

13



TABLE XIII—CORRECTIONS FOR TANGENTS AND EXTERNALS

These corrections are to be added to the approximate values, found by dividing the tangent, or external, for a 1° curve (Table VIII) by the degree of curve, in order to obtain the true tangents, or externals. Intermediate values may be obtained by interpolation.

FOR TANGENTS ADD

Central Angle	DEGREE OF CURVE													
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.03	.06	.09	.13	.16	.19	.22	.25	.28	.31	.34	.38	.42	.46
15°	.04	.10	.14	.19	.24	.29	.34	.39	.45	.51	.55	.58	.63	.68
20°	.06	.13	.19	.26	.32	.39	.45	.51	.58	.65	.72	.79	.84	.90
25°	.08	.16	.24	.33	.40	.49	.58	.67	.75	.83	.90	.99	1.06	1.14
30°	.10	.19	.29	.39	.49	.59	.69	.79	.89	.99	1.09	1.20	1.29	1.39
35°	.11	.22	.34	.47	.58	.69	.79	.81	.92	1.04	1.29	1.42	1.54	1.66
40°	.13	.26	.40	.53	.67	.80	.93	1.06	1.20	1.34	1.49	1.64	1.79	1.94
45°	.15	.30	.44	.60	.76	.91	1.06	1.21	1.37	1.52	1.70	1.87	2.04	2.21
50°	.17	.34	.51	.68	.85	1.02	1.19	1.36	1.54	1.72	1.91	2.10	2.29	2.48
55°	.19	.38	.57	.76	.95	1.14	1.32	1.52	1.72	1.92	2.14	2.35	2.56	2.77
60°	.21	.42	.63	.84	1.05	1.27	1.49	1.71	1.94	2.17	2.38	2.60	2.83	3.07
65°	.23	.46	.69	.93	1.16	1.40	1.64	1.88	2.13	2.38	2.63	2.88	3.13	3.39
70°	.25	.51	.76	1.02	1.28	1.54	1.80	2.06	2.33	2.60	2.88	3.16	3.44	3.72
75°	.27	.56	.83	1.12	1.40	1.69	1.98	2.27	2.57	2.87	3.16	3.47	3.78	4.09
80°	.30	.61	.91	1.22	1.53	1.84	2.15	2.46	2.78	3.10	3.44	3.78	4.12	4.46
85°	.33	.66	1.00	1.33	1.68	2.02	2.36	2.70	3.05	3.40	3.77	4.14	4.55	4.89
90°	.36	.72	1.09	1.45	1.83	2.20	2.57	2.94	3.32	3.70	4.10	4.50	4.91	5.32
95°	.39	.79	1.19	1.55	2.00	2.40	2.80	3.20	3.61	4.02	4.40	4.98	5.38	5.83
100°	.43	.86	1.30	1.74	2.18	2.62	3.06	3.50	3.95	4.40	4.88	5.37	5.85	6.34
110°	.51	1.03	1.56	2.08	2.61	3.14	3.67	4.21	4.76	5.31	5.86	6.43	7.01	7.60
120°	.62	1.25	1.93	2.52	3.16	3.81	4.45	5.11	5.77	6.44	7.12	7.80	8.50	9.22

FOR EXTERNALS ADD

Central Angle	DEGREE OF CURVE													
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.001	.003	.004	.006	.007	.008	.009	.011	.012	.014	.015	.017	.018	.020
15°	.003	.007	.010	.014	.018	.023	.027	.029	.032	.035	.039	.043	.047	.051
20°	.006	.011	.017	.022	.028	.034	.038	.045	.051	.057	.063	.070	.076	.083
25°	.009	.018	.027	.036	.046	.056	.065	.074	.083	.093	.106	.120	.127	.135
30°	.013	.025	.038	.051	.065	.078	.090	.103	.116	.129	.149	.170	.179	.188
35°	.018	.035	.054	.072	.086	.109	.131	.153	.175	.197	.213	.230	.247	.264
40°	.023	.046	.070	.093	.117	.141	.172	.203	.234	.265	.277	.290	.315	.341
45°	.030	.060	.093	.119	.153	.184	.216	.254	.289	.325	.351	.378	.411	.445
50°	.037	.075	.116	.151	.189	.227	.266	.305	.345	.384	.425	.467	.508	.550
55°	.048	.093	.142	.188	.236	.283	.332	.381	.420	.479	.530	.582	.641	.700
60°	.056	.112	.168	.225	.283	.340	.398	.457	.516	.575	.636	.697	.774	.851
65°	.067	.135	.204	.273	.343	.412	.483	.554	.625	.697	.771	.845	.922	1.01
70°	.080	.159	.240	.321	.403	.485	.568	.652	.735	.819	.906	.994	1.08	1.17
75°	.095	.182	.266	.353	.440	.528	.617	.707	.797	.877	1.07	1.18	1.29	1.39
80°	.110	.220	.332	.445	.558	.671	.787	.903	1.02	1.13	1.25	1.38	1.50	1.62
85°	.128	.259	.391	.524	.657	.790	.926	1.06	1.20	1.34	1.47	1.62	1.76	1.91
90°	.149	.299	.450	.603	.756	.910	1.07	1.22	1.38	1.54	1.70	1.87	2.03	2.20
95°	.174	.350	.522	.706	.885	1.06	1.25	1.43	1.62	1.80	1.99	2.18	2.38	2.58
100°	.200	.401	.604	.809	1.01	1.22	1.43	1.64	1.85	2.06	2.28	2.50	2.73	2.96
110°	.268	.536	.806	1.08	1.35	1.63	1.91	2.20	2.48	2.76	3.05	3.35	3.66	3.96
120°	.360	.721	1.08	1.45	1.82	2.19	2.57	2.95	3.33	3.72	4.11	4.50	4.91	5.32

