

DR #11 Blackhawk
No 5

Construction

DIETZGEN
D-100-100

ENGINEERS'
LEVEL BOOK

No. 412

1096

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

R. P. BRIGGS,
CIVIL ENGINEER
WATERLOO, - IOWA

FILED
AUG-8-21
J. W. Fisher
COUNTY CLERK

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 $30.6 + (20 - 16) \div 2$ or 2 ft. added to $30.6 = 32.6$. For slopes of 1 on 1½ see inside of back cover.

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Bench Marks for

Main + BR5 Hto 9 150-152

Elevs
+
cuts

Main

4-50

BR 1

52-54

BR 2

(540-28421)

(Pp 146 Book 6)

56-68

BR 2-A

= Pp 148 Book 6

~~70~~

BR 2-B

70

BR 2-C

72

BR 2-C-1

72

BR 2-D

74

BR 2-E

76 78

BR 2-F

80 82

BR 2-G

84

BR 2-H

84

BR 3

86-88

BR 3-A

90

BR 3-B

90

<u>Elevs +</u>	<u>Page to page</u>
Cuts BR4	92-96
BR4-A	98
BR4-B	98
BR5	100-102
BR6	104
BR6-A	106
BR7	108-120
BR7-A	122-126
BR7-A-1	128-130
BR7-A-2	132-134
BR7-A-2-A	136
BR7-A-3	138
BR7-A-4	138
BR7-B	140
BR7-B-1	142
BR7-C	142
BR7-D	144
BR7-E	146
BR8	148

4

5

Main Line

Gut

%Gr

Av. Max

Min

Sta Elev Gr. Gut Size

0 5.09 .06

0 6.46

0 8.93 5.09 3.84

1 8.16 5.15 3.01

1+50

2 8.16 5.21 2.95

3 7.01 5.27 1.74

4 7.31 5.33 1.98

5 8.76 5.39 2.37

6 8.71 5.45 3.26

7 9.23 5.51 3.72

8 9.58 5.57 4.01

9 9.98 5.63 4.35

10 10.13 5.69 4.44

10+43

11 9.18 5.75 3.43

12 8.58 5.81 2.77

Greek bed - Outlet in Grane

Water Level. Greek Approx

Ground Level. 900' E + 100' S of Center
Sec 15

E + W of Sec 15. Approx 850' E of Sec. Gen.

N + S of Sec 15 - 50' N of Sec Gen

6 Main Gut
Av. Max Mini

Sta Elev Gr Gut %Gr Size

13 9.64 5.87 3.77 p6

14 10.19 5.93 4.26

15 10.24 5.99 4.25

16 9.79 6.05 3.74

17 10.54 6.11 4.43

18 11.04 6.17 4.87

19 11.96 6.23 5.73

20 11.96 6.29 5.67

3.8

= Sta 0 BR. 1. - 5

21 12.26 6.35 5.91

22 12.41 6.41 6.00

23 12.51 6.47 6.04

+75

N45 E NW 1/4 Sec 15 - 50' N E + W 1/4 E

24 12.96 6.53 6.43

25 13.17 6.59 6.58

26 13.47 6.65 6.82

27 13.57 6.71 6.86

28 13.37 6.77 6.60

Sta Elev Gr. Cut. %Gr. Size

29 13.72 6.83 6.89 .06%

30 14.02 6.89 7.13

31 14.01 6.95 7.06

32 13.86 7.01 6.85

33 13.71 7.07 6.64

34 13.71 7.13 6.58

35 13.06 7.19 5.87

36 12.81 7.25 5.56

+87

+98 12.25 7.30

37 13.20 7.31 5.89

+10 13.35

+25 11.90

+85

38 12.65 7.37 5.28

39 13.10 7.43 5.57

40 13.35 7.49 5.86

6.3

= Sta 0 BR 2 - N

E. Hwy. Fence

E. Hwy. Ditch = Sta 0, BR, 3.5

E Hwy. - W Line sec 15. 50' N. E. W 1/4

W. Hwy. Ditch.

W. Hwy. Fence.

Sta	Elev	Gr	Cut	%Gr	Size	Cut	
						Av	Max
41	13.75	7.55	6.20	06			
42	14.05	7.61	6.44				
43	14.55	7.67	6.88				
44	14.75	7.73	7.02				
45	15.10	7.79	7.31				
46	15.70	7.85	7.95				
47	16.30	7.91	8.39				
48	16.60	7.97	8.63				
49	16.95	8.03	8.92				
50	16.70	8.09	8.61				
51	16.05	8.15	7.90				
52	15.15	8.21	6.94				
53	14.20	8.27	5.93				
54	13.95	8.33	5.62				
55	14.64	8.39	6.25				
56	14.64	8.45	6.19				
6 + 50	14.69						

= Sta 0 BR 4 - NW.

Sta Elev Gr Gut. % Gr Site
 Gut.
 Av. Max Min

57 14.69 8.51 6.18 p6

+10

EW 1/4 Sec 16.

58 14.59 8.57 6.02

59 14.24 8.63 5.61

60 13.99 8.69 5.30

6.9

61 14.59 8.75 5.84

62 14.32 8.81 5.51

63 14.42 8.87 5.55

64 14.82 8.93 5.89

+75 13.82

in Ditch

65 14.87 8.99 5.88

66 14.72 9.05 5.69

67 15.67 9.11 6.56

68 16.47 9.17 7.30

+50 9.20

= Sta O BR 5, -SE.

69 17.02 9.23 7.79

70 17.37 9.29 8.08

Sta Elev Gr. Cut. % Gr Size
 Av. Max Min

71 17.97 9.35 8.62

+55

72 17.87 9.41 8.46

73 17.57 9.47 8.10

74 17.77 9.53 8.24

75 17.92 9.59 8.33

76 17.97 9.65 8.32

77 17.72 9.71 8.01

78 17.27 9.77 7.50

79 16.81 9.83 6.98

80 16.51 9.89 6.62

+40 - 9.90 - - - -

81 16.76 9.95 6.81

82 16.56 10.01 6.55

83 16.91 10.07 6.84

84 17.01 10.13 6.88

85 17.19 10.29 7.00

86 17.94 10.25 7.69

+35 10.28

N45 1/4 Sec 16 - S0'N - E1W E 5/2

= Sta 0 BR 6 - N

= Sta 0 BR 7 - S

Cut.
Av.
Max
Min

Sta Elev Gr. Cut. Gr Size

87 18.19 10.31 7.88 06

88 18.39 10.37 8.02

89 17.89 10.43 7.46

90 18.09 10.49 7.60

91 18.53 10.55 7.98

92 18.58 10.61 7.99

93 18.83 10.67 8.16

94 19.43 10.73 8.70

95 19.68 10.79 8.89

96 19.83 10.85 8.98

97 19.56 10.91 8.65

+91

98 20.21 10.97 9.24

+15 21.41

+32 19.91

L +43

99 20.21 11.03 9.18

= Sta. 0 B.R. 8 - N.

E. Hwy #

E. Hwy Ditch

E Hwy - W Line Sec 16 50' N

W. Hwy Ditch

W. Hwy #

Sta	Elev.	Gr.	Cut.	Gut.		
				Av.	Max.	Min.
549	19.81	11.09	8.72	06 ⁹	7.50	
100	20.46	11.23	9.23	14 ⁹		
101	20.61	11.37	9.24			
102	20.52	11.51	9.05			
103	20.26	11.65	8.61			
104	20.21	11.79	8.42			
105	20.26	11.93	8.33			
106	19.96	12.07	7.89			
107	19.76	12.21	7.55			
108	20.81	12.35	8.46			
109	20.81	12.49	8.32			
110	21.36	12.63	8.73			
111	21.51	12.77	8.74			
112	21.46	12.91	8.55			
113	21.52	13.05	8.51			
114	21.83	13.19	8.64			
115	21.83	13.33	8.50			
116						

= Sta 0 BR 9 - 5M

Cut
Av. Max Min

Sta Elev Gr Cut. % Size

117 22.18 13.47 8.71 14

+13 21.83

118 22.29 13.61 8.68

119 22.34 13.75 8.59

120 22.49 13.89 8.60

121 22.89 14.03 8.86

122 22.92 14.17 8.75

123 23.22 14.31 8.91

124 23.47 14.45 9.02

125 23.87 14.59 9.28

126 24.03 14.73 9.30

127 23.96 14.87 9.09

128 23.91 15.01 8.90

129 24.06 15.15 8.91

130 24.21 15.29 8.92

131 24.41 15.43 8.98

132 23.76 15.57 8.19

NE 1/4 Sec 17

E-W 1/4 Sec 17 - 66' W NW Cor

- Groceries Sage Main S.W. here.

