DR #11 - Blackhawk Co.

No. 4.

Prelim Levels.

ENGINEERS'

LEVEL BOOK

No. 412

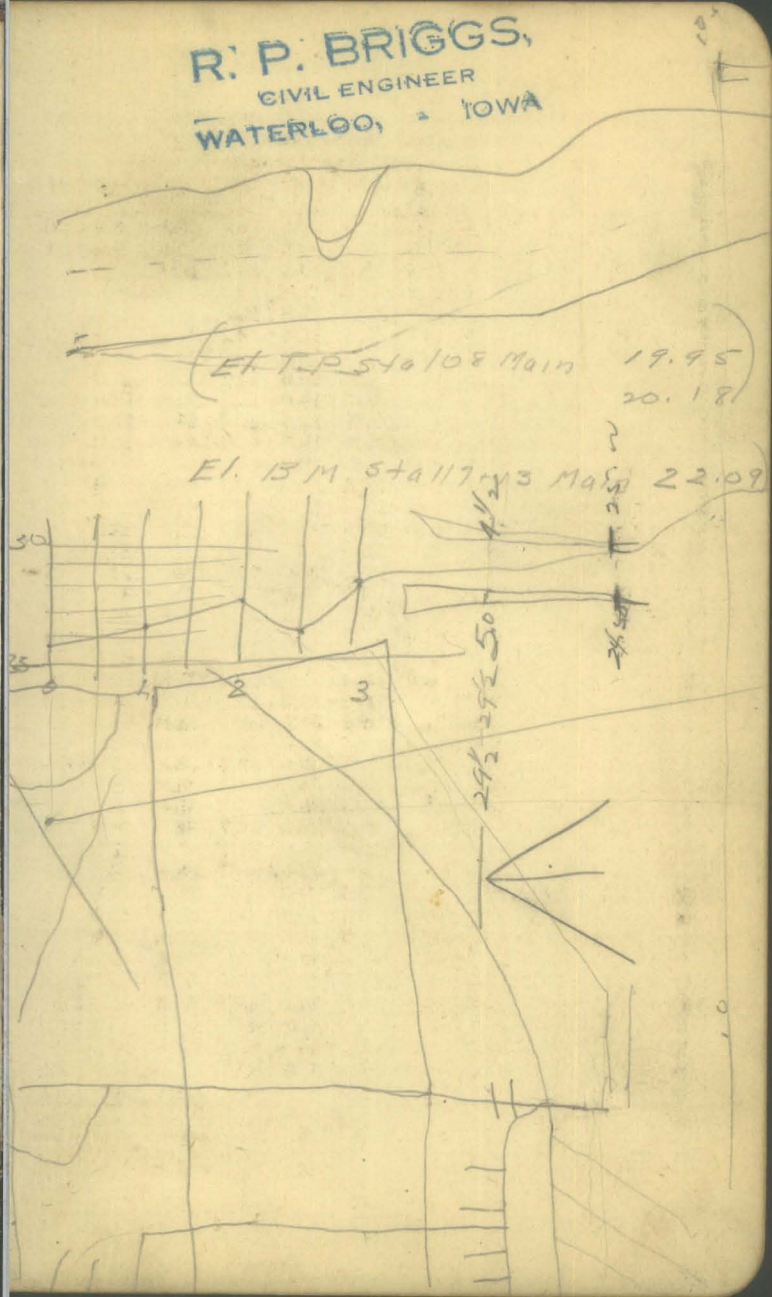
DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

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.



FILED

AUG -8 '21

F. W. Esher

COUNTY AUDITOR

Bench Marks ——— Pp 5-7

Lines Not run 1st " time over

on acct of crops = Pp 154

BR 9-9H+95 Pp 9-18

Main Sta 117+113 - 196+57 Pp 19-31

Main " 196+57 - 260+96 Pp 85-96

BR 10+10-A " 32-40

BR 11 " 41-44

" 12 45

" 13 47-50

" 14 51-54

" 15 55-70

" 15-A 71-74

" 15-13 73-74

" 15-6 75-76

" 15-G-1 77-78

" 15-G-2 77-78

" 15-D 79-81

" 15-E 83

#BR 16	Page 97
" 17	" 97
" 18	99-101
" 18-A	103
" 18-A1	103
" 19	105
" 20	107-111
" 20-A	113
" 21	115
" 21-A	115
" 22	117-122
" 22-A	123
" 22-B	123-128
" 23	129-131
" 23-A	133

Bench Marks

B.M	Elev	Description
# 9	22.09	Lath Hub S. of 2d post E. of SW¼ NE¼ Sec 17
# 10	26.19	Spikes in cor post S.W. Cor. NE¼ NW¼ Sec 17
# 11	29.04	Spike in N. end E. cap Bridge N Line Sec 17
# 12	29.73	Lath hub E+W ℄ Sec 8 by 2d F.P. W of Ditch.
# 13	35.52	Spike in S.E. of small maple grove SW of Sta 191+50 Main (End of open ditch)
# 14	36.70	Spike in N. end E cap Bridge N Line Sec 8
# 15	38.77	Spike in (Set in concrete) post W. of Gate on E+W ℄ N.E. of Center Sec 5
# 16	42.67	Spike in S end E cap Bridge on Bremer County Line

B M	Elev.	Description
#32	46.48	Spike in 1st Tel post. W. of W willow N side Hwy S Line sec 17 - Opposite Sta 31+73. BR 9.
#33	36.14	Top of large boulder in pasture 500' N of S Line Sec 17 - 50' E Sta 10 BR 9-A.
#34	35.67	Spikes near W end S cap plank Culvert N Line Sec. 8.
#35	42.53	Highest point large black boulder W of Hwy near S.E. cor NE 1/4 Sec 6.
#36	48.31	Top of largest rock in SW. cor NE 1/4 NE 1/4 Sec 6.
#37	54.61	Spike in SW Cor. post SE 1/4 SE 1/4 Sec 31 Bremer Co.
#38	45.25	Spike in N.E. Cor. post Sec 7.
#39	55.02	Top of S.E. Cor N end E wing Culvert at N W Cor Sec 9.
#40	44.30	Iron bar driven in boulder E Line F Sec 5 400' S of E+W 1/4 ℄

BR 9

Sta	B.S.	H.I.	-S.	Elev
T.P.-RP	6.97	~~26.92~~ 26.93		19.95
" "	6.76	~~26.94~~		20.18
0			6.75	20.18
1			6.00	20.93
2			5.45	21.50
3			5.20	21.73
4			4.50	22.43
5			3.70	23.23
6 - T.P.	6.70	~~30.41~~	3.22	23.71
" "	6.63	30.42	3.14	23.79
7			6.10	24.32
8			5.60	24.82
9			4.45	25.97
HUB=RP 10			3.55	26.87
11			3.35	27.07
12 - T.P.	7.06	35.20	2.28	28.14
" "	6.96	35.20 C.T.M. H.R.H.	2.18	~~28.24~~ 28.02

Sept 14 '20

= Sta 105 Main

= 0 BR 9-A.

