

9

TRANSIT

F.B. 628



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	97½
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

MICROFILMED

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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.
0		0		0		0	
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	14-31
9	1-24	16	4-02	23	8-64	30	15-47
10	1-55	17	4-56	24	9-47	35	22-07

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	80
1	99.98	1.75	99.98	2.18	99.97	2.62	99.95	3.05	81
2	99.94	3.49	99.92	3.93	99.91	4.36	99.88	4.80	82
3	99.86	5.23	99.84	5.67	99.81	6.10	99.79	6.54	83
4	99.76	6.98	99.73	7.41	99.69	7.85	99.66	8.28	84
5	99.62	8.72	99.58	9.15	99.54	9.58	99.50	10.02	85
6	99.45	10.45	99.41	10.89	99.36	11.32	99.31	11.75	86
7	99.25	12.19	99.20	12.62	99.14	13.05	99.09	13.49	87
8	99.03	13.92	98.97	14.35	98.90	14.78	98.84	15.21	88
9	98.77	15.64	98.70	16.07	98.63	16.50	98.56	16.93	89
10	98.48	17.36	98.40	17.79	98.33	18.22	98.25	18.65	90
11	98.16	19.08	98.08	19.51	97.99	19.94	97.90	20.36	71
12	97.81	20.79	97.72	21.22	97.63	21.64	97.53	22.07	72
13	97.44	22.50	97.34	22.92	97.24	23.34	97.13	23.77	73
14	97.03	24.19	96.92	24.62	96.81	25.04	96.70	25.46	74
15	96.59	25.88	96.48	26.30	96.36	26.72	96.25	27.14	75
16	96.13	27.56	96.00	27.98	95.88	28.40	95.76	28.82	76
17	95.63	29.24	95.50	29.65	95.37	30.07	95.24	30.49	77
18	95.11	30.90	94.97	31.32	94.83	31.73	94.69	32.14	78
19	94.55	32.56	94.41	32.97	94.26	33.38	94.12	33.79	79
20	93.97	34.20	93.82	34.61	93.67	35.02	93.51	35.43	80
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	91.53	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	85.25	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	79.60	60.53	79.34	60.88	79.07	61.22	52
38	78.80	61.57	78.53	61.91	78.26	62.25	77.99	62.59	51
39	77.71	62.93	77.44	63.27	77.16	63.61	76.88	63.94	50
40	76.60	64.28	76.32	64.61	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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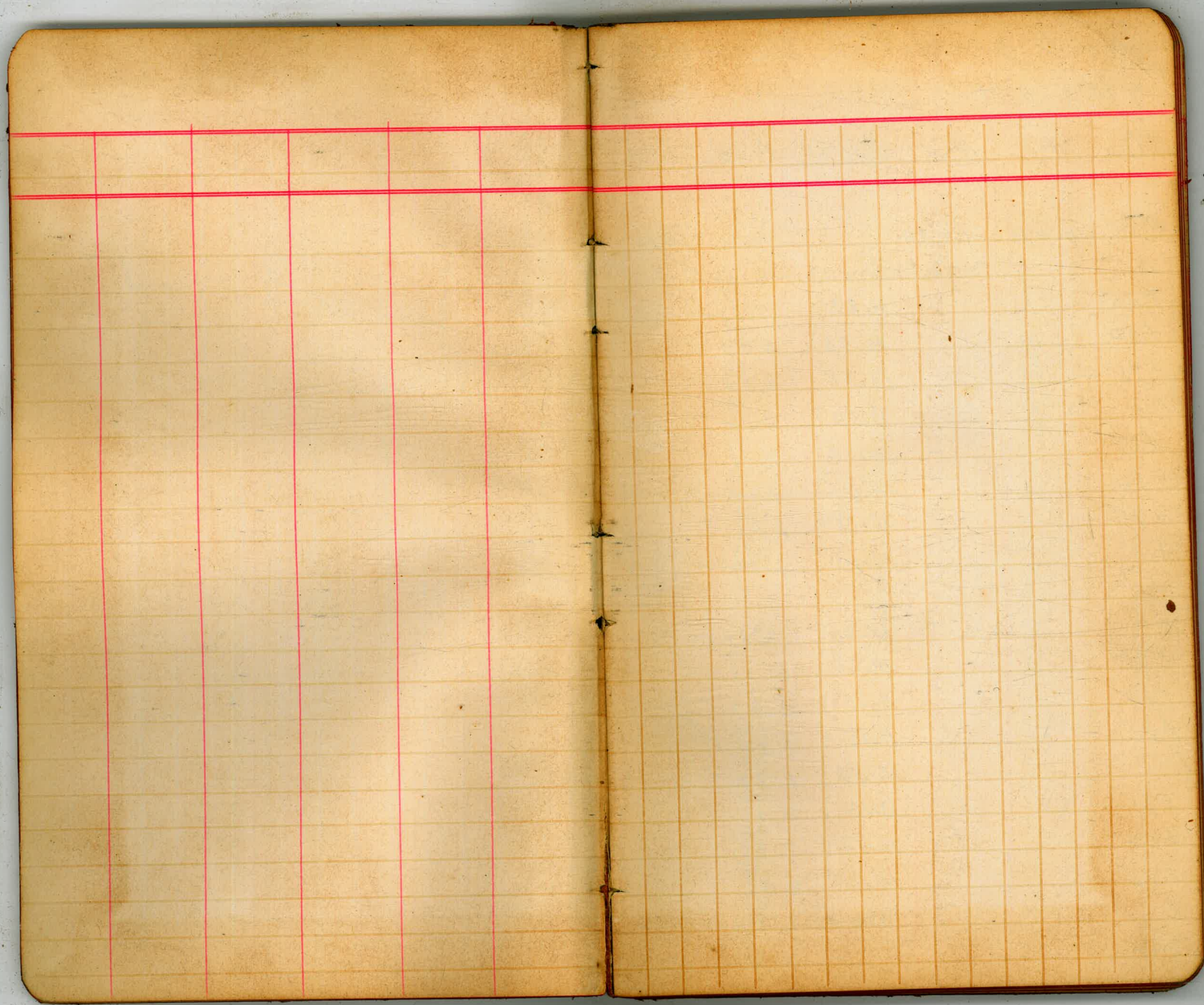
links to

Angle.

