
42
360
785
360
360

KEUFFEL & ESSER CO.

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NEW YORK.

CHICAGO. SAN FRANCISCO. ST. LOUIS.

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.

"Copyright, 1895, by Keuffel & Esser Co."

	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.

1054

327
215
11.2

Eugene Schaub
Logan Co Surv.
of Cache Co

5710
2348
8058

1815
165
1980
160
38

165
11.
165
165
1815
160
21.5

Chains.	
	A stone 24 x 12 x 8 in. in a mound of stone found to be corner
	East on a true line reversing line bet. S. 6 & 31 Var. 17° 40' E.
31.52	Road bears NW and SE.
40.00	No trace of old cor. set sandstone, 16 x 8 x 6, 10 in deep marked + in N side for reestablished ¼ cor.
80	No trace of old cor. set sandstone 22 x 12 x 4 18 in deep marked 5 notches on E and 1 notch on W for cor. of secs. 5. 6. 31 & 32
	East on a true reversing line between Sec. 5 & 32
~~40~~	~~No~~ Var. 17° 40' E.
40	No trace of old cor. set sandstone 16 x 9 x 4. 10 in deep marked + on N side for reestablished ¼ cor.
80	No trace of cor. set sandstone 16 x 8 x 7 10 in deep marked

N. boundary of Tp 10 N. R 1 E

Chains	
	4 notches on E and 2 notches on the West side for reestablished sec. to sec. 4, 5 32 and 33
	East on a true resurvey line between Sec. 4 & 33 Var 17° 40' E
40	No trace of old cor set sandstone 15 x 12 x 8 10 in deep marked ¼ on N side for re-est ¼ cor
58	foot of bench
70	Bottom of ravine
80	No trace of old Cor. set white sand stone 15 x 10 x 8 10 in deep marked 3 notches on E and 3 for West side for cor. sec's 3, 4 33 & 4 34
	East on a true resurvey line between sec's. 34 & 34 Var. 17° 40' E

of Salt Lake. meridian

copy

Oct. 10 1.0.5

3

Chains	
10	top of small bench
40	No trace of old cor. Set white Sandstone 18 x 12 x 6 12 in deep marked ¼ on North side
42.30	Brow of Bluff 100 ft high
47.00	Foot of Bluff bears full
59.50	Road to Canon bears N & S.
61.72	Beach mill fork creek 50 links wide
71.00	Provedence Canal runs N 15 links wide
72.20	top of bench 100 ft high
80.00	No trace of old corner set sandstone 18 x 10 x 8 x 12 in deep marked 4 notches on W and 2 on E for reestablished cor to Sec's 2, 3, 34 & 35
	The remainder of this line is ran due East and measures 160.20 chains. X. to est. NE cor.

4

Chains | Notes of boundary of sec. 6. Tp. 10 n. R. 1 E

From cor. to sec 5+6 on n. bdy of Tp. South bet. 5+6

40.00 set ¼ post Var 17° 30 E

80.00 set post cor to sec. 5.6 7.8

N. Boundary Township 10 n R. 1 West

From Cor Secs 2. 3. 34+35 Bldr 14x12x5 from I run West on a true line returning between sec 3+34. Var 17° 45 E.

6.89 to City Street in Wellsville 150 lks Wide bears N & S.

18.24 to City Street bears N & S.

29.72 to City " " "

33.80 foot of bench bears N & S

35.00 top " " "

40.00 Set sandstone 22x10x5 14 in deep marked ¼ on N side.

80.00 set sandstone 19x11 x15 12 in deep mark a 3 notches E & 3 on W

N boundary of Tp. 10 n R 1 E continued Oct. 10/05

Chains

for cor of secs. 3. 4. 33+34 on top of bench bears N & S.

From cor of sec. 34. 33. 3 4 West on true line bet. sec. 4 + 33

Var. 17° 45' E

15.70 Foot of bench bears N & S.

18.20 top of " "

35.20 middle of Hollow bears N & S.

40.00 Set Cobble stone 14 x 9 x 5 8 in deep marked ¼ on N side.

80 set a limestone 16 x 10 x 8 x 10 in heap marked 4 notches on E + 2 on W for cor of secs 4, 5. 32 + 33.

Deeap for the N line of sec. 1 + 2. Tp. 10 n. R. 1 W.

From cor of sections 2, 3, 34 + 35 East on true line Var 17° 45 E

2.75 picket fence bears N + S.

4.75 also to Street across Street

6

N line of Tp 10 N. R 1 W west cor.

Chains	
9.25	Willow fence N & S.
14.20	" " on Top of ascent
14.60	foot of ascent
17.00	Spring Creek 15 wide
19.50	Road foot of ascent bears E & of S and W of N
22.75	Top of ascent
29.25	Willow fence
32.00	Top of ascent
40.00	set boulder stone 18 x 7 x 7 for 1/4 cor.
57.35	Enter bena of Muddy Creek 15" deep runs N heads E
59.00	across bena of muddy
64	Irrigation ditch 20 lks Wide 18 in deep runs E of N
80	set cor to sec 1. 2. 35 & 36 1 mile W of the 4 Tp corners.

cor.

N line of Tp. 10 N. R 1 W. 7

Chains	
	From NW cor. of 1.
	East on old line on the north boundary of sec
1	Var. 17° 45' E
8.	to Irrigation ditch runs W of N heads S E
9.00	Foot of ascent, deer bottom
11.00	top " "
12.35	Road bears NW & SE
34.40	Irrigation ditch runs NW
40.00	set boulder 14 x 9 x 9 for 1/4 sec cor
80.00	set boulder stone 24 x 12 x 8 in mound of stone for corner of Tp. 10 & 11 R 1 E & W being on the Salt Lake Meridian.

Part Sub. Division of Tp 11 N. R 1 East

Chains. Sec. 31

From cor. sec. 31+32 on S Boundary of Tp. N. bet. 31+32
Var. 17° 40' E.

40.00 set 1/4 sec post in mound of earth and pits
80 set post to sec. 29 30 31 & 32
West on Ra. 80.09
E. on true
40.04 1/4 cor.

Sec 32

From cor of sec 32 and 33 on S. bdry of Tp. N bet. sec 32 & 33
Var. 17° 30' E
40 1/4 cor.
80 cor. sec

Chains

N. bet sec 29 & 30
40 set 1/4 sec post.
80.00 set post cor. to sec 28. 29 32. & 33.
Land 1st Rate
West on random bet sec. 19 & 20
31.50 to Road
80.14 to post Com to sec. 19 & 20 on Mer. East on true line.
40.07 set 1/4 post in mound
N. bet sec 19 & 20
37.00 to Road
40.00 set 1/4 post.
80.00 set post comn. to sec. 17, 18, 19 20.
West on Run. bet 18 & 19
80.07 to post on mer.
Com true line
40.03 set 1/4 post.
N bet sec 17 & 18
40.00 set 1/4 post

Sub Tp. 11 N. R 1 E.

chain	
43.50	to Deep Creek 12 links W
80.00	set cor to sec. 7, 8, 17 + 18
	West on Ran 7 + 18
32	to marsh
34.50	to creek
39.00	Crap marsh
80.10	to post on Mer
	E on true line
40.05	set 1/4 post.
	N bet 7 + 8
2	to outlet of spring
27.00	to Willow
40.00	Crap marsh set 1/4 post
80.00	set post 5, 6, 7 & 8
	West on Ran
80.04	
	E on true
40.02	set 1/4 post
	N bet 5 + 6
23 00	to Creek
40.00	set 1/4 post
80.06	to post Corn to sec
	5 + 6 on N. bdry of
	Tp. 11 N, R 1 E

Sub Tp 11 N. R 1 E

Chain	
	From cor of sec 32 + 33
	on South boundary of Tp
	11 N. 1 E
	N bet Sec 32 & 33
	Van 17° 30'
40.	set 1/4 post
80	set post Corn to 28.29
	32 + 33
	West on Ran bet 29.32
79.98	to post corn to 29.30.31+32
	E on true line
39.99	set 1/4 post
	N bet 28 + 29
40.00	set 1/4 post
80.00	set post corn to sec. 20
	21, 28 + 29
	West on Ran bet 20 +
	29
79.93	to post corn to 19.20;29+30
	E on true line
39.96	set 1/4 sec. post.
	N bet sec. 20 + 21
40.00	set 1/4 post.
80.00	set post corn to 16, 17 20
	1 + 21.

Sub. of Tp 11 N., R 1 E.

Chains	
	West on Ran. bet 17 + 20
41.70	to Irrigation ditch
41.50	to Road
79.97	to post on mer. sec 19, 18, 19, 20
	E on true line
39.98	set 1/4 post
	N bet 16 + 17
40	set 1/4 post.
56.00	to fence
80	set post corn to sec 8, 9, 16 + 17
	West on Random bet 8 + 17
78.50	to Spring Lunge & Loup
80.00	to post cor sec 7, 8, 17 + 18
	E on true line
40.00	set 1/4 post
	N bet sec. 8 + 9
34.00	to Clear Creek
40.00	set 1/4 post
80.00	" post corn to 4, 5, 8 + 9
	West on Random bet 5 + 8
80.08	to post cor. sec. 5, 6, 7 + 8

Sub Tp 11 N., R 1 E

Chains	
	East on true line
40.04	set 1/4 cor, a post
	N bet sec. 4 + 5
27.00	to creek
40.00	set 1/4 post
80.10	to post corn to sec. 4 + 5 on N. Boundary of Township.

From cor of sec 33 + 34 on S. line of Tp. 11. Var 17° 35' E

	N bet sec. 33 + 34
13.30	to bluff
40.00	on side of bluff set 1/4 post
50.00	foot of bluff.
80.00	set post corner to 27, 28, 33 and 34
	West on Random bet 28 + 33
80.06	to post corn to 28, 29, 32, 33
	E on true line
40.03	set 1/4 post.
	N bet 27 + 28
28.00	to Irrigation ditch
31.56	to Road

Sub Tp. 11 N. R 1 E.

Chains	
40.00	set 1/4 post
80.00	set post corn. to sec 21. 22, 27 + 28
	West on Random bet 21 + 28
11.60	to Slough
32.00	to Road
38.00	to irrigation ditch
44.00	to foot of hill
52.00	to top of "
80.02	to post corn to sec 20. 21. 28, 29
	E on true line
40.01	set 1/4 post
	N bet 21 + 22
23.00	to mark
40.00	set 1/4 post
80.00	set post corn to sec 15, 16 21 & 22
	West on Random bet 16 + 21
5.00	to Clear Creek
40.00	to small creek.
77.20	to irrigation ditch
79.90	to post corn to sec 16, 17, 20 + 21

Sub Tp. 11 N. R 1 E.

Chains	
	N bet 15 + 16
3.00	to Clear Creek
4.00	
9.20	to foot of bluff
10.00	to top " "
40.00	set 1/4 post
80.00	set cor corn to 9, 10 15 + 16
	West on Random bet 9 + 16
20.10	to Willow
22.25	to Clear Creek
63.00	to Small " "
77.60	to Road
79.86	to post corn to sec. 8 9, 16 + 17
	E on true line
39.93	set 1/4 post
	N bet sec. 9 + 10
5.80	midst of Springs
40.00	set 1/4 post
43.00	to ravine
57.00	to Creek 10 link wide
80.00	set post cor corn. to sec 3, 4, 9 + 10

16 Chains

Sub-Tp 11N. R1E.

West on Random bet 4 & 9

79.95 to post cor of secs. 4, 5, 8 & 9

East on true line

39.97 set 1/4 post

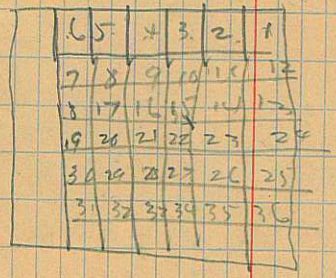
N but sec 3 & 4

40.00 set 1/4 post

80.11 to post cor of 3 & 4 on N line of Tp.

Land 1st Rate.

17



18. Sur for O.N.L. R.R

Oct 11/05

Dist	Course	L angles R
3.957		
14.47		
15.27		
21.87		
19.28		
		83° 58
40.22	N 83°58' W	92°42
4.21	S 3°20 W	

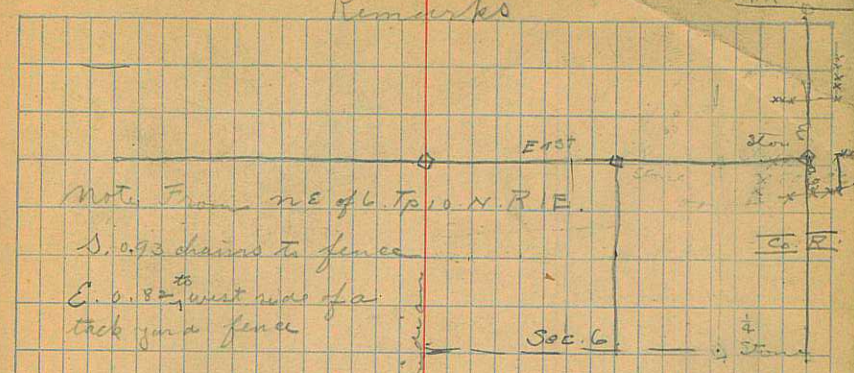
I did not make a tie from NW cor of NE¼ of sec 6

172
37
2.59

N.

19

Remarks



Mon. From NE of L. Tp 10 N. R 1 E.
S. 0.93 chains to fence
E. 0.82 chains to west side of tack yard fence

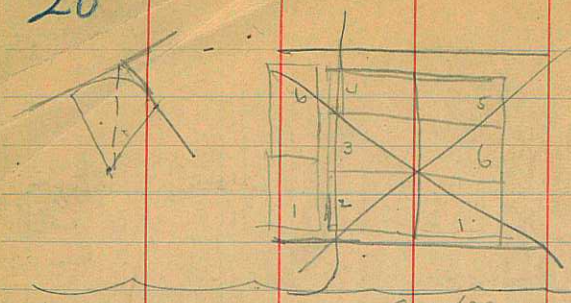
Tp 10 N, R 1 E

From the NE cor. of sec. 6 Tp 10 N R 1 E which is a stone 22 x 12 x 4. I run North from this pt. E. 0.75 chs to fence run N 19° E to S. side of fence pt. run E & W " N " " " " " " " to center of road way 16' Wide to a survey line, at this point 0.082 chains West a hub & stake was found marked 274

From the NE cor of sec 6 Tp 10 N R 1 E I run

See sketch on page

To NW cor. of NE¼ of sec. 6. Tp 10 N. 1 E



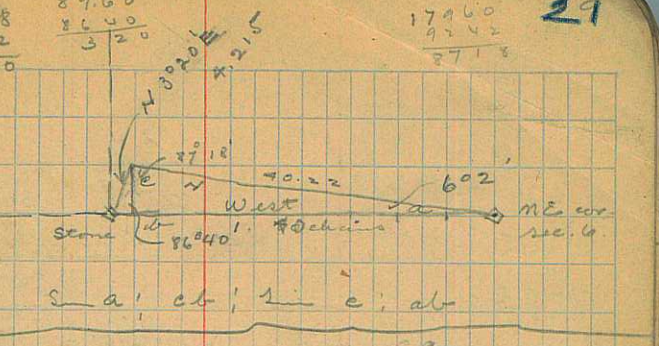
chains	Course	angles L	angles R
6			
22.858			
1 ch	N		
10.25	W		
40.00	W		
1.00	S		

787°18
9602
9320

8960
8640
320

17960
9320
8640

17960
9242
718



Sm a' cb; sm e; ab

From the corner of Tp's 11 N 1 E 11 N 1 W, 10 N 1 W and 10 N 1 E I run North on the Salt Lake meridian

to old fence

To center of Roadway on meridian.

Oct 12/05

From cor. of Tp. 11 N 1 E, 11 N 1 W 10 N, 1 W, and 10 N 1 E I run ~~run~~

In order to miss houses to keep creek 20 links wide

set a stake 1"x6"x2'. 1 foot in ground marked 1/4 on N side for the NW cor of NE¼ of Sec. 1 Tp 10 N R 1 W

Chains	Course	Angles L	Angles R
8.31	North		
23.345	North		
3 chains	N. West		
40 chains	To meander		
14.82	North		
9	S 88° 30 E		
~~9.46~~	" "		
9.46	" "		
32.60			
40.00			
43.56			
44.58			
80.03	S 88° 30 E	88° 30'	
12.74	S.	65° 28'	
0.554	S 65° 28 E		

(Con over)

Remarks

From the quarter cor of NE ¼ of Sec 1 Tp. 10 N Range 1 W east 0 chains to last surveyed fence corner E & W to center of roadway

From quarter cor of NE ¼ of Sec 1 Tp 10 N. R 1 W 0 chains

There are no other improvements OK

From NE cor of Sec 6 Tp 10 N, R 1 E. 0 chains

(To center of field road

from this pt N 88° 30 W 1.56 to lot line along center of field St. to W side of a field running N & S.

to E side of a field St. running N & S.

to fence N & S.

to lot line I D

to W. side of a field st. running N & S

to E " " " " " " " " "

Leap S = 2.088

to correct cor.

to cedar post supposed to be on the TP line cor Sec 32

on 33

Chains	Course	angles L	angles R
0.554	S 65° 28' E	114.32	
12.85	N		to S. side of St. of R.W.
20.00	N		" N " " " "
20.815	N		
26.42	N		
31.10			
40.00			
1.60 ap.	East		
11.58			
12.47			
12.795			
3.63	N		
14.45	N		
35.08	N		
40.00	N		

(See over)

17960
6528
11432

6528
90

25

Remarks

From cedar post on Tp. line
From this E 1.09 ch. to
to cent. line of roadway, W. to sta. 229 + 0.95
to bot line run E & W
to creek run N 45° W 10 l.
Set stake SW cor of mound
for the NW cor. of SW¼ of Sec 33
Tp. 11 N. R 1 E.
From the NW cor. of sd. qr.
Sec run
to lot line run. N & S. same line
to W ext of a field st. N & S
to East side of a " " "
to center of Roadway
From the above cor NW cor
of SW¼ of 33
Sec run
to proposed lot line E & W
to " " " E & W
to " lot line E & W a Ditch
Set a stone for cor of sec 28, 29, 32 & 33
33 marked 4 notches on E and 1
on the south

95
13
80

26 chains	Course	angles L	R 90°
~~2.25~~	~~East~~		
2.25	East		
12.55			
13.30			
13.46			
23.24			
79.75			
	N		

May Var 18° E

27

Remarks

From the cor of sec 28, 29 32 + 33 I run
to a lot line run N + S. a ditch
West side of a field st. N + S.
East " " " " " N + S
Center of roadway

From NW cor 33 I run E
on a random
to lot line gulf prominent
to NW cor of 34
N line of sec 33 bears N 89° 57'
E to NW cor of 34
old notes, the N line of 33 =
80.06, so for a correct cor
go West 0.31 chains and
establish the true cor of sec 28
29, 32 and 33 &
~~From the cor I had run~~
hence all ties to Roadway
and fence must be adjusted
accordingly

This proves that, that cc cor post
of TP line is 31 links too far E

28

Angles

Chains	Course	L	R
7.05	N		
21.81			
32.55			
40 ✓			
2.58	East		
13.55			
14.00			
14.456			
2.63	N		
12.55			
32.50			
32.74	to lot line		
40 ✓			

Over)

29

From the true NW cor of 23
Chain A
to surveyed lot line E & W
to Dodd E & W
to good fence E & W
Set stake for NW cor of SW ¼ of 28

From this cor Chain
To fence run N 11 ½ E
The NW cor of SW ¼ of 28
came on James Jenkins
Tax
to West side of field Chain N 11 ½ E
to " "
to center of Road

From the W ¼ cor of Sec 28
Chain
to lot line run E & W
to " " " " " "
to " " " " " a ditch
to the corners of Sec 20, 21, 29
and 28

Chains	Course	Angles L	Angles R
	~~W~~		
	W		
6.32			
26.93			
38.00			
40			
47.83			
57.85			
69.01			
~~89.93~~			
3.86	~~A~~ E		
14.22			
14.32			
15.105			
2.76	N		
13.00	to lot line		
22.89			
24.39			

Con over

Remarks

From the cor of 20. 21. 28 and 29 Drum
on a randown
To lot line run N & S
" " " " " " "
To field st run N & S
no cor found
to lot line run N & S
" " " " " "
To fence on W side of field st
Nothing found.
From NW cor of sec 28
Drum
to fence run N & S a lot line
to W. side of field st N & S
" E " " " "
to center of Roadway

From the NW cor of 28
Drum
To lot line E & W
to S. side of Co. Road from Mich
" N " " " "
from chisel West 0.53 To SW cor of a Stone

Chain	Course	Angles L	Angles R
~~24.39~~	~~N~~		
40.00	N		
			90°
0.70	W		
1.	W		
27 ov	N	1°14'	
13.004	N 1°14 W		
1	W		
16.39	E		
2.08	N		
2.48			
40			

to the NW cor of SW¼ of 21

From the NW cor of SW¼ 21
S run
to E side of a field St.
unto " "
(N 13) (W 0.30) to a pt 1.30 ch W of NW cor of 21
(more N due 19 = 795 or 7945)

{Note. Sec. line on N side of 20 is in error 2.34 chains to far North}

From NW cor of sec 28
S run
To E side of field St.
to center of Roadway.

