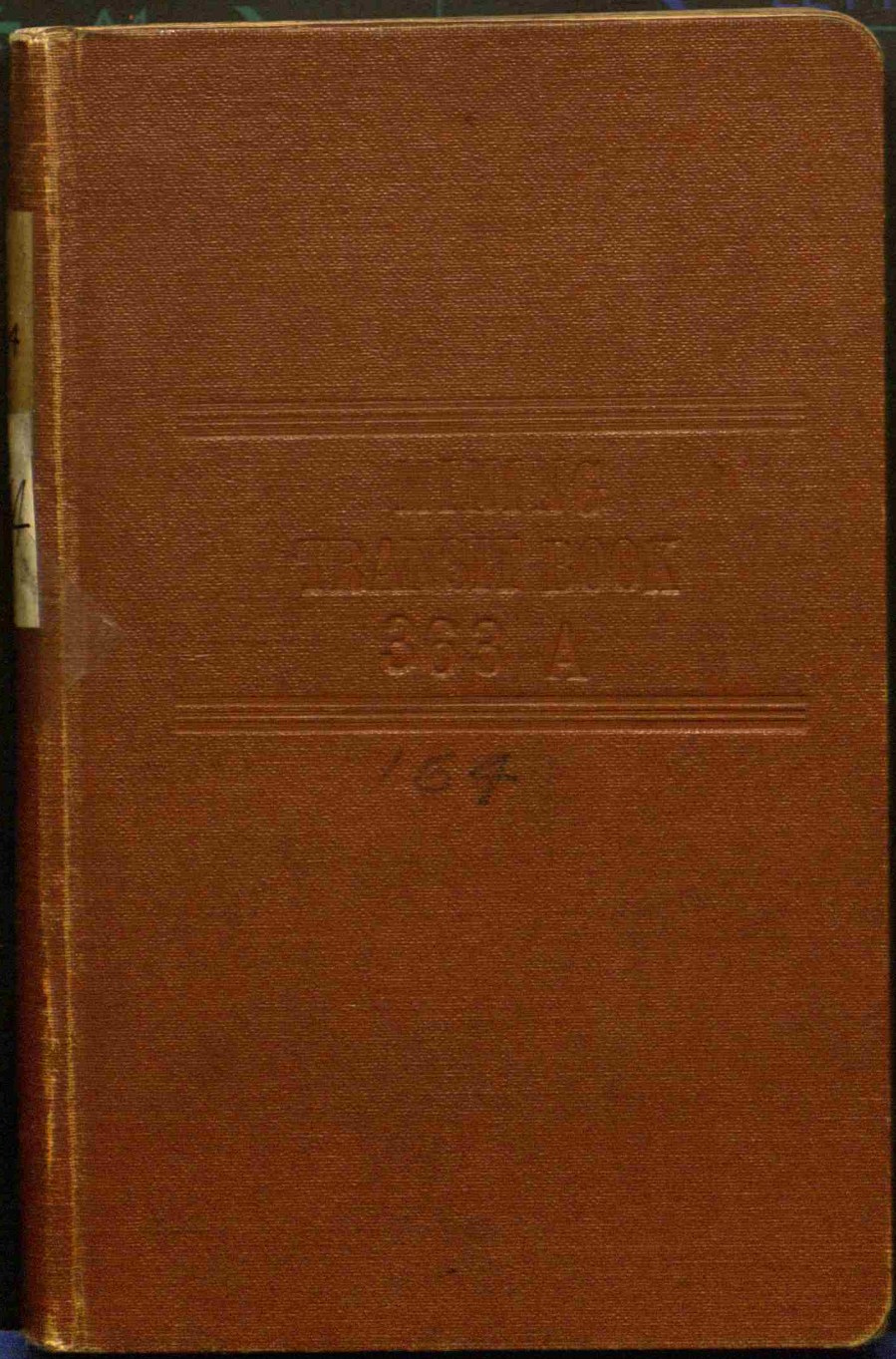

383 A
164

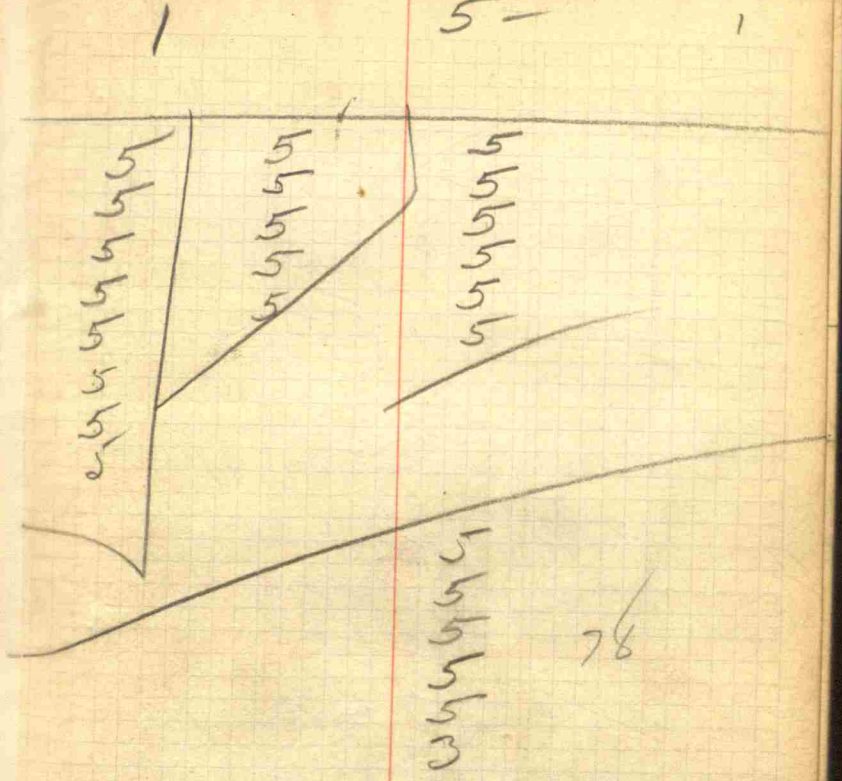
164

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.

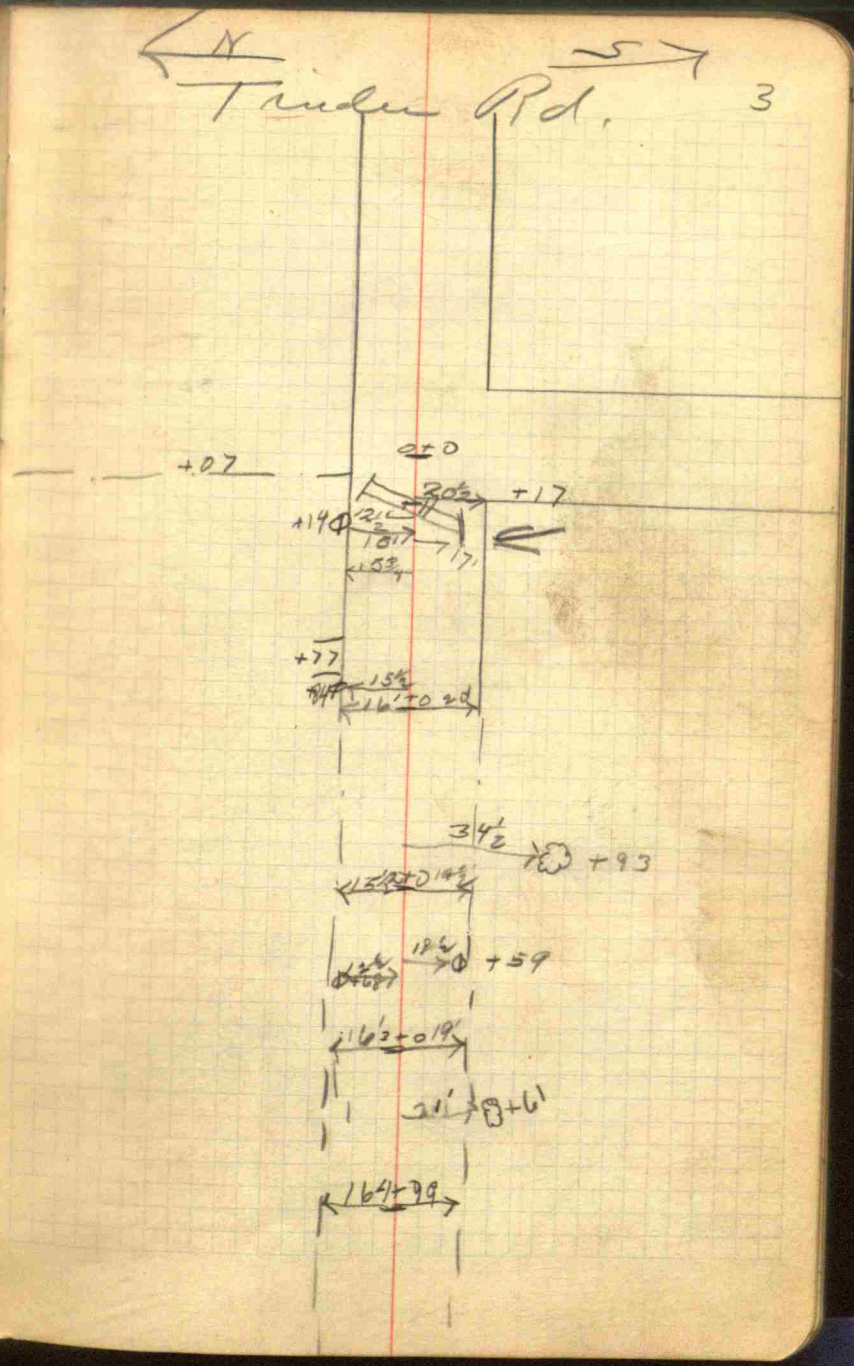
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	0
1	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	1
2	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	2
3	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	3
4	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	4
5	14.0	14.1	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

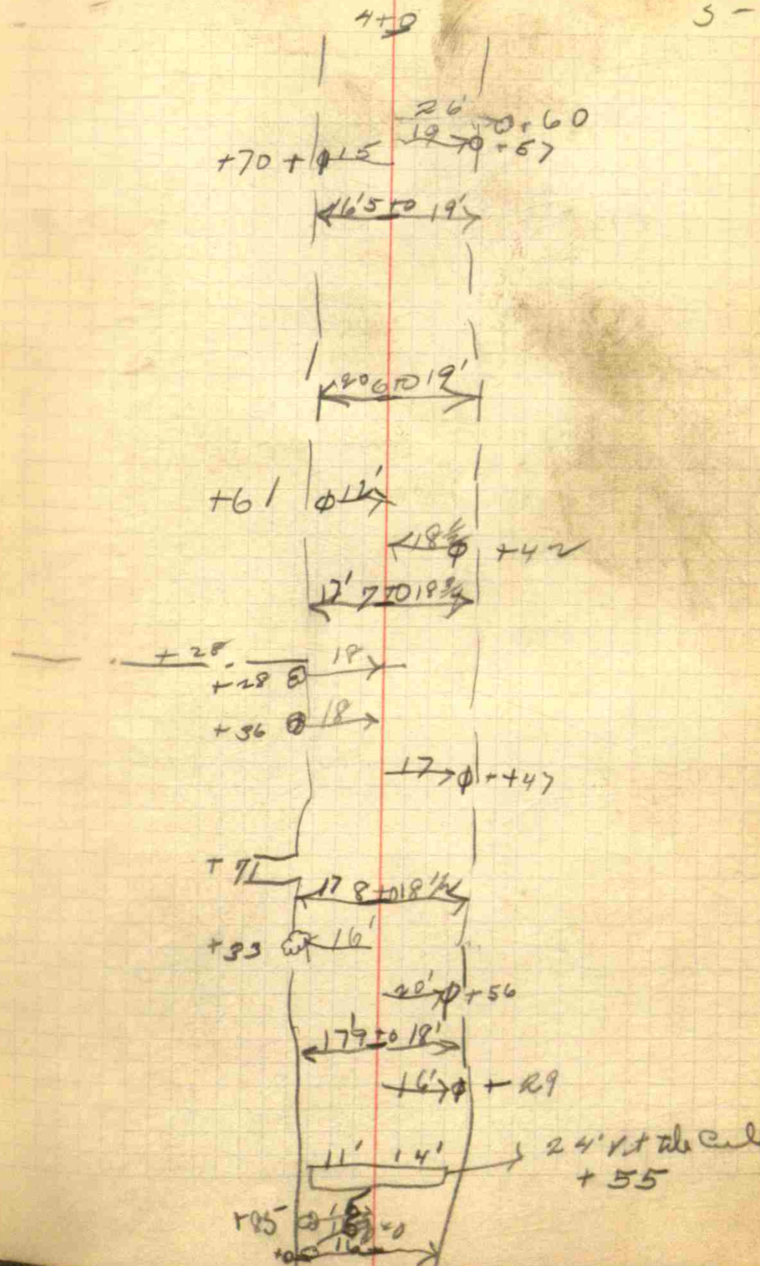
Calculated by Julien A. Hall, M. Am. Soc. C. E.



31.0
14.3
125

O.N. TINDER RD. Beg. at Cen. S. SE¼ 17-15-1W; thence W. 1.55 miles to Center Twp. line.

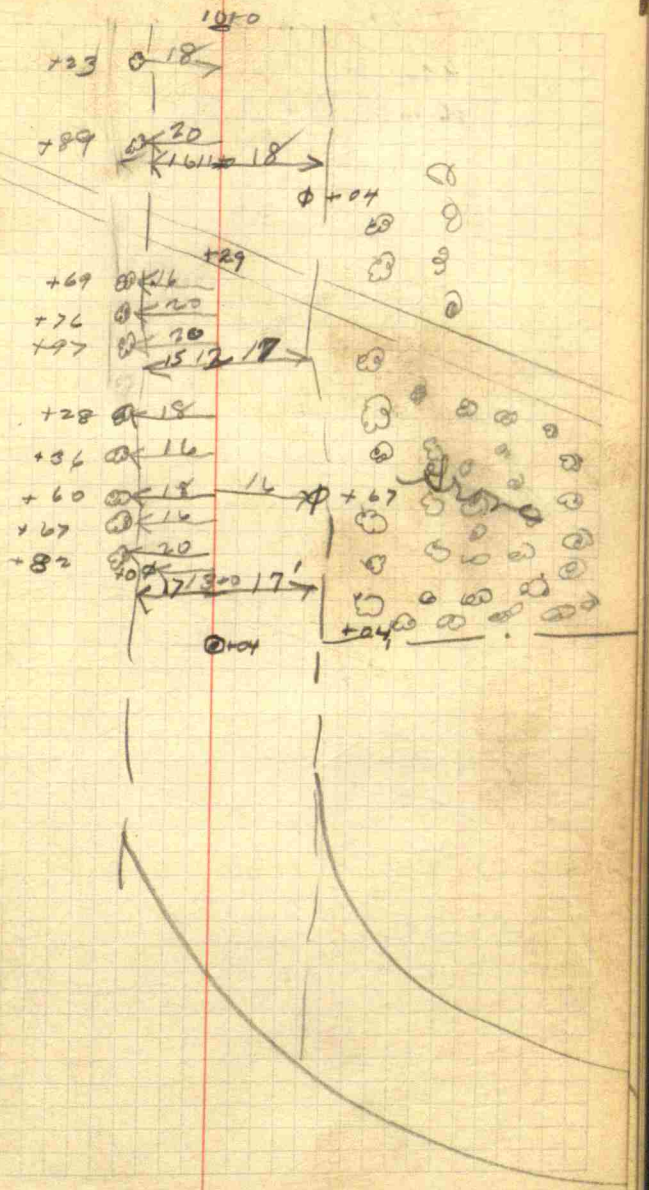



4+0
26'
0+60
19
+67
+70 +
15
16'5 to 19'
20 to 19'
+61
12'
18½
+42
17' 7 to 18¾
+28
18
+28
+36
18
17
+47
+71
17 8 to 18½
+33
16'
20'
+56
17½ to 18'
16'
+29
11'
14'
24' rt tile Culv
+55
+85
16

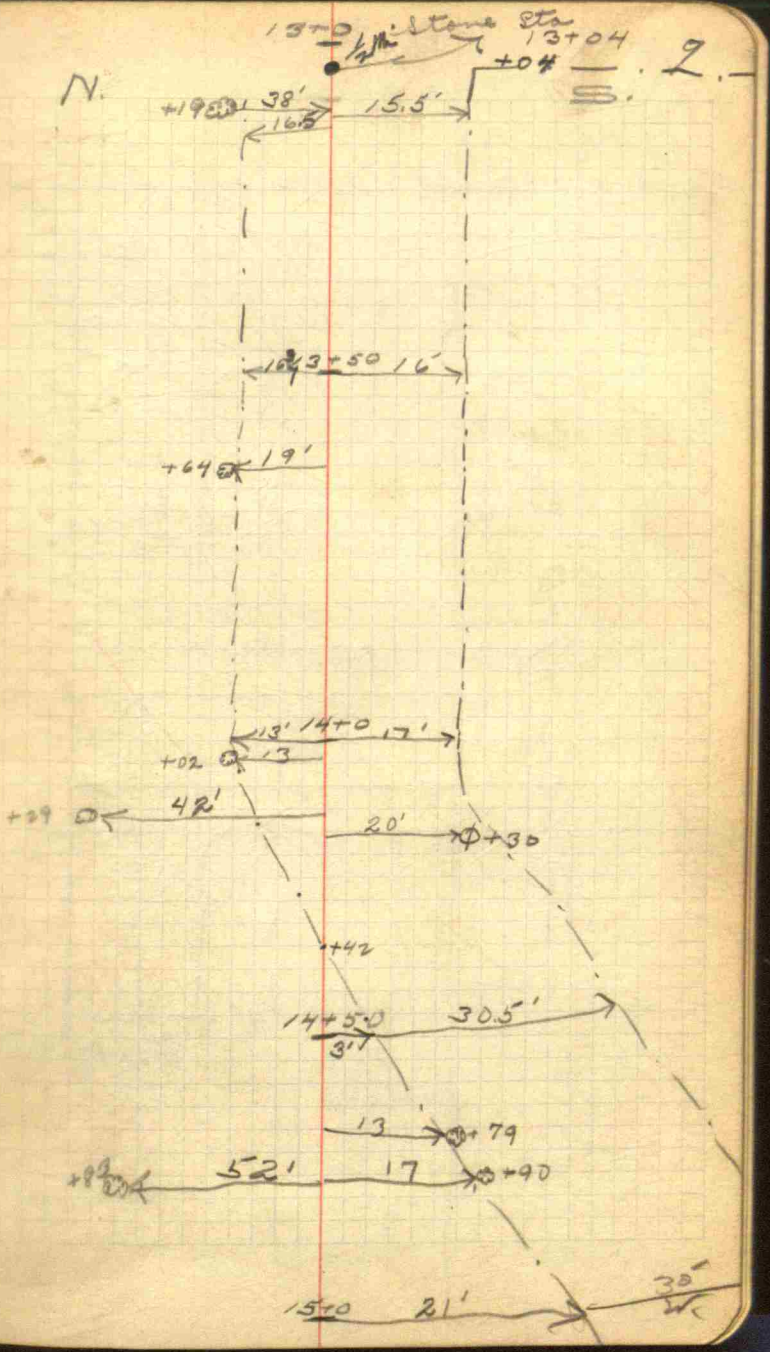
6

Witness for Cor. Stone
Oak
Elm.

