Survey-El Capitan Traverse
Level
Williams

W174

LEVEL BOOK

373

Halers Time Dec 6 — 4 hrs.
8 — 2 hrs

Index

99

98+04.1 Top of H2x
Ground 1.5 Lower

95+65.4 taken at angle Bisection.

93

90

86+55.7 xsections taken at ℄ Bisection

84

81

78+00

76+34.4 ℄

Streambed

1

1

Streambed ↓

Station	Elevation	Remarks	Cross-section (elevation, change / distance)
129+80	580.0		591.8 T.S +11.8/840; 590.8 +10.8/732; 589.8 +9.8/432; 587.8 +7.8/132; 582.0 +2.0/112; 580.0 00/70; • 583.0 +3.0/140; 598.0 T.S +18/160
126	578.1	✓ angle point will show this	• 578.1 00/45; 580.1 +2.0/62
122+60	578.4		578.4 0.0/256; 576.1 −2.3/80; 576.1 −2.3/62; • 578.4 0.0/76; 585.4 +7.0/106; 589.9 T.S. +11.5/376
118+80	576.74		582.0 T.S +15.3/200; 574.7 −2.0/160; 574.7 −2.0/110; • 576.2 +0.5/115; 584.6 +7.9/125; 589.1 T.S 12.4/242
117	575.9		591.9 T.S +16.0/225; 573.9 −2.0/180; 573.9 −2.0/105; • 575.9 00/85; 571.4 +4.5/97; 580.4 +4.5/118; 584.6 +8.7/130; 583.9 T.S 8.0/300
114+20	574.9		576.3 T.S +2.4/180; 572.5 −2.4/110; 572.5 −2.4/40; • 574.9 00/83; 583.4 +8.5/100; 583.9 T.S +9.0/264
110+50	572.19	Taken on angle Bisection	598.6 T.S 26.4/360; 590.6 +18.4/310; 577.6 +5.4/125; 572.6 +0.4/110; 570.2 ⊈ Stream −2.0/46; • T.S 0.0/118 572.2
108	569.7		585.7 T.S 16.0/275; 577.2 +7.5/195; 578.7 +9.0/115; 571.7 +2.0/55; • 569.7 0.0/70; T.S +13.0/90 582.7
105	568.2		582.4 T.S +14.2/160; 578.6 +10.4/120; 570.6 +2.4/95; • 570.8 +2.6/85; 582.1 +13.9/100; 583.6 15.4/125
102	567.4		579.4 T.S. +12.0/165; 567.4 0.0/110; • 567.9 T.S. +0.5/100

158+10 taken at a bisection ✓

156

153

151+10°

147

144

142+10° Taken at a Bisection

138+10 Taken at a Bisection

135 ✓

137

Stream Bed

592.5 T.S 0.0 / 115 — 592.5 00 / 55 — 698.0 T.S River bank +15.5 / 110 — flat to ink with line between 900 on 158+10 +

608.4 +17.0 / 220 — 600.4 +9.0 / 120 — 591.4 0.0 / 75 — 592.4 +1.0 / 155 — 606.4 +15.0 / 175 — 604.9 +17.5 / 475 — 608.9 +17.5 / 775 — 610.9 +19.5 / 900

606.6 T.S +13.0 / 275 — 597.8 +5.3 / 185 — 592.5 0.0 / 175

602.1 T.S +9.5 / 395 — 597.1 +4.5 / 260 — 589.7 −2.5 / 245 — 589.7 −7.5 / 160 — 592.6 0.0 / 150 — 589.6 −3.0 / 175 — 588.6 −3.0 / 205 — 594.6 +2.0 / 245 — 602.6 +10.0 / 260 — 607.1 +14.5 / 300 — 609.1 T.S +15.5 / 590

587.2 −5.0 / 150 — 587.2 −5.0 / 210 — 594.2 +2.0 / 300 — 604.2 T.S +13.0 / 375

586.7 −7.5 / 100 — 586.7 −2.5 / 200 — 588.2 −1.0 / 280 — 595.2 +6.0 / 340 — 604.2 T.S +15.0 / 360

603.6 T.S 138 / 875 — 596.6 +6.8 / 770 — 598.1 +8.3 / 470 — 596.4 +5.6 / 300 — 594.8 +5.0 / 183 — 587.0 −3.8 / 115 — 584.8 −6.0 / 95 — 584.8 −5.0 / 182 — 586.8 −3.0 / 217 — 602.8 T.S +13.0 / 242

596.9 +13.0 / 995 — 591.9 +8.0 / 800 — 591.3 +7.4 / 495 — 591.3 +7.4 / 194 — 584.9 +1.0 / 107 — 592.9 −1.0 / 84 — 590.9 +7.0 / 172 — 605.9 T.S +22 / 180

Int. T.s at a Pause — 590.1 +8.0 / 25 — 582.1 00 / 38 — 582.1 0.0 / 134 — 584.1 T.S +2.0 / 150

589.5 +9.0 / 20 — 580.5 00 / 5 — 580.5 00 / 170 — 582.5 +2.0 / 160 — 602.5 T.S 22.0 / 175

180+00 — 601.9

177+00 Rt to Sta. River bank int. with toe of slope at Rt. of Sta 177 — 600.2

174+00 — 598.3

172+30 — 597.6

171 — 597.3

168 — 596.0

165+80 Taken at a Bisection — 595.4

165 — 594.9

164+50 Taken at a Bisection — 594.2

160+42.4 Levels taken on sec line — 593.2

615.9 T.S +14.0 245 | 606.4 +4.5 212 | 605.4 +4.0 167 | 602.9 +1.0 160 • 602.9 +1.0 60 | T.S +16.5 618.4 85

T.S. Top bank 607.8 +7.0 265 | 600.8 00 260 | 600.8 0.0 40 | T.S +15.4 616.2 also Top bank 65

598.3 T.S 00 255 | 598.3 00 17 | 602.0 +3.7 75 | 613.8 Top River bank +15.0 170

597.6 00 30 | 611.6 Top River bank +14.0 75

597.3 T.S. 00 300 | 597.3 00 15 | 602.8 +5.5 65 | 613.8 Top River bank 16.6 85

596.1 T.S 00 170 | 596.1 00 40 | 596.1 00 70 | 611.6 Top River bank +15.5 140

595.2 T.S 00 45 | 595.2 00 130 | 610.2 Top River bank +15.0 180 flat slope taint.

594.9 T.S. 00 45

594.2 T.S 00 43 | 594.2 0.0 100 | 610.2 Top River bank +16.0 210 flat slope taint

593.2 T.S 0.0 175 | 593.2 00 5 | 595.7 +2.5 75 | 604.2 +11.0 135 | 606.7 +13.5 435 | 605.7 +12.5 735 | 611.2 +18.0 1065

Station	Elevation	Left	Right
204+51.0	611.43	611.4 T.S 00/12	
204		611.4 T.S. 00/15	
202+30	609.82	609.8 T.S 00/100	
200+68	609.44	617.4 +8.0/65; 609.4 00/25	
198+56.0	609.00	609.0 T.S. 00/115	609.0 00/10; 622.0 +13.0/55; T.S 633.0 +24.0/285
196+44.2	608.62		608.6 00/10; T.S 623.6 +15.0/45
194+50	607.75	609.3 T.S +1.5/210; 609.3 +1.5/50	608.8 +1.0/75; 620.8 T.S. +13.0/90
192+60	605.91	610.9 T.S. +5.0/170; 611.9 +6.0/90; 605.9 00/40	605.9 T.S. 00/30
189	604.7	625.4 T.S +12.7/170; 612.7 +8.0/160; 604.7 00/60	604.7 T.S 00/45
186+60	604.15	618.1 +14.0/275; 611.1 +7.0/250; 604.1 0.0/30	T.S 604.1 0.0/33
183	602.7	615.7 T.S +13.0/240; 607.7 +5.0/225; 602.7 0.0/10	T.S 602.7 0.0/58

