

*City Sewers
Levels
1st St.*

9

TRANSIT

F. B. 666

666

Table showing the difference of latitude and departure in running 80 chains at any course from 1 to 60 minutes.

Minutes.	Lks.	Minutes.	Lks.	Minutes.	Lks.
1	2½	21	49	41	95½
2	4½	22	51½	42	98
3	7	23	53½	43	100½
4	9½	24	56	44	102½
5	11½	25	58½	45	105
6	14	26	60½	46	107½
7	16½	27	63	47	109½
8	18½	28	65½	48	112
9	21	29	67½	49	114½
10	23½	30	70	50	116½
11	25½	31	72½	51	119
12	28	32	74½	52	121½
13	30½	33	77	53	123½
14	32½	34	79½	54	126
15	35	35	81½	55	128½
16	37½	36	84	56	130½
17	39½	37	86½	57	133
18	42	38	88½	58	135½
19	44½	39	91	59	137½
20	46½	40	93½	60	140

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Table for Running on Slopes.

In the following table the first column shows the angle, the second, the number of links to be added to a chain on the slopes, to make one chain, horizontal measurement.

Angle.	Cor. in links	Angle.	Cor. in links.	Angle.	Cor. in links.	Angle.	Cor. in links.
4	0.24	11	1.88	18	5.14	25	10.54
5	0.38	12	2.24	19	5.76	26	11.26
6	0.55	13	2.63	20	6.42	27	12.24
7	0.76	14	3.06	21	7.11	28	13.37
8	0.98	15	3.53	22	7.85	29	14.84
9	1.24	16	4.02	23	8.64	30	15.47
10	1.55	17	4.56	24	9.47	35	22.07

E. J. W. } July 7/87
 H. W. H. } — 11th St - St. City Union —

Δ	+	H.I.	-	Elev	B.B.	REMARKS
BM	3.06	7.71		4.65		J & 11 th St.
0+50			4.84	2.87		
Δ 1			3.86	3.85		
1+50			3.06	4.65		
Δ 2	9.79	15.71	1.79	5.92		
2+50			8.61	7.10		
Δ 3			7.83	7.88		
3+40			7.05	8.71		I & 11 th St.
0			6.45	9.26		
0+50			5.46	10.25		
Δ 1			4.47	11.24		
1+50			3.91	11.80		
Δ 2			3.73	11.98		
2+50			3.08	12.63		
Δ 3			3.99	11.72		
3+40			3.85	11.86		H & 11 th St.
Δ 0			3.12	12.59		
0+50			4.33	14.04		
Δ 1			4.40	13.97		
1+50			3.85	14.52		
Δ 2			4.05	14.32		

E. G. W. } July 7/87 1st ST - City Sewer. -
 H. H. H. }
 2

Δ	+	H.I.	-	Elev. BB.	REMARKS.
Δ2+50			3.93	14.45	
3			3.64	14.73	
3+40			4.39	13.98	G & 1 st ST.
0			4.94	13.43	
BM		18.36	4.28	14.09	14.08
0+50			4.87	13.49	
1			4.83	13.53	
1+50			4.04	14.32	
2			3.77	14.59	
2+50			3.03	15.33	
3	11.52	27.44	2.44	15.92	H & 1 st ST.
3+40			10.77	17.27	
0			10.52	16.92	
0+50			9.65	17.79	
1			8.68	18.76	
1+50			7.37	20.07	
2			6.19	21.25	
2+50			4.67	22.77	
3			3.55	23.89	
3+40			2.10	25.34	H & 1 st ST.
0			1.86	26.58	
Over	10.44	36.88	1.00	26.44	

G. W. }
 H. Steen } July 187

11th - 5th City Sewer -

Δ	+	HI	-	Elev	BB	REMARKS
		36.88	9.56	27.32		
1			8.30	28.58		
1+50			7.42	29.46		
2			6.60	30.28		
2+50			5.82	31.06		
2+85						
B.M.		36.84	5.17	31.71	31.67	
3+47.5			3.71	33.13		11 th & 11 th ST.
4+10+0			4.41	32.43		
0+50			3.64	33.20		
1			3.27	33.57		
1+50			2.79	34.05		
2			2.53	34.01		
3+50			2.70	34.14		
2+70			2.61	34.23		
3+10 = 7.31	41.66		2.49	34.35	34.45	C & 11 th ST.
0			7.21	34.28		
0+50			7.38	35.16		
1			6.50	35.49		
1+50			6.17	35.89		
2			5.77	35.8		
2+50			5.70	35.96		

G.P.M. }
H. Fisher } July/87

1st - 5th - City Sowers. -

4

Δ	+	H.I.	-	F.lev BB	REMARKS
B		41.66	5.21	36.45	
3+40			4.91	36.73	
0			3.68	37.98	
B.M.		41.70	4.51	37.15	37.19
0+50			1.97	39.73	
1			1.31	40.39	
1+50	11.21	52.77	0.74	41.56	
2			8.92	43.85	
2+50			4.36	45.41	
B			5.11	47.66	
3+40			3.71	49.06	
0			2.80	49.97	
0+50			1.39	51.38	
1	# 10.68	63.42	0.03	52.74	
1+50			9.74	53.68	
2			9.31	54.11	
2+50			8.17	55.25	
3			6.48	56.94	
3+40			5.46	57.96	
B.M.		63.43	4.78	58.64	58.65
0			4.86	58.57	

B & 1st ST.

