

Estimoteas

9

LEVEL BOOK

370

W97

KEUFFEL & ESSER CO.

DRAWING MATERIALS

AND

SURVEYING INSTRUMENTS.

NEW YORK.

CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

Tables for Excavations and Embankments.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.
ROADWAY 8 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
10	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	10
11	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	11
12	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	12
13	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	13
14	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	14
15	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	15
16	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	16
17	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	17
18	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	18
19	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	19
20	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	20
21	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	21
22	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	22
23	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	23
24	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	24
25	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	25
26	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	26
27	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	27
28	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	28
29	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	29
30	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	30
31	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	31
32	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	32
33	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	33
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 Julian A. Hall, M. Am. Soc. C. E.

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October Estimate - Excavation

Oct 30/17 1

Sta	+	21	-	Flt
B.M.	398	375.28		371.30
	"F" line			
F12-12N	Cut 00 across			
F12			100	653
F12-6N			110	643
13			107	646
14			104	649
15			100	653
F15-10N			8.1	672
	"E" line			
E12-9N			103	650
E12-15N			110	643
E 13			112	641
14			110	643
15			111	642
E15-18N			93	660
E15-20N			10.7	646

Note Copied from Book 7-1
 Pages 46-49

	Excavation	Oct. Esti	
510	+ 2/1	-	E16
E-16	375.28	11.0	64.3
E16-4'N		8.5	66.8
	"D" line		
D12		10.2	65.1
D12-6'N		10.4	64.9
D13		11.3	64.0
D14		11.4	63.9
15		11.1	64.2
D15-20'N		9.8	65.5
D 16		11.0	64.3
D16-6'N		11.0	64.3
	"C" line		
C 12		10.4	64.9
13		10.7	65.1
C13-15'N		10.3	65.0
14		11.0	64.3
15		10.9	64.4
C15-17'N		9.0	66.3

Copied from Book T-1-19 46-49

10/30/17 ✓

10/30/17 Exc. Est. Oct 1917

Sta	+	St	-	Exc
		375.28		
B ¹²			103	650
13			103	650
14			106	647
15			99	654
B15-5N			8.9	664
A ¹²			10.5	648
13			11.0	643
14			10.7	646
15			96	657
M ¹⁵			88	665
M14-20N			9.2	661
M14-10N			11.3	640
14			11.3	640
13			108	64.5
12			10.2	65.1

B¹² line

A line

M line

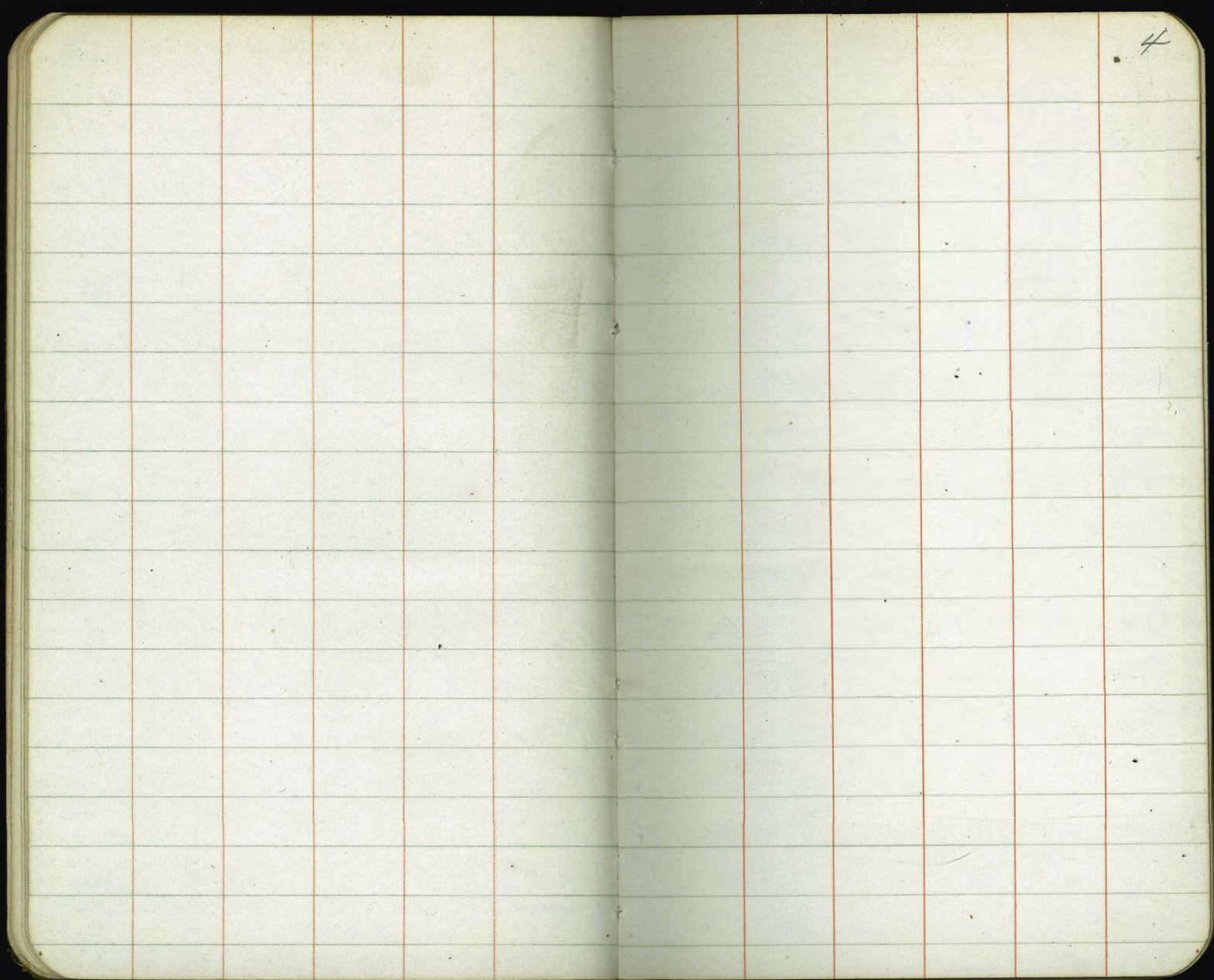
Sta	+	St	-	Exc
N ¹²			106	647
13			109	644
14			10.7	646
M14-15N			9.1	662
5/2				
F12-12N			00	236
F line			106	136.6
E "			189	181.9
D "			204	147.2
C "			114	75.0
B "			48	51.9
A			64	66.2
M			79	59.7
N			50	231
O			00	

Copied from Part I
 Page 48.
 See Section Sheet #1

END AREA Co Yds

Total Co Yds 765.2

Schedule 1 - Class 1 765 Co Yds @ 113 = 864.45
 Less 10% = 86.45
 Amount due = \$778.00



11/26/17 Estimate, Nov.

