

KEUFFEL & ESSER CO.

DRAWING MATERIALS

AND
SURVEYING INSTRUMENTS.

NEW YORK.

CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

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

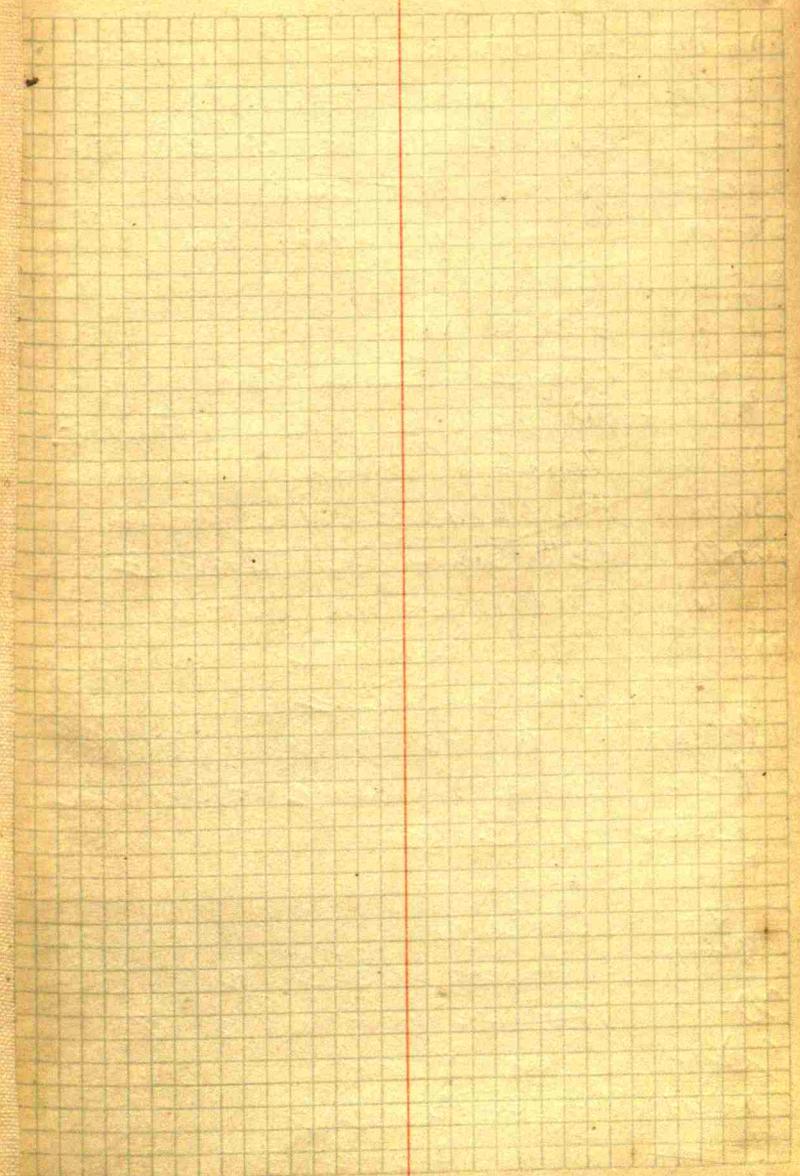
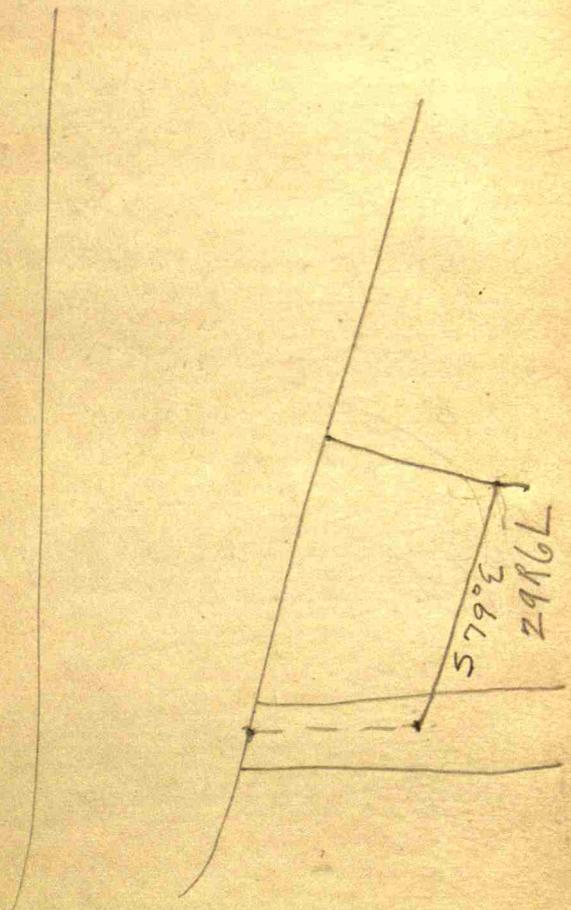
Calculated by Julien A. Hall, M. Am. Soc. C. E.

9168 9262
8810 8831
358 431

9390 9341 9308
8854 8875 8896
536 466 412

9345 9305
8917 8937
428 368

9422 9511
8958 8979
464 532
9387 9375
9021
354



0
1
2
3
4
5
6
7
8
9

- 20468 Maple 14.0 E 4 ✓
 20475 Shed 100' E 4 ✓
 20488 Maple 14.5 E 4 ✓
 20496 SW cor Home 60' E 4 ✓
 2148 Maple 14.5 E 4 ✓
 21426 Maple 14.5 E 4 + 119' W cor
 Res 60' E ✓
 21457 Wire fence E ✓
 21466 Cor post 15' E 4 ✓
 18488
 T02457 Board fence E side
 Gate E of 21462 ✓
 22497 Wire fence E ✓
 26400 12" Power Reqd. Flow E ✓
 From Sta 26469.5 North Trenches on
 16.5 from E ✓
 26469.5 lumber Tp line pl. on W side

11

12

13

14

15

16

17

18

19

20

21

22

23

8
Sta

0-100				93.75
0-105				94.35
0-12			95.80	94.35
0+00		20' W 95.60		95.67
0+18	100 94.45	20 94.95	10 95.45	95.15
1+00	20 97.40	147 9770	8 9660	96.37
2+00	147 97.10	147 9667	8 9556	96.25
3+00	147 95.00	147 9470	8 94.25	94.45
4+00	14 93.45	14 9380	8 9375	93.92
5+00	14 92.80	14 9305	8 9320	93.40
6+00	14 92.30	14 9270	8 9285	93.10
7+00	14 91.90	14 9230	8 9260	93.15
8+00	14 92.50	14 9295	8 9260	93.20
9+00	14 93.60	14 9391	8 9345	93.95
10+00	14 93.10	14 9340	8 9340	93.70
11+00	13.5 93.05	13.5 9325	10 9336	94.02
12+00	13.5 94.00	13.5 9432	9 9360	94.20
13+00	13.5 94.72	13.5 9462	9 9460	95.00
14+00	14 94.82	14 9495	10 9445	94.80
15+00	14 94.34	14 9455	8 9440	94.70
16+00	14.5 93.40	14.5 9360	7 9405	94.6
17+00	15 93.40	15 9365	5 9420	94.60
18+00	15 93.60	15 9374	5 9420	94.76
19+00	15 94.15	15 9470	9 9476	94.92
20+00	15.5 95.85	15.5 9580	5 9540	95.60
21+00	22.7 96.00	20 9613	4 9593	96.13

E

E			96.05 Crown Hart Road 0+08	BM
100' E 96.00				100.00 H 5 W. of post 0+00
	20' E 95.25	100 94.55		
10 95.40	20 95.30	20 94.55		
8 95.76	15.7 97.40	20 96.90		
8 95.73	14.5 96.85	20 96.22		
8 94.30	14.5 94.60	20 94.30		
8 93.60	14.5 94.50	20 93.60		
8 92.90	14.5 93.75	20 92.80		
8 92.50	14.5 92.50	20 92.05		
8 92.40	14.5 92.80	20 92.65		
8 92.75	14.5 92.85	20 92.70		
8 93.60	14.5 94.30	20 94.50		
8 93.55	14.5 93.80	20 93.05		
8 93.40	10 92.80	14 93.10		
8 93.80	11 93.25	14 93.60		
8 94.32	11 93.55	14 93.65		
8 94.60	13.5 93.65	13.5 93.95		
8 94.40	12.5 93.36	13.5 93.66		
8 94.15	12.5 93.50	13.5 93.60		
8 94.00	11 93.45	14 93.55		
8 94.25	12 93.70	13.5 93.80		
8 94.70	11 94.40	13 94.50		
	12.5 95.15	12.5 95.00		
	12.5 96.00	12.5 95.60		
		96.00		

9360

9544

10

Sta	20
22+00	9610
23+00	9620
24+00	9480
25+00	9495
26+00	95.00
26+57.5	95.05

100M End

W

167	10	
9653	9595	9662
16.37	12	
9645	95.85	9616
177	12	
95.16	95.75	95.85
177	13	
95.40	95.10	95.85
177	14	
95.25	95.10	95.75
177	11	
95.30	95.50	96.40

96.90

↘

E

11

5	7	20	
9620	125	9610	
9592	9578	95.76	
8	125		
95.35	95.66	94.76	
9	125		
95.20	95.05	95.16	BM
8	12		EI. 100.00
95.15	95.30	95.15	Corrupt
8	12		
95.50	95.20	95.35	17'E STA
	9540		26+69.5

	+	∞	-	E.I.	
8+00	11.25	21.25		10.00	
0+90				11.82	9.43 57
				1.655	19.40
				2.22	19.03 57
				2.03	

$$\begin{array}{r} 18.00 \\ .93 \\ \hline \end{array}$$

I.R. tile at C.H.

F.L. tile at C.H.

F.L. " of sewer

string of C.H.

$$\frac{2}{3} \times 57 = 98$$

14

Sta

0-378 98.45 Bed Stream
 0-178 99.23 " "
 0-86 99.90 " "
 0-78 100.00 Top 12" tile 78' E 0+00

0+00 101.51 Ground El. at Keams E line Fence 400' N E Hart Road
 Hart Road

1+00 102.60

2+00 103.29

3+00 103.16

4+00 103.64

5+00 104.76

6+00 106.81

7+00 107.02

8+00 107.41 (10480) 200' S. Sta 8+30
in low ground

9+00 106.67

10+00 106.30

11+00 106.27

12+00 106.51

13+00 107.03

14+00 107.41

15+00 108.10

16+00 107.95 S. Bdry Sta 6+50

BM No 1

15

16

16.14

Converted
to Road
Grade

E.L. BM 1100 El.

16.14 82.31

16.14 83.09

16.14 83.76

16.14 83.86

16.14 85.37

16.14 86.46

16.14 87.15

16.14 87.02

16.14 87.50

16.14 88.62

16.14 90.67

16.14 90.88

16.14 91.27

16.14 90.53

16.14 90.16

16.14 90.13

16.14 90.37

16.14 90.89

16.14 91.27

16.14 91.96

16.14 91.81

N&S

1	6
12	7

Jump 16

R. 1 E

Candy ROAD

17

Sta	St.	Gd	
0+78			8386 Top 12"
0+00	86.05		86.00
1+00	86.75		86.50
2+00	86.83		86.56
3+00	87.02		86.77
4+00	87.05		87.07
5+00	88.07		87.77
6+00	89.39		89.22
7+00	89.37		89.15
8+00	89.10		88.90
8+50	89.14		89.05
9+00	89.40		89.15
10+00	89.66		89.47
11+00	90.30		90.16
12+00	90.72		90.70
12+50	90.73		90.63
13+00	90.86		90.60
13+50	90.83		90.73
14+00	91.15		91.00
15+00	91.54		91.42
16+00	92.12		92.00
17+00	91.60		91.45
17+50	91.97		91.71
17+60	Top Tile		89.90
17+70	Gen. Rd		92.70

Bridges

① Fought		\$ 1100	00
② Liningen No 1	(12)	\$ 200	00
③ Liningen No 2	(22.5)	\$ 360	00
④ Hendricks	(21.6)	\$ 375	00
⑤ Wickwire			
⑥ N. Salem			

GEO. R. HARVEY

GEO. R. HARVEY

Grade Ditches



30
 15
 31 15
 10
 31.05
 10
 20.95
 1.50
 3005

George R. Harvey.

25
 24
 20
 9
 9
 0
 24
 9
 3
 60
 29
 8955
 1250
 7733



JOHN

FIREWORK HADLEY

FRANK K.K.T.

8000
 1250
 9750

ANDERSON
 INDIANA
 GOSMERIDIANS
 Sallust
 K.T. Sallust
 K.T. Sallust

K.T. SALLUST
 K.T. SALLUST
 101 N. INDIANA
 DANVILLE
 INDIANA

GEORGE
 K T SALLUST GEORGE
 CONGDON

21

Sta 2+40 E side def R 30'

W. side Sta 0+02 - Cut off box to be
lowered to Grade - 2.5' @ StakesSta 0+02. Water Plug 2.5' E. stake
0+00 Maple at stake

0+54 Maple at stake

1+28 " 1" W stake

1+52 " " stake

2+13.2 E end cement walk 6" E of stake
Res at 2+13.2 end 0+30

2+05. C.O.P. 6" E st.

