W
383

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

Roadway 16 feet wide. Side Slopes 1 on 1.

For Single Track Embankment.

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
0	8.0	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	0
1	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	1
2	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	2
3	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	3
4	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	4
5	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	5
6	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	6
7	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	7
8	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	8
9	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	9
10	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	10
11	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	11
12	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	12
13	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	13
14	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	14
15	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	15
16	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	16
17	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	17
18	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	18
19	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	19
20	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	20
21	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	21
22	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	22
23	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	23
24	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	24
25	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	25
26	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	26
27	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	27
28	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	28
29	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	29
30	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	30
31	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	31
32	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	32
33	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	33
34	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	34
35	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	35
36	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	36
37	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	37
38	46.0	46.1	46.2	46.3	46.4	46.5	46.6	46.7	46.8	46.9	38
39	47.0	47.1	47.2	47.3	47.4	47.5	47.6	47.7	47.8	47.9	39
40	48.0	48.1	48.2	48.3	48.4	48.5	48.6	48.7	48.8	48.9	40

MICROFILMED

Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 30.6. For same slopes but other widths of roadbed, correct above figures by one-half difference in width of roadbed; thus in example above, for 20 ft. roadbed distance will be 30.6+(20—16)÷2 or 2 ft. added to 30.6 =32.6. For slopes of 1 on 1½ see inside of back cover.

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537
4.6
532.4

W. H Simpson
El Capitan Dam
S. D. W. D.

5020
5050

N 3752 = Elev. 535
Elev. 537

N 3776 = Elev 537.
Elev 532

N 3810 = Elev 531

0 - 1.09
1 - 1.50
2 - 1.86
3 - 2.17
4 - 2.44
5 - 2.67
6 - 2.86
7 - 3.01
8 - 3.11
9 - 3.18
10 - 3.21
11 - "
12 - "
13 - "

2.22

INDEX

26 Stripping Stakes under Rock Emb. Dec. 22, 1932

30 Tunnel Grades - 10+39$\frac{2}{}$ to 11+13$\frac{7}{}$

77 Elevs. of start of batter at upstream toe wall

Profile of Core Wall
Oct 6 - 1932

Final Elevations

B.M.	+0.37	539.76		539.39
T.P. "A"			-12.98	526.78
T.P. "B"	-19.31	510.83	-9.62	530.14
3640			7.9	502.9
3630			8.0	502.8
3620			8.0	502.8
3610			8.3	502.5
3600			8.7	502.1
3590			9.1	501.7
3580			9.1	501.7
3570			9.4	501.4
3560			9.8	501.0
3550			10.0	500.8
3540			10.3	500.5
3530			9.8	501.0
3520			9.2	501.6

Core Wall Trench
Oct. 6, 1932 Final Profile Cont'

		510.83 ✓		
3510			9.0	501.8 ✓
3500			8.9	501.9 ✓
3490			8.5	502.3 ✓
3480			7.6	503.2 ✓
~~3470~~			7.1	503.7
		Oct 7 - 1932		
T.P. "B"	-19.13	511.01 ✓		530.14 ✓
3650			8.8	502.2 ✓
3660			8.4	502.6 ✓
		Oct. 13. 1932		
T.P. "B"	-19.45	510.69 ✓		530.14 ✓
3670			8.4	02.3 ✓
3680			8.0	02.7 ✓
3690			7.7	03.0 ✓
3700			6.3	04.4 ✓
3710			4.6	06.1 ✓
3720			2.3	08.4 ✓

Core Wall Trench Final Profile Cont.'

Oct. 13, 1932

		510.69		
N 3730			0.8	509.9 ✓
T.P.	9.25	519.36 ✓	0.58	510.11 ✓
3740			7.1	12.3 ✓
3750			4.4	15.0 ✓
3760			2.6	516.8 ✓

Nov. 1, 1932

3480			503.2
3470	↑ vertical		503.4
3470	↓		511.6
3460			513.4
3455			515.4
3450			515.4
3440			517.2
3436			518.4
3430			522.5
3420			524.4
3410			526.1
3400			527.3

Core Trench Final Profile Cont.'

Nov. 1, 1932

3390		529.0
3390	↑ vertical ↓	532.0
3385		532.6

Core Trench Final Profile
Cont.

Nov. 4, 1932

B.M.	12.12	551.51		539.39
	9.80	560.50	0.81	550.70
N 3375			12.0	48.5
3370			11.3	49.2
3365			7.8	52.7
3360			6.3	54.2
3350			4.3	56.2
3340			0.9	59.6
3334			+3.1	63.6

See F.B. 395-59

Feb. 25, 1933

B.M.	4.32	584.22		579.90
N 3317			13.6	70.6
3310			14.2	70.0
3303			14.2	70.0
3295			13.3	70.9
3290			9.2	75.0
3289			3.7	80.5
3276			1.2	83.0
3275			+7.3	91.5

Mar 16 – 1933

Elliott Simpson Soper Trenwith

B.M.	1.96	610.15		608.19
T.P.	5.82	603.26	12.71	597.44
3276			13.5	589.8
3268			12.1	91.2
3263			11.9	91.4
3255			7.2	96.1
3250			4.5	98.8
3245			4.3	99.0
3232			2.0	601.3
3231			+16.7	20.0

Completed 3/17/33
F.O.

