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DIETZGEN

ENGINEER'S

FIELD BOOK

No. 404

1006

EUGENE DIETZGEN CO.

DRAWING MATERIALS, MATHEMATICAL and
SURVEYING INSTRUMENTS

Chicago New York San Francisco New Orleans Pittsburg Toronto

Distances from Center of Roadway for Cross-Sectioning
Roadway 16 feet wide. Side Slopes 1 on 1.
For Single Track Embankment.

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
0	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	0
1	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	1
2	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	2
3	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	3
4	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	4
5	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	5
6	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	6
7	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	7
8	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	8
9	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	9
10	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	10
11	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	11
12	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	12
13	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	13
14	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	14
15	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	15
16	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	16
17	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	17
18	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	18
19	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	19
20	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	20
21	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	21
22	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	22
23	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	23
24	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	24
25	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	25
26	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	26
27	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	27
28	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	28
29	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	29
30	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	30
31	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	31
32	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	32
33	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	33
34	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	34
35	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	35
36	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	36
37	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	37
38	46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	46.9	38
39	47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7	47.8	47.9	39
40	48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7	48.8	48.9	40

Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 30.6. For same slopes but other widths of roadbed, correct above figures by one-half difference in width of roadbed; thus in example above, for 20 ft. roadbed distance will be 30.6+(20—16)÷2 or 2 ft. added to 30.6 =32.6. For slopes of 1 on 1½ see inside of back cover.

Eugene Schaub
Logan, Utah.

The only Smithfield City
notes are on page 2 Book 29

Eugene Schaub,
Logan, Utah.

EAG
941378

Sucked + Inked
8/3/33

Levels on Harley at pumping plant

Sta	RR	BS	HI	FS	Elev
	or gr				
		5.28			
			5.70		
			6.21		
	462			6.96	10000
	96	462			100	10462
	marked gr		5.60 on ground		
1+00			4.74		
2+00			4.60		
			3.6		
			5.54		

on pt near top pipe. grade on Water after leaving pipe

Give ditch 0.14 per 100

on H2O

$\sqrt{.6}$

$r = .6$

$\sqrt{r} = .77$

60 | .77
−49
1100
1029

.0015

1.

.00155

23
100
1
123.1 | 1.27
1143 | 99
880
762
28

.0250 | .77
224.034
260

24
.03
.72
.55
1.27

0015
04

.77
.04
.0308

.97
.03
2.91

600
3.75
2.25

5.00

600
4.92
1.08

5.0

600
41
1.8

6
41
9

5.5

97
.14
388
97
.1358

8.4
336
8.4
1.176

6.04
6.17
.14
.77

5.4

106
97
2403

200
.94
106

6.27

200
.38
1624
648
162
6.1268
6.38

200
62
1388
5.52
138
.193
616
4.35

2

	RRm	BS	FS	Elev	Cor
	8 + 4				F
	6.35	4.62			Cl
3+38	5.40				
1.42	23				
5+00	5.63				
.28					
7+00	5.91				
arbitrary		5.32	4.80	9982 / 10514	cl.1
7	6.43	6.43			
6	6.29				
7	6.43				
8	6.57				
9	6.71				
10	6.85				
** TP 11	6.99	1.32	5.47	9967 / 10099	1.32
11	2.84				
12	2.98				
13	3.12				
14	3.26				
15	3.40				
16	3.54				
17	3.68				
18	3.82				
TP 19	3.96	1.97	3.14	9785 / 9982	C.82
TP 19	2.790				
20	2.934				
21	3.07				

5.00
3.38
1.62

4.62
1.12
4.74

5.64
4
6.04
.12
6.16

1.62
.11
6.48
1.62
.2268

5.91
4.8
1.1
5.32
6.43
6.29

6.99
5.43
1.56
1.32
2.24

104.62
.48
99.82
5.32
105.14
5.47
99.67
1.32
100.99
3.11
97.85
97
99.82

3.96
3.94
.82
1.47
2.19

5

4

		BS	FS	Ele	HI
21	3.07				
22	3.21				
23	3.35				
24	3.49				
25	3.63				
26					
		4.38	1.32	98.50	
					102.88
		3.59	2.965	99.92	103.51
			3.46	100.	

on ctr ditch

99.82
1.32
98.50
4.38
102.88
2.96
99.92
3.59
103.51

on Sta 0

Levels from pond at pump to ditch ~~12.10~~

on H_2O in Pond
on first bolt in pole 5. in ditch

Ohi
on RR Tie

on Hy. grad - at bend.
on X RM → North

10.35
2.51

12.65	0.40
13.00	0.01
9.88	0.84
12.96	0.47
58.82	1.95
	3.67
	0.88

588
367
55.17 = h

1.95

Q as flowing = 2.77 cfs

Drain at 10th Ward
proposed Aug. 22 - 1917

	BS	FS	HI
(A)	2.27		
	3.87	11.78	
	6.14		
		9.20	
		20.98	
		6.14	
		14.84	

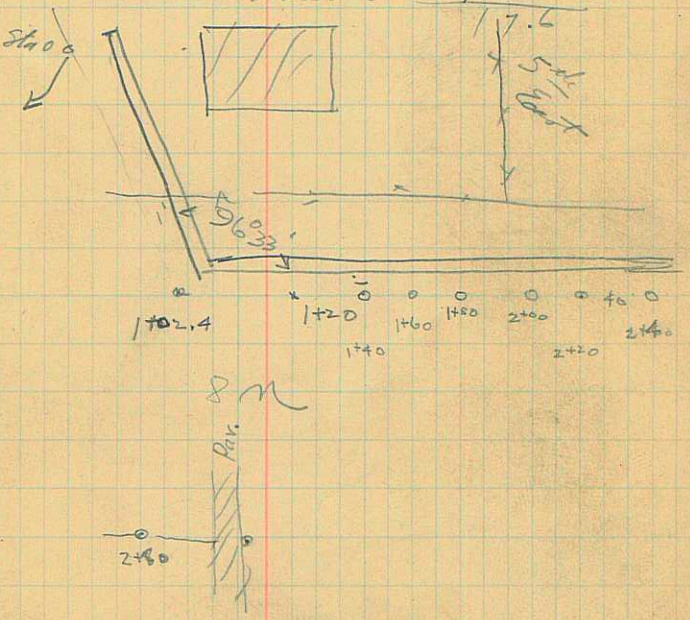
on Brick water table of old building

	HI	Ele	HI	BS	FS
(A)	101.97	100.00		1.970	
0				2.90	99.07
+20				3.36	9861
+40				3.76	9821
+60				4.34	97.63
+80				4.53	97.44
1+02.4				4.83	97.14
1+20				5.41	96.56
1+40				5.87	96.10
1+60				6.83	95.14
1+80				7.95	94.02
2+00				9.18	92.79
2+20				10.08	91.89
2+40				10.33	91.64
2+80	91.77	89.92		1.85	12.05

HI 91.77

on brick water table

10+97



				BS	FS
2+80	HI	Ele		1.80	
3+00		89.22	2.55	89.22	—
3+20		87.26	4.51	87.26	—
3+29.5 HP		86.77	5.00	86.77	—
3+~~44~~45		86.48	5.29	86.48	✓
3+~~45~~5		85.67	6.10	85.67	✓

HI 10415

Herb Hawkes
Bert Klemp
Trenton

at Hale

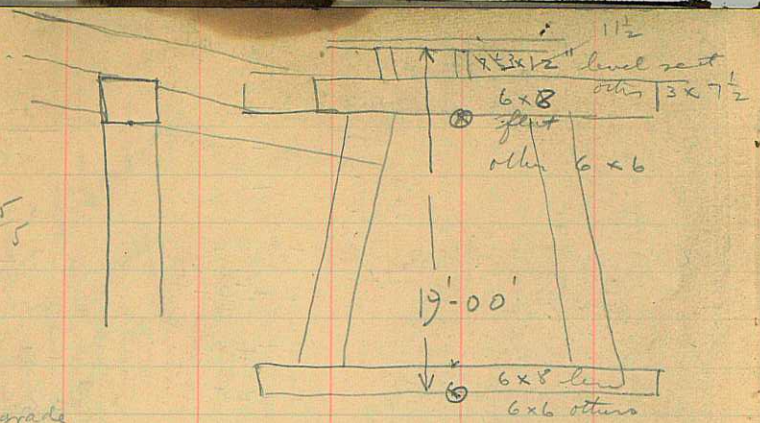
Sta	Ele	Grade	Rise or Fall	For C	
0 3+23.4					
	100.00	4.15	4.35 on form		2½' low
3+00	99.94	4.21	4.79	F 7" = 0.58	
2+88	99.88	4.27	5.08	− 0.81	9¾"
2+76	99.82	4.33	5.27	− 0.94	11¼"
2+64	99.76	4.39	5.81	− 1.42	1'-5"
2+52	99.70	4.45	5.70	− 1.25	1'-3"
2+40	99.64	4.51	6.22	− 1.71	1'-8½"
2+28	99.58	4.57	5.91	− 1.34	1'-4⅛"
2+16	99.52	4.63	6.30	− 1.67	1'-8⅛"
2+04	99.46	4.69	6.13	− 1.44	1'-5¼"
1+92	99.40	4.75	6.23	− 1.48	1'-5¾"
1+80	99.35	4.81	5.92	− 1.11	1'-1½"
1+68	99.28	4.87	6.11	− 1.24	1'-2⅞"
1+56	99.22	4.93	6.52	− 1.59	1'-7¼"
1+44	99.16	4.99	5.08	− .09	1⅛"
1+32	99.10	5.05	4.58	C 0.47	5⅝"
1+20	99.04	5.11	5.04	C 0.17	2"
1+08	98.98	5.17	5.58	F 0.31	3¾"
0+96	98.92	5.23	5.71	F 0.38	4½"
0+84	98.86	5.29	5.81	F 0.42	5"
0+72	98.80	5.35	6.12	F 0.67	8⅛"
0+60	98.74	5.41	5.71	F 0.20	2½"
0+48	98.68	5.47	6.41	F 0.84	10⅛"
0+36	98.62	5.53	6.1	F 0.47	5⅝"
0+24	98.56	5.59	6.76	F 1.07	1'-3"
0+12	98.50	5.65	6.50	F 0.75	9"
0 0					

Cor

C 1" = 1 in 12
F 4 7/8" = 1 in 8
F 5 3/4" = 1 in 6
6¼" = 1 in 4
9⅛" = 1 in 3
11¼" = 1 in 2½
6 7/8" = 1 in 2
1'-2⅛" = 1 in 1½
10¼" = 1 in 1¼

L1 0.7

12 | 96 | 84 | 72 | 60 | 48 | 36 | 24 | 12 | 36 | 84 | 72 | 60 | 48 | 36 | 24 | 12 from 96



Sta 1+00 grade RR 4.61

BS	FS	Grade	RR	Fo cut
100.90	3.25	3.70	.45	= 5½"
100.84	3.31	3.76	.045	= 5½"
100.78	3.37	4.05	0.68	8¼"
100.72	3.43	3.9	0.49	5⅞"
100.66	3.49	4.26	0.77	- 9¼"
100.60	3.55	4.6	1.07	- 1'-7/8"
100.54	3.61	4.49	0.88	- 10⅝"
100.48	3.67	4.06	039	- 4⅝"
100.42	3.73	4.78	1.05	1'-5/8"
100.36	3.79	4.82	1.03	- 1'-3/8"
100.30	3.85	4.95	F1.1	= 1'-1½"
100.24	3.91	5.20	F1.29	- 1'-3⅝"
100.18	3.97	5.01	F1.09	1'-1⅛"
100.12	4.03	5.46	F1.43	= 1'-5½"
100.06	4.090	5.10	F1.91	= 1'-11⅛"
100.00	4.150			

4.29 - 4.61 = -.32

5.10 - 4.61 = .49

Slope 1" = 1'-0"

4.61 - .46

	5+03	84
	4+91	72
	4+79	60
	4+67	48
	4+55	36'
	4+43	24 from 4+19
	4+31	96
	4+19	84
	4+07	72
	3+95	60
	3+83	48
	3+71	36
	3+59	24
0	3+47	12
0	3+35.4	12
0	3+23.4	

BS

2.010

on BM 3.15

1.480 11.25

2.350 12.75

5.840

2.47

9.35

33.34

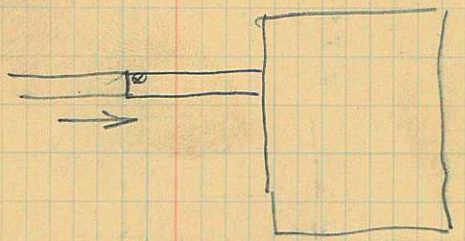
5.84

27.50

$E = \frac{26.80 \text{ theo H-P.}}{36.0 = \text{?}}$

$= 74.50\%$

on H_2O discharge on a
sq ft 9 x 6



+0.

36.7 impact

31

Vac.

