Estimates

11

FIELD BOOK

361

W101

Tables for Excavations and Embankments.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.

FOR SINGLE TRACK EXCAVATION.

	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	50.7	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 Julien A. Hall, M. Am. Soc. C. E.

FOR KEITH'S RAILROAD CURVE TABLES SEE END OF BOOK.

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5/30/18 Excavation May Estimate

Section from "E" line East.

"6" line = 0+00 End Area

"6" 12'N Same as March

"7" line " " "

"8" line

G 8.	9.22	24.73		415.51
Rock-00			5.5	19.2
+4			6.6	18.1
+5			13.2	11.8
+15			15.0	9.7

H.I. from 9 = 858

Use old Elevations excepting below

+68			0.5	85.4
+66			3.7	82.2
+54			3.7	82.2
+49			6.6	79.3
+41			2.0	83.9

✓

5/30/18

Proj. Estimate

Sta		+	Ht.	−	Ele.
		"9" line			
E 10		11.05	401.12		90.07
Hub E9	0+00			0.13	400.99
	+14			3.0	98.1
	+18			4.0	97.1
	+19			6.2	94.9
	+31			13.8	87.3
	+36			20.0	81.1
	—	—	—	—	—
E 11		11.40	85.86		74.46
	+48			11.3	74.6
	+57			16.8	69.1
	+68			16.0	69.9
	+73			9.6	76.3
	+82			7.8	78.1
	+95	Concrete		2.5	83.4
	+96	"		0.0	85.9

✓

2

5/30/18

Map Estimate

Sta	+ "10"	HI Line	−	Elev
BM.	1262	74.75		362.13
+15			8.6	66.2
+25			9.3	65.5
+30			12.0	62.8
+40			9.7	65.1
+44			10.3	64.5
+46			8.8	66.0
+57			8.1	66.7
+75			10.5	64.3
+82			9.0	65.8
+86			4.7	70.1
+90			4.2	70.6
TP. CHISLE	335	67.90	10.20	64.55

✓

5/30/18 Hoy Estimate

Sta	+	HI	−	Elev
		67.90		
	"11"	Inv		
+19			14.7	53.2
+22			13.8	54.1
+22.5			13.0	54.9
+31			14.8	53.1
+39			14.3	53.6
+47.5			11.5	56.4
+50			11.2	56.7
+53			7.1	60.8
+57.5			6.4	61.5
+66.5			6.5	61.4
+69			3.4	64.5
+74			4.0	63.9
+76			5.8	62.1
+80			6.0	61.9
+87			10.3	57.6
1+04			9.0	58.9
1+16			5.8	62.1
1+31			7.2	60.7
1+34			5.4	62.5
1+49	Ground Surface		1.1	66.8

5/30/18

Moy Estimate

Sta		+	HI	−	Ele
		12" Lige			
BM Plug in Masonry		11.80	49.03		337.23
+18.3	Bottom of Masonry			12.2	36.8
+19.8				10.3	38.7
+21.3				9.1	39.9
+27				8.9	40.1
+30.5				10.8	38.2
+32				10.8	38.2
+33.5				7.9	41.1
+41.0				6.0	43.0
+41.0				+ 1.5	50.5
+43.5				+ 2.0	51.0
BM		2.66	65.79		62.13
+43.5				7.4	58.4
+50 C12	Spike			6.04	59.75
+59				5.7	60.1
+60				7.3	58.5
+75				8.7	57.1
1+00				9.8	56.0
1+07				12.5	53.3
1+07			✓	13.5	52.3

5/30/18 Boy Estimate

Sta	+	Ht	−	Elev
		6.5.79		
	12"	high		
1+13			16.4	49.4
1+25			17.5	48.3
1+27			17.5	48.3
1+31			20.1	45.7
1+47			21.2	44.6
1+50			18.5	47.3
1+54			16.0	49.8
1+59			16.6	49.2
1+65			14.7	51.1
1+65			7.9	57.9
1+68			4.5	61.3
1+74			2.3	63.5
1+75			3.3	62.5
1+79	G. Surface		0.0	65.8

✓

Map Estimate

Sta		+	Alt	−	Elev
B.M.		3.18	65.31		62.13
		"C" line			
+08				56	59.7
+19				67	58.6
+27				60	59.3
+42				49	60.4
+49				57	59.6
+56				48	60.5
+64				55	59.8
+77				54	59.9
+82				68	58.5
+87				54	59.9
+95				73	58.0
+99	Flume.			68	58.5
1+04				18	63.5

5/30/18 May Estimate

5/9		+	31	−	210
		"B" line			
+00			65.31	8.2	57.1
+06				7.0	58.3
+11				7.7	57.6
+13				6.6	58.7
+21				6.5	58.8
+27				7.7	57.6
+30				7.7	57.6
+47				4.5	60.8
+49				4.8	60.5
+54				6.6	58.7
+76				8.5	56.8
+91				9.3	56.0
+97	Flume about 98			6.5	58.8
1+04				4.9	60.4
1+05				0.0	65.3
		"A" line			
+00				9.3	56.0
+10				9.2	56.1
+15				10.2	55.1
+40				9.7	55.6
+51				9.1	56.2
+63			✓	9.7	55.6

8

"A" 2' E = Face of old Masonry A. stream

5/30/18 Hoy Estimate

Sta		+	H.I.	−	Elev.
		"A"	Line		
			365.31		
+70				10.6	54.7
+83				10.7	54.6
+89				8.3	57.0
+94	Flume			8.3	57.0
+94				1.3	64.0
A Rock		11.3	53.84	17.60	52.71
		"M"	line	✓	
			53.84		
0+00				5.6	48.2
+04				6.5	47.3
+07				8.9	44.9
+12				9.3	44.5
+14				10.8	43.0
+14				11.4	42.4
+14				12.8	41.0
+15				13.0	40.8
+17				15.0	38.8
+25				17.3	36.5
+31				18.0	35.8
+36		✓		18.1	35.7

5/30/18 — 17 Day Estimate

Sta		+	HI	−	Elv
		"M" line			
			53.84		
+45				18.6	35.2
+50				15.5	38.3
+54				13.2	40.6
+67				12.9	40.9
+67				7.6	46.2
+69.5				6.3	47.5
+72				5.4	48.4
+79				7.2	46.6
+79				4.2	49.6
+87				3.6	50.2
+87				0.4	53.4
		Hand Level			
		11.3	61.5		50.2
+88				8.0	53.5
+88				6.9	54.6
+90	Flume			6.8	54.7
+92				7.0	54.5
+92				5.2	56.3
+95	N.S Flume			5.0	56.5
+95				3.0	58.5
+96				2.8	58.7
+97	✓			+8.2	69.7

5/30/18 NTOY Estimate

5/8		+	24	-	F10
		"	"		
		D hijo			
			5384		
00				6.5	47.3
+3				11.0	42.8
+8				11.3	42.5
+23				16.3	37.5
+33				16.4	37.4
+36				17.0	36.8
+44				17.5	36.3
+51				17.2	36.6
+51				14.7	39.1
+52				13.6	40.2
+54				13.6	40.2
+55				8.5	45.3
+60				4.4	49.4
+62				5.7	48.1
+72				5.6	48.2
+72.5				7.3	46.5
+85				8.0	45.8
286				5.0	48.8
+89	Flume 5.5			3.8	50.0
+91				+ 7.2	61.0
+94	Bottom of Flume Stringers			+ 9.2	63.0
			✓		

5/20/18 May Estimate

Sta		+	24	−	Elv
− 2 = 9.5		"0" Line			
0+00			35384	+ 8.7	625
0+5				+04.0	578
0+32				6.0	47.8
+33				10.1	43.7
+43				13.0	40.8
+54				15.0	38.8
+65				12.1	41.7
+68				12.6	41.2
+75				10.5	43.3
+78				11.2	42.2
+83				9.2	44.6
+84				4.2	49.6
+88				3.3	50.5
+93	+96 = Plume			2.7	51.1
+95				+ 2.2	56.0
1+00	Rt. Side Plume			+ 9.2	63.0

5/30/18 Day Estimate

Sta		+	H.I.	−	Elev
B.M.		6.92	369.05		362.13
		"F" line			
00				7.0	67.1
+8				2.0	67.1
+10				5.3	63.8
+39				5.3	63.8
+42				5.3	63.8
+53				11.8	57.3
+64				17.0	52.1
+70				15.5	53.6
+71				18.5	50.6
+80				17.0	52.1
+92				10.0	59.1
+99	Flume			7.3	61.8
1+04				5.0	64.1
1+10				2.0	67.1
		Q Line			
+49			369.05	2.5	66.6
+50				5.3	63.8
+66				15.8	53.3
+72				12.8	56.3
+73				9.0	60.1
+76				8.0	61.1

5/30/18 Day Estimate

STA		+	H1	−	E1c
+83			36905	6.2	62.9
+87				3.8	65.3
+94				3.5	65.6
+98	Flume	Bottom	Stringer	5.2	63.9
1+03				5.8	63.3
1+04				3.5	65.6

✓

73 Boulders
30 Below Section

Deduct 108 cu yds from Class 1 and add to Class V.

6/1/18 Excavation Spillway May

Schedule 2 Class 4.

2+90 = 0+00 South wall = 0+00.

3+00.

5.6	6.8	7.0	7.0	6.5	5.6		5.6
00	0.9	1.4	1.4	0.9	0.0		
27.5	27	26	13.9	7.8	9.3		00

3+40

5.6	9.0	10.0	10.0	11.0	10.8	9.6	9.8	9.3	9.4	5.6	5.6
00	3.4	4.4	4.7	5.4	5.2	4.0	4.2	3.7	3.8	0.0	00
29.0	36.0	33.0	31.0	19.0	16.0	14.0	12.0	10.0	7.0	1.0	00

3+80

5.6	11.4	13.3	13.5	12.6	12.6	5.6
00	5.8	7.7	7.9	7.0	7.0	00
30.0	27.0	24.0	18.0	14.0	6.0	0.0

3+90

5.6	10.2	13.0	15.0	11.8	11.0		5.6
00	4.6	7.4	9.4	6.2	5.4		00
30.0	27.0	22.0	15.0	13.0	6.0		

4+00 = Zero Steam Shovel Cut.

Add 50 yds. Spillway

Willcomb Bub. 15

May Estimate

End Area - Cu. yds.

0.0

23.7 4.4

91.1

99.3

108.8

18.5

6.9

168.1

31.1

00

400.3 Cu yds.

Schedule 2 Class 4 -

50.0

Total May Est. 450.3 Cu yds.

