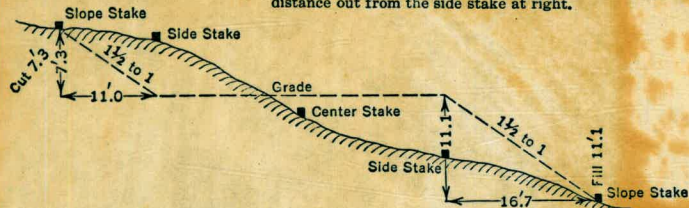


W
011

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING
 Roadway of any Width. Side Slopes 1 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	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

KEUFFEL & ESSER CO., N. Y.
 For Curve Tables see end of book.

DRILLING GROUT HOLES
 BOOK No 7

MICROFILMED

JAN 13 1965

Microfilm of this book No. F 863A

is made of 50% high grade rag stock
 with a WATER RESISTING surface sizing.

10,939. ca. ck. ys. cM.

Hole No II-13-40 Top Elev ----- Date 11-25-42

Inspector Back by NRC Foreman Betzer Crew No Betzer Page 1

Time		Depth		Core
From	To	From	To	Recor

Perc Dr ft	Core Dr-ft	Redrill ft	W.O. ft	Time (Hr Min)	
				M&SU	Lost

1-00 4-00 3-00 8.0 14.0

8.0

4-00 9-00 5-00 16.0 23.0

Curry 7.0 Betzer Betzer

0.0 15.0 0.0 00

Hole No D-13-40 Top Elev Date 11-26-42

Inspector Carry Foreman Betzer Crew No Betzer Page 2

Time		Hr. Min	Depth		Core Recorder
From	To		Fr	To	
8-00	12-00	4-00	23.0	27.5	
12-00	12-30	0-30			
12-30	4-00	3-30	Moring & setup on hole No D-13-30.		

Perc Dr. ft.	Core Jr. ft.	Redrill ft	W.O. ft	Time (Hr-Min)	M&SD Lost.
	4.5				230
0.0	4.5	0.0	0.0		

Hole No U-13-30 Top Elev --- Date 11-30-42

Inspector Curry Foreman Belzer Crew No Belzer Page 3

Time 4-00 9-00 5-00 Depth 16.0 20.0 Core ---
From To Hr-Min From To Recd

Core Drift --- Core Drift --- Redrill --- No --- Time (Hr-Min) ---
Dr-ft Dr-ft ft ft msu Lost

4-00 9-00 5-00 16.0 20.0

4.0

See page 5, for drilling
from 14.0 to 16.0

0.0 4.0 0.0 0.0

Hole No D-13-30 Top Elev. _____ Date 12-1-42

Inspector Back Foreman MRG Betzer Crew No Betzer Page 4

Time		Depth		Core
From	To	hr	Min	Recon

Perc	Core	Redrill	W.O.	Time	hr	Min
In	In	ft	ft	M&SU	Lost	

1-00 4-00 3-00 20.0 23.0

3.0

4-00 5-00 1-00 23.0 24.0

Curry

1.0

0.0 4.0 0.0 0.0

Hole No	Top Elev.	Date
I-13-30		11-28-42

Inspector	Foreman	Crew No	Page
Boek by JRC.	Belzer	Belzer	5

Time		Depth		Core
From	To	Hr-Min	From To	Recor

Core	Core	Retrill	W.O.	Time (Hr-Min)	
Dr Ft	Dr Ft	Ft	Ft	MSU	Lost

9-00	11-00	2-00	14.0	16.0	
------	-------	------	------	------	--

				2.0	
--	--	--	--	-----	--

0.0	2.0	0.0	0.0		
-----	-----	-----	-----	--	--

Hole No II-14-10 Top Elev 510.0 Date 12-2-42

Time		Depth		Core
From	To	Hr-Min	From To	Recor

1-00	4-00	3-00	0.0	3.0
------	------	------	-----	-----

12-2-42

4-00	9-00	5-00	3.0	10.0
------	------	------	-----	------

Inspector Bock by J.R.C. Foreman Betzer crew No Betzer Page 4

Perc Dr. Ft.	Core Dr. Ft.	Re-drill Ft.	W.O. Ft.	Time (Hr Min)	M&S ^U Lost.
--------------	--------------	--------------	----------	---------------	------------------------

3.0

H. R. Curry
7.0

0.0 10.0 0.0 0.0

Hole No II-14-10 Top Elev. 510.0 Date 12-3-42

Time		Depth		Core
From	To	Hr-Min	From To	Recor

1-00	4-00	3-00		chopping out 30' of core left in hole.
------	------	------	--	---

12-3-42.

