

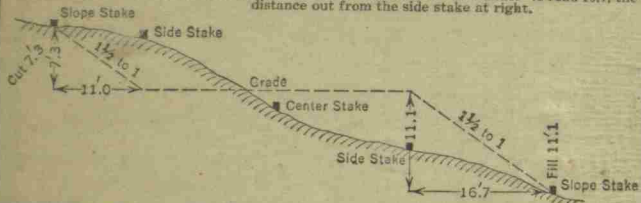
Nash Drain

194

THE
TRANSIT BOOK

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING
 Roadway of any Width. Side Slopes 1 1/2 to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



Cut or Fill	Distance out from Side or Shoulder Stake										Cut or Fill
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

28
 44
 168
 500
 6.75

66

34

4

Nash Drain
 Check Open Drain
 7/2/41 - M. Newman

164+32	-	X	+	BM	
				89.98	SW cor W and N Hdwy
		91.93	1.95		

2.00				89.93	
		96.51	6.58		

2.85				93.66	
		98.06	4.40		

5

$$\frac{169}{3} = 56.3$$
 $164+32 - 82.02$
 $156+49 - 87.43$

163+00

162+00

161+00 8.15 - 83.78

160+00 7.80 - 84.13 85.01

156+49 9.70 - 86.81 87.43

155+0 4.00 - 92.51 87.92 4.59 cut

152+0 2.85 - 93.66 88.37 5.29 "

6

98.06

3.20

94.86

100.61 5.75

4.75

95.86

101.31 5.45

3.90

97.41

101.51 4.10

2.85

98.66

103.06 4.40

3.42

99.64

7

8

149+0

3.20

94.86

88.82

6.04 cut

146+0

4.75

95.86

89.27

6.59

144+0

3.90

97.41

89.51

7.90

141+0

2.85

98.66

90.02

8.64

8

July 3, 1941² B.M. CHECKS

M. Newman

-

π

+

B.M.

105.93

B.M.#3

109.53 3.60

9.55 E End

9.40 W End.

9

8

10

B.M. checks

July 7, 1941

Clear - Warm

Newman

Everett.

-	+	BM
	126.82	3.00
	129.87	6.05
6.00		120.82
8.10	127.22	6.40
	128.57	6.80
7.50		119.72
5.20	123.77	4.05
	125.62	2.25
3.05		120.12
3.30		122.32
	124.77	4.65
4.25		120.52
	125.82	5.30
3.45		122.37
	124.22	3.85
5.60		120.62
	125.82	5.20
5.58		120.24
8.95		116.87
	119.92	2.95
3.62		116.20
		3.2

BM #10

#9

120.12

120.60
BM120.24
BM116.28
BM

11

12

-

x

+

B M

116.28

#34

126.08 9.80

5.50

120.58

121.83 1.25

7.70

114.13

118.73 4.60

10.05

108.68

113.23 4.55

5.50

107.73

113.58 5.85

5.15

108.43

115.78 7.35

4.20

111.58

116.08 4.50

4.10

111.98

117.08 5.10

7.10

109.88

111.03 1.05

5.20

105.83

BT.

105.93

109.13 3.20

W. SIDE 9.05

E. SIDE 9.15

13

14

OPEN Ditch El.

JULY 15, 1941

Clear - Warm

M. Newman

H. Cook

L. Thompson

-	π	+	B.M.
			100.00 #2
	103.00	3.00	
3.80			99.20
	101.00	1.80	

8.60			92.40
------	--	--	-------

	97.45	5.05	
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15

145+00	11.50	89.50
--------	-------	-------

146+00	11.80	89.20
--------	-------	-------

147+00	11.70	89.30
--------	-------	-------

148+00	12.00	89.00
--------	-------	-------

149+00	11.90	89.10
--------	-------	-------

150+00	12.50	88.50
--------	-------	-------

151+00	9.30	88.15
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152+00	9.60	87.85
--------	------	-------

153+00	9.80	87.65
--------	------	-------

154+00	9.90	87.75
--------	------	-------

8118

104.18 4.18 100.00 BM#2

2.80 107.98 6.60 101.38
2.15 105.83

July 18, 1941
Cloudy-Rain
3:00 P.M.

Cook 8119
Newman

Sta.	Read	Act El.	Grade	Cut.
136+00	3.32	100.86	92.58	8.28
135+00			92.77	
134+00	3.60	100.58	92.96	7.62
133+00	2.80	101.38	93.15	8.23
132+00				
132+00	6.40	101.58	93.34	8.24
131+00	5.35	102.63	93.53	9.10
130+39	5.65	102.33	93.60	8.73
130+00	5.55	102.43	93.72	8.71
129+00	3.70	104.28	93.91	70.37

1820

Clear Warren

10:30 AM

July 19, 1941

M. Newman

L. Thompson

-	π	+	BM	
			100.00	BM #2

104.10 4.10

0821

140+00	10.15	9395 9180	9182	
139+00	9.72	9438 9223	9201	22
138+00	9.62	9448 9233	9220	13
137+00	9.43	9467 9252	9238	3
136+00	9.38	9472 9257	9258	0
135+00	9.14	9496 9281	9277	0

8522

Tide Check

Cloudy - Sulfury

9:00

July 23, 41

Newman

Thompson

- π + BM #3

105.83

107.05 1.22

8523

Sta.	Read	Ad. El.	Grade
135+0	12.08	94.97	92.82
134+0	11.90	95.15	93.00 92.96
133+0	11.69	95.37	93.22 93.15
132+0	11.58	95.47	93.32 93.34
131+0	11.38	95.67	93.52 93.53
130+0	11.21	95.84	93.69 93.72

Cuts of Stakes

July 26, 1941

A Cook

Newman

Thompson

- π + BM #3

105.83

107.04 1.21

3.30

103.74

108.68 4.94

3.86

104.82

4.94

103.74

2

107.14 3.40

1.31

Head Sp
base of
post No
179 200

Sta.	Read	Act. El	Grade	Cut
127+0	3.90	103.14	9429	874 8.85
126+0	3.25	103.79	9448	931
125+0	3.30	103.74	9467	907
124+0	1.70	105.34	9486	10.48
123+0	3.30	103.74	9505	869
122+0	4.14	104.24	9524	900
121+0	3.38	105.30	9543	987
120+0			9562	920

0528

State Hgw #34 July 28th 41

- + BM

116.28

119.94 3.66

Cook
NewmanHot-Clear 29
76+-

Sta.	Read	Act. El.	Grade	Cut
51+30	335	116.59	109.26	7.33

50+80	356	116.38	109.33	7.05
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Raise Grade .30

51+30			109.56	
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50+80			109.63	
-------	--	--	--------	--

30

State Highway #34

-	π	+	BM
			116.28
121.00	4.72		

July 29, 1941

Hot - Clark
Cook - New 217

Sewer	
Top Bell	
11.74	109.26

332

Tile Check 128+0-120+0

July 30, 1941

Newman

Ellis

-	π	+	BM
			105.83

107.52 1.69

3.70

103.82

108.55 4.73

3.72

104.83

333

12' EXTRA 24" DC Tile

120+88 - End 24" Tile

Sta.	Read	Act. El.	Grade
127+0	11.35	9617 9402	9429
126+0	10.90	9662 9447	9448
125+0	10.67	9685 9470	9467
124+0	10.46	9706 9491	9486
123+0	10.38	9714 9499	9505
122+0	11.13	9742 9527	9524
121+0	10.95	9760 9545	9543

34

- X + BM

104.82

110.87 6.05

3.63

107.24

111.46 4.22

3.97

107.49

5.15

106.31

111.01 4.70

6.19

104.82

Head nail
in trunk
in fence line
No. of 1000

46 35

Sta	Read	Act EI	Grade	Cut
119+0	590	104.97	95.81	9.16
118+0	500	105.87	96.00	9.87
117+0	521	105.66	96.19	9.47
116+0	430	106.57	96.38	10.19
115+0	410	106.77	96.57	10.20
114+0	456	106.31	96.76	9.55
113+0	4 ³⁵ 27	106.52	96.95	9.57
112+0	440	106.47	97.14	9.33
111+0	4.45	106.42	97.33	9.09
110+0	3.63	107.24	97.52	9.72

109+0 4.34 107.12 97.71 9.41

108+0 4.03 107.43 97.90 9.53

36

-	π	+	BM
			116.28
	120.76	4.48	

-	π	+	BM
			116.28
	120.78	4.50	

			116.28
	119.84	3.56	

State Highway

Aug 2, 41

37

Newman

Fl. LINE	Top Tile	Top Main
11.18	9.46	9.59
109.58	111.30	111.17

Aug. 5, 1941

Cloudy - 72°

-

π

+

Cook

Newman

B.M.