Sta	B.S.	H.I.	-	Elev.
13		35.20	6.50	28.70
13.33			6.05	29.15
14			6.15	29.05
15			5.60	29.60
16			4.75	30.45
17			4.05	31.15
18 T.P.	9.44	41.60	3.04	32.16
" "	9.43	41.60	3.03	32.17
19			8.65	32.95
20			7.40	34.20
21			6.35	35.35
22			5.55	36.05
23			5.00	36.60
24 - T.P.	7.99	45.31	4.28	37.32
" "	7.94	45.31	7.23	37.37
25			7.35	37.96
26			6.60	37.71
		C.P.+ H.R.A.		H.R.A.

E½W¼ & SW¼ Sec 17

= O BR 9-B.

Sta	B.S.	H.I.	-S	Elev.	
27		~~45.31~~	5.50	39.51	
28			5.00	40.31	
29			3.80	41.50	
30			2.60	42.71	
31 - T.P.	6.74	~~51.01~~ 51.02	1.04	44.27	
" "	6.63	~~51.03~~	0.91	44.40	
31+73			5.75	45.27	N Hwy F
31+96			6.75	44.27	" " D.
32			6.00	45.02	
32+12			4.60	46.42	℄ Hwy 5 Line Sec 17
32+30			6.20	44.82	5 Hwy D
32+40			4.95	46.07	End 5 Hwy F.
BM 32 #			4.57	41.48	Spike in tel pole W of W willow N side Hwy opp Sta 31+73
⊙			4.30	46.72 HRA.	Bot. of pond 300' SW End of BR 9
		app. HRA.			

BR 9.A.

Sta	B.S.	H.I.	- S	Elev
Hub Sta 12 BR9	3.52	31.66		28.14
Hub 0	4.80	~~31.67~~		26.87
0+99			4.85	26.81
1			5.10	26.56
2			4.70	26.96
3			3.80	27.86
4			2.90	28.76
5-T.P.	7.54	37.14	2.06	29.60
...	7.33	37.14	1.85	29.81
6			6.40	30.74
7			5.55	31.59
8			4.75	32.39
9			4.15	32.99
V 10 T.P.	6.76	~~40.56~~ 40.57	3.34	33.80
...	6.43	40.58	2.99	34.15
B.M. #33			4.43	36.14
11			5.75	MRD 34.72
		Copy MRD.		

= Sta 10 BR 9

N Line SW, SE Sec 17 175' W of NE Cor.

= 0 BR 9-A-1.

50' E.
Top of Boulder Sta 10.

12	4057	4.50	36.07
13		3.65	36.92
14		3.10	37.47
14+06		2.90	37.67
14+23		3.05	37.52
14+40		1.40	39.17
14+55		3.00	37.57
14+69		2.50	38.07

BR 9A-1

0	40.57	6.76	33.81	=Sta 10 9+7 Br
1		5.90	35.67	
2		5.05	35.52	
3		4.25	36.32	
4		3.50	37.07	
4+09		3.00	37.57	

CRSP NRA

N. Hwy F

" " D

℄ Hwy 3 Line Sec 17

3 " D

" " F = End

325' W of N¼ & SE¼ Sec 17

BR 9-B

0	4.60	9.44	32.16	=Sta 18 Br 9
1		8.35	~~33.25~~ NRA	
2		7.25	34.35	
3		5.95	35.65	
4		4.00	37.60	
5		2.40	39.20	
5+85	CRSP NRA	0.30	~~41.30~~ End	SE Cor NE¼ SW¼ Sec 17

= End N½ & SE¼ Sec 17.

150' N of N Hwy F.L.

Main

Sta	B.S.	H.I.	-S	Elev
	5.55	27.64		
BM 9 Hub.	~~4.30~~	~~26.39~~		22.09
117+13			5.15	21.89
118			5.35	22.29
119			5.30	22.34
120			5.15	22.49
121			4.75	22.89
122 T.P.	5.41	~~28.33~~ 28.32	4.72	22.92
" "	5.15	~~28.31~~	4.48	23.16
123			5.10	23.22
124			4.85	23.47
125			4.45	23.87
126 T.P.	4.68	28.71	4.29	24.03
" "	4.94	28.71	4.05	24.27
127			4.75	23.96
128			4.80	23.91
129			4.65	24.06
130			~~4.50~~	~~24.21~~

cross road.

RR.

Hub S 2d Post E. of S W. NE ¼ Sec 17

Crosses Sage Main here

Stg	B.S.	H.I.	- S	Elev.	
131		28.91	4.30	24.41	
132 T.P.	5.57	29.33	4.95	23.76	
" "	5.30	29.33	4.68	24.03	
133			5.05	24.28	
134			5.20	24.13	
135			4.70	24.63	= ~~E H & E~~ Line N.E. ¼ Sec 17 95' E of NW¼ NE¼ SW cor.
136			5.20	24.13	→ N + S ¢ Sec 17 100' N " " "
136+21			4.75	24.58	
137			4.80	24.53	
B.M. 10			3.13	26.20	Spikes in SW cor post NW¼ NE¼ Sec 17
138 T.P.	4.80	29.45	4.68	24.65	
" "	4.58	29.45	4.46	24.87	
139			4.85	24.60	
140			4.90	24.55	
141			4.55	24.90	
142			4.75	24.70	
143			4.80	24.65	
		cost gone.		gone.	

Sta	B.S.	H.I. 29.45	-S.	Elev.
144-T.P.	5.53	~~30.39~~	4.59	24.86
" "	5.23	30.38 ~~30.37~~	4.31	25.14
145			5.50	24.88
146			5.35	25.03
147			4.85	25.53
148			4.60	25.78
✓149			4.15	26.23
150			4.35	26.03
151 T.P.	4.60	~~30.57~~	4.41	25.97
" "	4.18	30.56 ~~30.55~~	4.01	26.37
151+06			4.85	25.71
151+22			3.00	27.56
151+46			5.80	24.76
151+56			4.85	25.71
152			4.90	25.60
153			4.80	25.76
154		con. HRA.	4.70	25.86 H.R.A.
℄ 154+25				

Xes Sages Linew here.

S Hwy F. ~~Sept 16 1920~~

S " D

℄ "

N " D

N " F

Sta.	B.S.	H.I.	-S.	Elev.
155		3056	4.65	25.91
156 T.P.	5.14	~~31.24~~	4.46	26.10
"	4.90	31.25	4.21	26.35
157			5.05	26.20
158			5.00	26.25
159			5.00	26.25
160			4.65	26.60
161			4.35	26.90
#162 T.P.	5.33	~~32.46~~ 32.45	4.12	27.13
	5.18	~~32.44~~	3.99	27.26
163			5.05	27.40
Hub = RP 164			4.78	27.67
165			4.80	27.65
166			4.70	27.75
167			4.60	27.85
168 T.P.	4.95	33.24	4.16	28.29
"	4.72	33.24 C.R.H. 30 Rd.	3.93	28.52 Hill.