5

Excavation Schedule 1 Class

Sta	+	Al.	-	Exc	
	5.22	76.52		371.30	B.M.
	173	66.53	11.22	65.30	TP Rock

F 12' W = Cut on across

F 11		0.67		65.86	
F 11-18N		1.2		65.3	
F 11		3.1		63.4	
F 11-36N		2.9		63.6	
+50		4.9		61.6	
+75		3.7		62.8	
+87		3.7		62.8	
+94		5.6		60.9	
1+00		5.5		61.0	
1+04		2.5		64.0	

✓

11/26/17
Sta

Estimate November.

6

+ 71 - 210

6653

"E" Line

E11-18N 7.0 645

E12 4.3 622

+43 10.7 55.8

+52 11.7 54.8

+60 12.2 54.3

+79 12.0 54.5

+81 11.1 55.4

+95 11.3 55.2

1+00 10.3 56.2

1+09 5.3 61.2

"D" Line

D12 3.3 63.2

+05 4.3 62.2

+32 11.3 55.2

+50 11.6 54.9

11/26/17 Estimate November 1917

Sta + A - Elevation

6653

"D" Line

+75	11.5	550
+88	68	59.7
+95	3.2	63.3
+100	2.2	64.7
	1.5	65.0

"C" Line

Natural Ground

C12-16'S	00	66.5
C12	6.2	60.3
C12-11'N	7.7	58.8
+15'	10.0	56.5
+19'	7.3	59.2
+50'	5.7	60.8
+66	7.6	58.9
+87	7.1	59.4
+92	9.1	57.4
+99	6.0	60.5

11/16/17 November Estimate

8

5100 + 21. - 212

66.53

"C" Line

1+00 4.8 61.7

1+00 1.8 64.7

"B" Line

B.11 +0.1 66.9

+11 7.6 58.9

+25 - B.12 8.5 58.0

+50 B.13 7.9 58.6

+75 B.14 8.0 58.5

1+00 B.15 7.0 58.5

1+17 4.3 62.2

1+25 4.0 62.5

"A" Line

A.11 0.2 66.3

+18 7.5 59.0

A.12 ✓ 7.8 58.7

Hub gone

11/26/17

November Estimate

9

Sta

 # 2/1
 A" ^{665.3} Line

25			
+33		76	589
+40		4.0	628
+46		34	63.1
+57		47	62.3
+68	43	8.7	578
+75		88	57.7
+79		9.0	57.5
1+00		0.7	658
1+05	25 50	+7.0	68.5

"M" Line

111-8'N		0.2	66.3
+17		1.7	64.8
+20		.63	60.2
+30		6.4	60.3
+36		2.5	64.0
+50	✓	1.5	65.0

11/16/17

November Estimate

10

Sta + Sta - E/O
 in. ⁶⁶⁵³ Line

0" Line

+63 30 638

Cut 00 across

+72 66 599

+84 76 589

Excavation to Dec't Area

1+00 05 660

F12-12W

End

Cu Yds.

00.0

70.7

1+05- 30 6953

F

318.0

567.1

E

907.0

827.8

"N" Line

D

881.0

740.7

N11-20'14

20 645

C

719.0

722.2

+25 37 628

B

841.0

670.2

+30 37 628

A

477.0

361.6

+36 22 643

M

304.0

210.2

+50 12 653

N

150.0

69.4

+67 20 645

O

00.0

+75 37 628

Total Cu Yds. Schedule 1 - 4179.9

1+00 30 635

" " " " Excl. Nov 1st = 765.2

1+03 30 635

" " " " Nov Esti = 3414.7

1+09 1.5 650

3414.7 x 1.13 = 3858.61 - 10% or 385.86 =

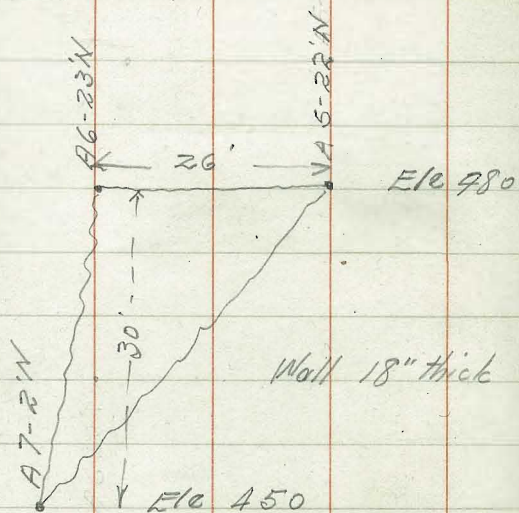
\$ 3472.75

Cont opp. page

See X-section Sheet #2

Nov. Estimate

Yardage in Concrete Core Wall
Shot down.



$$\frac{26 \times 15 \times \frac{1}{2}}{27} = 22 \text{ cu yds.}$$

Class 4

$$22 \text{ cu yds @ } 2.48 = \$54.56$$

12/30/17

Port Rod, 12
Sub Inst.

Sections Dec Estimate

F 12' W Cut 00 across

3.74	0.58	371.88	371.30
Hub on Curve	3.78	66.34	9323/2.56

12' taken as 0 ^{+ East} _{- West}

F" line

-10	1.1	652
F1200	3.1	632
+15	3.8	625
+25	5.0	613
+40	5.7	606
+48	4.0	623
+64	4.3	620
+76	5.9	604
+79	2.4	639
+84	0.9	654
+85	1.5	648
+90	1.5	648

12/30/17

December Estimate

13

F line

Flume
+95

6634 15 648.

E" Line

Flume

+98

54 609

+90

40 623

+87

91 572

+75

100 563

+63

120 543

+52

123 540

+10

100 563

00-E17

50 613

-6

24 639

-10 Edge Rock

15 648

"D" Line

-13 Edge Rock

11 652

-10

28 635

12/30/17

Dec Estimate

14

-6	D line 6634	2.0	643
00 D12		3.0	633
+5		3.8	625
+6		6.4	599
+26		10.5	558
+28		11.6	547
+37		11.5	548
+42 on Boulder		9.9	564
+46		11.8	545
+80		11.7	546
+92		10.0	563
+94		4.4	619
+99 Flume		1.6	647
	Δ-Line 13'E On line of Concrete		
D-16		+0.1	664
D12-12E		4.8	615
00			
+15	✓	7.6	587

12/30/17 December Estimate

15

D line 13' East

+19	6634	9.7	56.6
+24	Top Cor + Grand.	7.4	58.9
+35		11.0	55.3
+35	Top Cor.	6.0	60.3
+55		11.3	55.0
+55	Top Cor.	6.0	60.3
+73		11.3	55.0
+73	Top Cor.	6.0	60.3
+85		10.0	56.3
+85	Top Cor.	7.0	59.3
+90	Both the same de.	8.7	57.6
+100	Flume	4.5	61.8

G line

-16		+0.1	66.4
-14		2.0	64.3
00	Cir ✓	5.9	60.4

12/30/17 Dec. Estimate

16

C Line

+10	6634	7.3	59.0
+12		8.5	57.8
+20		7.0	59.3
+54		5.9	60.4
+101 Flume		6.2	60.1

"B" Line

-76		+0.7	66.5
-12		7.7	58.6
00 Bed		7.5	58.8
+10		2.4	63.9
+21		1.5	64.8
+20		1.6	64.7
+36		2.6	63.7
+45		6.9	59.4
+55		8.0	59.3
+78	✓	6.4	59.9