Index

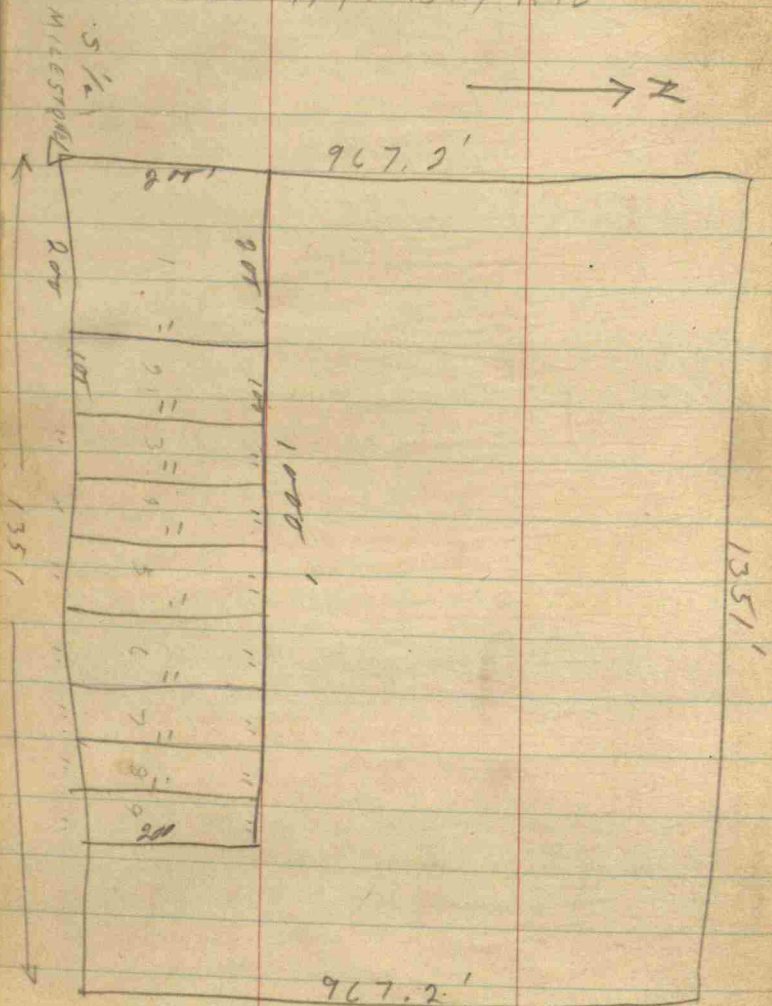
- 1-2 Arthur Kelly
- 3-5 Hill
- 7-8 Maurice Money
- 9-10 Dowden
- 11-12 Walt
- 13-14 Faulkner-Johnson
- 15-16 Hill
- 17-19 "Roy Hill" "Perc Test" "Shodgrass Adch."
- 26-46 Shelton Sub-division
- 48-56 County Home (Seven lines)
- 153-156 Sunoco



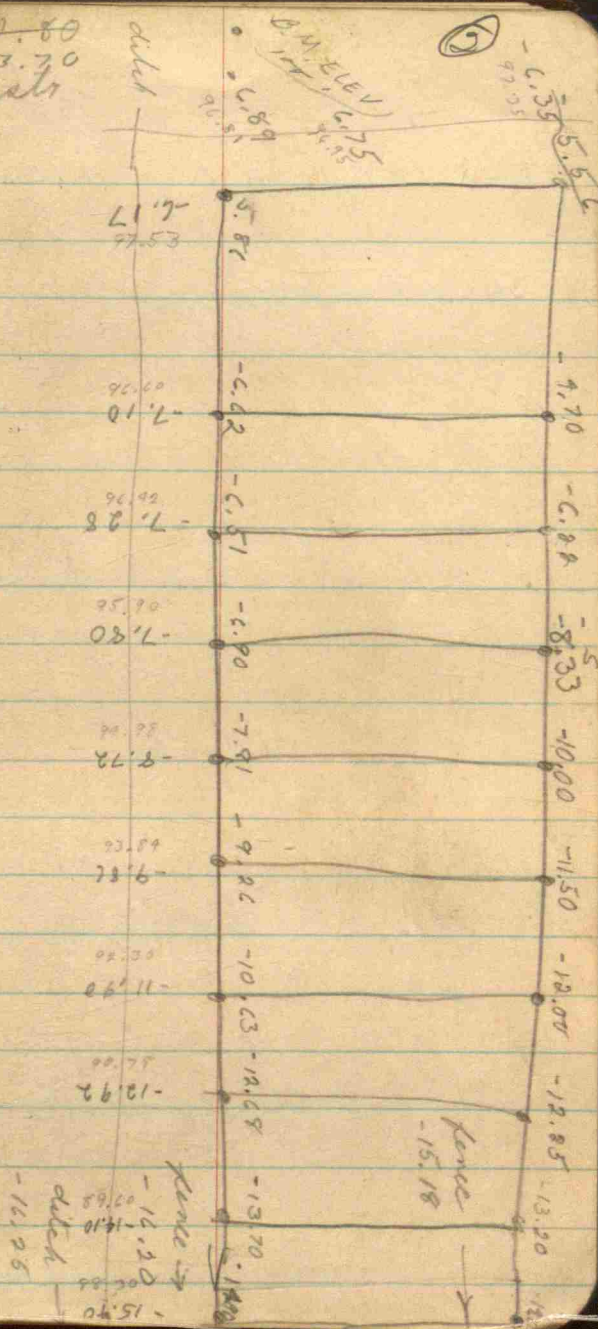
①

SURVEY ON  
SEC 17, T 15N, R 1E

ARTHUR KELLY  
PROPERTY



+ S : ~~0.80~~  
 elev in feet  
 103.80  
 103.70





3 1 1

SURVEY FOR HILL

SEC 7, T15N, R1W

NOTE EAST SECTION LINE ON AC.