0  
4  
5  
6  
7  
8  
9  
10









Cont grade on 2<sup>nd</sup> St W

4<sup>th</sup> & 5<sup>th</sup>

July 29 1890

Sta	+	HO	Grade	Prod	Elim
B.M.	6.44	17.24			10.80
0			11.00	6.24 <sup>.63</sup>	✓
+25			11.63	5.61 <sup>.62</sup>	✓
+50			12.25	4.99 <sup>.63</sup>	✓
+75			12.88	4.36 <sup>.62</sup>	✓
1			13.50	3.74 <sup>.63</sup>	✓
+25			14.13	3.11 <sup>.62</sup>	✓
+50			14.75	2.49 <sup>.63</sup>	✓
+75			15.38	1.86 <sup>.62</sup>	✓
2			16.00	1.24	✓
0			10.00	7.24 <sup>.63</sup>	✓
+25			10.63	6.61 <sup>.62</sup>	✓
+50			11.25	5.99 <sup>.63</sup>	✓
+75			11.88	5.36 <sup>.62</sup>	✓
1			12.50	4.74 <sup>.63</sup>	✓
+25			13.13	4.11 <sup>.62</sup>	✓
+50			13.75	3.49 <sup>.63</sup>	✓
+75			14.38	2.86 <sup>.62</sup>	✓
2			15.00	2.24	✓
B.M.				0.15	17.09

4<sup>th</sup> & 5<sup>th</sup>

East line of 4<sup>th</sup> St

West

seals in way

West line of 5<sup>th</sup> St

East line of 4<sup>th</sup> St

South

West of 5<sup>th</sup> St  
5<sup>th</sup> & 9<sup>th</sup> St



Grade for Sealer in D.S.T.

bet 4th & 5th on N side of St

Sta + H.O. Grade Rod Elev

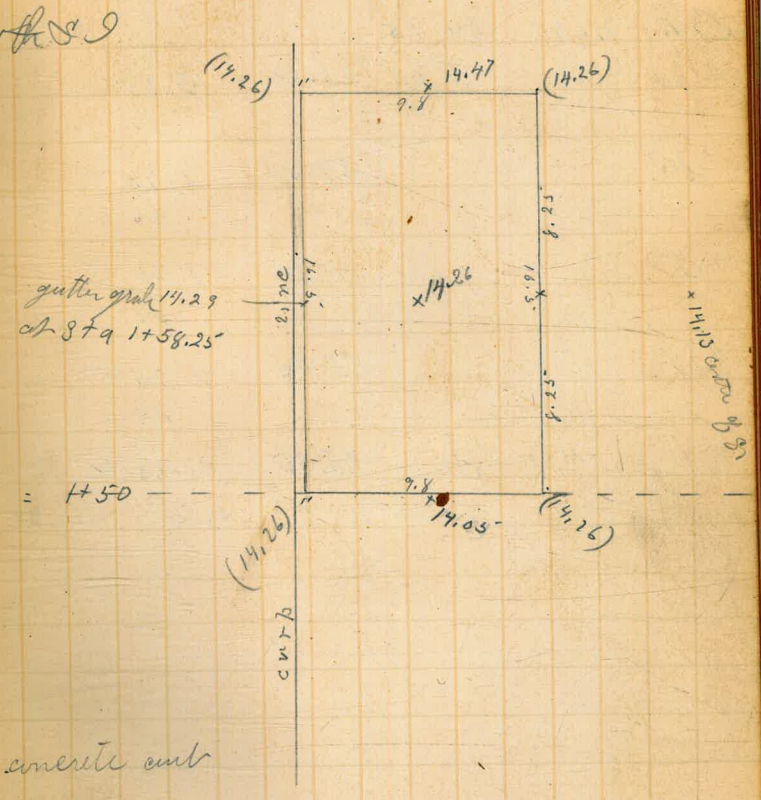
B.M. 7.14 17.94 10.80 → 4th St  
 Set grade for corners of  
 sealer taking grade at center  
 of Sealer = 14.26 3.68 ✓

Sta	H.O.	Grade	Rod Elev
B.M.	7.14	17.94	10.80
0			0.85 17.09
+25	11.00	6.94	E of 4th
+50	11.63	6.31	
+75	12.25	5.69	
+100	12.88	5.06	
1	13.50	4.44	
+25	14.13	3.81	
+50	14.75	3.19	
+75	15.38	2.56	
2	16.00	1.94	W of 5th
+90	15.83	2.11	end of

Aug 30 1890

14.26  
 13.93  
 3.34  
 3.68  
 4.02

14.26  
 10.15  
 13  
 3.68  
 3.81



concrete curb



Sept 1

Level graphic on N side  
of H St from Sta 1 to West line of 6th St

Sta	+	H <sub>2</sub>	Level	Wood	Color
B.M.	3.69	26.75			23.06
1			23.50	3.25	
				.50	
+25			24.00	2.75	✓
				.50	
+50			24.50	2.25	✓
				.50	
+75			25.00	1.75	✓
				.50	
2			25.50	1.25	✓
				0.71	26.04

100' East of 5th St

West line of 6th St



Gutter grade on H St  
 N side bet 5th & 6th

Sta	+	H <sub>g</sub>	Gule	Prod	Elv
13 9m	3.39	10.76			7.07
0			5.03	5.73	✓
				.45	
+50			5.48	5.28	✓
				.45	
1			5.93	4.83	✓
				.45	
+50			6.38	4.38	✓
				.45	
2			6.83	3.93	
				2.46	8.30

5th & K  
 East line of 5th St

West line of 6th St  
 6th & K



Gravel for St. cur av  
at 6th & 18th

sep 1 1890

3.61  
3.61  
50.60

3.01  
2.99

2.97

Sta	+	H <sub>0</sub>	Gravel	wd	Elv.
Bm	4.84	53.61			48.77
2			50.42	3.19 ✓	
				.34	
+14			50.08	3.53 ✓	
+40			50.67	2.94 ✓	
+66			50.58	3.03 ✓	
				.34	
0			50.92	2.69	2.84 S 2.74 N
				1.54	52.07

6th & 18th  
West of 6th St

3.00 priced in account of St  
- 3.55 dirt rail

6th St  
→ 2.97 S Rail  
→ 2.92 N Rail  
→ 3.02 dirt Rail  
→ 2.97 N Rail

East of 6th St  
Bm 6th & 18.



