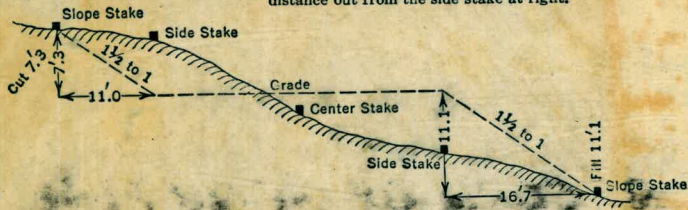


W.

802

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

RECORD OF GROUTING
BOOK 1

Handwritten: A.M.C.N. - 2/1/43

MICROFILMED

JAN 13 1965

The paper is made of 50% high grade rag stock

with a WATER RESISTING surface sizing.

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

grouching
(Batch) 11.78

meter. Roofing
19860-amp!

19/10.2.

1 2

23.5-

1

2. water

1.

RECORD OF PROGRESS
BOOK 1

MICROFILMED

JAN 13 1982

City of
C.R.M.

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40

1. 2/2/22 50- 22 2-9

2. 2/2/22 45- 8 2-8

The right page of the notebook is filled with a grid of blue graph paper. A vertical red margin line is present on the right side of the page. The grid is approximately 20 columns wide and 30 rows high. There are some faint, illegible markings and smudges on the grid, but no clear text or data is present.

HOLE No. 4-25

DATE 3/2/42

INSPECTOR

FOREMAN

Pg 1

ALLEN

CURTIS

TIME			DEPTH From-to	Water Test lbs./sq. in.	Grout Pressure lbs./sq. in.
From	To	Hr. - Min.			
10.45-A	11.40-A	1-0		none	
11.45-A	1.25-P	3-20	0-27'		10

Grout Proportion	MATERIALS USED (Cu. ft.)			Quantity Grout Cu. ft.	Grout per min. Cu. ft.
	Cement	Sand	Water		
17-19	19-5	0	17	19	0.17

✓ Bonded out in seam 10' below at 10:46 pm -

✓
APR 2

INSPECTOR

FOREMAN

page 2

HOLE No. 3-23-DATE 3/2/42AllenGuptis

TIME			DEPTH Fr. - to	Water Test lbs./sq. in.	Grout Pressure lbs./sq. in.
From	To	Hr. - Min.			
1.30-P	2.15-P	0-46		40	
2.15-P	2.30-P	0-20	0-25		50

Grout Proportion	Materials Used (Cu. ft.)			Quantity Grout (Cu. ft.)	Grout per min. Cu. ft.
	Cement	Sand	Water		
	Water pressure put to 40 lbs. shut off and grout 40 lbs in 20 min - 1 1/2			1	0.05
	Grout pressure put to 50 lbs, shut off and slut 1 lb pressure in 1.8 min				

Grout washed out?

✓
APPL

HOLE No. 21-25 DATE 3/21/42

INSPECTOR

FOREMAN

page 3

Allen

Curtis

TIME			DEPTH Fr. - To	Water Test lbs./sq. in.	Grout Pressure lbs./sq. in.
From	To	Hr. - Min.			
2.35.P	3.20.P	0-40"		40	
3.20.P	4.00.P	0-40	0-27 1/2"		50

Grout Proportion	Materials Used (Cu. ft.)			Quantity Grout (Cu. ft.)	Grout per min. (Cu. ft.)
	Cement	Sand	Water		
1:1 1/2 very water test.	1	0	1 1/2	1	0.03

very small amount of lost pressure
water test.

Grout washed out?

APR 2

HOLE No. 3-25-

DATE 3/4/42

INSPECTOR

ALLEN

FOREMAN

CURTIS

page 4

TIME		DEPTH	Water Test	GROUT Pressure		
From	To				Hr.-Min.	Fr. - To
8:00 A	8:30 A	0-30	0-56"	100		

GROUT Proportion	Materials Used (Cu. ft.)			Quantity GROUT Cu. ft.	GROUT per min. Cu. ft.
	Cement	Sand	Water		
Filled water test pressure 400 lbs no grout used.					

4
Duck-

HOLE No. 5-25³ DATE 3/4/42

INSPECTOR Ellen FOREMAN CURTIS page 5

TIME			DEPTH		Water Test	Grout Pressure
From	To	Hr. - Min.	From	To	lbs./sq.in.	lbs./sq.in.
8:15 A	8:40 A	0-30	0-28'	3"	50	

This hole held 40 lbs pressure for 20 min - no grout used.

Grout Proportion	Materials Used (Cu. Ft.)			Quantity Grout (Cu. Ft.)	Grout per min. Cu. Ft.
	Cement	Sand	Water		

✓
done.

HOLE No. 7-25 DATE 3/4/43

INSPECTOR

Allen

FOREMAN

Curtis

page 6

TIME			DEPTH Fr. - To	Water Test lbs./sq. in.	Grout Pressure lbs./sq. in.
From	To	Hr. - Min.			

Grout Proportion	Materials Used (Cu. ft.)			Quantity Grout (Cu. ft.)	Grout per min. (Cu. ft.)
	Cement	Sand	Water		

8:45 A 10:30 A 1-45

man worked rigging and washed
grout holes - while waiting for

and cleaned up facings of rock around
holes to be finished later for testing

10:30 A 11:00 A 0-30 0-53.0 100

This hole lost pressure fast - from 100
fault leakage near surface.

0 in 4 min. caused from small

11:0 A 1:0 2-0 0-53.0 100

This hole - 100 lb test on grout - but lost

1:1 1/2 8 0 12 8 0.07

pressure slowly because of small surface ^{leakage.}

1.0-P 3.30 P 2-30

washing and cleaning up rock surface

around grout holes - on west side -

3.30 P 4.0 P 0-30 0-53.0

Blowing out and cleaning out.

✓ out

HOLE No. 3-205 DATE 3/12/42

INSPECTOR

FOREMAN

page 7

H. H. E. N.

Richard

TIME		DEPTH		Water Test	Grout Pressure
From	To	Hr. - Min.	Fr. - To	lbs. / sq. in.	lbs. / sq. in.

8.43 - 9.00 0-15 0:99.8 150

This hole showed test for 3 min with

9.00 - 9.45 0-45 0:99.8 150

~~9.45 - 10.00 0-45 0:99.8 150~~

Grout Proportion	Materials Used (Cu. Ft.)			Quantity Grout Cu. Ft.	Grout per min. Cu. Ft.
	Cement	Sand	Water		
1-3	2	0	6	2	

loss of only 2/3 cu ft of water -

all
out

HOLE NO. 4-15 DATE 3/12/42

INSPECTOR
H. LLEN

FOREMAN

page 8

Archard

TIME		DEPTH		Water Test	Grout Pressure
From	To	Hr. - Min.	Fr. - To	lbs./sq. in.	lbs./sq. in.

9.45 A 10.00 A 0-15 0:10:0 0

This hole would hold no pressure

10.00 A 4.00 P 6-0 0:10:0 150

Grout Proportion	Materials Used (cu. ft.)			Quantity Grout (cu. ft.)	Grout per min. (cu. ft.)
	Cement	Sand	Water		

at all - because of broken open seams -

1-1 122 0 122 122

DL

HOLE No. 5-0 DATE 3/14/41

INSPECTOR

FOREMAN

page 9

Allen Richard

TIME		DEPTH	Water Test	Grout Pressure
From	To	Fr. - To	lbs./sq. in	lbs./sq. in

Grout Proportion	Materials Used (Cu. Ft.)			Quantity Grout	Grout per min.
	Cement	Sand	Water	cu. ft.	cu. ft.

8:00 A	8:30 A	0-30	0:27.3	
--------	--------	------	--------	--

washing and cleaning out - for drilling
 Grout washed and hole clean to 0:27.3

Handwritten mark

HOLE NO. 5-23 DATE 3/14/41

Allen Howard

TIME			DEPTH	Water Test	Grout Pressure
From	To	Hr. - Min.			

Grout Proportion	Materials Used (Cu. Ft.)			Quantity Grout Cu. Ft.	Grout per min. Cu. Ft.
	Cement	Sand	Water		

8:30 A 8:45 0-15 0:98.33

Washing and cleaning out grout for drilling.

