W
439

LEITZ

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.

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

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 30.6. 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)÷2 or 2 ft. added to 30.6 =32.6. For slopes of 1 on 1½ see inside of back cover.

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L. H. Hill General Insp Records 1-60
Force Account Record drilling &
Shooting Rock above Spillway 63-79

L. H. Hill

April 7, 1933

Borrow Pit A - Shovel #6 N. end #9 S. at time
1 cat foreman McMillan, 1 electric, 1 cat co. part time
2 dumpmen, 2 checkers.
Rockemb. dnstr. 1 fore.; 3 cat. bulldozers,
1 driller, 1 dumpman, 9 laborers. 1 cat co. sweeper
Quarry - rock trucks #6, 20, 11, 10, 3, 8, 9, 4, 5, 13 #32 misc
7 jtbms & drillers, 1 powderman & helpers, 1 lab. misc
2 shovels, 1 AC. bulldozer, Reg. shop force,

Loading 4/6/33

	Day	night
Shovel #1 -	93 loads	#1 - 90 loads
"	2 - 104 "	2 - 104
	197	194

Photo #3 Showing thickness of clay in borrow pit A Co-ords N 2200 E 10,100 2:20 P.M.
Photo #4 Showing thickness of clay in pit A at co-ords N 2250 E 11050 3 P.M.

Quarryloading 4/7/33

	night
Shovel #1 - 94 loads	88
" 2 - 66 "	0 repairs
160	88

1

April 8

Quarry - 2 shovels, ck'tls 1, 4, 8, 11, 13, 20, 3, 5, 10, 2
1 truck misc, 8 jtbms, 1 AC. bulldozer
1 powderman, 2 helpers, 1 lab. misc, Reg.
shop force & fore. 1 mechanic,
Rockemb. 1 fore., 3 cat. bulldozers (1 upstr.)
1 driller, 1 dumpman, 12 laborers.
Roads Gallion road grader & water truck.
Hyd. fill material 2 shovels #6 & #9
pit A 1 cat rtle. 1 electric bulldozer
Shop regular shop force

Quarryloading

	Day	night
Shovel #1 -	84	114
2 -	114	116
	198	230

April 9

Quarry - No rock hauling, regular crew on drilling & shop.

Rock emb. 1 fore, 1 driller, 1 cat. bulldozer & operator, 9 laborers.

Roads Cat. 30 & road blade, cat. 60 & McMillan, water truck.

Shovel "7 new road to 690 lift up stream, cat 60 bulldozer, 1 truck.

Hydraulic fill material no hauling shovel crews on maintenance.

Cat. 60 & McMillan leveling off at borrow pit.

April 10

Puddle core beach sample co-ord N.3600 E.5100

Elev. of sample 616

Photo #5 Dam from road to E. spillway about 800' E. of axis 2:15 P.M.

Photo #6 Hydr. fill material trucks at hdqts. near borrow pit "A" after shutdown 2:40 P.M.

Photo #1 Borrow pit "A" after shut down, E. from near junc. of gravel plant & borrow pit roads 2:45 P.M.

Photo #2 Dnstr. emb. from S. abut near core wall 3 P.M.

Photo #3 Upstr. emb. from S. abut. near core wall 3:10 P.M.

Photo #4 Crest of spill. axear 3:20 P.M.

Photo #5 Dnstr. emb. from tunnel spoil bank. 3:45 P.M.

Photo #6 trucks in shop yard 3:55 P.M.

April 10 (cont.)

Quarry shovel #1, 6 rock trucks 1 truck mixer, 1 A.C. bulldozer, 8 jackhammers & drillers, 1 powder-man, 3 powder helpers, 1 lab. mixer.

Rock emb. 1 foreman, 1 dump man 2 cat 60 bulldozers, 1 driller, 10 laborers.

Hydraulic fill same crew except shovel #9 moved to dam.

Roads - road grader & water truck

All work stopped at noon.

April 11

Photo #1 Quarry, w. from E. end 9:40 A.M.

Photo #2 Trucks at quarry 9:45 AM

Photo #3 Shop at quarry 9:50 AM.

Photo #4 Dam from site #1 10:45 AM.

Borrow pit 2 shovel runners repairing 6 men working around shop. 1 Ford truck driver & 1 laborer on pickup.

April 12

Borrow pit 1 shovel runner on repairs to #6.

4 men working in shop.

1 carp. force building gate at road near contractors office.

April 13

No work by cont's forces

City force laid off

Photo #5 Gate erected near cont's office 10 A.M.

Photo #6 Dam from east appro. to spillway. 10:30 A.M.

April 21

Borrow pit A: 2 shovel runners on repair

Dyke 1 shovel, 2 runners, 1 truck, 1 cat. 60 & McMillan, 1 fore. constr. spillway.

Quarry 1 shovel electrician.

Roads 1 cat. 30, 1 road grader.

Photo #1 Contrs. temp. dam and spillway - note reservoir nearly full. 1:30 P.M.

April 22

Quarry 1 shovel electrician, 1 welder & portable welding outfit.

Dyke 1 shovel, 2 trucks, 1 cat. 60 bull dozer - raising lower lift.

Roads cat. 30 & road blade

Shovel #8 began excav. for road at W. side of spillway around dam at about 700' elev. Commenced at 2:30 PM.

April 23

Stripping southabut. Shovel #7 + crew, 2 trucks, 1 port. compressor, 2 jackhammer drillers, 1 powderman, 1 helper

Stripping northabut. dragline #10 + crew, 1 truck. Material placed in up-str. emb. no work in P.M.

Roads. Shovels #8 + 9 on road across dam at about elev. 700. 1 truck, 1 compr. 1 drillers, 1 loader

Roads maintenance. cat. 30 + blade.

N.B. 1 compr. 2 drillers on road W. side of spillway in P.M.

Dragline #10 removed pump unit #1 from barge in puddle core preparatory to placing same in pond upstream

1 cat. 60 bulldozer at east road.

Shovel #6, 3 trucks, 1 cat. 60 + Me. raising road above damsite #1.

April 24

Photo #2 Monitor stripping S. abut. S. of core wall 2:15 P.M.

Photo #3 Same as #2, closer view - 2:20 P.M.

Quarry 1 shovel, electrician, 1 helper, 1 blacksmith, 1 helper.

Gravel plant 1 mechanic on LeRoi motor in P.M.

Borrow pit no work

April 25

Quarry 1 shovel electrician, 1 blacksmith & helper

Borrow pit - no work

Roads - no work in A.M.

Camp 1 gateman

J. L. Connolly, 4 drillers, 1 nipper 1 blacksmith & helper, candy wagon, compr. & operator 1/2 day.

N. B. blksmith, helper & candy wagon = 1/4 (3 jk.hmrs on Co. work)

1 sullivan compr. class WK 314

Hokanson	330
Thompson	331
Aho	335
Pietila	336
Hendrickson	319

Candy wagon 1½ hrs.

April 26

Hendricks	208
Nelson	325
Franklin	316
"	192
Gibbs	474
Larson	202

Nonotee blacksmith

Sather "

1 ~~compr.~~ Brown compr.

F. Hiller	239	candy wagon

April 26 (cont.)

Photo #4 Boulders above northeast spillway from S. side of cut 9:30 AM.

Photo #5 ~~Sta~~ Drilling boulders above spillway. 10 AM.

Photo #6 Drilling boulders - looking northeasterly from spillway cut, 12:45 P.M.

For April 27 - May 4 see force acct. work in back of book.

May 2

Photo #1 upstream, thickness of earth covering coords E5210 N3660 1:20 PM

Photo #2 same as #1 coords E5190 N3580 1:25 PM

" 3 " " 1 " E5200 N3390 1:30 PM

" 4 " " 1 " E5190 N3360 1:30 PM

" 5 " " 1 " E5180 N3300

" 6 look, S. from upstream midpt. after shoveling 1:40 P.M.

May 3

Photo #1 from coords N3500 E4860

" 2 " " N3810 E4840

" 3 " " N3600 E4870

" 6 " road " N3880 E4850

" 1 role upstr 2 rkemb. from N3760 E5185

" 2 " " " N3685 E5185

" 3 " " " N3540 E5190

" 4 " " " N3460 E5190

" 5 Upstr. beach from road of north abut. looking south

May 4

Borrow pit - shovel 1 c.y., cat, co bull d. 4 trucks, 1 foreman, 1 dumpman

May 5

Well #3 - Soe. #1-6" L. 21'9"

" #2 - 20'0"

" 3 19'8"

" 4 10' 1"

71' 6"

1 driller, 1 helper on well rig.
1 Ford truck part time.
Water placed in pipe Thurs.
ere. settled 8 feet. Hole dry for
most of way. Water used in drilling.
Borrow pit road shovel 1 c, cat co bull.
6 trucks, 1 tore. widening near
dam site #1.

May 6

Driller & helper on perforating equipment - no drilling.
Roads cat. co & McMillan
leveling off road near dam
site #1.
Quarry - blacksmith & helper
& compr. man (Forester).

May 7

No work

May 8

Well drilling Perforating pipe in hole #3

Hydraulic hill 1 tore. 1 monitor man, 1 helper. Operated units 2 & 5 part time. Part time on sluicing upstr. emb. with unit in hole above dam

Gravel plant 1 mechanic & helper on motor overhaul.

May 9

Well drilling - Regular crew. Rig moved to hole #5 on upstr. beach and began sinking 8" caisson at 10:15 A.M. Caisson sunk much more easily than it did in hole #3

Length of 6" sections - #2 20'0"
#1 18'10"
3 17'8"
4 10'2"
66'8

Photo #1 Well drilling, hole #5, 2P.

May 10

Photo #2 not exposed

Photo #3 & 4 Hydraulic Eng. U.N.S. Consultant Louis Hill, F.D. Pyle, Steves & J.L. Connolly Dist. Engr. Rockemb.

Well drilling - completed driving hole #5. 66' of 6" pipe placed. Pipe extends 2' above surface

May 11

Quarry 10 drillers & nippers, 1 powderman, 1 mechanic, 2 blacksmiths, 2 helpers, 1 compr. man, 1 foreman, 1 truck & driver

Well drilling - Rig moved to hole #4 in A.M. 35' of 8" caisson and 45' of 6" ~~pipe~~ well driven

Length of sections hole #4. #1 - 20' 7"
2 - 20' 1"
3 - 19' 2"
4 - 19' 0"
78' 10"

May 12

Photo #5 Shovel removing questioned rock on dnstr. emb. Looking S. from road on N. about 10:30 A.M.

Photo #6 Same as #5, 10:35 A.M.

Quarry 1 fore, 1 runner, 1 powderman, 2 helpers, 6 jack hammermen 2, nippers, 1 waterliner driller + nipper, 1 shovel electr., 2 smithys 2 helpers, 1 truck.

Well drilling 23'10" of pipe driven today to complete well #4. Perforating work completed at 5 P.M.

May 13

Well drilling Rig moved to well #6 on dnstr. emb. and commenced drilling.

Quarry same force as yest.

Roads cat. 30 + blade.

Photo #1 600' elev. uncovered by shovel at ordinate N. 38+02

Well #3 Elev. water in casing -17.0

" 4 " " " " -21'8

" 5 " " " " -15'1

Well #6 - 61'6" pipe.

May 15

Depth of water in Well #3 - 16'10"

" " " " " #4 - 19'6"

" " " " " #5 - 23'9"

Photo #2 + 3 600 lift dn str.

S. from N. about 12:40 P.M.

Roads shovel #9 & crew, 1 powder-

man, 2 drillers, 1 nipper, 1 portable

compr. 1 cat 60, part time on road

to 22 dam elev.

Cat & grader, watertruck on

mount.

Quarry same crew as yesterday

but 5 rocktrucks on hauling

Well drilling perforated pipe

in well #6 & drove 5-5 feet in well #2

Pool elev. 611.0

May 16

Gravel plant 1 foreman, 2 lab's

1 carpenter.

Roads cat. 30, road blade, watertruck

Well #2 19'3", 19'2", 18'10", 17'0"

total length of pipe 74'3" Depth

Water elev. from top of pipe well #4-17'10",

#5-23'9", #3-17'9", #6-25'7"

Quarry 6 rocktrucks, 1 A.C. bulldoz.

