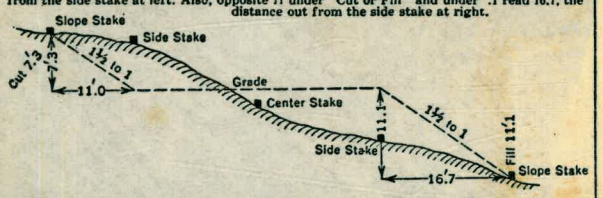
W
597

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

Roadway of any Width. Side Slopes 1½ to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



Cut or Fill	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Cut or Fill
	Distance out from Side or Shoulder Stake										
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2 4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19·8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59 7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

KEUFFEL & ESSER CO., N. Y.

5
~~297~~

MICROFILMED

JAN 13 1965

The paper in this book **No. F370A** is made of **50%** high grade rag stock with a **WATER RESISTING** surface sizing.

10,892-2. y, cc, ys. cM.

INDEX

Proposed Imperial Ave. P.L.
45th St. to 30th St. 1-30

Profile (Continued From Page 75 F.B. #675)

	7.98	69.89		61.91
130+50			9.5	
edge				
Pav.			9.8	
131			8.5	
edge			9.0	
Pav.				
+56			7.7	
edge pav.			7.8	
+55				
132			5.7	
edge				
Pav.			6.3	
+50			4.6	
edge pav.			5.2	
+78				
133			3.1	
edge pav.			3.8	
+42			4.0	
+45 5			4.1	
+65			9.9	
+65			21.9	
134			20.8	

7-17-44

℄

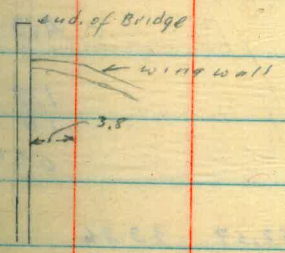
Note — This stationing not run to Transit Survey

B.M. nail in Tel. Pole N.W. Cor. 45th & Jm P.

7° O Tel. Pole #414517

11° O Tel. Pole #611172T

Spill Way (Conc.)

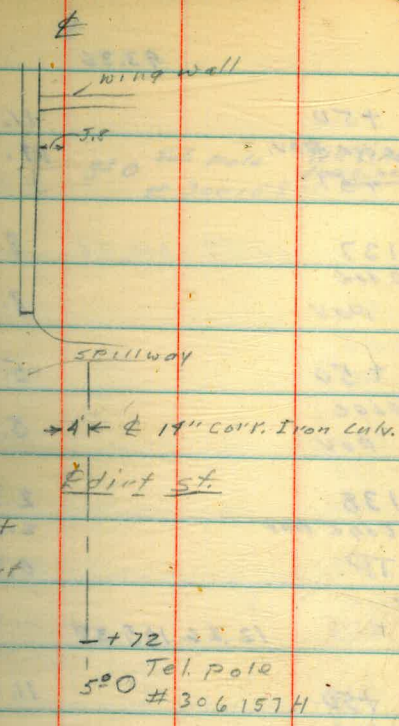


on wing wall

in wash

in wash

		69.89			
134+03			10.8		on wing wall
TP			0.39	69.50	
	11.50	81.00			
+24.5					
+26			11.8		in Spillway
+50			9.1		
edge pav.			9.6		
+61			8.7		
			11.80		Fl. 2 in + 16 end of Culvert
			9.80		Fl. 2 in + 72 end of culvert
+72					
+78					
135			7.5		
edge pav.			7.1		
+50			4.4		
edge pav			4.3		
136			1.9		
edge pav.			1.6		
TP			0.31	80.69	
	12.67	93.36			



		93.36									
+50			11.3								
edge pav.			11.1								
+51									5°0 Tel. Pole # 306158 H		Tel. Line end S. here
137			8.4								
edge pav			8.1								
+50			5.4								
edge pav			5.3								
138			2.7								
edge pav			2.6								
TP			0,23	93.13							
	12.26	105.39									
+50			11.9								
edge pav			11.7								
139			9.1								
edge pav.			9.1								
+50			6.3								
edge pav			6.8								
140			4.2								
edge pav.			4.9								

		105.39		2.9	
140+50			2.5		
edge PAV			2.7		
TP			0.14	105.25	
	10.59	115.84			
141			10.5		
edge PAV			11.0		
141+50			8.5		
edge PAV			8.9		
142			6.4		
edge PAV			6.8		
			9.80	Fl. line R. end	℄ 12" Corr. I. Culvert 2° →
+05			8.50	Fl. line L. end	
+50			4.6		
edge PAV			4.6		
143			2.6		
edge PAV.			2.6		
TP			0.91	114.93	
	7.39	122.32			