Station	Elev.	Left of center	Center	Right of center
228+52	621.88	626.4 T.S +4.5/250; 626.4 +4.5/215; 630.3 +8.5/75; 621.9 00/30	•	621.9 00/55; 633.9 +12.0/90; 625.9 +4.0/155; 625.9 T.S. +4.0/190
225+20	620.47	631.5 T.S +11.0/155; 627.5 +7.0/120; 629.5 +9.0/90; 620.5 00/45	•	620.5 00/17; 625.5 +5.0/55; 624.5 +4.0/90; 627.5 T.S +7.0/165
222	619.36	628.4 T.S +9.0/155; 626.4 +7.0/135; 631.4 +12.0/100; 619.4 00/35	•	619.4 00/20; 626.4 +7.0/40; 631.9 T.S +12.5/150
219	617.9	620.4 T.S +2.5/82; 617.9 00/20	•	617.9 00/25; 624.4 T.S +6.5/160
217+40	617.52	End Oct 11 - 1921; 631.5 T.S. +14.0/155; 620.0 +2.5/100; 617.5 00/30	•	617.5 0.0/10; 621.5 +4.0/25; 626.5 +9.0/80; 633.5 T.S +16.0/165
213	615.8		•	615.8 00/35; 628.8 T.S +13.0/80
211+60	615.32		•	615.3 00/38; 633.3 T.S +18.0/76
210	614.8	628.3 T.S +13.5/385; 622.8 +8.0/50; 614.8 00/5	•	614.8 00/45; 618.8 +4.0/65; 635.8 T.S +21.0/110
207+30	613.52	622.1 T.S +9.5/155; 621.6 +9.0/40; 612.6 00/10	•	612.6 00/5; 618.6 +6.0/25; 617.6 +5.0/70; 612.6 00/85; 612.6 00/120; 613.6 +1.0/150; 625.6 T.S +13.0/205
205+60	611.9	621.9 T.S +10.0/150; 618.9 +7.0/35; 611.9 00/15	•	611.9 00/10; 616.9 +5.0/205; 626.4 T.S +14.5/235

250+70

248

246

244+75

239+60

237+80

236+55

234+35

232+85

230+30

280

279

276+60

273

268+60

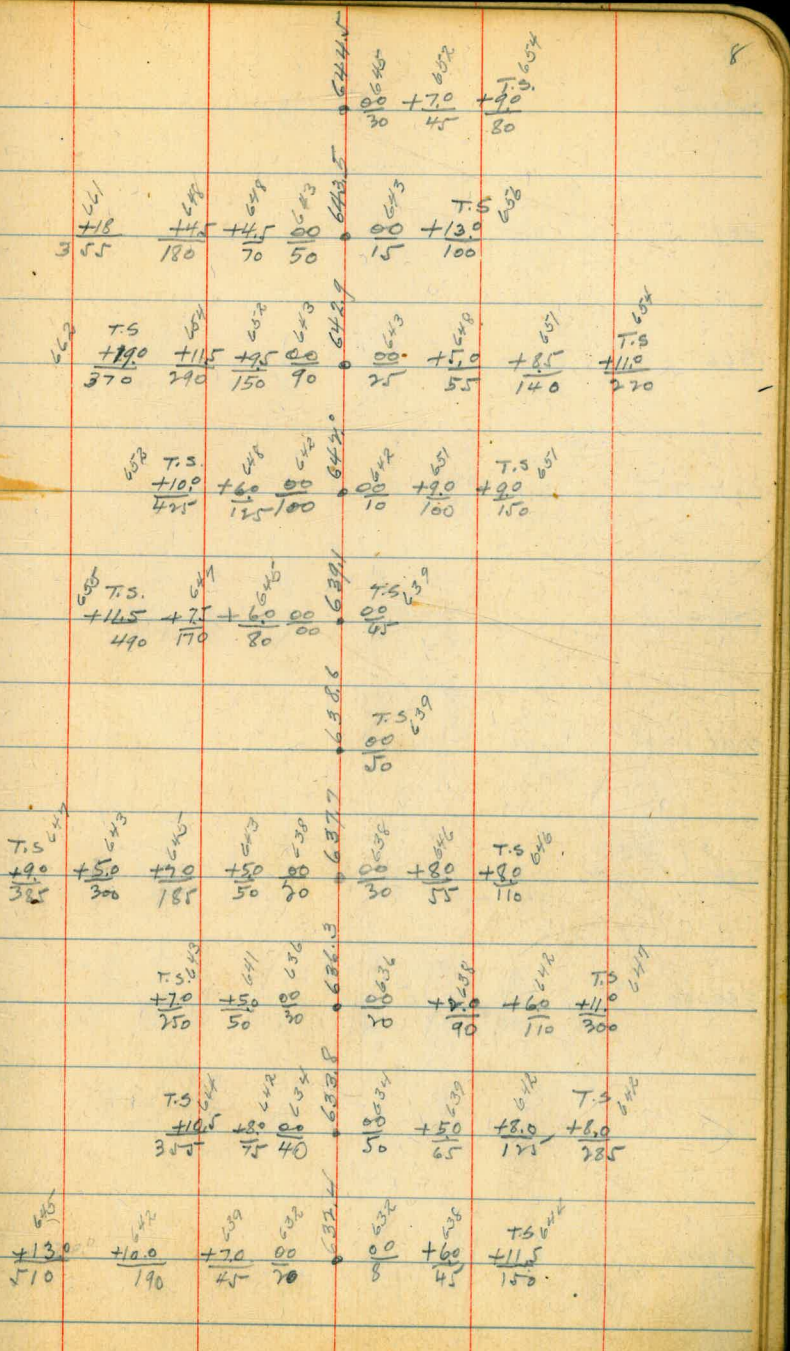
267

264

260+60

256+50

254+10



Station	Left	Centre	Right	
309+80	T.S 662 +8.0/70; 654 00/25	654.4		
309	T.S 664 +10/70; 654 00/30	654.1	654 00/30; 662 +8.0/85; T.S 662 +8.0/385	
306	T.S 667 +14.0/160; 662 +9.0/80; 653 00/65	653.0	653 00/55; 662 +9.0/75; T.S 668 +13.0/425	
302+05		651.5	652 00/78; 660 +8.0/88; T.S 671 +19.0/185	
298+40	T.S 662 +12.0/570; 660 +10.0/450; 657 +7.0/160; 650 00/145	650.2	650 00/35; T.S 661 +11.0/50	
296+30°		649.4	649 00/5; 657 +7.5/50; T.S 658 +9.0/100	
294	T.S 659 +11.0/570; 659 +11.0/285; 653 +4.5/30; 649 00/20	648.7	649 00/25; 654 +5.0/50; 659 +10/110; T.S 659 +10.5/200	
289+50	End Cut 1? T.S 656 +9.0/330; 658 +11.0/135; 655 +8.0/80; 651 +4.0/10; 647 .8/5.	647.0	647 00/65; 650 +2.5/80; 653 +5.5/300; T.S 655 +7.5/400	✓
285	649 T.S +5.0/400; 649 +5.0/300; 645 00/25	645.5	645 00/25; 649 +3.5/75; T.S 653 +8.0/215	
282+80		644.8	645 00/25; 653 +8.0/60; T.S 656 +11.0/90	

