Dr. #9 Black Hawk

1082

Book 3

LEVEL BOOK

370

Levels & Topog.

KEUFFEL & ESSER CO.

DRAWING MATERIALS
AND
SURVEYING INSTRUMENTS.

NEW YORK.

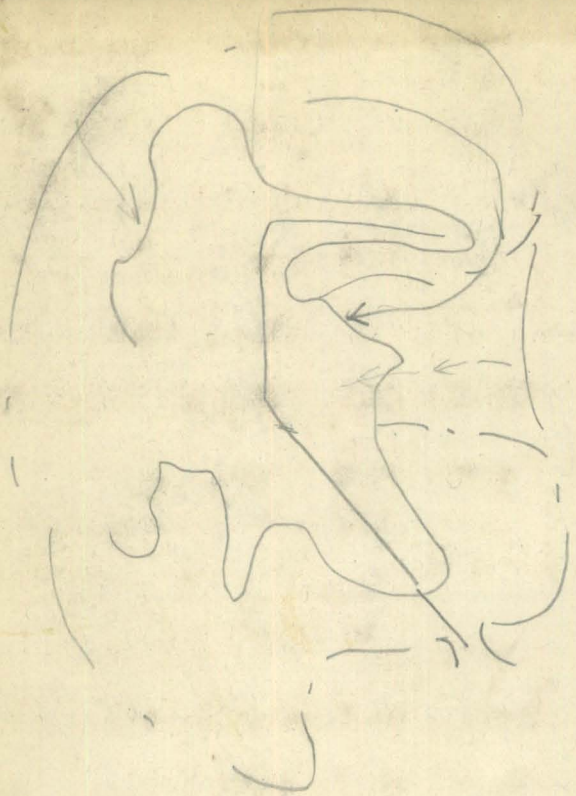
CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

Tables for Excavations and Embankments.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.
ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.
FOR SINGLE TRACK EXCAVATION.

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

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



Index

Check Levels
Main
District #9

	B-S	H.I	-S	Elev	
B.M.#1	6.02	56.02		50.00	50.00
T.P.	—	—	2.00	54.02	
	—	—	2.73	53.29	
	1.42	55.74		3	
	2.17	55.46		~~55.46~~	
		55.45			
T.P.	5.76	~~4.05~~	5.69	49.81	
	5.50	~~55.57~~	5.39	~~50.06~~	
B.M.A			4.31		51.26
T.P	6.99	55.76	6.80	48.77	
	6.61	55.73	645	49.12	
		55.74			
B.M#2			3.99		51.75
T.P	523	57.26	3.71	52.03	
141	487	57.27	3.34	5240	

56.20
56.22

N.&S.R.R.
Spike in East end of N. cap of Bridge

51.73

59.77

	B.S.	H.I.	- S	Elev.		
T.P.	7.46	60.59	4.13	53.13		
	7.01	60.64	3.63	53.63		
B.M.B	3.97	60.61	2.71		57.90	
		61.87				
T.P.	2.83	61.87	2.83	59.04		
	2.42		2.41	59.46		
T.P.	4.62	60.16	6.33	55.54		
B.M.#3			2.56		57.60	57.83
1 sta 55			5.09	55.07		
B.M.#3	4.62	62.22		57.60		
T.P.	4.00	~~63.46~~	2.76	59.46		
	~~3.65~~	63.47	2.40	59.82		
T.P.	4.89	~~64.46~~	3.90	59.57		
	4.33	64.47	3.33	60.14		
B.M.C.	1.87	65.12	1.22		63.25	
T.P.	6.32	67.79	3.65	61.47		
	4.63	67.80	1.95	63.17		
B.M.#5	3.16	68.46	2.50		65.30	65.45

LET

entrance West Willow in row approx ^ 27+00 Main

Black boulder at pasture fence Corner. Approx. Sta. 70 Main.

65.12 3.96 61.16

65.12 3.03 62.09

	B.S.	H.I. 68.46	− S.	Elev.		
T.P	2.70	69.39	1.77	66.69		
	3.32	69.39	2.39	66.07		
B.M#6			2.94		66.45	66.57
T.P.	5.91	71.57	3.73	65.66		
	5.43	71.55	3.27	66.12		
		71.56				
B.M D.			0.47		71.09	Spike in corner post 200' E of Main. on E&W. ¼ ℄ Sec. 22.
T.P.	5.19	73.23	3.52	68.04		
	4.73	73.22	3.07	68.49		
T.P.	3.71	75.11	1.82	71.40		
	3.33	75.11	1.44	71.78		
B.M E.			4.74		70.37	Lath 50' N of Sta 1. Br. 8 Lt. on N. & S. Fenceline
T.P.	4.13	77.90	1.34	73.77		
	4.18	77.89	1.40	73.71		
T.P.	6.45	79.86	4.48	73.41		
	5.83	79.85	3.87	74.02		
B.M F				2.18	77.67	N.E. Cor. of N. wing wall of Concrete bridge on Hawtere Hyd

LEC

S#8
143

	B.S.	H.I.	-S.	Elev.	
B.M.F	4.57	82.24		77.67	
T.P.	7.13	84.87	4.80	77.74	
	6.55	84.87	4.22	78.02	
B.M.G	6.20	85.77	5.00	-	79.57
~~T.P.~~	~~5.86~~	~~—~~	~~5.03~~	~~89.34~~ 89.24	
	~~5.50~~	~~—~~	~~2.33~~	~~82.24~~	
~~T.P.~~			~~3.83~~	~~81.94~~	
			~~3.47~~	~~2.30~~	
~~T.P.~~			~~2.57~~	~~83.20~~	
			~~2.07~~	~~83.7~~	
T.P.	5.88	87.82	3.83	81.94	
	5.51	87.81	3.47	82.30	
T.P.	5.18	91.18	1.81	86.00	
	4.67	91.16	1.32	86.49	
		91.17			
T.P.	5.86	94.42	2.61	88.56	
	5.81	94.42	2.56	88.61	
B.M. #8 C.E.			1.85	-	92.57

Spike in 1/16 cor. post approx. Sta. 163 Main or 5+0 0+00 Br. 11 Left.

94.75

Note. Use Elev 92.60

Recheck Levels

	B.S.	H.I.	- S	Elev.	
B.M.#2	6.82	58.57		51.75	
T.P.	6.24	58.93	5.88	52.69	
	6.13	58.93	5.77	52.80	
T.P.	4.80	59.91	3.82	55.11	
	4.34	59.89	3.38	55.55	
		59.90			
T.P.	5.92	62.71	3.11	56.79	
B.M.B.	4.77	62.70	1.97	57.93	57.93
~~T.P.~~	~~5.78~~	~~65.37~~	~~3.12~~	~~59.59~~	
	~~6.37~~	~~65.35~~	~~2.73~~	~~59.98~~	
		~~65.36~~			
~~T.P.~~	~~2.24~~	~~60.53~~	~~7.07~~	~~58.29~~	
	~~1.42~~	~~60.56~~	~~6.22~~	~~59.14~~	
		~~60.55~~			
T.P.			~~5.35~~	~~55.20~~	
B.M.#3			~~4.88~~ 2.82	~~55.67~~ 57.73	

~~7.07~~ 6.22 .85 ~~2.36~~ 31 1.97 1.14

	B.S.	H.I.	- S	Elev.
T.P.	~~4.60~~	~~61.39~~		~~56.79~~
B.M.B	~~3.40~~	61.33		57.93
T.P.	4.93	64.46	1.80	59.53
	4.53	64.47	1.39	59.94
T.P.	2.01	60.23	6.25	58.22
	1.22	60.22	5.47	59.00
T.P.			5.11	55.11
			4.64	55.58
B.M.#3			2.60	57.62

	B.S.	H.I.	−S	Elev
B.M.#6	2.87	69.32		66.45
T.P.	7.43	72.42	4.33	64.99
	6.73	72.42	3.63	65.69
T.P.	3.84	74.19	2.07	70.35
B.M.D.	3.12	74.21	1.33	71.09
		74.20		
T.P.	5.90	74.46	5.64	68.56
	5.79	74.44	5.55	68.65
		74.45		
T.P.	4.88	75.34	3.99	70.46
	4.57	75.35	3.67	70.78
B.M.E	4.93	BG	4.03	70.42
T.P.	5.11	77.00	3.46	71.89
	4.57	76.99	2.93	72.42
T.P.	4.91	78.98	2.92	74.07
LS1	4.29	78.99	2.29	74.70

	B.S.	H.I. (78.99)	-.S	Elev.
T.P.			4.41	74.58
B.M.F.	2.37	80.08	1.28	77.71
T.P.	5.05	80.89	4.24	75.84
	4.52	80.89	3.71	76.37
T.P.	4.07	83.80	1.16	79.73
	4.03	83.81	1.11	79.78
B.M G			4.16	79.65
T.P.	5.40	87.35	1.86	81.95
	5.04	87.36	1.49	82.32
T.P.	7.00	90.76	3.60	83.76
	6.56	90.76	3.16	84.20
T.P.	6.06	92.64	4.18	86.58
	5.81	92.63	3.94	86.82
T.P.	5.66	9443	3.86	88.77
	5.15	94.43	3.35	89.28
BM# 8			1.76 / 1.84 / 1.76	92.63
B.M. H. Sta 190+50 6+1			2.09	9234
			3.73	90.70

	B.S.	H.I.	F.S	Elev.
B.M.F.	1.04	78.71		77.67
146+48			4.17	74.57
146+00			4.84	73.87
144+00			4.72	73.99
143+00			5.15	73.56
T.P.	3.32	77.36	4.67	74.04
	2.68	77.34	4.05	74.66
		77.35		
T.P	3.69	76.05	4.99	72.36
	3.50	76.04	4.81	72.54
135+00			5.04	71.01
T.P.	4.29	75.17	5.17	70.88
	4.00	75.19	4.87	71.19
131+00		(75.18)	5.32	69.86
130+00			5.43	69.75
B.M.			4.83	

Extreme N.E. Cor. of E. end of Concrete Culvert Sta 190+75.