E. side

Res at 4+48.2 - 20' E ✓

Dinner Way Ent. 3+67 to 3+78 ✓

3+46 - C.O.P. 5.4' W st ✓

✓ 3+33.5 W end cement top 6" W stakes

3+06 C.O.P. 6" W stake ✓

3+15 Telephone 6" W stake ✓

✓ 3+34 Res 2+80 Res 12' E ✓

ally 2+48 to 2+58 ✓

2+06 Res 10' E ✓ 1+41 Res. 6' E ✓

2+01 Tel 5' W ✓ 1+27 maple 1' E ✓

1+54 C.O.P. 5' W ✓

1+93 Maple 1' E ✓ 1+18 to 1+19 Dine ✓

1+10 Maple 1' E ✓ 1+25 C.O.P. 6' W ✓ ✓

1+64 " at stake 0+83 Telephone 5' W ✓

1+50 " " " ✓

ABCDE

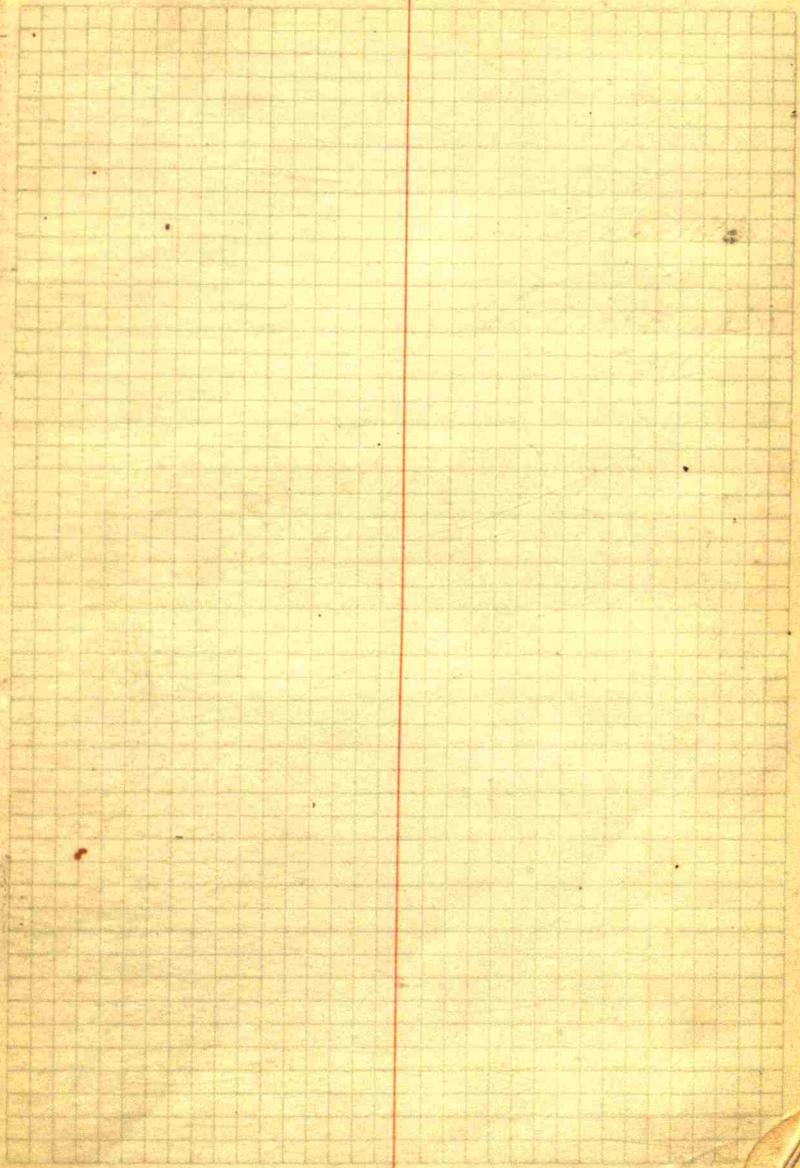
108
60
100
25

90049'

25

A B C D E F	G H I J K L	Janet
100+08	M N O P Q R	Bernyman
John N. Harley	S T U V W X	Hooton
	Y Z	120+07
		on Clinton
James & Madge		
Fulps		
60'		Martine Ellen Estes
		112'
James Fulps		
90'		
James & Annie		
Robbins		
60'		L.C. Hollister
Eugene & Flora		
Madden		
60.0		
Flora Madden		
45.2'		
Geo. E. Easley		
25'		
same		
51.5'		

Q+55.5 to 0+68 shed 6" W
0+59 to 0+75 ^{Dark wood} ✓ 0+78 - Res. 15E



30 M.E. Church N. Salem
Levels Church Property

Sta. El. Sta. Gds' Wst

0+00	92.72	93.60
0+50	104.72	104.76
1+00	105.39	105.62
2+00	105.95	105.73
3+00	104.90	104.86
4+00	105.03	104.77
5+00	106.65	106.40
6+00	106.27	106.34
7+00	108.52	108.54
8+00	110.52	110.58
8+45	111.20	110.87
8+75		
9+00	101.53	110.61

Bed S.
50' S of
0+00
88.50

cen
Bk St.
110.76

N. Salem

103 10300
102.00 1.61
1.39

31

BM No 1
Send E. of outlet
100' W Sta 0+00
100.00

103.48
Sta 1+40
El. Gd.
106.83

Trp.
Copying at SE
cen Church
112.73

is 8'8" above
top cement floor
of basement

Fl 2'S
101.61
102.04
102.49
102.52
102.62
102.52

	St. ^{Curb}	Tile Grade	Cut
8+45	111.20	102.82	8.38
8+00	110.65	102.67	7.98
7+50	110.08	102.50	7.58
7+00	108.52	102.33	6.19
6+50	107.36	102.17	5.19
6+00	106.27	102.00	4.27
5+50	106.22	101.88	4.34
5+00	106.63	101.67	4.96
4+50	106.45	101.50	4.95
4+00	105.05	101.33	3.72
3+50	105.02	101.17	3.85
3+00	104.92	101.00	3.92
2+50	105.68	100.83	4.85
2+00	105.97	100.67	5.30
1+50	106.98	100.50	6.48
1+00	105.39	100.33	5.06
0+50	104.75	99.00	5.75
0+25	102.18	96.00	6.18
0+00	92.72	93.00	0.00

M. G. Church
H. Salen

0.94.63

Side Wks N. High

W. Side

Sta	Stake	3'E	Gutter	W Stake	± Rd
0+00	^{WK} 97.25	97.30	96.66	97.25 ³	97.40
0+50	96.75	96.60	96.46	96.95 ³	96.70
1+00	95.42	95.32	95.85	94.42 ³	95.90
1+50	94.87	95.37	95.25	94.45 ³	96.00
2+00	96.46	95.95	95.95	96.65 ³	96.25
2+40	96.18	95.93	95.56	95.98 ³	95.97
3+00					94.46
3+50					91.53
4+00					87.50
4+482					82.50

Street

Stake	3'W.	Gutter	E. Stake
^{WK} 97.72	97.67	97.00	97.75 ³
97.62	97.10	96.50	99.62 ³
96.50	96.24	95.91	96.57 ³
96.52	95.96	95.56	96.86 ³
96.83	96.43	96.12	97.27 ³
97.74	96.62	96.10	98.28 ³
97.02	95.35	93.92	98.05
93.36	92.53	91.10	95.80
88.90	88.14	86.95	90.00
85.00	84.57	82.50 ^{6'W}	85.95

B.M. (D)
 Approx. Hand
 Hydrant 35
 100.00

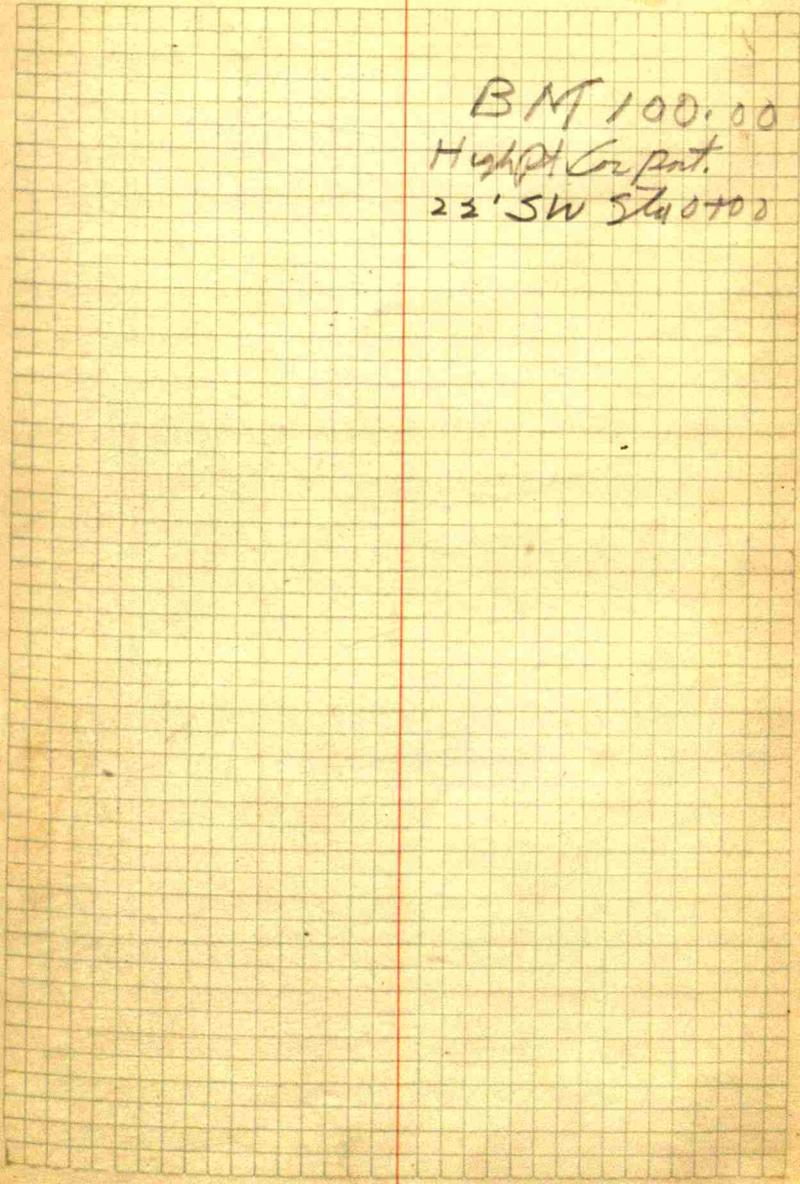
B.M. El. 94.63

But. Step Madam
 Rev

	5'	7'	Canary Road	
38	E	E	5'	7'
Sta	Stake	Std	Wst.	Wsd
26+695	95.72	95.67	95.52	95.10
26+00	95.36	94.93	95.50	95.00
25	95.59	95.20	95.48	94.85
24	95.63	95.35	95.50	94.82
23	95.06	95.85	96.03	95.79
22	96.27	95.96	96.26	95.89
21	95.89	95.96	96.09	95.65
20	95.64	95.95	95.35	95.12
19	94.90	94.66	94.63	94.52
18	94.06	94.06	94.14	93.94
17	93.76	94.10	93.77	93.79
16	93.79	93.74	93.96	94.03
15+50	93.90	93.92	93.64	93.69
15	94.64	94.92	93.56	94.19
14	94.89	94.83	94.26	94.20
13	94.92	94.64	93.87	93.86
12	94.46	93.60	93.45	93.50
11	93.85	93.52	93.14	92.73
10	93.60	93.42	93.67	93.39
9	93.45	93.45	94.20	93.64
8	93.13	92.63	93.04	92.79
7	92.85	92.72	92.80	92.39
6+50	92.88	92.90	92.73	92.13
6	93.05	92.80	92.86	92.52
5	93.56	93.10	93.77	93.21
4	94.01	93.63	93.47	93.66

39
 B.M. 100.60
 Comp. at 17 E. Sta 26+69

Sta	E Stake	E G.P.	W Stake	W G.P.
3	9497	9466	9475	9492
2	9500	9591	9670	9600
1	9619	9615	9692	9612



Tharp Road. Stones

① Stone 500' E. NE con sec
B. Iron Post S 20.3'

③ Cen N NE⁴ Sec 8
12" Apple N 20° W 29.3'
Cor Post N 5° E 15'
" " S 5° E 15.8'

④ N²Mi Stone Sec 8 Relocated
by Iron Pin. Cor Post N. 16'
Cor Post S. 15.4'

X ⑤ Cen N. NW⁴ sec. 8 Stone
W. gate post N. 10° W. 15'
End post S. 5° W. 16'

⑥ NW cor Sec. 8 R. Located I. P.
14" Maple N 35° W 32'
12" Round Cor. Post S 15° E 18.5'
St 919 + 44

X ⑦ Cen N NE⁴ Sec 7 Stone
Cor Brick Sch. House S 45° E 73'
Walnut tree near well S 30° E 99'

② I. P. NE con Sec 8

Telephone pole S. 45° W. 26'

Cherry Tree N 60° E 49'

(Rewitnessed - Sept. 30, 1935

Corner of W. Hdwall. on N. side
of Road - N 5° W. - 12.7'

Corner of E. Hdwall. on So. side
of Road - S 5° W. - 13'

48

95.72 98.20 90.30
 83 83

Tip. 948.9 37 95.55 97.46
 83 96.63

8" AT Rd 95.72 Gd
 Top 8" → 96.38 98.60
 " 8" 97.46 100.40 400' SW. at face
 " 8" ~~98.38~~ 98.95 1000' SW.

Sta	Str	Gd	Tile	St. Tile
0+00	10245	10200	99.17	9+90 103.40
0+50	10300	10285	99.29	Gd
1+00	10325	10325	99.38	9+90 103.35
1+50	10376	10370	99.48	Grade
2+00	10437	10420	99.59	9+90 101.45
2+50	10455	10446	99.69	
3+00	10525	10515	99.80	
3+50	10529	10510	99.90	
4+00	10519	10506	100.01	
4+50	10505	10485	100.11	
5+00	10456	10450	100.22	
5+50	10466	10437	100.34	
6+00	10445	10445	100.47	
6+50	10466	10445	100.49	
7+00	10444	10440	100.73	
7+50	10439	10425	100.85	
8+00	10440	10425	100.98	
8+50	10402	10390	101.10	
9+00	10372	10355	101.23	
9+50	10343	10325	101.35	



94.89
 95.55
 96.63
 97.37

96.38
 1.50
 97.88

B.M. Top 8" tile Sta 0+00
 El. 100.00
 Top tile Sta 0+90 100.67

FOR
 PROFILE Hiatt
 DRAIN

Top tile Sta. 4+45-101.70

Sta. 0 to 5 - 2 1/2" Fall
 Sta 5 to 9+90 3" Fall

Note Use 8" tile
 0 to 5 and 6" tile
 Sta 5 to 0 to Sta 9+90

1	A0	10.00	E8	34.20	I11	28.10
2	A1	9.26	E0	35.00	I10	34.70
3	A2	9.17	F13	12.32	I9	40.40
4	B0	16.10	F12	18.35	I8	46.30
5	B1	14.85	F11	25.00	I0	53.40
6	B2	14.40	F10	31.50	J13	12.50
7	B3	10.96	F9	36.00	J12	19.05
8	B8	15.30	F8	40.50	J11	25.22
9	B9	14.70	F0	42.60	J10	31.50
10	B10	11.20	G13	14.94	J9	36.30
11	B11	7.75	G12	21.50	J8	43.15
12	C11	12.60	G11	28.70	J0	48.90
13	C10	17.40	G10	34.70	K13	10.09
14	C9	19.55	G9	40.75	K12	16.25
15	C8	21.70	G8	47.00	K11	21.15
16	C0	22.20	G0	49.80	K10	27.25
17	D12	12.00	H14	9.90	K9	33.52
18	D11	17.65	H13	17.10	K8	40.20
19	D10	23.40	H12	23.70	K0	43.90
20	D9	25.52	H11	29.10	L12	12.00
21	D8	28.08	H10	36.10	L11	18.15
22	D0	28.50	H9	43.10	L10	24.10
23	E12	15.25	H8	49.60	L9	30.10
24	E11	20.65	H0	56.50	L8	34.95
25	E10	26.15	I13	15.25	L0	35.80
26	E9	31.50	I12	21.76		

