RES. No 2.
PINE RIVER.

R.H. #80

Book No 3

FIELD BOOK

364

KEUFFEL & ESSER CO.

DRAWING MATERIALS
AND
SURVEYING INSTRUMENTS.

NEW YORK.

CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

TABLES FOR EXCAVATIONS AND EMBANKMENTS.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.
ROADWAY 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	30.7	30.8	30.9	21
22	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	22
23	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	23
24	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	24
25	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	25
26	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	26
27	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	27
28	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	28
29	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	29
30	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	30
31	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	31
32	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	32
33	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	33
34	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	34
35	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	35
36	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	36

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

For Keith's Railroad Curve Tabels see end of book.

Daniels

INDEX

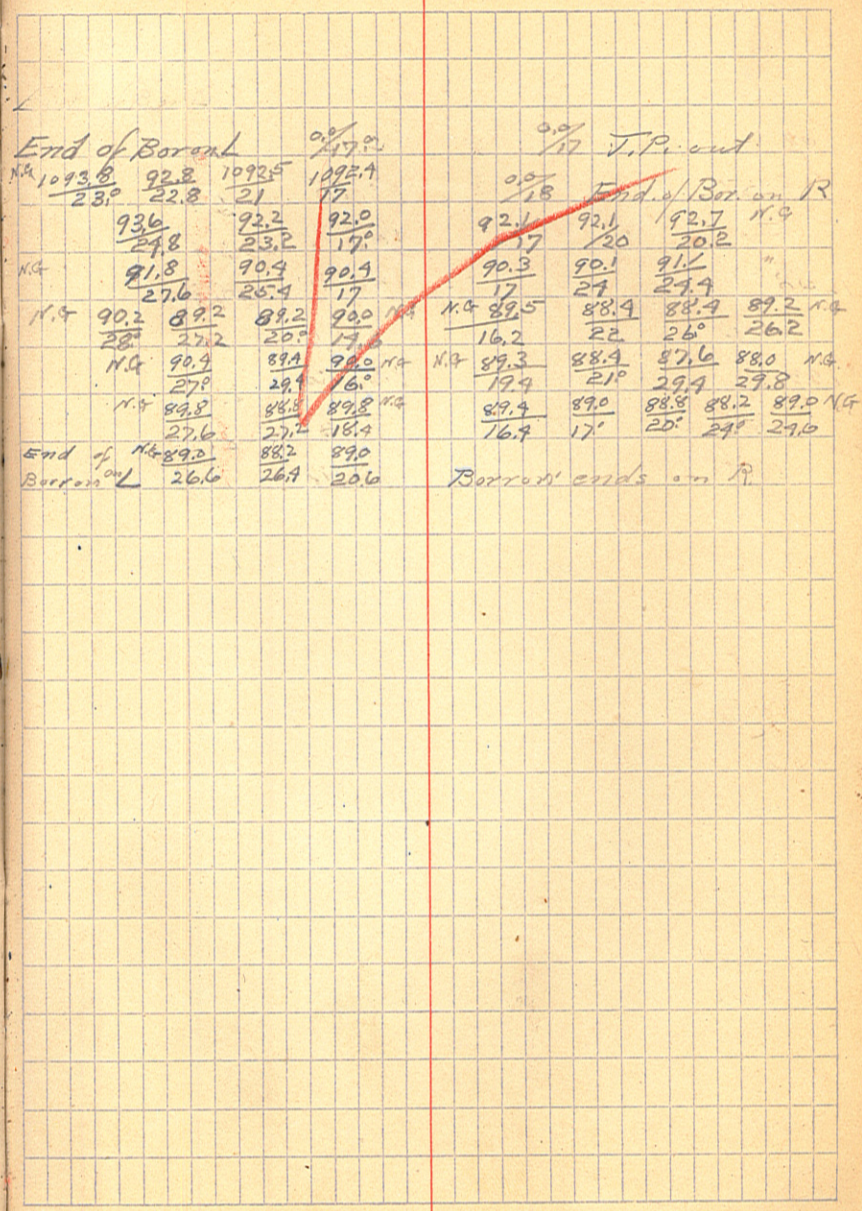
4 Oct. 18, 1916

Re measure

Molyneux
Watson
Crossman

Borrow

	Area	C. Yds
1707+14	0.00	3.8
07+38	8.53	14.8
+50	12.92	30.1
1708	19.66	34.1
+50	17.22	29.9
1709	15.06	21.2
+50	7.88	16.6
+85	2.90	5
		130.5



Oct. 18, 1916

Measurement after Exc

	Areas	Cu Yds
1687+50		
1688	25.12	45.2
+50	23.68	51.7
1689	32.19	69.0
1689.6	33.80	35.8
+50	7.92	14.3
1691	10.54	22.2
+50	13.40	21.6
1692	9.92	18.4
+50	10.02	16.3
1693	9.56	
	16.56	22.5
+50	17.78	29.3
1694	13.86	23.1
+50	11.14	31.0
1695	22.38	41.2
+50	22.12	31.6
1696	11.98	
	4.98	8.1
+50	3.78	5.2
1697	1.80	1.0
+36	0.0	32 1.6

Se Slip

N.G	91.1 / 31.8	87.8 / 28.8	89.7 / 16	N.G	N.G	90.0 / 19	88.8 / 23.0	88.8 / 29.9	89.8 / 30.9 N.G
N.G	90.2 / 38.0	88.1 / 30.2	89.2 / 17.6	89.7 / 15.6	N.G	89.1 / 22.6	88.7 / 23.8	89.7 / 30	89.7 / 31.9 N.G
N.G	90.0 / 29.6	89.3 / 29.4	89.3 / 21.4	90.2 / 18.4	N.G	90.0 / 15	89.1 / 24	88.7 / 29.4	91.3 / 31 N.G
	N.G 93.1 / 29		90.6 / 26	91.2 / 17		N.G 91.4 / 16	90.2 / 25.8	91.4 / 27.4	N.G
	94.6 / 28.2	90.8 / 29.8	91.5 / 21.0	92.0 / 17	No Borrow on R.				
	93.4 / 23		92.9 / 21	92.6 / 17.0	" "	" "	"		
	94.6 / 29.2		93.0 / 23.4	93.3 / 17	" "	" "	" "		
95.0 / 24	93.0 / 22.2		92.8 / 20	93.4 / 17	" "	" "	" "		
	95.2 / 23.2		92.4 / 21.8	93.8 / 17	" "	" "	" "		
	95.2 / 23.4		93.5 / 21.6	93.7 / 17	" "	" "	" "		
	95.0 / 24		93.4 / 22.4	93.8 / 17	" "	" "	" "		
	95.4 / 24		93.5 / 22	93.7 / 17	Borrow Beg on R				
	94.4 / 26.2		92.8 / 24	93.4 / 17	94.0 / 17	94.2 / 19	94.8 / 19.2	N.G	
93.2 / 25.6	92.2 / 25.0		92.2 / 20	92.8 / 17	92.2 / 17	92.2 / 18.8	92.8 / 19	N.G	
94.8 / 25.4	92.6 / 22.4		92.5 / 21	93.5 / 15	92.4 / 15	92.2 / 17	92.4 / 20.4	92.8 / 20.6	N.G
95.2 / 24.2	94.0 / 22.6		93.4 / 20	94.0 / 15	93.4 / 15	93.4 / 19	95.0 / 22.8	N.G	
	95.8 / 22.6		94.2 / 21	95.2 / 17	94.2 / 17	95.4 / 20.2	N.G		
	95.6 / 19.8		94.2 / 18.2	94.2 / 17	End of Bor on R				
			95.2 / 18.8	94.6 / 17					

Borrow ends on L

Oct. 20, 1916

Change of grade.

		Areas Cut	Quantities Cut
1827	℄ 1122.5	0.92	66.6
+50		71.02	181.4
1828	0.0	60.08	58.6
	0.0		
+50	℄ 1122.5	3.24	3.0
1829		0.0	249.6

Oct. 21, 1916
M. W. + C.

Surfacing B. after E + C.

	Area	C.Y.	R.R.
1444+75	0.0	7.0	
45	15.15	23.7	
45+40	16.89	25.4	
1446	15.97	10.6	
+50	5.46	8.7	
1447	3.97		
		1.8	
+25	0.0	77.2	

0.0/19° 0.0/10° 0.0 0.0/10° D +0.4/17° D +0.6/17.6
+0.6/16.6 +0.8/17 +2.0/10° +2.2 +2.6/10.0 D +2.6/17° +2.6/17.6 +2.6/18.6
0.0/16° +0.4/17° +2.0/10° +1.8 +2.0/10° +0.9/17° +0.4/16.9
D 0.0/17.0 0.0/12° 0.0 0.0/10 D +0.8/17 D +0.6/17.6
D 0.0/17

Borrow Begins

N.A. 6.0/20.8 9.0/20.2 9.1/17.8 2.0/17
N.A. 5.4/22.2 7.8/21.6 8.0/7 7.9/17
N.A. 5.3/22.4 7.0/21.6 7.1/19.5 6.6/17
N.A. 5.9/22.2 7.5/21.6 7.7/19.5
7.6/22° 9.0/21.6 8.9/19.5

Borrow Ends

Oct. 21, 1916

Chec readings on Side Borrow Work

		Area	C.Y.
1452+50	Exc. Borrow here		
53		19.88	35.6
+50		18.55	32.7
54		16.73	62.3
55		16.94	65.8
1456	Etc. Bor	18.56	

Surfacing borrow on Rt Meas after Es

		Area	C.Y.
1461+60		0.0	3.8
1462		5.14 ✓	12.9
+50		8.76 ✓	9.6
1463		1.56	0.1
+05	S. Bor Ends	0.0	26.4

1464+35 Surfacing begins
1466+30 " Ends
poor job of surfacing

N.G	6.6 / 19.3	8.6 / 18.3	8.1 / 14.3	6.6 / 8.7	7.1 / 11.6	8.3 / 15	8.6 / 19.4	7.1 / 20.6 N.G
N.G	6.3 / 19.6	7.7 / 18.8	7.6 / 14.9	6.3 / 10.2	6.3 / 10.0	7.7 / 15.2	7.8 / 19.0	6.3 / 19.6 N.G
N.G	6.0 / 19.2	7.5 / 18.8	7.3 / 15.2	6.0 / 10.4	6.0 / 10.9	7.2 / 15.	7.3 / 19.2	6.0 / 19.6 N.G
N.G	5.9 / 19.2	7.3 / 19.	7.3 / 14.8	5.9 / 10.7	5.7 / 11.	6.9 / 15.	6.9 / 19.	5.7 / 19.6 N.G
N.G	6.1 / 19.6	7.9 / 19.2	7.7 / 15.2	6.1 / 10.4	5.6 / 9.2	7.1 / 15.2	7.1 / 19.8	5.6 / 20 N.G

N.G	11 13.9 / 24.	12.6 / 22.2	11 12.6 / 19.8	~~N.G~~	Surfacing
N.G	15.6 / 24.8	13.9 / 23.8	13.8 / 19.8		spit not clean
	16.9 / 22.	14.8 / 21.6	15.1 / 16		up rough

See Austman Borrow

Remeasure after Oct. 21, 1916

Excess yds of FILL

	Area	cu yds.		Area	cu yds.
1486	1.40				
		3.8			
1487	0.66				
		1.5			
+40	1.32				
		22.1			
1488	18.56				
		26.3			
+30	28.87				
		114.8			
1489	59.66				
		219.8			
1490	59.05				
		49.4			
+25	47.58				
		97.6			
1491	22.67				
		535.3			
+50	18.78				
		38.4			
1492	25.54				
		41.9			
1493	34.77		1493+75	00	
		111.7			10.4
94	44.19	146.2	1494	24.91	
		357.3			16.8
+80	27.16	105.7	+80	20.50	
					43.2
1495	25.20	19.4	1495	8.62	
					38.1
1496	10.61	66.3	1496	11.95	
					22.1
1497	31.13	77.3	1497	.00	
					130.6
1498	44.53	140.1		cyds	
		62.3			
+60	11.60		1498+60	00	
		2.6			
+90					18.9
		478.7			
1499	00		1499	25.23	
1499	Culvert	N 54" x 24'	Elev E end		1119.92
			" W "		1117.74
1500			1500	24.20	91.5
1501			+20	00	90
1502				cyds	119.1

Remeasure

slide Boards

slide Boards

Culverts OK.

No surfacing needed, Sta 1500+50

Ditch Beg on L

Ditch ends in R.

		Area	C yds
1502+50			
1503	Cut exca. O/P	00	
+32		00	4.2
+50.	Subgrade Bottom surfacing Remeasured	1.51	10.2
1504		10.56	20.2
+50		1122	17.6
1505		7.76	52.2
		23.99	31.1
+50		9.61	208
1506		12.82	244
+50		15.66	324
1507		1923	10.7
+50		2026	36.6
1508		4095	566
			149.7
+75		6394	59.3
			289.2
1509	End of Mile 14.72		36.5
+40		4.51	4.2
+85		0.60	
1510		0.0	
+36		0.0	1.1
+50		3.0	
+80			32.4
1511		31.96	85.4
1512		14.14	46.1
1513		10.75	50.2
			181.7
1514		1636	
+30			

Cont on page ~~87~~ 93

N.G 35.7 14.6	39.4 13°	Ditch 35.5 10		36.4	35.6 10	34.5 Ditch 13.6	35.0 N.G 17.7		
		36.0 10		36.6	36.0 10°				
S.B. on L. Beg – Cut Begins					R & L.				
N.G 36.3 18.4	35.2 17.6	35.3 13.2	36.6 10		36.6 10	35.2 13.8	35.9 17.8	N.G	
N.G. 39.3 20.8	36.8 18.6	37.1 13.9	38.1 10	37.4 38.9	38.4 10	37.7 13	37.8 15°	39.4 17.8	N.G.
N.G 40.6 20.9	37.7 17.8	37.8 13.8	39.2 10	40.2	39.8 10	38.4 15.2	42.2 19.9	N.G	
N.G 39.6 20.2	38.0 18.4	38.7 13.9	39.7 10	41.0	40.4 10	39.2 15.2	41.6 17.8	N.G	
N.G. 40.6 19.2	39.8 18.7	39.8 13.9	40.8 10	41.7	40.6 10	39.3 17.8	39.1 16.8	40.2 17.2	N.G
N.G	41.2 19.2	39.6 17.6	41.7 10	42.0	41.1 10	39.8 16.	41.1 18.4	N.G	
N.G 41.2 20	40.0 18.9	40.9 15.2	41.8 10	42.7	42.2 10	40.5 14.8	40.3 17.2	42.2 19.8	N.G
N.G 41.9 19.6	40.1 18.6	40.4 15.6	42.3 10	43.2	42.5 10	41.1 16.6	43.0 19.2	N.G	
N.G 41.7 20.2	40.1 18.2	40.2 15.2	42.3 10	43.3	42.3 10	40.8 15.7	43.1 19.4	N.G	
N.G 41.3 18°	39.4 16.6	39.4 15.0	40.0 15.6	41.8	41.0 10	39.5 14.8	42.6 19.2	N.G	
N.G 39.7 16.6	37.8 15.2	37.8 13.2	38.4 10	39.4	38.7 10	38.0 12.4	37.8 19	41.3 17.5	N.G
N.G 38.2 16	36.7 14.8	36.7 12.8	37.7 10	38.6	37.6 10	36.7 13.8	39.9 17.8	N.G	
Ditch on L Ends				37.3	36.6 10	35.7 13.6	37.2 15.9	N.G.	
			35.0 10°	35.6	35.0 10	34.1 14	44.6 19.9	N.G Ditch on R Ends	
			34.5 10	35.1	34.5 10		~~Ditch on R Ends~~		
			32.2 10	33.5	32.9 10	+30 Ditch begins on R 32.9 12.2	31.6 14.2	31.2 16.6	NG 12.8 12.5
Ditch begins on L									
N.G 31.8 20.9	30.1 18.9	30.1 16.9	31.8 16	32.5	31.5 10°	30.0 17.6	33.3 N.G 21		
N.G 28.8 21	27.0 19	27.2 16.8	29.2 11	29.2 10	29.8	29.0 10	~~26.8~~ 19	28.7 21	N.G
N.G 25.3 19.6	23.8 17.8	23.8 15.8	26.1 10	26.7	25.7 10	23.9 17	25.4 19.6	N.G	
N.G 21.4 20	20.1 18.9	20.4 13.8	22.1 10	22.8	22.0 10	20.6 15.4	20.5 18.2	22.3 19.8	N.G

Ditch on L ends R Ditch 2' Wide, 5 Deep

Oct. 21, 1916.

