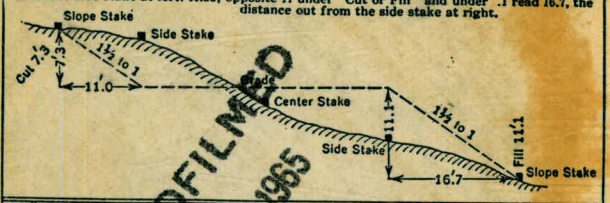
F 370 A

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.

The paper in this book **No. 370A** is made of **50%** high grade rag stock with a **WATER RESISTING** surface sizing.

11.083-5. k, m, yc. kM.

INDEX

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ELEV FOR FORMS Blk # 11 495 July 6-1942 Rogers

BM.	11.60	495.21			483.61	
℄ Blk				4.75	490.46	F 4.54 to Elev 495⁰ ~~490⁰~~ 120.30 S. Axis
Rt.				4.99	490.22	F 4.78 to " " " " "
Lt.				4.98	490.23	F 4.77 to " " " "
8+52⁵				5.23	489.98	F 5.02 to " " " "
T.P.	4.15	495.03	4.33		490.88	
℄				4.98	490.05 ~~489.95~~	F 4.95 to " " 13° L. Axis
8+52⁵				5.06	489.97	F 5.03 to " " " "
BM			11.43		483.60	= 483.60
	CHECK FORMS					
	4.75	495.63			490.88	
				0.18	495.45	Point on D.S. Form 119.95 S. Axis D = 119.97
				0.53	495.10	" " " " 120.21 S. " D = 120.23

ELEV FOR FORMS Blk #2 655° Rogers July 6-42 2

B.M.	3.62	655.04			651.42		
℄				4.95	650.09	F 4.91 to Elev. 655°	13° S. Axis
"				5.00	650.04	F 4.96 to " "	1° S. "
4+20				5.10	649.94	F 5.06 to " "	13° S. "
"				5.14	649.90	F 5.10 to " "	1° S. "
			3.62		651.42		

ELEV FOR FORMS Blk # 2 July 10-1942

	8.57	659.99			651.42	El 659.00		
℄				4.95	655.04	F 3.96 to Top of Dam	1° S. Axis	
4+20				4.99	655.00	F 4.00 to " "	13° S. "	
℄				4.97	655.02	F 3.98 to " "	13° S. "	4.93 / .45 / 4.48
4+20				5.12	654.87	F 4.13 to " "	1° S. "	
			8.57		651.42			
B.M.	0.79	663.93			663.14			
				4.93	659.00	Top of Forms Top of Dam		

ELEV FOR FORMS Blk # 8

B.M.	5.33	520.21		514.88
6+685			5.16	515.05
"			5.20	515.01
℄ Blk			5.17	~~520~~ 515 .04
"			5.27	514.94
7+07			5.14	~~520~~ 515 .07
"			5.25	514.96
B.M.		5.33		514.88

CHECK FORMS

5.78	520.66		514.88
		0.51	520.15

F 4.95 to Elev 520 = 101.30 S. Axis
F 4.99 to " " 10.5 N. "
F 4.96 to " " 101.30 S. Axis
F 5.06 to " " 10.5 N. "
F 4.93 to " 520 = 101.30 S. Axis
F 5.04 to " " 10.5 N. "
= 514.88

101.3°

Rogers

ELEV. FOR VACUUM BREAK

July 7-42 4

B.M.	10.65	485.88		475.23	
			6.31	479.57	F 4.03 to Top of V. Break 148.9 S. Axis Gr = 483.60
			6.25	479.63	F 3.97 to " " 143.86 S. " Gr = 483.60
			3.51	482.37	F 2.95 to " " 133.86 S. Gr = 485.32
TP	8.53	493.50	0.91	484.97	
			4.06	489.03	F 1.19 Gr = 490.63

July 9-1942

REVISION

	11.49	486.72		475.23	
148.90 S.			7.14	479.58	F 4.02 to Top of V. Brk 148.9 S. Axis Gr = 483.60 offset 2' Rt.
143.86 S			7.05	479.67	F ~~3.93~~ 3.93 to " " " offset 2' Rt. Gr = "
138.86 S			4.27	482.45	X F 2.70 to " " " " Gr = 485.15
TP	7.39	493.51	0.60	486.12	F to " " " " Gr = 490.35
			3.25	490.26	F 0.09 to End of V. Brk. & Gr = 490.35
			3.28	490.23	F 0.12 to " " " 2' offset Rt. "
		8.51		485.00	

86.12
07.12
86.84
11.61
75.23

ELEV FOR FORMS Blk #6

BM.	5.88	520.76			514.88
℄				5.75	515.01
6+20				5.83	514.93
℄ "				5.75	515.01
				5.71	515.05 ~~515.05~~
			5.88		514.88

CHECK FORMS

B.M.	6.13	521.01 ~~520.01~~			514.88

ELEVS.

B.M.	10.58	525.48			514.90
6+20				5.45	520.03
"				5.39	520.09
℄				5.42	520.06
"				5.52	519.96

520'

Rogers

July 8-42 5

F 4.99 to Elev 520' 100.55 S. Axis

F 5.07 to " " " "

F 4.99 to " " 10.5' N. "

F 4.95 to " " " "

July 17-1942

525'

F 4.97 to Elev 525' 10' N. Axis

F 4.91 to " " 96.75 S. "

F 4.90 to " " 10' N. "

F 5.04 to " " 96.75 S. "

Rogers

ELEV - FOR FORMS Blk # 5 550° July 8-1942 6

B.M.	10.50	550.32			539.82					
5+70				5.18	545.14	F 4.86	to	Elev	550°	75 N. Axis
℄				5.28	545.04	F 4.96	to	"	"	" "
5+70				5.33	544.99	F 5.01	to	"	"	~~70~~ 77.25 S. "
℄				5.46	544.86	F 5.14	to	"	"	" 5. "
B.M.			10.50		539 ~~54~~ .82	= 539.82				
	CHECK									
B.M.	11.29	551.09			539.80					
5+70										
	ELEV FOR FORMS									
~~B.M.~~	2.13	~~560.69~~ 550.69			558 ~~588~~.56	July 16-42				
T.P.	5.31	555.53	10.47		550.22					
℄				5.70	549.83	F 5.17	to	El	555°	23.95 S. Axis
5+71				5.69	549.84	F 5.16	to	"	"	" " 50.22 10.63 60.85
℄				5.59	549.94	F 5.06	to	"		~~11°~~ 7° N. " 2.27 558.56
				5.56	549.97	F 5.03	to	"	"	7° N. "

CHECK FORMS Blk # 4

	0.45	575.34	574.89
5+20		0.17	575.17
4+82.23?		+0.43	575.77

CHECK FORMS

	5.53	580.42	574.89
5+20		0.32	580.10
4+77.23		4.57	575.85

Elevs.

BM	10.40	585.29	574.89
5+20		5.37	579.92
℄		5.35	579.94
5+20		5.28	580.01
℄		5.20	580.09

CHECK

585.50

0.39	585.11	Point on Form 51.07 S. Axis D = 51.07

July 8-82

Point on DS. Form 58.61 S. Axis. D = 58.63
" " Gallery Form Gr = 575.78

July 16-1982

Point on DS. FORM 54.89 S Axis D = 54.88
" " lowest landing Gr = 475.83

July 18-1982

F 5.08 to Elev 585° 51.15 S. Axis
F 5.06 to " " " "
F 4.99 to " " 4° N. "
F 4.91 to " " 4° N.

ELEV FOR FORMS Blk #11 — 589 — July 9-42

B.M.	6.80	500.74 ~~646.74~~		493 ~~639.94~~	
7+60 ℄			0.73	500.01	Point on conc Blk #10 116.50 S. Axis
— ℄			5.58	495.16	F 4.84 to Elev. 500° " "
℄			5.65	495.09	F 4.91 to " " " "
℄ —			5.69	495.05	F 4.95 to " " " "
8+06			5.69	495.05	F 4.95 to " " " "
℄			5.62	495.12	F 4.88 to " " 12.5 N. "
8+06			5.73	495.01	F 4.99 to " " 12.5 N. "
		07 965	6.80	493.94	

ELEV. FOR FORMS — July 14-42

	6.94	505.13		498.19	
8+52 ℄			5.29	499.84	F 5.16 to Top of Form 112.70 S Axis
℄			5.29	499.84	F 5.16 to " " " "

July 16-1942

B.M.	11.25	505.19		493.94	
℄			5.14	500.05	F 4.95 to Elev. 505° 12° N. Axis
			5.10	500.09	F 4.91 to " " 12.0 N. "

ELEV FOR FORMS Blk #3 615° July 9-12

	6.02	615.12		609.10		
4+16 ℄			5.09	610.03	F 4.97 to Elev 615.00	1.75 ℄ Axis
"			5.05	610.07	F 4.93 to " "	28.35 S. "
4+71			5.04	610.08	F 4.92 to " "	1.75 ℄ "
"			5.10	610.02	F 4.98 to " "	28.35 S. "

