CONSTRUCTION NOTES
WHITE BEAR ROAD
CO. PROJ. 23-52

DIETZGEN

ENGINEERS'

FIELD BOOK

No. 403

White Bear Rd.
"7" 23-52

EUGENE DIETZGEN CO.

DRAWING MATERIALS, MATHEMATICAL and SURVEYING INSTRUMENTS

Chicago New York San Francisco New Orleans Pittsburg Toronto

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.

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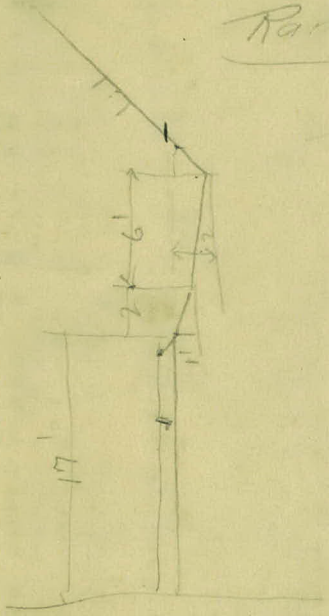
K. + E 38 + 68
Gurley - 222368

County Surveyor's Office.
Ramsey County.

H. E. Austin



Index

pp to	pp -	Description	Sta.	to Sta.
1	13	Cross-section - Slope St.	0	137
14	15	" " " "	215	229
16	17	" " " "	230	241
18	21	" " " "	241	263
22	23	" " " "	263	277+68
25	29	Culverts	00	217
30	32	2nd Slope Stakes	00	28
33	50	Final Xsections	277	138+60
51	63	" "	138+60	55+25
63	70	" "	55+25	0-33

Station	+	H.I	−	T.P	Profile Grade
N.E. Cor. Co. Rd. "A"	3.59	250.38		246.79	
0 - 33				245.2	
0 + 00				245.9	245.3
+ 50				46.9	
1 + 00				47.1	247.2
2 + 00				48.3	248.1
T.P	8.98	258.75	0.41	249.77	
3 + 00				51.1	251.1
4 + 00				53.2	253.2
5 + 00				55.4	255.4
6 + 00				57.6	257.6
T.P	9.78	267.71	.0.82	257.93	
7 + 00				59.7	259.8
8 + 00				62.2	261.9
9 + 00				63.9	263.8
10 + 00				65.5	265.7
B.M.	9.80	273.72	?	263.92	
11 + 00				67.9	267.7
12 + 00				69.5	269.3
+ 40				70.8	
12 + 00 B.M.	10.92	274.84	?	263.92	
13 + 00				71.8	272.0
T.P.	10.16	284.78	0.32	274.62	
13 + 75				74.7	
14 + 00				75.6	274.3

6-5-23

① Austin Macalun Mahoney Galvin

L | R

5.4 / 33.0 | 5.1 / 31.0 | 5.1 / 27.0 | 5.9 / 12.0 | 5.2

5.25 / 13.0 | 5.5 / 22.0 | 6.2 / 25.5 | 6.7 / 32.0

4.1 / 33.0 | 4.1 / 24.0 | 4.5 / 16.0 | 4.5

4.3 / 16.0 | 4.2 / 27.0 | 4.1 / 32.0

5.1

4.2 / 30.0 | 5.4 / 26.0 | 4.1 / 23.0 | 4.0 / 15.0 | 4.2 / 13.0 | 3.9 / 11.5 | 3.6 / 6.0 | 4.0

4.3 / 9.5 | 5.3 / 15.0 | 5.7 / 23.0 | 5.9 / 31.0

3.5 / 33.0 | 4.3 / 31.0 | 4.7 / 25.0 | 4.6 / 18.1 | 4.0 / 15.0 | 4.0 / 11.0 | 3.5 / 7.0 | 3.3

3.4 / 9.0 | 3.5 / 12.0 | 5.3 / 17.0 | 5.3 / 19.1 | 5.5 / 24.0 | 5.8 / 26.0 | 4.8 / 27.0 | 4.8 / 33.0

1.5 / 33.0 | 2.2 / 28.0 | 2.8 / 24.0 | 3.5 / 22.0 | 3.7 / 19.5 | 3.3 / 19.0 | 2.2 / 10.5 | 1.5 / 6.0 | 1.3 / 4.0 | 1.1

1.3 / 5.2 | 1.5 / 7.0 | 1.5 / 12.0 | 2.3 / 17.5 | 2.3 / 24.0 | 3.0 / 28.0 | 4.8 / 32.4 | 4.3 / 30.0 | 2.5 / 33.0

7.6 / 33.0 | 8.5 / 29.0 | 8.9 / 23.0 | 10.1 / 19.7 | 9.3 / 18.0 | 8.3 / 13.0 | 7.9 / 5.0 | 7.7

8.2 / 10.0 | 8.3 / 12.0 | 7.7 / 16.0 | 9.9 / 19.5 | 10 / 21.0 | 10.9 / 22.0 | 10.9 / 28.0 | 9.7 / 25.0 | 9.3 / 33.0

7.6 / 33.0 | 8.0 / 31.0 | 7.5 / 15.5 | 6.7 / 14.0 | 6.7 / 10.0 | 5.9 / 5.5 | 5.6

6.0 / 9.0 | 6.3 / 13.0 | 7.7 / 17.5 | 8.4 / 18.0 | 8.2 / 19.6 | 8.1 / 19.8 | 7.3 / 20.5 | 7.8 / 31.0 | 6.8 / 33.0

5.9 / 28.0 | 5.1 / 26.0 | 4.9 / 22.0 | 5.9 / 16.4 | 3.7 / 14.0 | 4.4 / 13.0 | 4.1 / 10.0 | 3.7 / 6.0 | 3.4

3.9 / 9.0 | 4.1 / 13.0 | 4.8 / 17.0 | 6.3 / 19.0 | 6.2 / 19.5 | 6.0 / 20.0 | 5.1 / 22.0 | 4.3 / 24.0 | 5.1 / 27.0

5.1 / 31.0 | 3.3 / 33.0

3.8 / 29.7 | 1.7 / 33.0

4.1 / 33.0 | 4.1 / 27.0 | 2.8 / 18.4 | 1.8 / 13.0 | 1.5 / 7.0 | 1.2

1.6 / 9.0 | 1.6 / 15.0 | 2.2 / 17.5 | 2.5 / 20.0 | 3.9 / 22.0 | 2.4 / 24.0 | 4.3 / 33.0

10.6 / 33.0 | 10.0 / 19.2 | 9.7 / 18.0 | 8.7 / 15.0 | 8.4 / 12.0 | 8.4 / 6.0 | 8.0

8.5 / 10.0 | 8.6 / 15.2 | 9.1 / 17.8 | 9.4 / 21.0 | 10.3 / 22.0 | 10.1 / 25.0 | 9.3 / 26.0 | 9.0 / 30.0 | 7.8 / 33.0

4.6 / 33.0 | 5.2 / 28.0 | 6.6 / 17.2 | 6.5 / 15.0 | 6.3 / 12.0 | 5.9 / 6.0 | 5.5 / 4.6 | 5.5

5.8 / 11.7 | 6.6 / 10.0 | 6.3 / 15.5 | 6.5 / 17.1 | 7.4 / 24.5 | 7.9 / 25.5 | 8.0 / 28.0 | 6.5 / 30.0 | 5.7 / 33.0

4.2 / 33.0 | 5.1 / 23.0 | 4.7 / 14.2 | 4.1 / 14.0 | 4.1 / 10.5 | 3.9 / 5.7 | 3.8

3.9 / 4.2 | 4.1 / 10.0 | 4.2 / 15.0 | 4.7 / 17.9 | 5.8 / 20.0 | 6.4 / 27.0 | 5.0 / 33.0

5.3 / 33.0 | 4.5 / 26.0 | 3.3 / 17.8 | 2.7 / 15.0 | 2.5 / 11.0 | 2.4 / 7.0 | 2.2

2.7 / 9.0 | 2.6 / 12.0 | 4.5 / 17.0 | 5.3 / 20.9 | 5.2 / 29.0 | 5.0 / 33.0

5.0 / 33.0 | 6.7 / 24.0 | 6.2 / 14.3 | 6.3 / 14.0 | 6.0 / 4.7 | 5.8

6.0 / 2.8 | 6.3 / 10.0 | 6.6 / 15.5 | 7.6 / 18.4 | 8.4 / 22.0 | 8.4 / 28.0 | 7.2 / 30.0 | 6.9 / 33.0

3.1 / 33.0 | 4.5 / 24.0 | 4.7 / 17.7 | 4.3 / 6.0 | 4.2

4.6 / 9.0 | 4.9 / 14.0 | 6.3 / 19.6 | 7.6 / 24.0 | 7.6 / 33.0

1.8 / 33.0 | 3.7 / 27.0 | 3.3 / 21.0 | 5.1 / 10.0 | 2.9

3.7 / 14.0 | 4.2 / 18.0 | 6.4 / 24.0 | 7.1 / 33.0

Mgeadam.

2.4 / 33.0 | 2.8 / 23.0 | 2.8 / 16.0 | 3.2 / 12.0 | 2.8 / 7.8 | 2.9 / 7.0 | 3.0

3.2 / 11.0 | 3.3 / 16.7 | 3.3 / 20.0 | 4.8 / 33.0

7.6 / 33.0 | 10.1 / 27.0 | 10.7 / 24.0 | 10.1 / 17.0 | 10.9 / 11.0 | 10.8 / 11.5 | 10.3 / 9.0 | 10.1

10.7 / 12.0 | 11.2 / 15.0 | 11.0 / 18.0 | 11.8 / 24.0 | 12.0 / 27.5 | 11.8 / 33.0

7.8 / 2.0 | 9.4 / 27.0 | 10.3 / 23.0 | 10.3 / 23.0 | 10.4 / 20.0 | 10.0 / 16.0 | 10.0 / 12.0 | 9.3 / 7.0 | 9.2

10.1 / 12.5 | 10.5 / 16.0 | 10.1 / 18.0 | 10.5 / 20.0 | 10.4 / 27.0 | 9.5 / 29.5 | 9.5 / 33.0

4 / 3.0

Station	+	H.I. 284.78	—	Elev.	Profile Grade
14+50				77.2	
15+00				78.1	276.7
16+00				79.7	279.1
+75				81.1	
17+00				81.9	280.8
17+50 B.M	4.02	287.36		283.34	
17+50				82.0	
18+00				82.2	281.5
19+00				81.8	281.2
+70				81.0	
20+00				80.5	280.2
21+00				79.2	279.2
22+00				78.5	278.2
T.P.	3,35	281.82	8.89	278.47	
23+00				77.5	277.5
+70				77.5	
24+00				77.6	277.1
B.M.	2,41	280.56		278.15	
25+00				77.0	276.3
+45				76.2	
+80				76.0	
26+00				75.7	274.6
+60				74.5	
+78				74.1	
27+00				72.9	272.1

h ℓ P

9.1	9.7	9.2	8.2	8.8	8.7		7.8	8.8	8.5	9.1	8.9	7.2	
33.0	29.5	24.5	15.0	13.0	10.0	7.6	5.5	15.0	19.5	22.5	27.0	33.0	
9.5	9.4	9.2	9.4	8.7	8.1	8.0	7.7		6.6	7.7	8.1	8.2	8.1	5.8	
33.0	81.0	27.0	21.5	16.9	15.0	14.8	10.0	6.7	3.5	13.0	15.7	16.2	17.5	28.0	33.0
5.2	5.1	6.9	6.4	6.2	5.7	5.6			5.3	5.7	5.8	5.7	7.3	7.8	8.1	8.3	
33.0	31.0	27.0	17.5	16.6	12.5	10.5	5.1		6.3	10.8	12.0	14.0	16.0	17.0	19.7	33.0	
2.0	4.4	4.5	4.4	4.9	5.0	4.5	3.8		3.8	4.3	5.6	6.0	5.8	5.1	6.2		
33.0	30.0	23.0	16.5	15.0	12.5	10.0	3.5	3.7	6.0	12.0	15.0	16.0	20.0	24.0	33.0		
0.0	3.4	3.7	4.5	4.5	4.8	4.4	4.0	3.4	3.5	4.0	4.4	5.4	5.3	4.1	4.6		
33.0	30.0	24.0	21.0	16.8	14.0	12.0	8.5	3.5	5.0	9.5	14.5	16.0	18.0	19.5	33.0		

1.2	5.7	6.4	7.0	6.8	5.4		6.2	7.2	7.1	4.6	5.1		
33.0	26.0	19.0	14.5	11.5	6.0	5.4	10.0	15.0	17.0	20.0	33.0		
1.8	1.4	5.8	5.9	5.9	6.4	5.9	5.4		5.9	6.2	7.0	6.6	4.3	4.4	4.5		
33.0	31.0	25.0	23.2	16.0	13.5	9.5	7.5	5.2	10.0	14.0	16.0	18.0	22.0	24.5	33.0		
4.7	5.4	6.2	6.6	6.7	6.2	5.5			6.2	7.2	7.2	4.8	4.6	4.4			
24.5	23.0	16.0	15.0	12.5	10.0	6.0	5.6		10.0	15.0	17.0	21.0	24.6	33.0			
4.6	6.2	5.3	6.1	7.5	7.1	6.7			6.9	7.8	7.9	7.3	7.1				
32.0	27.0	24.5	17.5	14.0	11.0	8.0	6.4		12.0	15.0	17.0	18.5	33.0				
5.7	6.4	6.5	6.8	8.2	8.2	7.2	6.9		7.2	7.8	8.7	8.5	8.8	8.5			
33.0	26.0	23.7	16.5	14.0	12.0	10.0	5.0	6.9	6.0	15.0	17.5	18.0	24.5	33.0			
6.1	6.5	7.6	9.0	8.7	9.1	9.7	8.8	8.2		8.2	9.0	9.8	10.5	11.0	12.0	11.8	
33.0	30.0	23.6	16.0	15.8	14.0	12.0	10.5	3.0	8.23	3.0	12.0	15.0	16.5	20.2	25.0	33.0	
7.5	8.3	10.0	10.2	10.4	9.5	9.2			9.2	9.7	10.5	12.0	13.2	13.8	13.4		
33.0	30.0	25.0	17.5	14.0	12.0	8.0	8.9		5.3	10.0	12.0	15.0	22.2	27.0	33.0		

4.5	6.2	6.8	6.2	4.5			4.9	7.8	8.2	8.3			
33.0	26.0	19.0	15.0	12.0	4.3		10.0	17.0	21.8	33.0			
7.9	6.5	6.3	5.2				5.2	6.8	6.9				
33.0	24.0	17.0	13.0	4.3			11.0	15.0	33.0				
6.4	6.5	6.1	6.1	5.3	4.7		4.7	5.1	Hedge				
33.0	29.0	18.1	15.3	12.5	7.3	4.2	6.4	15.2					

6/7/23

2.0	1.7	1.8	4.1	4.3	3.9		4.1	4.3	4.7	4.9	Wall.		
33.0	28.6	24.0	15.0	11.5	9.0	3.6	10.0	11.0	12.5	15.5			
2.1	1.8	1.9	5.1	5.1	5.5		4.7	5.6	5.6	Wall			
33.0	30.0	22.0	15.0	12.0	11.0	4.4	11.0	13.0	15.6				
2.1	2.1	5.0	5.0	4.8			5.1	5.8	5.9	Wall			
33.0	28.5	19.5	14.0	9.5	4.6		10.0	12.0	15.5				
4.7	5.6	6.0	6.0	5.2	4.9		5.2	6.0	6.3	6.2	Wall		
33.0	27.0	20.0	20.0	14.0	11.0	4.9	10.0	12.0	12.5	14.0			
5.5	6.2	6.5	7.0	6.3			6.7	7.5	7.4	Wall			
33.0	23.0	20.3	14.5	11.0	6.1		11.0	14.0	16.3				
1.9	2.4	5.2	6.8	7.2	6.6		6.9	7.6	7.5	Wall			
33.0	30.0	23.0	14.0	10.0	7.5	6.5	11.0	14.0	16.3				
2.2	2.2	2.1	2.5	4.4	6.4	8.5	7.7		8.1	8.5	8.7	Wall	
33.0	29.3	25.4	24.5	20.6	14.5	12.0	8.5	7.7	12.0	18.5	16.0		

Station	+	H.I	−	T.P	Profile Grade
		280.56			
28+00				69.5	268.5
T.P	6.69	275.77	11.48	269.08	
29+00				65.5	264.6
T.P	5.39	268.84	12.32	263.45	
30+00				61.5	260.7
31+00				57.4	256.9
T.P	0.37	256.15	13.01	255.83	
+68				55.1	
32+00				53.9	252.9
33+00				49.8	249.0
+30				48.5	
T.P.	3.80	250.42	9.53	246.62	
34+00				45.9	245.1
+35				44.6	
35+00				42.0	241.22
+35				40.6	
T.P	6.27	246.16	10.53	239.89	
36+00				37.4	237.3
+45				36.5	
T.P.	1.37	236.33	11.20	234.96	
+80				39.7	
T.P.	0.27	234.12	2.48	233.85	
37+00				33.9	233.46
Top Rail 38+00	11.32	232.27		220.95	229.58
				30.0	

L

C

R

3

4.6 / 33.0 — 11.6 / 30.5 — 11.9 / 28.0 — 7.2 / 22.0 — 11.2 / 16.0 — 12.1 / 12.0 — 12.4 / 6.0 — 11.1

10.6 / 8.0 — 9.9 / 16.8 — Mirrcway

11.5 / 32.7 — 11.7 / 24.0 — 11.2 / 18.0 — 11.3 / 12.0 — 11.2 / 10.3 — 11.7 / 6.0 — 12.3

10.7 / 6.6 — 11.2 / 10.5 — 11.9 / 13.6 — 12.5 / 15.0 — 11.6 / 17.4 — Wall

6.8 / 33.0 — 8.7 / 30.4 — 8.6 / 26.5 — 6.1 / 17.0 — 8.0 / 13.8 — 8.5 / 11.0 — 8.3 / 8.6 — 8.1 / 5.0 — 7.7

5.0 / 9.5 — 8.1 / 10.2 — 8.5 / 12.6 — 9.3 / 15.0 — 8.7 / 17.7 — Wall

11.5 / 33.0 — 6.4 / 28.8 — 6.4 / 27.5 — 5.9 / 25.5 — 13.1 / 12.5 — 13.1 / 14.0 — 12.2 / 11.0 — 12.0 / 7.0 — 11.4

11.7 / 6.5 — 12.0 / 10.7 — 12.3 / 11.4 — 13.0 / 13.0 — 13 / 16.0 — 12.2 / 18.5 — Wall

0.4 / 33.0 — 0.0 / 29.0 — 0.6 / 24.0 — 1.4 / 20.0 — 3.1 / 14.0 — 2.3 / 11.0 — 1.7 / 7.0 — 1.1

1.5 / 5.0 — 1.6 / 13.0 — 2.8 / 16.0 — 2.1 / 19.0 — 1.2 / 23.0 — 0.3 / 32.0

0.8 / 33.0 — 0.8 / 29.5 — 3.3 / 23.0 — 4.1 / 19.0 — 4.2 / 13.0 — 3.3 / 10.5 — 3.0 / 9.0 — 2.3

2.8 / 9.0 — 3.3 / 12.0 — 3.8 / 14.0 — 5.9 / 16.9 — 4.0 / 23.0 — 0.8 / 30.0 — 0.5 / 33.0

1.2 / 33.0 — 1.3 / 31.5 — 7.2 / 25.0 — 9.8 / 18.7 — 9.0 / 20.5 — 9.1 / 12.5 — 7.2 / 5.0 — 6.4

6.6 / 5.5 — 7.2 / 10.0 — 7.2 / 12.0 — 10.1 / 17.0 — 10.2 / 20.5 — 10.2 / 25.0 — 6.2 / 31.0 — 4.6 / 32.0 — 4.5 / 33.0

1.9 / 37.0 — 3.5 / 33.0 — 10.5 / 24.0 — 11.3 / 16.0 — 8.8 / 12.0 — 8.2 / 8.5 — 7.7

7.5 / 13.0 — 11.0 / 17.5 — 11.4 / 20.0 — 10.2 / 25.0 — 6.8 / 28.5 — 9.8 / 33.0

3.2 / 36.0 — 2.2 / 33.0 — 5.4 / 28.6 — 7.1 / 22.0 — 7.8 / 17.8 — 7.7 / 16.0 — 5.3 / 11.5 — 4.8 / 5.5 — 4.5

4.8 / 6.0 — 5.3 / 11.3 — 5.4 / 13.0 — 10.1 / 18.6 — 9.6 / 22.5 — 7.6 / 25.0 — 4.9 / 29.5 — 4.4 / 33.0

6.3 / 33.0 — 8.9 / 30.0 — 10.0 / 20.0 — 9.1 / 17.0 — 6.4 / 10.0 — 5.8

6.5 / 10.5 — 6.9 / 13.0 — 11.0 / 18.5 — 11.4 / 22.0 — 10.1 / 25.0 — 3.2 / 35.0

0.9 / 42.0 — 6.9 / 39.0 — 13.4 / 25.0 — 13.4 / 22.8 — 12.6 / 17.5 — 9.6 / 11.5 — 9.2 / 9.5 — 8.4

9.0 / 10.0 — 9.2 / 11.0 — 13.3 / 15.0 — 13.1 / 24.7 — 12.4 / 25.5 — 12.5 / 33.0

3.9 / 39.0 — 7.6 / 33.0 — 10.9 / 30.0 — 15.1 / 22.0 — 14.2 / 18.0 — 11 / 13.1 — 10.6 / 9.0 — 9.5

14.6 / 11.0 — 15.1 / 17.5 — 15.1 / 22.0 — 14.2 / 24.0 — 14.5 / 33.0

24.8 / 36.5 — 5.3 / 33.0 — 13.9 / 23.7 — 13.6 / 20.5 — 14.1 / 11.0 — 9.7 / 9.0 — 8.4 / 8.5

5.8 / 7.5 — 9.5 / 11.0 — 12.8 / 17.5 — 12.8 / 24.3 — 5.9 / 33.0 — 0.0 / 37.5

16.8 / 33.0 — 15.5 / 29.0 — 16.3 / 19.0 — 10.8 / 12.0 — 10.4 / 10.0 — 9.7

10.5 / 10.0 — 14.6 / 18.0 — 14.6 / 21.0 — 14.1 / 26.0 — 5.1 / 33.0 — 24.7 / 41.3

14.1 / 37.0 — 15.6 / 33.0 — 15.8 / 28.0 — 5.7 / 19.0 — 2.4 / 10.5 — 2.0 / 7.0 — 1.6

2.2 / 10.0 — 6.6 / 19.0 — 6.9 / 26.0 — 5.8 / 32.0 — 3.5 / 40.0

18.1 — 21.7.8 / 40.5 — 14.1 / 37.5 — 7.9 / 32.0 — 1.0 / 11.0 — 0.7 / 7.4 — 0.2

0.7 / 6.7 — 1.1 / 11.0 — 6.1 / 17.5 — 6.4 / 24.5 — 6.6 / 33.0

19.0 — 21.0.0 / 38.5 — 21.5.3 / 33.0 — 13.3 / 20.5 — 3.7 / 11.0 — 2.7 / 2.5 — 2.3

2.6 / 9.0 — 2.9 / 12.0 — 3.0 / 12.0 — 9.6 / 23.5 — 9.3 / 25.9 — 9.5 / 33.0

Station	+	H.I	−	T.P	Profile Grade
				6+433	
B.M. 42+15	12.35	227.69		215.34	
39+00				26.9	225.1
40+00		223.19		20.9	221.1
T.P.	3.40	223.50	7.60	220.09	
40+00				21.9	221.1
41+00				218.3	217.7
		213.64		215.33	
B.M. 42+15	3.71	219.05	5.16	215.34	
42+00				215.3	215.6
		218.30		214.96	
T.P.	4.44	218.91	4.58	214.47	
43+00				214.9	214.6
44+00				14.9	214.3
45+00				14.7	214.0
46+00	ended			14.3	213.7
47+00				14.9	214.1
		223.91		214.96	
T.P.	9.25	223.72	4.44	214.47	
48+00				16.5	215.2
49+15 B.M.	4.58	227.19		222.31	
49+00				19.0	217.5
+40				20.2	
50+00				21.2	220.9
T.P.	10.20	231.43	5.96	221.23	
50+00				21.2	220.3
+45				22.6	
51+00				24.4	223.1
+45				25.2	

Austin
Lapham
Mulford
Galvin

(4)

10.1	9.5	5.8	2.6	2.2	1.8	2.0	2.4	7.9	9.5	9.6	9.1		
33.0	26.4	22.3	12.3	7.0		8.5	10.2	21.0	26.4	30.3	33.0		
					5.5	6.2	6.6	12.8					
						9.0	12.7	20.5					
9.2	7.4	7.2	7.1	2.4	2.1	1.6			10.6	11.0			
33.0	27.0	23.2	21.0	12.3	8.0				28.3	33.0			
6.2	6.6	12.2	5.0	5.6		5.2	5.8	6.2	11.7	13.3	14.0		
33.0	33.9	23.5	8.4	9.0			6.3	10.0	19.0	27.2	33.0		
12.2	7.2	9.6	6.9	4.5	4.2	3.7	4.4	8.3	10.5	11.4	11.4		
33.0	20.8	21.4	13.5	11.6	10.0		12.0	17.0	22.0	27.9	33.0		
14.8	10.9	7.5	4.9	4.3		4.3	4.6	9.6	10.1	11.4	11.9	12.0	
33.0	25.9	15.5	10.0	4.9	4.0		6.0	11.0	17.0	21.0	24.0	27.4	33.0
11.1	10.9	6.6	5.0	4.6		4.0	4.9	8.9	10.0	11.2	11.6	11.6	
33.0	25.5	12.5	9.5	7.0	4.0		7.0	12.0	15.0	20.0	23.0	26.5	33.0
14.8	10.4	9.0	6.6	5.3	4.4		4.9	5.2	9.4	10.9	11.1	11.5	
33.0	28.0	22.1	13.0	11.0	9.2	4.2	9.0	10.7	17.0	22.0	25.3	33.0	
11.1	10.7	9.6	5.5	5.2		4.6	5.2	5.9	9.0	10.7	10.8	11.0	
33.0	28.0	22.6	11.5	8.5			8.0	12.0	15.6	22.3	24.0	33.0	
10.3	9.1	8.7	6.6	4.5		4.8	5.5	6.9	9.2	9.5			
33.0	25.6	21.5	15.5	11.0	4.0		7.8	12.5	17.0	22.6	33.0		
12.9	12.2	11.1	5.3	7.8		7.8	8.3	11.8	12.0	12.8			
33.0	25.0	20.2	10.5	8.0	7.2		8.0	12.0	19.0	21.5	33.0		
12.4	11.8	10.0	9.7	9.4	9.6	8.7							
33.0	25.5	21.0	14.0	14.0	10.0	8.0	8.2	8.0	9.7	10.8	10.8	11.7	12.2
								8.0	10.5	14.0	17.7	25.	33.0
7.2	9.1	10.4	9.6	8.1	7.7	7.7							
33.0	25.0	22.0	14.0	13.0	10.0	8.0	7.0	7.9	8.0	8.8	8.8	9.0	10.1
								6.0	10.0	15.0	17.0	20.	33.0
3.0	2.5	5.2	6.2	6.7	7.1	6.9	6.1	5.9					
33.0	30.0	24.5	22.0	17.0	14.5	13.0	10.0	5.0	6.0	6.6	6.7	6.7	5.2	2.2
									6.0	10.5	13.0	17.0	17.2	23.5
													3.1	3.2	3.4
													27.0	30.9	33.0
1.9	8.7	10.7	10.3	9.1	9.1	10.2									
33.0	25.5	18.0	14.0	11.0	8.0		8.8	9.0	9.6	10.3	10.0	6.2	0.0	233.2
								3.0	11.0	13.5	17.0	17.3	31.0	29.0
3.7	7.2	7.6	8.2	8.8	8.3	7.6								
34.0	31.3	27.0	17.5	25.8	14.4	9.5	7.0	7.7	8.0	8.7	9.2	3.4	3.2	2.7
								5.0	11.0	13.0	16.5	20.5	27.0	33.0
11.6	7.4	7.2	7.3	6.4										
33.5	31.5	24.0	12.5	9.0	6.2		6.7	7.0	7.9	6.4	4.4	2.5		
							7.0	11.0	13.5	16.5	22.0	33.0		

Station	+	H.I.	−	Elev.	Profile Grade
		231.43			
52+00				226.3	225.9
+50				27.8	
Co. Rd. 'B' B.M	9.96	237.41	0	227.45	
+55				28.0	
Equation +89				28.5	
+98				28.7	
53+00				28.7	229.7
+03				28.8	
+88				36.8	
54+00				31.0	231.0
T.P.	10.56	243.65	4.37	238.09	
54+00				31.0	231.0
+45				31.9	
T.P.	4.51	237.90	10.56	233.39	
+84				32.2	
55+00				32.3	232.3
+25				32.5	
+53				32.8	
56+00				32.6	232.6
57+00				31.7	231.7
58+00				31.1	230.7
60+75 B.M	4.59	234.56	0	229.97	
+40				30.7	
59+00				230.3	229.5