Final Profile
Core Wall - Mar 3 - 1933

B.M.	9.60	590.12 ✓		580.52
3838			18.5	71.6 ✓
3846			17.1	73.0 ✓
3855			12.2	77.9 ✓
3863			10.3	79.8 ✓
3869			4.6	85.5 ✓
3878			3.5	86.6 ✓
3889			2.3	87.8 ✓
3891			1.3	88.8 ✓
3900			+0.6	90.7 ✓

Core wall Points on Conc.
for elev. of start of steel

Oct. 17, 1932

B.M.	0.77	533.83 (583)		533.06
3564			11.77	522.06	C-0 06
3556			11.78	522.05	C-0 05
3548			11.75	522.08	C-0 08
3540			11.75	522.08	C-0 08
3532			11.84	521.99	F-0 01
3524			11.78	522.05	C-0 05
3516			11.80	522.03	C-0 03
3508			11.78	522.05	C-0 05
3500			11.80	522.03	C-0 03
3492			11.82	522.01	C-0 01
3484			11.84	521.99	F-0 01

Core Wall Trench Profile
And Elevs. on side bank.

Oct. 31, 1932

B.M	0.24	533.30	533.06	
	-2.94	523.97	6.39 526.91	
N 3470 ℄			12.4 511.6	
			7.73 516.24	= Rod Head in East Bank N 3470
N 3460 ℄			10.4 513.6	
			4.42 519.55	" " " " " N 3460
N 3450 ℄			8.4 515.6	
			4.17 519.80	" " " " " N 3450
N 3440 ℄			4.8 519.2	
			+1.03 525.00	" " " " " N 3440
N 3430 ℄			1.2 522.8	
			+0.92 524.89	" " " " "
T.P.			+2.94 526.91	
	+4.44	531.35		
			524.5	
N.3420 ℄			6.9 517.1	
			3.70 527.65	" " " " "

Cont'd on page-13

Downstream Toe Wall. Neat Line points for Trench.

Sept. 21, 1932

					Grades for Bottom of Trench.
B.M.	0.73	588.13		587.40	
0-25	Downstream		14.4	573.7	560.0
0-25	upstream		12.6	575.5	560.0
0-30	Downstream		13.8	574.3	560.0
0-30	upstream		12.7	575.4	560.0

Sept. 24, 1932

B.M.	9.78	581.30		571.52	
0-30			14.0	567.3	565.0
0-60		upstr.	1.7	79.6	
		Dnstr.	1.6	79.7	565.0

Grades for Calc. Neat Line widths	upstream ℄	downstream
560.0		C. 13 7/7 0
560.0	C. 15 5/2 0	
563.0		C. 14 3/6 0
563.0	C. 15 1/2 0	

4° Neat Line Trench from 0-30 To 0-60

C. 2 3/3 Spike in Bank

C. 14 6/6

C. 14 7/7

Downstream Toe Wall Trench
Final x Sections

Sept. 23, 1932

B.M.	8.01	579.53		571.52
0-30	Top D.G. upstr.		10:5	69.0
0-30	" " Dn.str.		11.2	68.3

Sept. 28, 1932

B.M.	8.99	570.98		561.99
0-40	Top D.G. upstr.		+1.4	72.4
"	" " Dn.str.		0.6	70.4
0-50	" " upstr.		+3.6	74.6
"	" " Dn.str.		+2.0	73.0
0-60	" " upstr.		+5.0	76.0
"	" " Dnstr.		+5.0	76.0

= Top D.G.

End Trench

Core Wall Trench Elevs.
For monthly estimate

Sept. 26, 1932

N 346.5				528.4
3470				505.0
3500				504.3
3530				504.0
3560				504.7
3590				506.0
3620				507.0
3650				507.4 X
3670				513.0
3700				516.5
3730				522.0
3760				531.3
3770				540.3

Top Core Wall Trench at South end

Bottom " " " " " "

Bottom Trench

" "

" "

" "

" "

" "

" "

" "

" "

" "

Top Trench North end

~~Oct. 13, 1932~~

B.M.	0.49	539.88		539.39
T.P.	4.06	533.76	10.18	529.70
T.P. 'B'			3.64	530.12

See page 3

Oct. 31, 1932 — Core wall Trench Profile and Elevs. on side of bank.