A & 1st ST.

A & 1st ST.

C. G. W. }
 H. Stokes } July 1887

Δ	+	HI	-	Elev	B.B.
0+50		6343	4.09	59.34	
1			2.07	60.36	
1+50			2.92	60.51	
2			2.47	60.96	
2+50			2.19	61.24	
3 #	11.87	74.18	1.12	62.31	
3+40			10.64	63.54	
0			10.36	63.82	
0+50			9.45	64.73	
1			7.47	66.71	
1+50			6.16	68.02	
2			4.94	69.24	
2+50			4.08	70.10	
3			3.61	70.57	
3+40			5.27	68.91	
0			6.87	67.31	
0+50			6.70	67.48	
1			4.59	69.59	
1+50	11.93	85.78	0.33	73.85	
1+50			11.27	74.51	
2			7.84	77.94	

Beech & 7th ST.

Cedar & 7th ST.

201 ft } July 1887
 76. Choke.

6

Δ	+	H.I.	—	Elev	B.B.
2+50			0.57	82.27	
#	11.73	96.40	1.11	84.57	
3			10.50	85.90	
3+50			8.43	87.98	
0			6.87	89.53	
B.M.			4.61	91.79	91.82
0+50			6.07	90.42	
1			6.48	89.95	
5' left of 0+50			9.20	87.23	
-50			0.37	96.06	

REMARKS.

DATED 2nd 5/16

Levels on 1st St. N. A. St.

Sta	+	HI	-	Elev
Bm	0.75	59.41		58.66
Bm			9.24	50.17
31			10.61	49.80
+20			10.13	49.26
+40			10.01	49.40
+60			9.34	50.07
+85			8.84	50.57
32+10			8.03	51.38
+35			7.03	52.39
+60			6.44	52.97
+85			5.80	53.61
33+10			5.13	54.28
+35			4.60	54.81
+60			4.05	55.36
+85			3.38	56.03
34+10			2.67	56.74
+35			1.95	57.46
+60			1.38	58.03
Bm#	7.66	66.32	0.75	58.66
+80			8.08	58.24
35			7.83	58.49

1st Ash

1st A SW Hydr

2nd Ash

Ash St

First St N Ash

Sta	+	l	-	clw
+20		66.32	7.80	58.52
+40			7.51	58.81
+55			7.20	59.12
+90			6.91	59.41
36+15			6.57	59.75
+40			6.08	60.24
+65			5.68	60.64
+90			5.47	60.85
37+15			5.14	61.21
+40			4.81	61.51
+65			4.38	61.94
+90			4.16	62.16
37+15			3.91	62.41
+40			3.35	62.97
+60			2.95	63.37
+80			2.56	63.76
38			2.43	63.89
+20			2.22	64.10
#	3.57	67.72	2.17	64.15
Bm			1.01	66.71

N 2 Ash St

S D Beech St

Beech - St.

N S Beech St

1 M. St. A. Beach

Stn	+	H.I.	-	lev
B.M.	5.30	72.01		66.71
+45			7.39	64.62
+76			6.94	65.07
+95			6.93	65.16
40+20			6.53	65.48
+45			5.82	66.19
+70			5.19	66.82
+95			4.65	67.36
40+20			4.34	67.68
+45			3.94	68.07
+70			3.62	68.39
+95			3.15	68.86
42+20			2.91	69.62
+40			2.27	69.74
+61			2.24	69.73
+80			2.16	69.85
43			1.94	70.03
B.M.	9.19	81.10	0.10	71.91
+25			10.77	70.33
+50			10.00	71.10

S. S. bedar

bedar St.

W L bedar

1 st St - N bedau

Stc	r	950	-	Blev
43+75		81.10	4.90	72.40
44			7.37	73.73
-125			6.31	74.79
+50			5.23	75.87
+75			4.06	77.04
45			2.77	78.33
-125			1.40	79.70
#	10.80	91.10	0.40	80.30
+50			10.10	80.94
+75			4.77	82.33
46			7.55	83.33
-20			6.52	84.58
+40			5.49	85.61
+60			4.84	86.26
+80			4.10	87.40
47+05			2.71	88.39
+30			1.32	89.74
#	11.11	101.52	0.69	90.41
+55			10.17	91.35
+80			8.22	93.30

S L Bate St.

Bate St.

N L Bate

1 St. St. A Date

Sta	+	H ₂ O	-	Clev
48+05		101.52	6.27	95.25
+30			4.05	97.47
+35			2.41	99.11
+40			0.65	100.87
#	11.35	112.08	0.79	100.73
49+05			9.45	102.63
+30			7.55	104.53
+35			5.89	106.20
+40			4.10	107.94
B _{9m}	9.14	121.05	0.21	111.87
30			11.77	109.28
+20			10.33	110.72
+40			8.86	112.19
+60			8.21	112.84
+85			6.79	114.36
57+10			5.17	115.88
+35			3.71	117.34
+60			2.44	118.61
+85			0.72	120.33
#	9.50	129.83	0.72	120.33