		122.32	
+50			7.2
edge			
pav.			6.9
144			5.1
edge			
pav.			4.9
+50			3.8
edge			
pav			3.5
145			2.9
edge			
pav.			2.6
+50			2.7
edge			
pav.			2.5
146			3.5
edge			
pav.			3.3
+50			4.6
edge			
pav.			4.5
147			6.9
edge			
pav			6.5

		122.32			
147+50			9.5		
edge pav			9.2		
148			12.3		
edge pav.			12.2		
TP			13.03	109.29	
	0.42	109.71			
+50			2.7		
edge pav			2.5		
149			5.5		
edge pav.			5.6		
+50			8.4		
edge pav.			8.4		
150			10.7		
edge pav.			10.7		
+50			12.5		
edge pav			12.3		

$\pm \frac{1.1}{1}$

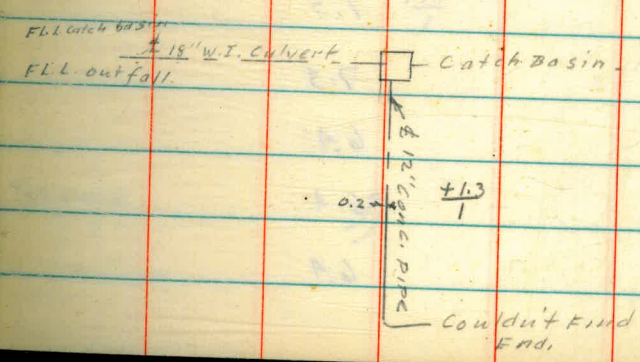
$\frac{+1.2}{1}$

$\frac{+1.2}{1}$

$\frac{+0.6}{1}$

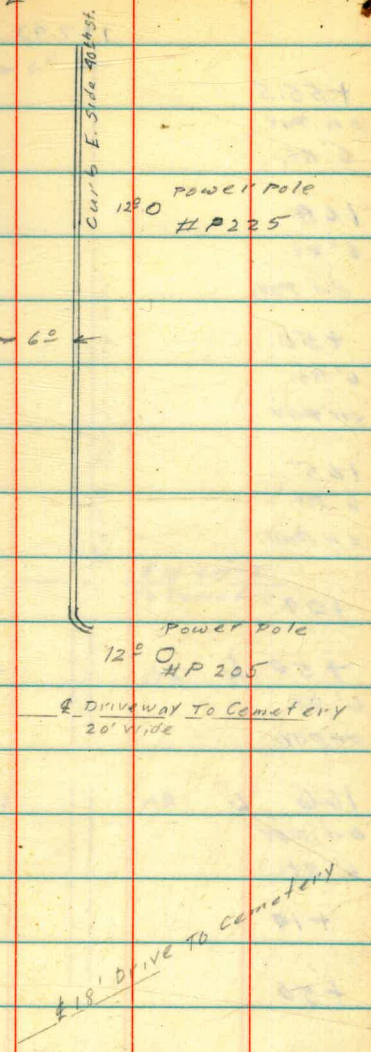
		109.71									
151			14.0						+0.1 / 1		
edge pav.			13.9								
+50			13.9						+0.8 / 1		
edge pav			13.8								
152			13.1						+1.0 / 1		
edge pav.			12.9								
+50			11.5						+1.3 / 1		
edge pav			11.5								
TP			11.48	98.23							
	11.69	109.92									
153			9.7						+1.0 / 1		
edge pav			9.8								
+50			8.0						+1.5 / 1		
edge pav			7.9								
154			6.3						+1.3 / 1		
edge pav.			6.3								

		109.92									
154+50			5.3								$+\frac{1.2}{1}$
edge											
pav.			5.2								
155			4.7								$\frac{+1.1}{1}$
edge											
Pav.			4.8								
+50			5.1								$\frac{+13}{1}$
edge											
pav.			4.9								
156			5.5								$\frac{+14}{1}$
edge											
pav.			5.3								
+50			5.9								$\frac{+15}{1}$
edge											
pav			5.6								
+64											$4^{8} \rightarrow$ Power Stub Guy To Pole # 173956
157			6.2								$\frac{+0.9}{1}$
edge											
pav			6.1								
$+09^{3}$			8.50 12.80								
+50			6.6								
edge											
pav.			6.5								$\frac{+1.3}{1}$

