

LEVEL BOOK

#101596

 **BEN MEADOWSSM**

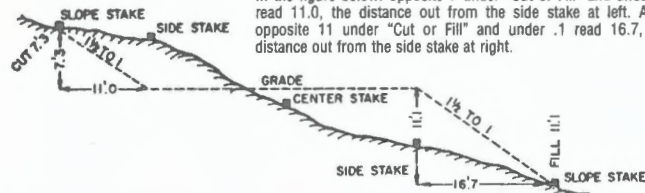
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When the
Outdoors
is Your
Office®

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.



TAZ m Annie 9272

Cut or Fill	Distance out from Side or Shoulder Stake										Cut or Fill
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
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

The paper in this book is made of 50% high grade rag stock with a WATER RESISTING surface sizing.

[illegible]

2161 N

2/16/11				
WL08	SS	30	21	25.6
		86	16	23.0
	BERM	30	21	26.5
		86	16	22.7
	BB	30	21	26.9
		86	16	22.5
WL07	SS	30	21	38.7
		86	17	17.7
	BERM	30	21	39.3
		86	17	17.7
	BB	30	21	40.0
		86	17	17.6
WL06	SS	30	21	51.6
		86	18	14.8
	BERM	30	21	52.0
		86	18	14.7
	BB	30	21	52.6
		86	18	14.4
WL05	SS	30	22	01.8
		86	19	12.5
	BERM	30	22	02.4
		86	19	12.5
	BB	30	22	03.4
		86	19	12.5

WL	04	SS	30	22	10.3
			86	20	08.5
		BERM	86	20	09.2
			30	22	11.5
		BB	30	22	12.4
			86	20	07.8

WL	03	SS	30	22	22.1
			86	21	08.5
		BERM	30	22	22.2
			86	21	08.4
		BB	30	22	23.1
			86	21	07.7

WL	02	SS	30	22	29.2
			86	22	05.6
		BERM	30	22	30.6
			86	22	05.3
		BB	30	22	31.7
			86	22	04.9

WL	01	SS	30	22	38.7
			86	23	03.2
		BERM	30	22	39.1
			86	23	03.2
		BB	30	22	39.9
			86	23	03.0

2/17/11

BY SS 46R	29	SS	52.7
SS	85	23	48.3
MB	29	55	53.1
	85	23	47.8
BB	29	55	53.4
	85	23	47.5

2/21/11

LV	11	83	01	30.6	Jungle
LV	12	No Beach			Long photo
LV	05	29	06	04.1	
		83	03	39.6	
LV	04	29	05	48.9	
		83	04	14.4	must close
LV	01	29	07	26.9	
Not marked in sand		83	05	22.1	
LV	02	29	06	07.0	
		83	04	15.9	
LV	03	29	05	45.5	
		83	03	51.9	
LV	08	29	08	09.8	
		83	02	13.4	
LV	07	29	08	20.3	
		83	02	28.5	
LV	06	No Beach			

LU	10	29	09	25.4
	22	83	00	33.5
LU	09	29	08	13.3
		83	01	45.7

2/22/11

DX	03	29	23	36.5
		83	12	08.6
DX	02	No	beach	beach
DX	01	29	26	16.2
		83	17	14.6

Taylor Co.
TYO

	03	29	49	07.0
		83	35	37.9

Foggy could not find road 2
~~104~~

TY	01	29	50	52.6
		83	37	06.7

3/01/11

Citrus County

CT	01	28	54	29.7
		82	41	28.5
HR	01	28	34	09.0
		82	39	23.4

3/02/11

PS 95 ~~28~~ ~~09~~ 49.7

08 82 50 52.1

BB 29 09 49.7

82 50 51.8

BB 28 09 50.0

82 50 50.7

PS 08 SS 28 09 29.9

82 50 36.3

BB 28 09 30.2

82 50 36.0

PS 07 SS 28 09 58.1

82 50 54.6

BB 28 09 58.1

82 50 54.5

BB 28 ~~09~~ 09 58.3

82 50 53.9

PS 06 SS 28 10 44.7

82 51 03.0

BB 28 10 44.7

82 51 02.6

PS 05 SS 28 11 43.1

82 51 05.1

BB 28 11 43.2

82 51 04.5

PS	04	28	12	41.6	
SS	02	82	51	07.4	←
BERM	BERM	28	12	41.7	
		82	51	06.7	
I	BB	28	12	41.6	
		82	51	06.3	
PS	03	28	13	30.6	
Single Point		82	50	29.6	
PS	02	28	13	40.7	
	SS	82	50	32.4	
	BB	28	13	40.6	
		82	50	31.8	
PS	01S	28	13	59.7	
		82	50	27.6	
	BB	28	13	59.6	
		82	50	27.2	
PS	09	28	14	18.3	
Single		82	45	46.3	
PS	10	28	15	12.4	
		82	45	28.3	
PS	11	28	11	56.3	
Single		82	47	06.4	

3/28/11 Escalante Co.

