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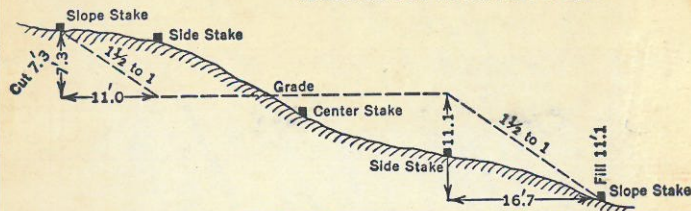
AUGER SAMPLES

K & E
LEVEL BOOK
W 373 A

LEON
WAKULLA

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING Roadway of any Width. Side Slopes $1\frac{1}{2}$ 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

Please Return
to
Florida Geological
Survey

Box 631, Tallahassee,
Fla.

George Wadd's book

The paper in this book No. 373 A
is made of 50% high grade rag stock
with a WATER RESISTING surface sizing.

	<u>B.S.</u>	<u>H.I.</u>	<u>F.S.</u>	<u>Elev.</u>
AT-15				81.75
	8.51	90.26	2.90	87.36
1	8.96	96.32	0.98	95.34
TBM-X in CONC. Culvert 100' E. of Gully Sta. on S. side of rd.	7.69	103.03	2.90	100.13
			1.34	101.69
	5.50	107.19	5.79	101.40
	2.28	103.68	8.65	95.03
	2.72	97.75	2.97	94.78
	2.09	96.87	14.49	82.38
2	0.27	82.65	14.35	68.30
TBM-CH 15. X M END CONC. ABMT.	0.93	69.23	5.10	64.13
S. SIDE RD.	0.63	64.76	4.39	60.37
	7.42	67.79	1.12	66.67
	9.40	76.07	0.32	75.75
TBM-3 - Can lid nailed in E. of rd. at CRSE N. of stm. bed	8.73	84.48	2.85	81.63
	2.51	84.14	11.55	72.59
	0.22	72.81	10.64	62.17
	2.70	64.87	1.03	63.84
	10.59	74.43	0.38	74.05

B.S.H.I.F.S.Elev.

12.94

~~4.094~~

86.99

0.20

~~12.79~~

86.79

12.44

99.23

6.00

93.23

6.08

99.31

5.83

93.48

7.20

100.00

1.00

99.68

6.71

106.39

7.04

99.35

0.77

100.12

11.65

88.47

2.04

100.51

9.58

98.93

B.S.H.I.F.S.Elev.

AT-15

81.75

8.87

90.62

0.64

89.98

TBM-1 - X chiseled
in conc. culvert 100' E
of Gulf Sta. on S. side of rd.

0.23

100.21

0.22

99.99

6.04

106.03

2.8³103.2⁰

0.63

103.83

8.75

95.08

0.97

96.05

4.79

91.26

9.14

100.40

11.81

88.59

0.75

89.34

13.83

75.51

TBM-2 - X chiseled
N. end conc. abut.
W. side of rd.

1.02

76.53

12.09

64.44

0.46

64.90

1.96

62.94

9.73

72.67

1.50

71.17

TBM-3 - R.R. spike
E of rd. top of rise
1/4 mi. N. of bridge

11.34

82.51

0.75

81.76

0.68

82.44

11.15

71.29

0.87

72.16

11.03

61.13

4.07

65.20

0.64

64.56

10.64

75.20

0.60

74.60

13.79

88.39

0.86

87.53

11.01

98.54

0.12

98.42

4.20

102.62

7.31

95.31

TBM-2

75.31

	7.95	103.26	0.63	102.63
TBM-1	4.06	106.69	6.54	100.15
	0.26	100.41	9.97	90.44
	1.39	91.83	9.91	81.92

AT-15

TBM - Top of Conc. Cross,
N side woods rd, marked
Tollesboro 5 m.

TBM - RR spike in
base of 5" glazed
out. E side of rd.