	B.S.	H.I	− S	Elev.
B.M.B.	3.55	61.48		57.93
T.P.	5.71	63.72	3.47	58.01
	5.39	63.72	3.15	58.33
T.P	428	6341	4.59	59.13
	3.86	63.41	4.17	59.55
T.P.	3.04	61.29	5.16	58.25
	2.73	61.30	4.34	59.07
	5.19	60.83	5.65	55.64
	4.38	60.84	4.83	56.46
B.M.2			3.20	57.64

Note. Check on Levels Page 13.

Notes. –

✓ Main Sta. 190+50 Cuts row of large live willow stumps. 5 to remove.

Br. 9 L. parallels row willows in grove Sta 28+00 to 35+00. Use 600' 8" S.P.

Br. 8 L. Sta. 32+50 Crosses row of 15 willow stumps & trees.

Br. P.R. Sta 22+90 cuts row live willows & Stumps appr. 12.

✓ Br. J R. Sta 11+65 old line cuts 2 rows willows. Within 100' for approx 6'. 30 trees. Can shift line and remove 4 large trees.

✓ Main. Sta 90+00 = Sta 0 Br 6.R. to 96+00 follows row willows. Approx. 25 large trees and stumps.

Main Sta 103+00 Crosses row willows. Approx. 10 large trees.

Br. 5 L. Sta 4+35. Crosses line of 10 partially rotted willow Stumps.

Cttl

Br. 6 L. Sta. 12+00 Crosses row of 12 willows.

Br. 9 L. cuts row of approx 12 willows at Sta 16+10 or end of line.

✓ Br. B L. ends at ~~edge~~ edge of grove of willow stumps.

✓ Br. B.R. Sta 19+50 to 22+00. 4 cotton wood trees.

✓ Br. D.R. Sta 15+61 ends at 2 cottonwood trees.

✓ Br. 5 R. Sta 49+00. 1 large willow.

✓ Br. F. R. Sta. 1+00. 2 willow clumps.

✓ Br. 5. R. Sta. 83+50 2 willows.

H+L

Dist 9

Δ-0 13 880' E. of Center
NW 1/4 Sec. 13 Barclay
Twp. Blackhawk Co. Iowa

π at Δ-0

B.S. 16th		81°-23'	860'
Outlet Bridge		258°	138'
	H	244 1/4	155'
	H	227°	200'
	H	202°	260'
	H	201 1/4	370.
	H	208 1/4	410'
	H	211°	510'
Bridge		217°	—
	H	208°	550
	H	207°	470'

May 7-1920
Briggs
Hoff
Whalen

Δ-0 10' S. E Hwy.

N. Hgw. F. east side Creek
east side Creek

on N+S. Hwy.
West side Creek
" " "

	H	199°	390'
	H	194°	280'
	H	209¼	215'
	H	225½	180'
	H	241°	120'
	H	281°	500'
	H	286°	670'
	H	286°	815'
	H	298½	810'
	H	307¾	1100'
	H	320°	1000'
	H	322°	960'
	H	327°	870'
	H	342½	990'
O-#1	337° 15'		1060'
Tie	343° 10'		
	H	6°½	400'
	H	18°	580'

Ath

W. Side Creek

N. Hwy. F. W. Side Creek

N+S ℄

N+S ℄

Windmill SE. (almost S.)

Ath.

	H	23°		740'
	H	31°		730'
O-#2	34°-08'		880'	
	H.	56°		530'
	H	81½		450'
	H	122		350'
	H	107½		820'
	H	97°		925'
	H	88°		900'
	⊼ at Δ #2			
B-5	34°-08'		880	
Tie	285°-16'		940'	
BS. lath	149°-44'			695'
	H	210¼		1160
	H	341½		1340
	~~H~~	~~347°~~		~~1240~~
	W	127½		420
	H	356°		1100

℄ E+W Hwy.

(May not include N. of Hwy)

N+S PL. Fence

N+S F.L. "

Δ-0

Δ-#1

Tile outlet on E ℄

℄ Hwy N+S.

	W.	105½		350'
	H.	7½		1080'
	W	61°		660'
	W	58½°		830'
2-#3	13°	38'	1110	

To Δ #3

Π at Δ #1

BS.	337°	15'	—	
Tie	54°	31'		1420'
Tie	105°	16'		940'
	H	25°	1120'	
	W	309½	500'	
	H	16°	1110'	
	W	318°	700'	
	H	348½	780'	
	W	315¼	760'	
	H	338'	1160'	
	H	345'	1220'	

To Δ-0
Δ-3
Δ-2

	H	348°	1400	
	H	344°	1460	
	H	340 ½	1240	
	H	335 ½	1300	
	H	335	1600	
1-4	337°-06'		1520'	
Tie	345°-05'			

℄ at Δ #4

BS.	337°-06		1520'	
Tie	138°-28'			
Tie	352°-06'			
	H	278 ¼	75'	
	W	197 ½	990'	
	H	43 ½	300'	
	W	193°	1220'	
	H	14 ½	330	
	W	207°	1400'	
	H	306 ½	290'	

To Δ #4

Same Windmill S.

Δ-1

Δ-2 (?)

Same Windmill S.

E + W ℄

E + W ℄

¼ line

	W.	221°	1400'	
	W.	220 ½	1500'	
	H	299°	495'	
	H	280 ½	630'	
	H	285 ½	780'	
	W	212°	1040'	
	H	303 ½	520'	
	H	315 ½	630'	
4-5	292° 21'			1440'
	W	199 ½	670'	
	W	245°	800'	
	W	249°	920	
	W	244 ½	1050	
	W	246 ¼	1320'	
	W	257 ½	1280'	
	W	268°	2100'	
	⊼ at Δ # 5			
BS.	292° 21'			1440

draw 100' wide

N + S FL.

E + W ¼ line

To Δ # 5

Δ # 4.

Tie	127° 52'		—
Tie	43° - 06'		
	W.	243½	1200'	
	W	252½	1260	℄ N/S Hwy
	W	259½	1400	
	W	275°	1600	
	W	274°	1820	
	W	277°	1850	
	W	285½	1800	
	W	289½	2200	
	W	291½	2100	
	H	96½	900	
	H	83°	1300	
	W	291°	1400	℄ N/S Hwy
	H	73½	1390	
	H	73½	1700'	
		269°	1240	Culvert.
	H		1640	

127

Δ #2 (?)

Same Windmill SW.

W.	274½	820	
H.	64½	1440'	
W	273	410	
H	72°	1200'	
H	70°	1000'	
H	59½	860'	
W	267°	460'	
W	268°	390'	
W	251°	240'	
H	47°	860'	
W	204°	200'	
H	39°	1000'	
W	121½	240'	
H	29½	1080	℄ E+W. Hwy
W	87½	200'	
H	17½	1100'	

127

W	48°	170'	draw 60' wid
W	21½	160'	
H	0°½'	1200'	
W	307½	310'	End "W" draw
H	355'	1300'	
H	350'	1220'	
H	357½	870'	Fenc Cor X
H	359½	850'	℄ Hwy .
	14½	920'	℄ Culv.
H	356½	730'	
H	337½	730'	
W	24½	300'	
H	2°	610'	
W	43½	380'	
H	21°	570'	
H	29½	530'	Close

At Δ #3

B.S.	13°-38'	1105'	Δ-#2
Tie	234°-32'		Δ-#1
Tie	202°-44'		Δ-#0
W.	135½°	1000'	
B.	293½°	315'	
B	308½°	395'	
B	309½°	720'	
W.	135½°	1000'	
B.	318½°	880'	
W.	133½°	1125'	
B	324½°	890	
W	133°	1300	
B	340½°	685'	℄ Hwy. N.C.
W.	131¼°	1400'	
B.	16°	675'	
B	20¼°	770	
W	128¼°	1270	

						B.	178¼	685	
	B	193¾°	860			W.	240¼	495'	
	W	129¼°	1100			B	176¾	885'	℄ E+W Hwy.
	W	124¼°	885'			W.	206¼	595	
	W	120°	820'			B	166½	1110	
	W	114½	845'			W	188°-10'	920	℄ E+W Hwy.
	W	104¾	1160'			W.	186	990	
	W	104°	1250'			W.	181½	1025	
3-6	358°-48'			1320'	To Δ #6	B	141½	1270	(on divide) N.+S. E+W. ℄
	W	105¼	1350'			W	175½	1180	
3-7	104°-14'			2080'	To Δ #7	B	134¾	1270	
						B.	133¾	1150	℄ Hwy
	⊼ at Δ-#7					B	129½	980	
B.S.	104°-14'			2080'	Δ-#3	Divide N.W.+S.E. 145°			
	B	310¼	650		E+W. ℄	Tie	311°-31'		Δ-6
	B.	288°	560'		N.+S. ℄	Tie	345°-16'		Δ-9
	B.	267°	370'			W.	173½	1500	
	W	277	675'			W.	166½	1640	