L	℄	R
$\frac{2.1}{34.0}$ $\frac{5.0}{30.0}$ $\frac{\overset{\times}{5.5}}{16.0}$ $\frac{5.5}{12.0}$ $\frac{5.2}{5.0}$	5.1	$\frac{5.3}{7.0}$ $\frac{5.5}{9.0}$ $\frac{5.8}{12.0}$ $\frac{6.2}{15.5}$ $\frac{\overset{\times}{6.1}}{16.9}$ $\frac{5.4}{20.0}$ $\frac{5.0}{27.5}$ $\frac{1.6}{32.0}$
$\frac{232.9}{35.0}$ $\frac{7.4}{27.2}$ $\frac{4.0}{20.0}$ $\frac{4.3}{8.5}$	3.6	$\frac{3.9}{8.0}$ $\frac{4.0}{13.5}$ $\frac{4.8}{16.0}$ $\frac{4.2}{19.0}$ $\frac{2.7}{27.3}$ $\frac{0.0}{32.5}$ $\frac{233.0}{35.0}$
$\frac{9.2}{33.0}$ $\frac{9.7}{20.0}$ $\frac{9.7}{8.0}$	9.4	$\frac{9.7}{8.0}$ $\frac{9.5}{13.0}$ $\frac{10.6}{15.0}$ $\frac{9.5}{18.0}$ $\frac{9.1}{24.0}$ $\frac{8.7}{33.0}$
$\frac{7.7}{33.0}$ $\frac{9.3}{18.0}$ $\frac{9.2}{6.5}$	8.9	$\frac{9.1}{6.0}$ $\frac{9.1}{12.0}$ $\frac{8.9}{33.0}$
$\frac{5.6}{33.0}$ $\frac{8.5}{15.0}$ $\frac{9.0}{4.0}$	8.7	$\frac{9.0}{11.0}$ $\frac{9.5}{14.0}$ $\frac{8.6}{18.5}$ $\frac{9.4}{20.0}$ $\frac{8.8}{33.0}$
$\frac{5.4}{33.0}$ $\frac{\overset{\times}{7.4}}{24.3}$ $\frac{8.1}{21.0}$ $\frac{8.7}{12.5}$ $\frac{8.9}{9.0}$	8.7	$\frac{9.0}{9.5}$ $\frac{9.3}{15.0}$ $\frac{10.0}{16.5}$ $\frac{\overset{\times}{9.7}}{17.5}$ $\frac{8.9}{20.0}$ $\frac{9.4}{23.0}$ $\frac{8.8}{27.5}$ $\frac{8.1}{33.0}$
$\frac{4.9}{33.0}$ $\frac{7.6}{22.0}$ $\frac{8.9}{9.0}$	8.6	$\frac{9.0}{10.0}$ $\frac{8.8}{14.0}$ $\frac{9.9}{16.0}$ $\frac{9.9}{18.0}$ $\frac{9.4}{20.0}$ $\frac{9.0}{24.0}$ $\frac{4.5}{33.0}$
$\frac{242.9}{33.0}$ $\frac{0.0}{24.0}$ $\frac{4.5}{19.0}$ $\frac{7.7}{15.0}$ $\frac{7.5}{11.5}$	6.6	$\frac{7.3}{9.5}$ $\frac{8.5}{13.5}$ $\frac{7.7}{21.0}$ $\frac{3.9}{26.0}$ $\frac{4.9}{33.0}$
$\frac{0.0}{24.0}$ $\frac{4.3}{18.0}$ $\frac{7.5}{15.0}$ $\frac{7.5}{12.0}$ $\frac{7.0}{8.0}$	6.4	$\frac{6.8}{6.0}$ $\frac{7.4}{10.0}$ $\frac{5.2}{13.0}$ $\frac{8.2}{16.0}$ $\frac{\overset{\times}{8.0}}{18.4}$ $\frac{7.4}{21.5}$ $\frac{4.0}{27.0}$ $\frac{5.2}{33.0}$
$\frac{\overset{\times}{2.5}}{33.4}$ $\frac{2.2}{30.0}$	13.7	
$\frac{10.5}{33.0}$ $\frac{10.4}{23.0}$ $\frac{10.5}{20.0}$ $\frac{13.4}{15.5}$ $\frac{13.3}{13.0}$ $\frac{12.5}{9.0}$	11.5	$\frac{12.3}{9.0}$ $\frac{13.4}{12.5}$ $\frac{13.5}{15.5}$ $\frac{12.3}{19.0}$ $\frac{11.5}{29.0}$ $\frac{10.9}{33.0}$
$\frac{8.6}{33.0}$ $\frac{7.0}{21.0}$ $\frac{6.3}{12.5}$ $\frac{5.5}{3.0}$	5.7	$\frac{6.1}{5.5}$ $\frac{6.1}{8.0}$ $\frac{6.8}{10.0}$ $\frac{6.7}{12.5}$ $\frac{6.2}{15.0}$ $\frac{5.9}{21.0}$ $\frac{4.6}{33.0}$
$\frac{9.7}{33.0}$ $\frac{8.0}{25.5}$ $\frac{7.1}{21.0}$ $\frac{\overset{\times}{6.7}}{17.7}$ $\frac{5.6}{16.0}$ $\frac{5.4}{3.0}$	5.6	$\frac{5.9}{6.0}$ $\frac{6.6}{9.0}$ $\frac{6.5}{12.0}$ $\frac{5.8}{14.0}$ $\frac{5.8}{16.0}$ $\frac{\overset{\times}{5.7}}{16.5}$ $\frac{5.6}{19.0}$ $\frac{4.0}{23.0}$ $\frac{2.4}{33.0}$
$\frac{10.5}{33.0}$ $\frac{6.5}{21.0}$ $\frac{6.9}{18.5}$ $\frac{5.9}{14.0}$ $\frac{5.3}{4.0}$	5.4	$\frac{5.7}{3.5}$ $\frac{6.4}{9.5}$ $\frac{5.8}{13.0}$ $\frac{5.0}{21.5}$ $\frac{1.2}{28.0}$ $\frac{1.5}{33.0}$
$\frac{9.2}{33.0}$ $\frac{7.9}{25.5}$ $\frac{6.2}{22.0}$ $\frac{6.8}{19.5}$ $\frac{5.6}{14.0}$ $\frac{4.8}{4.0}$	5.1	$\frac{5.6}{6.5}$ $\frac{6.4}{10.0}$ $\frac{6.1}{17.5}$ $\frac{4.9}{21.0}$ $\frac{5.6}{33.0}$
$\frac{6.0}{33.0}$ $\frac{6.3}{24.0}$ $\frac{6.0}{21.0}$ $\frac{\overset{\times}{5.5}}{16.3}$ $\frac{5.3}{13.0}$ $\frac{4.8}{6.0}$	5.3	$\frac{5.9}{6.0}$ $\frac{6.4}{8.5}$ $\frac{6.5}{15.0}$ $\frac{\overset{\times}{7.3}}{19.0}$ $\frac{8.7}{33.0}$
$\frac{9.4}{33.0}$ $\frac{9.3}{28.5}$ $\frac{8.0}{24.5}$ $\frac{7.7}{21.5}$ $\frac{\overset{\times}{6.5}}{16.8}$ $\frac{6.0}{12.5}$ $\frac{5.7}{7.0}$ $\frac{6.0}{2.0}$	6.2	$\frac{6.5}{3.0}$ $\frac{8.5}{9.0}$ $\frac{8.7}{13.0}$ $\frac{\overset{\times}{8.5}}{19.8}$ $\frac{8.2}{33.0}$
$\frac{8.5}{33.0}$ $\frac{8.1}{28.0}$ $\frac{8.4}{22.5}$ $\frac{7.5}{19.0}$ $\frac{\overset{\times}{7.2}}{16.0}$ $\frac{6.5}{6.0}$	6.8	$\frac{7.2}{3.0}$ $\frac{8.8}{7.0}$ $\frac{\overset{\times}{9.1}}{18.8}$ $\frac{9.5}{33.0}$
$\frac{3.8}{33.0}$ $\frac{3.8}{26.0}$ $\frac{5.0}{23.5}$ $\frac{4.0}{19.5}$ $\frac{3.3}{9.0}$	3.9	$\frac{4.0}{2.5}$ $\frac{4.9}{4.5}$ $\frac{4.2}{7.0}$ $\frac{3.6}{15.0}$ $\frac{2.8}{33.0}$
$\frac{2.0}{33.0}$ $\frac{1.9}{31.0}$ $\frac{3.0}{25.0}$ $\frac{4.9}{25.0}$ $\frac{\overset{\times}{4.7}}{23.4}$ $\frac{4.3}{19.8}$ $\frac{3.5}{10.5}$	4.3	$\frac{5.0}{3.0}$ $\frac{5.0}{4.5}$ $\frac{4.0}{6.5}$ $\frac{4.4}{13.0}$ $\frac{4.5}{18.0}$ $\frac{\overset{\times}{4.2}}{23.9}$ $\frac{3.3}{33.0}$

Station	+	H.I.	−	Elev.	Profile Grade
		234.56			
59+50				29.8	229.0
60+00				29.1	228.70
B.C. +38 3				28.1	228.60
60+88 3				25.8	228.60
61+50				28.8	228.75
62+00				28.6	228.90
T.P.	5.10	234.26	5.40	229.16	
+32 3 C.W.				29.2	229.0
+82 3 E.				29.4	229.15
Equation 68+34.7 Bk.				29.5	229.30
63+75				29.7	
64+00				29.8	229.5
B.M.	4.70	234.82		230.12	
64+35				29.8	
65+00				30.1	229.9
66+00				30.2	230.0
67+00				30.0	229.5
T.P.	3.83	233.95	4.70	230.12	
+50				230.0	
68+00				29.6	229.5
69+00				29.7	229.7
+50				29.3	
70+00				29.2	228.9
71+00				29.6	229.4

6-13-23

h z ρ

$\frac{1.0}{33.0}\ \frac{3.1}{29.0}\ \frac{5.7}{25.0}\ \frac{5.4}{26.0}\ \frac{4.2}{16.5}\ \frac{4.0}{12.0}\quad 4.8\quad \frac{5.4}{1.0}\ \frac{5.2}{3.5}\ \frac{4.7}{5.0}\ \frac{4.7}{10.0}\ \frac{5.6}{14.0}\ \frac{5.9}{24.0}\ \frac{6.1}{33.0}$

$\frac{1.9}{33.0}\ \frac{2.7}{30.0}\ \frac{5.1}{27.5}\ \overset{\times}{\frac{4.8}{23.7}}\ \frac{4.7}{23.0}\ \frac{4.1}{14.0}\ \frac{5.0}{2.0}\quad 5.5\quad \frac{5.7}{1.0}\ \frac{5.6}{2.5}\ \frac{4.9}{5.5}\ \frac{5.0}{9.5}\ \overset{\times}{\frac{6.2}{23.1}}\ \frac{6.5}{33.0}$

$\frac{4.0}{33.0}\ \frac{4.0}{30.0}\ \frac{5.5}{23.0}\ \overset{\times}{\frac{5.2}{23.1}}\ \frac{4.6}{15.0}\ \frac{5.1}{6.0}\ \frac{5.6}{2.4}\quad 6.5\quad \frac{6.7}{1.0}\ \frac{6.1}{2.5}\ \frac{5.9}{5.0}\ \frac{6.3}{11.0}\ \frac{6.4}{16.0}\ \overset{\times}{\frac{6.1}{25.3}}\ \frac{6.3}{33.0}$

$\frac{6.4}{33.0}\ \frac{5.7}{31.0}\ \frac{5.5}{28.0}\ \frac{5.3}{20.0}\ \overset{\times}{\frac{5.5}{16.8}}\ \frac{5.7}{6.0}\ \frac{8.8}{1.8}\quad 8.8\quad \frac{9.5}{3.5}\ \frac{9.3}{19.0}\ \overset{\times}{\frac{9.6}{23.7}}\ \frac{10.1}{33.0}$

$\frac{5.5}{33.0}\ \frac{5.4}{28.0}\ \overset{\times}{\frac{5.9}{17.7}}\ \frac{7.4}{12.0}\ \frac{7.6}{7.0}\ \frac{8.9}{3.0}\quad 5.8\quad \frac{10.8}{20.0}\ \overset{\times}{\frac{11.4}{26.6}}\ \frac{11.7}{33.0}$

$\frac{8.4}{33.0}\ \frac{6.9}{24.0}\ \frac{6.1}{22.0}\ \overset{\times}{\frac{5.9}{19.5}}\ \frac{5.5}{13.0}\ \frac{5.9}{2.0}\quad 6.0\quad \frac{6.3}{3.0}\ \frac{7.7}{10.0}\ \frac{8.0}{18.0}\ \overset{\times}{\frac{8.4}{22.2}}\ \frac{9.4}{33.0}$

$\frac{9.2}{33.0}\ \frac{8.7}{26.0}\ \overset{\times}{\frac{7.4}{20.7}}\ \frac{6.9}{18.5}\ \frac{5.7}{14.0}\ \frac{5.1}{3.0}\quad 5.1\quad \frac{5.5}{6.0}\ \frac{5.9}{12.0}\ \frac{7.4}{16.6}\ \overset{\times}{\frac{7.4}{21.4}}\ \frac{9.0}{33.0}$

$\frac{9.5}{33.0}\ \overset{\times}{\frac{9.4}{23.5}}\ \frac{8.3}{18.0}\ \frac{5.9}{12.0}\ \frac{5.4}{7.5}\quad 4.9\quad \frac{5.2}{9.0}\ \frac{5.1}{11.0}\ \frac{6.0}{15.0}\ \frac{7.2}{17.5}\ \frac{7.8}{20.8}\ \frac{7.9}{22.7}\ \frac{9.3}{27.0}\ \frac{9.6}{33.0}$

$\frac{10.0}{33.0}\ \overset{\times}{\frac{10.0}{24.4}}\ \frac{10.0}{22.0}\ \frac{7.8}{16.0}\ \frac{5.6}{11.0}\ \frac{5.2}{8.0}\quad 4.5\quad \frac{4.9}{9.5}\ \frac{5.1}{12.0}\ \frac{7.1}{17.5}\ \overset{\times}{\frac{7.2}{18.7}}\ \frac{7.5}{22.0}\ \frac{8.0}{24.0}\ \frac{7.0}{30.0}\ \frac{6.4}{33.0}$

$\frac{9.5}{33.0}\ \frac{9.0}{21.0}\ \frac{8.7}{19.8}\ \frac{7.5}{16.0}\ \frac{5.3}{10.0}\quad 4.6\quad \frac{4.6}{12.0}\ \frac{5.1}{13.5}\ \frac{6.2}{17.0}\ \frac{6.4}{23.0}\ \frac{3.7}{26.5}\ \frac{2.2}{33.0}$

$\frac{7.3}{33.0}\ \frac{7.0}{25.0}\ \overset{\times}{\frac{7.3}{19.8}}\ \frac{7.2}{16.5}\ \frac{5.3}{11.0}\ \frac{4.8}{6.7}\quad 4.5\quad \frac{4.6}{9.5}\ \frac{5.0}{13.0}\ \overset{\times}{\frac{6.1}{17.9}}\ \frac{5.5}{23.5}\ \frac{0.4}{29.0}\ \boxed{\frac{235.0}{33.0}}$

$\frac{6.3}{33.0}\ \frac{4.9}{23.5}\ \frac{6.6}{20.0}\ \frac{6.6}{14.0}\ \frac{5.7}{10.5}\ \frac{5.3}{7.0}\quad 5.0\quad \frac{5.1}{5.0}\ \frac{5.5}{11.5}\ \frac{5.6}{16.0}\ \frac{6.5}{18.5}\ \frac{6.6}{22.0}\ \frac{1.5}{29.0}\ \frac{0.0}{32.0}\ \left(\frac{237.5}{36.0}\right.$

$\frac{5.9}{33.0}\ \frac{6.2}{26.0}\ \overset{\times}{\frac{6.7}{18.5}}\ \frac{5.9}{14.5}\ \frac{5.0}{7.0}\quad 4.7\quad \frac{5.0}{6.0}\ \frac{5.2}{9.5}\ \frac{5.4}{12.0}\ \frac{6.1}{14.0}\ \overset{\times}{\frac{6.2}{17.8}}\ \frac{6.0}{19.5}\ \frac{1.9}{24.0}\ \frac{0.5}{33.0}$

$\frac{6.5}{33.0}\ \frac{5.5}{26.0}\ \frac{5.7}{23.0}\ \overset{\times}{\frac{5.5}{17.0}}\ \frac{5.7}{16.5}\ \frac{5.1}{14.5}\ \frac{4.5}{10.0}\quad 4.6\quad \frac{4.8}{5.0}\ \frac{4.9}{8.5}\ \frac{4.6}{12.0}\ \frac{6.0}{16.0}\ \overset{\times}{\frac{6.0}{17.8}}\ \frac{5.7}{20.5}\ \frac{2.0}{25.5}\ \frac{1.9}{33.0}$

$\frac{6.1}{33.0}\ \frac{6.1}{27.5}\ \frac{6.5}{21.0}\ \overset{\times}{\frac{6.2}{17.8}}\ \frac{5.2}{13.5}\ \frac{5.0}{10.5}\ \frac{4.7}{3.5}\quad 4.5\quad \frac{5.0}{5.5}\ \frac{5.5}{12.0}\ \frac{6.0}{14.0}\ \frac{6.8}{16.0}\ \overset{\times}{\frac{7.0}{19.0}}\ \frac{6.6}{25.5}\ \frac{5.0}{28.5}\ \frac{4.5}{33.0}$

$\frac{4.9}{33.0}\ \frac{4.8}{30.0}\ \frac{5.5}{24.0}\ \frac{5.2}{21.0}\ \frac{5.5}{17.0}\ \frac{4.2}{7.0}\quad 4.0\quad \frac{4.7}{9.0}\ \frac{4.7}{12.0}\ \frac{5.6}{15.0}\ \frac{6.1}{18.0}\ \frac{5.6}{25.0}\ \frac{4.6}{29.0}\ \frac{2.7}{33.0}$

$\frac{6.4}{33.0}\ \frac{6.1}{24.0}\ \overset{\times}{\frac{5.7}{17.8}}\ \frac{5.2}{14.5}\ \frac{4.5}{8.0}\quad 4.4\quad \frac{4.5}{3.0}\ \frac{5.2}{11.0}\ \frac{6.0}{14.5}\ \frac{6.3}{17.0}\ \overset{\times}{\frac{6.2}{18.5}}\ \frac{6.0}{22.0}\ \frac{5.6}{28.5}\ \frac{5.8}{33.0}$

$\frac{2.1}{33.0}\ \frac{2.7}{30.0}\ \frac{5.3}{23.0}\ \frac{5.6}{19.5}\ \overset{\times}{\frac{5.6}{17.2}}\ \frac{5.0}{16.0}\ \frac{4.8}{14.0}\ \frac{4.3}{6.0}\quad 4.3\quad \frac{4.8}{9.5}\ \overset{\times}{\frac{5.8}{17.7}}\ \frac{5.6}{21.0}\ \frac{5.6}{33.0}$

$\frac{5.0}{33.0}\ \frac{5.0}{26.5}\ \frac{6.4}{22.0}\ \frac{6.9}{18.5}\ \frac{5.4}{13.0}\ \frac{4.7}{3.0}\quad 4.7\quad \frac{5.0}{7.0}\ \frac{6.4}{11.5}\ \frac{6.8}{16.0}\ \frac{6.7}{23.0}\ \frac{7.7}{28.0}\ \frac{6.8}{33.0}$

$\frac{9.3}{33.0}\ \frac{9.0}{23.5}\ \overset{\times}{\frac{7.9}{20.4}}\ \frac{5.3}{15.5}\ \frac{5.0}{12.5}\ \frac{4.7}{8.0}\quad 4.8\quad \frac{5.0}{5.0}\ \frac{5.4}{8.0}\ \frac{7.5}{13.0}\ \frac{7.4}{16.5}\ \frac{8.4}{19.5}\ \overset{\times}{\frac{8.2}{20.8}}\ \frac{7.8}{33.0}$

$\frac{10.9}{33.0}\ \frac{10.4}{19.9}\ \overset{\times}{\frac{4.7}{16.3}}\ \frac{4.7}{17.0}\ \frac{4.5}{13.6}\ \frac{4.3}{9.0}\quad 4.4\quad \frac{4.5}{3.0}\ \frac{4.9}{5.0}\ \frac{8.8}{13.5}\ \overset{\times}{\frac{9.1}{22.6}}\ \frac{9.5}{33.0}$

Station	+	H.I.	−	Elev.	Profile Grade
		233.95			
72+00				31.2	231.4
T.P.	6.60	237.78	2.77	231.18	
+40				32.6	
+45.1				32.6	232.66
+77.9				33.2	
+95±				33.9	234.06
Castle Arc B.M.	0.54	249.23		248.69	
T.P.	8.76	246.20	11.79	237.44	
73+45±				34.6	235.46
T.P.	10.81	248.25	8.76	237.44	
73+95±				36.2	236.86
74+50				37.2	238.10
75+00				39.6	239.80
+50				41.5	241.20
T.P.	12.46	254.03	6.66	241.57	
+93±				12.7	242.4
B.M.	8.57	251.26		242.69	
76+48.6				14.2	243.90
+80				45.1	
+93±				15.6	245.2
T.P.	4.77	253.46	8.57	248.69	
77+00				45.7	
+10				45.9	
+13				46.0	

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2.5	9.3	5.3	2.6		4.9	6.5	7.2	7.1	6.0		
33.0	31.0	17.2	8.0	2.8	6.0	14.5	23.0	27.0	33.0		
11.0	9.0	5.6			5.7	9.5	8.4	5.7	5.2	3.1	
33.0	22.0	13.0	5.2	5.2	9.0	14.0	16.0	20.0	23.0	33.0	
10.9	9.4	5.5			5.5	7.5	7.5	4.2	3.4	1.4	
33.0	22.3	12.4	6.2	6.2	9.0	14.0	14.5	20.5	20.4	33.0	
9.1	7.7	6.0			4.6	5.5	5.9	0.0	4.4		
33.0	20.5	14.5	4.6	4.6	10.0	13.5	19.0	29.5	33.0		
7.4	7.7	7.0	6.0	4.2							
33.0	21.4	17.0	10.0	6.0	3.9	4.0	4.4	5.1	7.3	2.7	
						16.0	17.4	18.4	24.0	31.0	33.0
3.2	3.1	2.4	9.6	11.9							
32.3	24.5	20.5	12.5	6.5	11.6	10.7	13.6	10.8	11.4	12.0	11.7
						12.0	16.9	25.0	28.3	31.0	33.0
0.6	1.2										
33.0	16.5	12.1				12.6	11.3	11.5	11.5		
						1.5	17.3	25.5	33.0		
3.7	3.7	4.1	5.9	8.2	10.9						
32.0	32.4	21.5	13.5	8.5	3.5	11.1	9.5	9.9	10.0	10.2	9.0
							13.0	17.5	23.0	30.0	33.0
5.7	6.0	5.9	7.2								
33.0	26.7	17.5	8.0	9.6	9.3	6.7	8.4	8.2	8.4	6.2	
							7.0	17.7	25.0	33.0	
5.5	4.7	4.9	5.7	7.7	7.6						
33.0	24.4	16.0	10.0	14.5	11.0	6.8	6.9	6.9	5.2	3.4	3.7	2.7
							12.5	17.4	19.5	25.0	30.0	33.0
5.6	5.1	6.2	9.2	13.1	11.7						
33.0	22.1	15.0	20.0	14.5	10.0	11.3	11.5	12.4	5.9	6.2	
								17.2	25.2	33.0	
6.2	5.4	6.3	9.2	13.0	12.5						
32.9	26.0	20.0	21.0	13.0	8.0	13.1	13.3	12.5	13.3	11.3	8.5	8.6
							14.0	16.5	16.5	21.0	25.0	33.0
4.0	4.9	4.7	12.3									
33.0	29.0	24.5	10.0		12.2	13.9	12.1	8.8	9.0			
						12.5	17.0	24.5	33.0			
4.2	5.1	5.6	9.4	11.7								
33.0	30.8	19.0	14.0	9.0	11.7	11.7	10.7	11.2	10.6			
						10.3	16.7	23.0	33.0			
5.3	6.0	6.9	7.6									
33.0	24.0	17.5	7.5	7.8		7.6	7.6	7.0				
						11.0	21.5	33.0				
5.5	6.2	6.9	7.5									
33.0	27.5	17.0	7.0	7.6		7.4	7.0					
						12.0	33.0					
3.6	3.1	6.2	7.3									
33.0	16.0	15.0	12.0	7.5		7.3	7.0					
						12.0	33.0					

Station	+	H.I.	—	Elev.	Profile Grade
401+25 B.M	3.73	252.32		248.59	
77+00				46.3	246.2
78+00				47.4	247.4
401+25 B.M	3.47	252.06		248.59	
79+00				47.8	248.0
80+00				47.9	247.8
+50	E.S.T			47.9	
81+00				47.9	247.6
B.M	5.10	251.56		246.46	
+50				48.1	
82+00				47.8	248.4
+55				47.5	
83+00				47.2	247.2
+50				46.9	
84+00				46.1	246.3
+05				46.1	
+50				44.9	
T.P	0.09	246.55	5.10	246.46	
85+00				44.0	244.0
86+00				41.1	241.0
+50				39.9	
87+00				38.8	238.8
+30				38.0	
B.M	3.03	240.43		237.40	
78+00				36.2	235.6

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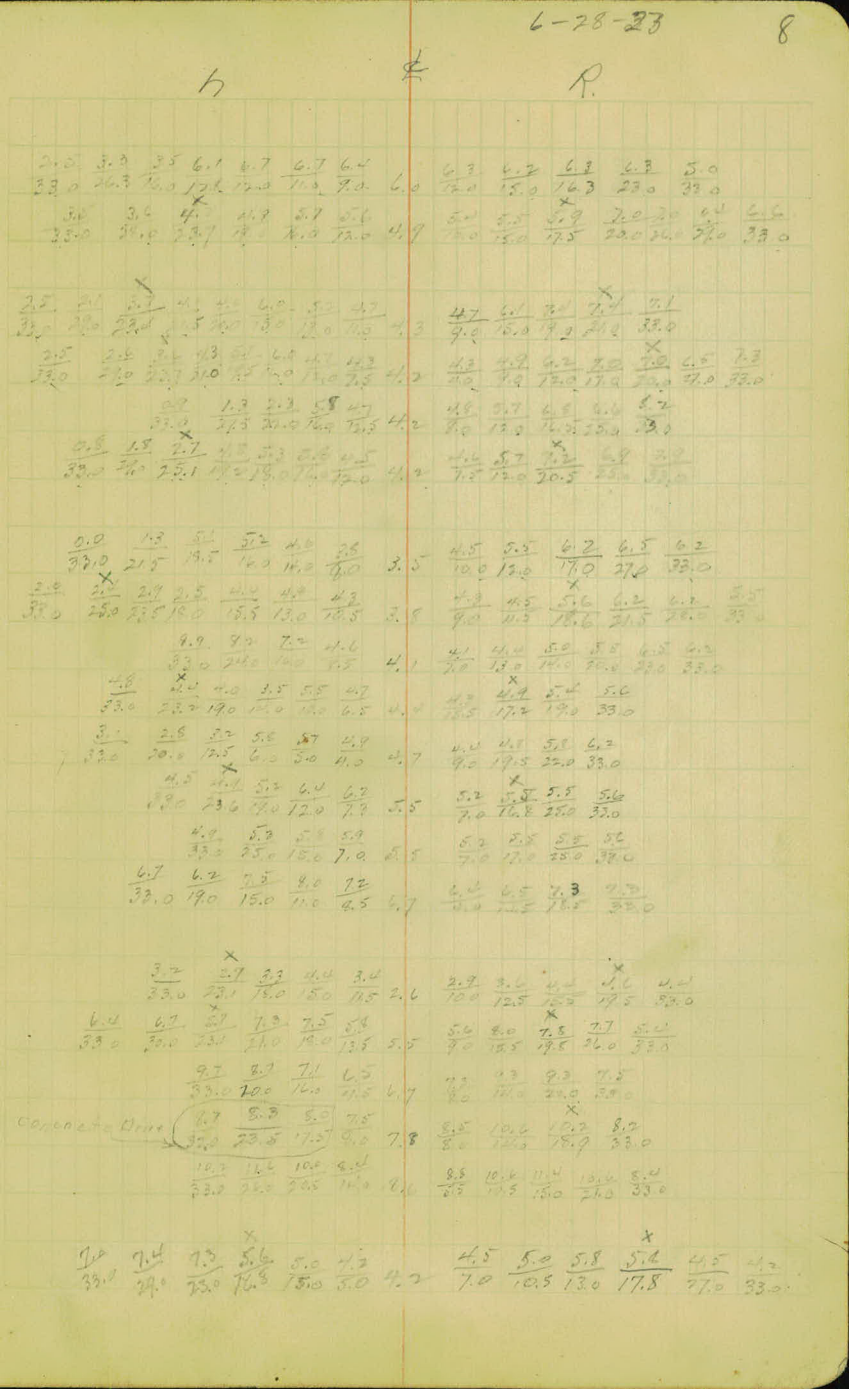

Station	+	H.I	−	Elev	Profile Grade
B.M.	4.35	240.03		235.68	
88+80				34.8	
89+00				34.8	5.5 5.3 5.1 234.7
+65				34.5	
90+00				34.4	5.6 234.4
+80				35.1	
91+00				35.2	5.9 234.1
+50				35.0	
T.P.	5.01	239.67	5.37	234.66	
92+00				34.3	5.9 233.8
+50				34.2	
93+00				33.7	6.4 233.3
+40				33.2	
94+00				32.3	7.2 232.5
95+00				31.5	8.2 231.5
T.P.	5.20	236.12	8.75	230.92	
+50				31.2	
96+00				31.3	5.4 230.7
96+25 B.M.	2.01	235.80	0	233.79	
+60				30.8	
97+00				30.6	5.4 230.4
+36				30.6	
98+00				30.6	5.5 230.3
+36				30.7	
99+00				31.3	5.4 230.2

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10.7	14.7	9.0	8.7	5.8						5.4	7.3	6.9	6.4								
33.0	30.0	14.0	19.0	13.0	5.2					17.0	17.0	21.0	23.0								
11.1	8.7	8.7	1.7	5.0						5.4	5.1	6.9	7.0	6.8	6.0						
33.0	24.0	16.3	18.2	13.0	5.2					17.0	12.0	17.0	18.9	23.0	33.0						
7.9	7.3	4.8	6.2							5.0	4.4	6.0	5.8								
33.0	25.0	15.0	11.0	5.5						17.0	13.0	17.0	23.0								
5.6	6.4	7.0	7.2	6.0	5.2					5.4	5.3	6.4	6.0	6.0	5.2						
33.0	24.6	18.3	17.0	11.0	5.4					12.0	12.0	16.5	17.2	23.0	33.0						
3.1	3.2	4.7	6.1	5.5						5.7	5.9	4.1	2.2								
33.0	26.0	23.0	14.0	12.0	4.7					12.5	6.5	27.0	33.0								
3.3	3.0	4.7	6.0	6.15	5.2					5.3	5.9	5.1	4.7	2.5	1.9						
33.0	26.5	24.2	21.0	17.0	13.5	4.8				13.0	17.0	20.0	23.5	26.4	33.0						
3.3	3.2	6.5	6.2	5.4						5.4	6.2	4.9	4.0	3.8	3.8						
33.0	24.5	14.0	13.5	9.5	5.0					13.5	17.0	20.0	23.0	25.8	33.0						
5.1	4.6	5.9	5.7	5.9	5.6					4.9	5.4	6.1	5.4	5.4	4.8	4.8					
33.0	24.3	16.5	13.0	11.0	7.0	4.8				6.0	14.0	18.0	19.5	23.5	31.5	33.0					
11.2	4.7	7.2	7.2	6.0						5.7	5.7	5.2	5.0								
38.0	26.3	20.5	13.0	9.5	5.5					9.0	13.0	24.0	33.0								
3.4	3.0	6.3	8.0	6.7	6.4					6.4	6.6	7.3	6.7	4.8	3.17	3.7					
33.0	30.0	18.9	14.0	12.0	8.5	6.0				11.0	14.0	15.5	18.0	24.0	25.7	33.0					
5.9	8.8	8.2	7.3							7.0	7.7	7.4	5.2	4.5							
37.0	30.0	15.0	10.0	6.5						12.0	15.0	17.0	20.5	33.0							
12.9	10.8	10.6	1.1	10.3	8.7	7.8				8.0	8.5	8.8	9.5	9.8							
33.0	30.0	25.0	21.9	17.0	11.5	8.0	7.4			12.0	16.0	18.4	24.0	33.0							
11.2	11.3	11.5	8.1							8.9	11.3	11.6	11.7								
33.0	20.9	17.5	9.0	8.2						13.0	19.0	21.1	33.0								
5.5	5.7	7.9	7.6	7.0	5.1					5.4	9.1	9.9									
33.0	24.0	19.0	17.0	13.0	9.0	4.9				12.0	20.5	33.0									
5.8	6.7	7.2	7.5	5.5	5.4					5.4	7.5	7.6	7.4	8.3							
33.0	29.5	19.0	16.0	9.0	8.0	4.8				13.0	18.0	19.3	22.5	33.0							
5.6	8.0	7.9	6.2	5.2						5.3	6.7	6.9	6.3	6.7							
33.0	22.0	16.5	12.0	8.5	5.0					12.5	17.0	20.0	22.5	33.0							
2.9	4.2	7.0	7.7	7.3	5.6	5.4				5.4	5.6	7.2	7.5	7.5							
33.0	26.5	22.0	19.4	16.5	9.5	6.0	5.2			10.5	14.0	18.7	28.5	33.0							
2.6	7.6	8.2	7.4	7.1	5.6					5.5	7.3	7.8	8.2								
33.0	29.5	25.0	20.0	16.0	10.5	5.2				12.5	18.0	27.0	33.0								
6.9	7.6	7.6	7.6	6.3	5.5					5.5	5.7	6.8	7.2	7.6	7.8						
33.0	19.5	16.5	13.0	10.5	8.0	5.2				12.0	14.5	18.0	19.5	28.0	33.0						
3.4	5.7	7.6	7.2	7.1	5.7					5.3	6.3	6.5	6.0	6.3							
33.0	29.0	24.3	17.0	12.5	9.0	5.1				13.0	18.5	26.0	30.0	33.0							
6.5	7.4	6.9	6.3	6.6	5.6	5.4				4.9	5.3	4.9	4.4	4.3	1.4						
32.0	27.5	23.0	18.0	14.3	10.0	8.5	4.5			15.5	17.5	20.0	24.2	28.5	34.0						

Station	+	H.I.	−	Elev	Profile Grade
99+25 B.M	8.42	242.23		233.79	
99+96.2				31.3	11.7 13.1 23[illegible]
100+46.2				30.9	230.05 11.6 [illegible]
T.P.	9.43	238.62	13.04	229.19	
101+00				30.9	7.9 8.6 [illegible] 28.0
+50				30.5	
+66.8				30.2	8.3 8.7 9.[illegible] 229.41
9+25 B.M	0.56	234.35		233.79	
102+36.8				230.0	4.4 4.5 4.6 229.86
T.T.	6.43	230.30 230.40	10.48	223.87 223.97	
102+36.8				230.0	0.4
103+00				29.6	8.6 229.8
T.P	2.97	232.42 232.52	0.85	229.45	
104+00				29.2	2.8 229.7
105+00				29.7	2.7 229.8
106+00				30.4	2.2 230.3
T.P	6.63	237.88 237.98	1.17	231.35	231.25
+20				30.7	
107+00				31.9	7.0 231.0
108+00				32.6	6.3 231.7
+50				33.1	
109+00				33.2	5.6 232.4
110+00				33.5	233.6

L ℄ R

$\frac{13.6}{33.0}$ $\frac{12.7}{27.7}$ $\frac{13.5}{24.0}$ $\overset{\times}{\frac{12.4}{17.1}}$ $\frac{12.3}{21.0}$ $\frac{11.8}{11.0}$ 10.9 $\frac{11.3}{13.0}$ $\frac{11.3}{18.5}$ $\overset{\times}{\frac{11.1}{24.4}}$ $\frac{10.5}{28.5}$ $\frac{7.2}{33.0}$ $\frac{3.3}{35.0}$
$\frac{12.5}{25.5}$ $\frac{12.5}{29.0}$ $\frac{13.0}{[illegible]}$ $\overset{\times}{\frac{12.3}{17.1}}$ $\frac{12.5}{16.5}$ $\frac{11.9}{12.0}$ $\frac{11.8}{8.5}$ 11.3 $\frac{11.5}{14.0}$ $\frac{11.4}{20.0}$ $\overset{\times}{\frac{11.7}{24.2}}$ $\frac{11.5}{26.5}$ $\frac{9.2}{31.0}$ $\frac{1.5}{37.0}$