Check of gutter grades on  
N. side of 5th St bet 5th & 6th

Sta	+	HI	Grade	Prod	Elev
09m	6.24	39.67			33.43
1			34.78	4.99 ✓	
+25			35.12	4.53 ✓	
+50			35.46	4.21 ✓	
+75			35.79	3.88 ✓	
2			36.47	3.20 ✓	
13 9m				2.07	37.60

5th & 6th St  
100' East of 5th St

West line of 6th St  
6th & 7th St



Center grade on H St  
bet. 4th & 5th

Sta	+	HI	Grade	Rod	Elev
B.M.	6.04	23.53			17.49
0			15.67	7.86	7.96 ✓
				1.24	
+50			16.91	6.62	6.72 ✓
				1.24	
1			18.15	5.38	5.48 ✓
				1.23	
+50			19.38	4.15	4.25 ✓
				1.24	
2			20.62	2.91	2.91 ✓
				0.48	23.05

H St  
East line of H St

West line of 5th St  
5th & H St



Leante grader on HST bet  
5th & 6th

Sta	+	HQ	Grade	Prod	Elw
Bm	4.65	27.69			23.06
0			20.62	7.07	7.17
				1.01	
+50			21.63	6.06	6.16
				1.02	
1			22.65	5.04	5.14
				1.01	
+50			23.66	4.03	4.13
				1.01	
2			24.67	3.02	3.12
				1.65	26.06

East of 5th St

West of 6th St



Curve grades on J St bet  
1st & 5th

Grade Rod	Grade Rod	Sta	Grade Rod	Sta
			(11.85)	Bm
5.80	6.05	5.00	6.85	0
6.35	5.50 <sup>.55</sup>	5.54	6.31 <sup>.54</sup>	+25
6.90	4.96 <sup>.55</sup>	6.08	5.77 <sup>.53</sup>	+50
7.45	4.40 <sup>.53</sup>	6.61	5.24 <sup>.54</sup>	+75
8.00	3.85 <sup>.55</sup>	7.15	4.70 <sup>.54</sup>	1
8.55	3.30 <sup>.55</sup>	7.69	4.16 <sup>.54</sup>	+25
9.10	2.75 <sup>.55</sup>	8.23	3.62 <sup>.53</sup>	+50
9.65	2.20 <sup>.55</sup>	8.76	3.09 <sup>.54</sup>	+75
10.20	1.65 <sup>.55</sup>	9.30	2.55 <sup>.54</sup>	2
			(15.35)	Bm #
10.20	5.15 <sup>.35</sup>	9.30	6.03 <sup>.34</sup>	0
10.55	4.80 <sup>.35</sup>	9.64	5.71 <sup>.34</sup>	+25
10.90	4.45 <sup>.35</sup>	9.98	5.37 <sup>.33</sup>	+50
11.25	4.10 <sup>.35</sup>	10.31	5.04 <sup>.34</sup>	+75
11.60	3.75 <sup>.35</sup>	10.65	4.70 <sup>.34</sup>	1
11.95	3.40 <sup>.35</sup>	10.99	4.36 <sup>.34</sup>	+25
12.30	3.05 <sup>.35</sup>	11.33	4.02 <sup>.33</sup>	+50
12.65	2.70 <sup>.35</sup>	11.66	3.69 <sup>.34</sup>	+75
13.00	2.35 <sup>.35</sup>	12.00	3.35 <sup>.34</sup>	2
				Bm

Sept 8 1890  
concrete  
160 feet of curb on J St

+	HO	-	Elc
5.67	11.85		6.18
East line of 4th St			
6.90	4.73		7.43
22	22	75	22
7.12 + 60	67	13	8.32
7.33	5.62	60	
7.45	.22	25	22
11.85	.22		
7.12	10	30	22
4.73	0.22	30	110
			22
			93
West line of 5th St			
3.91	16.35	0.41	11.44
East line of 5th St			
West line of 6th St			
6th St	1.60		14.75



Grades on H St bet  
4th & 5th

N gutter		N track		Sta	+	H <sub>2</sub> O	-	Elev.
Grade	rod	Grade	rod					
	5.97	23.46		17.49				17.49
15.83	7.63	✓	15.67	7.79	✓	0.		
17.08	6.38	✓	16.91	6.55	✓	+50		
18.33	5.13	✓	18.13	5.31	✓			
19.58	3.88	✓	19.38	4.08	✓	+50		
20.83	2.63	✓	20.62	2.84	✓	2		
			0.40			23.06		

East of 4th St

West of 5th St

B.M. 5th St



Gullie for cut at 4th &  
Hawthorn Sts

Sta	+	H <sub>2</sub> O	Gullie Rod	Elev
Bm	0.98	197.28		196.30
			194.50	2.78 -
			195.50	1.78 ✓

checked on cut already set.

4th & Hawthorn  
South of Hawthorn  
N of Hawthorn



Center grades on 4th St  
bet Sof Ash and S of Beech

Sept 12 1880

Sta	+	H <sub>2</sub> O	Grade	Rock	Blw
Bm	9.18	88.93			79.75
3			78.75	10.18	10.24
+40			79.75	9.18	✓
0			80.75	8.18	✓
+50			83.08	5.85	✓
10			85.41	3.52	✓
+50			87.74	1.19	✓
#	882	96.56		11.9	87.74
2			90.08	6.48	✓
+50			92.41	4.15	✓
3			94.75	1.81	✓
B.M.				1.08	95.48

4th & Ash  
South of Ash  
W of Ash

South of Beech St  
4th & Beech



Cuts for drain from cable  
Road conduit across curve

Sept 12 1890

at Union Hole and Tailman

Sta	+	H <sub>0</sub>	-	Elv	Grade	Cut	
	7.63	7.63		0.0			Bottom of conduit at lower end of curve
0			5.56	2.07	0.0	2.07	2' 0 7/8"
+25			5.76	1.87	0.08	1.79	1' 9 1/2"
+50			6.50	1.63	0.16	1.47	1' 5 5/8"
+75			5.83	1.80	0.25	1.55	1' 6 5/8"
1			4.80	2.83	0.84	1.99	1' 11 7/8"
+20			3.96	3.67	1.31	2.36	2' 3 3/8"
+42			3.67	3.96	1.84	2.12	2' 1 1/2"
+42			5.79	1.84			Bottom of conduit at upper end of curve



Gutter grades on N. St  
bet 4th & 6th

Sta.	+	H <sub>2</sub> O	Grade	Rods	Blor
B <sub>9</sub> m	6.42	23.91			17.49
0			15.83	8.08	✓
+25			16.46	7.45 <sup>63</sup>	✓
+50			17.08	6.83 <sup>62</sup>	✓
+75			17.71	6.20 <sup>63</sup>	✓
1			18.33	5.58 <sup>61</sup>	✓
+25			18.96	4.95 <sup>63</sup>	✓
+50			19.58	4.33 <sup>62</sup>	✓
+75			20.21	3.70 <sup>63</sup>	✓
2			20.83	3.08 <sup>62</sup>	✓
B <sub>9</sub> m #				0.86	23.05
Grade			South	Grade	Stn
20.83	3.08	✓	19.73	4.18	0
21.33	2.58 <sup>50</sup>	✓	20.24	3.67 <sup>51</sup>	+25
21.83	2.08 <sup>50</sup>	✓	20.76	3.15 <sup>52</sup>	+50
22.33	1.58 <sup>50</sup>	✓	21.27	2.64 <sup>51</sup>	+75
22.83	1.08 <sup>50</sup>	✓	21.78	2.13 <sup>51</sup>	1
B <sub>9</sub> m				0.86	23.05