10.16

20.80

30.96

27.50

3.46

$31 \times 7 \times 62.5$

550

76

$21 \times 24 \times 60$

60

1440

21

1440

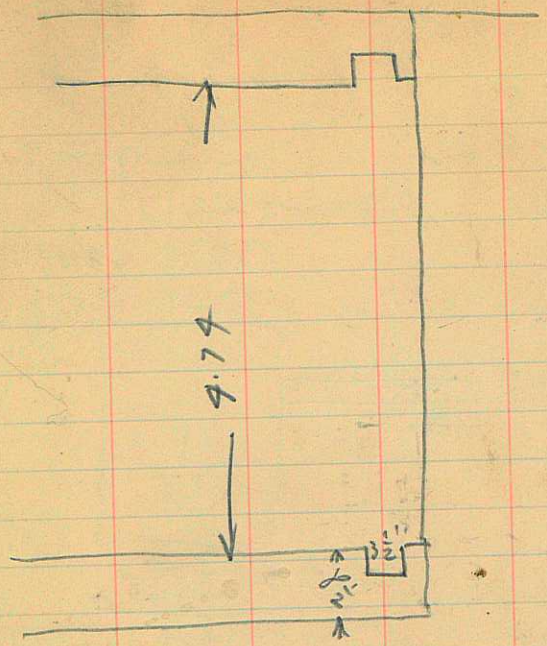
2880

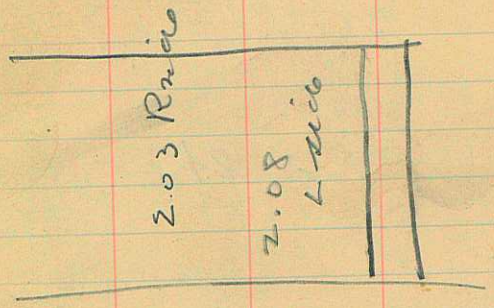
30240

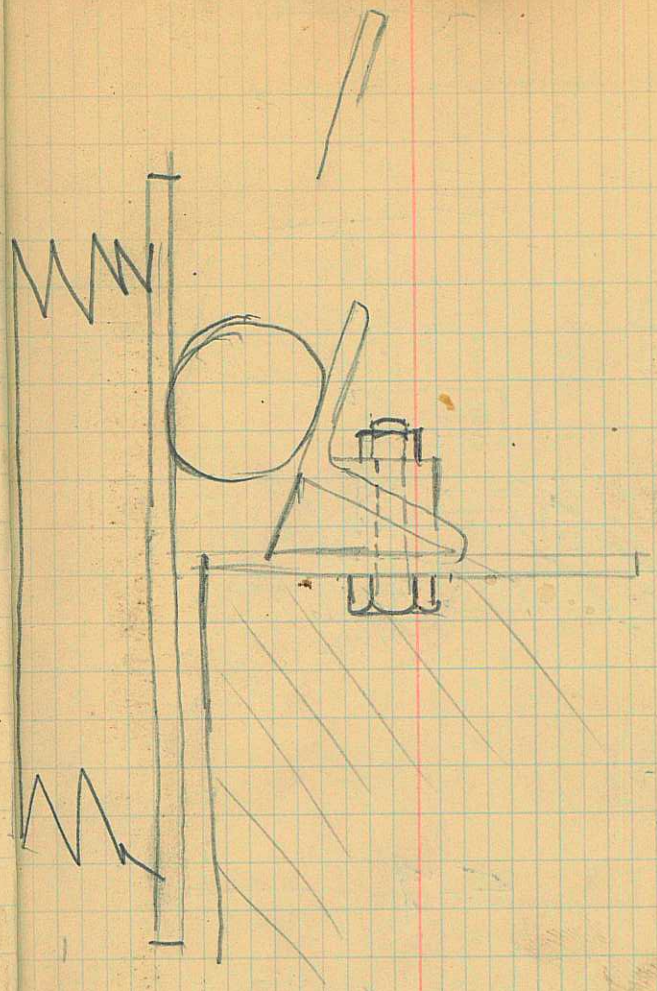
24 rev of meter

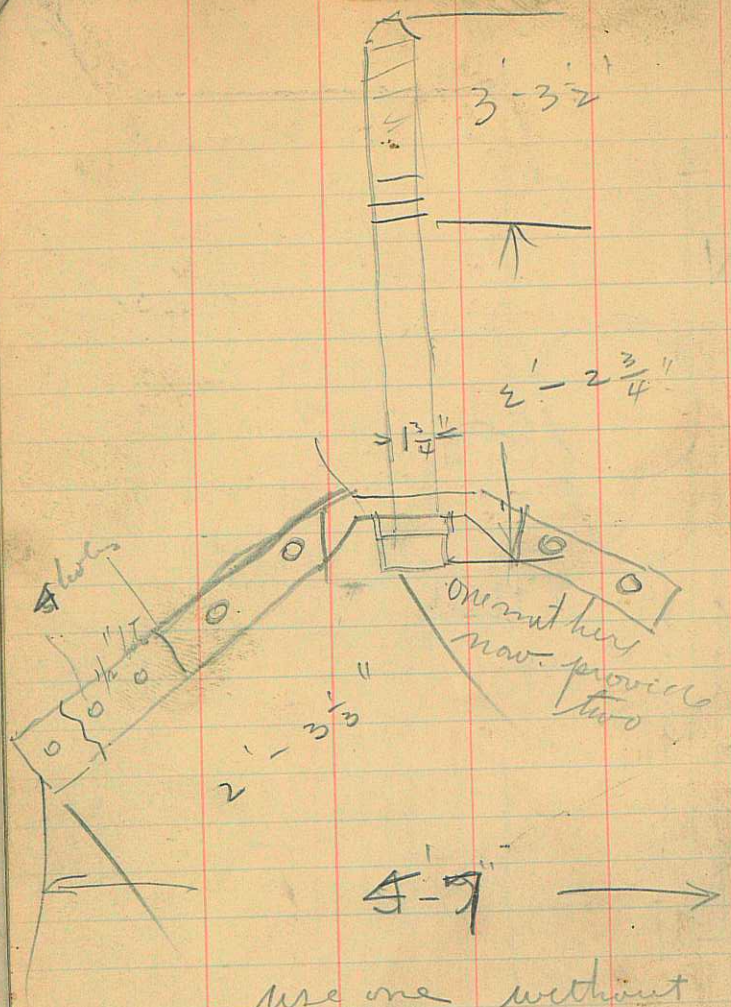
24 = K = ?

on

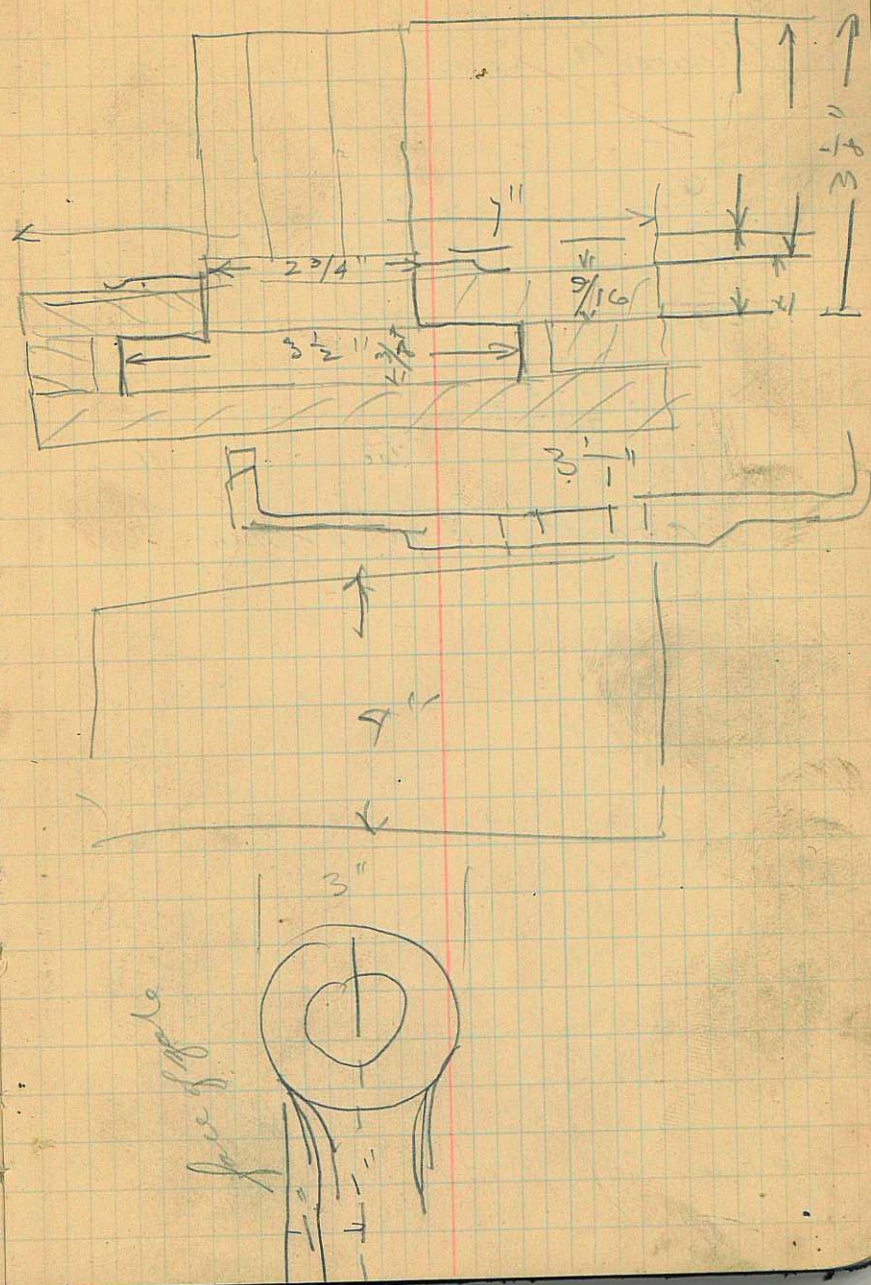








use one without wooden block



Wells Data at
N Redmond on
Aleworth Spring

.5
.06
.030
1.6
.03
.048 3

450
05
22.50

40
1420 20
28800 150
200

about 18 gal per min

Paul Merrell Hotel 8/31/17

6.35

5.70

6.70 RR

5.80
.15
5.95
.15
6.10
+
6.25

5.1 CI

21

west end culvert

End

on ground mark 5.4 for water surface

5.5
4.1
1.4

5.8

100'

5.95

10'

6.10

6.27

6.30

6.70

7.5

6.50

W. Paul Merrill

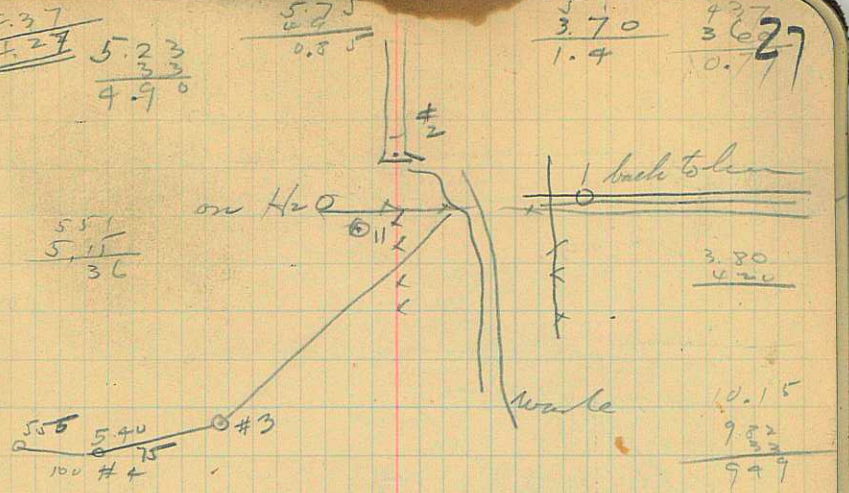
1	5.20	raise 4.90
10	5.26	
	4.70	
3	5.30	
4	5.40	
5	5.55	
6	5.65	
7	5.75	
7		4.67 .25 600 E.25
7	4.37	
8	4.50	
9	4.60	
last	4.70	

10	5.57	
1	5.51	
	5.10	raise .40
x	5.20	

4.37 / 5.27 — 5.23 / 4.90

5.75 / 0.5 5

3.70 / 1.4 — 4.37 / 3.68 / 0.7 — 27

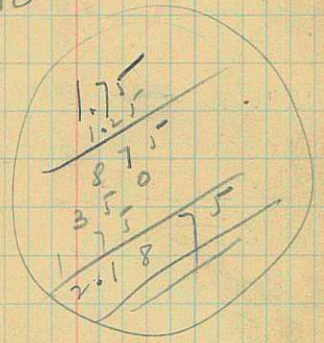


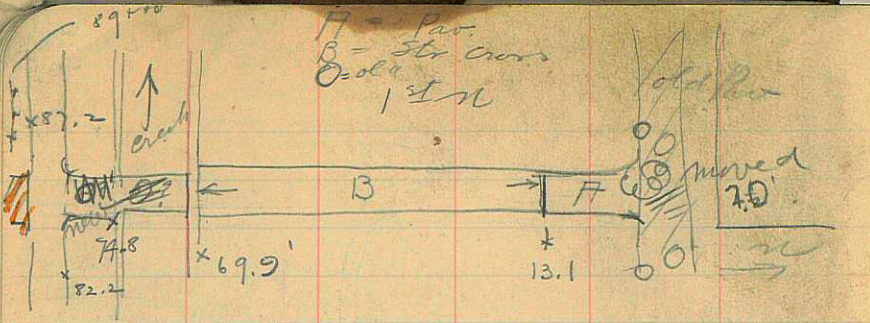
BS 5.20 — FS 6.000 / 4.62 / 36 — 9.82 / 33 / 96