B.S.	H.I.	I.S.	Elev.
			81.75
10.75	92.50	0.35	92.15
1.90	94.05	10.55	83.50
0.18	83.68	8.31	75.37
0.80	76.17	7.81	68.36
0.10	68.46	9.23	59.23
3.51	62.74	0.04	62.70
9.32	72.02	0.12	71.90
10.44	82.34	0.93	81.41
12.91	94.32	0.35	93.97
9.37	103.34	0.07	103.27
7.53	110.80	4.40	106.40
		3.05	107.75
2.22	109.97	0.94	109.03
14.42	123.45	0.45	123.00
13.04	136.04	1.61	134.43
4.59	139.02	1.71	137.31
7.25	144.56	1.42	143.14
11.05	154.19	1.06	153.13

TBM - RR spike in base
of 12" oak at pt. of rd.
intersection on top of rise.

5.12 158.25 3.59 154.66

5.61 152.64

0.18 152.82 12.50 140.32

0.59 140.91 12.64 128.27

0.34 128.61 11.85 116.76

0.88 117.64 5.62 112.02

3.91 115.93 13.92 102.01

0.29 102.30 9.80 92.50

0.14 92.64 12.33 80.31

0.40 80.71 14.58 66.13

0.19 66.32 12.69 53.63

0.30 53.93 10.88 43.05

12.07 55.12 0.24 54.88

12.50 67.38 0.07 67.31

13.07 80.38 0.48 79.90

10.62 90.52 0.56 89.96

9.32 99.28 0.44 98.84

4.81 103.65 1.90 101.75

TBM - RR spike in base
of 5" blazed oak on E. side
of rd. near 1st rise
S. of Enon Church.

153.13

3.24 104.99 4.17 100.82

4.03 104.85 7.00 97.85

1.35 99.²⁰~~50~~ 8.85 90.35

0.84 91.19 7.97 83.22

1.83 85.05 4.64 80.41

6.99 87.40 3.90 83.50

2.11 85.61 5.76 79.85

5.16 85.01 4.24 80.77

4.58 85.35 4.53 80.82

0.74 81.56 10.07 71.49

0.33 71.82 10.97 60.85

7.70 68.55 4.16 64.39

6.09 70.48 6.68 63.80

14.87 78.67 1.36 77.31

2.16 79.47 5.28 74.19

2.96 77.15 2.45 74.70

5.78 80.48 5.88 74.60

6.30 80.90 1.01 79.89

5.69 85.58 2.49 83.09

101.75

RR spike in base of 12" oak
on W. side of rd. 1/4 mi.
S. of rd. intersection S. of
Enon Church.
rd. Y ^{at} pine grove

83.09

6.59 89.68 5.96 83.72

81.76

4.99 88.71 1.18 87.53

AS-2

2.73

84.49 4.88

79.61

8.16 95.69 0.82 94.87

RR spike in base of
6" oak on W. side of rd.
N.E. of rifle range, S. of
house farm

7.90 102.77 3.77 99.00

99.99

4.95 103.95 2.44 101.51

AS-3

6.25

106.24 2.67

103.57

7.96 109.47 0.97 108.50

11.42 119.92 1.20 118.72

154.66

RR spike in base of 6"
oak on E. side of rd.
1/4 mi S. of firing
range on top of N.S.
ridge.

