

W 42

So. Cal. Mt. Water Co.
Moreno Dam.

9

LEVEL

404

Miscellaneous Levels
Dam-site and Vicinity
May-July '09.

H. S. CROCKER COMPANY

DRAWING MATERIALS AND
SURVEYING INSTRUMENTS

SAN FRANCISCO

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.

"Copyright, 1895, by Kueffel & Esser Co."

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	0
1	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	1
2	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	2
3	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	3
4	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	4
5	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	5
6	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	6
7	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	7
8	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	8
9	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	9
10	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	10
11	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	11
12	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	12
13	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	13
14	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	14
15	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	15
16	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	16
17	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	17
18	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	18
19	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	19
20	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	20
21	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	21
22	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	22
23	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	23
24	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	24
25	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	25
26	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	26
27	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	27
28	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	28
29	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	29
30	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	30
31	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	31
32	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	32
33	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	33
34	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	34
35	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	35
36	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	36

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

FROM
Loring's Book Store

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1. Levels around Mazona Buildings

Bm	1	2	3	4	5	6
	750	16409		156.59		
					115	1526
					69	1572
					85	1556
					18	1623
o	11.60	17516	053	16356	78	167A
o	11.60	17667	009	175.07	55	171E
o	10.84	177A7	004	176.63	99	177.6
o	11.44	20867	07A	197.23	20	206.7
o	11.37	21992	012	207.55	416	226.84
o	11.43	23100	035	219.57	0.10	230.90
Bm 2						
o	11.02	241.97	005	220.95		
o	10.57	252.44	010	241.87		
o	10.93	261.65	172	250.72		
o	10.05	272.63	007	261.59		
o	9.93	281.47	109	271.54		
o	10.72	292.10	009	281.38		
o	11.37	303.06	041	291.69		
o	10.84	313.59	031	302.75		
	16221		5.21			

5-16-09 AM
Wueste
Salisbury

Pr on Rock below curved Road at NE. cor. Rg. W. 50

Lower Road below Store
Bench on which stone stands
Elevation of Flemish Room under Kitchen
Boarding house Bench

Road in front of store
This HI set above Ridge of Bldg House
Sewer pipe on 2" Pipe Sin.

Floor of Bank house

Ridge of Bank house

NE. cor. 6000 gal Reservoir = Elev of Bench
Pr on Short Rock in back wall of Reservoir Excavated

	318.59				
	11.52 324.16	015 318.44		25	322.5
Bm 3		062 324.34			
o	9.59 358.93	068 333.25			
o	11.88 345.13	049 344.64			
o	11.51 356.15				
o		097 358.19			
o	11.12 366.30	071 366.09			
	7.98 374.07		96	364.5	
			9.1	365.0	
			1.0	373.1	
Bm 4		086 372.01			
	63.60	5.18			

Highest part of road to Head Tower Bench
Rock on outside of road near higher portion

About 1 foot above Trolley Bench N side

About 2' below foundation of Sta. tail tower and
3' below headblock of maverick tail tower

Lowest part of bottom of 25000 gal tank
ctr of outer pipe of ditch
top concrete lining ditch
Pr on rock 25' east of above Reservoir

3.

Bm 3			374.34		
o	062	324.96			
o			1116	313.80	
Bm 5	116	314.96			
o	020	304.57			
o			1079	304.17	
o			492	299.55	468
Bm 6	438	303.93			299.69
o					302.65
o			128		
o			107	293.21	
o	155	294.76			
o			1049	284.27	
Bm 7	289	286.66			
o					950
o			1223	274.43	277.16
o	010	274.53			
o	288	265.48			
o			1191	262.62	
o	164	255.73			
o			1134	254.09	
o			1009	245.64	
o	025	245.89			
o			1076	235.13	
	041	235.54			
	1556		10436		

See page 2

Iron pin in rock at East end of Trolley track

Track grade (Top of Rail)

Spike in East end of South sill supporting
beams in Sta Trolley Engine Room

on original Rock below NW cor of Trolley track

Bm 8	835.54	996	225.58	
o	068	22626		
o	010	21439	1197	214.29
o	645	20857	1227	202.12
o	090	19758	1189	196.68
o	021	18568	1211	185.67
o	072	17530	1110	174.58
Bm A		621	169.09	✓ 169.073
	906	7551	✓	

On split granite below lower Bm.

Reciprocal levels

between old bench 169.073
and new bench established on
north side to be used for
open cut, waterway & power cu-
rrent.

Bm A 169.073

3537 | 172.610

Bm B 0.185 | 172.425 .425

Bm A 169.073

6655 | 172.928

Bm B 3244 | 172.484 .484

$\frac{21909}{45X}$

Sum Bm B = 172.455

May 17th 1909
Wueste
Ferguson

169.673

173.05

Check-levels to Boating house

BMA

1231 18138 169.073

9.97 18469 666 174.72

0.76 173.91 115A 173.15

0.69 16439 1022 163.69

BM #1

7.8 156.60

23.73 36.20 ✓

May 17th '09.Wueste
Ferguson.

Rural elev = 169.673

By original survey and transfer 156.59
This bench is on rock 57' N of N.E. cor. of Bldg. base

7

Grade for Paulsen Drift

Sum B

266175.11

17245

1223 16289

067 163.55

755

156.00

333

1223 ✓

5-19-09

Wueste

Jim White

= 1 foot above grade
 a small step cut into rock at outer
 end of open cut to face of drift.

