

W 331

331

385	385	385	385
21	150	140	125
385	19250	1540	1925
770	385	385	770
8,085	5,7750	5,390	4,8125

MICROFILMED 331
 JAN 14 1965

Our Leather Bound Engineers Note Books are carried in the following rulings:

- No. 380 LEVEL BOOK. Left and Right Hand Page the same as Left Hand Page of this Book.
- No. 382 FIELD BOOK. Left Hand Page as in this Book, Right Hand Page 4 x 4 to the inch, Center Line Red.
- No. 384 MINING TRANSIT BOOK. Left Hand Page as in this Book, Right Hand Page 8x8 to the inch, Center Line Red.
- No. 385 FIELD BOOK. Left Hand Page as in this Book, Right Hand Page 8 vertical and 4 horizontal lines to the inch, Center Line Red.

We also carry the Note Books listed above, bound in extra strong Fabri-Hide (otherwise the same quality of book), which can be furnished at a somewhat lower price.

In ordering Fabri-Hide covered books, add the letter "F" to catalog number.

THE FREDERICK POST CO.
 ENGINEERING and DRAFTING SUPPLIES
 IRVING PARK STATION
 CHICAGO, ILL.

Index

Elevs. at Diversion Tunnel Portals	33
Profile of Entrance Portal Diversion Tunnel	34-37
Profile of Exit Portal Diversion Tunnel	38-39
Bench Levels to Clay Pit Barrow Area	61
Check Levels Clay Pit to Dam Site	62
Bench Levels over Dam Site	1-5
Toe of Slope Points N. Side of Dam	6-10
Axis Profile Levels	11-21
788 Contour Thru SE $\frac{1}{4}$ of SE $\frac{1}{2}$ Sect 5	24-31
Elevs. of Diversion Tunnel Portals	33
Profile of Entr. Diversion Tunnel	34-37
Profile of Outlet Diversion Tunnel	38-39
Additional Bench Levels on Dam Site	41-48
Coordinates of Toe of Slope of Dam	49-51
Tunnel Cut Slope Stakes - Exit	52-55
Tunnel Cut Slope Stakes - Entrance	56-58
Bench Levels of Clay Deposit	63
Diversion Tunnel Outlet Cut Stakes <small>using revised grades</small>	67

Bench Levels over Dam Site

1/13/32

Cold - cloudy - showers

584.45 = B.M. 1

Nail in Oak Tree, 100' W of Axis

0.71 585.16

10.20 574.96

4.69 579.65

6.61 573.04

7.50 580.54

B.M. 5-1

2.65 577.89 set B.M.

Reset Sec Page 33

Point on Rock 30' S.W. of Toe of slope Hub at 575 Elev.

(Down stream side)

5.54 575.00 set

Hub at Toe slope, Elev. 575

577.89 B.M.

12.19 590.08

1.63 588.45

12.76 601.21

1.21 600.00 set Hub

at Berm.

B.M. 5-2

3.50 597.71 set B.M.

Point on Rock 130' W of Toe of slope Hub at 600 Elev.

12.45 610.16

1.57 608.59

12.80 621.39

0.71 620.68

12.07 632.75

0.05 632.70

12.11 644.81

2.14 642.67

11.12 653.79

7182

653.79 ✓

3.79

650.00 cut

cross in Large Boulder at Berm

B.M. S-3

4.42

649.37 ✓

Set B.M.

Point on Rock 100'± W. of Toe of slope Point at 650 Elev.

12.88

662.25 ✓

0.63

661.62 ✓

12.73

674.35 ✓

0.65

673.70 ✓

12.40

686.10 ✓

1.26

684.84 ✓

12.56

697.40 ✓

0.07

697.33 ✓

12.31

709.64 ✓

9.64

700.00

cut cross

in Boulder at Berm - Elev 700

B.M. S-4

4.46

705.18 ✓

N3140

E4790

Set B.M.

High point of Large boulder 60'± S.W. of Toe of slope

9.33

714.51 ✓

0.91

713.600 ✓

12.235

725.835 ✓

0.720

725.115 ✓

12.570

737.685 ✓

0.700

736.985 ✓

12.610

749.595 ✓

1.485

748.110 ✓

12.145

760.255 ✓

(770)

	760.255			
	12.635	770.240	2.650	757.605
			5.240	765.000 set Hub at Berm Elev. 765
B.M. 5-5			6.020	764.220 Set B.M. on Boulder 100' West of Axis at 765 Elev.
	1.580	765.800		
			11.910	753.890
	3.530	757.420		
			7.420	750.000 set Hub at Berm, upstream side, Elev. 750
B.M. 5-6			1.430	755.990 set B.M. High point of large Boulder 250' East of Axis and 40' N of flume (P.O.G.'s Elev. 756.085)
	0.090	756.080		
			11.160	744.920
	0.310	745.230		
			12.340	732.890
	0.650	733.540		
			12.775	720.765
	0.555	721.320		
			12.265	709.055
	0.740	709.795		
			8.770	701.025 - check on B.M. P.O.G.'s Elev. 701.07
B.M. 5-7				
	0.830	709.360	1.265	708.530 Set B.M. on Large Boulder 100' East of Toe slope at 700 Elev.

9780

	709.360				
		12.280	697.080		
0.315	697.395				
		12.675	684.720		
0.000	684.720				
		12.955	671.765		
0.250	672.015				
		11.890	660.125		
0.270	660.395				
		10.395	650.000	set Hub	at Berm, upstream side, Elev. 650.00
B.M. 5-8		1.875	658.520	^{E5370} ^{N3280} set B.M.	High Point of large Boulder 80' N.E. of Toe slope at 650 El.
0.805	659.325				
		12.390	646.935		
0.400	647.335				
		12.740	634.595		
0.590	635.185				
		12.790	622.395		
0.600	622.995				
		12.900	610.095		
0.145	610.240				
		10.240	600.000	set Hub	at Berm, upstream side, Elev. 600
B.M. 5-9		5.090	605.150	^{N3395} ^{E5500} set B.M.	High Point of Large Boulder 75' E of Toe Slope at 600 El.
0.630	605.780				

(MCD)

605.780[✓]
11.870 593.910[✓]
1.045 594.955[✓]
12.565 582.390[✓]
2.630 585.020[✓]
10.020 575.000[✓]
T.P. 1.730 582.290[✓]
4.865 588.155[✓]
7.245 580.910[✓]
4.420 585.330[✓]
0.84 584.49[✓]

set Hub at Tie slope, upstream side, Elev. 575.

Establishing Toe of slope points on North side of Dam site.

		584.450	- B.M. #1
0.840	585.290		
		4.420	580.870
7.245	588.115		
		4.865	583.250
1.730	584.980		
		2.630	582.350 - T.P.
0.095	582.445		
		12.650	569.795
1.490	571.285		
		6.785	564.500 set Hub
B.M. N-10 - T.P.		1.025	570.260 set B.M.
12.680	582.940		
		6.975	575.965
7.235	585.200		
		10.200	575.000 set Hub
T.P.		0.950	584.250
12.280	596.530		
		0.360	596.170
12.635	608.805		
		8.800	600.005 set Hub

(ms)

1/14/32

Nail in Oak tree 100' W. of Axis.

at Toe slope on Base line

High point of large Boulder 150' E. of Toe slope at 575 Elev.

at Toe slope, upstream side, Elev. 575

at Berm, Elev. 600

		608.805		
B.M.-N-9	± T.P.		1.430	607.375 set B.M.
	12.355	619.730		
			0.290	619.440
	12.500	631.940		
			0.800	631.140
	12.385	643.525		
			1.600	641.925
	12.085	654.010		
			4.01	650.00 set Hub
			0.410	653.600
	12.650	666.250		
B.M.-N-8	± T.P.		8.305	657.945 set B.M.
	12.785	670.730		
			0.275	670.455
	12.420	682.875		
			0.670	682.205
	12.885	695.090		
			1.295	693.795
	12.810	706.605		
			6.60	700.00 set Hub
B.M.-N-7			3.100	703.505 set B.M.
	12.740	716.245		

7100

Point on large Boulder 120' E. of Toe slope point Elev. 600

at Berm El. 650 (upstream side)

High point of large Boulder 110' E. of Toe slope point Elev. 650 (upstream side)

at Berm El. 700 (upstream side)

High point of large Boulder 115' E. of Toe slope point Elev. 700 (upstream side)

	716.245		
		0.140	716.105
12.335	728.440		
		0.030	728.410
12.350	740.760		
		0.080	740.680
12.990	753.670		
		0.160	753.510
8.660	762.170		
		12.17	750.00
B.M. N-6	* T.P.	5.095	757.075
			Set B.M.
10.470	767.545		
B.M. - N-5A		8.890	758.635
			- check
0.975	759.630		
B.M. N-5	* T.P.	1.290	758.340
			Set B.M.
0.330	758.670		
		12.440	746.230
0.490	746.720		
		12.640	734.080
0.540	734.620		
		12.850	721.770
0.280	722.050		
		12.620	709.430
0.035	709.465		

(M)

at Berm El. 750, (upstream side)

High Point of large Boulder, 150" E. of Toe Slope Point at 750 Elev. (upstream side)

on P.O.G.'s B.M. on Pipe (El. 758.725)

High point of Boulder, 80" West of Toe Slope Point at 750 Elev. (Downstream side)

709.465 ✓

B.M.-N-4 I.T.P. 10.705 698.760 ✓ set B.M.

1.230 699.990 ✓

12.625 687.365 ✓

0.350 687.715 ✓

12.905 674.810 ✓

0.700 675.510 ✓

12.960 662.550 ✓

0.580 663.130 ✓

13.13 650.00 ✓ set Hub

High Point of Boulder 100' N.W. of Toe Slope at 700 Elev.
(Downstream Side)

at Berm, Elev. 650, (Downstream side)

B.M.-N-3 I.T.P. 8.295 654.835 ✓ set B.M.

1.535 656.370 ✓

13.000 643.370 ✓

0.500 643.870 ✓

12.585 631.285 ✓

0.200 631.485 ✓

13.090 618.395 ✓

1.165 619.560 ✓

12.820 606.740 ✓

0.545 607.285 ✓

7.28 600.00 ✓ set Hub

High Point of Boulder 100' N.W. of Toe Slope at 650 Elev.
(Downstream Side)

at Berm, Elev. 600 (Downstream side)

B.M.-N-2 I.T.P. 7.420 599.865 ✓ set B.M.

(7130)

High Point of Boulder 60' N.W. of Toe Slope at 600 Elev.
(Downstream Side)

			599.865	
	0.710	600.575		
			12.810	587.765
	0.255	588.020		
			13.02	575.02 ⁰⁰ set Hub
				at Toe slope, Elev. 575
T.P.			13.020	575.000
	0.150	575.150		
			10.745	564.405
	2.780	567.185		
B.M. - N-1			6.310	560.875 set B.M.
	2.685	563.560		Top of Pipe set in Concrete Block.
			7.06	556.50 set Hub
				at Toe Slope on Base Line
T.P.			0.560	563.000
	11.310	574.310		
			0.150	574.160
	10.465	584.625		
			0.200	584.425 = check
				on B.M. #1, nail in Oak Tree 100' West of Axis
				Elev. 584.45

1/21/32
Simpson
Louden

Profile Levels of Axis, and Elevations
on 20' Hubs along Axis.

Station	Offset	Hub Elevation	Distance	Point Elevation	Description
				764.220	B.M.S-5
3006.00 N 5000.00 E	6.595	770.815	5.000	765.815	on 2x2 R.W. Hub at So. End Axis.
3004.0			7.6	763.2	Ground
T.P.			13.100	757.715	
	0.650	758.365			
3014.0			5.4	753.0	Ground at So. side flume Bench
3017.4			4.5	753.9	Flow line of flume, So. side
3024.0			4.6	753.8	" " " " No. side
3053.0			6.5	751.9	Ground at N. side flume Bench
3036.0			9.4	749.0	Ground
3040.00	T.P.		11.915	746.450	on Hub.
	0.680	747.130			
3044.0			3.9	743.2	Ground

✓ R.L.

	747.130				
T.P.		12.770	734.360		
	1.845	736.205			
3060.00		3.095	733.110	on 2'x2'	R.W. Hub
3064.0		5.2	731.0		Ground
3070.0		8.9	727.3		"
T.P.		12.660	723.545		
	0.115	723.660			
3080.00		3.045	720.615	on 2'x2'	R.W. Hub
3089.0		9.1	714.6		Ground
T.P.		12.835	710.825		
	0.385	711.210			
3100.0		2.1	709.1		= Ground
3111.0		6.6	704.6		"
3120.0		12.4	698.8		"
3120.00		11.860	699.350	on 2'x2'	R.W. Hub in Spoil Bank of Tunnel excav.
T.P.		12.630	698.580		
	1.110	699.690			
3140.00		11.845	687.845	on 2'x2'	R.W. Hub in Spoil Bank of Tunnel excav.
3140.0		12.0	687.7		Ground

Note: This Profile is taken
to one side of Tunnel excav.
to show original ground line

Hub.