339+46

333

330

325+85

324

321

318

316+80

315

312

678 T.S +13.0 80 | 665 00 15 | 665.0 | 665 00 150 | 677 +9.0 205 | 678 T.S +7.0 500

673 T.S +11.0 180 | 672 +9.5 105 | 668 00 70 | 667.1 | 668 00 35 | 672 +10.0 120 | 674 +12.0 420 | 676 T.S +14.0 580

672 T.S +10 190 | 671 +9.0 70 | 668 00 40 | 666 | 668 00 50 | 672 +10.0 75 | 674 +12 375 | 679 T.S +17 675

670 T.S. +10 135 | 670 +10 30 | 660 00 10 | 659.8 | 662 +2.0 135 | 670 T+f Riverbank +10.0 185

671 T.S +12.0 145 | 669 +10.0 40 | 659 00 20 | 659.2 | 661 +1.5 115 | 669 +9.5 160 | 669 +10.0 460 | 673 +14.0 790

669 T.S +8.0 120 | 666 +8.0 45 | 658 00 20 | 658.1 | 660 +2.0 100 | 668 +10 130 | 669 +11.0 430 | 678 T.S +14.0 780

658 T.S 00 30 | 657.8 | 658 00 65

657 T.S. 00 15 | 657.3 | 659 00 75 | 674 +7.0 90 | 677 T.S +9.0 560

656 T.S 00 35 | 656.1 | 656 00 35

670 T.S +14.5 110 | 655 00 50 | 655.0 | 655 00 5 | 661 +6.8 85 | 673 +8.0 130 | 665 T.S +10.0 350

366+55

363+55.0

361+15

358+95 Taken at Δ Bisection

354

351+75

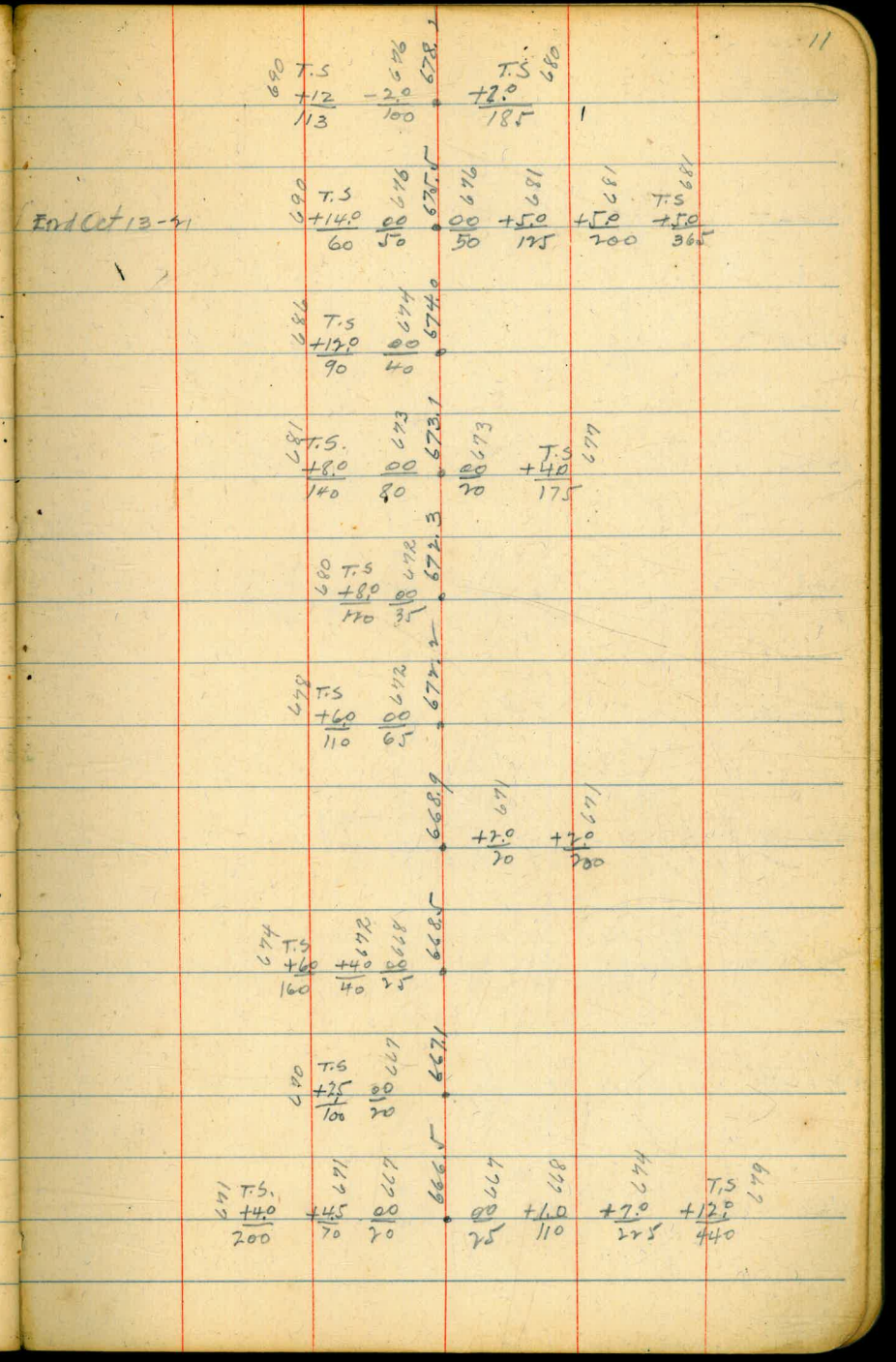
350+55 Taken at Rt ℄s to F.S

348+95 Taken at Rt ℄s to B.S.

345+40

343+30

End Cut 13-41



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Station	Left	Centre	Right
386+35	701 T.S +14.0/480; 696 +9.0/180	687.1	687 00/20; 692 +5.0/40; 696 +9.0/100; 695 +8.0/200; 689 +2.0/275; T.S +2.0/295 689
384+55	This Lt x section arrives at same point as sta. 383+05	686.0	686 00/40; 693 +7.0/85; T.S +4.0/245 690
383+05.0	698 T.S. +14.0/500; 693 +9.0/200; 693 +9.0/125; 693 +9.0/60; 689 +5.0/40; 684 00/25	683.7	684 00/10; 688 +4.0/20; 689 +5.0/100; T.S +3.0/165 686
381	698 T.S +16.0/400; 691 +9.0/100; 682 00/40	682.3	T.S 00/30 682
378	699 T.S +18.0/300; 691 +10./120; 683 +2.0/20	681.1	683 +2.0/10; T.S +3.0/85 684
376+50	683 T.S. +3.0/60; 682 +2.0/20	680.4	
374+30	684 T.S +4.0/145; 681 +1.0/50	679.9	680 00/25; 685 +5.0/40; 685 +5.0/140; 680 +5.0/175
374+00 (one station above Indian school)	682 T.S. +3.0/85; 682 +3.0/50; 679 00/15	679.0	679 00/15; 684 +5.0/35; 684 +5.0/100; 682 +3.0/110; T.S +3.0/240 682
370+45.0	681 T.S +3.0/50; 678 00/20	678.4	678 00/20; T.S +3.0/220 681
369	678 T.S 00/20	677.7	678 00/25; T.S +3.0/215 681

