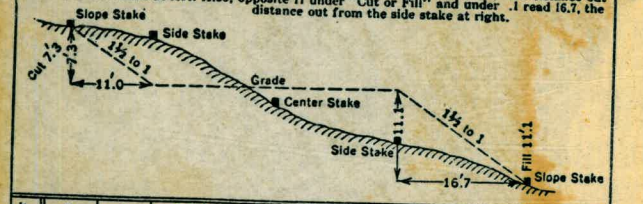
W
625

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.

MICROFILMED

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FINAL X-SECTIONS STA 5+11 - 5+21 March 31 - 1942

Rogers
Cole
Foster

1

	0.68	543.54			542.86
5+11					
13N				6.7	536.8
10N				7.7	535.8
8N				10.0	533.5
2N				9.1	534.4
Axis				7.5	536.0
5S				7.9	535.6
10S				6.5	537.0
16S				6.6	536.9
20S				5.5	538.0
28S				7.3	536.2
30S.				6.7	536.8
34S				7.3	536.2
38S				5.7	537.8
40S.				5.9	537.6

pl

	543.54		
5+11			
44.5		6.2	537.3
45.5		4.6	538.9
50.5		4.3	539.2
51.5		3.0	540.5
60.5		4.8	538.7
70.5		3.2	540.3
79.5		3.6	539.9
80.5		0.9	542.6
82.5		0.5	543.0
5+16			
86.5		4.1	539.4
82.5		6.5	537.0
80.5		5.7	537.8
78.5		6.8	536.7

pg

FINAL X-SECTIONS (CONTD) 3-31-42 3

Sta	5+11 -	5+21			
		54354			
5+16					
77.5				9.2	534.3
70.5				10.3	533.2
60.5				9.3	534.2
55.5				8.7	534.8
48.5				6.0	537.5
5+14					
20.5				8.3	535.2
12.5				8.3	535.2
10.5				8.9	534.6
7.5				7.9	535.6
6.5				9.4	534.1
Axis				9.2	534.3
T.P.	507	538.90	9.71		533.83

FINAL X SECTIONS (CONTD) 3-31-42 4

Sta 5+11 - 5+21

538.90

5+18

87 S	1.0	537.9
80 S	2.3	536.6
79 S	2.6	536.3
76 S	6.9	532.0
70 S	6.9	532.0
67 S	6.3	532.6
66 S	8.5	530.4
60 S	8.6	530.3
50 S	8.3	530.6
45 S	6.4	532.5
40 S	10.9	528.0
38 S	8.1	530.8
30 S	9.1	529.8
26 S	6.9	532.0

Sta 5+11 – 5+21

538.90

5+18		
20 S	7.9	531.0
10 S.	7.7	531.2
4 S	7.5	531.4
2 S	10.2	528.7
Axis	11.1	527.8
8 N	10.1	528.8
10 N.	8.5	530.4
13 N.	6.0	532.9
5+21		
13 N.	6.4	532.5
10 N	10.1	528.8
8 N	11.3	527.6
Axis	12.2	526.7
10 S	11.5	527.4
17 S	12.3	526.6

pg 1

FINAL X-SECTIONS (CONTD 3-31-42 6

Sta 5+11 - 5+21

5+21	538.90		
20S		12.5	526.4
30.S		11.4	527.5
34 S		10.5	528.4
40S		12.0	526.9
45S		11.7	527.2
50S		10.0	528.9
53S		8.0	530.9
57 S		8.4	530.5
60S		10.6	528.3
63S.		11.1	527.8
65 S		8.9	530.0
66S		7.4	531.5
70 S		9.0	529.9
75 S		9.2	529.7
78S.		4.7	534.2

MJ

FINAL X-SECTIONS (Cont'd) 3-31-42 7

Sta 5+11 - 5+21

5+21	+	538.90				
80S				5.6	533.3	
89S				2.9	536.0	
88S				2.2	536.7	
	49.6	543.15	0.71		538.19	
T.B.M.			0.29		542.86	= 542.86 Marked Rock

FINAL X-SECTION 5+71-5+51 April 1-1942

Rogers
Polak
Cole
King
Roberts
Foster

8

5+71 Blk #5

5+71	1.23	500.61			498.88
		5+71			
20 N				9.4	491.2
18 N				9.5	491.1
17.8 N				11.8	488.8
10 N				12.2	488.4
8 N				13.2	487.4
5 N				9.4	491.2
Axis				9.8	490.8
7 S				10.4	490.2
10 S				9.2	491.4
11 S				7.3	493.3
12 S				7.0	493.6
15 S				5.5	495.1
18 S				10.4	490.2
20 S				10.0	490.6

pl

FINAL X-SECTIONS Blk #5 5+51-5+71 April 1-1942

9

	500.61		
25S	5+71	7.4	493.2
26S		9.1	491.5
30S		8.0	492.6
37S		7.8	492.8
38S		6.4	494.2
40S		6.8	493.8
50S		5.0	495.6
60S		6.4	494.2
70S		5.0	495.6
80S		5.2	495.4
90S		5.1	495.5
93S		4.3	496.3
100S		1.1	499.5
	5+64		
20N		6.9	493.7

FINAL X-SECTION BLK #5 5751-5771 4-1-42 10

		500.61			
18N		5+64	8.2	492.4	
17.8N			9.6	491.0	
12N			10.5	90.1	
10N			6.7	93.9	
9N			9.4	91.2	
7N			9.4	91.2	
5N			5.2	95.4	
2N			5.8	94.8	
Axis			7.4	93.2	
7N	S		7.8	92.8	
9N	S		4.9	95.7	
10N	S		4.9	95.7	
12N	S		7.9	92.7	
15N	S		7.7	92.9	
17N	S		6.2	94.4	