	699.690				
T.P.		11.845	687.845		
	0.065	687.910			
3150.0		4.9	683.0		Ground
3160.00		10.490	677.420	on 2"x2"	R.W. Hub.
3164.0		12.1	675.8		Ground
3166.0		13.2	674.7		"
T.P.		12.820	675.090		
	0.260	675.350			
3173.0		2.0	673.4		Ground
3180.00		5.490	669.860	on cross	Cut in Boulder
3184.0		7.9	667.5		Ground
3188.0		8.9	666.5		"
3193.0		12.7	662.7		"
T.P.		12.860	662.490		
	0.555	663.045			
T.P.		12.115	650.930		
	0.070	651.000			
3220.00		1.385	649.615	on 2"x2"	R.W. Hub
3220.0		2.5	648.5		ground
3240.00		10.880	640.120	on 2"x2"	R.W. Hub in Spoil Bank of Tunnel excav.
3240.0		12.4	638.6		ground
T.P.		12.875	638.125		
	1.185	639.310			
3249.0		5.2	634.1		"

✓ R.W.H.

	639.310				
3260.00		8.200	631.110	on 2"x2"	R.W. Hub.
T.P.		12.435	626.875		
	0.120	626.995			
3280.00		5.795	621.200	on 2"x2"	R.W. Hub
3286.0		8.1	618.9		Ground
3287.0		10.1	616.9		"
3294.0		13.3	613.7		"
T.P.		12.800	614.195		
	0.510	614.705			
3300.00		4.235	610.470	on 2"x2"	R.W. Hub
T.P.		12.755	601.950		
	0.535	602.485			
3320.00		2.485	600.000	on 2"x2"	R.W. Hub
3326.0		4.4	598.1		Ground
3340.00		10.405	592.080	on 2"x2"	Hub, also Ground El.
3347.0		12.5	590.0		Ground
T.P.		12.970	589.515		
	3.835	593.350			
B.M. #1		8.875	584.475	check on	B.M. #1, Nail in Oak tree 100' W of Axis (Elev. 584.45)
			584.450		
	8.875	593.325			
T.P.		4.750	588.575		
	1.045	589.620			
3351.0		2.0	587.6		Ground
3358.0		4.6	585.0		"

all.

	589.620				
3360.00		5.730	583.890	on 2"x2" R.W.	Hub.
3370.0		9.0	580.6		Ground
3377.0		11.1	578.5		"
T.P.		11.790	577.830		
	0.530		578.360		
3380.00		2.030	576.330	on 2"x2"	R.W. Hub
3385.0		3.3	575.1		Ground of S. edge Rd.
3393.0		3.1	575.3		" of E. Rd.
3400.00		4.330	574.030	on 2"x2"	R.W. Hub.
3400.0		3.9	574.5		Ground
3405.0		4.2	574.2		"
3408.0		6.0	572.4		"
		12.720	565.640		
	0.800		566.440		
3411.0		2.5	563.9		"
3420.00		7.890	558.690	on 2"x2"	R.W. Hub also Ground El.
3430.0		7.3	559.1		Ground
3440.00		7.920	558.520	on 2"x2"	R.W. Hub also Ground El.
3453.0		8.3	558.1		Ground
3460.00		6.050	560.390	on 2"x2"	R.W. Hub also Ground El.
3480.00		5.100	561.340	on 2"x2"	R.W. " " " "
3500.00		5.040	561.400	" " "	" " " " "
3520.00		4.780	561.660	" "	" " " " "
3533.0		4.0	562.4		Ground

v R.L.

	566.490				
3540.00		4.860	561.580	on 2"x2"	R.W. Hub, also Ground Elev.
3547.0		5.5	560.9		Ground
3560.00	T.P.	4.590	561.850	" "	R.W. Hub. " " "
	4.310	566.160			
3580.00		3.990	562.170	" "	" " " " "
3600.00		5.870	560.290	" "	" " " " "
3605.0		6.3	559.9		= Ground
3615.0		9.0	557.2		"
3620.00		9.500	556.660	" "	R.W. Hub " " "
3629.0		9.6	556.6		= Ground
3635.0		9.4	556.8		"
		9.470	556.690	on Pipe	at 3635.25
3640.00		10.130	556.030	on 2"x2"	R.W. Hub, also Ground Elev.
3650.0		10.7	555.5		= Ground
3660.00		10.730	555.430	" "	R.W. Hub, " " "
3665.0		10.6	555.6		= Ground
3667.0		10.2	556.0		"
3679.0		10.5	555.7		"
3680.00		10.930	555.230	" "	R.W. Hub, " " "
3684.0		11.5	554.7		= ground
3685.0		12.2	554.0		= River channel, S. side
3725.0		11.9	554.3		= " " N. side
3727.0		11.0	555.2		= Ground
3735.0		10.3	555.9		

182

	566.160				
3740.00		10.370	555.790	on 2x2"	R.W. Hub, also Ground Elev.
3752.0		9.3	556.9		= Ground
3760.00		7.460	558.700	" "	R.W. Hub, " " "
3770.0		4.7	561.5		= Ground
3780.00		3.420	562.740	" "	R.W. Hub, " " "
T.P.		0.670	565.490		
	12.170	577.660			
3800.00		9.525	568.135	" "	" " " " "
3814.0		1.1	576.6		= Ground
T.P.		0.830	576.830		
	12.120	588.950			
3820.00		7.410	581.540	" "	R.W. Hub " " "
T.P.		0.125	588.825		
	12.715	601.540			
3840.00		9.960	591.580	" "	" " " " "
3847.0		3.3	598.2		= Ground
T.P.		0.425	601.115		
	11.250	612.365			
3855.0		5.2	607.2		= Ground
3860.00		1.575	610.790	" "	R.W. Hub, also Ground Elev.
T.P.		0.100	612.265		
	12.345	624.610			
T.P.		0.085	624.525		
	11.970	636.495			

✓ B&L

		636.495			
3877.0			10.8	625.7	= Ground
3880.0			9.0	627.5	"
3880.00			9.630	626.865	on 2"x2" R.W. Hub
3888.0			3.8	632.7	
T.P.			0.050	636.445	
	11.870	648.315			
3892.0			14.8	633.5	= Ground
3898.0			7.0	641.3	"
3900.0			1.5	646.8	"
T.P.			0.500	647.815	
	12.575	660.390			
3907.0			9.3	651.1	"
3912.0			7.6	652.8	"
3920.00			3.430	656.960	on 1"x2" Pine Hub
T.P.			0.785	659.605	
	9.010	668.615			
			10.675	657.940	= check on B.M. # M-8 (Elev. 657.945)
3930.0			6.2	662.4	Ground
3940.00	T.P.		3.050	665.565	on 2"x2" R.W. Hub. also Ground Elev.
	12.545	678.110			
3948.0			9.1	669.0	= Ground
3952.0			6.4	671.7	
3960.00			2.030	676.080	" " " R.W. Hub " " "
T.P.			0.280	677.830	

			677.830	
	12.535	690.365		
3966.0			11.8	678.6
3970.0			8.8	681.6
3980.00			4.640	685.725 in cross.
3984.0			0.6	689.8
T.P.			0.165	690.200
	11.680	701.880		
3993.0			9.2	692.7
4000.0			5.5	696.4
4000.00			5.850	696.030 on 2"x2"
T.P.			0.000	701.880
	12.285	714.165		
4010.0			14.2	700.0
4016.0			10.3	703.9
4020.00			9.575	704.590 on 2"x2"
4022.0			8.7	705.5
4025.0			6.2	708.0
T.P.			0.100	714.065
	12.930	726.995		
4036.0			14.0	713.0
4040.0			14.2	712.8
4045.0			8.6	718.4
4050.00			7.050	719.945 on 2"x2"
4056.0			5.7	721.3

Ground
 " "
 cut in side of large Boulder
 Ground
 "
 "
 R.W. Hub
 Ground
 "
 R.W. Hub also Ground Elev.
 Ground
 "
 "
 R.W. Hub
 Ground

✓ R.H.

		726.995			
4061.0			+1.0	728.0	- ground
T.P.			0.205	726.790	
	12.900	739.690			
4067.0			12.4	727.3	"
4078.0			5.4	734.3	"
4080.0			4.2	735.5	"
4080.00			5.120	734.570	on 2'x2'
T.P.			0.410	739.280	R.W. Hub
	12.550	751.830			
4093.0			8.7	743.1	
+100.00			8.270	743.560	on 2'x2' R.W. Hub
4107.0			5.1	746.7	
4120.00			2.340	749.490	" " " Hub also ground Elev.
4129.0			0.4	751.4	
T.P.			0.040	751.790	
	11.330	763.120			
4131.0			7.0	756.1	
4140.00			4.110	759.010	on cross cut in Rock
4147.0			3.9	759.2	
			4.450	758.670	= check on B.M. * N-5A. (Elev. 758.655)
T.P.			0.570	762.550	
	12.930	775.480			
4153.0			14.9	760.6	
4156.0			10.9	764.6	

VRL

		775.480			
4159.62			9.550	765.930 on 2"x2"	R.W. Hub at N. end of Axis
4180.00	T.P.		0.030	775.450 " "	" " also Ground Elev.
4195.0	Ground	12.095	787.545		
4200.00			6.8	780.7	" " " " "
4205.0			3.465	784.080 " "	" " " " "
			1.8	785.7	
	T.P.		0.090	787.455	
		11.900	799.355		
4213.0			9.7	789.7	
4220.00			8.600	790.755 " "	" " " " "
4240.0			2.5	796.9	= Ground
4240.00			0.960	798.295 on cross ✓ H&L	cut in large Boulder

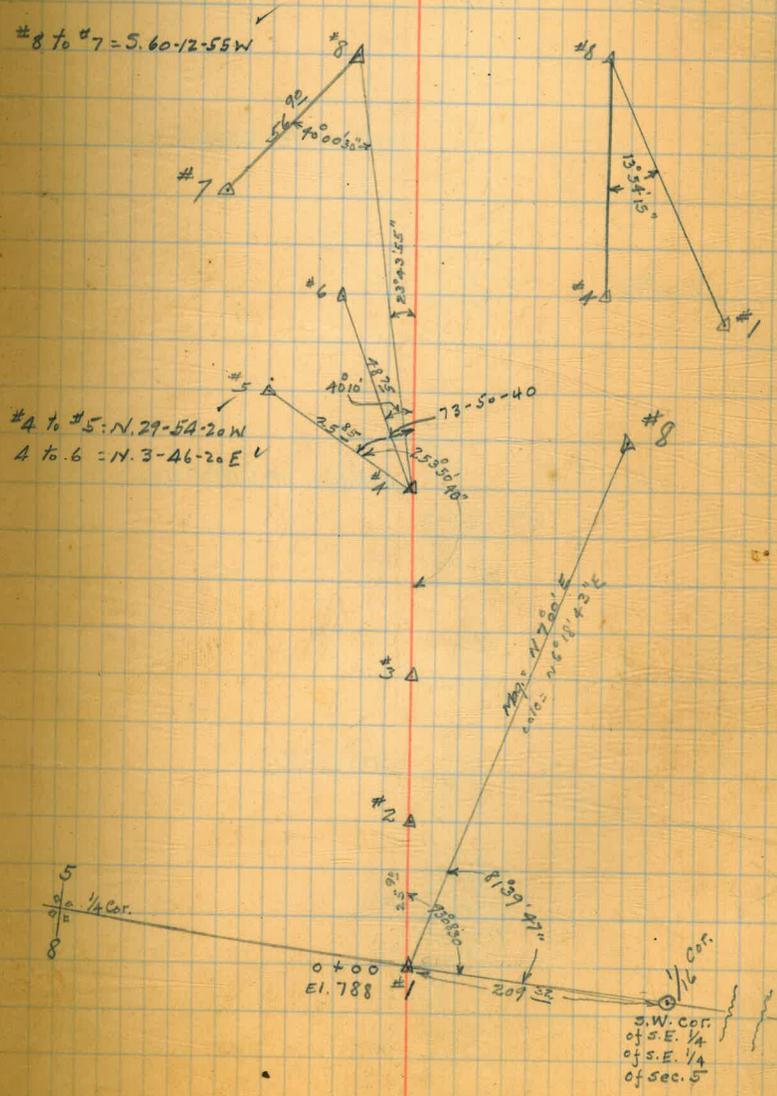
Contour Elev 788 Location.