Station	Left	Center	Right
408+90		694.7	695 00/15; 707 +12.0/55
408	697 T.S +3.0/125	694.0	694 00/10; 707 T.S +13.0/75
405	697 T.S +4.0/145; 697 +4.0/15	693.7	693 00/15; 695 +2.0/60; 703 T.S +10/90
403+40	697 T.S. +4.0/130; 698 +5.0/25; 693 00/5	692.7	693 00/15; 696 +3.0/40; 696 +3.0/155; 702 T.S +9.0/170 ×
401+63.0	Sta 211 160 Contour ←— 46.8; 693 T.S +1.0/50	692.7	692 00/15; 695 +3.0/50; 698 +6.0/150; 695 +3.0/180; 696 +4.0/370; 704 T.S +12.0/380
399	703 T.S 12.0/35; 691 00/20	691.0	
396+60.0	703 T.S +12.5/35; 690 00/15	690.3	690 00/15; 692 +2.0/50; 698 +8.0/90; 700 +10.0/339; 695 +5.0/350; 695 +5.0/550; 700 +10/560
396	705 T.S +15.0/45; 690 00/25	689.9	×
394	700 T.S +10.0/95; 690 00/45	689.8	
393	707 T.S. +17.0/80; 690 +1.0/55	689.4	689 00/30; 691 +2.0/55; 697 +7.5/70; 699 +10.0/190; 699 +10.0/325; 694 +5.0/335; 694 +5.0/535; 705 T.S +15.0/560

416+80

414

411+50

235 — 713.2 — $\frac{-5.0}{20}$ 708

234 — 713.2 — $\frac{-5.0}{15.0}$ 708

233 — 713.2 — $\frac{-5.0}{10}$ 708

232 — 713.2 — B.B. $\frac{-6.0}{14}$ 707

230 — 713.2 — B.B. $\frac{-10.0}{16}$ 703

229 — 713.2 — $\frac{-8.0}{14}$ 705

227 → 713.2 — B.B. $\frac{-12.0}{23}$ 701

Elev 713.2 = 160 Contour

698.1 — 699 T.S. $\frac{+1.0}{100}$

Starr's 160 Contour → • ← 76.0 — 698 $\frac{+1.0}{53}$ → 697.2 — 697 $\frac{00}{30}$ — 707 T.S. $\frac{+11.0}{90}$

696.3 — 696 T.S. $\frac{00}{60}$ — 696 $\frac{00}{40}$ — 708 T.S. $\frac{+12.0}{80}$

4+50 +71.0 Int. 160' Contour 713.2

4+50+00

44+56.5 ℄ Survey
19+80.8 =

17+70 P.O.T.

12+18 P.O.T.

9+18.0 Δ

8+48 P.O.T.

5+48.0 Δ

3+51. Δ

234	713.2	-7.0 / 40	706
238	713.2	00	713
237	713.2	-3.0 / 15	710
236.	713.2	-4.0 / 20	709

25 — 713.2 — 25

117 — 711.6

90.0 — 711.0

108.0 — 710.8

31.0 — 708.8

Perfunctory River mark

41.0 — 708.8

River mark — 26.0 — 707.2

66.6 — 706.5 — 3+51.0 Aux Line

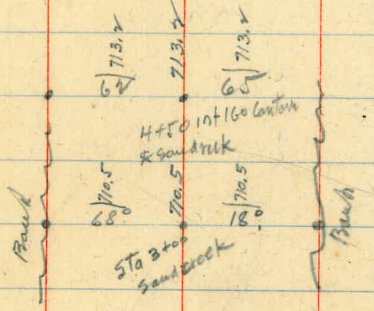
Contour Sta 239+

N 38°17' W

24W	713.2	-4.0 / 8.0	719	
24C	713.2	B.P.o. -3.5 / 7.0	109.8	
(160 contour 243.	713.2	Bottom bench -2.5 / 7.0	710.7	
436+20				
438+00				
440+17.4				
442+41.8				
444+11.3				
446+25.9				
447+56.5	"Note" facing South			

	75.0	709.3	
	30.0	709.4	
	20.0	709.8	
	20.0	711.1	
	30.0	712.3	
	30.0	711.5	
River bench	30.0	711.7	112.0 River bank

256	7/13	-17.0 / 185	701
255	7/13	-11.0 / 90	702
254	7/13	-10. / 75	703
252	7/13	-10.0 / 105	703
251	7/13	Bottom Bank -13.0 / 135	700 Sta 251 is on S bank of Sand Creek
250	7/13	-6.0 / 40	707 Sta 250 is on N bank Sand Creek
249	7/13	-11.0 / 40.	702
248	7/13	-11. / 120	702
247	7/13	-7.0 / 15	706
246	7/13	-8.5 / 15.0	704.7



259 • $\frac{-7.0}{300}$

257 • $\frac{-15}{215}$

Sept 8. 1923 Williams 19

Traverse of Sec 8 T15S R2E S.B.M.

		N	S	E	W
N0°38'W	2598.4	2598.2			28.7
N88°21'E	5240.4	150.9		5238.2	
S0°20'W	2718.9		2718.8		15.8
S89°40'W	5193.8		30.3		5193.7
		2749.1	2749.1	5238.2	5238.2

		N	S	E	W
N88°21'E	2620.2	75.45		2619.1	
S0°20'W	5437.7		5437.6		31.6
N89°44'W	2863.5	13.33			2863.5
N2°57'E	5355.9	5348.8		276.0	
		5437.6	5437.6	2895.1	2895.1

		N	S	E	W
N0°38'W	1299.2	1299.10			14.36
N88°21'E	2620.2	75.45		2619.1	
S2°57'W	1331.35		1329.6		68.52
S88°59'W	2536.6		44.95		2536.22
		1374.55	1374.55	2619.1	2619.1

2598.4 | 3.4147060
9.9999735
3.4146795 2598.2
8.0435274
11.4582069 28.72

5240.4 | 3.7193644
8.4593013
12.1786657 150.89
1.5405186
3.7191843 5238.2

2718.9 | 3.4343932
9.9999927
3.4343859 2718.8
7.7647610
Closing Course 11.1991469 15.818 E & W E Sec 8.

2863.5 = 3.4568972
7.6678445
11.1247417 13.327
1.3321508
3.4568925 2863.5

Closing Course N & S E Sec 8

		N	S	E	W
N0°38'W	2598.4	2598.2			28.72
N88°21'E	2620.2	75.45		2619.1	
S44°05'40"W	3716.1		2673.65		2590.38
		2673.65		2619.1	

closing Course S line of N1/2 of NW1/4 Sec 8. T15S R2E

see Page 25

Oct 18 - 1921 Williams
Hodgert
Harper

Cross Sections on South Fork from ℄ San Diego River at Sta 200+68.0

Station	Left	℄	Right
10+60	(629) T.S +3.0/100; (624) −2.0/65; (628) +2.0/30	626.3	(630) +3.5/50
9+40	(632) T.S +9.0/25	623.2	?.W.H.
7+67.0	(635) T.S +13.0/45; (625) +3.0/20	621.9	(630) +8.0/100; (630) +8.0/130; (625) +3.0/150; (630) T.S +8.0/185
6+5?	(630) T.S +17.0/85; (628) +9.0/70	618.7	(629) +10.0/65; (629) +10/95; (624) +5.0/155; (629) T.S +10/175
5+30	(623) T.S +6.0/35; (617) 00/10	617.3	(617) 00/15; (621) +4.0/40; (627) T.S +10.0/140
4+00	(622) T.S +8.0/35; (616) +2.0/15	613.5	(614) 00/5; (619) +5.0/60; (628) T.S +14.0/80
2+80	(623) T.S +10.0/45; (613) 00/10	613.0	(613) 00/20; (626) T.S +13.0/55
2+00	(620) T.S +11.0/50; (609) 00/20	609.4	(609) 00/20; (616) +7.0/70; (623) T.S +14.0/80

