76

HERBERT
NO. 4 HS

July 1938

~~Tremonton~~

~~Water Works~~

Eugene Schaub

Logan Utah

L. B. Stark

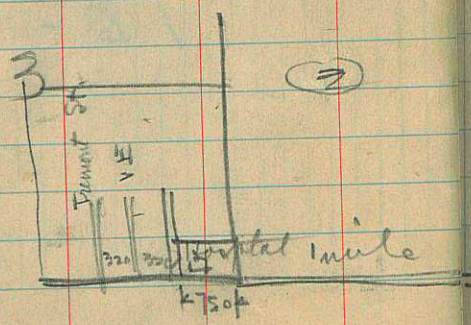
other than

Tremonton

10-30-1939

6-17-38

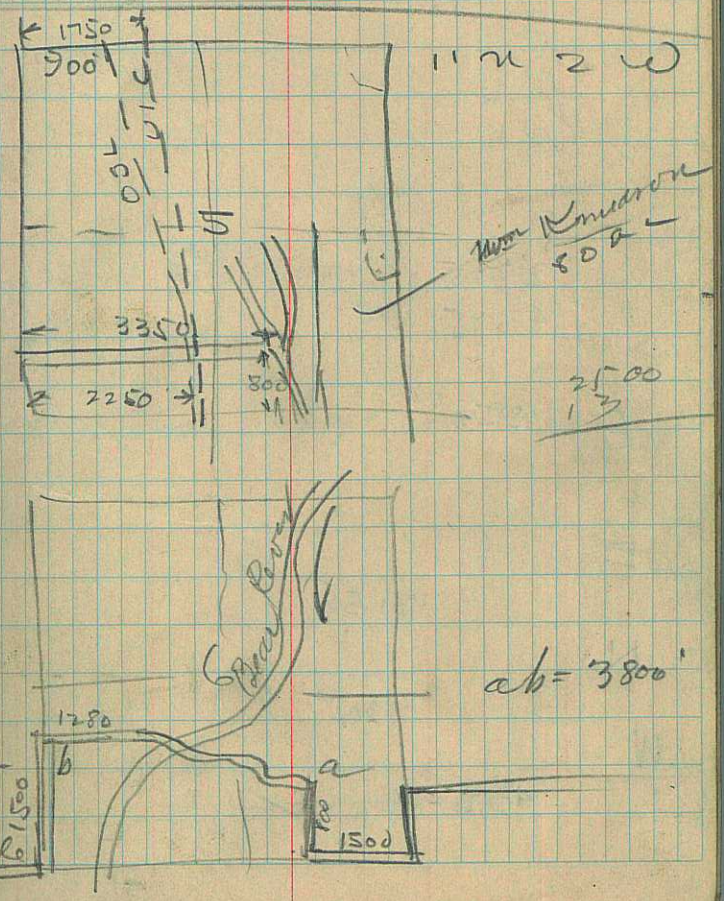
4375
4460
4795
4540



Barometric readings

Main St.

RR intake
main control of 7 users



Bar. Speed

4405
4375

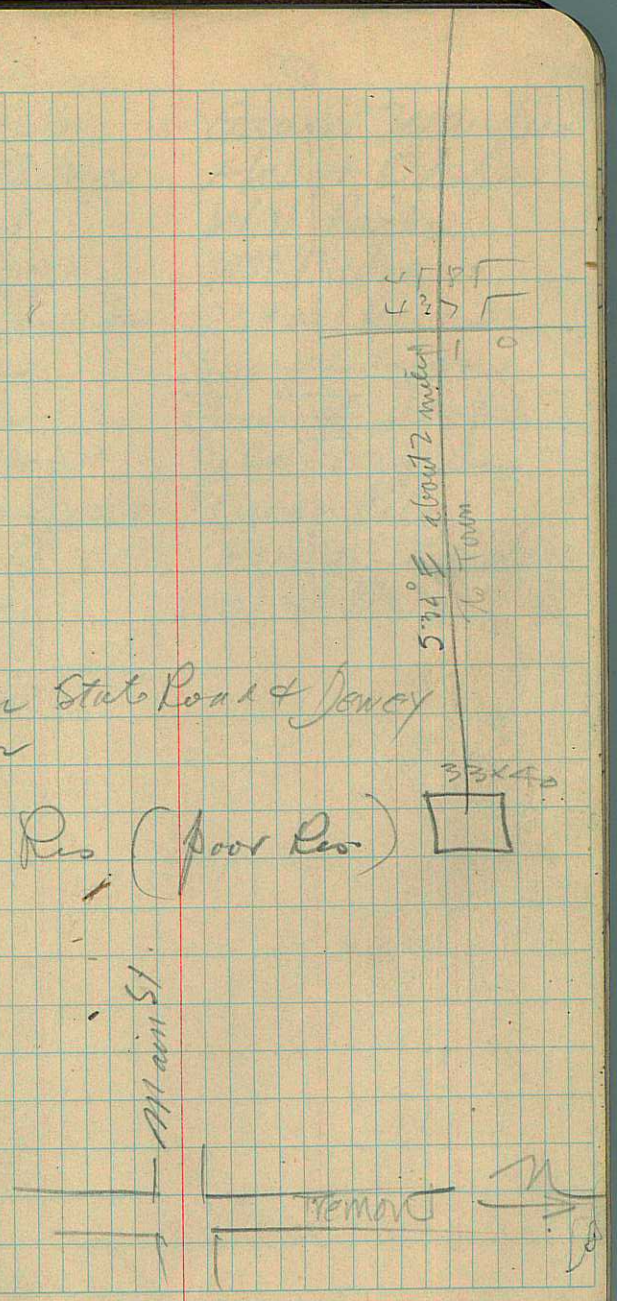
4585.0

E
N
W

931.55

930.5

4375 56927.72

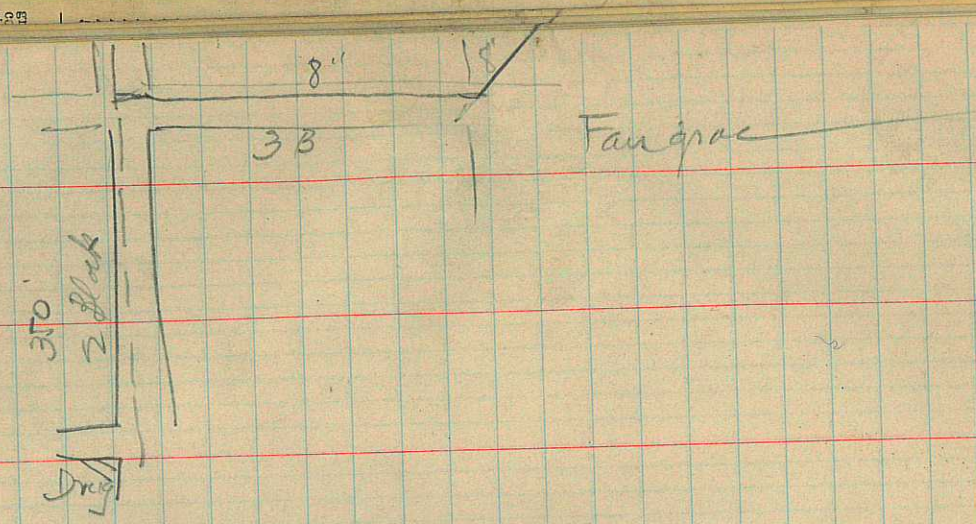


LPS Upper	Geo. W Waugh
Logan Northern	Heber Olson
LHP Canal	Will Perks
	Will Andrew
Logan Leland	Oscar Rice
Rossmore	Joe Wilson
7th Ward	Frederick Ashop
Logan Hollow	John Olson Sr.
Petersburg Pioneer	Oscar Rice
West Field	Earnest Knowles
Thatcher	W W Hall

July 18 - 1938
J Sped
4350 57166.5

Trimorton

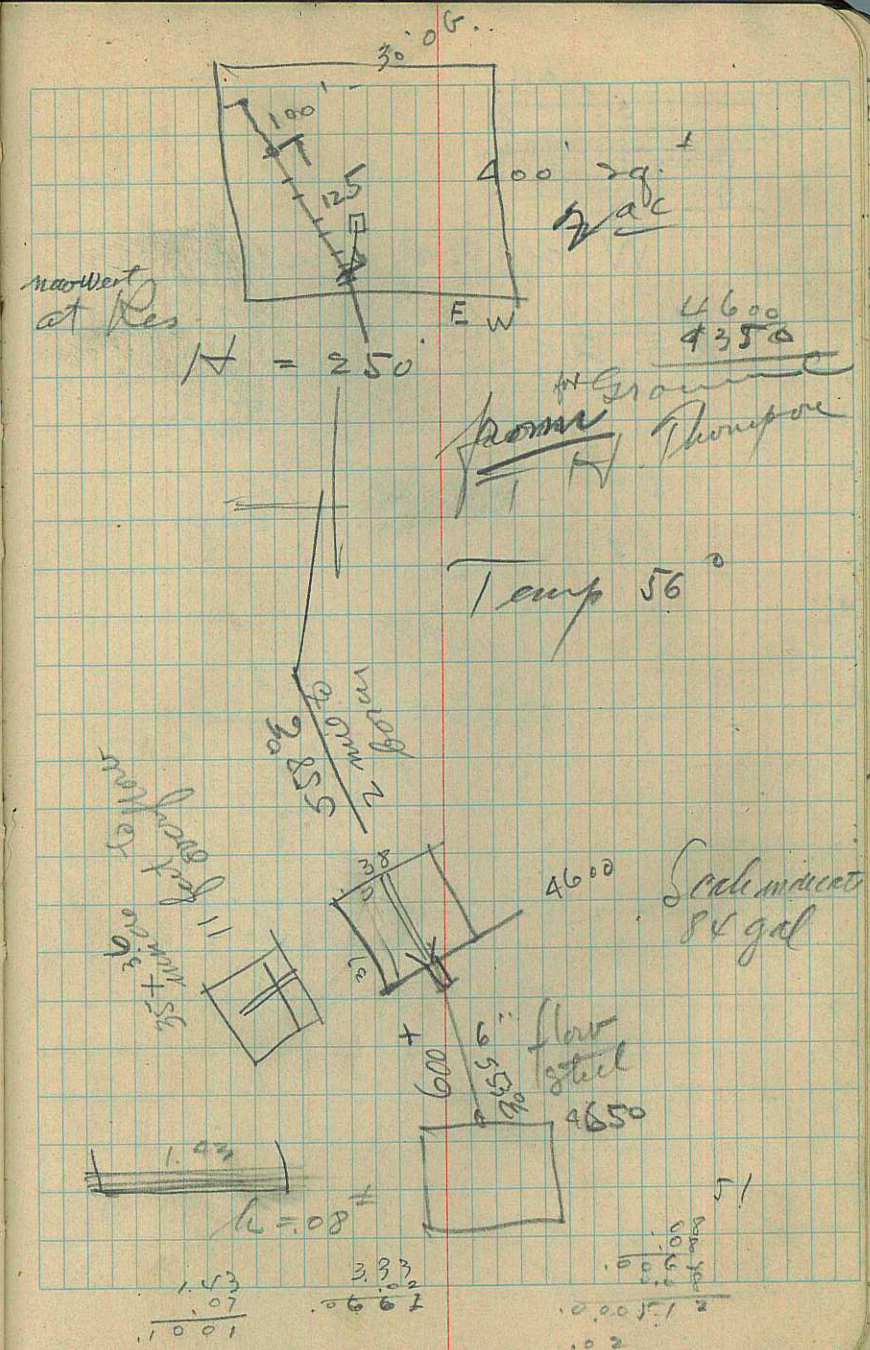
Trimorton at Cor Adams & Oreg


8'
18'
3B
Fan grac
350
2 block
Drug

4350

4600

4350 back in Town
later at 11 am



W > 1.32 net

h = 2.01
.11
90

.201
.11
.091

.09
.09
.0081
.09
.000729 .028
.07
40 | 4
3.29

.028
1.32
.028
1.056
2.64
.03696

3.33
.037
2331
999
.12321
.4110
6150
492
.5535 gal

Speed & Bar Read down

	Speed	Bar
E	57174.85	4350
	175.22	
E	175.35	4335
	176.34	4375
⊙	177.31	4375
1		
b	177.55	4375
c	177.82	4375
d	178.27	4290
e	178.69	4375
f	178.82	

(see over)

Fremonton 7-18-38

enter Main - Park ave

" Hospital & main

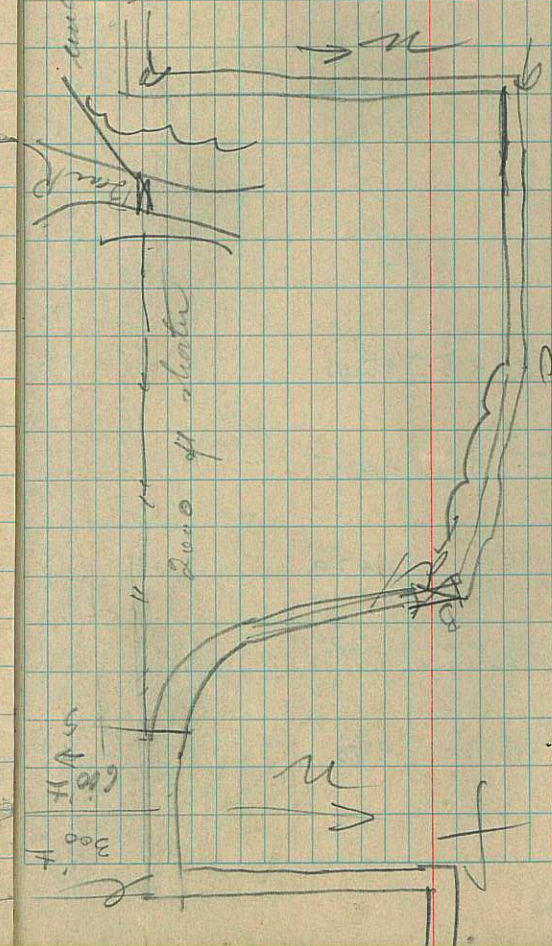
midlad River Bridge

~~make service station~~

~~turn River Bridge~~

enter - of main Roads

turn N



		4770
K	180.05	4500
i	179.98	4445
l		4420
h	179.82	4380
g	179.46	4380

Ab.

7-18-1938 Willow Spr

h = .375 in

Q = 0.22 cfs

= 99 gal.

estimated leakage 2 g per m

100' above R Intake

38

Mainly Dwarfwood

Dwarf Oak

Dewey

526.06

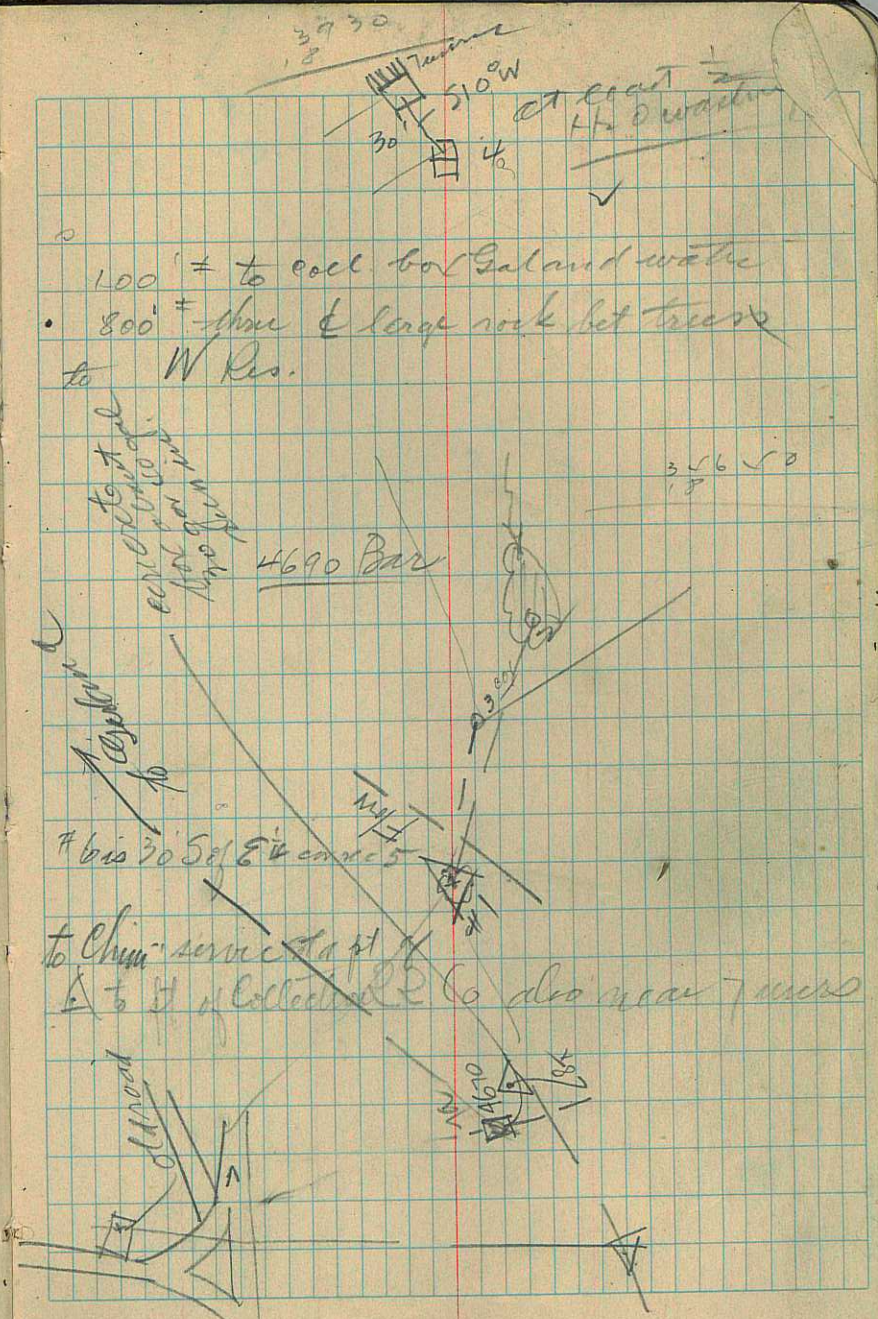
Canal

Lanny

565° W
535 800
McCov
St. Louis

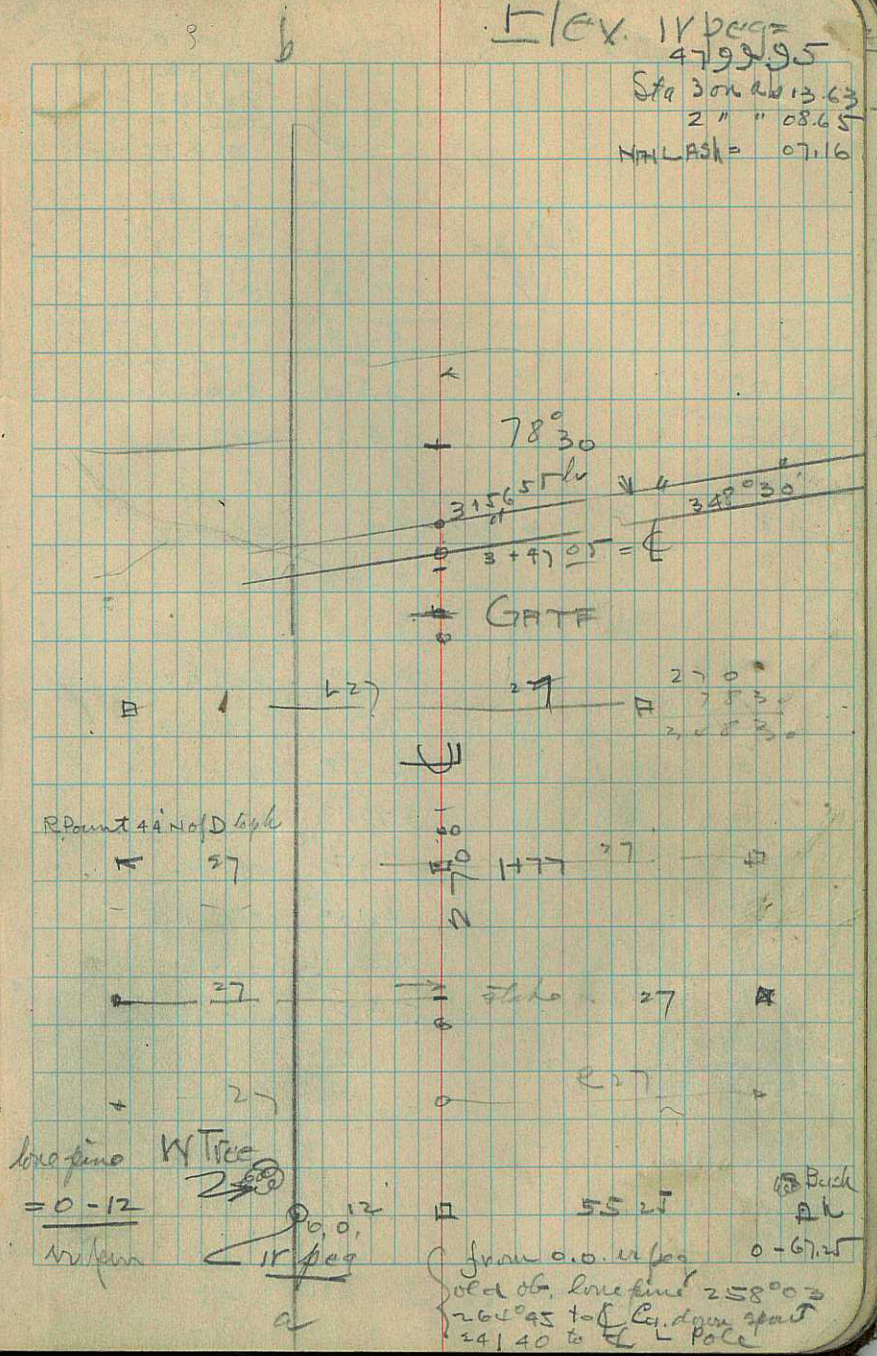
St. Louis
Mc Coy
560 W

	96°30	End tower ±			
g	12°25				
8	274°01'				
1	219°30'		+7°07' ±		
4					
	30°				
	346°54		-1°10		
	97°23'		-10'		
4	91°30' ±				
g	56°45				
1	166°40			2	+1°55 11.45
8					
7					
				+3°08' 4	11.7
1	171°30				
6					
5	346°40'	℄ St. Tower ahead			
g	28°10		-6°12		
4	39°30'		-7°08		
	107°40	℄ Garland Sugar Co			
3	186°05'			9	+2°14' 11.53
r	187°40	Intake		9	+1°49' 11.9
1					