S L Clin

Clin St

N S Clin St

Stn	+	#	-	blew	
52+10		123.83	7.81	122.02	
+35			6.25	123.57	
+60			4.40	125.43	
+85			2.61	127.22	
53+10			1.67	129.16	
#	9.37	138.44	0.76	129.07	
+35			7.63	130.81	
+60			6.54	132.10	
Blm	7.94	144.98	1.42	137.02	137.04
+80			11.73	133.25	
54			10.89	134.09	
+20			10.07	134.91	
+41			9.31	135.67	
+65			8.02	136.46	
+90			6.62	138.36	
55+15			5.06	139.92	
+40			3.89	141.09	
+65			2.69	142.29	
+90			1.71	143.27	
56+15			1.00	143.96	

S L Tire St

Tire St

N S Tire St

I St St & Grape

Sta	+	149	-	Clear
56+40		144.94	0.76	144.22
+65			0.72	144.26
+70			1.29	143.69
57+15			1.90	143.08
+40			2.93	142.05
PM	10.26	149.09	6.15	134.83 138.79
+60			7.56	141.53
+80			8.27	140.82
58			9.00	140.09
+20			10.06	139.03
+45			8.20	140.89
+70			6.75	142.34
+95			5.00	144.09
59+20			2.90	146.19
+45			0.07	148.22
#	11.91	160.27	0.73	148.36
+70			9.35	150.92
+95			7.40	152.57
60+20			5.42	154.85
+95			3.50	156.97

S & Grape St
 II St & Grape

Grape St

N & Grape

N of Hawthorn

Sta	+	HD	-	600	
#	11.32	169.03	2.56	157.71	
+70			10.14	157.89	
+95			7.99	161.84	
61+20			6.40	162.63	
B.M.	10.24	175.16	4.13	164.90	164.92
+40			11.24	163.92	
+60			10.59	164.77	
+80			9.72	165.44	
62			9.67	166.49	
+25			7.34	167.82	
+50			6.71	169.43	
+75			4.20	170.96	
63			2.53	172.61	
+25			0.75	174.41	
#	9.96	184.12	1.52	174.16	
+50			7.96	176.16	
+75			6.06	178.06	
64			4.18	179.94	
+25			2.18	181.94	
#	8.23	191.17	1.18	182.94	

S. S. Hawthorn

Hawthorn St

W. S. Hawthorn

I. Sh. N. Day

Sta	+	HD	-	Obs	
+50		191.77	7.17	184.60	
+75			5.60	185.57	
65-			4.01	187.16	
B.M.	9.24	198.71	0.71	190.45	190.47
+20			10.37	188.54	
+40			9.87	188.84	
+60			9.56	189.55	
+80			9.02	189.69	
66+05-			8.25	190.46	
+30			7.45	191.26	
+56			6.73	191.98	
+80			6.62	193.09	
67+05-			4.81	190.90	
+30			3.99	194.72	
+55			3.57	195.34	
+80			3.52	196.39	
68+05-			1.36	197.55	
#	6.85	204.84	0.72	197.99	
+30			6.14	198.70	
+55-			5.55	199.29	

I. Sh. Day

Day Sh.

N. Sh. Day

Trust Bank 25' S. Jam. K.

Front St N of Fair

Str	+	HD	-	C
Bm	10.06	99.79		89.73
#	11.86	110.91	0.74	99.05
Bm			1.29	109.62
54+65			9.39	101.32
+90			8.80	102.11
55+15			8.92	102.49
+40			7.85	103.06
+65			7.68	103.23
+90			6.82	104.09
56+15			5.12	105.79
+46			2.72	108.19
+65			0.51	110.40
#	9.28	119.23	0.96	109.95
+90			6.42	112.81
57+15			3.53	115.70
+90			2.12	117.17
60			1.82	117.41
58			1.44	117.79
58			1.23	118.00
+20			0.90	118.33
#	11.66	130.10	0.79	118.44

Wmire Fair

Front & Fair S. P. NB
25 N. N. L. Fair

119.95
117.00
2.95

S L Grape

Grape St

N L Grape

Front St Grape St

Sta	+	H 9	-	6
58+45		150.10	9.51	120.79
+70			6.57	123.73
59+95			3.99	126.11
59+20			1.06	129.04
Bm			2.60	127.50
#	11.04	140.27	0.87	129.23
+45			8.70	131.57
+70			5.83	134.44
+95			3.05	137.22
60+20			0.40	139.87
#	11.63	157.15	0.75	139.52
+45			8.71	142.44
+70			6.29	144.86
+95			3.44	147.71
61+20			0.83	150.32
#	11.97	161.66	1.46	149.69
#	9.17	167.90	2.93	158.73
Bm			3.01	164.89

C. Pickett 500 N.W. Front & Grape

J. L. Hawthorn Sr

J. L. Hawthorn

Trans. A Hawthorn

Sta	+	HJ	-	6
Bm	9.11	158.80		149.69
61	+40		7.75	151.05
	+60		7.10	151.70
	+80		6.50	152.30
62			5.66	153.14
	+25		4.16	154.64
	+50		2.50	156.30
	+75		0.41	158.39
#	10.32	164.39	0.73	158.07
63			7.96	160.43
	+25		6.25	162.14
	+50		4.07	164.32
	+75		2.11	166.28
64			0.15	168.24
#	9.45	177.13	0.71	167.68
	+25		6.64	170.49
	+50		4.43	172.70
	+75		2.33	174.80
65			0.75	176.38
Bm	8.00	142.43	2.30	174.83

Hawthorn Dr

N S Hawthorn.