= Sta 0 BR 10

= ~~0 BR 11~~

169		33.24	4.70	28.54	
170			4.80	28.44	
171			4.60	28.64	
172			4.50	28.74	
173			4.80	28.44	
174 T.P.	5.19	~~33.55~~ 33.57	4.88	28.36	
" "	4.93	~~33.53~~	4.64	28.60	
175			5.35	28.19	
176			4.75	28.79	
177			4.45	29.09	
178			4.20	29.34	
▷BM#12 178+10			3.81	29.73	=B.M.
179			3.95	29.59	
180-T.P.	4.69	~~34.38~~ 34.37	3.85	29.69	
" "	4.54	~~34.36~~	3.72	29.82	
181			4.70	29.67	
182			4.35	30.02.	
		C.R.R. 20.R.R.		2RR.	

↙E+W ℄ Sec 8
= 0 BR 12 E

Sta	B.S.	H.I.	- E	Elev	
183		34.37	4.40	29.97	
184			4.80	29.57	= Sta 0 BR 13 - W
Hub. 184+75			4.77	29.60	~~0 BR (2) W.~~
185			4.95	29.42	
186 T.P.	5.50	~~35.61~~	4.26	30.11	= Sta 0 BR 14 - E.
" "	5.35	35.60	4.12	30.25	
187			5.55	30.05	
188			5.05	30.55	
189			4.85	30.75	
190			4.40	31.20	
191			3.70	31.90	
Hub 191+50 T.P.	5.05	~~36.52~~	4.13	31.47	= End of open ditch = 0 BR - N. W.
"	4.96	36.51	4.05	31.55	
B.M. #13			1.01	35.50	Use 35.52 Spike 10 S.E. of small Maple grove W of Sta 191+50
192			5.22	31.29	
193			6.00	30.51	
194			6.60	29.91	
		Chkd. W.B.A.		JHR.	

Sta	B.S.	H.I.	-S	Elev.
195		36.51	6.40	30.11
196			5.45	31.06
Hub-RR				
1+96.57			4.95	31.56

N+S St. stopped levels Sept 16'20 on acct crop weeds - (Chained to E+W Hwy.)

BR-10

Sta	B.S.	H.I.	-S	Elev	Remarks
Hub = R.P. 0	5.53	32.66		27.13	= Sta 162 Main
1			6.50	26.16	
Ditch Xing 1+10			7.80	24.86	
2			5.25	27.41	
℄ 2+76			4.75	27.91	N+S ℄.
3			4.80	27.86	
4			4.45	28.21	
5			3.90	28.76	
6 - T.P.	5.81	34.97	3.50	29.16	
" "	5.63	~~34.96~~	3.33	29.33	
7			5.50	29.47	
8			5.00	29.97	
9			5.00	29.97	
℄ in ditch 9+20			5.25	29.72	
10			4.80	30.17	Not end - Stopped here Sept 16 '20 acct. Crop.
Hub. 10+87			3.30	31.67	N+S ℄ Sec 8. Approx 50' S. of 1/16 Line
R.P.		[illegible]	2.75	32.22 [illegible]	Lath by hub. Sta 10+87

Sta	BS	H.I.	-S	Elev
Hub 10+87	9.35	41.02		31.67
R.P.	8.80	41.02		32.22
11				
L +50			9.25	31.77
12			8.75	32.27
13			7.75	33.27
14			7.15	33.87
15			6.60	34.42
16			6.35	34.67
17			5.75	35.27
L 18			5.05	35.97
19			4.75	36.27
20			3.95	37.07
21			3.65	37.37
22			3.10	37.92
23			2.40	38.62
24			2.10	38.92

Sta	BS	H.I. 41.02	- S	ELEV
25	8.02	49.89	1.15	39.87
26		49.89	7.70	40.19
27			1.00	40.89
℄ +66			5.75	42.14
28			6.00	41.89
29			5.55	42.34
30			5.55	42.34
31			5.30	42.59
32			5.25	42.64
33			4.75	43.14
34			4.25	43.64
35			3.00	44.89
36			2.40	45.49
37			2.35	45.54
℄ +50	9.88	55.92	1.85	46.04
38			9.30	46.62
39			8.25	47.67

N+5 ℄ SE 1/4 Sec 8

Sta	BS	H.I.	- S	Elev	
40		55.92	7.35	47.57	
41			6.65	49.27	
42			5.75	50.17	
43			4.50	51.42	
44			3.90	52.02	
+15			3.45	52.47	W Hwy ℄
+28			4.15	51.77	" " D
+45			1.90	54.02	℄ "
+60			3.80	52.12	E " D
+75			2.85	53.07	End E. " ℄

BR 11

	B.S.	H.I.	F.S	Elev
~~Hub 0~~	~~5.48~~	~~33.65~~		~~27.67~~
~~1~~			~~5.65~~	~~28.00~~
~~2~~			~~5.20~~	~~28.45~~
~~3~~			~~4.95~~	~~28.70~~
~~Hub = R.R. 3+67~~		ERR!	~~4.60~~	~~28.05~~

BR 11

BM #12	16.00	45.73		29.73
0			17.28	28.45
1			16.90	28.83
+75			16.10	29.63
2			15.60	30.13
3			15.30	30.43
4			15.00	30.73
5			14.50	31.23
6			14.00	31.73
7			13.30	32.43
8			12.60	33.13

~~= Sta 164 Main~~

~~Not End Stopped here Sept 16 at c.t. Crop~~
~~N45E 9 posts N. from Corner.~~

= Sta 170 Main

N45E

Sta	B.S.	H.I.	- S	Elev
9		45.73	12.00	33.73
10			10.90	34.83
11			9.70	36.03
V + 50			9.00	36.73
12			8.70	37.03
13			8.35	37.38
L 14			7.70	38.03
15			7.15	38.58
16	7.85	47.43	6.15	39.58
17			6.95	40.48
18			5.95	41.48
+ 16			5.35	42.08
+ 30			6.15	41.28
+ 50			4.10	43.33
V + 62			5.25	42.18
19			5.30	42.13
20			4.60	42.83

Sta	B.S.	H.I.	- S	Elev.
21		47.43	3.2W	44.13
~~+50~~			3.0 ~	44.43
~~+90~~			1.90	45.53 nd -

at E end E+W
℄ Sec 7

Note: Use #2 S.P. Sta 18 to end

E W Hwy ℄
E Hwy ⊙
℄ "