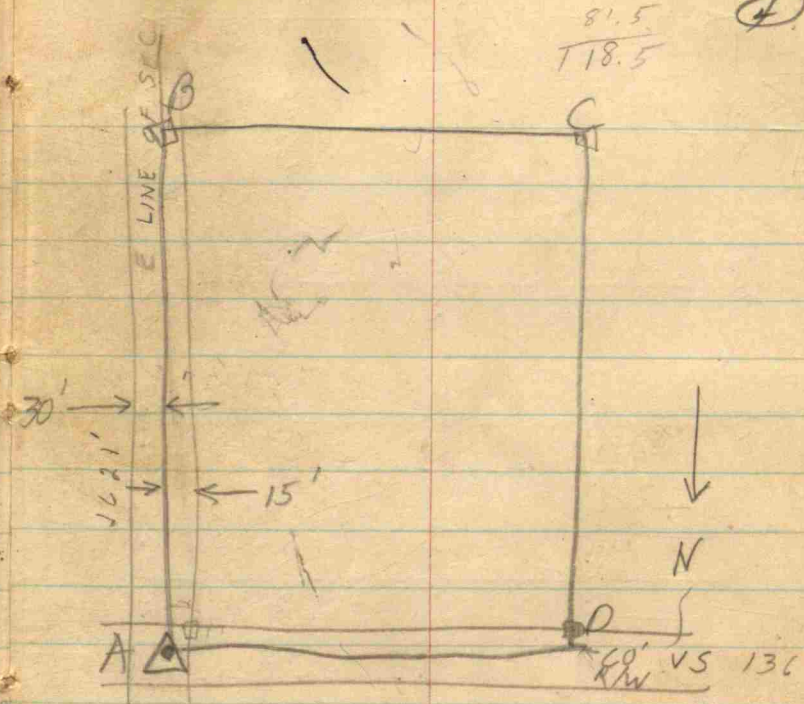
15' W OF SEC LINE TO R/W

30' E OF SEC LINE TO R/W

LC	90° 0'	
LD	90° 0'	
LB	<del>89° 13'</del>	89° 28'
LA	90° 14'	89° 59'

