#26

26

1016

DIXON'S

ENGINEERS

FIELD BOOK

No. 702

1016

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.

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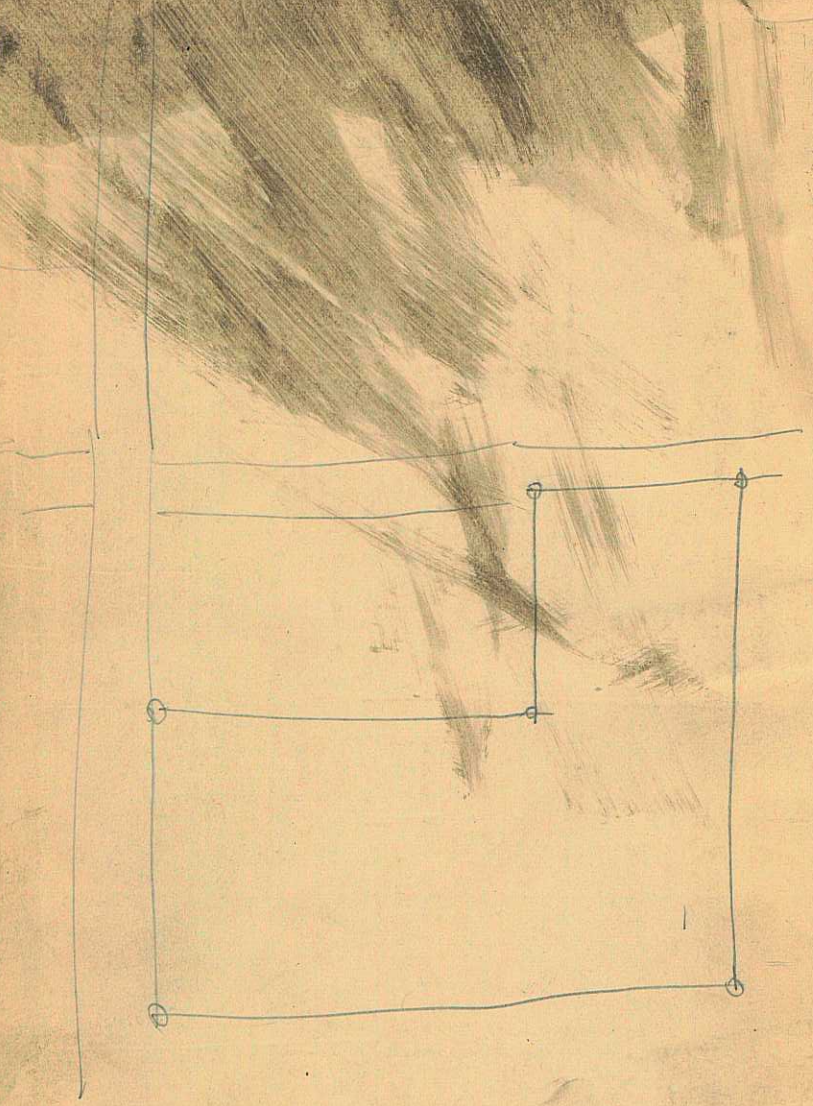
Eugene Schmitt
Logan
Utah

1016



6/7

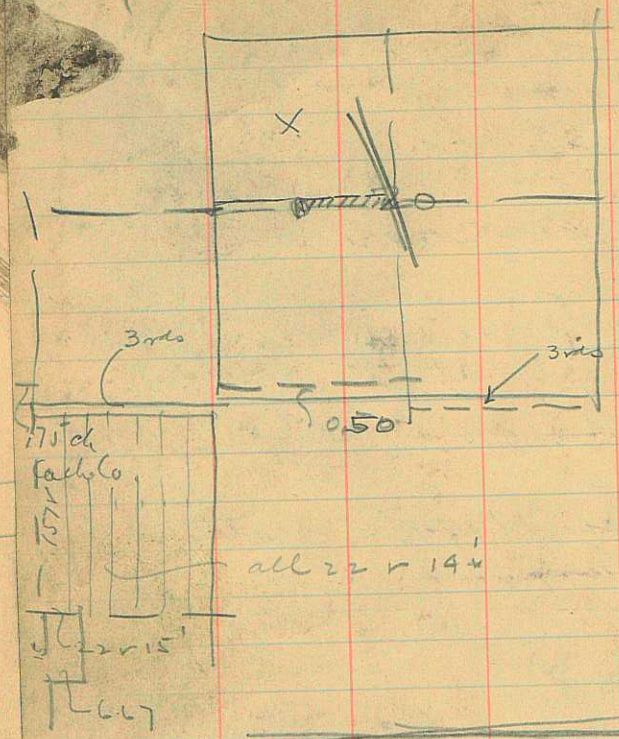
NOV 19 1918 + 7

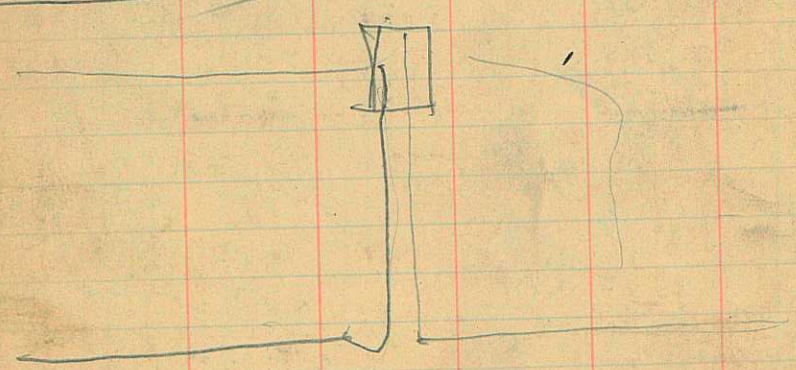
NOV 16 1918

Eugene Schaub
Logan Utah

No Smithfield notes
in here

Checked for Index
~~8/3/33~~
8/3/33
SBS





Beg at SE cor of SW¼ of sd 1/4 sec. thence east 17.06 ch to E west bdy of O.S.L. (R of W) N on sd by 1 rd; W 17.06 ch; S 1 rd to beg con 52/100

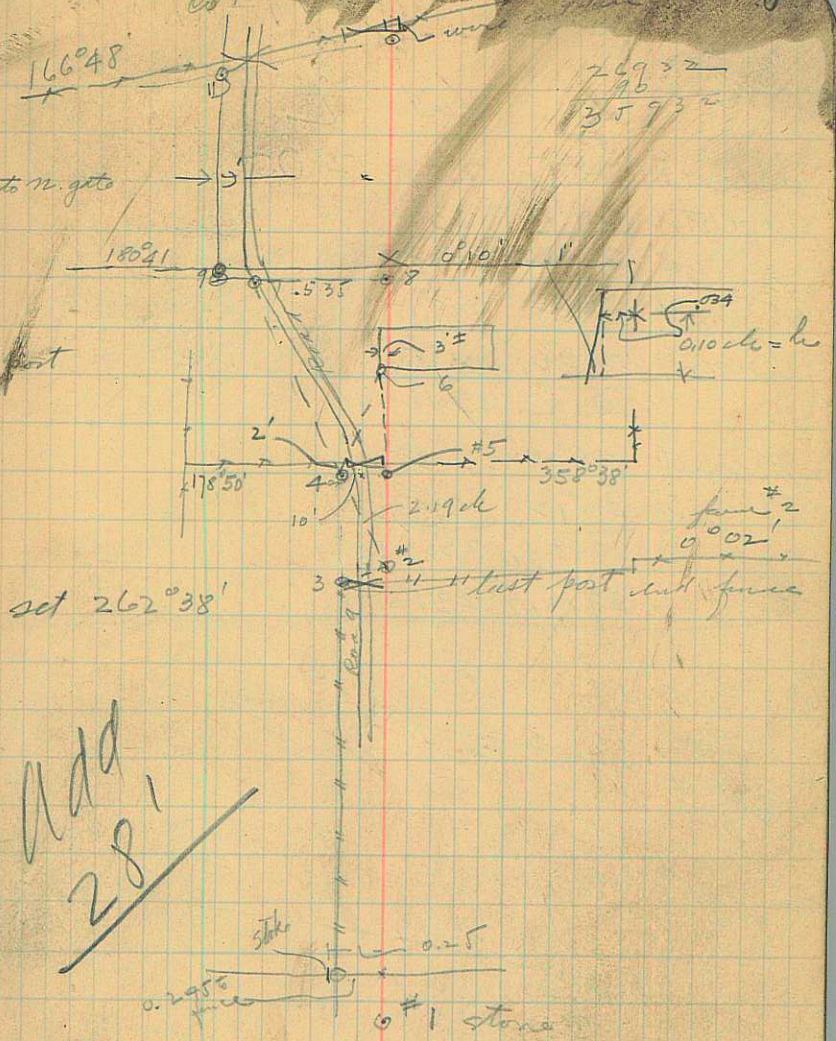
Junk

Beg. at SE cor. of NW¼ tract east of track sec 20 12 N 1 W N 79 rds to pt. 1 rd. S of NE cor of SE¼ of sd 1/4 W 6.10 ch to

also beg at pt 2 rds east of SW cor of NW¼ 20 E 78 rds to SE cor of SW¼ N 1 rds; W 78 rds S 1 rd to beg

Survey for Pelvisins at Petersboro
11/19/18

			Dist	
	12	278°	1.13	gate post
	11	171°43	0.658	
10 –		26932	11.175	to fence
	10	269°32	11.12	
	9	182°26	0.675	
8 –				
	8	359°32	0.535	
7 –				
	7	262°38	2.27	
4 –				
	6	266°47	0.758	
5 –				
	6	285°54	0.8025	
	5	356°37	0.263	
4 –				
	4	262°38	2.19	
	3	149°30'	0.26	
2 –				
	W stake	269°32	20.00	
		179°32		
	stake	269°32	0.512	
		284°21		
#1 –				



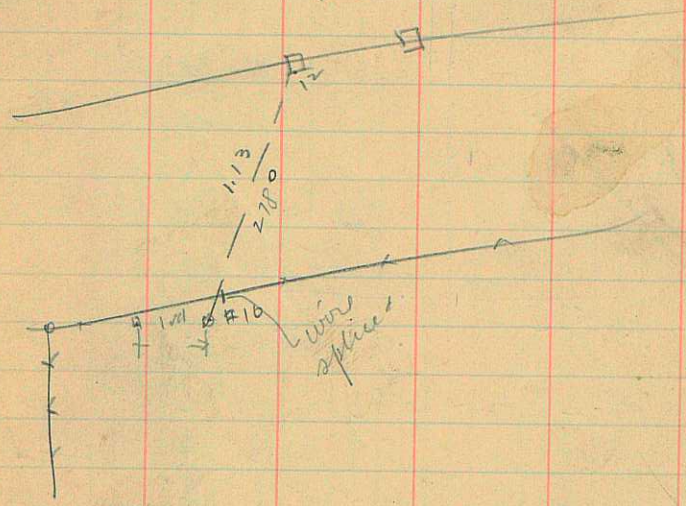
Add 28'

along sec. line to N.
to stake

to W. Tower of Lagun Temple
found W 1/4 cor see 20

Ob. Nov-19-1918

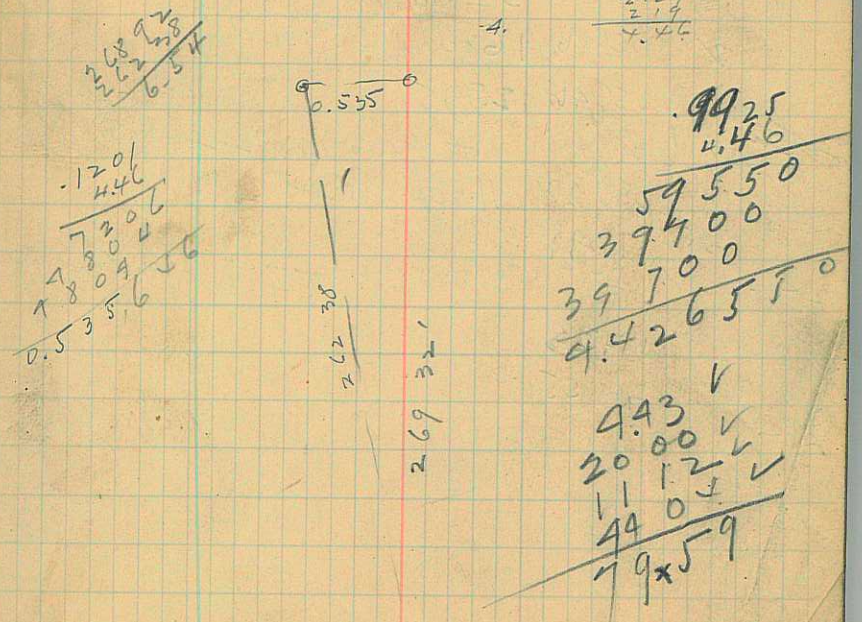
	Ag	Vert	time
Direct	28°17	23°48	2:05
Invert	29°07'	23 08	
	28.42	2328	
Direct	28°48	23°37	
Invert	29 36	22°56'	
	2912	23 1630	
Direct	29°19	23°24	
Invert	30°12	22°43	
	29 45 30	23°03'30"	
Σ	29°31'10"	2316	



on W 1/4 cor sec. 20
12 N - 1 W

Z = 89 59 60 - 23°13'50" = 66°46'10"
φ = 41°46
δ = -19°26

28.4°20 to W. Temple Tower

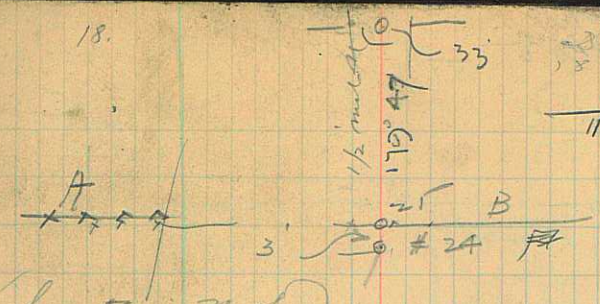


Wednesday Nov 19

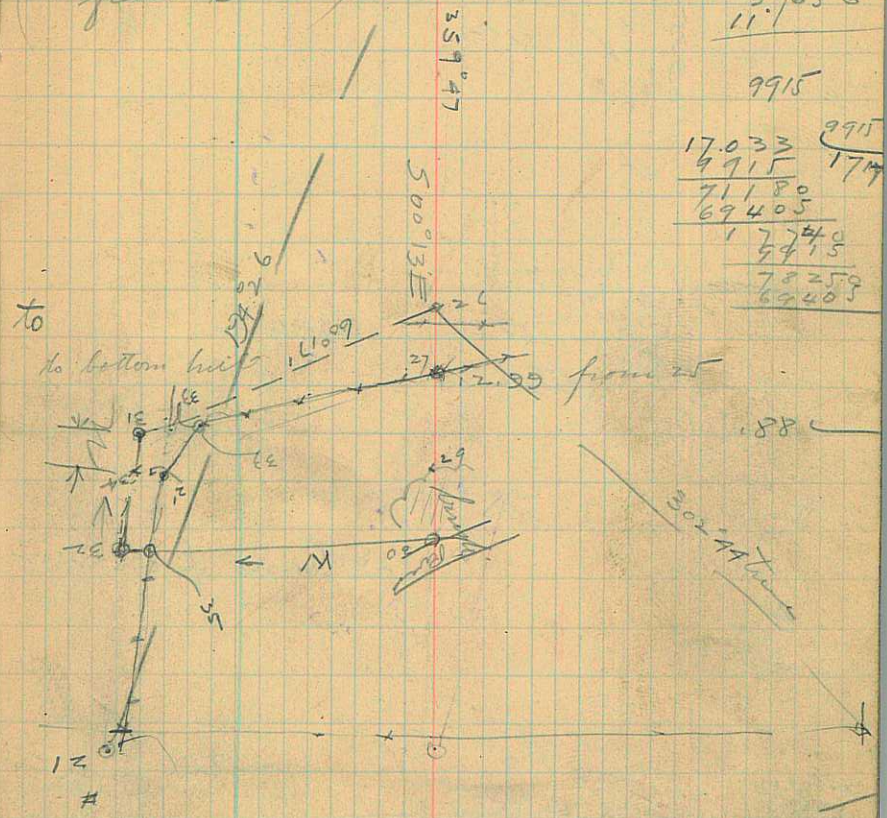
Survey for O W Merrill Southing

	1/4 cor	268°55	Dist	
21-	21	7°58'	7.301	
	1/4 cor 22	276°42		
	35	270	0.152	
32-				
	32	9°29	18.06	
	34	7.29	3.05	
31A				
	31	60°17	8.00	14.967
	33	60°17	7.23	
26-				11.00
	30	359°46	32.88	32.88
	29		32.00	
	28	359°46	16.00	
	27	359°46	12.995	
		(311°44	to N 1/4 cor 22 from #24)	
	26A	359°46	11.00 ch	11.00
	25	179°47		
		342°49	to Smoke stack of Rich Conaway	
24-		17		
	24	194°23		
	N 1/4 cor 22	268°55		
21-				

18.