From NW cor of 21
S run
to S side of St. E & W
" N " " " E & W
to NW cor of SW¼ of sec 16

17.02 E

2.53 N
2.79 N
40.00

7.72 E
13.85

8960
1,4
8846

From NW cor of NW¼ of 16
Thence
to center of track
From the NW cor of SW¼ of 16 Thence
to S side of St E + W
" N " " " " " "
to NW cor of 16
From the NW cor of 16
Thence
to fence N & S
to center of roadway

Grade for Jos E Wilson Jr on cement culvert at S. main. Oct 20/05

Sta	BS	FS	IM	Ele	HI
Bm	5.065			489.270	494.335
5+05			4.335	490.000	
~~7+08.4~~ 7+10.4				497.32	
7+18.4				497.95	
		1.300		493.035	
	5.540				498.575
7+10.4			1.255	497.32	
7+18.4			.625	497.95	

Sur for Skate Rink Nov. 14 '05

498.575 − 497.95 = .625

489.270 + 5.065 = 494.335

494.335 − 1.300 = 493.035

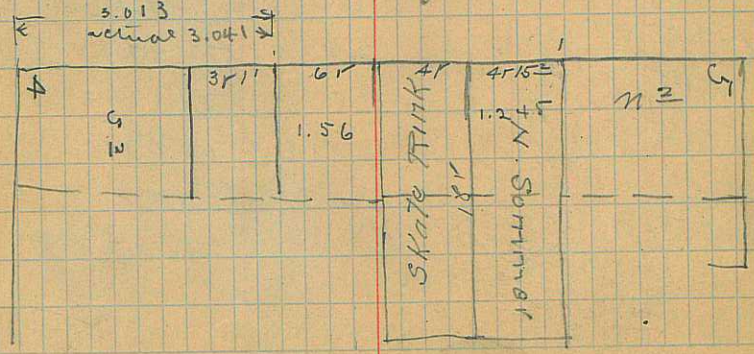
493.035 + 5.540 = 498.575

498.575 − 497.32 = 1.255

on a pin in Tel pole at Griffins from SE cor 13.5 Pt 40"

Lgs. of ground.

Beg. at a point 1 foot N of SW cor lot 5. 13.31: E 18 rds. N 4 rds. W 18 rds S 4 rds to beg.



42

Grade for Joe Wilson & on Smain Nov 14/05

Sta	BS.	FS	HI	Elv	HI
5+05				490.00	
6+04				492.18	
6+14				492.34	
6+24				492.69	
6+34				493.06	
6+44				493.45	
6+54			9.738	493.90	
6+63			9.408	494.30	
7+20.5			5.518	498.19	
7+10.5			6.368	497.34	
7+00.5			7.058	496.65	
6+90.5			7.758	495.95	
6+80.5			8.398	495.31	503.708
7+30.5			4.678	499.03	
7+40.5			3.778	499.93	
7+50.5			2.838	500.87	
7+60.5			1.838	501.87	
7+70.5			0.818	502.89	
Brn			0.000	503.70	
Brn +	5.44			489.27	494.71
6+34 +		1.702		493.00	
6+34 +	10.700				503.708

9.488
8.398
1.090

10.580
9.408
1.172

10.753
9.738
1.015

Remarks

RR above sta. on stake

S

E. Light Pole
53.62'

Iron pin

Tel. pole no 317
31.75

Reference point

10.753	1'' 1/8''
10.580	1'2''
5.710	2 3/8'' center of — crown
7.157	9 1/2'' 10's of —
8.205	1' 1 3/4 20
9.102	1' 4 1/4''
9.488	1' 1''
5.160	5 3/4''
4.557	7''
3.37	6 1/2''
2.15	3 3/4''
0.79	

503.708
493.51
8.398
503.

at Bridge S. side
on pin in Tel. pole at shop.

44

Grade for J. C. Walters

Sta	BS	FS	I m	Ele	H I
	2.31			128.06	130.37
			3.47	126.90	

Sur. of Blacksmith - for P. Canon. Dec 1/05

Sta	Course	L angles	R angles	−	+
0		77°49	from previous		
287.5	N 77°41 W	90°36'		44'	
1264	S 81°35 S 81°32 W	Reduced	49'		36'
1635	S 82°24 S 82°10 W	5°39		00	00
417.6	S 76°45 S 76°41 W		8°05'	1°51	
1.95	S 84°50 S 84°45 W	2°23'		1°56	
77	S 82°27 S 82°20 W		8°06		2°12
1.97.6	N 89°27 N 89°20 W	28°22		2°41	
209.	S 62°11 S 62°10 W		38°11'	1°16'	
151	N 79°38 N 79°40 W		57°56		1°18'
169.2	N 21°42 N 21°56 W	51°32'			2°13
164.8	N 73°14 N 73°00 W	14°29			0°06'
483.4	N 87°43 N 87°20 W		13°17'	3°03	
215.2	N 74°26 N 74°20 W	40°39		3 06	
271.6	S 65°05 S 65°05 W		40°33'		1°03
585.3	N 74°32 N 74°22 W	19°47		1°10	

45

130.37
126.90
3.47

Remarks

Top of post 1.5' W. of SE cor.
grade at SE cor.

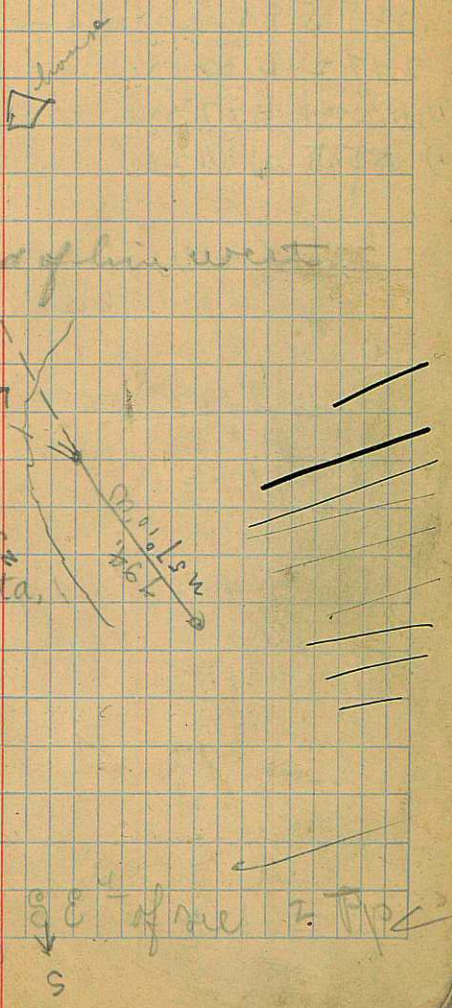
Remarks

H.I	
459	Set and take this point is at least 1.0' higher than River [illegible]
	E 281 60.67 N 7°E S.
5.11	
4.82	
4.36	
5.31	
5.00	
5.11	
6.04	
5.30	
5.00	
5.18	
5.05	
5.18	
5.31	
5.14	
5.02	

Dist	Course	Angles L	Angles R	Angles −	Angles +
	S 85 41 W				
555.1	S 86° 00 W		18° 45'		09'
724.1	N 75° 15 W	24° 58'		2° 20'	
227	S 79° 45 W	24° 46'		1° 06'	
297.2	S 55° 00 W		26° 35'	1° 08'	
158.8	S 81° 30 W		34° 03'		45'
465.4	N 64° 35 W		32° 54'	1° 43'	
391.7	N 32° 00 W		14° 56'	1° 39'	
329.3	N 16° 40 W	58° 00'			3° 46'
810	N 74° 10 W		4° 56'	1° 20'	
915	N 69° 50 W		2° 53'	1° 37'	
648	N 66° 30 W	37° 14'		1° 13'	
236.9	S 76° 30 W		6° 46'	32'	
734.9	S 83° 00 W		39° 42'	39'	
794.40	N 57° 10 W	23° 48'			06'
794.10	N 57° 10 W	23° 48'			
400.1	N 81° 00 W			5° 29'	
794.10	N 57° 10 W		1° 51'		
558	N 55° 35 W	36° 33'			
476.5	S 87° 30 W	64° 35'			
103.7	S 17° 56'		72° 03'		
271.3	S 89° 59 W		59'		
467	S 89° 00 W		106° 35'		
162	N 15° 35 E				

Stadia upper lower	Remarks
H.I.	
4.9	
5.16	Ursula Benson
5.00	Survey in Ft.
5.08	Land in Ft.
5.06	
5.25	
5.06 6 9.283	
5.15 5 9.640	
5.20 2 8.395	
5.03	
5.066	
5.17 9.038	

8300
3942
1224
1796
1322
5718


Survey
Ursula Benson
Survey in Ft.
Land in Ft.
Ursula Benson
Survey in Ft.
Land in Ft.
Engelhardt
Engelhardt
Engelhardt

48

Sta	Course	Dist	Angles R	Angles −	Angles +
0			81°33		
334.5	N 81°33 W				
	N 65°11 W		16°22	27'	
1758	N 16°50 W	1423.2		58'	
	S 82°17 W		32°32		
2655	S 82°30 W		52°26		23'
	S 29°51 W				1°22
2472	S 30°05 W		47°35		
① 622	S 77°26 W		62°51	22'	
	S 89°35 W				
② 885.8	N 39°32 W			11°20'	

	NE	Dep W	N	S
①		607.1		135.3
②		54.82	66.00	

49

Dec 2

#I

Remarks:

from sta 0 ft day prism
May we start. further E & at
Set better mtks.
this sta is about 10 chains

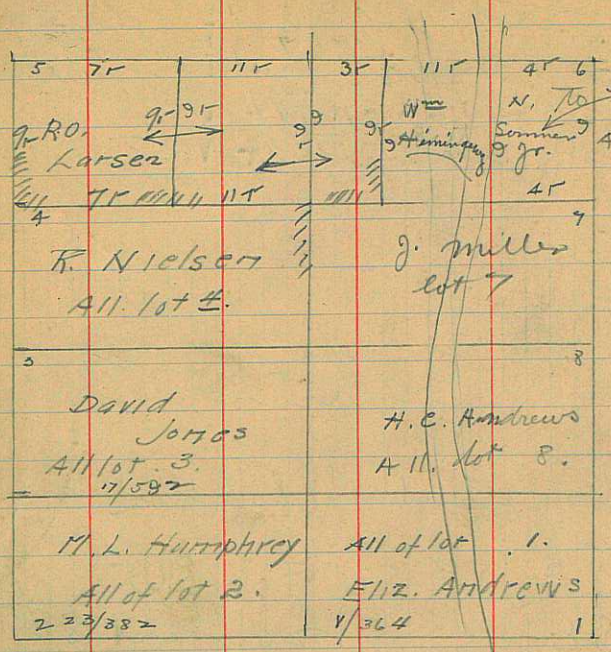
5.11 | 8.22

on slope
to sta 0.

Margret W. Benson

S ½ of SW¼ & SW¼ of
SE¼ 120 acres

50



Grade on theast side

of B. 2. Plat "B" Logan City

No B1 F S 1 m Ck 14 t

3.52

3.58
4.12
4.34

1.772

Sent in to Ecl

6.40
6.70
7.23
6.96
6.60

Over

6.96
6.46
.56

4.12
3.58
.54

6.70
.53

6.60
1.77
4.830
4 800
30 00

600
.800

3.58
8
4.38

4.12
3.52
.19 2

Len. of B. 2 on N side 600.7
0.805 o/o

on cement curb NW cor. B 1. Pl B
SW cor B 4. Pl "A"
SE cor. B 5 " "
or NE cor B 2. P. B. or gr
or nail gr NE 2. P. B
NW cor. B 2 on ground
SW cor. B 5. P A
SE cor. B 6 A
NE cor. B 3 P B
or gr. NW cor B 2. P B

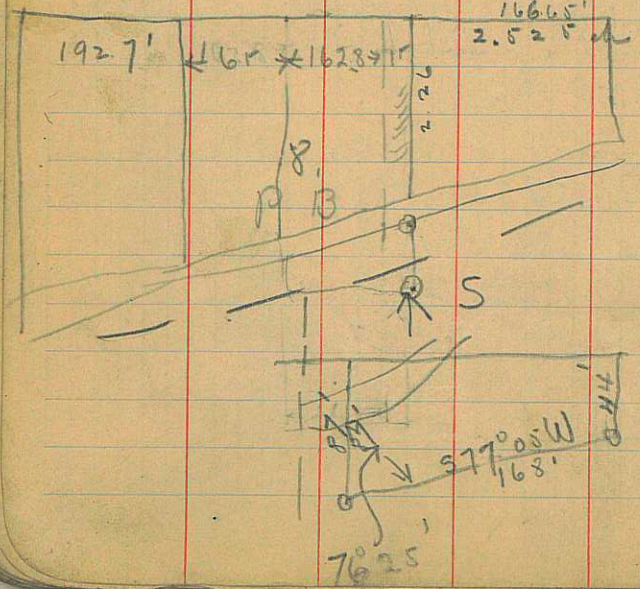
52

Sta	BS.	FS	Int	Elv	IFI
380.4			4.83		
324.7			4.38		

32.7
160
1927

150.35
66
21635
30035
21635
84.00

Sur. for city S. of B.3. P.B.



80.3
94
1793
165
1628

200 6007 2200.7
2203 146
3804 2203

600.70

2.20.3
.80 5
1101 5
1762 4
1.77 3 41 5
2.76
.805
1380
2208
2.221 80

53

75.3
2007
2760
600.7
2760
3247

on gr. 6.60
1.77
4.83
3.85
.98

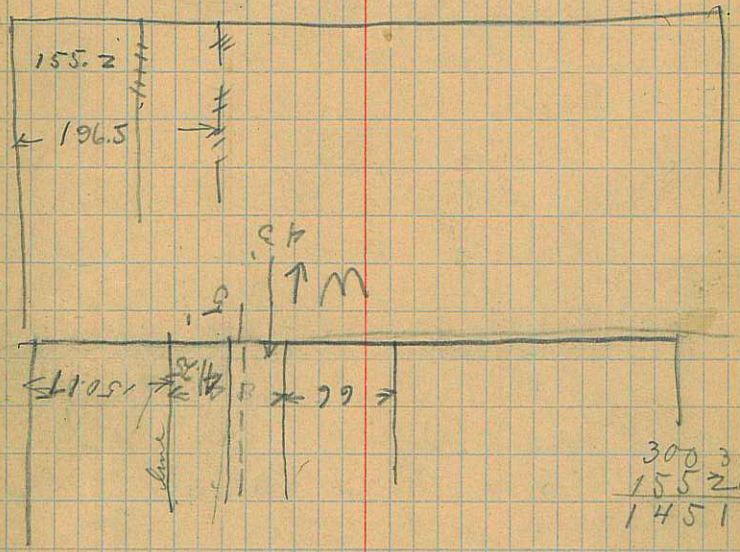
on gr 6.60
3.22
4.38

33.5
41.5

196.5
155.2
413

13 2.

16.5
9
148.5



30035
15520
14515

155.2
148.5
4.7

Work for Dec 8.

From 4th W on center to last st N.

From center on 2nd W 1 block north from 1st N and 2 E, to top of hill and down to Dist mill.

From 1st S and 1st E. to 3 E.

Smithfield City water Work measur. continued Dec. 13 05

Beg at cross int section of 1st E + 4 S. 1 block E of C Pearl.

W 27' to W side St.
E 67.5 to E " st.
N 26.6 to N side St
E 502 to Ser. S.
E 732 To W side of 2 E
E 804 to Ser S.
E 831 to E side 2 E
E 1041 in line with W side of a field
E 1084 in line with E side

E 10.96 to End main also Ser S 40° E.

Beg. at inter section on cross 1 E + 3 S.
W 28' to W side of 1 E
E 69 to E
S 25' to N side of 3-S.
E 462.5 to Ser. N.
E 560.0 to Ser S
E 674.0 to Ser S
E 730. to W side of 2 E
E 761 to cross
E 829 to E side 2 E
E 914 to Ser S
N 26' to N side 3 - S.
E 1188 to Ser S
E 1489.5 to W side of 3 E
E 1505.0 to End of main also Ser S 45° E

Beg. at cross 2 E & 3 S.
N 27 to 1st line
N 110.5 to Ser. W
N 204. to " E
N 287.5 to Ser. W

(see over)

N	522'	Ser. W	✓
N	667.5	" W	✓
N	689.4	to S side of 2" S	
N	778.4	" N " " "	
N	820	to canal	
N	904	to Ser. W	
N	947.4	" " E	
N	1461	to S side of 1½" S.	
N	1514.5	to cross	
N	1539	to N side of 1½" S.	
N	1640	to Ser. W	
N	1896	" " "	
N	2110	" " E	
N	2217	to S side of center St	
W	26	to W side St.	
N	2293	to cross	
N	23196	to St line	
N	2372	to Ser. W	
N	2413	" " E	
N	2764	to Creek at mile	
N	2984	to V. on 4" Main	
N	3058.5	to 6" Main	
N	3081.7	to St line	
V on 6" Main is 2.5' W of			
W side of 2 E on 1st N			
N	3185.6	to Ser. W	

all N

3459	to Ser W
3745.4	to S side St
3817	to 8" main
3820.6	to V. on 2" main
3840.6	to St line
4057.5	to Ser E
4511	to St line S side
W 28'	to W side of 2 E
4586	to cross
4612.5	to St
4679	Ser. W
4867	" E
4884	" W
5089.5	" "
5128	" E
5187.8	to S side St & N
W 22.7	to W side "
5233.5	to E of pipe

Beg. end of pipe on 3 E. 2, Ser
1 N 46° E 1 N 40° W
4+.3 N or 17 E of N E cor B.
S 576.6 Ser W
S 711.4 to N side St
W 17' to St line.

(over)

58

S	738	to cross
	934	to Ser N going W
W	1173	to Ser N
W	1329	to " S
W	1366	to " N
W	1432	to E side of 2 E
W	1500.6	to cross

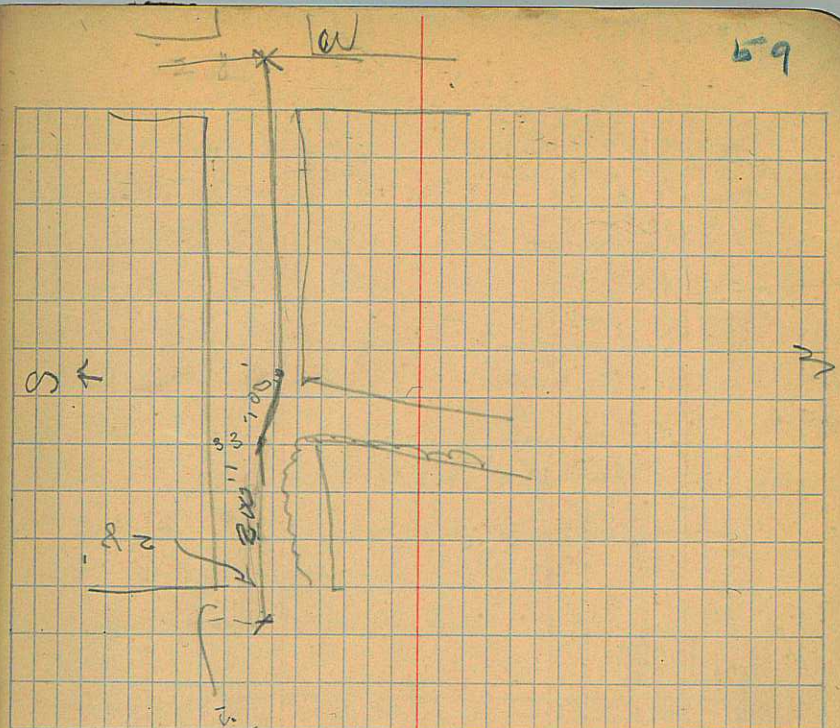
Note valve on 2" pipe on 2 E + 2 N is 25.8 ft. E of W side of St.