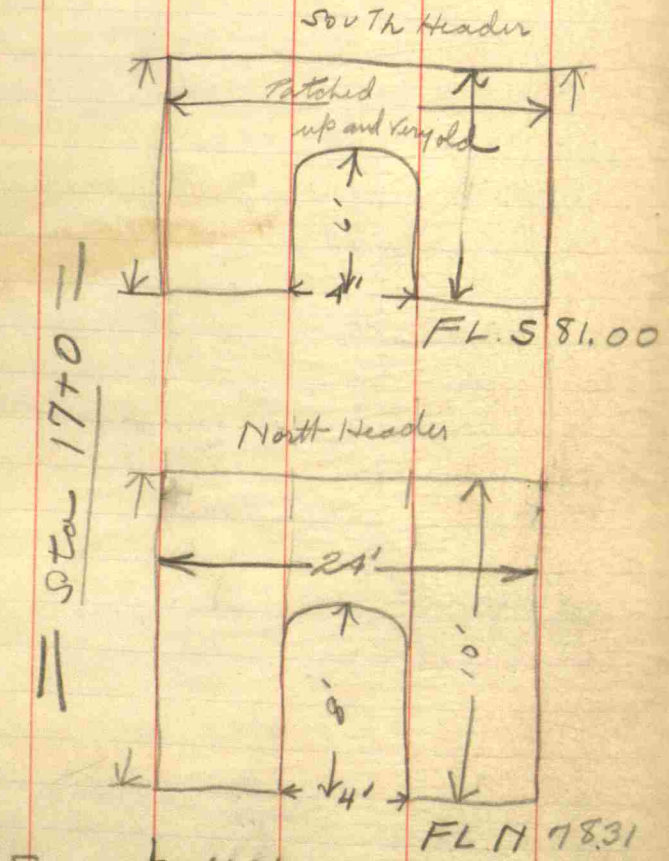
7

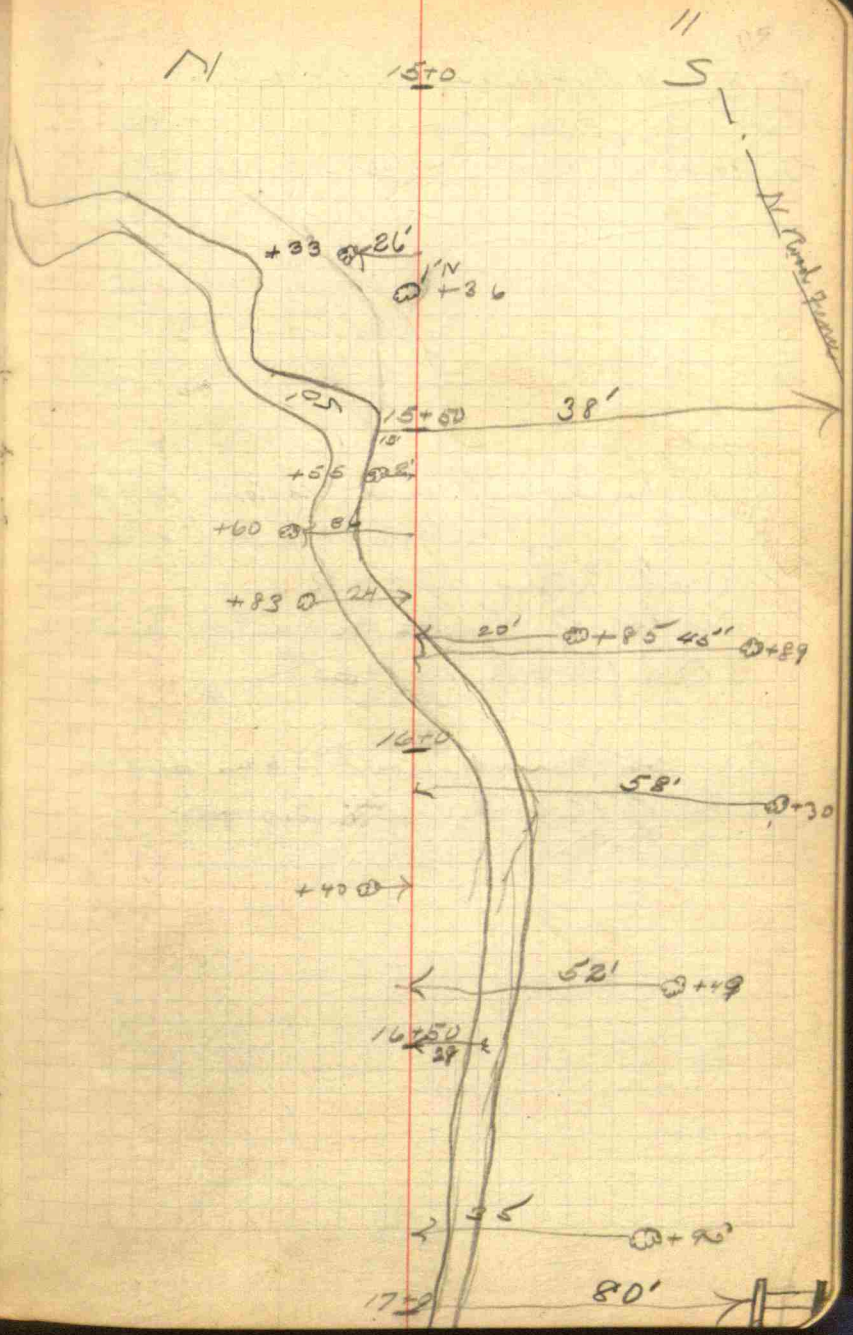


B from Sta 13+04
Def ∠ 0° 18' to Stone at
Sta. 26+07.



Sta 16+0 N. Road Fence South of ℄ is 58'
" 16+50 " " " " " ℄ is 65'
Sta 17+0 Distance of North Header from ℄ is 80'

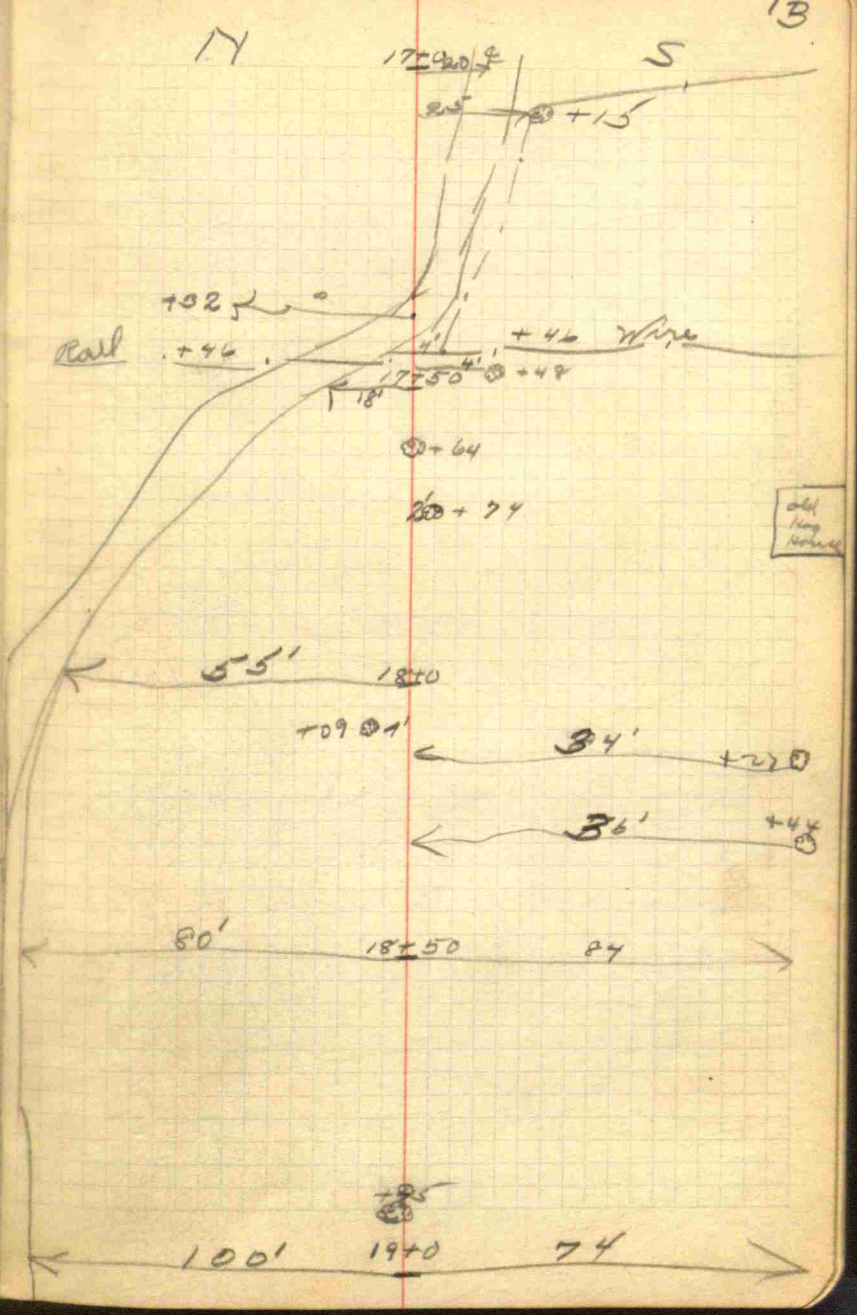




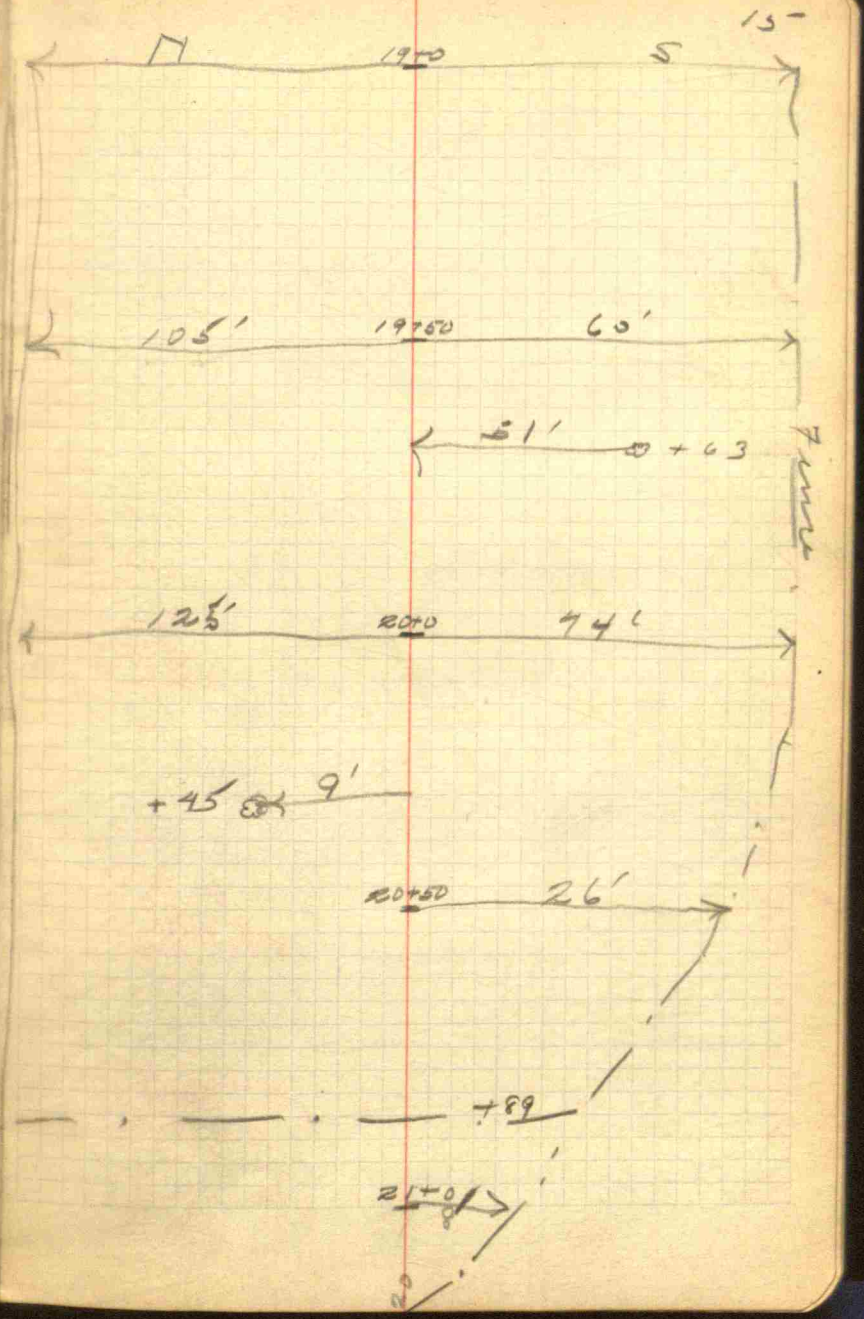
Sta 19+0 N. Road Fence South of the is 83'
Sta 19+50 " " " " " " " 84'
Sta 19+0 " " " " " " " 74'

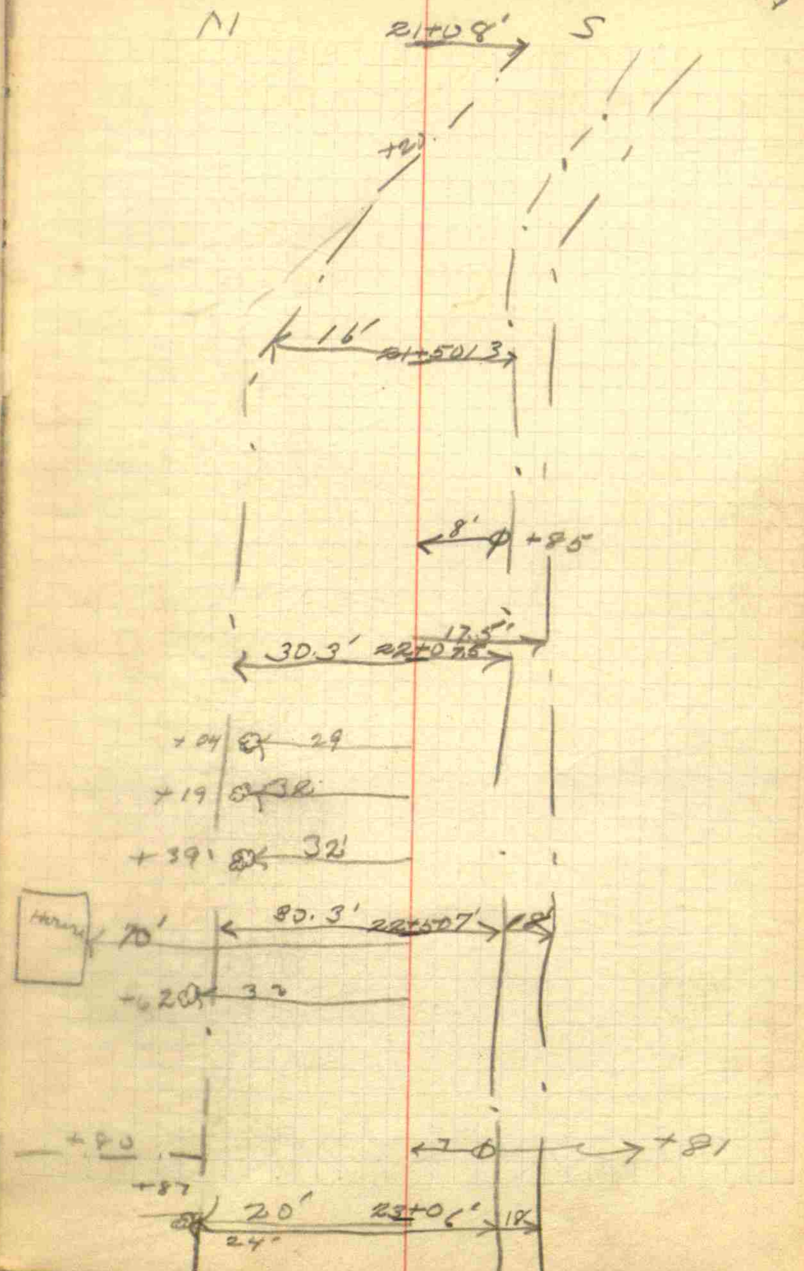
Fence goes South from Rd 18+36
Tree on South Side of old Road 19+25
Drive way on south side of old
Road Sta 19+60
center of House on South Side
of Old Road 19+65