Hwy Ditch bo Hom Ave 1.0
Below elevs taken

BR 12

0 Ditch Xing	4.80	34.53		29.73
0+60			6.80	27.73
1			5.60	27.93
2			4.75	29.78
3			4.05	30.48
4			3.45	31.08
5			3.15	31.38
6 T.P.	6.58	~~38.95~~ 38.96	2.16	~~32.37~~
" "	6.30	~~38.97~~	1.86	32.67
L.6+50				
7			5.65	33.31
8			4.85	34.11
9			4.55	34.41
10			3.70	35.26
10+50			2.30	36.66

= Sta 178+10 Main

- End at center Sec 8.
(Beware Skunk)

BR 13

Sta	B.S.	H.I.	-S	Elev.
0	6.73	36.30		29.57
1			6.05	30.25
2			5.50	30.80
3			4.20	32.10
4			3.70	32.60
5			3.45	32.85
6 - T.P.	6.90	40.07	3.13	33.17
" "	6.65	~~40.06~~	2.89	33.41
L 6+50				
7			6.30	33.77
8			5.65	34.42
9			5.00	35.07
L 10			4.00	36.07
11			3.00	37.07
12 - T.P.	8.97	46.71	2.33	37.74
" "	8.80	~~46.72~~	2.15	37.92
13			8.00	38.71

= Sta 184 Main

Sta	B.S.	H.I.	-S	Elev.	Remarks
14		46.71	7.10	39.61	
15			6.20	40.51	
16			5.30	41.41	
17			3.95	42.66	
17+44			3.25	43.46	E Hwy F.
17+58			4.28	42.43	" " D
17+80			2.30	44.41	℄ Hwy W Line Sec 17
17+96			3.75	42.96	W " D
18			3.60	43.11	
18+05			3.10	43.55	" " F = End

CRN.
JKA.

BR 14

Sta.	B.S.	H.I.	-S	Elev.
Hub=R.P. 0'	5.81	35.92		30.11
1			5.45	30.47
Ditch Xing 1+60			7.50	28.42
2			5.50	30.42
V 2+50				
3			5.05	30.87
4			4.30	31.62
5			3.90	32.02
6-T.P.	6.64	~~39.03~~	3.53	32.39
" "	6.53	39.02	3.43	32.49
7			6.45	32.57
8			6.40	32.62
9			6.00	33.02
10			5.60	33.42
11			4.65	34.37
Hub 11+07			3.92	35.10
R.P.			3.48	35.54

CRH.
JARa.

= Sta 186 Main

(Note:- consider running this line S.E then E then N.E also due N. or both from sta 11+07 to tap property to North)

N-S ¢ Sec 8 Approx 1000' N of sec Cen

Lath hub by sta 11+07

Hub				
	8.57	43.67		35.10
IR 1	8.13	43.67		35.54
11+ 50			8.30	35.37
L 12			7.85	35.82
13			7.30	36.37
14			7.20	36.47
15			5.70	37.97
+L1			4.55	39.12

End

BR 15

Sept 22 '56

Sta.	B.S.	H.I.	-S	Elev.
B.M.	2.52	38.04		35.52
0			6.52	31.52
1			6.70	31.34
2			6.75	31.29
3			5.85	32.19
4			5.85	32.19
L 5			5.90	33.14
6 - T.P	5.48	~~38.02~~	5.50	~~32.57~~
" "	5.22	38.03	5.23	32.81
7			5.50	32.53
8			4.95	33.08
9			5.15	32.88
10			4.70	33.33
11			4.55	33.48
12 - T.P.	6.62	~~40.32~~	4.33	33.70
"	6.35	~~40.32~~	4.06	33.97
Dmchxing 12+48		CRH M.A.Q.	7.15	32.57 JRQ.

Spike in SE of Maple grove SW Sta 0 = Sta 191+50 Main

Xec file line here

13		40.32	6.60	33.72
13+77			6.20	34.12
13+84			7.35	32.97
14			5.90	35.42
14+15			4.60	36.72
14+40			7.30	33.02
14+51			6.15	34.17
BM #34			4.65	35.67
T.P. R.P.	4.96	39.08	6.20	34.12
"	4.74	39.08	5.98	34.34
16			5.00	34.08
17			4.75	34.33
18 - T.P.	5.73	~~40.40~~ 40.39	4.41	34.67
"	2.52	~~40.38~~	4.22	34.86
Hub 19			5.52	34.87
19+50			7.50	32.89
20			5.40	34.99
		C.P.# 30.R.G.		9.R.L.

Xes file line here

S Hwy F

S " D

℄ Hwy

N " D

N " F

Current N Line sec 8

Spikes ~~W~~ end ~~E~~ cap. plank

= Sta 0 BR 15 - A

Ditch X'ing

L 21		40.39	5.10	35.29
22			4.50	35.89
23			4.40	35.99
V 24 - T.P.	5.78	44.93	4.24	36.15
" "	5.51	41.94	3.96	36.43
25			5.10	36.84
26			4.95	36.99
27			4.80	37.14
Hub = R.P. L 28			4.45	37.49
29			4.25	37.69
30 T.P.	6.77	44.91	3.80	38.14
" "	6.57	44.91	3.57	38.37
31			6.60	38.31
L 32			6.45	38.46
33			6.30	38.61
34			5.95	38.96
35			6.00	38.91
		corr. to R.P.		gRA.

= 5/4 0 BR 15 - B.

		H.I.		
S79	13.5	44.91	-5	Elev
36 - T.P.	6.53	45.97	5.47	39.44
" "	6.36	45.97	5.30	39.61
37			6.35	39.62
37+88			5.60	40.37
38			7.10	38.87
38+25			4.40	41.57
38+50			6.25	39.72
38+75			5.40	40.57
39 Hub				
40	4.60	45.07	5.50	40.47
B.M. #3	2.53	45.06	3.44	42.53
41			4.70	40.36
42 - T.P.	5.44	46.34	4.16	40.90
" "	5.28	46.34	4.00	41.06
43			5.15	41.19
44			5.10	41.24
45			4.65	41.69

CRR
WRR.

WRR.

4.60

E Hwy F 600'S.A at E4 W¼ Sec 5

" " D

℄ Hwy

W " D = Sta 0 BR 15-C

W " F

Note: Thicket of small willows each side of Hwy.

In pasture near Hwy SE cor. NE¼ Sec 6
Highest point large black boulder

46		46.34	4.40	41.94
47			3.95	42.39
L 47+75				
48			3.65	42.69
49 - T.P.	5.40	48.48	3.26	43.08
" "	5.08	48.48	2.94	43.40
⊙			7.50	40.98
50			5.40	43.08
51			5.05	43.43
52			4.50	43.98
53			3.85	44.58
54			3.55	44.63
55 - T.P.	5.72	51.04	5.16	45.32
" "	5.52	51.03	2.97	45.31
56			5.90	45.14
57			5.45	45.59
58			4.75	46.29

Pond Sta 47+75

Sta	13.5.	H.I.	-S	Elev.
58+82		51.04	4.60	46.44
59			4.85	46.19
60			4.75	46.29
61 - T.P.	5.58	52.20	4.42	46.62
" "	5.30	52.20	4.14	46.90
B.M.#36			2.73	48.31
62			5.25	46.95
62+72			4.50	47.70
63			4.80	47.40
L 63+50				
64			4.35	47.85
Hub: RR 65			4.05	48.15
66 - T.P.	5.86	54.44	3.62	48.58
" "	5.65	54.44	3.41	48.79
67			5.60	48.84
68			5.25	49.19
69			4.80	49.64
		cont. D.R.A.		gnd.

