

W

406

DIETZEN

CONCRETE

ENGINEERS

LEVEL BOOK

No. 412

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

Roadway 16 feet wide. Side Slopes 1 on 1.

For Single Track Embankment.

406

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
0	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	0
1	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	1
2	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	2
3	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	3
4	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	4
5	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	5
6	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	6
7	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	7
8	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	8
9	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	9
10	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	10
11	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	11
12	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	12
13	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	13
14	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	14
15	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	15
16	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	16
17	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	17
18	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	18
19	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	19
20	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	20
21	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	21
22	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	22
23	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	23
24	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	24
25	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	25
26	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	26
27	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	27
28	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	28
29	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	29
30	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	30
31	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	31
32	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	32
33	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	33
34	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	34
35	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	35
36	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	36
37	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	37
38	46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	46.9	38
39	47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7	47.8	47.9	39
40	48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7	48.8	48.9	40

MICROFILMED

JAN 12 1965

Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 39:6. For same slopes but other widths of roadbed, correct above figures by one-half difference in width of roadbed; thus in example above, for 20 ft. roadbed distance will be $30.6 + (20 - 16) \div 2$ or 2 ft. added to $30.6 = 32.6$. For slopes of 1 on $1\frac{1}{2}$ see inside of back cover.

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406.

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TUNNEL CONCRETING Etc

Inspection - by

R. H. Carter
R. J. Hamilton
W. A. Harper
W. J. Hendrick

MICROFILMED

APR 12 1969

DI

F

38
98
04

10 + 93 to 11 + 53.0

Thursday - Dec - 8 - 1932

7: A.M. to 4: P.M. shift

Placed concrete in tunnel

ring - Sta. 11 + 63 to Sta. 11 + 03.
(7)

1st Batch of concrete at 10:35 A.M.

Equipment:

- 1 - mixing plant
- 3 - Transit mix trucks
- 1 - Presswell Concrete Pressure tank
- 1 - Northern Portable - 24" Conveyor belt elevator

Labor:

All on tunnel work

- 1 - Gen. foreman
- 1 - Concrete foreman
- 1 - man dumping concrete from Trucks
- 2 - Men tamping concrete
- 1 - pressure tank operator
- 1 - elevator operator
- 6 - men in mixing plant
- 4 - Riggers
- 5 - Carpenters
- 5 - Carpenter helpers
- 3 - Steel Men
- 3 - Transit mix truck drivers
- 1 - Cement finisher

R. W. Carter 2
Conc. Inspector

- Mix: 6 - sacks Cement
1370# Sand
1220# 1 1/2" gravel
1030# 3/4" gravel
30 - Gallons.

The above mix and added water produces not over a 6" slump concrete which is necessary to fill all irregular areas behind steel forms

7: A.M. to 10:30 A.M. - cleanup, building scaffolds, rigging discharge lines, shimming reinforcing steel, closing port holes and caulking cracks in steel form joints.

10:45 A.M. to 11:30 A.M. delay concrete discharge line plugged. Delay 2: P.M. to 3:45 P.M. Conveyor belt broke.

30 - Batches Concrete { 7: A.M. to 4: P.M.
180 - Sacks Cement { Shift.

3

Shift #2

4 P.M. to 12 Midnight.
Pipeline unplugged at
4:10 P.M.

Shut down 5-6 P.M. meal
time.

Water in mix cut to 36
gals. at 5 P.M. and in-
creased to 37 gals at 9 P.M.
Crews changed at 10 P.M.,
except Gun operator and Mix
foreman. Relief crew con-
sisted of 1 shifter, 10 men &
1 carpenter.

Line plugged at 10:05 P.M.
and opened at 11:20 P.M.

Total of 108 batches for
the shift - ^{to 11:20 PM} 648 sq. cement.

T. Rathurstin

H.L. Harper.

4

Friday, Dec. 9, 1932.

Shift - 12:00 Midnite - 8 A.M.

Relieved Thurstin at 11:30 P.M.

Total Batches at Midnight = 156
This shift - 126 Batches

Midnite - 12:30 A.M. - Choke

12:30 A.M. - 1:10 A.M. - Placing conc. N. side

1:10 A.M. - 2:20 A.M. Lunch + change to S. side

2:20 A.M. - 2:40 A.M. Placing conc. S. side

2:40 A.M. - 3:05 A.M. - Choke

3:05 A.M. - 3:15 A.M. - Placing, S. side

3:15 A.M. - 3:40 A.M. - Choke

3:40 A.M. - 4:10 A.M. - Placing, S. side

4:10 A.M. - 4:20 A.M. - Change to N. side

4:20 A.M. - 4:40 A.M. - Placing, N. side

4:40 A.M. - 5:25 A.M. - Choke* + Change to S.

5:25 A.M. - 5:35 A.M. - Placing, S. side

5:35 A.M. - 5:50 A.M. - Choke

5:50 A.M. - 6:10 A.M. - Placing, S. side

6:10 A.M. - 6:20 A.M. - Change to N

Friday, Dec. 9, 1932 - Midnight - 8:00 AM ⁵

Remarks:-

Bad leak thru bulkhead at E. end of S. side, caulked at 12:10. Minor leaks at form joints, also caulked.

Practice of using water jet at gun should be discontinued. Use air.

Consider use of additional cement, better hydrated lime, Present mix is too wet and not plastic enough.

Some separation occurs on conveyor, more in drop into hopper and mortar is blown thru $1\frac{1}{2}$ " aggregate in the 5" line. A dryer, "fatter" mix will reduce choked leakage and give a better job.

Consider 6" line. Also chute from conveyor to hopper, or slower belt speed.

Friday, Dec. 9, 1932 - Midnight - 8:00 AM ⁶

Equipment:-

As listed on page #1

Force:-

Taken by Thurstin at 10:00 PM,

Dec. 8.

Change of Mix

At 3:30 AM changed mix noted on Page #2 to following: 5-1370[#], $3\frac{1}{4}$ "-1250[#]; $1\frac{1}{2}$ "-1000[#]. Reduced water, first to 36 Gal then to 35 Gal.

Remarks:- cont'd

At 4:00 AM, concrete had all the earmarks of cement shortage. This was checked and found 6 sack to batch. Another answer may be a dirty mixer.

Total Batches 225 - at 8:00 AM. Counter reading 69 batches this shift

Friday Dec 9.

8: A.M. To 10:45 - A.M.
Placing concrete in Tunnel ring

Continued:

Equipment: same + 1-truck

Labor: 1-foreman { cleaning up
12 men { spilled concrete
1-truck driver { and moving
timbers in tunnel

1- Gen. foreman
1- Conc. foreman
4-men placing conc.
1-man operating gun
1- " " elevator
3- Transit mix truck drivers
6-men in mixing plant
3-riggers
2-Carpenters { 1/2 day in tunnel
2-Carp. { 1/2 day entrance
portal forms
3-Carpenters { All day entrance
3-Carp. helpers { Portal
1-Cement finisher
2-men on steel { Core wall
North End

1-set of three test cylinders made

at 9:30 A.M.

6-545. Cement
1970 # Sand
1250 # 1 1/2" gravel
1000 # 3/4" gravel
37-gals. H₂O

Total Batches Conc. 255 - This 60 ft. Retro.
Sacks Cement → 1530
30-Batches this shift

2550-Sks. Cleaned
12-Recovered

Sat. Dec. 10 - RAIN

1x0 Concrete to-day

Setting steel tunnel forms

1#6 Cat. bulldozer {moving forms
for tunnel}

#10 Dragline {excavating channel
west of exit portal}

Labor:

1 - Gen foreman {stripping and setting
1 - conc. foreman } steel tunnel forms.
1 - mixer man
12 - men
1 - tractor oper

1 - Rigger {Cribbing up pressure
5 - men } gun and elevator to
a height to clear
expected flood.

#10 - Dragline oper.
#10 " " oiler

11.
R.W. Carter
Inspector

Dec. 11th 12th 13th reported by Mr.
Newcomb - No. Concrete.

Wednesday Dec. 14 Cloudy.

NO CONCRETE

Equipment:

- 1-#7-shovel
- 1-#10-Dragline
- 1-Tractor

Labor:

#7-shovel operator { bldg road
#7 " oiler { to gravel
plant

#10-dragline oper { Excav. Channel
#10 " oiler { muck-Exit
Portal & dug

1-mixer man { using tractor
1-Tunnel foreman { to pull truck
Jumbo out of
Tunnel and
odd jobs

1-pumpman

R.W. Carter
Inspector

12

Thursday Dec. 15- weather clear.

NO Concrete to-day

Equipment:

- #8-shovel
- 2-Dump trucks
- #10-Dragline

Labor: #8-shovel operator { filling hole in
#8 " oiler { dike above
entrance Portal
2-Truck drivers

1-foreman { working on pipe lines
1-rigger { and pumps east of
5-men { entrance portal

3-Carpenters { Framing head set
3-helpers { entrance Portal

1-mixer man { repairing 16" pipe
1-helper { line south side of
dam and tunnel work

2-Carpenters { Tunnel forms
12:30 P.M. to 4:30 P.M.

#10-dragline operator { excavating
#10 " oiler { channel west
of exit Portal

Friday Dec. 16.

~~Concrete place~~

Equipment: 7:00 A.M. to 4 P.M. Shift

#10 dragline {cleaning up muck
1-Bulldozer - 60 {at exit PortalLabor: 1-foreman {cleaning tunnel
1-Conc. foreman {muck at west
12-laborers {end of tunnel1-Carp. foreman {Bldg. forms for
1-Carp. {timg 1 lining back
3-helpers {of timbered section1-Cement finisher {Pointing up
1-helper {tie rod holes
and patching1-#10-dragline operator
1- " " oiler

1-Bulldozer operator

1-rigger {stripping D.S.
1-helper {to wall forms1-Carp. sawyer {cutting forms
1-helper {for entrance
Portal1-mixer man {Repairing belt conveyor
1-mechanic {in tunnel

6: P.M. to 2: A.M. Shift

Placed concrete in over break

section of South Tunnel wall from
ground to height of 6-ft {Sta. 6+88 to
Sta. 6+00

1:2 1/2: 5-MIX -

5-SK Cement {This mix
1340# Sand {authorized by
760# 2 1/2" gravel {MR. Head 11: A.M.
970# 1 1/2" " {this date
770# 3/4" "
33-bals #20
6: P.M. to 1:30 A.M. Placing concrete

Equipment:

1-mixing plant
2-Transit mix trucks
1-Northern Belt Conveyor elevatorLabor: 6-men in mixing plant
2-Transit mix truck drivers
1-man operating elevator and
dumping trucks.1-foreman {Steve the engineer
1-Sub foreman {Mac the rigger
3-men placing concrete
3-carpenters {forms ahead of
1-helper {concrete crew

Power off 9:45 to
10:30 P.M.

= 24 yds. concrete
poured at 10:30 P.M.
T. W. Thurston

might
4 men on Temp Dam
at Exit Portals
15" Pump off

Through Night Shift at 1245 AM 7²
Ordered 47 Bbls. Total plant
Used 235 Sack Cement Rec. m...
J.T.W.

3
e
o
t

Weather
Clear

Sat. Dec. 17-1932

Placed concrete in overbreak
area of South Tunnel wall to
height of 6-feet. Sta. 6+00 to
Sta. 3+60

10:45 A.M. to 8: P.M.

Equipment: 1-mixing plant
2-Transit mix trucks
1-60 H.P. Tractor
1-Belt conveyor elevator.

Labor:

All on concrete {

- 1-Gen. foreman (store the engineer)
- 1-Concrete foreman
- 4-men placing concrete
- 1-man operating tractor pulling elevator ahead.
- 1-man operating conveyor and dumping trucks.
- 2-Transit mix truck drivers
- 5-men in mixing plant

1-foreman { erecting steel tunnel forms
6-men

3-steel men { reinforcing steel in tunnel lining.

3-men { cleaning muck from area to receive concrete

R. W. Carter
Inspector

1-Carp. foreman { Forms for tunnel wall south side.
3-Carpenters
3-helpers

1-Carp. Sawyer { Sawing forms for entrance Portal structure
1-helper

1-Cement finisher { Finishing honeycomb areas both Portals
1-helper

2-men { Cleaning out lumber from behind south retaining wall exit Portal.

#8-Shovel operator & oiler { Backfilling south retaining wall exit Portal

5-Sks. C { 96-Batches
1340 #5
760 # 2 1/2" G
970 # 1 1/2" G
770 # 3/4" G } 480-Sks. Cement

Night Shift - next Page.

19
Dec. 17- Saturday

Night shift - 5: P.M. to 2: A.M.

1- foreman { erecting steel forms
11- men { for tunnel lining

2- men { Cleanup in tunnel

1- man { stripping forms in
tunnel -

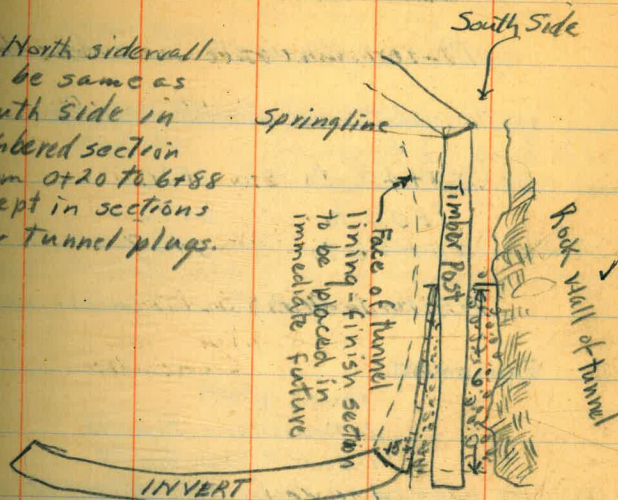
3- Carpenters { setting forms
for tunnel overbreak
concrete

#8- Shovel

1- operator { Backfilling
1- oiler { South Retaining
wall, exit Portal.

12-17-32 R. W. Carter 20

North sidewall
to be same as
south side in
timbered section
from 0+20 to 6+88
except in sections
for tunnel plugs.



Sketch showing location of
concreting operations to protect
timber sets from washing out in future
floods flowing through the tunnel
in case such floods come before
lining is completed.

Sunday Dec. 10, 1932

Weather Clear

Placed concrete in overbreak
section of tunnel, South wall from

Sta. 3+60 to sta. 1+30-

" 1+04 to " 0+72

" 0+56 to " 0+18

7: A.M. to 4: P.M.

Equipment:

Mixing plant
2 Transit mix trucks
1-60 H.P. Tractor #5
1 Northern Belt conveyor
elevator

Labor:

1-Gen. Foreman
1-concrete Foreman
3 men placing concrete
1 man operating tractor and
helping on concrete
1 man operating elevator and
dumping trucks.
5 men in mixing plant
2-Transit mix truck drivers
1-Carp. Foreman } Forms in
4-Carpenters } Tunnel
4-helpers }
1-Carpenter sawyer } Sawing forms
1-Sawyer helper } for Tunnel
entrance.