1 shovel, no W.L. other force as

reported previously.

New road shovel #9, 3 trucks, 1 compr.,

1 powderman, 2 drillers, 1 nipper,

1 cletrac bulldozer, 1 fore.

Well casing elevs.

#3	top of pipe	617.39	ground	615.9
4	"	617.39	"	615.8
#5	"	618.69	"	617.5
6	"	620.77	"	620.4

Pool elev. 615.9

May 17

Well #7 pipe 19'6", 19'-2", 18'11"
total 57'2".
Depth to water from top of pipe
#3 - 18'8", #6 - 25'5", #5 - 24'0", 4 - 18'5"
Gravel plant 1 fore, 1 mechanic, 2 labs.
Borrow pit road shovels #7 & 11,
2 drillers, 1 nipper, 1 compr.
Quarry road shovels 8 & 9, 2 compr's
4 drillers, 2 nippers, 3 tracks
Cletrac bulldozer, 1 fore, 1 powderman
Quarry same drill force. no
hauling.
Well casing elev's
#2 top pipe 627.78, ground 621.0
" 7 " " 624.43 " 621.9
Pool elev. 615.7

May 18

Well	Elev top pipe	Water	Bot. of pipe	Ground
2	627.78	41.7	73.1	621.0
3	617.39	19.4	69.1	615.9
4	617.39	18.4	77.4	615.8
5	618.69	24.3	64.3	617.4
6	620.77	25.2	60.4	620.4
7	624.43		56.5	621.9

Borrow pit road 2 shovels, 2 compr.
3 jackhammers, 1 cat. 30, 1 pitman helper
2 nippers.
Quarry road 2 shovels, 3 tracks, 2
compr's 4 drillers, 2 nippers, 1 fore, 1 powder-
man, 1 bulldozer opp., 2 labs. extr.
Pool elev. 615.5

May 19

Upstr. rock emb. 1 fore, 2 cats, 12 laborers pump cts.

Roads-borrow pit 2 shovels, 1 truck, 2 compr 4 jthmrs, cat & Mc, 2 nippers.

Quarry road 2 shovels, 3 trucks, 1 comp 2 jthmrs, 1 elctrc, 1 cat. co bull, 4 laborers.

Quarry 2 shovels, 1 cat. AC. 10 rock trucks, 1 truck misc, 1 Water liner, bel. same as yest.

Water elev. in core 615.5 10:15 A.M.

Well #2 41.5, #7 - 31.3, #3 - 19.5, 6 - 25.0 #5 - 24.2, #4 - 18.4

Pipe well #1 21' 1", 19' 8", 20' 1", 19' 0" total 80' 2"

Pool elev. 615.4

May 20

Gravel Plant 1 fore, 1 mechanic, 3 lab's

Borrow pit road 2 shovels, 3 trucks, 1 elctrc. 1 shovel in P.M.

Quarry road 2 shovels, cat & Mc., 3 trucks, 1 dump man, 1 cat co bulldozer

Quarry 1 shovel, 6 rock trucks, AC. bull, 1 truck misc. same force as yest.

Well #1 79.4 water ground elev. 633.0 ±
water 76.0
557.0
Bottom 551.0

Water in puddle 615.3

" " " after raising 616.5 10 A.M.

Gravel Plant P.M. 5 trucks, 1 shovel, 1 fore, 1 mechanic, 5 labs.

~~Pool elev. 615.3~~

May 22

Borrow pit shovel #6, 4 trucks (1 rent), elctric - on road crossing

Borrow pit road 2 shovels 7 & 11, 1 compr, 1 cat. 30, 2 jackhammers, 2 nippers, 1 truck

Quarry road 2 shovels, 3 trucks, cat. 60 bulldozer, cat. 4 Mc.

Up str. emb. 2 cat 60 bulldozers, 1 fore, 13 lab's.

	Depth	Top pipe	Bot. of well	Ground
Well # 5	35.8	629.5		
" 4	18.8	617.4		
" 1	72.2	633.0	552.4	633.8
" 7	30.5			
" 2	41.0			
" 3	19.1			
" 6	24.6			
		Top of well		
Dn. str. toe	27.0	577.5		
Up str. "	55	573.0		

May 23

Gravel Plant 1 fore. 2 lab's.

Roads shovel # 11, 2 trucks, cat. 60 & McMillan; 1 compr, 1 cat. 30, 4 jkhmrs.

Quarry 7 jackhammers, 3 nippers, 4 powder monkey helpers, A.C. bull., shovel # 2

Well Drilling Data

Well	Elev. top pipe	Elev. bot. pipe	Length of pipe	Surface	Hole drilled
1	633.0	552.3	80.7	633.8	81.5
2	627.8	553.5	74.3	621.0	67.5
3	617.4	545.9	71.5	615.9	70.0
4	617.4	538.6	78.8	615.8	77.2
5	629.5	552.0	77.5	617.4	65.4
6	620.8	559.3	61.5	620.4	61.1
7	624.4	566.8	57.6	621.9	55.1
			501.9		477.8

Quarry loads shovel # 1 - 62

" 2 139

201

May 24

Roads 1 shovel #11, 1 truck, 2 compressors, 3 jackhammers, 1 nipper 1 powderman, 1 tore.

Quarry 1 shovel, 6 rock trucks, 1 A.C. bull, no W.L. crew on powder trucks #2, 5, 11, 6, 14, 12

Camp 4 labs on pipe line

Quarry loading shovel #2 - 97 loads.

May 25

Photo #7 new road from borrow pit west from old hwy on S. side of river 10:20 AM

Photo #5 Dam from site #1 10:45 AM.

" 6 New road to Spillway trim above 10:50 AM

Road borrow pit shovel #11, 1 truck, cat. & Mc. well #9-19.2, well #7-30.6, #2-41.0, #6-24.8, #3-20.0, #1-72.5, #5-36.0. Pool 616.3

Photo #1 New road to 720 elev. from quarry - Photo from road above camp 3 P.M.

Quarry loading 107 loads

May 26

Photo #2 showing earth road material from upstr. rock emb. 10 A.M.

Roads Shovel #11, 1 truck, cat. & McQuarry same forces as yest.

May 27

Roads - road grader & water truck shovel #9, 2 trucks, cat. & McMillan surfacing quarry road.

Shovel #11, 2 trucks, cat. & bull-dozer surfacing borrow pit road.

No work at gravel plant

Water in wells.

Well	Depth	Elev.
1	72.5	560.5
2	40.8	587.0
3	19.5	597.9
4	19.1	598.3
5	36.2	593.3
6	24.8	596.0
7	30.8	593.6

Pool 616.2

May 28

No work

May 29

Watertrack, gateman, watchman

No operations.

May 30

1 gateman - no work

May 31.

Photo #3 Showing approaches to S. abut. from 1000' ± u. of axis. 9:30 AM

Photo #4 Dam from site #1 11 AM

Photo #5 Core wall, N. abut. from center of upstr. beach 11:15 AM

Photo #6 Core wall S. abut from southerly end of upstr. beach 11:20 AM

Wells - June 1 Pool 615.5

Well	Depth	Elev.	Ground	Top Casing	
1	73.6	559.4	633.8	630.0	
2	37.2	590.6	621.1	627.8	
3	20.4	597.0	616.2	617.4	
4	20.1	597.3	615.8	617.4	
5	36.0	593.5	617.4	629.5	
6	25.0	595.8	620.4	620.8	
7	31.1	593.3	622.7	624.4	
upstr.	5.9	569.1		576.0	toe wall
downstr.	27.2	550.3		577.5	top of wall

June 1

Photo #1 Newgate 1:30 P.M.
Upstr. rockemb 1 fore, 5 labs
cat. 60 bulldozer, cat. 60 scar.
Puddle unit #2 sluicing, 1 lab.
Bochon hyr. hill,
Quarry - same force as yest.
shovel #6 brot from borrow pit
to downstr. emb.

June 2

Roads 1 water truck
Up. str. emb. shovel #7, 1 truck in P.M.
3 drillers from spillway to quarry in
P.M.
Quarry 1 shovel crew repairs #1
1 fore, 1 powderman 2 helpers, (5 in P.M.)
1 water line crew, 5 jackhammer drillers,
1 nippers, 2 labs. misc.
Photo #2 Resumption of rock
placing, dnstr. emb, from 634 lift.
5:15 P.M. Photo #3 same as #2 - more time

June 3

Quarry trucks #17, 5, 9, 7, 8, 25, 1, 14, 2, 23
12, 11, ~~*~~, 10, 3, 15 *32 misc.
cat bulldozer (1 c), 7 jkhmrs, 1 waterliner,
1 powderman, 2 helpers, 2 nippers.
3 shovels #1, 2, + 6 #9 repairs
upstr. emb. slab, 1 tore, cat 60 bulldoz
1 dumpman
Quarry shovel #1 -

Wellelers - water

1	559.4
2	591.0
3	597.2
4	597.0
5	593.5
6	595.7
7	593.3
upstr. tue	569.1
ph str. "	550.3

June 4

Quarry - drill force working, shovels idle.
Shop 6 men.
Roads shovel #7, 1 truck widening road at upstr. emb. north abut.
Tower 6 men setting timbers.

(Sat. June 3)

Quarry shovel	#1 -	120
	#2	114
	6	110
	Night	
	#1 -	114
	6 + 9 -	122
	2 -	94

June 5

Quarry no shovels operating in A.M.
crews on overhaul. Reg. drill force
Gravel plant 1 tore, 5 labs, trucks,
1 shovel
Dastricmb, 1 tore, 9 lab, cat
Quarry loading

	Day (½)	Night
Shovel	1 - 92	—
	2 - 67	127
	6 51	114
	9 0	142

Sand 30
3/4 - 6 rad.
1 1/2 - 8
2 1/2 - 2

June 6.

Well	Water Depth		bot. Depth		Ground
1	73.5	559.5	79.8	553.2	633.8
2	36.3	591.5	72.8	555.0	621.3
3	20.2	597.2	68.1	549.3	616.3
4	21.0	596.4	75.7	541.7	615.8
5	36.2	593.3		554.0	617.4
6	25.4 ~~34.2~~	595.4	60.3 ~~56.5~~	559.5	620.9 ~~619.9~~
7 upstr. toe	31.2 6.9	593.2	65.5	568.9	622.8 ~~619.9~~

Water elev. in pool 616.0

Quarry shovels 1, 2, 6, 9, bulldozer, water boy
8 jitney's trucks 8, 10, 11, 9, 5, 7, 14, 13, 2, 26, 17, 15, 24, 6, 4, 23, 12,
32 steel, 1 powderman, 1 helper, 1 oiler
+ Sta 9+00 floor 0.45 (tunnel)
Sand & Gravel plant trucks 23, 43, 40, 21 ½ day
1 tore 5 labs. 1 cat & McMillan
Photos 4, 5 & 6 Flashlights of pockets at 8' distance
Sta 3+00 tunnel - N.B. maybe N.G.
Photo #1 same as above - 25 feet distance

June 7

Photo #2 650 lift note 3 pumps operating
water el 625 lift, 10:30 A.M.

	6/6/33		6/7
Sand		250	280
Gravel	3/4"	73	86
"	1 1/2	123	130
"	2 1/2	16	20

Photo #3 fire truck in action 1:30 P.M.
Photo #4 close up of fire truck

June 6 quarry loading

	Day	Night
Shovel 1	74	60
2	119	111
6	146	83
9	60	115
	399	369

June 7

1	79	97
2	122	117
6	103	131
9	60	81
	364	426

June 8

Quarry trucks 2, 9, 30, 13, 26, 1, 15, 11, 25, 20, 24, 14, 6, 39, 18, 10, 12, 4, 5, 7, 3 #35 steel - reg force.

Gravel plant shovel #7, 4 trucks, 1 fore, 4 laborers,

Dnstr. emb. 1 fore, 12 lab's, 1 dumpman, 1 cat. 60 bulldozer. 1 dumpman, 1 cat. upstr.