107.49 ^{AT} 108+00

110.29 2.80

5.00

109.59 4.30

105.29

4.78

104.81

Sta	Read	Act El.	Grade
110+0	10.80	99.49 97.49	97.52
111+0	10.95	99.34 97.34	97.33
112+0	11.12	99.17 97.17	97.14
113+0	11.45	98.84 96.84	96.95
114+0	11.60	98.69 96.69	96.76
115+0			
115+0	11.15	98.44 96.44	96.57
116+0	11.20	98.39 96.39	96.38
117+0	11.35	98.24 96.24	96.19
118+0	11.55	98.04 96.04	96.00
119+0	11.75	97.84 95.84	95.81

138

- π + BM

107.49

111.59 4.10

4.86

106.73

111.11 4.38

1.13

109.98

HACKBERRY
104ft

4.43

106.68

114.11 7.43

6.63

107.48

ELM TREE
So. 101+0

4.13

109.98

111.38 1.40

4.95

106.43

111.94 5.51

4.45

107.49

Cuts sta. 108+0 to 98+0

841

Sta	Read	Act El	Grade	Cut
109+0	12.25	99.69	99.71	ok
106+0	4.86	106.73	98.29	8.45
104+0	4.43	106.68	98.66	8.02
103+0	5.55	108.56	98.85	9.71
102+0	5.55	108.56	99.04	9.52
101+0	7.23	106.88	99.23	7.65
100+0	6.30	107.81	99.42	8.39
99+0	5.35	108.76	99.61	9.05
98+65	5.15	108.96	99.73	9.23
98+0	5.20	108.91	99.80	9.11

640

-	x	+	BM
			109.98

111.44 1.46

10.87

100.57

111.22 10.65

Check Tile Aug 11, 1941

643

Clear-Hot.

Newman

Ellis

Sta	Read	Act El	Grade
107+0	11.00	100.44	98.09
106+0	11.10	100.34	98.28
105+0	10.87	100.57	98.47
104+0	10.87	100.57	98.66
103+0	10.30	100.92	98.85
102+0	10.10	101.03	99.04
101+0	9.86	101.36	99.23
100+0	9.85	101.37	99.42

843 44

	IT	+	BM
			107.48
	172.03	4.55	
			BM of 101+0
5.12			106.91
	111.59	4.68	
4.68			106.91
	111.94	5.03	
4.47			107.47

Cuts on Tile Aug 12 1941

Sta	Read	Act El	Grade	Cut
99+0	1036	101.67	99.61	-
98+0	10.13	101.90	99.80	-
97+0	4.40	107.63	99.99	7.64
96+0	5.00	107.03	100.18	6.85
95+0	5.12	106.91	100.37	6.54
94+0	4.78	106.81	100.56	6.25
93+0	4.40	107.19	100.75	6.44
92+0	4.06	107.53	100.94	6.59
91+0	3.85	107.74	101.13	6.61
90+0	3.43	108.16	101.32	6.84
89+0	2.90	108.69	101.51	7.18
88+0	2.40	109.19	101.70	7.49
87+0				

845
Newman
Ellis

46

-	x	+	BM	BM at
			107.48	101+0

111.62 4.14

9.35

102.27

111.30 9.03

7.95

103.35

112.92 9.57

Tile check and Cuts 47

Aug 15, 1941

Newman

Cloudy-

Ellis

<u>Sta</u>	<u>Read</u>	<u>Act. El.</u>	<u>Grade</u>	<u>Cut</u>
97+0				
96+0				
95+0	9.35	102.27 100.47	100.37	
94+0	8.96	102.34 100.54	100.56	
93+0	8.70	102.60 100.80	100.75	
92+0	8.48	102.82 100.02	100.94	
91+0	8.30	103.00 101.20	101.13	
90+0	8.15	103.15 101.35	101.32	
89+0	7.95	103.35 101.55	101.51	

848

- π + BM

112.92

3.92

113.05 4.05

109.00

3.96

113.11 4.02

109.09

3.15

113.94 3.98

109.96

111.00

2.94

115.44 4.44

849

Sta	Read	Act/EI	Grade	Cut
87+0	400	10892	10189	703
86+0	360	10932	10209	728
85+0	392	10900	10227	673
84+0	411	10894	10246	648
83+0	396	10909	10265	644
82+0	404	10907	10284	623
81+0	358	10953	10303	650
80+0	315	10996	10322	674
79+0	365	11029	10341	688
78+0	294	11100	10360	740
77+0				

1050

- π + BM

115.44

1.10

114.34

BM. 0.70
150' No. of
74+0

4.20

111.24

118.49 7.25

11.00

107.49

111.99 4.50

4.52

107.47

BM of
101+0

0051

Sta	Read	Act. El	Grade	Cuts
77+0	3.95	111.49	103.79	7.70
76+0	4.31	111.18	103.98	7.15
75+0	3.66	111.78	104.17	7.61
74+0	3.82	111.62	104.36	7.26
73+0	4.20	111.22	104.55	6.69

52

-	π	+	BM
		323	109.09 83+0
	113.02		

Aug 21, 1941 -

Newman 53
Cook
Ellis

87+0	934	103.68	10189
	374	109.29	10182
86+0	912	103.90	10208
			10210
85+0	888	104.14	10227
			10234
84+0	872	104.30	10246
			10250
83+0	854	104.48	10265
			10268

654

Aug. 21, 1941

Cook
Newman Ellis

- K +

BM

114.34

114.84 .50

9.85

113.56 8.57

104.99

76+96 - End 20" Tile

655

76+96 - Start 18" "

~~73+0 8.60 10624 10455~~ 4~~74+0 8.80 10604 10436~~ 3~~75+0 9.02 10582 10417~~ 0