Beg. at cross on 1st E + enter

W	28	to St line
E	71.3	to " "
E	436	to Ser N
E	490	" " S
E	737	to W St line
E	764	to cross
E	830.6	to St line
E	1089.5	to Ser N
E	1222	
E	1375	to End of main

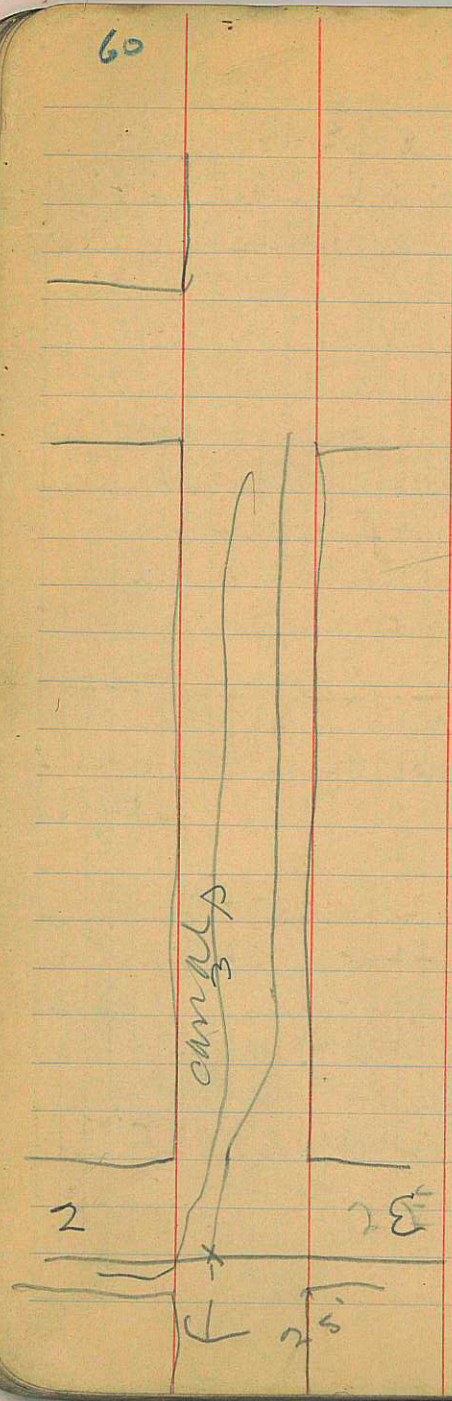
This is 73' N of S side of St.

59



Beg 15' E of W side St on 1st S + 3 E

W	283	Ser. N
W	281	" S
W	684	to E line of St.
N	26.5	to N line of 1 D.
W	747.5	to cross
	779	to St on pipe W of cross



Beg. at corner 2 E + 2 S
S 88° E 69.4 to St line
S 80° E 100' from cross
S 60° E 130
428 to Sec 3
496 " " M
658 " " S
737 To W side St 3 E
760.5 to End of main
at this cor. 20' N to
main pipe

Beg on cross on 6" main
1E + 1 N from depot St.

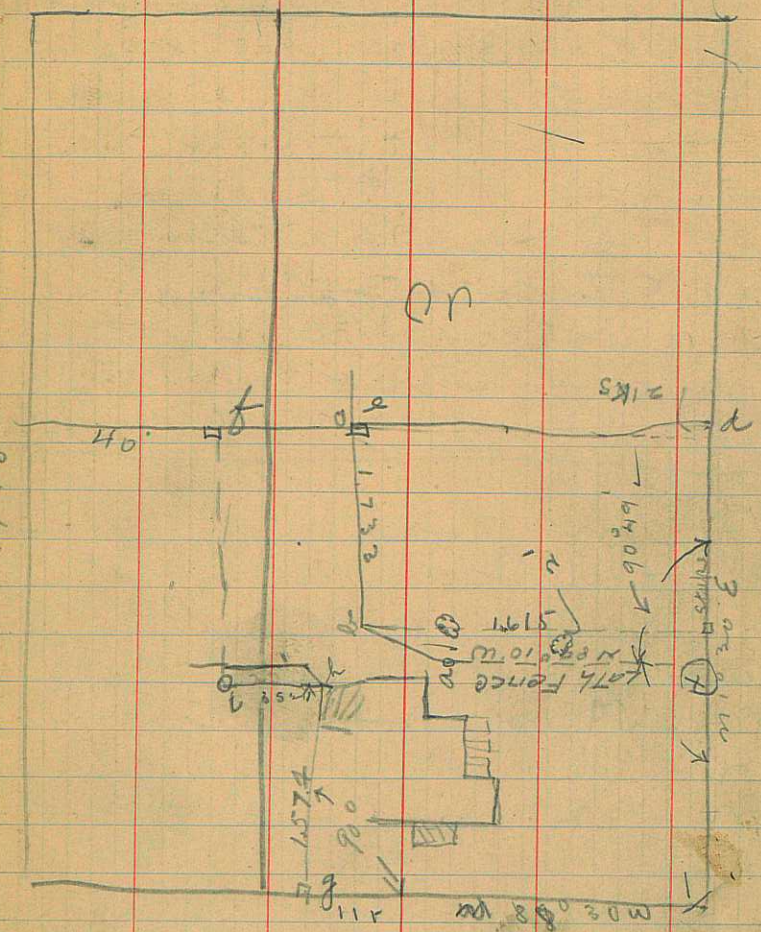
N 20' to N side St.
N 249 to Corner E
N 266 " W
N 327 " W also
end of 3" main
this pipe line is 28' E
of the W side of the St.

5 1.2 6
462 .77 2
480
462
180

Sur for D Eccles

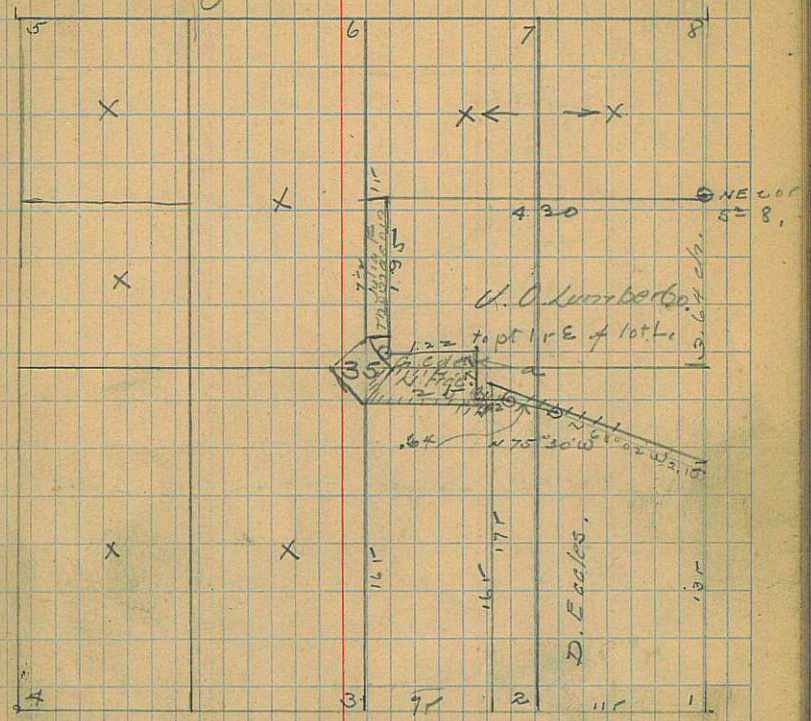
Dec 18 1905

B. 35



see next page for plat

Block 35. Plat "A" Logan City Survey. Dec. 15 1905



a = G Cole remainder of S 2 lot 7

b = " " N frac lot 2.

Beg at the SE cor B1R 35
N 1.638 to Lath fence
N 1.775 to stake 6" E of Box Elder
N 1.97 in line with S side Barn
N 2.147 to S side small gate to Barn
N 2.205 " N " " "
N 2.706 to board fence run E & W
N 2.46 to N side of House
N 3.305 to S side large gate
N 3.455 to N " " "
N 3.490 to line between W & E cor
N 3.505 to fence
N 2.720 to pt 51=.77 S of W Oline
Beg at pt 1.638 N of SE
N 89°.15 W along lath fence 1.163
to pt a. also from pt x
N 89°.10 W 0.98 to S edge of large
tree 2.5' dia
from pt a which is .5" S of
lath S 69°.15 W 0.09 to cor of
house. Thence from a
R 19°.35. N mag. 69°.32 W 2.425 ch to b
from lath fence at b. S 0.19
to Rock cellar
{Note. post at b was set new
stake.}

2.706
.044
27.20

20.066
20.30

63 61
51
12.1.22
1.768
3.552

Note! from b N 1.352 ch to post on
line E 0.40 to bush to the saved
E 1.615 to stake E side of Box
Elder.
E 1 ch to bush
from S side post lath fence at b
N on local var 1.73 to fence
N " " " 1.730 to stake
from W 1.61 to stake
from W 0.51 To "
from the SE cor 13 35
W 1.754 to net fence
W 1.768 to stake g.
W 2.09 to E side Barn gate
W 2.142 to W " "
W 2.759 to dirt fence
from g N 1.574 to new cor of
house or summer kitchen
N 159.32 to in line with lat
fence run W cor
from new cor of house pt b N 0
1.352 ch to set stake
from N 2.04 to lath fence
N 1.92 to stake f.

66

Dec 1905

Sur for Jno M Berry

Beg at the SW cor sec 12 Tp 12 N R 1 W Lincoln

S 33 W 13.43 ch. Thence L 91° 39. Bearing S 88° 54' W 45.00 chains T. R 85° 55'. N 5° 11' W 3.591 to SE cor of tract on bank of Canal N 36 W R 4° 35. N 13. 604 along E° Rd. of sd tract to S. Road

Bear	L	Begin at sd R	SE cor of tract
			Said 3.604
N 36 W	65° 04		
N 65° 40 W		17° 35	1.672
N 48° 05 W	131° 55	X	3.250
S			6.51 To Canal bk

O. K

+	13° 31'
−	12 26

480.5
90

1370 5

17960
4805
13155

91.34
33
17106

64 64
17 85
47 29

17960
9106
8854
8558
17449

6540
1735
4804

17960
17449
511

471
435
36

this pt is 2 lks at Rt of W end of this line is 2 lks in on Boulevard

67

Levels at a.c Shafer Dec 22

Sta	B.S.	F.S	H.I.	Elev	H.I.
	3.190				
	3.19				
			4.80		
			5.70		
			5.10		
			5.00		
Forge Room			4.85		
			4.91		
			6.00		
			6.00		
			4.70		
			4.50		
			4.80		
			5.40		
			5.10		
			5.20		
			5.00		
			5.20		
			5.20		
Extreme NE wing					
	3.024		5.00		
			4.85		
			4.90		
			5.00		
			5.10		
			4.20		
			5.20		
			4.80		
			5.10		

on sill at W main door
on W frogeroom door
sill cor froge "
cor of frogeroom 20 E of W door
S side " " 20 E of " "
S " " " 30 " " "
N " " " opp. fan Room
" " " " 50 E
in lowr. ground center 50 E
S side 50 E
S " 75 E
Cen 60 E
" " 75 E
N " 75 E
E 90 E
N side 90 E
S " 90

Floor sill at NE wing 1' 4"

Sun Rock
B1 = 1 m
1,44

5.10
5.20
3.60
4.70

Work worthwhile
aver. depth
of fill 1.28
Sur to 2.100
cu yd = 177.7 N.505
@ 1,50 / 91 yd
4.8 x 3.5 x 3 y

5.10
5.35
5.20
5.00
5.10
5.15
5.10
5.50
5.20

Actual fill
aver. D. 1.13
Act = 87.1 yd 3.70 z machine work

4.40
4.40
4.45

4.80
5.10
4.40

3.70
3.90
3.40

4.30
4.20
3.80

on general level

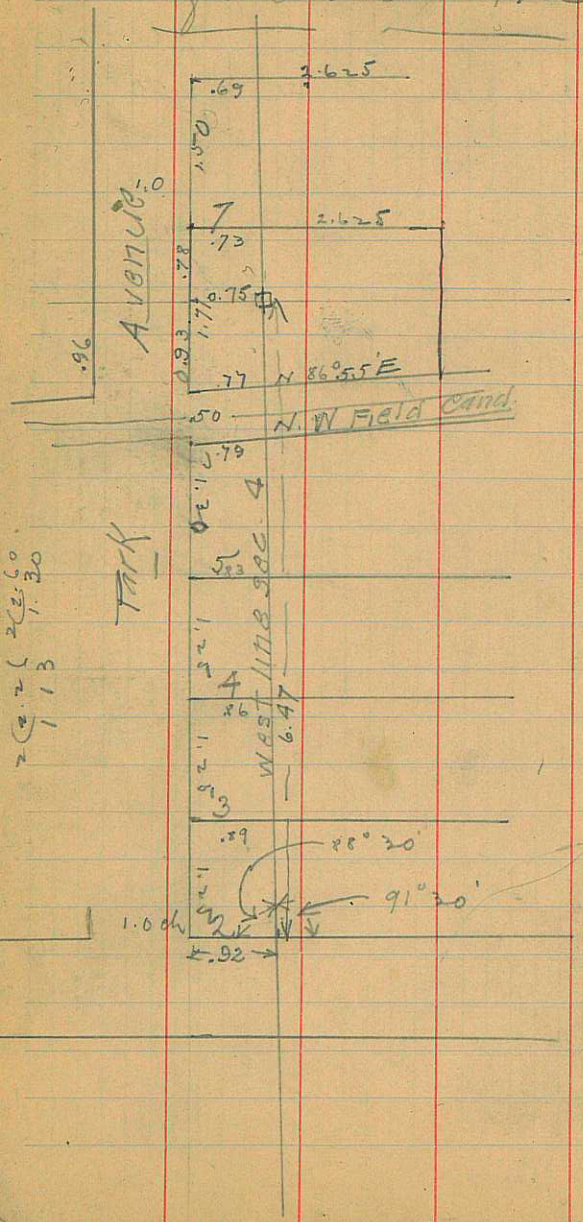
main grade line

on grade

Dec 27/05

72

Description of the NW cor
of the SW ¼ Sec 4. Tp 11 N. R 8



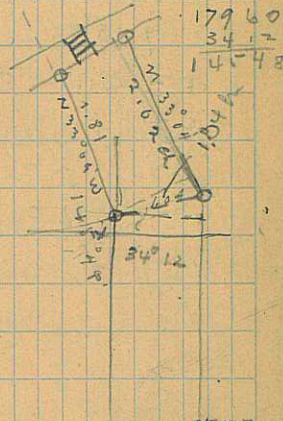
73

20.00
6.47
13.53

1.25
3.75
1.30
.50
93
6.48

a pt 0.152 ch E of for the N end of tr.
Beg at the SW cor. of the N½ of SW
Sec 4 Tp 11 N R 8 E

Dist	Course	Δ angles
0.15	N 11° 08 E	34° 12
1.81	N 33° 04'	



Lees for a tract from Logan City to Job Rowley

Beg at a pt N 75° 37' W 0.38 ch. of pt 16.47 S and 1.75 ch W of NW cor of SW¼ sec 4

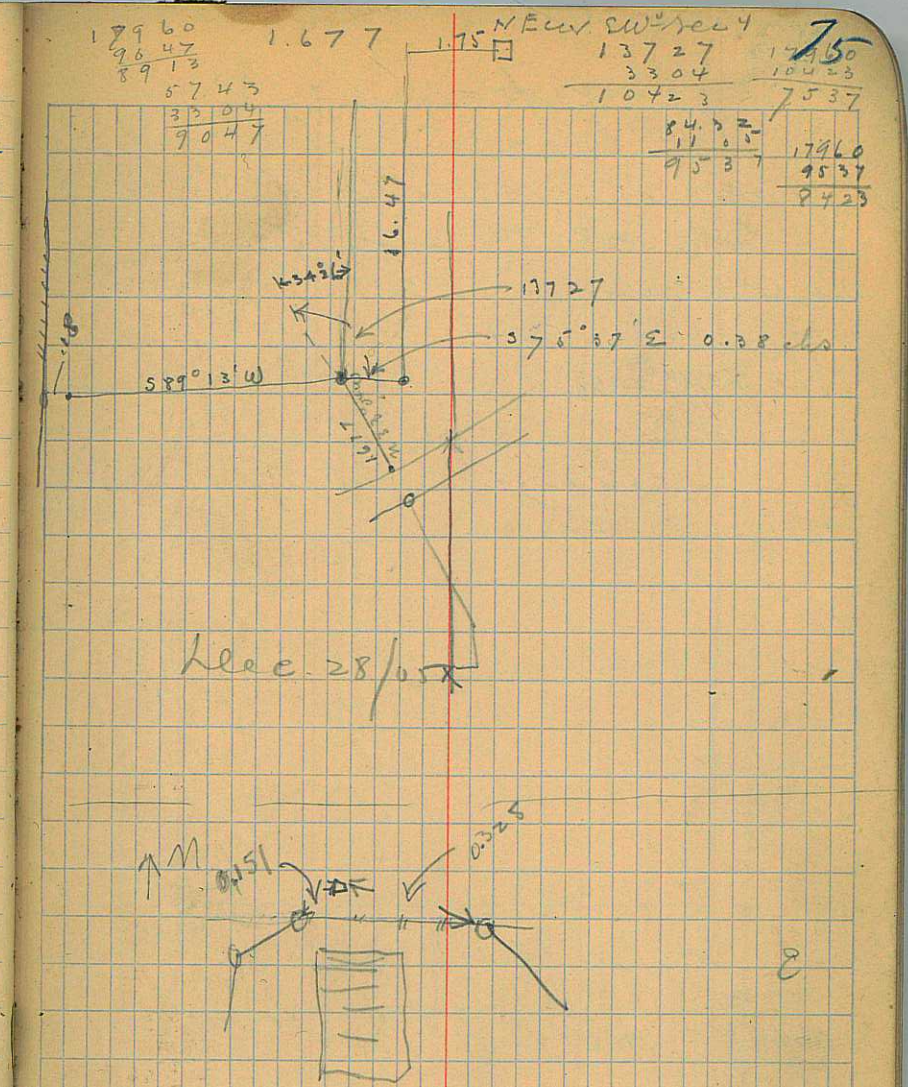
Dist ch.	Course mag.	angles	R
5.64	S 89° 13' W	162° 02'	to pt 1.8 link N 89° 13' W of
0.327	S 72° 30' E		61° 54'
1.112	S 11° 05' E	84° 32'	
0.97	N 84° 30' E	29° 10'	
1.647	N 55° 20' E		33° 25'
1.430	N 88° 50' E		28° 46'
2.587	S 62° 30' E		to pt S 33° 04' E 1.677 ch of beg N 33° 04' W 1.677 to beg.