Gravel plant loading

Sand - 260
3/4 - 90
1 1/2 - 98
2 1/2 - 12

Quarry loading

Shovel	day loads	night loads	Gravel yard loads
1	63	90	
2	114	111	
6	115	132	84
8	58	7	
9	54	66	
	404	406	84

June 9

Quarry trucks 1, 23, 8, 25, 30, 15, 7, 29, 24, 11, 2, 9, 14, 10, 1, 12, 26, +35 steel

10 jkhrm's, 1 unteding acrew, 1 powderman, 2 helpers, 3 nippers, balance same.

Well	Depth	Elev.	Pool elev. 616.5
4	20.7	596.7	
" 1	73.1	539.9	
5	36.1	593.4	
" 6	25.4	595.4	
" 3	19.3	598.1	
" 2	35.7	592.1	
" 7	31.4	593.0	gr. 1' below ave.
Dn str well	26.9	550.6	
" "	5.9	569.1	

Photo #5 commencing cso hist co dn str. rock emb. looking north from about ordinate 3750.

Quarry day	Quarry night	Gravel plant
+1 - 42	0	
2 - 108	111	Sand - 204
6 - 102	111	3/4 - 62
8 - 62	82	1 1/2 - 96
9 - 0	66	2 1/2 - 22
314	370	

June 10

Quarry 20 rock trucks, 1 truck misc. 1 portable compr. (quarry B) 9 jkhrs, 2 on WL; 1 powderman, 2 helpers, 6 nippers. Balance of crew as before.

Photo #6 dom from site 1 11:15 AM.

Quarry shovel	day loads	night loads
1 -	0	0
2 -	122	47
6 -	108	100
8 -	85	128
9 -	97	132
	412	409

Gravel plant

Sand 250

3/4 - 67

1 1/2 - 90

2 1/2 12

June 11

Quarry shovels idle. 1 track 9 jitbamm 1 waterliner 2 crew (2 mechers) 1 poadcrew 3 helpers, 5 nippers, 1 lab. misc. Reg. Shop force Eng. crew 1 trans. 2 chainman running line above quarry.

Gravel plant 1 fore, 3 laborers repairs.

June 12

Photo #1 sluicing 625 lift upstr. North of from ordinate N. 3500. 10:30 A.M.

Gravel plant shovel #7, 5 Co. tracks, 4 labs 1 fore.

Gravel plant		Quarry		
Sand	200	Shovel	Day loads	night loads
3/4	30	1	0	0
1 1/2	57	2	134	97
2 1/2	68	6	100	108
		8	82	116
		9	113	117
			429	438

June 13

Well	depth	El. water	El. top casing	Ground El.	AM.
			6 5 5 6 r 6/6/33		Pool
1	72.1	570.8	~~613.2~~	633.8	Water 6/6
2	35.4	592.4	627.8	621.9	
3	29.6	598.0	627.6	6 6 3	
4	30.6	597.1	627.7	615.8	
5	35.6	593.9	629.5	617.4	12.1 below
6	35.4	595.6	631.0	620.4	
7	41.7	593.0	634.7	622.8	
Da str. well	27.3	550.2			

Quarry Shovels 6, 8, 9, 2, 12 - 3 broked on 4 AM

"11 on at noon. 19 rock trucks req.

force.

Gravel plant	Quarry		
	Shovel	Day loads	Night loads
sand - 200			
3/4 - 45	1	- 0	- 0
1 1/2 - 36	2	- 145	- 77
2 1/2 69	6	- 101	- 100
	8	- 86	- 103
	9	- 23	- 53
	11	- 33	- 26
		388	394

June 14

Photo #2 sluicing below dastr. tie wall northerly end 9:30 AM.

Gravel plant 5 trucks (1 rent 9 yd) 1 Cat 60, 1 Mc., 1 fore., 4 laborers

Quarry		Gravel plant	
Shovel	Day loads	Night loads	sand - 240
1 -	0	- 0	3/4 - 40
2 -	136	- 125	1 1/2 - 46
6 -	110	- 115	2 1/2 - 75
8 -	86	- 62	
9 -	68	- 108	
11 -	38	- 38	
	432	448	

June 15

Photo #3 sluicing 634' near S. abut North from S. abut. 9 A.M. Dnstr.

Photo #4 sluicing with monitor attached to 8" pipeline from unit #3 looking N. from near S. abutment 9:30 AM. Dnstr.

Quarry

Shovel	Day loads	night loads
1	78	108
2	117	104
6	49	78
8	50	62
9	87	101
	381	453

Gravel Plant

sand - 298
3/4 - 42
1 1/2 - 45
2 1/2 - 70

Quarry Same crew as yesterday Coyote force loading

June 16

Photo #5 Sprinkling system operating Dnstr. emb. 10:30 AM.

Photo #6 Resumption of hydraulic operations upstr. emb. 11:00 AM.

Gravel Plant 1 fore, 4 laborers, 5 trucks & drivers.

Borrow Pit shovel 72, 1 cat. 60 & McMillan.

Well	Depth	Elev	Gr.	Pool 616.0
1	84.0	569.7	696.7	
2	35.7	592.1		
3	30.7	596.9		
4	30.0	597.7		
5	34.9	594.6		
6	35.8	595.2		
7	42.3	592.4		
upstr.	6.0	569.0		

Quarry

Shovel	day loads	night loads
1	86	85
2	118	131
6	103	0
8	65	78
9	68	101
	437	387

Gravel Plant

sand - 210
3/4" - 42
1 1/2" - 45
2 1/2" - 53

June 17

Quarry 21 rock trucks, bal. force same

Gravel Plant 1 fore, 1 labs, shovel crew, struck,

Shovel	loads day	loads night
1	101	108
2	98	69
6	80	124
8	81	66
9	105	104
	465	463

Gravel Plant yield

sand - 260

3/4" - 77

1 1/2" - 75

2 1/2 - 105

June 18

Dyke shovel - 12, 2 rent trucks, cat & Me. on dam above gravel plant

Gravel plant 1 fore, 1 lab, 1 welder

Quarry Rog drill force. shovels idle no waterline crew.

Roads shovel - 7, 6 trucks, cat. & Me. surfacing quarry road.

Grader & water truck

Spillway 2 drillers, 2 nippers, 1 portable compr.

June 19

Photo #1 Stee fin base of tower from adit 9:30 A.M.

Photo #2 Coyote shot with shovels loading. 10:30 A.M.

Photo #3 Sprinkling bec dnstr. rock emb. center of fill N from S. about 11 A.M.

Photo #4 Cener tower testing looking down from top of shaft. 11:40 A.M.

Quarry

Shovel	day load	night loads	Gravel plant
1	103	112	sand - 250
2	98	98	48 - 3/4"
6	62	64	75 - 1 1/2"
8	70	105	97 - 2 1/2"
9	116	125	
	479	504	
		50	
		454	

June 20

Photo #5 from dam site #1 7:45 A.M.

Photo #6 upstr. from dnstr. spoil bank 8 AM

Dnstr. Emb 1 tore, 1 cat + ball, 1 driller 9 labs

Quarry 21 rock trucks, 5 shovels, 10 drillers 12 labs loading, nine rippers

Reg. force for bal

2-3 P.M.

Well Upstr.	D.	Elev.	Ground	Pool	Bot. elev
		569.0			616.2
1	82.5	571.2	648.0		554.6
2	36.7 ~~35.7~~	592.1	5.1 622.4		556.7
3	25.7	601.9	9.9 617.7		549.5
4	25.7	602.0	10.0 617.7		542.5
5	22.0	607.5	7.1 622.4		558.1
6	35.7	595.3	620.8		561.8
7	41.3	593.4	11.1 623.6		568.8
dnstr. tie	28.6	598.9			

Shovel	D. loads	loads
1	101	92
2	98	97
6	103	118
8	39	78
9	103	58
	439	423

Gravel Plant

Sand	230
3/4	60
1 1/2	75
2 1/2	102

June 21

Quarry 9 jackhmrs, 5 shovels, 20 trucks, 18 labs. bal. of force same

Dn str. end. 1 fore, 9 labs, 1 cat.

Roads Road grader & water truck

Gravel Plant reg. force

2-3 PM. Pool 617.5

Well Upst. toe	Depth	Elev. 569.0	Gr. D.	Elev.	Bot.
1	82.1	571.6	648.2		99.0
2	30.5	597.3	5.2 622.6		11.1
3	24.5	603.1	9.6 618.0		78.1
4	23.9	605.8	9.2 618.5		85.2
5	25.9	603.6	6.4 623.1		81.4
6	26.0	605.0	8.8 622.7		69.2
7	41.6	593.1	11.1 623.6		65.9
Dn str. toe well	28.7	548.8			

Quarry

Shovel	D. loads	N. loads
1 —	100 —	107
2 —	55 —	79
6 —	109 —	48
5 —	60 —	81
9 —	109 —	66
	433	381

Gravel Plant

sand 150

44 - 3/4

44 - 1 1/2

63 - 2 1/2

Broke down 9:10 A.M.

Quarry June 22

Trucks 24, 10, 17, 7, 9, 6, 20, 23, 2, 12, 4, 8, 5, 3, 1

truck 25 misc. 18 labs (9 drillers)

Reg. shop force + shovel electr.

Gravel plant 1 fore, 1 lab., repairs.

Shop & roads same force.

2-3 PM.

Well Upst. toe	Depth	Elev. 569.0	Ground	Top of casing
1	81.2	572.5	648.2	653.7
	32.5		5.3	
2	~~34.2~~	595.3	622.5	627.8
			9.6	
3	34.2	593.4	618.0	627.6
			8.6	
4	22.8	604.9	619.1	627.7
			6.2	
5	24.0	605.5	623.3	629.5
			8.9	
6	34.1	596.9	622.8	631.0
			11.1	634.7
7	41.4	593.3	623.6	Pool 618.2
Dn str. toe	31.7	545.8		

N.B. Pump just finished

Quarry

	D. loads	N. loads
1 -	106 -	94
2 -	87 -	117
6 -	106 -	107
8 -	64 -	78
	363	396

Gravel Plant

Plant idle - repairs

June 23

Dnstr. emb. 1 tore. 8 lab, 1 driller 1 cat. 60 sloping near 634 elev.

Quarry 19 rock trucks, 4 shovels, 9 labs, 9 drillers

2-3 P.M.

Well No. upth. loc	D.	Elev. 568.9	Gr. D	Elev.	Top casing
1	81.1	572.6	4.9	648.8	653.7
2	26.3 ~~23.0~~	601.5	4.5	623.3	627.8
3	23.0	604.6	8.8	618.8	627.6
4	18.8	608.9	7.6	620.1	627.7
5	21.0	608.5	5.5	624.0	629.5
6	34.9	596.1	8.8	622.2	631.0
7	41.3	593.4	10.9	623.8	634.7
Dnstr. loc	30.9	546.6	Pool 618.4		577.5

Quarry Shovel	D. loads	N. loads
1 –	101	104
2 –	111	128
6 –	103	–
8 –	71	87
	386	319

Gravel Plant

Idle-repairs

June 24

Quarry rock trucks 2, 3, 4, 8, 11, 13, 15, 19, 30, 6, 7, 10, 5, 17; 35 misc

1 cat. 60 bulldozer, 1 waterliner & crew, 9 jackhis, 9 men misc. reg. shop force.

1 tore, 8 labs, 1 driller, 1 cat. on Dn str. emb.

Gravel Plant 1 tore 1 lab: dragline #10.

Pool 618.8 2-3 P.M.

Well upth. loc	D. 6.2	elev. 568.8	Gr. D.	elev	Top of casing
1	80.2	573.5	4.4	648.8	653.7
2	20.0	607.8	3.5	624.3	627.8
3	18.7	608.9	8.0	619.6	627.6
4	16.1	611.6	7.1	620.6	627.7
5	20.0	609.5	4.6	624.9	629.5
6	25.2	605.8	6.7	624.3	631.0
7	32.4	602.3	10.1	624.6	634.7
Dnstr. Well	31.0	546.5			

Quarry Shovel	loads	loads
1 –	109 –	84
2 –	115 –	108
8 –	98 –	85
	312	277

June 25

Quarry 1 fore., 4 jackhmrs, 3 nippers, 2 waterline drillers, 1 lab. misc., Roy. Shaptoe 1 truck driver

Spillway 1 powderman, 2 helpers, 4 drillers

Gravel plant 1 fore, 3 laborers,

Borrow pit 2 shovel crews, repairs

Misc. 1 fore. 4 labs. on main compr. pipeline.