J. S. Jay.
opk N. W. Cor.

Trent N Dry

Stc	+	HD	-	blv
+20		182.83	5.44	177.39
+40			4.96	177.87
+60			4.52	178.37
+80			4.57	178.26
66+05			6.23	176.60
+30			7.67	175.16
+55			8.11	174.72
+80			7.43	175.00
67+05			4.93	177.90
+30			2.73	180.10
#	9.46	191.61	0.68	182.15
+55			9.21	182.90
+80			7.57	184.04
68+05			6.20	185.41
+30			4.81	186.80
+55			3.65	187.96
Bm			1.96	189.65

S dry sh

N to Dry

25' S. I. S. Sample
Trent S. Dry

Atlantic North of

Lb St

Sta	+	HD	-	B
Bm	1.35	8.87		7.52
Bm# 4118	7	.19	5.86	3.01
16+50			7.72	-0.53
+75			7.26	-0.07
6/17			6.84	0.35
+25			6.74	0.45
+50			5.73	1.46
+75			4.73	2.46
6/18			4.52	2.67
#	5.60	8.49	4.50	2.89
+25			5.43	3.06
+50			5.34	3.15
+75			7.41	1.08
19			5.72	2.77
+20			5.13	3.36
+40			4.63	3.86
+60			4.83	3.66
+80			5.58	2.91
20			5.98	2.51
Bm	4.56	7.99	5.06	3.43

basis Lb sph Sign Post
 Att 5 Lb
 N. S. Lb

S. S. Lb

Lb

N. S. Lb

Att 5 Lb NO sph post

Atlantic North of

Sta	+	H ₂	-	B _{ho}
+25		7.99	7.50	0.49
+50			5.67	2.32
+75			5.46	2.53
21			5.40	2.59
+25			5.36	2.63
+50			5.71	2.29
+75			5.78	2.21
22			5.67	2.32
+25			9.91	-1.92
+50			9.44	-1.49
+75			7.72	0.27
23			7.70	0.29
BmH	4.97	7.91	6.05	2.44
Bm#	5.93	9.65	4.21	3.70
Bm			5.10	4.53
Bm	3.44	6.38		2.94
23+20			4.05	2.35
+40			3.25	3.13
+60			4.66	1.72
+80			3.51	2.87

B St

S S B St

AtL & B aft in SW cor. Filume

AtL & H aft with 55's cor.

Aft & AtL NB aft post

B St

N S B St

Atlantic No of B

Stc	+	979	-	660
24+05		6.38	6.59	-0.01
+30			5.37	1.01
+55			7.05	-0.57
#	0.10	1.64	4.84	1.54
+80			1.71	-0.07
25+05			2.11	-0.47
+30			2.15	-0.51
+55			2.42	-0.78
+80			3.36	-1.72
#	2.04	1.78	2.24	-0.60
26+05			2.85	-1.37
+30			3.55	-2.07
+55			3.84	-2.36
+80			4.05	-2.57
27			4.33	-2.85
+20			4.31	-2.83
+40			4.24	-2.76
+60			4.31	-2.83
+85			4.32	-2.84
#	7.47	7.90	1.05	0.43

S. S. A. L.

A. L.

N. S. A. L.

Atlantic A Ash

Stn	+	H ₂ O	-	6
24+10		7.90	10.90	-3.00
+35			10.82	-2.92
+60			10.94	-3.04
+85			11.05	-3.15
29+10			11.17	-3.27
+35			11.37	-3.47
+60			11.04	-3.14
+85			10.47	-2.57
30+10			10.62	-2.72
+35			10.94	-3.04
+60			11.17	-3.27
+80			11.03	-3.13
31			11.24	-3.34
B.M.	1.17	5.70		4.53
31			9.04	-3.54

S.S. Ash Sh

Manshole

bal. H bedur

Sta	+	H ₂	-	bleu	
Bm	3.80	19.85		16.05	
7+42			5.00	14.85	
+62			4.44	15.41	
+82			4.42	15.43	
8+02			4.57	15.28	
+27			4.88	14.97	
+52			4.88	14.97	
+77			4.77	15.09	
9+02			4.87	14.98	
+27			4.60	15.25	
+32			4.58	15.28	
+77			4.39	15.31	
10+02			4.33	15.52	
+27			4.34	15.51	
+32			4.19	15.66	
+77			4.13	15.72	
11+05			4.06	15.79	
Bm	2.22	19.23	2.82	17.03	17.01
+25			3.37	15.86	
+45			3.28	15.95	

bedur dr

N₂ bedur drS. L. Bate
bul & 10 etc

Bate dr

bal N of Hato

Sto	+	HO	-	Obv
+ 65		19.23	3.53	15.90
+ 85			3.14	16.09
12+10			3.07	16.16
+ 35			3.17	16.06
+ 60			2.95	16.28
+ 85			2.91	16.32
13+10			2.68	16.55
+ 35			2.62	16.61
+ 60			2.47	16.76
+ 85			2.40	16.83
14+10			1.97	17.22
+ 29			2.22	17.01
B.M. # 4.92	26.72		1.43	17.80
+ 49			9.49	17.28
+ 69			9.38	17.34
+ 89			9.20	17.32
15+09			9.14	17.58
+ 34			9.13	17.59
+ 59			9.10	17.62