FINAL X-SECTION BLK #5 5+51-5+71 6-1-42 11

	500.61		
20 ~~N~~ S	Sta 5+64	5.3	495.3
20 N	" 5+63	3.9	96.7
17.8 N		6.3	94.3
15 N		7.3	93.3
12 N		8.1	92.5
11 N		6.3	94.3
10 N		6.3	94.3
6 N		6.2	94.4
5 N		4.0	96.6
Axis		4.2	96.4
7 S		5.5	95.1
10 S		4.2	96.4
16 S		5.2	95.4
17 S		3.5	97.1
20 S		4.2	96.4

FINAL X-SECTION Blk #5 5+51-5+71 9-1-62 12

	500.61		
20 N	Sta 5+61	3.7	96.9
18 N		6.0	94.6
15 N		7.9	92.7
11 N		7.9	92.7
10 N		6.0	94.6
6 N		6.0	94.6
5 N		3.7	96.9
Axis		4.2	96.4
5 S		5.4	95.2
7 S		3.8	96.8
10 S		3.9	96.7
16 S		4.6	96.0
18 S		2.6	98.0
20 S		3.1	97.5
26 S		2.0	98.6

FINAL V-SECTION Blk #5 5+71-5+51 4-1-42

500.61

30 S	Sta 5+61	2.6	498.0
35 S		2.7	97.9
36 S		0.6	500.0
40 S		2.0	498.6
50 S		2.3	98.3
54 S		1.4	99.2
59 S		3.9	96.7
60 S		2.7	97.9
70 S		1.1	99.5
76 S		1.1	99.5
	Sta 5+55		
20 N		1.5	99.1
15 N		2.5	98.1
10 N		2.3	98.3
7 N		2.8	97.8

FINAL X-SECTION Blk #5 5+51-5+71 4-1-92 14

		500.61			
5		sta 5+55		1.3	499.3
Axis				3.2	497.4
T.P.	129'	511.79	1.73		498.88
		sta 5+71			
105 S				11.6	500.2
106 S				9.2	502.6
110 S				8.3	503.5
114 S				8.4	503.4
117 S				8.8	503.0
		sta 5+57			
70 S				13.4	498.4
80 S				11.9	99.9
86 S				13.0	98.8
90 S				12.4	99.4

FINAL X-SECTION Bk #5 5+51-5+71 4-1-42

	511.79		
77 S	Sta 5+61	10.9	500.9
80 S		11.3	500.5
86 S		11.3	500.5
90 S		8.6	503.2
95 S		7.6	504.2
100 S		5.4	506.4
101 S		4.1	507.7
106 S		3.9	507.9
108 S		2.0	509.8
110 S		1.2	510.6
114 S		1.8	510.0
	Sta 5+56		
50 S		9.9	501.9
54 S		9.6	502.2
56 S		12.6	499.2

FINAL X-SECTION Blk #5-5+51-5+7 4-1-42 16

511.79

60 S	Sta 5+56	11.3	500.5
61 S		12.3	499.5
66 S		11.8	500.0
67 S		9.2	502.6
70 S		8.9	502.9
74 S		10.7	501.1
77 S		9.1	502.7
80 S		8.9	502.9
	Sta 5+51		
18 N		10.2	501.6
15 N		11.9	499.9
10 N		11.4	500.4
1 N		11.3	500.5
Axis		12.4	499.4
10 S		12.1	499.7

pl

	511.79		
14 S	sta 5+51	12.8	499.0
16 S		11.2	500.6
18 S		10.3	501.4
20 S		10.4	501.3
26 S		8.8	503.0
30 S		9.5	502.3
33 S		8.5	503.3
40 S		7.9	503.9
50 S		7.9	503.9
52 S		7.3	504.5
60 S		8.1	503.7
61 S		10.7	501.1
65 S		8.6	503.2
68 S		5.3	506.5
70 S		5.5	506.3

Pl

FINAL V-SECTION Blk #5 5+51-5+71 4-1-42

		511.79				
74S	sta 5+51			5.6	506.2	
80S				5.5	506.3	
82S				1.9	509.9	
T.B.M.	9.24	520.83	0.20		511.59	= 511.60 Marked Rock
88S				8.6	512.2	
90S				7.2	513.6	
100S				5.7	515.1	
104S				5.6	515.2	
108S				4.7	516.1	
T.B.M.			9.24		511.59	= 511.60 Marked Rock

PL

FINAL X-SECTIONS

April 3-1942

Rogers
Cole
Roberts
Foster

	+	⊼	−		Elev
TBM	0.79	597.27			596.48
T.P.	0.67	590.04	7.90		589.37
		Sta 4+71			
50N				2.3	587.7
40N				4.0	586.0
30N				6.2	583.8
20N				10.3	579.7
16N				12.1	577.9
T.P.	4.06	581.51	12.59		577.45
		Sta 4+81			
50N				3.2	578.3
40N				4.0	577.5
30N				5.0	576.5
20N				4.3	577.2
16N				5.9	575.6
			12.12		569.39

pl

FINAL X-SECTIONS (Cont'd 3-3-92 Party same

	+	⌃	−	LS
	0.87	570.26		569.39
		Sta 4+85		
40N			0.4	569.9
30N			0.4	569.9
20N			0.6	569.7
14N			6.6	563.7
		Sta 4+91		
16N			5.1	565.2
20N			2.7	567.6
30N			3.1	567.2
40N			3.8	566.5
50N			4.1	566.2
		Sta 5+01		
50N			5.8	564.5
40N			5.3	565.0