76+0 9.22 10562 10398 1

77+0 9.25 10559 10379 0

78+0 9.40 10544 10360 4

79+0 9.80 10504 10341 17

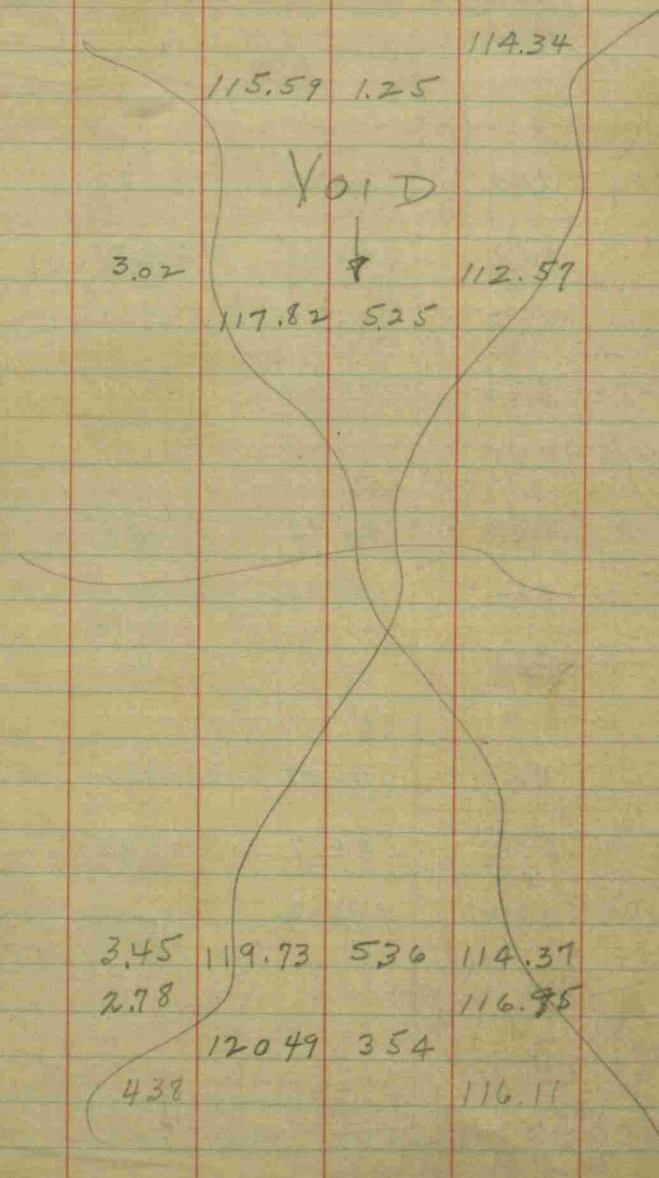
~~80+0 9.85~~

80+0 8.57 10499 10322 3

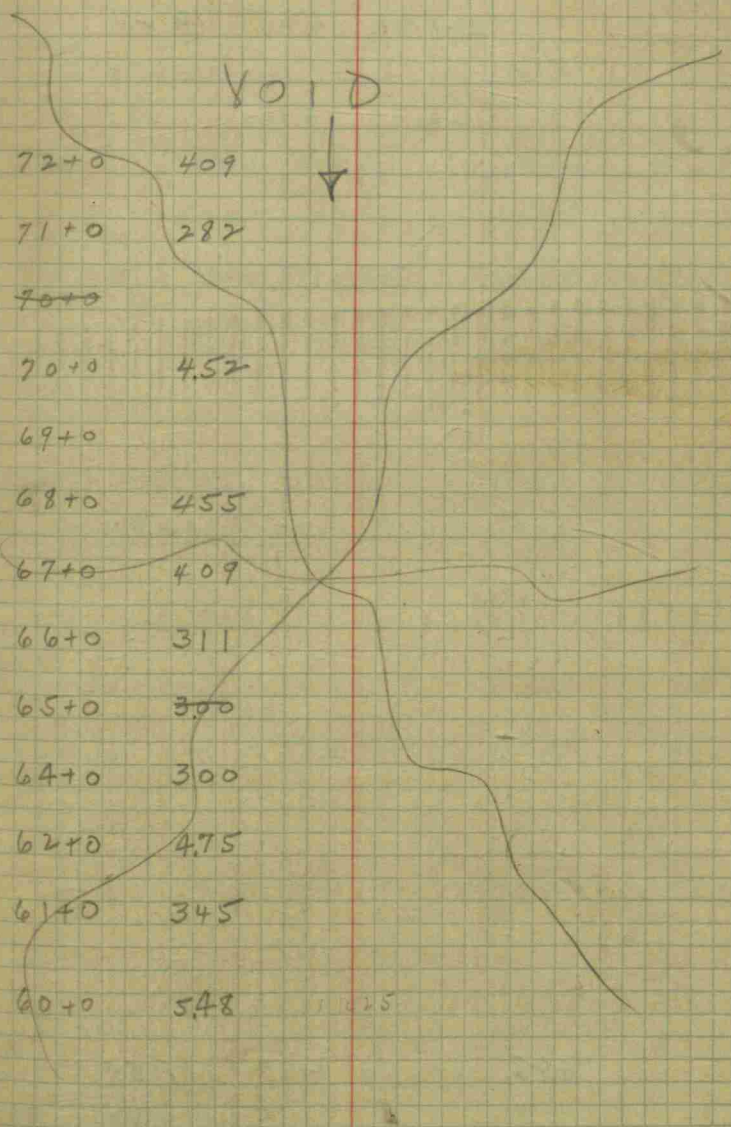
81+0 8.88 10471 10303 12

82+0 1.02 10454 10284 12

356



357



158

-	+	B.M.
120.63	4.35	116.28
5.10		115.53
120.45	4.92	

5.65	116.50	1.70	114.80
------	--------	------	--------

4.95	116.14	4.59	111.55
1.78			114.36

59

Sta	Read	Act El.	Grade	Cut
60+0	612	114.33	107.43	690
61+0	600	114.45	107.21	724
62+0	640	114.05	106.97	708
63+0				
64+0	555	114.90	106.53	837
65+0				
66+0	565	114.80	106.09	871
67+0	269	113.81	105.87	794
68+0	315	113.35	105.65	770
69+0				
70+0	315	113.35	105.21	814
71+0				
72+0	495	111.55	104.74	681

10 60

-

x

+

BM

114.05 STA 62+0

118.96 4.91

Aug. 26, 1941

Newman

61

STA	READ	Act El.	Grade
62+0	10.47	108.54 108.5	106.97 106.89
63+0	10.55	108.41	106.75 106.76
64+0	10.90	108.06	106.53 106.41
65+0	10.95	108.01	106.31 106.36
66+0	11.20	107.76	106.09 106.01

62

Aug 27, 1941

Cook
Newman
Ellis

114.66	20+0		
114.60			
PC	20+24	R	2°15' ✓
114.48	20+74	R	4°20' ✓
114.37	21+24	R	6°45' ✓
114.25	21+74	R	9°0' ✓
114.14	22+24	R	11°15' ✓✓
114.02	22+74	R	13°30' ✓✓
113.91	23+24	R	15°45' ✓✓
113.79	23+74	R	18°0' ✓✓
113.68	24+24	R	20°15' ✓✓
113.56	24+74	R	22°30' ✓
113.45	25+24	R	24°45'
113.33	25+74	R	27°0'
113.22	26+24		29°15'
113.10	26+74		31°30'
112.99	27+24		33°45'
112.87	27+74		36°00'
112.76	28+24		38°15'
112.64	28+74		40°30'
112.53	29+24		42°45'
112.41	29+74		45°00'
112.32	30+13		
112.13	31+0		
111.90	32+0		

Aug 28, 1941

Cook
Ellis
Newman. 63

Equations on Curve.

$$30+13 = 32+75.6$$

$$PC. 32+22 = 34+84$$

Equation

$$35+20 = 37+89$$

$$P.C. 32+72$$

$$32+22 \quad 111.85$$

$$33+22 \quad 5' \quad 111.62$$

$$34+22 \quad 10' \quad 111.39$$

$$Pt 35+20 \quad 15' \quad 111.16$$

$$PC 35+20 \quad 20'30'$$

$$36+20 \quad 5'$$

$$37+20 \quad 7'30'$$

$$38+20 \quad 10'$$

$$39+20 \quad 12'30'$$

$$40+20 \quad 15'$$

$$41+20 \quad 17'30'$$

$$41+85 \quad 20'$$

$$41+85 = 45+64 \text{ Plans}$$

$$\text{Equation}$$

$$42+20 = 46+0$$

66

-	+	BM
120.66	4.38	116.28

Aug 27, 1941

Newman 67

Cook

Ellis

STA	Read	Act El.	Grade	Cut
52+0	4.38	116.28	109.37	6.91
53+0	6.85	113.81	109.13	4.68
54+0	7.20	113.46	108.89	4.57
55+0	7.10	113.56	108.65	4.91
56+0			108.41	
57+0	5.80	114.86	108.17	6.69
58+0	5.88	114.78	107.93	6.85
59+0			107.69	
60+0	6.25	114.41	107.45	

8068

-

π

+

BM

116.28

ST. PD
BM

119.40

3.12

Aug 29, 1941

8069

Cook
Newman
ELLIS

STA.	Reod	Act. EL	Grade
53+0	8.60	11080	10913 10915
54+0	8.84	11056	10889 10891
55+0	8.98	11042	10865 10877
56+0			
57+0	9.60	10980	10817 10815
58+0	9.88	10952	10793 10787
59+0			
60+0	10.30	10910	10745 10745 -

170

-

π

+

BM

ST RD
BM.