Borrow ~~Exc.~~ R.R. after Exc. H.I. 1135.23

	area	Ac. yds
1625	00	8.9
+25	19.24	7.1
+36	15.57	9.3
+50	20.44	21.0
1626	2.24	1.4
+10	0.0	46.7
1626+75	0.0	8.2
1627	17.80	15.9
+22	21.35	16.9
+40	29.24	40.4
+80	25.36	17.2
1628	21.15	7.8
+20	0.0	106.4

N.G 11 26.3 8.9 20.6 | 20.3 15.0 14° | 20.8 19.4 10 | 22.8 13.0

N.G 26.2 9.0 22.9 ~~78.8~~ | 20.9 19.3 17.9 Ditch

N.G 26.2 9.0 23. | 21 19.2 17.6 Ditch | 20.4 13.8 19

N.G 25.4 9.8 22.2 | 21.2 14.8 17.6 | 21.2 14° 16° | 21.8 13.4 19

N.G 22.8 13.2 21.8 | 21.4 13.6 21.8 D | 21.4 13.8 18.6 D | 22.2 13.4 16.6

End of ditch

Ditches commence R. + L. - Rod readings

N.G 26.8 8.4 29.6. | 25.6 9.6 23.6 | 26.6 8.6 19.6 | 29.9 6.3 | 26.6 8.6 15° | 26.5 8.7 19.2 | 27.9 2.5 20.6 N.G

N.G 29.8 6.4 23.4 | 27.2 8.0 22° | 28.0 7.2 15.4 | 28.1 7.1 19 | 29.8 7.9 19.6 | 27.4 7.8 21.4 | 29.2 6.0 22.4 N.G

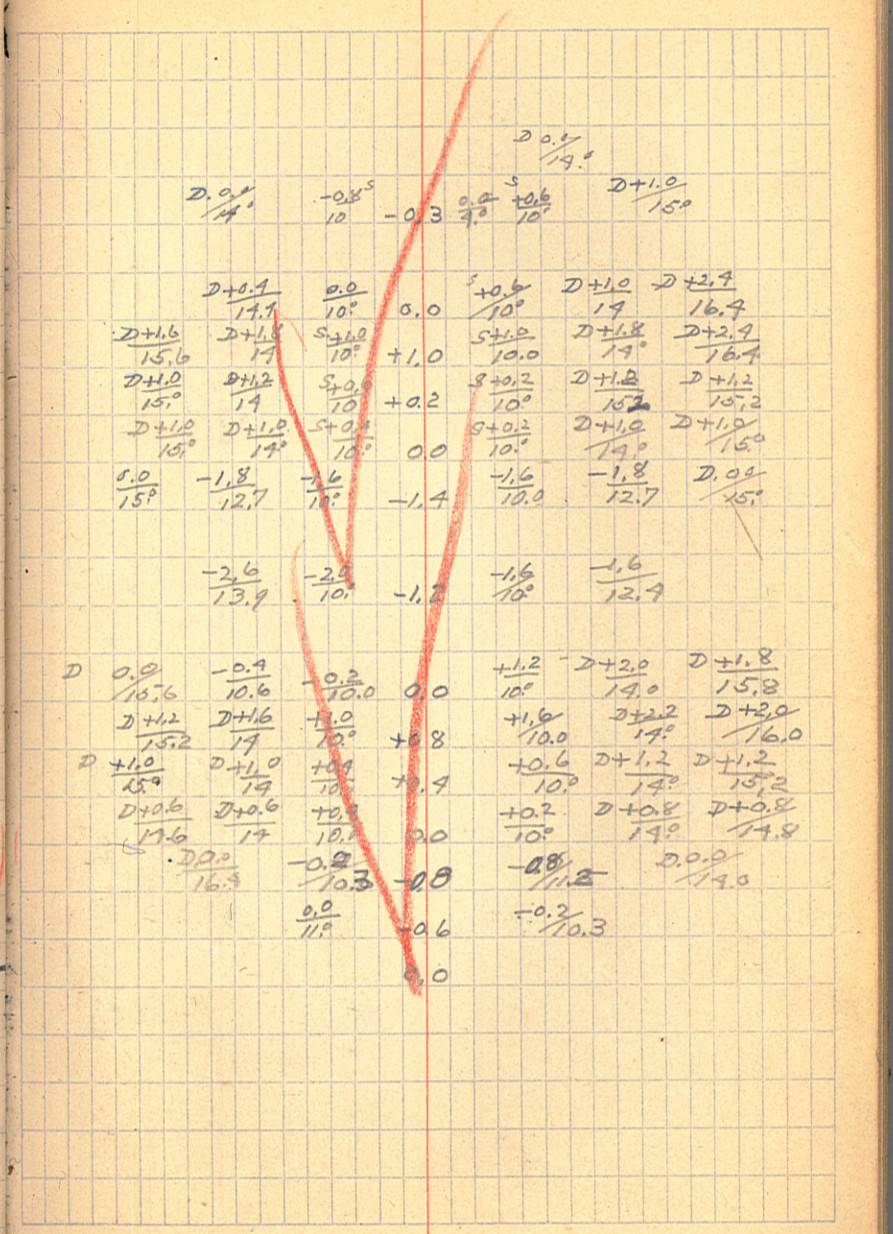
N.G 29.9 5.3 22.6 | 29.1 7.1 20.8 | 29.4 6.8 16 | 29.8 6.4 19 | 28.6 6.6 19 | 28.2 7.0 15.2 | 27.5 7.7 17.6 | 27.5 7.7 22.6 | 29.1 6.1 23.6 N.G

N.G 31.9 3.3 23.4 | 29.9 5.3 22° | 30.3 4.9 19 | 29.9 5.9 19 | 29.9 6.9 23° | 30.3 4.9 23.8 N.G

32.4 2.8 21.6 | 30.9 4.3 20.9 | 30.6 4.6 16.2 | 31.1 4.1 19 | 33.0 2.2 | 31.0 4.2 19 | 30.7 4.5 15.4 | 30.1 5.1 20.9 | 34.8 3.9 21.8

Borrow Ends R. + L

		Areas Cut	Areas Fill	Quantities Cut	Quantities Fill
2499	C. Line	0.0	0.0	10.2	12.2
2500	@ 1170	5.50	6.58		
	+ 71.7			26.5	12.2
2501	71.7	8.28	0.0	55.6	
+70	1172.83	34.80		27.1	
2502	1173.33	14.07		4.3	
+70	1173.50	9.20	0.0	15.3	57.2
2503	1175.0	0.0	34.32	138.0	
					129.9
2504	1176.7	0.0	35.82		
				24.4	74.0
2505	1178.33	13.20	9.12	54.1	5.1
+72	79.53	37.36	0.0	28.0	
2506	@ 1180	16.62		4.5	
+10	1180.1	12.50	0.00	5.6	9.3
+50	80.3	0.0	12.60		15.8
2507	1180.6		4.50	116.6	5.8
+70	80.9		0.0		321.5



	Grade	Areas Cut	Areas Fill	Quantities Cut	Quantities Fill
2 447+50		0.0		2.8	
2448	℄ 1183.5	2.98		17.5	
+80	1 82.7	8.82		14.9	
49	0.1182.5	31.46		89.8	
+50	1182.0	65.50		100.1	
2450	1181.5	43.10		36.0	
+43		3.88	0.0	5.0	4.6
2451	1180.5	6.0	35.56	266.1 ✓	66.8
+56	℄ 1180.0		36.56		71.1
2452	0.0 "		40.37		161.8
2453	"	0.0	46.44	17.1	77.4
+90		10.26	0.0	5.9	381.7 ✓
2454	"	21.52		71.9	
+50	"	56.12		105.6	
2455	℄ 1180.0	57.98	0.0	114.6	
	0.1-				4.0
2456		3.90	2.18		
				7.2	48.1
2457		0.00	23.82	322.3 ✓	
					44.1
2458			0.0		96.2 ✓

D +1.0 / 15.0		0.1 / 10.0	0.0	-0.4 / 10.0	0.0 / 12.0	D +0.9 / 14.9
D +1.0 / 15.0	D +1.2 / 14.9	+0.2 / 10.0	0.0	+0.2 / 10.0	D +1.2 / 14.9	D +1.2 / 15.2
D +1.4 / 15.4	D +1.6 / 14.9	+1.0 / 10.0	+0.6	+1.0 / 10.0	D +2.2 / 14.9	D +2.4 / 16.4
D +2.6 / 16.6	D +2.8 / 14.9	+1.0 / 10.0	+1.6	+2.0 / 10.0	D +2.8 / 14.9	D +2.8 / 16.8
D +2.0 / 16.0	D +2.0 / 14.9	+1.2 / 10.0	+1.2	+1.4 / 10.0	D +2.2 / 14.9	D +2.0 / 15.0	D +2.8 / 16.8
D +1.0 / 15.0	D +1.0 / 14.9	0.0 / 10.0	0.0	0.0 / 10.0	D +0.6 / 14.9	D +0.6 / 14.6
D 0.0 / 15.0	-1.8 / 12.7	-1.6 / 10.0	-1.5	-1.6 / 10.0	-2.0 / 13.0	D 0.0 / 15.0
	-1.8 / 12.7	-1.6 / 10.0	-1.6	-1.6 / 10.0	-2.0 / 13.0	
	-2.0 / 13.0	-1.6 / 10.0	-1.8	-1.8 / 10.0	-2.2 / 13.3	
D 0.0 / 15.0	-2.4 / 13.6	-1.8 / 10.0	-2.0	-2.0 / 10.0	-2.8 / 14.2	D 0.0 / 15.0
D +0.6 / 14.6	D +0.8 / 14.0	0.0 / 10.0	0.0	+0.6 / 10.0	D +1.4 / 14.0	D +1.2 / 15.2
D +1.0 / 15.0	D +1.2 / 14.9	+0.6 / 10.0	+0.4	+1.0 / 10.0	D +1.6 / 14.9	D +1.4 / 15.4
D +2.2 / 16.2	D +2.4 / 14.9	+1.6 / 10.0	+1.6	+2.2 / 10.0	D 2.8 / 14.9	D +3.2 / 17.2
D +2.8 / 16.8	D +2.8 / 14.9	+1.8 / 10.0	+1.6	+1.8 / 10.0	+2.8 / 14.9	D +3.4 / 16.4
D +1.0 / 15.0	D +1.0 / 14.9	+0.2 / 10.0	0.0	-0.4 / 10.0	-0.6 / 14.9	D 0.0 / 16.0
D 0.0 / 15.0	-1.8 / 12.7	-1.2 / 10.0	-1.0	-1.0 / 10.0	-1.6 / 12.9	
		0.0 / 10.0	0.0	0.0 / 10.0		

Acton

Change of grade - showing cuts to remove bumps in S.B. work

	Area	
2394+00	0.0	2.1
2394+80	3.68	8.5
2395	19.32	40.8
2395+00	23.92	16.4
2395+80	5.48	1.0
+90	0.0	68.0

D+0.9 / 15.4 D+0.4 / 14 S+0.4 / 10.5 0.0 0.0 / 10°

D+1.2 / 15.2 D+1.9 / 14.0 S+0.8 / 10.5 +0.7 S+0.4 / 10.0 0.0 / 14°

D+1.9 / 18° S+1.6 / 10° +0.6 S+1.2 / 10.0 D+0.6 / 17.6 partly taken out

D+0.6 / 18° S.+0.6 / 11.0 0.0 0.0 / 11.° D. 0.0 / 17°

Oct. 24, 1916
E.M.M.
F.E.W.
J.C.

	Area	C.Y.
1936+80	0.0	2.5
1937	6.80	13.5
+50	7.80	9.1
+80	8.60	3.3
1938	0.43	1.6
+20	3.85	5.5
+50	6.08	6.5
+80	5.70	2.0
1939	40.0	44.0

1938 Surfacing Beg.
1942 " E Sds

Surfacing Bor. Pit

Beg on R + L

N.G 1150.0 19°	1149.3 18.4	1149.2 17	1149.5 18	49.8 22°	1151.0 22.4	N.G
N.G	49.0 17.4	48.2 17	49.6	48.4 18	48.8 23.2	50.0 23.8	N.G
				47.1 16	47.0 19°	47.4 22°	48.6 23.4	N.G
			48.3	48.6 14	48.4 21.4	48.5 22.6	N.G
				N.G 45.4 18°	45.5 19.4	45.0 21.2	47.0 22.4	N.G
				N.G 44.8 17.4	44.4 18.8	44.4 28.2	45.2 28.6	N.G
				N.G 43.3 20.2	43.2 23.4	42.7 29.6	43.5 30.6	N.G

Borrow ends

Borrow end on L

		Area	C.Y.
1949+90		0.0	
~~1950~~			2.4
1950~~+35~~		2.16 / 8.96	8.8
50+35		4.70	18.4
1951		-10.60	5.9
+30	Highway	0.0	
+10		0.0	8.6
+50		11.56	17.4
1952		7.20	21.7
+50		16.25	35.8
1953		22.35 / 13.15	28.9
+50		18.06	32.7
1954		17.28	33.3
+50		18.72	21.5
1955		4.54	7.5
+50		3.58	3.3
1956		0.0	246.2
1957		0.0	6.8
+50		7.30	14.9
1958		8.84	16.4
+50		8.90	16.2
1959		8.60	16.0
+50		8.70	21.4
1960		14.40	20.9
1960+50		8.18	7.6
1961		0.00	120.2

Borrow Beg

Nothing on L — Beg here

N.G 52.5 / 17.6 — 51.6 / 17.9 — 51.9 N.G / 18° — 51.8 / 20.6 — 52.6 N.G / 20.8

N.G 53.0 / 18° — 51.8 / 17°

Nothing on R.

53.2 / 19 — 51.2 / 17° — 51.6 / 19 — " " R

Borrow Ends on L Highway Xing

Borrow Beg on R.

Nothing on L. — 53.1

N.G 52.0 / 15 — 50.6 / 25 — 50.3 / 30 — 51.7 N.G / 30.8

Borrow Beg on L. — 53.8

N.G 51.8 / 21.4 — 50.8 / 20.8 — 51.8 N.G / 12° — 53.6

N.G 51.2 / 16 — 49.6 / 29.8 — 50.6 N.G / 30.4

N.G 51.6 / 15 — 50.9 / 28.4 — 51.9 N.G / 30.4

N.G 53.5 / 20.6 — 53.1 / 20° — 52.2 / 18 — 59.4

53.1 / 18.4 — 52.3 / 26.0 — 53.7 N.G / 27.1

N.G 54.6 / 21.4 — 53.2 / 21 — 53.4 / 18 — 54.3

53.9 / 18 — 53.0 / 29.6 — 54.8 N.G / 26.4

N.G 54.5 / 21.2 — 53.9 / 21° — 53.6 / 18 — 55.9

53.7 / 18 — 53.5 / 26.8 — 55.0 N.G / 27.6 N.G

N.G 54.8 / 20.8 — 53.5 / 20.8 — 53.5 / 18

54.0 / 18 — 53.9 / 26.0 — 54.1 / 27. — 54.1 / 28.4 — 55.1 / 29.2

End of Bor on L

54.0 / 18 — 53.8 / 22 — 55.1 N.G / 23.2

54.1 / 18 — 54.0 / 22.6 — 55.1 / 23.6

Borrow Ends on R

Borrow Beg. on R.