4-00	9-00	5-00	10.0	18.0
------	------	------	------	------

Inspector Bock Foreman Betzler Crew No 7

Perc	Core	Retrill	W.O.	Time (Hr-Min)
Dr-ft	Dr-ft	ft	ft	M&SU Lost.

Curry
8.0

0.0 8.0 0.0 0.0

Hole No Top Elev Date
D-14-10 510.0 12-4-42

Time		Depth		Core
From	To	Hr-Min	From To	Recov

1-00	4-00	3-00	18.0	24.0
------	------	------	------	------

12-4-42

4-00	9-00	5-00	24.0	26.0
------	------	------	------	------

Moving and set up on
Hole No D-14-20

Inspector Foreman Crew No Page
Bock ~~McC~~ Betzer Betzer 8

Perc	Core	Refrill	W.O.	Time (Hr-Min)	
Dr-ft	Dr-ft	ft	ft.	M&SU	Lost.

~~6~~
4.0

Gurry
2.0

0.0 8.0 0.0 0.0

Hole No D-14-20 Top Elev ----- Date 12-5-42

Inspector Bock by WRC Foreman Betzer Crew No Betzer Page 9

Time		Depth		Core
From	To	Hr-Min	From To	Recall

Per core	core	Retrill	W.O.	Time (Hr-Min)
Hr-ft	Hr-ft.	ft	ft	M&SU Lost.

8-00	12-00	4-00	0.0	
12-00	12-30	6-30	Lunch	
12-30	4-00	3-30	14.0	

				00-30
		14.0		

4-00 5-00 1-00 Removed
drill as this Block is
to be poured Monday
Dec 7-42.

0.0 14.0 0.0 0.0

Hole No U-14-20 Top Elev ----- Date 12-9-42

Inspector Bock by DR Foreman Betzer Crew No J. Pierce Page 10

Time		Depth		Core
From	To	Hr-Min	From To	Recov
4-00	9-00	5-00	14.0	22.75

Perc	Core	ReDrill	W.O.	Time (Hr-Min)
Dr-ft	Dr-ft	ft.	ft	M&SU Lost.
	8.75			

0.0 8.8 0.0 0.0

Hole No Top Elev Date
 II-1A-20 - - - - - 12-10-42.

Inspector Foreman Crew No Page
 Bock by WRC. Betzer J. Pierce - 17

Time		Depth		Core
From	To	Hr-Min	From To	Recol

4-00	5-00	1-00	22.75 24.2	
5-00	6-30	1-30	Moving Machine.	

Per	Core	Re-drill	W.O.	Time (Hr-Min)
Dr-ft	Tr-ft	ft	ft	M&SU Lost.

1.45

0.0 1.4 0.0 0.0

Hole No D-15-10 Top Elev 539.5 Date 12-11-42

Inspector Carry Foreman Betzer Crew No 12 Page

Time		Depth		Core	Perc	Core	Retrill	W.O.	Time
From	To	Mr	Min	From	To	Recor	Dr-Ft	Dr-Ft	ft