1-foreman { erecting steel form for
6-men } tunnel lining

3-steel men { Reinforcing steel
for tunnel lining

1-Cement Finisher } Plastering honeycombed
1-helper } concrete on back face
of east Portal ret. Walls.

At noon the weigh man was eliminated
at mixing plant by arranging levers
for mixer man to operate.

MIX: 5-SKS. C.

1340# 5' G

760# 2 1/2' G

970# 1 1/2' G

770# 3/4' G

30- to 32- Gals. H₂O

{ 111 Batches Concrete
555 Sacks of Cement

$$\begin{array}{r} 10 + 25.5 \\ 67.5 \\ \hline 10 + 93.0 \end{array}$$

18th Sunday - 5: P.M. shift started this Sat

Placed concrete tunnel lining

From Sta-11+03 to Sta-10+35[±]

Time started - 11: P.M.

Equipment:

- 3-Transit mix trucks
- 1-mixing plant
- 1-Presswell concrete pressure gun
- 1-Northern Belt Conveyor elevator

MIX - 6-sacks Cement
 1440 # Sand
 1150 # 1 1/2" Rock
 1030 # 3/4" Rock
 Not over 36-gallons added
 mixing water.

Note: Under no circumstances is
 water to be added to concrete
 after leaving mixing plant. If
 pressure in concrete gun is not
 sufficient to clear the gun and
 discharge lines, then additional
 pressure must be obtained, but
 water at the gun or elsewhere
 at the placing end must NOT
be added R.W. Center
 Inspector

Dec. 18 - 1932

5 P.M.
1 shifter - 6 men setting
forms.

3 carpenters - 2 helpers
building forms.

Mixing crew of 4 men
started at 11 P.M.

1 Gun operator & 3 truck drivers,
started pouring at 11:45 P.M.

Gun crew prepared to
wash door with water. Told
them water must not be
used. Also told Pohl & Con-
nelly, who were both there.

L. H. HARPER

Dec. 19, 1932 - Sun. night / Mon. morning.

12:40 AM - 7:00 AM.

Relieved Mr. Thurston at 12:40 AM

Mix in use as per page #24

2:00 AM, Mr. Connolly asked for
wetter mix. This was refused.

Concrete operations stopped at 1:30 AM

discharge line plugged. Investigation

showed that sand from recent
flood had plugged vital parts of the
pressure tank and was not cleaned
out before attaching the discharge
line, this was the cause of the
plugging, because the pressure was
not effective in the discharge line.

The discharge line was taken out

and new line placed.

33 batches to 1:30 - SAME A.
9 batches of this 33. wasted because
it could not be used after the
long delay.

Dec. 19. 7:AM to 4:PM Shift.
FOR INSPECTOR

Concrete started at 9:15 AM.
after shutdown from 11:30 AM. (Repairs)

Same equipment as reported

on page 23, this book.

Labor:

2:AM-M:AM
Shift
M:AM to 7:PM
Shift - Labor Same

4 men in mixing plant
3 Transit mix truck drivers
1 man dumping trucks
1 man operating gun
5 men
1 Foreman { Working on
 } discharge end
 } of line on forms
1 Welder 4 hrs. { Welding
 } discharge line

Miscellaneous labor - 7:AM to 4:PM.

1 - Corp. Foreman { Tunnel entrance
1 - Corp. } Portal forms
3 - Helpers
2 - Corp. Helpers { wiring over break
 } Tunnel forms
2 - Carpaths } Bulkhead for tunnel steel forms
1 - Corp. Sawyer } Sawing forms
1 - helper } for tunnel entrance

9:45 - line plugged - Start 10:PM.

11:15^{AM} - 12:15^{PM} Delay moving discharge line.

2:55 PM - To 3:20 PM discharge line plugged.

3:20 PM to 3:35 PM Pulling pipe ahead

118 - Batches total on this pour.

85 - Batches this shift - 7:AM to 4:PM

1 - set of three test cylinders

Made at 3:PM - from tunnel

lining concrete at Sta. 10+60

6 - Sks. Cement

1440# sand

1150# - 1/2" Rock

1030# - 3/4" Rock

37 - gallons added mixing water

Sand was very dry, probably not over
2% moisture content.

DEC. 19-1932

4 P.M. to Midnight

No concrete poured from
4 to 6 P.M., adding to pipe line.2 Carpenters - 3 helpers
working at Entrance Portal.Mixing crew of 4 men
changed shifts at 5:30 P.M.Concrete gang of 1 Shifter
and 7 men started at 7 P.M.8:10 P.M. drive chain on
Belt conveyor broke.

Repaired at 9:45

75 batches 6 to 12 P.M.
poured this shift.Thurston
Inspector

Total to-date - 193 Batches

H.L. Harper.

Dec. 20, 1932 - Tuesday -

Midnight to 7 AM

Lunch to 12:30 AM

Started gun at 12:30 AM

Mix as per page #48

Shut down from 1:30 AM - 4:00 AM - Plug.

2 Transit-Mix Trucks only after 4:00.

Mixer Plant crew changed at 2:30 AM

1 Truck only hauling from crusher
which results in over-charging of
bunkers during mixer shutdowns in
an attempt to build up stock. This
causes mixing of aggregate sizes
and should be protested as con-
trol of mix is thus lost.

4:30 AM - 5:45 AM. Conveyor broken

Crews dismissed at 5:45

Batches - 12 Midnt - 7 AM. = 39

Total to-date - 232 Batches

31

7: A.M. TO 4: P.M. → R. K. Carter
Inspector

Dec. 20 - Continued

Placing crew changed at 4:30 A.M.

1-foreman { 4:30 A.M. to 1:30 P.M.
7-men { Shift changed at
1:30 P.M. except foreman
1-Gunoperator { 7: A.M. to
relief.
1-Carpenter { 7: A.M. to
aldg. Bulkhead end of steel

Note -
Drivers
work 12
hr. shifts

2- Transit mix truck drivers { 11: A.M. to
changed at 11: A.M.

4-men at
mixing plant { Changed shift at
11:30 - A.M.

No change in mix this shift

60-Batches concrete this shift.

292-batches to-date - 4: P.M.

7460 - Sks. Cement. " " " "

1752 OKS.

Dec. 20 -

32

8: A.M. to 9: A.M. Placing concrete

9:00 A.M. to 9:25 A.M. Cutting discharge pipe

9:25 A.M. to 10:30 Placing concrete

10:30 A.M. to 11:30 A.M. Pulling discharge pipe,
elevator and gun ahead.

11:30 to Noon 12:00 - Placing concrete

12:00 Noon to 12:30 P.M. Lunch hour.

12:30 P.M. to 1:45. Placing concrete

1:45 P.M. to 2:20 P.M. Moving equipment ahead

2:20 P.M. to 3:20 Placing concrete

3:20 P.M. to
Moving equipment ahead -
Broke the pipe

Notes: It is the opinion of the inspector

that sufficient pressure is not maintained
to force the concrete into a compact
mass in the crown of the tunnel
arch. The discharge line should at
all times be not over 1-ft. from the
area to be filled; instead, the end of
the pipe is pulled about 6-ft.
at a time, leaving too great a
distance to place the concrete
with the pressure available.

Continued →

The pressure when built up to capacity is $105 \frac{\text{lb}}{\text{sq. in.}}$, immediately after the gun starts to discharge, the pressure drops to $60 \frac{\text{lb}}{\text{sq. in.}}$ at the gauge, forcing the concrete through about 100 ft. of 5" pipe which rises to an elev. about 23 ft. above the gun through two angles in the line, one of about 50° at the gun and another about $40^\circ - 40$ ft. from the gun, all of which cuts down the effective pressure at the discharge end of the pipe which has the effect of not forcing the concrete

to the full section between the 10"x10" roof timbers, this conclusion is based solely on observation through port holes nearest the discharge end of the pipe, which are accessible from the floor of Jimbo working platform. It is difficult to determine from these observations whether or not the full section is being filled, but indications are that pockets, unfilled, will result in the crown section.

Mr. McCurdy, representative of the Pressed & Welded Products Co. mfgs. of the Pressweld Pneumatic Placer, told me at 1:30 P.M. to-day that the pressure was not being applied

as per the mfg's. directions and that the contractor Mr. Connelly, would not pay any attention to his instructions for operating the pressure. Instead of opening both bottom & top valves, the bottom valve to build up pressure beneath the flapper valve, the top valve only is being used which forces the concrete under the flapper valve and permits air to pass into & through the concrete which produces segregation instead of sending the concrete through the

discharge pipe in a compact "slug" with the cushion of air pressure behind it only to provide the driving force. Mr. McCurdy also said that the air mixed with the concrete dries the concrete at discharge end sufficient to cause trouble in proper placement.

12/21/32 Hedwood

Dec 20th Placed Concrete in
Cove Wall N 3704 to N 3728 E. 534 to 543
N 3728 to N 3736 " 536 " 543

1:45 PM Began Placing Concrete

1 Foreman + 3 men Placing.

Mr. Conc Crew Same as Tunnel.
Welder 1 hr.

19 Batches @ 7 Sacs 133 Sacs

6 " @ 6 " 36 "

Graut - 2 " @ 6 " 12 "

181 Sacs

40-ft. Copper
steel not reported

Shift #2 Dec. 20-1932

4 P.M. to 12 M.

1-Transit-mix truck broke pinion shaft and load of 3 yds. of concrete had to be dumped outside at 4:25.

Deduct 3 batches.

Started pouring at 4:30 P.M.

Gas shovel #7 filling behind retaining wall, north side, Entrance Portal.

6 batches 7:30 A.M. to 6 P.M. No

work 5-6 P.M. meal time.

3 carpenters-2 helpers on Entrance Portal forms-5 P.M. & Concrete crew of 7 men changed at 9:30 P.M.

Completed pouring section at 10:15 P.M. & started cleaning up.

39 batches since 6 P.M.

Shift #3-

Placed concrete in overbreak section of North Tunnel wall to height of 6 ft. - Sta. 7+00 to 6+30

Started at

Shift - 12/20/21/32 - 12 M - 7 AM

Batches - 41 ✓

Sacks cleaned - 1000

Cement Recvd - 12

Hours lost - 4:30

(Moving equip)

Mix: 5 SKS. Cement

1340 # Sand

760 # 2 1/2" Rock

970 # 1 1/2" Rock

770 # 3/4" "

Wednesday - Dec. 21 -

7 A.M. to
4 P.M.

Continued placing concrete
in overbreak section of North
Wall of tunnel - to height of 6-ft
above outside edge of invert.
Sta. 6+70 to sta. 0+22 this shift.
Same mix as on pg. 38

Equipment: 2 - Transit mix trucks
1 - Belt Conveyor elevator
1 - mixing plant
1 - 60 H.P. Tractor

Labor: 1 - foreman
1 - man dumping trucks
& operating elevator
1 - man oper. tractor
& help place conc.
3 - men placing conc.
2 - Truck drivers
4 - men in mixing plant

1 Carpenter	} 5 mat. Ton. 6 to 12	
3 " "		above Inv.
3 " "	} Ent Por 6 hrs	
1 " "		" " 8 "
1 " "		" " 8 "

2 Cone finishers Ex. Por. walls
2 Jackhammer men Cut. Inv.
for forms

1.30
7 to 3 P.M. - Dec 21st

102 Batches 510 Sacs ✓

20th 4200 Sacs C. 25 Sacs Rec.
21st 1000 " " 12 " "

4 1012 - shift

Dec. 21 - 1932.

Shift #2 3 PM to 11 PM

1 foreman - 8 men - chipping Invert
& cleaning up.

1 shiftr. - 4 men - concrete gang.

3 carpenters - 2 helpers at 5 P.M.

Completed filler wall at 11:30 P.M.

93 batches this shift. ✓

275 sx. cement left in mixing

house & 26 sx. spoiled.

Changed mix & started on Portal.

Shift #3 11 P.M. to 7 P.M.

2 truck drivers, 4 men mix gang.

1 shiftr. 5 men chipping Invert.

1 shiftr. 4 men concrete gang.

R. A. Hunter

Total 216 Batches, 1080 lbs cement.

12 to 9 Shift

Location - Entrance Portal Transition

✓ Batches - 45 -

Time Lost - 8:05

(arrang equip: -)

section
074 to 0722
to Springline

Mix: 6-Sks Cement

1440# Sand

1750# 1/2" Rock

1030# 3/4" Rock

86-Gals - #20

Dec. 22 ^{AM} 7 to 4: P.M.

Finished placing concrete
in Entrance portal Transition
Spring line.

Section to height of ~~9 ft~~
Sta. 0+04 to 0+07+22
17 Batches this shift ✓
102 SKs. cement " "

Total batches in transition
section — 62

Total SKs. Cement 372

Equipment:

- 1-mixing plant
- 2-Transit mix trucks
- 1-Belt Conveyor or elevator

Labor this shift:

1-hr. on Transition Section	1-Conc. foreman
5-hrs. moving & setting up conveyor to place sidewall overbreak	4-men placing conc.
2-hrs. placing sidewall over break to wall plate height both sides	1-man dumping conc.
	1-man on conveyor
	This crew changed shifts at 3: P.M.
	4-men in mixing plant
	2-Transit mix truck drivers

South side — Sta. 6+88 to 6+68
North side — 7+00 to 6+68
started at 1:15 P.M.

1-Carp. foreman } Bldg. forms for
7-Carpenters } side wall overbreak
7-helpers } to wall plate
height

About 20 M. B.M. new 2x12x20' used on side wall forms.

4-men-Cleanup in tunnel
1-Cement finisher } 4-hrs. on south
1-helper } retaining wall
exit Portal finishing
4-hrs. help
Carp. in tunnel.

24 Batches this shift 12:25
120 SKs. this shift 1: P.M. to 4: P.M.

1450-Cement Sacks Cleaned
21-SKs Cement Recovered.

Note: 27-SKs. of Cement spoiled for use by rain leaking into North side of Storage House. Mixer man said roofing paper had been ordered for use as wall cover on North side of mixing plant.

Concrete in walls being placed by buggies from working platform 20'x23' built on top of white truck to height of 12-ft. The belt conveyor elevator delivers concrete from trucks to working platform.

Dec. 22-1932

4 PM to 12 M. Shift.

#2 Shift 3 to 11

3 carpenters - 2 helpers.

25 batches from 4 to 7 P.M.

4 men mix crew changed 3 P.M.

1 shift. 12 men - concrete gang.

pouring filler wall up to Plates.

No work at Exit Portal, water.

Shift #3 11 PM to 7 AM.

2 truck drivers - 4 men at mix plant.

36 batches 7 to 12 M

Total for Shift 61 batches

1:2 1/2 Mix.

4 to 12 M.

305: 1/2 inch cement-

1 P.M. to 12 M 24 + 61 Batches.

Thurs. night - Dec. 22-23, 1932

Shift #3 - Midnight - 7 AM. -

Location: Second lift of side walls
in overbreak section

Mix: As per page #38

Counter reading at midnight = 36

" " " 7 AM = 87

Batches this shift = 51

Mix Plant 11 PM - 7 AM - 4 men

Transit Mix Trks 4 - " - 2 Drivers

Conc. Gang in Tull - 11 PM - 7 AM -

1 Fin - 9 men

Carpenters relieved at 1:30 AM -

by - 4 Carpenters - 1 Hlpr.