ELEV. FOR FORMS July 20-1962

BM	10.99	620.09		609.10		
℄			5.04	615.05	F 4.95 to Elev 620°	24.79 S. Axis
"			5.05	615.04	F 4.96 to " "	1.50 ℄ "
4+71			5.04	615.05	F 4.95 to Elev 620°	24.79 S. Axis
			4.99	615.10	F 4.90 to " "	1.50 ℄ "

CHECK FORMS

	2.69	620.12		621.03		
℄			3.72	620.40	Point on Form	26.36 S. Axis D= 24.69
4+70			3.73	620.39	" "	

ELEV FOR FORMS Blk #7

BM, 2,69 505.56			502.87		
6+23		5.47	500.09	F 4.91 to top of Form	112.705. Axis
BM, 2.80 505.67			502.87		
		0.34	505.33	Point on DS. Form	112.93
		0.53	505.14	" " "	112.65

D = 112.95
corr for .28 in Elev.
D = 112.65

ELEV FOR FORMS

BM. 2.59 510.46			502.87		
		5.57	504.89	F 5.11 to Elev. 505?	108.90 S. Axis

Check FORMS

BM. 7.81 510.68			502.87		

ELEV. FOR FORMS

BM. 12.45 515.32			502.87		
6+23.25		5.35	509.97	F 5.03 to Elev. 515?	105.10 S. Axis
6+67.5		0.27	515.05	Point on Conc.	105.10 S. Axis

ELEV. FOR FORMS Blk #8

July 13-42

BM.	~~10.24~~ ~~10.25~~ 10.27	525.13		514.88				
7+13			5.13	519.99	F 5.01 to	Elev.	525	~~97.50~~ ~~101.30~~ 97.50 S. Axis
℄			5.11	520.01	F 4.99 to	"	"	" "
~~6+68~~ ~~8+68~~ 6+68			5.11	520.01	F 4.99 to	"	"	" "
7+13			5.09	520.03	F 4.97 to	"	"	10° N. "
6+68			5.12	520.00	F 5.00 to	"	"	10° N. "
℄			5.12	520.00	F 5.00 to	"	"	" "
CHECK FORMS								
	10.91	525.79		514.88				
Elev.								
	3.07	530.36		527.29				
			5.33	525.03	F 4.97 to	Elev	530°	93.70 S. Axis
℄			5.36	525.00	F 5.00 to	"	"	" "
6+68			5.23	525.13	F 4.87 to	"	"	" "
"			5.32	525.04	F 4.96 to	"	"	95 N. "
℄			5.35	525.01	F 4.99 to	"	"	95 "
			5.34	525.02	F 4.98 to	"	"	95 N. "

CHECK FORMS Blk 10

	8.01	510.88		502.87		
8+05			0.56	510.32	Top of FORM	108.66 S. Axis D = 108.66
℄			0.54	510.30	" " "	108.62 S. " D = 108.64
7+60			0.53	510.35	" " "	108.65 S. " D = 108.64

ELEV. FOR FORMS 515° July 15-42

	0.37	515.27		514.90		
8+06			5.35	509.92	F5.08	to Top of Pavel 515 = 105.10 S. Axis
℄			5.15	510.12	F4.88	" " " " " "
7+615			5.26	510.01	F4.99	to " " " " "
"			5.28	509.99	F5.01	℄ " " " " "
8+06			5.25	510.02	F4.98	℄ " " " " "

CHECK FORMS

B.M.	1.08	515.98		514.90		
℄			0.69	515.29	Point on Forms	104.88 S. Axis D = 104.88
			0.71	515.27	" " "	104.90 S. " D = 104.90
8+06			0.70	515.28	" " "	104.90 S. " D = 104.90

Kopps

July 13-42 12

ELEV FOR GALLERY STEPS.

Rogers

July 19-1962 13

T.B.M.	6.22	470.63			464.41	El. Redhead in Tunnel D.S. outlet	
8+07				1.93	468.70	End of Previous Pour	Gr = 468.70
8+21				1.79	468.84	Grade Mark to top of Conc.	Gr = 468.84
8+34.26				1.66	468.97	" " " "	Gr = 468.97
T.B.M.			6.22		464.41	= 464.41	
	7.56	482.79			475.23		
8+53±				1.00	481.79	Top of STEPS.	Gr = 481.79

605
50
155

98
82
16

70
34
04

35.02
.76
34.26

34
?
27

ELEV. BOTTOM OF SHAFT

B.M.	12.85	557.27 ~~8.27~~			544.42	
T.P.	11.67	567.19		1.75	555.52	
			13.61		553.6	
B.M.	13.08	557.50			540.42	July 21-1902
T.P.	8.74	565.86	0.38		557.12	Top of Grout Pipe #17-37 ±
				17.8	548.1	El. bottom of shaft.

7.13
17.6
———
17.7

CHECK FORMS Blk #5

	5.72	555.90		550.22	
5+70			0.81	555.13	Point on Form 73.83 S. Axis D= 73.85
℄			0.93	555.01	" " "

$\frac{7}{8} \times 13 = \frac{39}{4} = 10$

ELEV. FOR FORMS

	1.95	560.51		558.56	
5+70			5.59	554.92	F 5.08 to Elev. 560° 6' N.
℄			5.49	555.02	F 4.98 to " " "
℄			5.56	554.95	F 5.05 to " " 70.15 S.
5+70			5.60	554.91	F 5.09 to " " "

CHECK FORMS July 31-1902

	1.86	560.42		558.56	
5+70			0.18	560.24	Point on Form 6.97 S. Axis D=6.97
℄			0.32	560.10	" " "

CHECK

~~ELEV~~ FOR FORMS. Blk #11 505°

B.M.	7.35	505.34		498.19	
			0.24	505.30	Point on Form 112.48 S Axis D = 112.48
ELEV. FOR FORMS					
	8.41	510.05		506.04	July 23-1942 (Rock on Blk #11)
℄			5.42	505.0	F 4.97 to Elev. 510° 11° N. "
8+52.5			5.44	505.01	F 4.99 to " " 11° N. "
"			5.39	505.06	F 4.94 to " " 108.90 S. "
℄			5.38	505.07	F 4.93 to " " " "
CHECK FORMS					July 29-1942
	4.51	510.55		506.04	
8+52.5			0.37	510.18	Point on DS. FORM. 108.75 S. Axis D = 108.24
℄			0.16	510.39	" " " " 108.60 S. Axis D = 108.60
B.M.	4.98	515.20		510.22	
℄			5.17	510.03	F 4.97 to Elev 515° 11° N. Axis
8+52.5			5.27	509.93	F 5.07 to " " " "
"			5.19	510.01	F 4.99 to " " 105.10 S. "
℄			5.19	510.01	F 4.99 to " " " "

CHECK LEVELS ON BM. CIRCUIT — 1/4 21-42 — 17

B.M.	0.70	545.12		544.42	Marked Rock ℄ Blk #15
T.P.	0.65	533.85	11.92	533.20	
B.M.	0.67	529.71⁻	4.81⁺	529.04⁻	= 529.03 Near #14/15
T.P.	0.82⁺	517.43⁺	13.10⁻	516.61	
B.M.	1.13	512.64⁺	5.92	511.575	= 511.57 Sta 9+00±
T.P.	0.98	505.74⁺	7.88	504.76⁺	
B.M.	0.95⁻	499.10	7.59⁺	498.15	= 498.19 Marked Rock under tree
T.P.	3.29	491.38	11.01	488.09	
B.M.	~~+.56~~	485.13	7.81	483.57	= 483.61 Rock N. of Dam
	1.34⁻	484.91⁻	~~8.17~~	~~476.96~~	
T.P.	4.07	481.82⁻	7.16	477.75⁻	
B.M.	8.25⁻	483.44⁻	6.63	475.19⁻	= 475.23 Rock S. of Dam
T.P.	12.31	494.73⁻	1.02	482.42⁻	
T.P.	13.03	507.10⁻	0.66	494.07⁻	
~~T.P.~~	12.71	519.45⁻	0.36	506.74⁻	
T.P.			0.14	519.31⁻	
B.M.			7.89	511.56	= 511.52 Sta 9+00±

Rogers

Elevs. FOR Gallery Floor Tunnel Outlet — July 22-42 — 18

	2.33	623.76		621.43	
4+08.5			2.72	621.04	Top of Gallery Floor Begin Adit, Gr = 621.0±
"			2.78	620.98	" " " " W. End of Gal. near gutter
"			2.82	620.94	" " " " in Doorway
"			2.99	620.77	" " " " Tunnel outlet
TP	2.69	624.12	2.33	621.43	
			3.76	620.36	Points for Poarch 1'Lt & 4'Rt Tunnel Outlet walls

Check Elev.