(from A is N of from B)



10

.88
.80

11 .88

32.880
14.967
17.913

4917
8
39656
11

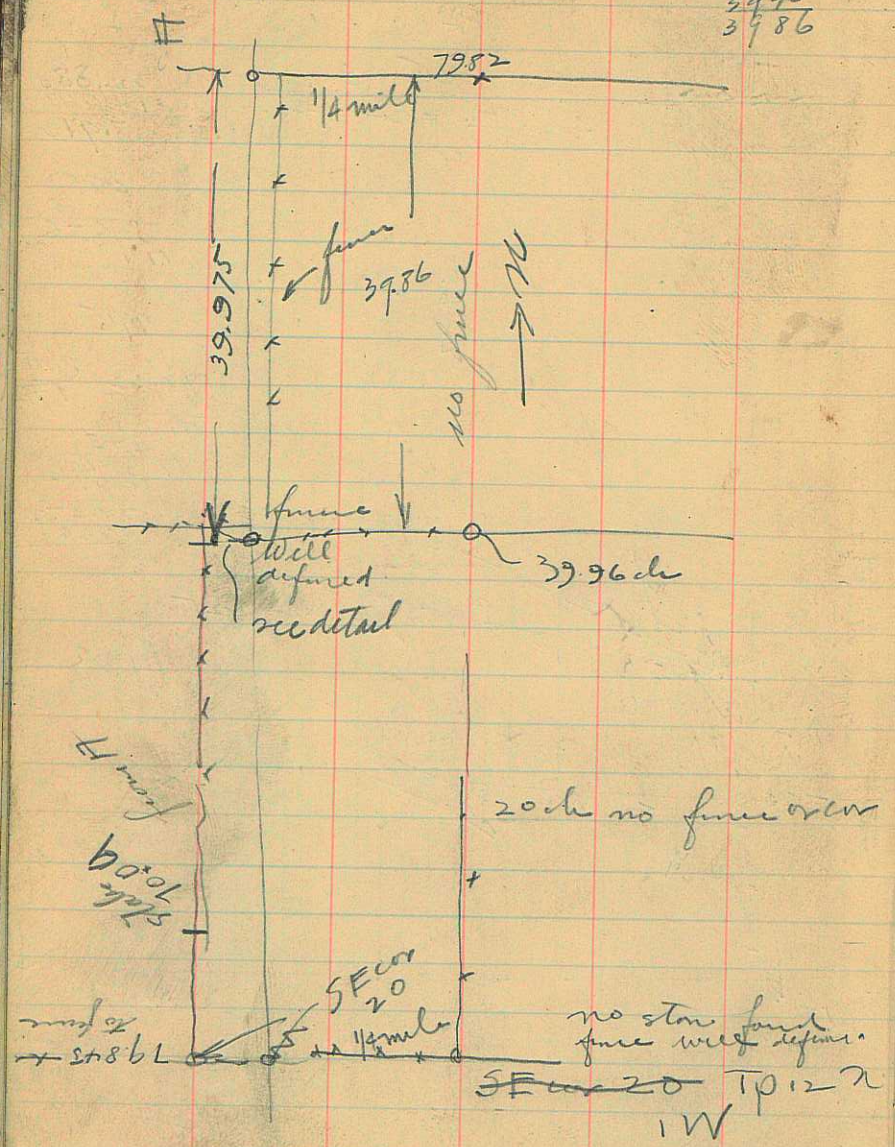
9915

17.033
9915
71180
69405
17740
9915
78250
69405

9915
1717

Nov — 25 - 1918

79.82
39.96
39.86



Petersons at Petersboro

12

32.88
14.967
17.913

log 17.03 = 1.231215
7.996285
1.234930

17.17

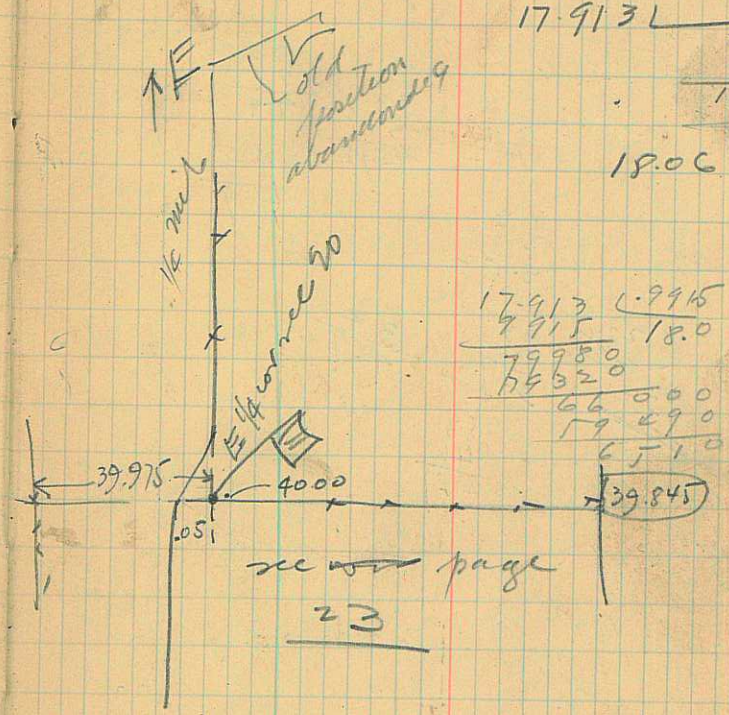
18.066
17.17
0.896

17.913 L — 1.253096
1.996285
1.256811
~~253096~~

18.06

17.17
.88
18.05

17.913 L .9915
9915 18.066
79980
79320
66000
59490
65100



see ~~over~~ page 23

7.5
3.3
2

8.3
2.5
5.8

7.6
3.3
4.3

8.0
3.3
1.7

7.3
3.3

8.3
3.9
4.4

8.3
4.1
4.2

8.33
3.55
4.78

8.3
3.4
4.9

8.3
3.78
4.52

3.4

8.3
4.88
3.42

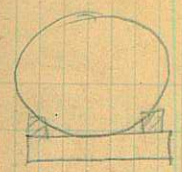
8.3
4.4
3.9

8.3
3.4
4.9

8.3
4.6
3.7

3.4
4
7.4

9.80
8.3
1.5



4.27
4.9
9.17

4.78
4.24
9.02
3.65
5.37

4.8
3.5
8.3

8.3
5.81
2.5

9.17
3.26
5.91

8.3

10.80
cut 5.80
sq ht to 2.5

× c5'-10"

level 10.80 on H2O 9.80 gr
level 4.0 on hub
6.8

		R.R	Cut				
RR mgr. 8.3		3.9 ~~3.65~~	4'-5" ×	2	RR on hub	cut of set set	9.80 × 8.5 = 1.3
9.80 × 5.80							4.5 × 4 = 8.5
8.30 × 5.8 = 2.50	S	3.4	4'-11" ×	3	4.27	9.17 3.26 c5'-11" 10.80 8.5 2.3	9.8
	S	3.55	4'-3½"	4	4.24	5'-4" set over 12" 3.65 ~~10.80~~	
	S	4.1	4'-2½"	5		9.80	4.5 × 3.5 = 8.00 / 9.80
	S	3.78	4'-6"	6			9.80 × 8.00 = 5.80
	S	4.4	3'-11"	7			9.80 × 1.80 = 8.00 / 9.80
	S	3.38	4'-11"	8			9.80 × 4.50 = 5.80 / 5.80 = 2.20
	S	4.88	3'-5"	9			
RR mgr. 8.3		4.60	3'-8½"	10			
7.3		3.3 level	4'	11			

8.3
4.

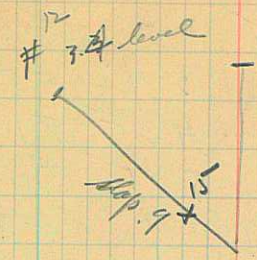
RR on grade	Cut		#	
8.3	4	4.3	12	3.4 level
8.3	3'-1½"	5.2	13	
8.3	3'-2"	5.15	14	
8.3	3'-6"	4.9	15	
8.66	3.25	5.41	16	
8.66	4'-5"	4.25	17	
8.66	3'-10"	4.84	18	
8.66	3'-9"	4.9	19	

3

8.3
5.2
3.1

8.3
5.15
3.15

O D Merrill
Drain



8.3
7.4

8.66
7.2
1.46

8.3
4.9
3.4

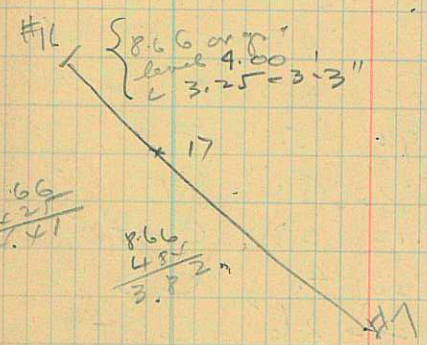
8.66

7.5
4

8.66
9.

8.66
3.25
5.41

7.25
4.



8.66
4.25
4.41

8.66
4.84
3.82

4.76 = 4.5
c 3.9
8.66

8.66
4.9
3.76

	455	RRm grad	RR	Cut or F
Sta 0		3.25	2.4	C10"
1		3.337	3.9	F8"
2		3.424	4.35	F11"
3		3.511	5.45	F1'-11"
4		3.598	4.9	F1'-4"
5		3.685	5.2	F1'-6"
6		3.772	4.8	F1'
7		3.859	4.3	F6"
8		3.946	4.7	F9"
9		4.033	4.00	G
10		4.120	3.8	C4"
11		4.207	4.	C3
12		4.294	3.6	C9"
13		4.381	3.5	C10"
14		4.468	3.65	C10"
15		4.555	3.75	C10"

Note marked this H I with notch in post 4.5 above ground at 0

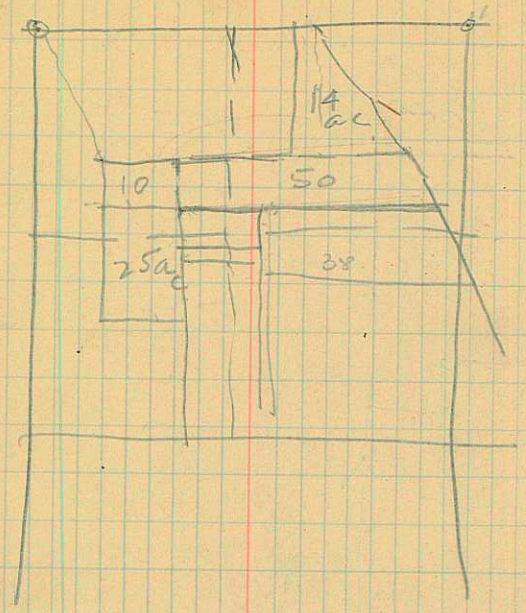
Sta 6+30

Rice

Hyrum ~~Hyrum~~

Lewiston

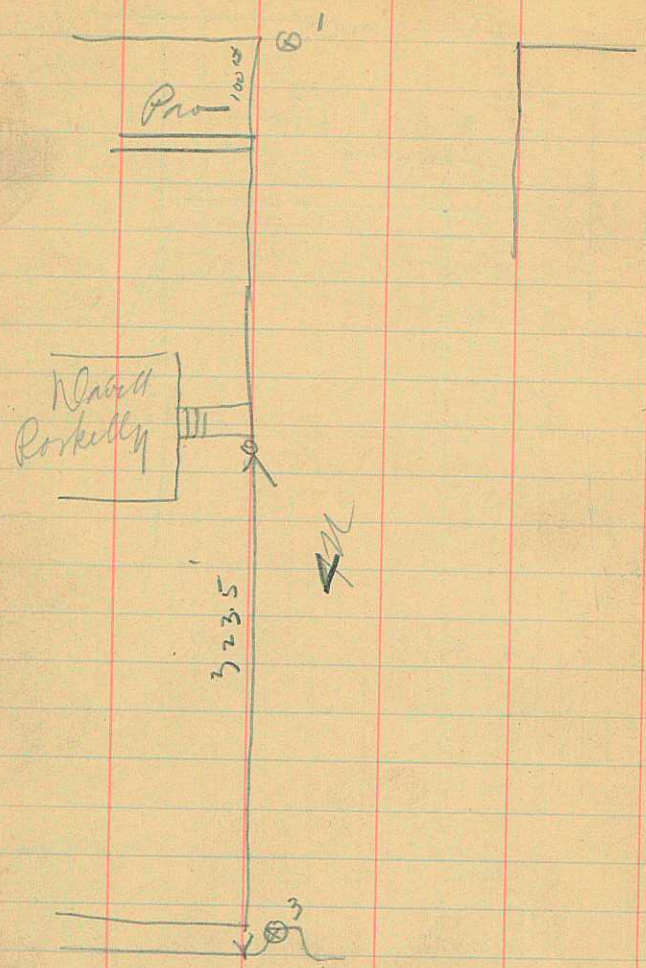
O. D. Merrill &
Martha L. W. Merrill
of Richmond Utah
150.00

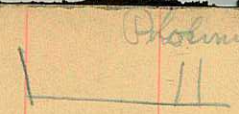


11/21/18 Smithfield City

BS FS m

15E





outh of Plowman

22

Smithfield 9 11/21/18

	BS	FS	m	Ele	HI
	1.02			526.55	527.57
			2.00	525.57 ✓	
			1.85	525.72 ✓	
1			3.85	523.72 ✓	
✓			8.80	518.77 ✓	
		12.85		514.72 ✓	
	0.08				514.80
			7.18	507.62 ✓	
			5.46	509.34	
			3.99	510.81	
3		10.03		504.77 ✓	

✓

	23.05	91°34	
✗	14.75	91°34	to Cond
	0.24 ch	220°	

23 →

Set 186°16

1

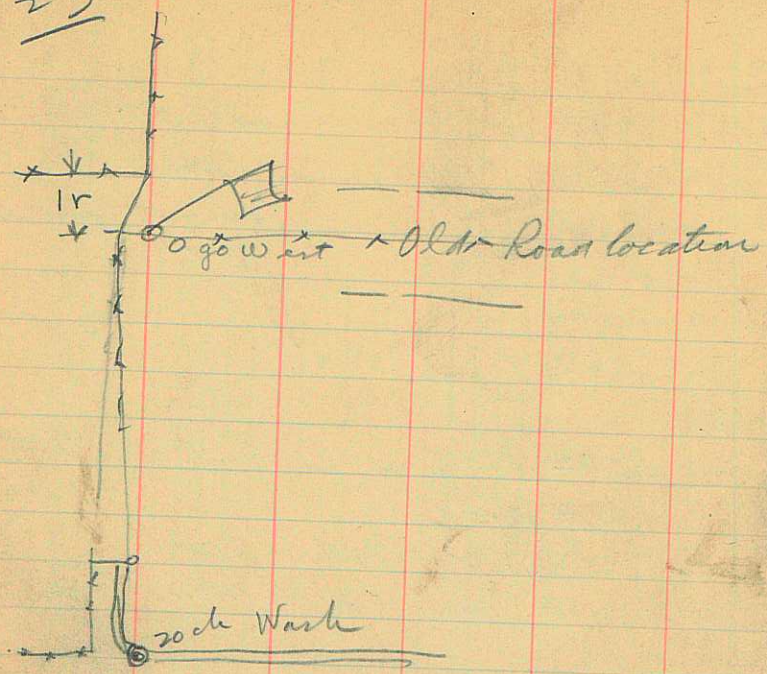
24

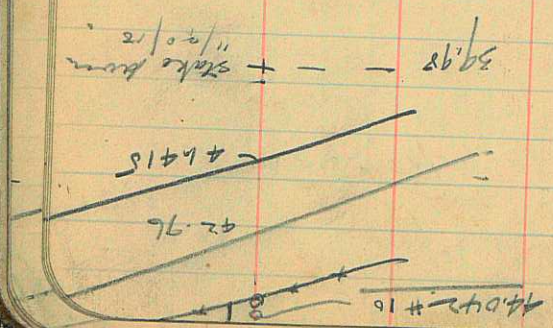
on BM on tree south of Plowman
on hub by Plowman's gate
" " cement walk

on hub at fence in front of D. Roskelly's house
{ on first step " "
{ on his cement porch
on pro east sid Main Sts

top his foundation about 8" below porch level

At Sorensen Est Con. from page 35


1r
0 go West
Old Road location
20ch Wash


44.042 #16
42.96
44.415
39.98
stake down

11/25/18
Peterson at
Petersboro

new line 269°35
old line 269°32
Temple 284°21

1

$\frac{20}{.018} = \frac{35.54}{x}$

$\frac{20}{.018} = \frac{24.42}{x}$

$x = \frac{.018 \times 24.42}{20}$

35.54
.018
28432
3554
.63972 | 20
.039 .031

24.42
.018
19536
2442
.43956 | 20
39 .229
195

new line on
E side, shed
~~abo~~ 5' ft S of
mend

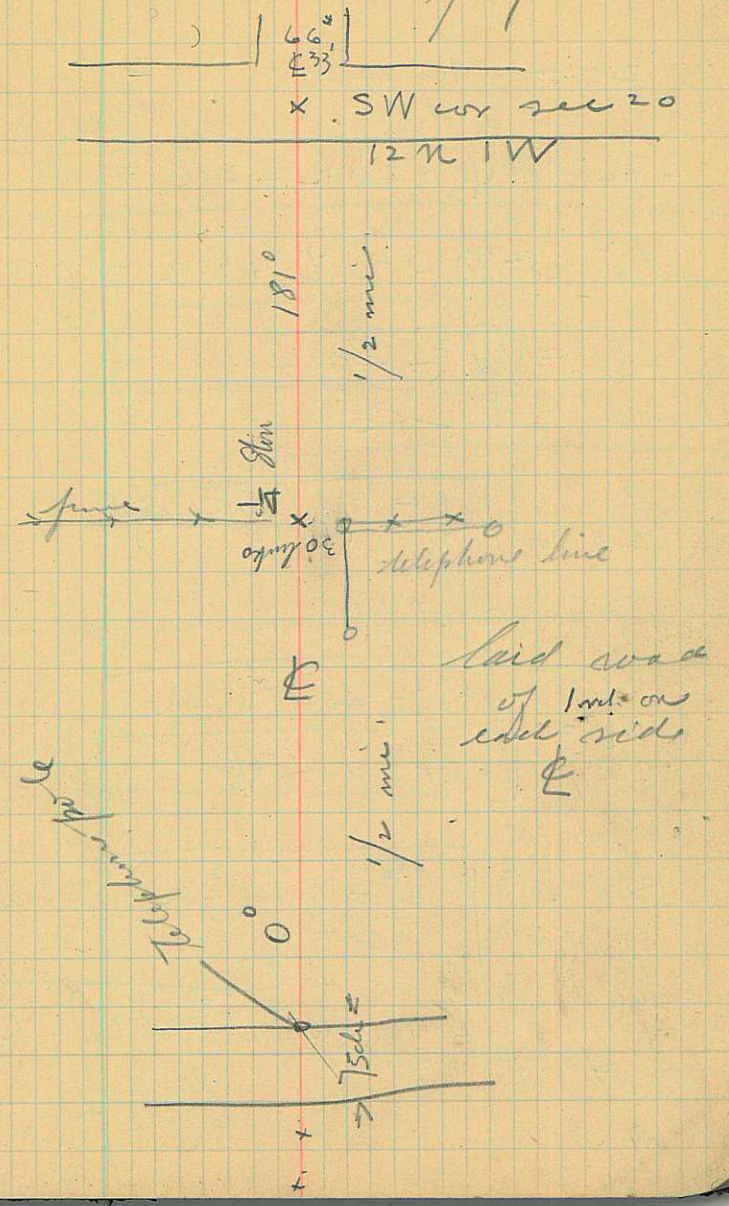
20 ch 0 to new point .018 S
= 1.15'

$\frac{20}{.018}$

Nov 25-1918

Nov. 25-1918

Cache County
Road proposed



$$2bh - \cot\varphi\, h^2 = 2a$$

$$2bh - h^2 \cot\varphi = 2a$$

$$-h^2 \cot\varphi + 2bh - 2a = 0$$

$$h^2 \cot\varphi - 2bh + 2a = 0$$

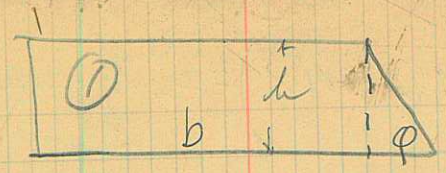
$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{2b \pm \sqrt{4b^2 - 4(\cot\varphi\, 2a)}}{2\cot\varphi}$$