FINAL X-SECTIONS (Cont'd) 3-3-62 Party Same

	+	A	-	15	
		570.26			
		Sta 5+01			
30N				5.3	565.0
20N				8.1	562.2
18N				6.8	563.5
16N				6.8	563.5
		Sta 5+04			
30N				14.2	556.1
40N				12.2	558.1
T.P.	11.3 ?	559.01	12.38		557.88
		Sta 5+11			
50N				6.6	552.4 ~~563.9~~
40N				4.8	554.2 ~~565.5~~
30N				6.6	552.4 ~~5~~
20N				11.0	548.0 ~~559.2~~

570.26
12.38
557.88

FINAL X-SECTIONS 3-3-52 Party Same

	559.01		
	Sta 5+11		
15N		12.6	546.4
	Sta 5+13		
15N		16.8	542.2
20N		13.0	546.0
30N		7.6	551.4
	Sta 5+21		
50N		7.8	551.2
40N		7.1	551.9
30N		6.9	552.1
20N		17.2	541.8
	Sta 5+31		
50N		7.9	551.1
40N		7.5	551.5

PLS

FINAL X-SECTIONS (Cont'd) 3-3-62 Party Same

	+	π	−	15	
		559.01			
		Sta 5+31			
35N				8.2	550.8
30N				11.7	547.3
24N				14.1	544.9
T.P.	1.94	548.27	12.68		546.33
		Sta 5+41			
30N				12.9	535.4
40N				10.6	537.7
50N				7.6	540.7
T.P.	0.73	536.74	12.26		536.01
25N				5.7	531.0
20N				7.0	529.7
~~18N~~				~~8.2~~	~~528.5~~

559.01
12.68
546.33

559.01
12.26
546.75

546.75
.73
547.48

PJ

FINAL X-SECTIONS 3-3-42 party-Same

	+	π	−		
		536.74			
		Sta 5+31			
20N				1.0	535.7
16N				1.9	534.8
		Sta 5+51			
50N				5.7	531.0
40N				5.6	531.1
30N				5.4	531.3
22N				6.1	530.6
T.P	3.96	528.00	12.70		524.04
		Sta 5+61			
50N				4.0	524.0
40N				3.5	524.5
30N				3.5	524.5
28N				3.5	524.5

524.04
3.96
528.00

536.74
12.70
524.04

PL

FINAL X-SECTIONS 3-3-42 Party Same 25

	+	X	−	IS	ELEV.
		528.00			
		Sta 5+61			
27N				10.1	517.9
24N				12.3	515.7
		Sta 5+71			
40N				14.8	513.2
50N				6.4	521.6
60N				6.0	522.0
T.P.	1.01	516.55	12.46		515.54
30N				7.7	508.8
21N ~~20N~~				15.2	501.4
		Sta 5+81			
70N				5.9	510.7
60N				8.3	508.3
50N				8.4	508.2
46N				9.1	507.5

528.00
12.46
515.54

FINAL X-SECTIONS Apr. 3-43 Party Same

	+	π	−	15	Elev.
		516.55			
		Sta. 5+91			
70N				13.2	503.4
62N				11.9	504.7
60N				13.1	503.5
T.P.	0.70	504.66	12.59		503.96
		Sta 6+01			
80N				4.7	500.0
72N				3.6	501.1
70N				5.1	499.6
60N				11.2	493.5
		Sta 6+11			
76N				5.5	499.2
80N				5.0	499.7
70N				11.9	492.8
		Sta 5+81			
40N				7.3	497.4

516.55
12.59
503.96

503.96
.70
504.66

FINAL X-SECTIONS (cont'd) Apr. 3-1943

Rogers
Cole
Roberts
Foster

	+	π	−	15	Elev.
		504.66			
		Sta 5+81			
30N				11.1	493.6
		Sta 5+91			
50N				6.3	498.4
47N				10.7	494.0
		Sta 6+21			
80N				11.5	493.2
90N				5.7	499.0
T.P.	2.79	494.50	12.95		491.71
		Sta 5+91			
46N				0.4	494.1
50N		Sta 6+01		6.9	487.6
47N				8.5	486.0
		~~Sta 6+11~~			
~~70N~~				~~1.2~~	~~493.3~~

5 04.6
2.79
494.50

FINAL X-SECTIONS (Cont'd) Apr. 3-43 Rogers Cole Roberts Foster

+	T	-	IS	Elev.	
	494.50				
	Sta. 6+11				
60N			5.3	489.2	
55N			8.1	486.4	
	Sta 6+21				
70N			5.5	489.0	
60N			7.9	486.6	
57N			9.4	485.1	
T.P.		10.66		483.84	Mark on Rock 60'N. Sta 6+41

FINAL X-SECTIONS of BLK #10 April 6-1942

Rogers
Cole
Foster

	+	HI	−	IS	Elev
T.B.M.	0.15	449.50			449.35
		7+60.5			
30 N				4.5	445.0
25 N				7.7	441.8
20 N				7.9	441.6
16 N				7.9	441.6
15 N				6.5	443.0
10 N				6.5	443.0
0				6.6	442.9
10 S				10.0	439.5
12 S				9.8	439.7
13 S				8.0	441.5
20 S				8.6	440.9
30 S				8.8	440.7
40 S				9.2	440.3
50 S				10.0	439.5