		531.35 ✓		
N 3410 ℄			5.2	526.2 ✓
			1.28	530.07 ✓ Red Head in East bank N 3410
N 3400 ℄			4.0	527.4 ✓
			0.67	530.68 ✓ " " " " " " N 3400
N 3390 ℄			1.3	530.1 ✓
			+3.30	534.65 ✓ " " " " " " N 3390
N 3385 ℄			+1.6	533.0 ✓ = end of supposedly finished Trench.
B.M.	12.47	551.86 ✓		539.39
	13.11	563.45 ✓	1.52	550.34 ✓
N 3375			14.0	549.4 ✓
N 3370			12.2	551.2 ✓
			6.69	556.76 ✓ Red Head in east bank N 3370
N 3350			5.2	558.2 ✓
			3.15	560.30 ✓ " " " " " " N 3350
N 3340			2.7	560.7 ✓
			0.15	563.30 ✓ " " " " " " N 3340
N 3320			+17.5	580.9 ✓ South end of trench at bottom

cont. from page 9

Original Profile of N. end Core Wall
Oct 31-1932

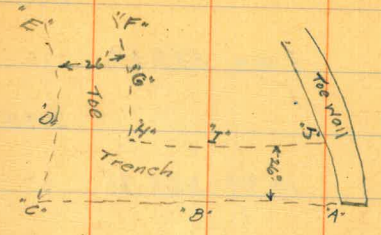
B. M.	6.83	546.22 ✓		539.39	
T. P.	11.46	555.93 ✓	1.75	544.47	✓ nn
N 3780			13.6	42.3	✓ ← This Elev used as top of 6' Neat line trench
3790			6.2	49.7	✓
T. P.	10.74	566.32 ✓	0.35	555.58	✓
3800			6.9	59.4	✓
T. P.	12.69	578.70 ✓	0.31	566.01	✓
3810			8.8	69.9	✓
T. P.	8.64	585.32 ✓	2.02	576.68	✓
3820			9.3	76.0	✓
3825			6.6	78.7	✓ Edge Road
3830			6.1	79.7	✓
3840			5.7	79.6	✓ Edge Road
3845			0.0	85.3	✓

0.31

Rock Fill Toe Trench, South Side, Downstream

Oct. 5, 1932

B.M.	1.03	550.35		549.32	
"A"			7.7	42.7	c-10^{2}
"B"			7.6	42.8	c-10^{8}
"C"			5.9	44.5	c-12^{5}
"D"			8.1	42.4	c-10^{3}
"E"			8.5	41.9	c-9^{9}
"F"			11.5	38.9	c-6^{9}
"G"			10.6	39.8	c-7^{8}
"H"			10.2	40.2	c-8^{2}
"I"			9.6	40.8	c-8^{8}
"J"			8.0	42.4	c-10^{4}



Nov. 21, 1932

B.M.	12.26	551.65		539.39	
			1.93	549.72	
	8.45	558.17			
			3.25	554.92	
	10.39	565.31			
			0.56	564.75	
	10.48	575.23			

Nov. 22, 1932

B.M.	13.06	546.12		533.06	
N 3770			10.72	535.40	Red Head in East Bank of Trench
3780			8.59	537.53	" " " " " " " "
T.P.	3.84	549.65	0.31	545.81	
3790			12.3	537.3	" " " " " " " "
3800			3.55	546.10	Cross on Rock
3810			+3.1	52.7	
T.P.	12.23	561.10	0.78	548.87	
3820			+2.23	563.33	on ℄ Red Head in cross timber
T.P.			2.15	558.95	

	11.39	570.34		558.95	
N 3830			+0.28	570.62	Red Head in East Bank of Trench
3835			+8.17	578.51	" " on & in cross timber
T.P.	2.86	579.73	+6.53	576.87	
B.M.			4.66	575.07	= check on B.M. N. end Dnstr. Toe Wall 575.05

Footing Grades Entrance Portal Structure

Oct. 26, 1932

				Top conc. Footing.	
B.M.	6.07	568.38	562.31		
		North Side			
0-47 "A"		6.38	562.00	562.00	
0-41 "A"		6.40	61.98	61.98	
0-30 "A"		6.44	61.94	61.94	
0-20 "A"		6.50	61.88	61.88	
0-10 "A"		6.61	61.77	61.77	
0+00 "A"		6.80	61.58	61.58	
0+00 "B"		10.29	558.09	62.34 61.84	F-4 25 F-3 75
0-10 "B"		8.92	59.46	61.90 62.40	F-2 44 F-2 94
0-20 "B"		8.62	59.76	61.97 62.44	F-2 18 F-2 68
0-30 "B"		8.35	60.03	61.97 62.47	F-1 94 F-2 44
0-41 "B"		7.92	60.46	61.98 62.48	F-1 52 F-2 02
0-47 "B"		6.19	62.19	62.00 62.50	C-0 19 F-0 31
0-47 "C"		6.16	62.22	62.50	F-0 28
0-41 "C"		7.88	60.50	62.50	F 2 00
0-30 "C"		8.28	60.10	62.50	F 2 40
0-20 "C"		8.62	59.76	62.50	F-2 74

