OFFICE OF
RAMSEY COUNTY ENG'R.

CONSTRUCTION NOTES

BIRCH LAKE BLVD. NO.
CO. PROJ. NO. 23-56

FILE No. 2

Birch Lane Blvd No
2 23-56

Distances from Center of Roadway for Cross-Sectioning

Roadway 16 feet wide. Side Slopes 1 on 1.
For Single Track Embankment.

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
0	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	0
1	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	1
2	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	2
3	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	3
4	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	4
5	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	5
6	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	6
7	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	7
8	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	8
9	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	9
10	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	10
11	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	11
12	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	12
13	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	13
14	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	14
15	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	15
16	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	16
17	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	17
18	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	18
19	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	19
20	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	20
21	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	21
22	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	22
23	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	23
24	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	24
25	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	25
26	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	26
27	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	27
28	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	28
29	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	29
30	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	30
31	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	31
32	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	32
33	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	33
34	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	34
35	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	35
36	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	36
37	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	37
38	46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	46.9	38
39	47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7	47.8	47.9	39
40	48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7	48.8	48.9	40

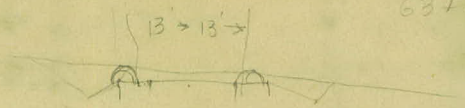
Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 30.6. For same slopes but other widths of roadbed, correct above figures by one-half difference in width of roadbed; thus in example above, for 20 ft. roadbed distance will be 30.6+(20—16)÷2 or 2 ft. added to 30.6 =32.6. For slopes of 1 on 1½ see inside of back cover.

1 man — Team 2hr 2hr
1 man — 45¢ S
1 boy — 35¢ S.

0+50

72' 6

63+84 6



Page to Page	Description	Stations
5 - 6 ✓	X sections and slope stakes	75-90
7 - 8 ✓	" " " "	91-112
8 — ✓	" " " "	60-63
9- 11 ✓	" " " "	0-18
17- ✓	" " " "	63-74
19- 23 ✓	" " " "	35-59
25- 26 ✓	" " " "	19-35
27- ✓	" " " "	" Plus to 35-51

P.I. 51+85.3 Δ = 38°-51' Lt. See P. 74

P.I. 84+83.7 Δ = 14°-56' Rt

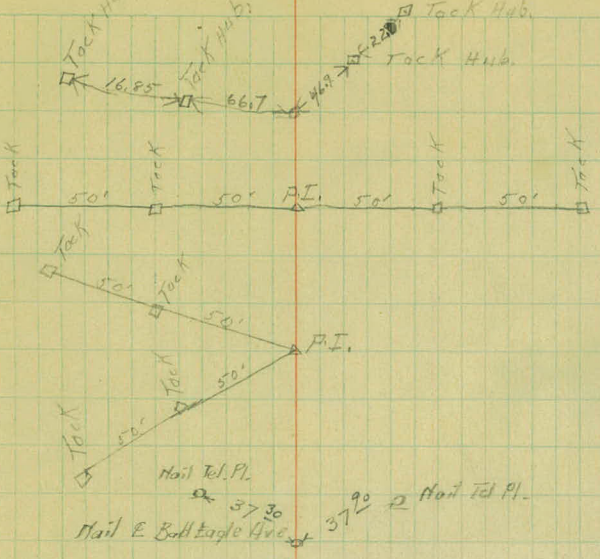
P.I. 80+75.1 Δ = 15°-02' Lt

End of Proj (410 O.K.) 112+28.7

Rt & Lt

83.55
66.7
16.85

69.9
41.9
27.0



(23-56) Grade Stakes for Drain Tile etc.

Sta.	+S	H.I.	-S	Profile Elev.	Grade Rod.
B.M.	2.19	242.24		240.05	
85+91			Elev outlet " intake	233.9 234.0	8.34 8.24
86+00				233.9 .17	8.34-4º
87+00				234.07 .17	8.17-5º
88+00				234.24 .17	8.00-4º
89+00				234.41 .17	7.83-4º
90+00				234.58 .17	7.66-3º
91+00				34.75 .17	7.49-4º
92+00				34.92 .17	7.32-4º
93+00				35.09	See below
T.P. & B.M.	2.42	242.47	2.19	240.05	
			1.97	240.50	
* 93+00				35.09 .17	
* 94+00				35.26 .17	
* 95+00				35.43	
* 15+50[6]	℄ Culvert now in place		Elev. intake " outlet	235.6 235.5	

* Note:- These stakes are in, but are not set correct. of 2.417 (R.E.Deutsche-) Didn't hear "2" when rodman

Copied from original notes taken in BK #2 for project (#23-02)(23-55) by R.E.D. 8-27-23.

Party { Deatsche, Weber, Mahoney, Franke }

℄ Road | Stk | ℄ Ditch Rt. | 8-17-23 Cool Fair

(2)

		℄ Road			Offset
R.R. Sp. Power Pl. 21' L Sta. 92+80					
			17⁴'		
			11⁰		6'
			9⁵'		6'
			10³		5'
89+02.4	T to North (12" C.M. Req. 34')		11⁵		4'
			12⁴		3'
			11⁰		4'
92+33.8	T to South ✓		11⁰		4'

R.R. Sp. Pw. Pl. 21' L Sta. 92+80 (This B.M. will be moved)

Sp. 18" Oak 70' L Sta. 94+25 (Set 8-17-23)

		℄ Road			
			11⁰		4⁰
94+30.6	T. to N. (12" x 34 C.M. Req.) ✓		11⁰		4⁰
94+32.9	T " South ✓		11⁰		4⁰
95+52	T to North 12" x 30' ✓ — Dist 19⁵, Diff. 3⁵, Grade down 19⁵		15⁵		℄ culv = ℄ drain, Grade down

Error was made by using B.S. on B.M. 21' L Sta. 92+80 as 4.17 instead called reading of target.

8/28/23

Grade stakes for tile drain.

	Fe	+	H.I.	−	Elev	Tile Grade
	B.M.	2.70	243.20		240.50	
95						35.45
95 +50						35.55
96						35.6
97						35.7
98						35.8
99						35.9
100						36.0
101						36.1
102						36.2
103	T.P.	4.94	244.17	3.97	239.23	36.3
104						36.4
105						36.5
106						36.6
107						36.7
108						36.8
109						36.9
110						37.0
111	T.P.	4.72	244.66	4.23	239.94	37.1
112	T.P.	4.63	244.34	4.95	239.71	237.2
					241.28	
	B.M.			3.06	241.34	

Checking out on B.M. found error of .06

Fair-Warop Carley Parsons Briggs Eck.

℄ Stake Line: Ditch ℄

Spike in 18" oak 70' Lt. of sta 99+25

Grade rod.		Ditch Cut.
7.8	L	C 3.0
7.7	L	C 1.0
7.6	L	C 2.0
7.5	L	C 3.0
7.4	L	C 3.0
7.3	L	C 4.0
7.2	L	C 3.0
7.1	L	C 2.0
7.0	L	C 3.0
7.9	L	C 3.0
7.8	L	C 3.0
7.7	L	C 3.0
7.6	L	C 3.0
7.5	L	C 2.0
7.4	L	C 3.0
7.3	L	C 3.0
7.2	L	C 3.0
7.6	L	C 3.0
7.5	L	

10'

Between sta 85 & sta 112 stakes are 10' from ℄ of road on straight Line.

99+18 T to North 12"x34'

101+20 T to South

102+96 T to North 12"x34'

104+49.6 T to South

104+18.7 Drop Inlet

107+33.4 T to South

107+00 T to North 12"x34' culvert

10'

Nail in tele pole Lt of sta 112+00

Moved to near cor. of conc. base of Gas Pump

Elev = 240.40 BM

Xsections + Slope 23-36

Sta	+	H.I.	−	Elev	Grade
BM:	1.61	241.66			240.05
90			4.8	36.9	237.7
89			3.8	37.9	237.6
88			3.9	37.8	37.5
87			2.4	39.3	37.4
86			1.0	37.7	37.43
TP	1.71	243.77	0.60	241.06	
85			5.9	36.9	37.7
+83.5			6.2	36.6	37.8
+50			6.1	36.7	37.9
84			6.0	36.8	38.4
83			5.2	37.6	38.8
TP	4.00	243.14	3.63	239.14	
82			4.8	38.3	38.9

8/30/23 [illegible]

Carley
Parsons
Briggs
Eck

(5)

Lt ℄ Rt

R.R. spk. in T.P. Lt. 92+80

4.8

F0.1 (4.1/20.9) 4.5/33 5.0/25 4.1/21 4.9/13 6.1/6 4.7/18 4.5/36 (4.4/20.6) F0.4

3.8

0.0 (4.1/21) 5.9/33 4.9/27 4.1/21 4.0/12 5.9/14 5.9/16 4.4/19 4.0/33 (3.9/21.2) C0.2

3.9

C0.4 (3.8/21.9) 4.2/33 4.3/27 3.8/24 3.6/10 6.4/14 6.5/16 4.2/19 4.1/26 4.1/33 (4.1/21.1) C0.1

2.4

C0.7 (3.6/21.7) 3.9/33 3.6/22 3.2/12 3.3/10 7.0/14 7.1/16 3.8/21 3.7/27 (3.6/21.7) C0.7

4.0

C0.5 (3.8/21.5) 3.8/33 3.8/29 3.8/15 3.6/10 7.8/16 7.8/18 4.2/22 4.0/33 No slope
4 ft ditch

5.9

D.C. 1.2 (5.9/24.3) F1.8 (6.0/17.7) 6.0/33 6.3/33 (5.9/25.2) C0.2 +.9 −1.0

6.2

D.C. 1.2 (5.8/24.2) F1.8 (5.8/17.7) 5.9/33 6.1/33 (6.1/18) 0.0 (6.0/26.1) D.C. 1.1 +1.0 −1.1

6.1

D.C. 0.8 (6.1/23.8) F2.0 (6.1/18.0) 5.9/33 6.1/33 (6.0/16.3) F0.2 (6.0/23.9) D.C. 0.9 +0.8 −0.8

6.0

D.C. 0.6 (5.8/23.6) F1.8 (5.8/17.7) 5.9/33 6.1/33 (6.0/16.8) F1.2 (6.0/23.4) D.C. 0.4 +0.4 −0.4

5.2

D.C. 0.6 (5.4/23.6) F1.4 (5.3/17.1) 5.3/33 5.4/33 (5.5/17.1) F1.4 (5.5/23.5) D.C. 0.5 +0.1 −0.1

4.8

D.C. 1.5 (4.7/24.5) 0.0 (4.6/15) 4.7/33 4.9/33 (5.2/18.5) F1.0 (5.0/24.2) D.C. 1.2 +0.5 −0.4

Sta	+	H.I.	−	Elev	Grade
	4.00	243.14		39.3	
81+30			4.8	39.3	
				38.7	
81+00			4.4	39.7	39.3
				38.5	
+75			4.6	39.6	39.4
80			3.4	39.7	39.65
79			3.8	39.3	39.9
78			3.5	39.6	40.1
TP	4.33	244.85	2.62	240.52	
77			5.1	39.8	40.3
76			5.4	39.5	40.5
75			4.7	40.2	40.7
BM			5.35		239.50

Lt ℄ Rt

Lt	℄	Rt
4.8/33	(4.8)	4.3/11 4.0/17 4.3/22 4.3/33
D.6 0.0 (5.8/23.0) 0.0 (4.8/18) 4.9/33 5.0/13	(4.4)	4.0/9 4.5/25 4.5/30 (4.4/17.4) F1.6 (4.6/24.2) D.C. 1.2 +0.9 −1.0 18
D.C. C1.0 (4.7/24.0) F0.2 (4.9/19.3) 4.9/33 5.0/15	(4.6)	4.3/4 4.7/11 4.9/33 (5.9/18.1) F2.2 (5.9/23.8) C0.8 +1.0 −1.1 19
F0.8 (4.2/32.2) 4.2/33	(3.4)	3.9/14 3.8/33 (3.9/15.1) F0.1 (3.9/32.5) F0.5 +0.3 −0.4
F1.2 (4.4/31.8) 4.4/33 4.1/18	(3.8)	4.2/33 (4.4/31.8) F1.2
F1.0 (4.0/32.0) 4.0/33 4.1/11	(3.5)	3.7/25 4.0/33 (4.0/32.0) F1.0
F1.1 (5.6/31.9) 5.6/33 4.9/9	(5.1)	5.7/21 5.6/33 (5.6/31.9) F1.1
F1.3 (5.7/31.6) 5.7/33 5.5/7	(5.4)	5.6/21 5.8/33 (5.8/31.7) F1.4
F0.8 (5.0/32.2) 5.0/33 4.5/11	(4.7)	4.7/20 4.7/33 (4.7/32.5) F0.5

Hub beside 8th F.P. Lt. of sta on ℄ fence, 65' ±

(23-56) X-Sec. & Slope Stk

Sta.	+S	H.I.	-S	Profile Elev.	Surface Elev.	Grade Rod
B.M.	3.62	243.67		240.05		
91+00				37.8	38.5	5.7
92				37.9	38.8	5.8
93				38.0	39.0	5.7
94				38.1	38.2	5.6
95				38.2	37.0	5.5
B.M.	2.58	242.63		240.05		
New Bkt.			2.13	240.50		
96				38.28	37.0	4.35
97				38.36	37.6	4.27
98				38.44	38.3	4.2
99	℄ Roadway Right			38.52	39.8	4.1
100				38.60	39.4	4.0
Top Grade Stk T.P. 99+00	3.60	243.50	2.73	235.9 ℄ 239.90 See Curley's notes		2.73
100				38.6	39.4	4.9
101				38.68	38.9	4.8
102				38.76	39.1	4.7
103				38.84	39.2	4.7
104	3.59 new			38.92	39.9	4.6
105				39.00	39.6	4.5
106				39.08	39.7	4.4
T.P.	5.28	244.91	3.87	239.63		
107				39.16	39.75	5.75

Note:- Grade Stk for drain tile set 10' R of ℄ at 92+50 to elev. 239.00. Stk marked "Grade 4' down" OFF 4 S.M.

92+50 ℄ 10' ~~R~~ 4 S ℄ drain

Party { Deutsche, Johnson, Mahoney, Franke

℄

9-6-23
Hot. Fair

L | R

Surface Rod

RR spike Power Pl. L Sta. 92+80

5.2 (C0.7/21.7) 5.6/30 5.4/20 8.0/15 5.0/10.5 C0.7/0 4.6/5.5 5.4/11.5 5.6/18.5 5.2/22 5.6/24.5 5.3/30 (C0.7/21.7)

Reverse these X-Sec.

4.9 (C0.5/21.5) 5.2/30 5.5/25 5.2/21.5 5.9/10 C0.9/0 5.0/10.5 7.6/15.5 5.4/19.0 5.5/30 (C0.2/21.2)

4.7 (C1.3/22.3) 4.3/30 4.3/21.5 5.1/16 5.2/7.5 C1.0/0 4.5/3 5.3/10.5 7.5/15 5.5/19.5 4.8/30 (C0.1/21.1)

5.5 (C0.9/21.9) 4.6/30 4.4/25 5.4/16 5.8/4 C0.1/0 5.1/4.5 5.7/10.5 7.7/15 5.9/19 6.1/30 (F0.9/17.2)

6.7 (F0.9/17.3) 6.0/30 6.7/15 5.9/7 F1.2/0 6.2/4.5 6.1/11.5 7.7/15 6.6/19 6.6/30 (F1.1/17.7)

RR Sp. Power Pl. L Sta. 92+80

" 18" Oak 70' L Sta. 94+25

5.6 (F0.8/17.2) 5.0/30 5.5/16 4.8/7 5.1/3 F1.2/0 5.0/2.5 5.7/6.5 5.0/11.5 6.6/15 4.8/19 4.9/30 (F0.8/17.2)

5.0 (F0.5/16.8) 4.7/30 4.9/15.5 5.4/14 4.7/6 F0.7/0 4.4/10 6.3/15 4.9/19 4.7/30 (F0.8/17.2)

4.3 (F0.2/16.3) 4.1/30 4.4/13.5 4.9/11.5 4.1/3.5 F0.1/0 4.7/3 3.9/5 3.6/9.5 6.1/15 4.4/19.5 4.3/30 (F0.7/17.0)

2.8 C0.9/18.9 3.0/30 3.2/21.5) 2.8/1 C1.3/0 2.8/1 3.5/30 (C0.9/21.9)

3.2 (C1.0/19.0) 3.1/30 3.0/20 3.6/14 2.9/2 C0.8/0 4.0/10 6.0/15 4.3/19.5

Grade Stk for tile 10' R Sta 99+00

4.1 2.4/24 5.4/30 (C2.4/23.4)

4.6 (C0.6/19.6) 4.1/30 4.2/19.5 5.1/13.5 C0.2/0 5.5/11 6.8/15.5 4.7/19.5 3.8/22.5 5.3/30 (C1.0/22.0)

4.4 (C0.4/19.4) 4.2/30 4.3/19.5 4.9/13.5 4.3/3 C0.3/0 4.9/10 6.8/15.5 5.1/21 4.9/30 (F1.2/17.8)

4.3 (C0.5/19.5) 4.1/30 4.3/17 5.0/15 4.4/10 C0.4/0 5.2/10.5 6.9/15.5 5.1/18.5 5.4/30 (F0.6/16.9)

3.6 (C0.5/19.5) 4.0/30 4.4/17 4.1/12 C1.0/0 4.5/10 6.8/15 4.0/20 4.4/30 (C0.2/21.2)

4.0 (C0.6/19.6) 3.9/30 3.9/19.5 4.2/10.5 C0.5/0 4.2/11 6.5/16 4.0/20 3.5/22 4.1/30 (C1.0/22)

3.8 (C0.4/19.4) 3.9/30 4.0/19.6 4.2/13 C0.6/0 4.2/10 6.9/15.5 3.7/21.5 4.0/30 (C1.0/22)

Top stk 10' R Sta. 106

5.2 (C0.3/19.3) 5.5/19.3 5.3/30 5.8/15 C0.6/0 6.3/10 8.2/15 6.3/19.5 5.5/30 (F1.1/17.6)

(23-56) X-Sec & St. Stakes

Sta.	+S	H.I.	−S	Profile Grade	Surface Elev.	Grade Rod
		244.91				
108		Cont'd fr prec page		39.24	40.3	5.7
109				39.32	40.2	5.6
110				39.4	40.3	5.5
111				39.48	40.3	5.4
112				39.48	39.6	5.4
T.P.	1.63	245.01	1.53	243.38		
B.M.			3.73	241.28		See Carleys 241.34
B.M.	3.15	243.92		240.77		
T.P.	1.09	234.41	10.60	233.32		
60+00				31.35	28.2	3.06 D
61+00				31.75	29.2	2.66 D
62+00				32.55	30.0	1.86 A
T.P.	11.31	244.63	1.09	233.32		
63+00				33.7	38.3	10.9
T.P.			11.31	233.32		
64						

9-6-23 (8)
P.M. Cool. Fair

Party { Deutsch, Johnson, Mahoney, Franke }

Surface Rod — L — ℄ — R

4.6 (C 0.4/19.4) 5.1/30 5.2/12.5 C 1.1/0 5.0/10 8.1/15 4.8/21 4.1/30 (C 0.9/21.9)

4.7 (C 0.4/19.4) 5.1/30 5.4/17 5.1/6.5 C 0.9/0 5.1/10 7.9/16 4.6/21.5 4.8/30 (C 1.0/22.0)

4.6 (C 0.7/19.7) 4.4/30 5.0/28.5 4.9/7 C 0.9/0 5.2/11 7.7/16.5 4.7/22 4.6/30 (C 0.8/21.8)

4.6 (C 0.3/19.3) 4.5/30 5.0/28 5.6/16 C 0.8/0 5.4/10 7.5/16 4.5/22 4.7/30 (C 0.8/21.8)

5.3 (C 0.1/19.1) Sidewlk Remainder not taken 5.2/28 5.3/19 5.7/14 C 0.1/0 5.8/10 7.0/16 4.8/22.5 (0.0/21) Rest not taken a/c laying sidewlk

Top. Hydrant L Sta. 111+80
levels (run 8-28-23 no page to date - but near front of book)
Sp. Tel. pl. L Sta. 112+00
Elev. shown in blue on pole

R.R. spike Black Oak 35'R Sta. 65+30

Sp. 12" Oak 50'R Sta 62+30

6.2 (F 3.5/21.2) 6.9/33 6.8/19 8.0/15 6.4/7 6.9/3 F 3.2/0 4.4/.5 4.3/17 4.6/28.5 7.6/35.5 (F 1.1/17.6)

7.7 F 5.9/24.1 8.1/33 7.2/2 F 4.5/0 6.2/17.5 6.5/23 5.7/29 5.7/33 (F 3.9/21.7)

4.4 (F 3.1/20.7) 5.2/33 5.0/20 4.4/1 F 2.5/0 4.4/1 4.2/33 (F 2.5/19.7)

0.0/25 @ 62+47 0.0/62+42 0.0/25 @ 62+36

Sp. 12" Oak 50'R Sta. 62+30

6.3 (C 5.3/30.3) 5.6/33 5.6/26.5 6.8/23 6.6/19.5 6.6/11 5.8/7 C 4.6/0 6.3/1 6.8/33 (C 4.3/29.3)

Sp 12" Oak 50'R Sta. 62+30

Xsections + Slope stakes
28-56

Sta.	+	H.I.	−	Elev	Grade
B.M.	5.11	261.47			256.36
B.M.			3.77	257.70	
0+00 P.C.			3.1	58.4	259.10
+50			4.0	57.5	258.70
1+00			8.3	53.2	258.65
+50			8.0	53.5	258.93
2+00			6.1	55.4	259.41
T.R	8.67	267.63	2.51	258.96	
+50			3.5	60.1	260.46
3+00			5.7	61.9	260.69
3+09.7 = 1+99.1					
2+50			4.7	62.9	261.1
3			5.1	62.5	261.14
B.M.			5.57	262.06	
1 +75			6.0	61.6	
4			6.5	61.1	260.47

Party { Carley, Persons, Briggs, Eck }

9/10/23 Fair – Warm

Lt ℄ Rt

Top of monument between Silver Lake & Centreville

#336

B.M. moved to tele. pole Rt of sta 0+00 Elev = 257.70

F7.8 (9.3/28.7) 9.8/33 9.6/27 9.0/20 4.5/11 3.3/8 3.5/14 6.4/21 7.0/33 (5.7/19.6) F2.4 +.93 −.93

F7.0 (8.9/27.5) 10.0/33 9.6/29 4.3/17 4.5/7 8.7/14 10.0/27 10.0/33 (9.5/5.7) F5.8 +.93 −.93

F2.8 (4.7/20.2) 7.4/52 5.0/43 4.3/35 4.3/29 4.6/15 7.6/7 8.6/7 9.8/33 (9.7/26.0) F6.0 +.93 −.93

F4.4 (6.1/23.6) 4.8/50 5.6/40 5.7/33 6.6/15 8.8/33 (8.8/24.8) F5.2 +.93 −.93

F1.8 (3.0/18.7) 2.7/33 3.4/9 6.7/14 6.6/31 6.6/33 (6.6/21.4) F3.6 +.93 −.93

F1.8 (8.0/18.7) 7.0/33 8.3/32 7.8/22 7.6/13 6.6/15 5.9/24 6.3/33 5.C/1.4 (6.0/26.1) C1.1 +.93 −.93

C4.1 (2.8/29.1) C0.4 (6.4/15) 2.7/33 3.2/24 6.4/15 6.3/13 5.7/14 5.3/19 1.3/25 1.3/25 1.3/33 C2.1 (5.7/15) (1.3/30.6) C5.6 +.93 −.93

Equation station – P.T. of 29° curve. +.81 −.81

3.7/33 3.7/27 4.4/14 4.9/12 5.5/12 5.9/15 4.2/33 +.30 −.30

C1.6 (4.9/26.6) C1.7 (5.2/15) 4.4/33 4.9/26 5.2/15 5.6/12 5.4/10 5.9/15 5.7/30 5.7/33 C0.1 (6.0/15) C0.1 (5.8/25.7) +.10 −.10

Nail in 24″ tree 40′ Lt of sta 3+45 set Sept. 10-1923

7.1/33 7.1/28 6.8/14 6.6/11 6.3/9 6.8/14 6.9/30 6.9/33

C1.3 (5.8/26.3) 5.7/33 5.7/16 6.7/13 6.9/10 7.1/15 5.5/17 4.6/33 (4.6/27.5) C2.5

Xsections + Slope stakes
23+56

Sta	+	H.I.	−	Elev	Grade
B.M.	2.77	264.83			262.06
5			5.4	59.4	58.9
+35			6.3	58.5	
6			7.0	57.8	57.2
+61			8.5	56.3	
7			9.5	55.3	55.5
TP	3.63	257.97	10.49	254.34	
8			4.3	53.7	53.8
B.M.	3.06	258.06	3.06	254.91	255.00
+29			4.8	53.3	
9			6.8	51.3	52.1
10			8.3	49.8	50.4
+47			9.1	49.0	
11			10.3	47.8	49.0
TP	9.32	252.30	10.08	247.98	

9/12/23 Fair-cool

Party { Carley, Parsons, Briggs, E.K.