W	151°	2000'	
H	66½°	320'	
W	151°	1800'	
H	22½	370'	
H	333½	630'	
H	32.5½	730'	Close B.
W	134½	1900'	
W	129°	2000'	
H	4°	1060'	W. Side draw
W	124°	1900'	
H	358°	890'	
W	122½	1860'	
H	14°	620'	
W	122½	1700'	
H	43½	470'	
W	121°	1600'	
H	57½	540'	
H	61°	450'	

W	120°	1520	E+W. Hwy.
H	97½	680	
W	121°	1360	
W	119°	1200	
H	95°	980	
W	117°	1200	
H	106	1070	
H	105	1240	
W	110½	1460	
H	106	1380	Close

		Π At Δ #6			
B-5	358°-	48'		1310'	Δ-3
6-8	71°-	13'		680'	
	W.	173	350		
	W	203½	310		
	H	93°	1000'	E+W P.L.	
	W	225	360		E. N+S R.
	H	96½	775	E+W P.L.	
	W	238½	460		
	W	249½	500		
	H	23½	300		
	W	259	640		
	W	272½	740		
	H	336	320		
	W	285½	780		
	H	324	520		
	W	296¼	760		
	H	312	360		

611

65°-5½ 13°-10	680			
W	310½	690		
H	10°	220		
W	325°	650		℄ Hwy.
H	60°	250		
W	312	540		Back on West side
H	100	350		Close.
W	287½	570		
W	278½	550		
H	127½	290		
H	159½	230		
W	251°	290		℄ Road
H	208½	190		
Culvert	239	315'		
	Π Δ #8			
BS	71°-13'			Δ-#6
T.C	145°-05'			Δ #7
T.C	201°-47'			Δ #3
8-7	61°-14'		890'	

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T At. #9

BS	61° 14'	895'		Δ #8
Tie	165° 18'			Δ #7
Tie	96° 16'		Red	S. to W.
W	212 ½	740		
W	213 ¼	600		
H	152	1600		
W	220 ½	560		
W	238 ½	470		
H	140°	1760	x over	
W	243 ½	330		
W	228	230		
W	180°	190		
W	150°	215		
W	120°	250		
W	98 ½	250		
H	129 ½	1380	xed over	
W	60'	250		

H	117°	1300	
W	37°	235	
W	12 ½	230	
H	120 ½	1000'	
W	327 ½	280'	
H	116 ¼	760'	
H	105°	750	
W	303	470	
H	99°	960	17+2 H
W	302 ½	560'	
H	98°	1170'	
H	101°	1320'	
H	96°	1420'	
W	325°	680'	
H	82	1600'	
W	355	590'	
W	357 ¾	630'	E+W. Hwy.
H	71°	1610'	

	W	11½	720'		
	W	13°	780		
	W	6°	920		
	H	63°	1810'		
	W	6°	1120		
	W	5°	1260		
	H	53°	1240	Hwy Bridge	
	W	2½°	1340		
	W	360°	1400		
9-10	24°- 32'			1580'	
Tie	96°- 16'				Silo W.
	∏ At. Δ #10				
BS.	24°- 32'			1600'	#9
Tie	180°- 08'				Δ#7
Tie	136°- 02'				Silo W.
	H	117	1280'		
	W	275	830		
	H	111°	1480		

	W	274°	1000'	
	H	272°	1200'	
	W	271¼	1320	℄ N+S Hwy
	H	105°	2020	℄ Hwy E&W.
	Culvert	279¾	1360	
10-11	105°- 0'			2080' Horn
10-12	311°- 49'			935' Wholen
	H	64¼	1800'	℄ E+W. Hwy.
	H	66°	1640'	
	H	50½	1440'	
	H	43°	1100'	
	H	44°	960'	E+W. Hwy.
	W H	83°	170'	
	W H	336	50'	
	W H	335°	150'	
	W H	345½	360'	
	W H	352½	490'	

	N H	356 3/4	610	E+W. Hwy (Cor	
		⊼ At △ #12			
BS.		311° 49'		935'	#10
Tie		134° 51'		Red Silo NW.	
	W	228°	970'		
	H	101°	270'	℄ E+W. Hwy	
	H	136°	235'		
	W	236 1/2	1200'		
	H	223 1/2	300'		
	W	237°	1400'		
	H	253	400	℄ Hwy.	
	W	237 1/2	1600'		
	H	272	480		
	W	238	1700		
	H	299 1/2	515		
	W	235	1720		
	H	298 1/2	840	℄ N+S. Hwy	

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W	234 1/2	1800'	
H	287 3/4	1070	
W	236 1/2	2020	
H	277	1300	
W	234	2080	
H	269	1200	
H	259 1/4	1340	E+W P.L.
H	251 1/2	1050	
H	245	1160	
H	250°	1440	
H	243	1400	
H	241 1/2	1600	
W	234 1/2	2240'	N+S P.L.
W	238	2400	

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W	239½	2510'		
H	243¼	2100	N+S #	
W	241½	(2700)		
W	244	(2650)	Close	
	X			
W	63½	290		
W	25	300		
H	76½	680	N+S E	
W	4°	300		
W	336½	255		
W	329°	440		
W	339	580		
W	346	760		
H	58½	1260		
W	348	830		
W	344½	890		
W	348-½	950		
H	40½	1200		

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	W	357½	990		
	H	34½	1380		
	W	358°	1095		
	W	354	1200		
	W	352	1300		
	H	43°	1780		
	H	47°	2000		
		44¼	2360		
12-13	326°-27'			1940	W.
	H	37½	2500		
	H	27°	2240		
	H	22½	1900		
12-14	6°-08'			2000'	W.
	H	28¾	1700		
	H	18¾	1540	N+S. P.L	
	∏ At #14				
BS.	6°-08'			2035	# 12
Tie	257°-01'		1020'	Δ. 13	

W	216 ½	830	Cont.
H	157 ½	300	Same as ℄
W	225	930	
H	178 ¼	470	
W	233 ¼	1110	
H	184	290	
W	237	1170	
H	168	250	
W	267	290	
H	303 ¼	310	
H	23 ½	190	
H	35 ¼	310	N+S P.L
? W	225	750	
W	227	650	
H	26 ¼	510	
W	235	610	
H	34	715	
W	264	665	

H	42°	800	
W	271 ½	720	
H	44 ½	615	
W	273 ¼	920	
H	65 ¼	1040	
H	63°	1380	(℄ ?)
H	61 ½	1720	E+W ℄
W	275 ½	1200	℄ N+S Hwy.
H	44 ½	1900	
H	18°	660	
WX	297	1400	N+S Hwy.
H	15°	1100	
W	297°	1560	
H	3°	1200	N+S ℄
W	299°	1780	
H	8°	1520	
W	299 ¼	2040	

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	W	296 ½	2220		
	W	297 ½	2370		
	W	304°	2500		
	W	306 ¼	2640		
	H	22°	2180		
	H	9 ½°	2020		
	~~H~~	~~5 ¾~~	~~1940~~		
	(H	1 ½°	2000	℄ HWY)	
			dont use	Topog.	
14-15	2°-18'			2000'	#15
Tie	264°-55'			Windmill East	
	ℸ At #15				
BS.	2°-18'			2020'	#14
Tie	205°-24'				#13
Tie	213°-36			Windmill N.	
	H	84°	1380	¼ Cor.	
	Road E	263°-30'			
	H	73 ½	1660		
	H	66 ¾	1860		

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	H	52 ½	2120		
	W	263°	2460	℄ HWY	
	H	44 ½	2300	E+W P.L	
	W	271	2120		
	W	273 ½	1890		
	W	277 ½	2000		
	W	280 ¼	1820		
	W	285 ¼	1900		
	W	290	1940		
	W	292	1920		
	W	297	1800		
	W	306	1760		
	W	317	1620		
	W		1625	E+W. P.L	
15-16	22°-38'			2320	
	Culv	262 ¾	680		

Π At Δ #16

BS.	22° 38'		2300'	#15
Tie	208° 26'			Windmill N.
Tie	204° 05'			Δ # 13
	W	251 1/4	1860	
	W	257	1720	
	H	119 3/4	1140	E+W ⊥
	W	259 1/2	1560	
	H	109 1/2	1360	
	W	258 1/2	1400	
	H	103 3/4	1300	
	W	255	1320	E+W ⊥
	W	251 1/2	1220	
	W	236°	1180	
	W	256°	1300	
	H	96 1/4	1300	
	W	262	1520	
	H	81 1/4	1200'	

	W	269°	1680	
	W	279 1/2	1840	
	W	284°	1945	E+W P.L.
	H	70 1/4	1170	
	W	288 1/2	1900	
	H	54° 20'	1380	E+W P.L.
16-17	57° 29'		1280'	
	H	37°	1280	
	W	294°	1800	
	H	24 3/4	1120	
	H	30 1/2	950	
	W	298°	1600	N+S ⊥
	H	11°	790	
	H	356°	800	N+S P.L.
	W	307°	1600'	
	W	308	1500'	
	H	5°	1060	
	H	35-4 1/2	1200	⊥ N+S

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W	303	1060	⊼ E+W	
H	345 ½	1500		
H	336	1680		
H	331 ¾	1780		
H	323	1800		
H	317 ½	1790		
H	310 ½	1780		
H	309 ½	1180		
H	302 ¼	1055	Close on (W)	