10.07 128.79 3.98 124.81

AS-4

4.42

159.08 4.50

154.58

4.30 129.11 4.87 124.24

1.07 125.31 5.89 119.42

124.81

2.77 122.19 6.00 116.19

AS-5

5.38

130.19 4.47

125.72

2.40 118.59 4.63 113.96

7.84 121.80 1.29 120.51

97.23

0.86 121.37 13.50 107.87

AS-6

4.72

101.95 3.45

98.50

RR spike in W.L.
pos. on FS, rd. 301
in depression below
Lake's Silver & more

0.12 107.99 11.93 96.06

14.76 110.82 0.70 110.12

12.51 122.63 1.26 121.37

0.76 122.13 10.00 112.13

4.33 116.46 3.25 113.21

USGS. TBM

113.9

Elev. 113.55

GS H.I. FS Elev									
TT-B-12				92.05					106.56
	3.07	95.12	6.70	88.42	Older Camp Tower	6.41	112.97	3.13	109.84
	5.25	93.67	1.09	92.58					
	4.14	96.72	2.11	94.61	Older Camp Tower				109.82
	6.09	100.70	4.50	96.20		2.47	112.29	5.61	106.68
	2.81	99.01	4.72	94.29		5.10	5.10	111.78	6.12 105.66
	4.71	99.00	5.39	93.61	R.R. spike in stump of telephone pole on W. side Rd. 344, .2 mi. N of Older Tower	5.17	110.83	3.45	107.38
R.R. spike in base of 16" burnt pine at rd. intersection of forest rds 344 & 307	3.37	96.98	4.42	92.56				3.28	107.55
	2.20	94.76	5.99	88.77		3.35	110.90	6.44	104.46
	4.88	93.65	4.11	89.54		3.54	108.00	3.79	104.21
	4.97	94.51	1.92	92.59		2.99	107.20	4.32	102.88
	5.98	98.57	4.55	94.02		3.28	106.16	4.27	101.89
R.R. spike in stump of telephone pole on E side of Rd. 344, 200' S. of bridge approx .6 mi. S of Older Tower	5.20	99.22	5.29	93.93	R.R. spike Bolt in bridge 19 S.W. corner on Rd 344. 13 th bridge S. of 305	5.59	107.48	3.26	104.22
			2.50	96.72		3.18	107.40	3.58	103.82
	4.31	101.03	3.37	97.66	TT-8-B	3.25	107.07	2.39	104.68
	6.06	103.72	2.69	101.03					
R.R. spike in stump of telephone pole on E side of Rd. 344. .3 mi S. of Older Tower opp. 16" pine	5.06	106.09	3.04	103.05					
	5.13	108.18	2.91	105.27					
	5.69	110.96	2.74	108.22					
	3.17	111.39	4.83	106.56					

98.84

4.89 103.73 1.96 101.77

3.26 105.03 11.68 93.35

3.15 96.50 2.06 94.44

11.02 105.46 1.62 103.84

AS-7 5.88 109.72 4.06 105.66

103.84

1.56 105.40 10.97 94.43

2.11 96.54 3.18 93.36

11.66 105.02 3.26 101.76

1.84 103.60 4.73 98.87

TT-10 92.44

6.10 98.54 2.66 95.88

9.42 105.30 1.53 103.77

~~9.97~~ 110.74 1.20 109.54

14.12 123.66 0.28 123.38

7.08 130.46 2.80 127.66

AS-8 3.20 130.86 5.11 125.75

			127.66					103.81
1.72	129.38	9.76	119.62		4.12	107.93	3.82	104.11
0.11	119.73	13.53	106.20		4.70	108.81	4.74	104.07
2.73	108.93	6.43	102.50		4.73	108.80	4.74	104.06
0.09	102.59	7.50	106 ⁹ .09	AS-10	4.77	108.83	4.70	104.13
2.71	107 ⁹ .80	5.45	102 ⁹ .35					104.06
			92.44		4.82	108.88	5.06	103.82
5.60	98.04	3.81	94.23		4.87	108.69	4.68	104.01
5.74	99.97	2.69	97.28		3.83	107.84	3.97	103.87
5.42	102.70	3.13	99.57					
7.41	106.98	0.83	106.15					
6.53	112.68	4.36	108. 04 ³²					116.87
2.62	110.94	7.16	103.78	AS-11	4.38	121.25	4.29	116.96
			108.32					92.56
4.36	112.68	6.47	106.21	AS-15	4.83	97.39	4.58	92.81
0.06	106.27	6.79	99.48					
3.84	103.32	6.93	96.39					93.93
3.38	99.77	5.56	94.21	AS-16	4.36	98.29	4.76	93.53
3.91	98.12	5.66	92.46					

Copper nail & washer
in 14" pipe, SW
corner of intersection
sec. 34, T-1-S, R-2-W