Lt ℄ Rt

Nail in 24" oak Lt at 3+45

(5.4)

0.0 (5.9/25.0) 6.6/33 5.9/29 5.8/14 5.8/7 | 5.7/10 6.4/13 7.5/33 (7.1/23.8) F1.2

(6.3)

6.8/33 6.2/28 5.5/17 6.5/15 6.7/11 | 6.7/11 7.2/16 6.6/18 7.9/33

(7.0)

C1.0 (3.6/29.0) 3.7/33 3.5/27 4.5/18 7.6/12 | 7.6/11 7.9/14 4.7/19 6.1/33 (5.4/27.2) C2.2

(8.5)

9.2/33 8.8/28 8.2/16 9.1/14 9.0/11 | 9.2/13 9.4/17 9.7/29 10.3/33

(9.5)

F1.6 (10.9/23.4) 11.5/33 11.1/27 9.7/11 | 10.0/10 10.5/13 11.7/28 12.4/33 (10.3/24.0) F1.0

(4.3)

F0.6 (4.8/24.4) 5.1/33 5.1/26 4.7/24 5.3/15 4.8/11 | 4.9/10 5.3/12 5.6/19 3.5/22 2.7/26 3.8/33 (2.8/26.4) C1.4

Nail in tele pole 28' Rt of Sta 7+75

4.3/33 4.3/24 5.3/13 (4.8) 5.3/12 5.8/16 0.9/25 0.2/31 0.3/33

(6.8)

F2.6 (8.5/19.9) 8.9/26 8.5/24 8.5/15 7.3/11 | 7.1/10 7.6/15 6.5/28 6.3/31 6.3/33 (6.3/24.6) C0.9

(8.3)

F0.6 (8.2/24.4) 8.3/33 8.3/27 8.7/18 9.2/15 8.6/11 | 8.6/10 9.5/15 7.8/18 8.1/29 8.1/33 (7.4/25.7) C0.2

(9.1)

9.1/33 9.1/17 9.7/15 9.7/12 | 9.4/10 10.1/15 9.3/17 9.9/28

(10.3)

C0.1 (8.9/25.1) 8.5/33 9.5/27 10.0/17 10.7/12 | 10.8/10 11.4/12 12.1/28 12.1/33 (11.8/20.9) F2.8

Sta	+	H.I.	−	Elev	Grade
		252.30			
12			6.2	46.1 16.1	48.2
13			6.5	45.8 15.8	48.0
	46.7		5.6	46.7 16.7	
14			5.0	47.3 17.3	48.4
	BM		2.89		249.41 ✓
15			4.1	48.2	49.1
16			2.2	50.1	49.8
	TP	7.74	1.95 ✓	250.35 ✓	
	4+50		6.4	51.7	
17			5.7	52.4	50.5
	4+50		5.2	52.9	
18			4.7	53.4 ✓	51.0 ✓
	B.M.		4.42	251.47 ✓	(251.40)

Lt ℄ Rt

(6.2)

F3.0 (7.1/20.5) 7.6/33 7.1/23 7.5/14 6.5/11 6.6/11 7.2/15 7.4/28 7.9/33 (7.3/20.8) F3.2

(6.5)

F4.4 (8.7/22.6) 10.1/33 9.3/29 9.0/24 8.4/15 6.7/10 6.8/10 7.7/16 8.9/29 [illegible]/33 (8.7/22.6) F4.4

(5.6)

7.1/33 7.1/24 7.4/22 6.8/19 7.0/14 6.0/7 6.2/11 6.3/15 5.8/16 4.7/24 5.7/33

(5.0)

F2.9 (5.9/19.0) 6.4/33 6.6/22 5.8/20 5.8/17 6.3/15 5.5/12 5.6/14 2.8/16 3.1/27 3.9/30 (2.9/26.0) C1.0

On S.W. corner of top conc. step on house 120' Left of 14+75

F2.0 (5.2/19.0) 5.5/33 5.2/18 5.7/15 5.7/12 4.6/10 (4.1) 4.4/10 5.1/15 4.1/21 4.5/33 (3.9/24.3) F0.7

(2.2)

F1.2 (3.7/23.8) 3.7/33 3.0/22 3.0/18 3.5/14 2.4/11 2.4/10 2.7/13 2.7/18 1.9/21 1.9/33 (1.9/21.6) F0.4

(6.4)

5.7/33 5.7/24 6.1/19 6.6/12 6.7/14 3.4/19 4.2/33

(5.1)

C4.6 (3.0/29.6) 2.8/33 3.2/24 3.4/19 6.0/12 6.0/11 2.6/17 0.0/19 0.5/28 0.6/33 (0.6/32.0) C7.0

(5.2)

3.1/33 3.1/27 2.6/18 5.5/11 5.2/11 (25 9.1/20) (25 9.1/33)

(4.7)

C2.3 (4.8/27.3) 4.8/33 4.8/28 4.5/23 4.9/12 5.0/10 0.4/17 0.7/33 (0.9/31.2) C6.2

Nail in power pole Lt 22+60

X sections & Slope st[illegible]
23-56

Sta	+	H.I.	−	Elev	Grade
B.M.	10.90	244.22			233.32
63+50			3.8	40.4	34.3
64			4.4	39.8	34.9
64+48.5 E.C.			4.3	39.9	35.5
T.P.	4.15	244.48	3.89	240.33	
65			4.7	39.8	36.1
T.P.	4.84	244.59	4.73	239.75	
66			4.8	39.8	37.3
67			4.7	39.9	38.4
68			5.0	39.6	39.2
69			4.9	39.7	39.8
T.P.	4.28	244.59	4.28	240.31	
70			4.8	39.8	40.1
71			4.5	40.1	40.3
72			5.5	39.1	40.5
73			4.6	40.0	40.7
74			4.4	40.2	40.8
B.M.			5.09	239.50	239.50

9/4/23 Fair - Warm

Lt ℄ Rt

Nail in 12" Oak 30' R 62+30

(3.6)

c6.4 (3.5/31.4) 3.5/40 3.5/33 4.5/15 4.3/35 4.5/33 4.6/40 (4.4/30.5) c5.5

(4.4)

c5.1 (4.2/30.1) 4.2/25 (3.3) 4.2/25 3.7/13 4.9/27 4.9/41 (4.9/29.4) c4.4 ℄ c.4.9

(4.3)

c4.2 (4.5/29.2) 4.5/33 4.9/20 4.8/12 4.9/33 (4.9/28.8) c3.8

(4.7)

c3.4 (4.9/30.4) 4.9/33 4.9/25 4.7/43 4.6/33 (4.6/30.7) c3.8 ℄ c.3

(4.8)

c2.2 (5.1/29.2) 5.1/33 5.1/14 4.5/10 5.3/33 (5.2/29.1) c2.1 ℄ c2.5

(4.7)

c1.3 (4.9/26.3) 5.0/33 4.3/15 4.1/12 5.1/33 (5.1/26.1) c1.1 ℄ c1.5

(5.0)

c0.5 (4.9/25.5) 5.0/33 4.4/14 4.7/14 5.6/33 (5.4/25) 0.0 ℄ c.0.7

(4.8)

F0.4 (5.3/24.6) 5.3/33 4.6/13 4.6/15 5.5/33 (5.3/24.5) F0.5 ℄ F0.1

Grade

(4.8)

4.5 F0.8 (5.3/24.2) 5.2/33 4.3/12 4.2/16 5.5/33 (5.1/24.4) F0.6 ℄ F0.3

(4.5)

F0.8 (5.1/24.2) 5.2/33 5.0/20 4.5/13 4.0/16 5.1/33 (4.8/24.5) F0.5 F0.2

(5.5)

4.1 F1.5 (5.6/23.5) 5.5/33 4.9/18 5.1/18 5.7/33 (5.5/23.6) F1.4 F1.4

(4.8)

3.9 F1.1 (5.0/23.9) 5.0/33 4.2/7 4.3/18 5.4/33 (4.8/24.1) F0.9 F0.7

(4.4)

F0.8 (4.6/24.2) 4.6/33 3.8/8 3.7/20 4.5/33 (4.2/24.6) F0.4 F0.6

Hub beside 8th L.p. Lt of sta 77+50 On X fence 65' Lt

Xsections + slope stakes

Sta	+	H.I.	−	Elev	Grade
B.M.	1.69	235.01			233.32
59+77			5.1	29.9	
59+72			5.0	30.0	
59+50			5.0	30.0	31.3
59+34			5.2	29.8	
59+26			5.2	29.8	
59			5.3	29.7	31.3
B.M.			3.47	231.54	231.57

Party { Carley, Parsons, Briggs, Eck

9/10/23 Cloudy – Cool P.M.

Lt ℄ Rt

Sp. in 12" oak 30' Lt of ℄ @ 62+30

(5.1)

7.8/33 7.8/30 8.3/25 7.5/21 6.8/8 5.2/4 5.3/22 8.4/30 8.4/33

(5.0)

5.7/33 5.6/17 5.1/20 8.7/30 8.7/33

(5.0)

F0.8 (4.9/17.2) 5.0/33 5.4/16 8.9/26 8.9/33 (9.1/25.7) F5.8

(5.2)

5.4/33 5.6/24 5.5/13 8.9/26 8.9/33

(5.2)

8.0/33 7.4/25 5.8/20 5.5/12 8.8/21 8.8/33

(5.3)

F4.0 (7.9/22.0) 8.2/33 8.1/27 7.6/19 5.4/13 5.5/10 8.2/19 8.6/23 8.6/33 (8.9/25.1) F5.4

5" cedar 25' Lt of 57+35

X sections + Slope st[illegible]

Sta	+	H.I.	−	Elev	Grade
B.M.	3.34	234.93 ✓			231.59 ✓
					31.3
58 + 31.7 P.I.			5.1	29.8 •	31.3
58			5.1	29.8 •	31.3
57 + 50			5.1	29.8 •	31.3
57			4.7	30.2 •	31.3
56 + 50			4.5	30.4 •	31.3
56 + 32.7 P.C.			4.3	30.6 •	31.3
56 + 15.47 P.T.			4.1	30.8 •	31.3
56			3.9	31.0 •	31.3
55 + 50			3.1	31.8 •	31.3
55			2.3	32.6 (32.7 •)	31.3
T.P.	3.73	236.15 ✓	2.51	232.42 ✓	

Party: Cayley, Pressass, Briggs, Eck

9/11/23 Fair - Warm

(20)

Lt ℄ Rt

5" Cedar 25' Lt of Sta 57+30

(5.1)

F3.0 (7.3/20.5) 7.4/33 7.3/20 5.4/16 5.4/7 7.9/19 5.5/27 9.0/33 (8.2/22.3) F4.2 +0.7 −0.7

(5.1)

F3.5 ~~F1.3~~ (6.8/21.7) 6.7/33 6.6/23 5.3/20 5.3/5 7.1/11 8.8/33 (8.1/22.6) F4.4 +0.9 −0.9

(5.1)

F0.8 (5.2/17.2) 5.1/33 5.1/19 5.3/5 7.7/16 7.6/23 9.1/33 (8.1/22.6) F4.4 +0.9 −0.9

(4.7)

F0.8 (5.4/20.2) 5.2/33 5.2/29 5.1/20 4.9/5 6.6/11 7.7/19 8.8/33 (8.3/25.4) F5.6 +0.9 −0.9

(4.5)

F0.3 (4.8/20.7) 3.3/33 4.1/25 4.8/23 4.9/5 5.5/7 6.8/22 8.2/27 8.7/33 (6.7/20.5) F3.0 +0.9 −0.9

(4.3)

2.8/33 3.4/24 4.8/21 4.7/6 6.5/23 7.9/27 7.9/33

(4.1)

2.6/33 2.9/24 4.6/20 4.3/6 6.4/24 8.0/28 8.1/33

(3.9)

F0.7 (4.1/20.3) 1.8/33 2.1/25 4.2/21 4.1/5 3.9/8 5.8/23 8.0/28 8.3/33 (5.6/19.9) F2.6 +0.6 −0.6

(3.1)

C2.9 (0.8/23.9) 0.2/33 0.7/23 3.4/18 3.3/6 2.8/7 4.1/18 6.2/30 7.5/33 (3.2/15) F0.2 +0.6 −0.6

(2.3)

C3.0 (0.8/24.0) 0.5/33 0.9/19 2.6/16 2.8/10 3.7/26 3.6/33 (2.8/15) C0.2 +0.6 −0.6

9/12/23 Xsections + slope stakes

Sta	+	H.I.	−	Elev.	Grade
	3.73	236.15 ✓			
54+50			3.5	32.7 ·	31.3
				32.1	
54			4.1	(32.2)	31.3
53+50			4.6	31.6 ·	31.3
53			5.3	30.9 ·	31.3
52+74.7	P.T.		5.4	30.8 ·	✓
B.M.	3.29	235.38 ✓	4.10	232.05 ✓	(232.09)
52+50			4.8	30.6	31.3
52			4.5	30.9	31.3
51+50			4.2	31.2	31.3
51			4.5	30.9	31.3
50			5.6	29.8	31.3
49			5.3	30.1	31.3
47+78.6 = 47+879					31.3
48			5.3	30.1	

Party (Cooley / [illegible] / Briggs / Eck.)   Fair-Cold

℄   Rt

(3.5)
C3.6 / 23.6 | 1.8/33 | 1.7/19 | 4.0/14 | 4.0/12 | 3.2/13 | 5.0/30 | 5.7/33 | (3.1/15) C1.4 Shoulder

(4.1)
C1.6 (4.8/22.6) | 3.2/33 | 3.3/30 | 4.3/11 | 4.3/12 | 5.5/17 | 4.9/24 | 6.3/33 | (4.9/25) 0.0

(4.6)
C1.3 (4.0/22.3) | 3.3/33 | 4.2/19 | 5.0/14 | 5.3/11 | 6.3/16 | 5.7/22 | 6.8/33 | (5.7/24.2) F0.8

(5.3)
F0.6 (6.0/20.4) | 4.9/33 | 5.6/17 | 6.3/10 | 7.1/12 | 7.0/15 | 5.9/17 | 6.4/26 | 8.3/33 | (6.3/23.6) F1.4

(5.4)
6.2/33 | 6.6/23 | 5.9/21 | 5.8/5 | 7.4/10 | 8.2/24 | 9.2/31 | 9.7/33

Sp. in 12" Brook 30' R of ℄ to 51+30

(4.8)
F0.8 (4.9/20.2) | 5.4/33 | 5.4/30 | 5.7/25 | 4.9/22 | 4.7/9 | 4.2/14 | 5.1/21 | 8.9/33 | (5.7/23.4) F1.6

(4.5)
F0.5 / 20.2 | 5.1/37 | 5.4/25 | 5.0/22 | 4.7/5 | 5.4/9 | 4.3/12 | 5.7/21 | 8.0/28 | 8.9/33 | (6.0/23.1) F1.9

(4.2)
C1.4 (2.9/22.4) | 2.5/33 | 2.5/30 | 2.9/20 | 4.5/18 | 4.4/12 | 5.5/22 | 8.2/30 | 8.5/33 | (5.5/23.6) F1.4

(4.5)
C3.0 (1.1/24.0) | 0.5/33 | 1.7/15 | 5.0/10 | 4.7/22 | 4.7/27 | 4.0/30 | 3.7/33 | (4.5/24.0) F0.7

(5.6)
F1.5 (5.6/23.5) | 4.8/33 | 6.2/12 | 6.0/25 | 7.3/33 | (5.7/23.4) F1.6

(5.3)
F5.1 (9.2/24.7) | 9.8/33 | 8.7/13 | 5.7/6 | 5.7/16 | 8.7/22 | 9.7/33 | (9.1/24.5) F5.0

(5.3)
F4.8 (8.9/24.2) | 8.9/33 | 8.7/21 | 5.7/14 | 6.3/10 | 9.0/16 | 9.7/24 | 10.3/33 | (9.9/23.7) F5.8

Sta	+	H.I.	-	Elev	Grade
		235.38 ✓			
TP.	5.40	235.53 ✓	5.25	230.13 ✓	
47			10.6	24.9 •	31.3
	+50		10.3	25.2 •	31.3
46			6.5	29.0 •	31.3
	+50		5.0	30.5 •	
45			9.3	31.3 •	
TP1	4.43	235.81 ✓	4.15	231.38 ✓	
44			4.5	31.3 •	
43			4.5	31.3 •	
	+50		4.5	31.3 •	
BM1			3.35	232.46 ✓	232.46
42			4.5	31.3 •	
41			4.7	31.1 •	
40			5.7	30.1 •	
TP1	4.77	235.08 ✓	5.50	230.31 ✓	

Left Grade Elev 31.3

L R+

10.9

F2.0 (5.7 / 19.0) 5.2 / 33 6.3 / 10 11.5 / 33 (11.6 / 26.9) F6.6

10.3

F2.0 (5.2 / 19) 4.8 / 44 4.5 / 33 4.8 / 16 11.5 / 27 (11.3 / 36.3) F6.2

6.5

F1.0 (4.4 / 24.0) 7.3 / 33 5.0 / 29 5.4 / 2 8.1 / 11 11.9 / 33 (10.4 / 25.1) F3.1

5.0

7.1 / 28 5.0 / 24 4.4 / 13 8.8 / 8 10.7 / 33

4.2

6.0 (4.2 / 25.0) 3.6 / 33 4.3 / 23 6.4 / 19 5.9 / 13 5.0 / 10 5.0 / 15 5.6 / 18 6.4 / 29 7.8 / 33 (6.0 / 23.2) F1.8

4.5

F1.4 (5.9 / 23.6) 5.8 / 33 5.4 / 20 4.4 / 15 4.7 / 6 5.3 / 7 6.0 / 16 4.8 / 20 8.8 / 33 (5.9 / 23.6) F1.4

4.5

F1.0 (3.5 / 24.0) 6.3 / 33 4.3 / 17 4.7 / 5 5.5 / 9 4.7 / 14 9.0 / 27 9.5 / 33 (6.7 / 19.3) F2.2

4.5

6.4 / 33 5.7 / 17 4.7 / 14 4.9 / 8 5.7 / 10 5.8 / 14 4.6 / 18 8.7 / 32

Nail in Power pole 29' Lt of sta 42+90

F3.0 (4.5 / 19.0) 6.9 / 33 5.9 / 17 5.0 / 12 4.7 / 10 5.4 / 13 3.9 / 18 8.4 / 33 (6.0 / 23.5) F1.5

4.1

F2.0 6.5 / 19.0 5.5 / 33 6.9 / 23 5.8 / 15 5.1 / 12 5.3 / 10 8.5 / 25 10.0 / 33 (6.7 / 19.3) F2.2

5.1

F3.4 (7.9 / 21.1) 8.0 / 33 8.0 / 29 5.7 / 15 6.2 / 5 6.7 / 8 11.2 / 33 (10.3 / 28.7) F5.1

Sta	+	HI	−	Elev	Grade
	4.77	235.08 ✓		29.8	
39			5.7	29.7	
E.C. +342			5.0	30.1	
38			4.8	30.3	
37			4.8	30.3	
T.P.	4.49	234.64 ✓	4.93	230.15 ✓	
36			4.8	29.8	31.3
35 P.C. +38.9			4.8	29.8 ✓	
B.M.			7.95	RR 6.69	

Lt Lt Rt

(6.3)

F5.8 (9.6 / 25.7) 10.9/33 9.5/14 5.6/8 5.9/12 7.5/17 9.6/33 (8.6 / 24.2) F4.8

(5.0)

9.0/33 8.7/14 5.5/11 5.3/10 6.9/15 5.3/21 8.3/33

(4.8)

F3.8 (7.6 / 21.7) 8.9/33 7.3/19 5.4/13 5.1/7 6.6/11 6.8/17 5.5/20 6.7/27 8.5/33 (5.8 / 19.0) F2.0

(4.8)

8.5/33 6.8/21 7.4/18 5.3/11 5.3/10 7.0/13 7.4/18 5.6/22 6.1/27 8.3/33 (5.7 / 23.1) F1.9

(4.8)

F4.8 (9.1 / 20.7) 9.1/33 9.1/23 5.5/13 5.1/11 7.1/15 7.3/19 5.8/23 7.6/28 8.5/33 (5.7 / 23) F2.1 ditch

(4.1)

8.3/33 8.7/19 5.0/12 5.5/10 8.3/15 8.9/33

Nail in tele. pole 40' Lt of sta 35+34

Transit Notes

Sta.	Defl. Angle Left	Right
36+91.2	P.I.	
35+00		
33+10.3	P.T.	
	40°-40'	
31+96.5	P.I.	
Sta 30-31 = Long Sta. 101.5'		
Prel. Sta 30+71.4 =		
New 30+72.5 =	P.C.	
26+17.4	P.T.	
		28°-30'
23+38.5	P.I.	
20+47.4	P.C.	
17+00		

EQUATION

Party { Deutsche, Johnson, Mahoney, Franke }

9-13-23
Cool. Fair

(24)

T.P. (Nail)

39.5'

18.7'

Nail tree.

Sta.	Defl.	Dist
+10.3	20°20'	10.3
33+00	19°27	100
32+00		100
31+00	10°57	100
30+71.1	2°27'	28.9

Δ = 40°40'
D = 17°00'
S.T. = 125.4'
L = 239.2'

8" Oak

36.8

44.9

Cloth tape

10" Oak

Ph. pl. — will probably be moved.

Nails 10" Box Elder

38.5

R.R. spike

Δ = 28°30'
D = 5°20'
S.T. = 291.1
L = 570.0

46.0

Tack Hub Flush with Grd

Sta.	Dist.	Cor.	Defl.
+17.4	17.4	17.4	14°45
26+00		[illegible]	13°49
+50	50	[illegible]	12°34
25+00	50	[illegible]	11°19
+50	50	[illegible]	10°04
24+00	50	[illegible]	8°49
23+00	100	100	6°19
22+00	100	100	3°49
+50	50	50.02	2°34
21+00	50	50.02	1°19'
20+47.4	52.6	52.62	

23-56		X-Sec &	Slope Stake	Profile Grade	Grade Elev.
Sta.	+S	H.I.	-S		
B.M.	7.54	258.94		251.40	Surface Elev.
19+00				51.24	53.1 7.70
20+00				51.12	51.9 7.82
20+47.5				50.9	51.4 8.0
21				50.66	50.7 8.28
+50				50.3	50.2 8.6
22				49.87	49.6 9.1
23				48.76	54.9 10.2
24				47.32	51.9 11.6
B.M.	6.73	258.13		251.40	
24				47.32	51.9 10.81
B.M.			6.73		
B.M.	5.06	256.46		251.40	
24+50				46.6	49.3 9.9
25+00				45.54	44.4 10.9
+50				44.6	42.0 11.9
26+00				43.43	44.3 13.0
+75				41.5	48.0 15.0
T.P.	0.09	247.34	9.21	247.25	
+90				41.1	46.8 6.2
27+00				41.0	44.3 6.3
28+00				38.4	39.3 8.9
29+00				35.82	35.9 11.5
T.P.	0.12	235.91	11.55	235.79	
30+00				33.73	32.6 2.2
+71				31.4	30.6 4.5

Party { Deutsche, Johnson, Mahoney, Franke

℄ 9-13-23 Cool-Fair (35)

L R

Surface Rod

Sp power pole L Sta. 22+60

Surface Rod	Left	Center	Right
5.8	(C 1.0/26.0) 6.3/33 6.8/25 6.1/10.5	C 1.9/0	6.3/10 4.3/17 5.2/21.5 5.6/33 (C 2.3/27.3)
7.0	(DC 1.4/24.4) 9.0/33 8.8/23 7.4/14	C 0.8/0	7.4/10 8.1/13 5.6/17.5 6.4/27 5.7/31 5.9/33 (C 1.5/26.5)
7.5	(DC 0.8/23.8) 9.3/33 9.2/17.5 8.0/11.5	C 0.5/0	8.0/10 8.3/12 4.6/17 4.7/33 (C 2.8/27.8)
8.2	(DC 0.5/23.5) 10.1/33 9.6/16.5 8.7/13	C 0.1/0	8.8/10 9.1/12 8.6/14.5 9.3/27 9.3/30.5 8.4/33 (DC 1.3/24.3)
8.7	(DC 0.4/23.4) 10.1/33 10.1/21 8.8/15	F 0.1/0	8.7/6 11.0/20 10.7/33 (F 2.1/19.1)
9.3	(DC 1.9/24.9) 9.1/33 9.2/23.5 8.8/21 8.6/11	F 0.2/0	9.1/10.5 12.5/17.5 12.6/23.5 11.9/29-33 (F 3.8/21.7)
4.0	(C 2.0/27.0) 8.4/33 8.1/28.5 8.9/14.5 4.5/9.5	C 6.2/0	3.5/6 4.8/33 (C 5.7/30.7)
7.0		C 4.6/0	5.8/19 4.9/33✓

Sp. Power Pl. L Sta. 22+60

Surface Rod	Left	Right
6.2	(C 4.4/29.4) 6.4/33 6.5/25 7.3/15	4.1/33✓ 4.0/40 (C 6.8/31.8)

Sp. Pr. Pl. L Sta. 22+60

{ Start 9-14-23, Cool Fair, Same Party as above

Sp. Power pole L Sta. 22+60

Surface Rod	Left	Center	Right
7.2	(C 2.8/27.8) 6.7/33 7.8/16.5	C 2.7/0	6.7/11.5 7.3/27 7.0/33 (C 2.6/27.6)
12.1	(DC 1.0/24.0) (F 1.1/17.6) 11.2/33 12.5/12	0.0/24+8.5, F 1.2/0	12.1/1 12.9/33 (F 1.3/18.0) (DC 0.3/23.3)
14.5	(DC 0.7/23.7) (F 1.6/18.4) 12.5/33 14.5/1	F 2.6/0	0.0/25+91 15.4/22 15.1/33 (F 3.2/20.8)
12.2	(C 5.2/30.2) 7.4/33	C 6.8/0	13.0/17 13.2/33 (0.0/16) (DC 1.5/24.5)
8.5	(C 3.5/28.5) 12.9/33 10.5/25	C 6.5/0	8.5/1 9.8/33 (C 5.4/30.4)

Top stump 2'L Sta. 26+90

Surface Rod	Left	Center	Right
0.5	(C 2.1/27.1) 4.6/33 3.9/18 2.4/14 2.5/7.5 0.8/3	C 5.7/0	0.3/26.5 0.6/33 (C 5.9/30.9)
3.0	(C 1.1/26.1) 5.1/33 4.6/11 3.6/8	C 3.3/0	1.6/4 1.0/22.5 1.4/33 (C 5.0/30.0)
8.0	(C 0.6/25.6) 9.7/33 8.0/19.5 8.5/17.5	C 0.9/0	8.0/1 7.0/33 (C 1.6/26.6)
11.4	(F 1.5/18.2) (DC 0.2/23.2) 13.3/33 12.8/12.5 11.5/8	C 0.1/0	11.7/13 11.2/15 10.5/33 (C 1.1/26.1)

Top stk L Sta. 29+25

Surface Rod	Left	Center	Right
3.3	(DC 0.5/23.5) (F 1.2/17.8) 3.4/33 3.7/25 3.4/21	F 1.1/0	3.5/14 3.1/15.5 3.9/33 (F 1.0/17.5) (DC 0.9/23.9)
5.3	(F 1.5/18.1) 7.1/33 6.8/21 5.5/12	F 0.8/0	5.3/11 8.4/18 6.5/24 6.3/33 (F 3.3/20.9)

23-56 X-Sec. & Slope Stakes

Sta.	+ S	H.I. 235.91	- S	Profile Grade	Grade Rod.
31+00		Contd fr prev pg.		32.27	30.1 3.6
31+90					30.0
32+00				31.47	29.9 4.4
33+00				31.3	29.7 4.6
34+00				31.3	29.8 4.6
35+00				31.3	29.7 4.6
BM.			0.26	235.65	Plan elev. 235.69
	0.26	235.95			
T.P.	2.50	234.63	3.82	232.13	
35+00				31.3	29.7 3.3
BM.			8.04	226.59	226.69

Party { Deutsche, Johnson, Mahoney, Franke }

℄

9-14-23
Cool. Windy (36)

L | R

					℄				
5.8	(F 2.6 / 22.9) 19' shldr	6.4/33	6.5/18		F 2.2 / 0			6.0/33	℄ Priv entr. Rt. (F 2.2 / 19.3)
5.9		10.4/33	9.6/17	7.0/12	5.9/0	6.1/16	6.8/33		" " " "
6.0	20' shldr (F 6.2 / 29.3)	10.7/33	9.8/16.5	7.0/11	F 1.6 / 0	6.7/18	7.7/22.5	8.5/33	(F 2.5 / 19.7)
6.2	19' shldr, 10% shrk (F 6.0 / 27.2)	9.8/33	9.6/18	6.5/14	F 1.6 / 0	6.3/6	9.7/12	11.1/33	(F 6.8 / 26.3) ← 10% shrink
6.1	17' shldr, 10% shrk (F 5.7 / 24.8)	10.5/33	9.4/17.5	6.4/11.5	F 1.5 / 0	6.6/10	10.3/15	11.0/33	(F 5.4 / 24.4) ← " " ← A/c culv fill (X-Sec to orig. grd.)
6.2					F 1.6 / 0	6.3/9	10.0/15	11.1/33	(F 6.8 / 26.3) " "

Nail power pole - 36' L Sta. 29+30

	" "	"	"	"	"	"
4.9	17' shldr, 10% shrk. (F 6.9 / 26.4)	9.9/33	9.1/17	5.4/12		

Sp. Power P. 40' L Sta. 35+25 (Established by Corley)

23-56 X-Sec at Plus Stations Hereto for ommitted

Sta.	+ S	H.I.	− S		
B.M.	8.40	235.09		226.69 (By Carlow)	
35+85					30.0
36+50					30.1
37+50					30.4
38+50					30.2
T.P.	4.96	235.23	4.82	230.27	
39+50					30.3
40+14					30.3
40+50					30.6
41+50					31.3
T.P.	5.05	236.19	4.09	231.14	
42+50					31.3
43+50					31.7
T.P.	6.94	237.92	5.21	230.98	
49+55					30.1
50+50					30.4
B.M.			5.78	232.14	Plan elev. (232.04)
51+25					31.2

Party { Deutsché / Johnson / Mahoney / Franke

9-15-23
Cool - Windy

27

L R

Sp. Fw. R. 40'L Sta. 35+25 (Estabd. by Carley)

✓ 10.0/33 9.1/19 6.0/13 5.1/0 5.3/7 7.5/15 8.9/33

✓ 9.9/40-33 8.2/21 5.9/15 5.0/0 5.1/12 7.0/16 7.0/24 5.5/27 7.7/33 9.9/45

✓ 8.0/45 6.7/33 5.5/24 7.1/21 6.9/14 5.7.2/10 4.7/0 4.9/10 6.6/13 6.7/20 5.4/23 5.9/29 7.7/33 10.3/40 11.7/55

✓ 10.0/33 8.8/15 5.6/10 4.9/0 5.1/7 6.8/12 7.0/18 5.5/22 5.6/27 7.8/33 10.0/40 10.9/45

Top stump 20'R Sta 38+55

✓ 9.3/33 7.8/15 5.3/10 4.9/0 5.2/11 6.9/15 6.9/17 5.8/20 6.0/23 8.6/30 9.6/33 10.4/40

✓ 7.8/33 7.2/17 5.1/13 4.9/0 5.3/5 7.3/10 10.0/29 10.3/33

✓ 8.2/33-29 6.8/24 6.7/15 4.7/11 4.6/0 5.1/8 6.2/11 5.8/15 6.5/21 6.3/25 8.9/33 10.1/40

✓ 7.1/33 6.9/25 5.7.4/20 5.2/14 4.5/11 3.9/0 4.1/10 5.1/13 5.2/22 7.6/33 10.1/45

Top stump - 20'R Sta. 41+90

✓ 7.0/35 5.9/17 5.6/14 4.9/0 5.2/7 6.1/10 6.1/14 5.1/17 8.4/28 11.1/45

✓ 2.9/35 2.9/30 6.0/24 5.7/13 4.7/10 4.5/0 5.2/11 6.2/13 6.2/24 5.8/26 7.7/33 9.5/45

Top pk. peg. in grd. 20'R Sta. 46+50

✓ 12.2/33 11.7/14 7.9/7 7.8/0 8.3/19 10.8/27 11.5/33 12.1/40

✓ 7.4/33 4.4/19 7.8/14 7.5/0 7.9/26 6.8/30 7.2/33 7.9/40 11.0/50

Sp 12"B.Oak. 30'R - Sta. 51+30 (Let 'er go!)