⊼ At △ #17

BS.	57°-29'	1380	#16
Tie	215°-28'		#15
Tie	214°-41'	Windmill	
Tie	213°-18'		#13 ?
17-18	158°-34'	1220'	To #1

EP

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⊼ At #18

BS.	158°-34'	1240'	#17
W	347°	1240'	
H	352°	1100'	
W	358°	1260'	E.+W. ⊼
H	345°	1000'	N+S. P.L.
W	6°	1400'	
H	338 ½	970'	
W	11°	1410'	
H	343°	820'	N+S. P.L
W	20 ½	1500'	
H	358 ½	730	
H	6°	530	
W	25 ¾	1460	E+W. P.L
H	1 ½°	380	
W	33°	1340'	
H	30 ¾	330'	

101

	W	41°	1300	
	H	57°	240	
	H			
	W	47°	1480	N+S Hwy
	H	77°	490	Tile
	W	46½	1620	
	H	69¼	640	
	H	70½	800	
	W	52	1800	
	H	79¼	800	Tile
	W	59½	1940	
	H	95	980	
	W	67°	2000	
	H	88½	1200'	N+S. Hwy
	W	72½	2000'	
	W	72	2200'	
18-19	107°- 55'		1580	
	W	71	2350	

Tie	225°-21'			Windmill NE
	Cor.	228°	170'	Center NW¼ Sec. 26
	W	251½	475	E+W. P.L
	H	205	260	N+S P.L
	H	127	200	
	W	230	800	
	H	112¾	450	
	H	97	600	
	W	213	970	
	W	204½	850	
	H	116°	980	
	W	183	760	¼ line N+S.
	H	120½	1460	
	W	173¾	830	
	W	166½	1060	
	W	157½	1200	
	H	135	1860	E+W. Hwy
	W	155	1400	

H			
W	153 ½	1500	
W	150° ?	1540	E+W Hwy
W	148 ¾	1600	
W	149 ½	1760	
W	152°	1800	
W	156	1660	
W	161 ½	1620	
H	130 ½	2000'	
W	166 ½	1440	E+W Hwy
W	167 ½	1400	
H	136	2100'	X
W	179	1220	N+S. ¼ L
W	186	1140	
W	194 ½	1160	
W	198 ½	1160	
W	206 ¼	1180	
W	204 ¼	1460	

	W	202°	1620	
	W	199 ½	1700	
	W	177°	1920	
	W	167°	1800	
	W	153 ½	1980	
18-20	147° 00'		1980'	
Tie	145° 47'		Vent on Barn NW.	

T At. Δ #19

BS.	107° 55'	1600'	#18
Tie	193° 12'	1380'	#20
Tie	———		Vent Barn
Culvert	226°	760	N+S. Hwy
H	334 ¼	580	E+W ⊥
W	5 ½°	820	Island
W	7 ½°	900'	"
H	9°	350	———
H	43 ½	370	

W	37 1/2	840	Island
H	66	360	
W	27 1/2	750	Close is/a
H	92 1/2	365	
H	97 1/4	500	
H	113 1/2	560	
W	37 1/4	1300	
W	40	1080	
H	101 1/2	770	
W	49 1/2	1000	E+W. RR
H	98 1/4	950	
W	53 1/2	1075	
H	99 1/4	1200	N+S RR
W	74 1/4	1160	N+S RR
H	101°	1400	
W	77 3/4	1320	
H	105	1560	
H	109	1640	

H	109°	1300	
W	62°	1540	E+W RR
H	114 1/2	1120	
H	122 1/4	1000	
~~W~~	~~55°~~	~~1600~~	
H	125 1/2	860	
H	120 3/4	740	
~~W~~	~~57°~~	~~1800~~	
H	121 1/2	570	
H	137 1/4	520	
H	161°	560	F. yard
H	148 3/4	660	
H	141 1/2	850	
H	129 3/4	1080	Hickey Hwy
H	118°	1360	
H	143 1/4	915	
H	151 1/4	950	
H	147°	1100	

	H	142½	1180		
		At. Δ #20			
BS.	147° 00'		2000'	# 18	
T.e	13° 10'			# 19	
T.e	145° 14'			Barn ent	
	W	202°	225		
	Sec. Cor.	21° 02'		570'	NW. Co sec. 26
	W	194	370'		
	T.e	131	390		
	H	138	490	Culvert	
	T.e	141½	470		
	W	217¾	520		
	W	234	760		
	H	89°	560	New Set.	
	H	91°	835		
	W	235°	990		
	H	103¾	980		
	W	214	700		

H	105½	1200		
W	200½	740		
H	99°	1210		
H	92°	1060		
W	161½	715		
H	84½	700		
W	152°	800	NHS Hwy.	
H	77°	730		
H	69°	590		
H	56°	520		
W	142½	990		
H	54°	640		
W	123½	980		
H	61°	890		
W	124°	1220		
H	68°	1050		
H	79°	1040		
H	88°	1070		

	H	91 3/4	1220		
20 – 21	99° - 10'			1700'	#21
		At. Δ #21			
B.S.	99° - 10'			1700'	#20
Tie	165° - 06'			Barn vent	
	W	230 1/2	740	E. Side Main	
	W	219 1/2	880		
	W	218 1/4	1600		
	W	215	1090		
	W	217 1/2	1180		
	W	209 1/4	1200		
	H	302	450	E. Side Main	
	H	314 1/2	360		
	W	205 1/4	1300		
	H	335 1/2	400		
	W	206 1/4	1420		
	H	354	580		

	W	198 3/4	1420		
	W	197	1540		
	H	354	875		X
	W	203 1/2	1640		
	W	203	1680		
21-28 Whalen	201° - 48'		1880'	Δ	X
	Culvert	23°	1140'		on Hwy.
	W	193°	1000'		
	W	194 1/2	890		
21-22	32° - 44'			1680'	#22
	W	189 1/2	790		
	W	182	440		
	H	39 1/2	1280		
	W	163	210		
	H	48 1/2	1360		
	W	57 1/2	140		
	H	58	1320		
	W	53	360		

	H	58 ½	1240	
	~~W~~	~~43~~	~~530~~	
	H	50 ¾	1080	
	~~W~~	~~44'~~	~~790~~	
	H	42 ¼	960	Close
	H	42 ½	820	Separate row.
	H	59	810	
	H	60°	580	
	H	59 ½	390	
	H	70 ¼	320	
	π	At. Δ # 22		
Bs.	32°- 44'		1680	#21
Tie	179°- 41'			vent Barn
	H	191°	340'	
	H	156°	400'	
	H	130 ¼	540'	
	H	112 ½	750'	

	H	106 ½	1000'	
	H	108 ½	1160'	
	W	41	560'	
	W	57 ½	590	
	H	116 ½	1260	
	W	68	665'	
	H	110 ½	1400'	
	W	69 ½	740'	
	H	109 ½	1440'	
	W	63°	770'	
	H	111 ½	1700'	
	W	51°	710'	
	W	47°	850'	
	W	59 ½	940'	
22-23	111°- 00'			1860

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$\overline{\Pi}$ at Δ # 23

May 14-20
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Whalen

BS.	111° 00'		1880'	# 22	H	79 1/4	335'	
Tie	201° 59'		Vent Barn E.		W	29 1/2	1860'	
23-24	345° 31'		1460	To # 2	H	97 1/2	460'	
	W	2°	1240		W	32 1/2	1630	
	H	225	230		H	99°	760	
	W	8 1/2	1100		H	110 1/2	910'	
	W	21°	1200		H	114 1/2	1220	
	H	214 3/4	380		H	121°	1340	
	W	31 1/4	1260	Yard	H	119°	1600	? N+S Hwy ?
	H	186	290		23-25	66° 34'		1680
	H	178 1/2	140	N+S. P.L.	H	119°	2000'	
	W	26°	1340		H	110 1/2	1780'	
	H	76 1/2	50'		H	108 1/4	1880'	
	W	26°	1560		H	109 1/4	2180	
	H	342 3/4	90'	N+S P.L	H	106 1/2	2220'	
	H	24 1/4	220		H	103 1/2	2100'	
	H	55 1/2	310		H	97°	2000'	

	H	95 3/4	2360	N+S, ℄
	H	95 3/4	2640	E+W ℄
		T At #25.		
BS	66° - 34'			#23
Tie	213° - 33'			Vent Barn
	H	115 1/2	1280	N+S. P.L.
	W	353	1090	
	H	143 1/2	580	
	H	160 1/2	435	
	W	18 1/2	1200	
	H	132°	470	
	W	32 1/2	1220	
	W	40 1/2	1380	
	W	49 1/2	1420	
	H	109 1/2	1200	N+S. P.L.
	W	56 1/2	1420	
	H	107 1/2	1380	

	H	103°	1540	
	W	78 1/2°	1270	℄ Hwy Hwy
	H	96 1/4	1420	
	H	87 1/2	1380	Close "W"
Sec. Cor.		286 1/2	320'	NW. Sec. 27
	T At D #24			
B.S.	345° - 31'		1460'	#23
Tie	241° - 32'			A #22
	H	252 1/4	530'	Main
	H	260'	590'	
	H	266'	500'	
	H	260 1/2	860'	
	H	272 1/2	630'	
	H	277 1/2	440'	
	H	310°	220'	
	H	5°	200'	
	H	55°	270'	