Sta	Elev	Gr	Cut	%	Size	Cut	
						AV	Max Min
133	24.28	15.71	8.57	14			
134	24.13	15.85	8.28				
135	24.63	15.99	8.64				
136	24.13	16.13	8.00				
121	24.58	16.17					
137	24.53	16.29	8.26				
138	24.65	16.41	8.24				
139	24.60	16.55	8.05				
140	24.55	16.69	7.86				
141	24.90	16.83	8.07				
142	24.70	16.97	7.73				
143	24.65	17.11	7.57				
144	24.86	17.25	7.61				
145	24.88	17.39	7.49				
146	25.03	17.53	7.50				
147	25.53	17.67	7.86				
148	25.78	17.81	7.97				

NW NE.
E + W $\frac{1}{2}$ NE $\frac{1}{4}$ Sec 17 75' E SW 60'

NW $\frac{1}{4}$ NE $\frac{1}{4}$
N + S $\frac{1}{2}$ Sec 17 100' N of SW 60'

Grosses Sages Main W here.

Gut
Av. Max Mid

Sta	Elev	Gr	Gut %	Size	Mid
149	26.23	17.95	8.28	14	8.50
150	26.03	18.09	7.94	*	
151	25.97	18.19	7.78	100	
+06	25.71				
+22	27.56				
+46	24.76				
+56	25.71				
152	25.60	18.29	7.31		
153	25.76	18.39	7.37		
154	25.86	18.49	7.37		
155	25.91	18.59	7.32		
156	26.10	18.69	7.41		
157	26.20	18.79	7.41		
158	26.25	18.89	7.36		
159	26.25	18.99	7.26		
160	26.60	19.09	7.51		

S Hwy #

S Hwy Ditch

E Hwy

N Hwy Ditch

N Hwy #

Sta Elev Gr Cut % Size

Cut.
Av Max Min.

161 26.90 19.19 7.71 10

162 27.13 19.29 7.84

163 27.40 19.39 8.01

164 27.67 19.49 7.18

165 27.65 19.59 8.06

166 27.75 19.69 8.06

167 27.85 19.79 8.06

168 28.29 19.89 8.40

169 28.57 19.99 8.55

170 28.44 20.09 8.35

171 28.64 20.19 8.45

172 28.74 20.29 8.45

173 28.44 20.39 8.05

174 28.56 20.49 7.67

175 28.19 20.59 7.60

176 28.79 20.69 8.10

177 29.09 20.79 8.30

= Sta 0 BIP 10 - E.

= Sta 0 BIP 11 - NW.

Gut.
Av
Max
Min.

Sta Elev Gr Gut. % Size

178 29.34 20.89 8.45 .10

+10 29.75

179 29.59 20.99 8.60

180 29.69 21.09 8.60

181 29.67 21.19 8.48

182 30.02 21.29 8.73

183 29.97 21.39 8.58

184 29.57 21.49 8.08

185 29.42 21.59 7.83

186 30.11 21.69 8.42

187 30.05 21.79 8.26

188 30.55 21.89 8.66

189 30.75 21.99 8.76

190 31.20 22.09 9.11

191 31.90 22.19 9.71

End +50 31.47 22.24 9.23 ⁰⁰ ^{8.10} ^{36"}

+60 31.47 24.00 7.47 ^{15%} ^{36"}

192 31.29 24.08 7.21

E-W of Sec 8 = Sta 0 BR 12 - E

= Sta 0 BR 13 - W

= Sta 0 BR 14 - E

End 0.1 = Sta 0 BR 15 - NW

Sta	Elev	Gr.	Cut.	%Gr	Size	Av	Max	Min
193	30.51	24.23	6.28	15				
194	29.91	24.38	5.53					
195	30.11	24.53	5.58					
196	31.06	24.68	6.38					
197	31.76	24.83	6.93					
198	31.46	24.98	6.48					
199	31.71	25.13	6.58					
200	31.81	25.28	6.53					
201	32.06	25.43	6.63					
202	32.36	25.58	6.78					
203	33.11	25.73	7.38					
+25	29.71							
204	32.36	25.88	6.48					
+65	32.71							
205	32.81	26.03	6.78					
206	33.06	26.18	6.88					
207	33.01	26.33	6.68					

Ditch King

N45 E Sec 8

Sta	Elev	Gr	Cut.	Size	Cut		
					% Gr	AV	MAX MIN
208	33.36	26.48	6.88	.15			
209	33.86	26.63	7.23				
210	33.66	26.78	6.88				
+25	33.31						
+37	33.06						
+55	37.21						
+75	32.96	26.90					
+83	33.81						
211	33.77	26.93	6.84				
212	34.12	27.08	7.04				
213	34.22	27.23	6.99				
214	33.97	27.38	6.59				
215	34.12	27.53	6.59				
+80	32.32						
216	34.36	27.68	6.68				
217	34.59	27.83	6.76				
218	34.94	27.98	6.96				

216+80 34" 6.80
34"

S. Hwy Fence L

S Hwy Ditch

E Hwy

= Sta OBR 16-W. N. Hwy D - Sta OBR 16

N Hwy E

Ditch Xing.

= Sta OBR 17 W + OBR 18 E

Sta	Elev	Gr.	Cut.	Size	Cut		
					Av.	Max	Min
219	34.89	28.13	6.76	15			
220	35.09	28.28	6.81	X-			
221	34.89	28.38	6.51	10			
222	34.93	28.48	6.45				
223	34.40	28.58	5.82				
224	33.75	28.68	5.07				
105	33.60						
225	35.20	28.78	6.42				
226	35.40	28.88	6.52				
227	35.30	28.98	6.32				
228	35.34	29.08	6.26				
229	33.21	29.18	4.03				
230	35.06	29.28	5.78				
231	35.36	29.38	5.98				
232	35.76	29.48	6.28				
233	35.86	29.58	5.28				
234	36.33	29.68	6.65				

In Ditch Approx 450' E of N 234
 " " E 1/4 SE 1/4 Sec 5

= 5400 BR 19-NW.

Ditch xing.

= 5400 BR 20-E

Sta Elev Gr. Cut. ^{Cut} ^{Av.} ^{Max} ^{Min}
 % Gr Size May Min

235 36.45 29.78 6.67 10. ~~34'~~ ~~30"~~ ~~6.20~~

236 36.68 29.88 6.80

= Sta 0 BIR 21 NW.

237 36.50 29.98 6.52

238 36.60 30.08 6.52

239 35.35 30.18 5.17

240 36.58 30.28 6.30

241 36.00 30.38 5.62

242 35.85 30.48 5.37

243 35.75 30.58 5.17

244 36.35 30.68 5.67

245 36.90 30.78 ~~6.12~~ ~~x~~

246 37.75 31.03 6.72 25 ^{30'} ~~28~~ ~~5.9~~

247 39.14 31.28 7.86

248 38.74 31.53 7.21

249 39.14 31.78 7.36

250 38.94 32.03 6.91

~~26~~ 7.20

+ 95 40.59

E+W & N.E. 1/4 Sec 5

Sta.	Elev.	Gr.	Cut.	Size	Av. Max % Gr Mid
------	-------	-----	------	------	---------------------

251 40.34 32.28 8.06.25

252 39.35 32.53 6.82

253 39.39 32.78 6.61

254 39.09 33.03 6.06

255 38.74 33.28 5.46

256 38.39 33.53 4.86

257 38.89 33.78 5.11

+50 39.09

258 39.27 34.03 5.24

259 38.84 34.28 4.56

260 40.57 34.53 6.01

+54

+41 41.24

+50 38.64

+70 44.29

+84 39.47

+96 40.89

= Sta 0 BR 22 NW.

= Sta 0 BR 23 - E.

Ditch Xing

S Hwy F

S Hwy D.

E Hwy Bremer Co Line.

N Hwy D = Sta 0 BR 24 E.

N Hwy F

Sta	Elev	Gr	Cut	% Gr	Size	Av Max	Min
261	40.97	34.98	5.99	457	$\frac{26}{24}$	6.00	
262	41.47	35.44	6.03				
263	42.02	35.89	6.13				
264	42.47	36.35	6.12				
X 179							
267	40.97						
265	43.37	36.80	6.57	x-			
266	43.37	37.05	6.32	25			
267	43.82	37.30	6.52				
268	44.32	37.55	6.77				
269	44.52	37.80	6.72				
270	44.76	38.05	6.71				
271	45.58	38.30	7.28				
272	45.63	38.55	7.08				
273	44.99	38.80	6.19				
274	45.38	39.05	6.33				
275	45.88	39.30	6.58				
276	46.26	39.55	6.71				

In Ditch

= Sta 0 BIR 25 - N.E.