✓ 3.8/33 4.3/18 7.0/13 6.7/0 7.3/24 8.3/33 11.4/45

23-56 Grade Stakes

Sta.	+ S	H.I.	- S	Profile Grade	Grade Rod 13'L & R
BM.	2.35 ✓	242.40		240.05	
85+33				37.6	4.8
+50				37.5	4.9
86+00				37.43	4.97
+50				37.41	4.99
87+00				37.40	5.00
+50				37.45	4.95
88+00				37.50	4.90
+50				37.55	4.85
89+00				37.6	4.80
+50				37.65	4.75
BM.			2.35	240.05	

Party { Deutsche, Johnson, Mahoney, Franke

9-15-23
Cool-Windy (28)

Sp. Power Pl. 21'L Sta. 92+80

Quit 12:35 Saturday

XR Sp. power pl. 21'L Sta. 92+80

(23-56) Grade Stakes

Sta.	+S	H.I.	-S	Profile Grade	Grade Rod B'L & R
T.P.	9.82	243.14		233.32	
63+00				33.7	9.4
+50					
64+00				34.9	8.2
+50					
65+00				36.1	7.0
+50					
66+00				37.3	5.8
+50					
67+00				38.4	4.7
+50					
68+00				39.2	3.9
T.P.			9.82		

Party { Deutsche, Johnson, Franke, Mahoney

℄ Rod.

9-19-23 . Warm Fair

(29)

L R

Sp. 12" Oak 50'R Sta. 62+30

9.9 Fo.5

8.2

8.0 C 0.2

7.6

7.6 F 0.6

6.8

6.4 Fo.6

5.8

5.3 Fo.6

5.0

4.2 Fo.3

Sub. grade stakes 23-56

Sta.	+	H.I.	−	Elev	Sub. Grade
	5.82	245.32			239.50
70					39.7
71					40.1
72					40.3
73					40.5
74					40.6
75					40.5
76					40.3
77					40.1
78					39.9
B.M. 78+74.6 = B.S.T.	4.88	244.38	5.82	239.50	
79					39.7
+50					39.58
80					39.45
+50					39.27
81					39.1
+50					38.87

See Revision on Succeeding pages

Party (Farley, Parsons, Briggs, Eck)

9/21/23 - Fair - Warm

Grade Book

Hub beside Ford post Lt. of Sta 77+50

5.4

5.0

4.8

4.7

4.8

5.0

5.2

5.4

	S.E.
4.7	+0.1 -0.2
4.8	+0.1 -0.3
4.9	+0.1 -0.4
5.1	+0.1 -0.1
5.3	+0.1 -0.1
5.5	+0.4 -0.4

Sta	+	H.I.	−	F/ev	Grade
		244.38			
82					38.65
+50					38.48
82+71.8 = E.S.E.					
82+83.5 = B.S.E.					
83					38.6
+50					38.33
84					38.1
+50					37.9
85					37.7
T.P. +50	5.50	242.39	7.49	236.89	37.89
86					37.43
+50					37.4
86+83.2 = E.S.E.					
B.M.	2.82	242.87	2.31	240.08	240.05
87					37.4
88					37.6
89					37.6
90					37.7
91					37.8

See Revision on Succeeding pages

Grade Rod:

	S.E
5.8 ✓	+0.1 −0.3 ✓
5.7 ✓	+0.1 −0.7 ✓
5.9 ✓	+0.1 −0.1 ✓
6.1 ✓	+0.1 −0.3 ✓
6.3 ✓	+0.4 −0.4 ✓
6.5 ✓	+.65 −.65 ✓
6.7 ✓	+0.65 ✓ −0.65
5.10 ✓ ✓	+0.4 ✓ −0.4
5.0 ✓ ✓	+0.2 ✓ −0.2
5.10 ✓	+0.1 −0.1

Nail in tele pole Lt of sta 92+80

set

5.12 ✓

5.11

Sta	+	H.I.	−	Elev	Grade
		242.87			
92					37.7
93					38.0
94					38.1
95					38.2
96					38.3
97					38.4
98					38.5
99					38.6
100					38.7
T.P.	4.76	243.50	4.13	238.74	
101					38.8
102					38.9
103					39.0
104					39.1
105					39.2
106					39.3
107					39.4
108					39.5
109 T.P.	5.10	244.56	4.04	239.46	39.6
110					39.7
111					39.8
112					39.8
B.M.			4.12	240.44	240.40

See Revision on Following pages

8 - 21 - 23

5.0 ✓
4.9 ✓
4.8 ✓
4.7 ✓
4.6 ✓
4.5 ✓
4.4 ✓
4.3 ✓
4.2 ✓

240.50
2.37
242.87
240.05
2.82

4.7 ✓
4.6 ✓
4.5 ✓
4.4 ✓
4.3 ✓
4.2 ✓
4.1 ✓
4.0 ✓
5.0 ✓
4.9 ✓
4.8 ✓
4.7 ✓

Base of gas f64177p - 112 + 90 RF

23-56

Sta	Grade Stakes +S	H.I.	-S	Profile Grade As Revised	Grade Rod
BM.	3.10	243.87		240.77	
71+00				39.90	3.97
70+00				39.70	4.17
69+00				39.38	4.49
68+00				38.83	5.04
67+50				38.34	5.53
67+00				38.04	5.83
+50				37.43	6.44
66+00				36.89	6.98
				I 36.23	7.64
+50				O 36.36	7.51
				I 35.52	8.35
65+00				O 35.96	7.91
				I 34.76	9.11
+50				O 35.56	8.31
T.P.	3.46	244.24 (3)	3.10 (240.78)	I 33.85	10.39
64+00				O 35.01	9.23
				I 33.46	10.78
+50				O 34.56	9.68
				I 33.23	11.01
63+00				O 33.95	10.29
				I 32.71	11.53
+50				O 33.09	11.15
				I 32.43	11.81
62+00				O 32.52	11.72
T.P.	2.52	235.84	10.91 (225.45)	I 31.87	3.97
+50				O 31.93	3.91
				I 31.58	4.26
61+00				O 31.88	3.96
				I 31.15	4.69
+50				O 31.82	4.02
				I 30.75	5.09
60+00				O 31.86	3.98
T.P.			2.52	233.32 ✓	

Allowances made for Super elev.

Party { Deutsche, Johnson, Mahoney, Franke

℄ L R

9-24-23
Coal Fair

33

Sp. 18" Bl Oak. 35'R Sta. 65+30

℄ Elev

36.31 ✓

35.74 ✓

35.16 ✓

34.43 ✓

34.01 ✓

33.59 ✓

32.90 ✓

As taken from Hoffman's Revised Profile Here.
Locks pearl Grades not uniform

32.51 ✓

Sp 12" Oak 50'R Sta. 62+30

31.95 ✓

31.73 ✓

31.49 ✓

31.35 ✓

Rod = 5.73 Guard stk marked ← (Grade 1'-9" up)
(6° Rt. OFF. 7' ℄)

Sp. 12" Oak 50'R Sta. 62+30

23-56 – Grade Stakes

Sta.	+ S	H.I.	– S	Profile Grade as Revised to obtain Shldr matl.	Grade Rod 13'L&R
B.M.	4.65	245.42		240.77	
72+00.				40.10	5.32
73+00				40.30	5.12
74+00				40.40	5.02
75				40.30	5.12
76				40.1	5.32
77				39.90	5.52
T.P. 78	4.61	244.51	5.32	39.90 39.70	4.81
				I 39.42	5.09
79				O 39.50	5.01
				I 39.21	5.30
+50				O 39.38	4.93
				I 38.89	5.62
80				O 39.60	4.91
				I 38.33	6.18
+50				O 39.55	4.96
				I 38.22	6.29
81				O 39.44	5.07
				I 38.34	6.17
+50				O 39.05	5.46
				I 38.22	6.29
82				O 38.68	5.83
				I 38.22	6.29
+50				O 38.30	6.21
				I 38.02	6.49
83				O 38.12	6.39
				I 37.76	6.75
T.P. +50	4.14	242.18	6.47	O 38.04	6.47
				I 37.37	4.81
84				O 38.02	4.16
				I 36.99	5.19
+50				O 38.00	4.18
				I 36.58	5.60
85				O 37.86	4.32
				I 36.75	5.43
+50				O 37.51	4.67
				I 36.86	5.32
86				O 37.24	4.94
				I 36.97	5.21
+50				O 37.07	5.11
87				37.05	5.13

Inside = Left.

Inside = Rt.

Party { Deutsche, Johnson, Mahoney, Franke

L

9-25-23
Cool Windy
Rain Probable

(34)

L R

Sp. 18' Oak 35'R Sta. 65+30

Top stk 13'R Sta. 76+00

Top. stk 13'L Sta. 83+50

23-56 –	Grade Stakes			Profile Grade as Revised	Grade Rod 13' L & R
	+ S	HI	-S		
		Cont'd fr. prec. page			
87+50		242.18		37.12	5.06
88				37.20	4.98
+50				37.28	4.90
89				37.35	4.83
+50				37.42	4.76
90				37.51	4.67
+50				37.55	4.63
91				37.60	4.58
+50				37.65	4.53
92				37.70	4.48
+50				37.75	4.43
B.M.	2.46 ✓	242.51	2.12	240.06 ✓	Plan elev. 240.0
93				37.80	4.71
94				37.9	4.61
95				38.0	4.51
96				38.1	4.41
97				38.2	4.31
B.M.			2.46 ✓		

{Same party
prec. page

℄

L R

R.R. Power Pl. 21' L Sta. 92+80

R.R. Sp. P. Pl. " " " " " End. 9-25-23

Grade stake 23+56

Sta	+	H.I.	−	Elev.	Grade
B.M.	3.34	234.93			231.59
58					231.3
+50					"
57					"
	1.40	236.17	3.16	231.77	
55	4.43	236.20		231.77	231.3
54					
53					
	4.13	236.22	4.13	232.07	232.07
52					
51					
T.P.	6.26	236.26	6.22	230.00	
50					
49					
48					
47					

9-26-23 Fair Warm

Party { Carley
Persons
Briggs
Eck }

(36)

super-elev

Nail perpendicular in tree Lt of sta 57+38

- 0.4

58 to 55 } These stakes were only set on Lt to approximate super-elevation. - M.W.C.

I 0.5
O 0.5

I 0.3
O 0.3

I 0.0
O 0.0

Nail in 12" oak Rt 51+30

I 0.3 ✓
O 0.3

I 0.5 ✓
O 0.5

I 0.3 ✓
O 0.3

I 0.6 ✓
O 0.6

F 0.6 ✓
O 0.6

F 0.4 ✓
O 0.4

0.0% grade

Sta		+	H.I.	−	Elev	Grade
			236.26			
46	TBM	5.51	236.36	5.41	230.85	231.3
45						"
43						"
42						"
41						"
40						"

Proj. Grade

STKs. for X Drain pipes
23-56

Sta	+	H.I.	−	Elev	℄ Grade
B.M.	3.94	244.34			240.40
T.B.	4.18	243.52	5.00	239.34	
B.M.			0.39		243.13
99+13					238.43
102+98					238.80
B.M.	0.79	243.92			243.13
104+98					239.20
108+10					239.50
B.M.	2.00	242.50			240.50
95+52					238.05
94+34					237.94
92+36					237.74
89+03					237.60

9-28-23 Fair - Warm

Party: Carley, Persons, Briggs, Eck.

Invert Stk.-Elev.

Corner of conc foundation on Gas pump Sta 112+40

Top of hydrant Lt of Sta 105+00

Invert Stk.-Elev.		
237.93	Stk. marked 1' above Flow Line	Flow Line = 236.93
238.30	" " " " " "	" " = 237.30
Top of hydrant.		
238.70	" " " " " "	" " 237.70
239.00	" " " " " "	" " 238.00
Nail in oak Lt 94+25		
237.55	" " " " " "	" " 236.55
237.44	" " " " " "	" " 236.44
237.24	" " " " " "	" " 236.24
237.10	" " " " " "	" " 236.10

Paving - Stakes
23-56

Sta	+	H.I	−	Elev	Sub. Grade
BM.	4.10	244.50			240.40
112					239.50
+50					
111					
+50					
110					
+50					
109					
+50					
108					239.50
B.M.	4.10	244.50			240.40
+50					239.43
107					239.36
T.P.	4.14	244.04	4.60	239.90	
+50					239.29
106					239.22
+50					239.15
105					239.08
BM.	0.87	244.02	0.89	243.15	
+50					239.01
104					238.94

+5.41
= Paving Grade

Party { Corley, Parsons, Briggs, Eck }

Cor. of Gas pump Rt of 112+90

	Grade Rod		10'R	℄	10'L
240.041	4.46	✓	5.11	5.02	5.24
		✓	5.24	5.00	5.34
		✓	5.00	5.00	5.10
		✓	5.00	4.91	4.82
		✓	5.02	4.90	5.02
		✓	5.00	4.76	5.00
		✓	5.20	5.72	5.01
		✓	5.26	4.73	5.02
240.041	4.46	✓	5.02	5.00	5.00

Gas pump 112+ (10'L) (10'R)

239.971	4.53	✓	5.18	5.10	5.15
239.901	4.60	✓	5.90	5.02	5.65
239.831	4.21	✓	4.68	4.80	4.80
239.761	4.28		4.50	4.71	4.76
239.691	4.35	✓	4.70	4.60	4.72
239.621	4.42	✓	4.80	4.65	4.68

Top of hydrant Lt of 115+00

239.551	4.47	✓	4.92	4.91	5.00
239.481	4.54		4.96	4.94	5.04

Sta.	+	H.I.	−	Elev	Sub. Grade
	0.87	244.02			
+50					238.85
103					238.80
+50					238.75
102					238.70
+50					238.65
101					238.60
T.P.	4.53	243.67	4.88	239.14	
+50					238.55
100					238.50
+50					238.45
99					238.40
B.M.	3.13	243.63	3.13	240.50	240.50
+50					238.35
98					238.30
+50					238.25
97					238.20
+50					238.15
96					238.10

+.541
= Paving Grade

	Grade Rod		10' Lt ℄	℄	10' Rt
39.391	4.63	L	5.16	5.25	5.20
39.341	4.68	L	5.12	5.14	5.150
39.291	4.73	L	5.44	5.42	5.65
39.241	4.78	L	5.38	5.15	5.178
39.191	4.83	L	5.52	5.34	5.83
39.141	4.88	L	5.34	5.35	6.10
39.091	4.58	L	4.89	5.05	4.88
39.041	4.63	L	4.90	4.90	4.90
38.991	4.68	L	5.00	4.61	4.86
38.941	4.73	L	4.65	5.00	4.86
Sp. in tree Lt of sta 944+25					
38.891	4.74	L	5.00	5.00	5.32
38.841	4.79	L	5.50	5.32	5.82
38.791	4.84	L	5.42	5.42	5.40
38.741	4.89				
38.691	4.94				
38.641	4.99				

12-40 P.M.

(23-56)	Paving Stakes	Blue Tops	Profile Grade +0.54	Grade Rod 12'L & R
Sta.	+5	H.I. -5	* = Except as noted.	
B.M.	1.91	241.96	240.05	
			238.20 .54	
97+00			38.74	3.22
			38.15 .54	
+50			38.69	3.27
			38.10 .54	
96+00			38.64	3.32
			38.05 .54	
+50			38.59	3.37
			38.00 .54	
95+00			38.54	3.42
			37.95 .54	
+50			38.49	347
			37.90 .54	
94+00			38.44	3.52
			37.85 .54	
+50			38.39	3.57
B.M.	1.91 ✓	12:M.	37.80 .54	
93+00			38.34	3.62
			37.75 .54	
+50			38.29	3.67
			37.70 .54	
92+00			38.24	3.72
			37.65 .54	
+50			38.19	3.77
			37.60 .54	
91+00			38.14	3.82
			37.55 .54	
+50			38.09	3.87
			37.50 .54	
90+00			38.04	3.92
			37.46 .54	
+50			37.96	4.00
			37.35 .54	
89+00			37.89	4.07
			37.28 .54	
+50			37.82	4.14
			37.20 .54	7
88+00			37.74	4.22
B.M. & TR	2.96	242.11	240.05 37.12 .54	
+50			37.66	4.45
			37.05 .54	
87+00			37.59	4.52
			I 37.57	4.54
SST. 86+83	St. Super		O 37.57	4.54
			I 37.56	4.55
+50		*	O 37.67	4.44
			I 37.47	4.64
86+00			C 37.87	4.24
			I 37.43	4.68
85+83			O 37.95	4.16

Party { Deutsche, Johnson, Mahoney, Franke

10-3-23
Cool Fair.

(41)

10'L		R-10'
R.R. Sp. Serv. Pl. 21'L Sta. 92+80		
4.2	4.1	4.1
4.3	4.1	4.1
4.3	4.2	4.4
4.1	4.3	4.3
4.6	4.2	4.5
4.4	4.2	4.4
4.2	4.1	4.1
3.9	4.1	4.0
4.1	4.0	4.1
4.1	4.0	4.0
4.3	4.2	4.3
4.3	4.6	4.3
4.7	4.6	4.4
4.4	4.4	4.5
4.4	4.6	5.0
4.5	4.8	4.7
4.6	4.3	4.1
4.6	4.5	4.4
4.7	4.6	4.6
Sp. Phone pl. 21'L Sta. 92+80		
5.0	4.8	4.9
4.6	4.7	4.8
4.5	4.4	4.5
4.9	4.8	4.6
4.8	4.8	5.0
4.7	4.8	5.0

(23-03) Blue Tops for Pav'g.

Sta.	+ S	H.I.	- S	Profile Grade plus 0.54 excepts noted *	Grade Rod.
		Cont'd fr prec page		I 37.36.	4.75
85+50		242.11		O 38.14	3.97
				I 37.30	4.81
P.T. 85+33				O 38.25	3.86
				I 37.23	4.88
$85+08^{5}$			*	O 38.43	3.68
				I 37.18	4.93
EWT / EST $84+83^{5}$				O 38.61	3.50
				I 37.41	4.70
$84+58^{5}$				O 38.63	3.48
				I 37.68	4.43
P.C. $84+33^{5}$				O 38.63	3.48
B.M.			2.06	240.05	Pln. elev. 240.05
B.M. T.P.	2.21	242.26		240.05	
T.P.	5.16	243.37	4.05	238.21	
				I 38.00	5.37
84+00				O 38.64	4.73
				I 38.13	5.24
E.W.T. $83+83^{5}$				O 38.65	4.72
				I 38.38	4.99
83+50				O 38.66	4.71
				I 38.64	4.73
83+00				O 38.69	4.68
				I 38.71	4.66
E.S.T. $82+83^{5}$				O 38.71	4.66
				I 38.74	4.63
S.S.T. $82+74^{8}$				O 38.74	4.63
				I 38.84	4.53
82+50			*	O 38.92	4.45
82+25	X-Sec Only-				
				I 38.95	4.42
82+00				O 39.29	4.08
				I 38.96	4.41
S.W.T. $81+74^{8}$				O 39.48	3.89
				I 38.97	4.40
81+50				O 39.67	3.70
				I 38.98	4.39
P.T. $81+24^{8}$				O 39.86	3.51
		243.37		I 38.99	4.38
$80+99^{8}$				O 40.05	3.32
				I 39.00	4.37
℄ Curve $80+74^{2}$				O 40.24	3.13
				I 39.18	4.19
$80+49^{6}$				O 40.33	3.04
				I 39.35	4.02
P.C. $80+24^{6}$				O 40.23	3.14

10-3-23
Cool Fair

Same party prev. page

	10' L		10' R
	4.6	4.5	5.0
	4.3	4.3	4.7
	4.0	4.0	4.7
	3.5	3.8	4.8
	3.7	3.9	4.7
	4.0	4.1	4.3

R.R. Sp. Power Pl. 21' L Sta. 92+80

Sp. Top of Bk. 85+33 - 13" L " " " " +80 - { Start 10-4-23 Same party Cool Fair

	5.1	5.4	5.7
	5.2	5.4	5.6
	5.3	5.4	5.4
83+25	5.1	5.3	5.4
83+00	5.0	5.3	5.2
	4.8	5.3	5.3
	4.8	5.2	5.3
	5.0	5.1	5.1
	5.1	5.1	4.8
	5.0	4.8	4.6
	5.0	4.7	4.3
	5.2	4.6	4.2
	5.1	4.3	3.8
	5.0	4.1	3.9
	5.0	4.2	3.6
	4.7	4.1	3.5
	4.8	4.0	3.6

(23-56) Blue Tops for Paving etc

Sta.	+S	H.I.	-S	Profile Grade	Grade Rod
				+0.54	
				*=Except as noted.	
		243.37		I 39.52	3.85 ✓
80+00		Cont'd fr. prec. page		O 40.22	3.15 ✓
				I 39.68	3.69
EW.T. 79+74.6				O 40.20	3.17
			*	I 39.84	3.53 ✓
79+50				O 40.18	3.19 ✓
79+25	X-Sec. Only				
				I 40.04	3.33 ✓
79+00				O 40.14	3.23 ✓
				I 40.09	3.28 ✓
EST. 78+74.6				O 40.09	3.28
				I	
78+50				* O 40.14	3.23 ✓
T.P. To check ✓			5.17	238.20 ✓	Previously 238.21
T.P.	3.73	243.87		240.14	See above.
78+25					
78+00				39.70 / 54 / 40.24	3.63
+75					
+50				39.80 / 54 / 40.34	3.53
+25					
77+00				39.90 / 54 / 40.44	3.43
+75					
+50				40.00 / 54 / 40.54	3.33 ✓
+25					
76+00				40.10 / 54 / 40.64	3.23
+75					
+50				40.20 / 54 / 40.74	3.13
+25					
75+00				40.30 / 54 / 40.84	3.03
+75					
74+50				40.38 / 54 / 40.92	2.95

Party { Oestsche, Johnson, Mahoney, Franke

10-4-23 Cool. Fair. (43)
10-6-23 Cool Fair

	10' Lt		10' Rt.	
	4.1	3.8	3.7	
P.I. 12' L & R	4.1	4.0	3.7	
	3.9	3.7	3.7	
	4.0	3.8	3.8	
	4.0	3.8	3.8	
	3.9	3.9	3.6	
	3.7	3.7	3.6	End. 10-4-23
Top. Stk - 13' L	Sta - 85+33			
" " 12' L	" 78+50			{Same party etc Start - 10-6-23}
	4.1	4.2	4.0	
	4.1	3.9	4.1	
	4.1	3.9	3.9	
	4.0	3.7	3.9	
	3.7	3.6	3.8	
	3.7	3.5	3.7	
	3.6	3.5	3.7	
	3.6	3.7	3.6	
	3.8	3.6	3.7	
	3.7	3.5	3.7	
	3.3	3.2	3.5	
	3.2	3.2	3.4	
	3.4	3.2	3.2	
	3.4	3.3	3.4	
	3.3	3.4	3.5	
	3.4	3.3	3.5	

(23-56) Blue Tops for Parg

Sta.	+ S	H.I.	- S	Profile Grade +0.54 x = Ex	Grade Rod. 12'L&R
74+25		243.87 Contd fr. prec page			
74+00				40.40 / 54 / 40.94	2.93
+75					
+50				40.38 / 54 / 40.92	2.95
TR	3.44	244.36	2.95	240.92	
+25					
73+00				40.30 / 54 / 40.84	3.52
+75					
+50				40.20 / 54 / 40.74	3.62
+25					
72+00				40.10 / 54 / 40.64	3.72
B.M.			3.58	240.78	Plan elev 240.77

Party { Deutsche, Johnson, Mahoney, Franke }

10-6-23
Cool. Fair.