ES 15	SS	30	19	39.7	
		87	17	57.7	
	BERM	30	19	40.0	
		87	17	57.6	
	MB	30	19	40.5	
		87	17	57.2	
	BB	30	19	40.9	
		87	17	56.9	
ES 16	SS	30	19	12.0	
		87	17	05.9	
Mistaken reference Photo	BB	30	19	12.4	
		87	17	05.5	
ES 17	SS	30	18	59.5	
		87	16	01.4	→
Misc. label Photo	BERM	30	19	00.5	
		87	16	01.4	→
	BB	30	19	01.1	
		87	16	01.4	→
ES 18	SS	30	19	02.2	
		87	15	03.6	
	BERM	30	19	03.1	
		87	15	03.7	
	BB	30	19	03.6	0.4
		87	15	03.8	

ES19 SS ~~BB~~ 30 19 07.2

87 14 06.9

BERM 30 19 07.7

87 14 06.5

BB 30 19 08.8

87 14 06.6

ES20 SS 30 19 12.7

87 13 09.9

BERM 30 19 13.0

87 13 09.9

MB 30 19 13.5

87 13 10.1

BB 30 19 14.2

87 13 10.2

ES21 ~~SS~~ 30 19 19.8

87 12 12.8

MB 30 19 20.2

87 12 12.9

BB 30 19 20.6

87 12 13.0

Next part is 22

intensity colored 24

in photos after photo

set marker on sand 22

ES22 SS 30 19 26.5

87 11 17.2

BERM 30 19 26.7

87 11 17.2

MB 30 19 27.6

87 11 17.2

BB 30 19 28.7

87 11 17.1

ES23 SS 30 19 32.4

87 10 24.2

BERM 30 19 32.8

87 10 24.1

MB 30 19 33.3

87 10 24.0

BB 30 19 34.0

87 10 23.8

ES24 SS 30 19 38.1

87 09 29.0

BERM 30 19 38.4

87 09 29.0

MB 30 19 39.2

87 09 29.1

BB 30 19 39.9

87 09 29.2

3/29/11 Escambia Co.

ES01	SS	30	16	47.8
		87	31	02.9
	BERM	30	16	48.2
		87	31	03.0
	MB	30	16	49.0
		87	31	03.1
		BB	30 16	58.3
		87	31	03.2
		ES02	SS	30
		87	16	59.2
		87	30	04.5
		BERM	30	17
		87	30	04.6
		BB	30	17
		87	17	01.2
ES03	SS	87	30	04.8
		30	17	10.8
		87	29	06.2
		BERM	30	17
		87	17	11.1
		87	29	06.3
		MB	30	17
		87	17	11.9
		87	29	06.6
	JB	30	17	12.7
		87	29	06.8

ES04	SS	30	17	22.5
		87	28	11.5
	BB	30	17	23.2
		87	28	11.7
		ES05	SS	30
		87	17	32.9
		87	27	14.9
		BERM	30	17
		87	17	33.3
		87	27	15.0
		JB	30 17	17.8
		87	17	33.7
		87	27	15.1
		ES06	SS	30
		87	17	40.5
		87	26	19.2
		BERM	30	17
		87	17	41.0
		87	26	19.3
		BB	30	17
		87	17	42.3
		87	26	19.4
		ES07	SS	30
		87	17	50.0
		87	25	18.3
		BERM	30	17
		87	17	50.4
		87	25	18.4
		BB	30	17
		87	17	51.1
		87	25	18.5

E508	SS	30	18	01.9
		87	24	18.1
		30	18	02.4
BERM		87	24	16.2
		30	18	03.1
		87	24	18.4
E509	SS	30	18	16.3
		87	23	21.3
		30	18	16.8
BERM		87	23	21.4
		30	18	17.6
		87	23	21.4
E510	SS	30	18	28.6
		87	22	26.8
		30	18	29.4
MB		87	22	26.9
		30	18	30.1
		87	22	27.0
E511	SS	30	18	41.6
		87	21	26.4
		30	18	41.7
BERM		87	21	26.5
		30	18	42.4
		87	21	26.7

E512	SS	30	18	52.9
		87	20	28.9
		30	18	53.2
BERM		87	20	29.0
		30	18	53.7
		87	20	29.2
E513	SS	30	19	05.9
		87	19	34.6
		30	19	06.3
BB		87	19	34.7
		30	19	17.4
		87	18	49.1
E514	SS	30	19	17.4
		87	18	49.1
		30	19	17.5
BERM		87	18	49.4
		30	19	17.7
		87	18	49.8
3/30		30	19	47.9
		87	08	34.7
		30	19	49.0
E525	SS	87	08	34.7
		30	19	50.0
		87	08	34.8
MB		30	19	50.0
		87	08	34.8
		30	19	50.0
BB		87	08	34.8
		30	19	50.0
		87	08	34.8