$\frac{9.2}{33.0}$ $\frac{9.5}{29.0}$ $\frac{12.4}{26.5}$ $\overset{\times}{\frac{10.2}{19.5}}$ $\frac{10.3}{20.0}$ $\frac{9.3}{12.0}$ $\frac{8.5}{8.0}$ 7.7 $\frac{8.0}{15.5}$ $\frac{7.5}{21.0}$ $\overset{\times}{\frac{7.8}{24.5}}$ $\frac{7.2}{28.5}$ $\frac{2.5}{34.0}$ $\frac{0.2}{37.0}$
$\frac{10.2}{33.0}$ $\frac{9.7}{27.5}$ $\frac{11.2}{24.5}$ $\frac{10.3}{16.5}$ $\frac{9.6}{10.5}$ 8.1 $\frac{8.0}{10.0}$ $\frac{8.7}{17.5}$ $\frac{9.8}{24.0}$ $\frac{9.0}{28.0}$ $\frac{1.0}{35.0}$
$\frac{14.6}{33.0}$ $\frac{12.3}{25.5}$ $\overset{\times}{\frac{12.0}{21.6}}$ $\frac{11.5}{16.5}$ $\frac{10.3}{12.0}$ $\frac{8.9}{8.0}$ 8.4 $\frac{9.1}{16.0}$ $\frac{10.5}{18.5}$ $\frac{10.6}{21.0}$ $\overset{\times}{\frac{9.1}{23.0}}$ $\frac{4.4}{30.0}$ $\frac{3.1}{37.0}$

$\frac{10.1}{17.0}$ $\frac{5.4}{10.0}$ 4.4 $\frac{5.0}{14.0}$ $\frac{7.7}{20.0}$ $\overset{\times}{\frac{7.8}{20.8}}$ $\frac{7.7}{23.0}$ $\frac{6.1}{28.0}$ $\frac{4.2}{33.0}$

$\overset{\times}{\frac{10.2}{31.7}}$ $\frac{9.9}{30.0}$ $\frac{6.9}{25.0}$ 0.3
$\frac{10.8}{33.0}$ $\frac{10.5}{31.8}$ $\frac{8.5}{27.0}$ $\frac{7.8}{21.6}$ $\frac{1.7}{10.0}$ 0.7 $\frac{1.1}{10.5}$ $\frac{1.7}{14.0}$ $\frac{7.2}{23.0}$ $\overset{\times}{\frac{8.0}{28.1}}$ $\frac{7.6}{33.0}$

$\frac{10.7}{33.0}$ $\frac{9.5}{29.0}$ $\overset{\times}{\frac{9.3}{26.8}}$ $\frac{8.6}{19.0}$ $\frac{3.9}{10.0}$ 5.2 $\frac{3.5}{9.0}$ $\frac{4.1}{13.0}$ $\frac{9.9}{23.0}$ $\frac{10.6}{26.0}$ $\overset{\times}{\frac{10.9}{29.1}}$ $\frac{11.1}{33.0}$
$\frac{7.7}{33.0}$ $\overset{\times}{\frac{7.6}{23.4}}$ $\frac{6.9}{18.5}$ $\frac{3.5}{12.0}$ 2.7 $\frac{3.4}{10.0}$ $\frac{8.3}{12.5}$ $\frac{8.9}{23.0}$ $\overset{\times}{\frac{9.4}{27.0}}$ $\frac{9.5}{33.0}$
$\frac{4.7}{33.0}$ $\frac{5.4}{26.5}$ $\overset{\times}{\frac{4.4}{19.3}}$ $\frac{4.4}{18.5}$ $\frac{2.6}{13.0}$ 2.0 $\frac{2.6}{10.0}$ $\frac{4.6}{16.0}$ $\overset{\times}{\frac{4.6}{19.6}}$ $\frac{4.0}{23.0}$ $\frac{4.5}{33.0}$

$\frac{8.9}{33.0}$ $\frac{9.1}{30.0}$ $\frac{10.1}{28.0}$ $\frac{10.0}{24.0}$ $\frac{7.9}{13.5}$ 7.2 $\frac{7.6}{10.5}$ $\frac{8.9}{14.0}$ $\frac{8.6}{19.0}$ $\frac{8.6}{23.5}$ $\frac{8.3}{33.0}$
$\frac{5.4}{35.0}$ $\frac{8.2}{29.0}$ $\frac{8.0}{21.0}$ $\overset{\times}{\frac{7.0}{18.0}}$ $\frac{6.6}{17.0}$ 6.0 $\frac{6.5}{10.5}$ $\frac{7.0}{12.5}$ $\frac{7.4}{14.5}$ $\frac{7.0}{17.0}$ $\frac{4.3}{24.0}$ $\overset{\times}{\frac{4.0}{25.9}}$ $\frac{3.0}{33.0}$
$\frac{7.0}{33.0}$ $\frac{7.8}{27.5}$ $\frac{7.2}{20.0}$ $\frac{6.3}{16.5}$ $\frac{5.7}{12.5}$ 5.3 $\frac{5.7}{10.0}$ $\frac{4.3}{12.0}$ $\frac{4.6}{13.5}$ $\frac{4.3}{18.5}$ $\overset{\times}{\frac{4.2}{25.1}}$ $\frac{3.0}{33.0}$
$\frac{7.4}{33.0}$ $\frac{8.8}{30.0}$ $\frac{8.7}{22.0}$ $\frac{5.5}{13.0}$ 4.8 $\frac{5.3}{11.0}$ $\frac{7.0}{17.5}$ $\frac{6.9}{20.5}$ $\frac{5.2}{25.5}$ $\frac{4.2}{33.0}$
$\frac{10.5}{33.0}$ $\frac{8.3}{26.5}$ $\overset{\times}{\frac{8.1}{17.6}}$ $\frac{7.7}{17.0}$ $\frac{5.6}{12.8}$ $\frac{5.2}{12.0}$ 4.7 $\frac{5.3}{10.5}$ $\frac{5.6}{12.0}$ $\frac{6.6}{15.5}$ $\overset{\times}{\frac{6.6}{17.5}}$ $\frac{6.5}{19.5}$ $\frac{5.6}{21.5}$ $\frac{5.5}{33.0}$
$\frac{9.2}{33.0}$ $\overset{\times}{\frac{7.9}{21.8}}$ $\frac{7.2}{15.5}$ $\frac{5.3}{12.0}$ 4.4 $\frac{4.0}{13.0}$ $\frac{4.4}{20.5}$ $\overset{\times}{\frac{4.3}{23.1}}$ $\frac{3.4}{33.0}$

	+	H.I			
109+50 B.M	5.95	239.10		233.15	
110+62				34.2	
+90				34.3	
+97				34.3	
111+00				34.3	5.8 233.3
+40				34.2	
112+00				34.3	5.7 233.4
+40				34.1	
113+00				33.7	5.9 233.2
109+30 B.M.	4.89	238.04		233.15	
114+00				33.0	5.1 232.9
+50				32.7	
115+00				32.6	5.3 232.7
T.P	8.93	241.64	5.33	232.71	
+70				32.7	
116+00				33.0	8.9 232.7
+45				32.9	
117+00				33.1	8.8 232.8
T.P	5.25	238.02	8.97	232.77	5.4 117-30
118+00				33.5	5.1 232.9
117+30 B.M	5.46	236.23		232.77	
119+00				34.0	3.0 233.2
120+00				35.1	2.2 233.0
121+00				35.8	1.2 235.0

Station	+	H.I.	−	Elev	Profile Grade
		236.33			
T.P	8.39	244.35	0.27	235.96	
122+00				36.5	236.0
+28				36.6	
+74?				37.4	236.75
123+00				37.8	
+82				38.1	237.50
124+00				38.6	
+50				38.9	239.5
T.P	5.67	244.85	5.17	239.18	
125+09				39.2	239.0
B.M 127+35	6.20	245.51		239.27	
126+00				39.7	239.5
+80				40.3	
127+00				40.6	240.9
+45				40.6	
128+00				40.8	240.5
129+00				41.1	241.2
+60				41.9	
130+00				42.3	242.3
131+00				43.6	243.6
T.P	6.49	249.78	2.22	243.29	
+20				43.9	
132+00				45.2	244.7
133+60				45.2	245.2

L L P

Station	+	H.I.	−	Elev.	Profile Grade
		249.78			
134+00				245.5	4.4 245.4
135+00				245.1	4.9 245.0
B.M 135+25	4.17	249.60	4.35	245.43	
136+00				244.6	5.2 244.4
137+00				244.3	5.5 244.1
138+00					

L E R { Hughin Maloney Keoghan Galvin 13

4.7	4.6	4.9	5.1	4.4		4.4	4.7	5.1	5.0	5.4	4.3	4.1			
33.0	23.0	14.8	15.0	7.8	4.3	3.8	12.0	18.0	16.9	23.5	29.0	33.0			
5.4	5.8	6.6	6.5	5.7	4.8		4.8	5.2	5.6	5.8	4.7	4.4			
33.0	26.0	20.5	13.8	14.5	8.9	4.7	7.0	12.0	17.2	22.0	29.0	33.0			
6.3	6.6	7.5	7.3	7.1	5.9	5.2		5.2	5.4	6.8	7.3	7.2	5.6		
33.0	28.0	23.0	17.2	17.5	13.0	8.0	5.0	7.2	14.0	14.5	19.2	23.0	33.0		
7.2	7.4	8.2	7.8	5.9	5.5			5.5	6.0	7.7	8.0	8.1	9.2	9.6	
33.0	28.0	20.1	16.0	11.5	8.6	5.3		3.8	10.0	15.0	19.8	23.0	27.0	33.0	

		H.I.			
B.M.	7.58	264.51		256.93	
215+00				60.6	4.3 / 60.2
216+00				59.6	4.9 / 59.6
217+00				58.6	6.0 / 58.5
T.P.	2.96	259.89	7.58	256.93	
218+00				56.8	2.8 / 57.1
219+00				55.5	4.3 / 55.6
B.M.	1.42	259.35		256.93	
219+28					
+74				54.8	
220				54.3	254.1
221				53.2	252.9
222				52.7	252.4
223				52.5	252.2
T.P.	3.95	257.79	5.51	253.84	
224				52.4	5.6 / 252.2
225				52.5	5.1 / 252.7
226				53.3	4.8 / 253.0
T.P.	10.05	263.13	4.71	253.08	
+40				53.6	

L ℄ R

2.5/33.0 2.6/24.7 2.4/23.0 4.0/20.0 3.9/15.0 4.1/6.5 3.9 4.3/11.6 4.2/16.0 3.1/24.2 2.1/33.0
3.4/33.0 3.5/24.4 3.8/20.5 4.9/16.0 5.2/7.0 4.9 5.3/12.0 4.6/16.5 2.7/24.0 2.1/25.8 2.5/29.5 2.3/33.0
6.8/33.0 6.8/22.5 6.6/17.2 7.1/14.0 6.7/12.0 6.0/3.3 5.9 6.0/7.0 6.2/12.0 6.7/13.5 6.4/23.0 5.6/33.0 6.7/17.1

5.1/33.0 4.5/23.0 4.4/18.4 4.2/16.0 4.6/13.6 3.6/10.5 3.1 3.6/12.0 4.1/17.0 4.2/18.1 4.1/33.0
5.2/33.0 5.3/17.5 5.3/15.0 5.0/11.5 4.4 5.2/16.0 5.2/17.4 5.6/21.5 4.8/25.0 4.9/33.0

2/1/23

N.W. Cor. of Lower school house step

Crane
Simmons
Walsh
Ahlberg

5.1/33 5.2/24 4.6/9 4.6 4.2/25 4.7/30 4.4/33
F3.1 8.4/28.7 6.3/33 6.7/30 8.6/25 8.6/21 5.6/13 5.1 5.4/11 6.4/19 4.5/33 6.3/24 F. 1.0
F3.1 9.4/20.7 9.6/33 9.4/24 9.8/17 6.8/10 6.2 6.7/8 6.6/12 7.5/18 9.8/30 9.1/33 7.9/18.1 F1.4
F4.4 11.4/22.6 11.8/33 11.4/32 10.9/17 7.6/10 6.7 7.4/11 11.6/20 12.1/33 11.9/23.9 F9.9
F.4.6 11.8/22.9 11.9/33 11.4/25 12.1/21 8.5/14 6.9 7.6/12 11.3/19 12.2/25 14.6/33 12.2/23.5 F.5.0

Top of fence post 33' Rt. of Sta. 213+30
F.3.9 9.5/21.8 9.5/33 9.4/20 6.8/14 6.1/12 5.4 6.0/10 6.4/13 8.7/18 8.8/25 7.8/29 4.7/33 8.4/21.2 F2.8

F.3.1 8.2/20.6 7.7/33 7.3/24 8.2/20 6.0/12 5.3 5.6/11 4.7/14 7.1/25 4.8/33 7.1/19 F. 2.0

F.1.2 5.6/23.3 4.7/33 4.4/27 5.7/23 5.0/20 4.9/13 4.5 4.9/12 5.5/17 3.5/27 1.1/31 1.1/33 4.6/25.4 C 1.4

9.3/33 10.6/20 9.9/3 9.5 10.0/12 11.1/18 8.8/24 7.8/26 5.3/30 5.8/33

Sta.					
		263.13			
+55				53.8	
227				54.3	9.0 259.1
+36				54.5	
228				55.0	8.3 254.8
+93				55.7	
229				55.9	7.6 255.5
T.P.	6.97	264.04	6.04	257.07	
T.P.	5.10	265.65	3.49	260.55	
B.M.			7.25	258.40	258.39
				258.14	

L ℄ R 8/2/23

$\frac{9.2}{33}$ $\frac{10.5}{20}$ $\frac{9.2}{3}$ 9.3 $\frac{9.7}{11}$ $\frac{10.5}{17}$ $\frac{7.9}{22}$ $\frac{5.1}{23}$ $\frac{4.9}{33}$

F.0.6 $\frac{9.6}{24.4}$ $\frac{8.8}{33}$ $\frac{10.3}{18}$ $\frac{8.8}{5}$ 8.8 $\frac{9.2}{9}$ $\frac{9.4}{13}$ $\frac{9.0}{25}$ $\frac{3.7}{30}$ $\frac{3.8}{33}$ $\frac{9.0}{30.3}$ C.5.2

$\frac{9.1}{33}$ $\frac{9.1}{31}$ $\frac{9.7}{17}$ $\frac{8.4}{2}$ 8.6 $\frac{8.9}{12}$ $\frac{3.9}{20}$ $\frac{3.4}{30}$

F.0.5 $\frac{8.8}{24.5}$ $\frac{9.2}{33}$ $\frac{8.6}{24}$ $\frac{8.5}{17}$ $\frac{8.0}{3}$ 8.1 $\frac{8.5}{11}$ $\frac{8.8}{13}$ $\frac{5.5}{19}$ $\frac{4.9}{33}$ $\frac{8.3}{28.4}$ C.3.4

$\frac{8.2}{33}$ $\frac{8.6}{27}$ $\frac{7.9}{22}$ $\frac{8.3}{19}$ $\frac{7.1}{3}$ 7.4 $\frac{7.5}{3}$ $\frac{8.1}{13}$ $\frac{5.2}{20}$ $\frac{5.0}{33}$

F.0.7 $\frac{8.3}{24.3}$ $\frac{8.2}{33}$ $\frac{8.1}{23}$ $\frac{8.5}{18}$ $\frac{7.2}{5}$ 7.2 $\frac{7.2}{3}$ $\frac{8.0}{13}$ $\frac{5.9}{19}$ $\frac{5.6}{27}$ $\frac{5.9}{33}$ $\frac{7.6}{26.8}$ C1.8

spk. in 20" tree Lt sta. 241+57

spk. in Tel. pole R. sta. 229+00

X Sections and Slope Stakes

from Sta 241+00 to Sta 230+00

Sta.	+	H.I.	−	Elev.	Grade
B.M.	7.25	265.64		258.39	
241				60.3	5.0 / 260.0
240 +10				60.7	
240				60.6	5.4 / 260.2
+79				60.6	
239				60.4	5.2 / 260.4
238				60.3	5.2 / 260.4
T.P.	4.49	264.08	6.05	259.59	
237				60.1	4.1 / 260.0
+25				59.8	
236				59.6	4.7 / 259.4
T.P.	5.85	262.79	7.14	256.94	
+70				59.3	
235				59.2	4.0 / 258.8
+21				58.4	
234				58.1	4.4 / 258.2
233				57.5	5.1 / 257.7
+48				57.4	

16

L R 8/2/23

Crane
Simmons
Walsh
Ahlberg

SPK in 20" tree Lt. Sta. 24+57

F.0.8 $\frac{6.4}{24.2}$ $\frac{5.4}{33}$ $\frac{6.3}{28}$ $\frac{6.3}{19}$ $\frac{5.2}{3}$ 5.3 $\frac{5.9}{9}$ $\frac{5.8}{11}$ $\frac{6.5}{14}$ $\frac{6.2}{17}$ $\frac{6.2}{33}$ $\frac{6.1}{24.5}$ F.0.5

$\frac{6.1}{33}$ $\frac{5.6}{14}$ $\frac{4.8}{4}$ 4.9 $\frac{5.6}{14}$ $\frac{7.1}{22}$ $\frac{5.1}{26}$ $\frac{5.6}{33}$

C.0.7 $\frac{5.4}{25.7}$ $\frac{1.5}{33}$ $\frac{3.2}{31}$ $\frac{4.3}{20}$ $\frac{5.7}{19}$ $\frac{5.6}{15}$ $\frac{5.0}{3}$ 5.0 $\frac{5.6}{9}$ $\frac{5.5}{13}$ $\frac{6.7}{23}$ $\frac{4.9}{26}$ $\frac{5.5}{33}$ $\frac{5.0}{25.4}$ C.0.4

$\frac{1.9}{33}$ $\frac{3.2}{31}$ $\frac{4.0}{21}$ $\frac{5.8}{18}$ $\frac{5.0}{4}$ 5.0 $\frac{5.7}{11}$ $\frac{5.5}{14}$ $\frac{4.2}{16}$ $\frac{5.3}{33}$

C.1.1 $\frac{4.1}{24.1}$ $\frac{2.7}{33}$ $\frac{3.9}{30}$ $\frac{4.3}{19}$ $\frac{5.5}{17}$ $\frac{5.2}{4}$ 5.2 $\frac{5.8}{11}$ $\frac{6.3}{14}$ $\frac{4.5}{17}$ $\frac{4.6}{27}$ $\frac{5.6}{33}$ $\frac{4.7}{25.5}$ C.0.5

C.0.4 $\frac{4.8}{25.4}$ $\frac{2.9}{33}$ $\frac{4.4}{29}$ $\frac{4.8}{26}$ $\frac{5.9}{20}$ $\frac{5.1}{4}$ 5.3 $\frac{5.8}{10}$ $\frac{6.2}{12}$ $\frac{5.4}{14}$ $\frac{5.4}{18}$ $\frac{5.9}{24}$ $\frac{6.9}{33}$ $\frac{5.9}{24.3}$ F.0.7

F.1.0 $\frac{5.1}{24.0}$ $\frac{5.2}{33}$ $\frac{5.2}{23}$ $\frac{5.6}{21}$ $\frac{4.6}{18}$ $\frac{3.9}{3}$ 4.0 $\frac{4.3}{8}$ $\frac{4.3}{11}$ $\frac{5.3}{13}$ $\frac{5.5}{17}$ $\frac{4.8}{33}$ $\frac{5.5}{23.6}$ F.1.4

$\frac{4.2}{33}$ $\frac{4.5}{30}$ $\frac{4.4}{27}$ $\frac{5.4}{23}$ $\frac{5.6}{22}$ $\frac{4.9}{19}$ $\frac{4.8}{13}$ $\frac{4.3}{4}$ 4.3 $\frac{4.5}{7}$ $\frac{4.9}{11}$ $\frac{5.4}{12}$ $\frac{3.8}{16}$ $\frac{3.3}{33}$

24 $\frac{4.3}{25.4}$ $\frac{2.7}{33}$ $\frac{3.8}{31}$ $\frac{3.4}{27}$ $\frac{4.8}{23}$ $\frac{4.4}{19}$ $\frac{5.0}{14}$ $\frac{4.5}{4}$ 4.5 $\frac{4.8}{11}$ $\frac{5.3}{12}$ $\frac{4.5}{16}$ $\frac{5.2}{18}$ $\frac{5.0}{23}$ $\frac{3.0}{25}$ $\frac{3.0}{33}$ $\frac{2.9}{22.7}$ C1.2

$\frac{0.9}{33}$ $\frac{1.8}{31}$ $\frac{2.0}{27}$ $\frac{3.8}{21}$ $\frac{3.5}{19}$ $\frac{3.9}{14}$ $\frac{3.3}{3}$ 3.3 $\frac{4.2}{13}$ $\frac{3.0}{16}$ $\frac{3.0}{22}$ $\frac{1.3}{25}$ $\frac{1.5}{30}$ $\frac{1.5}{33}$ C.0.5

C.0.7 $\frac{3.3}{25.7}$ $\frac{2.4}{33}$ $\frac{3.0}{27}$ $\frac{4.0}{23}$ $\frac{4.9}{22}$ $\frac{4.9}{18}$ $\frac{4.3}{15}$ 3.6 $\frac{4.2}{12}$ $\frac{4.8}{13}$ $\frac{4.4}{15}$ $\frac{4.5}{17}$ $\frac{3.2}{20}$ $\frac{3.7}{29}$ $\frac{4.5}{31}$ $\frac{4.6}{33}$ $\frac{3.5}{25.5}$

$\frac{5.8}{33}$ $\frac{5.3}{29}$ $\frac{4.0}{24}$ $\frac{7.4}{19}$ $\frac{4.7}{13}$ 4.4 $\frac{5.2}{12}$ $\frac{4.6}{16}$ $\frac{7.4}{27}$ $\frac{7.6}{33}$

F2.8 $\frac{7.4}{20.2}$ $\frac{6.6}{33}$ $\frac{6.1}{28}$ $\frac{7.8}{20}$ $\frac{5.2}{13}$ 4.7 $\frac{5.1}{11}$ $\frac{6.6}{17}$ $\frac{7.0}{23}$ $\frac{7.2}{33}$ $\frac{6.8}{19.3}$ F.2.2

F3.3 $\frac{8.4}{21.0}$ $\frac{7.3}{33}$ $\frac{6.6}{28}$ $\frac{8.3}{23}$ $\frac{8.7}{21}$ $\frac{5.8}{13}$ $\frac{5.3}{6}$ 5.3 $\frac{5.3}{2}$ $\frac{5.7}{7}$ $\frac{5.8}{12}$ $\frac{6.5}{14}$ $\frac{5.6}{16}$ $\frac{4.7}{28}$ $\frac{5.3}{33}$ $\frac{5.1}{25}$ 00

$\frac{4.7}{33}$ $\frac{6.2}{30}$ $\frac{6.6}{25}$ $\frac{8.5}{21}$ $\frac{5.8}{14}$ $\frac{5.5}{7}$ 5.4 $\frac{5.8}{9}$ $\frac{5.9}{11}$ $\frac{6.7}{14}$ $\frac{4.4}{19}$ $\frac{4.4}{28}$ $\frac{4.8}{33}$

Continued Sta.	+	H.I.	−	Elev.	Grade
		262.79			
232				257.2	257.2
231				56.7	256.7
230				56.2	256.2
T.P.	2.55	258.56	6.78	256.01	
T.P.			4.74	253.82	253.8+

L E R 21+123

F23 8.4 5.3 5.7 7.2 8.4 6.1 5.5 6.9 7.9 5.6 6.0 6.9 5.9 F0.3
20.2 33 29 25 25 15 3 5.6 12 14 20 24 33 24.7

F35 9.6 7.2 7.0 9.5 6.9 6.2 6.8 7.8 7.9 7.2 6.6 6.4 6.4 F0.3
24.2 33 28 22 14 3 4.1 11 13 15 16 20 33 24.7

F23 8.9 8.4 8.0 9.0 8.8 8.1 7.1 7.1 7.3 7.8 7.4 7.1 6.8 7.3 F0.7
19.7 33 25 22 19 15 12 6.6 9 12 15 19 28 33 24.3

Top of fence post Rt. Sta. 223+30.

X Sections & Slope Stakes

From Sta 241+05 To Sta 256+00

Sta.	+	H.I.	−	Elev.	Grade
B.M.	5.23	263.62		258.39	
241+65				59.7	
+75				59.5	
242				59.3	4.1 / 259.5
243				58.9	4.6 / 259.0
+80				58.6	
244				58.6	5.2 / 258.4
+72				58.7	
245				58.4	6.0 / 257.6
+44				58.3	
+80				58.0	
246				57.7	6.7 / 256.7
T.P.	2.33	260.31	5.64	257.98	

L. C. R. 8/2/23

Crane
Simmons
Walsh
Hoffberg

5/2.1 1/2 26" Trees 12 3.0 24-1 7.5 19

6.5	5.7	6.2	4.7	3.8					4.7	5.2	5.4	4.6							
33	23	21	14	4	3.7				10	14	23	33							
6.7	5.8	6.2	5.1	3.9								5.0	7.4	6.8	5.0	4.7			
33	29	21	17	4	4.1							10	16	22	25	33			
F.2.1	6.2	7.1	6.1	5.2	4.5	4.2			5.1	7.3	6.6	4.7	4.3	7.0	F.3.0				
	19.2	33	19	19	10	5	4.3		9	18	24	24	23	20.5					
3.0	6.4	7.0	6.7	7.0	6.4	6.6	5.4	4.4		5.4	6.9	7.3	3.6	4.1	6.7	F.2.3			
	19.0	33	28	24	23	19	15	5	4.7	10	16	22	28	33	19.5				
	8.0	7.0	6.6	5.7	4.9				5.6	5.6	6.2	6.1	5.1	5.5	6.8				
	33	27	19	14	9	5.0			8	11	17	21	23	27	33				
F.3.1	8.3	8.7	8.4	5.5	4.8				6.0	6.6	6.9	5.1	7.1	5.1	C.0.1				
	20.7	33	21	15	3	5.0			12	17	21	23	33	25.1					
	5.4	7.2	6.9	6.1	5.0				5.8	6.9	6.6	7.1	8.3						
	33	27	22	19	4	4.9			10	15	17	28	33						
1.0.6	5.2	8.4	8.0	6.3	5.1				6.1	6.8	8.4	7.7	F.1.4						
16	33	27	22	19	4	5.2			11	13	33	25.6							
	4.7	4.7	7.1	7.8	6.1	5.3			4.4	6.8	6.7	6.4	6.9						
	33	30	24	21	14	5	5.3		17	19	24	27	33						
	4.9	3.6	5.6	6.1	5.7				6.3	7.0	7.7	4.8	4.8						
	33	29	22	13	5	5.4			10	13	24	29	33						
1.0.4	6.5	4.4	6.4	5.9					6.2	7.3	7.6	7.5	F.0.6						
	25.7	33	13	4	5.7				8	17	33	24.9							

Sta.	+	H.I.	−	Elev.	Grade
		260.31			
247				56.0	4.8 / 255.5
+21				55.7	
248				54.4	5.1 / 254.2
249				53.0	7.6 / 252.7
B.M.	2.24	255.40	7.15	253.14	
+23				52.6	
250				51.3	4.3 / 251.1
+50				51.1	
251				50.8	5.1 / 250.2
+60				50.8	
252				51.2	4.9 / 250.5
+50				51.8	
T.P.	5.70	257.80	3.30	252.10	

L. R. 8/3/23

F0.1 4.9 4.5 4.6 5.1 4.8 4.1 — 4.3 — 4.4 4.7 5.6 6.8 (5.7) F0.9
24.8 33 27 22 19 4 — 6 11 17 33 (27.1)

5.1 5.2 5.9 5.8 5.2 4.8 — 4.6 — 5.4 5.0 7.0 7.2 6.1
33 27 24 21 13 4 — 7 10 16 24 53

F1.0 4.8 5.2 6.8 6.1 6.3 5.8 — 5.9 — 6.4 8.3 8.6 8.2 7.1 (8.3) F2.2
24.3 33 28 14 15 5 — 10 19 27 32 33 (17.8)

F1.5 (9.1) 6.3 7.8 7.1 7.9 7.8 9.2 — 7.3 — 7.8 7.6 11.2 11.0 10.8 10.7 (11.8) F2.3
(23.5) 33 29 20 13 4 — 8 9 18 23 29 33 (22.3)

5.0 F1.5 1.7 7.6 1.0 1.6 19 5.9 2.4 8.7 3.0
2.9 5.2 5.1 5.4 3.4 2.7 — 2.8 — 3.7 7.3 8.8 7.6
33 31 26 21 12 4 — 10 18 22 33
(245.6) H.1.

F.4.1 (8.4) 11.8 8.3 4.7 4.0 — 4.1 — 4.6 10.2 10.6 11.8 F 12.4
(22.1) 33 22 14 9 — 7 31 33 (47.1)
245.4 H.1

13.4 12.9 9.9 4.4 — 4.3 — 5.2 10.8 11.2 13.9
33 29 15 4 — 9 38 33 50
245.6

F4.6 (2.8 12.2 11.6 5.1 4.5 — 4.6 — 5.9 9.5 10.2 (11.5) F 10.1
(22.9) 33 28 15 5 — 10 28 33 (42.1)
245.4

10.4 10.9 5.1 4.6 — 4.6 — 5.5 6.9 7.3 8.4 8.5
33 27 16 5 — 11 18 33 40 50
245.6

F8.3 (13.2 13.5 12.6 4.7 4.2 — 4.2 — 4.7 7.9 (3.8 9.3 (4.4) F 9.3
(29.4) 33 27 15 4 — 7 11 (2.6 23 (30.9)

13.8 12.3 9.5 5.7 — 3.6 — 3.9 4.4 4.5 9.0 8.5
33 27 15 5 — 7 10 13 22 33

Sta.	+	H.I.	-	Elev.	Grade
		257.80			
253				52.3	6.3 / 251.5
+35				52.8	
254				53.1	5.6 / 252.2
255				53.7	5.3 / 252.5
256				53.3	5.6 / 252.2
T.P.	3.78	257.77	4.01	253.79	
257				52.3	6.7 / 251.1
258				51.0	7.8 / 250.0
259				49.2	9.4 / 248.4
+20				48.7	
+57				47.9	
260				47.0	11.0 / 246.8
+40				46.4	
T.P.	2.20	247.28	12.69	245.08	

8/3/23

L C P

F1.0 7.3 11.0 10.4 7.6 7.0 6.5 5.5 5.9 6.8 7.0 6.1 2.6 2.5 6.4 5.1
19.5 33 30 21 19 16 5 5.5 8 13 21 26 31 33 24.7

28.2 H.T.

5.9 7.2 7.4 6.1 5.0 5.6 6.5 4.6 2.9 8.4 8.7
33 30 26 17 4 5.0 8 12 27 30 33 30

28.2

F0.8 6.7 4.8 5.6 6.8 5.7 4.6 5.4 4.8 3.4 6.0 5.1 6.8 5.2 C.10.8
28.2 33 30 23 15 3 4.1 9 16 25 33 35 30 35.8

28.8

C1.0 5.3 10.9 5.8 4.8 3.9 4.0 4.5 2.9 8.3 2.7 3.5 8.7 C.2.0
26.0 33 20 18 3 4.1 2 10 23 33 39 30 32.9

12.4 5.6 1.8 2.9 3.4 5.0 5.4 5.3 4.7 4.8 3.2 10.1 5.4 C1.0
27.9 33 25 24 20 14 4.5 12 19 21 29 33 26.9

SPA in Tol. Above R 574, 256, 780

8/4/23

C.2.2 4.5 4.5 4.8 4.8 4.1 6.6 6.0 4.0 4.1 5.1 C.1.0
27.2 33 29 23 15 3.5 12 26 30 33 26.6

C.0.2 8.6 8.0 8.4 7.3 7.5 8.0 6.3 5.2 6.5 C.1.3
25.2 33 29 22 15 6.8 14 28 30 26.3

F1.5 10.9 12.1 11.4 9.6 9.3 10.1 10.1 9.0 9.2 9.8 F0.4
25.6 33 28 18 8.6 10 16 23 27 33 24.6

12.2 11.7 11.9 10.3 9.0 9.6 10.5 10.0 9.6 8.6
33 26 27 14 2 9.1 10 14 26 30 33

11.3 12.5 10.6 9.8 10.5 11.2 11.1 8.6
33 22 13 2 9.7 10 10 19 33

F1.1 12.7 10.4 10.7 12.7 11.4 11.4 12.1 10.5 11.6 F.0.4
23.3 33 24 20 11 10.8 10 18 33 24.4

10.0 10.3 10.4 13.2 12.9 12.1 13.6 11.9 11.8
33 30 27 20 12 11.4 11 16 30 33

Sta.	+	H.I.	−	Elev.	Grade
		147.28			
261				45.3	3.1 145.2
262				44.1	3.4 143.9
263				43.3	4.0 143.3
B.M.			1.81	145.47	145.44

L R 8/4/23

F4.7	6.8	4.9	5.4	4.9	6.7	2.5		2.8	6.0	6.3	6.2	(6.2)	F4.1
	30	33	28	25	22	11	2.0	12	19	25	33	(23.1)	
FV1.4	17.3		14.5	13.4	4.0			3.7	4.2	9.4	10.3	9.2	FC.2
	34.4		33	29	11	3.2		10	13	22	33	26.3	
F8.8	12.8		13.3	12.8	11.8	4.6		4.3	9.0	10.2	10.4	9.9	F5.9
	30.2		33	30	25	12	4.0	11	21	28	33	25.8	

Sp. # 10 10" Trees L. Sta. 2+60+35

Y sections & Slope stakes

from Sta. 277+68 to Sta. 263+70.

