

L.O.D.

C.H.B.

JUL 10 1919

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FIELD BOOK

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# KEUFFEL & ESSER CO.

DRAWING MATERIALS

AND  
SURVEILING INSTRUMENTS.

NEW YORK.

CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

## Tables for Excavations and Embankments.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.  
ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.  
FOR SINGLE TRACK EXCAVATION.

"Copyright, 1895, by Keuffel & Esser Co."

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	0
1	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	1
2	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	2
3	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	3
4	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	4
5	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	5
6	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	6
7	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	7
8	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	8
9	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	9
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19	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	19
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34	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	34
35	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	35
36	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	36

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

FOR KEITH'S RAILROAD CURVE TABLES SEE END OF BOOK

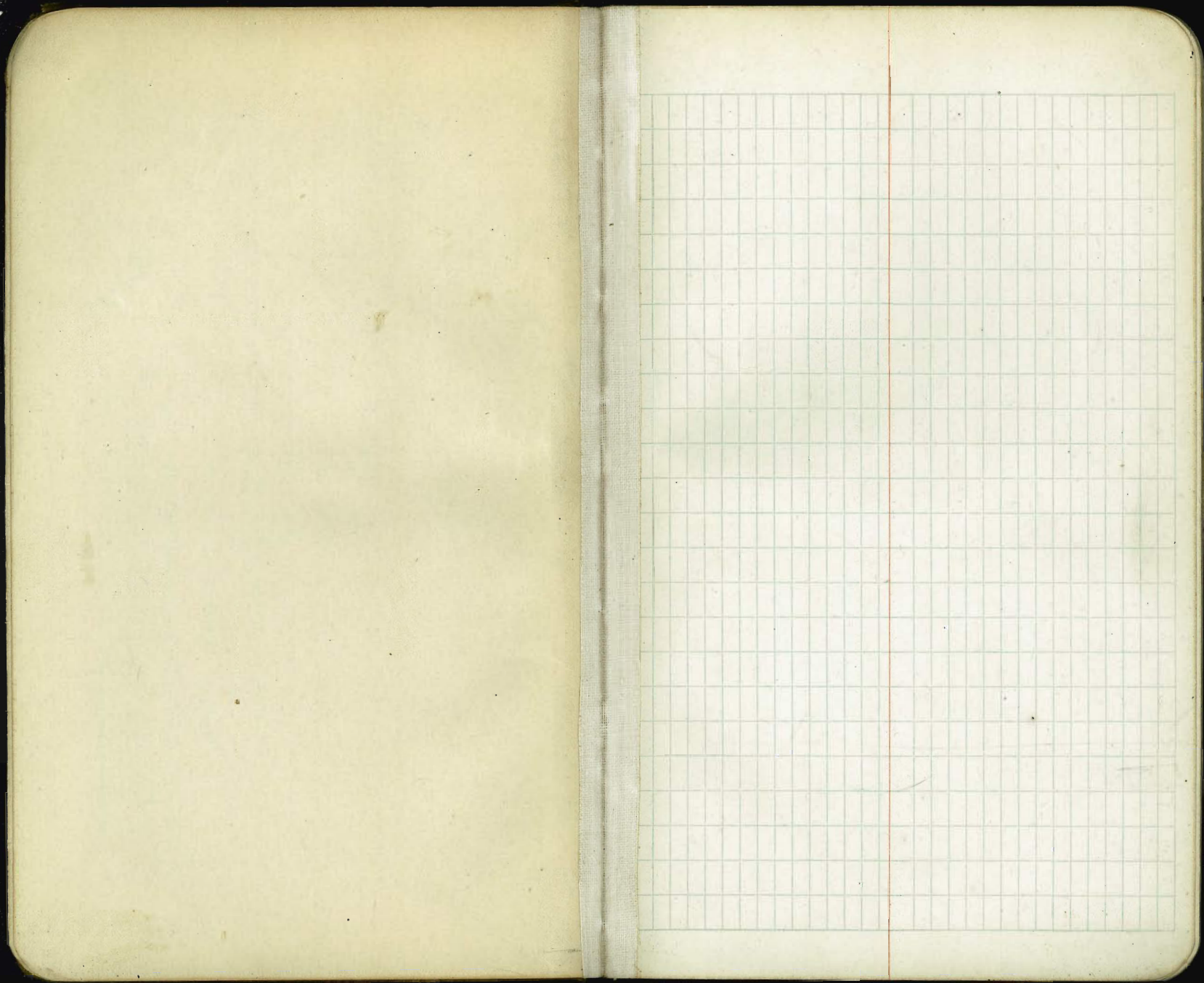
JUL 10 1919

July 21  
48 bat @ 1 75/108  
Spill

36x4x8

250901  
207  
207  
207  
207





JUL 10 1919

Night.

Excavation - Progress by hand crew & teams on excavation of spillway weir lip.

Sand Washing & hauling - No sand washed or hauled.

Quarry - Not operated acct. no requirement.

Masonry Placing

Proportions - Concreting portion of spillway lip. Using a 1-2 $\frac{1}{2}$ -3 $\frac{1}{2}$  mix - think this is too rich.

Duration - good

Wetness - O.K.

Laitence - O.K.

Placing - good

Mass rock - not possible

Bonding - good.

JUL 10 1919

Day

Excavation - Progress by drilling, blasting, steam shovel & teams & hand crew on spillway weir lip excavation.

Sand Washing & Hauling - Progress to meet masonry requirements.

Quality - good.

Quarry - Mill rock - plenty

Mass rock - no requirement.

Overburden - Some being wasted. Satisfactorily clean rock being sent to crushers.

Masonry Placing - In conc. roadway floor left abt. 1-2 $\frac{1}{2}$ -3 $\frac{1}{2}$  mix used.

Duration - good.

Wetness - "

Laitence - "

Mass rock - not possible to place any.

Groot washing - good progress  
Housekeeping - good



(Night)

JUL 11 1919

Excavation - Progress by teams & hand crew on spillway weir lip excavation.

Sand Washing & hauling - No sand washed or hauled.

Quarry - Not operated - No requirement for mill rock or mass rock.

Masonry Placing -

Proportions - good.

Wetness - good.

Duration - good.

Laitence - not objectionable.

Placing - O.K.

Mass rock - not possible to place any.

Banding - good.

Day

JUL 11 1919

Excavation - Progress drilling & shooting & excavating by hand crew & teams & steam shovel for spillway weir.

Sand Washing & Hauling - Progress to meet masonry requirements.

Quality - good.

Quarry - Mill rock good. Foreman instructed to correct man using fork improperly

Mass rock - No requirement for.

Overburden - Not bad. Satisfactorily clean rock being sent to crushers.

Masonry Placing - Proportions - Good Using 1-2 1/2-3 1/2 mix while placing dam roadway floor left abt.

Duration - good.

Wetness - "

Laitence - not objectionable.

Mass rock - not possible to place any.

GROUT Washing - good progress.

Banding - good

Placing - "

Housekeeping - good.



JUL 12 1919

Night. Excavation - Progress by hand crew & teams on excavation for spillway weir.

Sand Washing & Hauling - No sand washed or hauled.

Quarry - Not operated acct. no requirement.

Masonry Placing - Proportions - good.

Duration in mixer - good.

Wetness - Too wet - supt. inst. to use less water.

Laitence - Laitence water ordered baled out.

Bonding - good.

Placing - Good.

Mass rock - several derrick counter weights used as mass rock.

JUL 12 1919

Day - Excavation - Progress by hand crew, steam shovel & teams on excar. for spillway weir, also drilling & blasting for same.