8. grade for Matinee Road
North side

B.M. 13			1724.5	
2+00	1196	1844.1		3.91 180.50
			734	177.07
	1107	188.14		
3 +50				7.51 180.63
3 +50				7.39 180.75
B.M. 25				7.77 180.88
	1186	189.93	1117	176.97
4 +50				7.83 181.00
5 +50				7.71 .12
5 +50				7.59 .25
6 +50				7.46 .37
6 +50				7.33 .50
6 0				7.21 .62
			1022	178.61
	1207	190.68		
7 +50				8.93 181.75
7 +80				
8 +50				
9 +06				
B.M. 22			162	189.06
	1149	200.55		
	58.45		303.5	✓

5-17-09

W. Westre
Jim White

this measure from ctr of cross of can

on Rock ' out from sta

continued from here

5-20-09

W. Westre

A. Salsbery

Jim White

6.8	183.9
2.7	188.5
4.1	186.6
0.1	190.6
2.9	187.8
4.3	186.40

on Rock ' out from Sta

9

9 +50
0

2055

1170 21130

095 19960

10 +50
0

1150 2222

085 21072

11 0

1151 23304

069 22153

12 +50
0

1188 24403

082 23222

13 +50
0

1007 25522

188 24215

BM +50
27

417 24805

5659

9.09 ✓

66 1940

95 2018
8.102 56
29 288.4

54 2168

90 235.0
07 232.348 239.2
20 242.052 2470 = interaction with regular road
on rock 10' out from regular road.

10

Elevation of Bm's to be used
during construction of Murre Dam

Bm A			169.73	
o	1.04	170.11		
	1.88	160.98	11.01	159.10
Bm C			12.07	148.91
o	1.46	150.37		
	0.98	139.36	11.99	138.38
Bm D			8.69	130.67
o	0.57	131.24		
	1.20	120.66	11.78	119.46
Bm E			11.27	109.39
o	0.92	110.31		
	1.82	100.68	11.45	98.86
Bm F			10.97	89.71
o	1.11	90.82		
	2.50	81.71	11.61	79.21
o	0.02	69.79	11.94	69.77
Bm G			9.42	61.37
	2.05	63.42		
Bm H			11.98	51.44
	1.40	52.84		
	16.95		13.818	✓

5-22-09 PM.
cloudy.R. W. W. W.
A. Salisbury

169.673

149.51

131.27

replaced by E' on page 60 114.40

90.31

61.97

replaced by H' on page 60 45.99

		52.84		
o			1153	41.31
	048	41.79		
o			1173	20.06
	020	30.26		
Bm I			421	26.05
	297	29.02		
o			1011	18.91
	042	19.33		
o			1141	7.92
	195	9.87		
Bm J			665	3.82
	1100	14.82		
o			191	12.91
	051	22.42		
o			100	21.42
	616	27.59		
Bm I			153	26.05 ✓
	3269	59.48 ✓		

~~R6~~⁶⁵ This Bm is on same rock with old Bm
Near Tunnel Exit.

~~442~~ About 30' below proposed shaft

26.05 ✓

12 Elevation of Bm
To be used in construction of Dam

windy

May 23⁰⁹
Pm

W. West - Salisbury

Bm B			17245
o	259	175.04	1138 163.66
o	122	164.88	1105 153.83
o	503	158.86	637 152.49
Bm K			1132 142.93
o	176	154.25	530 137.73
o	010	143.03	094 138.57
Bm L			1217 126.40
o	094	138.57	1103 117.12
o	175	128.15	301 120.13
Bm M			704 113.09
o	201	120.13	181 114.90
o	181	114.90	1145 103.45
o	085	104.30	1096 93.34
Bm N			820 85.50
o	036	93.70	820 85.50
o	075	86.25	1101 75.24
o	129	76.53	2136
	2136	117.28	✓

1730's see page 5

15309

13833

11369

8610

Bm O	76.53	6.31	70.22
o	054 70.76	11.84	58.92
Bm P	053 59.45	9.11	49.64
o	073 56.37	7.74	42.63
Bm Q	109 43.72	5.73	38.49
Bm R	984 48.33	0.32	48.01
o	10.60 58.61	0.51	58.10
o	1114 69.24	0.05	69.19
o	10.84 80.03	0.59	79.44
o	10.41 89.85	0.07	89.78
Bm S	879 91.27	10.6	97.21
o	705 104.26	1.34	102.92
Bm E	916 111.08	1.70	109.38 (39) ✓
	7942	46.57	✓

39.09

70.82

Continued from here 5-26-09
W. Weste
Salisbury

5024

4323

at portal of outlet Tunnel. East end
Replaced by Bm R. on page 60
43.605

Replaced by Bm S. on page 60
100.29 on rock at outside edge of rock-crusher
bench

on page 10

14

Grades for Open cut
North quarry bench

BMB					
	2.54	174.99	172.45	33	171.7
				36	171.4
				52	169.8
				52	169.8
⊙			0.19	174.80	
	11.24	186.04			
				06	185.4
				32	182.8
				53	180.7
				27	183.3
				37	182.3
				48	181.3
	13.78		0.19		

Grade

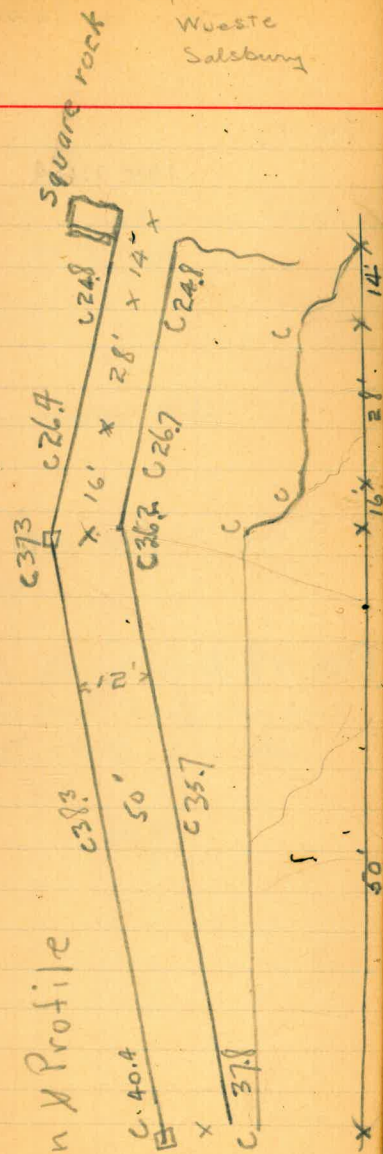
145.0	+26.7
	+26.4
	+24.8
	+24.8
	+40.4
	+37.8
	+35.7
	+38.3
	+37.3
	+36.2

Jan 5th Nelson Comm. Open cut.
July 16th 74th of cut done

May 26, 09

Waste
Salisbury

Plan & Profile



Grades for Cement house road

Bm 27

1059 758.64

248.05

o

649 752.15

9.07 761.22

4.0 757.2

5.5 755.7

7.0 754.2

8.5 752.7

9.3 751.9

10.1 751.1

10.9 750.3

Bm 28

234 758.88

19.66

8.83 ✓

See page 9.