R. K. Carter

Dec. 23- 7: A.M. to 4: P.M.

Placing concrete in sidewall,
overbreak area of tunnel to
wall plate height continued.

Same equipment as used on
previous shifts, this pour

labor: 2- Transit mix truck drivers

4-men in mixing plant

1- foreman

7- men

2- Carp.

1- man dumping conc.

1- Carp. foreman

5- Carpenters

4- helpers

1- Cement Finisher
helping Carp.

1- foreman } setting steel

5- men } tunnel forms.

Placing
Concrete

Forms for
tunnel sidewall
overbreak
Concrete

{ 900 cement sacks cleaned
No cement weighed up.

56 Batches conc. to 3: P.M. this shift

65 " " " 4: P.M. " shift

11:2½:5

Roof of mixing plant repaired to-day

One section of steel forms was
removed from the last section
placed. The surface condition
is better than the 1st section
placed, but the concrete stuck
to the steel forms causing
some rough pitted areas. I
suggested to Mr. Gossowitch, foreman
that he use wire brooms to
thoroughly clean the forms and
to paint the form with
form oil, which was done
during this shift. A smoother
surface will result on the next
section.

Note: Batch meter will run

Continuous from 7: A.M. Dec. 23- Readings
will be taken at end of each inspectors
shift.

Dec. 23-1932

4 to 12 P.M. Rain.

Shift #2 3 to 11 P.M.

1 foreman-5 men, moving forms.

1 shiftr.-8 men concrete gang.

4 men mixer crew. 1 carpenter.

5 PM to 1:AM-3 carpenters and
3 helpers, building forms.

Meter reading at 11 P.M.,

104

39 batches 4 to 11 PM

195 Sx. Cement

TR Thurston

Fri. night, Dec. 23/24, 1932 - 11 PM - 7 AM

Showers -

Location - Tunnel side walls - overbrk south

Counter reading - 11 P.M. - 12/23 = 104

" " - 7 AM - 12/24 = 158

Batches this shift - 11 PM - 7 AM = $\frac{46}{34}$

Bags cement

65
39
104

R. W. Carter
7:15 P.M. to 4:15 P.M.

SAT. DEC 24 -

Continued placing concrete
in overbreak section of tunnel
wall both sides to height of
Arch wall plates - Sta. 2+75 to
1+55 this shift

Equipment:

- 1-mixing plant
- 2-Transit mix trucks
- 1-Northern Belt Conveyor
- 1-Jumbo on white truck

Labor:

- GREY
- 1-Conc. foreman
 - 6-men placing conc.
 - 1-Carp. on chutes
 - 1-man on elevator operations
 - 4-men in mixing plant
 - 2-transit mix truck drivers

- 1-Carp. foreman { Tunnel sidewall
- 8-Carpenters { forms
- 3-helpers

2-men on tunnel cleanup

1-foreman { setting up steel
6-men { tunnel forms

1-Carp. helper { Reinforcing steel
1-helper { over steel forms

1:2 1/2 : 5 - mix
5-SKS Cement
1340 # Sand
760 # 2 1/2" Rock
970 # 1 1/2" Rock
770 # 3/4" Rock

Meter reading 7:15 A.M. = 158
" " 3:15 P.M. = 215
" " 4:15 P.M. = 224

This
Shift { Batches to 4:15 P.M.
7:15 A.M. { SKS. Cement to 4:15 P.M.
4:15 P.M.

600-Cement sacks cleaned
13-SKS-Cement recovered.

Dec. 24-1932

3 PM to 11 PM Shift.

1 foreman-9 men-moving steel forms
1 shifr.-7 men-concrete gang.

1 shifr.-3 men-mixing gang.

Meter reading 4 P.M. 224

Meter reading 11:30 P.M. 263

39 batches this shift.

Filler Wall poured to 9+14
R.A. Thurston

1315

R. W. Carter 54
Weather - Clear

MONDAY - DEC. 26

8: A.M. I made inspection of clearance between steel forms and timbers. Found south side O.K., North side clearance varied from 5 1/2" to 7 1/2". I reported this condition to Mr. Wells & Mr. ROHL. They immediately put carpenters to work trimming timbers to get the clearance. From sta. 10+35 to 9+68, the section of tunnel lining to be placed on this set-up.

Equipment: 1-mixing plant
3-Transit mix trucks
1-Belt conveyor and chutes.

Labor: 1-Carp. Foreman } Trimming
6-Carp. } timbers and
2-helpers } bldg. chutes
+ working platform

4 - Carpenters } Forms for transit
 2 - helpers } section - Entrance
 } Portal

Cement Fire Camp } stripping forms on
 1 - helper } side wall concrete.

1 - foreman } lining up steel forms
 4 - men } and setting gun equipment.

Cleanup in
 tunnel

7: AM to 9:

11: AM -

11: 30 AM to

4 - P.M. on

Concrete

started
 at 11: AM

1 - Conc. foreman } Placing Conc.

10 - men

1 - man operating conveyor

3 - Transit mix truck drivers

1 - welder } on discharge

1 - helper } line - 4 - hrs.

Concrete

Concrete started at 11:20 A.M.

MIX:

6 - Sks. Cement
 1440# Sand
 1150# 1/2 Rock
 1030# 3/4 Rock
 36 - Gals. H₂O

63 Batches Concrete } DAY - shift.
 378 Sks. Cement } to 4: P.M.

500 - Cement sacks cleaned
 recovered cement not
 weighed up.

Delay - 3:15 P.M. - to Making
 change from chutes to gun.

Dec. 26-1932.

1 shift. - 7 men - 1 Gun operator -
1 carpenter - concrete gang.

1 shift. 3 men - mixing crew,
Steel gang - 5 men - ^{repairing} scaffold.

Started to pour at 6:10 P.M.

Valve on Gun broke with
first batch, repaired at 7:40
2 truck drivers changed at 7 P.M.

Third truck added at 9 P.M.

At 10 P.M. forms from 10+35 to
10+15 shifted, at bottom, on
north side, on account of
insufficient bracing. Greatest
amount of movement, about
6" at 10+25. Allowed to
proceed with understanding
that concrete will be chipped

off to the neat line.

Meter reading at 11:30 - 111

48 batches this shift.

288 SX. Cement.

T. Thurston

Dec. 26/27-1932 - 11:30 P.M. - 7 A.M.

Counter ready at 11:30 P.M. = 111

" " " 6:00 A.M. = 189

Batches placed = 78

* (9 Batches wasted)

Sacks Cement =

Mixer Crew - 1 Emin. + 3 Men

Conc. Crew - 1 Emin. - 1 Welder

1 Carp + 1 Hlpr

1 Gun man + 1 Hlpr

6 Laborers

Steel Crew - 1 Emin

6 Men

Hose back of nozzle blew at 2:30 AM

Conveyor motor also out of order -

No conc. placed after 2:30 AM.

* 9 Batches, mixed at 2:30 AM, ordered
wasted at 5:40 AM. *T. Thurston*

9 + 57.5
~~67.5~~
 5

10th Dec. 27 - 7: A.M. to 4: P.M.

R. W. Carter

Continued placing concrete in
 tunnel lining Sta 10+²⁵35 to 9+⁵⁷68

Same equipment: including
 Pressweld Pneumatic Placer

Labor: 4 men in mixing plant

All on concrete

1 Rigger foreman } on forms and
 3 men } discharge line.

1 Concrete foreman } Placing
 7 men } concrete

1 Gun operator

3 Transit mix truck drivers

1 Carpenter on bulkhead
 at end of steel forms.

1 Carp. Cont. Finisher } stripping
 2 helpers } sidewall forms
 in tunnel

1 Welder } on discharge line

1 Carpenter foreman } Entrance
 7 Carpenters } Portal transition
 1 helper } Section forms

METER Reading 7: A.M. = 189

" " 4: P.M. = 270

Batches 81

SKS. Cement used = 486

Total Batches to date =

1500 - SKS. cleaned

17. SKS. cement recovered.

7: A.M. to 7:30 A.M. - Placing concrete

7:30 A.M. to 8: A.M. - Moving equipment

and discharge line 6' ahead

8: A.M. to 9: A.M. - Placing concrete

9: A.M. to 9:20 - moving ahead.

9:20 A.M. to 11: A.M. - placing Conc.

11: A.M. to 11:30 - Moving

11:30 to 12:00 - Placing Conc.

12:00 to 1:00 P.M. - Moving

1:00 to 2: P.M. - Placing Conc.

2:00 to 2:30 - Moving

2:30 to 3:00 - Placing Conc.

3:00 to - Moving

Dec. 27-1932

Started pouring 4 P.M., continuing without interruption, except moving, until 10:30 P.M. when pour was finished.

Labor.

1 shift. 6 men - 1 Gun operator.

1 shift. 3 men - mixing crew.

2 trucks - cleaning up.

Meter reading at 10:30 P.M. 324

54 batches this shift.

324 sk. cement.

T. R. Thurston

Dec. 27-1932

Placed Concrete in Core Wall.

Sta. N3736 to N3752 - Elev. 536' to 543'

Sta. 3752 to N3768 - Elev. 538' to 543'

start - 3:50 P.M.

Mix: 7 sks. Cement

1440 # Sand

1150 # 1 1/2" Rock

1030 # 3/4" Rock

39 ft. Copper

24 - 1 1/8" ϕ bars - 32'-0" horizontal

24 - 1 3/8" ϕ bars 3'-4" laps.

Finished pouring at 7:20 P.M.

2 batches grout - 10 sk.

20 batches concrete 140 sk.

Total 150 sk. Cement

T. R. Thurston

Tues. night, Dec. 27/28, 1932.

11:00 PM - 7 AM.

1 Man + 7 Lab. } Excavating
1 Truck + 1 Over } for plug key

1 Man (Mixer crew)
3 Men } Moving concret equip't
A.W.D.

Dec 28 1932.

Concrete Core Wall.

N 3776 to 3784 E 1532-536
N 3784 to 3820 ± to To 540

? 13' Copper Water Stop to 3784
 } Hor 8' at E 1536.
 } Vert 5' at 3784
 } Hor = 35' Total 48' 12" w/ water stop
 } Su Cem
 2 Batches Grout @ 8 10
 24 " Conc @ 7 168"
 178

To 5 PM.

Shift #2. 1 shift, 1 carpenter
4 men & 2 trucks.

Finished pouring at 9:30 P.M.
33 batches concrete

231 SX cement

Total of 57 batches.

Thurston

399

Dec. 28-1932
Concrete for Key

6 SX cement

760 - 2 1/2"

1340 - sand

970 - 1 1/2"

770 - 3/4"

33 gals. water

Started pouring at 10:30

1 shift - 3 men - mix crew.

15 batches at 11 P.M.

90 SX cement

Thurston

Dec. 28/29/32 - 11 PM - 2 AM -

Total Conc. East Key - Batches - 48.5

Cement - 291 Sacks

On Conc - 1 Fin - 4 Lab.

On Tunnel - 1 Fin - 3 Lab

Mixer - 1 Fin - 3 Lab.

Trucks - 3 Drives
(Ltr. 2:00 AM in tunnel)

Invert
plug.

0+72
to
0+56

Dec. 29 1932 Core Wall
2:25 PM to
Sta 3792 to 3823 El. 540-546.

Vert Water Stop El 540 to 547 at N 3792 - 1'
Hor " " " 546 N 3792 to N 3823
L 30'

5' Pour - 3' co. Hor
N 3440 to N 3448 - Butler Sec 4' " Vert
Kend

N 3392 - 3408 6' Pour 16' Water Stop top
6' " " " 3408.

N 3384 - 3392 6' Pour 3' new water stop top
3' " " " Ver. at 3392

N 3376 to N 3384 6' pour top bottom
Water stop

New Water Stop 8' Hor 7' Vert

2 batches grout & 33 batches

Concrete at north end section.

3 batches grout & 45 batches 15

Concrete at south end. 31.5

Total 571 SX cement. 576

Finished pouring at 7:45 PM. Thurston

67

Dec. 29/30, 1932 - 11 PM - 7 AM

Setting steel forms for lining

1 Foreman + 4 Men (Mixer crew)

1 Foreman + 6 Men (Miners)

- No other work this shift - *RWC*

68

R. W. Carter

Dec. 30 - 1932 -

12:00 Noon to
4: P.M.

Placed Concrete in Core Wall

Sta. N 3800 to N 3826 - Elev. 546' to 554'

1: P.M. - start - finish: 3:30 P.M.

MIX:	7-545. Cement	} 41 Batches Conc	
	1340 # Sand		} 2 " Grout.
	1250 # 1 1/2" Rock		
	1030 # 3/4" Rock.		} 97 loads

35-ft. copper.

Equipment:

- 1-mixing plant
- 3-Transit mix trucks.

Labor:

- 4-men in mixing plant
- 3-Truck drivers
- 4-men placing concrete
- 1-foreman (Steve, the engineer)

2 Grout holes blown with air and
18-ft pipes set. - N 3808 - N 3818 25-ft each (depth)

2 - 6' pipe nipples added to 18'-pipe in
two holes previously piped - 3806-3809

Empty cement Jacks sent to lakeside 11/19/32
11,250 SKS.

" " " " " 12-30-32

12,350-SKS

Total - 23,600 SKS.

Dec. 30th

Core wall concrete.

Sta. N 3376 to N 3368 - Elev. 560° - 566°

Sta. N 3368 to N 3352 Elev. 564° - 570°

Start - 4:30 Finish, 7 PM

48-lin-ft. 13/16" reinforcing steel.

Copper water stop.

Hor. at 3352 - 3368 = 16'

" " 3368 - 3376 = 8'

Vert. at N 3352 - previously measured

" " N 3368 5'

" " N 3376 6' 3 5'

2 batches grout & "

26 " concrete.

192 sx. cement.

4 men at mixing plant

3 " concrete gang.
Thurston

Dec. 30 - 1932 3 to 11 P.M.

Started pouring tunnel
section at 8:30 P.M.

Sta. 7+00 to 6+30

Crew. 1 shifr. 3 men at mixer.

2 shifr. - 7 men - 3 truck drivers.

3 carpenters - 3 helpers.

1 Gun operator.

Mix: 6 sx. Cement

1440# sand

1150# - 1 1/2" rock.

1030# 3/4" rock.

36 gals. water.

No interruptions.

75 batches at 11 P.M.

450 sx. cement.

Thurston

Dec. 30/31, 1932 - 11 PM - 7 AM

Tunnel lining - 7:00 to 6:30

Mix, as per page #70

Counter read'g at 11:00 PM = 75

" " " 7:00 AM = 169

Batches this shift - - - = 94

Sacks Cement - - - = 564

Force:-

Mixer Crew - 1 Fm'n + 3 Men

Transit-Mix Trks - 3 Drivers

In Tunnel:-

2 Fm'n - 1 Gun man + 1 Hlpr + 7 Men

2 Carpenters + 1 Hlpr

At 12:35 AM the East end of the North form raised from pressure of concrete, allowing about 6 cu yds. of concrete flow out. This is a repetition of a similar accident which occurred on Dec. 26 and results from the

same cause, i.e., contractor's failure adequately to secure forms before beginning to place concrete. Forms were jacked back into place as nearly as possible, and work was allowed to proceed on understanding that, after stripping, concrete would be chipped back to neat lines as per drawings.