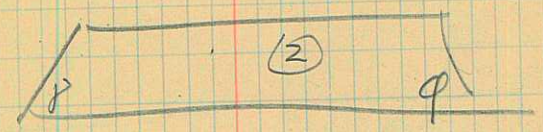
$$2b \pm \sqrt{\frac{4b^2 - 4(\cot\varphi\, 2a)}{4\cot^2\varphi}}$$

$$= 2b \pm \sqrt{\frac{b^2 - \cot\varphi\, 2a}{\cot^2\varphi}}$$

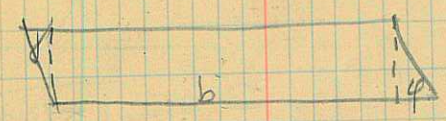
$$h = 2b \pm \tan\varphi \sqrt{b^2 - \cot\varphi\, 2a} \quad (1)$$



$$2bh - h^2 \cot\varphi = 2a$$



$$h = 2b \pm \sqrt{b^2 - 2a(\tan\gamma + \tan\varphi)}$$



$$\cancel{h \cot\varphi} \quad 2b - \cot\varphi\, h + h \cot\gamma = 2a$$

$$2bh - \cot\varphi\, h^2 + h^2 \cot\gamma = 2a$$

$$2bh - h(\cot\varphi - \cot\gamma) = 2a$$

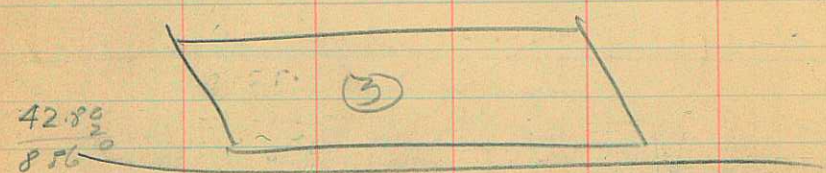
$$-h(\cot\varphi - \cot\gamma) + 2bh - 2a = 0$$

$$h^2(\cot\varphi - \cot\gamma) - 2bh + 2a = 0$$

$$h^2\left(\cot\varphi - \cot\gamma\right) - 2bh + 2a = 0$$

$$\frac{2b \pm \sqrt{4b^2 - 4\left(\cot\varphi - \cot\gamma\right)2a}}{2\left(\cot\varphi - \cot\gamma\right)}$$

$$2b + \sqrt{b^2 - \left(\tan\varphi - \tan\gamma\right)2a} \quad (3)$$



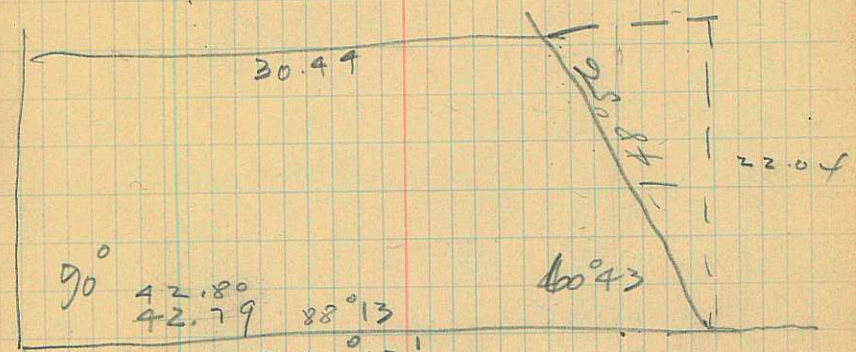
$$85.6 \pm 1.7832\sqrt{42.8^2 - .561 \times 1000}$$

500 | 35
1

8960
6043
2917

42.80
1236
3044

22.04
.561
2204
13224
11020
1236.444



268°13'
180
88.13
26773
14856
917
14856
8813
6043

42.8
42.8
3424
856
1712
1831.88
561
1270.88

1270.88 | 35.65
9
65 370
5 325
706 4588
6 4236
7125 35200

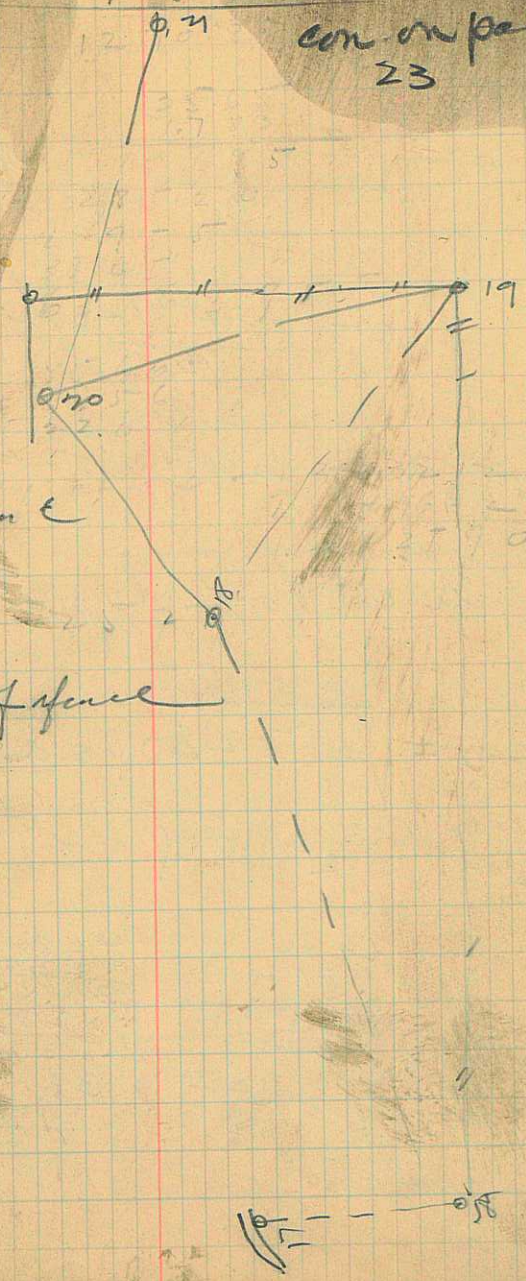
85.60
3565
49.95

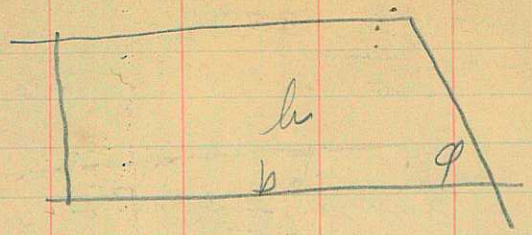
log 49.95 = 1.698535
log sin 60°43 = 1.940622
1.757913

Carried from page 60

con. on page 23

			Ch.	L	C	U	
		260°54	1.13	to lot cor	con. to page 24		
23-							
	23	180°16	9.68				
		270°46	0.03	to [illegible] n + s			
11-				set 270°46			
	11	178°	11.182				
14-				set 276°36			
	(9) D	237°		4		6.80	
	(8) D	~~193°05~~ 293°05		3		6.67	
18-				set ~~343°56~~ 243° cor to [illegible]			
	19	84°35	11.415				
		0°30'	1.57				W cor of lane
		158°15		6.1	—	8.00	
	n	7°42	11.645	to cor post by stone			
20-							
	20	319°30'	12.486		2	6.17	2' west of fence
	(7) D	315°50			3	6.22	out 18
	(6) D	308°50		2		6.58	out 9
	(5) D	301°00		2		6.05	W bank
	(4) D	201°12		3		6.75	
	(3) D	188°55		2		6.35	out 9
	19	17°03	11.05	2			
	2 D	184°[illegible]		2		6.9	out 9
	1 D	177°			3.0	6.15	out 9
18-							





$$\left(b - \frac{h\cot\varphi + b}{2}\right)h = a2$$

$$2bh - h^2\cot\varphi - 2a = 0$$

$$h^2\cot\varphi - 2bh + 2a = 0$$

$$\frac{2b \pm \sqrt{4b^2 - 4\cot\varphi\, 2a}}{2\cot\varphi}$$

2204
.561
2204
13224
11020
1236444

42.80
1236
30.44
4280
2(73.24
3662
2204

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= 2b \pm \sqrt{\frac{4b^2 - 4\cot\varphi\, 2a}{4\cot^2\varphi}}$$

$$2b \pm \sqrt{\frac{b^2 - \cot\varphi\, 2a}{\cot^2\varphi}}$$

$$2b \pm \tan\varphi\sqrt{b^2 - \cot\varphi\, 2a}$$

42.80
42.8
3424
856
1712
1831.84
561
1270.8

10380
274
104078

5.00

4146
3864
3428

273.6
3

$\log 1270.8 = 3.104078$
1.552039

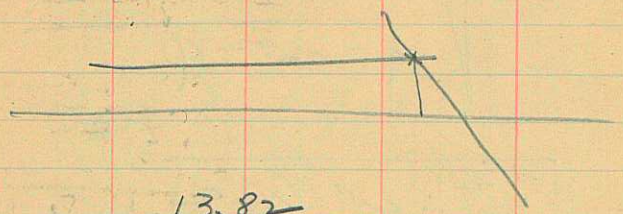
42.80
2
85.60
63.54
22.06

35.65
1.783
10695
28520
24955
3565
63.56395

0.89 | 35.51

1.08906 | 35.51
2

35.51
.71020



13.82
.561
1382
8292
6910
7.75302

42.80
775
3505
2(7785
38.92
13.82
7784
31136
11676
3892
53.787

.561
16
3166
561
8.776

42.80
878
3402
2(7682
38.41
16
23046
3841
61.456

.561
15
2805
561
8.415

42.80
841
3439
2(7719
38.59
15
19295
3859
58.885

.561
14
2244
561
7.854

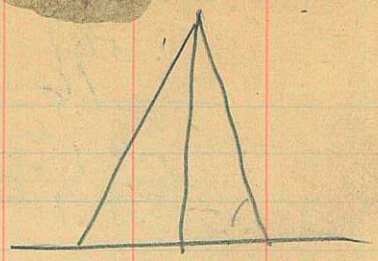
42.80
785
3495
2(7775
38.87
14
15548
3887
54.418

.561
13
1683
561
7.293

42.80
729
35.51
2(7831
39.15

39.15
13
11745
3915
50.895

12.82
.561
1282
7692
6410
7.19202



42.80
719
3561
2(7841
39.20

12.82
39.2
2564
11538
3846
50.3544

0.350(35.60
1

log 12.75 = 1.105510
$\ln 60°47$ = $\bar{1}$ 940622
1.164888
~~105510~~

14.61

12.70 42

.561
12.70
39270
1122
561
7.1247

1275
3.31

42.80
712
3568
2(7848
39.24
12.7
27468
7848
3924
49.8348

1

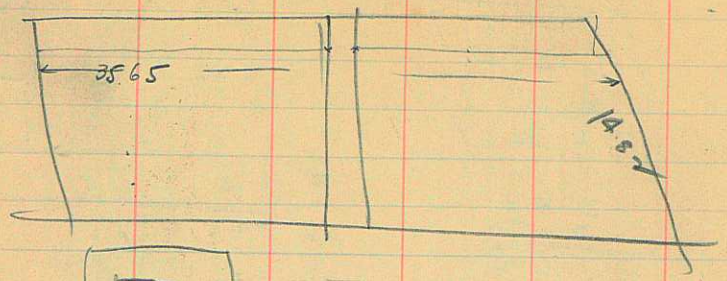
~~86.~~
85.60
1275
72.95

1275
561
1275
7650
6375
7.15275

42.80
715
3565
2(78.45
39.22
12.75
19610
27454
7844
3922
50.00550

42.80
715
3565
7845
3922

42.80
3565
7845
39.22



50
14 ½
10
25

2 | 12.75
0.6.370 | 35.65
2

3

×25
.50
12.50

25

13

13

12.

50.895
64
50.255

12.90
.561
129
774
645
7.2369

12.90

42.80
724
3556
2 | 7836
3918
129
35262
7836
3918
50.5422

12×95
.561
1295
7770
6475
7.26495

42 80
726
3554
2 | 7834
3917
12.95
19585
35253
7834
3917
50.72515
64
.08

12×95
647

50.

12.93
.5 61
1293
7758
6465
7.25373

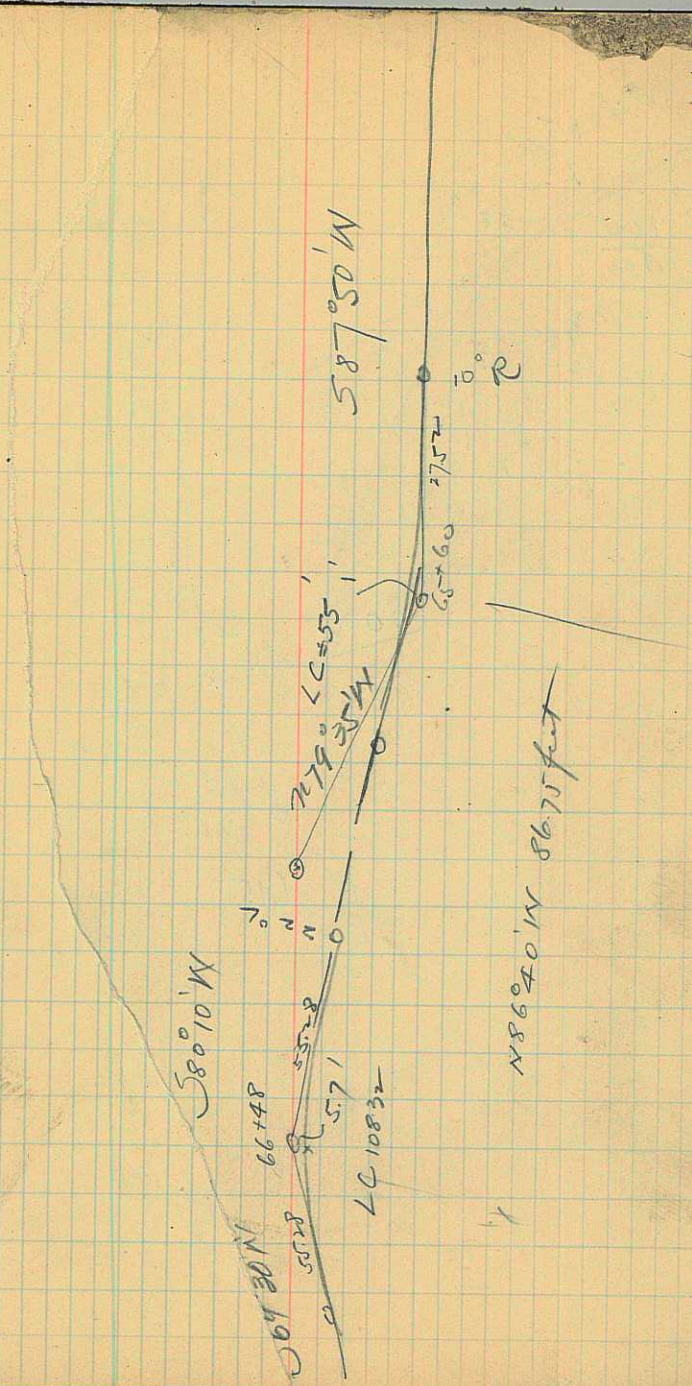
42.80
7 25
35.55
7835
3917 log 12.93
12.93
11751
35253
7834
3917
50.64681

64

1.111599
$\bar{1}$ 940622
1.170977
~~111599~~

14.82

.08006872
7848.09



12.93
.5 61

.1293
7758
6465

7.25373

42.80
725

35.55

7835

3917 log 12.93

12.93

11751

35253
7834
3917

50.64681

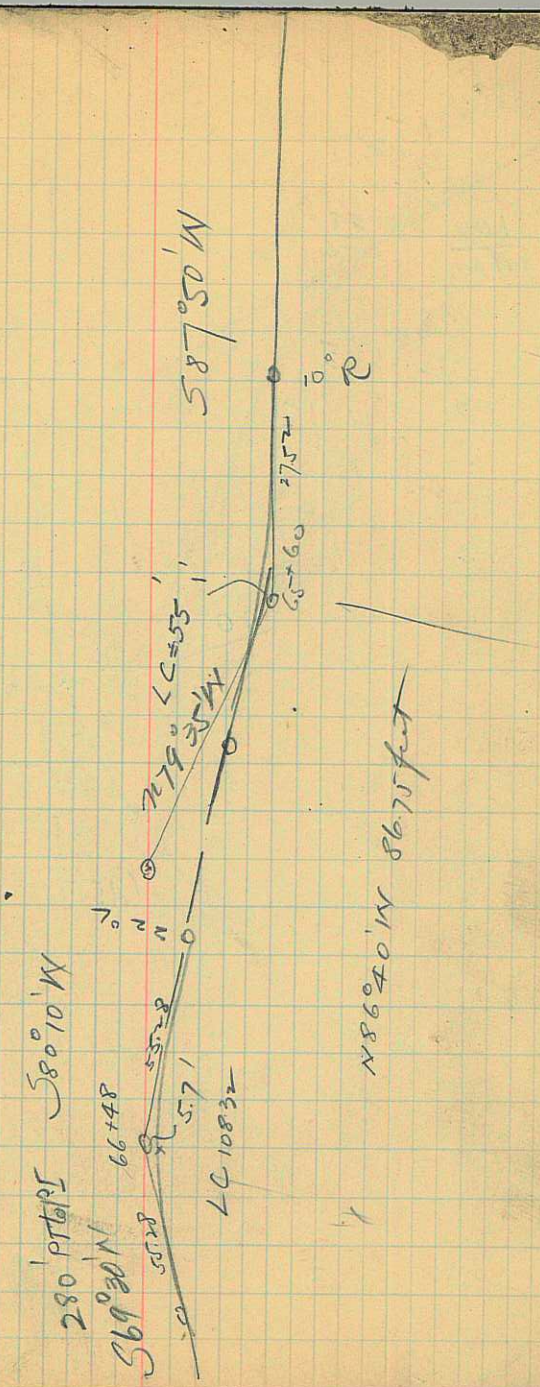
1.11159
$\bar{1}$ 94062

1.17097

~~1115~~

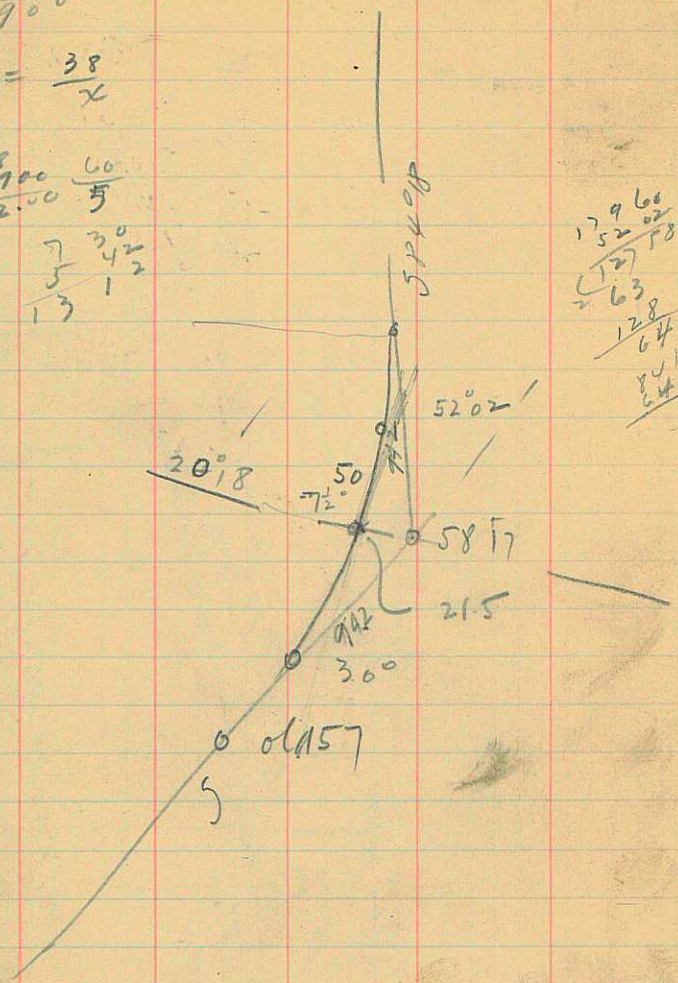
14.82

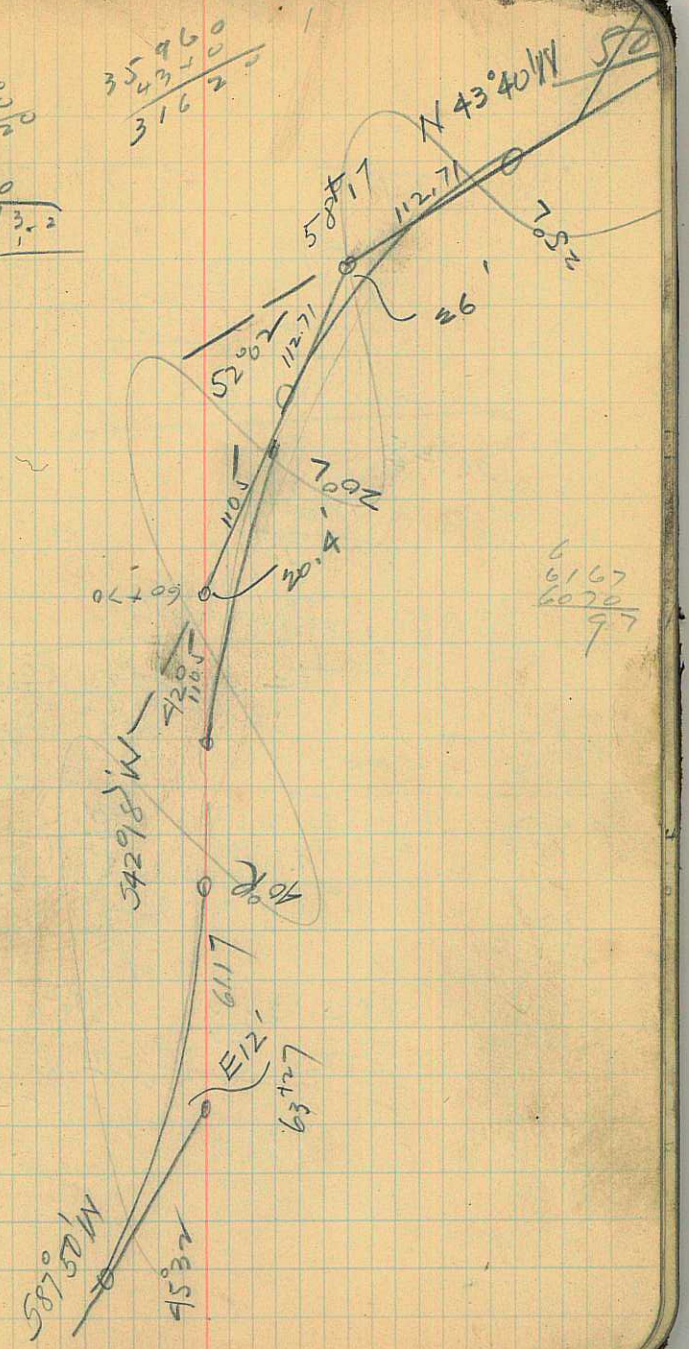
.08006.872
7848.09



$\frac{15}{900}$

$\frac{100}{900} = \frac{38}{x}$





8.8
7
6.1 6

26°37

1349.2
62
1355.4 | 30
120 | 45.5
155
30
158 | 30
80 | 5.3

2199 | 35
210 | 62.83
99 | 9
70 | 63.73
290
280
100

97
63.7
33.3

407 | 35
57 | 11.4
120

36°25'

1889.4
1880.1
219.3
4.6
1880.1
1884.7
180
84

36
5
1884.7 | 50
150 | 37.6
380 | 1
350 | 38.6
300

300

42

2199 | 30
210 | 73.3
99
90

2199 | 40
199 | 54.97
160
390
360
300

56.