Sand Washing & Hauling - Progress to meet masonry requirements. Quality - good.

Quarry - Mill rock - good

Mass " - no requirement.

Overburden - Not bad, Satisfactorily clean rock being sent to crushers. Foremen's attention called to fact of some men not using forks correctly.

Masonry Placing - No masonry being placed.

Housekeeping - good.



JUL 13 1919

JUL 13 1919



JUL 14 1919

JUL 14 1919



JUL 15 1919

JUL 15 1919



JUL 16 1919

JUL 16 1919



JUL 17 1919

Night.

Excavation - Progress on class 4 excavation right abutment. No work done on spillway.

Sand Washing - No sand washed or hauled.

Quarry - Not operated acct. no requirement.

Masonry Placing - Proportions

Batches, running slightly over on  $2\frac{1}{2}$ " rock until corrected.

Duration - good.

Bonding - "

Latence - Not obj.

Placing - good.

Wetness - "

Mass rock - not possible to place any.

JUL 17 1919

Day. Excavation - Progress on class 4 excav. right abutment. Progress by steam shovel & teams on excav. for spillway weir.

Sand Washing & Hauling - No sand washed or hauled.

Quarry - Mill rock - good

Mass rock - no requt.

Overburden - Not bad.

Satisfactorily clean rock being sent to crushers.

Masonry Placing -

Proportions - good.

Duration - "

Latence - Not obj.

Mass rock - Pooring spillway section lip. Not possible to place any.

Bonding - good

Placing. With carts - good.

Wetness - O.K.



JUL 18 1919

Excavation - Progress on class 4  
excavation - right abt.

Quarry - not operated

Masonry Placing -

Proportions - good.

Duration - good.

Laitence - not objectionable

Wetness - slightly too wet.

Supt. instructed to dry up  
mix. which he did.

Bonding - good.

JUL 18 1919

Excavation - Progress on spillway  
weir excavation by steam shovel  
& teams & hand crew.

Sand Washing & Hauling - Prog. No  
sand washed or hauled.

Quarry - Mill rock - good

Mass rock "

Overburden - Not bad.

Satisfactorily clean rock being  
sent to crushers.

Masonry Placing -

Proportions - good.

Duration - "

Wetness - Too wet. Supt. inst-  
ructed to use less water.

Laitence - Laitence water  
ordered bailed out.

Mass rock - good.

Bonding - good.

Placing - good

Grout Washing - Progress.



JUL 19 1919

Excavation - Progress by  
small crew backfilling class  
4 excar. left abt.

Quarry -

Mill rock - Mill not running  
& quarry operated only for mass  
rock.

Mass rock - Good.

Masonry Placing -

Proportions - good.

Duration - good

Wetness - Good.

Liftence - Liftence water  
ordered baled out

Mass rock - good.

Placing - good.

Bonding - good.

JUL 19 1919

Excavation - Progress by drilling  
& blasting & excavating by steam  
shovel & teams for spillway weir.

Quarry -

Mill rock - good.

Mass rock - No requirement

Overburden - Not bad satisfactorily  
clean rock being sent to crushers.

Masonry Placing - Placed masonry  
in low part of spillway section  
for 1/2 shift.

Proportions - good

Duration - "

Wetness - "

Liftence - not objectionable.

Mass rock not possible to place  
any.

Bonding - good

Sand Washing & Hauling - Progress to  
meet masonry requirements. Quality  
good.

Housekeeping - good.



JUL 20 1919

Excavation - Progress by small crew backfilling class 4 excar. left about mept.

Quarry - Not operated - No requirement for.

Sand Washing & Hauling - No sand hauled - 1 bin sand washed.

Masonry Placing

Proportions - good.

Duration - good.

Wetness - slightly too wet until corrected.

Laitence - Laitence water ord. bailed out.

Mass rock - Not possible to place any.

Bonding - good.

Placing - "

JUL 20 1919

Excavation - Progress by drilling & blasting for spillway weir excavation. Steam shovel & teams idle acct. shovel repairs.

Sand Washing & Hauling - Progress to meet masonry requirements Quality good.

Quarry - Mill rock - good

Mass rock - no request.

Overburden - Not bad. Satisfactorily clean rock being sent to crushers.

Masonry Placing - Batches running shy on  $1/2$ " &  $3/4$ " until corrected so sack batch used as conc. floor spillway channel.

Duration in Mixer - good.

Wetness - good.

Laitence - not objectionable.

Mass rock - none reqd.

Bonding - good.

Placing - good

Grout Washing - good



Cotes in Santa Bard.

JUL 21 1919

Excavation - Progress by small crew on backfill, left abutment.

Quarry - Operated for mill rock for 3 hrs.

Overburden - Satisfactorily clean rock being sent to crushers.

Masonry Placing - Proportions good.

Duration in Mixer - good.

Wetness - good.

Exposure - not objectionable.

Mass rock - no reqmt.

Placing - good.

Bonding - good.

JUL 21 1919

Excavation - Progress by hand crews steam shovel & teams on excav. for spillway weir & approaches.

Sand Washing & Hauling - Progress to meet masonry requirements. Quality - good.

Quarry - Mill rock - good

Mass " - no requirement

Overburden - Not bad & satisfactorily clean rock being sent to crushers.

Masonry Placing - Placing masonry in floor of spill channel.

Proportions - Using 1-2 1/2 - 5 mix. Running high shy on 2 1/2 rock until notified.

Duration - good.

Wetness - "

Exposure - OK.

Mass rock - not possible.

Grout Washing - good progress.

Housekeeping - OK.



JUL 22 1919

Night - Progress by hand crew  
in trimming & excavation for  
spillway weir & approaches.

Quarry - Not operated except  
by overtime crew of day  
shift in, barring down rock.

Masonry Placing.

Proportions - Good

Duration - "

Wetness - "

Latence - Not objectionable.

Mass R - Not possible.

Banding - good.

Placing - "

JUL 22 1919

Progress by hand crew, steam  
shovel & teams & by drilling & blasting  
for excavation of Spillway weir &  
approaches.

Sand Washing & Hauling - Progress  
to meet masonry requirements  
Quality - good.

Masonry Placing - Crew working  
only part of morning finishing, except  
where bin, stands, spillway channel floor.

Proportions - 1-2 1/2 - 5 good

Duration in mixer - good.

Wetness - good.

Latence - OK.

Grout Washing - Progress

Placing - OK

Quarry

Mill rock - Plenty

Mass R - No requirement.

Overburden - OK. Satisfactorily  
clean rock being sent to crushers.

Housekeeping - good.



(Night) JUL 23 1919

Excavation - Progress by hand crew in excavating & trimming for spillway weirs & approaches.

Quarry - Not operated except by overtime crew barring down rock from above.

Masonry Placing - No masonry placed acct. no place ready to receive masonry.

Excavation - JUL 23 1919

Progress by hand crew steam shovel & teams in excavating for spillway weirs & approaches.

Sand, Washing & Hauling - Progress to meet masonry requirements. Quality - good.

Quarry - Mill rock - good.

Mass rock - no requirement  
Overburden - Not bad. Satisfactorily clean rock being sent to crushers.

Masonry Placing - Proportions - Good  
1-2-3½ mix being placed on spillway piers & bridge.

Duration in mixer good.

Wetness - good.

Liftence - OK.

Placing - Good. Well tamped & Spaded.

Reinforcing steel - Position good.

Grout Washing - Good progress.

Housekeeping - good.