27	E11	32.71	I11	28.10
28	E10	34.70	I10	34.70
29	E9	40.40	I9	40.40
30	E8	46.30	I8	46.30
31	E7	53.40	I0	53.40
32	E6	12.50	J13	12.50
33	E5	19.05	J12	19.05
34	E4	25.22	J11	25.22
35	E3	31.50	J10	31.50
36	E2	36.30	J9	36.30
37	E1	43.15	J8	43.15
38	E0	48.90	J0	48.90
39	F13	10.09	K13	10.09
40	F12	16.25	K12	16.25
41	F11	21.15	K11	21.15
42	F10	27.25	K10	27.25
43	F9	33.52	K9	33.52
44	F8	40.20	K8	40.20
45	F7	43.90	K0	43.90
46	F6	12.00	L12	12.00
47	F5	18.15	L11	18.15
48	F4	24.10	L10	24.10
49	F3	30.10	L9	30.10
50	F2	34.95	L8	34.95
51	F1	35.80	L0	35.80

~~38.78~~~~42.10~~

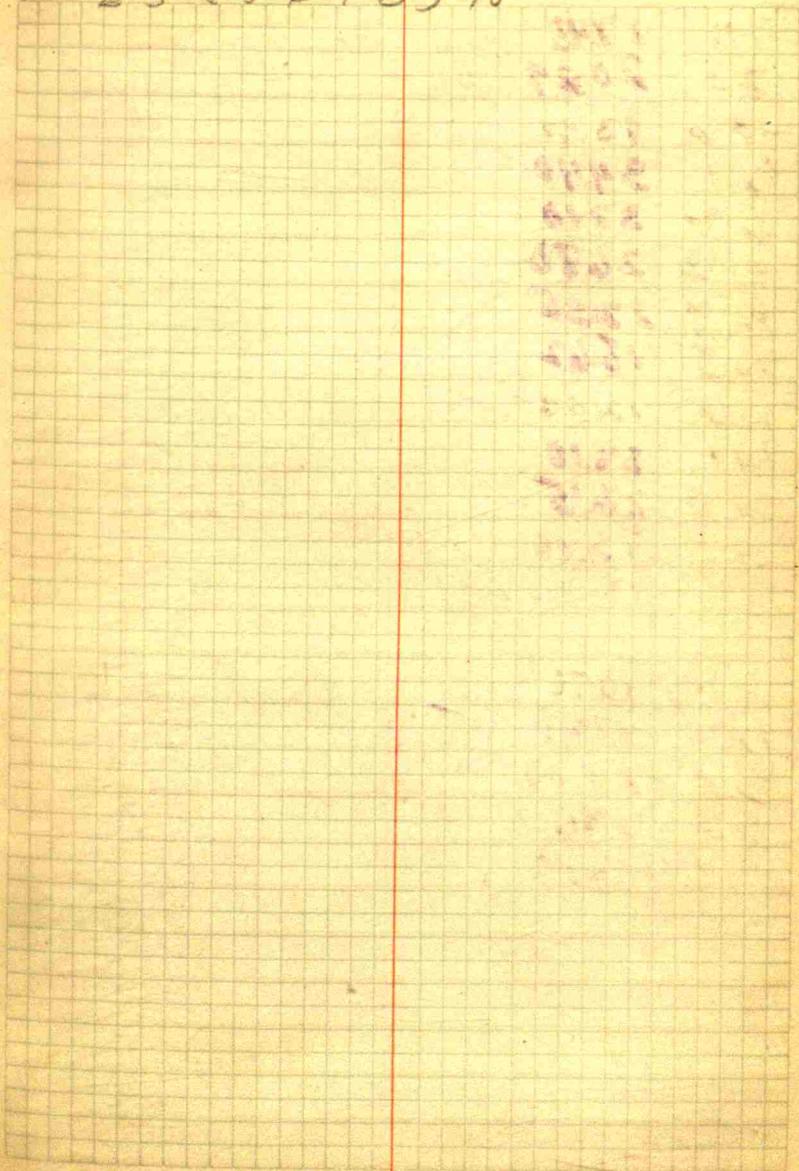
M11	14.15	M2	19.53	J7	11.25
M10	19.40	M3	20.79	I1	47.10
M9	25.10	M4	18.35	I2	39.80
M8	29.00	M5	13.70	I3	33.55
M0	28.00	M6	11.70	I4	27.00
N11	10.04	L1	34.50	I5	21.25
N10	14.66	L2	29.40	I6	14.45
N9	19.10	L3	27.00	I7	11.03
N8	22.35	L4	21.10	H1	49.25
N0	22.15	L5	16.50	H2	41.10
O9	13.52	L6	12.70	H3	34.50
O8	15.82	L7	11.05	H4	27.72
O0	16.06	K1	39.00	H5	21.60
P0	10.32	K2	35.50	H6	15.05
P1	10.46	K3	30.55	H7	11.30
O1	15.70	K4	24.50	G1	47.05
O2	13.70	K5	18.50	G2	40.50
O3	10.40	K6	13.18	G3	33.85
N1	22.32	K7	11.56	G4	27.53
N2	19.22	J1	43.70	G5	22.15
N3	17.00	J2	37.70	G6	16.20
N4	12.62	J3	30.45	G7	10.72
N5	10.55	J4	23.70	F1	41.60
N6	9.58	J5	17.82	F2	36.60
M1	28.00	J6	13.32	F3	32.30

20
 25
 25
 28
 19
 172
 32
 20
 4

24.75
 18.05
 01.25
 04.48
 04.28
 07.15
 22.15
 64.81
 20.15
 01.75
 12.15
 07.55
 05.21
 02.15
 04.05
 19.01

74	27.45	
75	20.29	
76	13.40	
E1	34.40	
E2	32.10	
E3	26.80	
E4	22.55	
E5	18.62	
E6	12.00	
D1	28.10	
D2	26.15	
D3	22.90	
D4	18.76	←
D5	14.76	
D6	10.70	
C1	21.30	—
C2	20.20	—
C3	16.96	
C4	13.35	

0 1 2 3 4 5 6 7 8 9 10



$$\frac{28}{100}$$

10016 F.L. 4" Tile 200' S.

101.20 100' N in Low Gd

101.76 200' N at Fence

101.76 Top 4" Tile 25' N Fence

102.50 Gd " " "

101.93 Top Tile 75' N Fence

102.22 Gd

101.97 T.J. 100' N Fence

102.22

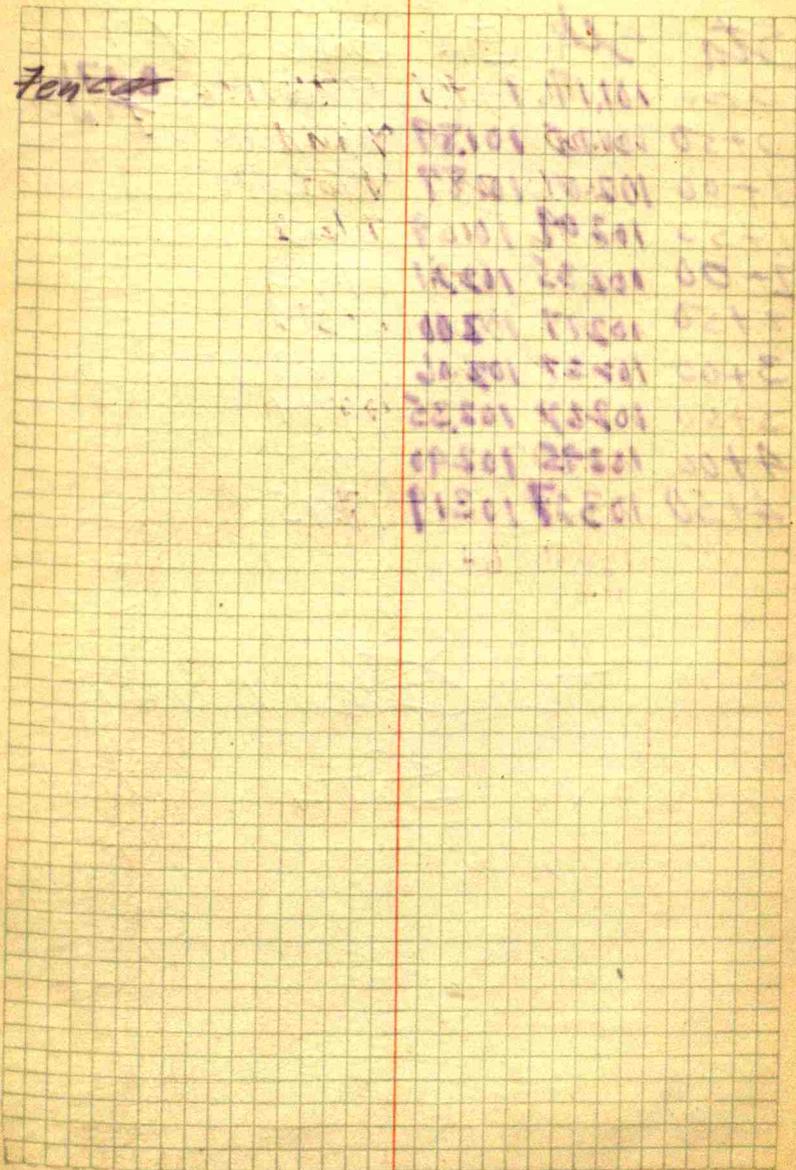
10210 T 150' N F

10290 Gd

100.81

2.

Fences



Sta	Slk.	Elev	Tile Grade
0+00	101.17	99.95	99.00
0+50	101.75	101.89	99.11
1+00	102.00	101.87	99.21
1+50	102.09	101.69	99.32
2+00	102.35	102.21	99.42
2+50	102.17	102.00	99.53
3+00	102.24	102.06	99.63
3+50	102.62	102.35	99.74
4+00	102.95	102.90	99.84
4+50	103.27	103.19	99.95

99.45
 6174
 Tile 0+00

Note Clean out
 below Sta. 0+00

98.95 Bed 15's 0+00
 100.40 - Low pt. st 0+75

Profile
 for
 Ben Davis

open ditch.

O. L. Larkin H.T. = 100

1	R.R.	
0	3.90	3'6"
0 + 56	4.14	
2 + 04 + 06	4.41	
1 + 39.5	4.67	
1 + 89.5	5.37	5.90
2 + 39.5	7.30	7.30
2 + 89.5	8.67	7.53
3 + 39.5		9.80
Outlet	11.25	

Levels 1st $\frac{5.99}{1.00}$
 $\frac{5.12}{4.39}$

BM. sidewalk $\frac{4.79}{.82}$
 1st $\frac{4.97}{3.67}$

5.12

4.79

33

4"

AD
 10
 10
 10
 10
 10

Rise

$\frac{5.12}{4.39}$
 1.11

5.12
~~4.39~~

1.87

11"

5.12

4.97

.15

.10

.25

Vermont St. West

Sta	T.M.H.		
0+00	233.00	222.00	11 1/2
0+33	235.11	222.11	13
0+67	235.72	222.22	13 1/2
1+00	235.83	222.33	13 1/2
1+33	235.94	222.44	13 1/2
1+67	236.05	222.55	13 1/2
2+00	235.16	222.66	12 1/2
2+33	234.77	222.77	12
2+67	233.88	222.88	11
3+00	233.99	222.99	11
3+33	233.60	223.10	10 1/2
3+67	233.21	223.21	10
4+00	232.32	223.32	9
4+33	231.93	223.43	8 1/2
4+67	232.04	223.54	8 1/2
5+00	231.65	223.65	8
5+33	231.76	223.76	8
5+67	231.37	223.87	7 1/2
6+00	231.98	223.98	8
6+33	231.59	224.09	7 1/2
6+67	231.70	224.20	7
7+00	230.31	224.31	6

Connections

North	South
6+70	6+72
5+65	5+63
4+55	4+53
3+33	3+40
1+67	2+38
	0+70

76

W.B. Graham Road

- ① Scallop Removed
from E. side of Road - East
of Steel Br.
- ② One Coat Paint for
steel Br.
- ③ Raise Outside Curve -
W-end Br.

77

Sta	Stk	Md	Cut
0+00	231.00	223.00	8
0+50	231.25	223.25	8
1+00	232.00	223.50	8 1/2
1+50	232.25	223.75	8 1/2
2+00	233.00	224.00	9
2+50	233.25	224.25	9
3+00	233.50	224.50	9
3+50	234.25	224.75	9 1/2
4+00	234.50	225.00	9 1/2
4+50	234.75	225.25	9 1/2
5+00	235.50	225.50	10
5+50	235.75	225.75	10
6+00	236.00	226.00	10
6+50	236.25	226.25	10
6+80	236.40	226.40	10

Connections

East

6+80 in M.H.

5+80

4+80

3+80

2+50

1+50

West

6+80 in M.H.

5+76

4+76

3+76

2+76

1+45

Additions

13+54 X 9.5 X 5.5 slab - Town
 13+25 13 X 4 sidewalk - Town

12+55 to

12+07 46 X 4.5 walk - McCully

12+00 X Int - 4.5 X 7.5 + 9 sq ft acct Radius
 12.5 lin ft curb + gutter

11+50-12 50 X 4.5 wk + 3 X 9 wk - Swann

at st.

Int - $\left\{ \begin{array}{l} 1 \times 16 \text{ alley slab} - 19 \times 2' \text{ slab} - \\ 4' \text{ Curb} + \text{Gutter} - 99 \text{ sq ft WK} \\ 4.5 \times 5' \text{ WK} \end{array} \right\}$ Town

10+00- 126.5 X 4.5 wk - Reed

9+00 12 X 3 wk Sch Home

8+50

700-710 66 X 4.5 wk slavers -
 4 X 4 wk Sch. House

Plumbcut N. East Street

4+4=16

Deductions

- 20 sq ft acct Radius

- 16' 5" curb + gutter

- 2' X 15.7' slab acct narrowing st int.

- 5 X 12 slab and - 10' cur line + gutter Sch house

7+0 to 6+34 - 4.5 x 64' Walk - Colbert
 6+34 to 5+68 4.5 x 64' walk - Swins
 5+68 — 101 x 4.5' w/p - Cot
 54 x 4.5' w/p - Ferguson
 4.5 x 3 Town at Intersection w/p
 12 x 5 w/p Town " "
 X 2 x 21 slab " "
 4' curb + gutter " "
 120' x 5' w/p town st to alley
 50' x 1' slab widening on curve.

