

W361

1881

July Est.

361

Tables for Excavations and Embankments.
Distances from Centre of Roadway for Cross Sectioning.
Roadway 22 feet wide. Side Slopes 1 to 1.
For Single Track Excavation.

MICROFILMED											
							.7	.8	.9		
0	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	0
1	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	1
2	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	2
3	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	3
4	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	4
5	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	5
6	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	6
7	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	7
8	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	8
9	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	9
10	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	10
11	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	11
12	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	12
13	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	13
14	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	14
15	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	15
16	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	16
17	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	17
18	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	18
19	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	19
20	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	20
21	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	21
22	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	22
23	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	23
24	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	24
25	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	25
26	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	26
27	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	27
28	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	28
29	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	29
30	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	30
31	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	31
32	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	32
33	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	33
34	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	34
35	46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	46.9	35
36	47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7	47.8	47.9	36
37	48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7	48.8	48.9	37
38	49.0	49.1	49.2	49.3	49.4	49.5	49.6	49.7	49.8	49.9	38
39	50.0	50.1	50.2	50.3	50.4	50.5	50.6	50.7	50.8	50.9	39
40	51.0	51.1	51.2	51.3	51.4	51.5	51.6	51.7	51.8	51.9	40

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below downstream toe wall for
Nov. 1932 Estimate.

Area
Rock Emb Hyd. Fill

601.43
590.03 12.71 588.72

T.P. 1.31

N3360

E 5000		78.6	83.9	5.3
020	14.5	575.7	84.7	-9.0
040	16.1	73.9	84.4	-10.5
060	14.3	75.7	85.5	-9.8
080	11.3	78.7	84.9	-6.2
100	6.4	83.0	86.4	-2.8
120	4.3	85.7	89.7	-4.0
140	5.2	84.8	91.8	-7.0
150	0.6			0.0

48.45
 $51.95 \times 20 =$
 3.5×10

969.
 35
 1039.0
 1004

N3400

579.81

5

E 5000		66.2	74.3	8.6	
020	12.5	567.3	74.0	-6.7	
040	11.6	68.2	74.8	-6.6	
060	11.6	68.2	76.0	-7.8	
080	11.0	68.8	76.5	-7.7	
100	7.3	72.5	77.5	-5.0	
120	5.2	74.6	79.8	-5.2	
140	2.3	76.5	80.5	-4.0	$45.05 \times 20 =$
160	0.2	79.6	81.4	-1.8	
180	+1.6	81.4	83.1	-1.7	
200	+0.6	80.4	86.4	-6.0	
220	+0.6	80.4	88.9	-8.5	
240	0.6		90.7	20	$20 \times 20 = 400.0$

901.0 ✓

400.0 ✓

N 3420

579.81

Rock Emb

Hyd Fill

E 5240		0.6	84.6	0.0	
220	1.4	78.4	82.2	-3.8	
200	0.3	78.5	78.9	-0.4	
180	+0.6	80.4	80.1	+0.3	
160	5.7	72.1	78.3	-6.2	
140	12.4	67.4	76.4	-9.0	149
120	16.3	63.5	75.4	-11.9	298
100	17.5	62.3	74.7	-12.4	15.20 x 20 = 304.0
080	19.4	60.4	74.9	-14.5	
060	19.0	60.8	73.2	-12.4	
040	20.4	59.4	67.6	-8.2	
020	21.1	58.7	61.5	-2.8	
5000		58.6	59.2	0.6	67.0 x 20 =

1340.0

N3440

Rock Emb

7
Hyd. Fill.

579.81

5000		55.8		2.07		
020	22.1	57.7	59.0	- 1.3		
040	21.6	58.2	58.8	- 0.6		
060	21.0	58.8	60.1	- 1.3		
080	21.5	58.3	71.7	- 13.4		
100	20.9	58.9	72.2	- 13.3		
120	21.2	58.6	72.6	- 14.0		
140	20.2	59.6	73.4	- 13.8	52.15 x 20 =	1043.0 ✓
160	14.6	65.2	74.3	- 9.1		
180	12.3	67.5	75.1	- 7.6		
200	4.6	75.2	76.4	- 0.8 1.2		
220	1.5	78.3	78.6	- 0.3		
240	3.9	75.9	78.3	- 2.4		
260	1.8	78.0	79.2	- 1.2		
280	0.5	79.3	80.9	- 1.6		
300	0.3	79.5	80.8	- 1.3		
320	0.9	78.9	81.5	- 2.6		
340	1.2	78.6	82.3	- 3.7		
360	0.6		85.2	0.0	37.5 x 20 =	750.0 ✓

N3460

580		0.6		0.0		
560	579.8	19.2	60.6	74.5	13.9	
540		19.0	60.8	74.4	13.6	
520		18.4	61.4	74.7	13.3	
500		18.1	61.7	74.5	12.8	47.2 x 20 = 944.0 ✓

N3460

579.81

5490			17.6	62.2	74.5	12.31	$12.55 \times 10 =$	125.5
5470			0.6			0.0	$6.15 \times 20 =$	123.0
orig. Ground Here to Here								
5420			0.6		78.4	0.0		
5400			3.8	76.0	76.4	-0.4		
380			4.0	75.8	75.8	0.0		
360			5.3	74.5	75.9	-0.4		
340			9.4	70.4	76.2	-5.8		
320			9.6	70.2	76.3	-6.1		
300			8.4	71.4	76.6	-5.2		
280			6.6	73.2	77.5	-4.3		
260			5.0	74.3	75.9	-1.6		
240			? 4.2	75.6	74.5	+9.0?	possibly	
220			9.7	70.1	72.9	-2.8		
T.F.	1.67	568.55	12.93	566.88				
200			6.6	62.0	72.4	0.4	10.4	
180			7.9	60.7	71.9	7.2	11.2	
160			8.8	59.7	71.3	7.6	11.6	
140			9.5	59.0	62.5	3.5	$31.45 \times 20 =$	629.0
120			10.1	58.5	59.2	-0.7		1821.5
100			9.1	59.5	58.4	-0.9		
080			13.1	55.5	58.2	-2.7		
060			28.0	40.5	58.5	-18.0		
040			29.7	38.8	58.6	-19.8		

80

N3460

568.55

5020

29.4 539.1 559.9

-20.8

5000

39.2 60.3

-21.1 75.20x20 =

1504.0 ✓

July 28-1932

10

B.M.	0.67	567.14		566.47
			11.92	555.22

	2.24	557.46		
--	------	--------	--	--

N3500

B.M.	5.05	571.52		566.47
	2.07	564.33	9.26	562.26

E 5560		564.3	3.6	560.7	68.8	8.1
540			7.8	565	68.2	11.7
520			9.3	55.0	68.3	13.3
500			8.8	55.5	67.5	12.0
480			6.7	57.6	67.4	10.8 9.8
460			2.9	61.4	67.1	5.7
440			3.6	60.7	66.9	6.2
420			2.9	61.4	67.8	6.4
400			3.3	61.0	66.3	5.3
380			3.1	61.2	64.5	3.3
360			1.3	63.0	61.1	0.0
340			6.2	58.1	61.4	3.3
320			5.9	58.4	61.3	2.9
300			9.7	54.6	64.0	9.4
280			8.5	55.8	64.5	8.7
260			9.9	54.4	64.2	9.8
240			10.2	54.1	60.5	6.4
T.P.			9.11	555.22		

	2.24	557.46		
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N3500

557.46

5220	557.5	6.9	50.6	60.8	10.2
200		8.2	49.3	61.0	11.7
180		10.7	46.8	60.5	13.7
160		10.0	47.5	60.9	13.4
140		9.3	48.2	61.4	13.2
120		8.3	49.2	61.4	12.2
100		17.8	39.7	61.4	21.7
080		18.5	39.0	61.4	22.4
060		18.3	39.2	61.4	22.2
040		19.3	38.2	61.3	23.1
020		18.1	39.4	61.4	22.0
00			35.6	61.4	25.8

174.85 x 20

3497.0

143.1 x 20

2862.0

562.26

0.66

562.92

56.3

+6.6

transit

11

N3520

B.M. 1.04

556.26

558.22

5000			35.7	61.4	25.5
020	556.3	17.9	38.4	61.7	23.3
040		17.6	38.7	61.6	22.9
060		16.3	40.0	61.7	21.7
080		17.4	38.9	61.6	22.7
100		17.3	39.0	61.6	22.6
120		7.0	49.3	61.8	12.5
140		8.1	48.2	61.6	13.4

145.35 x 20 =

2907.0

N3520

12

556.26

5160	8.4	47.9	61.8	13.9
180	8.0	48.3	61.8	13.5
200	8.2	48.1	62.1	14.0
220	7.9	48.4	62.2	13.8
240	7.8	48.5	62.4	13.9
260	6.4	49.9	62.7	12.8
280	6.7	49.6	62.7	13.1
300	5.5	50.8	62.8	12.0
320	4.9	51.4	63.0	11.6
340	4.3	52.0	63.7	11.2
360	2.8	53.5	63.2	9.7
380	2.2	56.1	63.2	7.1
400	+1.1	57.4	63.4	6.0
420	+1.9	58.2	63.5	5.3
440	+3.0	59.3	63.6	4.3
460	+2.1	58.4	63.8	5.4
480	6.1	50.2	63.9	13.7
500	15.0	41.3	63.8	22.5
520	15.4	40.9	63.9	23.0
540	7.7	48.6	63.4	14.8
560	0.8		63.8	0.0