0+00
200+68.0 ℄ San Diego River =

Began 8.00 A.M Oct 18. 1921

20

19+70

18+58

18

16+80

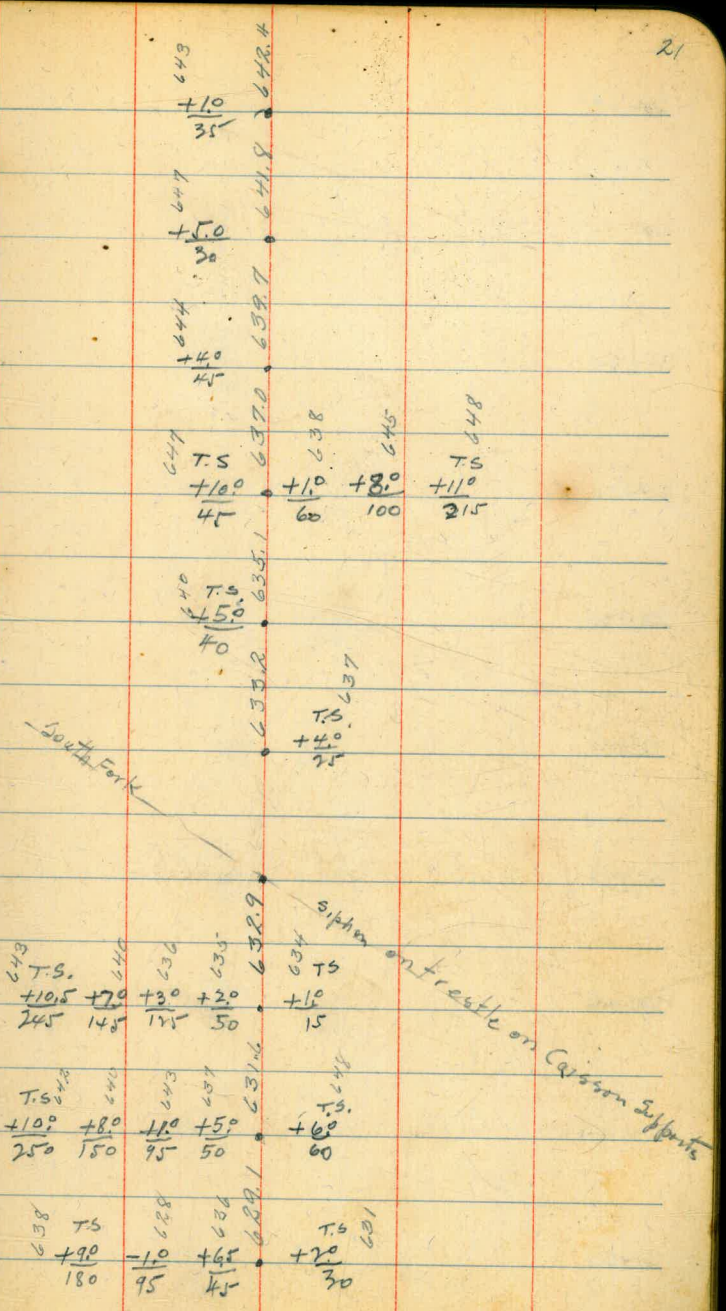
15+50

14+78 Cross South Fork (Fletcher Syphon)

14+00

13+25.94 Taken on line of Intersection

11+80



29+79.0

29

28+30

27+50

26+80

25+43

24+50

23+55

22+30

21+20

663 T.S +3.0 35 — 660.1

662 T.S +3.0 65 — 658.8 — 665 +7.0 70 — 664 +7.0 95 — 661 +2.0 150

658 T.S 00 30 — 658.3

635 T.S. +8.0 70 — 646.5 — T.S 634 +6.0 75

657 T.S +10.0 80 — 646.7 — T.S 658 +11.0 50

649 T.S +4.0 70 — 645.8 — T.S. 00 00

649 T.S. +4.0 35 — 645.4 — T.S. 649 +2.0 50

T.S. 00 00 — 643.8 — T.S. 649 +6.0 85 ✓ ✓

646 T.S. +4.0 30 — 642.5 — T.S. 646 +3.0 70

646 T.S. +3.0 30 — 642.8 — 646 +2.0 75 — 658 T.S +15.0 145

42+65.°

41+75.°

41+00 Cross line of foundations of old flume trestle

40+67

39+44

38+86.°

37+34.°

36+19.°

35+04

32+96.°

32+39.°

698 T.S. +60 35 — 686.7 — T.S. +40 55 698

692 T.S +80. 70 — 684.0 — T.S. +5.0 45 689

683 T.S +3.0 25 — 679.9 — T.S. +4.0 40 684

00 00 — 676.6

675 T.S. 00 15 — 675.4 — T.S. +9.0 100 694

678.4 — 00 00 — +5.0 60 — 677 — T.S. +6.0 120 678

681 T.S +3.0 45 — 677.8 — T.S. 00 15 — 676

672 T.S +7.0 85 — 669.3 — T.S. 00 00

669 T.S +6.0 75 — 663.3 — T.S. +9.0 45 672

666 T.S +3.0 60 — 663.3 — +2.0 35 — T.S +8.0 60 669

48+71.0

Last Station Int. 160 Contour

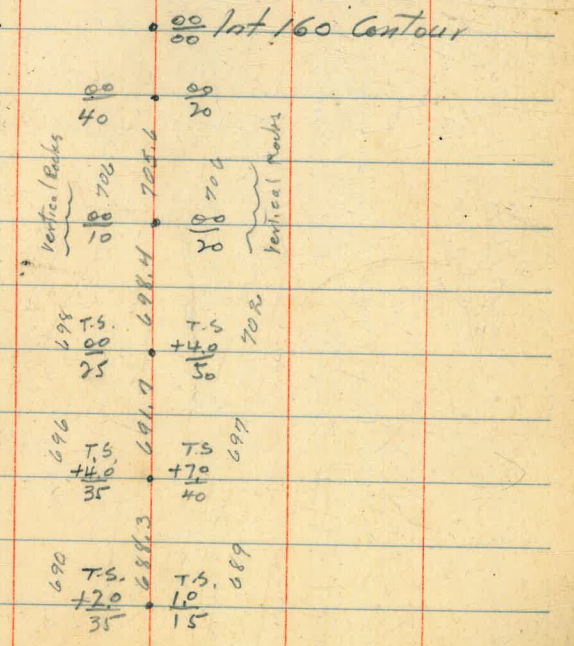
47+16

46+07

44+95.0

43+35.0

Finished
11.57 A.M Oct 12-1931



X Sections on Chocolate

Traverse of Sec 8 T. 15 S R. 2 E SBM.

		N	S	E	W
N0°38'W	298.35	298.33			3.3
S61°55'E	18.31		8.67	16.15	
S71°38'E	132.6		41.78	125.84	
S66°21'E	147.6		59.21	135.20	
S75°45'E	111.3		27.40	107.88	
N88°44'E	130.4	2.88		130.37	
S38°41'E	84.0		67.57	50.30	
S80°15'W	570.68		96.68		562.44
		301.21	301.31	565.74	

Traverse of Sec 7, T 15 S. R. 2 E. S 13 B.M.

		N	S	E	W	
N 69°22 E	112.5	39.64		105.28		
N 21°28 E	148.8	138.48		54.46		
N 47°01 E	138.4	94.36		101.25		
N 25°45 E	126.7	31.19		122.80		
S 88°55 E	194.6		3.68	194.57		
N 88°34 E	96.3	2.46		96.27		
S 59°19 E	109.9		56.08	94.51		
S 61°55 E	139.17		65.57	122.78		
S 0°38 E	298.35		298.33	3.30		
N 82°31'20" W	907.90	117.48			895.27	Closing Course
		473.61	423.61	895.27		

A.W. Daniels
Thompson
Mc Cormick

11/29/24

+	H.I.	−	Elev
0.27	369.981		369.711
0.68	361.171	9.490	360.491
		11.17	350.00
1.63	371.341		369.711
0.30	360.801	10.840	360.501
		10.800	350.001
5.34	375.051		369.711
3.70	373.70	5.05	370.00
7.93	373.557		365.627

County B.M. # 11.