Sept. 15 - 1890

4th & N St  
East line of 4th St

Start drive

West line of 5th St  
- 5th & N St -

East line of 5th St

100' East of 3rd St

5th & N St



Center on H St. bet  
Beech & Cedar

Sta	+	H <sub>0</sub>	Shull	rod	Blu
B.M.	11.60	107.08			95.48
3			94.75	12.33	✓
+40			95.75	11.33	✓
0			96.75	10.33	✓
+25			97.75	9.33	✓
+50			98.75	8.33	✓
+75			99.75	7.33	✓
1			100.75	6.33	✓
+25			101.75	5.33	✓
+50			102.75	4.33	✓
+75			103.75	3.33	✓
2			104.75	2.33	✓
+25 #7.30		113.05	105.75	1.33	✓
+50			106.75	6.30	✓
+75			107.75	5.30	✓
3			108.75	4.30	✓
B.M.			0.63	106.75	

Sept 15 1890

H St Beech St  
S out of Beech  
N of Beech

S out of Cedar St  
H St & Cedar St



Bottom & center grades on  
K St bet 4th & 5th

Sept 15 1890

N	C	S			
Grade	Prod	Grade	Prod	Grade	Prod
		(9.24)			
1.33	7.91 <sup>✓</sup> 3	1.42	7.82 <sup>✓</sup> .90	0.83	
2.26	6.98 <sup>✓</sup> 92	2.32	6.92 <sup>✓</sup> 00	1.71	
3.18	6.06 <sup>✓</sup> 93	3.22	6.02 <sup>✓</sup> .90	2.58	6.66 88
4.11	5.13 <sup>✓</sup> 92	4.12	5.12 <sup>✓</sup> 90	3.46	5.78 <sup>✓</sup> 87
5.03	4.21 <sup>✓</sup>	5.02	4.22 <sup>✓</sup>	4.33	4.91

Sta	+	H O	-	Elev
B 91	5.79	9.24		3.45
0	East of 4th			
+50				
1				
+50				
2	West of 6th St			
		1.86		7.38



center grade on Est bet  
4.4 to 5.4

Sept 15 1890

Sta	+	H <sub>0</sub>	Grade	Prod	Elev
B <sub>9m</sub>	3.90	45.55			41.65
0			39.87	5.68 <sub>34</sub>	✓
+25			40.21	5.34 <sub>39</sub>	✓
+50			40.55	5.00 <sub>33</sub>	✓
+75			40.88	4.67 <sub>34</sub>	✓
1			41.22	4.33 <sub>37</sub>	✓
+25			41.56	3.99 <sub>34</sub>	✓
+50			41.90	3.65 <sub>33</sub>	✓
+75			42.23	3.32 <sub>34</sub>	✓
2			42.57	2.98	✓
				0.99	44.56

5.4 to Est  
East line of 5.4 St

West line of 5.4 St



Gutter & Center Stakes  
on R St Bet 4th & 5th  
center

	North Gude Rod	Center Gude Rod	South Gude Rod		
				4th & K	
		(9.27)			
1.33	7.94 .93	1.42	7.85 .90	0.83	8.44 .88
2.26	7.01 .92	2.32	6.95 .90	1.71	7.56 .87
3.18	6.09 .93	3.22	6.05 .90	2.58	6.69 .88
4.11	5.16 .92	4.12	5.15 .90	3.46 <small>0.12 5.51 5.15</small>	5.81 .87
5.03	4.24	5.02	4.25	4.33	4.94
			5th & K	St	

Stu + HD - Elev

BM 582 9.27 3.45

0 East line of 4th St

+50

1

+50

2 West line of 5th St

B.M. 1.88 7.39



Cont grader on R St  
bet 4th & 5th St

Sta +	H <sub>2</sub> O	Grade	Rod	Blu
B.M.	5.01	8.46		3.45
0		2.00	6.46 ✓	
+25		2.46	6.00 <sup>.46</sup> ✓	
+50		2.93	5.53 <sup>.47</sup> ✓	
+75		3.39	5.07 <sup>.46</sup> ✓	
1		3.85	4.61 <sup>.46</sup> ✓	
+25		4.31	4.15 <sup>.46</sup> ✓	
+50		4.78	3.68 <sup>.47</sup> ✓	
+75		5.24	3.22 <sup>.46</sup> ✓	
2		5.70	2.76 <sup>.46</sup> ✓	
B.M.			1.07	7.39

~~4th & R St~~

East line of 4th St

West line of 5th St  
~~5th & R St~~



Lev. grader on K St  
S side bet 4th & 5th

Sta	+	H <sub>2</sub>	Grade	Rock	Elv
B.M.	4.80	8.25			3.45
0			1.50	6.75	✓
+25			1.94	6.31 <sup>.44</sup>	✓
+50			2.38	5.87 <sup>.44</sup>	✓
+75			2.81	5.44 <sup>.43</sup>	✓
1			3.25	5.00 <sup>.44</sup>	✓
+25			3.69	4.56 <sup>.43</sup>	✓
+50			4.13	4.12 <sup>.44</sup>	✓
+75			4.56	3.69 <sup>.43</sup>	✓
2			5.00	3.25 <sup>.44</sup>	✓
B.M.				0.86	7.89
B.M.	2.72	10.10			7.38
0			5.00	5.10 <sup>.19</sup>	✓
+25			5.19	4.91 <sup>.19</sup>	✓
+50			5.38	4.72 <sup>.18</sup>	✓
+75			5.56	4.54 <sup>.19</sup>	✓
1			5.75	4.35 <sup>.19</sup>	✓
+25			5.94	4.16 <sup>.19</sup>	✓
+50			6.13	3.97 <sup>.18</sup>	✓
+75			6.31	3.79 <sup>.19</sup>	✓
2			6.50	3.60 <sup>.19</sup>	✓
				1.78	8.32