234.65

$$248.3 \times 20 = 4966.0 \checkmark$$

$$4693.0 \checkmark$$

N3540

13

556.26

5570	0.0		64.0	0.0	
5560	+1.3	57.6	63.8	6.2	3.1 x 10
540	17.3	39.0	63.8	24.8	31.0
520	17.3	39.0	63.8	24.8	
500	17.4	38.9	63.5	24.6	
480	12.4	43.9	63.5	19.6	
460	0.0	56.3	63.9	7.6	
440	+1.4	57.7	63.6	5.9	
420	+0.6	56.9	63.5	6.6	
400	0.0	56.3	63.2	6.9	
380	0.9	55.4	63.2	8.8	
360	2.0	54.3	62.9	8.6	
340	2.8	53.5	63.0	7.5	
320	3.9	52.4	62.8	10.4	
300	5.0	51.3	62.5	11.2	
280	6.0	50.3	62.5	12.2	
260	6.8	49.5	62.5	13.0	
240	7.5	48.8	62.2	13.4	
220	7.5	48.8	62.2	13.4	
200	7.6	48.7	61.9	13.2	

556.26

5180	8.5	47.8	62.1	14.3		
160	8.1	48.2	61.9	13.7	271.85	5437 ✓
140	7.2	49.1	61.6	12.5	274.95 × 20 =	5499.0
120	7.0	49.3	61.6	12.3		
100	17.6	38.7	61.7	23.0		
080	17.6	38.7	61.8	23.1		
060	16.6	39.7	61.8	22.1		
040	16.9	39.4	61.7	22.3		
020	18.0	38.3	61.6	23.3		
5000		36.2	61.5	25.3	145.0 × 20 =	2900.0

556.26

5000			37.5	62.1	24.6
020	556.3	18.0	38.3	62.3	24.0
040		18.2	38.1	62.4	24.3
060		18.7	37.6	62.5	24.9
080		18.6	37.7	62.5	24.8
100		16.8	39.5	62.5	23.0
120		6.4	49.9	62.7	12.8
140		7.1	49.2	62.6	13.4
160		7.6	48.7	62.6	13.9
180		7.7	48.6	62.6	14.0
200		7.8	48.5	62.5	14.0
220		7.4	48.9	62.6	13.7
240		7.1	49.2	62.6	13.4
260		6.6	49.7	62.7	13.0
280		6.5	49.8	62.5	12.7
300		6.5	49.8	62.7	12.9
320		6.6	49.7	62.9	13.2
340		6.9	49.4	62.8	13.4
360		8.2	48.1	62.7	14.6
380		2.6	53.7	62.8	9.1
400		1.9	54.4	62.9	8.5

$$152.80 \times 20 =$$

3056.0

3580

16

556.26

542.0	2.1	54.2	62.9	8.7		
440	2.9	53.4	63.3	9.9		
460	9.7	46.6	63.7	17.1		
480	19.0	37.3	63.4	26.1		
500	19.4	36.9	63.2	25.3		
520	18.4	37.9	63.3	25.4		
540	17.8	38.5	63.2	24.7	297.95 x 20	599.5
570	0.6 +8.4	64.7	63.4	0.9	12.35 x 30 310.3 x 20	370 6206.0 6365

N3620

E 5570	0.6 +8.4	64.7	65.0	0.3		
540	17.4	38.9	64.7	25.8	13.05 x 30	391.5
520	18.1	38.2	64.3	26.1		12.9
500	17.3	39.0	63.7	24.7		
480	19.5	36.8	63.3	26.5		
460	12.4	43.9	63.7	19.8		
440	7.4	48.9	63.7	14.3		
420	8.0	48.3	63.2	14.9		
400	7.5	48.8	63.5	14.7		

556.26

5380	8.2	48.1	63.2	15.1	
360	7.9	48.4	63.1	14.7	
340	7.9	48.4	63.1	14.7	
320	8.2	48.1	62.7	14.6	
300	8.0	48.3	62.2	13.9	
280	8.0	48.3	61.2	12.9	
260	6.9	49.4	62.3	12.9	
240	7.1	49.2	61.7	12.5	
220	7.3	49.0	61.7	12.7	
200	7.6	48.7	59.9	11.2	
180	7.2	49.1	58.5	9.4	
160	6.9	49.4	57.7	8.3	310.55
140	6.1	50.2	57.7	7.5	$323.45 \times 20 = 6469.0$
120	9.5	46.8	57.6	10.8	6602.5
100	10.5	45.8	57.5	11.7	
080	16.0	40.3	57.7	17.4	
060	17.7	38.6	57.7	21.1	
040	17.8	38.5	58.3	19.8	
020	17.2	39.1	57.2	18.1	
5000		38.7	56.3	17.6	$111.45 \times 20 =$

88

2229.0

556.26

E 5000		46.0	54.6	8.6	4.3
020	17.1	39.2	55.1	15.9	
040	16.3	40.0	56.5	16.5	
060	13.0	43.3	56.4	13.1	
080	10.6	45.7	56.5	10.8	
100	10.3	46.0	57.6	11.6	
120	10.1	46.2	60.6	14.4	
140	6.0	50.3	61.8	11.5	92.35 x 20
160	6.7	49.6	62.8	13.2	
180	7.0	49.3	61.7	12.4	
200	6.3	50.0	62.7	12.7	
220	7.5	48.8	64.6	15.8	
240	6.4	49.9	65.7	15.3	
260	7.7	48.6	65.0	16.4	
280	8.6	47.7	63.9	16.2	
300	9.5	46.8	63.8	17.0	
320	9.6	46.7	63.9	17.2	
340	9.3	47.0	63.9	16.9	
360	7.1	47.2	63.8	16.6	
380	8.3	48.0	64.1	16.1	
400	7.3	49.0	64.0	15.0	

✓
1847.0

556.26

5420	6.8	49.5	64.6	15.1
440	6.6	49.7	64.9	15.2
460	7.3	49.0	65.3	16.3
480	18.2	38.1	65.8	27.7
500	18.3	38.0	65.7	27.7
520	17.4	38.9	66.6	27.7
540	17.8	38.5	64.8	25.3
570	0.6			0.0

248.90 x 20

2126.5 x 30

361.55 x 20 =

6978.0 ✓

379.5 ✓

7231.0 ✓

7357.5 ✓

m.65

N 3700

5570	0.6		61.9	0.0
560	7.0	49.3	62.2	12.9
540	16.8	39.5	62.5	23.0
520	14.0	42.3	63.5	21.2
500	13.9	42.4	62.7	20.3
480	15.5	40.8	61.9	21.1
460	8.3	48.0	62.5	14.5
440	8.4	47.9	63.9	16.0

6.45 x 10

64.5

64.5

556.26

5420	84	47.9	64.7	16.8		
400	9.0	46.3	65.6	19.3		
380	8.7	47.6	66.2	18.6		
360	8.7	47.6	67.5	19.9		
340	8.2	48.1	66.6	18.5		
320	8.8	47.5	66.0	18.5		
300	8.8	47.5	67.0	19.5		
280	8.6	47.7	67.1	19.4		
260	8.1	48.2	67.0	18.8		
240	8.0	48.3	67.0	18.7		
220	8.1	48.2	64.7	16.5		
200	7.8	48.5	63.8	15.3		
180	8.2	48.1	58.9	10.8		
160	8.0	48.3	57.7	8.9	366.05	7321.0 ✓
140	7.4	48.9	56.9	8.0	$372.5 \times 20 =$	7450.0 ✓
120	6.4	49.9	57.1	7.2		7385.5 ✓
100	7.8	48.5	55.8	7.3		
080	6.0	50.3	55.7	5.4		
060	6.6	49.7	55.3	5.6		
040	7.2	49.1	54.4	5.3		
020	7.3	49.0	54.5	5.5		
5000		47.8	54.5	6.7	$4365 \times 20 =$	873.0 ✓

(335)

N3740

556.26

21

5000		49.2	55.7	6.5
020	6.6	49.7	53.9	4.2
040	7.1	48.2	54.5	6.3
060	7.2	49.1	54.8	5.7
080	8.1	48.2	54.9	6.7
100	6.7	49.6	55.0	5.4
120	7.5	48.8	55.2	6.4
140	7.4	48.9	55.0	6.1
160	8.3	48.0	54.9	6.9
180	9.1	47.2	56.0	8.8
200	8.9	47.4	56.2	8.8
220	9.0	47.3	56.6	9.3
240	9.2	47.1	56.6	9.5
260	8.8	47.5	56.6	9.1
280	9.0	47.3	56.6	9.3
300	8.9	47.4	58.2	10.8
320	8.6	47.7	59.6	11.9
340	7.5	48.8	59.9	11.1
360	8.2	48.1	60.2	12.1
380	8.8	47.5	61.0	13.5
400	8.8	47.5	61.2	13.7

3.26

41.0 x 20 =

820.0 ✓

N3740

22

556.26

5420	9.0	47.3	59.9	12.6
440	8.3	48.0	60.8	12.8
460	4.5	51.8	60.0	8.2
480	13.9	42.4	59.6	17.2
500	13.1	43.2	59.4	16.2
520	10.5	45.8	58.8	13.0
540	9.4	46.9	57.2	10.3
560	5.8	50.5	57.5	7.0
570	0.6			0.0

$$\begin{array}{r}
 7.0 \text{ } 23 \text{ } 11.5 \\
 25 \times 10 \\
 0.0 \text{ } 2 \text{ } 35.15 \times 20 = 4703.0 \\
 4668
 \end{array}$$

4633.0

25.0

4703.0

4668

(95)