3+56.55	85	Fs	m	
3+47.05				
3+07.05				
3+00				
2+50				
2+00				
			3.210	4807.37
1+77			℄ 3.40	4807.18
			L27 12.45	4808.13
1+50			R27 4.10	4806.48
			4.70 ℄	4805.88
109.5			L27 4.00	4806.58
			6.30 ℄	4804.28
1+00			R32 - 6.50	4804.08
			℄ 6.60 -	4803.98
			L32 6.75	4803.83
			R32 8.60	4801.98
0+50			8.70 ℄	4801.88
	257°58'		L32 = 9.00	4801.60
Sta. O.K			10.75	4799.83 (B)
	10.63			4799.95 4810.58

Elev. 1r peg = 4799.95
Sta 3 on L 13.63
2 " " 08.65
Nail Ash = 07.16



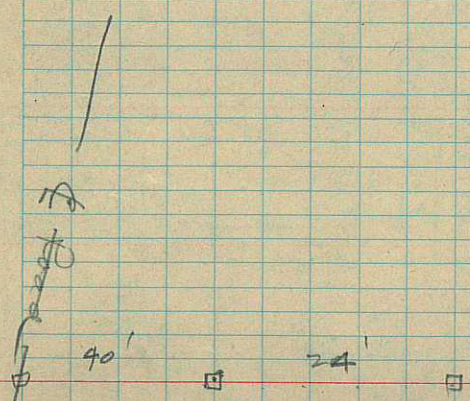
a

	BS	FS	HI	(see over)	
c			5.55	807.02	
			4.70	807.87	
			3.73	808.84	
			2.80	809.77	
			3.55	809.02	
		Rod	5.73	806.84	
			3.66	808.91	
			5.10	807.47	
2+00 R27			5.10	807.47	
2 R17			3.67	808.90	
2+00 L27			3.50	809.07	
2+00 ℄			4.17	4808.40	
1+97+	4.21 Bico	2.22 u		4808.36	4812.57
			4.44	4806.14	
			4.27	806.31	
H			4.10	806.48	
C			3.50	807.08	
G			3.28	4807.30	
A		Grade rod	3.78 u	4806.80	
E			4.02 u	4806.56	
D			4.10 u	4806.48	
			4.60 u	4805.98	
			5.32 u	4805.26	4810.58
1+97 18					

Levels up same line as 8

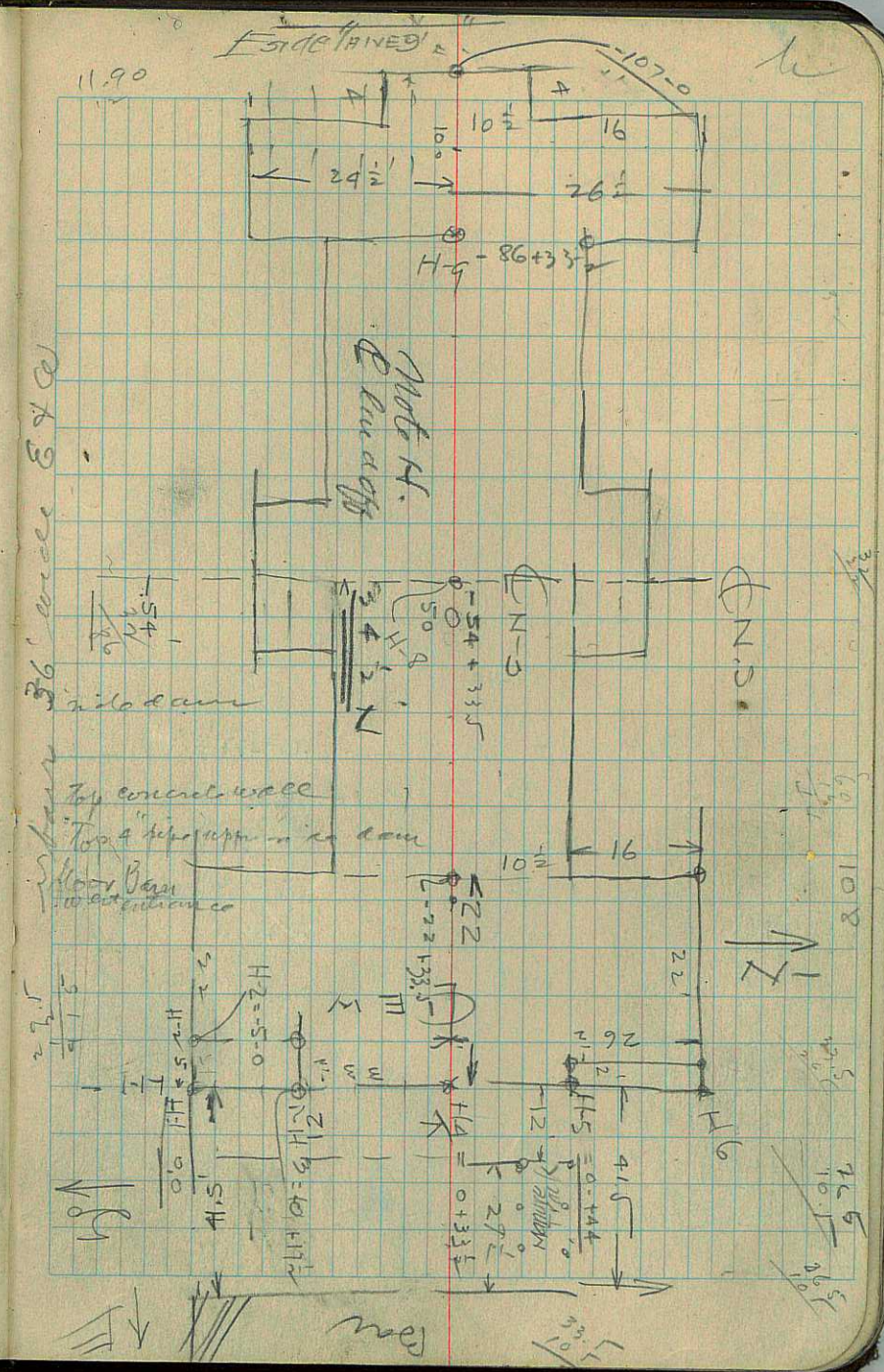
d

℄ Road
℄ count B-W


40'
24'

9

	23 - 11			
		6		
	17	7		
		6		
	40.	30		
	42.5			
	60			
	42.5			
	17.5			
1+97	8.59		4808.27	
			4809.81	
		7.05	[illegible]	4809.78
		7.08	grade 4" pipe lower	
0.15	11.88		4816.71	4816.86
		5.32	4823.27	
		15.12	4813.47	
4.03	1.91		8.24.56	4828.59
0-0		4.04	8.27.43	
0+33			4821.57	4826.97
		4.9	[illegible]	
252.5	100		top 2 S of [illegible]	



				Co-or
H10	90°	107		-107+34½
H9	90	86-		-86+34½
H8	90	54		-54+34½
H7	90	22		-22+34½
H6	180	26.5		0 + 60'
H5	180	10.5	10'-6"	0 + 44
H4a			34'-6"	
H3	180	17.5	17'-6"	
H4	180°	33.5	33'-6"	
H2	90°	5.00	5'-0"	

Ex Westend
℄ M 4.5.

on ℄ pt.

℄ E 4(W)

107
86
21

J

45'
35'
10'

2 35'
10'

	BS	FS			
k	5.49	Rel 4.31	9	820.98	4826.47
	226.52		5.10	820.19	
H-8 N 50'			6.20	819.09	
H8			4.9	820.39	
H8 - S 50'			3.90	821.39	
H10 S 45'			5.90	819.39	
H10 N 100'			9.20	816.09	
H10			6.6	818.69	
	7.45	1+82 h		4817.84	4825.29
			0.1	819.56	
			3.75 h	815.91	
3+56.55			3.700	815.96	
3+56.55			4.10 cu	815.56	
3+47.05			5.00	814.66	
1+97.38			11.30 h	808.36	
SE ℄ side house entrance			5.36	814.30	
G-13			4.20	815.46	
G-11			4.33	815.33	
NW cor garage			6.35	813.31	
NE cor garage			5.45	814.21	
SE cor garage			3.7	815.96	
G-10			5.1	814.56	
G-5			6.88	812.78	
G-4			7.26	812.40	4819.66

H1.

Nov - 6 - 1939

L. B. Hatch - on Smith Place

75'

27-6

N 3°30' E

154.7' So of 3+47.05

60' S of ℄ home stable

100' So of 3+47.05

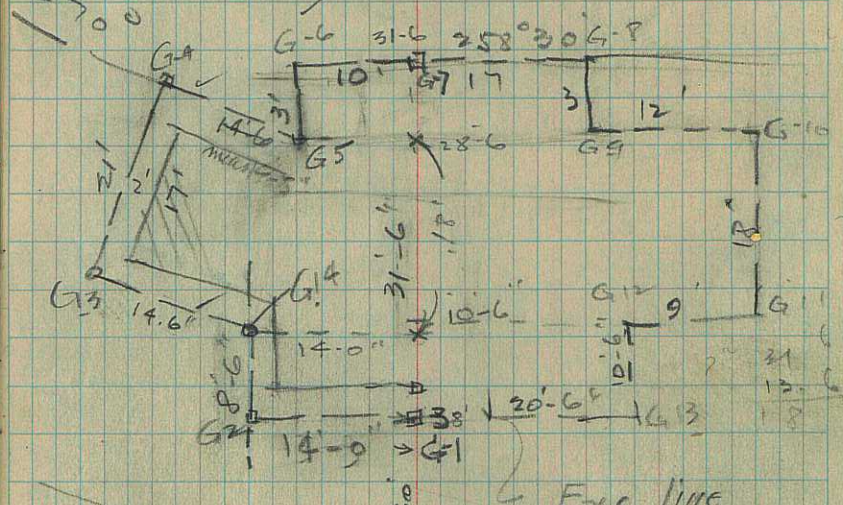
Tree

Before

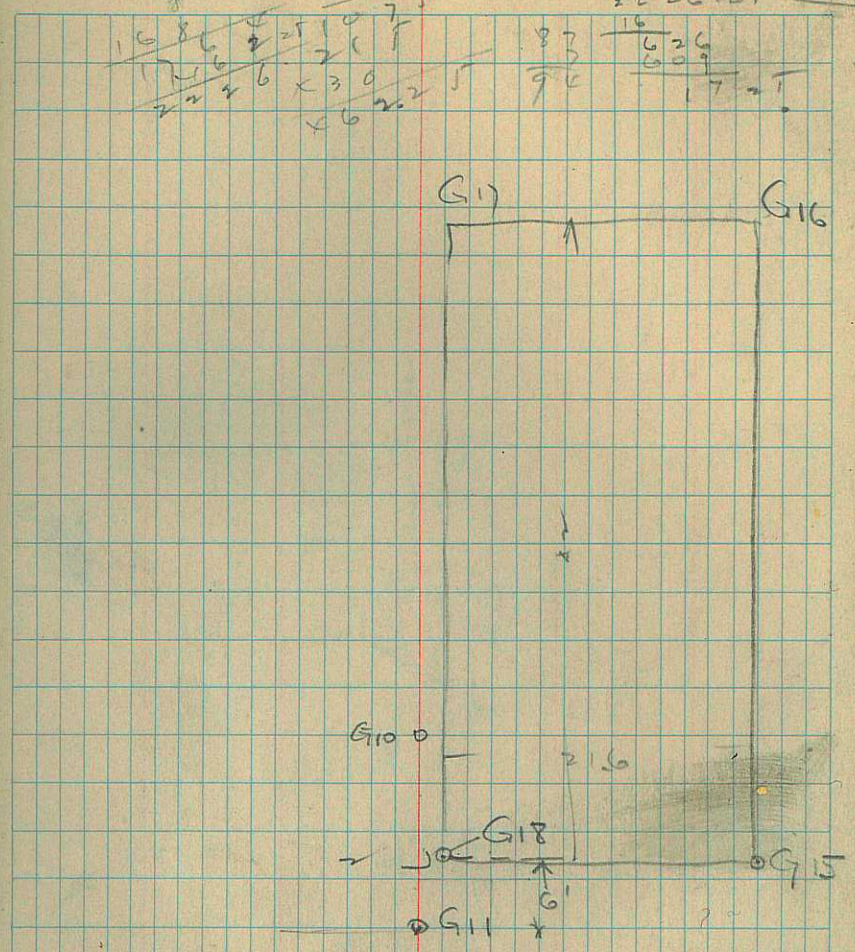
□ RP.

3+83.30
2.50
2583.0

2700



25252 100



348°30
-180°

257°23 Horse Barn
-170°
269°23 Bee
-270°
-0°23

Bee -107 +34° Work railroad to open

154°70
348°30
-270°
-360°

RR Elev HT

10.35 93.29

350°02 14.75
346°32
260°45 14.55

215°17 60' ± 3.64 106.00 103.64

90°40' over line looking

---

mar 2 - 1940 cm

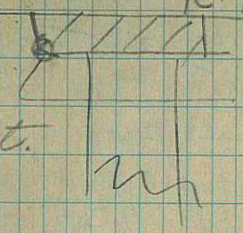
BS	FS	cm	elev	H.I.
3.51			100	103.51
		3.00	100.51	
3.62	1.49			102.02
		5.65		105.65
			93.29	

2 - 7 - 40

E 5. Home sewer line

on top rim of 4 bell

Lateral out to Top 4 ft
to sewer of house
to shingle and in pic
R.K's house



Levels down

street
bulb over "y"

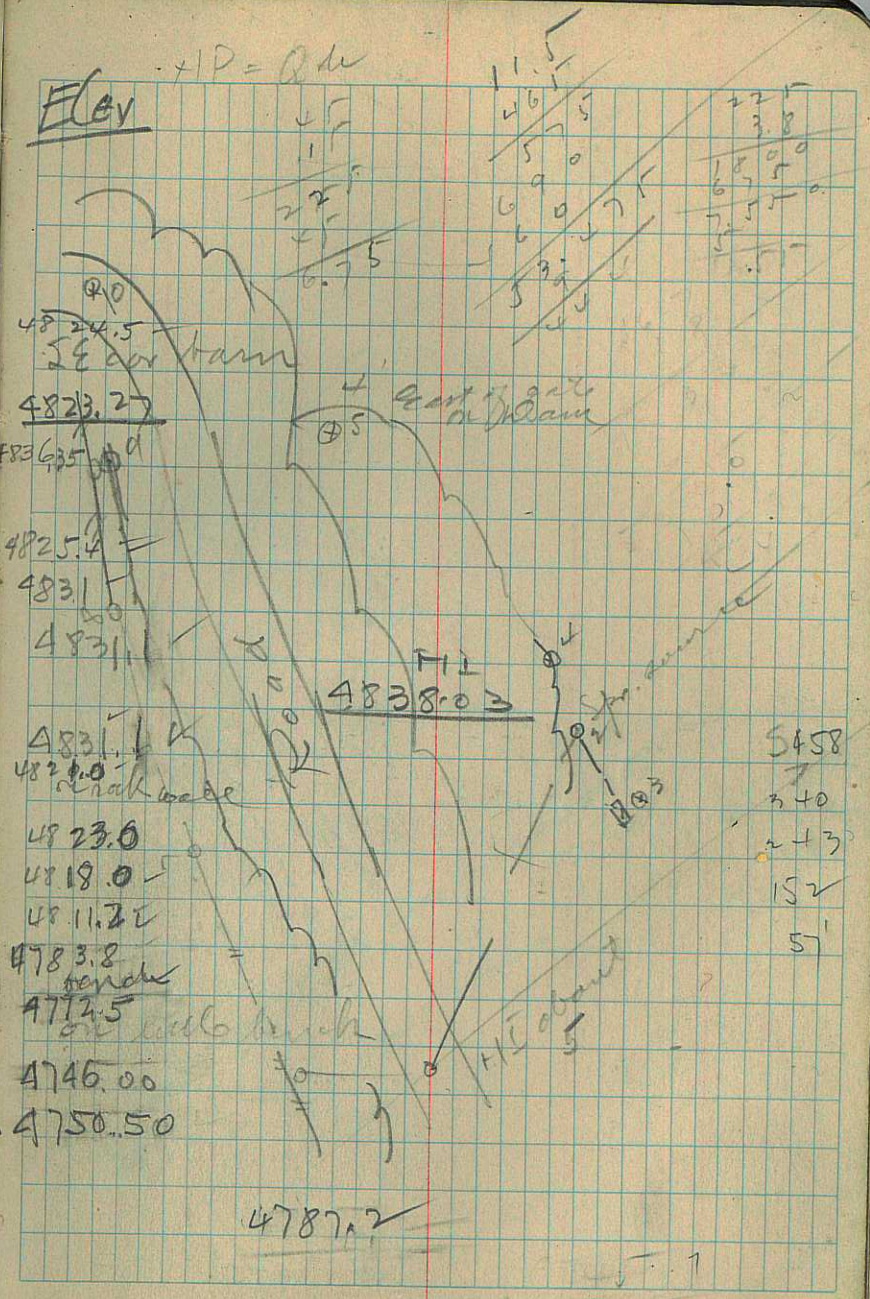
on 1' m stands

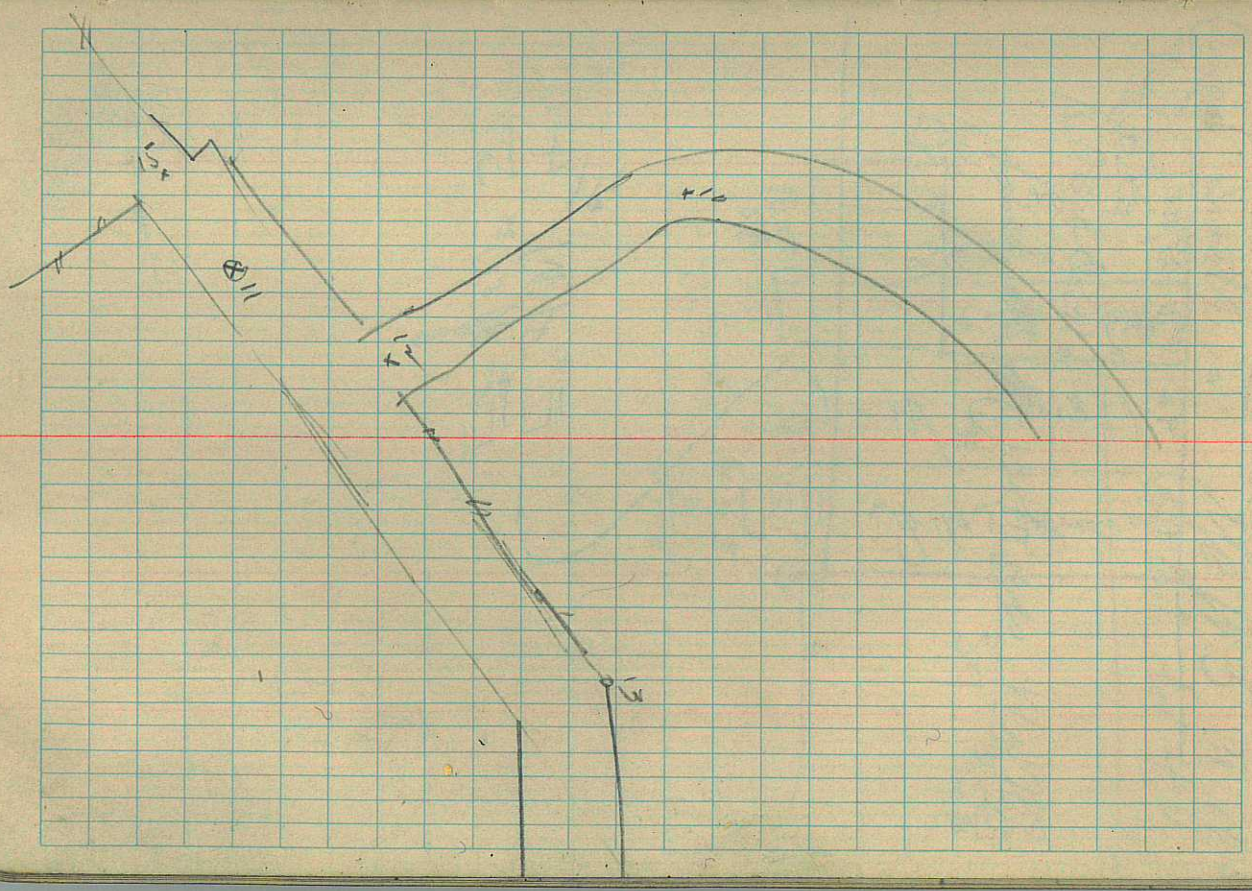
35 F5 VM
9RK

17	N41°W	-13.5	5.00	-1°56'	7.20
16	N16°20'W		5.00	-1°41'	7.85
15	S87°50'E		1.65	85'	
14				-2°05'	
13	S88°10'W		12.6	225'	
12	S77°15'W		6.95	78'	
10	S37°W	6.95	~~200'~~	200	
11/x					
10	298°24'	+43.9	7.0	+6°37'	11.65
9	290°43'	+33.8	2	+6°17'	5.45
8	271°50'	+35.8	4.00	+9°16'	6.50
7	254°48'	+30.8	4.00	+12°52'	5.60
6	201°44'	+24	5.0	+27°15	5.72
5	300°30'	-3.4	3.00	+0°12'	5.47
4	302°	-14.7	10.0	-1°52'	11.25
3	333°15'		10.5	-9°47'	11.8
2	322°		7.00	-8°45'	4.95
1/x					