 $\frac{24}{22} \times 6.50$

Sta	Elev	Gr.	Got.	%Gr	Av Size	Max Mid
277	46.28	39.80	6.48	25		
278	46.83	40.05	6.78			
279	46.63	40.30	6.33	$\frac{22}{20} \times$	6.5'	
280	46.38	40.55	5.83			
281	46.33	40.80	5.53			
282	46.48	41.05	5.43			
283	46.47	41.30	5.17			
284	46.87	41.55	5.32			
285	46.57	41.80	4.77			
286	47.12	42.05	5.07			
287	47.57	42.30	5.27			
288	48.07	42.55	5.52			
289	48.55	42.80	5.75			
290	48.65	43.05	5.60	$\frac{18}{16} \times$	5.5	
291	49.10	43.45	5.65	$\frac{18}{16} \times$	5.70	
292	49.35	43.85	5.50			
136	49.90					

=Sta O BR 26 - N.

=Sta O BR 27 - W.

ENE Sec 32 - Approx 600' W
of Sec 6N.

AV.
MAX
MIN

Sta Elev Gr Gut. No & Size

293 49.97 44.25 5.72.40

= Sta 0 BR 28 - E

294 50.27 44.65 5.62

295 50.63 45.05 5.58

296 50.88 45.45 5.43

297 51.38 45.85 5.53

298 51.58 46.25 5.33

299 51.93 46.65 5.28

300 52.68 47.05 5.63 x -

= Sta 0 BR 29 - W

301 53.56 47.71 5.85 66 $\frac{16}{14} \times 55$

302 54.66 48.37 6.29

303 55.46 49.03 6.43

L. 304 56.11 49.69 6.42

305 56.46 50.35 6.11

306 57.10 51.01 6.09

307 56.90 51.67 5.23

308 57.40 52.33 5.07

$\frac{12}{12} \times 590$

+24

= N 15 E NW 1/4 Sec 32

Sta	Elev	Gr	Cut	% Gr	Size	Av. Max	Min
-----	------	----	-----	------	------	---------	-----

309	57.90	52.99	4.91	.66			
-----	-------	-------	------	-----	--	--	--

+25

310	58.45	53.65	4.80				
-----	-------	-------	------	--	--	--	--

311	59.35	54.31	5.04				
-----	-------	-------	------	--	--	--	--

312	60.19	54.97	5.22				
-----	-------	-------	------	--	--	--	--

313	60.97	55.63	5.34				
-----	-------	-------	------	--	--	--	--

 $\frac{12''}{10''} \times 55'$

314	62.17	56.29	5.88				
-----	-------	-------	------	--	--	--	--

315	63.22	56.95	6.27				
-----	-------	-------	------	--	--	--	--

L + 62 63.92

316	63.62	57.61	6.01				
-----	-------	-------	------	--	--	--	--

317	64.37	58.27	6.10				
-----	-------	-------	------	--	--	--	--

318	65.22	58.93	6.29				
-----	-------	-------	------	--	--	--	--

319	65.64	59.59	6.05				
-----	-------	-------	------	--	--	--	--

320	66.09	60.25	5.84				
-----	-------	-------	------	--	--	--	--

321	66.24	60.65	5.59	.70			
-----	-------	-------	------	-----	--	--	--

322	66.59	61.05	5.54				
-----	-------	-------	------	--	--	--	--

L + 65 67.39

+80 66.34 61.37 4.97

E + W $\frac{1}{2}$ NW $\frac{1}{4}$ SEC 32

= Sta O B R 30 - N.W.

N + S $\frac{1}{2}$ W $\frac{1}{2}$ NW $\frac{1}{4}$ SEC 32 (L)

E Hwy F.

E Hwy D

Sta Elev Gr. Lot. %Gr Av. Max Min
Size

322+95 70.19

40

323 69.89 61.45 8.44

+15 67.54

+35 68.04 61.55 6.39

324 67.72 61.85 5.87

 $\frac{10''}{8''} \times 5.9'$

325 67.97 62.25 5.72

326 68.47 62.65 5.82

327 68.17 63.05 5.12

328 68.97 63.45 5.52

329 68.92 63.85 5.07

330 68.76 64.25 4.51

331 69.57 64.65 4.92

332 70.22 65.05 5.17

L: 333 70.27 65.45 4.82

334 70.92 65.85 5.07

335 70.97 66.25 4.72

336 71.02 66.65 4.37

E Hwy W Line Sec 32

W Hwy D

" " F

9.6r

Av

MAX

Mid

Sta Elev Gr Gt. Size

337 71.57 67.05 4.52⁴⁰
x— x—L 338 72.57 68.05 4.52¹⁰⁰

+58 74.07

+68 73.57

+85 76.22

339 74.92 69.05 5.87

+14 76.37 69.19 7.18

510'

5 Hwy F

5 Hwy D

4 Hwy N Line Sec 31

N Hwy D

N Hwy F = End of Main

At W Gate Post N side Hwy

BR-1

%Gr AV MAX
Size MID

Sta Elev Gr. Cut Size MID

0 12.06 8.00 4.06 .48

+50 12.76

1 12.41 8.48 3.93

2 13.81 8.96 4.85

3 14.51 9.44 5.07

4 15.06 9.92 5.14

5 14.81 10.40 4.41

6 17.56 10.88 6.68

7 17.81 11.36 6.45

8 17.11 11.84 5.27

L 9 17.36 12.32 5.04

10 17.59 12.80 4.79

11 18.59 13.28 5.31

12 19.49 13.76 5.73

L +50 19.79

13 20.09 14.24 5.85

14 20.59 14.72 5.87

$$\frac{10''}{8''} \times 5.10$$

= Sta 20 Main

E-W & sec 15

Ditch King

Sta	Elev	Gr.	Cut	Size	Min
15	20.09	15.20	4.89	8" x 6" x 5.40	
16	21.39	16.20	5.19	1.00	
17	22.09	17.20	4.89		
18	23.57	18.20	5.34		
19	24.69	19.20	5.49		
20	25.59	20.20	5.39		
21	26.59	21.20	5.39		
22	27.24	22.20	5.04		
+10	27.19	22.30	4.89	5.20	

End - N45 E W 1/2 SW 1/4 Sec 18

BR-2

Sta	Elev	Gr	Cut.	Size	% Gr	Av. Max	Min
0	13.86	8.00	5.86	.08			
1	13.16	8.08	5.08				
2	12.46	8.16	4.30				
3	10.81	8.24	2.57				
4	11.81	8.32	3.49				
5	11.41	8.40	3.01				
6	11.81	8.48	3.33				
7	12.48	8.56	3.92				
8	12.18	8.64	3.54				
9	12.08	8.72	3.36				
10	12.23	8.80	3.43				
11	12.58	8.88	3.70				
+15							
12	12.77	8.96	3.81				
13	13.07	9.04	4.03				
14	12.72	9.12	3.60				
15	12.42	9.20	3.22				

% Gr Av. Max
Min

26"
24" x 38"

Note: These figures from Sta 57
0 to Sta 28+21 are abandoned, and
those on Page 146 Book 6 substituted
Sta 32 Main

ENE NW 1/4 Sec 15

No. Gr AV MAX

Sta Elev Gr Gut size Mid

16 12.82 9.28 3.57 .08

17 12.77 9.36 3.41

18 12.97 9.44 3.53

19 13.40 9.52 3.88

20 13.40 9.60 3.50

21 12.70 9.68 3.02

1/2 +50

22 12.65 9.76 2.89

24"
22" X 340

23 12.75 9.84 2.91

24 13.30 9.92 3.38

25 13.74 10.00 3.74

26 14.29 10.08 4.11

+08 13.14

+39 14.64

+72 12.89

+81

27 13.99 10.16 3.83

Out

= Sta 0 BR 2-A - N

E Hwy A

E Hwy D

105' S NW Cor Sec 15

E Hwy

W Line Sec 15

W Hwy D

W Hwy A

BGR Av Max

Size Min

Sta Elev Gr. Gut. Size Min

27+68 ~~Out~~ .08
 27+74 ~~12.44~~ to Sta 28+21
 28 14.14 10.24 3.92

+21

29 14.49 10.32 4.17

30 14.89 10.40 4.49 x $\frac{22'}{20'} = 420$

31 15.96 10.50 5.46 .10

32 16.39 10.60 5.79

+75

33 16.16 10.70 5.76

+34 16.51 10.80 5.71

+14 14.66

+30

35 15.91 10.90 5.01

36 15.91 11.00 4.91

37 16.16 11.10 5.06

38 16.36 11.20 5.16

Note: - Use figures Page 146
 Book 6 for BR 2 Sta 0-28+21

S Hwy #

S Hwy 0 90' west of cor sec 9.