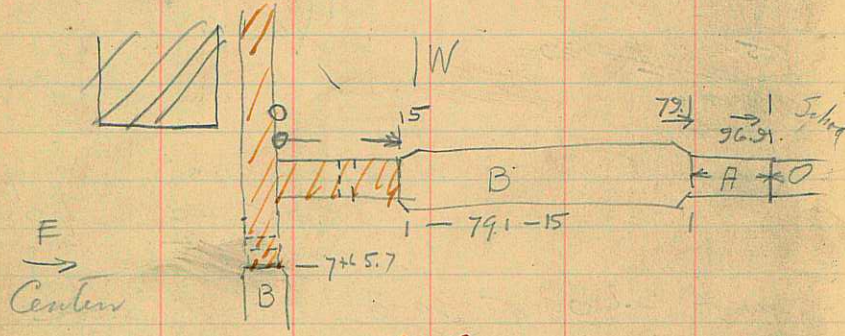
not 3.60 pt 30' E on last foresight

5.10

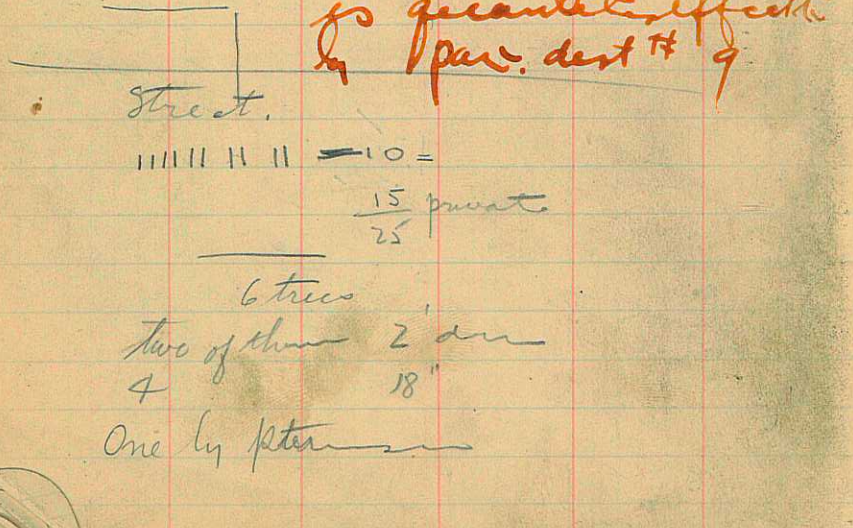
5.51 / 33 / 5.18



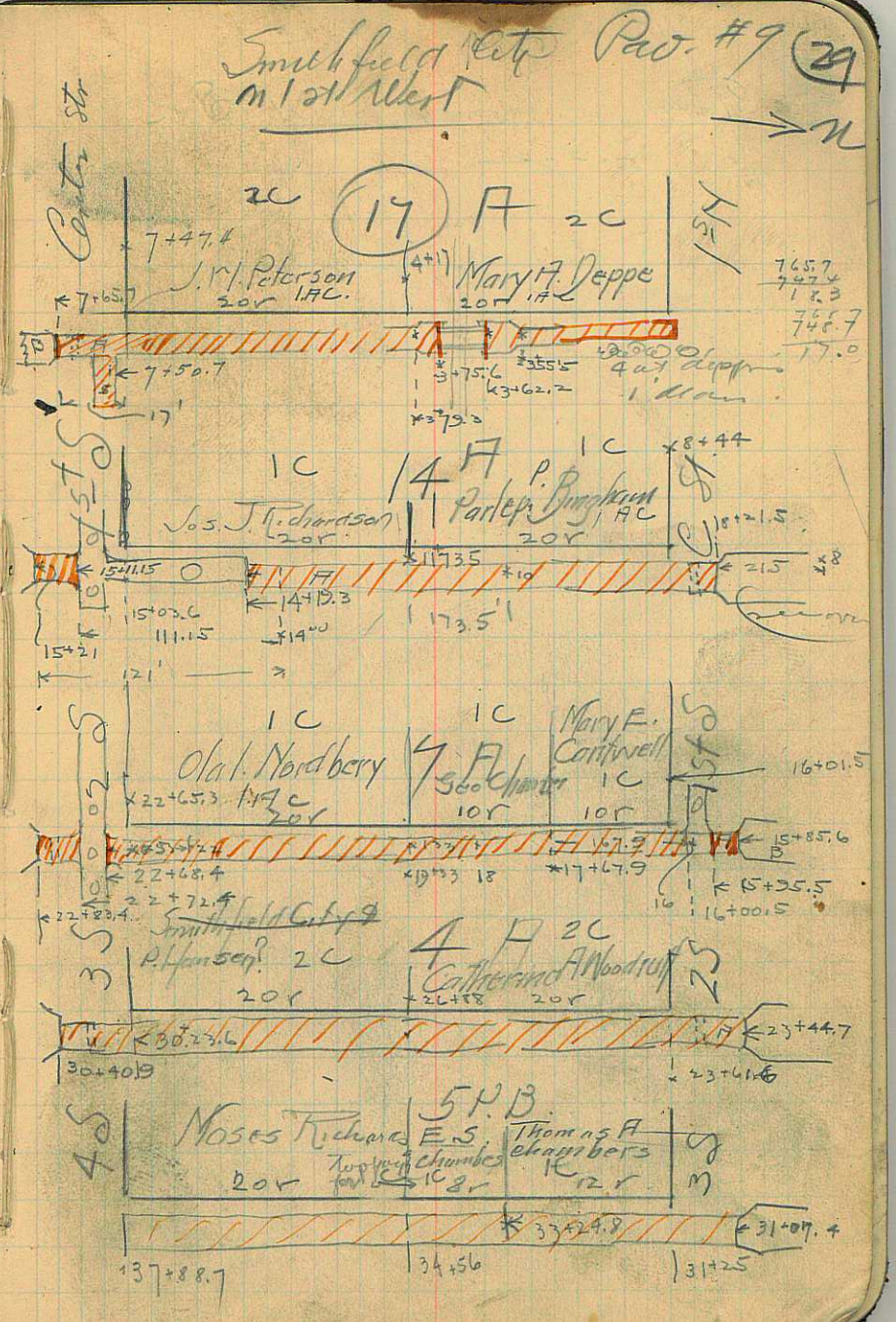




Note: yellow is present effect of pav. dest # 9



Smithfield City Pav. #9 (29)
N 1st West

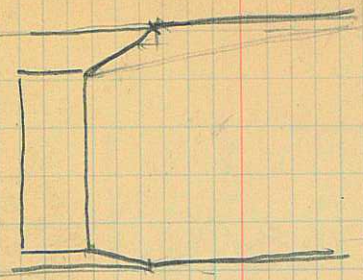


Work to be done

Two section rimmed S of foot bridge

330
89
417

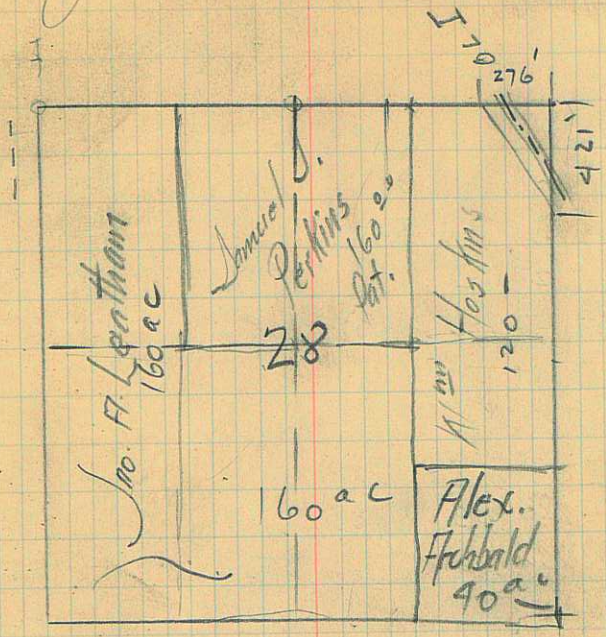
165
330.0
89
241



31

Jno Perkins survey

33



Survey for [illegible] of Wellsville
for [illegible] 8-17-W 1W
Sept -

A - P.I.

40.00 90

90°01

A - 27.62

- A 27.62 89°33

20.393 89°33'

A₁ ⊙

perhaps the cor a
fine post 8" in dia

B 77.22 curve 80.58 to cor post

Perhaps 69.66
Wat line

70.00

60.00 stake drove here

50.00

40.00 from A₁ stake here

60.66
20.39
40.27

0° 30.393

meas. continuously from A₁ 27.62

10.0
3.32
6.8

0° 20.393

39.68

Sec 28
T 11 N

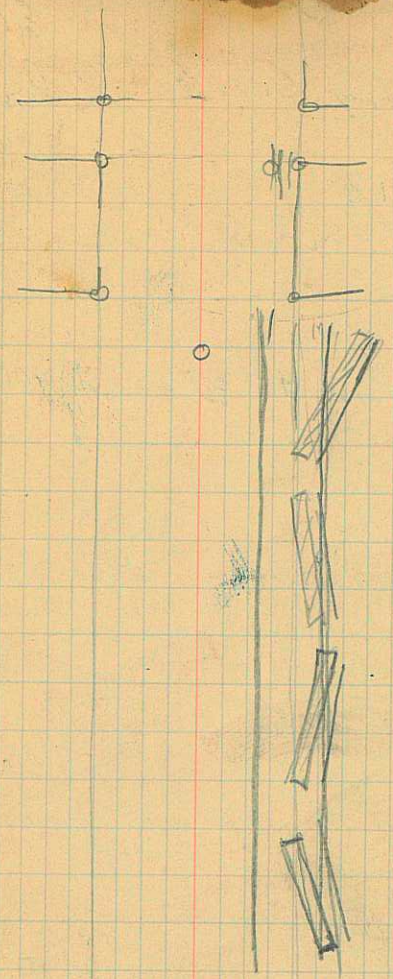
from a line
between A₁-B

89°33

2.3

.375

.25



9/17/17 Elc

Spring Creek clear

11.10
9.70 on H_2O

403 10000 10403

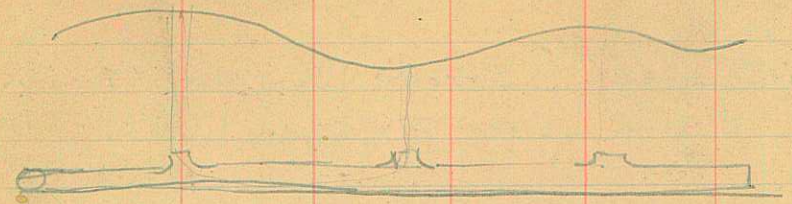
11.10
1.4
9.7

39

on spill boards, hy. grd. 1.4 higher at dam spring

104.03
9.70
94.33

94.20
2
94.20
94.33
1.87



.78 $v = 8.02\sqrt{rh}$

7

$\sqrt{\frac{h}{f\frac{L}{2}}}$ .02 $\frac{200}{4.00}$ $\frac{20}{.7}$ $\frac{}{14.0}$

12

1.5" 5

Earth Dam Survey

for Stockton Res Co. Ele

9/17/17

Station

Pt	Az	Vert	L	C	U
21	123°31	−1°23'	9	92.1	10.30
20	133°07	−3°10'	3	94.3	4.27
19	142°38	+0°55'	3	103.1	4.19
18	157°30	+8°10'	3	117.8	4.18
17	173°33	+14°38	3	132.2	4.27
16	187°13	+17°53	3	139.	4.30
15	203°15	+19°37	3	149.1	4.52
14	213°25	+19°55	3	139.	4.18
13	236°20	+18°15	3	127.7	3.88
12	268°17	+11°55	3	116.2	3.73
11	296°52	+1°53	3	104.	3.85
10	328°05	−2°37	10	89.50	11.1
9	328°57	−1°09'	9	93.2	10.07
8	328°16	−5°11'	3	92.00	4.06
7	348°26	−2°19'	3	91.0	4.57
6	3°37'	−56'	3	98.0	4.85
5	16°42'	+5°47	3	120.8	5.02
4	23°44'	+8°13	3	130.7	5.12
3	34°18'	+10°30	3	140.7	5.24
2	58°53	+12°20'	3	157.2	5.72
1	58°55'	+10°10'	3	141.8	5.38
0				100.00	

Hor Dist

130 on top

127

119

115

119.0

118.0

135.0

104

80

10 on bottom

105

157

185

201

207.0

216

258

230

104.80

Ends cone wall 43°22

⊙ . HI = 4.8

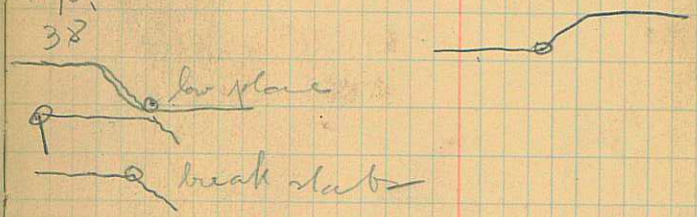
	Pt	Az	Vert	L	C	D
	35	~~177°08'~~	~~+1°20'~~ 1°20'			
	34	~~193°42'~~	-7' ±	2		5.3
33		~~143°~~		~		9.3
	~~33~~	325°02'	+1°04'	2		8.70
	32	21°15	-1°42'	11.	90.7	11.9
	31	43°30	-13°28	12	83.5	12.4
	30	43°30	~~-13°43~~	10	87.7	11.06
	29	43°30	-11'	3	100.6	4.48
	28	43°30'	-39'	3	99.8	4.26
	27	54°51'	-5°41'	3	90.8	4.05
	26	81°32	-9°35	3	87.8	3.83
	25	86°08	-3°01'	3	94.	4.33
	24	97°20	-2°51'	3	92.0	4.75
	23	103°45'	-2°30'	3	95.8	4.26
	22	123°49	-2°41	11.00	87.0	12.32

about 800' to spoil mat

Mat

90'

38



81

133

175

126

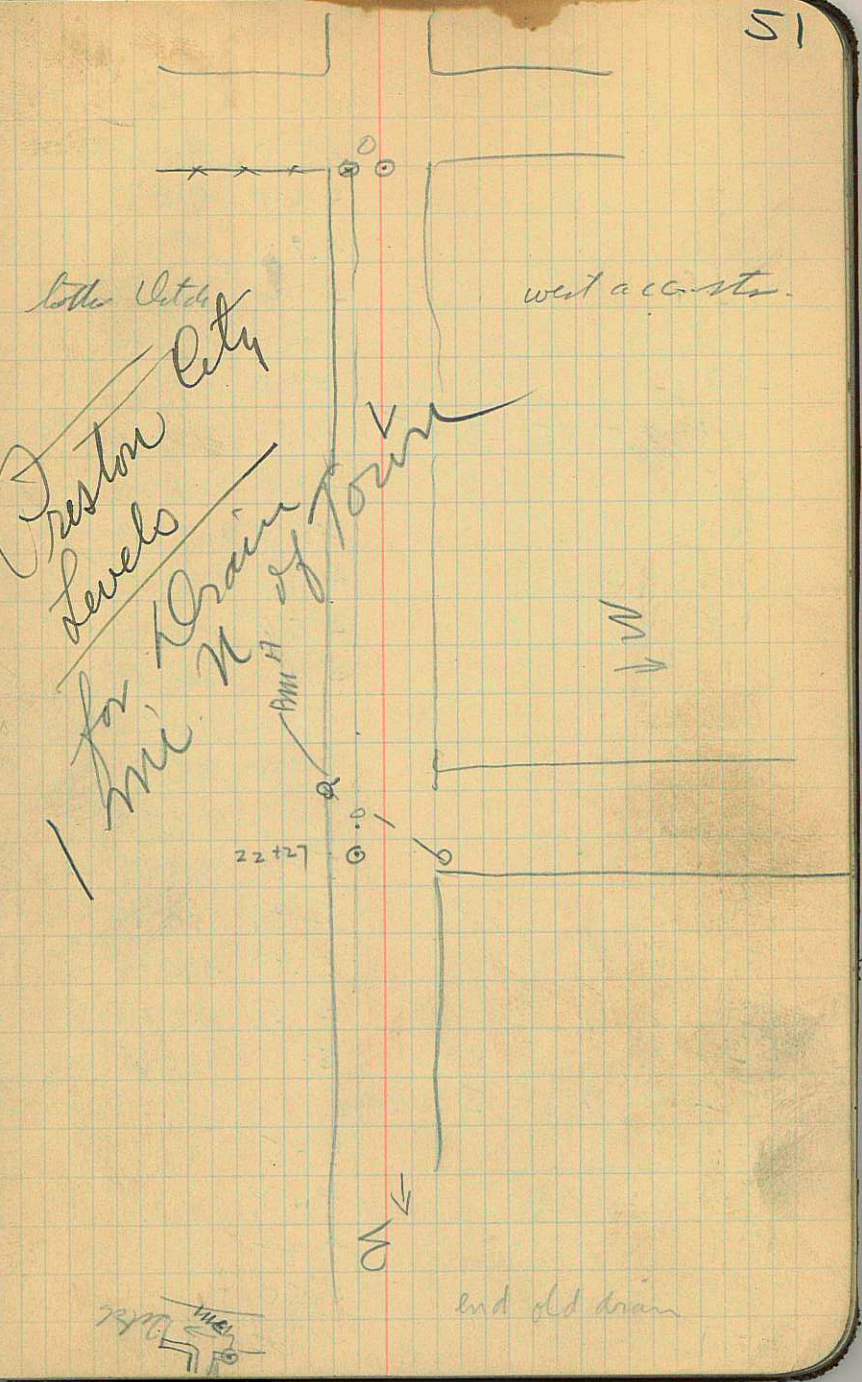
131

Preston Wrau

Stokes out 47
#20.00
4/
50 redrawn

Levels down

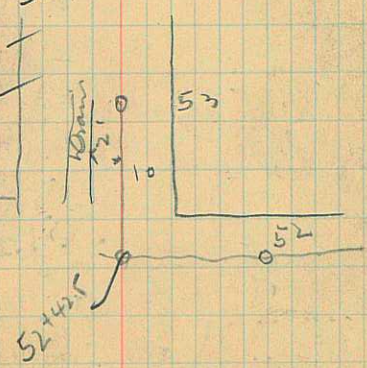
Sta	BS	FS	rise	Ele	HI
52+00	4.92			100.03	104.95
4+00			5.60	99.35	
6+00			5.40	99.55	
6+25			5.10	99.85	
	3.130	2.85		102.10	105.23
8+00			6.00	99.23	
10+00			5.40	99.83	
12+00			5.60	99.63	
14+00			5.30	99.93	
16			5.70	99.53	
18			6.4	98.83	
20+00	4.72	6.38		98.85	103.57
22+00					
22+27			5.70	97.87	
Perm Pt on bridge rail			3.36	100.21	
24			7.35	96.22	
26			7.20	96.37	
28			7.10	96.47	
30			6.50	97.07	
32			5.80	97.77	
34			6.6	96.97	
	4.91	3.08		100.49	105.40
35+75			9.40	96.00	
Perm BS			2.22	103.18	