Delay from above: 12:35 AM - 2:30 AM.

Note:- In discussing this useless repetition of careless work with the foreman in charge the inspector was informed by the foreman that ^{he} had intended to brace forms properly but was prevented by Contractor Rehl who was personally pushing the work and would not permit the expenditure of time required properly to brace the forms.

W.S.D.

Dec. 31.

Placing concrete in Tunnel

Lining continued Sta. 7+00 to 6+30

METER reading - 7: A.M.	169
METER " 4: P. M.	248

This shift 79 Batches

474 sks. Cement

Same mix as on page 70. Total Batches

This section -

250

1300 sks. Cement

Equipment:

- 1-mixing plant
- 3-Transit mix trucks
- 1-Pressweld pneumatic placer mounted on dump truck.
- 1-Jumbo working platform
- 1-Northern Belt conveyor, elev.

Labor: 3-Transit mix trucks.

4-men in mixing plant

- 1-Gunner
- 1-helper

3-Carpenters on bulkheads and spreaders

7-men handling placing and discharge line.

2-men stripping west bulkhead

1-Cement finisher } Finishing Tunnel Lining

1-helper

3-Carpenters entrance Portal

2-helpers } forms.

No delays from discharge line plugging.

Finished mixing concrete at 4:30 P.M.

2-Batches 125 sks. Cement

Meter reading 4: P.M. 248
4:30 250

1-Truck -

- 1-foreman { excavating for Tunnel plug.
- 6-laborers }
- 1-Truckdriver }

8- Steel men on reinforcing steel for tunnel lining

- 1-foreman { Backfilling test tunnel # 4
- 3-laborer }

- 1-Cap. foreman { Core wall
- 1-helper }
- 5-Carpenters } forms

- 1-Steel man { Core wall steel
- 1-helper }

- 2-men { Cleanup and blowing Grout holes and setting pipe

N

All holes were blown with water and air.

N 3842 West
25'6" deep⊗ N 3837 East
25-ft. deep
9-ft. pipeN 3832 - west ⊗
25-ft. 3" deep
9-ft. pipe 2"⊗ N 3827-East (batter)
25-ft. deep
1-18-ft. 2" pipeN 3825 West ⊗
4 ft.

Data Taken 12:00 am to 5:00 pm - 12/31/20

3: P.M. to 11: P.M.

No concrete after 4:30 as
recorded on page 73.

Labor:

1 foreman } excavating
6 laborers } for tunnel
1 truck driver } plug -

1 foreman } moving steel
10 men } forms and
 } equipment
3 men from mixing plant
crew - helping in tunnel

Dec 31, 1932, 11: P.M. to 7: A.M. Jan. 1, 1933

No concrete placed this shift -

1 Mixer Fm + 3 Men } Setting steel
1 Fm + 6 Men } lining forms
2 Carpenters } Sta. 6+30 to 5+70

AWC

Weather Clear.

Jan. 1 - 1933 Sunday

Placing concrete in tunnel

lining - Sta. 6+30 To 5+70

Start - Did not get started this shift

Mix: 6-sks. Cement
 1440# Sand
 1150# - 1 1/2" Rock
 1030# - 3/4" Rock

Meter reading	P.M. start -	00
"	"	4 P.M. -
		00
Batches this shift		00
Sacks Cement this shift		00

Dec 31 1932
 Reported: 2050 Sacks cleaned
 26 Sacks of Cement recovered

1 set of 3 test cylinders taken
 at from Sta. 6+00. same mix
 as above stated
 3 gals. H₂O

R. W. Cooley
Inspector

Equipment:

- 1-Mixing plant
- 1-Jumbo working platform built on white truck.
- 1-Pressweld. pneumatic placer mounted on dump truck
- 1-Northern-Belt conveyor elevator
- 3-Transit mix trucks

Labor: 3-men in mixing plant
 cleaning sacks and repairing mixing equipment - 7: A.M. to
 2-Carpenters from 12:30-P.M.

3-Transit mix truck drivers
 repairing trucks - 7: A.M. to 3 P.M.

1-foreman { moving and setting
 6-men { up steel forms &
 equipment 7: A.M. to 3: P.M.

1-Gun man { 9: A.M. to 3: P.M. repairing
 pneumatic placer.

1-Steel foreman { Placing
 6- " men { reinforcing steel
 for tunnel lining
 8-hrs.

2: P.M. I inspected forms and found them
 4" off center which I reported to Gossovitch,
 foreman, the next two hrs. spent in lining forms.
 I notified Gossovitch that forms were
 not braced properly, and that this
 should be done, but no attention was
 made to my suggestion

Jan 1 - 1933

4 to 12 M. shift.

4 men mixing plant

3 men excavating key

1 shift. 8 men, concrete crew

2 truck drivers - 2 carpenters.

60 foot Tunnel section

ready 6+30 to 5+70

Started pouring at 4:20 P.M.

At about 6 P.M. one form

"floated" losing 4 or 5 yds. of

concrete. Pouring resumed at

8:30 P.M. "Floating" of forms

can be expected as long as

the present system of bracing

is used. Forms must be braced

laterally from toe to toe, or

they will not stay in place.

Meter reading at 11 P.M.

75

75 batches this shift.

450 SX. Cement.Jan. 1/2, 1933. - 11 P.M. - 7 A.M.

Placing conc. tunnel lin'g. Sta. 6+30 - 5+70

Mix as per page #77

Counter reading at 11 P.M. = 75

" " " 7 A.M. = 171

Batches this shift = 96

Sacks cement " = 576

Force - 1 Mixer Em'n + 3 Men

2 Trk Drivers

2 Carp. + 1 Hlpr

1 Em'n + 6 men

1 Gun man + 1 Hlpr

[Signature]

Weather Clear
R. K. Carter

Jan. 2 - 1933 - 7: A.M. to 4: P.M.

Continued Placing concrete in
Tunnel ring - sta. 6+30 to 5+70

Same mix continued

meter reading to start 171

meter " finish - 12: noon 207 - Total

Batches this shift 36 124

Sacks Cement this shift 216

Same equipment to 12: noon
when tunnel section to sta. 5+70
completed.

Labor on tunnel concrete

7: A.M. to	1 - foreman	12: noon to 3: P.M.
12: noon on concrete	6 - men	
	1 - gun man	moving equipment
Concrete in tunnel until noon	2 - transit mix truck drivers	
	1 - Carpenter on bulkhead	
	3 - men in mixing plant	

5 - Carpenters { entrance Portal forms

1 - Cement finisher { finishing tunnel lining
1 - helper

1 - Set of 3 - Test Cylinders at 9: A.M.

6 - SKS C. 1440 # 8, 1450 # 1 1/2, 1030 # 3/4
38 - gals H₂O

Jan. 2

Placing Concrete in Cove Wall

N3768-N3776 - elev. 538° to 543°
16 - ft. horiz. copper - 2 - ft. Vertical.
18 - 1 3/16" - 12'-0"
2 - 1 3/16" - 16'-0"

N3776-N3784 - elev. 536° to 543°

N3784 - N3792 - elev. 540° to 546°

2 - 1 3/16" - 8'-0"
8 - ft. copper - horiz.
6 - ft. copper - vert.

N3792 - N3800 - elev. 546° to 552°

2 - 1 3/16" - 8'-0"
8 - ft. horiz. copper
6 - ft. vert. copper

N3808 to N3832 - elev. 554° - 562°

24 - ft. horiz. copper
9 - ft. vert. copper

2" Pipe nipples added to 18 ft. pipe
on place in grout holes -

N3790 - 5 - ft. nipple

N3795 - 6 - ft.

X-3796 - 1 - ft.

N-3805 - 3 - ft.

79
Cm Meter
Stop

Start 1:30 P.M.

4: P.M. { Batches Conc. 47
Batches Grout 1

329 SK
334.

labor - next Page

Equipment on Core Wall

Concrete:

- 1-mixing plant
- 2-Transit mix trucks

Labor -

1:30 P.M.

to 4 P.M.

- 1-Gen. foreman
- 3-laborers
- 3-transit mix truck drivers
- 4-men in mixing plant

- 5-Carpenters { Core wall
- 2-helpers { forms 8-hrs
- 3-helpers { on forms 5-hrs
- { on concrete 7-hrs

Duplicated measuring pipe

47-Batches concrete } 334-Sacks Cement

1-batch Grout

1250-cement sacks cleaned
Recovered cement not weighed
& sacked this shift.

Grout hole in Core wall at Sta

N. 3825 only 4-ft deep. Grout pipe was
in place before being blown and
measured and concrete placed
about 2-ft. on pipe. The foreman
put two men at work to take
pipe out but were unsuccessful.
This 18-ft pipe should not be
allowed because the grout
hole is only 4-ft deep.

Total 59 - Jan-2-1933

1250 sx. cleaned. 4 P.M. to 12 M.

Labor.

Mixing Crew - 4 men.

Core Wall - 3 men - 1 carpenter.

Tunnel Key - 1 shift - 11 men - 2 truck drivers
& 2 carpenters.

Moving forms. 1 shift. 9 men.

Finished pour at Core Wall at 5 P.M.

Total batches for pour 59 batches

& 1 of grout. 418 sx. cement - total.

Cleaned 1250 sx. today.

Mixing Crew to tunnel at 5 P.M.

Mon. night, Jan. 2/3, 1933 - 11 PM - 7 AM.

Plug keys at 1+10⁵ & 1+21⁵

MIX - as per page #65

Total Batches - 75

Sacks Cement - 450

Started placing at 12:30 AM

Finished " " 5:30 AM

Foreman 1 Fin + 4 Men

2 Carpenters

1 Finisher

Mixer Crew of 1 Fin + 4 m'n

Steel forms for tunnel lining

1 Fin + 6 Men - Erecting

Jan. 3 - 1933 - Wednesday

Placed concrete in tunnel lining

Sta. 5+70 to 5+20

Start - 11 A.M.

Same equipment as on page 78

Labor: 1 Foreman
6 men
1 Gun man
3 Transit mix truck drivers
4 men in mixing plant
2 Carpenters
2 laborers on bypass for trucks
and cleanup for next set up
of steel forms.

NOTE: The above labor crew worked
from 7 A.M. to 11 AM setting equipment
and lining & anchoring forms.

1 - steel foreman	} Reinforcing steel
7 - steel men	
1 - truck	} for tunnel lining
1 - Cement finisher	
1 - helper	} Finishing tunnel lining

Sta 5+20 - 5+28
6" clearance only on North side at
springline on timber set. MR. Connelly &
foreman were notified, but concrete was
placed regardless of clearance.

Jan. 3, 1933

Miscellaneous labor:

- 1- General Foreman
 8- Carpenters { entrance Portal
 2- helpers { forms
 1- foreman { Backfilling test
 4- men { Tunnel #4

63-batches concrete this shift
 378-sacks of cement

Notes on tunnel concreting this shift

Forms from sta. 5+20 to 5+30 on
 South side "Flated", causing forms
 to go out of alignment about 3'

MR. Newcomb & I both spoke to
 foreman about clearance 8" between
 forms & timbers, also steel clearance.

but practically no attention was
 shown to our warnings that
 sufficient clearance was not
 obtained at sta. 5+20 & 5+28 - North
 side.

MR. Newcomb, MR. Connolly
 MR. Wood

1/3/33.

Shift #3, 3 PM to Midnight

- Labor: 1 Shifter + 2 Men Excav E Key.
 1 " + 5 " } On Concrete Gang.
 1 Gun operator }
 2 Carpenters }
 4 Men on Mixing Crew +
 3 Tran. Mx. Tr. Dr.

Delays -

Meter Reading 3 PM. 63 Batches
 " " " " 147 "
 Batches this Shift 84
 Cement Sacks " " 504

R. H. Weston

Jan. 3/4, 1933, Tues. night - 11 PM - 7 AM

Tunnel lining - 5+70 to 5+20

Counter reading at 11 PM = 147

" " " 1 AM = 156

Batches this shift = .9

Sack Cement " = 54 @

Finished at 1:00 AM

1 Mixer Fin + 3 Men - 2 Hr. at Plant

- 6 Hr. Moving steel forms

1 Fin + 6 Men - 2 Hrs. placg. conc

- 6 Hrs. Mov'g forms

1 Gunman & 1 H/Pr

3 Trk Drivers

R. H. Weston

R. W. Carter

Jan. 4 - 7: A.M. to 4: P.M. Shift
Placing concrete in Headwall
of exit Portal structure.

Started at 1: P.M. - Finish - 2: P.M.

1- #10 Dragline
3- Transit mix trucks.
1- mixing plant.
1- Dragline operator
1- " oiler
2- laborers - Placing conc.
1- cement finisher - 2 hrs.
4- men in mixing plant
6- SKS. Cement } 12- batches Concrete
340 # sand } 1- batch grout
1250 # 1 1/2 Rock }
1030 # 3/4" Rock } 77- SKS. Cement

NOTE: I was on pressure grouting
in core wall and went to Headwall
job only once for about 2-minutes,
no other inspector on job.

Jan. 4 - 4: P.M. to 12-midnight
Placing concrete in Core Wall -
Sta. N3448 to N3480 elev. 543° to 553°
Sta. N3512 to N3544 elev. 543° to 552°

Equipment: 3- Transit mix trucks
1- mixing plant
1- #10 Dragline

Start 3:40 P.M. - Finish 8:15 P.M.

7- SKS. Cement } Batches Concrete 33
340 # sand }
1250 # 1 1/2 Rock }
1030 # 3/4" Rock } Sacks Cement 231

Labor: 1- Gen. foreman } 3:40 P.M.
5- men placing conc. } to
3- Transit mix drivers }
4- men in mixing plant }

Materials:

84- 13/16" bars - 32'-0" } Horizontal
84- 13/16" bars - 2'-6" laps }
84- 1" bars - 16'-0" vertical
26- ft. vertical Copper
64- ft. horiz. Copper

Thurston Properties
R. W. Carter

Jan. 4/5, 1933 - Wed. night. 11 PM - 7 AM

Tunnel lining - 5+20 - 4+70

Started placing concrete - 6:00 AM

Counter reading at = 0

" " " 7 AM = 74

Batches this shift = 74

Cement " " = 144

1 Mixer Fin + 3 Mn - 7 Hr. Clearing in

- 1 Hr. Placg. conc.

1 Fin + 6 Mn - 7 Hr. Moving forms

- 1 Hr. Placg. Conc.

1 Gun men + 1 Hlpr from 2 AM on

1 Finisher + 1 Hlpr - Patching

3 Trk. Drivers

2 Carpenters - from 5:00 AM on

[Signature]

Jan 5-1933 - 7: A.M. to 4: P.M.