= grade of Cement house Bench

opp rock on opp side

= grade of road on fill east of
cement house.= pt on rock about grad of
regular road and halfway bet.
Cement house & road junction

- 6%

x

- 3.2%

16 March Levels

Boarding house Beach to USGS 3010

Bm 1	214	15873	156.59	
o	105	14805	1173	147.00
o			1153	126.52
o	114	13766	1178	125.88
o	225	12813	269	125.44 x
o	125	12669	911	117.58
Bm 9	783		46.84	
	6104		766	
	1110	13654	175	144 x
o			001	136.53
o	1179	14832	90	148.22
o	1123	15945	013	159.32
o	1140	17072	095	170.57
Bm 10	1047	18104	274	178.25
	505	18330	448	178.82
Bm 10			056	182.74

N.E. cor Bldg here.

on Rock 90' N.E. of beam near creek bottom;

= last T.P. above

Note: Aug 20, '09
See page 60
of this book for
transfer of this elevation
to an oak tree 25' north
of gun cottage porch.
Wueste-Simonds

should be 18334

on Rock 35' south-east of gun cottage

Elev above Sea level

= spike in Rock of gun cottage

3065.694

17

Mearns Swells cont.

Bm 9	070	118.28	117.58
o	603	107.89	1042 107.86
o	068	98.65	992 97.97
o	070	87.49	1186 86.79
o	027	78.61	915 78.34
o	139	68.53	1147 67.14
o	316	60.43	1126 57.27

Bm 11

o	283	51.36	1190 48.53	056 59.87
o	10.72	61.22	086 50.50	112 40.2 125 38.9
	20.48	76.84	✓	

5-26-09

Wueste
Selsbury

see page 16

at Barrett & Campes Road just on Rock

= elev of top
= level of water

	6122		
o	1132	744	58.78
	70.10		
o	1097	097	69.13
	80.10		
o	1152	050	79.60
	91.12		
o	1086	079	90.33
	101.19		
o	1082	106	100.13
	110.95		
o	1155	075	110.20
	121.75		
o	775	155	120.20
	127.95		
USGS BM		077	<u>127.18</u>
	1164		
	1388.2		
o		231	136.44
	11.71		
	148.15		
o		078	147.37
	1217		
	159.54		
o		083	158.71
	1201		
	170.72		
o		192	168.80
	1218		
	180.98		
	134.56		
		14.74	✓

Stamp 3010 (3010.134)

127.18
2882.954

2882.354 = Corrected Elev of
Morena Zero Contain.

o	18096	042 180.56	
o	1163 19219	137 190.82	
o	1173 20255	072 201.83	
o	1179 21362	016 213.46	
o	1104 22450	077 223.73	
o	1155 23527	245 232.83	
o	1023 24306	050 24256	
o	952 25208	463 248.05 ✓	248.05
Bm 27			

7749

1042 ✓

3010

127

1.7

2883

see page 9

20

Mensch Levels

green cottage - Mimos cottage - Tracing Bench

Bm 10			17.82	
o	1117	189.99	015	189.84
o	1160	201.44	042	201.02
o	1127	212.29	012	212.17
o	1123	223.40	004	223.36
o	1117	234.53	043	234.10
o	1143	245.53	053	245.00
o	1118	256.18	043	255.75
o	414	259.89	712	252.77
o	436	265.11	414	255.75
Bm 12			4.90	260.21
o			1.47	263.64
o	1078	274.42	138	273.04
o	1096	284.00	086	283.14
o	1088	294.02		
	125.17		9.97	✓

5-27-09

W Westo

Salisbury

= elev of water pipe from Ward spring to
Camp or Mimos cottage (stand-pipe)

on rock at edge of road

89402

o

093793.09

11.03 304.2

o

120 30292

10.13 313.05

Bm 13

672 30633

on Rock outside edge road above bench plan

o

476 308.79

684315.63

o

17331390

12.14 316.04

Bm 3

171 32483

40.14

9.83 ✓

22 Incls Mimos cattaq to ward Spring

5-30-09

PM

Wueste
Sassary

Bm 12			260.21
0	419	264.40	1077 253.63
0	051	254.14	1173 242.41
0	145	243.86	1066 233.20
0	228	235.48	1167 223.81
0	031	224.12	1172 212.40
0	203	214.43	

Bm 14			354	210.89
0			078	213.65
0	111.86	225.51	003	225.49
0	1203	237.51	095	226.56
0	1168	248.24	011	248.13
0	1090	259.93	170	257.23
0	1153	268.76	091	267.85
0	1044	278.29	041	277.88
0	706	284.14		
	86.17		6144	✓

about 60' North of gate on road to
ward Spring.

This bls about 4' below wallput of cement here

Run 15	2194	138	283.6
Top wall Wand Spring		28	282.1
Over flow pipe (ctr)		44	280.5
Bottom		10.7	274.2
Submerged outlet pipe		6.0	278.9
Surface of water		5.2	279.7

Pan Rock about 15' north of Wand Spring

24 Seville to North Tower Bunch

June 6th 09

Wueste
Salisbury

11194 1885 ✓

Bm 28 258.88

10.70 269.58

0 069 268.89

1130 280.19

0 061 277.58

1104 290.62

0 046 290.16

1183 301.99

0 001 301.98

1106 3130.4

Bm 29 1.66 3138

0 092 312.12

1086 322.98

0 099 321.99

1134 333.33

0 086 332.47

1145 343.92

0 095 342.97

888 351.85

Bm 30 1.81 350.04

1155 361.59

1155 350.04

193 351.97

3.5 358.3

7.7 244.3

= about 4' below top ward opening.