Lees from Gallinger to Logan City Sec 28/05

from a pt 65½ ch E of SW cor of N½ of SW¼ sec 4. D. Iron

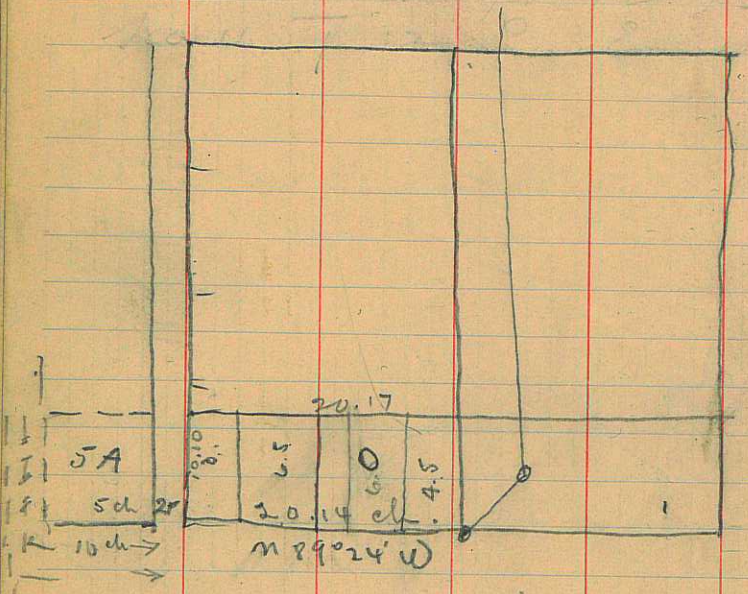
44 ch S 1° 32' W 1° 14'

11.37 S 1° 18' W. Iron stake is .06 ch W. set. rd right is N of fence and located as shown on sketch with reference to posts



Sur for
Wm Evans. Sec 29 T 10 S
Beg at NW cor of SW¼
Sec. 28. T 10 S R 10 E

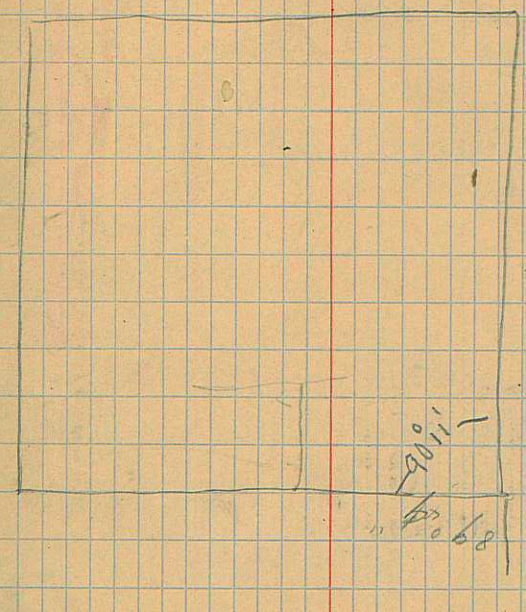
ch	l	run	R
2 0	S	52°49'	~~X~~
5.66	S 52°49' W		38°05



17 96 8
90 54
89 06

52 49
38 05
90 54

to SE cor Lot 2. 18.45 ch E Ft



78

Surv for Wm Davis
Jan 23 1906
Beg. at the SW cor of
SE¼ of the NE¼ sec 3.
fore & right to the NW cor
2d 1/4. 1/4. mag var
18° 10' E

Dist	mag. course	angles L	R
21.93	N65°20W	65°20	
21.95	"	24°26	
6.26	N89°46W		
—	—	—	—
2195	N65°20W	65°32	
5.40	N30°E		
1 ch	"		
4 ch	+ - angle		
—	—	—	—

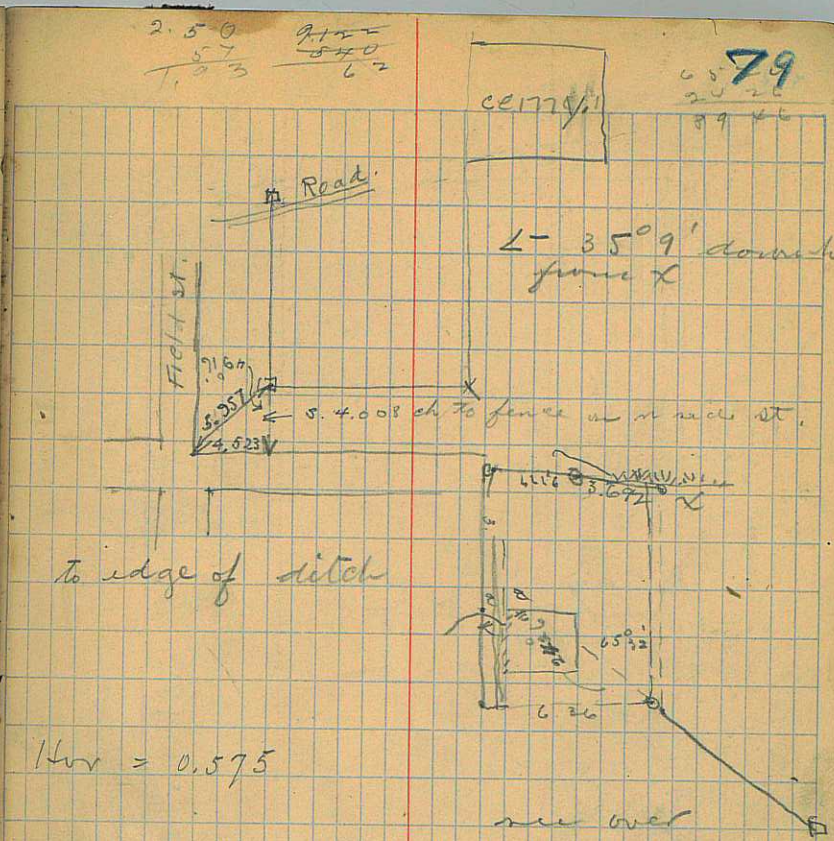
To flag
to SE cor Post
meas from post 78

To bank of ditch
along line
- 35°09
to cor

thence from cor last
meas from ⊥

	N30E	69 15'
3.692	N68°49W	28°52'
2.777	S81°30'W	80°13'
3.00	S2°00W	
5.75	" "	
6.323	"	

79

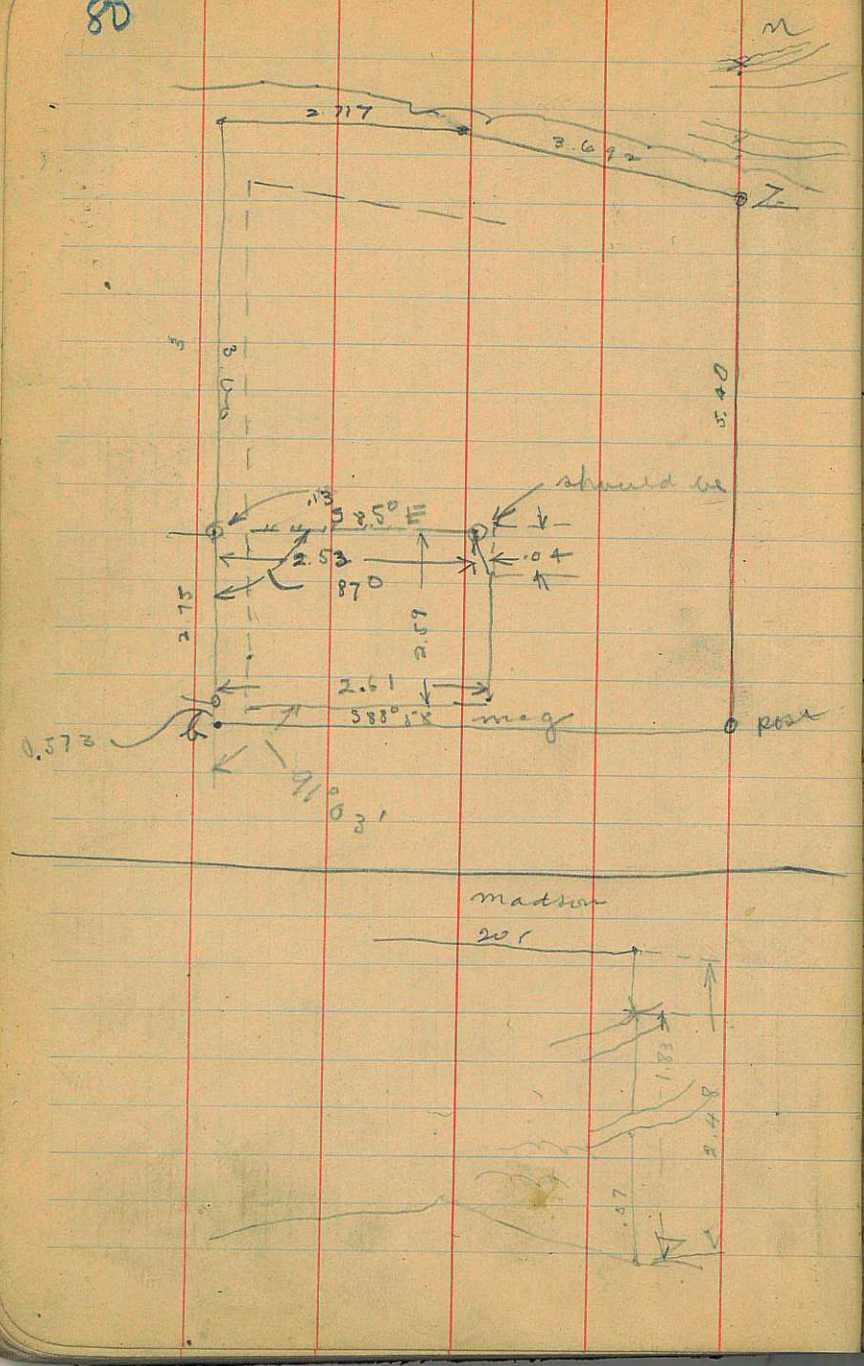


see over

3 links east of fence line
along bank of ditch

to N side St. (Outer bank
to S " " " "
to S. SW cor cor

80



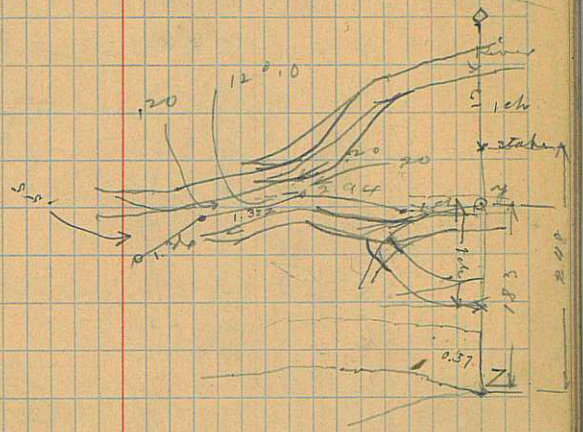
9.12 ft
3.46
14.58 ft

17.00
14.52
2.48

1.56
1.83

81

from Z N E 1.83 to N bank of canal old canal



from Z N E 1.83

dist	mag Courses	Angles	R	from y 1.83 N
	N E	13°27		
1.00a	S 81° 30' W		14°05	along bank
2.94	N 79° 45' W	12°16'		
1.325	S 88° 30' W	16°16'		
1.326	S 73° 00' W			

82

Sta	BS	HI = 5	Inst	
	5.990	7.055		
	2.380	6.910		
	2.860	5.220		
	4.320	5.920		
	4.740	4.330		
	4.830	4.020		
	4.980	4.640		
	5.030	3.158		
	5.310	0.490		
	42.440	41.735		
	10.890	5		
BM		1.540	8.620	
	12.080	9.037		
	3.230	6.500		
	8.250	9.900		
	61.890	68.712		
	3.700	8.010		
	2.030	7.900	5.270	B.M. on
	74.620	84.622		
		72.62		
		12 00		

68.712
8.010
76.722

1.787 1.590
86.62
73 62
5

8100
6871
1229

58.80
5

83

73.620
11 00
84 62
76 72
7.90

on bottom of ditch on east end
direct, Leveling for Hyrum Canal

nail in
on 1 milk stump at N. of house

68712
8.010
76.722

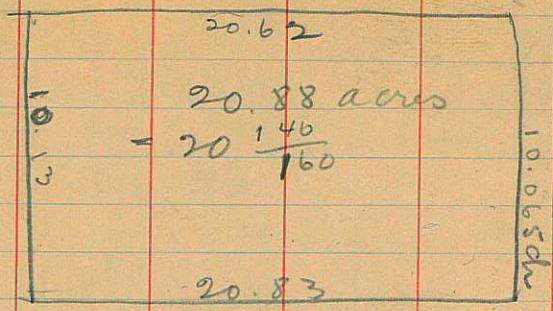
73.620

84.62
73 62
11 00

84.620
76 72
7.90

telephone post E. Brown

84



20.83
20.62
2 (41.45
20.72
10.08
16 576
20 72
20.88576

10.13
10.06
2 (20.19
10.08
160
.88
1280
1280
140.80

85

$S a = 1$

$A = \frac{S}{160}$

86

Sur for Dr Bridge

Feb 7. 1906

Sta	BS.	FS	HI	Elev	HI
1	2.78				
2			5.00		
3			5.85		
4			7.78		
10 x			8.24		
5			9.15		
11 x			7.00		
6.			5.25		
14 x			5.80		
12 x			6.87		
rm			5.10		
13 x			5.00		
9			4.45		
8			5.00		
7			4.25		
		2.80			
	9.39				
		0.55	11.29 on mud in a cedar post		
	5.72	11.00			
	17.89	14.35			
	14.35				
	3.54				
	10.60				
	6.70	9 1 W U			
	1.45	2.400			
	18.75	6.350			
		17.89			

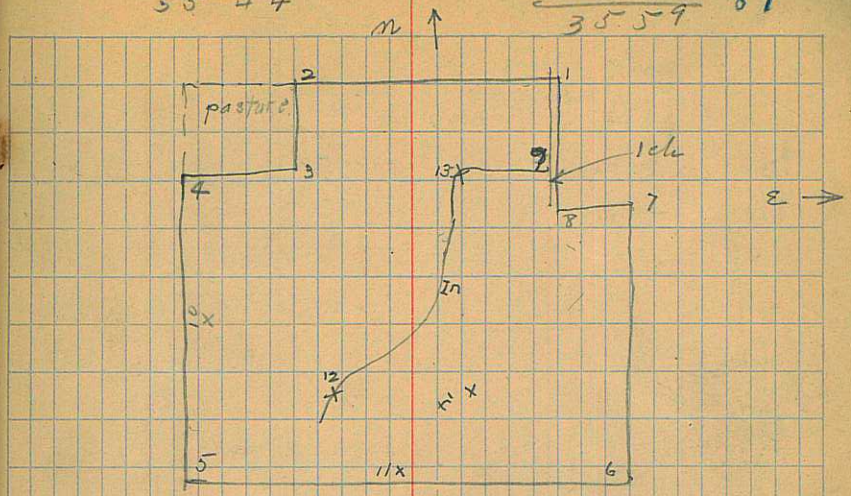
0 '	Course	L	R
461 '	S 61° 45' W	35°44	
188	S 35° 59 W		44° 33
1300	S 80° 20 W		9° 28
{ 27 '	N 89° 45' W		
{ 100	" "	36°	
1056	S 54° 15' W		36° 54
1700	N 88° 50 W	53° 54	
3015	S 37° 30 W		

meters

60 10 3
35 3 9
35 44

17960
N 41 1
35 59

87



on bank of River

Beg at intake.

to pt opp. o

to 1/4, 1/4 cor. on sugar factory Road

88

Stadia Work

for Elev. Bridge

Dist	Vert. angles −	Vert. angles +	Int. S.	Bridge Forest S.	H I
West of int.	2° 36′		5.55		4.97
	4° 00		5.33		
		35′		4.85	
	00	00			4.97
East from Road	12° 42			4.85	
	6° 11′		5.71		
	—		5.342		
	1° 57′		5.69		
	2° 04′		6.05		
TP	1° 07		6 20		
E					new 4.97
		1° 40	∠	4.84	
		0° 20′	5.37		
		0° 20	5.62		
		0° 45		3.81	
10′	11° 10′				new 4.97
		48′	5.147		
	55′		5.260		

Profile

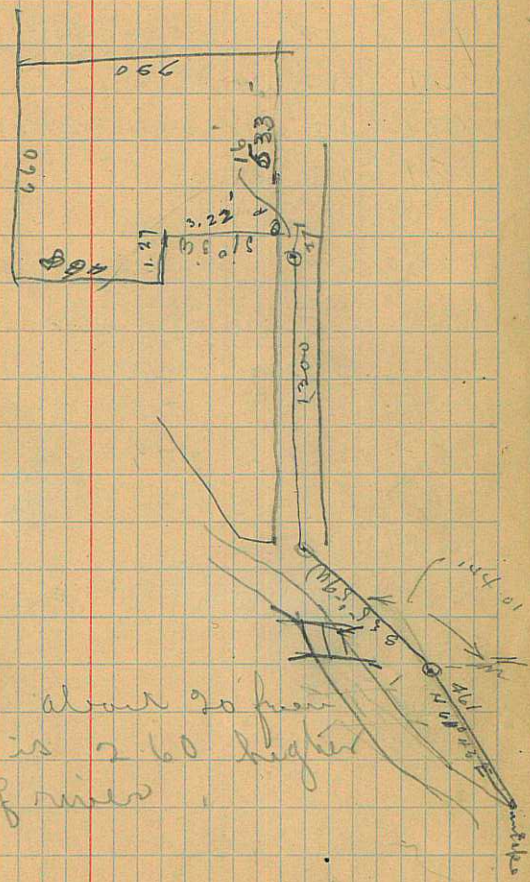
for

9.20

9 4 5
7 0 9
2.66 89

at E side of gr. at Bridge

at int.



end of line is about 20 from mile and is 2.60 higher than bed of river

95

Sur for Weston Mills
Feb. 15/06

Dist	Course	angles L	angles R	
5.30	~~N~~ S N 89° 05' W		90° 51'	see sketch over
10.88	~~N 0° 51' W~~	3° 58		
12	S 86° 55' W		13° 54	
4.81	N 79° 28' W	29° 48		
4.30	S 71° 05' W		27° 04'	
8.71	N 81° 30' W			to ½ sec -
~~H~~ 15.69	N 00° 15' W			to N contours
16.23				

from sta d

	S 87° 30' E	129.86'	to trig sta C.
			from sta d. B.S. to b 81° 01'
3.35	N 83° 00' E	37° 13	
6.43	N 66° 05' E		16° 22'
9.00	N 82° 05' E		60° 40'
4.00	N 82° 40' E		65° 27'
5.935	S 31° 45' E		

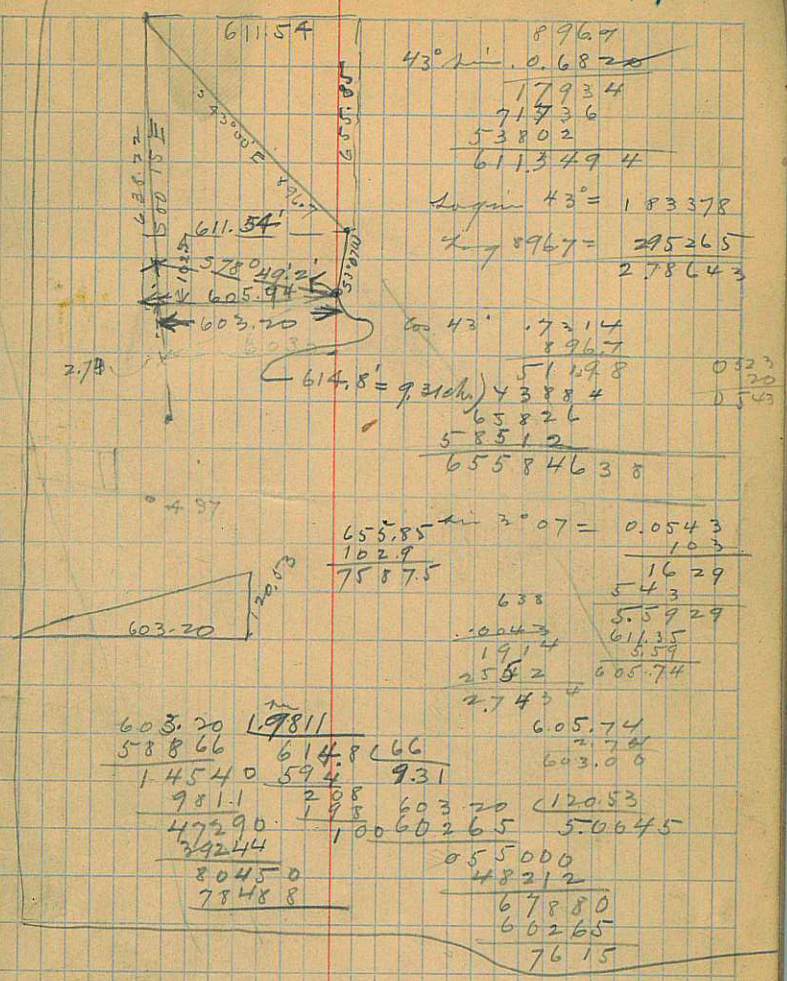
should be S.
end of this line
thence the end of this
L. 603.28 to B car

to ½ sec
still fm

17960 7849 15 7834

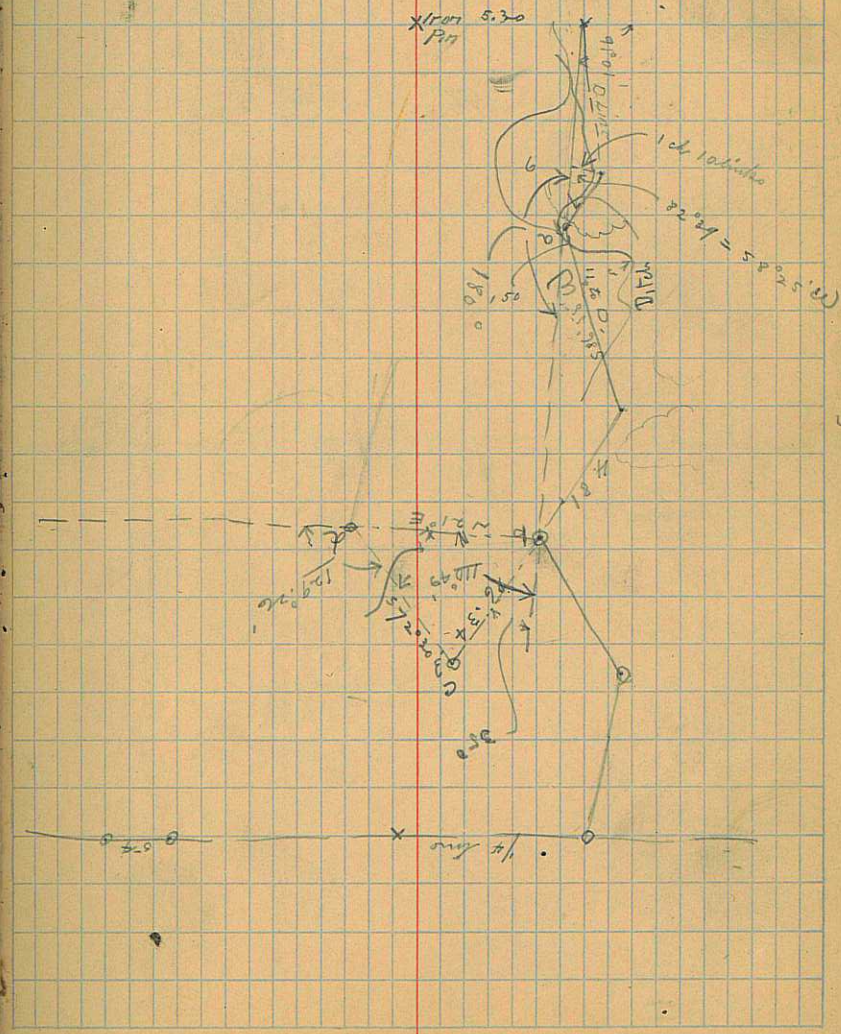
78° 40

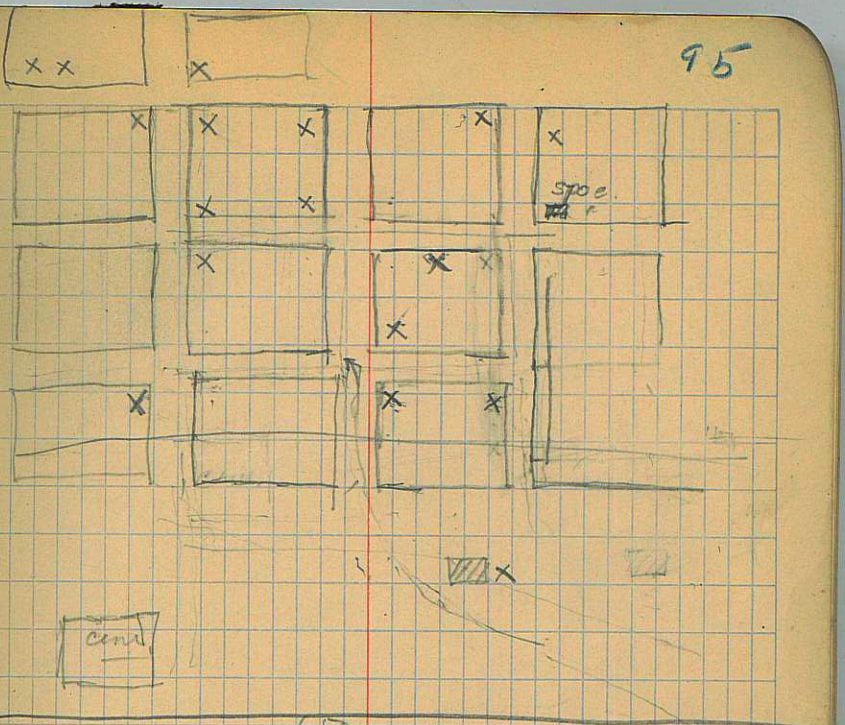
91



92

93





650
459
1 8 12
3 6 2
1 7 1
3 6 2
25 3 4
36 2
41 9 0 2

96

Sta	Course	Angles −	Angles +	HI	upper Stadia
b.				4.965 at a	
a				4.59 at c	
a+e		10°		4.96 d.	6.50
c+d		3°24		4.865	
d+e		2°14			8.083