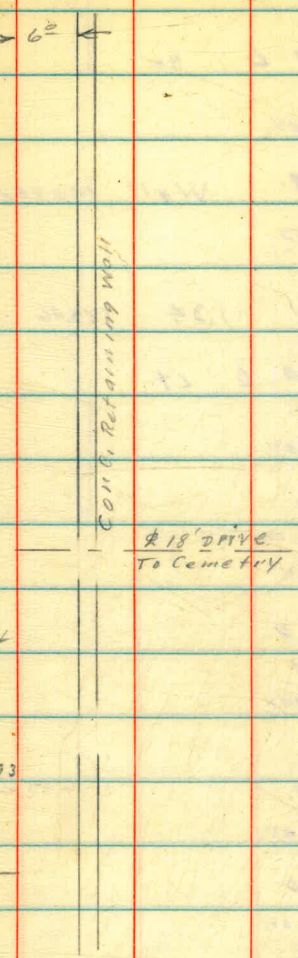


		109.92								
158			6.5						+1.3 / 1	
edge										
pav.			6.4							
+50			6.1						+1.3 / 1	
edge										
pav.			6.1							
			5.91	104.01						
	12.39	116.40								
159			11.8						+1.0 / 1	
edge										
pav.			11.7							
+50			10.5						0.8 / 1	
edge										
pav			10.3							
160			8.8						0.8 / 1	
edge										
pav			8.7							
+50			7.5						+1.0 / 1	
edge										
pav.			7.3							
+84			6.4							
+84			6.4		Top curb					
edge										
pav			6.4							

		116.40	
161+18			5.0
Top curb 6' Rt.			4.7
+19			
+50			3.5
Top curb			3.0
162			2.1
Top curb			1.7
+			0.9
Top curb			0.5
+62			
+95			
TP			0.14
	11.17	127.43	
163	L	Lt.	10.8
on pav' 6' Rt.			10.8
+40			
+50			10.1
on pav' 6' Rt.			10.1



		127.43	
+55.5			10.0
on Pav			
6' Rt.			10.2
164			9.1
6' Rt.			
on Pav.			9.2
+50			7.6
6' Rt.			
on Pav			7.9
165			6.3
6' Rt.			
on Pav.			6.4
+09			
+50	L.	Lt.	4.9
6' Rt.			
on Pav.			5.0
166	L.	Rt.	3.7
on Pav			
6' Rt.			3.9
+19			
+50			3.6
			3.8



Note - ℄ P.L. offset
1' to Parellel Wall
Betwn. +50 & 166
L at +50 & L at 166
Wall moves L. 1.2' sta. 165+93

℄ Ada St.

167 L	Rt.		4.3		
6' Rt. on pav.			4.3		
+19	Wall Moves Rt. 6'				
TP			5.31	122.12	
	1.34	123.46			
+50 L	Lt.		1.5		
6' Rt. on pav			1.5		
1.68			2.5		
6' Rt. on pav			2.5		
+50			3.5		
6' Rt on pav			3.6		
169			4.4		
6' Rt. on pav			4.4		
+50			5.3		
6' Rt. on pav.			5.4		
B.M.			4.98		
+71					

Note - line off set 6' right to parellel wall betwn. Sta. 167 & 167+50.

B.P. S.E. Cor. 39th & Imp El. 118.38
439th St.

		123.46			
170			5.7		
6' Rt.					
on Pav.			5.7		
+50			6.7		
6' Rt.					
on Pav.			6.8		
171			7.9		
6' Rt.					
on Pav.			8.0		
+50			9.1		
6' Rt.					
on Pav.			9.2		
172			10.5		
6' Rt.					
on Pav.			10.6		
+50			12.8		
6' Rt.					
on Pav.			13.0		
TP			12.69	110.77	
	0.61	111.38			
+82					
173			3.6		
6' Rt.					
on Pav.			3.7		

+67 End of wall

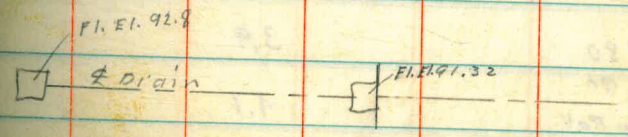
℄ 30' Drive to Cemetery

		111.38		
+50			6.6	
on pav 6' Rt.			6.8	
174			8.2	
6' Rt on pav.			9.8	
+50			11.0	
6' Rt. on pav.			11.1	
175			12.7	
			12.9	
TP			13.00	98.38
	2.45	100.83		
+50			3.7	
6' Rt. on pav.			3.8	
TP B.M.			2.83	98.00
	3.32	101.32		
176			5.7	
6' Rt. on pav.			6.0	
+04			10.0 8.5	

98.58

2.8
1.2

Top F.P. S.E. Cor. 38th & Imp El. 98.58



		101.32									
176+30.5						℄ 38th St.					
+50			5.9								
6' Rt. on Pav.			6.1								
177			5.6								
6' Rt. on Pav.			5.8								
+50			5.3								
6' Rt. on Pav.			5.5								
178			5.0								
6' Rt. on Pav.			5.1								
+50			4.7								
6' Rt. on Pav.			4.9								
179			4.5								
6' Rt. on Pav			4.6								
+50			4.2								
6' Rt. on Pav.			4.4								
180			3.9								
6' Rt. on Pav.			4.1								