621.43

4.38 6R5.81

486	07	
5.03	620.78	Sa ENTRANCE
5.03	620.79	
5.45	620.36	Porch
5.51	620.30	Porch

CHECK FORMS Blk #6

	10.90 525.80	514.90	
		0.42 525.36	Point on DS Form 96.48 S. Axis D=96.48
	ELEV FOR FORMS		
	3.29 530.58	527.29	July 24-1902
6+20		5.62 524.96	F 5.04 to Elev 530= 92.95 S. Axis
℄		5.59 524.99	F 5.01 to " " " "
6+20		5.54 525.04	F 4.96 to " " 9= N. "
℄		5.55 525.03	F 4.97 to " " 9= N. "
	ELEV FOR FORMS		
B.M.	3.57 625.00	621.43	
4+70		5.01 619.99	F 5.01 to Elev 625= 1.25 N. Axis
℄		5.05 619.95	F 5.05 to " " " "
4+70		4.95 620.05	F 4.95 to " " 21.66 S. "
"		4.98 620.02	F 4.98 to " " " 5. "

ELEV FOR FORMS Blk #10

B.M.	11.89	510.08			498.19	
T.P.	12.81	518.85	4.04		506.04	Painted Rock on Blk #11
T.P.	3.30	518.89	3.26		515.59	" " " " #10
T.P.	4.23	510.02	13.10		505.79	
B.M.			11.82		498.20	= 498.19 as above
T.P.	4.67	520.21			515.59	on Blk #10 as above
7+61 ℄				5.28	514.93	F 5.07 to Elev 520 ± 10 ⅝ W. Axis
℄				5.24	514.97	F 5.03 to " " " "
8+06				5.23	514.98	F 5.02 to " " " "
℄				5.10	515.11	F 4.89 to " " 101.305 "
8+06				5.26	514.95	F 5.05 to " " " "
				5.14	515.07	F 4.93 to " " " "
	CHECK FORMS					July 28-1942
B.M.	4.68	520.27			515.59	
8+06				0.11	520.16	Point on FORM 101.18 S. Axis D = 101.18
℄				0.04	520.23	" " " 101.13.5. " D = 101.12
7+61 ℄				0.22	520.05	" " " 101.285. " D = 101.27

ELEV FOR FORMS Blk 4

	0.58	597.06	596.48
℄		12.09	584.97
5+20		12.13	584.93
"		12.05	585.01
℄		12.06	585.00

CHECK FORMS

	1.02	597.50	596.48
		7.36	590.14
		7.33	590.17

ELEV. FOR FORMS

BM	0.52	597.00	596.48
~~℄ BM~~		7.11	589.89
5+20		7.11	589.89
℄		6.96	590.04
5+20		7.12	589.88

July 23-1902 21

F 5.03 to Elev 590 - 3.5 N. Axis
F 5.07 " " " 3.5 N. "
F 4.99 to " " 47.35 S. "
F 5.00 to " " " " "

July 29-1902

Point in Form 47.26 S. Axis D = 47.25
" " " 47.16 S. " D = 47.22

August 16-1902

F 5.11 to Elev 595.30 N Axis
F 5.11 to " " " "
F 4.96 to " " 43.55 S. "
F 5.12 to " " " "

CHECK FORMS Blk #8

	3.60	530.89			527.29

ELEV COPPER WATER STOP. August 5-1942

					555.86
B.M.	12.56	568.42			
11+50				11.37	557.05
BM			12.56		555.86

= 555.86 Indexed F.B. # 618 P 35

Rogers

July 23-42 22

ELEV FOR FORMS Blk # 7

	5.37	520.27	514.90
		0.26	520.01
℄		5.09	520.18
6+23.25		5.31	519.96

CHECK FORMS

	6.05	520.95	514.90
℄		0.45	520.50
		0.86	520.09

Elev. FOR FORMS

	10.21	515.11	514.90
℄		5.17	509.99
6+23.25		5.23	509.88

CHECK FORMS

	10.73	525.63	514.90

Rogers

July 25-1942 23

Pointon Conc. Blk # 10 101.30 S. Axis
F4.82 to Elev 520° 101.30 S. "
F5.04 to " " " " "

July 30-1942

Pointon Forms 100.91 S. Axis D=100.92
" " " 101.24 S. " D=101.23

August 1- 42

F5.01 to Elev 525° 97.50 S. Axis
F5.12 " " " " "

Aug. 15-1942

ELEV. FOR FORMS Blk #17

Sta	+	H I	−	I S	Elev	
BM	12.00	556.86			544.42	
11+00				6.75	550.11	F 4.29 to Bottom of Fillet 10.69 N. Gr = 554.90
"				8.35	548.51	F 14.82 to Top of Fillet 6.17 N. Gr = 563.33
T.P.	0.86	556.72	1.00		555.86	Marked Rock
B.M.			12.29		544.43	= 544.42
T.P.	7.07	562.93			555.86	
11+30				8.15	554.78	F 5.52 to Bott of Fillet 10.15 N. Axis Gr = 560.30
"				9.28	553.65	F 15.08 to Top " " 5.63 N. " Gr = 568.73
CHECK FORMS						July August 1-42
	6.03	561.89			555.86	
ELEV. FOR FORMS						August C-1942
	1.79	569.90			568.11	
11+01		569		10.95	558.95	F 6.05 to Elev 565.6 N. Axis
+10		563.91		11.77	558.13	F 7.00 to Top of Fillet 5.99 N. Axis Gr = 565.13
+30				11.87	558.03	F 10.70 to " " 5.63 N. " Gr = 568.73
+40				10.58	559.32	F 11.21 to " " Gr = 570.53
+50				7.10	562.80	F 9.53 to " " 5.27 N. " Gr = 572.33

Rogers

ELEV. FOR FORMS Blk # 18 July 25-42 25

	11.37	567.18		555.86		
11+50			8.92	558.26	F 5.66 to	Bottom of Fillet 9.79 N. Gr=563.90
"			10.15	557.03	F 15.30 to	Top of Fillet 5.27 N. Gr=572.33
T.P.	7.07	562.93	11.37	555.86		
11+60			1.72	561.21	F 5.19 to	Bott. of Fillet 9.54 N. Axis Gr=566.40
"			3.15	559.78	F 15.05 to	Top of " 5.02 N. " " =570.83
B.M.						Aug 22 '42
B.M.	8.33	576.44	8.33	568.11		
11+70			13.05	563.39	F. 5.51	Bott. of Fillet 9.29 N.A. Gr=568.90
"			11.83	564.61	F. 12.72	Top " " 4.77 N.A. Gr=577.33

El. of Risers Blk. 18

11+60	11.7	564.7
11+70	4.8	571.6

July 27
DICKINSON 26

ELEVS FOR FORMS - BLOCK #8

BM	8.69	535.98	527.29	
7+13			5.93 530.05	F. 4.95 to Elev 535 89½° S. Axis
℄			5.90 530.08	F. 4.92 to " " " "
6+68.5			5.86 530.12	F. 4.88 to " " " "
7+13			6.05 529.93	F. 5.07 to " " 9° N "
6+65			6.00 529.98	F. 5.02 to " " " "
℄			5.97 530.01	F. 4.99 to " " " "

Check Forms Blk 6

	3.81	533.10	527.29
6+20			
℄			
57			

CHECK

8.83	536.12	527.29

Point on forms 92.95 S.A.
" " " 92.95 S.A

Rogers

ELEV FOR FORMS Blk # 3 July 29-62 27

	8.63	630.06	621.43	
4+70			5.07	624.99
℄			5.11	624.95
4+70			5.08	624.98
			5.07	624.99
CHECK FORMS				
	9.26	630.69	621.43	
ELEV				
	5.49	634.82	629.33	
4+70			4.75	630.07
℄			4.94	629.88
4+70			4.84	629.98
℄			4.92	629.90
CHECK FORMS				
	10.95	640.28	629.33	
			10.30	629.98

F 5.01 to Elev 630 ± 18.92 S. Axis
F 5.05 to " " " "
F 5.02 to " " Axis
F 5.01 to " " "

July 31-1962

F 4.93 to Elev 635 ± on Axis
F 5.12 to " " "
F 5.02 to " " 16.54 S. Axis
F 5.10 to " " "

ELEV FOR FORMS Blk # 19

	9.93	591.07		581.14	
12+00			20.4	589.03	F 5.97 to D.S. inters. 48.2 S. Axis Elev. 595.0
			5.36	585.71	F 9.29 to El 595.0 43.55 S. "
	10.42	591.56	9.93	581.14	F ~~to Top of Fillet 2.00 " Axis~~ Gr = 601.62
12+00			7.78 4.04	587.52	F ~~7.18~~ to Bott. " 5.70 N. " Gr = ~~594.70~~ 595.30
"			14.40 3.74	587.82	F ~~+3.80~~ to Top Fillet 2.00 N. " Gr = ~~604.62~~ 602.22
BM.	0.83	612.43		611.60	July 30-1902
12+18			12.77	599.66	F 12.12 to Top of Fillet 1.91 " Axis Gr = 611.78
			12.14	600.29	F 4.57 to Bott. " 5.19 N. " Gr = 604.86
CHECK FORMS					August 13-02
	3.72	607.26		603.54	
12+00			19.2	588.1	Bott. Copper Water Stop F.B. #618 p 35
			12.04	595.22	Point on Form 43.37 S. Axis D = 43.39
			12.14	595.12	" " " 43.47 S. " D = 43.47
TP			4.99	602.27	Marked Rock