52.2 / 18 — 51.7 / 24.6 — 52.7 N.G / 25

49.6 / 18 — 49.2 / 26.0 — 50.3 N.G / 26.8

48.5 / 18 — 48.0 / 25.2 — 49.2 N.G / 26.

48.3 / 18 — 47.7 / 26 — 48.7 / 26.2

47.8 / 18 — 47.5 / 26.2 — 48.5 / 26.2

47.7 / 18 — 47.8 / 26 — 48.4 / 26.4

		Area	
1960+50		8.18	
1961		0.0	
	1962	Surfacing	Beg Ends
	1967+20		

	Area	C.Y.	
1966+35	0.0	1.5	
+50	5.46	17.4	
1967	13.36	31.5	
+50	20.66	32.9	
1968	14.84	23.8	107.1
+50	10.88	16.4	
1969	6.86	20.1	
+63	10.40	12.5	
1970	7.80	14.9	
+50	8.34	16.4	
1971	9.36	12.6	
+50	4.20	9.8	
1972	6.38	16.4	
+50	9.36	15.1	
1973	6.96	12.9	
+50	0.0	~~254.2~~ 147.1	

Borrow - No surfacing from Circuit Rd. 25 N. of River small gate

Borrow Ends on R

46.6 / 18	46.6 / 25.1	47.6 / 25.6

Borrow Beg on R

N.G. 43.2 / 20.6	42.8 / 27.6	44.3 / 28.4 N.G.
45.0 / 19	43.9 / 28.4	45.6 / 30.2 N.G.
46.1 / 19	42.8 / 28.6	47.3 / 30.6 N.G.
46.9 / 19	48.2 / 25.6	48.1 / 26.8 N.G.
47.2 / 18	46.6 / 25.1	48.2 / 26.6 N.G.
47.2 / 18	42.1 / 22.9	48.5 / 23 N.G.
48.6 / 18	48.0 / 22.2	50.2 / 23.4 N.G.
48.4 / 18	48.2 / 22	50.0 / 23.2 N.G.
46.8 / 18	46.6 / 22.6	48.4 / 23.4 N.G.
45.2 / 18	45.6 / 21.6	47.0 / 23.2 N.G.
43.7 / 18	43.5 / 21.0	44.6 / 21.8 N.G.
43.2 / 18	42.8 / 21.6	44.4 / 22.4 N.G.
43.0 / 18	42.6 / 21.6	44.6 / 23.2 N.G.
42.2 / 18	41.7 / 21.6	43.4 / 22.8 N.G.

End of Borrow on R

Borrow Beg on L

N.G.	46.6 / 20.4	44.9 / 19.4	44.9 / 19
N.G.	42.2 / 20.2		45.9 / 19
N.G.	42.4 / 20.8		46.2 / 19

End of Borrow L

	area	Cu.Yds.
1639 +30	0.00	4.4
1639+65 Bot.	6.76	11.6
1640	11.23	49.8
1641	15,68	61.3
1642	17.42	41.4
1643 ← Surface B. Ends Beg.	14.82 / 7.57	168.5 End of S. Ditch
		54.9
1644	22.09	78.7
1645	20.39	85.0
1646	25,51	90.8
1647	23.56	54.3
1648	5.78	20.8
1649	5.44	18.3
1650	4,52	9.7
+75	2.48	1.1
1651	0,00	413.6

1642+40 Surfacing Begins Rt
1648+90 End of Surface

1561+65 — C.M.C. — 28'L
12" at upper end
15" " lower "

1664+60 Offtake Rt R

Borrow on Rt. Beg

No Bor. on L

Bor. Beg 1100.6 at 20.6 — 1100.8

N.G 97.0/24 — 95.9/22.6 — 95.5/20.2

95.9/29 — 94.9/28.2 — 94.0/22

N.G 95.0/29.6 — 93.4/28 — 93.2/22

N.G 93.9/30 — 92.0/29.0 — 92.0/22

N.G 93.2/32 — 92.1/31 — 91.7/28.6 — 92.0/22

N.G 93.1/23.8 — 92.3/22.4 — 92.4/23.8 — 92.9/13 N.G

N.G 95.3/23.8 — 93.8/21.8 — 93.6/20 — 94.1/17.0 — 95.1/13

N.G 96.9/27.6 — 95.3/21 — 95.7/17.0 — 96.8/12

N.G 97.4/21 — 97.0/20 — 96.9/17

N.G 99.1/21.7 — 97.7/20 — 97.6/17

09.5 — 09.7 — 1100.8

09,6/19 — 08.9/19 — 08.2/20.9 — 1100.1/29 N.G

08.0/14 — 06.9/19 — 06.0/25 — 08.3/26 N.G

03.3/19 — 01.9/20.0 — 01.4/26.6 — 03.8/27 N.G

99.6/17.0 — 98.0/19.0 — 97.8/25 — 1100.2/26 N.G

95.1/22 — 95.3/26.6 — 96.6/27.5 N

94.1/22 — 93.8/28.2 — 95.7/30 N.G

92.6/22 — 92.7/29.0 — 95.0/30 N.G

92.1/22 — 92.0/27.6 — 92.4/29.6 — 93.8/30.6 N.G

92.1/22 — 91.5/25.4 — 92.2/27.6 — 93.3/28.6 N.G

N.G 93.2/17 — 93.1/21.0 — 92.2/25.0 — 92.4/27 — 93.9/20 N.G

10 95.3/13 — 93.8/19.6 — 93.9/23.8 — 95.5/26 N.G

97.1/11.6 — 95.8/18 — 95.5/22.4 — 1097.2/29 N.G

97.1/17 — 97.1/22 — 98.9/23.4 N.G

1098.6/18 — 98.9/22 — 99.4/23.4 N.G

		Area	C.Y.
1653		0.00	8.4
+40		11.30	25.5
1654		11.69	67.1
55		24.52	35.1
+40		22.87	58.0
56		29.36	49.6
+40	S, B joins Exc. Bor	37.64	~~243.7~~ 82.2
1657		36.38	117.4
58		27.03	36.8
+40		22.60	46.6
1659		19.38	12.6
+35		0.0	295.6

1659 Surfacing begins

Surface Bor

Beg on R

Nothing Bor

Borrow Beg on L

1102.3 / 11 — 01.1 / 18 — 01.0 / 22° — 01.2 / 24° — 03.3 / 25 N.G

1101.1 / 13 — 99.7 / 18 — 1100.0 / 25 — 02.2 / 26.0 N.G

1100.6 — 99.9 / 13 — 97.8 / 19 — 97.0 / 26.6 — 1100.4 / 27 N.G

N.G 98.1 / 28.1 — 97.0° / 27° — 97.4 / 19 — 98.4 / 12 — 1098.7 — 99.2 / 12° — 97.5 / 18° — 97.3 / 27.4 — 99.5 / 27.8 N.G

N.G 97.4 / 31° — 95.6 / 30 — 95.7 / 23 — 97.4 / 12° — 98.7 — 96.9 / 13 — 96.2 / 19.8 — 96.0° / 26 — 98.2 / 26.8 N.G

N.G 97.2 / 31.6 — 95.5 / 30° — 95.5 / 20 — 96.6 / 14 — 98.4 — 97.0 / 14° — 95.7 / 18 — 94.8 / 25.8 — 97.8 / 26.8 N.G

N.G 96.8 / 32.6 — 94.8 / 31 — 94.8 / 26 — 95.3 / 21 — 96.5 / 13 — 97.8 — 96.8 / 12 — 95.0 / 19° — 95.0 / 26.8 — 97.0 / 28 N.G

95.9 / 31 — 93.8 / 30.4 — 94.1 / 25 — 95.7 / 13 — 96.9 — 95.8 / 12 — 94.5 / 18.8 — 94.4 / 25 — 96.0 / 26 N.G

95.4 / 28 — 93.6 / 27.6 — 93.8 / 19.0 — 95.5 / 11 — 96.6 — 96.0 / 10 — 93.6 / 20.4 — 93.6 / 26° — 95.6 / 26.8 N.G

N.G 95.0 / 27 — 93.2 / 27 — 93.0 / 19.0 — 95.4 / 10.0 — 96.6 — 95.6 / 10 — 93.8 / 21.0 — 93.8 / 26° — 95.2 / 27 N.G

Borrow Ends R + L

Borrow

	Area	C.Y
~~1664+90~~		
1664+90		
1665	0.0	39.3
1666+55	21.22	124.3
1666+85	35.99	27.1
1667	61.52	300.1
1668	100.59	59.5
+25	27.96	550.3

	Area	C.Y
1668+75	2.10	2.6
1669	3.38	4.3
+50	1.20	1.5
1670	0.40	4.1
1671	1.80	12.5

1671 Culvert 18" x 26'

2 C.Y. Rip Rap

Joint up into S.D

11 N.G	94.9 / 26	93.6 / 25.6	93.9 / 22	92.8 / 21	92.8 / 18	94.3 / 15	96.9	11	93.6 / 13.6	92.6 / 19	92.5 / 22	93.2 / 22.8	93.4 / 25.8	94.2 / 26 N.G
N.G	95.8 / 25	95.0 / 24	94.2 / 20.0	94.3 / 19	97.4				95.0 / 19	94.1 / 18.6	94.1 / 24	95.3 / 24.6	N.G	
N.G	96.6 / 26.8	95.3 / 25	95.3 / 19	96.1 / 16	96.7 / 14	~~98.8~~			96.9 / 19	96.9 / 16	95.6 / 19	95.5 / 24.6	97.7 / 26	N.G
N.G	97.2 / 28	95.9 / 27	95.9 / 21	96.5 / 16	97.3 / 14	98.8			96.9 / 19	96.3 / 16.2	95.3 / 19.9	95.9 / 26.4	98.0 / 27	N.G
	1100.0 / 32.8	97.2 / 28.9	96.6 / 22	97.2 / 18	97.8 / 14	99.1			97.9 / 19	96.2 / 17.2	95.9 / 19	95.9 / 26.4	1100.0 / 28.6	N.G
									97.8 / 19	97.0 / 18	96.6 / 24.0	97.0 / 28	99.2 / 28.6	N.G

Borrow Ends R + L.

N.G	98.3 / 16	96.3 / 19	96.0				97.1 / 17	96.8 / 16	98.2 / 18	N.G		
N.G	98.0 / 16.8	97.0 / 16	97.0 / 15	96.0 / 14			96.1 / 19	96.0 / 15.9	97.0 / 16.8	98.5 / 17.0	N.G	
N.G	96.6 / 16	95.0 / 19	96.6				99.5 / 19.0	96.7 / 16.8	N.G			
N.G	99.9 / 16	93.8 / 14	99.7 / N.2	95.6			Ends on R.					

Ditch continues to Culvert same size

1990+10 Surfacing Begins
1994+20 " Ends

Surfacing pit

		Area	C.Y.
1993+75			
1994	See book N page 161 Revised Elevs	0.0	7.8
+40		10.58	25.1
1995		11.97	35.3
1996		7.08	26.6
1997		7.30	6.8
+50		0.0	101.6
1998			

	Area	C.Y.
2000	0.0	3.4
2001	1.82	20.6
2002	9.31	23.1
2003	3.18	2.9
+50	0.0	59.0

2005+85 Surfacing begins
2017 " Ends

2006+39
+50

T.P. Ditch Beg on R.
N.G 17 N. Borr on R
Bor Beg on L. N.G 54.9 31 53.8 26 54.9 15 115.6 N.G 17 No Borrow take out Bor Beg on R.
N.G 57.3 32 55.8 29 56.2 17 57.5 56.3 17 57.9 19 N.G
58.4 33 57.4 31.0 57.9 17 59.2 57.9 17.0 58.8 19 N.G
58.9 31.6 58.0 27 58.4 17 59.4 Borrow ends
Borrow ends on L T.P. only 1.1ly 16' on R
T.P. 11.6 on L 160.3 T.P 17' on R

T.P. 16.6 on L T.P. 17 on R Borrow Beg on R
Borrow Beg on L 11 49.7 48.1 17 48.3 19 48.9 20.4 N.G
N.G 48.5 23.0 47.2 21.0 47.8 17 48.8 47.3 17 47.2 18.9 48.5 20.9 N.G
N.G 46.7 24 46.5 23 46.0 15 48.2 46.2 17 47.6 18 End of Bor.
Borrow ends on L

Surfacing pit begins on R

	Area	C.Y.
2006+30	0.0	6.1
2006+50	16.54	36.5
2007	22.90	46.3
+50	27.12	43.2
2008	19.48	9.0
+25	0.0	14.1

	Area	C.Y.
2015	3.12	9.9
+50	7.53	11.3
2016	4.69	3.1
+20	3.72	16.5
+50	26.00	43.1
2117	20.61	56.0
2118	9.60	43.7
2119	13.70	33.0
+50	22.12	33.2
2020	14.14	33.6
2021	9.66	44.1
2022	16.22	47.9
2023	17.44	62.3
2024	8.92	48.8
2025	10.03	35.1
2026	12.59	41.8
2027	13.66	46.4

E to Bor Beg
S Bor End

Surfacing

P-2
P-116

Elevations as shown are 10' high.

Surfacing pit begins on R

End of Sur. Bor

Borrow ditch

S Bor. Beg. on R.