	556.26	0.6			
580					0.0
540		6.3	50.0	57.4	7.4
520		9.1	47.2	57.2	10.0
500		7.9	48.4	57.1	8.7
480		7.5	48.8	56.9	8.1
460		0.0	56.3	57.0	0.7
440		0.2	56.1	56.6	0.5
420		6.1	50.2	56.8	6.6
400		4.2	52.1	56.6	4.5
380		8.6	47.7	56.3	8.6
360		8.2	48.1	56.2	8.1
340		6.7	49.6	56.4	6.8
320		6.4	49.9	56.3	6.4
300		6.8	49.5	55.6	6.1
280		4.9	51.4	55.9	4.5
260		4.6	51.7	55.7	4.0
240		5.4	50.9	55.6	4.7
220		9.9	46.4	55.6	9.2
200		7.8	48.5	55.6	7.1
180		5.0	51.3	55.6	4.3
160		5.0	51.3	55.9	4.6
140		2.9	53.4	55.4	2.0
					121.9 × 20 = 2438.0 ✓

556.26

5120		4.0	52.3	55.7	3.4		
100		4.9	51.4	54.6	3.2		
080		2.6	53.7	56.7	3.0		
060		2.3	54.0	57.1	3.1		
040		1.2	55.1	57.7	2.6		
020		2.0	54.3	62.2	7.9		
5000		0.6		62.7	0.0	21.5	430
T.P.	7.11	562.26	1.11	555.15		24.20 x 20 =	484.0

N3820

5550	562.3	0.6			0.0		
540		9.0	53.3	59.8	6.5	3.25 x 10	32.5
520		13.5	48.8	59.3	10.5		(32.5)
500		11.4	50.9	58.5	7.6		
480		7.4	54.9	58.5	3.6		
460		7.1	55.2	58.3	3.1		
440		5.4	56.9	57.4	0.5		

N3820

25

562.26

5420	6.9	55.4	57.4	2.0
400	5.6	56.7	56.9	0.2
380	9.2	53.1	56.8	3.7
360	8.8	53.5	57.1	3.6
340	10.0	52.3	57.1	4.8
320	11.0	51.3	56.8	5.5
300	10.4	51.9	57.0	5.1
280	8.6	53.7	56.9	3.2
260	8.9	53.4	56.8	3.4
240	9.0	53.3	57.4	4.1
220	8.0	54.3	56.8	2.5
200	8.8	53.5	57.4	3.9
180	8.4	53.9	57.2	3.3
160	7.7	54.6	57.2	2.6
140	0.6			0.0

76.45

79.7 x 20 =

1529.0

1594.0

1561.5 ✓

B.M.

7.00 555.26 555.27

Check

N3840 is O.G.

Section	Area			Cu Ft.	Cu Ft.	Cu Yd.	Cu Yd.
	Rock Emb	Hyd. Fill		Rock Emb.	Hyd. Fill	Rock Emb	Hyd. Fill.
N 3340		536.5 1073.0	506.75 1013.5				
3360		1839.0	1004.0				
3380	151.5 303.0	698.0	686.0				
3400	400.0	901.0					
3420	298 304.0	1340.0					
3440	750.0	1043.0	6309.5 x 20 =			124.655	
3460	91.075 1821.5	1752.0 1504.0				126,190	
	2510.75 2516.25	25 x 20 =		50205			
				50,325			
3500	1748.5 3497.0	1431 2862.0	1821.5 + 3497.0 x 40 =	106,370		87,320	
3520	4693 4966.0	2907.0	1504 + 2862 x 40 =				
3540	2749.5 5499.0	1050 2900.0	5788 x 20 =			115,760	
	7464 x 20 =			189,280			
3580	9160 6206.0	3056.0		183,200			
3620	6602.5 6469.0	2229.0					
3660	7357.5 7231.0	1847.0					
3700	7385.5 7450.0	873.0					
3740	4668 4703.0	820.0					
3780	2438.0	484.0					
3820	797 1515.5	10,517 x 40 =				420,680	
	38,043.5 x 40 =			1532630			
	38315.75			6,521,740			
				1,867,715	749,950	69,175	27,776
				1,872,402	748,415	69,343	27,719
				Total above axis		96,950 Cu Yd.	
						97,062 ^{O.K.}	6.W.L.

Note - See Book 360, Page 19, for Totals.
Additional Yardage in Book #360

For Estimate See Final Calc from Sec. PA 446.
 Stem 10

27

Volume of solid rock below 550
 at south end of upstream toe wall exc.
 (from pages 11-13) this level... 59 ft

N 3540

E 5552 0.0 } 55 x 12 = 66.0 ✓

5540 .11.0

5520 11.0

5500 11.1

5480 6.1 } 30.65 x 20 = 613.0 ✓

5470 0.0 } 30.5 x 10 = 30.5 ✓

N 3520 709.5 ✓

5541 0.0

5540 1.4 } 0.7 x 1 = 0.7

5520 9.1

5500 8.7

5480 0.0 } 18.5 x 20 = 370.0 ✓

N 3500 370.7 ✓

00.0

$\frac{0 + 370.7 \times 20}{2} = 3707$ ✓

$\frac{370.7 + 709.5}{2} \times 20 = 10802$
 14509

$\frac{14509}{27} = 538$ Cu Yd. ✓

Measurement of rock embankment
 in place July 25, 1932

100 x 110 x 3 = 33000 Cu ft.

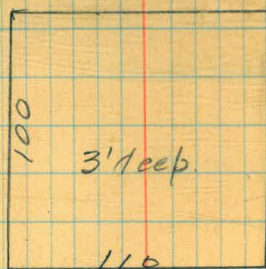
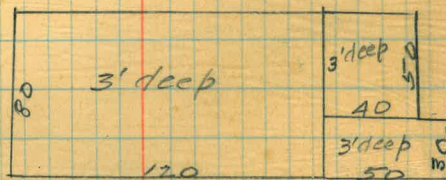
80 x 120 x 3 = 28800 "

30 x 50 x 3 = 4500 "

40 x 50 x 3 = 6000 "

15 x 45 x 2 = 1350

73,650 "



$\frac{73,650}{27} = 2728$ Cu Yd.

Account segregation

Above axis

N.C.

Rock Emb. South of N 3460	1,859 Cuyd.
Hyd Fill " " "	4,617 "
	6,476 "
Total above axis	97,062 "
Less Hyd Fill & Rock Emb	6,476
Chargeable to rolled Emb	90,586 "

Account segregation Above Axis

chargeable to

Rollled Embankment	23,102 Cuyd.
Hydraulic Fill	4,617 " "
Rock Embankment	69,343 " "

97,062

Month of Aug Estimate

N 3560

B.M.	0.96	550.94	549.98
Set T.P. ¹		12.02	538.92
Set T.P. ²		2.60	548.34
T.P. ¹	7.49	546.41	538.92

E 4440		9.2	37.2	51.7
420		9.7	36.7	51.7
400		14.6	31.8	51.7
380		5.2	41.2	51.6
360		4.2	42.2	51.6
340		0.6		

T.P.² 8.78 547.70 538.92

N 3540

4340		0.6		
360		5.9	41.8	51.5
380		6.3	41.4	51.6
400		15.1	32.6	51.8
420		10.0	37.7	52.1
440		10.2	37.5	52.6
460		11.8	35.9	52.6

Aug 25 - 1932

29

Note: Page 29 to 36 under rock embank.

B29

7.2

- 14.5
15.0
19.9
10.4
9.4

57.25 x 20
9.4 x 10

11450.
94
1239.00

N3540

30

547.70

4480	12.0	357	52.4	-	16.7
500	12.0	357	52.0		16.3
520	8.3	394	52.4		13.0
540	9.0	387	52.5		13.8
560	8.7	390	52.6		13.6
580	5.7	420	52.7		10.7
600	0.6				

169.4 x 20

3388.0 ✓

N3520

4540	3.3	444	53.9	-	9.5
520	9.0	387	54.5		15.8
500	11.2	365	53.9		17.4
480	11.3	364	54.0		17.6
460	10.8	369	54.1		17.2
440	9.9	378	53.4		15.6
420	9.2	385	52.6		14.1
400	14.0	337	53.1		19.4
380	5.5	422	53.2		11.0
360	3.5	442	53.5		9.3
340	3.2	445	53.5		9.0
320	0.6				

151.15 x 20

3023.0 ✓

(4.75)

N3500

547.70

31

	P.S.				
4360	5.0	42.7	52.7	10.0	(5°)
80	6.2	41.5	53.1	11.6	
400	6.8	40.9	54.8	13.9	
20	8.2	39.5	55.3	15.8	
40	7.9	39.8	54.5	14.7	
60	9.0	38.7	55.1	16.4	
80	10.6	37.1	58.0	20.9	
500	10.2	37.5	58.7	21.2	
4520	9.5	38.2	60.3	22.1	
540	4.2	43.5	60.5	17.0	
560	1.5	46.2	60.1	13.9	
580	0.6			172.50 × 20 =	3450.0 ✓

N3480

4560	0.6			0	
580	3.3	44.4	69.4	25.0	17.5
540	4.0	43.7	69.1	25.4	12.7
520	6.8	40.9	69.4	26.5	
500	8.1	39.6	64.4	24.8	20
					37.70 × 10 = 377.0 (over)

N3480

32

547.70

(cont.) → 377.0

4480	6.7	41.0	65.0	-	24.0
60	6.8	40.9	62.0		21.1
40	7.5	40.2	61.6		21.4
20	6.7	41.0	89.9		18.9
400	^{PS} 6.1	41.6	60.1		18.5 - 9.25

$$158.65 \times 20 = \underline{3173.0}$$

total 3550.0

N3460

560	0.5				
540	+3.5	51.2	73.8	-	22.6
520	2.1	45.6	73.1		27.5
500	3.0	44.7	72.0		27.3
480	6.1	41.6	71.3		29.7
460	^{PS} 5.5	42.2	68.0		26.8
440	5.7	42.0	63.7		21.7 - 10.85

$$143.75 \times 20 =$$

2875.0 ✓

N3720

12.67
3.47
16.14

33

B.M. 16.14 558.18 542.04

E 5460	9.0	49.2	61.3
480	15.7	42.5	61.1
500	15.7	42.5	61.9
520	13.0	45.2	60.3
540	13.5	44.7	61.0
560	6.4	51.8	59.0
570	0.6		