12/30/17

Dec Estimate

17

6634

"B" Line

+101 Flume 6634 6.0 603

"A" Line

-20 14 649

-14 58 605

00 Airt 8.7 576

+04 8.7 576

+14 3.0 633

+21 16 647

+34 17 646

+43 86 577

+60 85 578

+75 not on hub 0.5 65.8

"M" Line

-20 ✓ +0.5 66.4

17/30/17

18

"M" Line

00 NIV	66.34	6.2	60.1
+04		6.2	60.1
+10		2.4	63.9
+22		1.4	64.9
+34		1.3	65.0
+50		8.0	58.3
+63		7.0	59.3
+75		10.5	66.8

"N" Line

-06		1.7	64.6
00 NIV		3.0	63.3
+14		1.6	64.7
+20		0.8	65.5
+30		1.0	65.3
+40	✓	2.0	64.3

12/20/17 Dec Estimate

19

"N" Line

+67	66.34	7.3	59.0
+83		00	66.3
+89		00	66.3

"O" Line

00 (017)		1.0	65.3
+20		0.7	65.6
+30		0.7	65.6
+40		2.4	63.9
+53		6.1	60.7
+70		5.7	60.6
+81		1.3	65.0
+84 Top old dump		+3.4	69.7

"P" Line

00 P₁₇

✓ +0.5 66.8

12/30/17

Dec Estimate

Excavation December

70

				Sta	Excavation	Co Yds.
	P. Line			F12-12'W	00.0	
+21	6634	1.0	65.3	F	12	91.8
+25		+0.5	65.8	E	25	675.0
+40		0.4	65.9	D	25	951.4
+50		1.8	64.8	D-13'E	13	479.1
+56		+1.0	67.3	D-13E	00	310.2
+60		+0.5	66.8	C	12	310.2
+70		2.1	64.2	B	25	618.5
+82		1.0	65.3	A	25	510.6
+90	Topdump	+2.5	68.8	M	25	362.0
				N	25	242.6
				O	25	181.9
				P	25	99.1

Total to Jan 1st = 4522.6

Schedule 1
Class 1

Total To Nov = 4179.9

Co Yds Exc during 342.3 Dec. 1917

$342.3 \times 1.13 = 386.80$

Dec X section sheet #3

21

41-49

R Topog Jan 7 1918

364.1

At B14-15W

359.20

364.1 At B14-15'W 359.20

RC
Con. Co 21.8 281-30 58 36.1 316-30

" " RC 29.0 316° 58 39.2 320-30

" " RC 11.5 317-30 58 35.9 325-45

" " RC 2.5 270 ^{N.S. Drain Ditch} 58 37.8 334

" " RC 6.5 175-45 ^{N.S. Drain Ditch} 58 38.2 339-30

" " RC 13.0 223° ^{NS "} 58 38.0 342

Concrete
Face RC 23.5 249° ^{NS "} 58 39.0 343-45

RC ^{South Side Drain Ditch} 60 17.2 205-30 58 40.6 339-45

RC 60 17.4 198° 58 42.5 335

RC 60 17.4 198° 58 40.0 327

RC 60 15.8 202-30 58 43.0 333.45

Top Rock 3.81 ^{Elc 60.3}
17.1 187

Face Concrete
56 34 322.30

58 34.5 323° 56 35 321

58 35.8 319-45 56 34.9 318-45

58 35.2 318-15 56 38.1 312 30

364.1

At B14-15W

359.20

56 41.2 316-30 52 49° 304-15

56 42.5 314-45 52 48° 304-15

56 42.5 306-30 52 45.5 304-15

56 45.0 308° 52 43.5 303

56 46.5 312° 52 39.0 309

56 48.5 311-45 52 36.8 307-15

56 50.5 315 52 35.8 309-15

56 50.5 315.45 52 37.2 314

56 53.0 314-15 52 34.5 319

Face Con.
54 33.9 322-20

54 38.0 313°

56 36.8 309-45

54 38.2 309

54 43° 303-45

54 45° 305

54 46° 305

Checked in
Book 10
Page 4-5

H147 on spike

3554

+ HI
34 3554

Continue
352

On 350	53'	354-30	48	515	350-45
350	51.5	356°			
350	49.0	356-30	46	498	347-45
350	48.5	359-45	46	492	351-30
350	48.0	4°-45'	46	460	353-15
350	46.0	5°-0'	46	445	354-45
350	47.1	17°-30'	46	455	3°
348	On Face 47.4	17°	46	440	4°-45'
			46	472	12°-10'
48	45°	9°-15'			
48	46	8°-0'			
48	45.6	4°-15'			
48	48.4	10-30'			
48	48.0	358-45			
48	46.0	355-15			
48	48.5	352			

Corrected in
Book #10
page 5

1/9/18 Cuts for Spillway Bottom
 Sta + S 2/1 Sub - S E1C 85
 Grade Gr Rod Rod

B.M. T-31 517 475.59 470.42

Q. 32 482 70.77

0+00

A34-5.54N

0+50.9 =

Vert. Face Wier

0+66 ⁹⁰

Crest spill ^{top}

0+68 ²⁸

487.2

467.2

463.2

463.2

467.2

467.2

470.2

470.2

470.2 539 439

469.2

468.2 7.39 439

467.2

466.2 9.39 439

465.2 10.39 439

464.2

1/9/18 2d

Willcomb - 1/2 in
 Bub - Rod

Cuts for Spillway Bottom

Stn	+ S	Gr	Sub - S	Gr. Rod	15' Rod
2	+10	A7559	4632	12.39	4.39
	+60		4622		
	+80		4612	14.39	4.39
3	+00		4602	15.39	4.39
	+20		4592		
	+40		4582	17.39	4.39
	+60		4572		
	+80		4562	19.39	4.39
A	+00		4552	20.39	5.39
	+25		45395	21.64	
3/28/18		67566.73			
				121	
	010	55.53		11.30	55.43
	+30		45370	18.3	
	+35		45345	2.08	
	+40		45320	2.33	
	+45		45295	2.58	

Sub Grade 12" below Finish Gr

Grade

19/18
Wilcomb last 25
Sub Road

455.53	45270	283
	45245	308
	45220	333
	45195	358
	45170	383
	45145	408

Jan 28 1918

Sections for Jan. Esti.

B.M. T. Rock
15M.
3'E-R14-15W

+	A1	-	E10
555	67.68	.	362.13

Sections on F 12'W + F line

same as last Esti

Section on ^{line} E-10'W.

5/16 00 = 12 line ^{minus to south} plus to North.

00	6.7	61.0
-6	4.4	63.3
-16 1/2 O.G.S.	2.6	65.1
+15.5	10.4	57.3
+33.5	12.1	55.6
+41	11.6	56.1
+47	12.5	55.2
+63	12.5	55.2
+75.5	9.6	58.1
+84	4.2	63.5
+96 Flump	3.2	64.5

✓

Bob Instra
William - B
Pat - C.