T.P.

365.627
5.75

County B.M. # 11

373.70
7.95
365.75

Check

365.627
7.50
77

Contour

County B.M.

AWD 11/22/23

Levels across River from County B.M. # 16

+	H.I.	−	Elev
~~7.95~~	~~373.577~~		~~365.627~~
~~5.165~~	~~367.812~~	~~10.930~~	~~362.647~~
~~6.357~~	~~374.169~~	~~5.165~~ ~~10.660~~	~~367.812~~
10.660	384.829	6.357	374.169

7.95	373.577		365.627
5.165	367.812	10.930	362.647
10.660	384.829	6.357	374.169
3.33	387.679	5.53	379.299
7.95	373.577		365.627

~~County B.M. # 16~~

~~T.P.~~

T.P

T.P.

County B.M. # 16

T.P.

T.P

T.P.

11/23/23

370' Contour AWD

+	H.I.	−	Elev.
7.95	373.577		365.627
6.165	367.812	10.930	362.647
10.660	372.115	6.357	361.455
3.330	369.915	5.530	366.585
7.49	374.405	3.000	366.915
7.82	377.82	4.405	370.000
7.74	377.74	7.82	370.00
9.41	379.41	7.74	370.00
2.33	372.33	9.41	370.00
6.25	376.25	2.33	370.00
4.63	374.63	6.25	370.00
1.53	371.53	4.63	370.00
11.04	381.04	1.53	370.00
5.58	375.58	11.04	370.00
9.66	379.66	5.58	370.00
0.72	370.72	9.66	370.00
0.73	359.08	12.37	358.35
		9.16	349.92

350' Contour (error 0.08)

+	H.I.	−	Elev
370 Contour			
4.24	373.951		369.711
6.69	376.69	3.951	370.00
6.93	376.93	6.69	370.00
6.26	376.26	5.93	370.00
6.26	376.26	6.26	370.00
1.29	371.29	6.26	370.00
3.24	373.24	1.29	370.00
6.22	376.22	3.24	370.00
5.51	375.51	6.22	370.00
3.10	373.10	5.51	370.00
4.39	374.39	3.10	370.00
1.86	363.47	12.78	361.61
		4.75	358.72
1.81	359.49	5.79	357.68
		7.30	352.19
3.30	353.30	9.49	350.00
7.06	357.06	3.30	350.00
9.04	359.04	7.06	350.00
4.25	354.25	9.04	350.00

Contour set from B.M.

T.P.

360' Contour (Stadia Elev. Error 1.28)

T.P.

350 Contour (error 2.19)

+	HI	−	Elev.
	354.25		
8.33	358.33	4.25	350.00
10.79	360.79	8.33	350.00
5.31	355.31	10.79	350.00
6.02	356.02	5.31	350.00
		6.24	

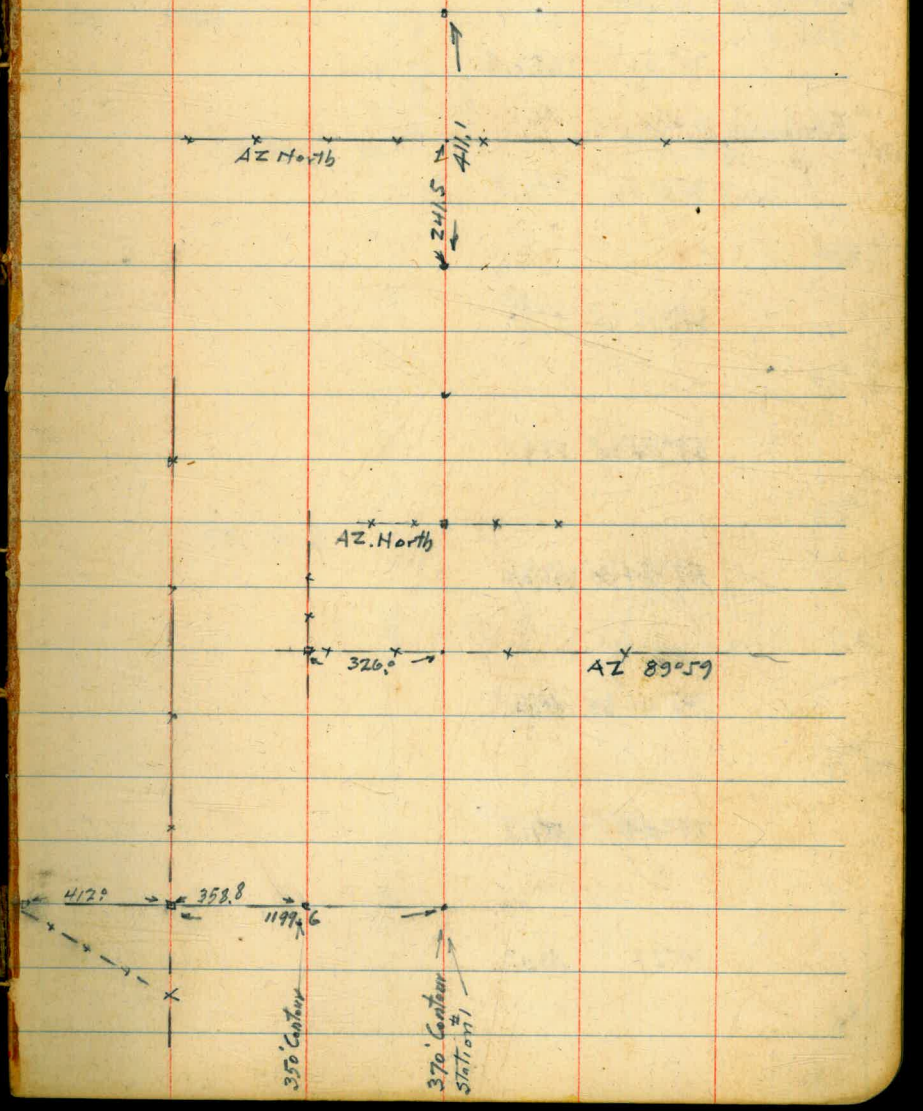
Daniels - Transit Thompson McCormack chain

Nov. 26-1923 Williamson Chief of Party

30

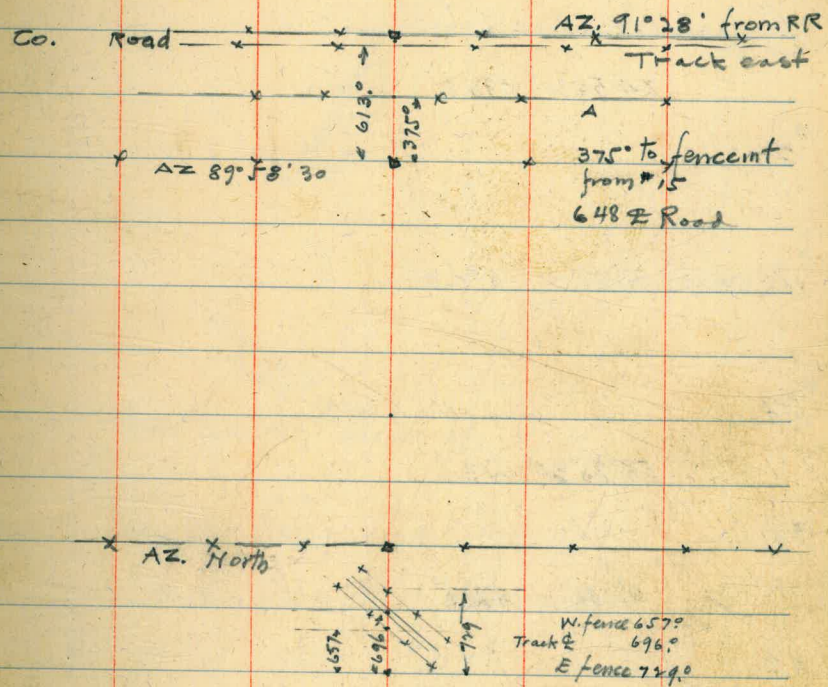
Traverse 370 Contour

Sta	Az	Dist
#8		
#7 omitted (course from #6 to #8)	45°51'30	411.'
#6	139°38'	795.7
#5	140°54'	796.'
#4	131°23'30"	433.4
#3	122°00	688.7
#2	135°30	595.°
#1	This fence runs North across river AZ North	