8-00 11-00 3-00 Setting up machine

11-00 4-00 5-00 0.0 11.0

P.M
4:00 12:00 11.0 25.0

Note. Driller reports 36.0' to rock from Elev 575.0

0.0 25.0 0.0 0.0

A. Book

Hole# Top Elev. Date
D-17-20 .552.0 12-12-42

Inspector Foreman
Adolph Bock Betzer. 13

Time		Depth	
From	to	From	to
4:00 ^{p.m.}	12:00	0.0	7.0

Core
Dr. ft.
7.0

7.0

Hole No II-17-20 Top Elev 552.0 Date 12-14-42

Inspector Carry Foreman Betzer Crew No Pierce Page 1A

Time		Depth		Core
From	To	Hr-Min	From To	Recor

Per	Core	ReDrill	W.O.	Time (Hr-Min)
Dr-ft	Dr-ft	ft	ft	M&SU Lost

8-00	12-00	4-00	7.0	
12-00	12-30	0-30	lunch	
12-30	4-00		14.0	

7.0

0-30

0.0 7.0 0.0 0.0

Hole #

D17-20

Date

12-15-42

Inspector
Adolph Bock

Foreman
Betzer

15

Time

From to

Depth

From to

Core
Dr. ft.

Am P.m
8:00 4:00

14:00 19:00

5.0

P.m P.m
4:00 10:00

19.0 25.0

6.0

Moving to hole #17-0

11.0

Hole# D17-30 Elev. 554.9 Date 12-18-42

Time From to Depth From to

8:00 AM 4:00 PM 0.0 4.0

4:00 PM 12:00 PM 4.0 14.5

Inspector Adolph Bock

Foreman Betzer

16

Core Dr. ft.

4.0

Spent some time moving and setting up.

10.5

14.5

Hole #
D17-30

Date
12-19-42

Inspector
Adolph Bock

Foreman
Betzer

17

Time
From to

Depth
From to

8:00 AM 4:00 PM

14.5 22.0

Core
Dr. ft

7.5

No drilling on swing shift
out of bits.

7.5

Hole #
D17-30

Date
12-28-42

Inspector
Adolph Bock

Foreman
Betzer.

18

Time
From to
Pm
4:00 12:00

Depth
From to
22.0 25.0

Core
Dr. ft
3.0

Moved to hole # D-17-0

3.0

Hole #

Elev.

Date

Inspector

Foreman

D17-0

552.6

12-29-42

Adolph Bock

Betzer

19

Time

Depth

From to

From to

Core

Dr. ft.

A.M.

P.M.

8:00

2:30

0

2.0

2.0

2.0

Hole #

D-17-0

Date

12-30-42

Inspector
Adolph Bock

Foreman
Betzer.

20

Time

Depth

From to

From to

A.M. P.M.
8:00 2:30

2.0 3.0

Core

Drift

3.0

Out of bits.

Having considerable trouble
tore up two bits today.

3.0

Hole No Top Elev Date
147-0 552.6 12-30-42

Inspector Foreman Crew No Page
J.R. Curry Betzer Betzer 21

Time		Depth		Core
From	To	From	To	Recov

4-00	8-00	4-00	5	
8-00	8-30	0-30	Lunch	
8-30	12-00	3-30	10.5	

Perc	Core	ReDrill	W.O.	Time (Hr Min)	
Dr-ft	Dr-ft	ft	ft	M&SU	Lost

5.5

5.5

Hole No Top Elev Date
II-17-0 552.6 12-31-42

Inspector Foreman Crew No Page
Back by W.R. Betzer Pierce 22

Time		Depth		Core
From	To	Hr-Min	From To	Recov

Perc	Core	ReDrill	W.O.	Time (Hr-Min)
Jr-ft	Jr-ft	ft	ft	M&S.U. Lost

8-00	4-00	8-00	10.5	19.0					
------	------	------	------	------	--	--	--	--	--

	8.5								
--	-----	--	--	--	--	--	--	--	--

8.5

Hole No 17-0 Top Elev 552.6 Date 1-5-43

Inspector H. R. Curry Foreman Betzer Crew No Pierce Page 23

Time		Depth		Core
From	To	Hr-Min	From To	Recov

Per core	Retrill	W. O.	Time (Hr-Min)
In-ft	In-ft	ft	M&S _U Lost.

9-30 11-00 1-30 Setting up.

11-00 12-00 19.0

12-00 12-30 0-30 Lunch

12-30 4-00 3-30 22.0

3.0

0-30

4-00 12-00 8-00 22.0 25.0

Bock ^{DR.}
3.0

Betzer Betzer

6.0

Hole No Top Elev Date
 D-15-20 543.6 1-6-48

Inspector Foreman Crew No Page
 Curry Betzer Pierce 24

Time Depth Core
 From To Hr. Min From To Recor

Perc Core Reburil W.O. Time (Hr. Min)
 Dr. ft. Dr. ft. ft ft M&SU Lost.