= pt on rock outside edge road when road
branches off up to tower bunch.

= pt on big boulder outside edge road; next level
north bench

= top of movable tail-tower. Top tower 1 $\frac{1}{2}$ ' above head-block

= sill of 26 $\frac{1}{2}$ ' Sta. tail-tower. Top of tower 1 $\frac{3}{4}$ ' above
head-block

= top of rail for movable tower.

25 Grade for open cut

Bm B			17745	
o	09A	17339	1175	16214
o	003	16217	1205	15012
	101	15113		

613 145⁰⁰

Bm 31 4.60 14653

Bm R 952 15605
357 15248 (15249) ✓

11.50 3147 ✓

June 6th 09
West
Salisbury.

= grade of open cut. = drill hole - side of rock

= pt on rock near intersection of rock
fill and canon-side (within sight of
open-cut)

26

Grade for Powder drift
6-6-09

Tunnel bench			15600
	395	159.95	
0+74		395	15600

Elevation of Ice-wall

Bm R

068 39.17

3849

Top wall	9.81	29.36
Bottom Groove	14.71	24.46
Top wall	9.75	29.42
Bottom Groove	14.75	24.42

June 6th 09
Wueste
SalisburyJune 15th 09
Wueste
SalisburySection bank by Mr. Molony on South end
Section exposed " " " North "

Note: Movable heat-tower - Top 42.9'
above track grade. Heat block 43.6'
above track grade -

Bm 6

596 308.61 302.65

151 307.10

1037 317.47

195 315.52

1112 326.64

023 326.41

1201 333.42

028 338.14

1308 350.22

010 350.12

1143 361.53

026 361.29

1148 372.77

15

03 372.5

908 363.69

7445

13.41 ✓

June 6th of
Wueste
Sachling

= spike in boiler-room of sta heat-tower

= Top oak heat-block sta heat-tower

= top of 27⁵' sta heat tower

= Reading on old elevation mark
back of sta heat-tower 365

28 Finishing Hubs 170' Road

see page 8

June 7th 09

Wueste
Salsbury
Sullivan

Bm 25

956 186.53

- 176.97

4 + 00

553 181.07

+ 50

541 181.12

3 + 50

565 180.88

3

577

2. + 50

589

0

527 186.38

542 181.11

5

514

+ 50

502

6

490

+ 50

478

*

29 X-section Levels of Dam

6-12-09
Wueste
Salisbury
Mr. Malony

Bm S	1154	108.75	97.21		
D-24				10.5	98.3
D-25				11.3	97.5
D-26				12.8	96.0
D-27				14.3	94.5
D-28				26	106.2
C-27				27	106.1
C-26				8.9	99.9
C-25				9.1	99.7
C-24				9.8	99.0
C-24, C-23, 9				11.1	97.7
C-23				16.1	92.7
B-24				6.6	102.2
B-25				7.7	101.1
B-26				0.5	107.3
A-24				2.2	106.6
E-24				9.3	99.5
E-25				11.0	97.8
E-26				11.1	97.7
E-27				14.0	94.8
E-28				11.7	97.1
F-27				13.2	95.6
F-26				13.4	95.4
F-25				9.7	99.1
F-24				10.4	98.4

1154 ✓

	10875			
G-25			84	100.4
G-25, G-26, 6			101	98.7
H-24			102	98.6
I-24			102	98.6
I-25			80	100.8
I-26			5.7	103.1
H-27			62	102.6
I-23			112	97.6
I-22			83	100.5
I-21			13.1	95.7
0				

	098	98.82	1091	97.84
H-22			5.1	93.7
G-22			115	87.3
G-23			83	90.5
F-23			111	87.7
E-23			120	86.8
D-23			98	89.0
E-23	dup		71	91.7
B-23			53	93.5
I-21	dup		32	95.6
H-21			7.7	91.1
G-21			12.5	86.3
I-20			31	95.7
H-20			5.0	92.8

098

1091

	98.2			
I-19			69	91.9
H-19			7.7	90.1
0		95.4	89.28	
	207	91.35		
I-18			7.7	83.7
H-18			8.1	83.3
H-17			10.1	81.3
H-16			11.8	79.6
H-15			10.5	80.9
H-14			11.3	80.1
H-13			10.4	81.0
H-12			7.0	84.4
H-11			6.1	85.3
H-10			4.5	86.9
H-9			3.9	87.5
H-8			3.8	87.6
I-8			6.0	85.4
J-8			5.6	85.8
K-8			10.2	81.2
L-8			6.1	85.3
M-8			0.1	91.3
N-8			3.5	87.9
O-8			9.4	82.0
P-8			9.0	82.4
Q-8			8.2	83.2

207

95.4 ✓

	9.35			0.4	91.0
H-7				0.2	91.2
G-7				8.0	83.4
F-7				0.3	91.1
F-6					
D					
	002	10.88	10.49	80.86	
E-7				9.1	71.8
E-6				6.6	74.3
D-6				14.0	66.9
G-9				1.9	79.0
G-10				2.3	78.6
G-11				4.0	76.9
G-12				2.0	78.9
G-13				5.2	75.7
G-14				6.5	74.4
G-15				7.0	73.9
G-16				6.8	74.1
G-17				7.8	73.1
G-18				9.1	71.8
G-19				6.8	74.1
G-20				6.0	74.9
F-22				0.7	80.2
E-22				4.7	76.2
D-22				4.2	76.7
C-22				5.6	75.3