Correction +.27
.27
103.88

7.05	110.05	3.00	107.05
2.33	109.38	6.72	102.66
2.80	105.46	5.38	100.08
0.89	100.97	3.28	97.69
0.18	97.87	6.79	91.08
13.69	104.77	6.86	97.91
2.92	100.83	0.01	100.82
6.28	107.10	5.08	102.02
7.34	109.36	1.07	108.29
3.50	111.79	3.11	108.75
2.90	111.58	3.33	108.68
2.89	111.14	8.45	102.69
4.58	107.27	10.83	96.44
6.55	102.99	3.10	99.89
0.87	100.76	9.36	91.40
7.33	98.73	2.34	96.39
8.70	105.09	2.43	102.66
6.39	109.05	3.86	106.19
2.61	108.80	5.95	103.12
			102.85

R.R. spike in W. side
of 10" oak, 10' E of
E.N. 10' in sec. 2
S.W. corner
of secs. 2, 3,
10, 11, T-2-S;
R-2-W.

A

			108.95	
	0.31	109.26	9.84	99.42
	0.89	100.31	9.95	90.36
Sta. 3	1.67	92.03	4.72	87.31
			9.21	82.82
Sta. 4			3.04	88.99
(13)			4.58	87.45
(11)	4.58	93.57	5.01	88.56
(10)			4.32	89.25
(7)			5.97	87.60
(4)	0.88	88.48	3.94	84.54
(3)			5.10	83.38
(2)			8.32	80.16
(1)			12.18	76.30
(8)	2.78	90.38	4.19	86.19
(5)			8.01	82.37
(6)			10.54	79.84
			5.15	86.23
(9)	4.11	89.34	5.02	84.32

Plane		Table		Survey
Sta. 1 =	106.5		H.I.	9.9 108.7
Sta. #		1.3	110.0	6.1 103.9
		3.5	107.4	8.6 98.8
		3.3	102.1	8.1 94.0
		3.4	97.4	7.0 90.4
Sta. 2		3.4	93.8	5.1 9.0 88.7
Sta. 3		3.6	92.3	4.7 9 87.6
Sta. 4		3.5	91.1	8.2 3.2 82.9
" 5		3.7	86.6	4.1 8 82.5
" 6		3.5	86.0	4.1 2.2 81.9
" 7		3.3	85.2	Beaman 7.0 86.7
" 2		3.5	90.2	9.7 8 89.5
(12)			2.81	86.53
		4.60	4.60	84.74
(14)		1.17	85.91	3.96 81.95
(15)			8.66	77.25
			3.06	82.85

Sta. 3

87.3

R-107

35.10

(16)

3.7

91.0

3.8

87.2

AS-28

4.73

39.83

3.39

36.44

(17)

6.6

84.4

(18)

5.5

85.5

Wynnaman
track

105.1

3.71

108.81

7.15

101.66

(19)

3.6

89.1

5.6

83.5

Ruskin
A

(20)

5.0

84.1

40.88

(21)

5.3

83.8

AS-23

4.19

45.07

4.63

40.44

6.2

82.9

6.06

39.01

2.76

41.77

6.64

35.13

82.8

AS-22

4.40

39.53

7.33

32.20

(22)

3.1

86.2

5.2

81.0

7.73

31.80

AS-12

5.2

81.0

1.12

32.92

7.82

25.10

(23)

7.7

78.5

1.10

26.20

5.20

21.00

(24)