61 38
62 21
8 17

Ent. Portal Structure
Footing Grades cont'

Oct. 26, 1932	568.38			Top conc. Footing.	
0-10 "C"		8.90	559.48	562.50	F-3 02
0+00 "C"		10.60	58.78	562.50	F-4 72
0+00 "D"		10.05	58.33	563.00	F-4 67
0-10 "D"		8.86	59.52	563.00	F-3 48
0-20 "D"		8.59	59.79	563.00	F-3 21
0-30 "D"		8.21	60.17	563.00	F-2 83
0-41 "D"		7.57	60.81	563.00	F-2 19
0-47 "D"		6.16	62.22	563.00	F-0 78

Profile of Core Wall
Nov. 29-1932

N.3839	580.0	
3835	567.6	
3826	560.9	
3824	551.0	
3813	544.0	
3809	531.8	} Muck
3795	518.0	
3780	517.7	
3770	517.8	
3762 5	517.3	Sump
3762 5	531.8	Concrete

578.5
29.6
548.9

Elliott
Soper
Remmen
Dec 1 - 1932

Profile of Core Wall
For Nov - 1932 - Estimate

Good For Finals if No More Exc. After Dec 1

B.M.	9.13	542.19 ✓		533.06	
N 3762 E			10.3	531.9 ✓	Top of Cong.
N 3762 E			24.9	517.3 ✓	
3770			24.5	517.7 ✓	
3780			24.5	517.7 ✓	
3790			24.2	518.0 ✓	
3800			22.8	519.4 ✓	
3804			15.0	527.2 ✓	
3809			13.0	529.2 ✓	
3811			9.2	533.0 ✓	
3815			8.0	534.2 ✓	
3822			+0.4	542.6 ✓	
T.P.	13.54	555.71 ✓	0.02	542.17 ✓	
3823			5.1	550.6 ✓	
3825			4.4	551.3 ✓	
T.P.	+27.81	583.52 ✓	0.00	555.71 ✓	

Continued on Next Page

Profile Continued

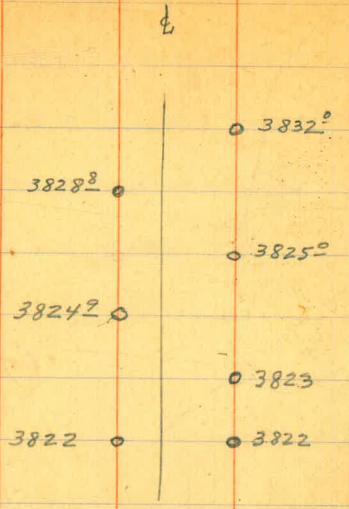
583.52

N3825	24.8	558.7		
N3837	14.9	568.6		
	4.9	578.6	578.5	Check on ℄ stake
N3837	3.5	580.0	→	Back to 6.

Typical Sections of Rock Emb.
Dec 17 - 1932

N3760	N3800	N3840
E 5145 = 549.4	E 5150 = 553.7	E 5155 = 556.4
E 5244 = 625.7	E 5244 = 626.9	E 5245 = 627.1
E 5314 = 625.9	E 5317 = 626.4	E 5320 = 626.1
E 5375 = 581.0	E 5377 = 582.3	E 5375 = 582.8

Grout Holes-Core Wall - Dec 20-1932
Five Feet Apart on Slope



35.8
7
28.8

Toe of Upstream Rock Using New Slope of 1.32 to 1 from Elev. 625 at E. 5232

Dec 20 - 1932

T.P. 585.02 + 12.98 = 672.04

B.M.	6.27	584.77		578.5	
T.P. N 3890 E 5172	6.72	585.02	6.47	578.30	
			5.1	579.9	Toe of Slope — Rock Placed to E 5190
	12.58	596.86	0.74	584.28	
N 3920 E 5203	12.41	609.15	0.12	596.74	
N 3960 E 5213			6.2	603.0	Toe of Slope — Rock Placed to E 5214
			+2.1	611.3	Toe of Slope — Rock Placed to E 5222
B.M.	0.66	572.70		572.04	
T.P. N 3840 E 5143	0.56	560.37	12.89	559.81	
			2.4	558.0	Toe of Slope — Rock Placed to E 5152
T.P. N 3740 E 5131.3	2.03	554.45	7.95	552.42	
N 3640 E 5127			5.8	548.7	Toe of Slope — Rock Placed to E 5143
N 3540 E 5131			8.7	545.8	Toe of Slope — Rock Placed to E 5146
N 3460 E 5134			5.4	549.0	Toe of slope — Rock Place to E 5150
			3.2	551.2	Toe of slope — No Rock Placed
Check			3.04	551.41	Record 551.43