DC	1592 + 31 =	1623.0
BC	1318.5 + 15	1333.5
BA	1621.75	
AD	1335.7	

200.0  
81.5  
118.5

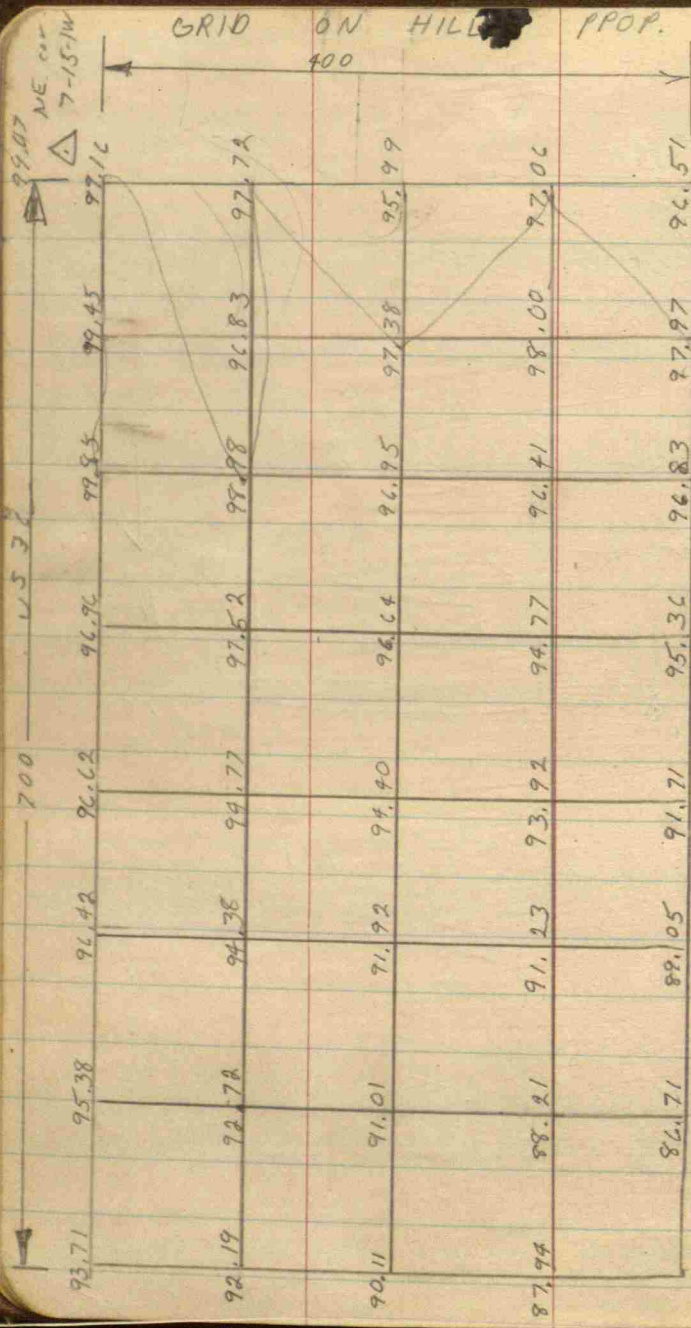


NE COR

SEC 7, T15N, R1W

LA = 90° 2'	AB = 1621'
91° 0' LB = 92° 0'	BC = 1326.5'
LC = 90° 10'	CD = 1393' + 281.2
LD = 90° 13'	DA = 1324.5

10 P.M.



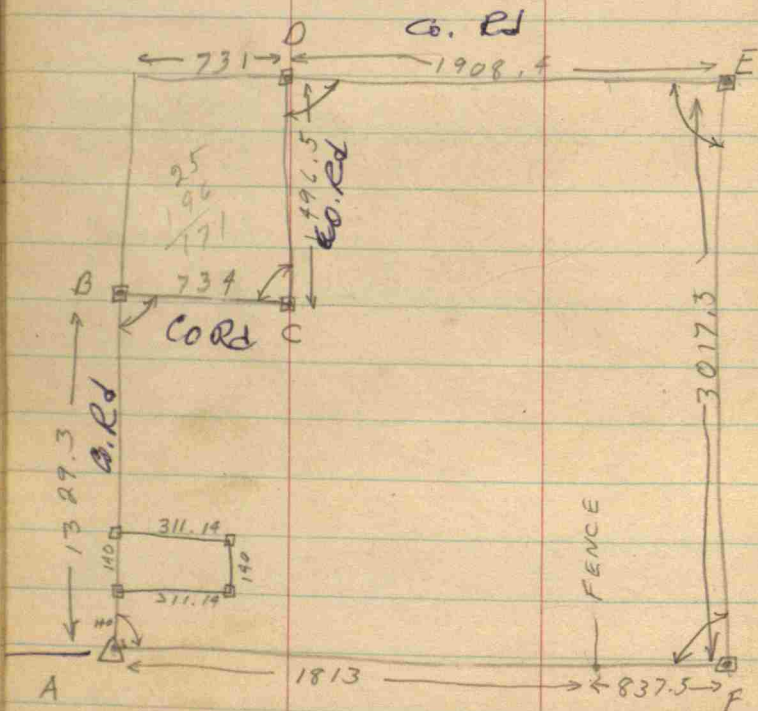
5

6



7

SURVEY FOR MONEY  
 NW 1/4, SEC 2, T15N, R1W  
 START W 1/2 MILESTONE



8

SIDE	LENGTH
AB	1329.3
BC	734.0
CD	1496.5
DE	1908.4
EF	3017.5
FA	2650.5

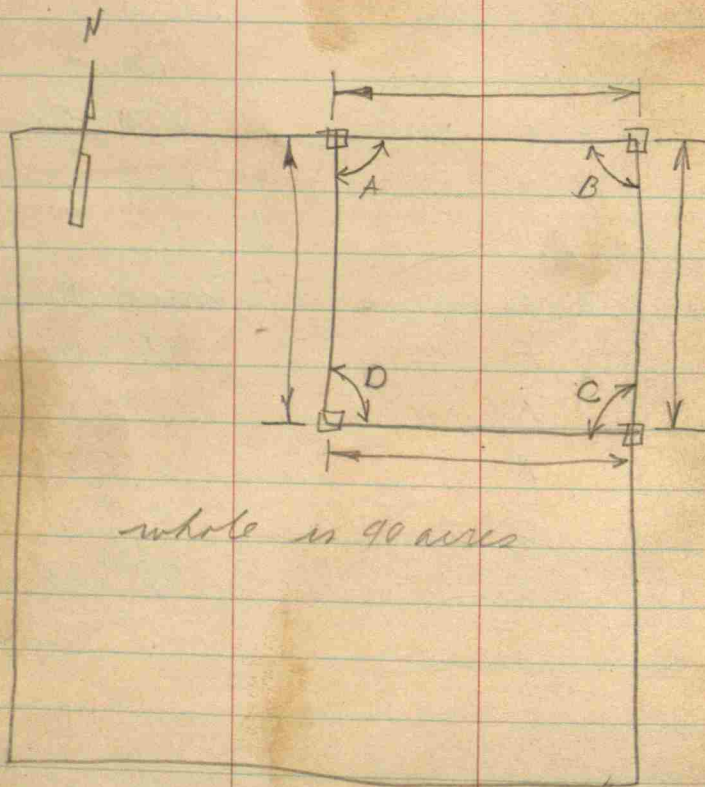
ANGLE	MEASUREMENT
F	90° 10'
A	89° 34'
B	89° 52'
C	90° 19'
D	89° 23'
E	91° 42'

9

SURVEY FOR DOWDEN

SEC 28, T17N, R1W

NE 1/4 of NE 1/4



10

SIDE

LENGTH

AB

411.5

BC

987.0

CD

435.0

DA

990.8

ANGLE

MEASUREMENT

A

89° 46' 90° 37'

B

91° 12'

C

89° 11'

D

88° 49'

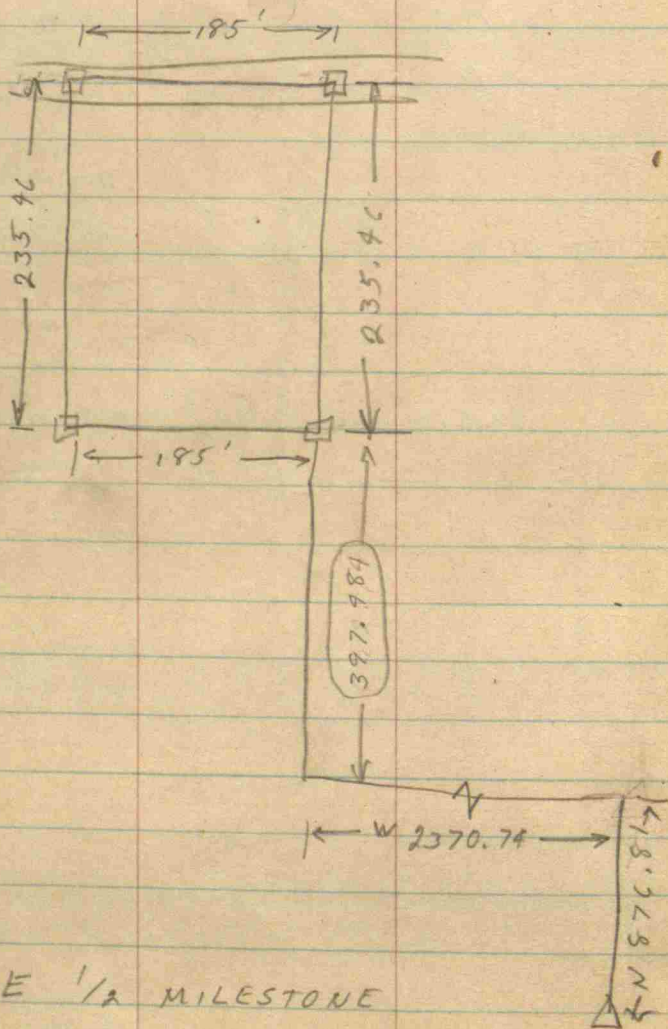
357.10

358.57



(11)

SURVEY FOR HOLT



E 1/2 MILESTONE

34-16-1E

(12)

question in

632.99



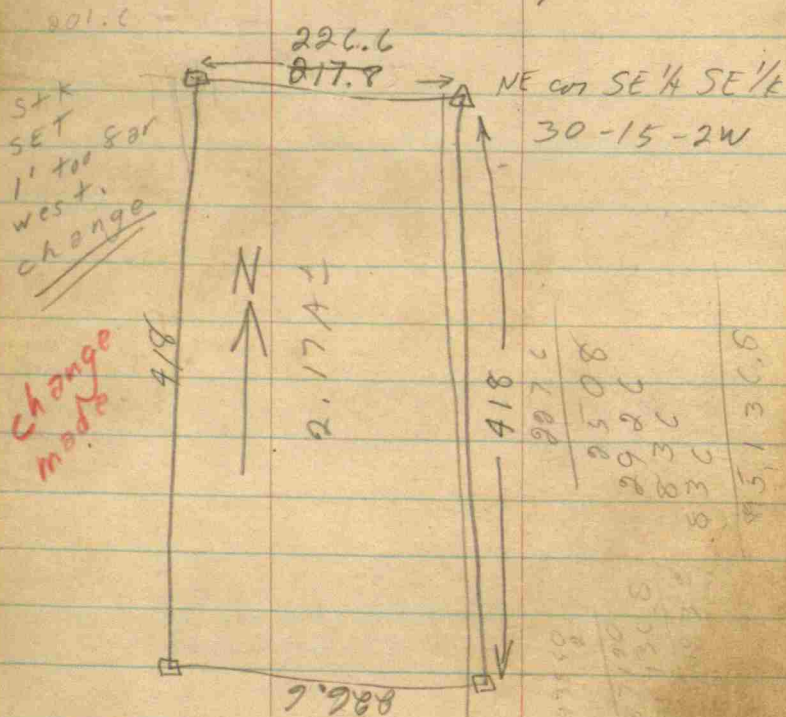
(13)

R.R. Lake Johnson Jr.