97

Lower Stadia

Surv at Melville H.O works

(u.p) 10.58

10.7 / 10.5

1.140

1.487

HI 4.96

S 23° 05' W

a ← P. Sit.

4.2.497

F 65.3
Dis = 376
H. Dis = 370.

Fall = 40 ✓
Dis 682

1700 lin ft 6" Pipe
643
682
Balance 50 ft
130
100

Dis 643.6
Fall =

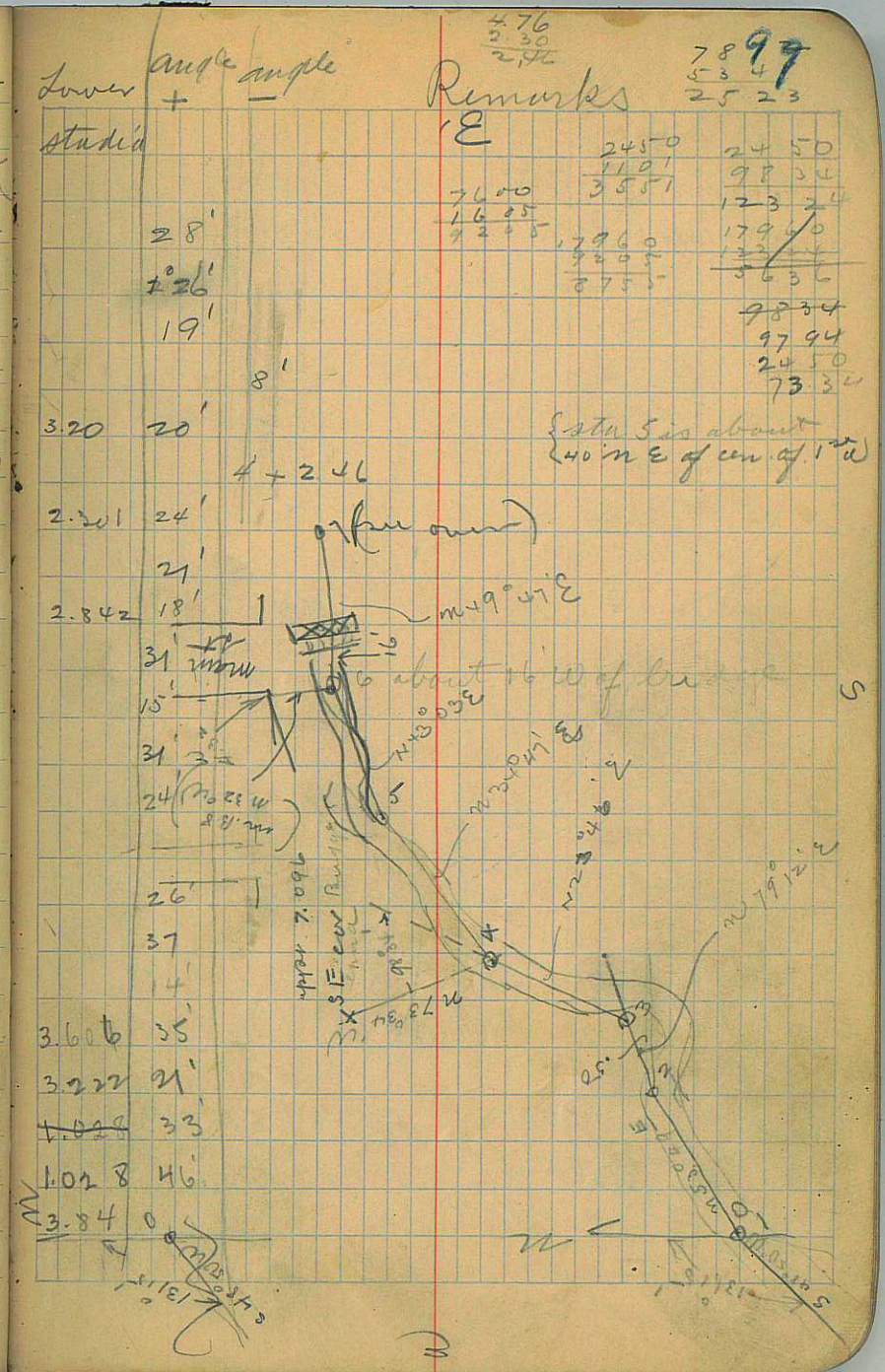
130 for fall
for d to e

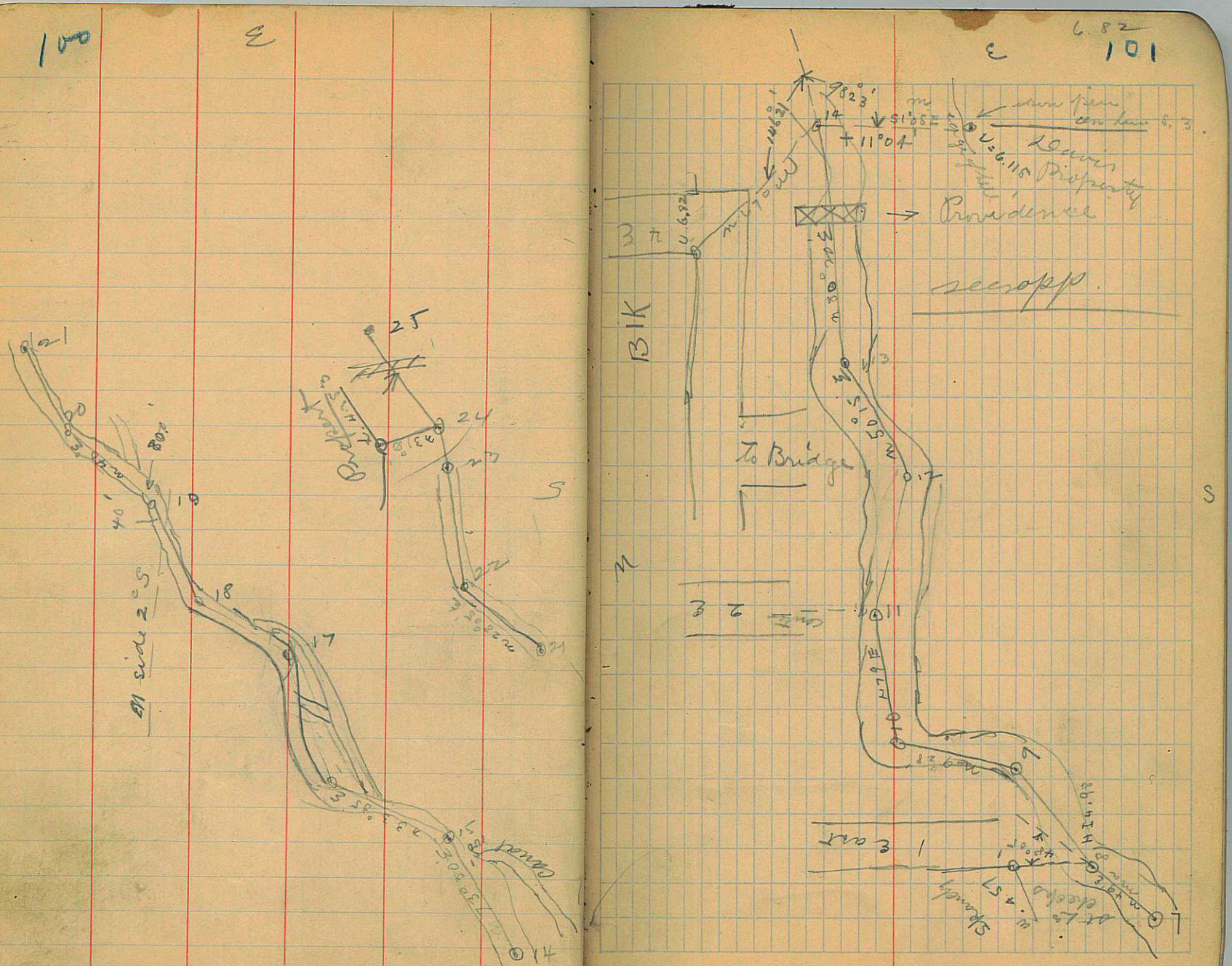
98

Sur of Logan River

March 20

Sta	Course	Angles L	Angles R	HI	upper stadia
P	N53°49E			4.65	~~4.65~~
2	N79°20E		25°23'	4.602	9.77
3	N24°50E	55°26'		4.970	5.493
4	N34°45E		11°01	5.29	10.892
5	N43°00E		8°16	4.98	
6	N49°44E		6°44	4.76	10.758
7	N49°80E	49'		4.79	
8	N58°E		9°01'	4.98	6.971
9	N9°28E	48°26		4.75	
10	N76°01E		66°18	4.85	6.731
11	S88°E		16°05'	4.73	6.523
12	N50°15E	41°43		4.94	6.31
13	N80°20E		30°06	4.86	5.965
14				4.80	11.184
	March 21				
14	N73°30E	6°48		4.66	
15	N33°35E	39°48'		4.84	7.767
16	N69°05E		35°25	4.75	8.198
17	N26°28E	42°39		4.68	
18	N53°35E		27°06	4.74	
19	N40°00E	13°33		4.91	7.882
20	N60°00E		19°55	4.65	
21				4.87	




E
E
101
6.82
Providence
Bik
To Bridge
Old Road
Old Side
Court
Shanty
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1

102

Mark 21 Sur of Logan River upper station

Sta	Course	Angle	R	HI	
21	N 28°05' E	31°48		4.87	
22	N 76°15' E		47.58'	4.74	
23	N 76°15' E	00	00	4.54	7.094
24	N 34°45' E	41°40		4.74	
~~25~~					
25					
24	N 31°50' W	107°57		4.59	

Lost Trail

n

5960
3143
2812

2805
4758
7603

103

17960
8451
9049

Lower station	Angle +	
	30'	
3+1175	(32')	Flame Lite
	02'	
4269	30'	
3510		at bridge near Kleffner
3216		just above bridge in center of the river
	6°33'	
4353		cor of property

Sur for
John W Lane
mill site
from a pt 0.187 N 89° 57' E
from NW cor sec 34 Twp

Dist ch	Course	Bearing	Lat N	Lat S	Dep E	Dep W
13	N	89° 57'			+.187	
12	N 22° 30' W	22° 30'		+11.08		-4.59
55.94	N 1° 10' E	23° 40'		+34.92		-1.33
	E	88° 50'		80.00	+1.14	+3.26
					+1.327	
1.00	E					
2 26						

to E side of co Rd

to NW cor sec 27

see over

.187
1.139
1.326

2.590
1.737
3.268

2340
2230
110

8957
37
89220

105

Log 55.92 = 1.74757
Log cos 1°10 = T.99985
1.74772
55.94

4.590
.187
4.403

4.59
.187
4.403

Log 55.94 = 1.74772
Log sin 1°10 = $\bar{2}$.30879
0.05651
1.139

19.92
19.55
.37

N 89° 57' E — N 89° 20' E — N & cor
NW cor sec 34
34

4.59
.187
4.403
1.139
3.264

Log sin 22°30 T.58284
12 = 1.07918
0.66202
4.59

Log cos 22°30 T.96562
12 = 1.07918
1.04480
27.46
11.086
11.86
5.4
2.6

sin 22°30 = .38268
12
76536
38268
4.59216
92.388
12
184776
92388
11086

13.00
11.086
24.086
80.000
24.08
55.92

Log = 55.92 = 1.74757
Log sin 1°10 = $\bar{2}$.30879
1.43878

sin A = a/c
cos A = b/c

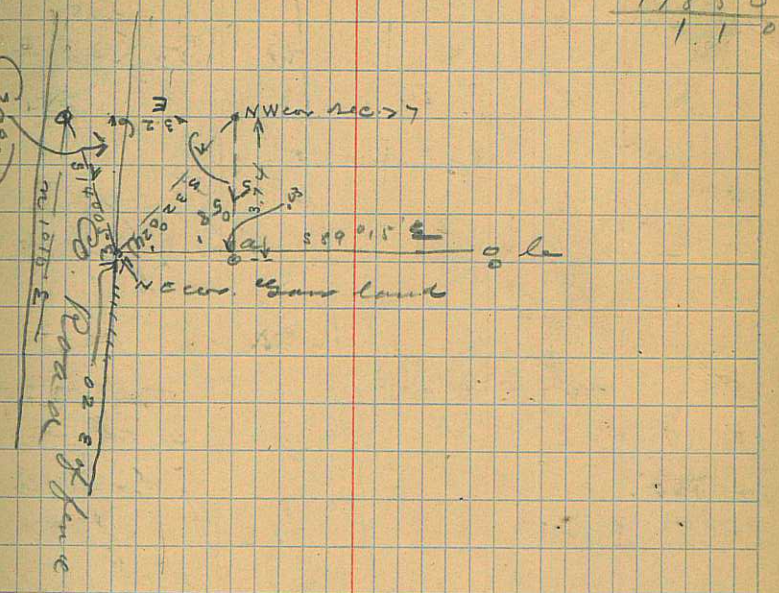
896.0
57.58
33.02
106

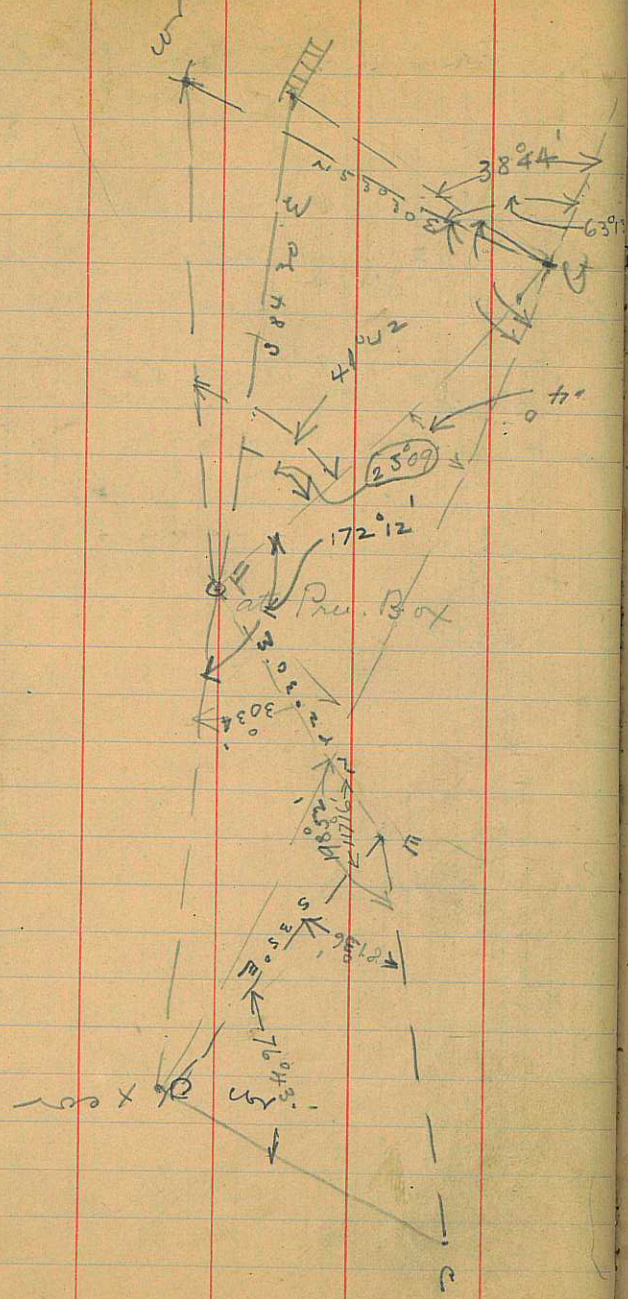
John Gould Survey

List	Course	Angle L / R	
	Beg at a 3.74 ch S of the NW cor sec 27		
	sd pt being .03 ch S of the N line of fence thence		
19.55	S 89°15' E		to E fence
19.92	" "		to sub-irreg fence
	Beg at a		
	N 89°15' W		which .03 S of E fence
2.31	N 89°15' W		to stake
2.355	"	89°35	to Enid Co. Rd
5 ch	S 1°10' W		between fence

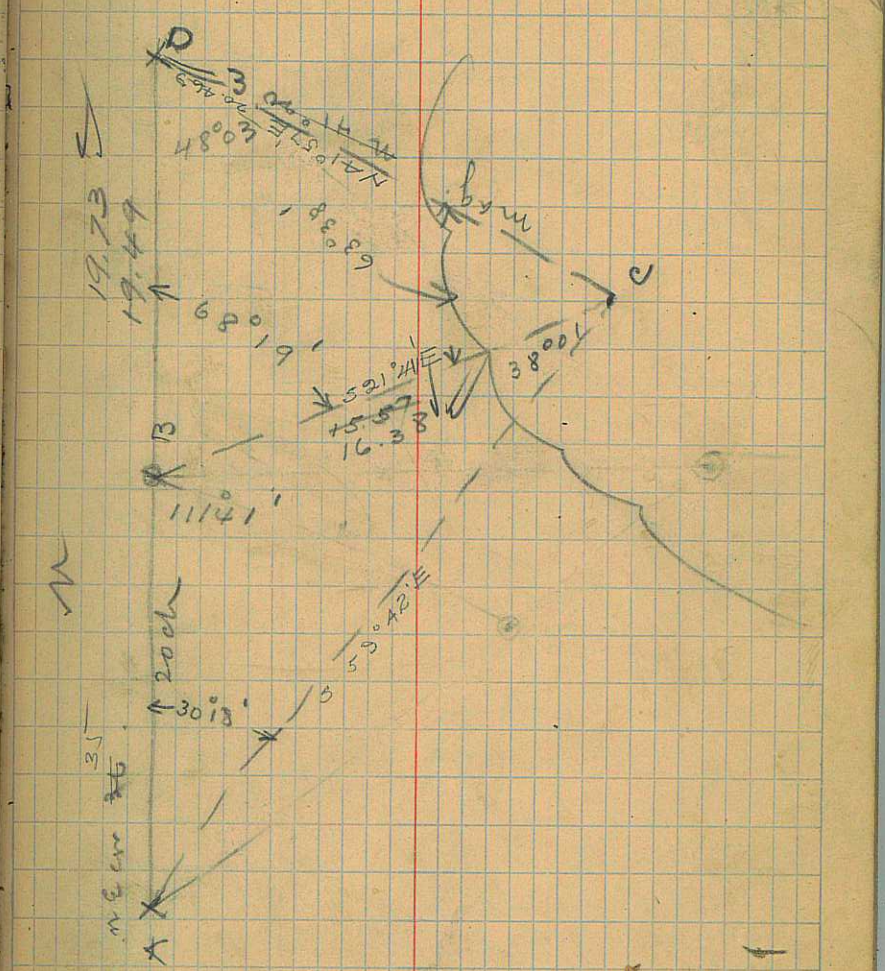
N

89.15
89.35 — 107
178.50
179.60
178.50
1.10





Survey for Joe Rhoades



100

Sur for EP Bacon
Mar 1906

Sta	BS.	FS.		HI	fall
0				5.01	
change	X	5.88	near flat Rock B.R.		
X at flat R.				5.04	
				~~4.88~~	
				5.07.	
				4.94	
				4.78	
				4.84	
				4.52	