12.1

(6.05)

18.6

19.4

15.1

16.3

7.2

79.05 x 70

(26)

3.6 x 10

1581.0

36.0

1617.0

N3740

E 5460	8.8	49.4	60.0
480	15.3	42.9	59.6
500	15.3	42.9	59.4
520	11.6	46.6	58.8
540	10.0	48.2	57.2
560	6.8	51.4	57.5
570	0.9		

10.6

(5.3)

16.7

16.5

12.2

6.1

9.0

6.1

30.5 62.75 20

3.05 x 10

1255.0

30.5

1285.5

N3760

34

558.18

E5460

7.2

51.0 56.8

5.8

2.9

480

12.6

45.6 56.9

11.3

500

14.3

43.9 56.7

12.8

520

11.3

46.9 57.1

10.2

5.1

540

10.4

47.8 57.2

9.4

560

5.0

53.2 57.4

4.2

48.7 x 20

(21)

974.0

570

0.6

2.1 x 10

21.0

995.0 ✓

N3780

5460

4.0

54.2 57.0

2.8

(14)

480

7.8

50.4 56.9

6.5

500

10.0

48.2 57.1

8.9

520

10.2

48.0 57.2

9.2

4.6

540

8.9

49.3 57.4

8.1

560

1.7

56.5 57.5

1.0

34.6 x 20

0.5

570

0.6

0.5 x 10

692.0

5.0

697.0 ✓

N3760

34

558.18

E5460

7.2

51.0 56.8

5.8 ^{2.9}

480

12.6

45.6 56.9

11.3

500

14.3

43.9 56.7

12.8

520

11.3

46.9 57.1

10.2 5.1

540

10.4

47.8 57.2

9.4

560

5.0

53.2 57.4

4.2 } 48.7 x 20

(21)

974.0

570

0.6

2.1 x 10

21.0

995.0 ✓

N3780

5460

4.0

54.2 57.0

2.8

(14)

480

7.8

50.4 56.9

6.5

500

10.0

48.2 57.1

8.9

520

10.2

48.0 57.2

9.2 4.6

540

8.9

49.3 57.4

8.1

560

1.7

56.5 57.5

1.0 } 34.6 x 20

0.5

692.0

570

0.6

0.5 x 10

697.0 ✓

N3800

35

558.18

5460	4.8	53.4	56.9	-	3.5	177	(1.75)
480	4.1	54.1	57.5		3.4		
500	9.7	48.5	57.0		8.5		
520	9.8	48.4	57.9		9.5		
540	7.2	51.0	58.7		7.7	27.00 x 20	(3.25)
550	0.6					3.85 x 10	

$$\begin{array}{r} 540.0 \\ 38.5 \\ \hline 578.5 \end{array} \checkmark$$

N3820

E5460	3.7	54.5	58.3	-	3.8		(1.9)
480	3.9	54.3	58.5		4.7		
500	8.1	50.1	58.5		8.4		
520	9.1	49.1	59.3		10.2		
540	5.4	52.8	59.8		7.0	28.2 x 20	(3.5)
550	0.6					3.5 x 10	

$$\begin{array}{r} 544.0 \\ 25.0 \\ \hline 599.0 \end{array} \checkmark$$

Partial

37

VOLUME 5

Section	Area	cut
N 3460	4440-4560 ^E 2875 _{1437.5}	
N 3490	4440-4560	3550
N 3500	4360-4580	3450
N 3520	4320-4540	3023
N 3540	4340-4600	3388 x
N 3560	4340-4440 _{619.5}	1239 ✓
total 15468.0 x 20 x .27		
below Axis - all rock embank = 11,457.8 cub.yds. ✓		
N 3720	5460-5570 _{809.5}	1617
N 3740	5460-5570	1285.5
N 3760	5460-5570	995.0 ✓
N 3780	5460-5570	697.0 ✓
N 3800	5460-5550	578.5
N 3820	5460-5550	599.0
N 3840	5560-5460	553.0
N 3860	5460-5550 _{121.5}	243.0
total 5638.0 x 20 x .27		
above Axis - all rock embank = 4176.3 cub.yds. ✓		

Rock Embankment
In Place Sept 26, 1932

81.65

Elliott-Notes
Simpson-X
Seper-9
Remmen-Chain

39

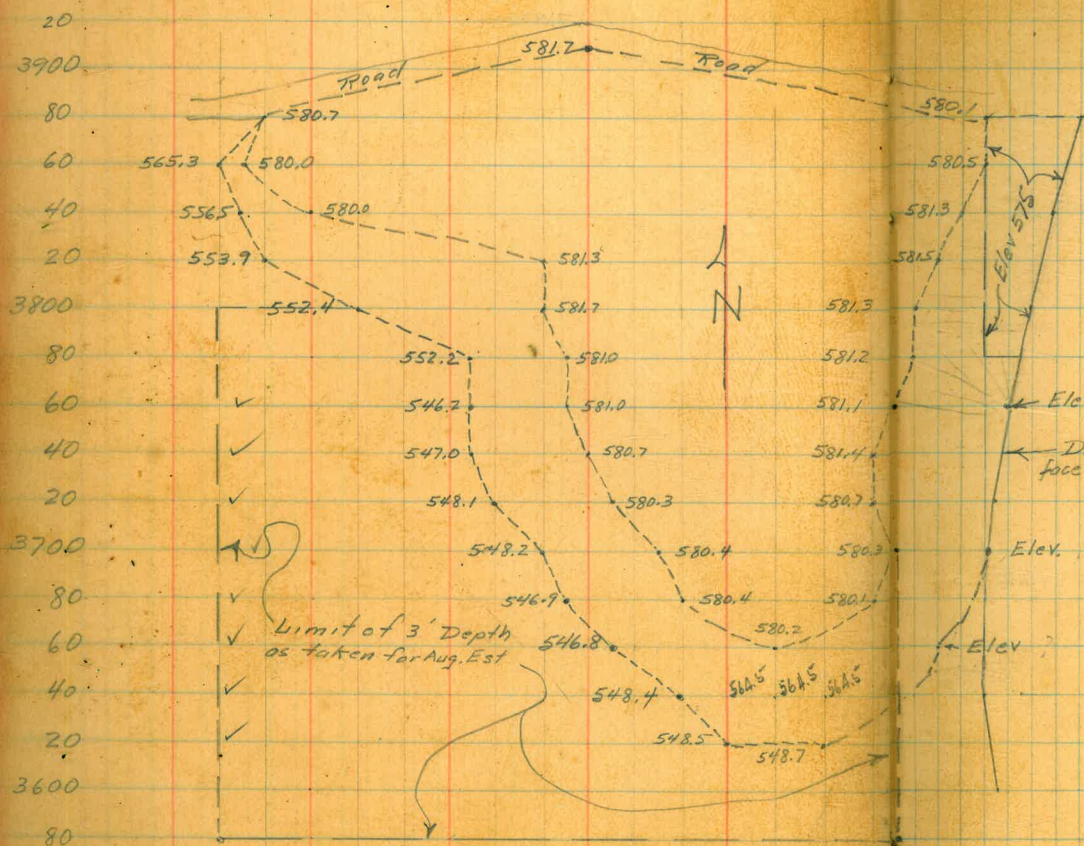
End Areas.

N. 3620	- 0.0	
N. 3640	- 1021	510.5 x 20
N. 3660	- 1977.4	1499.2 x 20
N. 3680	- 4161.6	3069.5 x 20
N. 3700	- 4833.6	4497.6 x 20
3720	- 5344.0	5088.8 x 20
3740	- 5712.4	5686.6 x 20
3760	- 6287.5	5996.7
3780	- 6662.4	6471.7
3800	- 7308.6	6985.5
3820	7689.8	7499.2
3840	8400.6	8045.2
3860	6623.6	7512.1
3880	3437.8	5030.7
3910	0.0	1718.9 x 30