	H	78 1/2	435'	
	H	87°	820'	
24-26	301°- 11'		1800'	#26'
	H	84°	1100'	
	H	68°	1000'	
	H	60 3/4	1070'	
	W	320 1/4	1560	E. S. do Ma.
	H	64 1/2	134-0	
	W	323 1/2	1400	
	W	329 1/2	1280	
	H	66 3/4	1580	E N+S, Hwy
	W	338 1/2	1400	
	W	338 1/4	1540	
	H	72 3/4	2200	? Trees
	W	343	1900	E+W "
	W	355 3/4	1860	E+W Hwy
	W	1 3/4°	2000	
	W	7 1/4	2040	

	W	17°	2060	N+S. Hwy?
24-27	25°- 33'		1960'	#26

T At A # 27

BS	25°- 32'	1960'	#24
Tie	196°- 29		Vent Barn
Tie	218°- 35		A # 22?
H	131 1/4	1800	
H	124°	2000	
W	321 3/4	270	
H	118 1/4	2100	
W	351 1/4	300'	
H	112 1/4	1900	
W	47°	495	
H	103 1/4	1800	
W	38 3/4	600	N+S Hwy.
H	94°	1720	
W	33°	780	

	H	85°	1400	
	W	48°	960	
	H	75¼	1380	E+W. P.L
	H	52¼	1150	Close —
Tie	250°-26'			Δ #26

Π At Δ #26

B.S.	301°-11'			#24
Tie	178°-26'			Vent Bo
	W	235¼	1080	E. Side Main
	H	87°	150	"H" Island
	H	109°	200	
	H	130°	180'	
	W	235½	790'	
	H	273	150'	
	H	302	290'	
	W	263¾	640'	
	H	355	110'	Close "H" Island

W	271½	720	
W	278½	780	
W	275¾	890	
H	59°	595	S. S. Jo Br.
W	280¼	980	
H	40¼	600'	
W	288¼	980	
W	290½	1050	
H	19¾	830	E+W P.L.
H	11½	890	
W	287	1260	W.J. P.L.
H	7½°	770	C.o R.
W	282½	1340	
H	359°	640	
W	291°	1540	
H	342°	750	E+W. P.L.
W	291¾	1620	
H	334'	900	

W	291 1/4	1620	
H	327 3/4	1050	
H	323 1/2	1090	
W	288 1/2	1785	
H	322 1/2	1240	
W	286 1/2	1840	
H	316 1/4	1340	
W	285 1/2	1740	
H	309 1/2	1400	
W	283°	1600	
W	284 3/4	1480	
H	307 1/2	1620	
W	278 1/2	1540	
H	308 1/4	1960	
W	280 1/4	1900	
H	307°	2300	
H	304 1/2	2600	
H	299 1/2	2640	

H	294°	2420	
H	290°	2340	

T at Δ #28

BS.	201° 48'	1880'	#21
Tie	137° 33'		vert Barn
28-29	77° 02'		1260
W	31 1/2	900	W. Side Main
W	45 1/2	840	
W	57 1/4	840	
H	68 1/2	220	E. Side Main
W	67 1/2	810	
H	100°	320	E+W 1/4 P.L
W	78 1/2	830	
H	129	350	
W	87	850	
H	179 1/2	290	
H	203	300	

H	229°	180	E+W ¼ line
H	256¼	285	
W	128¼	935	
H	289°	480	N.S. Hwy.
W	137½	930	
H	293°	680	
W	155°	1050	
H	298½	900	
W	156°	1110	
W	161½	1200	
H	297°	1140	
W	175	1050	
W	179½	1070	
H	284	1260	
H	279¾	960	
W	164°	1400	
W	158½	1520	
H	261	630	

H	249½	530	
W	154½	1600	
H	241°	470	Hwy
W	153°	1760	℄ E+W Hwy.
H	205¾	510	
H	184¼	580	
H	190	710	
H	205½	795	℄ N+S. Hwy.

T At Δ #29

BS	77°-02'	1280	#28
Tie	339°-18'		#21
Tie	169°-25'		West Barn
H	209½	920	N. side BR.
H	203½	760	
W	229¼	400	E+W F.L.
H	194	700	
H	180½	800	

W	150°	240	E+W. P.L
H	170°	570	
W	112°	240	
H	148½	590	
W	73°	215	
H	122°	700	
W	74°	540	
H	112¼	940	
W	81½	840	
H	119¼	1200	
H	124¾	1380	N+S. P.L.
W	84¼	1010	N+S ⊄
H	122°	1580	
H	115¾	1720	
~~H~~	~~90°~~	~~1300~~	
H	113¼	1840	
H	115½	2000	
~~H~~	~~86~~	~~1600~~	

	W	79½	1640	
29-30	106°-46'		2020'	To #30
	W	78¾	1860	
	W	76°	2040	
	W	79¾	2000	
	W	80°	2120	
	H	105°	1100	14" Tile ⊄
	W	74°	2300	N+S. Hwy
Tie	113°-12'		Brick	Silo NW.
	⊼ At Δ #30			
BS.	106°-46'		2015'	#29
Tie	278°-04'			#28
Tie	115°-52'		Brick	Silo
	W	9½	1800	N+S P.L.
	W	16°	1840	
	H	69½	120	

H	112°	250	
W	30°	1800	
H	133 ½	470	
W	39 ½	2040	
H	130 ½	810	
W	44 ¼	2100	
H	134	1060	
H	124	1150	
W	49°	2040	
H	119 ¼	1420	
W	41 ½	1740	
H	121 ½	1700	
W	41°	1500	
H	119 ¼	1920	
W	54°	1280	# =
H	121 ½	2700	
W	55 ½	1420	
W	58	1600	

	W	55 ½	1740	
	W	52°	2120	
	W	51°	2180	NH J. P.L
30-31	110°-29'		2350	To #31
	W	54 ¼	2400'	
	W	56 ¼	2360	
	W	69°	1940	NH3 #
	W	71 ½	1880	
	W	79°	2000	
	π AT Δ #31			
BS.	110°-29'			#30
TIE	121°-00'			brick silo
	W	359°	1700'	
	W	½°	1860'	
	W	358 ¾	2200'	
	H	227°	475	
	H	214	590	

	H	219	780	95° 140° 96° 14 1/2	98° 166°		W	96 1/2	1220
	H	232 1/2	1000				W	99 1/2	1160
31-32	18° 31'		1940'	To # 32	W.		H	175 1/2	2000
	H	230 1/4	1160				W	107	930
	H	222 1/2	1320				H	170	2600
	H	213 1/2	1600				W	127	650
	H	212	1840				H	166	2640
	H	204	1940				W	134 1/4	700
	H	197 3/4	1760				W	135 1/2	870
	H	193	1660				H	162	2280
	H	183	1000	N.S. Hwy		School	W	131 1/2	1140
	H	174 1/2	1180				H	155	1800
	W	67°	1020				W	115°	1430
	H	171 1/2	1580				H	149 1/2	1500
	W	73 1/2	970				W	118 1/2	1900
	W	81	1140				H	149	1260
	H	179	1800				H	141 1/2	1340
	W	90 3/4	1220				W	119	1800

E+W. Hwy or. H

E+W. Hwy.

	H	133°	1500	
	H	129½	1640	
	H	119¼	1820	Close
	⊼ At Δ # 32			
BS.	18° 31'		1920	#31
Tie	153° 47'			brick silo
	H	167°	1480	W. Ft.
	W	299°	950	
	H	156°	1400	
	W	309°	1070	9sk Whalen
	W	323¼	1010	
	H	142	1540	
	H	140	1660	E+W FL.
	W	336½	660	
	H	135¾	1800	
	H	130¾	1820	
	H	125½	1640	
	W	243½	100'	E+W FE

H	121½	1400	
W	186½	235	
W	109	90'	E+W. FL.
W	121½	1200'	
H	129°	1030'	
H	131¼	900'	
H	123°	790	
W	9½°	700	
W	5½	720	
H	106½	750	
W	2½	920	
H	102	920	
W	10¼	1080	
H	95¼	1090	
H	88½	1120	
W	30½	1300	
H	83°	1200	
~~H~~	~~39°~~	~~1260~~	

H	75°	1210		
W	45½	1230		
H	68½	880		
W	53½	1400		
H	63½	1000		
W	59½	1420	Close	

Checking Δ points

⊼ at Δ # 15

B.S.	2°-18"	2020'	To Δ # 14
Tie	213°-35'		windmill - N.E.
Tie	205-18'		Δ # 13
	263°-04'	1460'	NE Cor. Sec. 26
		= 2340	
15-16	22°-34	990 + 1350	To Δ # 16

⊼ at Δ # 16

B.S.	22-38'		To Δ # 15
Tie	208°-24'		windmill N.E.
Tie	101°-30'		" N.W.
		= 1370	
16-17	57°-29'	580' + 790	

⊼ at Δ # 17

B.S.	57°-29'		To Δ # 16
Tie	219°-40'		windmill NE.
Tie	129°-52'		windmill N.W.
17-18	158°-34	600' + 630	To Δ # 18

	⊼ at △# 18				
B.S.	158°-54'				
Tie	225°-20			w.mill	NE
Tie	97-20				N.W.
18-19	107°-54'		840 +750		To △# 19
	⊼ at △# 19				
B.S.	107°-54'				To △# 18
Tie	309°-30			w.mill	was N.W.
Tie	104°-30'				△# 22
19-20	193°-12'		850" + 840 (Chwy 570)		To △# 20
		187°-37'	825		NE Cor Sec
	⊼ at △# 20				
B.S.	193°-12'				To △# 19
		21°-29'	570		NE Cor Sec
Tie	356°-30	(P)		w.mill	was N.W.