002

10.49 ✓

B-22	80.88		3.2	77.7
o		6.83	74.05	
a-22	602 80.07		1.5	78.6
o		1060	69.47	
B-21	219 71.66		11.5	60.2
D-21			10.2	61.5
E-21			4.4	67.3
F-21			0.0	71.7
F-20			7.4	64.3
F-19			10.3	61.4
F-18			13.4	58.3
F-17			14.4	57.3
F-16			12.0	59.7
F-15			12.0	59.7
F-14			12.8	58.9
F-13			11.5	60.2
F-12			10.8	60.9
F-11			8.7	63.0
F-10			6.7	65.0
F-9			6.9	64.8
F-8			0.8	70.9
E-8			9.4	62.3
D-7			8.9	62.8

8.21

17.43 ✓

Near edge of tunnel approach

C-7	71.6		13.6	58.1
B-7			14.6	57.1
o		10.68 60.98		
D-8	16.6 62.64		7.5	55.1
C-8			8.9	53.7
B-8			15.5	47.1
E-9			5.0	57.6
E-10			5.1	57.5
E-11			7.3	55.3
E-12			10.4	52.2
E-13			10.3	52.3
E-14			14.2	48.4
E-15			14.1	48.5
E-18			14.1	48.5
E-19			13.4	49.2
E-20			8.3	54.3
D-20			14.5	48.1
o		11.11 51.53		
E-16	0.86 52.39		6.7	45.7
E-17			9.9	42.5
o		9.51 42.88		
D-19	24.9 45.37		9.6	35.8
	5.01	31.30 ✓		

D-18			10.6	34.8
D-17			12.3	33.1
D-16			11.9	33.5
D-15			11.4	34.0
D-14			11.9	33.5
D-13			7.4	38.0
D-12			9.5	35.9
D-11			4.2	41.2
D-10			1.4	44.0
D-9			(-2.1)	47.5
C-9			7.3	38.1
B-9			8.9	36.5
B-10			11.3	34.1
C-10			12.2	33.2
C-11			12.7	32.7
C-12			12.2	33.2
C-13			12.2	33.2
C-14			12.3	33.1
C-15			12.3	33.1
C-16			12.5	32.9
C-17			11.3	34.1
C-18			12.1	33.3
Bm R	516	695	38.42 ✓	(A9)
C-19			10.1	33.5

516

695 ✓

B-19			101	335
B-20			12.8	30.8
a-20			7.0	42.6
a-19			9.1	34.5
a-18			10.5	33.1
a-17			10.8	32.8
B-17			10.3	33.3
Bm R				

4358

516 38.42 ✓

Bm S

#

97.21

428 101.49

J-23

4.7 96.8

J-22

9.7 91.8

0

1052 90.97

138 92.35

J-21

9.8 82.6

J-20

12.2 80.2

K-22

11.2 81.2

L-22

10.3 82.1

M-22

- 0.9 93.3

M-21

10.2 82.2

M-21

9.7 82.7

0

1159 80.76

144 82.20

N-20

14.8 67.4

7.10

22.11 ✓

return approach

Continued 6-13-04

Wueste
Solsbury

	8220		
M-20		15.7	66.5
K-21		11.8	70.4
K-20		15.7	66.5
J-19		7.0	75.2
J-18		13.4	68.8
I-17		11.0	71.2
I-16		14.9	67.3
I-15		13.8	68.4
I-14		9.6	72.6
I-13		6.0	76.2
I-12		6.1	76.1
I-11		5.3	76.9
I-10		4.5	77.7
I-9		5.4	76.8
J-9		7.8	74.4
K-9		15.6	66.6
L-9		13.7	68.5
M-9		7.7	74.5
N-9		13.5	68.7
R-8		5.1	77.1
o			
	229	73.25	1124 70.96
R-9		6.6	66.7
Q-9		10.3	63.0
P-9		10.0	63.3
	229		1124 ✓

	7325		11.3	62.0
0-9			11.8	61.5
J-10			9.5	63.8
J-11			9.4	63.9
J-12			10.3	63.0
J-13			12.3	61.0
J-14			15.6	57.7
J-15			15.7	57.6
J-16			13.1	60.2
J-17			16.3	57.0
M-19			10.9	62.4
Om-18			11.0	62.3
Om-17			10.0	63.3
Om-16			7.3	66.0
Om-15			10.1	63.2
Om-14			14.4	58.9
N-17			13.1	60.2
N-18			12.4	60.9
O-20			11.5	61.8
P-21			5.7	67.6
Q-22			5.8	67.5
R-22				
0		1102	62.23	
	0.57	62.80		
L-20			1.3	61.5
L-19			10.2	52.6
	0.57	1102	✓	

L-18

6280

11.5 513

L-17

11.3 515

L-16

10.1 527

L-15

8.1 527

L-14

13.1 49.7

M-11

10.8 520

M-12

11.7 51.1

L-10

5.5 573

K-10

9.8 530

K-11

15.1 47.7

K-12

13.0 49.8

K-13

12.3 50.5

K-14

15.3 47.5

K-18

8.2 54.6

K-19

9.1 53.7

0

0.44 52.51

10.73 52.07

K-17

4.4 48.1

K-16

5.0 47.5

K-15

6.2 46.3

L-13

9.7 42.8

L-12

10.0 42.5

L-11

7.3 45.2

0

5.66 57.69

0.48 52.03

6.10

11.21 ✓

		5769			
N-11				10.8	46.9
N-12				13.9	43.8
N-13				10.6	47.1
N-14				4.2	53.8
N-15				1.1	56.6
N-16				1.2	56.5
N-19				2.3	55.4
O-19				9.7	49.0
O-18				12.0	45.7
O-17				14.2	43.5
⊙					
	0.89	47.88	10.70	46.99	
O-16				5.1	42.9
O-15				4.5	43.4
O-14				9.8	38.1
O-13				11.0	36.9
O-12				15.7	32.2
O-11				6.5	41.4
⊙					
			43.6	43.52	
⊙	1.17	44.69			
			11.65	33.04	
	2.30	35.34			
P-12				9.2	26.1
P-13				10.5	24.8
P-14				10.0	25.3
	4.86				
		26.71	✓		