Borrow Ends on L

Bor. Beg on L

	Area	C.Y.
2028	11.89	40.4
2029	9.93	40.1
2030	11.70	38.5
2031	9.10	45.5
2032	15.46	54.1
2033	13.86	52.1
2034	14.30	65.9
2035	21.30	65.6
2036	14.15	44.3
2037	9.80	46.0
2038	15.02	51.4
2039	12.76	49.3
2040	13.86	44.6
20 41	10.20	32.2
2042	7.20	25.8
2043	6.70	40.8
2044	15.30	46.8
2045	10.00	40.8
2046	12.06	51.9
2047	15.97	62.3
2048	17.68	58.1
2049	13.70	43.7
2050	9.90	27.0
2051	4.70	37.8
2052	15.70	50.6

Plan 36
B-2
B-12

244+70 – 12" x 18' C.M.C – P.R. on L

N.G 46.2 / 21°	45.1 / 20.6	45.1 / 17	46.8	44.8 / 17	44.5 / 20.6	44.7 / 23.4	45.6 / 23.8	N.G	
N.G 43.8 / 21	42.7 / 20.5	42.6 / 17	44.5	42.2 / 17	42.1 / 23.0	42.8 / 23.8		N.G	
N.G 43.7 / 21	42.5 / 20.4	42.7 / 17	44.1	42.4 / 17	42.1 / 23	43.4 / 23.8		N.G	
N.G 42.2 / 20	41.1 / 19.6	41.2 / 17	43.0	41.5 / 17	41.3 / 22.8	42.3 / 23		N.G	
N.G 42.1 / 21.6	40.7 / 21°	40.8 / 17	42.8	41.4 / 17	41.0 / 23.8	42.4 / 24.0		N.G	
N.G 40.5 / 21	39.6 / 20.6	39.6 / 17	41.6	40.9 / 17	40.3 / 25	41.4 / 26		N.G	
N.G 42.4 / 21.2	40.9 / 20.8	40.6 / 17	41.2	39.2 / 17	39.4 / 26	40.4 / 26.6		N.G	
N.G 42.3 / 20.8	41.1 / 20	41.1 / 17	42.6	41.6 / 17	40.8 / 23°	41.1 / 26.6	42.8 / 27	N.G	
B.E. on L N.G	41.2 / 17.4	40.7 / 17	42.3	40.6 / 17	40.2 / 19.2	40.2 / 23.8	42.1 / 25	N.G	
B. Beg. on L N.G	41.6 / 17	40.6 / 18.5	42.2	41.0 / 17	40.6 / 21.2	40.7 / 24.8	41.9 / 25.4	N.G	
N.G 40.8 / 21	39.6 / 20.4	39.9 / 17	41.7	40.1 / 17	39.3 / 22	39.2 / 25	40.7 / 26.2	N.G	
N.G 40.2 / 21	39.0 / 20.°	39.1 / 17	40.9	39.1 / 17	38.6 / 25.8	39.7 / 26.6		N.G	
N.G 39.7 / 21	38.6 / 20.6	38.9 / 17	41.0	39.2 / 17	38.7 / 25.4	40.0 / 26.6		N.G	
No Bor.	41.8 / 17	41.0 / 18.6	42.9	41.6 / 17	40.9 / 22	42.8 / 26		N.G	
No Bor.	42.7 / 17	41.5 / 16.7	43.4	42.2 / 17	42.1 / 22	43.5 / 23		N.G	
N. Bor. Beg.	42.9 / 17.4	42.1 / 17	43.9	42.2 / 17	42.1 / 22.8	43.1 / 23.6		N.G	
N.G 44.5 / 21	42.6 / 20.6	43.0 / 17	44.8	43.1 / 17	42.6 / 21.6	42.7 / 25.2	44.2 / 26.4	N.G	
N.G 42.0 / 20.6	40.7 / 20	40.8 / 17	42.8	41.1 41.° / 17 20	40.7 / 26	42.0 / 27.°		N.G	
N.G 42.2 / 21	40.2 / 20.6	40.9 / 17	42.3	40.8 / 17	40.5 / 26	41.5 / 26.8		N.G	
N.G 40.9 / 21.6	39.9 / 20.8	40.0 / 17	41.9	40.1 / 17	40.° / 26	41.2 / 27.°		N.G	
N.G 41.9 / 21.6	40.3 / 20.6	40.5 / 17	42.6	40.5 / 17	40.3 / 26.8	41.3 / 27.2		N.G	
N.G 43.3 / 21	42.3 / 20	42.4 / 17	43.8	42.7 / 17	42.7 / 25.6	43.7 / 26.8		N.G	
End of Bor. N.G 17.4	43.5 / 17	43.7 / 17	45.4	43.2 / 17	43.9 / 23.0	44.1 / 26.8	45.1 / 27.6	N.G	
No Bor on L			47.0	45.5 / 17	45.2 / 25.°	45.6 / 27.6	46.6 / 28.6	N.G	
" " " L			49.1	47.9 / 17	47.1 / 24	47.2 / 26.6	48.0 / 27.4		

Oct 27, 1916

		Area	C.Y.
2053		11.62	17.2
+50		6.96	6.4
2054		0.00	

2054+10 Surfacing Begins.
2057+50 " Ends

Oct. 28, 1916

		Area	C.Y.
2057		0.0	18.2
+60		16.44	6.3
+70	S.B. on R. haul S.	17.86	15.6
2058		10.14	42.3
2059		12.72	53.6
2060		16.20	69.6
2061		21.40	73.1
2062		16.08	65.3
2063		17.20	55.9
2064		13.00	31.6
+50		21.10	36.9
2065		18.80	77.1
2066		22.82	46.1
+50		26.98	47.8
2067		24.64	33.5
+50		11.52	14.9

No Bor on L 48.8 47.7 47.2 48.6 N.G.
No Bor " L 48.7 47.6 47.6 48.7 N.G.
" " " L 48.7 48.7 48.7 No Borrow

End of S. ditches R. + L.

N.G.	49.5	42.9	42.5	43.2	42.2	43.8	44.1	N.G.
	18.4	16	14	17	15.6	26.6	27.9	
N.G.	44.6	43.0	43.0	43.9	43.2	43.0	43.3	44.3 N.G.
	18.9	15.8	14	14	15.9	16.4	26.6	27.2
N.G.	45.3		43.6					
No Bor. on L	17		16.6	41.8	44.0	43.8	43.6	44.8 N.G.
					17	22.	26.9	27.2
N. Bor.	T.P. 16.6 out			44.9	43.9	43.5	43.6	44.8 N.G.
					17	22.4	26.4	27.8
Bor Beg on L	N.G. 42.6	41.6	41.5	43.5	43.6	41.7	43.5	N.G.
	19.2	18.4	17		17	26	27.8	
	N.G. 42.7		40.2	42.5	41.4	40.6	42.9	N.G.
	18.2		16		17	28	31	
N.G.	39.6	38.0	38.0	40.6	38.8	38.0	39.2	N.G.
	20.7	18.4	17		17	30.4	31.6	
N.G.	39.5	48.6	38.4	on fill	37.8	36.8	36.2	37.4 N.G.
	19.8	19	17	40.2	17	18.6	30.4	31.4
N.G.	42.1	40.6	40.6	T.S.	39.8	38.1	39.4	N.G.
	20	19	17	41.8	17	30	31	
N.G.	43.0	41.5	41.6	T.S.	40.3	39.1	41.0	N.G.
	21.2	20.4	17	42.5	17	26	27	
N.G.	43.0	41.2	41.5	T.S.	40.3	37.4	40.0	N.G.
	22	21	17	42.8	17	29.6	25.6	
N.G.	41.9	39.4	39.6		39.6	38.2	40.0	N.G.
	21.9	20	17	41.0	17	27.4	28.9	
N.G.	39.6	38.0	38.1		38.3	37.2	39.2	N.G.
	21	20	17	39.9	17	29.4	31	
N.G.	38.3	36.7	36.9		37.0	36.7	38.2	N.G.
	22	20.4	17	39.2	17	29	30.4	
N.G.	36.6	36.5	36.7	T.S.	36.3	36.5	37.5	N.G.
	21	20.2	17	38.7	19	26.8	28	

		Area	C.Y.
2067+75	S. Bor. on R. Haul N.	20.84	25.7
2068		39.70	96.2
+69		40.63	41.6
2069		31.90	109.6
+75	N. End of S. Pit.	47.01	40.0
2070		39.32	63.5
2070+50		29.28	41.6
2071		15.69	11.9
+25		10.12	8.2
+50		7.75	8.9
2072		1.88	1.8
+53		0.0	

cut not out deduct 5.68 from Area

Deductions for borrow areas & cut quantities not taken out.

2068+25 Surfacing begins
Hauled north to 2079.
Als hauls south to 2079

2086 Surfacing ends.

Bor. x.

End of Bor. on R.

		Area	C.Y.	
2083+30		0.0	6.8	Cut not cut by area of 22110 s.f
+70		9.11	20.6	
2084		28.09	32.8	Cut not cut by area of 23.80
+35		22.62	66.9	Cut not cut by area of 21.00
2085		32.96	140.5	Deduct 8.00
2086		42.92	27.6	Deduct 3.4
+20	Ex B. Ends S. B. Beg	31.50	105.6	Deduct 5.2
2087		39.78 / 32.78	123.9	
2088		39.15	105.7	
+95		20.94	8.1	
2089		7.20	23.3	
2090		5.40	10.0	
2091		0.0	666.8	

		Area	C.Y.
2094	S. Bor Beg.	4.42	39.6
2095		16.95	67.9
2096	Plan 37	19.71	75.1
2097		20.86	180.6
+40	End of S. Bor.		28.6
+50		10.10	42.4
2098		35.68	110.8
2099		24.16	136.6
2100		48.58	234.9
2101		78.28	252.2

These elevations are all 10 ft. apart.

End of Borrow & cut ditches

N.G.	22.7 / 19.9	20.6 / 18.6	20.9 / 19	22.7	20.2 / 17	20.2 / 18	20.2 / 19.8	20.° / 37.6	22.1 / 35.6	N.G.		
N.G.	29.0 / 21	21.0 / 18.4	21.2 / 19	23.0	21.0 / 19	20.9 / 18	20.4 / 21.6	20.2 / 35.2	23.4 / 35.6	N.G.		
N.G.	29.5 / 22.2	21.3 / 18.6	21.5 / 19	23.1	21.2 / 19	20.6 / 18	20.6 / 21.6	20.7 / 39.2	28.7 / 36.4	N.G.		
N.G.	29.4 / 22	23.0 / 19.6	22.0 / 18	22.1 / 19	24.1	21.6 / 19	21.3 / 18	21.3 / 20.8	21.0 / 33.6	23.7 / 36.2	N.G.	
N.G.		26.0 / 20.2	24.6 / 18	24.9 / 19	25.9	23.6 / 19	23.3 / 18	23.0 / 20	22.2 / 28.°	22.4 / 33.4	25.4 / 35.8	N.G.
N.G.	26.2 / 19.6	25.4 / 19	25.2 / 18	25.4 / 19		24.2 / 19	23.4 / 18	23.3 / 19.8	22.8 / 26	22.7 / 31	25.1 / 35.2	N.G.
N.G.	26.8 / 19.2		25.6 / 18.6	25.6 / 17	27.1	25.9 / 17		25.° / 20.6	24.6 / 30.8	26.8 / 33.2	N.G.	
N.G.	38.2 / 19.2	37.1 / 18.6	36.8 / 17		38.2	36.1 / 17	36.7 / 18	36.5 / 20	26.0 / 24.9	36.0 / 32.3	38.1 / 33.2	N.G.
N.G.	38.7 / 18.2	38.9 / 17.8	38.7 / 17		40.0	38.5 / 17	38.0 / 22	38.9 / 32	39.8 / 33	N.G.		
N.G.	39.7 / 18.2	38.9 / 17.8	38.7 / 17		40.1	38.7 / 17	38.5 / 21.8	39.9 / 22	N.G.			
		42.0 / 18.6	40.8 / 17		42.5	40.9 / 17	40.9 / 20.4	41.0 / 21.9	N.G.			

3 Borrow Ends R+L

Flat end of B. on L.

Borrow Beg R. + L.

N.G.	48.1 / 22	47.1 / 21	47.4 / 17	48.8	T.P. only on R.					
N.G.	46.9 / 20.8	45.7 / 20	45.6 / 17	47.5	45.9 / 17	46.3 / 26.7	47.3 / 27.4	N.G.		
N.G.	43.6 / 21.2	43.0 / 20.6	43.0 / 17	44.6	42.6 / 17	42.1 / 23	42.1 / 30	43.4 / 31	N.G.	
B. Ends on L	No Bor on L			41.8	40.1 / 17	40.1 / 26.°	40.5 / 31	41.6 / 31.6	N.G.	
T.P. at 15.6	Private Road on R — 1.5 C.Y.									
T.P. out 16.5 on L				41.2	40.0 / 17	40.° / 25.9	41.2 / 26.0	N.G.		
T.P. 16 on L				40.7	38.5 / 17	37.9 / 21	37.9 / 27.4	41.1 / 29.8	N.G.	
T.P. 17° L. OK				39.8	38.1 / 17	37.° / 29	37.0 / 29.4	38.1 / 30.8	N.G.	
T.P. 16.4 on L				38.2	36.7 / 17	37.8 / 24.8	34.8 / 31.4	37.6 / 33.2	N.G.	
T.P. out.				36.4	37.6 / 17	33.2 / 26	33.7 / 32.4	36.° / 34	N.G.	

2101 to 2102 top of hill cut off

	Area	C.Y.
2102	57.92	154.6
2103	25.56	104.0
2109	30.57	48.1
+85	0.0	

2104+90 Surfacing begins to north - Haul from South

2108+70 Surfacing ends.

	Area	C.Y.
2115	0.0	38.8
+50	41.84	77.3
2116	41.65	68.5
2116+50	32.32	6.0
+60	0.0	190.6

2118+10 Surfacing Begins

21257.70 " " Ends

	Area	C.Y.
2118+47	0.0	16.5
2118+50	26.98	23.9
+75	24.74	24.4
2119	37.97	25.6
+20	31.24	2.9
+25	0.0	93.3

N.G.	35.7 / 19.9	34.2 / 18.9	34.2 / 17	35.5	1133.8 / 19	32.6 / 25.4	32.4 / 32.4	35.0° / 34.8 N.G.
No. Borrow on L.				33.8	32.0° / 17	31.0 / 29.6	31.0 / 31	31.4 / 33.6 32.6 / 35 N.G.
N.G.	31.9 / 21.0	31.2 / 20.6	31.2 / 17	33.2	31.6 / 17	31.0 / 27.0	30.0 / 30.6	32.2 / 38.6 N.G.

Borrow ends R + L

Borrow on R. Begins

Adjust out on L

70.0	38.4 / 17	38.1 / 25	37.6 / 30	38.0 / 36.8	40.1 / 39.9 N.G.
73.6	42.0 / 17	41.1 / 30	41.0 / 36.0	41.4 / 41.2	43.1 / 41.8 N.G.
76.3	45.0 / 17	44.1 / 27	44.0 / 35	46.1 / 35	N.G.

End of Borrow

S. Bor Beg. on R.

1157.7	51.0 / 15	52.0 / 17.4	52.3 / 20.0	51.8 / 27.8	54.1 / 29.2 N.G.
1152.8	51.2 / 19	52.4 / 15.7	52.5 / 18	52.9 / 27.6	54.7 / 28.8 N.G.
52.6	50.9 / 19	52.3 / 16	52.4 / 17.6	52.8 / 23.6	53.0 / 28.6 54.4 / 29.7 N.G.
52.1	50.3 / 13.	51.5 / 15.6	51.7 / 18.2	52.2 / 20.4	52.5 / 28.3 53.9 / 31 N.G.

