

W160

LEVEL BOOK

373

CITY OF
SAN DIEGO - CALIFORNIA
ADDITIONAL WATER SUPPLY
EL CAPITAN CONDUIT
ALTERNATE LINE VIA MISSION GORGE

13

KEUFFEL & ESSER CO.

DRAWING MATERIALS

AND

SURVEYING INSTRUMENTS.

NEW YORK.

CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

Tables for Excavations and Embankments.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.
ROADWAY 18 FEET WIDE, SIDE SLOPES 1 TO 1.
FOR SINGLE TRACK EXCAVATION.

" Copyright, 1895, by Keuffel & 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.

MICROFILMED

JAN 8 1965

Return to
Office of Board of Water Commissioners
Room 370 McNeece Bldg., San Diego

Alternate Conduit Line - El Capitan to Univ Hts

Reservoir - between Lakeside & East San Diego 3 - 43

Conduit Line - El Capitan to Univ. Hts. Res. 44 - 80

MICROFILMED

JAN 8 1987

Alternate Conduit Line El Capitan to Univ. Hts
S-Z Line

Hayler, Inst.
Williams, Rod

S-2

2-23-22

3

Sta.	Azi.	Rod.	Hor. Dist.	Vert. Δ	Elev.
π @403+23	S Line				418.93
BS on 394+84	Δ 81° 13'	8.38			
404+35	299° 00'	1.11			417.1
405+79	"	2.55		-2° 42'	-12.01 406.9
410+24	299° 00'	7.00		-0° 56'	-11.41 407.5
411+79	Δ 299° 00'	8.55		-0° 48'	11.97 406.96
π @411+79					
BS on 403+23	119° 00'	8.55			
413+63	316° 23'	1.83			406.3
415+55	Δ 316° 23'	3.75		+0° 18'	408.94
π @415+55					+195 408.91
BS on 411+79	136° 23'	3.75			
	116° 25'	4.7			
	78° 49'	3.10			
416+04	261° 22'	.48			
417+71	"	2.15		-1° 36'	-6.00 402.9
421+24	\odot 261° 22'	5.68		-0° 51'	-8.41 400.53
π @421+24					
BS on 415+55	81° 22'				

F.S. H.I. B.S.
423.81 4.88

Near Jct. Julian Ave + Alpine Road

6.7
At W Edge of Alpine Road

Bottom of Wash

At Fence (W edge of Road)

At W edge of road 15' E. of W. fence
Main Street of Lakeside

411.51 4.55

5.2
In road
2.57

413.67 4.73

4.6' South of S Edge of Paving

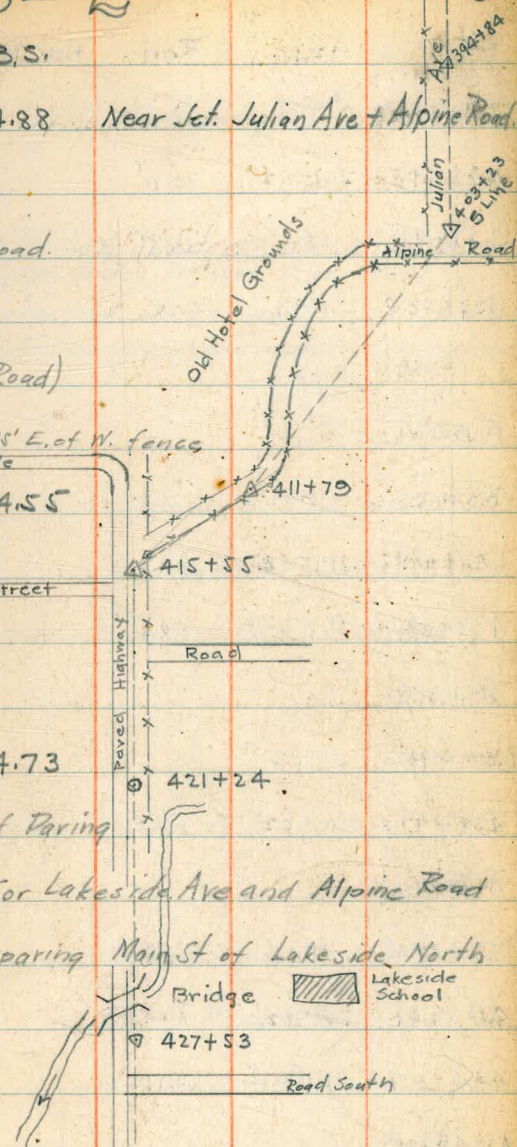
3x3 White stake SW Cor Lakeside Ave and Alpine Road

Δ of Road at turn in paving Main St of Lakeside North

Δ of Street North

Δ of Road to South

405.15 4.62



Sta	Azi.	Rod	Hor. Dist	Vert \angle	Elevation	F.S.	H.I.	B.S.	
π @421+24				203.15					2-23-22
					400.60	4.55	405.15		Co. Highway BM#21 (400.356)
425+15	261°22'	3.90			398.75	6.40			
426+45	"	5.20			400.85 395.5	4.30			On Bridge Floor at Cen of Bridge & Stream under Bridge Elev 395.5
427+53 A	261°22'	6.28			397.40	7.75			South side of Pave ment
2-24-22 Hayler-Transit Williams-Rod.									
π @427+53A									
B.S. on 421+24	81°22'	6.28					401.61	1.25	400.36 BM#21
427+89	261°02'	0.35			496.8	4.77			ϕ of Road to South.
433+38 \odot	261°02'	5.84			395.78	5.83	400.18	4.40	South side of Pave ment
π @433+38									
B.S. on 427+53	81°02'								
438+97 \odot	261°02'	5.58			392.08	8.10	396.34	4.26	S. Side of Pave ment
π @438+97									
B.S. 433+38	81°02'	5.58			394.19	2.15			County BM#20 Elev 394.176
443+08	261°02'	4.10			393.2	3.10			ϕ of Road to Bostonia. South
444+09A	261°02'	5.11			392.86	3.48			6.5' South of Pave ment
π @444+09							397.33	4.47	
					393.71	3.62	397.27		County BM#19 $\frac{1}{2}$ Elev 393.646
B.S. on 438+97	81°02'	5.11							

Sta.	Azi.	Rod	Hor. Dist	Vert A.	Elev.	F.S.	H.I.	BS		
π@444+09							307.27	3.62	393.646	BM 19½
452+40	261° 36'	8.30			387.13	10.14				
π@452+40							391.67	4.54		
B.S. 444+09	81° 36'									
458+03	261° 36'	5.62			383.89	7.78				
π@458+03							388.49	4.60		
BS on 452+40	81° 36'									
463+62	261° 36'	5.58			383.29	5.20				2.5' S of Edge of Pavement 6' E. of E Line Riverview Ave. So. (Riverview High School on West side of road)
π@463+62							382.98	4.62		
BS on 458+03	81° 36'									
470+46	261° 36'	6.83			380.64	7.34				At Curve in pavement 23' W. of W Line School Grounds
π@470+46							385.22	4.58		
BM					381.89	3.33				County BM #18 Elev 381.841
BS on 452+40	81° 36'	18.00 ±					New H.I. 385.17	3.33		
475+11	269° 46' 30"	4.64			379.5	5.68				± Road South (Magnolia Ave)
476+81	269° 46' 30"	6.24			378.90	6.27				
π@476+81							383.52	4.62		
B.S. 470+46	89° 46' 30"									
481+31	269° 46' 30"	4.49			376.56	6.96	380.83	4.27		

2-24-27

Sta.	Azi.	Rod	Hor. Dist	Vert. X.	Elev.	F.S.	H.I.	B.S.	
π@481+31							380.83		
B.S. 476+81	89°46'30"								
483+15	269°46'30"	1.83			374.4	6.4			Bottom of Culvert under Pavement
484+87	"	3.55			378.05	2.78			6' Pared Highway
485+50A	269°46'30"	4.18			377.83	3.00			West of pavement at curve
π@485+50							382.66	4.83	
B.S. 481+31	89°46'30"	4.18					Correct H.I.		
B.M.					379.65	3.01	382.72		County BM #17 Elev 379.708
"C"-7		1.31				6.65	376.07		Sta 7 of "C" Line Δ on 370' Contour Survey
492+98A	255°53'	7.47		+1°11'	+1543 393.26				6' West of Pavement (At Summit of pavement near River view opposite Railway Platform + sign Lorraine Park)
π@492+98							397.87	4.61	
B.S. on 485+50	75°53'	7.47		-1°11'					
497+02A	237°48'	4.03			387.11	10.76			6' West of Pavement opposite Sand loading switch on S.D. + A.Ry
π@497+02							391.75	4.64	
B.S. on 492+98	57°48'	4.03							
502+44 Δ	222°50'	5.41		-1°44'	-16.34 370.77				
π@502+44							375.52	4.75	
B.S. on 497+02	42°50'	5.41							
499+09	42°50'	3.34							Back Shot Intersection with fence line E + W Cen. Line of Section H.M. Learn's North Line

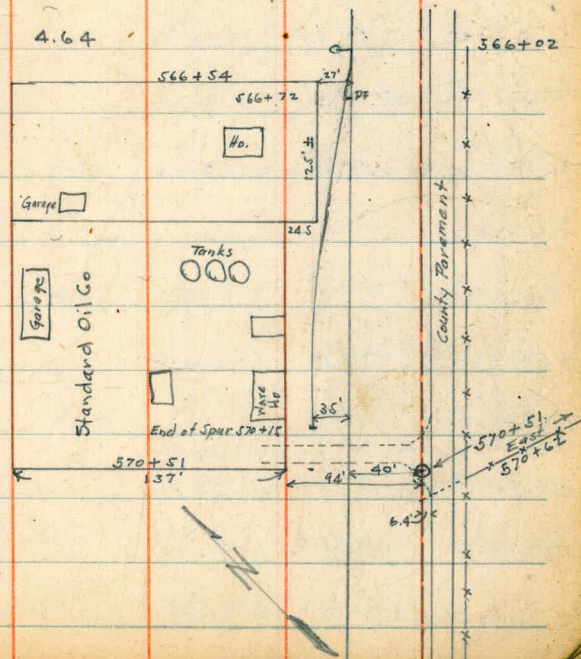
Sta	Azi	Rod	Hor. Dist	Vert &	Elev.	FS.	H.I.	B.S.	
T@502+44							375.52		
"C" 4	90°54'	1.33			370.01	5.51			Sta Δ 4 of "C" Line at Sand Loading Plant (fenton)
507+72	225°20'	5.27			367.12	8.40			
T@507+72							371.87	4.75	
B.S. on 502+44	45°20'								
"C" 3	1°29'	.48			367.15	4.72			Sta Δ 3 of "C" Line
513+23	227°07'30"	5.50			363.64	8.23			
T@513+23							368.30	4.66	
B.S. on 507+72	47°07'30"								
B.M.					365.56	2.74	Corrected H.I. 367.85		County B.M. #15 1/2 Elev 365.108
"C"-2	300°59'	0.51			365.00	2.86			Sta Δ 2 of C Line
518+98	227°07'30"	5.74			362.66	5.19		4.67	3.85' W of Wedge of pavement
T@518+98	Used F.S.						367.33	4.67	
521+92	227°07'30"	2.93			362.60	4.73			Main E & W Fence running East Probably Learn's South Line
524+87	227°07'30"	5.88			362.68	4.65			
T@524+87							366.75	4.07	2-25-22 Hayler - Transit Williams - Rod
B.S. on 507+72	47°07'30"								
530+91	227°07'30"	6.03			363.59	3.16			
T@530+91							368.14	4.55	

2-24-22

Sta	Azi.	Rad	Hor. Dist	Vert. Δ	Elev.	F.S.	H.I.	B.S.	
π @ 530+91							368.14		
BS on 507+72	47°07'30"								
Δ 138	340°27'	0.72			359.88	8.26			Sta 138 Δ of 360' Contour Survey
to 537+83 \odot	227°07'30"	6.91			361.34	6.80			5' west of W Edge of Pavement
π @ 537+83							265.83	4.49	
BS on 507+72	47°07'30"								
B.S. 534+52	47°07'30"	3.30							Intersection with main fence line running North from Railway 2. of N. County BM #14 Elev. 361.922
B.M.					361.96	3.87			
543+44	227°07'30"	5.60			361.23	4.60			
to 544+50 \odot	227°07'30"	6.66			362.98	2.85			
π @ 544+50							367.48	4.50	
B.S. 507+72	47°07'30"								
546+34	227°07'30"	1.83			366.0	1.51			
to 551+68 \odot	227°07'30"	7.17		+0°26'	+5.45 368.43				
π @ 551+68							372.81	4.38	
B.S. on 507+72	47°07'30"								
554+56	227°07'30"	1.87			371.8	1.04			
to 557+95 \odot	227°07'30"	6.26		+0°20'	+3.63 372.06				
π @ 557+95							376.60	4.54	

Sta.	Azi.	Rod	Hor. Dist.	Vert. Δ	Elev.	F.S.	H.I.	B.S.	
π @557+95							376.60		
BS on 567+72	47°07'30"								
558+86	227°07'30"	0.90			371.7	4.89			Lane + Fence running West from Ry.
+ 564+46	227°07'30"	6.50			370.44	6.16			
π @564+46							374.98	4.54	
BS 554+?	47°07'30"								
B.M.					366.72	8.26	374.11		County BM #12 Elev. 365.850
566+54	227°07'30"	2.07			369.76	4.35			N. Line Fence Std. Oil Co.
+ 570+51	227°07'30"	6.04			370.17	3.94			On S Line Fence Std. Oil Co.

π @570+51							374.81	4.64	
BS 554+?	47°07'30"								
	316°03'	.93			SE Cor Std. Oil Co.				
	316°03'	2.30			SW Cor Std. Oil Co.				