Back Branch done with
now color

ES26	SS	30	19	58.5
		87	07	39.4
	BERM	30	19	59.2
		87	07	39.7
	MB	30	19	59.6
		87	07	39.9
	BB	30	20	00.2
		87	07	40.0
ES27	SS	30	20	08.6
		87	06	46.0
	BERM	30	20	08.9
		87	06	46.0
	BB	30	20	09.7
		87	06	45.9
ES28	SS	30	20	19.2
		87	05	52.6
	BB	30	20	19.9
		87	05	52.8
ES29	SS	30	20	30.5
		87	04	54.6
	BERM	30	20	30.9
		87	04	54.9
	MB	30	20	31.5
		87	04	54.5
	BB	30	20	32.2
		87	04	54.5

ES30	SS	30	20	42.1
		87	03	58.6
	MB	30	20	42.6
		87	03	58.7
	BB	30	20	43.0
		87	03	58.8
ES31	SS	30	20	53.2
		87	03	03.1
	BB	30	20	53.6
		87	03	03.0
ES32	SS	30	21	02.6
		87	02	06.0
	MB	30	21	03.1
		87	02	06.2
	BB	30	21	04.0
		87	02	06.4
ES33	SS	30	21	13.8
		87	01	10.3
	BERM	30	21	14.3
		87	01	10.4
	BB	30	21	15.2
		87	01	10.7
ES34	SS	30	21	23.1
		87	00	13.8
	BB	30	21	23.6
		87	00	14.0

3/31/11

ES35 SS 30 21 31.7

86 59 18.5

BERM 30 21 31.9

86 59 18.5

BB 30 21 32.5

86 59 18.6

ES36 SS 30 21 42.2

86 58 23.2

BERM 30 21 42.4

86 58 23.3

BB 30 21 42.8

86 58 23.5

ES37 SS 30 21 52.5

86 57 27.0

~~BB~~ 30 21 53.1

86 57 27.1

ES38 SS 30 22 01.7

86 56 30.2

BERM 30 22 01.9

86 56 30.3

BB 30 22 02.2

86 56 30.4

ES39 SS 30 22 11.8

86 55 33.6

BERM 30 22 12.0

86 55 33.6

BB 30 22 12.6

86 55 33.8

ES40 SS 30 22 20.0

86 54 37.7

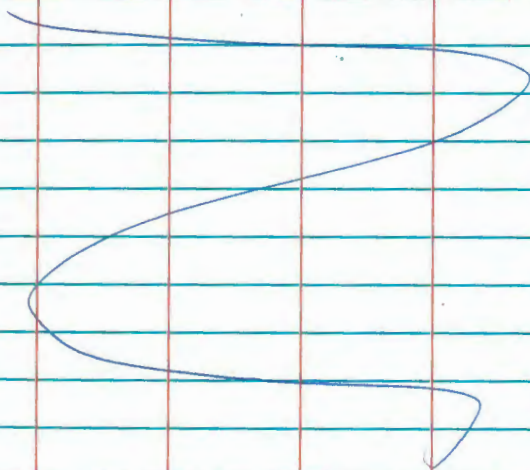
BERM 30 22 20.2

86 54 37.7

BB 30 22 20.3

86 54 37.8

ES22, 23, 24



8/3/n Start 10:00 ^{am} Leave T 11:00
End 7:30 ^{am}

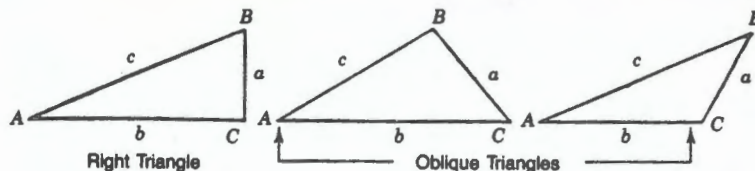
8/4/11 VO 104 CG ~~#3~~ As on sheet
VO 105 CG #3
VO 106 CG #4
VO 107 CG #5
VO 108 CG #6
VO 109 CG #7
VO 110 CG #8 4 Attempts
VO 111 CG #9
VO 112 CG #10
X VO 114 CG #11 combined
VO 116 CG #12 2 Attempts ~~CG~~
VO 119 CG #13
VO 120 CG #14
VO 117 CG #15
VO 121 CG #16
VO 118 CG #17
VO 115 CG #18
VO 113 CG #19

9/4/11 Start 7:00 End 7:30

8/5/11 Start 7:00 End

2/21/11 9:00 5:30
 2/22/11 7:00
 3/01/11 7:30 8:30 7:00
 5316 6519N
 722-847-9005
 3/02/11 8:00 4:00
 3/03/11 8:00

TRIGONOMETRIC FORMULAE



Solution of Right Triangles

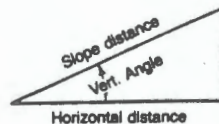
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

Given a, b	Required 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 A, B, a	Required 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	$\text{area} = \frac{bc \sin A}{2}$
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.