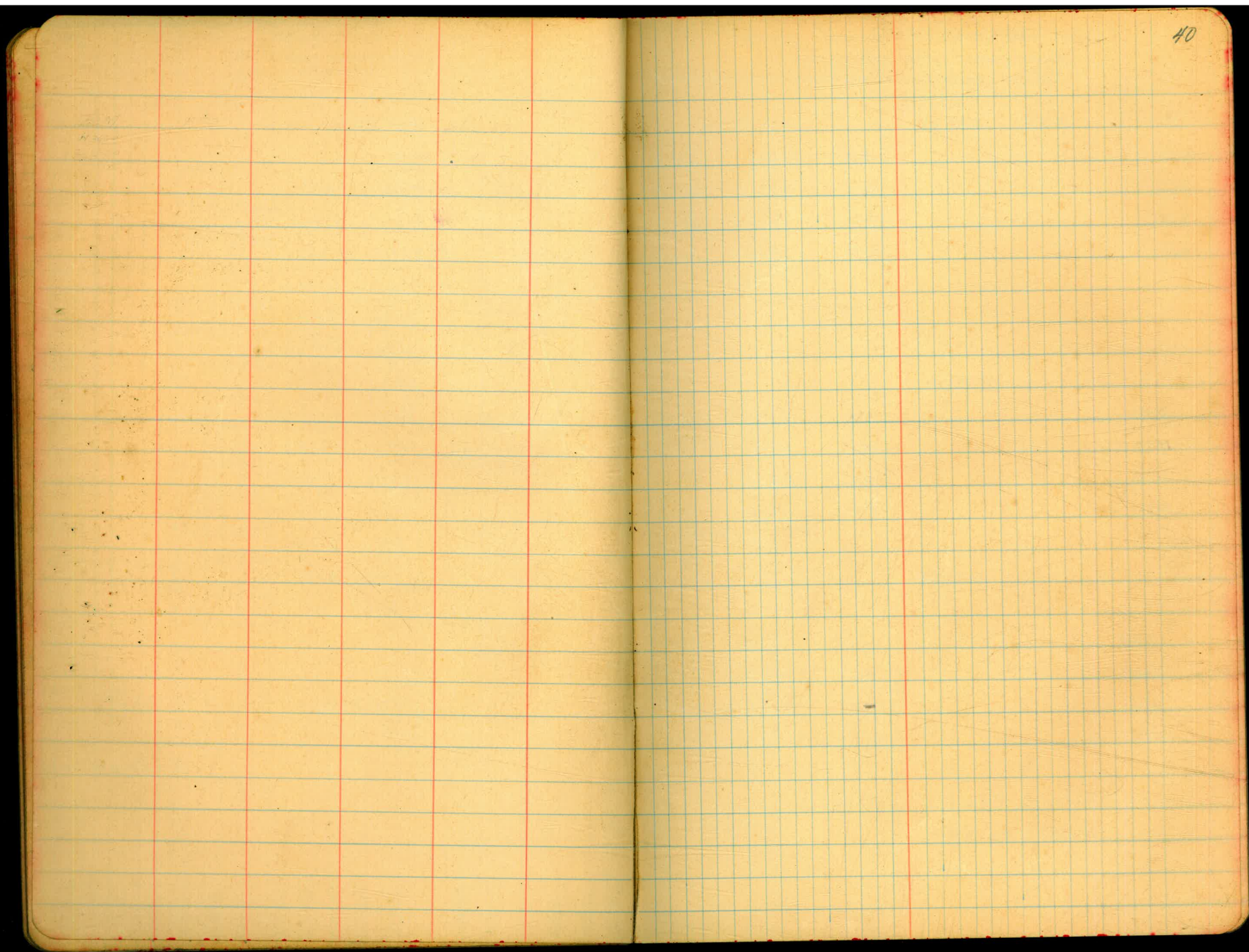
$$67,724.9 \times 20 = 1,354,698 \text{ cu. ft.}$$

$$1718.9 \times 30 = 51,567$$

$$\frac{1,406,265}{27} = 52,080 \text{ cu. yd.}$$



5140
5160
5180
5200
5220
5240
5260
5280
5300
5320
5340
5360
5380
5400
5420
5440
5460
5480
5500
5520
5540
5560



Cross Sections of Tunnel Spoil
 Dumped into Structure
 To be deducted from rock embankment

Sept 26 - 1932

41

4380

N3500

B. M.	0.50	549.82	549.32			
4450			9.8	540.0	540.0	0.0
460			9.5	540.3	540.1	0.2
470			9.2	540.6	540.1	0.5
480			9.7	540.1	540.1	0.0
						0.7 x 10 = 7.0

N3510

450			11.4	538.4	38.2	0.2
460			10.0	539.8	38.0	1.8
470			9.2	540.6	37.7	2.9
480			9.5	540.3	37.5	2.8
						6.3 x 10 = 63.0

N3520

450			12.4	537.4	38.2	0.0
460			9.6	540.2	37.2	3.0
470			9.3	540.5	37.1	3.4
480			10.7	539.1	37.0	2.1
						7.45 x 10 = 74.5

$$103.75 \times 10 = 1037.5 \text{ cu ft.}$$

$$= 38.42 \text{ cu yd.}$$

N3520

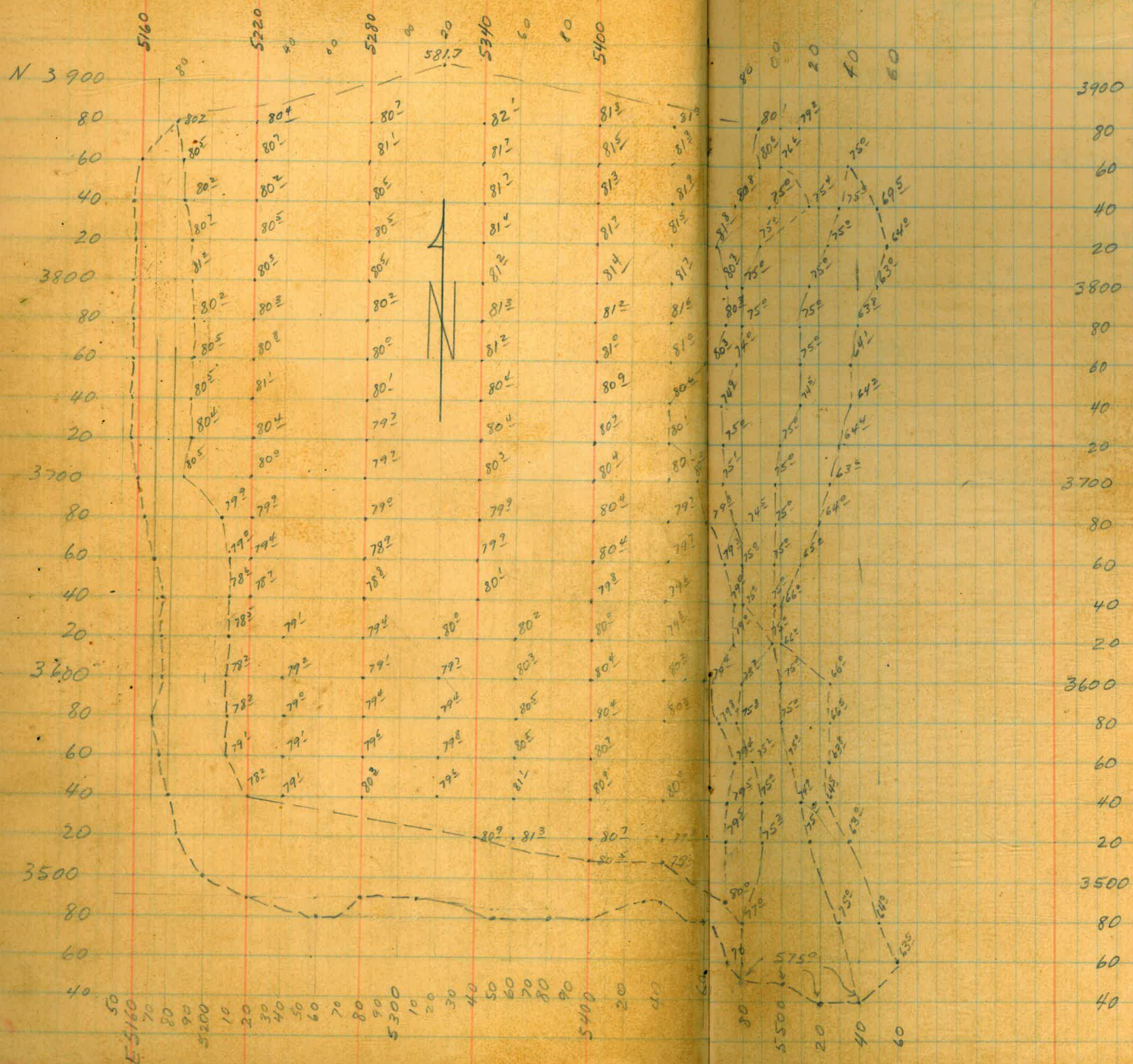
549.82

4450	12.3	537.5	37.6
460	11.3	38.5	37.2
470	10.3	39.5	37.1
480	12.4	37.4	37.0

Note N3540 is as final X section (No rock placed)

Rock Embankment
In place Nov 1 - 1932

Ernest
Simpson
Super
Inspector



15.2
17
17.5

Rock Embankment
Above Downstream Toe Wall
For Nov-1932 Estimate

B.M. 5.62 580.68 575.06

N3450 is as final X sections.

N3460

E 4560	580.7	4.9	73.8	
4540		4.3	76.4	
4483		28.7	52.0	Toe Wall

N3480

E 4489		15.7	65.0	Toe Wall
4510		6.2	74.5	
4540		5.8	74.9	
4560		5.0	73.7	
4580		4.7	76.0	
4600		3.7	77.0	
4620		5.4	75.3	
4640		5.5	75.2	
4660		5.2	75.5	
4680		5.1	75.6	✓
4705				Toe

plotted
REL

Nov 30-1932
Elliott - Notes
Simpson - X
Soper - 9
Remmen - Ch

N3500

580.68

732.00

45

4720				Toe
4690		5.4	57.53	
4680		5.6	75.1	
4660		6.2	74.5	
4640		6.2	74.5	
4620		5.5	75.2	
4600		4.6	76.1	
4580		4.9	75.8	
4560		4.9	75.8	
4540		5.9	74.8	
4520		5.5	75.2	
4500		5.7	75.0	
4496				Toe Wall

N3520

E 4502		5.7	75.0	Toe Wall
4540		5.1	75.6	
4560		4.6	76.1	
4580		4.5	76.2	
4600		5.0	75.7	
4620		5.4	75.3	
4640		6.0	74.7	
4660		6.4	74.3	
4680		5.9	74.8	
4690		5.7	75.0	✓
4725				Toe

N3540

580.68

46

4730			Toe
4700	7.0	73.7	
4680	6.9	78.8	
4660	7.0	73.7	
4640	5.7	75.0	
4620	4.6	76.1	
4600	4.9	75.8	
4580	4.7	76.0	
4560	4.4	76.3	
4540	4.9	75.8	
4507	5.7	75.0	Toe Wall

