

463

463

W463A

F.O. Aug. 23, 1933

EL CAPITAN DAM

OUTLET TUNNEL

Location of holes for 60 pounds pressure grouting per letter to contractor 5-21 July 3, 1933

station	Distances from ϵ of Crown											
	17.6	13	9	6	3	0	3	6	9	13	17.6	
0+60	X			X				X				X
0+80	X			X				X				X
1+08	X	X										X
1+25	X			X			X			X		X
1+44	X		X				X					X
1+60	X			X				X				X
1+80	X			X				X		X		X
2+03	X			X				X			X	X
2+22	X	X				X		X				X
2+40	X		X				X			X		X
2+58	X					X		X				X
2+80	X			X			X					X
3+00	X				X			X				X
3+18	X			X					X			X
3+40	X			X			X					X
3+60	X			X				X				X
3+80	X			X				X				X
3+03	X			X				X				X
4+20	X				X			X				X
4+42	X				X			X				X
4+60	X			X			X					X
4+78	X			X			X					X
5+00	X 0											X 3
5+20	⑭ X 0					708 X + 103		3 X				X 3
5+40	⑩ X 3					⑮ X 0	Sept. 9	3 X ⑫				⑬ X 3
5+60	⑦ X 4			5 X ⑨				③ X ⑤				⑥ X 8
5+80	③ X 16			① X ②				+1295				① X 7
5+98	⑫ X 0	Sept. 7		⑪ X 0				④ X ⑧	+299			⑩ X 14'
6+20	⑧ X 0			⑦ X 0				527 X ⑤	+1020 (Sept. 6)			X ⑥ 2
6+42	③ X 0			X				① X ④				X ④ 11'
6+60	② X 0					302 X		① X ③				X ① 18'

These holes are to be drilled radially to the Axis of the tunnel at the distances from the center of crown measured along the intrados as above
 Depth of holes to reach the rock

great holes
6th time
for tunnel

322
132
116
89
125
220
248
261
122
86

1406

527
1020
1058
961
859
230

4176

. min 594

420
54
867

1591

Oct 31
Nov 30
Dec 31
Jan 31
Feb 28
Mar 31
Apr 30
May 31
243

6.28
21.9

28.18

421
373

864

27) 642 124

634
82
102

855
425
835

1275
80

975

EL CAPITAN DAM

OUTLET TUNNEL

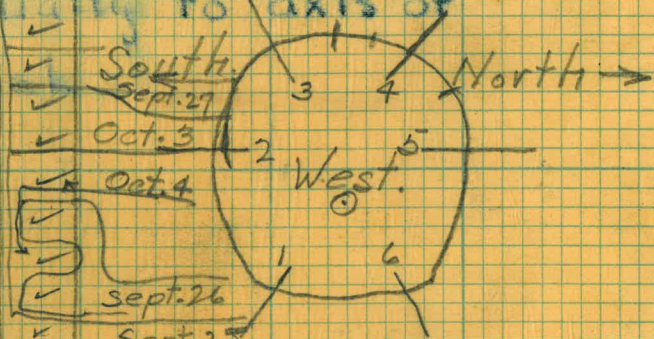
Location of holes for 100 pounds pressure grouting
per letter to contractor - 5-21 - July 8, 1933

No. 1 2 3 4 5 6
Station 18's 20 10 10 20 8' ← Invert

South side North side

Holes in all rings as follows:
10' each side of axis of arch
20' each side of axis horizontal
3' each side of axis in invert

Station	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	Date
0+68							
0+90							
1+10							
1+23							
1+50							
1+68							
1+88							
Oct. 2 - 2+11	✓	✓	✓	✓	✓	✓	Oct. 2
2+32	✓	✓	✓	✓	✓	✓	
Sept. 30 2+50	✓	✓	✓	✓	✓	✓	Sept. 30
2+70	✓	✓	✓	✓	✓	✓	Ring
2+92	✓	✓	✓	✓	✓	✓	
Oct. 3 3+10	✓	✓	✓	✓	✓	✓	Sept. 28
Sept. 30 3+30	✓	✓	✓	✓	✓	✓	and at right
3+48	✓	✓	✓	✓	✓	✓	to axis of
Sept. 28 3+68	✓	✓	✓	✓	✓	✓	South
5+90	✓	✓	✓	✓	✓	✓	Sept. 27
4+10	✓	✓	✓	✓	✓	✓	North →
Sept. 27 4+30	✓	✓	✓	✓	✓	✓	West
4+50	✓	✓	✓	✓	✓	✓	Oct. 3
4+70	✓	✓	✓	✓	✓	✓	Oct. 4
Sept. 26 4+90	✓	✓	✓	✓	✓	✓	Sept. 26
5+10	✓	✓	✓	✓	✓	✓	Sept. 25
Oct. 4 5+29.5	✓	✓	✓	✓	✓	✓	Sept. 23
5+50	✓	✓	✓	✓	✓	✓	Sept. 22
5+68	✓	✓	✓	✓	✓	✓	Sept. 21
5+90	✓	✓	✓	✓	✓	✓	Sept. 20
6+10	✓	✓	✓	✓	✓	✓	Sept. 19
6+30	✓	✓	✓	✓	✓	✓	
6+50	✓	✓	✓	✓	✓	✓	



Station	Extra H				Invert			
	South	10'	15'	25'	South	10'	15'	25'
6+04	✓	✓	✓	✓	✓	✓	✓	✓
Oct. 9 6+15	✓	✓	✓	✓	✓	✓	✓	✓
6+25	✓	✓	✓	✓	✓	✓	✓	✓
6+35	✓	✓	✓	✓	✓	✓	✓	✓
	Oct. 6				Oct. 15			Oct. 6

F.O. Aug. 23, 1933

197
434
788
591
788
854.98

53

48

32

8.0

101

15

116

180

180

36

mm

$$9\frac{1}{2} - 1$$

$$13 - 2$$

$$16.5 - 3$$

$$20 - 4$$

$$23\frac{1}{2} - 5$$

$$27 - 6$$

$$30.5$$

$$\begin{array}{r} 11 \overline{) 192} \quad 47.5 \\ \underline{11} \\ 82 \\ \underline{77} \end{array}$$

$$\begin{array}{r} 17.5 \overline{) 465.00} \quad 26.5 \\ \underline{350} \\ 1150 \\ \underline{1050} \\ 1000 \\ \underline{1000} \\ 0 \end{array}$$

$$\begin{array}{r} 17.5 \\ \underline{26} \\ 1050 \\ \underline{350} \\ 455.0 \end{array}$$

$$\begin{array}{r} 56 \\ \underline{26} \\ 336 \\ \underline{112} \\ 1456 \\ \underline{1512} \end{array}$$

$$\begin{array}{r} 1095 \\ \underline{848} \\ 247 \\ 1342 \\ \underline{1095} \\ 247 \end{array}$$

$$\begin{array}{r} \underline{848} \\ 1095 \\ \underline{247} \end{array}$$

Aug. 24 - 1933

Shifts #2 & #3

Tunnel

No work. Crew
changing to day
shift.

Aug. 26 - 1933

Shift #1

Tunnel

1 foreman and 6 men -
drilling grout holes.

1 jumbo - 5 Leyners.

Drilled holes from
0+60 to 2+58 inclusive.

29
189
202

Aug. 28-1933 Shift #1

Tunnel

1 foreman and 6 men
drilling grout holes
in arch section.

5 Leyners.

Starting at 2+80

Completed to 5+00

Then moving steel
forms.

Aug. 29-1933 Shift #1

Tunnel

1 foreman and 6 men

drilling grout holes in
arch section.

5 Leyners.

Starting at 5+20

Drilling completed at

6+60 at 10:00 A.M.

Sept. 5-1933- Shift #1

Tunnel

(16) 1 foreman and 6 men
 screening sand.
 1 foreman and 4 men
 grouting.
 1 jumbo and cement gun.
 grouting started
 at 7:45 A.M.

18 #1-7+7+4=18 cu.ft.
 wasted 3 cu.ft.
 0 Hole #2 - 0 cu.ft.
 0 Hole #3 - 0 cu.ft.
 wasted 14 cu.ft.

11 Hole #4 - 4+7=11 cu.ft.
 23 Hole #5 - 7+7+7+2+7+7+7+7
 39 +7+4+7+7+7+7+5
 40
 38 7+7+7+7+3+7+7+7+7+3
 38
 39 7+7+7+7+7+4+7+7+7+7+4
 39

cu.ft.

256 Hole #5 - Continued.

42
 41 7+7+7+7+7+7+7+7+7+6
 37
 36 7+7+7+7+7+2+7+7+7+7+4
 39
 35 7+7+7+7+7+4+7+7+7+7+7
 38
 527
 7+7+7+7+7+3

32 batches grout
160 sx. Cement.

395 bds. mt. sx.
shipped out @ 50 ea.

527 cu.ft. in Hole #5

3950
 1975

Sept. 6-1933 Shift #1
Tunnel

1 foreman and 6 men
mixing and screening.

1 foreman and 4 men
grouting.

2 truck drivers.

Grouting started

at 6:40 A.M. on

Hole #5 at 6:20

38

Hole #5 - $\overline{7+7+7+7+3}$

38

$\overline{7+7+7+7+3} + \overline{7+7+7+7+3}$

38

$\overline{7+7+7+7+1} + \overline{7+7+7+7+3}$

36

38

$\overline{7+7+7+7+4} + \overline{7+7+7+7+3}$

39

38

$\overline{7+7+7+7+1} + \overline{7+7+7+7+5}$

36

40

$\overline{7+7+7+7+4} + \overline{7+7+7+7+2}$

39

37

$\overline{7+7+7+7+7} + \overline{7+7+7+7+6}$

35

41

$\overline{7+7+7+7+4} + \overline{7+7+7+7+6}$

39

41

573

573

42

42

36

38

39

37

36

39

32

37

35

34

102.0

Hole #5 Cont.