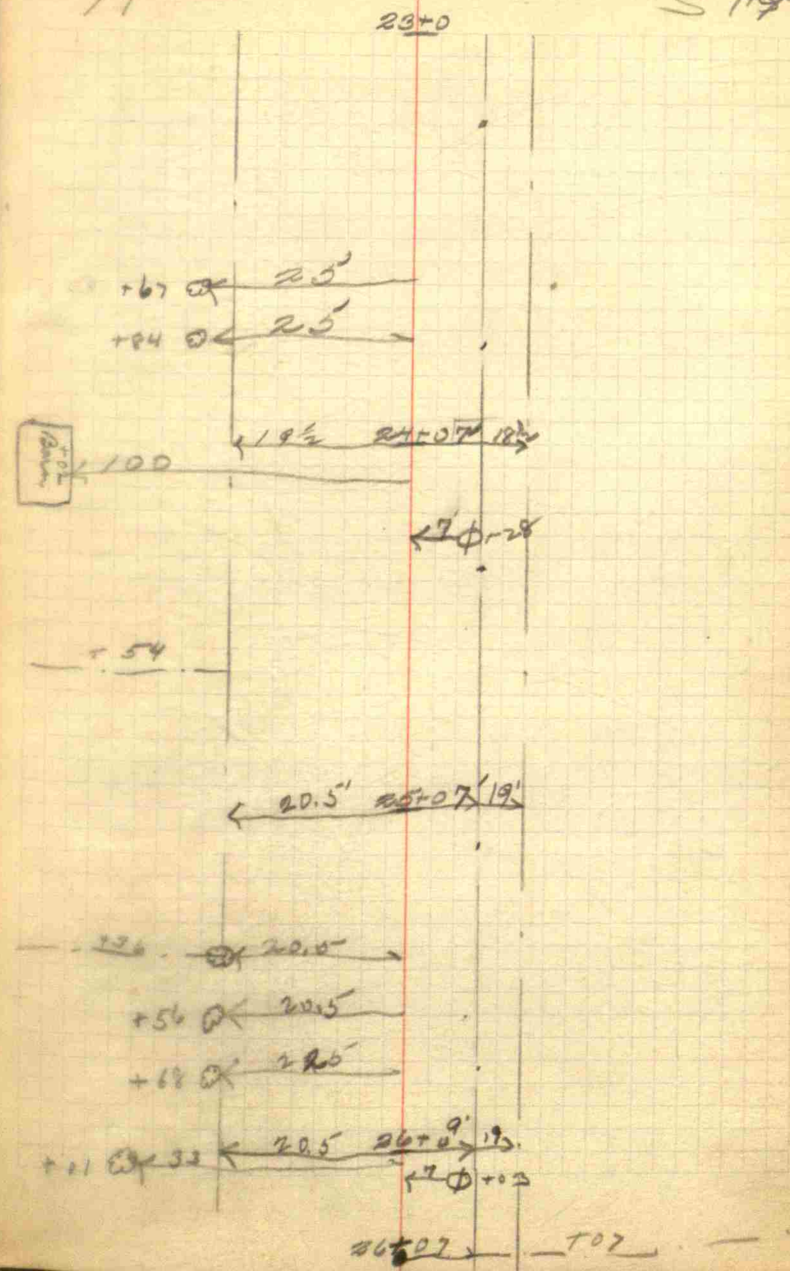
Fence runs South on South
Side of Road Sta 20+0



14

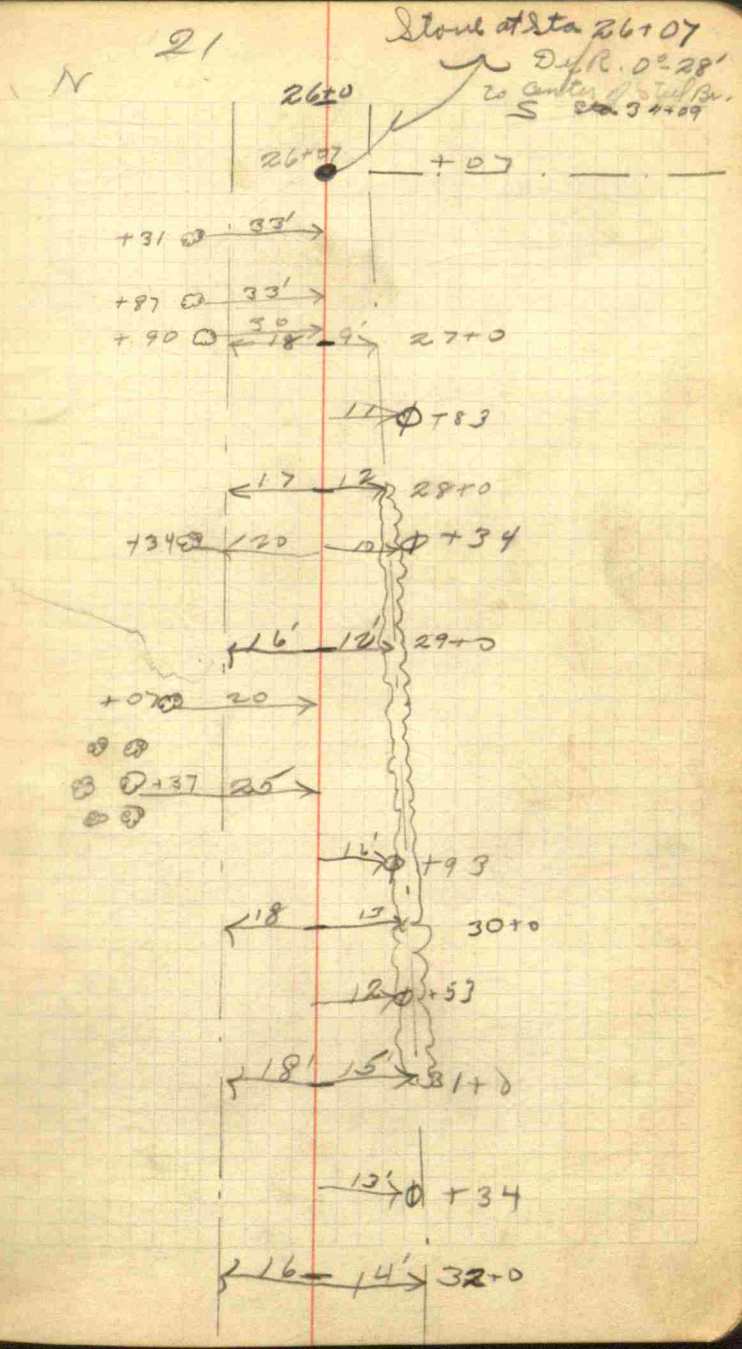



N
21+08'
S
+20'
16'
21+50 13
8'
+85
17.5'
30.3'
22+0
+04
29
+19
+39'
32'
70'
80.3'
22+50 7'
18'
+62
+80
+81
+87
20'
23+0 6'
18'
24'


23+0
+67
25'
+84
25'
19½
24+07
18½
100
7'
28
+54
20.5'
25+07
19'
+36
20.5
+56
20.5
+68
+21
33
20.5
26+09
19
+03
26+07
+07

20

21


Stone at Sta 26+07
Dir. R. 0°-28'
to center of Tul Br.
N
S
26+0
26+07
+07
+31
33'
+87
33'
+90
30°
18'
9'
27+0
17'
+83
17'
12'
28+0
+34
20'
10'
+34
16'
12'
29+0
+07
20'
+37
25'
16'
+93
18'
17'
30+0
12'
+53
18'
15'
31+0
13'
+34
16'
14'
32+0