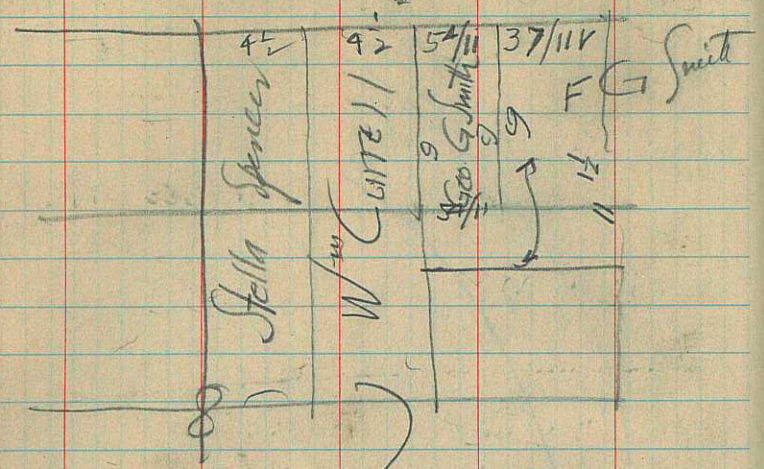
Elev

+1P = Qtr





Carter



E½ of W½ 4
E½ of W½ 5

Geo Smith

the W 5 4/11 of the E½ lot 4 of

Reece

Beg at pt 3 7/11 rds W of NE cor lot 4 W 5 4/11 sq. E 5 4/11 N 9 N

16.5 11
55 1.5
7
10.5

16.5
3
9 1.5
1 0.5
6 0.0

95
60
155
1485
6.5

Meas. for Smith

Beg at a point 59 ft E of the NW cor of the E ½ of lot 4 Block 8 Pl a Sagan City Surv thence E on the N line of sd lot 4 36 ft ± to a pt 3-7/11 rds W of the NE cor of sd lot 4. thence S 9 rd ± to a pt in the So line of lot 4 thence W 36 ft. thence N 9 rd to more or less to beg Cont. 0.1298 ac ±

96.05 to Expansion joint

8½" to E side of 6x8 post

8½"

Home Owners Loan
Phillip West

Survey for Geo Smith
520 W Center Sagan
2-8-1940

36.00

138.7 N 1°

60 = 3 7/11 rods

West edge pav.

-RR

39				14.7	
38	2°40'	32'		11.34	
37	321°30'	107'		11.34	
36	319°30'	142'		11.34	
35	310°40'	145'		"	
34	303°30'	123'		11.34	
33	293°30'	11'		11.34	
32	84°20'	25'		11.34	
31	88°40'	48'		6.34	
30	32°	36'		6.34	
29	325°16'	106'		6.34	
28	324°22'	160'		"	
27	310°40'	160'		"	
26	299°30'	130'		6.34	
25	295°35'	66'		6.34	
24	288°25'	64'		2.23	
23	282°25'	28'		3.90	
22	89°40'	53'		5.34	
21	348°30'	91'		1.00	
20	19°42'		+1.08	+3°25'	8.93
19	57°20'		-4.46	+1°33'	6.58
H10	74°54'		-9.17 8	-0°33'	5.35
	139°38'				
18				5.00	

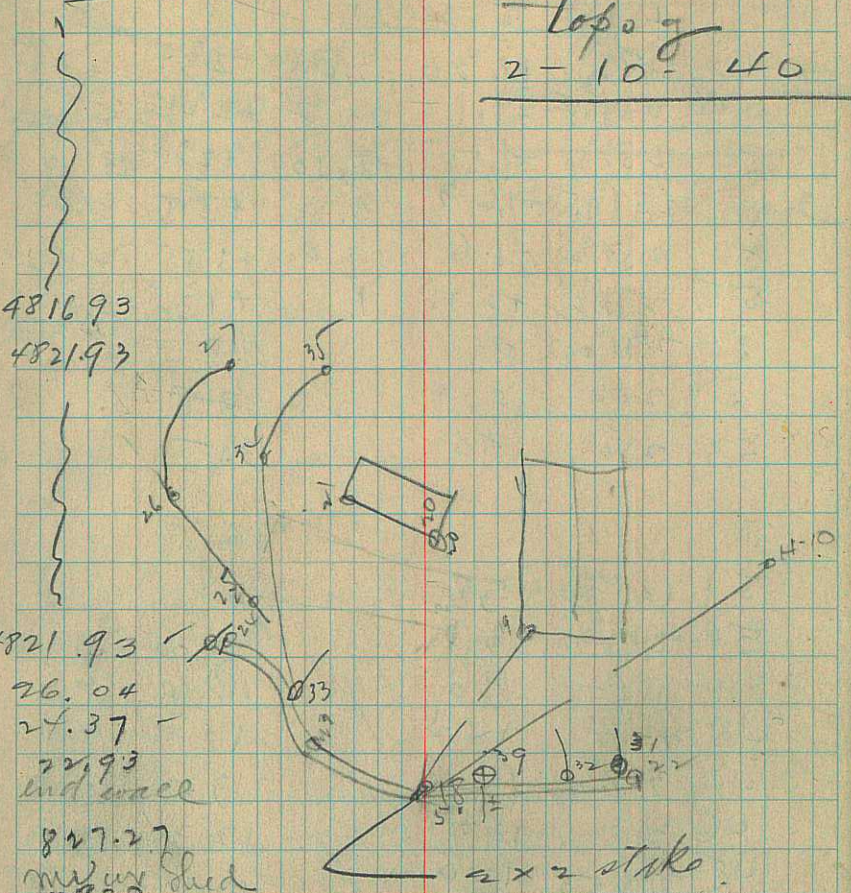
Flow 2-10-40

4813.57 by 4" valve

L. B. Hatch

Topo

2-10-40



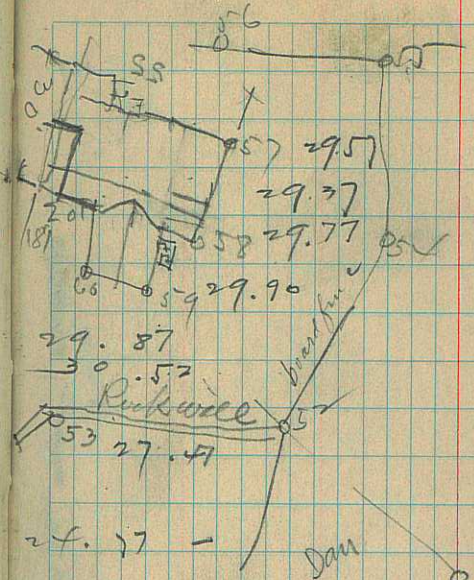
To [illegible] window top cupola - Sidewall

4823.27 4828.27 = +1

± not precise

	139.38	to 20 ft			
60	239°	+1.30	3.00	+2°37	4.07
59	247°15	+1.1	2.52	+2°24	3.52
58	253°30	+1.50	2×10	+2°09	3.19
57	257°45	+1.63	3.0	+2°15	4.36
56	258°20	+1.6	3.0	+1°55	4.62
55	273°22	+2.25	1.0	+1°30	2.55
54	271°20	88		0.8	
53	200	100 ✗		~~0.8~~	
52	240°	40		3.5	
51	141°20	58			
50	347°30	36		14.00	
49	314°50	96		14.00	
48	320°	142		12.34	
47	318°30	140		13.50	
46	311°	147		12.34	
45	303°53	120		12.34	
44	312°30	120		14.34	
43	305°15	120		14.00	
42	306°15	63		14.00	
41	303°50	63		12.34	
40				14.34	

18



14.34

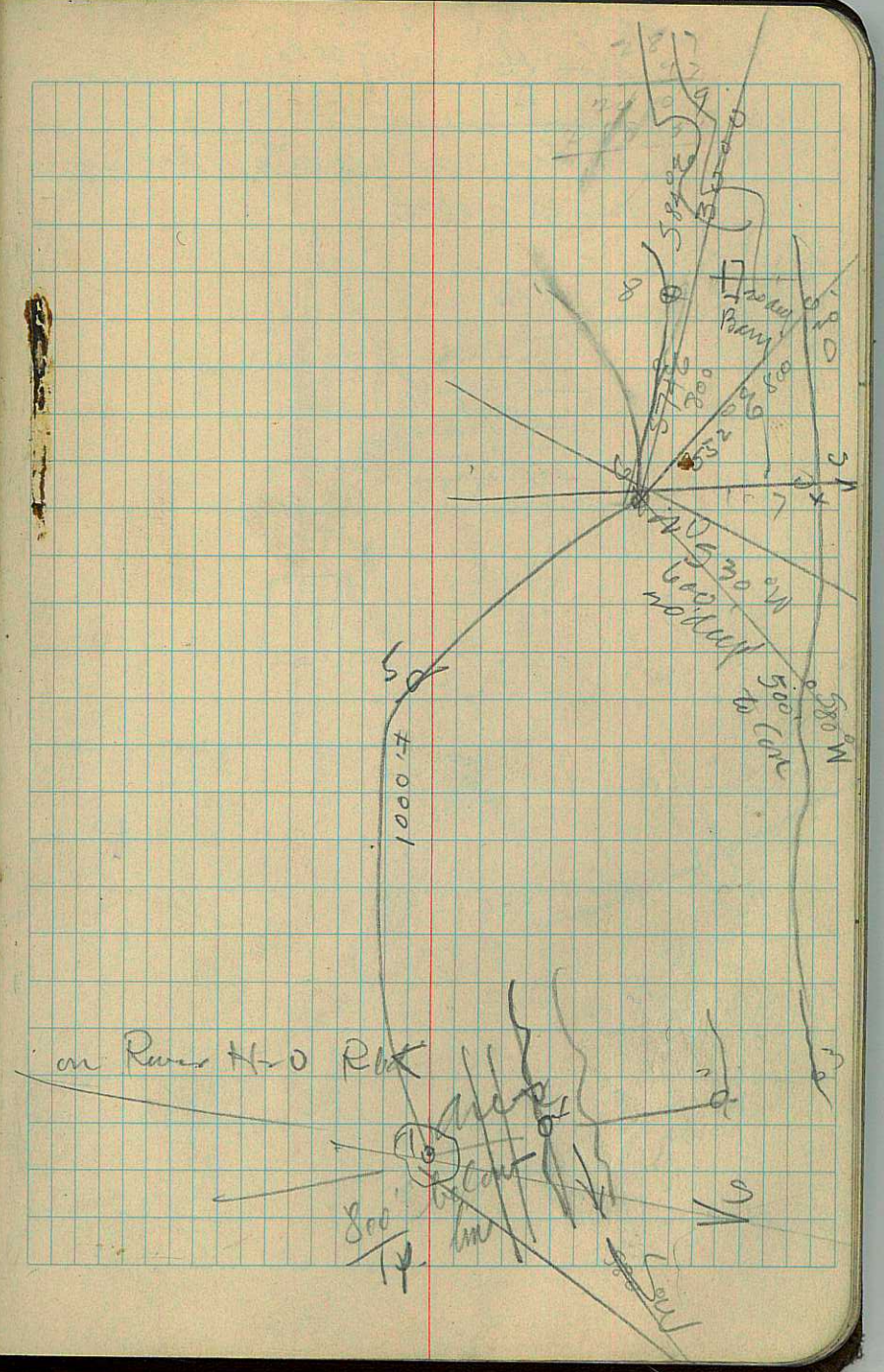
L. B. Hatch
topo
2-10-40

Frankrod

Dam 21
rock on
top

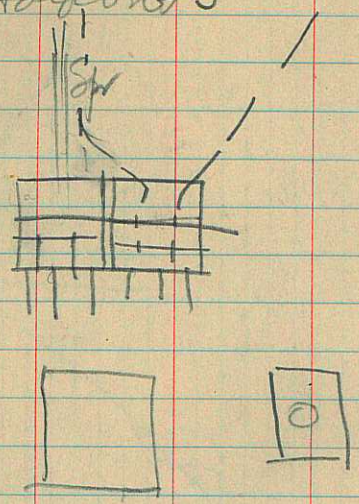
	316	
6	301°	2000
5	269°	1000
4	321°30'	
3	347°10	
2	345°15	
1		

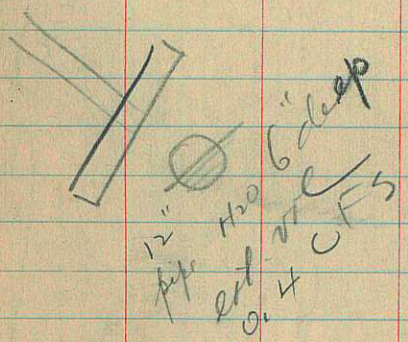
4	-17°32'	4.97
7	+1°	11.15
8	-3°	11.7

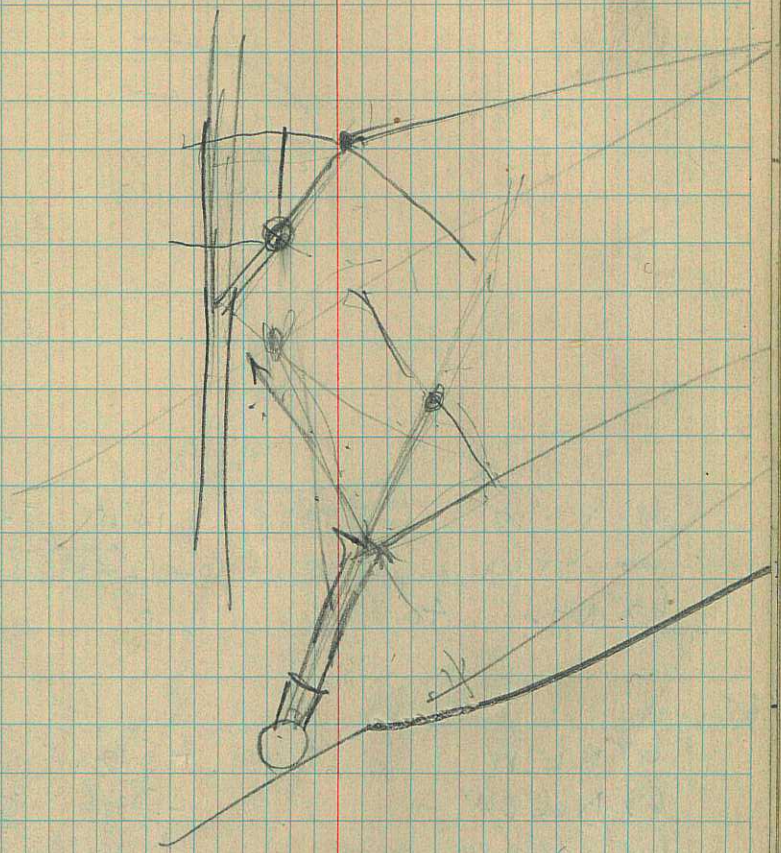


Feb 16 - 1946

Study of water in
Wry Hodgons







67	S52°W		4.0	−14°16	5.45
66	S58°30'W		10.00	−12°48	11.3
67	N87°W	40'		0°	
65					
64	N67°W		3.00	−5°19'	5.80
63	N66°10'W		"	−5°30'	5.26
62	S33°30'W	66'		0°	
10	S64°10'E		17.0	+6°08'	2.8
61					

FS
RR

1.2
2
9.2

4706.65

old Chesapeake & Ohio main-line, here entrance to 12 gallery

on ⊖

+5.78

4745.95

℄ main gallery entrance

-3.13 on stump

3.13 | 4740.17

4831.1 | 4841.3

4743.3

103.02
3.62
105.64

105.65

100.51
93.29
7.22
7.11
6.