116.78

120.17 3.89

4.36

115.81

125.59 9.78

5.38

120.21

RR. Bench
MARK

5.01

120.58

120.60
110.25
10.35

071

STA	READ	ACT. EL.	GRADE	CUT
50+0	3.79	116.38	109.73	6.65
49+0	4.90	115.27	109.86	5.41
48+0	4.82	115.35	109.99	5.36
47+0	4.36	115.81	100.12	5.69

572

TILE CHECK

Aug 30, 1941

Newman

116.28

119.93 365

573

Sta	Read	Act EL	Grade
50+0	868	11125	10973 10960
49+0	850	11143	10986 10978
48+0	832	11161	10999 10996
47+0	825	11168	11012 11003

Grade on Tile

42+20	110.25
41+20	110.38
40+20	110.51
39+20	110.64
38+20	110.77
37+20	110.90
36+20	111.03
35+20	111.16

74

Sept 2, 1941

Newman
Ellis

120.22

123.56 334

120.60

121.42 .82

$$\begin{array}{r} 121.42 \\ 114.78 \\ \hline 6.64 \end{array}$$

110.25

$$\begin{array}{r} 110.25 \\ 4.5 \\ \hline 114.75 \end{array}$$

110.30

$$\begin{array}{r} 110.30 \\ 4.5 \\ \hline 114.80 \end{array}$$

110.39

$$\begin{array}{r} 110.39 \\ 4.5 \\ \hline 114.89 \end{array}$$

$$\begin{array}{r} 121.42 \\ 114.88 \\ \hline 6.54 \end{array}$$

$$\begin{array}{r} 121.42 \\ 114.85 \\ \hline 6.57 \end{array}$$

$$\begin{array}{r} 121.42 \\ 114.75 \\ \hline 6.67 \end{array}$$

10.90

110.52

$$\begin{array}{r} 110.25 \\ 4.5 \\ \hline 114.75 \end{array}$$

75

77

-	π	+	BM	THIRTE BM
	120.70	.10	120.60	
6.44			114.26	
	120.32	6.06		
2.90			117.42	
	121.40	3.98		

STA 41+20 END 18" TILE 77

STA 41+20 START 15" TILE

39+20 6.44

6d.

39+20 832

~~110.64~~

112.00

~~110.64~~

1.36

38+20 510 115.32 110.77-4.45

37+20 290 117.42 110.90-6.52

36+20 465 116.75 111.03-5.72

35+20 369 117.71 - 111.16 6.55

e78

-

π

+

BM

120.12

123.99 3.87

$$\begin{array}{r} 123.99 \\ 5.75 \\ \hline 81 \end{array}$$

Cuts - Sept. 3, 1941

Newm 379
Ellis

20+24

20+74	4.10	119.89	114.48	5.41
21+24	5.75	118.24	114.37	3.87
21+74	5.05	118.94	114.25	4.69
22+24	5.50	118.49	114.14	4.35
22+74	5.26	118.73	114.02	4.71
23+24	4.70	119.29	113.91	5.38
23+74	4.40	119.59	113.79	5.80
24+24	4.35	119.64	113.68	5.96
24+74	4.40	119.59	113.56	6.03
25+24	4.35	119.64	113.45	6.19
25+74	3.96	120.03	113.33	6.70
26+24	4.32	119.67	113.22	6.45
26+74	4.76	119.23	113.10	6.13

80

123.99

4.82

122.01 2.84

119.17

5.10

121.70 4.79 116.91

81

27+24	522	11877	11299	578
27+74	510	11889	11287	602
28+24	540	11859	11276	583
28+74	540	11859	11264	595
29+24	572	11827	11253	574
29+74	590	11809	11241	568
30+13	648	11751	11232	519
31+0	540	11859	11213	646
32+0	475	11924	11190	734
32+22	482	11917	11185	732

33+22	895	113.06	11162 11266
34+22	935	112.66	11139 11126
35+20	943	112.58	11116 11118
36+20	950	112.51	111.03 11111

88

82

121.70

1.08

120.62

83

88

37+20 9.32 11238 11090

11078

38+20 9.55 11215 11077

11075

Top of old site (OLD EL)
 STA 1310 - 117.09 - 117.30

3884

-	+	BM	
		120.12	Tree 26+80
123.66	354		

3.32		120.34	
127.37	7.03		

5.23

122.14

BM 10
Post 224
13+80
1st Post W
of 600 ft

Sept. 6, 1941

Newman
Ellis 835

29-84 - END 15" TILE

29+84 - START 12" TILE

Sta	Read	Act EL	Grade
20+24	332	12034	114.60

Sta	Read	Act EL	Grade	Cuts
20+0	673	12064	114.66	5.98
19+0	645	12092	114.87	6.05
18+0	602	12135	115.08	6.27
17+0	498	12239	115.29	7.10
16+0	389	12348	115.50	7.98
15+0	360	12377	115.71	8.06
14+0	630	12107	115.92	5.15
13+48	630	12107	116.13	4.94
	1025	117.12		
		116.20		

86

-	+	BM
123.72	3.60	120.12

Grade Check

87

Sept 6, 1941

Cloudy

Newman
Ellis

24+74	910	11462 11357	113.56
25+24	916	11456 11343	113.45
25+74	932	11440 11229	113.33
26+24	945	11427 11315	113.22
26+74	952	11420 11308	113.10
27+24	975	11397 11285	112.99
27+74	980	11392 11280	112.87
28+24	990	11382 11270	112.76
28+74	10.10	11362 11260	112.64
29+24	10.15	11357 11245	112.53

- A + B.M
120.12
124.57 4.45

Sept. 9-1941

started concrete encasement of
15" tile No. of R.R. approx sta. 38+47
to Sta 40+03
156 ft north

38+47
156
40+03

Connect tile at 10" old
tile Sta 13+48

Sept. 9, 1941 - Check grade

Cook Clear
Ellis

Sta	Reading	Actual	Grade
24+24	9.65	114.92 113.89	113.68
23+74	9.68	114.89 113.77	113.79
23+24	9.66	114.91 113.79	113.91
22+74	9.42	115.15 114.03	114.02
22+24	9.33	115.24 114.12	114.14
21+74	9.20	115.37 114.26	114.25
21+24	9.12	115.45 114.33	114.37
20+74	9.02	115.55 114.43	114.48
20+24	8.94	115.63 114.51	114.60
20+0	8.78	115.79 114.67	114.66
19+0	8.63	115.94 114.82	114.87
18+0	8.35	116.22 115.10	115.08
17+0	8.10	116.47 115.35	115.29
16+0	7.86	116.71 115.59	115.50
15+0	7.75	116.82 115.70	115.71

1890

R.R. TILE CHECK

120.22

RR BM

121.98 1.76

6.58

115.40

115.74 .34

1.200

1.1

Newman
CookSept 11, 1941
Clear

0091

N. SIDE RR 396 Tile

11178

11013 11012

408 CMP

11166

11166

406 CMP

11168

11166

S. SIDE RR 428 CMP

11154

11154

11154

Connected old tile at Sta 21+80
10" x 12" Connection from old 10"

- Nov. 17, 1941 - Collect call from Mr. Hennings
Concerning broken tile.
Stopped at his place some day about
12 noon and saw broken tiles
- Nov. 18, 1941 - Sadler & myself inspected tile
from outlet to approx. Sta 72+0.
- Nov. 18 - Zenor came to Danville upon my
call - Here about 1 P.M.
- Nov. 21st. - 2 loads 22" tile to Hennings
farm from Brooklyn tile Co.
Stopped to see Hennings
- Nov. 22 - Sadler moved dragline to Hennings
farm.
- Nov. 24 - Sadler's men opened some of the
ditch - Too much water to work
well. - Was at the ditch. Mon. P.M.
for Sadler men
- Nov. 26 - Sadler's men started again Wed
noon. - Was there
- Nov. 27. Sadler men worked. - Was there myself
- Nov. 28 " " " " " "
- Nov. 29 " " " " " "

- Dec. 1st. - Sadler's men worked.
- Dec 2nd - " " " - Lec and
I were at ditch from about 11 A.M.
till 2 P.M. - Called David Harker.
Zenor reported to me that 6 loads
of 22" tile had been hauled to
the ditch. - 528 ft.
- Dec. 3 - 11:30 P.M. Met Leo Sadler,
Mr. Powell - Mr. Zenor of Brooklyn -
Mr. Tyndall of Krich - Tyndall Tile
Co and 2 men from Portland
Tile Co. Was at Ditch till 4 P.M.
Tyndall will send a load of tile
22" tomorrow - Part 2'-0 and 30" long.
Zenor says he has sent 528'
of 22" tile to the job so far.
- | | |
|--|------|
| Krich - Tyndall - Portland Tile Co. | |
| 371 pc 22" - 30" long - | 80' |
| 46 pc 22" 2' long - | 92' |
| | 172' |
- Dec. 5 - Sadler men worked.
measured ditch opened
Was at ditch from 9:30 to 11:30 A.M.
" " " " 3:30 to 4:30 P.M.