Sta.	Dist.	Not L	Calc. Bear.	Mag. Bear.
#8	135 ⁸¹		N20°N.25'E	N20°30'E
#A	288 ⁹	23°43'55" Lf.	N43°56'20"E	N44°45'E
#3	89 ³⁶	67°55'50" Rf.	N23°59'30"W	N25° W
#2	25 ⁹⁰	18°49'30" Lf.	N°5'10"W	N3°00'W
#1	0+00 El. 788		N87°58'30"E	N88°15'E

Section Nine

Apr. 1, 1932
 Simpson - H. Ch.
 Loudon - H. Ch.
 Bailey - R. Ch.

13°54'10"
 27°48'30"
 13°54'15"



Sta. Dist. L Calc. Br. Mag. Br.

23

730 ⁹¹

N12°11'40"E N13° E

20 B.S. on #16
to #239°08'40"
18°17'20" Rt.
9°08'40"116 ⁹⁸

N3°03'E N3°45'E

16 B.S. on #15

0°50'20"
1°40'50" Lf.
0°50'20"105 ¹⁸

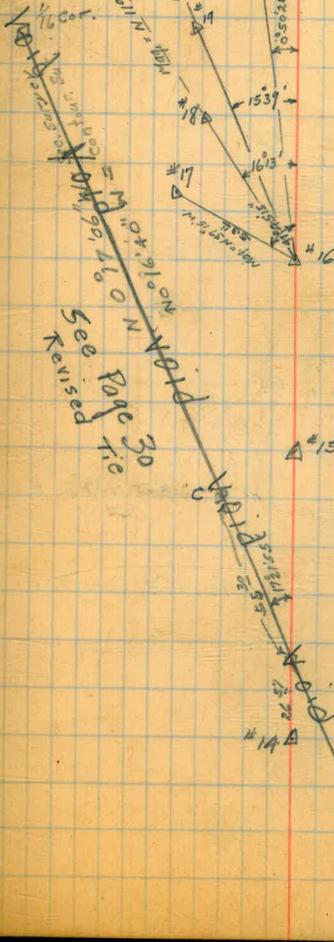
N3°53'20"E N4°45'E

15

13°11'45"
26°23'50" Lf.
13°11'55"90 ⁷⁴

N17°05'15"E N17°45'E

14

N.W. Cor. of
S.E. 1/4 of
Sec. 5# 23 to 22 = 51 ³⁴
5.38-48-40W ✓# 20 to 23 = 130 ⁹¹# 20 to 21 = 61 ⁵⁶
N.12-44-30 E. ✓# 16 to 20 = 116 ⁹⁸# 16 to 19 = 92 ⁶²# 16 to 18 = 56 ⁴⁰# 16 to 17 = 53 ¹¹

16 to 17 = N 37-51-55 W ✓

16 to 18 = N.17-19-40W ✓

16 to 19 = N.11-48-40W ✓

S.W. Cor. of S.E. 1/4
of Sec. 5.

Sta. Dist. L Calc. Br. MAq. Br.
 567°51'10" E 567°5' E

#29 B.S. on #27-A
 To #32
 97¹⁰
 48°48'15"
 77°36'10" Rt.
 48°48'05"

101⁰⁶
 N63°20'45" E N67° E

#27-A B.S. on #24
 To #29
 73
 32°20'30"
 64°40'40" Lf.
 32°20'20"

132⁷³
 584°18'55" E 583°40' E

#26 B.S. on #24
 73
 12°02'10"
 24°04'40" Rt.
 12°02'20"

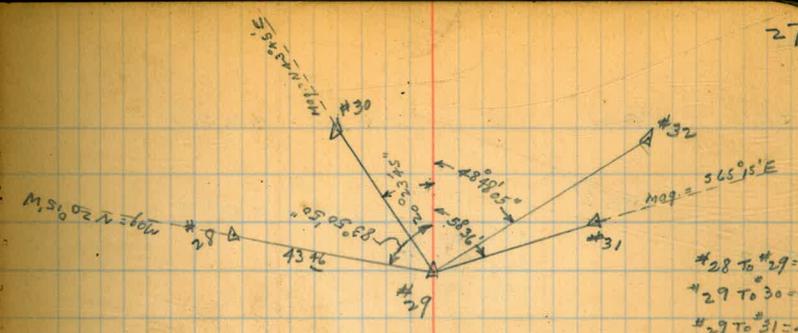
156⁷³
 N83°38'55" E N84°30' E

#24 B.S. on #23
 73
 64°06'40"
 128°13'20" Rt.
 64°06'40"

114⁹⁰
 N19°32'15" E N20°30' E

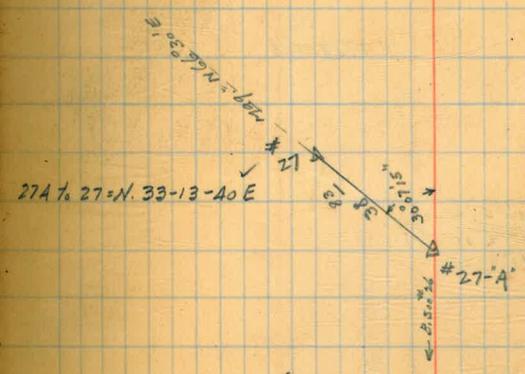
#23
 90
 7°20'30"
 14°41'10"
 7°20'35" Rt.

N12°11'40" E



#28 to #29 = 43¹⁶
 #29 to #30 = 75¹⁵
 #29 to #31 = 77¹³
 #29 to #32 = 97¹⁰

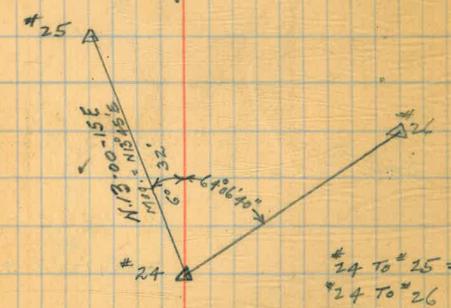
29 to 28 = N.20-29-55 W
 29 to 30 = N.42-57-10 E
 29 to 31 = S.66-03-05 E



27A to 27 = N.33-13-40 E

Note: #27-A is not on the contour Elev. set on account of obstacles.

See Tie Page 30



#24 to #25 = 156⁶⁵
 #24 to #26 = 114⁷⁸

#23A

Sta.	Dist	L	calc. Br.	Mag. Br.
#37	282 ⁹⁹		N 54° 29' 10" E	N 55° E
		25° 28' 50"		
		50° 57' 50"		
		25° 28' 55"		

15
N 79° 58' 05" E

66⁴²

#36	815.00 ³⁷	16° 20' 30"		
		92° 41' 10"		
		46° 20' 35"		

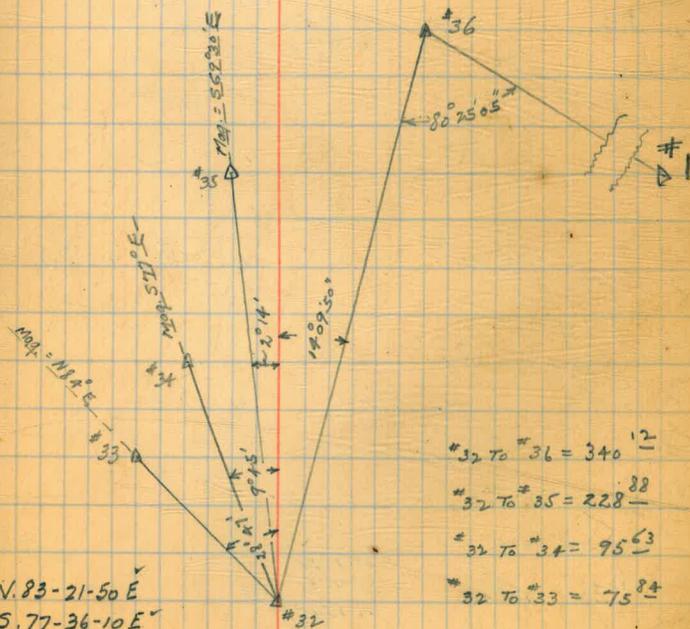
340.¹²

10
S 53° 41' 20" E S 53° 15" E

#32	85.00 ^{#29} to #36	14° 09' 50"		
		28° 19' 40"		
		14° 09' 50"		