97
73
23

97
56
41

17°30

882 | 33.3
666 | 28
2160

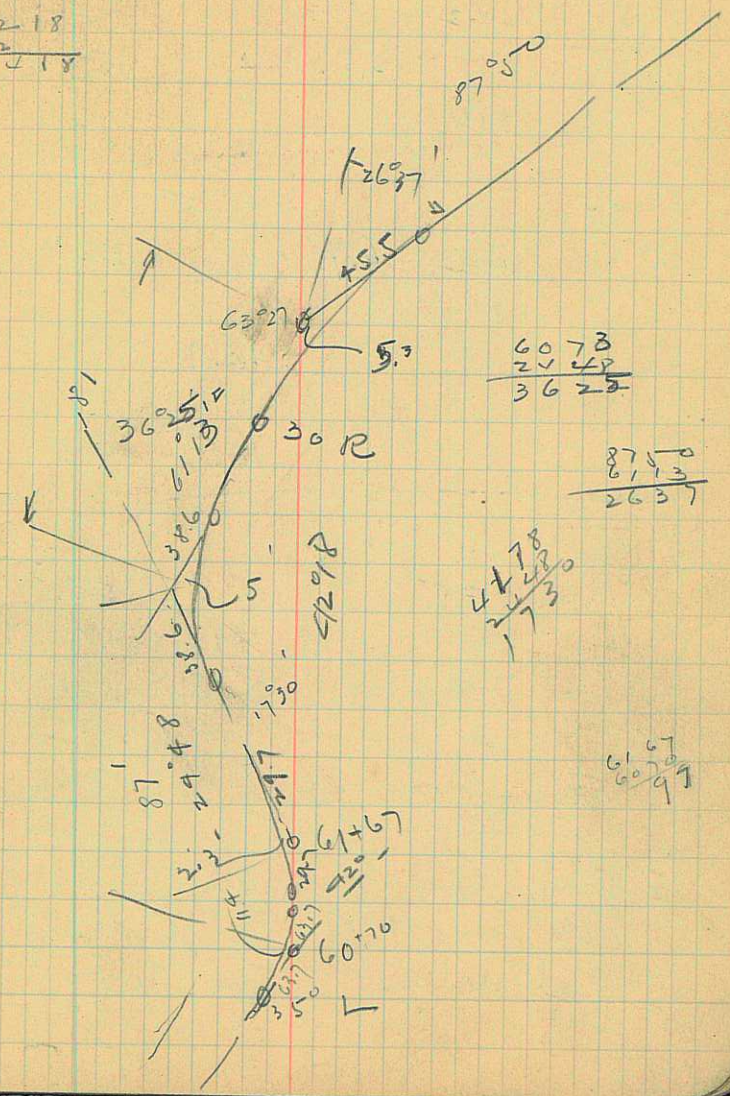
882 | 30
280 | 29.3
100 | 4

67.5 | 30
75 | 2.3

180
42
138
69
264.18
333.18

81
45.5
35.5

42.18
42
84.18



6073
2448
3625

8750
6113
2637

4178
2448
1730

61 67
60 70
99

Level in Blacksmith Fork
Hyrim Ex.
12/24/18

BS	FS				
12.62			140.68	153.30	on Dam
	2.51		150.79		
13.10				163.89	
		7.30			in trench near 67
		7.65			
10.06	6.98		156.91	166.97	
		10.7			
		10.5			by sack
10.45			140.68		on ice
		5.00			on constructed grade west side ledge
		6.00			E. side ledge rare 1 foot

Too sharp turn just be light on road. Turn first angle above 58+17 too low

140.68
12.62
153.30
2.51
150.79
13.10
163.89
7.3
156.59

67
.2
13.4
170
.14
156
163.89
7.65
156.24

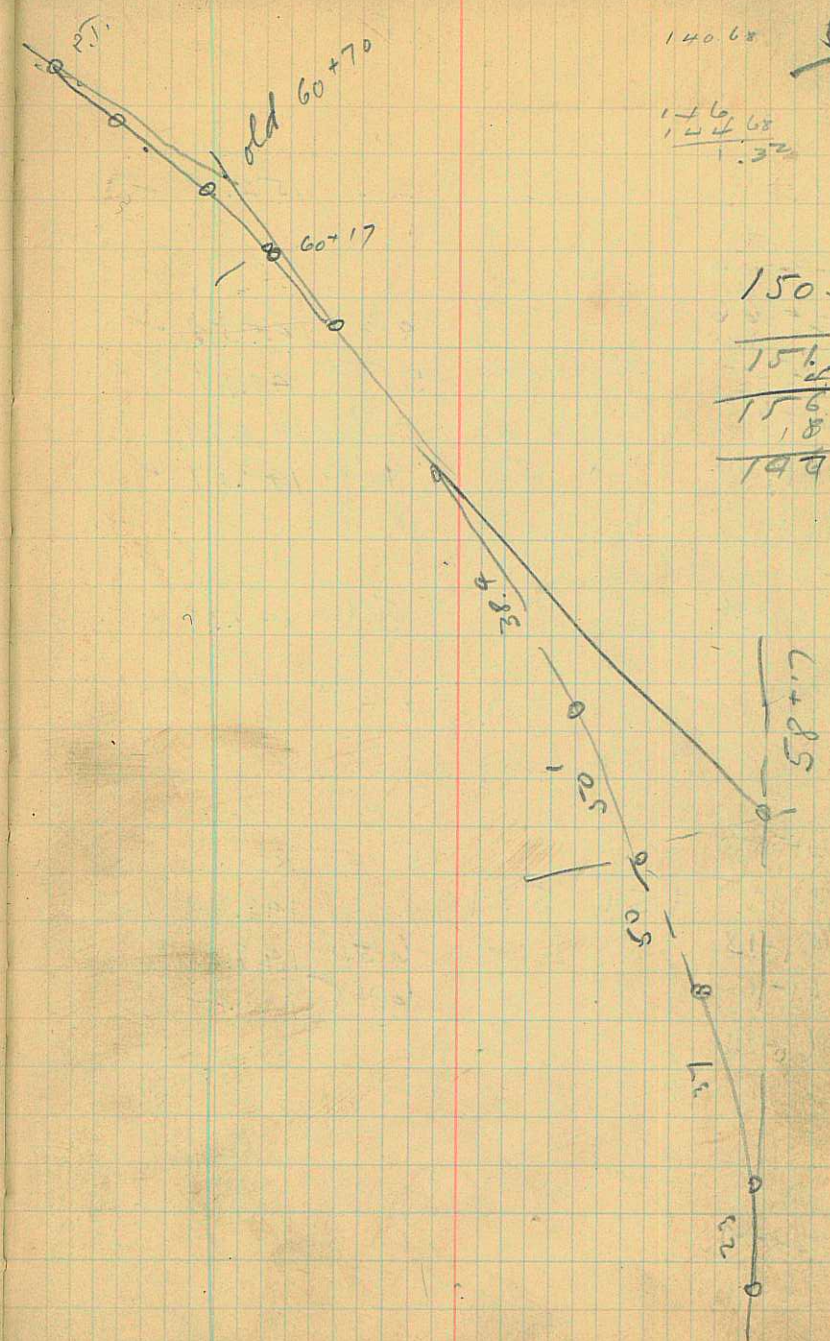
163.89
156
7.89

163.89
7.2
00.69

163.89
6.98
156.91
10.06
166.97

Sta 135 FS

60+89			7.00	148.87	✓
old PI 60+70					
60+53			6.32	149.55	✓
60+17 on curve			4.2	151.67	✓
			3.15	152.72	✓
P.C. 59+92			4.25	151.62	✓
59+47			10.1	145.77	✓
58+98			8.6	147.27	✓
58+60			6.70	149.17	✓
on top 58+17	4.19	~~9~~ 9.03		151.68	155.87
58+10	on curve		6.50	154.21	
old 58+17			9.9 on ground	150.81	
PM 57+70 rock			5.9	154.81	160.71
57+60			2.9	157.81	
57+23			3.05	157.66	
57 00	3.76			157	



56

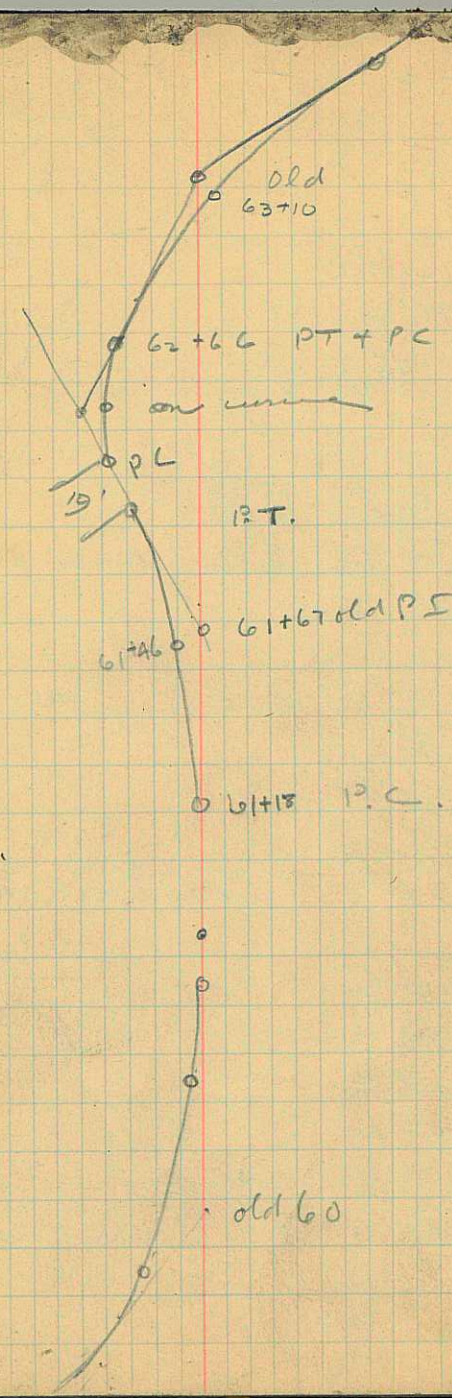
140.68

146
144.68
1.32

150.9
9
151.8
47
156.9
18.6
149.4

156
146
140.68
5.0

55		0.3	154.19	
63+10		2.3	152.19	
~~63+10~~				
62+66		8.9	145.59	✓
62+32		5.7	148.79	✓
61+75		4.7	149.79	
61+76		4.6	149.89	✓
		5.1	149.39	✓
61+46				
~~61+46~~				
Top 61+18	4.51	5.89	149.98	154.49
PC 61+18		6.50	149.37	
PT. 61+14		6.45	149.42	
60+89				
~~60+89~~				

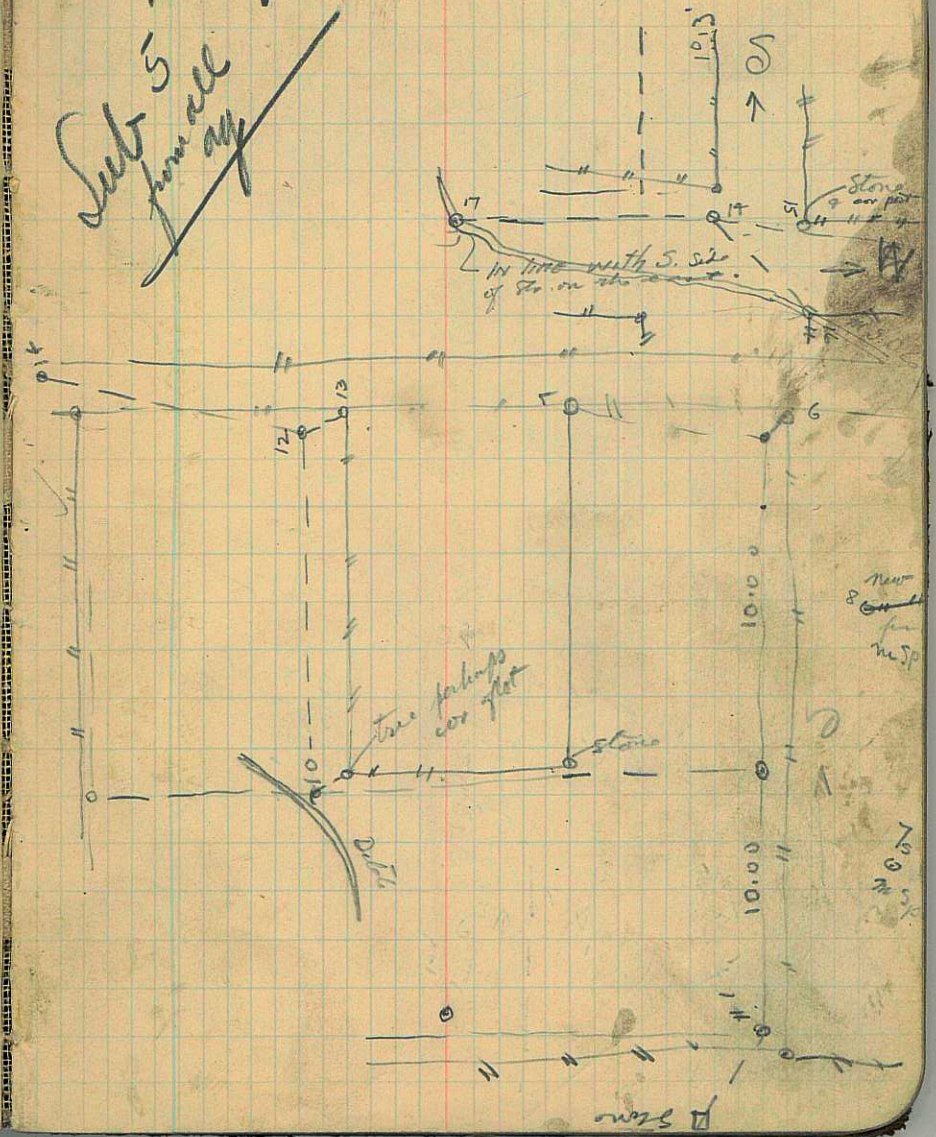


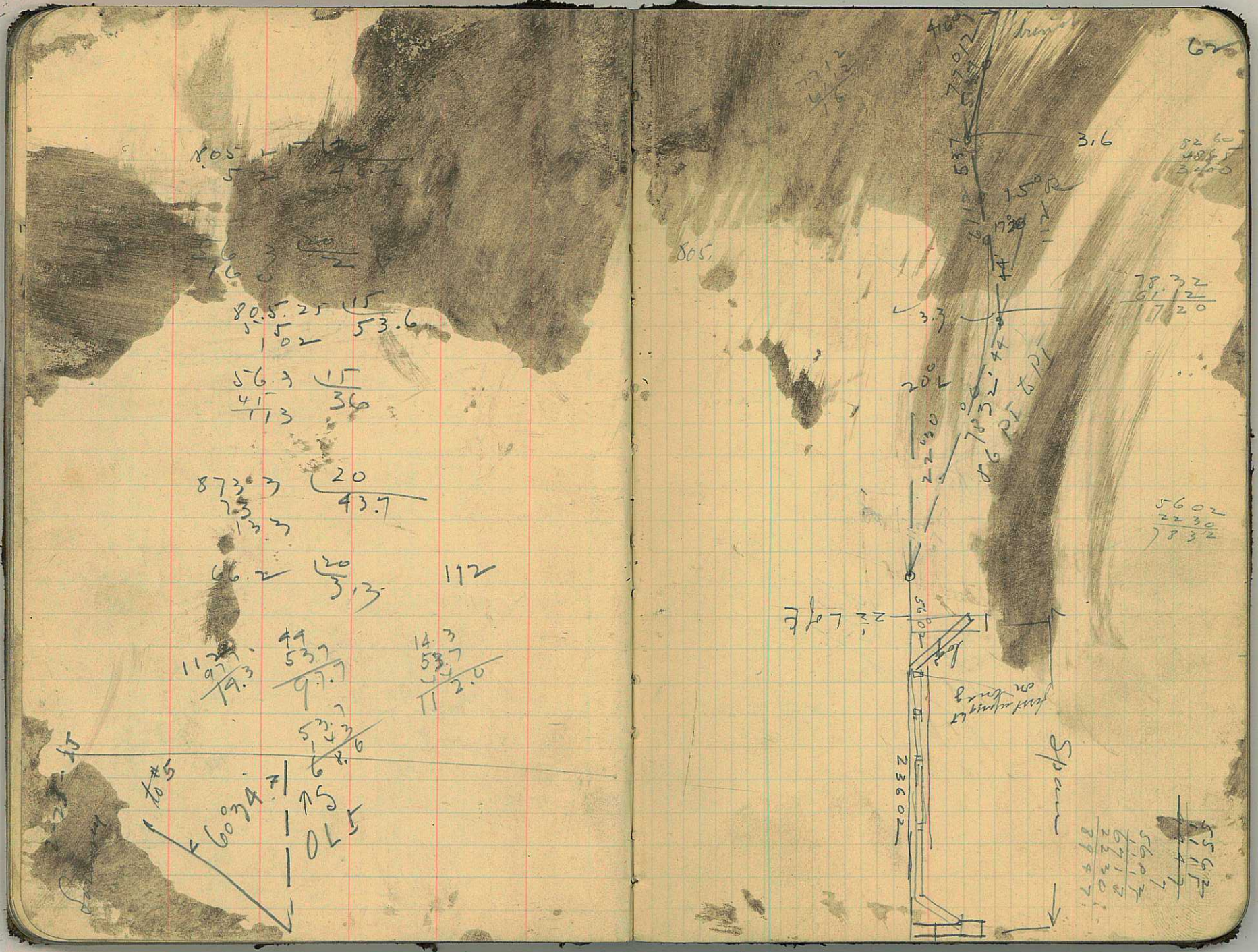
Survey for N C [illegible]