26

4/28/18

Jan Esti

to 2A - E/e

36768

27

on E line

E17				
0+00			9.8	57.9
-3			9.7	58.0
-3			7.5	60.2
-8			4.6	63.1
-10.5			4.4	63.3
-10.5 m	old R. bed. Rock Shoulder		2.6	65.1
+3			10.1	57.6
+5			12.4	55.3
+8			13.3	54.4
T.P. Rock	005	55.40	12.33	55.35
+17			3.8	52.6
+14		✓	3.3	52.1

1/28/18

E ligo H - K10
5540

+185

46 50.8

+24

74 480

+34

95 45.9

+43

109 44.5

+54

84 470

+70

68 486

+75

46 50.8

+86.5

67.68 12.3 55.4

+93

67.68 9.6 58.1

+97.5 Floma S side

67.68 3.6 64.1

✓

28

1/28/18

Jon Estli

- AS + E10

29

367.68

E12-7'E

00

7'E of E line

00

11.4

56.3

-3.5

11.0

56.7

-3.5

10.0

57.7

-5

8.5

59.2

-5

5.5

62.2

-10

6.1

61.6

-10.5

4.0

63.7

-12

3.6

64.1

-13.5 Surface

1.1

66.6

+4.5

12.7

55.0

+0.5

14.7

53.0

+9

55.4

3.2

52.2

+11

5.5

49.9

+23

10.2

45.2

+42

14.9

40.5

1/28/18.

Jon Estli

30

Eliza 7' East

+ 51		55.40	13.7	41.7
+ 64			9.6	45.8
+ 64			8.3	47.1
+ 70			9.0	46.4
+ 75			8.0	47.4

+ 90

		367.68	14.0	53.7
--	--	--------	------	------

+ 985 Flume

		367.68	7.2	60.5
--	--	--------	-----	------

✓

1/28/18

JON ESTI

- H.I. + E/c

367.68

D tie 10' West.

31

-3	16.3	51.4
-3	11.8	55.9
-8.5	9.1	58.6
-11.0	7.0	60.7
-11.0	5.6	62.1
-14.	3.6	64.3
-17	2.4	65.3
-17.9 Surface	0.8	66.9
	<u>55.40</u>	
0+00	5.8	49.6
+04	6.9	48.5
+07	10.8	44.6
+14	14.5	42.9
TP Rock.	0.03	44.50
	10.93	44.47
TBM on plank against Concrete	3.07	41.43

E/c from Tron. Book #1 Page 63 (347.68) P
in Error.

1/28/15

Jon Esli
D. line 10' W

E/c

32

+25	44.50	5.6	28.9
+33	44.50	8.0	36.5
+40	44.50	9.0	35.5
+44	44.50	7.4	37.1
+51	44.50	6.1	38.4
+52	44.50	1.8	42.7

+61	44.5	2.0	44.5
+62	55.4	10.0	45.4
	55.4	10.0	45.4

Check

44.50

+63	55.4	8.5	46.9
-----	------	-----	------

1146

559.3

.0.3

44.47

+70	55.4	9.0	46.4
-----	------	-----	------

0.58

55.35

+73	55.4	6.0	49.4
-----	------	-----	------

TRM Top Rock

1.33

(54.65)

54.60

+77	55.4	5.0	50.4
-----	------	-----	------

+81	55.4	6.0	49.4
-----	------	-----	------

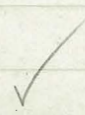
+83	67.68	14.5	53.2
-----	-------	------	------

+86	67.68	13.5	54.2
-----	-------	------	------

+86	67.68	14.6	53.1
-----	-------	------	------

+93	67.68	12.8	54.9
-----	-------	------	------

+995 Flumg	67.68	6.4	61.3
------------	-------	-----	------



1/28/18

Jan Esti.

+ 247

67.68

210

33

D. line

-7		122	555
-10		96	581
-16.5		87	590
-16.5		0.3	674
-2	<u>554</u>	41	513
-1	554	82	472
00	554	82	472
+3	554	107	447
+8	554	110	444
+14	<u>554</u>	140	410
+18	445	50	395
+22	445	52	393
+27	445	74	371
+35	445	82	363
+41	445	84	361
+42	445	74	371

1/28/18

Jan. Esti.

"D" 100

241 - 510

34

+51 44.50 7.7 36.8

+59 44.5 5.6 38.9

+67 55.4 11.0 44.4

+67 55.4 12.7 42.7

+69.5 55.4 11.3 44.1

+75 55.4 6.2 49.2

+77.5 55.4 4.6 50.8

+80 55.4 9.6 50.8

+ 80 67.68 14.0 53.7

+ 85 67.68 13.3 54.4

+ 90 67.68 12.0 55.7

+ 94 67.68 10.5 57.2

+ 94 67.68 8.3 59.4

+ 99 Flumo 67.68 5.1 62.6

1/28/18

Jon Estli

+ Hi.
367.68

- 210

35

D line 11' East.

-6		9.9	57.8
-6		16.6	51.1
-10		8.4	58.3
-17		4.3	63.4
-17	6.3	4.3	68.0
-6		<u>55.4</u>	4.4
			51.0
00		5.5	49.9
+2		5.5	49.9
+2		7.9	47.5
+12		<u>55.4</u>	13.8
			42.5
+34		44.5	6.6
			37.9
+31.5		44.5	7.0
			37.5
+31.5		40.5	4.8
			39.7
+37		44.5	7.2
			37.3
+42		44.5	8.3
			36.2
+50	✓	44.5	6.0
			38.5

1/28/18

Jon Esti

+ 21 - 210

D line 11' East

+52 445 56 38.9

+61 5540 133 42.1

+67 5540 66 48.8

+69 5540 39 51.5

+75 554 3.1 52.3

+79 554 1.7 53.7

+80 554 3.5 51.9

+81 554 3.5 51.9

+82.5 67.68 13.0 54.7

+92 67.68 12.3 55.4

+93 67.68 8.0 59.7

X 95 67.68 7.0 60.7

1+00 Flume 67.68 5.2 62.5



1/28/18. Jan. Esti.

37

Bm
SE BU-SW

	+ Ht.	-	Elc
	397	66.10	362.13

C Line

00		5.4	60.7
-15		1.2	64.9
+17	95: Rock Ledge	+2.0	68.1
+15		7.8	58.3
+21		6.6	59.5
+46		5.3	60.8
+66		7.0	59.1
+88		7.2	58.9
+95		6.8	59.3
+100	Flume	5.5	60.6

Line of Con on Flume 15' W of C. line
 H. C-12- " " 9.5 W of C.L.