E of 13th 181 on 3rd  
W of 4th 194.5

S of Hawthorn 68' = 189.91

East of 4th St

4.55  
44  
4.11  
44  
3.67

West of 5th St

East of 5th St

W of 6th  
6th & K



Curb grade for a pond  
68' W of 4th St on Hawn on

south side

Stn	+	H <sub>2</sub> O	Grade	mult.	Elv
-----	---	------------------	-------	-------	-----

P. 9m.	0.75	197.06			196.30
--------	------	--------	--	--	--------

25			194.50	2.56	
			<del>189.91</del>	<del>7.18</del>	

2+40			196.45	6.61	
------	--	--	--------	------	--

checked on curb

4th & Hawn

60' W of 4th St

7 W  
6.0  
14.0

200) 1330  
675  
655  
40500

194.50  
4.05  
190.45  
9.45  
181.00

.0675  
140  
27000  
6735  
9.4500

.675  
140  
27000  
475  
7.4500

.0675  
60  
40.500

.675  
60  
40.500

200) 1330.6



Curb grades on 5th St,  
bet 4th & 5th on N side

Sta	+	HO	Grade	Rod	Elev
B.M.	4.96	36.01			31.05
0			30.00	6.01 <sup>.51</sup> ✓	
+25			30.51	5.50 <sup>.52</sup> ✓	
+50			31.03	4.98 <sup>.51</sup> ✓	
+75			31.54	4.47 <sup>.51</sup> ✓	
1			32.05	3.96 <sup>.51</sup> ✓	
+25			32.56	3.46 <sup>.52</sup> ✓	
+50			33.08	2.93 <sup>.51</sup> ✓	
+75			33.59	2.42 <sup>.51</sup> ✓	
2			34.10	1.91 <sup>.51</sup> ✓	
				0.33	35.68

4th & 5th St  
East of 4th St

West of 5th St



Center grade on 4th  
bet 4th & 5th

Sept 22

Sta	+	H.O.	Grade	Rock	Obs
B9m	5.19	29.30			24.11
0			22.17	7.13	
+25			22.86	6.44	✓
+50			23.55	5.78	✓
+75			24.23	5.07	✓
1			24.92	4.38	✓
+25			25.01	3.99	✓
+50			25.70	3.60	✓
+75			26.08	3.22	✓
2			26.47	2.83	
B9m	6.45	34.80		0.96	28.34 28.35
0			26.47	8.33	✓
+25			27.06	7.74	✓
+50			27.65	7.13	✓
+75			28.23	6.57	✓
1			28.82	5.98	✓
+25			29.41	5.39	✓
+50			30.00	4.80	✓
+75			30.58	4.22	✓
2			31.17	3.63	✓
				1.18	33.62

4th & 5th  
East of 4th St.

West of 5th St.  
5th & 6th  
East of 5th St.

West of 6th St.



Gutter grades on Ft St  
N side bet 4th & 5th

Sta	+	H <sub>2</sub>	Grade	Pool	Elev.
B <sub>9m</sub>	5.53	36.60			31.05
0			29.33	7.27 ✓	
				1.03	
+30			30.36	6.24 ✓	
				1.02	
1.73			31.38	6.22 ✓	
				1.03	
+50			32.41	4.19 ✓	
				1.02	
2			33.43	3.17 ✓	
#	4.58	38.66		2.52	34.08
B <sub>9m</sub>				2.99	35.67
B <sub>9m</sub>				1.07	37.59

Sept 22

East of 4th St

5.22  
0  
4.33

6.24  
1.19  
6.15

5.22  
1.5  
3.72

4.15  
1.5  
4.38

West of 3rd St

5th & Ft. OF N of Hyatt  
6th & Ft



Center grader on H.A. St  
bet Cedar & Hato

Sept 23 1890

Sta	+	H.O.	Grade	Prob	Elev.
R.M.	5.73	118.18			112.45
3			108.75	9.43	
+40			109.75	8.43	
0			110.75	7.43	
+25			111.56	6.62	
+50			112.38	5.80	
+75			113.19	4.99	
1			114.00	4.18	
+25			114.81	3.37	
+50			115.63	2.55	
+75			116.44	1.74	
2 #	5.78	123.03	117.25	0.93	
+25			118.06	4.97	
+50			118.88	4.15	
+75			119.69	3.34	
3			120.50	2.53	
B.M.				1.55	121.48
				0.88	122.15

400 Cedar St

Cedar St

South of Hato St



Stn	+	H <sub>2</sub> O	-	Elev	Grade
B.M.	6.83	203.13		196.30	
0			7.61	165.52	195.50
0			7.58	165.55	195.50
0			7.44	165.69	195.63
+50			6.05	167.08	197.08
1			4.45	168.68	198.67
1			4.33	168.80	198.80
+50			2.86	200.27	200.25
2			1.30	201.83	201.83
2			1.18	201.95	201.96
#	9.78	211.62	1.29	201.84	
+50			8.22	203.40	203.42
3			6.60	205.02	205.00
3			6.49	205.13	205.13
B.M.			5.62	206.00	
#	10.32	221.44	0.50	211.12	
B.M.			5.16	216.28	

4th & Haw

N of Return N of Haw

N .. Return

center of Walk

center of Walk

center of Walk

S of Long St.

center of Walk

top of curb just N.E. cor



center ginder on HST  
bet 2nd & 3rd

Sept 26 1890

Bm	+	H0	End	rod	Elv
Bm	2.57	42.57			40.00
0			36.15	6.42 <sub>53</sub>	
+25			36.68	5.89 <sub>53</sub>	
+50			37.21	5.136 ✓	
+75			37.94		
1			38.27	4.30 ✓	
+25			38.80		
+50			39.33	3.24 ✓	
+75			39.86		
2			40.40		
Bm	2.90	40.09		5.58	37.19
			34.33	5.76	5.76
			35.33	4.76	4.84

End & HST  
E of end

W of end



Account under for 8th car  
truck on 1st St

Sept 25 1890

Sta	+	179	Grade	Wrd	Elv
-----	---	-----	-------	-----	-----

B.9m	6.33	38.05			31.77
3+40			32.07	5.48	✓
"			32.47	5.58	✓
"			31.92	6.13	✓
"			32.25	5.80 <sup>13</sup>	✓
			30.83	7.22	
			32.33	5.72	
			31.92	6.13	

1st St East



Centers & grades for St. Clair  
 Co on 1st St 1st to 2nd

Sta	+	BO	Grade	rod	Elev
B9m	2.50	39.69			37.19
0			33.15	6.54 ✓	
				50	
+50			33.65	6.04 ✓	
				50	
1			34.15	5.54 ✓	
				50	
+50			34.65	5.04 ✓	
				50	
2			35.15	4.54 ✓	
+40			35.65		
0			36.15		
				7.96	31.73
			30.83	8.86	8.94, 8.71
			32.25	7.44	