No hauling from quarry or gravel plant.

June 26

Quarry 4 jackhmrs, 2 nippers, 1 powderman helper, 1 driller, 1 nipper, 1 mucker in coyote, 1 cat. 60, 11 rock trucks, 1 truck misc.

Photo #1 Spillway activity from S. about 11 A.M. N. 9300 E. 5200

Photo #2 " cut at ~~at~~ cut from shovel coord. pt

requested by Wood. 11:00 A.M.

Photo #3 Spillway shovel loading at end of axis 11:15 A.M.

Well	D	Elev.	Gr. D.	Elev	Top of casing
		Peel	621.5	2-3 PM.	
upstr. toe	6.6	568.4			
1	79.4	574.3		648.8	653.7
2	17.0	610.8	2.5	625.3	627.8
3	14.7	612.9	6.5	621.1	627.6
4	10.8	616.9	5.7	622.0	627.7
5	15.7	613.8	3.4	626.1	629.5
6	19.6	610.4	1.0	627.0	631.0
7	21.9	612.8	8.2	626.5	634.7
Dnstr. toe	29.0	548.5			

Quarry	D.	N.
Shovel #1 -	114	85
" 2 -	123	114
	237	199

Gravel Plant

Sand - 280

3/4" - 55

1 1/2 - 80

2 1/2 - 100

June 27

Quarry trucks #7, 17, 10, 2, 5, 6, 30, 12, 13, 3 #35 misc.
1 powderman (Larson) 1 helper 4 drillers
2 nippers, 1 cat. 60 bull, 1 water liner & crew
1 mucker. Reg. shop force.

Time 9:30 AM – 10:30 AM Pool 622.0

Well	D.	Elev.	Gr. D.	Elev.	casing
Upstr toe		566.7			
1	78.8	574.9		648.8	653.7
2	28.8	609.4	11.1	627.1	638.2
3	9.6	618.0	5.4	622.2	627.6
4	7.9	619.8	4.8	622.9	627.7
5	13.0	616.5	2.3	627.2	629.5
6	10.5	620.5	2.9	628.1	631.0
7	17.3	617.4	6.2	628.5	634.7
Dnstr toe	30.1	547.4			

Quarry

Shovel 1 – 87
" 2 106

Gravel Plant

Sand – 240
3/4 – 99
1 1/2 – 85
2 1/2 – 65

June 28

Quarry 2 shovels, 10 rock trucks, 1 truck mixer, 3 jackhammers, coyote crew. Small rock

Borrow Pit 3 shovels. #7 added. extra Me. Cat. bulldozer at hill. 2 dump men.

Dnstr emb. 1 foreman, 13 laborers.

Pool 623.5 – 2-3 P.M.

Well	D.	Elev	Gr. D.	Elev.	Top of casing El.
Upstr toe		567.0			
1	78.3	575.4		648.8	653.7
2	22.5	615.7	7.6	630.6	638.2
3	5.5	622.1	3.1	624.5	627.6
4	5.1	622.6	2.9	624.8	627.7
5	19.5	620.3	10.9	628.9	639.8
6	16.9	624.3	11.3	629.9	641.2
7	8.7	626.0	3.0	631.7	634.7
Dnstr toe	30.5	547.0			

Gravel Plant

Sand – 290
3/4 – 70
1 1/2 – 89
2 1/2 – 112

Quarry

Shovel #1 – 104
2 106
210

June 29

Quarry 2 shovels, 9 rock trucks, 1 truck mise, 1 powderman, 2 helpers, 3 jkhmrs, 1 nipper, Reg. cayote & shop crews.

Borrow pit same as yest.

Dnstr. emb. 1 tore, 13 laborers, 1 cat. 60 bulldozer, 1 dumpman

Pool 625.5 2-3 PM.

Wall Upstr. toe	D.	Elev. 567.4	Gr. D.	Elev.	Casing
1	25.6	578.1		648.8	653.7
2	21.0	617.2	6.4	631.8	638.2
3	12.7	625.5	11.8	626.4	638.2
4	3.0	624.7	1.0	626.7	627.7
5	17.0	622.8	9.7	630.1	639.8
6	16.4	624.8	9.4	631.8	641.2
7	17.5	627.5	11.4	633.6	645.0
Dnstr. toe	31.4	545.6			

Quarry

Shovel #1 - 122

" 2 - 61

183

Gravel Plant

	day	night
Sand	280	
3/4"	57	Gravel
1 1/2"	60	294
2 1/2"	85	

June 30

Photo #4 Upstr. from dnstr. spoil bank 3:15 PM

Quarry same force

Dnstr. emb. "

Gravel Plant New night shift - same as day excepting 4 trucks

Pool 627.5

Wall Upstr. toe	D	Elev. 567.6	Gr. D	Casing	Bot. Wall
1	65.2	588.5	648.8	653.7	99.0 554.7
2	14.8	623.4	634.7 3.5	638.2	81.0 558.2
3	10.7	627.5	629.3 8.9	638.2	87.4 550.8
4	11.8	625.9	626.9 8.8	637.7	94.1 544.1
5	15.4	624.4	632.8 7.0	639.8	80.6 559.2
6	14.3	626.9	634.1 7.1	641.2	78.6 562.6
7	17.3	627.7	635.0 10.0	645.0	75.5 569.5
	30.4	547.1			

Quarry

Shovel #1 - 93

" 2 61

154

Gravel Plant

Sand	270	
3/4	80	N. Gravel
1 1/2	89	200
2 1/2	118	Sand

July 1

Quarry No hauling - coyote crew, 1 powderman, 6 drillers + helpers

Dnstr. emb. 1 foreman, 13 laborers

Photo #5 Dam transite #1 - 12:05 P.M.

Photo #6 Spillway, L end, 0+75, 12:15 P.M.

Dnstr. emb 1 fore, 12 labs, 1 driller

2 cat. 60 bulldozers.

Well Upstr. toe	D.	Elev. Gr. D.		Elev.	Casing
		5678 Pool 630.9			
1	60.1	593.6		648.8	653.7
2	12.0	626.2	2.0	636.2	638.2
3	10.0	628.2	7.1	631.1	638.2
4	11.7	626.0	7.2	630.5	637.7
5	14.9	624.9	6.1	633.7	639.8
6	13.6	627.6	5.1	675.8	641.2
7	17.3	627.7	8.5	636.5	645.0
Dnstr. toe	32.5				

Gravel plant

N.	D
Sand 250	Sand 240
3/4" - 65	3/4 - 65
1 1/2" - 70	1 1/2 - 70
2 1/2" - 95	2 1/2 - 90
230	225

July 2

Quarry 1 fore, 1 powd. man, 1 helper 4 drillers, 1 nipper 4 in coyote

Gravel plant 1 fore, 4 labs repairs

Roads cat + blade El Monte-Dam road. 2 water trucks

Shovel #8 on road to 670 clear, 3 trucks.

July 3

Quarry shovels, 11 rodtracks, 1 truck misc.
1 powderman, 5 jkhmrs, 1 nipper, 1 cat fine grade.
Gravel Plant - reg. crew, 5 trucks
Borrow pit - same force.
Dnstr. emb. 1 foreman, 12 laborers.
1 cat. w/ bulldozer

Well	D.	Elev.	Gr. D.	Elev.	Casing
Upstr.		568.0 pool	630.8		
1	51.9	601.8		648.8	653.7
2	21.9	626.7	10.8	637.8	648.6
3	8.9	629.3	5.7	632.5	638.2
4	11.5	626.2	5.6	632.1	637.7
5	14.7	625.1	4.4	638.4	639.8
6	12.5	628.7	4.5	636.7	641.2
7	17.1	627.9	6.8	638.2	645.0
Dnstr toe	34.0	643.5			

Quarry	D.	Gravel	Plant	D.
	sand	240	sand	250
	3/4"	- 68	3/4"	65
shovel 1 - 106 loads	1 1/2"	- 79	1 1/2"	75
" 2 - 127 "	2 1/2"	- 130	2 1/2"	125
233				

July 4

July 5

Quarry 2 shovels, 11 rock trucks, 1 truck misc., 4 jt hrs, 1 powderman, 1 helper, 1 nipper, 1 cat bull. 1 in cogate

Gravel Plant - reg. crew

Dnstr. emb. 1 tore, 12 laborers, 1 cat, 1 bulldozer

Well Upstr. toe	D.	Elev. 568.1	Gr. D. Pool 632.9	Elev.	Casing
1	48.9	604.8		648.8	653.7
2	20.4	628.2	10.3	638.3	648.6
3	7.7	630.5	4.4	633.8	638.2
4	12.1	625.6	4.8	632.9	637.7
5	15.3	624.5	3.7	636.1	639.8
6	11.6	629.6	3.0	638.2	641.2
7	15.5	629.5	6.4	638.6	645.0
Dn. str. toe	35.6	541.9			577.5

Quarry

Shovel #1 - 110

" 2 - 116

226

Gravel Plant

	D	N
Sand	260	250
3/4	65	60
1 1/2	71	60
2 1/2	120	95

July 6

Quarry 2 shovels, 11 rock trucks, 5 jt hrs, 1 powd. man, 1 helper, 1 in cogate, 1 cat 60 bulldozer, reg. shop force,

Dnstr. emb. 1 tore, 9 laborers

Upstr. emb. 5 lab's. 1 cat bulld., 1 cat & H.M.

Well Upstr. toe	D.	Elev. 568.3	Gr. D. Pool 634.0	Elev.	casing
1	47.7	606.0		648.8	653.7
2	17.9	630.7	9.6	639.0	648.6
3	6.0	632.2	3.3	634.9	638.2
4	11.7	626.0	3.0	634.7	637.7
5	15.2	624.6	2.1	637.7	639.8
6	20.1	631.3	12.4	639.0	641.4
7	14.0	631.0	6.0	639.0	645.0
Dnstr. toe	36.3	541.2			

Quarry

Shovel #1 - 82

" 2 - 120

202

Gravel Plant.

	D.	N.
Sand	230	280
3/4"	60	75
1 1/2"	60	80
2 1/2"	90	115

July 7

Photo #1 Dam looking S. westerly from E. appro. to Spillway, 10:30 A.M.

Quarry Reg. Force,

Gravel Plant " "

Borrow Pit " "

Photo #2 Spillway W. from E. end 11 AM.

Well	D.	Elev.	Gr D	Elev.	Casing
Upstr. toe		568.4			
1	46.1	607.6		648.8	653.7
2	17.5	631.1	9.1	639.5	648.6
3	5.3	632.9	2.4	635.8	638.2
4	11.0	626.7	2.5	635.2	637.7
5	14.3	625.5	1.8	638.0	639.8
6	19.6	631.8	10.9	640.5	651.4
7	13.8	631.2	5.0	640.0	645.0
Dnstr. toe	32.9	544.6	Pool 634.7	Pool	577.5

Quarry

Shovel #1 - 108

" 2 117

225

Pool 2 approx

Sand 235

3/4 - 83

1 1/2 - 88

2 1/2 - 120

July 8

Contractors forces same as reported previously

Well	D	Elev.	Gr. D.	Elev.	Casing
Upstr. toe		568.4	Pool	636.2	
1	45.6	608.1	4.9	648.8	653.7
2	16.4	632.2	8.3	640.3	648.6
3	4.5	633.7	1.2	637.0	638.2
4	10.6	627.1	1.4	636.3	637.7
5	13.9	625.9	0.7	639.1	639.8
6	18.0	633.4	9.2	642.2	651.4
7	13.3	631.7	4.7	640.3	645.0
Dnstr. toe	36.1	542.4			577.5

Gravel Plant

	D.	N.
Sand	184	200
3/4	55	45
1 1/2	52	65
2 1/2	84	110

July 9

Quarry: 2 shovels, 10 rock trucks, 1 truck mixer, 5 jack hammers (outside drilling) 1 jack hammer, 1 waterliner 5 men in coyote. Remainder of quarry force as reported previously.