B Line

00	66.10	7.3	58.8
-10		7.2	58.9
-17		5.2	60.9

1/28/18

Jan Esti

B + Ligo

+ F12

-27	GL	6610	+05	66.6
+10			62	59.9
+15			24	63.7
+21			1.3	64.8
+31			1.5	64.6
+38			29	63.2
+44			5.5	60.6
+43			6.5	59.6
+52			7.6	58.5
+68			7.8	58.3
+85			5.9	60.2
+101	F/0 mo		5.9	60.2

A" Ligo

00.		6610	85	57.6
-11			55	60.6
-19	GS	✓	1.0	65.1

1/28/18

Jan Est'.

A Line

+06.	66.10	73	588
+12		3.1	63.0
+23		1.2	64.9
+33		1.7	64.4
+42		8.4	57.7
+77		86	57.5
+88		6.3	59.8
+94 Flume		2.2	63.9

"M" Line

1712.			
00 on Dump.	66.1	00	66.1
+08		3.5	62.6
+19		0.7	65.4
+32		0.7	65.4
+46		86	57.5
+78		78	58.3
+90 Flume		20	64.1

1/28/18

Jan Esti.

H Ligo

6610

510

40

00 on Dump about

+5 71.1

+11 1.9 64.2

+16 00 66.1

+33 0.7 65.4

+47 8.4 57.7

+76 7.6 58.5

+87 Flood 20 64.1

4.75 70.37 0.18 65.62

0 Line

70.37

+07 50 65.4

+10 40 66.4

+39 60 64.4

+49 11.7 58.7

+81 11.5 58.9

1/28/17

Jon + Estli.

"O" Line

C10

Excavation Yardage Jan. 1918.

End Area	Cu Yds.	End Area	Cu. Yds.
Class 1	Class 1	Class 2	Class 2

+91

7837 57 64.7

F line 12N

0.0

91.8

+97 Flume

50 65.4

F line

413.0

345.8

E line 10W

834.0

452.3

E line

1610.0

12.0

00

34 67.0

E line 7E

1874.0

131.0

18.5

+39

40 66.4

D line 10W

1790.0

542.8

476.0

89.9

+49

52 65.2

D line

1623.0

632.0

800.0

236.3

+58

30 67.4

D line 11E

1494.0

635.0

754.0

316.5

+66

62 64.2

C line 12W

1574.0

698.0

000

28.0

+83

63 64.1

C line

735.0

318.5

Total cu. yds

Class 2

689.2

+87

48 65.6

B line

672.0

651.4

612.0

1400 Flume

4.3 66.1

A line

650.0

497.7

Class 1 - 1710.7

Class 2 - 689.2

M line

425.0

369.4

2399.9

N line

373.0

332.9

Total Cu yds

O line

346.0

186.1

moved during

P line

56.0

January 1918.

Total Cu. Yds. to Feb 1 Class 1 6232.9

" " " Jan 1 " 4522.2

" " " during Jan " 1710.7

See X Sections
Sheet #4

42

Feb Estimate

Willcoomb Instr Notes 2/26/18
 Bub-Road
 Y.W. Choin 43

	+	St	-	E/c
510				
T.P.	8.95	360.54		351.59
E-12 00 ✓		<u>12 L 170</u>	3.4	57.1
" -4' E ✓		E12 = 00	3.7	56.8
-5' E ✓		Running East.	4.5	56.0
+ 9.5 ✓			21.5	39.0
+ 12 ✓			21.5	39.0
+ 14 ✓			24.5	36.0
+ 17 ✓			24.5	36.0
+ 19 ✓			20.0	40.5
+ 25 ✓			20.0	40.5
+ 30 ✓			20.0	40.5
+ 35 ✓			18.7	41.8
+ 39.5 ✓			17.2	43.3
+ 40.8 ✓			17.2	43.3
+ 46.7 ✓			10.2	50.3
+ 43 ✓			3.5	57.0
+ 43 ✓			2.0	58.5

Hub E 15 - 1.32 W

E12 = 0.00

2/26/18

44

510	Feb Est.			
	+	St. I.	-	E10
		360.54		

44 ✓ 1.2 59.3

50 ✓ 0.7 59.8

38	<u>11 Ligo</u>	0.6	59.9	E-11 = 0.0
50				

30 ✓ 5.3 55.2

22 ✓ 4.7 55.8

18 ✓ 6.4 54.1

12 ✓ 8.1 52.4

11.5 ✓ 5.3 55.2

10 ✓ 4.7 55.8

A 0.27 360.27 E-11 14.5 = 0.0

12.40 372.67

32 ✓ 10.9 61.8 E-11 = 0.0

38 ✓ 7.9 64.8

40 ✓ 5.8 66.9

48 ✓ 1.1 71.6

50 ✓ 1.2 71.5 ✓

578

Feb Esti

+ Sta. - E/c

372.67

+ 33 ✓ 11 Ligo 145 1.9 70.8 E11 + 145 = 0.0

32 ✓ 2.5 70.2

28 ✓ 6.3 66.4

26 ✓ 9.1 63.6

25 ✓ 10.5 62.2

20 ✓ 11.1 61.6

14 ✓ 9.1 63.6

Δ 0.98 371.69

12.55 384.24

39 ✓ 11 Ligo 145. 3.8 80.4 E11 + 145 = 0.0

50 ✓ 5.0 79.2

4 ✓ 11 Ligo 12.0 72.2 E11 = 0.0

2 ✓ 10.3 73.9

E11
0.0 ✓ 9.77 374.47E11 - 14.5
0.0 ✓ 11 Ligo 145 ✓ 2.7 81.5 E11 + 145 = 0.0

2/26/15

45

2/16/18

46

370

Feb Esti.

+ H.I.

-

E10

384.24

11 Lige 145

5 ✓

4.5

79.7

9 ✓

4.4

79.8

10.82

10 Lige

50 ✓

1.9

82.3

E10 = 0.0

C10

58 ✓

3.8

80.4

70 ✓

4.0

80.2

75 ✓

4.2

80.0

B10

90 ✓

5.7

78.5

100 ✓

3.8

80.4

A10

1.63

382.61

10.82 393.43

0.0 ✓

10 Lige

3.37

390.06

E10 = 0.0

5 ✓

4.5

88.9

10 ✓

5.8

87.6

16 ✓

4.6

88.8

25 ✓

6.2

87.2

Δ

0.33

393.10

Plug in
Old Masonry
B.M.

Feb Esti.

+ H.I. - 439.11

0.20 439.31

0.0	✓	<u>7 Ligo</u>	9.2	430.1
3.0	✓		9.8	295
10.	✓		9.0	30.3
14	✓		7.6	31.7
23	✓		10.6	28.7
28	✓		12.2	27.1
38	✓		14.9	24.4
44	✓		16.2	23.1
54	✓		20.2	19.1
54	✓		16.2	23.1
58	✓		15.4	25.9
70	✓		17.7	21.6
75	✓		14.1	25.2
77	✓		13.2	26.1
78	✓		5.7	33.6
83	✓	✓	5.4	33.9

Jill Cornish ^{instr} Photos.
Bob - Road.
Y.W. Choung

2/27/28

47

	Fob Esti.		Elc
570	+ 7.1	-	
100	439.31		
B 7-11E 7		2.7	366
88 ✓			B 7-12E
A		10.74	428.57
	0.85		429.42
A		11.07	418.35
	1.21		419.56
B 8-15E			
90 Circuits ✓		4.0	156
B 8-15E ✓			
90 Circuits		12.6	407.0
77 ✓		16.6	030
66 ✓		18.3	013
53 ✓		19.2	400.4
34 ✓		21.4	398.2
31 ✓		16.8	402.8
25 ✓		16.0	403.6
0 ✓		1.7	418.2
5 ✓		1.6	418.0
18 ✓		5.0	414.6

2/27/15 48

✓

5to

Feb. Esti.
+ JH. - E/c

2/27/18

49

10.89 400.95 390.06

T.B.M.