SW Cor NE¼NE¼

E+W ℄ NE¼ Sec 6 200' E of

Top of boulder SW Cor. post NE¼NE¼ Sec 6.

NE¼NE Sec.

14 S ℄ NE¼ Sec 6 300' N SW Cor

= 540 O BR 15-D.

Sta	B.S.	H.I.	+S	Elev.	
70		54.44	4.40	50.04	
71			5.95	50.49	
71+60			4.13	50.31	S Hwy F
71+70			5.25	49.19	S " D
71+88			1.95	52.49	℄ Hwy Bremer Co Line approx 375' W of NW SE SE¼ sec 31
72 T.P.	5.31	57.07	2.68	51.76	
" "	5.03	57.06	2.41	52.03	
B.M. #37			2.45	54.61	Spike in S.W. cor. Ast SE¼ SE¼ sec 31.
72-T.P.	4.82	56.58		51.76	
" "	4.55	56.58		52.03	
72+8			7.30	49.28	N Hwy D
72+15			5.60	50.98	" " F.
73			5.80	50.78	
74			5.15	51.43	
Hub = RP. 475			4.70	51.88	= Sta 0 BR 15 E.
76			4.25	52.33	
		1324 30.R.Q.		1324.	

77		56.58	3.85	52.73
78 - T.P.	6.38	59.57	3.39	53.19
" "	6.18	59.56	3.21	53.37
79			6.05	53.51
80			5.80	53.76
L 80+50			5.45	54.11
81			5.20	54.36
82			4.70	54.86
83			4.35	55.21
84 - T.P.	7.33	63.24	3.65	55.91
" "	7.03	63.24	3.35	56.21
85			6.85	56.39
L 86			6.30	56.94
87			5.80	57.44
88			4.65	58.59
89			3.60	59.64
L 89+75 T.P.	6.62	66.91	2.95	60.29
" "	6.19	66.91	2.52	60.72

Sta	BS	H.I	-S	Elev
90		66.91	6.55	60.36
91			5.20	61.71
92			3.65	63.26
93			2.90	64.01
94			2.25	64.66
94+30			1.80	65.11

End at N+S & SE¼ Sec 31

approx 100 rod / N of road

BR 15-A

Sept 24 '20 22

Sta Hob = R.P.	B.S.	H.I.	-S	Elev	
0	7.73	42.60		34.87	= Sta 19 BR 15
0+10			9.55	33.05	Ditch xing.
1			7.35	35.25	
2			6.60	36.00	
3			5.85	36.75	
4			5.00	37.60	
5			4.05	38.55	
6 T.P.	8.70	~~48.46~~ 48.47	2.84	39.76	
" "	8.46	~~46.48~~	2.58	40.02	
7			1.75	40.72	
8			6.90	41.57	
8+85			5.35	43.12	E. Hwy F.
9			6.00	42.47	" " D
9+20			4.65	43.82	170' N X roads.
9+35			5.40	43.07	℄ Hwy E line Sec 6
			6.20	42.27	In ditch by Sta 9+35
10			5.15	43.32	
		CRH NRA.		NRA.	

Sta	BS.	HI	-S	Elev	
11		48.47	3.35	45.12	℄ E-W Hwy S Line Sec 6
11+20			5.05	43.42	Hwy D
11+24			4.00	44.47	= End of NE Cor post Sec 7
B.M. #38			3.22	45.25	Spike in NE Cor post Sec 7
				gjka.	

BR 15-B

Hub=R.P.					
0	8.28	45.77		37.49	= Sta 28 BR 15
1			7.90	37.87	
2			7.20	38.57	
2+40			6.80	38.97	E Hwy F.
2+55			7.70	38.07	E Hwy D
2+70			5.70	40.07	℄ Hwy W Line Sec 5
2+85			7.20	38.57	W " D
3+00			6.40	39.37	W " F = End
				gjka.	

gjka.

Note. Use S.P. from point 100' E of E Hwy F. to end.

BR 15-C

Sta	B.S.	H.I.	-S	Elev.
B.M. Grlevel	5.82	48.35		42.53
0			7.80	40.55
			8.65	39.70
1			7.45	40.90
2			6.50	41.85
3			5.90	43.45
4			5.35	43.00
5			5.00	43.35
6 T.P.	8.29	~~52.29~~	4.35	44.00
11	8.13	52.30	4.18	44.17
7			7.90	44.40
8			6.95	45.35
9			5.95	46.35
10			5.00	47.30
11			4.75	47.65
12 T.P.	5.88	~~53.24~~ 53.23	4.94	47.36
	5.57	~~53.22~~	4.65	47.65

CHKD. CHKD.

W of Hwy near S.E. cor N.E. ¼ Sec 6
Highest point large black boulder
= Sta 38+50
Hwy Ditch by Sta 0

= Sta 0 BR 15-C-1

Note. W side Hwy Sta 0-13 BR 15-C
Contains approx 30 small cott
Poplar + Willow clumps + trees

Note. W Hwy Ditch dpth. approx 1.25'

Sta	B.S.	H.I.	-S	Elev	
13		53.23	5.80	47.43	= Sta 0 BR 15-C-2
14			5.90	47.33	
15			4.90	48.33	
16			4.05	49.18	
L: 17			3.25	49.98	
17+30			3.70	49.53	W Hwy D.
17+54			2.50	50.73	End at SE Cor. NE¼ NE¼ Sec 6.
		Const. Hdq.			
		BR 15-C-1			
0		52.30	8.30	44.00	= Sta 6 BR 15-C
0+15			7.55	44.75	℄ Hwy E Line Sec 6
0+40			9.05	43.25	E Hwy D
0+60			7.40	44.90	E ∥ F = End
		BR 15-C-2.			
0		53.23	5.80	47.43	= Sta 13 BR 15-C.
0+25			5.20	48.03	℄ Hwy E Line Sec 6
0+60			6.70	46.53	E ∥ D
0+85		Const. Hdq.	5.55	47.68	E ∥ F = End

BR 15-D

Sta	B.S	H.I	-S	Elev	
Hub=RP 0	7.15	55.30		48.15	=Sta 65 BR 15
1			6.60	48.70	
1+9			6.25	49.05	= N+S ℄ NE $\frac{1}{4}$ sec 6.
2			6.30	49.00	
3			5.85	49.45	
4			4.95	50.35	
5			4.05	50.25	
6- T.P.	6.15	~~58.01~~	3.44	51.86	
" "	5.85	58.00 ~~57.99~~	3.16	52.14	
+7			5.65	52.35	
8			4.80	53.20	
9			4.10	53.90	
10			3.10	54.90	
10+24			2.60	55.40	S Hwy F.
10+40			4.00	54.00	S Hwy D
10+55			2.00	56.00	℄ Hwy
℄ 10+72			2.90	55.10	N side Hwy
		WPH 30RQ.	3.75	54.25 [illegible initials]	Hwy D by Sta 10+72

11		58.00	2.75	55.25
12 - T.P.	8.44	~~64.30~~	2.14	55.86
" . .	8.26	64.31	1.95	56.05
13			7.80	56.51
14			6.50	57.81
15			5.10	59.21
16			4.00	60.31
17			3.00	61.31
17+10			2.45	61.86
℄ 17+30			3.10	61.21
17+50			4.00	60.31
17+62		Chkd. MRA	2.50	61.81 MRA.