4

$\overline{7+7+7+7+7} + \overline{7+7+7+7+7}$

$\overline{7+7+7+7+1} + \overline{7+7+7+7+3}$

$\overline{7+7+7+7+4} + \overline{7+7+7+7+2}$

$\overline{7+7+7+7+1} + \overline{7+7+7+7+4}$

$\overline{7+7+7+7+4} + \overline{7+7+7+7+2}$

$\overline{7+7+7+7+7} + \overline{7+7+7+7+6}$

54 batches grout

270 sx. cement

1020 Cu. ft. grout.

Sept. 7-1933 Shift #1

301

Hole #9

5

Tunnel

4 4

1 foreman and 6 men
screening & mixing.

wasted 30 cu. ft. (2 batch)

1 foreman & 4 men

14 7+7+

Hole #10. at 5+98 North.

grouting.

0 Hole #11 - 0

2 trucks.

0 Hole #12 - 0

Hole #5 Continued
started at 6:30 AM.

Hole #13 - at 5+80 N.

Hole #5

28

42

38

36

40

40

38

38

38

38

38

38

38

38

38

38

38

38

38

38

38

38

38

38

38

38

38

38

38

38

38

38

38

37

36

42

37

38

32

40

37

299

7+7+7+7+7+2+7+7+7+7+7+1

7+7+7+7+7+7+7+7+7+7+2

7+7+7+7+7+3+7+7+7+7+4

7+7+7+7+7+5+7+7+7+3+6+7

Hole #6

2 24

0 Hole #7 - 0

0 Hole #8 - 0

58 | Total 262 Cu. ft. in #13

Sept 8-1933 Shift #1

Tunnel

1 foreman & 1 men

mixing.

1 foreman & 4 men

grouting.

grouting started
at 6:30 A.M.

Hole #13

41
42 $\overline{7+7+7+7+7+6} + \overline{7+7+7+7+7+7}$

41
39 $\overline{7+7+7+7+7+6} + \overline{7+7+7+7+7+4}$

42
40 $\overline{7+7+7+7+7+7} + \overline{7+7+7+7+7+5}$

39
42 $\overline{7+7+7+7+7+4} + \overline{7+7+7+7+7+7}$

39
36 $\overline{7+7+7+7+7+4} + \overline{7+7+7+7+7+1}$

58
40 $\overline{7+7+7+7+7+7+7+2} + \overline{7+7+7+7+7+5}$

42
39 $\overline{7+7+7+7+7+7} + \overline{7+7+7+7+7+4}$

40
38 $\overline{7+7+7+7+7+5} + \overline{7+7+7+7+7+3}$

38
40 $\overline{7+7+7+7+7+3} + \overline{7+7+7+7+7+5}$

736

Cu. Ft.

736 Hole #13 - Cont.

38
40 $\overline{7+7+7+7+7+3} + \overline{7+7+7+7+7+5}$

40
35 $\overline{7+7+7+7+7+5} + \overline{7+7+7+7+7+7}$

37
926 $\overline{7+7+7+7+7+2}$ ~~at 6:00 P.M.~~

35
961 $\overline{7+7+7+7+7+7}$ + at 3:00 P.M.

49 batches grout.

245 sx. Cement

41
38 $\overline{7+7+7+7+7+3} + 41$

39
43 $\overline{7+7+7+7+7+4} + \overline{7+7+7+7+7+7+1}$

38
 $\overline{7+7+7+7+7+3}$

+658 from 6:00 P.M.

857 to 12:00 M.

42 batches (total)

210 sx. Cement.

Sept. 9-1933 Shift #1

Tunnel

1 foreman and 1 man
mixing

1 foreman & 4 men
grouting.

TRUCKS.

Grouting started
at 6:30 A.M.

Hole #13

39	
37	$7+7+7+7+7+4+7+7+7+7+7+2$
42	
21	$7+7+7+7+7+7+7+7+7$
129	

Hole #1 (17'6" N at 5+80)

7 7

Hole #2 (6'S at 5+80)

Hole #3 (17'6" S at 5+80)

16 $4+6+3+3$

152

152

32
21

Hole #4 (6'S at 5+60)⁷

$7+7+7+7+4+7+7+7+7$

Hole #5 (6' N at 5+60)

6 6

Hole #6 (17'6" N at 5+60)

8 4+4

Hole #7 (17'6" S at 5+60)

4 4 (Wasted 1 1/2 batches)

Hole #8 (6' N at 5+40)

3 3

Hole #9 (6'S at 5+40)

5 5

Hole #10 (17'6" S at 5+40)

3 3

Hole #11 (17'6" N at 5+40)

3 3

Hole #12 (6' N at 5+20)

3 3

240

240 Hole #13 (14'6" Nat 5+20)

3 3

Hole #14 (17'6" S at 5+20)

0 0

Hole #15 (3'S at 5+20)

0 0

3:00 P.M.

16 batches grout

80 sx. Cement

wasted 1/2 batches.

Hole (6' N at 5+00)

3 3

Hole (17'6" N at 5+00)

3 3

Hole (3'S at 5+00)

125 5-42-35-43

40 $\overline{7-7-7-7-7-5} + \overline{7+7+7+7+7+5}$

40

211

⁶
205 Hole (6'S at 5+00 Cont.) ⁸

41

42 $\overline{7+7+7+7+7+6} + \overline{7+7+7+7+7+7}$

37

38 $\overline{7+7+7+7+7+2} + \overline{7+7+7+7+7+3}$

40

45 $\overline{7+7+7+7+7+5} + \overline{7+7+7+7+7+7+3}$

38

40 $\overline{7+7+7+7+7+3} + \overline{7+7+7+7+7+5}$

37

35 $\overline{7+7+7+7+7+2} + \overline{7+7+7+7+7}$

40

31 $\overline{7+7+7+7+7+5} + \overline{7+7+7+7+7+3}$

615

39 $\overline{7+7+7+7+7+4}$

714 Total.

36 batches grout.

180 sx. Cement

Sept. 11-1933 Shift #1

Tunnel

1 foreman and me
mixing.

1 foreman and 4 men
grouting

grouting started
at 6:30 A.M.

Hole (3's at 5+00)

38
37
28
103

$7+7+7+7+7+3 + 7+7+7+7+7+2$

$7+7+7+7+$

Hole (17'6" S at 5+00)

0.0

Hole (17'6" S)
0

4+78

17'6"
2

Sept. 12-1933 Shift #2

Tunnel

1 foreman & 1 man
mixing

1 foreman & 4 men
grouting.

18
7
2

Hole 3 N at 4+60

40
39
43
42
45
45
42
41
44
42
44
41
43
42
43
41
43
420

$18.5+14+7.5+13.5+14.5+11$

$15+15+13 + 14.5+16+11.5$

$13+15.5+16.5 + 15.5+14.5+15$

$24+18 + 24+17 + 24+20$

$24+18 + 24+20$

$24+17 + 24+19$

$24+16 + 24+19$

$24+17 + 24+19$

720

3'N at 4+60 B

39

41

 $\overline{24+15} + \overline{24+17}$

43

45

 $\overline{24+19} + \overline{24+21}$

45

41

 $\overline{24+21} + \overline{24+17}$

974

44

10 18

Sept. 13-1933 Shift ¹⁰ 2
Tunnel1 foreman and 1 man
mixing.1 foreman and 4 men
grouting.

Hole 3's at 4+42.

2 11+

1 Hole 17'6" S at 4+42

0 Hole 6' N at 4+42

0 Hole 17'6" N at 4+42

0 Hole 3 S at 4+20

0 Hole 17'6" S at 4+20

0 Hole 6' N at 4+20

0 Hole 17'6" N at 4+20

0 Hole 17'6" N at 4+00

0 Hole 6' N at 4+00

0 Hole 6' S at 4+00

3

2 Hole 17'6" S at 4+00

0 Hole 6' S at 3+80

Hole 17'6" S at 3+80

14 3+3+3+5

0 Hole 6' N at 3+80

Hole 17'6" N at 3+80

11 5+6

30

Total 30 Cu. Ft.

3 batches

15 sq. Cement.

Sept. 14-1933 Shift #2

1 foreman and 1 man
mixing.

1 foreman and 4 men
grouting.

2 Transit mix trucks.

Hole 3' N at 3+40

53 7+7-7+7+7+7+7+4

44 7+7+7+7+7+7+2

39 7+7+7+7+7+4

40 7+7+7+7+7+5

38 7+7+7+7+7+3

38 7+7+7+7+7+3

38 7+7+7+7+7+3

28 7+7+7+7+

318

3 Hole 17'6" N at 3+40

0 Hole 6' S at 3+40

2 Hole 17'6" S at 3+40

323

- 0 Hole 6's at 3+18
- 0 Hole 17'6" at 3+18
- 2 Hole 9'N at 3+18
- 0 Hole 17'6"N at 3+18
- 0 Holes 17'6" & 3'6" N at 3+00
- 0 Hole 17'6" N at 3+00
- Hole 6's at 2+80

2
 41 2 + 7+7+7+7+7+6
 42
 37 7+7+7+7+7+7+7+7+7+7+2
 42
 52 7+7+7+7+7+7+7+7+7+7+7+3
 58 7+7+7+7+7+7+7+7+2
 56 7+7+7+7+7+7+7+7
 56 7+7+7+7+7+7+7+7
 54 7+7+7+7+7+7+7+5
 440 56 7+7+7+7+7+7+7+7
 56 7+7+7+7+7+7+7+7

552 in Hole

440
841

325
877 total

46 batches grout.
230 sx. cement.