The grout in this hole was set up too hard to be washed out, this hole was left over night with out being washed out to prevent back bleeding of this grout.

rd
den

HOLE NO. 5-47 DATE 3/14/44

INSPECTOR

FOREMAN

page 11

HILTON

H.C. Wood

TIME			DEPTH	WATER TEST	Grout Pressure
From	To	Hr - Min.	Fr. - To	lbs/sq. in.	lbs/sq. in.
9:00 A	9:30 A	0-30	0:24.75	0	

Grout Proportion	MATERIALS USED (Cu. Ft.)			Quantity Grout (Cu. Ft.)	Grout per min. (Cu. Ft.)
	Cement	Sand	Water		

This hole would stand no pressure at all, but will be able to seal off fault

all, because of bad open fault below fault for grouting all.

9:30 A	11:30 A	2-0	0:24.75	0	
--------	---------	-----	---------	---	--

Very bad open fault 4 1/2' off bottom

1:1 29 0 29 29
may have to use thicker grout.

11:30 A	12:30 P	1-0	0:24.75	50	
---------	---------	-----	---------	----	--

1 1/2 16 0 7 1/2 16
grout - then brought hole up to test - OK.

Sealed 3 bad faults with thicker

OK
D.W.

HOLE No. 4-0

DATE 3/14/42

INSPECTOR

FOREMAN

page 12

Allen

McNoyd-

TIME		DEPTH	Water Test	Grout Pressure
From	To			

Grout Proportion	MATERIALS USED (Cu. ft.)			Quantity Grout (Cu. ft.)	Grout per min. (Cu. ft.)
	Cement	Sand	Water		

1:30	3:12	0:12	0	25
------	------	------	---	----

1:1	16	16	16	16
-----	----	----	----	----

This hole had several open seams west of the hole and grout was placed slowly until the pressure was gradually raised until it held at 25.

It would not hold any water pressure.

Adolph Back Inspector

3:00 P.M. to 4 P.M.

3:12	4:00	cleaning up.		
------	------	--------------	--	--

Adolph Back

HOLE No. 4-25 DATE 3/17/42

TIME			DEPTH	Water Pressure	GROUT Pressure
From	To	Hr. - Min.	Fr. - To	lbs./sq. in.	lbs./sq. in.
8:35 A	11:00 A	2-25	0:13.67		

Blowing out and washing clean for drilling.

INSPECTOR

FOREMAN

page 13

A. H. HEN

R. CHARD

GROUT Proportion	MATERIALS USED (Cu. Ft.)			Quantity GROUT (Cu. Ft.)	GROUT per min. (Cu. Ft.)
	Cement	Sand	Water		

This hole was left grouted overnight.

HOLE NO. 3-0 DATE 2/17/42

TIME		DEPTH	Water	GROUT
From	To	Fr. - To.	Test lbs./sq.in.	Pressure lbs./sq.in.

11:30 A 12:00 M 0-30 0:25.9 0

This hole would not hold pressure at
seams - above and below.

1:05 P 1:40 P) 0:25.9 10

(Shut down on account of broken
of dam site.)

(1:40 P 2:25 P 0:45) Shut down 45 min.
broken air line

2:25 P 3:45 P 1-20 0:25.9 40

To be washed out and cleaned in

INSPECTOR

FOREMAN

page 14

H. H. E. N

H. H. O. R. D

GROUT Proportion	MATERIALS USED (cu. ft.)			Quantity GROUT (cu. ft.)	GROUT per min. (cu. ft.)
	Cement	Sand	Water		

1:3 16 0 48 16

main air line crossing at base

1:1 21 0 21 21

4-hrs for redrilling

rl

HOLE No.

4-0

DATE

3/19/42

INSPECTOR

ALLEN

FOREMAN

Richard

page 15

TIME		DEPTH	Water Test	GROUT Pressure
From	To			

From	To	Hr. - Min.	Fr. - To	lbs./sq.in.	lbs./sq.in.
8:00	8:30	0-30	0:52.1	0	

This hole would not hold any water and faults above top of hole.

9:05 A	9:45 A	0:45	0:52.1	20	
--------	--------	------	--------	----	--

9:45 A	11:35 A	2:25	0:52.1	60	
--------	---------	------	--------	----	--

only gave this hole 60 lbs pressure because of bad open fault above top of hole - was very hard to deal off.

This hole to be blown out and cleaned for drilling at 3:30 P. - 4 P. S.F.

GROUT Proportion	MATERIALS USED (Cu. Ft.)			Quantity GROUT (Cu. Ft.)	GROUT per min. (Cu. Ft.)
	Cement	Sand	Water		

pressure at all - several open seams

1:3	12	0	36	12	
-----	----	---	----	----	--

1:1	29	0	29	29	
-----	----	---	----	----	--

of bad open fault above top of hole -

xl

HOLE No. 5-0

DATE 3/19/52

TIME			DEPTH		Water Test	GROUT Pressure	GROUT Proportion	MATERIALS USED (Cu. Ft.)			Quantity GROUT (Cu. Ft.)	GROUT per min. (Cu. Ft.)
From	To	Hr.-Min.	Fr. - To	lbs./sq. in.	lbs./sq. in.	Cement		Sand	Water			
11:00 A	11:15 A	0-15	106.6	150								
This hole would only take 1 1/3 cu ft of water in 3-min test.												

re

HOLE No. 3-0 DATE 3/19/42

INSPECTOR

FOREMAN

page 17

Allen

Archard

TIME		DEPTH Fr. - To	Water Test lbs./sq. in.	Grout Pressure lbs./sq. in.
From	To			

12:45 P 1:10 P 0-35 0:50.5 0

This hole would not hold water
seams below and a bad fault

1:35 P 2:00 P 0:35 0:50.5 0

changed cement proportion could not

2:00 P 4:30 2:30 0-50.5 80

Grout Proportion	MATERIALS USED (Cu. ft.)			Quantity Grout (Cu. ft.)	Grout per min. (Cu. ft.)
	Cement	Sand	Water		

pressure because of open seams
above top of hole.

1:3 7 0 31 7

deal of open seams with 1:3.

1:1 16 0 16 16

This hole had some seams near
the top that were hard to
shut off. About 4 P.M. the
leak started to stop and the
pressure was gradually brought
to 80 lbs. and it held this
with out further leakage.

Adolph Bock, Inspector

4:00 P.M. to 12 P.M.

de

HOLE NO. 5-47 DATE 2/21/52

TIME		DEPTH		Water Test	Grout Pressure
From	To	Hr. - Min.	Fr. - To	lbs./sq. in.	lbs./sq. in.
9:00	9:20	0:20	0:54.75	0	
9:45	11:00	1:15	0:54.75	12	
11:00	3:30	4:30	0:54.75	65	

This hole would not hold water pressure hole.

changed proportion to seal large open

65 lbs was all the pressure this hole

open seam 4' above top of hole - in one top seam -

INSPECTOR H. H. N. FOREMAN H. Chord. page 19

Grout Proportion	MATERIALS USED (Cu. Ft.)			Quantity Grout (Cu. Ft.)	Grout per min. (Cu. Ft.)
	Cement	Sand	Water		
1:3	14	0	43	14	
1:1	73	0	73	73	

at all - open seam below top of

seam opening 15' below top of hole.

would stand - because of very bad good seal even when except - this -

PL. off.

HOLE No. 3-38

DATE 3/24/42

INSPECTOR

FOREMAN

page 20

H. H. BEN

Hobard

TIME			DEPTH		Water Test	GROUT Pressure
From	To	Hr. - Min.	Fr. - To		lbs./sq. in.	lbs./sq. in.

8:20 A 9:00 A 0:40 0:40.6

Washing and cleaning out - to be drilled.
 This hole should be drilled another
 25' at least as it took grout freely
 at this depth.

GROUT Proportion	MATERIALS USED (Cu. Ft.)			Quantity GROUT (Cu. Ft.)	GROUT per min (Cu. Ft.)
	Cement	Sand	Water		

Hole No. 2-0 Date _____

Time			Depth	Water Test	Grout Pressure
From	To	Hr. - Min.	Fr. - To	lbs/sq.in.	lbs/sq.in.