6.25 / 67 / 6.92

6.15 / 7 / 6.85

7.60 / 6.15

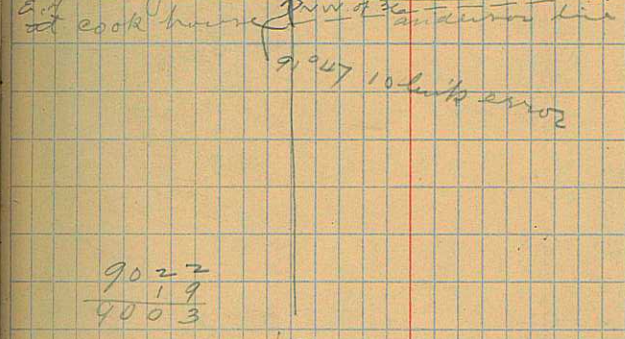
7.11 / 6.25

2(1.375) / 0.7

2(1.375) / 0.67

6.31 / 5.04 / 1.31

5.77 / 4.88 / .37

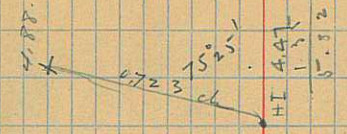


9.947 10 link error

8922 / 19 / 8941

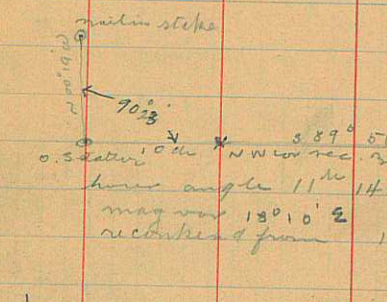
9027 / 19 / 9003

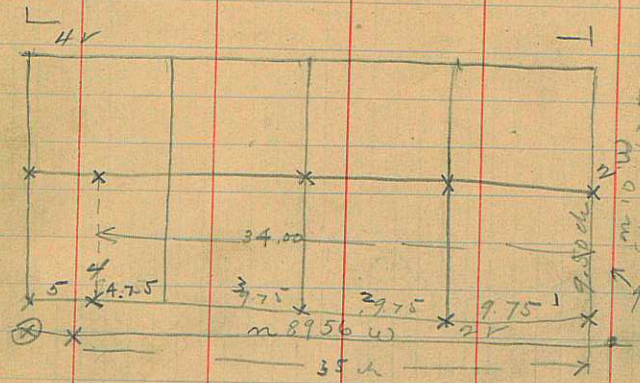
S 89°57' E



12

Sur for H Johnson
and all
mar 29





90 23 | 35.50 / 15 50 / 50 50 .85
90 04

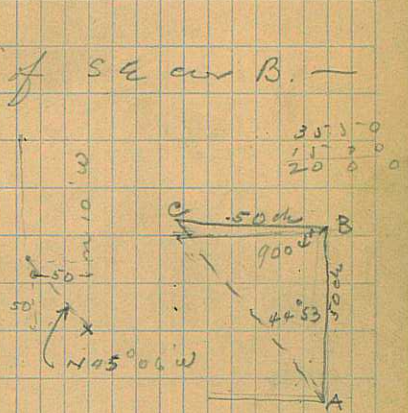
100 89
0.01 72 00

40
42 | 38
9.50
4 | 39
9.75
4
39.00
9.75
2925
475
3400

41 62½
15.50
30
35.10

62.5
180
50.00 00
49 50.90
500 .72

Detail of SE cor B. —
Plat G.



3573.9
1117.00
2000

10
8956
2 | 89.46
44 53

17

N 10 W
golden



over

Note.
Sur cor 17 right from 10 mw
course N 6° W
angle from at pt 0,8,87
ch. N of new mw cor 39.73 ch
39.73 ch to other cor
40 20 ch to new cor

A 0.00 ; B 1.00
5.00 00 | 70 56
49 39 2.70
60 80 6

Begat

NW cor 36 Dr sum

N 45°06' W to brict angle

2 list

.700

sta	BS	FS	HI	Ele	HI
	4.65				
			11.04		
			9.10		
	lower flat				
	4.54				
			8.28		

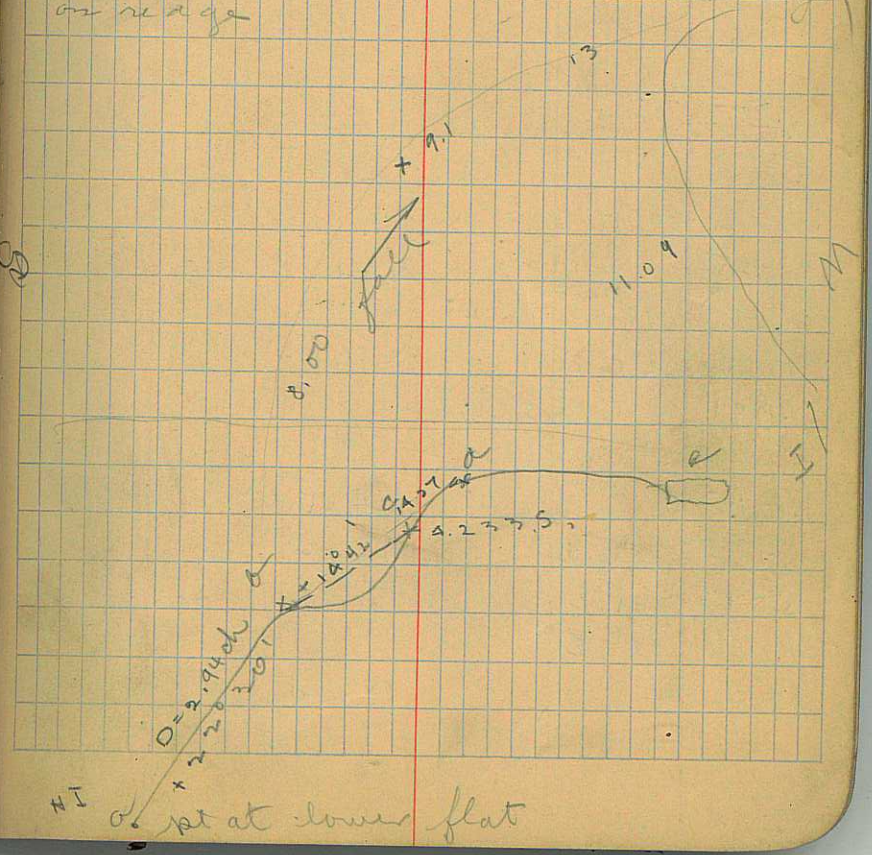
Stadia

	up. S.	— angles +	Low S	HI
a				4.59
b			3.572	4.453
c				4.233
d	5.197	from b to d 14°37		
e	Diff	5.35 R on d		Direct
		4.95 R on HxO		
		5.35 in bottom of ditch		

40.00
34.73
.27

to SE cor B.M. Plat 9.

in hollow or low land mid-height on range



+30
4 31.6
116

Surv for John W Sam ... mar 30/0

List	Mag Course	L	R
	Beg at nw cor sec 27		
	Tp 11 N. R 1 E chain		
			33°07
	n 33°07 E		
5.57	"		
13.51	"		
22.275	n 33°07 E		43°48'
6.70 / 6.46	n 76°55' E		
8.16 / 8.44	n 76°55' E		
16.60 / 905	"		
17.505			
	thence from a chain		
	n 76°55' E	83°00	
2.25	n 6°00' W		21°31'
2.00	n 15°40 E (n 15°26 E)	13°25	
1.00	n 2°05' E		13°41
2.081	n 15°30' E	29°40	
1.306	n 13°35' W	25°22	
1.545	n 39° W		129°51
6.722	S 88°45' E		68°32
3.577	S 21° E		12°23
+4.191	S 8° E		
4.356	S 77° W		85°20

To a

+ dist must read to this fence

8.16 / 8.44 / 16.60 / 905 / 17.505

8.16 / 8.44 / 16.60 / 905 / 17.065

4.356 / .165 / 4.191 see sketch over

8.44 / 90.5 / 9.345

5.905 / 4.485

117

8.16 / 9.34 / 17.50

to fence E & W

" " " "

to turning point

to W bank of Blacksmith fork River

to SW theoretical cor. a

to b. west bank of mill race

to c. SW cor of Sam's upper place

this point is 4 links N & 5 links E of fence A and 60 links E of cor of R

" " " 5 " E of fence 60 E of R

this point over 5 links " " 60 E of R

" " 60 link E of R

this cor is 0.03 S and 0.03 E of line of cor R

pt is N 42° 30 E 1.30 from cor also 1.55 S 88°45 E

along parallel 0.3 link S of fence and 0.3 E of fence end of line 02

along West bk of mill race

" " " " " to fence E & W

To pt b.

from

(over)

17 18
136 12
16 1

Beg a point C which bears N 76°55' E from a mon

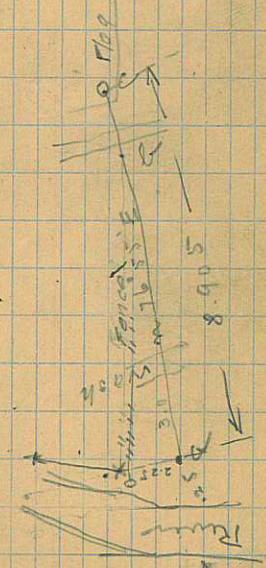
dist	Course	∠ angles	R
		85 44	
3.557	N8°30'W	7°31	
4.685	N16°10'W		107°20
12.01	S89°00'E		83°53
1.524	S5°E	12°47	
6.875	S17°35'E		109°05
12.405	N88°45W		

4.68
3.55
8.23

E 8.23 2.26 .57 0.19 3.57 7.7 419

pt C being .065 ch N 1° W & 0.17 E of pt NW

pass. 17 lks E of fence
pass. 17 " S. " " this course 07 S of 1st
& this pt is 07 S & 0.43 W of fence on Rt bank
this " 0.22 ch W of Ditch Cl
at .55 ch E. end of this line is .065 N & .12 W of B
to pt C



120

Sur on bench

NW cor cor. 35 found stone 3.75 ch S

Beg at a pt. 03 W of said cor.

Sun N

Dist Curve L angles R

4.280 N 91°22

correct

S 88°04 E

List between NW cor of SW¼ 24 to NW cor of SW¼ 21 80.40

Dist ~~Pat~~ 40 chains N of NE cor. 35 Bear N 4° E

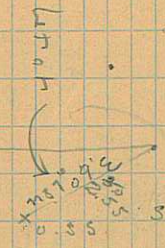
From the NW cor of SW¼ 21

R I E T P 12 R Run

40 W

of NW cor. College farm

of cor.



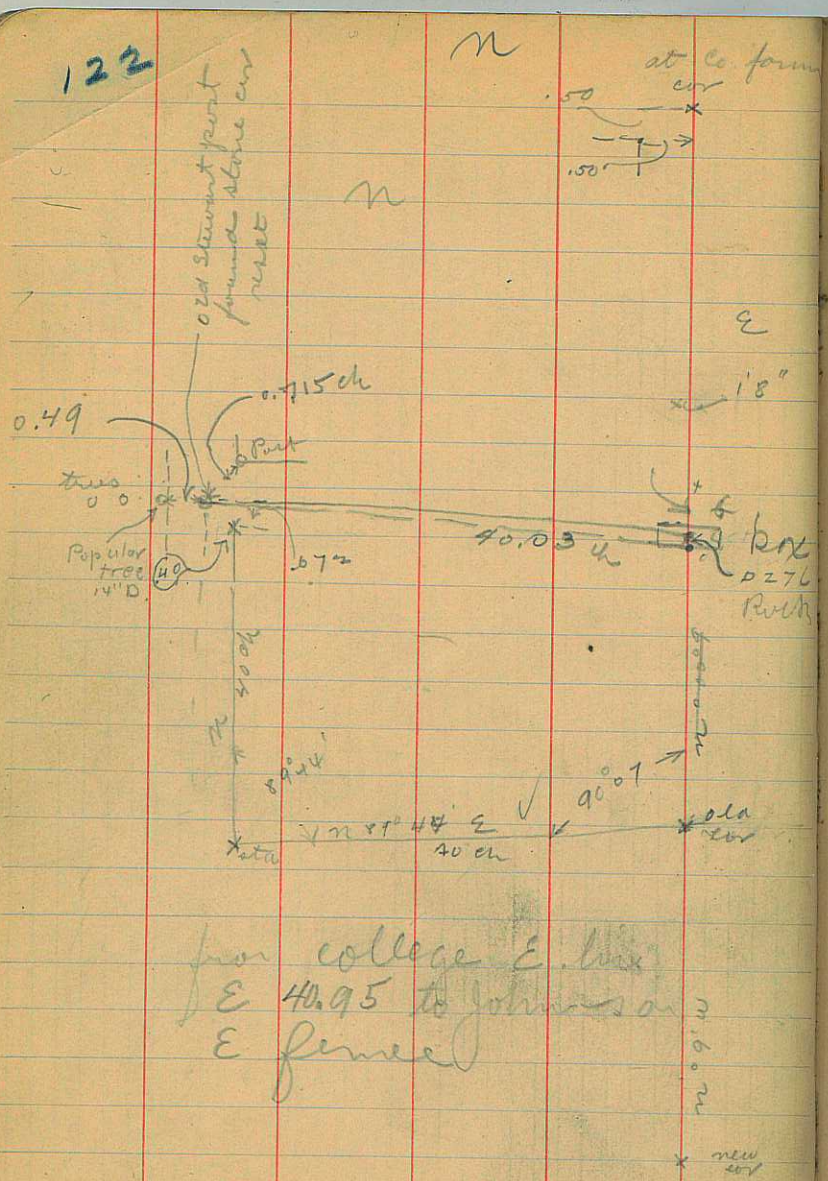
8709
447
9156

S 89 57 E

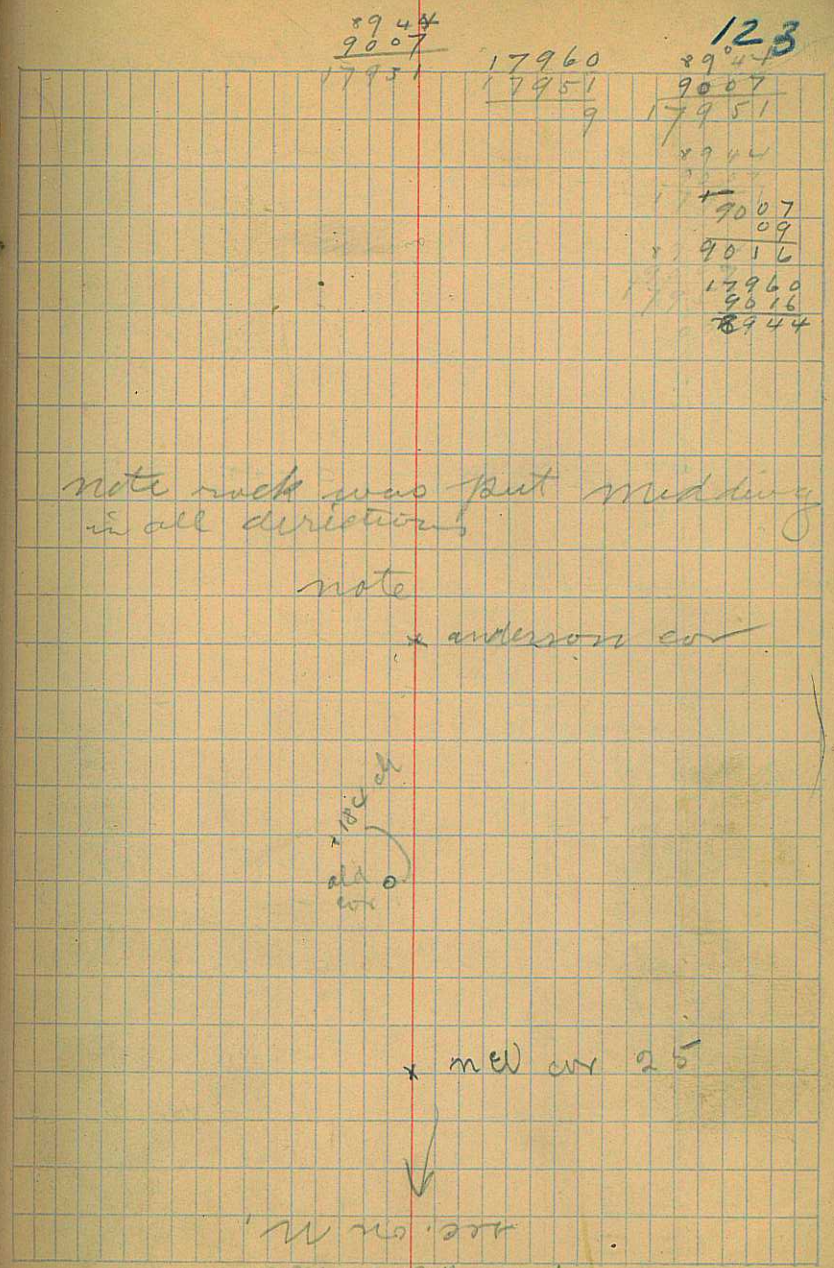
17960
9156
8804

9211
61
51
17960
9251
8709
251
8960
251
8709

122

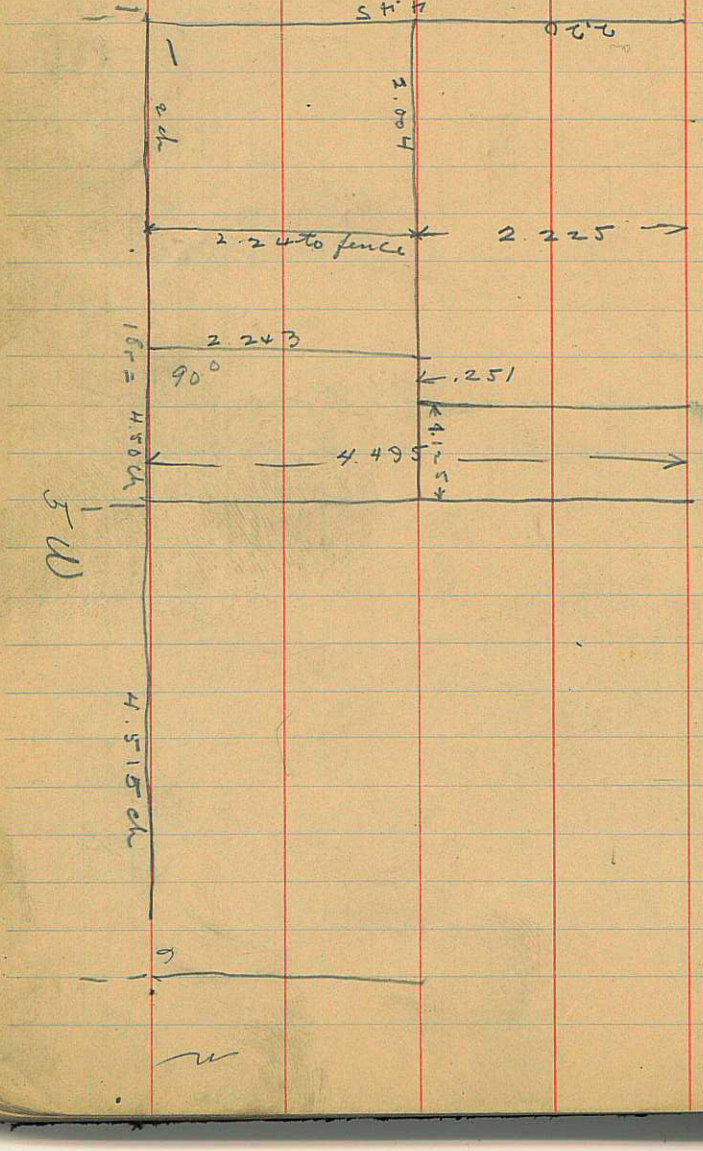

N
at Co fence
.50
cor
.50
E
18"
0.49
0.715 ch
Post
trees
Popular tree 14" D.
HQ
.07 ch
40.03 ch
box
0276
Rock
40.00 ch
N 89°44' E
40 ch
90°07'
old cor
Extra
from college E. line
E 40.95 to Johnson
E fence
new cor