E Hwy N Line Sec 16

+ Note Hwy 0 ave 1.50' below

elevations taken

= Sta 0 BR 2-B-2

N. Hwy 0

N Hwy #

Sta	Elev	Gr	Cut	%Gr	Av	Max	Min
					Size		
39	16.66	11.30	5.36	10			
40	16.76	11.40	5.36	x	$\frac{20}{18}$		5.30
41	17.06	11.60	5.41	20			
42	17.51	11.80	5.71				
43	18.23	12.00	6.23				
44	18.68	12.20	6.48				
45	18.88	12.40	6.48				
46	19.03	12.60	6.43				
47	19.03	12.80	6.23				
48	19.33	13.00	6.33				
49	19.41	13.20	6.21				
50	19.91	13.40	6.51	x	$\frac{18}{16}$		6.10
○	16.82			52			
51	20.65	13.92	6.73				
52	20.61	14.44	6.17				
53	20.71	14.96	5.75				
54	20.96	15.48	5.48				

Bottom of Pond 500' NW Sta 50
= Sta 0 BIR 2 - C.

Sta Elev Gr. Cut. Size $\frac{Av}{Max}$ Min

55 21.19 16.00 5.19 52 $\frac{16''}{14''} \times 6.00'$

56 21.69 16.52 5.17

57 22.34 17.04 5.30

58 23.18 17.56 5.62

59 23.58 18.08 5.50

60 24.33 18.60 5.73

L + 34

61 25.27 19.12 6.15

62 25.97 19.64 6.33

63 26.67 20.16 6.51

+ 50 27.06

64 27.27 20.68 6.59

$\frac{14''}{12''} \times 5.50$

65 27.42 21.20 6.22

66 28.02 21.72 6.30

67 28.08 22.24 5.84

68 28.23 22.76 5.47

69 28.35 23.28 5.05

MSECC 9 350' Not $\frac{1}{16}$ Cor.

= Sta 0 BR 2-D - W

= Sta 0 BR 2-E N.E.

Sta Elev Gr Gt Size $\frac{H}{G}$ Av. Max Min

70 29.18 23.80 5.38 5.2

71 29.48 24.32 5.16

L +87

72 30.09 24.84 5.25

73 30.49 25.36 5.13

74 30.94 25.88 5.06

75 31.64 26.40 5.24 $\times \frac{12''}{10''} \times 5.60$

76 32.57 27.20 5.34 50

V 77 32.95 28.00 4.95

78 33.45 28.80 4.65 $\times \frac{10''}{8''} \times 5.10$

79 34.45 29.60 4.85

80 35.40 30.40 5.00

81 35.95 31.20 4.75

82 37.40 32.00 5.40

83 37.95 32.50 5.15

84 38.16 33.60 4.56

85 39.00 34.40 4.60

EW of Sec 9 615' W of Sec 6

= Sta 0 DR 2-F-NE

EW E

Sta	Elev	Gr	Gut	% Gr	Av. Max size Min
-----	------	----	-----	------	---------------------

86	40.25	35.20	5.05	.50	
----	-------	-------	------	-----	--

+50 4

87	41.35	36.00	5.35		
----	-------	-------	------	--	--

88	42.15	36.80	5.35	x-	
----	-------	-------	------	----	--

89	42.95	38.20	4.75	1.40	$\frac{8''}{6''} \times 500$
----	-------	-------	------	------	------------------------------

90	44.35	39.60	4.75		
----	-------	-------	------	--	--

91	45.45	41.00	4.45		
----	-------	-------	------	--	--

92	46.50	42.40	4.10		
----	-------	-------	------	--	--

✓ 93	47.75	43.80	3.95		
------	-------	-------	------	--	--

94	49.40	45.20	4.20		
----	-------	-------	------	--	--

95	51.55	46.60	4.95		
----	-------	-------	------	--	--

96	52.62	48.00	4.62		
----	-------	-------	------	--	--

97	54.52	49.40	5.12		
----	-------	-------	------	--	--

+23

+30 53.97

+52 53.92

+76 54.97

+85 56.22 50.59 5.63

4.70

- End

- Sta 0 BR 2.6 - IV

- Sta 0 BR-2H m.

E. Hwy F

E. Hwy D

E. Hwy W Line sec 9

W Hwy D

W Hwy F = Eod E W & NE 1/4 Sec 8

BR 2-A

Sta	Elev	Gr	Cut.	Size	% Gr	Av Max	Mi.
0	12.78	9.50	2.98	10	8"		
1	12.98	9.90	3.08				
2	12.63	10.00	2.63				
3	13.58	10.10	3.48				
4	13.48	10.20	3.28				
+56							
+66	12.08						
+84	14.18						
5	12.58	10.30	2.28				
+05	12.33						
+18		10.32				3.00	

BR 2-B.

0	16.21	11.37	4.84	50	6"		
+16	16.36	11.50	4.86				
+42	14.46	11.75	2.71				
+50	13.51	11.77	1.74			4.10	

Note: - Figures for BR 2-A
transferred to p 148 Book 6

S Hwy A

S .. D

190' E of NW Cor
E Hwy N Line Sec 15

N Hwy D

N Hwy A - End

= Sta 32+75 BR-2

E Hwy - N Line Sec 16

S Hwy D.

End - Flow line present tile outlet

BR-2-G

Sta Elev. Gr Cut Size

8' Gr Av. Max Min

0 20.66 14.40 6.26 1.50

= Sta 4.51 - BR-2

1 20.61 16.20 4.41

2 23.21 18.00 5.21

L 3 23.81 19.80 4.01 x $\frac{8''}{6''} \times 5.0'$

= Sta 0 BR 2-G-1 - W.

4 25.52 21.20 4.36 1.40

5 26.06 22.60 3.46

6 28.46 24.00 4.46

L 7 30.09 25.40 4.69

8 31.29 26.80 4.49 4.30

+52 27.52

End - N45 E sec 9

BR 2-G-1

0 23.69 19.80 3.89 9.6'

= Sta 3 BR 2-G

1 24.59 20.70 3.89

2 25.89 21.60 4.29

3 27.09 22.50 4.59

+14 27.24 22.63 4.61 4.20

End - N45 E sec 9

Sta Elev Gr Cut Size ^{Net} ^{Av. Max} ^{Min}

0 27.06 20.80 6.26 1.20 6"

1 27.56 22.00 5.56

2 28.51 23.20 5.31

3 29.36 24.40 4.96

4 30.51 25.60 4.91

5 31.56 26.80 4.76

6 32.76 28.00 4.76

7 33.92 29.20 4.72

8 35.37 30.40 4.97

9 36.77 31.60 5.17

L +50

10 38.12 32.80 5.32, —

11 39.72 35.20 4.52 240

12 42.47 37.60 4.87

+16 42.87 37.98 4.89 500

End E+WE SW 1/4 Sec 9

= Sta 63+50 BR 2

BR-2-E.