Schedule 2 Class 4 Sections 400.3
Additional Class 4 50.0
Schedule 2 Class 4 Total to Date 450.3

June 1

Summary May Estimate

Class 1

Section on	Dist.	End Area	Cu. Yds.
C line 12' W		698	
	12'		334.7
"C" line		808	
	25'		816.2
"B" line		955	
	25'		936.1
"A" line		1067	
	2'		79.0
"A" line 2' E.		1067	
	00'		
"A" line 2' E		2376	
	23'		2024.0
"M" line		2376	
	25'		2150.0
"N" line		2268	
	25'		1896.8
"O" line		1829	
	25'		1130.1
"P" line		612	
	25'		403.7
"Q" line		260	
	25'		120.4
"R" line		00	

Class 1 Sections = 9891.0
Class 1 From Topog = 3109.9
Class 1 Above Contour 366 = 75.5
Total = 13076.4
Deduct + Add to Class 2 Boulders 103.0
Total Class 1 to Date 12973.4 Cu Yds

See Xsection Sheet #8

Section on	Dist between Sections	Class A End Area	Class A Cu Yds	Class 2 End Area	Class 2 Cu. Yds
"6" line		00			
	12'		47.5		
"6" line 12 N		214			
	13'		310.0		
"7" line		1074			
	25'		1537.5		
"8" line		2247			
	25'		1665.2		
"9" line		1350			
"9" line 15' N	25'		1101.9	00	
					21.1
"10" line		1030		114	
	25'		647.2		346.8
"11" line		368		635	
	25'		170.5		644.9
"12" line		00		758	
North of River Bottom					
"17" line		00		00	
	2'		2.4		0.4
"17" line 2' S		65		10	
	8'		25.2		3.6
"17" line 10' S		105		14	
	10'		19.4		7.2
"17" line 20' S		00		25	
			5526.8		1024.0

Class A Sections = 5526.8
May Estimate = 22.0
Total Class A to date = 5548.8

Class 2 Sections = 1024.0
" " Topog 1436.0
Boulders from Class 1 103.0
Class 2 to Date 2563.0 Cu Yds

Continued page 15

June Estimate
Excavation At Spillway

July 2-18 Willcomb Smith

2+90 = 0+00 South Wall = 0+00

		0.	0.	-1.2	-1.7	-1.7	-1.6	0.
3+00	Grade rod 5.3	5.3=G 0.0	5.3G 10.5	6.5 10.5	7.0 17.0	7.0 22.0	6.9 25.0	5.3G 28.0
		0.	-3.7	-3.7	-4.3	-5.3	-3.2	0.
3+40	Grade rod 5.5	5.5G 0.0	9.2 7.0	9.2 10.0	9.8 12.0	10.8 18.0	8.7 25.0	5.5G 29.0
			0.	-5.2	-6.0	-7.3	-6.4	-4.3	0.
3+75	Grade rod 5.5		5.5G 0.0	10.7 3.0	11.5 5.0	12.8 17.0	11.9 25.0	9.8 28.0	5.5G 30.
			0.	-12.5	-14.1	-13.3	-8.9	0.
3+88	Grade rod 5.5		5.5G 0.0	18.0 4.0	19.6 17.0	18.8 26.0	14.4 34.0	5.5G 38.

T.P. 11.6 - 5.5 + 1.2 = 7.3 (add 4.9 to below)

		0.	-9.0	-14.1	-13.9	-13.1	-9.4	0.
4+00	0+00 is 6ft above below ground surface	0. 0.0	4.1 0.0	9.2 6.0	9.0 20.0	8.2 28.0	4.5 36.0	(Ground) 38.0

0.0 = El. 470.

at 4+70 Uniform grade to rod 14.4 = ground surface on line of north wall. (19.3 = depth below datum.)

Summary June Estimate 17

Schedule 2 - Class 4.

Station of	Dist.	End Area	Cu yds.
2+90		00	
	10'		48
3+00		26	
	40'		933
3+40		100	
	35'		1782
3+75		175	
	13'		912
3+88		619	
	12'		1909
4+00		240	
	30'		1489
4+30		28	
	40'		400
4+70		00	

Schedule 2 Class 4 = 8280 Cu yds.

Schedule 1

Estimated Schedule 1 Class (1) 27 Cu yds = 13,000.
" " " " (2) 400 cu yds = 2,963.
" " " " (3) 55 Cu yds = 25.
" " " " (4) 51 " " = 5,600.

Schedule 3

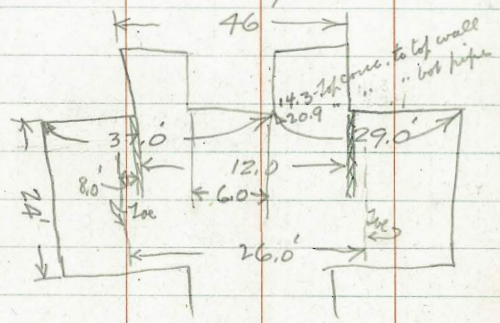
Estimated Class (3) = 210 cu yds 210
" " (4) = 12 " " 12

Excav. for Base of Outlet Tower

Left side 24'

July 6-18

Wilcomb Smith



allow 10 Cy. class 3 for cleaning out muck in tunnel.

Estimated Class 4 = 12 Cu yds.

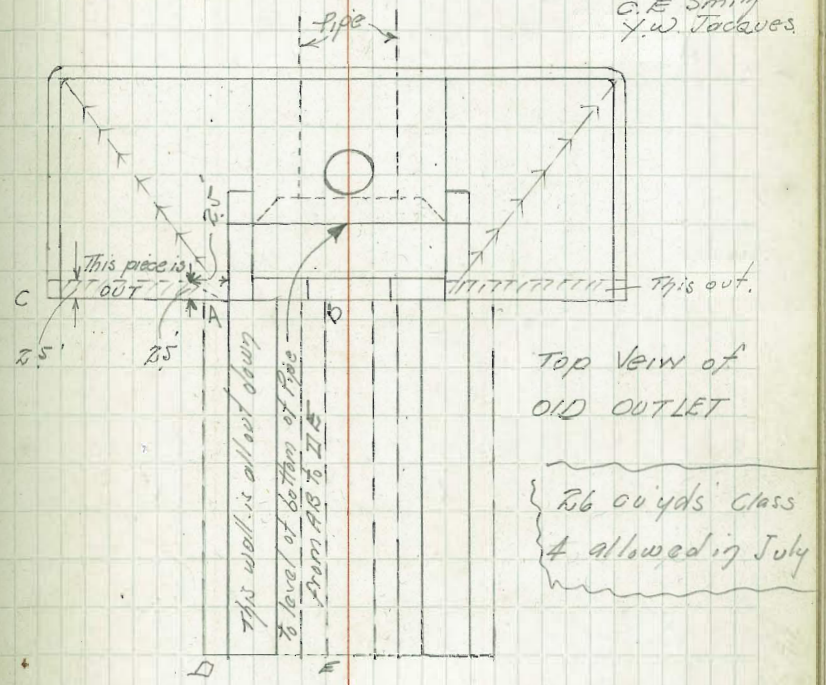
Class 3 = 210 Cu yds.

Construction at Outlet Tower

June 29-18

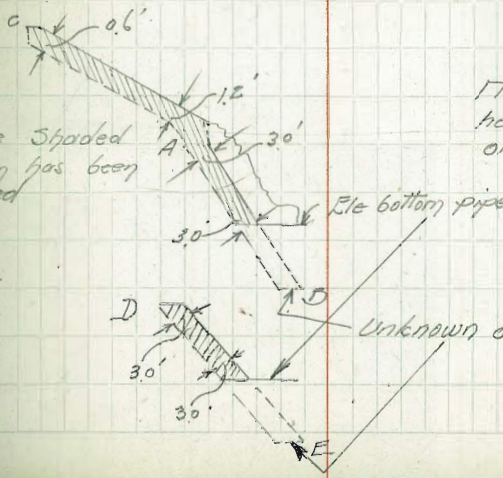
C.E. Smith

Y.W. Jacques



Top View of OLD OUTLET

256 cu yds class 4 allowed in July



Note Shaded portion has been removed

Note old Concrete has been removed only where so noted on the sketch

For other dimensions see Xsections

7-10-18

Estimate for

Cyclopean Concrete - Below old masonry.

	+	H.I.	
B.M.			347.2
	1.57	3.55.77	

Sta. 0 = downstream Face old Masonry

0+10

0+20

0+30

0+40

0+50

0+60

0+70

0+80

Grade on forms-

All sections measured From rock at left abutment-

Sections taken every 10' beginning at downstream face of old masonry-

7.4 / 0	9.4 / 10	8.8 / 15	8.8 / 28	8.4 / 30	9.2 / 37	9.5 / 55	8.8 / 60	8.5 / 66	9.3 / 70		
484	464	470	470	474	476	463	470	473	465		
6.7 / 0	9.0 / 8	8.1 / 14	8.6 / 15	8.4 / 16	8.7 / 17	8.8 / 19	6.7 / 19	8.3 / 25	8.7 / 40	9.2 / 48	8.9 / 60	8.5 / 7.8
491	468	467						475	471	466	469	473
7.0 / 3	8.7 / 17	8.4 / 25	9.6 / 28	9.4 / 38	9.2 / 51	8.6 / 55	9.1 / 64	7.8 / 72	8.8 / 8.5		
488	471	470	462	464	466	472	467	480	470		
6.5 / 0	6.3 / 13	Rock	7.8 / 22	8.4 / 28	8.6 / 36	8.4 / 45	8.9 / 56	9.1 / 68	8.6 / 78	9.7 / 88	
493	495		480	470	472	474	469	467	472	461	
7.1 / 0	7.0 / 12	Rock	7.8 / 24	8.0 / 35	8.4 / 47	8.4 / 63	9.7 / 77	9.7 / 86			
487	488		480	478	474	474	461	461			
8.6 / 0	8.2 / 8	7.3 / 24	7.9 / 37	9.3 / 50	8.9 / 56	9.1 / 68	9.2 / 80	8.6 / 89			
472	476	485	479	465	469	467	466	472			
7.8 / 0	7.6 / 10	8.5 / 30	9.5 / 38	9.6 / 60	9.9 / 75						
480	482	473	463	462	459						
8.8 / 0	8.5 / 10	9.3 / 12	9.4 / 24								
470	473	465	464								
9.0 / 0											
468											

Flatbed

July 10 1918.

HRB

7/25/18

July Etc. Spillway

Estimate for July

T 32 — 39 — 743 r — 704.2

	Lt							Ct	
2+90	00							00	704
	3.9	3.9	5.1	5.6	5.0	3.8	4.0		
	704	704	69.7	68.7	69.3	70.5	70.3		
3+00	19.1	9.0	6.8	0.0	7.5	7.8	19.1		704
Gr = 460.2									
TP			5.6	7.2.3	7.6		66.7		
	1.8	1.5	4.1	4.8	5.6	3.8	1.7	1.8	
	70.8	70.8	68.7	66.7	65.7	68.5	70.6	70.3	
3+20	19.1	11.0	6.8	4.0	0.0	10.0	13.4	19.1	70.3
Gr. 459.2									
			5.6	7.7.7	5.7		66.6		
	1.9	1.8	4.4	5.6	6.0	5.6	2.0		
	70.3	70.4	67.8	66.6	66.7	66.6	70.7		
3+40	19.0	10.7	7.5	0.0	5.8	11.0	19.0		70.7
Gr. 458.2									
			5.6	6.4.9	1.7.9		59.3		
	CW 0.0	5.0	5.6	6.6	5.6	3.6	Concrete		
	649	599	593	583	593	613			
3+60	19.0	19.0	12.0	5.0	0.0	13.0	17.0	19.0	70.1
Gr = 457.2									
			5.6	6.7.4	8.1		56.8		
	CW 3.8	4.7		5.6	4.5	4.9	0.4	B wall	
	18.8	5.8.6	58.7	56.8	57.9	57.5	62.0		
3+80		14.0	5.0	0.0	2.0	10.0	17.8	18.8	70.0
Gr. 456.2									
			5.6	6.7.4	5.6		56.8		
		B Spill							
		1.6	4.6	4.6	5.6	5.0	1.0	-8.9	
	69.8	68.8	66.8	57.8	57.8	56.8	57.4	61.4	70.3
4+00	19.0	17.7	17.3	17.0	3.0	0.0	11.0	18.5	18.8
Gr. = 455.2									✓

	Lt							Ct				Rt	
								62.4					
4+00	← omit							Same as above with			1.0	6.7.9	7.4.4
											18.5	7.7.5	2.8.0
TP				5.6			5.9.6		8.4			5.4.0	
	6.9.3	3.3	3.7				5.6	5.3	5.8	4.4			
	5.6.0	5.6.3	5.5.9				5.4.0	5.4.3	5.3.8	5.5.2	6.7.2		
4+20	2.1.8	1.3.8	6.0				0.0	10.0	16.0	21.0	30.0		
Gr = 454.2													
TP				5.6			5.8.3		6.9			5.2.7	
	6.5.4	3.4	4.0				5.6	7.7	6.8	5.0	6.5	0.0	
	5.2.5	5.4.9	5.4.3				5.2.7	5.0.6	5.1.5	5.3.3	5.1.8	5.8.3	
4+40	2.2.5	2.0.0	6.0				0.0	8.0	14.0	19.0	27.0	38.0	
Gr = 453.2													
TP				5.6			5.7.9		6.0			5.2.3	
	6.3.4	5.9.9	5.8.9	3.5	5.3	5.6							
	7.3.8	7.7.8	1.9.8	1.8.5	1.4.0	0.0							
4+60				5.4.4	5.7.6	5.7.3							
Gr = 452.2													
TP				5.6			5.5.7		7.8			5.0.1	
		3.0		5.2		5.6							
		5.2.7		5.0.5		5.0.1							
4+80		1.5.5		1.3.0		0.0							
Gr. = 451.2													

✓

4/2/18.