Tile from 101+50 to 104+0
replaced were quartered tile but only
one tile that was partly crushed.

103+0 to 102+0 Replaced 14-2'-0" tile
and 5-30" tile - 40% replaced 14-

103+0 to 104+0 - Replaced 8 pc 30"
and 1 pc 24" Total Replacement
22 ft in the 100 ft. Dec 5, 1941

104+0 Henning - TRahn line

104+0 to 106+0 - Several good tile
a few places as much as 30"
in a strip.

107+27 Round trap - approx 2'-0"

107+89 Fence E & W - Henning wheat field
2 good tile near fence

107+89 to 110+43 - Only 1 tile good
all replaced.

Before ditch was opened 2 tile
covered completely in and about 6 sink
holes.

Dec 6. - Sadler men finished upper
end of 22" tile to about stat
101+50 - with flashlight looking
about 100 feet into 22" tile could
see no tile broken. - Partly
backfilled the trench that was
opened by 1' or 18" dirt and
replaced some 22" tile at Sta.
110+43 - Uncovered about 50 feet.

Dec 8, 1941 - opened ditch at East side
of lane. (Bad weather some snow)
Sadler's men worked. Replaced about
10 feet of tile in about 60 feet open,
some tile quartered, some good. Worst
place at point of connection of old tile
into new tile.

Dec. 22, 1941 - Chester Saltee taking
6 pcs 22" tile to Purdue to be tested.

sp. #1	} Brooklyn	#4	} Portland Tile
sp. #2		#5	
sp. #3		#6	

#6 is tile out of
ditch

196

Dec. 23 - 1 P.M. Call from
 Sumpter that Avon - Chug Rd.
 caved in. Rd. men washed
 to get hole filled in till 7 P.M.
 3 men of Suller helped.

Dec. 24. More cove in at Avon - Chug.
 road - To make save temporary
 wooden bridge built. Road
 men washed from noon till 5 P.M.
 building bridge.

ordered 48' x 24" C.M.P. from
 O'Neal Co.

Dec. 26 - 48' x 24" C.M.P. delivered
 to site. Inspected the condition
 at road.

Dec 27. Called Zenor of Brooklyn to
 come up and look over,

197

Jan 23, 1947 - Suller (2 men) had
 dragline dig out Avon - B. Hwy
 Rd crossing.

Jan 24, 1947 - Worked at road crossing
 found that gravel and blue sand had
 stopped tile at West edge of road.

Opened tile at about 300 ft. SW of
 Road where one tile was broken. Boy
 taking out cracked tile and others every
 6 or 8 ft. removed all gravel, sand etc
 in the tile up to the road, Suller (2 men)

Jan 25, 1947 [Brooklyn 128' x 24" - 1/26/47]
 Suller had two men working.

Jan 26, 1947 } cleaned out tile and

Jan 27, 1947 } put in 80 feet C.M.P.

Jan. 28, 1947 } with bauls. and
 connected all the tile together
 about noon Jan. 28, 1947. Had
 flow of water - Dan S. is backfilling
 some.

Jan. 29, 1947 - Dan Suller backfilled
 road crossing 1/2 day.

Jan 30, 1947 - Dan S. finished backfill
 at road and moved machine to
 Henning Bould.

2698

Mch. 19. Mr. Shockley Mgr. for Mr.
 Mavissey come to see me. Took
 a set of plans with him. Suggested
 landowner representative be
 present when repairing was made.
 Later in day I saw Mr. Shockley
 with Mr. Fulwider of Lebanon
 walking over ditch.

Mch. 20 Soller & I walked entire
 ditch making inspection

Mch. 25. Soller plans to move machine
 to ditch in next day or so if
 the weather remains good.

April 13 Soller moved machine to down
 Brownsburg Rd. Backfilled trench
 West of Road.

April 14 Soller cleaned out dirt in the
 open ditch approx. 600 feet
 below tile outlet. Lowered water
 till water was flowing out of 24"
 tile - Was at ditch myself.

April 15 Moved to Henning land at about

2699

Sta 125+0. Opened tile over summer
 holes. Was at ditch myself 9:45 a.m.
 till 3:45 P.M.

19 pcs of 24" tile hauled here about
 Jan. 26th - show cracks and checks
 upon inspection today 38 ft.

Uncovered approx 150 to 200 ft tile
 West of Henning Lane. Tile had mud
 in feet of them.

Mavissey bought load 18", 15" and 12" tile to state
 April 16, 1947. Was at ditch about 1 1/2
 in a.m. and about 2 1/2 hrs. in P.M.

Soller backfilled on Armstrong land from
 101+50 South onto Henning. Opened
 broken tile at about Sta 125+0 to Sta
 121+0 to force water thru tile. Too
 much water to work. This tile had been
 totally stopped with mud.

Mavissey was at ditch. Saw Soller.
 Repaired 1 pc 18" tile at Sta 65+75
 in Salmon. - Only one tile broken at
 this point. Examined tile in both
 directions with flashlight. ~~about~~
 wasn't any cracked tile either direction
 as far as could see.

April 17/18

1490

Was at ditch while Salmon Hole was repaired
Sta 64+50 repaired tiles by putting
in 3 pcs 18" new tiles. Tiles each side
standing in good condition

N. side of Salmon hole approx
Sta 60+0. Repaired 18 tiles by
replacing 8 pcs 18" tiles. Moved
manure farm and repaired 3 tiles
in 15" line. Put 4 pcs 15" in 1st
hole, 1 pc in 2nd hole and 5 pcs
15" tile in 3rd hole.

Approx Sta 37+50 - 36+50 - 4 1/2' cover

April 18, 1942 - Opened 15" at 30+25

4 ft cover. Machine has
not been over the tiles but has
worked from side of trench.

Was at ditch on manure farm sat A.M.
Dirt in tiles about 1/2 or 2/3 filled. Too
much water to repair. Solder men
worked trying to get dirt out of tiles
to lower the water level. Opened about
60 or 75 ft. of ditch while I was
- there. ~~Was~~ Approx. 60% or 75%
of these tiles were cracked and broken.
Some good tiles.

1491

Measured cover of tiles at

Sta. 30+0 - 3 1/2'

Uncovered from 30+25 to 28+35.

29+84 start of 12" tile

30+25 to 29+84 - 15" - 1'

29+84 to 28+35 - 149' x 12" tile -

Replaced 30' x 12" on 18th.

April 20, 1942 -

Opened ditch at 17+80 to 15+00
Tiles from 17+15 to 17+80 are not
broken and not hardly any sand
or clay in tiles. 6' cover and more
Broke out good tiles to get dirt out of
tiles

Replacing 15" tiles from Sta 30+25 to
Sta 29+84 - Replaced 22' of 15"

also replacing 12" tiles Sta. 29+84 to
28+35. - 66' new tiles.

Brooklyn brought 100' x 12" and 24' x 15"
to manure farm.

April 21. Still working putting in
12" new tile at sta 29+84 to
sta. 28+35. Also repaired
12" tile by replacing 30 ft 12"
at sta 17+80 to sta 16+90.
Backfilled 17+80 to 16+90.

April 22, 1942. Brooklyn brought
170 ft 12" tile. Soder
replacing broken tile sta. 16+90
to 15+00 Replaced 158 ft
12" tile sta 15+00 to 16+90.

April 23, 1942 - Backfilled 15+00 to 16+90
Backfilled 30+0 to 28+35, moved
machine south to Henning farm

April 30, 1942 - Called Brooklyn - Zenor
about 22" and 24" tile

May 1st - Brooklyn called saying
22" and 24" tile would be
at job Sunday May 3rd.