9:30 A	10:30 A	1-0	0:71.0	125	
--------	---------	-----	--------	-----	--

This hole tested very tight would take

10:30 A	10:50 A	0-30	0:71.0		150
---------	---------	------	--------	--	-----

Inspector _____

Foreman _____

Page 21

Grout Proportion	Materials Used (Cu. Ft.)			Quantity Grout (Cu. Ft.)	Grout per. mic. (Cu. Ft.)
	Cement	Sand	Water		

only 1/2 cu ft water in 3 min.

1:3	2	0	6	2	
-----	---	---	---	---	--

Hole No. 1-0 Date 3/24/12

Time		Depth	Water Test	Grout Pressure
From	To	Hr. - Min. Fr. - To	lbs./sq. in.	lbs./sq. in.

10:50 A	11:10	0-20	0:58.8	100
This hole tested very tight - only took				

11:10 A	11:30 A	0-20	0:58.8	100
---------	---------	------	--------	-----

Inspector Allen Foreman Richard Page 22

Grout Proportion	Materials Used (Cu. ft)			Quantity Grout (Cu. ft)	Grout per Min. (Cu. ft.)
	Cement	Sand	Water		

$\frac{1}{2}$ cu ft water in 3 min

1:3	2	0	6	2	
-----	---	---	---	---	--

Hole No. 0-25 Date 3/24/42

Time		Depth		Water Test	GROUT Pressure
From	To	Hr.-Min	Fr.-To	lbs./sq.in.	lbs./sq.in.

11:30	12:00M	0-30	0-25.0	20	
-------	--------	------	--------	----	--

At 20 lbs pressure the hole lost several open seams just below very hard to seal for grout.

12:00M	1:55	1-55	0:25.0	20	
--------	------	------	--------	----	--

Changed cement proportion.

1:55	6:25			40	
------	------	--	--	----	--

Inspector

Allen

Foreman

Harold

Page 23

GROUT Proportion	Materials Used (Cu. Ft.)			Quantity GROUT (Cu. Ft.)	GROUT per Min. (Cu. Ft.)
	Cement	Sand	Water		

3 2/3 cu ft of water over three min top of hole. But will not be

1:3	25	0	75	35	
-----	----	---	----	----	--

1:1	134	0	134	134	
-----	-----	---	-----	-----	--

Adolph Beck Inspector

4:00 P.M. to 12 P.M.

The grout slowly rose in this hole from 35' below the hole until some grout came to the surface right up to and a short distance above the hole. the pressure was gradually raised from 20 lbs to 40 lbs.

Hole No. 11-23.25- Date 3/26/42

Inspector

Foreman

Page 24

Hobbs

Richard

Time		Depth		Water Test	Grout Pressure	Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (Cu.ft.)	Grout per Min. (Cu.ft.)
From	To	Hr.-Min.	Fr.-To	lbs./sq. in.	lbs./sq. in.		Cement	Sand	Water		
8:15 A	8:45 A	0-30	0-25.5								
This hole would not hold any seams and faults all around top.											
9:00 A	10:30 A	1-30	0-35.5		0	1:3	12	0	36	12	
changed to heavier cement proportion top open seams near top hard to seal.											
10:30 A	12:35 P	2:05	0-25.5		0:50	1:1	24	0	24	24	
This hole sealed off very nice and tight.											

Hole No. 10-23-25 Date 3/26/42

Inspector Allen

Foreman Echoed

Page 25

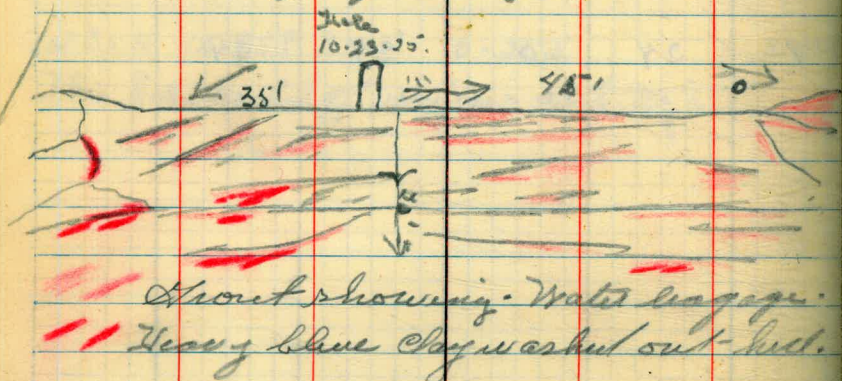
Time	Depth	Water Test	Grout Pressure
From To Hr. - Min.	Fr. - To	lbs./sq. in.	lbs./sq. in.

Grout Proportion	Materials Used (Cu. Ft.)			Quantity Grout (Cu. Ft.)	Grout per Min. (Cu. Ft.)
	Cement	Sand	Water		

2:15 P 2:45 P 0-30 0:23.0 0

This hole would not hold any water pressure at all as there were many open seams and faults and faulted out well white water clay washed out in several places and run by careful grouting it will

water pressure at all as there were all around. Washed all these seams. There was a thick blue looking. This hole is very bad on leakage, but seal up very tight.



2:45 P 3:15 P 0:30 0:23.0 0:10

Changed proportion of cement.

1:3	31	0	93	31
-----	----	---	----	----

3:30 P 4:30 1-00 0:23.0 0:50

1-1	21	0	17	21
-----	----	---	----	----

This hole gradually raised to a pressure of 50 lbs. and held this pressure until no further leaks developed.

Hole No.

13-25⁷

Date

3-26-42

Inspector

Adolph Beck

Foreman

Richard

Page 26

Time			Depth	Water Test	Grout Pressure
From	To	Hr.-Min.	Fr.-To	lbs./sq.in.	lbs./sq.in.

4:50 ^{PM}	5:15	0-25	0-28.5	0	
--------------------	------	------	--------	---	--

5:15 PM	5:30	0:15		0	
---------	------	------	--	---	--

5:30	6:30	1:00		50	
------	------	------	--	----	--

Grout Proportion	Materials Used (Cu. Ft.)			Quantity Grout (Cu. Ft.)	Grout per. Min. (Cu. Ft.)
	Cement	Sand	Water		

This hole would not hold any water pressure as large sedm near the hole.

1-3	4	0	12	4	
-----	---	---	----	---	--

1-1	15	0	15	15	
-----	----	---	----	----	--

This hole was pumped gradually until the pressure was raised to 50 lbs and it hold this pressure without further leakage

Hole No.

11-93-

Date

3/28/44

Inspector

Allen

Foreman

Richard

Page 27

Time

Depth

Water Test

Grout Pressure

Grout Proportion

Materials Used (Cu. Ft.)

Quantity Grout (Cu. Ft.)

Grout per Min. (Cu. Ft.)

From

To

Hr.-Min.

Fr.-To

lbs./sq. in.

lbs./sq. in.

Cement

Sand

Water

8:15 A

8:30 A

0-15

0:78.2

0:50

This hole only took 1 1/2 cu ft water in

3-min test. Very tight.

Hole No. 16-213- Date 3/28/41

Time Depth Water Grout
From To Hr.-Min. Fr.-To Test Pressure
lbs./sq.in. lbs./sq.in.

8:30A 8:45A 0-15 0-50 0.50

This hole only took 1 2/3 cu ft water in

Inspector

H. H. N.

Foreman

H. H. N.

Page 28

Grout Materials Used (Cu. Ft.) Quantity Grout
Proportion Cement Sand Water (Cu. Ft.) per Min.
(Cu. Ft.)