Sections for Estimate Exc old Channel to Outlet Tower.

Sta	+	HI	−	Ele
B.M. below old Diverting dam	1.62	379.21		377.59
Rock T.P.	11.96	91.00	0.17	79.04
" "	11.94	402.34	0.60	90.40
" "	8.87	407.96	3.25	99.09
T.B.M. R.P. ℄ Tunnel 0+00				
0+00 Flo Line Outlet Tunnel			1.8	406.11

Lt. — ℄ — Rt.

Sta	Cross-section readings, left to right (upper / middle / lower)
0+00	℄: 12.7 / 95.3 / 0.0
0+50	6.2 / 01.8 / 13.0; 9.8 / 98.2 / 6.0; 11.8 / 96.2 / 2.0; ℄ 12.2 / 95.8 / 00; 11.9 / 96.1 / 2.0; 11.0 / 97.0 / 2.0; 9.2 / 98.8 / 8.0; 5.3 / 02.7 / 15.0
1+00	5.6 / 02.4 / 18.0; 6.2 / 01.8 / 13.0; 10.2 / 97.8 / 5.0; 11.0 / 97.0 / 2.0; 11.9 / 96.1 / 2.0; ℄ 11.9 / 96.1 / 00; 11.9 / 96.1 / 2.0; 10.4 / 97.6 / 2.0; 9.2 / 98.8 / 5.0; 4.4 / 03.6 / 13.0
1+50	00 / 08.0 / 24.0; 8.4 / 99.6 / 13.0; 9.9 / 98.1 / 4.0; 11.0 / 97.0 / 3.0; ℄ 11.0 / 97.0 / 00; 0.5 / 07.5 / 17.0
	6.35 + ; 414.06 HI ; 0.25 − ; 407.71 Ele
2+00	4.4 / 09.7 / 28.0; 15.2 / 98.9 / 13.0; 15.6 / 98.5 / 6.0; 16.0 / 98.1 / 4.0; 17.0 / 97.1 / 4.0; 17.0 / 97.1 / 2.0; ℄ 16.0 / 98.1 / 00; 13.0 / 01.1 / 6.0; 6.0 / 8.1 / 18.0
2+50	2.7 / 11.4 / 29.0; 6.6 / 07.5 / 23.0; 13.3 / 0.8 / 12.0; 15.8 / 98.3 / 4.0; ℄ 15.8 / 98.3 / 00; 10.5 / 03.6 / 9.0; 5.3 / 8.8 / 19.0; 0.8 / 13.3 / 21.0; 00 / 14.1 / 23.0

	+	HI	−	Ele
T.P. Bolt in 3x8	0.01	406.18	7.89	406.17

	+	HI	−	Ele
Ele Flow line Bronze flange inside Valve		406.18	10.13	396.05

Sta	Cross-section readings, left to right (upper / middle / lower)
2+84	4.1 / 14.5 / 25.0; 1.5 / 04.7 / 10.0; 11.0 / 95.2 / 5.5; ℄ 11.0 / 95.2 / 00; 11.0 / 95.2 / 1.5; 3.0 / 03.2 / 4.0; 2.2 / 16.4 / 23.0
T.P.	+ 12.38 ; − 18.55 ; Ele 406.17
2+97	2.6 / 16.0 / 25.0; ℄ 1.7 / 16.9 / 00; 1.9 / 16.7 / 23.0
T.B.M. 0+00	− 12.45 ; Ele 406.10

Plotted 4/2/18
H.W.B.
Copied from
Book 9. Page 68.

Bob
Willcomb

Base outlet tower
Slope Stakes set by hand Level

Flow line Pipe	13.7	13.7		00
	9.7	(21.9)	1.5	12.7
T.P.	6.7	25.3	3.3	18.6
T.P.	7.7	(26.3)		18.6

Grade = Ele 396.01

	Lt.	℄	Rt.	
NE Cor	5.4 / 16.5 / 29.0	← 35 →	6.5 / 19.8 / 32.7	NW Cor.
Concrete Face SE Cor.	4.4 / 20.9 / 33.4		4.2 / 22.1 / 35.6	S. West Cor.

copied from Transit Book #1

7/30/18

July Estimate

Bob Willcomb Y.W

Sections for Estimate Excavation -

Sta		+	H.I.	—	Elev.
		11	line -	El =	0.0
		10.91	373.04		362.13
+ 6.0	Top Curtain			6.9	366.1
+ 18.0	"			7.0	366.0
+ 18.0	Rock			19.8	353.2
+ 53.0				12.2	360.8
65.0				11.2	61.8
75.0				13.7	59.3
80.0				10.7	62.3
88.				15.8	57.2
92				16.3	56.7
92	Old Diaphragm			13.4	59.6
94	"			13.4	59.6
95				14.7	58.3
	10 Line				
+ 14				6.9	66.1
+ 22				7.7	65.3
+ 30				9.7	63.3
+ 42				8.6	64.4
+ 47				7.0	66.0
+ 56				6.7	66.3
+ 72				8.6	64.4
+ 74				10.2	62.8

7/30/18

July Estimate

	+	H.I.	-	Elev
		373.04		
		10 Line		
+86			12.2	60.8
+95			11.9	61.1
+95			7.3	65.7
+97			6.4	66.6
+97			11.4	61.6
1+02			12.5	60.5
1+03			9.9	63.1
1+07			8.3	64.7
A		10.07	382.73	0.38	372.66
		9 Line		
+36			3.6	79.1
+44			5.8	76.9
+56			8.1	74.6
+60			14.1	68.6
+68			14.0	68.7
+76			8.0	74.7
+91			8.5	74.2
+93			2.5	80.2

✓

7-30-18

Sections for Estimate - Outlet Tower.

	+	H.I.	-	Elev
	9.66	405.67		396.01
2+50				
2+57				
2+61				
2+65				
2+77.5				
2+84				
Δ			0.74	404.93
	10.53	415.46		
N.W. Cor. Top of Slope			0.2	15.3
S.W. Cor. "		Cut = 22.1	+	
S.E. Cor. "		Cut = 20.9		
N.E. Cor. "		Cut = 16.5	3.2	13.3

24

0.0 = 2+25

L. R.

403.1 400.8 99.8 00.0 00.3 03.2

2.6/17 4.9/14 5.9/5 5.7/0 5.4/5 2.5/9

04.8 04.4 01.6 99.3 99.0 03.2

0.9/18 1.3/13 4.1/12 6.4/8 6.7/0 2.5/7

Rod Readings

05.7 96.3 98.1 98.4 98.9 96.6 97.0 05.67

0.0/25 9.4/10 7.6/7 7.3/0 6.8/2 9.1/2 8.7/4 0.0/14

05.5 07.5 97.0 97.6 97.6 96.7 97.5 97.2 97.7 98.5 97.3 03.5

0.2/22 2.2/21.5 8.7/15 13.1/13.5 13.5/7.5 9.6/6 8.2/0 8.5/2 13.0/5 13.2/9 8.4/10 2.2/13.5

05.7 03.8 97.1 97.9 97.9 96.2 96.3 96.2 94.1 94.4 97.6 05.7

0.0/20 1.9/18 8.6/13 12.8/13 12.8/6 9.5/4.5 9.4/0 9.5/2 11.6/3 11.3/8 8.1/8 0.0/17

07.0 96.9 96.0 96.4 94.6 94.6 07.7

Concrete +2.3/15 8.8/9 9.7/0 9.3/3 11.1/5 11.1/7 +2.0/12 Concrete

Hole 8'x5½'x4'

Hole 6'x6'x4'

Note: 0+98 ℄ Tunnel 7' rt. ⊥ to right = 2+50

Plotted July 31, 18

See Estimate Sheet #9

for July

August 3 1918

Williams Bib.

17 Concrete

Sections for Rock Estimate

Set M15 - 65' from B15-15 W.

Ties to Curve R = 221.1. Elev 361.63

				Rod	Elev.
0+00	28.1'	124°14'		6.35	
+10	19.8'	110°41'		6.00	
+17.8 = 15 Slope	15'	90°			
+20	14.3'	82° 01'			
+30	15.2'	42° 37'			
+40	21.7'	18° 27'			
+50	30.3'	7° 02'			
+60	39.7'	1° 36'			
		+	H.I.	−	Elev
		4.99	367.12		362.13

Sections taken on Radial Lines

Sta. 0+00 — 360.8 / 0.0

Sta. 0+10 — 361.1 / 0 ; 360.6 / 12 ; 357.6 / 20 ; 357.4 / 24

Sta. 0+20 — 361.5 / 0 ; 362.1 / 11 ; 359.4 / 17 ; 357.5 / 26

Sta. 0+30 — 361.5 / 0 ; 361.6 / 7 ; 360.6 / 13 ; 358.8 / 18 ; 358.6 / 26 ; 356.6 ← Old Masonry / 38

8/3/18

Sections for Estimate of Mass Rock in Concrete

		4.98	367.11			362.13
Sta. 0+40	361.4 / 0	360.5 / 12	358.8 / 18	358.3 / 25	356.7 / 27	356.9 / 34
Sta 0+50	361.7 / 0	361.8 / 10	359.2 / 15	357.9 / 26	357.3 / 32	357.7 / 51
Sta. 0+60	361.0 / 0	360.5 / 13	358.7 / 19	358.3 / 32	357.9 / 49	

August 3-'18

From M-15 set Auxiliary Point
65.6' Dist.- 352° 26' Azimuth-

From Auxiliary Point-
Ties to Curve - R. 2211

0+60	27.1	158° 55'
0+70	17.3	154° 17'
0+80	8.1	134° 59'
0+90	6.1	46° 48'
1	14.6	13° 15'
+10	24.3	7° 25'

		3.67	365.80			362.13
Sta. 0+70	360.8 / 0	360.2 / 10	359.2 / 18	359.0 / 26	358.7 / 47	

8/3/18 Sections for Estimate of Mass Rock in Concrete

Sta	+	H.I.	−	Elev
		365.80		
0+80	360.7 / 0	360.3 / 12	359.4 / 18	359.1 / 26	359.3 / 36	358.6 / 50
0+90	360.9 / 0	360.0 / 13	359.0 / 26	359.5 / 31	357.7 / 36	358.0 / 45
1+00	360.2 / 0	360.5 / 9	359.8 / 13	358.8 / 23	357.7 / 33	
1+10	360.9 / 0	360.4 / 10	359.5 / 13	356.6 / 23		
Divide Wall 1+16.2	361.0 / 0	362.7 / 11	359.8 / 17	359.0 / 25		

A-11 38.6' 334°58'

From A-11 at A-11- 21.85' S.

7.13 369.26 367.13

At A-11- 21.85' S.

Tie to Cross on Concrete Divide Wall

26.92 192°47'

Elev.	Dist.	Azimuth	363.8	10.5	18°30'
360.9	12.1	193°	364.7	8.1	63°30'
364.2	2.5	302°30'	364.2	9.1	116°30'
363.7	11.6	349°30'	361.9	12.9	156°30'

Level to end of Divide Wall.