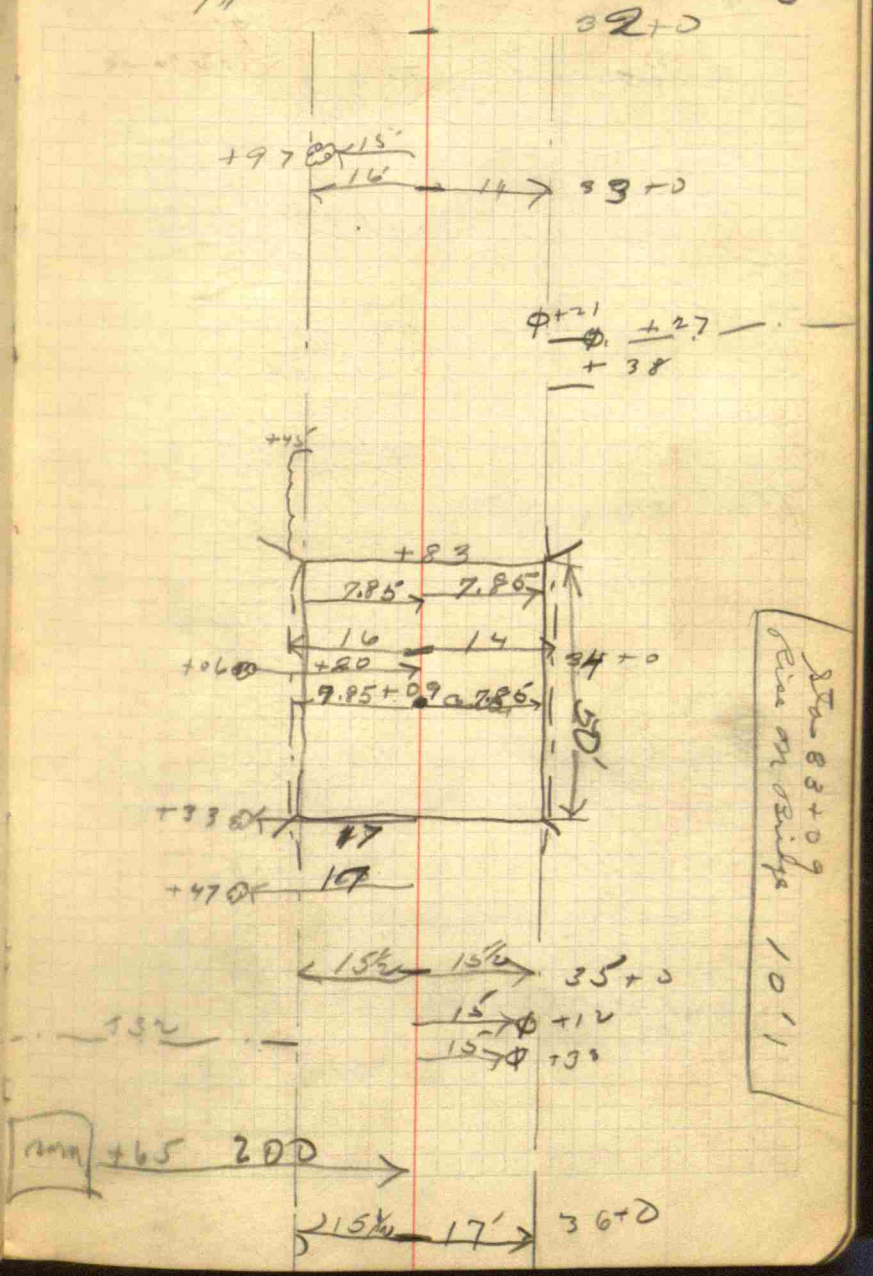
22

Def at Steel Bridge Sta 34+09
of 20°-53' to Steel Bridge
at Sta 41+08½

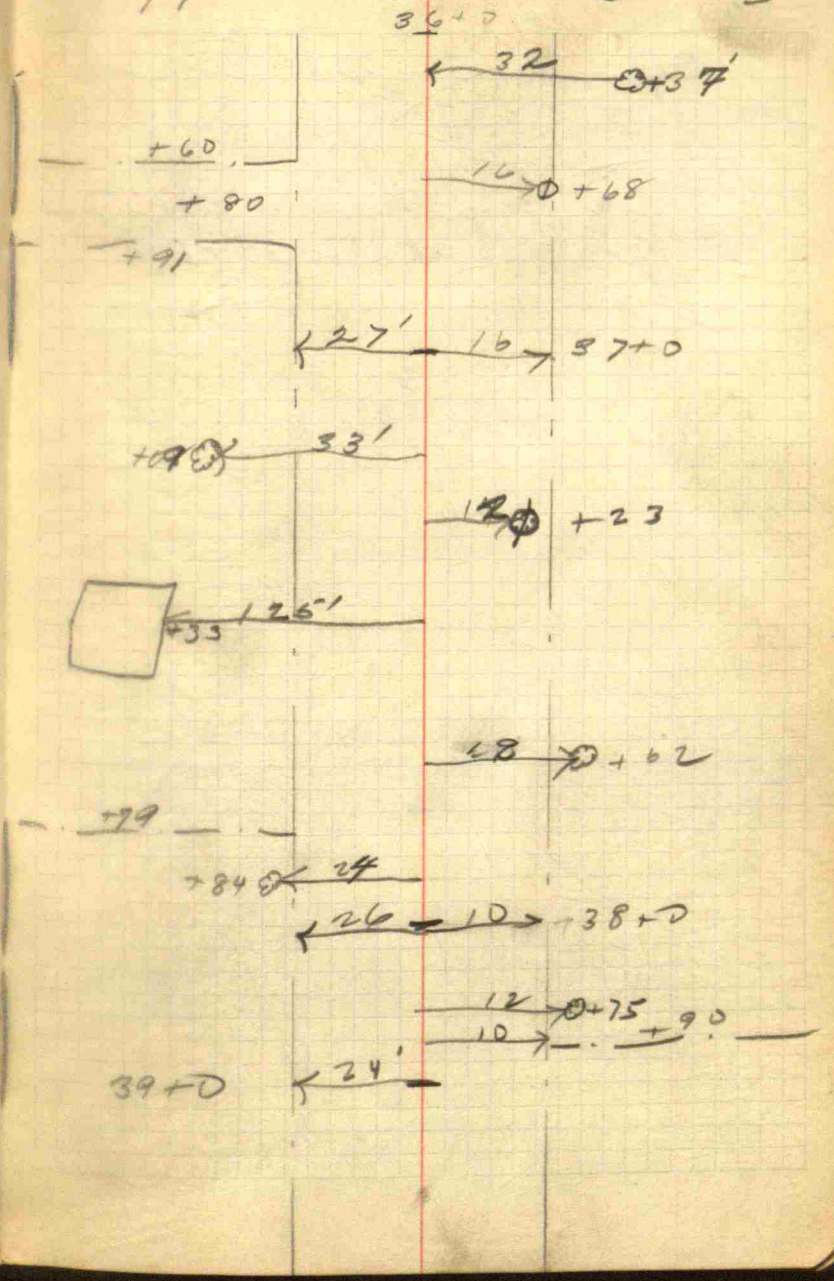
N

S

23

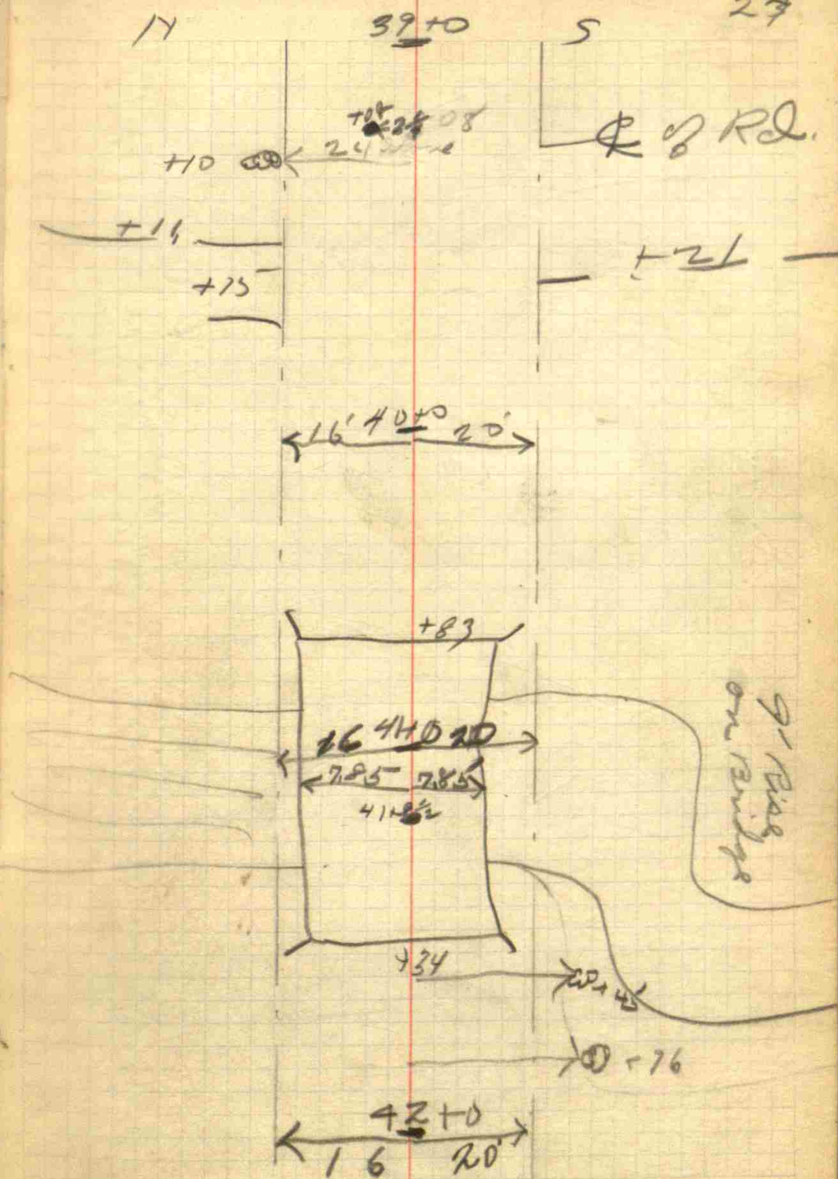


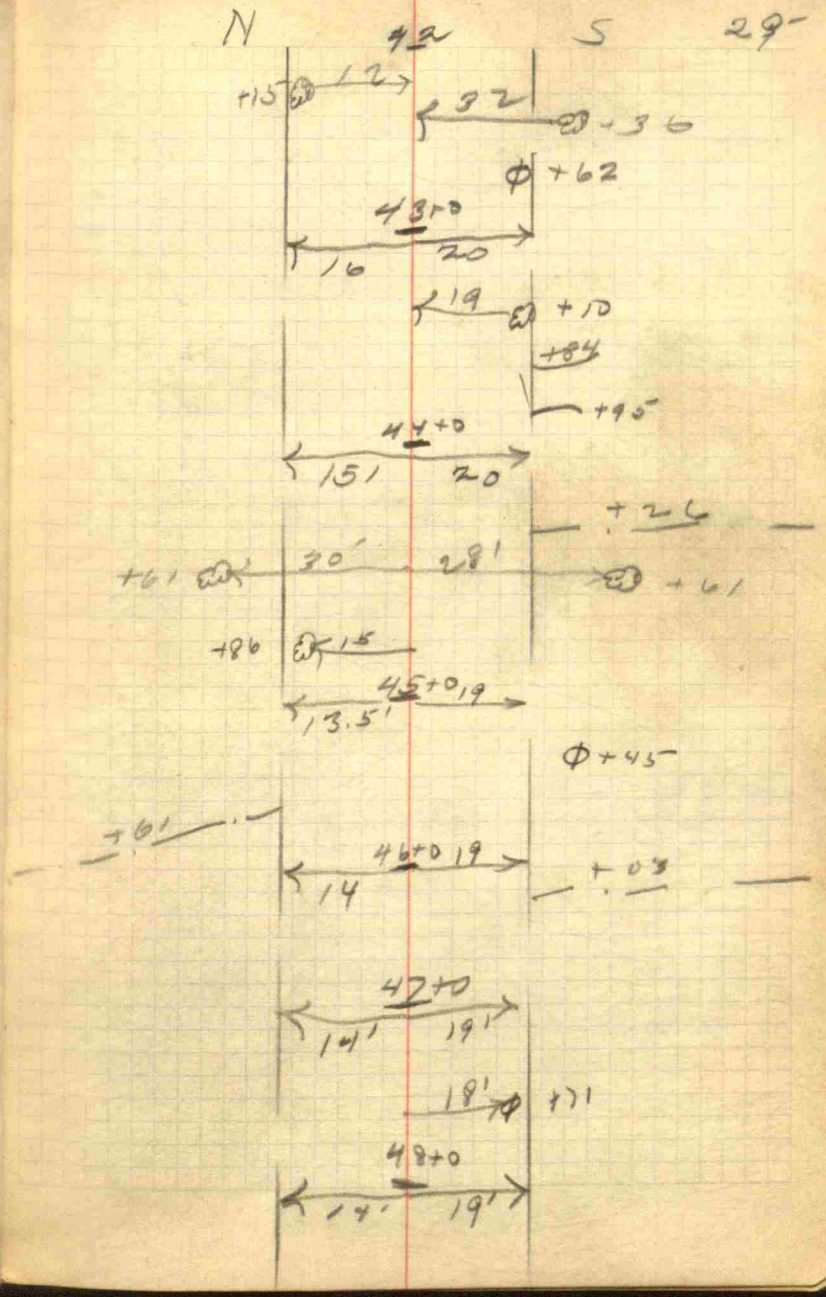
N 5 25

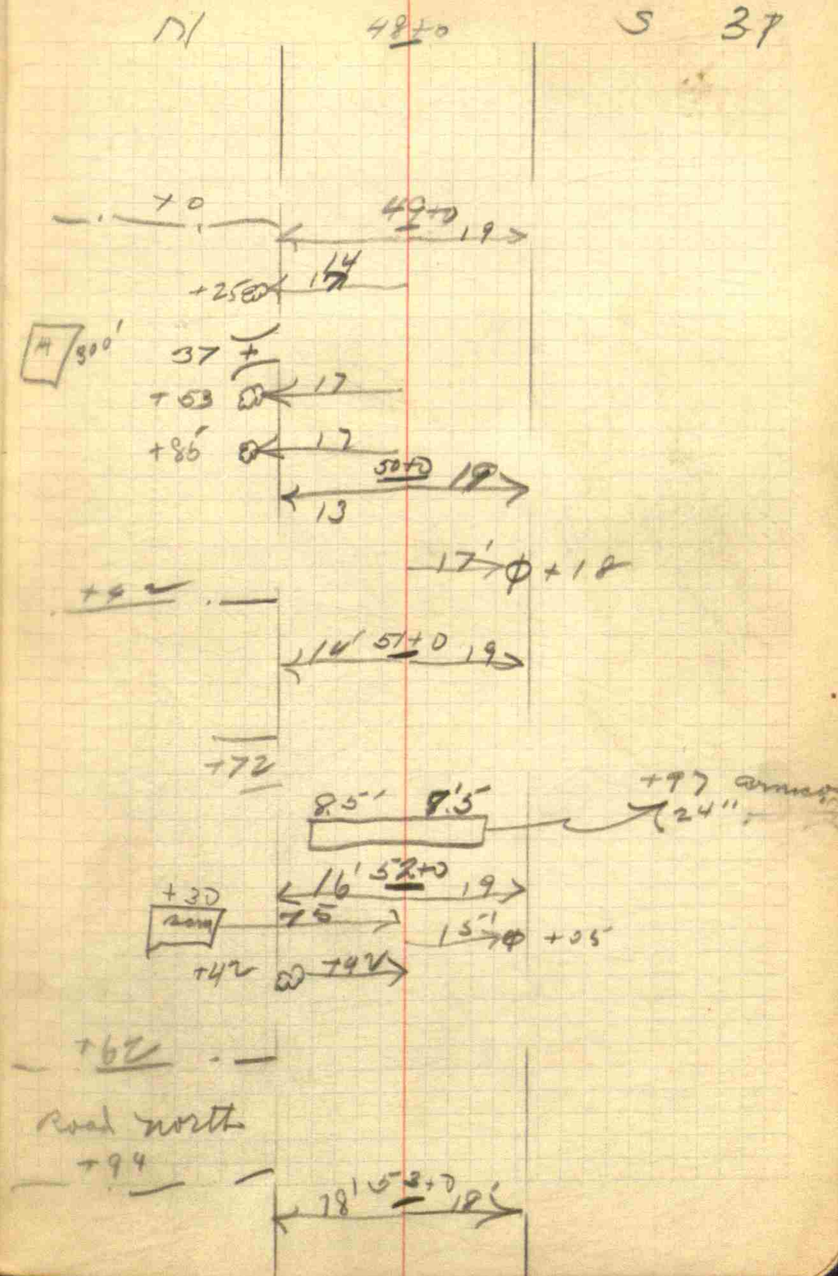

36+0
32
37
+60
+80
16
+68
+91
27'
16
37+0
33'
+23
+33
26'
28
+62
+79
+84
24
26
10
38+0
12
+75
10
+90
39+0
24'

26 Def. at Steel Bridge 41+08½
Def. L 0°-28' to Stone

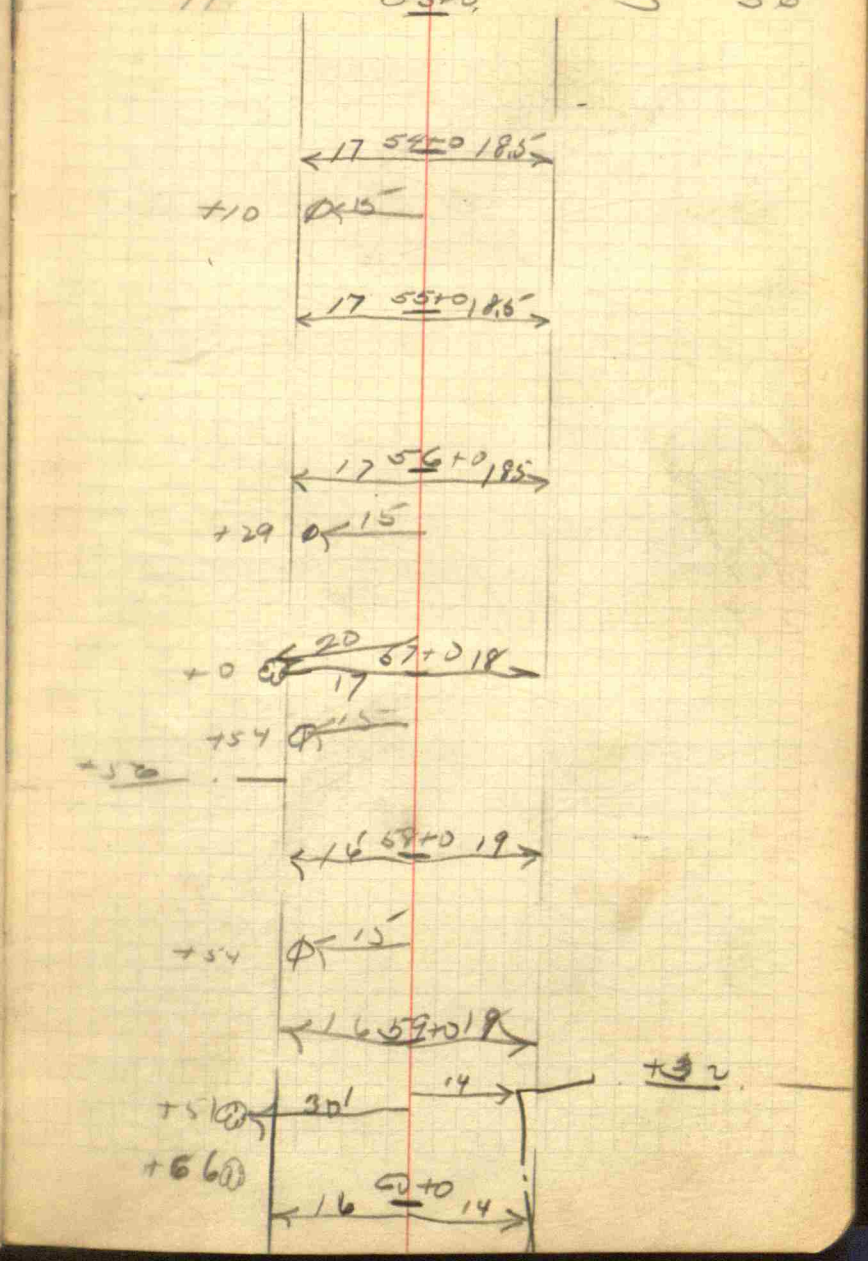
℄ of Project runs 2¼' South of Stone at Sta 39+08.

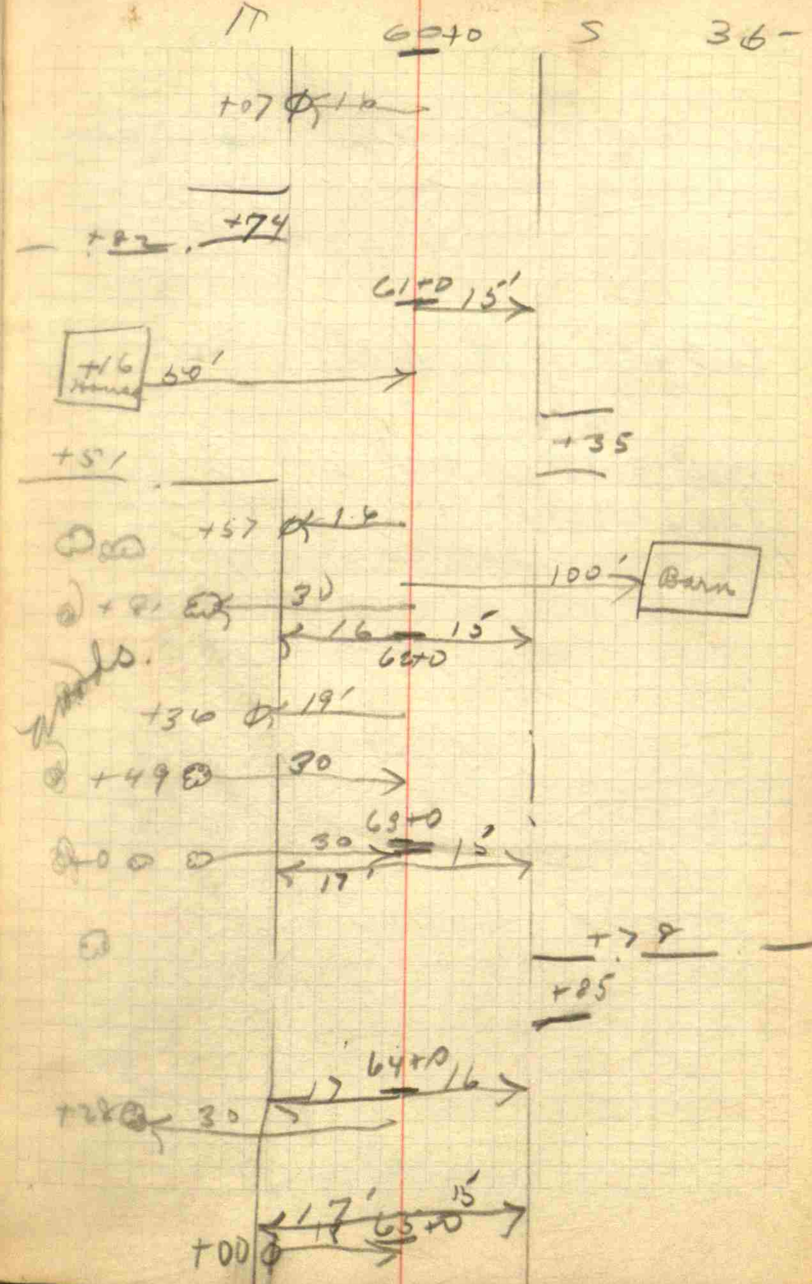



N
S
+15
12
32
36
+62
43+0
16
20
19
+10
+84
+90
44+0
151
20
+26
+61
30'
28'
+61
+86
15
45+0,19
13.5'
+45
+61
46+0 19
14
+03
42+0
141'
191'
18'
+71
48+0
17'
19'


N
48+0
S
49+0
19
+25
300'
17
+53
+86
50+0
13
+18
51+0
19
+72
8.5'
+97
24"
52+0
16'
+30
15'
+42
+62
Road north
+94
53+0
18'

82

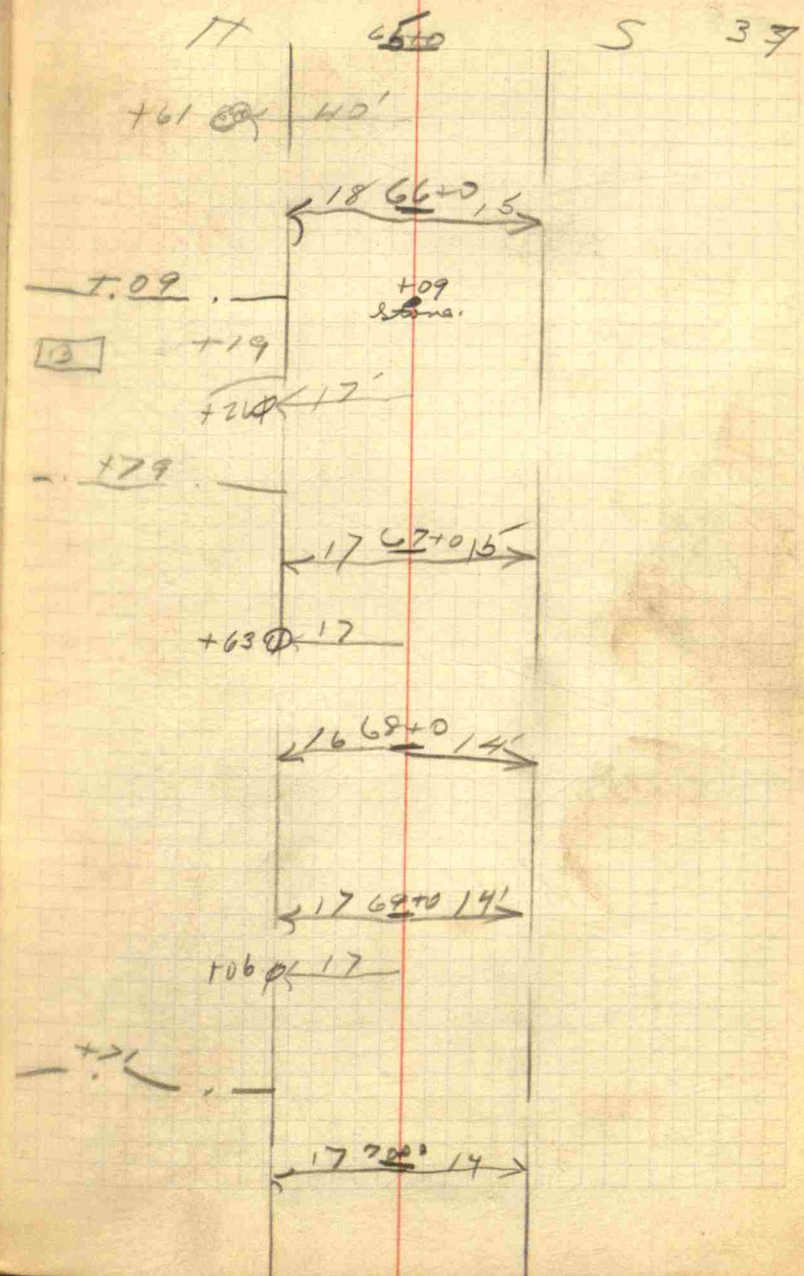

17
53+0
S 38
17 54+0 18.5'
+10
15'
17 55+0 18.5'
17 56+0 18.5'
+29
15'
+0
20
17
57+0 18'
+54
+58
16 58+0 19
+54
15'
16 59+0 19
+92
+51
30'
14
+66
16
60+0
14