Bor on R. ends

	Arc	C.Y.
2123+50	0.0	19.1
2124	23.95	54.4
+70	18.06	17.8
2125	14.10	5.2
+20	0.0	96.5

	Arca	C.Y.
2130+60	4.76	8.3
2131	6.48	24.7
2132	6.76	18.6
+50	13.34	30.5
2133	19.62	14.2
+30	6.04	14.8
2134	5.40	0.5
+05	0.0	111.6

See B. 2 P. 142 Bar

Surf. B. on R. Beg

N.G 45.3 / 16.8 | 46.3 / 17.6 | 47.9 / 18 | 47.9 / 23.4 | 45.1 / 29.4 | 46.4 30
46.0
48.0 / 16.8 | 49.0 / 18.2 | 49.5 / 19.6 | 48.9 / 27.8 | 48.8 / 28.4 | 50.1 N.G
48.9
48.9 / 17 | 50.0 / 18 | 48.6 / 18.8 | 49.2 / 22 | 49.7 / 26.8 | 50.7 N.G 28
50.0

Surf. B. on R. Ends

N.G 54.5 / 22.2 | 53.6 / 21.8 | 53.8 / 17 | N. Bar on R. Ext. S Bar Beg on L
N.G 55.3 / 22.8 | 54.1 / 22 | 51.3 / 17 | 55.7
N.G 55.3 / 22.6 | 53.0 / 21 | 54.0 / 17 | 55.4 | No Bar on R.
Bar Beg on R.
N.G 55.0 / 22.4 | 53.0 / 21.4 | 54.0 / 17 | 55.9 | 54.1 / 17 | 53.8 / 23 | 55.0 / 29.4 N.G
N.G 55.7 / 22.4 | 54.3 / 21.6 | 54.6 / 17 | 56.2 | 54.4 / 17.4 | 54.1 / 25 | 55.7 / 29.4 N.G
N.G 56.0 / 21.4 | 54.4 / 20.0 | 54.8 / 17 | 56.4 Bar on R. joins Lendable Bar
N.G 56.2 / 21 | 55.0 / 20.8 | 55.0 / 17 | 57.7

Bar ends on L

See former Bar

Oct 29, 1916

Check levels
Afternoon
taken out

	Area	
2352+75	0.0	4.0
2353	8.72	38.0
2354	11.81	44.4
2355	12.15	22.6
+50	12.25	24.9
2356	14.66	13.7
+54	0.0	
		148.6

Subd 22
Less Dd

20.0 / 14.8	+0.3 / 14°	+1.0 / 10°	0,0	+0.6 / 10°	D+1.2 / 14	D+1.2 / 15.2
D+0.8 / 14.8	+0.6 / 14°	+0.1 / 10°	+0,2	+0.6 / 10°	D+1.4 / 14	D+1.4 / 15.4
D+1.2 / 15.2	+0.7 / 14°	+0.1 / 10°	0,0	0.0 / 10°	+0.5 / 14°	D+0.5 / 14.6
D+0.4 / 14.4	+0.4 / 14°	−0.1 / 10°	0,0	−0.4 / 10°	+0.2 / 14°	+0.2 / 14.2

N.G. 52.2 / 18	51.4 / 17	53.2 / 11	54.8	53.6 / 12.5	52.0 / 18.2	53.6 N.G. / 20.4
N.G. 51.3 / 18	49.3 / 17°	51.8 N.G. / 11	53.	N.G. 52.0 / 13.4	51.0 / 18.6	52.3 N.G. / 20.5
N.G. 50.5 / 21°	49.0 / 19.4	50.8 N.G. / 12	52.3	N.G. 51.3 / 15.6	49.9 / 21.8	51.4 N.G. / 22.8
49.4 / 21.8	48.4 / 21	50.2 N.G. / 13.8	52.4	N.G. 51.5 / 12.4	49.3 / 22.4	50.8 N.G. / 23.4
N.G. 51.0 / 22	49.7 / 20.9	51.4 N.G. / 13	52.9	N.G. 51.4 / 12.8	50.5 / 21.8	52.4 N.G. / 24.4

Bm Ends R & L

Oct. 30, 1916

		Area	
2379+80		0.0	5.1
2380		13.81	58.4
2381		17.71	75.0
2382		22.80	70.4
+65		35.72	53.8
2383		47.48	110.8
2384	18.58-6.25	12.33	61.1
2385	2.89-1.11	20.73	36.3
+50	2.27-2.26	18.51	25.7
2385	9.69-0.29	9.45	50.0
+70		29.10	36.9
2387		37.27	65.3
+50		33.32	12.3
+70		0.0	13.8
2388		24.98	60.1
+50		39.94	67.7
2389		33.18	41.3
+50		11.48	6.4
+80		0.0	
		850.4	
		577	

Side S. to swamp not dug as ordered

Borrow ditches R. + L. Begin

NG 39.3 20.6	37.6 19		39.5 10	40.7	39.9 10	39.3 NG 11.4	38.4 19.6	39.4 N.G. 21			
NG 41.7 23.4	39.5 19.8	NG 41.1 11.4	41.7 10°	42.5	41.6 10	41.1 NG 11.6	39.9 18.8	41.0 N.G 21°			
NG 44.7 21.6	42.1 19.6	44.1 11.8	44.7 10°	45.3	44.5 10°	44.1 NG 11.9	42.1 19.6	44.1 N.G 21°			
NG 44.7 20.8	42.9 19.6	44.1 12	44.9 10	46.4	45.4 10	44.6 13.4	42.9 21.6	46.1 N.G 23°			
NG 45.7 22	43.1 19.8	43.3 16.4	44.8 12	45.6 10	46.6	46.1 10	45.9 13	43.0 18	42.3 20.8	46.3 N.G 22.4	
NG 44.1 19.4	43.1 18.8	43.1 15.2	43.9 13	45.1 10	45.9	45.4 10	44.8 13	43.5 17.2	43.9 19.9	45.8 N.G 21.4	
NG 45.2 21	43.6 20.4	43.4 15.8	45.5 11	45.6 10	46.9	45.9 10°	45.6 12	44.0 18.2	44.0 22	45.6 N.G 24	
NG 45.1 21	43.7 20.2	44.1 15.2	45.5 12	46.3 10	47.4	46.5 10	46.2 12.6	44.6 19.4	44.6 21.8	46.6 N.G 23.6	
Borrow Ditch ends on L.				46.7 10	47.8	47.0 10	46.4 12	45.0 18.4	44.2 23.2	46.1 NG 24.2	
Borrow Begins on L.			S.T. 47.7 92		48.7	47.6 10	46.6 12	46.2 16	45.5 25°	48.5 N.G 28.4	
47.8 19.8	46.0 18.6	46.2 15.4	46.5 14	47.7 10.6	48.8	48° 10	47.1 13	46.7 16.8	46.0 25.8	49.3 NG 29°	
48.8 20.8	46.8 18.6	46.8 16	47.0 14	48.2 10	49.2	48.6 10	47.9 14	47.8 19	47.5 23.8	50.9 N.G 27	

No borrow on R

Borrow ends on L — Ditches left in for road Xing

No Bor. on L			48.8 10	49.7	48.7 10	48.1 14	47.9 16.2	47.5 20	47.5 26.2	50.0 NG 28.4	
N. " " L.			49.3 10	50.0	49.0 10	48.2 14	46.6 19.2	47.3 33.2	48.9 NG 34.4		
No " " "			49.4 10	50.7	49.3 10	48.6 NG 14	48.0 16	48.0 30.4	48.5 34.6	49.9 NG 35.6	
No " " "			51.5 10	52.4	51.3 10	50.5 14	50.5 16	50.1 25.2	51.7 26	N.G	

No Borrow - Joins C.D. Tch on R.

	Area	C.Y.
2394		
2395		
+30.	0.0	1.20
+50	3.31	15.8
2396	13.89	10.2
+40	0.0	27.2
+45	Area	C.Y.
+70	0.0	2.7
2397	4.90	12.1
+50	8.20	8.2
+80	6.52	4.2
2398	4.80	11.2
+50	2.34	2.7
+70	0.0	41.1

This yardage not allowed as cut locks above same amount of being cut.

	Area	C.Y.
2402	0.0	23.8
2403	12.96	89.1
2404	4.14	7.6
+50	0.0	70.5

1140.0
71.4

Bor	Beg	on	L			Borrow	Beg	on	R	
N.G	29.9	23.9	23.2		73.3	11 71.2	71.0	72.0	N.G	
	23.6	22.4	19.5			19.5	22.6	23°		
					74.9	72.9	72.2	73.5	N.G	
						19.5	22.6	28.8		

Borrow Ends R. + L

Road Xing - Old Gov. Trail

	Borrow	Beg	on	R.	
76.7	74.7 / 19	79.2 / 15	78.3 / 20	25.0 / 22	N.G
77.5	75.4 / 14	84.7 / 16	84.3 / 19.6	86.2 / 21.4	N.G
	95.8 / 14	85.3 / 16.2	74.8 / 18.6	87.5 / 21°	N.G
78.0	76.3 / 14	95.8 / 15.6	95.2 / 19.4	22.2 / 21.6	N.G
78.7	76.5 / 19	76.3 / 17.6	75.3 / 19.4	22.6 / 21.4	N.G

Borrow Ends - on R.

Borrow	Beg	on	L.				1180.0
N.G	72.1	75.5	76.0	79.4	N.G		
	26.6	25.4	20	12.6			79.0
N.G	79.4		77.2	77.1			
	21.2		19.4	17			78.8
Borrow ends on L.							80.0

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	Area	C.Y.
2418 +80	0.0	4.7
2419	12.72	84.4
2420	32.89	121.4
2421	32.67	15.0
2421 +25	0.0	1.1
+50	2.39	14.2
2422	13.00	12.0
+40	0.0	252.8
	Area	C.Y.
2427	0.0	15.4
+50	16.66	32.4
2428	23.72	44.0
+50	23.82	50.0
2429	24.66	57.0
+56	24.54	40.7
2430	25.38	51.3
+50	29.02	30.1
+81	23.40	13.6
2431	15.26	16.0
+50	2,09	1.9
2432	0.0	351.4

Culvert Elevations

2432+70 Upper End 1148.0

Lower 1147.1

Borrow Beg. R. + L

	N.G. 70.4 / 21.8	70.0 / 20.8	70.3 / 14.6	1172.1	70.6 / 14	69.9 / 20.2	1171.0 N.G. / 22.6	
N.G.	69.9 / 21.2	68.0 / 18.8	68.9 / 15.2	69.1 / 14	70.6	69.8 / 14	69.0 / 16.4	68.2 / 20.4	70.9 / 23.0	N.G.
	N.G. 64.9 / 23		63.8 / 21.8	64.8 / 14	67.2		64.9 / 14.6	63.0 / 25.0	65.9 / 31	N.G.

No Bor on L

Borrow ends on R

N.G.	62.4 / 26.4	61.8 / 25.2	62.5 N.G. / 18.6	
	63.4 / 26.6	62.0 / 25.6	63.4 / 13.2	65.0

Borrow ends on L

1159.1	Borrow Beg. on R.				
53.2	1151.2 / 14	51.2 / 16.4	51.2 / 22.6	53.4 N.G. / 25	
52.2	50.3 / 14	50.1 / 15.4	50.0 / 25.8	52.5 / 29.6	N.G.
52.1	50.1 / 14	50.1 / 15	49.8 / 26.5	52.3 / 30.2	N.G.
51.1	49.5 / 14	49.3 / 16.4	49.0 / 21.4	51.8 / 25.4	N.G.
51.5	49.7 / 14	49.1 / 17.4	48.8 / 19	52.7 / 23.8	N.G.
51.7	49.5 / 14	48.8 / 18.2	53.5 / 23.4		N.G.
51.7	50.0 / 14	49.1 / 18.2	53.2 / 24.4		N.G.
—	49.8 / 14	49.0 / 16.2	52.8 / 23.0		N.G.
51.4	49.1 / 14	48.7 / 17.6	51.7 / 21.6		
51.0	48.3 / 14	48.3 / 15	48.3 / 15.8	50.4 / 17.2	N.G.
51.4	49.0 / 14	51.7 / 16.8	N.G.	End of Borr...	

P.M. - Oct. 31, 1916

2477 c.m.c. { Elev. Up End 1147.52 ; Lower " 1147.12

	Area	C.Y.
2477		
2477+25	0.0	3.5
+60	4.20	8.4
2478	7.22	2.0
+15	0.0	
+50	0.0	3.3
+75	7,15	16.0
2479	27.31	24.4
+25	25,55	15,3
+50	7,50	2.1
+65	0.0	
		77.0

	Area	C.Y.
2488+10	0.0	11.7
+50	15.84	11.7
+90	0.0	
		23.4

Culvert

2515 Elev. U End 1153.21

" L " 1152.76

2477 ℄ 1150.7

Bor Beg on L

N.G 49.2 / 23 ; 48.° / 22.° ; 48.8 / 19 ; 1151.9

N.G 1151.0 / 19.8 ; 49.2 / 18.4 ; 49.3 / 16 ; 49.6 / 14 ; 51.3

Borrow ends on L

Borrow begins on L

N.G 51.1 / 21 ; 49.3 / 19 ; 49.3 / 16 ; 49.6 / 14

N.G 50.7 / 26.0 ; 48.5 / 24.2 ; 49.0 / 15.2 ; 49.3 / 14 ; 51.2

N.G 49.6 / 28.2 ; 47.6 / 27.° ; 48.9 / 19 ; 51.8

47.9 / 26.4 ; 47.2 / 26.° ; 48.8 N.G / 15.0

Borrow begins on R.

49.5 / 19 ; 49.3 / 15.2 ; 49.3 / 17 ; 51.3 / 19 N.G

49.3 / 19.6 ; 49.2 / 19.2 ; 50.7 / 21.° N.G

49.5 / 19.2 ; 49.2 / 18.2 ; 50.4 / 19.2 N.G

Borrow ends R + L

Borrow begins on R.

1153.8 72.7 / 17 ; 72.4 / 17.8 ; 72.9 / 18.6 ; 76.° / 23.7 N.G

Borrow ends on R

Oct. 31, 1916

Molyneaux
Kline
Crossman.

Station	Area	C.Y.
2517+90	0.0	
		20.7
2518	111.70	
		176.6
+25	269.88	
		243.0
2519 +50	254.98	
		422.7
2519	202.55	
		289.0
+50	109.42	
		95.8
+75	97.58	
		86.7
2520	89.74	
		164.4
+50	87.84	
		151.0
2521	75.25	
~~2521~~		55.8
+40	0.0	1705.7

The surface of this pit was used for surfacing.

Surfacing 305. C. Yds.

Surfacing hauls S. to 2572
" " W. to end of Mile 45

B.M. on Birch Tree 1161.59
4.67
H.I. 1156.26

Rod Readings only

See B 20/65

Borrow Begins

5.6
7.1/14 8.5/22 7.3/26° 5.8/40 5.0/60 4.9/78.4 N.G 0.9/82°
60.7 59.2 57.8 59.0 60.5 61.3 61.9 65.4

7.2/14 8.1/21.4 6.6/26.8 6.4/30 7.0/40° 6.0/60° 4.2/78.8 N.G 0.3/82.8
59.1 58.2 59.7 59.9 59.3 60.3 62.3 66.0

6.8/14° 7.5/17.2 7.0/30° 6.8/40 6.0/60° 5.0/78.9 1.0/82.6 N.G
59.5 58.8 59.3 59.5 60.3 61.3 65.3

4.9
6.0/14 6.6/16.6 7.6/23.4 6.6/30 6.8/40 6.4/60 5.4/79.4 N.G 2.4/83
60.3 59.7 58.7 59.7 59.5 59.9 60.9 63.9

6.4/14 6.7/16.2 7.4/25.8 6.6/30 6.2/40 6.6/60 5.6/77.8 N.G 3.1/81
59.9 59.6 58.9 59.7 60.1 59.7 60.7 63.2

E+W Div. line Bet S.B+Ex B.
6.7/14 7.1/16.2 8.0/30.0 6.2/38° 6.2/40 5.0/60° 4.5/78.6 N.G 2.1/81.2
59.6 59.2 58.3 60.1 60.1 61.3 61.8 64.2

Surfacing

5.3
7.6/13.8 8.0/22 8.0/23.2 8.0/30 6.4/40 4.1/60 2.7/80.2 N.G 1.3/82.2
61.0 58.7 58.3 58.3 58.3 59.9 62.2 63.6 65.0

7.4/14 7.8/22 7.8/31.6 5.8/39 5.8/40 3.3/60 2.4/81.4 N.G. 0.8/83
58.9 58.5 58.5 60.5 60.5 63.0 63.9 65.5

5.2
6.9/14 7.5/22 7.7/29.4 8.6/28 8.0/30 6.7/35 6.4/40 4.3/60 3.1/81.2 2.0/82
61.1 59.4 58.8 58.6 57.7 58.3 59.6 59.9 62.0 63.2 64.3

Borrow Ends

S.D. {5.9 1st / 2.1 bot} 1.2' deep

Oct. 31

Check levelles over G.L

2499		
2500	⊗	1170
2501		71.7
+70		72.83
2502	+	73.33
+10	+	73.50
2503	↓	1175.0
2504		76.7
2505		78.32
+72		79.53
2506	⊗	1180.0
+10	+	80.1
+50	+	80.3
2507		80.6
+70		80.9

Culvert Elevation

2465 West End 1146.93

East " 1146.93

72.2
73.7
84.6
74.1
74.5
85.6
78.4
79.6
79.8

84.0
80.4
80.9

Nov. 1st 1916

1+34.3 Jenkins Road = 1681+84.6 Tangent produced from West

No borrow

No borrow

1679

+25 Main Road T+C to Br

~~+629~~+50

+75

1680

+25

+50

+75

1681

+25

+25

Jenkins Run off

0+00

+25

+50

+75

1

+25

+50

+75

2

+25

+50

End of Small hand ditch on L

End of ditch

Runs out

Tangent produced

1680

+25

+50

+75

1681

+25

+50

+75

Culvert at Bridge

Upper End = Elev 1088.71

Lower " " 1088.04

Culvert 67' long 15'