8/5/18

CLASS 1 EXCAVATION

JULY ESTIMATE

Field Topog Sheets

Contour	13	14	15	16	17	26	27	28	45	46	47	48	49	66	67	68	69	86	Total Sq Feet	Cu. Yds
330																				
332																				
334																				
336											0	0			0				.00	
338										7	124	935			67				1133	42
340			134				171			275	531	1386			130	21			2548	136.3
342			277				218			449	604	1773			190	125			3636	229.0
344			490				267			609	1030	2107			251	364			5118	324.2
346		1	914				389			915	1153	2227			318	542			6459	428.8
348		50	1263				443			1092	1208	2451			405	758			7670	523.3
350		150	1463	56			514			1319	1252	2783			507	1019			9063	619.7
352		209	1585	207			654			1490	1268	2911			701	1308			10333	718.4
354		347	1718	358		26	702			1681	1316	3066			884	1744		5	11847	821.5
356		615	1760	520		214	945	46	42	2426	2302	3194			1028	2021		75	15188	1001.3
358		850	2070	645		821	1496	91	95	3394	3386	3295			1176	2297	1	152	19768	1294.7
360		1069	2348	749		1599	2974	140	191	3631	3534	3401			1348	2617	15	291	23907	1617.6
362	6	1322	2661	916	12	1763	3729	254	402	3710	3591	3479	4		1525	2863	66	496	26793	1878.2
364	166	1669	2961	1085	66	2132	3750	445	742	3740	3670	3535	34		1714	3063	184	809	29765	2094.7
366	449	1785	3650	1532	203		3750	593	887	3747	3738	3547	66	2						

Schedule 1 Class 1 Cu yds = 117297

Class 1 from following Sections = 23158

Total Excavation Class 1 = 140455

Summary July Estimate Cont'

Class Sections above Contour 364.

Class Section of	Dist. bet. Sta.	End Area	Cu yds.
"G" Line		00	
	25'		119.0
"F" Line		257	
	10'		93.5
"E" line 10'W		248	
	15'		143.1
"E" Line		267	
	7'		68.7
"E" line 7E		263	
	8'		75.0
"D" line 10'W		243	
	10'		86.7
"D" line		225	
	11'		99.0
"D" line 11E		261	
	2'		19.3
"C" line 12'W		261	
	12'		120.8
"C" line		283	
	25'		247.7
"B" line		252	
	25'		247.2
"A" line		282	
	25		260.6
"M" line		281	

Sections of	Dist. Between Sta.	Class 1 End Area	Class 1 Cu yds.
"M" Line		281	
	25'		234.7
"N" line		226	
	25'		183.3
"O" line		170	
	25'		157.4
"P" line		170	
	25'		112.5
"Q" line		73	
	35'		47.3
"R" line 10E		00	

2315.8 Total Class 1 above Ele 364
11729.7 Class 1 from Topog
14045.5 Grand Total

Note

See Estimate Sheet # 9
for Platted Sections
July Estimate

Summary
July Estimate Cont.
Spillway Sections

Sections on	Dist bet Sta	End Area	Cu Yds
2+90 Gr = 60.7		00	
	10'		4.1
3+00 Gr = 60.2		22	
	20'		32.6
3+20 Gr = 59.2		66	
	20'		35.6
3+40 Gr = 58.2		84	
	20'		174.1
3+60 Gr = 57.2		386	
	20'		293.0
3+80 Gr = 56.2		405	
	20'		283.7
4+00 Gr = 55.2		361	
	20'		178.9
4+20 Gr = 54.2		122	
	20'		63.7
4+40 Gr = 53.2		50	
	20'		24.8
4+60 Gr = 52.2		17	
	20'		6.3
4+80 Gr = 51.2		00	

Schedule 2 Class 4 = 1116.8 Cu. Yds to date

Summary
July Estimate Cont.
Outlet Tower

Schedule 3
Class - 3 & 4.

Sections on	Dist	End Area	Cu Yds	
2+25		00		Note
	25'		6.9	Equasion —
2+50		15		Station 2+50 of
	7'		5.4	X sectioned Line
2+57		27		is 7' Right of
	4'		18.2	Station 0+98
2+61		219		E of Tunnel at
	4'		44.2	Rt Angles.
2+65		378		
	12.5'		166.2	
2+77.5		340		
Face old Concrete	6.5'		60.5	
2+84 = Face old Concrete		163		

Add for Hole 6"x6"x4" = 144 — 5.3
" " " 8"x5½"x4" = 176 — 6.5

313.2 Cu Yds.
Estimated old Concrete = 26.0 " " Class 4
287.2 " "
Estimated Earth Removed from Tunnel = 10.0 " "
Total Class 3 to date = 297.2 " "

Summary July Estimate Cont.

Station of	Dist. Between Sta	Class 4 End Area	Class 4 Cu Yds	Class 2 End Area	Class 2 Cu Yds
"6" line		00			
	12'		47.5		
"6" 12 N		214			
	13'		310.0		
"7" line		1074			
	25'		1537.5		
"8" line		2247			
	25'		1707.9		
"9" line		1442			
	25'		1185.2	00	
"9" line 15' N					54.8
	25'		682.4	296	482.4
"10" line		1118			
	25'		1648	746	751.0
"11" line		356			
	25'			873	
"12" line		00			

Class 2 below old Masonry
Sections taken from Topog sheets.

"A" line 3½ E				82	
	225'				77.9
"M" line				105	

July Estimate Cont.

Section of	Dist. Between Sta.	Class 4 End Area	Class 4 Cu yds.	Class 2 End Area	Class 2 Cu yds.
	25'				94.0
"N" line				98	45.3
	25'			00	45.3
"O" line				00	

5635.3 | 15054

Sections = 15054

North of River See sheet #5 = 11.2
Class 2 from Topog 1436.0
Add for Boulders 103.0
Total Class 2 to Date 30556 Cu yds

Class 4 Sections = 56353
" North of River 47.0
Max Est. old Masonry 22.0
Total Class 4 to Date 57043 Cu yds

5/21/18 Copied from Book 12

CES.
YWJ
EM

Sections for Pond Storage Site

Sta	+	H	−	Ele
406 I-1 = 0+00	.165	365.57		463.92
+25			2.9	462.7
+50			5.1	460.5
+75			6.8	458.8
1+00			8.0	457.6
1+25			10.5	455.1
TP 1+50	1.79	454.72	12.64	452.93
1+75			5.4	449.3
2+00	0.9	444.0	11.2	443.5
2+25			4.9	439.5
2+50			8.1	436.3
+75			10.5	433.9
3+00			13.1	431.3

Measured along Hilltop Coord. System

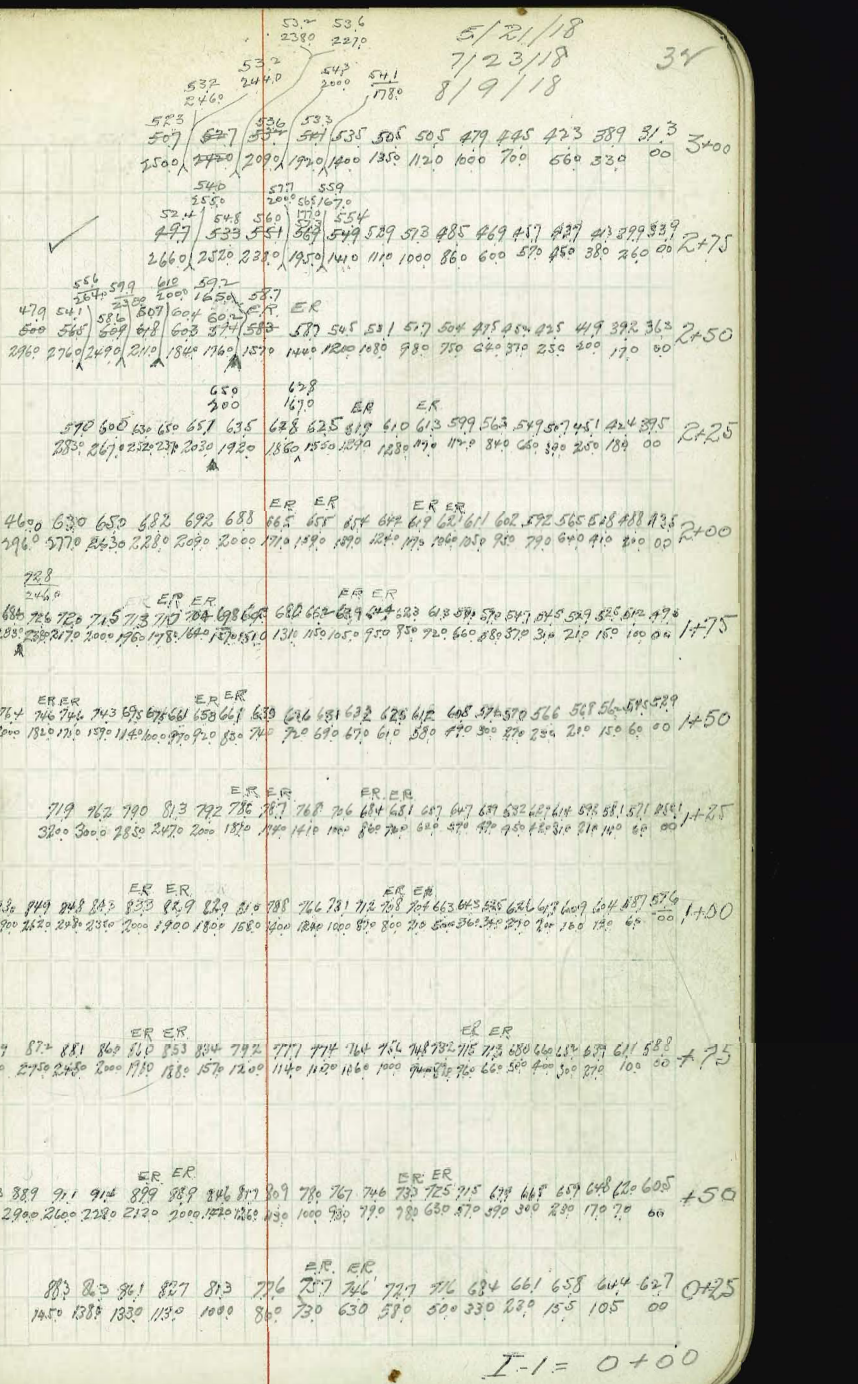
Plotted Aug 9, 1918 KRB

Continued on pg 6

See pages 38 & 42 for corrections

5/21/18
7/23/18
8/9/18

34



8/29/18 August Estimate — Nixter Bro

Outlet Tower Etc.

Steel God SE Cor. Foundation	773	403.87	396 64

2+50 Same as. Estimate

2+57 " " "

2+61

2+65

2+77½

2+84 & 1.00

Lt. — ℄ — Rt

balance			6.3	7.5 5.1	5.8	6.1	11.5	8.8	6.6	00	balance same as July
Same			97.6	96.3 98	95.1	97.8	92.4	95.1	97.3	03.9	
23 July			11.4	10 7	00	1.3	3.5	5.3	8.1	11.0	
	4.5	7	12.0	12.1	7.0	6.5	7.8	11.9	11.9	7.0	1.5	00	
(11)	99.4	96.9	91.9	91.8	96.9	97.4	96.1	92.0	92.0	96.9	02.4	03.9	(11)
	20.0	16.2	16.0	10	7.7	00	1.5	3.1	9.1	9.4	12.5	13.8	
	3.7	7.0	12.0	12.0	7.8	8.0	12.0	12.0	2.6	1.5	-2		
(11)	00.7	96.9	91.9	91.9	96.1	95.9	91.9	91.9	01.3	02.4	05.9		(11)
	17.6	14.6	14.6	8.1	5.7	00	2.6	7.0	12.5	14.1	14.1		
			-3.1	7.1	7.9	8.1	-3.9						
(11)			07.0	96.8	96.0	95.8	07.8						(11)
			8.3	8.3	00	11.0	11.0						

Plotted Aug 30 18.