N Hato

S to Fin st
bal & Fin st

Fin st

bal N Tr

Sta	+	HD	-	Elv
13784		26.72	8.98	17.74
16+09			9.05	17.67
+34			8.96	17.76
+39			8.97	17.85
+84			8.82	17.90
17+09			8.72	18.00
+34			8.72	18.00
+59			8.48	18.24
+74			8.41	18.31
18+11			8.62	18.10
+29			8.99	17.73
B.M.	10.80	27.68	4.84	16.88
18+37			10.08	17.60
+71			10.91	16.77
+91			10.91	16.77
19+16			10.59	17.09
+41			10.51	17.37
+66			10.46	17.22
91			10.35	17.33
20+16			10.24	17.44

S.S. Grape st

8x8 Y Grape st

Grape

N.S. Grape

Cal N Grape

Sta	+	H ₂ O	-	Clear
20+41		27.68	10.51	17.17
+66			10.43	17.25
+91			10.58	17.10
21+16			10.70	16.98
+41			11.22	16.46
+66			11.39	16.29
+91			11.49	16.19
Bom	1.43	23.08	6.03	21.65
22+11			6.35	16.73
+31			6.69	16.39
+51			6.49	16.59
+71			6.35	16.73
96			6.82	16.26
23+21			7.33	15.75
+46			8.04	14.99
+71			7.97	15.11
+96			8.30	14.78
24+21			8.22	14.86
+46			7.69	15.39
+71			7.70	15.38

S. S. Hawthorne
Cal. S. Hawthorne

Hawthorne S. S.

S. S. Hawthorne

Bal N Hawthorn

Sto	+	HJ	-	clew
29+96		25.08	8.68	14.40
25+21			9.22	13.46
+46			8.93	14.15
+71			8.92	14.16
+91			9.49	13.59
26+11			9.72	13.36
+31			9.42	13.66
+51			9.23	13.83
20m	7.05	24.65	5.48	17.60
+76			10.70	13.92
27+01			10.69	13.96
+26			10.10	14.55
+51			10.10	14.55
+76			10.60	14.65
28+01			10.03	14.62
+26			10.60	14.65
+51			10.24	14.41
+76			10.51	14.14
29+01			10.54	14.27
+16				

S L Long Sh

Long Sh

M L Long
Bal & Long

bal of July 31

Sto	+	HD	-	Blv
29+27		24.65	10.29	14.41
+38			10.18	14.47
+49			9.80	14.85
+60			9.11	15.54
+71			9.13	15.52
+82			9.92	14.73
+93			10.01	14.64
30+04			8.58	18.07
+15			6.42	18.23
+26			5.97	19.68
+37			5.51	19.34
+66			4.44	20.21
BM			6.62	18.03

9.87
18.00
 21.50
13.50
 6.50

7/17
 Ed & Juniper

Grape 6 of bal

Sta	+	HO	-	Chir
Bm	8.93	25.81		16.88
0				
+10			7.13	14.68
+20			9.12	16.69
+30			10.22	15.59
+40			9.73	16.08
+50			9.89	15.92
+57			9.97	15.94
+67			10.89	14.92
+92			9.15	16.66
+117			7.70	18.11
+42			3.71	20.10
+67			4.52	21.22
+92			3.18	22.63
2+17			2.03	23.74
#	9.41	34.25	0.97	24.84
+42			8.36	25.89
+79.5			2.58	31.67
Bm	6.90	35.97	5.16	29.07

FIT

W L Arctic

Arctic St

C L Arctic

3+17		33.97	11.37	24.58
+42			0.96	25.01
+67			8.98	26.99
+92			6.80	29.14
4+17			4.28	31.69
+42			1.91	34.06
#	10.55	46.37	0.45	35.52
+67			9.30	37.17
+92			8.98	37.39
4+17	7.97	53.64	0.78	45.67
+545			7.03	46.62
Bm			2.29	51.33

SB Arctic

W.D. India Lt.
India Lt.

Grape East of Arcata

Bm	4.84	33.95		29.07
3+17			9.57	24.58
+42			8.75	25.02
+67			6.96	26.99
+92			4.80	29.15
4+17			2.27	31.68
#	11.52	43.96	1.57	32.44
+42			9.92	34.04
+67			7.89	36.07
+92			7.57	36.39
#	8.72	35.77	1.90	42.06
3+17			6.11	44.67
+345			3.17	45.61
Bm			0.40	50.85
Bm	2.46	50.75		48.29
+92			7.33	43.42
6+17			11.29	39.46
+42			9.18	41.67
+67			8.30	44.45
+92			5.39	45.41

W S Imbler
 Onda

C S Imbler Sr

Group C of India

Sta	+	HD	-	Elev
-----	---	----	---	------

7+17		50.75	3.20	47.55
+42			1.80	49.35
#	10.64	59.86	1.57	49.18
+67			9.52	50.54
+92			6.00	53.86
8+295			1.45	58.44
Boon			1.29	58.57

W. L. Columbia St.
Columbia St.

Abatement N of Q of *Illinois*

Sta	+	H 2	-	Obs
Bm	11.45	89.09		77.64
0			7.83	81.26
+29			6.46	82.23
+54			5.75	83.34
+79			4.52	84.57
17 04			3.11	85.98
+29			1.84	87.25
+54			0.59	88.50
#	11.08	98.94	1.23	87.86
+79			9.01	89.93
2+10			7.20	91.74
+31			6.07	92.87
+51			5.69	93.25
+71			5.12	93.82
+91			4.62	94.32
3+16			3.61	95.33
+71			2.83	96.11
+66			1.88	97.06
+91			0.79	98.15
#	10.58	106.65	0.87	98.07