Survey for Paul Jones & Johnson

Start NE cor of SE 1/4 of SE 1/4  
30-15-2W

16' from E Rd to fence



(14)

210.6

+16.0

226.6

217.8

9.8



15

SURVEY FOR GILL

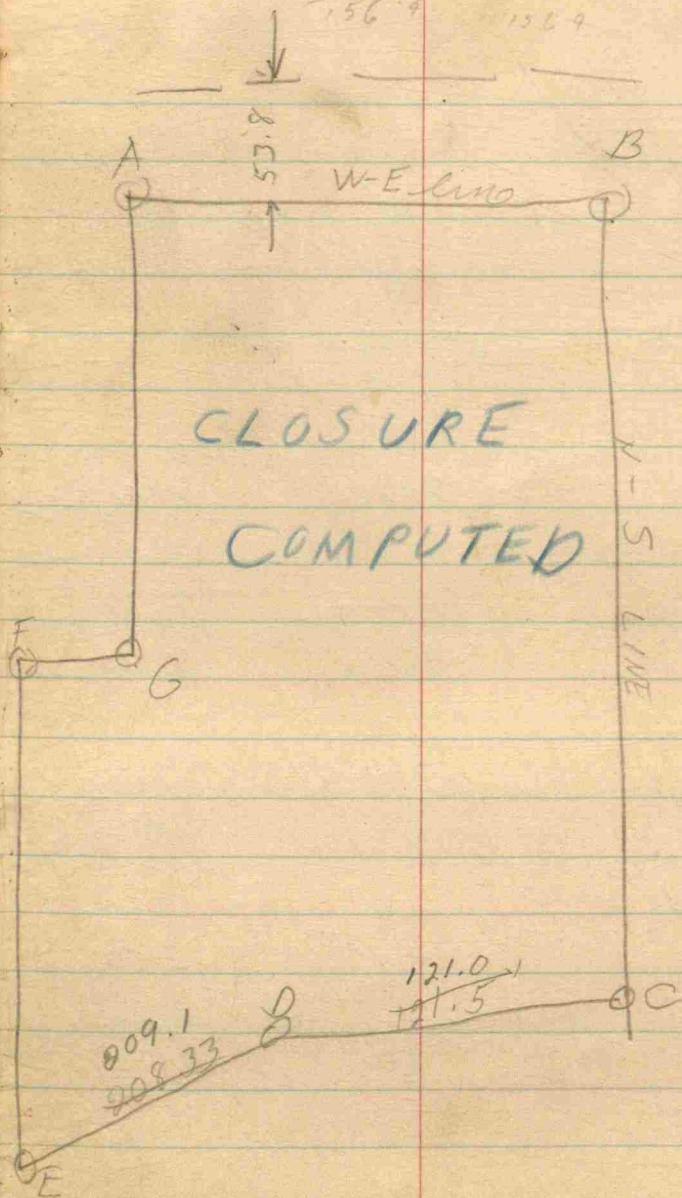
LINE	ANGLE
FG	F
117.25'	97° 44'
GA	G
156.7	259° 45'
AB	A
130.8	99° 19'
BC	B
<del>230.5</del> 231.9'	<del>89° 6.5'</del>
EF	88° 37'
255.6	
DE	
<del>208.3</del> 209.1	
CD	
<del>121.5</del> 121.0	

To the pt  
327.3 W pt A

210.2  
53.8  
156.4

169.4  
9  
158.4

16





(17)

PERC TEST  
FOR ROY HILL

↓  
N

1st  
○

2nd  
○

3rd  
○

Start

Start

Start

8:45

~~9:05~~

9:10

9:10

9:15

Stop

9:45

Stop

Stop

10:10

10:15

3.1"

2.7"

2.9"

(18)



(19) July 2, 1953

Levels for Storm  
Sewers

500 grass addition

20

STA	+	II	-	L/F
B.M.	2.59	102.59		100
Top Stake #1	3.05			
Top Stake #2	4.05			
Top Stake #3	6.05			