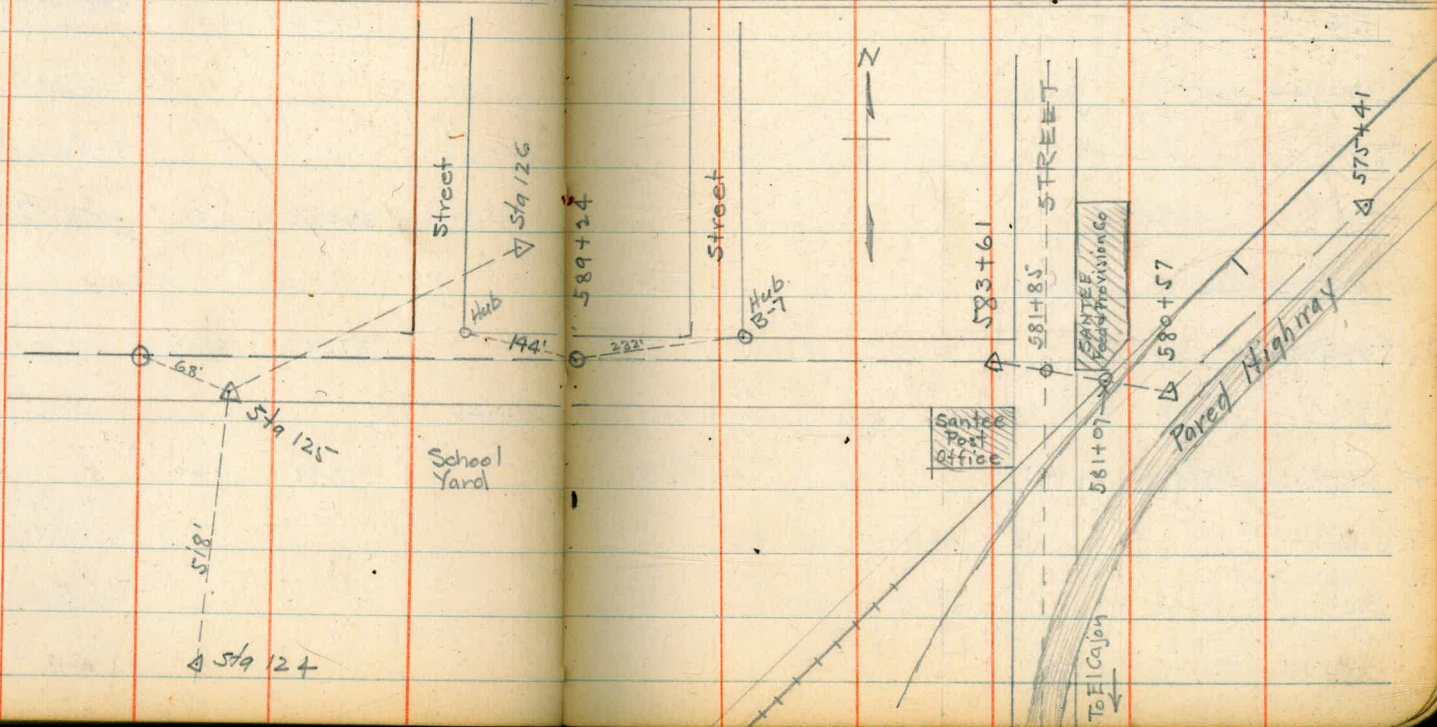
Sta.	Azi.	Rod	Hor. Dist	Vert. Δ	Elev.	F.S.	H.I.	B.S.	
π @570+51							374.81		
BS. on 554+?	47°07'30"								
to 575+41	227°07'30"	4.89			365.52	9.29			
π @575+41							370.12	4.60	
BS on 554+?	47°07'30"								
	309°21'	2.60		-1°30'	-6.83 358.69				A. 129 of 360' Contour Survey
to 580+57 A	227°07'30"	5.15			363.72 363.78	6.40 7.13	370.911	1.20	County B.M. #11 Elev. 369.711
π @580+57	See sketch next page								
BS on 575+41	47°07'30"	5.15					367.98	4.20	See sketch next page
to 581+07	279°11'	0.49			367.08	0.90			± SD+ARY Top of Tie
581+85	279°11'	1.27			367.42	0.56			± N+S Street + Paved Road South
to 583+61 A	279°11'	3.03		+0°51'	368.26 368.20	5.82	374.02	4.31	369.71 ^{1/2} N. Side of dirt Road opposite Santee Post Office.
π @583+61									
BS. on 580+57	99°11'	3.03		-0°51'			372.85	4.65	
to 589+24	271°33'	5.62			362.39	10.46			
π @589+24							366.99	4.60	
BS on P	91°33'								Backsight on South Edge of letter P in SANTEE FEED & PROVISION CO.
Block Cor	85°12'	2.31							Hub Marked B-7 at NE of Street Int.
"	281°55'	1.44							Hub at NE Cor of Street Int.

v
|
w
PRO

Sta.	Azi.	Rod	Hor. Dist	Vert. Δ	Elev.	F.S.	H.I.	B.S.	15A	2-25-22
⊗ @ 589+240							366.99			
to 594+470	271° 33'	5.22			358.19	8.80		4.67		
⊗ 594+47							362.86	4.67		
to Δ 125	118° 33'	0.68			358.80	4.06			Δ 125 of 360' Contour	
to 600+040	271° 33'	5.56			351.07	11.79				
⊗ @ 125										
Bsm 594+47	298° 33'									
to Δ 124	197° 03'	5.18							Δ 124 of 360' Contour	

Survey of 360' Contour shows
Az 195° 43' Rod 5.10

Δ 124 of 360' Contour



2-27-22
Hayler, West
Williams, Rod

Sta.	Azi.	Rod	Hor. Dist.	Vert. A	Elev.	F.S.	H.I.	B.S.	
π@600+04		BS on Sign on Bldg.			351.07		355.63	4.56	On North side county road.
B.S.	91°33'								
601+76	271°33'	1.71			350.8	4.80			⊥ Road North thru Dupee's Ranch
to 606+50	271°33'	6.45			345.40	10.23			
π@606+50							349.81	4.41	
B.S.	91°33'								
to 612+77	271°33'	6.26			342.82	6.99			
π@612+77							347.04	4.22	
B.S.	91°33'								
to 619+34	271°33'	6.56			340.15	6.89			
π@619+34							344.50	4.35	
B.S.	91°33'								
to 625+58	271°33'	6.23			337.50	7.00			
π@625+58							341.95	4.45	
B.S.	91°33'								
to 633+01A	271°33'	7.42			336.19	5.76			
π@633+01							340.27	4.08	
B.S.	91°33'								
633+56	270°11'	0.54							

Fence Line North across River

County Road to Service ↑
625+58
633+01
Road South
DEOULLARD RANCH
N+S Fence Line across Valley
East Line of Deouillard Ranch
W Line of Road South

Sta.	Azi.	Red.	Hor. Dist	Vert. X	Elev.	F.S.	H.I.	B.S.	
T@633+01							340.27		
+ 639+80	270° 11'	6.78			335.76	4.51			
T@639+80							340.24	4.48	
F.S.	270° 11'								
640+74	"	0.93			335.0	5.20			Fence line runs North. (W Line of Dr Good's ranch?)
+ 646+21	270° 11'	6.40			335.93	4.31			
T@646+21							340.55	4.62	
F.S.	270° 11'								
+ 652+48	270° 11'	6.26			333.81	6.74			
T@652+48							337.96	4.15	
F.S.	270° 11'								
656+23	"	3.74			332.2	5.8			Fence line North (Scripps East Fence?)
+ 658+91	270° 11'	6.42			331.52	6.44			
T@658+91							335.89	4.37	
F.S.	270° 11'								
+ 665+30	270° 11'	6.38			327.10	8.79			(Azimuth 180° 20' On line with fence to South West line of Drouillard Ranch.)
T@665+30							331.72	4.62	
F.S.	270° 11'								
+ 671+59	270° 11'	6.28			325.59	6.13			

Sta.	Azi.	Rod	Hor. Dist	Vert. \pm	Elev.	F.S.	H.I.	B.S.	Notes
T@671+59					325.59		330.48	4.89	
F.S.	270° 11'								
673+12	"	1.52			327.27	3.21			On Floor of Bridge
673+24	"	1.64			321.9	8.6			East End of Bridge 24' Span West Abutment washed out.
+0 679+09	270° 11'	7.49			324.98	5.50			Center of Stream under Bridge
T@679+09							329.76	4.78	
F.S.	270° 11'								
675+35 Backshot	90° 11'	3.73			324.6	5.2			Fence running South over Butte or knob hill.
+0 685+76	270° 11'	6.66			326.83	2.93			Center of Road South Sign Post reads <i>Fansy Heights</i> \rightarrow S
T@685+76							331.45	4.62	
F.S.	270° 11'								
	180° 08'								\perp Road South
Ford Tang.	250° 39'								F.S. on East Edge of Ladder on Silo
+0 693+25	250° 39'	7.48			327.50	4.95			
T@693+25									
F.S.	250° 39'						332.10	4.60	Z-28-22 Hayler Transit Williams, Rod
+0 701+13	250° 39'	7.87			321.68	10.42			On line with Scripps fence North Az. 0° 25' - Old Perry Road
T@701+13									
F.S.	250° 39'						326.31	4.63	

Sta.	Azi.	Rod	Hor. Dist	Vert. \pm	Elev.	F.S.	H.I.	B.S.	
T@ 701+13	250°39'						326.31 ✓		
696+75									
Back Shot	70°39'	4.37							Main Fence line runs South up hill
702+09	250°39'	0.95			321.9	4.41			(This is where we ran tie line across river on 368 contour survey)
to 707+81	250°39'	6.67			318.63 ✓	7.68			On Fence line North Azi 299°51'
T@ 707+81							323.22 ✓	4.59	
F.S.	250°39'								
707+43									
Back Shot	70°39'	0.37							Fence Line South
to 710+67A	250°39'	2.85			318.15 ✓	5.07			At angle in road.
T@ 710+67							322.85 ✓	4.70	
F.S.									on NW Cor Green House
712+65	265°10'	1.97			317.5	5.40			Fence Line South
to 717+68	265°10'	7.00			317.86 ✓	4.99			On Fence Line South Az. = 180°54'
T@ 717+68							322.48 ✓	4.62	
F.S.	265°10'								
722+72	265°10'	5.03			316.1	6.36			Fence Line South
to 723+59A	265°10'	5.90			316.00 ✓	6.48			At Angle in Road On East Fence of Angling Road South Azimuth 217°12' Road to Murray Reservoir
T@ 723+59							320.46 ✓	4.46	
F.S.	265°10'								
to 729+07	274°33'	5.47			312.08 ✓	8.38	316.48 ✓	4.40	

Sta	Azi.	Rod	Hor Dist	Vert'x	Elev.	F.S.	H.I.	B.S.	
T@729+07							316.48		
F.S.	274°33'								
to 735+61	274°33'	6.53			313.34	3.14			
T@735+61							317.98	4.64	
F.S.	274°33'								
740+02	274°33'	4.40			304.9	13.1			Bottom of Wash
742+28	"	6.66			305.4	12.6			Fence South (starts 200 ± South of Road)
to 746+72	274°33'	11.10			315.18	2.80			(Found large hollow sycamore near creek with USGS Temp BM, marked on it but BM had been destroyed)
T@746+72							319.86	4.68	
F.S.	274°33'								
747+43	274°33'	0.70			318.7	1.2			
750+00	274°33'	3.27			317.2	2.7			Fence South with 2" Pipe Posts
to 754+31	274°33'	7.58			318.47	1.39			On Fence North Az 50/21
T@754+31							323.06	4.59	
F.S.	274°33'								
757+57	274°33'	3.25			322.76	0.30			
T@757+57							327.26	4.50	
F.S.	274°33'								
758+67	274°33'	1.09			320.22	7.04			Division Fence South

Sta	Azi.	Rod	Hor. Dist	Vert. X	Elev.	F.S.	H.I.	B.S.
$\pi @ 757+57$					326.97	0.29	327.26	
to 761+67 \circ	274°33'	4.09			331.90	4.73	336.63	9.66
$\pi @ 761+67$								
F.S.	274°33'							
763+11	274°33'	1.43			334.05	2.58		
T.P.					336.58	0.05	344.46	7.88
to 764+66 Δ	274°33'	2.98		+1°33'	339.89	4.57		
$\pi 764+66$								
F.S.	274°33'							
767+77	280°33'	3.10			333.46	11.00		
to 770+89 \circ	280°33'	6.22			338.03	6.43		
$\pi @ 770+89$							342.65	4.62
B.S.	100°33'							
to 776+32 \circ	280°33'	5.42		+1°04'	348.04	4.78		
T.P.					342.36	0.29	352.82	10.46
$\pi @ 776+32$								
B.S.	100°33'							
778+53	255°27'	2.20		+3°38'	+13.90 361.94			
T.P.	280°33'				352.33	0.49	360.00	7.67

Fence Line N + S from road
(Section Line)

$\Delta 81$ of 360' Contour Survey

Sta.	Azi.	Rod	Hor Dist	Vert Δ	Elev.	F.S.	H.I.	B.S.	
⊥@776+32									
to 782+71	280°33'	6.38		0°30'	355.26	4.74	360.00		
⊥@782+71									
B.S.	100°33'								
	224°26'	0.92	92	+4°10'	+6.67 361.93				Δ 80 of 360' Contour Survey
to 786+25	280°33'	3.53			347.58	12.42	352.22	4.64	
⊥@786+25									
B.S.	100°33'								
to 790+01	280°33'	3.75			341.03	11.19			
⊥@790+01							345.70	4.67	3-1-22 Hayler, Transit Williams, Rod.
B.S.	100°33'								
790+31	280°33'	0.29			338.95	6.75			Fence Line South
793+81	"	3.79		-1°36'	-10.6 328.3				
794+72	"	4.70			336.65	9.05			Fence line South
to 796+70	280°33'	6.68			336.51	9.19			
⊥@796+70							341.04	4.53	
B.S.	100°33'								
	280°33'	2.70	270	-2°56'	-13.85 322.6				At angle in road on old tangent
800+21	299°52'	3.40		-3°01'	-17.9 318.6				Intersection with ⊕ Road
to 802+16	299°52'	5.45			337.64	3.40			
					332.54	8.10	340.64	3.00	On Fletchers 320 Hub (?) No Mark

Sta.	Azi.	Rod	Hor. Dist	Vert Δ	Elev.	F.S.	H.I.	B.S.	
π @802+16					337.64		342.23	4.59	
BS.	119°52'								
to 803+30 Δ	306°02'	1.18	114	+11°43'	+23.66 361.30		365.31	4.01	Sta. 75 of 360' Contour
π @803+30									
BS on 802+16	126°02'	1.18 ✓		-11°43' ✓					
to Sta 74	328°27'	2.05			361.44	3.87			(Azi = 146°53' Rod 2.05) 1934 to Sta 74 of 360' Contour.
to 805+55 Δ	311°06'	2.16	215	+5°44'	+21.57 382.97				
π @805+55							387.49	4.62	
BS on 803+30	131°06'	2.16 ✓		-5°43'					
to 807+54 Δ	272°51'	2.01	199	+7°09'	+24.95 407.82				
π @807+54							412.54	4.72	
BS. 805+55	92°51'	2.01 ✓		-7°09' ✓					
to 810+16 Δ	238°08'30"	2.61		+1°13'	+5.56 413.38				
π @810+16							417.62	4.24	
BS on 807+54	58°08'30"	2.61 ✓		-1°13' ✓					
to 811+89 Δ	219°22'	1.72		+1°53'	+5.68 419.06				
π @811+89							423.61	4.55	
BS. on 810+16	39°22'	1.72 ✓		-1°52'					
to 813+77 Δ	197°50'	1.88	1.88	-4°51'	-15.92 403.14				