π At Δ #11

BS.	105°-00'		2080'	#10	
11-32	82°-29'		1150'	N. Right.	
	H	82°	750	℄ E+W Hwy	
	W	159°	40'		
	H	105°	1010		
	H	104½	1200		
	W	155½	405'		
	H	112½	1300'		
	H	121°	1340'		
	H	124°	1580'		
	W	151°	900'		
	H	121°	1660'		
	W	153°	1040		
11-34	150°-56'		1520'	#34	
Tie	145°-54		Windmill NW.		

18° 57½
150 L 1150
95° L 9 30
20 80

May-18-20
Briggs
Hoff
Whalen

π At #34

BS.	150°-56'	1520'	#11.	
Tie	15°-06'	1515'	#33	
Tie	143°-33'		Windmill NW.	
	W	285°	580'	
	~~W~~	~~263°~~	~~540'~~	
	W	262°	920'	
	H	56¼	840'	
	W.	255½	900	
	H	59½	1000'	
	H	57	1200'	
	H	52½	1300'	
	H	60¼	1320'	
	W	185½	160'	
	H	69°	1460	
	W	150	380	
	H	72½	1580	

	W	159½	560	
	H	72¾	1680	N+S. Hwy.
	W	180½	490	
	W	166½	640	
	H	82½	1800	
	W	168°	940	X
	H	91½	1720	N+S. Hwy
	H	87	1440	
	H	84¼	1320	
	W	151¼	1360	E+W P.L.
	H	81°	1100	
	H	78	960	
34-35	142°-16'		1410'	
	H	74°	680'	
	H	85½	630'	
	W	139°	1000'	
	H	107½	860'	
	W	134	1130'	

	H	108½	1060	
	H	104°	1200	
	~~W~~	~~132½~~	~~1680~~	
	H	95	1320	
	W	135°	1640	~~E+W~~ E ~~N+S. Hwy.~~
	W	140½	1900'	
	⊼ At Δ #35			
BS.	142°-16'		1420'	#34
Tie	326°-46'			#11.
Tie	144°-34'			Windmill NW.
	W	136½	850'	
#35 35-36	148°-23'		1035'	
	W	120°	1200	N+S. Hwy
	W	124°	1280	
	W	136°	1240	
	W	135¼	1430	
	W	131	1420	N+S Hwy

104					
	W	138 1/4	1720.	Cor. Hwys	
	H	29°	1320.		
	H	37 1/2	1400		
	H	29 1/4	1100		
	H	26	910		
	H	32 1/2	840		
	H	43 3/4	820		
	H	55°	1080	N to S. Hwy.	
	H	50 3/4	1360		
	H	57°	1600		
	H	61 1/4	1720		
35-37		71°-56'	2060		
	W	129 1/4	1400	N to S. Hwy	
	W	128 1/2	1600		
	H	65	1800		
	H	69 1/2	1600		
	W	132	1840	E to W. Hwy.	
	H	74 1/2	1760		

105					
	H	75°	2080		
35-38	138°-58'			2140	To #38
	H	85°	2200		
	H	83 1/2	2300		B. Yard.
	At A #38				
BS.	138°-58'			2140	#35
Tie	293°-35'				same Windmill SE.
Tie	10°-00'				A #37
	W	146 1/2	530		
	H	27°	2140		
	W	151 1/4	860		
	H	38 1/2	2120		
	W	146	1120		E to W F.L
	H	38	1840		
	H	41 1/2	1740		
	W	144 1/2	1460		
	H	51 1/4	1860		

	W	143°	1920		
	W	148	2300		
	W	146½	2410		
38-39	68°-15'			1940	# 39
38-40	117°-12'			1700'	
T.C	166°-30'			Barn Vent'l.	
	At. Δ # 40				
BS.	117°-12'			1720'	# 38
T.C	185°-16'			vent' Barn	
T.C	302°-25'				# 36
T.C	10°-24'			1540'	# 37
	W	183	600	N+S LE	
	W	186	310		
	W	291	250	N+S E	
	H	37'	1800		
	W	317°	490		

H	42½	1840		
W	322¼	630		
H	50½	2060		
W	344	395		
H	56½	2200		
W	32½	220		
H	61°	2280		
W	101	355		
H	64¾	2390		
W	118	360		
H	58½	2000'		
W	168	760		
H	55½	1740		
W	177	630		
H	51¾	1320	N+S. P.L	
W	170	1180		
H	63¾	1200	N+S. P.L	
W	165¾	1160		

H	76°	1440	
W	160 ½	810	
H	73 ¼	1760	
W	156 ½	750	
H	83 ½	1960	E+W P.L.
W	140 ¼	720	
H	87 ½	2000	
W	120 ½	860	
H	91 ½	1760	
W	131 ¼	1090	
H	93	1500	
W	120 ½	1210	
H	100 ½	1200	N+S. P.L.
W	107 ¼	1220	
W	105°	1100	Close

T At A #39

BS	10° 24'	1520'	#40
Tie	248° 16'		#38
Tie	186° 39'		Barn Vent
H	92 ½	675'	Cor. in Hwy
H	92 ¼	430'	
W	325 ½	570	
H	76 ¾	670	
~~H~~	~~342°~~	~~550~~	
H	77°	810	
~~W~~	~~338 ½~~	~~670~~	
H	88°	600	E+W Hwy.
H	90 ¼	1440	
H	86 ½	1640	
W	331 ½	750	
W	336 ¼	830	
H	76 ¾	1480	
W	353 ½	730	

	H	68 1/4	1320	
	W	13 1/2	480	
	H	60 1/2	1360	
	W	25 3/4	580	
	H	52°	1180	
	W	41°	690	
	H	46 1/4	1030	
	W	36 1/2	820	
	H	35°	975	N+S ⊄
	W	31°	900'	Close

⊼ ⊄ Δ # 36

BS.	148°-22'	1040'	# 35
Tie	160°-00'		Vent Barn
Tie	139°-21'		Jamie Windmi
Tie	90°-19'		#39

	W	308°	1540
	W	304 1/2	1560

H	317	1100	⊄ E+W
W	298	1560	E+W. P.L
H	311 1/4	1120	
W	291 1/4	1520	
H	312 1/4	790	
W	282	1600	
H	302 1/4	630	
W	280 1/2	1800	
H	313°	375	
W	282 1/2	2000	
H	340 1/4	200	
H	282 3/4	335	
W	280 1/2	2260	N+S P.L
H	255 1/2	280	
H	159 1/2	105'	
~~W~~	~~270 3/4~~	~~2220~~	
H	220 1/2	270	
H	208	370	

W	266	2160	N+S. P.L.
H	156	370	
H	153 1/2	500	
H	153 3/4	790	Barn Yard
(W	251 1/2 Not tot	2340)	Cor E+W Hwy.
H	153 3/4	1100	
W	250 1/2	2040	E+W Hwy
H	158 3/4	1340	
W	255 1/2	2000	
H	165 1/2	1440	
W	257 1/2	1800	
W	258 1/2	1600	
H	169 1/2	1600	
W	259°	1440	
H	168°	1840	E+W P.L.
W	256°	1320	
W	264°	1420	
H	161 1/2	1865	E+W. P.L.

W	270	1460	
H	159	1780	
W	275	1480	
W	279 1/2	1500	
W	284 1/2	1420	
H	158 3/4	2000	
W	280	1160	
H	163°	2140	
W	270 1/4	1120	
W	265 1/4	1280	
H	174	1800	E+W P.L.
W	265°	1380	
H	180 3/4	1720	
H	186 1/2	1740	
W	243 1/4	1330	E+W Hwy.
H	187 1/2	1860	
W	247 1/2	1760	
W	248 1/2	1900	

36-41	186° - 28'		1840'	#41	
	W	244 1/2	2200'	Pasture	
	T At Δ # 41				
BS.	186° - 28'		1840	#36	
T.ie	353° - 03'			#35	
T.ie	28° - 38'			Windmill S.	
	H 16°	900		Island	
	H 24 1/4	980			
	H 36 1/2	770			
	W 295 3/4	2000		Scotch ban	
	H 20°	800			
	W 289 1/2	2040			
	H 357°	810			
	W 285 1/2	1840			
	H 346 1/4	1000			
	W 280°	2000			
	H 358 1/4	890		Close H. Isl	

W	273 3/4	2000		
W	265°	1820		
W	254 3/4	1800		
H	240 1/2	48'	E + W P.L.	
W	255	2160		
W	257	2150		
H	117 1/2	490		
W	255 1/2	2300		
H	124 1/4	700		
H	123°	780		
W	243 1/2	2400		
H	117 1/2	1200		
W	242 1/2	2040		
W	235 1/4	1740		
W	233°	1700		
H	118 1/4	1540		
W	234°	1900		
W	238°	1960		

	H	116 1/4	2200	
	W	240 1/4	2080	
	H	114 1/2	2460	
	W	236	2140	
	H	117 1/4	2900	
	W	230 3/4	2000	
	H	123°	2800	
	H	126°	2600	
41-42	213°-24'		1720'	
	H	129 1/2	2260	
	W	229°	1640	
	H	131 1/4	1860	
	W	221°	1460	
	H	136°	1720	
	W	222 1/2	1090	Island
	W	224 1/2	1030	
	W	218 1/2	980	
	W	207°	940	Close island