N3560

4511	5.7	75.0	Toe Wall
4540	4.8	75.9	
4560	4.9	75.8	
4580	4.9	75.8	
4600	5.7	75.0	
4620	5.5	75.2	
4640	6.3	74.4	
4660	6.4	74.3	
4680	7.2	73.5	
4710	7.3	73.4	✓
4735			Toe

N3580

580.68

E 4735

Toe

4705	6.6	574.1
4680	7.0	73.7
4660	6.7	74.0
4640	6.3	74.4
4620	6.4	74.3
4600	5.9	74.8
4580	5.4	75.3
4560	5.5	75.2
4540	5.4	75.3
4514	5.7	75.0

Toe Wall

N3600

4516	5.7	75.0
4540	5.9	74.8
4560	5.6	75.1
4580	5.8	74.9
4600	6.1	74.6
4620	6.3	74.4
4640	6.4	74.3
4660	6.6	74.1
4680	6.7	73.8
4700	6.9	73.8

Toe Wall

✓

4735

Toe

N3620
580.68

E 4735			Toe
4700	7.6	573.1	
4680	7.4	73.2	
4660	7.2	73.5	
4640	6.9	73.8	
4620	6.4	74.3	
4600	6.2	74.5	
4580	6	74.6	
4560	6.0	74.7	
4540	5.7	75.0	
4517	5.7	75.0	Toe Well

N3640

4517	5.7	75.0	Toe Well
4540	6.1	74.6	
4560	6.3	74.4	
4580	6.7	74.0	
4600	6.8	73.9	
4620	6.7	74.0	
4640	7.2	73.5	
4660	7.7	73.0	
4680	7.7	73.0	
4700	8.1	72.6	✓
4730			Toe

N3660

580.68

E 4725

4695	8.9	571.8
4680	8.7	72.0
4660	8.1	72.6
4640	7.7	73.0
4620	7.8	72.9
4600	7.4	73.3
4580	7.3	73.4
4560	6.9	73.8
4540	6.5	74.2
4516	5.7	75.0

Toe
wall

N3680

4514	5.7	75.0
4540	7.3	73.4
4560	7.3	73.4
4580	7.7	73.0
4600	7.9	72.8
4620	7.9	72.8
4640	8.0	72.7
4660	8.3	72.4
4685	9.0	71.7
4715		

Toe
wall

Toe

N3700

50

580.68

E 4700

Toe

4675 8.3 572.4

4660 8.3 72.4

4640 8.0 72.7

4620 7.7 73.0

4600 8.0 72.7

4580 7.5 73.2

4560 7.4 73.3

4540 7.1 73.6

4511 5.7 75.0 Toe wall

N3720

4506 5.7 75.0 Toe wall

4520 6.7 74.0

4540 6.9 73.8

4560 7.2 73.5

4580 7.4 73.3

4600 7.8 72.9

4620 8.2 72.5

4640 8.4 72.3

4655 8.1 72.6 ✓

4680 Toe

N3740
580.68

E 4660	18.3	56.24	Toe
4640	8.5	72.2	Top
4620	8.4	72.3	
4600	7.8	72.9	
4580	7.3	73.4	
4560	7.2	73.5	
4540	7.0	73.7	
4520	6.3	74.4	
4503	5.7	75.0	Toe Wall

N3760

4495	5.7	75.0	Toe Wall
4520	6.7	74.0	
4540	6.8	73.9	
4560	7.0	73.7	
4580	7.3	73.4	
4600	8.0	72.7	
4620	8.6	72.1	
4630	8.6	72.1	Top
4640	12.4	68.3	Toe V

N3780

580.68

4620 9.1 571.6

4600 8.3 72.4

4580 7.5 73.2

4560 6.8 73.9

4540 6.6 74.1

4520 6.6 74.1

4500 6.5 74.2

4488 5.7 75.0 Toe
Wall

N3800

4479 5.7 75.0 Toe
Wall

4500 6.5 74.2

4520 6.4 74.3

4540 6.6 74.1

4560 7.1 73.6

4580 7.7 73.0

N3820

4540 6.3 74.4

4520 6.0 74.7

4500 6.0 74.7

4480 5.7 75.0 Toe
Wall V

Rock Embankment Below Downstr.
Toe Wall For Nov. 1932, Estimate

B.M. 0.44 575.49 575.05

N 3850 is as final X Sections Show

N 3840

4493	575.5	4.7	70.8	Toe Wall
480		5.8	69.7	
470		5.1	70.4	
460		4.6	70.9	
430		4.4	71.1	
4422		8.1	67.4	

N 3820

4471		6.6	68.9	Toe Wall
460		6.7	68.8	
435		6.0	69.5	
410		22.5	53.0	

N 3800

4405		26.2	49.3	
4440		8.7	66.8	
460		8.8	66.7	
471		9.3	66.2	Toe Wall

Bones Clavert
Notes for Contractor

Dec 2 - 1932
Elliott - Notes
Simpson - X
Soper - 9
Remmen - R.C.H.

53

Plotted 7.0.

575.49

N3780 ✓

4479			10.9	64.6	Toe Wall
460			10.6	64.9	
435			10.4	65.1	
T.P.	2.30	565.42	12.37	563.12	
4395			20.8	44.6	

N3760 ✓

4390			28.0	37.4	
4400			28.0	37.4	
4430			3.6	61.8	
4440			2.3	63.1	
4460			1.9	63.5	
4487			2.6	62.8	Toe Wall

Water 23.0

N3740 ✓

4493			2.3	63.1	Toe Wall
4460			2.2	62.7	
4447			3.0	62.4	
4425			7.5	57.9	
4405			25.0	40.4	
4380			25.0	40.4	

N3720 ✓

565.42

4400	26.1	39.3	
4411	26.1	39.3	
4425	10.0	55.4	
4440	4.4	61.0	
4460	3.6	61.8	
4480	2.9	62.5	
4498	2.4	63.0	Toe Wall

N3700 ✓

4502	3.6	61.8	Toe Wall
4480	4.1	61.3	
4460	5.4	60.0	
4435	9.5	55.9	
4414		541.3	
4400		541.3	

T.P. 5.44 563.39 7.47 557.95

N3680 ✓

4505	2.0	61.4	Toe Wall
480	3.3	60.1	
460	5.8	57.6	
440	10.5	52.9	
415		541.0	
400		541.0	

563.39 ✓

N3660

4400		541.5	
413		541.5	
440	11.7	51.7	
460	5.9	57.5	
480	2.2	61.2	
4507	1.9	61.5	Toe wall

N3640 ✓

4509	0.4	63.0	Toe wall
500	0.8	62.6	
480	1.7	61.7	
460	7.3	56.1	
440	12.6	50.8	
420	15.8	47.6	
415		539.5	
405		539.5	

N3620 ✓

4405		536.0	
4415		536.0	
430	13.7	49.7	
440	11.2	52.2	
460	6.9	56.5	
475	2.1	61.3	
500	0.8	62.6	
509	0.6	62.8	Toe wall

563.39

N 3600

4508	0.4	63.0	Toe Wall
500	0.7	62.7	
480	0.0	63.4	
460	3.8	59.6	
440	9.0	54.4	
420		541.5	
415		532.0	Toe

N 3580

4410		532.0	Toe
420		548.0	
440	11.8	51.6	
460	5.8	57.6	
470	3.1	60.3	
500	0.7	62.7	
506	0.7	62.7	Toe Wall

T.P. 0.41 563.13 0.67 562.72

N 3560

4503	0.8	62.3	Toe Wall
470	2.6	60.5	
440	9.8	53.3	
420	12.6	50.5	
405		532.0	Toe

563.13

N3540

4405		532.0	Toe
420	13.5	496	
440	8.6	54.5	
470	2.3	60.8	
480	1.8	61.3	
499	1.5	67.6	Toe Wall

N3520

4493	1.9	61.2	Toe Wall
480	2.2	60.9	
460	3.0	60.1	
440	7.1	56.0	
425	9.8	53.3	
407		535.0	Toe

N3500

4410		540.5	Toe
420	13.5	496	
440	7.4	55.7	
460	2.6	60.5	
480	1.8	61.3	
487	1.8	61.3	Toe Wall