(44)

10'Lt.		10'Rt.
3.4	3.3	3.5
3.4	3.3	3.4
3.6	3.4	3.5
3.6	3.5	3.5

Top. stk 12'Rt. Sta. 73+50

4.2	4.0	4.1
4.1	3.8	4.1
4.1	4.0	4.1
4.2	4.1	4.1
4.3	4.1	4.0
4.0	4.2	4.3

Nail 18" Black Oak 30'R Sta. 65+30 (End. 10-6-23)(to run line)

IR3-56	Blue tops for paving			Profile elev +0.54	Grade RP 12'R+L,
Sta	+	H.I.	−	=P.E.	
BM1	3.00	243.77		240.77	
71+75				40.05 / .54 / 40.59	3.18 L
+50				40.00 / .54 / 40.54	3.23 L
+25				39.95 / .54 / 40.49	3.28 L
71				39.90 / .54 / 40.44	3.33 L
+75				39.85 / .54 / 40.39	3.38 L
+50				39.80 / .54 / 40.34	3.43 L
+25				39.75 / .54 / 40.29	3.48 L
70				39.70 / .54 / 40.24	3.53 L
+75				39.69 / .54 / 40.23	3.54 L
+50				39.57 / .54 / 40.11	3.66 L
+25				39.48 / .54 / 40.02	3.75 L
69				39.38 / .54 / 39.82	3.95 L
+75				39.26 / .54 / 39.80	3.97 L
+50				39.17 / .54 / 39.71	4.06 L
+25				39.02 / .54 / 39.56	4.21 L
68				38.83 / .54 / 39.37	4.40 L
+75				38.69 / .54 / 39.23	4.54 L
+50				38.50 / .54 / 39.04	4.73 L
+25				38.25 / .54 / 38.79	4.98 L

Party { Zarley, Persons, Briggs, Fox

10-9-23
Fair - Warm.

(45)

Nail - 18" Beech 30' Pt. sto 65+30

10' Lt	℄	10' Rt
3.5	3.7	3.7
3.4	3.5	3.5
3.6	3.7	3.8
3.7	3.7	3.7
3.6	3.7	3.8
3.6	3.6	3.5
3.7	3.6	3.6
3.6	3.6	3.6
3.8	3.7	3.8
4.0	4.0	4.0
4.1	4.1	4.2
4.3	4.4	4.4
4.6	4.4	4.4
4.3	4.5	4.5
4.6	4.7	4.5
4.9	5.0	4.6
5.0	5.2	4.9
5.3	5.4	5.5
5.6	5.6	5.8

Notes cont.

Sta	+	H.I.	−	Profile Elev. +0.54 = P.E.	Grade Rod, 12' Rt L.
	3.00	243.77			
67				38.04 .54 38.58	5.19 ✓
+75				37.80 54 38.34	5.43 ✓
+50				37.56 54 38.10	5.67 ✓
+25				37.29 54 37.83	5.94 ✓
66				37.02 54 37.56	6.21 ✓
B.M.			3.00	240.77	Plan Elev. 240.77

10' Lt.	℄	10' Rt
6.0	6.0	6.0
6.2	6.4	6.4
6.5	6.6	6.6
6.7	6.8	6.7
7.1	7.1	6.8

Oak Pt sta 65+30

Correction Curve Sta 0+00

Sta	+	H.I.	−	F/ew	Grade
BM.	5.56	261.92			256.36
0+00 RC			3.5	58.4	259.10
0+50			4.7	57.7	258.70
1			4.7	57.7	258.65
+50			3.6	58.3	258.193
T.T.	6.48	265.20	3.16	258.72	
2			5.7	59.5	259.141
D.W. 5' +50			5.0	60.2	260.46
D.W. 3' 3+00)			4.5	60.7	260.69
=3+09.2 =1+99.06 P.T.					
T.T.	4.82	266.07	3.95	261.25	
D.W. 8' 2+50			4.8	61.3	261.1
D.W. 8' 3			5.0	261.1	261.14
+75			5.0	261.1	
D.W. 5' 4			5.3	260.8	260.47

10-1-23 Cloudy cool (47)

Corley, Parsons, Briggs, Eck

Lt ℄ Rt

Top of mon. 1+99 –

			9.7/22	4.9/11	3.1/10	7.0/23		(6.9/23.0) F3.0		−1.14 +0.97
		10.0/5.9	3.8/8	3.8/8	4.1/9	4.2/17	9.2/25	(9.5/29.5) F5.0		−1.30 +0.99
			5.0/16	4.3/12	5.2/17	10.2/26		(10.7/30.4) F5.6		−1.30 +0.99
			6.7/26	2.7/19	4.7/17	9.5/25	9.3/31	(9.3/28.5) F5.0		−1.30 +0.99
			6.8/26	5.4/23	6.5/14	10.3/21		(10.3/25.8) F3.2		−1.30 +0.99 −1.30 +0.99
				4.5/18	5.9/7	4.2/14	4.1/26	(3.7/30.8) C0.8		–
										−1.14 +0.93
0.8/28	5.3/20	5.5/16	4.2/13	5.3/13	5.5/21	(267.20/30)	(267.20/33.6) C5.6			
1.8/28	5.5/21	5.7/14	5.4/12	4.8/13	5.5/17	5.1/21	3.7/25	2.6/28		
2.9/27	5.9/20	6.0/15	5.3/13	5.0/12	5.5/14	5.6/21	4.4/26	C0.8/33.8		
5.0/24	6.3/21	6.6/16	5.6/13	5.4/12	6.2/16	6.2/22	5.5/24			
4.2/25	6.0/20	6.2/14	5.8/13	6.0/13	6.3/14	6.3/21	3.1/27	C2.6/32.6		

Correction Curve Sta 45

Sta	+	H.I.	−	Elev	Grade
B.M.	3.93	236.02			232.09
T.P.	4.88	235.71	5.19	230.83	
47+50			4.4	231.3	231.3
47			4.3	231.4	
+50			4.5	231.2	
46			4.8	230.9	
+50			4.7	231.0	
45			4.4	231.3	
+50					
44					231.3

0.0% Grade Rod 4.4

10-1-23 Cloudy cool

(Corley
Porter Parsons
Bulogo
Eck

W	Lt			℄			Rt		
	Spike in Bl. oak 30' Rt to Sta 31+30								
4.62			6.0/20	5.5/8	5.5/19	11.6/32	(11.6/32.0) F6.0 shoulder		+ 0.99 − 1.20
5.00	F1.2 (4.6/17.8)	5.4/34	5.12/23	4.3/17	5.5/14	11.6/27	(11.7/31.0) F6.0		+ 0.99 − 1.30
5.00	F1.4 (4.8/18.1)			5.12/22	5.3/16	11.5/28	(11.7/31.0) F6.0		+ 0.99 − 1.30
5.00	F1.2 (4.6/17.8)		4.6/18	4.9/13	5.7/13	11.1/27	(11.3/30.4) F5.6		+ 0.99 − 1.30
5.00	F4.4 (7.8/22.6)		7.2/17	5.1/15	5.7/17	9.9/31	(5.12/21.0) C0.5		+ 0.99 − 1.30
5.00					5.2/22				+ 0.99 − 1.30
2.59									+ 0.99 − 1.30
0.17									+ 0.99 − 1.00

Curve #3. -7° 700'

Paving blue tops.

23-56

Sta	+	H.I.	−	Super-elev Grades	Grade Red.
B.M.	0.33	241.10		240.77	
				I. 37.50	
65+94± S.S.T.				O. 37.50	3.60 L
				I. 36.99	4.11
+50				O. 37.13	3.97 L
				I. 36.26	4.84
65				O. 36.74	4.36 L
				I. 36.17	4.93
+44± S.W.T.				O. 36.69	4.41 L
				I. 35.50	5.60
+50				O. 36.34	4.76 L
64+44±				I. 35.42	5.68
64+43 = P.T.				O. 36.30	4.80 L
B.M.	0.32	241.09	0.33	240.77	Plan.-Elev. 240.77.
				I. 35.04	6.05
+18				O. 36.08	5.01 L
				I. 34.66	6.43
63+93.5				O. 35.90	5.19 L
				I 34.42	6.67
63+73				O. 35.66	5.43 L
				I. 34.24	6.85
63+48				O. 35.28	5.71 L
				I. 34.03	7.06
63+23 AC.				O. 34.91	6.18 L
				I. 33.86	7.23
63+00				O. 34.56	6.53 L
				I. 33.64	7.45
62+73				O. 34.16	6.93 L
				I. 33.45	7.64
62+50				O. 33.81	7.28 L
				I. 33.26	7.83
62+23				O. 33.42	7.67 L
				I. 32.85	8.04
62+00				O. 33.13	7.76 L
TR	3.11	235.94	8.26	232.83	

VOID A/C GRADE CHG'S SEE DATA 2-54 FOR REVISIONS

Inside = Right

Party { Carley, Parsons, Briggs, Eck }

Fair. - Warm - 10 - 9 - 23

Using notes calculated by R. E. Deutsche. M.W.C.

	10' Lt	℄	10' Rt
	4.5	4.6	4.2
	5.0	4.8	4.8
	5.5	4.9	5.4
	5.6	5.0	5.3
	5.5	5.2	5.3
	5.5	5.3	5.4
Oak Rt. 65+30			
	5.7	5.5	5.4
	6.2	5.6	5.8
	6.4	5.9	5.7
	6.5	6.0	6.2
	6.6	6.3	6.9
	7.1	7.2	7.2
	7.8	7.7	7.6
	8.0	7.9	8.1
	8.2	8.3	8.5
	8.4	8.5	8.7

P3-56 Blue tops for paving

Sta	+	H.I.	−	Super Elev	Grade Rods
		235.94			
				I. 32.79	3.15
61+73.0 E.S.T.				O. 32.79	3.15
61+50				I. 32.60	3.34
				O. 32.66	3.28
61				I. 32.20	3.74
				O 32.50	3.44
				I. 31.93	4.01
60+70 E.W.T.				O. 32.45	3.49
+50				I. 31.77	4.17
				O. 32.44	3.50
+20 P.T.				I. 31.52	4.42
				O. 32.45	3.49
				I. 31.33	4.61
59+95				O 32.49	3.45
59+69 C. of curve				I. 31.18	4.76
				O. 32.55	3.39
+44				I. 31.29	4.65
				O. 32.45	3.49
+19.7 P.C				I. 31.43	4.51
				O. 32.36	3.58
				I. 31.55	4.39
59+00				O. 32.28	3.66
					Plan-Elev
	4.56	236.16	4.29	231.65	231.60
				I 31.55	4.61
58+31.1 P.T.				O 32.28	3.88
58					"
+75					"
+50					"
+25					"
57.					"
+75					"
+50					"
56+32 P.C.					"
B.M.			4.56	231.60	

Inside — Left

Inside — Left

Using same super for entire curve

℄ Profile elev. 231.30

VOID A/C GRADE CHANGE

SEE DATA P. 54, 55 FOR REVISION

Party { Carley
Persons
Briggs
Eck

10-10-23
Fair, Warm.

10' Lt	℄	10' R
3.8	3.7	3.9
4.1	4.1	4.1
4.5	4.2	4.0
4.5	4.4	4.0
4.5	4.6	4.0
5.1	5.4	5.5
5.3	5.5	5.7
5.4	5.7	5.8
5.7	5.9	6.0
5.7	6.1	6.3
5.8	6.0	6.0

Nail in 5" cedar ℄ o f s to 58+30

10' Lt	℄	10' R
6.0 / 11	6.1	5.9
5.8 / 11	5.7	5.8
6.0 / 11	5.9	5.8
5.8 / 11	5.7	5.7
5.9 / 11	5.7	5.7
5.8 / 11	5.6	5.6
5.60	5.6	5.5
5.4	5.20	5.1
5.3	5.0	4.8

Quit to run time

(23-56) Reset Blue Tops A/C Knocked Out.
See following pages for data

Sta.	+S	H.I.	-S
		283.25	

See following pages

21+29		O 51.52	3.73
21+54		O 51.32	3.93
23+79		O 48.69	6.56
24+04		O 48.31	6.94
24+29		O 47.89	7.36
24+54		I 46.54	8.71
24+79		I 46.10	9.15
		O 46.98	8.27

Party { Deutsche
Johnson
Mahoney
Franke

10-22-23
Cool. Fair.

(5)

23-56

Sta.	Data for Grade Revision +5	H.I. 235.00	-5	℄ Elev.
EM.	+3.88	235.97		232.09
51+00				230.9
+25				31.2
+50				31.2
+75				31.0
52+00				31.0
+25				31.0
+50				31.1
+75				31.4
53+00				31.5
+25				31.4
+50				31.4
+75				31.3
54+00				31.1
+25				31.1
+50				31.3
+75				31.5
55+00				31.5
+25				31.4
+50				31.4
+75				31.3
56+00				31.3
+23				31.2
* +50				31.0
+75				30.7

Party { Deutsche
Johnson
Mahoney
Franke }

10-11-23
Cool. Fair

(52)

℄ Rod.
5.1
4.8
4.8
5.0
5.0
5.0
4.9
4.6
4.5
4.6
4.6
4.7
4.9
4.9
4.7
4.5
4.5
4.6
4.6
4.7
4.7
4.8
5.0
5.3

Data for Grade Revision

Sta.	+S	H.I.	-S	E Elev.
		Contd fr. prev. page 2-25-97		
57+00				30.6
+25				30.5
+50				30.4
+75				30.3
58+00				30.4
+25				30.2
+50				30.3
+75				30.1
59+00				29.8

Reset Blue Tops A/C Knocked Out

Sta.	+S	H.I.	-S	Elev. I / O	Grade Rod
B.M.	5.29	241.07		235.78	
30+22.6				I 33.69	✓ 7.38
				O 34.21	✓ 6.86
29+97.6				I 34.20	✓ 6.87
				O 34.54	✓ 6.53
29+72.6				I 34.76	✓ 6.31
				O 34.92	✓ 6.15
29+47.6				I 35.23	✓ 5.84
				O 35.31	✓ 5.76
29+22.6				I 35.77	✓✓ 5.30
				O 35.77	✓ 5.30
29+00				I & O 36.36	✓ 4.71
28+50				I & O 37.64	✓ 3.43
28+00				I & O 38.94	✓ 2.13
27+50				I & O 40.24	✓ 0.83
27+29.3				I & O 40.76	✓ 0.31
B.M.			5.29	235.78	

Sameparty see. orig.

10-11-23

Cool. Fair

℄

Rod.

5.4

5.5

5.6

5.7

5.6

5.8

5.7

5.9

6.2

See following shts for orig. data.

Nail Pow Pl. 36' Left Sta. 29+30

10-22-23

Sameparty as above

Same as above.

23-56 Blue Tops for Pav'g.

Sta.	+ S	H.I.	− S	Revised Profile ℄ Elev.	Elev. of Edge Pav'm't
B.M.	0.32	241.09		240.77.	
62+23				232.70	I 33.24 O 33.40
62+00				32.44	I 32.98 O 33.06
E.S.T. 61+73				32.14	I 32.68 O 32.68
E.S.T. 61+70±				32.11	I 32.65 O 32.65
61+50				31.88	I 32.32 O 32.38
61+00 T.P.	3.04	235.12	9.01 32.08✓	31.31.	I 31.78 O 32.08
E.W.T. 60+70±				31.02	I 31.38 O 31.90
60+50				30.86	I 31.14 O 31.81
P.T. 60+20±				30.67	I + 0.25 O + 0.98
59+95±				30.55	I O Same as above
59+69.9				30.48	I O "
59+44.7				30.45	I O "
P.C. +19.7				30.49	I O "
59+00				30.50	I O "
58+78.6				30.54	I O "
58+50				30.60	I O "
EQ. 58+37.5 P.T. 58+31.7				30.63	I O "
58+00				30.70	I O "
57+75				30.75	I O "
T.P. +50 B.M.	4.24 3.90	236.02 235.99	3.34 3.97 232.05✓	30.80	I O Plan Ele. 232.09✓
" +25				30.85.	I O "
57+00				30.90	I O "
56+75				30.95	I O "

Note: — Maintain constant super = −0.37 inside ℄
Plus +0.36 outside ∴ net correction to ℄ elev = Ins. +0.62 − 0.37 = +0.25
& Outside = +0.62 + 0.36 = 0.98

Party { Deutsche, Jonnson, Mahoney, Franke

10-11-23
Warm Fair.
10-12-23
Cold. Windy

54

Elev.	Rod	Width to tack on Stk in Ft. Inside (2° of Ft)	Outside
Sp. Oak 30'R Sta. 654 30			
	7.85		
	7.69	12°	12°
	8.11		
	8.03	12°	12°
	8.41		
	8.41	12°	12°
	8.44 (11 stk. set)		
	8.44	12°	12°
	8.77		
	8.71	12°	12°
	9.31		
Top Stk 12'R Sta 61+00	9.01	12°	12°
	3.74		
	3.22	12°	12°
	3.98		
	3.31	12 11	12°
= 30.92	4.20		
31.65	3.47	13 06	12°
30.80	4.32		
31.53	3.59	13 86	12°
30.73	4.39		
31.46	3.66	14°	12°
30.70	4.42		
31.43	3.69	14°	12°
30.74	4.38		
31.47	3.65	14°	"
30.75	4.37		
31.48	3.64	14°	"
30.79	4.33		
31.52	3.60	"	"
30.85	4.27		
31.58	3.54	"	"
30.88	4.24		
31.61	3.51	"	"
30.95	4.17		
31.68	3.44	"	"
31.80	4.12		
31.73	3.39	"	"
31.05	4.07		
31.78 — Sp. Oak 12" Oak 30' R	3.34 Top Stk 12'R (End & Start) Sta 51+30	"	"
31.10	4.39		
31.83	4.16	"	"
31.15	4.84		
31.88	4.11	"	"
31.20	4.77		
31.93	4.06	"	"

23-56 Blue Tops for Pav'g.

Sta.	+ S	H.I.	− S	Revised Profile ℄ Elev.	Elev. at Edge of Pavmt
		Cont'd fr. prev. page			
56+50		235.99		231.0	I 31.75 O 31.98
P.C. 56+32[1]				31.03	I 31.28 O 32.01
P.T. 56+15[47]				31.07	I 31.32 O 32.05
56+00				31.10	I 31.35 O 32.08
+75				31.15	I 31.40 O 32.13
+50				31.20	I 31.45 O 32.18
+25				31.24	I 31.49 O 32.22
55+00				31.27	I 31.52 O 32.25
+75				31.29	I 31.54 O 32.27
+50				31.30	I 31.55 O 32.28
+25				31.30	Constant as above
54+00				31.30	
+75				31.30	
+50				31.30	
P.C. 53+32[8] B.M.	+3.66	235.75	3.90	31.30 232.09	Plan elev I 31.55
~~53+25~~	~~This station not set (Too close)~~			31.30	O 32.28
53+00					
P.T. 52+74[1]					
+50					
+25					
52+00					
+75					
+50					
+25					
51+00					
P.C. ~~50~~+88[0] B.M.			−3.66	232.09	

Note:—
Correction to ℄ Elev for edge pavement is obtained as follows.
(G Christison) "Maintain super = −0.37' inside & +0.98' outside"
Paving = 7½" = 0.62'
∴ Net corr. ins. = +0.62 − 0.37 = +0.25
∴ " " outs. = +0.62 + 0.36 = +0.98

Constant at 231.30

Constant as above

VOID A/C GRADE CHANGE
See following pages

10-12-23

55

Party { Deutsche, Jonsson, Mahoney, Franke

Grade-Rod.

L	R
4.74 ✓	
4.01 ✓	
4.71	
3.98 ✓	
4.67 ✓	
3.94 ✓	
4.64 ✓	
3.91 ✓	
4.59 ✓	
3.86 ✓	
4.54 ✓	
3.81 ✓	
4.50 ✓	
3.77 ✓	
4.47 ✓	
3.74 ✓	
4.45 ✓	
3.72 ✓	
4.44 ✓	
3.71 ✓	
Constant	
4.20 ✓	
3.47 ✓	
Constant	

Note:-
Maintain Dist. to stk on outside of curve 12°
& on inside - 14°

Sp. 12" Bl Oak 30'R Sta. 514+30

23-56 Blue Tops for Paving.

	+ S	H.I.	- S	Final Elev.	Grade Rod.
B.M.	3.20	235.29	232.09	I 31.61	3.68 ✓
50+63				0 32.23	3.06
				I 31.66	3.63
+38				0 32.18	3.11 ✓
50+00				I 31.79	3.50
				0 32.05	3.24
49+75				I 31.84	3.45
				0 31.94	3.35
49+50				I 31.84	3.45
				0 31.84	3.45
49+37.9				I 31.84	3.45
				0 31.84	3.45
49+00				I 31.84	3.45
				0 31.94	3.35
48+75				I 31.79	3.50
				0 32.05	3.24
48+50				I 31.70	
				0 32.14	
48+37.9				I 31.66	3.63
				0 32.18	3.41
48+00				I	
47+87.9				0	
EQ 47+78.6				I	
				0	
47+53.6				I	
				0	

VOID A/c GRADE CHANGE See following page

(A/c Knocked Out) Reset Blue Tops for Paving 10-18-23

✓ 45+28.6		236.82	See following pages	I 30.99	5.83
				0 32.54	4.28
✓ 45+03.6				I 30.99	5.83
				0 32.54	4.28
✓ 42+44.4				I 31.16	5.66
				0 32.54	4.28
✓ 42+19.4				I 31.16	5.66
				0 32.54	4.28
✓ 41+94.4				I 30.6	5.66
				0 32.54	4.28
✓ 41+68.2				I 31.16	5.66
				0 32.54	4.28
✓ 41+18.2				I 31.43	5.39
				0 32.36	4.46
B.M.	4.18 ✓	236.82		232.64	
			- 4.18 ✓		

Party { Deutsche, Johnsen, Mahoney, Franke

10-13-23
Cold Fair

(56)

	L	R	Width Paving In.	Out.
Sp 12" Bl. Oak 30' R Sta. 57+30			11½	10½

Sp Power Pl. 27' L Sta. 42+94

(23-56) Blue Tops for Paving

Sta.	+S	H.I.	-S	Revised E. Profile Elev.	Elev Edge of Pavg
B.M.	3.59	235.68		232.09	
53+25				31.29	I 31.54
53+00				31.26	O 32.2 I 31.5
P.T. 52+74 1				31.21	O 32.24 I 31.4
52+50				31.14	O 32.19 I 31.39
52+25				31.04	O 32.12 I 31.29
52+00				30.96	O 32.02 I 31.21
51+75				30.88	O 31.94 I 31.13
+50				30.80	O 31.86 I 31.05
51+25				30.72	O 31.78 I 30.97
51+00				30.63	O 31.70 I 30.88
P.C. 50+88				30.59	O 31 81 I 30.84
50+63				30.54	O 31.67 I 30.85
E.W.T 50+38	(Drain outlet here left) ✓			30.44	O 31.47 I 30.80
50+00				30.40	O 31.32 I 30.89
49+75	(End curb here left) ✓			30.45	O 31.15 I 30.99
49+50	(Drain outlet here & St curb Rt) ✓			30.55	O 31.05 I 31.09
B.M.			3.59	232.09	O 31.09
B.M.	3.15	235.24		232.09	
E.S.T. S.S.T. 49+37 2				30.61	I 31.15 O 31.15
49+00				30.80	I 31.15 O 31.46
48+75				30.92	I 31.41 O 31.67
48+50				31.05	I 31.45 O 31.89
S.W.T. 48+37 2				31.10	I 31.46 O 31.98
48+00				31.24	I 31.42 O 32.25

Inside = Left.

Inside = Rt.

Party { Deutsche, Johnson, Mahoney, Franke } Grade Rod.

10-13-23
Cold. Windy -
10-15-23
Cold. Windy

Sp. 12" Bl. Oak 30' R Sta. 51+30

Rod	Dist to Stock Stk L (2' OFF)	R
4.14 ✓	14.0	12.0
3.41 ✓		
4.17 ✓		
3.44 ✓	14.0	12.0
4.22 ✓		
3.49 ✓	"	"
4.29 ✓		
3.56 ✓	"	"
4.39 ✓		
3.66 ✓	"	"
4.47 ✓		
3.74 ✓	"	"
4.55 ✓		
3.82 ✓	"	"
4.63 ✓		
3.90 ✓	"	"
4.71 ✓		
3.98 ✓	"	"
4.80 ✓		
4.07 ✓	"	"
4.84 ✓		
4.11 ✓	"	"
4.83 ✓		
4.21 ✓	13.0	"
4.88 ✓		
4.36 ✓	12.0	"
4.79 ✓		
4.53 ✓	"	"
4.69 ✓		
4.59 ✓	"	"
4.59 ✓		
4.59 ✓	"	"

Maintain Super = 0.73' (Ins. -.37 & Outs. +0.36)
(By Christman)
Method of computing - Elev. of Edge of Brng.
Paving = 7½" = 0.62'
Super inside = -0.37'
" outside = +0.36
∴ Add to ℄ Elev. +0.62 - 0.37 = +0.25 Ins.
∴ " " " +0.62 + 0.36 = 0.98 Outs.
"Maintain Pavt. 12' wide Inside } by ℄ C."
" " 10' " Outside

Used Super { -.028/Ft width Ins. ; +.031/" " Outs.

Std. Taper Inside & Out

Std. width Ins. & Out.

Sp. 12" Bl. Oak 30' R Sta. 51+30 (End. 10-13-23 12:30)

(Start 10-15-23 9:00 A)

Rod	L	R
4.09		
4.09 ✓	12.0	12.0
4.09 ✓		
3.78 ✓	"	"
3.83 ✓		
3.57 ✓	"	"
3.79 ✓		
3.35 ✓	"	"
3.78 ✓		
3.26 ✓	12.0	12.0
3.82 ✓		
2.99 ✓	12.0	13.31

(23-56) Blue Tops for Pav'g.

Sta.	+ S	H.I.	− S	Profile Grade	Elev. Edge of Pavement
P.T. 47+87.9 / EQUAT 47+78.6		Cont'd fr. prec. page 235.24		31.27	I 31.34 O 32.33
B.M.	3.14	235.23	3.14 (prev)	232.10 (232.09)	
47+53.6				31.29	I 31.14 O 32.44
E.S.T. E.W.T. 47+28.6				31.30	I 30.99 O 32.54
47+03.6					I O
46+78.6					I O
46+53.6					I O
46+28.6					I O
46+03.6		(Drain outlet here rt.)			I O
45+78.6					I O
45+53.6					I O
45+28.6					I O
45+03.6					I O
S.S.T. S.W.T. 44+85.1					I 31.15
T.P.	3.23	235.77	2.69	232.54	
44+60.1					O 32.45
P.C. 44+35.1					I 31.37 O 32.36
44+10.1					I 31.55 O 32.27
E.W.T. 43+85.1					I 31.65 O 32.18
B.M.			3.12.5		232.64
BM	2.81	235.45			
S.W.T. 43+69.4					I 31.65 O 32.18
43+44.4					I 31.55 O 32.27
P.T. 43+19.4					I 31.43 O 32.36
42+94.4					I 31.28 O 32.45
E.S.T. EWT 42+69.4					I 31.16 O 32.54
42+44.4					I 31.16 O 32.54

Maintain Max. Super & Widening (47+28.6 to 45+03.6)

Inside = Rt.

0.0% Grade – Elev = Constant @ 231.30

Constant elev inside & out = to respectively 230.99 & 232.54.