Quarry loading

Shovel #1 - 106 loads

" 2 - 122 "

128

July 10

Photo #3 Dam looking upstr from downstr spoil bank 1:45 P.M.

Quarry: Reg force 10 trucks

Gravel Plant idle

Borrow Pit shovel #11 upstr. emb. 1 tora, 13 slabs 1 cat 60. bull.

Well	D.	Elev.	Gr. D.	B of. Elev.	Pool 638.2 Casing
Upstr. toe		568.5		99.0	
1	14.0	609.7	648.8 5.0	555.7 89.6	653.7
2	14.6	634.0	643.6 9.9	559.0 ~~546~~ 95.5	648.6
3	12.1	636.5	638.7 9.2	563.1	648.6
4	20.2	627.8	638.8 9.1	544+ 89.8	648.0
5	23.9	626.2	641.0 6.6	560.3 89.6	650.1
6	14.4	637.0	644.8 4.2	566.8 75.6	651.4
7	11.4	633.5	640.7	569.9	644.9
Dnstr. toe	34.5				

Quarry	D.	N.
#1 -	95	- 51
2 -	117	- 53
	212	6 - 24

July 11

Photo #4 Dam from site #1 8:30 A.M.

Photo #5 Commencing 662 lift of dn str. emb, N trem near N. abut. 8:30 A.M.

Photo #6 Preparing 650 lift dn str emb for new 662 lift N. trem near S. abut. 9 A.M.

Upstr emb 1 tore, 13 labs, 1 driller, 1 cat scr, 1 compr.

Dnstr emb, 1 cat co bull, 1 dumpman

Quarry 4 shovels, 22 rock trucks, 3 drillers, 1 nipper bol. force same

Quarry D.	N.
#1 - 88	- 81
2 - 92	- 95
6 - 96	- 96
9 - 85	- 102
361	374

Gravel Plant	
Sand	150
3/4	- 29
1 1/2	- 29
2 1/2	- 55

July 12

Composite puddle core sample Av. water 0.12 av. sample depth 16' cu. yds. 4950 - 5040

Quarry 22 rock trucks, 4 shovels, electric 3 drillers 1 pump, 8 men on cogote.

Upstr emb 1 tore., 12 labs, 1 driller, 1 cat bull & scr, 1 cat Me, 1 compr.

Dnstr emb 1 cat co bull 1 dumpman

Well Upstr Tee	D.	Elev. 5693 Pool	Gr. D. 639.0	Elev.	casing
1	42.6	611.1		648.8	653.7
2	15.5	633.1	4.9	643.7	648.6
3	12.1	636.5	9.1	639.5	648.6
4	19.6	628.4	8.7	638.9	648.0
5	23.0	627.1	8.3	641.8	650.1
6	17.8 ~~15.1~~	633.6	6.6 ~~4.9~~	644.8	651.4
7	12.0	632.9	1.1	643.8	644.9
Dnstr Tee	34.8	542.7			577.5

Quarry D	N.
1 - 65	- 79
2 - 91	- 111
6 - 82	- 112
9 - 85	- 121
323	423

Gravel Plant	
Sand	- 200
3/4	- 44
1 1/2	- 50
2 1/2	- 90

July 13

Photo #1 Quarry face before shooting coyote N.E. from westerly end. 9 AM

Photo #2 Same as above after shooting from 50' further S. 1:30 PM.

Quarry 4 shovels, 22 rock trucks, 1 cat bulldozer, 6 labs, backfilling coyote, 1 powderman, 2 drillers, 1 nipper, 1 bear

Well	D.	El.	Gr D	El.	Casing
Upstr toe		569.8	Pool	639.0	
1	51.8	611.6	3.8	659.6	663.4
2	15.9	632.7	4.9	643.7	648.6
3	12.5	636.1	9.2	639.4	648.6
4	20.3	627.7	9.1	638.9	648.0
5	23.8	626.3	8.4	641.7	650.1
6	18.4	633.0	6.8	644.6	651.4
7	12.9	632.1	1.0	644.0	645.0
Dnstr toe	35.0	542.5			

Quarry	D	N
Shovel #1	8	42
2	111	104
6	89	139
9	65	126
	351	411

Gravel Plant	
Sand	210
3/4"	43
1 1/2"	49
2 1/2"	90

July 14

Quarry same shovel & truck force, 5 drillers, 2 nippers.

Pastremb. same force

Gravel Plant & Borrow Pit - idle

Roads 2 watertrucks, cat & blade

Well	D	Elev	Gr D.	Elev	Casing
Upstr toe	4.8	570.5	Pool	638.8	
1	51.5	611.9	3.0	660.4	663.4
2	16.6	632.0	4.9	643.7	648.6
3	12.7	635.9	9.2	639.4	648.6
4	20.9	627.1	9.1	638.9	648.0
5	24.5	625.6	8.4	641.7	650.1
6	12.9	632.5	6.8	644.6	651.4
7	13.4	631.6	1.0	644.0	645.6
Dnstr toe	33.2	544.3			

Quarry	D	N
1	31	84
2	91	90
6	119	127
9	84	157
	324	458

Gravel Plant	
Sand	263
3/4	63
1 1/2	60
2 1/2	90
	213

July 15

Quarry 4 shovels, 24 rock trucks, 1 truck mix, 7 jackhmrs, 2 nippers, 1 powderman, (2 ot drill tacing up for coyote

Photo #3 commencing 662 lift upstr. emb. 2 P.M.

Well	D	El	Gr. P.	El	Casing
upstr. toe	4.2	570.8	Pool	639.6	
1	51.7	611.7	2.0	661.4	663.4
2	17.0	631.6	4.8	643.8	648.6
3	12.7	635.9	9.2	639.4	648.6
4	21.3	626.7	8.4	639.6	648.0
5	24.9	625.2	8.0	642.1	650.1
6	19.1	632.3	6.8	644.6	651.4
7	14.1	630.9	1.0	644.0	645.0
Dnstr toe	34.2	643.3			

Quarry
1 - 85 - 76
2 - 105 - 140
9 - 100 - 142
9 - 135 - 141
425 499

Gravel Plant
3/8 - 58
1½ - 40
2½ - 83
Sand 200

July 16

Quarry no hauling, 10 men on drilling, 2 with waterliner in coyote. Shovel crews on maintenance

Roads Cletrac & road blade, 1 water truck & driver.

July 17

Roads same force & equip.

Quarry 4 shovels, 24 rock trucks, 4 drillers 2 nippers, 1 pond. mo, coyote crew. Reg. force for remainder.

Well	D	El	Gr. D.	El	Casing
Upstr. toe	4.0	571.0	Pool	639.0	
1	52.0	611.4	2.0	661.4	663.4
2	17.7	630.9	4.8	643.8	648.6
3	12.7	635.9	9.2	639.4	648.6
4	21.8	626.2	8.4	639.6	648.0
5	25.7	624.4	8.0	642.1	650.1
6	19.6	631.8	6.8	644.6	651.4
7	14.8	630.2	1.0	644.0	645.0
Dn str. toe	36.0	541.5			

Quarry	Dist	N.	Gr. yard
Shovel #1	83	56	
2	121	122	
6	113	135	74
9	127	154	100
	444	467	174

Gravel Plant	
Sand	135
3/4	25
1 1/2	30
2 1/2	33

July 18

Quarry 4 shovels (#9 down -) 23 rock trucks, 1 portcompr, 2 tractors, 6 drillers, 2 nippers bal. force same. 4 in coyote

Chute #4 building 662 lift over 650 dn str N from S. abut. 11 AM.

Well	D.	El.	Gr. D.	El.	Casing
Upstr. toe	3.9	571.1	Pool	638.9	
1	52.1	611.3	2.0	661.4	663.4
2	17.9	630.7	4.8	643.8	648.6
3	13.0	635.6	9.2	639.4	648.6
4	21.7	626.3	8.4	639.6	648.0
5	25.4	624.7	8.1	642.0	650.1
6	19.6	631.8	6.8	644.6	651.4
7	15.0	630.0	1.0	644.0	645.0
Dnstr toe	34.4	543.1			

Quarry	D	N	N. #2
Shovel #1	89	36	
" 2	119	117	
" 6	126	121	95
" 9	35	127	96
	369	402	191

Gravel Plant	D.	N.
Sand	290	300
3/4"	90	90
1 1/2"	45	50
2 1/2	70	65

July 19

Photo #5 Constr. 662 lift at about mid point upstr. emb. N. from southerly end 9:25 A.M.

Quarry 23 trucks, 4 shovels, 1 cat bull, 1 powd. man 6 drillers, 1 nipper, Rog. shop force.

Well	D.	El.	Gr. D.	El.	Casing
Upstr. toe	3.8	571.2	Pool 639.1		
1	52.1	611.3	2.0	661.4	663.4
2	18.0	630.6	4.8	643.8	648.6
3	12.6	636.0	9.2	639.4	648.6
4	21.5	626.5	8.4	639.6	648.0
5	25.1	625.0	8.0	642.1	650.1
6	19.7	631.7	6.8	644.6	651.4
7	25.6	629.7	11.0	644.0	655.3
Distr. toe	39.1	591.4			

Quarry

D	N.	Gr. yd
1-76	- 32	
2-92	- 83	
6-100	- 124	68
9-102	- 114	46
372	353	171

Gravel Plant

Sand	Pa	N.
3/4	- 60	- 75
1 1/2	- 45	- 55
2 1/2	- 70	40

July 20

Quarry 4 shovels, 22 rock trucks, 1 truck mixer, 1 A.C. bulldozer, 6 jackhmrs. 1 nipper, 1 powd. man, 4 in coyote.

Upstr. emb. 1 tore, 1 cat. 60 bulldozer, 13 laborers, 2 dumpmen, 1 flagman. Photo #6 from site #1, 9 A.M.

Well	D.	El.	Gr. D.	El.	Casing
Upstr. toe	3.8	571.2	Pool 639.0		
1	52.4	611.0	2.0	661.4	663.4
2	18.0	630.6	4.8	643.8	648.6
3	12.5	636.1	9.0	639.6	648.6
4	21.7	626.3	8.4	639.6	648.0
5	25.2	624.9	7.8	642.3	650.1
6	19.8	631.6	8.0	649.6	651.4
7	25.5	629.8	11.0	644.3	655.3
Distr. toe	35.0	542.5			

Quarry

1-76	77	
2-83	102	
6-91	103	
9-60	94	
310	326	

Gravel Plant

Sand	Pa	N.
	220	200
3/4	- 45	- 40
1 1/2	- 64	- 62
2 1/2	- 105	100

July 21

Dnstr. comb. 1 tore, 11 slabs, 1 cat.

Quarry same force

Gravel Plant reg. force

Photo #1 Upstr. from dnstr. spill bank 3:30 PM.

Pool 639.5

Well	D.	El.	Gr. D.	Elev.	Casing
Upstr. toe	3.7	571.3			
1	52.5	610.9	2.0	661.4	663.4
2	17.9	630.7	3.9	644.7	648.6
3	12.1	636.5	8.1	640.5	648.6
4	22.0	626.0	8.3	639.7	648.0
5	25.5	624.6	7.0	643.1	650.1
6	19.8	631.6	5.1	646.3	651.4
7	25.5	629.8	9.5	645.8	655.3
Dnstr. toe	34.2	543.3			

Quarry	D.	N.
Shovel #1	86	57
2	69	67
6	89	31
9	97	82
	341	237

Gravel Plant			
Sand		220	230
	3/4	55	57
	1 1/2	52	74
	2 1/2	90	90

July 22

Photos #2 & 3 flashlight of rock pockets in tunnel sta. about 9+60 10 A.M.

Photo #4 S.W. diag. dnstr. comb. 1:30 PM

Dnstr. comb 1 tore, 8 slabs, 1 cat.

Upstr. comb 3 slabs

Pool 639.8

Well	D.	El.	Gr. ~~Elev.~~	Ground Elev.	Casing
	3.7	571.3			
1	52.2	611.2	661.4	661.4	663.4
			3.6		
#2	17.1	631.5		645.0	648.6
			7.7		
#3	11.8	636.8		640.9	648.6
			7.3		
4	21.3	626.7		640.3	648.0
			3.6		
#5	25.3	624.8		646.5	650.1
			3.8		
#6	16.5	634.9		647.6	651.4
			9.4		
#7	25.0	630.3		645.9	655.3
Dnstr. toe	35.5	542.0			

Quarry	D.	N.
Shovel 1	48	62
2	106	72
9	65	79
	219	213

July 23

Quarry 6 jackhmrs, 2 nippers, 2 oyotecrew.