JUL 24 1919

Excavation - Progress by hand crew excavating & trimming for spillway weir lip & approaches. Sand Washing & Hauling - No sand washed or hauled acct. bin at concreting plant filled.

Quarry - Operated only to send to mill skips that had been loaded by day shift.

Masonry Placing

Proportions - Good - 1-3 $\frac{1}{4}$ -6 $\frac{1}{2}$

Duration in mixer - Good.

Wetness - Good.

Settling - Not objectionable.

Mass Rock - Not possible.

Bonding - good.

Placing - Good.

JUL 24 1910

Excavation - Progress by hand crew, steam shovels & teams in excavating for spillway weir lip & approaches.

Sand Washing & Hauling - Progress to meet masonry placing. Quality - good.

Quarry - Mill rock - good.

Mass Rock - No requirement.

Overburden - Not bad. Satisfactorily clean rock being sent to crushers.

Masonry Placing -

Proportions - 1-2-3 $\frac{1}{2}$  mix used for bridge floors - 1-2 $\frac{1}{2}$ -4 mix for spillway channel walls. 2 $\frac{1}{2}$ " rock bin is running over & a large amt. of rock we are using for 1 $\frac{1}{2}$ " to 2 $\frac{1}{2}$ "

Duration in Mixer - Good.

Wetness - Good.

Settling - Not objectionable.

Mass Rock - Not possible.

Grout Washing - Good Prog.

Reinforcing - Steel - Steel in several places placed much less than min. dist. from forms until corrected.

House Keeping - good.



JUL 25 1919

Night-Excavation-Progress by hand crew in excavating & trimming for spillway weir lip & approaches.

Quarry-Not operated acct. no requirement.

Masonry Placing-

Proportions-Using 1-2 1/2-5 mix for top of lip of spillway section of dam. Large amount of 2 1/2" rock in 1 1/2" bin acct.

2 1/2" bin running over all day.

Duration in mixer-good.

Wetness-good.

Layence-not objectionable.

Placing-good

Bonding-good.

JUL 25 1919

Excavation-Progress by hand crew, steam shovel & teams in excavating for spillway weir lip & approaches.

Sand Washing & Hauling-Progress to fill bin at concrete mixing plant. Quality-good.

Quarry-Mill rock-plenty

Mass Rock-No requirement.

Overburden-Satisfactorily clean rock being sent to crushers.

Crushing Plant-Shut down for 6 hrs. putting new set of concaves in # 8 crusher.

Masonry Placing-No masonry placed.

Groot Washing & finishing-Good progress.

Housekeeping-good.



JUL 26 1919

Night.

Progress by hand crew & teams in excavating for spillway weir & approaches.

Quarry - Not operated.

Masonry Placing - No masonry being placed. Crew working building forms for bridge over spillway section of dam.

JUL 26 1919

Excavation - Progress by hand crew, teams & steam shovel on excavation for spillway lip & approaches.

Sand Washing & Hauling - No sand washed or hauled acct. bin at concrete mixing plant full. Quarry - Not operated acct. crushing plant shut down all day.

Masonry Placing - Placing masonry in morning in walls of spillway channel.

Proportions - 1-2 $\frac{1}{2}$ -4 mix being used for walls of spillway channel. Quite a lot of 2 $\frac{1}{2}$ " rock in 1 $\frac{1}{2}$ " bin.

Duration - good.

Wetness - "

Lightness - not objectionable.

Placing - Dump carts - good.

Bonding - good.

Grout washing - Good progress.

Housekeeping - good.



JUL 27 1919

JUL 27 1919



JUL 20 1919

JUL 22 1919

Excavation - Progress by hand crew - steam shovel & teams in excavating & trimming for spillway weir lip.

Sand Washing & hauling - No sand washed or hauled acct. bin at concrete mixing plant.

Quarry - Not operated except by drilling & blasting.

Masonry Placing - No masonry placed.

Grout washing - good progress.  
House excepting - OK.



JUL 20 1919

Excavation - Progress by  
hand crew & teams in excar.  
& trimming for spillway weir  
lip.

Quarry - Not operated

Masonry - Placing - No  
masonry placed. Work only  
on forms for spillway bridge.

JUL 29 1919

Excavation - Progress in  
trimming & excavating for  
Ind. Spillway weir lip.

Sand Washing & Hauling - No sand  
washed or hauled acct. bin at  
concreting plant full.

Crushers - Operated 4 hrs.  
4 hrs. Screen repairs.

Quarry - Operated 4 hrs only.

Mill rock - good.

Mass rock - no requirement

Overburden - Being shoveled  
into skips & wasted.

Masonry Placing - No masonry  
being placed.

Grout Washing - good.

Housekeeping - "



JUL 30 1919

Excavation - Progress in trimming  
& excavating for spillway weir  
lip.

Progress placing steel in bridge  
& floors over spillway section  
of dam.

No other work done.

JUL 30 1919

Excavation - Progress by hand  
crew & teams in excavating &  
trimming for spillway weir lip.

Progress by steam shovel in  
leveling old spoil bank.

Sand Washing & Hauling - No sand  
washer or hauled acct, bin at  
concrete mixing plant full.

Quarry - Mill rock - good

Mass " - no requirement

Overburden - Being shoveled  
into skips & wasted. Satisfactorily  
clean rock being sent to crushers.

Masonry Placing - Proportions. Using a  
1-2 1/2-4 mix on spillway channel walls.  
Using 1-2 1/4-3/4 mix on roadway  
bridge floors.

Duration in mixer - good.

Wetness - good.

Agitence - Not objectionable

Placing - Good - By dump carts.

Bonding - good

Reinf. Steel - Some too close to forms  
until corrected.

Finishing - OK.

Housekeeping - Good.



JUL 31 1919

Work only in placing reinforcing steel for floor at inlet end of spillway weir lip.

JUL 31 1919

Excavating - Progress by hand crew & teams in excavating for spillway lip across channel. Prog to completion by steam shovel in leveling spoil bank of dam excavated material near tail tower. Steam shovel stored near left abt.

Sand Washing & Hauling - Progress to meet masonry requirements. Quality - good.

Quarry - Mill rock - good.

Mass Rock - No requirement.

Overburden - Some being shoveled into skips & wasted.

Masonry Placing - Proportions 1-2 $\frac{1}{4}$ -3 $\frac{1}{4}$  mix used on spillway sec. floor & piers. Prop. good.

Duration in mixer - good.

Wetness - good.

Lightness - Not objectionable.

Placing - Good - By dump carts.

Reinforc. Steel - Some placed too near forms & surface until corrected.

Housekeeping - good.



AUG 1-1919

No work except trimming  
along right lip wall Ind.  
Spillway where was not  
excavated deep enough.

AUG 1-1919

Excavation - Progress by hand crew  
& teams in excavating for Spillway  
lip across channel. Progress in  
drilling for parapet extension &  
highway approach right abt.

Sand Washing & Hauling - Progress  
to meet masonry requirements.  
Quality - good.

Quarry - Mill rock plenty

Mass Rock - no reqt.

Overburden - Not bad. Satisfactorily  
clean rock being sent to crushers

Masonry Placing - Proportions  
 $1-2\frac{1}{4}-4\frac{1}{4}$  for Spillway (Inlet end)  
floor.

Duration in mixer - Good.

Wetness - Slightly too wet.

Supt. notified.

Lattice - Not objectionable.

Banding - Good.

Reinforcing Steel Placing - good.

Grout Washing - good progress

Housekeeping - good.



AUG 2-1919

Night Crew-

No work except placing reinf.  
steel in independent spillway  
lip.