3534

P-15	68	285
P-16	7.0	283
P-17	7.7	276
P-18	24	329
Q-19	35	31.8
R-19	10.0	253
S-20	9.0	263
R-20	30	323
T-20	82	27.1
Q-18	11.8	235
Q-12	104	249
R-12	65	288
S-12	69	28.4
T-12	61	29.2
U-12	75	27.8
V-12	87	26.6

6

309 2720

1123 24.11

V-13	74	19.8
U-13	57	21.5
T-13	73	19.9
S-13	8-2	19.0
R-13	86	18.6
Q-13	81	19.1
Q-14	13.1	14.1

309

1123 ✓

Q-15	27.20		12.9	14.3
Q-16			8.6	18.6
Q-17			9.0	18.2
R-18			6.7	20.5
S-19			10.8	16.4
0		11.59		
	35.6	19.17	15.61	
R-17			6.6	12.6
R-16			9.4	9.8
R-15			10.7	8.5
R-14			9.3	9.9
S-14			9.9	9.3
T-14			7.2	12.0
U-14			6.1	13.1
V-14			4.0	15.2
V-15			9.6	9.6
U-15			11.6	7.6
T-15			13.9	5.3
S-15			13.2	6.0
0		10.57	8.60	
	20.4	10.64		
S-16			6.4	1.2
S-17			2.4	7.7
S-18			-2.0	12.6
T-18			2.5	8.1
	560	2216		

1064

T-17
 T-16
 U-16
 U-17
 U-18
 V-18
 V-17
 V-16
 W-16
 W-17
 W-18
 W-19
 X-19
 X-18
 X-17
 0

64 4.2
 66 4.0
 81 2.5
 75 3.1
 31 7.5
 50 5.6
 58 4.8
 82 2.4
 71 3.5
 77 2.9
 66 4.0
 49 5.7
 100 0.6
 111 -0.5
 138 -3.2

527

15.19

0.72

9.92

T-19
 U-19
 V-19
 0

37 11.5
 41 11.1
 56 9.6

9.4

24.02

1.01

14.18

0

0.58

23.44

87

32.11

T-19, T-20, 6

9.5

22.6

23.78

2.31

3211

T-21	79	24.2
U-22	43	27.8
V-22	47	27.4
W-22	36	28.5
T-20, U-20,	137	18.4
U-20	152	16.9
U-21	11.4	20.7
Bm I	612 25.99 ✓	26.0
V-21	11.9	20.7

Bm B

0.85

7330

17245

K-1	29	168.4
L-1	4.8	168.5
M-1	53	168.0
N-1	50	168.3
O-1	17	171.6
P-1	5.0	168.3
Q-2	12.8	160.8
P-2	15.7	157.6
O-2	15.1	158.2
N-2	13.2	160.1
M-2	8.3	165.0
L-2	9.4	163.9

Continued 6-14-09

Wueste
Salisbury

		17330			
K-2				133	160.0
J-1				8.3	165.0
I-1					145.0
H-1				39	169.4
G-1				92	165.1
0			109.1	162.49	
F-1	4.75	16724		10.8	156.4
0			114.8	155.76	
	0.05	155.81			
E-1				52	158.6
D-1				76	149.2
C-1				79	147.9
B-1				142	141.6
A-1				149	140.9
0			0.05	155.76	
	9.64	16540			
K'-2				6.9	158.5
H-2, N-3, 4				9.1	156.3
H-2, G-2, 10				7.7	157.7
H-2, I-2, 11				12.8	152.6
0			9.64	155.76	
	0.05	155.81			
0			11.88	143.93	
	0.12	144.05			
	14.61	43.86			

du open cut
 floor of open cut
 = Transmittance J on Transmittance

	144.55			
E-2			4.3	139.8
F-2			4.4	139.7
D-2			5.3	139.8
C-2			12.6	131.5
B-2			13.6	130.5
A-2			15.9	128.2
G-3			8.6	135.5
F-3			8.6	136.5
H-3			10.5	133.6
o				
	9.16	48.39	38.2	140.23
H-3, H-2.17			5.8	142.6
J-3			9.2	139.2
K-3			7.6	140.8
L-3			2.2	146.2
o				
	4.93	151.68	1.64	146.75
m-3			1.6	150.1
n-3			4.9	146.8
O-3			8.7	143.0
P-3			10.8	140.9
Q-3			11.1	140.6
R-3			10.4	141.3
S-3			13.3	138.4
T-3			11.7	140.0
	13.09	546		

Not an open-cut dump at this date

Base of blocky rock crest of cam.
Edge of dump of open cut

U-3	151.68		123	139.4
o		11.90	139.78	
U-4	4.04	143.82		
T-4			17.0	126.8
S-4			16.2	127.6
o		11.22	132.60	
R-4	3.19	135.79		
Q-4			8.7	127.1
P-4			8.4	127.4
O-4			6.5	129.3
N-4			6.1	129.7
M-4			5.0	130.8
M-5			1.9	134.9
L-4			12.1	123.7
K-4			4.6	131.2
J-4			6.7	129.1
H-4			8.7	127.1
o			13.3	122.5
F-3	6.37	135.14	7.02	126.77
E-3			0.8	134.3
D-3			6.2	128.9
o			9.9	125.2
	4.02	129.21	9.95	125.19
	17.62	40.09		

edge camp of open cut

		129.21					
C-3					11.7	117.5	
B-3					15.2	114.0	
A-3					11.6	117.6	
F-4					6.2	123.0	
G-4					6.2	123.0	
G-4, H-4, I-4					8.6	120.6	
K-5					13.3	115.9	
L-5					8.7	120.5	
N-5					10.0	119.2	
			9.7	120.04			
J-5	17.2	121.76			5.7	116.1	
K-6					15.7	106.1	
M-6					10.3	111.5	
C-4					15.2	106.6	
B-4					13.8	108.0	
A-4					11.3	110.5	
D-4					11.2	110.6	
E-4					8.4	113.4	
F-5					11.8	110.0	
G-5					6.5	115.3	
H-5					11.1	110.7	
G-5, G-6, I					9.7	112.1	
0			10.53	111.23			
	130	112.53					
	3.02		14.50	✓			