563.13

N3480 ✓

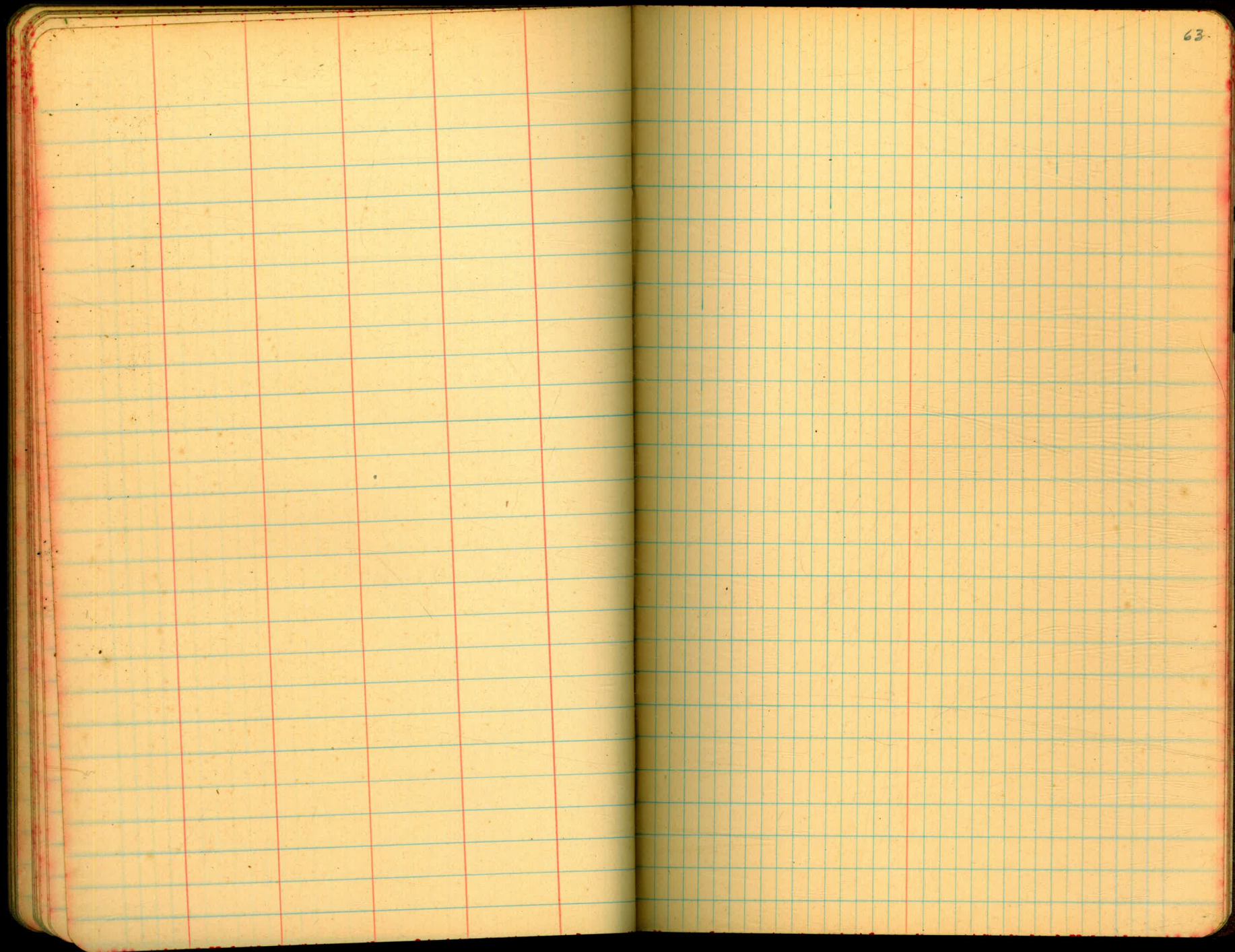
4480	2.1	61.0	
460	3.7	59.4	
440	6.2	56.9	
430	9.8	53.3	
410	N.G. 36.		Toe.

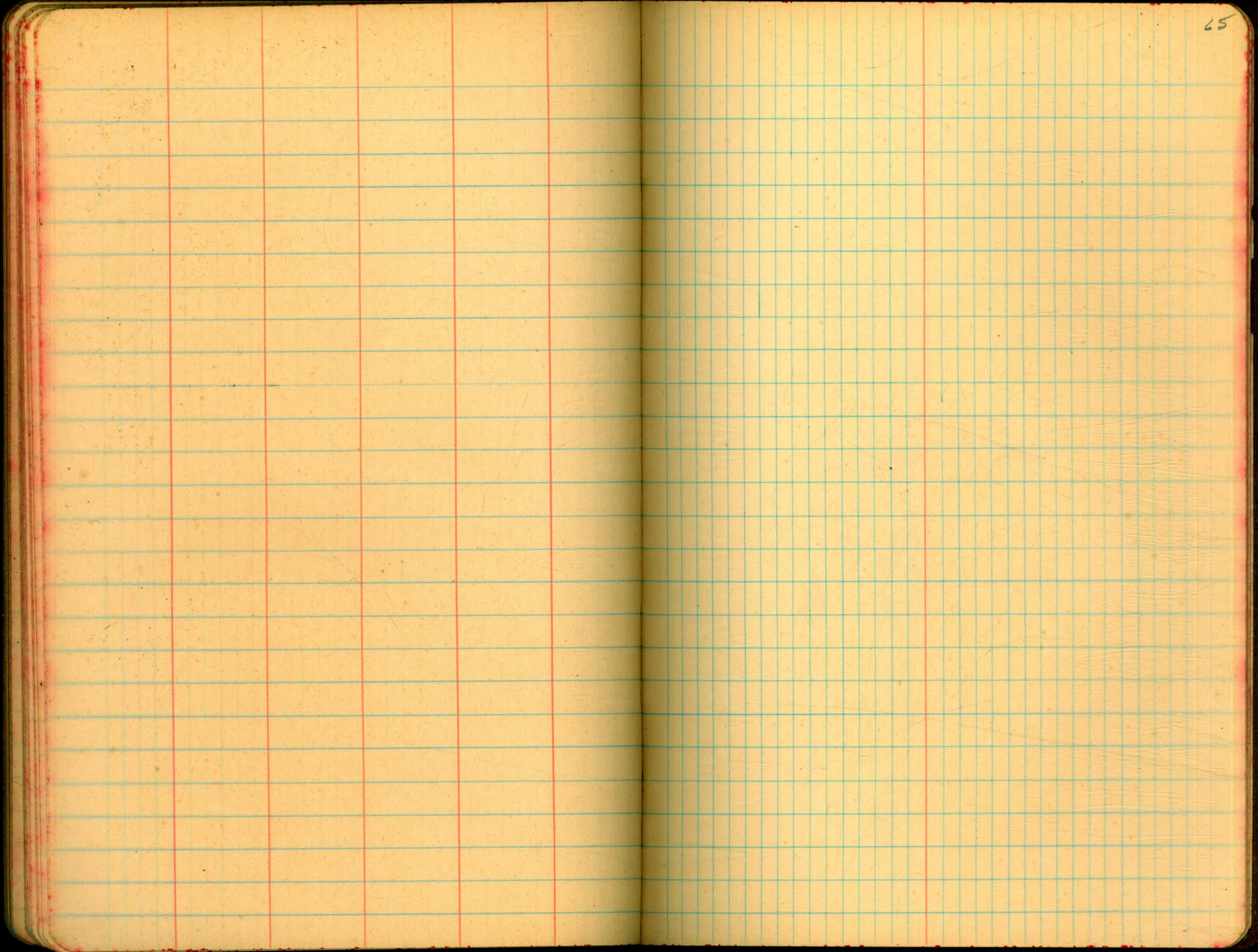
N3460 ✓

417	19.8	43.3	Toe
430	20.1	43.0	
440	15.2	47.9	
460	4.1	59.0	
472	3.5	59.6	Toe Wall

N3440

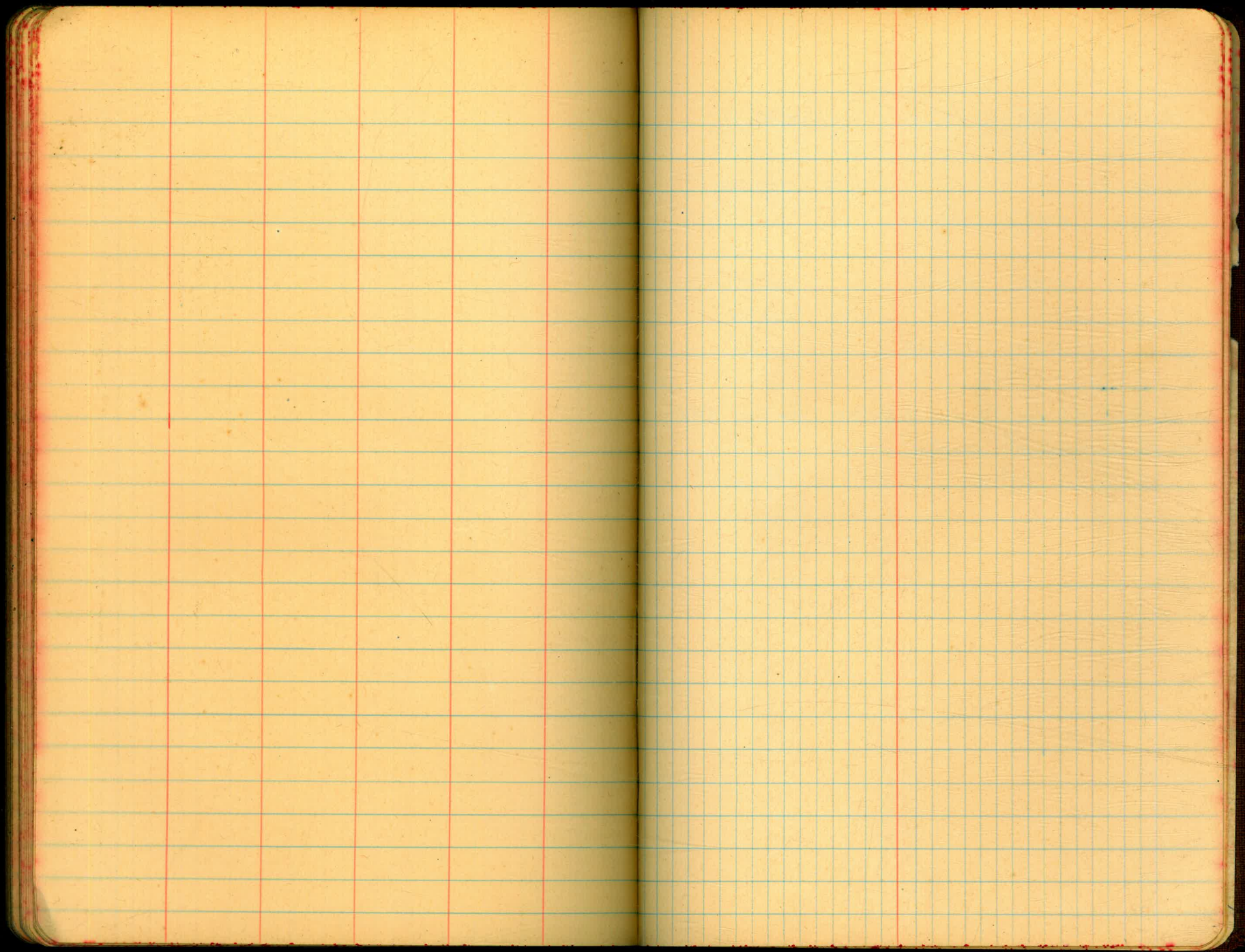
No Rock Placed.