ELEV FOR FORMS Blk 6

BM	8.69	535.98		527.29
6+20			5.99	529.99
			6.00	529.98

Check Forms

B.M.	8.54	535.83		527.29
6+20			0.75	535.08

ELEV FOR FORMS-

	12.59	539.88		527.29
6+20			4.96	534.92
℄			4.90	534.98
BM,	1.09	540.87		539.78
6+20			5.88	539.99
			5.87	539.00

CHECK FORMS

	13.02	540.31		527.29

Rogers

July 29-42 29

F 5.01 to Elev 535 = 89.15 S. Axis

F 5.02 to " " 9° W. "

Aug 3-1942

Point on Form D-89.09

August 5-1942

F 5.08 to Elev. 540 = 85.35 S. Axis

F 5.02 to " " "

August 7-1942

F 5.01 to " " 8° W. Axis

F 5.00 to " " "

Aug. 10-1942

FORMS Blk # 10

10.56 525.46 516.90

8+06 5.42 520.04 F 4.96 to El. 525 97.50 S. Axis

℄ 5.37 520.09 F 4.91 to " " " "

7+61 5.53 519.93 F 5.07 to " " " "

" 5.49 519.97 F 5.03 to " " 10° W. "

℄ 5.00 520.06 F 4.94 to " " " "

8+06 5.47 519.99 F 5.01 to " " " "

CHECK FORMS August 1-02

10.72 525.62 516.90

0.61 525.04 Point on form 97.48 S. Axis D = 97.50

℄ 0.33 525.29 " " " 97.27 S. " D = 97.29

0.31 525.31 D = 97.26

Elev FORMS

~~2.63 529.92~~ ~~527.29~~

8+06

ELEV FOR FORMS Blk #20

BM,	11.03	637.09		626.06
12+50			10.07	627.02
"			8.02	629.07
			3.07	634.02
BM,	9.83	644.69		635.26
12+60			12.55	632.14
"			12.26	632.43
12+70			5.51	639.18
			4.98	639.71

CHECK FORMS

	8.36	643.62		635.26
12+60			3.62	640.0
+60			+0.08	643.70
			15.5	628.1

Roger's

August 1-42 31

F 9.97 to Top of Fillet 0,63 N. Axis Gr: 637.39

F 3.13 to Bott. " 3.09 N. " Gr: 632.20

DS. intersect. 16.79 S. Axis

August 3-1942

F 11.56 to Top Fillet 0.31 N. Axis Gr=640.70

F 6.08 to Bot. " 2.77 N. " Gr=638.51

F 10.82 to Top " Axis Gr=650.00

F 5.10 to Bott. " 2.46 N. Axis Gr=640.81

Aug 13-1942

Point on FORM 14.69 S. Axis D=14.69

" " " 0.31 N. " D=0.31

Bott. Copper F.B. #618 P35

650.01 640.81
0 0 2.46

ELEV FOR FORMS B/t #10

B17.	2.63	529.92		527.29		
8+06			5.09	524.83	F 5.17	to Elev. 530 = 93.70 S Axis
℄			4.91 4.89	525.01 525.03	F 4.99	to " " "
7+61.5			4.90 4.87	525.02 525.05	F 4.98	to Elev 530 = 93.70 S-Axis
"			4.87	525.05	F 4.95	to " " 9.5 N. "
℄			4.89	525.03	F 4.97	to " " 9.5 N. "
8+06			4.84	525.08	F 4.92	to " " 9.5 N. "

Check Forms

B.M.	3.47	530.76		527.29		
8+06			0.49	530.27	Point on forms	93.70 S of Axis D = 93.71
℄			0.79	529.97	" " "	" " " D = 93.70
7+61.5			0.59	530.17	" " "	" " " D = 93.72

ELEV. FOR FORMS Blk #17

B.M. 1.56 560.42		555.86			
11+01	5.42	555.00	F 8.33 to Top Fillet	6.17 N. Axis	Gr = 563.33
"	5.32	555.08	F 0.0 to Bott. "	10.67 N. "	Gr = 555.08
+10	5.22	555.20	F 9.93 to Top "	5.99 N. "	Gr = 565.13
"	3.72	556.70	F to Bott. "	10.51 N. "	Gr = 556.70
+20	5.06	555.36	F 11.57 to Top "	5.81 N. "	Gr = 566.93
"	1.92	558.50	F to Bott. "	10.33 N. "	Gr = 558.50
+35	4.57	555.85	F 13.78 to Top "	5.51 N. "	Gr = 569.63
"	+0.28	561.20	F to Bott. "	10.06 N. "	Gr = 561.20

CHECK FORMS

August 5-1942

12.56 568.42		555.86			
11+01	5.19	563.33	Top of Fillet	6.17 N. Axis	
+10	3.00	564.98	" "	5.99	
+20	1.52	566.90	"	5.82	

CHECK FORMS

Aug 16-1942

B.M. 7.22 575.55		568.11	
	5.39	572.16	

Rogers

Blk # 8 Elevs. Aug 4 - 1942 34

B.M.	4.69	540.16		535.47				
6+68.5			5.14	535.02	F 4.98	to Elev 540	8.5	N. Axis
℄			5.11	535.05	F 4.95	to "	"	"
7+13			5.21	534.95	F 5.05	to "	"	"
"			5.19	534.97	F 5.03	to "	86.10	S. "
℄			5.00	535.16	F 4.84	to "	"	S. "
6+68.5			5.07	535.09	F 4.91	to "	"	S. "
CHECK					Aug 20-1942			
	1.08	540.86		539.78				
Elevs					August 25-42			
B.M.	5.43	545.21		539.78				
7+13			5.20	540.01	F 4.99	to Elev 545	8.0	N.A.
"			5.18	540.03	F 4.97	to " "	87.30	S.A.
6+67.5			5.21	540.00	F 5.00	to " "	8.0	N.A.
"			5.16	540.05	F 4.95	to " "	87.30	S.A.
℄			5.20	540.01	F 4.99	to " "	"	"

ELEV FOR Outlet PIPES

	3.25	486.86		483.61
			6.2	480.6
			4.1	482.8
	6.2	486.2		480.0
9+35.5			2.7	483.5

148.9' S. Axis El. Bottom Steps = 485.00

CHECK B.M. CIRCUIT

B.M.	2.31	485.92		483.61	Marked Rock N. Dam
T.P.	12.27'	496.92'	1.27	484.65	
B.M.	12.98'	506.89	3.01	493.91'	=493.94
	8.92'	514.74	1.07	505.82	
	4.39	516.19	2.94'	511.80	
B.M.			4.63	511.56	=511.52 Sta 9+00±

Conclusion: B.M. N. of Dam
should be 483.57.

Elev. FORMS Blk # 12

	0.10	483.67			483.57
9+00				9.24	474.43
"				9.74	473.93
$8+93^{5}$				9.94	473.73
"				10.14	473.53
$8+83^{5}$				11.03	472.64
"				10.77	472.90
B.M	0.36	483.93			483.57
T.P.	6.71	479.62	11.02		472.91
$8+63^{5}$				11.72	467.90
"				10.10	469.52
$8+53^{5}$				9.65	469.97
"				8.89	470.73
TP	7.07	484.04	2.65		476.97
B.M			0.48		483.56

F 3.95 to Bott. of Fillet 19.23 N.A. Gr = 478.38
F 14.90 to To " " 13.62 N.A. = 488.83
F 3.84 to Bott. " " 19.31 Gr = 477.57
F 14.49 to Top " " 13.70 N.A. Gr = 488.02
F 14.13 to " 13.83 N.A. Gr = 486.77
F 3.42 to Bott. 19.44 N.A. Gr = 476.32

Aug. 8-42

F. 16.37 to Top of Fillet 14^{08} N.A. Gr 484.27
F. 4.30 to Bott. of Fillet 19^{69} N.A. Gr 473.82
F 13.05 to Top of Fillet 14^{20} N.A. Gr 483.02
F 1.04 to Bott of Fillet $19.^{81}$ NA Gr 472.57

Marked El. 483.57

Blk # 11 CHECK FORMS

4.23 515.75 511.52

0.71

Elev. Forms Blk 5

B.M. 6.54 565.10 658.36 Aug 8-12

5+70		5.07	560.03	F 4.97 to elev 565 @ 6.@ N. of Axis
℄		5.10	560.00	F 5.00 " " " " " "
5+70		5.15	559.95	F 5.05 " " " 66.35 S of Axis
℄		5.08	560.02	F 4.98 " " " " " "

Blk # 11 Elevs. August 10-12

8.60 520.12 511.52

8+52.5		5.20	514.92	F 5.08 to Elev 520 10.5 N.A.
℄		5.24	514.88	F 5.12 to " " " "
8+52.5		5.22	514.90	F 5.10 to " " 101.30 S.A.
		5.14	514.98	F 5.02 to " " " "

Blk #12 Elevs.