Roads watertruck, eletrac + road blade.

Shop 1 tore, 1 blacksmith, 1 mec, 1 welder, 1 electrician.

Borrow pit shovel crews working on equip.

July 24

All forces as 23 d.

Pool 641.0

Well	D	El.	Gr. D.	El.	Casing
upstrtoc	3.6	571.4			
1	51.5	611.9	2.0	601.4	663.4
2	25.8	633.0	12.9	645.9	658.8
3	10.5	638.1	7.3	641.3	648.6
4	10.9	632.1	5.1	642.9	648.0
5	34.7	625.4	12.8	647.3	660.1
6	25.7	633.8	13.3	648.2	661.5
7	24.0	631.3	6.7	648.6	655.3
outstrtoc	35.1	642.4			

Quarry	D	N
#1	89	72
2 -	"	56
9 -	113	108
	202	236

Gravel Plant	P.	N
Sand	210	230
3/4	35	50
1 1/2	60	45
2 1/2	75	73

July 25

3-62 K

Steel samples 7/8 ⌀ from bench 40' long

H 3-2 K 1" □ " " 23½", 27 pcs

2-31 HM. 1" □ " " 24½" 8 pcs.

Quarry trucks 15, 3 shovels bal.

of force same as yesterday.

Borrow Pit shovel #6 moved to

pit S. of syphon in PM.

Pool 642.3

Well	D.	El.	Gr. D.	El.	Casing
Upstr. tee	3.4	571.6			
1	51.0	612.4	2.0	661.4	663.4
2	25.8	633.0	12.1	646.7	658.8
3	9.5	639.1	6.6	642.0	648.6
4	13.8	634.2	4.6	643.4	648.0
5	33.4	626.7	12.1	648.0	660.1
6	24.9	636.6	12.9	648.6	661.5
7	9.5	635.8	5.8	649.5	655.3
Dnstr. tee	35.4	542.0			

Quarry

Shovel	D.	N.
#1	74	77
2	77	68
9	90	23
	241	168

Gravel Plant

Sand	150	120
3/4	30	20
1/2	90	30
3/8	60	30

July 26

Quarry shovels 1 to 2, 11 rock trucks,

1 truck misc., some drill force

Gravel Plant 1 fore, 2 labs repairs, plant

idle.

Dostcmb 1 fore, 1 driller, 13 labs, 1 comp.

Pool 644.0

Well	D.	El.	Gr. D.	El.	Casing
Upstr. tee	3.3	571.7			
1	50.6	612.8	2.8	661.4	663.4
2	24.7	634.1	11.4	647.4	658.8
3	7.8	640.8	5.5	643.1	648.6
4	11.9	636.1	3.8	644.2	648.0
5	32.5	627.6	11.6	648.5	660.1
6	23.7	637.8	12.3	649.2	661.5
7	17.2	638.1	5.1	650.2	655.3
Dnstr. tee	34.8	542.7			

Quarry

Shovel	D	N
1	117	61
2	137	139
	254	200

July 27

Photo #6 diag. across Dnstr. tracktomb 9 A.M.

Photo #1 flashlight at concr. S side tunnel at about sta. 9+10 10:45 A.M.

Photo #2 same as above sta. 8+90 10:50 A.M.

" 3 Coord.

" 4 Material placed in spoil bank and road

Quarry 1 shovel, 7 tracks reg. force

Pool 645.2

Well	D.	El.	Gr. D	El.	Casing
Upstr. toe	3.2	571.8			
1	49.9	613.5	2.0	661.4	663.4
2	23.0	635.8	10.3	648.5	658.8
3	6.3	642.3	4.5	644.1	648.6
4	10.3	637.7	2.5	645.5	648.0
5	31.4	628.7	10.9	649.2	660.1
6	22.6	638.9	11.5	650.0	661.5
7	15.0	640.3	4.2	651.1	655.3
Dnstr. toe	35.8	541.7			

Quarry

	D	N
shovel 1	0 -	0
2	98 -	153
	98	153

July 28

Quarry shovel #2, 7 track tracks, ~~cat. 60~~ 5 drillers, reg. force for balance.

Dnstr. omb. 1 tore, 11 lab's 1 cat. 60 bulldozer.

Pool 645.3

Well	D	El.	Gr. D.	El.	Casing
Upstr. toe	2.4	572.1			
1	49.3	614.1	1.4	662.0	663.4
2	20.7	638.1	9.6	649.2	658.8
3	15.8	642.7	13.3	645.2	658.5
4	19.9	638.3	12.3	645.9	658.2
5	30.7	629.4	10.7	649.4	660.1
6	20.5	641.0	10.4	651.1	661.5
7	23.9	641.7	13.8	651.8	665.6
Dnstr. toe	34.9	542.6			

Quarry

	D	N
Shovel #1	0 -	97
2	126 -	117
	126	214

July 29

Quarry 2 shovels, 11 rock trucks, 1 truck misc, 1 cat. 60 bulldozer, 2 drillers, 1 nipper, 1 powdman Rip force

Pool 645.5

Well	D.	El.	Gr. D.	El.	Casing
Upstr toe	2.7	572.3			
1	48.2	615.2	1.2	662.2	663.4
2	19.1	639.7	8.4	650.4	658.8
3	14.8	643.7	11.9	646.6	658.5
4	19.5	638.7	11.5	646.7	658.2
5	29.4	630.7	10.4	649.7	660.1
6	16.2	645.3	9.2	652.3	661.5
7	22.2	643.4	13.6	652.6	665.6
Dn str toe	35.4	542.1			

Quarry

Shovel	D.	N.
1	69	70
2	115	151
	184	221

July 30

Quarry 1 tore, 5 drillers, 1 nipper, coyote crew, powd. shovels idle

Roads Shovel 8, 3 trucks 1 cat 65 surfacing 220 road thru dam

Shop 4 men in shop

Borrow pit shovel crew on overhead

July 31

Well	D	El.	Gr. D	El.	Casing
Upstr toe	2.5	572.5	Pool 646.9		
1	45.3	618.1	0.0	663.4	663.4
2	20.7	638.1	7.7	651.1	658.8
3	16.5	642.0	11.2	647.3	658.5
4	22.7	635.5	10.9	647.3	658.2
5	32.1	628.0	9.6	650.5	660.1
6	18.4	643.1	7.8	653.7	661.5
7	23.4	642.2	13.1	652.5	665.6
Dnstr toe	34.6	542.9			

Quarry

No hauling

July 31

Quarry Reg. force, 11 rock trucks
Downstream 1 fore, 11 labs, ~~rest~~
Upstream 1 dumpman, 1 cat bulldozer
Borrow pit reg. force
Gravel Plant idle, 1 fore

Quarry trucks #12, 13, 17, 2

Quarry	D.	N.
Shovel #1	74	
2	111	
	185	

Aug. 1

All forces about as yesterday.

Quarry	
Shovel 1	84
2	93
	177

Aug. 2

Photo #5 Down from site #1 10:45AM

Photo #6 Upstr from dnstr spoil 11:15AM

Forces same as reported before

Aug. 1

Well	D.	El.	Gr. D	El.	Casing
Upstr toe	2.5	572.5			
1	45.8	617.6			663.4
2	22.0	636.8	6.0	652.8	658.8
3	17.1	641.4	10.0	648.5	658.5
4	24.9	633.3	8.7	649.3	658.2
5	32.8	627.3	9.0	651.1	660.1
6	18.6	642.9	9.9	651.6	661.5
7	22.1	643.5	12.1	653.5	665.6
Dnstr toe	32.5	545.0			

Quarry

Shovel #1 - 84

Aug 3

Same crews working as reported previously. 3 shifts on borrow pit 2 shifts on other work.

Quarry shovel #1 - 69 loads

Quarry

Larson rerew at drillers putting down holes at top of quarry at west end.

1 shovel, 6 trucks bal. of force same. Shovel #1 - 79 loads

Well	D	El.	Gr. D.	El.	Casing
Upstr toe	2.5	572.5			
1	46.0	617.4	668.4		663.4
2	18.7	640.1	656.1	2.7	658.8
3	18.1	640.4	650.0	8.5	658.5
4	25.2	633.0	652.1	6.1	658.2
5	25.1	634.7	654.3	5.8	660.1
6	18.0	643.5	654.1	7.4	661.5
7	18.5	647.1	655.6	10.0	665.6
Dnstr toe	34.0	543.5			

Aug 5

Quarry same force

Upstream 1 tore, 7 labs, 1 cats

Roads reg. road equip.

Wall	D	El.	G.D	El.	Casing
Upstr toe	2.4	572.6			
1	46.3	617.1	0.	663.4	663.4
2	26.8	642.3	10.7	658.4	669.1
3	18.9	639.6	6.7	651.8	658.5
4	25.9	632.3	5.0	653.2	658.2
5	22.6	637.5	4.0	656.1	660.1
6	17.0	644.5	6.2	655.3	661.5
7	18.0	647.6	9.3	656.3	665.6
Dnstr toe	31.0	646.5			

Quarry

Shovel ~~77~~ 72-97

Aug. 6

Quarry 4 drillers on bull dozing 1 shovel, 3 trucks part time surfacing river xing near camp.

Road blade & water truck operating.

Monitors operating in puddle core

Aug 7

Quarry 1 shovel #2, 7 rock trucks, 1 truck misc., 6 jackhmrs, 12 in drill crew.

Borrow pits idle

Aug. 8

Well	D.	El.	Gr. D.	El.	Casing
Upstr toe	2.4	572.6			
1	46.5	616.9	0	663.4	663.4
2	14.0	653.1	11.1	658.0	669.1
3	19.3	639.2	6.0	653.5	658.5
4	24.2	634.0	5.1	653.1	658.2
5	24.2	635.9	3.0	657.1	660.1
6	15.8	645.7	3.5	658.0	661.5
7	10.3	655.3	6.5	659.1	665.6
Dnstr toe	31.8	545.7			
Shovel #7	378		2211 yds.		

Quarry

Shovel #2 - 106

Aug. 8

Samples #384, 385, 386 sand from N. mid pt. rend of stock pile, west side at plant.

Quarry shovel #9, 6 trucks, 6 jk hmrs 11 drillers, 1 cat 60, reg. shop force

Upstream 1 tore, 11 labs, 1 cat. 60 bulldozer

Quarry

Shovel #1 - 82 loads

Aug. 9

9'3" - 36", 4'5" 36", 6'5" ~~36~~ 42", 8'6" 36" 8'5" 36", 11'5" 42", 5'6" 42"

Quarry Same as yest. except but 6 men in drill crew

Up Dnstr. emb's 1 tore., 1 eat, 6 labs.

Quarry

shovel #2 - 104 loads

Aug 10

4'5" 42, 2 pos 11'5" 36, stopped, 10'9½" 36", 11'5" 36", 8'4½" 42", 10'5½" 42", 8'5½" 42",

Quarry Reg force 4 drillers 19 labs loading coyote

Up & Dnstr. emb 1 tore, 1 eat, 5 labs

Well	D.	El.	Gr. D.	El.	Casing
Upstr tee	2.3	572.7			
1	47.6	616.4			663.4
2	10.5	658.6	8.0	661.1	669.1
3	18.3	640.2	2.0	656.5	658.5
4	27.3	641.1	11.8	656.6	668.4
5	33.0	637.5	7.8	662.7	670.5
6	13.5	658.5	10.5	661.5	672.0
7	11.5	654.1	3.0	662.6	665.6
Dnstr tee	31.5	546.0			

Quarry shovel #1 - ~~105~~ 102

Aug. 11

Quarry shovel #1, 6 trucks, dragline part time, 8 labs, loading coyote, 5 drillers, 1 powd. man, 1 helper 1 in pipe Reg. shop force.

Quarry

shovel #1 - 35

2 - 67

102

Aug 12

Photo #1 Dam from site #1 11:05 A.M.