5.4

80.8

AS-21

2.90

23.90

7.77

16.13

7.65

23.78

2.73

21.05

5.35

26.40

1.95

24.45

8.44

32.89

0.46

32.43

7.60

40.03

3.46

36.57

7.04

43.61

2.50

41.11

Bm
u-39

12.57

10.0

4.65 17.22 5.84 12.38

4.95 14.95 3.36 11.59 AS-33

3.87 16.25 3.92 12.33

8.03 19.62 5.90 13.72

3.96 12.29

AS-18 5.30 19.02 3.63 15.39

6.14 18.43 4.83 13.60

~~5.85~~ ~~19~~ 5.30 13.72

10.84 24.44 3.90 20.59

6.00 19.72 8.47 ~~11.55~~

5.50 26.04 1.93 24.11

3.64 ^{15.19}
~~4.39~~ 5.11 ~~11.28~~

6.26 30.37 2.05 28.32

10.08

35.00

AS-29 4.64 39.64 5.22 34.42

16.00

7.92 31.72

7.09 23.09 0.11 22.98

3.43 35.15 4.62 30.53

6.72 29.70 4.53 25.17

AS-30 2.80 33.33 3.84 29.49

5.73 30.90 4.68 26.22

5.48 27.85

4.80 31.02 4.95 26.07

4.08 31.93 6.25 25.68 AS-36

6.84 32.91 3.45 29.46

AS-31 4.09 29.77 3.84 25.93

6.54 26.37

11.33 18.44

4.33 30.70 4.78 25.92

AS-32 1.70 20.14 4.62 15.52

3.23 29.15 7.36 21.79

AS-34 7.57 12.57

2.39 24.18 8.17 16.01

24.00

RR Xing

35.00

7.80 31.80 1.85 29.95

RR

4.24 39.24 3.74 35.50

AS-35

7.93 37.88 1.24 36.64

AS-44

4.15 39.65 5.13 34.52

5.73 42.37 4.27 38.10

5.01 34.64

5.05 43.15 4.56 38.59

AS-45

4.32 38.96 5.06 33.90

5.85 44.44 6.13 38.31

7.79 31.17

AS-38

3.64 41.95 4.30 37.65

2.65 33.82 11.58 22.24

5.58 36.57

AS-46

3.21 25.45 4.77 20.68

1.39 37.76 6.88 30.88

✓ pt.

4.45 21.00

2.27 33.15 8.08 25.07

6.53 18.92

1.72 26.79 7.97 18.82

3.97 22.89 4.97 17.92

AS-39

1.90 20.72 5.37 15.35

AS-47

2.72 20.64 4.63 16.01

6.22 14.50

2.78 17.86

✓ pt.

5.39 23.25 2.20 21.05

L-92				21.48		AS-43-42-41			
AS-52	7.85	29.33	2.90	26.43					32.00
K-92				19.53	AS-41	4.23	36.23	4.40	31.83
	3.85	23.38	5.44	17.94				7.47	28.76
AS-51	4.22	22.16	4.71	17.45	AS-42	2.50	31.26	6.60	24.66
			4.89	17.27		3.21	27.87	7.58	20.29
	5.38	22.65	4.63	18.02	AS-43	4.94	25.23	4.05	21.18
AS-50	5.97	23.99	4.73	19.26	✓pt.			0.21	25.02
			1.02	22.97					
	10.54	33.51	0.60	32.91					
	9.47	42.38	1.10	41.28	Bm 44				35.97
	3.46	44.74	5.74	39.00	SRW				
					AS-53	3.76	39.73	4.47	35.26
AS-48	4.17	43.17	5.99	37.18				8.16	31.57
			5.13	38.04		1.09	32.66	7.93	24.73
	5.82	43.86	4.40	39.46		2.72	27.45	8.17	19.28
✓pt.	4.96	44.42	3.65	40.77	AS-54	3.27	22.55	4.96	17.59
AS-49			5.21	39.21				6.03	16.52
						4.61	21.13	4.50	16.63
						4.90	21.53	4.51	17.02

			17.02	B.M. - 800'				65.67	
	4.04	21.06	5.06	16.00	E. of Wages Pond in 12" data AS-111	11.66	77.33	4.16	73.17
AS-523			4.50	16.56					
			16.00	B.M. 1111 26 WSM84					84.71
	4.69	20.69	1.32	19.37	AS-115	0.52	85.23	9.30	75.93
AS-546	7.20	26.57	4.30	22.27					
			5.84	20.73					
	2.27	23.00	6.38	16.62	B.M. TT22-C				144.59
✓ pt.	2.43	19.05	5.30	13.75	AS-113	2.72	147.31	6.66	140.65
				spot elev. at rd. intersection					191.00
						3.87	194.87	2.58	192.29
						6.50	198.79	4.57	194.22
						5.21	199.43	2.14	197.29
						4.82	202.11	4.21	197.90
						8.27	206.17	1.79	204.38
				AS-116		6.71	211.09	5.08	206.01
						5.14	211.25	8.23	203.02
						3.51	206.53	8.43	198.10
						3.60	201.70	4.15	197.55