AUG 2-1919

Excavation - Progress in excavation  
for Ind. Spill. Lip. foundation & cut off  
trench across channel of Spillway.

Sand Washing & Hauling - Progress  
to meet masonry requirements.  
Quality good.

Quarry - Mill rock - plenty

Mass " - no requirement

Overburden - Not bad. Satis-  
factorily clean rock being sent  
to crushers.

Masonry Placing - Proportions - Good  
using a 1-2 $\frac{1}{4}$ -4 $\frac{1}{4}$  mix in placing  
spillway section floor.

Duration in mixer - Good.

Wetness - Slightly too wet -  
Supt. notified.

Latence - Not objectionable.

Placing - By Dumpcarts - Good.

Compressed Air Lines - Several  
air line leaks reported to Supt.

Grout Washing - Progress to meet  
stripping of forms.

Housekeeping - OK.



AUG 3-1919

Excavation - Progress on  
Excav. for foundation & cut  
off trench for lip across  
channel.

No other work except trying  
reinforcing steel Ind. Spillway  
Lip.

AUG 3-1919

Excav. - Progress on Excav. for  
parapet wall extension & roadway  
right abt. Progress on Excav.  
for Ind. Spillway Lip across  
channel and retaining wall  
on right side.

Sand Washing & Hauling - No sand  
washed or hauled bin at plant  
full.

Quarry - Mill rock - good.

Mass " - no requirement.

Overburden - not bad. Satisfy  
factorily clean rock being sent to  
crushers.



AUG 4 - 1919

AUG 4 - 1919



AUG 5 - 1919

AUG 5 - 1919



Aug. 9

Work only cleaning up in Ind.  
Spillway & tying & placing  
reinforcing steel.

Day. Aug-9

Sand Washing & Hauling - Progress to  
meet masonry requirements. Quality  
good.

Quarry -

Mill rock - plenty

Mass rock - no requirement

Overburden - Not bad, Satisfactorily  
clean rock being sent to crushers.

Masonry Placing -

Proportions - Good. 1-2<sup>3</sup>/<sub>4</sub>-5  
concrete being used in Spillway  
Lip. Proportions - good.

Duration in mixer - good.

Wetness - Too wet when being  
placed in portion of lip across  
channel. Supt instructed to use  
less water.

Latence - Objectionable.

Placing - Not tamped or worked  
enough in some sections.

Bonding - good.

Housekeeping -

Grout washing - Prog. to meet  
stripping of forms.



August 14, 1919

Day

Quarry-

Mill rock - Fair

Mass rock - No requirement

Overburden - Bad - Superintendent's attention called to dirty condition of rock being sent to crushers, Supt. rejected several slips of rock which had been loaded for crushers, & gave Quarry foreman instructions to send up cleaner rock.

Masonry Placing - Proportions good except large amount of  $3/4$ " rock in  $1 1/2$ " acct. hole in bin ~~with~~ partition. Supt. notified of this who corrected it.

Duration - good.

Wetness - good

Waitence - OK.

Grout Washing - good progress.

Placing - good.

Banding - good.

Sand Washing & Hauling - Progress to meet masonry reqts.

Housekeeping - good.



August 12

Day-

Sand Washing & Hauling - Progress to meet masonry requirements.

Quality - good.

Quarry - Mill rock - fair.

Mass rock - No requirement.

Overburden - Bad, being

shoveled into skips & wasted. Fairly clean rock being sent to crushers. Practically all rock sent to mill forced out of overburden & covered with a film of dust.

Proportions - good.

Duration in mixer - good.

Wetness - OK.

Consistence - Not objectionable.

Placing - good.

Bonding - Surface of old cong.

in retaining walls covered with dirt & masonry placed over same until inspector called Supt's attention to who corrected same.

Grout Washing - Good progress.

Housekeeping - "

August 13.

Day-

Sand Washing & Hauling - Progress to meet masonry requirements.

Quality - good.

Quarry - Mill rock - fair.

Mass Rock - Some being stockpiled for future use.

Overburden - Bad. Being shoveled into skips & wasted. Fairly clean rock being sent to crushers.

Masonry Placing - Proportions - good.

Duration - good.

Wetness - good.

Consistence - Not objectionable.

Placing - good.

Bonding - good.

Grout Washing - Progress to meet stripping of forms.

Housekeeping - good.



August 14  
(Day)

Sand Washing & Hauling - Progress  
to meet masonry requirements  
Quality - good.

Quarry - Mill rock - fair  
Mass " - some being  
stockpiled for future requirements.

Over burden - Bad - Being  
shoveled into skips & wasted.  
Fairly clean rock being sent  
to crushers.

Masonry Placing -

Proportions - good.

Duration in mixer - good.

Wetness - good.

Laitence - some collected  
at low end of forms, ordered  
bailed out.

Placing by dump carts &  
chutes - Good.

Grout Washing - Good  
progress - Behind on left divide  
wall.

Howe keeping - OK.



Gear Cast Steel

5" face

63 teeth

$2\frac{15}{16}$ " bore

5" through hub

3'-1 $\frac{1}{8}$ " Outside Diam

2'-10 $\frac{5}{8}$ " Inside "

Shafting 5'-6 $\frac{1}{2}$ " of  $2\frac{15}{16}$ " shaft

Gear Cast Steel

6" face 6 $\frac{1}{2}$ " through hub

$2\frac{15}{16}$ " bore - 15 teeth

13 $\frac{7}{16}$ " O.D. - 9 $\frac{15}{16}$ " I.D.

Shafting 5'-8" -  $2\frac{7}{16}$ "

Cast Steel Gear 11 $\frac{3}{8}$ " O.D.

9" I.D.

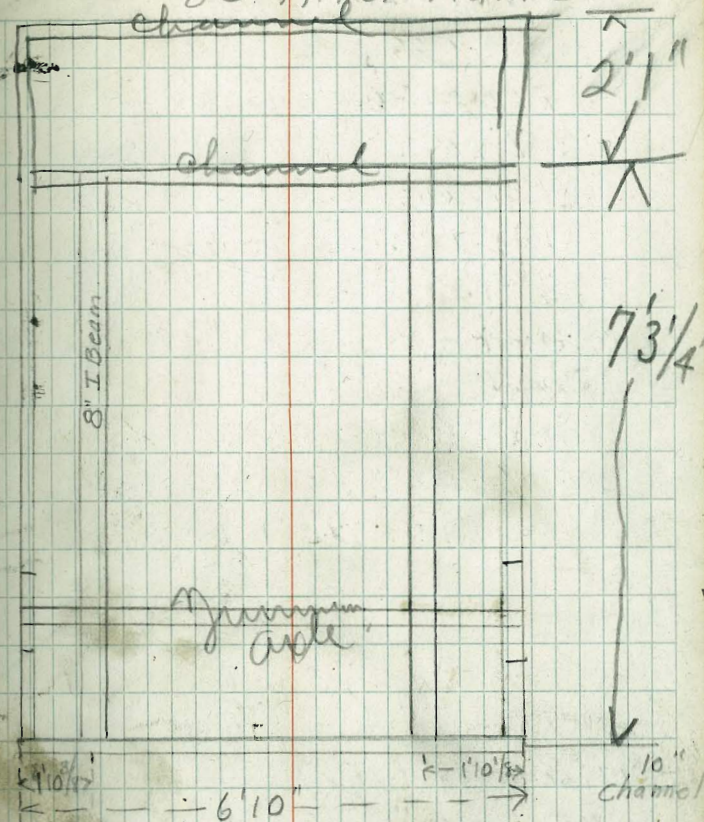
18 teeth

5" face

5" through hub

$5\frac{4}{16}$   
 $5\frac{7}{16}$   
 $2\frac{15}{16}$   
 $13\frac{7}{16}$

Sketch showing  
80' Mixer frame  
channel





Lower Cement House Lumber  
 To be transferred to 8/13/19

21-1x12x29.5' } less	620
16-1x12x17.0' } 3-1x12x8'	272
1-1x12x5.0' =	5
	<u>897-24-</u>
22-1x12x20'	873
22-1x12x16'	440
14-1x12x8'	352
6-1x12x8'	112
29-1x12x12	48
22-1x12x12	348
46-2x6x16	264
73-2x6x8	2336
19-2x6x8	584
52-2x6x24 (less 12-2x6x8)	152
56-2x6x24	1152
25-2x6x8	1344
24-1x12x12	200
	288
	<u>8493.00</u>

Transferred  
 O.K.