9.5r Av

Max

Min

Sta Elev Gr Cut Size

0 28.02 22.00 6.02 60

1 27.00 22.60 4.40

2 27.50 23.20 4.30

5 28.50 23.50 4.70

4 29.30 24.40 4.90 x

L +18 30.50 2.00

5 31.52 26.40 5.12 $\frac{8''}{6''} \times 1.90$

6 32.82 28.40 4.42 x

7 34.37 29.50 4.87 1.10

8 35.27 30.60 4.67

9 36.22 31.70 4.52

10 37.32 32.80 4.52

11 38.57 33.90 4.67

12 39.87 35.00 4.87

13 41.02 36.10 4.92

L 14 42.52 37.20 5.32

15 43.52 38.30 5.22

= Sta 66 BR 2

ENE sec 9 225' W of sec 6

Per Av Max
Min

Sta Elev Gr Cont Size

16 44.12 39.40 4.72 1.10

17 44.62 40.50 4.12

18 45.87 41.60 4.27

+62 46.87 42.28 4.59

470

E4W E NE 1/4 Sec 9

BR. 2-F

Sta Elev Gr Cut, Size ^{7.6r} ^{Av} ^{Max} ^{Min}

0 32.95 28.10 4.85 84

1 33.40 28.94 4.46

2 34.50 29.78 4.72

+59 35.90

3 35.40 30.62 4.78

4 36.80 31.46 5.34

5 38.10 32.30 5.80

6 38.35 33.14 5.21

7 38.70 33.98 4.72

8 39.65 34.82 4.83

9 40.00 35.66 4.34

+30 40.50

10 40.80 36.50 4.30

11 42.00 37.34 4.66

12 42.80 38.18 4.62

13 43.80 39.02 4.78

14 44.30 39.86 4.44

5" X 460
6" X

= Sta 77 BR 2

E-W & S-W 1/4 NW 1/4 Sec 9

E-W & NW 1/4 Sec 9

Sta Elev Gr Out. ²⁶ Size ^{Av. Max} Min

15 44.80 40.70 4.10 ⁸⁴_x

16 46.40 41.50 4.60 1.10

17 47.80 42.90 4.90

18 49.30 44.00 5.30

19 50.30 45.10 5.20

20 51.45 46.20 5.25

21 51.80 47.30 4.50

22 52.60 48.40 4.20

+58 53.50

+68 53.40

+90 53.30

23 54.45 49.50 4.95

+15 53.40 49.67

+25 54.55 49.77 4.78

4.70

S Hwy #

S Hwy D

E Hwy N Line Sec 9

N. Hwy D

End - N. Hwy #

BR 2-G

Sta	Elev	Gr	Cut	% Gr	Size	Av. Max Min.
-----	------	----	-----	------	------	-----------------

0	40.83	35.60	5.23	1.00	6"	
---	-------	-------	------	------	----	--

1	41.48	36.60	4.88			
---	-------	-------	------	--	--	--

2	42.53	37.60	4.93			
---	-------	-------	------	--	--	--

3	43.68	38.60	5.08			
---	-------	-------	------	--	--	--

4	44.03	39.60	4.43			
---	-------	-------	------	--	--	--

+23	44.08	39.83	4.25			4.80
-----	-------	-------	------	--	--	------

= Sta 86+50 BR-2

End E+W & NW 1/4 Sec 9

BR 2-H

0	44.75	43.50	1.25	1.00	6"	
---	-------	-------	------	------	----	--

0+36	48.35	44.16	4.19			4.10
------	-------	-------	------	--	--	------

= Sta 93 BR-2

End E+W & NW 1/4 Sec 9

Sta	Elev	Gr	Cut	% Gr	Av. Max
12 Hwy 0				Size	Min
0	12.25	9.30	2.95	36	
1	13.52	9.66	3.90		
2	13.86	10.02	3.84		
3	14.41	10.38	4.03		
4	14.66	10.74	3.92		
5	15.01	11.10	3.91		
6	15.66	11.46	4.20		
7	16.63	11.82	4.81		
8	18.83	12.18	6.65		
9	19.45	12.54	6.94		
10	18.18	12.90	5.28		
11	18.43	13.26	5.17		
12	18.43	13.62	4.81		
13	19.01	13.98	5.03	X-	
14	19.61	14.52	5.09	54	$\frac{12''}{10''} \times 4.70$
15	20.01	15.06	4.95		
16	20.86	15.60	5.26		

= Sta 36+98 Main

Note: Hwy Ditch ave. 2.0'
below elev's. taken

= Sta 0 BR 3A.

Sta	Elev	Gr	Cut	% Gr	Av. Max Size Min
-----	------	----	-----	------	---------------------

17	22.11	16.14	5.97	57	
----	-------	-------	------	----	--

18	23.11	16.68	6.43		
----	-------	-------	------	--	--

19	22.98	17.22	5.76		
----	-------	-------	------	--	--

20	22.88	17.76	5.12		
----	-------	-------	------	--	--

21	23.28	18.30	4.98		
----	-------	-------	------	--	--

22	24.13	18.84	5.29		
----	-------	-------	------	--	--

23	24.73	19.38	5.35		
----	-------	-------	------	--	--

L 24	25.18	19.92	5.26		
------	-------	-------	------	--	--

25	24.18	20.46	3.72	$\frac{10}{8} \times 5.30$	
----	-------	-------	------	----------------------------	--

26	25.78	21.00	4.78		
----	-------	-------	------	--	--

+93	25.93				
-----	-------	--	--	--	--

27	27.86	21.54	6.32		
----	-------	-------	------	--	--

+06	27.88				
-----	-------	--	--	--	--

+25	24.98				
-----	-------	--	--	--	--

+37	26.43	21.73	4.70	490	
-----	-------	-------	------	-----	--

= Sta 0 BR 3-D

EHwy D W Line Sec 15

NHwy D S Line Sec 15

E Hwy

S Hwy Ditch

S Hwy E-End

BR 3-A

Sta	Elev	Gr	Cut	% Gr	Av. Max Size Min
-----	------	----	-----	------	---------------------

0	18.46	13.90	4.56	1.00	6"
---	-------	-------	------	------	----

+12	18.66				
-----	-------	--	--	--	--

+38	17.61				
-----	-------	--	--	--	--

+48	18.66	14.38	4.28		4.5"
-----	-------	-------	------	--	------

BR-3-B

0	25.18	20.10	5.08	80	6"
---	-------	-------	------	----	----

+10	25.38				
-----	-------	--	--	--	--

+30	23.68				
-----	-------	--	--	--	--

+41					
-----	--	--	--	--	--

+70					
-----	--	--	--	--	--

1	25.53	20.90	4.63		
---	-------	-------	------	--	--

2	26.08	21.70	4.38		
---	-------	-------	------	--	--

3	26.88	22.50	4.38		
---	-------	-------	------	--	--

+07					
-----	--	--	--	--	--

+17	26.18				
-----	-------	--	--	--	--

+35	27.88				
-----	-------	--	--	--	--

+53	26.18				
-----	-------	--	--	--	--

+68	27.58	23.04	4.57		4.65
-----	-------	-------	------	--	------

= Sta 12 BR 3

E Hwy W Line Sec 15

W Hwy D

End - W Hwy F

= Sta 24 BR 3

E Hwy W Line Sec 15

W Hwy D

W Hwy A

N Hwy A

N Hwy D

E Hwy S Line Sec 16

S Hwy D

End - S Hwy A

BR-4

%Gr Av. Max
Size Mid

Sta Elev Gr Gut Size Mid

0 14.64 10.40 4.24 30

56+50 Main

1 14.59 10.70 3.89

2 15.04 11.60 4.04

3 15.57 11.30 4.24

4 15.99 11.60 4.39

5 16.44 11.90 4.54

6 17.29 12.20 5.09

7 17.84 12.50 5.34 x — $\frac{14''}{12''}$ 450

8 18.39 13.18 5.21 .68

L: +50

N+5 ± Sec 16

9 18.84 13.86 4.98

10 19.14 14.54 4.60

11 19.79 15.22 4.57

12 20.59 15.90 4.69 $\frac{12''}{10''}$ 490

13 21.38 16.58 4.80

14 22.13 17.26 4.87

15 22.78 17.94 4.84

Sta Elev Gr. Cut. size $\frac{\%Gr}{Av}$ $\frac{Max}{Min}$

16 23.95 18.62 5.31 68

17 24.43 19.30 5.13

18 24.43 19.98 4.45

19 24.95 20.66 4.29

20 25.70 21.34 4.36

L +50

21 26.30 22.02 4.28

22 27.30 22.70 4.60

23 27.40 23.38 4.02

24 28.35 24.06 4.29

25 29.52 24.74 4.78

26 30.52 25.42 5.10

27 30.77 26.10 4.67

28 31.47 26.78 4.69

V 29 32.07 27.46 4.61

30 32.77 28.14 4.63 $\times \frac{8''}{6''} \times 460$

+59

$\frac{10''}{8''} \times 470$

= Sta 0 BR 4-A.

= Sta 0 BR 4-B.

N+5 & NW $\frac{1}{4}$ ~~NE $\frac{1}{4}$~~ Sec 16

Sta Elev Gr. Cut. Size ^{% Gr} ^{AV. MAX MIN}

31 33.77 29.24 4.53 1.10

32 35.22 30.34 4.88

33 36.27 31.44 4.83

34 37.12 32.54 4.58

35 38.17 33.64 4.53

36 39.12 34.74 4.38

37 40.27 35.84 4.43

+20 /

+40 40.73

+60 42.58

+75 40.93

+85 41.73 36.77 4.96

+60

S. Hwy E

S. Hwy D

E Hwy N Line Sec 16

N Hwy D

N Hwy E - End.