0
S 67° 51' 10" E

32 to 33 = N. 83-21-50 E ✓
32 to 34 = S. 77-36-10 E ✓
32 to 35 = S. 70-05-10 E ✓

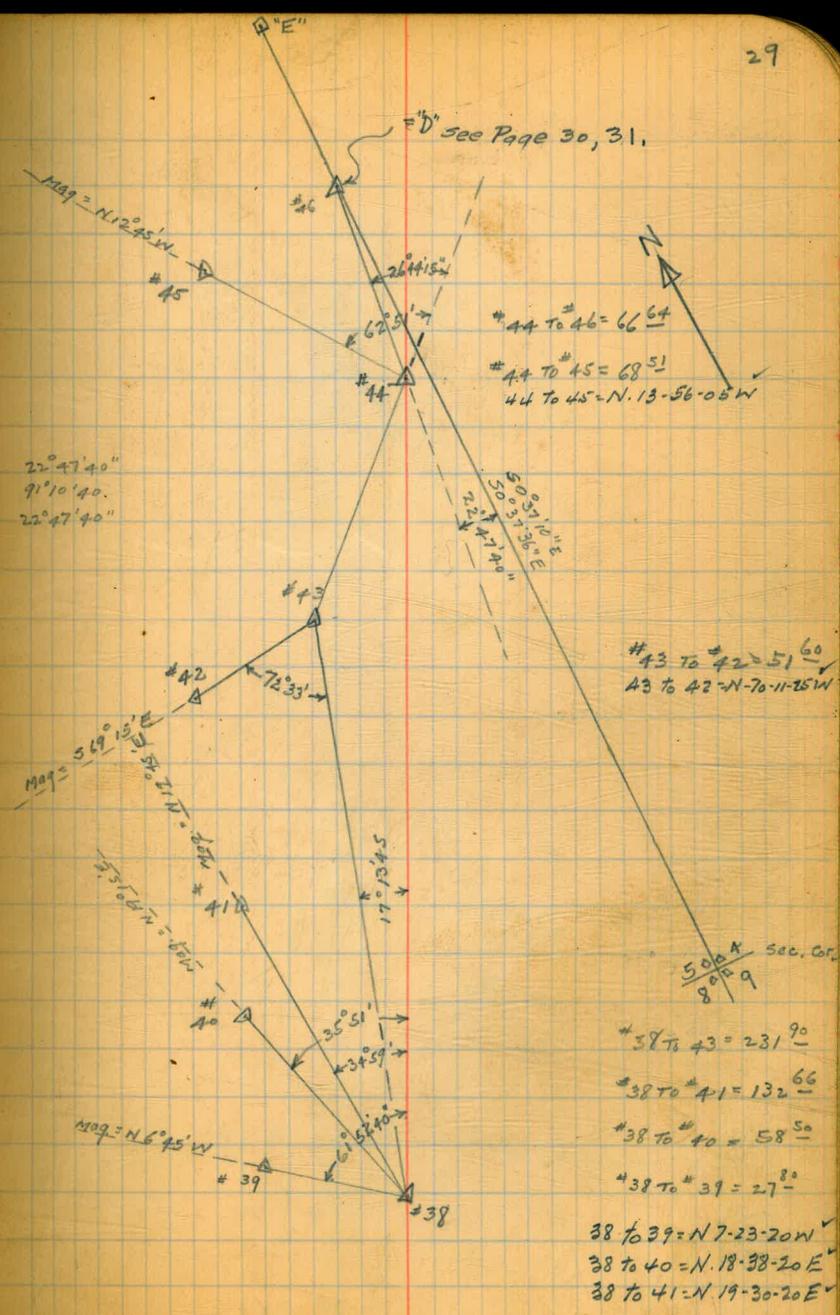


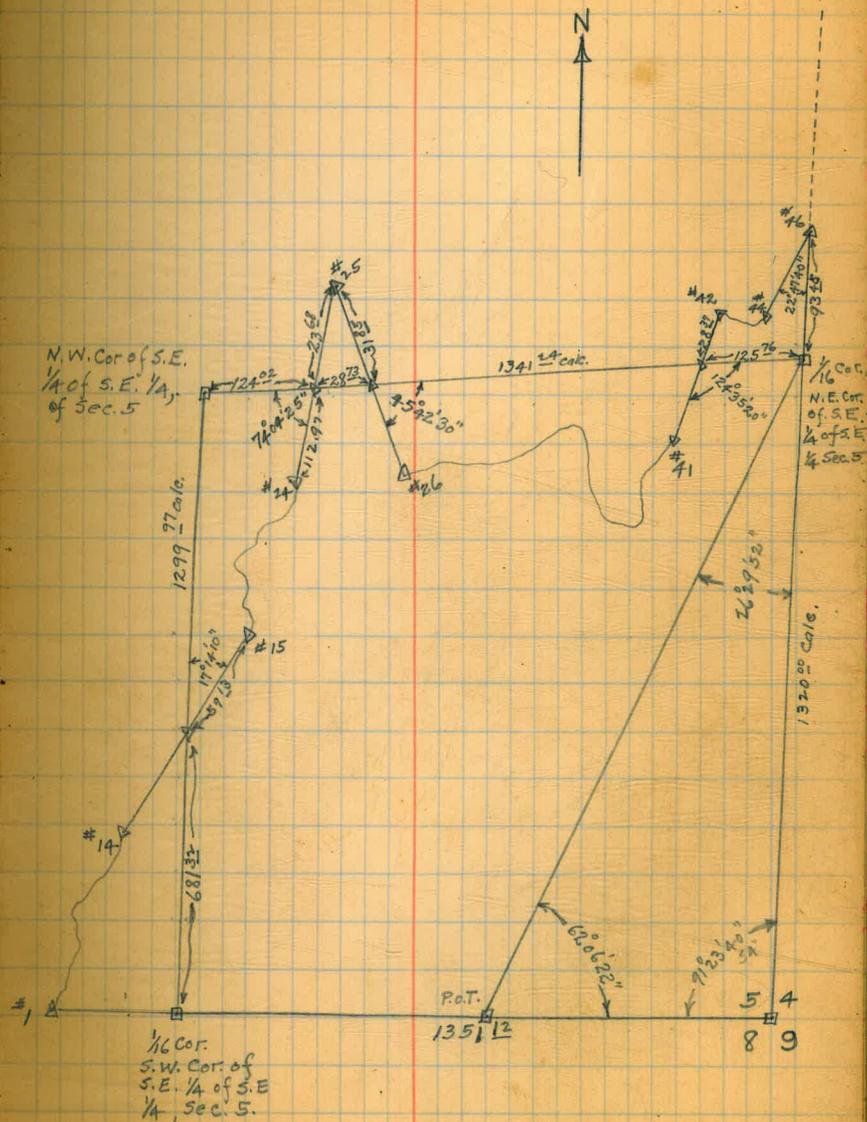
#32 to #36 = 340¹²
#32 to #35 = 228⁸⁸
#32 to #34 = 95⁶³
#32 to #33 = 75⁸⁴

A #29

Sta.	Dist.	L	Calc. Br	Mag. Br.
#46 = intersection with East line Sec. 5.	66.64	✓	N 22°10'30" E	N 23°15' E
# 44	47.75	✓	N 48°54'45" E	
# 43	231.90	✓	N 37°15'25" E	N 31° E
#38 to #43			N 54°29'10" E	

26°44'30"
 53°28'30" Lf.
 26°44'15"
 11°39'15" Rt.
 23°18'40"
 11°39'20"
 17°13'50"
 34°17'30"
 17°13'45" Lf.





See Page 30

Simpson's
Elliott Notes
Soper Rod

33

Elevs of Division Tunnel Portals			
B.M.	1.00	606.15	605.15
Entrance Portal		9.30	596.85
T.P.	0.19	595.83	10.51 595.64
Hub at Apron		13.10	582.73
B.M.	9.90	587.79	577.89
EXIT Portal		7.60	580.19
Hub at Apron		12.76	575.03
Set B.M.		3.87	583.92

E 4348
N 3406

Profile of Entrance Portal Div. Tunnel
May - 4 - 1932

B.M.	0.26	605.41	605.15
Portal 0+00			
T.P.		13.04	592.37
	0.80	593.17	
0+25			
0+50			
0+75			
1+00			
1+06			
1+08			
1+25			
T.P.		12.70	580.47
	1.01	581.48	

Elliott - Notes
Simpson - T
Soper - 9
Kermer - Tape

34

H.I. 605.4

592.8

8.6

\$

H.I. 592.2

589.6

3.6

\$

582.8

10.4

\$

582.6

10.6

\$

582.1

11.1

\$

582.1

11.1

\$

580.7

12.5

\$

580.1

13.1

\$

581.48

H.I. 581.5

1+30

5771
44
8

1+45

5768
47
8

1+50

5772
43
8

1+58

5757
55
8

1+61

5781
33
4

1+75

5774
41
8

2+00

5759
44
6

2+22

5797
48

T.P.

12.76 568.72

2.99 571.71

571.71

2+50

2+75

3+00

3+22

3+35

3+50

3+75

3+89

36

H.I 571.7

567.3

44

\$

563.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

562.1

\$

571.71

4+00

4+15

4+25

Edge River
4+40

Hubat End of Boss Line

7.47 564.24 564.5#

H.I. 571.7

561.7

10.0

E

E

561.5

10.2

E

E

562.3

9.4

E

E

560.4

11.3

E

E

Profile of Exit Cut of Diversion Tunnel
May 4 - 1932

B.M.	2.53	580.42	577.89
Portal 0+00			
0+25			
0+40			
0+50			
0+73			
Edge Road 0+81			
Edge Road 1+02			
1+16			
T.P.	0.51	568.19	12.74 567.68

Elliott - Notes
Simpson - T
Soper - Rod
Remmert - Tape
H.I. 580.4

38

80.2
0.2
76.9
3.8
75.0
5.4
74.6
5.8
72.5
7.9
67.8
10.6
69.4
11.0
67.1
13.3

0.32.6

568.19

1+35

1+47

1+62

T.P.

2.97 558.53

12.63 555.56

1+81

2+10

2+55

2+63

Edge Tower
2+79

T.P. 12.76 569.35 1.94 556.59

T.P. 11.38 580.07 0.66 568.69

T.P. 8.81 586.67 2.21 577.86

B.M. 2.75 583.92 Record
583.92

H.I. 568.2

64.2

4.0

\$

60.5

7.7

\$

59.0

9.2

\$

H.I. 558.5

54.0

4.5

\$

52.5

6.0

\$

53.8

4.7

\$

52.3

6.2

\$

51.3

7.2

\$

Additional B.M.s on Dam Site

5/5/32.
Simpson
Seper.

41

	1.59	586.04	584.45	B.M. 1	Nail in Oak stump 100' west of Axis
B.M.			2.11	583.93 583.920	check on B.M. on Large Boulder N3405 E4335 (El. 583.92)
	0.185	584.105			
T.P.			12.420	571.685	
	0.380	572.065			
T.P.			12.695	559.370	
	2.340	561.710			
T.P. & B.M.			5.850	555.860	set B.M. on large Boulder N3472 E4208
	12.745	568.605			
T.P.			0.760	567.845	
	12.510	580.355			
T.P.			2.120	578.235	
	8.395	586.630			
B.M.			2.710	583.920	check on B.M. N3405 E4335 (El. 583.92)
				584.45	B.M. 1
	7.08	591.53			
T.P.			0.53	591.00	
	12.26	603.26			
T.P.			0.93	602.33	
	5.24	607.57			
B.M. & T.P.			2.44	605.13	on Large Boulder N3394 E5500
	0.845	605.975			

	605.975				
		10.790	595.185		
	3.665	598.850			
B.M. & T.P.		2.160	596.690	Set B.M.	on large Boulder 120' S.E. of Entrance Portal Tunnel.
	0.520	597.210			
T.P.		12.800	584.410		
	0.665	585.075			
T.P.		12.980	572.095		
	1.110	573.205			
T.P. & B.M.		7.365	565.840	Set B.M.	on large Boulder N 3334 E 5960
	12.890	578.730			
T.P.		0.715	578.015		
	12.810	590.825			
T.P.		0.220	590.605		
	11.700	602.305			
		1.730	600.575		
	7.090	607.665			
		2.520	605.145	- check	on B.M. on Boulder N 3394 E 5500 El. 605.13

607.375 = B.M. N-9
 4.530 611.905
 B.M. 3.160 608.745 set B.M. on Large Boulder

579.865 B.M. N-2
 a. N. 5. 600.490
 B.M. 9.580 ~~Ab. G.~~ set B.M. on pipe ~~N.P. G.~~ of Wall Pipe moved 5/11/32 - WMS.

5/6/32
 Simpson
 Soper.

757.075 = B.M. N-6
 A.P. 4.630 761.705
 0.735 760.970
 B.M. 6.800 767.770
 4.850 762.920 set B.M. on Large Boulder N4290 E 5855
 12.910 775.830
 0.130 775.700
 12.630 788.330
 0.600 787.730
 13.000 800.730
 0.300 800.430
 13.010 813.440

	813.440				
B.M.-T.P.		1.470	811.970	Set B.M.	on Large Boulder N 4375 E 5565
	12.680		824.650		
		0.240	824.410		
	12.600		837.010		
		0.150	836.860		
	12.435		849.295		
		0.490	848.805		
	12.580		861.385		
B.M.-T.P.		2.885	858.500	Set B.M.	on Large Boulder N 4496 E 5520
	13.080		871.580		
		0.170	871.410		
	12.480		883.890		
		0.460	883.430		
	12.625		896.055		
		0.270	895.785		
	13.105		908.890		
B.M.-T.P.		9.360	899.530	set B.M.	on Large Boulder N 4594 E 5422
	13.030		912.560		
		0.230	912.330		
	12.890		925.220		
		0.405	924.815		
	12.595		937.410		
		0.205	937.205		
	12.890		950.095		
		0.300	949.795		

			947.795		
B.M.-T.P.	12.985	962.780	3.365	959.415	set B.M. on Large Boulder
	12.715	972.130			
			0.650	971.480	
	12.760	984.240			
			0.760	983.480	
	7.240	990.720			
B.M.-T.P.			6.320	984.400	set B.M. on Large Boulder
	0.260	984.660			
			12.860	971.800	
	0.145	971.945			
			12.900	959.045	
	0.510	959.555			
B.M.-T.P.			6.810	952.745	set B.M. on Boulder
	0.615	953.360			
			12.900	940.460	
	0.360	940.820			
			12.660	928.160	
	0.475	928.635			
			12.925	915.710	
	0.535	916.245			
B.M.-T.P.			8.040	908.205	set B.M. on Large Boulder 50' N.W. of Small Sight on Axis above spillway area
	0.640	908.845			
			12.885	895.960	
	0.890	896.850			

	896.850				
		13.040	883.810		
	0.130	883.940			
		12.680	871.260		
	0.450	871.710			
		12.290	859.470		
	0.655	860.125			
B.M. - T.P.		8.790	851.335	Set B.M.	on large Boulder N4665 [±] E 4820 [±]
	0.300	851.635			
		12.275	839.360		
	0.640	840.000			
		12.340	827.660		
	0.740	828.400			
		12.380	816.020		
	0.620	816.640			
		12.480	804.160		
	5.805	809.965			
B.M. - T.P.		9.880	800.085	Set B.M. 100 corrected with	on large Boulder ✓
	0.425	800.510			
		12.910	787.600		
	0.840	788.440			
		12.450	775.990		
	0.700	776.690			
		12.920	763.770		
	0.255	764.025			
B.M. - T.P.		7.890	756.735	Set B.M. 16 corrected see check next page	on large Boulder 130 [±] S.E. of Large sight on Tangent To & Toe Wall (N. side)

756.135

5650 761.785

7.400 754.385

8.640 763.025

B.M.

4.720 758.305 = check on B.M. N-3 El. 758.34

5/9/32
Simpson
Solper.

756.160 = B.M. (See Page 46)

0.625 756.785

13.020 743.765

0.680 744.445

12.645 731.800

0.260 732.060

13.000 719.060

1.730 720.790

B.M. - T.P.

8.530 712.260 Set B.M. on High point of large Boulder 50' S.W. of Sight on
Tangent to & Top Wall

0.220 712.480

12.620 699.860

0.790 700.650

12.775 687.875

0.220 688.095

12.730 675.365

0.250 675.615

B.M. - T.P.

8.340 667.275 Set B.M. on High point of large Boulder

0.360 667.635

667.635

12.430 655.205

0.305 655.510

12.870 642.640

0.625 643.265

13.040 630.225

4.770 634.995

B.M. - T.P.

5.050 629.945 set B.M. on large Boulder.