See Estimate #10. Sheet

8/29/18 Sand Estimate of Stock Pile.

	+	HI	−	Ele
BM of Basis	0.50	495.39		494.89
00				
0+10 End Sand				
0+25				
0+50				
0+75				
Nail 1+00 R	1.37	84.51	12.25	83.14
1+00				
1+25				
R Nail 1+75	5.43	76.74	13.20	71.31
1+50				
1+75				
2+00				
2+10				

North Pile

0+00

00 across

0+10

4.7 3.0 2.7 7.4 11.3
90.7 92.4 93.7 88.0 84.1
171 164 150 129 123

0+25

6.4 3.8 8.5 10.4 14.5
89.0 91.6 86.7 85.0 80.9
194 180 130 123 114

0+50

10.7 7.5 10.5 14.4 12.3 12.5 17.0 15.6 19.4
85.7 87.9 84.9 81.0 83.1 83.0 78.4 79.8 76.0
187 178 144 131 125 124 114 112 103

0+75

2.5 −1.0 7.4 9.7 12.3
82.0 85.5 77.1 74.8 72.2
184 180 107 94 89

1+00

6.7 4.0 5.0 8.7 12.5 16.0
77.8 80.5 79.5 75.8 72.0 68.5
178 171 140 110 99 71

1+25

2.5 −1.0 2.4 6.0 4.2 7.4
74.2 77.7 74.3 70.7 72.5 69.3
168 160 138 125 121 114

1+50

6.3 3.6 4.3 8.0 6.3 10.0
70.4 73.1 72.4 68.7 70.4 66.7
164 157 148 138 132 125

1+75

10.9 10.3 8.7 8.6 12.0
65.8 66.4 68.4 68.1 64.7
158 156 145 138 131

2+00

00 End North Pile

8/29/18

Sta	+	HI	−	Elev
Nail 1+75	1068	481.99		471.31
1+35				
1+50				
Nail 1+75	335	746.6		471.31
1+75				
2+00				
	647	685.6	1257	62.09
2+25				
2+50				
	590	622.2	1224	56.32
2+75				
3+00				
3+15				

00 across 1+35

8.5	4.3		7.6	5.7
73.5	77.7		79.4	76.8
287	277		251	246

1+50

6.2	1.4	-1.4	9.0	3.0
68.4	72.3	76.9	74.7	71.7
283	276	246	212	205

1+75

11.8	5.7	2.0	4.2	7.8
62.8	69.0	72.7	70.5	66.9
277	264	217	183	177

2+00

86	9.7	1.4	3.5	6.0	2.8	3.9	6.0
600	67.9	67.2	65.1	62.6	65.8	65.6	62.6
246	252	272	218	186	175	171	167

2+25

13.0	7.3	5.6	5.4	5.0	6.0	9.8	9.4
556	61.3	63.0	63.2	63.6	64.6	58.8	59.2
264	254	238	200	185	172	165	

2+50

8.3	4.0	2.3	3.2	6.8	
539	58.7	69.9	59.0	55.9	
255	247	200	177	167	

2+75

9.0	5.2	4.7	4.9	8.2
53.7	56.8	58.0	57.3	54.0
246	238	198	188	178

3+00

00 across

8/30/18

Concrete Estimate

C12		11.55	71.29	59.74
H.I. 71.3				
		A D 15		
Edge of Conc.				
59.7	26.2	90°		
59.8	26.9	72°		
60.1	30.5	56°		
60.3	36.9	42°		
60.0	45.0	32°		
62.	49.0	39°		
	40.0.	46°		
	34.5.	56°		
	33.2	71°		
	31.7	90°		
64	41.0	88°		
	39.9	81°		
	49	76°		
	50.3	64°		
	50.6	56°		
	58.	54°		
	Set B15-10'E.			
Forms		6.3	73.0	66.7

Concrete to top of forms all way across.

At B15-10'E.

H.I. 73.0

Contour	Dist.	Azimuth				
Edge Concrete						
58.7	30.8	255°	66	—	14.1	325°
58.3	32.8	241°			15.6	3°
58.7	33.8	219°			23.8	349°
60.2	30.5	218°			38.6	4°
61.5	34.5	207°			44.0	353°
61.2	40.5	201°			48.6	354°
62	38.0	196°			50.6	5°
	32.0	206°			57.0	14°
	26.7	226°	68		35.5	36°
	21.1	242°			32.7	30°
64	15.0	232°			28.0	15°
	19.0	211°			21.3	10°
	20.5	202°			23.0	24°
	26.6	199°			22.3	30°
	32.3	196°			11.8	30°
	35.6	189°			13.3	61°
66	35.1	180°			26.5	58°
	28.7	172°			36.3	53°
	18.8	181°	69	Top	30	38°
	15.9	207°	68		29.5	75°
	12.7	215°			39.2	73°
	13.4	264			42.4	87°
	13.1	294			41.5	97°

Ring

Ring

8/30/18

Concrete Estimate

At B15-10'E

68	43.1	104°	62	27.0	172°
	36.6	104°	64	30.8	169°
Ring →	30.5	99°		23.7	118°
69.3 Top	39.5	88°		26.2	104°
	At C 12			31.0	85°
59.7 − 4.7 = H.I. 64.4				26.3	73°
				34.1	69°
59.3	26.6	181°		39.0	52°
58.1	14.5	163°		30.6	26°
58.1	10.7	129°		32.5	7°
58.5	14.0	103°		~~23.5~~	
58.7	20.0	74°			
58.4	22.3	54°			
58.5	21.2	40°			
61.2	23.0	15°			
62.2	29.5	7°			
62	29.0	9°			
	25.5	16°			
	24.8	25°			
	34.6	52°			
	32.2	65°			
	28.4	70°			
	27.0	96°			
	20.3	115°			
	18.0	153°			

Edge of Concrete

Bob Willcomb 37

Set A12-5'W

At A12-5'W

	11.07	373.13		362.06	
H.I. = 373.13					
64	23.5	223°	68	12.1	325°
66	17.9	205°		15.4	347°
	19.5	241°		17.6	3°
	13.9	261°	69	10.8	22°
	13.0	306°	64.8	51.0	334°
	16.1	317°	64.9	62	342°
	23.5	336°	65.1	59.5	352°
	23.4	358°	67.7	59.0	13°
	34.2	9°	66.5	51.0	18°
	39.3	25°			
	32.9	33°			
	28.2	44°			
68	16.6	24°			
	12.6	45°			
	10.9	72°			
	9.4	118°			
	4.5	156°			
	7.6	208°			
	11.8	223°			
	10.8	257°			
	9.3	305°			

See page 43 for Fier Measurements.

Sept. 3 1918.

		Check on Levels		Pond	Estimate
B.M. Basin		0.850	49.574		49.89
Nail 1+00		0.73	83.51	1246	83.28
Nail 1+75				1204	71.47
1+50 – 700				700	76.5 ✓
" – 218				63	77.2 ✓
1+50 – 246				66	76.9 ✓
R.		2.15	73.62	215	71.47 ✓
2+00 177				6.6	67.0 ✓
200 – 171				7.0	66.6 ✓
2+25 – 167				10.8	62.8 ✓
2+25 – 155				10.9	62.7 ✓
R Rock		0.95	63.70	1137	62.25
2+50 – 165	ER South.			40	59.2
2+75 167	" " "			7.3	55.9 ✓
3+00 178	" " "			91	54.1 ✓
3+00 140	Edge road N=150 ~~150~~.			97	53.5
2+75 – 141	Edge R N			80	55.2
2+50 157	ER N. South Road.			44	58.8
2+50 – 144	ER S North Road.			45	58.7
2+50 131	ER N " "			51	58.1
R. Rock		1.30	51.60	1290	50.30
00 2+25				1235	39.25
00 2+00				82	43.4
00 1+75				24	49.2
R Rock		✓		207	49.53

Elevation from Hand Level 66.5

" " " " 63.1

Elevation from N.S. = 53.5 ok.

" " " " 54.9 "

" " " " 58.3 "

" " " " 58.7 "

9/3/18

E. Mixter Job.

Sand Estimate
Check Levels

			51.60		
P Rock		2.04	49.56	9.37	42.23
0+00	2+50			8.10	36.17
"	2+75			10.50	33.77
"	3+00			13.15	31.12
P Rock		11.55	61.08		49.53
1+50				8.3	52.8
1+50	6			6.7	54.4
"	15			5.0	56.1
P Rock		12.40	77.21	12.7	59.81
1+50	- 114			2.7	67.5
1+50	- 100			4.7	67.5
"	97	South Edge road.		6.1	66.1
"	92	E R		6.4	65.8
"	83	North E.R.		6.1	66.1
"	74			8.3	63.9
"	72			8.6	63.6
"	69			9.1	63.1
"	67			9.0	63.2
"	61			9.7	62.5
"	58			11.0	61.2
"	49			11.4	60.8
"	30			14.6	57.6
"	27			15.2	57.0
"	23			15.5	56.7

8/3/18

Sand Estimate

Check Levels

7721

1+75	125			50	66.8 ✓
"	115			60	66.2 ✓
"	105	Edge Road S.		83	63.9 ✓
"	95	" " N		78	64.4 ✓
2+00	131			73	64.9 ✓
"	124			77	64.5 ✓
Nail	1+75		3.1 7457		71.47
2+25 - 200		average with 1+75		9.6	65.0 ✓
"	186			12.0	62.6 ✓
2+50 - 200				11.0	63.6
2+25	203			9.5	65.1 ✓
Nail	1+00		593 89.21		83.28
1+25	285			10.2	79.0 ✓
0+25	300			5.2	84.0 ✓
0+50	290			0.4	88.8 ✓

✓

H. Level El 65.7

9/4/18

E. Mixter
Sub.

Check on Sand Storage

P Rock		4.67	66.9'		462.25
2+50	144	South ER North		8.2	58.7
"	157	North ER South		8.2	58.7
"	165	South ER "		7.7	59.2
"	176	1.6		5.0	61.9
"	176			6.7	60.2
"	184	3.1		3.4	63.5
"	184			6.5	60.4
"	200	2.5		3.4	63.5
"	200			5.9	61.0
"	211	3.4		3.8	64.1
"	211			6.2	60.7
"	238	3.3		3.7	63.2
"	238			7.0	59.9
"	249	1.7		5.6	61.3
"	249			8.3	58.6
"	264			11.3	55.6
"	276			12.8	54.1
"	296			19.0	47.9
2+75	266			14.5	52.4
"	255			12.9	54.0
"	252	1.5		10.6	56.2
"	252			12.1	54.8
"	238	2.7		8.2	58.7
"	238		✓	10.9	56.0

Top Sand.
Bottom Sand = G. Surface

9/4/18

E. Mixter Sub.

Check on Sand Estimate

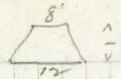
2+75	200	23	4669Y	6.9	60.0
2+75	200			9.2	57.7
"	195	24		7.2	59.7
"	195			9.6	57.3
"	177	25		7.9	59.0
"	177			10.4	56.5
"	167	ERS		11.0	55.9
"	147	ERN		11.5	55.4
3+00	178	ERS		12.8	54.1
"	197	26		11.0	55.9
"	197			13.6	53.3
"	200	35		9.1	57.8
"	200			12.6	54.3
"	209	29		10.4	56.5
"	209			13.3	53.6
"	227	17		11.6	55.3
"	227			13.3	53.6
"	238	35		10.2	56.7
"	238			13.7	53.2
"	244	20		11.7	55.2
"	244			13.7	53.2
"	246			13.7	53.2
"	250			14.6	52.3

Sept 4 1918

E. Mixter
Bub.

Pier measurements above Concrete

	S.E. Cor.	S.W. Cor.	N.E. Cor.	N.W. Cor.	
#1	7.5	7.5	8.1	8.7	No Base Above
	00	15.9	00	16.5	Base 9.5 x 9.0
#2	7.4	10.2	9.5	10.1	" 8.9 x 8.0
	9.9	00	12.9	10.8	" 9.x 9.
#3	7.3	7.4	7.4	7.5	" 8 x 8
#4	4.8	9.1	6.6	11.8	No Base above
#5	12.2	16.0	10.2	14.3	" " "
#6	6.9	9.6	6.8	7.8	" " "
#7	6.2	3.8	6.3	5.3	" " "
#8	12.1	13.5	10.4	13.4	" " "
#9	9.4	10.5	8.5	10.3	" " "
#10	6.6	6.5	6.3	6.4	" " "
#11	13.8	14.3	15.3	14.5	" " "

Key ways = 

Dige Piers 8'x8'

Cu. Ft.