8-00 10-30 2-30 Setting up.
 10-30 12-00 1-30 0.0
 12-00 12-30 6-30 Lunch
 12-30 4-00 3-30 6.6

4-00 12-00 8-00 6.6 12.6

Note Driller reports
 56.5 ft to rock from
 Elev 600.0

12.6

Back ARE. Betzer Betzer
 6.0

0-30

6.6

Hole No 11-15-20 Top Elev ----- Date 1-7-43 Inspector Curry Foreman Betzer Crew No 25 Page 25

Time		Depth		Core	Perf	Core Dr-ft	Refrill	W.O.	Time (Hr-Min)
From	To	Hr-Min	From To						

8-00 12-00 4-00 12.6

12-00 12-30 Lunch

12-30 4-00 3-30 26.0

13.4

Hole No A-15-30 Top Elev 548.6 Date 1-9-43

Inspector Curry Foreman Betzek Crew No Pierce Page 26

Time		Depth		Core
From	To	Hr-Min	From To	Recor

8-00	12-00	4-00	Waiting on highline	
12-00	12-30	0-30	Lunch	
12-30	1-30	1-00	Setting up	
1-30	4-00	2-30	0.0	2.6

Note: Driller reports
56.6 to Rock from
Elev 605.4

Per Core	Core	Redrill	W.O.	Time (Hr Min)
Dr-ft	Dr-ft	ft	ft	M&SU Lost

2.6

2.6

Hole No Top Elev Date
D15-30 548.6 1-11-43

Inspector Foreman Crew No Page
Curry Betzer Pierce 27

Time		Depth		Core
From	To	Hr-Min	From To	Recov

Perc	Core	ReDrill	W.O.	Time (Hr-Min)
Hr-ft	Hr-ft	ft	ft	M&SU Lost.

8-00am	12-00	4-00	2.6	
12-00	12-30	0-30	Lunch	
12-30	3-00	2-30	11.0	
3-00	4-00	1-00	out of Bits.	

8.4

0-30

0.0 8.4 0.0 0.0

Hole No D-15-30 Top Elev 548.6 Date 1-12-43

Inspector Curry Foreman Betzer Crew No Pierce Page 28

Time		Depth		Core
From	To	Hr-Min	From To	Recor

Perc	Core	ReDrill	W.O.	Time (Hr-Min)
Hr-ft	Hr-ft	ft	ft	MSU Lost.

8-00	12-00	4-00	11.0	
12-00	12-30	0-30	Lunch	
12-30	3-15	2-45	24.5	

13.5

0-30

0.0

13.5

0.0

0.0

Hole No D-15-40 Top Elev 550.0 Date 1-13-43

Inspector Gurry Foreman Betzler Crew No Pierce Page 29

Time		Depth		Core
From	To	Hr-Min	From To	Recol

8-00	10-00	2-00		Setting up
------	-------	------	--	------------

10-00	12-00	2-00		0.0
-------	-------	------	--	-----

12-00	12-30	0-30		Lunch
-------	-------	------	--	-------

12-30	4-00	3-30		7.0
-------	------	------	--	-----

P.m.	P.m.
4:00	10:00

7.0	10.0
-----	------

Perc	Core	ReDrill	W.O.	Time (Hr-Min)
Hr-ft	Hr-ft	ft	ft	MSU Lost.

7.0				
-----	--	--	--	--

3.0				
-----	--	--	--	--

Adolph Bock

Broke rods off in hole and had to fish them out.