Preston final Drain N 91

of a point	BS	FS	Int	Ele	HI	Ele Grade	Cov
72			4.78	98.67	✓	96.63	2'-1/2"
71			4.68	98.77	✓	96.66	2'-1¼"
70			4.39	99.06	✓	96.69	2'-4½"
69			4.12	99.33	✓	96.72	2'-8"
68			4.02	99.43	✓	96.75	2'-8½"
67			3.68	99.77	✓	96.78	3'
66	5.55	3.35		100.10	105.65	96.81	3'-2½"
65			4.10	101.55	✓	96.84	~~3'-9"~~ 4'-9"
64			4.13	101.52	✓	96.87	4'-8"
63			4.40	101.25	✓	96.90	4'-4"
62			4.58	101.07	✓	96.93	4'-2"
61			5.18	100.47	✓	96.96	3'-6"
60			5.01	100.64	✓	96.99	3'-8"
59			4.44	101.21	✓	97.02	4'-2½"
58			6.40	99.25	✓	97.05	2'-2½"
57			5.78	99.87	✓	97.08	2'-9½"
56			5.47	100.18	✓	97.11	3'-1"
55			5.47	100.18	✓	97.14	3'-1/2"
54			5.37	100.28	✓	97.17	3'-1¼"
53			5.20	100.45	✓	97.20	3'-3"
52	3.72	5.60		100.05		97.23	
51			3.85				
50			4.10				
49			4.22				
48			5.50				
HIB 47			5.72				

Elevation Line

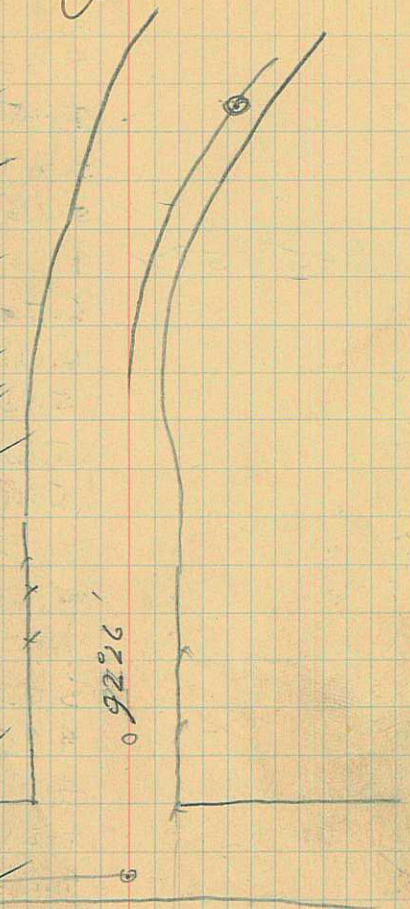


Levels Down

	BS	FS	HI	Ele	HI	Grade Ele	@ or =
BM on curb B	1.73			102.90	104.63		
88+58			7.15	97.48	✓	96.14	1'-4⅛" ✓
88			6.22	98.41	✓	96.15	2'-3" ✓
87			4.35	100.28	✓	96.18	4'-1" ✓
86			4.61	100.02	✓	96.21	3'-10" ✓
85			5.76	98.87	✓	96.24	2'-8" ✓
84			6.00	98.63	✓	96.27	2'-4½" ✓
83			5.30	99.33	✓	96.30	3'-½" ✓
82			5.53	99.10	✓	96.33	2'-9½" ✓
81			6.90	97.73	✓	96.36	1'-4½" ✓
80	5.29	6.47		98.16	103.45	96.39	1'-9½" ✓
79			6.40	97.05	✓	96.42	8" ✓
78			7.10	96.35	✓	96.45	Gr. ✓
77			6.90	96.55	✓	96.48	Gr ✓
76			6.04	94.41	✓	96.51	C 11" ✓
						~~96.52~~	
74+84			6.10	97.35	✓	96.52	180° C 10" ✓
VMA			3.50	99.95	✓		
74			5.50	97.95	✓	96.54	1'-4½" ✓
73			4.90	98.55	✓	96.60	1'-11½" ✓

(con. back)

Preston Ctr Levels



55

Preston Cut
Levels

	BS	FS	Elev
HI b 46			5.62
45			5.91
HI			5.33
43 out			
42			5.40
41			5.15
40			5.27
39			5.86
38	6.95	5.82	
37			6.50
36			6.16
35			5.85
34			5.60
33			5.65
32			5.72
31			5.60
30 out			
29			5.03
28			4.95
27			4.70
26			4.28
25			4.02
24			3.80
23			3.62
22	6.85	3.10	
21			6.38

	BS	FS	HI	Ele	
H. 20					
19			6.00		
18			5.90		
17			5.50		
16			5.15		
15			4.48		
14			4.15		
13			3.90		
12			2.86		
11			2.37		
10			1.80		
9			1.85		
8			1.52		
7	5.90	1.55	+		
6			5.50		
5			4.70		
4			4.96		
3			4.66		
2			4.30		
1			3.69		
0			3.31		
bm a		0.38		111.85	

Prestar City Lively

Gage Levels for
Benson Canal 9/20/17

6.045

5.055

5.045

5.020

2.028

4.000
4000

5.040
4.74

.055
.045
.02
.120

5.04 .35 12/3

61

on hook when staff touches bottom

Zero single 4×4 on concrete control south end

" same 4×4 on Center

Mean on same 4×4

on 3/4" bolt west end spill.

on H₂O surface in canal

on " " in box

Mean on single 4×4
on hook called zero of gage

Thatcher's Race
gage installed 9/20/17

7.620
7.640
9.64

mean 7.633

BM 2923

62
62
62
3)186
62

west side concrete entrance
center " "
E. side " "

point hook

{on 8d nail driven in 2×8 upright that supports staff

9/27/17 Survey for Emily B. Johns

in sec 11 – Tp 10 N 1W

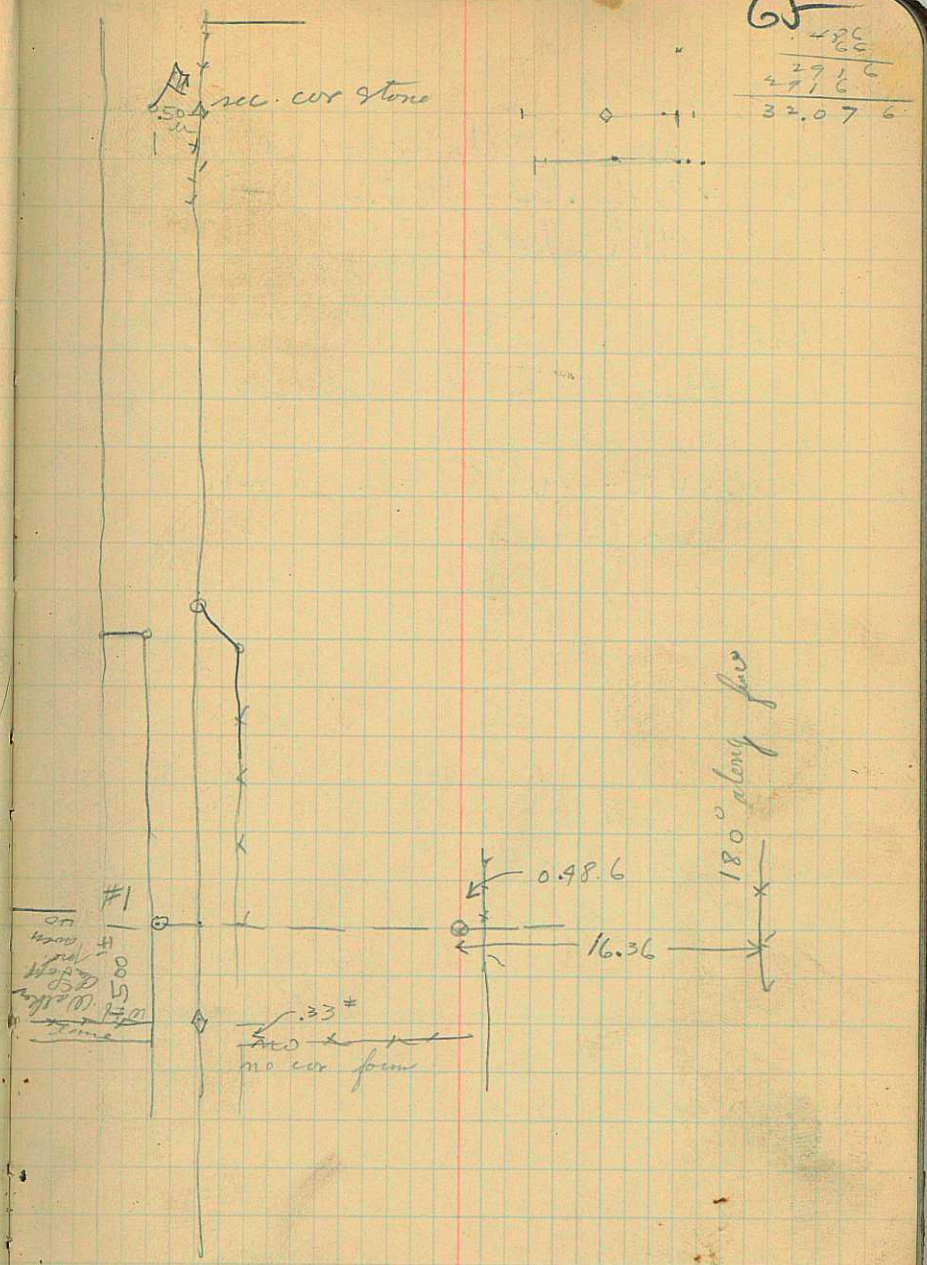
06. on #1

	Horiz	Vert L	time
Direct	328°54'	+42°31	10:50am
Invert	330°17'	+42°15	

Direct	330°	42°52	10:51 R
Invert	331°13'	42°31	

330°57'	43°08	11:00
332°03'	42°45'	

65



Egra Cooley Survey

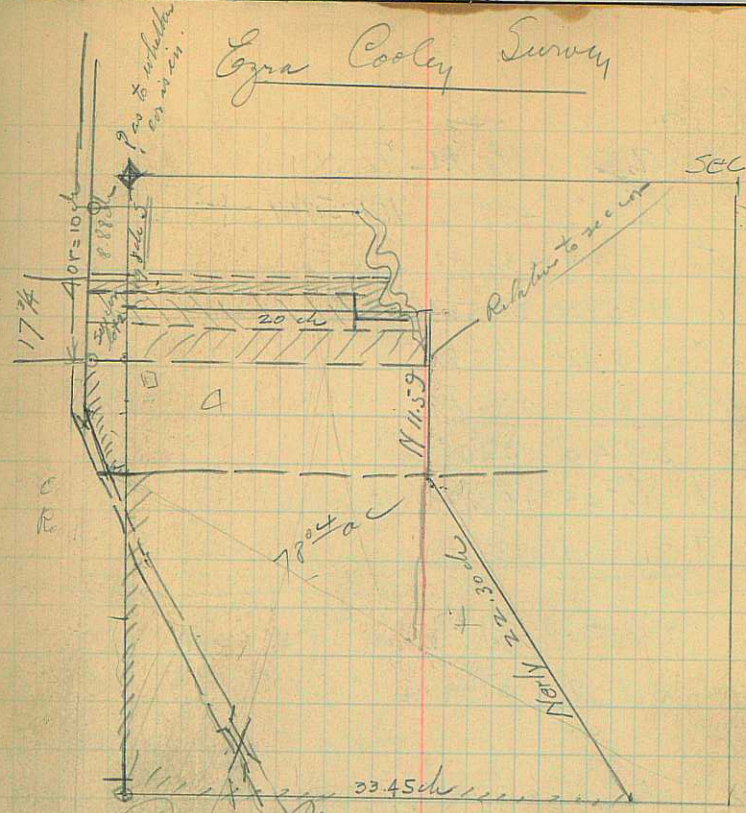
67

Job Smith

Beg at NW cor of SW¼ sec 27 - E 20 ch : S 8.41 ch W 20 ch N 8 ch to beg.

Hill

Beg 8 ch S of NW cor of NW¼ of SW¼ sec 27 - S 32 ch E 33.45 ch - NW 22.30 - N 11.59 ch W 20 to beg.



Part of lot 2 - Com at a pt 17¾ rds N of SW cor lot 2 N 1 rd; E 9 rds 2 rds; S 9¾ rds; W 21.5 rds N 5¾ rds W 7 rds to beg.

Part Beg at pt 24.25 rds S of NW cor of NW¼ SW¼ 27 S W 13 rds to E R. S 00° 50' W 40.27 rds. S 26° 30' E 18 rds to S bk of NE¼ of SE¼ sec 28 - E 6 rds ; S 20 ch E 33.45 ch. NW'ly 22.30 ch. N 11.59 ch. W 21½ rds N 7.75 rds W 58 rds to beg.