BM.	0.03	483.60		483.57	
	6.03	479.30	10.33	473.27	F ~~to Bott of Fillet~~ 1969 N.A. Gr = 473.82
8+63 ℄			9.74	470.06	F 14.21 to Top of Fillet 1408 N.A. " = 484.27
"			8.55	470.75	F 3.07 to Bott of Fillet 1969 N.A. Gr = 473.82
8+73 ℄			9.70	469.60	F 5.47 to " " " 1956 N.A. Gr = 475.07
			11.40	467.90	F 17.62 to Top " " 1395 S. " Gr. 485.52
8+83 ℄			6.99	472.31	F 14.46 to Top " " 1383 Gr = 486.77
Check on T.P.			6.41	472.89	F 3.03 to Gr 476.32 = F 3.42
~~T.P. 9+00~~	2.24	480.21		477.97	
8+98			10.78	479.43	F 5.57 to Elev 575 = 1402 S. Axis
Levels & CHECK FORMS					
BM,	0.66	484.23		483.57	Aug 10 - 1942
			6.95	477.28	F 11.55 to Top of Fillet 1362 N.A. Gr = 488.83
~~9+00~~			~~10.9~~	~~473.3~~	~~Elev Bott. Copper Water 500p.~~ (See page 56)
8+63 ℄			0.01	484.24	Top of Fillet 1410 N. Axis D = 1408 Gr = 484.27

ELEV FOR FORMS Blk #10

B.M.	6.38	535.41		529.03	
8+06			5.42	529.99	F 501 to Elev. 535.2 9° ℄ Axis
℄			5.42	529.99	F 501 to " " " "
7+61.5			5.56	529.85	F 515 to " " 90 ℄ "
8+06			5.47	529.94	F 507 to " " 89.90 S.
℄			5.50	529.91	F 509 to " " " S.
8+06			5.51	529.90	F 510 to " " " S.

CHECK FORMS

	8.43	535.72		527.29	
			0.50	535.22	Point on Form 89 D=
			0.44	535.28	
			5.73	529.99	

FORMS OK. Descrep. in B.M.'s

B.M.	11.13	540.16		529.03	9-4-42
T.P.	4.20	540.10	4.26	535.90	T.P. on Rock Blk #10
B.M.			11.09	529.01	=529.03

Check Forms Blk 17 — Aug 11 '42 — 41

B.M.	5.05	573.16		568.11		
11+30			4.43	568.73	Top of Fillet	5.64 N. D = 5.63 N
11+40			2.64	570.52	" " "	5.43 N D = 5.45 N
11+50			0.90	572.26		5.26 N D. = 5.27 N

ELEV FOR FORMS Blk #6

August 12-42

	5.56	545.34		539.78		
6+20			5.24	540.10	F 4.90 to El 545°	8.0 N. Axis
℄			5.23	540.11	F 4.89 to " "	" "
6+20			5.22	540.12	F 4.88 to " "	81.55 S. "
"			5.30	540.04	F 4.96 to " "	" " "
Elevs.					August 27-42	
B.M.	6.20	545.98		539.78		
			0.90	545.08		
Levels						
B.M.	10.53	550.31		539.78		
℄			5.25	545.06	F 4.94 to El. 550°	7.5 N.A.
6+20			5.32	544.99	F 5.01 to " "	" "
"			5.36	544.95	F 5.05 to "	77.25 S.A.
			5.41	544.90	F 5.10 to "	" "

Rogers

ELEV FORMS Blk #13 — August 11-02 — 13

OUTLET TOWER

BM 1	1.66	485.23		483.57	
9+01.90			8.84	476.39	Toe of Conc. 14.98 from C. Tower 11°37' E. of N. Axis
			8.80	476.43	Toe of Conc 31°00' from Sta 0100 14.87 from C. Tower
			8.71	476.52	" " 57° 14.87 from C. "
			9.44	475.79	" " 80° 14.88 " " "

VALVE CHAMBER

BM 1	2.16	480.13		477.97	
9+25			4.89	475.24	F 4.26 to Floor Valve CHAMBER 144.02 S.A. Gr 479.5
"			3.17	476.96	F 2.54 to " " " 129.02 S.A. Gr "
9+27			6.55	473.58	F 5.84 to " " " 144.02 S.A. Gr 479.42
9+25			4.97	475.16	F 9.84 to Platform Grade 145.02 S.A. Gr 485°
+35.5'			3.08	477.05	F 7.95 to " " " Gr "
+35.5'			1.38	478.75	F 6.25 to " " 129.02 S.A. Gr 485°

5.03

Rogers

ELEV FOR FORMS Blk # 17 Aug 13-1942 QQ

	1.96	570.07	568.11	
11+01		5.75	564.82	F 5.18 to Elev. 570° 5.5 N. Axis
+20		5.09	564.98	F 5.02 to " " " "
+30		5.10	564.97	F 3.76 to Top Fl Hdt 5.63 N. " Gr = 568.73
+40		5.24	564.83	F 5.22 to " " 5.45 N. " Gr = 570.55
+49		4.98	565.09	F 7.06 to " " 5.29 N. " Gr = 572.15
CHECK Forms				
	7.44	573.53		
		3.39	572.16	Top of Fillet 5.28 N. A. D = 5.29 Gr = 572.15
Elevs.				Aug 17-1942
	10.37	578.48	568.11	
11+01		2.28	576.20	Toe of Conc 58.85 S. Axis
"		8.33	570.15	F 4.85 to El 575° 5.9 N. Axis
2+		8.42	570.06	F 4.94 to " " " "
11+49		8.29	570.19	F 4.81 to " " " "
		3.26	575.22	F 9.78 to " 580° 54.9 S. Axis

FORMS BLKS

B.M.	2.11	561.67		558.56	
5+20			0.01	561.26	Point on FORM. 66.07 Axis D=
				~~558.56~~	August 1st 1942
	11.69	570.25		558.56	
5+70			5.27	569.98	F 5.02 to Elev 570= 62.55 S. Axis
℄			5.29	569.96	F 5.04 to " " " "
5+70			5.31	569.91	F 5.09 to " " 55 N. Axis
			5.26	569.99	F 5.01 to " " " "

Rogers

Aug 13-42 05

ELEV FORMS Blk # 19

Rogers

Aug 14-42 26

B.M.	402	607.56		603.54	
12+00			12.59	594.97	F 8.21 to Top of Fillet 2.34 N.A. Gr. 603.18
"			12.23		F " to Both " " 5.62 N.A. Gr. 596.26
"			12.65	594.91	F 5.09 to El. 595 = 39.75 S. Axis
B.M.	880	612.34		603.54	
			7.34	605.00	D.S. Toe of Conc 35.95 S.A.
12+01			12.42	599.92	F 5.08 to Elev. 605 = 35.95 S.A.
+01			12.34	600.00	F 3.18 to Top Fillet 2.34 N.A. Gr. 603.18
+15			8.51	603.83	F 12.73 to " " 1.67 N.A. Gr. 616.56
"			8.98	603.36	F 6.18 to Both " 4.95 N.A. Gr. 609.54
B.M.	425	612.85		611.60	Aug 31-42
12+20			3.15	609.70	F 4.22 to Both of Fillet 4.71 N.A. Gr. 614.42
			4.31	608.54	F 12.80 to Top " 1.43 N. " Gr. 621.34

Rogers

Aug 16-17 87

ELEV #7

	2.73	530.07		527.29
6+23.25			4.83	525.19
℄			5.08	524.92
CHECK FORMS				
BM.	3.08	530.37		527.29
			0.30	530.37
Elevs				
BM.	8.11	535.40		527.29
TP.	4.95	535.32	5.03	530.37
BM check			8.03	527.29
℄			5.35	529.97
6+23.25			5.26	530.06
CHECK FORMS				
	4.83	535.20		530.37
			0.10	535.10

-4.81 to Elev. 530° 93.70 S. Axis

F 5.06 to " " " "

9-3-87

Point on DS. Form 93.63 S. D = 93.65

9-10-87

Rock on BM #7

= 527.29

F 5.03 to Elev. 535° 89.90 S.

F 4.90 to " " " "

9-10-87

Point on Form 89.83 S. D = 89.83

Bk #12

	0.55	484.12		483.57	
8+73.5			9.09	475.03	F 10.49 to Top of Fillet 13.95 N.A. Gr: 485.52
+72.8			9.11	475.01	F 9.98 to Gallery Invert Gr: 484.99
8+98			7.99	476.13	Invert of Drain 141.07 S. Axis
+96.52			9.15	474.97	F 1.03 to " invert at outlet 150.70 S.A.
B.M.	0.69	484.26	0.55	483.57	
℄			9.07	475.24	F 5.76 to El. 481.° 132.83 S. Axis
Rt			9.14	475.17	F 5.88
Lt			9.13	475.13	F 5.87 to " " " "
20.30 Lt			9.22	475.04	F 5.96 to " " " "
B.M.	4.97	482.94		477.97	Aug. 17 - 1942
℄			2.92	480.02	F 0.0 to Top of spillway 157.5 S. Axis Gr: 480.02
C					
	5.62	483.59		477.97	
8+68.65			1.61	482.18	Point on Gallery Gr - 482.22
			1.90	485.49	" " Fillet 13.94 N.A. D = 13.95 Gr: 485.52

Rogers

Blk # 4	CHECK FORMS					Aug 16, 42 49
	0.80	597.28			596.48	
				2.07	595.21	Point on Form 4337 S.A. D=
CHECK FORMS						
	7.94	600.43			592.49	
				0.20	600.23	Point on D.S. FORM 3962 D=39.59
Elevs FOR FORMS						August 28-42
B.M.	8.76	605.24			596.48	
℄				5.25	599.99	F 501 to Elev 605° 2.25 N.A.
5+20				5.29	599.95	F 505 to " " "
"				5.21	600.03	F 497 to " " 35.95 S.
℄				5.24	600.00	F 500 to " " " "
CHECK Forms						
	8.99	505.47			596.48	
				0.30	505.17	Point on D.S. Form 3579 S.A. D=35.82

Blk #17

BM 7.01 575.12

11+00

+41.97

CHECK FORMS

9.26

Elevs. 12.03 580.14

11+01

+21

+41.77

+49

+49

+01

11+49

+10

+20

+30

+40

		568.11
	1.22	573.90
	4.96	470.16
		568.11
	7.28	572.86
	6.67	573.47
	6.31	573.83
	5.11	575.03
	5.07	575.07
	5.22	574.92
	4.86	575.28
	4.27	575.87
	1.79	578.35
	6.81	573.33 ~~.24~~
	6.53	573 .61
	6.64	573 .50
	6.89	573 .25

Rogers

Aug 19-62 30

Point & Gallery invert 11° S.A.