Sta.	+	H.I.	=	Elev.	Cuts
B.M.	3.57	252.50		248.93	
+68				47.7	
277				47.8	4.4 / 248.1
276				48.1	4.7 / 248.1
275				48.0	4.7 / 247.8
274				47.8	5.1 / 247.4
273				47.9	5.5 / 247.6
T.P.	4.01	251.45	5.04	247.44	
272+30				47.4	
+31				47.4	
+68				47.3	
272				47.2	5.1 / 246.4
271				46.7	5.3 / 246.2
270				46.1	5.7 / 245.8
B.M.	3.72	250.07	5.10	246.35	

8/4/23

Spot 10 12 7 5 4 3 2 1 0 9 8 7 6 5

5.7 5.9 6.8 5.3 4.7 5.2 7.4 5.9 5.3
33 21 15 10 48 8 15 23 30 39

F1.6 (6.0) 5.5 5.8 6.0 5.2 5.2 7.1 7.4 5.5 5.4 (6.9) F2.5
23.4 33 17 14 10 4.7 15 21 27 30 33 19.7

F1.0 5.4 4.9 5.4 6.2 4.9 4.8 6.4 4.9 5.5 5.6 (4.9) F0.5
24.0 33 18 14 9 4.4 10 17 24 27 33 24.5

F0.4 5.1 4.9 4.6 5.7 5.0 5.3 5.7 4.7 4.4 (4.8) F.0.1
27.6 33 18 14 10 4.5 15 19 23 33 24.8

F0.1 (5.2) 5.0 5.1 5.7 5.5 4.6 4.3 (4.7) C.0.9
24.9 33 16 13 4.7 15 23 33 25.7

C.0.3 (5.2) 4.9 4.9 5.3 5.8 5.4 5.5 4.6 4.4 4.3 (4.6) C.0.7
25.3 33 17 13 5.0 15 17 20 22 27 33 25.9

3.8 3.7 4.8 4.9 3.8 4.1
33 20 18 4.1 17 21 33
5.4 5.0 4.0
33 4.1 17 33
4.6 4.7 4.9 4.4 4.9
33 18 4.2 17 22 33

C1.6 (3.6) 3.8 5.1 4.8 4.8 4.4 4.5 (4.3) C.0.2
24.3 33 19 13 4.3 15 19 33 25.6

C.0.7 (4.2) 4.5 4.5 5.4 5.8 5.4 5.8 5.8 5.1 5.2 (5.1) C.0.2
25.7 33 27 10 15 13 4.8 15 18 22 33 25.2

F2.4 5.1 7.3 7.4 8.0 6.1 5.9 8.2 7.7 7.8 7.9 (7.9) F2.2
19.6 33 20 18 18 5.4 10 17 23 29 33 19.3

Spk. in Face VR 5-3. 208 ± 27

Sta.	+	H.I.	−	Elev.	Grade
		250.07			
269				45.7	45.7 / 245.+
+60				45.6	
268				44.9	45.1 / 245.0
267				44.7	45.3 / 244.4
266				44.6	45.9 / 244.2
T.P.	6.34	251.31	5.12	244.95	
+20				44.3	
265				44.1	7.5 / 243.8
+90				44.2	
264					243.4
+55				43.8	
+40				43.8	
264				43.5	7.9 / 243.4
263+70				43.2	
T.P.	1.90.	248.79	4.42	246.89	
B.M.			3.32	245.47	

L. R. 8/7/23

F.23 7.0 6.2 6.4 7.0 6.8 5.1 — 4.8 4.5 5.7 5.7 5.9 F1.2
19.5 33 27 21 17 13 4.4 — 11 16 28 33 23.8
4.7 5.2 6.5 5.4 — 4.6 5.5 4.2 5.4 4.5
33 21 19 13 4.5 — 10 16 20 23 33
C.17 4.4 3.9 4.4 4.5 4.1 5.8 — 5.3 4.3 5.9 4.1 5.2 4.7 5.2 F1.1
25.7 33 31 25 21 15 5.2 — 10 14 14 17 20 33 24.9

C1.8 3.7 3.5 3.8 4.6 6.2 5.4 — 6.3 4.7 5.0 3.7 C.4.3
26.8 33 21 17 14 5 5.4 — 17 20 33 25.3

C.37 3.2 2.8 3.1 3.9 6.6 6.0 5.6 — 4.5 4.6 4.6 4.6 C.1.3
27.7 33 29 21 16 13 5 5.5 — 14 19 33 26.3

4.6 5.0 8.1 — 7.9 7.7 6.1 4.6 7.3
33 21 15 7.0 — 12 15 19 23 33
C.33 4.2 3.7 4.4 5.9 8.1 7.3 — 8.1 7.7 9.4 3.9 4.0 C.3.5
28.3 33 33 19 15 5 7.2 — 13 15 20 33 28.5

3.7 4.3 8.0 — 8.2 3.9 3.4 5.6
33 21 16 7.1 — 14 20 25 33

3.2 5.5 8.3 8.8 8.6 — 8.2 8.8 3.2 2.8
33 30 25 19 15 7.5 — 11 15 24 33

4.1 9.1 8.1 8.8 8.3 — 8.2 8.9 7.6 2.7
33 26 18 15 13 7.5 — 11 14 24 33

C.17 6.2 6.2 6.1 8.7 9.3 8.7 — 8.4 9.2 5.3 4.8 5.0 3.2 C2.7
26.7 33 27 21 15 12 7.8 — 10 17 24 31 33 27.7
10.1 9.5 7.8 8.7 — 8.2 8.4 9.6 8.9
33 20 15 11 8.1 — 5 12 19 33

Spl. in 16" Trc Lt Sta. 260+85

B.M.	6.73	263.66		256.93	
214+00					
+25					
+50					
+75					
215+00					
+25					
+50					
+75					
216+00					
+25					
+50					
+75					
217+00					
+25					
+50					
+75					
218+00					
+25					
+50					
+75					
219+00					
+25					
+50					
+75					

1400+65

H.		R.
N.W. Con Lower School Hu Step.		
3.55 / 12.0	3.5	3.5 / 12.0
3.65 / 12.0	3.6	3.55 / 12.0
3.6 / 12.0	3.7	3.65 / 12.0
3.8 / 12.0	3.75	3.8 / 12.0
3.7 / 12.0	3.65	3.7 / 12.0
3.8 / 12.0	3.8	3.75 / 12.0
3.75 / 12.0	3.95	3.9 / 12.0
4.2 / 12.0	4.2	3.9 / 12.0
4.25 / 12.0	4.0	4.05 / 12.0
4.5 / 12.0	4.25	4.5 / 12.0
4.7 / 12.0	4.55	4.55 / 12.0
5.0 / 12.0	4.8	4.8 / 12.0
5.3 / 12.0	5.1	5.3 / 12.0
5.7 / 12.0	5.4	5.4 / 12.0
6.25 / 12.0	6.0	5.95 / 12.0
6.4 / 12.0	6.5	6.5 / 12.0
7.0 / 12.0	6.85	6.75 / 12.0
7.4 / 12.0	7.3	7.3 / 12.0
7.7 / 12.0	7.6	7.6 / 12.0
7.85 / 12.0	7.95	7.85 / 12.0
8.35 / 12.0	8.15	8.05 / 12.0
8.4 / 12.0	8.41	8.5 / 12.0
8.95 / 12.0	8.9	8.85 / 12.0
9.25 / 12.0	9.15	9.3 / 12.0

Station	Size	Kind	Intake Elev.	Invert Elev	
		Concrete Pipe			
0+40	24" × 48'		243.8	243.5	Mains East
14+38.5	15" × 26'	C.M.P.			Right Private Drive
14+64.5					
26+07.2					Left Co. Rd "H"
Eq 26+23.7 = 26+35.9	16" × 34'	C.M.P.			
26+54.2					
33+34	16" × 26'	C.M.P.			Right Cemetery Drive. Old. Culvert
33+60					
42+64	36" × 66'	C.M.P.	203.76	203.55	Mains West.
	Old "	Culvert "	Ext. 4' " 4'	West side East "	
52+46	15" × 32'	C.M.P.			Co. Rd B
Eq 52+74.3 = 52+85.1					Left
52+89.2					
52+57					Co. Rd B Right
	15" × 32'	C.M.P.			
52+89.1					

Station	Size	Kind	Intake Elev.	Invert Elev	
54+74.5 55+00.5	12" x 26'	C.M.P			Private Drive left.
59+13.8 59+38.8	12" x 26'	C.M.P			Private Drive Right
61+00±	24" x 48'	Concrete Pipe	225.85	223.45	Illinois East.
65+63± 65+89±	12" x 26'	C.M.P			Private Drive Right
71+01	24" x 49'	Concrete Pipe	224.87	222.96	Illinois West.
76+83 77+13	12" x 30'	{Old Pike} C.M.P			Private Drive left.
77+09 77+39	15" x 30'	C.M.P			Castle Ave. Right
78+12± 78+38±	12" x 26'	C.M.P			Private Drive left.

Station	Size	Kind	Intake Elev	Invert Elev	
84+02 +28	12" x 26'	C.M.P.			Private Drive Right
92+385 92+645	12" x 26'	C.M.P.			Private Drive Right
93+370 93+630	12" x 26'	C.M.P.			Private Drive left
118+86	24" x 57'	Concrete Pipe	225.63	225.30	Drains West
122+07 122+33	12" x 26'	C.M.P.			Private Drive Right
128+41	24" x 56'	Concrete Pipe	233.55	232.0	Drains West.
137+06	24" x 48'	Concrete Pipe	240.87	239.07	Drains East.
144+78 145+04	12" x 26'	C.M.P.			Private Drive Right.
146+37 146+63	12" x 26'	C.M.P.			Private Drive left

USDA
LIBRARY

148+17	24" x 48'	Concrete Pipe	248.66	246.77	Drains East
153+35 153+61	12" x 26	C.M.P.			Private Drive left
155+60	24" x 48'	Concrete Pipe	251.29	249.49	Drains West
165+00	24" x 48'	Concrete Pipe	249.77	248.09	Drains West
171+83	24" x 48	Concrete Pipe	247.54	244.46	Drains East
173+37 173+73	12" x 36.8'	C.M.P Old Pipe			Private Drive Right
173+52 173+72.6	12" x 20.6	C.M.P Old Pipe			Private Drive left
177+67	℄ Private Drive Left Old V.t. pipe in place			12" x 21'	
180+10	℄ Private Drive left Old V.t. Pipe in place.			12" x 20.6'	

182+795	24" 49'	Concrete Pipe	235.66	234.90	Drains East
188+85	12" x 26'	C. M. P.			Private Drive Right
189+11.5					
203+06	24" x 40'	Concrete Pipe	243.48	242.79	Drains West.
208+38	12" 42.5'	C. M. P.			Private Drive left
+64					
217+08	12" x 28'	C. M. P.			Private Drive left
217+36					

171+93.65
10.65-
171+83.00

254.16
4.22
258.38
8.61
249.77
58.38
9.89
48.49

6.28
2.33
8.61
2.33
7.56
9.89

36.8
27
7.38

252.23
6.94
257.14
9.6
247.54
17.68
229.46

2.33
7.27
9.60
2.33
7.35
2.68

240.17
4.52
244.69
9.03
235.66
12.69
9.79
225.90

2.33
6.70
9.03
2.33
7.46
9.79

247.64
4.65
252.49
9.01
243.48
52.49
9.70
242.79

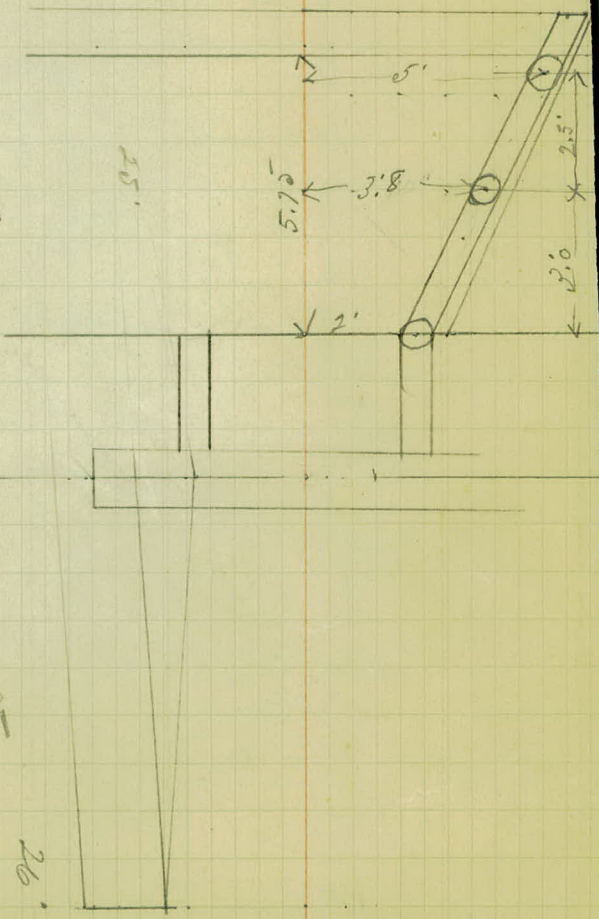
6.68
2.33
9.01

2.33
7.37
9.70

60
8
480
480

8 10.25
36
20

217.42
213.72
19


5'
2.5'
5.75'
3'8"
3'0"
2'
.5'
2.5'
26'

Slope stakes -23-52

Sta	+	HI	−	Elev	Grade
B.M.	3.70	251.75			(248.05)
0+33					243.9 5.9
1					47.2 4.6
2					49.1 2.7
3					51.1 0.6
T.P.	9.94	261.55	0.14	251.61	
4					53.2 3.4
5					55.4 6.7
6					57.6 [illegible]
7					59.8 1.0
T.P.	9.56	269.87	1.24	260.31	
8					61.9 8.9
9					63.8 6
10					65.7 [illegible]
B.M.	8.20	272.12	5.95	263.92	263.92
11					67.7 [illegible]

10-19-23
Fair - cold

Party: Carley, Parsons, Briggs, Eck

Lt & Rt

Top of hydrant Lt of 0+00

	<0.5 (5.4 / 27.5)	5.5 / 12.2	(7.2 / 25.7)	F1.3
F1.4	6.0 / 23.6	4.7 / 14	4.7 / 14	(7.6 / 20.8) F2.0
F1.4	(4.1 / 25.6)	2.7 / 14	2.6 / 13.8	(3.8 / 25.9) F1.1
F2.2	(2.8 / 20.3)	0.9 / 16	0.6 / 14	(2.9 / 20.5) F2.3
F1.6	(10.0 / 19.4)	8.4 / 14	8.4 / 14	(10.4 / 20.0) F2.0
F1.6	(7.8 / 25.4)	6.3 / 14	6.1 / 15	(7.7 / 25.4) F1.6
F2.0	(6.0 / 20)	4.3 / 15	4.5 / 16	Shoulder stake
F2.1	(3.9 / 20.1)	1.9 / 14	1.7 / 14	(2.8 / 18.5) F1.0
<0.3	(7.7 / 27.3)	7.8 / 17	8.5 / 18	
F1.2	(7.3 / 18.8)	6.0 / 14	5.6 / 15	(7.1 / 18.5) F1.0
F1.8	(6.0 / 19.7)	4.8 / 15	4.0 / 15	(7.2 / 21.5) F3.0

Spike in 36" poplar Rt — 10+00

<0.5	3.9 / 27.5	4.5 / 15	4.2 / 15	5.4 / 18.5 F1.0

Slope stakes for widened sect. 3.17

Sta		+	H.I.	−	Elev.	Grade
			272.12			
12						69.8 2.3
	T.P.	8.47	279.04	1.55	270.57	
13						72.0 2.0
14						74.3 4.7
15						76.7 2.3
	T.P.	8.28	286.64	0.68	278.36	
16						79.1 2.5
17						80.8 3.8
	B.M.					283.34
18						81.5 5.5
	B.M.	4.21	286.59	4.21	282.43	282.38
19						81.2 5.2
20						80.2 6.2
21						79.2 7.2
22						78.2 8.2
	T.P.	3.05	281.84	7.80	278.79	
23						77.2

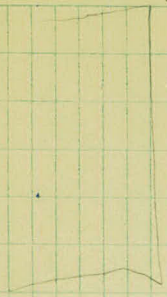
10-20-23
Fair-cold

Lt & Rt Party
Carlos
Pat-Jams
Brian
Eric

C0.3	2.0 / 27.3	2.8 / 15	3.3 / 16	4.5 / 20.3 FR2
C0.2	6.8 / 27.2	7.3 / 15	6.9 / 14	X road dr
C1.0	3.7 / 28.0	5.0 / 14	4.7 / 15	4.7 / 27.0 0.0
F1.1	3.4 / 29.9	3.0 / 17	2.2 / 16	1.1 / 28.2 C1.2
F1.2	8.7 / 25.8	8.1 / 15	7.4 / 15	9.5 / 20.0 F2.0
C0.3	5.5 / 27.3	6.3 / 14	6.3 / 14	6.2 / 26.6 F0.4
Mail kiz tele pole Lt sta 17+50 - moved				
C4.2	0.9 / 31.2	5.7 / 15	5.6 / 14	3.6 / 28.0 C1.6
fence post Rt sta 17+33				
C3.8	7.6 / 30.8	6.0 / 15	5.5 / 14	3.8 / 28.6 C1.6
C1.2	5.2 / 28.2	6.5 / 14	6.8 / 15	8.1 / 35.3 F1.7
C1.3	4.1 / 28.3	7.9 / 14	7.6 / 14	9.4 / 20.0 F2.0
F0.4	8.8 / 26.6	8.6 / 15	8.4 / 15	12.9 / 23.0 F4.0
F1.6	6.2 / 25.4	5.2 / 16	4.8 / 17	6.4 / 20.0 F2.0

Sta	+	H.I.	−	Elev	Grade
		281.84			
24					76.2 5.1
25					74.9 6.5
26					73.8 8.0
B.M.			2.42	279.42	279.44
27					70.8 11.0
28					67.29 14.5

Lt & Rt



5.8/15 (6.8/25.8) A1.2

6.9/15 (2.9/31.0) C1.0

9.0/15 (6.8/28.2) C1.2

S.W. Cor. intersection Co.rd A2.

11.2/15 (3.7/34.3) C7.3

(6.7/35.3) C8.3

23-52 Final Xsections

Sta	+	H.I.	−	Elev.	
BM.	4.41	253.35		48.6	248.93
277+68		253.34	4.7	48.7	
277			4.6	48.7	
				48.8	
276			4.6	48.7	
				48.8	
275			4.9	48.4	
				48.5	
274			5.3	48.0	
				48.1	
273			5.7	47.6	
				47.7	
+36			5.9	47.4	
				47.5	
+31			6.0	47.3	
				47.4	
+08			6.0	47.3	
				47.4	
272			6.1	47.2	
				47.3	
271		250.38	6.5	46.8	
				46.9	
T.P.	3.25	250.37	6.21	247.13	
				247.14	
270			3.9	46.5	

11/14/23
cloudy - wet.

Lt Lt Lt

Conley
Parsons
Briggs
Eck

Spike 1.17 1.24 1.31 1.38 1.45 1.52 2.03 2.10 2.17 2.24 2.31 2.38 2.45 2.52 2.59 3.06 3.13 3.20 3.27 3.34 3.41 3.48 3.55

6.4/33 6.6/28 7.8/28 7.8/20 4.7/15 4.7/10 (4.7 6.1) 4.7/10 4.8/15 8.1/21 8.2/31 6.0/33 5.8/35

(5.5)

6.3/37 6.6/30 8.0/25 8.9/21 4.8/15 4.6/10 4.6/10 4.8/15 7.9/21 8.0/31 6.4/33 6.4/34

(5.2)

5.8/37 6.3/24 7.2/35 7.4/21 4.7/15 4.7/10 4.6/10 4.8/15 7.3/20 7.4/28 5.8/30 5.8/33

(5.3)

5.8/31 6.0/25 7.7/23 7.6/20 4.9/15 4.9/10 4.9/10 4.9/15 6.5/19 6.7/28 5.4/30 5.2/33

(5.5)

6.9/31 6.2/25 7.6/22 7.6/18 5.5/15 5.4/10 5.3/10 5.4/15 6.8/19 6.6/29 5.2/31 5.1/33

(5.8)

5.8/33 6.0/25 7.9/23 7.7/17 5.9/15 5.8/10 5.7/10 5.8/15 7.2/20 7.4/28 5.2/29 5.0/32

5.2

(5.9)

(5.2)/33 7.7/27 6.4/23 6.0/17 6.0/10 6.9/10 5.7/16 7.5/21 7.9/29 5.8/26 5.8/33

(5.9)

X-road. 6.3/36 6.2/27 6.1/17 6.1/10 6.1/26 5.7/35 X-road.

(6.0)

6.4/31 6.1/20 6.1/10 6.1/10 6.0/18 6.3/36

(6.1)

5.5/32 5.5/27 8.0/23 7.8/18 6.3/15 6.1/10 6.2/10 7.8/19 8.1/24 6.4/31 (5.1)/36

6.6

6.3/33 4.6/24 8.4/23 8.6/19 6.6/15 6.6/10 6.6/10 6.7/15 8.3/19 8.3/28 7.0/30 6.8/33

(4.3)

6.2/33 6.3/28 6.6/19 4.2/15 4.0/10 4.0/10 4.1/15 6.3/19 6.6/27 6.7/32

Sta	+	H.I.	−	Elev	
	3.25	250.39			
269			4.3	46.1	
+60			4.5	45.9	
				246.31	
B.M.	4.07	250.42 ✓	4.07	246.35	246.35 ✓
268			4.8	45.6	
267			5.2	45.2	
266			5.5	44.9	
265			5.9	44.5	
+90			6.0	44.4	
+55			6.1	44.3	
+40			6.2	44.2	
264			6.3	44.1	
+10			6.4	44.0	
T.P.	2.24	249.15 ✓	3.51	245.91 ✓	
263			5.1	44.1	

(4.7)

6.3	6.4	7.0	6.2	4.4	4.4	4.4	4.6	7.2	7.2	6.1	6.2
33	28	24	18	15	10	10	15	20	24	26	29

(4.8)

4.8	4.8	7.3	6.5	4.7	4.6	4.6	4.8	7.3	7.2	5.2	5.0
35	33	30	20	15	10	10	15	20	24	26	33

5 p.i.c. 1 in. + 10 c. + 4. 5 + 3 = 268 + 27

(5.5)

4.0	4.7	7.1	6.7	4.9	4.9	4.9	4.9	7.2	7.0	5.3	5.2
33	31	28	19	15	10	10	14	20	25	27	33

(5.7)

3.6	3.9	6.8	7.1	5.3	5.3	5.3	5.3	7.0	7.2	5.7	5.5
35	33	29	21	15	10	10	15	19	26	27	33

(5.8)

3.2	3.6	7.4	7.5	5.7	5.7	5.6	5.7	7.6	7.9	4.9	4.7
33	28	24	18	15	10	10	15	19	29	29	33

(6.3)

3.0	3.2	7.6	8.0	6.0	6.0	6.0	6.1	7.8	7.7	3.2	3.0
33	30	24	20	15	10	10	15	20	25	31	33

(6.2)

2.8	3.1	7.6	7.8	6.1	6.1	6.1	6.2	7.7	7.6	2.7	2.7
33	29	24	20	15	10	10	15	18	25	30	33

(6.6)

2.2	2.7	8.1	8.5	6.4	6.2	6.2	6.4	8.2	8.1	1.9	1.5
35	32	25	19	15	10	10	15	18	24	30	33

(6.6)

3.1	3.3	8.3	8.6	6.4	6.3	6.3	6.4	8.1	8.0	2.0	1.7
35	32	26	20	15	10	10	15	18	25	31	33

(6.9)

5.6	5.7	8.1	7.6	6.5	6.4	6.4	6.5	8.6	8.3	4.0	3.8
34	31	27	17	15	10	10	15	19	24	31	34

(7.2)

9.9	9.5	8.8	6.4	6.5	6.4	6.4	6.6	8.6	9.0	7.7	7.0
34	28	21	15	10	10	10	15	19	24	28	33

(5.9)

14.5	14.2	5.1	5.2	5.2	5.2	5.4	11.6	12.1			
34	30	15	10	10	10	16	26	33			

Sta	+	H.I	−	Elev	
	2.24	249.15			
262			4.6	44.6 •	
Yd-Rain	24"X64"				
261			3.3	45.9 •	
B.M.	9.14	254.61 ✓	3.67	245.48 ✓	245.47 ✓
+40			7.9	46.7 •	
260			7.3	47.3 •	
				48.0	
+57			6.6	(47.0)	
				48.5	
+20			6.1	(47.5)	
259			5.8	48.8 •	
T.P.	6.16	256.37 ✓	4.40	250.21 ✓	
258			6.1	50.3 •	
257			4.9	51.5 •	
256			4.2	52.2 •	
255			3.9	52.5 •	
254			4.2	52.2 •	

Lt ℄ Rt

(6.1)

16.1 / 37	14.9 / 33	4.6 / 16	4.7 / 10	4.7 / 10	4.6 / 16	10.7 / 25	12.1 / 33

262+22 -24" conc. culvert Inlet 291.8± 236.80 Outlet 351' Lt± 233.70

6.8 / 33	7.7 / 28	8.7 / 26	8.2 / 23	7.5 / 15	3.4 / 10	(3.4) 3.4 / 10	3.2 / 15	7.7 / 22	8.1 / 31

Spike in 16" tree Lt of Sta 260+85

6.4 / 36	6.8 / 32	7.9 / 29	9.8 / 19	8.1 / 15	8.0 / 10	(8.0) 8.0 / 10	7.8 / 15	9.7 / 19	10.1 / 25	8.9 / 30	8.9 / 33

(7.6)

7.5 / 34	7.7 / 32	9.5 / 29	9.1 / 19	7.4 / 15	7.4 / 10	7.4 / 10	7.4 / 15	9.4 / 20	9.0 / 29	8.2 / 30	7.4 / 33

(6.7)

8.2 / 36	8.2 / 31	9.3 / 29	8.6 / 18	6.7 / 15	6.7 / 10	6.7 / 10	6.7 / 15	8.3 / 21	8.3 / 25	7.4 / 27	6.3 / 31	5.8 / 34

(5.9)

8.9 / 33	8.8 / 30	8.8 / 22	6.2 / 15	6.2 / 10	6.2 / 10	6.2 / 15	7.9 / 20	8.0 / 28	6.5 / 31	6.5 / 33

(5.4)

8.8 / 35	8.4 / 27	8.0 / 21	5.8 / 15	5.9 / 10	5.9 / 10	5.9 / 15	7.6 / 21	7.4 / 27	6.7 / 31	5.9 / 32	5.8 / 33

(5.4)

8.0 / 32	7.3 / 27	7.9 / 24	7.6 / 19	6.3 / 15	6.2 / 10	6.2 / 10	6.2 / 15	7.6 / 19	7.5 / 25	3.8 / 34	1.6 / 36

(4.1)

3.3 / 33	3.3 / 31	5.8 / 25	6.3 / 19	5.0 / 15	5.0 / 10	5.0 / 10	5.1 / 15	7.0 / 20	7.1 / 23	4.1 / 27	2.8 / 34

(3.1)

2.2 / 32	1.6 / 31	1.5 / 27	5.5 / 24	5.7 / 18	4.4 / 15	4.3 / 10	4.3 / 10	4.4 / 15	6.4 / 19	6.4 / 24	2.3 / 27	4.5 / 30

+11.8

(2.7)

1.8 / 29	2.0 / 28	5.3 / 23	5.6 / 19	4.0 / 15	4.0 / 10	4.0 / 10	4.0 / 15	5.5 / 19	5.4 / 23	0.9 / 27	0.5 / 29	(26.5.5 / 38)

+10.0

(3.3)

0.0 / 35	1.8 / 33	5.9 / 29	6.3 / 19	4.4 / 15	4.3 / 10	4.3 / 10	4.3 / 15	5.5 / 19	5.8 / 23	0.0 / 30		(26.3.1 / 36)

Sta	+	H.I.	−	Elev.	
	6.16	256.37			
+35			4.5	51.9	
253			4.7	51.7	
T.P.	3.97	255.94	4.40	251.97	
+50			4.5	51.4	
252			4.8	51.1	
+60			5.0	50.9	
251			5.1	50.8	
+50			4.9	51.0	
250			4.4	51.5	
+23			3.2	52.7	
249			2.7	53.2	
B.M.	9.06	262.22	2.75	253.19	253.16
248			7.6	54.6	
+21			6.8	55.6	

LT RT

+7.2

3.6

4.3/35 4.7/33 6.3/31 6.6/19 4.7/15 4.6/10 4.6/10 4.6/15 6.4/20 6.2/25 0.0/32 (260.8/35)

4.1

9.3/33 8.6/28 7.2/22 4.8/15 4.8/10 4.8/10 4.8/15 6.7/19 6.7/27 9.0/36

4.1

14.3/33 12.7/28 4.7/15 4.6/10 4.6/10 4.7/15 7.4/24 9.2/29 9.2/34

4.7

14.1/33 13.0/28 4.9/16 4.7/10 4.9/10 4.9/15 6.1/22 (241.7/31) -9.5

5.1

11.7/33 10.9/27 6.3/20 5.1/15 5.1/10 5.1/10 5.1/15 6.10/17 6.5/21 (238.2/36) -12.6

5.1

12.8/33 11.7/26 5.7/15 5.2/10 5.2/10 5.6/18 (235.3/41) -15.5

4.8

14.1/33 13.0/28 5.2/15 5.1/10 5.0/10 5.2/15 6.4/19 (233.3/42) -17.8

4.6

11.4/30 8.9/25 4.6/16 4.5/10 4.5/10 4.6/15 6.1/19 (234.2/43) -19.1

3.3

2.8/33 4.6/31 5.5/24 4.0/20 3.3/15 3.3/10 3.3/10 3.7/15 9.0/24 9.4/27

2.9

2.0/32 3.9/30 4.8/27 4.8/23 2.7/17 2.7/10 2.8/10 2.8/15 6.6/21 6.4/25

Spin Rt Lt Rt Lt Rt Lt 248+30

4.8

7.1/33 8.7/30 9.7/30 4.7/15 4.7/10 4.7/10 7.7/15 10.6/23 9.9/29

6.5

6.9/34 8.8/32 9.3/22 6.7/15 6.7/10 6.7/10 6.6/15 8.7/18 9.1/24 8.5/29

Sta	+	H.I	−	Elev	
	9.66	262.22			
247			6.2	56.0	
246			4.9	57.3	
T.P.	6.90	264.92	4.20	258.02	
+80			7.4	57.5	
+44			7.0	57.9	
245			6.6	58.3	
+72			6.4	58.5	
244			5.9	59.0	
+80			5.8	59.1	
243			5.3	59.6	
242			4.8	60.1	
+75			4.7	60.2	
+65			4.6	60.3	
B.M.			6.53	258.39	258.3

Lt & Rt

(6.2)

6.4	8.4	8.7	6.5	6.3	6.3	6.2	8.3	8.4	7.7	7.7
35	32	21	15	10	10	15	19	21	22	32

(4.5)

X-road	5.5	5.1	5.0	5.0	4.9	7.3	7.5	6.5	8.6	6.0
	37	21	10	10	16	20	22	24	28	31

(6.9)

5.5	9.6	9.9	7.6	7.5	7.5	7.3	9.4	8.9	6.9	6.0
33	28	21	15	10	10	15	20	27	30	33

(6.6)

6.3	6.3	9.4	9.2	7.2	7.1	7.1	7.2	8.7	8.8	8.2	7.5	8.3
33	31	28	21	15	10	10	15	19	23	25	27	33