May 4, 1942 - Soder worked at
ditch cleaning out dirt,
2" rain Sunday, weather

Turned cold, approx 43°

May 3, 1942 - Portland brought 200 ft
tile - 100' x 22" and 100' x 24" but
20 ft 24" of tile was broken as truck
tumbled in field off of highway.

May 4, 1942 - Replacing 24" tile - Had 6'
24" Brooklyn tile from tile brought. Found
10' ft. 24" found to be cracked besides
the 20 broken from unloading.
Apparently cracked from unloading.

May 5, 1942 - Replacing 24" tile - Replaced
78' of 24" total, brought by Portland.
Called Zenor and ordered 70' more of 24"

May 7, 1942. - Portland brought 24" tile - 2 or 3
tile broken in unloading. 66' x 24" looked
good.

May 8, 1942. Soder men replacing 24"
tile. Replaced 60' x 24"

May 9, 1942 - Walked from down Spring Rd
to outlet. Tile in good shape. No
holes or settlement in backfill.
Finished repairing 24" and started repairing
22" tile.

May 11, 1947. Soller men finished putting in 22" tile on Henning farm west of lane. approx. 66 ft. Repaired hole in tile about 200' east of lane by replacing 1 pc. 22" tile. Replaced 74 ft of the 22" tile out of the 100 ft. delivered, 26' ft 22" tile left on job.

Inspected tile by walking over it from State Rd No. 34 north to Wash South line, all ok. No holes and not much settlement of backfilled dirt, at Sta. 13+ where new tile was connected to old tile there was a good flow of water. approx. 2 in 3". No dirt in tile. At North side of J.H.I.EE at air vent about the same flow of water and no dirt in bottom of tile.

Dan Soller backfilling truck

on Henning farm.

May 17, 1947 - I walked ditch from State Rd. No. 34 to outlet. No indication ^{of any break} ~~that~~ the ditch was ok. No holes or places sinking in. Dan Soller backfilling on Henning and trucking dirt to tile that was washed out near East side of Avon-Blumig Rd. This tile was washed out because water had gone into old tile line at this point all winter.

May 13, 1947. Finished backfill of all surplus dirt on Henning farm and moved machine to west side of Avon-Blumig Rd. and started trucking surplus dirt from Huggard farm to hole on East side of Avon-Blumig Road.

May 14, 15, - Rain, no work.

May 16, 1947 - Finished trucking dirt from Huggard farm to Henning

May 18, 1947. - Finished leveling

back fill dirt and moved
machine off job.

May 19, 1942. Walked over ditch
on Henning farm. Found
3 places sunk down
Place on East side of Henning
lane still dug out. Too
much water to repair.
This was where a tile came
into South side of new
ditch and tile was not
connected to new ditch.
No more work on ditch till
June 2nd. on account of too
much rain.

June 2, 1942 - Sadler had two
men dig out holes in
field East of Henning lane
2 of the 3 places sunk
down were over the old
tile line. Old tile was
full of water due to the
fact that it was not

connected into new tile on
East side of Henning lane.
The other place sunk down
was tile (top) broken in.

June 3, 1942 - Sadler had two men
working digging out connection at
East side of Henning lane. This old
tile had been originally connected
at time of construction but at time
the main tile was repaired this
connection was not made again.
The water in the old 16" tile
was held back because of not
being connected into new tile.
Sadler made a new connection by
going into new tile and connecting
the old 16" tile.

June 4, 1942 - Sadler (2 men) replaced
1-22" tile about 200 ft. East of
Henning lane. Tile adjoining was
cracked and was replaced by new
22" tile making total replacement at
this point of 2 feet of 22" tile.
Other holes or settlement shown in
this field were over the old tile.

June 5, 1942 - Soller (2 men) repaired the old tile on Armstrong farm. There was nothing wrong with the new tile at this point (approx Sta. 82+00) Water had washed dirt out of field into upper end of old tile.

June 6, 1942 - Soller (2 men) were hauling 11 pcs of 22" tile from edge of Avon - Blumy Rd up to Hummings' barn lot.

Heavily rained the night of June 6, 1942.

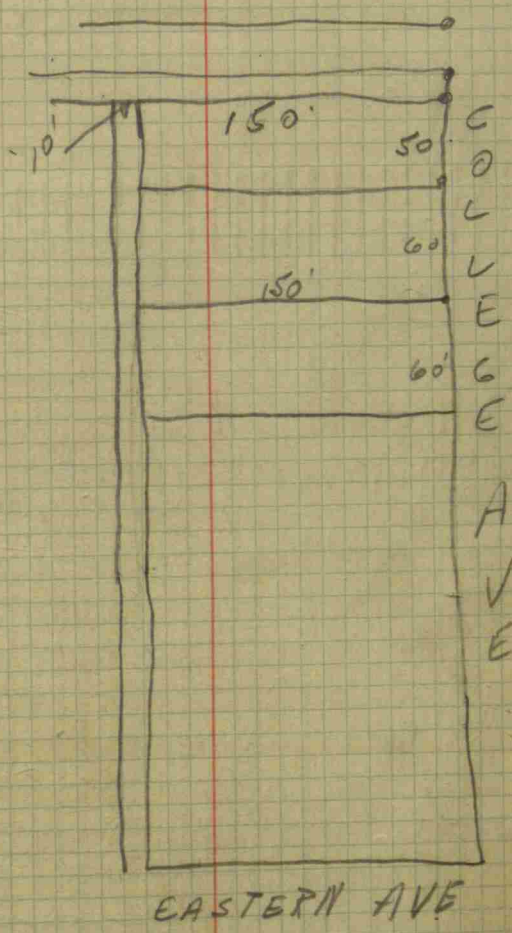
June 7, 1942

About 2" or 3" rainfall Sunday night.

June 8, 1942. Too muddy to inspect ditch. Water had run down over top of ground.