2nd & 1st St  
 E of 1st St

W of 2nd St

E of 2nd St



Grader on W of 5th St  
crossing K&N

Sta	+	H <sub>2</sub>	Grad	new	Old
-----	---	----------------	------	-----	-----

Bm	2.37	9.75			7.38
----	------	------	--	--	------

			5.02	4.78	
--	--	--	------	------	--

			5.25	4.40	
--	--	--	------	------	--

5.70  
~~5~~  
 210.90  
~~5.38~~  
~~55~~  
 5.02

centre of 1st of W of 5th (old)  
 centre as raised to carry water  
 across K&N



center grades on 4th St bet  
S of Bate & S of Elm St

Sta	+	HO	Grade	Road	Elm
B.M.	7.31	129.46			122.15
0			120.50	8.96 ✓	
+40			121.50	7.96 ✓	
0			122.50	6.96 ✓	
+25			123.54	5.92 ✓ 1.04	
+50			124.58	4.88 ✓ 1.04	
+75			125.63	3.83 ✓ 1.05	
1			126.67	2.79 ✓ 1.04	
+25			127.71	1.75 ✓ 1.04	
+50 #	9.70	138.45	128.75	0.71 ✓	128.75
+75			129.79	8.66 ✓ 1.04	
2			130.83	7.62 ✓ 1.03	
+25			131.86	6.59 ✓ 1.05	
+50			132.92	5.53 ✓ 1.04	
+75			133.96	4.49 ✓ 1.07	
3			135.00	3.45 ✓	
B.M. #	3.18	141.27		0.36	138.09
				1.19	140.08

Bate St

south of Bate St  
elm & 4th St  
elm & 5th St



Grader for Stewarts truck  
on R St, truck is 10' W of curb

Oct 2 1890

Sta	+	HD	Grade	Prod	Clear
B 9m	4.97	8.42			3.45
0			1.06	7.36	✓
+25				88	
+50			1.94	6.48	✓
+75			2.09	.89	
1			2.83	5.59	✓
				.88	
+50			3.71	4.71	✓
				.88	
2			4.59	3.83	✓
B 9m				1.02	7.40
			4.91	3.51	
4					
1+75			4.15	4.27	✓
1+92			4.67	3.75	✓

4th R St  
East of 4th St

8

$$\frac{206}{1.32}$$

$$\begin{array}{r} 4.59 \\ 3.71 \\ \hline 2.88 \\ 44 \end{array}$$

$$\frac{25}{17}$$

$$\frac{8}{25} \times .76$$

$$\begin{array}{r} .76 \\ 25 \overline{) 608} \quad (24) \\ \underline{50} \\ 108 \end{array}$$

$$\begin{array}{r} 3.71 \\ 44 \\ \hline 4.15 + 75 \\ 44 \\ \hline 4.59 - 2 \end{array}$$

$$\begin{array}{r} 4.91 \\ 4.15 \\ \hline .86 \end{array}$$

West of 5th St  
R St

$$\begin{array}{r} 4.91 \\ 4.15 \\ \hline .76 \end{array}$$

$$\frac{17}{25} \times .76$$

$$\begin{array}{r} 4.15 \\ 52 \\ \hline 4.67 \\ 24 \\ \hline 4.91 \end{array}$$

$$\begin{array}{r} 532 \\ 26 \\ \hline 25 \overline{) 1282} \quad (52) \\ \underline{125} \\ 42 \end{array}$$

$$\begin{array}{r} 4.27 \\ 3.75 \\ \hline .52 \end{array}$$



Center grade on 5th  
bet 5th & 6th

Sta	+	HO	Grade	Mod	Elev
B.M.	6.97	35.31			28.34
0			26.47	8.84	
+25			27.06	8.23 <sup>.59</sup>	✓
+50			27.65	7.66 <sup>.59</sup>	✓
+75			28.23	7.08 <sup>.58</sup>	✓
1			28.82	6.49 <sup>.59</sup>	✓
+25			29.41	5.90 <sup>.59</sup>	✓
+50			30.00	5.31 <sup>.58</sup>	✓
+75			30.58	4.73 <sup>.59</sup>	✓
2			31.17	4.14	✓
B.M.				1.69	33.62

5th & 6th  
East of 5th St

Low 0.02

West of 6th St



cut grade for Ingle on  
64th

Sta	+	HT	Grade	Prod	Elev.
B, 9m,	6.00	39.62			33.62
B, 9m,				2.03	37.59
1+25			33.79	5.83	
			<sup>1.02</sup> 32.77	<sup>1.02</sup> 6.85	
1			32.77	6.85	
			36.05	3.57	✓
			35.94	3.68	✓
			35.83	3.79	✓
			36.22	3.40	

64th East  
64th West  
cut grade.  
gutter grade

36.13  
65  
36.05  
35.83  
371.88  
35.54



center grades on 1st  
 bet 4th & 5th

Sta	+	HO	Grade	Rod	Elev
B.M.	6.07	23.56			17.49
0			15.67		
+50			16.91		
1			18.15	5.41	
+50			19.38		
2			20.62	0.51	23.06

23.56  
 17.95  
 ---  
 5.61

East of 1st

16  
 7.5  
 ---  
 23.5  
 50  
 ---  
 26.7

W of 5th



center ginder on K&N  
bet 4th & 5th

Sta	+	HO	Gunda	Prod	Elev
Bm	3.91	9.36			31.43
0			1.42	7.94 ✓	
				.45	
+25			1.87	7.49 ✓	
				.45	
+50			2.32	7.04 ✓	
				.45	
+75			2.77	6.59 ✓	
				.45	
1			3.22	6.14 ✓	
				.45	
+25			3.67	5.69 ✓	
				.45	
+50			4.12	5.24 ✓	
				.45	
+75			4.57	4.79 ✓	
			.68	.68	
2			5.25	4.11	
B.m.				1.96	7.40

4th & K&N  
East of 4th St

W of 5th St



## Center grade on D St

Oct 6 1820

Sta	+	HD	Grade	rod	Elev.
B.M.	3.84	20.92			17.08
0			15.17	5.75 ✓	
				.38	
+25			15.53	5.37 ✓	
				.37	
+50			15.92	5.00 ✓	
				.38	
+75			16.30	4.62 ✓	
				.37	
1			16.67	4.25 ✓	
				.38	
+25			17.03	3.87 ✓	
				.37	
+50			17.42	3.50 ✓	
				.38	
+75			17.80	3.12 ✓	
				.37	
2			18.17	2.75 ✓	
				1.17	19.75