7.88 400.98 393.10

0.0 ✓ 0 401.00 E9 = 0.0

13 ✓ 3.4 397.6

18 ✓ 5.3 95.7

90 ✓ 9.4 91.6

85 ✓ 10.1 90.9

80 ✓ 12.1 89.9

73 ✓ 18.5 82.5

58 ✓ 17.9 83.1

44 ✓ 16.8 84.2

38 ✓ 15.8 85.2

31 ✓ 15.4 85.6

✓

D

Feb Esti.
 Stationing + sh. - E10
 On Rock T.P. 11.87 363.83 351.96

B 15 + 75 6.3 57.5
 94 6.9 56.9
 100 4.9 58.9
 67 5.1 58.7
 55 5.5 58.3

A 15 + 75 8.6 55.2
 - 78 8.5 55.3
 - 84 4.9 58.9
 - 94 4.0 59.8
 + 61 6.6 57.2

M 15 75 9.2 54.6
 79 8.9 54.9
 83 6.4 57.4
 83 3.4 60.4
 90 1.2 62.6
 93 9.3 54.5

2/27/18 50

B12 = 0.0

Bottom of Flume 5' higher

A15 A-12 = 0.0

Flume 5.4' higher to bottom of flume

M12 = 0.0

Flume 1.2' higher to bottom

2/27/18

51

Feb Est.

Station	+	Sta.	-	Ele
	✓	363.83	11.0	528
N15	✓		8.9	549
	✓		8.5	553
	✓		7.0	568
	✓		3.0	608
	✓		0.6	632
	✓		9.7	541
O15	✓		7.7	561
	✓		7.6	562
	✓		4.6	592
	✓		7.0	568
Δ			4.75	359.08
		10.34369.42		
O	✓		5.0	644
	✓		4.2	652
P	✓		3.7	657
P	✓		4.7	64.7

N12 = 0.0

Flume 0.4' higher bottom of Flume -

O12 = 0.0

O12 = 0.0

Flume

Flume P12 = 0.0

2/27/18

Feb. Esti:

Summary Feb Estimate

52

Station	+	241	-	E=10	Sections	End Area	Cu. Yds	Class 1	Class 1
A	82	✓	3694 ^r	8.3	611	C line 12' W	698	3184	
P15	75	✓		9.0	604	C line	735	680.1	
	56	✓		8.6	608	B line	734	693.1	Class 1
	50	✓		3.4	660	A line	763	626.0	
	25	✓		3.1	663	M line	589	533.8	
P12	0	✓		2.9	665	N line	564	461.1	
D12	0	✓		1.6	678	O line	432	278.2	
	5	✓		3.6	658	P line	169	78.2	
	32	✓		3.8	656	Q line	00		
	41	✓		6.6	628				Class 1 Downstream from 12' W of C line = 3668.9
	48	✓		10.3	591				" " Upstream from 12' W of C line Jan Feb = 3264.9
	50	✓		14.8	546	7 line 15'	00		Total Class 1 to Date = 6933.8
IV 1	13	✓		4.7	647	7 line	662	878.7	" " Allowed Feb = 6870.0
	15	✓		3.4	660	8 line	1236	686.7	Balance due = 638
	30	✓		3.9	655	8 line 15' N	1236	357.2	
	40	✓		10.1	593	9 line	693	320.8	
	44	✓		14.2	552	10 line	00		
								2427.4	Cont. next page

Station	Feb Esti			E/c	Sections	2/27/18			
	+	HA	-			Class 4	Class 4	Class 2	Class 2
						End Area	Cu Yds	End Area	Cu Yds
53	✓	369.42	16.7	52.7	10" line	25' 00	2427.4	Brought Forward	00
M 12=00	13	✓	5.8	63.6	11" line	14.5	334	68	13.9
18	✓		4.3	65.1	11" line	14'	298	164.0	99.7
32	✓		4.0	65.4	12" line	25'	00	138.0	480.0
38	✓		6.6	62.8	Class 4			720	
40	✓		12.7	56.7	Feb Sections		2797.4	From Topog =	1294.6
52	✓		14.4	55.0	Class 4 Nov Estimate		22.0	Due from Jan	42.6
55	✓		18.2	51.2	Class 4 To Date		2819.4	Feb Estimate Class 2 =	1930.8
A 12=00	0.0	✓	11.8	57.6	Allowed in Feb Esti		2813.0	Balance Due	6.4 Cu Yds
5	✓		10.9	58.5	Concrete				190 Cu Yds
11	✓		6.4	63.0	Core drill holes				118 ft
21	✓		4.7	64.7					
31	✓		4.8	64.6					
40	✓		11.7	57.7					
45	✓		13.9	55.5					

3/26/18 March Estimate

Dub
Y-zw.

54

Sta + M - E/c

6 line = 0.0 End Area.

5 M 86.3 447.74 43911

6 line 12' North

+33 90 38.7

+35 123 35.4

+40 150 32.7

+48 110 36.7

+50 107 37.0

+58 123 35.4

+61 81 39.6

+64 72 40.5

+70 67 41.0

+77 64 41.3

+81 31 44.6

+82 45 48.2

+85 Top Rock ✓ 15 49.2

3/16

19 March 1951

Pat
Dob
y.w.

55

5/2

+ 51 - 510

TP

$$\begin{array}{r} 1100 \\ 1.3 \quad 43341 \end{array}$$
 43211

0+18

30 30.4

+24

31 30.3

+32

7.3 26.1

+31.5

17.5 18.9

+33.5

22.5 10.9

+40

79.0 14.4

+47

18.0 15.4

+61

18.8 14.6

+81

13.0 20.4

+84

3.0 30.4

+86

+3.0 36.4

Com+88

+4.2 37.6

✓

3/46

March Esti

56

216

+ A

- E10

8 Line

43341

0+18

170 164

E 10

88 9887

9007

89

+90

00 989

+83

30 959

+74

74 915

+67

120 869

+61

130 859

+49

122 867

+31

61 928

9 Line

+965

102 887

+95

122 867

+86

146 843

3/16

5/9

0 + 24 - E/6

9/100

9887

+65

15.3 83.6

+42

12.8 86.1

+32

11.3 87.6

+15

1.9 97.0

10 line

E 10

3.0 93.07

90.07

+08

4.8 88.3

+13

12.4 80.7

+16

16.5 76.6

+25

17.0 76.1

+27

15.5 77.6

+44

19.5 73.6

+57

16.7 76.4

+72

✓

14.6 78.5

3/16

March Esti

58

Sta

+	24	-	Flc
20	line		
	9307		

+73		13.0	80.1
+90		14.4	78.7
+100		12.7	80.4

11 line

E 11	2.9	77.36	74.46
+04		5.5	71.9
+09		19.0	58.4
+19		19.0	58.4
+36		13.0	64.4
+40		11.0	66.4
+44		10.5	66.9
+46		6.7	70.7
+49		5.4	72.0
+60		5.5	71.9
+88	✓	9.8	67.6
+96, +00		4.0	73.4
		3.6	73.8