148

149



150

$$\begin{array}{r} 304.75 \\ 1 \\ \hline \times 8.35 \\ \hline \end{array}$$

$$\begin{array}{r} 120.32 \\ 115.12 \\ \hline 5.20 \end{array}$$

$$\begin{array}{r} 121.42 \\ 114.75 \\ \hline 6.67 \end{array}$$

$$\begin{array}{r} 121.42 \\ 114.85 \\ \hline 6.57 \end{array}$$

$$110.64$$

$$\begin{array}{r} 110.62 \\ 4.5 \\ \hline 115.12 \end{array}$$

$$\begin{array}{r} 110.25 \\ 4.5 \\ \hline \end{array}$$

$$\begin{array}{r} 110.25 \\ .1 \\ 4.5 \\ \hline 114.85 \end{array}$$

111

152

104.55 4.55

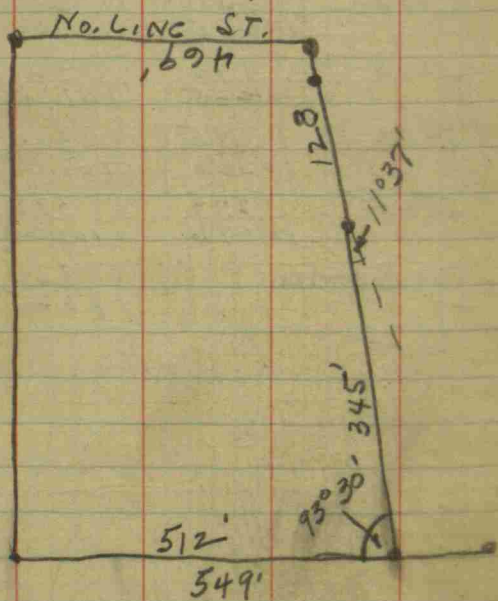
100.0

Top So.
Pipe to ST
STA-5+65

AUDIE WATKINS LEVELS 153

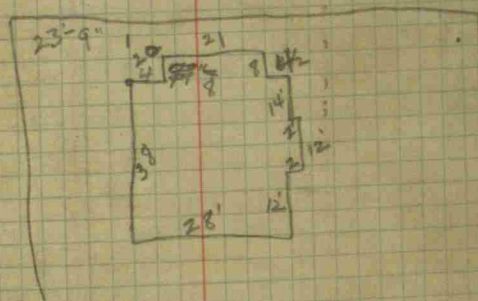
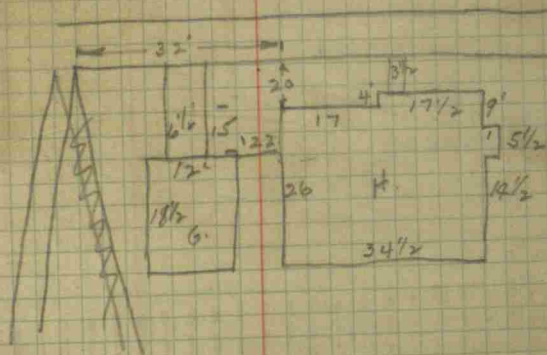
Sta	Stk	Ground	Grade	Cut
0+00	9.15 95.40	103.32 94.23	92.76	1.47
		8.26	96.29	2.64
1+00	4.40 100.15	5.65 98.90	93.26	5.64
				6.29
2+00	2.40 102.15	3.56 100.99	93.76	7.23
				8.37
3+00	2.40 102.15	3.47 101.08	94.26	6.82
				7.89
4+00	1.90 102.65	3.29 101.26	94.76	6.50
				7.89
5+00	1.95 102.60	3.10 101.45	95.26	6.18
				7.34
5+65	2.79 101.76	3.35 101.20	95.59	5.62
				6.18
TOP FOOTING		8.30 96.25		

154



155

Pt Lot 7 Bl. 3

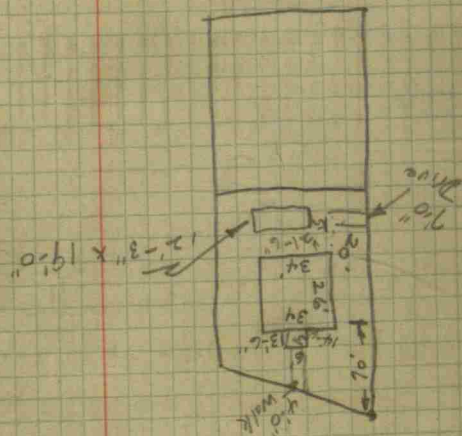


156

1490088

Jim Barlow,

157



158.

Station	π	Vertical Angle	Deflect. Bearing
0+00	5.00	-10°03'	S 87°E

19+75

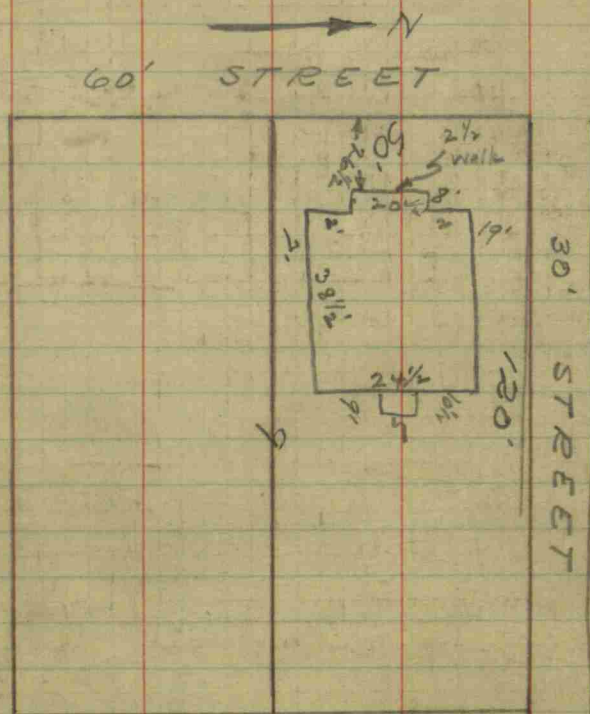
20+00	4.50	$\begin{matrix} B \\ +10^{\circ}07' \\ +15^{\circ}00' \end{matrix}$	R. 12°00' S. E
-------	------	---	----------------

Martin-Proch
Acid-Prept.

26+00

159





$\begin{array}{r} 29.54 \\ 28.35 \\ \hline 1.19 \end{array}$

CURVE TABLES.

Published by KEUFFEL & ESSER CO.

HOW TO USE CURVE TABLES.

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

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

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

To find Nat. Tan. and Nat. Ex. Sec. for any angle by Table I.: Tan. or Ext. of twice the given angle divided by the radius of a 1° curve will be the Nat. Tan. or Nat. Ex. Sec.

EXAMPLE.

Wanted a Curve with an Ext. of about 12 ft. Angle of Intersection or I. P. = $23^\circ 20'$ to the R. at Station 542+72.

Ext. in Tab. I opposite $23^\circ 20' = 120.87$
 $120.87 \div 12 = 10.07$. Say a 10° Curve.

Tan. in Tab. I opp. $23^\circ 20' = 1183.1$
 $1183.1 \div 10 = 118.31$.

Correction for A. $23^\circ 20'$ for a 10° Cur. = 0.16
 $118.31 + 0.16 = 118.47 =$ corrected Tangent.

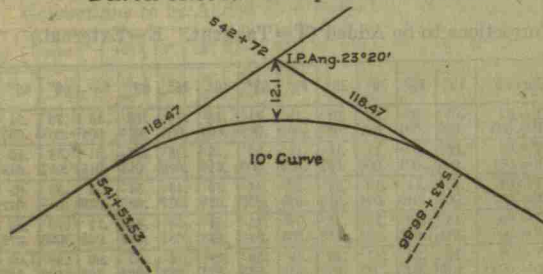
(If corrected Ext. is required find in same way)
 Ang. $23^\circ 20' = 23.33^\circ \div 10 = 2.3333 =$ L. C.

$2^\circ 19\frac{1}{2}' =$ def. for sta.	542	I. P. = sta.	542+72
$4^\circ 49\frac{1}{2}' =$ " " "	+50	Tan. =	1.18.47
$7^\circ 19\frac{1}{2}' =$ " " "	543	B. C. = sta.	541+53.53
$9^\circ 49\frac{1}{2}' =$ " " "	+50	L. C. =	2.33.33
$11^\circ 40' =$ " " "	543+	E. C. = Sta.	543+86.86
	86.86		

$100 - 53.53 = 46.47 \times 3' (\text{def. for 1 ft. of } 10^\circ \text{ Cur.}) = 139.41' =$
 $2^\circ 19\frac{1}{2}' =$ def. for sta. 542.

Def. for 50 ft. = $2^\circ 30'$ for a 10° Curve.

Def. for 36.86 ft. = $1^\circ 50\frac{1}{2}'$ for a 10° Curve.