Outlet Tower Cement  
 House transferred for storehouse

11-2'x12"x14'	floor	308
13-1x12x16	} roof	208
5-2x4x12	}	40
2-2x4x14	}	18
16-2x4x8	Posts	86
3-1x2x6	Door	18
20-1/2x6-5Lx14	Siding	140
20-1/2x6"x12"	"	120
3-1/2x6"x12"	"	18
16-1/2x6"x10"	"	80
18-"x14"	"	126
4-4x4x14	Sills	75
12-2x6x12	"	144
		<u>1381</u>
	Less for resaw.	242
		<u>1039</u>

Transferred  
 O.K.



Lumber used in  
Piers & Steps WO#15

4- 4x8x8	waling pieces	85.0
6- 4x6x8'	studs	96.0
16- 2x6x8'	lagging	128.0
9- 2x6x2'		<u>18.0</u>
	Bull nose	327.0
2- 4x4x8'		21.0
8- 1x12x3		24.0
8- 1x12x3;		24.0
2- 1x12x3		6.0
2- 1x12x6		<u>12.0</u>

166 lin ft #9 wire

5# nails per pier

13 piers as above

4 extra bullnoses

1 pier without bullnoses

Stairs

4- 2x8x6

12- 2x6x4

32.0

48.0

80

Charge all.

17 bull noses 87' BM ea = 1479.50

14 piers @ 327 (charge 1/3) 4578

2240 lin ft = 78# #9 wire @

70# nails @

80

4658



# Lumber Used B802

## Lagging

43-2x6x80	3440
Wales	
2-2x6x80	160
Studs	
10-4x6x12	240
5-4x6x14	140
4-4x6x8	64
10-4x6x8	160
10-2x6x12	120
3-4x6x24	144
8-4x6x12	192
24-2x6x20	480
16-4x6x14	448
9-4x6x16	288
24-2x8x25	800
1-4x6x62	124
9-4x6x8	144
20-2x6x12	240
3-4x6x30	180
12-4x6x18	240
9-2x8x40	480
8-4x6x8	128

8212

*Transferred*

# Runways & chutes

11-2x6x20	220
3-2x6x16	48
1-2x6x6	6
7-2x6x16	112
6-2x6x49-Chute	294
14-2x6x63	882
12-2x8x6	96
15-2x6x118'	1770
16-2x6x16	256
10-2x8-6	80
13-2x6x16	208
12-2x6x16	192
<del>17-2</del>	
14-2x6x67	938

*Transferred*

*Chg 1200 B/M to B501*

5102  
1200  
3902



Lumber Used 502

Wales-

1-4x6x81		162
1-4x6x90		180
33-2x6x88	Lagging	2904
24-2x6x71		1704
4-2x4x90		240
10-2x6x6		60
11-2x6x4		44
11-2x6x3		55
4-4x6x70	Wales	560
25-4x6x20	Studs	1000
3-4x6x12		72
4-4x6x8		64
		<hr/>
		7045

*Transferred*



Cement Sacks on hand  
8/15/19.

Baled in Lower warehouse	5350 Sacks
Loose in " "	500 "
Cement in Sack " "	40 "
" " " Upper Wh	15800 "
	<hr/>
	21690



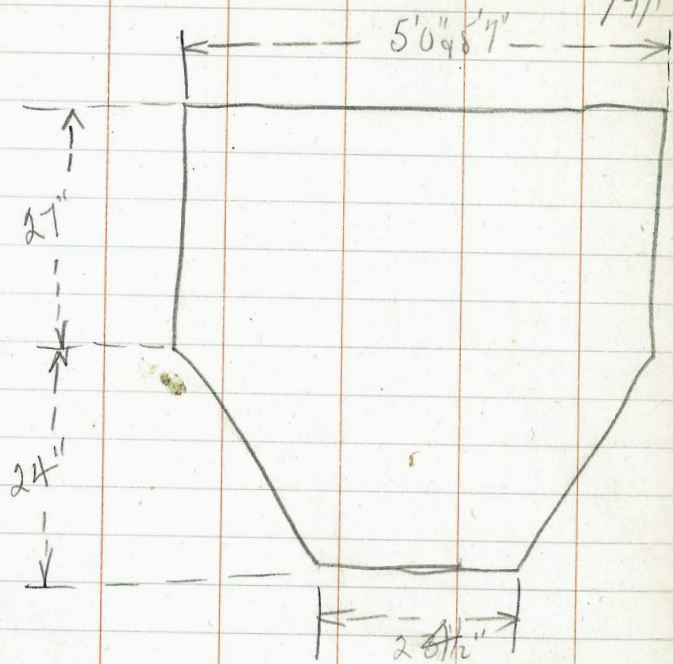
Lower Cement Wh. 8/4/19

(11 x 11 x 10.2) x .9 = 1110 Sax

30.5 x 12 x 10.2 x .9 = 3294 "



Haines Concrete Bucket  
8/9/19



$$3\frac{8}{16}$$

$$7\frac{15}{16}$$

$$5\frac{4}{16}$$

$$5\frac{4}{16}$$

$$2\frac{15}{16}$$

$$12^{23}$$

2" from top  
3" " "



Lumber to be transferred to 801B.

Spillway Walls.

Use of 86- 6"x8" Ties. ?  
4- 2x8x16, 850  
2- 8x8x28 sills —  
#1 4x6x16' —  
180 lin. ft. 2x8 Chute 213

Platform.

22- 2x8x16 469  
11- 2x8x72 1056  
60- 2x8x16 1280  
230 lin. ft. 8x8 sills ?  
170 " 4x6 posts 340  
220 " 2x6x8 braces 440

Forms.

Wales.

540 lin. ft. 4x6

Studs.