3/16	March Esti		
51a	+ 24	-	210
B.m. Rock.	640	68.53	36213

Q. line.

Q12	32	65.3
+14	35	65.0
+19	11	67.4
+25	13	67.2
+30	32	65.3
+37	28	65.7
+40	17	66.8
+51	12	67.3
+64	53	63.2
+79	54	63.1
+86	29	65.6
+91	30	65.5

March Esti

60

Sta

+ H1

- 510

Q Life

+98 Flume

6853

48

637

P Life

+99 Flume

54

631

+93

18

667

+74

96

589

+59

97

588

+42

30

655

+29

41

644

+24

13

672

+14

14

671

+11

36

649

+07

17

668

+00

15

670

✓

3/16 March Esti.

Sta + OH - E10
6853

O Line

012-02 07 67.8

+06 2.1 66.4

+20 1.6 66.9

+28 10.0 58.5

+84 10.0 58.5

+96 Phone 5.1 63.4

N Line

+13 2.1 66.4

+28 2.0 66.5

+13 9.2 59.3

+49 11.0 57.5

Level across to Rock face.

2/26

March Esti

Sta

+ 21 - E10

6853

M Line

00	08	67.7
+05	08	67.7
+10	13	64.2
+16	13	64.2
+21	25	66.0
+28	29	65.6
+33	25	61.0
+ 47	11.0	57.5

Level across to Rock

A Line

00	90	59.5
+30	34	65.1
+38	34	65.1
+45	105	58.0

Level across to flint.

3/26	March Esti.		
Sta	+ 34	-	R10
	B Line		
00	6853	90	595
+04		85	600
+7		66	619
+16		50	635
+21		31	654
+48		33	652
+37		61	624
+A6		102	58.3
+72		102	58.3
+95 Plume	✓	81	604

3/26 March Esti.
Sta + Sta - Elevation
C-17 2.0 77.61 75.61

II line = 0+00 running
toward East

End Area 17 line = 00.

17 line - 2' South

+13	3.0	74.6
+15.	12.0	65.6
+18	12.0	65.6
+25	5.7	71.9

17 line 10' South

C-17	00	75.61	75.61
+0.7	1.7	73.9	
+0.9	10.7	64.9	
+2.2	11.2	64.4	
+3.5	7.0	68.6	
+3.8	4.0	71.6	

3/26	Morch	Estimate		
Sta	+	sh	-	E10
	17	line	20	South
C-17	-05	7511		7561
00			94	657
+08			95	656
+13			102	649
+19			102	649
+25			115	636

3/30/18 Summary March Estimate

Section	End Area Class 1	Co Yds Class 1	Relief System Face of old Quarry Feb Above
C line 12W	698	318.4	Allowed in February = 6870.0 Allowed in March = 630.0 (640 Co Yds)
C" line	735	680.5	
B" "	735	653.2	
A" "	676	552.8	
M" "	518	456.5	
N" "	468	455.6	
O" "	516	353.1	
P" "	751	123.6	
Q" "	00		
		3595.7	

Section	End Area Class 4	End Area Class 2	Co Yds Class 2	Co Yds Class 2
G" line	00		77.5	
G" line 12W	214		310.1	
7" line	1074		1388.9	
8" "	1926		1252.3	
9" "	779		556.5	
10" "	423	00	338.4	75
11" "	308	198		

Section on	End Area Class 4	Co Yds Class 4	End Area Class 2	Co Yds Class 2
12 line	00	142.6	720	425
		4036.3	60 Yds	500 Co Yds
17" line	00	2.4	00	0.4
17" line 25	65	25.2	12	6.5
17" line 105	105	19.4	32	15.9
17" line 205	00		54	
		47.0		22.8
		Carried from above 4036.3		
		Class 4 - Not Estimate = 22.0		
		" " Allowed in March = 105.0		

Class 1

Relief System Face of old Quarry Feb = 3668.9
 " " " " " " " " = 3264.9
 Total Class 1 & 2 Feb = 6933.8
 Allowed in February = 6870.0
 Allowed in March = 630.0
 (640 Co Yds)

Class 2 March Sections 5228
 " " Topog Feb Estimate 12946
 March Sections 18174

Class 2 Allowed in Feb 19310
 March Excavation 228
 Allowed in March 19530

786 Co Yds Concrete
 138.3 lin ft Core Drill Holes

See Cross Sections Sheet # 6

4/2/18

Sub Level
7-w- Rod. 67

Sections for Estimate
of Excavation of old
Channel to Outlet Tower

Sta	+	ft	-	ft	ft
B.M. below old diverting dam	162	379.21			577.59
" Rock TP	11.96	91.00	0.17		79.04
" Rock TP	11.94	402.34	0.60		90.40
" Rock TP	887	407.96	3.25		99.09
T.B.M. R.P. 0+00 E Tunnel c.o. line of Outlet Tunnel			185		406.11

Sta	Lt.	ft	ft	ft	ft	ft	ft	ft	ft	
0+00		13.7	93.3	00						
"		67	98	48	13.2	11.9	11.0	92	5.3	
"		018	982	962	95.8	961	920	98.8	2.7	
0+50		13.0	60	20	00	20	20	80	15.0	
"		5.6	67	102	110	11.9	11.9	104	92	4.4
"		05.2	018	973	920	961	961	976	98.8	03.6
1+00		0.80	130	50	20	20	20	50	13.0	
"									17	
"		00	84	99	110	110			05	
"		080	996	981	970	970			07.5	
1+50		24.0	130	40	30	00			17.0	
✓		635	414.06		025				407.71	

Copied
 Book #11
 Page 21

4/2/18 Old Excavation of Approach
to outlet Tunnel

68

Sta Lt + Lt - Etc

	4.2	15.2	15.6	16.0	17.0	17.0	16.0	13.0	6.0
"	09.7	98.9	98.5	98.1	97.1	97.1	98.1	01.1	8.1
"	2+00	28.0	13.0	6.0	4.0	4.0	2.0	0.0	6.0

	2.7	6.6	13.3	15.8	15.8	10.5	5.3	0.8	0.0
"	11.4	07.5	00.8	98.3	98.3	03.6	8.8	13.3	14.1
"	2+50	29.0	22.0	12.0	4.0	0.0	9.0	19.0	21.0

TP
Bolt in 3x8 0.01 406.18 789 406.17

Etc Flowline 10.17 396.01

	2.1	1.5	11.0	11.0	11.0	3.0	2.2
"	14.5	04.7	95.2	95.2	95.2	03.2	16.4
"	2+84	25.0	10.0	5.0	0.0	1.5	4.0

12.38 18.55 406.17

	2.6	1.7	1.9
"	16.0	16.9	16.7
"	2+97	25.0	0.0

TRM RP 0+00. 12.45 406.10

Plotted & Computed
by MRB 4/2/18

Check book in
page 21

April Excavation

4/29/18

Pat
Dub
E.M.