Sta.	Azi.	Rod	Hor. Dist	Vert. Δ	Elev.	F.S.	H.I.	B.S.	
T@ 813+77					403.14				
B.S. on 811+89	17°50'	1.88		+4°51'			407.52	4.38	
814+76	255°47'	1.12	99	-2°44'	-37.5 365.6				Bottom of Wash
816+93	"	3.16	316	-3°34'	-19.7 383.4				
818+77	"	5.00	500	-3°08'	-27.4 375.7				
to 820+75 Δ	255°47'	6.97		-1°29'	-18.08 385.06				
T@ 820+75							389.55	4.49	
BS on 813+77	75°47'								
	254°04'	2.47		+5°52'	+25.22 410.28				Sta -1+66.2 Axis of Mission Dam #1
* 822+35	264°17'	1.62	160	-8°15'	-23.17 361.8				Bottom of Wash
* 822+25	264°17'	1.50	150		<small>5' lower than last reading</small>				
823+46	"	2.80	271	+4°14'	+20.69 405.75				
to 824+29 Δ	264°17'	3.56	354	+4°04'	+25.25 410.31				= Sta -1+25 Axis "B" of Damsite #1
T@ -1+66.2	<small>BS on 820+75</small> 74°04'							4.34	
On Sta 68	354°05'	1.77	164	-16°35'	-48.7 361.58				Axis of Damsite #1 'Old Mission Sta 68 of 360' Contour
T@ 824+29							414.81	4.50	
BS on 820+75	84°17'								
to 0+00	335°01'	1.44	126	-21°16'	-49.04 361.27				Axis "B" Damsite #1 "Old Mission Dam" 0+00 of Axis B
to 825+68 Δ	257°00'	1.38			412.30	2.51			

Note, See Bk 2, p. 13 for location + elevation of
U.S.G.S. Gage at Old Mission Dam. Zero = 268.65
(266.42)

Sta.	Azi.	Rod	Hor. Dist	Vert. \angle	Elev.	F.S.	H.I.	B.S.
π @ 825+68					412.30		416.52	4.22
BS on 824+29	77°00'	1.38 ✓						
to 827+54 Δ	236°27'	1.85		+1°18'	+423 416.53			
π @ 827+54						420.63	4.10	
BS on 825+68	56°27'	1.85 ✓		-1°18' ✓				
to 829+30 Δ	230°37'	1.75 ✓			415.68	4.95		
3-2-22 Hayler, Inst. Williams, Rod.								
π @ 829+30						419.41	3.73	
B.S. on 827+54	50°37'	1.75 ✓						
to 830+40 Δ	218°05'30"	1.09			416.37	3.04		
π @ 830+40						420.44	4.07	
BS on 829+30	38°05'30"	1.09 ✓						
to 832+50 Δ	192°02'	2.09		+3°56'	+436 430.73			
π @ 832+50						435.11	4.38	
BS on 830+40	12°02'	2.09 ✓						
to 834+00 \odot	174°03'	1.49		+1°47'	+466 435.39			P.O.T.
π @ 834+00						439.63	4.24	
BS on 832+50	354°03'	1.49 ✓						
824+98	174°03'	0.97	97.5	-4°56'	-840 427.0			

Sta.	Azi.	Rod	Hor. Dist	Vert. L	Elev.	F.S.	H.I.	B.S.
$\bar{\pi}$ @846+90							432.02	
to 847+66 Δ	241° 41'	0.75			424.74	7.28		
$\bar{\pi}$ @847+66							429.11	4.37
BS on 846+90	61° 41'	0.75 [✓]						
848+43	235° 15' 30"	0.78	76.6	-10° 30'	-14.20	410.5		
to 849+58 Δ	235° 15' 30"	1.91		-2° 32'	-8.48	416.26		On Axis of Dam site #2 (Approx.)
$\bar{\pi}$ @849+58							420.24	3.98
BS on 847+66	55° 15' 30"							
to 0+00 of Axis	322° 02'	1.15		-35° 44'	-55.1	361.2		To Sta. 0+00 of Axis (Dam site #2) On 360 Contour between Δ #56 + Δ #57
	322° 05'	Azi. to Hub on West Side of River						
to 850+83 Δ	235° 24' 30"	1.24		+1° 59'	+4.32	420.58		
$\bar{\pi}$ @850+83							425.08	4.50
BS on 849+58	55° 24' 30"	1.24 [✓]		-1° 59' [✓]				
853+57	239° 43'	2.75	274	-4° 30'	-21.58	399.00		
to 854+80 Δ	239° 43'	3.96'		-1° 43'	-11.89	408.69		
$\bar{\pi}$ @854+80							412.45	3.76
BS on 850+83								
to 856+92 Δ	242° 22'	2.11			403.92	8.53		
$\bar{\pi}$ @856+92								
BS on 854+80	62° 22'	2.11 [✓]		+1° 17'			408.11	4.19

3-3-27
Hayler, Inst.
Williams, Rod

Sta.	Azi.	Rod	Hor. Dist	Vert. \angle	Elev.	F.S.	H.I.	B.S.
π @ 856+92					403.92		408.11	4.19
858+00	238°04'				390.0			
to 858+93 Δ	238°04'	2.00		+2°27'	+858 412.80			
π @ 858+93							417.06	4.56
B.S. on 856+92	58°04'							
to 860+09 Δ	253°44'	1.15			413.11	3.95		
π @ 860+09							416.81	3.70
B.S. on 858+93	73°44'	1.15 ^v						
to 861+20 Δ	243°06'	1.10		+1°10'	415.32 +227 415.36	1.49		
π @ 861+20							419.30	3.98
B.S. on 860+09	63°06'	1.10 ^v			(413.11	6.19)		
to 862+21 Δ	229°42'	1.00			411.73	7.57		
π @ 862+21							416.00	4.27
B.S. on 861+20	49°42'	1.00 ^v						
to 862+82 Δ	209°58'	0.60			412.36	3.64		
π @ 862+82							416.32	3.96
B.S. on 862+21	29°58'	0.60						
to 863+79 Δ	203°14'	0.96			412.32	4.00		
π @ 863+79							416.65	4.33
B.S. on 862+82	230°14'	0.96 ^v						

Sta.	Azi.	Ref	Hor Dist	Vert L	Elev.	F.S.	H.I.	B.S.
T@863+79							416.65	4.33
to 864+41 A	182° 21'	0.61			414.71	1.94		
T@864+41							418.62	3.91
BS on 863+79	2° 21'	0.61						
866+21	183° 45'		180		340			Bottom of Canyon
866+36	"	2.10	195	-16° 06'	-56.22 358.5			
866+87	"	2.62	246	-14° 45'	-64.78 350			
867+95	"	3.53	354	-2° 00'	-123.6 402.3			
to 870+77 A	183° 45'	6.35		-0° 44'	406.50 -8.14 406.57	12.12		
T@870+77							410.73	4.23
BS on 864+41	3° 45'							
to 871+81 A	180° 12'	1.03			401.95	8.78		
T@871+81							406.18	4.23
BS on 870+77	0° 12'	1.03						
872+62		0.96	81	-24° 30'	-36.71 365.2			50' to left is 40' ± higher
874+15		2.33	234		399.6	6.6		
to 875+41 A	199° 16'	3.59			402.19	3.99		
T@875+41							406.31	4.12
BS on 871+81	10° 16'							

Sta.	Azi.	Rpd	Hor. Dist	Vert L	Elev.	F.S.	H.I.	B.S.	
T@ 875+41							406.31	4.12	
to 876+68 A	194°00'	1.26			400.71	5.60			
T@ 876+68							404.94	4.23	
B.S. on 875+41	14°00'	1.26 ✓							
879+28	191°56'	2.60	260	-3°38'	-16.51	384.2			
880+19	" "	3.50	351	-2°02'	-12.46	388.2			
to 882+72 A	192°03'30"	6.03		+0°56'	+9.84	410.55			On Rocky Point East of Loop Dam
T@ 882+72							414.43	3.88	3-18-22 Hayler, Transit 12:30 PM Williams, Rod
B.S. on 876+68	12°03'30"								
884+20	12°03'30"	1.65	152.5	-16°40'	-45.67	365			Back Shot in Gulch
883+92	185°13'	1.20	120	-4°24'	-9.27	401.3			Forward Tangent
885+02	185°13'	2.30							
885+22	185°13'	2.50	250	-4°30'	-19.64	391			15' lower than
to 886+04 A	185°13'	3.32	332 ✓	-2°43'	-15.76	394.79			
T@ 886+04									
B.S. on 882+72	5°13'						399.47	4.68	
886+73	180°28'	.68	69	-4°37'	-5.58	389.2			
887+04	"	1.00							20' lower than
887+50	"	1.47	147	-5°36'	-14.38	380.4			

Sta.	Azi.	Rod	Hor. Dist	Vert. \angle	Elev.	F.S.	H.I.	B.S.
T@ 886+04					394.79			
888+04	180°28'	2.00		20' lower than last shot			399.47	4.68
888+64	"	2.60	260	-3°28'	-15.76	379		
889+54	"	3.50		30' lower than				
889+94	"	3.90	390	-3°01'	-20.57	379.2		
891+58	"	5.53	554			393.8	5.70	
+893+85A	180°28'	7.80		+1°00'	+13.60	408.39		
T@ 893+85							412.75	4.36
BS 886+04	0°28'							
895+30		1.45		10' lower than				
895+46		1.60	161	-2°38'	-7.39	401		
+896+01A	167°35'	2.15				409.84	2.91	
T@ 896+01							414.05	4.21
BS on 893+85	347°35'							
897+41		1.40		10' lower than				
897+58		1.58	157	-7°10'	-19.71	390		
898+15		2.13	214	-2°54'	-10.87	399.0		
899+81		3.80	380	-3°00'	-19.93	390		
900+99		4.97	498	-1°22'	-11.86	398		

Sta.	Azi.	Rod	Hor. Dist.	Vert. \angle	Elev.	F.S.	H.I.	B.S.
T@896+01								
to 902+52 Δ	151°33'30"	6.50		-0°52'	-9.82 400.07			
T@902+52							404.41	4.39
B.S. on 896+01	331°33'30"							
to 905+02 Δ	160°12'	2.50		-3°02'	-13.26 386.76			
T@905+02							391.40	4.64
B.S. on 902+52	340°12'	2.50 ✓	250	+3°04'	-13.41 373.4			
906+42	173°09'	1.50	140	-15°45'	-39.48 347.3			Bottom of Dog Springs Canyon
907+16	173°09'	2.16	214	-6°23'	-23.98 362.78			Stages of 360' Contour Survey
907+52	"	2.50	250	-4°10'	-18.21 368.7			
911+63	"	6.60	661		387.8	3.56		On old road
to 912+49 Δ	173°09'	7.46		+1°08'	+14.80 401.56			
T@912+49							405.93	4.37
B.S. on 905+02 ✓	353°09'							
to 914+15 Δ	239°29'	1.65			404.93	1.00		
T@914+15								
B.S. on 912+49	59°29'	1.65 ✓			401.56	7.62	409.18	4.25
915+46	274°11'	1.30			401.9	7.30		
to 916+75 Δ	274°11'	2.59			408.83	0.35		
T@916+75								

3-20-22
Hayler, Inst.
Williams, Rod.

Sta.	Azi.	Rod	Hor Dist	Vert \angle	Elev.	F.S.	H.I.	B.S.
T@916+75					408.83		413.15	4.32
BS on 914+15	94°11'							
to 921+21 Δ	266°58'	4.45		+0°46'	+5.97 414.80	On Saddle		
T@921+21							419.14	4.34
B.S. on 916+75	86°58'							
to 924+21 Δ	242°50'	3.00		-3°56'	-20.58 394.22			
T@924+21							398.24	4.02
BS on 921+21	62°50'	2.98	298	+3°56'	+20.45			
929+09	220°10'	5.00	488	-9°24'	-80.76 313.4	Bottom of Canyon		
929+97	"	5.85	576	-7°44'	-78.15 316			
to 932+52 Δ	220°10'	8.30			394.94	3.30		
T@932+52								4.05
BS on 924+21	40°10'							
to 937+31 Δ	277°10'	4.78		+1°00'	+83.44 403.28			
T@937+31							407.55	4.27
BS on 932+52	97°10'	4.78			394.93	12.62		
to 938+91 Δ	248°59'	1.59			403.46	4.09		
T@938+91							407.60	4.14
BS on 937+31	68°59'	1.59			403.28	4.32		

Sta	Azi.	Rod	Hor. Dist	Vert L	Elev.	F.S.	H.I.	B.S.
T@938+91					403.46		407.60	4.14
939+73	234°25'	0.81	82		396.0	11.6		
942+36	"	3.50	345	-7°30'	-45.44 358	Canyon Bottom		
942+94	"	4.05	403	-5°06'	-35.97 367			
944+52	"	5.60	561	-2°08'	-20.85 382.4			
+ 945+30 Δ	234°25'	6.38		-2°01'	-22.51 380.95			
T@945+30							385.23	4.28
BS on 938+91	54°25'							
945+91	262°05'	0.60	61		373.4	11.8		
947+99	"	2.76	269	-9°36'	-45.56 335.4	Bottom of Canyon		
+ 951+30 Δ	262°05'	5.99		+1°42'	+17.82 398.77			
T@951+30							402.91	4.14
BS on 945+30	82°05'							
	36°22'	1.55	147.3	-13°42'	-35.90 362.87	Sta #10 of 360' Contour		
+ 953+43 Δ	279°37'	2.13		+3°22'	+12.54 411.31			
T@953+43							415.74	4.43
BS on 951+30	99°37'	2.13 [✓]						
+ 954+71 Δ	264°23'	1.27			412.80	2.94		

Sta.	Azi.	Rod	Hor. Dist	Vert L	Elev.	F.S.	H.I.	B.S.
#@ 954+71					412.80	1	417.09	4.29
BS on 953+43	84°23'	1.27			411.34	5.75		
to 956+20 Δ	227°12'	1.48			413.56	3.53		1
T@ 956+20							417.74	4.18
BS on 954+71	47°12'	1.48			412.83	4.91		
957+16	212°28'	0.95	96		404.0	13.7		
to 959+50 Δ	212°28'	3.29			412.94	4.80		
T@ 959+50							417.47	4.53
BS on 956+20	32°28'							
960+45		1.00	95	-13°50'	23.48	389.4		
961+00		1.50	150	-2°26'	-6.41	406.5		
961+81		2.30	231		214.5	2.93		
to 964+78 Δ	235°52'	5.27		+0°55'	484.4	421.38	In Saddle	East of Dam site #3
T@ 964+78							425.70	4.32
BS on 959+50	55°52'							
963+24	55°52'	1.55	154	-6°45'	-18.22	403	Back Shot	
to 966+68 Δ	196°16'	1.89			421.63	4.07		
T@ 966+68							426.15	4.52
BS on 964+78	16°16'	1.89			421.43	4.72		