5th &amp; D St



Centers & grades on H&H  
bet 4th & 5th  
north south

Oct 7 1890

Sta	Grade	rod		Grade	rod	+	H&H	-	Elev.
			(23.35)						
B9m						5.86	23.35		17.49
2	15.67	7.68 ✓		15.57	7.78 ✓	West of 4th St			
+14	15.33	8.02 ✓		15.23	8.12 ✓				
+40	15.67	7.68 ✓		15.57	7.78 ✓				
+66	15.33	8.02 ✓		15.23	8.12 ✓				
0	15.67	7.68 ✓ 1.24		15.57	7.78 ✓ 1.24	East of 4th St			
+50	16.91	6.44 ✓ 1.24		16.81	6.54 ✓ 1.24				
1	18.15	5.20 ✓ 1.23		18.05	5.30 ✓ 1.23				
+50	19.38	3.97 ✓ 1.24		19.28	4.07 ✓ 1.24				
2	20.62	2.73 ✓		20.52	2.83 ✓	West of 3th St			
B9m						5th & 1st	0.30		23.05



center stakes on D & T  
bet 5th & 6th

Oct 9 1890.

Sta	+	H <sub>2</sub>	Grade	Rod	Elev.
B.M.	4.13	21.21			17.08
0			15.17	6.04 ✓	
				.38	
+25			15.55	5.66 ✓	
				.37	
+50			15.92	5.29 ✓	
				.38	
+75			16.30	4.91 ✓	
				.37	
1			16.67	4.54 ✓	
				.38	
+25			17.05	4.16 ✓	
				.37	
+50			17.42	3.79 ✓	
				.38	
+75			17.80	3.41 ✓	
				.37	
2			18.17	3.04 ✓	
				1.46	19.75

East of 5th St

W of 6th St



Center grade on 5th bet  
4th & 6th

Oct 9 1890

Sta	+	HS	Grade	Red	Blw
Bm	7.30	18.10			10.80
0			10.17	7.93 ✓	
				.63	
+25			10.80	7.30 ✓	
				.62	
+50			11.42	6.68 ✓	
				.63	
+75			12.05	6.05 ✓	
				.62	
1			12.67	5.43 ✓	
				.63	
+25			13.30	4.80 ✓	
				.62	
+50			13.92	4.18 ✓	
				.63	
+75			14.55	3.55 ✓	
				.62	
2			15.17	2.93 ✓	
				1.01	17.09

4th & 5th  
East of 4th

West of 5th



Center grade on D & H  
bet 4th & 5th

Oct 13 1890

Sta	+	H <sub>2</sub>	Grade	Road	Elev
B.M.	6.73	17.53			10.80
0			10.17	✓	
+25			10.80	6.73 ✓	
				.62	
+50			11.42	6.11 ✓	
				.63	
+75			12.05	5.48 ✓	
				.62	
1			12.67	4.86 ✓	
				.62	
+25			13.30	4.23 ✓	
				.62	
+50			13.92	3.61 ✓	
				.63	
+75			14.55	2.98 ✓	
2			15.17		
				0.44	17.09

East line of 4th St

West line of 5th St



Gutter stakes on JH  
bet 4th & 5th Sts

Oct 14 1890

Sta	+	H <sub>0</sub>	Grade	Rod	Elev
B <sub>m</sub>	5.48	11.66			6.18
0			5.13	6.53 ✓	
				.53	
+25			5.68	5.98 ✓	
				.55	
+50			6.23	5.43 ✓	
				.55	
+75			6.78	4.88	
1			6.48	5.18 ✓	
				.54	
+25			7.02	4.64 ✓	
				.54	
+50			7.56	4.10 ✓	
				.53	
+75			8.09	3.67 ✓	
				.54	
2			8.63	3.03 ✓	
B <sub>m</sub>				0.21	11.45

4th St  
East of 4th St

25' East of 4th St

100' East of 4th St

South Side

West of 5th St



Since grades on HST  
bet 5th & 6th from St car ev  
N 3

Oct 16 1890

Sta	Grade	Rod	Grade	Rod
			(26.73)	
B.M.				
0	20.62	6.11	20.52	6.21
		1.51		1.01
+50	21.13	5.10	21.53	5.20
		1.02		1.02
1	22.65	4.08	22.55	4.18
		1.01		1.01
+50	23.66	3.07	23.56	3.17
		1.01		1.01
2	24.67	2.06	24.57	2.16
		.34		.34
+14	24.33	2.40	24.23	2.50
+40	24.92	1.81	24.82	1.91
+66	24.83	1.90	24.73	1.00
		.34		.34
0	25.17	1.56	25.07	1.66
B.M.	64			

+ H0 - Elev.

3.68 26.73 23.05  
East of 5th St

West of 6th St

East of 6th St  
0.70 26.03



center grader on post bet  
5th & 6th St

Sta	+	HO	Grade	Rock	Elev.
B.M.	2.08	9.46			7.38
0			5.02	4.44 ✓	
				.21	
+25			5.23	4.23 ✓	
				.20	
+50			5.43	4.03 ✓	
				.21	
+75			5.64	3.82 ✓	
				.21	
1			5.85	3.61 ✓	
				.20	
+25			6.05	3.41 ✓	
				.21	
+50			6.26	3.20 ✓	
+63			6.36	3.10 ✓	
1466			6.33	3.07 ✓	
+69			6.41	3.06 ✓	
+75			6.46	3.00 ✓	
				.21	
2			6.67	2.79	
B.M.			1.15		8.31

5th & K  
East of 5th St

9"

7 3/4"

6 1/4"

7 3/4"

7 3/4"

9"

} set to give slope to corner  
center of on hole

7"

W of 6th St  
at K

9.46  
5.71  
3.75 + 71

5.93  
3.63 - 1  
5.48  
3.98

13/25 x .20

25) 250 (104  
25  
100

6.26  
104  
6.364

19/25 x .20

19/25 x .20

25) 380 (152  
25  
150  
230  
30

6.364  
15

1.26  
152  
6.412

6/25 x .20

41  
65  
46  
25) 120 (5  
125



Center grade on JST west  
~~6th St~~ 6th

Oct 18 1890

Sta	+	H <sub>0</sub>	Grade	Rock	Eliv
Bm	3.52	14.95			11.43
0	3.52		9.42	5.53 ✓ .34	
+25			9.76	5.19 ✓ .35	
+50			10.11	4.84 ✓ .34	
+75			10.45	4.50 ✓ .35	
1			10.80	4.15 ✓ .34	
+25			11.14	3.81 ✓ .34	
+50			11.48	3.47 ✓ .34	
+75			11.83	3.12 ✓ .34	
2			12.17	2.78 ✓	
Bm				1.21	13.74