69

Stn	+	Stn	-	E10
E 10				
B.M.	36	93.67		90.07
		<u>90 Line</u>		
E 9-00				
+17			+3.3	97.0
+25			5.6	88.1
+30			7.1	86.6
+31			10.3	83.4
+36			12.8	80.9
+45			14.0	79.7
+53			17.0	76.7
+62			17.8	75.9
+68			17.8	75.9
+75			11.6	82.1
+83			9.4	84.3
+90			8.3	85.4
+96 Steel			6.2	87.5

Add to Excavation

South of 9 line 50 yds
Class 4

Apr 27/18 April. Estimate

70

slā + A - Ele

E 11 750 8196 7446

E 10 = 0400. 10 lye

+12 +60 880

+14 156 664

+32 134 686

+36 112 708

+72 130 690

+77 60 760

+88 25 795

1+00 10 810

83

✓

4/29/18 April Estimote

5/10 + 21 - Ele

11 1/20

0	1+00	81.96	83	73.66
	+94		10.0	720
	+89		13.0	680
	+78.		12.5	695
	+67		11.0	710
	+56		13.0	690
	+39		21.0	61.0
	+21		25.0	57.0
	+21 Conarts.	-	15.7	66.3
	+6	-	15.7	66.3
	+4		9.0	73.0

0+00 = 511

✓

4/29/18 April Estimato

72

Sta	+ A	-	Elev
B ² M	42	366.3	362.13
B ¹ V 0+00	13	64	599
+49	10 10	42	621
+56		73	59.0
+97 Rock		10.3	56.0
+101 Flone		7.0	59.3

A Lige

A12=00	366.3	6.9	59.4
+06		3.8	62.5
+15		5.4	60.9
+36		4.7	61.6
+44		7.0	57.3
+81		10.2	56.1
+97 Flone		5.0	61.3

✓

4/29/18 April Estimate

73

Sta + Alt - Elev

M Ligo

M 12-0+00 366.3

+09		1.4	64.9
+28		1.4	64.9
+41		8.0	58.3
+45		12.6	53.7
+54	25	15.0	51.3
+73		11.2	55.1
+88	Flame. Level into Rock 1/4 to 1/2 on	10.7	55.6

M Ligo

+70	26	+1	67.3
+76		0.0	66.3
+58		15.0	51.3
+70		11.2	55.1
+86	Flame. 1/4 to 1 Slope. 2' to Rock	13.0	53.3

✓

4/29/13

April Estimate

74

5/0

+ 24 - E10

366.3

O Lige

O12 = 0 + 00.

+30

+20 68.3

+50

+10.1 56.2

+56

+10.2 56.1

+61

14.0 52.3

+74

11.0 55.3

+81

12.2 54.1

+96 Plume

3' to Rock

1/4 to 1

10.0 55.3

P Lige

+30

00 66.3

+44

3.3 63.0

+55

9.0 57.3

+60

12.8 53.5

+74

9.5 56.8

+84

✓

6.4 59.9

4/29/18. April Estimate

5/01 + 21 - Ele

P Ligo.

+99 Flone. ^{vert to better} of Flone. 50 61.3

Q Ligo

Q12=00 366.3

+30 +20 68.3

+47 +10 67.3

+63 8.7 57.6

+72 5.6 60.7

+80 3.7 62.6

+88 0.0 66.3

+96 Flone. 2.0 64.3

✓

Summary April Estimate

Section	End Area Class 1	Cu Yds Class 1	Total Class 1 East of C line 13' W - 4521.6 Final Topog Below Contour 366 - 3109.9 " Above Contour 366 - 75.5 Total Class 1 to date 7907.0
C line 12' W	698	318.4	
C line	735	730.5	
B line	843	762.5	
A line	804	692.6	
M line	692	617.1	
H line	641	599.5	
O "	654	490.8	
P "	406	249.1	
Q "	132	61.1	
R "	00	61.1	

Section	End Area Class 4	Cu Yds Class 4	End Area Class 2	Cu Yds Class 2
G line	00	47.5		
G line 12' W	214	310.0		
F line	1074	1388.9		
E line	1926	1403.2		
D line	1105	898.1		
D "	835	543.1	2	149.1
D "	338		320	

17 to 20
See sections
Sheet # 7

Section of	End Area Class 4	Cu Yds Class 4	End Area Class 2	Cu Yds Class 2
12' line	00	156.5	720	481.5
Additional Class 4 Estimated between 889 lines		500		
17 line	00	2.4	00	0.4
17 line 2' 3/4	65	25.2	10	3.6
17 line 10.5	105	19.4	14	7.2
17 line 20.5	00		25	
Class 4 Total Sections		4844.4		
" " Nov Esti Old Concrete		22.0		
Total Class 4 to Date		4866.4		
Class 2 Total Sections From Final Topography Class 2			641.8	
Total Class 2 to Date			1436.0	

Section of	End Area	Cu Yds
C-12-W	236	136
D-11-E	13.1	7.66
D line	24.5	
Estimated Schedule 2 Class 4		50.0
Class 1 above Elev 366		

Summary April Estimate
Continued

Class 1 above Ele 366

77

Section of		End Area	Co Yds
"D" 10' W	10' ↑	13.0	6.94
"E" 7' E	8' ↓	33.7	6.92
"E" line	7' ↓	36.0	9.03
"E" 10' W	10' ↓	21.3	10.61
"F" line	15' ↓	36.5	16.06
"G" line	25' ↓	00	16.90

Total Class 1
Above Contour 366 - 75.48 Co Yds.

Estimates
Continued Book #11

78

List of B.M's

U.S.G.S. X in Brass Cap in Boulder E End Dam 486.569

#1 Nail in Boulder 1/2 way down slope below W. End Spillway 440.24

#2 Nail in ledge 20' above Bottom Prow W Side ^{below #1} 401.22

#3 Bolt in Rock Ledge W Side Canyon 27' W. Core Wall 371.30

#4 Bolt in Flat Ledge W Side Canyon 50' ^{below old Diverting Dam} 377.59

#6 Rock West End Basin below Tool House 494.89

Reg Point Mark on Boulder in old Concrete

3' E of 314- ^{15 West} 15 North 362.13

Plug in Concrete Abutment old

Core Wall R.P. Pile 1470 near Shaft 439.11

R.P. Spike in Plug Upstream Face

old Masonry 337.23

Bolt in Rock Ledge 75' E of N End

#7 Diversion Dam to Replace #3 372.66

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1½ TO 1.

FOR SINGLE TRACK EMBANKMENT.

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

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