(217 x 5' w/p + 5 x 5' w/p + 3 x 5' w/p
 + 129 x 4' w/p) Town

21' curb + gutter + 6' x 19' slab
 9' x 4' int. for town slab
 + 33 sq ft. w/p - steps

125 cu yds Exc. Extra
 Removing Tree \$10.00

Paving pitch + labor —

Extra slab 175' x 1/2' =

- Fenton 66'

" 66'

" 103'

" 54'

Pellet 60' - Fenton

Order Slaveni - Pt SE 4 SE 4
 Sec 27 - Beg SE. on Lat 5 in Black.
 18 - Center add - N 86 1/2° E 135' - N 3 1/2° W
 60' - S 86 1/2° W 135' - S 3 1/2° E to

Beg 130 yds Top Course rep
 Used 87 yds sand at 1.92

$$\begin{array}{r} 26 \quad 5 \\ \underline{5} \\ 1404 \times 15 \times 1 \\ \hline 27 \quad 130 \end{array}$$

$$\begin{array}{r} 3141 \\ \hline 130 \\ \underline{44} \\ 520 \\ \underline{520} \\ 57 \end{array} \quad \begin{array}{r} 47.677 \\ \underline{2} \\ 94.354 \times 15 \times 1 \\ \hline 27 \end{array} \quad \begin{array}{r} 1354 \\ \underline{15} \\ 50 \\ \underline{5} \\ 58 \\ \underline{29} \\ 87 \end{array}$$

$$\begin{array}{r} 27 \overline{) 3385} \\ \underline{54} \\ 1456 \\ \underline{60} \\ 129 \end{array} \quad \begin{array}{r} 125 \\ \hline 130 \\ \underline{65} \\ 195 \\ \underline{44} \\ 780 \\ \underline{78} \\ 8580 \end{array}$$

$$\begin{array}{r} 224 \frac{1}{2} \\ \underline{66} \\ 158 \frac{1}{2} \end{array}$$

86

$$1 \times \frac{7}{3} \times \frac{5}{15} = \text{one Ton Schoupst}$$

$$\frac{4}{24} \times \frac{1}{6} \times 12 = 48 \text{cutt} = 3\frac{1}{2} \text{ Tons Containst}$$

87

231
 250
 235
 231
 231

$\frac{1178}{92}$ — Kitley Kitley
 +15 Bags -319 Bags
^{Johnson}
 +135 Bags -198 Bags
 $\frac{1086}{1086}$ BB's —

30210# Stone out —

Town 910# Tar 24-lbs

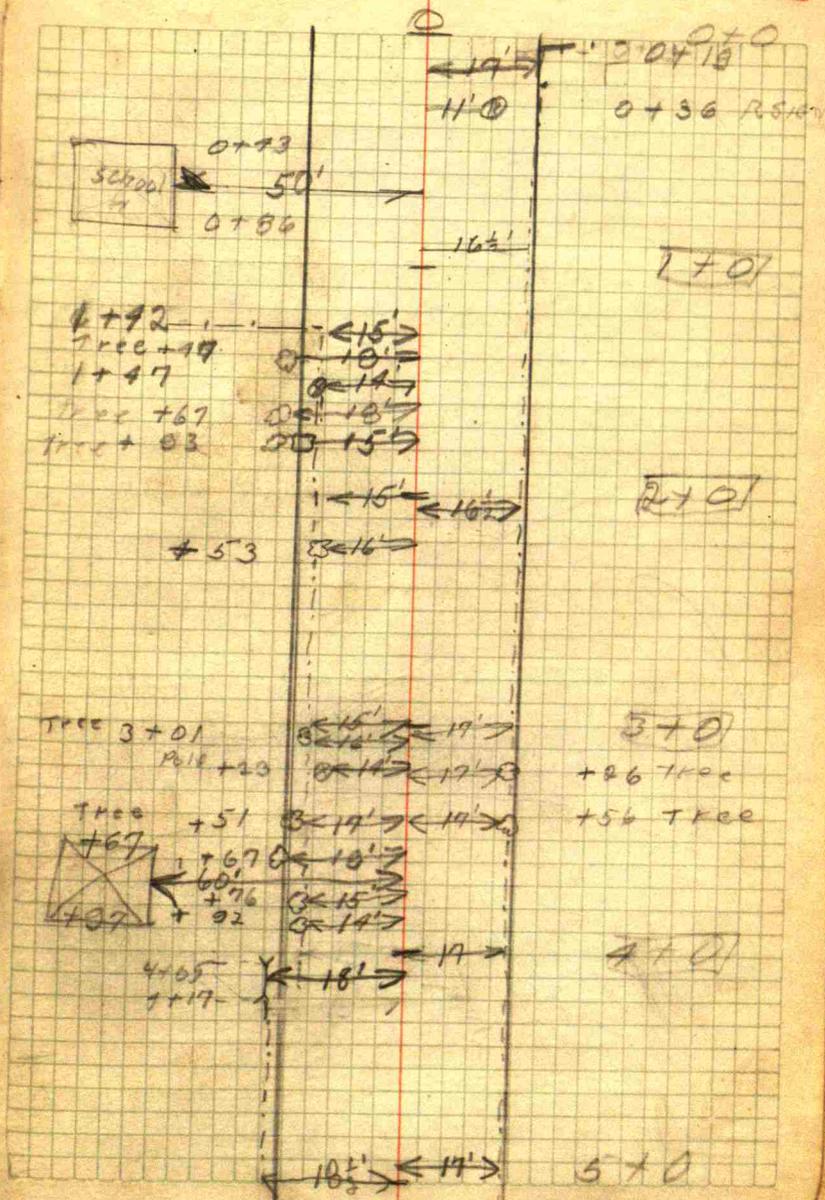
$\frac{517}{156}$ 1354
 $\frac{4)367}{92}$ $\frac{2708}{2708}$
 $\frac{4)2978.8}{744.7}$

90

Walter Coble

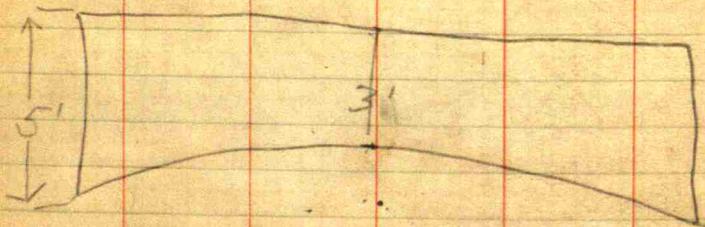
91

← LETTER →



Bridge 9+14
15' wide
40' Long
Rock Slab Abut.

Waterway 7' High to Bridge
East Rock Abutment 18' wide
Girders 13½' long
Hand rail 3' High
I Steel Beams 14' long
Arch Steel Supports 3' From
Rail supporting Hand rail.
⊕ 6' From S rail
⊕ 8 " " N " "



Sta No _____
Sta 9+34
See Sheet No _____



5+08
+56½

17'

13'

18' 17½'

6+10

13 6+30

10' 18'

7+0

hole 7+26

16' 10'

26' 18'

8+0

Gate 8+91

9+0

pole 9+06 15'

9+14
Bridge
W-end

Bridge

E end 9+54

9+81 17'

9+90 17'

20'

35'

10+0

Deflection Right of 13+99 $\frac{1}{4}$
19'

Culverts

4+10 - 20' x 10" S

13+61 - 16' x 10" S

26+70 - 16' x 10" N

28+53 - 26' x 15" Round Rd a

35+06 - 16' x 10"

35+14 - 16' x 10"

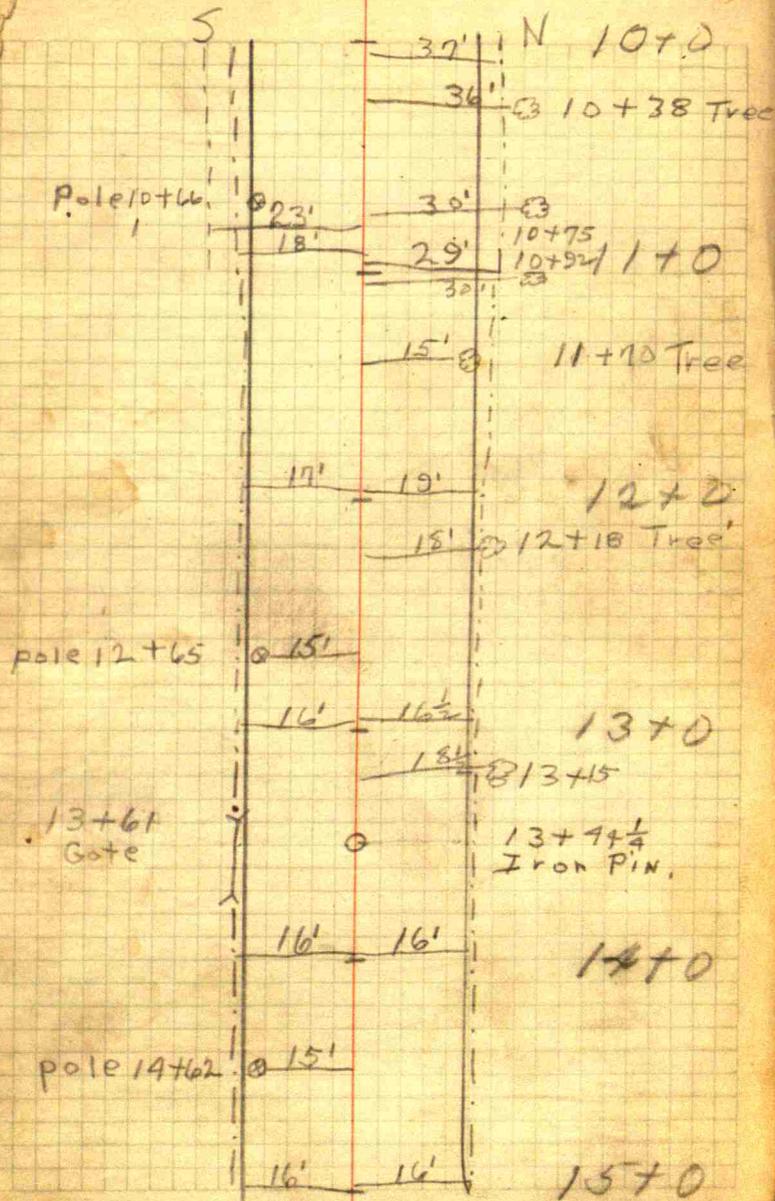
39+91 - 16' x 10" N

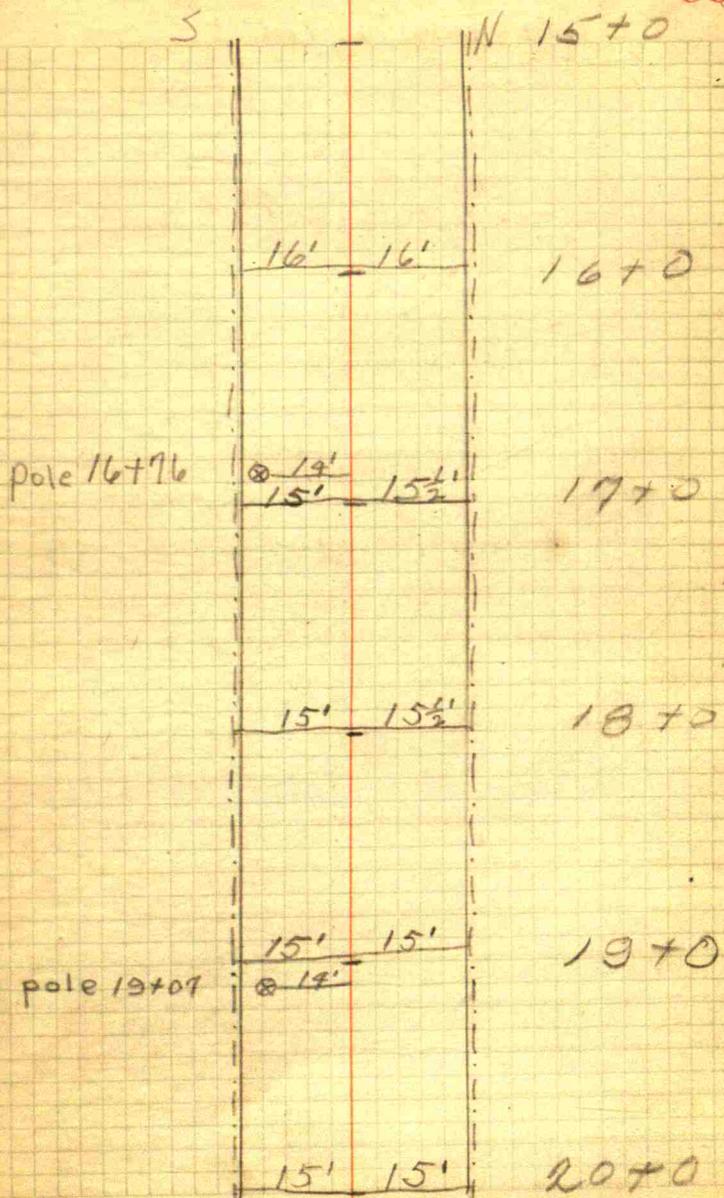
40+10 - 20' x 10" S

46+53 - 26' x 14" + B

No Culvert at end

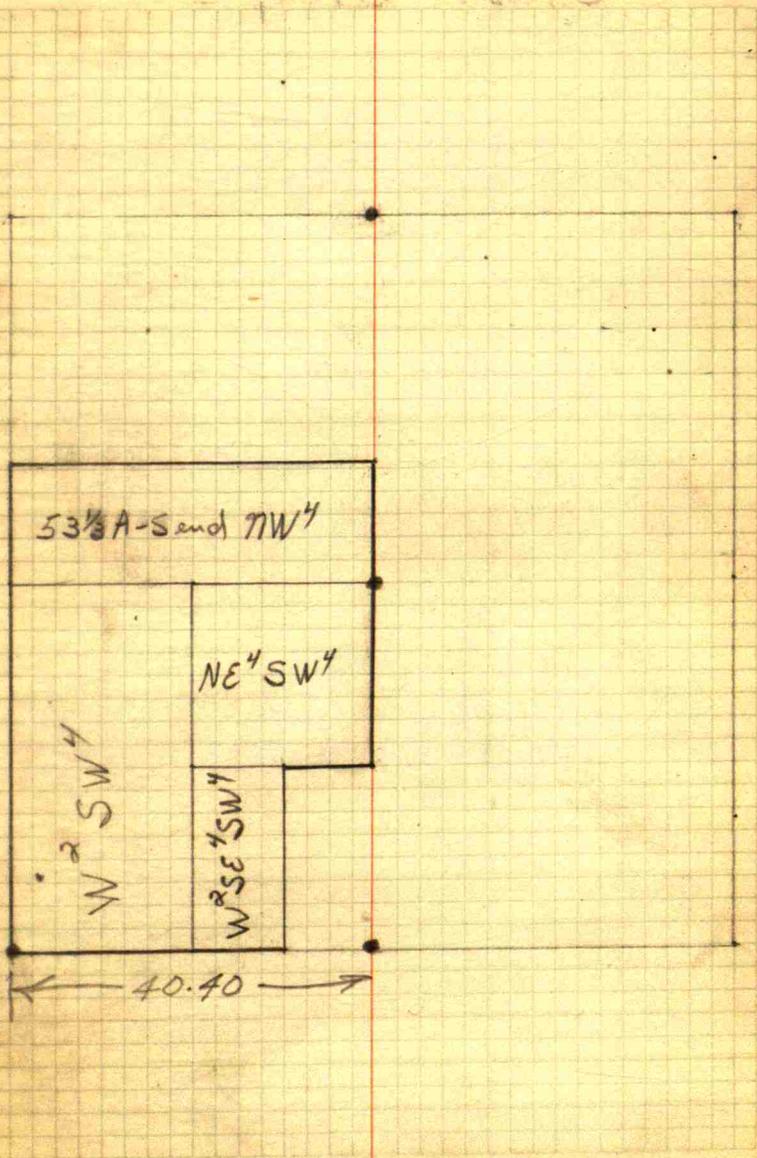
Carry Tile E 225' and
terminate in L headwall
at culvert.