	2-2	3-2	
18-			
18	10.00	343°56	
17	2.06	268°30	
16	1.21	151°00	
15	0.64	96°	
14-			
	1051	to in line with N + S fence	
14	10.53	276°36	
13	0.23	76°30	
12-			
12	10.09	1°55'	
cor	0.35	63°30	to tree cor of lot
10-			
11-			
11	22.73	270°46	
	13.23	270°46	℄ of Leitch
10	13.0	270°46'	stake
9	2.730	272°54	to stone, also cor. Sch. Sec 76
7s		89°29	
8		62°24	
4-			
		85°52	to O.L.I point
8	Δ	96°15	
7s	Δ	116°10	
7	2.248	275°15'	
	1.13	So. side	street E & W
6	0.497	64°00'	a stone here. good condition
5-			
5	20.	358°24'	
4	10.	358°24	
3	8	358°24	
2*	0.13	115°30	
	2.52	232°01'	NW cor. sec 16. may have
		103°58	NE cor Floyd Hairman House
		266°31	to N. stack Anal. Sugar
1-Δ			

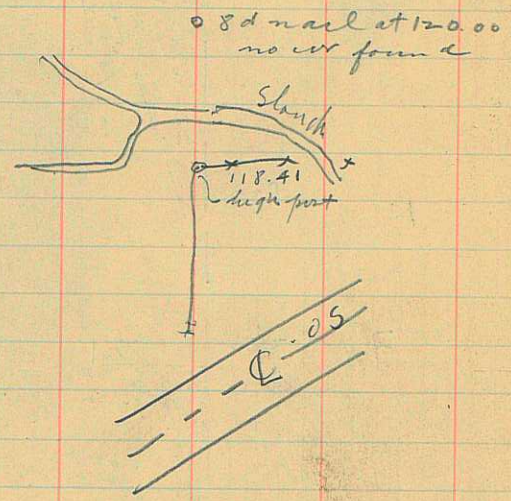
(Con on page 35)

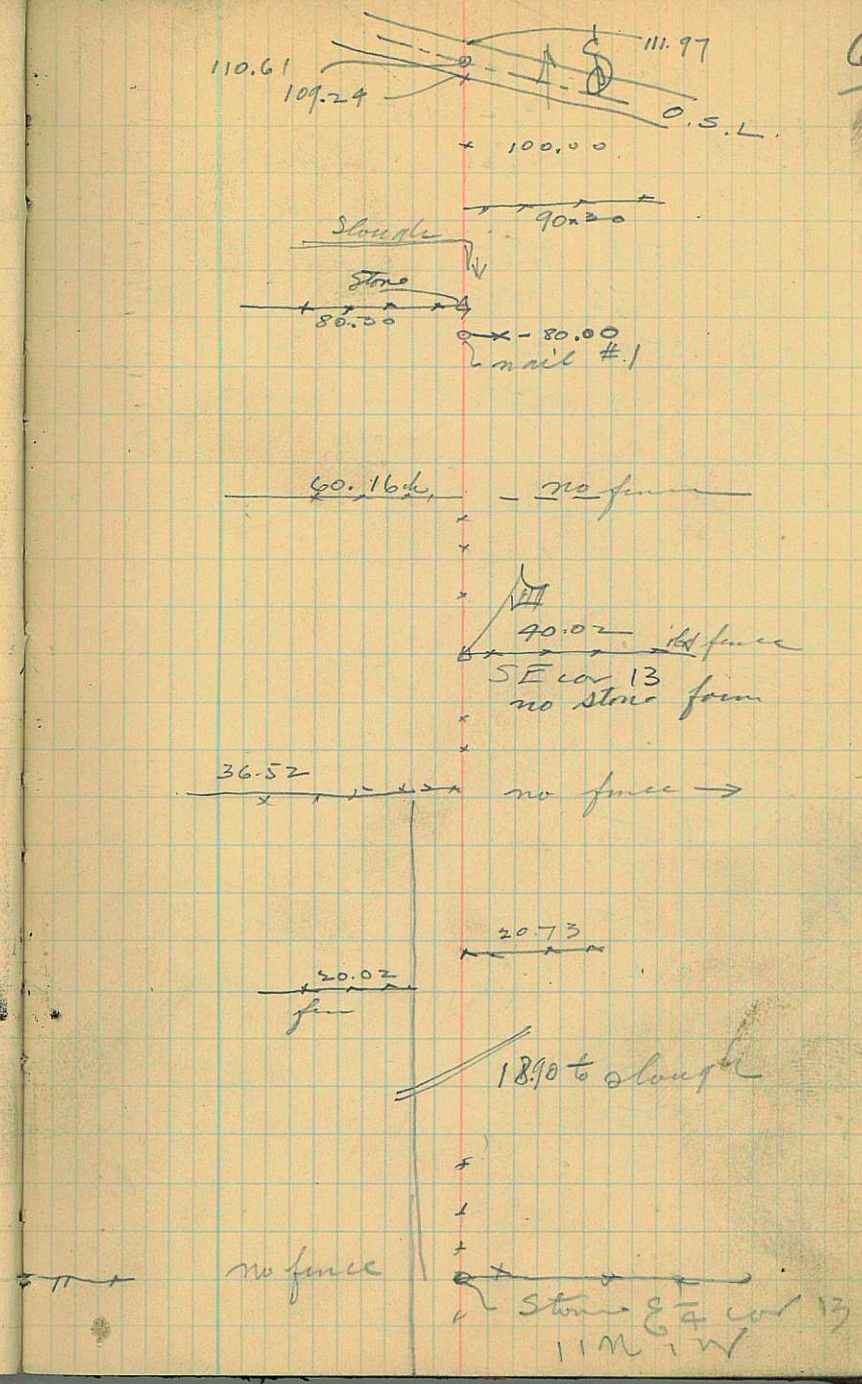
Sub 5 from all ag





John Berry
Survey
12/26/18





John Berry
12/26/18

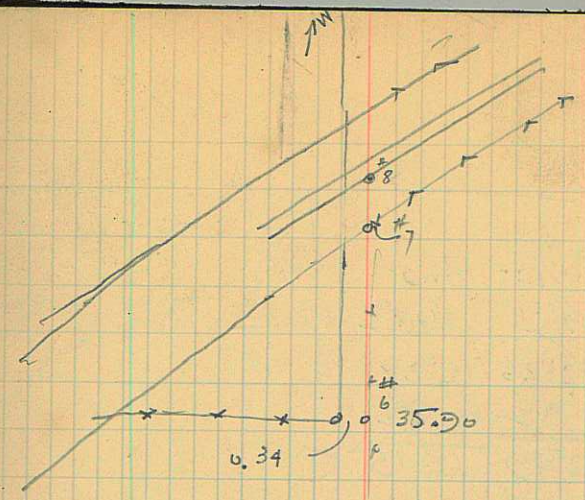
2 227°28 SE cor 13

8-

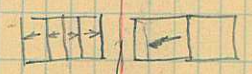
8	43.57.0	90°05
7	42.35	90°05
6	35.90	90°05

90°05

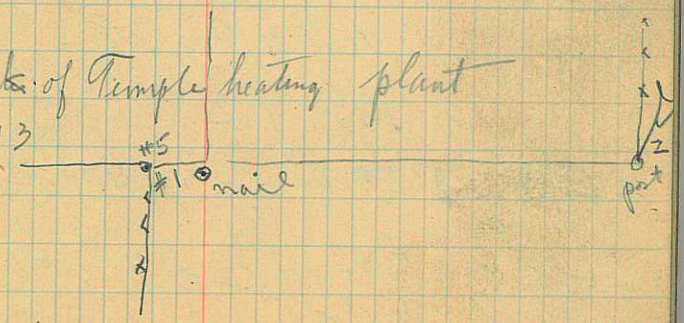
Stone 5 2°14 0.31
90°05
3 302°38
2 179°58
nail #1



270
269 65
45
270 05
225 05



Smoke stack of Temple heating plant
to SE cor 13



12/26/18

Ob on #8

	Az	Dist L	time
Direct	42°26	12°38	3:00
Invert	43°12	11°57	
	42°49'	12 15 ✓	
Direct	42°57	12°18	
Invert	43°47	11°30'	
	43°22	11°54' ✓	
Direct	43°31	11°56'	
Invert	44°16	11°10	3:10 P
	43°53'30"	11°33	
	43°21'30" ✓	11°54	

Corrected $\bar{h}$ =

11 53 60
4 23
11 49 37

Z = 89 59 60 - 11°49 40

Z = 78°10'20" ✓

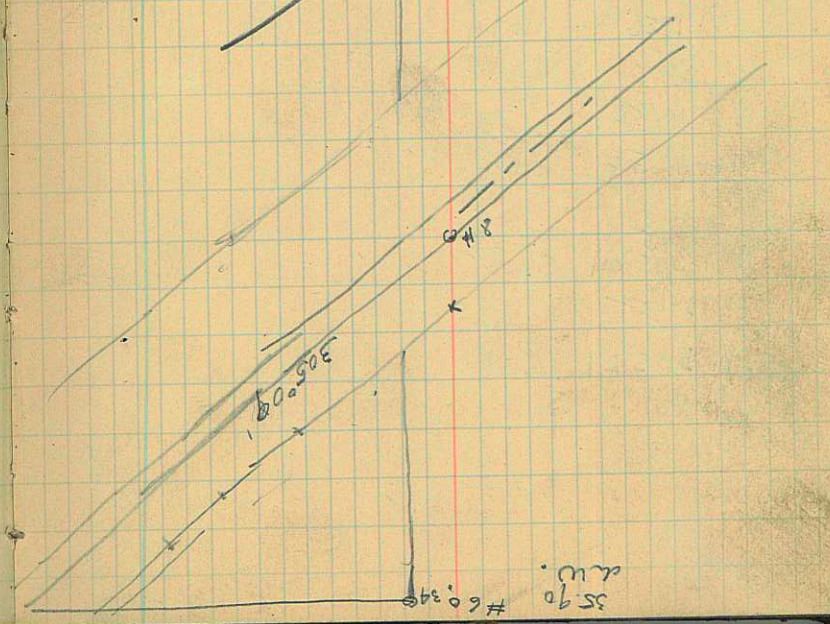
φ = 41°46

δ = - 23 22 40

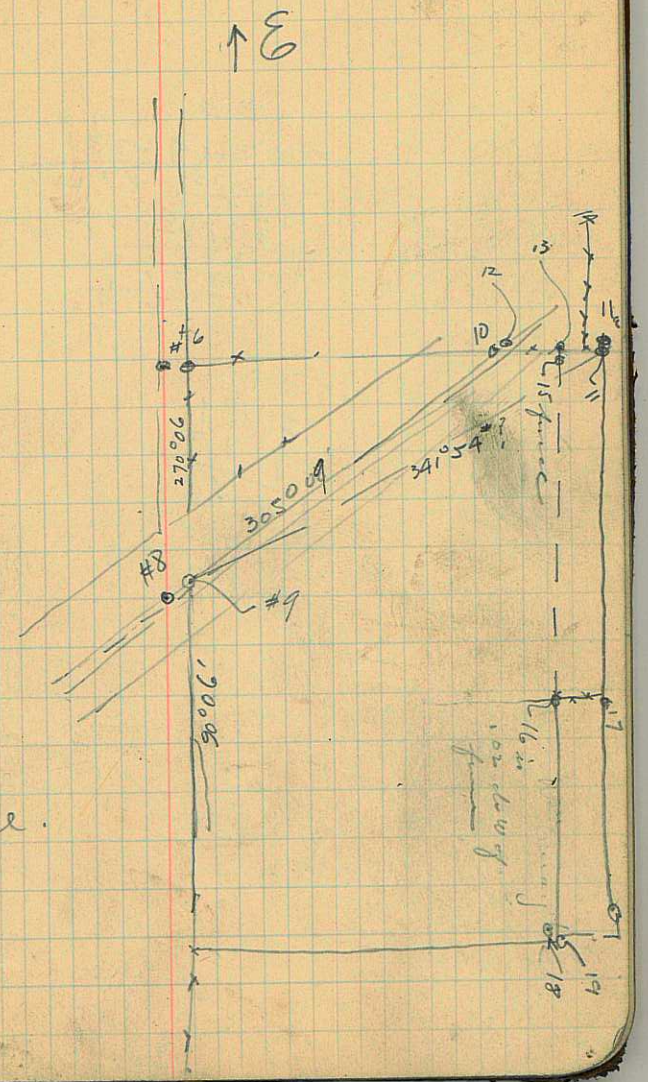
Az start 270°05

finish 270 06

Sub 18' ✓



	9	270°06'	13.48
	Post	W	0.02
20 –			
	20	181°11'	16.081
	Post 19	48°26	0.04
18			
	18	91°53	10.105
	17	2°09'	5.53 parallel
16			
	16	91°53	10.37
	15	91°53'	0.02
	11a	1°56	5.39
	14	1°56	3.28
13 –			
	13	1°56	11.79
12			
	6	181°56'	
	11	1°56	
10			
	12	305°09'	8.625
	10	305°09	8.605 in line with fence
	11	341°54	
9			
	9	305°09'	0.561 along N rail.
8 –			



00116
43
348
464
.04988

8960
6043
2917

03
0.08006 42173
42730 01872
37270
34184 .00187
30860
29911
9990

3 58 11
1 80 11
17 8 11

2 6 1
9 7 3
12.34

19.74

72

1.50
9.35
51.50 19.74
3948 26
12020
11844

		Az	dist
5 –			
	5	148°56	16.00
	4	148°56	14.82
	3	323°15	0.13
2 –			
	2		42.73

~~42.73 peg~~

20.86 to stuk 2½ link from fen

20.40

268°07 .02

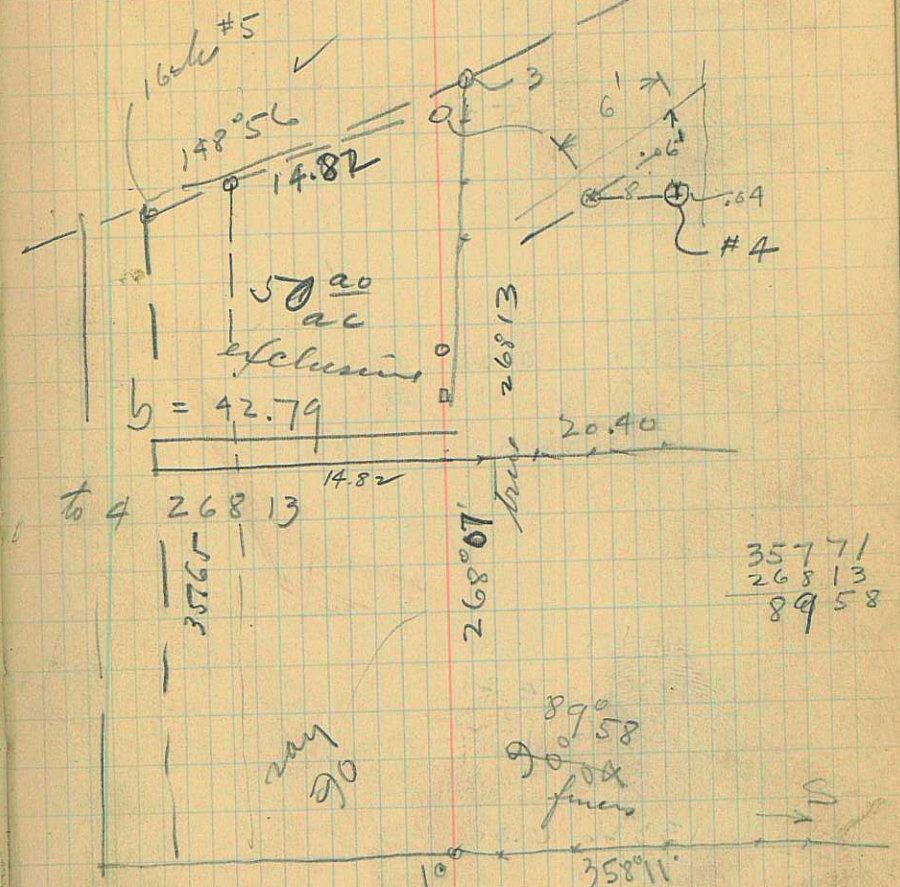
#1

1600
1482
1.18

4.275
4
171.00

35881
2687
9004
7+

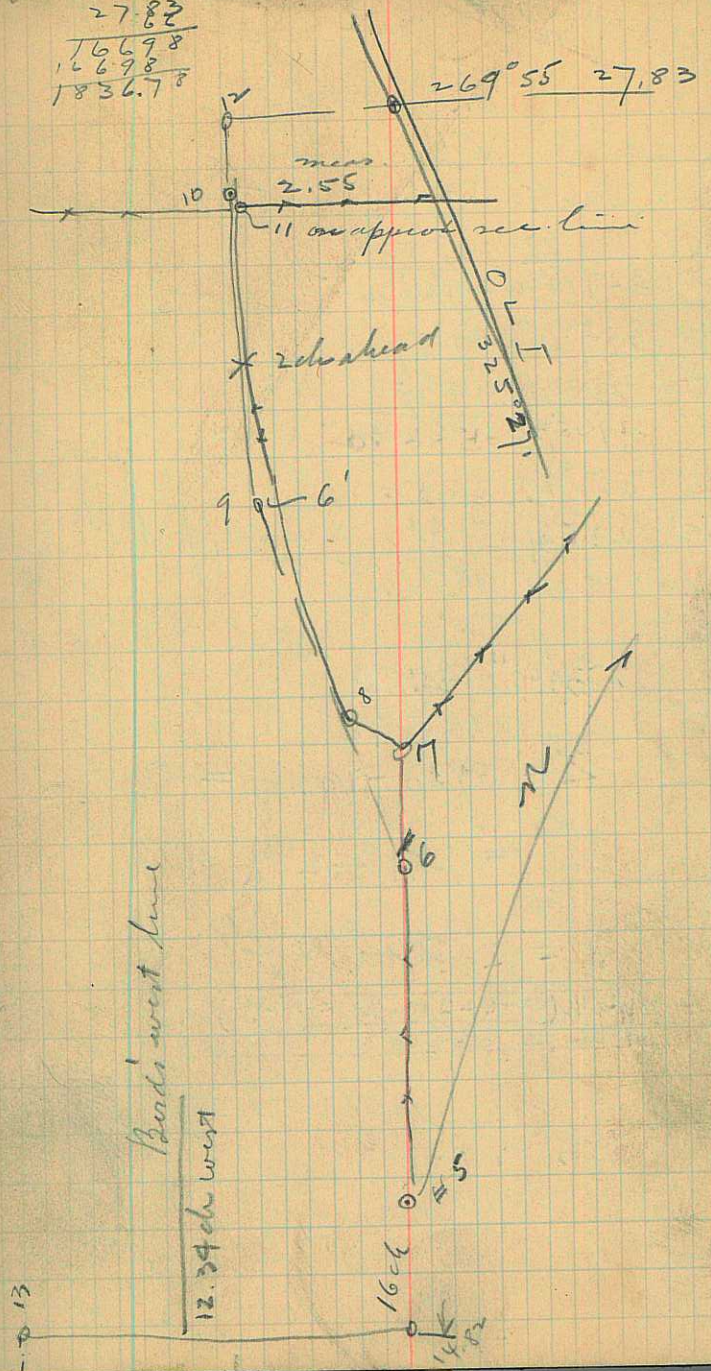
to nE wr Hardman's tract



35771
26813
8958

	13	88°13	35.56 fell .15 link E.
4 –			
	sec cor	269°55'	began Dec 3-1918
12			
	12	156°26	0.60
	11	333°	0.08
10 –			✓
	10	156°26'	6.42
9 –			
	9	147°55'	8.55
	8	147°55	2.21
	7	153°26	1.79
6 △ –			
	6	153°26	6.00
5 –			