Nov. 26 - 1923 Traverse of 370 Contour

Sta	Az.	Dist
#17		
	351°22'30"	638.4
#16		
	30°31'	687.8
#15		
	350°56	496.3
#14		
	346°12'30"	628.0
#13		
	59°54'30"	379.0
#12		
	57°54'30"	1162.9
#11		
	345°01'30"	483.8
#10		
	35°09	581.9
#9		
	19°27	410.0
#8		

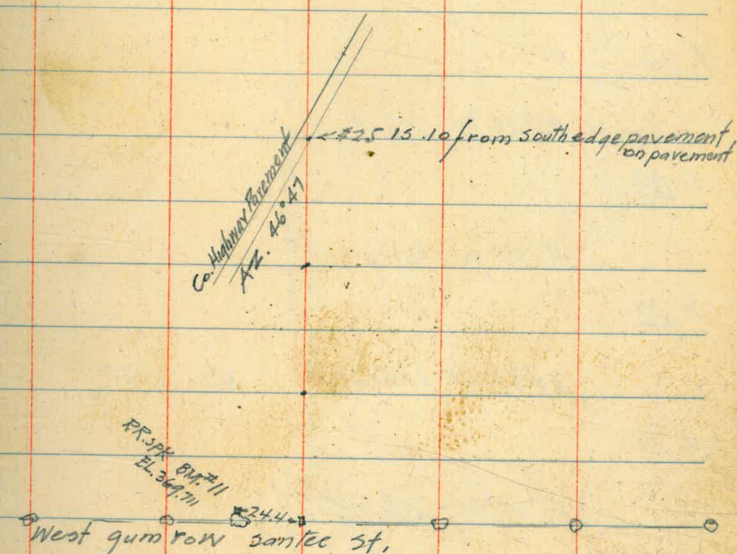


Nov. 26 - 1923 Traverse of 370 Contour

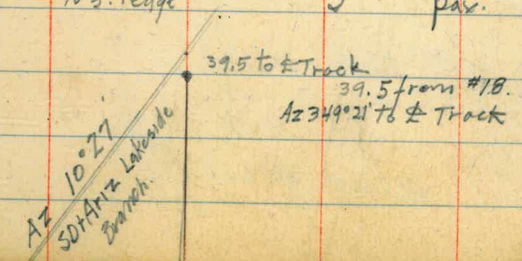
Sta	Az.	Dist
#25		
	24°54'30"	490.8
#24		
#23 omitted	56°32'	692.2
#22		
	58°25'30"	613.8
#21		
	41°46'	481.5
#20		
	28°56'	199.0
#19		
	9°18	399.6
#18		
	349°21'	507.8
#17		

47.6 back EC. 10.25 over ℄ Tr.

788
236
1024

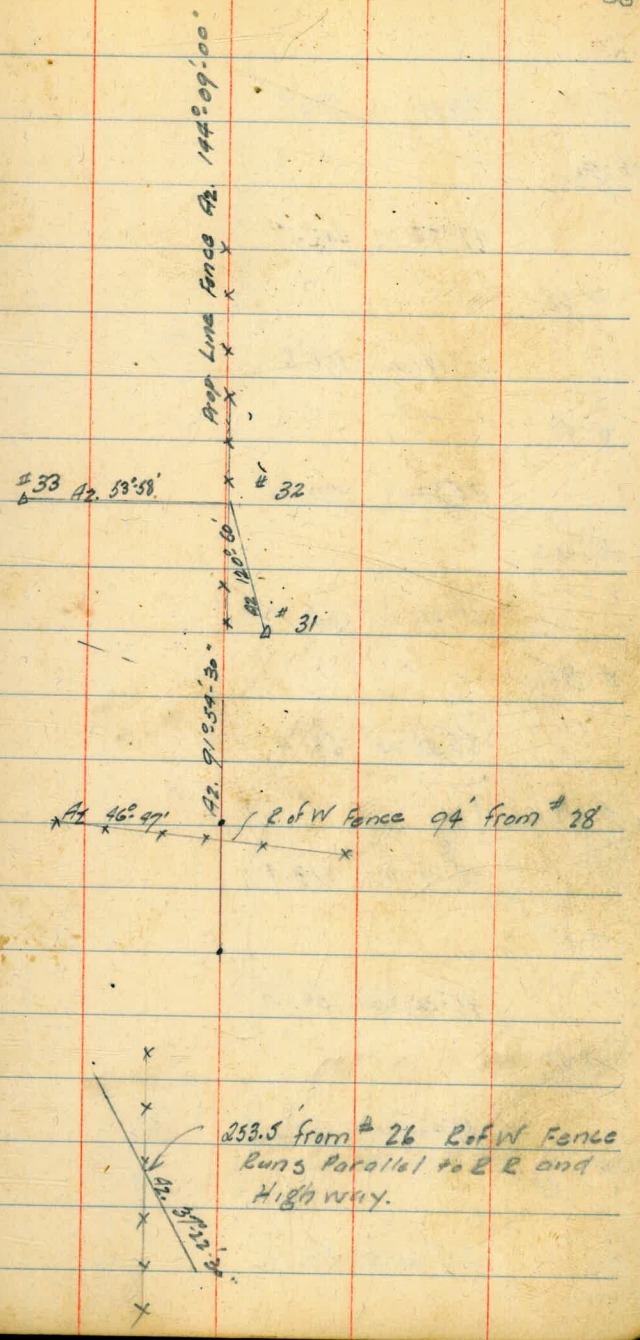


	azm	Dist	
Set up on #22	352°20	96.15	P.I. Highway
	345°50	152.5	℄ Track on ℄ St
	89° 13	455.0	#23
	56° 32	19.5	to W. edge pavement
Set up W. edge p.	155°10'30	76.8	azm of W. edge pav.
" " S edge	47° 09 00	To S. edge	" " S " pav.