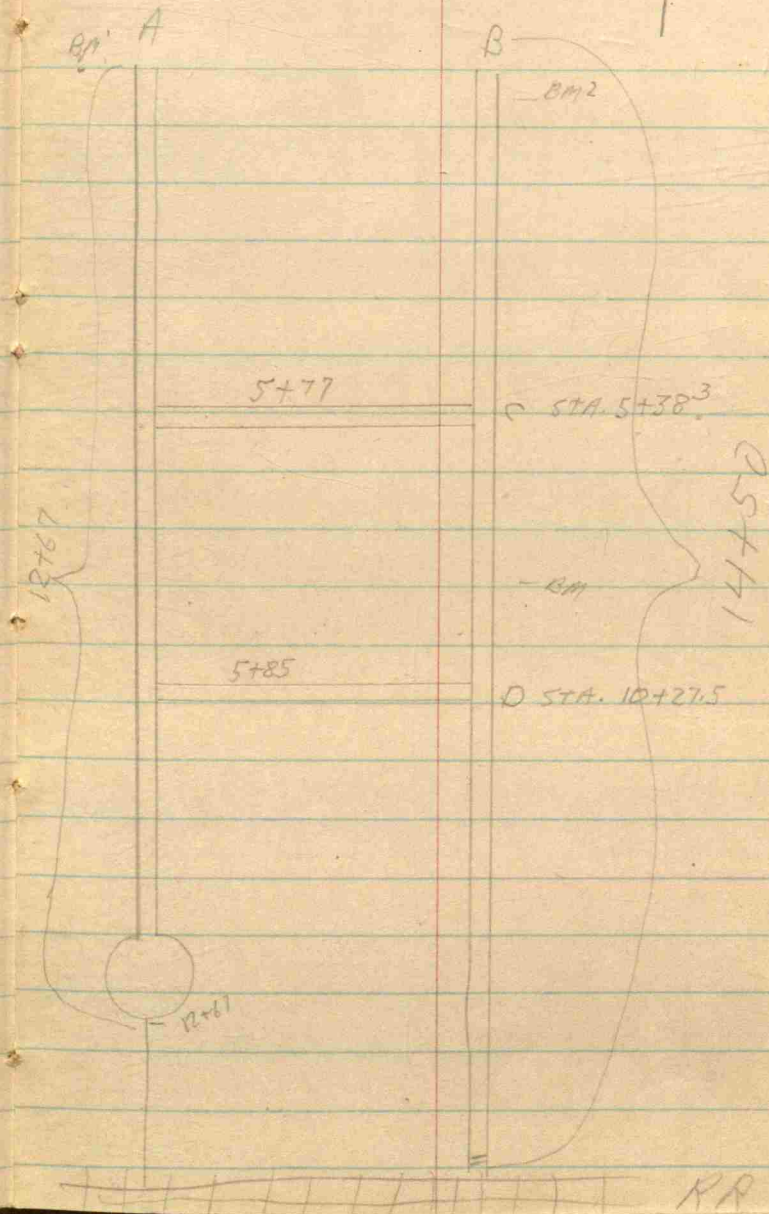
11.99



25

Shelton

26



27

Road A

Shelton Sub Division 28  
streets

Sta.	+	$\pi$	-	BM	$\frac{W}{30}$ 30' 3pk	$\frac{30}{Gd.}$	Ditch	Ditch	$\frac{30}{Gd.}$	$\frac{30}{3pk}$	7-3-63 E
BM <sup>1</sup>	3.87	103.87		100.00							
0+00					3.25	4.21	5.00	4.08	4.80	4.57	3.41
1+00					3.37	4.35	5.10	4.55	5.48	5.20	4.20
2+00					3.27	4.11	4.41	4.77	5.48	5.23	4.16
3+00			5.01	98.86							
	3.26	102.12									
3+00					1.91	2.98	3.87	3.19	4.34	3.26	
4+00					3.42	4.37	4.90	4.14	5.36	4.34	3.47
5+00					4.25	5.20	5.87	5.08	5.97	5.59	4.68
6+00					4.17	5.19	6.06	4.76	6.09	4.50	3.44
7+00					3.82	4.94	6.46	4.90	6.28	4.53	



29

30

STA	+	0	-	AM	30' Ed.	30' Ed.	Ditch	Φ	Ditch	30' Ed.	30' Ed.	E Stake	
0			3.82	98.30									
	2.49	100.74											
8+00					16'	2.83	4.96	5.36	4.39	15'	5.76	4.44	3.42
9+00					14'	3.98	4.97	5.97	4.04	14.5'	6.46	4.85	3.86
10+00					14'	5.42	6.30	6.89	5.81	11'	7.20	6.18	5.17
11+00					16.5'	7.61	6.87	7.52	6.45	17'	7.51	6.51	5.56
0			4.91	95.88									
	3.17	99.05											
12+00					41'	41'	37'			26.5'			
					4.07	5.18	6.23	5.19		3.94	5.34	4.13	
12+01													
12+0													
								Top Stk	5.53				
								Ed.	6.26				

STA	+	$\pi$	-	BM
-----	---	-------	---	----

13+00

13+00

14+00

14+00

14+51

14+51

14+93

O

7.15

10291

O

6.02

10455

3.79

95.26

3.88

98.53

4.51

100.04

E

TOP  
STK

5.10

Ed

6.14

TOP  
STK

6.04

Ed

7.05

TOP  
STK

6.00

Ed

7.00

TOP  
STK

7.04

Ed

7.43





STA	+	A	-	B.M.	30' STA	30' STA	pitch	4	12' 6"	30' STA	27' STA
3+00	4.61	99.64	5.97	95.03	5.83	6.57	6.78	5.95	6.42	5.97	5.09
4+00					5.18	5.94	6.43	5.32	6.21	5.69	4.66
5+00					4.45	5.33	6.00	5.36	6.08	5.62	4.66
6+00					4.49	5.05	5.78	4.78	5.91	5.00	4.22
7+00	3.82	101.00	2.46	97.18	3.82	4.84	6.41	5.36	6.61	5.87	4.95
8+00					4.14	5.09	5.47	5.06	6.30	5.58	4.68
9+00					4.43	5.55	6.51	5.00	6.35	5.70	4.95
10+00					4.80	5.79	6.38	5.20	6.44	5.59	4.81
11+00	4.46	100.19	5.27	95.73							



STA	+	T	-	BM
11+00				
12+00				
13+00				
14+00				
14+50				
①			3.99	96.20
	4.62	100.82		
②			5.85	94.97
	4.73	99.70		
BM 2			3.50	96.20

W	30'	30'			30'	30'
STA	W	STA	ditto	±	ditto	STA
4.46	5.39	5.95	4.82	6.19	5.44	4.35
5.97	6.02	6.83	5.01	6.59	5.61	4.67
5.00	6.07	6.72	5.11	6.65	5.61	4.52
4.47	6.24	7.14	5.08	6.77	5.14	4.16
5.20	5.90	7.52	5.95	7.55	5.35	4.50

bottom R.R. ditto 11.93

39

Road c

5+38

40

STA.	+	$\pi$	-	BM	S. 25' Sta.	30' E.L.	Ditch	♀	Ditch	30' E.L.	30' N Sta.
BM <sub>2</sub>	3.92	100.19		96.27							
⊙			4.35	95.84							
	5.57	101.41									
0+00					5.47	6.17	6.54	6.02	6.73	6.24	5.25
1+00					4.90	5.54	5.99	5.26	6.06	5.40	4.50
2+00					3.97	4.19	4.76	4.00	4.94	4.08	3.19
⊙			3.15	98.26							
3+00	3.91	102.17			3.91	4.84	5.63	4.51	5.52	4.53	3.95
4+00					5.30	5.99	6.31	5.21	6.23	5.83	4.95
5+00					3.36	4.14	6.21	5.12	6.62	5.87	5.00
5+77					4.04	4.59	6.21	5.06	6.62	5.77	4.86
⊙			4.09	98.08							