F 4.35 to invert 11° S.A. Gr= 470.51

August 21-1962

Aug. 24-1962

F 1.05 to invert 11° S. Axis Gr= ~~573~~ 573.91

F 0.73 to " " " Gr 574.20

F 0.68 to " " " Gr= 574.51

F 4.30 to " " " Gr= 579.33

F 4.93 to Elev. 580° 4.5 N.A.

F 5.08 to " " " "

F 4.72 to " " 5495 S. Axis

D.S. Toe Conc 58.09 S. Axis

F 1.65 to El. 580° 5495 S.A.

F 4.72 to Gallery C.I. Pipe Gr= ~~578~~ 578.05

F 4.58 " " " Gr= 578.19

F 4.84 " " " Gr= 578.34

F 6.05 " " " Gr= 579.30

Rogers

Aug 20-42 51

ELEV FOR FORMS Blk # 12

B.M.	7.26	485.23		477.97	
℄			4.99	480.24	F 5.76 to Elev 480 = 128.37 S.A.
Rt			5.11	480.12	F 5.88 to " " " "
Lt.			4.99	480.24	F 5.76 to " " " "
8+97			5.17	480.11	F 5.89 to " " " "
B.M.	1.81	485.38		483.57	August 21-1942
8+99			5.33	480.05	F 10.66 to Top Fillet 13.63 N/A. Gr = 488.71
+83.5			5.43	479.95	F 6.82 to " " 13.83 N/A Gr = 486.77
+73.5			5.34	480.04	F 5.48 to " " 13.95 N.A. Gr = 485.52
+66.5			5.11	480.27	F 7.19 to Gallery Invert 11'-5. Gr = 487.46
			2.36	483.02	
+6.280			5.30	480.08	F 9.72 to Top C.I. Pipe Gr = 489.80
B.M.	7.50	~~485.47~~ 487.47		~~477.97~~ 479.97	

128.37

480

Blk #5

	0.40	575.29	574.89	
℄			5.32	569.97
5+70			5.37	569.92
"			5.35	569.94
℄			5.11	570.18
CHECK				
BM 099		575.88	574.89	
			0.61	575.27
Elevs.				
	5.38	580.27	574.89	
5+70			5.33	574.94
"			5.43	574.84
℄			5.19	580.08
"			5.13	580.14
CHECK FORMS				
	5.71	580.60	574.89	
			0.50	580.10

Reports

Aug 20-42 52

F 5.03 to Elev 575° 5° N.A.

F 5.08 to " " 5° N.A.

F 5.06 to " " 58.75 S.A.

F 4.82 to " " "

Aug 28-1942

Point on Forms 58.55 S.A. D = 58.55

Sept 8-1942

F 5.06 to El. 580° 4.5 N.A.

F 5.16 to " " 569.5 S."

F 4.92 to " " "

F 4.86 to " " 4° N.A.

9-18-42

Point on Form 54.86 S. Dwg D = 54.87

Elev. for Forms Blk 3

B.M	10.56	639.89		629.33
℄			5.06	634.83
4+70			4.85	635.04
4+70			4.89	635.00
℄			4.92	634.97
B.M.	10.88	640.21		629.33
℄			0.31	639.90
4+70			0.10	640.11

ELEVS.

	2.83	645.07		642.24
℄			5.04	640.03
4+70			5.13	639.94
.			4.97	640.00
℄			5.02	640.05

CHECK Forms Blk # 3

BM	2.95	645.19		642.24

Pilot

Aug 22 '12 53

F. 5.32 to El. 640.15 14.69 S. Axis

F. 5.11 " " " " " "

F. 5.15 to El. 640.15 0.50 N. Axis

F. 5.18 " " " " " "

Point on Form 14.93 D=14.69 El=640.15

" " 14.69 S.A. " "

F 4.99 to El. 645.02 14° S.A.

F 5.08 to " " " "

F 5.02 to " " On Axis

F 4.97 to " " " "

9-3-12

Rapps

Blk #12 CHECK FORMS

B.M.	11.44	489.41		477.97		
9+00			0.56	488.85	Top of Fillet Form	Gr=488.83
846.57			1.22	488.19	Point on Gallery Form 11° S.A.	Gr=488.17
			3.41	486.00	Point on Curve 128.37 S Axis D=128.37 Gr=486.0	
8+73.5			3.92	485.49	Top Fillet Form 13.99 N. Axis	Gr=485.52
			4.80	484.61	Grade-Strip Guidewall	Gr=484.60

ELEVS

Aug 26-12

B.M.	12.29	490.26		477.97		
℄			5.15	485.11	F 4.89 to Elev 090°-13.5 N.A.	
8+99			5.28	484.98	F 5.02 to " " "	
"			5.32	484.94	F 5.06 to " " 124.17 S.A.	
℄			4.90	485.36	F 4.64 to " " "	
	7.11	490.68		483.57		
846.02			5.29	485.39	F 3.76 to invert 11° S.A.	Gr=489.15
+89.10			5.20	485.48	F 3.95 to " 11° "	Gr=489.43
8+99			5.62	485.06	F 10.97 to " "	Gr=496.03

Bk #17 CHECK FORMS

B.M.	6.72	587.86		581.10
11+00			3.95	583.91
+20+			3.70	584.16
+37.68			3.50	584.36
11+01			7.14	580.72
11+50			5.84	580.02

Elevs for FORMS

B.M.	3.94	585.08		581.14
11+01.			5.20	579.88
"			5.06	580.02
—			5.11	579.97
11+69			4.85	580.23
"			4.89	580.19

Rogers

August 26-42 55

Top of Gallery Form Gr.- 583.90

" " " Gr.- 584.18

" " " Gr.- 84.48

Point on D.S. FORM 5.46 S.A. D=5.46

" " Gallery Gr.=580.00

August 28-1942

F 5.12 to Elev 585 = 5.15 S. Axis

F 4.98 to " " 0° N. "

F 5.03 to " " 5.15 S. "

F 4.77 to " " " S. "

F 4.81 to " " 0° N. "

BLK # 13 ELEVS

B.M.	7.12	485.09		477.97	
9+29.56			0.60	484.49	F 6.40 to Bott. Fillet 17.98 N. Axis Gr 490.89
"			0.45	484.64	F 16.71 to Top " 12.37 N " Gr 501.35
9+25			2.63	482.46	F 6.54 to End of " Gr 489.0
+20			6.53	478.56	F 8.28 to Bott " 18.38 N " Gr = 486.84
+10			8.56	476.53	F 6.08 Gr = 482.61
9+00			9.9	475.2	Elev. Copper Water STOP
9+20			6.4	478.7	" Bottom of Riser
9+10			9.2	475.9	" " " "
B.M.	7.21	485.18		477.97	15.150 / 2.095 / 12.695
			5.85	479.33	
			6.52	478.66	F 6.34 to El 485.0 127.15 S.A.
			5.68	479.50	
			12.10	473.08	F 6.42 to Floor V. Chamber. Gr = 479.50
CHECK	4.84	482.81		477.97	
9+25			3.32	479.49	Point on V. CHAMBER Floor Gr = 479.50
			3.49	479.32	" " " at sump Gr = 479.33
		33 / 23	+ 2.52	485.33	

Roger.