27.83
66
16698
16698
1836.78



Stone △
Nc cor 17
11 N 1 W

7.92
5
3960

Dec 3-1918 Mendon S Pasture

Ob on pt # 4

	Az	Vl	Time	
Direct	326°35'	19°41	10:05	
Invert	327 28	19°12		
	327°01'30"	19°26'30"		
Direct	327°10'	19°57		
Invert	328 01	19°28		
	327°35'30"	19°42'30"		
Direct	327°43	20°12		
Invert	328°31	19 41		
	328 07	19°56'30"		

add 54'

MZ 327°34'40" 194150

238" = refraction

1939 12

$Z = 8960 - 1939 = 70°21'$

$\varphi = 41°42'N$

$\delta = -22°04'$

$\sin \frac{1}{2} v_1 = \sqrt{\frac{\cos \frac{1}{2}(z+\varphi+\delta) \sin \frac{1}{2}(z+\varphi-\delta)}{\sin z \cos \varphi}}$

8813 7.74

13 –

78

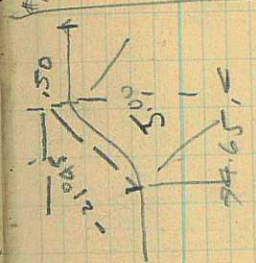
14856
480
328.56

12.94
7.74
51.76
9058
9058
10.01556

set

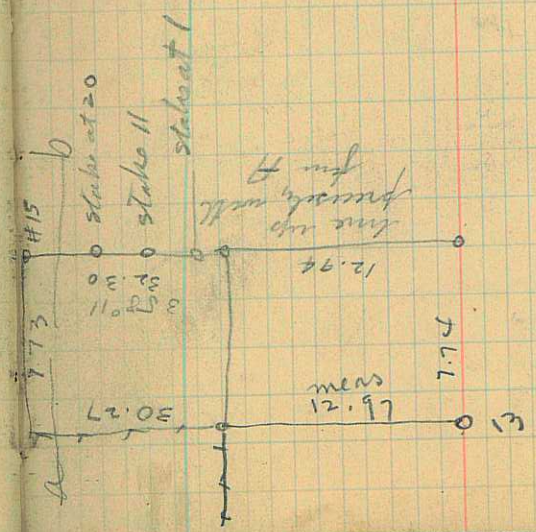
32.30
12.94
45.24

32.30
7.74
1292
2261
2261
25.0002

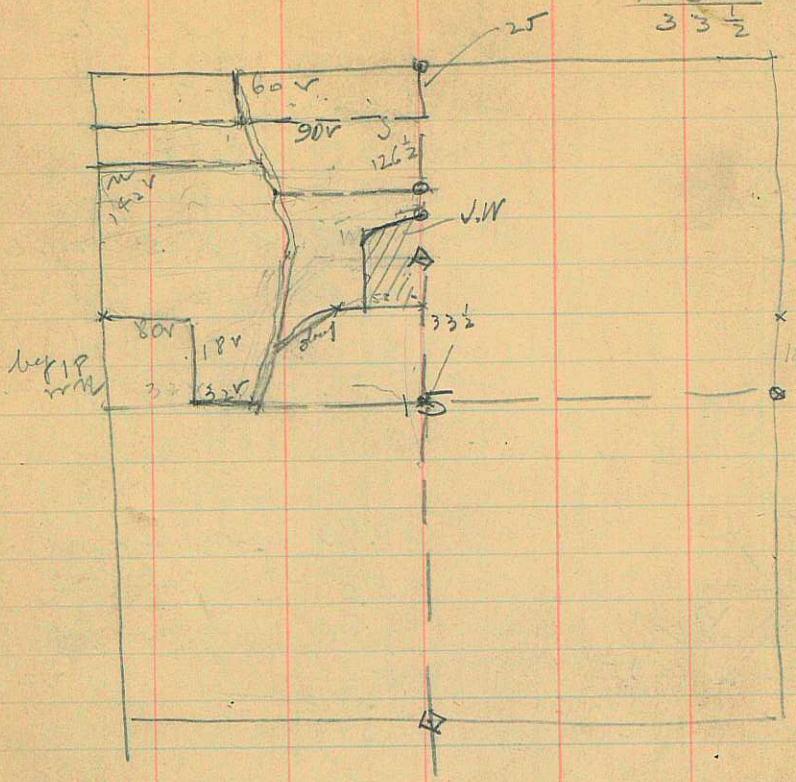


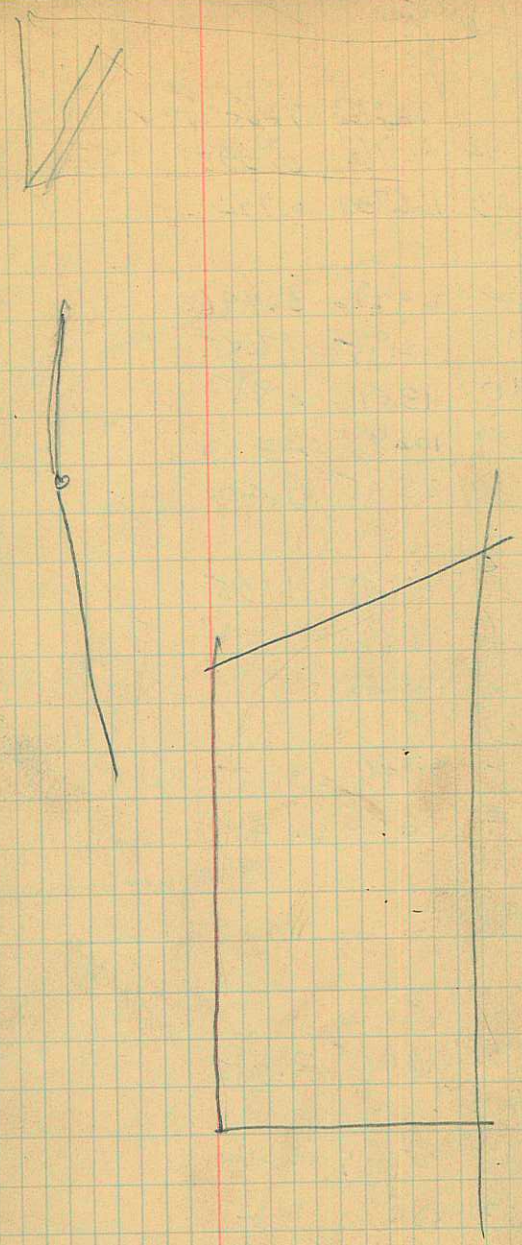
0.93
5
4.65
5.0
2.58
7.73

250.0 | 7.74
2322 | 323
1980
1548
2320
32.30



$$\begin{array}{r} 166\tfrac{1}{2} \\ 126\tfrac{1}{2} \\ \hline 33\tfrac{1}{2} \end{array}$$





12/4/18

Survey for Hendricks

14 -		N 180°	1.595
	14	16°16'	0.998 Stone
	13	166°39'	0.72
12			
	12	247°16	3.496
	11	221°15	1.645
	10	190°16	0.85
	9	104°	0.32
	8	52°45	0.40
7 -			
	7	179°58	11.135
	6	100°	0.04
		178°55	
5 -			
	5	91°46'	3.18
	4	45°55	0.14
3 -			
	3	180	7.375
	2		
2		270°03	0.20
	2	180	1 ch
1 -			

150
28
2

3

82

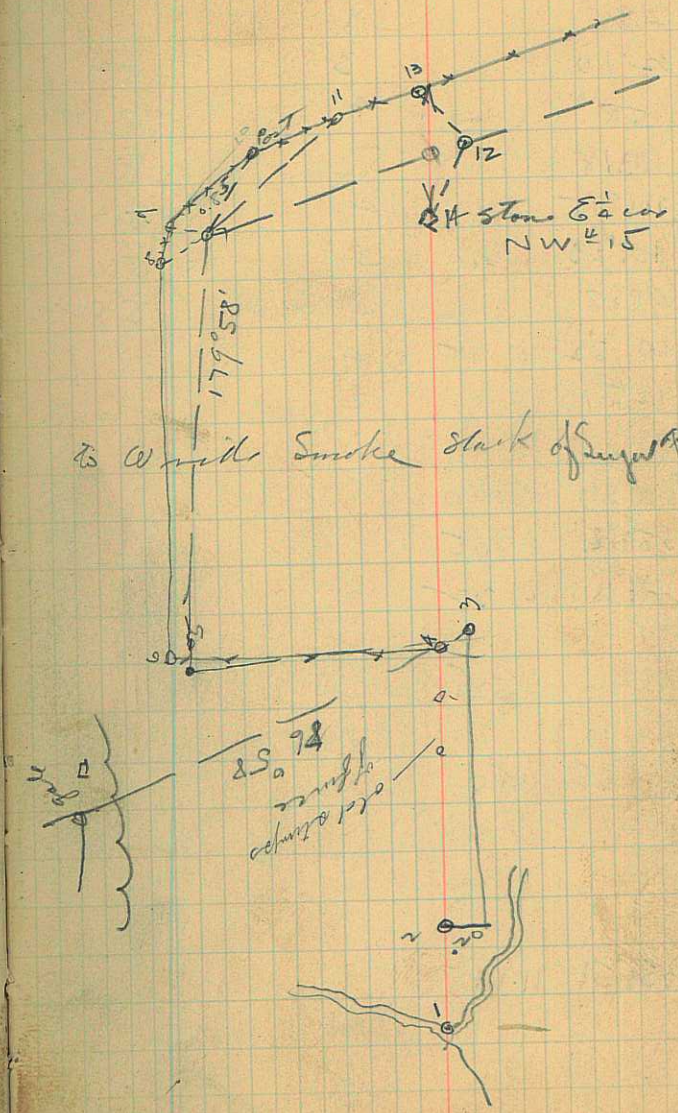
Christina Hendricks to J. W. Hendricks

4 | 33.5
8.375

1.25
11.13
8.375
20.755
84
.922

.386
35
1930
1158
1.2510

.922
35
4610
2766
3.2270
20
3.42
3.18
0.26



Stada

Center 15	280°		3	8	11.4
R 27	32°10		3		5.9
R 26	58°		4		5.13
R 25	10318		5		5.65
R 24	116°15		4		5.70
R 23	101°23		3		5.06
R 22	98°08'		3		5.52
R 21	101°52'		4		6.9
R 20	125°10		2		6
19					
19	328°59'	8.00			
18	358°50	1.705			
17	169°15'	0.32			
16a					
16	91°46'	11.525			
	86°35'				
15 –	15	358°55	0.10		
5 –					
	3	358°51	11.615		
14 –					

84

11.615
8375
19.990

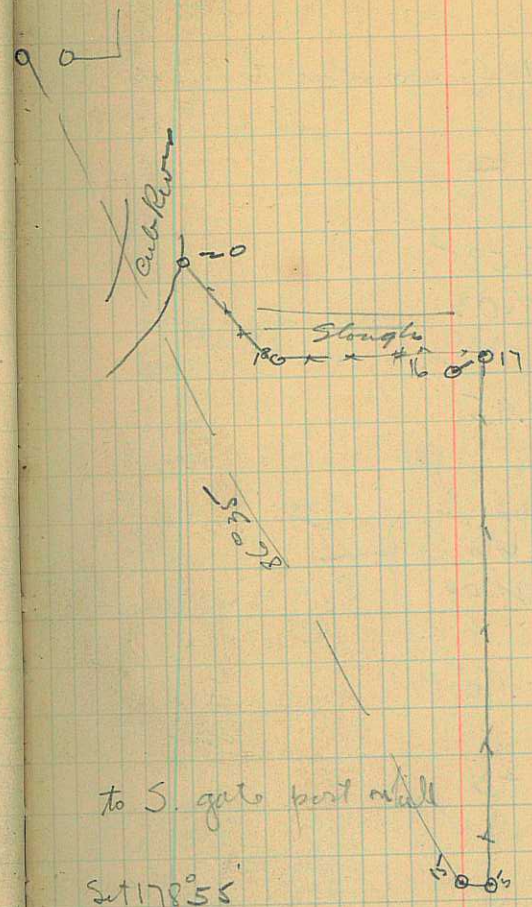
11.6

3.18
11.52
1460
4
58.4

14
7
.98

1450
4
58.00

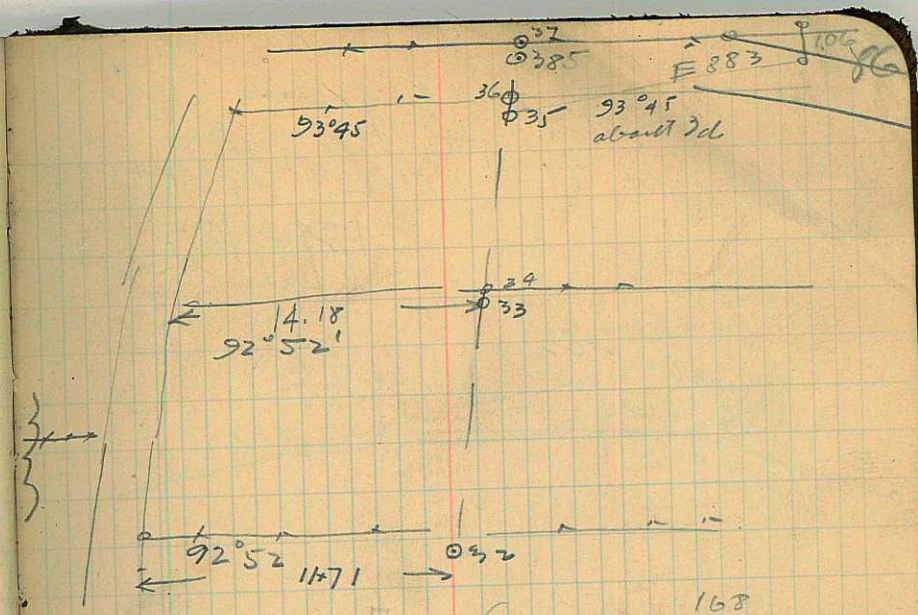
17
7.00
119.00



to S. gate post wall

Set 178°55'

Δ38	189°19	0.90	
37	177°30'	1.06	N via Str
36	189°19	0.03	to Str
35 –			
	180	1.06	no cor found
×			
×	270°	8.83	
35 –			
35	189°19	5.585	
34	189°19'	0.03	
33 – 12/6/18			
33	189°19'	4.95	
	184°52		
32			
32	168°	11.64	to peg 32
31	168	11.66	to fum
	168°00'	2.00	
30			
30	90°	4.90	
29 –			
29	359°58	2.43	
7 –			
~~28~~	~~259°43'~~	~~7.00~~	
~~12~~ –			

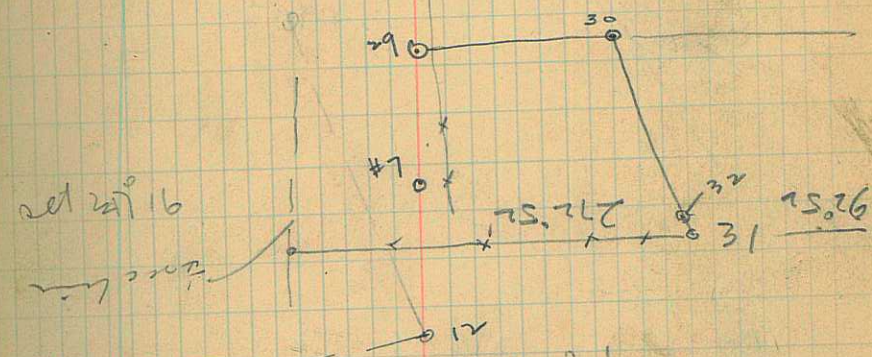


168
180
348

to smoke stak S.F. 60 (West edge 8/11/19)

168 + 180 = 348

to truck

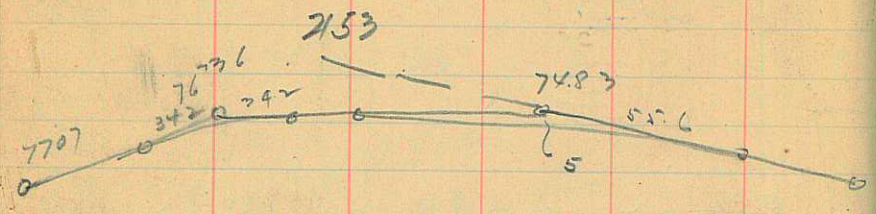


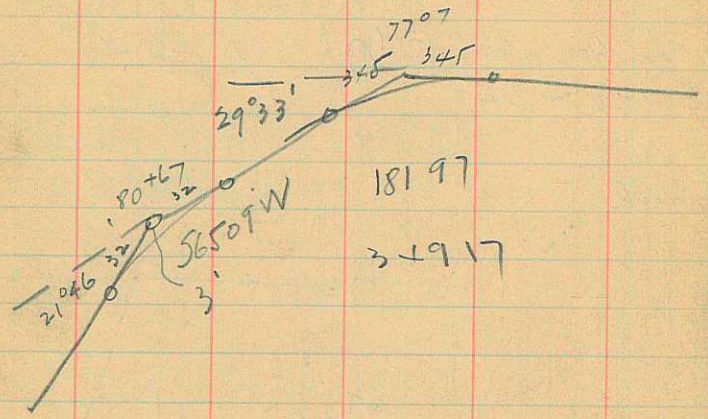
set 247°16

Set 247°16 – 180 = 67°16'

72.40
1.76
74.16

Hymne Cty
H_2O Extension
12/4/18





18197

34917

21.88 | 9
38 | 24.31
8
10

200
24.31
175.69
108.63
284.32

2 | 175.69
87.84
108.63
196.47 -E- 5'