BR-4-A

% Gr Ar Max

Sta Elev Gr. Cont. size Min

0 25.45 21.90 3.55 90 6"

1 27.05 22.80 4.25

2 28.40 23.70 4.70

3 28.70 24.60 4.10

4 29.65 25.50 4.15

+67 30.85 26.10 4.75 430

BR-4-B

0 31.97 27.60 4.39 1.20 6"

1 32.87 28.80 4.07

2 34.12 30.00 4.12

3 35.37 31.20 4.17

4 36.68 32.40 4.28

5 38.22 33.60 4.62

+78

6 39.08 34.80 4.28

+16 40.73

+33 39.73

+48 40.08 35.37 4.71 430

= Sta 20 + 50 BR 4

End - N45 E NW 1/4 Sec 16

= Sta 29 BR 4

S Hwy E

S Hwy D

E Hwy N Line sec 16

N. Hwy D

N. Hwy E - End

Sta	Elev	Gr	Cut	Size	Av. ^{Max}	
					Min	
0	16.21	12.00	4.21	50	12"	
1	17.26	12.50	4.76			
2	17.66	13.00	4.66			
3	18.36	13.50	4.86			
4	18.21	14.00	4.21			
5	19.56	14.50	5.06			
6	20.78	15.00	5.78			
7	20.54	15.50	5.04			
8	20.59	16.00	4.59			
9	20.84	16.50	4.34			
10	21.34	17.00	4.34	x—		
11	21.89	17.35	4.54	.35		
12	22.59	17.76	4.89			
13	22.82	18.05	4.77			
L: +50	23.32					
14	22.97	18.40	4.57			
15	24.57	18.75	5.82			
①	22.42					

El = 19.28
 BM # 6 Spike in N.E. Cor post SE 1/4 SW 1/4 Sec 16
 = Sta 68 + 50 Main

El = 27.12
 BM # 26 Center of top N Wall Conc Culv
 on Hwy Sta 18 + 30 Br 5

Small Pond 50' W Sta 16

Sta	Elev	Gr	Cut	Size	%G		Av.	
							MAX.	Min
16	23.92	19.10	4.82	35	12'			
17	23.67	19.45	4.22					
18	24.47	19.80	4.67					
+08	24.47							
+20	24.37							
+30	25.27							
+42	24.37							
+66	24.02	20.03	3.99			4.70		

N. Hwy A

N. Hwy D

E Hwy 5 Line Sec 16

S Hwy D

S. Hwy A — End.

Sta Elev Gr Cut Size
 % Gr Av. Max Min

0 16.67 12.00 4.67 20 8"

1 16.82 12.20 4.62

2 16.72 12.40 4.32

L +50 16.92

3 17.00 12.60 4.40 x — $\frac{5''}{6''}$ +50

4 17.97 13.75 4.22 1.15

5 19.37 14.90 4.47

6 20.16 16.05 4.11

7 21.80 17.20 4.60

8 23.50 18.35 5.15

9 23.90 19.50 4.40 x —

L 10 26.20 21.00 5.20 1.50

11 26.95 22.50 4.45

12 28.33 24.00 4.33

13 29.96 25.50 4.46

14 31.41 27.00 4.41

15 33.41 28.50 4.91

+19 34.66 28.79 5.87

450

= Sta 80 + 40 Main

= Sta 0 B. 15 6 - A - NE.

End E+W Sec 16

Sta Elev Gr Cut. Size ^{1/2 Gr} ^{Av} ^{Max} ^{Min}

0 16.95 12.60 4.35 .85 6"

1 17.05 13.45 3.60

2 18.10 14.30 3.80

3 19.20 15.15 4.05

4 20.95 16.00 4.95

5 22.00 16.85 5.15

6 22.34 17.70 4.64 x—

2.05

✓ +35

7 23.81 19.75 4.06

8 26.16 21.80 4.36

9 28.26 23.85 4.41

10 31.01 25.90 5.11

11 32.41 27.95 4.46

+02 27.99

6" 440

= Sta 2+50 BIP 6

End - E+W & Sec 16

Sta Elev Gr Cot Size

0 17.97 12.30 5.67-18" 26"

+ 48

1 17.82 12.48 5.34

2 18.02 12.66 5.36

+ 15 15.87

3 17.72 12.84 4.88

L 4 18.02 13.02 5.00

5 18.22 13.20 5.02

6 18.60 13.38 5.22

7 18.63 13.56 5.07

8 18.98 13.74 5.24

9 18.03 13.92 4.11

9 19.13 14.10

10 19.33 14.10 5.23

26"
24" 5.10

11 19.68 14.28 5.40

L 12 19.71 14.46 5.25

+ 40 17.92

= Sta 86+35 Main

N. Line SW 1/4 SW 1/4 Sec 16 200' wide

Ditch Xing

Ditch Xing

Gr level

Ditch Xing

Sta	Elev	Gr	Cut	Size	Mid
13	19.62	14.64	4.98	18	24"
14	19.17	14.82	4.35		
+22	17.02				
+30	20.47				
+40	22.22				
+55	20.32				
+70	20.52				
L 15	19.82	15.00	4.82		
16	20.07	15.18	4.89		
16	18.72				
17	20.72	15.36	5.36		
18	21.18	15.54	5.64		
L 19	21.30	15.72	5.58		
20	21.70	15.90	5.80	24" X 22"	5.20
21	22.05	16.08	5.97		
22	23.00	16.26	6.74		
23	22.45	16.44	6.01		

N. Hwy F Bottom of Ditch by 1422

N. Hwy D

E Hwy

S. Hwy D

S Hwy E

= D BIR 7-A

Ditch Xing

.18
 .3
 .54

.18
 .7
 1.26

1 13

Sta Elev Gr Cut. size

%Gr Av
Max
Min

24 22.82 16.62 6.20 18 22"

L 25 22.83 16.80 6.03

26 22.93 16.98 5.95 $\frac{22''}{20''} \times 6.10$

27 23.08 17.16 5.92

28 23.13 17.34 5.79

29 23.38 17.52 5.86

30 23.31 17.70 5.61

31 23.65 17.88 5.77

32 24.05 18.06 5.99

33 24.10 18.24 5.86

L 34 24.35 18.42 5.93

35 24.37 18.60 5.77

36 25.02 18.78 6.24

37 24.92 18.96 5.96

L 38 24.47 19.14 5.33

0 22.52

39 13.97 19.32 4.65 $\frac{20''}{18''} \times 5.80$

= Sta 0 BIP 7-13

= Sta 0 BR 6

Bot pond 75' E Sta 38

Sta Elev G. Gut. Size ^{70 Gr} ^{Av. Max} ^{Min}

40 24.57 19.50 5.09.18 18"

41 25.22 19.68 5.54

L 42 24.91 19.86 5.05

43 24.79 20.09 4.75

44 25.59 20.22 5.31

45 24.79 20.40 4.39 ~~x~~

46 28.69 20.76 4.93.36 $\frac{18''}{16''} \times 5.00$

47 26.24 21.12 5.12

48 26.60 21.48 5.12

49 27.59 21.84 5.75

50 28.04 22.20 5.84

+10 27.14

51 28.34 22.56 5.78

+25 27.59

52 28.74 22.92 5.82

53 29.44 23.28 6.16

57 28.48 23.64 4.84

= OBR 7-D.

Ditch Xing

Ditch Xing

Ditch Xing

% Gr Av.
Max
Min

Sta Elev Gr. Cut. Size

55 29.77 24.00 5.77 36 16"

56 30.12 24.36 5.76

57 30.52 24.72 5.80

58 30.22 25.08 5.14

59 30.32 25.44 4.88

L. 60 31.10 25.80 5.30

61 31.20 26.16 5.04 $\frac{16''}{14''} 5.40$

62 31.41 26.52 4.89

63 31.56 26.88 4.68

64 32.16 27.24 4.92

65 32.56 27.60 4.96

L. 66 32.87 27.96 4.91

67 33.49 28.32 5.17

68 33.74 28.68 5.06

69 34.34 29.04 5.30

70 34.94 29.40 5.54

71 35.49 29.76 5.73

Sta	Elev	Gr.	Cut.	% Gr	Av Max Size Min
-----	------	-----	------	------	--------------------

72	36.39	30.12	6.27	36	14"
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73	36.49	30.48	6.01		
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74	36.44	30.84	5.60		
----	-------	-------	------	--	--

468	37.04				
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+83	35.89				
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75	37.79	31.20	6.59		
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+12	36.59				
-----	-------	--	--	--	--

+12	35.64				
-----	-------	--	--	--	--

76	37.34	31.56	5.78	$\frac{14''}{12''} \times$	5.40
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77	37.49	31.92	5.57	$\frac{12''}{10''} \times$	5.70
----	-------	-------	------	----------------------------	------

78	37.16	32.28			
----	-------	-------	--	--	--

78	36.39		4.88		
----	-------	--	------	--	--

79	37.57	32.64	4.93		
----	-------	-------	------	--	--

80	37.17	33.00	4.77		
----	-------	-------	------	--	--

81	38.17	33.36	4.81		
----	-------	-------	------	--	--

82	38.57	33.72	4.85		
----	-------	-------	------	--	--

83	39.62	34.08	5.54	$\times$	
----	-------	-------	------	----------	--

84	38.78			40	
----	-------	--	--	----	--

84	40.35	34.98	5.37	$\frac{10''}{8''} \times$	5.10
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E Hwy A

E Hwy D

E Hwy.