Cooley Sur 9/29/17 ✓

Ob on sun

	Az.	Vert ∠	Time
Direct	317°30'	+37°02'	10:05 am
Invert	318°29'	+36°41'	
	317°59'30"	36°51'30"	
Direct	318°12'	+37°22'	
Invert	319°08'	+36°59'	
	318°40'	37°10'30"	
Direct	318°45'	+37°38'	10:15 am
Invert	319°44'	+37°16'	
	319°14'30"	37°27'	
Σ mean	318°38'	37°09'40"	

$\zeta = -2°22$

$\phi = 41°39'10"$

$Z = 89°59'60" - 37°08'20" = 52°51'40"$

Ref for 37° = 1'16"

Cor h = 37°09'40"
− 1'16"
37°08'24"

Nearest 39' ✓ from all az read value = 38'40"

~~O3~~ West

~~O2~~

8 322°14' 3.05 ch

7 343°38 .81.2 ch (decimal pt must be in wrong place)

4- ~~343° 81.2~~ 4-23-68

4 211°36'

1 123°34'

3 148°52' ch

6- F

6 115°54 1 ch

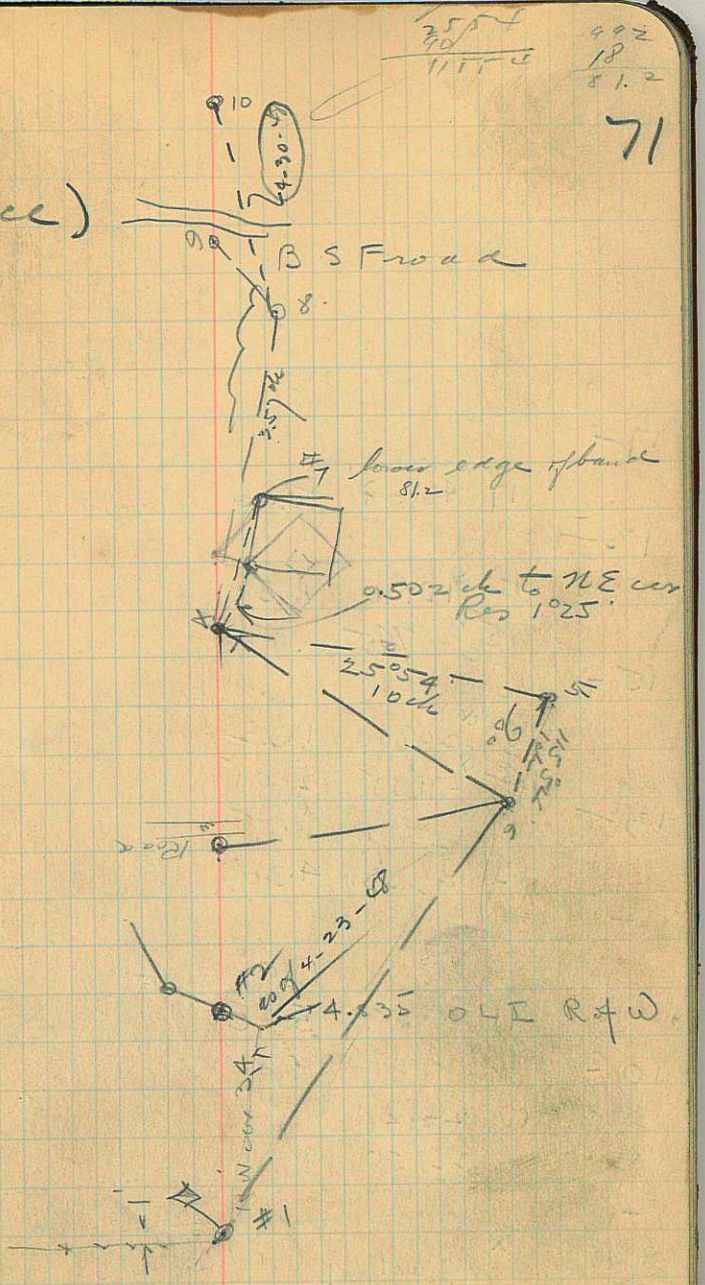
5-

5 25°54' 10 ch

4-

2 4.835 270°

1-



17 ⊗=152°44'
17 146°08 7.00

13

16 ⊗ 101°10 1.15
15a ⊗ 29°45 0.92

15

15 ⊗ 209°30 1.32
14 ⊗ 271°55 2.01

13

13 150°09' ✓
143°33 4.30d

11

12 6.97
11 5.20

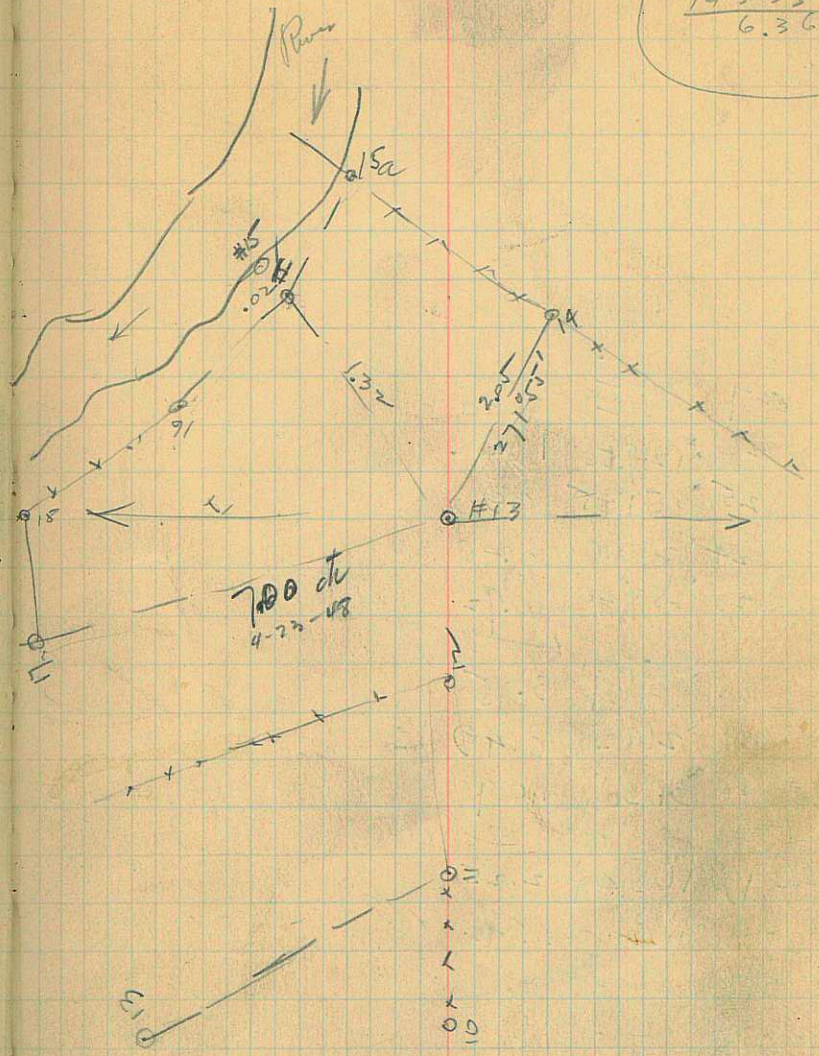
10

10 244°40'
9 228°58 ✗

8

⊗ correct by adding 2°36

14969
14333
6.36



90 03

10/22/17

27	90°02'	70+84+86=
26	129°50'	2.40
25	157°45'	1.64
24	217°10'	0.90
23	287°20'	0.48
		0.92
22	148°07'	3.75
21	268°30'	0.49
20	311°30'	1.09
19	170°23'	2.25 dh
18	238°38'	45 dh.

10/22/17

22 –

19 –

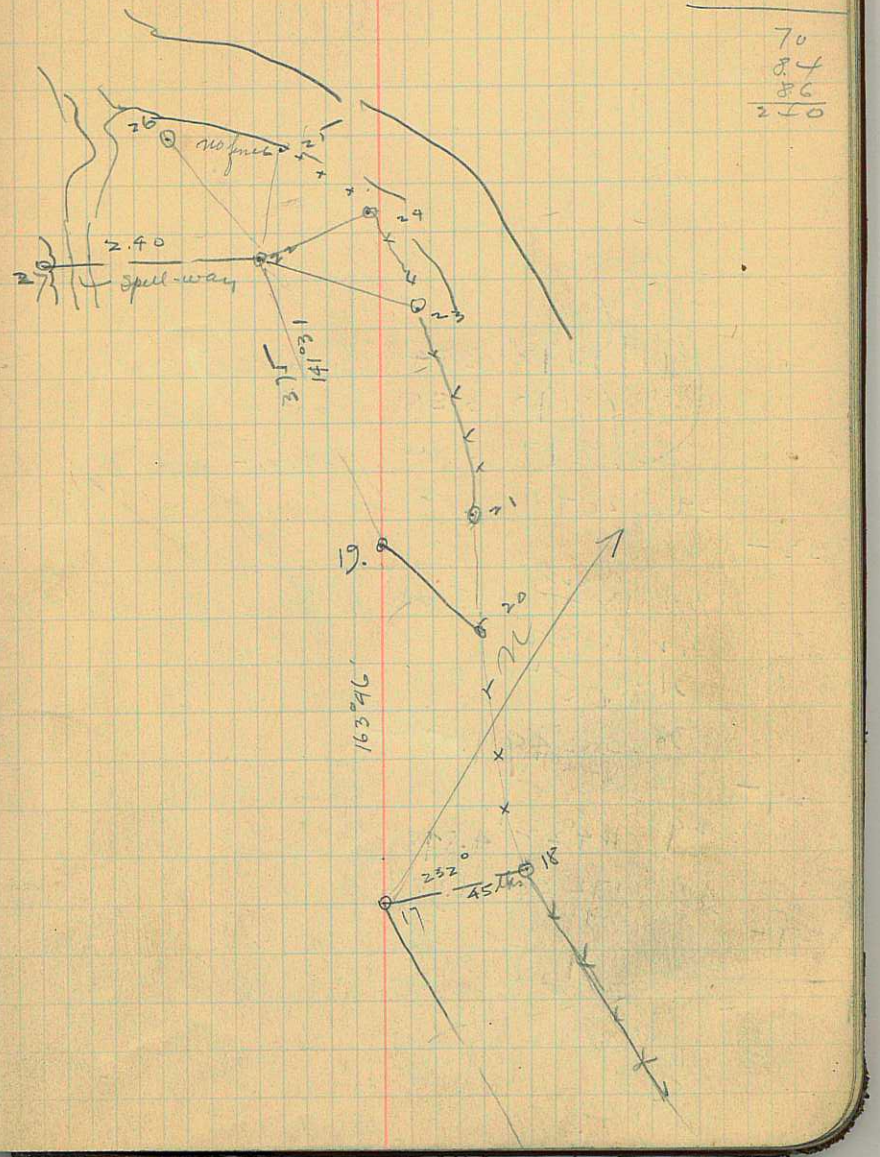
17 –

⊕ add 6°36

75

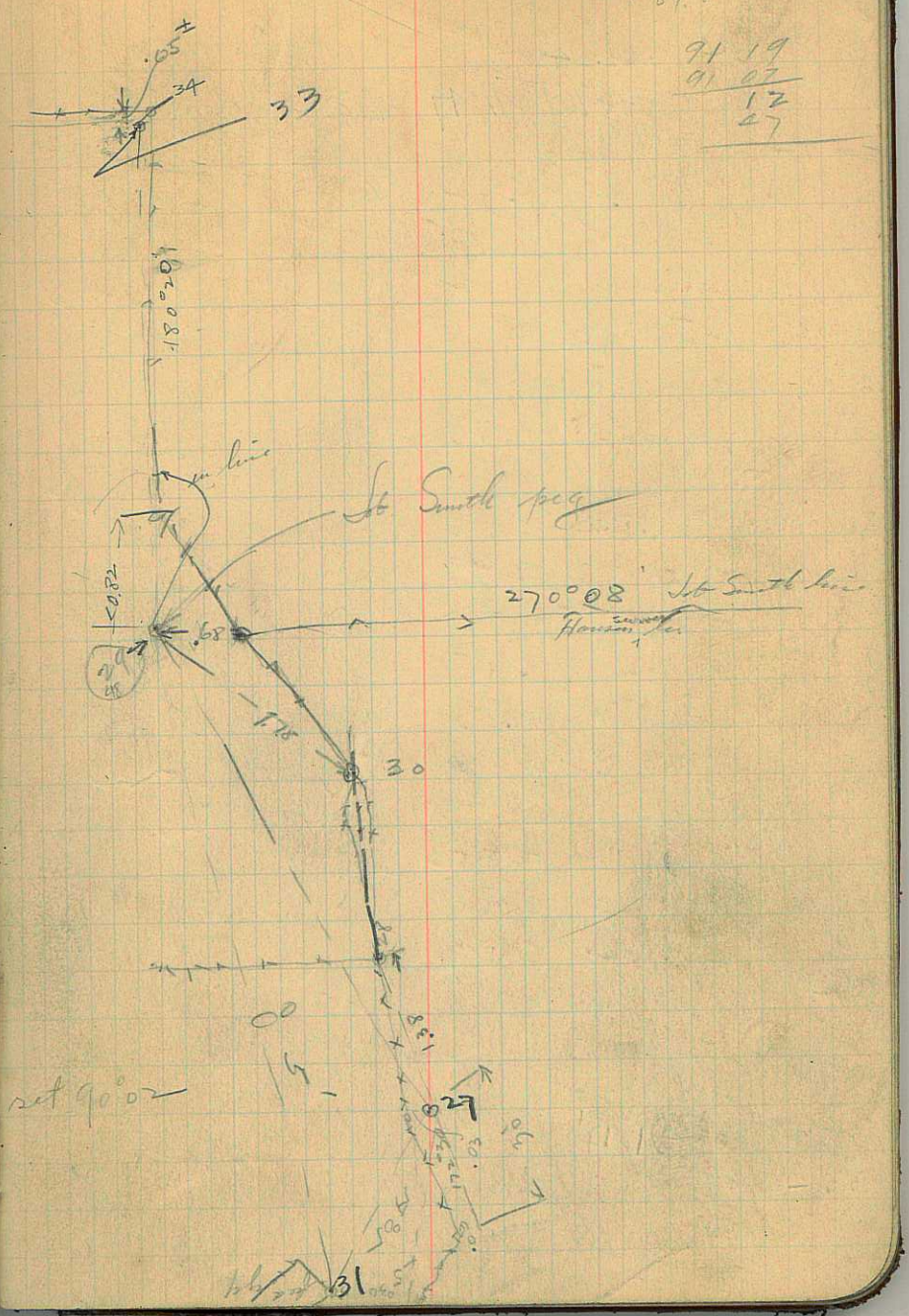
163°47'
6°36'
170°23'

70
84
86
240



dk

91°19	91°47'	3.84	W Brick OLI Post
	91°47	3.50	To Ground O.L.I.
	91°47	2.84	to O.L.I.
34	207°11'	0.07	
33			
33	180°~~20~~	15.00	
~~32~~	180°27		
31	0°05'		
30	303°49	1.78	
29			
29	164°22	4.878	
28	172°30	1.38	
27			