0.0	10.0	0.0	0
-----	------	-----	---

Hole No 1-15-80 Top Elev ----- Date 1-14-43

Inspector Gurry Foreman Belzer Crew No Pierce Page 30

Time		Depth		Core
From	To	Hr-Min	From To	Recov

Perc	Core	Redrill	W.O.	Time (Hr-Min)
Dr-ft	Dr-ft	ft	ft	WESU Lost

8-00	12-00	4-00	10.0	
12-00	12-30	0-30 Lunch		
12-30	4-00	3-30	17.0	

				0-30
			17.0	

0.0 7.0 0.0 0.0

HOLE NO
D-15-40

DATE
1-15-43

INSPECTOR
MCCOWN

FOREMAN
BETZER

CREW PAGE
PIERCE 31

TIME		DEPTH		COBE
FROM	TO	HRS MIN	FROM TO	RECOY.
8 AM	2 PM		17 17.6	
2 PM	4 PM		17.6 22.0	
4 PM	12 Mid.		22.0 26.0	

PREC	COBE	REDRILL	W.O.	TIME	HRS MIN
DRILL	DR-FT	FT	FT	M&SU	LOST
	9.0				

0.0 9.0 0.0 0.0

Hole No	Rock Elev.	Date
D 19-10	601.5	1-16-1943

Inspector	Foreman
Adolph Bock	Betzer.

32

Time		Depth	
From	to	From	to
A.M.	P.M.		
8:00	4:00	0.0	8.0

Core

Dr. ft.

8.0

8.0

1 Hole #

D-19-10

Date

1-18-1943

Time

From to
8:00 AM 4:00 P.M.

Depth

From to
8.0 17.0

Inspector

Adolph Bock

Foreman

Betzer

33

Core

Dr. ft.

9.0 ✓

¹⁹
~~D-19-10~~

1-18-43

4-00 11-00 7-00 17.0 24.0

Curry

7.0 ✓

Betzer

16.0

Hole # D-19-0
Rock Elev. 587.0
Date 1-19-43

Time
From 8:00 AM To 2:00 P.M.
Depth
From 0 To 4.5

Inspector
Bock

Foreman
Betzer

34

Core

Dr. ft.

4.5

4.5

Hole #
D-19-0

Date
1-20-43

Inspector
Bock

Foreman
Betzer

35

Time
From To
8:00 AM 4:00 PM

Depth
From to
4.5 15.5

4:00 PM 12:00 PM

15.5 23.0

Core
Dr. ft.
11.0

7.5

18.5

Hole #

D-19-0

Date

1-21-43

Inspector

Bock

Foreman

Betzer.

36

Time

From to

Depth

From To

8:00 Am. 11:00 Am

23.0 28.0

Core

Dr. ft.

5.0

Moving to Drain Hole

14-0

5.0

Hole #	Rock Elev.	Date
14-0	503.9	1-25-43
Time	Depth	
From	to	From to
4:00	8 ^{p.m}	
8:00 A.M	4:00	0 4.0

Inspector
Adolph Bock

Foreman
Betzer.

37

Core	Dr. ft.
	4.0

4.0

Hole ^z	Date
D-14-0	1-28-43
Time	Depth
From to	From to
8:00 AM ^{P.M} 2:45	4.0 12.0

Inspector	Foreman
Adolph Bock	Betzer. 38

Core
Dr. ft.

8.0'

Core drill broke down
at 2:45 P.M.

8.0

Hole No D-1A-0 ~~5187~~ Top Elev --- Date 2-8-43

Inspector Curry Foreman Betzer Drew No Pierce Page 39

TIME		DEPTH		CORE
FROM	TO	HRS-MIN	FROM TO	RECOV

^{9M} 8-00	^{9M.} 10-30	2-30	15.0 18.0	
--------------------	----------------------	------	-----------	--

4:00 P.M.	12:00		18.0 19.0	
-----------	-------	--	-----------	--

PREC.	CORE	RE DRILL	NO	TIME	HRS-MIN
DR-FT.	DR FT.	FT.	FT	M&SU	LOST

3.0

1.0

4.0

Hole #

D-14-0

Date

2-6-43

Inspector

Bock

Foreman

Betzey.

40

Time

From to

Depth

From to

8:00 AM 4:00 PM

12.0 15.0

Core

Dr. ft.

3.0

3.0

Hole #

D-14-0

Date

2-9-43

Inspector

Adolph Bock

Foreman

Betzer.

41

Time

From to

8:00 A.M. 4:00 P.M.

Depth

From to

4:00 P.M. 12:00

19.0 24.0

Core

Dr. ft.