N Hwy Ditch are approx 1.60'

~~Sta 15 in D - S - 1.70~~

℄ N+S Hwy

30' E of Sec Cor
End S Line Bremer Co

BR 15 E.

Sta Hub = R.P.	B.S.	H.I.	-S	Elev
0	6.73	58.61		51.88
1			6.05	52.56
2			5.40	53.21
3			4.95	53.66
4			4.45	54.16
4+58			3.65	54.96
		Rest. Hub.		BRA.

= Sta 75 13R15

End N+S ¼ SE ¼ Sec 31

Approx 350' N. of Hwy

Main

579	B.S.	H.I.	−S	Elev
Hub=RP				
196+57	9.65	41.21		31.56
197			9.45	31.76
198			9.75	31.46
199			9.50	31.71
200			9.40	31.81
201			9.15	32.06
202			8.85	32.36
203			8.10	33.11
+25			11.50	29.71
L 204			8.85	32.36
+65			8.50	32.71
205			8.40	32.81
206			8.15	33.06
207			8.20	33.01

N45E NE of Jnct of Main & BR 15

Ditch King.

N45E Sec 8

Main

Sta	B.S.	H.I.	-S	Elev	
	N				
208		41.21	7.85	33.36	
209			7.35	33.86	
210			7.55	33.66	
+25			7.90	33.31	5 Hwy F
+37			8.15	33.06	" " D
+55			4.00	37.21	℄ Hwy N Line Sec 8
+75			8.25	32.96	N " D
+83			7.40	33.81	N " F
BM.			4.60	36.61	

Main

Sta	13.5	H.I.	-S	Elev.	
B.M. #14	2.87	39.57		36.70	36.70
Sta 210+75			6.55	33.02	
210+83			5.85	33.72	
211			5.80	33.77	
212			5.45	34.12	
213			5.35	34.22	
214			5.60	33.97	
215			5.35	34.12	
Ditching 215+80			7.25	32.32	
216 T.P.	5.23	39.59	5.21	34.36	
"	4.96	39.59	4.94	34.63	
217			5.00	34.59	
218			4.65	34.94	
219			4.70	34.89	
220			4.50	35.09	
221			4.70	34.89	
222 T.P.	5.17	40.10	4.66	34.93	
"	4.96	40.10	4.95	35.14	

Cont. over

Sept 27. 1922

Sec 8.

Spike in N End Ec ap Bridge N Line

N Rwy Ditch = 0 BR 16

" " F Line Sec 5

= 5+40 BR 17 + 0 BR 18.

Stg	BS	H.I	-S	Elev.	
223		40.10	5.70	34.40	
224			6.35	33.75	In Ditch
224+05			6.50	3360	Approx 450' E of N+S & 500 " " E+W & SE 1/4 Sec 25
225			4.90	35.20	
226			4.70	35.40	
227			4.80	35.30	= O BR 19.
228 - T.P.	5.47	40.81	4.76	35.34	
" "	5.17	40.81	4.46	35.64	
229			1.60	33.21	Ditch xing -
230			5.75	35.06	
231			5.45	35.36	
232			5.05	35.76	
233			4.95	35.86	
234 T.P.	5.17	41.50	4.45	36.33	= O BR 20
" "	4.84	41.50	4.15	36.66	
235			5.05	36.45	
NVO 236			4.82	36.68	= O BR 21.

area 3URG.

3URG.

23
LB
50 0
21

549	13.5.	H.I.	-5	Elev.
237		41.50	5.00	36.50
238			4.90	36.60
239			5.15	35.35
240-T.P.	4.32	40.90	4.92	36.58
" "	4.05	40.90	4.65	36.85
B.M. #15			2.73	38.77
241			4.90	36.00
242			5.05	35.85
243			5.15	35.75
244			4.55	36.35
245			4.00	36.90
246-T.P.	5.79	43.54	3.15	37.75
" "	5.60	43.53	2.97	37.93
247			4.40	39.14
248			4.80	38.74
249			4.40	39.14
250			4.60	38.94
		check 9180.		9180.

on E+W ℄ N of E+W ℄ sec 5
Spike in post set in 8000 c. W. of gate

Sta				
250+95		43.57	2.95	40.59
251			3.20	40.34
252 - T.P.	4.38	43.73	4.19	39.35
" "	4.15	43.74	3.95	39.59
253			4.35	39.39
254			4.65	39.09
255			5.00	38.74
256			5.35	38.39
257			4.85	38.89
Hub = RP				
257+50			4.65	39.09
258 TP	9.07	48.34	4.47	39.27
" "	8.84	48.34	4.24	39.50
259			9.50	38.84
260			7.80	40.54
260+41			7.10	41.24
+ 50			9.70	38.64
+ 70			4.05	44.29
+ 85			9.25	39.09
+ 96		crank 91RA	7.45	40.89

E4W & NE ¼ Sec 5

= O BR 22

Willow to remove here.

= O BR 23

Pitch Xing.

		H.I.	- S	Elev
S. Hwy F	BM 16	48.34	5.67	42.67
	Spikes. End E cap Bridge			

" " D

℄ Hwy Bremer Co. Line

N " D

" " F

BR 1 L

Sta	BS	H.I.	-S	Elev	
BM #14	6.58	43.28		36.70	Spike in N. End E cap Bridge
0			10.40	33.88	= Sta 210+75 Main.
0+50			12.05	31.23	N Side Bridge
1			10.35	32.93	to Hwy D
2			9.70	33.58	" " "
2+34			8.35	34.93	End N Hwy F & N45 ℄ Sec 5

BR 17

HWD=R.R.					
0	5.95	40.31		34.36	= Sta 216 Main
"	5.68	40.31		34.63	
1			5.50	34.81	
2			4.40	35.91	
3			3.85	36.46	
3+68			3.10	37.21	Approx 40 rods N of N Hwy. F.
				HWD.	End N45 ℄ Sec 5

crest HWD.