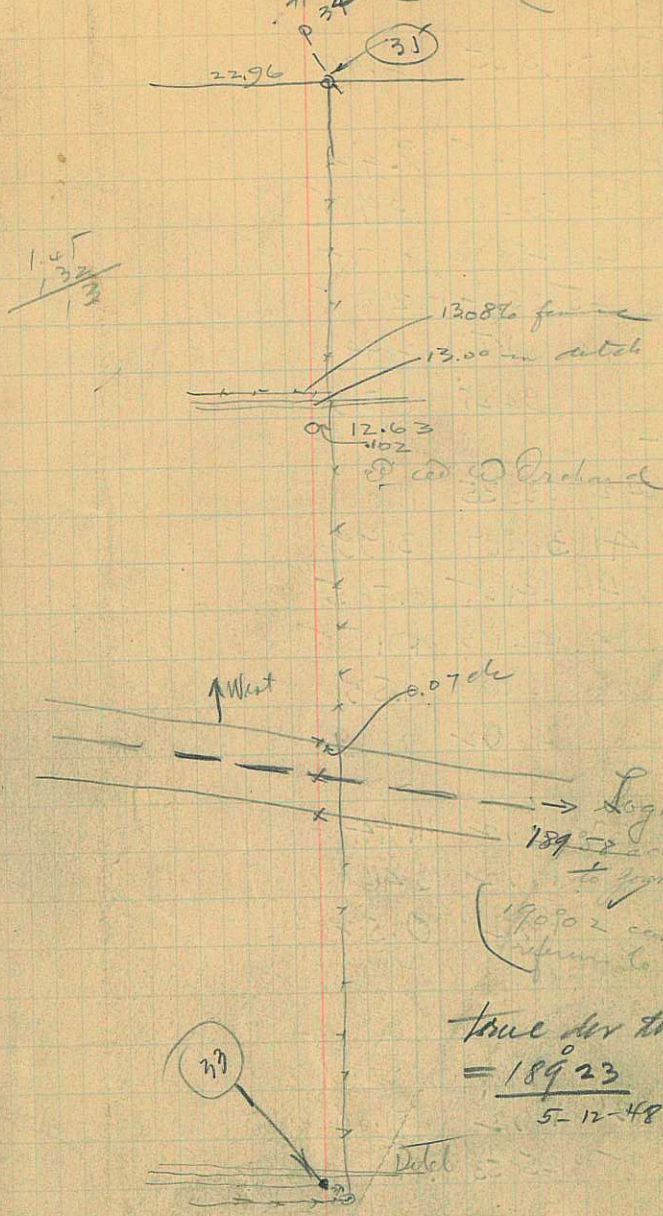


34 23.34
22.96 91°47' to E. side Co. Road

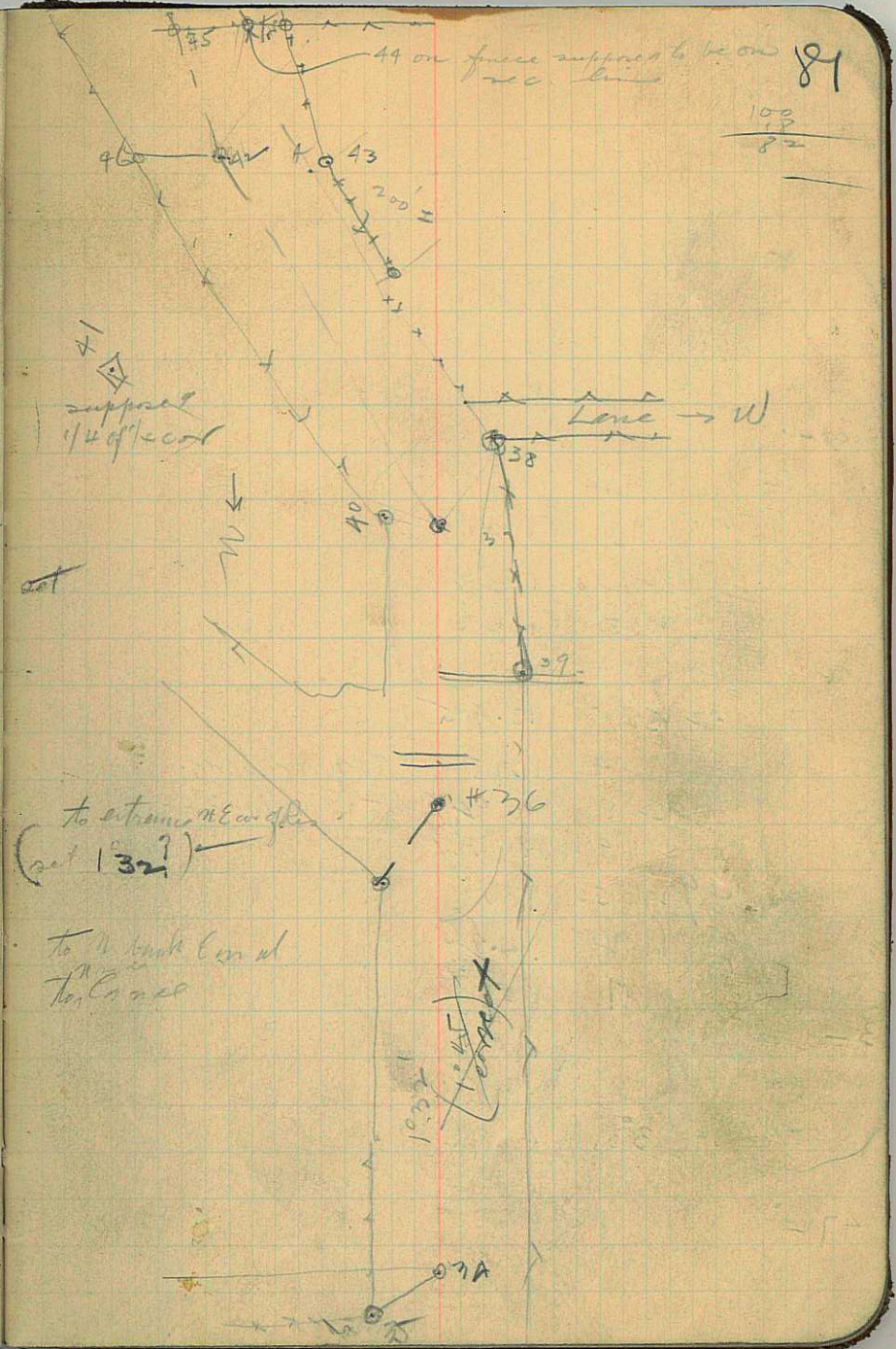
91°47'

33—

#34 Co. Road — 79



	#1 to NW cor 34	3°35'	2.96 ±
47 –			
	47	6°45'	9.42 ±
	#3	332°18'	13.985
	46	258°16'	0.82 ±
	45	352°44'	2.075
	44	31°57'	2.44
	43	94°25'	0.83
42 –			
	42	333°35'	11.00 ±
	41	301°07'	3.99
	40	241°45'	0.505
	39	142°13'	1.715
	38	3°08'	1.53
		316°02'	
37 –			
	37	1°32'	4.44 ±
		1°32'	3.46
		1°32'	0.52 ±
36 –			
	36	1°32'	9.00
	35	250°53'	.41
4 –			



42 152°18' 13.985

152°18 197.5 to N cor bridge

152°18 0.94 to S cor bridge

269°49½ NE cor 34

49 276°50 1.00

48 66°40 0.622

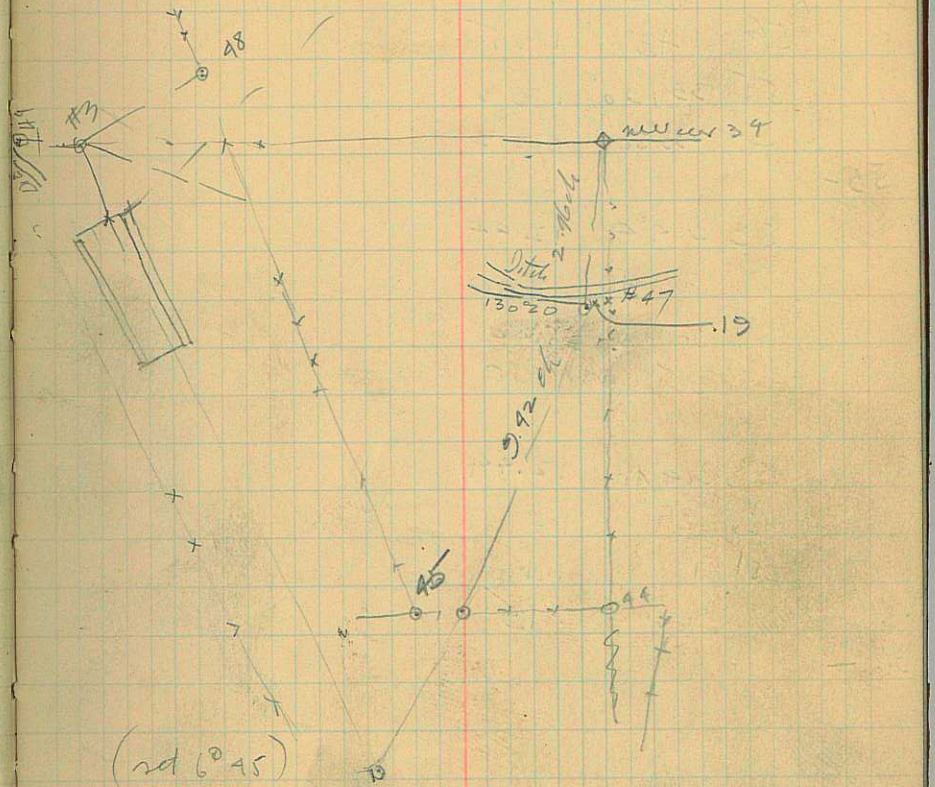
NW cor 34 89°47

#3—

NW cor 34 3°35 2.96

47—

S. side OLIVE St (W)



57-

18.47
17
17.00

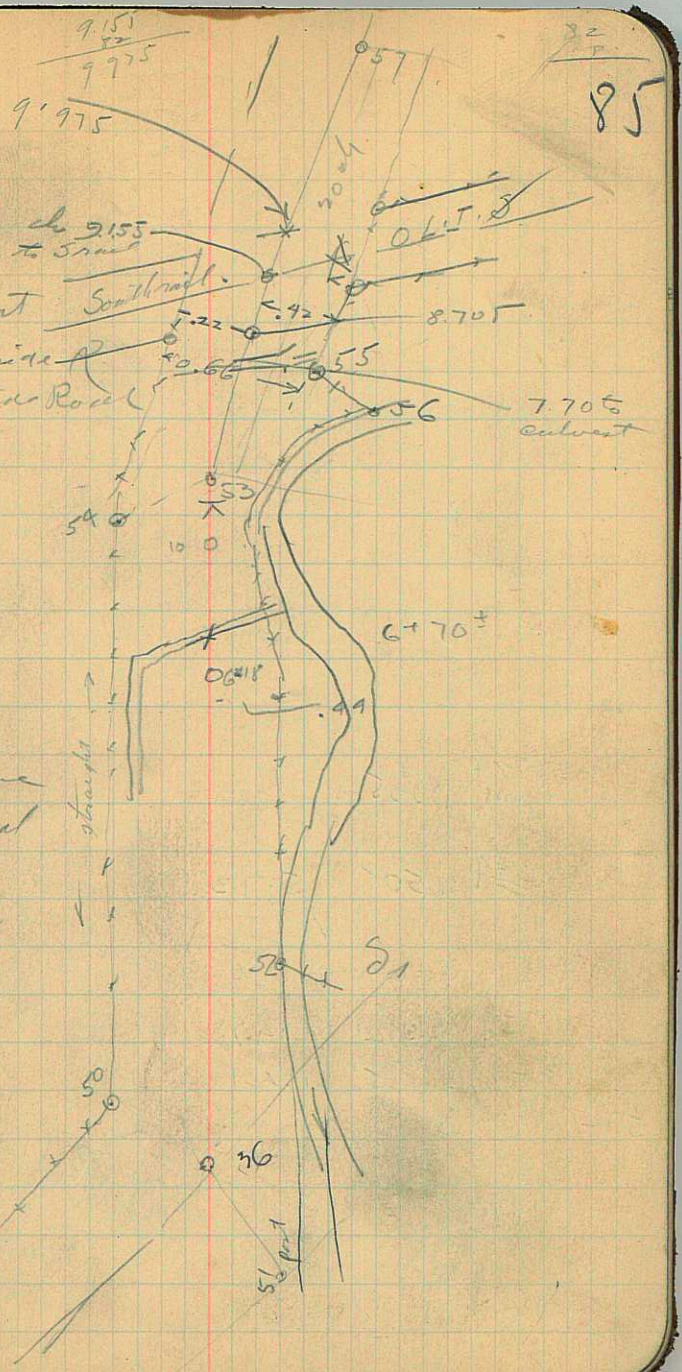
54-

↑57	319°44'	20.00
56	43°00'	1.25
55	339°30	1.33
54	233°50'	0.23

53-

53	304°40'	12.44
	304°40	10.00
	304°40	8.00
	304°40	6.18
53	304°40'	12.44
52	318°	1.41
51	107°	1.14
50	224°47	0.615

36 —



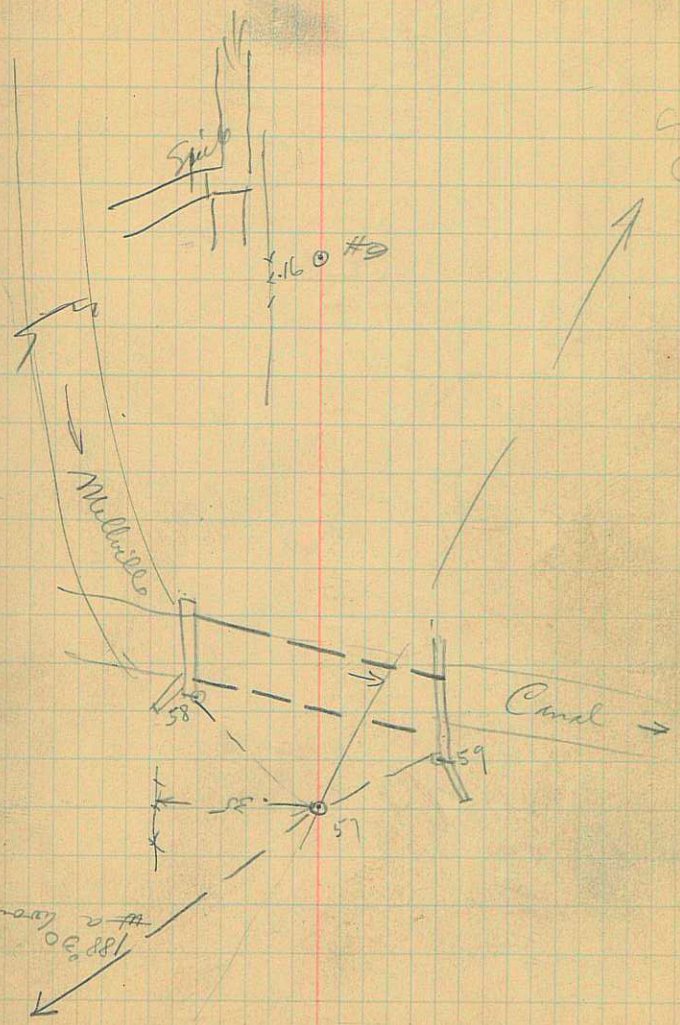
307° 30' 0"
238° 39' 0"