S S Fire St

Fire St

N S Fire St

Albatross N of

Trin St

Sta	+	979	-	Old
4+10		108.65	9.64	99.01
+46			9.39	100.26
+66			7.52	101.18
+90			6.40	102.25
5+16			5.53	103.12
+40			4.46	104.19
+66			3.26	105.59
+90			2.60	106.05
Bm	2.66	109.51	1.90	106.95
6+11			3.00	106.51
+31			2.62	106.89
+51			2.58	106.93
+71			1.99	107.52
+96			0.18	109.33
#	11.30	120.07	0.74	108.77
7+21			8.54	111.53
+40			6.69	113.34
+71			4.37	115.70
+96			2.24	117.83
#	10.75	130.07	0.75	119.32

S.S. Grape St

Albatross & Grape N.W.C.B.B

Grape St

N.S. Grape

Albatross N. Group

Sta	T	H ₂ O	-	Cl ₂
8+21		130.07	9.93	120.14
+46			7.96	122.11
+71			6.02	124.05
+96			4.06	126.01
9+21			1.99	128.08
#	10.95	140.25	0.77	129.30
+46			10.13	130.12
+71			9.29	131.96
B.M.	6.11	143.33	3.03	137.22
+91			10.78	132.55
10+11			9.71	133.62
+31			9.28	134.05
+51			9.79	134.54
+76			7.54	135.79
11+01			6.15	137.18
+26			4.36	138.97
+57			2.78	140.55
+76			1.40	141.93
#	10.74	153.31	0.76	142.57
12+01			9.73	143.58

S. S. Hawthorn St.
Albatross & Hawthorn exp. picket

Hawthorn St.

N. S. Hawthorn St.

Albuturn N of
Sta + H.9 - Lbw

12+26		153.31	7.98	145.33
+51			6.58	146.73
+76			4.93	144.38
13+01			3.38	144.93
+26			1.70	151.61
#	4.95	156.19	2.07	151.24
+51			3.19	153.00

Hawthorn St

B W
S B Long St

State of Ark

Sta	+	H ₂	-	Elev
Bm	9.20	41.21		32.01
Bm	5.33	46.26	0.28	40.93
0			7.94	38.32
+99			7.80	38.46
+19.4			7.69	38.57
+29.7			7.54	38.72
+39.6			7.15	39.11
+49.5			6.90	39.36
+53.7			6.77	39.49
+67			6.50	39.76
+92			5.84	40.42
1+17			5.79	40.47
+42			5.58	40.48
+67			4.96	41.30
+92			4.50	41.73
2+17			3.96	42.30
+42			3.38	42.88
+67			2.80	43.46
+92			2.44	43.82
3+17			1.69	44.57
+42			1.08	44.86

Columbia & State
State & Ark RR exp top post

Stair St N of Aft

Sta	+	Hs.	-	Ele
Bm	7.63	54.06		46.43
3+42			9.09	44.97
+62			8.96	45.10
+82			8.88	45.18
4+02			8.86	45.70
+22			7.54	46.52
+47			6.71	47.35
+72			5.97	48.09
+97			5.15	48.91
5+22			4.84	49.72
+47			3.43	50.63
+72			2.21	51.65
+97			1.60	52.46
6+22			0.72	53.34
T.P.	8.36	61.98	1.04	53.02
+47			7.24	54.14
+72			6.40	54.98
+97			5.47	55.91
7+22			4.70	56.68
+42			4.21	57.17

Stair + Buck N E M. Leonard Rest
 S L Buck 44.00

Buck St

54.16
 44.00
 10.16

N L Buck St

44.95
 41.50
 3.45
 3.5

S L Cedar

Mendenhall Hamble

40

State St - N of Ash

Sta	+	Hi.	-	Elev	Bar
7+62		61.38	3.60	57.78	
+82			3.08	58.50	
4+02			2.98	58.40	
B.M.	2.14	62.77	0.74	60.64	60.63
+27			4.37	54.40	
+32			4.21	58.56	
+77			4.02	58.75	
9+02			3.65	59.12	
+27			3.29	59.48	
+32			3.27	59.50	
+77			3.13	59.64	
10+02			2.99	59.78	
+27			2.64	60.13	
+32			2.31	60.46	
+77			2.31	60.46	
11+			2.29	60.48	
#	3.28	65.35	0.70	62.07	
B.M.	5.21	64.18	2.88	62.97	
+20			7.57	60.61	
+20			7.71	60.47	

Cedar St

NZ Cedar St

Grade 57.00

S B Lutte

Buted L

State N of Route					
Sta	+	HD	-	Blm	
11+60		68.18	7.61	60.57	
+80			7.51	60.67	
12+05			7.48	60.70	
+30			7.34	60.87	
+55			7.19	60.99	
+80			6.59	61.59	
13+05			5.68	62.50	
+30			7.71	63.47	
#	5.34	71.29	2.24	65.94	
130m	2.86	72.91	1.22	70.06	70.05
+55			8.49	64.42	
+80			7.19	65.72	
14+05			6.09	66.87	
+30			4.80	68.11	
+49			4.26	68.85	
+69			3.44	69.47	
+89			3.08	69.83	
15+09			2.69	70.22	
+29			2.34	70.57	
+54			1.55	71.36	