43

## ROAD D

10+27.5

S

44N

STA	+	Δ	-	BM	30' STK	30' GL	Ditch	♀	Ditch	30' ED	30' STK
BM <sup>2</sup>	4.37	100.64		96.27							
⊙			5.37	95.27							
	4.95	100.22									
BM <sup>3</sup>			2.43	97.79							
⊙	2.43	100.22									
⊙			5.04	95.13							
	5.66	100.79									
BM <sup>2</sup>			4.52	96.27							
BM <sup>3</sup>	3.65	101.44		97.79							
0+00					4.89	5.70	5.91	5.19	5.74	5.30	4.47
1+00					4.91	5.73	6.48	5.87	6.66	6.58	5.49
2+00					5.55	6.57	6.91	6.08	6.73		5.98
⊙			5.65	95.74							
	4.79	100.58									
3+00					4.25	5.62	6.88	5.74	5.72		4.61

W side of sycamore tree 3' dia. 1' from ground  
on top of nail



45

STA	+	A	-	BM
-----	---	---	---	----

4400

5100

5+85

C

5.62

101.89

BM<sup>3</sup>

4.18

4.10

96.17

46

N

Sta	20	Ditch	±	Ditch	30'	30'
576	577	131		101	End.	578

4.68

5.38

5.96

5.26

5.98

5.72

4.76

4.14

4.87

6.24

5.67

6.40

4.57

3.73

5.77

6.56

6.97

6.01

6.78

5.25

6.16

47

48

Preliminary Survey  
of  
Sewer Lines  
for  
Hendricks County Home

7-30-63

Darrell, W.

George W.



Line "A"

$$\begin{array}{r} 12.13 \\ 5.23 \\ \hline 17.01 \end{array}$$
John Bradly  
Carmel, Ind