3-min test - very tight

Hole No. 17-25 Date 3/28/42

Inspector H. L. Egan Foreman H. Chard Page 29

Time		Depth	Water Test	Grout Pressure
From	To			

Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (cu.ft.)	Grout per Min. (cu.ft.)
	Cement	Sand	Water		

9:45H 10:20H 0-35 0:26.6 0

This hole would not hold pressure and faults above top of hole.

at all - several large open seams

10:20H 11:20H 1-0 0:26.6 0:10

changed proportion cement to large seams

1:3	31	0	93	31	
-----	----	---	----	----	--

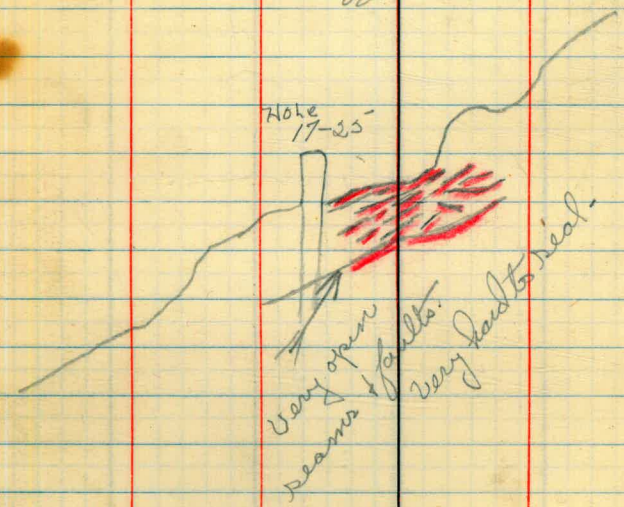
above.

11:20H 2:45P 4-25 0:26.6 0:50

This hole sealed off tight - but still

1-1	39	0	39	39	
-----	----	---	----	----	--

very bad seams above top of hole -



Hole No. 13-27 Date 3/28/49

Time		Depth	Water Test	Grout Pressure
From	To	Hr-Min Fr-To	lbs./sq.in.	lbs./sq.in.

2:45 P	3:15 P	0-30	0.53	0
--------	--------	------	------	---

This hole would not hold pressure
 heavy seepage below top of hole

3:15 P	3:30 P	0-30	0.53 ^{50.3}	0:10
--------	--------	------	----------------------	------

Changed proportion of cement to seal

3:30 P	4:00 P	0-30	0.53 ^{50.3}	0:10.0
--------	--------	------	----------------------	--------

This hole sealed off very tight.

Inspector Hillen Foreman Richard Page 30

Grout Proportion	Materials Used (cu.ft)			Quantity Grout (cu.ft)	Grout per min (cu.ft)
	Cement	Sand	Water		

at all sight next to road deep and
 very hard to seal-

1:3	6	0	18	6
-----	---	---	----	---

Open seams at top of hole-

1:1	5	0	5	5
-----	---	---	---	---

Hole No. 9-23²⁵ Date 3-28-42

Time			Depth Fr.-To	Water Test lbs./sq.in.	Grout Pressure lbs./sq.in.
From	To	Hr.-Min.			
4:00	5:00	1-00			
5:00	6:00	1-00	0-21 ⁵		
6:00	6:30	0-30	0-21 ⁵		0
Change mix 1 to 1					
6:30	11:30	5-00			5

Note: 160 sack of cement was used in this hole but at 10:15 the seam near the hole broke loose again and while they were trying to stop it I estimated that 20 sacks of cement were lost. So I have only shown 120 sacks in the hole.

This hole would not stand full pressure until the grout in the top has a chance to set up.

Inspector

Edolph Back

Foreman

Harold

Page 31

Grout Proportion	Materials Used (cu.ft.)			Quantity Grout lb. (cu.ft.)	Grout per min (cu.ft.)
	Cement	Sand	Water		
1-3	20	0	50	20	
1-1	20 140	0	20 140	140	

Hole # 9-23²⁵ was making some water, and shortly after starting to grout hole # 8-23²⁵ this flow increased considerably and for 2 hours it had a muddy look but did not seem to contain very much grout. After that the flow became quite clear but was reduced some in quantity.

Hole No. 11-0 Date 2/2/13

Inspector

Foreman

Page 32

Time			Depth	Water Test	Grout Pressure
From	To	Hr.-Min.	Fr.-To	lbs./sq.in.	lbs./sq.in.

12:00 M 12:30 P 0:30 0:25.6 0:40

At 40 lbs water pressure this hole took to north side of hole.

12:30 P 1:45 P 1:15 0:25.6 0:40

changed proportion of cement to seal

1:45 P 2:10 P 0:25 0:25.6 0:50

This hole can be washed out at 4:00 P.

Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (cu.ft.)	Grout per min. (cu.ft.)
	Cement	Sand	Water		
1:3	8	0	24	8	
1:1	3	0	3	3	

2 3/8 cu ft of water - reveal open seams

open seam north of top of hole

Hole No. 11-23 Date 8/31/44

Inspector H. H. H. H. Foreman H. H. H. H. Page 33

Time		Depth	Water Test	Grout Pressure
From	To	Hr.-Min.	Fr.-To	lbs./sq.in.

8:00 H	8:30 H	0-30	0-10	0:40
--------	--------	------	------	------

This hole took 7 cu ft water in 2 min

8:30 H	11:00 H	2-30	0:10	0:100
--------	---------	------	------	-------

changed proportions of cement to seal opening

11:00 H	11:50 H	0:50	0:10	0:150
---------	---------	------	------	-------

This hole can be washed out at 6:00 P

Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (cu.ft.)	Grout per min (cu.ft.)
	Cement	Sand	Water		
7:3	84	0	252	84	
7:1	11	0	11	11	

Test-

seal above top of hole.

Hole No. 10-23 Date 2/21/42

Inspector Allen Foreman Achor Page 34

Time		Depth	Water Test	GROUT Pressure
From	To	Fr.-To	lbs./sq.in.	lbs./sq.in.

2:10P	2:30P	0-20	0:114.5	0:150
-------	-------	------	---------	-------

This hole took $4\frac{1}{2}$ cu ft of water in 2 min

2:30P	3:00P	0:30	0:114.5	150
-------	-------	------	---------	-----

No leakage - very tight hole.

This hole can be blown out for

GROUT Proportion	Materials Used (cu.ft.)			Quantity GROUT (cu.ft.)	GROUT per min. (cu.ft.)
	Cement	Sand	Water		

test - at 150 lbs pressure -

1:3	4	0	12	4	
-----	---	---	----	---	--

redrilling at 6:30 P.

Hole No. 7-23-

Date 4/2/44

Inspector

Foreman

Page 35

Time		Depth	Water Test	Grout Pressure	Grout Proportion	Materials Used (cu.ft)			Quantity Grout (cu.ft)	Grout per min (cu.ft)
From	To	Fr-To	lbs./sq.in.	lbs./sq.in.		Cement	Sand	Water		
11:30 A	12:00 M	0-30	0:30.0	0.50.0						
At 50 lbs pressure this hole took all around top hole - 3 1/2 cu.ft of water leakage showed up										
12:30 P	2:00 P	1-30	0:30.0	0:40.0	1:3	16	0	48	16	
2:00 P	2:30 P	0:30	0:30.0	0:50.0	1:1	6	0	6	6	
This hole sealed off tight.										

Hole No. 8-23-

Date 4/2/44

Inspector

Allen

Foreman

Richard

Page 36

Time		Depth	Water Test	Grout Pressure
From	To	Fr.-To	lbs./sq.in.	lbs./sq.in.

2:30 P	3:00 P	0-30	0-55.0	100
--------	--------	------	--------	-----

This was a water test on this hole and at 100 lbs. it would only take $1\frac{3}{4}$ cu ft of water in running a free stream of water.

Grout Proportion	Materials Used (cu ft)			Quantity Grout (cu. ft)	Grout per min. (cu. ft)
	Cement	Sand	Water		

hole and at 100 lbs. it would only take $1\frac{3}{4}$ cu ft of water in running a free stream of water.

Hole No. 11-0 Date 4/2/42

Inspector Allen

Foreman Richard

Page 37

Time		Depth	Water Test	Grout Pressure
From	To	Fr-To	lbs./sq.in.	lbs./sq.in.

4:00 P	4:20 P	0-20	0:45	90
--------	--------	------	------	----

This hole only took 2 cu ft of
OK for drilling.

Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (cu.ft.)	Grout per min. (cu.ft.)
	Cement	Sand	Water		

water in 3 min test =

Hole No. 11-23

Date 4/2/42

Inspector Allen

Foreman H. G. ...