1.580 631.525

12.860 618.665

2.815 621.480

12.640 608.840

1.310 610.150

8.220 601.930

0.465 602.395

11.455 590.940 = check on B.M. Gr pipe R.P. on N.G. wall El. 590.91

Coordinates of Toe of Slope of Dam

49

649.37 - B.M.

2.36 651.73
 N 322.0
 E 472.0 4.5 647.2

N 3207.2
 E 4700 9.7 642.0

577.89 B.M.

4.48 582.37
 N 3438.2
 E 4500 7.4 575.0

N 3410
 E 4480 7.4 575.0

560.88 - B.M.

12.85 573.73
 0.28 573.45

12.75 586.20
 N 3851.4
 E 4500 11.2 575.0
 N 3850.5
 E 4540 3.5 582.7
 T.P. 0.17 586.03

12.99 599.02
 N 3871.3
 E 4580 3.0 596.0
 T.P. 2.39 596.63

596.63

4.23 600.86

0.99 599.87 check on B.M. E.I. 599.87

654.84 = B.M.

12.55 667.39

0.57 666.82

12.48 679.30

7.8 671.5

0.33 678.97

N 3949.6
E 4780

12.76 691.73

10.2 681.5

N 3953.9
E 4800N 3959
E 4820

0.2 691.5

0.29 691.44

13.31 704.75

5.95 698.80 = check on B.M.
698.76

5.95 704.71

0.11 704.60

13.16 717.76

0.84 716.92

4.10 721.02

14.5 706.5

4.10 716.92

N 3977
E 4860

12.61 729.53

$$\begin{array}{r}
 716.92 \\
 8.9 \\
 \hline
 725.8 \\
 16.5 \\
 \hline
 742.3
 \end{array}$$

N 3976
E 4880

729.53	
13.0	716.5

N 4152.5
E 5070

2.55	761.56		759.01
		6.3	755.3
		12.58	748.98

N 4170
E 5060

0.97	749.95		
		2.1	747.9
		12.60	737.35

N 4159.7
E 5100

0.77	738.12		
		10.2	727.9
		13.04	725.08

N 4155.2
E 5120

0.29	725.37		
		7.5	717.9
		12.38	712.99

0.11

713.10			
		9.62	703.48

B.M.
N 4140.5
E 5160

0.74	704.24		703.50
		9.9	694.3

T.P

0.67	692.07	12.84	691.40
------	--------	-------	--------

T.P
N 4089
E 5220

0.54	679.65	12.96	679.11
		9.35	670.3

check on B.M. E 1 703.48-

Continued on page 59

Slope stakes on Exit Tunnel
Portal cut. (south side)

			Grade	\$ Elev.	Lf.	\$
			583.92	B.M.		
	11.55	595.47				
0+40			542.0		97.1 C-55.7 59.3	92.6 C-50.6 50.3
0+50			542.0	574.6	82.2 C-40.2 25	75.0 C-33.0
T.P.	6.84	589.73	582.89		92.6 C-51.9 57	71.6 C-32.6
		12.58			89.5 C-47.5 48.7	71.6 C-32.6
0+73			542.0	572.5	90.9 C-38.9 25	71.6 C-32.6
T.P.	0.94	581.19	580.25		82.6 C-49.0 58.5	77.4 C-35.4 25
		7.48			82.6 C-44.5 47.2	72.5 C-30.5
0+81			542.0	569.8	81.0 C-42.2 60	77.4 C-31.2 6
					85.0 C-43.0 46.5	69.8 C-27.8
1+02			542.0	569.9	76.3 C-39.1 50	73.2 C-31.2 6
					81.1 C-37.6 43.8	69.8 C-27.8
1+16			542.0	567.1	73.1 C-31.1 20	69.8 C-27.8
					79.9 C-37.7 50	69.8 C-27.8
					71.5 C-35.5 42.8	69.8 C-27.8
					72.5 C-30.5 25	69.8 C-27.8
					69.9 C-27.9 23.5	69.8 C-27.8
					69.9 C-27.9 23.5	69.8 C-27.8
1+35			542.0		77.5 C-35.5 41.0	69.8 C-27.8
					74.2 C-32.2 41.1	69.8 C-27.8
					70.9 C-28.3 35.5	69.8 C-27.8
					70.0 C-28.0 25	69.8 C-27.8
					69.9 C-27.9 19	69.8 C-27.8
					65.1 C-23.9 11	69.8 C-27.8

T.P. 581.19 ✓
 2.10 572.51 ✓
 10.78 570.41 ✓
 572.5

1+47

560.5 542.0

78.0	20.5	70.0	70.1	62.0	60.5
+0.8	2.0	2.5 ^{stage}	2.4	10.5	
<u>C-31.0</u>	<u>C-28.5</u>	<u>C-28.0</u>	<u>C-28.1</u>	<u>C-20.0</u>	<u>C-18.5</u>
45	43	39	25	10	

1+62

559.0 542.0

70.6	67.9	70.2	65.1	60.5	59.0
1.9	2.6	2.3	7.4	12.0	
<u>C-28.6</u>	<u>C-27.9</u>	<u>C-28.2</u>	<u>C-23.1</u>	<u>C-18.5</u>	<u>C-17.0</u>
50	39	35	25	11	

1+81

554.0 542.0

70.6	66.5	62.7	61.3	56.7	54.0
1.9	6.0	9.8	11.2	15.8	
<u>C-28.6</u>	<u>C-24.5</u>	<u>C-20.7</u>	<u>C-19.3</u>	<u>C-14.7</u>	<u>C-12.0</u>
47.5	37.2	32	25	9	

T.P.

3.56

564.98

11.09

561.42

565.0

2+10

552.5 542.0

65.0	57.6	54.1	53.0	52.5
0.0	7.4	10.9	12.0	
<u>C-23.0</u>	<u>C-15.6</u>	<u>C-12.1</u>	<u>C-11.0</u>	<u>C-10.5</u>
42	32.8	25	21	

2+55

553.8 542.0

53.0	53.2	52.6	52.3	52.8
12.0	11.8	12.4	12.7	
<u>C-11.0</u>	<u>C-11.2</u>	<u>C-10.6</u>	<u>C-10.3</u>	<u>C-11.8</u>
40	30.6	25	5	

T.P.

3.84

558.08

10.74

554.24

2+63

552.3 542.0

53.0	52.6	52.3	52.3
5.1	5.5	5.6	
<u>C-11.0</u>	<u>C-10.6</u>	<u>C-10.5</u>	<u>C-10.3</u>
40	30.3	25	
52.1	52.6	52.3	51.3
5.0	5.5	5.2	
<u>C-11.1</u>	<u>C-10.6</u>	<u>C-10.9</u>	<u>C-9.3</u>
40	30.3	25	

2+79

551.3 542.0

3+02

3+27

3+57

2.22

555.86 = check on

B.M. El 555.86

Slope stakes, North side Portal cut (Exit)

577.89 = B.M.

0.06 577.95

0+70

572.0

0+50

0+73

T.P.

2.10 570.45

0+81

1+02

1+16

T.P.

0.87 562.77

1+35

9.60 568.35

8.55 561.90

54

±

R.L.

578.0

13.5	70.5	70.1	70.8	71.1
4.5	7.5	7.1	7.2	6.9
$\frac{C-31.5}{8}$	$\frac{C-28.5}{15}$	$\frac{C-28.9}{25}$	$\frac{C-28.8}{34.4}$	$\frac{C-29.1}{50}$

13.1	70.4	70.4	69.8	68.4
4.9	7.6	7.6	8.2	7.6
$\frac{C-31.1}{8}$	$\frac{C-28.4}{16}$	$\frac{C-28.4}{25}$	$\frac{C-27.8}{38.9}$	$\frac{C-26.4}{50}$

72.2	70.0	69.9	69.5	63.4	61.8
5.8	8.0	8.1	8.5	7.0	8.6
$\frac{C-30.2}{2}$	$\frac{C-28.0}{4}$	$\frac{C-27.9}{21}$	$\frac{C-27.5}{25}$	$\frac{C-21.4}{35.7}$	$\frac{C-19.8}{45}$

570.4

69.4	66.9	62.8	60.5
1.0	3.5	7.6	4.9
$\frac{C-27.4}{19}$	$\frac{C-25.0}{25}$	$\frac{C-20.8}{35.4}$	$\frac{C-18.5}{45}$

64.0	62.5	61.9	59.6
6.4	7.9	8.6	10.8
$\frac{C-22.0}{10}$	$\frac{C-20.5}{25}$	$\frac{C-19.8}{34.9}$	$\frac{C-17.6}{44}$

62.6	61.7	60.4	56.3
7.8	8.7	10.0	14.1
$\frac{C-20.6}{10}$	$\frac{C-19.7}{25}$	$\frac{C-18.4}{34.2}$	$\frac{C-14.3}{42}$

562.8

61.7	59.8	57.7	55.8	53.8
1.1	3.0	5.1	7.0	9.0
$\frac{C-19.7}{4}$	$\frac{C-17.8}{19}$	$\frac{C-15.7}{25}$	$\frac{C-13.8}{31.9}$	$\frac{C-11.8}{38}$

562.77

Grade

1+47

542.0

1+62

1+81

2+10

2+55

2+63

6.89 555.88 = check

562.8

55

59.3	50.1	55.1	53.6	53.0
3.5	Rt. 6.7	7.7	9.2	9.8
$\frac{C-17.3}{12}$	$\frac{C-14.1}{19}$	$\frac{C-13.1}{25}$	$\frac{C-11.6}{30.8}$	$\frac{C-11.0}{40}$
50.0	52.8	52.8	52.8	53.5
6.8	10.0	10.0	10.0	9.3
$\frac{C-14.0}{7}$	$\frac{C-10.8}{20}$	$\frac{C-10.8}{25}$	$\frac{C-10.8}{30.4}$	$\frac{C-11.5}{41}$
52.8	53.4	53.6	53.8	
10.0	9.4	9.2	9.0	
$\frac{C-10.8}{9}$	$\frac{C-11.4}{25}$	$\frac{C-11.6}{30.8}$	$\frac{C-11.8}{45}$	
52.8	54.3	53.7	53.4	52.6
10.0	8.5	9.1	9.4	10.2
$\frac{C-10.8}{12}$	$\frac{C-12.3}{20}$	$\frac{C-11.7}{25}$	$\frac{C-11.4}{30.7}$	$\frac{C-10.6}{40}$
51.3	51.3	51.2	51.2	
11.5	11.5	11.6	11.6	
$\frac{C-9.3}{15}$	$\frac{C-9.3}{25}$	$\frac{C-9.2}{29.7}$	$\frac{C-9.2}{38}$	
52.3	51.1	51.1	51.0	
10.5	11.7	11.7	11.8 ^{51.0}	
$\frac{C-10.3}{7}$	$\frac{C-9.1}{10}$	$\frac{C-9.1}{25}$	$\frac{C-9.0}{29.5}$	here

on B.M. 555.86

Cross sections and slope stakes at Entrance Portal cut.