FINAL X-SECTIONS BK #10 (cont'd) 4-6-52

		449.50			
		7+60.5			
55 S				5.6	443.9
60 S				5.6	443.9
65 S				7.4	442.1
66 S				6.3	443.2
70 S				6.2	443.3
80 S				7.5	442.0
90 S				9.1	440.4
96 S				9.5	440.0
97 S				7.7	441.8
100 S				7.3	442.2
113 S	ok			5.6	443.9
103 S	ok			4.8	444.7
120 S				4.6	444.9
130 S				3.6	445.9

Rogers
Cole
Foster

FINAL X-SECTIONS Blk #10 (cont'd) Apr. 6-42

+	⊼	−	TS	ELEV.
	449.50			
	7+60.5			
140 S			3.9	445.6
150 S			3.7	445.8
160 S			2.2	447.3
	7+70.5			
160 S			3.4	446.1
150 S			4.1	445.4
140 S			4.7	444.8
130 S			4.8	444.7
120 S			7.0	442.5
110 S			9.2	440.3
100 S			9.7	439.8
90 S			10.1	439.4
	7+65.5			
90 S			8.8	440.9

pl

	449.50		
	7+65.5		
80S		7.4	442.1
70S		7.7	441.8
60S		10.4	439.1
	7+70.5		
80S		9.6	439.9
70S		9.2	440.3
60S		8.8	440.7
50S		8.2	441.3
40S		7.6	441.9
30S		6.0	443.5
20S		6.4	443.1
10S		7.1	442.4
0		7.3	442.2
10N		7.4	442.1

pl

FINAL X-SECTIONS Blk #10 (Cont'd) 4-6-42

	449.50	
	7+70.5	
20 N	7.7	441.8
23 N	7.7	441.8
27 N	4.0	445.5
	7+78.5	
0	7.3	442.2
10 S	7.2	442.3
20 S	4.7	444.8
30 S	4.9	444.6
40 S	5.8	443.7
50 S	7.5	442.0
60 S	8.3	441.2
	7+80.5	
25 N	6.1	443.4
20 N	5.9	443.6

	449.50		
	7+80.5		
10 N		7.1	442.4
0		7.4	442.1
10 S		7.7	441.8
20 S		7.7	441.8
30 S		7.0	442.5
40 S		6.0	443.5
50 S		6.3	443.2
53 S		8.9	440.6
60 S		8.4	441.1
70 S		8.5	441.0
80 S		9.9	439.6
89 S		10.0	439.5
90 S		6.5	443.0
100 S		6.9	442.6

	449.50		
	7+80.5		
110 S		6.5	443.0
120 S		8.5	441.0
	7+78.5		
130 S		8.9	440.6
135 S		5.5	444.0
140 S		4.8	444.7
	7+80.5		
130 S		8.9	440.6
140 S		9.2	440.3
150 S		8.7	440.8
160 S		8.5	441.0
170 S		7.6	441.9
	7+90.5		
170 S		8.7	440.8
180 S		4.5	445.0

	449.50	
	7+90.5	
160 S	8.7	440.8
150 S	7.8	441.7
140 S	7.4	442.1
130 S	7.9	441.6
120 S	7.6	441.9
110 S	7.0	442.5
100 S	8.3	441.2
	7+85.5	
100 S	9.7	439.8
90 S	10.6	438.9
80 S	8.4	441.1
	7+90.5	
90 S	8.3	441.2
81.5	8.6	440.9

	449.50		
	7+90.5		
80 S		6.4	443.1
70 S		6.2	443.3
60 S		6.4	443.1
50 S		5.8	443.7
40 S		6.3	443.2
30 S		5.8	443.7
20 S		5.5	444.0
10 S		6.7	442.8
0		6.0	443.5
10 N		6.4	443.1
20 N		6.3	443.2
24 N		6.0	443.5
	8+00.5		
24 N		3.8	445.7

FINAL X-SECTION Blk #10 (cont'd) April 6-42

	449.50		
	8+00.5		
20N		4.9	444.6
10N		3.0	446.5
0		3.3	445.2
10S		1.2	448.3
20S		1.6	447.9
30S		2.8	446.7
40S		2.6	446.9
50S		2.6	446.9
60S		3.0	446.5
70S		3.9	445.6
80S		5.5	444.0
90S		6.5	443.0
100S		6.3	443.2
110S		6.5	443.0

FINAL X-SECTION BK #10 (cont'd) 4-6-42

	449.50		
	8+00S		
120 S		7.2	442.3
130 S		7.1	442.4
140 S		7.2	442.3
150 S		8.0	441.5
160 S		8.5	441.0
170 S		8.4	441.1
	8+07		
170 S		7.4	442.1
160 S		6.9	442.6
150 S		7.0	442.5
140 S		6.0	443.5
130 S		5.7	443.8
120 S		7.2	442.3
110 S		7.1	442.4

pl

FINAL V-SECTIONS BLK #10 4-6-97

449.50

8+07

100S	6.6	442.9
90S	6.3	443.2
84S	6.6	442.9
80S	5.0	444.5
70S	4.1	445.4
60S	3.4	446.1
50S	2.6	446.9
40S	2.2	447.3
30S	0.1	449.4
20S	+0.4	449.9
17S	+1.7	451.2
10S	+1.7	451.2
6S ok	+1.5	451.0
4S	1.1	448.4