LOCATION & ELEVATION of GROUT Hole 3/K#13 Aug 28 1912 57

910 487.07 477.97

P. 38

9+05	13.5	473.6	53' S. Axis	Entered in F.B. # 618
9+12	9.8	477.3	On Axis	" " "

Rogers

August 31-42 58

Blk #13 Outlet Pipes

BM. 3.86 487.43 483.57

PIPE A

NO.	Grade	Rod	Elev.	F
1	483.61	4.96	482.47	1.14
2	483.60	4.83	482.60	1.00
3	483.46	5.20	482.23	1.23
4	483.13	5.57	481.86	1.27
5	482.62	5.75	481.68	0.94
6	482.01	5.92	481.51	0.50
7	481.51	6.40	481.03	0.48
8	481.21	6.99	480.44	0.77
9	481.11	7.34	480.09	1.02
10	481.11	7.94	479.49	1.62

PIPE B

No	Grade	Rod	Elev	F
1	483.61	4.89	482.54	1.07
2	483.60	4.95	482.48	F1.12
3	483.46	5.41	482.02	1.42
4	483.11	5.67	481.76	1.35
5	482.60	5.96	481.47	1.13
6	482.01	5.92	481.51	0.50
7	481.51	6.91	480.52	0.99
8	481.21	7.28	480.15	1.06
9	481.11	7.37	480.06	1.05
10	481.11	7.96	480.47 479.47	1.64

PIPE C

No	Grade	Rod	Elev.	F
1	483.61	5.08	482.35	1.26
2	483.60	5.11	482.32	1.28
3	483.46	5.69	481.74	1.72
4	483.13	5.93	481.50	1.63
5	482.62	6.29	481.14	1.48
6	482.01	6.26	481.19	0.82
7	481.51	7.16	480.27	1.24
8	481.21	7.36	480.07	1.14
9	481.11	7.22	480.21	0.90
10	481.11	7.96	479.49	1.62

Blk # 12 ELEVS.

	7.15'	490.72	483.57	
8+69.92			1.63	489.09	Point on Invert	Gr. 489.15
			3.6		Top of Grout Pipe 12-12½±
			4.1		" " " " 12-40±
			3.4		" " " " 12-27± 37± S.A.
			0.6	490.66	Pt. on D.S. Form
					9-3-42
Elevs.					
B.M.	11.55	495.12		483.57	
8+89.10			6.98	488.14	F 1.29 / 0.29 to invert	Gr. 489.03
8+99			5.20	489.92	F 6.11 to "	Gr. 496.03
B.M.	10.94	494.51		483.57	9-3-42
℄			6.53	487.98	F 7.02 to El 495° 13° N. Axis
8+99			4.48	490.06	F 4.96 to " " " "
"			4.62	489.89	F 6.14 to invert 11° S.	Gr. 496.03
			4.20	490.11	F 4.89 to El 495° 120.30.S.
			4.35	490.16	F 4.84 to " " " "

concluded p 65

Rogers

Sept. 1-42 60

BLK # 17 CHECK FORMS

	4.00 585.16		581.14
11+50		+.02	585.16
		+0.07	585.21

ELEVS. FOR FORMS

	8.81 589.95		581.14
11+99		4.72	585.23
"		5.19	584.76
11+00		4.94	585.01
"		5.01	584.94
"		5.07	584.88

CHECK FORMS

B.M. 9.38 590.52			581.14
11+50		0.35	590.17
11+0		0.30	590.22

CHECK FORMS

Point on D.S. Form 51.03 SA D= 51.03

" " " " 50.97 D= 50.99

Sept 3-1942

F 4.77 to El. 590.0 3.5 N. Axis

F 5.24 to " " 47.35 S. "

F 4.99 to " " 3.5 N. "

F 5.06 to " " 47.35 S. "

F 5.12 to " " " S. "

9-9-42

Point on DS. FORM 47.20 SA D=47.22 S.

" " " " 47.17 S. D=47.19 S.

16 35

BLK 19 CHECK FORMS

	1.48	605.02		603.54	
			1.84	603.18	Top of Elect 2.33 N.A. D = 2.34 Gr = 603.18
			+11.50	616.52	" " 1.68 N.A. D = 1.67 Gr = 616.56
			+4.56	609.58	
			+.04	605.06	Point on D.S. Form 35.92 S.A. D = 35.93
			+.0.29	605.31	" " " 35.75 S.A. D = 35.91
BM				611.60	Sept 5th
	3.76	615.36			
12+01			10.34	605.02	F 4.98 to Elev. 610.00 - 2.00 North
12+01			10.28	605.08	F 4.92 to " " - 32.5 South
12+10			10.41	604.95	F 6.83 to " 611.78 - 1.91 North
BM	7.38	618.98		611.60	
12+20			10.45	608.53	F 12.81 to El 621.34 - 1.43 North
12+20			9.29	609.69	F 4.73 to El 614.42 - 4.71 "
12+30			3.03	615.95	F 12.77 to El 628.72 - 10.6 "
12+30			2.71	616.27	F. 5.53 to El = 621.80 - 4.34 North

Blk # 13 ELEVS. FOR FORMS

B.M.	4.05	487.62			483.57	
℄				7.68	479.94	F 1.09 to Bottom of Pipe Box #A Gr = 481.03
"				7.72	479.90	F 1.13 to " " " #B Gr = "
"				7.85	479.77	F 1.26 to " " " " #C Gr = "
T.P.	4.95	485.04	2.53		480.09	
℄				5.27	479.77	F 5.23 to Bottom Gal. Floor 128.525 Gr = 485.0
"				5.50	479.54	F 5.46 to " " " 144.525 A. Gr = "
T.P.	3.89	487.45	1.48		483.56	
9+05				7.40	480.05	F 8.95 to Top of Fillet 13.73 NA Gr = 489.00
"				6.95	480.50	F 0.0 to Bott. " Gr = 480.50
9+10				6.82	480.63	F 8.37 to Top " 14.17 NA. Gr = 489.00
"				5.95	481.50	F 1.11 to Bott. " Gr = 482.61
9+15				6.85	480.60	F 8.40 to Top " 14.97 NA. Gr = 489.00
"				6.37	481.08	F 3.65 to Bott. " Gr = 484.73
9+20				6.17	481.28	F 5.56 to " " 486.84
"				6.63	480.82	F 8.18 to Top " 16.22 NA Gr = 489.0
BM			3.88		483.57	= 483.57

3.88

B/C #18 ELEV FOR FORMS

B.M.	1.85	577.18		575.33	
11+60			11.91	565.27	F 9.56 to Top Fillet 502 N. Gr = 574.83
"			10.80	566.38	Pl. on Form Gr = 566.40
11+75			12.11	565.07	F 16.66 to Top " 4.33 N. Gr = 581.73
"			11.89	565.29	F 8.01 to Bott Fillet 8.85 N Gr = 573.30
P.	11.49	586.82	1.85	575.33	
11+85			10.29	576.53	F 14.00 to Bott. " 3.25 N. Gr. 590.53
"			8.01	578.38	F 3.72 to Top " 7.97 N. Gr. 582.10

CHECK FORMS 9-9-42

B.M.	2.83	578.16		575.33	
11+60			3.36	575.80	Top Fillet Form 502 N.A. Gr. 574.83
+70			0.86	577.30	" " " 1.87 N.A. Gr = 577.33

ELEVS 9-11-42

	0.81	576.14		575.33	
			5.80	570.34	F 4.99 to Top Fillet 502 N.A. Gr = 574.83
			5.61	570.53	F 6.83 to " " 4.77 N.A. " Gr = 577.33
11+80			2.1	574.0	Bottom of Riser

Blk #13 Elevs. For Forms

T.P.	1.37	581.93		483.56	Desc. p 62	
9+34.5			5.69	479.24	F 5.76 to Gallery Floor	144.52 S. Gr. 485.=
"			4.27	480.16	F 4.84 to " "	128.52 S. Gr. = "

Outlet Pipe Grades Sept 6-1912

B.M.	1.82	485.38		483.56		

PIPE A					PIPE B				PIPE C				
No.	Grade	Rod	Elev	F	No.	Grade	Rod	Elev	F	No.	Grade	Rod	Elev	F

Elevs. 9-10-12

B.M.	7.34	490.90		483.56		
T.P.	8.86	491.03	8.73	482.17		
			7.48	483.55	= 483.56	
T.P.	1.67	483.84		482.17		
					El 489.04	
			3.65	480.19	F 8.85 to Lt. Side	18.56 from C. Tower
			3.59	480.25	F 8.79 to Rt. "	" " "

Blk # 12	Elevs		from p 59		Repairs 9-4-42	65
	10.94	494.51		483.57		
8+90.7			6.38	488.13	F 7.17 to Top C.I. Pipe	Gr - 495.30
+81.4			6.59	487.92	F 5.40 to " " "	Gr - ~~489~~ 493.32
+72.1			6.44	488.07	F 5.12 to " " "	Gr = 493.19
CHECK					9-8-42	
	11.95	495.51		483.56		
			+3.79	499.30		
			6.09	489.42		
			+0.47	495.98		Gr = 496.03
			+0.26	495.77	Point on D.S. Form	D. 119.72
Elevs					9-10-42	Gr = 498.02
	2.65	500.84		498.19		
			5.75	495.09	F 4.91 to El 500° 116.50 S.A.	
			5.98	492.86	F 5.14 to " " "	
B.M. ℄	1.96	500.15		498.19	9-11-42	
			5.11	495.04	F 4.96 to El 500° 125 N.A.	
			5.07	495.08	F 4.92 to " " "	
			3.56	496.59		