		101.32			
180+50			3.6		
6' Rt.					
on Pav			3.7		
TP			2.95	98.37	
	5.48	103.85			
181			5.7		
edge pav.					
6' Rt.			5.8		
+22					
+50			5.5		
6' Rt. on					
Pav			5.6		
182			5.2		
6' Rt. on					
Pav.			5.2		
+50			4.9		
6' Rt. on					
Pav.			5.0		
+89					
183			4.8		
6' Rt. on					
Pav.			5.0		

℄ 18' Drive

Note - Line Angled at 181+50 ℄ 182 to parallel curb which jogs 0.7' Rt. at sta. 181+87

℄ 37th St.

		103.85		
183+50			5.0	
6' Rt. on Pav.			5.1	
184			5.2	
6' Rt. on Pav			5.3	
+50			5.3	
6' Rt. on Pav			5.4	
+68				
185			5.5	
6' Rt. on Pav.			5.6	
+50			5.7	
6' Rt. on Pav.			5.9	
186			5.9	
6' Rt. on Pav.			6.1	
+20.5				
+50			6.2	
6' Rt. on Pav.			6.4	
TP			6.14	97.71

℄

℄ 13' Driveway

℄ Southlook St.

				97.71	
	4.05	101.76			
187			4.3		
6' Rt. on pav			4.4		
+50			4.4		
6' Rt. on pav.			4.6		
188			4.9		
6' Rt. on pav			5.0		
+50			6.5		
6' Rt. on pav.			6.7		
TP B.M.			7.80	93.96	SET B.M. L.P. C.T. IN WALK S.E. Col. 36th & Imp.
	7.87	101.83			
189			8.8		
6' Rt. on pav.			9.1		
+13	L.	Lt.	9.5		
+50			8.7		
+55					& 36th St.

		101.83			
190			7.1		
+50			5.6		
+68					
+85.6	L	Rt.	4.5		
191			4.2		
+09					
+50			3.8		
192			5.0		
+09					
+16					
+50			6.6		
TP			9.11	92.72	
	0.69	93.41			
193			1.2		
+50			3.2		
+53					
+85					

℄ Webster st. (dirt.)

Power Pole #3597 0.6°

← 15° →

℄ Alley

Trans. Pole #3565 0.6°

℄ Webster st.

Note – P.L. Parallels ℄ Webster st. to Bancroft.

℄ Pardee st. dirt

Power Pole #3599 0.6°

		93.41			
194			5.6		
+50			8.8		
195			12.3		
TP			12.93	80.48	
	0.31	80.79			
+03					
+15					
+50			4.3		
196			7.6		
+50			10.5		
+51					
+88					
197			13.1		
TP			13.08	67.71	
	0.06	67.77			
+50			3.1		
198			7.0		

℄ Alley

Power Pole
#3525 07

℄ 35th St
(dirt)

Power Pole
#3499 05

		67.77						℄			
+22						℄ dirt Alley					
+29						Power Pole Pole line ends here # 3473			O 5⁵		
+50			9.4								
199			13.5								
TP			12.89	54.88							
	0.15	55.03									
+50			5.3								
+90						℄ dirt road.					
200			9.9								
+50			14.1								
TP			13.11	41.92							
	0.63	42.55									
201			5.0								
+06						Leave Road. Rd. turns Left here			Dirt St.		
+36			5.6								
+46			7.2 17.3	Top M.H. F.L.L.		℄ dirt St.			11°	O M.H. Sewer	
+50			9.1								

		42.55		
TP			13.07	29.48
	0.19	29.67		
+85				
202			4.7	
+18				
+29			9.3 15.4	
+38			8.1	
+50			10.9	
+56			11.5	
+65			14.9	
203			14.0	
TP			11.93	17.74
	4.05	21.79		
+16			4.05 13.45	
+38			6.9	
+50			6.8	
+70			3.7	