95
616

Sept. 15-1933 Shift #2

Tunnel
1 foreman and 1 man
mixing
1 foreman and 4 men
grouting.
2 TRUCKS

848

Hole 6's at 2+80

56 7+7+7+7+7+7+7+7
 57 7+7+7+7+7+7+7+7+1
 55 7+7+7+7+7+7+7+6
 54 7+7+7+7+7+7+7+5
 56 7+7+7+7+7+7+7+7
 61 7+7+7+7+7+7+7+5
 52 52
 57 7+7+7+7+7+7+7+7+1
 55 7+7+7+7+7+7+7+6
 57 7+7+7+7+7+7+7+7+1
 56 7+7+7+7+7+7+7+7
 56 7+7+7+7+7+7+7+7
 53 7+7+7+7+7+7+7+4
 62 7+7+7+7+7+7+7+7+6
 54 7+7+7+7+7+7+7+5
 55 7+7+7+7+7+7+7+6
 52 7+7+7+7+7+7+7+3
 56 7+7+7+7+7+7+7+7

(189)

(202)

(225)

(232)

1004

1004

Hole 6's at 2+80

56 7+7+7+7+7+7+7+7

58 7+7+7+7+7+7+7+7+2

56 7+7+7+7+7+7+7+7

56 7+7+7+7+7+7+7+7

56 7+7+7+7+7+7+7+7

56 7+7+7+7+7+7+7+7

56 7+7+7+7+7+7+7+7

42 7+7+7+7+7+7+7+7

496 in Hole.

3 Hole 17'6" S at 2+80

0 Hole 17'6" N at 2+80

3 Hole 3' N at 2+80

Total 1502 Cu. Ft

81 batches

405 sx. Cement

Wasted 3 batches

134²
98

Sept. 16-1933-Shift # 2

1 foreman and 1 man

mixing.

1 foreman and 4 men

grouting.

2 trucks.

Hole 6's at 1+80.

54 7+7+7+7+7+7+7+5

54 7+7+7+7+7+7+7+5

56 7+7+7+7+7+7+7+7

164 Not completed
Stopped, account grout
running out at 0+76

Hole 6's at 1+60

56 7+7+7+7+7+7+7+7 Not

completed.

220

Hole 18' N at 0+33.5

23

35 3+5+7+7+1 +7+7+7+7

40

35 7+7+7+7+7+5 +7+7+7+7

35

40 7+7+7+7+7 +7+7+7+7+5

208

220

208

28

36

42

35

37

36

Hole 18' N. at 0+33.5

7+7+7+7+7+7+7+7+1

7+7+7+7+7+7+7+7+7

7+7+7+7+7+2+7+7+7+7+1

422 in Hole

642 Total

36 batches.

180 sx. Cement.

Sept. 18-1933

Shift #2¹⁴

Tunnel

Jumbo & 6 Leyners.
1 foreman and 4
men, drilling 10'
grout holes. Start-
ing at Sta. 6+50

Sept. 19-1933

Shift #1

Tunnel

Jumbo and 6
Leymers.

1 foreman and 6
men, drilling
grout holes.

6750 - 5 holes com-
pleted

Hole in invert - 8'
South of E not finished

6430 - 4 holes com-
pleted - 2 holes in
invert - not finished

Sept. 20-1933

Shift #1

Tunnel

1 foreman and 4 men
drilling grout holes
3 men building scaffold-
ing at west key.

Shovel #10 & crew drain-
ing pond at east toe
of dam.

Completed 4 holes at
6410 - 2 holes in invert
not finished.

5490 - Completed 4 holes
2 in invert not finished.

Sept. 21-1933 Shift #1

Tunnel

1 foreman and 9 men
drilling grout holes.
3 men excavating at
west key.

4 Holes completed at
5+68. No holes in invert.

Invert - 2 holes at 6+10

1 hole S at 6+30

1 hole S at 6+50

4 holes at 5+50

4 holes at 5+29.5

4 holes at 5+10

total 200 feet

Sept. 22-1933 Shift #1¹⁶

Tunnel.

1 foreman and 9 men
drilling grout holes.
3 men enlarging west
key.

4 Holes completed
at 4+90

at 4+70

4+50

4+30

4+10

3+90

Invert Holes

1 at 6+30

2- 5+68

2- 5+90

Sept. 23-1933 Shift #1

Tunnel

1 foreman and 9 men
drilling grout holes.

3 men enlarging
Key section.

4 Holes drilled at:

3+68

3+48

3+30

3+10

2+92

Invert

2 at 5+50

Sept. 25-1933 Shift #1¹⁷

Tunnel

1 foreman and 9 men
drilling grout holes.

3 men enlarging
Key section.

Drilled 4 holes in

Arch at: 2+70

2+50

2+32

2+11

Invert

1 at 5+29.5 North

1 at 5+10 South.

Sept. 26-1933 Shift#1

Tunnel

1 foreman and 6 men
drilling grout holes
5 men enlarging
key section.

4+70N

~~5+10S~~

5+10N

4+90S

4+70S

Sept. 27-1933 Shift#1

Tunnel

1 foreman and 5 men
drilling grout holes
7 men enlarging
key section.

Invert holes finished.

4+50S

3+90N

4+30S

4+10S

Sept. 28-1933 Shift

Tunnel

1 foreman and 6 men
drilling grout holes.

6 men enlarging
key section.

Invert holes finished

3+90 S 3+10 N

3+68 S 3+48 N

3+48 S 3+68 N

18
Sept. 29-1933 Shift #1

1 foreman and 4 men
drilling grout holes.

7 men enlarging
key section.

No holes completed,
shortage of steel.

$\frac{1}{2}$ - $2\frac{1}{2}$ ' and $\frac{1}{2}$ - $3\frac{1}{2}$ '			
0+60	2		62
1+60	2	5+00	4
1+80	3	5+20	3
2+00	4	5+42	4
2+22	5	5+60	4
2+40	4	5+80	3
2+58	4	5+98	4
2+80	4	6+20	4
3+00	1	6+42	4
3+18	3	6+60	4
3+40	4		<u>96</u>
3+60	4	Sept. 30	
3+80	4	48 pcs. - $2\frac{1}{2}$ ' each	
4+00	3	48 pcs. - $3\frac{1}{2}$ ' each	
4+20	4	Total 288'	
4+42	4		
4+60	4		
4+78	3		
	<u>62</u>		

19

$\frac{1}{3}$ -3' and $\frac{2}{3}$ -2'			
			87
2+11	5	5+29.5	5
2+32	6	5+50	6
2+50	6	5+68	2
2+70	6	5+90	2
2+92	6	6+10	3
3+10	6	6+30	6
3+30	6	6+50	6
3+48	6		<u>117</u>
3+68	2	Sept. 30	
3+90	5	39 pcs. 3' each	
4+10	6	78 pcs. 2' each	
4+30	6	Total 273'	
4+50	5		
4+70	5		
4+90	5		
5+10	4+2		
	<u>87</u>		

Sept. 30-1933 Shift #1

Tunnel

1 foreman and 3 men
drilling grout holes
7 men enlarging
key section and
mucking.

3+30S 2+32N

2+92S 2+50N

2+70S ~~2+70N~~

2+50S 2+92N

2+32S

Invert holes

Total 90 feet.

Oct. 2-1933 Shift #1²⁰

Tunnel

1 foreman and 3
men drilling grout
holes

7 men enlarging
key section.

Invert holes completed:

2+11S and N

3+30N

Oct. 3-1933 Shift #1

Tunnel

1 foreman and 7
men - enlarging
key section and
mucking.

2 men drilling
grout holes.

Invert holes

completed:

- 1 at 3+10 S
- 1 at 4+10 N
- 1 at 4+30 N

Oct. 4-1933

Shift #1

Tunnel

1 foreman and 7 men
enlarging key section
and mucking.

2 men drilling
grout holes.

Invert holes

1 at 5+29.5 S

1 at 4+90 N

1 at 4+50 N

Oct. 5-1933 Shift #1

Tunnel

1 foreman and 7
men enlarging
key section and
mucking.

2 men drilling
grout holes.

6+35 - 3 holes

10' & 15' north

10' south

Total drilled 30 feet.

Oct. 6-1933 Shift #1

Tunnel

1 foreman and 7 men
enlarging key section
and mucking.

2 men drilling grout
holes.

6+35 - 3 holes

25' north

15' & 25' south

at 6+25

15' & 25' north

Total 50 feet

Oct. 7-1933 Shift #1

Tunnel

1 foreman and 7 men
enlarging key section
and mucking.

2 men drilling
grout holes.

at 6+25

10' north

10'-15' & 25' south

at 6+14.5

25' north

Oct. 9-1933 Shift #1

Tunnel

1 foreman and 6
men enlarging
key section and
mucking.

2 men drilling
grout holes.

at 6+14.5

10' & 15' north

10'-15' & 25' south

at 6+04

25' north

10'-15' & 25' south

90 feet

Oct. 10-1933 Shift #1

Tunnel

1 foreman and 6 men
enlarging key sec-
tion and mucking.

2 men drilling
grout holes.

Holes completed:

at 6+04

5' south

0' at $\frac{1}{2}$

5'-10' & 15' north

at 6+14.5'

5' south

0'

5' north

Total 80 feet.

Oct. 11-1933 Shift #1²⁴

Tunnel

1 foreman and 6
men - enlarging
key section and
mucking.

2 men drilling
grout holes.