Stakes for stripping under rock embankment using slope of 1.32 to 1

Dec 22-1932

South Abutment

B.M.	0.26	630.26		630.00	
N3264 E5232			5.3	625.0	Bottom of rock
N3280 E.5228			8.3	622.0	Bottom of rock
N3300 E5223.8			11.5	618.8	Bottom of rock
T.P.	0.09	617.81	12.54	617.72	
N3320 E5208			10.4	607.4	Bottom of rock
T.P.	0.71	605.61	12.91	604.90	
N3340 E5196			7.4	598.21	Bottom of rock
N3360 E5192			10.5	595.1	Bottom of rock
T.P.	0.51	593.59	12.53	593.08	
N3380 E5176			10.8	582.8	Bottom of rock
N3400 E5174			12.5	581.1	Bottom of rock
T.P.	1.84	584.20	11.23	582.36	
Toe Wall			9.12	575.08	575 ± Check

NOV. 10, 1932

				Middle Seg. Grade	to Top Segment Grade.	Grade over Segment.	Spring Line Grade
B.M.	3.01	550.01		547.00			
11+13 7			+12.73			562.74	
+10 6			+12.79			62.80	
+04 6			+12.85			62.90	
10+98 6			+12.99			63.00	
+92 5			+13.09			63.10	
+86 5			+13.19			63.20	
+80 5			+13.29		569.88	63.30	

Nov. 11, 1932

	3.50	550.50		547.00			
				+17.72	+19.41	+12.90	+6.31
10+74 5				568.22	569.98	63.40	56.81
					73.17		
					1.51		
+68 5				68.32	570.08	63.50	56.91
+62 3				68.42	570.18	63.60	57.01
				+18.02	+19.71	+13.20	+6.61
+56 3				68.52	570.28	63.70	57.11
+50 3				68.63	570.39	63.81	57.22
+45 2				68.71	570.47	63.89	57.30
				+18.31	+20.07	+13.49	+6.90
+39 2				68.81	570.57	63.99	57.40

56857
1317
55540 = S.L. 11+58 8

55601 = S.L. 11+22 6

56.81 = 10+74 5

3.4	550.45		547.00
		4.28	546.17
	560 1		
4.35	550.52		
	5.49		

B.M.	3.56	550.56		547.00
	5.14	554.76	0.94	549.62
T.P.			2.95	551.81
Angle Pt.			5.08	549.68
7+80			4.79	549.97

Dec. 6, 1932.

B.M.	9.80	542.86		533.06
N 3560 E 5020			7.1	33.8
3560 5050			7.5	35.4
3500 5020			10.3	32.6
3500 5050			8.5	34.4
3470 5020			10.9	32.0
3470 5050			4.2	38.7
T.P.	11.27	553.61	0.52	542.34
3440 5020			6.7	46.9
3440 5050			7.4	46.2
3410 5020			5.4	548.2
3420 5050			7.8	45.8
T.P.	12.14	563.58	2.17	551.44
3395 5020			7.1	56.5
3400 5050			6.1	57.5
T.P.	12.12	574.37	1.33	562.25
3385 5020			5.4	69.0

		574.37			
3394 5050			5.2	569.2	
3355 5020			3.7	70.7	
3355 5050			3.6	70.8	
T.P.	10.68	584.63	0.42	573.95	
T.P.	9.48	593.29	0.82	583.81	
3340 5020			6.8	86.5	
3335 5050			6.2	87.1	
3320 5020			5.8	87.5	
3320 5050			5.2	88.1	
3315 5020			O.G.		
3315 5050			O.G.		
		Section of E 5200			
3375 5200			0.8	92.5	O.G.
3388 5200			11.7	81.6	
3421 5200			13.5	79.8	
T.P.	1.78	582.78	12.29	581.00	
T.P.			13.08	569.70	

	1.56	571.26		569.70
3424 5200			3.2	68.1
3445 5200			3.2	68.1
3455 5200			12.9	58.4
3480 5200			18.1	53.2
3500 5200	in Rock Emb.			
T.P.	1.53	559.99	12.80	558.46
			8.54	551.45 = T.P. 551.43.

B.M.	12.28	614.28		602.00
T.P.	5.68	618.78	1.18	613.10

upstream Toe Wall Elev's. of Start of Batter.