℄

Eucalyptus trees
(4) from +85
to 202+32 on line

9°

Top M.H.
Fl. Line

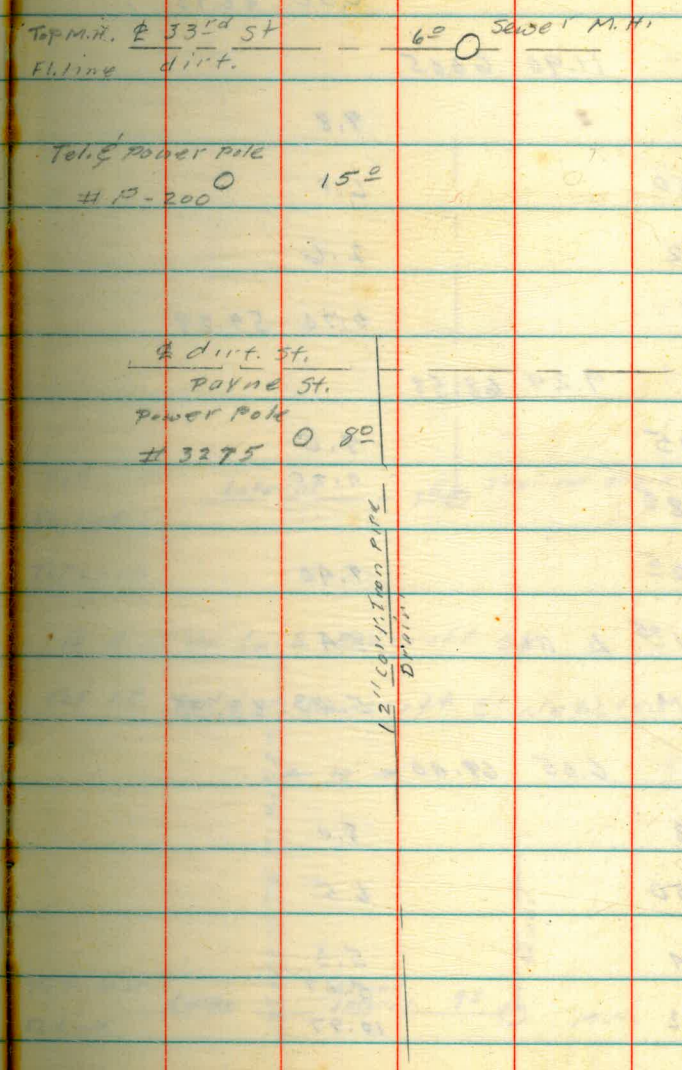
10.5 M.H.
sewer

Top M.H. ℄ interceptor
Fl. line interceptor

sewer M.H.
Intersection

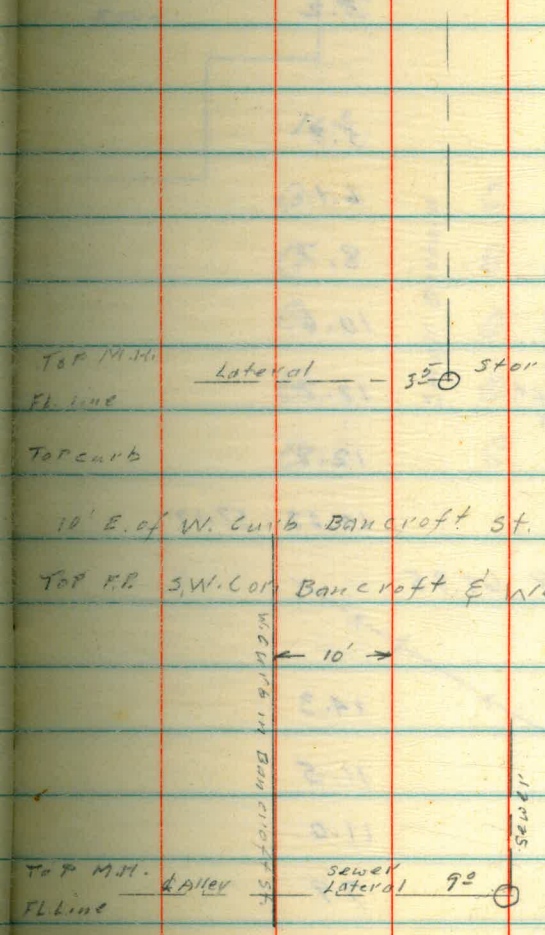
		21.79							℄		
+76						℄ dirt st.					
204			4.6								
+50			3.8								
+94						Power Pole #3315	O	11°			
205			4.7								
+28			4.77 8.27			Top M.H. FL. Line			8.5 O	Sewer M.H.	
+50			4.2								
+92						Stub Guy	O	19°			
206			3.9								
+14						℄ dirt st.					
+36						Power Pole #3349	O	13°			
TP B.M.			3.56	18.23							
	5.52	23.75									
+50			5.3								
+87						℄ 8' dirt drive					
207			5.2								
+50			4.6								

		23.75			
208			4.6		
			4.34		
+27			11.44		
+50			4.8		
+56					
209			5.0		
+50			4.3		
+72					
+90					
210			2.2		
+16			0.2		
TP			0.36	23.39	
	12.85	36.24			
+35			6.4		
TP			0.28	35.96	
	12.69	48.65			
+50			12.0		
+67			4.1		