FINAL X-SECTION B/K #10 4-6-42

449.50

8+07

0	0.5	449.0
10N	0.2	449.3
14N	+1.0	450.5
20N	0.7	448.8
24N	+2.0	451.5

Final X-Section Blk #3 April 6-1942 Rogers Cole Foster 42

	+	π	−	IS	Elev.
	11.34	572.76			563.42
		~~Sta 4+61~~			
20S				9.6	565.2
30S				9.7	565.1
40S	For Sta 4+61			9.5	565.3
50S	See F.B. #614			8.5	566.3
60S		Page 64		5.5	569.8
65S				3.7	571.1
70S				1.9	572.9
71S				2.0	572.8
		~~Sta 4+55~~			
0	For STA 4+55			8.0	566.8
10S	See FB #614			7.6	567.2
11S		Page 66		8.0	566.8
13S				5.8	569.0
20S				6.0	568.8

FINAL X-SECTIONS BLK #3 4-6-47

	+	T	−	IS	Elev.		
		574.76					
		~~Sta 4+55~~					
30 S				5.0	569.8		
40 S				5.8	569.0		
45 S				5.4	569.4		
50 S				6.3	568.5		
		~~Sta 4+51~~					
10 N				3.2	571.6	584.57	
0				5.2	569.6	12.33	
6 S				5.0	569.8	596.90	
10 S				6.0	568.8		
20 S				5.1	569.7		
30 S				5.1	569.7		
40 S				5.7	569.1		
45 S				1.3	573.5		
T.P.	12.33	586.90	0.19		574.57		

FOR STA 4+55
SEE F.B. #614
Page 66

FOR STA 4+51
SEE F.B. #614
Pages 53+65

58690
~~596.90~~ ~~4+51~~
Sta ~~5+51~~

FOR STA 4+51
See F.B # 614
Pages 53 + 65

48 S	10.2	576.7
50 S	8.5	578.4
54 S	7.4	579.5
60 S	6.0	580.9
70 S	1.8	585.1
74 S	1.2	585.7

~~4+41~~
Sta. ~~5+41~~

See F.B # 625
Page 32

~~54 S~~	0.9	~~586.0~~
~~50 S~~	2.2	~~584.7~~
~~44 S~~	3.5	~~583.4~~
~~43 S~~	5.2	~~581.7~~
40 S	5.8	581.1
30 S	9.5	577.4
20 S	9.4	577.5

pM

FINAL X-SECTIONS, Blk #3 4-6-42

Rogers
Cole
Foster

586.90
~~586.90~~
4+41
Sta ~~5+41~~

10 S	8.8	578.1
5 S	6.9	580.0
0	7.9	579.0
2 N	8.7	578.2
3 N	9.8	577.1
10 N	8.8	578.1
10 N	5.1	581.8
15 N	2.9	584.0
18 N	0.5	586.4

Sta 4+36

0	4.6	582.3
5 N	9.0	577.9
10 N	7.2	579.7
11 N	5.0	581.9

PL

FINAL X SECTIONS Blk #3 Apr. 6-1942 Rogers Cole Foster 46

586.90
~~596.90~~

Sta 9+36

15N		1.1	585.8
18N	+	0.8	587.7
8S		4.0	582.9
10S		1.7	585.2
20S		4.1	582.8
30S		5.2	581.7
40S		3.0	583.9
T.B.M.	12.45		574.45

= 574.46 Marked Rock

FINAL X-SECTIONS Blk #4 Apr. 11-1962

T.B.M.	899	551.85		542.86
		5+06		
10 N			11.6	540.2
0			11.3	540.5
10 S			11.4	540.4
20 S			11.6	540.2
30 S			11.8	540.0
40 S			11.0	540.8
50 S			9.7	542.1
60 S			10.2	541.6
61 S			7.7	544.1
	Sta 5+05			
0			11.1	540.7
10 S			10.5	541.3
11 S			7.7	544.1
13 S			6.9	544.9

FINAL X-SECTION BLK # 4 Apr 11 - 1942 Rogers Cole Foster 48

551.85

5 to 5+05

20S	7.6	544.2
30S	8.0	543.8
36S	10.7	541.1
40S	9.6	542.2

5+01

12N	7.6	544.3
10N	7.6	544.3
0	9.7	542.1
3S	7.1	544.8
10S	7.1	544.7
12S	6.5	545.4
20S	6.6	545.3
30S	7.3	544.6
35S	9.0	542.9

FINAL X-SECTION Blk #4 4-11-1942

551.85

Sta 5+01

40 S	8.8	543.1
45 S	5.7	546.2
50 S	6.6	545.3
58 S	6.1	545.8
60 S	3.9	548.0
66 S	3.2	548.7
70 S	1.0	550.9
80 S	0.6	551.3

Sta 4+91

13 N	2.2	549.7
10 N	2.9	549.0
0	4.2	547.7
10 S	4.9	547.0
20 S	3.7	548.2

pl

FINAL X-SECTION Bk #4 4-11-1942

		551.85			
	Sta 4+86				
13N				1.6	550.3
10N				2.2	549.7
0				3.7	548.2
T.P.	4.67	556.03	0.49		551.36
	Sta 4+97				
70S				4.2	551.8
65S				3.2	552.8
60S				4.9	551.1
53S				3.9	552.1
50S				4.8	551.2
45S				5.0	551.0
40S				5.5	550.5
	Sta 4+91				
70S				2.7	553.3

pl

FINAL X SECTIONS Blk # 0 April 4 - 1942

556.03

Sta 4+91

61S				2.6	553.4	
60S				3.2	552.8	
50S				3.9	552.1	
40S				3.9	552.1	
36S				5.6	550.4	
32S				4.7	551.3	
30S				7.0	549.0	

Sta 4+86

10S				8.2	547.8	
20S				7.9	548.1	
24S				5.9	550.1	
30S				2.7	553.3	
I.R	2.06	556.10	1.99		554.04	
I.R	2.15	545.20	13.05		543.05	
TBM			2.34		542.86	= 542.86