Sept. 17, 1932

B.M.	9.16	568.00		558.84	
0+15 - 0+30			4.8	563.2	= El. of Start of Batter
0+30 - 0+50			9.9	558.1	" " " " "
T.P.	0.37	559.21	9.16	558.84	
0+50 - 0+80			6.2	553.0	" " " " "
0+80 - 1+20			10.1	549.1	" " " " "
1+20 - 1+70			13.1	546.1	" " " " "
T.P.	3.73	549.89	13.05	546.16	
1+70 - 2+20			6.8	543.1	" " " " "
2+20 - 3+73			7.9	540.0	" " " " "
3+73			8.5	541.4	" " " " "
4+00			4.7	545.2	" " " " "
4+00 - 4+16			0.9	549.0	" " " " "
T.P.	12.28	561.28	0.89	549.00	
4+16 - 4+30			3.6	557.7	" " " " "
T.P.	12.49	572.80	0.97	560.31	
4+30 - 4+50			10.1	562.7	" " " " "

cont'd on next page

572.80

4+50 - 4+65	5.3	567.5	= El. of	Start of Batter
4+65 - 4+75	0.6	572.2	" "	" " "
4+75 - 4+85	4' vertical Trench.			

Nov. 19, 1932 P.M.

B.M. 0.87	597.56	596.69		
Set B.M.	9.46	588.10	Red Head	in west end of South Retaining Wall at Entrance Portal structure
Set B.M.	9.16	588.40	Red Head	in west end of North Retaining Wall at Entrance Portal Structure.

B.M. 2.75 549.75 547.00

Nov. 9, 1932

11+72 77		568.34
11+53	+18.92	568.67
+50	+18.97	568.72
+47 2	+19.02	568.77
+40 8	+19.12	568.87
+34 7	+19.23	568.98
+28 7	+19.33	569.08
+22 6	+19.43	569.18
+16 6	+19.53	569.28
+13 7	+19.57	569.32
	+17.98	

3.91 550.91 547.00

Nov. 10, 1932

	+19.80	
11 +10 6	+18.47	569.38
+04 6	19.90	
	+18.57	569.48
10 +98 6	+18.67	569.58
+92 5	+18.77	569.68
+86 5	+18.87	569.78
+80 5	+18.97	569.88

cont. on page 30

Floor slab grades at Exit Portal Structure

79

Nov. 5, 1932

B.M. 1.34 550.66 549.32

8.79 541.87

7.34 546.21

0 +00 Portal	3.54	542.67
+10	3.71	42.50
+20	3.88	42.33
+30	4.04	42.17
+40	4.21	42.00

2.58 549.58 547.00

+18.04	
18.14	
+16.81	
+16.91	
+17.01	
+17.11	
+17.21	

1667
88
13336
13336
146696

B.M.	1.13	540.52		539.39	
B.M.			7.46	533.06	Set B.M. on Boulder East Side of Core Trench
	0.79	533.85			
	0.29	549.61		549.32	
B.M.	0.68	550.00		549.32	
			8.72	541.28	
			8.56	41.44	
			8.29	41.61	
			8.31	41.69	
			8.33	41.67	
			8.48	41.52	

0+15.8 = 574.40
0+58.1 = 573.69

533.06
2.72
535.78

539.39
8.14
547.53

39.39
8.22
47.61
11.77
35.84
9.41
45.25
35.84
9.43
45.27

562.31 D.M. 0-50
Ent. Tunnel Portal (Typ)

Calculation of Earthwork.