(6.5)

6.6	6.6	9.2	8.7	6.8	6.7	6.7	6.9	8.9	9.2	8.8	9.8
33	32	27	20	15	10	10	15	19	23	24	23

(6.2)

6.7	7.2	5.7	7.8	6.6	6.5	6.5	6.6	8.3	9.0	8.6	8.7	9.7
33	30	25	19	15	10	10	15	18	24	25	29	33

(6.3)

10.3	10.4	9.2	6.1	6.0	6.0	6.1	8.2	8.5	7.4	8.5
33	28	22	15	10	10	15	19	27	28	33

(6.3)

9.2	8.6	8.5	6.0	5.9	5.9	5.9	8.5	8.3	7.4	8.3
33	28	23	15	10	10	15	21	27	29	34

(6.0)

3 8.2	8.3	9.0	8.5	5.5	5.4	5.4	5.6	7.6	7.9	5.2	5.7
3 28	26	25	22	15	10	10	15	20	25	27	36

(5.6)

7.8	7.8	8.5	7.8	5.0	4.9	4.9	5.0	7.6	7.5	6.0	5.8
27	25	24	21	15	10	10	15	20	25	28	33

(5.4)

8.3	7.4	8.3	6.6	4.9	4.8	4.8	5.0	8.1	7.7	6.2	6.0
33	26	25	18	15	10	10	15	20	24	27	33

(5.2)

7.9	7.1	7.7	6.9	4.9	4.7	4.7	4.9	7.8	7.7	6.3	6.0
33	26	25	19	15	10	10	15	18	24	28	33

Slope: Ke to 30" Hard @ Lt 241+57

Sta	+	H.I	−	Elev
	6.90	264.92		
241			4.3	60.6
+10			4.1	60.8
240			4.1	60.8
+79			4.0	60.9
239			3.9	61.0
T.P.	4.04	265.46	3.50	261.42
238			4.5	61.0
237			4.8	60.7
+25			5.3	60.2
236			5.4	60.1
+70			5.6	59.9
235			6.0	59.5
+21			6.4	59.1

(4.6)

4.8	3.7	6.6	6.2	4.5	4.4	4.4	4.5	7.2	7.5	6.3	5.7
33	23	23	19	15	10	10	15	21	23	26	33

(4.2)

3.4	5.3	6.0	5.7	4.2	4.2	4.2	4.1	6.4	6.9	4.5	5.0
33	26	24	20	15	10	10	15	19	22	26	33

(4.3)

2.0	5.8	5.7	4.2	4.2	4.2	4.1	6.3	6.7	4.2	4.8	
33	27	20	15	10	10	15	19	23	26	33	

(4.3)

1.2	5.2	5.5	4.2	4.1	4.1	4.0	5.9	6.4	4.0	4.5	
33	29	19	15	10	10	15	18	22	26	33	

(4.5)

2.0	4.8	5.4	4.1	4.0	4.0	4.1	6.2	6.3	4.1	3.9	4.8	
35	30	19	15	10	10	15	20	23	26	28	33	

(5.2)

2.2	5.9	6.5	4.5	4.6	4.6	4.5	7.6	7.4	5.9	6.8	
35	31	19	15	10	10	15	21	23	25	33	

(6.4)

6.5	6.4	7.0	6.9	4.8	4.9	4.9	4.9	7.1	7.5	6.1	6.3
33	32	31	19	15	10	10	15	17	29	31	33

(5.7)

5.6	5.7	7.3	7.2	5.4	5.4	5.3	5.4	7.3	6.9	4.7	
33	32	30	19	15	10	10	15	20	30	33	

(5.4)

4.2	6.8	6.8	5.5	5.4	5.4	5.5	5.4	7.0	6.8	4.3	
33	30	19	15	10	10	10	15	19	30	33	

(6.2)

3.7	4.3	7.0	7.0	5.7	5.7	5.7	5.5	7.1	6.6	4.0	4.1
33	32	29	19	15	10	10	15	20	30	32	33

(6.3)

5.0	5.1	7.4	7.4	6.1	6.1	6.1	6.9	7.5	7.7	6.8	7.3
33	31	29	19	15	10	10	15	19	29	30	33

(7.1)

7.8	7.9	8.4	8.4	6.6	6.6	6.5	6.5	9.5	10.0	10.4	
29	27	26	20	15	10	10	15	20	27	33	

Sta	+	H.I	−	Elev	
	4.04	265.46			
234			6.6	58.9	
233			7.0	58.5	
	2.85	261.56	6.75	258.71	
+48			3.4	58.2	
232			3.7	57.9	
231			4.3	57.3	
230			4.8	56.8	
229			5.4	56.2	
B.M.	1.98	260.12	3.43	258.13	258.14
+73			4.2	55.9	
228			4.7	55.4	
+36			5.1	55.0	
227			5.3	54.8	
+55			5.6	54.5	
				53.9	

(7.4)

8:7	8:9	8:7	6:7	6.7	6:7	6:6	9:5	10:0	
28	25	20	15	10	10	15	20	33	

(8.0)

9:3	9:4	10.8	7:2	7:1	7:1	7:2	9:3	8:9	8:0
27	26	21	15	10	10	15	20	31	35

(4.2)

5:0	5:4	6:3	6:6	3:6	3:3	3:5	3:5	5:3	5:5	3:1	3:6
28	25	24	21	15	10	10	15	21	27	29	33

(4.4)

3:9	4:9	6:3	6:8	4:0	3:8	3:8	3:8	5:6	5:8	4:6	4:6
29	27	22	19	16	10	10	15	19	24	26	28

(4.9)

5:7	6:5	7:6	8:11	4:5	4:4	4:3	4:4	6:5	6:4	5:2	5:1
28	25	24	22	16	10	10	15	19	23	25	27

(5.4)

7:0	6:8	7:4	7:3	5:1	4:9	4:9	4:9	7:3	7:3	6:1	6:0
29	26	25	20	16	10	10	15	19	22	24	26

(5.7)

	6:6	8:2	8:1	5:4	5:5	5:5	5:6	7:8	7:7	4:2	4:3
	33	30	21	15	10	10	15	18	21	25	29

See page 15

Spoil No 1 on Yale, pulled 3 of 5½ 29+0 0

5:4	5:4	6:4	6:8	4:1	4:3	4:3	4:3	6:3	6:2	2:10	2:10
33	32	30	22	15	10	10	15	18	21	26	29

Quit 11-14-23
Began 11-15-23

(5.1)

6.2	7:3	7:1	4:5	4:8	4:5	4:9	6:3	6:5	1:9	1:8
32	30	21	15	10	10	15	17	22	27	33

(5.16)

6:4	7:3	8:0	7:3	5:3	5:2	5:2	5:1	6:7	6:7	0:6	0:6
33	32	29	20	15	10	10	15	19	23	29	33

(5.8)

6:0	8:1	7:9	5:7	5:4	5:4	5:5	7:1	7:1	1:1
33	30	20	15	10	10	15	18	25	33

(6.3)

6:9	8:7	8:1	5:9	5:7	5:7	5:9	7:3	7:4	1:7
33	30	20	15	10	10	15	18	27	33

Sta	+	H.I	−	Elev.	
	1.98	260.12			
74.8			5.7	54.4	
226			6.0	54.1	
225			6.7	53.4	
T.P.	4.32	258.09	6.35	253.77	
224			5.2	52.9	
223			5.3	52.8	
222 + 17	X Drain				
222			5.0	53.1	
221			4.5	53.6	
B.M.	8.50	265.73	1.16	256.73	256.73
220			10.8	54.9	
	7.4		10.5	55.2	
	2.8		9.9	55.8	
219			9.5	56.2	

(6.5)

6.4	8.7	8.4	5.9	5.9	5.8	5.9	7.8	7.6	2.2
34	30	17	15	10	10	15	18	27	34

(6.8)

7.2	8.9	8.5	6.3	6.1	6.1	6.1	7.9	8.1	3.4
34	27	21	15	10	10	15	18	29	34

(7.6)

10.0	10.4	10.0	7.0	6.8	6.8	6.7	9.4	9.3	7.1
32	30	20	15	10	10	15	21	26	32

(5.7)

9.9	9.3	5.3	5.3	5.3	5.4	7.8	7.9	7.6	
31	21	15	10	10	15	19	24	30	

(5.6)

10.5	9.9	5.6	5.4	5.4	5.5	10.1	10.3	10.1	
31	22	15	10	10	15	23	28	33	

24" x 48" Conc. culvert — Invert 25' Lt 247.90 — Out let 23' Rt 247.80

(5.4)

10.4	9.8	5.3	5.1	5.1	5.2	10.6	10.0	10.9	
31	29	15	10	10	12	24	29	33	

(4.9)

8.3	8.3	9.1	9.4	8.4	4.6	4.7	4.6	11.6	7.0	7.6	8.7	7.7
31	28	29	25	21	15	10	10	15	19	26	30	33

N.W. Cor. of lower school house site.

Quit bond 11-15-23

(11.4)

12.6	14.6	14.1	11.1	10.9	10.9	10.4	12.1	14.8	14.8	11.7
33	30	21	15	10	10	15	22	24	26	29

12.8 14.8 11.7

(10.9)

10.3	10.3	10.6	10.6	10.8	11.2	
30	34	15	15	21	33	

11.3	13.4	12.7	9.8	9.8	9.9	10.1	13.0	12.4	
33	30	25	18	11	11	18	22	33	

(10.2)

14.4	11.3	13.5	12.1	9.7	9.6	9.6	9.6	12.9	12.4	10.5	10.5
33	31	29	20	15	10	10	15	21	29	28	33

Sta	+	H.I.	−	Elev	
	8.80	265.73			
218			8.0	57.7	
217			6.6	59.1	
216			5.4	60.3	
215			4.9	60.8	
214			4.9	60.8	
+50			5.1	60.6	
213			5.5	60.2	
+30			6.4	59.3	
212			6.9	58.8	
+50			7.7	58.0	
211			8.6	57.1	
210+30 B.M.					259.61
+30 ✓			9.7	56.0 ✓	

14 4 84

(8.9)

10.8 / 34	10.8 / 28	12.0 / 27	10.8 / 19	8.3 / 15	8.11 / 10	8.0 / 10	8.3 / 15	10.8 / 21	11.3 / 26	9.9 / 27	10.0 / 33

(7.1)

7.8 / 33	7.9 / 28	9.1 / 27	8.8 / 20	6.9 / 15	6.6 / 10	6.6 / 10	6.7 / 15	8.2 / 20	8.8 / 26	7.0 / 28	6.8 / 33

(6.1)

4.6 / 33	11.7 / 29	7.3 / 26	7.1 / 19	5.7 / 15	5.5 / 10	5.5 / 10	5.4 / 15	6.5 / 17	6.9 / 22	5.3 / 24	4.3 / 33

(5.1)

3.7 / 33	3.8 / 27	6.6 / 22	6.6 / 19	5.1 / 15	5.0 / 10	5.0 / 10	5.0 / 15	6.4 / 18	6.5 / 21	4.3 / 25	4.2 / 30

(5.4)

3.5 / 31	3.2 / 26	7.0 / 21	7.6 / 19	5.1 / 15	5.0 / 10	5.0 / 10	4.9 / 15	6.6 / 19	6.7 / 24	4.0 / 26	3.1 / 33

(5.4)

2.6 / 33	2.5 / 27	7.7 / 21	7.4 / 18	5.3 / 15	5.2 / 10	5.2 / 10	5.2 / 15	6.9 / 18	6.7 / 22	3.9 / 26	3.0 / 33

(5.5)

1.9 / 33	1.9 / 28	7.8 / 22	7.6 / 18	5.6 / 15	5.6 / 10	5.6 / 10	5.7 / 15	7.0 / 19	7.1 / 22	1.2 / 30	1.6 / 32

(6.4)

1.1 / 33	1.4 / 30	8.6 / 22	8.4 / 19	6.7 / 15	6.5 / 10	6.5 / 10	6.6 / 15	7.7 / 19	7.9 / 22	6.9 / 28	0.8 / 33

(6.9)

1.3 / 33	1.1 / 32	9.3 / 22	7.1 / 20	7.1 / 15	7.0 / 10	6.9 / 10	7.0 / 15	8.2 / 19	8.10 / 24	8.8 / 33	

(7.9)

	1.7 / 32	10.1 / 21	10.9 / 19	7.9 / 15	7.8 / 10	7.8 / 10	7.6 / 15	8.9 / 18	8.7 / 22	1.2 / 33	

(8.6)

	1.9 / 32	10.3 / 22	10.6 / 19	8.7 / 15	8.7 / 10	8.6 / 10	8.6 / 15	7.8 / 19	9.9 / 23	2.8 / 32	

4.9 / 28	5.6 / 28	11.4 / 22	11.5 / 19	9.9 / 15	9.8 / 10	9.8 / 10	9.9 / 15	11.6 / 18	11.4 / 22	7.0 / 27	7.0 / 33

Sta	+	H.I	−	Elev	
	8.80	263.73			
210			10.3	53.4	
+50			11.0	52.7	
210+30 B.M.	0.25	259.86 ✓	6.11	253.62 ✓	259.61 ✓
209			6.1	53.8	
208			7.7	52.2	
T.P.	2.71	255.89 ✓	8.68	251.18 ✓	
207			3.3	50.6	
206			4.6	49.3	
205			5.4	48.5	
204			5.8	48.1	
203			6.2	47.7	
203+05	X Drain				
202			6.3	47.6	
201+90 B.M.	7.60	255.24 ✓	6.24	247.65 ✓	247.64 ✓
201			7.3	47.9	
200			6.4	48.8	

Lt & Rt

(10.3)

6.6 / 33	8.1 / 27	12.2 / 22	12.3 / 20	10.5 / 15	10.4 / 10	10.4 / 10	10.6 / 15	12.1 / 18	12.5 / 21	9.6 / 26	9.0 / 30

(11.4)

12.1 / 28	12.7 / 25	13.6 / 24	13.0 / 20	11.2 / 15	11.1 / 10	11.2 / 10	11.2 / 15	13.1 / 19	13.5 / 25	12.6 / 28	12.4 / 33

(6.4)

Painted here 11-20-23	8.0 / 33	8.4 / 22	7.8 / 18	6.3 / 15	6.2 / 10	6.2 / 10	6.2 / 15	9.3 / 21	9.8 / 25	9.0 / 26	9.1 / 30	8.0 / 33

(8.3)

11.4 / 33	11.3 / 22	8.0 / 14	7.8 / 10	7.9 / 10	8.2 / 15	11.4 / 19	13.3 / 27	12.2 / 28	12.5 / 33

(3.7)

5.2 / 33	6.0 / 29	7.2 / 28	7.2 / 22	3.4 / 15	3.4 / 10	3.4 / 10	3.5 / 15	7.9 / 23	8.2 / 27	7.9 / 28	8.0 / 33

(4.7)

3.5 / 33	7.7 / 29	7.4 / 22	4.9 / 15	4.7 / 10	4.7 / 10	5.0 / 15	8.1 / 22	8.2 / 25	7.0 / 26	7.9 / 33

(6.0)

7.5 / 28	9.3 / 26	8.8 / 21	5.6 / 15	5.5 / 29	5.5 / 10	5.6 / 15	8.8 / 20	9.1 / 25	9.1 / 33

(6.3)

8.0 / 33	8.3 / 27	9.5 / 26	9.2 / 21	6.0 / 15	5.9 / 10	5.9 / 10	6.0 / 15	9.8 / 22	10.4 / 25	9.5 / 26	8.5 / 33

(6.9)

9.8 / 33	9.6 / 26	10.2 / 25	9.3 / 21	4.5 / 15	6.4 / 10	6.3 / 10	6.4 / 15	8.8 / 20	9.0 / 24	7.8 / 25	7.0 / 33

Rt 19' Lt 21'

24" x 40' conc culvert Invert 243.70 Outlet 242.80

7.7 / 33	7.7 / 25	8.9 / 24	8.8 / 20	6.4 / 15	6.4 / 10	6.4 / 10	6.5 / 15	9.2 / 21	9.3 / 28	7.5 / 29	6.8 / 33

(7.0)

9.1 / 33	9.0 / 24	10.0 / 23	9.8 / 20	7.5 / 15	7.4 / 10	7.4 / 10	7.5 / 15	10.0 / 20	10.0 / 23	8.7 / 24	8.2 / 33

(7.0)

11.1 / 33	10.9 / 27	11.2 / 26	10.8 / 22	6.7 / 15	6.5 / 10	6.5 / 16	6.3 / 15	10.1 / 21	10.5 / 24	9.7 / 25	9.2 / 33

Sta	+	H.I	−	Elev	
	7.60	255.24			
199			5.2	50.0	
198			4.3	50.9	
197			3.7	51.5	
196			3.4	51.8	
195			3.7	51.5	
194	Note: 193+15.6 = 193+13.9 Long sta 193-194 = 101.7'		4.1	51.1	
193+45 BM1	3.83	253.68	5.42	249.82	249.85
193			3.2	50.5	
192			4.1	49.6	
+50			4.5	49.2	
191			5.0	48.7	
+50			5.4	48.3	
+25			5.6	48.1	
190			5.8	47.9	

cloudy - cold 2+ & P+ 11-27-23

5.7

7.3 / 33	6.8 / 26	8.4 / 23	8.5 / 21	5.3 / 15	5.3 / 10	5.3 / 10	5.4 / 15	7.8 / 19	7.1 / 23	5.7 / 25	4.3 / 33

5.0

6.3 / 33	6.0 / 25	7.2 / 24	7.0 / 20	4.5 / 15	4.3 / 10	4.7 / 10	4.5 / 15	6.5 / 19	6.6 / 24	5.0 / 25	4.6 / 33

4.2

6.8 / 33	6.5 / 25	7.4 / 24	7.1 / 20	3.8 / 15	3.8 / 10	3.8 / 10	3.9 / 15	6.0 / 20	6.5 / 23	5.7 / 24	5.7 / 33

3.6

4.4 / 31	5.4 / 29	5.7 / 26	6.6 / 25	6.4 / 21	3.4 / 15	3.5 / 10	3.5 / 10	3.6 / 15	5.9 / 19	6.5 / 23	4.6 / 25	4.7 / 33

3.4

4.7 / 33	5.3 / 25	6.7 / 24	6.5 / 20	3.5 / 15	3.7 / 10	3.7 / 10	3.7 / 15	6.5 / 20	6.6 / 23	4.8 / 24	5.1 / 33

4.0

5.0 / 33	5.0 / 26	7.3 / 25	7.3 / 20	4.2 / 15	4.2 / 10	4.2 / 10	4.3 / 15	6.8 / 19	7.3 / 22	6.2 / 23	6.6 / 33

3.6

3.9 / 33	4.2 / 28	6.4 / 26	6.2 / 19	3.3 / 15	3.3 / 10	3.3 / 10	3.3 / 15	5.8 / 20	6.3 / 24	4.4 / 25	4.9 / 33

4.5

6.4 / 33	6.5 / 28	8.6 / 26	8.1 / 21	4.3 / 15	4.3 / 10	4.1 / 10	4.1 / 15	7.4 / 21	8.1 / 25	7.0 / 26	7.1 / 33

4.6

7.2 / 33	6.9 / 27	8.5 / 26	7.8 / 21	4.7 / 15	4.7 / 10	4.4 / 10	4.3 / 15	7.4 / 21	7.8 / 26	5.3 / 28	5.2 / 33
8.1 / 33	7.4 / 27	8.7 / 25	8.1 / 20	5.0 / 15	5.0 / 9.7	5.3 / 9.7	4.6 / 10	4.6 / 15	7.7 / 20	7.9 / 24	2.4 / 31	2.4 / 33

5.1

5.6

7 / 3	7.8 / 27	9.4 / 25	9.1 / 21	5.6 / 15	5.5 / 9.7	5.8 / 9.7	5.0 / 10	4.9 / 15	7.5 / 20	7.6 / 23	2.9 / 33

5.4

5 / 3	7.8 / 28	10.1 / 25	9.7 / 21	5.8 / 15	5.8 / 9.7	6.1 / 9.7	5.2 / 10	5.2 / 15	7.8 / 20	8.0 / 24	3.0 / 32

5.9

8 / 3	8.1 / 29	10.4 / 26	10.2 / 22	6.0 / 16	6.0 / 9.7	6.3 / 9.7	5.5 / 10	5.3 / 15	7.9 / 19	8.1 / 22	1.8 / 30	2.0 / 33

Sta	+	H.I.	−	Elev	
	3.83	253.68			
+50			6.2	47.5	
+30			6.5	47.2	
189			6.7	47.0	
+50			7.0	46.7	
188			7.5	46.2	
T.P.	2.85	249.52	7.01	246.67	
+50			3.7	45.8	
187			4.2	45.3	
+50			4.6	44.9	
186			5.1	44.4	
185+60 B.M.	6.80	246.97	9.35	240.17	240.17
185			3.5	43.5	
+30			4.0	43.0	
184			4.3	42.7	

(6.5)

8.2/28	10.1/26	9.8/20	6.4/15	6.4/9.7	6.7/9.7	6.0/10	5.8/15	8.1/19	8.2/22	2.6/29	3.5/33

(6.7)

8.6/33	8.0/28	10.0/26	9.8/31	6.4/15	6.6/9.7	6.7/9.7	6.1/10	5.8/15	8.7/20	8.8/23	6.0/26	6.0/33

(7.1)

9.2/33	8.3/29	10.6/27	10.2/21	6.8/9.7	7.1/9.7	6.4/10	6.4/15	8.5/20	8.3/22	6.4/26	6.4/33

(7.4)

10.6/33	7.9/28	11.7/26	11.2/31	7.3/15	7.2/9.7	7.4/9.7	6.7/10	6.4/15	8.8/19	8.7/21	4.6/25	4.3/33

(7.9)

11.2/33	10.6/27	11.7/23	11.5/21	7.6/15	7.6/9.7	8.0/9.7	7.1/10	7.0/15	9.0/18	9.2/22	6.8/24	6.4/33

(4.2)

6.0/33	5.6/27	7.6/25	7.1/20	3.9/15	3.9/9.7	4.2/9.7	3.4/10	3.2/15	5.4/19	3.3/23	3.0/33

(4.8)

4.6/33	4.6/27	7.5/24	7.5/20	4.2/15	4.3/9.7	4.6/9.7	3.8/10	3.6/15	6.0/20	6.4/24	4.2/27	2.4/33

(5.5)

4.7/33	5.2/28	7.8/26	7.2/20	4.6/15	4.8/9.7	5.1/9.7	4.3/10	4.2/15	7.3/21	7.1/26	5.1/27	6.2/30

(6.4)

4.4/33	6.2/28	6.8/25	8.3/21	5.1/15	5.2/9.7	5.5/9.7	4.7/10	4.6/15	8.3/23	8.3/33	

(5.6)

5.0/33	5.6/30	7.8/28	7.3/21	3.5/15	3.6/9.7	3.9/9.7	3.1/10	2.9/15	5.6/22	13.1/30	

(5.8)

3.1/33	4.8/29	7.8/26	7.7/20	4.1/15	4.1/9.7	4.4/9.7	3.8/10	4.1/15	13.8/33		

(5.8)

3.8/23	4.9/28	7.5/25	7.5/20	4.3/15	4.3/9.7	4.6/9.7	4.2/10	4.2/15	14.3/33		

Sta	+	H.I	−	Elev
	6.80	246.97		
183			4.9	42.1
182+70	XDrain			
182			4.6	42.4
+25			3.9	43.1
181			3.6	43.4
180			1.7	45.3
T.P.	4.82	25 0.79	1.00	245.97
+65			4.9	45.9
179			3.4	47.4
178			1.2	49.6
T.P.	7.27	257.38	0.68	250.11
+50			6.8	50.6
177			6.1	51.3
+50			5.7	51.7
+12			5.6	51.8

LT & RT

(5.8)

11.0 / 33 | 10.6 / 24 | 5.0 / 15 | 5.0 / 10 | 5.0 / 10 | 5.0 / 16 | 13.2 / 28 | 14.4 / 33

24" x 48" conc culvert Invert 237.7 Outlet 22' Rt 236.8 26' Rt 236.8

7.3 / 33 | 7.7 / 25 | 8.1 / 24 | 7.9 / 22 | 4.7 / 15 | 4.7 / 10 (5.7) | 4.7 / 10 | 4.6 / 15 | 8.7 / 24 | 8.9 / 28 | 7.5 / 29 | 8.2 / 33

(4.8)

0.5 / 33 | 0.5 / 31 | 6.6 / 26 | 6.6 / 21 | 4.8 / 15 | 4.8 / 10 | 4.0 / 10 | 4.1 / 15 | 7.0 / 19 | 7.9 / 26 | 5.2 / 30 | 5.5 / 33

(4.1)

0.1 / 33 | 0.1 / 31 | 6.0 / 26 | 5.8 / 21 | 3.7 / 15 | 3.6 / 10 | 3.6 / 10 | 3.7 / 15 | 6.4 / 20 | 7.2 / 27 | 4.8 / 29 | 5.2 / 33

(2.4)

3.6 / 33 | 3.2 / 27 | 4.2 / 26 | 3.8 / 19 | 1.7 / 15 | 1.8 / 10 | 1.8 / 10 | 1.8 / 15 | 5.7 / 20 | 6.0 / 24 | 4.5 / 26 | 5.9 / 33

(5.7)

8.0 / 26 | 8.0 / 21 | 4.9 / 15 | 4.8 / 10 | 5.0 / 9.6 | 4.6 / 9.7 | 4.8 / 15 | 9.8 / 24 | 12.7 / 33

(4.7)

7.7 / 29 | 7.7 / 23 | 3.0 / 15 | 3.2 / 10 | 3.8 / 9.6 | 3.4 / 9.7 | 3.4 / 15 | 15.0 / 34

(2.1)

2.1 / 29 | 3.0 / 25 | 3.9 / 24 | 3.6 / 20 | 0.8 / 15 | 0.7 / 10 | 1.7 / 9.6 | 1.3 / 9.7 | 1.5 / 15 | 8.1 / 25 | 9.9 / 33

(7.3)

6.5 / 33 | 6.9 / 26 | 9.0 / 24 | 8.2 / 18 | 6.3 / 15 | 6.4 / 10 | 7.3 / 9.6 | 6.9 / 9.7 | 6.9 / 15 | 9.3 / 20 | 9.6 / 26 | 8.7 / 27 | 8.4 / 30

3.0 / 33 | 3.0 / 29 | 8.1 / 25 | 7.4 / 18 | 5.6 / 15 | 5.6 / 10 (6.1) | 6.6 / 9.6 | 6.2 / 9.7 | 6.3 / 15 | 8.18 / 19 | 9.6 / 30 | 5.1 / 36

(5.4)

2.7 / 32 | 4.7 / 28 | 7.0 / 24 | 7.0 / 20 | 5.1 / 15 | 5.2 / 10 | 6.2 / 9.6 | 5.8 / 9.7 | 5.8 / 15 | 7.9 / 18 | 8.8 / 31 | 5.0 / 36

(4.8)

0.7 / 33 | 0.4 / 29 | 6.9 / 24 | 6.6 / 20 | 5.0 / 15 | 5.1 / 10 | 6.1 / 9.6 | 5.7 / 9.7 | 5.7 / 15 | 7.8 / 19 | 8.5 / 31 | 3.9 / 37

Sta	+	H.I.	−	Elev	
	7.27	257.38			
176			5.5	51.9	
+50			5.4	52.0	
T.P.	5.29	257.12	5.55	251.83	
175			5.1	52.0	
+43			5.1	52.0	
+35			5.1	52.0	
174			5.0	52.1	
+50			5.0	52.1	
173			5.0	52.1	
172+75 B.M.			4.89	252.23	252.23
+50			4.8	52.3	
172			4.9	52.2	
171+84	XD1-air				
171			4.9	52.2	
170			4.8	52.3	

L & R+

4.8

0.5/33 0.3/29 6.9/23 6.7/20 4.8/15 5.0/10 6.9/9.6 5.7/9.7 5.7/15 7.7/19 8.2/31 5.7/37

4.8

6.3/33 6.3/30 6.4/23 6.2/20 4.7/15 5.0/10 6.0/9.6 5.6/9.7 5.5/15 7.2/19 7.7/27 5.9/30 4.5/33

4.7

(2.8 ft / 30) ×6.7 = 1.9/23 6.0/20 4.2/15 4.6/15 4.6/10 5.6/9.6 5.3/9.7 5.3/15 6.9/19 7.2/24 3.1/28

4.8

1.0/33 1.0/26 6.7/23 6.3/19 4.5/15 4.6/10 5.5/9.6 5.2/9.7 5.1/15 6.8/19 7.1/23 5.4/25 3.3/33

4.9

1.2/29 6.3/22 6.2/18 4.5/15 4.6/10 5.6/9.6 5.3/9.7 5.1/15 6.8/20 7.1/23 5.6/26 5.2/33

5.1

2.0/28 6.7/24 6.6/19 4.5/15 4.6/10 5.6/9.6 5.1/9.7 5.0/15 7.2/19 7.4/23 5.6/25 5.2/33

5.2

2.4/29 6.5/26 7.4/19 4.4/15 4.5/10 5.5/10 4.9/16 4.5/33

5.4

1.0/32 7.4/27 7.0/20 4.5/15 4.6/10 5.3/10 5.4/15 7.5/20 7.6/22 5.2/25 5.1/33

5.3

2.1/33 8.0/27 7.8/21 4.7/15 4.8/10 5.2/10 5.3/17 7.5/21 7.6/23 7.0/24

5.3

5.8/30 6.3/28 6.3/24 8.1/21 5.2/15 5.2/10 5.1/10 5.0/16 12.3/29

24" x 48' conc culvert - Inlet - L 20 ft / 247.50 Outlet 28' Rt / 244.40

5.7

6.9/30 7.2/28 8.5/27 7.8/19 5.1/15 5.0/10 5.0/16 5.2/15 11.2/25 11.7/29

5.0

5.5/30 5.8/28 7.5/26 6.8/19 4.9/15 4.9/10 4.9/16 5.2/15 7.6/20 7.6/24 6.1/26 6.1/28

Sta	+	H.I.	−	Elev	
	5.29	257.12			
169			4.8	252.3	
168			4.7	252.4	
+50			4.6	252.5	
167			4.6	252.5	
+56			4.5	252.6	
T.P.	5.35	258.22	4.45	252.67	
166			5.5	252.7	
Road +35			5.1	253.1	
165+03	X Drain				
165			4.8	253.4	
164+85 B.M.	6.76	261.00	4.03	254.19	254.24
164			5.9	255.1	
163			3.8	257.2	
+60			3.0	258.0	
T.P.	6.60	264.63	2.97	258.03	
162			5.7	258.9	

LT F RT

(4.7)

5.0 5.1 7.6 6.4 4.9 4.8 4.8 4.9 7.3 7.4 6.0 6.3
29 27 25 19 15 10 10 15 19 24 26 33

(4.3)

3.2 3.2 6.8 6.4 4.7 4.7 4.7 4.6 6.6 6.9 3.3 3.2
29 27 23 18 15 10 10 15 18 22 26 33

(4.3)

3.8 3.8 6.8 6.4 4.7 4.6 4.7 4.6 6.5 6.6 2.7 1.3 1.3
28 27 24 19 15 10 10 15 19 22 26 30 33

(4.4)

4.6 4.5 7.0 6.2 4.6 4.7 4.7 4.7 6.5 6.8 4.2 4.0
30 27 24 18 15 10 10 15 18 23 26 33

(4.6)

6.8 5.9 7.2 7.1 4.8 4.6 4.6 4.6 6.2 6.4 5.3 5.2 3.1
27 25 24 19 15 10 10 15 19 24 26 27 33

(5.9)

7.7 7.5 8.1 7.8 5.6 5.5 5.6 5.7 7.4 7.7 7.0 6.9 5.7
27 24 23 18 15 10 10 15 20 24 26 29 33

(5.0)

7.3 7.0 5.2 5.2 5.0 4.8
33 29 10 10 24 33

19 RT 21 LT

24" x 40' Concrete Culvert 249.70 Outlet 248.50

(4.9) 10.2 8.8 9.5 7.1 5.1 4.9 4.9 4.9 7.8 7.5 6.2 5.4
33 26 25 18 15 10 10 15 20 23 24 33

Stacked from 11-15-23

(6.2)

8.8 8.5 9.7 9.1 6.1 6.0 6.0 6.1 8.4 8.8 8.1 7.2
36 24 27 19 14 10 10 14 18 23 24 33

(4.0)

6.2 5.5 6.5 6.4 4.0 3.9 3.9 4.0 6.0 5.6 3.6 2.5
29 27 25 19 15 10 10 15 18 21 24 33

(3.3)