5/10/15

x 10+15



Level			
B. M.	0.67	567.14	566.47
Set B. M.		11.92	555.22
	2.24	557.46	
Transit			
B. M.	5.05	571.52	566.47
T. P.		9.26	562.26
	2.07	564.33	

B. M.

71.5	566.47
<u>557.5</u>	<u>5.05</u>
14.0	571.52

579.8
<u>71.5</u>
8.3

564.33
<u>57.46</u>
7

Everything So. of N3540 below 550
to be classed solid rock
Hydrogen See Wall See Page 27

B.M.	0.38	564.03	563.65
		12.30	551.73
	0.78	552.51	
		10.42	542.09
	4.34	546.43	
2 + 50		8.7	537.7 out 114.
2 + 00		8.0	538.4 out 112.
1 + 50		8.0	538.4 out 112.
1 + 00		7.4	539.0 out 110.
0 + 50		6.7	539.7 out 108.

Table I - Right Ordinates and Deflections

Dist.	Ordinate	Deflection	Dist.	Ordinate	Deflection
0	0.00	0.00	10	1.00	0.00
1	0.10	0.00	11	1.10	0.00
2	0.20	0.00	12	1.20	0.00
3	0.30	0.00	13	1.30	0.00
4	0.40	0.00	14	1.40	0.00
5	0.50	0.00	15	1.50	0.00
6	0.60	0.00	16	1.60	0.00
7	0.70	0.00	17	1.70	0.00
8	0.80	0.00	18	1.80	0.00
9	0.90	0.00	19	1.90	0.00
10	1.00	0.00	20	2.00	0.00
11	1.10	0.00	21	2.10	0.00
12	1.20	0.00	22	2.20	0.00
13	1.30	0.00	23	2.30	0.00
14	1.40	0.00	24	2.40	0.00
15	1.50	0.00	25	2.50	0.00
16	1.60	0.00	26	2.60	0.00
17	1.70	0.00	27	2.70	0.00
18	1.80	0.00	28	2.80	0.00
19	1.90	0.00	29	2.90	0.00
20	2.00	0.00	30	3.00	0.00
21	2.10	0.00	31	3.10	0.00
22	2.20	0.00	32	3.20	0.00
23	2.30	0.00	33	3.30	0.00
24	2.40	0.00	34	3.40	0.00
25	2.50	0.00	35	3.50	0.00
26	2.60	0.00	36	3.60	0.00
27	2.70	0.00	37	3.70	0.00
28	2.80	0.00	38	3.80	0.00
29	2.90	0.00	39	3.90	0.00
30	3.00	0.00	40	4.00	0.00

Table II - Minutes in Decimals of a Degree

1	0.0167
2	0.0333
3	0.0500
4	0.0667
5	0.0833
6	0.1000
7	0.1167
8	0.1333
9	0.1500
10	0.1667
11	0.1833
12	0.2000
13	0.2167
14	0.2333
15	0.2500
16	0.2667
17	0.2833
18	0.3000
19	0.3167
20	0.3333
21	0.3500
22	0.3667
23	0.3833
24	0.4000
25	0.4167
26	0.4333
27	0.4500
28	0.4667
29	0.4833
30	0.5000
31	0.5167
32	0.5333
33	0.5500
34	0.5667
35	0.5833
36	0.6000
37	0.6167
38	0.6333
39	0.6500
40	0.6667
41	0.6833
42	0.7000
43	0.7167
44	0.7333
45	0.7500
46	0.7667
47	0.7833
48	0.8000
49	0.8167
50	0.8333
51	0.8500
52	0.8667
53	0.8833
54	0.9000
55	0.9167
56	0.9333
57	0.9500
58	0.9667
59	0.9833
60	1.0000

Table III - Inches in Decimals of a Foot

1	0.0833
2	0.1667
3	0.2500
4	0.3333
5	0.4167
6	0.5000
7	0.5833
8	0.6667
9	0.7500
10	0.8333
11	0.9167
12	1.0000
13	1.0833
14	1.1667
15	1.2500
16	1.3333
17	1.4167
18	1.5000
19	1.5833
20	1.6667
21	1.7500
22	1.8333
23	1.9167
24	2.0000
25	2.0833
26	2.1667
27	2.2500
28	2.3333
29	2.4167
30	2.5000
31	2.5833
32	2.6667
33	2.7500
34	2.8333
35	2.9167
36	3.0000
37	3.0833
38	3.1667
39	3.2500
40	3.3333
41	3.4167
42	3.5000
43	3.5833
44	3.6667
45	3.7500
46	3.8333
47	3.9167
48	4.0000
49	4.0833
50	4.1667
51	4.2500
52	4.3333
53	4.4167
54	4.5000
55	4.5833
56	4.6667
57	4.7500
58	4.8333
59	4.9167
60	5.0000

Table VII. Excavation and Embankments, Cu. Yds. per 100 ft.

Slope	¼ to 1	1 to 1			1½ to 1				All Slopes 1 Ft. Base
		BASE			BASE				
		20'	20	22	24	14	16	20	
1	75	78	85	93	57	65	80	94	3.7
2	152	163	178	193	126	141	170	200	7.4
3	230	256	278	300	206	228	272	316	11.1
4	311	356	385	414	296	326	385	444	14.8
5	393	463	500	537	398.	435	509	583	18.5
6	477	578	622	666	511	556	644	733	22.2
7	564	700	752	804	635	687	791	894	25.9
8	652	830	889	948	770	830	948	1067	29.6
9	742	967	1033	1100	917	983	1116	1250	33.3
10	833	1111	1185	1259	1074	1148	1296	1444	37.0
11	926	1263	1344	1425	1243	1324	1487	1650	40.7
12	1022	1422	1511	1600	1422	1511	1689	1867	44.4
13	1119	1589	1685	1781	1613	1709	1902	2094	48.1
14	1219	1763	1867	1970	1815	1919	2126	2333	51.8
15	1319	1944	2055	2166	2028	2139	2361	2583	55.5
16	1422	2133	2251	2369	2252	2370	2607	2844	59.2
17	1527	2330	2456	2582	2487	2613	2865	3117	62.9
18	1633	2533	2667	2800	2733	2867	3133	3400	66.6
19	1742	2744	2885	3025	2991	3131	3413	3694	70.3
20	1852	2963	3111	3259	3259	3407	3704	4000	74.0
21	1963	3189	3344	3500	3539	3694	4005	4317	77.7
22	2078	3422	3585	3748	3830	3993	4318	4644	81.4
23	2193	3663	3833	4003	4131	4302	4642	4983	85.1
24	2310	3911	4089	4267	4444	4622	4978	5333	88.8
25	2430	4167	4352	4537	4769	4954	5324	5694	92.5
26	2551	4430	4622	4814	5104	5296	5681	6067	96.2
27	2675	4700	4900	5100	5450	5650	6050	6450	100.0
28	2800	4978	5185	5392	5807	6015	6430	6844	103.6
29	2926	5263	5477	5691	6176	6391	6820	7250	107.3
30	3055	5556	5778	6000	6556	6778	7222	7667	111.0
31	3185	5856	6085	6314	6946	7176	7635	8094	114.7
32	3318	6163	6399	6635	7348	7585	8059	8533	118.4
33	3452	6478	6722	6966	7761	8006	8494	8983	122.1
34	3589	6800	7052	7304	8185	8437	8941	9444	125.8
35	3727	7130	7389	7648	8620	8880	9398	9917	129.5
36	3866	7467	7733	8000	9067	9338	9867	10400	133.2
37	4008	7811	8084	8358	9524	9798	10346	10894	136.9
38	4051	8163	8444	8725	9993	10274	10837	11400	140.6
39	4296	8522	8811	9100	10472	10761	11339	11917	144.3
40	4444	8889	9185	9481	10963	11259	11852	12444	148.0
41	4593	9263	9567	9871	11465	11769	12376	12983	151.7
42	4744	9644	9955	10266	11978	12289	12911	13533	155.4
43	4897	10033	10351	10669	12502	12820	13457	14094	159.1
44	5052	10430	10756	11084	13037	13363	14015	14667	162.8
45	5208	10833	11166	11499	13583	13917	14583	15250	166.5
46	5366	11244	11584	11924	14141	14481	15163	15844	170.2
47	5527	11663	12011	12359	14709	15057	15754	16450	173.9
48	5688	12089	12444	12799	15289	15644	16356	17067	177.6
49	5853	12522	12884	13246	15880	16243	16968	17694	181.3
50	6018	12963	13333	13703	16481	16853	17592	18333	185.0
52	6355	13867	14251	14635	17719	18104	18874	19644	192.4
54	6700	14800	15200	15600	19000	19400	20200	21000	200.0
56	7051	15763	16177	16591	20326	20741	21570	22400	207.2
58	7410	16756	17186	17516	21696	22126	22985	23844	214.6
60	7777	17778	18222	18666	23111	23555	24444	25333	222.0
70	9722	23332	23850	24368	30852	31370	32407	33444	259.0
80	11852	29629	30221	30813	39704	40296	41480	42667	296.0
90	14167	36666	37333	38000	49667	50333	51665	53000	333.0
100	16667	44444	45184	45924	60741	61481	62962	64444	370.0

Tables for Excavations and Embankments.
Distances from Edge of Roadway for Cross-Sectioning.
Any Roadway. Side Slopes 1½ to 1.
Half the width of roadway to be added to table to find distance from centre line.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

750
666

785
666

1.20
36