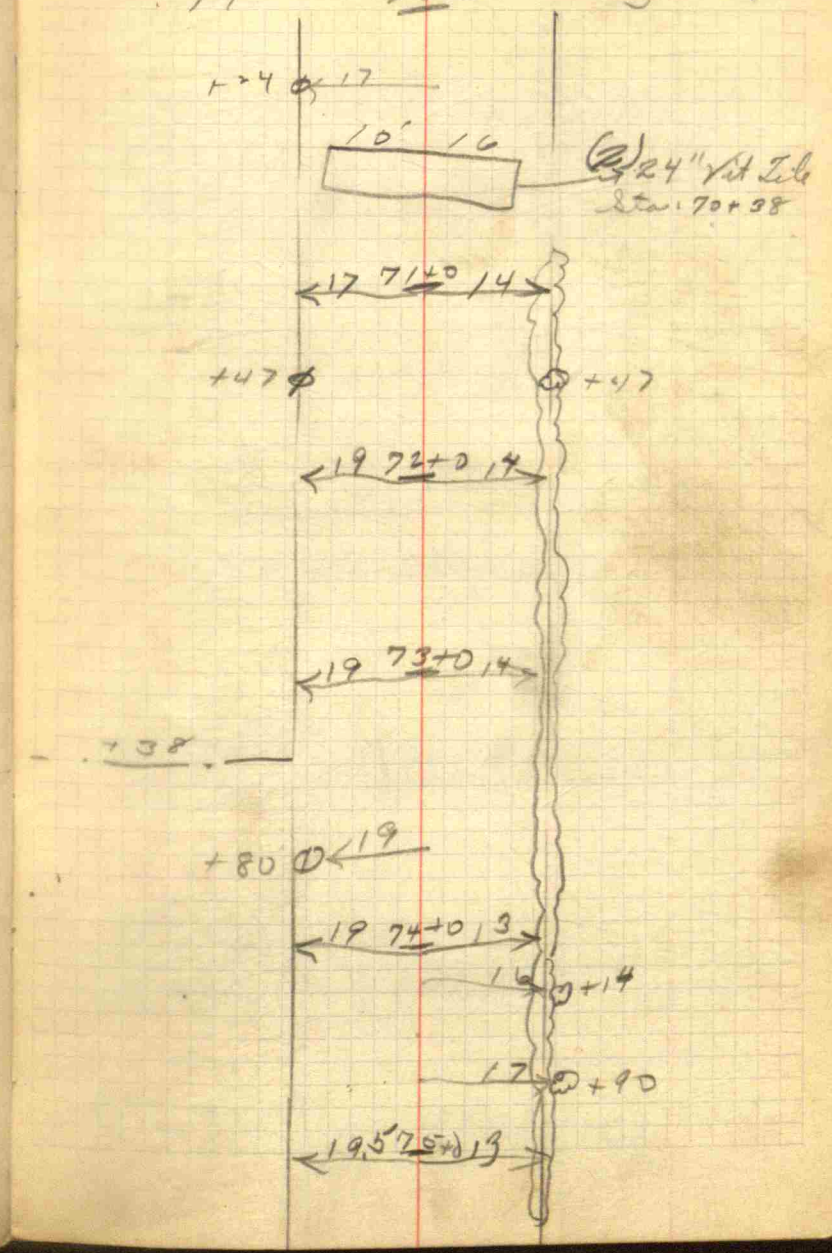


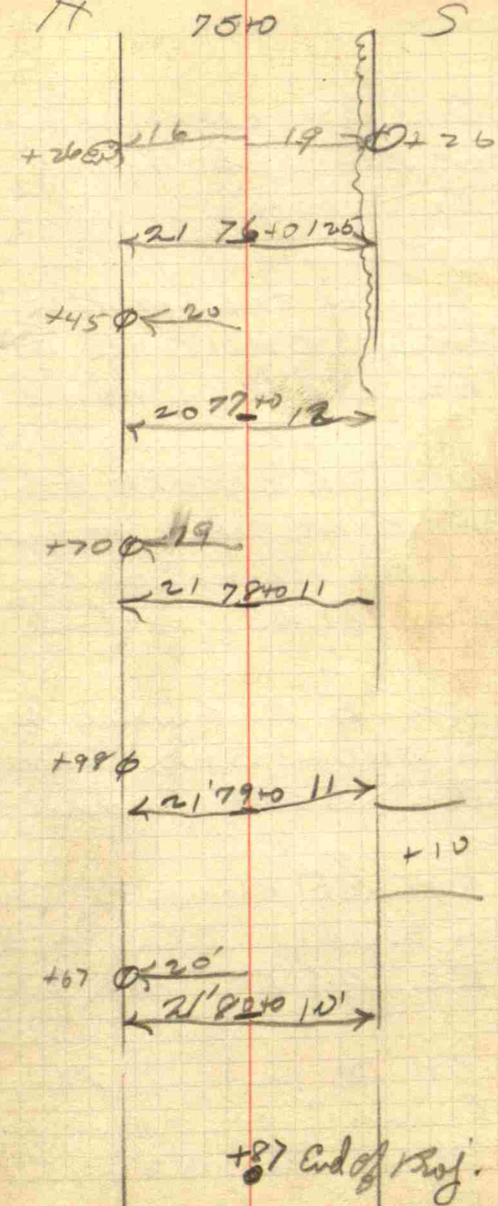
60+0
S
+07
+74
61+0
15'
+16 House
50'
+35
+51
+57
100'
Barn
30
16
62+0
+36
19'
+49
63+0
17'
+85
64+0
+28
65+0
+00

at Stone Sta 66+09
Def to center of Stanley Rd.
Def R. 0°12' and to
end of Linder Rd. proj.

Last page of this book:
66+09
Beech N43°E? 62'
Pear N60°W 71'




N
70+0
S
+74
17
10'
16
24" Vit Tile
Sta. 70+38
17 71+0 14
+47
+47
19 72+0 14
19 73+0 14
+38
+80
19
19 74+0 13
16
+14
17
+90
19.5 75+0 13



H
75+0
S
+26
16
19
+26
21 76+0 126
+45
20
20 77+0 12
+70
19
21 78+0 11
+98
21' 79+0 11
+10
+67
20'
21' 80+0 10'
+87 End of Proj.

BENCH MARKS

#1 ON SW CORNER OF W. END OF Hdwll. - STA. 0+07
EL. 100.00

#2 ON W END OF NORTH Hdwll. OF OLD Rd. STA 17+0
EL. 88.12. check ✓

#3 ON SE CORNER OF SIDE WALK AT FENCE at OSCAR TIMDER'S HOUSE - STA. 22+40
EL. 81.43 check ✓

#4 ON E MUDWALL 2' FROM S. END. STA. 33+80
EL. 50.68 check 50.71

#5 On SE corner of SW Wing of Bridge Sta 41+20
EL. 48.59 check 48.61

#6 On N. end of West headwall on road going N. at sta. 52+75
EL. 66.10 check 66.13

TURNING POINTS

⊙ 95.96
⊙ 88.63
⊙ 82.55
⊙ 77.66
⊙ 66.05
⊙ 55.07
⊙ 51.07
⊙ 53.55
⊙ 64.17
⊙ 70.67
⊙ 81.55

#7 On SW. corner of Concrete porch of House on N. side of Rd., Sta 61+20
EL. 92.05 check 92.03

○ 83.39

Q 75.00
○ 83.32

○ 94.69

#8 on head of Concrete post on N. side of Stanley Rd 150' W of Sta 80+87
EL. 98.64
check 98.60

#6-

Sta.	5' out	Stk 50'	E		20' E
	99.55				
	98.90	50'	S		
		FL. 2	7	5	
0+17		97.39	97.50	98.97	99.27
1+0	97.67	97.74	97.65	99.21	99.27
2+0	99.28	99.44	98.81	99.87	100.09
3+0	97.65	97.83	97.45	98.82	99.38
4+0	96.54	96.85	96.06	97.46	97.82
5+0	94.67	94.72	94.27	95.73	96.19
6+0	93.72	93.96	92.94	94.27	94.66
7+0	91.91	92.27	91.24	92.52	92.95
8+0	90.51	90.50	89.98	91.05	91.25
9+0	87.52	87.37	88.31	90.20	90.54
9+55	86.30	FL. 6 86.26	Tan. 6 88.09	89.84	90.00
10+0	90.15	90.04	89.14	90.38	90.37
11+0	92.50	92.47	91.03	91.86	92.00
12+0	91.39	91.35	89.55	90.45	90.52
13+0	89.50	89.45	88.25	89.33	89.60
13+50	88.94	88.73	88.03	88.76	89.14

		40' Stk	N. 5' out
98.96	97.74	FL. 34 97.35	
98.25	98.15	98.91	98.71
99.61	98.59	100.30	99.91
98.85	97.87	99.83	99.50
97.45	96.04	98.00	97.61
95.65	94.56	96.56	96.17
94.40	93.07	94.71	94.33
92.55	91.83	93.00	93.10
91.00	90.41	91.20	91.23
90.37	89.00	89.11	89.20
89.44	Tan. 31 87.71	Fl. 31 86.54	85.95
90.16	89.06	89.08	88.84
91.69	90.77	92.34	92.30
90.33	89.24	88.87	88.73
89.36	87.66	87.47	87.18
88.93	87.52	87.03	85.07

⊙ 94.75

⊙ 90.43

84.89

48			5		
	5.5	sth.	7 n.	8	20'
14+0	89.14	88.92	88.05	88.42	88.80
	7-S	sth.	9 n	12	20
14+50	87.81	88.41	88.24	87.11	86.86
	E-15'S	25th	n 20'	40	54
15+0	88.62	86.89	85.60	84.10	82.12
	37-S	33.5	sth	20'n	28
15+50	89.39	88.77	82.83	80.00	73.78
	E 25.5	sth.	n. 20	40'	60'
15+25	88.75	86.80	85.60	72.65	74.22
	89.53 65S	35S	sth	15 n	ch. 20 n
15+75	88.82-50S	80.89	75.18	71.20	66.30
	90.17-60S	14-S	sth	5 n	ch. 20' n
16+0	90.93-50S	75.25	70.40	66.30	66.76
	15.5	ch. 10'S	sth	18 n.	20 n.
16+50	69.44	65.06	66.23	69.15	71.16
	E-75.5	68.5	40'S	32.5	
	89.18	88.76	74.66	72.00	
✓17+0	E-80S	70S	60'S	45'-S	15S
	88.30	87.95	74.85	80.55	70.69
✓17+50	E-80S	21S	5.S	sth	20' n
	88.36	85.00	80.86	78.95	70.95
✓17+75			E 75S	42'S	sth
			88.85	87.30	84.20
✓18+0	E 85'S	24S	sth		20' n
	88.52	85.60	82.62		79.85
✓18+50	E-95S	74'S	56S	sth	20 n.
	87.61	86.55	80.90	74.00	73.40
✓19+0	E 72'S	58S	45S	sth	20 n
	87.21	85.72	79.63	73.85	70.61

⊙71.56		7	49		⊙83.42
					⊙73.73
27	40	53	65		⊙72.16
87.59	86.30	84.30	81.15		⊙82.44
45	61	75			
86.03	81.04	76.00			
68	82				
79.35	70.65				
40	77	87	102	110	
71.05	71.07	74.45	74.25	67.51	– channell
97	110				
74.43	67.93				
ch. 29	45	62	ch. – 64	ch. 94	98.
65.70	71.14	71.77	65.95	66.00	71.86
21' n	40	100			
68.72	70.55	71.57			
n. 40'	50	60	70		
71.93	71.85	71.95	72.00		
ch. sth	15 n.	20' n.	40' n	60'	80' n.
64.95	66.58	67.65	70.55	69.63	70.00
28' n	ch. – 33 n	ch. 46' n	51 n	80 n	
68.27	63.65	64.60	68.95	68.67	
20' n	35' n	42 n	45 n	80'	
82.74	63.70	64.15	68.31	68.60	
40 n.	52 n.	70 n.	90' n	93 n.	100 n
76.63	73.25	65.50	63.47	68.05	68.77
	58 n	64 n.	84 n	94 n	104 n / 109 n.
	72.25	67.75	67.07	63.70	63.85 / 67.65 Level
40 n	75 n	108	185	135 n	140' n
68.85	65.35	66.94	62.80	64.00	67.48 Level

50

	E-56'S	53'S	26'S	2th	20'N
19+50	85.38	82.95	75.10	72.94	68.92
	E 37'	21' S	19-S'	4'-S	20.N.
20+0	84.60	82.14	82.40	74.60	69.78
		E 22'S	7'S	2th	20.N
20+50		83.95	82.74	80.25	72.15
		15'S	E 3'S	5th	20'N.
21+0		83.50	83.20	83.45	77.00
		5'	5th	E-Ad 10'	20'N
21+38		83.00	82.85	83.18	82.55
	5'S	5th	10N.	20N.	26
21+50	83.50	83.37	82.25	83.06	81.82
	5'S	5th	16.N	20N	25N
22+0	82.77	82.68	81.70	82.25	82.61
	5'S	5th	16N	20N.	28N
22+50	82.22	82.20	81.35	82.00	82.28
	5'S	5th	14N	20N.	28
23+0	81.63	81.55	80.93	81.53	81.68

5

51

40'N	77 N	88 N	105	115
67.63	67.63	64.65	65.75	63.20
40'N	86N.	94' N	115N	
68.30	67.70	65.67	65.45	
40N.	60N.	115N	118N	
66.33	65.38	65.00	61.97	
40N	60N.	80'N.		
69.89	67.50	66.80		
34'N	52N			
81.05	76.00			
28	40	50		
83.00	82.08	79.90		
36'	43'			
82.05	82.33			
38	50'			
8147	8143			
37	45N			
81.23	81.05			

~~81.78~~ 40

⊙67.13

⊙74.54

⊙82.84

Sta	5's	Stks	16 n.	20 n.	26 n.
24+0	80.72	80.62	79.74	79.90	80.28
25+0	78.56	78.64	16 n. 78.03	20 n. 78.46	26 n. 78.83
26+0	76.15	76.00	16 n. 76.26	20 n. 77.00	26 n. 77.08
27+0	74.10	74.23	15 n. 73.60	20 n. 74.26	25 n. 74.58
28+0	71.02	71.41	14 n. 70.12	18 n. 71.02	20 n. 71.23
29+0	67.87	68.10	15 n. 62.87	19 n. 63.97	20 64.00
30+0	64.04	63.03	15 n. 56.62	18 n. 57.12	20 n. 56.95
31+0	51.44	51.78	9 n. 52.47	16 53.67	20 n. 53.61
32+0	50.60	50.80	10 n. 51.12	17 51.82	20 n. 52.20
33+0	50.05	50.31	9 n. 49.90	12 n. 50.45	20 51.02
33+	Bridge floor			50.68	
			FL. 9'	Sta 8'	E
34+0			40.68	50.68	50.68
35+0	46.00	46.84	6' 48.42	14 51.77	20 51.90
36+0	59.90	59.92	6 60.00	14 54.63	17 55.08
36+50	65.44	65.60	5 65.24	14	20 56.45
37+0	63.75	63.60	7 63.28	16 56.69	19 57.00
38+0	57.17	57.05	11 56.65	15 54.31	20 54.59
39+0	49.40	49.70	11 50.50	15 50.91	20 51.15
39+	℄ of Rd South 50' — 47.95				
40+0	47.71	48.00	3 47.66	6 48.00	13 49.49
41+0	Bridge		FL. 9' 40.00	8' 49.51	E 49.49

33	36	40'	45' n.
80.04	79.37	79.78	79.72
32 78.44	38 77.55	40 78.33	45 n. 77.97
32 n. 76.89	36 76.11	40' 77.20	45 77.25
32 n. 74.44	35 73.74	40 74.74	45 74.75
20 n. 70.90	33 70.19	40 71.28	45 n. 71.67
28 n. 63.94	32 n. 62.36	40 n. 65.84	48' 67.85
29 56.82	33 56.26	37 56.65	40 n. 55.47
31 n. 53.86	33 53.20	40 52.03	45 51.95
31 51.91	33 51.84	40 51.42	45 51.30
29 n. 50.35	35 50.05	40 49.60	45 n. 49.05
8 50.68	FL. 9' 40.68		
29 51.83	35 49.58	40 49.84	45 n. 50.31
20 55.00	30 55.09	33 54.80	40 57.77 | 45 58.64
33 56.40	35	40 57.72	50 60.10
20 57.01	34 57.41	40 59.41	42 63.40 | 50 63.58
32 54.42	34 53.96	40 57.51	45 57.83
33 50.08	37 49.45	40 49.81	45 49.62
20 50.04	30 49.60	32 48.02	40 48.01 — 45 47.80
51 49.51	FL. 9' 40.00		