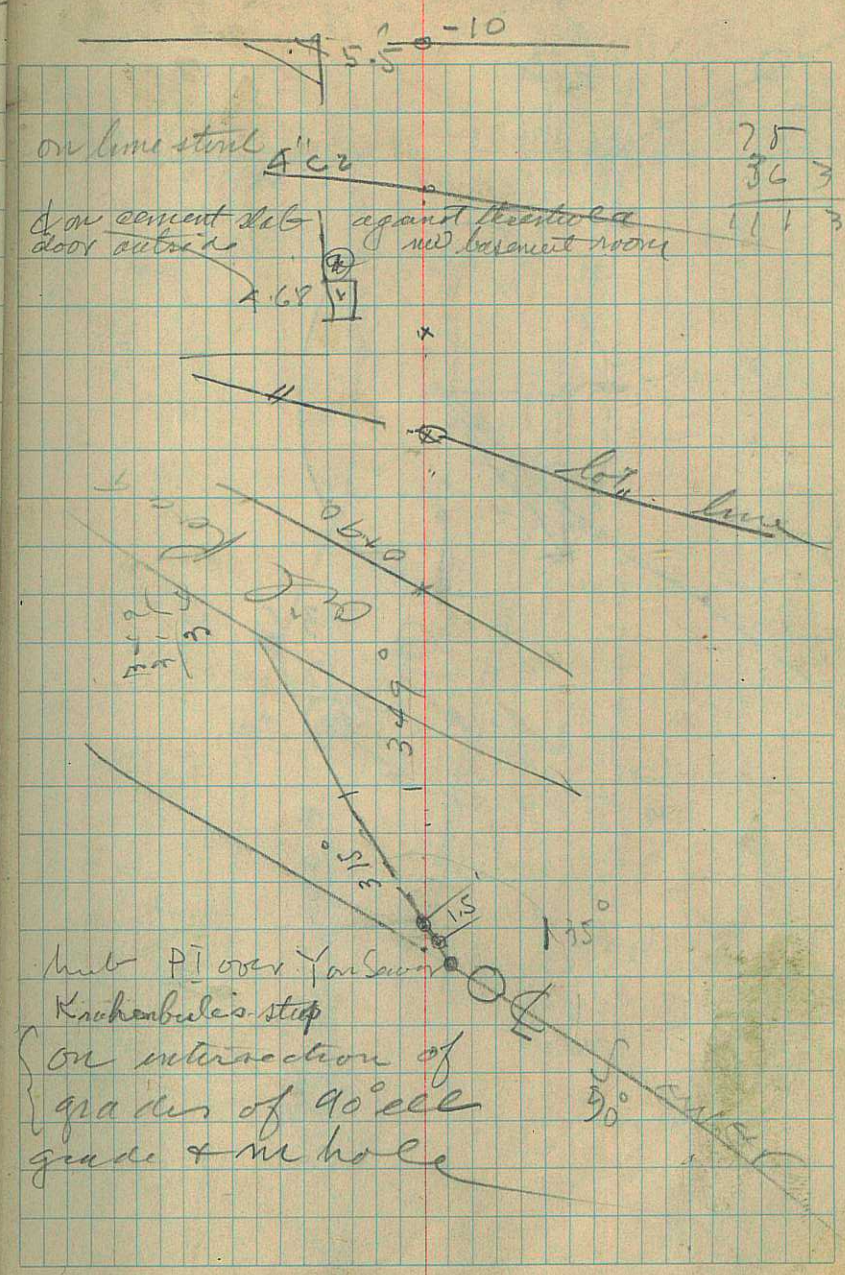
103.64
10.35
93.29

1.65
7
1.125

Fowc 7.00
Frank B 2.00
Vera Camp. 5.00
Earl 2.50

Levels & Down

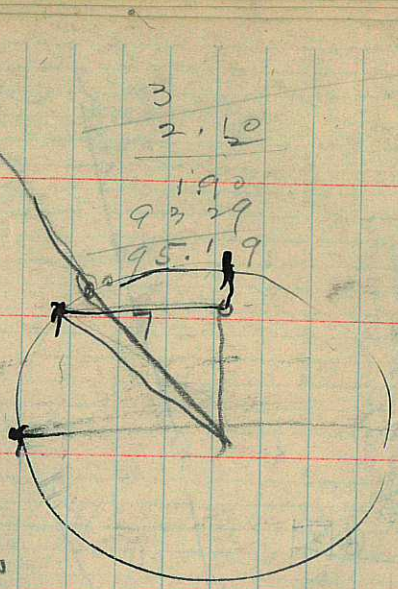
	BS	FS	HI	
	4.51			
0			7.69	101.95 grade
a			7.31	102.33
			4.68	104.96
0+25			5.38 h	104.26
0+50			5.87 h	103.77
0+75			8.15 h	101.49
+90'			8.53 h	101.11
1+11.3			8.39	101.25
			7.62	102.02 / 104.64
			9.63	100.00
1+11.3				94.59
0				101.65



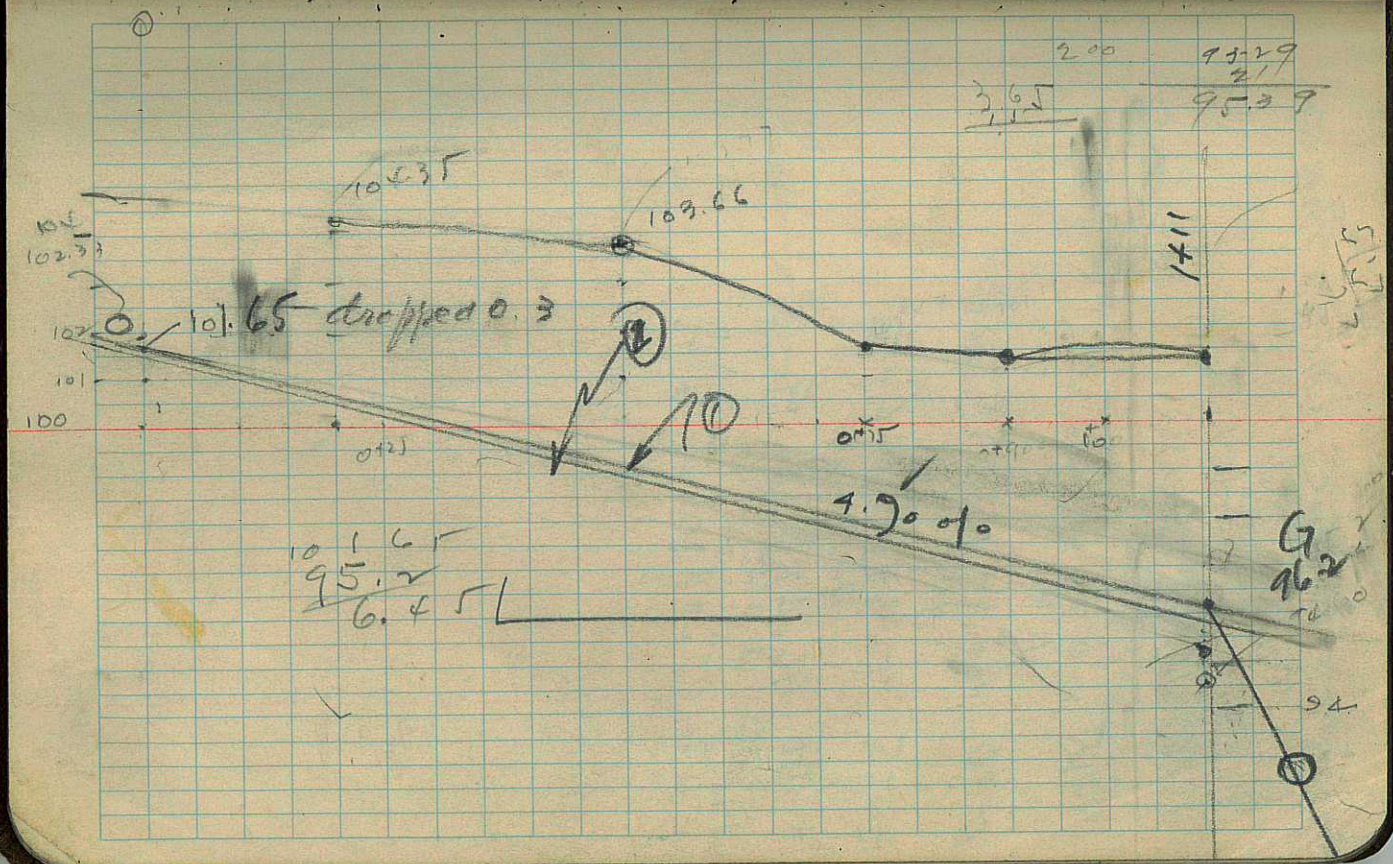
5

5.5
3.85
3.65
93.29
96.94

3
2.10
1.90
93.29
95.19



1.11
2
3



Stone Sewer grades

	Grd. Elev	Hub Elev	℄
1.0	101.65 (1.44)	104.26	
0+25	100.21 (1.44)	104.26	4'-2"
0+50	98.77 (1.66)	103.77	5.00'
+ 75	97.33 (.86)	101.49	4'-2"
+ 90	96.47 (1.26)	101.[illegible]	4'-8"
1+12	95.21	101.25	6'-½"

3-4-60 ~~5.66 ft~~

102.33 grade 5x75 5 o/c

hub edge oil

	7.79		102.02	109.81
1+11		8.50	101.31	
0+90		8.50	101.31	
0+75		8.27	101.54	
0+50		6.15	103.66	
0+25		5.46	104.35	
0		7.46		

ELEVG C hub over T

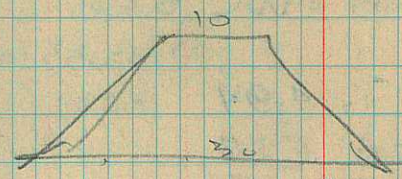
96.22	5'-1¼"
97.25	4'-1"
97.99	3'-7"
99.21	4'-5⅜
100.43	3'-11"
101.65	

Increased hub ht 0.25 ft.

Wm Mathews	29
Ben Thewes	16
Ike Butler	18
Helen Mathews	4
Gessel	10
Smith	5
Carl mohr	5
Humphrey	14
Chas Fool	11
Fred Kohler	10
Jones	6
	128

250

200) 30
7



200) 27

20000)
5000) 200
2

102.33

3-10-1940
Top Cap Prot. Res 5200
S.E. Hanover Dtd by fence 5275
3½' disp Hatch Cons ft
S E H Isaac

Ob. the control chamber at the Res 3-10-1940
Coarflow screw = 5¼"
H2O surface about 1" below top of tube
2½ CFS flowing into Res.

Checking of sewer ser.
trench grades

	BS	FS	HI	Elev	HI
	6.94			102.33	109.27
			4.94	104.33	
0+25					
				100.18	
0+03			3.22 set to this		
			3.33		
			+bar		
0+25			4.34		
			1.22		
0+50		+bar	5.56		
0+75			6.78		
0+93			7.66		
			13.56		
			14.76		
			95.29		
		+b	7.66		
0+93			1.73		
1+08			8.39		

Home of Eugene Schaub
3-12-68 1-7

on 4" c.2 filter 102.33
" " " 6.94
109.27
.38
3
104.33

102.33
.68
101.65

109.27
100.18
9.09
4.75
4.34

on + bar

109.27
3.33
105.94
4.75
101.19

101.65
101.55
.21
101.34
4.75
106.09
105.94
.10

109.27
106.07
3.22

1.22
.98
.24
.24
.98

tap hole

on grade bell

7.66
4.31
12.01

.19
.49
.53
.68
.83
8.39
4.75
3.64

8.49
4.75
13.24

	B3	F7		Brg	Dist.	Elev
13		1.23		S71°E	48'	109.64
12			93	S10°E	92'	101.57
12			6.85			104.02
			20.4 / 10.4			
11				N53°W	20	100.47
11			8.15	N53°W		102.72
10			3.00	N6°E	61	102.87
8	7.93			N53°30'W	78	102.94
9						
8		2.77		S46°E	75	102.94
			4.46	S46°E	77	101.25
6			3.39	S72°30'E	44	102.32
5			3.5	N4°W	3'	102.21
3	3.81			N47°10'W	80'	
4						
3		8.84		S31°30'E	125'	101.90
				6°W	10.8	12°18' 57 / 1140
			9.00	S40°E	74	101.72
			10.00	S3°W ±	16'	100.72
			10.06	S3°W ±	14	100.66
2	10.72			N3°15'E	126	100.00
1						

1:5 L.B. Hatch

Study of Water develop.

in Kirby Tailrace 4-17-40

clay 103.87

on H-2 on hard clay strata

bot hole clay

on 1-2-0

end probable cut-off

110.87 H! on Conc. wall over end 12"

end 12" pipe

bot gravel

end 10" beg 12" gravel

Top 10" steel

Top 10" steel

14" ID

Vitrified clay

105.71 = 41 ft

on 10 ft

N30°E

3 on gravel

20"

10" Sec.

bot Corrugated steel

bot 14" vitr. pipe

110.7

83
30
249 0

25
9

450
.02
9 00

17
8
136

100.47
10
90.47

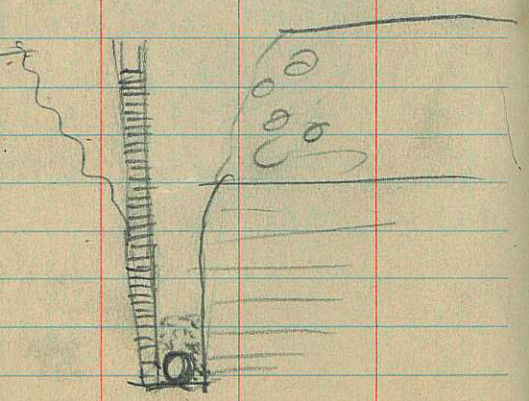
10.
101.50
905
1100

10 1.5
2 HP

HP = Q h .15

2.0 | 1.5
50 | 1.3

1.25

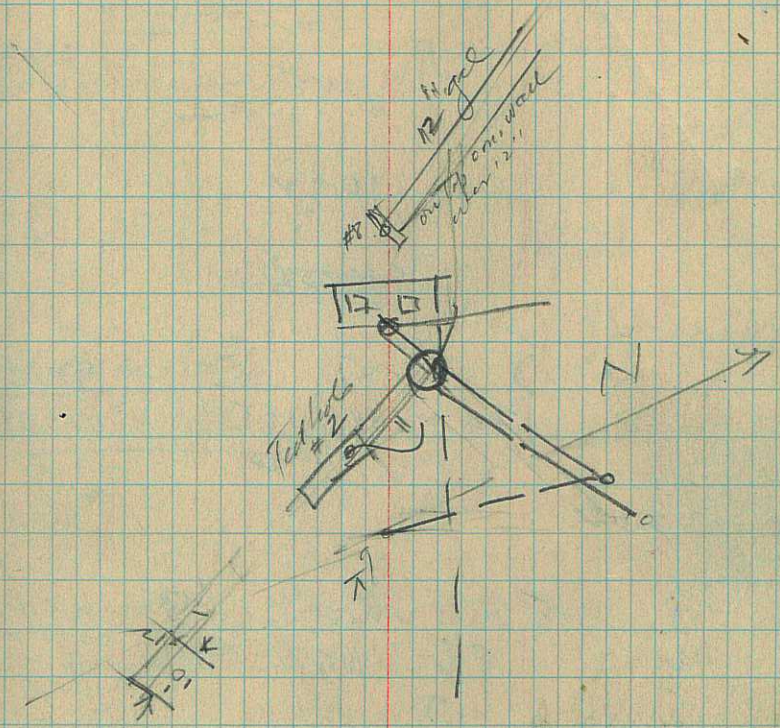


126
16
125
80
80
427

1.25 | 4.50
1.250 | .3

.03.0

36
30
1080
845
17.00

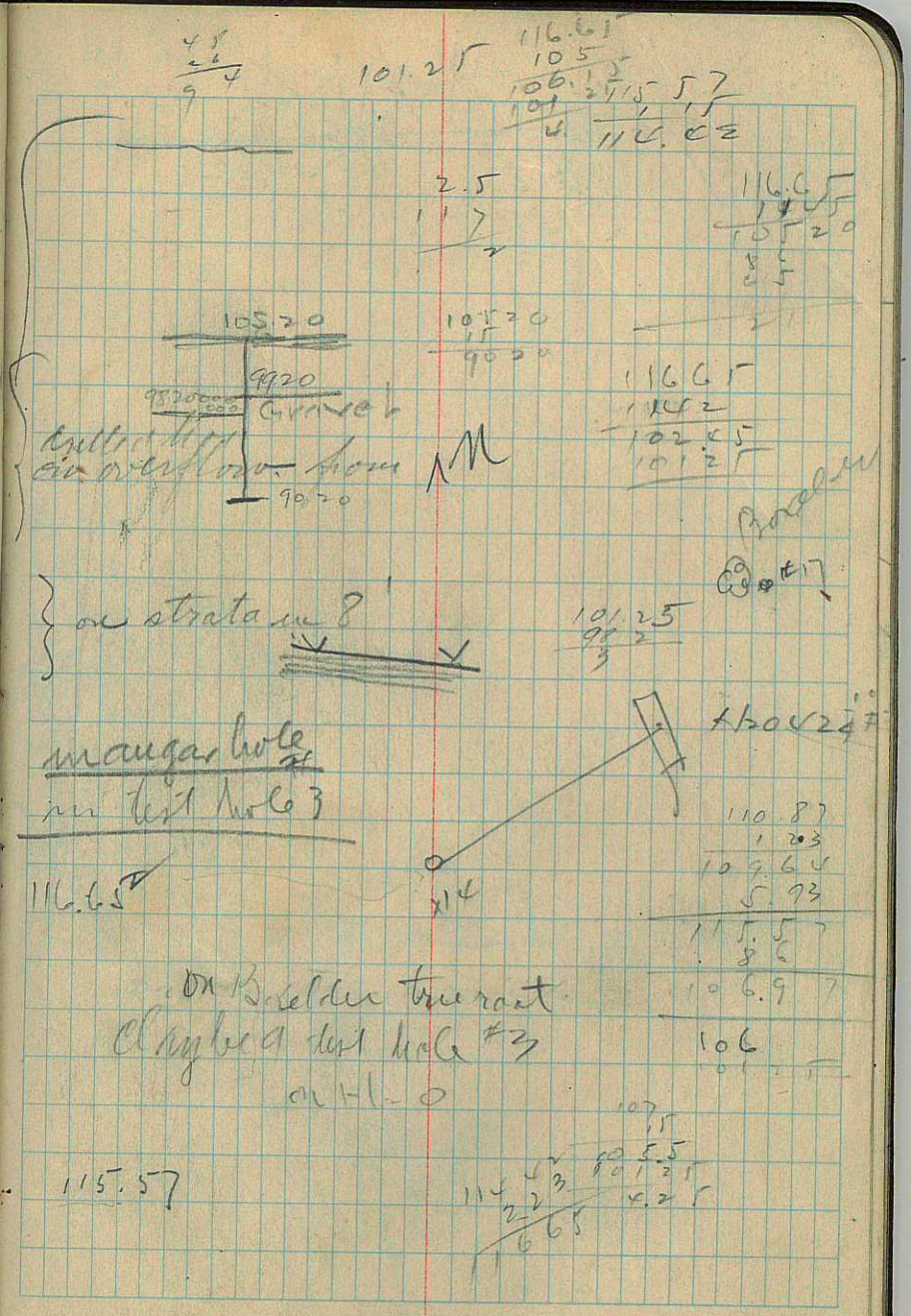


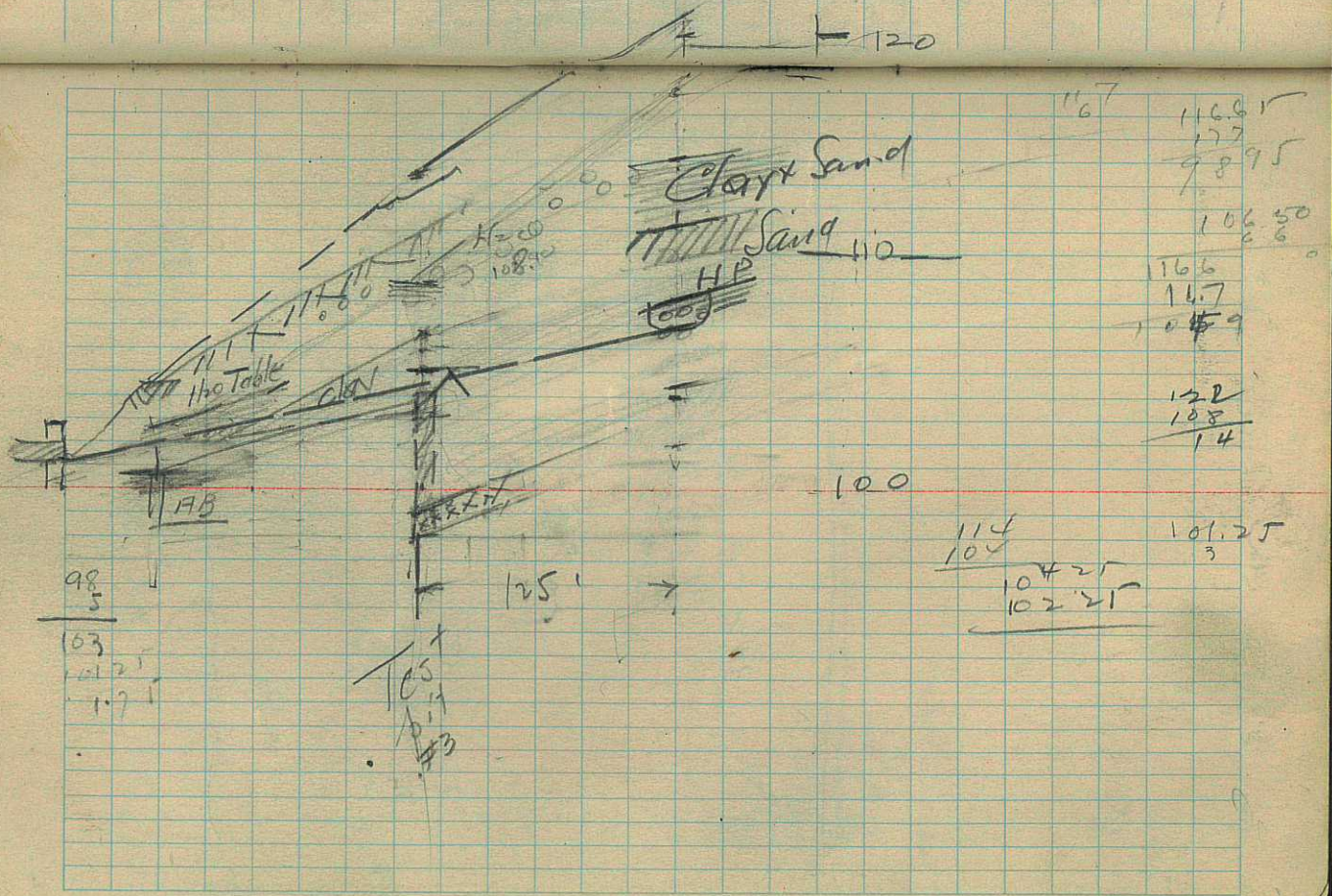
21
.01

PT BS FS [illegible] Near Dist.