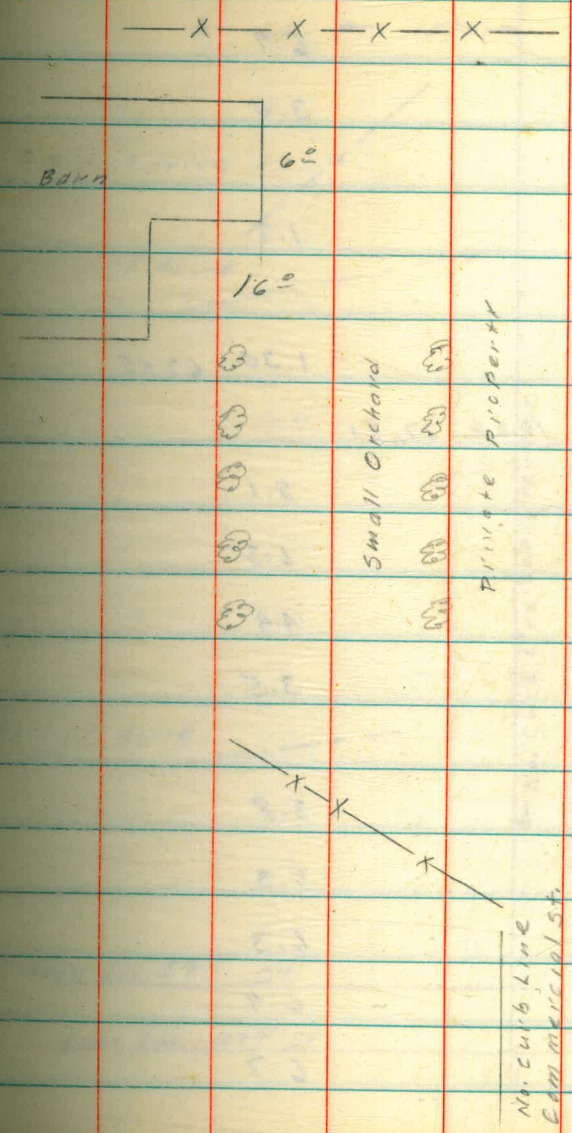


		48.65		
TP			0.50	48.15
	11.90	60.05		
211			9.8	
+50			6.1	
212			2.6	
TP			0.76	59.29
	9.29	68.58		
+15			9.0	
+18.5			9.20	
+22.5			9.40	
+51.95	L. Rt.		8.4	
TP B.M.			5.23	63.35
	6.05	69.40		
213			8.0	
+50			6.5	
214			5.3	
+32			5.07 10.97	