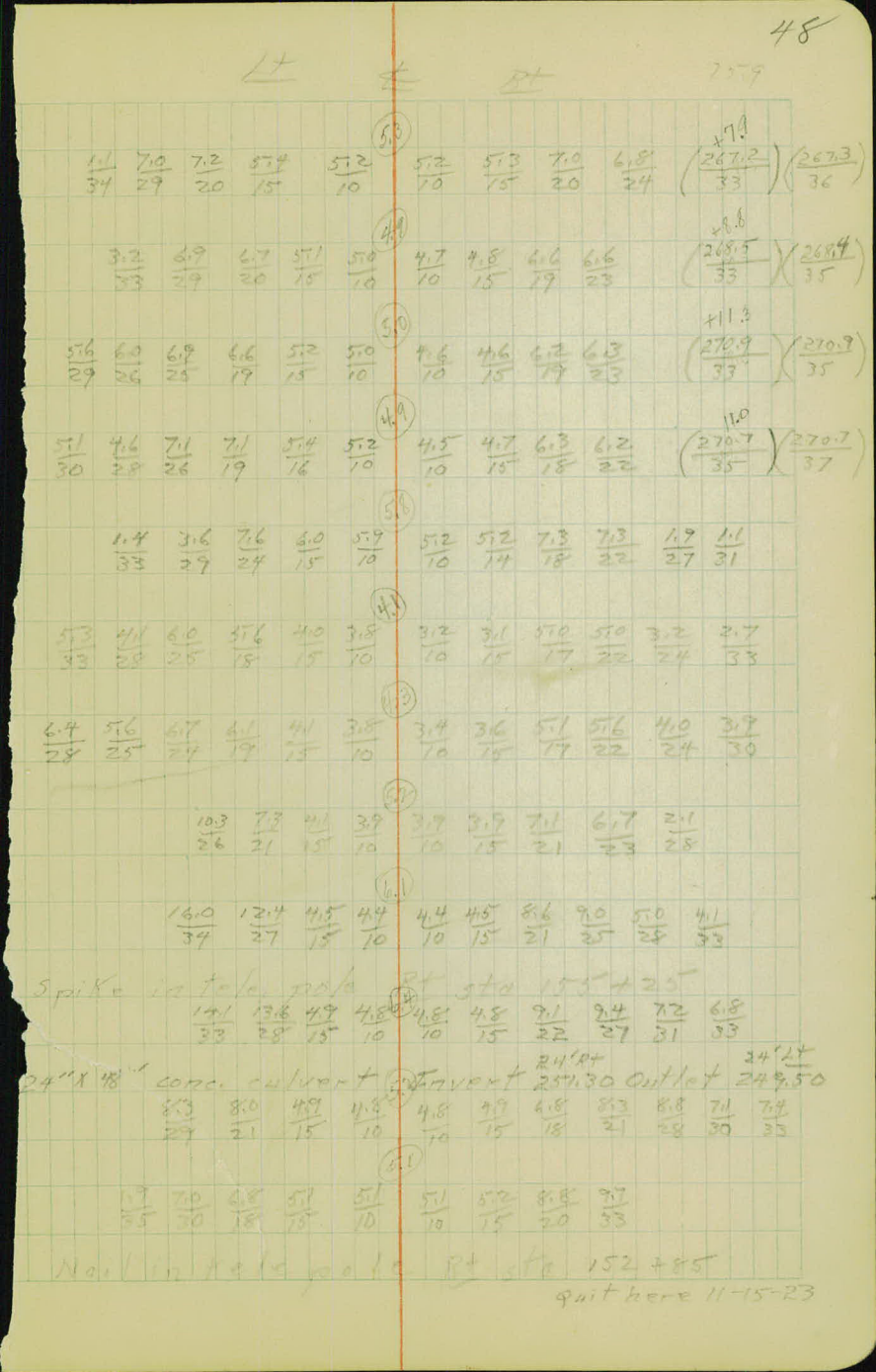
4.1 3.9 5.5 5.6 3.3 3.1 3.1 3.2 5.0 4.9 1.4 0.4
30 28 26 19 15 10 10 15 18 21 24 33

(6.0)

47.2

3.7 3.0 2.9 5.7 5.8 5.8 5.9 7.7 7.7 (265.8/30) 26.5.9/33
33 28 21 19 10 10 15 19 22

Sta.	+	H.I.	−	Elev.
	6.60	264.63		
+45			5.1	59.5
161			4.8	59.8
+65			4.8	59.8
160			4.8	59.8
159			5.5	59.1
T.P.	2.50	261.72	5.41	259.22
158			3.5	58.2
+65			3.5	58.2
157			3.5	57.9
156			4.3	57.4
B.M.	6.40	261.60	6.45	255.27
155			4.7	56.9
T.P.	4.08	261.25	4.35	257.25
155+61	X Drain.			
154			4.7	56.6
153			5.0	56.3
T.P.	4.28	259.05	6.48	254.77



Lt ℄ Rt 7579

5.3

$\frac{1.1}{34}$ $\frac{7.0}{29}$ $\frac{7.2}{20}$ $\frac{5.4}{15}$ $\frac{5.2}{10}$ | $\frac{5.2}{10}$ $\frac{5.3}{15}$ $\frac{7.0}{20}$ $\frac{6.8}{24}$ +7.9 $\left(\frac{267.2}{33}\right)$ $\left(\frac{267.3}{36}\right)$

4.9

$\frac{3.2}{33}$ $\frac{6.9}{29}$ $\frac{6.7}{20}$ $\frac{5.1}{15}$ $\frac{5.0}{10}$ | $\frac{4.7}{10}$ $\frac{4.8}{15}$ $\frac{6.6}{19}$ $\frac{6.6}{23}$ +8.8 $\left(\frac{268.5}{33}\right)$ $\left(\frac{268.4}{35}\right)$

5.0

$\frac{5.6}{29}$ $\frac{6.0}{26}$ $\frac{6.9}{25}$ $\frac{6.6}{19}$ $\frac{5.2}{15}$ $\frac{5.0}{10}$ | $\frac{4.6}{10}$ $\frac{4.6}{15}$ $\frac{6.2}{19}$ $\frac{6.3}{23}$ +11.3 $\left(\frac{270.9}{33}\right)$ $\left(\frac{270.9}{35}\right)$

4.9

$\frac{5.1}{30}$ $\frac{4.6}{28}$ $\frac{7.1}{26}$ $\frac{7.1}{19}$ $\frac{5.4}{16}$ $\frac{5.2}{10}$ | $\frac{4.5}{10}$ $\frac{4.7}{15}$ $\frac{6.3}{18}$ $\frac{6.2}{22}$ 11.0 $\left(\frac{270.7}{35}\right)$ $\left(\frac{270.7}{37}\right)$

5.8

$\frac{1.4}{33}$ $\frac{3.6}{29}$ $\frac{7.6}{24}$ $\frac{6.0}{15}$ $\frac{5.9}{10}$ | $\frac{5.2}{10}$ $\frac{5.2}{14}$ $\frac{7.3}{18}$ $\frac{7.3}{22}$ $\frac{1.9}{27}$ $\frac{1.1}{31}$

4.8

$\frac{5.3}{33}$ $\frac{4.1}{28}$ $\frac{6.0}{25}$ $\frac{5.6}{18}$ $\frac{4.0}{15}$ $\frac{3.8}{10}$ | $\frac{3.2}{10}$ $\frac{3.1}{15}$ $\frac{5.0}{17}$ $\frac{5.0}{22}$ $\frac{3.2}{24}$ $\frac{2.7}{33}$

4.3

$\frac{6.4}{28}$ $\frac{5.6}{25}$ $\frac{6.7}{24}$ $\frac{4.1}{19}$ $\frac{4.1}{15}$ $\frac{3.8}{10}$ | $\frac{3.4}{10}$ $\frac{3.6}{15}$ $\frac{5.1}{17}$ $\frac{5.6}{22}$ $\frac{4.0}{24}$ $\frac{3.9}{30}$

5.8

$\frac{10.3}{26}$ $\frac{7.3}{21}$ $\frac{4.1}{15}$ $\frac{3.9}{10}$ | $\frac{3.9}{10}$ $\frac{3.9}{15}$ $\frac{7.1}{21}$ $\frac{6.7}{23}$ $\frac{2.1}{28}$

6.1

$\frac{16.0}{34}$ $\frac{12.4}{27}$ $\frac{4.5}{15}$ $\frac{4.4}{10}$ | $\frac{4.4}{10}$ $\frac{4.5}{15}$ $\frac{8.6}{21}$ $\frac{9.0}{25}$ $\frac{5.0}{28}$ $\frac{4.1}{33}$

Spike in tele pole Rt sta 153+25

5.4

$\frac{14.1}{33}$ $\frac{13.6}{28}$ $\frac{4.9}{15}$ $\frac{4.8}{10}$ | $\frac{4.8}{10}$ $\frac{4.8}{15}$ $\frac{9.1}{22}$ $\frac{9.4}{27}$ $\frac{7.2}{31}$ $\frac{6.8}{33}$

24'Rt 24'Lt

24"x48" conc. culvert Invert 251.30 Outlet 249.50

$\frac{8.3}{29}$ $\frac{8.0}{21}$ $\frac{4.9}{15}$ $\frac{4.8}{10}$ | $\frac{4.8}{10}$ $\frac{4.9}{15}$ $\frac{6.8}{18}$ $\frac{8.3}{21}$ $\frac{8.8}{28}$ $\frac{7.1}{30}$ $\frac{7.4}{33}$

5.1

$\frac{1.9}{35}$ $\frac{7.0}{30}$ $\frac{6.8}{18}$ $\frac{5.1}{15}$ $\frac{5.1}{10}$ | $\frac{5.1}{10}$ $\frac{5.2}{15}$ $\frac{8.8}{20}$ $\frac{9.7}{33}$

Nail in tele pole Rt sta 152+85

Quit here 11-15-23

Sta	+	H.I	−	Elev
	4.28	259.05		
152			2.9	56.2
151			3.7	55.4
+35			4.5	54.6
+25			4.6	54.5
150			4.9	54.2
+72			5.2	53.9
149			6.1	53.0
+70			6.5	52.6
+53			6.7	52.4
+40			6.9	52.2
148+16	X Drain			
148			7.3	51.8
T.P.	3.03	254.07 ✓	8.04	251.01 ✓
147			3.3	50.7

3.0

1.0 / 3	1.12 / 31	3.17 / 28	3.12 / 20	2.18 / 15	2.1 / 1	3.0 / 10	3.1 / 15	8.1 / 25	8.7 / 33

4.0

4.1 / 33	4.0 / 29	6.3 / 3.6 / 21	6.0 / 20	3.15 / 15	3.6 / 10	3.9 / 10	4.0 / 15	6.15 / 20	6.9 / 27	6.14 / 29	6.8 / 33

4.9

4.7 / 33	4.6 / 29	6.8 / 26	6.7 / 19	4.4 / 15	4.4 / 10	4.7 / 10	4.7 / 15	6.7 / 19	6.7 / 25	4.1 / 29	2.1 / 33

4.9

4.8 / 33	4.4 / 28	7.1 / 24	7.8 / 20	4.5 / 15	4.5 / 10	4.8 / 10	4.7 / 15	6.7 / 18	6.7 / 26	1.0 / 31	0.17 / 33

5.0

5.12 / 33	4.14 / 27	7.2 / 24	6.9 / 19	4.7 / 15	4.7 / 10	5.0 / 10	5.0 / 15	7.14 / 21	7.17 / 25	3.1 / 31	3.16 / 33

5.3

6.5 / 31	6.7 / 26	7.8 / 24	7.6 / 19	5.7 / 15	5.7 / 10	5.4 / 10	5.5 / 15	8.12 / 21	8.11 / 25	5.9 / 29	5.9 / 33

6.1

6.3 / 33	6.3 / 31	7.8 / 29	9.0 / 24	9.0 / 20	6.10 / 15	6.9 / 10	6.3 / 10	6.5 / 15	10.6 / 23	11.3 / 26	11.7 / 29

6.7

7.7 / 33	7.15 / 31	10.0 / 27	9.6 / 20	6.14 / 15	4.3 / 10	6.7 / 10	7.10 / 15	8.3 / 33		

Entrance

6.8

7.14 / 33	9.5 / 30	10.1 / 26	10.0 / 21	6.7 / 15	6.4 / 10	6.9 / 10	7.1 / 16	8.16 / 33	6

6.9

7.2 / 33	9.2 / 30	9.15 / 27	10.3 / 26	10.12 / 21	6.8 / 15	6.7 / 13	7.1 / 10	7.12 / 16	8.1 / 24	14.2 / 33

24" X 48" conc. culvert + invert 4+22' / 248.70 Outlet Rt 26' / 246.80

7.9 / 33	9.9 / 30	10.6 / 27	10.1 / 26	7.3 / 23	7.12 / 15	7.15 / 10	7.15 / 10	7.15 / 15	11.7 / 22	14.6 / 33

7.0

6.3

3.1 / 33	3.12 / 31	6.10 / 28	5.11 / 21	3.5 / 15	3.4 / 10	3.4 / 10	3.14 / 15	6.9 / 19	6.15 / 24	5.4 / 26	6.3 / 33

Sta	+	H.I.	−	Elev	
	3.03	254.04			
146			3.8	50.2	
146+30		✓		✓	✓
B.M	5.77	254.08	5.77	248.27	248.31
145 +30			4.2	49.9	
144			4.8	49.3	
+70			5.0	49.1	
143			5.5	48.6	
142			6.2	47.9	
+65			6.4	47.7	
141 +23.9			6.6	47.5	
T.P.	3.85	251.21 ✓	6.72	247.36 ✓	
140 +56.7			4.2	47.0	

Note: 140+08.1 = 140+06.7
Long sta 140-141 = 101.4'

140			4.6	46.6	
139			5.4	45.8	
+60			5.7	45.5	

				(3.6)							
7.3 / 33	7.6 / 31	6.5 / 20	3.9 / 15	3.9 / 10	3.8 / 10	3.8 / 15	5.9 / 19	6.3 / 24	5.4 / 28	3.5 / 33	
				(4.0)							
6.1 / 33	5.9 / 32	6.9 / 31	5.8 / 20	4.2 / 15	4.3 / 10	4.3 / 10	4.0 / 15	5.6 / 19	6.0 / 22	4.1 / 25	2.0 / 27	2.0 / 31
				(4.3)							
4.5 / 33	6.6 / 31	5.8 / 19	4.8 / 16	4.9 / 10	4.9 / 10	4.6 / 15	5.9 / 18	6.4 / 23	(25 4.8 / 30) 4.9		
				(4.6)							
4.6 / 33	7.0 / 30	6.3 / 21	5.2 / 16	5.2 / 10	5.1 / 10	4.9 / 15	6.6 / 18	6.9 / 24	(25 4.5 / 29) 4.9		
				(5.5)							
5.8 / 33	8.0 / 30	7.0 / 18	5.85 / 15	5.6 / 10	5.6 / 10	5.4 / 15	7.5 / 19	7.9 / 25	6.2 / 28	4.0 / 33	
				(6.0)							
6.6 / 34	9.1 / 30	7.9 / 20	6.4 / 15	6.3 / 10	6.3 / 10	6.3 / 15	9.8 / 20	11.9 / 26	12.0 / 33		
				(6.8)							
5.7 / 23	9.2 / 29	8.5 / 20	6.6 / 15	6.5 / 10	6.5 / 10	6.5 / 15	8.9 / 20	10.6 / 26	10.5 / 33		
				(7.0)							
7.9 / 33	7.9 / 32	9.7 / 28	9.5 / 22	7.0 / 15	6.8 / 10	6.6 / 10	6.6 / 15	9.3 / 20	9.3 / 28	8.4 / 33	
				(4.2)							
	10.8 / 33	10.2 / 30	4.6 / 15	4.5 / 10	4.1 / 10	4.0 / 15	5.7 / 19	6.3 / 29	3.8 / 32	2.1 / 33	
				(4.1)							
12.5 / 33	11.1 / 27	10.0 / 24	4.9 / 15	4.9 / 10	4.6 / 10	4.6 / 15	6.5 / 19	6.8 / 29	5.7 / 31	5.4 / 33	
				(5.7)							
7.4 / 29	6.4 / 26	8.0 / 23	7.7 / 19	5.6 / 10	5.5 / 10	5.0 / 10	5.5 / 15	7.0 / 20	7.3 / 28	4.9 / 31	4.9 / 33	
				(6.)							
6.7 / 33	5.4 / 28	5.3 / 24	6.0 / 18	5.7 / 18	5.8 / 10	5.8 / 10	5.7 / 15	7.6 / 21	8.2 / 25	9.3 / 27	10.5 / 33	

Sta	+	H.I.	-	Elev	
	3.85	251.21			
138			6.1	45.1	
137+07	X Drain				
137			6.5	44.7	
136		✓	6.2	45.0	
135+25 B.M.	5.08	250.51	5.75	245.46 ✓	245.43 ✓
135			4.9	45.6	
134			4.5	46.0	
133			4.8	45.7	
132			5.3	45.2	
+20			6.1	44.4	
131			6.4	44.1	
130			7.6	42.9	
+60		✓	8.1	42.4	
T.P.	3.71	245.42	8.80	241.71 ✓	
129			3.6	41.8	
128+40	X Drain				

Lt Lt Rt 125+23 245.43

(6.5)

5.3/33 6.0/29 8.8/24 8.8/20 6.2/15 6.2/10 6.2/10 6.4/16 14.5/30

24" x 48' Conc culvert (6.8) Invert 22'Lt 240.80 Outlet 26'Rt 239.0

9.1/33 8.4/24 8.0/21 6.5/16 6.5/10 6.6/10 6.5/15 9.0/20 10.4/26 11.2/33

(10.0)

8.2/33 8.1/29 9.3/28 8.7/21 6.3/15 6.3/10 6.3/10 6.4/15 8.3/20 9.2/27 8.1/28 7.2/33

(5.4)

6.4/33 6.4/28 7.6/27 6.8/30 5.0/15 5.0/10 5.0/10 5.0/15 6.8/19 7.5/25 5.6/27 5.2/33

(5.0)

5.5/33 6.4/29 7.5/26 7.0/21 4.7/15 4.6/10 4.6/10 4.6/15 6.5/20 7.0/25 5.3/27 4.8/32

(5.3)

6.6/33 6.7/28 8.0/24 7.1/19 4.9/15 4.8/10 4.8/10 4.7/15 6.6/20 6.6/25 5.4/27 5.5/33

(5.3)

6.9/33 7.0/28 9.0/25 8.5/20 5.4/15 5.4/10 5.4/10 5.4/15 7.1/20 7.8/28 5.5/30 5.6/32

(6.6)

7.0/33 7.0/27 9.2/23 9.4/20 6.3/15 6.2/10 6.2/10 6.2/15 7.7/19 8.6/28 6.1/31 6.1/33

(6.1)

7.1/33 7.1/28 9.8/24 9.5/19 6.4/15 6.4/10 6.5/10 6.5/15 8.3/20 9.0/28 6.0/30 6.1/33

(9.2)

9.0/33 9.0/27 11.0/25 10.2/20 7.7/15 7.7/10 7.7/10 7.8/15 9.2/18 10.6/27 6.4/33

(8.6)

9.5/33 9.7/28 11.5/26 10.5/21 8.2/16 8.2/10 8.2/10 8.2/15 9.8/20 11.3/29 9.2/32 9.2/33

(4.8)

6.6/33 7.3/25 6.6/19 3.7/15 3.7/10 3.7/10 3.7/15 11.1/28 11.6/33

24" x 56' Conc. culvert Invert 30'Rt 233.7 Outlet 26'Lt 231.82

Sta	+	H.I	−	Elev	
	3.71	245.42			
128			4.3	41.1	
+45			4.6	40.8	
127+35 B.M.1	5.38	244.65	6.20	239.22	239.27
127			4.0	40.7	
+50			4.3	40.4	
126			4.5	40.2	
125 +09.7			5.0	39.7	
124 +50			5.5	39.2	
124			6.0	38.7	
+48.4			6.5	38.2	
123			6.9	37.8	
+74.9			7.2	37.5	
+28			7.7	37.0	

4.6

11.4/33 10.7/28 9.7/23 4.5/15 4.7/10 4.4/10 4.6/15 9.0/23 10.8/27 11.3/33

4.8

7.6/33 6.8/23 7.9/22 7.4/19 4.8/15 4.8/10 4.7/10 4.7/15 6.1/18 6.8/22 7.1/27 6.0/32

4.1

5.6/33 5.3/24 7.0/22 6.4/19 4.1/15 4.1/10 4.1/10 4.1/15 5.6/19 5.7/22 4.2/24 11.4/30

4.4

5.5/33 5.3/24 6.9/23 6.4/19 4.4/15 4.3/10 4.4/10 4.1/15 5.4/20 5.5/22 3.5/25 3.5/30

5.0

7.5/33 6.8/22 6.6/19 4.6/15 4.6/15 4.6/10 4.5/15 5.8/19 6.2/23 3.6/26 3.1/30

5.5

8.3/33 7.7/22 8.0/22 7.5/18 5.3/14 7.2/9.7 5.3/9.7 4.8/10 4.7/15 6.4/19 6.8/23 5.10/26 3.9/33

5.8

7.4/33 6.7/24 8.6/22 8.0/19 5.7/15 5.6/9.7 6.0/9.7 5.1/10 5.0/15 7.3/20 7.9/24 7.4/26 12.3/33

6.1

6.6/33 6.2/25 8.4/23 8.4/20 6.0/15 6.0/9.7 6.4/9.7 5.6/10 5.5/15 7.7/19 8.3/23 9.3/26 9.9/33

6.6

8.1/33 7.9/24 9.2/23 9.0/21 6.4/15 6.4/9.7 6.8/9.7 6.3/10 6.3/14 8.3/18 8.5/21 6.0/24 6.7/33

6.9

5.12/33 5.12/27 9.5/22 9.3/18 7.5/15 7.0/10 7.1/9.7 6.9/10 6.7/15 8.4/18 8.6/21 3.9/26 4.1/33

7.3

6.3/33 6.1/25 9.8/22 10.0/19 7.7/15 7.3/18 7.0/15 8.9/17 8.9/22 3.5/28

8.1

10.2/30 9.9/24 10.4/22 10.2/19 8.0/15 7.8/10 7.8/10 7.7/15 9.3/18 9.6/22 7.8/25 7.8/33

Sta	+	H.I.	−	Elev	
	5+38	244.65			
122			8.0	36.7	
T.P. 1	2.80	239.02	8.43	236.22	
121			3.4	35.6	
120			4.4	34.6	
119			5.2	33.8	
118+92	XDrain				
118			5.5	33.5	
117+30 B.M. 1			6.25	232.77	232.77
117			5.6	33.4	
+45			5.6	33.4	
116			5.6	33.4	
T.P. 2	4.76	238.60	5.18	233.84	
+70			5.3	33.3	
115			5.3	33.3	
+50			5.3	33.3	
114			5.1	33.5	

Lt ℄ Rt

11.3

(8.2)

7.3/28 10.9/23 9.8/18 8.3/15 8.1/10 8.1/10 8.1/15 10.0/19 10.4/23 9.4/24 8.4/30

(3.2)

6.4/28 6.2/25 6.4/24 5.2/19 3.5/10 3.5/10 3.3/15 6.1/22 6.4/25 5.6/27 5.7/29

(3.9)

4.9/26 6.5/25 6/22 4.6/15 4.5/10 4.5/10 4.4/15 6.3/22 8.2/28 8.7/33

(5.0)

10.2/33 9.8/22 5.3/16 5.3/10 5.3/10 5.3/16 10.1/24 13.5/30

24" X ? 'conc. culvert. Invert 28' Rt 224.60 Outlet 50' Lt 224.40

↳ see plans

(5.5)

10.0/33 8.7/22 5.7/15 5.6/16 5.6/10 5.4/15 8.1/21 7.8/24 8.0/28

(5.9)

6.2/33 6.2/28 6.7/23 7.9/22 7.4/19 5.7/15 5.7/10 5.7/10 5.7/15 8.6/21 8.8/25 8.4/26 8.4/33

(6.1)

3.6/33 3.5/27 7.4/22 7.4/18 5.6/15 5.7/10 5.7/10 5.6/15 7.6/20 7.9/23 6.5/26 6.4/29

(6.0)

0.0/33 0.0/28 7.2/21 7.9/19 5.6/15 5.7/10 5.7/10 5.8/15 7.5/19 7.6/21 5.0/24 5.3/32

(6.9)

x7.3 x7.3

(240.0/33) (240.0/28) 7.0/21 6.6/17 5.3/15 5.4/10 5.4/10 6.8/15 7.5/18 7.6/22 5.2/24 5.8/28 5.5/33

(6.0)

3.1/33 3.0/27 8.0/24 7.0/18 5.5/15 5.4/10 5.4/10 5.4/15 7.8/20 7.9/24 7.5/26 9.1/29 9.5/33

(5.9)

6.9/31 7.1/27 8.3/25 7.7/19 5.5/15 5.4/10 5.4/10 5.3/15 9.3/21 10.5/33

(5.4)

8.2/33 7.8/27 8.8/25 8.1/21 5.3/15 5.2/10 5.2/10 5.3/15 9.4/23 10.2/27 10.5/33

Sta	+	H.I.	−	Elev	
	4.76	238.60			
113			4.8	33.8	
+40			4.7	33.9	
112			4.6	34.0	
+40			4.6	34.0	
111			4.7	33.9	
+97			4.7	33.9	
+90			4.7	33.9	
+62			4.8	33.8	
110			5.0	33.6	
109+50					
B.M.	3.24	236.39	5.45	233.15	233.15
109			3.4	33.0	
+50			3.7	32.7	
108			4.10	32.4	

(4.9)

7.3/35 8.4/33 8.5/25 7.4/19 5.0/15 4.9/10 4.9/10 5.0/15 7.3/20 7.4/23 4.8/27 3.9/31

(4.5)

5.7/34 7.3/32 7.1/20 4.8/15 4.8/10 4.8/10 4.8/15 7.0/20 7.2/24 2.3/29 1.6/33

(4.3)

4.0/34 7.0/31 6.7/20 4.7/15 4.7/10 4.7/10 4.7/15 6.5/19 7.0/23 1.1/30 0.7/33

(4.4)

1.8/35 7.1/30 6.9/20 4.8/15 4.7/10 4.7/10 4.7/15 6.3/18 6.3/24 0.3/31 0.1/33

(4.3)

8.3/34 6.8/30 6.5/18 4.9/15 4.8/10 4.8/10 4.8/15 6.3/17 6.5/24 1.1/30 0.7/33

(4.3)

3.2/34 6.8/30 6.5/18 4.4/15 4.8/10 4.8/10 4.9/15 6.3/17 6.3/24 1.2/31 1.0/33

(4.3)

3.5/34 6.7/30 6.8/19 4.8/15 4.8/10 4.8/10 4.9/15 5.7/17 5.7/25 5.0/33

(4.4)

5.3/33 4.9/10 4.9/10 4.6/33

Co. rd. C.

X road

(5.1)

9.9/33 8.8/24 7.5/19 5.1/15 5.1/10 5.1/10 5.2/15 7.2/18 7.2/22 5.0/23 4.4/33

(3.2)

9.0/32 8.6/26 6.2/21 3.5/15 3.4/10 3.5/10 3.6/15 5.6/19 5.3/25 4.0/28 4.0/33

(3.8)

5.8/33 7.0/31 6.9/22 4.0/15 3.8/10 3.8/10 4.0/15 5.6/19 5.7/24 3.2/30 2.7/33

(3.5)

5.2/34 7.1/32 6.7/19 4.3/15 4.1/10 4.1/10 4.3/15 5.8/18 5.7/22 2.7/26 1.9/31 1.4/33

Sta	+	H.I	-	Elev
	3.27	236.39		
107			4.8	31.6
+20			5.3	31.1
106			5.5	30.9
105			6.0	30.4
T.P.	4.88	235.18	6.09	230.30
104			4.9	30.3
103 X36	X Drain			
103			4.8	30.4
102 +36.8			4.7	30.5
101 +86.8			4.7	30.5
+50			4.6	30.6
101			4.6	30.6
100 +46.1			4.5	30.7
99 +96.1			4.4	30.8
T.P.	6.49	236.67	5.00	230.18

	5:12 / 33	7:14 / 31	7:1 / 19	5:10 / 15	4:9 / 10	4:9 / 10	5:10 / 15	7:1 / 21	7:10 / 25	1:6 / 32
5	7:5 / 32	8:5 / 31	8:7 / 25	7:4 / 19	5:13 / 15	5:4 / 10	5:4 / 10	5:10 / 15	8:10 / 23	8:12 / 28	7:4 / 30	7:3 / 33
	8:6 / 33	9:2 / 32	9:3 / 26	8:12 / 21	5:7 / 15	5:6 / 10	5:6 / 10	5:8 / 15	8:5 / 22	9:3 / 27	8:5 / 29	8:6 / 33
		11:8 / 33	11:2 / 33	6:2 / 15	6:1 / 10	6:1 / 10	6:1 / 15	12:5 / 26	13:3 / 33			
		12:0 / 29	14:5 / 36	5:1 / 15	5:0 / 10	5:0 / 10	5:1 / 15	6:6 / 20	13:7 / 31	13:8 / 33		

27'.84 — 27'.44

Conc. culvert 4'X6'X 5'-4" Invert 217.50 Outlet 217.40

13:1 / 33	6:5 / 19	5:1 / 15	4:3 / 10	4:0 / 10	5:0 / 19	6:1 / 18	6:5 / 20	12:2 / 28	12:5 / 33
13:1 / 33	6:5 / 20	4:7 / 15	4:7 / 10	4:8 / 9.6	4:4 / 9.7	4:4 / 15	8:0 / 21	8:4 / 25	5:4 / 33
10:9 / 31	8:4 / 24	7:3 / 20	4:4 / 15	4:4 / 10	4:9 / 9.6	4:5 / 9.7	4:5 / 15	7:1 / 19	7:5 / 22	4:4 / 26
7:0 / 23	8:5 / 31	7:3 / 20	4:2 / 15	4:3 / 10	5:0 / 9.6	4:6 / 9.7	4:6 / 15	6:9 / 19	7:5 / 24	4:7 / 27
5:9 / 33	7:7 / 31	6:1 / 19	4:1 / 15	4:2 / 10	5:0 / 9.6	4:6 / 9.7	4:6 / 15	6:6 / 18	7:0 / 24	4:4 / 27	3:7 / 29
4:2 / 33	7:1 / 30	6:0 / 19	4:1 / 15	4:1 / 10	4:9 / 9.6	4:6 / 9.7	4:5 / 15	6:6 / 18	7:0 / 25	3:8 / 28	2:4 / 31
5:7 / 33	6:4 / 31	6:1 / 19	4:3 / 15	4:3 / 10	4:7 / 9.6	4:4 / 9.7	4:3 / 15	6:3 / 19	6:9 / 25	3:6 / 29	

Sta	+	HI	−	Elev
	6.49	236.67		
99			5.8	30.9
+36			5.7	31.0
98			5.7	31.0
+36			5.5	31.2
97			5.5	31.2
+60			5.4	31.3
96			5.1	31.6
+50			4.8	31.9
95			4.4	32.3
94			3.4	33.3
+40			2.8	33.9
93			2.5	34.2

					(5.4)						
					6.4 / 33	8.5 / 33	7.8 / 21	5.9 / 15	5.9 / 10	5.9 / 10	5.5 / 15	8.0 / 19	8.5 / 26	5.2 / 30	4.0 / 33
					(6.0)						
					4.6 / 36	8.5 / 32	7.9 / 21	6.0 / 16	5.8 / 10	5.8 / 10	6.0 / 15	7.9 / 19	8.0 / 33	7.3 / 36	
					(6.1)						
					5.0 / 35	8.5 / 31	8.1 / 21	5.8 / 15	5.7 / 10	5.7 / 10	5.7 / 15	7.7 / 19	8.7 / 33		
					(6.1)						
					2.7 / 34	8.1 / 28	7.4 / 20	5.7 / 15	5.6 / 10	5.6 / 10	5.7 / 15	7.7 / 19	8.4 / 32	9.0 / 33	
					(6.1)						
					3.6 / 35	8.2 / 29	7.8 / 22	5.6 / 15	5.6 / 10	5.6 / 10	5.7 / 15	8.0 / 21	8.3 / 28		
					(5.7)						
					6.7 / 33	8.1 / 32	8.2 / 22	5.6 / 15	5.5 / 10	5.5 / 10	5.5 / 15	7.4 / 20	7.2 / 26		
					(5.4)						
	7.3 / 30	7.5 / 24	8.2 / 23	7.7 / 20	5.4 / 15	5.2 / 10	5.2 / 10	5.2 / 15	7.6 / 20	7.9 / 24					
					(5.5)						
6.2 / 33	6.9 / 29	6.6 / 25	8.1 / 24	7.8 / 20	5.2 / 15	4.9 / 10	4.9 / 10	4.8 / 15	9.8 / 22	10.5 / 33					
					(5.2)						
	8.2 / 33	8.5 / 29	7.6 / 20	4.6 / 15	4.5 / 10	4.5 / 10	4.4 / 15	8.1 / 21	8.6 / 33						
					(4.4)						
	8.7 / 33	7.7 / 31	7.6 / 22	3.6 / 15	3.5 / 10	3.5 / 10	3.4 / 15	6.0 / 19	6.3 / 33						
					(5.5)						
4.8 / 33	4.7 / 27	6.0 / 25	5.2 / 20	3.2 / 15	2.9 / 10	2.9 / 10	2.9 / 15	5.2 / 18	5.2 / 22	1.6 / 26	1.3 / 33				
					(3.0)						
	0.1 / 32	5.6 / 24	4.8 / 19	2.9 / 15	2.6 / 10	2.6 / 10	2.7 / 15	4.9 / 19	5.0 / 21	0.8 / 25	0.8 / 33				