Sta.	Azi.	Rod	Hor. Dist	Vert. L	Elev.	F.S.	H.I.	B.S.	
T@966+68					421.63		426.15	4.52	
	332° 17'	4.37		-1° 45'	-13.36 (408.27)				Sta. A. 7 of Stadia Survey Dam Site #3
971+39	184° 57'	4.75	471	-5° 52'	-48.41 373.5				Bottom of Canyon (incl. Spillway?)
to 973+82 Δ	184° 57'	7.13		-1° 32'	-19.07 402.56				
T@973+82							407.01	4.45	
BS on 966+68	4° 57'								
to 977+65 Δ	171° 45'	3.82		+0° 37'	(+4.14) 406.5	0.49			
T@977+65							411.05	4.53	
BS on 973+82	351° 45'	3.82			402.56	8.49			
to 979+59 Δ	173° 05'	1.94		-3° 45'	-12.73 393.79				
T@979+59							397.97	4.18	
BS 977+65	353° 05'	1.93		+3° 45'					
982+07	172° 16'	2.60	248	-12° 42'	-56.02 337.8				
983+33	"	3.78	374	-6° 50'	-44.77 349.0				
to 986+31 Δ	172° 16'	6.75	672	-4° 19'	-50.74 343.05				
T@986+31							347.52	4.47	
BS on 979+59	352° 16'								3-21-22 Hayler, Inst Williams, Rod
986+89	181° 17'	0.59	58	-11° 30'	-11.76 331.2				
988+96	"	2.80	265	-13° 56'	-65.70 277.3				Bottom of Canyon

Sta.	Azi.	Rod	Hor. Dist	Vert. L	Elev.	F.S.	H.I.	B.S.
T@986+31					343.05		347.52	4.47
990+47	181° 17'	4.15	416		337.4	10.1		
991+72	"	5.40	541	+1° 30'	114.13 329			
+ 993+46 Δ	181° 17'	7.14		+2° 10'	+27.03 370.08			
T@993+46							374.00	3.92
BS on 986+31	1° 17'							
+ 996+31 Δ	179° 44'	2.84			367.99	6.01		
T@996+31							372.34	4.35
BS on 993+46	359° 44'	2.83			370.11	2.23		
999+68	184° 32'	3.40	337	-6° 24'	37.79 330	Bottom of Draw		
+ 1002+42 Δ	184° 32'	6.10		-1° 06'	-11.74 356.25			
T@1002+42							360.30	4.05
BS on 996+31	4° 32'							
+ 1003+65 Δ	185° 57'	1.23		-5° 06'	-10.99 345.26			
+ T@1003+65							349.64	4.38
BS on 1002+42	5° 57'	1.23		+5° 07' ✓				
1006+79	191° 13'	3.45	314	-17° 38'	-99.95 245	Main Canyon Bottom		
1010+26	"	6.60	661	+1° 06'	+12.73 332.5			
+ 1010+83 Δ	191° 13'	7.17		+1° 38'	+20.46 365.72			

Sta.	Azi.	Rod	Hor. Dist	Vert. \angle	Elev.	F.S.	H.I.	B.S.
T@1010+83					365.72		369.61	3.89
BS on 1003+65	11° 13'							
1013+85	25' back	is 10' lower than						
1014+10	201° 18'	3.52	327	-15° 50'	-92.7	273		
to 1017+36 Δ	201° 18'	6.52		+1° 04'	+12.16	377.88		
T@1017+36							382.05	4.17
B.S. on 1010+83	21° 18'							
1019+52	25' back	is 15' lower than						
1019+77	213° 16'	2.60	241	-15° 54'	-68.81	309	Bottom of Wash	
1021+77	"	4.40	441			379.7	2.13	
to 1022+87 Δ	213° 16'	5.50		+1° 35'	+15.21	393.09		
T@1022+87							397.29	4.20
BS on 1017+36	33° 16'							
to 1027+37 Δ	19° 40'	4.49		+1° 00'	+78.4	400.93		
T@1027+37							405.28	4.35
BS on 1022+87	10° 40'							
1030+47	203° 33'	3.10	310	-3° 00'	-16.27	384.6	Draw	
to 1032+26 Δ	203° 33'	4.88				395.65	7.63	
							399.89	4.24

Sta.	Azi.	Rod	Hor. Dist	Vert. \angle	Elev.	F.S.	H.I.	B.S.
T@1032+26					395.65		399.89	4.24
BS on 1027+37	23° 33'							
to 1035+82 Δ	192° 24'	3.55			390.94	8.95		
T@1035+82							395.37	4.43
BS on 1032+26	12° 24'	3.56		+0° 46'				
1036+75	207° 41'	0.97	93	-13° 20'	-22.03 368.9			
1038+33	"	2.50	251	+2° 13'	+9.71 381.2			
to 1039+45 Δ	207° 41'	3.62		+1° 56'	+12.23 403.17			4.53
T@1039+45							407.70	
BS on 1035+82	27° 41'							
to 1040+97 Δ	211° 20' 30"	1.51			395.15	12.55		
T@1040+97								
BS on 1039+45	310° 20' 30"	1.51		+3° 04'			399.39	4.24
	221° 37'	1.92		-2° 20'				
	"	3.40		-0° 54'				
to 1048+60 Δ	221° 37'	7.63		+2° 37'	+34.83 429.98			
T@1048+60							434.32	4.34
BS on 1040+97	41° 37'							
to 1052+08 Δ	238° 43' 30"	3.47			429.57	4.75		

Canyon Bottom

Note
See next page

Sta.	Azi	Rod	Hor. Dist	Vert L	Elev	F.S.	H.I.	B.S.
Backed up to 1039+45 A					403.17		407.62	4.45
BS on 1035+82	27° 41'							
to 1042+89 A	159° 16'	3.43			404.92	2.70		
T@ 1042+89							409.37	4.45
BS on 1039+45	339° 16'	3.43			403.22	6.15		
1045+71	166° 42'	2.88	287	-9° 14'	-458 359			
1047+26	"	4.36	437		405.0	4.4		
to 1049+80 A	166° 42'	6.90		+2° 03'	+24.71 429.63			
T@ 1049+80							433.95	4.32
BS on 1042+89	346° 42'							
to 1055+88 A	179° 15'	6.07		+1° 04'	+11.32 440.95			
T@ 1055+88							445.39	4.44
BS on 1049+80	359° 15'							
to 1058+72 A	189° 39'	2.83		-2° 05'	-10.31 430.64			
T@ 1058+72							434.84	4.20
BS on 1055+88	9° 39'	2.83		+2° 05'				
1062+38								
1062+63		4.00	391	-9° 11'	-63.21 367.4			
to 1066+20 A	184° 47'	7.47			433.34	1.50		

25' back is 10' lower than

Sta.	Azi.	Rod.	Hor. Dist	Vert L	Elev.	F.S.	H.I.	B.S.
T@1066+20					433.34		437.60	4.26
BS on 1058+72	4° 47'							
to 1071+61 A	181° 42'	5.40		+1° 29'	+14.02 447.36			
T@1071+61							451.70	4.34
BS on 1066+20	1° 42'	5.40 ✓		-1° 28'				100' West is 7' or 8' lower.
to 1076+31 A	167° 16'	4.69			440.63	11.07		F.S. R Pole of 2
T@1076+31							444.96	4.33
BS on 1071+61	347° 16'							
1073+68	347° 16'	2.62	263		435.6	9.4	Back Shot	
1074+17	"	2.15	214	-5° 40'	-24.24 419.4		" "	
1078+06	215° 00'	1.88	175	-15° 34'	-48.90 391.7		Forward Tangent	
to 1083+49 A	215° 00'	7.28	718	-6° 55'	-87.14 353.49			
T@1083+49							357.59	4.10
BS on 1076+31	35° 00'							
to 1087+55 A	229° 18' 30"	4.22	406	-11° 27'	-82.30 271.19			
T@1087+55							275.33	4.14
BS on 1083+49	49° 18' 30"							
Perpendicular Rock Chasm 25' across + 25' down from							Bottom of Canyon at foot of Adobe Falls	Alvarado Canyon
1090+59		3.10	3.04	-8° 53'	-47.47 223.7			

Sta.	Azi.	Rod	Hor. Dist	Vert. \angle	Elev.	F.S.	H.I.	B.S.
π @1087+55					271.19		275.33	4.14
1091+81	227° 43'	4.25	426	-1° 45'	-13.0 258			
1093+76	227° 43'	6.2	621	+1° 08'	+12.33 283.5			
to 1094+96 A	227° 43'	7.40		+1° 25'	+18.31 289.50			
π @1094+96							293.53	4.03
B.S. on 1087+55	47° 43'							
1096+27	241° 00'	1.36	131	-1° 42'	-27.22 262	Gen of Drarr		
1097+96	"	3.00	300	+3° 54'	+20.43 269			
to 1101+27 A	241° 00'	6.40	631	+7° 03'	+78.08 367.58			
π @1101+27							372.18	4.60
B.S. on 1094+96	61° 00'							
to 1102+31 A	199° 11'	1.03			363.01	9.17		
π @1102+31							367.06	4.05
B.S. on 1101+27	17° 11'	1.03 [✓]	104	+2° 35'	+4.69 367.10			
1104+46	186° 47'	2.22	215	-11° 06'	-42.17 321			
to 1106+05 A	186° 47'	3.75	374	-4° 26'	-28.99 334.02			
π @1106+05							338.34	4.32
B.S. on 1102+31	6° 47'							
1109+25		3.25	320	-7° 46'	-43.67 290.3	Canyon Bottom		

Sta.	Azi.	Rod	Hor. Dist	Vert. L	Elev.	F.S.	H.I.	B.S.
T@ 1106+05					334.02		338.34	4.32
to 1112+31 A	184° 22'	6.30	626	+5° 03'	+55.35 389.37			
T@ 1112+31							393.44	4.07
BS on 1106+05	4° 22'							
to 1114+40 A	193° 46'	2.14	209	+9° 50'	+36.19 425.56			
T@ 1114+40							429.56	4.00
BS on 1112+31	13° 46'	2.14 ✓	209	-9° 50' ✓	-36.20 389.4			
to 1115+89 A	222° 48' 30"	1.51	149	+8° 13'	+24.51 447.07			
T@ 1115+89							451.20	4.13
BS on 1114+40	42° 48' 30"	1.51 ✓		-8° 13' ✓				
to 1117+57 A	220° 55'	1.67		+1° 53'	+5.51 452.58			
T@ 1117+57							456.77	4.19
BS on 1115+89	40° 55'							
to 1120+02 A	230° 15'	2.44			450.62	6.15		
T@ 1120+02							454.67	4.05
BS on 1117+57	50° 15'							
to 1122+53 A	241° 42'	2.50		-2° 21'	-10.29 440.33			
T@ 1122+53							444.44	4.11
BS on 1120+02	61° 42'							

3-23-22
Hayler, Inst.
Williams, Rod

Sta.	Azi.	Rod	Hor. Dist	Vert. \angle	Elev	F.S.	H.I.	I.S.
π @1122+53					440.33		444.44	4.11
1123+84	242°00'	1.40	131	-15°10'	-35.65 404.6			
1125+45	"	2.95	292	-6°25'	-32.89 407.4			
1126+40	"	3.90	387	-5°55'	-40.10 400.2			
1128+13	"	5.60	560	-2°00'	-19.55 420.7			
to 1129+04A	242°00'	6.50		-1°14'	-14.00 426.33			
π @1129+04							430.55	4.22
B.S. on 1122+53	62°00'							
1130+10	215°41'	1.05	106	-2°47'	-5.14 421			
to 1133+60A	215°41'	4.56		-2°31'	-20.06 406.27			
π @1133+60								4.25
B.S. on 1129+04	35°41'							
1131+59	35°41'	2.00	201	-2°15'	-7.90 398.4	Back shot		
to 1135+91O	214°45'	2.33	231	-6°43'	-27.17 379.10	P.O.T.		
π @1135+91							383.43	4.33
B.S. on 1133+60	34°45'							
1136+92		1.15	101	-2°05'	-39.02 340	Bottom of Canyon		
1137+59		1.67	168	-2°32'	-7.41 371.7			
to 1138+26O	214°45'	2.34			379.50	P.O.T.		3.93

Sta.	Azi.	Rod	Hor Dist	Vert X	Elev	F.S.	H.I.	B.S.
T@1138+260					379.50	3.93		
BS on 1133+60	34°45'						383.67	4.17
to 1143+77 A	214°45'	5.50		-1°59'	-19.06	360.44		
T@1143+77							384.89	4.45
BS on 1133+60	34°45'							
1145+32		1.55	155	-4°02'	-10.97	349	Low Point in Saddle	
1146+68		2.90	291	-1°51'	-9.40	351		
to 1147+72 A	217°47'30"	3.94		-2°00'	-13.79	346.65		
T@1147+72							350.71	4.06
BS on 1143+77	37°47'30"							
1151+15	208°48'	3.67	343	-15°10'	-93.0	254	N Edge of Canyon Bottom	
1152+55	"	5.00	483	-11°20'	-95.93	251	5 " " " "	
to 1154+33 A	208°48'	6.64	661	-4°38'	-53.53	293.12		
T@1154+33								4.10
BS on 1147+72	28°48'							
1155+92		1.68	159	-13°45'	-39.1	254	Bottom of Canyon	
1157+00		2.70	267	-6°30'	-30.15	263		
to 1161+25 A	213°11'	7.07	692	+8°46'	+106.62	399.74		
							404.15	4.41

Sta.	Azi.	Rod	Hor. Dist	Vert. Ang.	Elev.	F.S.	H.I.	B.S.
T@1161+25					399.74		404.15	4.41
BS on 1154+33	33° 11'							
1160+63	33° 11'	0.64	62	-13° 00'	-143 385			Back Shot - break at top of hill
to 1163+04 Δ	220° 30'	1.78'		+10 22'	(+4.27) 403.92	0.23		
T@1163+04							408.05	4.13
BS on 1161+25	40° 30'	1.78			399.74	8.31		
to 1165+35 ○	220° 00' 30"	2.30'			403.97	4.08		F.S. on Flag pole on old City Hall Tower East San Diego
T@1165+35							408.39	4.42
FS on Flag Pole	220° 00' 30"							
to 1168+73 ○	220° 00' 30"	3.37			402.92	5.47		
T@1168+73							407.73	4.31
FS on Flag Pole	220° 00' 30"							
to 1174+69 ○	220° 00' 30"	2.95			400.96	6.27		
T@1171+69							405.61	4.65
FS on Flag Pole	220° 00' 30"							
to 1174+36 Δ	220° 00' 30"	2.66			401.12	4.49		On approx. ♀ of Winona Arc. Azi. 179° 30' ±
T@1174+36	FS on Flag Pole	220° 00' 30"					406.24	5.12
	78° 42'	0.59	60					Hub at NE Cor Winona + (?) Marked 29
to 1177+91 ○	198° 17'	3.54			399.28	6.96		

3-24-22
Hayler, Inst.
Williams, Rod.