L B Hatch Dry Hollow

		11.45		105.20
		10.0 ✓		
		10.30		
				92.45
	24.2 =	11.7 12.5		104.85
17	2.23			
18				
17	1.15	N58°E	63'	114.42 ✓
16	8.6	N58°E	39	106.97
15	6.48	"		
13	5.93	W	26'	
14				




120
Clay & Sand
Sand
110
HP
100
Clay
AB
100
125'
98
5
103
101.25
1.75
116.67
177
98.95
106.50
166
14.7
132
108
14
101.25
3
114
104
104.25
102.25

BS	FS	HI	Bear	Dist	Elv
21	3.82				121.38
		11.00	N63°E	34	114.20
		10.5	N50°E	90'	114.7
		17			108.2
		14x0			111.2
					111.7
21	3.82		S80°30'E	18	121.38
19	9.48		N63°30'W	66	
20A 19TP	3.03		S24°E	47	115.72
		9.73			
17	4.33		N64°E	40'	114.42
18A					
		2.17			114.42
	7.69				108.90

$\frac{12.2}{1.8.9}$

$\frac{110.72}{12}$

$\frac{9.81}{87}$

$\frac{125.2}{13.5}$

111.7

114.42
2.17
116.59
7.69
108.90

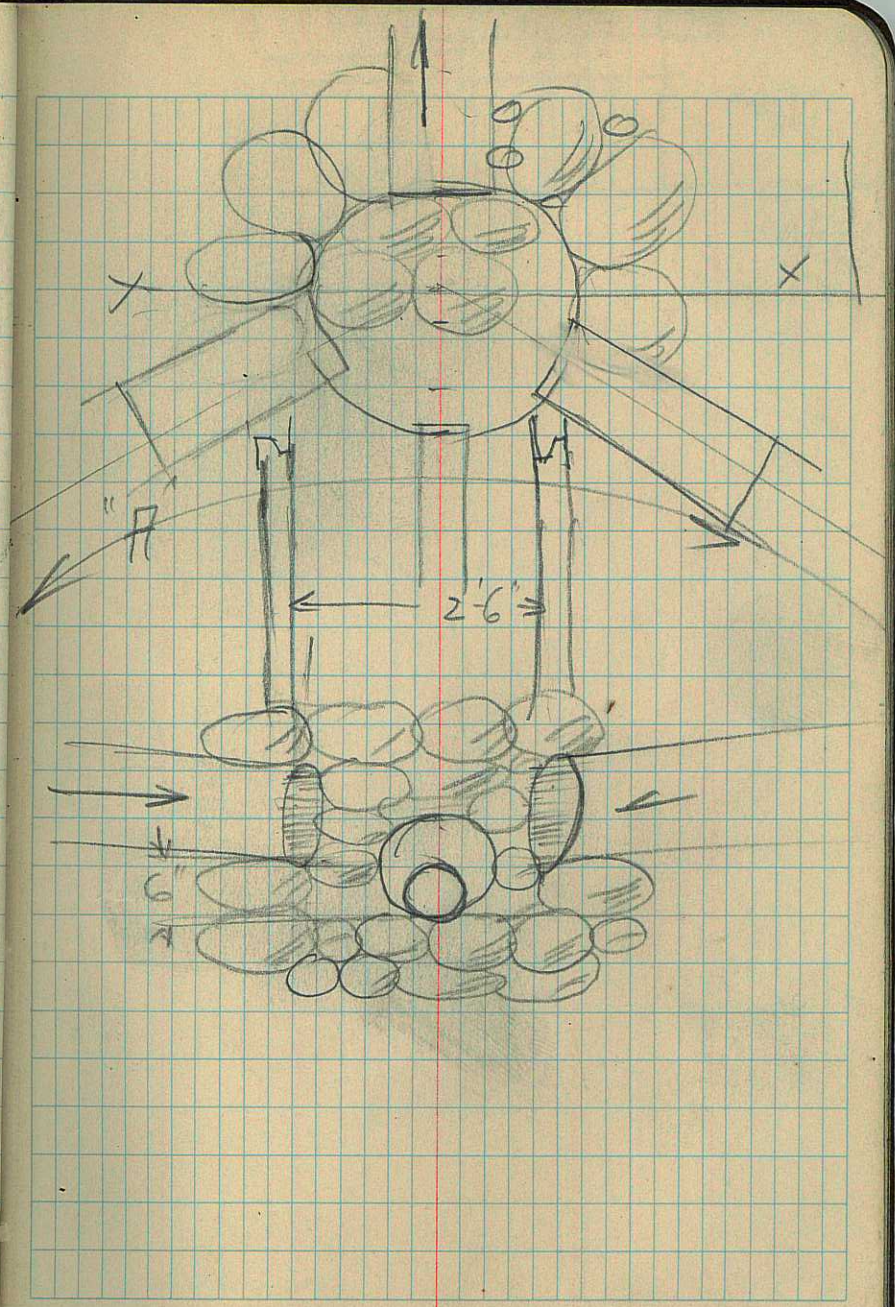
test hole 4 #7 South one same clay bed
test hole 5 11 one
estimated on Gravel
on bot E.E.
excavation

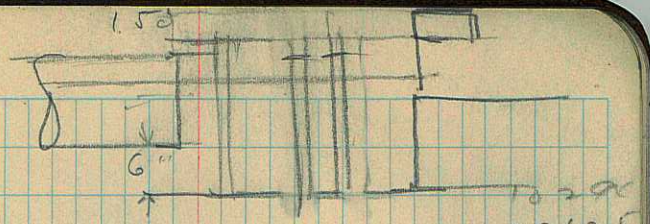
114.42
4.03
118.75
3.03
115.72
9.20
125.20
1.38

125.20

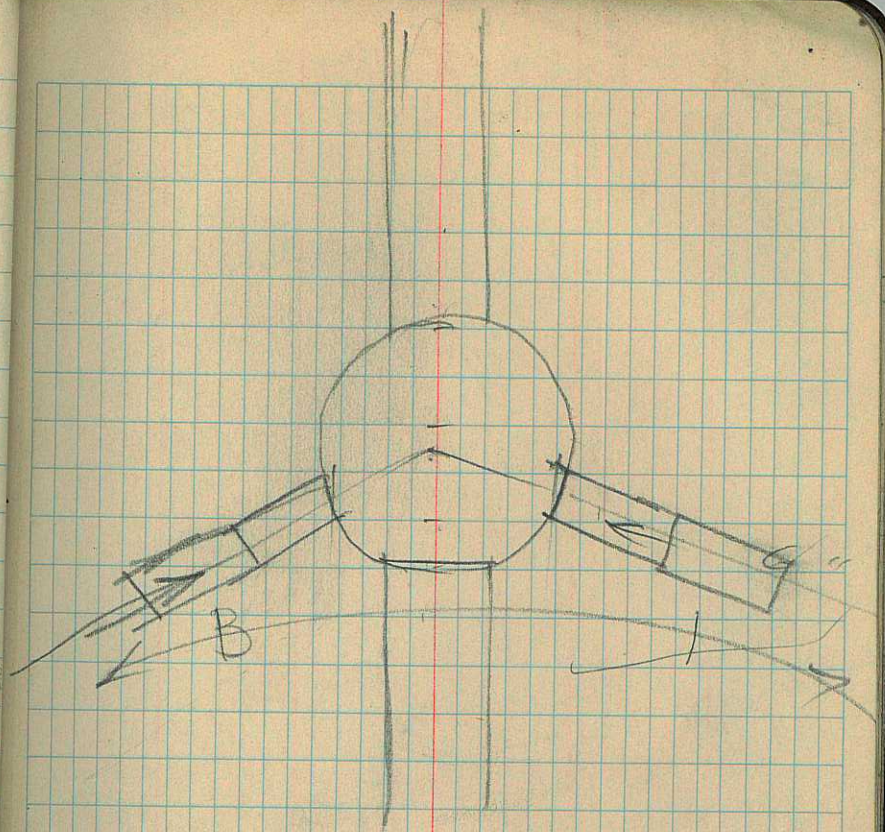
at 4:15 PM

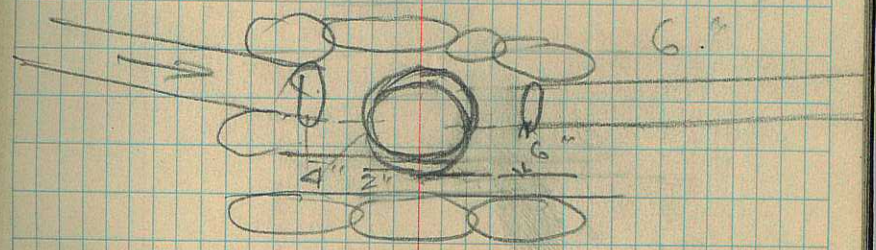
on H.O. test hole #3 9AM 4-18


2'-6"
6"



1.0
1.25
1.69


B


6"
4"
2"
6"

May 1 - 1950

	BS	FS	HI	Rod	Elev.
			5.26	104.63	
1+68 MH#3		3.92	5.76	104.13	
1+30		5.07	6.48		
1+00 MH#2			7.08	103.31	
1+00		6.71	7.22	102.81	
				103.18	
0+50		7.74	7.74		
0		7.86	8.24	101.65	109.89
50				104.06	
50				104.56	
49				102.81	
49				102.65	
				101.65	
50		4.33		105.56	
49		6.75	68'	103.15	
	6.95		173	102.94	109.89

50

to L. B. Hatch - Study m

- Dry Hollow

1.4' for 12" tile

- 1'-10" for manhole grade

- 1-5"

at 6" outlet tile

- 4½" above

- 6½ down

Grade for 6" tile

L 1.5 G top hub grade

- 4½"

manhole

if branch

step

grade at

junction

top Cur Wall

106.50

106.23

about 1" above

14-0

Pen. Wall

fence

Sta BS FS UU PEG Elev HI

2+13

2+02 1.80 3.20 106.69

1+68

109.89

109.89

3 2
1 8

5.76
3.92
1-84

5.76
3.33
1.46

1.9
3.8
15.2
5.7
12.2

5.26
3.2

-1'5"

2'

3'

24.05

C1-10
C1-4 4'

2.20 for muck
3.20 on grade

main 106.23 line

BS 73 in RRG Elev HI

2+26

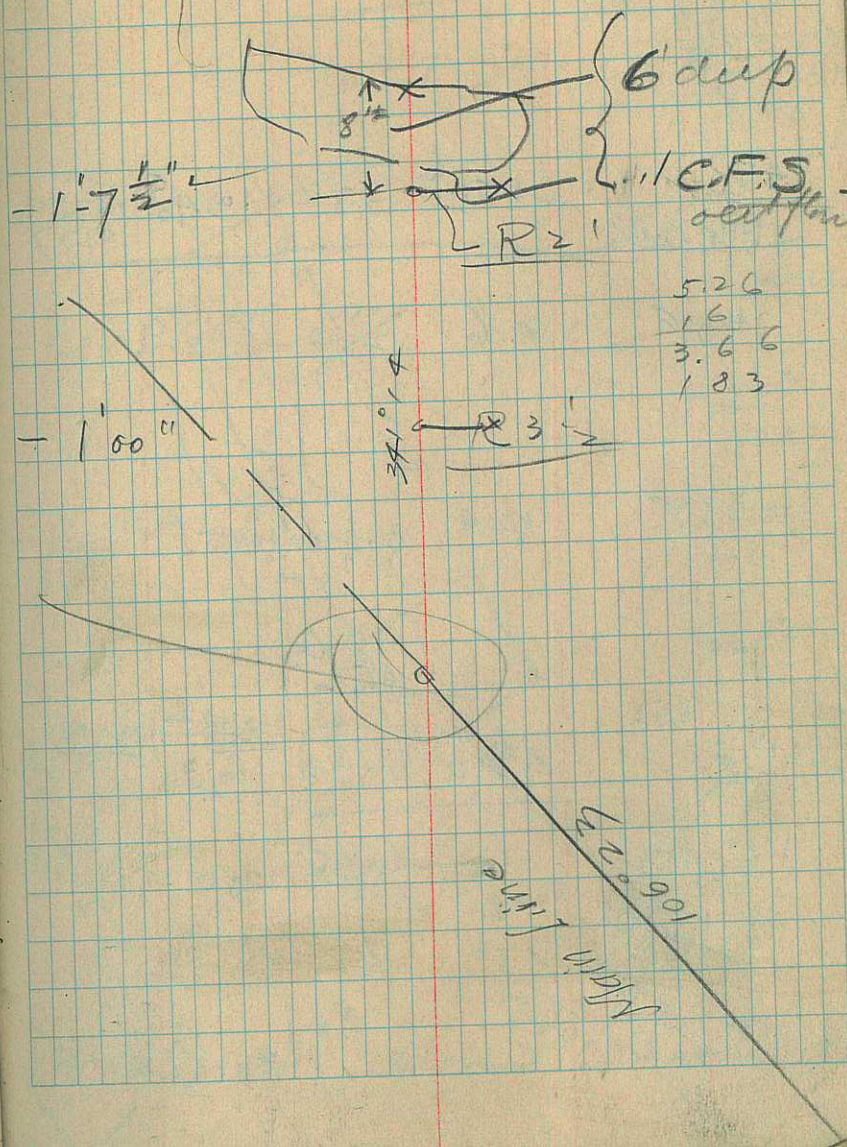
2+18 ~~R~~ 0 1.60 108.29 G
1.83

1+93 2.413.43

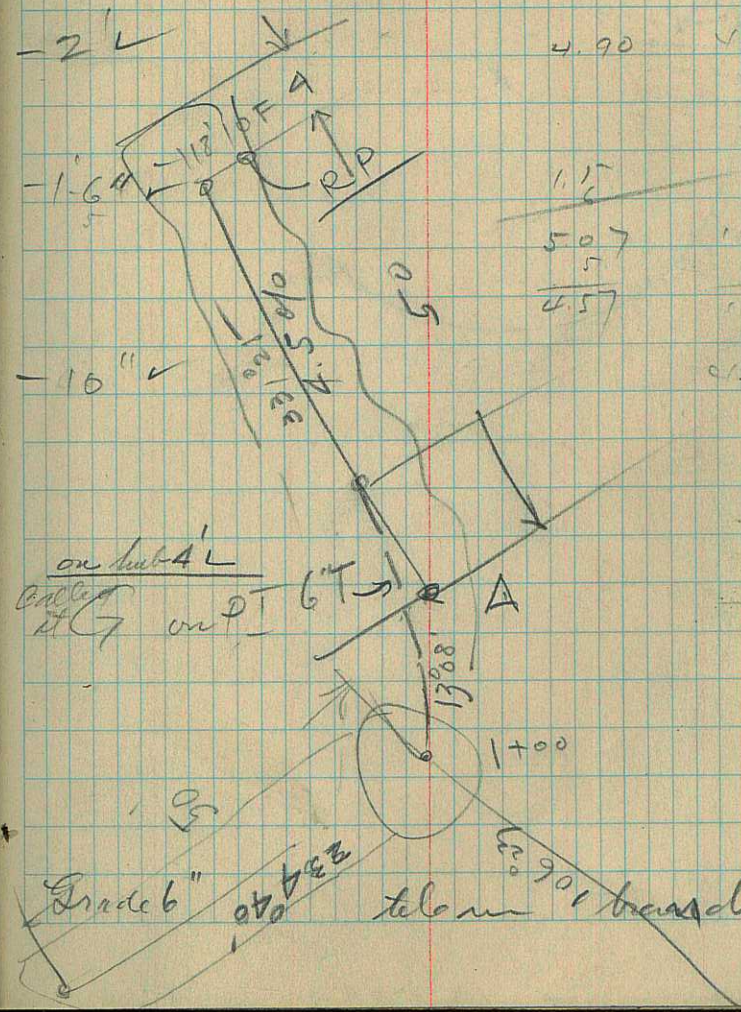
1+68 ~~R~~ 5.26 104.63 G 109.89

5.12½
4.4½

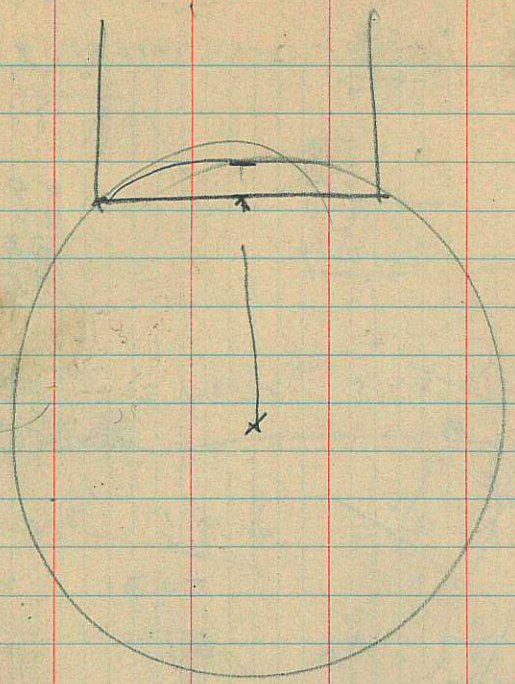
5.62
1.4
4.8



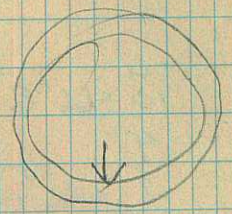
BS	FS	HI	RRG	Elev	HI
1+50		1.84	3.84	103.93 G	107.77 / 107.77
1+31	4.46				
1+63		0.6	2.1	107.11 / 105.61 G	
1+38		2.4	3.20	104.5 G	
1+00			4.56 G		
1+13 A	4.53	4.40	4.40	103.18 / 103.31	107.71
1+00	4.53			103.18	107.71
1+00				103.18 G	



-2'
-1'6"
-10"
A
RP
on hub 4' L
A
1+00
Grade 6" above telem transch



1	10
2	2
3	12



Pt.	Bear	Dist	BS	FS	Im	Elev	HT
	TO 12 S75°E	68'					
	10 S70°E	44'	9.09	1.47			
11							
	TO 10 S66°E	46'		1.08			
	9				5.00		
	8 N65°W	70±	8.50				
9							
	TO 8 S66°E	36		1.75			
	BM N84°W	56.	7.67			121.38	
7							
						~~121.38~~	
	6			.47			
	4		8.50				
5							
	4 S47°E	26'		2.45 ~~2.45~~		121.38	
					19.9		
	2 N51°W	92'	11.77				
3							
	TO 2 S76°E	58'		.48	9.31		
					10.98		
	N70°W	108'	9.62			102.94	
1							

10.5
9.6

head old dutch

on old flume where now 200'd
goes step

old hub
on upper manhole

on H2O S pit
on H2O N pit
on con wall

Pt	Bear	Dist	BS	FS	Cm	Elev
TP 19	S16°W	12'		5.19		
17	N40°E	61	3.80			
18						
TP 17	N74°W	190		3.1		
6	S74°E	41'	4.46			
16						
15					0	
14	N23°W	33			6.97	
TP 12	N76°W	80	10.53			
13						

BS	FS
7.67	1.75
8.50	1.08
9.09	1.47
10.53	9
35.79	11.30
11.30	
24.49	
1.38	
145.87	43.50
102.94	21.50
42.93	19.350

1/2 C FS

1.90 ⌊ 4 / 5

Q.h 15
26
9
30
3.90

in old ditch

protrable 4.20 overlotable

{ on pipe Upper Sipe - Hand line

Leads down

Sta.	Az	Dist	BS / FS	m	Elev	HI
						4826.63
5+39						
5+25						
5+25	316°30 / 363°50	144.3		6.8 h	4819.83	
	155°54					
3	210°	17.5	2.69	11.93	4814.70	
1	324°08	14.25				
2	40°39	21.55				
3+81 h	253°59 / 266°39	3+81 h		3.79 h top Crs (c)	4813.60	
				1.89	4813.50	
		3+53 D				
			1.93	9.25	4808.16	4810.07
	270°					
	215°30	31" out HI				
	253°59					
	260°16					
0			(is. pin. 10.12)		4799.95	

m 38.29 252.12

Topo. Survey L. B. Hatch 10-18-40

543°30' E

5th Ward Church spire

N86°39' E

Beta house foundation

3+81 443 / 525 3

(Beyer. 57°20' E / 78.45 E) to ℄ walnut tree

(fortress Az + 12°40 577°20' E)

to East N. Cor. Gar. Foundation

set 251.58 FS to pine

Ir pin

Bar check 4800 on or pin

144.3 303°50

50 uncorrected

25.12 38.29 / 13.85

Sta	Az	Dist	BS	FS	HI	Elev	H.I.
+47							4836.55
9+00							
+80							
8+00							
+70 5/10				8.17		4828.38	
7+00							
6+42 5/10							
6+00							
5+39							
		0.46	10.38			4826.17	4826.63
				1.8		24.83	