Party { Deetsche, Johnsen, Mahoney, Franke

10-15-23
Cool Windy
58

10-16-23
Windy & Rain

Grade Rod.

Dist to tack 57K (2° OFF)

	L	R
3.90 ✓		
2.91 ✓	12°	14 48
4.09 ✓		
2.79 ✓	12°	16 48
4.24 ✓		
2.69 ✓	12°	17 00
4.24 ✓		
2.69 ✓	〃	〃
✓		
diffs.	〃	〃
✓		
〃 ✓	〃	〃
✓		
〃 ✓	〃	〃
✓		
〃 ✓	〃	〃
✓		
〃 ✓	〃	〃
✓		
〃 ✓	〃	〃
✓		
〃 ✓	〃	〃
✓		
〃 ✓	〃	〃
Top str. 12'L Sta. 457+53.6		
4.62 ✓	〃	16 48
3.32 ✓		
4.40 ✓	〃	14 48
3.41 ✓		
3.90 ✓	〃	12 50
3.18 ✓		
3.80 ✓	〃	12 50
3.27 ✓		

(Hor shows. 332.46 But pole has been moved or transposition of figures?)

Hail power pole 27'L Sta. 4+27+94

〃 〃 〃 〃 〃 〃 〃.

(Start 10-16-23)

3.80 ✓		
3.27 ✓	12 00	12 50
3.90 ✓		
3.18 ✓	〃	〃
4.02 ✓		
3.09 ✓	12 20	13.13
4.17 ✓		
3.00 ✓	〃	13.99
4.29 ✓		
2.91 ✓	〃	14.27
4.29 ✓		
2.91 ✓	〃	14.27

(23-56) Blue Tops for Paving

Sta.	+S	-H.I.	-S	Profile Grade	Elev - Edge of Pavmt
42+19 4		Contd fr. prec page 235.45 (Drain outlet here Rt.)			I 31.16
					O 32.54
41+94 4					I O Same as above
SW.T. S.S.T. 41+68 2					I O " " "
					I 31.28
41+43 2					O 32.45
					I 31.43
P.C. 41+18 2					O 32.36
					I 31.56
40+93 2					O 32.27
					I 31.66
E.W.T. 40+68 2					O 32.18
					I 31.75
40+43 2	3.59	235.69	335	232.10	O 32.09
					I 31.84
40+18 2					O 32.00
					I 31.84
40+00	(End Curb here Rt.)				O 31.94
E.S.T.					I 31.84
S.S.T. 39+76 2					O 31.86
T.P.	(Start Curb here Lt)		543	230.26 ✓	I 31.84
39+50	(Previously obtained Sec X-Sec Notes taken by REO 9-15-23 Prec. pages.)			230.27 ✓	O 31.95
					I 31.72
39+00					O 32.12
					I 31.66
SW.T. 38+84 2					O 32.18
					I 31.56
38+59 2					O 32.27
					I 31.42
P.T. 38+34 2					O 32.36
T.P.			543	230.26 ✓	
T.P.	5.65	235.91		230.26 ✓	
					I 31.27
38+09 2					O 32.45
E.S.T.					I 31.14
EW.T. 37+84 2					O 32.54
					I 31.14
37+59 2					O 32.54
					I Same as above
37+34 2					O
					" " "
37+09 2					
					" " "
36+84 2	(Drain outlet here) (Set O.R)				
					" " "
36+59 2					

Inside = Rt

Inside = Lt

0.0% Grade Elev = 231.30

Party { Deutsche, Johnson, Mahoney, Franke }

10-16-23 Rain Windy Cold

10-17-23 Cool Windy

Grade Rod		Dist to toe Stk (2° OFF) L	R
4.29 ✓			
2.91 ✓		12^{00}	14^{29}
4.29 ✓			
2.91 ✓		"	14^{29}
4.29 ✓			
2.91 ✓		"	"
4.17 ✓			
3.00 ✓		"	13^{99}
4.02 ✓			
3.09 ✓		"	13^{13}
3.89 ✓			
3.18 ✓		"	12^{28}
3.79 ✓			
3.27 ✓		"	12^{00}
3.70 ✓	Top stk 12'L Sta. 40+43²		
3.36 ✓		"	"
3.85 ✓			
3.69 ✓		"	"
3.85 ✓			
3.75 ✓		"	"
3.85 ✓			
3.83 ✓		"	"
3.85 ✓	Top stump 20'R Sta. 38+55		
3.74 ✓		"	"
3.97 ✓	Used 4.97 } marked stk ("Grade 1° Up.)		
3.57 ✓	Used 4.57 }	"	"
4.03 ✓			
3.51 ✓		"	"
4.13 ✓			
3.42 ✓	Used 4.42 Mk'd stk ("Grade 1° Up")	12^{31}	12^{00}
4.27 ✓			
3.33 ✓		13^{27}	"

Top stump 20'R Sta. 38+55 (End 10-16-23)

(Start 10-17-23)

Grade Rod	L	R
4.64 ✓		
3.46 ✓	14^{25}	12^{00}
4.77 ✓		
3.37 ✓	14^{57}	12^{00}
Same as above ✓		
✓	"	"
✓		
" " " ✓	"	"
✓		
" " " ✓	"	"
✓		
" " " ✓	"	"
✓		
" " " ✓	"	"

(23-56) Blue Tops for Paving

Sta.	+S	H.I.	-S	Profile Grade Elev.	Elev Edge of Pavmt
		Contd from prec. page 235.91			I 31.14
36+34 ±					O 32.54
36+09 ±					Same as above
E.S.T.					
S.W.T. 35+88 ℄					
					I 31.27
35+63 ℄					O 32.45
					I 31.42
P.C. 35+38 ℄					O 32.36
B.M.			9.21	226.70	226.69 ±
B.M.	9.96	236.66		226.70	
					I 31.56
35+13 ℄					O 32.27
					I 31.66
E.W.T. 34+88 ℄					O 32.18
					I 31.75
34+63 ℄					O 32.09
					I 31.84
34+38 ℄					O 32.00
E.S.T.					I 31.92
S.S.T. 34+24 ℄					O 31.92
					I 31.84
34+10 ℄					O 32.00
					I 31.75
33+85 ℄					O 32.09
					I 31.66
S.W.T. 33+60 ℄					O 32.18
					I 31.56
33+35 ℄					O 32.27
					I 31.39
P.T. 33+10 ℄					O 32.36
B.M.			9.96	226.70	
B.M.	10.20	236.90		226.70	
					I 31.24
32+85 ℄					O 32.45
E.S.T		(Drain outlet here Lt) (Set OK)			I 31.11
E.W.T. 32+60 ℄					O 32.55
					I 31.15
32+35 ℄					O 32.59
					I 31.23
32+10 ℄					O 32.67
					I 31.35
31+85 ℄					O 32.79
					I 31.52
31+60 ℄					O 32.96

Party { Deutsche, Johnson, Mahoney, Franks, Grade Rod }

10-17-23
Cool Windy

(60)

Dist to Tack Stk (2 Ft OFF)

	L	R
4.77 ✓		
3.37 ✓	14 57	12 00
✓		
Same as above ✓	"	"
✓		
" " " ✓	"	"
4.64 ✓		
3.46 ✓	14 25	"
4.49 ✓		
3.55 ✓	13 27	"

(As established by Corley 9-12-23 When X-Sectioning. See prec. pages)
Sp. Ph. pole 40' L Sta. 35+25 (OK. Go ahead)

" " " " " " " "

5.10 ✓		
4.39 ✓	12 31	12 00
5.00 ✓		
4.48 ✓	12 00	12 00
4.91 ✓		
4.57 ✓	"	"
4.82 ✓		
4.66 ✓	"	"
4.74 ✓		
4.74 ✓	"	"
4.82 ✓		
4.66 ✓	"	"
4.91 ✓		
4.57 ✓	"	"
5.00 ✓		
4.48 ✓	"	"
5.10 ✓		
4.39 ✓	12 37	12 00
5.27 ✓		
4.30 ✓	13 63	"

Sp. Sm. M. 40' L Sta. 35+25 (End 10-17-23)

(Start 10-18-23)

5.66 ✓		
4.45 ✓	14 90	12 00
5.79 ✓		
4.35 ✓	15 29	"
5.75 ✓ Used 4.75 Mk I Stk "Grade 1' down" ✓		
4.31 ✓	"	"
5.67 ✓		
4.23 ✓	"	"
5.55 ✓		
4.11 ✓	"	"
5.38 ✓		
3.94	"	"

(23-56) Blue Tops for Paving

Sta.	+S	H.I.	-S	Profile Elev.	Elev of Point
		Contd fr. prec. page 236.90			I 31.72
31+35 B					O 33.14
S.W.T.					I 31.85
S.S.T. 31+21 ±					O 33.27
30+96 ±					I 32.26
30+71 ±					O 33.47
EQ. 30+72 6 P.C.	EQUATION				I 32.72
					O 33.68
B.M.			1.12	235.78	Plan elev. 235.69
B.M.	5.88	241.66		235.78	
30+47 6					I 33.20
					O 33.91
E.W.T. 30+22 6					I 33.69
					O 34.21
29+97 6					I 34.20
					O 34.54
29+72 6					I 34.76
					O 34.92
29+47 6	(End. Curb Lt) (Set ok)				I 35.23
					O 35.31
E.S.T. 29+22 6					I 35.77
					O 35.77
29+00					I. & O. 36.36
28+50					I & O 37.64
28+00					I & O 38.94
27+50					I & O 40.24
S.S.T. 27+29 I					I 40.76
					O 40.76
27+17 4	4.82 5	245.95	0.53	241.13	I 41.09
					O 41.13
26+92 4	(Start Curb Rt & outlet drain Set ok)				I 41.74
					O 41.85
26+67 4					I 42.32
					O 42.58
26+42 4					I 42.85
					O 43.29
P.T. 26+17 4					I 43.36
					O 43.96
T.P.	9.78	255.53	0.20	245.75	
B.M.			4.03	251.50	Plan Elev 251.40

Party { Deutsche, Johnson, Mahoney, Franke }

10-18-23 Cold! Raw Windy
10-19-23 Cold Raw

(61)

Grade Rod	Dist to Tack stk (2° ft off) L	R
5.18 ✓		
3.74 ✓	15^{29}	12^{00}
5.05 ✓		
3.61 ✓	15^{29}	12^{00}
4.64 ✓		
3.43 ✓	14^{90}	"
4.17 ✓		
3.22 ✓	13^{63}	"

Nail Pow. Pl 36'L Sta. 29+30 (Quit to go on (23-02)(23-55)

" " " " " " " " (Start 10-19-23 12:45 PM)

Grade Rod	L	R
8.46 ✓		
7.75 ✓	12^{37}	12^{00}
7.97 ✓		
7.45 ✓	12^{00}	12^{00}
7.46 ✓		
7.12 ✓	"	"
6.90 ✓		
6.74 ✓	"	"
6.43 ✓		
6.35 ✓	"	"
5.89 ✓		
5.89 ✓	"	"
5.30 ✓✓	"	"
4.02 ✓	"	"
2.72 ✓✓	"	"
1.42 ✓✓	"	"
0.90 ✓		
0.90 ✓	"	"
0.57 ✓		
0.53 ✓ Top stk 12'L Sta. 27+29²		
4.21 ✓		
4.10 ✓	"	"
3.63 ✓		
3.37 ✓	"	"
3.10 ✓		
2.66 ✓	"	"
2.59		
1.99 ✓	"	"

Top stk 14'L Sta. 25

Sp. Pow. Pl. L Sta. 22+60 (Let er go.)

(23-56)

Sta.	+ S	H.I.	− S		Elev. of Face of Pavement	
		Blue Tops for Paving				
B.M.	1.70	253.20		251.50		
26+04					I	43.59
					O	44.29
E.S.T. 25+79					I	44.06
					O	44.94
25+54					I	44.60
					O	45.48
25+29					I	45.12
					O	46.00
25+04					I	45.62
					O	46.50
24+79					I	46.10
					O	46.98
24+54					I	46.54
					O	47.42
24+29					I	47.01
					O	47.89
24+04					I	47.43
					O	48.31
23+79					I	47.81
					O	48.69
23+54					I	48.18
					O	49.06
23+29					I	48.54
					O	49.42
23+04					I	48.88
					O	49.76
22+79					I	49.19
					O	50.07
22+54					I	49.48
					O	50.36
22+29					I	49.76
					O	50.64
22+04					I	50.01
					O	50.89
B.M. 21+79	+ 3.75	255.25	1.70	251.50	I	50.23
					O	51.11
21+54					I	50.44
					O	51.32
21+29					I	50.64
					O	51.52
21+04					I	50.80
					O	51.68
S.S.T. 20+84					I	50.92
					O	51.80
20+59					I	51.15
					O	51.85
P.C. 20+47					I	51.26
					O	51.86

Cont'd on 4th page following this.

Party { Deutsche, Johnson, Mahoney, Franke

10-20-23 Cool. Windy Fair

10-22-23 Warm " " (2° 19 OFF)

(62)

Grade Rod.	Dist To Tack Stk L	R
Sp. Pow. Pole. L Sta. 22+60		
9.61 ✓		
8.91 ✓	12.00	12.00
9.14 ✓		
8.26 ✓		
8.60 ✓		
7.72 ✓		
8.08 ✓		"
7.20 ✓		
7.58 ✓		
6.70 ✓		"
7.10 ✓		
6.22 ✓		"
6.66 ✓		
5.78 ✓		
6.19 ✓		"
5.31 ✓		
5.77 ✓		
4.89 ✓		"
5.39 ✓		"
4.51 ✓		
5.02 ✓		"
4.14 ✓		
4.66 ✓		
3.78 ✓		
4.32 ✓		
3.44 ✓		
4.01 ✓		
3.13 ✓		
3.72 ✓		
2.84 ✓		
5.49 ✓		
4.61 ✓		
5.24 ✓		
4.36 ✓		
Sp. Pow. Pl. L Sta. 22+60		
5.02 ✓		
4.14 ✓		
4.81 ✓		
3.93 ✓		
4.61 ✓		
3.73 ✓		
4.45 ✓		
3.57 ✓		
4.33 ✓		
3.45 ✓		
4.10 ✓		
3.40 ✓		
3.99 ✓		
3.39 ✓		

To H.I. 253.20 (readings above 2.84)

To H.I. 253.25 (readings below 2.84)

Maintain 12.00 for all stations on this page

Maintain 12.00 " " " " " "

{ Quit 10-20-23
{ Start 10-22-23 Same party

For Grading.

First Curve Widening - S.E

23-56

Sta	point	Widening	Super-Elev	offset
			I. -1.42	18.5'
0 + 00	P.C.	2.48'	O. +0.99	16
			I. -1.30	21
+50	E.T.W.	5.00'	O. +0.99	16
			I. -1.30	21'
1 + 00		5.00'	O. +0.99	16'
			I. -1.30	21'
+50		5.00'	O. +0.99	16'
			I. -1.30	21'
2 + 00		5.00'	O. +0.99	16'
			I. -1.30	21'
+59.7	E.T.W.	5.00'	O. +0.99	16'
3 + 09.7			I. -1.64	18.5'
=7 + 99.06	P.T.	2.48'	O. +0.99	15'
2 + 49.06	B.T.W.	0.0	I. -0.93	15'
			O. +0.93	15'

(63)

10-1-23
M.W. Corley

Widening of 29° Curve 5 to 45

5 to	Point	Widening	Super-Elev I	Super-Elev O
			0.10	0.10
	+85½	B.W.T.	0.0	
44			0.17	
	+35.4	P.C.	2.48	-1.15 +0.99
	+50		2.59	-1.20 +0.99
	+86½	E.W.T.	5.00	-1.30 +0.99
45			5.00	-1.30 +0.99
	+25		5.00	
	+50		5.00	-1.30 +0.99
	+75		5.00	
46			5.00	-1.30 +0.99
	+25		5.00	
	+50		5.00	-1.30 +0.99
	+75		5.00	
47			5.00	-1.30 +0.99

N. W. Carlson

47 +28.6	E.W.T.	5.00	
47 +50		4.62	-1.30 +0.99
+78.6	P.T.	2.48	
48		0.69	-1.00 +0.99
+28.6	B.W.T.	0.0	
+50			
+80.4	E.S.T.		
49			
+25			
+50			
+75			
50			
+25			
+50			
+80.4	B.S.T.		

4 7 4 7 8,6
3(0 3 + 21.8
5 0 4 8 0 4

4 7 2
4 2 4
.0 4 8
8
.3 8 4
4.6 2

(23-56) Blue Tops for Paving-

Sta.	+ S	H.I.	- S		Elev of Edge of Pavement
		258.25			I 51.47
20+22 ℄		Cont'd fr. prec. page (4th back)			O 51.91
					I 51.63
19+97 ℄					O 51.89
					I 51.74
19+72 ℄	(End Curb here ℄)		(Set o/s)		O 51.85
					I 51.77
19+47 ℄					O 51.81
					I 51.77
E.S.T. 19+34 ℄	3.75 ✓		3.75 ✓		O 51.77
					51.24 54
E.M. 19+00	4.86	256.36 ✓		251.50	51.78
					51.18 54
18+50					51.72
					51.03 54
18+00					51.57
					50.81 54
+50					51.35
					50.50 54
17+00					51.04
					50.15 54
+50					50.67
					49.80 54
16+00					50.34
					49.45 54
+50					49.99
					49.10 54
15+00					49.64
					48.75 54
+50					49.29
					48.40 54
14+00					48.94
T.P. ℄ B.M.	3.03	252.50	6.89	249.47	(249.41)
					48.12 54
+50					48.66
					48.00 54
13+00					48.54
					48.03 54
+50					48.57
					48.20 54
12+00					48.74
					48.53 54
+50					49.07
					49.09 54
11+00					49.54
					49.62 54
+50					50.16
					50.40 54
10+00					50.94

Party { [illegible]
[illegible]
[illegible]
Franke

10-22-23
Cool - Windy P.M.

10-23-23
Cool. Windy Fair

Grade Rod.	Dist to Tack Stk (2⁰⁰ Ft Off) L	R
3.78 ✓	12⁰⁰	12⁰⁰
3.34 ✓		
3.62 ✓		
3.36 ✓		
3.51 ✓		
3.40 ✓		
3.48 ✓		
3.44 ✓		
3.48 ✓		
3.48 ✓		

End. 10-22-23
Start 10-23-23

Maintain 12⁰⁰ to tack for all stations on this page both L & R

Sp. Pow. Pl. L Sta. 22+60

Grade Rod.
4.58 ✓
4.64 ✓
4.79 ✓
5.01 ✓
5.32 ✓
5.67 ✓
6.02 ✓
6.37 ✓
6.72 ✓
7.07 ✓
7.42 ✓

*As taken by Carley Let er go!

Top S.W. Cor. Conc. Step for House 120' L Sta. 15+25

Grade Rod.
3.84 ✓
3.96 ✓
3.93 ✓
3.76 ✓
3.43 ✓
2.96 ✓
2.34 ✓
1.56 ✓

(23-56) Blue Tops for Paving

Sta	+ S	H.I.	- S		Elev. of Edges of Pavement
		252.50			51.25
9+50		Cont'd fr. prev page			54
T.P.	7.98	259.78		0.70 251.80	51.79
9+00					52.10
					54
					52.64
+50					52.95
					54
					53.49
8+00					53.80
					54
					54.34
B.M.			4.70	255.08	(253.00)
					54.65
7+50					54
					55.19
7+00					55.50
					54
					56.04
+50					56.35
					54
					56.89
6+00					57.20
					54
					57.74
+50					58.05
					54
					58.57
T.P. & 5+00	6.92	266.36	0.34	259.44	58.90
					54
					59.44
+50					59.75
					54
					60.29
4+00					60.47
					54
					61.01
			9.83		High center 256.36
T.P. B.M.	5.35 ✓	261.86	9.85	-256.51	Low.
			9.87		
B.M.			4.12	262.24	As 262.06 ✓
B.M.			3.49 ✓		
					As'mkd on P.
B.M.			4.02 ✓	257.84	257.70 ✓
B.M.	3.13	265.37		262.24	
				I 61.47 ✓	3.90 ✓
S.S.T. 3+50 ±				O 61.47 ✓	3.90 ✓
				I 61.61 ✓	3.76 ✓
3+25 ±				O 61.69 ✓	3.68 ✓
				I 61.68 ✓	3.69 ✓
3+00 ±				O 61.84 ✓	3.53 ✓
				I 61.60 ✓	3.77 ✓
2+75 ±				O 61.94 ✓	3.43 ✓
B.M.	3.04	265.28	3.13 ✓	I 61.45	3.83 ✓
S.W.T. 2+50 ±				O 61.97	3.31 ✓
				I 61.21	4.07 ✓
2+25 ±				O 61.93	3.35 ✓
EQUATION				I 60.84	4.44 ✓
P.T. 2+00 ±				O 61.83	3.45 ✓
(3+11.03)					

Tabulated

Party { Deutsche / Johnson / Mahoney / Franks }

10-26-23 Cold-Rainy

10-23-23 Cool. Fair

10-25-23 Cold. Windy

67

Grade Rod. | Dist to Tack Stk. L. R.

0.71 ✓
Top stk 12'L Sta. 9+50
7.14 ✓
6.29 ✓
5.44 ✓
As noted on profile, But I started from BM at. 22+60 - .10 higher than Profile Elev. ∴ OK to proceed - By Carley 254.91
Sp. Tel. Pl. 28'R Sta. 7+75
4.59 ✓
3.74 ✓
2.89 ✓
2.04 ✓
1.19 ✓
0.34 ✓ Top-stk 12'R Sta. 5+00
6.07 ✓
5.35 ✓

{Maintain 12⁰⁰ Lt. for all stations down including 2+50 ±}

Diff. +0.15
Plan elev. Mont. Intsc. Ɛs. Centerville & Birch Lake Rds.
determined by Carley. ?
Nail 24" Oak 40'L Sta. 3+45
Nail Tel. pl. 40'R Sta. 275+33 Centerville Project Stationing
Nail Tel. pl. #336 Rt Sta. 0+00 Birch Lake " "
Nail 24" Poplar 40'L Sta. 3+45 (Start. 10-25-23) (after running line)

3.68 ✓

" " " " " " " " (Quit. 10-25-23) (Start - 10-26-23)

12⁰⁰ 12⁵⁰

" 14⁴⁸

(23-56) Blue Tops for Paving

Sta.	+ S	H.I.	- S	Elev Edge of Pavement
		Contd fr. prev. page 265.28 ✓		I 60.37
2+86				O 61.67
E.S.T.				I 57.89
E.W.T. 2+61				O 61.44
				I 59.51
2+36				O 61.06
				I 59.21
2+11				O 60.76
				I 58.94
~~1+86~~				O 60.49
				I 58.64
1+61				O 60.19
				I 58.46
1+36				O 60.01
				I 58.36
1+11				O 59.91
				Only
0+90				O 59.88
				I
0+86		VOID P/G GRADE CHANGE		only 58.33
				I
0+61				only 58.37
				O
~~0+62.8~~				only 59.83
BM.	1.60	263.84	262.24	
				I 58.86
1+86				O 60.41
				I 58.51
1+61				O 60.06
				I 58.18
1+36				O 59.73
				I 57.95
1+11	(Drain outlet here Rt)			O 59.50
				Out only
0+90				59.23
				Ins. only
0+86				58.26
				℄ only
0+62.3				59.33
				Ins only
0+61				58.57
BM.	2.17	264.41	262.24	
				Ins only
0+25				59.02
		To ✓ = 4.		Ins only
P.C. 0+00		2.17		59.33

Party { Deutsche, Johnson, Mahoney (Sick), Franke

10-26-23 Cold Rainy-
10-27-23 Cold. Misty (68)

Grade Rod	Dist to Tack Sta. (2° AT OFF)
4.91 ✓	L 12°° R 16 48
3.61 ✓	
5.39 ✓	
3.84 ✓	12°° 17°°
5.77 ✓	
4.22 ✓	" "
6.07 ✓	
4.52 ✓	" "
6.34 ✓	
4.79 ✓	
6.64 ✓	
5.09 ✓	
6.82 ✓	
5.27 ✓	
6.92 ✓	
5.37 ✓	
5.40 ✓	
6.95 ✓	
6.91 ✓	
5.45 ✓	End - 10-26-23
Nail 24" Poplar 40'L Sta. 3+45	Start 10-27-23
4.98 ✓	
3.43 ✓	" "
5.33 ✓	
3.78 ✓	" "
5.66 ✓	
4.11 ✓	" "
5.89 ✓	
4.34 ✓	" "
4.51 ✓	" "
5.58 ✓	" "
4.51 ✓	" "
5.27 ✓	" "
Nail 24" Poplar 40'L Sta. 3+45	
5.39 ✓	
5.08 ✓	12°° 16 48
	12°° 14 48

17+00 P.C.T.

3+09.1
-1+99.06 P.T.

P.I.

0+00 P.C

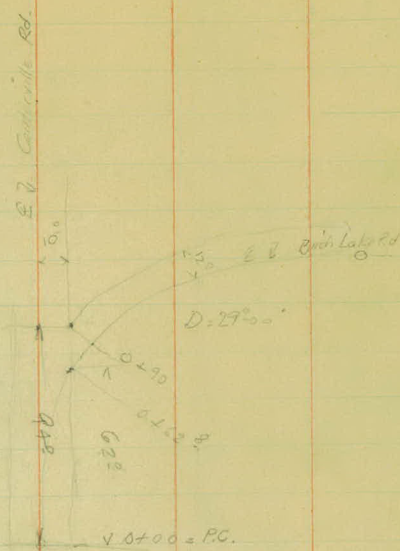
Sta.	Def.
0+00	0°-00'
0+50	7°-15'
1+00	14°-30'
1+50	21°-45'
2+00	29°-00'
2+50	36°-15'
3+00	43°-30'
3+09.7	44°-54.5'

Δ = 89°-49'

D = 29°-00'

S.T. = 199.1'

L = 309.7'


℄ Centreville Rd.
D = 29°00'
℄ Birch Lake Rd
0+00 = P.C.
62°

Party - Deutsche, Johnson, Mahoney, Franke

℄

10-24-23
Cool Fair

Note:- Profile Stone △ as 89°48' - Evidently interior ∠ instead of exterior angle was noted on profile

Brich Lake Rd.

P.I. - 23+38.5

P.O.T. 13+00 (Set 10-19-23)

P.O.T. 4+00 (Set 10-19-23)

EQUATION
P.T. 2+00.4 = 3+11.03 (Stone on Profile as 89°48')

90°12'

△ = 90°12'
T = 200.4'
D = 29°00'
L = 311.03

0+00
Mont. Inters. ℄ Brich Lake & ℄ Centerville Rds. ℄ Centerville Road

N

Transit Notes 23-56

Sept 5 / 23
Carley
Parsons
Briggs
Eck

Sta	Point	Δ Rt		Δ Lt
~~42+78.6~~ ~~= 47+88.00~~ 47+78.6 = 47+87.2 (L.D.H. 9/5/23)	P.T. chg. 0.1			Δ = 99° - 37'
				D = 29°
				S.T. = 236±
46+71±	P.I.	Δ 99° - 37'		L = 343±
44+35±	P.C.			
43+19.4	P.T.			Δ = 20° - 07'
				D = 10° - 00'
				S.T. = 101.6
42+19.8	P.I.	20° - 07'		L = 201.2'
41+18.2	P.C.			