Holes completed:

at 6+25

5' south

0'

5' north

at 6+35

5' south

0'

5' north

Total - 60 feet.

Oct. 12-1933 Shift #1

Tunnel

1 foreman and 6
men enlarging key
section and mucking.
2 men drilling grout
holes

1 carpenter 8 hrs. ~~2~~
~~carp.~~ building
forms.

Holes in invert
drilled thru concrete
only and not com-
pleted.

Oct. 13-1933 Shift #1

Tunnel

1 foreman and 6 men
enlarging key sec-
tion and mucking.
2 men drilling
grout holes.

4 Invert holes com-
pleted

1-each- 8' north of C
at 6+0.4

6+14.5

6+25

6+35

Total drilled 40 feet

Oct. 14-1933 Shift #1
Tunnel

6 men enlarging
key section and
mucking.

Enlargement com-
pleted and timber
out. All material
excavated went to
upstream rock
embankment.

2 men drilling
grout holes.

2 men - 4 hrs. bending
steel.

Completed 2 invert
holes

1 at 6+04-8' south
1 at 6+14.5-8' "

19 $\frac{3}{4}$ "[□] - 24'4" long
31 $\frac{3}{4}$ "[□] - 26'0" Berit ~~st~~
16 1" [□] 36'0" st.
46 $\frac{1}{2}$ " [□] 33'0" "
14 $\frac{3}{4}$ "[□] ~~26'0"~~ "

Oct. 14-1933 Shift #2

1 foreman and 4 men
placing re-enforcing
steel, 9½ hrs.

03'2"
- 24'4"
27'6"
22'6"
49

Used 3000' fuse

400 caps

250# 40% pwr.

Note: Key excavation
is 24'4" long.

from 1+03'2" to 1+27'6"

1+50 - 22'6"

24'4"

Oct. 16-1933 Shift #1

1 foreman and 4 men
moving steel forms.
2 men drilling ^{grout} holes

Oct. 17-1933

Shift #1²⁷

Tunnel

1 foreman and 6 men
moving and placing
steel forms.

2 carpenters and
1 helper - 4½ hrs.
building forms.

1 foreman and 4 men
(riggers) arranging
equipment.

Oct. 18-1933 Shift #2

1 foreman and 6 men
on concrete crew

5 carpenters and 1
helper until 8:30 P.M.

1 foreman and 4
men-mixing crew

2 truck drivers, <sup>(transit-
mix)</sup>

Pouring key section
1+03 to 1+27.5.

Started at 9:25 P.M.

Mix:

6 sx. cement

1500[#] sand.

1090[#] - 1 $\frac{1}{2}$ " rock

1030[#] $\frac{3}{4}$ " rock

50 gals. water.

Concrete gang changed

at 2:00 A.M.

Mixing crew changed at
7:00 A.M.

Concrete crew-1 foreman
and 4 men.

Mixing- 1 foreman
and 5 men.

Meter at 7:00 - A.M.

90 batches - 540 sx. Cmt.

Oct. 19-1933 Shift¹

1 foreman and 5
men (mixing crew)

10:00 P.M. 1 foreman
and 6 men (concrete)

Delay 9:30-12:30 A.M.
shortening conveyor belt.

4:00 P.M. - 112 batches.

Mixing gang - 1 fore-
man and 4 men.

At 6:00 P.M. Concrete
crew - 1 foreman and
4 men.

At 9:30 P.M. 63 batches

11:20 P.M. 78 "

78
112
190
6
1140

Oct. 20-1933 Shift²

Tunnel

1 foreman and 6
men.

Moving forms
and cleaning
equipment.

Oct. 21-1933 Shift 2
Tunnel

1 foreman and
6 men, grouting
holes.

1 foreman and 4
men. Mixing crew.

2 transit mix trucks.

Grouting started
at 7:20 P.M.

Hole 1+80 - 6' north

3 3'

Hole 6' south.

3 3'

0 Hole 17'6" south

2 Hole 13' north

0 Hole 17'6" north.

¹⁺⁶⁰
Hole 6' south

8 3' + 7+7+7+7+7+5
43

8 at 1+60

Hole 6' south (cont.)

42 7+7+7+7+7+7+7
85 total

13 + 7+6

60 7+7+7+7+7+7+7+7+4

61 7+7+7+7+7+7+7+7+3

56 7+7+7+7+7+7+7+7

55 7+7+7+7+7+7+7+6

60 7+7+7+7+7+7+7+7+4

54 7+7+7+7+7+7+7+5

56 7+7+7+7+7+7+7+7

53 7+7+7+7+7+7+7+4

56 7+7+7+7+7+7+7+7

56 7+7+7+7+7+7+7+7 66.5

55 7+7+7+7+7+7+7+6

720 total in hole

728 total for shift.

Mix: 15/5" sand
2 1/2" x. amt.

add 13 batches
65 sx.

Oct. 23-1933 Shift #2
Tunnel.

1 foreman and
men-grouting holes
1 foreman and 4
men-mixing.

Oct. 19. cleaned 1150sx
reclaimed 5 sx.

Oct. 21 cleaned 2950sx
reclaimed 18 sx.

2 Transitmix trucks.

Grouting started 7:15
at 1+60

- 0 - at 6' north
- 0 - at 17'6" "
- 0 - at 17'6" south

At 1+44
at 3' north.

50 7+7+7+7+7+7+8

50
3' north (Cont.)
59 7+7+7+7+7+7+7+7+7+3.
56 7+7+7+7+7+7+7+7+
58 7+7+7+7+7+7+7+7+2
65 7+7+7+7+7+7+7+7+7+2
56 7+7+7+7+7+7+7+7+7
58 7+7+7+7+7+7+7+7+2
49 7+7+7+7+7+7+7+7+
55 7+7+7+7+7+7+7+7+6
56 7+7+7+7+7+7+7+7+7
27
62
61 7+7+7+7+7+7+7+7+5
56 7+7+7+7+7+7+7+7+7
55 7+7+7+7+7+7+7+7+6
21 7+7+7

844 at 9' south.

7 7+

851 Total
Wasted 4 batch.
50 batches.

Oct. 23 Cleared 2800
Reclaimed 21

Oct. 24-1933 Shift 2
Tunnel

1 foreman and 6
men-grouting.

1 foreman and 4
men-mixing.

2 truck drivers.

Grouting started
at 6:45 P.M.

At 1+44

at 17'6" south.

3 3+

at 17'6" north.

2 2+

At 1+28

at 3' north

3 3+

0 17'6" north

8

Delay. 1 hr. 30 min. repairing gun.

8

At 1+28 (cont.)

at 6' south

3

3+

0

at 17'6" south

At 0+80

at 6' south

25

7+7+7+4

56

7+7+7+7+7+7+7

56

7+7+7+7+7+7+7

52

7+7+7+7+7+7+3

63

7+7+7+7+7+7+7+7

56

7+7+7+7+7+7+7

61

7+7+7+7+7+7+7+5

59

7+7+7+7+7+7+3

54

7+7+7+7+7+7+5

54

7+7+7+7+7+7+5

536

55

7+7+7+7+7+7+6

591

1

602 Total

Oct. 25-1933 Shift 2
Tunnel

1 foreman and 3
men-grouting holes
1 foreman and 4
men-mixing
1 truck drivers.

Grouting started
at 5:55 P.M.

At 0+80.

- 7 7 Hole 6' north
- 2 2 Hole 17'6" north
- 2 2 Hole 17'6" south

At 0+60

- 2 2 Hole 6' north
- 3 3 Hole 6' south
- 0 0 Hole 17'6" south
- ✓ Hole 17'6" north

40 5+7+7+7+7

Mix 5 sx. cmt. 35 gals. Water.

33

16 at 17'6" north (cont)

40
80 40 7+7+7+7+7+5

At 6+50

0 ✓ 0 at 20' south

0 0 at 10 south

3 ✓ 3 at 10' north

0 ✓ 0 at 20' north

at Inv. north

14 14 8+3+3

at Inv. south.

19 19 ✓ 4+7+8

132

Oct. 26-1933 Shift 2
Tunnel

Oct. 24

Cleaned 2650 SX
reclaimed 22 SX.

Oct. 25

Cleaned 3200 SX
reclaimed 21 SX.

1 foreman and 3 men
grouting holes.

1 foreman and 3 men
mixing.

truck drivers.

Grouting started
at 7:00 P.M.

At 6:35

Invert south; 8'

21 7+7+7
16 7+7+2

37

37 Inv. south (cont.)

31 7+7+7+7+3
31 7+7+7+7+3
32 7+7+7+7+4
28 7+7+7+7
40 7+7+7+7+5
35 7+7+7+7+7
40 7+7+7+7+5
39 7+7+7+7+4
45 7+7+7+7+7+3
35 7+7+7+7+7
42 -
41 -
42 7+7+7+7+7+7
38 7+7+7+7+7+3
42 7+7+7+7+7+7
38 7+7+7+7+7+3
42 7+7+7+7+7+7
45 7+7+7+7+7+7+3
45 7+7+7+7+7+7+3
45 7+7+7+7+7+7+3
45 7+7+7+7+7+7+3

813

858 Total

107 Batches

535 ~~540~~ SX. Cement

Cleaned SX.
reclaimed SX.

Oct. 27-1933 Shift #2

1 foreman and 3 men drilling grout holes.

1-8' south at 6+25

1-8' " at 6+35

1-3' north at 6+04

Oct. 27 Shift #1

3 men arranging equipment to drill holes.

4

5

↓

3

1

2

Oct. 28-1933 Shift #1 ³⁵

Tunnel

3 men - drilling short grout holes.