			± Elev.	Grade
			596.69	B.M.
	0.94	597.63		
T.P.		10.15	587.48	
	0.21	587.69		
0+50			582.8	563.0
0+75			582.6	"
1+00			582.1	"
T.P.		2.84	584.85	
	2.03	586.88		
1+06			582.1	"
1+08			580.7	"
1+25			580.1	"

Lf.	±	Rt.
	587.7	
	587.7	
7.0	6.1	6.2
C-17.7	C-18.6	C-18.5
50	39.3	30
580.7	581.6	582.8
582.8	583.0	584.7
582.6	584.5	585.7
582.1	585.1	586.4
582.1	585.7	586.8
584.85	586.5	587.3
586.88	587.7	588.3
582.1	588.5	589.7
580.7	589.7	590.7
580.1	590.7	591.7
	591.7	592.7
	592.7	593.7
	593.7	594.7
	594.7	595.7
	595.7	596.7
	596.7	597.7
	597.7	598.7
	598.7	599.7
	599.7	600.7
	600.7	601.7
	601.7	602.7
	602.7	603.7
	603.7	604.7
	604.7	605.7
	605.7	606.7
	606.7	607.7
	607.7	608.7
	608.7	609.7
	609.7	610.7
	610.7	611.7
	611.7	612.7
	612.7	613.7
	613.7	614.7
	614.7	615.7
	615.7	616.7
	616.7	617.7
	617.7	618.7
	618.7	619.7
	619.7	620.7
	620.7	621.7
	621.7	622.7
	622.7	623.7
	623.7	624.7
	624.7	625.7
	625.7	626.7
	626.7	627.7
	627.7	628.7
	628.7	629.7
	629.7	630.7
	630.7	631.7
	631.7	632.7
	632.7	633.7
	633.7	634.7
	634.7	635.7
	635.7	636.7
	636.7	637.7
	637.7	638.7
	638.7	639.7
	639.7	640.7
	640.7	641.7
	641.7	642.7
	642.7	643.7
	643.7	644.7
	644.7	645.7
	645.7	646.7
	646.7	647.7
	647.7	648.7
	648.7	649.7
	649.7	650.7
	650.7	651.7
	651.7	652.7
	652.7	653.7
	653.7	654.7
	654.7	655.7
	655.7	656.7
	656.7	657.7
	657.7	658.7
	658.7	659.7
	659.7	660.7
	660.7	661.7
	661.7	662.7
	662.7	663.7
	663.7	664.7
	664.7	665.7
	665.7	666.7
	666.7	667.7
	667.7	668.7
	668.7	669.7
	669.7	670.7
	670.7	671.7
	671.7	672.7
	672.7	673.7
	673.7	674.7
	674.7	675.7
	675.7	676.7
	676.7	677.7
	677.7	678.7
	678.7	679.7
	679.7	680.7
	680.7	681.7
	681.7	682.7
	682.7	683.7
	683.7	684.7
	684.7	685.7
	685.7	686.7
	686.7	687.7
	687.7	688.7
	688.7	689.7
	689.7	690.7
	690.7	691.7
	691.7	692.7
	692.7	693.7
	693.7	694.7
	694.7	695.7
	695.7	696.7
	696.7	697.7
	697.7	698.7
	698.7	699.7
	699.7	700.7
	700.7	701.7
	701.7	702.7
	702.7	703.7
	703.7	704.7
	704.7	705.7
	705.7	706.7
	706.7	707.7
	707.7	708.7
	708.7	709.7
	709.7	710.7
	710.7	711.7
	711.7	712.7
	712.7	713.7
	713.7	714.7
	714.7	715.7
	715.7	716.7
	716.7	717.7
	717.7	718.7
	718.7	719.7
	719.7	720.7
	720.7	721.7
	721.7	722.7
	722.7	723.7
	723.7	724.7
	724.7	725.7
	725.7	726.7
	726.7	727.7
	727.7	728.7
	728.7	729.7
	729.7	730.7
	730.7	731.7
	731.7	732.7
	732.7	733.7
	733.7	734.7
	734.7	735.7
	735.7	736.7
	736.7	737.7
	737.7	738.7
	738.7	739.7
	739.7	740.7
	740.7	741.7
	741.7	742.7
	742.7	743.7
	743.7	744.7
	744.7	745.7
	745.7	746.7
	746.7	747.7
	747.7	748.7
	748.7	749.7
	749.7	750.7
	750.7	751.7
	751.7	752.7
	752.7	753.7
	753.7	754.7
	754.7	755.7
	755.7	756.7
	756.7	757.7
	757.7	758.7
	758.7	759.7
	759.7	760.7
	760.7	761.7
	761.7	762.7
	762.7	763.7
	763.7	764.7
	764.7	765.7
	765.7	766.7
	766.7	767.7
	767.7	768.7
	768.7	769.7
	769.7	770.7
	770.7	771.7
	771.7	772.7
	772.7	773.7
	773.7	774.7
	774.7	775.7
	775.7	776.7
	776.7	777.7
	777.7	778.7
	778.7	779.7
	779.7	780.7
	780.7	781.7
	781.7	782.7
	782.7	783.7
	783.7	784.7
	784.7	785.7
	785.7	786.7
	786.7	787.7
	787.7	788.7
	788.7	789.7
	789.7	790.7
	790.7	791.7
	791.7	792.7
	792.7	793.7
	793.7	794.7
	794.7	795.7
	795.7	796.7
	796.7	797.7
	797.7	798.7
	798.7	799.7
	799.7	800.7
	800.7	801.7
	801.7	802.7
	802.7	803.7
	803.7	804.7
	804.7	805.7
	805.7	806.7
	806.7	807.7
	807.7	808.7
	808.7	809.7
	809.7	810.7
	810.7	811.7
	811.7	812.7
	812.7	813.7
	813.7	814.7
	814.7	815.7
	815.7	816.7
	816.7	817.7
	817.7	818.7
	818.7	819.7
	819.7	820.7
	820.7	821.7
	821.7	822.7
	822.7	823.7
	823.7	824.7
	824.7	825.7
	825.7	826.7
	826.7	827.7
	827.7	828.7
	828.7	829.7
	829.7	830.7
	830.7	831.7
	831.7	832.7
	832.7	833.7
	833.7	834.7
	834.7	835.7
	835.7	836.7
	836.7	837.7
	837.7	838.7
	838.7	839.7
	839.7	840.7
	840.7	841.7
	841.7	842.7
	842.7	843.7
	843.7	844.7
	844.7	845.7
	845.7	846.7
	846.7	847.7
	847.7	848.7
	848.7	849.7
	849.7	850.7
	850.7	851.7
	851.7	852.7
	852.7	853.7
	853.7	854.7
	854.7	855.7
	855.7	856.7
	856.7	857.7
	857.7	858.7
	858.7	859.7
	859.7	860.7
	860.7	861.7
	861.7	862.7
	862.7	863.7
	863.7	864.7
	864.7	865.7
	865.7	866.7
	866.7	867.7
	867.7	868.7
	868.7	869.7
	869.7	870.7
	870.7	871.7
	871.7	872.7
	872.7	873.7
	873.7	874.7
	874.7	875.7
	875.7	876.7
	876.7	877.7
	877.7	878.7
	878.7	879.7
	879.7	880.7
	880.7	881.7
	881.7	882.7
	882.7	883.7
	883.7	884.7
	884.7	885.7
	885.7	886.7
	886.7	887.7
	887.7	888.7
	888.7	889.7
	889.7	890.7
	890.7	891.7
	891.7	892.7
	892.7	893.7
	893.7	894.7
	894.7	895.7
	895.7	896.7
	896.7	897.7
	897.7	898.7
	898.7	899.7
	899.7	900.7
	900.7	901.7
	901.7	902.7
	902.7	903.7
	903.7	904.7
	904.7	905.7
	905.7	906.7
	906.7	907.7
	907.7	908.7
	908.7	909.7
	909.7	910.7
	910.7	911.7
	911.7	912.7
	912.7	913.7
	913.7	914.7
	914.7	915.7
	915.7	

586.88

± Elev. Grade

586.9

1+28

577.0

563.0

76.2	78.6	79.5	80.1	82.3	77.0	80.4	80.8	84.6	82	87.1
C-14.3	C-15.6	C-16.5	C-17.1	C-15.8	C-14.0	C-17.4	C-17.8	C-20.6	C-21.6	C-23.2
50	37.8	30	18	9	6	20	24	30	41.6	50

1+45

577.0

76.7	77.4	78.0	79.2	75.2	77.0	80.6	81.1	80.9	81.7	84.7	85.2	86.6
C-13.7	C-14.4	C-15.0	C-16.2	C-12.3	C-14.0	C-17.6	C-18.1	C-17.9	C-18.7	C-21.7	C-22.8	C-23.6
50	37.2	30	15	12	6	12	27	30	34	41.1	50	50

1+58

575.6

76.2	77.0	77.7	78.0	75.2	75.6	78.5	81.4	80.5	80.8	82.4	84.2	85.4
C-13.2	C-14.0	C-14.7	C-15.0	C-12.2	C-12.6	C-15.5	C-18.4	C-17.5	C-17.8	C-19.4	C-21.2	C-22.4
50	37.0	30	16.5	14	3	20	30	35	39.7	42	50	50

1+61

578.0

75.9	76.6	77.5	76.7	74.9	74.2	78.0	81.5	80.6	80.7	83.4	85.0
C-12.9	C-13.6	C-14.5	C-13.7	C-11.9	C-12.2	C-15.0	C-18.5	C-17.6	C-17.7	C-20.4	C-22.0
50	36.8	30	20	15	4	10	21	30	36	40.2	50

1+75

577.4

75.0	76.0	76.4	76.4	73.5	73.7	77.4	78.6	81.0	81.0	80.9
C-12.0	C-13.0	C-13.4	C-13.4	C-10.5	C-10.7	C-14.4	C-15.6	C-18.0	C-18.0	C-17.9
50	36.5	30	24	23	14	20	20	39.0	48	

T.P.

1.82

579.17

9.53

577.35

579.2

1+95

576.2

74.5	74.0	75.1	77.1	72.2	75.3	76.2	75.6	77.1	78.4	80.2
C-11.5	C-11.0	C-12.1	C-8.9	C-9.2	C-12.3	C-13.2	C-12.6	C-14.1	C-15.4	C-17.2
50	35.5	30	22	16	15	11	11	30	37.7	50

2+04

575.6

77.3	79.0	80.4	81	77.1	75.7	75.6	74.7	75.8	74.4	76.9	77.1
C-6.3	C-7.0	C-7.4	C-8.1	C-12.7	C-12.6	C-11.7	C-12.8	C-13.4	C-13.8	C-16.1	
47	38.5	30	26	8	11	17	30	36.9	50	50	

579.17 ✓

\$ Elev. Grade

2+12

575.1 563.0

2+22

574.7 "

9.53 ✓ 569.64 ✓

4.11 573.75

2+58

565.2 "

2+75

563.0

2+95

B.M.

7.90 565.85 ✓ check

on B.M. El. 565.84

579.2

58

	Li.	\$	Rt.						
	9.5	7.12	5.735	7.48	7.51	7.40	7.57	7.60	7.75
	0.67	0.82	0.10.5	0.11.8	0.12.1	0.12.1	0.11.0	0.12.7	0.13.0
	15	34.1	30	24	10	14.5	30	36.5	50
	6.4	6.6	6.9	7.08	7.51	7.53	8.52	8.92	9.2
	12.8	10.6	9.3	8.9	4.1	3.9	3.4	2.2	2.1
	0.3.4	0.5.6	0.6.9	0.7.8	0.11.7	0.12.1	0.12.3	0.12.8	0.13.3
	45	32.8	30	18	25	30	36.4	50	50

573.8

	69.5	69.0	65.2	66.7	69.8	70.1	72.1	73.5
	10.3	10.8	0.2.2	7.1	4.0	1.7	1.1	0.3
	0.0.5	Grade	0.3.7	0.6.8	0.9.1	0.9.7	0.10.5	0.3
	40	30	10	25	30	34.8	50	50
	6.5	6.7	6.8	6.8	6.8	6.8	6.8	6.8
	8.7	6.8	6.8	6.8	6.8	6.8	6.8	6.8
	0.2.0	0.4.0	0.4.0	0.4.0	0.4.0	0.4.0	0.4.0	0.4.0
	20	30	32	40	40	40	40	40
	6.0	10.8	10.2	10.2	10.2	10.2	10.2	10.2
	Grade	Grade						
	30	40	40	40	40	40	40	40

May 18 - 1932

Simpson T
Elliott - Notes
Soper - 4
Remonto - Tape

59

Cont. from page 51

	679.65				
		12.59	667.06		T.P.
	0.36	667.42			
		12.29	655.13		T.P.
	3.77	658.90			
B.M.		0.96	657.94	Record 657.94	B.M. Check
		12.98	645.92		
	0.13	646.05			
N 4048					
E 5300		3.7	642.3		
N 4054.4		11.7	634.3		
E 5320					
B.M.	0.71	608.09	607.38		
		12.93	595.16		T.P.
	0.00	595.16			
N 3893.8					
E 5440		1.3	593.9		
N 3893		4.6	590.6		
E 5460		12.79	582.37		T.P.
	0.67	583.04			
N 3882					
E 5480		4.4	578.6		
N 3887		8.0	575.0		
E 5500		8.0	575.0		
N 3876.5		8.0	575.0		
E 5520		8.0	575.0		
N 3856.0		8.04	575.00	Record 575.00	Hub at 575 Elev.
E 5540					

B.M.

574.96

Hub at 575 Elev.