160 ~~4~~ lin. ft. 2x8 213  
560 lin. ft. 4x6 1020  
lagging  
40- 2x8x30 1600  
30- 2x8x30 1200  
12- 2x8x25 400

Manufactured

400 - 160  
90 - 120  
50 - 280  
520

Sunday 98 small mixed shellway  
Monday 52 " " "  
Tuesday 17 large mixed dam  
Wednesday (night) 60 large mixed  
Wednesday (day) 171 big mixed  
2800 mass rock



Photographs

~~7/25/19~~

Serial# Film#

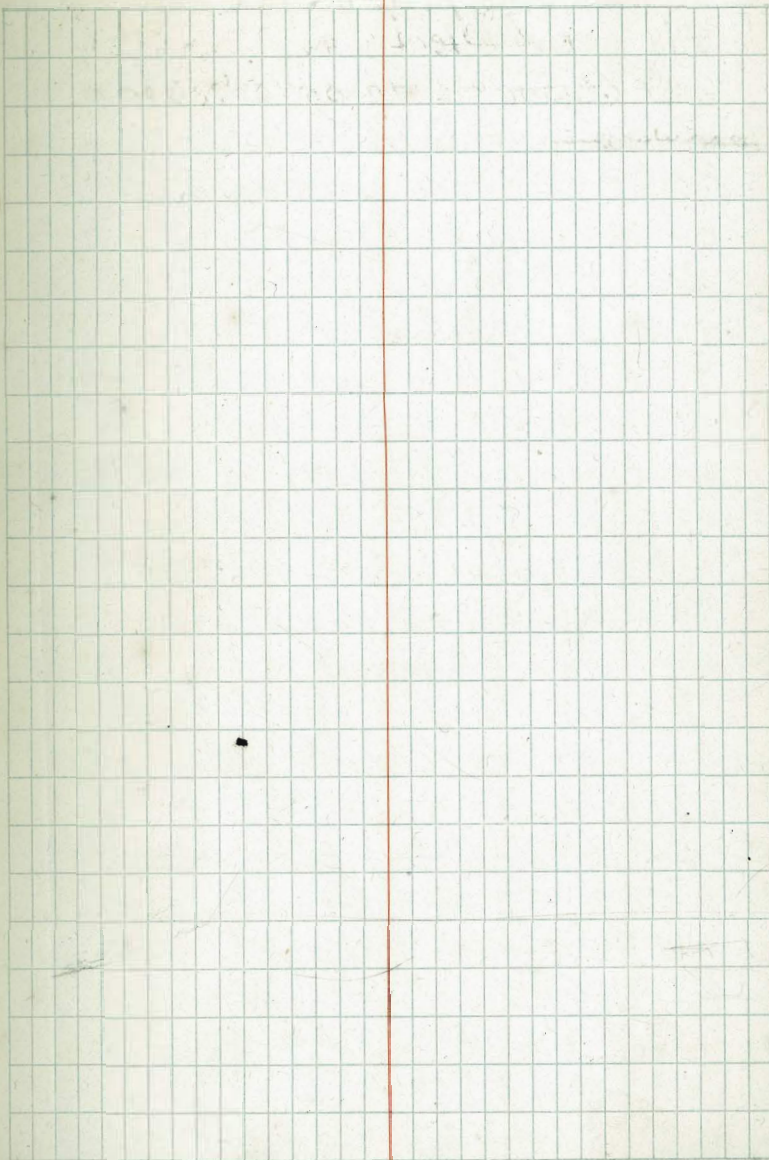
~~Lower Otay Dam.~~

1 ^

~~View from point of~~

~~rocks, looking down stream~~

~~showing~~





9/25 { stop 64.  
Time - Inst. slow  
Time of day - 1-3 PM  
Light - Brilliant.

# Photographs.

Film #1 Serial # 251

Lower Otay Dam - Looking  
downstream from right  
side of canyon. Spillway Overflow  
section completed, piers & bridge  
about 50% completed.

Film 2 Serial # 252

L.O.D. Looking across top  
of dam from cableway head  
tower. Dam completed to fixed lip of spillway

Film 3 Serial # 253

L.O.D. Looking upstream from  
left side of canyon.

Film 4 Serial # 254

L.O.D. - Looking upstream from  
right side of canyon. Dam comp.  
to fixed lip of spillway section.

Gu Res. Gauge <sup>137.5</sup> 145 - Elev. ~~492~~ 484.7

Res. Cap 50,000'. Gravity sec.  
comp. to top of parapet. Gauge  
149. FL. 496.2 Except short reach in  
extreme right end not shown.

Film 5 Serial # 255

L.O.D. Independent Spillway outlet  
looking upstream shows floor comp.

first lift of side walts, poured & forms  
& steel for second lift.

#6 Serial # 256

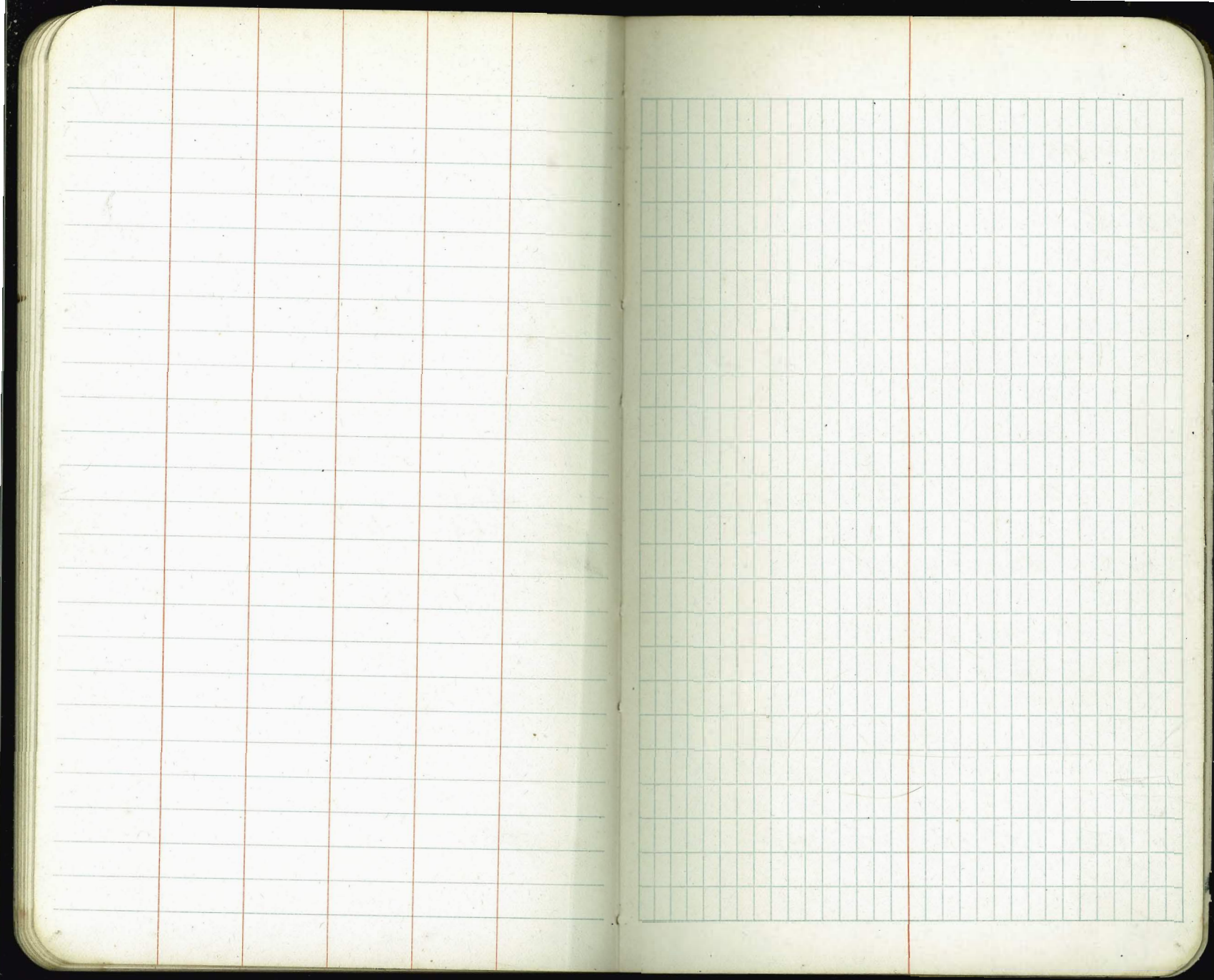
L.O.D. Ind. Spillway. Looking up  
stream from right bank, showing  
completed excar. for left wing  
spillway, lip. Steam. Shorel being  
mored out.