" 2 Quarry after blast N.E. turn westerly and 1:30 PM.

Well	D	El	Gr. D	El.	Casing
Upstr toe	2.3	572.7	1.00	658.5	
1	17.0	616.4	0	663.4	663.4
2	11.0	658.1	8.0	661.1	669.1
3	18.4	650.4	11.5	657.3	668.8
4	22.6	645.8	8.6	659.8	668.4
5	27.7	642.8	7.0	663.5	670.5
6	14.0	658.0	10.8	661.2	672.0
7	18.4	657.6	12.5	663.5	676.0
Pa Str toe	32.0	545.5			

Quarry

shovel #1 - 96

Aug 14

Photo #3 Concreting in tower 9:1 AM.

Quarry 4 shovels, 21 rock trucks, 7 jt hmrs, 1 cat, 1 powd. man, 1 helper, 7 drillers, 2 nippers.

Gravel Plant 1 tore, 1 lobs, 4 trucks #11, 1 cat. 60 & McMillan.

Well	D.	El.	G.D.	El.	Casing
Upstr. toe	23	572.7	Pool 658.4		
1	43.5	619.9		663.4	663.4
2	13.2	655.9	7.5	661.6	669.1
3	15.3	653.5	9.8	659.0	668.8
4	18.1	656.0	9.2	659.2	668.4
5	33.0	637.5	7.0	663.5	670.5
6	18.6	653.4	10.7	661.3	672.0
7	31.5	644.5	12.1	663.6	676.0
Dnstr. toe	34.2	643.3			

Quarry	D.	N.
Shovel 1	103	66
" 2	114	125
" 6	8	126
" 9	132	7
	357	318

Gravel Plant	D.	N.
Sand	175	180
3/4	40	45
1 1/2	45	45
2 1/2	55	55

Aug. 15

Photo #5 Placing rock on 662 level Dnstr. emb. 8:00 AM. S. from N. abut.

Photo #4 sluicing N. abut. at dnstr. rock emb. 7:55 AM.

Photo #6 New rock lift 775, drillers in foreground. 8:10 AM.

Quarry 4 shovels 6, 9, 192, 8 jt hmrs, 1 powd. man, 1 helper, 2 nippers, 1 blksmith, 1 helper bal. force same.

Crabs 3 lob. dnstr. 7 upstr, 2 cats upstr.

Quarry	D	N
Shovel 1	66	53
" 2	115	93
" 6	110	115
" 9	97	89
	388	350

Gravel Plant	D.	N.
Sand	200	210
3/4	55	30
1 1/2	65	50
2 1/2	75	75

Aug 16

Sample #1 El. 710 N 4120 E 5320, #2 El. 735 N. 4100 E. 5380, #5 El. 745 N 4200 E 5050

#6 El. 775 N. 4500 E. 5050, #3 El. 730 N. 4350 E 5300, #4 El. 725 N 4330 E. 5250

Quarry 4 shovels, 22 rock trucks, 8 drillers, 2 nippers, 1 powd. m, 1 Eletrac, Reg. shop force

Photo #1 Tunnel spoil 1:30 P.M.

Well	D	El. Pool	Gr. D	El.	Casing
Upstr. toe	2.3		658.5		
1	13.0	620.4		663.4	663.4
2	17.1	652.0	7.5	661.6	669.1
3	13.4	651.4	9.7	659.1	668.8
4	15.7	652.7	9.2	659.2	668.4
5	34.4	636.1	7.0	663.5	670.5
6	23.5	648.5	10.7	661.3	672.0
7	34.8	641.2	12.4	663.6	676.0
Dnstr. toe	33.0	644.5			

Quarry	D.	N.	Gravel Plant	D	N.
Shovel 1	33	61	Sand	300	275
2	103	107	3/4	75	60
6	130	115	1 1/2	70	65
9	91	116	2 1/2	110	85
	377	399			

Aug. 17

Quarry 4 shovels, 21 rock trucks, 8 drillers, 1 powd. 1 helper, 2 nippers, 1 in shop

Upstream 1 Fore, slabs, 1 cat. 662 level

1 cat, 1 dumpman 615 level

Dnstream 1 cat., 1 dumpman, 1 flagman

Photo #2 Quarry face at about mid pt. 9 AM

Quarry	D.	N.	Gravel Plant	D	N.
Shovel 1	49	67	Sand	270	290
2	112	106	3/4	48	65
6	113	95	1 1/2	45	65
9	103	93	2 1/2	70	75
	377	361			

Aug. 18

Quarry same force as yesterday

Photo #3 Spillway cut E end from a 369

N. 4330 E 5400 9:15 AM. 370

Photo #4 Cutting tree near S. Fork 10 A 371

Photo #5 clearing looking downstr. from near 372

Sample N 4380 E 5510 (E end Spillway) 373

Well	D.	El.	G. P.	El.	Cas	
Upstr. toe	2.3	Pool	659.0			374
1	42.7	620.7		663.4	66	375
2	19.5	649.6		661.6	66	376
3	12.7	656.1		659.1	66	377
4	14.5	653.9	9.3	659.2	66	
5	33.5	637.0	7.0	663.5	67	
6	22.2	649.8		661.3	67	
7	35.3	640.7	11.4	663.6	67	
Downstr. toe	35.7	641.8				

Aug. 1.

Sample	Coordinates North	East	Water	Sample	W.S.
333	3880	5050	9.0	11.0	647.4
334	✓	5000	13.0	20.0	
335	✓	4970	12.0	16.0	
336	3620	4970	7.0	9.0	
337	✓	5000	11.0	20.0	
338	✓	5050	9.0	14.0	
339	3500	4970	12.0	15.0	
340	✓	5000	12.0	20.0	
341	✓	5050	8.0	14.0	

Barona Reservation Data

Aug. 12 & 13 15th dedication chapel

19 & 20 big times

70 graves left

66 moved to Barona

17 houses & families, 55 inhabit.

600 acres tillable soil, mostly under hay.

#1	48.9	
2	20.4	10.3
3	7.7	4.4
4	12.1	4.8
5	15.3	3.7
6	11.6	3.0
7	15.5	6.4
upstr.	66.2	
dn str.	35.6	

Accidents June 20-30
Only minor cuts bruises

N 2710	top	348	E 10,150 N 2100 ± 354 Borrow pit
E 11,300	center	349	
	bot.	350	S. pit
N. 5740	top	351	
E 11,200	"	352	
	bot.	353	

Rock	holes	length holes	Powder sticks	Powder lbs.	Rock C.Y.
38	1	3	5	1.25	
39	1	3	5	1.25	
40	1	2	5	1.25	
41	1	2	4	1.00	
42	1	2	5	1.25	
43	1	3	7	1.75	
44	1	3	6	1.50	
45	1	2	4	1.00	
46	1	3	7	1.75	
47	1	3	7	1.75	
48	1	4	11	2.75	
49	1	4	9	2.25	
50	1	4	9	2.25	
51	1	4	9	2.25	
52	1	4	7	1.75	
53	1	3	5	1.25	
54	2	8	12	3.00	

No powder expd. incl.

Trudcheck

7/17/33

Truck	Left	Arrived	
2	1:28	1:45	0:17
30	1:32		
26	1:32	1:48	16
(4) B.N.	1:34	1:52	18
(4) Cap. no shots	1:34	1:58	24
4	1:37	1:58	21
23	1:39		
25	1:39	1:59	20
24	1:40	1:56	16
48	65		
17	16		
18	20		
24	16		
21	18		
20	20		
29	24		
19	15		
18	7 (139)	197	
20	2		
16	68		
302	63		

7/18/33

Truck	Left	Arrived	
24	8:35	8:53	0:18
Bloc S. (4) cap.	8:37	8:57	0:20
17	8:38	9:07	29
25	8:38	9:02	24
10	8:41		
9	8:42	9:11	29
6	8:42	9:01	19
15	8:46	9:01	15
30	8:48		
17	8:48		
25	8:49		
4	8:57	9:15	18
7	8:57	9:17	20
8	9:00		
2	9:01	9:17	16

Rock	holes	length holes	Powder Sticks	Powder lbs.	Rock Cy.
55	1	6	13	3.25	
56	1	4	3	0.75	
57	1	4	7	1.75	
58	1	2	4	1.00	
59	1	4	8	2.00	
60	1	4	7	1.75	
61	1	3	6	1.50	
62	2	9	7	1.75	
63	2	8	11	2.75	
64	2	10	18	4.50	
65	1	4	9	2.25	
66	1	4	7	1.75	
67	1	5	10	2.50	
68	1	3	7	1.75	
69	1	4	7	1.75	
70	1	3	10	2.50	
71	1	5	11	2.75	

Truck check, Quarry - Fill
7/18/33

powder lbs per dump truck	Left	Arrived	
33	1:17		
17	1:20	1:37	0:17
25	1:20	1:37	0:17
12	1:21	1:40	0:19
18	1:23	1:41	0:18
23	1:24	1:41	0:17
24	1:26	1:43	0:17

Rock	holes	length hole	powder sticks	Powder lbs.	Rock C.Y.	powder lbs per yd rock
72	1	3	7	1.75		Shorty, ~2.17
73	2	12	24	6.00		
74	1	3	7	1.75		
75	1	3	8	2.00		
76	1	4	9	2.25		
77	2	8	16	4.00		
78	1	2	4	1.00		
79	1	3	7	1.75		
80	1	4	9	2.25		
81	1	4	11	2.75		
82	1	3	7	1.75		
83	1	3	6	1.50		
84	1	3	5	1.25		

Rock	No. holes	Length of holes	Sticks of powder 7/8 x 8	lbs powder	Yardage of rock	powder per yard of rock
1	1	5'	7	1.75	2.67	0.65
2	1	4'	12	3.00	3.56	0.84
3	2	14'	16	4.00	6.48	0.62
4	1	6'	10	2.50	5.32	0.47
5	8	86'	166	41.50	181.30	0.23
6	4	33'	52	13.00	29.63	0.44
7	4	40'	51	12.75	71.11	0.18
8	10	140	436	109.00	130.00	0.84
9	2	18'	45	11.25	22.41	0.50
10	1	7'	10	2.50	4.67	0.53
11	2	14'	17	4.25	9.33	0.46
12	1	4'	4	1.00	3.70	0.27
13	2	14'	20	5.00	5.19	0.96
14	1	2'	5	1.25	2.67	0.47
15	2	12'	18	4.50	4.15	1.08
16	4	30'	72	18.00	41.48	0.43
17	3	15'	37	9.25	12.22	0.75

Rock	No. holes	Length	powder sticks 7/8 x 8"	powder lbs	Yardage rock	powder per yard of rock
18	1	6'	17	4.25	4.74	0.90
19	3	30'	71	17.75	46.67	0.38
20	1	8'	15	3.75	12.44	0.30
20 A	2	11'	24	6.00	18.52	0.32
21	1	6'	9	2.25	6.67	0.34
22	1	11'	45	11.25	16.00	0.70
23	1	4	13	3.25	4.63	0.70
24	1	4	9	2.25	3.70	0.61
25	1	4	11	2.75	2.22	1.24
26	1	2	5	1.25	4.63	0.27
27	1	9	43	10.75	19.04	0.57
28	4	58	171	42.75	41.48	1.03
29	2	16'	30	7.50	6.00	1.25
30	2	24'	98	24.50	43.33	0.57
31	3	18'	53	13.25	12.00	1.10
32	1	5'	9	2.25	6.67	0.34
33	3	30	67	16.75	28.89	0.58

Rock	No. holes	length	sticks powder 7/8 x 8	lbs powder	Yardage rock	Powder per yard of rock
33A	2	10'	26	6.50	15.0	0.43
34	2	8'	14	3.50	8.33	0.42
35	3	14'	24	6.00	5.45	1.10
36	1	3'	5	1.25	2.67	0.47
37	1	2'	5	1.25	1.85	0.67
85	1	4'	11	2.75	7.00	0.39
86	2	12½'	20	5.00	8.00	0.62
87	2	8'	14	3.5	7.00	0.50
88	1	3'	5	1.25	4.00	0.31
89	1	3'	5	1.25	4.00	0.31
90	3	20'	51	12.75	18.00	0.71
91	1	4'	5	1.25	4.00	0.31
92	1	2'	3	0.75	2.00	0.37

Removal of rock above spillway

April 25

J. L. Connolly-foreman	½ day	Co. No.
Hokanson-driller	"	330
Thompson "	"	331
Aho "	"	335
Pietila "	"	336
Hendrickson nipper	"	319
Menchee, blacksmith	2 hrs.	
Candy wagon & driver	2 hrs.	
compressor man	½ day	
Portable compressor	2 hrs.	
4 jackhmrs, steel & hose	½ day	

April 26

J. L. Connolly foreman
Hokanson
Thompson
Aho
Pietila
Hendrickson
Hendricks
Nelson
Franklin
Franklin
Gibbs
Larson - powderman
Sather - blacksmith
Brown - compressorman
Hiller - candy wagon & driver 4 hrs

April 27

1 fore.