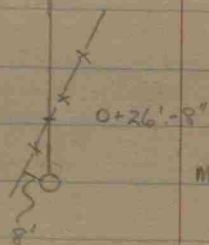
4+00

3+00

2+00

1+00

5+00



manhole #1

4+00

51

9.89

109.89

100.00

4.82

105.07

3.10

108.17

18.03

90.14

← # →

BM<sup>#1</sup>

3.22

103.22

100.00

14.97

88.25

9.91

93.31

①

4.95

98.27

3.50

101.77

18.28

83.49

5.98

1.23

18.28

52

top of window sill of East window of boiler room

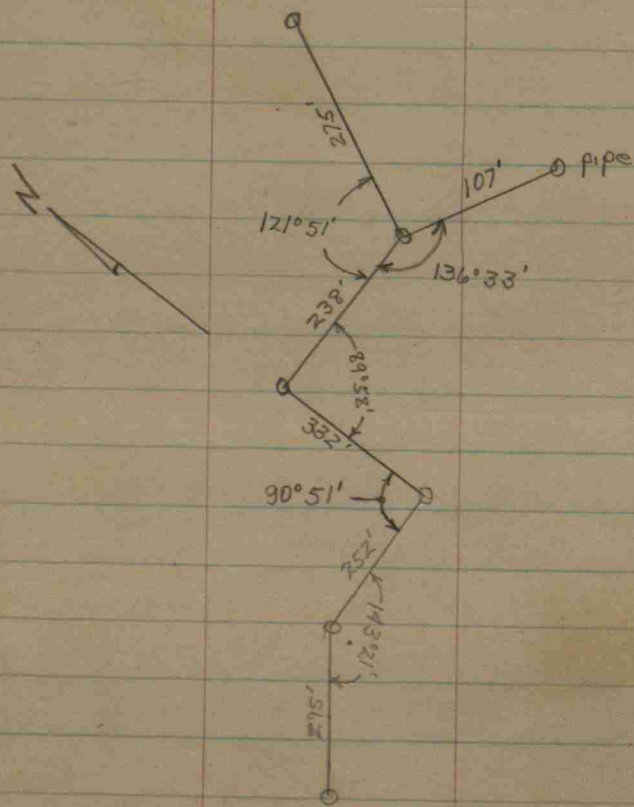
boiler room drain

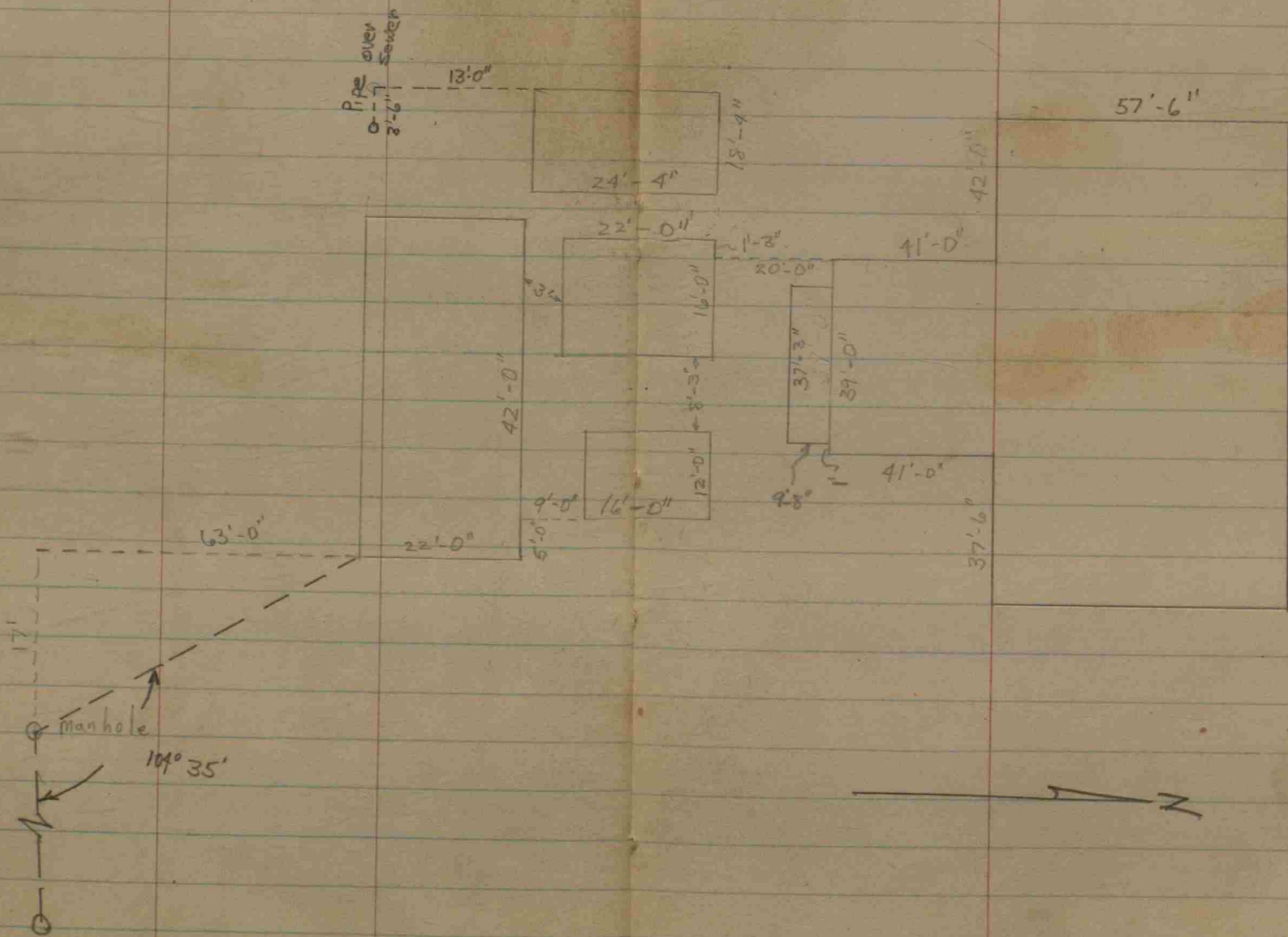
house drain

flow line of manhole



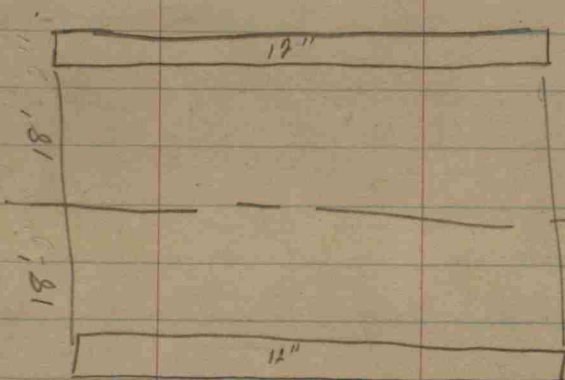
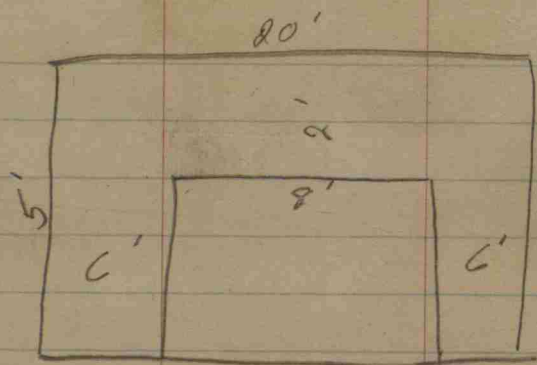
## Sewer line Traverse







153



Sunoco

154

power pole 24' from ~~line~~ & Co Line

22' " E 30<sup>th</sup>

power pole 221.5' N & 30<sup>th</sup>

24' W & County Line Rd

power pole 429' N & 30<sup>th</sup>

24' W & Co. Line Rd

Ditch parall Co Line Rd

20' W &

power poles parall 30<sup>th</sup> 22' N & E

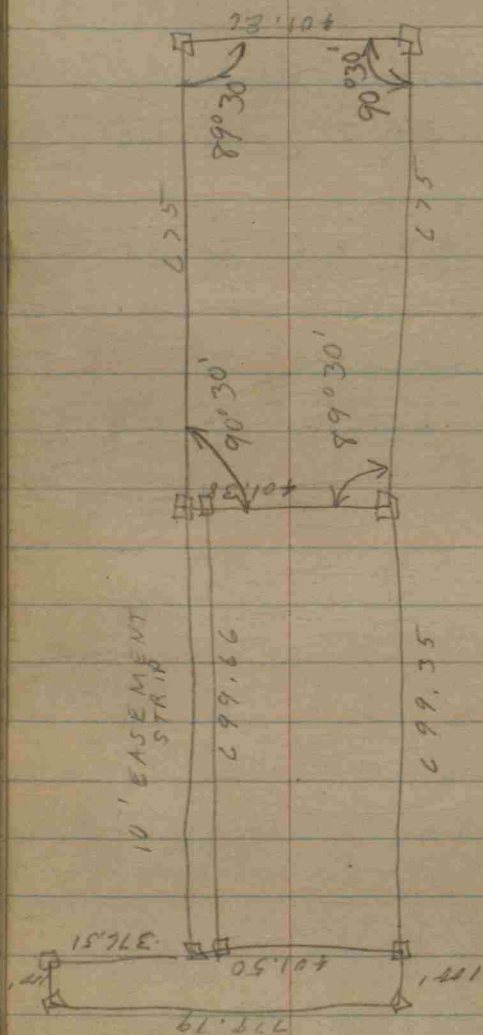
5.9' W & E

233.33 W & E

412' W & E 13.5' N & E

588<sup>1</sup>/<sub>4</sub>' W & E 14' N & E

156



Sunoco Survey

156

20' HEAD WALL, parall.  $\&$  30<sup>th</sup>  
 W end 306.5 W of E County Line Rd  
 E end 288.5 W of E County Line Rd  
 N side 17.5' N  $\&$  30<sup>th</sup> 1.25" thick

Head Wall

287' W of County Line Rd

12' HEAD WALL

center 39' N  $\&$  30<sup>th</sup>

11" thick

Manhole 2' dia Hole, 4 1/2' sq.  
 36' N  $\&$  30<sup>th</sup>

36.33 W of County line Rd