123


89°44'
90°07
17960
17951
9
17960
17951
89°44'
90°07
09
90°16
17960
90°16
89°44'
note rock pile Post marking in all directions
note
Anderson cor
18" ch
old cor
new cor 25
N

Surf for
H E. Hatch april 5/06

2 ch. South



125

7 5
.1 2 5
1 8 7 5

16 5
5 5
8 1 2 5
8 2 5
9 6 . 1 5
9 6 6
2 4 7
1 9 8
4 9 0
4 6 2
2 8 0
3 3 0
11.50
.2 5
1 2 5
3 1 2 5
4.0 0
.2 5
1 2 5
4 3 7 5
4 4 5
2 7 0
2 2 5

1 6 6
1 3 7 5

Check levels at Hymun canal

Elevation on Mill Stump 102.98
0.71
103.69

Elev on stake 50.093 ch 93.26
103.69
93.26
10 43

Curve for Riparian Canal

when r = 1,054

n = .022

s = .002

r = 2.99

p = 6.40 at 675

Angle — 7'

.00200

— 7' min. angles

Dist	Course	L	R	HI	RR
ch.	mag	140°35 from n		4.80	
1.01	S 39°30' W		28°28	4.73	2.24
5.21	S 67°55 W	00	00	4.690	5.47
PI 3.62	S 67°55 W		35°58	4.150	
4.11	N 76°05 W	27°01		5.030	
PI 7.867	S 77°05 W		16°18	4.530	
2.38	N 86°30' W		on same line		
5.206	N 86°30 W		2°55	4.670	
1.42	N 83°55' W			—	
8.00	" "			—	
11.481	" "		4°14'	4.91	
1.48	N 79°35				
X 4.784	mag.		103°39'	toward SE cor sec 32	
2.65	N 24°00 E				
3.74					
11.13	N 24°00 E				

480
224
256

00204
00175
00029

1.00 29' 60 00 25" N

1 60

.155 00 29
155 5 3
100

4.73
2.24
6.97
1.50
5.47
1.50
6.97

cut	fill	
		in old ditch on west road beg
2.56		enter John P Nielsen
1.50		end of line is 03 E of NE cor of A B Nielsen land
1.50		Ditch begins in " "
1.50		this pt is 03 E of East line of Hans Peterson
1.50		" " 104 E of " " " " pasture
1.50		enter chas. negro on right to W line of Hans Petersen's land in order
1.50		This pt. is 04 E of cor. 22 st. also 4.33 S 1°30 W from Irrig field ditch.
A		to W side st enter A B Nielsen
		crosses fence E + W on N side A B Nielsen
1.50		to pt 03 ch E of cor 1st W east line Bert Jensen
		to W side st enter Hans Johnson Estate
		to pt 03 ch E of West line Johnson
		from this point towards cedar cor SE cor sec 32
		to S. side field st E + W
		to N side on bear
		to sec. cor. 32 on tp line

129	8.55 / 9.99 / 4.56 — 9.50 / 5.01 / 3.99 — Iver corr					
	Dist	Course	angles ←	R	HI	RP
	4.784	N 79°35'W	1°06'		4.89	
	0.03	N 80°55'W				
PI	6.805	" "		12°54'	4.85	
	1.30	N 67°55'W				
	3.357	N 67°55'W		20°54'	4.52	
	1.60	N 46°55'W				
	6.994	N 46°55'W		8°29	4.73	4.13
	0.07	N 38°28W				
	1.85	" "				
	2.227		1°39		5.01	
	3.107	N 40°W	114°52			9.00
	0.427	S 25°W	✓	93°19'	5.04	
	1.04	N 61°30'W				
	6.664	N 61°30W	13°24'		4.85	
	3.890	N 75°W		14°56'	4.96	
	3.69	N 60°05W				
PT	5.266	N 60°05'W		22°16	5.04	
	.10	N 37°55'W				
	.71	N 37°55'W				
PI	2.883	" " "	27°46		5.06	
	0.836	N 65°40'W			4.82	.46
	0.646	" "		42°19'	4.96	4.16
PP	1.163	N 23°30W	32°10		5.06	11.27
PP	1.212	N 55°30W				

4.96 / 5.26 / 10.22 — 40 — n J. Iver — 4.53 / 4.13 / .40 — 2.95 / 4 / 3 — 129

at fill

this pt is .03 ft. E of line as described on preceding page
enter A. L. & Beckie Allen st,
this pt. is 0.32 of a rod W side of center st,
this pt. is also 0.31 S of S. side st.
to W side of st, enter Nielsen house
S line of field pt,
to N link fence st
this pt is on E and on W line of N. J. Larsen
" " was moved .4' lower which .133 N
enter Chas Jensen land
enter Samuel Anderson land
line Chas. Jensen land
to PI in S. Anderson land

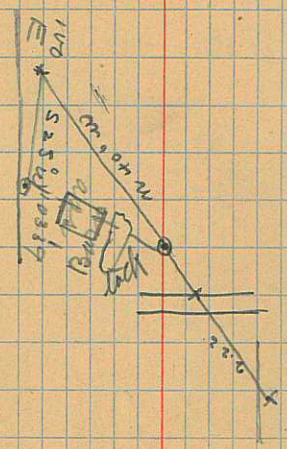
1.90 — 3.99 — see sketch this pt is 3.99 low
this pt. is 0.32 of a rod S. Anderson W line

enter Hyrum Anderson land
to PI
to PI
to Hyrum Andersons W line at
.06 E of W side st - this should be a
W side st enter Christian Jensen
leave Christian Jensen enter Andersen
~~Barn 25' N of this pt~~ beg. of pipe

4.60 — " " " " " " "

5.26 — SW cor. Barn .06 N 45° E
this was lowered 1' for more slope

see next


Mt. Ida
Mt. Ida
Bldg
Bldg
Bldg

	dist	Course	Angles —	R	AI	RP
PI	1,212	N55°30W		20°24	4.88	
	0.10	N35°W				
PI	1.485	N35°W	11°13		5.05	
	.05	N46°30W				
	1.12					
PI	2.245	N46°30W	13°31		4.650	
PT	3.303	N59°55W	3°35		5.05	
	.04	N61°30W				
PI	3.16	N61°30W	13°33		5.09	
	.03	N77°W				
PI	1.95	" "	23°37		4.43	
PI	2.927	S79°30W	22°01		4.93	
	.04	S57°05W				
	1.07	" " "				
PT⊗	2.736		71°15		5.000	
PI	0.193	S14°10E		79°33	5.29	
	3	S65°30W				
	3.43	" "				
	5.26	" "				
	7.08	"				
PI	9.59	" "	6°51		5.20	.485
PT	4.504	S59°55W			5.18	

⊗ is no detail pt. but this

5.29 / 4.65 / .44 / 5.09 / 4.20 / 2.59 / 2.29 / 1.50

cut	fill	Remarks
		to Andersons West line from C Larsen
		to S side st. leaves from C Larsen
		to N side st enter Christen Jensen
		" " "
		leave C Jensen enter James C Jensen
		leave James C Jensen enter Beck Allen
1.50		exits N side of
		Leave Beck Allen — enter 10.0 Nelsons
		to pt .06 S of S E cor 10.0 Nelsons
		this pt about 1rd N of old ditch which
3.75		cross old ditch
		enter N.W. Nelsons land not
		leave 10.0 Nelsen land fm
		leave N J Nelsen on N side field st
		enter N J Nelsen on S " " "
.44		in " " " land & orchard

139

Last	Course	∠ angles	R	HI	RR
PI 4.504	S59°55W	7°32		5.18	
PI 2.177	S51°40W		2.2°	5.03	
PI 4.564	S73°05'W	100°21		5.11	
2.846	S26°55E		69°43'	4.99	
0.624	S42°30W		83°26'	5.09	
1.99	N54°05W	20°45'		4.94	
1.147	N74°55W	28°51		4.89	
2.467	S76°20W	69°07			
6.29	S7°30W		(corrected bearing from 2 cor.		7°35'
2.467	S71°20W	24°52	mag var. 18°05 E		
.05	S51°55W		note drove a peg S of SE cor of 32, 11 N 1 E on south side of st on line		
3.13					
3.63					
10.12					
11.67	" "				
11.67 +10'					

	BS.	direct FS.	Level Elev	check HI	work
	9.25				
		1.91			
	7.85	2.77			
	17.10				
	4.68	4.684	(on Bm mail in Tel. post at Brown's place		
	12.42				

cut fill

4.89
1.50
6.39

5.107
4.94
.167

135

in N.J. Nelsons land
from this pt can I must go 5.26° W. 28 ↑
pt of fleume on N.J. Nelsons land
N 5°
N 5° meiton Land

no datch at the
To S E cor. Sec 31 Tp 11 N R 1 E

leave N.J. Nelsen onto Clara Nielsen
Peter Christgens
in Clarence Nelsen enter ↑
to Peter Christgens enter E Brown
to Ezra Brown's W at Cave
enter from C Nelsen
to stake
to old ditch from Paradise

to datch from Paradise
on stake where new ditch runs on

136

Bar for
N.C. Nielsen at Hyrum
Spring bears N 77° 38 W
37.02 chains from S E cor
sec. 32, Tp. 11 N. R 1 E.

also S 36° 30 E. 6.456 chs
from a point
from a point 13.12 chains
N of SW cor of S E ¼

6.456
66
38736
38736
426.096

37

102.23
102.21
204411
2 | 1.02.22

179.60
102.23
77 37

179.60
102.22
77 38

13.12
7.93
5.19

Log 3.84 = 0.58433
Log 5.19 = 0.71517
T. 86916

Log = 5.19 = +1-1 0.71517
36° 30 36°30 = = T. 90518
0.80999
6.456

3.84
7.93
13.12
5.19
36.16
N 77° 38' W 37.02

Log sin 77° 38' = T. 98980
37.0 + = 1.56844
ω = 77° 38 = 1.55824
T. 33075
37.02 = 1 56844
0.89919
= 36.16
= 7.93

40.00
36.16
3.84

137

138

Sur for
Chas Edefson

35.50
.36
35.86

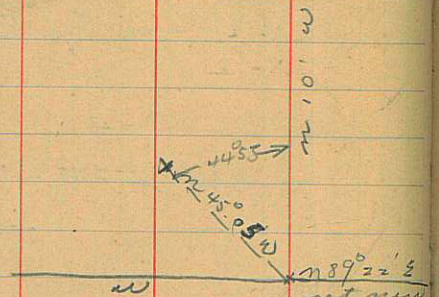
to fine Jess's

35.50
5 43
40 93

36
.17
.53

5.43
36
5,17

35.50
5 00
40 50
40 21
.29



N 89 18
89° 22'

E

60 21 10
5 5

28950
44 8.5

139

44 55
1 0.
45 05

89 60
45 05
44 55

45 09
45 05

44 55
1 14
45 69
4

89 60
45 05
44 55

79
63
1.2 2

9.802
3
29.406
50
29.906
5.60
35.50

40.20
35 50
4.71

9.802
9.802
19604

20
15.50
35.50
29.90
5,60

Sta No	Dist	Course	angles L	angles R	HI
0					
1	193'	N 62°04' W			
2	61.6	N 62°04' W	136°33		
3	77	S 17°05 E			
4	143.8	S 17°05' E		20°42'	
5	155.1	S 3°15 W	14°16'		
6	285.3	S 10°30' E		28°23	
7	1.634	S 18°35 E		30°24'	
8	234.6	S 49° W	14°44		
9	321.7	S 35° W	80°16'		
10	4.4'	S 44°30' E	0 0		4.58
11	216	" " "	0 0	-31°58	4.40
12	116	" "	0	-33°42	

Example turn 7 to 8 = 23 ft 6 ft

	BS	FS		Lower station
12	5.12	6.		
		6.140		5.687

see over for levels from No 0.

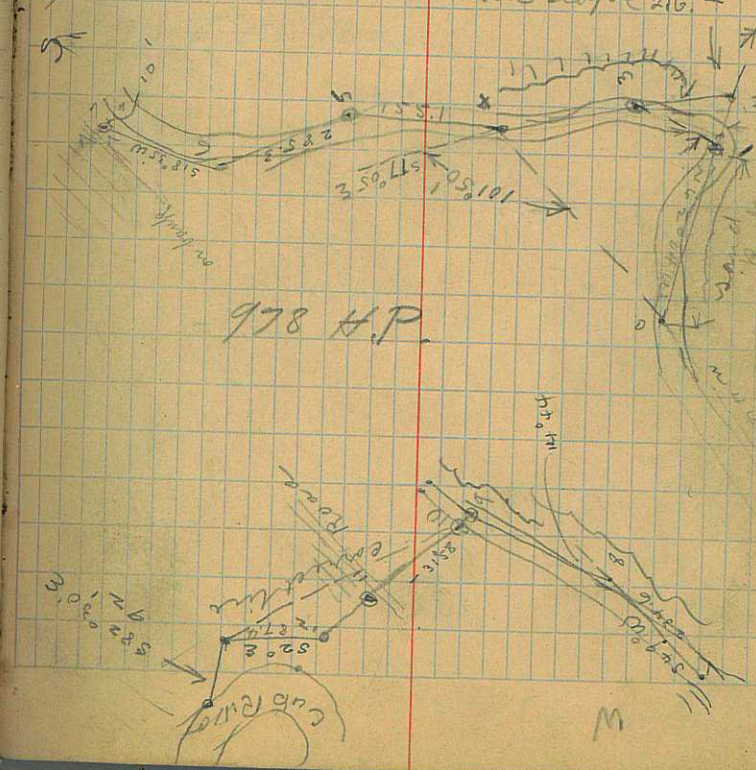
Cub R. Skeleton and notes

141

in center of Canal to P.I.
(Note! from sta 1 to 3 = 53.7)

note needle at at 6+7 was drew

9 is in bed of old canal
from sta 10 - 31° 58' on slope 216'
6.88 - 4.58 = lower



Sta No.	BS.	FS	IM	Ele	HI
0	7.48			100.00	107.48
1	8.07		8.107	99.36	
2			3.394	104.086	
3			8.35	99.13	
4			9.17	98.31	
5			9.21	98.27	
TP 6		10.78		96.706	
6	6.404				103.161
7			7.05	96.05	
TP 8		7.313		95.788	
8	5.962				101.750
10	19.843		5.24	96.50	
9		7.52		94.23	
		25.6 | 3			
		19.843			
		5.770 ft.			

In bed of old canal

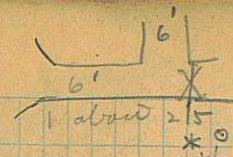
BM on stub-up hollow PI
in bed of old canal

BM on top of stake on bank
in bed of canal on bed rock
where pipe goes down

Levels at Whitney Canal April 17 1906

Sta	BS.	FS	IM	Ele	HI
0	9.60			97.16	
1			11.32	95.44	
TP 2					
2+65	—	6.762		100.00	106.762
2+65	3.70			100.00	103.700
2+65 —			8.76	94.94	
3			9.65	94.05	
4			10.04	93.16	
5			10.52	93.18	
6			10.68	93.02	
7			10.85	92.85	
TP		3.37		100.33	
8	2.032		9.55	92.81	102.362
9			9.82	92.54	
TP		8.814		93.548	
TP.	7.987				101.535
10			9.05	92.48	
11			9.85	91.68	
12			10.21	91.32	
13			10.90	90.63	
14			11.30	90.23	
TP		10.173		91.362	
	6.200				97.562
15			3.78	93.78 on bank R	
15			8.20	89.36	
16			8.00	89.56	
17			5.28	92.28	
17			8.50	89.06	
BM			1.03	96.537	

Bridge over canal



at old Headgate at floor in flume
Reading
in bed of Canal 12 feet wide
at lower headgate at spike on bank
on hub
in bed of flume.
in bed of old Canal

11' ⊕
11' ⊕
12 ⊕

12 ⊕
10 +

8'
8'
8'
10.
8'

south bank
at this pt line of stakes was put in
1.70 ⊕
old corr
P.C
2.30
P.C
on hub by ~~station~~ wood post about 30' N of
Bridge over canal

Sta	BS.	FS	HI	Ele	HI
18			8.55	89.01	97.562
19			5.30	92.26	
19			8.90	88.66	
TP 20		4.69		92.872	
TP	0.54				93.412
20			4.89	88.52	
21			5.00	88.41	
22			1.40	92.01	
22			5.63	87.78	
23			1.30	92.11	
23			5.70	87.71	
24					
25			2.80	90.61	
25			6.40	87.01	
26			0.85	92.56	
26			7.00	86.41	
TP		5.18			
TP	8.253			88.232	96.485
27			10.00	86.48	
27			6.20	90.28	
			9.61 in	86.87	
TP Bm		0.49		95.995	→
27+78					
TP Bm	1.630				97.625
28			11.20	86.32	
	8.464	11.607		86.018	94.486
29			10.60	83.88	
30			11.75	82.73	
30			4.30	90.28	
31			5.50	88.98	
32			11.75	82.73	
TP 32			6.60	87.88	
TP 32	9.310	11.897		82.589	91.899
33			9.32	82.579	
34			4.70	87.20	
TP 34+	3.852	9.576		82.323	86.175
35			4.50	81.67	
TP 36		7.447		78.728	
36	10.937				89.665
36			3.00	86.66	

c.b. 11'
bed c. 10'
on stake on canal bank
c.b.e. 10'
" " 8'
c.b. 8'
c.b. 11.00
c bed 10.00
c b/k
c bed 9.1
c bank in reach to downstream
{on hub west about 20' from where
{small creek flows into canal
at creek
c bed
c bank
c bed
c bank
c bed
c bank
on stake in c. bed
c bed
c bank
Can cancel bed off stake 4'
in c bed below this sta a quick (6'
drop of 1 foot.
on canal bed

on canal bank at sta 36 reference stakes were driven on both banks

198 April 18 1906

Sta	BS	FS	HI	Elev	
37			11.70	77.96	89.665
38			12.10	77.56	
39			5.20	84.46	
40			12.73	76.93	
41			13.50	76.16	
TP 41		6.306		83.359	
41	3.660			84.02	87.019
42.42			3.00 bank	75.77	
42+95			11.25		
BM 42.95			8.485	78.534	
43			11.65	75.37	
TP		7.194		79.825	
	3.470				83.295
44			4.00	79.29	
44			8.75	74.54	
45			9.15	74.14	
46			8.55	74.74	
46			4.20	79.09	
47			9.05	74.24	
48			9.25	74.04	
48			6.05	77.24	
49			9.20	74.09	
TP			Reading lost I moved		
	8.012	6.717		78.534	86.546
TP 49-49				79.829	
49+49	3.387	8.637		83.216	
50	7.736			74.579	82.315
51			8.55	73.76	
51			5.60	76.71	
52			8.10	74.21	
53			9.05	73.26	
53			9.20	73.11	
54			5.00	77.31	
at I 55			8.80	73.51	
56			9.60	72.71	
56			9.60	72.71	
57			6.50	75.81	
58			10.00	72.31	
58			10.50	71.81	
59			6.60	75.71	
60			10.80	71.51	
61			10.50	71.81	
61			10.99	71.32	
TP		8.302	7.97	74.34	
				74.013	

Transferred to field book 116 Rods

8.485
7.194
1.291

8.012
1.291
6.721

198 Width

on canal bank 8'
and bed 6'
" " bank turning point
" " bed
to fence running N & S
BM is a 6"x12" pine post about 50' S. of Canal
on Canal bed (5' west of fence)
TP on bank about 43+80. bet 43+44 a sharp c. 8'
canal bank 7'
14'
on bank 10'
8'
on bank

on bank near sta 42+95 at pine post

bed equal at this point R.f stakes 16'
on bank 16'
10'
bank 16'
10'
bank 14'
bank 9'

At Preston for H.C.E. & P.C.

April 10/06

Fair	Ernest & I	2.40
Stakes		.50
Dinner April 10		.50
Supper "		.50
Beds	at Preston	.50
All my expense		4.40

Frank Taylor has two teams

At Cub River

April 14

Fair Ernest and I 1.70

Went up curb rim Carl, Joe, Jim, Ernest, Roy Merrill, Glen Lewis

April 15. I worked 14 hours on maps 6.00

Ernest 0.