N & State

Break in Grade

Blm & State

S. L. Blm

Blm St

N. S. & Blm St

State of Ohio

Sta	+	Hd	-	Clear
15+79		72.91	1.03	71.88
16+04			0.63	72.28
#	9.50	80.10	1.31	71.60
+29			7.30	72.80
+54			6.67	73.43
+79			6.20	73.90
17+04			5.59	74.51
+29			4.91	75.19
+54			4.60	75.50
+79			3.79	76.81
18+04			3.47	76.63
+20			2.97	77.13
13M	5.35	80.92	4.53	75.57
+40			3.63	77.30
+60			3.54	77.38
+80			3.40	77.52
19			3.40	77.52
+25			3.40	77.52
+50			3.51	77.41
+75			3.40	77.52

S B Fire St

State & Fire

Fire St

N B State

State N Tri In				
Sta	+	HD	-	Clv
20		80.92	3.43	77.49
+25			3.50	77.62
+50			3.33	77.59
+75			3.39	77.53
21			3.46	77.46
+25			3.23	77.69
+50			3.22	77.70
+75			3.20	77.72
22			3.17	77.75
B.M.	4.83	83.17	2.58	78.34
+50			5.08	78.09
+40			5.04	78.13
+60			4.95	78.22
+80			5.00	78.17
23+05			4.83	78.34
+30			4.66	78.51
+55			4.53	78.84
+80			5.95	79.22
24+05			5.71	79.46
+30			3.45	79.72

S B Grape
Stat & Grape

Grape St

N D Grape St

State of Maine

Sta	+	HD	-	Clv
24+55		93.17	2.86	80.31
+80			2.61	80.36
25+05			2.45	80.72
+50			2.51	80.86
+55			2.12	81.05
+80			1.99	81.18

S S Hawthorn Lt

3rd St connection

with Main

Sta + HI - Elev

BM	2.20	8.89		6.69
0			6.45	2.44
+15			7.39	1.50
+23			7.56	1.53
+31			6.76	2.13
+39			6.53	2.34
+47			6.60	2.29
+55			6.44	2.45
+61=1			6.33	2.56

BM	6.03	46.96		40.93
BM #	9.59	56.02	0.55	46.43
#	7.62	62.67	0.97	55.05
BM			2.04	60.63

7th St connection to Main

BM	1.92	10.56		8.64
0			4.64	5.92
+16			4.55	6.01
+25			4.95	6.11
+33			4.27	6.29
+42=1+5			3.90	6.66

State & Beech N.C. 1/2 k post

State & Cedar N.C. 1/2 k post

First St connection to Main

Sta	+	HD	-	Elv
BM	2.82	14.29		11.47
0			5.21	9.08
+25			5.76	8.53
+36			5.57	8.92
+46			5.25	9.04
+55			5.05	9.26
+65			4.77	9.52
+75			4.56	9.73
+81=1110			4.55	9.74

0+71 N L I St

2nd St connection with Main

BM	4.95	7.96		3.01
1			4.48	3.08
+9			4.06	3.90
+18			4.00	3.96
+27			3.80	4.16
+36			3.72	4.24
+44=1			3.64	4.29

Sto	+	J	-	Cho
Bm	11.94	28.82		16.88
#	11.58	39.58	0.42	28.00
Bm			6.67	32.91
#	11.89	49.90	1.57	38.01
Bm			1.61	48.29
#	11.36	60.39	0.87	49.03
Bm	11.56	70.11	1.84	58.55
#	10.82	80.23	0.70	69.41
Bm	11.07	89.48	1.42	78.41
Bm	10.45	99.23	0.70	88.79
#	10.98	109.51	0.70	98.53
Bm			2.66	106.85

Turned up from Grape

#		140.25		
#	10.51	149.94	0.42	139.43
#	7.70	156.71	0.93	149.01
Bm			5.47	151.24

Arctic & Grape S & Sph tel. 55 S

India & Grape est BB 100 S est
S W

Columbia & Grape beads

State & Grape S & Sph post
Winn & Grape S W Sph post

Albatross & Grape S W Sph post

Albatross & Jay est post S W

Levels Columbia St connection with Main

Bm	7.08	10.79		3.71
0			5.95	4.87
+10			6.14	4.61
+20			6.20	4.39
+30			6.21	4.38
+40			6.27	4.32
+50			5.60	5.19
+56.1			5.53	5.26
+25			5.72	5.07
+50			5.66	5.13
+75			3.98	6.81
Bm	4.56	65.19		60.63
Bm#	3.69	66.66	2.22	62.97
#	9.04	74.82	0.88	65.74
Bm			4.77	70.05
#	8.34	82.29	0.87	73.95
Bm			6.72	75.37
Bm			3.95	78.34

$$\begin{array}{r} 2.65 \\ 46.43 \\ \hline 49.08 \\ 49 \\ \hline 5.08 \end{array}$$

Stable bedrock

Stable & Gate 30' exp from 7' 30' corner

Stable & Ground 30' exp Base

Stable & Trip SW exp post

Stable & Grope

Stc	+	HID	-	♂
B/M	10.76	4.9.60		58.82
#	7.72	56.22	1.10	48.30
			7.08	49.14
				45.37
+110			8.05	50.17
+80			7.20	49.12
+120			8.53	47.79
+106			7.08	49.14

100) 1.3.6.18
 1.00
 60.