15' of old culvert 12" in upper end

Rip Rap

P.R. Bridge

South end

West side 25 long 4' high

East " 25 " 4' "

North end

East side 25 " 4"

West " 30 " 4"

	1090.3 / 14	91.0 / 17.8		98.2 N.G / 21.6		
91.3	88.8 / 16.4	90.4 / 17.4	92.8 / 21.8	99.4 N.G / 23.4		
88.6	88.6 / 11	89.2 / 14	93.0 / 19.8	1100.0 N.G / 21.6		
88.6	88.7 / 8.4	90.5 / 11.8	93.4 / 16.8	1100.0 N.G / 17.4		
89.0	89.9 / 4	94.0 / 10.6	96.8 / 12	99.5 N.G / 15		
89.4 / 5	90. / 20	92.4 / 24	92.5 / 9	94.6 / 11.0	1100.0 N.G / 12.0	
90.6	91.8 / 3.0	93.0 / 8.6	94.0 / 11	96.0 / 11.4	99.2 N.G / 15.8	
91.2 / 3	91.8	93.2 / 8.4	89.6 / 14.2	96.8 / 18	99.6 N.G / 22	
	94.5					

Nov. 2, 1916

	Area	C.Y.
1837+75	0.0	2.4
1838	20.28	32.1
+50	14.34	21.3
1839	8.65	28.4
+50	16.66	24.8
1840	10.30	20.4
+50	11.70	18.0
1841	7.77	28.5
+50	24.12	36.4
1842	15.18	25.0
+50	11.78	1.3
+76	0.00	

Culvert

1841+60 { Elev. of Upper (E) End 1110.66
" " Lower " 1110.07

15" x 24'

71

S. Bor. Beg. on A

1116.3	N.G 14.3 / 15.4	12.6 / 19.6	12.6 / 30.2	11.1 / 30.6	9.0 N.G
16.8	N.G 14.5 / 16.0	13.1 / 22.2	13.2 / 29.2	14.2 / 29.4	N.G
16.3	N.G 14.3 / 15.4	13.5 / 16.0	13.6 / 28.5	14.1 / 29.6	N.G
16.9	N.G 13.6 / 17.8	12.3 / 16.2	12.5 / 28.4	13.7 / 29.4	N.G
15.8	N.G 13.2 / 14.1	12.6 / 17.2	12.6 / 25.4	13.6 / 26.8	N.G
15.3	N.G 13.2 / 13.4	11.2 / 17.7	11.9 / 22.3	12.1 / 24.6	N.G.
15.1	N. 12.4 / 19.8	11.3 / 20.6	13.0 / 25.4		N.G
14.6	N.G 12.6 / 11.8	11.4 / 13.4	11.3 / 27.0	13.3 / 28.4	N.G
14.6		11.3 / 14.2	11.3 / 27.4	12.6 / 28.4	N.G
15.6		13.4 / 12.4	12.8 / 20.4	14.0 / 27.6	N.G

Borrow ends

E End of S.B
Beg of E.B.

		Areas	Cu. Yds	
~~1844+80~~				
1849+80		0.0	1.6	
1848+50		4.28	16.4	
1846+80		16.49	30.6	
1846	Surfacing Ends	17.60	36.8	
1847+50	Surfacing Ends	22.17	41.8	
1847+50		22.94	32.5	← S.B. End
+60		12.14	4.5	
+70		0.00	~~164.2~~	
1848		2.38	1.3	
+50		2.90	4.9	
1849		5.95	8.2	
+30		6.49	6.9	
+60		3.14	5.3	
1850		1.94	3.8	
+50		0.0	1.8	
			32.2	

Sor. Bor. Beg on L

						S. Bor Beg. on R				
N.G	24.9 / 20	23.9 / 19.5	23.1 / 16	23.2 / 19	1129.5					
N.G	24.5 / 25	23.2 / 23.7	23.5 / 17.7	24.5 / 16	25.5	24.0 / 11.8	23.2 / 13.5	23.2 / 21	24.0 / 21.4	N.G
N.G	25.5 / 24.6	24.2 / 23	24.8 / 15		26.8	24.6 / 24.8	24.0 / 20	24.4 / 24.4	25.1 / 24.6	N.G
N.G	27.0 / 26	25.2 / 23	26.5 / 19		27.8	25.8 / 19	25.6 / 25	26.6 / 25.6		N.G
N.G	27.7 / 24.6	26.4 / 22.6	27.2 / 19.6		28.3	27.1 / 19.4	27.2 / 24.4	28.4 / 25.2		N.G
N.G	27.6 / 23.4	26.8 / 22	27.6 / 19		29.1	28.1 / 19	27.8 / 21.2	29.2 / 23.2		
			~~24.4~~			Surfacing Borrow Ends R+L				
N.G	28.5 / 19	27.7 / 18	28.4 / 19.4		29.8					
N.G	29.9 / 19.2	28.9 / 19	29.0 / 19		30.4					
N.G	31.1 / 22	30.5 / 20.6	29.6 / 19.2	29.9 / 16	30.2 / 19	31.1				
N.G	31.3 / 22.3	30.0 / 19.7	30.0 / 16	30.3 / 19	31.6					
	30.4 / 20.2	29.6 / 19	30.2 / 15.2	30.4 / 19						
N.G	30.2 / 20.1	29.5 / 19.8		30.3 / 19.6	32.1					
		N.G	32.2	<						
Bor Ends			28.8	on	33.0					

Nov. 2, 1916

	Area	Cu. Yds.
1857+50	0.0	7.6
1858	5.03	33.3
1859	12.98	46.4
1860	12.08	20.3
+50	9.86	9.1
1861	0.00	13.7

1860 Surfacing begins
1871 " Ends

	Area	C.Y.
1862+90	0.0	1.1
1863	5.90	18.2
+50	13.72	22.2
1864	12.22	33.3
+75	11.78	6.9
1865	3.08	21.3
1866	8.51	15.2
+50	7.95	5.9
+90	0.0	124.1

Privat Road M. R. & L. 1864+05 = 0.0

	Elev.
0+00	1129.5
+10 S	28.7
+15 T.P.	27.2
+49	26.9
+50	27.7

Surfacing Begins on R.

1139.6	37.6 / 20.6	38.0 / 27.2	38.5 / 27.9	N.G.
1139.1	37.9 / 20.6	37.4 / 21.4	38.5 / 32.2	N.G.
1136.4	33.7 / 20.6	33.5 / 29.2	34.9 / 31	N.G.
35.3	32.5 / 19	33.9 / 15.4	33.0 / 23.6	34.9 / 24.8

S.B. Ends on R.

S. Barren Begins

29.8	27.7 / 14.8	27.2 / 35?	27.8 / 35.6		N.G.
29.7	27.5 / 14	27.4 / 15.6	27.2 / 35.8	28.5 / 36.2	N.G.
28.5	26.2 / 15.2	26.7 / 35.2	27.9 / 36.9		N.G.
28.8	26.8 / 14	26.7 / 30.6	27.8 / 37.2		N.G.
29.1	26.7 / 14	26.2 / 28.9	27.1 / 29.2		N.G.
31.3	27.9 / 13	27.7 / 16.9	27.3 / 18?	27.0 / 26.5	28.0 N.G. 27.4
33.5	29.7 / 14.2	29.7 N.G. / 17.6	29.3 / 18	28.7 / 26.8	30.0 N.G. 29.9

S.B. End of Barren on R

	Area	C.Y.	
1868+50	0.0	12.0	
1869	12.97	15.8	
+50	4.08	9.4	
1870	6.10	21.8	
+50	17.42	28.5	87.5
71	13.34	24.0	
+50	12.58	21.3	
72	10.46	51.8	97.1
73	17.50	43.7	
74	6.10	14.6	
75	1.78	7.9	
76	2.44	4.3	
+45	2.78	29.3	
1877	16.02	32.1	
+50	18.60	41.0	
1878	25.66	78.0	
+75	29.05	28.4	
1879	32.44	59.0	
+50	31.24	60.8	
1880	34.38		
Culv 15'x26'		62.7	Elev Z end 1127.94
~6' of old pipe			1127.66
1880+50	32.36	60.6	522.4
1881	33.04	48.8	
+50	19.68	36.8	
1882	20.08	29.8	115.4
+80	0.0	822.4	

Ex. Borrow Beg on R.

1140.5	37.9 / 14	37.2 / 16.2	37.6 / 18.5	1140.0 / 21	N.G
40.5	38.2 / 14	37.9 / 22.4		38.5 / 23.4	N.G
40.9	N.G 38.3 / 14	37.8 / 15°		37.8 / 25.2	38.4 / 26 N.G
41.3	40.4 N.G / 14	38.5 / 17		38.5 / 24.6	40.6 / 26.4 N.G
End of Ex B N.G 40.5 / 18.2	39.6 / 17				
Beg of S.B.	40.2 / 17	39.8 / 26		41.3 / 26.4	N.G
N.G 40.9 / 20.6	39.5 / 19.6	39.5 / 17	41.4	40.1 / 17	39.8 / 26.9	40.9 / 26.8	N.G
N.G 40.8 / 21.8	39.8 / 19		41.5	40.0 / 17	39.8 / 25.6	40.8 / 26.5	N.G
N.G 42.2 / 21.8	40.2 / 19		42.4	40.7 / 17	40.5 / 26°	41.9 / 26.9	N.G
Borrow ends on L			1142.8	40.9 / 17	40.9 / 21.8	42.0 / 22.2	
No " on L			43.0	41.3 / 17	41.5 / 18.4	42.2 / 19.2	N.G
No Bor on L 18			41.8	40.4 / 17	40.7 / 18.6	41.5 / 19.4	N.G
Borrow Beg on L			40.8	39.3 / 17	39.5 / 18.6	40.5 / 19.2	N.G
N.G 37.9 / 21.4	38.7 / 20.6	37.0 / 17	38.6	37.4 / 17	37.0 / 23.6	38.6 / 25°	N.G
N.G 35.1 / 21.7	37.0 / 21	34.1 / 17	35.7	33.8 / 17	33.3 / 21	33.5 / 26	35° / 25.8	N.G
N.G 33.6 / 23	31.2 / 22.2	31.3 / 17	33.6	31.5 / 17	31.3 / 26	32.9 / 28	N.G
N.G 30.4 / 22.8	29.3 / 21.8	29.7 / 17	32.0	29.5 / 17	29.6 / 20.6	28.9 / 27.4	28.8 / 30	30.8 / 31.4	NG
			31.6	29.6 / 17	29.1 / 19.6	28.0 / 22.2	28.2 / 29.6	30.7 / 32.9	N.G
Borrow ends on L				N.G 29.8 / 18.4	28.9 / 20.8	28.0 / 29.6	31.0 / 32.6	N.G
No Bor on L			31.6					
No " on L			31.7	N.G 29.9 / 17	27.0 / 19.9	27.2 / 28.9	30.5 / 31.9	N.G
			32.2	N.G 29.8 / 17	28.6 / 18.9	27.7 / 29.9	31.4 / 32°	N.G
Turnpike Proj Beg on L			32.4	30.2 / 17	28.8 / 23.8	28.8 / 30°	31.8 / 33.4	N.G
N.G 34.2 / 20.2	32.6 / 19	32.8 / 17	32.8	31.8 / 17	31.0 / 31.9	32.7 / 33°	N.G
			36.9	36.2 / 17	34.2 / 21.9	34.6 / 30	36.0° / 30.9	N.G

Borrow Ends

	Exc. Area See B II p 50	Area Add'l	C. Y.
1882+7			
1883+10			
1887	00	0.0	7.1
1888	10.0	3.86	15.5
1889	10.0	4.52	21.9
1890	10.0	7.30	44.4
1891	10.0	16.66	52.7
1892	10.50	11.80	25.0
+50	19.25	15.25	23.1
1893	8.00 S.B. Ends	9.68	15.1
+50	8.00	6.58	12.1
1894	8.00	6.57	13.7
+50	8.10	8.25	12.1
1895	8.20	4.78	2.0
+12	18.98	4.32	1.4
+30	31.82	0.0	

1895+ Surfacing begins
1901+20 " Ends

Farme Xing on L 0.5 Cu. Y. of E
" " " R 1.5 Cu Y of "

Borrow Pit L

N.G. 45.1 / 22.2	43.9 / 21.6	43.9 / 18	1154	43.8 / 20	43.9 / 26	45.1 / 26.4	N.G.
N.G. 44.0 / 22.2	43.2 / 21.6	43.2 / 18	453	42.3 / 20	42.0 / 32.4	43.0 / 33	N.G.
N.G. 45.0 / 22	44.0 / 21.0	44.2 / 18	455	43.9 / 20	42.4 / 32.6	43.9 / 34	N.G.
N.G. 45.3 / 22	44.3 / 21	44.3 / 18	458	44.1 / 20	43.8 / 33.2	45.6 / 34.6	N.G.
N. Borrow on L		19	495	43.2 / 20	43.0 / 34.8	44.5 / 35.8	N.G.
" " " L			435	41.7 / 20	41.4 / 34.4	43.5 / 36.0	N.G.
" " " L			429	40.4 / 18	40.3 / 33.4	41.5 / 33.8	N.G.
			415	41.2 / 18	40.5 / 24.6	42.9 / 26.4	N.G.
			419	40.9 / 18	40.0 / 24.0	42.5 / 26.2	N.G.
			415	40.0 / 17	39.6 / 22	42.3 / 25.4	N.G.
			410	39.6 / 19	39.4 / 16	29.4 / 18.2	41.3 / 19 N.G.
			407	39.2 / 19	38.9 / 16.8	41.2 / 18.4	N.G.
				38.3 / 17	40.6 / 17	N.G.	Borrow Ends

	Prev. Borrow	Area	C.Y.
1901		0.0	12.2
+40		16.49	36.9
1902		16.79	84.3
1903	0.0	28.97	84.5
1904	9.00	16.68	50.6
1905	9.00	10.68	46.1
1906	9.00	14.23	19.2
+50	0.0	6.50	1.2
+60		0.0	
			335.0
1908+50		0.0	
1909		0.0	2.1
+50		2.30	7.4
1910		5.70	16.5
+50		12.10	107.6
1911		104.06	
1911 Culvert 15"x28'		Elev W. End	1127.6
		" E. End	1126.60
			177.5
1912+50		87.60	111.8
1912		33.18	30.7
+50		0.0	
			453.6

Out as to X Sec stakes No Bor.

N.G. 45.7 / 23.2	44.2 / 22.4	44.1 / 18.4	45.2 / 15.2	45.2 / 14	1196.1	44.6 / 14	44.6 / 15.6	44.9 / 22.8	45.9 / 23.4 N.G.
N.G. 45.9 / 24	44.4 / 23.2	44.1 / 20.6	44.9 / 17		46.4	44.5 / 17	44.2 / 29.6	45.4 / 25.2	N.G.
N.G.	45.5 / 23	43.8 / 21.4	44.1 / 17		46.9	44.7 / 17	44.2 / 25	44.7 / 38	45.9 / 30.4 N.G.
N.G.	44.4 / 21.6	43.2 / 20.2	43.4 / 17		45.6	43.6 / 17	43.6 / 32.0	45.0 / 33.0	N.G.
N.G.	44.8 / 22	44.0 / 21.4	44.1 / 17		46.1	44.5 / 17	43.8 / 32	45.2 / 32.6	N.G.
N.G.	45.8 / 22.8	44.4 / 22	44.8 / 17		47.0	45.2 / 17	44.9 / 28	46.4 / 28.8	N.G.
N.G.		46.3 / 17.4	45.0 / 17		47.0	45.2 / 17	45.4 / 21.2	46.4 / 21.6	N.G.
End of Borrow P+L					46.6	45.2 / 17	45.2 / 18	46.4 / 18.4	N.G.