7/28/1919

#1 - Serial # 257

L.O.D. Duroc pigs raised  
at L.O.D. Const. Camp from  
Mess House Garbage.







unperfected

Braces

2- 4x4-8', 16' x 1 1/3 x 18	384
2- 6x6x 6', 36x18	648
2- 8x8x 16', 42 3/4 x 18	768

Bull Nose,

1- 4x6x 8', 16' x 19	304
32 lin ft, 1" x 12', 47' x 19	893
15 lin ft 1" x 12'	

Corbing

3- 2x8 length of bridge	1024
34- 2x12x9	Cross boards at piers <del>##</del> 1224

Platform for piling

Length of bridge 256' x 8' wide	
using 2x8 floor 256 x 1 1/3	
= 11- 2x8 x 256' long =	
14 2/3 x 256 =	3755'

Mr. Paddock says to charge 30% of first cost for the use of this lumber except that which is in ~~the~~ platforms for which to charge 10%.

Forms over Spillway 1/2 P.

17 Piers & 2 ends  
18 openings

Pier-Studs - 2x8-5'	} 32 x 34 = 1088
2x8-9'	
2x8-16'	} 10 x 34 = 340'
4x6-5'	
2x8-4'	} 5 1/3 x 34 = 181
4x6-8'	
6x8-5'	} 16 x 34 = 544
4x6-8'	
2x6-8'	} 20 x 34 = 680
4x6-8'	
2x6-8'	} 16 x 34 = 544
4x6-1'	
2x6-4'	} 8 x 34 = 272
4x6-1'	
2x6-4'	} 12 x 34 = 408
4x6-4'	
2x6-4'	} 4 x 34 = 136
4x6-4'	

One side only

Pier Lagging -

one 55' - 2x8 = 55 x 1 1/3 x 34	2492
Side only 176' - 2x8 = 176 x 1 1/3 x 34	7979

One Side Only - Waling Piece 4x6 x 16 = 1088

Floor Stringers -

8- 4x6-18' x 18	4032
-----------------	------

Cross Stringers -

2- 4x6 x 16'	1152
--------------	------

Floor Lagging

18- 2x8 x 18' = 18 x 24 x 18	7776
------------------------------	------

Supporting Posts

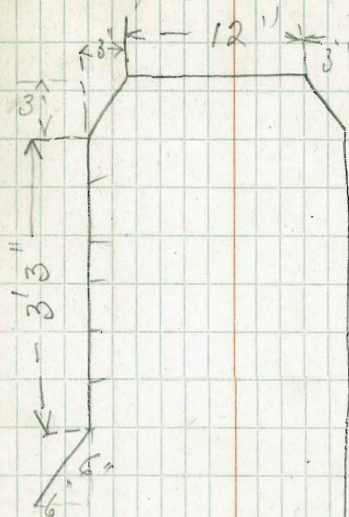
4- 6x8 x 6	1728
------------	------



Studs	220-2x8x4	1173'
	220-4x6x4	1760
Wales		
	4x6x1744	3488
Lagging		
	14-2x8x436	8134
Resaw	2x4x436	290
Braces Platform		
	55-2x8x8	587
Platform		
Lagging		
	12-2x8x160'	2560
	12-2x8x190	3040
Joists		
	120-4x4x8	1280'

## Parapet Wall

7/28/19



right abt. 240'  
left abt. 196' to  
end of dam.  
37' around curve.

Studs 2x8 inside  
" 4x6 outside  
5' long spaced 2'  
apart.

Waling Pieces 2  
inside 4x6 - 2 outside 4x6 continuous  
for length of wall.

Brackets every 16' - 3' of 2"x8"  
Platform right abt 160' long 8' wide  
floor 2"x8" 4"x4" joists 3' center 8'  
long.

Platform left abt 190' long same.  
37' of right abt on curve beyond  
end of dam about half lumber regular  
section.

— 10 ft right abt yet to  
build.



N. O. #14

~~2-2x8x16~~ - 17 <sup>PIERS</sup> S/S

2-Carpenters 8hrs each pier.



# Concrete Proportions

## Large mixer

Cement	7	c.f.
Sand	19	" "
2 1/2" rock	21.6	" "
1 1/2" "	15.4	" "
3/4" "	8.4	" "
Dust	4.0	" "

## Small Mixer.

Cement	4	c.f.
Sand	10.9	" "
2 1/2"	12.35	" "
1 1/2"	8.80	" "
3/4"	4.80	" "
Dust	2.3	" "

15-11 22

$$\begin{array}{r}
 21.6 - 2\frac{1}{2} \\
 15.4 - 1\frac{1}{2} \times 27 \\
 \hline
 8.4 \times \frac{3}{4} \times 13 \\
 \hline
 45.4
 \end{array}$$

$$\begin{array}{r}
 27 \\
 1.6 \\
 \hline
 16.2 \\
 27 \\
 \hline
 2
 \end{array}$$

185

$$\begin{array}{r}
 1.85 \\
 27 \\
 \hline
 129.5 \\
 370 \\
 \hline
 499.5
 \end{array}$$



Haines Conc. Bucket 7854

2841  
7854

31416  
62832

533  
5.33

15718

1599  
2663  
284089

22323214 area top circle

22.32<sup>01</sup>  
3.14<sup>01</sup>  
2546

22.32<sup>01</sup>  
2.25

558  
4/22.32  
20  
23  
20  
32

11160  
4464  
4464  
50.2200  
2546

7854 12.73  
4     2  
25.46

75.68 if full  
5.58

70.18 - 3" from top.



Temporary Safety  
 Railing  
 Lumber used

911 - 2x4 5x5	46 <sup>50</sup> cut
56' - 2x4 5-45	6 <sup>00</sup> Haul
136' - " " "	37' BM
136 - 2x4 " "	90' " "
140' - 2x4 " "	90' BM
128' - 2x4 " "	92' BM
288' - 2x4	86' BM
	192
	587

OK

# KEITH'S RAILROAD CURVE TABLES.

Published by KEUFFEL & ESSER CO., New York.

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100

## HOW TO USE KEITH'S TABLES.

### EXAMPLE.

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

18  
 12  
 108  
 18  
 288

Ext. in Tab. IV opposite 23° 20' = 120.87  
 $120.87 \div 12 = 10.07$ . Say a 10° Curve.

Tan. in Tab. IV opp. 23° 20' = 1183.1  
 $1183.1 \div 10 = 118.31$ .

Tab. V correction for A. 23° 20' for a 10° Cur. = 0.16  
 $118.31 + 0.16 = 118.47 =$  corrected Tangent.

(If corrected Ext. is required find in same way)  
 Ang. 23° 20' =  $23.33^\circ \div 10 = 2.3333 =$  L. C.

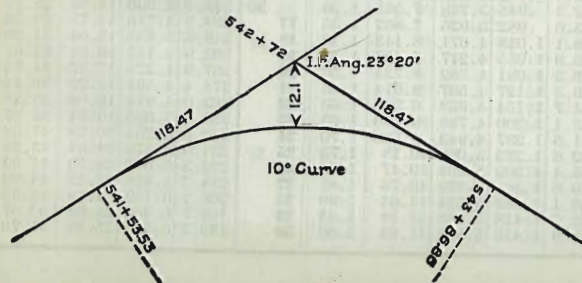
2° 19½' = def. for sta.	542	I. P. = sta.	542+72
4° 49½' = " " "	+50	Tan. =	1.18.47
7° 19½' = " " "	543	B. C. = sta.	541+53.53
9° 49½' = " " "	+50	L. C. =	2.33.33
11° 40' = " " "	543+	E. C. = Sta.	543+86.86
	86.86		

$100 - 53.53 = 46.47 \times 3'$  (def. for 1 ft. of 10° Cur.) = 139.41' =  
 2° 19½' = def. for sta. 542.