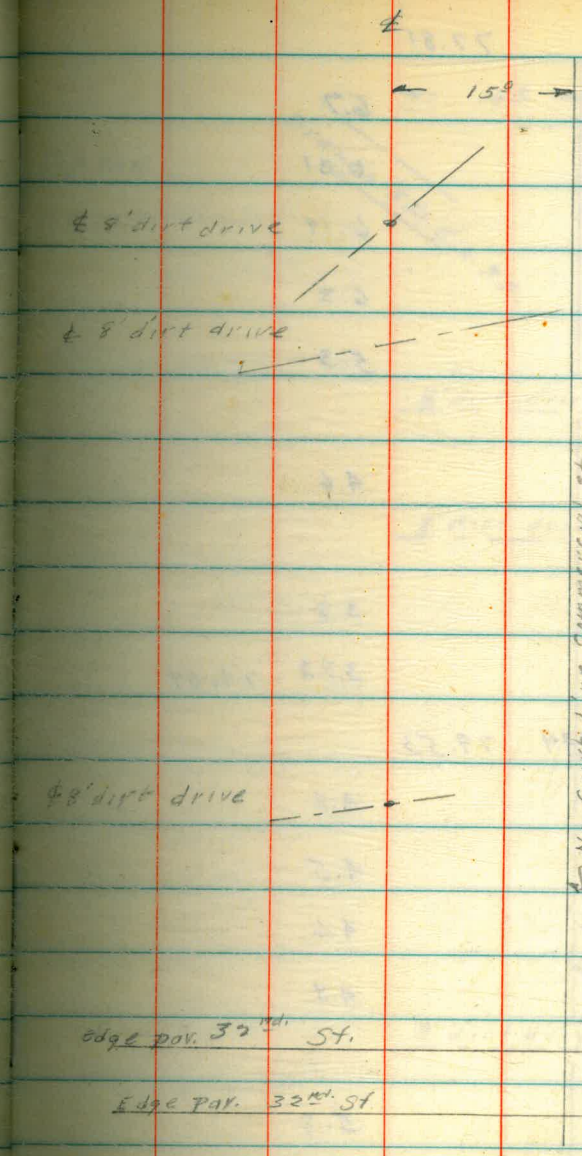
℄



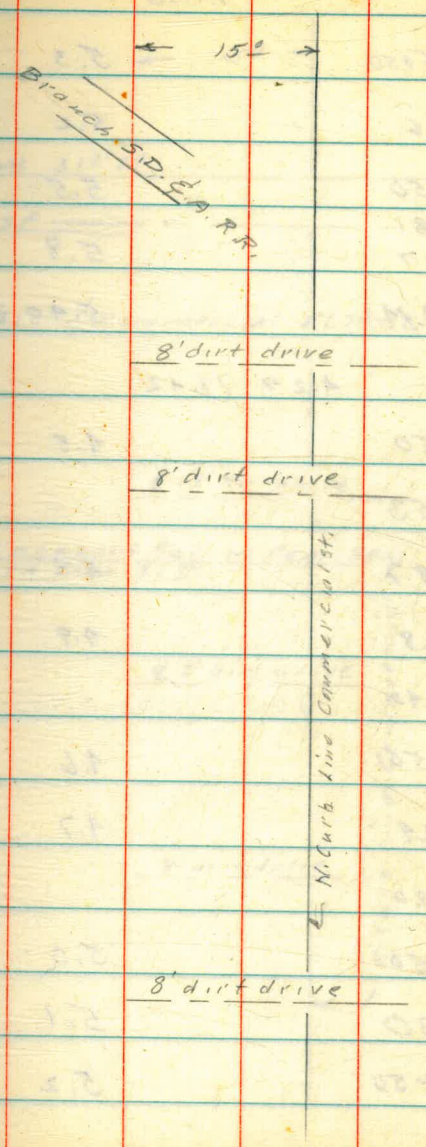
		69.40			
+40 6					
+44					
+50			5.2		
55 5					
215			5.8		
+33			6.1		
+44			8.7		
216			10.6		
+34 7	L	Lt.	12.7		
+50			12.8		
TP			12.23	57.17	
	11.68	68.85			
+53					
+59			14.3		
+80			11.5		
217			11.0		
+32			7.9		



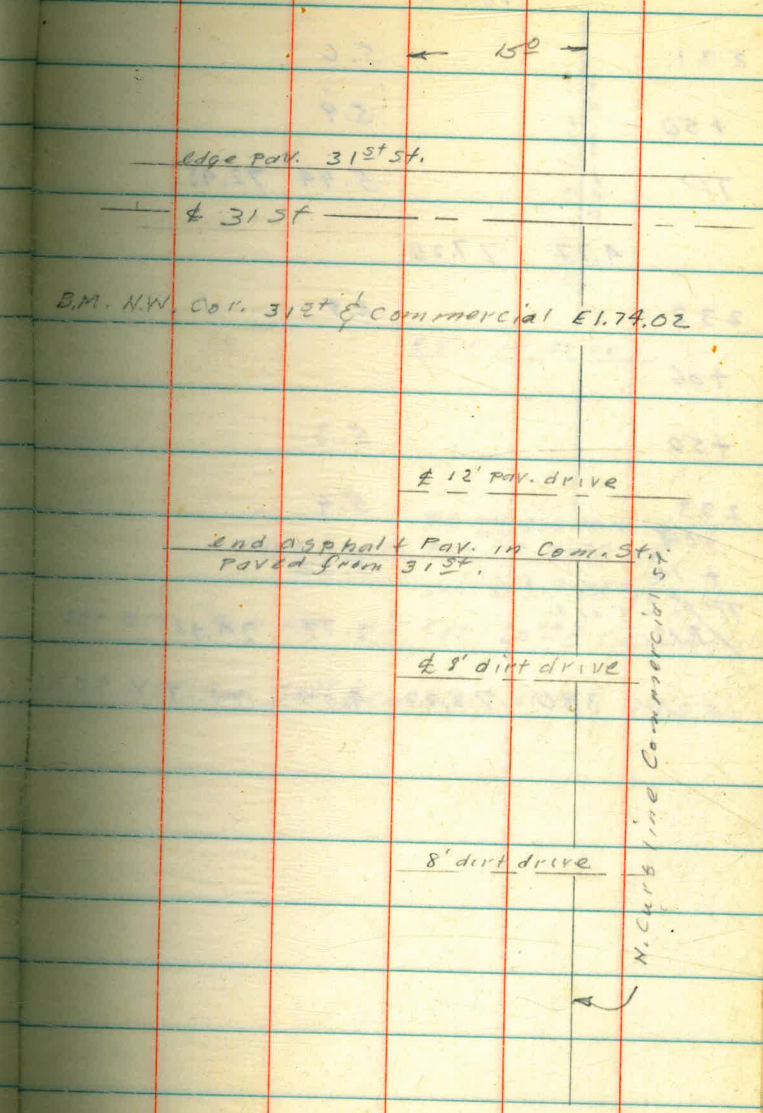
		68.85		
+50			6.4	
+72			3.0	
+88				
218			1.8	
+18				
TP			1.30	67.55
	10.26	77.81		
+22			8.1	
+50			6.3	
219			4.4	
+23			3.5	
+31				
+50			3.8	
+71			3.3	
+77			6.3	
220			6.9	
+40			6.7	