Balsam Realty Co.

Sec. 35-17-2W.



102

S

103

N 2070

pale 21+19

 $14\frac{1}{2}$ - 15'

21+0

⊗ 13'

21+13

 $14\frac{1}{2}$ - 15'

22+0

 $14\frac{1}{2}$ - 15'

23+0

pale 23+27

⊗ 12'

15' - $14\frac{1}{2}$

24+0

15' - $14\frac{1}{2}$

25+0

9E 104

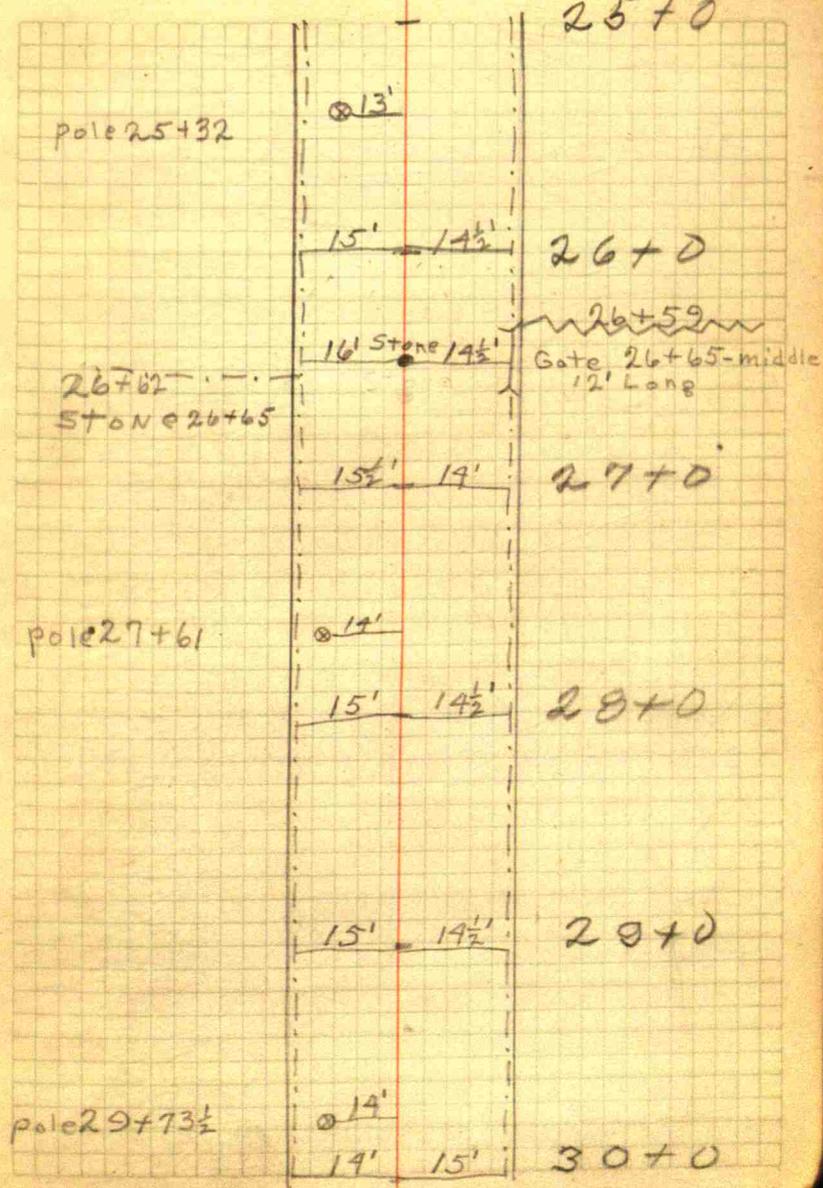
Stove 26+65

Sta 27+21 needs culvert.

S.

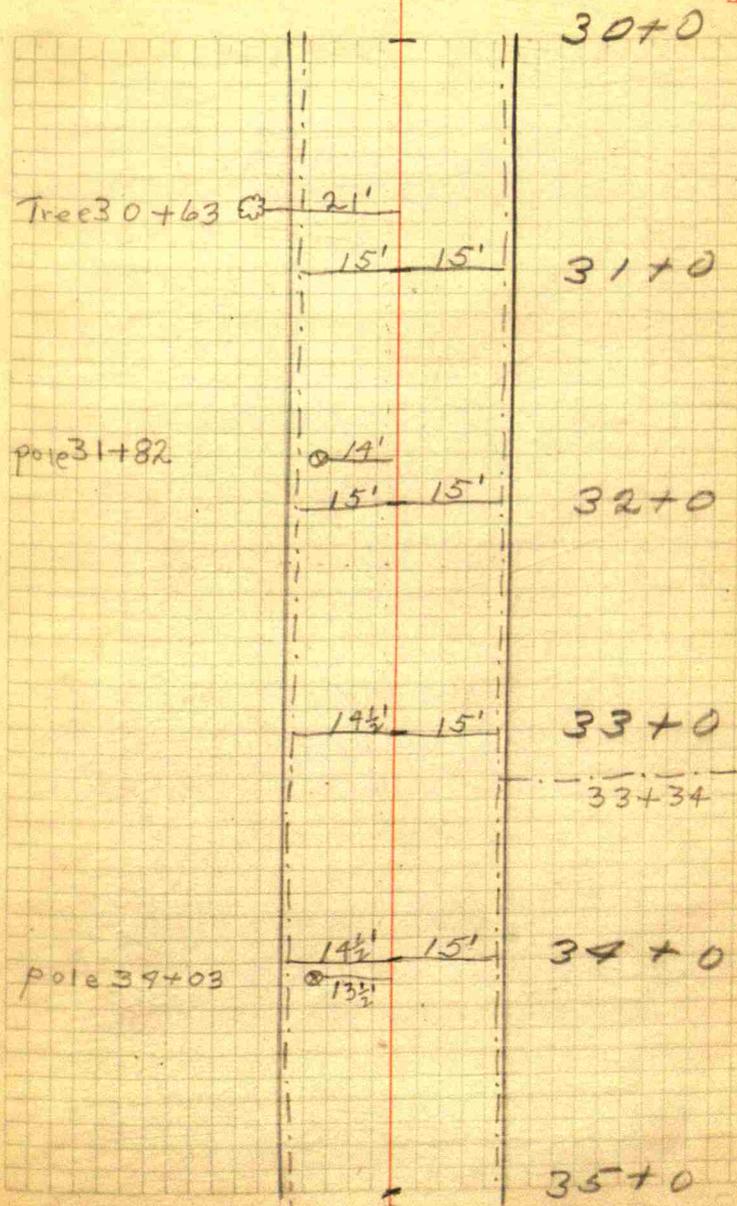
N.

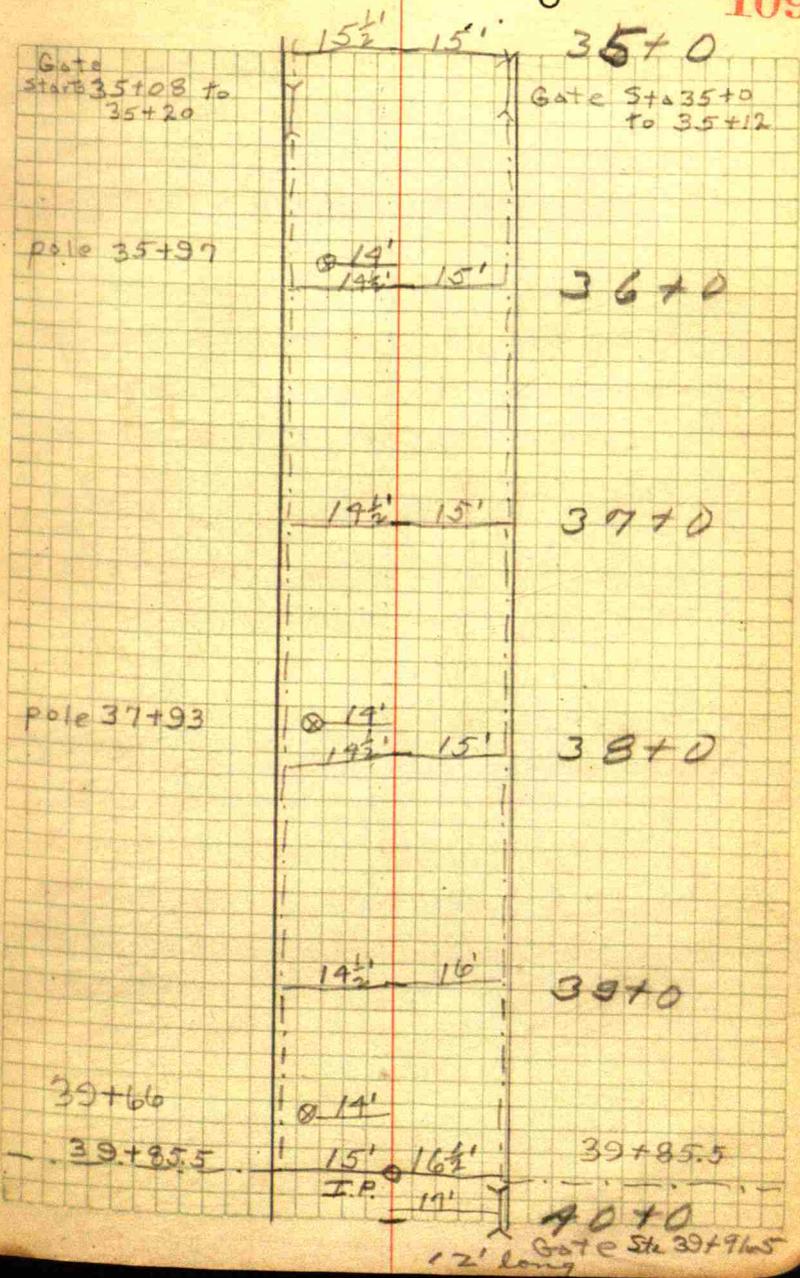
105



S

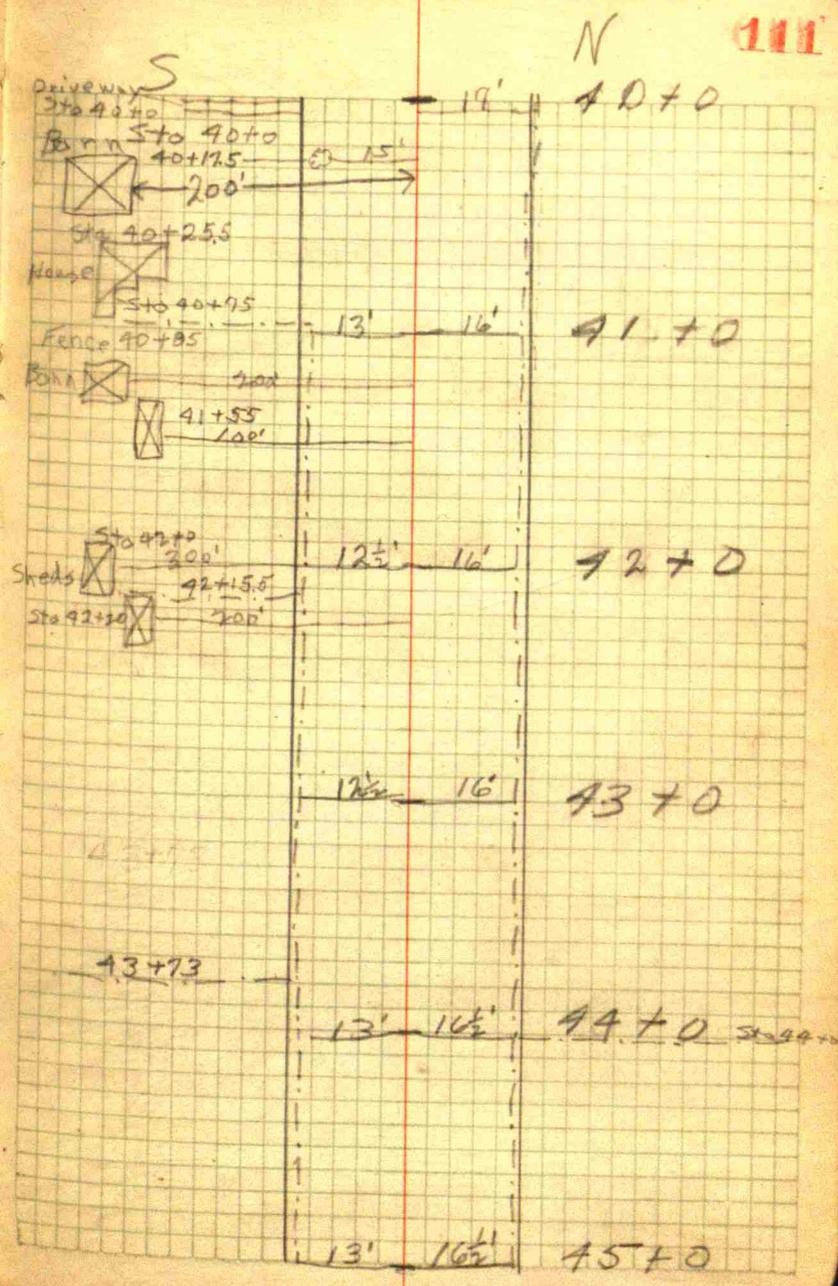
N.