Sta	+	H.I	−	Elev.	
	6.49	236.67			
+50			2.3	34.4	
92			2.1	34.6	
T.P.	5.76	240.28 ✓	2.15	234.52 ✓	
+50			5.6	34.7 / 34.1	
91			5.5	34.8	
+80			5.4	34.9	
90+45 B.M.			4.68	235.60 ✓	235.60 ✓
90			5.2	35.1	
+65			5.2	35.1	
89			4.9	35.4	
+85			4.8	35.5	
88			4.0	36.3	
+30			2.4	37.9	
87			1.5	38.8	
T.P.	11.10	251.27 ✓	0.11	240.17 ✓	

(1.5)

1.8/33	1.9/30	5.3/26	4.8/19	2.6/15	2.4/10	2.4/10	2.4/15	4.8/19	4.5/22	2.4/33

(1.8)

2.1/33	1.8/30	4.4/28	4.5/20	2.3/16	2.2/10	2.2/10	2.3/15	4.3/19	4.4/22	2.0/24

(3.3)

3.5/33	3.5/31	8.1/26	7.8/21	5.7/15	3.7/10	5.7/10	5.7/15	7.3/18	7.14/22	4.1/26	4.1/29

(5.1)

3.8/33	3.6/29	7.7/25	7.3/19	5.7/15	5.6/10	5.6/10	5.6/15	6.9/19	7.3/23	3.3/27	2.8/28

(5.2)

3.8/33	3.8/31	7.8/26	7.3/19	5.7/15	5.5/10	5.5/10	5.5/15	6.8/20	7.2/23	5.3/25	2.9/33

(5.7)

6.1/33	5.9/31	8.0/29	7.4/20	5.4/15	5.3/10	5.3/10	5.3/15	7.3/21	7.2/24	6.3/25	5.7/33

(5.8)

8.0/32	7.6/27	8.1/26	7.6/21	5.0/15	5.3/10	5.2/10	5.3/15	7.9/21	7.3/25	6.4/26	6.4/33

(5.5)

10.3/33	8.7/26	8.0/20	4.7/10	4.7/9.7	5.1/9.6	4.8/10	4.9/15	7.2/21	7.5/25	6.8/25	6.7/33

(5.5)

10.8/33	9.1/28	8.4/26	4.8/15	4.6/9.7	5.0/9.6	4.7/10	4.8/15	7.0/21	7.3/24	6.8/25	6.8/33

(4.1)

6.8/33	6.6/32	7.5/31	6.4/29	4.0/15	3.7/9.7	4.1/9.6	3.9/10	3.7/15	5.4/20	5.6/23	5.0/24	4.0/33

(2.3)

3.8/33	4.1/31	4.5/30	3.7/19	2.4/15	2.1/9.7	2.3/9.6	2.3/10	2.3/15	4.4/19	4.2/23	3.1/24	2.1/33

(1.5)

2.3/33	1.5/15	1.4/9.7	1.7/9.6	4.5/10	1.4/15	4.1/21	4.2/24	2.7/26	2.1/33

Sta	+	H.I.	−	Elev	
	11.10	257.27			
+50			11.0	40.3	
86			9.6	41.7	
85			6.5	44.8	
84+65 B.M.	6.80	253.26 ✓	4.82	246.45 ✓	246.46 ✓
+50			7.3	46.0	
+05			6.4	46.9	
84			6.3	47.0	
+50			5.7	47.6	
83			5.4	47.9	
+55			5.3	48.0	
82			5.2	48.1	
+50			5.1	48.2	
81			5.0	48.3	

(11.4)

14.1 / 26 | 13.0 / 19 | 11.2 / 15 | 10.9 / 9.7 | 11.2 / 9.6 | 11.0 / 10 | 14.0 / 15 | 13.6 / 19 | 14.0 / 24 | 13.5 / 27 | 12.0 / 33

(10.2)

10.7 / 31 | 11.6 / 29 | 11.3 / 18 | 9.4 / 15 | 9.4 / 9.7 | 9.8 / 9.6 | 9.5 / 10 | 9.4 / 15 | 12.1 / 21 | 12.7 / 25 | 10.6 / 32

(7.3)

7.8 / 32 | 7.6 / 29 | 9.0 / 27 | 8.4 / 18 | 6.6 / 15 | 6.4 / 9.7 | 6.8 / 9.6 | 6.5 / 10 | 6.5 / 15 | 9.1 / 21 | 9.1 / 33

Started here 11-23-23

(8.4)

8.3 / 28 | 9.9 / 26 | 9.1 / 18 | 7.2 / 15 | 7.1 / 9.7 | 7.5 / 9.6 | 7.2 / 10 | 7.1 / 15 | 8.7 / 19 | 9.0 / 23 | 8.8 / 31

(7.2)

7.0 / 29 | 8.9 / 26 | 8.3 / 19 | 6.3 / 15 | 6.2 / 9.7 | 6.6 / 9.6 | 6.3 / 10 | 6.4 / 18 | 8.0 / 23 | 8.1 / 26 | 7.5 / 27 | 7.2 / 34

(7.2)

6.3 / 29 | 8.7 / 25 | 8.4 / 19 | 6.3 / 15 | 6.1 / 9.7 | 6.5 / 9.6 | 6.2 / 10 | 6.4 / 17 | 8.1 / 23 | 8.1 / 25 | 7.6 / 27 | 7.5 / 33

(6.4)

4.6 / 28 | 8.1 / 24 | 7.3 / 19 | 5.6 / 15 | 5.5 / 9.7 | 5.9 / 9.6 | 5.6 / 10 | 5.4 / 15 | 7.8 / 22 | 8.0 / 24 | 7.6 / 25 | 7.8 / 33

(6.1)

6.4 / 33 | 6.3 / 24 | 7.6 / 22 | 7.4 / 19 | 5.5 / 15 | 5.2 / 9.7 | 5.6 / 9.6 | 5.3 / 10 | 5.3 / 15 | 7.6 / 21 | 7.8 / 24 | 7.3 / 24 | 7.3 / 33

(6.8)

10.5 / 33 | 9.3 / 20 | 5.2 / 15 | 5.1 / 9.7 | 5.3 / 9.6 | 5.2 / 10 | 5.3 / 15 | 8.1 / 21 | 7.8 / 28 | 8.3 / 33

(5.4)

3.3 / 33 | 3.7 / 28 | 7.2 / 24 | 6.9 / 19 | 5.1 / 15 | 4.9 / 9.7 | 5.3 / 9.6 | 5.2 / 10 | 5.1 / 15 | 7.6 / 22 | 7.7 / 27 | 7.2 / 33

(5.4)

1.3 / 33 | 1.6 / 30 | 6.9 / 24 | 6.5 / 21 | 4.9 / 15 | 4.9 / 9.7 | 5.3 / 9.6 | 5.0 / 10 | 4.7 / 15 | 7.9 / 21 | 7.9 / 33

(5.4)

2.3 / 33 | 3.1 / 30 | 6.9 / 25 | 6.5 / 19 | 4.8 / 15 | 4.8 / 9.7 | 5.2 / 9.6 | 4.9 / 10 | 4.9 / 15 | 7.7 / 20 | 8.0 / 25 | 9.1 / 33

Sta	+	H.I.	−	Elev	
	6.80	253.26			
+50			4.9	48.4	
80+25 B.M.					248.59
80			4.8	48.5	
79			4.7	48.6	
78			5.1	48.2	
Castle Ave B.M.	1.67	252.23 ✓	2.62	250.64 250.54 ✓	250.56 ✓
+46			5.0	47.2	
+13			5.9	46.3	
+10			6.0	46.2	
77			6.3	45.9	
+93.6			6.5	45.7	
+80			6.9	45.3	
76 +43.6			7.9	44.3	
75 +93.6			9.3	42.9	
T.P.	3.99	246.55 ✓	9.67	242.56 ✓	

(5.4)

2:0 / 31 | 2:3 / 28 | 6:8 / 23 | 6:4 / 20 | 5:0 / 15 | 5:0 / 10 | 4:9 / 10 | 4:9 / 15 | 7:2 / 21 | 7:8 / 25 | 9:7 / 33

(5.4)

3:7 / 33 | 4:4 / 26 | 6:9 / 23 | 6:4 / 18 | 4:9 / 15 | 4:9 / 10 | 4:9 / 10 | 4:8 / 15 | 7:6 / 20 | 8:0 / 24 | 7:6 / 27 | 8:4 / 33

(5.5)

3:7 / 28 | 5:1 / 24 | 6:9 / 22 | 6:6 / 19 | 4:8 / 15 | 4:7 / 10 | 4:7 / 10 | 4:9 / 15 | 7:9 / 20 | 8:2 / 28

(5.7)

4:5 / 28 | 5:2 / 24 | 7:0 / 22 | 7:0 / 19 | 5:2 / 15 | 5:2 / 10 | 5:1 / 10 | 5:2 / 15 | 7:9 / 21 | 8:0 / 26 | 7:4 / 30

(5.7)

2:4 / 33 | 2:8 / 27 | 7:7 / 21 | 7:6 / 19 | 5:5 / 15 | 5:3 / 10 | 5:1 / 10 | 5:1 / 15 | 6:7 / 20 | 6:5 / 29 | Castle Hwo Dirt-Rd

(6.7)

1:3 / 33 | 1:3 / 30 | 5:7 / 25 | 6:0 / 18 | 6:1 / 10 | 5:7 / 10 | 5:4 / 15 | 5:5 / 32

(6.3)

4:1 / 37 | 5:3 / 28 | 6:2 / 15 | 6:2 / 10 | 5:8 / 10 | 5:5 / 16 | 7:0 / 22 | 7:2 / 24 | 6:1 / 27 | 6:1 / 33

(6.5)

Driveway 5:0 / 33 | 5:3 / 28 | 6:3 / 15 | 6:6 / 10 | 6:1 / 10 | 6:1 / 15 | 7:0 / 19 | 7:5 / 22 | 6:0 / 26 | 5:8 / 33

(6.0)

(2:5 / 32 +7½ 3:8) | 5:9 / 25 | 6:8 / 10 | 6:3 / 10 | 6:2 / 15 | 7:6 / 19 | 7:8 / 23 | 5:6 / 26 | 5:3 / 33

(7.1)

(2:5 / 3:3 +1:3 3:4) | 8:7 / 22 | 8:3 / 18 | 6:9 / 15 | 6:8 / 9:7 | 7:2 / 9:5 | 6:6 / 10 | 6:6 / 15 | 8:0 / 19 | 8:2 / 23 | 4:2 / 27 | 4:0 / 33

(8.0)

0:4 / 34 | 10:0 / 23 | 9:5 / 19 | 8:1 / 16 | 8:0 / 10:7 | 8:3 / 10:5 | 7:5 / 10 | 7:4 / 15 | 8:9 / 18 | 9:0 / 22 | 3:7 / 28 | 3:9 / 33

(9.5)

4:3 / 32 | 11:6 / 25 | 11:4 / 22 | 9:7 / 17 | 9:7 / 12:0 | 10:0 / 11:8 | 8:7 / 10 | 8:5 / 15 | 9:9 / 18 | 10:0 / 21 | 4:2 / 29 | 4:4 / 33

Sta	+	H.I.	-	Elev.
	3.99	248.55		
+50			4.8	41.8
75			6.3	40.3
74 +50			7.7	38.9
73 +95 ⊥			9.1	37.5
73 +45 ⊥			10.5	36.1
T.P.	5.56	241.42	10.69	235.86
T2 +95.1			6.8	34.6
+77.0			7.3	34.1
T.P.	1.08	234.70	7.80	233.62
+45 ⊥			1.6	33.1
+40			1.6	33.1
T2			2.8	31.9
71 +04	XOver 17			
71			4.8	29.9
70			5.3	29.4

Lt # Rt

(5.1)

2.6	3.1	7.9	7.1	5.6	5.2	5.5	4.2	3.9	5.3	5.6	1.8	1.9
31	29	24	20	15	12.0	11.8	10	15	17	23	28	29

(7.0)

4.4	4.4	9.2	8.7	6.9	6.7	7.0	5.7	5.4	6.8	6.9	5.9	5.0
32	29	23	19	16	12.1	11.9	10	15	18	26	27	30

(9.4)

1.9	10.3	9.7	8.2	8.2	8.5	7.1	7.1	8.2	8.4	
33	24	19	17	12.2	12	10	15	18	30	

(10.4)

(24 6.8	11.4	10.9	9.6	8.5	9.8	8.5	8.4	9.5	10.1	
37)	24	19	17	12	11.8	10	15	19	30	

(12.9)

4.2	12.6	12.5	10.9	10.7	11.0	10.1	10.2	10.9	11.3	12.9	
34	24	19	15	11	10.8	10	15	19	25	30	

(7.5)

11.9	11.7	7.0	6.8	7.1	6.6	6.8	8.4	8.6		
33	23	16	9.7	9.5	10	15	20	26		

(8.2)

12.5	11.4	7.5	7.5	7.2	7.2	8.8	9.0	7.8	5.7	
27	23	15	10	10	15	19	22	24	28	

(3.1)

7.8	6.2	1.7	1.6	1.6	1.7	3.1	3.4	0.2	
32	24	16	10	10	15	18	22	25	

(2.1)

8.1	6.8	1.9	1.7	1.6	1.8	3.4	3.8	1.3	0.0
33	25	15	10	10	15	18	22	25	33

(3.5)

10.5	4.8	2.9	2.9	2.8	2.8	7.6	7.6	
32	21	15	10	10	15	24	28	

22' Rt. 26' Lt.

24" x 48" corr. culvert (4.1) Invert 223.80 Out let 222.80

11.4	9.6	5.0	4.7	4.9	5.0	9.3	10.3
30	24	16	10	10	15	24	33

(5.5)

9.9	9.1	5.4	5.4	5.4	5.4	8.7	8.8
29	23	15	10	10	16	22	26

Sta	+	H.I.	−	Elev.	
	1.08	234.70			
+50			5.2	29.5	
69			5.0	29.7	
68			4.7	30.0	
+50			4.6	30.1	
67+60 B.M.	4.14	234.80	4.14	230.56	230.66
67			4.4	30.4	
66			4.2	30.6	
65			4.4	30.4	
+35			4.5	30.3	
64			4.6	30.2	
T.P.	4.50	234.70	4.60	230.20	
+75			4.6	30.1	
63 +34.7			4.7	30.0	
62 +82.3			4.8	29.9	

					(3.4)					
5.6 / 32	5.5 / 26	7.6 / 24	7.1 / 19	5.4 / 15	5.2 / 10	5.3 / 10	5.5 / 15	7.0 / 19	7.5 / 22	8.3 / 27
					(5.0)					
	6.3 / 24	7.3 / 23	6.9 / 19	5.1 / 15	5.1 / 10	5.1 / 10	5.1 / 15	6.7 / 19	6.4 / 33	
					(5.1)					
7.2 / 33	7.0 / 34	7.4 / 23	7.1 / 19	4.9 / 15	4.8 / 10	4.8 / 10	5.0 / 15	6.6 / 19	6.7 / 22	6.5 / 23	6.4 / 29
					(4.7)					
5.8 / 33	5.4 / 25	7.1 / 23	6.8 / 19	4.7 / 15	4.6 / 10	4.6 / 10	4.7 / 15	6.8 / 21	6.6 / 23	5.7 / 27	5.5 / 29
					(4.8)					
6.0 / 33	6.1 / 25	7.0 / 24	7.0 / 20	4.6 / 15	4.5 / 10	4.5 / 10	4.6 / 15	6.8 / 20	7.0 / 24	5.8 / 26	5.4 / 29
					(4.6)					
5.6 / 29	5.5 / 24	6.4 / 22	6.1 / 18	4.4 / 15	4.3 / 10	4.3 / 10	4.4 / 15	6.3 / 19	6.1 / 22	2.0 / 25	1.6 / 30
					(4.7)					
	8.3 / 28	7.0 / 22	6.9 / 20	4.8 / 15	4.5 / 10	4.5 / 10	4.6 / 15	6.4 / 19	6.5 / 23	1.9 / 26	0.9 / 29
					(4.0)					
6.0 / 33	5.0 / 23	7.3 / 22	7.0 / 19	4.9 / 15	4.6 / 10	4.6 / 10	4.6 / 15	6.7 / 20	6.9 / 23	3.0 / 27	0.0 / 29
					(5.0)					
	8.3 / 33	8.0 / 25	7.4 / 21	4.8 / 15	4.6 / 10	4.7 / 10	4.7 / 15	6.7 / 20	6.7 / 23	1.5 / 28	
					(5.0)					
	9.8 / 33	6.6 / 24	4.7 / 15	4.3 / 10	4.7 / 10	4.8 / 15	6.8 / 20	6.8 / 23	4.4 / 27	3.8 / 30	
					(5.2)					
	10.4 / 33	10.2 / 24	4.4 / 15	4.4 / 10	4.9 / 9.6	4.6 / 9.7	4.8 / 15	8.0 / 23	8.2 / 26	6.7 / 33	
					(5.3)					
	9.8 / 33	9.4 / 24	4.4 / 15	4.4 / 10	5.3 / 11.8	4.9 / 12	5.1 / 18	9.4 / 26	9.9 / 33		

54+0	+	HI	—	E/EV	
	4.50	234.70			
+32.3			5.0	29.7	
62			5.1	29.6	
61 +50			5.3	29.4	
61 +02	XDrain				
60 +88.3			5.4	29.3	
60+75 B.M.			4.73	229.97 ✓	229.97
+38.3			5.4	29.3	
60			5.3	29.4	
+50			5.0	29.7	
59			4.5	30.2	
+40			3.8	30.9	
58			3.4	31.3	
57			2.8	31.9	
56			2.8	31.9	

LT # RT

9.4 / 30	7.7 / 22	4.3 / 15	4.7 / 10	5.8 / 13.4	5.4 / 13.6	5.7 / 19	7.5 / 22	9.2 / 33

(5.1)

8.0 / 33	7.3 / 29	4.6 / 20	4.5 / 10	5.9 / 13.2	5.5 / 13.4	5.8 / 19	8.0 / 27	9.7 / 33

(5.9)

5.4 / 33	4.6 / 15	4.7 / 10	6.1 / 13.2	5.7 / 13.4	6.1 / 19	10.3 / 26	11.2 / 31	

24" x 48" conv. universal mount LEFT Outlet 29 RT

225.9 223.6

6.3 / 33	5.4 / 23	7.3 / 21	7.0 / 18	4.8 / 15	4.9 / 10	6.2 / 13.2	5.8 / 13.4	6.1 / 18	9.2 / 23	10.7 / 33

(6.6)

5.0 / 28	5.3 / 24	7.3 / 22	6.9 / 19	5.1 / 15	5.0 / 10	5.9 / 11	5.5 / 11.2	5.8 / 16	7.6 / 19	8.0 / 25	6.6 / 27	6.3 / 33

(5.6)

2.3 / 31	5.1 / 28	4.6 / 25	7.1 / 21	7.0 / 19	5.1 / 15	5.1 / 10	5.6 / 9.8	5.3 / 10	5.5 / 15	7.2 / 18	7.5 / 23	6.4 / 24	6.5 / 30

(4.9)

5.1 / 27	4.8 / 25	6.9 / 22	6.5 / 17	5.0 / 15	4.9 / 10	5.1 / 10	5.4 / 13	6.8 / 17	7.1 / 22	5.8 / 23	5.8 / 33

(4.4)

4.5 / 26	4.5 / 25	6.5 / 23	6.3 / 18	4.7 / 15	4.6 / 10	4.6 / 10	4.8 / 15	6.2 / 19	6.3 / 22	4.2 / 26	3.2 / 33

(4.0)

4.0 / 33	4.0 / 25	5.6 / 23	5.3 / 19	4.1 / 15	3.9 / 10	3.9 / 10	3.9 / 15	5.3 / 17	5.6 / 23	3.4 / 25	3.3 / 31

(3.6)

5.5 / 29	4.0 / 24	5.3 / 22	3.6 / 16	3.5 / 10	3.5 / 10	3.6 / 15	5.5 / 18	6.5 / 33	

(3.0)

5.8 / 30	4.2 / 24	5.1 / 22	2.9 / 15	2.9 / 10	2.9 / 10	3.1 / 15	4.9 / 19	5.2 / 27	

(2.4)

3.0 / 31	3.1 / 27	3.5 / 24	4.8 / 22	4.5 / 18	3.0 / 15	2.8 / 10	2.9 / 10	3.0 / 15	4.1 / 18	4.8 / 26

12/7/23 Clear - Mild

Sta	+	Hi	-	Elev
	4.50	234.70		
+53			2.9	31.8
+25			3.1	31.6
TR	3.85	234.75	3.80	230.90
55			3.4	31.4
+82			3.6	31.2
+95			4.0	30.8
54			4.5	30.3
+88			4.7	30.1
+03			6.1	28.7
53			6.3	28.5
+98			6.3	28.5
Equation +89			6.4	28.4
+85			7.0	27.8

Co. Rd. 31
B.M.

227.45

Jorgenson
Parsons
Briggs
E&K.

23-52 63

Lt ℄ Rt

(1.9)

4.7 4.0 5.1 4.7 3.1 3.0 3.0 3.1 4.4 4.6 2.1 2.1
28 24 22 19 15 10 10 15 18 22 25 30

(2.2)

5.5 4.7 5.3 4.9 3.3 3.2 3.2 3.3 4.5 4.6 (236.9)
28 24 22 19 15 10 10 15 18 21 28

Neil in talk pole ℄ of sta 55+40

6.7 4.5 3.8 3.4 (2.5) 3.5 3.7 5.0 5.1 6.4 6.7
27 23 15 10 10 15 18 21 26 28

5.0 4.2 3.8 3.6 (2.6) 3.7 3.8 5.4 5.6 7.6 7.1
29 24 15 10 10 15 18 21 24 28

6.4 4.4 6.0 5.6 4.1 4.0 (2.9) 4.1 4.3 5.8 6.0 7.6 1.8 1.3
28 24 21 18 15 10 10 15 18 21 24 26 28

+66 0.0 6.3 6.1 5.0 4.1 (3.8) 4.6 4.8 6.3 6.6 1.3 1.5
35 28 22 17 15 10 10 15 17 22 27 29

46.7 0.0 6.7 6.3 5.0 4.7 (4.0) 4.7 4.8 6.4 6.5 1.3 1.8
36 29 22 18 15 10 10 15 18 22 28 34

2.0 3.8 3.7 8.2 6.0 6.4 6.7 (6.0) 6.2 6.3 7.4 7.9 6.7 1.9 1.9
34 31 27 22 18 15 10 10 16 18 22 25 32 36

3.0 4.3 8.4 8.1 6.6 6.3 (6.1) 6.3 6.7 4.5 6.3
32 27 22 18 15 10 10 12 28 35

3.5 4.9 8.4 7.9 6.6 6.4 (6.1) 6.4 6.3 6.3
31 22 17 18 15 10 10 16 33

6.0 6.3 6.5 6.5 (6.3) 6.5 6.3 6.7
34 25 16 10 10 16 33

6.7 6.9 7.1 (6.8) 7.1 7.0 8.9 8.9 6.2 4.6 4.4
26 16 10 10 15 20 27 26 30 37
11.4
35

Sta	+	HI	−	Elev	
		234.75 ✓			
+50			7.2	27.6	
52			8.3	26.5	
+45			9.7	25.1	
51			11.0	23.8	
T.P.	0.15	223.80 ✓	11.10	223.65 ✓	
+45			1.6	22.2	
50			2.8	21.0	
49+75 B.M.			1.46	222.34	222.31
+40			4.5	19.3	
+24	end cut 9 x 4				
49			5.6	18.2	
48			7.7	16.1	
T.P.	3.91	219.81 ✓	7.90	215.90 ✓	
47			5.0	14.8	
46			5.5	14.8	
45			5.2	14.6	

4.8	7.0	9.9	8.9	7.4	7.3	(7.0)	7.3	7.7	9.0	9.1	6.3	3.8	1.7
30	25	22	18	15	10		10	15	19	22	25	32	35
8.3	8.6	10.7	10.5	8.6	8.4	(8.3)	8.9	8.5	10.2	10.3	8.5	7.6	
30	26	22	20	15	10		10	13	18	21	24	29	
10.5	10.6	12.3	11.4	10.0	9.8		9.8	10.0	11.5	7.9	8.7	7.7	
30	25	23	20	15	10		10	15	18	21	25	27	
10.8	11.2	13.3	13.1	11.7	11.1		11.1	11.2	12.5	13.1	6.5	6.3	
30	25	22	18	15	10		10	15	17	20	24	30	
0.4	1.6	4.0	3.7	1.8	1.7		1.6	1.6	3.4	3.4	0.0	+ 9.5	
27	25	22	19	16	10		10	15	19	21	24	34	
0.0	1.8	5.0	4.8	3.1	2.9		2.9	5.0	4.2	4.5	0.0	+ 4.6	
27	25	22	19	15	10		10	16	19	22	26	31	
5.4	5.5	6.3	6.3	4.7	4.6		4.6	4.6	6.0	6.2	5.5	5.6	
29	25	23	20	15	10		10	16	20	23	24	28	
8.4	6.4	5.8	5.7				5.6	5.8	7.2	8.3			
24	22	15	10				10	15	21	26			
12.5	12.0	8.0	7.8				7.8	8.1	11.5	12.5			
32	23	15	10				10	15	21	27			
10.7	8.9	5.3	5.1				5.1	5.4	8.8	10.2	10.3		
26	23	15	10				10	15	23	28	32		
11.1	10.2	5.8	5.6				5.6	5.7	11.4	11.9			
27	23	15	10				10	15	25	31			
11.2	9.8	5.4	5.3				5.3	5.3	12.0	11.6			
27	22	15	10				10	15	27	32			

Sta	+	H.I.	−	Elev	
		219.81			
44			4.9	14.9	
43			4.6	15.2	
42+15 B.M. +64	Culv.				245.33
42			3.7	16.1	?
41			1.4	18.4	?
T.P.	9.51	228.97 ✓	0.35	219.46 ✓	
40			7.0	22.0	
39			2.6	26.4	
38+67 = 38+57 ℄ R.R.			1.2		
T.P.	11.86	240.10 ✓	0.73	228.24 ✓	
38			9.9	30.2	
37			6.0	34.1	
+80			5.2	34.9	
+45			3.8	36.3	?
36			2.1	38.0	
T.P.	10.93	250.59 ✓	0.44	239.66 ✓	
35+00			8.6	42.0	

11.8 / 27	11.2 / 24	5.3 / 15	5.1 / 10		5.0 / 10	5.2 / 15	12.5 / 27	12.8 / 34
12.5 / 30	11.1 / 25	8.1 / 15	4.7 / 10		4.7 / 10	4.9 / 15	12.3 / 26	13.1 / 31
		16.3 / INF			16.0 / INF.			
12.0 / 29	11.8 / 26	4.0 / 15	3.8 / 10		3.8 / 10	3.8 / 15	11.7 / 27	12.1 / 32
✓ 8.7 / 20	8.3 / 25	1.5 / 15	1.5 / 10	(13)	1.5 / 10	1.6 / 15	9.3 / 24	10.0 / 32
✓ 12.9 / 28	12.7 / 24	7.5 / 15	7.1 / 10		7.1 / 10	7.4 / 15	12.0 / 23	15.6 / 29	16.5 / 33
○ 11.7 / 31	10.7 / 28	8.3 / 24	3.0 / 15	2.7 / 10	2.7 / 10	2.9 / 15	9.8 / 26	10.7 / 30	
			2.2 / 32	1.7 / 16	1.0 / 10	1.5 / 26			
✓ 25.0 / 40	24.3 / 38	12.0 / 19	10.2 / 15	10.0 / 10	10.0 / 10	10.0 / 16	12.0 / 19	16.6 / 27	17.5 / 32
✓ 22.8 / 41	21.3 / 37	12.0 / 24	6.2 / 15	6.0 / 10	6.1 / 10	6.3 / 15	11.6 / 23	12.3 / 27	
✓ 19.0 / 40	19.1 / 36	12.0 / 25	5.4 / 15	5.3 / 10	5.3 / 10	5.4 / 15	9.9 / 22	10.3 / 28	
7.5 / 30	8.0 / 29	11.8 / 29	12.0 / 26	8.3 / 23	4.0 / 15	3.9 / 12	(3.6) 3.9 / 10	4.1 / 15	7.5 / 19	7.9 / 22	10.0 / 31
✓		9.0 / 33	6.6 / 24	7.0 / 22	7.3 / 15	2.1 / 10	(2.7) 2.1 / 10	2.3 / 15	5.5 / 20	5.3 / 23	7.0 / 31
✓		2.7 / 40	7.2 / 33	12.5 / 27	12.3 / 27	8.8 / 15	8.7 / 10	(8.6) 8.7 / 10	8.9 / 15	12.5 / 21	12.5 / 27

Sta	+	H.I	-	Elev	
		250.59 ✓			
35 +35			10.0	40.6	
+35					
+30			6.1	44.5	?
34			4.7	45.9	?
+30			2.1	48.5	
33			1.0	49.6	?
T.P.	11.54	261.96 ✓	0.17	250.42	✓
32			8.3	53.7	
+18			7.1	54.9	
+15	start rubble Gutter Ft.				
31			4.5	57.5	
30			1.1	60.9	
T.P.	10.56	272.17 ✓	0.35	261.61	✓
29			7.7	64.5	
28			4.2	68.0	
27			0.9	71.3	
T.P.	11.15	282.28 ✓	0.44	271.73	✓

LT ℄ RT

✓	5.1 / 34	10.8 / 32	14.3 / 25	14.3 / 23	10.1 / 15	10.1 / 10	10.1 / 10	10.3 / 15	17.3 / 21	14.1 / 28	
✓	7.6 / 29	9.1 / 25	9.5 / 22	8.6 / 19	6.9 / 15	6.3 / 10	6.1 / 10	6.7 / 15	10.5 / 23	10.9 / 25	2.5 / 34
✓	6.6 / 28	7.9 / 24	6.5 / 19	5.1 / 15	4.8 / 10	4.8 / 10	5.0 / 15	9.1 / 21	8.9 / 23	7.9 / 24	6.7 / 27 / 5.1 / 29
✓	+2.8 / 32	0.0 / 31	4.7 / 26	3.9 / 18	2.3 / 15	2.1 / 10	2.2 / 10	2.7 / 15	4.1 / 19	4.9 / 24	4.1 / 26
✓	+4.1 / 32	0.0 / 29	2.7 / 26	2.7 / 18	1.1 / 15	1.0 / 10	1.0 / 10	1.1 / 15	3.9 / 18	3.8 / 21	3.8 / 25
✓	6.6 / 32	6.6 / 29	10.1 / 23	7.9 / 18	8.6 / 15	8.4 / 10	8.4 / 10	8.5 / 15	10.8 / 20	10.8 / 24	8.7 / 26 / 6.7 / 29
✓	5.3 / 30	5.2 / 28	7.5 / 26	7.9 / 15	7.2 / 10	7.2 / 10	7.4 / 15	9.0 / 19	8.8 / 24	7.2 / 32	6.3 / 33
✓	+3.7 / 31	0.0 / 30	5.9 / 26	6.8 / 19	4.6 / 16	4.6 / 10	4.6 / 10	5.9 / 15	5.9 / 19		
	+6.5 / 31	0.0 / 27	2.6 / 24	2.3 / 18	1.2 / 16	1.1 / 10	1.2 / 10	2.3 / 14	1.3 / 18		
✓	+2.2 / 33	0.0 / 31	9.2 / 24	7.3 / 18	2.0 / 16	7.8 / 10.4	7.8 / 10.4	8.9 / 14	8.0 / 17		
	+3.7 / 31	0.0 / 29	5.4 / 24	5.7 / 19	4.2 / 16	4.2 / 12	4.2 / 12	3.3 / 18	1.9 / 25		
✓	+5.8 / 29	0.0 / 25	2.4 / 22	2.4 / 19	1.1 / 17	0.9 / 12	0.9 / 12	1.1 / 14	0.9 / 16		