2 at 6+18

2 at 5+98

2 at 5+80

2 at 5+60

2 at 5+40

2 at 5+20

2 at 5+00

2 at 4+80

1 on 6+07

1 on 6+42

1 on 6+18

each 1' deep and 8' from A

4' deep

2' deep

4' "

38-7+7+5+3+4+5+7

STATIONS OCT 28 1933

SHIFT#

OCT. 28 1933

36
SHIFT
#2

6+42 } 3 3+

6+18 } 7+2

6+07 } 7+4

6+18 } 3

5+98⁹ N

5+80 North 5

5+80 South

5+50⁹ 3

5+50 N

5+40⁹ South

5+40 North

6+30^{1/2} South

6+25 South 25 10/30/33 #2

6+10^{1/2} 3 South

had to go to head primary
graveling looking
out sand.

one Foreman

3 men grouting

Holes -

1 Foreman

and 4 men mixing

2 Trucks

Batches 16

sk. Cement 80

Cleaned 2900

Reclaimed 25

Started at station

6+42

38 - 7+7+5+3+4+5+7

54 7+7+7+7+7+7+5+7

40 7+7+7+7+5

132 Batches water 3

Oct. 30 - 1933 Shift #1

Tunnel

3 men drilling
grout holes.

1 at 5+78 N

2 at 0+92 5

2 at 1+44

2 at 1+60

2 at 1+80

2 at 2+00

2 at 2+20

2 at 2+40

2 at 2+64

2 at 2+82

2 at 3+00

2 at 3+23

2 at 3+40

2 at 3+58

2 at 3+83

2 at 4+04

2 at 4+20

2 at 4+40

2 at 4+60

Total 40 feet

OCT 30/33 SHIFT #2

TUNNEL

Pressure grouting

1 Foreman

3 men

MIXING

1 Foreman

3 men

1 Truck

started 7 P M
at hole
4+40-5

BATCHES

7

SACK CEMENT

35

CLEANED

2050

RECLAIMED

21

BATCHES WASTED

2

7+7+6+5+7+7+7

OCT 30 1933

4+60

S

3+4

TOTAL

7

4+60

N

0

0

4+40

S

3

3

4+40

N

4

4

4+20

S

1

1

4+20

N

0

0

4+04

S

0

0

4+04

N

3

3

3+83

S

0

0

3+83

N

7

7

3+58

S

1

1

3+58

N

3

3

3+40

S

2

2

3+40

N

0

0

3+23

S

7

7

3+23

N

0

0

3+00

S

0

0

3+00

N

2

2

TOTAL = 40

MIX: 750 # sand & cement

38

OCT 30 1933 SHIFT #2
 CONT.

2+82	S	0	0
2+82	N	7+7+7+1	22
2+64	S	1	1
2+64	N	0	0
2+40	S	1	1
2+40	N	0	0
2+20	S	0	0
2+20	N	1	1
2+00	S		
2+00	N		

39
 Oct. 31-1933 Shift #1
 Tunnel

3 men drilling
 grout holes.
 2 finishers - 4 hrs.
 on lining
 Holes completed
 Invert 6+04 10' deep
 3' North 6+25 " "
 6+35 " "

OCT 31 1933 SHIFT # 2

10/31/33 #2 shift

STARTED GROUTING

AT-6-PM

40

TUNNEL
 PRESSURE GROUTING
 (1) FOREMAN
 (4) MEN
 MIXING
 (1) FOREMAN
 (3) MEN
 1 TRUCK

STAT. #	DIR.	INVT.	TOTAL CU. FT.
2+00	S	3+	3
2+00	N	1	1
1+80	S	5+0	5
1+80	N	0	0
1+60	S	2	2
1+60	N	0	0
1+44	S	3	3
1+44	N	0	0
6 0+92	S	4	4
30 0+92	N	1	1
700			19
6		7+7+5	
0	6+35	✓ S 3-0" FMZ	1
	6+35	✓ N	4
	6+25	✓ S	7+9
	6+25	✓ N	3
	6+13	S	3
	6+13	N	3

68 = 7+7+5+7+7+7+7+7+7+7+

19 of the above total mixed with sand rest grout

22
 3

OCT 31 1933 SHIFT # 2

CONT. INV. 10-0 Holes
3-0 ~~2~~

6+15 S ✓ 2 2

6+15 N ✓ 3 3

6+04 S ✓ 3 3

6+04 N ✓ 3 3

10-0 HOLE in INV.

6+12 S 0

6+12 N ✓ 3 3

6+04 N ✓ 2 2

6+04 S ✓ 0 0

6+35 N ✓ 7+4 11

6+35 S 27

6+14.5 } Total drilled
6+25 }
20'

41
Nov. 1-1933 Shift # 1

3 men drilling
grout holes.

Holes completed:

2 at 1+88 - 10' out

2 at 1+68 - 10' out

2 at 1+56 - 10' out

2 at 1+28 - 10' out

Total drilled

80 feet.

NOV. 1 1933 SHIFT #2

STATS CONT.

42
CU. FT.
TOTAL

	GROUTING	6+50	20' 30.	4	4
1	FOREMAN	6+35	25 30.	7+7+7+7+7+7+7	49
3	<u>MEN</u>			7+7+7+4	25
	MIXING	6+25	25 30=	3	3
1	FOOTMAN	6+15	25 30=	6	6
1	MEN	6+04	25 30=	7+4+3	14
1	TRUCK	6+50	20 30=	7+7+7+7+7+7+4	46
2	BATCHES	36	6+10	20 30=	3
2	SX. CEMENT	180	6+35	25 NR. =	0
	SX. CLEANED	0	6+25	25 NR. =	7+7+7+7+7+7+3 = 45
	SX. RECLAIMED	0			7+7+7+7+7+7 = 49
	BATCHES WASTED	0			7+7+7+7+7+7 = 49
					7+7+7+3+ = 24

STARTED GROUTING

10'-0" HOLE' AT INV. 6'

6+12	✓ 8' South	1+	1
6+4	✓ 8' South	1+	1
6+50	✓ 9' South	3+	3

313

322

Nov. 2-1933 Shift # 1

3 men drilling

grout holes - 3 1/2"

Holes completed:

2 at 1+10 - 10' out

2 at 0+90 - 10' out

Total drilled - 40 ft.

Nov. 2-1933 SHIFT # 2⁴³

GRouting TUNNEL

STARTED AT 6 PM

1 FOREMAN

3 MEN

MIXING

1 FOREMAN

1 MAN

1 TRUCK

BATCHES 17

SX CEMENT 85

SX CLEANED 650

SX RECLAIMED 0

BATCHES WASTED 0

6+15 ✓ 25 NORTH = 1

6+04 ✓ 25 NORTH 0

6+30 ✓ 20 NORTH 7+7+7+7+7 42

+7+7+7+7+7 35

7+7+3

17
TOTAL = 95

used 2H of sanding in hole 6+30-20-North

NOV. 2 1933 SHIFT # 2

CONT.

6+10 [✓] -20 North	- 7+1	8
6+35 [✓] 15 North	- 0	0
6+35 [✓] 10 NORTH	- 7+3+4+2	16
6+35 [✓] 5 NORTH	- 1	1
6+35 [✓] 0 TOP	- 2	2
6+35 [✓] 15 South	- 2	2
6+35 [✓] 10 South	- 1	1
6+35 [✓] 5 South	- 2	2
6+30 [✓] 20 SOUTH	- 2+2	4
6+30 [✓] 10 NORTH	- 1	1
6+30 [✓] 15 North	- 0	0

NOV. 3-1933 SHIFT #1 ⁴⁴

TUNNEL

No work.

NOV. 3 1933 SHIFT #2

TUNNEL GROUTING

1 FOREMAN

3 MEN

MIXING

1 FOREMAN

1 MEN

BATCHES 12

SX. CEMENT 60.

SX CLEANED 10

SX RECLAIMED 11

BATCHES WASTED 0

STARTED AT 5 P.M.

6+25[✓] 15 north 0

6+25[✓] 10 north - 4+2 6

NOV. 3 1933 SHIFT # 2

CONT.

6

6+25 ✓ 5 North - 1

1

6+25 ✓ 0 TOP - 0

0

6+25 ✓ 15 South - 3+1

4

6+25 ✓ 10 South - 2+1

3

6+25 ✓ 5 South - 1+0

1

6+15 ✓ 15 North - 1+0

1

6+15 ✓ 10 North - 1+0

1

6+15 ✓ 5 North - 2+0

2

6+15 ✓ 0 TOP - 2+0

2

6+15 ✓ 15 South - 7+7+7+7+4 - 32

6+15 ✓ 3+5+4+7+4+7 - 27

23

6+15 ✓ 10 South - 4+2

6

6+15 ✓ 5 South - 5+1

6

6+10 ✓ 10 South - 4+0

4

6+04 ✓ 15 SOUTH - 5+

5

6+04 ✓ 10 SOUTH - 4+

4

6+10 ✓ 10 NORTH - 1

~~1~~
10

NOV 3 1933 CONT.

SHIFT # 2

45

101

6+04 ✓ 5 SOUTH - 2+0

2

6+04 ✓ 0 TOP - 1

1

6+04 ✓ 15 NORTH - 4+1

5

6+04 ✓ 10 NORTH - 2+0

2

6+04 ✓ 5 NORTH - 1

1

5+90 ✓ 8 NORTH - 4

4

~~15~~

116

Nov. 4-1933 Shift #1
Tunnel

3 men drilling
grout holes.