Iron Pin Sta 39+85.5

Deflection to right at Sta 39+85.5 39'



S.

N 113

45+0

13' 17'

46+0

46+83
Tile
needs culvert

13'

47+0

13¹/₂' 16'

48+0

48+75

16'

21'

48+53

49+06

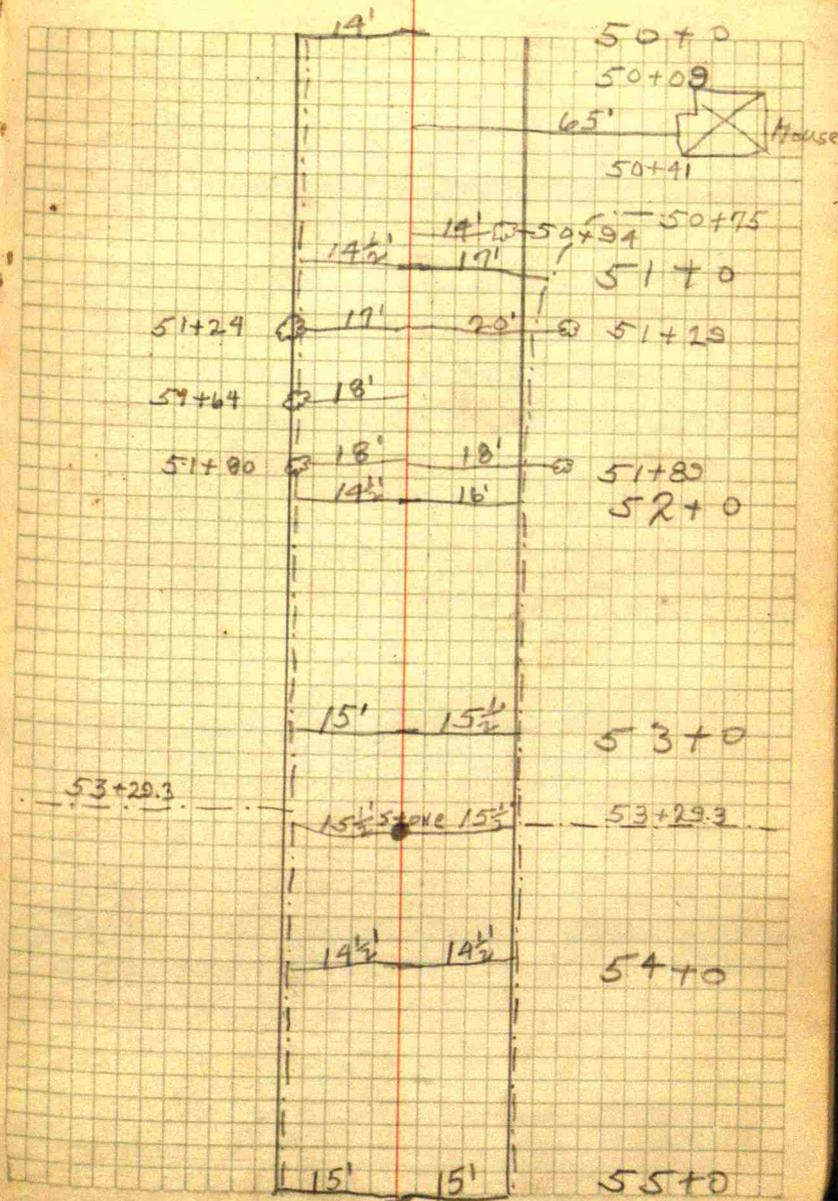
13¹/₂' 15¹/₂'

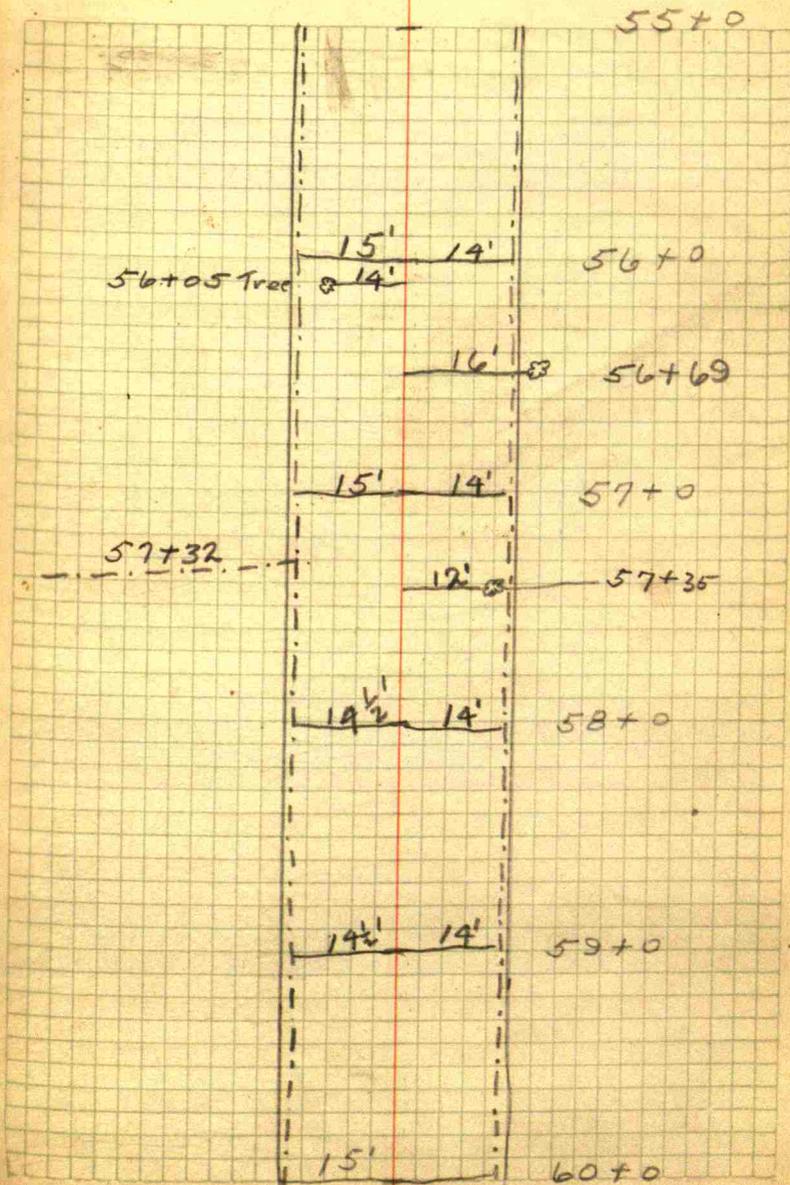
49+0

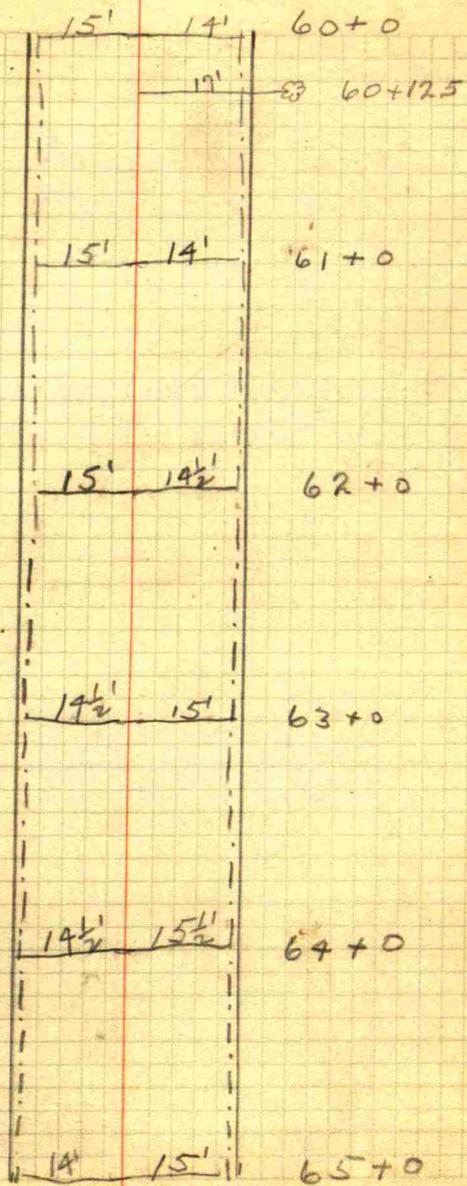
14'

50+0

Stone 53+29.3
 Deflection right at 53+29.3
 10'



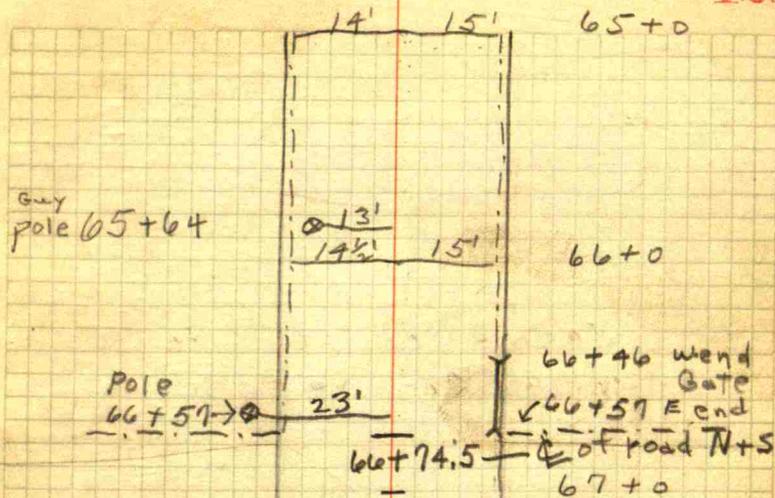




Needs culvert for side
ditch of Co. line road.

S

N



124

S.

Station	3+T	STA	DITCH	STAKE
0+0		99.05		
1+0	99.20	99.30	9 ⁵ 9880	99.98
2+0	99.30	99.46	9 ⁵ 9885	6 ⁵ 99.09
3+0	100.30	100.83	9 ⁵ 9765	6 ⁵ 97.71
4+0	96.88	96.60	9 ⁵ 9467	5 ⁵ 94.72
5+0	92.25	92.37	"92.11	8 ⁵ 92.92
6+0	90.95	91.34		8 ⁵ 87.75
7+0	78.96	79.40	"93.11	6 ⁵ 81.29
8+0	77.92	77.95	8 ⁵ 77.96	5 ⁵ 79.60
9+0	77.670	77.25	"77.05	5 ⁵ 79.69
10+0	1779.60			14 ⁵ 80.74
11+0	95.17	93.53		6 ⁵ 88.89
12+0	99.42	99.55	9 ⁵ 95.67	6 ⁵ 96.42
13+0	101.40	101.42	1 ⁵ 98.49	4 ⁵ 99.78
14+0	102.36	102.13	1 ⁵ 100.57	7 ⁵ 101.29
15+0	102.91	102.20	"101.10	8 ⁵ 101.67
16+0	102.75	102.81	"101.70	8 ⁵ 102.03
17+0	103.02	103.10	9 ⁵ 102.32	6 ⁵ 102.50
18+0	102.14	101.96	"101.34	8 ⁵ 101.90
19+0	101.62	101.80	"100.85	6 ⁵ 101.46
20+0	101.60	101.58	"100.73	"101.22
21+0	101.10	100.97	"100.84	"101.35
22+0	101.15	101.30	"100.65	8 ⁵ 101.12
23+0	101.15	101.01	"100.58	"100.85
24+0	100.60	100.58	"100.10	8 ⁵ 100.67

12 99.21 N.B 12 5

125

\$	Shrub	Ditch	STA	3+T	Notes
100.04			100.35		
99.35	809.21	13867	99.68	99.60	B. 777
99.41	809.08	"9867	99.63	99.45	O+O
98.13	797.70	"9751	100.07	99.80	Base
95.00	994.86	89.16	94.65	94.63	R.R. 51011
93.02	803.37	"9209	94.95	95.45	ON TANK
88.16	804.45	85	87.50	83.27	RD. 10474
81.62	801.77	"8091	80.70	79.78	0 9158
79.94	79.29	7831	7838	98.26	B. m.
79.72		67953	7738	76.11	8+34
82.22		"82.93	8137	8131	E 0107
88.57	809.42	95	81.90	80.16	MAIL 704
96.60	806.07	95	100.23	100.25	83.33
98.84	"80.63	"9897	101.56	101.70	0 9177
101.46	"101.37	"10043	101.15	101.12	0 9725
102.09	"101.60	"10019	101.39	101.17	0 10174
102.36	"102.08	"10144	102.22	102.15	
102.69	"102.38	"10136	102.30		
102.99	"102.09	"10100	102.22	8	102.15
101.81	"101.62	"10058	101.11	101.18	
101.50	"100.35	"10073	101.39	101.38	
101.45	"101.46	"10071	101.22	101.18	
101.27	"101.15	"10055	101.30	101.39	
101.19		"10119	100.30	101.05	
101.10	"100.74	"9988	100.44	7	

	3+T	STA	DIT	SHO
2540	10083	10096	1099.92	90035
2640	10040	10059		9969
2740	← 9975	1099.5	999.21	
2840	9922	99867	99875	
2940	17.9950	1098.60	9903	
3040	9950	109848	99.12	
3140	109999	99833	99.17	
3240	99.21	109742	99.11	
3340	99.02	99831	99886	
3440	99.37	99859	99914	
3540	←	99.12	999.01	
3640	9830	109835	99893	
3740	98.18	109828	99874	
3840	99.33	109835	79860	
3940	9855	109830	79880	
4040	22 9932	109929	99.12	
4140	9892	109834	99841	
4240	9864	109845	99843	
4340	9823	99801	99832	
4440	29 7990 9129	99734	99752	
4540	30 682 9669	99642	99652	
4640	9509		99464	
4740	9441		99436	
4840	96.10	8.5 9572	99624	

	\$	SHO	DITCH	STA	3+T
100.95		610040	79998	100	10002
100.11		5100.01	9915		9985
99.29		99946	109863		9925
99.26	0		59907	10.5 9764	9842
99.22	99.66	9988	79822	9845	9880
99.50			69922	109822	9838
99.32			79909	9826	9930
99.67			759896	109877	9838
9.910			89310	109859	9887
99.44			79924	109856	9907
99.12			709.10	1099.11	9926
99.36	BM STA 70	599.10	109822		9856
99.24	11 side	4.5 99.12	99803		9840
99.02	over stak lower gr = 100.36		69501	109825	9863
99.45			5599.01	98.19	9973
99.40	0 99.07		699.12	109840	9862
98.97		89879	109829	9858	
98.72		898.57	109803	9856	
98.64		89851	109766	9839	
98.04	25	9792	109729	9764	
96.78		109652	109632	9663	
95.38	0 95.80	109537	109530	9511	
95.14		69568	109506	9428	
95.98	3 96.30	109576	109572	9537	