3.59 578.55

N 3447.0
E 5540
N 3453.0
E 5520
N 3452.0
E 5500

3.55 578.0
3.55 578.0
3.55 578.0

Bench Levels Dam Site To Clay Bed

July 12-1932
 Simpson - Level
 Elliott - Notes
 Soper - Rod
 Hammer - Truck & T.P.s

B.M.	0.75	586.18		585.43
			7.22	578.96
	6.50	585.46		
			7.46	578.00
	5.37	583.37		
			0.65	582.72
	1.25	583.97		
			2.78	581.19
	2.10	583.29		
			4.26	579.03
	6.40	585.43		
			2.33	583.10
	7.25	590.35		
			4.73	585.62
	2.65	588.27		
			4.71	583.56
	4.88	588.44		
			4.04	584.40
	3.87	588.27		
			0.46	587.81
	7.77	595.58		
			0.17	595.41
	13.03	608.44		
Set B.M.			0.39	608.05
	+ 61.82		- 39.20	

+ 61.82
 - 39.20
 22.62
 585.43
 22.62
 608.05 Check

Top of hub at Triangulation Sta. E'

B.M. #1	0.26	608.31	608.05
			12.83 595.42
	0.93	596.41	
			8.96 587.45
	8.95	596.40	
			5.15 591.25
	2.23	593.48	
			9.59 583.89
	7.11	591.00	
			6.03 584.97
	2.44	587.41	
			6.87 580.54
	2.83	583.37	
			4.51 578.86
	5.50	584.36	
			5.74 578.62
	8.01	586.63	
			6.31 580.32
	4.44	584.76	
			4.47 580.29
	5.96	586.25	
B.M.			Record 0.79 585.46 585.43

Hub at Triangulation Sta. E

587.17

Bench Levels Around Clay Pt.

July 12 - 1932

B.M. #1	12.86	620.91	608.05
		0.90	620.01
	12.99	633.00	
		0.62	632.38
	12.98	645.36	
		0.52	644.84
	12.86	657.70	
		0.37	657.33
	12.80	670.13	
		0.60	669.53
	12.72	682.25	
Set B.M. #4		2.06	680.19
	9.20	689.39	
		0.47	688.92
	10.54	699.46	
		2.85	696.61
	11.96	708.57	
Set B.M. #5		0.42	708.15
	2.68	710.83	
		10.31	700.52
	10.03	710.55	
		12.60	697.95
	7.32	705.27	
Set B.M. #6		3.78	701.49
	2.99	704.48	

July 12 - 1932
 Elliott - Notes
 Simpson level
 Saper - rod
 Remmen stakes

63

Hub of Δ F

Rock on E. Side Clay Deposit

July 15 - 1932

Spike in stump 50' N. & 40' below inlet syphon

Point on rock about 100' E. of Δ F

	704.48		
		9.47	695.01
8.47	703.48		
		1.99	701.49
3.33	704.82		
Set B.M. #7		5.50	699.32
0.68	700.00		
		13.01	686.99
0.73	687.72		
		12.80	674.92
0.64	675.56		
T.P.		12.93	662.63
0.64	663.27		
		8.12	655.15
0.54	655.69		
Set B.M. #8		10.82	644.87
0.36	645.23		
		10.14	635.09
0.76	635.85		
		12.93	622.92
1.18	624.10		
Set B.M. #9		7.49	616.61
1.81	618.42		
		8.58	609.84
4.77	614.61		

Point on rock in draw about 400 S. of Syphon

End July 15

Start July 16

Spike in stump in first draw S. of syphon half way between
flume and Chocolate Creek

Spike in 30" oak near first draw S. of syphon near
E. bank of Chocolate Creek

	614.61				
		7.89	606.72		
	4.32	611.04			
Set B.M. #10		3.59	607.45		Spike in stump near junction of Chocolate + S.D. River
	3.29	610.74			
		6.11	604.63		
	8.60	613.23			
B.M. #1		5.18	608.05	Record 608.05	Check on hub at A Sta. E
	9.56	617.61			
Set B.M. #2		2.71	614.90		Spike on stump about 500' E. of AE
	3.64	618.54			
		12.94	605.60		
	3.47	609.07			
Set B.M. #3		0.63	608.44		Spike in elder berry tree by road N.E. Cor. of clay deposit area.
	2.00	610.44			
		4.92	605.52		
	6.48	612.00			
		6.68	605.32		
	8.86	614.18			
B.M. #1		6.13	608.05	Record 608.05	Check on hub at A Sta. E

Exit Portal Cuts
With Revised Grades

Elliott
5

Aug 29-1932

B.M.	7.80	552.19	Grade Rod	542.39	Grade
12+1277	0+40		10.2		542.0
12+52	0+79		10.2		542.0
13+00	1+27		10.2		542.0
13+25	1+52		9.2		543.0
13+50	1+77		8.2		544.0
T.P.	13.03	564.08	1.14	551.05	
13+75	2+02		19.1		545.0
14+25	2+52		17.1		547.0
14+50	2+77		16.1		548.0
14+75	3+02		15.1		549.0
15+00	3+27		14.1		550.0
T.P.	5.37	561.35	8.10	555.78	
15+30	3+57				551.2

Lt. 90



Rt. 66

Pipe 13+10

17.2

8.6

C 45
272

Runs into
Wall

C 76
282

C 05
252

C.
Catches on Top

C. 15
252

C. 183
342

C 00
252

C. 144
322

C. 08
252

C. 116
308

C. 94
292

C. 100
300

C. 80
290

C 102
304

C 40
270

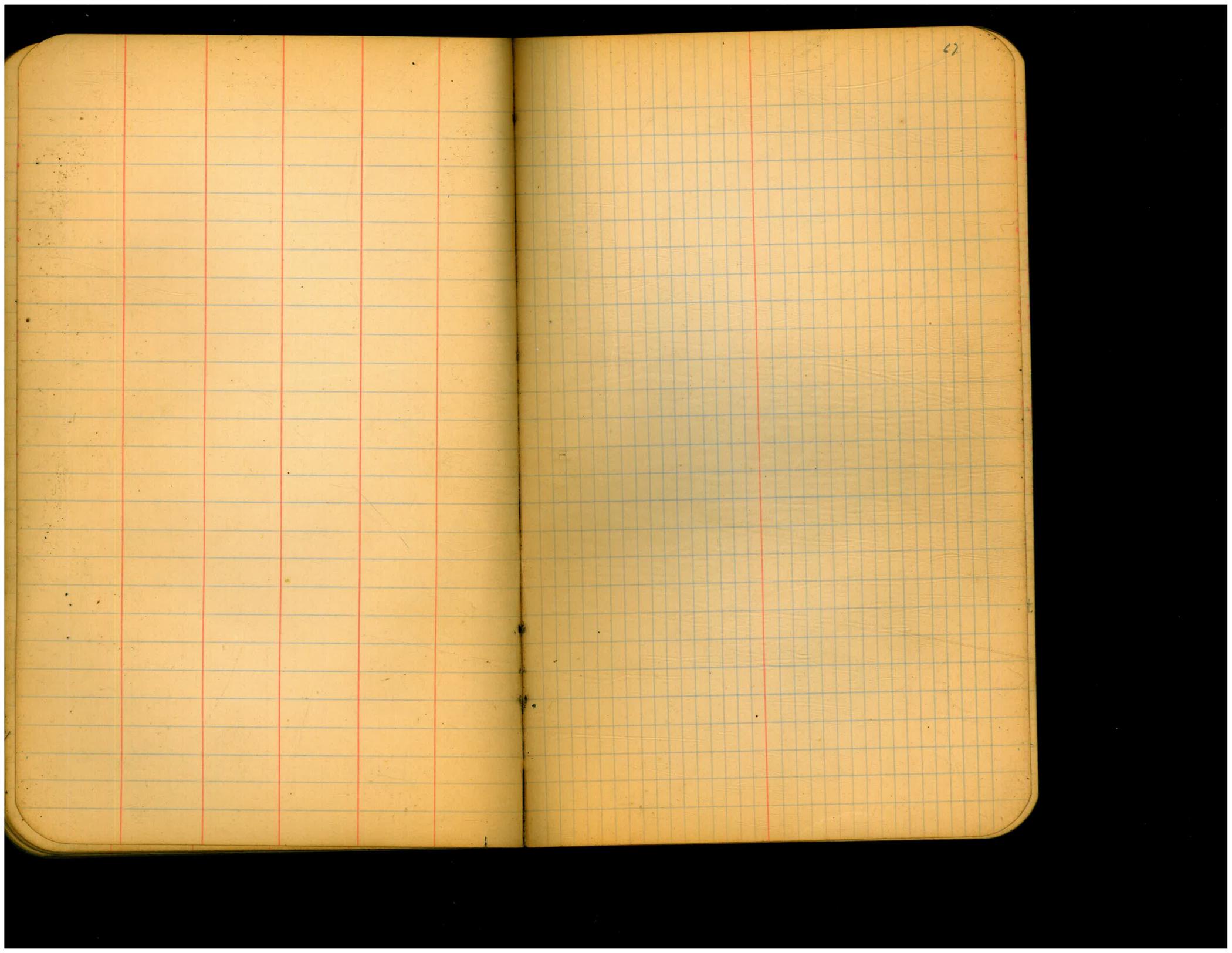
C 110
305

C 12
256

C 118
309

C 00
250

C 00
250

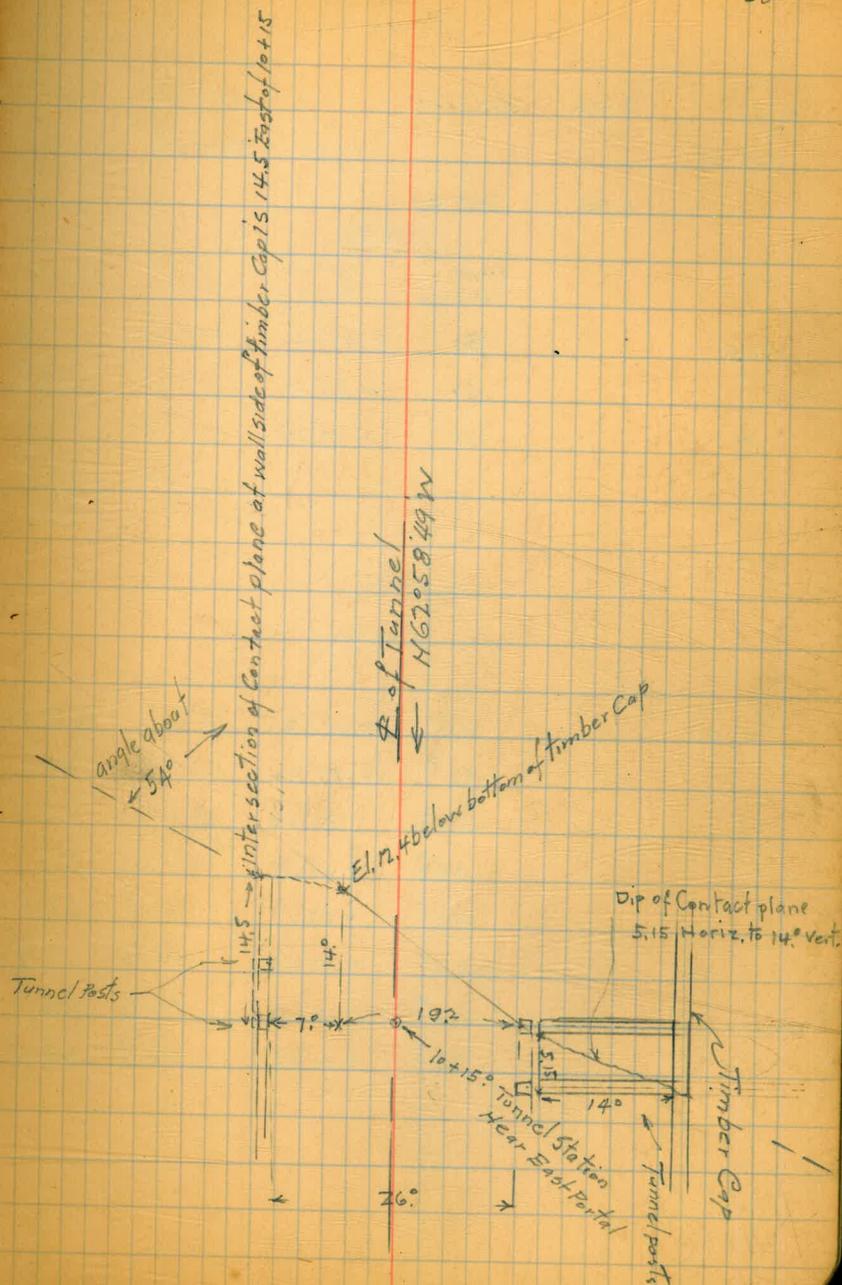
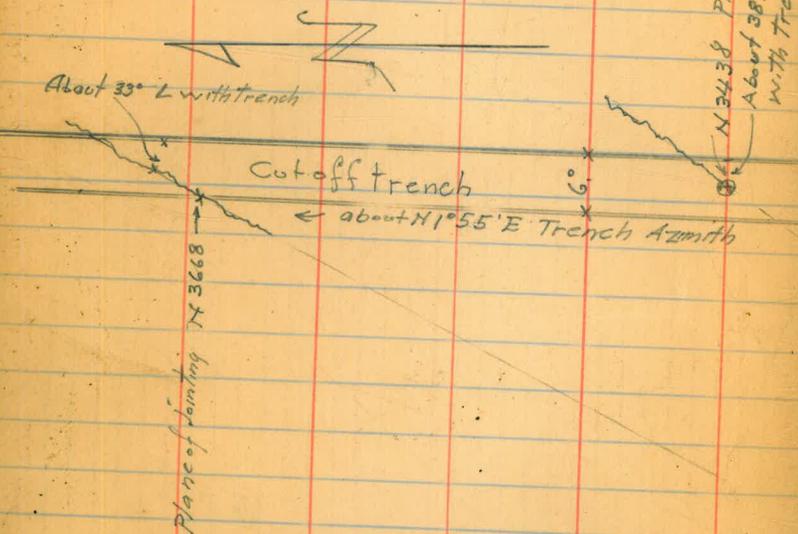


27

J.W. Williams
Frank Osborne.