6 to

	W	210°	1000	
41-43	173°-29'		1820'	#43
divide	W	265°	1900	divide
	W	269 1/2	1200	divide
	W	263 1/2	1100	Island
	W	280 1/2	930	
	W	284°	830	
	W	278 1/4	750	
	W	263 1/2	780	
	W	261°	1020	
	W	263 1/2	1120	
	W	269 1/4	1200	Close Island
	W	309 1/2	960	Island
	W	314	1100	"
	W	333°	1030	N+S Hwy
	W	335 1/2	760	N+S in Hwy.
	W	321°	720	Close Island

1/4 line is divide
E+W Water E of island
E+W Flows South into main

8 to

⊼ At Δ # 43

BS.	173° - 29'		1820	#41
Tie	132° - 39'		Vent	Barn
Tie	288° - 32'	1200'		#42
W	297½	1260		
H	62	930		
W	292	1035		
W	287½	980		
H	76¾	1400		
H	80°	1620		
W	278°	1540		
H	85°	2040		
W	276½	1880		
H	96½	2140		
H	101°	2220		
H	105°	2600		
W	271°	1920		
H	111½	2300		

W	266½	1800		
W	265°	2120		
H	111½	2800		
W	255½	2100		
H	111½	3000		
H	118½	3200 ?		
H	122°	2900		
H	121°	2700		
H	128¼	2500		

⊼ At Δ # 43

BS.	173° - 29'			#41
43-44	157° - 10'		985'	

⊼ At Δ # 44

BS.	157° - 10'		980'	#43
Tie	111° - 49'		Barn	vent.
W	280°	1960		
H	99°	1866'		

W	272 ½	2100	
H	103°	1400	N+S. P.L
W	264 ½	2100	E+W. P.L.
H	110°	1480	N+S. P.L
W	261°	2200	
W	261 ¼	2140	
H	108	1860	
W	264 ½	2160	E+W. P.L.
H	112°	2200	
W	270	2140	
W	269°	1860	
W	265°	1880	E+W. P.L.
H	130°	1880	
W	260 ½	2000	
W	253°	2100	
W	252 ½	1900	
W	250 ½	1800	
W	24L	1760	

W	250°	2140	
H	139°37'	1190	
H	133	1300	~~E+W. P.L.~~
W	245 ½	2060	
W	243	1920	
H	120	1320	
W	240 ½	1900	
H	116 ½	1220	
W	235°	1540	N+S. P.L
H	123°	790	
W	234 ½	1360	
H	137	680	
W	235	1200	
W	238°	1050	
W	240°	1040	
W	233 ½	800	
H	150	830	
W	222	700	

Cont on Pg. 38

		T At Δ # 28			
FS.	77°-02'	—			#29
26-45	281°-33'			1300'	#45
Tie	158°-34'			3/4	NW
	W	152°	1640		
	W	153¼	1800		
	W	159½	1840		
	W	164°	1680		
	W	168°	1600		
	W	173°	1600		
	W	173¼°	1800		
	W	174½°	1920	Close to B-5	
	T At Δ # 45				
BS.	281°-33'			1320'	# 28
Tie	197°-12			Barn	Vent
	W	169½	1800		
	W	168¼	1640		

EH

May-20-20
Briggs
Hoff
Whaley

W	169°	1560		
H	148°	1320	E+W	P.L.
W	174°	1360		
H	155½	1240	E+W	P.L.
W	179°	1320		
H	159¾	1050		
W	184	1320		
W	185	1380		
H	164°	770		
W	192	1420		
H	162¼	530		
W	201½	1440		
H	181½	400		
H	219½	265		
W	208¼	1400		
H	280½	280		
W	216°	1220		
H	284°	590		

EH

H	309°	540		
W	232½	1340		
H	307	750		
W	236½	1320		
H	304°	920		
W	242½	1206		
W	249½	1210		
H	307½	1400		
W	252½	1400		
H	304°	1300	E+W R.L	
W	260°	1320		
W	265°	1400		
W	265°	1340		
H	310°	1680		
W	267½	1480		
H	307½	1800		
W	271¾	1460		
W	272½	1860		

H	292½	1740		
W	278½	1880		
H	290	1900		
W	284½	1920		Close.
45-46	221°-44'		1560	#46
	T At A #46			
BS	221°-44'	——		#45
Tie	132°-32'			Vert Barn
W	216½	1460		S. Side Main
W	119½	1400		
H	203½	710		
W	116¼	1280		
H	227½	450		
W	103	980		
H	203	400		
W	108½	760		
H	161	470		

126	W	115½	820		
	H	150	540		
	W	118°	790		
	W	110¾	720		
	H	161°	310		
	W	113°	670		
	H	206°	270		
	W	128½	900	B. yard	
	H	243½	350		
	H	266°	350		
	H	285°	460	H. Jays Igarosse.	
	H	265°	170'		
	H	195½	130'		
	H	142°	240'		
	H	120½	350'		
	H	108'	275'		
	H	56°	120'		
	W	135½	800'	Yard	

	W	128½	660		127
	H	102½	375		
	W	107°	490		Close.
	T At · A # 44				
	W	211°	710		
	H	175°	920	℄	1H S. Hwy
	W	202°	800		
	H	178½	1080		
	W	184°	770		
	W	180½	850		
	H	177°	1240		
	W	189½	940		
	H	185°	1200		
	W	211°	960		
	H	196½	1240		
	W	223°	910		
	W	228°	1020		
	H	210°	1400		

W	221½	1120		
W	214½	1120		
W	215	1240		
H	199¼	1480		
W	220½	1260		
W	225	1370		
H	211	1720		
W	232	1600	NTS. P.L.	
H	216	2000		
W	236	1700		
H	220½	2080		

T At A #9

F.S.	96÷16'		Red Silo W.	
W	130	1380		
W	123	1560		
H	140	1790		
W	123½	1840		

H	136°	2080		
W	119½	2100		
H	135°	2400		
W	116°	2380		
H	137°	2600	Et W Tr	
W	118°	2360		
H	142°	2940		
W	122°	2400		
W	123½	2700		
H	141°	3100		
W	124½	3000		
H	136°	2900		
W	120½	3300		
H	132½	3100		
H	133½	3500		
W	121°	3300		

130 T at Δ # 33

BS.	82°-29'			#11
Tie	159°-04'			Windmill NW.
	H	270 1/2	620	
	W	50 1/2	1460	
	H	294 1/2	770	
	W	58 1/4	1580	
	H	331 1/4	360	
	W	62 1/4	1880	
	H	81 3/4	220	℄ E+W Hwy
	82°-06			Hwy bearing
	262°-00			" "
	H	126	250	
	W	65 1/2	2000	
	W	64 1/2	2150	
	H	91 1/4	700	
	W	65 1/2	2320	
	H	82°	660	E+W Hwy

May-24-26
Briggs
Hoff
Whaley

131

	W	68 1/4	2340	
	H	59	520	
33-47	71°-12'		2340	#47
	H	7 1/4°	310	
	H	1 1/2°	470	
	W	72 1/4	2160	
	W	70 1/2	1920	
	H	47 3/4	820	
	W	74 1/4	1900	
	H	65 1/2	750	
	H	83°	870	E+W Hwy
	H	83°	1080	C.R. X
Tie	64°-05'			Silo SW
Tie	228°-55'			old Silo before

T at Δ #47

BS	71°-12'		2345	#33

Tie	241° - 00'		old Silo	
Tie	25° - 00		Silo SW.	
	H 222°	1140		
Tie	214° - 21°		Silo used by	
	H 220½	1660		
	W 217½	440	BR.	
	H 221	2000		
	W 184½	270		
	H 214	1820		
	W 110½	490		
	H 198°	2000		
	W 66½	700		
	W 74½	990		
	H 189°	1920		
	H 187°	2120		
	W 115°	800	Colv. E+W H.	