Page 38

Time		Depth	Water Test	Grout Pressure
From	To			

4:15 P 4:30 P 0-15 0:11 4.5 100

This hole on tool 2 1/3 ft. of water
 5 1/2 in. diameter

Grout Proportion	Materials Used (cu. ft)			Quantity Grout (cu. ft)	Grout per min. (cu. ft)
	Cement	Sand	Water		

on 3 min test =

Hole No. 10-0

Date 4/2/42

Inspector

Foreman

Adolph Book

Acherd

Page 39

Time		Depth		Water Test lbs./sq.in.	Grout Pressure lbs./sq.in.
From	To	Hr.-Min.	Fr.-To		
4:20 PM	5:00	0-40	0-23	0	
5:00 PM	5:15	0-15	0-23	0	0
5-15 PM	7:00 PM				50

Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (cu.ft.)	Grout per min. (cu.ft.)
	Cement	Sand	Water		
1-3	6		18	6	
1-1	36		36	36	

Pumping water and washing out would not hold pressure as it had several open seams near the surface.

Pressure was raised on this hole until it sealed.

Hole No. 10-0Date 4-4-42Inspector
CavanaughForeman
Archard

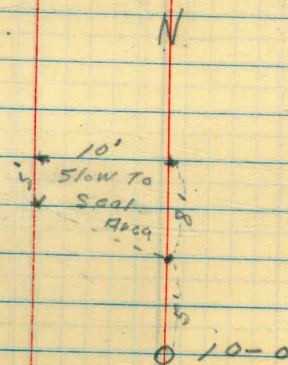
Page 40

Time		Depth	Water Test	Grout Pressure
From	To	Fr.-To	lbs./sq.in.	lbs./sq.in.

8:55A	9:20A	0-25		Grav.
9:20A	11:30A	2-10		
		48.5		

Pressure Gravity to 10AM
 " To 30/65 Lost
 " " 100# 11:30AM OK

3 PM. Hole Washed out
 for Drilling



Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (cu.ft.)	Grout per min. (cu.ft.)
	Cement	Sand	Water		
3-0	13	0	39	13	
1-0	44	0	44	44	

12

Hole No. 8-23

Date 4-4-42

Inspector

Foreman

Page #1

Cavanagh

Time		Depth	Water Test	Grout Pressure
From	To			

9:35 9:40

100.

75'

After Test Blue Muck Flowing from Pipe

Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (cu.ft.)	Grout per min. (cu.ft.)
	Cement	Sand	Water		

12.0

Hole No. 9-0

Date 4-4-42

Inspector

Cavanaugh

Foreman

Achord

Page 42

Time		Depth Fr. - To	Water Test lbs/sq. in.	Grout Pressure lbs/sq. in.
From	To			

9:40 9:50

24.5 80.

Grout Proportion	Materials Used (cu. ft.)			Quantity Grout (cu. ft.)	Grout per. min. (cu. ft.)
	Cement	Sand	Water		

Hole No. 10-23²⁵

Date 4-4-42

Inspector

Foreman

Page 43

Cavanaugh

Achord

Time		Depth Fr. - To	Water Test lbs/sq. in.	Grout Pressure lbs/sq. in.	Grout Proportion	Materials Used (cu ft)			Grout per Min. cu. ft.
From	To					Hr. - Min.	Cement	Sand	
9:55	10:00		Tight					2	
12:	12:30	162.0		160	3-0	2			

pl

Hole # 11-0

Date 4-4-42

Cavanaugh

Anchor

From	To	Time	Depth	Water T.	GROUT Pressure
------	----	------	-------	----------	----------------

161.0

10:10

150

1:PM 2:15

170

GROUT

Cement

Water

1.0
3.0

6
4

3

12:30 PM. Blew Hole

Flow
From Seam - 30' North of Hole
against Rock cut. Stopt 2 PM.

Hole No 11-23²⁵

Date 4-4-42

Caranough

Time		Depth	water	Grout
From	To		Test	

2:20	2:40	155.5		160
------	------	-------	--	-----

Grout				
2:50 PM	3:45			180

Hole Blown out 2:45 PM

Grout	Proportion	Cement	Water
			1
1-0-1			
1-0		2	
3-0		3	
1-0-3			

PL

Hole No. 10-0 Date April 5-42

Inspector
P. R. Curry

Foreman
Achord

Page 46

Time		Depth		Water Test	Grout Pressure
From	To	Hr.-Min.	Fr.-To	Lbs./Sq. in.	Lbs./Sq. in.

8-20 a.m.	8-40 a.m.	0-20	0-74.1	30	
8:50	9:20	0-30	0-74.1		50.0
9:20	10:10	0-50	0-74.1		125.0

Grout Proportion	Materials Used (cu. ft.)			Quantity Grout (Cu. ft.)	Grout Per Min. (Cu. ft.)
	Cement	Sand	Water		

1-3	19.0	0.0	57.6	19.0	
1-1	11.0	0.0	11.0	11.0	

Notes -

This hole had quite a large seam that the Grout re appeared on the surface in. Approx. 12 ft East of hole and 2' to 10' North of axis. This hole built up the desired pressure with a small loss on the surface.

This hole took water when tested at 7 cu. ft. in 3 min at 0 to 30 lbs.

(9-22)

Hole No. 8-22 (?)	Date Apr 5-42
Time	Depth
From To	Hr.-Min. Fr.-To
	Water test Pressure
	lbs./sq. in. lbs./sq. in.

10:25 AM	10:55	0-30	0-75	125.0
10:55 AM	10:00 PM	11-05	0-75	90.0
10:00 PM	10:45 PM	0-45	0-75	170.0

Notes - The connection on Hole 8-22 put approx. the same pressure on Hole 9-22.

This hole leaked a small amount of Grout into Hole 10-0 but when cap was removed after a short time it had sealed off completely.

Inspector J.R. Curry Foreman Achord Page 47

Grout Proportion	Material Used (cu.ft.)			Quantity Grout cu.ft.	Grout Per Min. Cu.ft.
	Cement	Sand	Water		
				25	
	Took 12 cu. ft. of water in 3 min.				
1-3	688.0	0		688.0	
1-1	28.0		2148.0	28.0	

HOLE No. 10-0 Date 4/7/42

INSPECTOR H. S. C. N. FOREMAN Richard Page 48

From	To	H ₂ O Min.	DEPTH Ft. - To	Water Test lbs./sq. in.	Grout Pressure	Grout Proportion	MATERIALS USED (Cu. ft.)			Quantity Grout Cu. ft.	Grout per Min. Cu. ft.
							Cement	Sand	Water		
9:15 A	9:45 A	0-30	0:12:1.0		50	1:3	9	0	37	9	
9:45 A	2:15 P	4-30	0:12:1.0		150	1:1	59	0	59	59	

Had some trouble sealing this hole off - because of large loose rocks to the right of hole, with large open seams running under same. But this hole sealed off tight at 150 lbs pressure -

PL .

800-56.9
Hole No 8-0 Date 4/7/42
Time Depth Water Grout
From To Hrs-Min. Fr.-To Test Pressure
lbs/sq. in. lbs/sq. in.

10:30A 10:45A 0-15 0:56.9 0

This hole would not hold water pressure at all. Took 7 cu ft of water in 3 min test. Commencing from many open seams on the surface around top of hole -

Hole No 8-0 Date 4-7-42
2:45 PM 4:30 PM 1-45 0-56.9 120.0

3 sks waste in agitator and line.

INSPECTOR
H. W. E. N. — Achord
Page 49
Grout Materials Used (cu. ft.) Quantity Grout per
Proportion Cement Sand Water. (Cu. ft.) (Cu. ft.)

D. P. Curry Achord
1-1 18.0 0.0 18.0 18.0

PR

8-23-

4-7/42

50

3:35 P 4:00 P 0-25 0:100.0 135

This hole at 135-lbs water pressure
would take all the water we could
pump in to it.

