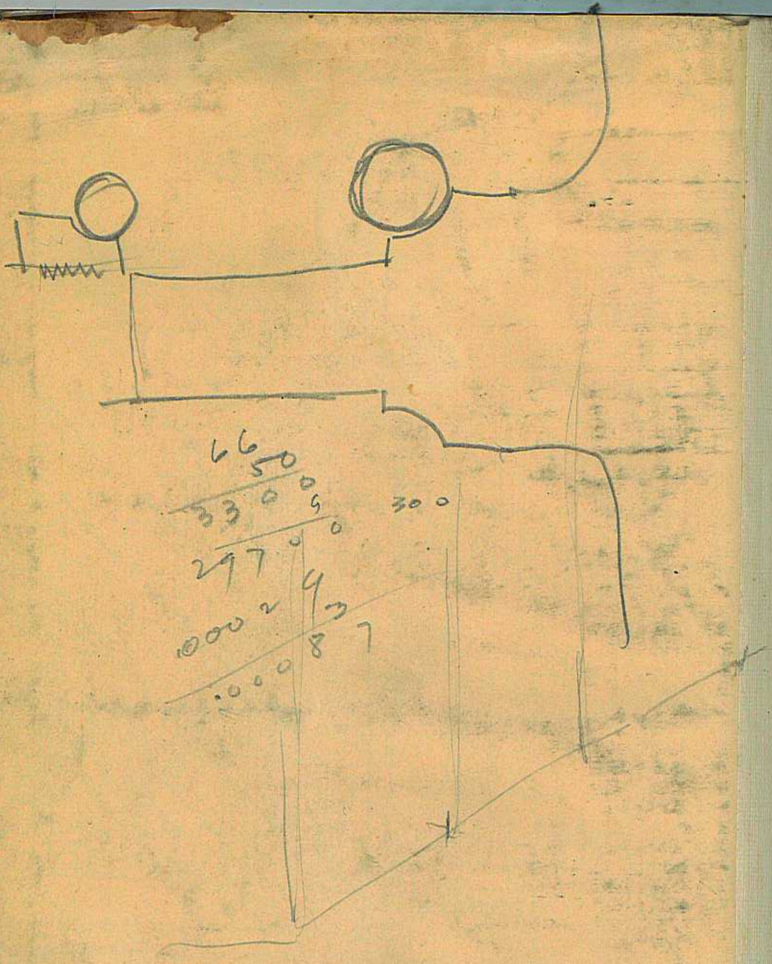
ROADWAY 14 FEET WIDE. SIDE SLOPES $1\frac{1}{2}$ TO 1.

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.



DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES $1^1/_2$ 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.

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