29.55 | 9
25 | 32.83
75
30

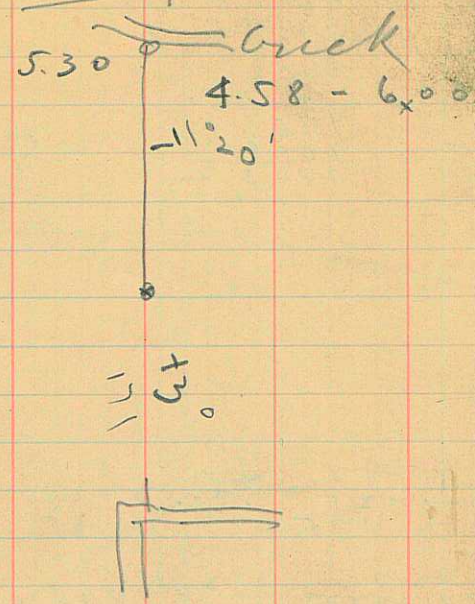
21.77 | 9
37 | 24.20
17

200
32.83
167.17
181.97
349.24

28.18
24.20
3.98

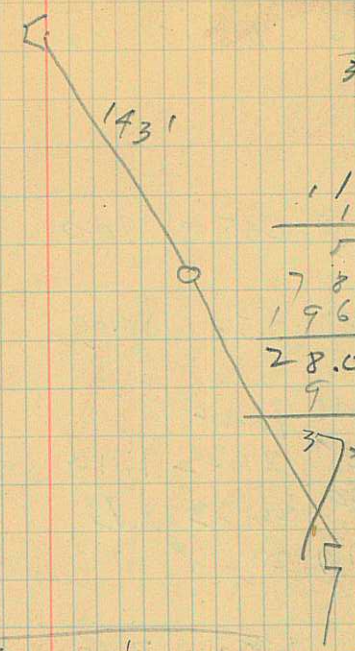
42818
200
22818

Willsville
Darby location



		N	S	E	W
		5.50		.89	
N 9° 19' E	4.95	4.87		0.80	
N 12° W	11.64	11.41		1.69	2.44
					4.90
		8.70			
		0.09			3.18
		8.375			10.52
					1.69
		33.44			8.83

11.13



6.00
4.58
1.42
.71
5.29

.171
.052
342
851
9.892

33.44
55
3894
0 6

.196
.143
588
784
196
28.029
9
37

5.60
.16
3360
560
.8960

40
33.44
6.56
5.58
0.98

.986
558
788
730
4930
493
5.50188

1164
.21
1164
2328
2.4444

11.135
243
8.70

.986
495
4930
4974
3844
3.87270

495
16
2970
495
7920

1164
98
9312
1476
11.4072

167°34

73	90°50	14x28 dk edgl post	
74	90°54		parallel with S. fence Cav

50-

48

48	345°48'	9.00

47-

47	3°52	10.00

43-

46	90 42	
45	270°42	1.10
44	261°22	3.13
33	272°52	d along fence

42-

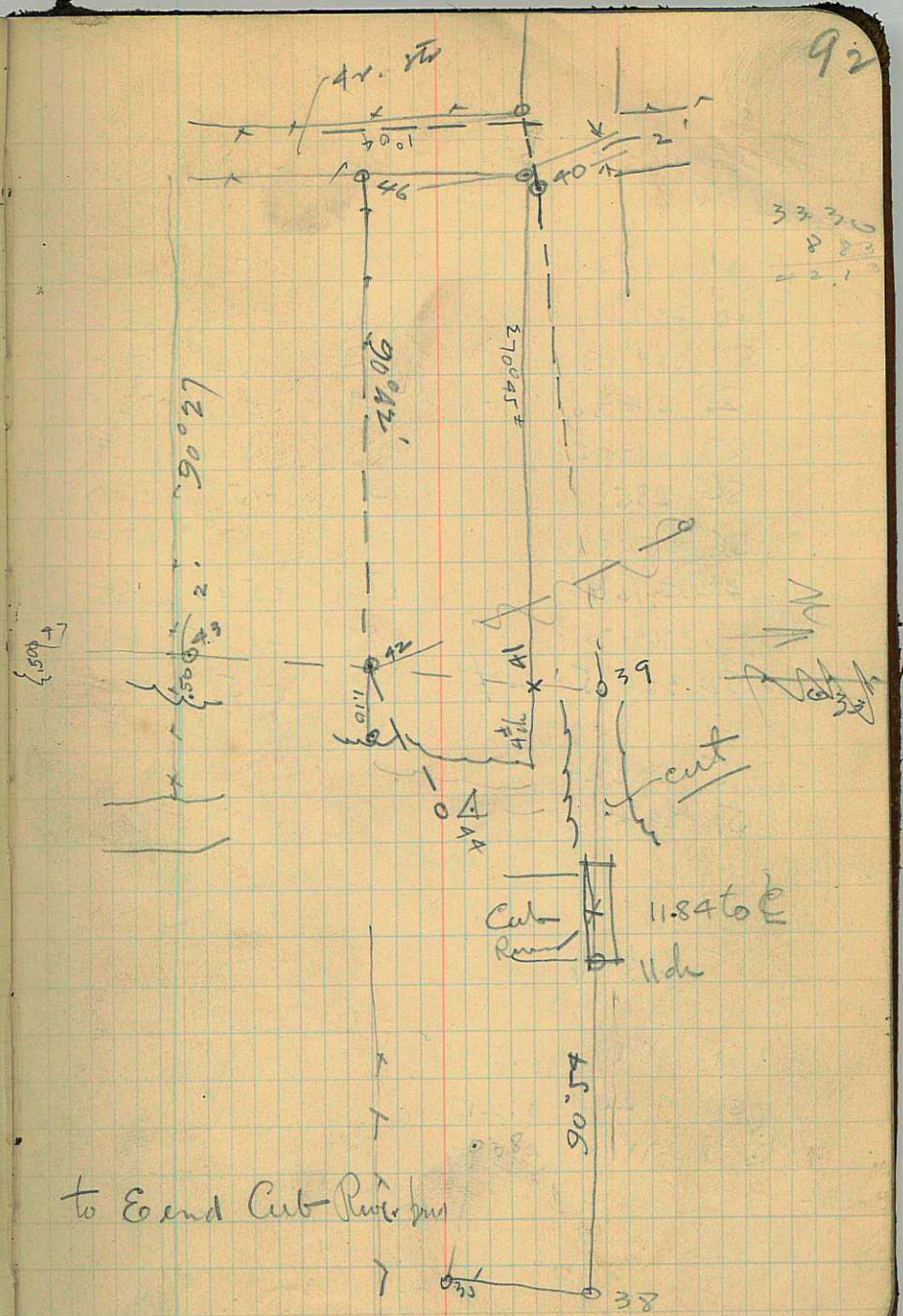
43.	3°52	8.10
42	3°52	5.73
41	3°52	0.676
40	87°53	13x30

39-

39	90°54	20.00
	90°54'	11.00

38-

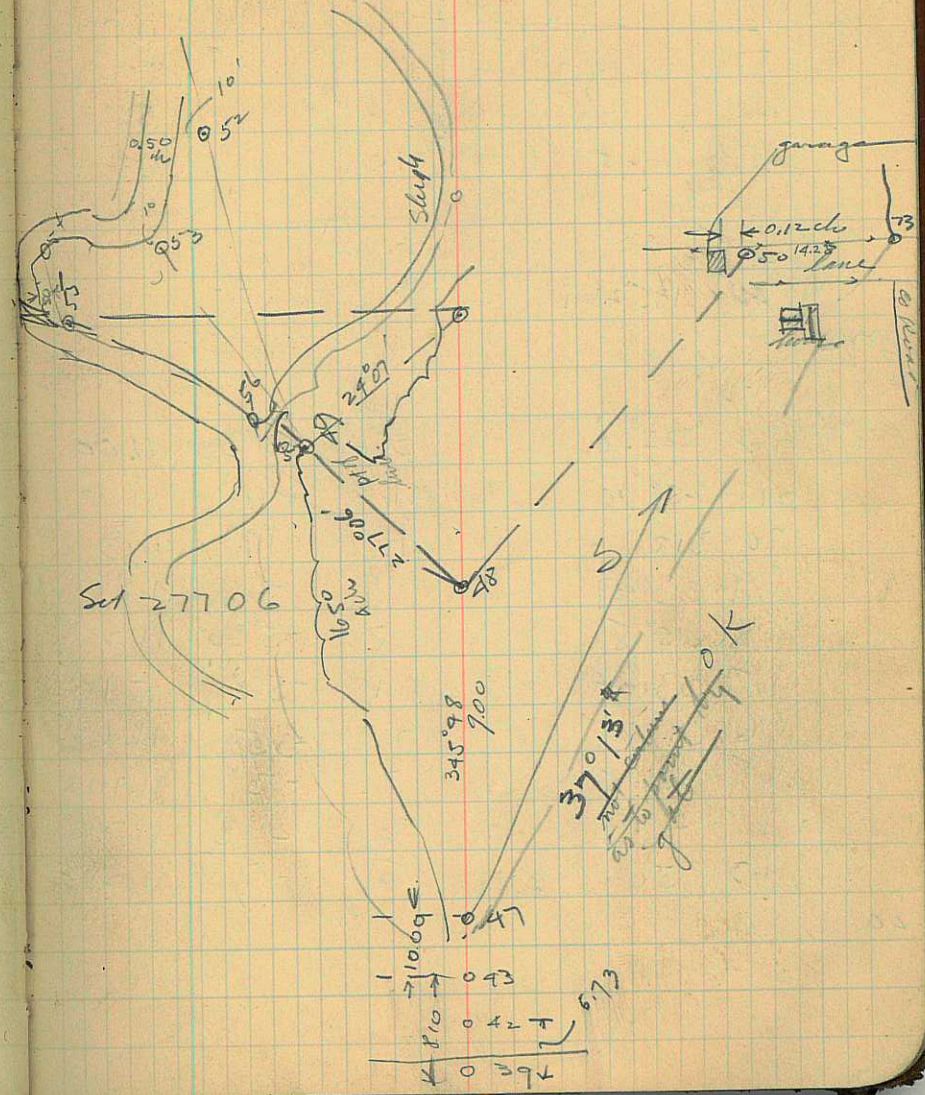
Sub 1017' from Ay

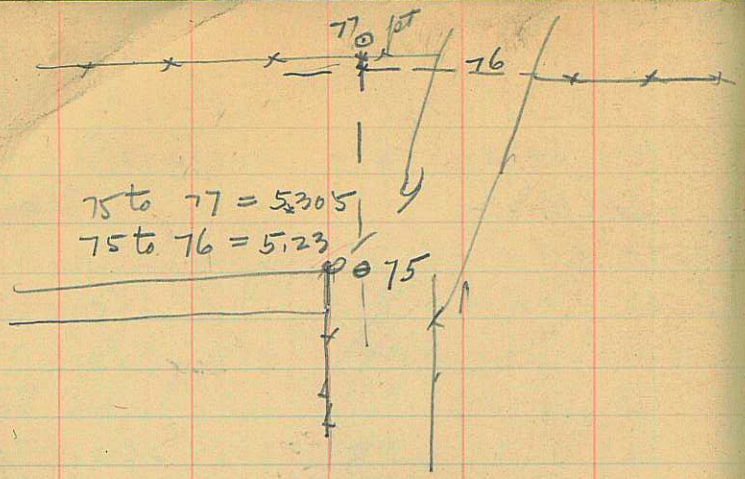


62	6°15		4	-2°40	11.3
44					
61	191°26		8	-7°	11.50
60	207°11		8	-7°40'	11.30
59	224°05'		3	-12°	5.50
58	214°50'		4	-21°30	5.9
57	285°45'		10	-18°20	11.40
56	285°		3	-15°	4.98
55	282°41		7	6°	11.4
54	292°46		7	-5°43	11.4
53	316°13		8	-6°45	11.68
52	326°15	-5°	6	-5°	11.15
15	282°24				
51	24°07'				
A90	-				
15	266°31'				
51-					
A51	345°49'	6.536			
50	4°20'	8.21			
49	277°06	4.239			
48-					

86.35
180
266.35

Set 261°22



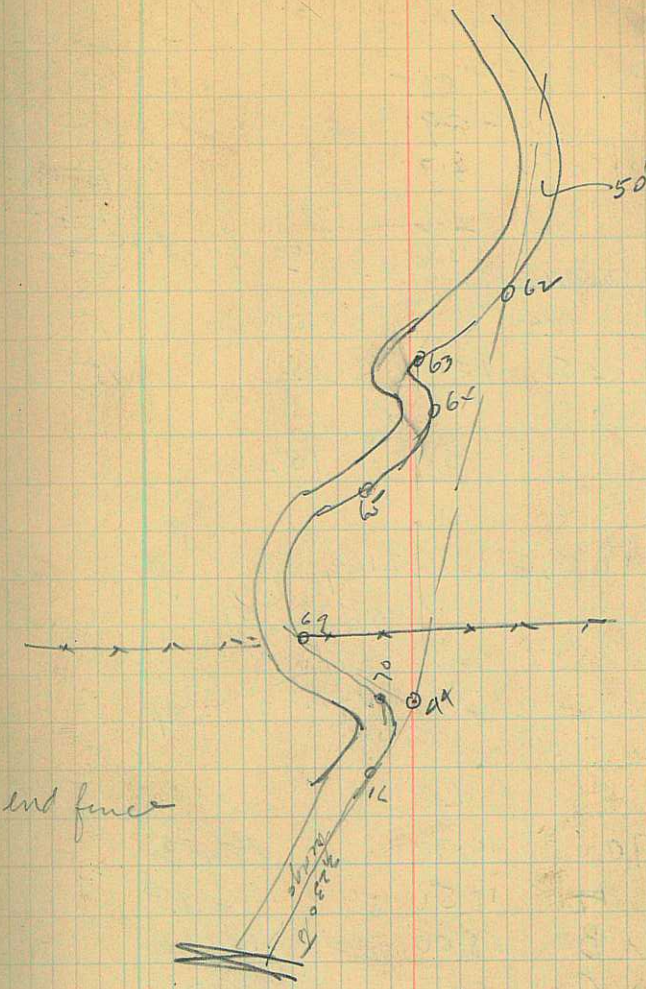


Pivot 40 145°26'

47 -

72	222°30'	9.00	-8°30	11.00
71	259°30'	11.	-18°	11.98
70	318	11	19°	11.9
69	313°47	9	-6°	11.8
68	315°15	8	-5°30	11.2
67	330°44	1	-5°8'	5.1
66	341°13'	7	-3°50'	11.60
65	356°45	7	-3°	11.70
64	3°10'	6	-3°	11.70
63	50'	5	-3°	11.28

44.



8.10
67
7.43
109
9
821
34.64
138.5
18
156.50

97 H_2O Extension

Hymm 12/11/18 Ele

G	PC to 72+40	8.35		150.8
H		4.9	50' from P.C.	154.2
Exteral I		3.7		155.4
72+40		4.6		154.5
J		3.6	100' from PC	155.5
K	130' f. PC 3.1		35	156.00
PC	10.4		60	148.7
74	4.5	$\frac{100}{2100} = \frac{30}{}$	17.	154.6

630.00 | 60 = 10

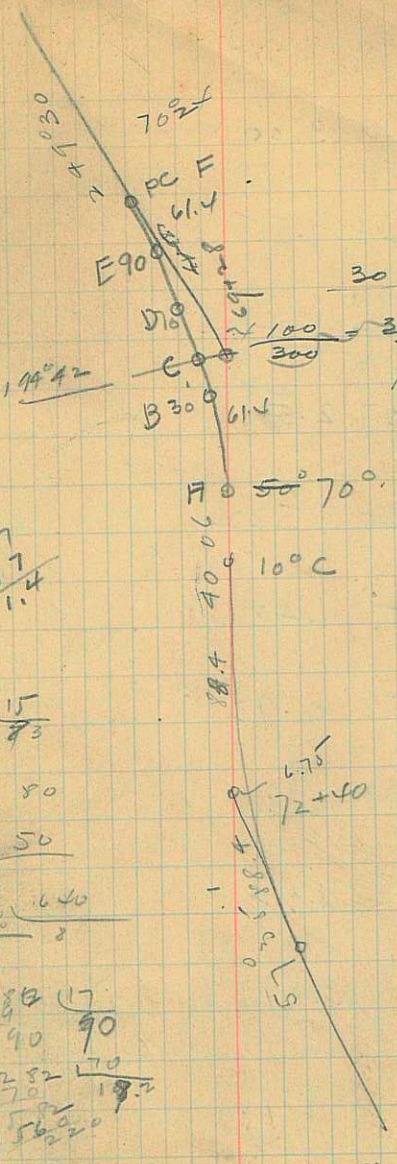
10°30'

2100 90 / 1890.00 | 60 = 31

2100 70 / 1470.00 | 60 = 24

RR

70	10.70	146.53
A	10.50	146.7
B	8.00	149.23
C	8.6	148.6
D	9.50	147.7
E	4.20	153.0
F	3.20	154.00



159.11 = 5-12

$\frac{100}{300} = \frac{30}{}$

30

130

194°42

1280 | 50

57.7 / 3.7 / 61.4

1280 | 15 / 83

80

R = 50

500 | 640 / 480 / 8

1282 | 17 / 90 / 90

1282 | 70 / 70 / 19.2

1280 | 50

5 | 88.1 88 / 17 / 67.47

88.19 / 13 / 88.37

57.35 / 40.06 / 17.29

17960 / 57.35 / 122.25

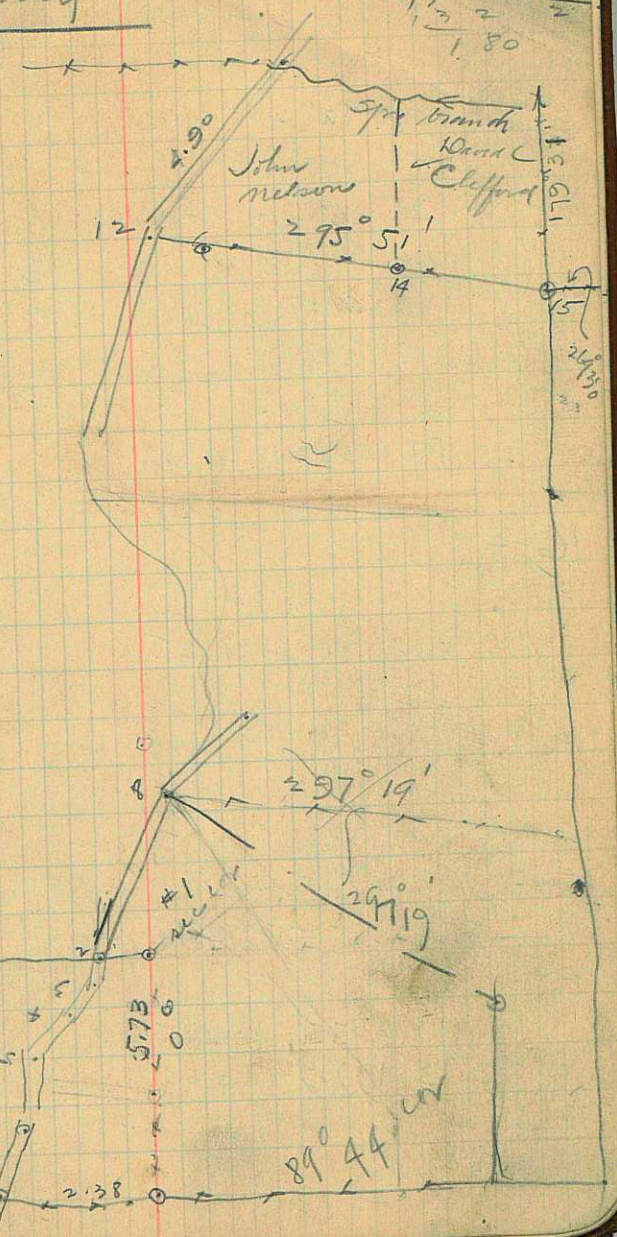
17960 / 40.06 / 139.54 / 80 / 319.54

11	12	193°46	0.718
10	11	201°10	3.00
9	10	190°34	1.85
8	9	232°02'	1.21
2 –	8	208°37	2.~~50~~ 49
6	7	19°30	1.522
5	6	7°34	1.48
4	5	28°59	0.93
3	4	42°34	0.94
2	3	15°05	1.32
1 –	2	89°31'	0.261