Continued placing concrete tunnel

lining - Sta. 5+20 to 4+70

Counter reading 7: A.M. 24

" "

Batches this shift

sacks cement

Same equipment as listed page 78

labor: 4 men in mixing plant

3 Transit mix truck drivers

1 foreman

6 men

1 gun operator { Placing
Concrete }

2 carpenters bldg. bulkhead

1 cement finisher - Patching tunnel
lining

Mix: 6 SKS. Cement

1440# Sand

1150# 1/2" Rock

1030# 3/4" Rock

2150 - SKS. cleaned

10 - SKS. Cement Recovered.

See Page
#92 for total
batches in
this tunnel in
this section

5th
Thursday 4 P.M. to 11 P.M.
Shift -

1 Shift - 10 men - 1 Gun operator -
1 carpenter & 2 truck drivers.
Pouring concrete Tunnel
Lining in Section 5+20
to 4+70. Finished this
Section at 7:50 P.M. &
patched hole in Arch
at about 5+60. Used
*9 batches for this patch.
Also reported on next
page.

4 P.M. Meter reading 138
7:50 P.M. " " 174
36 batches this shift.
216 sx. cement.

Thurs

Thurs. night, Jan. 5/6, 1933 - 11 PM - 7 AM

Same *9 Batches placed to mend hole in
arch. - Section 5+70 - 5+20
(This was on section of form left
in place)
Cement used - 54 Sacks

Mixer Crew of 1 Fin + 2 Mn - clearing invert
1 Fin + 6 Men moving steel forms

6 Carpenters on entrance portal
transition & headwall started 3 AM.

Hole fixed 5+60 to 5+70 in
crown of arch -
D. J. [Signature]

Reported on
5+ as [unclear]
finished arch
174 - batches { From Sta. 5+20 to 4+70 }
1044 - sacks
9 - batches as listed above in
patch at Sta. 5+60 to 5+70
54 - Sx. cement

Jan. 6 - 1933 -

Placed concrete in transition
Section of Entrance Portal structure
to elev. 584 =

start at 1:50 P.M.

Equipment - 1 #10 - dragline
2 - Transit mix. trucks.

labor -

1 Gen. Foreman
5 men placing Conc. { 5-hrs. day shift, over time
2 - Transit mix drivers { 5-hrs.
1 - #10 - Dragline Operator { 11 P.M. to
1 - #10 " oiler { 4 P.M. - change crews
4 - men in mixing plant { 1 P.M. to 3 P.M. change crews

labor in tunnel -

6 - carpenters on form at angle point - 4 + 20 - 4-hrs
2 - helpers
2 - Carpenters all-day entrance portal
6 - Carp. { 4-hrs. entrance
2 - helpers } portal
1 - foreman { moving steel forms
6 - men }
2 - men on cleanup in tunnel
2 - cement finishers
1 - helper
4 - men excav. for tunnel place
8 - steel men

one of these men was injured at 9:30 AM by falling rock.

Jan. 6 - 1933

3 P.M. to 11 P.M.

Pouring concrete at Entrance Portal until 6:45 P.M.

99 batches at 6:45 - 2 Batches GRout

2 men working at Key.

1 shift. 7 men - 6 carpenters & 2 finishers on steel forms.

4 men mixing crew working in tunnel since 7 P.M.

39 - batches from 4 P.M. to 6:45 P.M.
234 - Sks. Cement

Total sacks of Cement ~~724~~ 604
724
O.K.
Recd.

Jan. 6 - 1933.

11: P.M. to 7: A.M.

Started tunnel lining - Sta. 4+70 to
4+05 - 6:30. A.M.

6 - Batches concrete to 7: A.M.
36 - Sks. cement

6 - Sks. Cement
1440# Sand
1150# 1 1/2" Rock
1030# 3/4" Rock
36 - Gal's H₂O

1 Dragline #10 + Crew } Stripping
2 Trucks + 2 Drivers } S.E. Quarter

1 Foreman + 3 Men (Mixer crew) cleaning iron

1 Foreman + 6 Men erecting steel forms

6 Carpenters on wood forms for angle

Jan. 7 - 1933.

7: A.M. to 4: P.M.

Continued placing concrete in
Tunnel lining Sta. 4+70 to 4+05.

Counter reading - 7: A.M. 6

~~Counter reading 9: P.M. 96~~

~~Batches this shift 90~~

Equipment: Same as on page 97
except only 2 Transit mix trucks

Labor: 1 - Conc. foreman
6 - men placing conc.
+ gun operator
1 - helper
2 - Transit mix drivers
4 - men in mixing plant
8 - men on reinforcing steel
2 - cement finishers
1 - helper

Batches recorded on Page 99.

Jan. 7 - 1933

Notes - 7: A.M. to 7:30 - Placing Conc.

7:30 A.M. to 12:15 Repairing Conveyor ^{Boiler}108 Meter reading at 5 P.M.

Shift #2 3 P.M. to 11 P.M.

Labor 4 men mixer crew
1 shift. - 6 men - 2 car-
penters - 1 G.M. operator
& 2 truck drivers.

189 Meter reading at 11 P.M.

183 batches this shift.

1098 sx. cement.

No unusual delays.

Thurston

Continued on Page 101

Jan. 7 - 1933.

Placed concrete in Entrance

Portal Transition Section to Elev. 589.

started - 12:15 P.M. - Finish - 5: P.M.

Equipment:

1 - #10 Dragline
1 - Transit mix truckLabor. 1 Foreman - 1 truck driver -
8 men - 2 carpenters - Dragline
operator & oiler.

Completed pour at 5: P.M.

70 batches & 2 of grout

430 SX. Cement.

Thurston

6 SKS. Cement
1440# Sand
1150# 1 1/2" Rock
1030# 3/4" Rock
34 - Gals H₂O

Saturday night, Jan. 7/8 - 11 PM - 7 AM

Tunnel lining Section - 4+70 to 4+105

Counter reading at 11 PM = 189

" " 7 AM = 206

Batches 11 PM - 7 AM = 17

Sacks Cement " = 102

Finished section at 2:10 AM

Force:

Mixer Crew: 1 Fm'n } 3 Hrs. at Mixer

3 Men } 5 Hrs. cleaning invert
(1 man left 2 AM)

3 Transit-Mix Trk. Drivers } Extra Driver on 1

1 Gun man and 1 Helper } 5 Hrs. Placg

1 Fm'n + 6 Men on Conc. } 5 Hrs. Cleang

1 Dragline #10 + Crew } Stripping

2 Trks + 2 Drivers } S.E. Quarter

1 Pitman

1 Sh. #2 + Crew } Stripping

2 Trks. + 2 Drivers } N.W. Quarter

Handwritten initials

7: A.M. to 3: P.M.
Weather: Clear.

Sunday, Jan. 8, 1933

Placed concrete in transition section
of Entrance Portal to Elev. 596'

Start 8:30 A.M. Finish - 3: P.M.

Mix - 6 SKS. C

1440 # 5

1150 # 1 1/2 R

1038 # 3/4 R

34 gal. #20

Batches Concrete 96 @ 6-SKS

Batches Grout 2 @ 8-SKS

Total SKS-Cement 586

Equipment: 1-mixing plant
1- #10-Dragline
2- Transit mix trucks

Labor: 1- Gen foreman
1- Dragline operator
1- " " oiler
2- Transit mix truck drivers
4- men in mixing plant
1- Carp. foreman } forms entrance
2- helpers } Portal
4- steel men } Reinforcing steel
entrance Portal 2-hrs.
5- men placing concrete

Labor in Tunnel:

1- foreman } Cleaning muck
6 men } from tunnel
2- Trucks + drivers } invert
3- mixers } Clearing rock from sidewalls
to give form clearance.

4- Carpenters - 1-helper } Core wall forms
1- Truck + driver } Hauling 16" steel pipe to
4- men } run pipeline through
1- foreman } tunnel.

Finish tunnel lining with transition section to 4+165

2- laborers - stripping forms etc. Exit portal headwall.

Jan 8-1933

3 P.M. to 11 P.M. Tunnel.

Labor

1 man cleaning mixer.
 2 men on pipe line to Tunnel
 1 shift. 7 men setting forms
 Stations 4+05 to 3+35

Sun. night. Jan. 8/9, 1933 - 11 PM - 7 AM

Tunnel lining - Section 4+05 - 3+35

1 Form + 6 Men setting forms

1 Mixer Form + 3 Men " "

2 Carpenters

1 Dragline #10 + Crew; 2 Trks + 2 Drvs; Stripping 3:15

1 Shovel #7 + Crew; 2 Trks + 2 Drvs; " " NW

R. W. Carter.

MONDAY - Jan. 9 - 1933

Placed concrete in headwall over
 transition section of entrance
 portal. This finishes all concrete
 in entrance portal.

Start - 12:30 A.M. - Finish 4:15 P.M.

Mix: 6 sks. cement	} 43 - batches Concrete - @ 6 sks 2 - batches Grout @ 5 sks 268 - sks. Cement
1440# Sand	
1150# 1 1/2" Rock	
1030# 3/4" Rock	

Equipment:

1 mixing plant
 1 - Transit mix truck
 1 - #10 dragline

Labor:

1 - Gen. Foreman
 4 - men placing concrete { stripping
Forms A.M.
 1 - Carpenter on forms all day
 1 - dragline operator { From 12:30 P.M.
1 - " - oiler }
 2 - carpenters 4-hrs { 4-hrs on Core Wall
 2 - men stripping forms all day

1300 sks cleaned - no cement
sacked

Jan. 9. MONDAY - 7:AM to 4:PM.

Placed Concrete in tunnel
lining Sta. 4+05 to sta. 3+35
Start 8:50 A.M.

Equipment:

- 1- mixing plant
- 1- Pneumatic placer mounted on truck
- 1- Working jumbo platform " " "
- 1- Northern Belt Conveyor
- 2- Transit mix trucks.

Labor:
on
Concrete

- 1. Foreman
- 7. men
- 1- Pneumatic placer operator
- 2- Transit mix drivers
- 4- men in mixing plant
- 2- Carpenters on bulkhead.

Mix: 6-5ks Cement
1440# Sand
1150# 1 1/2" Rock
1030# 3/4" Rock

102 Batches Concrete to 3:PM =
612- 5ks. Cement

Miscellaneous tunnel labor:

- 1- Foreman { excavating for
- 4- men { tunnel plug
- 2- Cement finishers { Patching
- 1- helper { lining

Notes: 1-9-33-

Finishers patched an area which should have been dug out and replaced with concrete at Sta. 4+60 to 4+70 to height of 3 ft. above the invert, both walls of tunnel, South & North; Mr. Connolly was shown the place by MR. Newcomb, but no steps were made to remove the loose rocks in rock pocket before patching.

At 10:15 A.M. water running through tunnel was deep enough to run on the belt of the conveyor and work was stopped long enough to have the water volume reduced by closing valve on the overflow pipe line, feeding water to tunnel. I asked the Asst. Supt. Steves, to Wet Tunnel Lining every day

Jan. 9 - 1933

3 P.M. to 11 P.M.

102 Meter reading at 3 P.M.210 Meter " at 11 P.M.

108 Batches this shift

648 SX. cement.

Labor

4 men Mixing Crew.

1 shift. - 6 men - 2 carpenters
placing concrete.

2 truck drivers.

Continuing pour on
Section 4+05 to 3+35.

Mon. night, Jan. 9/10, 1933 - 11 PM - 7 AM

Tunnel lining, Section 4+05 to 3+35

Counter reading at 11 PM = 210

" " " 7 AM = 248

Batches this shift = 38

Sacks Cement " " = 228

Finished section at 2:25 AM.

Force: - 1 Foreman + 3 Men } 3:25 Mixg conc.
} 4:35 Cleaning plant.

2 Carpenter, Framing sets over plug

2 Carpenters Chipping sets to grade

1 Gun mn + 1 Hlpr

1 Foreman + 6 Men } 3:25 Placg. conc.
} 4:35 Movg forms

2 Transit-Mix Trk Drvs

1 Dragline #10 + Crew } Stripping
} 5
2 Trks + 2 Drivers } T.E. Quarter

Cleaned 1600 SKS.

Recovered - 14 SKS

109
7: AM - to 4: PM.

R. W. Carter
Inspector

TUESDAY - JAN. 10 - 1933.

Placed concrete in Core

Wall:

Sta. N. 3448 - N3480 - elev. 553⁵ - 557⁵

Sta. N 3512 - N 3544 - elev. 552⁵ - 557⁵

Sta. N 3576 - N3608 - elev. 543 - 557⁵

Sta. N3340 - N3352 - to elev. 577⁵

Start: 7²⁰ AM Finish 3:45 PM

MIX: 7 SKS. Cement
1440# Sand
1150# 1/2 Rock
1030# 3/4" Rock
34 Gals. H₂O to 36 gals.

Equipment:

- 1 - mixing plant
- 2 Transit mix trucks
- 1 #10 - Dragline

Labor: 1 - Gen. foreman
1 - Dragline operator
1 - " " oiler
2 Transit mix truck drivers
4 - men in mixing plant
4 - men placing concrete
7 - Carpenters { Core wall
3 - helpers { forms

110

Cleaned 1000 cement sacks.
Recovered 12 - sacks of cement

66 Batches Concrete @ 7 SKS.	=	462
Batches - Grout @ 5 SKS.	=	10
		472 - SKS

Note: Top horizontal steel - 15 inches
below top of wall.

MATERIALS?

Sta. N3448 N 3480

20 - 13/16^ø bars - 32'-0" { Horizontal
20 - 13/16^ø bars - 2'-6" laps
20 - 7/8^ø bars - 5'-0" Vertical
NO - Horizontal Copper (Top of Wall)
Vertical copper previously reported

Sta. N3512 - N3544

22 - 13/16^ø bars - 32'-0" Horizontal
22 - 13/16^ø bars - 2'-6" laps
20 - 7/8^ø bars - 6'-0" vertical
NO - Horizontal copper water stop.

Sta. N3576 - N3608

60 - 13/16^ø bars - 32'-0" { Horizontal
60 - 13/16^ø bars - 2'-6" laps
20 - 7/8^ø bars - 16'-0" Vertical
32 - ft. Vertical copper water stop
NO - Horizontal Copper (Top of Wall)

Sta. N3340 - N3352 → 26 - ft. copper
24 - 7/8^ø 7 ft. Vertical 24 - 11 - ft. 13/16^ø bars - Horiz.

Jan-10-1933 - 7:15 A.M. to 3:15 P.M.

Tunnel labor:

- 3-men excavating for tunnel plug-
 1-foreman } placing steel forms for
 6-men } tunnel lining.
 8-steel men } placing reinforcing
 } steel for tunnel lining
 2-cement finishers } patching tunnel
 1-helper } lining

Jan-10-1933- 3 P.M. to 11 P.M.

- 1 Shifter, 6 men, 2 Carpenters & 2 men
 from Mixing Crew Set Steel Tunn. Forms.
 2 Carpenters Trim Timbers.
 1 Man Clean Mixer.

Remarks: Steel forms were set
 from 2+77 to 3+35. The Easternmost of
 these forms at 2+77 had too much
 clearance on South side & not enough
 on North side. I notified both Stoves &
 Brickson who said the forms would
 be blocked over. However at 11 P.M.
 when ready to pour the form was
 still in same place. Clearance at Spring
 line on the N side at 2+77 was $4\frac{3}{4}$ " & at pt
 " in Arch. Sec. was $5\frac{1}{2}$ ".