No water showing anywhere
on surface -

(next page - 51)

pl

Hole No

9-0

Date

4/9/42

Inspector

Allen

Foreman

H. Chord

51

Time		Depth	Water	Grout Pressure	
From	To				Hr-Min

8:15 A 8:45 A 0-30 0:82.5 0.65

This hole took 7 cu. ft. of water in a 3 min test - several leaks showing upon surface -

8:45 A 9:15 A 0-30 0:82.5 0:0

Unable to seal with 1:3 at all -

9:15 A 1:15 P 4-0 0:82.5 0:125

This hole sealed off very tight - but very likely to open seams again on next set-up of drilling - very bad around nipple -

Grout Proportions	Materials used (cu. ft.)			Quantity Grout (cu. ft.)	Grout per min. (cu. ft.)
	Cement	Sand	Water		

1:3 5 0 15 5

1:1 32 0 32 32

pl.

8-0

4/9/42

H. Chord-

52

Time		Depth		Grout Pressure
From	To	hr-Min	Fr-To	

10:00 A	10:30 A	0:30	0:86.6	120
---------	---------	------	--------	-----

#1 120 lbs this hole took 7 cu ft of water, on stopping the pumps this hole built up a 25-lb back pressure - upon releasing the back pressure water flowed from hole with quite some force, showing a thick dull blue color -

2:30 P	4:00 P.M.	1-30	0:86.6	
--------	-----------	------	--------	--

4:00 P.M.	4-20 P.M.	0-20	0-86.6	20.
-----------	-----------	------	--------	-----

4:20 P.M.	9:05 P.M.	4-45	0-86.6	125.0
-----------	-----------	------	--------	-------

Notes this hole sealed off very good. The Grout reappeared on surface in almost same locations as it reappeared from last Grouting of hole 7-22.

Allen

Grout Preparation	Materials used			Quantity Grout Cu Ft.
	Cement	Sand	Water	

1-3

D.P. Curry

achord-

1-3	150	0.0	450.0	150
-----	-----	-----	-------	-----

1-1	349	0.0	349.0	349.0
-----	-----	-----	-------	-------

3 sks waste.

pl

8-23

4/9/40

Allen

Hoyd

53

1:30P 2:15P 0-45 0:100 0:180

1:3

30

0

60

20

This hole has a back pressure
of 165 lbs and would not take
any more grout under 180 lbs -
but I tried this hole at 200 lbs
and it took 7 cu ft of grout in
2-min, no showing leaks
anywhere on surface - dropped
pressure back to 185 lbs and sealed
hole off. This hole been running
water at all times -

Before sealing off, the pressure made
a showing of blue mud
showing in Block-10 where they
were pouring concrete.

PL

Hole No. 17-0 Date -----

Inspector

Foreman

Allen

Hebord

Page 54

Time		Depth	Water	Grout
From	To	Hr.-Min. Fr-To	Test lbs./sq.in.	Pressure lbs./sq.in.

Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (cu.ft.)	Grout per min. (cu.ft.)
	Cement	Sand	Water		

8:30 A	9:00 A	0:30	0:26.5	40
--------	--------	------	--------	----

At this pressure this hole took $4\frac{1}{3}$ cu ft. of water. 3-min test - several leaks showing on surface near top of hole.

1:1	36	0	36	36	
-----	----	---	----	----	--

9:45 A	11:45 A	2-0	0:26.5	40
--------	---------	-----	--------	----

Several bad seams around top of hole very hard to seal - but sealed off tight - at 40 lbs -

Noted.

Hole No. 16-0Date 4-16-42

Time		Depth	Water	Grout
From	To	Fr-To	Test lbs./sq.in	Pressure lbs./sq.in.
11:45 A	12:10 P	0-25	0-25.0	40
12:30 P	2:30 P	2: 0	0:25.0	50

This hole took $4\frac{3}{4}$ cu ft of water in 3-min test - leaks on surface around top of hole -

28
7/4
8

Inspector

H. L. C. N.

Foreman

H. C. H. O. R. D.

Page 55

Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (cu.ft.)	Grout per min. (cu.ft.)
	Cement	Sand	Water		
1:3	28	0	84	28	

Notes

Notes

Hole No. 10-0 Date 4-21-42

Time		Depth	Water Test	GROUT PRESSURE
From	To	Hr.-Min.	Fr.-To	lbs./sq. in.

8:30 A	10:30	2-0	0.164.6	100
--------	-------	-----	---------	-----

10:30 A	12:30 P	2-0	0.164.6	200
---------	---------	-----	---------	-----

Inspector

Allen

Foreman

Eschard

Page 56

GROUT PROPORTION	MATERIALS USED (cu. ft.)			QUANTITY GROUT (cu. ft.)	GROUT PER MIN. (cu. ft.)
	Cement	Sand	Water		
1:3	33	0	69	23	
1:1	10	0	10	10	

Noted

Hole No. 13-25 Date 1-21-42

Inspector H. H. H. H.

Foreman H. H. H.

Page 57

Time		Depth Fr-To	Water Test lbs./sq.in.	Grout Pressure lbs./sq.in.
From	To			

3:00 P	4:00 P	1-0	0.1470	200
TINAH - GROUTING.				

Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (cu.ft.)	Grout per min. (cu.ft.)
	Cement	Sand	Water		

1:3	2	0	6	2	
-----	---	---	---	---	--

Noted.

Hole No 14+25Date 4-23-42

Inspector

Foreman

McCown Daybill Richard

Page 58

Time		Depth Fr-To	Water Test lbs./sq.in.	Grout Pressure lbs./sq.in.
From	To			

8:20 AM	8:50 AM	30	62 ⁵ 132 ⁵	100
8:50 AM	9:00 AM	10		
9:00 AM	9:45 AM	45		80
9:45 AM	12:30	2:45		80 to 185

Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (cu.ft.)	Grout per min. (cu.ft.)
	Cement	Sand	Water		

					washed out.
					Blowed out with air
3-1	16			48	
7-0	55			55	
					Sealed at 185 ^{lb} pressure.
					Moved to 15.0

R.

Hole No. 15+00

Date

Inspector

Foreman

Page 59

Time		Depth Fr-To	Water Test lbs/sq in
From	To		
8:00	8:20	20 0-49.5	10#
12:50	3:00 PM	2-10 0-49.5	5# to

grout ran freely from crack below hole at elev. joining grouting from 14+25. Crack plugged.

Crack under large rock thru which hole drilled completely sealed. Not safe to put pressure on due to danger lifting rock.

Grout Proportion	Materials Used (cu. ft.)			Quantity Grout (cu. ft.)	Grout per min. (cu. ft.)
	Cement	Sand	Water		
1-0	35	0	35	35	

washed open crack below hole
prevented pressure water
noted rising from pipe in 14+25
mored to 14+25 to grout first.

✓

Hole No. 15+25

Date

Inspector

Foreman

Page 60

Time		Depth Fr-To	Water Test lbs./sq.in.	Grout Pressure lbs./sq.in.
From	To			

12:00 12:15 100'

3:20 3:50 30 257-739

3:50 4:25 35

Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (cu.ft.)	Grout per min. (cu.ft.)
	Cement	Sand	Water		

open.

30 17 0 51 17

10 25 0 25 25

grout passing to
hole No 16+00 which is
drilling.

Note: 3 sacks wasted.

R.P.

Hole No. 18-0 Date 4-27-42

Time		Depth	Water Test	Grout Pressure
From	To	Fr-To	lbs./sq.in.	lbs./sq.in.

8:00 A	8:15 A	0-15	0:26.5	40
--------	--------	------	--------	----

This hole took 3 cu ft - water in 3 min
 but several small leaks showing
 on surface near top of hole.

8:15 A	9:00 A	0-45	0:26.5	35
--------	--------	------	--------	----

9:00 A	10:30 A	1-30	0:26.5	50
--------	---------	------	--------	----

This hole sealed off tight.

Washed out 26.5"

Inspector

Allen

Foreman

Richard

Page 61

Grout Proportion	Materials Used (cu.ft.)			Quantity Grout (cu.ft.)	Grout per min. (cu.ft.)
	Cement	Sand	Water		

1:3	9	0	18	9	
-----	---	---	----	---	--

1:1	11	0	11	11	
-----	----	---	----	----	--

Noted.