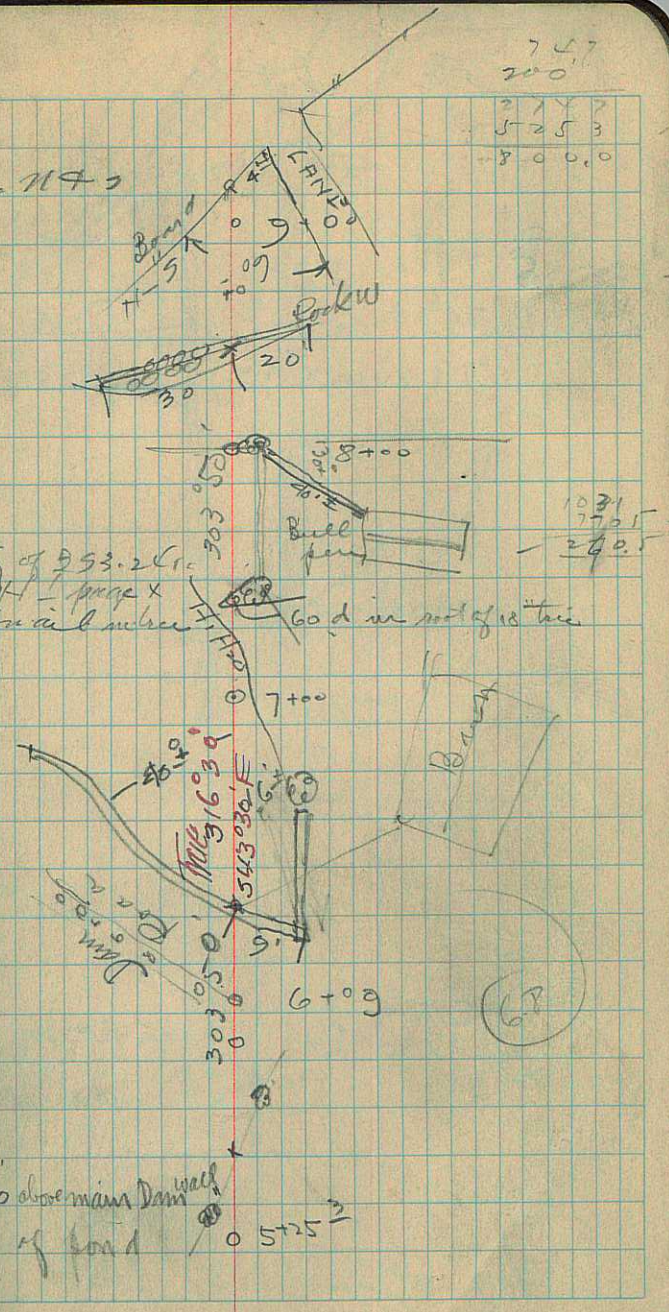
hard fine N 4 3

on 60 d in a 8 inches

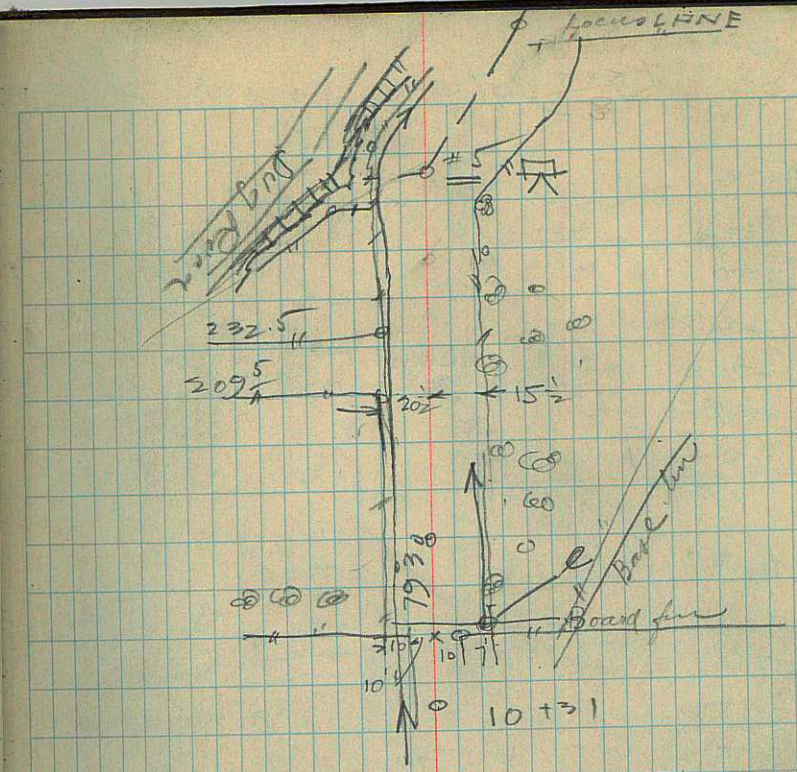
on 60 d in not of 18" tree

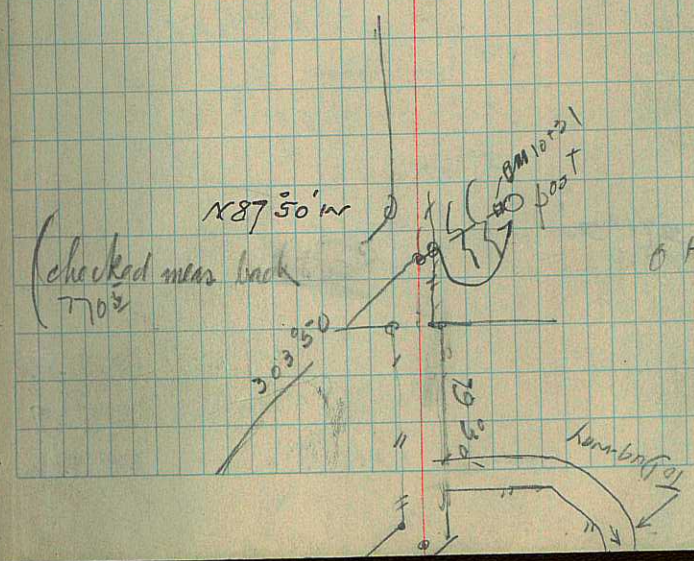
on left bed 6 above main Dam wall

by H2O of pond

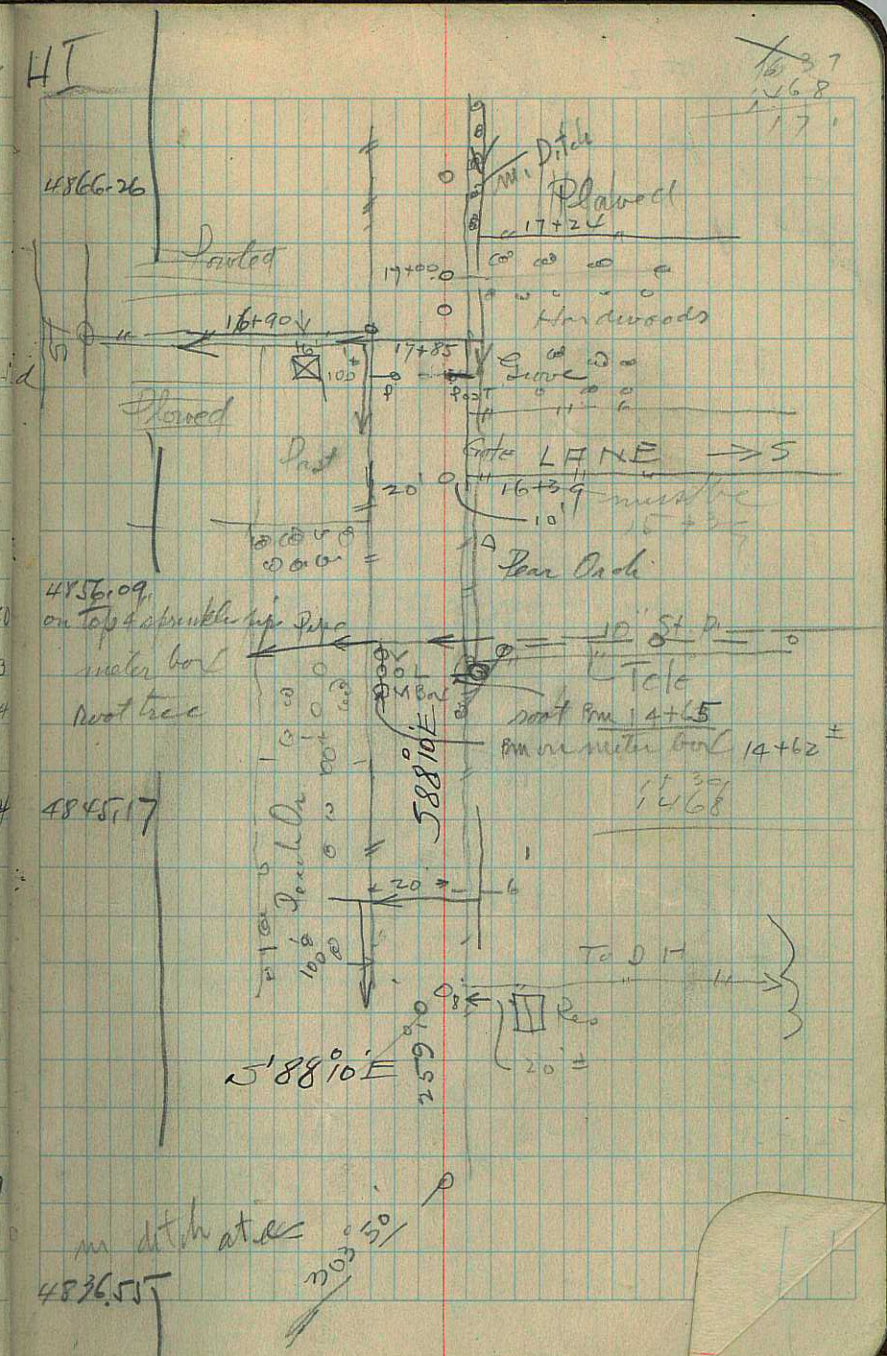


Az	Dist
79°30'	37
79°30'	232½
79°30'	209½
79°30'	60
10+31	
~~N 92°10'~~ 79°30'	60
10+31	
10+31	

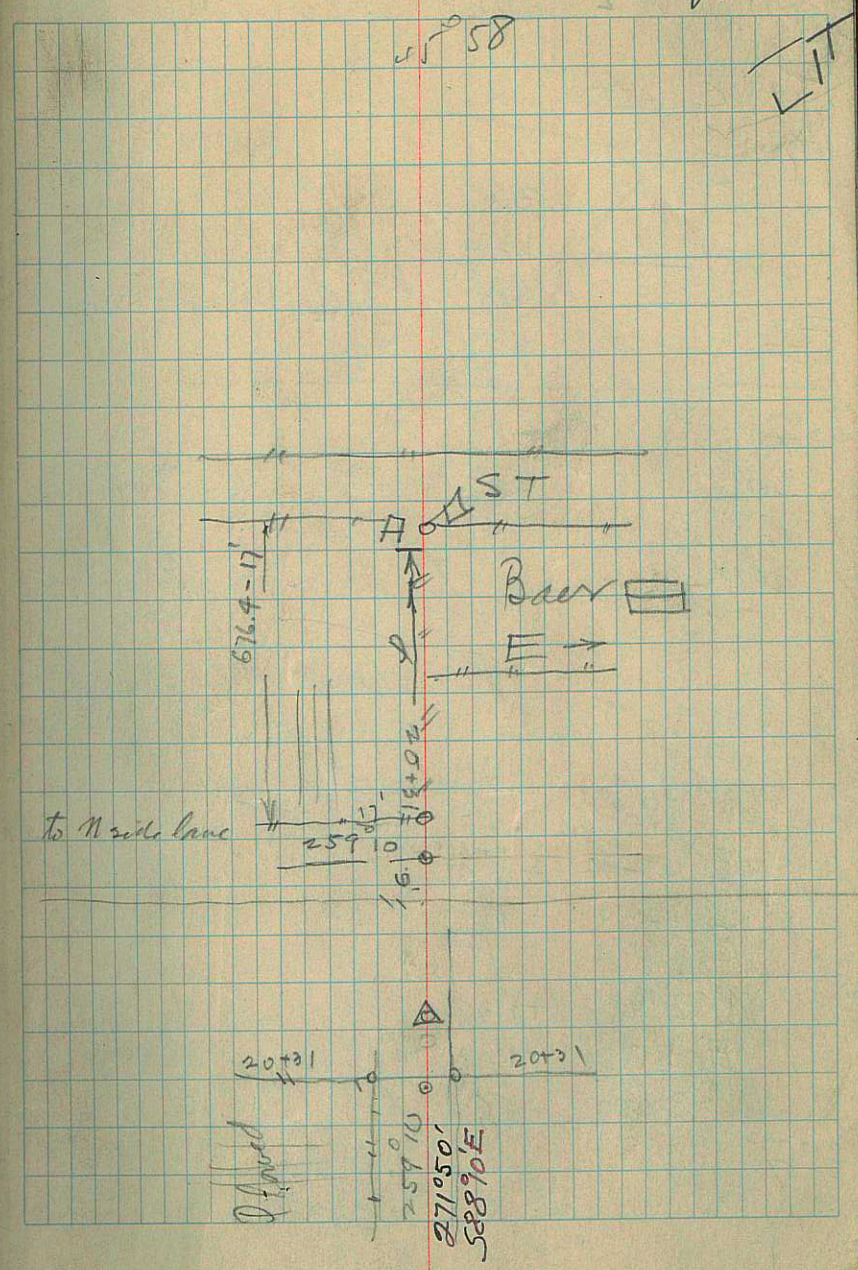




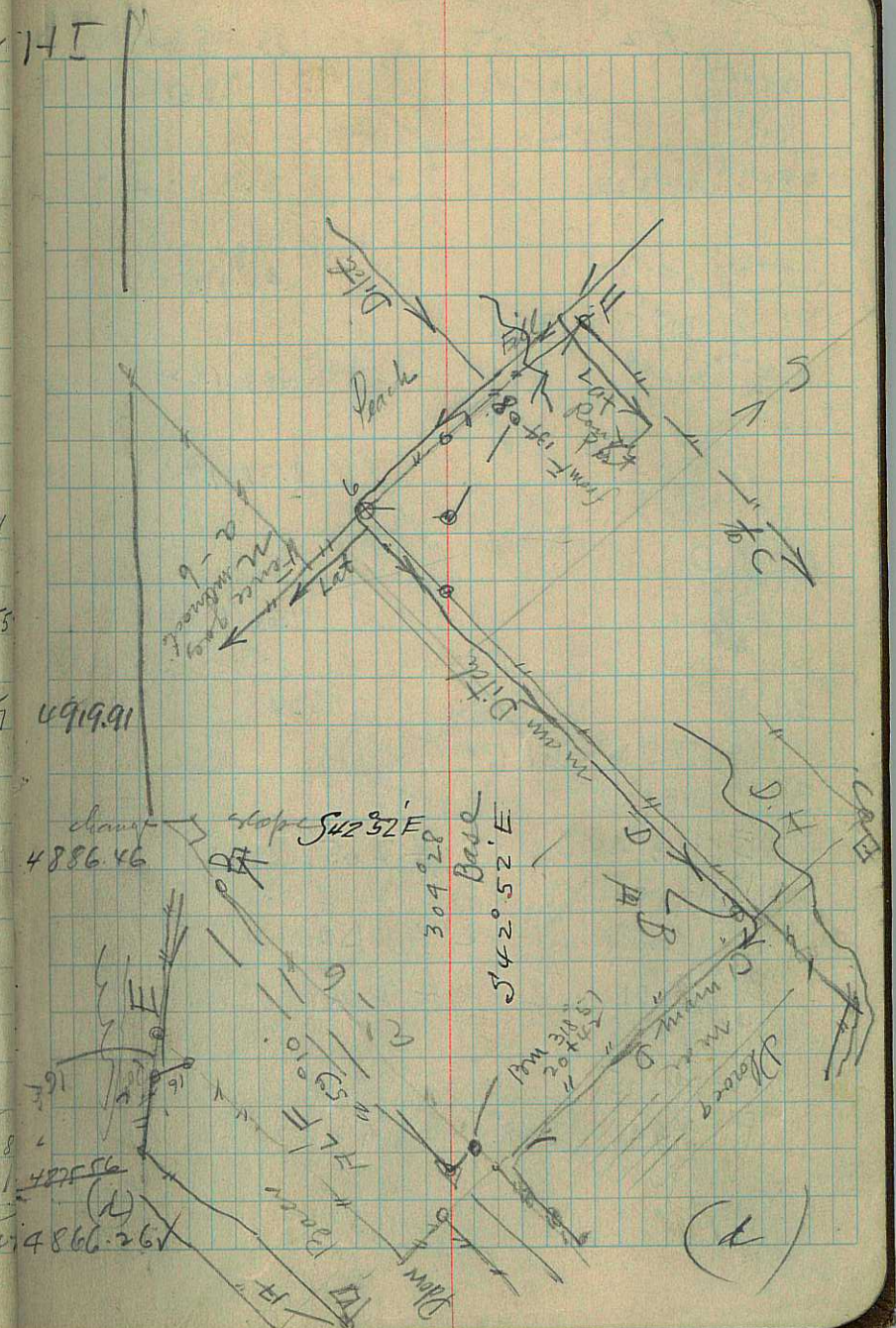
Sta.	Az	Dist.	BS	FS	IM	Elev	HI
20+00							
+24							
17+00							
+90							
16+76		Lex:			5.00	4861.26	
+64							
+39							
16+00							
			0.69	10.86		4855.40	
+68					2.96	4853.13	
+65					1.95	4854.14	
14+00							
			1.13	12.05		4844.04	
					~~7.67~~		
12+84							
12+43							
		271.50'					
		259.10					
10+31					7.67	4837.50	
					9.60	4835.57	
			3.24	11.86		4833.31	



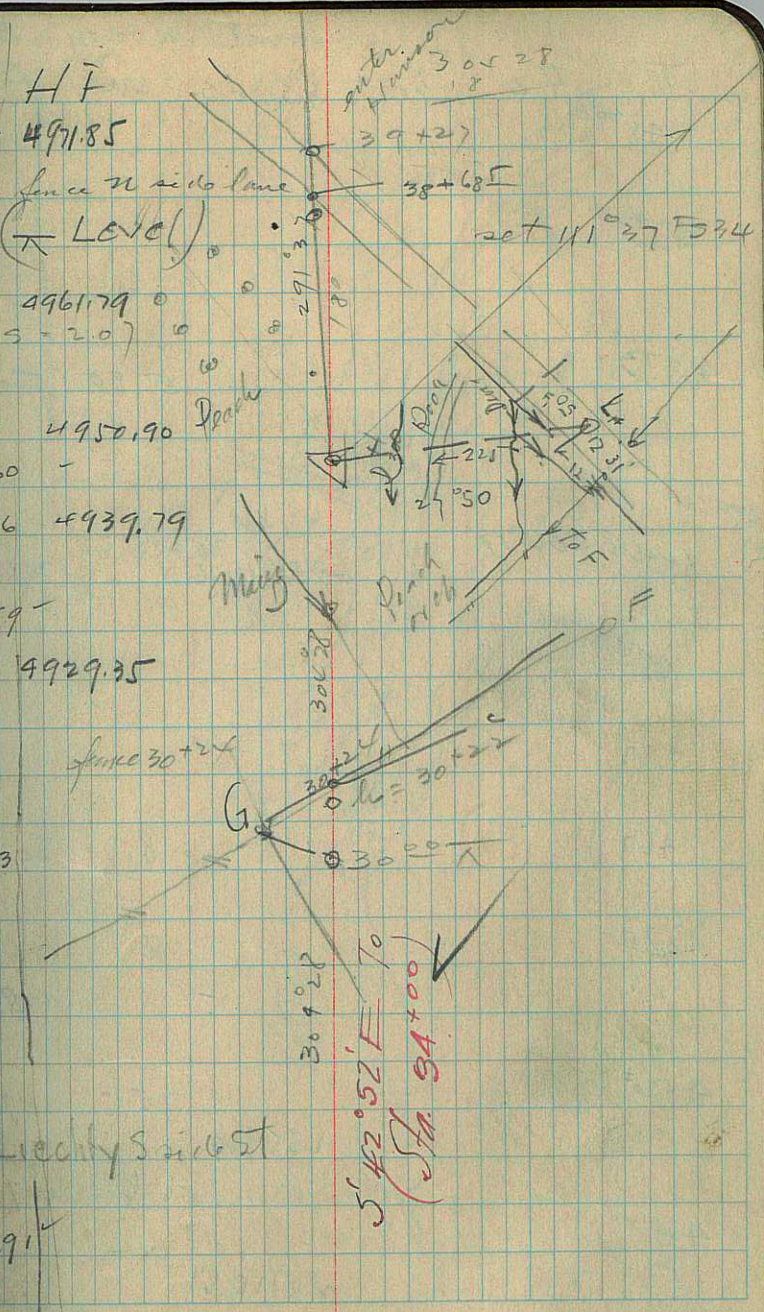
Sta	Az	Dist
	N	676.4
	N ±	379.5'
	N ±	17'
20+31		
20+42		
20+31		



Sta	Az	Dist	BS	Fs	un	Elev	HI
C	45°58'	x					
49 ⊼							
30+00		308'					
		134'					
		60'	to ℄ D Hollow				
F ⊼							
30+00 ⊼							
30+00		+2°50	+		6.44 h	4922.91	
29+31					10.80 D	4918.55	
			1.34	10.78		4918.57	4919.91
			0.38	12.00			
⊼ 23+00 Level	317°08	—	0+14	11.01			change
21+00	304°28 Base		0.34	11.3	on fender		4886.46
E	225°16'	+0°48'					
D	259°52	+2°	top of lath				
C	349°21						
B	349°25	+1°39'					
A	167°54'	−1°43'					
BM 5 by post	318°57	11.5'			10.08	4876.38	
20+42 ⊼			0.66 h	10.90		4875.56	4875.56 (d)
			0.84	10.80		4865.47	4866.26



Sta	Az	Dist	BS	FS	HI	Elev.	HI
39+27							
38+685						4971.85	4971.85
38+64	291°37				4.9		
To fence N side lane							
						4966.95	(℄ Level)
~~38+62~~	291°37'		1.46	11.52		4960.33	4961.79
						BS = 2.07	
7	275°50'	367'					
20+42 PI							
				-2°47		4950.17	4950.90
34 ℄					9.30	4941.60	
			0.73	11.84		4939.06	4939.79
32+32 D					6.2	4933.59	
			1.00	11.44		4928.35	4929.35
C					6.4 D	4923	
30+24							
G	185°13'	51.6					
30+22	304°28				5.62	4923.73	
ΔE	163°40			-2°05			
ΔD	176°54						
C could not see took Δ from 29+00							
B	83°01			-2°30			
20+42	124°28						
A	142°15						
F	344	308'		+1°42			
30+00 ℄					6.44	4922.91	



Levels down

Sta	Az	Dist	BS	FS	HI	Elev
48+00						
47+60						
46+73					5.80	5000.41
+77						
45+62	304°17		3.84	10.26		4995.95
45+36						
+87						
+67					8.1	49 91.64
44+00			0.43	11.75		4988.04
41+30					7.50	4981
			1.55	9.63		4978.84
					6.6	4973.79
40+00			2.07	10.61		4969.78

Going backwards

HI.