~~6th St~~ JST  
 East of ~~6th St~~

8 3/4"

9"

8 1/4"

9"

8 1/2"

9"

6 1/2"

West of ~~6th St~~  
~~6th St~~ JST



center grade on RST  
bet 5th & 6th

Sta	+	170	Grade	Avch	Elw
Bm	3.52	10.90			7.38
0			5.02	5.88	✓
				.21	
+25			5.23	5.67	✓
				.21	
+50			5.43	5.47	✓
				.21	
+75			5.64	5.26	✓
				.21	
1			5.85	5.05	✓
				.20	
+25			6.05	4.85	✓
				.21	
+50			6.26	4.64	✓
				.20	
+75			6.46	4.44	✓
				.21	
2			6.67	4.23	✓
Bm				2.60	8.30

5th & RST  
Curb of 5th St

West of 6th St  
6th & RST



Center grade in 2nd  
bet 5th & 6th

Sta	+	NO	Grade	and	blue
B on	3.67	15.10			11.43
0			9.42	5.68	
				.34	
+25			9.76	5.34	✓
				.36	
+50			10.11	4.99	✓
				.34	
+75			10.45	4.65	✓
				.33	
1			10.80	4.30	✓
				.34	
+25			11.14	3.96	✓
				.34	
+50			11.48	3.62	✓
				.36	
+75			11.83	3.27	✓
2			12.17		✓
				1.36	
				13.74	+

Best of 4th St

Best of 6th St



$$\begin{array}{r} 5.02 \\ 3.33 \\ \hline 1.69 \end{array}$$

$$\begin{array}{r} 4.13 \\ 26 \overline{) 102} \\ \underline{52} \\ 50 \\ \underline{26} \\ 24 \end{array}$$

$$\begin{array}{r} 8.42 \\ 3.13 \\ \hline 5.29 \end{array}$$

$$\begin{array}{r} 5.00 \\ 3.33 \\ \hline 1.67 \end{array}$$

$$\begin{array}{r} 5.29 \\ 4.67 \\ \hline 0.62 \end{array}$$

$$\begin{array}{r} 5.30 \\ 4.67 \\ \hline 0.63 \end{array}$$

$$\begin{array}{r} 26 \overline{) 163} \\ \underline{52} \\ 110 \\ \underline{104} \\ 60 \end{array}$$

$$\begin{array}{r} 5.02 \\ 4.67 \\ \hline 0.35 \end{array}$$

$$\begin{array}{r} 26 \\ 4.33 \\ 4.67 \\ \hline 1.01 \end{array}$$

$$\begin{array}{r} 4 \overline{) 353} \\ \underline{12} \\ 233 \\ \underline{182} \\ 510 \end{array}$$

$$\begin{array}{r} 9.75 \\ 5.7 \\ \hline 4.05 \end{array}$$

$$\begin{array}{r} 100 \\ 19 \\ \hline 81 \end{array}$$

$$\begin{array}{r} 4.67 \\ 24 \\ \hline 4.81 \end{array}$$

$$\begin{array}{r} 1.06 \\ 8815 \\ \hline 1.9425 \end{array}$$

$$\begin{array}{r} 1.9425 \\ 8820 \\ \hline 2.8245 \end{array}$$

$$\begin{array}{r} 2.8245 \\ 8825 \\ \hline 3.7070 \end{array}$$

$$\begin{array}{r} 3.7070 \\ 8830 \\ \hline 4.5900 \end{array}$$

86  
93

$$\begin{array}{r} 300 \\ 1.000 \\ \hline 200 \\ 1000 \\ \hline 200 \end{array}$$

$$\begin{array}{r} 1.84 \\ 25 \\ \hline 1.59 \end{array}$$

$$\begin{array}{r} 67 \overline{) 1039} \\ \underline{234} \end{array}$$

$$\begin{array}{r} 75 \\ 2033 \\ \hline 225 \\ 225 \\ \hline 2475 \end{array}$$

$$\begin{array}{r} 4.81 \\ 38 \\ \hline 4.19 \end{array}$$

$$\begin{array}{r} 142 \\ 75 \\ \hline 67 \end{array}$$

$$\begin{array}{r} 1147 \\ 58 \\ \hline 89 \end{array}$$

$$\begin{array}{r} 38 \\ 24 \\ \hline 62 \end{array}$$

$$\begin{array}{r} 63 \\ 16 \\ \hline 378 \end{array}$$

$$\begin{array}{r} 26 \overline{) 1008} \\ \underline{52} \\ 488 \\ \underline{378} \\ 1100 \end{array}$$

$$\begin{array}{r} 1945 \\ 405 \\ \hline 190.45 \end{array}$$

$$\begin{array}{r} 26 \overline{) 1000} \\ \underline{52} \\ 480 \\ \underline{378} \\ 1020 \\ \underline{780} \\ 2400 \end{array}$$

$$\begin{array}{r} 167 \\ 40500 \\ \hline 4.0500 \end{array}$$

$$\begin{array}{r} 4.67 \\ 24 \\ \hline 4.91 \end{array}$$

$$\begin{array}{r} 4.91 \\ 38 \\ \hline 4.25 \end{array}$$



3.56  
2.23

5.79

$\frac{18}{.025}$   
90  
36  
450  
15,58  
15.83  
17  
16.00

$\frac{15.83}{17}$   
16.00

7

$\frac{16.175}{15.83}$

$\frac{14.08}{14.05}$

$\frac{16.5}{.025}$   
825  
330  
2) 4125  
206

14.29  
14.26  
13  
14.13

$\frac{25}{18}$   
7  
 $\frac{.025}{7}$   
1.175  
 $\frac{.025}{7}$   
1.175

70.16  
11.53  
81.71

1.96  
79.75

Scale 11.8

$\frac{303}{12}$   
3.15

15

cont. time Benzoin  
8 3/4  
u con con 3.02

$\frac{8.30}{1.5}$   
9.8

$\frac{3.03}{.08}$   
3.11

cont. time Benzoin

$\frac{16}{25} \times 20$   
 $\frac{15}{2}$   
 $\frac{6.25}{6.39}$   
 $\frac{16}{25} \times 20$   
 $\frac{9}{25} \times 20$   
 $\frac{16}{25}$   
25) 1320 | 128 8.39  
25  
70  
30  
200  
6.46  
25) 140 | 97  
30

16  
2  
18

$\frac{175}{18}$   
9.72