500.5 — .6
258.2
595.2
230.9
473.6
516.5 — .8
843.5 — .0
497.9 — .6
345.6
790.4
619.5 — .2
412.8
967 — .4

7011.3 | 259.7 Cu. yds.
5466
1611
1351
2601
2433
1683
1890

Keys Less 8.4 c.y.

Net 251.3 C.Y.

RAM

Summary August 1918 Estimate

Schedule I Class 1 Correction deduct 103 cu. yds. boulders omitted in July Estimate

July Estimate = 14045
103
Total Class 1 to Date = 13942

Schedule I Class 2 Estimated Yardage for August = 20 cu yds.
3056 " " = July Estimate
3076 " " = Total Class 2 to date

Schedule I Class 3 No additional Yardage 50 cu. yds. to date.

Schedule I Class 4 Estimated Yardage for August = 30 Cu. yds.
5704 " " = July Estimate
5734 " " Total Class 4 to Date

Schedule II Class 4 No additional Yardage for August 1117 cu. yds. to date

Schedule III Class 3 Sections

Station	Dist. bet. Sta.	End Area	Cu. Yds.
2+25		00	
	25'		
2+50	x	15	
	7'		
2+57	x	27	
	4'		
2+61	x	237	
	4'		
2+65	x	410	
	12.5'		
2+77.5	x	420	
	6.5'		
2+84	x	196	
		3398	cu. yds.
July Estimate Class 3 removed from Tunnel =		10.0	" "
		3498	" "
July Estimate Class 4 =		26.0	" "
Total Class 3 to Date =		3230	" "

See Sheet #10 for Xsections

CYCLOPEAN MASONRY

Field Sheets

Contour	26	27	28	45	46	47	48	67	68	Total	Cu. Yds.
332						4				4	3.7
334						96	00			96	9.9
335						201	237			438	23.0
336						307	492	5		804	83.6
338					49	498	838	67		1452	1329
340					255	544	1212	124		2135	180.9
342					432	656	1474	179	7	2748	246.1
344					693	1059	1820	263	62	3897	318.6
346					1109	1190	2054	270	82	4705	2158
347½					1212	1218	2216	271	89	5006	138.9
348					1221	1237	1908	7		4373	312.3
350					1192	1261	1607			4060	295.4
352					1204	1297	1416			3917	286.6
354	25				1237	1349	1211			3822	341.0
356	182	168	52	83	1555	2302	1042			5384	493.2
358	443	538	83	206	2365	3386	911			7932	627.4
360	404	1325	166	444	2375	3334	761			9009	681.5
362	480	1259	185	1036	2197	3584	650			9391	656.4
364	309	505	152	1315	1890	3629	532			8332	517.7
366		31	57	375	1504	3248	432			5647	242.0
368		00			362	498	26			886	16.4
369					0	0				0	
											58233

Cu. Yds in Curtain Wall to Date = 1747.

58233
249

Total Cu. Yds from Topog 58482

Between Curtain Wall & Old Masonry = 389.0

Derrick Piers = 251.3

Mass Rock above Concrete = 128.0

Total Cu. Yds to date = 66165

Oct 16 1918.   Bob Mixter

Section Sand Storage Site

Sta.	+	H.I.	−	Elev.	
B.M. Basin	1.39	496.28			494.89
0+50 [2+90]			7.48	88.80	
0+00					
Hub 0+50 - 300 △			9.48	86.80	
	6.97	493.77			
0+00					
0+25					
0+50					
0+75					
1+00					
1+25					
△			12.17	81.60	
	3.46	85.06			
0+50					
0+75					
1+00					
△			12.75	72.31	

Hub. 47³
86.80 - 0+50 - 300
91.53
9.94
81.59
3.63
85.22 H.I.
12.93
72.29 @ Rock

85.22 Hub
1.55
83.67

0+50 / 458.2

33.2
425
458.2

96.4 / +0.1 / 300

+2.5 96.4 / 300	93.1 / 0.65 / 320	91.4 / 2.35 / 350	89.2 / 4.55 / 368	87.0 / 6.75 / 389	84.9 / 8.85 / 400	81.9 / 11.9 / 425	81.5 / 12.3 / 437	82.4 / 11.35 / 444	84.? / 9.6 / 458

91.1 / 2.7 / 300	88.2 / 5.6 / 323	84.4 / 9.4 / 350	80.9 / 12.9 / 375	77.9 / 15.9 / 400	76.3 / 17.5 / 415	76.5 / 17.3 / 423	80.6 / 13.2 / 439	84.5 / 9.3 / 458

86.8 / 6.97 / 300   82.1 / 11.7 / 325

~~10.6 / 300~~   ~~13.2 / 313~~   ~~17.4 / 330~~

~~12.8 / 300~~   ~~15.1 / 310~~   ~~18.5 / 327~~

76.6 / 16.2 / 300   71.0 / 22.8 / 323

76.2 / 8.9 / 353	74.7 / 10.4 / 373	70.3 / 14.8 / 396	72.9 / 12.2 / 406	76.7 / 8.4 / 420	78.2 / 6.9 / 428	81.8 / 3.3 / 443	83.67 Hub / 1.39 / 458.2

72.0 / 13.1 / 341	68.1 / 17.0 / 361	66.7 / 18.4 / 372	70.5 / 14.6 / 400	72.6 / 12.5 / 411	75.8 / 9.3 / 427	80.2 / 4.9 / 443	82.4 / 2.7 / 458

71.5 / 13.6 / 338	64.8 / 20.3 / 356	62.4 / 22.7 / 372	65.3 / 19.8 / 380	67.3 / 17.8 / 388	70.0 / 15.1 / 400	71.9 / 13.2 / 418	73.8 / 10.3 / 430	77.6 / 7.5 / 441	79.4 / 5.7 / 458

Oct. 17/1918

1+25 line

Sta		Sand +	Storage H	Sections -	Ele
		2.00	74.31		72.31
458 ±				+0.3	74.6
437				1.1	73.2
427				2.2	72.1
418				4.7	69.6
400				10.0	64.3
39 ±				10.8	63.5
380				13.0	61.3
373	45			18.0	56.3
360	135			15.7	58.6
340				10.3	64.0

1+50 line

		0.73	73.04		72.31
458 ±				2.2	70.8
437				3.3	69.7
428				4.6	68.4
417				6.9	66.1
400				10.1	62.9
39 ±				13.0	60.0
380				16.5	56.5
360	185			19.7	53.3
357	40			18.8	54.2
337	23			12.2	60.8
			✓		

Sub. Mixter

47

P

Rock

10/17/18 Section Sand Storage Site

Sta	+	HI	−	Elev
	1+75 line			
		7304		
458.2			5.2	678
	2+00 line			
458.2			8.8	642
	2+25 line			
458.2			12.7	603
	1+75 line			
		7304		
437			6.5	665
427			10.3	627
410			11.9	611
PP Rock	2.25	6.58	12.71	6033
400			3.9	587
390			7.0	556
374			10.1	525
364			12.7	499
353			9.0	536
337			5.5	571
323			3.2	594

✓

10/17/18

Sand Storage Site Sections

Sta	+	HI	−	Elev
		6258		
	2+00 line			
427			1.3	61.3
411			3.1	59.5
400			5.8	56.8
390			8.0	54.6
377			11.0	51.6
369			14.0	48.6
360	3.0		17.4	45.2
350			14.6	48.0
336	1.4		12.1	50.5
340			9.3	53.3
	2+25 line			
		6258		
421			5.0	57.6
400			7.0	55.6
387			11.0	51.6
364			15.7	46.9
346			18.9	43.7
336			17.0	45.6
327			15.0	47.6
300			11.0	51.6

10/17/18

Sand Storage Site Sections

Sta		+	21	-	Ele
			6258		
		2+50 line			
458.2				6.1	56.5
435				6.7	55.9
412				6.0	56.6
400				6.7	55.9
385				9.1	53.5
374				12.4	50.2
364				14.3	48.3
		2+75 line			
458.2			6258	9.1	53.5
418				9.8	52.8
400				11.4	51.2
370				14.4	48.2
Rock		217	5222	12.53	50.05
		2+50 line			
			5222		
353				7.3	44.9
340				9.7	42.5
329				11.5	40.7
319				8.7	43.5
300				5.4	46.8

✓

10/17/58 Sand Storage Sight Sections

Sta		+	HI	-	Ele
		2+75	line		
			5xxx		
283				4.6	47.6
288				7.5	44.7
300				9.4	42.8
330				11.8	40.4
343				10.6	41.6
356				6.5	45.7
370				4.1	48.1
		3+00	line		
			5xxx		
458				4.3	47.9
437				2.8	49.4
413				3.1	49.1
400				4.4	47.8
360				6.9	45.3
347	ER.			11.0	41.2
340				13.7	38.5
323	ER.			12.8	39.4
316				15.5	36.7
300				14.2	38.0
278	ER.			6.5	45.7
258	ER.			5.5	46.7
255				1.1	51.1
			✓		

10/18/18

Sections Sand Storage

Continued from Page 32.

385
340.0

3+00	447.9	494	491	478	453	417	394	367	380	457	467	51.1
	458±	437.0	413.0	400.0	360.0	342.0	323.0	316.0	300.0	278.0	258.0	255.0
2+75	535	528	512	481	457	416	404	428	447	476		
	458±	418	400.0	370.0	356.0	343.0	330.0	300.0	288.0	383.0		
2+50	565	559	566	559	535	507	483	449	425	407	435	468
	458±	435.0	417.0	400.0	385.0	374.0	364.0	353.0	340.0	329.0	317.0	300.0
2+25	603	576	556	516	469	437	456	476	516			
	458±	421.0	400.0	382.0	364.0	346.0	336.0	324.0	300.0			
2+00	647	613	595	568	546	516	486	452	480	505	533	
	458±	437.0	411.0	400.0	390.0	377.0	369.0	360.0	350.0	336.0	320.0	
1+75	678	665	627	611	587	556	525	499	536	571	594	
	458±	437.0	422.0	410.0	400.0	390.0	374.0	364.0	353.0	337.0	323.0	
1+50	708	697	684	661	629	600	565	533	542	608		
	458±	437.0	428.0	417.0	400.0	392.0	380.0	360.0	350.0	337.0		
1+25	746	732	721	696	643	635	613	563	586	640		
	458±	437.0	427.0	418.0	400.0	392.0	380.0	373.0	360.0	340.0		
1+00	794	776	738	719	700	673	653	624	648	715		
	458±	441.0	430.0	418.0	400.0	388.0	380	372.0	356.0	338.0		
0+75	824	802	758	726	705	667	681	720				
	458±	443.0	427.0	411.0	400.0	372.0	361.0	341.0				
0+50	406											
	8367	818	782	767	729	703	747	762				
	458±	443.0	428.0	420.0	406.0	394.0	378.0	358.0				
0+25	845	806	765	763	779	809	844	867	911			
	458.0	439.0	423.0	415.0	400.0	375.0	358.0	323.0	300.0			
0+00	842	824	815	819	843	870	892	914	931	964		
	458±	444.0	437.0	425.0	400.0	389.0	368.0	350.0	320.0	300.0		