⊙ 76.80

⊙ 66.71

⊙ 57.93

⊙ 51.75

45 55.35

⊙ 51.27

⊙ 61.16

⊙ 68.37

⊙ 76.92

⊙ 53.35

⊙ 58.01

S. J-4

Sta	5' out	5th			
	3' out	1' rt.	9'	14	20
41+40	45.70	45.40	46.51	49.41	49.56
42+0	46.78	46.85	46.55	47.96	48.18
43+0	46.22	46.44	46.93	47.59	48.25
44+00	48.75	49.00	49.05	49.80	50.05
45+0	12 out 63.00	7 out 62.75	5th 59.08	57.00	54.10
46+0	60.90	61.10	61.37	60.18	60.49
47+0	62.52	62.74	63.00	63.40	63.79
48+0	64.55	64.69	64.46	64.60	65.05
49+0	64.65	64.78	64.61	65.15	65.74
50+0	65.65	65.96	65.39	65.71	65.80
51+0	64.50	64.70	64.45	64.97	65.50
51+97	20 62.80	15 62.19	6 FL. 63.17	7.5 Top 64.96	63.39
52+0	64.05	63.95	63.70	65.35	65.47
52+75	50' rt. on Rd			66.23	
53+0	66.33	66.64	65.82	66.46	67.00
54+0	68.11	68.52	67.87	68.22	68.61
55+0	70.73	70.90	69.80	70.53	70.53
56+0	72.95	73.26	72.31	73.12	73.37
57+0	76.03	76.01	74.84	75.54	76.05
58+0	78.67	78.75	77.77	78.47	79.15
59+0	81.91	81.83	81.20	81.48	82.16
60+0	84.94	85.09	84.18	84.55	85.36

M 5-3-42

25'	30'	37	40.	
49.35	47.50	41.60	40.50	Level
27 48.18	37 44.43	40 44.40	45 43.90	⊙ 50.92
27 48.16	31 47.30	40 48.00	45 47.40	⊙ 58.78
27 49.80	30 48.80	40 49.71	48.82	
11 54.32	20 54.90	25 54.53	28 53.50 / 34 59.30	40 61.15 / 49 63.89 - Level
20 60.61	24 60.07	30 59.75	40 62.15 -	45 62.19
34 63.32	29 62.64	40 64.29	45 64.34	⊙ 65.84
27 64.56	30 64.18	40 65.07	45 65.14	
28 65.40	30 64.81	40 65.75	45 65.33	⊙ 70.70
27 65.60	29 65.18	40 66.00	45 65.85	
27 65.00	30 64.78	40 64.97	45 64.83	⊙ 79.23
8½' Top 64.85	9' FL. 63.12	16 63.55		
28 65.38	33 64.54	40 64.70	45 63.95	
28 66.36	32 66.03	40 66.20	45 66.01	
28 68.32	32 67.60	10 67.95	67.60	
28 70.42	32 69.56	40 69.40	45 69.25	
27 73.19	32 72.20	40 72.50	45 72.44	
28 75.74	32 74.58	40 76.01	45 76.12	
28 78.76	31 78.26	40 79.00	79.15	
27 82.00	30 81.23	40 81.95	45 82.00	
28 84.91	32 84.28	40 85.55	45 85.51	

5b.

Sta	5' ant	7th
61+0	89.17	89.52
62+0	89.06	89.20
63+0	86.87	87.04
64+0	83.25	83.40
65+0	80.56	80.82
66+0	78.70	79.15
67+0	77.11	77.30
68+0	75.57	75.79
69+0	74.74	74.85
70+0	72.74	72.91
70+38	70.13	70.75
71+0	72.57	72.78
72+0	73.50	73.65
73+0	74.05	74.15
74+0	75.10	75.11
75+0	76.82	76.53
76+0	79.27	79.31
77+0	82.00	81.98
78+0	85.00	84.92
79+0	88.41	88.40
80+0	91.71	91.61
80+87	96.06	96.16
50' W. - E		
140' W - E		
200' W - E		

S

88.37	88.80	89.00	
88.53	89.33	89.93	
86.17	86.81	87.18	
82.90	83.50	83.87	
80.38	81.36	81.74	
78.88	80.14	80.22	
76.81	77.95	78.23	
75.45	76.34	76.60	
74.40	75.50	75.74	
73.66	75.00	75.50	
Tot. 10	81	E	
72.90	74.33	74.95	
72.95	74.62	75.10	
74.18	75.34	75.40	
74.47	75.75	75.94	
75.74	76.82	77.00	
77.38	78.24	78.34	
79.51	80.47	80.41	
82.05	82.54	82.63	
84.54	85.21	85.43	
87.67	88.28	88.44	
91.12	91.61	91.78	
94.06	94.28	94.40	
95.86			
96.84			
95.66			

7

88.82	88.64	89.77	89.84
89.43	88.73	89.21	89.10
86.80	86.35	87.00	87.26
83.47	82.77	83.35	83.27
81.53	80.34	81.52	81.65
80.07	79.20	80.28	80.31
77.94	76.93	78.31	78.51
76.71	75.77	76.10	76.22
75.87	74.71	75.43	Level
74.98	72.10	73.30	73.40
74.60	Tot. 9	Fl. 9½	70.90
74.95	73.30	71.65	74.00
75.37	73.98	74.00	74.27
75.91	75.06	74.35	74.78
77.13	75.99	74.84	76.35
78.46	77.47	76.27	78.27
80.45	79.30	77.95	80.52
82.70	81.86	80.50	83.71
85.25	84.21	83.54	86.03
88.37	87.28	86.17	88.77
91.55	91.00	89.92	92.20
94.35	94.02	92.52	95.16
		96.00	

5-7.

⊙ 88.15

⊙ 83.54

⊙ 80.01

⊙ 75.75

⊙ 75.45

⊙ 80.09

⊙ 84.84

⊙ 91.36

60

S

	3'S				
15+70	66.60		6777	7019	6983
15+80		6971	6658	7174	7216
16+0	6659	6671	7185		7210
16+50			7124		7160
17+0			7029		6773
16+75			7355		7203
17+50			6765		6841
18+0			6347	6801	6757
18+20			6397		6347

E

7211
7250
7196
7103
7076
7095
7031
6915
6347 6801 6860

61

⊙ 77.88

ESTIMATE — TIMBER ROAD,

11,896	Cu. Yds. Exc.	@ 40¢	4,758.40 ✓
72' x 24"	R.C. Pipe	@ 3.50	252.00 ✓
30' x 18"	R.C. Pipe	@ 2.50	75.00 ✓
160' x 12"	C.M. Pipe	@ 1.50	240.00 ✓
26' x 15"	Pipe - Relaid	@ .30	7.80 ✓
600	Cu. Yds. Special Exc.	@ 40¢	240.00 ✓
163	Cu. Yds. Concr.	@ 14.00	2282.00 ✓
6767	Lbs. Steel	@ .05	338.35
2750	Tons (4½" x 2¾") Stone	@ 2.50	6875— ✓
728	Tons (¾" To Dust) "	@ 2.50	1820— ✓
1698	Tons (4" x 2½") "	@ 2.50	4245— ✓
222	Tons (1" x ½") "	@ 2.50	555—
222	Tons (¾" x ½") "	@ 2.50	555—
35,942	Gals. Tar	@ .14	5031.88

Total — $27,275.43

Bonds 28600.00

Sta	No. side 5th El.	Cut sheet New Gd. Sub.Gd.El.	Cut	Fill
0+0	99.71	98.50	1'-3½"	
1+0	99.52	98.66	0'-10"	
2+0	100.72	98.82	1'-11"	
3+0	100.36	98.77	1'-7"	
4+0	98.37	97.48	0'-10¾"	
5+0	96.95	95.98	1'-0"	
6+0	95.24	94.48	0'-9"	
7+0	94.05	92.98	1'-1"	
8+0	91.96	91.48	0'-6"	
9+0	89.85	90.09		0'-2"
10+0	89.56	89.58	GRADE	
11+0	93.24	89.18	4'-1"	
12+0	89.81	88.78	1'-0½"	
13+0	88.20	87.62	0'-7"	
13+50	87.53	86.48	1'-0½"	
14+0	86.92	84.95	2'-0"	
14+50	86.45	83.24	3'-2½"	
⊙ 15+0	84.44	81.52	2'-11"	
⊙ 15+25	76.79	80.66		3'-10½"
15+50	69.41	79.81		10'-5"
15+75	72.32	78.95		6'-8"
16+0	71.76	78.09		6'-4"
16+50	72.49	76.37		3'-10½"
17+0	70.54	74.66		4'-1½"
17+50	70.10	73.32		3'-3"

99.50

⊙ 92.45

Sta	N side Sth EL	New Gd Sub Gd EL @ ℄	CUT	FILL
17+75	73.11	72.76	0'-4"	
18+0	74.12	72.73	1'-4½"	
18+50	73.55	72.89	0'-8"	
19+0	72.13	73.81		1'-8½"
~~19+50~~				
20+0	68.75	76.39		7'-8"
20+50	66.00	77.68		11'-8½"
21+0	70.75	78.97		8'-3"
21+50	81.60	80.01	1'-7"	
22+0	83.00	80.53	2'-6"	
22+50	81.90	80.55	1'-4"	
23+0	81.69	80.05	1'-8"	
24+0	80.33	78.55	1'-9"	
25+0	78.60	77.05	1'-7"	
26+0	77.44	75.41	2'-0½"	
27+0	75.38	72.74	2'-8"	
28+0	72.20	69.09	3'-1½"	
29+0	66.89	65.30	1'-7"	
⊙ 30+00	55.33	61.51		6'-2"
31+0	52.62	57.72		5'-1¼"
32+0	51.92	54.10		2'-2"
33+0	49.48	51.67		2'-2½"
35+0	50.45	52.04		1'-7"
36+0	59.40	55.01	4'-5"	
36+50	59.94	56.10	3'-10"	

~~⊙ 75.76~~
~~⊙ 76.40~~
⊙ 66.30

50.75

56.70

70 Sta	No side Stk EL.	New Gd Sub Gd. EL @ ℄	Cut.	Fill
37+0	64.36	56.36	8'-0"	
38+0	58.56	54.48	4'-1"	
39+0	50.24	51.56		1'-4"
40+0	48.61	49.82		1'-2½"
43+0	48.12	52.06		3'-11"
44+0	49.83	53.81		4'-0"
45+0	64.07	55.56	8'-6"	
46+0	62.70	57.68	5'-0"	
47+0	64.88	60.18	4'-8½"	
48+0	65.57	62.68	2'-11"	
49+00	65.77	64.54	1'-3"	
50+0	66.58	65.12	1'-5½"	
51+0	65.48	65.06	0'-5"	
52+0	out	—	—	—
53+0	66.82	66.89		0'-1"
54+0	68.48	68.77		0'-3½"
55+0	70.72	70.65	0'-1"	
56+0	73.01	72.90	0'-1½"	
57+0	76.66	75.71	0'-11½"	
58+0	79.48	78.89	0'-7"	
59+0	82.48	82.07	0'-5"	
60+0	86.21	85.25	0'-11½"	
61+0	90.30	88.10	2'-2½"	
62+0	89.55	88.62	0'-11"	
63+0	87.43	86.80	0'-8"	

℄ 49.61

71

B.M. Sta 41+20 on wing at E end of SW Handrail - El. - 49.95

~~℄ 58.89~~

~~℄ 66.74~~

~~℄ 74.56~~

℄ 83.84

Sta	No. side Stk El	New Gd. Sub-Gd. El. @ ℄	Cut.	Fill
64+0	83.68	84.65		1'-0"
65+0	82.12	82.50		0'-4½"
66+0	80.81	80.35	0'-5½"	
67+0	78.71	78.20	0'-6"	
68+0	76.97	76.40	0'-7"	
69+00	75.96	75.30	0'-8"	
70+0	73.62	74.55		0'-11"
71+0	74.50	74.48	GRADE	
72+0	74.75	75.08		0'-4"
73+0	75.76	75.68		0'-5"
74+0	76.50	76.08	0'-8¾"	
75+0	78.53	77.52	1'-0"	
76+0	80.90	79.70	1'-2½"	
77+0	84.23	82.07	2'-2"	
78+0	86.71	85.02	1'-8½"	
79+0	90.32	88.06	2'-3"	
80+0	93.12	91.10	2'-0"	
80+87	96.38	93.74	2'-8"	

⊙ 83.82

B.M. on W. end of N. rail of Bridge at Sta. 70+42
El. 75.85

~~⊙ 75.62~~
~~⊙ 80.57~~
⊙ 90.32

STA.	Sub at ℄		STA	Sub at ℄		
0+0	98.50	98.80	12+50	8820	88.50X	88.33✓
0+50	98.58	98.88✓	13+0	8762	87.92X	87.75✓
1+0	98.66	98.96✓	13+50	8648	86.78X	86.61✓
1+50	98.74	99.04✓	14+0	8495	85.25X	85.08✓
2+0	98.82	99.12✓	14+50	8324	83.54X	83.37✓
2+50	9890	99.20✓	15+0	8152	81.82X	81.65✓
3+0	9877	99.03	15+50	7981	80.11X	79.94✓
3+50	9823	98.53✓	16+0	7809	78.39X	78.22✓
4+0	9748	97.78✓	16+50	7637	76.67X	76.50✓
4+50	9673	97.03✓	17+0	7466	74.96X	74.79✓
5+0	9598	96.28✓	17+50	7332	73.62X	73.45✓
5+50	9523	95.53✓	18+0	7273	73.03X	72.86✓
6+0	9448	94.78✓	18+50	7289	73.19X	73.02✓
6+50	9373	94.03✓	19+0	7381	74.11X	73.94✓
7+0	9298	93.28X	19+50	7510	75.40X	75.23✓
7+50	9223	92.53✓	20+0	7639	76.69X	76.52✓
8+0	9148	91.78X	20+50	7768	77.98X	77.82✓
8+50	9073	91.03X	21+0	7897	79.27X	79.11✓
9+0	9009	90.39X	21+50	8001	80.31X	80.14✓
9+50	8978	90.08X	22+0	8053	80.83X	80.66✓
10+0	8958	89.88X	22+50	8055	80.85X	80.78✓
10+50	8938	89.68X	23+0	8005	80.35X	80.35✓
11+0	8918	89.48X	23+50	7930	79.60X	
11+50	8898	89.28X	24+0	7855	78.85X	
12+0	8878	89.08X	24+50	7780	78.10 X	

BM. 58 on Swlk Timber
22+40 — 81.43

12+0 —	88.91✓
11+50 —	89.11✓
11+0 —	89.31✓
10+50 —	89.51✓
10+0 —	89.71✓
9+50 —	89.91✓
9+0 —	90.22✓
8+50 —	90.86✓
8+0 —	91.61✓
7+50 —	92.36✓
7+0 —	93.11✓
6+50 —	93.86✓
6+0 —	94.61✓
5+50 —	95.36✓
5+0 —	96.11✓
4+50 —	96.86✓
4+0 —	97.61✓
3+50 —	98.45✓

+30

STA	Surf at CL	Form line	STA	Surf at CL	
25+0	7705	77.35X	37+50	5583	56.13X
25+50	7630	76.60X	38+0	5448	54.78X
26+0	7541	75.71X	38+50	5302	53.32X
26+50	7422	74.52X	39+0	5156	51.86X
27+0	7274	73.04X	39+50	50.62	50.92X
27+50	7098	71.28X	40+0	49.98	50.28X
28+0	6909	69.39X	40+50	49.48	49.78 X
28+50	6720	67.50X	41+0	49.34	
29+0	6530	65.60X	41+50	49.47	49.78
29+50	6341	63.71X	42+0	50.34	50.64x
30+0	6151	61.81X	42+50	51.21	51.51x
30+50	5962	59.92X	43+0	52.08	52.38X
31+0	5772	58.02X	43+50	5295	53.25X
31+50	5583	56.13X	44+0	5382	54.12X
32+0	5410	54.40X	44+50	5469	54.99X
32+50	5271	53.01X	45+0	5556	55.86X
33+0	5167	51.97X	45+50	56.50	56.80X
33+50	5054	50.84X	46+0	5768	57.98X
34+0	Bridge		46+50	5893	59.23X
34+50	5056	50.86X	47+0	6018	60.48X
35+0	5204	52.34X	47+50	6143	61.73X
35+50	5352	53.82X	48+0	6268	62.98X
36+0	5501	55.31X	48+50	6361	63.91X
36+50	5610	56.40X	49+0	6454	64.84X
37+0	5636	56.66X	49+50	6483	65.13X

⊙ 51.34

0.75

26+50	74.52 X
27+0	72.94 X
27+50	71.08 X
28+0	69.09 X
28+50	67.10 X
29+0	65.10 X
29+50	63.21 X
30+0	61.31 X
30+50	59.42 X
31+0	57.52 X
31+50	55.73 X
32+0	54.20 X
32+50	53.01
33+0	