	3FT	STA	DIT	Sho	W
4940	9833	9829	9735	9771	
50+0	9884	9907	9856	9872	
51+0	9792	9826	9789	9787	
52+0	9761	9785	9770	9775	
53+0	9766	9803	9773	9792	
54+0	9803	9770	9759	9774	
55+0	9795	9811	9740	9795	
56+0	9780		9726	9762	
57+0	9683		9601	9688	
58+0	9601		9578	9648	
59+0	9598		9537	9611	
60+0	9470		9439	9454	
61+0	9316		9318	9380	
62+0	9230	9268	9297	9331	
63+0	9235	9255	9206	9261	
64+0	9151	9189	9117	9170	
65+0	9080	9106	9021	9103	
66+0	8956	9005	8924	9035	
66+795	8941		8941		

87.14
100ft BD

89.47
L RD CONTINUING
THRU N. CO. 240
2171 104 500 014
63 ft beyond
E of RD going S+7

	Sho	DIT	STA	3FT	
9819	9774	9751	9829	9769	
9915	9887	9887	9913	9920	
9942	9832	9773		9836	
9925	9799	9750		9819	
9942	9800	9716		9767	
9831	9780	9688	9941	9750	98.16
9874	9795	9709	9765	9713	
9800	9768	9635		9741	
9718	9678	9604		9675	
9667	9644	9561		9565	
9670		9629	89568	9680	
9504		9451	89387	9568	
9385	318387	89287	9415	9356	9378
9356	9312	89242		9297	
9259	9245	89192		9313	
9173	9144	90118	9213	9185	
9119	91	9095	9037	9152	
9044	8987	9067	9063		
8979		8969		100 89.60	

B 17
+ 89.73
H C C R
West Rail
CIVIL EN
COUNTY N.Y.C.
RD 300 147 SOUTH
THAIR RD
ST 60, 79

9+34
BRIDGE

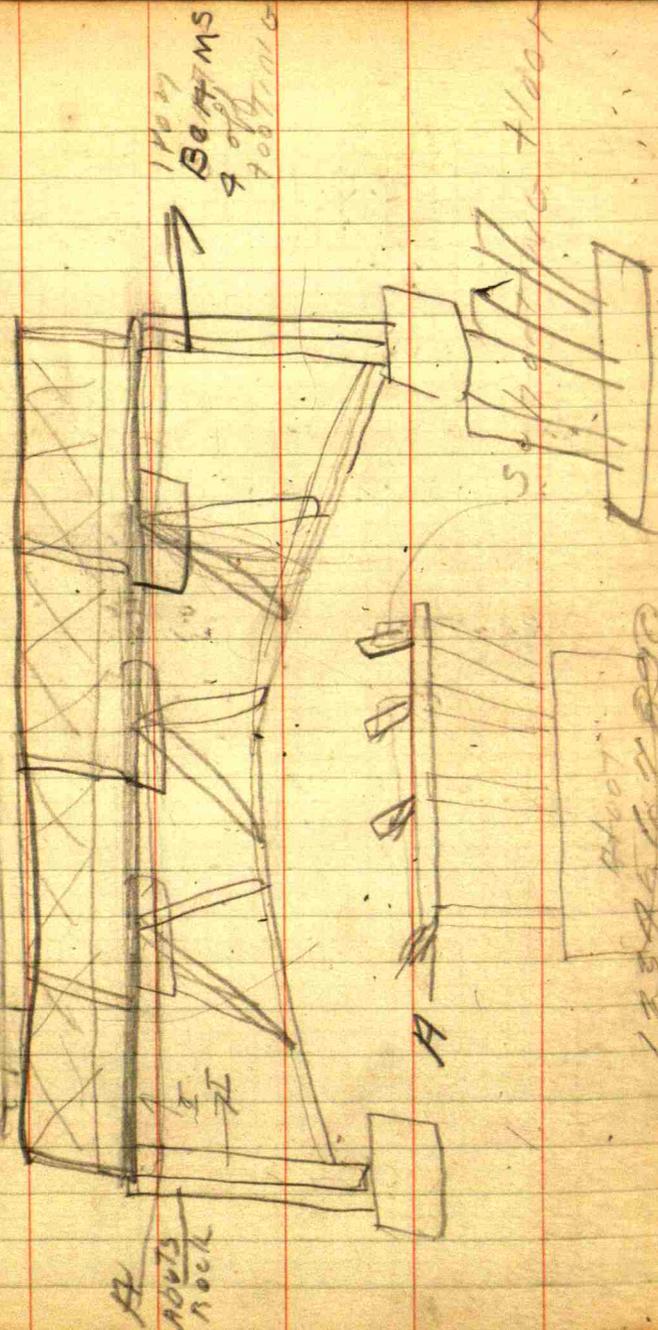
S. FLOWL =
N. FLOWLINE

EABUTS

WABUTS

STIFFERS

25 KONGITUA 101



17396700

57.217
E 83.57

ON TAYKIA ROAD N.
 STA 0+0 100 FT
 98.62
 TAY. RD W. 100 FT &
 100.25
 RD SOUTH 58 FT
 98.13

BRIDGE STA 9+39

FOOTINGS E.
 W.
 PLOW GINS N 73.70
 S 73.72
 ABUT S. E 79.95
 W 80.30
 FLOOR E & 80.57
 W & 80.20

STA E 77.09
 & 78.20
 W 76.73

HANDRAILS 5 cur = 83.25
 in cont: 83.31

EL BOTTOM of beam.
 AND TOP of
 CROSSBEAM A TOP of ABUTS
 A = 99.70

8009 1017 STRAINERS

138

E X T R A S READING
T H A T D R D. &
3 out ST 11 7

13744 102.14 10205 10020 100.89 101.10

cul needed 10/37 6. 100.74 10/24

ST ORV 26+60 ST 9987 19926 9983 3+7007 99.76 9949

Culv Rqd 27+21 STA 9 9965 9908 79901 = 99.03

Culv Rqd 28+53 23 9935 9871 89885 99.05

culvert? 34+69 99.15 10 9846 99.16

DIN 39+85.5 ST 99.25 12 99.11 99.12

ST 100+24.5 18 9930 15 9382 9 9436 9524

hraculvert 53+29.3 ST 9800 22 9782 9.5 9741 9822
7 9778

add

N

139

8 70281 7.5 9983 ST 3+7 10161 1101.52

10 60185 101+2

6 9950 10 9930 STAKE 9993

5.5 9896 9.5 STAKE 9865 99.03

99901 10.5 9780 STAKE 9829

7 9956 10 9890 STAKE 9933

6 9902 " 98.47 ST 99.14

11+800 9558 10 9401 ST 9333
F LINE 9590

5.5 9814 " 9709 ST 9765

Est Tharp Road

4226 Cu Yds Exc @ 40c = 1690.40
 144' x 10" Armeo in place @ 125 = 180.00
 52' x 15" " " " @ 180 = 93.60
 52' x 18" " " " @ 2.30 = 119.60
 61.30 Cu Yds of Conc @ 12.00 = 735.60
 47.00 Cl. B. Conc @ 12.00 = 564.00
 1665# loose steel @ .05 = 83.25
 Raising Br + Centering = 50.00
 Black Floor paint = 375.00
 1870 Tons ~~of~~ ~~stone~~ @ 2.70 = 5099.00
 1235 Yds Gramp @ 2.10 = 2593.00

 Total = \$11533.45

Bonds 12500⁰⁰

$$\begin{array}{r}
 52.4 \\
 112.14 \\
 \hline
 80.75 \\
 \hline
 245.29
 \end{array}$$

$$\begin{array}{r}
 18.69 \text{ a} \\
 \hline
 11214 \\
 16.15 \text{ B} \\
 \hline
 5.24 \\
 80.75
 \end{array}$$

A
 A B C D E F G H I J K L M N O P
 Q R S T U V W X Y Z
 1 2 3 4 5 6 7 8 9 0
 1 2 3 4 5 6 7 8 9 0

A A A A A A A A A A A A A A A A
 B B B B B B B B B B B B B B B B
 C C C C C C C C C C C C C C C C
 D D D D D D D D D D D D D D D D
 E E E E E E E E E E E E E E E E
 F F F F F F F F F F F F F F F F
 G G G G G G G G G G G G G G G G
 H H H H H H H H H H H H H H H H
 J J J J J J J J J J J J J J J J
 K K K K K K K K K K K K K K K K

1583.64
25

16.5 | 900
825
750

54

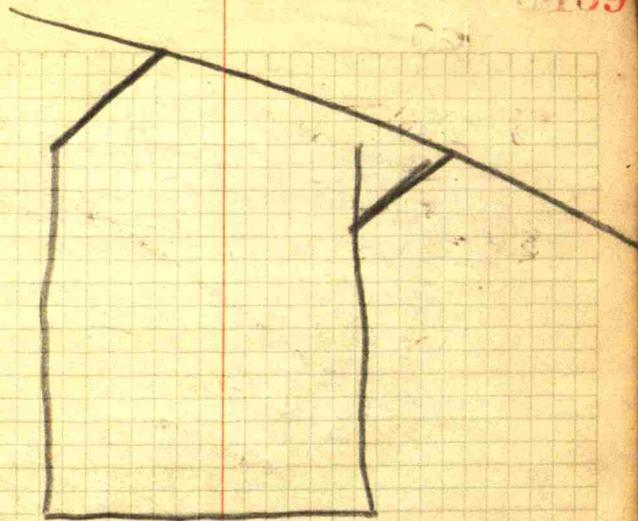
6820
2728
34.100

25 | 1.00

.664
25.4

1364

6820
2728
34.100
37.3



56.4
54.56

66 | 900
66

240
198

420
396

240

13.64, 29.33

11732

29.33 (L+W)

13.64 | 4000
2728

12720
12276

4440
4092

3580

29.33
66

17598
17598

1935.78

Natural Trigonometrical Ratios.

Angle.	Sin.	Tan.	Sec.	Cosec	Cotg.	Cosin.	Angle.	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.
0	0	0	1.	∞	∞	1.	90						
10	.0020	.0020		343.8	348.8	1.	50	10	.1421	.1435	1.0102	7.040	6.968
20	.0053	.0058		171.9	171.9	.99998	40	20	.1449	.1465	1.0107	6.900	6.827
30	.0087	.0087		114.6	114.6	.99996	30	30	.1478	.1495	1.0111	6.766	6.691
49	.0116	.0116	1.0001	85.94	85.94	.99993	20	40	.1507	.1524	1.0115	6.636	6.561
50	.0143	.0145	1.0001	68.76	68.75	.99989	10	50	.1536	.1554	1.0120	6.512	6.435
1	.0175	.0175	1.0002	57.30	57.29	.99985	89	9	.1564	.1584	1.0125	6.394	6.314
10	.0204	.0204	1.0002	49.11	49.10	.99979	50	10	.1593	.1614	1.0129	6.277	6.197
20	.0233	.0233	1.0003	42.98	42.96	.99973	40	20	.1622	.1644	1.0134	6.166	6.084
30	.0262	.0262	1.0003	38.20	38.19	.99966	30	30	.1650	.1673	1.0139	6.050	5.976
40	.0291	.0291	1.0004	34.38	34.37	.99958	20	40	.1679	.1703	1.0144	5.955	5.871
50	.0320	.0320	1.0005	31.26	31.24	.99949	10	50	.1708	.1733	1.0149	5.855	5.769
2	.0349	.0349	1.0006	28.65	28.64	.99939	88	10	.1736	.1763	1.0154	5.759	5.671
10	.0378	.0378	1.0007	26.45	26.43	.99929	50	10	.1765	.1793	1.0160	5.665	5.576
20	.0407	.0407	1.0008	24.56	24.54	.99917	40	20	.1794	.1823	1.0165	5.575	5.485
30	.0436	.0437	1.0010	22.93	22.90	.99905	30	30	.1822	.1853	1.0170	5.488	5.396
40	.0465	.0466	1.0011	21.49	21.47	.99892	20	40	.1851	.1883	1.0176	5.403	5.306
50	.0494	.0495	1.0012	20.23	20.21	.99878	10	50	.1880	.1914	1.0181	5.320	5.226
3	.0523	.0524	1.0014	19.11	19.08	.99863	87	11	.1908	.1944	1.0187	5.241	5.145
10	.0552	.0553	1.0015	18.10	18.07	.99847	50	10	.1937	.1974	1.0193	5.164	5.066
20	.0581	.0582	1.0017	17.20	17.17	.99831	40	20	.1965	.2004	1.0199	5.089	4.989
30	.0610	.0612	1.0019	16.38	16.35	.99813	30	30	.1994	.2035	1.0205	5.016	4.915
40	.0640	.0641	1.0020	15.64	15.60	.99795	20	40	.2022	.2065	1.0211	4.945	4.843
50	.0669	.0670	1.0022	14.96	14.92	.99776	10	50	.2051	.2095	1.0217	4.877	4.773
4	.0698	.0699	1.0024	14.34	14.30	.99756	86	12	.2079	.2126	1.0223	4.810	4.705
10	.0727	.0729	1.0027	13.76	13.73	.99736	50	10	.2108	.2156	1.0230	4.745	4.638
20	.0756	.0758	1.0029	13.23	13.20	.99714	40	20	.2136	.2186	1.0236	4.682	4.574
30	.0785	.0787	1.0031	12.75	12.71	.99692	30	30	.2164	.2217	1.0243	4.620	4.511
40	.0814	.0816	1.0033	12.29	12.25	.99668	20	40	.2193	.2247	1.0249	4.560	4.449
50	.0843	.0846	1.0036	11.87	11.83	.99644	10	50	.2221	.2278	1.0256	4.502	4.390
5	.0872	.0875	1.0038	11.47	11.43	.99619	85	13	.2250	.2309	1.0263	4.445	4.331
10	.0901	.0904	1.0041	11.10	11.06	.99594	50	10	.2278	.2339	1.0270	4.390	4.275
20	.0929	.0934	1.0043	10.76	10.71	.99567	40	20	.2306	.2370	1.0277	4.336	4.219
30	.0958	.0963	1.0046	10.43	10.39	.99540	30	30	.2334	.2401	1.0284	4.284	4.165
40	.0987	.0992	1.0049	10.13	10.08	.99511	20	40	.2363	.2432	1.0291	4.232	4.113
50	.1016	.1022	1.0052	9.839	9.788	.99482	10	50	.2391	.2462	1.0299	4.182	4.061
6	.1045	.1051	1.0055	9.567	9.514	.99452	84	14	.2419	.2493	1.0306	4.133	4.011
10	.1074	.1030	1.0058	9.309	9.255	.99421	50	10	.2447	.2524	1.0314	4.086	3.962
20	.1103	.1110	1.0061	9.065	9.010	.99390	40	20	.2476	.2555	1.0321	4.039	3.914
30	.1132	.1139	1.0065	8.834	8.777	.99357	30	30	.2504	.2586	1.0329	3.994	3.867
40	.1161	.1169	1.0068	8.614	8.556	.99324	20	40	.2532	.2617	1.0337	3.949	3.821
50	.1190	.1198	1.0072	8.405	8.345	.99290	10	50	.2560	.2648	1.0345	3.906	3.776
7	.1219	.1228	1.0075	8.206	8.144	.99255	83	15	.2588	.2679	1.0353	3.864	3.732
10	.1248	.1257	1.0079	8.016	7.953	.99219	50	10	.2616	.2711	1.0361	3.822	3.689
20	.1276	.1287	1.0082	7.834	7.770	.99182	40	20	.2644	.2742	1.0369	3.782	3.647
30	.1305	.1317	1.0086	7.661	7.596	.99144	30	30	.2672	.2773	1.0377	3.742	3.606
40	.1334	.1346	1.0090	7.496	7.429	.99106	20	40	.2700	.2805	1.0386	3.703	3.566
50	.1363	.1376	1.0094	7.337	7.269	.99067	10	50	.2728	.2836	1.0394	3.665	3.526
							82						
							84						
							86						
							88						
							90						

Cosin. Cotg. Cosec. Sec. Tan. Sin. Angle

Cosin. Cotg. Cosec. Sec. Tan. Sin. Angle

Natural Trigonometrical Ratios.