Width	HEIGHT														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	.02	.04	.06	.07	.09	.11	.13	.15	.17	.18	.20	.22	.24	.26	.28
2	.04	.07	.11	.15	.18	.22	.26	.30	.33	.37	.41	.44	.48	.52	.56
3	.06	.11	.17	.22	.28	.33	.39	.44	.50	.56	.61	.67	.72	.78	.83
4	.07	.15	.22	.30	.37	.44	.52	.59	.67	.74	.81	.89	.96	1.04	1.11
5	.09	.19	.28	.37	.46	.56	.65	.74	.83	.93	1.02	1.11	1.20	1.30	1.39
6	.11	.22	.33	.44	.56	.67	.78	.89	1.00	1.11	1.22	1.33	1.44	1.55	1.67
7	.13	.26	.39	.52	.65	.78	.91	1.04	1.16	1.30	1.42	1.55	1.68	1.81	1.94
8	.15	.30	.44	.59	.74	.89	1.04	1.19	1.33	1.48	1.63	1.78	1.92	2.08	2.22
9	.17	.33	.50	.67	.83	1.00	1.17	1.33	1.50	1.67	1.83	2.00	2.17	2.33	2.50
10	.18	.37	.56	.74	.93	1.11	1.30	1.48	1.67	1.85	2.04	2.22	2.41	2.59	2.78
11	.20	.41	.61	.82	1.02	1.22	1.43	1.63	1.83	2.04	2.24	2.44	2.65	2.85	3.06
12	.22	.44	.67	.89	1.11	1.33	1.56	1.78	2.00	2.22	2.44	2.67	2.89	3.11	3.33
13	.24	.48	.72	.96	1.20	1.44	1.68	1.92	2.16	2.41	2.65	2.89	3.13	3.37	3.61
14	.26	.52	.78	1.04	1.30	1.55	1.81	2.08	2.33	2.59	2.85	3.11	3.37	3.63	3.89
15	.28	.56	.83	1.11	1.39	1.67	1.94	2.22	2.50	2.78	3.06	3.33	3.61	3.89	4.17
16	.30	.59	.89	1.18	1.48	1.78	2.07	2.37	2.67	2.96	3.26	3.56	3.85	4.15	4.44
17	.31	.63	.94	1.26	1.57	1.89	2.20	2.52	2.83	3.15	3.46	3.78	4.09	4.41	4.72
18	.33	.67	1.00	1.33	1.67	2.00	2.33	2.67	3.00	3.33	3.67	4.00	4.33	4.67	5.00
19	.35	.70	1.06	1.41	1.76	2.11	2.46	2.82	3.17	3.52	3.87	4.22	4.57	4.92	5.28
20	.37	.74	1.11	1.48	1.85	2.22	2.59	2.96	3.33	3.70	4.07	4.44	4.81	5.18	5.56
21	.39	.78	1.17	1.55	1.94	2.33	2.72	3.11	3.50	3.89	4.28	4.67	5.06	5.44	5.83
22	.41	.81	1.22	1.63	2.04	2.44	2.85	3.26	3.67	4.07	4.48	4.89	5.30	5.70	6.11
23	.43	.85	1.28	1.70	2.13	2.56	2.98	3.41	3.83	4.26	4.68	5.11	5.54	5.96	6.39
24	.44	.89	1.33	1.78	2.22	2.67	3.11	3.56	4.00	4.44	4.89	5.33	5.78	6.22	6.67
25	.46	.92	1.39	1.85	2.31	2.78	3.24	3.70	4.17	4.63	5.09	5.56	6.02	6.48	6.94
26	.48	.96	1.44	1.92	2.41	2.89	3.37	3.85	4.33	4.82	5.30	5.78	6.26	6.74	7.24
27	.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50
28	.52	1.04	1.55	2.07	2.59	3.11	3.63	4.15	4.67	5.18	5.70	6.22	6.74	7.26	7.78
29	.54	1.07	1.61	2.15	2.68	3.22	3.76	4.30	4.83	5.37	5.91	6.44	6.98	7.52	8.06
30	.56	1.11	1.67	2.22	2.78	3.33	3.89	4.44	5.00	5.55	6.11	6.67	7.22	7.78	8.33
31	.57	1.15	1.72	2.30	2.87	3.44	4.02	4.59	5.17	5.74	6.32	6.89	7.46	8.04	8.61
32	.59	1.18	1.78	2.37	2.96	3.56	4.15	4.74	5.33	5.92	6.52	7.11	7.70	8.30	8.89
33	.61	1.22	1.83	2.44	3.05	3.67	4.28	4.89	5.50	6.11	6.72	7.33	7.94	8.55	9.17
34	.63	1.26	1.89	2.52	3.15	3.78	4.40	5.04	5.67	6.29	6.93	7.56	8.18	8.81	9.44
35	.65	1.30	1.94	2.59	3.24	3.89	4.53	5.18	5.83	6.48	7.13	7.78	8.42	9.08	9.72
36	.67	1.33	2.00	2.67	3.33	4.00	4.66	5.33	6.00	6.67	7.33	8.00	8.67	9.33	10.00
37	.68	1.37	2.06	2.74	3.42	4.11	4.79	5.48	6.17	6.85	7.54	8.22	8.91	9.59	10.28
38	.70	1.41	2.11	2.82	3.52	4.22	4.92	5.63	6.33	7.03	7.74	8.44	9.15	9.85	10.56
39	.72	1.44	2.17	2.89	3.61	4.33	5.05	5.78	6.50	7.22	7.95	8.67	9.39	10.11	10.83
40	.74	1.48	2.22	2.96	3.70	4.44	5.18	5.92	6.67	7.41	8.15	8.89	9.63	10.37	11.11

Table gives cu. yds. in 1 ft. of a triangle of given width and height. Corrections for tenths of width are one tenth the values found under each height considering the widths from 1 to 9 as tenths and similarly the corrections for tenths of height are one tenth the figures opposite width considering the heights from 1 to 9 as tenths. Thus if w =16.2 and h =5.3, cu. yds. =1.48+.028+.089 =1.597 cu. yds. or practically 160 cu. yds. per 100 ft. If w exceeds 40 ft., use one half and multiply result by 2, if both w and h are large use one half of each and multiply result by 4. Any cross-section may be divided into triangles by the following rule. To the triangle of the sum of the outside cuts (or fills) =h, and ½ the roadbed =w, add the triangles formed by taking the distance out to each break in turn (=w's) by the difference between the cuts (or fills) on each side of it (=h's) always subtracting the outer from the inner.

Distances from Center of Roadway for Cross-Sectioning.

Roadway 16 feet wide. Side Slopes 1 on 1½.

For Single Track Embankment.