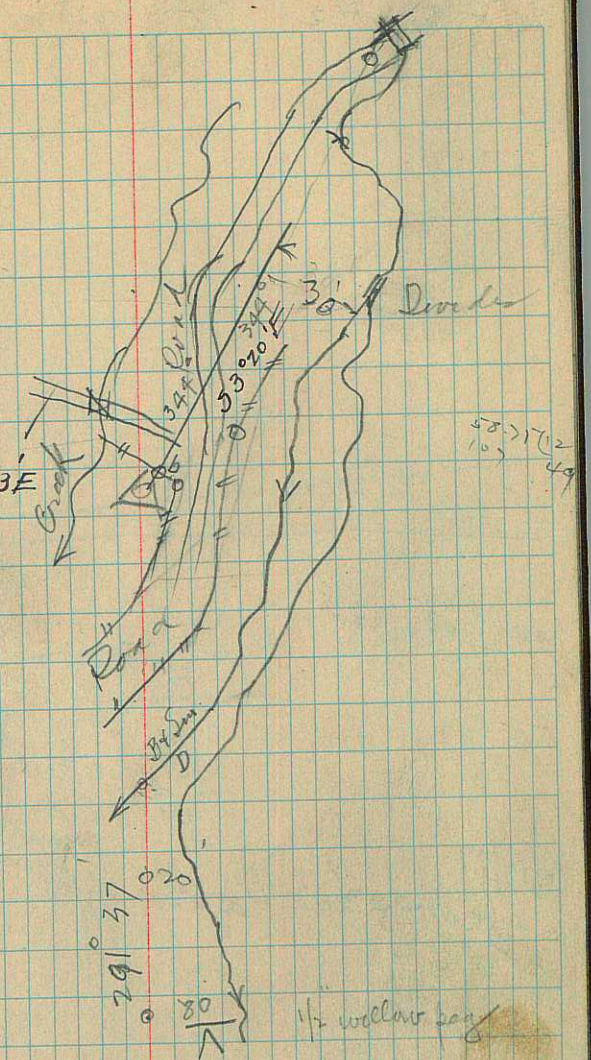
5006.71

4999.19

4988.47

4980.39

4971.85



Nature D crosses N side Cricket Road

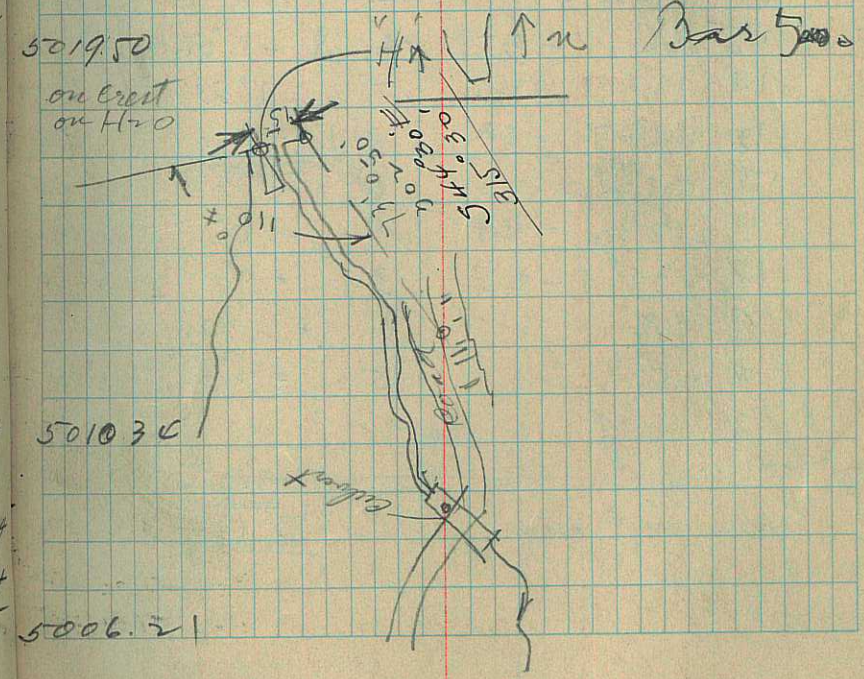
monuments opposite

1 L for Station

Rag at end of Road

Levels down

Sta	Az	Dist	BS	FS	IH	Elev	HT
"H"			5.70			5013.80	5019.50
					6.47	13.03	on crest
					6.10	13.40	on H_2O
50+23							
49+50					6.9.7	5012.53	
49+50	53°20'E = 356°40'						
			2.30	11.46		5008.04	5010.36
48+13					3.50	5006.84	
48+13			Crock		6.60	5003.74	
			4.62	8.75		5001.59	5006.21



BS | FS

3:00 = −10° 8′ 40

For 3 30 P δ = −10° 8′ 30″

RR ∡ from HI

D∡	143°25				
	102°				
	138°40			−2°41	
	155°07			~~−2°41~~	
16	162°20	−40.7	3	−2°16	11.5
15	166°	−35.8	4	−2°06	11.4
14	171°	−28.6	5	−1°53	11.3
13	166°27	−19	8	−1°20	11.9
12	175°25	−23	6	−1°40	11
11	212°30	−9.9	8	−0°	11.9
10	234°	(−2.5)	3	+0°21	6
9	258°		8	+2°30	11.35
8	258°		5	+2°02	7.5
38+6+				4.9	

unbat 2.07

Obs Sta 34

Lat 41° 42

Co 48 18 ← Co. lat

89 60

δ for 3 PM −10 01.4

−10 19.8

−10 8.6 = 108 40

Elev | HI

∡ Kras. house

main spire of 0.17 a

tan = 4.69 o/o

4931.1
4936.
4943.2
4952.8
4948.8
4962
69.3
16.8
49738 Lev.
in Detail
11.37
38
set
4966.95
4969.78 4971.85

on Sta 34

#1 168°53 A C main spire

#2 168°53 use

#3 168°53

70+42 137°08

45+62 30°17

34

30428
1 8
12428

13668
12428
+1240

(t DI 45°62) 29°37 = +12°40

set 168°53 F5 t A C spire

303 77
29 37
1240

30428
1240
31668

180
13668

137°08

2

29137
1240
30417

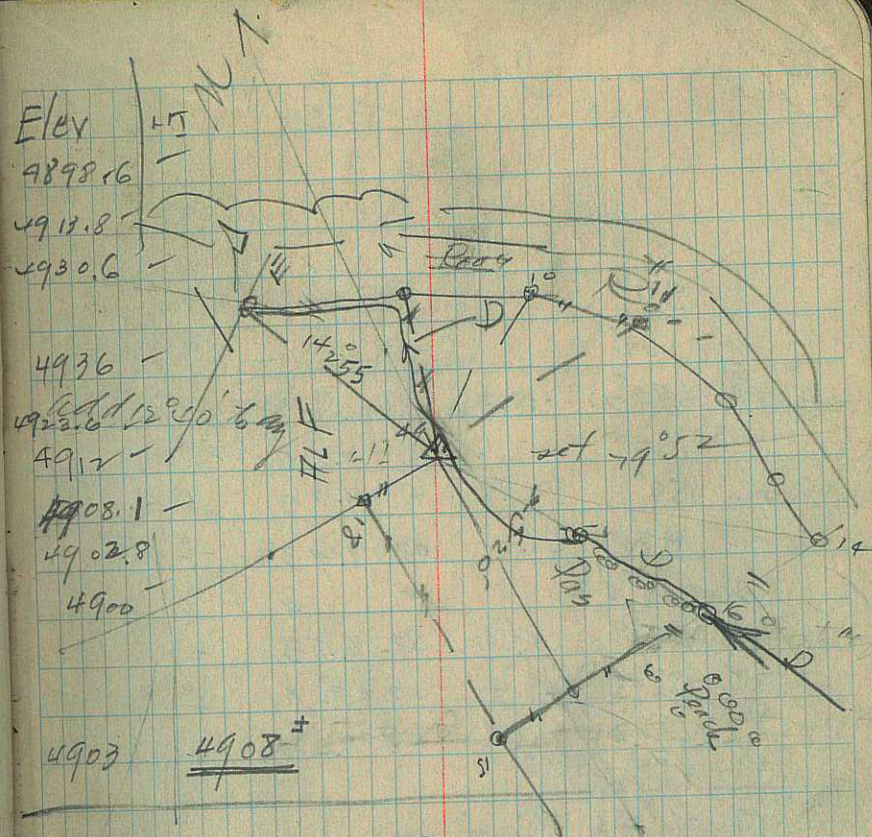
RR±

20+42	79°52				
18	77°51'	-9.4	6	-1°40	7.00
D 17	72°13	+5.8	2.00	+2°10'	6.4
16	315°36'	+22.6	4.30	+3°0	10
15	359°16			+1°30	
14	300°10'	+28	4.0	+2°52	11.2
13	287°33	+15.6	3.0	+2°27	7.9
12	270°32	+4.4	3.0	+1°33	6.2
11	260	+0.4	3.0	+1°10'	5.46
10	217°08'	-5.2	4.0	-0°17'	5.25
9	189°	-8	7.0	-0°10'	8.35
E	142°55'				
20+42	79°52'			-2°05'	

△D△

	142°17	
10+31	79°10	-1°58
C	349°25	
B	349°25	+1°38
	98°20	-2°10
	124°28	-2°18

20+42
^



to E spire of Logan Temple for true az add 12°40'
to ⊥ of W of 10+31. 10+31 is in a hole

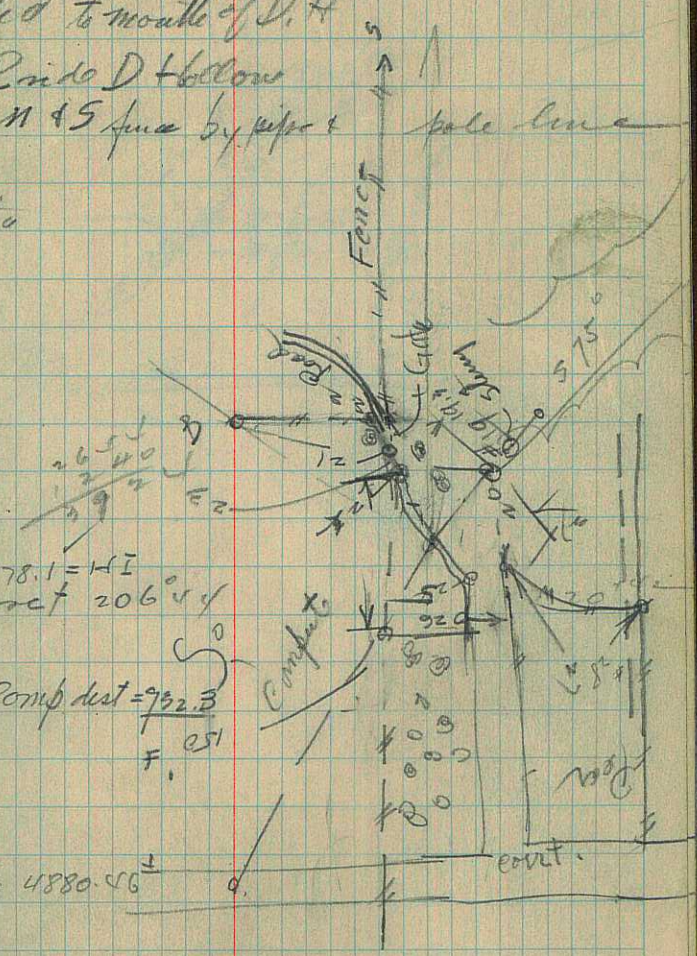
to top bath (3.7±)
to ext. NE cor of nurs house

set 204°28

	Dist	BS/FS	Elev			
	97°					
	106°				−2°15′	
28	89°35′	−15.35	4862.75	8	−1°36′	102
27	127°	−7.6	4870.55		−1°38′	5.7
26	159°	−6.8	4871.3	2	−1°31′	3.8
25	147°05′	−6.2	4871.9	3.0	−2°05′	3.79
24	213°40′			4		4.
23	251°	−1.6	4876.5	3.0	+1°33′	3.62
22	288°55′	+1.4	4879.5	4.	+2°12′	5.6
21	283°22′	+1.9	4880.0	3.	+2°17′	4.3
△B	268°21′					
19	264°44′	19.3′	3.73			
20 △						
19	264°44′	940′ ± / F 732.3	−0°10′	4.0		−6.1
30	304°28′					
20						

Elev.

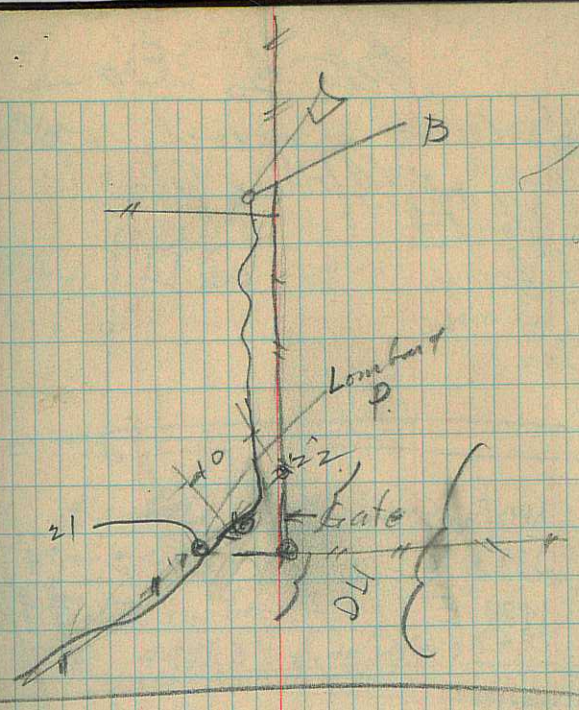
extended to mouth of D.H
down Ridge D to below
on N & S fence by paper & pole line
in Data



4878.1 = HI
ref 206°

Comp dist = 732.3
F. 251

4875.56 HI = 4880.56 ±


B
Lone Land
D
40
22
21
Gate
OH

Oct 30 - 1940

Study gravity ditch out of Spring Creek to "E"

Bear	BS	FS	VM	Sta			
				C			
N182°30'E							
S88°30'E				2	+4°50'	5.7	
N89°E				1.	+9°15'	5.5	
9 F							
4							
5	S18°E			5	-2°40	6	
4 F							
4	S76°45'E			9	-4°15'	9.7	
✓	N14°W			9	-2°20	11	
3							
✓	S55°30'E		4.		+10'		
1 F							
1	N7°E				+10'		
		580					
E							

L-13 Hatch '42

Dist	Elev	HI	
	Ele		
to ℄ little hollow			
6 fine cor			
Bear Ditch on bank			
4976.8	4981.3	(from Sta 38+64)	
4887 m	Crack		
		4897.2	
4893.2	-	10.6	+ 9.4
4889	HI	+20'	
		4908.4	
620	4889.0		
		4891.2	
62'	4886.20	4891.8	
	4886	m)	

.051
4.30
8.2 30
9.4 30
21.7 16.6
10.6 49
20

.080
5.60
5

8.
5.5
13

1.50
2

A 226°02 Elev HI
145°18
0°
14+70

A 217°42
359°51
16+39

A 180°24
121°45 -2°06
20+42

Nov 4-1940

N 68°E 5059.8 5 +3°15' 11.2
49+50 N 32°10W 5012.53 8 -1°45 11.1

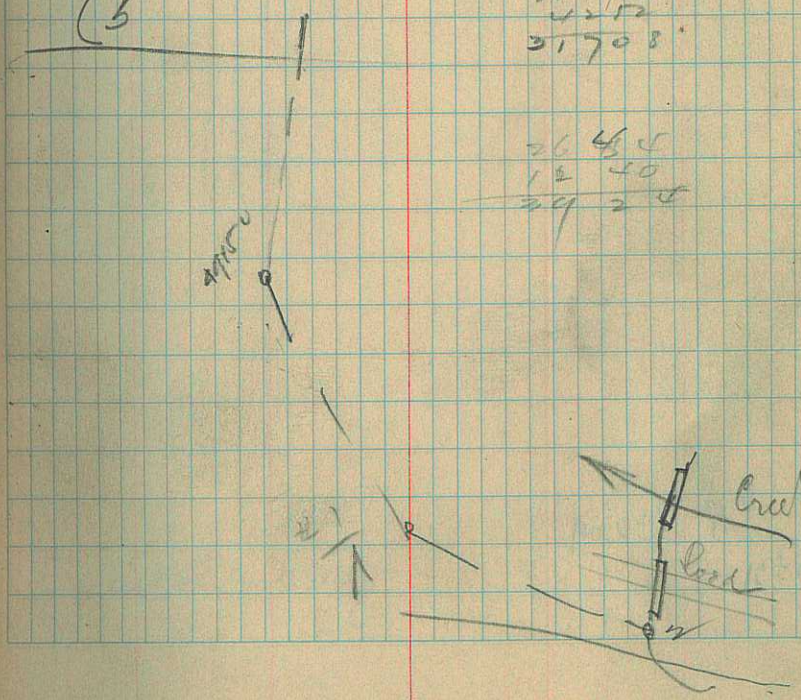
5033

(500' 20 to B)

cor pole @ Jensen
along fence
set 271°50 back to 20+42

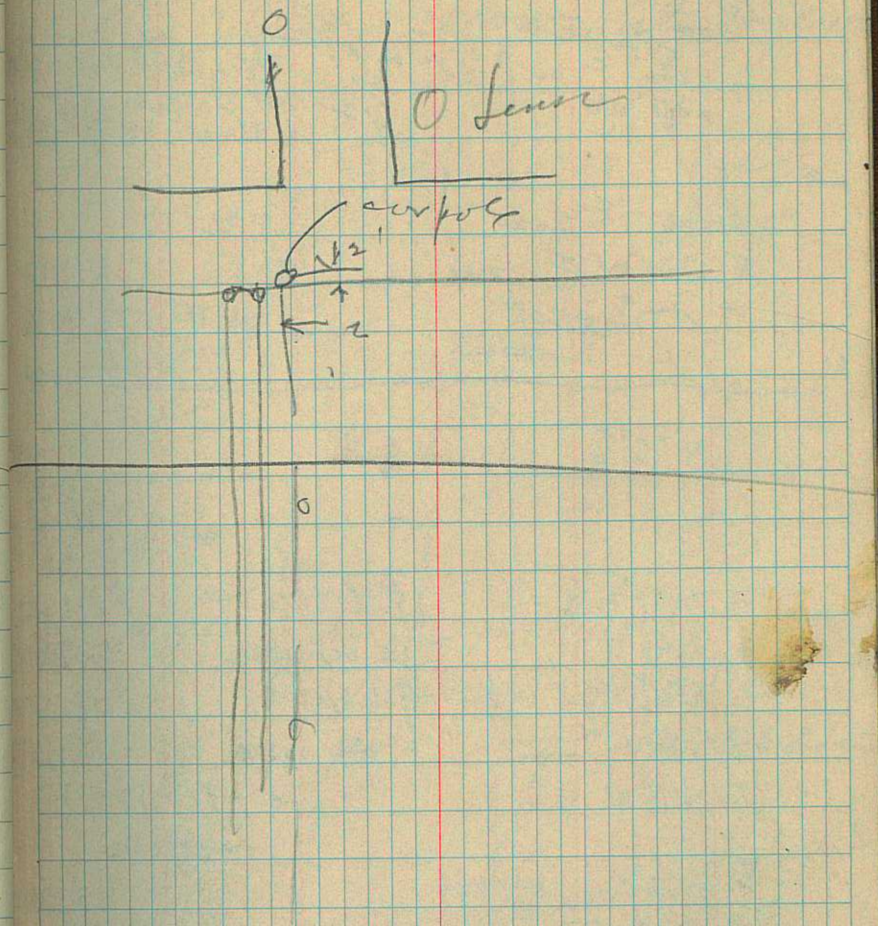
up west side lane
set 91°50 FS 10+31

true up to cor pole @ Jensen
set S 42°52' E
= 31708 FS 6+34



"A" 240°09'

10+31



set at true ang 271°50

Nov 14 - 1900

Additional new

Providence City Res.