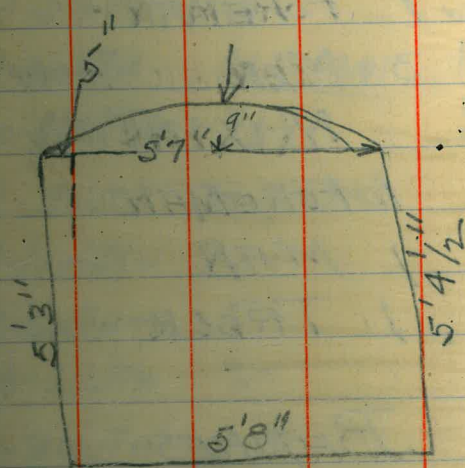
Lining has cracked
and opened up
from Sta. 6+00 to
6+16 - 10' above
invert on north
side.

Also an area ^{8' x 8'}
~~5' x 5'~~
7' above invert
at 6+27 south side.

Holes completed:

2	at 0+68	- 10'	from &
2	" 0+68	- 20'	from &
2	" 0+90	- 20'	" "
2	" 1+10	- 20'	" "
1	1+28	- 20'	" " north
1	1+56	- 20'	" " "
1	1+68	- 20'	" " "
1	1+88	- 20'	" " "

Total 120 ft.



Nov 4 1933 SHIFT # 2

TUNNEL GROUTING

1 FOREMAN

3 MEN

MIXING

1 FOREMAN

1 MAN

1 TRUCK

BATCHES

SX. CEMENT

SX. CLEANED

SX. RECLAIMED

BATCHES WASTED

started grouting
at 6 P.M. at station

5+90-8 South 3-	3
5+90-20 South 1-	1
5+90 10 SOUTH 2-	2
	<hr/>
	6

Nov. 4 - 1933 SHIFT # 2 47
CONT. 6

5+90-20 South 1	1
5+90 10 SOUTH 3	3
5+68-8-NORTH 1+3+3+1	8
5+68-20-NORTH-7+1	8
5+68-8-SOUTH 3+4+3+3	13
5+68-10-NORTH-2-	2
5+68-20-SOUTH-5-	5
5+68-10-SOUTH 2-	2
5+50-8-SOUTH-0	0
5+50-20-NORTH-7+7+7-2	23
5+30 8 NORTH-0	0
5+50-10-NORTH 0	0
5+50-20-South 1	1
5+50-10-South 2	2
5+29.5-8-SOUTH 1	1
5+29.5 8 North 1+3+2	6
5+10-8-South-1	1
5+10-8-NORTH 2	2

84 80

Nov. 4 1933 SHIFT #

CONT. 84

5+295-20 NORTH-2 2

5+295-20 SOUTH- 1+2 3

89

48
Nov. 6-1933 Shift #1

No work in
Tunnel. Crew
working in Spill-
way.

NOV 6 1933 SHIFT # 2

TUNNEL BONTING

1 FOREMAN

4 MEN

MIXING

1 FOREMAN

1 MAN

1 TRUCK

BATCHES 17

SX. CEMENT 85

SX. CLEANED 850

SX. RECLAIMED 7

BATCHES WASTED 0

STARTED GROUTING

AT 6 P.M. AT

STATION

5+29.5-10-SOUTH-3+3+7+7

NOV. 6 1933 SHIFT #2

CONT.

49

TOTAL

→ 5+29.5-10-SOUTH=3+3+7+7- 20

+7+7+7+7+6 41

5+29.5-10-NORTH-2- 2

5+10-20-NORTH-3+0 3

5+10-10-NORTH-3+0 3

5+10-20-SOUTH-4+0 4

5+10-10-SOUTH-0 0

4+90-8-SOUTH-3+5 8

4+90-8-NORTH-2+7+7+3 19

4+90-20-NORTH-1 1

4+90-20-SOUTH-1 1

4+90-10-SOUTH-1 1

4+90-10-NORTH-2+5-3 10

4+70-8-NORTH-3+5- 8

4+70-20-NORTH-2+0 2

4+70-20-SOUTH-1- 1

4+70-10-SOUTH-1- 1

4+70-10-NORTH 0

125

start at 1:00 PM

Nov. 7-1933 Shift #

Tunnel

3 men. growt.
ing holes. 4 hrs

Invert Holes

At 4+70 south, 8'

8 7+1

At 4+50 south, 8'

0 0

At 4+30 south, 8'

0 0

At 4+10 south, 8'

0 0

At 4+50 north, 8'

1 1

At 4+30 north, 8'

1 1

At 4+10 north, 8'

8/10 0

10

Wasted 2 batches.

50

Hole over rock pocket
developed in Lining
at 4+70 north, just
above invert 4'x18"

At 4+70 - 20' south

5 5

At 4+50 - 20' north

2 2

" - 10' north

1 1

✓ - 20' south

1 1

- 10' south

0 0

At 4+30,

✓ 20' north

1/20

Nov. 7 1933 SHIFT # 2

1 FOREMAN

3 MEN GRADING TUNNEL

AT MIXING PLANT

1 FOREMAN

1 MAN

1 TRUCK

BATCHES

27

SX. CEMENT

135

SX. CLEANED

500

SX. RECLAIMED

0

BATCHES WASTED

0

STARTED AT 5³⁰ P.M

AT 4+30-20-SOUTH-2+4+7+7

+5+2

TOTAL 27

AT 4+30-10-SOUTH 0 0

CONT.

27⁵¹

4+30-10-NORTH

4+30-NORTH-3+1

4

4+10-20-NORTH-2

2

4+10-10-NORTH-1+0

1

4+10-20-SOUTH-1-

1

4+10-10-SOUTH-3-1

4

3+90-8-SOUTH-3+2+2-

7

3+90 8-NORTH-2-

2

3+90-20-SOUTH-3+7+7

17

7+7+7+5+7+7+7

47

7+7+7+7+3+7+7

45

7+7+7+7+6+3

37

7+7+7+7+7-

30-

78

14

243

195

not finished
Blow out pipe
South wall about 1 foot
in area

Nov. 8-1933 - Shift #1

Tunnel 1 foreman &
1 foreman & 1 man (mixing)
3 men grouting

holes
2 finishers, 4 hrs.
1 truck driver.

Started at 8⁰⁰ A.M.

Holes grouted

At 3+90

20' south.

14 ✓ 7+7 unfinished

10' south

2 ✓ 2

20' north

1 ✓ 1

10' north

2 ✓ 2

At 3+68

8' north

$\frac{5}{24}$ ✓

2+3

24

Nov. 8 shift 1 Cont. ⁵⁷

At 3+48

8' north

8 ✓ 4+2+2

At 3+30

8' north

23 ✓ 4+7+7+1+4

At 3+68

8' south

2 ✓ 2

At 3+48

0 ✓ 8' south

At 3+30

8' south

47 7+7+7+4+7+7+7+1

46 7+7+7+7+7+7+4

45 7+7+7+7+7+7+3

43 7+7+7+7+7+7+1

204 ✓ 23 7+7+7+2

261

261 Nov. 8 - Shift #1 Cont.

At 3+68

2✓ ② 20' south

0✓ ① 10' south

3✓ ③ 20' north

2✓ ② 10' north

At 3+48

0✓ ① 20' north

1✓ ① 20' south

At 3+90

4✓ ④ 20' south (finish)

273 Total

41 Batches

205 sx. Cement.

NOV. 8 1933 SHIFT #

GROUTING TUNNEL

1 FOREMAN

4 MEN

MIXING

1 FOREMAN

1 MAN

1 TRUCK

STARTED AT 9 P.M.

At 3+48-10-SOUTH- 5✓

3+48-10-NORTH- 1 1✓

3+30-20-NORTH- 3+ 3✓

3+30-10-NORTH- 4+ 4✓

3+30-20-SOUTH- 7+7+7+4 25✓

3+30 10 SOUTH- 1 1✓

3+10 8' SOUTH- 7+7+5 19✓

3+10 8' NORTH- 1 1✓

3+10-20 south 7+7+3= 17✓

3+10-20-north 4+6= 10✓

TOTAL 86

NOV 8 1933 SHIFT #2
Cont

Batches 12
Sx. Cement 60
Sx Cleaned 750
Reclaimed 7

Note:

Mr. Wood
requested a Pressure
Gauge on the
grout guns

54
Nov. 9-1933 Shift #1
Tunnel

1 foreman and 3 men
grouting.
1 foreman and 1 man mixing
1 truck driver
1 finisher and 1 helper.

Started grouting at 4M.
Lining cracked at
3+38-north side, 8' above
invert. Area 3'x3'.

Started at 9:15 A.M.
At 3+10-10' south.

4 ✓ ⊕
0 ✓ ⊙ 10' north.
At 2+92, 8' north
0 ✓ ⊙
1/5 ✓ ⊙, 8' south

5 | Nov. 9-1933 (Cont.)

At 2+70, 8' north

0 ✓ ①

0 ✓ ② 8' south

At 2+50, 8' north.

1 ✓ 1

1 ✓ 1 8' south

At 2+92, -20' north.

3 ✓ ③

0 ✓ ④ -10' north.

2 ✓ 2 -20' south

1 ✓ 1 -10' south

At 2+32 - 8' south

2 ✓ 2

0 ✓ 0 8' north

At 2+11 - 8' south

0 ✓ 0

0 ✓ 0 8' north

15

15 | Nov. 9-33 (Cont.)

At 2+70 - 20' south.

3 ✓ ③

2 ✓ ④ 10' south.

0 ✓ ⑤ 20' north

1 ✓ ⑥ 10' north.

At 2+50 - 20' north.

0 ✓ ⑦

5 ✓ ⑧ 10' north.

2 ✓ ⑨ 20' south

⑩ ✓ ⑩ 10' south

At 2+32, 20' south

2 ✓ ⑪

0 ✓ ⑫ 10' south

2 ✓ ⑬ 20' north.