		77.81			
+50			6.7		
+73			6.31		Top rail
+88			6.19		Top rail
221			6.3		
+50			5.3		
+60					
222			4.6		
+25					
+50			3.8		
			3.72	74.09	
	5.44	79.53			
223			4.8		
+50			4.5		
224			4.6		
+50			4.8		
+85					
225			5.2		



		79.53		
225+50			5.3	
226			5.2	
+50			5.5	
+81				
227			5.8	
TP				
B.M.			5.40	74.13
	4.29	78.42		
+50			4.8	
+53				
+87			4.8	
228			4.9	
+40				
+50			4.6	
229			4.7	
+20				
+50			5.0	
230			5.1	
+50			5.2	



		78.42		
231			5.6	
+50			5.9	
TP			5.94	72.48
	4.72	77.20		
232			4.9	
+06				
+50			5.3	
233			5.4	
+09				
+12			5.32	
TP/B.M.			2.78	74.42
	3.80	78.22	4.09	74.13

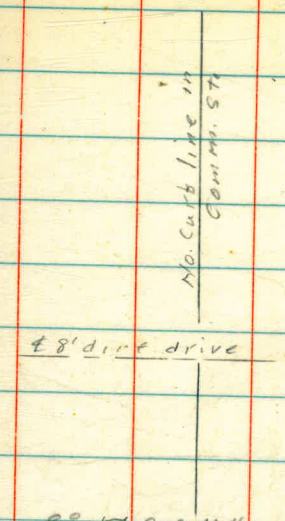
+20.5 Drain
+22 to curb line
+418 to ℄

No. Curb line in Comm. St.

℄ 8' dirt drive

8" ☐ Gas M.H.

edge conc. pav in 30th St.

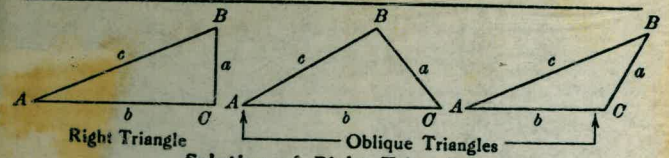


Set B.M. Top F.P. S.E. Cor. 30th & Commercial

B.M. B.P. N.W. Cor. 31st & Commercial El. 74.02

1,23.46
1269
110.77

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\text{cosec} = \frac{c}{a}$

Given	Required	
a, b	A, B, c	$\tan A = \frac{a}{b} = \cot B,\ c = \sqrt{a^2+b^2} = a\sqrt{1+\frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B,\ b = \sqrt{(c+a)(c-a)} = c\sqrt{1-\frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90° - A,\ b = a \cot A,\ c = \frac{a}{\sin A}.$
A, b	B, a, c	$B = 90° - A,\ a = b \tan A,\ c = \frac{b}{\cos A}.$
A, c	B, a, b	$B = 90° - A,\ a = c \sin A,\ b = c \cos A,$

Solution of Oblique Triangles

Given	Required	
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A},\ C = 180° - (A+B),\ c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a},\ C = 180° - (A+B),\ c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A+B = 180° - C,\ \tan \frac{1}{2}(A-B) = \frac{(a-b)\tan\frac{1}{2}(A+B)}{a+b},$ $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a+b+c}{2},\ \sin\frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{bc}},$ $\sin\frac{1}{2}B = \sqrt{\frac{(s-a)(s-c)}{ac}},\ C = 180° - (A+B)$
a, b, c	Area	$s = \frac{a+b+c}{2},\ \text{area} = \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	$\text{area} = \frac{bc \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL

Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = 5° 10′. From Table, Page IX. cos 5° 10′ = .9959. Horizontal distance = 319.4 × .9959 = 318.09 ft.

Horizontal distance also = Slope distance minus slope distance times (1 − cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. Cosine 5° 10′ = .9959. 1 − .9959 = .0041. 319.4 × .0041 = 1.31. 319.4 − 1.31 = 318.09 ft.

When the rise is known, the horizontal distance is approximately:—the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance $= 302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.

MADE IN U. S. A.