Equation

Sta.	Def.
44+60	2° - 10'
45	10 - 25.5'
+50	16° - 40.5'
46	23° - 55.5'
+50	31° - 10.5'
47	38° - 25.5'
+50	45° - R.P. - Hub
+78.2	49° - 48.5'

Tack

Hub R.P.

Hub 46+71.6 P.I.

Tack Hub

37.3

18.7

18.41

P.I. Tack H.b

Tack Hub

Tack Hub

Sta	Def.
42	40 - 05 1/2'
42+50	60 - 35 1/2'
43	9° - 05 1/2'
43+19.11	10° - 03 1/2'

R.P. 51 K. 29.35 38.65 T.P.

T.P.

23-56

Transit Notes

Sta	Ang. Rt	Ang. Lt
48+05.2 E.C.		
47+00.1 P.I.		101°-33'
44+55.3 P.C.		
42+96.2 P.I.		18°-36'
36+91.7 P.I.		35°-26'
31+96.5 P.I.		40°-40'

VOID

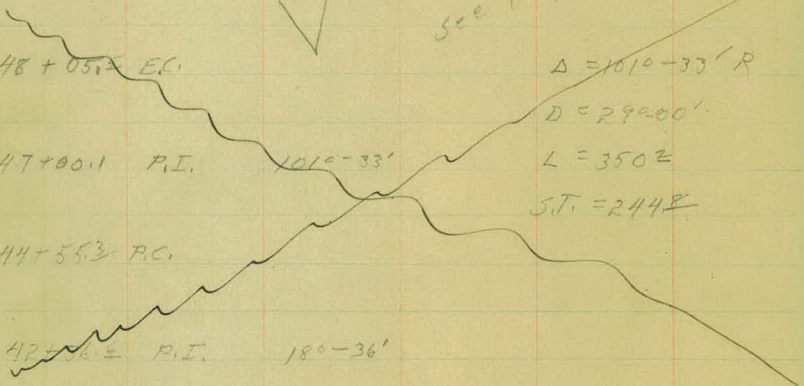
See preceding page

Δ = 101°-33' R

D = 29°-00'

L = 350.2

S.T. = 244.8



Party: Carley, Persons, Briggs, Eck.

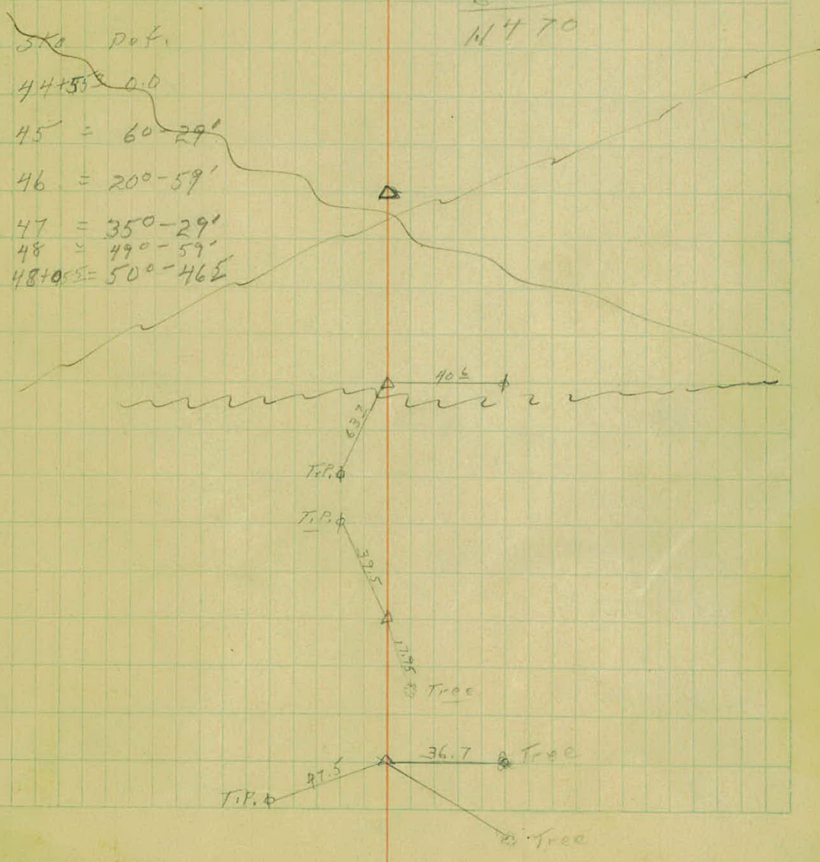
Lt. | ℄ | Rt.

.062
18.5

310
496
62

11470

Sta	Def.
44+53	0.0
45 =	6° - 29'
46 =	20° - 59'
47 =	35° - 29'
48 =	49° - 59'
48+9.5 =	50° - 46.5



23-56

Transit Notes

Sta. | Deft. Angle Left | Deft. Angle Right

55+86.4 P.T.

11°-24'

54+72.8 P.I.

53+58.4 P.C.

52+77.0 P.T.

38°-24'

51+85.3 P.I.

50+85.0 P.C.

47+8?.0 P.T.
=47+76.2

101°-09'

46+?? P.I.

44+33.4 P.C.

43+28.7 P.T.

18°-36'

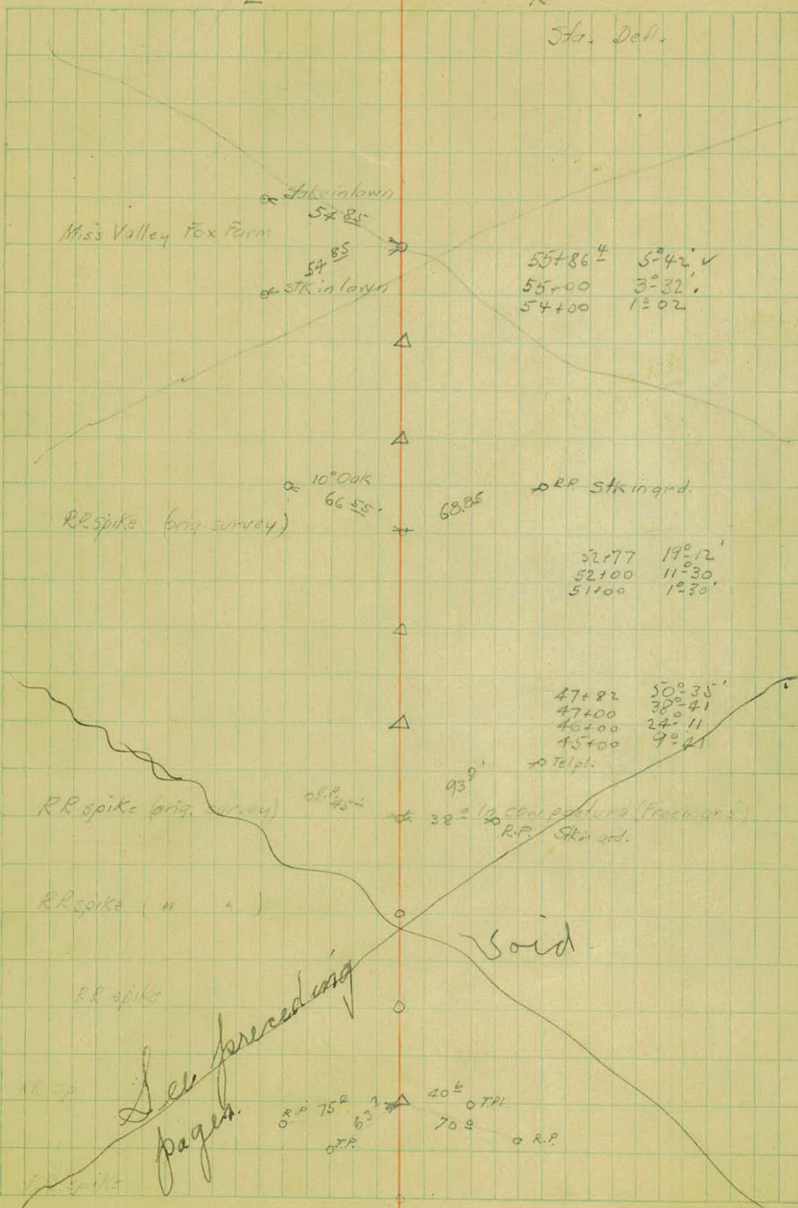
42+36.6 P.I.

35 41+47. P.C.

Party { Deutsche, Johnson, Mahoney, Franke }

9-4-23

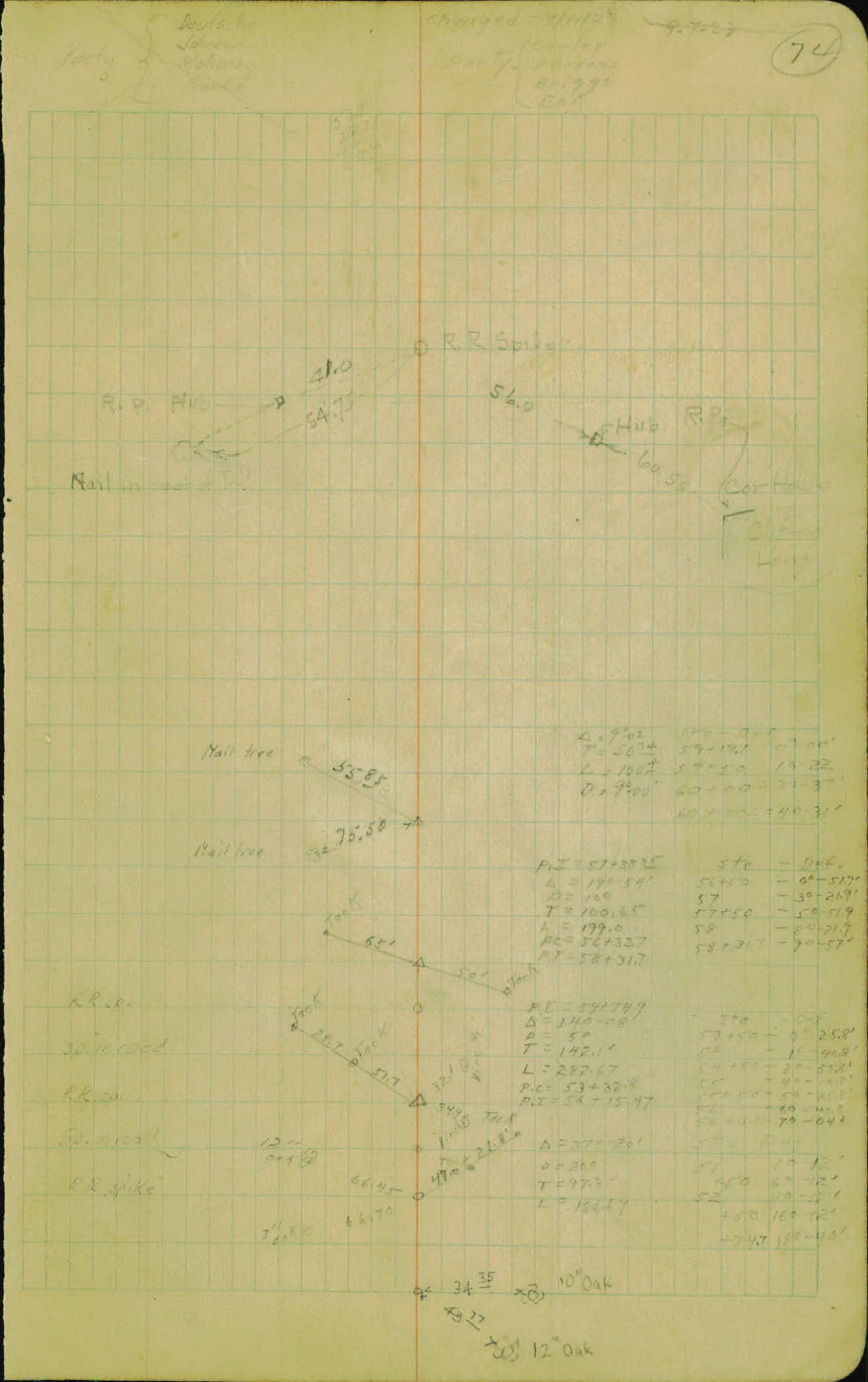
(73)



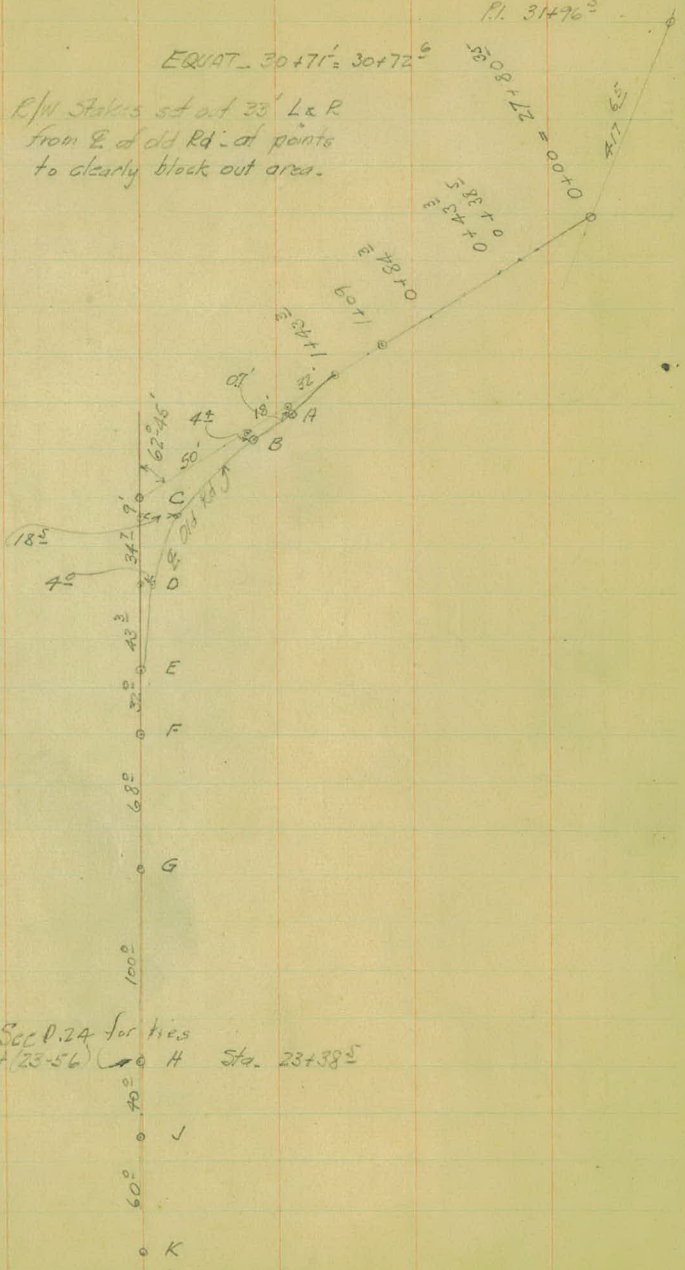
(23-56)

Transit Notes

Sta.		Defl Angle Left	Rt.
64+43.5 P.T. = 64+44.4			} [illegible]
63+33.4	P.I.	T = 60 [illegible]	
	P.C.		
60+20.6	P.T.		
59+70	P.I.	9°-02'	
59+19.7 (58+31.7)	P.C.		
= 58+37.5	P.T.		
57+33.35	P.I.	19°-54'	
56+32.20	P.C.		
56+15.47 ~~55+85.0~~	P.T.		
54+74.9	P.I.	14°-08'	
53+32.87 ~~53+50~~	P.C.		
52+74.7	P.T.		
51+85.3	P.I.	37°-20' ✓	
50+88.0	P.C.		


R.R. Spike
R.P. Hub
Hub R.P.
Nail in
Nail tree
Nail tree
10" Oak
12" Oak

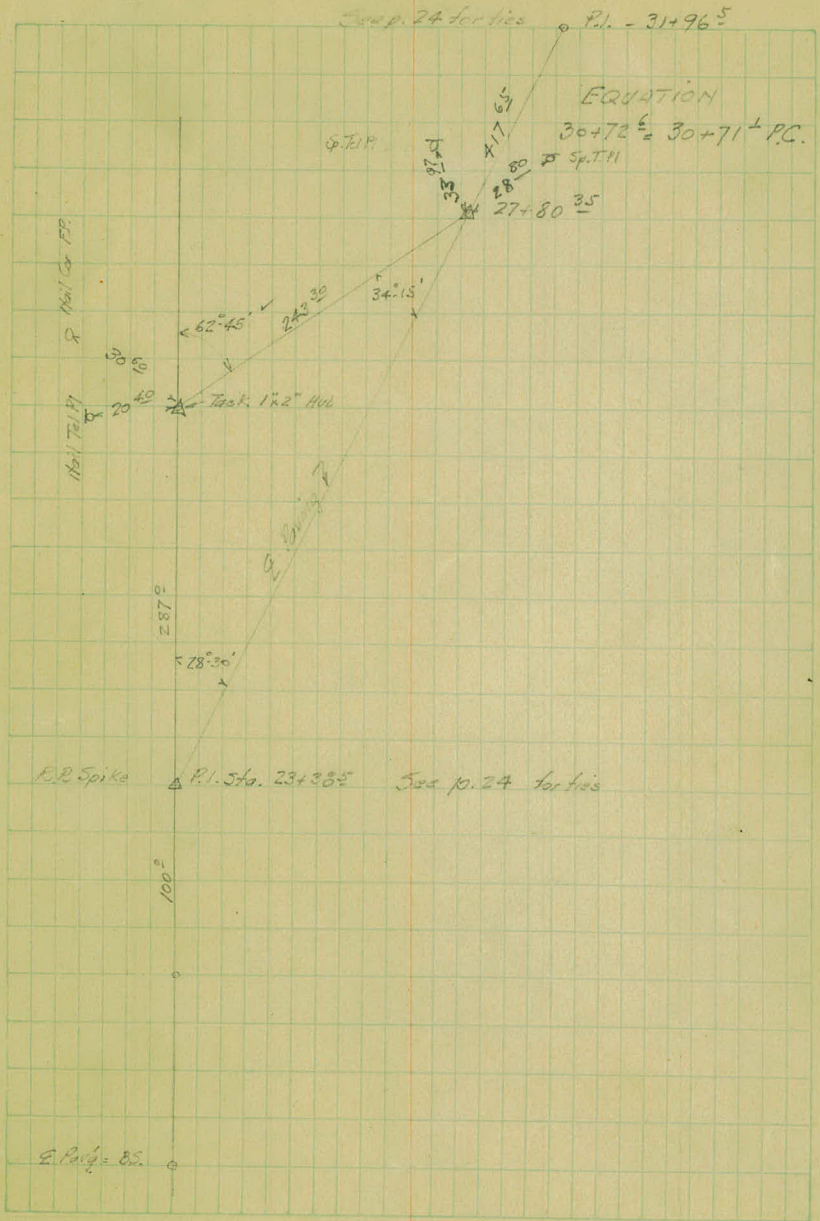
Transit. Notes
For Shoulder Matl. Borrow Pit.



Party { Deutsche, Johnson, Mahoney, Franke

11-27-83
Cold Cloudy

75



(23-56) X-Sections Borrow Pit For Shldr Matl.

Sta.	+ S	H.I.	- S	Elev.	
B.M.	11.33	247.11		235.78	
0+00					239.4
0+38 S					239.1
0+43 S					240.7
0+84 S					242.2
1+09					243.1
1+43 S					244.3
"A" (1+75)					245.3
T.P.	9.94	255.36	1.69	245.42	
"A" (1+75)					
"B" See alignment notes					245.7
"C" ditto					247.7
"D" "					249.0
"E" "					249.6
"F" "					250.2
"G" "					251.0
"H" "					251.0
"J" "					250.9
"K" "					248.4
B.M.			- 3.85	251.51	Previously 251.50

Party { Deutsche, Johnson, Mahoney, Franke }

11-22-23
Cold Cloudy

℄
Lt Rt

Hail Pav. Pl. 36' L Sta. 29+30 See page 61

On Pavg 7.61/0 7.87/12 8.5/12.5 8.6/14 10.0/18 10.2/27 7.5/31 7.6/32 7.4/33

On Pavg 6.30/33 6.6/16 7.2/15 7.6/11 8.4/10 8.0/0 6.4/6 7.5/33

7.0/18 7.5/14 8.2/13 7.9/4 6.4/0 6.0/2 7.7/33

7.1/33 6.7/31 4.3/23 5.2/11 4.9/0 5.7/15 5.3/27 7.9/33 6.6/39 5.6/41 5.7/44 Edge Pavg

4.9/67 5.2/64 6.3/56 6.4/48 1.4/38 3.0/36 3.4/33 4.1/15 4.5/11 4.0/0 4.6/13 4.3/27 4.9/30 5.9/33

0.1/33 2.7/29 2.9/16 3.3/10 2.8/0 3.3/14 3.3/24 2.9/27 4.5/33

1.5/21 2.3/18 1.8/0 1.7/15 2.3/18 2.0/20 1.0/22 1.0/30 1.7/33

Top stk

2.9/33 3.2/28 7.4/23 (10.1)

2.3/33 2.8/30 4.5/28 6.1/23 9.2/21 10.1/17 10.1/8 9.7/0 9.0/11 9.5/22 8.7/27 8.4/33

2.3/33 3.9/31 4.7/27 8.2/22 9.0/16 7.7/0 7.0/10 7.3/22 ℄ Pl. 7.1/25 7.9/33

3.3/33 3.1/30 4.2/29 4.6/25 7.4/22 7.2/12 6.4/0 6.2/8 7.3/21 7.1/28 5.5/32 5.4/33

6.4/33 5.0/20 5.6/15 6.3/14 5.8/0 6.2/13 6.7/16 6.6/19 5.7/22 5.7/25 6.3/33

6.5/33 5.7/28 4.4/21 5.4/15 6.1/14 5.2/0 5.6/11 5.5/18 4.9/20 5.6/21 6.8/33

Edge Pavg 8.3/57 8.5/53 9.6/50 9.5/45 8.7/42 4.2/35 4.9/33 3.7/23 3.7/18 5.1/14 4.4/0 4.8/10 5.1/20 4.7/21 4.4/25 5.1/33

Edge Pvg. 6.7/27 7.0/23 8.2/21 8.0/14 4.6/8 4.4/0 5.5/17 5.3/26 5.2/33

Conc. ✓ Edge Pvg 6.1/17 6.3/12 7.9/11 7.7/4 4.5/0 5.2/16 5.0/33

" " 5.5/6 7.0/0 6.8/5 4.7/8 5.5/17 5.1/33

…mined

Ja. Pav. Pl. Lt Sta. 22+60 See p. 62

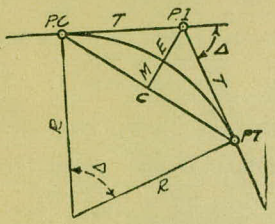
Data re: Grade Revision
See Corrected Profile for Conclusion

	Outside	
53 –	-0.2	0.5
52+75	-0.2	.5
51+50	I. -.3	O. -.7
50+88	I -.7	O .7

Start

	OK	Will stand
53 –		
52+75		-.3
52+50		-.5
52+25		-.2
52+00		-.3
51+75		-.3
51+50		-.45
51+25		-.35
51+00		-.5
50+88		-.7
50+63		-1.0
50+38		-1.0
49+75		-.6
49+50		-.8
49+38		-.8
49+00		-.7
48+75		-.7
47+879	OK	

DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES



CURVE FORMULAS

Radius=R=$\frac{50}{\text{sin. } D/2}$ (1) Degree of Curve=D and sin. $\frac{D}{2}=\frac{50}{R}$ (2)

Tangent=T=Rtan$\frac{\Delta}{2}$ (3) Length of Curve=L=100$\frac{\Delta}{D}$ (4)

Middle ordinate=M= R(1—cos. $\frac{\Delta}{2}$) (5) =Rvers $\frac{\Delta}{2}$ (6)

External=E=Ttan$\frac{\Delta}{4}$- (7) =R÷cos.$\frac{\Delta}{2}$—R(8)=Rxsec$\frac{\Delta}{2}$(9)

Long Chord=C=2 R sin.$\frac{\Delta}{2}$ (10) Δ=Central Angle

EXPLANATION AND USE OF TABLES

Stations.—Given P. I.=Sta. 161+60.35 to find Sta. of P. C. and P. T. Δ=62° 10′ D=8° 20′. From Table IV for 1° curve T=3454.1 and÷8⅓=414.49 ft. From Table V correction=.36 or T=414.85 ft. P. C.=Sta. P.I.—T=157+45.50. Also from (4) L=746.00 and P. T.=Sta. P. C.+L=164+91.50.

Offsets.—Tangent offsets vary (approximately) directly with D and with square of the distance. Thus tangent offset for Sta. 158 on above curve is 2.16 ft. found as follows. From Table III tangent offset for 100 ft.=7.27 ft. Distance=158—Sta. P. C.=54.50, hence offset=7.27 (54.50÷100)²=2.16 ft. Also square of any distance divided by twice the radius equals (approximately) the distance from tangent to curve. Thus (54.50)²÷(2 x 688.26)=2.16 ft.

Deflections.—Deflection angle=½ D for 100 ft., ¼ D for 50 ft., etc. For c ft.=(in minutes) .3 x C x D° or=defl. for 1 ft. from Table III x C. For Sta. 158 of above curve=.3 x 54.5 x 8⅓=136.2′ or 2° 16.2′, or=2.50 x 54.5=136.2′ from Table III. For Sta. 159 deflection angle=2° 16.2′ +8° 20′÷2=6° 26.2′, etc.

Externals.—May be found in similar manner to tangents. Thus E for curve above is 91.37. For from Table IV for 1° curve E=960.6 for 8° 20′=960.6÷8⅓=91.27 and from Table V correction=.10 or E=91.37 ft. Or suppose Δ=32° and E is measured and found to be 42 ft. What is D? From Table IV E=230.9 and÷42=5.5 or D=5° 30′.

Table I.—Minutes in Decimals of a Degree.

1′	.0167	11′	.1833	21′	.3500	31′	.5167	41′	.6833	51′	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

Table II.—Inches in Decimals of a Foot.

1–16	3–32	1/8	3–16	1/4	5–16	3/8	1/2	5/8	3/4	7/8
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729

1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

Table III.—Radii, Ordinates and Deflections.