1 powderman

1 compressorman

1 blacksmith

1 " helper

8 drillers

3 nippers

1 truck driver

8 jkhmrs, Ford truck, compr(sta), blacksmith equipment.

April 28

Same force as 27th plus 1 compressorman, 2 portable compressors worked ½ hr. - rain

May 1

Same crew as ~~yest.~~ 28th

30' lin ft broken steel

May 2

Same as yest. but 1 powderman.

May 3

1 fore.
1 powderman
1 " helper
4 drillers & pt. tenders
3 nippers
1 compr. man
1 blacksmith & equip
1 " helper
1 Ford truck & driver
1 stat. compr.
6 broken drill steel

May 4

1 foreman
1 powderman
1 " helper
1 compr. man
1 truck driver
4 drillers
3 nippers

Loading

5/3/33 battery

	Hole sticks				
✓8	1-59	2-47	3-56	4-53	5-9
✓18	1-17				
✓17	1-15	2-9	3-14		
✓16	1-19	2-15	3-17	4-21	
✓15	1-9	2-9			
✓14	1-5				
✓13	1-13	1-7			

5/4/33 battery

23	1-13				
22	1-45				
24	1-9				
25	1-11				
26	1-5				
27	1-43				
28	1-47	2-63	3-33	4-30	
30	1-47	2-51			
29	1-15	2-15			

Loading

6-49	7-39	8-53	9-59	10-13	

5/4/33 battery (cont)

31	1-14	2-21	3-18	
32	1-9			
37	1-5			
36	1-5			
35	1-7	2-8	3-9	
34	1-7	2-7		
85	1-11		7 yds	
86	1-13	1-7	8 "	
87	1-7	2-7	7 "	
88	1-5		4 "	
89	1-5		4 "	
91	1-5		4 "	P.M.
92	1-3		2 "	
90	1-15	2-19	3-17	18 yds

Loading

5/2/33

Secondary shooting

1	1-3	18	1-9
2	1-5	19	1-7
3	1-6	20	1-6
4	1-7	21	1-6
5	1-6	22	1-7
6	1-10		
7	1-3		
8	1-7		
9	1-5		
10	1-5		
11	1-10		
12	1-12		
13	1-14		
14	1-13		
15	1-12		
16	1-12		
17	1-12		

177 sticks

Loading

Rocks ~~Holes~~ sticks

53	1-5	41	1-4
52	1-7	40	1-5
56	1-3	39	1-5
55	1-13	38	1-5
58	1-4	83	1-6
59	1-8	84	1-5
54	1-5	2-7	
60	1-7		
49	1-9		
50	1-9		
48	1-11		
46	1-7		
47	1-7		
45	1-4		
44	1-6		
43	1-7		
42	1-5		

Loading

5/1/33 battery

Rock	sticks per hole				
" 7	"1-8	2-9	3-21	4-13	c.51
" 6	1-3	2-9	3-9	4-31	
" 5	1-37	2-35	3-32	4-9	5-13
11	1-8	2-9			
10	1-10				
12	1-4				
3	1-10	2-6			
4	1-10				

5/2/33 battery

9	1-25	2-20	
20A	1-9	2-15	
33	1-19	2-23	3-25
19	1-23	2-25	3-23
21	1-9		
20	1-15		
33A	1-13	2-13	

Loading

6-11	7-9	8-29	

5/2/33 fuse

Rock	powder	Rock	powder	
82	1-7	67	1-10	
81	1-11	66	1-7	
80	1-9	71	1-11	
79	1-7	73	1-9	2-15
78	1-9	65	1-9	
76	1-9	64	1-9	2-9
77	1-7	2-9	63	1-7	2-9
74	1-7	2	1-12	fuse
75	1-8	1	1-7	
72	1-7	61	1-6	
69	1-7	62	1-7	
70	1-10	57	1-7	
68	1-7	51	1-9	

Loading

battery

Secondary shooting 5/3/33

Hole	sticks
1	7
2	7
3	5
4	5
5	5
6	5
7	3
8	5
9	9
10	7
11	5
12	4
13	3
14	3
15	3
16	5
17	5
	86

Loading

Secondary shooting 5/9/33

18	1-5	36	1-5	
19	1-5	37	1-3	tallied to here
20	1-5	38	1-11	
21	1-15	39	1-5	
22	1-11	40	1-4	
23	1-7	41	1-5	
24	1-17	42	1-5	
25	1-17	43	1-5	
26	1-5	44	1-3	5/9/33 PM
27	1-9	45	1-4	
28	1-21	46	1-7	
29	1-12	47	1-7	
30	1-17	48	1-7	
31	1-5	49	1-5	
32	1-3	50	1-7	
33	1-7	51	1-8	
34	1-3	52	1-10	
	164		101	

Estimated yardage in draws above Spillway.

	c.r.	extremity
Draw E. of sta 0+00	20	60'
" At sta. 0+00	100	80
" " " 1+15	50	50'

		Coordinate North	Coordinate East	Water	Sample	Water Elev.
333	306	3800	5060	10.	15 ~~17~~	638.5
334	307	✓	5000	14	18 ~~20~~	
335	308	✓	4970	10	16	
336	1	3620	4970	9	12	
337	2	✓	5000	12 ~~14~~	18	
338	3	✓	5050	11	14	
339	4	3300	4960	10	13	
340	5	✓	5000	12	18	
341	6	✓	5060	12	15	
			Aug. 15. 1933.			
369		3260	5050	9	18	656.5
370		✓	5000	11	20	
371		✓	4960	9	15	
372		3600	4960	10	13	
373		✓	5000	11	20	
374		✓	5050	10	18	
375		3900	5050	8	15	
376		✓	5000	13	18	
377		✓	4960	9	12	

Drilling

Rock	Holes
56	1-4
59	1-4
58	1-2
56	1-2
55	1-6
52	1-4
53	1-3
51	1-4
54	2-4
60	1-4
49	1-4
50	1-4
48	1-4
46	1-3
47	1-3

Drilling

5/1/33

Rock	Holes		
66	1-4'	76	1-4
67	1-5'	74	1-3
68	1-3'	75	1-3
71	1-5'	72	1-3
83	2-6'	69	1-4
80	1-3'	70	1-3
61	1-3'	68	1-3'
62	1-4' 1-5'	63	2-4'
1	1-5'	45	1-2
64	2-5'	44	1-3
65	1-4'	42	1-2
77	2-4'	41	1-2
82	1-3'	40	1-2
81	1-4'	39	1-3
80	1-4	38	1-3
79	1-3	2	1-4
78	1-2	83	1-3'

Cy. in Rocks above Spillway

No.	Cu ft.	No	Cu ft.
1	72	17	330
2	96	18	128
3	175	19	1260
4	144	20A	500
		20	336
5	4896	21	180
6	800	22	432
7	1920	23	125
8	3070	24	100
9	605	25	60
10	126	26	125
11	252	27	574
12	100	28	1120
13	140	29	162
14	72	30	1170
15	112	31	324
16	1120	32	180

(cont.)

No	Cu ft
33	780
33A	405
34	225
35	147
36	72
37	50

total 22,210 = 822 Cu. yds.

Drilling

No.	Holes	Depth			
25	1	3½'	46	4	2-7' 2-8'
21	1	4'	19	3	10'
23	1	3½'	18	1	6'
22	1	11'	20		
26	1	2'	6	4	1-14 2-8 1-3
27	1	9'	7	4	1-8 2-10 1-12
12	1	4'	5		2-18' 1-15
11	2	7'			3-7 1-14'
29	2	8'	48	10	4-18 2-16 1-14 1-10 2-6
13	2	7'	16	4	2-8 2-7
10	1	7'	18	1	1-6
3	2	7'	85	1	1-4
4	1	6'	86	2	3'
30	2	12'	87	2	4'
14	1	2'	88	1	3'
17	3	5'	89	1	3
15	2	~~1-4'~~ ~~1-2'~~ 6'			

Drilling

No.	Holes	Depth	No.	Holes	Depth
32	1	5' ✓	4	1	6' ✓
36	1	3' ✓	31	3	1-3' 1-6' 1-7
34	2	4' ✓	33A	2	5'
35	~~4~~ 2	~~15~~ 2-5' 1-4	N.B. 60 ft. of holes		
37	1	2' ✓	lost by broken drills		
33	3	10' ✓			
20A	2	1-6' 1-4½' ✓			
9	2	9' ✓			
20	1	8'			
28	2	2-12' 2-17' ✓			
~~12~~	~~1~~	~~4'~~ ✓			
~~11~~	~~2~~	~~7'~~ ✓			
~~29~~	~~2~~	~~8'~~ ✓			
~~22~~	~~1~~	~~11'~~			
~~13~~	~~2~~	~~7'~~			
~~10~~	~~1~~	~~7'~~ ✓			
~~3~~	~~2~~	~~7~~ ✓			

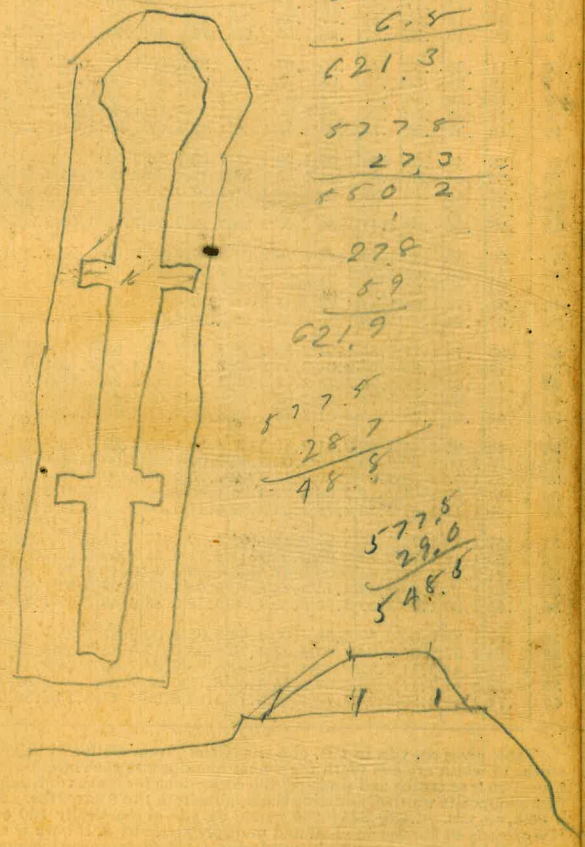
Av. daily yield of Gravel plant for mo's of Oct., Nov. + Dec. CY.

Sand	3/4"	1 1/2"	2 1/2"
275	96	107	43

	Coordinates		Water	Sample	Water Elev.
✓ #256	N. 3850	E. 4960	9.0	17.0	629.5
# 245	N. 3780	E. 5040	11.0	17.0	331
262	N. 3780	E. 5000	18.0	25.0	330
315	N. 3550	E. 5000	16.0	20.0	328
317	N. 3850	E. 5000	14.0	20.0	325
258	N. 3850	E. 5050	15.0	15.0	326
244	N. 3550	E. 4970	10.0	14.0	327
316	N. 3550	E. 5050	10.0	14.0	329

3276

Return - 369 4/27/33



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	3.11	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 ½ 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 1½.

For Single Track Embankment.

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
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)÷2 or 2 ft. added to 41.9 =43.9. For slopes of 1 on 1 see inside of front cover.

Made in Germany.