FINAL X-SECTIONS 6+31 - 7+80^{5} April 14-1942

	8.78	484.01		475.23
		6+31		
60N			0.8	483.2
58N			1.2	482.8
		6+41		
60N			1.9	482.1
55N			3.3	480.7
50N			7.9	476.1
45N			12.6	471.4
		6+51		
60N			3.8	480.2
66N			4.3	479.7
54N			7.3	476.7
50N			12.2	471.8
		6+61		
60N			10.4	473.6

pl

FINAL X-SECTION 6+31 – 7+80.5 (cont'd) 4-14-42

		484.01			
		6+61			
55 N				10.3	473.7
50 N				11.9	472.1
TP	1.78	473.80	11.99		472.02
		6+51			
40 N				8.0	465.4 ~~475.6~~
		6+61			
40 N				7.6	466.2 ~~476.4~~
		6+67.5			
60 N				4.4	469.4 ~~479.6~~
50 N				5.7	468.1 ~~478.3~~
		6+77.5			
60 N				10.8	463.0 ~~473.2~~
50 N				10.6	463.2 ~~473.4~~

pl

FINAL X-SECTION 6+31-7+80.5 (cont'd) 4-14-42

Rogers
Pobst
Cole
Roberts

	473.80	
	7+24	
50N	8.7	465.1
46N	8.5	465.3
40N	13.5	460.3
	7+34	
50N	6.4	467.4
45N	6.3	467.5
42N	9.1	464.7 ~~474.9~~
	7+44	
50N	4.7	469.1
43N	8.1	465.7
	7+54	
60N	2.5	471.3
51N	2.4	471.4
50N	3.8	470.0

Rogers
Polat
Cole
Roberts

FINAL X-SECTION 6+31 - 7+80.5 (cont'd) 4-14-92

	47380			
	7+54			
45 N			7.0	466.8
43 N			9.6	464.2
	7+60.5			
60 N			5.7	468.1
54 N			4.0	469.8
50 N			6.9	465.9
	7+70.5			
60 N			6.9	466.9
54 N			6.3	467.5
50 N			12.0	461.8
	7+80.5			
50 N			8.2	465.6
48 N			8.1	465.7
		12.48		461.32

Rogers
Polak
Cole
Roberts

FINAL X-SECTION 6+31 – 7+80 ℄ 4-14-42

	0.81	462.13		461.32
		6+41		
31 N			10.7	451.4
40 N			3.4	458.7
43 N			0.0	462.1
		6+31		
35 N			8.6	453.5
40 N			4.8	457.3
44 N			3.0	459.1
		6+51		
32 N			8.3	453.8
31 N			12.7	449.4
30 N			14.8	447.3
		6+61		
27 N			15.9	446.2
~~40 N~~ 39 N			6.6	455.5

9.7

ply

Rogers
Polak
Cole
Robgs
Foster

FINAL X-SECTION 6+31 - 7+80.5 (Km 14) 4-14-42

46213

6+67.5

26N ~~25N~~	14.7	447.4
30N	13.3	448.8
40N	4.7	457.4

6+77.5

40N	6.6	455.5
37N	8.1	454.0
36N	12.3	449.8
~~30N~~	~~16.1~~	~~446.0~~

6+87.5

~~30N~~	~~12.3~~	~~449.8~~
~~35N~~	~~16.4~~	~~445.7~~
36N	9.2	452.9
40N	8.0	454.1
45N	6.5	455.6
46N	4.3	457.8

See book 625, pgs. 10-12

pl

FINAL X-SECTION 6+31 - 7+80.5 (cont'd) 4-14-47

	46213	
	6+87.5	
50N	3.9	458.2
55N	3.6	458.5
56N	0.5	461.6
60N	0.5	461.6
	6+92.5	
50N	6.7	455.4
40N	8.6	453.5
37N	9.0	453.1
36N	16.0	446.1
	6+97.5	
42N	18.4	443.7
45N	10.6	451.5
50N	9.1	453.0
55N	5.4	456.7
60N	+0.6	462.7
70N	+0.6	462.7

44

13.2
4.4
7.8
1.0

7.3
5.6
2.5

ok

Rogers
Potak
Cole
Roberts
Foster

FINAL X-SECTION 6+31 - 7+80.5 (cont'd) 4-14-42

46213

7+07.5

70N	0.3	461.8
60N	3.9	458.2
50N	9.4	452.7
44N	12.9	449.2
43N	19.0	443.1

7+14

40N	8.8	453.3
39N	8.8	453.3
50N	6.2	455.9
60N	1.3	460.8
63N	+1.2	463.3
70N	+1.7	463.8

7+24

32N	12.0	450.1
34N	5.8	456.3

38
5
43

78
11.2
79.0

pd

Rogers
Polak
Cole
Roberts
Foster

FINAL X-SECTION 6+31-7+80.5 (Cont'd) 4-14-42

	462.13		
	7+34		
40N		2.7	459.4
30N		11.1	451.1
29N		13.5	448.6
	7+44		
30N		14.8	447.3
38N		7.7	454.4
	7+54		
28N		13.5	448.6
40N		6.3	455.8
	7+60.5		
32N		10.7	451.9
40N		3.7	458.8
	7+70.5	~~11.9~~	
30N		11.9	450.2