5 Line Sec 5

BR 18

Sept - 28 20

Sta	B.S.	H.I.	- S	Elev
Hub=RP				
0	5.62	39.98		34.36
"	5.36	39.99		34.63
1			6.90	33.09
2			4.80	35.19
3			4.35	35.64
4			4.05	35.94
L 5			4.15	35.84
6 T.P.	6.75	~~43.40~~	3.34	36.65
"	6.45	43.40	3.04	36.95
7			6.45	36.95
8			5.95	37.45
9			5.25	38.15
10			4.60	39.80
11			3.60	39.80
L 11+17				
12 T.P.	8.86	~~49.32~~	2.94	to 46
"	8.56	49.33	2.63	to .71
		ORH.		
		XRA.		ORA.

= S/9 216 Main

In small pond

5+9	13.5	H.I.	-5	Elev.
13		~~49.33~~	8.05	41.28
14			6.80	42.53
15			5.85	43.48
16			5.10	44.23
17			4.45	44.88
18 - T.P.	6.15	~~51.49~~	3.51	~~45.82~~
" "	5.93	51.98	3.28	46.05
19			5.50	46.48
20			4.70	47.28
21			3.75	48.23
22			2.85	49.13
23 - T.P.	6.25	55.91	2.32	49.66
" "	6.05	55.91	2.12	49.86
23+82			5.70	50.21
23+90			6.75	49.26
23+99			5.20	50.71
24+12			4.40	51.51
24+30		appr.	6.90	49.01
24+47		bldg.	5.30	50.61

W Hwy F.
" " D
= Sta 0 BR 18 A
℄ Hwy E Line Sec 5.
E Hwy D
" " F - End

BR 18-A

Sta	B.S	H.I.	-S	Elev.	
0		55.91	5.20	50.71	= Sta 23+94 BR 18
1			5.75	50.16	
2			5.60	50.31	
L3			4.70	51.21	= Sta 0 BR 18-A.1.
3+75			3.45	52.46	℄ E+W Hwy
3+95			4.80	51.11	S+W Hwy D.
4+05			3.35	52.56	End - N.E. cor post Sec 8

BR 18-17-1.

0		55.91	4.70	51.21	= Sta 3 BR 18-17.
0+63			4.85	51.06	N+E Hwy D.
0+90			3.15	52.76	℄ Hwy
1+05			4.20	51.71	~~S~~+W Hwy D
1+12			3.75	52.16	End - N.W. Cor post Sec 9.
BM #39			0.89	53-02 DNGA.	Top of S.E. cor N. end E wing of Sec 9. Conc Culvert at N.W. Cor

cross NPCA.

BR 19

Sta	B.S.	H.I.	-S	Elev	
Hub=RP 0	6.35	41.65		35.30	=Sta 227 Main
0+50			8.25	33.40	Ditch Xing
1			6.40	35.25	
2			4.85	36.80	
3			4.35	37.30	
4			3.65	38.00	
4+78			2.60	39.05	End N+S ℄ Sec 5
		CRH' SRA.		SRA.	

BR 20

Sta	B.S.	H.I.	-S	Elev
Hub=R.P. 0	3.67	~~40.00~~		36.33
" "	3.36	40.01 ~~40.02~~		36.66
1			4.40	35.61
2			5.25	34.86
3			5.10	34.91
3+50			6.15	33.96
4			5.25	34.86
5			4.10	35.91
6. T.P.	5.03	41.49	3.55	36.46
" "	4.81	41.49	3.33	36.68
7			5.35	36.14
8			5.60	35.89
9			5.25	36.24
10			4.70	37.79
11			4.30	37.19
12-T.P	6.64	44.46	3.67	37.82
" "	6.44	44.46	3.47	38.02
		CROI. NRA		NRA.

= Sta 234 Main

Ditch xing -

Sta	B.S.	H.I.	-S	Elev.
13		44.46	6.25	38.21
✓14			5.60	38.86
15			5.00	39.46
16			4.30	40.16
17			3.70	40.76
18 = T.P.	6.98	48.46	2.98	41.48
" "	6.81	48.46	2.81	41.65
19			6.95	41.51
20			6.25	42.21
21			5.50	42.96
21+53			5.75	42.71
B.M.#40			4.16	44.30
21+62			5.95	42.51
21+80			3.05	45.41
22			5.85	42.61
℄ 22+16			4.38	44.08
23			4.45	44.01

CRH
JRP

[illegible]

W Hwy F

E line secs 400' S of sec cen.

Iron bar in boulder at W Hwy F

W Hwy D

℄ Hwy

E Hwy D

" " F = 0 BR 20 - A.

25

Sta	B.S.	H.I.	-	Elev
24-T.P.	6.11	~~50.46~~ 50.47	4.11	44.35
" "	5.90	~~50.48~~	3.88	44.58
25			6.35	44.12
L 26			5.90	44.57
27			5.55	44.92
L 28			4.90	45.57
29			4.05	~~46.42~~
30 · T.P.	7.62	~~54.98~~	3.11	47.36
" "	7.34	54.98	2.83	47.64
31			6.85	48.13
32			6.30	48.68
33			5.40	49.58
34			4.35	50.63
35			3.55	51.43
36			2.50	52.48
36+97			1.65	53.33

~~END~~ 9MA.

9MA.

End N45 & SW¼ Sec 4

Approx 30 rods S of E+W ¼ &

BR 20-A

Sta	BS	H.I.	-S	Elev
0	7.50	51.58		44.08
1			7.50	44.08
2			6.95	44.63
3			6.35	45.23
4			5.70	46.88
5			4.85	46.73
6			4.00	47.58
6+18		approx. HHL	3.65	47.93

= Sta 22+16 BR 20

End - E+W ℄ 500 4

Approx 26 Rd Est E Hwy F.

BR 21

Sta Hub-RP.	B.S.	H.I.	-S	Elev	
0	7.05	43.73		36.68	= Sta 836 Main
1			6.40	37.33	
2			6.10	37.63	
3			5.70	38.03	
4			5.10	38.63	= Sta 0 BR 21-A
5			4.40	39.33	
6			3.70	40.03	
6+65			3.35	40.38	End NHS & Sec 5

BR 21-A

0		43.73	5.10	38.63	= Sta 4 BR 21 200' Nof Center
1			3.90	39.83	
2			2.35	40.38	
2+49			2.05	41.68	End Center Sec 5.
		CRH. grd.		grd.	

BR 22

Sta	BS	H.I	-S	Elev
Hub~RP				
0	3.23	~~42.58~~		39.35
	3.00	42.59		39.59
1			4.10	38.49
2			3.95	38.64
3			5.53	37.06
4			4.80	37.79
5-TP.	5.68	44.29	3.98	38.61
" "	5.48	44.29	3.78	38.81
6			5.45	38.84
7			5.15	39.14
8			4.70	39.59
Hub~R.P.				
8 7 84			3.54	40.75
				BM.

BM.