197.55

✓ 194 199.49 4.67 194.82

4.59 199.41 6.41 193.00

2.51 195.51 4.20 191.31

$$\begin{array}{r}
 8679 \\
 1242 \\
 \hline
 99236413 \quad 103.03 \\
 \quad \quad \quad 2.90 \\
 \hline
 6384100.13 \\
 \hline
 29 \quad 103.03
 \end{array}$$

$$\begin{array}{r}
 103.68 \quad 9775 \quad 6830 \\
 \quad \quad \quad 93 \\
 \hline
 64.76 \quad 6476 \quad 6923 \\
 \hline
 38.923299 \\
 \hline
 6923 \\
 510 \\
 \hline
 64.13
 \end{array}$$

$$\begin{array}{r}
 7405 \\
 12947 \quad 759 \\
 \hline
 8699 \\
 020 \\
 \hline
 86.79
 \end{array}$$

853

3.6

889

4.9

840

889

6.9

820

8414

1155

7259

8414

889

1.9

870

7281

1064

6217

7281

6384

1059

7443

81.8

3.3

85.1

8

1270

3.38

42

40.9

85.1

1.2

83.9

8.2

35

65.7

5.1

60.1

5.6

434

3.8

66

366

81.8

85.33

42.1

3-33

81.8

+ 1.22

85.7

8.2

77.5

9687

1449

82.38

96.87

7

100.2

1165

9847

100.12

$$\begin{array}{r}
 9968 \\
 \underline{671} \\
 740510639 \\
 12947575 \\
 \underline{8699873} \\
 020448 \\
 \underline{8671} \\
 8635385 \\
 \underline{77} \\
 100121.63
 \end{array}$$

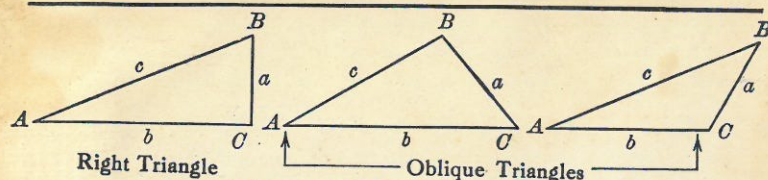
$$\begin{array}{r}
 9931 \\
 \underline{583} \\
 106399348 \\
 \underline{704} \\
 9935 \\
 \underline{10639}
 \end{array}$$

$$\begin{array}{r}
 9968 \\
 \underline{671} \\
 10639
 \end{array}$$

$$\begin{array}{r}
 9847 \\
 \underline{204} \\
 (10051) \\
 \underline{958} \\
 (9093) \\
 \underline{100.51}
 \end{array}$$

$$\begin{array}{r}
 6667 \\
 \underline{942103.03} \\
 103.7607 \quad 134 \\
 \underline{865} \\
 95.03 \quad 101.69 \\
 \underline{103681} \quad 03.03 \\
 10169 \\
 \underline{550} \\
 8265 \quad 107.19 \\
 \underline{1435} \\
 6830 \\
 \underline{8265} \quad 16719 \\
 579 \\
 \underline{16140} \\
 10719 \\
 6476 \\
 \underline{439} \\
 60.37 \\
 \underline{6477}
 \end{array}$$

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

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

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	$B = 90^\circ - A, b = a \cot A, c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90^\circ - A, a = b \tan A, c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90^\circ - A, a = c \sin A, b = c \cos A$

Solution of Oblique Triangles

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

REDUCTION TO HORIZONTAL

Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = $5^\circ 10'$. From Table, Page IX. $\cos 5^\circ 10' = .9959$. Horizontal distance = $319.4 \times .9959 = 318.09$ 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. $\cos 5^\circ 10' = .9959, 1 - .9959 = .0041. 319.4 \times .0041 = 1.31. 319.4 - 1.31 = 318.09$ 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.