Edge dump from open-cut

Edge dump from open-cut

	112.53			
I-6			102	102.3
J-6			9.6	102.9
K-6			77	104.8
o		1193	100.60	
	0.78	101.38		
M-6			63	95.1
F-6, F-5, 12			68	94.6
E-6	cup		92	92.2
G-6			98	91.6
a-6, G-5, 7			91	92.3
I-7			99	91.5
J-7			74	94.0
K-7			104	91.0
L-7			21	99.3
D-5			77	93.7
C-5			78	93.6
B-5			20	99.4
A-5			26	98.8
E-5			7.1	94.3
o		1164	89.74	
	1.85	91.59		
G-8			97	81.9
A-6			34	88.2
B-6			46	87.0
B-6, B-7, 5			68	84.8
	2.63	23.57		

Edge of dump from open - end

Edge of dump from open - end

c-6
Bm 11

91.59

6.10 85.49 ✓

20.8

70.8

75.50

Bms

8.57 105.79

97.21

H-23
G-24
G-26
G-27
H-25
H-26
J-24
J-25
K-23
L-23
M-23
N-23
N-22
O

9.2 96.6
6.2 99.2
9.3 96.5
6.3 99.5
4.3 101.5
8.0 97.8
5.2 100.6
1.5 104.3
13.1 92.7
10.4 95.4
6.0 99.8
6.2 99.6
7.7 98.1

10.88 116.08

0.58 105.20

L-24
K-24
J-26
K-25

6.3 109.8
9.0 107.1
2.7 113.4
2.3 113.8

1945

0.58 ✓

at base of purple limestone cliff

		116.08			
Om-24				36	112.5
K-24				50	111.1
o			0.37	115.71	
	9.85	125.56			
o			0.02	115.54	
	7.10	132.64			
L-25				7.5	125.1
Om-25				14	131.2
K-25				5.9	126.7
O-25				14.4	118.2
P-25				14.2	118.4
o			2.27	130.37	
	10.92	141.19			
P-26				7.8	133.4
O-26				8.7	132.5
M-26				1.6	139.6
Om-26				3.1	138.1
L-26				4.0	137.2
K-26				0.2	141.0
o			1.10	140.09	
	10.79	150.88			
o			1.78	149.10	
	10.26	159.36			
J-27, I-27, 13				9.8	149.6
J-27				5.4	154.0
	48.82		5.5A ✓		

Top edge of paper circle wall

	1593.6			
K-27			5.7	153.7
L-27			7.1	152.3
M-27			6.6	152.8
N-27			9.3	150.1
O-27			14.3	145.1
⊙		125	158.11	
	1164	169.35		
O-28			10.9	158.9
N-28			4.2	165.6
M-28			3.6	166.2
L-28			2.2	167.6
K-28			0.7	169.1
Bm A		058	169.17 ✓	169.07
	1035	179.52		
O-29			12.4	167.1
X-29			10.3	169.2
M-29			10.0	169.5
L-29			7.1	172.4
K-29			5.9	173.6
J-29			5.0	174.5
I-29			2.5	177.0
I-29; H-29, 7			0.5	179.0
J-28			4.4	175.1
J-28, I-28, 18			8.9	170.6
Bm A		1035	169.67 ✓	.07
	2199	1218 ✓		

Bm E			10939		
0-24	535	114.74		82	106.5
o			1171	103.03	
0-23	122	104.25		11.1	93.2
P-24				1.7	102.6
o			1079	93.46	
0-22	0728	93.74		9.6	84.1
P-23				5.9	87.8
o			1188	81.86	
P-22	010	81.96		52	76.8
0-21				87	73.3
o			1165	70.31	
o	113	71.44			
			1112	60.32	
P-20	055	60.87		92	51.7
Q-21				8.1	52.8
Q-21, P-21, 7				-06	61.5
R-21, S-21, 10				2.2	58.7
R-21				127	48.2
o			1190	48.97	
	074	49.21			

Elevation of L-23 7-4-09
West
Salisbury

Bm S		97.21
	6.86	104.07
	10.87	93.20
	0.86	94.06
	11.66	82.40
	3.19	85.59
L-21		126 73.0
	4.60	80.99
Bm F	11.66	92.65
	2.96	89.69
		89.71

	4921			
Q-20			82	41.0
P-19			78	40.4
R-21, R-20, 2			108	38.4
S-21			13.0	36.2
S-21, S-22, 2			113	37.9
R-21, S-21, 10	(i'offsur N)		148	34.4
0		027		
	1075 5969			
M-13			57	54.0
M-10			-15	61.2
N-10			-05	60.2
D-10			63	53.4
P-10			75	52.2
Q-10			73	52.4
R-10			49	54.8
0		1144		
	135 4960			
P-11			113	39.3
Q-11			117	37.9
R-11			95	40.1
R-11			94	40.2
T-11			89	40.7
0		133		
	032 4859			
W-23			75	41.1

	48.59		11.3	37.3
V-23			21.0	27.6
V-23, U-23, 10			11.6	37.0
U-23			2.7	45.9
T-22			2.1	46.5
T-23			1.8	46.1
T-23, T-24, 4			7.5	41.1
U-23-U-24, 12				
0		0.95	47.64	
	10.97	58.11		
V-24			7.0	51.1
0		0.31	57.80	
	9.52	67.32		
S-22			4.7	62.6
S-22, S-23, 13			3.6	63.7
S-22, S-21, 14			6.1	61.2
T-22, T-21, 6			12.6	54.7
		0.80	66.52	
	10.73	77.25		
S-23			1.9	75.4
T-24			0.5	76.8
U-24			7.7	69.6
W-24			22.6	54.7
X-25			15.2	62.1
V-25			9.6	67.7
	11.22	86.17	23.0	74.95