Sept 24. 34

El Capitan Dam
Sketch of plane of
Jointing at Intersection
of Outlet Tunnel and
Cut off Wall Trench



Exit Tunnel Portal cut
Final cross-sections
(South Side)

B.M. 3.24 552.56 549.32
T.P. 'A' 7.86 544.70
2.75 547.45

0+40

	Slope Distance	Vertical Angle	Hor. Dist	Elev.
O.G.	90	+37°02'	71.8	601.6
	69	+35°34'	56.1	587.5
R	51	+27°36'	45.2	71.0
			46'	554.5
			44.5	546.8
			44.5	542.0

0+50

H.I. 547.72

O.G.	68	+40°02'	52.1	591.4
	60 ⁷	+37°30'	48.1	84.6
	55 ²	+32°06'	46.8	77.0
	49 ³	+29°30'	42.9	72.0
	46 ⁵	+27°07'	41.4	68.9
R	43 ⁴	+24°04'	39.6	65.4
	41 ⁵	+12°28'	40.5	56.6
	36 ⁸	+4°23'	36.7	50.5

Exit Tunnel Portal cut
Final x sections (South side)

70

slope Distance vertical angle Hor Dist Eled

0+73

H.I. 548.05

O.G.	62	+38°51'	48.3	586.9
	49	+32°44'	41.2	74.5
R.	40 ⁴	+23°18'	37.1	64.0

0+81

H.I. 548.46

O.G.	58 ³	+36°55'	46.6	83.5
	50 ⁵	+34°03'	41.8	78.8
	43 ³	+32°01'	36.7	71.4
	42	+25°50'	37.8	66.8
R	37 ⁸	+17°53'	36.0	60.1
	35 ⁶	+16°17'	34.2	58.5
	29°	+2°52'	29.0	49.9

Exit Tunnel Portal cut
Final x sections (Southside)

Slope Distance	Vertical Angle	Hor. dist	Elev
----------------	----------------	-----------	------

1+02

H.I. 549.70

R.	31°	+7°06'	30.8	553.5
	43°	+25°55'	38.7	68.5
O.G.	53°	+34°22'	43.7	79.6

1+16

H.I. 549.41

O.G.	50°	+33°30'	41.7	77.0
	40°	+24°51'	36.3	66.2
	27 ^S	+2°40'	27.8	51.2

1+35

H.I. 547.67

	23°	+5°52'	22.9	50.1
	33°	+18°34'	31.3	58.2
	44°	+30°52'	38.0	70.4
O.G.	48°	+32°50'	40.3	73.7

Slope Distance Vertical Angle Hor. Dist. Rod

1+47

H.I. 548.87

O.G.	Slope	Vertical Angle	Hor. Dist.	Rod
	45°	+28°50'	39.4	570.1
	34°	+18°33'	32.2	59.2
	24°	+6°31'	23.8	51.1

1+62

H.I. 548.52

	24°	+2°55'	24.0	49.7
	27°	+13°33'	26.2	54.8
	33°	+17°18'	31.9	58.5
O.G.	44°	+29°27'	38.5	70.2

1+81

H.I. 549.39

O.G.	39°	+24°27'	36.0	65.7
	34°	+17°30'	32.4	59.6
	26°	+11°50'	25.4	54.7

?

Exit Tunnel Portal cut
Final Sections Cont.

73

Stope Vertical Horizon. ELEV. ELEV.
Dist. Angle Dist.

0+35

H.I. 547.37

T.P. 44.70

2.67

47.37

O.G	90°	+37°47'	71.1	602.5
	78°	+32°32'	66.4	589.8
	69°	+29°14'	60.5	81.2
Rock	57°	+26°59'	51.0	73.4
	54°	+26°22'	48.6	71.5
	48°	+21°24'	45.3	65.2

47'

552.8

48'

542.0

0+30

H.I. 547.56

2.86

544.70

547.56

O.G	88°	+38°10'	69.6	602.3
	85°	+37°03'	67.8	598.8
	76°	+32°12'	64.7	88.4
	65°	+28°12'	57.3	78.3
Rock	58°	+27°17'	51.8	74.3
	56°	+26°50'	50.2	73.0
	49°	+19°35'	46.3	64.0

45'

557.9

47'

542.0

	Slope Dist	Vert Angle	Hor. Dis.	Elev
			0+20 H.I. 547.89	
O.G	85 ⁸	+39°42'	66.0	602.7
	74°	+33°46'	61.5	589.0
	67°	+31°23'	57.2	82.8
Rock	58°	+28°44'	50.9	75.8
	53 ³	+23°47'	48.8	69.4
	47°	+18°16'	44.6	62.6
			37	544.3
			34	542.0

544.70
3.19
547.89

0+10
H.I 547.97

544.70
3.27
47.97

O.G.	84°	+41°53'	62.5	604.1
	77 ⁸	+39°06'	60.4	597.1
	71 ⁵	+35°49'	58.0	89.8
	65 ³	+34°13'	54.0	84.7
Rock	57 ²	+31°48'	49.0	78.4
	52 ⁸	+25°20'	47.7	70.6
	48°	+21°24'	44.7	65.5
			39	547.3
			30	542.0

	Slope	Dist.	Vert. Angle	Hor. Dist.	Elev.
				0+00	
				H.I. - 548.95	
O.G.	81°		43°06'	59.1	604.2
	73°		40°09'	56.4	596.5
	71°		38°53'	55.9	94.0
	62°		36°09'	50.5	85.8
Rock	55°		33°49'	46.3	79.9
	51°		33°18'	42.6	76.9
	44°		24°55'	40.3	69.6
				32'	550.0
				27'	547.7
				26'	542.0

544.70
4.25

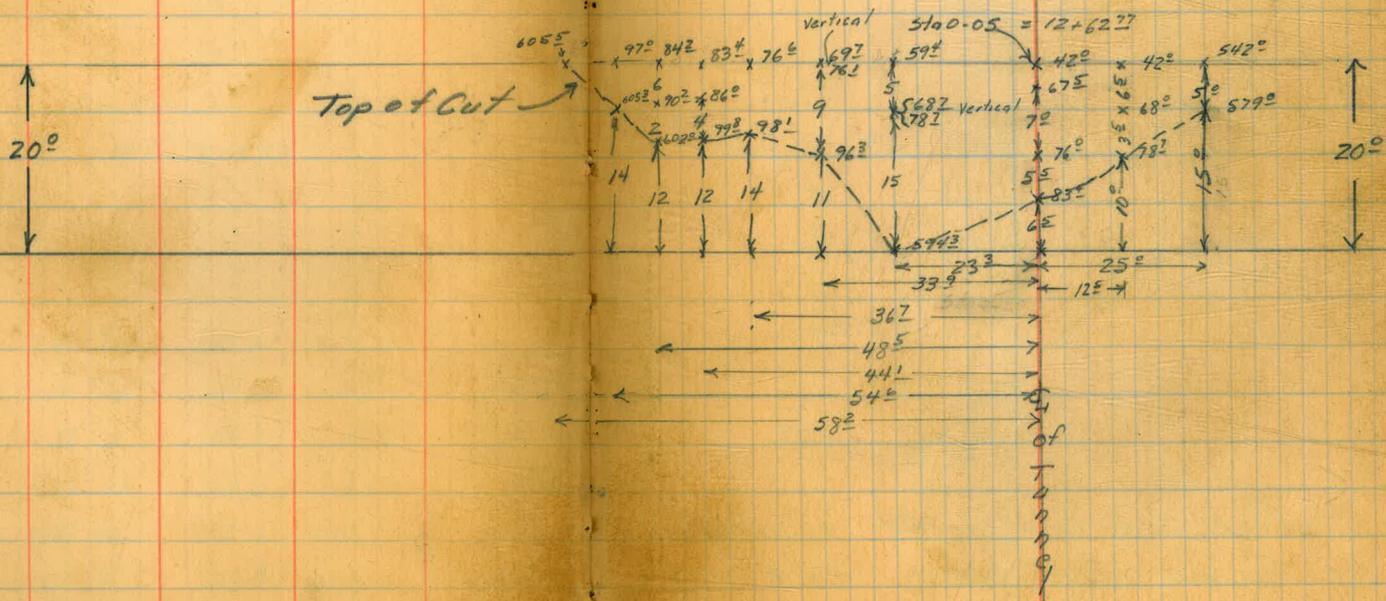
0-05

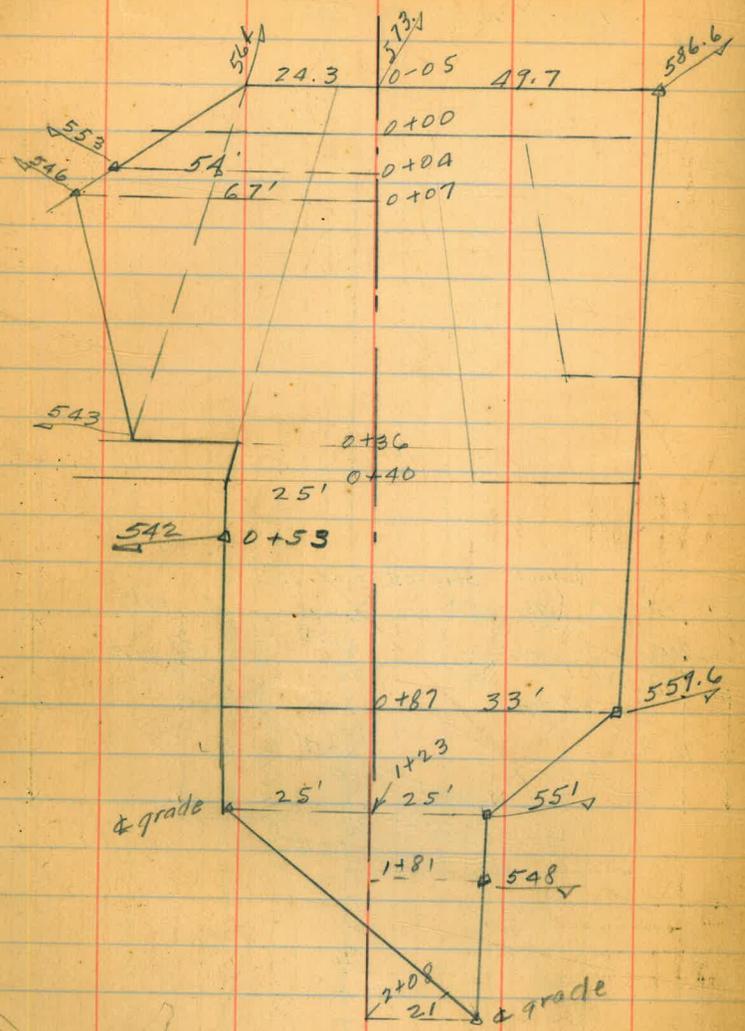
H.I. 548.87

544.70
4.17
48.87

O.G.	81°	+44°14'	58.2	+56.6	605.5
	72°	+41°27'	54.6	+48.1	597.0
	56°	+38°0'	44.1	+34.5	583.4
	60°	+36°03'	48.5	+35.3	584.2
Rock	46°	+36°59'	36.7	+27.7	576.6
	39°	+31°29'	33.9	+20.8	569.7
	25°	+24°18'	23.3	+10.5	559.4
			24'		542.0

Final X Sections 3100-05 to 0-25
 Nov 9 - 1932
 Div. Tunnel outlet





Rock line Exit Portal as defined
 by Mr. Pyle and Mr. Weed Nov 2, 1932

Copied from book 380 by R.E.L.

98.74
34.44
133.18