In Ditch by 75+12

Gr level

In Hwy D by 5+978

In Hwy D by 84

Gr level

Sta Elev Gr Cut ^{%Gr} Size ^{Av} ^{Max} Min

85 40.79 35.88 4.91 90

86 41.19 36.78 4.41 8" 4.90
6"

87 42.07 37.68 4.36

88 42.79 38.58 4.21

+75 44.39

89 43.44 39.48 2.96

L. +55 43.64

+80 44.47

+95 43.79

90 44.59 40.38 4.21 4.20

= Sta 0 BIR 7-E.

⊕ E & W Hwy & Roads.

⊕ N & S Hwy.

E. Hwy D

End at E Hwy E.

BR 7-A

95% AV Max

Sta Elev Gr Cut Size Min

0 19.84 15.40 4.44 40 16"

+12 18.97

+50 21.01

1 20.87 15.80 5.07 $\frac{16''}{14''} \times 4.80$

2 21.27 16.20 5.07

3 21.67 16.60 5.07

4 21.67 17.00 4.67

5 22.32 17.40 4.92 $\frac{14''}{10''} \times 5.00$

6 22.63 17.80 4.83

7 22.65 18.20 4.45

8 23.05 18.60 4.45

9 24.15 19.00 5.15

10 24.16 19.40 4.70

11 24.30 19.80 4.50 $\times$ 12 25.03 20.52 4.47 $\frac{10''}{8''} \times 4.70$

13 26.34 21.32 5.02

14 26.85 22.08 4.77

= Sta 15 BR 7.

Ditch King

= Sta 0 BR 7-A-1.

✓

= 0 BR 7-A-2

Rodman Pt in 500' - 14' -
400' - 12' -

Sta Elev. Gr. Cut. %Gr Av. Max
Size Min

15 27.54 22.84 4.70 .76 8"

16 27.94 23.60 4.34

17 28.19 24.36 3.83

18 29.52 25.48 4.40

19 30.69 25.88 4.81

20 30.79 26.69 4.15

21 31.74 27.40 4.34

22 32.49 28.16 4.33

23 33.24 28.92 4.32

+24 34.24

+35 33.14

+50 35.17

+77 34.58

+80 33.67

+95 35.07

24 34.87 29.68 5.19

25 35.17 30.44 4.73

26 35.57 31.20 4.37

$\frac{8''}{6''} \times 450$

E. Hwy ~~1E~~

E. Hwy D

E Hwy = Sta 0 BR 7-A-3

W. Hwy D

W. Hwy ~~1E~~

Sta	Elev	Gr	Cut	Gr Size	Av Max Min
27	36.67	31.96	4.71	.76	6"
28	37.27	32.72	4.53		
29	38.02	33.48	4.54		
30	39.46	34.24	5.22		
31	39.09	35.00	4.09		
L +15	39.57				
32	39.57	35.76	3.78		
33	40.64	36.52	4.12		
L +75	41.79				
34	41.64	37.28	4.36		
35	42.04	38.04	4.00	x —	
36	43.49	39.04	4.45	1.00	
37	44.24	40.04	4.20		
38	45.14	41.04	4.10		
+55	45.94	41.59	4.35		

440

End - N45E NE 1/4 Sec 20

= OBR 7-H-4.

%Gr. $\frac{AV}{MAX}$

Sta Elev Gr Cut Size Min

0 21.01 16.10 4.91 55 8"

1 21.05 16.65 4.40

2 21.60 17.20 4.40

3 22.40 17.75 4.65

4 23.25 18.30 4.95

5 23.60 18.85 4.75

6 24.33 19.40 4.93

7 24.96 19.95 5.01

8 25.66 20.50 5.16

9 26.16 21.05 5.11

10 26.51 21.60 4.91

+76 26.46

+86 25.56

11 28.06 22.15 5.91

+15 25.76

+30 26.66

12 26.93 22.70 4.23 $\times \frac{8''}{92} \frac{6''}{6''}$ 4.90
 92 6''

= Sta 0+50 BR 7-A.

E Hwy $\frac{1}{2}$

E. Hwy 0.

 $\frac{1}{2}$ Hwy.

W Hwy 0.

W Hwy $\frac{1}{2}$

Sta Elev. Gr Gut ^{20 Gr} size ^{Av} Max. Min

13 27.77 23.62 4.15.92 6"

14 28.82 24.57 4.28

15 29.92 25.46 4.46

16 30.92 26.38 4.54

17 31.67 27.30 4.37

18 32.42 28.22 4.20

+91 33.92

19 32.97 29.14 2.83

+21 35.07

+36 33.47

+58 34.52 29.67 4.85

430

S. Hwy 17

S Hwy 0

E Hwy. 5 Line Sec 17

N. Hwy 0

End. N. Hwy 17

Sta Elev Gr Gut Size ^{7.6v} ^{Av. Max} Min

0	21.67	17.80	4.37	50	10"
1	22.24	17.80	4.44		
2	22.99	18.30	4.69		
3	23.09	18.80	4.29		
4	23.64	19.30	4.34		
5	24.19	19.80	4.39		
L 750	24.31				
6	24.76	20.30	4.46		
7	25.06	20.80	4.46	x	
8	26.21	21.58	4.64	.77	$\frac{10''}{8''} \times 440$
9	27.21	22.34	4.87		
+61	27.96	23.11			
+70	27.86				
+82	29.51				
10	28.16	23.11	5.05		
+15	29.34				

= Sta 4 BIR 7-A

E. Hwy ~~E~~

E. Hwy D

E Hwy W Line Sec 21

W. Hwy D.

W Hwy ~~E~~

Sta Elev. Cor Cut. ^{7.6} Size ^{Av. Max} Min

11 29.53 23.88 5.68 .77 8"

12 30.21 24.65 5.56

13 30.71 25.42 5.29

14 30.91 26.19 4.72

15 31.66 26.96 4.70

16 32.41 27.72 4.68

17 32.96 28.50 4.46

18 33.56 29.27 4.29 $\frac{8''}{6''} \times 490$

19 34.46 30.04 4.42

20 35.81 30.81 5.00

21 36.48 31.58 4.90

22 +25 36.48

23 36.98 32.35 4.63

24 38.18 33.12 5.06

25 39.18 33.89 5.29

+21 39.98 34.05 5.93 490

= Sta 0 B.P. 7 A. 2-A.

End- N 45 E NE $\frac{1}{4}$ Sec 20.

BR 7A2A.

Sta	Elev	Gr	Cut	Size	Per	Av	Max	Min
-----	------	----	-----	------	-----	----	-----	-----

0	32.96	28.60	4.36	94	6"			
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1	33.98	29.57	4.41					
---	-------	-------	------	--	--	--	--	--

2	35.18	30.48	4.70					
---	-------	-------	------	--	--	--	--	--

3	35.88	31.42	4.46					
---	-------	-------	------	--	--	--	--	--

4	36.78	32.36	4.42					
---	-------	-------	------	--	--	--	--	--

5	38.03	33.30	4.73					
---	-------	-------	------	--	--	--	--	--

6	38.63	34.24	4.39					
---	-------	-------	------	--	--	--	--	--

7	39.53	35.18	4.35					
---	-------	-------	------	--	--	--	--	--

8	40.18	36.12	4.06					
---	-------	-------	------	--	--	--	--	--

9	41.08	37.06	4.02					
---	-------	-------	------	--	--	--	--	--

10	42.03	38.00	4.03					
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+95	43.13	38.89	4.24		6"	440		
-----	-------	-------	------	--	----	-----	--	--

= Sta 17 BR 7A2.

End - N45 E NE 1/4 Sec 20.

BR-7A-3

Sta	Elev	Gr	Cut	Size	Av. Max. Min.
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7.6r
Max.
Min.