~~1111~~ 1111 N line 34 N89°21'E 100

Jessop Survey

℄ canal

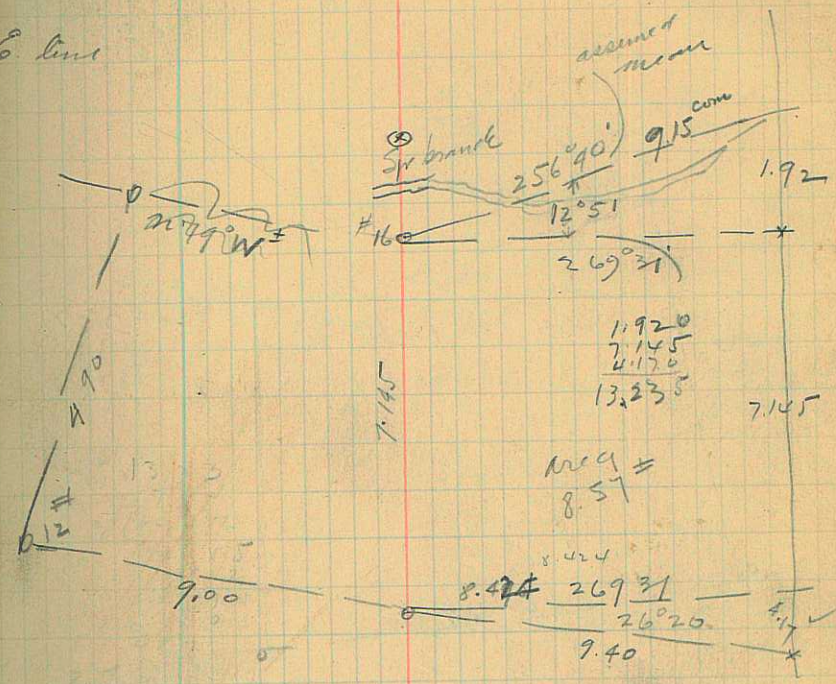


Andelep

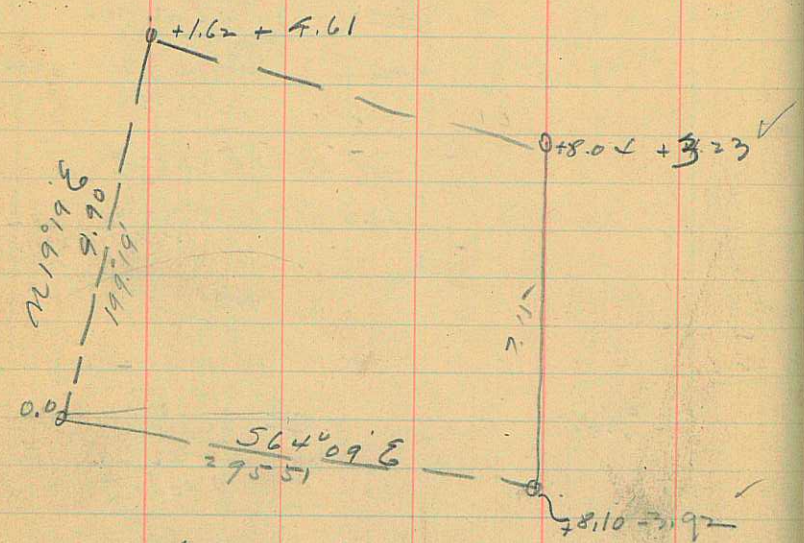
Stadia

			L	C	U
25	100°35		9	-2°30	11.69
24	98°04		10.	-2°50	11.7
23	82°30		10	-3°50	11
22	259°10'		+3°	9	11.84
21	258°30'		6	+2°55	11.32
20	269°52'		3	+1°43	5.96
19	274°		4	+1°	5.97
18.	290°18'		10	+2°15	11.15
17					
17	179°31	0.70			
	179°31'	0.28	to Check		
16 -					
16	179°31	7.145			
14					
	179°31				
15 -					
15	295°51'	9.404			
14 -					
14	295°51'	9.00			
13	199°19	4.90			
12					

E. line



249
121
185
300
.72
9.27
66
5562
5562
61.182



35960
29551
6409

89
.9
.436
9
3.924

7.7
5
.385

5.00 | 7.7
385
11 50 52

.008
7.2
7
.008
.0576

9.27
249
6.78
66
4068
4068
x4648
87
66
522
522
574

249
132
94
93
148
152
8.68

7.15
3.92
323
7.15

cos 19°16

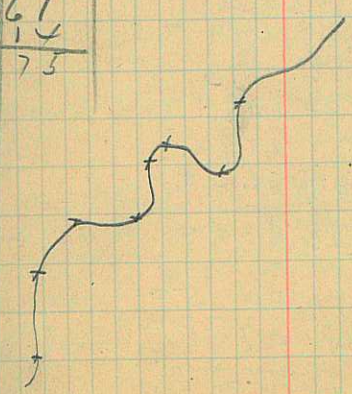
.94
4.9
846
376
4.606

.33
4.9
297
132
1.617

0 +8.10 +8.04 +1.62 0
0 -3.92 +3.23 +4.61 0

first
+ −
26 16
37 06
63 22
31 61
13 14
18.47
31 61
13 14
4.475

sec.
+ −
5.23
~~31.15~~
31.52
+5.23
26.29
+13.14



8.10
323
2430
1620
2430
26.1630

8.04
4.61
804
4824
3216
37.0644

3.23
162
646
1938
323
5.2326

8.04
3.92
1608
7236
2412
31.5168

12/17/18 ✓

Jeppson Sun
Ob on 14

	Hour	UL	time
Direct	38°11	15°01	3:10 P
Invert	38°57	14°15'	
	3834	1438	
Direct	38°44	14°40	
Invert	39°28	13°57'	
	3906	14°18'30"	
Direct	39°16'	14°22'	
Invert	40 01	13°37	3:15 P
	39 38	13°59'30"	

Σ Mean 3906 14°18'40"

117 24 90
23 21 40
2) 9 40 3 50

110

117 25 30
23 21 40
2) 1 40 47 10
70 23 35

cos 47°01 55 = T.8335122
sin 70 23 35 = T 9740549
T.8075671
T 9864273
log sin 75°45 T.8211398
cos 41°40 30 T.8732790
2) T.9478608
T.9739304 = 70°20'50"

Sun = S 39 18 20 ✓
3906

179 59 60
70 20 50
109 39 10
2
2191820

Sun bears S 39°18'20" W

Add 12'

Set 295°5'

φ = 41°40'30"

Mean Z = 75°45'

δ = ~~17°21'40"~~ 23°21'40"

75°45'
41 40 30
117 24 90"
17 21 40
2) 10 00 3 50

117 24 90
11

50
60
110

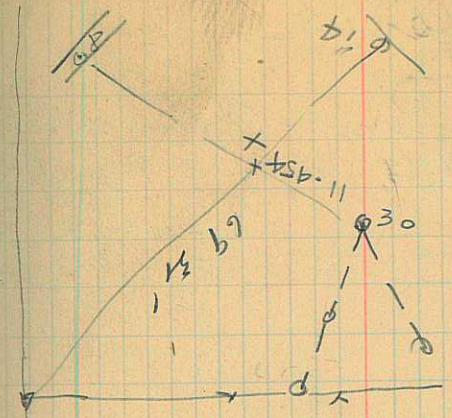
117 25 30
17 21 40
2) 1 34 47 10
67 23 35

cos 50 01 55 = T.8077662
sin 67 23 35 = T 9652743
T.7730405
log sin 75°45 T.9864273
T.7866132
ln cos 41°40 30 T.8732790
2) T 9133342
T.9566671
64°49'40"

230 20 40
180
50 20 40

179 59 60
64 49 40
115 10 20
2
230 20 40

×		11.45				
31	8°11	1.50				
Pt 15	23°10'	8.14	R.R. above grade	L	C	U
8	117°20					
30						
#30	131°14'	0.562				
11	23°10'		5.15	5	5.65	
10			5.00			
			5.70	9		
10	48°33		~~5.50~~		11.62	
9	51°15		5.40	4	5.98	
8	53°2		5.30	4	5.3	
7						
6+71	16°45		5.20	4	5.1	
6			5.10			
5-			5.00			
6	47°05'		7.58	10	11.53	
5	53°32		7.48	9	11.52	
4	53°19'		7.38	10	11.86	
3	43°41'		7.28	10	11.28	
2+60	32°30'		7.22	10	11.13	
2-29	49°14		7.12	5 -1°	5.9	
1-28	78°15'		7.02	7 -3°45	7.29	
0-27	209°30'		6.92	5.00	5.93 -3°30	
26-						
26	115°51	0.40				
15-						


b
b
b

Willsville City

1/8/19

Pump plant out of dam

	Az	Vert L	Slope	RR	HI	Ele
	4	2°15	+1°50	1500		150.
3						107.20
	3	335°24	+1°23'	300'		
	1	150°35	-23°50	57	6	100.00
2						100.00

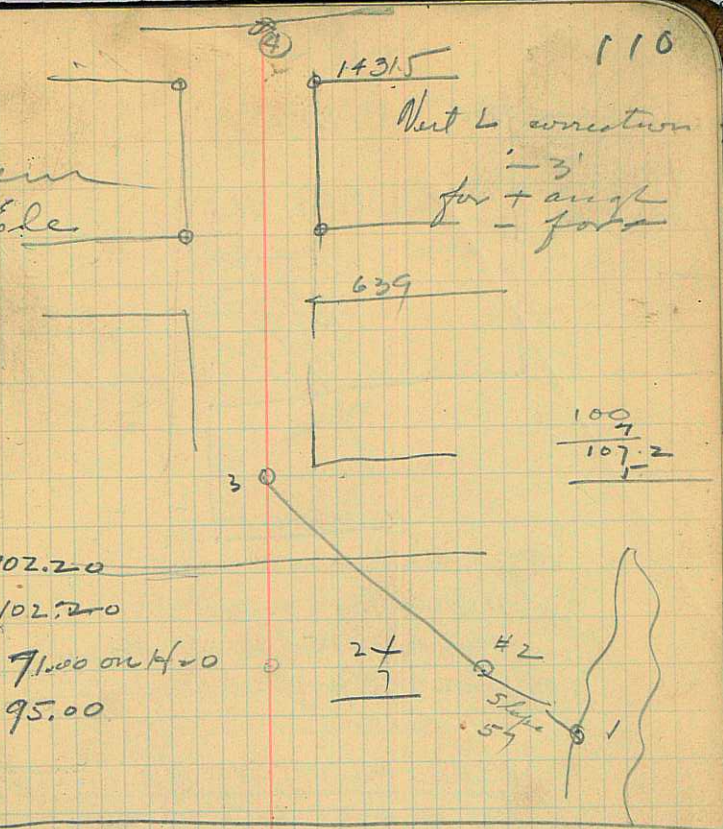
269°22'

1-

Port 30 349°16

1	69°31	12.346	3		11.28
X	~~69°34~~	~~9.136~~			

14-



5.10 102.20

102.20

71.00 on H2O

95.00

To ref pt 1

100
29
71

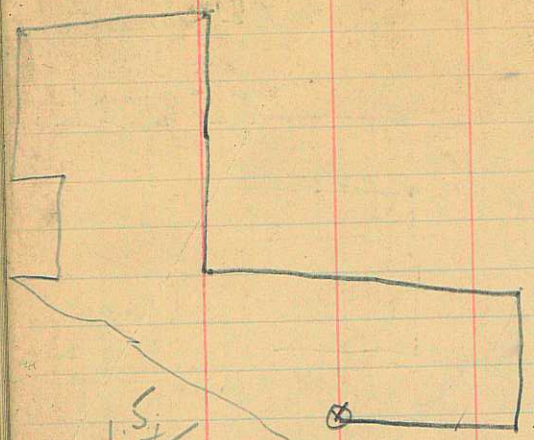
.40 L
.57

2828
2020

23 x 028
6

.02 300
7.2

set 295°51



1.5
24
60
30
36.0

$\frac{f\,l\,v^2}{Rg}$

1800
.02
36.00

72

2

82 x .2 x 6.25
2
135.0
82
270
1080
11070

8

82
2
164
.15
820
164
24.60

550
.7
385.0

1.33
1.4

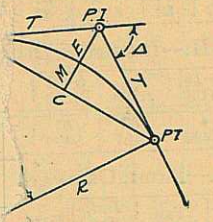
2.00
133
670

11070
1140
670

380
32

AILROAD CURVE
AND
ON TABLES

ene Dietzgen Co., New York City



URVE FORMULAS

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

$\frac{\Delta}{2}$ (3) Length of Curve=L=$100\frac{\Delta}{D}$ (4)

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

an$\frac{\Delta}{4}$- (7) =Rcos$\frac{\Delta}{2}$(1-cos.$\frac{\Delta}{2}$) (8)=Rexsec$\frac{\Delta}{2}$ (9)

2 R sin.$\frac{\Delta}{2}$ (10) Δ=Central Angle

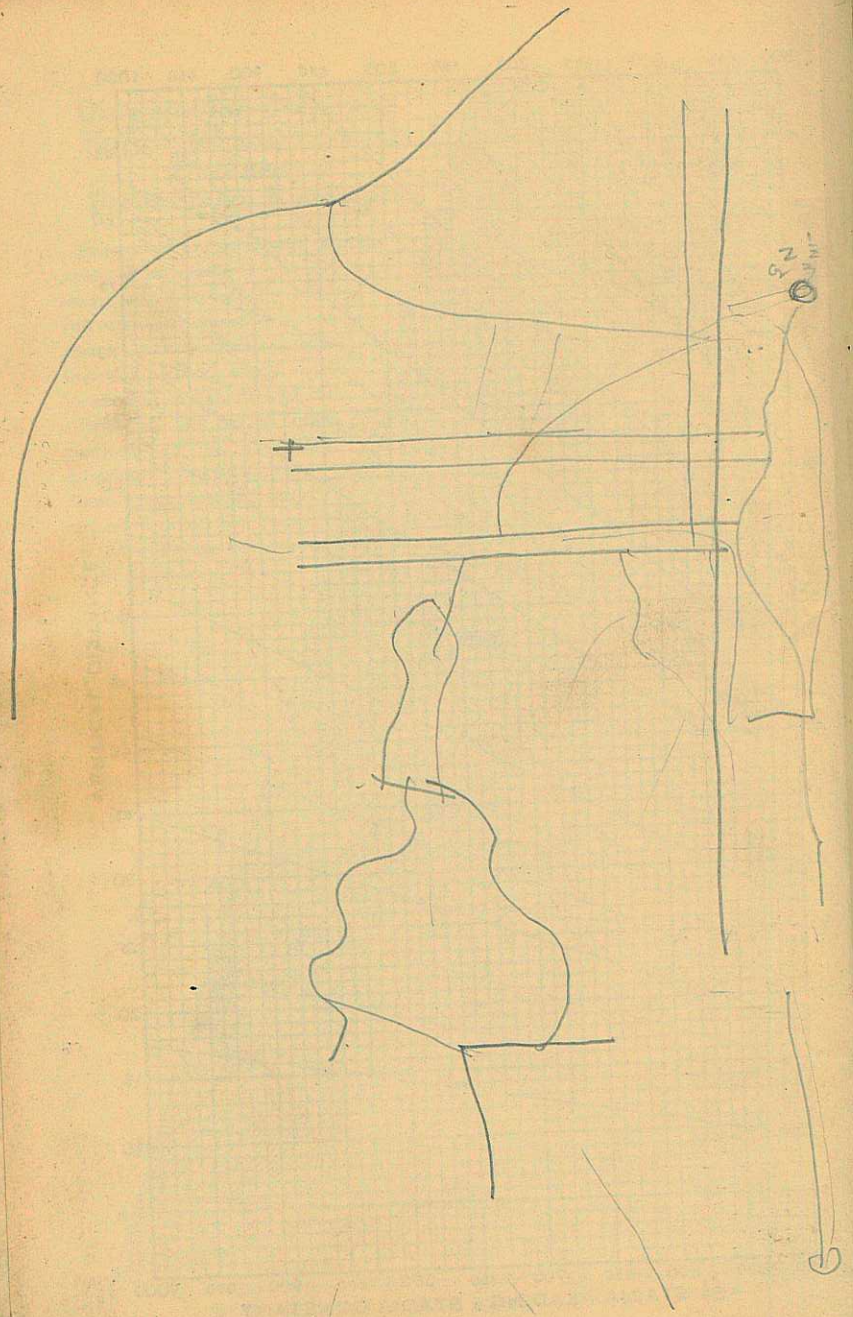
EXPLA TION AND USE OF TABLES

Stations.—Given P. I.=Sta. 161 +60.35 to find Sta. of P. C. P. T. Δ=62° 10′ D=8° 20′. From Table IV for 1° curve T= 4.1 and ÷8⅓=414.49 ft. From Table V correction=.36 or T= .85 ft. P. C.=Sta. P.I.—T=157 +45.50. Also from (4) L= 00 and P. T.=Sta. P. C. +L=164 +91.50.

Offsets.—Tangent offsets vary (approximately) directly with and with square of the distance. Thus tangent offset for Sta. 58 on above curve is 2.16 ft. found as follows. From Table III tangent ffset for 100 ft.=7.27 ft. Distance=158—Sta. P. C.=54.50, hence ffset=7.27 (54.50÷100)²=2.16 ft. Also square of any distance livided by twice the radius equals (approximately) the distance from angent to curve. Thus (54.50)² ÷ (2 x 688.26)=2.16 ft.

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

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



032
1500
16000
32
48.000

107.20
48
15520

150
71
79

62.5

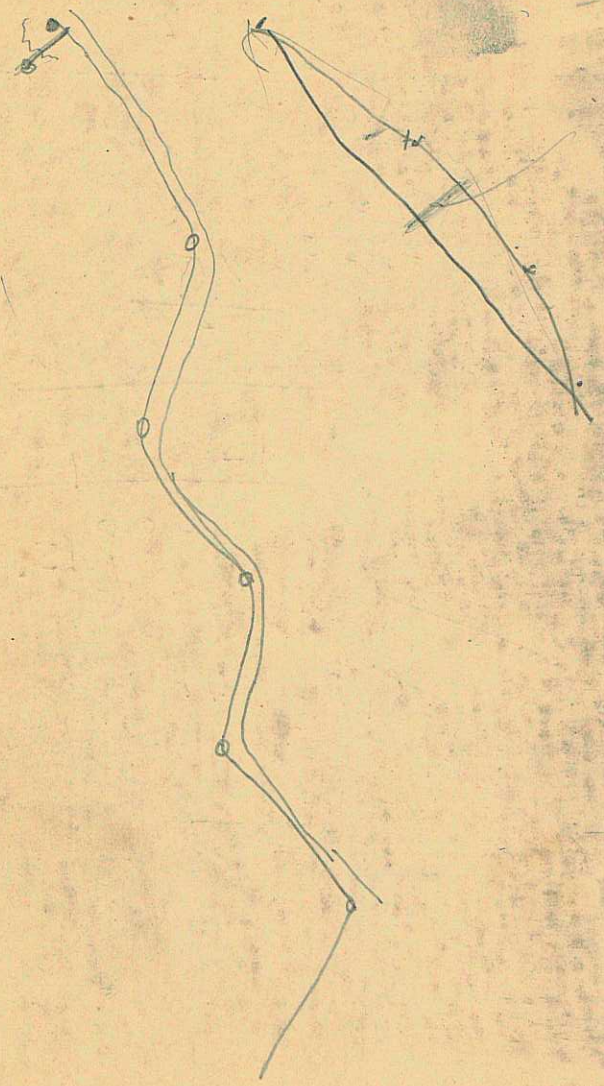
150 x 31.25
300
15.00

33
33
99
99
189 9

B

50

$\frac{Q}{a} = cw$



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	25.2	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.

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