68.7
32
35.7

Sta.	Azi	Roc	Hor. Dist	Vert X	Elev.	F.S.	H.I.	B.S.
T@ 1177+91					399.28			
F.S. on T.P.	198° 17'						403.50	4.22
to 1183+82 A	198° 17'	5.90			392.17	11.33		
T@ 1183+82							396.45	4.28
F.S. on T.P.	198° 17'							
to 1190+93 O	200° 17'	7.10		-0° 44'	-7.10 383.07			
T@ 1190+93	FS 200° 17'						387.51	4.44
1189+60	200° 17'	1.32	133		377.5	10.0 Back Shot		
to 1192+32 A	200° 17'	1.38			381.81	5.70		
T@ 1192+32	FS 200° 17'						385.93	4.12
to 1199+46 A	184° 54'	7.13		-1° 34'	-7.13 362.32		{ 7' South of S Line of Pavement - Cajon Blvd and 10' West of Φ of N + S Street	
T@ 1199+46							367.34	5.02
BS on 1192+32	4° 54'							
to 1204+89 A	259° 41'	5.42			358.63	8.71	{ 6' South of S Line of Pavement } $\frac{358.63}{353.45}$ 5.18	
- Sta. 1135+460 on S Line								
T@ 1204+89							363.20	4.57
BS on 1199+46	79° 41'	5.42						
Sta 1128+450 S	79° 46'	6.98						
259° 46'								
					1199+46 = 1130+03			

1270+78
1130+03
140+75

See BK 6

P. 20

A Stadia Survey of Conduit Line from
El Copitan Dam Site #2 to Univ. Hts.
"V" Line

Hagler - Chief: Witte - Rodmar 4-19-1922
Chilton - Inst.: Baines - Axeman

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Sta.	Azi	Rod	Hor. Dist	Vert L	Elev.	F.S.	H.I.	B.S.	
T @ -1+33.3A = 0+00					569.87		575.05	5.18	On axis of Dam site #2
B.S. on 5+31.6	20°-46'					3.59			
					571.46	BM 20			(Williams) bolt in oak tree - South Side Road - -near Axis - 50' W. of Axis
1+81		1.80	1.81	-	570.45	4.6			North edge of Road
2+36 A	289°-01'	2.35	2.36		566.05	2.00			
T @ 2+36									
B.S. on -1+33.3A	109°-01'	2.35		+0-53			571.06	5.01	
3+57 A	267°-58'	1.20	1.21	-1-27	563.01	8.05			
T @ 3+57									
B.S. on 2+36	87°-58'	1.19		+1-28				4.89	
4+63 A	248°-26'	1.05	1.06	+3°-40'	567.77	567.78			= Sta. 4+43 "S" Line Δ N. edge of road. (570.29)
T @ 4+63									
B.S. on 3+57	68°-26'	1.05		-3°-39'			574.71	4.93	
6+20		1.56	1.57		572.71	2.00			= Sta. "S" 7+01 Δ (579.83)
7+23 A	268°-10'	2.59	2.60		569.41	5.30			N. Edge of Road
T @ 7+23									
B.S. on 4+63	88°-10'	2.58					573.96		
							574.33	4.55	
10+48 A	261°-01'	3.24	3.25		568.46	5.50			= Sta "S" 10+24 Δ S. Edge of Road
T @ 10+48 A									
B.S. on 7+23 A	81°-01'				569.37	4.28	573.28	4.82	
							573.65		

Sta.	Azi.	Rod	Hor. Dist	Vert L	Elev	B.S.	H.I.	I.S.
					568.46		572.28	
T @ 10+48A					568.46		573.65	4.82
13+06A	280-20 $\frac{1}{2}$	2.57	258		570.23	3.05		
					570.00			
T @ 13+06								"S" 12+82 (571.03) S. Edge of Road
B.S. on 10+48	100-30 $\frac{1}{2}$	2.58	✓		568.89	6.95	575. 41 ⁴⁷	5.24
14+49A	291°-30'	1.42	143		565. 72 ³⁵	10.12		"S" 14+24 (566.15) N. Edge of Road
T @ 14+49								
B.S. on 13+06	111°-30'	1.42	143		570.64	0.28	570. 82 ⁵⁵	5.20
15+59	260-01	1.09	110		566.06	4.86		
16+30	260-01	2.10	241		562.82	8.10		
18+78A	260°-01	4.28	429		563. 82 ⁴⁹	7.06		"S" 18+50 4-20-22 (564.30) N. Edge of Road
T 18+78								
B.S. on 14+49	80°-01	4.27	✓		565.77	3.23	568.63 569.00	5.14
19+13	263-12 $\frac{1}{2}$	0.34	35		559.1	9.9		
19+82	263-12 $\frac{1}{2}$	1.03	104		567.6	1.4		"S" 20+26 (568.59) N. Edge of Road
20+54A	263-12 $\frac{1}{2}$	1.75	176		567.81 568.18	0.82		
T 20+54								
B.S. on 18+78	83°-12 $\frac{1}{2}$	1.76	✓		563.90	9.51	573. 41 ⁰⁴	5.23
22+20A	256°-14'	1.65	166		564. 83 ⁵²	8.52		
T 22+20A							569.67 570.04	5.15

Sta.	AZI	Rod	Hor. Dist	Vert. \angle	Elev.	FS	H.I.	BS	
B.S. on 20+54	76°-14'	1.65			568.21			1.83	
24+13 A	283°-58 $\frac{1}{2}$ '	1.92	193		566.47 ⁰⁸	3.59			Below road.
Δ 24+13							571.43 ⁰⁶	4.98	
B.S. on 22+20	103°-58 $\frac{1}{2}$ '	1.92			564.93			6.50	
25+26 A	279°-00 $\frac{1}{2}$ '	1.12	1.13		565.62 ²⁵	5.81			Below road
Δ 25+26							569.89	4.64	
B.S. on 24+13	99°-00 $\frac{1}{2}$ '	1.12			566.48			3.78	
26+03 A	282°-45 $\frac{1}{2}$ '	0.76	77		565.96	3.93			
Δ 26+03							570.99	5.03	
B.S. on 25+26	102°-45 $\frac{1}{2}$ '	0.76			565.68			5.70	
26+86 A	276°-16'	0.82	83	-3°-50'	566.73 ³⁵				
Δ 26+86							564.77	4.42	
B.S. on 26+03	96°-16'	0.82		+3°-55'					
28+03 A	268°-49 $\frac{1}{2}$ '	1.16	117		562.82	1.95			
Δ 28+03							567.80	4.98	
B.S. 26+86	88°-40 $\frac{1}{2}$ '	1.16			560.82			7.42	
28+65	269°-36 $\frac{1}{2}$ '	0.61	62		556.73	11.51			
31+71 A	269°-36 $\frac{1}{2}$ '	3.67	3.68		558.54 ⁴⁰	9.40			N. Edge road.
Δ 31+71							563.70	5.30	

Sta.	Azi	Rod	Hor. Dist	Vert. L	Elev	FS	HI	BS	
B.S. 28+03		3.68			563.23			0.85	
32+24		0.52	53		561.42	2.72			
34+38 A	283°-57'	2.66	267		552.75 553.19	10.95			Approximately on boundary of National Forest - 9' South of post. In N. Edge of Road
∇ 34+38							557.86 558.30	5.11	
B.S. 31+71		2.65		+1°-15'					= 'S' 36+23 (555.22)
36+35 A	271-51	1.96	197		554.95 ⁵¹	3.35			15' South of Road.
∇ 36+35							559.65 560.09	5.14	
B.S. 34+28	91-51	1.96			553.24			6.85	= 'S' 37+33 (563.38)
37+43 A	290-39	1.08	108	+4°-16'	+8.18 562.69				
∇ 37+43									
B.S. 36+35	110°-39'	1.09		-4°-15'				5.00	
38+51	296-14	1.07	108	-8°-16'	-15.4 547.3				= 'S' 39+73 (548.00)
39+83 A	296-14	2.40	240	-3°-40'	-15.38 547.31				N. Edge of Road.
∇ 39+83	116-14						552.95 ⁵²	5.21	
B.S. 37+43		2.39		+3°-39'	-3.30				39+83 to 43+07 along steep rocky cut above Wagon Road
43+07 A	304-55½	3.23	324	+0-35'	+3.23 +3.30 550.54 551.04				
∇ 43+07							554.93 555.43	4.39	
B.S. 39+83	124-55½	3.23		-0°-33'	1880 1883				
43+90 A	283-41½	0.83	83	+6°-04'	359.87 559.34				

Sta.	AZI	Rod	Hor. Dist	Vert. L	Elev	FS	H.I.	BS
π 43+30					559.34		364.24 ³¹	4.97
B.S. 43+07	103°-41½'	0.83		-6°-00'	+8.56			
46+50A	274°-49'	2.59	260	+1°-53'	567.90 568.11			= 546+53 (568.11)
π 46+50							572.70 573.21	4.80
B.S. 43+30	94°-49'	2.59		-1°-53'				
48+78A	274°-48'	2.27	228		40 561.91	11.30		
π 48+78							566.53 ⁰²	4.62
B.S. 46+50	94°-48'	2.27		+1°-40'				
49+92A	273-24	1.13	114		565.75 566.26	0.27		
π 49+92							570.50 571.01	4.75
B.S. 48+78	93°-24'	1.13						3.06
51+10A	271-17	1.17	118		569.54 570.05	0.96		
π 51+10A							574.68 575.19	5.14
B.S. 49+92	91-17	1.17			566.29			8.90
53+73A	285°-08'	2.62	263		48 567.99	7.20		
π 53+73							572.68 ¹⁷	4.69
B.S. 51+10	105°-08'	2.63			570.08			2.60
P.O.T.								
55+28A	298-38½	1.54	155		26 565.77	6.31		
π 55+28							569.88 ³⁷	4.11

4-24-1922

Sta	Azi	Rod	Hor. Dist	Vert L	Elev	FS.	HI	BS
BS 53+73	118-38 $\frac{1}{2}$				568.02		569. ³⁷ 50	1.86
55+47	298-38 $\frac{1}{2}$	0.23	10	-27° 05'	-9.85 555.4			
56+21 A	298-38 $\frac{1}{2}$	0.92	93		568.91 569.42	0.46		
∇ 56+21							573.79 574.30	4.88
BS 55+28	118-38 $\frac{1}{2}$	0.92		-2° 14'				
57+21 A	321-25	0.99	100		562. ³⁴ 85	11.45		
∇ 57+21							567. ⁰⁶ 57	4.72
BS 56+21	141°-25'	0.99		+3° 48'				
58+07 A	307°-47'	0.85	86		565. ⁰³ 54	2.03		
∇ 58+07							569.59 570.10	4.56
BS 57+21	127°-47'	0.85			562.89			7.21
* 59+35	300-04	1.27	128	-2°-57'	-6.57 558.5			* Note - 20' back in 10' Lower than this reading
59+78 A	300°-04'	1.70	171	+1°-51'	+5.54 570. ⁵⁷ 56 571.06			
∇ 59+78							575. ¹⁷ 66	4.60
BS 58+07	120°-04'	1.71			565.66			10.00
60+55	330-10	0.78	77	-9°-19'	-12.65 557.9			
61+20 A	330°-10'	1.41	142		563.80 564.29	11.37		
∇ 61+20							568.74 569.23	4.94
BS 59+78	150°-10'	1.42		+2°-46'				

Sta	Azi	Rod	Hor. Dist	Vert L	Elev	F.S.	H.I.	B.S.	
62+75A	312°-46'	1.54	155		555.90 556.33	12.87	563.23 568.74		
π 62+75							560.78 561.27	4.88	60
B.S. 61+20	137°-46'	1.54		+2°-58'					
63+90	307-49	1.17	1.15	-8°-42'	-17.66 538.2				
65+13	307-49	2.39	2.38	-4°-07'	-17.20 538.9				
66+53A	307°-49'	3.77	378		555.73 556.22	5.05			
π 66+53							46 560.95	4.73	
B.S. 62+75	127-49	3.77			556.45			4.50	
68+07A	267°-24'	1.53	154	+2°-01'	5.43 561.16 561.65				
π 68+07A							34 566.83	5.18	
B.S. 66+53	87°-24'	1.54			556.35			10.48	
68+40		0.42	33	-28°-50'	-18.3 542.9				Gulch
69+06		1.01	99	-9°-55'	-17.3 543.9				Gulch
69+32		1.24	125	-3°-06'	-6.77 554.4				Top of bank
70+18A	277°-10'	2.10	211		07 558.57	8.32			
π 70+18							01 563.58	4.99	
B.S. 68+07		2.10			561.70			1.80	
71+64		1.46	146	-5°-12'	-13.29 544.7				
73+05		2.86	287	-2°-18'	-11.5 546.5				N Edge Road

Sta	Azi	Rod	Hor. Dist.	Vert. \angle	Elev.	F.S.	H.I.	B.S.	
74+43 A	274°-52' (275-20)	4.25	425	-2°-28'	18.33 539.69 540.19				= 573+98 A (539.35)
Σ 74+43							544.89 545.39	5.20	
B.S. 70+18	94°-52'	4.25		+2°-28'					
	280°-45'								
	280°-45'	3.53		-2°-09'					
	281°-13'	Corrected			+13.47 +13.44				Azi. Corrected to 281°-13'. Azi. Check on S line
75+96 A	256°-00' ₂	1.53	153	+5°-02'	13 553.66				4-22-1922
Σ 75+96							558.09 558.62	4.96	
B.S. 74+43	76°-00' ₂	1.54		-5°-00'					
78+12 A	257°-10'	2.15	216		06 554.59	403			
Σ 78+12							558.92 559.45	4.86	
B.S. 75+96	77°-10'	2.15						5.75	
78+64	290°-56' ₂	0.51	52			12.45			
80+30 A	290°-56' ₂	2.17	218		25 552.78	6.67			
Σ 80+30							557.94	5.13	
B.S. 78+12	110°-56' ₂	2.17						3.25	
80+58	288°-45'	0.27	28			7.4			
82+42 A	288°-45'	2.11	212		41 555.34	6.97			
Σ 82+42							560.91	4.97	
B.S. 80+30	108°-45'	2.11						8.08	

A spike 3' North of North gate Post of El Monte Ranch. 1016 North to Corner #1 of the El Monte Ranch.

Sta	Azi	Rod	Hor. Dist	Vert. \angle	Elev	FS	H.I. ³⁸ 560.51	BS.
83+60	294-14	1.17	118		547.9	13.0		
84+50 A	294-14	2.07	208		556. ¹⁸ 77	4.20		
π 84+50							560.99 561.52	4.81
B.S. 82+42	114-14	2.07			556.01 -10.14			5.51
85+68 A	331-09 $\frac{1}{2}$	1.18	118	-4-54	546. ⁰⁴ 59			
π 85+68							550.95 551.50	4.91
B.S. 84+50	151-09 $\frac{1}{2}$	1.18		+4-55	-20.97			
		1.35		-8-43	525. ⁰⁷ 62			
86+82 A	306-39 $\frac{1}{2}$	1.13	114		544.66 545.21	6.29		
π 86+82							549.84 550.39	5.18
B.S. 85+68	126-39 $\frac{1}{2}$	1.13			546.60			3.79
87+31	297-06	0.48	49		538.6	11.8		
88+35	297-06	1.52	153		540.7	9.7		
88+98	297-06	2.15	216		542.6	7.8		
89+41 A	297-06	2.58	259		545.81 546.36	4.03		
π 89+41							550.52 551.07	4.71
B.S. 86+82	117-06	2.58			545.25			5.82
90+31		0.89	90		546.5	4.6		
90+71 A	295-52	1.30	130	+5-58	+13.53 559. ⁸⁴ 84			

check on Williams B.M. 10 $\frac{1}{2}$ Elev. 524.62
 three nails in crotch of oak on River bank

Top of precipitous cut -
 Above road.