Angle.	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	Angle.	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.		
16	.2756	.2867	1.0403	3.628	3.487	.96126	74	.4067	.4452	1.0946	2.459	2.246	.91355	66	
10	.2784	.2899	1.0412	3.592	3.450	.96046	50	10	.4094	.4487	1.0961	2.443	2.229	.91236	50
20	.2812	.2931	1.0423	3.556	3.412	.95964	40	20	.4120	.4522	1.0975	2.427	2.211	.91116	40
30	.2840	.2962	1.0429	3.521	3.376	.95882	30	30	.4147	.4557	1.0989	2.411	2.194	.90996	30
40	.2868	.2994	1.0438	3.487	3.340	.95799	20	40	.4173	.4592	1.1004	2.396	2.177	.90875	20
50	.2896	.3026	1.0448	3.453	3.305	.95715	10	50	.4200	.4628	1.1019	2.381	2.161	.90753	10
17	.2924	.3057	1.0457	3.420	3.271	.95630	73	25	.4226	.4663	1.1034	2.366	2.145	.90631	65
10	.2952	.3089	1.0466	3.388	3.237	.95545	50	10	.4253	.4699	1.1049	2.351	2.128	.90507	50
20	.2979	.3121	1.0476	3.357	3.204	.95459	40	20	.4279	.4734	1.1064	2.337	2.112	.90383	40
30	.3007	.3153	1.0485	3.326	3.172	.95372	30	30	.4305	.4770	1.1079	2.323	2.097	.90259	30
40	.3035	.3185	1.0495	3.295	3.140	.95284	20	40	.4331	.4806	1.1095	2.309	2.081	.90133	20
50	.3062	.3217	1.0505	3.265	3.108	.95195	10	50	.4358	.4841	1.1110	2.295	2.066	.90007	10
18	.3090	.3249	1.0515	3.236	3.078	.95106	72	26	.4384	.4877	1.1126	2.281	2.050	.89879	64
10	.3118	.3281	1.0525	3.207	3.048	.95015	50	10	.4410	.4913	1.1142	2.268	2.035	.89752	50
20	.3145	.3314	1.0535	3.179	3.018	.94924	40	20	.4436	.4950	1.1158	2.254	2.020	.89623	40
30	.3173	.3346	1.0545	3.152	2.989	.94832	30	30	.4462	.4986	1.1174	2.241	2.006	.89493	30
40	.3201	.3378	1.0555	3.124	2.960	.94740	20	40	.4488	.5022	1.1190	2.228	1.991	.89363	20
50	.3228	.3411	1.0566	3.098	2.932	.94646	10	50	.4514	.5059	1.1207	2.215	1.977	.89232	10
19	.3256	.3443	1.0576	3.072	2.904	.94552	71	27	.4540	.5095	1.1223	2.203	1.963	.89101	63
10	.3283	.3476	1.0587	3.043	2.877	.94457	50	10	.4566	.5132	1.1240	2.190	1.949	.88968	50
20	.3311	.3508	1.0598	3.020	2.850	.94361	40	20	.4592	.5169	1.1257	2.178	1.935	.88835	40
30	.3338	.3541	1.0608	2.996	2.824	.94264	30	30	.4617	.5206	1.1274	2.166	1.921	.88701	30
40	.3365	.3574	1.0619	2.971	2.798	.94167	20	40	.4643	.5243	1.1291	2.154	1.907	.88566	20
50	.3393	.3607	1.0631	2.947	2.773	.94068	10	50	.4669	.5280	1.1308	2.142	1.894	.88431	10
20	.3420	.3640	1.0642	2.924	2.747	.93969	70	28	.4695	.5317	1.1326	2.130	1.881	.88295	62
10	.3448	.3673	1.0653	2.900	2.723	.93869	50	10	.4720	.5354	1.1343	2.119	1.868	.88158	50
20	.3475	.3706	1.0665	2.878	2.699	.93769	40	20	.4746	.5392	1.1361	2.107	1.855	.88020	40
30	.3502	.3739	1.0676	2.856	2.675	.93667	30	30	.4772	.5430	1.1379	2.096	1.842	.87882	30
40	.3529	.3772	1.0688	2.833	2.651	.93565	20	40	.4797	.5467	1.1397	2.085	1.829	.87743	20
50	.3557	.3805	1.0700	2.811	2.628	.93462	10	50	.4823	.5505	1.1415	2.073	1.816	.87603	10
21	.3584	.3839	1.0711	2.790	2.605	.93358	69	29	.4848	.5543	1.1434	2.063	1.804	.87462	61
10	.3611	.3872	1.0723	2.769	2.583	.93253	50	10	.4874	.5581	1.1452	2.052	1.792	.87321	50
20	.3638	.3906	1.0736	2.749	2.560	.93148	40	20	.4899	.5619	1.1471	2.041	1.780	.87178	40
30	.3665	.3939	1.0748	2.729	2.539	.93042	30	30	.4924	.5658	1.1490	2.031	1.767	.87036	30
40	.3692	.3973	1.0760	2.709	2.517	.92935	20	40	.4950	.5696	1.1509	2.020	1.756	.86892	20
50	.3719	.4006	1.0773	2.689	2.496	.92827	10	50	.4975	.5735	1.1528	2.010	1.744	.86748	10
22	.3746	.4040	1.0785	2.670	2.475	.92718	68	30	.5000	.5774	1.1547	2.000	1.732	.86603	60
10	.3773	.4074	1.0798	2.650	2.455	.92609	50	10	.5025	.5812	1.1566	1.990	1.720	.86457	50
20	.3800	.4108	1.0811	2.632	2.434	.92499	40	20	.5050	.5851	1.1586	1.980	1.709	.86310	40
30	.3827	.4142	1.0824	2.613	2.414	.92388	30	30	.5075	.5890	1.1606	1.970	1.698	.86163	30
40	.3854	.4176	1.0837	2.595	2.394	.92276	20	40	.5100	.5930	1.1626	1.961	1.686	.86015	20
50	.3881	.4210	1.0850	2.577	2.375	.92164	10	50	.5125	.5969	1.1646	1.951	1.675	.85866	10
23	.3907	.4245	1.0864	2.559	2.356	.92050	67	31	.5150	.6009	1.1666	1.942	1.664	.85717	59
10	.3934	.4279	1.0877	2.542	2.337	.91936	50	10	.5175	.6048	1.1687	1.932	1.653	.85567	50
20	.3961	.4314	1.0891	2.525	2.318	.91822	40	20	.5200	.6088	1.1707	1.923	1.643	.85416	40
30	.3987	.4348	1.0904	2.508	2.300	.91706	30	30	.5225	.6128	1.1728	1.914	1.632	.85264	30
40	.4014	.4383	1.0918	2.491	2.282	.91590	20	40	.5250	.6168	1.1749	1.905	1.621	.85112	20
50	.4041	.4417	1.0932	2.475	2.264	.91472	10	50	.5275	.6208	1.1770	1.896	1.611	.84959	10

Natural Trigonometrical Ratios.

Angle.	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	Angle.	Sin.	Tan.	Sec.	Cosec.	Cotg.	Cosin.		
32	.5299	.6249	1.1792	1.887	1.600	.84805	58	30	.6225	.7954	1.2778	1.606	1.257	.78261	30
10	.5324	.6289	1.1813	1.878	1.590	.84650	50	40	.6248	.8002	1.2808	1.601	1.250	.78079	20
20	.5348	.6330	1.1835	1.870	1.580	.84495	40	50	.6271	.8050	1.2838	1.595	1.242	.77897	10
30	.5373	.6371	1.1857	1.861	1.570	.84339	30	39	.6293	.8098	1.2868	1.589	1.235	.77715	51
40	.5398	.6412	1.1879	1.853	1.560	.84182	20	10	.6316	.8146	1.2898	1.583	1.228	.77531	50
50	.5422	.6453	1.1901	1.844	1.550	.84025	10	20	.6338	.8195	1.2929	1.578	1.220	.77347	40
33	.5446	.6494	1.1924	1.836	1.540	.83867	57	30	.6361	.8243	1.2959	1.572	1.213	.77162	30
10	.5471	.6536	1.1946	1.828	1.530	.83708	50	40	.6383	.8292	1.2991	1.567	1.206	.76977	20
20	.5495	.6577	1.1969	1.820	1.520	.83549	40	50	.6406	.8342	1.3022	1.561	1.199	.76791	10
30	.5519	.6619	1.1992	1.812	1.511	.83389	30	40	.6428	.8391	1.3054	1.556	1.192	.76604	50
40	.5544	.6661	1.2015	1.804	1.501	.83228	20	10	.6450	.8441	1.3086	1.550	1.185	.76417	50
50	.5568	.6703	1.2039	1.796	1.492	.83066	10	20	.6472	.8491	1.3118	1.545	1.178	.76229	40
34	.5592	.6745	1.2062	1.788	1.483	.82904	56	30	.6494	.8541	1.3151	1.540	1.171	.76041	30
10	.5616	.6787	1.2086	1.781	1.473	.82741	50	40	.6517	.8591	1.3184	1.535	1.164	.75851	20
20	.5640	.6830	1.2110	1.773	1.464	.82577	40	50	.6539	.8642	1.3217	1.529	1.157	.75661	10
30	.5664	.6873	1.2134	1.766	1.455	.82413	30	41	.6561	.8693	1.3251	1.524	1.150	.75471	49
40	.5688	.6916	1.2158	1.758	1.446	.82248	20	10	.6583	.8744	1.3284	1.519	1.144	.75280	50
50	.5712	.6959	1.2183	1.751	1.437	.82082	10	20	.6604	.8796	1.3318	1.514	1.137	.75088	40
35	.5736	.7002	1.2208	1.743	1.428	.81915	55	30	.6626	.8847	1.3352	1.509	1.130	.74896	30
10	.5760	.7046	1.2233	1.736	1.419	.81748	50	40	.6648	.8899	1.3386	1.504	1.124	.74703	20
20	.5783	.7089	1.2258	1.729	1.411	.81580	40	50	.6670	.8952	1.3421	1.499	1.117	.74509	10
30	.5807	.7133	1.2283	1.722	1.402	.81412	30	42	.6691	.9004	1.3456	1.494	1.111	.74314	48
40	.5831	.7177	1.2309	1.715	1.393	.81242	20	10	.6713	.9057	1.3492	1.490	1.104	.74120	50
50	.5854	.7221	1.2335	1.708	1.385	.81072	10	20	.6734	.9110	1.3527	1.485	1.098	.73924	40
36	.5878	.7265	1.2361	1.701	1.376	.80902	54	30	.6756	.9163	1.3563	1.480	1.091	.73728	30
10	.5901	.7310	1.2387	1.695	1.368	.80730	50	40	.6777	.9217	1.3600	1.476	1.085	.73531	20
20	.5925	.7355	1.2413	1.688	1.360	.80558	40	50	.6799	.9271	1.3636	1.471	1.079	.73333	10
30	.5948	.7400	1.2440	1.681	1.351	.80386	30	43	.6820	.9325	1.3673	1.466	1.072	.73135	47
40	.5972	.7445	1.2466	1.675	1.343	.80212	20	10	.6841	.9380	1.3711	1.462	1.066	.72937	50
50	.5995	.7490	1.2494	1.668	1.335	.80038	10	20	.6862	.9435	1.3748	1.457	1.060	.72737	40
37	.6018	.7536	1.2521	1.662	1.327	.79864	53	30	.6884	.9490	1.3786	1.453	1.054	.72537	30
10	.6041	.7581	1.25												

$$\begin{array}{r} 25 \overline{) 200} \\ 66 \\ \hline 53 \end{array}$$

$$\begin{array}{r} 66 \\ 8 \\ \hline 53 \end{array}$$

$$\begin{array}{r} 8 \\ \hline \end{array}$$



$$\begin{array}{r} 10 \\ 25 \overline{) 190} \\ 175 \\ \hline 150 \end{array}$$

$$\begin{array}{r} 7.6 \\ 66 \\ \hline 456 \\ 456 \\ \hline 50 \text{ H.C.} \end{array}$$

$$\begin{array}{r} 25 \overline{) 190} \\ 175 \\ \hline 15 \end{array}$$

$$\begin{array}{r} 15 \\ 25 \overline{) 190} \\ 150 \\ \hline 40 \\ 25 \\ \hline 15 \\ 25 \\ \hline 1900 \end{array}$$

$$\begin{array}{r} 108 \\ 150 \\ 120 \\ 70.2 \\ \hline 448.2 \end{array}$$

$$\begin{array}{r} 10 \\ 10 \\ \hline 100 \\ 3\frac{1}{4} \end{array}$$

$$\begin{array}{r} 300 \\ 14 \\ \hline 4 \overline{) 314} \\ 79 \end{array}$$