Platted Oct 21 1918

Summary September Estimate

		Cu. Yds.
Schedule I Class 1	No addition for Sept. Total to Date	13942
" I " 2	" " " "	3076
" I " 3	" " " "	50
" I " 4	Estimated 75 c.y for Sept. August = 5734 / 5809 cu. yds = Total =	5809
" II Class 4	Total to Date =	1117

Schedule III Sections

Sta.	Distance between Sta.	End Area	Cu. yds.
2+25		00	
		00	6.9
2+50		15	
			16.1
2+57		109	
			74.9
2+64 3/4		445	
			168.2
2+74 6		437	
			98.3
2+82		226	
			15.8
2+84		200	
Add 10 c.y. Removed from Tunnel		100	
			392.2

See X Section Sheet # 11

Total Schedule III — 392.2
Estimated Class 4 to date 32.0
Total Class 3 to date = 360.2

~~Total Due to Error only 349 cu yds was allowed in Sept. Estimate.~~

11/1/18 October Concrete Estimate

Sta	+	HI	-	Ele
Top of Steel form B.M.	2.40	83.23		80.83
2+79.86 Contraction Joint				
2+84.96				
2+94.96				
3+04.96				
3+14.96				
3+24.96				
3+34.96				
3+44.96				
3+54.96				
3+64.96				
3+74.96				
3+88.91 Contraction Joint				

Stationing on R = 325'

Willcomb - Instr.
Bub - Rod
Mitler - Chain

0 Distance = Steel Forms - R = 330.94

(Readings: elevation / rod / distance)

2+84.96: 76.2/7.0/0 — Recess for Copper Water Stop 5 x .75 from El. 36.6 = 1.4 c.y — 76.8/6.4/4 — 78.3/4.9/10 — 81.1/2.1/16 — Recess 5'x2.7'x10.2 = 5.1 c.y — 81.1/2.1/26 — 79.7/3.5/39 — 74.3/8.9/39

2+94.96: 75.8/7.4/0 — 75.8/7.4/3 — 79.8/3.4/11 — 81.6/1.6/16 — 81.2/2.0/25 — 79.7/3.5/40 — 74.3/8.9/40

3+04.96 (upper): 75.7/7.5/0 — 75.7/7.5/3 — 76.6/6.6/7 — 79.0/4.2/13 — 81.8/1.4/22 — 80.0/3.1/29 — 81.5/1.7/36 — 80.4/2.8/43 — 74.3/8.9/43

3+04.96: 75.7/7.5/0 — 76.2/7.0/8 — 78.3/4.9/15 — 80.8/2.4/21 — 81.0/2.2/26 — 81.3/1.9/42 — 79.5/3.7/52 — 68.5/14.7/52

3+14.96: 75.3/7.9/0 — 75.4/7.8/8 — 77.8/5.4/13 — 79.5/3.7/19 — 80.7/2.5/26 — 79.2/4.0/35 — 80.8/2.4/41 — 79.8/3.4/48 — 70.8/12.4/4.8.

3+24.96: 75.1/8.1/0 — 75.4/7.8/12 — 79.4/3.8/12 — 78.1/5.1/17 — 78.8/4.4/25 — 79.6/3.6/33 — 78.9/4.3/38 — 76.8/6.4/43 — 74.7/8.5/44

3+34.96: 75.3/7.9/0 — 75.3/7.9/8 — 77.1/6.1/15 — 79.3/3.9/22 — 79.1/4.1/28 — 78.3/4.9/35 — 74.5/8.7/44 — 73.9/9.3/50

3+44.96: 75.7/7.5/0 — 75.5/7.7/5 — 79.0/4.2/10 — 79.2/4.0/19 — 78.7/4.5/31 — 74.9/8.3/40 — 72.9/10.3/47 — 72.7/10.5/50

3+54.96: 77.1/6.1/0 — 78.2/5.0/8 — 79.4/3.8/13 — 79.1/4.1/23 — 77.9/5.3/33 — 73.1/10.1/45 — 73.0/10.2/50

3+64.96: 76.4/6.8/0 — 77.1/6.1/5 — 79.1/4.1/14 — 79.3/3.9/39 — 77.9/5.3/37 — 73.4/9.8/47 — 73.9/9.3/50

3+74.96: 76.6/6.6/0 — 76.4/6.8/5 — 78.9/4.3/10 — 78.7/4.5/18 — 78.7/4.5/27 — 77.3/5.9/40 — 75.0/8.2/47 — 74.7/8.5/50 — Recess 10.5 x 1. x 5' deep = 1.9 c.y.

3+88.91: 76.5/6.7/0 — 76.5/6.7/8 — Recess 5 x 2.5 = 1.4 c.y — 79.2/4.0/13 — 77.5/5.7/22 — Recess 5 x 2.8 x .5 = .5 c.y — 76.0/7.2/30 — 75.8/7.4/40 — Recess 10.5 x 1. x 5 — 75.2/8.0/48

Plotted 11/2/18 ✓

11/1/18

October Estimate
Concrete

Sta	+	H.I.	−	El.
		83.23		
P. Rock	687	77.94	12.16	71.07
3+88 96				
4+04 96		Substract 1.5' from all +'s ✓		
4+14 96		" " " " ✓		
4+29 96		" " " " ✓		
4+34 96				
			11.5	66.4 =
	20 ✓	73.76		66.74
3+88 96 South				
3+74 96				
3+64 96				
3+54 96				

Plotted 11/2/18

Plotted 11/11/18

Williamsburg 1st.
Sub-Rod
Mixtar - Cyclone:

55

4+38 96 = Rock at Elev. Bottom Floor

Pier - 8'x8·9' = 21.3 C.Y.

66.3	66.3	66.3	68.7	63.7	64.7	66.4	66.7	67.6	67.2	67.1	68.5	68.8
11.6	11.6	11.6	14.2	14.2	13.2	11.4	11.7	10.3	10.7	10.8	9.4	9.1 ✓
-1.5	0	15.9	15.9	19.9	19.9	28	41	47	57	63	72	78
											66.7 11.2 105	67.8 10.1 88
66.7	66.7	65.9	64.4	65.4	66.8	67.4	65.9	68.0	67.5	68.4	68.5	11.2 66.7
11.7	11.7	12.10	13.5	12.5	11.1	10.5	12.0	9.9	10.4	9.5	9.4	10.8
-1.5	0	9.5	9.5	17	26	36	45	55	60	77	95	105.5
				15.5	24.5	34.5	43.5	53.5	58.5	75.5	93.5	
65.9												
12.0	65.9	65.9	64.3	67.4	67.8	66.5	69.7	68.3	67.6	68.5	68.2	66.7
-1.5	12.0	12.0	13.1	10.5	10.1	11.4	8.7	9.6	10.3	9.4	9.7	11.2
	0	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2	+2
		105	105	22.5	34.5	40.5	53.5	68.5	75.5	90.5	98.5	104.5
Wall		64.3	64.3	64.7	67.2	66.4	67.4	66.8	(Pier		68.1	69.2	66.6
-2		13.6	13.6	13.2	10.7	11.5	10.5	11.1	8'x8'x6.5		9.8	8.7	11.3
		0	9	+2	+8	+7	68	77	15.4 cy.		87	98	104.5
				30.5	76.5	85.5	66.5	75.5			85.5	96.5	
Wall	64.0	64.0	61.0	61.0	64.6	65.5	65.1	67.4	66.0	68.2	68.8	66.6
-1	13.9	13.9	16.9	16.9	13.3	12.4	9.8	10.5	11.9	9.7	9.1	11.3
	0	9	10	14	26	28	42	70	76	84	96	105

Contact Concrete Rock N.E. Cir. Rod = 11.5

Top forms 3+88 96 downstream face.

Balance same as above

	4.3	7.2		6.1	
	69.5	66.6		67.7	
	75	69		60.0	
7.0	4.8	6.0	5.1	2.6	1.5
66.8	69.0	67.8	68.7	71.2	72.3
104.5	87	78	71	70	58
	7.05	6.8	6.3	2.0	2.1
	66.7	67.0	67.5	71.8	71.7
	105	87	78	64	59

Add Pier 8x8x5 = 11.8

66.3	67.3	68.0	69.2	69.4	72.1
7.5	6.5	5.8	4.6	4.4	1.7
105	91	80	74	69	63

✓

11/1/18

October Estimate

Sta	+	H.I.	−	Elev
3+44 96		73.76		
		73.76	3.96	69.80
	5.62	75.42		
3+34 96				
3+24 96				
3+14 96				
3+04 96				
2+94 96				
2+84 96				
2+79 96				

Plotted 11/7/18

3+44

66.4	69.1	69.4	69.4	69.9	70.1	74.5
7.4	4.7	4.4	4.4	3.9	3.7	+0.7
105	92	84	76	70	67	57

3+34

66.5	66.1	69.7	70.1	70.4	73.7
8.9	9.3	6.2	5.3	5.0	1.7
105	93	88	80	69	60

3+24

66.7	66.8	70.5	70.4	70.7	77.0
9.2	8.6	4.9	5.0	4.7	3.4
105	90	81	71	58	53

Pier 8'×8'×7' = 17.9 cy

3+14

66.4	66.4	68.5	69.0	67.9	66.6	68.7
9.0	9.0	6.9	6.4	7.5	8.8	6.7
105	96	87	82	72	64	52

3+04

66.6	68.1	68.4	69.5	67.8	66.7	66.7
8.8	7.3	7.0	5.9	7.6	9.2	9.2
104	96	90	83	77	72	61

2+94

66.3	69.3	68.7	68.8	65.8	66.3	67.9
9.1	6.1	6.7	6.6	9.6	9.1	7.5
104	94	86	76	74	58	51

2+84

66.7	67.0	69.4	68.6	66.3	65.1	67.8		72.6
9.2	8.4	6.0	6.8	9.1	10.3	8.3	5.7	2.8
104	95	91	81	75	61	55		45

Pier 8'×8'7" = 17.9
" 8'×8'×8.5" = 20.7
" 8'×8'×2" = 1.2
" 8'×8'×8" = 18.6

2+79

66.5	67.8	67.8	66.5	67.9	65.8	72.1
8.9	7.6	7.6	8.9	7.1	9.6	3.3
103	79	89	79	67	59	49

Continued Book #14

8-3-18 Final Topog.