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

Def. for 36.86 ft. = 1° 50½' for a 10° Curve.

(These tables are published in Field Books of  
 KEUFFEL & ESSER CO., New York, N. Y.)





(42)

Natural Tangents.

Deg.	0'	10'	20'	30'	40'	50'	Deg.	Deg.	0'	10'	20'	30'	40'	50'	Deg.
0	0000	0029	0058	0087	0116	0145	89	40	8391	8441	8491	8541	8591	8642	49
1	0175	0204	0233	0262	0291	0320	88	41	8693	8744	8796	8847	8899	8952	48
2	0349	0378	0407	0437	0466	0495	87	42	9004	9057	9110	9163	9217	9271	47
3	0524	0553	0582	0612	0641	0670	86	43	9325	9380	9435	9490	9545	9601	46
4	0699	0729	0758	0787	0816	0846	85	44	9657	9713	9770	9827	9884	9942	45
5	0875	0904	0934	0963	0992	1022	84	45	1.0000	1.0058	1.0117	1.0176	1.0235	1.0295	44
6	1051	1080	1110	1139	1169	1198	83	46	1.0355	1.0416	1.0477	1.0533	1.0599	1.0661	43
7	1228	1257	1287	1317	1346	1376	82	47	1.0724	1.0786	1.0850	1.0913	1.0977	1.1041	42
8	1405	1435	1465	1495	1524	1554	81	48	1.1106	1.1171	1.1237	1.1303	1.1369	1.1436	41
9	1584	1614	1644	1673	1703	1733	80	49	1.1504	1.1571	1.1640	1.1708	1.1778	1.1847	40
10	1763	1793	1823	1853	1883	1914	79	50	1.1918	1.1988	1.2059	1.2131	1.2203	1.2276	39
11	1944	1974	2004	2035	2065	2095	78	51	1.2349	1.2423	1.2497	1.2572	1.2647	1.2723	38
12	2126	2156	2186	2217	2247	2278	77	52	1.2799	1.2876	1.2954	1.3032	1.3111	1.3190	37
13	2309	2339	2370	2401	2432	2462	76	53	1.3270	1.3351	1.3435	1.3514	1.3597	1.3680	36
14	2493	2524	2555	2586	2617	2648	75	54	1.3764	1.3848	1.3934	1.4019	1.4106	1.4193	35
15	2679	2711	2742	2773	2805	2836	74	55	1.4281	1.4370	1.4460	1.4550	1.4641	1.4733	34
16	2867	2899	2931	2962	2994	3026	73	56	1.4826	1.4919	1.5013	1.5108	1.5204	1.5301	33
17	3057	3089	3121	3153	3185	3217	72	57	1.5399	1.5497	1.5597	1.5697	1.5798	1.5900	32
18	3249	3281	3314	3346	3378	3411	71	58	1.6003	1.6107	1.6212	1.6319	1.6426	1.6534	31
19	3443	3476	3508	3541	3574	3607	70	59	1.6643	1.6753	1.6864	1.6977	1.7090	1.7205	30
20	3640	3673	3706	3739	3772	3805	69	60	1.7321	1.7437	1.7556	1.7675	1.7797	1.7917	29
21	3839	3872	3906	3939	3973	4006	68	61	1.8040	1.8165	1.8291	1.8418	1.8546	1.8676	28
22	4040	4074	4108	4142	4176	4210	67	62	1.8807	1.8940	1.9074	1.9210	1.9347	1.9486	27
23	4245	4279	4314	4348	4383	4417	66	63	1.9626	1.9768	1.9912	2.0057	2.0204	2.0353	26
24	4452	4487	4522	4557	4592	4628	65	64	2.0503	2.0655	2.0809	2.0965	2.1123	2.1283	25
25	4663	4699	4734	4770	4806	4841	64	65	2.1445	2.1609	2.1775	2.1943	2.2113	2.2286	24
26	4877	4913	4950	4986	5022	5059	63	66	2.2400	2.2637	2.2817	2.2998	2.3183	2.3369	23
27	5095	5132	5169	5206	5243	5280	62	67	2.3559	2.3750	2.3945	2.4142	2.4342	2.4545	22
28	5317	5354	5392	5430	5467	5505	61	68	2.4751	2.4960	2.5172	2.5386	2.5605	2.5826	21
29	5543	5581	5619	5658	5696	5735	60	69	2.6051	2.6279	2.6511	2.6746	2.6985	2.7228	20
30	5774	5812	5851	5890	5930	5969	59	70	2.7475	2.7725	2.7980	2.8239	2.8502	2.8770	19
31	6009	6048	6088	6128	6168	6208	58	71	2.9042	2.9319	2.9600	2.9887	3.0178	3.0475	18
32	6249	6289	6330	6371	6412	6453	57	72	3.0777	3.1084	3.1397	3.1716	3.2041	3.2371	17
33	6494	6536	6577	6619	6661	6703	56	73	3.2709	3.3052	3.3402	3.3759	3.4124	3.4495	16
34	6745	6787	6830	6873	6916	6959	55	74	3.4874	3.5261	3.5656	3.6059	3.6470	3.6891	15
35	7002	7046	7089	7133	7177	7221	54	75	3.7321	3.7760	3.8208	3.8657	3.9136	3.9617	14
36	7265	7310	7355	7400	7445	7490	53	76	4.0108	4.0611	4.1126	4.1653	4.2193	4.2747	13
37	7536	7581	7627	7673	7720	7766	52	77	4.3315	4.3897	4.4494	4.5107	4.5736	4.6382	12
38	7813	7860	7907	7954	8002	8050	51	78	4.7046	4.7729	4.8430	4.9152	4.9894	5.0658	11
39	8098	8146	8195	8243	8292	8342	50	79	5.1446	5.2257	5.3093	5.3955	5.4845	5.5764	10
Deg.	60'	50'	40'	30'	20'	10'	Deg.	Deg.	60'	50'	40'	30'	20'	10'	Deg.

Deg.	0'	10'	20'	30'	40'	50'	Deg.
80	5.6713	5.7694	5.8708	5.9758	6.0844	6.1970	9
81	6.3138	6.4348	6.5606	6.6912	6.8269	6.9682	8
82	7.1154	7.2687	7.4287	7.5958	7.7704	7.9530	7
83	8.1443	8.3450	8.5555	8.7769	9.0098	9.2553	6
84	9.5144	9.7882	10.078	10.385	10.711	11.059	5
85	11.430	11.826	12.250	12.706	13.197	13.727	4
86	14.300	14.924	15.605	16.350	17.169	18.075	3
87	19.081	20.206	21.470	22.903	24.542	26.432	2
88	28.636	31.242	34.368	38.189	42.904	49.104	1
89	57.290	68.750	85.940	114.588	171.885	343.77	0
Deg.	60'	50'	40'	30'	20'	10'	Deg.

Natural Cotangents.

8/360  
32

July 26  
38 batches  
cone in pullway  
walls small mix.  
6 Sax

21  
W.O#  
42  
4  
210  
168

Aug 6, 19  
120 bat small mix 4  
Aug 7  
58 bat 4 Sax