Deg.	Radius	Mid. Ord.	Tan. Offset	Def. for 1 Foot	Deg.	Radius	Mid. Ord.	Tan Offset	Def. for 1 Foot
0° 10′	34377.5	.036	.145	0.05′	7°	819.02	1.528	6.105	2.10′
20	17188.8	.073	.291	0.10	20′	781.84	1.600	6.395	2.20
30	11459.2	.109	.436	0.15	30	764.49	1.637	6.540	2.25
40	8594.42	.145	.582	0.20	40	747.89	1.673	6.685	2.30
50	6875.55	.182	.727	0.25	8	716.78	1.746	6.976	2.40
1	5729.65	.218	.873	0.30	20	688.16	1.819	7.266	2.50
10	4911.15	.255	1.018	0.35	30	674.69	1.855	7.411	2.55
20	4297.28	.291	1.164	0.40	40	661.74	1.892	7.556	2.60
30	3819.83	.327	1.309	0.45					
40	3437.87	.364	1.454	0.50	9	637.28	1.965	7.846	2.70
50	3125.36	.400	1.600	0.55	20	614.56	2.037	8.136	2.80
					30	603.80	2.074	8.281	2.85
2	2864.93	.436	1.745	0.60	40	593.42	2.110	8.426	2.90
10	2644.58	.473	1.891	0.65					
20	2455.70	.509	2.036	0.70	10	573.69	2.183	8.716	3.00
30	2292.01	.545	2.181	0.75	30	546.44	2.292	9.150	3.15
40	2148.79	.582	2.327	0.80	11	521.67	2.402	9.585	3.30
50	2022.41	.618	2.472	0.85	30	499.06	2.511	10.02	3.45
					12	478.34	2.620	10.45	3.60
3	1910.08	.655	2.618	0.90	30	459.28	2.730	10.89	3.75
10	1809.57	.691	2.763	0.95	13	441.68	2.839	11.32	3.90
20	1719.12	.727	2.908	1.00	30	425.40	2.949	11.75	4.05
30	1637.28	.764	3.054	1.05	14	410.28	3.058	12.18	4.20
40	1562.88	.800	3.199	1.10	30	396.20	3.168	12.62	4.35
50	1494.95	.836	3.345	1.15					
					15	383.07	3.277	13.05	4.50
4	1432.69	.873	3.490	1.20	30	370.78	3.387	13.49	4.65
10	1375.40	.909	3.635	1.25	16	359.27	3.496	13.92	4.80
20	1322.53	.945	3.718	1.30	30	348.45	3.606	14.35	4.95
30	1273.57	.982	3.926	1.35	17	338.27	3.716	14.78	5.10
40	1228.11	1.018	4.071	1.40	18	319.62	3.935	15.64	5.40
50	1185.78	1.055	4.217	1.45	19	302.94	4.155	16.51	5.70
5	1146.28	1.091	4.362	1.50	20	287.94	4.374	17.37	6.00
10	1109.33	1.127	4.507	1.55	21	274.37	4.594	18.22	6.30
20	1074.68	1.164	4.653	1.60	22	262.04	4.814	19.08	6.60
30	1042.14	1.200	4.798	1.65	23	250.79	5.035	19.94	6.90
40	1011.51	1.237	4.943	1.70	24	240.49	5.255	20.79	7.20
50	982.64	1.273	5.088	1.75					
					25	231.01	5.476	21.64	7.50
6	955.37	1.309	5.234	1.80	26	222.27	5.697	22.50	7.80
10	929.57	1.346	5.379	1.85	27	214.18	5.918	23.35	8.10
20	905.13	1.382	5.524	1.90	28	206.68	6.139	24.19	8.40
30	881.95	1.418	5.669	1.95	29	199.70	6.360	25.04	8.70
40	859.92	1.455	5.814	2.00	30	193.18	6.583	25.88	9.00

Note. Chord Deflection=2 times tangent deflection.

TABLE IV.—TANGENTS AND EXTERNALS TO A 1° CURVE.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
1°	50.00	.22	11°	551.70	26.50	21°	1061.9	97.57
10′	58.34	.30	10′	560.11	27.31	10′	1070.6	99.16
20	66.67	.39	20	568.53	28.14	20	1079.2	100.75
30	75.01	.49	30	576.95	28.97	30	1087.8	102.35
40	83.34	.61	40	585.36	29.82	40	1096.4	103.97
50	91.68	.73	50	593.79	30.68	50	1105.1	105.60
2	100.01	.87	12	602.21	31.56	22	1113.7	107.24
10	108.35	1.02	10	610.64	32.45	10	1122.4	108.90
20	116.68	1.19	20	619.07	33.35	20	1131.0	110.57
30	125.02	1.36	30	627.50	34.26	30	1139.7	112.25
40	133.36	1.55	40	635.93	35.18	40	1148.4	113.95
50	141.70	1.75	50	644.37	36.12	50	1157.0	115.66
3	150.04	1.96	13	652.81	37.07	23	1165.7	117.38
10	158.38	2.19	10	661.25	38.03	10	1174.4	119.12
20	166.72	2.43	20	669.70	39.01	20	1183.1	120.87
30	175.06	2.67	30	678.15	39.99	30	1191.8	122.63
40	183.40	2.93	40	686.60	40.99	40	1200.5	124.41
50	191.74	3.21	50	695.06	42.00	50	1209.2	126.20
4	200.08	3.49	14	703.51	43.03	24	1217.9	128.00
10	208.43	3.79	10	711.97	44.07	10	1226.6	129.82
20	216.77	4.10	20	720.44	45.12	20	1235.3	131.65
30	225.12	4.42	30	728.90	46.18	30	1244.0	133.50
40	233.47	4.76	40	737.37	47.25	40	1252.8	135.35
50	241.81	5.10	50	745.85	48.34	50	1261.5	137.23
5	250.16	5.46	15	754.32	49.44	25	1270.2	139.11
10	258.51	5.83	10	762.80	50.55	10	1279.0	141.01
20	266.86	6.21	20	771.29	51.68	20	1287.7	142.93
30	275.21	6.61	30	779.77	52.89	30	1296.5	144.85
40	283.57	7.01	40	788.26	53.97	40	1305.3	146.79
50	291.92	7.43	50	796.75	55.13	50	1314.0	148.75
6	300.28	7.86	16	805.25	56.31	26	1322.8	150.71
10	308.64	8.31	10	813.75	57.50	10	1331.6	152.69
20	316.99	8.76	20	822.25	58.70	20	1340.4	154.69
30	325.35	9.23	30	830.76	59.91	30	1349.2	156.70
40	333.71	9.71	40	839.27	61.14	40	1358.0	158.72
50	342.08	10.20	50	847.78	62.38	50	1366.8	160.76
7	350.44	10.71	17	856.30	63.63	27	1375.6	162.81
10	358.81	11.22	10	864.82	64.90	10	1384.4	164.86
20	367.17	11.75	20	873.35	66.18	20	1393.2	166.95
30	375.54	12.29	30	881.88	67.47	30	1402.0	169.04
40	383.91	12.85	40	890.41	68.77	40	1410.9	171.15
50	392.28	13.41	50	898.95	70.09	50	1419.7	173.27
8	400.66	13.99	18	907.49	71.42	28	1428.6	175.41
10	409.03	14.58	10	916.03	72.76	10	1437.4	177.55
20	417.41	15.18	20	924.58	74.12	20	1446.3	179.72
30	425.79	15.80	30	933.13	75.49	30	1455.1	181.89
40	434.17	16.43	40	941.69	76.86	40	1464.0	184.08
50	442.55	17.07	50	950.25	78.26	50	1472.9	186.29
9	450.93	17.72	19	958.81	79.67	29	1481.8	188.51
10	459.32	18.38	10	967.38	81.09	10	1490.7	190.74
20	467.71	19.06	20	975.96	82.53	20	1499.6	192.99
30	476.10	19.75	30	984.53	83.97	30	1508.5	195.25
40	484.49	20.45	40	993.12	85.43	40	1517.4	197.53
50	492.88	21.16	50	1001.7	86.90	50	1526.3	199.82
10	501.28	21.89	20	1010.3	88.39	30	1535.3	202.12
10	509.68	22.62	10	1018.9	89.89	10	1544.2	204.44
20	518.08	23.38	20	1027.5	91.40	20	1553.1	206.77
30	526.48	24.14	30	1036.1	92.92	30	1562.1	209.12
40	534.89	24.91	40	1044.7	94.46	40	1571.0	211.48
50	543.29	25.70	50	1053.3	96.01	50	1580.0	213.86

TABLE IV.—TANGENTS AND EXTERNALS TO A 1° CURVE.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
31°	1589.0	216.3	**41°**	2142.2	387.4	**51°**	2732.9	618.4
10′	1598.0	218.7	10′	2151.7	390.7	10′	2743.1	622.8
20	1606.9	221.1	20	2161.2	394.1	20	2753.4	627.2
30	1615.9	223.5	30	2170.8	397.4	30	2763.7	631.7
40	1624.9	226.0	40	2180.3	400.8	40	2773.9	636.2
50	1633.9	228.4	50	2189.9	404.2	50	2784.2	640.7
32	1643.0	230.9	**42**	2199.4	407.6	**52**	2794.5	645.2
10	1652.0	233.4	10	2209.0	411.1	10	2804.9	649.7
20	1661.0	235.9	20	2218.6	414.5	20	2815.2	654.3
30	1670.0	238.4	30	2228.1	418.0	30	2825.6	658.8
40	1679.1	241.0	40	2237.7	421.4	40	2835.9	663.4
50	1688.1	243.5	50	2247.3	425.0	50	2846.3	668.0
33	1697.2	246.1	**43**	2257.0	428.5	**53**	2856.7	672.7
10	1706.3	248.7	10	2266.6	432.0	10	2867.1	677.3
20	1715.3	251.3	20	2276.2	435.6	20	2877.5	682.0
30	1724.4	253.9	30	2285.9	439.2	30	2888.0	686.7
40	1733.5	256.5	40	2295.6	442.8	40	2898.4	691.4
50	1742.6	259.1	50	2305.2	446.4	50	2908.9	696.1
34	1751.7	261.8	**44**	2314.9	450.0	**54**	2919.4	700.9
10	1760.8	264.5	10	2324.6	453.6	10	2929.9	705.7
20	1770.0	267.2	20	2334.3	457.3	20	2940.4	710.5
30	1779.1	269.9	30	2344.1	461.0	30	2951.0	715.3
40	1788.2	272.6	40	2353.8	464.6	40	2961.5	720.1
50	1797.4	275.3	50	2363.5	468.4	50	2972.1	725.0
35	1806.6	278.1	**45**	2373.3	472.1	**55**	2982.7	729.9
10	1815.7	280.8	10	2383.1	475.8	10	2993.3	734.8
20	1824.9	283.6	20	2392.8	479.6	20	3003.9	739.7
30	1834.1	286.4	30	2402.6	483.8	30	3014.5	744.6
40	1843.3	289.2	40	2412.4	487.2	40	3025.2	749.6
50	1852.5	292.0	50	2422.3	491.0	50	3035.8	754.6
36	1861.7	294.9	**46**	2432.1	494.8	**56**	3046.5	759.6
10	1870.9	297.7	10	2441.9	498.7	10	3057.2	764.6
20	1880.1	300.6	20	2451.8	502.5	20	3067.9	769.7
30	1889.4	303.5	30	2461.7	506.4	30	3078.7	774.7
40	1898.6	306.4	40	2471.5	510.3	40	3089.4	779.8
50	1907.9	309.3	50	2481.4	514.3	50	3100.2	784.9
37	1917.1	312.2	**47**	2491.3	518.2	**57**	3110.9	790.1
10	1926.4	315.2	10	2501.2	522.2	10	3121.7	795.2
20	1935.7	318.1	20	2511.2	526.1	20	3132.6	800.4
30	1945.0	321.1	30	2521.1	530.1	30	3143.4	805.6
40	1954.3	324.1	40	2531.1	534.2	40	3154.2	810.9
50	1963.6	327.1	50	2541.0	538.2	50	3165.1	816.1
38	1972.9	330.2	**48**	2551.0	542.2	**58**	3176.0	821.4
10	1982.2	333.2	10	2561.0	546.3	10	3186.9	826.7
20	1991.5	336.3	20	2571.0	550.4	20	3197.8	832.0
30	2000.9	339.3	30	2581.0	554.5	30	3208.8	837.3
40	2010.2	342.4	40	2591.0	558.6	40	3219.7	842.7
50	2019.6	345.5	50	2601.1	562.8	50	3230.7	848.1
39	2029.0	348.6	**49**	2611.2	566.9	**59**	3241.7	853.5
10	2038.4	351.8	10	2621.2	571.1	10	3252.7	858.9
20	2047.8	354.9	20	2631.3	575.3	20	3263.7	864.3
30	2057.2	358.1	30	2641.4	579.5	30	3274.8	869.8
40	2066.6	361.3	40	2651.5	583.8	40	3285.8	875.3
50	2076.0	364.5	50	2661.6	588.0	50	3296.9	880.8
40	2085.4	367.7	**50**	2671.8	592.3	**60**	3308.0	886.4
10	2094.9	371.0	10	2681.9	596.6	10	3319.1	892.0
20	2104.3	374.2	20	2692.1	600.9	20	3330.3	897.5
30	2113.8	377.5	30	2702.3	605.3	30	3341.4	903.2
40	2123.3	380.8	40	2712.5	609.6	40	3352.6	908.8
50	2132.7	384.1	50	2722.7	614.0	50	3363.8	914.5

TABLE IV.—TANGENTS AND EXTERNALS TO A 1° CURVE.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
61°	3375.0	920.2	**71°**	4086.9	1308.2	**81°**	4893.6	1805.3
10′	3386.3	925.9	10′	4099.5	1315.6	10′	4908.0	1814.7
20	3397.5	931.6	20	4112.1	1322.9	20	4922.5	1824.1
30	3408.8	937.3	30	4124.8	1330.3	30	4937.0	1833.6
40	3420.1	943.1	40	4137.4	1337.7	40	4951.5	1843.1
50	3431.4	948.9	50	4150.1	1345.1	50	4966.1	1852.6
62	3442.7	954.8	**72**	4162.8	1352.6	**82**	4980.7	1862.2
10	3454.1	960.6	10	4175.6	1360.1	10	4995.4	1871.8
20	3465.4	966.5	20	4188.5	1367.6	20	5010.0	1881.5
30	3476.8	972.4	30	4201.2	1375.2	30	5024.8	1891.2
40	3488.3	978.3	40	4214.0	1382.8	40	5039.5	1900.9
50	3499.7	984.3	50	4226.8	1390.4	50	5054.3	1910.7
63	3511.1	990.2	**73**	4239.7	1398.0	**83**	5069.2	1920.5
10	3522.6	996.2	10	4252.6	1405.7	10	5084.0	1930.4
20	3534.1	1002.3	20	4265.6	1413.5	20	5099.0	1940.3
30	3545.6	1008.3	30	4278.5	1421.2	30	5113.9	1950.3
40	3557.2	1014.4	40	4291.5	1429.0	40	5128.9	1960.2
50	3568.7	1020.5	50	4304.6	1436.8	50	5143.9	1970.3
64	3580.3	1026.6	**74**	4317.6	1444.6	**84**	5159.0	1980.4
10	3591.9	1032.8	10	4330.7	1452.5	10	5174.1	1990.5
20	3603.5	1039.0	20	4343.8	1460.4	20	5189.3	2000.6
30	3615.1	1045.2	30	4356.9	1468.4	30	5204.4	2010.8
40	3626.8	1051.4	40	4370.1	1476.4	40	5219.7	2021.1
50	3638.5	1057.7	50	4383.3	1484.4	50	5234.9	2031.4
65	3650.2	1063.9	**75**	4396.5	1492.4	**85**	5250.3	2041.7
10	3661.9	1070.2	10	4409.8	1500.5	10	5265.6	2052.1
20	3673.7	1076.6	20	4423.1	1508.6	20	5281.0	2062.5
30	3685.4	1082.9	30	4436.4	1516.7	30	5296.4	2073.0
40	3697.2	1089.3	40	4449.7	1524.9	40	5311.9	2083.5
50	3709.0	1095.7	50	4463.1	1533.1	50	5327.4	2094.1
66	3720.9	1102.2	**76**	4476.5	1541.4	**86**	5343.0	2104.7
10	3732.7	1108.6	10	4489.9	1549.7	10	5358.6	2115.3
20	3744.6	1115.1	20	4503.4	1558.0	20	5374.2	2126.0
30	3756.5	1121.7	30	4516.9	1566.3	30	5389.9	2136.7
40	3768.5	1128.2	40	4530.4	1574.7	40	5405.6	2147.5
50	3780.4	1134.8	50	4544.0	1583.1	50	5421.4	2158.4
67	3792.4	1141.4	**77**	4557.6	1591.6	**87**	5437.2	2169.2
10	3804.4	1148.0	10	4571.2	1600.1	10	5453.1	2180.2
20	3816.4	1154.7	20	4584.8	1608.6	20	5469.0	2191.1
30	3828.4	1161.3	30	4598.5	1617.1	30	5484.9	2202.2
40	3840.5	1168.1	40	4612.2	1625.7	40	5500.9	2213.2
50	3852.6	1174.8	50	4626.0	1634.4	50	5517.0	2224.3
68	3864.7	1181.6	**78**	4639.8	1643.0	**88**	5533.1	2235.5
10	3876.8	1188.4	10	4653.6	1651.7	10	5549.2	2246.7
20	3889.0	1195.2	20	4667.4	1660.5	20	5565.4	2258.0
30	3901.2	1202.0	30	4681.3	1669.2	30	5581.6	2269.3
40	3913.4	1208.9	40	4695.2	1678.1	40	5597.8	2280.6
50	3925.6	1215.8	50	4709.2	1686.9	50	5614.2	2292.0
69	3937.9	1222.7	**79**	4723.2	1695.8	**89**	5630.5	2303.5
10	3950.2	1229.7	10	4737.2	1704.7	10	5646.9	2315.0
20	3962.5	1236.7	20	4751.2	1713.7	20	5663.4	2326.6
30	3974.8	1243.7	30	4765.3	1722.7	30	5679.9	2338.2
40	3987.2	1250.8	40	4779.4	1731.7	40	5696.4	2349.8
50	3999.5	1257.9	50	4793.6	1740.8	50	5713.0	2361.5
70	4011.9	1265.0	**80**	4807.7	1749.9	**90**	5729.7	2373.3
10	4024.4	1272.1	10	4822.0	1759.0	10	5746.3	2385.1
20	4036.8	1279.3	20	4836.2	1768.2	20	5763.1	2397.0
30	4049.3	1286.5	30	4850.5	1777.4	30	5779.9	2408.9
40	4061.8	1293.6	40	4864.8	1786.7	40	5796.7	2420.9
50	4074.4	1300.9	50	4879.2	1796.0	50	5813.6	2432.9

Table IV.—Tangents and Externals to a 1° Curve.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
91°	5830.5	2444.9	**101°**	6950.6	3278.1	**111°**	8336.7	4386.1
10′	5847.5	2457.1	10′	6971.3	3294.1	10′	8362.7	4407.6
20	5864.6	2469.3	20	6992.0	3310.1	20	8388.9	4429.2
30	5881.7	2481.5	30	7012.7	3326.1	30	8415.1	4450.9
40	5898.8	2493.8	40	7033.6	3342.3	40	8441.5	4472.7
50	5916.0	2506.1	50	7054.5	3358.5	50	8468.0	4494.6
92	5933.2	2518.5	**102**	7075.5	3374.9	**112**	8494.6	4516.6
10	5950.5	2531.0	10	7096.6	3391.2	10	8521.3	4538.8
20	5967.9	2543.5	20	7117.8	3407.7	20	8548.1	4561.1
30	5985.3	2556.0	30	7139.0	3424.3	30	8575.0	4583.4
40	6002.7	2568.6	40	7160.3	3440.9	40	8602.1	4606.0
50	6020.2	2581.3	50	7181.7	3457.6	50	8629.3	4628.6
93	6037.8	2594.0	**103**	7203.2	3474.4	**113**	8656.6	4651.3
10	6055.4	2606.8	10	7224.7	3491.3	10	8684.0	4674.2
20	6073.1	2619.7	20	7246.3	3508.2	20	8711.5	4697.2
30	6090.8	2632.6	30	7268.0	3525.2	30	8739.2	4720.3
40	6108.6	2645.5	40	7289.8	3542.4	40	8767.0	4743.6
50	6126.4	2658.5	50	7311.7	3559.6	50	8794.9	4766.9
94	6144.3	2671.6	**104**	7333.6	3576.8	**114**	8822.9	4790.4
10	6162.6	2684.7	10	7355.6	3594.2	10	8851.0	4814.1
20	6180.2	2697.9	20	7377.8	3611.7	20	8879.3	4837.8
30	6198.3	2711.2	30	7399.9	3629.2	30	8907.7	4861.7
40	6216.4	2724.5	40	7422.2	3646.8	40	8936.3	4885.7
50	6234.6	2737.9	50	7444.6	3664.5	50	8965.0	4909.9
95	6252.8	2751.3	**105**	7467.0	3682.3	**115**	8993.8	4934.1
10	6271.1	2764.8	10	7489.6	3700.2	10	9022.7	4958.6
20	6289.4	2778.3	20	7512.2	3718.2	20	9051.7	4983.1
30	6307.9	2792.0	30	7534.9	3736.2	30	9080.9	5007.8
40	6326.3	2805.6	40	7557.7	3754.4	40	9110.3	5032.6
50	6344.8	2819.4	50	7580.5	3772.6	50	9139.8	5057.6
96	6363.4	2833.2	**106**	7603.5	3791.0	**116**	9169.4	5082.7
10	6382.1	2847.0	10	7626.6	3809.4	10	9199.1	5107.9
20	6400.8	2861.0	20	7649.7	3827.9	20	9229.0	5133.3
30	6419.5	2875.0	30	7672.9	3846.5	30	9259.0	5158.8
40	6438.4	2889.0	40	7696.3	3865.2	40	9289.2	5184.5
50	6457.3	2903.1	50	7719.7	3884.0	50	9319.5	5210.3
97	6476.2	2917.3	**107**	7743.2	3902.9	**117**	9349.9	5236.2
10	6495.2	2931.6	10	7766.8	3921.9	10	9380.5	5262.3
20	6514.3	2945.9	20	7790.5	3940.9	20	9411.3	5288.6
30	6533.4	2960.3	30	7814.3	3960.1	30	9442.2	5315.0
40	6552.6	2974.7	40	7838.1	3979.4	40	9473.2	5341.5
50	6571.9	2989.2	50	7862.1	3998.7	50	9504.4	5368.2
98	6591.2	3003.8	**108**	7886.2	4018.2	**118**	9535.7	5395.1
10	6610.6	3018.4	10	7910.4	4037.8	10	9567.2	5422.1
20	6630.1	3033.1	20	7934.6	4057.4	20	9598.9	5449.2
30	6649.6	3047.9	30	7959.0	4077.2	30	9630.7	5476.5
40	6669.2	3062.8	40	7983.5	4097.1	40	9662.6	5504.0
50	6688.8	3077.7	50	8008.0	4117.0	50	9694.7	5531.7
99	6708.6	3092.7	**109**	8032.7	4137.1	**119**	9727.0	5559.4
10	6728.4	3107.7	10	8057.4	4157.3	10	9759.4	5587.4
20	6748.2	3122.9	20	8082.3	4177.5	20	9792.0	5615.5
30	6768.1	3138.1	30	8107.3	4197.9	30	9824.8	5643.8
40	6788.1	3153.3	40	8132.3	4218.4	40	9857.7	5672.3
50	5808.2	3168.7	50	8157.5	4239.0	50	9890.8	5700.9
100	6828.3	3184.1	**110**	8182.8	4259.7	**120**	9924.0	5729.7
10	6848.5	3199.6	10	8208.2	4280.5	10	9957.5	5758.6
20	6868.8	3215.1	20	8233.7	4301.4	20	9991.0	5787.7
30	6889.2	3230.8	30	8259.3	4322.4	30	10025.0	5817.0
40	6909.6	3246.5	40	8285.0	4343.6	40	10059.0	5846.5
50	6930.1	3262.3	50	8310.8	4364.8	50	10093.0	5876.1

Table VIII.—Natural Trigonometrical Functions.

Angle	Sine.	Tan.	Cotg.	Cosin.		Angle	Sine.	Tan.	Cotg.	Cosin.	
° /						° /					
16	.2756	.2867	3.487	.96126	74	24	.4067	.4452	2.246	.91355	66
10	.2784	.2899	3.450	.96046	50	10	.4094	.4487	2.229	.91236	50
20	.2812	.2931	3.412	.95964	40	20	.4120	.4522	2.211	.91116	40
30	.2840	.2962	3.376	.95882	30	30	.4147	.4557	2.194	.90996	30
40	.2868	.2994	3.340	.95799	20	40	.4173	.4592	2.177	.90875	20
50	.2896	.3026	3.305	.95715	10	50	.4200	.4628	2.161	.90753	10
17	.2924	.3057	3.271	.95615	73	25	.4226	.4663	2.145	.90631	65
10	.2952	.3089	3.237	.95545	50	10	.4253	.4699	2.128	.90507	50
20	.2979	.3121	3.204	.95459	40	20	.4279	.4734	2.112	.90383	40
30	.3007	.3153	3.172	.95372	30	30	.4305	.4770	2.097	.90259	30
40	.3035	.3185	3.140	.95284	20	40	.4331	.4806	2.081	.90132	20
50	.3062	.3217	3.108	.95195	10	50	.4358	.4841	2.066	.90007	10
18	.3090	.3249	3.078	.95106	72	26	.4384	.4877	2.050	.89879	64
10	.3118	.3281	3.048	.95015	50	10	.4410	.4913	2.035	.89752	50
20	.3145	.3314	3.018	.94924	40	20	.4436	.4950	2.020	.89623	40
30	.3173	.3346	2.989	.94832	30	30	.4462	.4986	2.006	.89493	30
40	.3201	.3378	2.960	.94740	20	40	.4488	.5022	1.991	.89363	20
50	.3228	.3411	2.932	.94646	10	50	.4514	.5059	1.977	.89232	10
19	.3256	.3443	2.904	.94552	71	27	.4540	.5095	1.963	.89101	63
10	.3283	.3476	2.877	.94457	50	10	.4566	.5132	1.949	.88968	50
20	.3311	.3508	2.850	.94361	40	20	.4592	.5169	1.935	.88835	40
30	.3338	.3541	2.824	.94264	30	30	.4617	.5206	1.921	.88701	30
40	.3365	.3574	2.798	.94167	20	40	.4643	.5243	1.907	.88566	20
50	.3393	.3607	2.773	.94068	10	50	.4669	.5280	1.894	.88431	10
20	.3420	.3640	2.747	.93969	70	28	.4695	.5317	1.881	.88295	62
10	.3448	.3673	2.723	.93869	50	10	.4720	.5354	1.868	.88158	50
20	.3475	.3706	2.669	.93769	40	20	.4746	.5392	1.855	.88020	40
30	.3502	.3739	2.675	.93667	30	30	.4772	.5430	1.842	.87882	30
40	.3529	.3772	2.651	.93565	20	40	.4797	.5467	1.829	.87743	20
50	.3557	.3805	2.628	.93462	10	50	.4823	.5505	1.816	.87603	10
21	.3584	.3839	2.605	.93358	69	29	.4848	.5543	1.804	.87462	61
10	.3611	.3872	2.583	.93253	50	10	.4874	.5581	1.792	.87321	50
20	.3638	.3906	2.560	.93148	40	20	.4899	.5619	1.780	.87178	40
30	.3665	.3939	2.539	.93042	30	30	.4924	.5658	1.767	.87036	30
40	.3692	.3973	2.517	.92935	20	40	.4950	.5696	1.756	.86892	20
50	.3719	.4006	2.496	.92827	10	50	.4975	.5735	1.744	.86748	10
22	.3746	.4040	2.475	.92718	68	30	.5000	.5774	1.732	.86603	60
10	.3773	.4074	2.455	.92609	50	10	.5025	.5812	1.720	.86457	50
20	.3800	.4108	2.434	.92499	40	20	.5050	.5851	1.709	.86310	40
30	.3827	.4142	2.414	.92388	30	30	.5075	.5890	1.698	.86163	30
40	.3854	.4176	2.394	.92276	20	40	.5100	.5930	1.686	.86015	20
50	.3881	.4210	2.375	.92164	10	50	.5125	.5969	1.675	.85866	10
23	.3907	.4245	2.356	.92050	67	31	.5150	.6009	1.664	.85717	59
10	.3934	.4279	2.337	.91936	50	10	.5175	.6048	1.653	.85567	50
20	.3961	.4314	2.318	.91822	40	20	.5200	.6088	1.643	.85416	40
30	.3987	.4348	2.300	.91706	30	30	.5225	.6128	1.632	.85264	30
40	.4014	.4383	2.282	.91590	20	40	.5250	.6168	1.621	.85112	20
50	.4041	.4417	2.264	.91472	10	50	.5275	.6208	1.611	.84959	10
					66						58
	Cosin.	Cotg.	Tan.	Sine.	Angle.		Cosin.	Cotg.	Tan.	Sine.	Angle.