86.7

U-25		6.7	79.5
S-24		0.5	86.7
Q-23		4.5	81.7
R-28		6.2	80.0
	0.98	85.19	
	11.79	96.98	
R-24		5.8	91.2
Q-24		1.5	98.5
BmF		7.17	89.81 ✓
			89.71

Bms	1185	109.06	9721		
4-28				18	107.3
0	1006	11739	1.73	107.33	
A-25				2.9	114.5
C-28				-1.4	118.8
E-29				9.2	108.2
F-29				1.7	115.7
G-28				1.2	116.3
B-27				0.0	117.4
0			0.34	117.05	
	1099	128.04			
B-28				-2.5	130.5
G-29				3.3	124.7
H-29				-0.9	128.9
0			0.33	127.71	
	1144	139.15			
A-29				4.0	135.2
H-29, 4-30, 12				4.2	135.0
0			11.22	127.93	
	0.53	128.46			
0			11.49	116.97	
	8.9	125.56			
			9.85	115.71	✓
	53.46				
		34.96	✓		

June 15 09

W. Weste
Salsbury

at base perpendicular wall

at base of wall

at base perpendicular wall
in corner at base of 2 walls.

= 1st I.P. page

Bm R			38.49		
B-18	1.15	39.64		6.7	32.9
o			0.50	39.14	
C-20	10.46	49.60		8.3	41.3
C-21				2.6	47.0
o			1.59	48.01	
o	11.03	59.04			
o			0.49	58.55	
a-27	11.32	69.87		9.9	60.0
o			0.36	69.51	
o	11.20	80.71			
o			0.64	80.07	
o	11.28	91.35			
o			1.50	89.85	
a-23	9.28	99.13		5.4	93.7
Bms			1.88	97.25 ✓	(97.21)

June 15th 09
Wueste
Salisbury

Bm N					
				85.50	
	9.35	94.85			
				6.96	93.89
				5.75	99.64
M-7					(-1.0) 100.6
N-7					6.8 92.8
O-7					7.5 93.1
P-7					8.3 91.3
				1.00	98.64
	12.08	110.72			
Q-6					6.6 104.1
P-6					6.5 104.2
O-6					6.3 104.4
N-6					6.3 104.4
	11.62	121.89	0.45	110.27	
O-5					5.9 116.0
P-5					6.4 115.5
	12.04	133.68	0.75	131.64	
	11.47	145.05	0.60	133.08	
	3.38	147.39	1.04	144.01	
a-2				0.5	146.9
Bmt				9.63	137.73 ✓

58

Levels on x-sections near Town Hall

6-15-09

Wueste
Salisbury

Bm R

068 39.17

38.49

B-16

7.2

32.0

A-16

6.9

32.3

A-15

7.1

32.1

A-14

6.4

32.8

B-15

6.7

32.5

B-14

6.5

32.7

B-13

5.8

33.4

A-13

5.7

33.5

B-12

6.0

33.2

A-12

5.6

33.6

A-11

5.7

33.5

B-11

6.0

33.2

a

064 38.53

975 41.28

A-10

15.0

33.3

A-9

4.0

44.3

o

153 46.75

1135 58.10

A-8

2.9

55.2

o

1.44 56.66

11.88 68.54

A-8, A-7, 14

6.2

62.3

o

0.72 67.82

1.47 78.99

A-7

6.5

72.5

Bm

874 70.25

(70.22)

Results of Levels.

Pins for Dam Center line.

South side		North side	
A		B	
C		K	
D		L	
E		M	
F		N	
G		O	
H		P	
I		Q	
J			
R			
S			

Sounding Pins

	South side		North side
1	156.59	25	176.97
2	230.90	26	189.06
3	324.34	27	249.05
4	372.01	28	257.77
5	304.17	29	311.39
6	302.65	30	350.04
7	277.16	31	146.53
8	275.59		
9	117.58		
10	178.92		
11	59.87		
12	260.21		
13	306.33		
14	210.71		
15	293.56		

Boat's lower bend	162 ±
Top 6,000 gal Res.	226.8
Top 23,000 gal Res.	373.1
Track grade South bench	299.7
Top sta head town	372.5
Top sta tail town	384.8
Top movable head town	344.6
Top movable tail town	361.6
Top of wall ward spring	292.1

560.

Transfer of Elev at Green Cottage
to Oak Tree 25' north of Porch

Bm Green Cottage 3065.694
3.21 3068.904

Spike in Oak Tree 4.43 3064.474 ✓

8-20-09
Wueste, Simons

See page 16

Transferring & Replacing Small Concrete
Bms

Bm P	5.05	44.145	39.09	
Bm P'		0.54	43.605	
Bm D	12.49 0.96	132.23	131.27	
		11.63	120.60	61
Bm E'	1.44	122.04	114.38	40
	0.64	115.02	7.66	
		11.08	103.94	97
Bm S'	2.38	106.32	100.25	29
	3.03	103.28	6.07	
	20.4	95.40	9.92	41
Bm F		5.15	90.25	31
			93.36	

Bm G	0.33	62.30	61.97
		10.68	51.62
	0.12	51.74	
Bm H'		5.76	45.98 <u>99</u>
	0.15	46.13	
		11.94	34.19
	1.01	35.20	
		8.57	26.63 <u>65</u>
	1.61		36.95

See page 11

903) See page 10

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

FOR SINGLE TRACK EMBANKMENT.

ROADWAY 14 FEET WIDE. SIDE SLOPES $1\frac{1}{2}$ TO 1.

	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.

7336
 186
 9520
 495
 90

4225
 3909
 4511
 952
 14015

2882
 113
 3065

4985
 4815
 470