3 ✓ ⑭ 10' north

At 2+11, 20' north

1 ✓ ⑮

36

36/Nov. 9-33 (Cont)
At 211; 10' north.

0 ✓ ⊙

9 ✓₂₊₇₊ 20' south
unfinished

45

Total

Batches 12

SX. Cement 60

Wasted 7 Batches

NOV. 9 33 SHIFT # 2

DRILLING GROUT HOLE

IN TUNNEL

1 FOREMAN

3 MEN

STARTED AT 5 P.M.

Holes completed:

1+88-20-SO-

1+68-20-SO-

1+88-8' SO

1+88-8'-NR.

1+68-8'-NR

each 10' deep.

TOTAL 50

FINISHED

Nov. 10-1933 Shift #

Tunnel

1 foreman and 4
men drilling

grout holes.

1 finisher and 1

helper. ^{2 hrs} Used

2 5x. Cement.

Holes completed:

In Lining, 10' deep.

1 at 1456, 20's. of E

In Invert,

1 at 1468, 8's. of E

2 at 1456, 8' from E

1 at 1428, 8's. of E

Holes in Lining

4+02 South 8' up.

4+02 North 7' "

4+30 North 12' "

✓ 4+70 " at Inv.

5+65 " 3' up

5+70 " at Inv.

✓ 6+00 + "

✓ 6+16 " 10' up

✓ 6+27 North at Inv.

6+27 South 8' up.

163 Nov. 13 Cont.
Invert broken and
cracked, 7' south of
☿, from 1+65 to 1+89.

At 1+88, 10' south of ☿

4 ✓ ④
2 ✓ ② 20' north of ☿
0 ✓ 0 10' " " " "
8' north of ☿

17 ✓ ① 1+7+7+2 Unfinished

186 Total

Batches 21
Sx. Cement 105

59
Nov. 13, 1933 SHIFT # 2

TUNNEL

1 FOREMAN AND 3 MEN

GROUTING

AT ✓ 1+88-8'-N FM ☿

④ 7+7+7+7+7+7+7

⑤ 2 +7+7+7+3+7+7+7+7

④ 1 +7+7+7+7+7+6 (143)

BLEW UP INVERT AT

1+98 to 2+16 4' North of ☿

to 9' NORTH OF ☿

1+88-8'-N- NOT FINISHED

⑦ AT-1+88 8' SOUTH - 7 UNFINISHED

② 8 - 1+88-20' South 7+7+7+7

⑤ 3 +7+2+7+7+7+4+7+7+7

70 7+7+7+7+7+7+7+7+7

54 7+7+7+7+7+7+6+7

207
256

NOV. 13 1933 SHIFT #2

356 TUNNEL CONT.

HT 1+88-20-S CONT.

(17) 7+7+3 NOT FINISHED

373 BATCHES 42

SX. CEMENT 210

TOTAL

60
Nov. 14-1933 Shift #1

Tunnel

1 foreman and 3 men

grouting.

1 finisher and 1 helper.

Started at 7:45 AM

A 1+88-20 south of E

51 7+7+7+7+7+2+7

45 7+7+7+7+7+3+

40 7+7+7+7+7+5

51 7+7+7+7+7+7+2

187 Grouting stopped by Contractors' order at 10:30 A.M.

Batches 33

Sx. Cement 165

Holes drilled:

4.50' 1 at 6+27 north and
2' above invert.

4.00' 1 at 6+28 south and
10' above invert.

4.75' 1 at 6+16, north and
9' above invert.

13.25

13.25 Nov. 14-1933 Cont.

4.75 1 at 5+60 north,
and 18' above Inv.

5.50 1 at 6+28 south
and 2' above Inv.

4.00 1 at 6+08 north
1.5' above Inv.

4.00 1 at 5+68, north
and 1.5' above Inv.

31.50
Total drilled: 31½ ft.

Nov. 14 1933 - SHIFT #2

TUNNEL

CREW ON SPILLWAY

Nov. 15-1933 Shift
Tunnel
1 finisher and
1 helper.
Grouting crew
working on spillway

Nov. 15-1933
Shift #2
Tunnel
No work.

Nov. 16-1933 Shift #1⁶²
Tunnel
1 finisher and
1 helper,
patching lining.

Nov. 17-1933 Shift¹

Tunnel

1 finisher and 1
helper, patch-
ing lining.

6 hours.

Nov. 18-1933 Shift¹

Tunnel

1 finisher and
1 helper, patch-
ing lining.

Nov. 20-1933 Shift #1

Tunnel

1 finisher and 1
helper, patching
lining. 6 hours.

Nov. 21-1933 Shift #1

Tunnel

1 finisher and 1
helper, patching
lining.

64
Nov 21 1933 Shift #2

TUNNEL

GROUTING

NO WORK

Nov. 22-1933 Shift #1

Tunnel

1 finisher and 1
helper, patching
lining.

Nov. 23-1933 Shift #1⁶⁵

Tunnel

No work.

N. side, 6+00 to 6+16
10' up, 1' wide.

S. side, 6+27 & 7' up
8' x 8'

N. side, 4+70 at invert
4 x 1.5'

N. side, 3+38, 8' up.
3' x 3'.

Nov. 23 1933 SHIFT #2

TUNNEL

GRAVITY

NO WORK

CREW ON SPILLWAY

Nov. 24 1933 Shift #1⁶⁶

Tunnel

1 finisher and 1
helper, 4 hours,
patching lining.

NOV. 24-1933 SHIFT #²
TUNNEL

GRouting STARTED AT 7³⁰

1 FOREMAN

4 MEN

1 FOREMAN and 1 Man mixing

1 TRUCK

TOTAL

AT 1+88 20' SOUTH 0 0

" 10' " 0 0

" 20' North 0 0

" 10 " 2 2

AT 1+68 8' North 3 3

" 20' " 5+7+7+5 = 24

" 10' " 1

" 8' south 0 - 0

" 20' " 3 - 3

" 10' " 1 - 1

THE ABOVE HOLES 34

GRouted WITH 75# PRESSURE

AT COMPRESSOR

CONTRACTOR - CHANGED PRESSURE WITHOUT ORDER - J.C.M.

NOV. 24-33 SHIFT #2 ⁶⁷
CONT. ³⁴

PRESSURE CHANGED

Too: 100#

TOTAL

AT 1+50 8'-SOUTH 2+ 2

20' ⁷⁺⁷⁺⁷⁺⁷⁺⁵⁺⁷⁺⁷ 139

10' " 7+ 7

8' NORTH 0 0

20' " 3+ 3

10 " 2

AT 1+28 8' SOUTH ⁷⁺⁷⁺⁷⁺⁵ 26

NOT FINISHED

TOTAL = 213

BATCHES

23

SX CEMENT

115

74
139
213

NOV. 25/33 SHIFT #2

TUNNEL GRouting

1 FOREMAN

4 MEN

HT MIXIER

1 FOREMAN

1 HELPER

1 TRUCK
BATCHES

25

SX. CEMENT

125

SX. CLEANED

0

SX. RECLAIMED

0

BATCHES WASTED

0

STARTED AT 5:30 P.M

HT

1+28

8' SOUTH

7+7

14

8' NORTH

1

1

20' NORTH

5+7+7+7+2
7+7+3

45

NOV. 25/33 SHIFT #2

CONT.

HT 1+28

10' NORTH - 2

2

20' SOUTH - 1

1

10' SOUTH - 0

0

HT 1+10

8' SOUTH INVERT

5

4+1

8' NORTH - 3+7+7+5

22

20' NORTH - 5

5

10' NORTH - 2

2

20' SOUTH - 0

0

10' SOUTH 4+7+7+7+7+7

7+7+7+7+7+7+7

7+7+7+7+7+7+4

134

TOTAL =

231

for the shift

68
60

Nov. 27-1933 Shift #1

Tunnel

1 finisher and 1 helper, patching lining.

1 man burning off grout pipes.

Nov. 27/33 SHIFT #2
INVERT SECTION BROKEN IN PLACE
4-0 LONG AT STARTING AT 4-21 SOUTH

69
NOV. 27/33 SHIFT #2

TUNNEL GROUTING

1 FOREMAN AND 4 MEN

AT MIXER 1 FOREMAN 1 HELPER

1 TRUCK STARTED AT 5:30 P.M.

AT 0+90 TOTAL

8'-SOUTH. 4 4

8'-NORTH 2 2

20'-SOUTH- 7+7+7+7+7 35

7+7+7+7+7+7+7+7+7 70

7+7+7+7+7+7+7+7+7 70

7+7+7+7+7+7+7+7+7 70

7+7+7+7+7+7+7+7+7 70

7+7+7+7+7+7+7+7+7 70

7+7+7+7+7+7+7+7+7 70

7+7+7+7+7 35

Not Finished 503

BATCHES 60

SX CEMENT 300

Nov. 28-1933 Shift #1
Tunnel

1 finisher and
2 helpers, patching
lining.

2 men, grouting
6 1/2 hrs. { 1 foreman and 2
men, mixing.
1 truck driver.

Grouting started
at 9:40 A.M.

Hole at 0+90

1 1 20' south of E
20' north

12 6+6

1 1 At 0+68- 8' north

2 2 8' South

16

16

1

28

0

3

29

77 Total

0

Shift #1 Cont.

1 At 0+68- 20' south
20' north

4+7+7+7+3

At 0+90- 10' south

3 3 10' north

At 0+68- 10' north

7+7+7+2+6

0 0 At 0+68- 10' south

2 men cutting
pipe, 3 hours.