Hole No. 10-11 Date 3-27-42

Time		Depth		Water Test	Grout Pressure
From	To	Hr-Min.	Fr. To.	lbs./sq. in.	lbs./sq. in.

10:30 A	11:15 A	0:45	0:30:0	45	
---------	---------	------	--------	----	--

At 45 lbs pressure this hole took 2 3/4 cu ft of water, no leaks showing except - water came up thru pipe on hole 10-11.

11:15 A	12:30 P	1-15	0:25:0	55	
---------	---------	------	--------	----	--

This probe sealed tight. JINDL

Inspector

Allen

Foreman

Howard

Page 62

Grout Proportion	Materials Used (cu.ft.)			Quantity (Grout) (cu.ft.)	Grout per min. (cu.ft.)
	Cement	Sand	Water		

7:3	11	0	33	11	
-----	----	---	----	----	--

ll

10-34

12:30 P 1:00 P 0-30 0:20:10 100

This hole sealed off - Tight. FINAL

63

113 3 0 9 3

PL

15-0

4-27-42

2:30P 5:00P 2-30 0:77.0 35

Sealed this hole of AT 35 lbs
as it is very loose around top of
hole.

This hole was washed out at
8:30P to depth of 77.0-

ALLEN

64
Achsrd-

~~1:1 20 0 20 20~~

Noted

9-0

4-29-42

Allen

Richard

8
65

9:00 A 10:15 A 1-15 6:165.0 190

1:3 16 0 48 16

FINAL GROUTING

RP

8-34-

4-29-42

10:30 A 100 F 2-30 0:25.0 2.00

= FINAL =

78

66

ALLEN

Hayden

7.3 26 0 78 26

RE

8-11

4-29-42

Allen

Archard-

67

1.00 P 2:30 P 1-30 0:35.0

2.00

113

25

0

75

25

= SIGNAL =

RE

14-0

4-29-42

From to Pressure

2:30 P	5:30 P	3-0	130	136	100
5:30 P	7:30 P	2-0	0	136	180

Adolph Bock
4 p.m. to 12 P.m.

Achorad 68

	Cement	Sand	Water	Grout
113	123	0	369	123
111	56	0	56	56

At 4:30 a small amount of water started to appear out of Hole #15-0 and grout start coming out at 5:30 P.m. This hole was then capped. Some grout also appeared in a crack 20' north of hole #14-0 and at a crack 15' north of hole #13-25

RF

WATER - Tight

	DATE	NO	DEPTH
4/9/42	6-25		54.7
4/9/42	6-23		24.2
4/11/42	8-0		117.8
4/11/42	9-0		106.5
4/11/42	10-0		164.5-?

? This hole water tested - but would only hold 80 lbs pressure, leaks showing up in several places thru the concret poured in blk 10.

4/18/42	14-0		43.0
4/18/42	16-25		96.0
4/19/42	13-25		127.0
4/21/42	14-0		69.0
4-21-42	14-25		90.0
4-21-42	15-25		52.3
4-21-42	16-0		55.0
4-22-42	17-25		92.0
4-23-42	16-0		80.0
4-23-42	14-0		111.0
4-29-42	15-0		92.0

was med. out 140

DATE - NO - DEPTH

4-16-42	16-25		58.8
4-16-42	18-25		53.0
4-16-42	16-0		22.0
4-17-42			
4-18-42			
4-20-42	17-25		69.0
4-20	17-0		85.0
25-	15-0		47.0
25-	15-25		73.0
27-	18-0		26.0
27	15-0		77.0

lots of drillout

FINAL EAST-Side.

Hohe. no. Depth

13-25

14-25

15-25

16-25

17-25

18-25

19-25

~~20-25~~

Bottom-

16-23- 95.8

6-25- 154.6

7-0

7-25

8-0

9-25

9-0

10-25

No. a no.	ZINRL Depth.	West-Side		Projected to Depth = F.
0-25-?			25' 3/24	
1-0	58.8			
1-25	65.			
2-0	72.5			71.0
2-25	80.13			80.1
3-0	88.9			88.5
3-25	99.8			99.8
3-38-?	40.6	3/24/42		
4-0	105.5			110.6
4-25	123.3			125.9
5-0	121.4			121.10
5-23	133.6			132.6
5-47	138.6			
2-39-?				

DATE	Cement on Hand. no-sacks	Cement used.	WASTE on grout	Cement Brought on Job
3/2/42	50	23	2-cu'	
3/4/42	90	8	2-cu'	
3/12/42	178	127	2-cu'	
3/14/42	76	61	4	
3/17/42	65			
3/19/42	125	66	2	
3/21/42	171		3	
3/24/42	251	163	2	
3/26/42	230	107	1	
3/28/42	248	221	20	
3/31/42	201	110	1-9	
4/2/42	132	64	5-5	
4-5-42	128	749	3.0	700.
4/7/42	162	86.0	3.0	100
4/9/42	247	556	3.0	403
4/16/42	210	54	3.	
4/29/42	375	240	2	

		Depth of Hole-	Air- Gauge- Pressure	Loss of Pressure in ft.
1"	.08	25'	50	1-1/3
3"	.17	50'	100	2-2/3
3"	.25	75'	125	4-0
4"	.33	100'	150	4-1/3
5"	.42	125'	150	4-2/3
6"	.50	150'	180	5-1/3
7"	.58	160'	200	5-2/3
8"	.67			
9"	.75			
10"	.83			
11"	.92			
12"	1.00			

Drill-Holes
Depth

770-8 ÷ 2.

1-25-	1-0
2-25-	2-0
3-25-	3-0
4-25-	4-0
5-47-	5-0
5-23-	

CURVE TABLES.

Published by KEUFFEL & ESSER CO.

HOW TO USE CURVE TABLES.

Table I. contains Tangents and External to a 1° curve. Tan. and Ext. to any other radius may be found nearly enough, by dividing the Tan. or Ext. opposite the given Central Angle by the given degree of curve.

To find Deg. of Curve, having the Central Angle and Tangent:
Divide Tan. opposite the given Central Angle by the given Tangent.
To find Deg. of Curve, having the Central Angle and External:
Divide Ext. opposite the given Central Angle by the given External.

To find Nat. Tan. and Nat. Ex. Sec. for any angle by Table I.: Tan. or Ext. of twice the given angle divided by the radius of a 1° curve will be the Nat. Tan. or Nat. Ex. Sec.

EXAMPLE.

Wanted a Curve with an Ext. of about 12 ft. Angle of Intersection or I. P. = 23° 20' to the R. at Station 542+72.

Ext. in Tab. I opposite 23° 20' = 120.87
120.87 ÷ 12 = 10.07. Say a 10° Curve.

Tan. in Tab. I opp. 23° 20' = 1183.1
1183.1 ÷ 10 = 118.31.

Correction for A. 23° 20' for a 10° Cur. = 0.16
118.31 + 0.16 = 118.47 = corrected Tangent.

(If corrected Ext. is required find in same way)
Ang. 23° 20' = 23.33° ÷ 10 = 2.3333 = L. C.

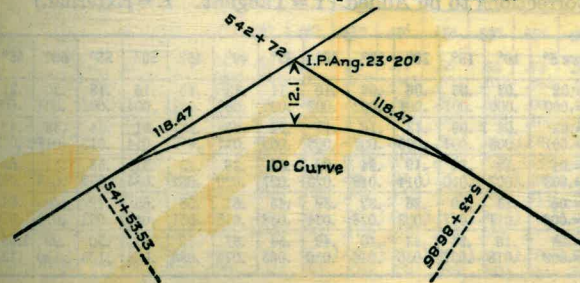
2° 19 1/2' = def. for sta.	542	I. P. = sta.	542+72
4° 49 1/2' = " " "	+50	Tan. =	1.18.47
7° 19 1/2' = " " "	543	B. C. = sta.	541+53.53
9° 49 1/2' = " " "	+50	L. C. =	2.33.33
11° 40' = " " "	543+	E. C. = Sta.	543+86.86

100 - 53.53 = 46.47 × 3' (def. for 1 ft. of 10° Cur.) = 139.41' =

2° 19 1/2' = def. for sta. 542.