Natural Trigonometrical Functions

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	.6293	.8098	1.2868	1.589	1.235	.77715
10	.5324	.6289	1.1813	1.878	1.590	.84650	10	.6316	.8146	1.2898	1.583	1.228	.77531
20	.5348	.6330	1.1835	1.870	1.580	.84495	40	.6338	.8195	1.2929	1.578	1.220	.77347
30	.5373	.6371	1.1857	1.861	1.570	.84339	30	.6361	.8243	1.2959	1.572	1.213	.77162
40	.5398	.6412	1.1879	1.853	1.560	.84182	20	.6383	.8292	1.2991	1.567	1.206	.76977
50	.5422	.6453	1.1901	1.844	1.550	.84025	10	.6406	.8342	1.3022	1.561	1.199	.76791
33	.5446	.6494	1.1924	1.836	1.540	.83867	57	.6428	.8391	1.3054	1.556	1.192	.76604
10	.5471	.6536	1.1946	1.828	1.530	.83708	50	.6450	.8441	1.3086	1.550	1.185	.76417
20	.5495	.6577	1.1969	1.820	1.520	.83549	40	.6472	.8491	1.3118	1.545	1.178	.76229
30	.5519	.6619	1.1992	1.812	1.511	.83389	30	.6494	.8541	1.3151	1.540	1.171	.76041
40	.5544	.6661	1.2015	1.804	1.501	.83228	20	.6517	.8591	1.3184	1.535	1.164	.75851
50	.5568	.6703	1.2039	1.796	1.492	.83066	10	.6539	.8642	1.3217	1.529	1.157	.75661
34	.5592	.6745	1.2062	1.788	1.483	.82904	56	.6561	.8693	1.3251	1.524	1.150	.75471
10	.5616	.6787	1.2086	1.781	1.473	.82741	50	.6583	.8744	1.3284	1.519	1.144	.75280
20	.5640	.6830	1.2110	1.773	1.464	.82577	40	.6604	.8796	1.3318	1.514	1.137	.75088
30	.5664	.6873	1.2134	1.766	1.455	.82413	30	.6626	.8847	1.3352	1.509	1.130	.74896
40	.5688	.6916	1.2158	1.758	1.446	.82248	20	.6648	.8899	1.3386	1.504	1.124	.74703
50	.5712	.6959	1.2183	1.751	1.437	.82082	10	.6670	.8952	1.3421	1.499	1.117	.74509
35	.5736	.7002	1.2208	1.743	1.428	.81915	55	.6691	.9004	1.3456	1.494	1.111	.74314
10	.5760	.7046	1.2233	1.736	1.419	.81748	50	.6713	.9057	1.3492	1.490	1.104	.74120
20	.5783	.7089	1.2258	1.729	1.411	.81580	40	.6734	.9110	1.3527	1.485	1.098	.73924
30	.5807	.7133	1.2283	1.722	1.402	.81412	30	.6756	.9163	1.3563	1.480	1.091	.73728
40	.5831	.7177	1.2309	1.715	1.393	.81242	20	.6777	.9217	1.3600	1.476	1.085	.73531
50	.5854	.7221	1.2335	1.708	1.385	.81072	10	.6799	.9271	1.3636	1.471	1.079	.73333
36	.5878	.7265	1.2361	1.701	1.376	.80902	54	.6820	.9325	1.3673	1.466	1.072	.73135
10	.5901	.7310	1.2387	1.695	1.368	.80730	50	.6841	.9380	1.3711	1.462	1.066	.72937
20	.5925	.7355	1.2413	1.688	1.360	.80558	40	.6862	.9435	1.3748	1.457	1.060	.72737
30	.5948	.7400	1.2440	1.681	1.351	.80386	30	.6884	.9490	1.3786	1.453	1.054	.72537
40	.5972	.7445	1.2466	1.675	1.343	.80212	20	.6905	.9545	1.3824	1.448	1.048	.72337
50	.5995	.7490	1.2494	1.668	1.335	.80038	10	.6926	.9601	1.3863	1.444	1.042	.72136
37	.6018	.7536	1.2521	1.662	1.327	.79864	53	.6947	.9657	1.3902	1.440	1.036	.71934
10	.6041	.7581	1.2549	1.655	1.319	.79688	50	.6967	.9713	1.3941	1.435	1.030	.71732
20	.6065	.7627	1.2577	1.649	1.311	.79512	40	.6988	.9770	1.3980	1.431	1.024	.71529
30	.6088	.7673	1.2605	1.643	1.303	.79335	30	.7009	.9827	1.4020	1.427	1.018	.71325
40	.6111	.7720	1.2633	1.636	1.295	.79158	20	.7030	.9884	1.4061	1.422	1.012	.71121
50	.6134	.7766	1.2661	1.630	1.288	.78980	10	.7050	.9942	1.4101	1.418	1.006	.70916
38	.6157	.7813	1.2690	1.624	1.280	.78801	52	.7071	1.0000	1.4141	1.414	1.000	.70711
10	.6180	.7860	1.2719	1.618	1.272	.78622	50						
20	.6202	.7907	1.2748	1.612	1.265	.78442	40						
30	.6225	.7954	1.2778	1.606	1.257	.78261	30						
40	.6248	.8002	1.2808	1.601	1.250	.78079	20						
50	.6271	.8050	1.2838	1.595	1.242	.77897	10						

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

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

Handwritten notes and diagrams on the right page of the notebook.

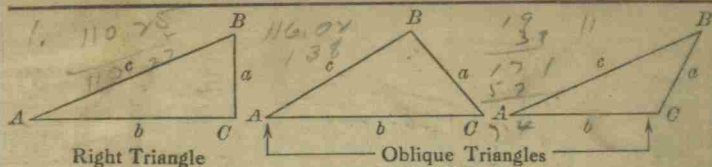
At the top right, there are some faint numbers: "50", "10000".

Below these, there are several diagrams and calculations:

- A diagram showing a horizontal line with a square attached to its right end. Above the line, there is a calculation: $\frac{528}{30} = 17.6$, and below it, $\frac{498}{12} = 41.5$.
- Another diagram showing a square with a smaller square attached to its top side. To the right of this diagram, there is a calculation: $60 \times 120 = 7200$.
- A diagram showing a square with a smaller square attached to its left side. To the right of this diagram, there is a calculation: $\frac{11043}{10789} = 10.24$.
- A diagram showing a square with a smaller square attached to its bottom side. To the right of this diagram, there is a calculation: $\frac{11043}{103} = 107.21$.
- A diagram showing a square with a smaller square attached to its top side, similar to the second diagram. To the right of this diagram, there is a calculation: $\frac{643}{486} = 1.32$.
- A diagram showing a square with a smaller square attached to its left side, similar to the third diagram. To the right of this diagram, there is a calculation: $\frac{157}{8} = 19.625$.
- A diagram showing a square with a smaller square attached to its bottom side, similar to the fourth diagram. To the right of this diagram, there is a calculation: $\frac{7+43}{7+43} = 1$.
- At the bottom of the page, there is a large diagram showing a grid of squares. A circle is drawn in the center of the grid. Below the grid, there is a calculation: $\frac{70}{70} = 1$.

121.00
 109.56
 11.44
 434
 69
 3888
 2592
 29108
 10418
 1170
 92.48
 119.84
 109.63
 10.21
 1.91
 9.30
 120.76
 109.60
 11.16
 109.56
 106.97
 2.59
 120.79
 109.60
 11.19
 1.84
 9.14
 116.28
 4.50
 170.78
 8407
 299
 85.01
 96.51
 8743
 9.08
 114.66
 1.38
 116.04
 93
 13
 22
 47.5
 13
 104
 119.84
 109.60
 10.24
 102.1
 171
 850
 170.78
 109.60
 11.18
 1.84
 9.14
 116.28
 4.50
 170.78
 111.48
 9.30
 33
 165.000000
 11.000000
 0.000000

TRIGONOMETRIC FORMULAE



Solution of Right Triangles

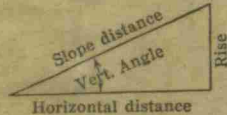
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

Given	Required	Formula
a, b	A, B, c	$\tan A = \frac{a}{b} = \cot B$, $c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B$, $b = \sqrt{c^2 - a^2}$, $c = \frac{a}{\sin A}$
A, a	B, b, c	$B = 90^\circ - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90^\circ - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90^\circ - A$, $a = c \sin A$, $b = c \cos A$

Solution of Oblique Triangles

Given	Required	Formula
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180^\circ - C$, $\tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$ $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a + b + c}{2}$, $\sin \frac{1}{2}A = \sqrt{\frac{(s - b)(s - c)}{bc}}$ $\sin \frac{1}{2}B = \sqrt{\frac{(s - a)(s - c)}{ac}}$, $C = 180^\circ - (A + B)$
a, b, c	Area	$s = \frac{a + b + c}{2}$, $\text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
A, b, c	Area	$\text{area} = \frac{b c \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = $5^\circ 10'$. From Table Page IX. $\cos 5^\circ 10' = .9959$. Horizontal distance = $319.4 \times .9959 = 318.09$ ft. Horizontal distance also = Slope distance minus slope distance times (1 - cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. $\cos 5^\circ 10' = .9959$. $1 - .9959 = .0041$. $319.4 \times .0041 = 1.31$. $319.4 - 1.31 = 318.09$ ft.

When the rise is known, the horizontal distance is approximately: - the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft. slope distance = 302.6 ft. Horizontal distance = $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.