Note: In Center of Arch Sec. at about 3+50
 the concrete is thin enough to see through

R.A.T.

Tues. night, Jan. 10/11, 1933 - 11 PM - 7 AM.

Tunnel lining - Sect. 3+35 - 2+75

Mix as usual

Counter reading at 11 PM = 6*

" " " 7 AM = 50

Batches this shift = 44

Sacks Cement " = 264

* Includes 6 Batches ordered wasted at 12:30

Started mixing at 10:50 PM.

Conveyor trouble 10:50 PM - 11:30 PM

No power 11:30 PM - 11:45 AM

Repairing gun 1:45 AM - 4:50 AM

4:50 AM - 7 AM mixing with frequent stops

due to lack of water, No pump men

Force - 1 Mixer Fin'n + 3 Men

Lining { 2 Transit Mix Trks + 3 Drivers

1 Conc. Fin'n + 6 Men

1 Gun m'n + 1 Hlpr

Plug excav. 2 Drills + 1 Hlpr

5 PM Jan. 10 - 2 AM Jan. 11

#7 Sh. + Crew } Hyd. #10 Drag + Crew } 5 Trks

2 Trks + 2 Drivers } Fill 2 Trks + 2 Drivers } NE -

Jan. 11, 1933

Continued placing concrete in
tunnel lining sta. 3+35 to 2+75

Counter reading at 7:0 AM 50

" " " 3: P.M. 175

Batches this shift - 125
Sacks Cement }
this shift } → 750

MIX: 6-SKS. Cement

1440# Sand

1150# 1 1/2" Rock

1030# 3/4" Rock

Made set of Three test cylinders

at 11:0 AM from concrete going

into the above section of

tunnel lining - 36-gals. H₂O

Equipment: Same as listed on
page 105

Labor: 1 Foreman

7 men

1 Gun operator

4 men in mixing plant

2 Transit mix truck drivers

2 Carpenters on bulkhead

4 men { excavating for
tunnel plug

2 cement finishers { patching

1-helper { entrance
portal conc.

Jan-11- Miscellaneous labor

3-men
1-truck+driver } stripping entrance
portal forms and
hauling lumber to
core wall

At 8:AM. I asked the Supt. and MR. Ellison to keep all fresh concrete thoroughly wet.

9:AM. I asked Supt. Steves to make some effort to vibrate the forms to aid in better placement of concrete and he said the finish suited the contractor and that he didn't have enough men for that. I told him the entire area of tunnel lining so far did not meet specification requirements and that he could expect orders at any time to produce the required quality of workmanship.

R. W. Carter.

Jan-11- Notes

Foreman and Supt. Steves was notified by, Newcomb, Thurston and Carter that the forms from Sta. 2+75 to 2+85 were not centered and that only $4\frac{1}{2}$ " clearance from springline down 4-ft on wall of North side of Tunnel was obtained, also that the South side had $12\frac{1}{2}$ " clearance. No effort was made to center the forms and concrete was placed without centering the forms, even after the inspector notified the foreman and Supt. The timbers however were trimmed and the required clearance could have been obtained if sufficient time had been taken to center the forms.

Tunnel

Jan. 11-1933 3PM to 11PM

Labor. 1 shift. - 7 men - 2 carpenters - 2 truck drivers - 1 Gun operator & 4 men mixing crew.

Repairing pipe line from 3 P.M. to 4:45 and nipple on Gun from 5 to 6:45

Cleaned 1500 sx. & recovered 10 sx. cement.

Finished pouring in Tunnel at 9:15 P.M.

196 Meter reading at 9:15 P.M.

21 batches this shift.

126 sx. cement.

Core Wall. 1-11-33

10 P.M., Jan. 11 to 7 A.M. Jan. 12

2:30 AM Sta. N 3480 to N 3512₃₂ elev. 543° - 559°

5:15 AM Sta. N 3544 to N 3576₃₂ elev. 543° - 559°

~~Sta. N 3608 to N 3640 elev. 543° - 559°~~

Started pouring at 10 P.M.

Labor. 1 Foreman - 4 men

Drag Line #10 - operator & oiler,

Mixer Crew of 1 Em + 3 Men (1 Man $\frac{1}{2}$ shift)

2 Transit - Mix. Trks. & 3 Drivers

Finished placing 5:50 A.M.

Total Batches = 56 } Concrete
Sacks Cement = 392 }

Batches Grout = 2 } Grout
Sacks Cement = 10 }

AWB

Wednesday night, Jan. 11/12, 1933.

Road to Boron Pit.

1 - Shovel #7 + Crew } 5 P.M. Jan. 11,
2 - Trucks + 2 Drivers } to
1 - Pitmen } 2 A.M. Jan. 12

Tunnel

1 - Truck } Loading muck from plug excavation
4 - Laborers } 11 P.M. Jan. 11 to 7 A.M. Jan. 12
{ 2 Carpenters - Chipping sets to grade
1 Foreman + 7 Men - Moving forms
↓ 11 P.M. Jan. 11 to 7 A.M. Jan. 12

W. H. Carter

R. W. Carter
7: A.M. to 4: P.M.

Jan. 12 - 1933

Notes:

Sta. 2+98 to 3+04 forms were stripped and showed hole in crown of arch approximately 6'x4' - not filled with concrete. Sta. 3+48 to 3+51 - Hole in crown of arch not filled with concrete. A very thin layer of concrete of about $\frac{1}{2}$ " or less covers the hole, and small holes through this thin layer reveals the void at the crown of arch.

7⁵⁰ A.M. notified foreman Cossoitch and Supt. Stevens, that cleanup of area between outside edges of invert and walks was not satisfactory from Sta. 2+75 to 2+15 and that this cleanup must be satisfactorily done before

Jan-12- notes continued

forms are finally in place to receive concrete. A man with air hose was immediately put to work cleaning up.

Labor:

1-foreman { setting steel forms
7-men { in tunnel

1-foreman
7-men { cleaning up
1-truck driver { muck from
tunnel plug
excav.

2- finishers { finishing tunnel
1-helper { lining

2-men { stripping forms from
4-hrs. { entrance Portal

7-steel men { reinforcing
steel for
tunnel lining

Core Wall Forms:

1-Carp. foreman

6-Carpenters

2-helpers

2-men { chipping out rock
pockets Core Wall,
with jackhammer

Jan. 12-1933.

Tunnel 3 PM to 11 PM.

Labor 1st shift - 6 men & 4 men
from mixing crew - setting
forms from 2+77 to 2+17.

Started pouring at 8:10 P.M.

At 6 P.M. add 2 carpenters.

at 8 PM add 1 Gun operator and
2 truck drivers.

Pouring on north side only to crowd
forms over and into place. Poured
30 yds. on north side & forms
shifted small amount. Then
changed to south side.

Motor on Mixer #2 "burned out"
at 10:15 P.M. No delay.

66 Meter reading at 11 PM.

66 Batches this shift.

396 sx. cement.

Thurston

11:00 AM Jan 12 to 7:00 AM Jan 13.

Concrete tunnel lining

continued - 2+77 to 2+17.

Counter reading - 11:00 AM - 66

" " " 7:00 AM - 167

Batches this shift 101

Sacks of Cement → 606 ✓

Force: 1 Mix Fin + 3 Men

2 Carp. on Blvd

1 Fin + 6 Men - Conc.

1 Gun man + 1 Hpr.

2 Trans-Mix Trucks

FRIDAY - Jan. 13

Continued placing Concrete

in tunnel lining sta. 2+77 to 2+17

Counter reading: 7:00 AM - 167

" " 9:45 AM - 194

27 batches
this shift
to finish

194 Total batches @ 60ks - 1164 sacks cement

Mix: 6 Sacks cement

1440 # Sand

1150 # 1 1/2" Rock

1030 # 3/4" Rock.

Equipment: same as listed Page 105

Labor: 1 Foreman

7 men

1 Gun operator

2 Transit mix trucks - 3 hrs.

4 men in mixing plant 3 hrs.

2 Cement finishers

1 helper

7 steel men

4 men {excav. on tunnel plug

1 Truck and driver " "

Concrete 3-hrs
moving equipment +
forms. 5-hrsPatching ceiling of
tunnel from Jumbo

Reinforcing steel - tunnel

8:20 Workman started stripping forms from
sta. 2+47 to 2+57 and found concrete too green
to strip and put the form back in position.

125

R. W. Carter
Inspector
7:30 A.M. to 3: P.M.
Weather Clear.

Jan. 13-1933.

Placed concrete in core wall
starting at 10: A.M.

Sta N3640 to N3672 - to elev. 559²Sta N3704 to N3736 - to elev. 559³Sta N3768 to N3800 - to elev. 559²

Equipment:

- 2-Transit mix tracks
- 1-mixing plant
- 1-#10- Dragline.

Labor:

- 1-Gen. Foreman
- 4-men placing Conc.
- 4-men in mixing plant
- 2-Transit mix drivers
- 1-#10- Dragline operator
- 1- " " " Oiler

5-hrs.
10: A.M.
to 3: P.M.

Mix: 7-SKS. Cement
1440# Sand
1150# - 1 1/2" Rock
1030# - 3/4" Rock
34-gals. H₂O.

Materials:

Sta. N3640 - N3672

30-Ft. Copper Vertical
60-1 3/16" ϕ - 32'-0"
60-1 3/16" ϕ - 2'-6"
42-7/8" ϕ - 15'-0"

126

Sta. N3704 to N3736

30-ft. Copper

60-1 3/16" ϕ - 32'-0"60-1 3/16" ϕ - 2'-6"42-7/8" ϕ - 15'-0"

Sta. N 3768 to N3800

22-ft. Vertical copper

24 ft. horiz. Copper

28-1 3/16" ϕ - 32'-0"20-1 3/16" ϕ - 24'-0"12-1 3/16" ϕ - 16'-0"10-7/8" ϕ - 6'-0"10-7/8" ϕ - 14'-0"18-7/8" ϕ - 15'-0"

44 Batches Concrete to 3: P.M. = ^{7-SKS.} 44
3 Batches Concrete @ 3-SKS = 3
Grout to 3: P.M. = 1

Total sacks 331 - SKS.
of Cement to 3: P.M. =

Jan. 13-1933

3 P.M. to 11 P.M.

Completed pouring Core
Wall at 7:30 P.M.82 batches Total1 batch grout Total

35 batches since 3 P.M.

245 SX. Cement.

Tunnel.

1 shift: 7 men, moving &
setting forms.

3 miners - 1 truck - 1 driver

cleaning up at East Key

4 men mixing crew.

(1 3/4 tons included in above wasted
Forms full.) not on report
Cleaned 2200 cement sacks
Reclaimed 14 sacks of cement

11: P.M. Jan. 13 - to 7: A.M. Jan. 14

No concreting this shift

1 Mix. Em + 3 Men	} Erecting Forms
1 Em + 7 Men	

2 Corp. on Bulkhead started at 3 AM

W.H.G.

Sat. Jan. 14. 7:AM to 3:PM

Placing concrete in Tunnel

lining - Sta. 2+17 to 1+57

Same equipment as on page-105.

Start - 7:45 A.M.

Labor: 1. Foreman
7. men
1. Gun operator
2. Transit mix truck drivers
4. men in mixing plant
1. Foreman { stripping forms
3. men { entrance Portal
and work on
timbering and
excav. plug.

1. man wetting concrete in tunnel

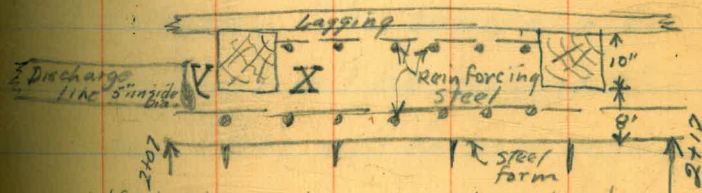
MIX: 6 Sacks Cement
1440# Sand
1150 # 1 1/2" Rock
1030 # 3/4" Rock
37. Gals. H₂O

135. batches Concrete at 3:PM

810 - Sacks of Cement "

Notes:

McGuire, graveyard shift foreman set concrete discharge pipe ready to place concrete at 7:AM. The pipe was so placed as to cause the concrete to be forced against a timber set, which probably will cause a dam of concrete and prevent the concrete from filling the area between timber sets. Cossowitch said he wouldn't change it and get blamed for delay on his shift.



If discharge line is placed at X. instead of at Y. it is obvious that the space to be filled will have better chance to fill completely

Core wall labor - Jan. 14.

1- Gen. Foreman } Forms -
 6- Carpenters }
 7- helpers } Helping carpenters
 } and stripping forms
 } Cleanup
 1- man wetting Conc. }
 } Setting reinf.
 } Steel south end
 1- truck and driver }
 } hauling lumber from Core Wall

Excavating south end of Core Wall:

1- #10 dragline
 1- dump truck
 1- Dragline operator
 1- " " oiler (drives truck also)
 1- driller
 2- muckers.

Jan. 14 1933.

Tunnel 3 P.M. to 11 P.M.

1 shift. - 7 men pouring concrete.

3 Mixers - 2 carpenters building forms.

1 G.M. operator - 2 truck drivers.

4 men - mixing crew.

Finished this section 2417 to 1457

at 8:15 P.M.

191 Meter reading at 8:15 P.M.

↙ Total for this pour

1146 sx. cement.

Moving equipment to East Key. The concrete here does not need a keyway. The concrete to be poured will all be behind the timbers. This will form a keyway with the concrete previously placed in the walls.

(over)

not included
in 21 batches

Dumped one (1) batch of
6 SX. which had stood too long.
Started to pour Walls
in East Key at 10:15 P.M.
21 Batches at 11 P.M.
126 SX. cement.

Thurston

Sat. 11 PM, Jan. 14 to Sun. 7 AM, Jan. 15

Keyway for Plug. - East -

Counter reading at 11 PM = 21

" " " 7 AM = 46

Total Batches this shift = 25
(Includes 3 Batches wasted - form failure)
Sacks Cement " " 150

At 1:30 AM, forms on South side
failed due ^{to} insufficient bracing.
Placing conc. was suspended
until 5:35 AM and an attempt
was made to realign the forms

Sat. night, Jan. 14/15 - 11 PM - 7 AM 134

Continued -

and additional bracing was added.
Work permitted to proceed on under-
standing with Engr. stores that con-
crete would be trimmed back to
grade. Permission was thus given in
order not to delay work, but I con-
sider this whole south side as a poor
piece of work and suggest that a
carefull inspection be made as soon
as forms are removed. Also, unless
bracing is added under the arch,
the operation of pouring will be
extremely hazardous.

Force :- 1 Mixer Foreman + 3 Men
2 Transit-Mix Truck Drivers
1 Conc. Fin' + 6 Men
2 Carpenters + 1 Helper
1 Welder
1 Gun man (repairing)

W.A.

R. W. Carter
Inspector
Weather cloudy
Showers in P.M.

Sunday - Jan. 15 - 1933.

Placed concrete in Core wall.
7:30 - AM 9:40 P.M.