5.0

Chopping out core.

Completed hole
and moved to D-14-30

5.0

Hole # *Rock Elev* Date
D-14-30 *514.2* 2-10-43

Time		Depth	
From	To	From	to
8:00 A.M.	4:00 P.M.	0	7.5
4:00 P.M.	12:00	7.5	13.0

Inspector
Adolph Bock

Foreman
Betzer.

42

13.0

Hole #

D14-30

Date

Feb. 11, 1943

Inspector

Adolph Bock

Foreman

Betzer.

43

Time

Depth

From to

From to

8:00 AM. 4:00 PM.

13.0 25.0

Core

Dr. ft.

12.0 ✓

12.0

Hole # Top Elev. Date
D-14-40 518.9 2-~~12~~-43

Inspector Foreman
A. Bock Betzer. 44

Time		Depth	
From	to	From	to
4:00 PM	12:00	0	9.0

Core
Dr. ft.
9.0

9.0

Hole #

D-14-40

Date

2-12-43

Inspector

A. Bock

Foreman

Betzer.

45

Time

From to

8:00 AM 4:00 P.M.

Depth

From to

9.0 12.0

Core

Dr. ft.

3.0

3.0

Hole #
D-14-40

Date
2-13-43

Inspector
H. Bock

Foreman
Betzer 46

Time
From to

Depth
From to

8:00 AM. 4:00 P.M.

12.0 19.0

Core
Dr. ft.

7.0

7.0

Hole #

D-14-40

Date

2-15-1943

Inspector
Adolph Bock

Foreman
Betzer.

47

Time

From to

8:00 AM 4:00 PM

Depth

From to

19.0 24.0

Core

Dr. ft.

5.0'

5.0

Hole #
D-18-40 5796

Date
2-16-43

Inspector
Adolph Bock

Foreman
Betzer. 48

Time
From to
8:00 AM 4:00 PM

Depth
From to
0 4.0

Core
Drift
4.0

4:00 PM 12:00 M

4.0 17.0

13.0

17.0

Hole #
D-18-40

Date
2-17-43

Inspector
Adolph Bock

Foreman
Betzer

49

Time
From to
8:00 A.M. 4:00^{P.M.}

Depth
From to
17.0 17.0

4:00 P.M. 12:00

17.0 23.5

Core
Dr. ft.

0

Lost 20' of pipe in the
hole spent all shift
fishing for it.

6.5

Hole reported to be
caving.

6.5

Hole # D-10-30
Rock Elev. 574.0
Date 2-18-43

Time
From to
Depth
From to

8:00 AM 4:00 PM 0 3.0

Inspector Adolph Bock
Foreman Betzer 50

Core
Dr. ft.

3.0

Moved machine and
started hole
No night shift.

3.0

Hole #
D-18-30

Date
2-19-43

Inspector
Adolph Bock

Foreman
Betzer 51

Time
From to

Depth
From to

8:00 A.M. 4:00 P.M.

3.0 9.0

6.0

Pipe screwed off.
Had to fish it out.
Coupling on bottom
of pipe lost in hole.

4:00 P.M. 12:00

tried to get coupling
out of hole with
magnet. Could not
get it.

6.0

Hole #

D-18-30

Date

2-20-43

Inspector

Adolph Bock

Foreman

Betzer

52

Time

From to

Depth

From to

8:00 AM 4:00 PM

0 8.0

4:00 PM 12:00

* 9.0
~~8.0~~ 18.0

* See preceding page

Core

Dr. ft.

~~8.0~~

Pipe moved over and
could not get back into
the same hole, so
had to re-drill.

9.0
~~10.0~~

9.0

Hole #

D-18-30

Date

2-22-43

Time

From to

8:00 A.M. 4:00 P.M.

Depth

From to

18.0 ✓ 22.0

Inspector

Adolph Bock

Foreman

Betzer

53

Core

Dr. ft.

4.0 ✓

Some trouble with
bit getting stuck in
the hole.

No night shift.

4.0

Hole #

D-10-30

Date

2-23-43

Inspector

Adolph Bock

Foreman

Betzer

54

Time

From to

8:00 A.M. 4:00 P.M.