Sta.	Azi.	Rod	Hor. Dist.	Vert. L.	Elev.	FS.	H.I. W.	BS.
790+71							564.82	4.68
B.S. 89+41	115°-52'	1.30	✓	-5°-56'				
92+25	295-01½	1.54	154	-5°-38'	-KTS 544.2			
93+11 A	295-01½	2.39	240		554.62 559.13	240		Above wagon road cut.
793+11							559.74 ¹⁷	4.55
B.S. 90+71	115°-01½	2.39		+1°-00'				
	101°-03'	1.57		-10°-01'	-27.41 527.78 ²¹	B.M. Elev. 529.85		U.S.G.S. Gauging Station Ref. Mark Bronze Tablet in Rock. N. Side of Road
93+75	311°-16'	0.63	64		545.2	14.5		
94+42	311°-16'	1.30	131		550.5	9.2		
95+48 A	311°-16'	2.36	237		548.99 543.56	10.18		
795+48							554.90 ²³	5.34
B.S. 93+11	131°-16'	2.36		+11°-24'				
97+02 A	302°-27'	1.53	154		545.92 546.43	841		
797+02							551.57 ²⁰	5.08
B.S. 95+48	122°-27'	1.53	✓		549.59			1.98
97+81	302°-40'	0.78	79		539.8	11.8		
98+38	302°-40'	1.35	136		543.2	84		
98+88 A	302°-40'	1.85	186		543.82 544.39	7.18		
798+88							548.58 549.15	4.76

Sta.	Azi	Rod	Hor. Dist	Vert. \angle	Elev	FS	HI	BS
B597+02	122°-40'	1.85	✓	✓	546.53		548.58	
					+6.16		549.75	2.62
100+38 A	278°-07'	1.49	1.50	+2°-21'	550.55			
					549.98			
π 100+38							554.95	
							555.52	4.37
B5.98+88	98°-07'	1.49		-2°-20'				
20.7. ✓								
101+10 A	255°-06 $\frac{1}{2}$ '	0.71	72	✓	549.53	5.42		
					550.10			
π 101+10							554. ⁴² 99	4.89
B5.100+38	75°-06 $\frac{1}{2}$ '	0.71			550.58			4.41
101+84	255°-06 $\frac{1}{2}$ '	0.75	74	-9°-02'	^{-11.82} 537.7			
102+14 A	255°-06 $\frac{1}{2}$ '	1.03	104	✓	541.70	12.72		
					542.27			
π 102+14							546.76	
							547.33	5.06
B5.101+10	75°-06 $\frac{1}{2}$ '	1.03		+4°-22'				
102+93	293°-26 $\frac{1}{2}$ '	0.78	79		537.3	10.0		
103+73 A	293°-26 $\frac{1}{2}$ '	1.58	159	✓	544.65	2.11		
					545.22			
π 103+73							549. ⁰⁵ 62	4.40
B5.102+14	113°-26 $\frac{1}{2}$ '	1.59			542.30			7.32
104+83	295°-35'	1.11	110	-7°-15'	^{-14.05} 530.6			
105+28	295°-35'	1.54	155	-2°-38'	^{-7.17} 537.5			
					539.8			
105+85 A	295°-35'	2.11	212	-2°-33'	535. ¹⁷ 74			
π 105+85							539.99	
							540.56	4.82

Sta	Azi.	Rod	Hor. Dist	Vert. \angle	Elev	ES.	H.I.	BS.	
B.S. 103+73	115°-35'	2.11		+2°-35'			540.56 539.99		
106+33	281°-29'	0.47	48		533.2	7.4			
107+12	281°-25'	1.26	127		535.4	5.2			
107+65 A	281°-25'	1.79	180	+1°-38'	540.57 +5.13 540. ³⁰				
π 107+65							545. ⁰³ 545.60	4.73	
B.S. 105+85	101°-23'	1.79			535.85			9.75	
108+35	294°-43'	1.29	130		535.0	10.6			
110+66	294°-43'	3.00	301		528.6	17.0			
111+20 A	294°-43'	3.54	355		535.63 ⁰⁶	9.97			
π 111+20							539.94 540.51	4.88	
B.S. 107+65	114°-43'	3.54		+0°-51'					
112+86	338°-58 $\frac{1}{2}$ '	1.65	166		530.3 +3.97	10.2			
113+55 A	338°-58 $\frac{1}{2}$ '	2.34	235	+2°-26'	545.60 ⁰³				
π 113+55							540.82 550.32	4.75	
B.S. 111+20	158°-58 $\frac{1}{2}$ '	2.35		-2°-26'					
114+48	335°-23 $\frac{1}{2}$ '	0.97	93	+13°-16'	+21.9 566.9 +32.60				
114+75 A	335°-23 $\frac{1}{2}$ '	1.28	120	+15°-10 $\frac{1}{2}$ '	573.25 577.63				
π 114+75							582.64 583.28	5.01	in saddle above Cape Horn.
B.S. 113+55	155°-25 $\frac{1}{2}$ '	1.28		-15°-08 $\frac{1}{2}$ '					

Sta	Azi.	Rod	Hor. Dist	Vert L	Elev	FS	H.I.	BS
					-26.35		583.25	
115+76 A	231°-16 $\frac{1}{2}$	1.07	101	-14°-35	551. ²⁸ 38		582.64	
π 115+76							555.91	
BS 114+75	111°-16 $\frac{1}{2}$	1.07		+14°-35			556.53	4.63
116+71 A	232°-57'	0.94	95		550.46	545		
					551.08			
π 116+71							555. ¹⁶ 78	4.70
BS 115+76	57°-57'	0.94			551.93			3.85
117+37		0.65	66		549.3	6.5		
118+33		1.61	162		541.3	19.5		
119+37 A	215°-41'	2.65	266		552.44	2.72		
					553.06			
π 119+37							557. ¹⁹ 81	4.75
BS 116+71	35°-41'	2.65			551.14			6.67
120+83		1.45	146		546.9	10.5		
121+21 A	233°-00'	1.83	184		555. ⁰² 64	2.17		
							559.74	
π 121+21							560.36	4.72
BS 119+37	53°-00'	1.83			553.10			7.26
121+44	262°-54'	0.22	23		546.9	13.5		
					-9.87			
122+06 A	262°-54'	0.87	87	-6°-28'	545. ¹⁵ 77			"S" 117+74 (545.09)
							549.00	
π 122+06							550.61	4.84
BS 121+21	82°-54'	0.87		+6°-29'				

Sta.	Azi	Rod	Hos. Dist	Vert. L	Elev	FS.	B.I.	B.E.
	262°-52 $\frac{1}{2}$						549.99 550.61	
122+88 ✓	242°-06 $\frac{1}{2}$	0.81	82 ✓		547.82 ²⁰	2.79		
⊖ 122+88							551.93 552.55	4.73
B.S. 122+06	62°-06 $\frac{1}{2}$	0.82			545.81 -9.10			6.74
123+91 A ✓	273°-01 $\frac{1}{2}$	1.03	103 ✓	-5°-01 $\frac{1}{2}$	538.72 ¹⁰			
⊖ 123+91							542.62 543.24	4.52
B.S. 122+88	93°-01 $\frac{1}{2}$	1.03		+5°-02				
124+76	250°-55 $\frac{1}{2}$	0.84	85		528.9	13.7		
125+22 A ✓	250°-55 $\frac{1}{2}$	1.30	131 ✓		535.48 536.19	7.14		
⊖ 125+22							540.00 540.62	4.52
B.S. 123+91	70°-55 $\frac{1}{2}$	1.30		+1°-12'				
126+31 A ✓	256°-43 $\frac{1}{2}$	1.08	109 ✓		527.95 528.57	12.05		
⊖ 126+31							532.51 533.13	4.56
B.S. 125+22	76°-43 $\frac{1}{2}$	1.08		+4°-00				
127+14		0.82	83		527.7 210.74 10.29	5.4		
127+62 A ✓	237°-23 $\frac{1}{2}$	1.31	131 ✓	+4°-29 $\frac{1}{2}$	538.91 538.24			
⊖ 127+62								
B.S. 126+31	57°-23 $\frac{1}{2}$	1.32		-4°-28 $\frac{1}{2}$				
128+38 A ✓	253°-48'	0.75	76 ✓	+2°-54 $\frac{1}{2}$	+3.84 542.76 ⁰⁸			

Azi check to "S116+07" S line Azi = 263°-18'

Sta	Azi.	Rod	Hor. Dist	Vert. \angle	Elev	F.S.	H.I.	B.S.
π 128+38					542.08		547. ⁰⁷ ₉₅	4.99
B.S. 127+62	73°-48'	0.76		2°-53'				
✓ 129+05 A	249°-23'	0.66	67		544.83 545.51	2.24	549.56 550.24	4.73
π 129+05							549.56 550.24	4.73
B.S. 128+38	63°-23'	0.67						7.45
✓ 129+94 A	244°-37'	0.88	89	-8°-02'	-12.30 532.53 533.16			
π 129+94							537.43 538.08	4.90
B.S. 129+05	64°-37'	0.87		+8°-04'				
✓ 132+05 A	245°-37'	2.10	2.11	-2°-36'	-8.56 522.97 523.60			
π 132+05							527.88 528.51	4.91
B.S. 129+05	65°-37'	2.10		+2°-37'				
132+28	239°-21½'	0.22	23		517.4	10.5		
133+61	239°-31½'	1.55	156		523.2	47		
✓ 133+98 A	239°-31½'	1.93	193	+4°-03'	+13.69 536.66 537.29			
π 133+98							541. ²⁸ 541.91	4.62
B.S. 132+05	59°-31½'	1.93		-4°-02'				
134+38	228°-19'	0.45	40	-21°-57'	-16.04 520.6			
135+51	"	1.52	1.53		535.0	6.3		
✓ 136+05 A	228°-19'	2.06	207		534.96 535.59	6.32		

Point on Cliff 40' above Road.

Sta	Azi	Rad	Hor. Dist	Vert L	Elev	FS	H.I	BS	
TI 136+05							540.52 541.15	5.56	
BS 133+38	48°-19'	2.05	←		537.33			3.82	25-100
136+87	205°-31'	0.81	82		526.7	13.8			
137+60	205°-31'	1.54	155		531.9	86			
138+13 A	208°-31'	2.07	208	✓	534.33 534.36	6.15			
TI 138+13							538.99 539.62	4.66	
BS 136+05	25°-31'	2.06	✓					4.00	
138+85 A	186°-33'	0.71	72	✓	534.98 535.56	4.06			✓
TI 138+85							539.94 540.57	5.01	
BS 138+13	6°-33'	0.71	←		534.56			5.61	
140+75 A	150°-39½'	1.85	190	✓	531.55 532.18	8.39			
TI 138+85	265-53	1.04		-15°-12'	467 504.93		Tie-shot.		2x2 hub Corner #7 of the El Monte Oak Park = S 135+33 (501.73)
TI 138+85	275-16½	1.39		-13°-14'	3123 500.32				Azi to S 132+73
TI @ S 135+33 A	32-05½	2.68				6.64		5.17	"S Line Azi. 212°-32'
TI 140+75							30 536.93	4.75	
BS 138+85	330°-39½'	1.90			535.61			1.32	on fence line. 48' to fence corner at turn in road. Fence runs S.E. to flume
	128°-33'								
141+21	197°-04'	0.45	46		522.6	13.7			in road
143+53 A	197°-04'	2.75	278	✓	35 527.32	8.95			South edge of road

Sta.	Azi.	Rod	Hor. Dist	Vert. L	Elev.	FS.	H.I.	B.S.	
143+53					527.35		532 ³⁵ 38	5.00	
B.S. 140+75	17°-04'	2.75			532.16	0.72			
146+05	221°-53'	2.51	252		517.5	15.5			
148+75	221°-53'	5.25	526	-1°-18'	^{-11.95} 515.4				
	233°-50'								Azi of Fence along road
151+29 A	221°-53'	7.75	776	+0°-36'	^{+8.17} 535.52 536.15		540.58 541.21	5.06	
B.S. 143+53	41°-53'	7.76		-0°-36'					
149+53	41°-53'	-1.76	176	-6°-58'	^{-21.34} 514.2	Back Shot			On fence line running from center of valley up to flume.
149+95	41°-53'	-1.37	134	-9°-25'	^{-22.3} 513.2	Back Shot			
152+30	233°-31'	1.01	102		531.2	10.0			
155+21 A	233°-31'	3.91	392	+1°-12 $\frac{1}{2}$ '	^{+8.00} 543.72 544.44				21' back to fence, which runs from center of valley to flume.
155+21							548 ²³ 548	4.51	
B.S. 151+29	53°-31'	3.92		-1°-11'					
156+39	223°-15'	1.17	118		534.2	14.0			
158+12	223°-15'	2.90	291		532.0	16.2			
158+99	223°-15'	3.77	378		543.7	45			
159+64 A	223°-15'	4.42	443		544.47 545.16	37.6			on hill above old farm houses.
159+64							549.45 550.14	4.98	

Sta	Azi	Rod	Hor. Dist	Vert. L	Elev	FS	HI	BS	
BS 155+21		4.42					549.45	5.65	
161+24 A	215°-22'	1.59	160		543.72 ⁰³	6.42			
T 161+24							548.88 ¹⁹	5.16	
BS 159+64	35°-22'	1.58			545.20			3.68	
162+47	197°-47'	1.22	123		543.2	5.7			Taken at main fence which crosses valley
163+57	197°-47'	2.32	233		546.0	2.9			
165+17	197°-47'	3.92	393		537.7	11.2			
166+63 A	197°-47'	5.38	539		546.52 547.21	1.67			
T 166+63							551.36 552.05	4.84	
BS 164+24	17°-47'	5.38			543.83			8.22	
168+95 A	226°-02'	2.31	232		541.72 ⁰³	10.33			2' from fence line which runs at about 4-25-22
T 168+95							546.88 ¹⁷	5.14	
BS 166+63	46°-02'	2.31		11°-23'					2' from fence line
171+67 A	253°-29'	2.71	272		537.94 ²⁵	8.92			
T 171+67							541.69 542.38	4.44	
BS 168+95	73°-29'	2.72			541.78			0.60	
172+50	285°-15'	0.82	83		533.2	9.2			
172+64 A	285°-15'	0.96	97		536.51 537.20	5.12			
T 172+64							541.45 542.14	4.94	