Sta. N3608 To N3640 - to elev. 559'

Copper water stop previously reported

In Vertical expansion joints - No horiz. copper

60 - 13/16" ϕ - 32'-0"

42 - 7/8" ϕ - 15'-0"

Equipment:

- 1 - concrete mixing plant
- 2 - Transit mix Trucks
- 1 - #10 - Dragline

Labor:

- 1 - Gen. foreman
- 4 - men placing concrete
- 1 - Dragline operator
- 1 - " " oiler
- 4 - men in mixing plant
- 2 - Transit mix truck drivers
- 1 - Carpenter foreman } Core Wall
- 2 - Carpenters } forms
- 1 - helper
- 2 - men } chipping out rock Pockets
- } in Core Wall - Sta. N3448
- } To N3544

4 - MEN } stripping forms from inside of
 } drain Wells - D.S. To Wall

Placed concrete in Core Wall.

9:40 A.M. To 1:05 P.M. 1-hr. out for lunch.

Sta. N3672 To N3704 to elev. 559'

No copper water stop { Has been
 } Previously
 } Reported

60 - 13/16" ϕ - 32'-0"

60 - 13/16" ϕ - 2'-6"

42 - 7/8" ϕ - 15'-0"

1:05 P.M. - 3:15 P.M.

Sta. N3736 To N3768 to elev. 559'

No copper water stop { Has been
 } Previously
 } Reported

60 - 13/16" ϕ - 32'-0"

60 - 13/16" ϕ - 2'-6"

42 - 7/8" ϕ - 15'-0"

Note - Reinforcing steel placed to
within 15" of top of wall.

MIX: 7 - SKS. Cement

1440# Sand

1150# 1 1/2" Rock

1030# 3/4" Rock

77 Batches Concrete @ 7.5 SKS = 589

3 batches Grout @ 5 SKS = 15

554 - SKS.
Cement.

1250 Sacks Cleaned

10 - Sacks Cement recovered.

Sunday - Jan - 15 -

Tunnel labor:

1 - foreman } moving steel forms.
7 - men

1 - man wetting tunnel lining

1 - foreman } Shoring Roof Timber for
3 - men } east tunnel plug, and
2 - carpenters } stripping forms in transition
section of entrance Portal

2 - Cement finishers } Patching tunnel
1 - helper } lining

Jan. 15 - 3: P.M. to 11: P.M.

Tunnel.

4 men - mixing crew & 2 truck drivers

1 shift - 7 men - pouring concrete.

Started pouring concrete on Arch
section of East Key at 3:30 P.M.
Cleaned 1150 sq.

72 batches at 11 P.M.

432 sq. cement
Thurston

Sun. night, Jan. 15/16, 1933 - 11 P.M. - 7 A.M.

East keyway for tunnel plug

Counter reading at 11 P.M. = 72

" " (Finish) 2:15 A.M. = 93

Batches this shift = 71

Sacks cement this shift = 176

Force: 1 Mixer Em'n + 3 Men } 3:15 Mixing
4:45 Cleaning Plant
1 Conc. Em'n + 6 Men } 3:15 Plac'g Conc.
4:45 Erect'g Forms

1 Gun man + 1 Helper (off at 2:15 A.M.)

2 Tran-Mix Truck Drivers (off at 2:30 A.M.)

2 Carpenters (on at 3:00 A.M.)

- No other work this shift -

W.A.

MONDAY. JAN ~~26~~¹⁶ 7:AM TO 3:PM

Placed concrete in tunnel lining
Sta. 1+57⁵ to 1+27⁵ Start 8:25 AM

Mix: 6 sacks Cement
1440# Sand
1150# 1 1/2" Rock
1030# 3/4" Rock.

Equipment:

- 1-mixing plant
- 2-Transitmix trucks
- 1-Pneumatic placer mounted on truck
- 1-Jumbo-mounted on truck
- 1-Northern belt Conveyor elevator

Labor:

- 1-foreman
 - 7-men
 - 1-Gun operator
- } Placing Conc.
- 1-foreman
 - 3-men
 - 4-men at mixing plant
 - 2-Transitmix drivers
- } Removing shoring on tunnel plug and general tunnel work.
- 2-of these men were used at 10:AM to work on filling exploration tunnel

93-batches concrete to 3:PM.

Note: 3/4" rock started coming with large percentage of sand. From batch #33 to #84 - 1240# Sand 1350# 1 1/2" Rock and 1030# 3/4" rock, used instead of mix listed above.

Notes:

When steel form was removed from Sta. 2+07 to 2+17, as predicted on page 130, this book, the area between the timber sets at the crown of the arch was not filled with concrete.

From Sta. 1+87 to 1+97, the concrete showed rock pocket both sides of tunnel from Top of invert to height of 4-ft. Repeated requests by inspector to vibrate the forms in some manner to assist in proper placement of concrete, have been ignored.

Sta. 5+00. hole in crown-ft. N-C

Sta. 5+20-5+28 Steel exposed N Wall

Sta. 5+10. Steel exposed-2-ft. South of C of Crown

Sta. 5+32- " " 4-ft. South of C of Crown

Jan. 16-1933

Tunnel 3PM to 11PM.

4 men, mixing crew

2 truck drivers.

1 shift. 7 men. pouring concrete.

1 carpenter. 1 gun operator.

cleaned 700 sq.

Completed pouring section 1427 to 1457 at 6:30 PM

Meter reading 103 at 6:30

10 batches this shift60 sq. cement.Men. night, Jan. 16/17, 1933 - 11 PM - 7 AM

Tunnel - 1 Conc. Emin	} Strip'g transition and erect'g steel forms
2 Carpenters	
1 Truck Drvr	
6 Laborers	

Mixer Plant

1 Foreman	} 11 PM - 12:45 AM only Mov'g cement in whouse
3 Laborers	

No shovels working this shift.

No work in either #7 or #8 explor. tunnel

D.V.A.

Feb. 9-1933.

1 shift. - 6 men - moving forms in Tunnel.

Shovel #7 - operator & oiler & 2 trucks stripping on S.E. 1/4.

2 men on East Fill Dump.

1 man plugging boulders.

Estimated 25 yds. of rock stripped from puddle

Recorded on 347, page 56. JTW

core area. Approx. 16 yds. of rock above ground & 9 yds. from below surface.

All material placed in East fill dump. J. Hurst.

Feb. 10-1933

3 P.M. to 12 P.M.

Labor. Shovel #7-operator &
oiler-struck drivers-
stripping puddle core
area in S.E. $\frac{1}{4}$.

1 man on dump.

1 man drilling boulders
Tunnel-1 shft. - 6 men
moving forms.

2 men on Hydraulic Fill.

All material stripped was
placed in East Fill Dump.
& included 11 yds. of rock
from above surface & 16
yds. from below surface.

Recorded in book 347, Page 545
Thurston
K.M.

Feb. 11-1933

3 P.M. to 12 P.M.

S.E.		N.W. $\frac{1}{4}$	
above	below		
1.5	0.5	2.0	2
1.0	1.0	1.5	1.5
1.5	1.5	1.5	0.5
1.0	1.0	1.5	4.0
1.5	1.0	2.0	
1.5	1.0	1.0	
2.0	1.0	1.5	
1.5	1.5	18.0	
1.5	1.5	29.0	
1.5	2.0		
1.5	1.0		
1.0	1.0		
2.0	2.0		
20.5	18.0		

Labor: Tunnel-1 shft. - 6 men
moving forms.

Shovel #7 stripping S.E. $\frac{1}{4}$.

1 Operator - 1 oiler - 2 truck
drivers - 1 dump man - 1 man
clearing & burning.

(Rock excavated: - 4 yds. (above
surface) from N.W. $\frac{1}{4}$ - 20 $\frac{1}{2}$ yds.
(above surface) from S.E. $\frac{1}{4}$ &
29 yds. (below surface) same $\frac{1}{4}$
Thurston

Feb 12-1933.

3 P.M. to 12 P.M.

Labor: Shovel #7 - Operator & oiler.

1 Dumpman - 3 truck drivers.

Drag #10 - Operator, oiler & helper.

All of above, excavating in

SE 1/4.

Rock.	Above	Below
	1.0	1.5 1.0 1.5
	1.0	2.0 3.0 3.0
	2.0	2.0 4.0 3.0
	2.0	51.5 4.0 2.0
	2.0	57.0 2.0 3.0
		1.5 3.0 3.0
		2.0 1.5 1.5
		1.5 2.0 2.0
		3.0 2.0 1.5
		1.0 1.5 2.0
		1.0 2.0 2.0
		1.5 2.0
		26.5

Recorded
 book 347
 Page 57
 2/12/33

Rock excavated - 2 yds. from above surface and 57 from below surface.

1 shft. - 6 men in tunnel moving forms Thurston.

Feb. 13-1933

Started pouring Tunnel Lining
 - Section 0+50 to 1+03 - at 9:30 P.M.
 #6 Rec.

Labor - 4 men - mixing crew.

- 2 truck drivers - 1 compressor man.

1 shft. - 6 men - 1 gun operator.

Equipment - 2 Sullivan Compressors -

3 Portable Compressors - 1 Cement Gun.

2 Transit Mix Trucks - 1 Mixing Plant.

Mix. 6 sx. cement.

1400# sand

1190# - 1 1/2" rock.

1030# - 3/4" rock

42 gals. water.

^{4 Rec.} 58 batches at 2 A.M.

^{24 Rec.} 378. Six. cement Thurston.

{ 8-batches of this 54 wasted at 3:30 A.M.
 mixed from 11:30 P.M. to 3:30 A.M.
 Plugged discharge line + compressor
 trouble - 11:30 P.M. to 3:30 A.M. Rec.

7:30 -
2: A.M. to 11: A.M.
Feb. 14 - 1933.

Weather clear.
P. W. Carter
Inspector

Continued placing concrete
in tunnel lining Sta. 0+46 to 403

Started concrete again at 3:30
A.M. after delay from 11:30 P.M.

Changed mix at 3:30 A.M.

6-Sks. cement }
1340# - Sand } from batch #54
1250# - 1 1/2" Rock }
1030# 3/4" Rock. }

Water 36 to 39 gals.

Meter reading: 2: A.M. - 54

" " 11: A.M. - 128

Batches this shift 74

Sacks of Cmt. 464

Crew change at 2: A.M.

1-mixer man } Holdovers from
2-Transitmix drivers } last shift

1-foreman

3-men

1-Gunner

3-men in mixing plant besides
mixer man.

2-Compressor tenders

Foreman expected anytime
after 3:30 A.M. to see discharge
hose blow out and from 3:30 A.M.
2-batch loads were sent to
the tunnel instead of 3-batch
loads, to prevent too much
waste in case of another
breakdown. The short haul
prevented any delay when
using 2-batch loads.

4: A.M. Discharge hose broke,
causing delay to 5:30 A.M.

Note: Keyway Sta. 0+61 to 0+67 is being
filled with concrete integral with the
tunnel lining and is to be chipped
to required section when forms are removed.

1-set of three test cylinders made
at 9: A.M. from mix on opposite
page - 38 gals. H₂O

Aggregate very dry.

Feb. 14 - 1933

11 A.M. to 11:30 P.M.

Crews changed at 10 A.M.

Delay 11 A.M. to 12:40 P.M. changing pipe.

Cleaned 800 sx. and reclaimed 6 sx. cement.

Crew changed at 6 P.M.

Less than 10 yds poured from 11 A.M. to 4:30 P.M. due to bursting of rubber hose, broken bulkhead, etc.

177 Meter reading at 11:30 P.M.

49 batches since 11 A.M.

294 sx. cement.

Mixing Plant

2 Trans Mx Trucks.

1 Jumbo on Truck

1 Press weld Pn. Conc. Gun. on Truck

3 Portable Comp.

Stationary Comp Plant & Comp.

1 Cat Trac Co.

$$\begin{array}{r} 22 \\ 128 \\ \hline 40 \end{array}$$

 150
 R. W. Carter.
 10:30 P.M. to 8:15 A.M.

Feb. 14 - 11:30 P.M. to Feb. 15

Continued placing concrete in tunnel lining Sta. 0146 to 1703

Meter reading - 11:30 P.M.	177
" " 12:00 A.M.	218

41 batches

From 11:30 P.M. to 12:00 A.M.

Same mix used since batch #54

Same crew in numbers on each shift as on previous page.

Crew Change - 7:15 A.M. - Crew that come on at 6:15 P.M. worked until 7:15 A.M.

Considerable delay on moving discharge line ahead.

500 - sks. cleaned -
6 - sacks cement salvaged

1 Foreman, 3 mers	12 M. Finish.
1 Gun Op + 1 Helper	Total 218 Batches
1 Dump man Tr Mx	1308 Sx Cement.
2 Tr Mx Drivers	
1 Mx Man + 2 Laborers	
1 Tractor Op - holder	
1 Tr + Dr. part Time.	
1 Op Sta Comp Plant. 6 10 M.	

 Discharge Pipe
 Cleaned 5 P.M.

DAY-Shift

R.W. Carter
Inspector
Weather - Clear.

Thursday - Feb. 16 -

NO CONCRETE WORK TODAY.

- | | |
|-----------------------|--|
| 1-foreman | } stripping steel forms
from tunnel lining. |
| 5-men | |
| 2-Carpenter helpers | } 0+46 to 1+03 also
removing air line
from tunnel |
| 1-tractor | |
| 1-truck | |
| 1-Jumbo on truck. | |
| 2-Cement finishers | } chipping +
finishing tunnel
lining concrete |
| 1-Portable Compressor | |
| 1-Jackhammer | } 0+14 to 1+03
including chipping
keyway sta. 0+61 to
0+67. |
| | |

Weather clear.

R.W. Carter
Inspector.

Friday - Feb. 17.

- | | |
|-----------------------|--|
| 1-foreman | } Moving tunnel lining
forms & lining equipment
4-hrs. |
| 6-men | |
| | } 4-hrs. on pipe lines
west of Dam. |
| | |
| 1-Carp. foreman | } Bldg. Scaffold for
men on chipping
keyway in tunnel |
| | |
| 2-Cement finishers | } Chipping keyway
keyway in tunnel
lining - Sta. 0+61 to 0+67 |
| 1-Carp. helper | |
| 1-portable compressor | |
| 2-jackhammers. | |

Feb. 17-1933

Core Wall. 1 Foreman-10 men
 1 Shovel #10 & runner-1 truck
 #43 & driver.

Dumps. 2 men - one on each
 dump

Tailing Pond. 3 men.

No work on Tunnel or Spillway.

2 $\frac{1}{2}$ ^{not to Rock Emb. n.} yds. rock remove from Core
 trench and placed on old
 road, just east of excavation.

Working at each end of core wall.
 Thurston

Feb. 18-1933

5 P.M. to 2 A.M.

Core Wall. Working at both ends.
 1 Shovel #10-Runner & oiler-1 truck
 & driver-1 Foreman-10 men.

Tunnel - No work.

Spillway- Shovel #11- operator
 & oiler- casting.

10 yds. rock from Core trench
 and dumped as rock fill.

Recorded Vol 347
 58. Thurston.

Sunday- Feb. 19-1933 5 P.M. to 2 A.M.