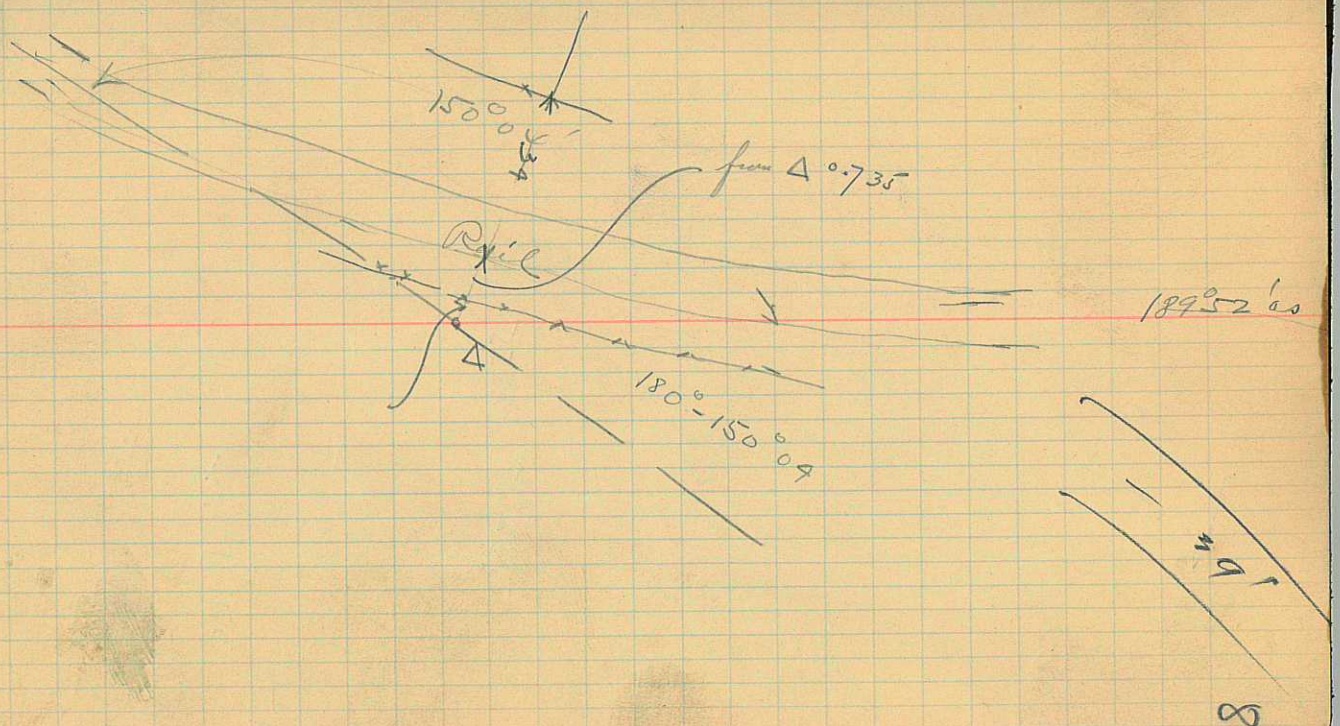
31944
50
13944

cor of yard 183°35

~~#60~~ #9	316°50' ✓	5.73
#59	23°21	0.149
#58	308°25'	0.441

57-




150°
from Δ 0.735
189°52'.0
180°-150°0Δ

T – Pl 4

3 – 332° 18 13.855

Az –

Az 333° 35

37 –

37 1° 32

34 –

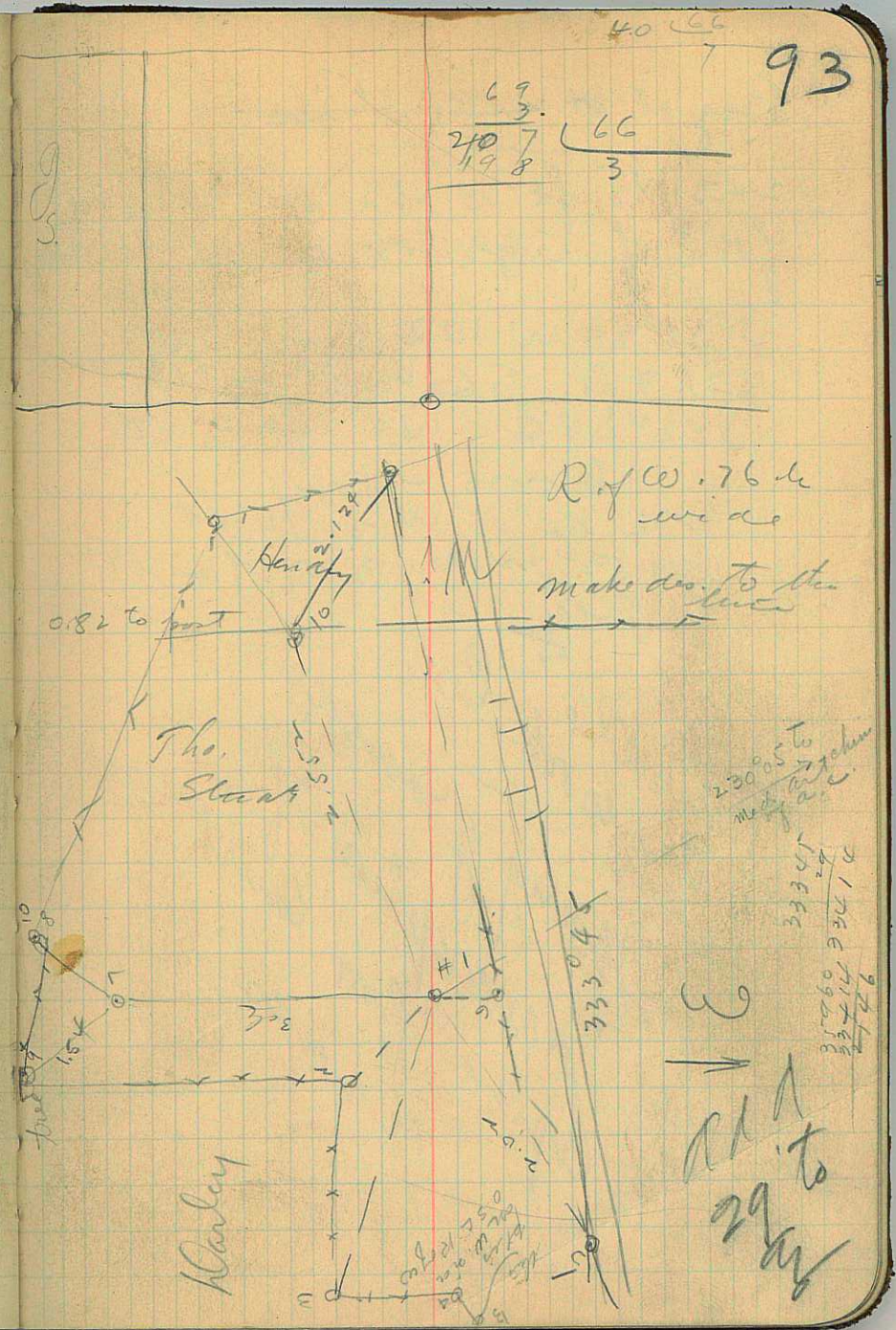
set 333° 35

set 1° 32

* 9107

Amalgamated Sugar Co. Sec. N of Walville

	13	320°35	3.213
1 –			
	12	179°52'	2.124
	11	136°04	1.461
10 –			
	10	148°58	2.55
1 –			
	9	83°09'	1.54
	8	136°10	0.82 to post 0.89 to ~~post~~ point
7 –			
	7	89°48'	3.00
	6	243°54	0.716
	5	301°34'	2.02
	4	324°56	153
cor post	3	3°34'	1.265
cor of 27	2	48°30'	0.23
1 –			



Beg at pt ~~on ... of~~

2+31.88 ft W of a pt 14959 ft S of Cor of 2d sec 32

S 31°20' W 102.10 ft. S 29°28 E 121.3 ft. S 62°01 E 50. S 82°08 E 141. ft to pt

136 rods — pass

N 00°05' W 7 90 ft

N 52°32' W 3.27.92 ft to beg

Melbourne
Water works Co

Spring grounds
description of
Copied from
records

136 8

95

144
16.5

8 6 2 0
1 4 5

2 3 7 6 0

89 53
23

29
09

38
19

20
10

23
17
6

79
9
38.
19

80 08
5997
20.51

89°32

A

B

90°28

29°28

60°04

60°04
90 28
150 32
17960
15032
2928
9028
60 04
18000

$\text{Sin}\frac{29°28}{2050} = \text{Sin}\frac{60°04}{x}$

log 2050 = 1.311754
log Sin 60°04 = T 937822
1.249576
log 29°28 = T 691892
1.557684

36,12
.29
35.83
1.7

10
6

200 .66
.03

26

3

06

80.487
20.51
59.97
19.54
40.947

40.947
80.487
59.97
20.517
20.517

18.86
.68
19.54

600
594
60
1955

66
90
50.487

1954
2050
4004

97

89°49 = 1914

3.93
1/4 Tan

B

D

Sin 29°28 = 1914.7 Tan 20.49 = 1955.2

60°04

60°04

0.35

C

C A B ang A-B = 89°32
A = North
A-D = 89°49'

19.55

11°04
36

66
17
49.2
66
11.2

6'

X

1955
66

80 48
40.42
4006
66
2.4036
2×3.6
26×3.76

2644 / 13 = 1280 / 4

191.3
189.6
247.1
1600
22280
1603
23883

1280
13
3840
1280
16640
15864
776 0

2644
6.3
6

.956 200 200 200
191.3

.948 200
189.600

14 4
16.5 20
76 4
84 1600
1 3 7 1 2 3 3
8 8
2 3 2 2 6 0.3
2 1

4.00 2640 / 10
2640
13600

.29
66
174
174
19.14
6
25

13

19.55
66
11730
11730
1280.30

4.000 2640
26400013 7
13600
13200
4000

Stan 0.98

Stan 0.6×

.4 2
1 2
1 3.0

.20.00 4088
200 .005

17.1

29 4
66
174
174
19.17
6

13.000 2640
10560 0048.8
2640
24120
22800

Harbor Slope

179° 37'

(cont. over)

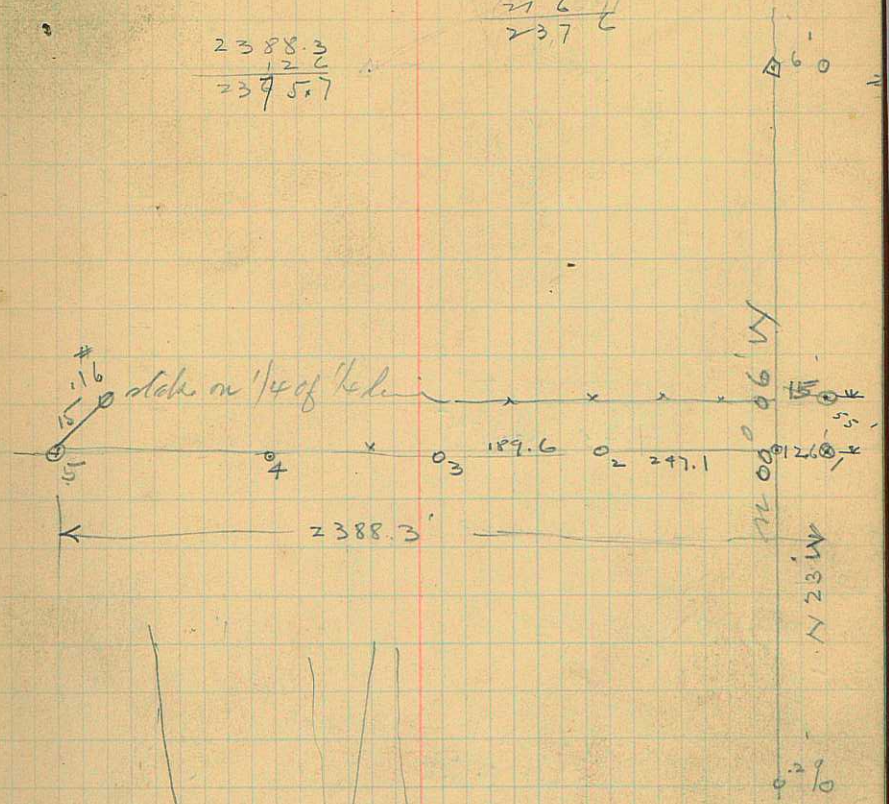
	16		15	
5 –				
	-5	89°44'	1760.3	
4 –				
	4		191.3	-16° 57' 200'
3 –				
	3	89°44	189.6	-18°34' 200' ✓
2 –				
	-2	89° true 44	247.1	
1 –				
			2388.3	