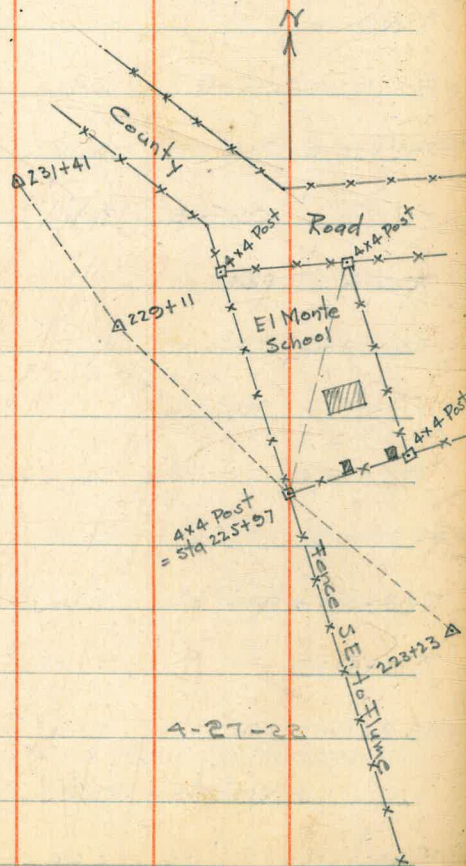
Sta	Azi	Rod	Hor. Dist.	Vert. L	Elev.	FS.	H.I.	BS.	
BS. 174+67	105°-15'	0.96			537.97		542.77 541.45	4.17	
173+33	342°-46'	0.68	69		531.8	10.3			
175+49A	342°-46'	2.84	285		539.51 540.20	1.94			
T 175+49							544.38 545.07	4.87	
BS. 172+64	162°-46'	2.84			537.28			7.79	
176+32A	314°-27'	0.82	83		536.91 537.60	7.97			in Terrace above road.
T 176+32							541.66 542.35	4.75	
BS. 175+49	134°-27'	0.82		+1°-49'					
177+34A	243°-54'	1.01	102		539.71 ⁰²	2.64			
T 177+34							543.83 544.52	4.81	
BS. 176+32	63°-54'	1.01			537.62			6.30	
178+15	231°-21½'	0.80	81		540.3	4.2			Crosses fence, 7' South to Corner of Curved fence down d. hill to East
178+80A	231°-21½'	1.45	146		537.93 538.62	5.90			
T 178+80							542.74 543.43	4.81	
BS. 177+34	51°-21½'	1.45						3.69	
180+80A	216°-19½'	1.99	200		537.77 538.46	4.97			
T 180+80							542.44 543.13	4.67	
BS. 178+80	36°-19½'	1.99						4.49	
T 180+80		1.88		-11°-02'	-35.54 502.23 502.92			Williams B.M. #9	Elev. 500.91

Sta	Azi	Rod	Hor. Dist.	Vert. L	Elev	FS	H.I.	BS	
π 180+80	250°-16	2.22	215	-11°-06'	42.16 495.61 496.70				"S" 171+02 "S" Elev. 494.39
182+78A	208°-50	1.97	198		536.95 537.64	5.49			
π 182+78							541.90 542.59	4.55	
BS 180+80	28°-50'	1.38						4.09	
184+05	169°-11½	1.26	127		525.9	16.2			
188+38A	169°-11½	5.59	560		531.95 532.64	9.35			
π 188+38							536.90 537.59	4.95	
BS 182+78	349°-11½	5.59		+0°-31½					
189+42	225°-40	1.03	104		520.9	16.0			
191+36	225°-40	2.97	298		531.1	5.8			
192+55	225°-40	4.16	417		525.9	11.0			
193+56	225°-40	5.17	518		528.8	8.1			
199+79A	225°-40	11.40	1141		529.45 530.14	7.45			
π 199+79							534.84 ¹⁵	47.0	
BS 188+38	45°-40'	11.39			532.63			2.21	
202+24		2.44	245		523.6	13.3			
203+69		3.89	390	-2°-22'	-16.12 513.3				
204+00		5.20	521	-2°-17'	-20.75 504.1				The reading - 10.0 - 20.75 = 30.75
211+34A	226°-40½	11.58	1156		523.87 524.56	10.28			

Sta	Azi	Rod	Hor. Dist	Vert. L	Elev		
π 211+34					5.17	528.64	
						529.33	4.77
B.S. 199+78	46°-40'	11.58		+0°-17'	529.73		
					-76.64		Back Shot.
210+34		1.06	100	-14°-54'	497.23		
					+5.55		
π 212+63 A	268°-48'	1.28	129	+2°-27½'	529.42		
					530.11		
π 212+63						534.61 ¹²	4.70
B.S. 211+34	88°-48'	1.28			524.68		10.13
π 215+27 A	264°-50'	2.63	264		528.87	5.92	
π 215+27						532.99	
						533.68	4.79
B.S. 212+63	84°-50'	2.63			530.16		3.52
π 217+47 A	250°-02'	2.19	220		531.72	1.27	
					532.41		
π 217+47						536.58	
						537.27	4.86
B.S. 215+27	70°-02'	2.19			528.22		8.35
222+71	237°-26'	5.23	524		519.6	170	
π 223+23 A	237°-26'	5.75	576		532.89	4.38	
π 223+23						537.80 ²¹	5.01
B.S. 217+47	57°-26'						
223+47	309°-43½'	0.23	24		525.9	113	
224+49	309°-43½'	1.25	126		532.6	46	
225+97 A	309°-43½'	2.73	274		535.85 ¹⁹	202	

This elev. 2' above ground, 4x4 post, with tack
S.W. of El Monte School Ground.

Sta	Azi	Rod	Hor. Dist	Vert. L	Elev	FS.	H.I.	BS.	
225+97							538.70 ⁰¹	2.82	
BS. 223+23	129°-43½'	2.74			532.95			5.75	S.E. Corner of El Monte School Grounds
	72°-42'	1.63	158	-11°-23'					N.W. Corner school Grounds
	343°-06'	3.01	296	-7°-58'					Angle in Road
	343°-01'	3.66	360	-8°-11'					N.E. Corner School Grounds
	14°-13'	3.12	304	-9°-42'					
229+11 A	314°-18½'	3.13	314 ✓		533.80 534.49	4.21			
229+11							538.72 539.41	4.92	
BS. 225+97	134°-18½'	3.12			535.35			3.46	
231+41 A	324°-24'	2.29	230 ✓		534.31 535.00	4.41			
231+41							538.97 539.66	4.66	
BS. 229+11	144°-24'	2.29			534.56			5.10	
232+30 A	312°-53'	0.88	85 ✓		529.40 530.09	3.57			
232+30							534.77 ⁰⁸ 534.77	4.68	
BS. 234+1	132°-53'	0.88		+3°-12½'					
232+87 A	265°-25½'	0.56	57 ✓		526.82 527.21	7.56			
232+87							530.89 531.58	4.37	4-27-23
BS. 232+30	85°-25½'	0.56		+2°-57'					
235+63 A	224°-34½'	2.75	276 ✓		521.89 ²⁰ 521.89	3.69			



Sta	Azi	Rod	Hor Dist	Vert L	Elev	F.S.	H.I.	B.S.
π235+63							526.17	4.97
BS 232+87	44°-34½	2.76		+1°-07½				
					-20.15			
236+11	311-47	0.55	48	-22°-52'	501.0			
236+53	311-47	0.89	90		511.7	14.5		
240+19A	311°-47'	4.55	456		522.87 523.56	330		
π240+19							527.82 528.51	4.95
BS 235+63	131°-47'	4.56			521.96			6.55
241+12A	274°-29'	0.92	93		522.05	577		
	105°-45'	2.44		-9°-14'				To 'S' 216+85 Side Shot
π @ 'S' 216+85								4.87
BS 241+2	285-45	2.44		+9°-15½				To 'S' 213+25
	85°-28'							
π241+12							526.91 527.60	4.86
BS 240+19	94°-29'	0.92						4.02
243+29A	249°-07½	2.16	217		523.99 524.68	292		
π243+29							528.85 529.54	4.86
BS 241+12	69°-07½	2.16			522.76			6.78
	314°-44'	0.85		-14°-36'	-210 503.68			Side Shot to 'S' 223+06 'S' Elev. 500.24
245+35A	211°-03	2.05	206		521.11	174		

Sta	Azi	Rod	Hor Dist	Vert. L	Elev	FS.	HI.	BS.	
2245+35							526.13	5.02	
BS. 243+23	31°-03'	2.05			524.71			2.11	
246+71A	183°-55½'	1.35	136		524.24	1.89			
2246+71							529.17	4.93	
BS. 245+35	3°-55½'	1.36			521.83			8.03	
248+45	199°-22½'	1.65	164	-6°-00'	507.0				25' further is 10' lower
249+12	199°-22½'	2.40	241	-2°-43'	512.8				
250+88A	199°-22½'	4.16	417		527.72 528.47	1.45			on hill above Foster Place
2250+88							532.66 533.35	4.94	
BS. 246+71	19°-22½'	4.15			525.02			8.33	
252+20	192°-42'	1.31	132		516.3	17.0			
253+35	192°-42'	2.46	247		519.3	14.0			
254+10A	192°-42'	3.21	322		530.74	2.61			
2254+10							534.46 535.15	4.41	
BS. 250+88	12°-42'	3.21			528.45			6.70	
254+71		0.60	61		528.5	9.6			
256+34A	222°-50'	2.23	224		529.54 530.23	4.92			
2256+34							531.27	4.73	
BS. 254+10	42°-50'	2.23			530.74			4.22	

Sta	Azi	Rod	Hor. Dist	Vert. L	Elev.	FS.	HI	BS.
256+34								
256+86	213-20 $\frac{1}{2}$	0.51	52		520.0	15.0		
257+22	213-20 $\frac{1}{2}$	0.87	88					Crosses North & South Fence.
259+05A	213-20 $\frac{1}{2}$	2.70	271		528.35 529.04	5.92		
T259+05							5334.0 534.09	5.05
B.S. 256+34	33-20 $\frac{1}{2}$	2.71			530.26 -282	3.83		
259+62	283-53 $\frac{1}{2}$	0.70	57	-26-10	500.1			
260+99A	283-53 $\frac{1}{2}$	1.93	194		527.88 528.57	5.52		
T260+99							532.73 533.42	4.85
B.S. 253+05	103-53 $\frac{1}{2}$	1.94			529.09 +124 $\frac{28}{28}$			4.33
264+32A	271-10	3.32	333	+2-08	540.27			
T264+32							545.23 545.22	4.95
B.S. 260+99	91-10	3.33		-2-07				
265+03	281-57	0.73	71	-12-37	524.5 -15.81			
266+76	281-57	2.43	244		539.3	6.6		
268+72A	281-57	4.39	440		533.64 534.33	11.59		
T268+72							538.53 539.22	4.89
B.S. 264+32	101-57	4.39		+0-53				
270+98A	273-12	2.25	226	-2-15	-887 524.77 525.46			
T270+98							529.57 530.26	4.80

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Sta.	Azi.	Rod.	Hor. Dist	Vert L	Elev	FS.	H.I.	BS.
B5268+72	93°-12'	2.25		+2°-16'			530.86 529.57	
272+55	263-08	1.56	157		513.2	170		273+00 = Elev. 500.00
273+45	263-08	2.46	247		512.7	17.5		
274+39A	263°-08+	3.40	341		527.41 528.10	216		
274+39							532.81 ²²	4.81
B5.270+98	83°-08'	3.40			525.51			7.40
275+64	320°-14½'	1.24	125		525.3	7.6		
277+57A	320°-19½'	3.17	318		526.69 527.38	5.53		on Point of hill hill slopes about +22°
277+57							531.55 532.24	4.86
B5.274+39	140°-14½'	3.17			528.12			4.12
278+05	255°-14'	0.47	48		530.0	2.2		
278+52A	255°-14'	0.94	95		524.42 525.11	7.13		
278+52							528.87 529.56	4.45
B5.277+57	75°-14'	0.94		+1°-25'				
279+31	240-06	0.78	79		519.2	10.4		
280+36A	240°-06'	1.83	184		524.96 525.65	3.91		
280+36							529.41 530.10	4.45
B5.278+52	60°-06'	1.83			525.14 + 579			4.96
281+85A	237°-45½'	1.48	149	+2°-13½'	530.73 531.44			

Sta	Azi.	Rod	Hor. Dist	Vert. L.	Elev.	FS.	H.I.	BS.
π281+85							535.63 526.34	4.90
BS.280+36	57°-45 $\frac{1}{2}$	1.48			525.70			10.64
282+18	260-35	0.32	33		528.5	7.8		
284+60 ✓	260°-35'	2.74	275		523.8 5 ²⁷	12.41		
π284+60							527.97 529.68	4.75
BS.281+85	80°-35'	2.74		+1°-36'				
285+78 A ✓	236°-33'	1.17	118	+2°-22 $\frac{1}{2}$	528.5 5 ¹² +4.90			
π285+78							532.75 533.46	4.63
BS.284+60	56°-33'	1.17			524.05			9.41
286+28		0.49	50		529.6	3.9		
286+83 A ✓	238-36+	1.10	111		525.96 526.67	6.73		
π286+83							530.51 531.22	4.55
BS.285+78	58°-36'	1.10			528.86			2.36
287+85 A ✓	205°-32'	0.95	96		526.68 527.39	3.83		
π287+85							531.28 531.99	4.60
BS.286+83	25°-32'	0.95			526.71			5.28
289+10	195°-36'	1.24	125		524.0	8.0		
290+45 A ✓	195°-36'	2.59	260		527.32 528.03	3.96		
π290+45							531.61 532.32	4.29

Sta.	Azi.	Rod	Hor. Dist.	Vert. L.	Elev.	FS.	HI.	BS.
B.S. 287+85	15°-36'	2.60			527.32		531.61	
							532.32	4.87
291+37	258-51	1.09	92	-21°-10'	³⁵⁷⁴ 491.9			
292+71 ✓	258-51	2.25	226 ✓		529. ²¹ 72	240		
π 292+71							533.74 534.25	4.53
B.S. 290+45	78°-51'	2.26			527.89			6.36
293+90	275°-28'	1.18	119		532.0	22		
294+60 ✓	275°-28'	1.88	189 ✓		529. ⁰⁴ 55	470		
π 294+60							534. ⁰² 53	4.98
B.S. 292+71	95°-28'	1.89			529.78			4.75
296+034 ✓	252°-12'	1.42	143 ✓		^{525.85} 526.36	817		
π 296+03							530. ⁴⁷ 98	4.62
B.S. 294+60	72°-12'	1.42			529.58			1.46
297+23 ✓	228°-53'	1.19	120		527. ⁰⁷ 58	340		
π 297+23							531.72 532.23	4.65
B.S. 296+03	48°-53'	1.20			526.39 -36.76			5.84
	281°-38'	0.95	78	-24°-54'	490. ³¹ 82			Tie Shot To S 270+92
	0°-53'	1.25	110	-20°-21'	^{41.16} 485.91 486.42			" S Elev 487.67
298+21 A	202°-52'	0.97	98		^{526.56} 527.02	516		Tie Shot To S 269+69
π 298+21							531. ⁴⁶ 97	4.90
								" S Elev 483.48