H	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	H
0	8.0	8.2	8.3	8.5	8.6	8.8	8.9	9.1	9.2	9.4	0
1	9.5	9.7	9.8	10.0	10.1	10.3	10.4	10.6	10.7	10.9	1
2	11.0	11.2	11.3	11.5	11.6	11.8	11.9	12.1	12.2	12.4	2
3	12.5	12.7	12.8	13.0	13.1	13.3	13.4	13.6	13.7	13.9	3
4	14.0	14.2	14.3	14.5	14.6	14.8	14.9	15.1	15.2	15.4	4
5	15.5	15.7	15.8	16.0	16.1	16.3	16.4	16.6	16.7	16.9	5
6	17.0	17.2	17.3	17.5	17.6	17.8	17.9	18.1	18.2	18.4	6
7	18.5	18.7	18.8	19.0	19.1	19.3	19.4	19.6	19.7	19.9	7
8	20.0	20.2	20.3	20.5	20.6	20.8	20.9	21.1	21.2	21.4	8
9	21.5	21.7	21.8	22.0	22.1	22.3	22.4	22.6	22.7	22.9	9
10	23.0	23.2	23.3	23.5	23.6	23.8	23.9	24.1	24.2	24.4	10
11	24.5	24.7	24.8	25.0	25.1	25.3	25.4	25.6	25.7	25.9	11
12	26.0	26.2	26.3	26.5	26.6	26.8	26.9	27.1	27.2	27.4	12
13	27.5	27.7	27.8	28.0	28.1	28.3	28.4	28.6	28.7	28.9	13
14	29.0	29.2	29.3	29.5	29.6	29.8	29.9	30.1	30.2	30.4	14
15	30.5	30.7	30.8	31.0	31.1	31.3	31.4	31.6	31.7	31.9	15
16	32.0	32.2	32.3	32.5	32.6	32.8	32.9	33.1	33.2	33.4	16
17	33.5	33.7	33.8	34.0	34.1	34.3	34.4	34.6	34.7	34.9	17
18	35.0	35.2	35.3	35.5	35.6	35.8	35.9	36.1	36.2	36.4	18
19	36.5	36.7	36.8	37.0	37.1	37.3	37.4	37.6	37.7	37.9	19
20	38.0	38.2	38.3	38.5	38.6	38.8	38.9	39.1	39.2	39.4	20
21	39.5	39.7	39.8	40.0	40.1	40.3	40.4	40.6	40.7	40.9	21
22	41.0	41.2	41.3	41.5	41.6	41.8	41.9	42.1	42.2	42.4	22
23	42.5	42.7	42.8	43.0	43.1	43.3	43.4	43.6	43.7	43.9	23
24	44.0	44.2	44.3	44.5	44.6	44.8	44.9	45.1	45.2	45.4	24
25	45.5	45.7	45.8	46.0	46.1	46.3	46.4	46.6	46.7	46.9	25
26	47.0	47.2	47.3	47.5	47.6	47.8	47.9	48.1	48.2	48.4	26
27	48.5	48.7	48.8	49.0	49.1	49.3	49.4	49.6	49.7	49.9	27
28	50.0	50.2	50.3	50.5	50.6	50.8	50.9	51.1	51.2	51.4	28
29	51.5	51.7	51.8	52.0	52.1	52.3	52.4	52.6	52.7	52.9	29
30	53.0	53.2	53.3	53.5	53.6	53.8	53.9	54.1	54.2	54.4	30
31	54.5	54.7	54.8	55.0	55.1	55.3	55.4	55.6	55.7	55.9	31
32	56.0	56.2	56.3	56.5	56.6	56.8	56.9	57.1	57.2	57.4	32
33	57.5	57.7	57.8	58.0	58.1	58.3	58.4	58.6	58.7	58.9	33
34	59.0	59.2	59.3	59.5	59.6	59.8	59.9	60.1	60.2	60.4	34
35	60.5	60.7	60.8	61.0	61.1	61.3	61.4	61.6	61.7	61.9	35
36	62.0	62.2	62.3	62.5	62.6	62.8	62.9	63.1	63.2	63.4	36
37	63.5	63.7	63.8	64.0	64.1	64.3	64.4	64.6	64.7	64.9	37
38	65.0	65.2	65.3	65.5	65.6	65.8	65.9	66.1	66.2	66.4	38
39	66.5	66.7	66.8	67.0	67.1	67.3	67.4	67.6	67.7	67.9	39
40	68.0	68.2	68.3	68.5	68.6	68.8	68.9	69.1	69.2	69.4	40

Example—If point is 22.6 ft. above grade, how far should it be from center line to be a slope stake point? Ans. from Table 41.9. For same slopes but other widths of roadbed correct above figures by one-half difference in width of roadbed; thus in example above for 20 ft. roadbed distance will be 41.9+(20−16)÷2 or 2 ft. added to 41.9 =43.9. For slopes of 1 on 1 see inside of front cover.

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