Depth

From to

22.0 24.0

Core

Dr. ft.

2.0

Moved and setup
on hole # D-10-20

2.0

Hole #
D-10-20

Date
2-24-43

Inspector
Adolph Bock

Foreman
Betzer

56

Time
From to

Depth
From to

Core
Dr. ft.

A.M. P.M.
8:00 4:00

1.0 15.0

14.0

14.0

Hole # D-18-20 Date 2-25-43

Inspector Adolph Bock Foreman Betzer 57

Time From to Depth From to

8:00^{A.m} 4:00^{P.m} 150 200

Core Dr. ft

50

50

Hole #

D-18-20

Date

2-26-43

Inspector

Adolph Bock

Foreman

Betzer

38

Time

From to

Depth

From to

Core

Dr. ft

A.m

8:00 11:00

20.0 23.0

3.0

Broke down

3.0

Hole #
D-18-20

Date
2-27-43

Inspector
Adolph Bock

Foreman
Betzer

59

Time
From to

Depth
From to

Core
Dr. ft.

A.M. P.M.
8:00 4:00

23.0 25.0

2.0

Moved to hole
D-18-10.

2.0

Hole # D-18-10
Rock Elev. 564.6
Date 3-1-1943

Time
From 8:00^{A.M.} to 4:00^{P.M.}
Depth
From 0.0 to 9.0

Inspector Adolph Bock
Foreman Betzer 60

Core
Dr. ft.
9.0

9.0

Hole #
D-18-10

Date
3-2-43

Inspector
Adolph Bock

Foreman
Betzer

61

Time
From to

Depth
From to

Core
Dr. ft.

8:00 A.M. 4:00 P.M.

9.0 20.5

11.5

4:00 P.M. 12:00

20.5 26.5

6.0

17.5

Hole # D-18-0
Rock Elev. 559.7
Date 3-4-43

Time From to
Depth From to

8:00 A.M. 4:00 P.M.

4:00 P.M. 12:00 0 4.0

Inspector Adolph Bock
Foreman Betzer. 62

Moved and setup.

4.0 Feed Gear broke
had to weld and
Turn down in lathe.

4.0

Hole #

D-18-0

Date

3-5-1943

Inspector

Adolph Bock

Foreman

Betzer

63

Time

From to

4:00 pm 12:00

Depth

From to

4.0 8.5

Core Dr.
ft.

4.5

4.5

Hole #

D-18-0

Date

3-6-43

Inspector

Adolph Bock

Foreman

Betzer.

64

Time

From to

3:00 4:00

Depth

From to

8.5 16.0

Core

Dr. ft.

7.5

7.5

Hole #
D-10-0

Date
3-8-43

Inspector
Adolph Bock

Foreman
Betzer.

65

Time
From to

Depth
From to

8:00 A.M. 4:00

16.0 24.0

Core

Dr. ft.

8.0

8.0

Hole #

Rock Elev.

Date

Inspector

Foreman

D-16-40

553.9

3-~~18~~⁹-1943

Adolph Bock

Betzer

66

Time

Depth

From to

From to

8:00 A.M. 4:00 P.M.

0 2.0

4:00 P.M. 12:00

2.0 10.0

Core

Dr. ft

2.0

8.0

10.0

Hole #
D-16-40

Date
3-10-1943

Inspector
Adolph Bock

Foreman
Betzer

67

Time
From to
8:00 AM 4:00 PM

Depth
From to
10.0 15.5

4:00 PM 12:00

15.5 24.5

Core Dr. ft

5.5 ✓

Ground very blocky.

9.0

14.5

Hole #

Rock Elev.

Date

Inspector

Foreman

D-16-20

552.1

3-12-43

Adolph Bock

Betzer.

68

Time

Depth

From to

From to

4:00 PM 12:00

0 3.0

Core Dr.

ft.

3.0

3.0

Hole #
D-16-20

Date
3-13-43

Inspector
Adolph Bock

Foreman
Betzer

69

Time
From to

Depth
From to

Core Dr.
ft.