Rogers
Polak
Cole
Roberts
Foster

61

FINAL V-SECTION 6+31 - 7+80$^{\underline{S}}$ 4-14-42

		462.13				
		7+70.5				
40N				6.0	456.1✓	
		7+80$^{\underline{S}}$				
30N				11.7	450.4✓	
40N				7.3	454.8✓	
44N				4.7	457.4✓	
TBM.			6.74		455.37	= 455.40 Marked Rock
TBM.	1.98	477.21			475.23	
		6+31				
1775				2.1	475.1✓	
1805				1.4	475.8✓	
~~1905~~				~~4.1~~	~~473.1~~	
1905				+0.9	478.1✓	
1945				+2.4	479.6✓	
2005				+8.2	485.4✓	
2105				+6.6	483.8✓	

FINAL X-SECTION April 14-1940

	477.21		
	6+41		
1615		12.5	464.7✓
1705		7.7	469.5✓
1765		2.6	474.6✓
1805		2.7	474.5✓
1905		2.8	474.4✓
1995		2.1	475.1✓
2015		+1.6	478.8✓
2105		+2.3	479.5✓
	6+51		
1705		13.5	463.7✓
1805		4.9	472.3✓
1905		3.4	473.8✓
	6+61		
1715		12.4	464.8✓
1805		5.7	471.5✓
1905		3.9	473.3✓

FINAL X-SECTION 6+31-7+80S 4-14-47

Rogers
Polk
Cole
Roberts
Foster

63

477.21

6+67.5

180S			8.6	468.6
190S			10.8	466.4
196.5			10.0	467.2
197.5			4.8	472.4
200S			4.8	472.4
T.P.	1.19	466.41	11.99	465.22

6+77.5

~~168S~~			7.8	~~458.6~~ 469.2
170S			6.2	460.2 471.0
~~172.5~~			~~+1.3~~	~~467.7~~ ~~478.5~~
164.5			16.1	450.3 ~~461.1~~
170S			12.6	453.8 ~~464.6~~ 53.8
172.5			12.6	453.8 ~~464.6~~
177.5			5.5	460.9 ~~471.7~~
180S			5.3	461.1 ~~471.9~~ 61.1
190S			4.6	461.8 ~~472.6~~

VOID

PL

FINAL X-SECTION 6+31-4+80E 4-14-41

466.41

6+87.5

170S	14.7	452.7✓
175S	5.8	460.6✓
180S	5.6	460.8✓
190S	5.0	461.4✓

6+97.5

170S	10.4	456.0✓
175S	7.0	459.4✓
180S	6.0	460.4✓
190S	5.7	460.7✓

7+07.5

162S	13.2	453.2✓
170S	11.7	454.7✓
171S	9.0	457.4✓
180S	7.3	459.1✓
190S	6.6	459.8✓

✓

FINAL X-SECTION 6+31-7+80 S 4-14-92

Rogers
Polak
Cole
Roberts
Fosta

	466.41		
	7+14		
166 S		13.3	453.1
170 S		11.0	455.4
180 S		10.4	456.0
190 S		7.3	459.1
	7+24		
173 S		10.3	456.1
180 S		9.9	456.5
190 S		8.6	457.8
	7+34		
175.5		10.7	455.7
180 S		11.4	455.0
190 S		9.6	456.8
	7+44		
170 S		14.1	452.3
180 S		13.4	453.0
190 S		10.3	456.1

FINAL Y-SECTION 6+31 - 7+80.5 4-14-42

	466.41		
170S	7+54	13.7	452.7
180S		12.6	453.8
190S		11.1	455.3
	7+60.5		
170S		12.5	453.9
180S		11.8	454.6
190S		10.2	456.2
	7+70.5		
170S		12.1	454.3
180S		11.4	455.0
190S		10.3	456.1
	7+80.5		
178S		17.4	449.0
180S		15.0	451.4
185S		10.0	456.4
190S		10.2	456.2

Rogers
Polak
Cole
Foster

FINAL V.- SECTION 7+90.5 - 8+73.5 4-14-47

46641

7+90.5

187.5	10.4	456.0
190.5	10.2	456.2

8+00.5

186.5	10.3	456.1
190.5	9.8	456.6

8+07

185.5	10.5	455.9
190.5	9.3	457.1

8+17

180.5	10.5	455.9
190.5	8.1	458.3

8+27

168.5	12.5	453.9
170.5	11.9	454.5
180.5	8.5	457.9
190.5	5.4	461.0

FINAL X-SECTION 7+90.5 – 8+235

		466.41			
		8+37			
165S				11.5	454.9
170S				10.0	456.4
180S				6.7	459.7
190S				2.1	464.3
		8+47			
160S				11.3	455.1
170S				8.3	458.1
180S				5.4	461.0
183S				2.9	463.5
190S				2.9	463.5
		~~8+57~~			
~~158S~~				~~8.6~~	
	11.95	477.33	1.03		465.38

FINAL X-SECTION 7+905 - 8+735 April 10-1942

	477.33		
	8+47		
		13.8	463.5
200 S		6.4	470.9
210 S		5.6	471.7
160 S	8+53.5	20.5	456.8
170 S		16.8	460.5
180 S		13.4	463.9
190 S		10.7	466.6
193 S		7.2	470.1
200 S		5.8	471.5
	~~8+63.5~~		
172 S		12.9	464.4
180 S		11.3	466.0
185 S		6.7	470.6
190 S		5.8	471.5
~~200 S~~		~~9.3~~	~~473.0~~