Def. for 50 ft. = 2° 30' for a 10° Curve.

Def. for 36.86 ft. = 1° 50 1/2' for a 10° Curve.



Natural Trigonometrical Functions

Angle. Sin. Tan. Sec. Cosec. Cotg. Cosin.							Angle. Sin. Tan. Sec. Cosec. Cotg. Cosin.						
32	.5299	.6249	1.1792	1.887	1.600	.84805	53	.6293	.8098	1.2868	1.589	1.235	.77715
10	.5324	.6289	1.1813	1.878	1.590	.84650	50	.6316	.8146	1.2898	1.583	1.228	.77531
20	.5348	.6330	1.1835	1.870	1.580	.84495	40	.6338	.8195	1.2929	1.578	1.220	.77347
30	.5373	.6371	1.1857	1.861	1.570	.84339	30	.6361	.8243	1.2959	1.572	1.213	.77162
40	.5398	.6412	1.1879	1.853	1.560	.84182	20	.6383	.8292	1.2991	1.567	1.206	.76977
50	.5422	.6453	1.1901	1.844	1.550	.84025	10	.6406	.8342	1.3022	1.561	1.199	.76791
33	.5446	.6494	1.1924	1.836	1.540	.83867	57	.6428	.8391	1.3054	1.556	1.192	.76604
10	.5471	.6536	1.1946	1.828	1.530	.83708	50	.6450	.8441	1.3086	1.550	1.185	.76417
20	.5495	.6577	1.1969	1.820	1.520	.83549	40	.6472	.8491	1.3118	1.545	1.178	.76229
30	.5519	.6619	1.1992	1.812	1.511	.83389	30	.6494	.8541	1.3151	1.540	1.171	.76041
40	.5544	.6661	1.2015	1.804	1.501	.83228	20	.6517	.8591	1.3184	1.535	1.164	.75851
50	.5568	.6703	1.2039	1.796	1.492	.83066	10	.6539	.8642	1.3217	1.529	1.157	.75661
34	.5592	.6745	1.2062	1.788	1.483	.82904	56	.6561	.8693	1.3251	1.524	1.150	.75471
10	.5616	.6787	1.2086	1.781	1.473	.82741	50	.6583	.8744	1.3284	1.519	1.144	.75280
20	.5640	.6830	1.2110	1.773	1.464	.82577	40	.6604	.8796	1.3318	1.514	1.137	.75088
30	.5664	.6873	1.2134	1.766	1.455	.82413	30	.6626	.8847	1.3352	1.509	1.130	.74896
40	.5688	.6916	1.2158	1.758	1.446	.82248	20	.6648	.8899	1.3386	1.504	1.124	.74703
50	.5712	.6959	1.2183	1.751	1.437	.82082	10	.6670	.8952	1.3421	1.499	1.117	.74509
35	.5736	.7002	1.2208	1.743	1.428	.81915	55	.6691	.9004	1.3456	1.494	1.111	.74314
10	.5760	.7046	1.2233	1.736	1.419	.81748	50	.6713	.9057	1.3492	1.490	1.104	.74120
20	.5783	.7089	1.2258	1.729	1.411	.81580	40	.6734	.9110	1.3527	1.485	1.098	.73924
30	.5807	.7133	1.2283	1.722	1.402	.81412	30	.6756	.9163	1.3563	1.480	1.091	.73728
40	.5831	.7177	1.2309	1.715	1.393	.81242	20	.6777	.9217	1.3600	1.476	1.085	.73531
50	.5854	.7221	1.2335	1.708	1.385	.81072	10	.6799	.9271	1.3636	1.471	1.079	.73333
36	.5878	.7265	1.2361	1.701	1.376	.80902	54	.6820	.9325	1.3673	1.466	1.072	.73135
10	.5901	.7310	1.2387	1.695	1.368	.80730	50	.6841	.9380	1.3711	1.462	1.066	.72937
20	.5925	.7355	1.2413	1.688	1.360	.80558	40	.6862	.9435	1.3748	1.457	1.060	.72737
30	.5948	.7400	1.2440	1.681	1.351	.80386	30	.6884	.9490	1.3786	1.453	1.054	.72537
40	.5972	.7445	1.2466	1.675	1.343	.80212	20	.6905	.9545	1.3824	1.448	1.048	.72337
50	.5995	.7490	1.2494	1.668	1.335	.80038	10	.6926	.9601	1.3863	1.444	1.042	.72136
37	.6018	.7536	1.2521	1.662	1.327	.79864	53	.6947	.9657	1.3902	1.440	1.036	.71934
10	.6041	.7581	1.2549	1.655	1.319	.79688	50	.6967	.9713	1.3941	1.435	1.030	.71732
20	.6065	.7627	1.2577	1.649	1.311	.79512	40	.6988	.9770	1.3980	1.431	1.024	.71529
30	.6088	.7673	1.2605	1.643	1.303	.79335	30	.7009	.9827	1.4020	1.427	1.018	.71325
40	.6111	.7720	1.2633	1.636	1.295	.79158	20	.7030	.9884	1.4061	1.422	1.012	.71121
50	.6134	.7766	1.2661	1.630	1.288	.78980	10	.7050	.9942	1.4101	1.418	1.006	.70916
38	.6157	.7813	1.2690	1.624	1.280	.78801	52	.7071	1.0000	1.4141	1.414	1.000	.70711
10	.6180	.7860	1.2719	1.618	1.272	.78622	50						
20	.6202	.7907	1.2748	1.612	1.265	.78442	40						
30	.6225	.7954	1.2778	1.606	1.257	.78261	30						
40	.6248	.8002	1.2808	1.601	1.250	.78079	20						
50	.6271	.8050	1.2838	1.595	1.242	.77897	10						

Cosin. Cotg. Cosec. Sec. Tan. Sin. Angle

Cosin. Cotg. Cosec. Sec. Tan. Sin. Angle

9-0-156

8.5

71

6-23.5

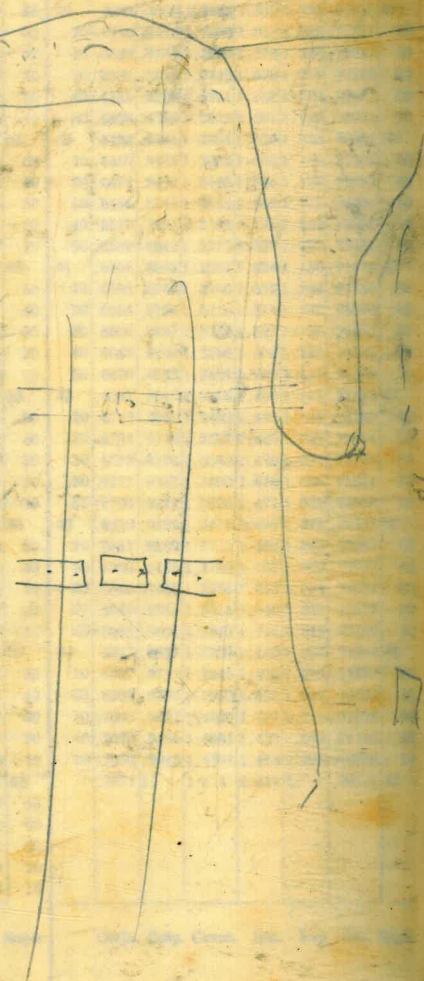
6-25

28

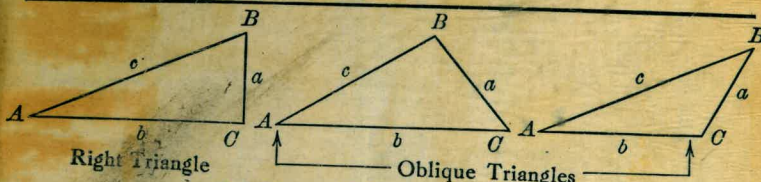
36

44

6-21/3



TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

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

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	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

451
1546
2967

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. $\text{Cosine } 5^\circ 10' = .9959$. $1 - .9959 = .0041$. $319.4 \times .0041 = 1.31$. $319.4 - 1.31 = 318.09$ 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.