OIT. E. MUDWALL 2' FROM So. end
sta 33+80
EL. 50.68

SE cor SW wing of bridge sta 41+20
EL. 48.59
~~Done~~

sta 41+20
~~E end SW wing~~
on wing at E end of SW handrail
EL. 49.95

178

8250
1.07

sw. cor. Porch
EL. 92.05
sta. 61+40

STA	set at ℄		STA	Sub at ℄		
50+0	6512	65.42 X	62+50	8788	88.18 X	
50+50	6509	6539 X	63+0	8680	87.10 X	
51+0	6506	65.36 X	63+50	8573	86.03 X	
51+50	6527	6557 X	64+0	8465	84.95 X	
52+0	6549	6579 X	64+50	8308	83.88 X	
52+50	6619	6649 X	65+0	8250	82.80 X	
53+0	6689	67.19 ✓	65+50	8143	81.73 X	
53+50	6783	68.13 ✓	66+0	80.35	80.65 X	
54+0	6877	69.07 X	66+50	79.28	79.58 X	
54+50	6971	70.01 ✓	67+0	78.20	78.50 X	
55+0	7065	7095 ✓	67+50	77.30	77.60 X	
55+50	7175	7205 ✓	(68+0)	76.45	76.75 X	
56+0	7290	73.20 ✓	68+50	7598	76.28 X	
56+50	7428	7458 ✓	69+0	75.50	75.80 X	
57+0	7571	7601 ✓	69+50	75.23	75.53 X	
57+50	7730	77.60 ✓	70+0	7495	75.25 X	75.25 ✓
58+0	7889	79.19 ✓	(70+50)	74.85	75.15 X	75.05 -10
58+50	8048	80.78 ✓	71+0	7498	75.28 X	75.08 ✓ -20
59+0	8207	82.37 ✓	71+50	7528	75.58 X	75.38 ✓ -25
59+50	8366	8396 ✓	72+0	7558	75.88 X	75.58 ✓ -30
60+0	8525	8555 ✓	72+50	7588	76.18 X	75.88 ✓
60+50	8684	87.14 ✓	73+0	76.18	76.48 X	76.18 ✓
61+0	8810	88.40 X	73+50	7648	76.78 X	76.48 ✓
61+50	8868	8898 X	74+0	7697	77.27 X	76.97 ✓
62+0	8862	8892 X	(74+50)	7747	77.47	✓ .3

5.60

76.05
27
75.78

3 3/8
5

Sta	Sub Gd at ℄	Forms line		
75+0	7835	78.65	x ~~7849~~	78.35 ✓
75+50	79.24	7954	x ~~[illegible]~~	79.24 ✓
76+0	80.32	80.62	x	80.32 ✓
76+50	81.40	81.70	x	81.45 ✓
77+0	8259	8289	x 82.67 ✓	
77+50	8398	84.28	x 84.10 ✓	
78+0	8548	85.78	x 85.53 ✓	
78+50	8698	8728	x 86.96 ✓	
79+0	8848	88.78	x 88.39 ✓	
79+50	8998	9028	x 89.99 ✓	
80+0	91.48	91.78	x 91.60 ✓	
80+50	92.98	9328	x 93.20	
80+87	9409	9439	x 94.39	

2 | 3.20
1.60

187 | 6.00 | 1.320
561
390
374
160

8267 94.14
82.48
3

20
3
20

387 | 11.66
11.68

32
37
224
96
2784
1184

143
50
72.50

82.48
3
88.39
82.67
4 | 5.72

8267
.72
83.39

1.43
50
71.50

1.43
8267
84.10
1.43
85.53
1.43
86.96
1.43
88.39

78.
78.3'

88.39
1.60
89.99
1.61
91.60
1.60
93.20
1.18

8267
78.35
4 | 4.32
1.08

78.35
1.08
79 43

8267
77.42
5 | 5.25
1.05

77.42
1.05
78.47

	181.4
Ratliff	2048.5
Tinden	2848.00

88		Fed			Edg Cou. 6's
0-100	✓	99.65	11+50	104.97	104.86
0-50	✓	99.45	12+00	104.80	104.66
0+00	✓	99.35	12+50	105.18	
0+50		99.55	13+00	104.95	
1+00		99.65	13+50	105.19	
1+50		99.78	14+0	105.66	
2+0		99.96	14+50	106.35	
2+50		100.30	15+00	107.35	
3+0		100.63	15+50	108.58	
3+50		101.09	16+00	109.42	
4+00		101.64	16+50	110.37	
4+50		102.10	17+00	111.04	
5+00		102.35	17+50	111.66	
5+50		102.75	18+0	112.20	
6+00		103.35	18+50	112.89	
6+50		104.35	19+0	113.66	
7+00		105.20	19+50	114.82	
7+50		106.25	20+0	115.57	
8+0		106.95	20+50	116.69	
8+50		107.12	21+0	118.15	
9+0		106.90	21+50	119.75	
9+50		106.65	22+00	121.55	
10+0		10641	22+50	123.60	123.57
10+50		10589	23+00	125.25	
11+0		10527	23+50	126.60	12660

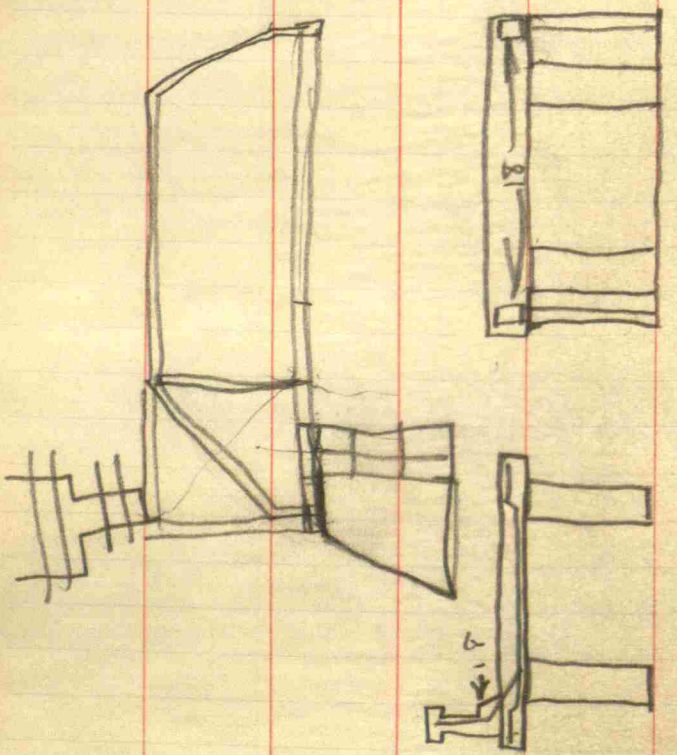
24+00	127.42
24+50	127.96
25+00	12815
25+50	12800
26+0	12785

0+50	99.55	V X	14	10578	X —
1	9975	V X	+50	10651	X —
+50	9995	V X	15	10742	X —
2	10015	V X	+50	10839	X —
+50	10042	V X	16	10939	X —
3	10078	V X	+50	11031	X —
+50	10121	V X	17	11105	X —
4	10164	V X	+50	11171	X —
+50	10207	V X	18	11237	X —
5	10250	V X —	+50	11303	X —
+50	10293	V X —	19	11378	X — ⊙
6	10348	V X —	+50	11469	X —
+50	10430	V X —	20	11569	X —
7	10524	V X —	+50	11684	—
+50	10618	V X —	21	11831	—
8	10688	V X —	+50	11993	—
+50	10706	V X —	22	12163	
9	10688	V X —	+50	12345	
+50	10660	V X —	23	12520	
10	10623	V X —	+50	12650	
+50	10582	⊙ X —	24	12742	
11	10541	X —	+50	12790	
+50	10511	C ⊙ —	25	12805	
12	10505	C —	+50	12800	
+50	10510	X —	26	12785	
13	10515	X —			
+50	10520	X —			

Mackey Road

Ext — E from

Tinden Road



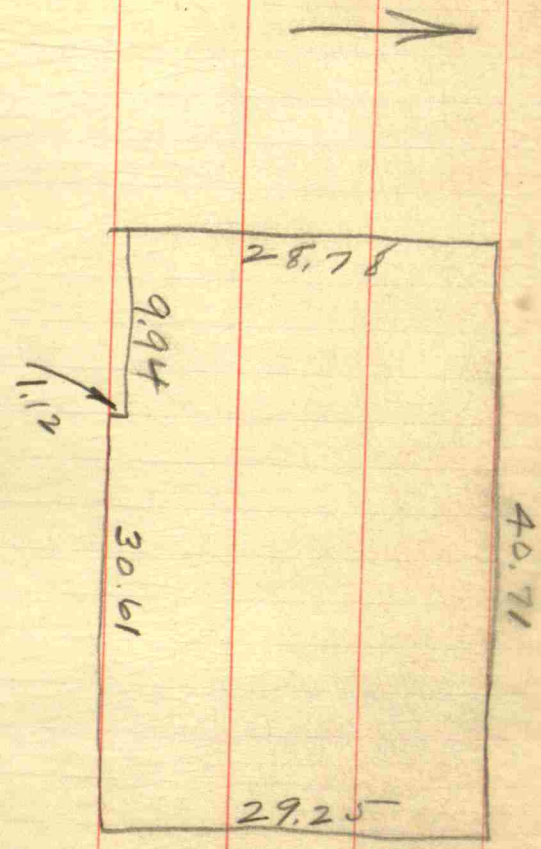
5643
48.85

417 | 758 | 1.82
417
3410
3336
740

1.82
17
1274
182
3094

31

NASH PARTITION.



2925
4
117.00

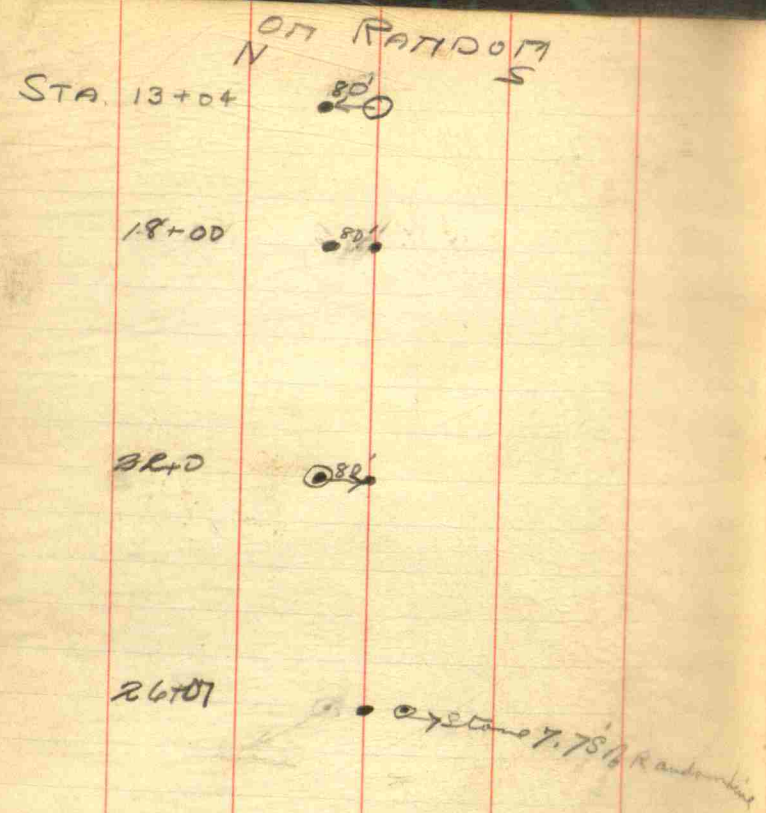
3 1/2
7

100
300 2
8100 x 16 x 7/
27 24
3

1400
3

300 2
8100 x 16 x 3
27 24
3
300 4 3
8100 x 16 x 3/
27 12
3

1200
300



0°-20'
3°-21'

.58 ft a foot to the 100'

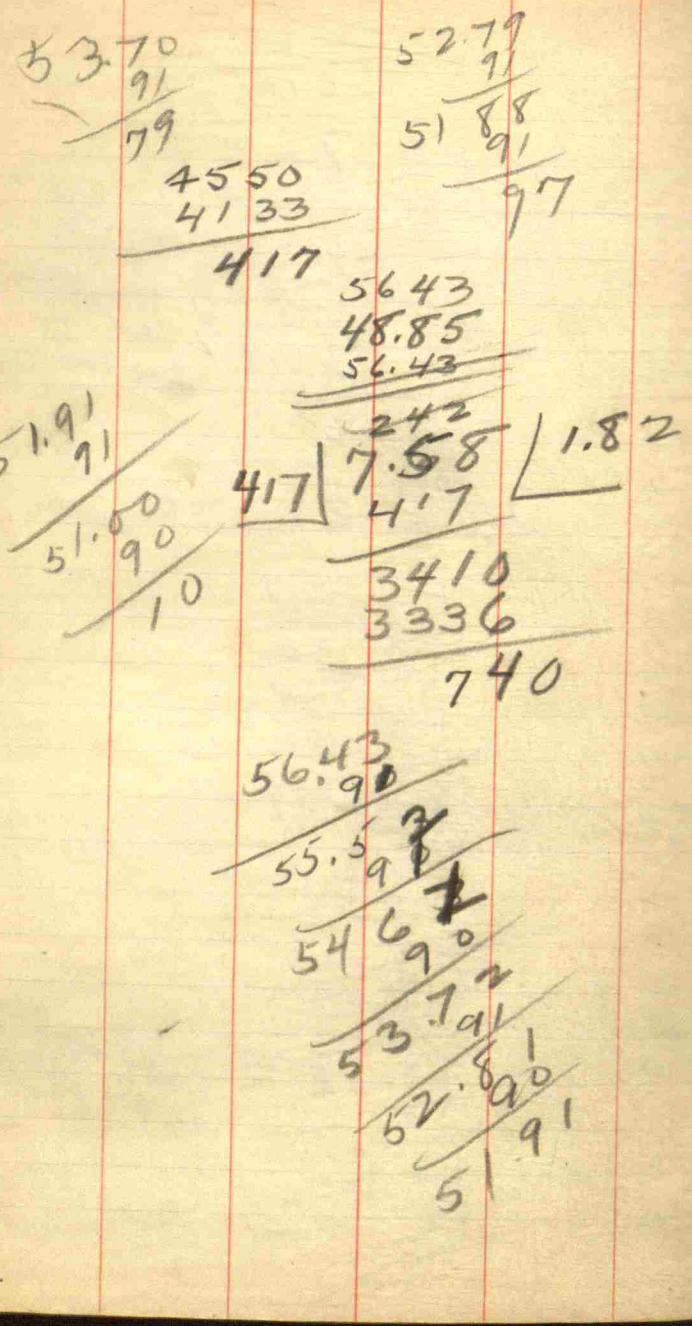
10000
1
900.00

1278.00
900
9 | 378.00
4200

14200

50 98
49.98
56
4550
4133 — 56 43
417
49.34
4 | 7.09 | 174
4
30
29
53
56.43
.87
55 56
87
54 69
87
53.82
87
52.95
87
52.08
87
51 21
87
50341
47
400
87 8087 x 16
799
16
4794
799
12784

39 — 50.98
49.64
1.22
50.01
.67
49.34
50.98
49.34
183 | 1.640 | .90
1647
50.98
45
50.53
33
90
2970
49.34
30
49.64
45
50.09



Natural Trigonometrical Ratios.

Angle.	Sine.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
° ′							
0	0	0	1.	∝	∝	1.	90
10	.0029	.0029		343.8	343.8	I.	50
20	.0058	.0058		171.9	171.9	.99998	40
30	.0087	.0087		114.6	114.6	.99996	30
40	.0116	.0116	1.0001	85.94	85.94	.99993	20
50	.0145	.0145	1.0001	68.76	68.75	.99989	10
1	.0175	.0175	1.0002	57.30	57.29	.99985	89
10	.0204	.0204	1.0002	49.11	49.10	.99979	50
20	.0233	.0233	1.0003	42.98	42.96	.99973	40
30	.0262	.0262	1.0003	38.20	38.19	.99966	30
40	.0291	.0291	1.0004	34.38	34.37	.99958	20
50	.0320	.0320	1.0005	31.26	31.24	.99949	10
2	.0349	.0349	1.0006	28.65	28.64	.99939	88
10	.0378	.0378	1.0007	26.45	26.43	.99929	50
20	.0407	.0407	1.0008	24.56	24.54	.99917	40
30	.0436	.0437	1.0010	22.93	22.90	.99905	30
40	.0465	.0466	1.0011	21.49	21.47	.99892	20
50	.0494	.0495	1.0012	20.23	20.21	.99878	10
3	.0523	.0524	1.0014	19.11	19.08	.99863	87
10	.0552	.0553	1.0015	18.10	18.07	.99847	50
20	.0581	.0582	1.0017	17.20	17.17	.99831	40
30	.0610	.0612	1.0019	16.38	16.35	.99813	30
40	.0640	.0641	1.0020	15.64	15.60	.99795	20
50	.0669	.0670	1.0022	14.96	14.92	.99776	10
4	.0698	.0699	1.0024	14.34	14.30	.99756	86
10	.0727	.0729	1.0027	13.76	13.73	.99736	50
20	.0756	.0758	1.0029	13.23	13.20	.99714	40
30	.0785	.0787	1.0031	12.75	12.71	.99692	30
40	.0814	.0816	1.0033	12.29	12.25	.99668	20
50	.0843	.0846	1.0036	11.87	11.83	.99644	10
5	.0872	.0875	1.0038	11.47	11.43	.99619	85
10	.0901	.0904	1.0041	11.10	11.06	.99594	50
20	.0929	.0934	1.0043	10.76	10.71	.99567	40
30	.0958	.0963	1.0046	10.43	10.39	.99540	30
40	.0987	.0992	1.0049	10.13	10.08	.99511	20
50	.1016	.1022	1.0052	9.839	9.788	.99482	10
6	.1045	.1051	1.0055	9.567	9.514	.99452	84
10	.1074	.1080	1.0058	9.309	9.255	.99421	50
20	.1103	.1110	1.0061	9.065	9.010	.99390	40
30	.1132	.1139	1.0065	8.834	8.777	.99357	30
40	.1161	.1169	1.0068	8.614	8.556	.99324	20
50	.1190	.1198	1.0072	8.405	8.345	.99290	10
7	.1219	.1228	1.0075	8.206	8.144	.99255	83
10	.1248	.1257	1.0079	8.016	7.953	.99219	50
20	.1276	.1287	1.0082	7.834	7.770	.99182	40
30	.1305	.1317	1.0086	7.661	7.596	.99144	30
40	.1334	.1346	1.0090	7.496	7.429	.99106	20
50	.1363	.1376	1.0094	7.337	7.269	.99067	10
							82
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sine.	Angle.