= Sta 252 Main

= Sta of BR 22 - A.

NE¼ Sec 5

N-S ℄ Sec 5 33 rods 5 Not E-W ℄ occ crops.

Not end - Stopped here Sq 128.20

DR 22

Nov 4, '20

Sta	BS	H.I	-S	Elev	
Hub 8+84	9.10	49.85		40.75	
L 9			9.20	40.65	
10			8.15	41.70	
11			7.60	42.25	
12			6.60	43.25	
13			5.60	44.25	
14			4.80	45.05	
+66			4.55	45.30	5 Hwy E
+78			5.00	44.85	5 Hwy D
15			2.70	47.15	E Hwy
+70			4.60	45.25	N to O
L +46			3.50	46.35	N to E
16			3.35	46.50	
17			2.80	47.05	
18	6.48	54.48	1.85	48.00	
19			6.55	47.93	
20			5.90	48.58	

Sta	B.S.	H.I.	-S	Elev.
21		54.48	5.10	49.38
L + 00				
22			5.00	49.48
23			3.95	50.53
24	5.25	56.73	3.00	51.48
25			4.60	52.13
26			4.40	52.33
29			3.50	53.23
+06			3.30	53.43

Approx 45 R.I.s N. of Hwy

End N+S & SW¼ Sec 32

BR 22-17

Sta	BS	H.I.	-S	Elev.
HUB=RP				
0	3.68	44.29		38.61
1			5.80	38.49
2			4.60	39.69
3			3.75	40.54
4			4.00	40.29
4+75			3.75	40.54
		check HI.		44.29

= Sta 5 BR 22

End IN 3 & Sec 5 At center NE¼

13 R 22-13

Sta	BS	HI	FS	Elev
B.M.	8.80	49.55		40.75
0			9.96	39.59
+80			9.30	
1			9.30	40.25
L 2			8.10	41.45
3			7.40	42.15
4			6.30	43.25
5			5.10	44.45
6			4.10	45.45
7			3.85	45.70
8	7.05	54.02	2.58	46.97
9			6.45	47.57
10			5.70	48.32
11			4.85	49.17
12			3.90	50.12
13			3.15	50.87
14			2.60	51.42
+08			2.35	51.67

Hub Sta 8+84 13 R 22
= Sta 8 13 R 22
N+S & Sec 5

BR 23

Sta	BS	H.I	-S	Elev	
Hub=R.P. 0	5.60	44.69		39.09	= Sta 25-7+50 Main
1			5.80	38.89	
2			5.50	39.19	
3			4.90	39.79	
4			3.90	40.79	
5			3.30	41.39	
6- T.P.	6.51	48.78	2.42	42.27	
" "	6.30	48.96	2.21	42.48	
7			5.85	42.93	
7+50			7.25	41.43	In pond Use 200' S.P. here.
8			5.30	43.48	
9			4.60	44.18	
10			4.55	44.23	
11			4.20	44.58	
11+50 T.P.	6.58	51.60	3.76	45.02	= Sta 0 BR 23-A.
" "	6.35	51.60	3.53	45.25	
12			5.95	45.65	

C.L. of Rd.

Sta	B.S.	H.I.	- S	Elev
13		51.60	5.60	46.00
14			4.85	46.75
15			4.35	47.25
16			3.60	48.00
17			2.70	48.90
18 - T.P.	6.67	55.71	2.56	49.04
"	6.53	~~55.90~~	2.43	49.17
18+57			5.60	50.11
18+70			6.90	48.81
18+95			4.10	51.61
19+10			7.20	48.51
19+30			5.70	50.01
		CR&I.		
		98Ra.		98Ra.

W Hwy F

" " D

℄ Hwy ℄ Line Sec 5

E " D

E " F End Approx 16 rods

N of E&W℄ NE¼ Sec 5

BR 23 A

Sta	BS	H.I.	−S	Elev
0	9.22	~~54.24~~		~~45.02~~
	9.00	54.25		45.25
1			8.00	46.25
2			7.00	47.25
3			5.00	49.25
3+61			3.20	51.05
3+72			4.65	49.60
3+90			2.10	52.15
4+10			4.20	50.05
4+20			2.45	51.80
		CRH HHA.		JRD.

= Sta 11+50 Br 23

S Hwy F

S " D

℄ Hwy N Line sec 5

N " D

N " F End

Approx 26 rods W of NE cor post sec 5

Lines Not run on Acct of Crops

Main	Sta -196+57 - 210+	Page 85
BR 10	Sta 0 = Sta 162 Main	Page 33
BR 11	" 0 = " 164 "	" 41
" 14	" 0 = " 186 "	" 51
BR 22	" 0 = " 252 "	" 117
" 22-B	" 0 =	BR 22 " 123

Homer

	EHwyD	
	6.95	Culvert Eend
	HwyD	
	6.65	
	EHwyF	
	6.35	
	InPond	
0+50	6.65	
1	5.55	
1+50	5.05	
		At Fallen Tree
2	5.20	
2+50	4.85	
		BR 20
3	4.50	=5to 26
4		

44.92
44.57
.35

157

BR 15

0	6.35	41.65		35.30 = Sta 22 7 Main
Ditching 0+50			8.25	
1			6.40	
2			4.85	
3			4.35	
4			3.65	
4+78			2.60	End 145 ℄ sec 5

158

BM { 38.84 - 42.76

BR 15 C-1

0	52.30		= Sta 6 15-C
0+15		7.55	℄ Hwy
0+40		9.05	E Hwy D
0+60		7.40	E Hwy F End

End 40 N Cen. Sec 5 (?)

BR 15-C-2

0			= 13 15-C
0+35		5.20	℄ Hwy
0+60		6.70	E " D
0+85		5.55	E " F = End

BM	6.06	41.73		35.67
T.P.	3.00	41.82	2.91	38.82
" "	2.80	41.83	2.79	39.03
	7.40	40.13	6.10	35.73
	7.16	40.12	5.89	35.96
B.M.			3.43	36.70

BR 9-13

0		41.60	9.44
1			8.35
2			7.25
3			5.95
4			4.00
5			2.40
5+85			0.30 = End

	26.19	35.52
	24.95	34.19
	1.24	1.33

35.69 − 34.19 / 1.24 = 35.43
35.52
35.43

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	5.33
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 enths of width are one tenth the values found under each height considering the widths rom 1 to 9 as tenths and similarly the corrections for tenths of height are one tenth the igures opposite width considering the heights from 1 to 9 as tenths. Thus if w =16.2 and =5.3, cu. yds. =1.48+.028+.089 =1.597 cu. yds. or practically 160 cu. yds. per 100 ft. f w exceeds 40 ft., use one half and multiply result by 2, if both w and h are large use ne half of each and multiply result by 4. Any cross-section may be divided into riangles 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 reak in turn (=w's) by the difference between the cuts (or fills) on each side of it (=h's) lways subtracting the outer from the inner.

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.