April 16. Ernest, Roy Glen and I went up Cub River.

Expenses

Ernest paid Hendricks		1.75
" plug potatoes		.25
Eugen " April 16		1.90
Bacon at Franklin		#5
Butter 2 pounds		40

April 17. Ernest, Roy Glen and I up curb sur. all day

Expense

Ernest eggs 10¢ hay 10¢		20
		20
Eugen eggs		30
	Total	30

also got 50¢ hay at Chadwick not paid as he was not home

May

4. cross sectioning

5. R. G. E. & I 12 meals

6 I went home sick.

8 I went up to Richmond with Herbert and buggy

R. G. E. & 1/2 day crossing 8 meals. 1 meal 1 day .40

9 R. G. E & I cross sections 1/2 day, 4.80

R. G. E worked 1/2 on 9. for Wm Lewis on Cantel

12 meals

10. R. G. E and all day Sun, 12 meals

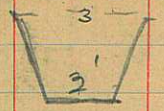
11

R. G. E & I sur all day weasurt had 8 meals up Monday

152

11.90 11.80 11.80

12.30 9.70 2.60 8.30 3.50



300 900

1800 27

2400 27 88 240

216 24 315.2

9.72

10.00 7.27 2.73

5. 20

64 8 512 160 9 1449

Log 892 = 2.950 36 3

6460 12800 2

8.85108

= 709,710,000189

2 × 80² = 12800 512

2×80×9 1440 197.710

9² 81 128970

14321 6874000000

890 890 800 80 120 702100

2×890² = 792100

9465 3/5 9.839 3.00 8.7 1

625 30

700 18750 2.50

50 46.00

375000000 550

3300 685

4500 4200 3000 528.00

506 46 460

.20 100 2.000

10 20

.0004 153.0000 0002.24000

Job. F. Smiths Locs

Beg at the NW cor of the SW sec 27. E 20 ch. S. 8.41. Westly 20 ch. N 8. chain. To beg.

also Beg at NE cor of the SE sec 28. S. 8.88. N 89° 32 W 3.13 ch to co 12. N 50 E. 8.85 ch To sec. E 3 chain to beg

1.147 66 6882 6882 75702 1.020408 30280 15140 4 .154432 08

10 .924 .383 184 76 11.08 4.59

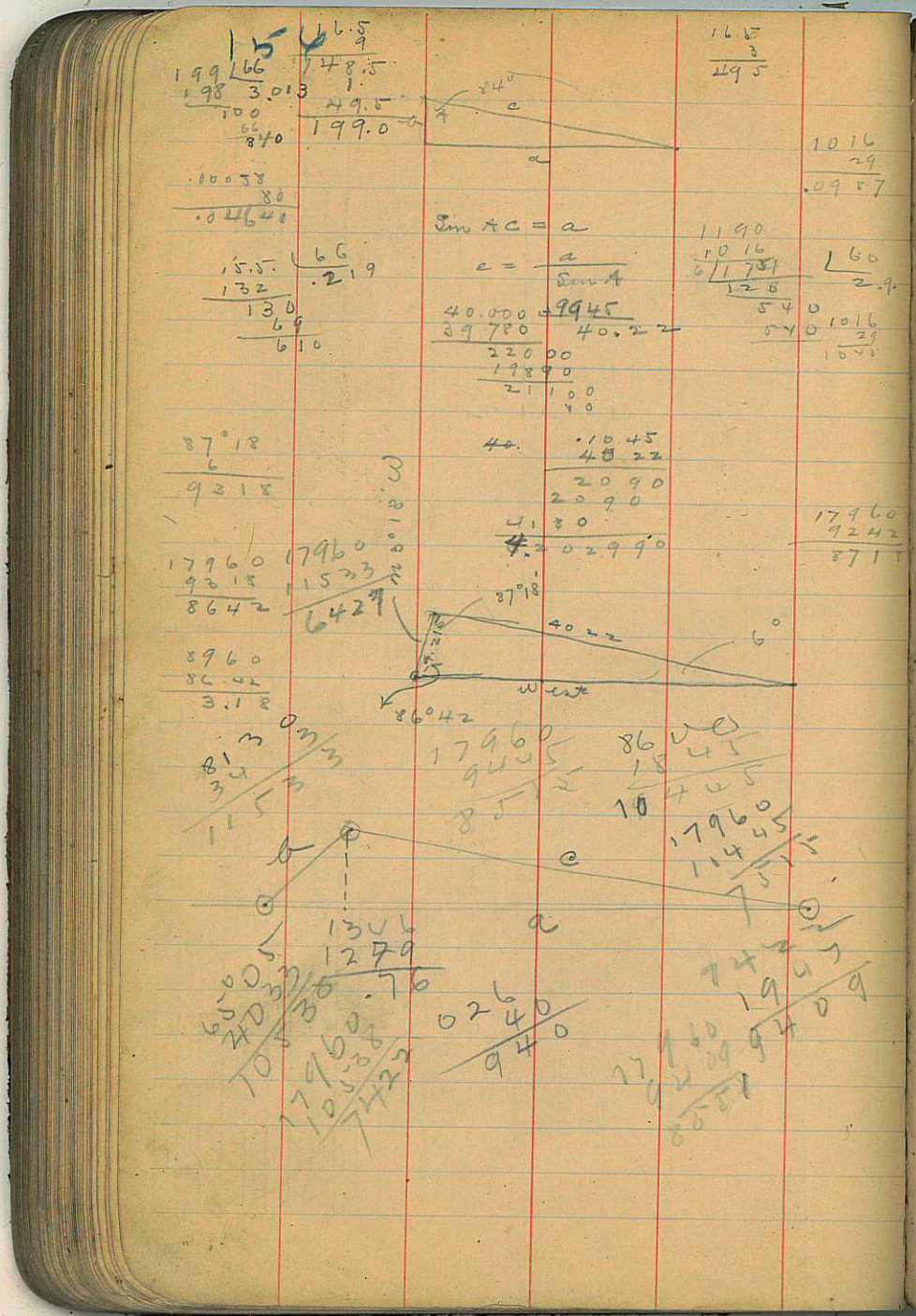
59.00 3.00 1.899 44 55,948

154



155

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36



KEITH'S RAILROAD CURVE TABLES.

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HOW TO USE KEITH'S TABLES.

EXAMPLE.

Wanted a Curve with an Ext. of about 12 ft. Angle of Intersection or I. P.=23° 20′ to the R. at Station 542+72.

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

Tan. in Tab. IV opp. 23° 20′=1183.1
1183.1÷10=118.31.

Tab. V. correction for A. 23° 20′ for a 10° Cur.=0.16
118.31+0.16=118.47=corrected Tangent.

(If corrected Ext. is required find in same way)
Ang. 23° 20′=23.33°÷10=2.3333=L. C.

2° 19½′=def. for sta.	542	I. P.=sta.	542+72
4° 49½′= " " "	+50	Tan.=	1.18.47
7° 19½′= " " "	543	B. C.=sta.	541+53.53
9° 49½′= " " "	+50	L. C.=	2.33.33
11° 40′= " " "	543+	E. C.=sta.	543+86.86
	86.86		

100—53.53=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.

Def. for 36.86 ft.=1° 50½′ for a 10° Curve

(These tables are published in Field Books of KEUFFEL & ESSER Co., New York, N. Y.)

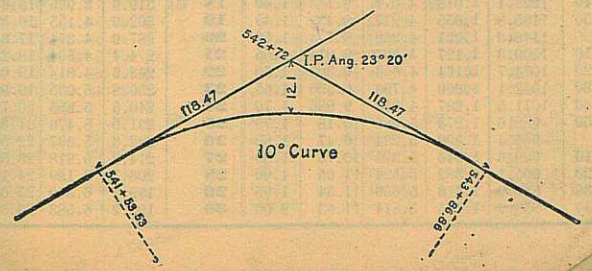


Table VI. Deflections for Sub Chords for Short Radius Curves.

Degree of Curve	Radius 50 / sin. def. ang.	½ sub chord / R = sin of def. angle 12.5 Ft.	15 Ft.	20 Ft	25 Ft.	Length of arc for 100 ft.
30°	193.18	1° 51′	2° 17′	2° 58′	3° 43′	101.15
32°	181.39	1° 59′	2° 25′	3° 10′	3° 58′	101.33
34°	171.01	2° 06′	2° 33′	3° 21′	4° 12′	101.48
36°	161.80	2° 13′	2° 41′	3° 33′	4° 26′	101.66
38°	153 58	2° 20′	2° 49′	3° 44′	4° 40′	101.85
40°	146.19	2° 27′	2° 57′	3° 55′	4° 54′	102.06
42°	139.52	2° 34′	3° 05′	4° 07′	5° 08′	102.29
44°	133 47	2° 41′	3° 13′	4° 18′	5° 22′	102.53
46°	127.97	2° 48′	3° 21′	4° 29′	5° 36′	102.76
48°	122.92	2° 55′	3° 29′	4° 40′	5° 50′	103.00
50°	118 31	3° 02′	3° 38′	4° 51′	6° 04′	103.24
52°	114 06	3° 09′	3° 46′	5° 02′	6° 17′	103 54
54°	110.11	3° 16′	3° 54′	5° 13′	6° 31′	103.84
56°	106.50	3° 22′	4° 02′	5° 23′	6° 44′	104.14
58°	103.14	3° 29′	4° 10′	5° 34′	6° 57′	104 43
60°	100.00	3° 35′	4° 18′	5° 44′	7° 11′	104.72

CURVE FORMULAS.

$T = R \tan \frac{1}{2} I$

$T = \frac{50 \tan. \frac{1}{2} I}{\text{Sin. D}}$

$\text{Sin. D} = \frac{50}{R}$

$\text{Sin. D} = \frac{50 \tan. \frac{1}{2} I}{T}$

$R = T \cot. \frac{1}{2} I$

$R = \frac{50}{\text{Sin. D}}$

$E = R \text{ ex. sec. } \frac{1}{2} I$

$E = T \tan \frac{1}{4} I$

$\text{Chord def.} = \frac{\text{chord}^2}{R}$

$\text{No. chords} = \frac{\frac{1}{2} I}{D}$

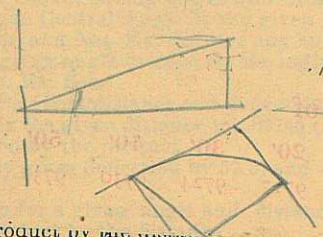
Tan. def. = ½ chord def.

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve, very nearly.

Table IV. contains Tangents and Externals to a 1° curve. Tan. and Ext. to any other radius may be found. nearly enough, by dividing the Tan. or Ext. opposite the given Central Angle by the given degree of curve.

To find Deg. of Curve, having the Central Angle and Tangent: Divide Tan. opposite the given Central Angle by the given Tangent.

To find Deg
Ext. opposite the
To find. Nat
or Ext. of twice
the Nat. Tan. or
To find angl
Rule 1. Mu
divide given def
Rule 2. Mu
the given distan
To find defl
by .01745, and the product by the distance.



Right Angle Triangles.— Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt 10. $10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. 25. $25^2 \div 200 = 3.125$. $100 - 3.125 = 96.875$ = Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

Natural Sines

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	6428	6450	6472	6494	6517	6539	49
1	0175	0204	0233	0262	0291	0320	88	41	6561	6583	6604	6626	6648	6670	48
2	0349	0378	0407	0436	0465	0494	87	42	6691	6713	6734	6756	6777	6799	47
3	0523	0552	0581	0610	0640	0669	86	43	6820	6841	6862	6884	6905	6926	46
4	0698	0727	0756	0785	0814	0843	85	44	6947	6967	6988	7009	7030	7050	45
5	0872	0901	0929	0958	0987	1016	84	45	7071	7092	7112	7133	7153	7173	44
6	1045	1074	1103	1132	1161	1190	83	46	7193	7214	7234	7254	7274	7294	43
7	1219	1248	1279	1305	1334	1363	82	47	7314	7333	7353	7373	7392	7412	42
8	1392	1421	1449	1478	1507	1536	81	48	7431	7451	7470	7490	7509	7528	41
9	1564	1593	1622	1650	1679	1708	80	49	7547	7566	7585	7604	7623	7642	40
10	1736	1765	1794	1822	1851	[illegible]	79	50	7660	7679	7698	7716	7735	7753	39
11	1908	1937	1965	1994	2022	2051	78	51	7771	7790	7808	7826	7844	7862	38
12	2079	2108	2136	2164	2193	2221	77	52	7880	7898	7916	7934	7951	7969	37
13	2250	2278	2306	2334	2363	2391	76	53	7986	8004	8021	8039	8056	8073	36
14	2419	2447	2476	2504	2532	2560	75	54	8090	8107	8124	8141	8158	8175	35
15	2588	2616	2644	2672	2700	2728	74	55	8192	8208	8225	8241	8258	8274	34
16	2756	2784	2812	2840	2868	2896	73	56	8290	8307	8323	8339	8355	8371	33
17	2924	2952	2939	3007	3035	3062	72	57	8387	8403	8418	8434	8450	8465	32
18	3090	3118	3145	3173	3201	3228	71	58	8480	8496	8511	8526	8542	8557	31
19	3256	3283	3311	3338	3365	3393	70	59	8572	8587	8601	8616	8631	8646	30
20	3420	3448	3475	3502	3529	3557	69	60	8660	8675	8689	8704	8718	8732	29
21	3584	3611	3638	3665	3692	3719	68	61	8746	8760	8774	8788	8802	8816	28
22	3746	3773	3800	3827	3854	3881	67	62	8829	8843	8857	8870	8884	8897	27
23	3907	3934	3961	3987	4014	4041	66	63	8910	8923	8936	8949	8962	8975	26
24	4067	4094	4120	4147	4173	4200	65	64	8988	9001	9013	9026	9038	9051	25
25	4226	4253	4279	4305	4331	4358	64	65	9063	9075	9088	9100	9112	9124	24
26	4384	4410	4436	4462	4488	4514	63	66	9135	9147	9159	9171	9182	9194	23
27	4540	4566	4592	4617	4643	4669	62	67	9205	9216	9228	9239	9250	9261	22
28	4695	4720	4746	4772	4797	4823	61	68	9272	9283	9293	9304	9315	9325	21
29	4848	4874	4899	4924	4950	4975	60	69	9336	9346	9356	9367	9377	9387	20
30	5000	5025	5050	5075	5100	5125	59	70	9397	9407	9417	9426	9436	9446	19
31	5150	5175	5200	5225	5250	5275	58	71	9455	9465	9474	9483	9492	9502	18
32	5299	5324	5348	5373	5398	5422	57	72	9511	9520	9528	9537	9546	9555	17
33	5446	5471	5495	5519	5544	5568	56	73	9563	9572	9580	9588	9596	9605	16
34	5592	5616	5640	5664	5688	5712	55	74	9613	9621	9628	9636	9644	9652	15
35	5736	5760	5783	5807	5831	5854	54	75	9659	9667	9674	9681	9689	9696	14
36	5878	5901	5925	5948	5972	5995	53	76	9703	9610	9617	9624	9630	9637	13
37	6018	6041	6065	6088	6111	6134	52	77	9744	9750	9757	9763	9769	9775	12
38	6157	6180	6202	6225	6248	6271	51	78	9781	9787	9793	9799	9805	9811	11
39	6293	6316	6338	6361	6383	6406	50	79	9816	9822	9827	9833	9838	9843	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	9848	9853	9858	9863	9868	9872	9
81	9877	9881	9886	9890	9894	9899	8
82	9903	9907	9911	9914	9918	9922	7
83	9925	9929	9932	9936	9939	9942	6
84	9945	9948	9951	9954	9957	9959	5
85	9962	9964	9967	9969	9971	9974	4
86	9976	9978	9980	9981	9983	9985	3
87	9986	9988	9989	9990	9992	9993	2
88	9994	9995	9996	9997	9997	9998	1
89	9998	9999	9999	9999	1.0000	1.0000	0
DEG.	60′	50′	40′	30′	20′	10′	DEG.

Natural Cosines

Natural Tangents

DEG	0′	10′	20′	30′	40′	50′	DEG.	DEG.	0′	10′	20′	30′	40′
0	0000	0029	0058	0087	0116	0145	89	40	8391	8441	8491	8541	8591
1	0175	0204	0233	0262	0291	0320	88	41	8693	8744	8796	8847	8899
2	0349	0378	0407	0437	0466	0495	87	42	9004	9057	9110	9163	9217
3	0524	0553	0582	0612	0641	0670	86	43	9325	9380	9435	9490	9545
4	0699	0729	0758	0787	0816	0846	85	44	9657	9713	9770	9827	9884
5	0875	0904	0934	0963	0992	1022	84	45	1.0000	1.0058	1.0117	1.0176	1.0235
6	1051	1080	1110	1139	1169	1198	83	46	1.0355	1.0416	1.0477	1.0533	1.0599
7	1228	1257	1287	1317	1346	1376	82	47	1.0724	1.0786	1.0850	1.0913	1.0977
8	1405	1435	1465	1495	1524	1554	81	48	1.1106	1.1171	1.1237	1.1303	1.1369
9	1584	1614	1644	1673	1703	1733	80	49	1.1504	1.1571	1.1640	1.1708	1.1778
10	1763	1793	1823	1853	1883	1914	79	50	1.1918	1.1988	1.2059	1.2131	1.2203
11	1944	1974	2004	2035	2065	2095	78	51	1.2349	1.2423	1.2497	1.2572	1.2647
12	2126	2156	2186	2217	2247	2278	77	52	1.2799	1.2876	1.2954	1.3032	1.3111
13	2309	2339	2370	2401	2432	2462	76	53	1.3270	1.3351	1.3452	1.3514	1.3597
14	2493	2524	2555	2586	2617	2648	75	54	1.3764	1.3848	1.3934	1.4019	1.4106
15	2679	2711	2742	2773	2805	2836	74	55	1.4281	1.4370	1.4460	1.4550	1.4641
16	2867	2899	2931	2962	2994	3026	73	56	1.4826	1.4919	1.5013	1.5108	1.5204
17	3057	3089	3121	3153	3185	3217	72	57	1.5399	1.5497	1.5597	1.5697	1.5798
18	3249	3281	3314	3346	3378	3411	71	58	1.6003	1.6107	1.6212	1.6319	1.6426
19	3443	3476	3508	3541	3574	3607	70	59	1.6643	1.6753	1.6864	1.6977	1.7090
20	3640	3673	3706	3739	3772	3805	69	60	1.7321	1.7437	1.7556	1.7675	1.7797
21	3839	3872	3906	3939	3973	4006	68	61	1.8040	1.8165	1.8291	1.8418	1.8546
22	4040	4074	4108	4142	4176	4210	67	62	1.8807	1.8940	1.9074	1.9210	1.9347
23	4245	4279	4314	4348	4383	4417	66	63	1.9626	1.9768	1.9912	2.0057	2.0204
24	4452	4487	4522	4557	4592	4628	65	64	2.0503	2.0655	2.0809	2.0965	2.1123
25	4663	4699	4734	4770	4806	4841	64	65	2.1445	2.1609	2.1775	2.1943	2.2113
26	4877	4913	4950	4986	5022	5059	63	66	2.2460	2.2637	2.2817	2.2998	2.3183
27	5095	5132	5169	5206	5243	5280	62	67	2.3559	2.3750	2.3945	2.4142	2.4342
28	5317	5354	5392	5430	5467	5505	61	68	2.4751	2.4960	2.5172	2.5386	2.5605
29	5543	5581	5619	5658	5696	5735	60	69	2.6051	2.6279	2.6511	2.6746	2.6985
30	5774	5812	5851	5890	5930	5969	59	70	2.7475	2.7725	2.7980	2.8239	2.8502
31	6009	6048	6088	6128	6168	6208	58	71	2.9042	2.9319	2.9600	2.9887	3.0178
32	6249	6289	6330	6371	6412	6453	57	72	3.0777	3.1084	3.1397	3.1716	3.2041
33	6494	6536	6577	6619	6661	6703	56	73	3.2709	3.3052	3.3402	3.3759	3.4124
34	6745	6787	6830	6873	6916	6959	55	74	3.4874	3.5261	3.5656	3.6059	3.6470
35	7002	7046	7089	7133	7177	7221	54	75	3.7321	3.7760	3.8208	3.8657	3.9136
36	7265	7310	7355	7400	7445	7490	53	76	4.0108	4.0611	4.1126	4.1653	4.2193
37	7536	7581	7627	7673	7720	7766	52	77	4.3315	4.3897	4.4494	4.5107	4.5736
38	7813	7860	7907	7954	8002	8050	51	78	4.7046	4.7729	4.8430	4.9152	4.9894
39	8098	8146	8195	8243	8292	8342	50	79	5.1446	5.2257	5.3093	5.3955	5.4845
DEG	60′	50′	40′	30	20′	10′	DEG.	DEG.	60′	50′	40′	30′	20′

Natural Cotangents

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.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1½ TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

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