Blk # 8 CHECK FORMS

	5.91	545.72	539.78		
7+14		0.68	545.04	Point on DS Form 82.27 S.	D = 82.27
6+67.5		0.58	545.14	" " " " 82.14 S.	D =

OUTLET PIPES - BLOCK #13

Sept 5th

T.B.M.	3.51	487.07	483.56		
		3.47	483.60	Grade = 483.60 - "A" Pipe - S 82 South	
"A"		4.58	482.49	F = 6 6/8 To Elev 489 1/2 - Top of Valve Seat	
"B"		5.05	482.02	F = 7 1/3 " " "	
"C"		5.03	482.04	F = 7 11/16 " " "	
"A"		4.60	482.47	F = 1 14/16 To Inv	4.59
"B"		4.55	482.52	F = 1 9/16	4 7/8
"C"		4.76	482.31	F = 1 30/32	4.76

ELEVS - FORMS - BLOCK #20

Sept 5-14 67

BM	10.39	45.65	635.26	
12+51		5.56	640.09	F 4.91 To El. 645.0 - Offset 0.25
12+51		5.29	640.36	F 4.66 to El. 645.02 ~ 14.00 south
12+60		5.20	640.45	F 3.25 to Top Fillet - 643.70 - 0.31 North
12+70		6.60	639.05	F 10.95 To Top Fillet - 650° ~ On Axis
12+70		5.94	639.71	F 5.10 To Bot. " " - 644.81 - 2.46 North
12+80		4.72	640.93	F 4.09 To El. 645.02 14.00 south

Blk #3

	7.74	649.98		642.24			
℄			4.84	645.14	F 4.86	E 1, 650°	on Axis
"			4.78	645.20	F 4.80	" "	13° S. "
4+70			4.90	645.08	F 4.92	" "	on Axis
"			4.87	645.11	F 4.89	" "	13° S. "
Elevs					9-12-42		
	5.60	655.15		649.55			
℄			5.16	649.99	F 5.01	to E 1 650°	1° S. A.
4+70			5.08	650.07	F 4.93	to " "	1° S. "
			5.05	650.10	F 4.90	to " "	13° S. "
			5.16	649.99	F 5.01	to " "	1° "

Blk #8

BM	13.07	548.97			535.90	
T.P.	2.77	~~548.79~~ 548.90	2.93		~~546.02~~ 546.13	
CHECK	13.01	549.03	12.88		536.02	
6+68.5				4.00	544.92	F 5.08 to El. 550.0 7.5 N.A.
7+13				4.01	544.91	F 5.09 to " 550.0 " "
"				4.07	544.85	F 5.15 to " " 78.50 S. "
6+68.5				4.08	544.84	F 5.16 to " " " "
℄				4.06	544.86	F 5.14 to " " " "
BM	10.26	550.04			539.78	
T.P.	3.88	550.01		3.91	546.13	
BM				10.24	539.77	= 539.78
6+68.5				5.00	545.01	F 4.99 to El 550.0 7.5 N.A.
7+13				5.00	545.01	F 4.99 to " " " "
"				5.06	544.95	F 5.05 to " " 78.50 S.A.
6+68.5				5.07	544.94	F 5.06 to " " — —
℄				5.05	544.96	F 5.04 to " " " "

BLK 11

CHECK FORMS

	9.09	520.61		511.52				
			0.20	520.41	Point on D.S. Form	1010	S.A.	D= 101.0
ELEVS								
B.M.	4.96	525.15		520.19				
8406			5.18	519.97	F 5.03 to El.	525.0	97.50	S.A.
"			5.02	520.13	F 4.87 to "	"	"	"
"			5.19	519.96	F 5.04 to "	"	"	"
8406			5.18	519.97	F 5.03 to "	"	"	"

B.M.	3.37	594.21		590.84				
11+49			4.29	589.92	F 5.08	to El 595	43.55	SA.
+01			4.36	589.85	F 5.15	to "	"	"
"			4.10	590.11	F 4.89	to "	3°	N.A
			4.13	590.08	F 4.92	to "	"	"
CHECK FORMS					9-15-62			
B.M.	5.02	595.86		590.84				
11+50			0.63	595.23	Point on Ex.		43.32	S. D=43.38
11+00			0.77	595.09	" "	"	43.50	S D=43.68
Elevs					9-17-62			
	9.47	600.31		590.84				
11+49			5.15	595.16	F 4.81	to El. 600	39.25	S.
℄			5.09	595.22	F 4.78	to "	"	"
11+01			5.26	595.05	F 4.95	to "	"	"
"			5.30	595.01	F 4.99	to "	2.5	N.A.
11+49			5.24	595.07	F 4.93	to "	2℄	"

Blk #10

	4.10	540.00		535.90				
7+59			4.98	535.02	F 4.98	to E'	540	8.5 N.A.
"			5.06	534.94	F 5.06	to "	"	86.10 S.
℄			4.99		F 4.99	to "	"	
7+15			4.96		F 4.96			" "
"			5.08		F 5.08	to "		8.5 S.A.

CHECK FORMS

	4.30	540.20		535.90				
E.			+0.12	540.32	Point on Form		85.90 S.	D = 85.86
W.			0.00	540.13	" "		86.01 S	D = 86.01

Blk # 13

	9.64	493.21			483.57	
9+23				8.85	484.36	F 6.67 Top Window 143.52 S. Gr = 491.03 (windows)
9+13				8.86	484.35	F 6.68 " " " " " " (windows)
9+09				8.86	484.35	F 6.68 " " " " " " (windows)
8+99				7.82	485.39	F 4.61 to El 490= 142.02 S. (W. wall)
9+00				7.80	485.41	F 4.59 to " " 128.52 S. (N. W. wall)
9+35.5				7.54	485.67	F 4.33 to " " 123.35 S. (slope)
9+25				7.66	485.55	F 4.45 to " " 128.52 S. (N. wall)
9+33.5				8.19	485.02	F 4.98 to " " 130.02 S. (N. E. wall)
"				8.20	485.01	F 4.99 to " " 102.02 S. (S. E. wall
9+26				8.21	485.00	F 5.00 to " " " S. wall
Elevs						9-15-42
	7.10	490.67			483.57	
9+05				5.54	585.13	F 3.87 to Top Fillet 13.73 N.A. Gr = 489.00
+15				5.52	485.15	F 3.85 to " " 14.97 N. " Gr = "
+20				5.52	485.15	F 3.85 to " " 16.22 N. "

Blk #12	CHECK				
BM. 303	501.22		498.19		
		1.02	500.20	Point on DS. Form	D= 116.35
Elevs				9-18-47	
	6.78		498.19		
℄	504.97	4.98	499.99	F 501 to El 505= 12° N.	
8+52.5		4.98	499.99	F 501 to El 505°	
℄		5.08	499.89	F 5.11 to " "	112.70 S.
		4.95	500.02	F 4.93 to " "	112.70 S.

Lengths of C.I. Pipe (cont'd) Sept

Blk #12	sta 8+62.8	L: 5.35'	upper
"	8+72.1	9.25'	Lower
	7+81.4	5.4	"
	7+70.7	7.0	"

Lengths of Galv. C.I. Pipes

Blk #3	sta 4+41	L = 5.5	Upper
"	" 31	L: 5.8	Lower
✓ " #4	" 4+81	7.7	"
✓ " #4	5+01	5.4	Upper
✓ " #4	4+91	4.4	Lower
✓ " #5	5+41	5.3	Upper
✓ " #7	6+21	6.5	Lower
✓ " #6	5+91	5.4	Upper
✓ " #6 6-29-02.	5+81	7.7	Lower
✓ " #4	4+91	5.8	Upper
✓ " #4	4+81	4.8	Lower
✓ " #5	5+31	5.9	Upper
✓ " #3	4+31	5.5	"
✓ " #4	4+81	5.5	"
✓ " #6	5+81	5.4	"
✓ " #2	4+21	5.6	"
✓ " #6	5+71	5.1	"

Lengths of Gallery C.I. Pipes — August

Blk # 6	Sta	5+21	L = 5.5	Upper
" #6	"	4+71	6.5	"
				August
Blk #17	Sta	8+63.5	L = 9.7	Lower
" #17		11+10	5.3	"
"		11+20	5.1	"
"		11+30	5.2	
"		11+40	6.7	
	Sta	4+21	5.0	"
		4+71	6.0	"
		5+21	7.6*	"
		5+71	6.0	"
		?+?? 6+21	5.1	"
		8+07	5.5	"
		"	4.3	Upper

* to be cut off

89.15
8249
66

8915
8202
.3

4481
3973
10
1

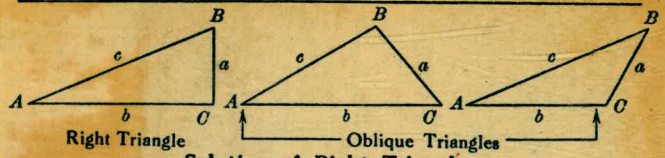
83.61
8256
112
.5

83.61
8237
24

4.81
1.33

6.1

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

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

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	$s = \frac{a+b+c}{2}$, area $= \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	area $= \frac{bc \sin A}{2}$
A, B, C, a	Area	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 = 318.06 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.