0	34.58	29.60	4.98	15	6"
---	-------	-------	------	----	----

1	34.88	30.35	4.53		
---	-------	-------	------	--	--

2	35.38	31.10	4.28		
---	-------	-------	------	--	--

3	35.88	31.85	4.03		
---	-------	-------	------	--	--

4	36.33	32.60	3.63		
---	-------	-------	------	--	--

5	36.93	33.35	3.58		
---	-------	-------	------	--	--

173	38.03	33.67	4.36		6" 4.20
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BR 7-A-4

0	41.79	37.09	4.70	1.00	6"
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1	42.57	38.09	4.45		4.60
---	-------	-------	------	--	------

= Sta 23+77 BR 7-A

End - End E+W & Sec 20
w side Hwy.

= Sta 33+75 BR 7-A

End - E+W & Sec 20

Sta Elev Gr. Cut [%] Gr Side ^{Av} Max Min

0	22.83	17.50	5.33	30	8"
1	22.46	17.80	4.66		
2	22.86	18.10	4.76		
3	22.96	18.40	4.56		
4	23.46	18.70	4.76		
5	23.11	19.00	4.11		
6	23.23	19.30	3.93	$\times \frac{8'}{6'} \times 460$	
7	23.70	19.80	3.90		
8	24.30	20.30	4.00		
9	24.70	20.80	3.90		
10	25.05	21.30	3.75		
11	26.05	21.80	4.25		
+23	26.90				
+29	25.75				
+45	27.30				
+60	25.90				
+73	27.00	22.16	4.84	410	

= Sta 25 BR 7.

= Sta 0 BR 7-13-1.

S Hwy A

S Hwy D.

E Hwy 5 Line Sec 16

N. Hwy D.

End - N Hwy A

BR 7-B-1.

Sta	Elev	Gr	Cut	Gr Size	Av Max Min
0	23.23	19.40	3.83	30	6"
1	23.40	19.70	3.70		
2	23.80	20.00	3.80		
3	24.35	20.30	4.05		
4	24.70	20.60	4.10		
5	25.05	20.90	4.15		
+45	25.45	21.03	4.42		6" 4.00

BR 7-C.

0	24.47	19.50	4.97	20	12"
1	22.82	19.70	3.12		4.00
0	22.52				

= Sta 6 BR 2-13

End - N+5 E Sec 21

= Sta 38 BR-7.

End - N+5 E Sec 21.

Bottom of Pond.

BIP 7-D.

Sta	Elev	Gr	Cut	Size	
				70 Gr	Av Max Min
0	24.90	20.30	4.60	20	10"
1	25.45	20.50	4.95		
2	25.90	20.70	5.20		
3	25.90	20.90	5.00		
+70	26.15				
4	25.65	21.10	4.55		
5	25.80	21.30	4.50		
+10	26.50	21.32	5.18	10	4.80
①	24.85				

= Sta 42 BIP 7

100' Not sec center
N+S E Sec 21100' E of sec. cen
End - E & W E Sec 21

Bottom pond 50' N Sta 4+50

Sta Elev Gr Cut. Size Min

0 40.79 36.00 4.79 to 8"

+05 39.24

+24 40.89

1 40.69 36.40 4.29

2 41.19 36.80 4.39

3 41.59 37.20 4.39

4 42.09 37.60 4.49

+32 42.44

+42 42.14

+57 43.69

+75 42.14

+98 43.49 37.99 5.50

8" 4.70

= Sta 85 BR 7

W Hwy 10

W Hwy #

N Hwy #

N. Hwy D

E Hwy S Line Sec 20

S Hwy D

End - S Hwy #

Sta Elev Gr Gut ^{9.6r} size ^{Av} Max Min

0 18.80 12.70 6.10 ² 10"

1 18.74 12.90 5.84

2 18.69 13.10 5.59

+45 15.29

3 18.74 13.30 5.43 ^{1.44} ^{10"} ^{6"} 5.70

4 20.54 14.77 5.77

L+60 21.75

5 21.75 16.21 5.54

6 22.65 17.65 5.00

7 23.75 19.09 4.66

8 24.80 20.53 4.27

L 9 25.85 21.97 3.88

L 10 27.59 23.41 4.18

11 29.34 24.85 4.49

12 30.94 26.29 4.65

13 32.19 27.73 4.46

+03 33.64 27.74 5.90 6" 4.80

= Sta 93 Main

Ditch xing

Note - Use S.P. + cement
Joints Sta 5 to end

End - E+W & Sec 16

Bench Marks

B.M.	Elev.	
#1	10.00	Top of N.E. Cor. of S.E. wing of Bulkhead outlet Dr #4 - 1000' E of center Sec 15
#2	11.56	Spike at bottom of square Corner post opposite Sta 17+50 Main
#3	14.20	Spike in E end N cap Bridge Bet Secs 15 & 16
#4	12.96	Spike in stump E side Hwy Bet Sec 7 15 & 16 E-W $\frac{1}{4}$ E - At Jct Main & BR 3.
#5	18.68	Spike in West of Row Willow stumps on E-W $\frac{1}{4}$ E sec 16 - Sta 30+50 Main
#6	19.28	Spike in N.E. Cor. post SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec 16 - Sta 71+55 Main
#7	17.64	Spike in N.E. Cor post SW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec 16 (Note: BM #7 not solid)
#8	22.10	Spike in top of E end N cap Bridge W. Line Sec 16
#9	22.09	Lath hub side 3d F Post, E of NW cor NE $\frac{1}{4}$ SE E $\frac{1}{4}$ Sec 17

B.M.	Elev	
# 10	26.19	25 pikes in SW cor post NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec 17
# 11	29.04	Spike in N end E cap Bridge N Line ^{Sec 17}
# 12	29.73	Lath hub by 2 ^d F.P.W. of Ditch on EW $\frac{1}{4}$ b ^{Sec 8}
# 13	35.52	Spike in S.E. of Small Maple grove S.W. of Sta 191 + 50 Main = Sta 0 Br 15
# 14	36.70	Spike in N end E cap Bridge N Line sec 8 Sta 210 + 50 Main
# 15	38.77	Spike in post (set in concrete) W. of Gate on E.W. $\frac{1}{2}$ N.E. of center sec 2
# 16	42.67	Spike in S. end E cap Bridge on ^{Main} Blackhawk-Bremner Co Line Sta 260
# 17	53.01	Spike in willow stump = Center post Sec 32
# 18	70.09	Top of N.E. or E wall concrete culvert N Line Sec 32 Sta 323 Main

BM	Elev		
#19	71.29	Top of NE	Cor. E wall Concrete Culvert in pastures. of Bldgs opposite Sta 333+50 Main
#20	16.43	Top of NE	Cor E. wall Conc Culvert NW. Cor Sec 15
#21	19.53	Spike in road	of S of clump willows in pasture Sta 47 BR 2
#22	30.62	Spike in	3rd Tel Post W center sec 9
R.P.	31.59	Spike "	1st " " " " " "
#23	56.90	Spike in	Cor. post E end E & W 1/2 sec 8 at W side Hwy end BR 2
#24	23.04	Spike in NE	Cor post SE 1/4 SE 1/4 sec 16 Across Hwy from Sta 17 BR 3
#25	28.74	Spike in Cor	post E of SE Cor NW 1/4 NW 1/4 sec 16 opposite Sta 1 BR 4-A.
#26	27.12	Center of	top of N wall Conc Culvert on Hwy Sta 18+30 BR 5

Dench Mark's

- BM Elev
 #27 22.71 N.E. Cor. of
 N. Wall Conc. Culvert S Line
 Sec 16 Sta 14+30 BR 7
- #28 26.77 Top of short
 post S.E. side of center post
 Sec 21 (Brace Vires Attached)
- #29 39.13 Spike in
 N.E. Cor post SW 1/4 SW 1/4 Sec 20
 Opposite Sta 75+25 BR 7
- #30 — 34.28 Top of
 large boulder in pasture
 300' E of Hwy. opposite
 Sta 21 BR 7A.
- #31 30.11 Spike in
 large post W side Hwy.
 S of N.E. Cor Sec 20
 by Sta 10+15 BR 7A-2.

17.00
 13.00
 4.00

135
 .16
 210
 35
 0560

78
 31
 375
 225
 12625

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	.08	.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	3.35
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	2.32	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. $= .148 + .028 + .089 = 1.597$ cu. yds. or practically 160 cu. yds. per 100 ft. If we exceed 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 $\frac{1}{2}$ 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.

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	26.2	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 $41.9 + (20 - 16) \div 2$ or 2 ft. added to 41.9 = 43.9. For slopes of 1 on 1 see inside of front cover.