At A11 - 21.85' S -

H.I. 369.26

60	13.5	210°30'	62	20.0	236°
	12.7	222°		22.5	237°30'
	10.6	247°	Ring. H.P.	26.4	237°30'
	13.5	246°	363.4	24.3	233°
	14.1	221°30'	363.3	26.4	228°30'
	17.3	209°	362	27.5	253°
	18.7	208°		25.4	257°30'
	20.4	216°30'		24.7	264°
	23.0	220°30'		25.0	267°
	28.7	216°30'		20.6	269°30'
	32.1	216°30'		21.0	274°30'
	34.0	219°		19.5	278°
	35.3	223°		20.9	293°
	27.7	240°30'		16.1	298°30'
	29.0	242°30'		13.9	299°30'
	31.5	240°		11.0	322°30'
62 Ring	28.6	232°		12.8	332°30'
	30.8	225°30'	362 (Vert. for 10')	13.0	339°30'
	32.	222°	364 (Vert. 9')	13.0	340°30
	29.1	222°		13.9	333°30'
	25.5	220°		13.1	331°30'
	23.4	226°30'		14.3	321°30'
	21.2	229°		14.7	315°30'
	20.8	228°30'		16.5	308°30'

Plotted

364	19.6'	302°30'	366	42.4	275°30'
	23.3'	301°30'		43.3	278°
	24.8	297°30'		46.2	277°
	26.3	297°30'		44.3	288°
	28.1	289°		37.6	291°
	29.9	284°30'		36.1	293°30'
	26.7	279°30'		35.7	295°
	26.6	275°		33.5	298°
	28.0	270°30'		30.4	298°
	26.7	265°30'		25.9	306°
	27.3	260°		20.5	310°
	27.3	258°30'		18.5	317°30'
	28.5	253°		16.6	322°30'
	30.2	253°		16.7	334°
	30.6	255°30'			
	31.8	256°			
	33	261°30'			
	34.5	262°30'			
	37.3	261°			
	38.6	264°30'			
366	38.3	270°30'			
	36.0	270°30'			
	35.7	273°30'			
	39.5	273°			

Plotted

Next 2 shots same as next lower contour

Continued in book Topog 1 page 50-51

9/4/18

Bob

58

Mass Rock Above Concrete

2x2x1	4.0	3x3x1	9.0	3x1x2	6.0
2x2x.5	2.0	2x2x3	12.0	2x2.5x1	5.0
3x2x.3	1.8	2x2.5x1	5.0	3x1.5x1	3.0
3x3x.4	2.7	3x3x5	45.0	1x1x2	2.0
2.5x2x1	5.0	3x3x1.5	13.5	3x3x2.5	22.5
2.3x3.4x1.4	11.0	2x2x1	4.0	2.5x3x.5	3.8
2x3x1.5	9.0	2x3.5x3	21.0	3x1x2.5	5.0
1.5x3x.1	4.5	1x2x1	2.0	3x1x1	3.0
3.5x3.5x2	24.5	2x2.5x1	5.0	2x3x3	18.0
2.7x4x1	10.8	3x3x1.5	13.5	2.5x3x3	22.5
1x1x1	1.0	1.5x2.5x1	3.8	2x4x1	8.0
3x5x1.5	22.5	3x1x1	3.0	1x3x1.5	4.5
4x3x1.5	18.0	2x3x1.5	7.5	1x3x.5	1.5
2x3x1.5	9.0	2x2x1	4.0	3x3x.5	13.5
2x3x1.2	7.2	1x3x4	12.0	2.5x5x1	12.5
7x2x1	14.0	3x4x2	24.0	1x2x1	2.0
2x2x1.5	6.0	3x2x.5	3.0	1.5x4x3	18.0
2.5x4x2.5	25.0	2x4x1.5	9.0		
2x2x.5	2.0	1x1x1	1.0		
1.5x2x.8	2.4	5x3x2	30.0		
4x1.5x1.5	9.0	3x3x2	18.0		
2x3x1	6.0	3x6x1.3	23.4		
2x2x.5	2.0	1x1.5x4	6.0		
2x2x1	4.0	3.5x4x2	21.0		
3x3x1	9.0	2x7x2	28.0		
3x3x1.5	13.5	3.5x3x1.5	11.3		
3x2x1.5	6.3	2x4x3	24.0		
2.5x2.5x1	2.0	4x2x2	16.0		
2x2x.5	2.2	1x3x1	3.0		
3x1.5x.8	2.6	2x2x2	8.0		
3.5x3x2.5	15.6	5x2.5x2	15.0		
2.6x3x2	4.0	2x1x1	2.0		
2x2x1	2.3	1.5x1.5x3	6.8		
2.5x3x.3	4.5	2x2x.5	2.0		
3x3x.5	1.5	4x1x1	4.0		
1.5x2x.5	2.0	3x1.5x2	9.0		
1x2x1	3.8	5x3x2	30.0		
2.5x1.5x1	7.0	2x3x1	6.0		
1.5x2x2.5	8.0	2x2x1.5	6.0		
2x4x1	6.0	2.5x2.5x6	37.5		
2x3x1		2.5x3x1	7.5		

Set on E10 and located ⊼ at D10-15.15 E-

List B.M.s

		Elev.
USGS Cross in Brass Cap E. End Dam		486.569
#1 Nail in Boulder ½ Way down Slope below W. End Spillway		440.24
#2 Nail in Ledge 20' above Bottom Draw W. Side below #1		401.22
#3 Bolt in Rock Ledge West Side Canyon 217' W. of Core Wall		371.30
#4 Bolt in Flat Ledge W. Side Canyon 50' below Upper Dam		377.59
#6 Rock West End Basin below Tool House		494.89
Red Paint Mark on Boulder in old Concrete 3' E. of B.M. 15 W. 15 N.		362.13
Plug in Concrete Abutment old Core Wall C.P. Sec 4 T 20 R. 315		439.11
R.R. Spike in Plug Upstream Face old Masonry		337.23
#7 Bolt in Rock Ledge 75' E. of N. End Diversion Dam To Replace #3		372.66

94.89
18
950

KEITH'S RAILROAD CURVE TABLES.

Published by KEUFFEL & ESSER CO., New York.

HOW TO USE KEITH'S TABLES.

EXAMPLE.

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

Ext. in Tab. IV opposite 23° 20′ = 120.87
120.87 ÷ 12 = 10.07. Say a 10° Curve.

Tan. in Tab. IV opp. 23° 20′ = 1183.1
1183.1 ÷ 10 = 118.31.

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

(If corrected Ext. is required find in same way)
Ang. 23° 20′ = 23.33° ÷ 10 = 2.3333 = L. C.

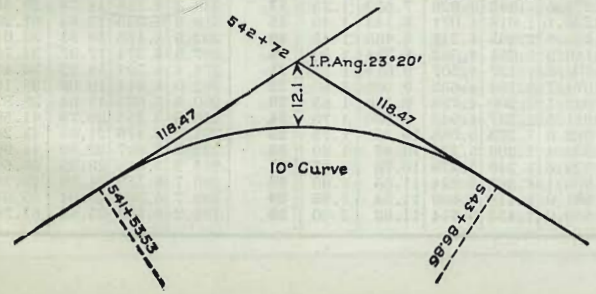
2° 19½′ = def. for sta.	542	I. P. = sta.	542+72
4° 49½′ = " " "	+50	Tan. =	1.18.47
7° 19½′ = " " "	543	B. C. = sta.	541+53.53
9° 49½′ = " " "	+50	L. C. =	2.33.33
11° 40′ = " " "	543+	E. C. = Sta.	543+86.86
	86.86		

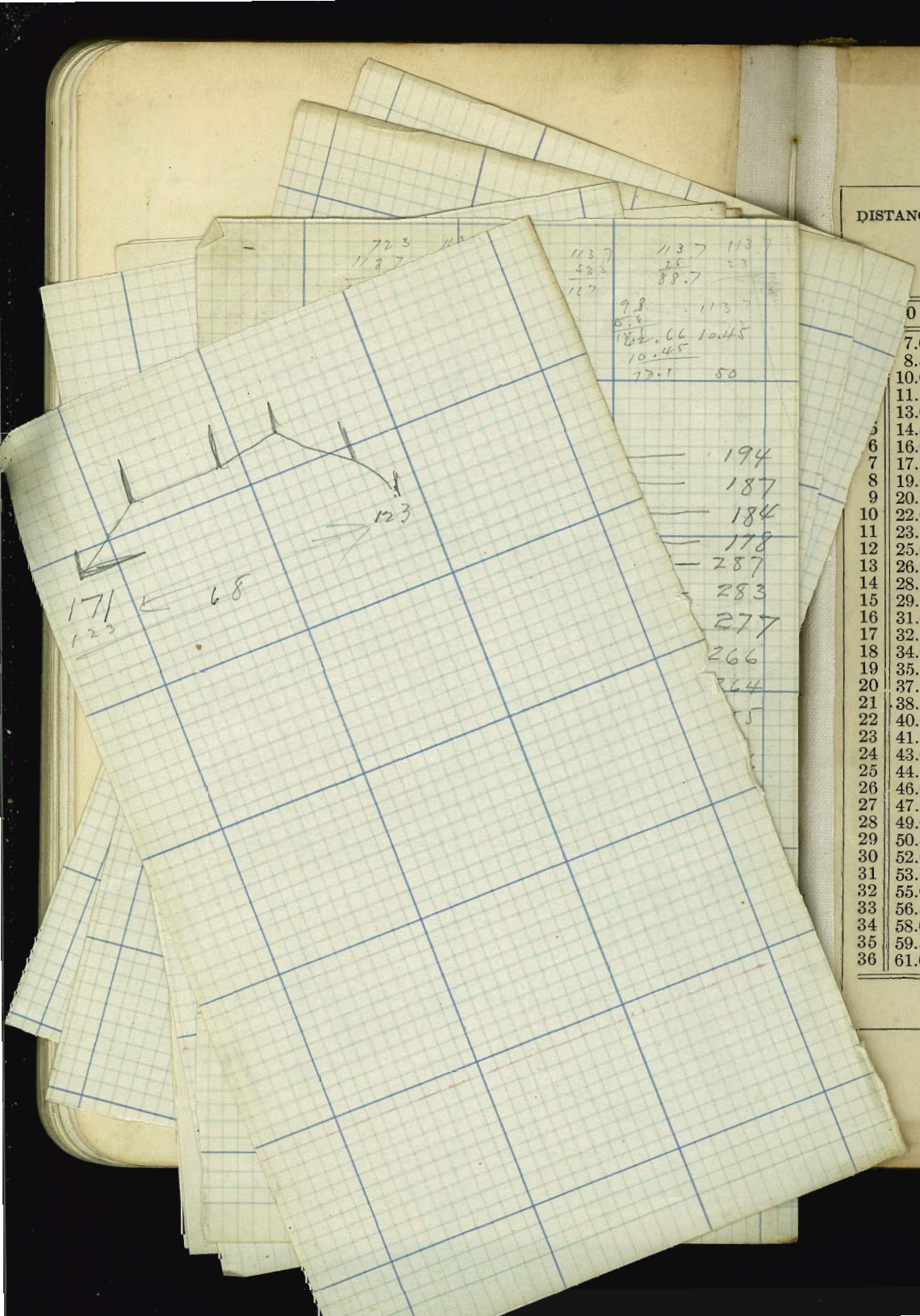
100 − 53.53 = 46.47 × 3′ (def. for 1 ft. of 10° Cur.) = 139.41′ = 2° 19½″ = def. for sta. 542.

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

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

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





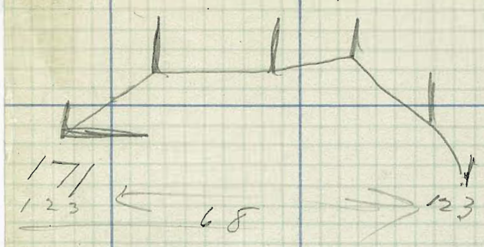
DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1½ TO 1.

FOR SINGLE TRACK EMBANKMENT.

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

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



723
1137
186

1137
583
167

1137
583
167

1137
25
88.7

1137
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116
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9.8
5.8
17.2 .66 10.45
10.45
73.1 50

00 + 10 = 00 End of Sand

12.7
5.8
11.5

0+25 123 End Sand —— 194
0+50 114 " " —— 187
0+75 103 " " —— 184
1+00 89 " " —— 178
1+25 91 " " — 1+35=00 168 — 246 — 287
1+50 114 " " 164 — 205 — 283
1+75 125 " " — 150 — 177 — 277
2+00 131 " "
2+25 167 " " — 186 — — 218 —— 266
264
2+50 165 " "
255
2+75 167 " "
3+00 178 " "
246

3+15 = 00

4582
35
4832

7794
112
6674

627

4 40.3
380.3
594

83.0
5.6
88.6
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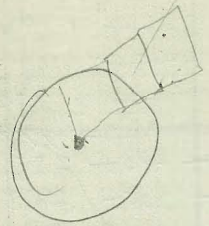
113.7

2 × 4 hub



132
102

140
3

29
2
53
49
10

64
64
128

11.3

28
22
1600

102.7
22.6
80.1

24
13

58
25
83

24
24
48

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