Bor. beg on L

11.35.0 / 16.8	33.8 / 15.6	33.9 / 14		1136.1	Head in ditch To offset, Amt out back of D
N.G. 33.2 / 14	31.1 / 16	31.5 / 14			
N.G. 31.6 / 24	28.9 / 18	29.2 / 15	29.3 / 14	1131.6	
N.G. 32.2 / 22.6	28.0 / 14	28.0 / 16	28.4 / 14.6	30.7	
N.G. 36.4 / 40.0	27.5 / 31.0	27.7 / 14	27.8 / 17	27.9 / 14.6	30.7
					30.5
N.G. 35.6 / 40	28.0 / 31.4	28.7 / 19.8	29.8 / 17		30.5
N.G. 33.9 / 32.4	30.1 / 29.4	29.8 / 24	29.8 / 22	29.6 / 16.2	30.5 / 14	30.9

Bor ends on L

	Area	C.Y.
1918 +20	0.0	5.8
+40	15.71	6.1
+50	17.12	26.1
1919	11.13	43.9
1920	12.56	40.1
1921	9.11	45.0
1922	15.18	8.0
+90	0.0	175.0

Borrow Pit RHL

N.G.	48.8 / 23	47.2 / 20.2	47.3 / 15.8	47.7 / 14	49.6	47.0 / 17	47.0 / 15.8	48.8 / 19.8	N.G.
N.G.	48.9 / 23.4	47.1 / 21.°	47.3 / 17	48.2 / 14		47.9 / 17	47.1 / 17	47.1 / 19.°	48.7 / 20.8	N.G.
N.G.	48.9 / 23		47.4 / 21.6	48.6 / 18	49.3	47.6 / 17	47.6 / 19.6	49.0 / 21.°		N.G.
N.G.	49.6 / 22.4		48.0 / 20.6	48.2 / 18	50.1	48.3 / 17	48.3 / 20.6	49.7 / 21.8		N.G.
N.G.	50.0 / 22.6		48.8 / 21.4	49.9 / 19	50.6	48.8 / 17	48.7 / 20.2	50.6 / 21.2		N.G.
N.G.	50.4 / 22		49.0 / 21.8	48.8 / 18	50.6	49.0 / 17	48.8 / 21.4	50.4 / 22.2		N.G.

Borrow Ends RHL.

Nov. 3, 1916 — Molyneux, Wilson, Kline

	Area	Cu. Y.
1306+25	0.0	27.6
1307	17.70	67.3
1308	18.65	35.9
+50	20.16	29.8
1309	12.09	29.1
1310	3.65	0.6
+10	0.0	187.3
~~+50~~		

1298 Surfacing Begins
1304+50 " " Ends

Culvert at 1337+79
Elev E. end 1111.80 Upper end
" W. " 1111.79

Culvert at 6'x10' x24.3
Road bed 100 W. (1386) — ℄ of Culv 100' E 1387+79 E
1079.7 — 1077.6 — 1077.6
Top of curb N.E 1079.6 — S.E. 1077.57
Bottom N.E 1069.69 — S.E. 1070.30

S. B. begins on R.

1108.7	1108.0 / 10	07.7 / 14	07.7 / 19.6	09.3 / 20.6	N.G.	
09.6	08.9 / 10	08.4 / 14	08.0 / 16.4	07.6 / 23	11.0 / 26	N.G.
09.7	09.1 / 10	08.6 / 14	08.1 / 15.6	08.4 / 23.2	11.8 / 25.6	N.G.
09.5	08.7 / 10	08.2 / 14	07.5 / 16.8	07.6 / 23.0	11.3 / 25.4	N.G.
08.8	08.2 / 10	07.8 / 14	07.2 / 18	07.8 / 23	09.0 / 23.8	N.G.
07.7	06.8 / 10	06.3 / 14	06.0 / 22.6	07.0 / 23		

S. B. Bot begins on L

N.G.	10.2 / 21.2	08.7 / 14	08.7 / 14	09.8 / 10		
N.G.	08.3 / 22.6	06.9 / 21.8	07.5 / 14	07.8 / 10		
	06.5 / 22.0	06.6 / 21.6	06.0 / 14	06.6 / 10		

End of S. B. on R. & L

~~S. B. ends on L~~

Culvert at 1402 / 15" X 24'
Upper S. End. Elev 1079.48
Lower N. End. " 1079.48

Culvert at 1407+00
Upper End – E – Elev, 1082.0
Lower " W. " " 1081.9

Fill at 1410 – 2' narrow

Culvert at 1424 ±
Elev E or Upper End 1084.45
" W or lower " 1084.33

Culvert at 1433 { 15" X 30' / 15" X 32'
Elevation E. or Upper end 1084.84
" W or lower " 1084.64

Cont from page 14

		Area	R.T.
1514+78	Borrow on R. only	1.20	1.7
			3.0
1514+93		9.56	3.1
1515		14.58	13.3
+27		12.01	19.0
+71		11.25	9.7
1516		6.78	7.5
+60		0.0	57.3

Culvert 1519 —

Elev. U. End - East = 1108.89

" L. " West = 1108.35

Make ditch W. of P.R. Br.

	Elev.	G.L.	Cut
0+00			
+50	1091.3	91.3	
+75	91.5		
1+00	91.7	91.4 ✓	
+50	92.0	91.5 ✓	
2+00	92.1	91.6 ✓	
+50	92.3	91.7 ✓	
3	92.4	1091.8 ✓	
+50	92.4	1091.9 ✓	
4	92.4	1092	
+50	ice 92.4 / bot. 92.1		
+60	92.0		

Culvert

Ditch on L Begins			19.6/10	1120.6	20.0/10	19.1/12.2 19.1/13.6	18.6/16.8	19.3/20.8 N.G
N.G	19.5/15.2	18.5/14.2	19.5/10	20.3	20.0/10.0	18.8/14.2	18.2/20.4	19.8/21.2 N.G
N.G	20.2/16	18.5/14	19.7/10.0	20.1	19.8/10	18.1/15.2	17.7/19.8	20.2/21.8 N.G
N.G	20.3/17	18.0/14.4	19.1/10.0	19.8	19.0/18	17.4/15.4	17.4/18.6	21.1/22.6 N.G
N.G	18.9/15.8	17.0/14.4	17.9/10.0	18.7	18.1/10	16.2/15.2	16.1/19.4	18.0/20.2 N.G
	17.4/15.6	16.1/14.0	17.2/10	17.7	17.0/10	15.4/14.8	15.5/18.4	17.0/19.4 N.G

Borrow on R. ends.

End of culvert

{ Up. End = 1091.05
{ Lower " = 1090.45

W. E. = 1092.02 U. End

E. E. = 1092.25 L. End

P.M. – Nov. 4 — Molyneux, Wilson, Crossman

		Borrow Areas	C.Y.
1565		0.0	
+60	Borrow Beg. on L.	0.0	
+75		1338	3.7
1566		1537	13.3
+13		1300	6.8
+26		1046	5.6
+33			3.5.2
+68		3476	
1567		2512	35.5
+50		3578	54.6
+68		1086	15.5
+85		0.0	3.4
			175.4
+ 98	Culvert	0.0	W. End 13.3.5 / E " 13.3.3
1568		0.0	
+20		1857	6.9
+30		2763	8.6
1569		5570	108.0
+26		6973	46.4
+42		6567	55.2
1570		11743	196.6
+50		12993	229.1
+70		8419	79.3
+80		5216	25.2
1571		3861	33.6
+50		4835	80.5

1121.8

95

N.G.	09.9 / 18	06.7 / 13.6	06.8 / 11	07.5 / 10	1108.4	07.8 / 10	06.8 / 12	06.7 / 14.6	09.8 / 18		N.G.
N.G.	10.6 / 18.6	07.4 / 15.2	07.6 / 12.4	08.3 / 10	08.7	08.3 / 9	07.2 / 12.8	07.2 / 14.2	10.1 / 17.4		N.G.
N.G.	11.6 / 22.2	07.2 / 18.6	07.4 / 13.4	08.3 / 10	08.7	08.3 / 10°	06.9 / 12	07.0 / 14.4	10.8 / 18		N.G.
N.G.	11.7 / 23.8	07.9 / 20.2	07.2 / 16	08.5 / 10	08.8	08.3 / 10	07.2 / 12.4	07.1 / 14.2	09.7 / 17		N.G.
N.G.	11.2 / 29.4	06.6 / 21.8	06.7 / 16.6	08.3 / 10	08.8	08.1 / 10°	07.3 / 12.4	07.0 / 14.6	08.3 / 16.8		N.G.
N.G.	11.1 / 26.2	06.5 / 22.6	06.8 / 16.4	08.5 / 10	08.8	08.2 / 10	06.8 / 13.8	07.3 / 15°	N.G.		

Cut ditch ends on R.

N.G.	10.1 / 28.8	06.0 / 25.6	06.5 / 16.4	07.9 / 10	09.0	08.0 / 10	No Exc. on R.				
N.G.	09.0 / 29.0	05.8 / 25.4	06.6 / 16	07.6 / 10	08.7	07.8 / 10	No Exc on R.				
N.G.	09.1 / 26.4	05.4 / 22.6	05.8 / 16	08.2 / 10°	08.7	07.7 / 10	No Exc on R.				
N.G.	06.9 / 24.2	05.2 / 22.2	05.3 / 17.8	06.6 / 14°	07.9 / 10	08.9	07.6 / 10	No Exc on R.			

No Exc on L or R

Culvert needs cleaning

07.7 / 10. — 08.5 — 07.4 / 10°

Nothing — Nothing

N.G.	06.8 / 25.6	05.6 / 29.6	05.6 / 17	06.3 / 19	07.2 / 10	08.4	07.6 / 10	05.3 / 15.8	09.7 / 25.2	05.8 / 26	N.G.
N.G.	07.1 / 25.8	05.7 / 24.8	05.7 / 18.6	06.3 / 19	07.3 / 10°	08.3	07.5 / 10	05.9 / 15.4	09.8 / 27.8	06.4 / 25.8	N.G.
N.G.	07.8 / 29.2	05.8 / 27.6	06.1 / 17	06.5 / 19	07.6 / 10	08.4	07.4 / 10	05.9 / 16	09.9 / 30	06.9 / 32.4	N.G.
N.G.	18.0 / 30.4	15.9 / 28.4	16.2 / 19	17.3 / 10	18.0	17.2 / 10	15.3 / 16.6	19.8 / 29.6	17.3 / 32.4	N.G.	
N.G.	17.1 / 31.2	15.7 / 28	15.8 / 19	17.0 / 10	17.6	17.3 / 10	15.1 / 16.4	19.7 / 29.2	17.7 / 31.8	N.G.	
N.G.	19.1 / 32.6	14.5 / 27.8	14.4 / 19	15.1 / 10	16.1	15.3 / 10	13.1 / 16	13.9 / 29	17.9 / 32.4	N.G.	
N.G.	18.5 / 32.2	14.6 / 30	13.6 / 25.6	13.1 / 23	13.9 / 17	14.5	13.8 / 10	12.5 / 17	12.5 / 26.2	19.0 / 32	N.G.
N.G.	19.8 / 24		12.8 / 17.4	12.6 / 19	13.1 / 10	13.8	13.1 / 10	12.8 / 13	12.0 / 16	12.2 / 25.2	19.2 / 30.6	N.G.
N.G.	21.1 / 24.6	11.3 / 15.8	12.4 / 16	12.1 / 14	12.9 / 10	13.5	12.8 / 10	12.0 / 13	10.7 / 20.4	19.9 / 36	N.G.
N.G.		22.1 / 25.6	11.2 / 16.4	11.4 / 12.4	12.1 / 10	12.9	12.0 / 10	11.0 / 20		19.9 / 26.8	N.G.
N.G.	22.9 / 26.0		09.6 / 15.4	09.6 / 12.8	10.6 / 15	11.3	10.7 / 10	10.7 / 11	09.9 / 12.4	09.7 / 20	20.1 / 28.6	N.G.

		Borrow Area	cuyds.
			89.1
1572		47.83	
	+50	42.17	83.3
1573		42.92	78.8
	+60	8.66	57.3
1574		1.00	7.1
	+05	00	0.1
			1135.1
	+20		
	Nov. 5, 1916		
	+35		
	Ditch Beg on L		
1575		10.88	62.5
1576		22.87	80.8
1577		20.77	71.3
1578		17.74	60.4
1579		14.89	68.6
1580		22.17	82.6
1581		22.43	85.9
1582		23.97	80.4
1583		19.44	80.0
1584		23.72	89.4
1585		24.55	95.0
1586		26.73	103.2
1587		28.98	102.6
1588		26.45	105.4
1589		30.50	106.6
1590		27.08	

End of cut ditch on L (R.P. { 25' R Hub 21' L.

		Ditchout Area	cu yds	
			103.1	
1591		28.59		Elev. Mon. 1089.07
+57	Culvert	36" x 26'	107.8	" Ext. 1089.17
1592		29.70	108.1	
1593		28.68	99.8	
1594		25.22	96.9	
1595		27.12	91.0	
1596		22.00	82.9	
1597		22.73	82.7	
1598		22.04	75.1	
1599		18.52	70.5	
1600		19.73	64.3	
1601		15.00	58.9	
1602		14.79	54.0	
1603		15.09	53.3	
1604		14.77	51.7	
1605		13.16	51.5	
1606		14.46	52.6	
1607		13.75	48.1	
1608		12.23	47.1	
1609		13.21	45.8	
1610		11.50	40.5	
1611		10.37	33.0	
1612		7.92	22.5	
1613		4.70	1.21	
1614	End of ditches	1.82		
	Total		2835.3	

SUNDAY Nov. 5, 1916 { Molyneaux Wilson Crossman

	Area Fine day S.E. Wind	cu yds
1614+30	00	00
1614+50	59.13	21.9
1615	149.31	193.0
+50	178.69	303.7
1616	115.89	272.8
+50	51.96	155.0
		81.8
1617	36.84	
+50	16.20	44.1
		25.4
1618	11.20	
	1102.7 Total	

Cold day Nov. 10, 1916 HI 1111.24

	Shepards Area	cu yds	Stevens Area	cu yds
1618	00 L		11.20	
		93 L		78.5
+35	144 L		109.90	
		249 L		234.3
+70	24.0 L 00 R		251.54	
		27.3 L 1.2.2 R		288.2
1619	25.2 L 25.85 R		267.18	
		41.3 R		
+40	29.99		167.21	321.8
		23.3 L		
+50	00 L	12.9 R	37.31	37.9
	34.97 R	85 R		
+56	41.64 R		26.45	7.1
+70	34.32 R	19.7 R	16.37	11.1
1620	24.52 R	32.7 R	14.37	14.8
		11.1	10.32	12.9
1620+25	00 R		17.55	
+35		cy. 222.3	+35 00	3.3
~~425~~				1089.9 cy.

Final crosssection Notes taken after Stevens Borrow

Cut ditches begin R + L.

Rod Readings — HI 1111.24

Borrow Ends

1413
1414
1415
1416
1417

See Diagram and Calculations

Channel Change
Culvert Sta 1380+32
Area C.Y.