Angle.	Sine.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
° ′							
8	.1392	.1405	1.0098	7.185	7.115	.99027	82
10	.1421	.1435	1.0102	7.040	6.968	.98986	50
20	.1449	.1465	1.0107	6.900	6.827	.98944	40
30	.1478	.1495	1.0111	6.766	6.691	.98902	30
40	.1507	.1524	1.0115	6.636	6.561	.98858	20
50	.1536	.1554	1.0120	6.512	6.435	.98814	10
9	.1564	.1584	1.0125	6.394	6.314	.98769	81
10	.1593	.1614	1.0129	6.277	6.197	.98723	50
20	.1622	.1644	1.0134	6.166	6.084	.98676	40
30	.1650	.1673	1.0139	6.059	5.976	.98629	30
40	.1679	.1703	1.0144	5.955	5.871	.98580	20
50	.1708	.1733	1.0149	5.855	5.769	.98531	10
10	.1736	.1763	1.0154	5.759	5.671	.98481	80
10	.1765	.1793	1.0160	5.665	5.576	.98430	50
20	.1794	.1823	1.0165	5.575	5.485	.98378	40
30	.1822	.1853	1.0170	5.488	5.396	.98325	30
40	.1851	.1883	1.0176	5.403	5.309	.98272	20
50	.1880	.1914	1.0181	5.320	5.226	.98218	10
11	.1908	.1944	1.0187	5.241	5.145	.98163	79
10	.1937	.1974	1.0193	5.164	5.066	.98107	50
20	.1965	.2004	1.0199	5.088	4.989	.98050	40
30	.1994	.2035	1.0205	5.016	4.915	.97992	30
40	.2022	.2065	1.0211	4.945	4.843	.97934	20
50	.2051	.2095	1.0217	4.877	4.773	.97875	10
12	.2079	.2126	1.0223	4.810	4.705	.97815	78
10	.2108	.2156	1.0230	4.745	4.638	.97754	50
20	.2136	.2186	1.0236	4.682	4.574	.97692	40
30	.2164	.2217	1.0243	4.620	4.511	.97630	30
40	.2193	.2247	1.0249	4.560	4.449	.97566	20
50	.2221	.2278	1.0256	4.502	4.390	.97502	10
13	.2250	.2309	1.0263	4.445	4.331	.97437	77
10	.2278	.2339	1.0270	4.390	4.275	.97371	50
20	.2306	.2370	1.0277	4.336	4.219	.97304	40
30	.2334	.2401	1.0284	4.284	4.165	.97237	30
40	.2363	.2432	1.0291	4.232	4.113	.97169	20
50	.2391	.2462	1.0299	4.182	4.061	.97100	10
14	.2419	.2493	1.0306	4.133	4.011	.97030	76
10	.2447	.2524	1.0314	4.086	3.962	.96959	50
20	.2476	.2555	1.0321	4.039	3.914	.96887	40
30	.2504	.2586	1.0329	3.994	3.867	.96815	30
40	.2532	.2617	1.0337	3.949	3.821	.96742	20
50	.2560	.2648	1.0345	3.906	3.776	.96667	10
15	.2588	.2679	1.0353	3.864	3.732	.96593	75
10	.2616	.2711	1.0361	3.822	3.689	.96517	50
20	.2644	.2742	1.0369	3.782	3.647	.96440	40
30	.2672	.2773	1.0377	3.742	3.606	.96363	30
40	.2700	.2805	1.0386	3.703	3.566	.96285	20
50	.2728	.2836	1.0394	3.665	3.526	.96206	10
							74
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sine.	Angle.

Angle.	Sine.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
0 ′							
16	.2756	.2867	1.0403	3.628	3.487	.96126	74
10	.2784	.2899	1.0412	3.592	3.450	.96046	50
20	.2812	.2931	1.0423	3.556	3.412	.95964	40
30	.2840	.2962	1.0429	3.521	3.376	.95882	30
40	.2868	.2994	1.0438	3.487	3.340	.95799	20
50	.2896	.3026	1.0448	3.453	3.305	.95715	10
17	.2924	.3057	1.0457	3.420	3.271	.95630	73
10	.2952	.3089	1.0466	3.388	3.237	.95545	50
20	.2979	.3121	1.0476	3.357	3.204	.95459	40
30	.3007	.3153	1.0485	3.326	3.172	.95372	30
40	.3035	.3185	1.0495	3.295	3.140	.95284	20
50	.3062	.3217	1.0505	3.265	3.108	.95195	10
18	.3090	.3249	1.0515	3.236	3.078	.95106	72
10	.3118	.3281	1.0525	3.207	3.048	.95015	50
20	.3145	.3314	1.0535	3.179	3.018	.94924	40
30	.3173	.3346	1.0545	3.152	2.989	.94832	30
40	.3201	.3378	1.0555	3.124	2.960	.94740	20
50	.3228	.3411	1.0566	3.098	2.932	.94646	10
19	.3256	.3443	1.0576	3.072	2.904	.94552	71
10	.3283	.3476	1.0587	3.046	2.877	.94457	50
20	.3311	.3508	1.0598	3.020	2.850	.94361	40
30	.3338	.3541	1.0608	2.996	2.824	.94264	30
40	.3365	.3574	1.0619	2.971	2.798	.94167	20
50	.3393	.3607	1.0631	2.947	2.773	.94068	10
20	.3420	.3640	1.0642	2.924	2.747	.93969	70
10	.3448	.3673	1.0653	2.900	2.723	.93869	50
20	.3475	.3706	1.0665	2.878	2.699	.93769	40
30	.3502	.3739	1.0676	2.856	2.675	.93667	30
40	.3529	.3772	1.0688	2.833	2.651	.93565	20
50	.3557	.3805	1.0700	2.811	2.628	.93462	10
21	.3584	.3839	1.0711	2.790	2.605	.93358	69
10	.3611	.3872	1.0723	2.769	2.583	.93253	50
20	.3638	.3906	1.0736	2.749	2.560	.93148	40
30	.3665	.3939	1.0748	2.729	2.539	.93042	30
40	.3692	.3973	1.0760	2.709	2.517	.92935	20
50	.3719	.4006	1.0773	2.689	2.496	.92827	10
22	.3746	.4040	1.0785	2.670	2.475	.92718	68
10	.3773	.4074	1.0798	2.650	2.455	.92609	50
20	.3800	.4108	1.0811	2.632	2.434	.92499	40
30	.3827	.4142	1.0824	2.613	2.414	.92388	30
40	.3854	.4176	1.0837	2.595	2.394	.92276	20
50	.3881	.4210	1.0850	2.577	2.375	.92164	10
23	.3907	.4245	1.0864	2.559	2.356	.92050	67
10	.3934	.4279	1.0877	2.542	2.337	.91936	50
20	.3961	.4314	1.0891	2.525	2.318	.91822	40
30	.3987	.4348	1.0904	2.508	2.300	.91706	30
40	.4014	.4383	1.0918	2.491	2.282	.91590	20
50	.4041	.4417	1.0932	2.475	2.264	.91472	10
							66
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sine.	Angle.

Angle.	Sine.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
0 ′							
24	.4067	.4452	1.0946	2.459	2.246	.91355	66
10	.4094	.4487	1.0961	2.443	2.228	.91236	50
20	.4120	.4522	1.0975	2.427	2.211	.91116	40
30	.4147	.4557	1.0989	2.411	2.194	.90996	30
40	.4173	.4592	1.1004	2.396	2.177	.90875	20
50	.4200	.4628	1.1018	2.381	2.161	.90753	10
25	.4226	.4663	1.1034	2.366	2.145	.90631	65
10	.4253	.4699	1.1049	2.351	2.128	.90507	50
20	.4279	.4734	1.1064	2.337	2.112	.90383	40
30	.4305	.4770	1.1079	2.323	2.097	.90259	30
40	.4331	.4806	1.1095	2.309	2.081	.90133	20
50	.4358	.4841	1.1110	2.295	2.066	.90007	10
26	.4384	.4877	1.1126	2.281	2.050	.89879	64
10	.4410	.4913	1.1142	2.268	2.035	.89752	50
20	.4436	.4950	1.1158	2.254	2.020	.89623	40
30	.4462	.4986	1.1174	2.241	2.006	.89493	30
40	.4488	.5022	1.1190	2.228	1.991	.89363	20
50	.4514	.5059	1.1207	2.215	1.977	.89232	10
27	.4540	.5095	1.1223	2.203	1.963	.89101	63
10	.4566	.5132	1.1240	2.190	1.949	.88968	50
20	.4592	.5169	1.1257	2.178	1.935	.88835	40
30	.4617	.5206	1.1274	2.166	1.921	.88701	30
40	.4643	.5243	1.1291	2.154	1.907	.88566	20
50	.4669	.5280	1.1308	2.142	1.894	.88431	10
28	.4695	.5317	1.1326	2.130	1.881	.88295	62
10	.4720	.5354	1.1343	2.119	1.868	.88158	50
20	.4746	.5392	1.1361	2.107	1.855	.88020	40
30	.4772	.5430	1.1379	2.096	1.842	.87882	30
40	.4797	.5467	1.1397	2.085	1.829	.87743	20
50	.4823	.5505	1.1415	2.073	1.816	.87603	10
29	.4848	.5543	1.1434	2.063	1.804	.87462	61
10	.4874	.5581	1.1452	2.052	1.792	.87321	50
20	.4899	.5619	1.1471	2.041	1.780	.87178	40
30	.4924	.5658	1.1490	2.031	1.767	.87036	30
40	.4950	.5696	1.1509	2.020	1.756	.86892	20
50	.4975	.5735	1.1528	2.010	1.744	.86748	10
30	.5000	.5774	1.1547	2.	1.732	.86603	60
10	.5025	.5812	1.1566	1.990	1.720	.86457	50
20	.5050	.5851	1.1588	1.980	1.709	.86310	40
30	.5075	.5890	1.1606	1.970	1.698	.86163	30
40	.5100	.5930	1.1626	1.961	1.686	.86015	20
50	.5125	.5969	1.1648	1.951	1.675	.85866	10
31	.5150	.6009	1.1666	1.942	1.664	.85717	59
10	.5175	.6048	1.1687	1.932	1.653	.85567	50
20	.5200	.6088	1.1707	1.923	1.643	.85416	40
30	.5225	.6128	1.1728	1.914	1.632	.85264	30
40	.5250	.6168	1.1749	1.905	1.621	.85112	20
50	.5275	.6208	1.1770	1.896	1.611	.84959	10
							58
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sine.	Angle.

Angle.	Sine.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
0 ′							
32	.5299	.6249	1.1792	1.887	1.600	.84805	58
10	.5324	.6289	1.1813	1.878	1.590	.84650	50
20	.5348	.6330	1.1835	1.870	1.580	.84495	40
30	.5373	.6371	1.1857	1.861	1.570	.84339	30
40	.5398	.6412	1.1879	1.853	1.560	.84182	20
50	.5422	.6453	1.1901	1.844	1.550	.84025	10
33	.5446	.6494	1.1924	1.836	1.540	.83867	57
10	.5471	.6536	1.1946	1.828	1.530	.83708	50
20	.5495	.6577	1.1969	1.820	1.520	.83549	40
30	.5519	.6619	1.1992	1.812	1.511	.83389	30
40	.5544	.6661	1.2015	1.804	1.501	.83228	20
50	.5568	.6703	1.2039	1.796	1.492	.83066	10
34	.5592	.5745	1.2062	1.788	1.483	.82904	56
10	.5616	.6787	1.2086	1.781	1.473	.82741	50
20	.5640	.6830	1.2110	1.773	1.464	.82577	40
30	.5664	.6873	1.2134	1.766	1.455	.82413	30
40	.5688	.6916	1.2158	1.758	1.446	.82248	20
50	.5712	.6959	1.2183	1.751	1.437	.82082	10
35	.5736	.7002	1.2208	1.743	1.428	.81915	55
10	.5760	.7046	1.2233	1.736	1.419	.81748	50
20	.5783	.7089	1.2258	1.729	1.411	.81580	40
30	.5807	.7133	1.2283	1.722	1.402	.81412	30
40	.5831	.7177	1.2309	1.715	1.393	.81242	20
50	.5854	.7221	1.2335	1.708	1.385	.81072	10
36	.5878	.7265	1.2361	1.701	1.376	.80902	54
10	.5901	.7310	1.2387	1.695	1.368	.80730	50
20	.5925	.7355	1.2413	1.688	1.360	.80558	40
30	.5948	.7400	1.2440	1.681	1.351	.80386	30
40	.5972	.7445	1.2466	1.675	1.343	.80212	20
50	.5995	.7490	1.2494	1.668	1.335	.80038	10
37	.6018	.7536	1.2521	1.662	1.327	.79864	53
10	.6041	.7581	1.2549	1.655	1.319	.79688	50
20	.6065	.7627	1.2577	1.649	1.311	.79512	40
30	.6088	.7673	1.2605	1.643	1.303	.79335	30
40	.6111	.7720	1.2633	1.636	1.295	.79158	20
50	.6134	.7766	1.2661	1.630	1.288	.78980	10
38	.6157	.7813	1.2690	1.624	1.280	.78801	52
10	.6180	.7860	1.2719	1.618	1.272	.78622	50
20	.6202	.7907	1.2748	1.612	1.265	.78442	40
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sine.	Angle.

Angle.	Sine.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
0 ′							
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
39	.6293	.8098	1.2868	1.589	1.235	.77715	51
10	.6316	.8146	1.2898	1.583	1.228	.77531	50
20	.6338	.8195	1.2929	1.578	1.220	.77347	40
30	.6361	.8243	1.2959	1.572	1.213	.77162	30
40	.6383	.8292	1.2991	1.567	1.206	.76977	20
50	.6406	.8342	1.3022	1.561	1.199	.76791	10
40	.6428	.8391	1.3054	1.556	1.192	.76604	50
10	.6450	.8441	1.3086	1.550	1.185	.76417	50
20	.6472	.8491	1.3118	1.545	1.178	.76229	40
30	.6494	.8541	1.3151	1.540	1.171	.76041	30
40	.6517	.8591	1.3184	1.535	1.164	.75851	20
50	.6539	.8642	1.3217	1.529	1.157	.75661	10
41	.6561	.8693	1.3251	1.524	1.150	.75471	49
10	.6583	.8744	1.3284	1.518	1.144	.75280	50
20	.6604	.8796	1.3318	1.514	1.137	.75088	40
30	.6626	.8847	1.3352	1.509	1.130	.74896	30
40	.6648	.8899	1.3386	1.504	1.124	.74703	20
50	.6670	.8952	1.3421	1.489	1.117	.74509	10
42	.6691	.9004	1.3456	1.494	1.111	.74314	48
10	.6713	.9057	1.3492	1.490	1.104	.74120	50
20	.6734	.9110	1.3527	1.485	1.098	.73924	40
30	.6756	.9163	1.3563	1.480	1.091	.73728	30
40	.6777	.9217	1.3600	1.476	1.085	.73531	20
50	.6799	.9271	1.3636	1.471	1.079	.73333	10
43	.6820	.9325	1.3673	1.466	1.072	.73135	47
10	.6841	.9380	1.3711	1.462	1.066	.72937	50
20	.6862	.9435	1.3748	1.457	1.060	.72737	40
30	.6884	.9490	1.3786	1.453	1.054	.72537	30
40	.6905	.9545	1.3824	1.448	1.048	.72337	20
50	.6926	.9601	1.3863	1.444	1.042	.72136	10
44	.6947	.9657	1.3902	1.440	1.036	.71934	46
10	.6967	.9713	1.3941	1.435	1.030	.71732	50
20	.6988	.9770	1.3980	1.431	1.024	.71529	40
30	.7009	.9827	1.4020	1.427	1.018	.71325	30
40	.7030	.9884	1.4061	1.422	1.012	.71121	20
50	.7050	.9942	1.4101	1.418	1.006	.70916	10
	.7071	1.	1.414	1.414	1.	.70711	45
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sine.	0 ′ Angle.

66409

Beech N 43° – 62'

Pear N 60° W – 71'

50.98
48.85
2.13

1.75
17
1225
175
2975

1.81
17
1267
181
3077

48.85

50

.30
40.85
49.15

1.75
67
1225
1050
1172.5

50.31
48.85
1.46

2.20

67 | 1.46
134

50.31
49.8

183 | 213
183
300
183
1170

40.83
39
1.83

[redacted]

…S FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1½ TO 1.

FOR SINGLE TRACK EMBANKMENT.

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

…culated by Julien A. Hall, M. Am. Soc. C. E.

MADE IN GERMANY.