Roger Polk
Cola Foster

FINAL X-SECTION 7+90.5 - 8+73.5 April 14-1942

427.33

8+73.5

~~1905 9.1 460.2~~

~~1805 7.2 434.1~~

~~1905 3.1 47[illegible]~~

See Bk. 651 pg. 56

TBM. 210 475.23 = 475.23 Marked Rock

FINAL X-SECTIONS BK#9

	682	451.41		444.59
		7+54		
23 N			9.8	441.6
20 N			9.9	441.5
10 N			10.4	441.0
0			9.5	441.9
10 S			9.2	442.2
20 S			9.9	441.5
24 S			9.2	442.2
30 S			8.8	442.6
35 S			8.1	443.3
40 S			8.3	443.1
50 S			8.3	443.1
57			7.7	443.7
60			7.0	444.4
70			7.4	444.0

pl

FINAL X-SECTION: BK #9

451.41

7+54

80 S	9.1	442.3
88 S	10.2	441.2
90 S	8.3	443.1
100 S	7.3	444.1
110 S	7.2	444.2
116 S	6.5	444.9
120 S	7.1	444.3
125 S	7.4	444.0
130 S	6.1	445.3
138 S	7.2	444.2
140 S	6.3	445.1
146 S	5.4	46.0
147 S	6.3	445.1
150 S	6.3	445.1

FINAL X-SECTIONS BLK #9

	451.41		
160 S	~~7+54~~	3.2	448.2
33 N	~~7+44~~	10.0	441.4
20 N		10.3	441.1
12 N		10.1	441.3
10 N		8.8	442.6
0		8.4	443.0
2 S		7.5	443.9
10 S		9.0	442.4
20 S		10.3	441.1
25 S		9.5	441.9
30 S		7.7	443.7
40 S		7.1	444.3
50 S		7.0	444.4
60 S		7.8	443.6
70 S		7.7	443.7
80 S		9.1	442.3

FINAL X-SECTIONS Blk #9

	451.41		
	7+44		
83S		9.0	442.4
90S		7.6	443.8
100S		7.5	443.9
110S		7.2	444.2
120S		7.0	444.4
130S		6.7	444.7
140S		6.9	444.5
144S		6.8	444.6
150		5.1	446.3
	7+34		
23N		9.9	441.5
20N		10.3	441.1
10N		9.6	441.8
0		9.1	442.3

451.41

7+34

10S	8.5	442.9
20S	9.2	442.2
30S	8.4	443.0
37S	7.2	444.2
40S	8.5	442.9
44S	9.4	442.6
50S	9.6	441.8
55S	8.0	443.4
60S	7.9	443.5
66S	8.9	442.5

7+39

70S	8.4	443.0
80S	8.8	442.6
90S	7.8	443.6

FINAL X-SECTION BK #9 April 23-1942

	451.41	
	7+34	
70S	10.4	441.0
80S	9.8	441.6
90S	7.7	443.7
	7+32	
70S	8.5	442.9
80S	7.2	444.2
90S	6.7	444.7
	7+34	
100S	8.4	443.0
106S	8.4	443.0
107S	7.4	444.0
110S	7.6	443.8
120S	7.8	443.6
130S	6.3	445.1
140S	5.5	445.9

FINAL X-SECTION Blk #9 April 23-1942 77

	451.41		
	7+34		
149 S		6.4	445.0
150 S		9.5	446.9
	7+24		
23 N		10.2	441.2
20 N		10.7	440.7
10 N		10.8	440.6
1 N		9.2	442.2
0		10.2	441.2
10 S		9.7	441.7
20 S		9.7	441.7
21 S		8.5	442.9
30 S		9.0	442.4
35 S		8.8	442.6
36 S		9.5	441.9
40		9.4	442.0

	451.41		
	7+24		
50 S		9.2	442.2
60 S		9.1	442.3
61 S		7.1	444.3
70 S		7.1	444.3
80 S		7.5	443.9
87 S		6.1	445.3
90 S		6.1	445.3
97 S		7.6	443.8
100 S		7.2	444.2
110 S		6.3	445.1
113 S		7.5	443.9
120 S		8.4	443.0
130 S		7.5	443.9
140 S		6.6	444.8
145 S		6.8	444.6

FINAL X-SECTION Blk #9

Page 78

		451.41			
		7+24			
150 S				5.9	445.5
TP			682		444.59
April 24-1942					
	997	454.56			44459
		7+24			
25 N				12.5	442.1
28 N				7.5	447.1
30 N				5.9	448.7
		7+34			
25 N				11.8	442.7
		7+44			
25 N				12.8	441.7
		7+54			
25 N				12.8	441.7
		7+24			
159 S				7.8	446.8
159 S				5.4	449.2

April 26 79

	454.56		
160 S	7+24	5.5	449.1
164 S		4.8	449.8
	7+30		
160 S		5.8	448.8
170 S		1.2	453.3
	7+34		
160 S		6.2	448.4
	7+24		
170 S		~~0.0~~	
	7+90		
160 S		12.1	
170 S		12.0	
	8+00		
160 S		12.4	
170 S		12.5	
	8+07		
160 S		12.1	
170 S		11.6	

Copied to F.B. #65 Page 12-13

4-24-42

FINAL X-SECTION BK #9

454.56

7+80 5/

1605 11.8

1705 11.9

BM. #7 444.59

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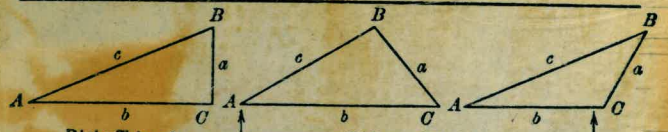
TRIGONOMETRIC FORMULÆ



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

466.41
24
458.6

REDUCTION TO HORIZONTAL

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

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

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

MADE IN U. S. A.