8:00 AM 4:00 PM

3.0 8.5

5.5

5.5

Hole #
D-16-20

Date
3-15-43

Inspector
Adolph Back

Foreman
Betzer.

70

Time
From to

Depth
From to

Core Dr.
ft.

4:00 P.M. 12:00

8.5 13.5

5.0

5.0

Hole #

D-16-26

Date

3-16-43

Inspector

Adolph Back

Foreman

Betzer.

71

Time

From to

Depth

From to

8:00 A.M. 4:00 P.M.

13.5 19.0

Core Dr.

ft.

5.5

4:00 P.M. 12:00

19.0 23.9

4.9

10.4

Hole # D-16-00
Rock Elev. 552.1
Date 3-18-43

Time From to
Depth From to

8:00 AM 4:00 PM 0 4.0

4:00 PM 12:00 4.0 ~~7.0~~ 13.0

3-19-43

8:00 AM 4:00 PM 13.0 24.2

Inspector Adolph Bock
Foreman Betzer 72

Core
Dr. ft.

4.0 Driller reported
considerable sand
9.0 and gravel to clean
out of hole.

11.2

24.2

H. Hole #
D-15-0

Rock Elev.
531.5

Date
3-22-43

Inspector
Adolph Bock

Foreman
Betzer

73

Time		Depth	
From	to	From	to
4:00 P.M.	12:00	0	4.0
<u>3-23-43</u>			
8:00 A.M.	4:00 P.M.	4.0	17.5
<u>3-24-43</u>			
8:00 A.M.	4:00 P.M.	17.5	23.5

Core Dr.
ft.

4.0

13.5

6.0

23.5

Hole *
D-16-³⁰⊖

Rock Elev.
552.9

3-24-43

Inspector
Adolph Bock

Foreman
Betzer.

74

Time
From to

Depth
From to

Core
Dr. ft.

4:00 P.M. 12:00

0 2.0

2.0

8:00 A.M. 4:00

3-25-43
2.0 7.5

5.5

4:00 P.M. 12:00

7.5 9.0

1.5

8:00 A.M. 4:00

3-26-43
9.0 9.5

0.5

Driller reports
that the hole
is caving and
he is having
considerable trouble.

This hole was
abandoned as it
was still caving,
per C.P.W.

9.5

Hole#
17-10

Rock Elev.
550.5

Date
3-29-43

Inspector
Adolph Bock

Foreman
Betzer.

75

Time

From to

8:00 AM 4:00 PM

Depth

From to

0 2.0

3-30-43

8:00 AM 4:00 PM

2.0 7.0

Core Dr.

ft.

2.0

5.0

7.0

Hole # D17-40
Rock Elev. 556.3
Date 4-1-1943

Time		Depth	
From	to	From	to
8:00 AM	4:00 PM	0	4.0

4-2-1943

8:00 AM	4:00 PM	4.0	6.0
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Inspector Adolph Bock
Foreman Betzer 76

Core Dr. ft.
4.0
2.0

Driller reported hole caving causing redrilling.

6.0

1 Hole # Rock Elev.
D-16-10 553.1

Date
4-3-43

Inspector
Adolph Bock

Foreman
Betzer.

77

Time
From to

Depth
From to

Core dr.
ft.

8:00 AM 4:00 PM

0 3.0

3.0

4-5-43

8:00 AM 3:30 PM

3.0 10.0

7.0

4-7-43

8:00 AM 4:00 PM

10.0 15.0

5.0

4-8-43

8:00 AM 4:00 PM

15.0 19.0

4.0

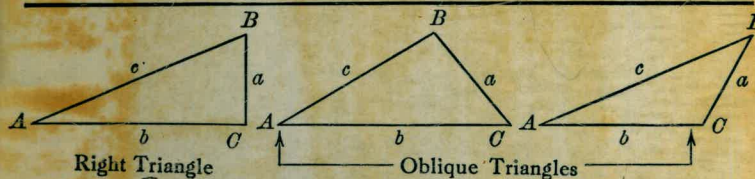
4-9-43

8:00 AM 12:00

19.0 23.7

4.7

23.7



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	Formulas
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	Formulas
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	$\text{area} = \frac{bc \sin A}{2}$
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.