0+00		
0+05	11	
0+05		
0+15	Ang 45° L	
0+25		
0+40		
0+60		
0+70		
	146.4	

See diagram for computation

Surface elevations for borrow on Sundeisons work. (From slip)

℄

1194.1 / 30	94.4 / 20.8	93.3 / 19	1193.6 / 18	93.0 / 19.3	93.1 / 30
92.2 / 30	92.3 / 21	91.2 / 20	91.8 / 18	93.1 / 19.2	93.1 / 30
89.8 / 20	90.3 / 20.3	89.3 / 19	89.5 / 17.8	90.6 / 18.9	90.7 / 30
88.7 / 30	89.2 / 20	88.6 / 18	87.7 / 18	88.8 / 19.3	88.9 / 30
87.2 / 30	87.0 / 20	86.8 / 19.1	86.1 / 18	87.3 / 19.1	87.5 / 30

Lower end of 6'x10'x24' Concrete Culvert
Vertical end of excavation by culvert cent.

+6.2 / 11.2	+6.2	6.2 / 11.2
+5.4 / 10.4	+5.4	+4.6 / 11.6
+3.8 / 8.8	+3.8	+3.8 / 8.8
+1.2 / 6.2	+3.4	+3.4 / 8.6
	+1.2	+3.2 / 8.2
		+3.0 / 8.0 on bank

Elevations on road
July 6, 1916 as follows, (clif.)

Ang
1337+97
1338
1339
1340
1341
+60
1342
+50
43
+56
1344
+30

← Sanderson goes in
and deepens ditches.
← See accompanying notes.

				15.7				
				15.7				
				15.0				
				15.0				
		16.9/16		17.7		17.7/16		
		20.0/16		20.6		20.0/16	cut begins End of cut ditch	
N.G	22.6 B / 22.0	20.5/18	21.2/10	22.0	21.3/10	20.9 B.D / 18.0	23.3/20.5	N.G
N.G	26.5/21	B D 23.2/18	23.8/10	24.4	23.9/10	23.6 B.D / 18	26.6/20.4	N.G
	28.5/21.0	24.6/18	25.1/10	25.7	24.9/10	24.5/18.	29.0/21	N.G
	27.7/21	24.7/18.4	25.4/10	26.6	25.3/10	24.3/17.4	26.1/19	
	25.3/21	24.6/19.2	24.8/10	25.2	24.7/10	24.4/17	E of D	

Cut taken out without regard to slakes with machine by Stevens
Measurements made after the cut was completed. See diagram.

	Area	C.Y.
1303	4.56	2.6
+06	19.28	119.4
+50	127.35	236.1
1304	127.70	374.4
1305	74.50	49.3
+20	58.66	172.3
1306	57.68	270.4
1307	88.36	330.4
1308	90.09	141.6
08+50	62.90	88.1
1309	32.24	78.6
1310	10.26	1863.2

Excavation taken out without slakes

	Areas	C.Y.
1340	7.22	38.4
1341	13.52	45.9
+70	21.87	57.7
1342	71.25	182.0
+50	126.34	215.7
1343	107.64	235.5
+50	146.74	207.1
1394	76.99	85.8
+50	15.66	1023.7

Showing cuts

0.0 / 16	+0.2 / 15	0.0 / 12		0.0 / 10.0	+0.8 / 19	0.0 / 20.4
0.0 / 17.5	+0.4 / 17	+0.2 / 10	0.0	+0.8 / 10.0	+1.6 / 19	0.0 / 20.6
0.0 / 21.5	+3.4 / 18	+2.6 / 10	+3.0	+3.2 / 10.0	+4.0 / 19	0.0 / 22
0.0 / 21.0	+3.8 / 17	+3.0 / 10	+3.6	+3.0 / 10	+3.6 / 19.2	0.0 / 22.5
0.0 / 21	+3.2 / 18	+1.2 / 10	+0.8	+1.7 / 10	+3.6 / 21	0.0 / 23
0.0 / 23	+2.2 / 19	+1.0 / 10	+0.4	+1.0 / 10	+3.2 / 20	0.0 / 23
0.0 / 20.6	+2.6 / 18	+1.4 / 10	+0.6	+1.4 / 10	+2.4 / 19	0.0 / 20
0.0 / 20	+3.6 / 17.6	+2.2 / 10	+1.8	+2.0 / 10	+3.0 / 18	0.0 / 20
0.0 / 20.8	+3.0 / 18	+2.2 / 10	+1.6	+2.4 / 10	+3.4 / 18	0.0 / 19.7
0.6 / 21.5	+2.2 / 19	+1.0 / 10	+1.4	+1.0 / 10	+3.6 / 17.5	0.0 / 20
0.0 / 20	+1.2 / 19.4	+0.8 / 10	+0.4	+0.8 / 10	+1.6 / 17.6	0.0 / 19.5
0.0 / 20.4	+1.0 / 19.5	0.0 / 10	Turnpiking	0.0 / 10	+1.0 / 19.5	0.0 / 20

by Stevens Bros - See diagram

0.0 / 20	+1.3 / 20	0.0 / 10.0	-0.7	0.0 / 10	+1.3 / 19.5	0.0 / 20.8
0.0 / 19	+1.7 / 18.5	+0.2 / 10	0.0 / 8.0	-0.5	0.0 / 4.5	+0.7 / 10	+1.7 / 18.6	0.0 / 19.6
0.0 / 20.5	+2.3 / 17.4	+1.6 / 10	+1.1	+2.0 / 10	+3.2 / 17	0.0 / 23
0.0 / 21	+4.0 / 17	+3.3 / 10	+2.3	+3.4 / 10	+3.9 / 18.6	0.0 / 20.6
0.0 / 21	+3.6 / 17.4	+2.8 / 10	+2.2	+2.8 / 10	+3.4 / 17	0.0 / 20.4
0.0 / 21.5	+4.5 / 17.7	+3.6 / 10	+3.2	+4.0 / 10	+4.6 / 17	0.0 / 20
0.0 / 20.8	+3.6 / 17	+2.2 / 10	+1.5	+1.8 / 10	+1.9 / 17	0.0 / 19
0.0 / 20.4	+0.3 / 19	0.0 / 10	+0.4	+0.3 / 10	+1.1 / 17.6	0.0 / 23.6

Levels on stevens work after completing by Machine sept 8 1916.

	G line		Area	cu yds.
1476				
1477				
1478				
1479	1119.30			
1480	93.0			
1481	93.0			
+40			00	00
1482	93.5		63.79	23.7
1483	95.5	sec Plan	81.00	268.5
1484	97.5		99.99	335.2
1485	99.5		71.21	317.0
				52.8
+40			00	00
				997.2 Rcamcastre
				573.2 as per x sect cu
				424.0
1614+50	1094.0			
1615	1095.0			
1616	1097.0			
1617	+ 1099.0			
1618	1101.0			
1619	1103.0			

Borrow North of P.R. Bridge

		Area	cu yds
1683	1090.0	00	
+15		11.00	1.5
+50		1500	16.8
+60		3030	8.4
1684		7010	94.4
+50		3916	1012

L & R. 105

	1092.0 / 11.4	1092.7	1092.3 / 9.4			
	1091.7 / 12.6	1092.3	1091.6 / 10.5			
	1091.5 / 12.4	1092.1	1091.5 / 9.6			
	1091.5 / 12.0	1092.4	1091.7 / 9.0			
	1091.8 / 11.8	1092.7	1092.1 / 9.2			
Shoulder	1092.0 / 11.8	1092.8	1092.0 / 10 S			
1091.9 / 24.8	1091.0 / 12.1.7	1092.9 / 10	1093.3	1092.5 / 10.8	1091.7 / 21	1092.6 / 22.8
1095.9 / 23.6	1093.2 / 21.2	1094.7 / 10.9	1095.1	1094.6 / 10	1093.4 / 17.6	1096.0 / 22.2
1098.2 / 24	1095.5 / 21	1094.8 / 10	1097.1	1096.7 / 10	1095.6 / 18.6	1099.0 G / 22
1099.5 / 25	1097.2 / 22	1098.5 / 10	1099.1	1098.6 / 10.0	1097.6 / 20	1100.1 / 22.6

Ditch Runs out.

Borrow Ditch

+12.1 / 32				+1.9 / 32		
+4.0 / 32				+4.0 / 32		
+5.1 / 32				+4.7 / 32		
+4.0 / 32				+4.4 / 32		
+4.1 / 32				+2.6 / 32		

L & R. Borrow begins on R

TS 1083.6 / 22.5	83.4 T.D. / 24.2	81.4 BD / 27.8	81.4 BD / 29.8	86.2 NG / 37.6				
TS 800 / 21.2	Tel.D. 810 / 31.2	BD 81.2 / 33.6	BD 81.2 / 35.2	84.8 / 39.5	NG			

Borrow starts on L

Ditch

NG 88.0 / 33.8	82.2 / 29.4	83.4 / 25			NG				
85.4 / 32.6	82.6 / 30.2	82.8 / 26.2	86.0 / 16.6		84.8 / 16.8	82.8 / 27.4	82.0 / 34.2	85.6 / 37.0	NG
NG 76.0 / 32.9	83.3 / 29.2	83.4 / 25.2	85.6 / 18.6	86.6 TS / 16.0	NG 85.4 / 16.0	85.0 / 22.6	83.2 / 29.6	83.0 / 34.6	84.6 / 37

		Area	cu yds.
			79.4
1685		46.56	
			86.4
+50		46.80	
1686		32.16	73.1
+50		40.00	66.8
1687		42.36	76.2
+50		26.10	63.4
1688		25.12	47.4
			695.0 cu yds.

L & R

NG	87.8	85.2	87.2	NG	87.2	84.4	87.2 NG
	32.3	29.6	17.4	NG	17.4	30	35.8
NG	88.2	86.0	88.0		88.2	86.0	88.8 NG
	32.6	29	17		17	24	32.6
NG	89.2	87.0	88.6	NG	88.5	86.8	89.3 NG
	31	28.6	17		17	29	32
NG	89.8	87.4	89.0	NG	88.5	89.0	89.6 NG
	30	27	17		17	26.6	29
NG	90.0	88.0	88.2	NG	89.4	88.0	90.0 NG
	30.8	28.4	17		17	29.6	31.6
NG	89.2	87.8	89.2	NG	88.8	88.6	90.0 NG
	30.4	27.8	17		19.2	27.4	30
NG	90.0	87.8	88.8 NG	NG	89.2	88.8	89.0 NG
	32.8	30	14		23	24.4	30

1784+50			
1785			
+50			
1786			
+50			
1787			
+50			
1788			

	1124	1120	1105
	32	24	24
	1124	1120	1105
	32	24	25
	1139	1135	1117
	320	258	22
	1149	1147	1134
	31	25	22
	1146	1146	1138
	1139	NG	1129
	31		19

A09 28 7916 For R & R.

109.6	110.9	111.7
23.8	26.0	35.0
108.2	109.3	109.4
24.8	26.2	35.0
108.3	109.0	109.2
24.0	25.6	35
110.1	111.2	111.2
23	25	35
112.0	110.0	113.2
23	25	35
113.3	114.0	113.8
23	25	35
113.6	114.4	114.2
18	20	35
99	NG. 92	
19		35

Not used on R.

	Borrow on L. from turnpiking out Sept 1119 staked		
	Borrow begins on Roadway Hub		cu yds
18 27+40			4.9
+50			25.8
18 28			20.6
+50			
18 29			14.2
			65.5

00	+16	00	ditch
10	2.0	00	
+12	+16	00	"
139	30	00	
+16	+10	00	"
120	20	00	
+12	+08	00	
12	2.0	00	
+12	+06	00	
8	2.0	00	

	Borrow	Area	cu yds
1929		00	
1930		14.5	25.0
31		18.00	60.2
32		18.00	66.7
33		18.00	66.7
34		18.00	66.7
35		00	33.3
			318.6

Borrow and ditch Deepening
for. Thomas Bros - sept 14 1916

	Glint L	Glint R	
2124+70			
21 25	11480		
25+50	480	485	
2126	486	487	
2126+50	480	1148.9	43.2 cu yds

Elevations for Borrow Pit
For surfacing

2006						
+50						
2007						
+50						
2008						
+50						
2016+50						
2017						

L & R.

Borrow

		00/19			00/17
+16/22	10/19	08/18		00/16	10/17	16/25
+10/22	10/17	00/13		00/15	00/17	+10/26
+10/22	+10/17	00/13		00/13	+10/19	+10/28
+10/22	10/17	00/12		00/13	+10/17	+10/25
"	"	"		"	"	"
		00/17			00/18

				00/13	00/14.6
+3.4/21.4	+3.4/17.7	+0.9/14.9		+1.0/13	+3.6/17	+2.4/20.4
+2.3/20.2	+1.8/16.6	+0.6/15.4		+0.8/16.2	+1.8/17.2	+1.8/19.8
		00/17			00/17

				1141.7/15	43.7/30
				1145.2/20	43.3/40
				1145.3/20	43.7/40.0
				1145.4/20	43.8/40.
				43.2/20	43.0/40
				42.1/20	43.8/40
				1153.0/20	1153.0/34
				54.5/20	54.1/40

2017+50

2118

+50

2119

L & R.

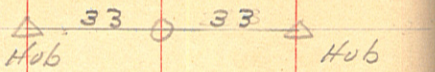
11 55.9 / 20 — 54.9 / 40

11 55.5 / 20 — 55.0 / 40

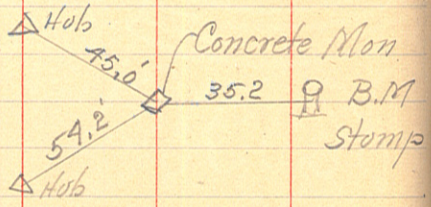
55.4 / 20 — 55.2 / 40

11 56.1 / 20 — 55.8 / 40

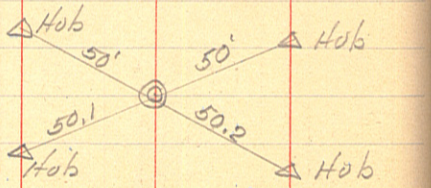
1376



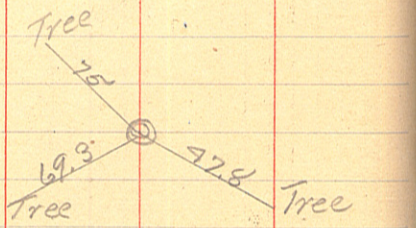
1353+79.2



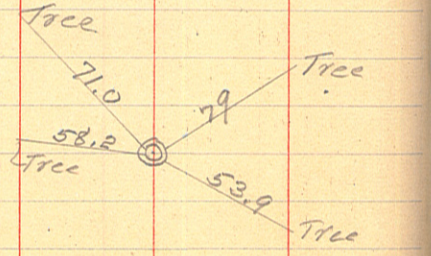
1591+45.6
¼ Sec. Cor



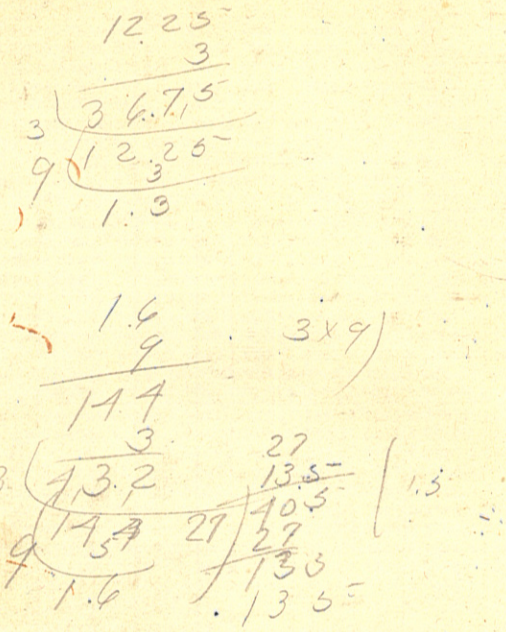
1565+11 Sec Cor



1618+02.4 Sec. Cor.



1649+65.5
¼ Sec Cor



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.