Batches 13

Sx Cement 78

Nov. 28 / 33 SHIFT #2

TUNNEL

1 FORMAN AND

3 MEN CLEANING,

TUNNEL

1 MAN BURNING

OFF GROUT PIPES

Nov. 29-1933 Shift #1⁷¹

Tunnel

1 finisher and

1 helper, patching lining, 4 hrs.

1 man burning off grout pipes, 8 hours.

Dec. 1-1933 Shift #1
Tunnel

1 finisher and
2 helpers, patch-
ing lining.

Dec. 2-1933 Shift #1
Tunnel

1 finisher and
1 helper, patch-
ing lining.
2 men burning
off grout pipes.

Dec. 4-1933 Shift #1

Tunnel

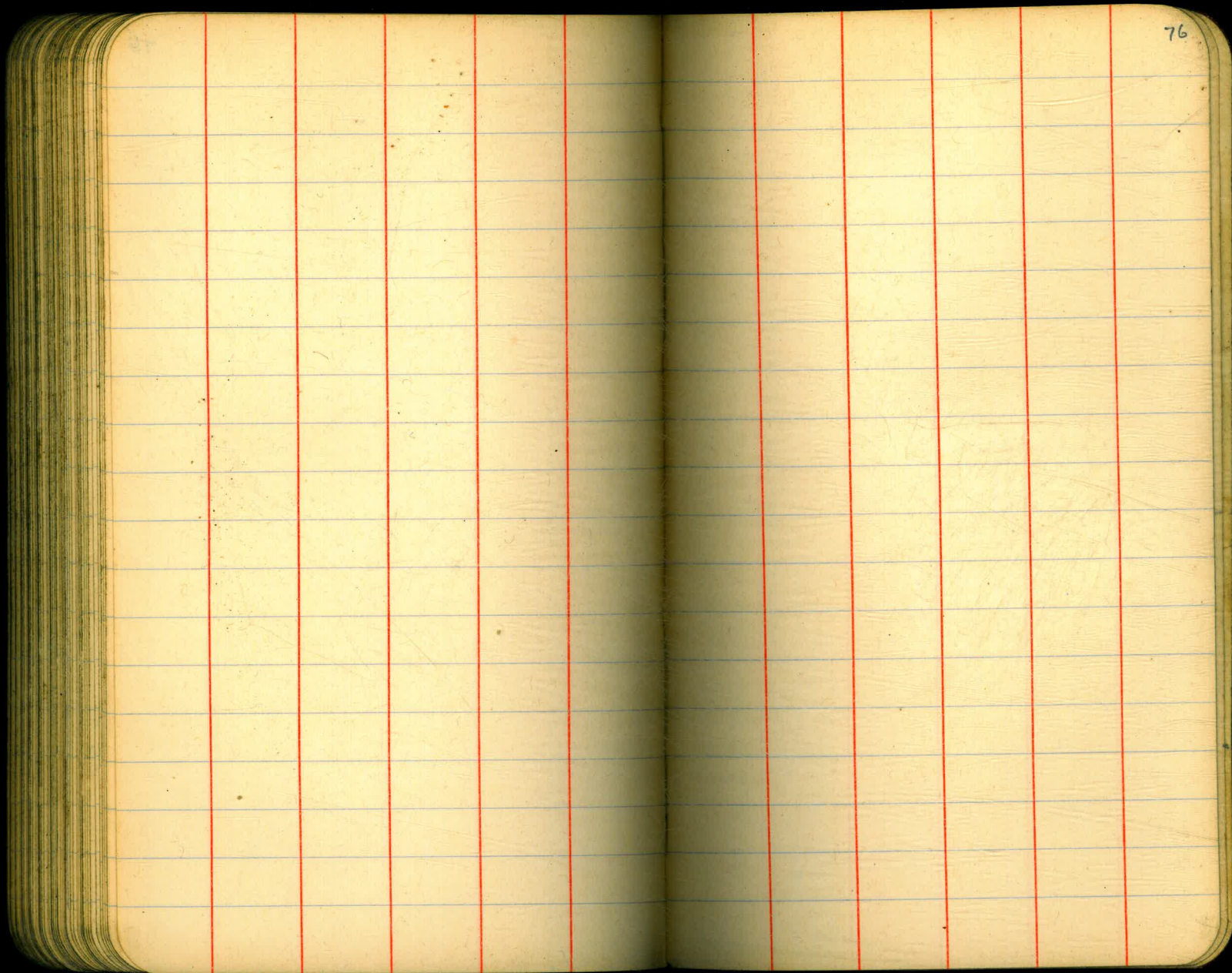
1 finisher and 2
helpers, patching
lining.

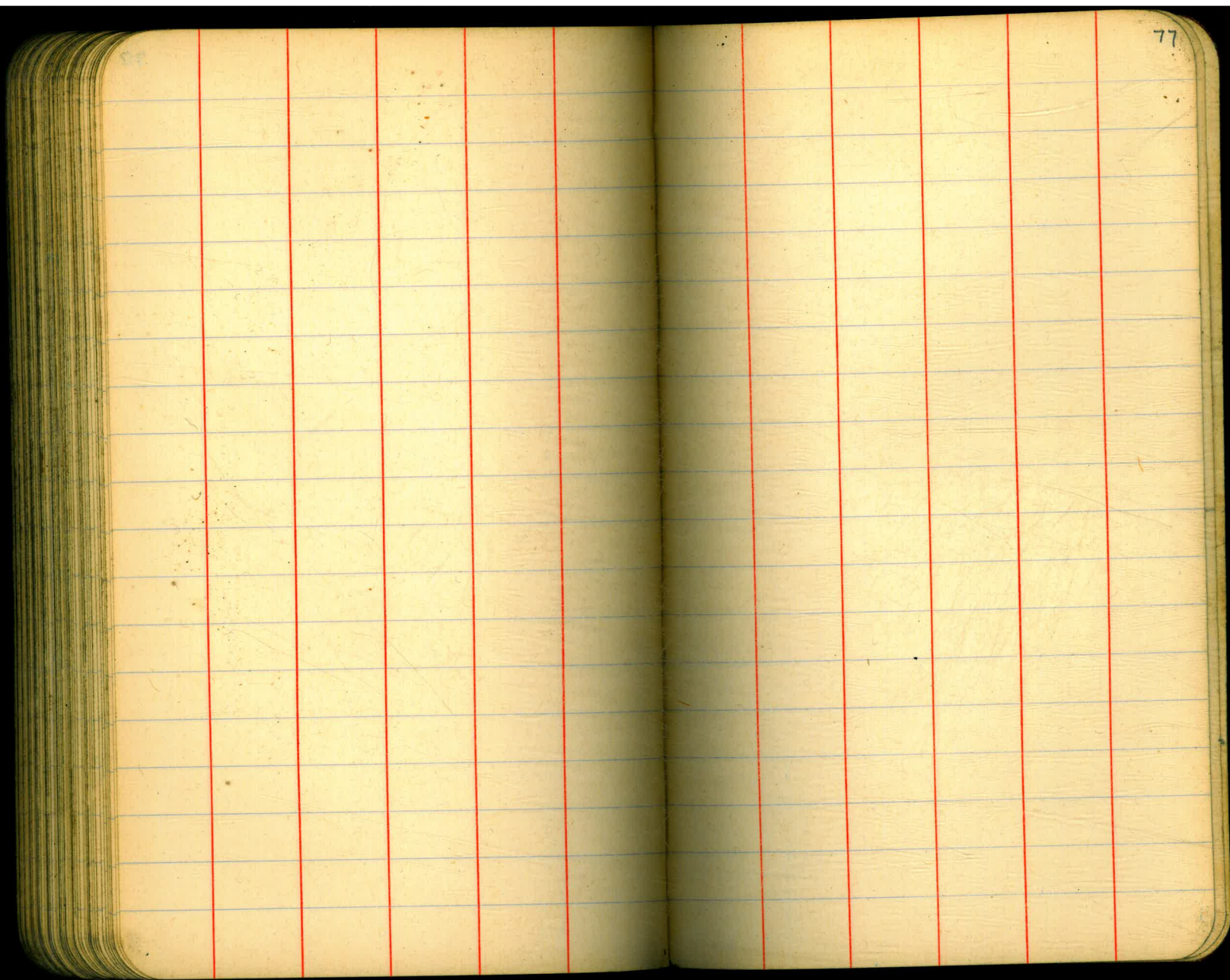
Used 5 sx. Cement

73
Dec. 5-1933 Shift #1

Tunnel

1 finisher and 2
helpers, patch-
ing lining.





The image shows an open notebook with two facing pages. Both pages are cream-colored and feature light blue horizontal ruling. Vertical red lines create margins on both pages. The right page has the number '78' printed in its top right corner. The notebook's binding is visible on the left side, showing the edges of many pages. The entire notebook is set against a solid black background.

20
Form # 8-14-13

79

Аммунимент # 26

asst. 2600

11.25

asso. 3200

1.50

25

1000

1228

11

3

4.33

5

1.65

25

46

120

$\frac{1}{3} - 3'$

35

$\frac{2}{3} - 2'$

$\frac{1}{2} - 2\frac{1}{2}$

117

$\frac{1}{2} - 3\frac{1}{2}$

39

3

117

156

273

$$\begin{array}{r} 48 \\ 2.5 \\ \hline 240 \\ 26 \\ \hline 120.0 \end{array}$$

$$\begin{array}{r} 48 \\ 3.5 \\ \hline 240 \\ 44 \\ \hline 168 \\ 20 \\ \hline 288 \end{array}$$

$$\begin{array}{r} 9 \\ 21 \\ \hline 186 \\ 168 \\ \hline 18 \end{array}$$

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES $1\frac{1}{2}$ TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.

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