11/8/17 Survey for Millerville Hrd Work Co Spr grove

101

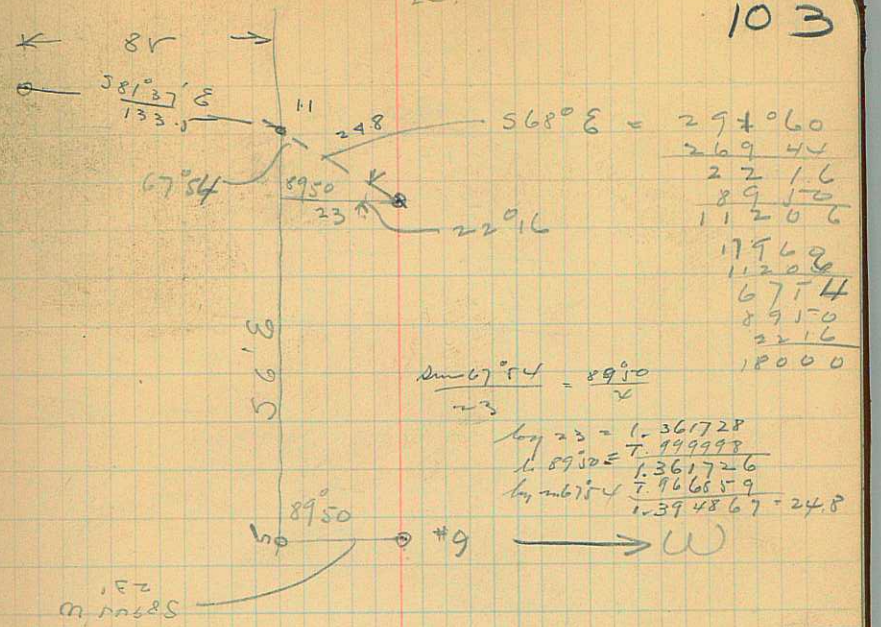
2388.3 / 126 = 2395.7

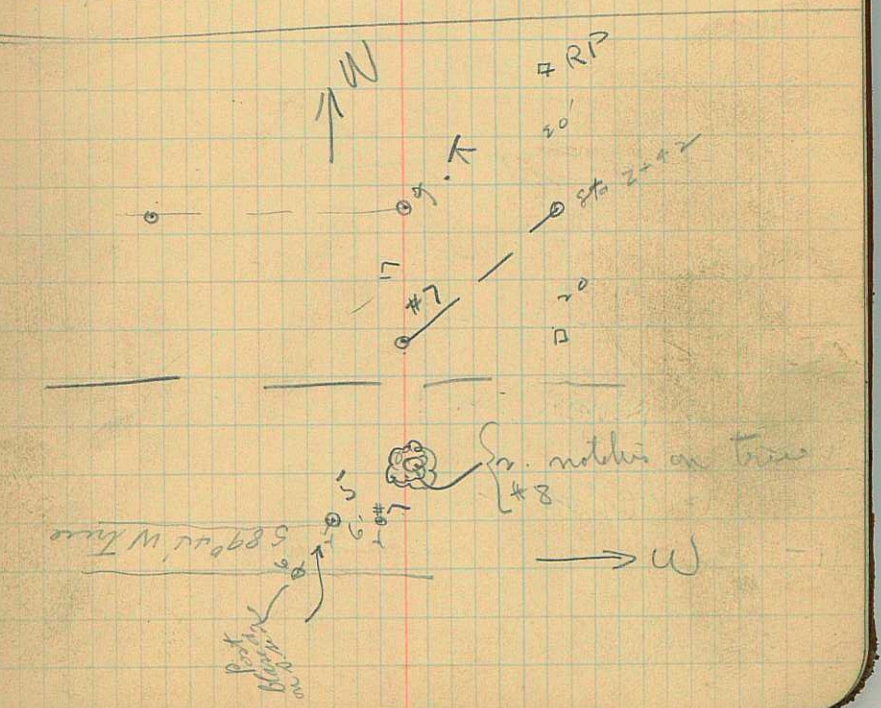
36 / 66 / 216 / 216 / 237 ℄



slope on 1/4 of ℄ line

set 179°37' ✓


N
67°54
89°50
22°16
248
S68°E
#9
W


N
RP
#7
#8
W

log 132 2.120574
ln 8°39 T 9953 34
2.125240 = 133.1

.95 / 91 / 95 / 855 / 8645

95 / .95 / 380 / 855 / 8913

36.12 + 29 = 36.83

783 / 121.7

.17 / 66 / 102 / 102

4/19/18

Recheck on Yeates

48.5

89°44 132' #5

S 6° E

14 211°20 N31°20' E 102.1

13

13 149°17 N30°43' W 121.7 also #5 old survey

12

12 N62°04' W 50'

11

Levels at Whatcom
Tail Race gage 11/12/17

Sta			
	3.190		Depth
		6.65	
		6.69	
0		8.57	1.90
1		8.56	1.88
2		8.45	1.77
4		8.32	1.64
6		8.31	1.63
8		8.30	1.62
10		8.42	1.74
12		8.38	1.70
13		8.33	1.65
14.9		8.32	1.64
		6.72	mitro Race

on nail in top 2×8 (look for gage 1.20)

H.O
on meas section in Race
on H.O in gage well

8.30
6.65
1.65

8.30 8.31
6.68 6.68
1.62 1.63

6.65
6.72
1337
6.68 = mean

8.42
6.68
1.74

8.38
6.68
1.70

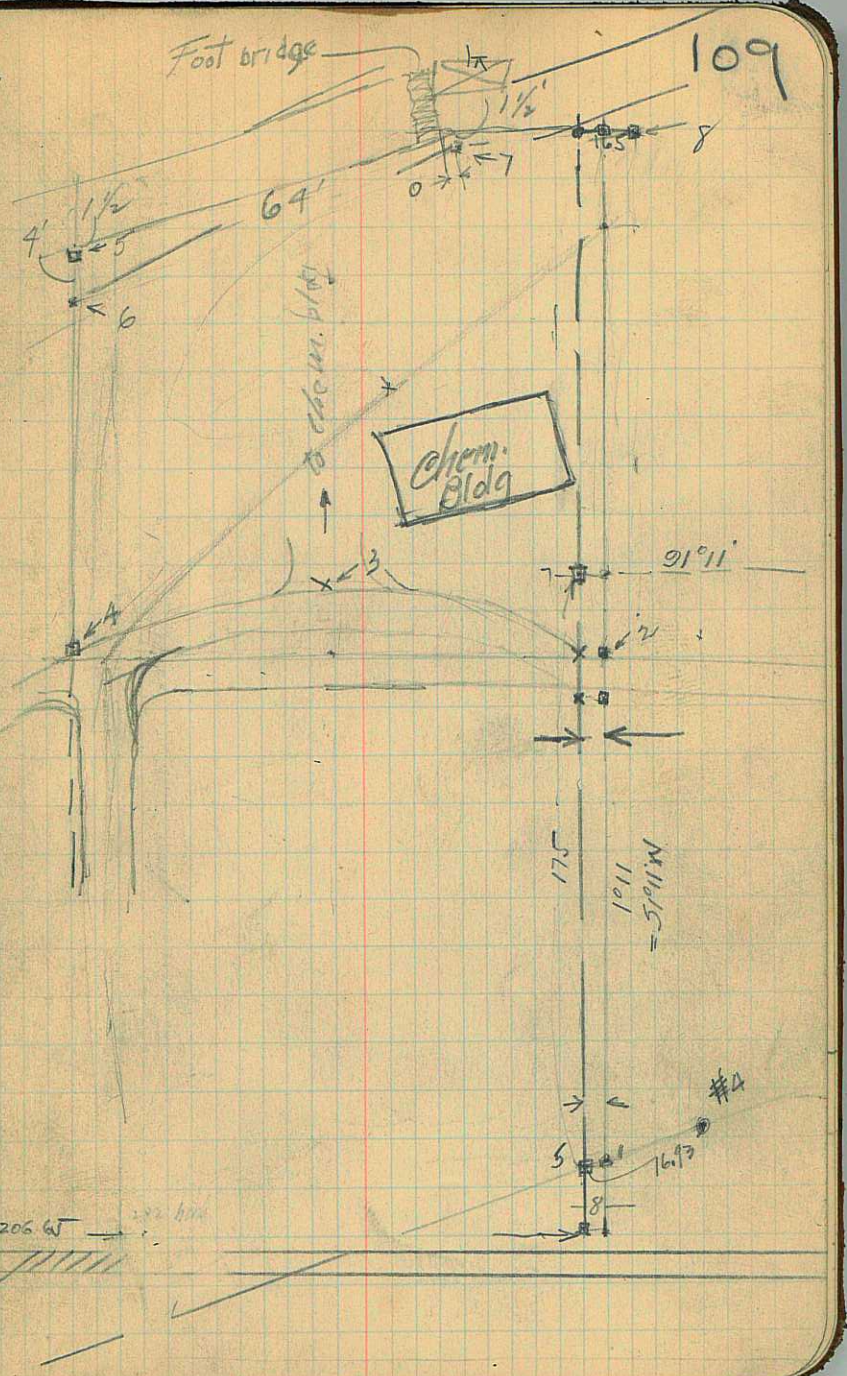
8.33
6.68
1.65

gage 1.20

L.D.S.

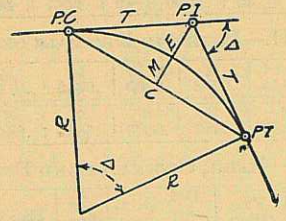
4/23/27
Survey - of
Relief Soc. Grounds
B.Y.C. property - by
C.E. and L.S.
Schaub

Foot bridge



Finish			1°-18
	8	87.25	64-18
	7	64.0	57°15'
6T-	6T	129.	1°12'
	5	133.0	1°11'
4T-	4T	70.75	26°1°
	3	32.5	26°22'
2T-	2T		1°-11'
#1T			1°-11'

DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES



CURVE FORMULAS

Radius=R=$\frac{50}{\text{sin. } D/2}$ (1) Degree of Curve=D and sin. $\frac{D}{2}=\frac{50}{R}$ (2)

Tangent=T=R tan $\frac{\triangle}{2}$ (3) Length of Curve=L=$100\frac{\triangle}{D}$ (4)

Middle ordinate=M= R(1—cos. $\frac{\triangle}{2}$) (5) =Rvers $\frac{\triangle}{2}$ (6)

External=E=T tan $\frac{\triangle}{4}$ (7) =R cos $\frac{\triangle}{2}$ (1-cos. $\frac{\triangle}{2}$) (8)=R x sec $\frac{\triangle}{2}$ (9)

Long Chord=C=2 R sin. $\frac{\triangle}{2}$ (10) $\triangle$=Central Angle

EXPLANATION AND USE OF TABLES

Stations.—Given P. I.=Sta. 161+60.35 to find Sta. of P. C. and P. T. $\triangle$=62° 10′ D=8° 20′. From Table IV for 1° curve T=3454.1 and ÷8⅓=414.49 ft. From Table V correction=.36 or T=414.85 ft. P. C.=Sta. P.I.—T=157+45.50. Also from (4) L=746.00 and P. T.=Sta. P. C.+L=164+91.50.

Offsets.—Tangent offsets vary (approximately) directly with D and with square of the distance. Thus tangent offset for Sta. 158 on above curve is 2.16 ft. found as follows. From Table III tangent offset for 100 ft.=7.27 ft. Distance=158—Sta. P. C.=54.50, hence offset=7.27 $(54.50 \div 100)^2$=2.16 ft. Also square of any distance divided by twice the radius equals (approximately) the distance from tangent to curve. Thus $(54.50)^2 \div (2 \times 688.26)$=2.16 ft.

Deflections.—Deflection angle=½ D for 100 ft., ¼ D for 50 ft., etc. For c ft.=(in minutes) .3 x C x D° or=defl. for 1 ft. from Table III x C. For Sta. 158 of above curve=.3 x 54.5 x 8⅓=136.2′ or 2° 16.2′, or=2.50 x 54.5=136.2′ from Table III. For Sta. 159 deflection angle=2° 16.2′+8° 20′ ÷2=6° 26.2′, etc.

Externals.—May be found in similar manner to tangents. Thus E for curve above is 91.37. For from Table IV for 1° curve E=960.6 for 8° 20′=960.6 ÷8⅓=91.27 and from Table V correction=.10 or E=91.37 ft. Or suppose $\triangle$=32° and E is measured and found to be 42 ft. What is D? From Table IV E=230.9 and ÷42=5.5 or D=5° 30′.

1 1/2
3
4 1/2

1 2 5
4.5
6 2 5

6 0 0
6,6 2 5

1 1 8
30 | 3

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

Roadway 16 feet wide. Side Slopes 1 on 1½.
For Single Track Embankment.

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
0	8.0	8.2	8.3	8.5	8.6	8.8	8.9	9.1	9.2	9.4	0
1	9.5	9.7	9.8	10.0	10.1	10.3	10.4	10.6	10.7	10.9	1
2	11.0	11.2	11.3	11.5	11.6	11.8	11.9	12.1	12.2	12.4	2
3	12.5	12.7	12.8	13.0	13.1	13.3	13.4	13.6	13.7	13.9	3
4	14.0	14.2	14.3	14.5	14.6	14.8	14.9	15.1	15.2	15.4	4
5	15.5	15.7	15.8	16.0	16.1	16.3	16.4	16.6	16.7	16.9	5
6	17.0	17.2	17.3	17.5	17.6	17.8	17.9	18.1	18.2	18.4	6
7	18.5	18.7	18.8	19.0	19.1	19.3	19.4	19.6	19.7	19.9	7
8	20.0	20.2	20.3	20.5	20.6	20.8	20.9	21.1	21.2	21.4	8
9	21.5	21.7	21.8	22.0	22.1	22.3	22.4	22.6	22.7	22.9	9
10	23.0	23.2	23.3	23.5	23.6	23.8	23.9	24.1	24.2	24.4	10
11	24.5	24.7	24.8	25.0	25.1	25.3	25.4	25.6	25.7	25.9	11
12	26.0	26.2	26.3	26.5	26.6	26.8	26.9	27.1	27.2	27.4	12
13	27.5	27.7	27.8	28.0	28.1	28.3	28.4	28.6	28.7	28.9	13
14	29.0	29.2	29.3	29.5	29.6	29.8	29.9	30.1	30.2	30.4	14
15	30.5	30.7	30.8	31.0	31.1	31.3	31.4	31.6	31.7	31.9	15
16	32.0	32.2	32.3	32.5	32.6	32.8	32.9	33.1	33.2	33.4	16
17	33.5	33.7	33.8	34.0	34.1	34.3	34.4	34.6	34.7	34.9	17
18	35.0	35.2	35.3	35.5	35.6	35.8	35.9	36.1	36.2	36.4	18
19	36.5	36.7	36.8	37.0	37.1	37.3	37.4	37.6	37.7	37.9	19
20	38.0	38.2	38.3	38.5	38.6	38.8	38.9	39.1	39.2	39.4	20
21	39.5	39.7	39.8	40.0	40.1	40.3	40.4	40.6	40.7	40.9	21
22	41.0	41.2	41.3	41.5	41.6	41.8	41.9	42.1	42.2	42.4	22
23	42.5	42.7	42.8	43.0	43.1	43.3	43.4	43.6	43.7	43.9	23
24	44.0	44.2	44.3	44.5	44.6	44.8	44.9	45.1	45.2	45.4	24
25	45.5	45.7	45.8	46.0	46.1	46.3	46.4	46.6	46.7	46.9	25
26	47.0	47.2	47.3	47.5	47.6	47.8	47.9	48.1	48.2	48.4	26
27	48.5	48.7	48.8	49.0	49.1	49.3	49.4	49.6	49.7	49.9	27
28	50.0	50.2	50.3	50.5	50.6	50.8	50.9	51.1	51.2	51.4	28
29	51.5	51.7	51.8	52.0	52.1	52.3	52.4	52.6	52.7	52.9	29
30	53.0	53.2	53.3	53.5	53.6	53.8	53.9	54.1	54.2	54.4	30
31	54.5	54.7	54.8	55.0	55.1	55.3	55.4	55.6	55.7	55.9	31
32	56.0	56.2	56.3	56.5	56.6	56.8	56.9	57.1	57.2	57.4	32
33	57.5	57.7	57.8	58.0	58.1	58.3	58.4	58.6	58.7	58.9	33
34	59.0	59.2	59.3	59.5	59.6	59.8	59.9	60.1	60.2	60.4	34
35	60.5	60.7	60.8	61.0	61.1	61.3	61.4	61.6	61.7	61.9	35
36	62.0	62.2	62.3	62.5	62.6	62.8	62.9	63.1	63.2	63.4	36
37	63.5	63.7	63.8	64.0	64.1	64.3	64.4	64.6	64.7	64.9	37
38	65.0	65.2	65.3	65.5	65.6	65.8	65.9	66.1	66.2	66.4	38
39	66.5	66.7	66.8	67.0	67.1	67.3	67.4	67.6	67.7	67.9	39
40	68.0	68.2	68.3	68.5	68.6	68.8	68.9	69.1	69.2	69.4	40

Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 41.9. For same slopes but other widths of roadbed correct above figures by one-half difference in width of roadbed; thus in example above for 20 ft. roadbed distance will be 41.9 + (20—16) ÷ 2 or 2 ft. added to 41.9 = 43.9. For slopes of 1 on 1 see inside of front cover.