Sta	+	HI	T	Elev	
		282.88 ✓			
	+68		10.8	72.1	
	+60		10.6	72.3	
26			9.1	73.8	
	+80		8.7	74.2	
	+65		8.4	74.5	
25			7.3	75.6	
	BM		4.74	278.14	278.15
	+05 and cut Lt.				
24			6.0	76.9	
	+70		5.7	77.2	
23			5.1	77.8	
22			4.0	78.9	
21			3.0	79.9	
20			2.0	80.9	

4.4	4.4	8.4	9.3	12.5	12.5	10.8	10.6	(8.8)	10.76	10.7	10.7
32	32	34	26	22	19	16	12		12	14	16
				5.8	9.7	10.8	10.8	(8.4)	10.8	10.5	10.6
				22	38	18	12		12	14	15.5
6.1	8.4	8.4	8.7	9.1	9.9	9.2	9.2	(7.2)	9.2	9.2	9.2
49	61	48	34	28	17	12			12	14	15.4
4.6	4.1	3.1	10.2	10.3	8.8	8.7	8.8	(6.9)	8.8	8.9	8.8
46	41	32	52	15	17	12			12	14	15.5
3.6	3.8	9.0	10.8	9.9	8.5	8.5	8.5	(6.7)	8.5	8.6	8.6
34	32	29	22	15	17	12			12	14	15.4
4.4	4.4	8.7	8.8	7.5	7.4	7.3	7.3	(5.7)	7.3	7.5	7.3
36	31	24	20	17	12				12	14	15
		7.6	7.2	6.1	6.1	6.0	6.0	(5.3)	6.0	6.0	6.1
		25	20	17	12				12	12.4	16
		7.6	7.5	6.1	5.8	5.8	5.8	(5.4)	5.8	6.9	7.0	8.0
		24	20	17	12				12	17	20	23
		7.3	7.4	5.3	5.1	5.1	5.3	(5.4)	5.1	5.3	9.2	9.9
		26	20	17	12				12	17	24	29
3.0	3.4	6.6	6.7	4.7	4.1	4.1	4.1	(4.4)	4.1	4.7	8.6
35	33	25	22	17	12				12	16	23
1.5	1.7	5.5	5.7	3.7	3.1	3.1	3.1	(3.0)	3.1	3.1	7.4	7.5
33	32	26	21	17	12				12	17	25	30
1.4	4.5	4.7	2.1	2.1	2.1	2.1	2.3	5.1	5.3	4.1	4.1
31	24	22	17	12					12	16	21	24	30	32

Sta	+	H.I	−	Elev	
		282.88 ✓			
+70			1.7	81.2	(1.9)
T.P.	4.20	285.48 ✓	1.60	281.28 ✓	
19			3.5	82.0	(3.3)
18			3.4	82.1	(3.5)
+50			3.7	81.8	(3.5)
17+50 B.M.			3.10	282.38 ✓	Hay W425 (283.34)
17			4.1 ✓	81.4	4.1
+75			4.4	81.1	4.4
+61	end cut Rt & Lt.				
16			5.8	79.7	5.8
15			8.2	77.3	(7.4)
+85	start cut Lt.				
+50			9.4	76.1	(8.3)
14			10.6	74.9	(9.9)
+75			11.2	74.3	(10.8)
T.P.	1.41	275.41 ✓	11.48	274.00 ✓	
13			2.8	72.6	

Lt # Rt

2.9	4.3	4.2	1.9	1.8	(1.9)	1.8	1.8	4.7	4.7	2.7	
32	24	21	17	12		12	16	23	25	31	
0.5	6.0	6.0	3.8	3.7	(3.7)	3.6	3.8	5.4	4.7	2.6	
33	24	21	17	12		12	18	20	26	32	
3.0	5.8	5.8	3.5	3.4	(3.3)	3.4	3.6	5.7	6.0	7.9	
32	24	20	17	12		12	17	21	24	31	
0.6	6.2	6.3	3.9	3.7	(3.5)	3.7	3.9	6.3	6.3	3.7	
32	25	21	17	12		12	17	22	24	31	
0.9	2.3	6.4	6.4	4.3	4.2	(4.1)	4.2	4.5	6.6	6.9	5.2
34	31	27	21	17	12		12	17	21	25	30
3.0	6.5	6.9	4.6	4.5	(4.4)	4.5	4.7	7.0	7.4	7.0	
34	26	22	17	12		12	17	23	27	32	
7.8	7.7	6.1	5.9	(5.8)	5.9	6.0	8.7	9.3			
24	20	17	12		12	17	22	27			
10.1	9.8	8.4	8.3	(7.4)	7.3	8.8	10.2	9.5	9.3		
34	29	17	12		12	17	23	29	26		
9.4	11.4	11.3	7.4	9.9	(8.3)	9.4	9.3	11.2	11.5	9.1	8.7
31	31	20	17	12		12	17	20	23	28	31
9.1	12.4	12.9	10.7	10.6	(9.9)	10.7	10.8	12.5	12.4	10.1	
33	24	21	17	12		12	17	22	26	29	
8.4	13.1	13.8	11.5	11.3	(10.9)	11.3	11.4	13.9	13.3	12.3	
32	23	20	17	12		12	17	20	28	29	
3.1	3.4	4.4	4.3	2.9	2.9	(2.6)	2.9	3.0	4.6		
29	24	23	19	16		12	12	17	29		

Sta	+	HI	−	Elev	
		275.41 ✓			
+60			3.8	71.6	
12			5.0	70.4	
11			7.0	68.4	
10+00 B.M.			11.49	263.92	263.92
10			9.0	66.4	
T.P.	0.13	265.84 ✓	9.70	265.71 ✓	
9			1.4	64.4	
8			3.3	62.5	
+28	end cut Lt.				
7			5.5	60.3	
6			7.6	58.2	
5			9.8	56.0	
T.P.	0.88	256.57 ✓	10.15	255.69 ✓	
4			2.8	53.8	
3			5.0	51.6	
2			6.9	49.7	
T.P.	3.01	252.10 ✓	7.48	249.09 ✓	

Lt & Rt

3.4 6.0 6.9 3.9 3.8 (4.6) 3.8 3.9 7.8 8.7
33 26 21 17 12 12 17 23 28

5.0 7.6 7.5 6.3 5.1 (5.9) 5.1 3.3 8.7 9.7
31 25 20 17 12 12 17 22 27

6.9 9.4 8.5 7.7 7.1 (7.5) 9.1 8.7 10.0 10.5
31 23 21 17 12 12 17 21 26

13.1 11.8 9.1 8.1 9.1 (9.9) 9.1 9.4 13.0 13.3
27 21 17 12 12 12 18 23 27

2.3 2.7 4.3 4.7 1.4 1.5 (1.9) 1.5 1.5 4.1 4.9
32 30 24 20 17 12 12 17 22 27

3.2 4.7 4.9 3.5 3.1 (3.6) 3.4 3.4 6.1 6.3
31 32 33 17 12 12 17 23 28

8.5 8.0 5.6 5.4 (6.1) 5.6 5.6 8.3 8.3 7.4
26 21 17 12 12 17 21 26 28

11.8 9.4 7.9 7.7 (8.2) 7.7 8.0 10.3 10.6 9.9 9.5
26 22 17 12 12 17 23 26 27 31

11.6 12.9 13.4 10.1 10.0 (10.4) 7.8 10.9 12.9 13.0 13.9 12.0
31 27 23 17 12 12 17 21 2 26 28

5.6 5.5 3.0 2.9 (3.4) 2.9 3.1 5.2 5.5
25 20 14 12 12 17 20

5.1 5.2 8.0 8.1 5.7 5.4 (5.5) 5.1 5.7 N. S.R. Rmp 5.9
34 31 24 21 17 12 12 17 34

7.6 8.1 10.0 9.3 7.7 7.0 (7.3) 7.0 7.9 8.4 8.5
24 31 22 17 12 12 17 21 24

Sta	+	H.I	−	Elev	
		252.10 ✓			
1			4.4	47.7	
+50			5.3	46.8	
0+00			6.3	45.8	
0−33			7.1	45.0	
N.E. Cor. CMA B.M. removed.					246.79 ✓
New B.M.			4.12 ✓	247.98 ✓	

4.9	5.3	7.6	8.9	4.7	4.5	(50)	4.5	4.6	7.0	7.9	7.6	7.6
36	33	27	21	14	12		12	17	22	24	27	29

5.1	5.7	8.5	8.6	5.4	5.8	(61)	6.9	5.9	8.2	7.9	6.8	7.4
36	31	25	23	17	12		12	17	24	28	29	33

5.1	6.3	6.3	(67)	6.4	6.9	5.9
37	18	12		12	17	35

6.4	6.9	7.2	(69)	7.1	7.1	7.7	7.9
31	21	12		12	17	22	36

These are Great Pavement grade
this S. W. moved
for City Hydrant S. W. Cor Co. Rd 89.

B.M.					Elev
241+57	Spike in	20"	Tree	Left	259.39
260+85	"	16"	"	L 33'	245.44
273+75	"	12"	"	R 35	248.93

DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES

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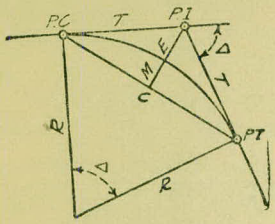


CURVE FORMULAS

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

Tangent=T=R tan $\frac{\Delta}{2}$ (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=T tan $\frac{\Delta}{4}$ (7) =R ÷ cos. $\frac{\Delta}{2}$ —R (8)=R exsec $\frac{\Delta}{2}$ (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	20	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 V.—CORRECTIONS FOR TANGENTS AND EXTERNALS.

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

FOR TANGENTS ADD

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

FOR EXTERNALS ADD

Central Angle.	DEGREE OF CURVE													
	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
10°	.001	.003	.004	.006	.007	.008	.009	.011	.012	.014	.015	.017	.018	.020
15°	.003	.007	.010	.014	.018	.023	.027	.029	.032	.035	.039	.043	.047	.051
20°	.006	.011	.017	.022	.028	.034	.038	.045	.051	.057	.063	.070	.076	.083
25°	.009	.018	.027	.036	.046	.056	.065	.074	.083	.093	.106	.120	.127	.135
30°	.013	.025	.038	.051	.065	.078	.090	.103	.116	.129	.149	.170	.179	.188
35°	.018	.035	.054	.072	.086	.109	.131	.153	.175	.197	.213	.230	.247	.264
40°	.023	.046	.070	.093	.117	.141	.172	.203	.234	.265	.277	.290	.315	.341
45°	.030	.060	.093	.119	.153	.184	.216	.254	.289	.325	.351	.378	.411	.445
50°	.037	.075	.116	.151	.189	.227	.266	.305	.345	.384	.425	.467	.508	.550
55°	.046	.093	.142	.188	.236	.283	.332	.381	.420	.479	.530	.582	.641	.700
60°	.056	.112	.168	.225	.283	.340	.398	.457	.516	.575	.636	.697	.774	.851
65°	.067	.135	.204	.273	.343	.412	.483	.554	.625	.697	.711	.845	.922	1.01
70°	.080	.159	.240	.321	.403	.485	.568	.652	.735	.819	.906	.994	1.08	1.17
75°	.095	.182	.286	.383	.480	.578	.678	.777	.877	.977	1.07	1.18	1.29	1.39
80°	.110	.220	.332	.445	.558	.671	.787	.903	1.02	1.13	1.25	1.38	1.50	1.62
85°	.128	.259	.391	.524	.657	.790	.926	1.06	1.20	1.34	1.47	1.62	1.76	1.91
90°	.149	.299	.450	.603	.756	.910	1.07	1.22	1.38	1.54	1.70	1.87	2.03	2.20
95°	.174	.350	.522	.706	.985	1.06	1.25	1.43	1.62	1.80	1.99	2.18	2.38	2.58
100°	.200	.401	.604	.809	1.01	1.22	1.43	1.64	1.85	2.06	2.28	2.50	2.73	2.96
110°	.268	.536	.806	1.08	1.35	1.63	1.91	2.20	2.48	2.76	3.05	3.35	3.66	3.96
120°	.360	.721	1.08	1.45	1.82	2.19	2.57	2.95	3.33	3.72	4.11	4.50	4.91	5.32

Table VI.—Corrections for Sub-Chords and Long Chords.

FOR SUB-CHORDS ADD										Excess of arc per 100 ft.	LONG CHORDS				
D	10	20	30	40	50	60	70	80	90		D	200	300	400	500
4°	.00	.00	.01	.01	.01	.01	.01	.01	.00	.02	1	199.99	299.97	399.92	499.85
6	.00	.01	.01	.02	.02	.02	.02	.01	01	.05	2	199.97	299.88	399.70	499.39
8	.01	.02	.02	.03	.03	.03	.03	.02	.01	.08	3	199.93	299.73	399.32	498.63
10	.01	.02	.03	.04	.05	.05	.05	.04	.02	.13	4	199.88	299.51	398.78	497.57
12	.02	.04	.05	.06	.07	.07	.07	.05	.03	.18	5	199.81	299.24	398.10	496.20
14	.02	.05	.07	.08	.09	.10	.09	.07	.04	.25	6	199.73	298.90	397.26	494.53
16	.03	.06	.09	.11	.12	.12	.12	.09	.05	.33	7	199.63	298.51	396.28	492.57
18	.04	.08	.11	.14	.15	.16	.15	.12	.07	.41	8	199.51	298.05	395.14	490.31
20	.05	.10	.14	.17	.19	.20	.18	.15	.09	.51	9	199.38	297.54	393.86	487.75
22	.06	.12	.17	.21	.23	.24	.22	.18	.10	.62	10	199.24	296.96	392.42	484.90
24	.07	.14	.20	.25	.28	.28	.26	.21	.12	.74	12	198.90	295.63	389.12	478.34
26	.09	.17	.24	.29	.32	.33	.31	.25	.15	.86	14	198.51	294.06	385.22	470.65
28	.10	.19	.27	.34	.37	.38	.36	.29	.17	1.00	16	198.05	292.25	380.76	461.86
30	.11	.22	.31	.39	.43	.44	.41	.33	.19	1.15	18	197.54	290.21	375.74	452.02
32	.13	.25	.36	.44	.49	.50	.47	.38	.22	1.31	20	196.96	287.94	370.17	441.15
34	.15	.28	.40	.50	.55	.57	.53	.43	.25	1.48	22	196.32	285.44	364.06	429.30
36	.17	.32	.45	.56	.62	.64	.59	.48	.28	1.66	24	195.63	282.71	357.43	416.53
38	.18	.36	.51	.62	.70	.71	.66	.53	.31	1.86	26	194.87	279.76	350.30	402.89
40	.21	.40	.56	.69	.77	.79	.73	.59	.35	2.06	28	194.06	276.59	342.69	388.43
42	.23	.44	.62	.76	.85	.87	.81	.65	.38	2.28	30	193.18	273.20	334.61	373.20
44	.25	.48	.68	.84	.94	.96	.89	.72	.42	2.50	32	192.25	269.61	326.08	357.28
46	.27	.52	.75	.92	1.02	1.05	.98	.78	.46	2.74	34	191.26	265.81	317.12	340.73
48	.30	.57	.81	1.00	1.12	1.14	1.06	.86	.50	2.99	36	190.21	261.80	307.77	323.61
50	.32	.62	.89	1.09	1.21	1.24	1.15	.93	.55	3.24	38	189.10	257.60	298.03	305.99
52	.35	.67	.96	1.18	1.31	1.35	1.25	1.01	.59	3.52	40	187.94	253.21	287.94	287.94
54	.38	.73	1.04	1.28	1.42	1.46	1.35	1.09	.64	3.80	42	186.72	248.63	277.51	269.54
56	.41	.78	1.12	1.38	1.53	1.57	1.46	1.17	.69	4.09	44	185.44	243.87	266.78	250.85
58	.44	.84	1.20	1.48	1.65	1.69	1.57	1.26	.74	4.40	46	184.10	239.93	255.78	231.95
60	.47	.91	1.29	1.59	1.76	1.81	1.68	1.35	.80	4.72	48	182.71	233.83	244.51	212.92

Note.—When a chord of less than 100 ft. is used the corrections given in the above table should be added to the nominal length of chord to get the length which should be used in order that the 100 ft. points will check with those obtained by using the standard 100 ft. chord. Thus in locating a 14° curve by 25 ft. chords measure 25'.06 for each chord. Long chords are useful in passing obstacles.

Table VII.—Middle Ordinates for Rails in Feet.

Deg. of Curve	LENGTH OF RAILS							Deg. of Curve	LENGTH OF RAILS.						
	32	30	28	26	24	22	20		32	30	28	26	24	22	20
1°	.022	.020	.016	.013	.011	.009	.008	16°	.356	.313	.273	.236	.200	.170	.139
2	.045	.038	.034	.029	.025	.021	.017	17	.378	.333	.290	.252	.213	.180	.148
3	.037	.058	.051	.044	.037	.031	.026	18	.400	.351	.306	.265	.225	.190	.156
4	.089	.079	.069	.060	.050	.042	.035	19	.423	.371	.324	.280	.238	.201	.165
5	.112	.099	.086	.074	.063	.053	.044	20	.445	.392	.341	.296	.250	.212	.174
6	.134	.117	.102	.088	.076	.064	.052	21	.466	.410	.357	.309	.262	.222	.182
7	.156	.137	.120	.104	.088	.074	.061	22	.487	.430	.375	.325	.275	.233	.191
8	.179	.158	.137	.119	.100	.085	.070	23	.509	.450	.390	.338	.287	.243	.199
9	.201	.175	.153	.133	.112	.095	.078	24	.531	.469	.408	.354	.299	.253	.208
10	.223	.196	.171	.148	.125	.106	.087	25	.552	.486	.424	.367	.311	.263	.216
11	.245	.216	.188	.163	.139	.117	.096	26	.573	.506	.441	.382	.323	.274	.225
12	.268	.236	.206	.179	.151	.128	.105	27	.594	.524	.457	.396	.335	.284	.233
13	.290	.254	.222	.192	.163	.138	.113	28	.618	.545	.475	.411	.348	.294	.242
14	.312	.275	.239	.207	.175	.148	.122	29	.638	.564	.491	.424	.361	.303	.250
15	.334	.295	.257	.223	.188	.159	.131	30	.660	.583	.508	.438	.374	.313	.259

SLOPE REDUCTIONS.

When distances are measured on a slope they may be reduced to the equivalent horizontal distance by the following approximate rule:—subtract from the slope distance the square of the rise divided by twice the slope distance. Thus for a slope distance of 250.3 ft. and a rise of 15 ft. correction=$15^2 \div 2 \times 250.3$=.45 (by slide rule) or horizontal distance=250.3—.45=249.85. When vertical angle=V. A. is measured horizontal distance=slope distance—slope distance (1—Cos. V. A.). Thus for slope distance of 248.7 ft. and V. A. of 4° 20′ from Table VIII Cos=.99714 and correction=1—.99714=.00286 per foot or total of .286×2½ (near enough)=.57 and horizontal distance=248.7—.57=248.13 ft.

TRIGONOMETRICAL FORMULAS.

See fig. (a).

sin. $A=\frac{a}{c}$

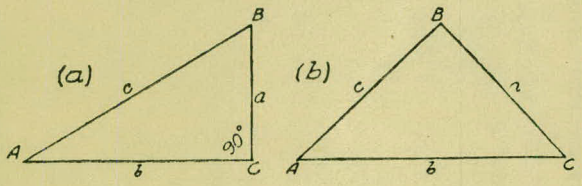
cos. $A=\frac{b}{c}$

tan. $A=\frac{a}{b}$

cot. $A=\frac{b}{a}$

sec. $A=\frac{c}{b}$

cosec. $A=\frac{c}{a}$



FORMULA FOR SOLVING TRIANGLES.

Given	Sought.	Right triangles. See fig. (a).
a, c	A, B, b	$\sin. A=\frac{a}{c}$, $\cos. B=\frac{a}{c}$, $b=\sqrt{(c+a)\,(c-a)}$
a, b	A, B, c	$\tan. A=\frac{a}{b}$, $\cot. B=\frac{a}{b}$, $c=\sqrt{a^2+b^2}$.
A, a	B, b, c	$B=90°-A$, $b=a \cot. A$, $c=\frac{a}{\sin. A}$.
A, b	B, a, c	$B=90°-A$, $a=b \tan. A$, $c=\frac{b}{\cos. A}$.
A, c	B, a, b	$B=90°-A$, $a=c \sin. A$, $b=c \cos. A$
Given	Sought.	Oblique triangles. See fig. (b).
A, B, a	b	$b=\frac{a \sin. B}{\sin. A}$
A, a, b	B	$\sin. B=\frac{b \sin. A}{a}$
a, b, C	$A - B$	$\tan. \frac{1}{2}(A-B)=\frac{(a-b) \tan. \frac{1}{2}(A+B)}{a+b}$
a, b, c	A	If $s=\frac{1}{2}(a+b+c)$, $\sin. \frac{1}{2}A=\sqrt{\frac{(s-b)(s-c)}{bc}}$; $\cos. \frac{1}{2}A=\sqrt{\frac{s(s-a)}{bc}}$, $\tan. \frac{1}{2}A=\sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$; $\sin. A=\frac{2\sqrt{(s-a)(s-b)(s-c)\,s}}{bc}$
A, B, C, a	area	$\text{area}=\frac{a^2 \sin. B \sin. C}{2 \sin. A}$
A, b, c	area	$\text{area}=\frac{1}{2} b c \sin. A$
a, b, c	area	$s=\frac{1}{2}(a+b+c)$, $\text{area}=\sqrt{s(s-a)(s-b)(s-c)}$

Table VIII.—Natural Trigonometrical Functions.

Angle	Sine.	Tan.	Cotg.	Cosin.		Angle	Sine.	Tan.	Cotg.	Cosin.	
°						°					
0	0	0	00	1	90	8	.1392	.1405	7.115	.99027	82
10	.0029	.0029	343.8	I	50	10	.1421	.1435	6.968	.98986	50
20	.0058	.0058	171.9	.99998	40	20	.1449	.1465	6.827	.98944	40
30	.0087	.0087	114.6	.99996	30	30	.1478	.1495	6.691	.98902	30
40	.0116	.0116	85.94	.99993	20	40	.1507	.1524	6.561	.98858	20
50	.0145	.0145	68.75	.99989	10	50	.1536	.1554	6.435	.98814	10
1	.0175	.0175	57.29	.99985	89	9	.1564	.1584	6.314	.98769	81
10	.0204	.0204	49.10	.99979	50	10	.1593	.1614	6.197	.98723	50
20	.0233	.0233	42.96	.99973	40	20	.1622	.1644	6.084	.98676	40
30	.0262	.0262	38.19	.99966	30	30	.1650	.1673	5.976	.98629	30
40	.0291	.0291	34.37	.99958	20	40	.1679	.1703	5.871	.98580	20
50	.0320	.0320	31.24	.99949	10	50	.1708	.1733	5.769	.98531	10
2	.0349	.0349	28.64	.99939	88	10	.1736	.1763	5.671	.98481	80
10	.0378	.0378	26.43	.99929	50	10	.1765	.1793	5.576	.98430	50
20	.0407	.0407	24.54	.99917	40	20	.1794	.1823	5.485	.98378	40
30	.0436	.0437	22.90	.99905	30	30	.1822	.1853	5.396	.98325	30
40	.0465	.0466	21.47	.99892	20	40	.1851	.1883	5.309	.98272	20
50	.0494	.0495	20.21	.99878	10	50	.1880	.1914	5.226	.98218	10
3	.0523	.0524	19.08	.99863	87	11	.1908	.1944	5.145	.98163	79
10	.0552	.0553	18.07	.99847	50	10	.1937	.1974	5.066	.98107	50
20	.0581	.0582	17.17	.99831	40	20	.1965	.2004	4.989	.98050	40
30	.0610	.0612	16.35	.99813	30	30	.1994	.2035	4.915	.97992	30
40	.0640	.0641	15.60	.99795	20	40	.2022	.2065	4.843	.97934	20
50	.0669	.0670	14.92	.99776	10	50	.2051	.2095	4.773	.97875	10
4	.0698	.0699	14.30	.99756	86	12	.2079	.2126	4.705	.97815	78
10	.0727	.0729	13.73	.99736	50	10	.2108	.2156	4.638	.97754	50
20	.0756	.0758	13.20	.99714	40	20	.2136	.2186	4.574	.97692	40
30	.0785	.0787	12.71	.99692	30	30	.2164	.2217	4.511	.97630	30
40	.0814	.0816	12.25	.99668	20	40	.2193	.2247	4.449	.97566	20
50	.0843	.0846	11.83	.99644	10	50	.2221	.2278	4.390	.97502	10
5	.0872	.0875	11.43	.99619	85	13	.2250	.2309	4.331	.97437	77
10	.0901	.0904	11.06	.99594	50	10	.2278	.2339	4.275	.97371	50
20	.0929	.0934	10.71	.99567	40	20	.2306	.2370	4.219	.97304	40
30	.0958	.0963	10 39	.99540	30	30	.2334	.2401	4.165	.97237	30
40	.0987	.0992	10.08	.99511	20	40	.2363	.2432	4.113	.97169	20
50	.1016	.1022	9.788	.99482	10	50	.2391	.2462	4.061	.97100	10
6	.1045	.1051	9.514	.99452	84	14	.2419	.2493	4.011	.97030	76
10	.1074	.1080	9.255	.99421	50	10	.2447	.2524	3.962	.96959	50
20	.1103	.1110	9.010	.99390	40	20	.2476	.2555	3.914	.96887	40
30	.1132	.1139	8.777	.99357	30	30	.2504	.2586	3.867	.96815	30
40	.1161	.1169	8.556	.99324	20	40	.2532	.2617	3.821	.96742	20
50	.1190	.1198	8.345	.99290	10	50	.2560	.2648	3.776	.96667	10
7	.1219	.1228	8.144	.99255	83	15	.2588	.2679	3.732	.96593	75
10	.1248	.1257	7.953	.99219	50	10	.2616	.2711	3.689	.96517	50
20	.1276	.1287	7.770	.99182	40	20	.2644	.2742	3.647	.96440	40
30	.1305	.1317	7.596	.99144	30	30	.2672	.2773	3.606	.96363	30
40	.1334	.1346	7.429	.99106	20	40	.2700	.2805	3.566	.96285	20
50	.1363	.1376	7.269	.99067	10	50	.2728	.2836	3.526	.96206	10
					82						74
	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.	
o/						o/					
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	.90133	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 Sino)] is the Vertical Distance.

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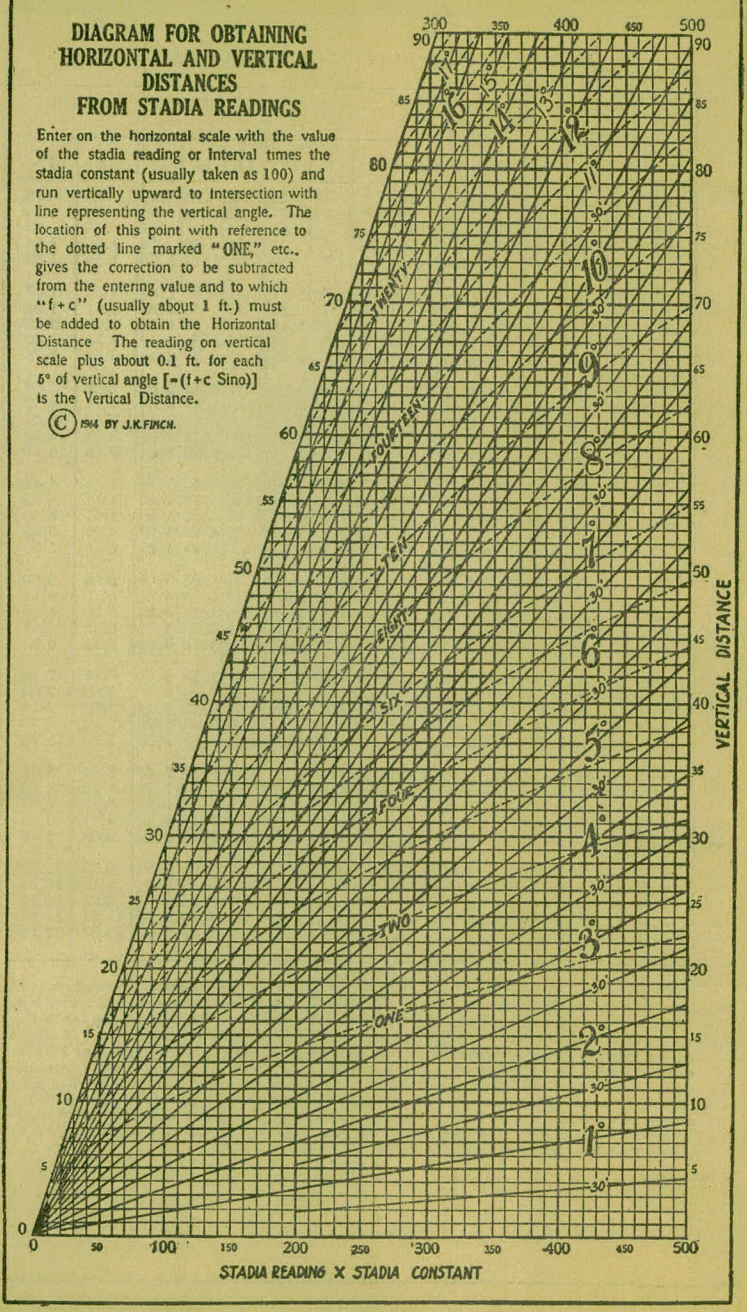

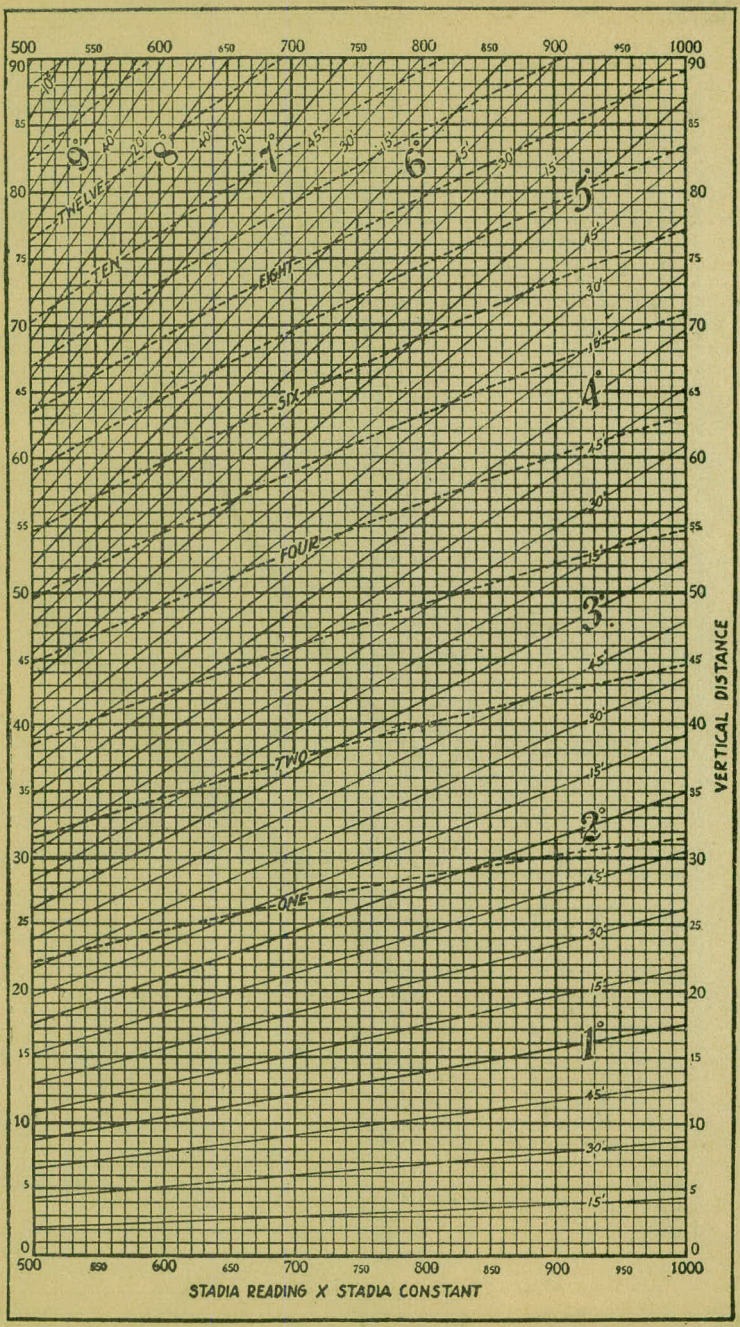
500
550
600
650
700
750
800
850
900
950
1000
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
9°
8°
7°
6°
5°
4°
3°
2°
1°
10'
40'
20'
40'
20'
45'
30'
15'
45'
30'
15'
TWELVE
TEN
EIGHT
SIX
FOUR
TWO
ONE
VERTICAL DISTANCE
STADIA READING X STADIA CONSTANT

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.

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