47-48	140° - 24'		1440		
	W	73½	1000		
	W	79¼	1010		
	W	86¼	1200		
	W	88°	1400		
	W	88°	1460	W+S. P.L	
	W	86½	1540		
	W	82¾	1460	W+S. P.L	
	W	82°	1400		
	W	79°	1300		
	W	75¾	1320		
	W	72	1200		
	W	69	1320		
	W	67	1290		
	H	187½	1900		
	W	69¼	1460		
	H	186½	2060		
	W	72¼	1600		

W	73 3/4	1660	
W	76 1/2	1800	
W	80°	1640	
W	83 1/4	1980	
W	84	2140	
W	86	2180	
W	87 1/4	2200	
W	90	2190	
W	92	2200	
W	94°	1820	
W	95 1/4	1760	
W	92	1460	Δ to B.P.L
AEM	99 1/4	1540	E to W Hwy
W	93°	1320	
W	93°	1200	
W	95 1/2	1070	
W	99 1/4	1040	
W	107 1/4	1070	E to W Hwy

Mitchell Whaley

W	109°	1100	

T at Δ #48 1440

#47

BS.	140°-24'		Big Silo
Tie	227°-24		Silo near N.
Tie	181°-08'		
H	224	1600	
H	215	1600	
H	211	1580	
H	214	1300	
H	208 1/4	1180	
W	20°	800	
H	202°	1200	
W	30 1/4	790	
H	202 1/2	1380	
W	35 1/2	820	
H	194 1/2	1460	
W	31°	960	

H	185°	1700	
W	42°	910	
H	180	1300	
W	51°	1640	
W	51 3/4	710	
H	189°	1120	
W	51°	650	
H	181°	930	
W	61 1/2	750	
W	65 1/2	730	
H	194 3/4	820	
W	66	740	
H	212 3/4	650	
W	70°	900	
W	73 1/2	930	
H	260	640	W + S. P. L
W	78°	950	
H	275°	600	

W	78 1/4	1000	
H	266 1/2	430	
W	70°	1060	
H	230 1/2	480	
W	65°	1100	
H	261°	540	
H	188 3/4	520	
W	67 1/2	1280	
H	177°	580	
W	65	1300	
H	156 1/2	510	
H	136°	720	
W	66°	1420	
H	142°	900	
H	154 1/2	920	
W	67 1/2	1720	
H	147 1/2	1140	
W	77°	1660	

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	H	156 3/4	1340	
	H	155	1660	
	H	160	1800	
	H	149°	2000 ?	
48-49	113°-34'		1520'	#49
	℄ At Δ #49			
BS	113°-34'		1540'	#48
Tie	232°-08'			S/o New
Tie	239°-06'			B.g S/o
	W	18 1/2	820	
	H	198 3/4	1260	C.o R.
	H	202 1/2	1120	
	H	207 1/2	970	
	H	204	890	
	H	212 1/2	700	
	H	203 1/4	630	
	H	195	770	

27

154°

139

H	187°	830	
H	183°	930	
W	358°	720	
H	188	1100	
W	356	640	
H	188°	1180	
W	14 1/4	570	
H	189°	1260	
W	37 1/2	720	
H	182 1/2	1340	
W	40 1/2	820	
H	178°	1460	
W	45°	810	
H	172°	1580	
W	48 1/2	680	
H	167°	1600	
W	58°	600	
H	164	1450	

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140.

W	66 ½	690	
H	160°	1320	
W	68°	830	
H	162°	1200	
W	58°	900	
H	168°	1130	E+W #
W	43°	1000	
H	169 ½	1040	
W	39 ½	1100	
H	169 ¼	700	
W	42 ½	1260	
H	166 ½	870	
W	48	1240	
H	163°	720	
W	52 ½	1080	
H	159°	620	
W	57°	1110	
H	152°	650	

96

	W	59 ¼	1120		
	H	149°	580		
	H	137°	600		
	W	64 ½	1200		
	H	131	760		
	W	68°	1600		
	H	130 ½	1040		
	W	75°	1800		
	H	142°	1300		
	H	147 ½	1260		
	H	154 ¼	1400		
	H	154 ½	1560		
	H	159°	1780		
	W	82 ¾	1820		
	W	91°	1810		
49-50	114°-00'			1440	to #50

97

T At Δ #50

BS.	114°-00'			1440'	#49
Tie	259°-09'			Silo	New
Tie	247°-50'			Big	Silo
50-51	110°-56'			1060'	#51
	W	55 1/2	1020	N+S.	Hwy
	H	208°	1300		
	H	201°	1520		
	W	69 3/4	1000		
	H	194°	1680	Barn	Yard
	W	73 1/2	1100		
	W	82°	1120		
	H	179°	1660	E+W	Hwy.
	W	94 1/2	940	N+S.	Hwy
	H	172°	1600		
	W	102 1/2	980	Cor.	
	H	184 1/2	1340		
	W	106 1/2	838	E+W.	P.L.

W	104 1/4	760			
H	190 1/2	1200			
W	98 3/4	540			
H	198 1/4	950			
W	91°	380			
H	196 3/4	780			
H	184 1/2	830			
W	62 1/2	140			
H	173 1/2	690			
W	92°	53'			
H	165 1/2	750			
W	123 1/2	100'			
W	121 1/4	250'			
H	167°	1110			
W	120 1/2	350			
H	165 1/2	1280			
W	122 3/4	535	E+W	1/4	line

H	160 1/4	1480	
W	123°	650	
H	158 1/2	1640	
W	120 1/2	760	
H	152 1/2	1600	
W	118°	860	
H	152 1/2	1400	
W	114 1/2	1045	
H	147 1/2	1380	
W	116°	1100	N+S. Hwy
H	143 3/4	1460	
W	122 1/2	1160	
W	128	1060	
W	129	1080	
H	140 1/2	1760	N+S. Hwy
W	125	1160	
H	143 1/4	1960	N+S. Hwy
W	123 1/4	1200	N+S. Hwy

H	137 1/4	1920	
W	122°	1280	
H	131 1/2	2000	
W	120	1400	
H	129°	1800	
W	120	1480	
W	120 1/2	1560	
H	123	1740	~~Clear~~
H	119	1400	

Check Δ Pts

From #47 To #20

℄ at Δ #47

BS	71°-12'		#33
47-1	329°-31'	1080'	

℄ At Δ #1

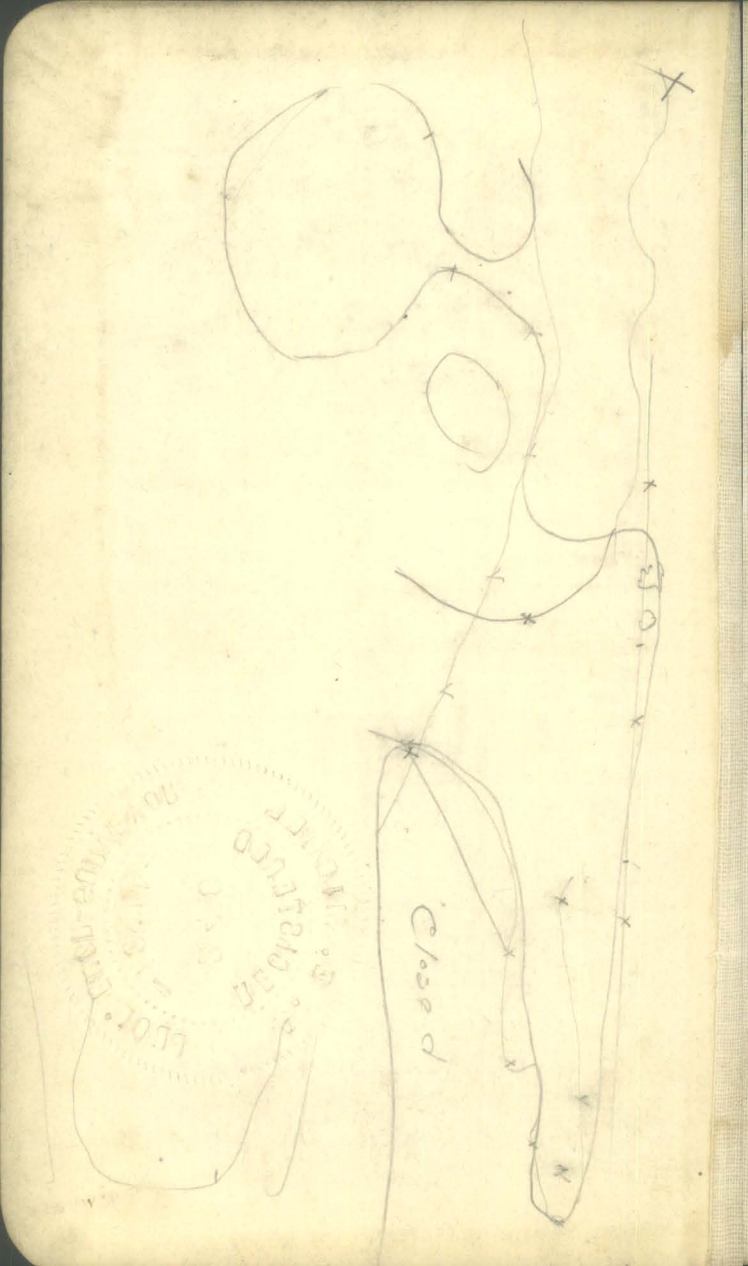
BS	329°-31'	1075'	#47
Tie	226°-47'		old Sil
1-old 28	334°-50'	1400'	

℄ at original #28

BS.	334°-50'	1410'	(#1 ch
28-Chk 3	338°-10'	1270'	(#Chk #3
Tie	137°-14'	Silo	From #33

℄ At Δ Chk #3

BS.	328°-10'	1270'	orig. 28
Tie	158°-09'		Silo new
Tie	64°-15'	1260	orig #21
Nth S. Hwy (W)	317½°	255'	
To #20	326°-30'	980'	
	Culvert 335°	500'	



A	3.645	Mt.		
B	5.180	Tel. Rev		
	5.185	Nat.	Inst Mid Mar.	
	3.645	Tel. Rev		5.19 3.65 1.53
A	8.46			3
B	5.98		Inst at H	5 9 3 1 5

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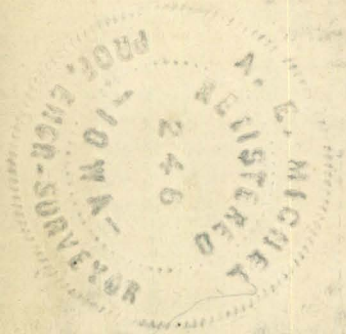

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1½ TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37 0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47 1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50 1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51 1	51.3	51.4	51.6	51 7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53 1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57 1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61 9	62.1	62.2	62.4	36

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