Sta	Azi.	Rod.	Hor. Dist	Vert. Z	Elev	F.S.	H.I.	B.S.
298+21					526.56			
B.S. 297+23	22°-52'	0.97			527.59		521.57	4.38
299+19	184-48	0.97	98		522.0	10.0		
300+41	184-48	2.19	220	-5°-13'	506.6			
300+91 A	184-48	2.69	270		527.85 528.36	3.61		
K 300+91							532.58 533.09	473
B.S. 298+21	4°-48'	2.70			527.12			5.97
301+74	248-30	0.82	83		519.1	14.0		
302+54	248-30	1.62	163		528.4	47		
303+57 A	248-30	2.65	266		523.96 524.47	8.62		
K 303+57							528.97 529.48	5.01
B.S. 300+91	68°-30'	2.64		+0°-50'				
304+34	222-50	0.76	77		527.2	23		
305+92 A	222°-50'	2.34	235		525.63 526.14	3.34		
K 305+92							530.84	470
B.S. 303+57	42°-50'	2.34			524.50			6.39
307+27		1.34	135		519.2	11.6		
308+21		2.28	229		511.8	19.0		
309+38		3.45	346		527.0	3.8		
311+34 A	219°-19'	5.41	542		528.64 529.15	16.9		

20' back is 10' lower

Sta	Azi	Rod	Hor. Dist	Vert. L	Elev.	F.S.	H.I.	B.S.	
311+34					528.64				
BS. 308+82	33°-19'	5.41			526.19		533.61 ¹⁰	4.46	
310+64	33°-19'	-0.69	70		515.6	18.0			Back shot in Gulch
312+39	243°-49½'	1.08	105	-11°-23'	⁻²¹¹³ 507.5				
313+98A	243°-49½'	2.64	265		^{528.50} 529.01	4.60			
313+98							533.60 ⁰⁹	4.59	
BS. 311+34	63°-49½'	2.65			529.18			4.42	
314+61		9.62	63		521.9	11.7			
315+69		1.70	171	-5°-32'	⁻¹⁶⁴³ 529.70 530.21 =	3.39			25' back is 10' lower - 4-29-22-
317+51A	262°-24'	3.52	353		526.97				Elev. Corrected by Bench # 5 Correction = - 2.73 ft.
317+51							531.75	4.78	
BS. 313+98	82°-24'	3.51			525.81			5.94	
318+28	258°-41½'	0.76	77		519.01	12.8			
319+31A	258°-41½'	1.79	180		519.16	12.59			
319+31							523.83	4.67	
BS. 317+51	78°-41½'	1.79		+2°-33½'					
318+86	78°-41½'	-0.59	55	-16°-12'	⁻¹⁶¹⁴ 503.0				Back Shot
319+75	275°-35'	0.43	44		512.3	11.5			
320+46	275°-35'	1.14	115		522.2	1.6			

Sta.	Azi	Rod	Hor. Dist	Vert \angle	Elev	FS.	HI.	BS.
✓ 321+01A	275°-35'	1.69	✓ 170		✓ 521.00	2.83		
∇ 321+01							✓ 525.40	4.40
BS. 319+31	95°-35'	1.69			519.18			6.22
✓ 322+64A	269°-59'	1.62	✓ 163		✓ 520.07	5.33		
∇ 322+64							✓ 524.61	4.54
BS. 321+01	89°-59'	1.62			521.03			3.58
	303°-23'	1.64	138	-23°-53'	-61.19 458.88			4x4 Post Marked. West T.R. 1 East T.R. 2 Line
✓ 324+01A	263°-03'	1.36	✓ 137		✓ 518.69	5.92		
∇ 324+01							✓ 523.37	4.68
BS. 322+64	83°-03'	1.36			520.10			3.27
✓ 325+20A	253°-58'	1.18	✓ 119		✓ 521.52	1.85		
∇ 325+20							✓ 526.18	4.66
BS. 324+01	73°-58'	1.18			518.70			7.48
✓ 326+80A	247°-02½'	1.59	✓ 160		✓ 523.04	3.14		
∇ 326+80							✓ 527.64	4.60
BS. 325+20	67°-02½'	1.59			521.54			6.10
327+26	271-44½'	0.45	46		520.0	7.6		
328+56	271-44½'	1.25	176		521.2	6.4		
✓ 329+05A	271°-44½'	2.24	✓ 225		✓ 525.85	1.29		

Sta.	Azi	Rod	Hor. Dist	Vert. L	Elev	FS	HI	BS
κ 322+05							530.56 ✓	4.11
BS. 326+80	91°-44½'	2.24	-		523.07			7.49
330+23 A	264°-49½'	1.17	118		528.40 ✓	2.16		
κ 330+23							532.93 ✓	4.53
BS. 325+05	84°-49½'	1.17	-		525.88			7.05
331+02 A	239°-32'	0.78	79		526.88 ✓	6.05		
κ 331+02							531.23 ✓	4.41
BS. 330+23	59°-32'	0.18	-		528.43			2.86
331+79 A	121°-13½'	0.76	77		526.85 ✓	4.44		
κ 331+79							531.56 ✓	4.71
BS. 331+02	11°-13'	0.76	-		526.89			4.67
332+72 A	158°-48½'	0.92	53		526.18 ✓	5.38		
332+79	158°-48½'							
κ 332+72							530.93 ✓	4.75
BS. 334+79	338°-48½'	0.92			526.87			4.06
333+82	149°-52'	1.09	110		519.7	112		
334+66 A	149°-52'	1.93	194 ✓		522.91 ✓	8.02		
κ 334+66							527.61 ✓	4.70
BS. 332+72	323°-52'	1.93			526.20			1.91

cross 20" pipe line from pump
in valley to Flume.

Sta	Azi	Rod	Hor. Dist	Vert. L	Elev	FS	HI	BS	
334+66					522.91				
336+44	218-43	1.99	178	-19°-24'	-62.73 460.2				
337+34	218-43	2.80	268	-12°-30'	-59.41 463.5				
339+02	218°-43'	4.35	436		526.37	1.24			
339+02							530.59	4.22	
BS. 334+66	38°-43'	4.36			522.91			7.68	S.E. Corner of Fence.
	306°-46'	0.94	91	-12°-24'	-19.6 506.4				Fence from N.E. Corner of Pumping Plant to Flame.
339+78	262°-07½'	0.75	76		528.4	22			
341+29	262°-07½'	2.26	227		527.08	3.51			
341+29							531.98	4.90	
BS. 339+02	82°-07½'	2.26			526.38			5.60	
342+82	239°-14'	1.52	153		528.81	3.17			
342+82							533.42	4.61	
BS. 341+29	59°-14'	1.52			527.11			6.31	
343+83	223°-57'	1.00	101		514.2	19.2			
346+02	223°-57'	3.19	320		527.72	5.70			
346+02							531.95	4.23	
BS. 342+82	43°-57'	3.19						3.26	
346+61	240-41½'	0.58	59		521.5	10.4			
347+20	240-41½'	1.20	118	-9°-04'	-18.86 508.8				

Sta	Azi	Rod	Hor Dist	Vert \angle	Elev	FS	H.I.	BS
347+86	240-41 $\frac{1}{2}$	1.83	184		520.9	11.1		
348+70A	240-41 $\frac{1}{2}$	2.67	268		524.70	7.25		
π 348+70							529.45	4.75
BS.346+02	60-41 $\frac{1}{2}$	2.66			527.77			1.68
					-22.22			
350+62	241-18 $\frac{1}{2}$	1.93	182	-6-37	502.5			20' further is 10' lower.
					-25.83			
351+22	241-18 $\frac{1}{2}$	2.53	252	-5-46	499.3			
352+77	241-18 $\frac{1}{2}$	4.06	407		513.5	16.0		
354+13A	241-18 $\frac{1}{2}$	5.42	543		519.05	10.40		5-1-22
π 354+13							523.93	4.88
BS.348+70	61-18 $\frac{1}{2}$	5.91		+0-37 $\frac{1}{2}$				
357+30A	227-54	3.16	317		520.87	3.06		
π 357+30							525.87	5.00
BS.354+13	47-54	3.16			519.10			6.77
359+00A	208-58	1.69	170		521.33	4.54		
π 359+00							526.42	5.09
BS.357+30	28-58	1.69			520.80			5.52
					-39.32			
361+13	223-47	2.19	213	-10-28	482.0			
					-49.02			
364+81	"	3.80	381	-7-20	472.3			

Sta	Azi	Rod	Hor. Dist	Vert. \angle	Elev	F.S.	HI	B.S.	
364+65 A	223°-47'	5.67	565	-4°-08'	-40.86 480.47 ✓				In South edge of road - at Summit. Approximately at station S 333+90
π 364+65							485.59	5.12	
B.S. 359+00	43°-47'	5.68		+4°-05'					
365+93	206°-42'	1.27	128		479.0 -14.48 ✓	66			Hub in East edge of road. Approx on line of West side of Elm Str. = S 339+75
370+51 A	206°-42'	5.85	586	-1°-25'	465.99 ✓				
π 370+51							470.87	4.88	
B.S. 364+65	26°-42'	5.86		+1°-26'					Check on Williams BM.
					466.97 ✓	3.90			Elev 466.33
	261°-40'	0.62	63						3x3 Post at S.W. Corner of Elm Street & Julian Avenue. Approx. Azi of Elm Str.
374+54	206°-21½'	4.02	403		459.7	11.2			S Azi = 206°-24'
374+76	206°-21½'	4.24	425		456.9	14.0			Bottom of ditch
375+52 A	206°-21½'	5.00	501		455.23 ✓	11.64			= S 344+74
π 375+52							464.78	5.55	
B.S. 370+51	26°-21½'	5.00		+0°-46'					
380+21 A	205°-40½'	4.68	469	+0°-42'	+5.73 ✓ 464.96				At Angle in Road.
π 380+21							470.34	5.38	= S 349+40 Enter Eucalyptus Grove
B.S. 375+52	25°-40½'	4.68		-0°-43'					
381+97 A	205°-16'	1.75	176		465.79 ✓	4.55			
π 381+97							470.53	5.14	

Sta	Azi.	Rod	Hor. Dist	Vert. L	Elev	FS.	H.I.	BS.	
							470.93 ✓		
BS380+21	25°-16'	176						5.91	
385+13 A	216°-05'	315	316		466.63 ✓	430			
T385+13							471.28 ✓	5.15	
BS381+37	36°-05'	315			465.87 ✓			5.91	
388+37 A	216°-05'	3.23	324		467.48 ✓	430			S. Edge Eucalyptus Grove
T388+37							472.48 ✓	5.00	
BS.388+13	36°-05'	3.23			466.70			5.78	
389+89	223°-49'	1.51	152		472.0 ✓	05			in grain field.
					+25.15 ✓				
391+45 A	223°-49'	3.09	308	+4°-40'	492.63 ✓				on rocky knoll.
T391+45							497.61 ✓	4.58	
BS.388+37	43°-49'	3.09		-4°39 1/2					South line of Lot 120 of the 'K' Tract.
391+47	269°-52'								
391+82	237-37	0.36	37		486.0	11.6			
					-36.05				
392+80	237-37	1.43	135	-15°-00'	456.6				Edge of grain
					-39.75				
393+61	237-37	2.22	216	-10°-26'	452.9				Grain field
					-40.73				
*	270-06	3.78	375	-6°-12'	451.9				S.W. Corner Lot 120
					-30.43				
395+47	237-37	4.03	402	-4°-20'	462.2				center of Wagon road
					-22.84				
397+06	237-37	5.60	561	-2°-20'	469.8				
398+33 A	237-37	7.47	748		495.85 ✓	176			Edge of Clearing

Sta	Azi	Rod.	Hor. Dist	Vert \angle	Elev	FS.	HI.	BS.
∇ 358+83							500.80	4.95
BS.351+45	57°-37'	7.50			498.73			8.07
400+08	274°-51'	1.14	115		488.7 +7.03	12.1		
∇ 401+19A	274°-51'	2.25	226	+1°-47'	502.88			
∇ 401+19							507.82	4.94
BS.358+83	94°-51'	2.25			495.90			11.92
402+10		0.90	91		499.2 +5.88	8.6		
∇ 403+26A	255°-43 $\frac{1}{2}$ '	2.76	277	+1°-13'	508.76			
∇ 403+26							513.73	4.97
BS.401+19	75°-43 $\frac{1}{2}$ '	2.77			503.00			10.73
∇ 404+31A	229°-51'	0.94	95		502.83	3.90		
∇ 404+31							514.85	5.02
BS.403+26	49°-51'	0.94			508.77			6.08
405+30		0.98	99		502.0	12.9		
∇ 407+02A	227°-29'	2.10	211		510.05	4.80		
∇ 407+02							515.09	5.04
BS.404+31	47°-29'	2.10			409.87			5.22
409+94		2.91	292		497.3	17.8		
411+17A	204°-42'	4.14	415		512.74	2.35		

Continued in book #15

577.71 H.I. @ 4463

0.81

576.90

4.90

581.80

9.81

571.99 TR

4.41

576.40

1.86

574.54

71.46

3

08

439.83 W.S. G.S. BM

4.61

444.44 H.I.

5.80

480.64 TR

1.84

478.48 H.I.

4.16

472.32 TR

6.56

448.88 H.I.

2.97

445.91 = 446.20 Millions BM #5

2.97

449.17 H.I.

0.20

448.97 TR

13.85

462.82 H.I.

0.18

462.64 TR

13.56

476.20 H.I.

0.15

476.05 TR

13.61

489.66 H.I.

0.43

489.23 TR

13.92

503.18 H.I.

0.66

502.45 TR

502.49 TR

14.17

516.66 H.I.

0.32

516.34 TR

11.80

528.14

1.17

526.97

265

403 + 23

8 56

411 + 79

3 76

415 + 55

5 69

421 24

6 29

427 + 53

101
202
303

2.845 = 100.00
2.87 102.87 4.21 98.66
5.92 104.58 4.48 100.10
5.87

5780
36960
52200
89760

6.35
4445
635
10795

5.87 105.87 100.00
4.72 104.22 4.47 101.40

412

2) 165.06
162
30

6.1
17
927
61
103.7

2.723 102.723 100.00
5.790 104.384 4.127 98.596
4.392 99.994

5280
5280
10560
140880

8.55
1.4
3420
855
11.970

6'E01



6.92 106.92 100.00
2.48 104.635 4.765 102.155
4.585 100.050
2.585 100.130

6.35
26
3810
1270
165.10

475
165
310

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.
ROADWAY 14 FEET WIDE. SIDE SLOPES 1 1/2 TO 1.
FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

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