Shovel #11- Operator & oiler-3 trucks &
 3 drivers- On Spillway Road. All material
 to West Dump. 1 man on Dump.

Core Wall. Shovel #10-Runner & oiler-
 1 truck & driver-1 Foreman-9 men. Working
 both ends of Core wall. Extracted
 14 yds. rock. ← Recorded Vol 347
 59 n

10-11-35 } extrados steel
 4-1" 30 } entrance Portal
 29-1" 18-8" Beat } transition section

Feb. 20-1933 - 5 P.M. to 2 P.M.

Spillway:- Shovel #11 - Runner
 and oiler - 2 trucks & 2 drivers.

Tunnel - No work.

Core Wall - Shovel #10 - Runner
 & oiler:- 1 truck & driver.

1 Foreman 9 men.

Rock:- 6 yds. from Core
 trench & 5 yds from
 Spillway. ^{see 247} Hurst

Recorded ³⁵⁹
 W. ₅₀

Cement used by Cement Finisher

Dec-30-1932-	6-sacks	} tunnel lining
Dec-31-1932 -	4-sacks	
Jan-2-1933 -	6-sacks	}
Jan-3-1933	10-sks	
Jan-4-1933	10-sacks	
Jan-8	" 18	
Jan-10	" 6	
Jan-11	" 6	{ Entrance Portal finish
Jan-12	8	Tunnel lining
Jan-14	6	
Jan-15	4	2-on patching for core wall
Jan-15 to Feb-12 reported in book #411		

#2

Cement Sacks Cleaned & Recovered

Date	Cleaned	Recovered	
12/8th/32	2550	12	
12/4/32	1150	11	
12/7/32	1650	11	
12/20/32	4200	25	
12/21/32	1000	12	
12/22/32	1450	21	
12/23/32	900	-	
12/24/32	600	13	
12/26/32	1500	17	
Dec 31 - 1932	2050	26	Reported on 31 st book Record on Jan 1 st
Jan 2 - 1933	1250	0	not weighed & sacked yet
Jan 3	800	14	
Jan 5	2150	10	
Jan 7	700	9	
Jan 9	2900	14	
Jan 10	1000	12	
Jan 11	1500	10	
Jan 13	2200	14	
Jan 15	1250	10	
Jan 15 to Feb 13	reported in book #411		
Feb 14	800	6	
Feb 15	500	6	

Pressed & Welded Products Co.

Box 4622

Pittsburgh

PA.

Mr. McCurdy.

Pressweld Pneumatic Pliers
1/2 m. McCurdy's.

Tunnel invert mix.

6-SKS. Cement

1220 # Sand

864 # 2 1/2" or

864 # 1 1/2" if

672 # 3/4 harsh.

1320 # Sand

764 # 2 1/2"

864 # 1 1/2"

672 # 3/4

3620

GROUT-

1040 # Sand

5-SKS. Cement

- #68 U.T.W.
 #75 " "
 #79 "
 #122 W. Portal
 #123 Rock Dump
 #125 - Core Wall Steel
 #127 - East Portal
 #135 - Drain
 #133 - Conc. Footings West Portal
 #140 - Conc. Drain
 #141 - Jumbo on tracks
 #142 - Steel North wing Rel. Wall East Portal
 #149 - Drains
 #150 - Core Wall Copper joint
 #161 - Core Wall
 #162 - Core Wall
 #167 - East Portal
 #168 - Tunnel West Portal
 #169 - " " Shaft forms + floor
 #174 Tunnel
 #176 - Core Wall
 #179 - West Portal
 #180 "
 #183 - Powder loading equipment
 #187. Quarry
 #189 "
 #202 - Core Wall

160
 480
 3640

Wed. Dec. 14 -

- #11 - Dryline + Acid { Clearing muck
 from Exit Portal.
 #7 - Shovel + Crew { Bldg. Road to
 gravel plant
 mixer man { Odd jobs +
 Tunnel foreman { moving truck lumber
 from tunnel



11151 11171
 23
 11154
 11178
 111

D. W. Albert
 2235 - Garvin Ave.
 Richmond
 Calif

CALCULATION OF EARTHWORK.

Width	HEIGHT														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.02	.04	.06	.07	.09	.11	.13	.15	.17	.18	.20	.22	.24	.26	.28
2	.04	.07	.11	.15	.18	.22	.26	.30	.33	.37	.41	.44	.48	.52	.56
3	.06	.11	.17	.22	.28	.33	.39	.44	.50	.56	.61	.67	.72	.78	.83
4	.07	.15	.22	.30	.37	.44	.52	.59	.67	.74	.81	.89	.96	1.04	1.11
5	.09	.19	.28	.37	.46	.56	.65	.74	.83	.93	1.02	1.11	1.20	1.30	1.39
6	.11	.22	.33	.44	.56	.67	.78	.89	1.00	1.11	1.22	1.33	1.44	1.55	1.67
7	.13	.26	.39	.52	.65	.78	.91	1.04	1.16	1.30	1.42	1.55	1.68	1.81	1.94
8	.15	.30	.44	.59	.74	.89	1.04	1.19	1.33	1.48	1.63	1.78	1.92	2.08	2.22
9	.17	.33	.50	.67	.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00	2.17	2.33	2.50
10	.18	.37	.56	.74	.93	1.11	1.30	1.48	1.67	1.85	2.04	2.22	2.41	2.59	2.78
11	.20	.41	.61	.82	1.02	1.22	1.43	1.63	1.83	2.04	2.24	2.44	2.65	2.85	3.06
12	.22	.44	.67	.89	1.11	1.33	1.56	1.78	2.00	2.22	2.44	2.67	2.89	3.11	3.33
13	.24	.48	.72	.96	1.20	1.44	1.68	1.92	2.16	2.41	2.65	2.89	3.13	3.37	3.61
14	.26	.52	.78	1.04	1.30	1.55	1.81	2.08	2.33	2.59	2.85	3.11	3.37	3.63	3.89
15	.28	.56	.83	1.11	1.39	1.67	1.94	2.22	2.50	2.78	3.06	3.33	3.61	3.89	4.17
16	.30	.59	.89	1.18	1.48	1.78	2.07	2.37	2.67	2.96	3.26	3.56	3.85	4.15	4.44
17	.31	.63	.94	1.26	1.57	1.89	2.20	2.52	2.83	3.15	3.46	3.78	4.09	4.41	4.72
18	.33	.67	1.00	1.33	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00
19	.35	.70	1.06	1.41	1.76	2.11	2.46	2.82	3.17	3.52	3.87	4.22	4.57	4.92	5.28
20	.37	.74	1.11	1.48	1.85	2.22	2.59	2.96	3.33	3.70	4.07	4.44	4.81	5.18	5.56
21	.39	.78	1.17	1.55	1.94	2.33	2.72	3.11	3.50	3.89	4.28	4.67	5.06	5.44	5.83
22	.41	.81	1.22	1.63	2.04	2.44	2.85	3.26	3.67	4.07	4.48	4.89	5.30	5.70	6.11
23	.43	.85	1.28	1.70	2.13	2.56	2.98	3.41	3.83	4.26	4.68	5.11	5.54	5.96	6.39
24	.44	.89	1.33	1.78	2.22	2.67	3.13	3.56	4.00	4.44	4.89	5.33	5.78	6.22	6.67
25	.46	.92	1.39	1.85	2.31	2.78	3.24	3.70	4.17	4.63	5.09	5.56	6.02	6.48	6.94
26	.48	.96	1.44	1.92	2.41	2.89	3.37	3.85	4.33	4.82	5.30	5.78	6.26	6.74	7.24
27	.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50
28	.52	1.04	1.55	2.07	2.59	3.11	3.63	4.15	4.67	5.18	5.70	6.22	6.74	7.26	7.78
29	.54	1.07	1.61	2.15	2.68	3.22	3.76	4.30	4.83	5.37	5.91	6.44	6.98	7.52	8.06
30	.56	1.11	1.67	2.22	2.78	3.33	3.89	4.44	5.00	5.55	6.11	6.67	7.22	7.78	8.33
31	.57	1.15	1.72	2.30	2.87	3.44	4.02	4.59	5.17	5.74	6.32	6.89	7.46	8.04	8.61
32	.59	1.18	1.78	2.37	2.96	3.56	4.15	4.74	5.33	5.92	6.52	7.11	7.70	8.30	8.89
33	.61	1.22	1.83	2.44	3.05	3.67	4.28	4.89	5.50	6.11	6.72	7.33	7.94	8.55	9.17
34	.63	1.26	1.89	2.52	3.15	3.78	4.40	5.04	5.67	6.29	6.93	7.56	8.18	8.81	9.44
35	.65	1.30	1.94	2.59	3.24	3.89	4.53	5.18	5.83	6.48	7.13	7.78	8.42	9.08	9.72
36	.67	1.33	2.00	2.67	3.33	4.00	4.66	5.33	6.00	6.67	7.33	8.00	8.67	9.33	10.00
37	.68	1.37	2.06	2.74	3.42	4.11	4.79	5.48	6.17	6.85	7.54	8.22	8.91	9.59	10.28
38	.70	1.41	2.11	2.82	3.52	4.22	4.92	5.63	6.33	7.03	7.74	8.44	9.15	9.85	10.56
39	.72	1.44	2.17	2.89	3.61	4.33	5.05	5.78	6.50	7.22	7.95	8.67	9.39	10.11	10.83
40	.74	1.48	2.22	2.96	3.70	4.44	5.18	5.92	6.67	7.41	8.15	8.89	9.63	10.37	11.11

Table gives cu. yds. in 1 ft. of a triangle of given width and height. Corrections for tenths of width are one tenth the values found under each height considering the widths from 1 to 9 as tenths and similarly the corrections for tenths of height are one tenth the figures opposite width considering the heights from 1 to 9 as tenths. Thus if w = 16.2 and h = 5.3, cu. yds. = $1.48 + .028 + .089 = 1.597$ cu. yds. or practically 160 cu. yds. per 100 ft. If w exceeds 40 ft., use one half and multiply result by 2, if both w and h are large use one half of each and multiply result by 4. Any cross-section may be divided into triangles by the following rule. To the triangle of the sum of the outside cuts (or fills) = h, and 1/2 the roadbed = w, add the triangles formed by taking the distance out to each break in turn (=w's) by the difference between the cuts (or fills) on each side of it (=h's) always subtracting the outer from the inner.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.
Roadway 16 feet wide. Side Slopes 1 on 1 1/2.
For Single Track Embankment.

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	II
0	8.0	8.2	8.3	8.5	8.6	8.8	8.9	9.1	9.2	9.4	0
1	9.5	9.7	9.8	10.0	10.1	10.3	10.4	10.6	10.7	10.9	1
2	11.0	11.2	11.3	11.5	11.6	11.8	11.9	12.1	12.2	12.4	2
3	12.5	12.7	12.8	13.0	13.1	13.3	13.4	13.6	13.7	13.9	3
4	14.0	14.2	14.3	14.5	14.6	14.8	14.9	15.1	15.2	15.4	4
5	15.5	15.7	15.8	16.0	16.1	16.3	16.4	16.6	16.7	16.9	5
6	17.0	17.2	17.3	17.5	17.6	17.8	17.9	18.1	18.2	18.4	6
7	18.5	18.7	18.8	19.0	19.1	19.3	19.4	19.6	19.7	19.9	7
8	20.0	20.2	20.3	20.5	20.6	20.8	20.9	21.1	21.2	21.4	8
9	21.5	21.7	21.8	22.0	22.1	22.3	22.4	22.6	22.7	22.9	9
10	23.0	23.2	23.3	23.5	23.6	23.8	23.9	24.1	24.2	24.4	10
11	24.5	24.7	24.8	25.0	25.1	25.3	25.4	25.6	25.7	25.9	11
12	26.0	26.2	26.3	26.5	26.6	26.8	26.9	27.1	27.2	27.4	12
13	27.5	27.7	27.8	28.0	28.1	28.3	28.4	28.6	28.7	28.9	13
14	29.0	29.2	29.3	29.5	29.6	29.8	29.9	30.1	30.2	30.4	14
15	30.5	30.7	30.8	31.0	31.1	31.3	31.4	31.6	31.7	31.9	15
16	32.0	32.2	32.3	32.5	32.6	32.8	32.9	33.1	33.2	33.4	16
17	33.5	33.7	33.8	34.0	34.1	34.3	34.4	34.6	34.7	34.9	17
18	35.0	35.2	35.3	35.5	35.6	35.8	35.9	36.1	36.2	36.4	18
19	36.5	36.7	36.8	37.0	37.1	37.3	37.4	37.6	37.7	37.9	19
20	38.0	38.2	38.3	38.5	38.6	38.8	38.9	39.1	39.2	39.4	20
21	39.5	39.7	39.8	40.0	40.1	40.3	40.4	40.6	40.7	40.9	21
22	41.0	41.2	41.3	41.5	41.6	41.8	41.9	42.1	42.2	42.4	22
23	42.5	42.7	42.8	43.0	43.1	43.3	43.4	43.6	43.7	43.9	23
24	44.0	44.2	44.3	44.5	44.6	44.8	44.9	45.1	45.2	45.4	24
25	45.5	45.7	45.8	46.0	46.1	46.3	46.4	46.6	46.7	46.9	25
26	47.0	47.2	47.3	47.5	47.6	47.8	47.9	48.1	48.2	48.4	26
27	48.5	48.7	48.8	49.0	49.1	49.3	49.4	49.6	49.7	49.9	27
28	50.0	50.2	50.3	50.5	50.6	50.8	50.9	51.1	51.2	51.4	28
29	51.5	51.7	51.8	52.0	52.1	52.3	52.4	52.6	52.7	52.9	29
30	53.0	53.2	53.3	53.5	53.6	53.8	53.9	54.1	54.2	54.4	30
31	54.5	54.7	54.8	55.0	55.1	55.3	55.4	55.6	55.7	55.9	31
32	56.0	56.2	56.3	56.5	56.6	56.8	56.9	57.1	57.2	57.4	32
33	57.5	57.7	57.8	58.0	58.1	58.3	58.4	58.6	58.7	58.9	33
34	59.0	59.2	59.3	59.5	59.6	59.8	59.9	60.1	60.2	60.4	34
35	60.5	60.7	60.8	61.0	61.1	61.3	61.4	61.6	61.7	61.9	35
36	62.0	62.2	62.3	62.5	62.6	62.8	62.9	63.1	63.2	63.4	36
37	63.5	63.7	63.8	64.0	64.1	64.3	64.4	64.6	64.7	64.9	37
38	65.0	65.2	65.3	65.5	65.6	65.8	65.9	66.1	66.2	66.4	38
39	66.5	66.7	66.8	67.0	67.1	67.3	67.4	67.6	67.7	67.9	39
40	68.0	68.2	68.3	68.5	68.6	68.8	68.9	69.1	69.2	69.4	40

Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 41.9. For same slopes but other widths of roadbed correct above figures by one-half difference in width of roadbed; thus in example above for 20 ft. roadbed distance will be $41.9 + (20 - 16) \div 2$ or 2 ft. added to 41.9 = 43.9. For slopes of 1 on 1 see inside of front cover.

Made in Germany.