49.14

48.53

9.43

49.14

48.53

.61

4.80

1.65

-0.58

.61

Bm	4.22	11.65		7.43
#	0		4.65	7.00
0	7.20		5.03	6.82
+1	+29		4.97	6.68
+2	+55		4.50	7.18
+3	+48		4.25	7.40
+4	+54		3.90	7.72
+5	+65.21		3.87	7.74
Bm			3.11	8.54
Bm	9.63	56.63		47.00
N & Ind			47.50	9.13
#	9.23	64.86	1.00	55.63
bolan			63.00	

2
if
w

India & Tin 48.00
bolan & Tin

8850
8350

India &



TRAVERSE TABLE FOR TRANSIT BOOK,
From 1° to 90° for a distance of 100.

Degrees.	DEGREES.		¼ DEGREE.		½ DEGREE.		¾ DEGREE.		Degrees.
	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	
0			100.00	0.44	100.00	0.87	99.99	1.31	89
1	99.98	1.75	99.98	2.18	99.97	2.62	99.95	3.05	88
2	99.94	3.49	99.92	3.93	99.91	4.36	99.88	4.80	87
3	99.86	5.23	99.84	5.67	99.81	6.10	99.79	6.54	86
4	99.76	6.98	99.73	7.41	99.69	7.85	99.66	8.28	85
5	99.62	8.72	99.58	9.15	99.54	9.58	99.50	10.02	84
6	99.45	10.45	99.41	10.89	99.36	11.32	99.31	11.75	83
7	99.25	12.19	99.20	12.62	99.14	13.05	99.09	13.49	82
8	99.03	13.92	98.97	14.35	98.90	14.78	98.84	15.21	81
9	98.77	15.64	98.70	16.07	98.63	16.50	98.56	16.93	80
10	98.48	17.36	98.40	17.79	98.33	18.22	98.25	18.65	79
11	98.16	19.08	98.08	19.51	97.99	19.94	97.90	20.36	78
12	97.81	20.79	97.72	21.22	97.63	21.64	97.53	22.07	77
13	97.44	22.50	97.34	22.92	97.24	23.34	97.13	23.77	76
14	97.03	24.19	96.92	24.62	96.81	25.04	96.70	25.46	75
15	96.59	25.88	96.48	26.30	96.36	26.72	96.25	27.14	74
16	96.13	27.56	96.00	27.98	95.88	28.40	95.76	28.32	73
17	95.63	29.24	95.50	29.65	95.37	30.07	95.24	30.49	72
18	95.11	30.90	94.97	31.32	94.84	31.73	94.69	32.14	71
19	94.55	32.56	94.41	32.97	94.26	33.38	94.12	33.79	70
20	93.97	34.20	93.82	34.61	93.67	35.02	93.51	35.43	69
21	93.36	35.84	93.20	36.24	93.04	36.65	92.88	37.06	68
22	92.72	37.46	92.55	37.86	92.39	38.27	92.22	38.67	67
23	92.05	39.07	91.88	39.47	91.71	39.87	91.55	40.27	66
24	91.35	40.67	91.18	41.07	91.00	41.47	90.81	41.87	65
25	90.63	42.26	90.45	42.66	90.26	43.05	90.07	43.44	64
26	89.88	43.84	89.69	44.23	89.49	44.62	89.30	45.01	63
27	89.10	45.40	88.90	45.79	88.70	46.17	88.50	46.56	62
28	88.29	46.95	88.09	47.33	87.88	47.72	87.67	48.10	61
29	87.46	48.48	87.25	48.86	87.04	49.24	86.82	49.62	60
30	86.60	50.00	86.38	50.38	86.16	50.75	85.94	51.13	59
31	85.72	51.50	85.49	51.88	85.26	52.25	85.04	52.62	58
32	84.80	52.99	84.57	53.36	84.34	53.73	84.10	54.10	57
33	83.87	54.46	83.63	54.83	83.39	55.19	83.15	55.56	56
34	82.90	55.92	82.66	56.28	82.41	56.64	82.16	57.00	55
35	81.92	57.36	81.66	57.71	81.41	58.07	81.16	58.42	54
36	80.90	58.78	80.64	59.13	80.39	59.48	80.13	59.83	53
37	79.86	60.18	79.58	60.54	79.34	60.88	79.07	61.22	52
38	78.80	61.57	78.52	61.94	78.26	62.25	77.99	62.59	51
39	77.71	62.93	77.43	63.30	77.16	63.61	76.88	63.94	50
40	76.60	64.28	76.34	64.65	76.04	64.94	75.76	65.28	49
41	75.47	65.61	75.18	65.93	74.90	66.26	74.61	66.59	48
42	74.31	66.91	74.02	67.24	73.73	67.56	73.43	67.88	47
43	73.14	68.20	72.84	68.52	72.54	68.84	72.24	69.15	46
44	71.93	69.47	71.63	69.78	71.33	70.09	71.02	70.40	45
45	70.71	70.71							
Degrees.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Degrees.
Degrees.	DEGREES.		¼ DEGREE.		½ DEGREE.		¾ DEGREE.		Degrees.

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Handwritten calculations on the left page of the notebook, including numbers like 138.40, 8.47, 130.33, 132, 6.69, 8.61, 5.32, 2.69, 7.99, 3.08, 174.34, 5.82, 6.34, 1.05, 5.70, 3.29, 9.09.