Table VIII.—Natural Trigonometrical Functions.

Angle	Sine.	Tan.	Cotg.	Cosin.		Angle	Sine.	Tan.	Cotg.	Cosin.	
°						°					
32	.5299	.6249	1.600	.84805	58	30	.6225	.7954	1.257	.78261	30
10	.5324	.6289	1.590	.84650	50	40	.6248	.8002	1.250	.78079	20
20	.5348	.6330	1.580	.84495	40	50	.6271	.8050	1.242	.77897	10
30	.5373	.6371	1.570	.84339	30						
40	.5398	.6412	1.560	.84182	20	39	.6293	.8098	1.235	.77715	51
50	.5422	.6453	1.550	.84025	10	10	.6316	.8146	1.228	.77531	50
						20	.6338	.8195	1.220	.77347	40
33	.5446	.6494	1.540	.83867	57	30	.6361	.8243	1.213	.77162	30
10	.5471	.6536	1.530	.83708	50	40	.6383	.8292	1.206	.76977	20
20	.5495	.6577	1.520	.83549	40	50	.6406	.8342	1.199	.76791	10
30	.5519	.6619	1.511	.83389	30						
40	.5544	.6661	1.501	.83228	20	40	.6428	.8391	1.192	.76604	50
50	.5568	.6703	1.492	.83066	10	10	.6450	.8441	1.185	.76417	50
						20	.6472	.8491	1.178	.76229	40
34	.5592	.6745	1.483	.82904	56	30	.6494	.8541	1.171	.76041	30
10	.5616	.6787	1.473	.82741	50	40	.6517	.8591	1.164	.75851	20
20	.5640	.6830	1.464	.82577	40	50	.6539	.8642	1.157	.75661	10
30	.5664	.6873	1.455	.82413	30						
40	.5688	.6916	1.446	.82248	20	41	.6561	.8693	1.150	.75471	49
50	.5712	.6959	1.437	.82082	10	10	.6583	.8744	1.144	.75280	50
						20	.6604	.8796	1.137	.75088	40
35	.5736	.7002	1.428	.81915	55	30	.6626	.8847	1.130	.74896	30
10	.5760	.7046	1.419	.81748	50	40	.6648	.8899	1.124	.74703	20
20	.5783	.7089	1.411	.81580	40	50	.6670	.8952	1.117	.74509	10
30	.5807	.7133	1.402	.81412	30						
40	.5831	.7177	1.393	.81242	20	42	.6691	.9004	1.111	.74314	48
50	.5854	.7221	1.385	.81072	10	10	.6713	.9057	1.104	.74120	50
						20	.6734	.9110	1.098	.73924	40
36	.5878	.7265	1.376	.80902	54	30	.6756	.9163	1.091	.73728	30
10	.5901	.7310	1.368	.80730	50	40	.6777	.9217	1.085	.73531	20
20	.5925	.7355	1.360	.80558	40	50	.6799	.9271	1.079	.73333	10
30	.5948	.7400	1.351	.80386	30						
40	.5972	.7445	1.343	.80212	20	43	.6820	.9325	1.072	.73135	47
50	.5995	.7490	1.335	.80038	10	10	.6841	.9380	1.066	.72937	50
						20	.6862	.9435	1.060	.72737	40
37	.6018	.7536	1.327	.79864	53	30	.6884	.9490	1.054	.72537	30
10	.6041	.7581	1.319	.79688	50	40	.6905	.9545	1.048	.72337	20
20	.6065	.7627	1.311	.79512	40	50	.6926	.9601	1.042	.72136	10
30	.6088	.7673	1.303	.79335	30						
40	.6111	.7720	1.295	.79158	20	44	.6947	.9657	1.036	.71934	46
50	.6134	.7766	1.288	.78980	10	10	.6967	.6713	1.030	.71732	50
						20	.6988	.9770	1.024	.71529	40
38	.6157	.7813	1.280	.78801	52	30	.7009	.9827	1.018	.71325	30
10	.6180	.7860	1.272	.78622	50	40	.7030	.9884	1.012	.71121	20
20	.6202	.7907	1.265	.78442	40	50	.7050	.9942	1.006	.70916	10
							.7071	1.	1.	.70711	45
											°
	Cosin.	Cotg.	Tan.	Sine.	Angle.		Cosin.	Cotg.	Tan.	Sine.	Angle.

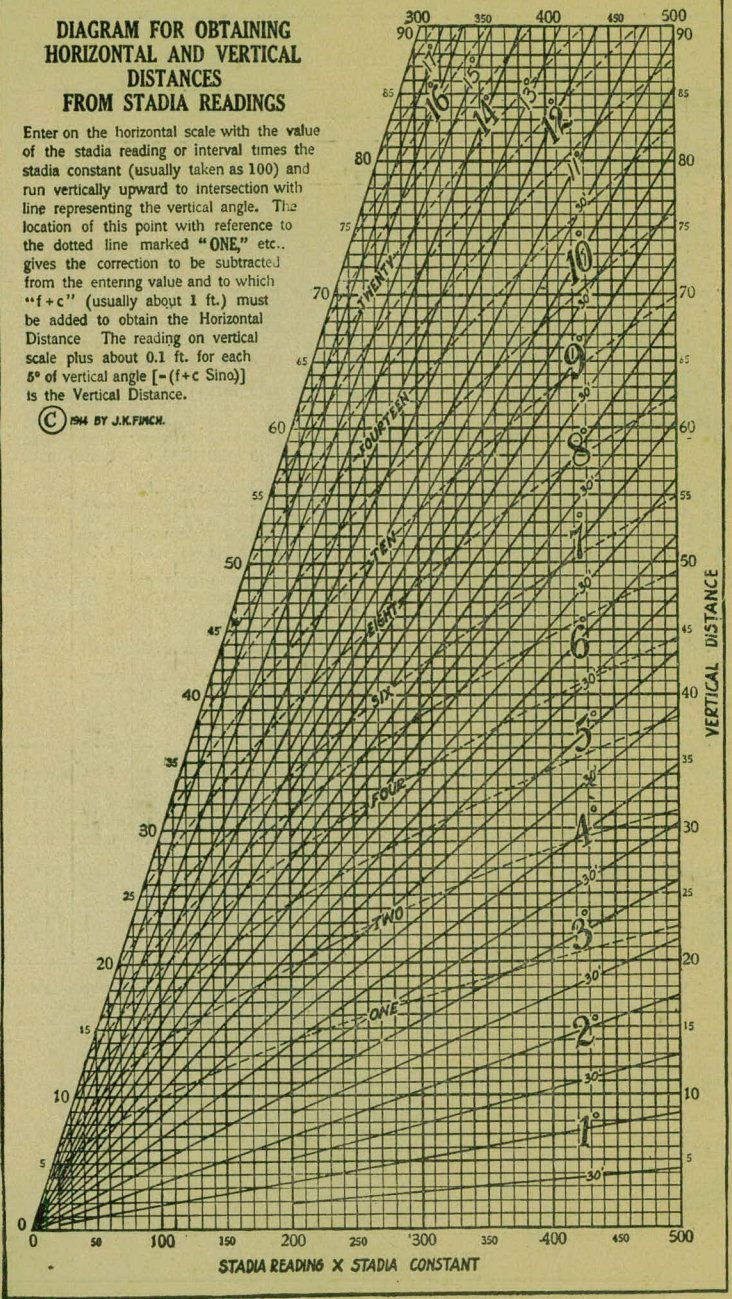
Table IX.—Calculation of Earthwork.

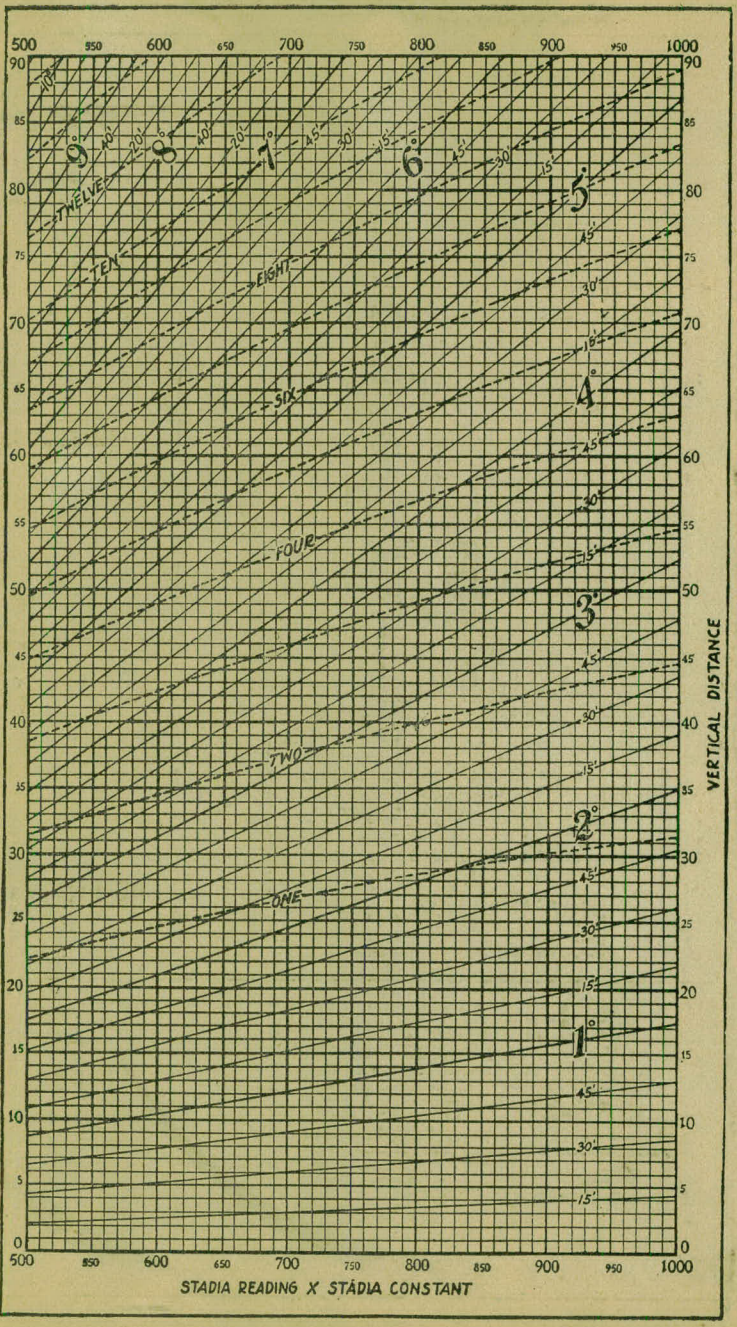
Width	HEIGHT														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.02	.04	.06	.07	.09	.11	.13	.15	.17	.18	.20	.22	.24	.26	.28
2	.04	.07	.11	.15	.18	.22	.26	.30	.33	.37	.41	.44	.48	.52	.56
3	.06	.11	.17	.22	.28	.33	.39	.44	.50	.56	.61	.67	.72	.78	.83
4	.07	.15	.22	.30	.37	.44	.52	.59	.67	.74	.81	.89	.96	1.04	1.11
5	.09	.19	.28	.37	.46	.56	.65	.74	.83	.93	1.02	1.11	1.20	1.30	1.39
6	.11	.22	.33	.44	.56	.67	.78	.89	1.00	1.11	1.22	1.33	1.44	1.55	1.67
7	.13	.26	.39	.52	.65	.78	.91	1.04	1.16	1.30	1.42	1.55	1.68	1.81	1.94
8	.15	.30	.44	.59	.74	.89	1.04	1.19	1.33	1.48	1.63	1.78	1.92	2.08	2.22
9	.17	.33	.50	.67	.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00	2.17	2.33	2.50
10	.18	.37	.56	.74	.93	1.11	1.30	1.48	1.67	1.85	2.04	2.22	2.41	2.59	2.78
11	.20	.41	.61	.82	1.02	1.22	1.43	1.63	1.83	2.04	2.24	2.44	2.65	2.85	3.06
12	.22	.44	.67	.89	1.11	1.33	1.56	1.78	2.00	2.22	2.44	2.67	2.89	3.11	3.33
13	.24	.48	.72	.96	1.20	1.44	1.68	1.92	2.16	2.41	2.65	2.89	3.13	3.37	3.61
14	.26	.52	.78	1.04	1.30	1.55	1.81	2.08	2.33	2.59	2.85	3.11	3.37	3.63	3.89
15	.28	.56	.83	1.11	1.39	1.67	1.94	2.22	2.50	2.78	3.06	3.33	3.61	3.89	4.17
16	.30	.59	.89	1.18	1.48	1.78	2.07	2.37	2.67	2.96	3.26	3.56	3.85	4.15	4.44
17	.31	.63	.94	1.26	1.57	1.89	2.20	2.52	2.83	3.15	3.46	3.78	4.09	4.41	4.72
18	.33	.67	1.00	1.33	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00
19	.35	.70	1.06	1.41	1.76	2.11	2.46	2.82	3.17	3.52	3.87	4.22	4.57	4.92	5.28
20	.37	.74	1.11	1.48	1.85	2.22	2.59	2.96	3.33	3.70	4.07	4.44	4.81	5.18	5.56
21	.39	.78	1.17	1.55	1.94	2.33	2.72	3.11	3.50	3.89	4.28	4.67	5.06	5.44	5.83
22	.41	.81	1.22	1.63	2.04	2.44	2.85	3.26	3.67	4.07	4.48	4.89	5.30	5.70	6.11
23	.43	.85	1.28	1.70	2.13	2.56	2.98	3.41	3.83	4.26	4.68	5.11	5.54	5.96	6.39
24	.44	.89	1.33	1.78	2.22	2.67	3.11	3.56	4.00	4.44	4.89	5.33	5.78	6.22	6.67
25	.46	.92	1.39	1.85	2.31	2.78	3.24	3.70	4.17	4.63	5.09	5.56	6.02	6.48	6.94
26	.48	.96	1.44	1.92	2.41	2.89	3.37	3.85	4.33	4.82	5.30	5.78	6.26	6.74	7.24
27	.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50
28	.52	1.04	1.55	2.07	2.59	3.11	3.63	4.15	4.67	5.18	5.70	6.22	6.74	7.26	7.78
29	.54	1.07	1.61	2.15	2.68	3.22	3.76	4.30	4.83	5.37	5.91	6.44	6.98	7.52	8.06
30	.56	1.11	1.67	2.22	2.78	3.33	3.89	4.44	5.00	5.55	6.11	6.67	7.22	7.78	8.33
31	.57	1.15	1.72	2.30	2.87	3.44	4.02	4.59	5.17	5.74	6.32	6.89	7.46	8.04	8.61
32	.59	1.18	1.78	2.37	2.96	3.56	4.15	4.74	5.33	5.92	6.52	7.11	7.70	8.30	8.89
33	.61	1.22	1.83	2.44	3.05	3.67	4.28	4.89	5.50	6.11	6.72	7.33	7.94	8.55	9.17
34	.63	1.26	1.89	2.52	3.15	3.78	4.40	5.04	5.67	6.29	6.93	7.56	8.18	8.81	9.44
35	.65	1.30	1.94	2.59	3.24	3.89	4.53	5.18	5.83	6.48	7.13	7.78	8.42	9.08	9.72
36	.67	1.33	2.00	2.67	3.33	4.00	4.66	5.33	6.00	6.67	7.33	8.00	8.67	9.33	10.00
37	.68	1.37	2.06	2.74	3.42	4.11	4.79	5.48	6.17	6.85	7.54	8.22	8.91	9.59	10.28
38	.70	1.41	2.11	2.82	3.52	4.22	4.92	5.63	6.33	7.03	7.74	8.44	9.15	9.85	10.56
39	.72	1.44	2.17	2.89	3.61	4.33	5.05	5.78	6.50	7.22	7.95	8.67	9.39	10.11	10.83
40	.74	1.48	2.22	2.96	3.70	4.44	5.18	5.92	6.67	7.41	8.15	8.89	9.63	10.37	11.11

Table gives cu. yds. in 1 ft. of a triangle of given width and height. Corrections for tenths of width are one tenth the values found under each height considering the widths from 1 to 9 as tenths and similarly the corrections for tenths of height are one tenth the figures opposite width considering the heights from 1 to 9 as tenths. Thus if w =16.2 and h =5.3, cu. yds. =1.48+.028+.089 =1.597 cu. yds. or practically 160 cu. yds. per 100 ft. If w exceeds 40 ft., use one half and multiply result by 2, if both w and h are large use one half of each and multiply result by 4. Any cross-section may be divided into triangles by the following rule. To the triangle of the sum of the outside cuts (or fills) =h, and ½ the roadbed =w, add the triangles formed by taking the distance out to each break in turn (=w's) by the difference between the cuts (or fills) on each side of it (=h's) always subtracting the outer from the inner.

DIAGRAM FOR OBTAINING HORIZONTAL AND VERTICAL DISTANCES FROM STADIA READINGS

Enter on the horizontal scale with the value of the stadia reading or interval times the stadia constant (usually taken as 100) and run vertically upward to intersection with line representing the vertical angle. The location of this point with reference to the dotted line marked "ONE," etc.. gives the correction to be subtracted from the entering value and to which "f + c" (usually about 1 ft.) must be added to obtain the Horizontal Distance The reading on vertical scale plus about 0.1 ft. for each 5° of vertical angle [= (f + c Sin α)] is the Vertical Distance.



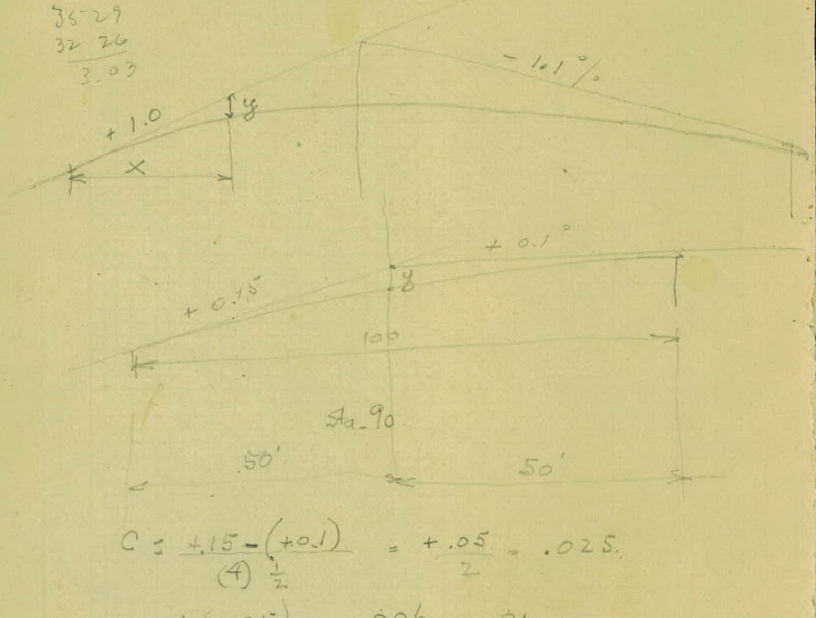

500
550
600
650
700
750
800
850
900
950
1000
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
TWELVE
TEN
EIGHT
SIX
FOUR
TWO
ONE
9°
8°
7°
6°
5°
4°
3°
2°
1°
40'
20'
40'
20'
45'
30'
15'
45'
30'
15'
45'
30'
15'
45'
30'
15'
45'
30'
15'
VERTICAL DISTANCE
STADIA READING X STADIA CONSTANT

$$C = \frac{g - g'}{4n}$$

$$y = x^2 C$$

V.C. = 400'

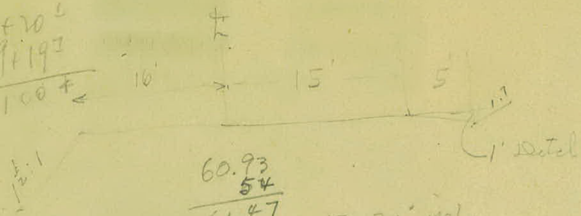
35-29
32 26
3.03



$$C = \frac{+.15 - (+0.1)}{(4)\frac{1}{2}} = \frac{+.05}{2} = .025$$

$$y = \frac{1}{4}(.025) = .006 = .01$$

60+20[1]
59+19[7]
100[8]



60.93
54
61.47

19.35' incl.

149
88.1

24077
31.5
243.92

32.54
3.23
35.77

.062
21
062
124
1,306

46 + 40.1
2 + 44.5
44 + 45.2

57+33[3] 5
100.65
34.05
5

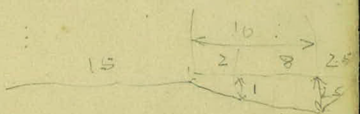
0.62
16
372
62
.992

44+35.1
2 + 36.5
46 + 71.6

57+31[7]
1 08[5]
56+23 2

56+32[1]
1.99
58 34 7

60.93
.54
61.47

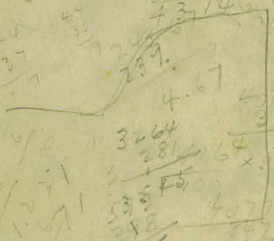


2+82.7
53 + 32.8
56+ 15 5

4575
980
5555
402
25153

4575
938
55.13
402
25151

56+32[7]



DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

Roadway 16 feet wide. Side Slopes 1 on 1½.

For Single Track Embankment.

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
0	8.0	8.2	8.3	8.5	8.6	8.8	8.9	9.1	9.2	9.4	0
1	9.5	9.7	9.8	10.0	10.1	10.3	10.4	10.6	10.7	10.9	1
2	11.0	11.2	11.3	11.5	11.6	11.8	11.9	12.1	12.2	12.4	2
3	12.5	12.7	12.8	13.0	13.1	13.3	13.4	13.6	13.7	13.9	3
4	14.0	14.2	14.3	14.5	14.6	14.8	14.9	15.1	15.2	15.4	4
5	15.5	15.7	15.8	16.0	16.1	16.3	16.4	16.6	16.7	16.9	5
6	17.0	17.2	17.3	17.5	17.6	17.8	17.9	18.1	18.2	18.4	6
7	18.5	18.7	18.8	19.0	19.1	19.3	19.4	19.6	19.7	19.9	7
8	20.0	20.2	20.3	20.5	20.6	20.8	20.9	21.1	21.2	21.4	8
9	21.5	21.7	21.8	22.0	22.1	22.3	22.4	22.6	22.7	22.9	9
10	23.0	23.2	23.3	23.5	23.6	23.8	23.9	24.1	24.2	24.4	10
11	24.5	24.7	24.8	25.0	25.1	25.3	25.4	25.6	25.7	25.9	11
12	26.0	25.2	26.3	26.5	26.6	26.8	26.9	27.1	27.2	27.4	12
13	27.5	27.7	27.8	28.0	28.1	28.3	28.4	28.6	28.7	28.9	13
14	29.0	29.2	29.3	29.5	29.6	29.8	29.9	30.1	30.2	30.4	14
15	30.5	30.7	30.8	31.0	31.1	31.3	31.4	31.6	31.7	31.9	15
16	32.0	32.2	32.3	32.5	32.6	32.8	32.9	33.1	33.2	33.4	16
17	33.5	33.7	33.8	34.0	34.1	34.3	34.4	34.6	34.7	34.9	17
18	35.0	35.2	35.3	35.5	35.6	35.8	35.9	36.1	36.2	36.4	18
19	36.5	36.7	36.8	37.0	37.1	37.3	37.4	37.6	37.7	37.9	19
20	38.0	38.2	38.3	38.5	38.6	38.8	38.9	39.1	39.2	39.4	20
21	39.5	39.7	39.8	40.0	40.1	40.3	40.4	40.6	40.7	40.9	21
22	41.0	41.2	41.3	41.5	41.6	41.8	41.9	42.1	42.2	42.4	22
23	42.5	42.7	42.8	43.0	43.1	43.3	43.4	43.6	43.7	43.9	23
24	44.0	44.2	44.3	44.5	44.6	44.8	44.9	45.1	45.2	45.4	24
25	45.5	45.7	45.8	46.0	46.1	46.3	46.4	46.6	46.7	46.9	25
26	47.0	47.2	47.3	47.5	47.6	47.8	47.9	48.1	48.2	48.4	26
27	48.5	48.7	48.8	49.0	49.1	49.3	49.4	49.6	49.7	49.9	27
28	50.0	50.2	50.3	50.5	50.6	50.8	50.9	51.1	51.2	51.4	28
29	51.5	51.7	51.8	52.0	52.1	52.3	52.4	52.6	52.7	52.9	29
30	53.0	53.2	53.3	53.5	53.6	53.8	53.9	54.1	54.2	54.4	30
31	54.5	54.7	54.8	55.0	55.1	55.3	55.4	55.6	55.7	55.9	31
32	56.0	56.2	56.3	56.5	56.6	56.8	56.9	57.1	57.2	57.4	32
33	57.5	57.7	57.8	58.0	58.1	58.3	58.4	58.6	58.7	58.9	33
34	59.0	59.2	59.3	59.5	59.6	59.8	59.9	60.1	60.2	60.4	34
35	60.5	60.7	60.8	61.0	61.1	61.3	61.4	61.6	61.7	61.9	35
36	62.0	62.2	62.3	62.5	62.6	62.8	62.9	63.1	63.2	63.4	36
37	63.5	63.7	63.8	64.0	64.1	64.3	64.4	64.6	64.7	64.9	37
38	65.0	65.2	65.3	65.5	65.6	65.8	65.9	66.1	66.2	66.4	38
39	66.5	66.7	66.8	67.0	67.1	67.3	67.4	67.6	67.7	67.9	39
40	68.0	68.2	68.3	68.5	68.6	68.8	68.9	69.1	69.2	69.4	40

Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 41.9. For same slopes but other widths of roadbed correct above figures by one-half difference in width of roadbed; thus in example above for 20 ft. roadbed distance will be 41.9+(20—16)÷2 or 2 ft. added to 41.9 =43.9. For slopes of 1 on 1 see inside of front cover.

Made in Germany.