585°E
Ay
518°30 E

3.45 on L. #1 FS
BS
7.2
4

Sta de
bet. 12" outlet 20 ft
on H+O

9

8 N27°E 7.02

8 S34°W 7 2.25

7 N77°30 W 12.05

11

N 78°E

3 ±

10 N78°30 E

9 N48°E

8 N66°30 E

7 S74°W

5 N78°W 12.2

6

5 N78°15 1.32

4 113°45

3 69°

2 37°

107°30

8.6

14.00

9.66

4 2

4.0

10.9

13.0

7.8

4.8

8 +0°01' 9.35

11.3 −3°14

4.0 0°

1 0°

4.0 11.5

0° 8.14

4.5 0° 5.47

6 −3°30 11

1.

5.32

on L

Elev. for blowoff below City Inflow Creek.

5119.00

5115.12

5118.40

.06

2.6

BS FS

4.8 1.32

12.2 14.2

19.0 15.5

1.5

1.5

5122.40

11.5

5.2

15

5115.38

5105.58 5117.63

set about 4' E of outflow line

(36')

5106.6 ±

5101. bed Creek

5095.6 pt. in line on opposite side of creek

5099.92 ① bot 12" cup pipe (4')

5105.58 on con. pipe

5105.38 5109.58

5109.58

5097.38

5085.7

5091.

5094.

5059.8

5098.7

Bellock divider

Bellock divider

Base

on pipe line Ditch

Upper END Baer Culvert

HI about 12 above point at pipe

250 ft 14" con. pipe @ 60 $150.00

Wiggins 50.00

300 ft 12" con. 50 150.00

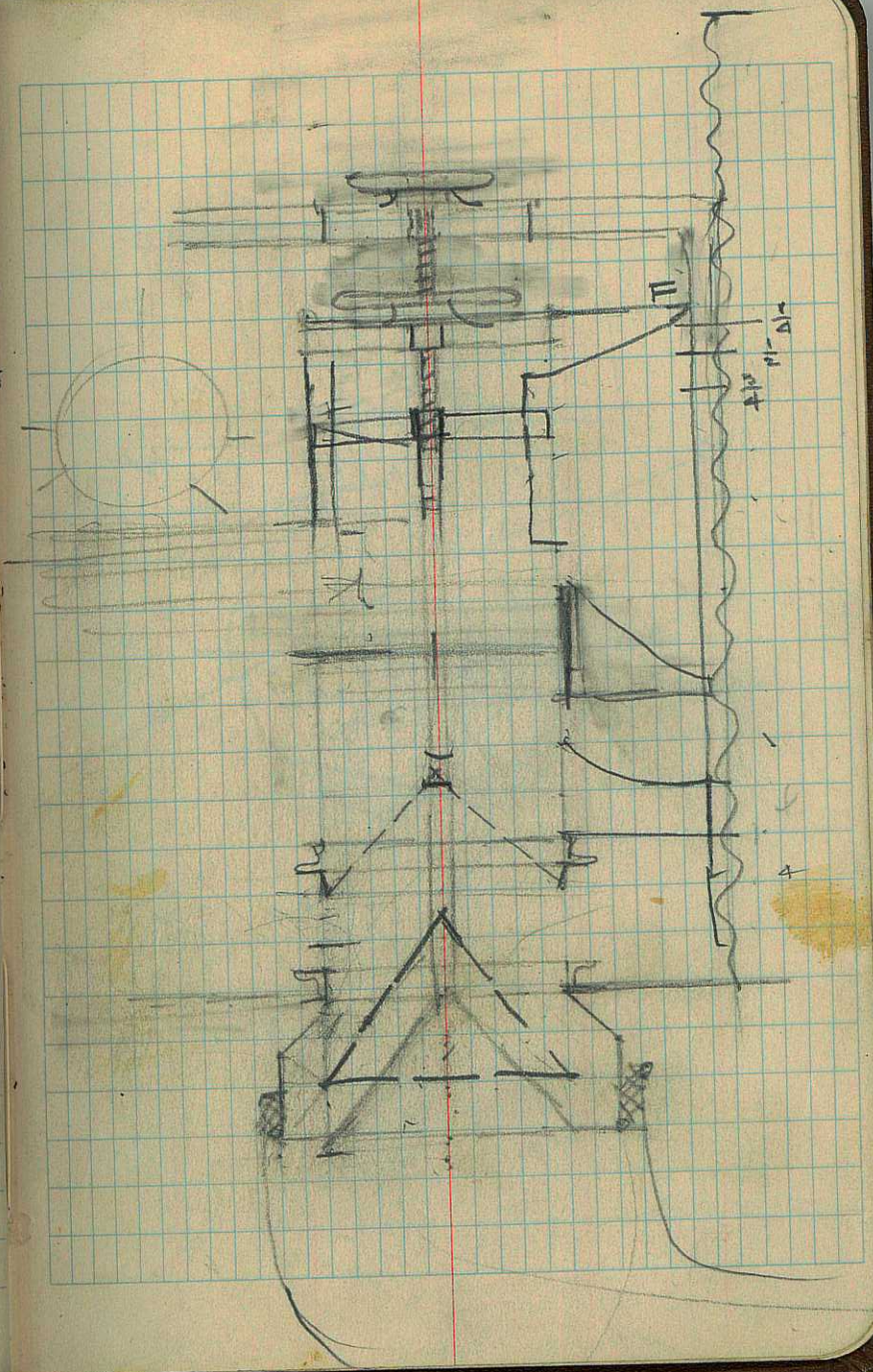
Repair #1 50.00

" Bullock 75

4 75.00

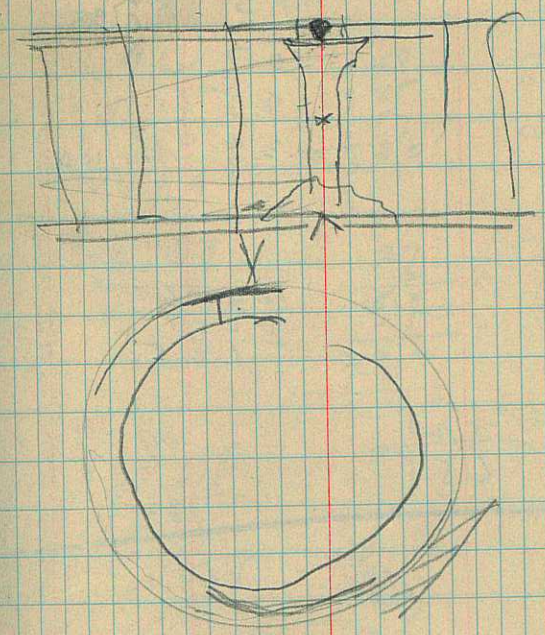
+ 150

525.00



1741 152

152.20 1741
13928.875
17920
1792



220
41 10
311 10

2° — 52' 13

3° .13 per 100

2 .07

4° .25

5° 0.39 per 100

104.06
102.81
1.25

1.25
65.5

109.89
70
102.81

38
30
68
21
65.1

173
68
15

101.25
173
68
105

35 FS

9.62
11.77
8.50
29.89
3
26.49

.49
2.45
49
3.60

27
.2
5.4
.15
270
54
7.10

.75
.015
375
75
.01125

.24
30
7.20

30.00

10989
625
103.14

10989
633
105.56

103.14
102.61
.49

102.65
16
102.81

105.56
1.50
106.06
102.81
1.25

= PQ = coexsec B

coexsec A = PT = exsec B

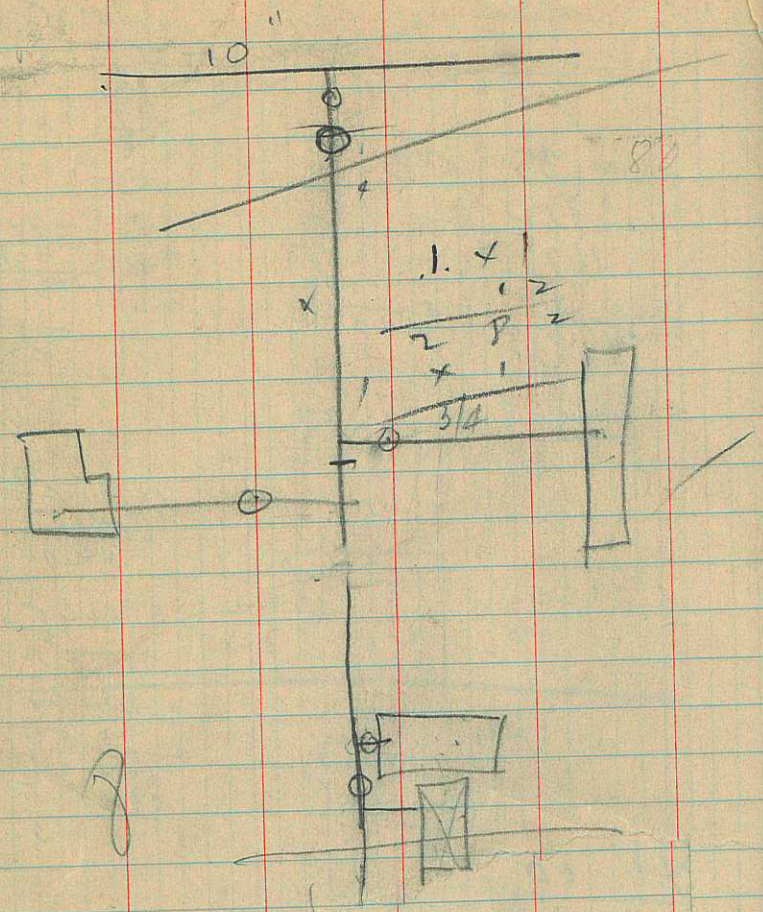
$\sin \frac{1}{2}A = \sqrt{\frac{1-\cos A}{2}}$ $\cos \frac{1}{2}A = \sqrt{\frac{1+\cos A}{2}}$

$\sin 2A = 2 \sin A \cos$ $\cos 2A = \cos^2 A - \sin^2 A$

Law of Sines $\frac{\sin A}{a} = \frac{\sin B}{B} = \frac{\sin C^1}{C}$

Law of Cosines $c^2 = a^2 + p^2 - 2\,ab \cos C$

Law of Tangents $\frac{a+b}{a-b} = \frac{\tan \frac{1}{2}(A+B)}{\tan \frac{1}{2}(A-B)}$



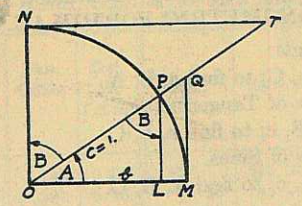


TABLE II

TRIGONOMETRIC FORMULAE

$= \angle MOP \qquad \angle B = \angle PON = \angle OPL$

$R = OB = c = 1$

$A = \frac{a}{c} = \frac{a}{1} = a = \cos B = LP$

$A = \frac{b}{c} = \frac{b}{1} = b = \sin B = OL$

$= \frac{a}{b} = \frac{MQ}{OM} = \frac{MQ}{1} = MQ = \cot B = MQ$

$\frac{NT}{ON} = \frac{NT}{1} = NT = \tan B = NT$

$\frac{OQ}{1} = \frac{OQ}{1} = OQ = \csc B = OQ$

$= \frac{OT}{1} = OT = \sec B = OT$

LM = covers B #

$= OP - LP$ = vers B

PQ = coexsec B

coexsec A = PT = exsec B

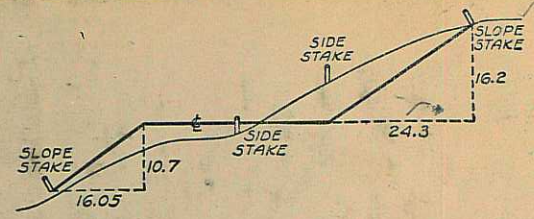
$\sin \frac{1}{2}A = \sqrt{\frac{1 - \text{Cos } A}{2}} \qquad \cos \frac{1}{2}A = \sqrt{\frac{1 + \text{Cos } A}{2}}$

$\sin 2A = 2 \sin A \cos \qquad \cos 2A = \cos^2 A - \sin^2 A$

Law of Sines $\frac{\sin A}{a} = \frac{\sin B}{B} = \frac{\sin C^1}{C}$

Law of Cosines $c^2 = a^2 + p^2 - 2\,ab \cos C$

Law of Tangents $\frac{a+b}{a-b} = \frac{\tan \frac{1}{2}(A+B)}{\tan \frac{1}{2}(A-B)}$



Distances from Side Stakes for Cross-Sectioning

Slope 1½ to 1. Roadway of Any Width

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.00	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	0
1	1.50	1.65	1.80	1.95	2.10	2.25	2.40	2.55	2.70	2.85	1
2	3.00	3.15	3.30	3.45	3.60	3.75	3.90	4.05	4.20	4.35	2
3	4.50	4.65	4.80	4.95	5.10	5.25	5.40	5.55	5.70	5.85	3
4	6.00	6.15	6.30	6.45	6.60	6.75	6.90	7.05	7.20	7.35	4
5	7.50	7.65	7.80	7.95	8.10	8.25	8.40	8.55	8.70	8.85	5
6	9.00	9.15	9.30	9.45	9.60	9.75	9.90	10.05	10.20	10.35	6
7	10.50	10.65	10.80	10.95	11.10	11.25	11.40	11.55	11.70	11.85	7
8	12.00	12.15	12.30	12.45	12.60	12.75	12.90	13.05	13.20	13.35	8
9	13.50	13.65	13.80	13.95	14.10	14.25	14.40	14.55	14.70	14.85	9
10	15.00	15.15	15.30	15.45	15.60	15.75	15.90	16.05	16.20	16.35	10
11	16.50	16.65	16.80	16.95	17.10	17.25	17.40	17.55	17.70	17.85	11
12	18.00	18.15	18.30	18.45	18.60	18.75	18.90	19.05	19.20	19.35	12
13	19.50	19.65	19.80	19.95	20.10	20.25	20.40	20.55	20.70	20.85	13
14	21.00	21.15	21.30	21.45	21.60	21.75	21.90	22.05	22.20	22.35	14
15	22.50	22.65	22.80	22.95	23.10	23.25	23.40	23.55	23.70	23.85	15
16	24.00	24.15	24.30	24.45	24.60	24.75	24.90	25.05	25.20	25.35	16
17	25.50	25.65	25.80	25.95	26.10	26.25	26.40	26.55	26.70	26.85	17
18	27.00	27.15	27.30	27.45	27.60	27.75	27.90	28.05	28.20	28.35	18
19	28.50	28.65	28.80	28.95	29.10	29.25	29.40	29.55	29.70	29.85	19
20	30.00	30.15	30.30	30.45	30.60	30.75	30.90	31.05	31.20	31.35	20
21	31.50	31.65	31.80	31.95	32.10	32.25	32.40	32.55	32.70	32.85	21
22	33.00	33.15	33.30	33.45	33.60	33.75	33.90	34.05	34.20	34.35	22
23	34.50	34.65	34.80	34.95	35.10	35.25	35.40	35.55	35.70	35.85	23
24	36.00	36.15	36.30	36.45	36.60	36.75	36.90	37.05	37.20	37.35	24
25	37.50	37.65	37.80	37.95	38.10	38.25	38.40	38.55	38.70	38.85	25
26	39.00	39.15	39.30	39.45	39.60	39.75	39.90	40.05	40.20	40.35	26
27	40.50	40.65	40.80	40.95	41.10	41.25	41.40	41.55	41.70	41.85	27
28	42.00	42.15	42.30	42.45	42.60	42.75	42.90	43.05	43.20	43.35	28
29	43.50	43.65	43.80	43.95	44.10	44.25	44.40	44.55	44.70	44.85	29
30	45.00	45.15	45.30	45.45	45.60	45.75	45.90	46.05	46.20	46.35	30
31	46.50	46.65	46.80	46.95	47.10	47.25	47.40	47.55	47.70	47.85	31
32	48.00	48.15	48.30	48.45	48.60	48.75	48.90	49.05	49.20	49.35	32
33	49.50	49.65	49.80	49.95	50.10	50.25	50.40	50.55	50.70	50.85	33
34	51.00	51.15	51.30	51.45	51.60	51.75	51.90	52.05	52.20	52.35	34
35	52.50	52.65	52.80	52.95	53.10	53.25	53.40	53.55	53.70	53.85	35
36	54.00	54.15	54.30	54.45	54.60	54.75	54.90	55.05	55.20	55.35	36
37	55.50	55.65	55.80	55.95	56.10	56.25	56.40	56.55	56.70	56.85	37
38	57.00	57.15	57.30	57.45	57.60	57.75	57.90	58.05	58.20	58.35	38
39	58.50	58.65	58.80	58.95	59.10	59.25	59.40	59.55	59.70	59.85	39
40	60.00	60.15	60.30	60.45	60.60	60.75	60.90	61.05	61.20	61.35	40
41	61.50	61.65	61.80	61.95	62.10	62.25	62.40	62.55	62.70	62.85	41
42	63.00	63.15	63.30	63.45	63.60	63.75	63.90	64.05	64.20	64.35	42
43	64.50	64.65	64.80	64.95	65.10	65.25	65.40	65.55	65.70	65.85	43
44	66.00	66.15	66.30	66.45	66.60	66.75	66.90	67.05	67.20	67.35	44
45	67.50	67.65	67.80	67.95	68.10	68.25	68.40	68.55	68.70	68.85	45
46	69.00	69.15	69.30	69.45	69.60	69.75	69.90	70.05	70.20	70.35	46
47	70.50	70.65	70.80	70.95	71.10	71.25	71.40	71.55	71.70	71.85	47
48	72.00	72.15	72.30	72.45	72.60	72.75	72.90	73.05	73.20	73.35	48
49	73.50	73.65	73.80	73.95	74.10	74.25	74.40	74.55	74.70	74.85	49
50	75.00	75.15	75.30	75.45	75.60	75.75	75.90	76.05	76.20	76.35	50

Distance of slope stake from side or shoulder stake for any width roadway, slope 1½ to 1. If ground is nearly level, the cut or fill at side stake is located by the double entry method in left column and top row. The number in body of table in same row and column gives distance from side stake to slope stake. If ground is not level estimate the difference in elevation between the side stake and slope stake, lower target by this amount if cut, elevate if fill. Add this amount to cut or fill and find distance in table. Set up rod at this point, and line of sight should cut target. If it does not make the slight adjustment necessary.