Nov 27–1933 Traverse of 370' Contour

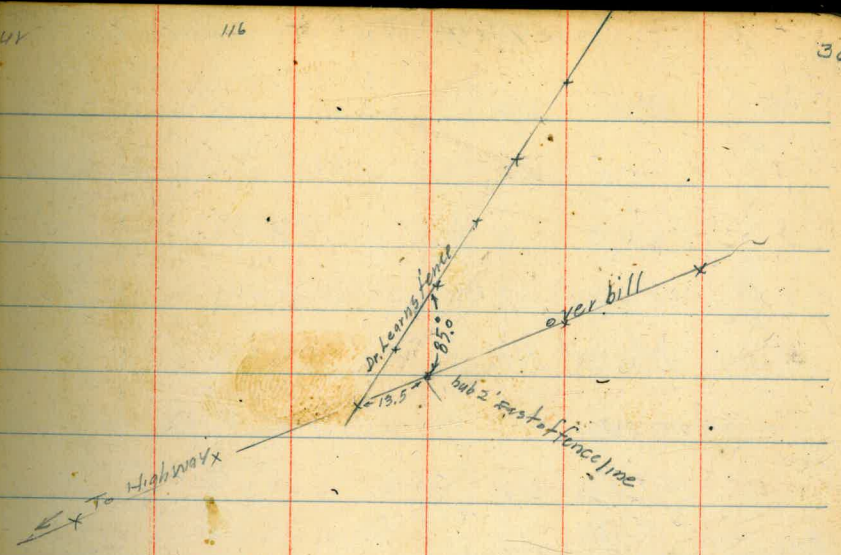
Sta.	Azm	Dist.
# 34		
	43°-27'-30"	802.6
# 33		
	53°-58'-00"	461.6
# 32		
	120°-50'-00"	282.2
# 31		
	46°-48'-00"	218.0
# 30		
	31°-59'-00"	291.9
# 29		
	91°-54'-30"	209.5
# 28		
	47°-22'-30"	444.7
# 27		
	37°-22'-30"	302.5
# 26		
	46°-47'	946.5

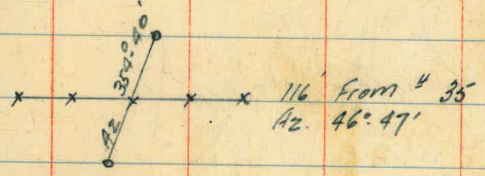


Nov. 27 - 1923 Traverse of 370' Contour

116

Sta	Azm.	Dist.
#43		
	47°55	415.5
#42		
	62°38'30"	155.8
#41		
	55°30'	324.4
#40		
Div. Yd	47°59'30"	340.9
#39		
	83°28'00"	158.4
#38		
	63°59'00"	143.1
#37		
	95°55'30"	156.0
#36		
	354°40'00"	121.9
#35		
	319°36'00"	196.6





Traverse of 370' Contour

Sta	Azm	Dist.
#2		
	181°01'30"	253.6
#1 on north side River		
#50=	251°21'30"	1661.4
#49		
	302°55'30"	1000.° ~~800.0~~
#48 Last point on south side of River		
	47°42'30"	653.°
#47		
	23°53	342.1 ✓
#46		
	17°40'	506.0
#45		
	36°16'30"	334.9
#44		
	53°46'	439.8
#43		

371
744
927

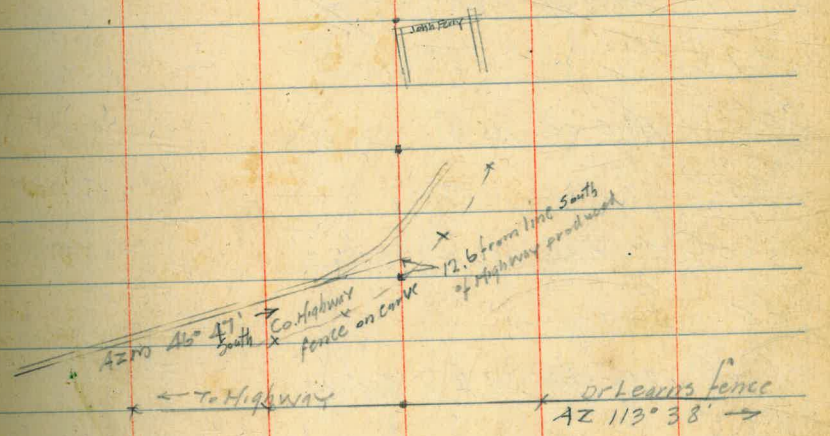
0°08 + 0°09'

64.1 from S.S. Pavement to ℄ Track at P.C. = 37
Width of Pavement 18.°
55.1 ℄ Pav. to ℄ R.R. Track

Stadia Ties

Setup on #46	Az to #47	23°53	
"	" E.C. R.R	322°52'	91 feet
"	" Hale Pt.	234°28'	469.°
"	" P.C. R.R.	233°58'	554.°
Setup on 47	Az to S.P	47°15'	293.°
"	" to E.C.	47°28'	309.°
"	℄ Track	130°00	13.5
"	℄ S.S. Pav	130°00	88.°

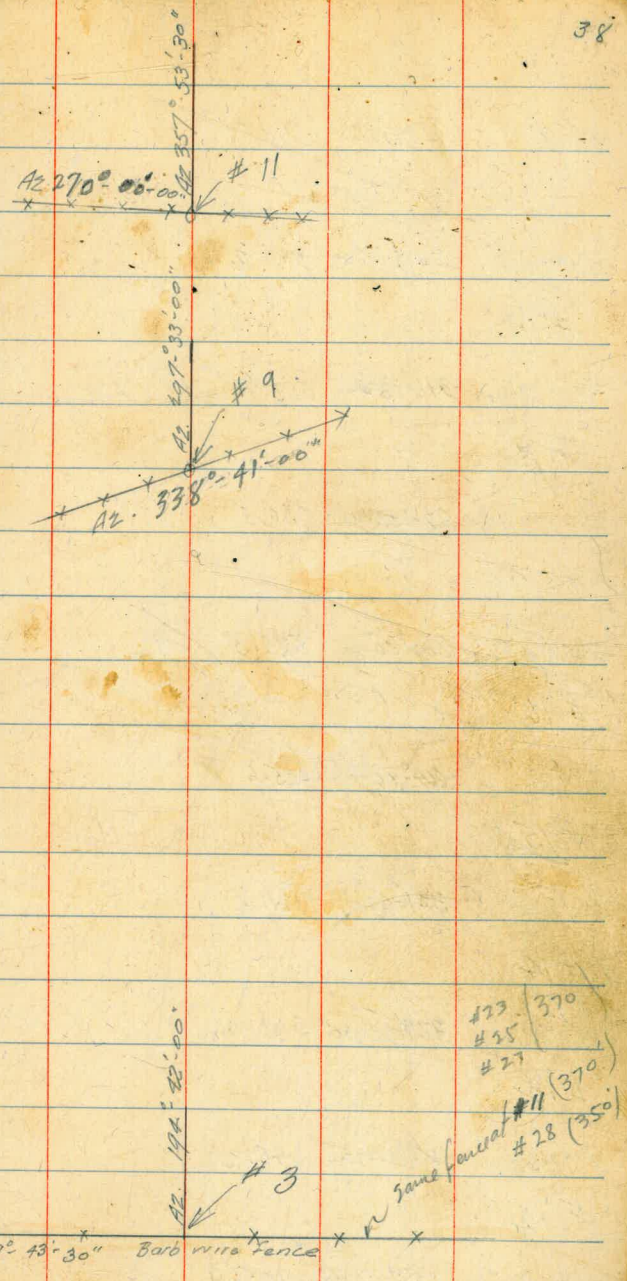
Point in river not on 370 Contour



11/30/23 Traverse of 370 Contour

Sta.	Azm	Dist	
#11			
	~~315°-04'-00"~~	557.7	317°-16'-00"
#10			
	~~297°-33'-00"~~	584.6	299°-43'-30"
#9			
	~~282°-39'-00"~~	344.9	299°-51'-00
#8			
	~~250°-41'-30"~~	448.0	250°-46'-30"
#7			
	~~227°-51'-00"~~	135.9	224°-55'-00"
#6			
	~~222°-46'-00"~~	186.4	219°-20'-00"
#5			
	~~208°-51'-30"~~	218.9	205°-55'-30"
#4			
	194°-42'-00	103.9	194°-46'-30"
#3			
	191°-20'-30	221.3	

315°-04'
317°-16'
2.48

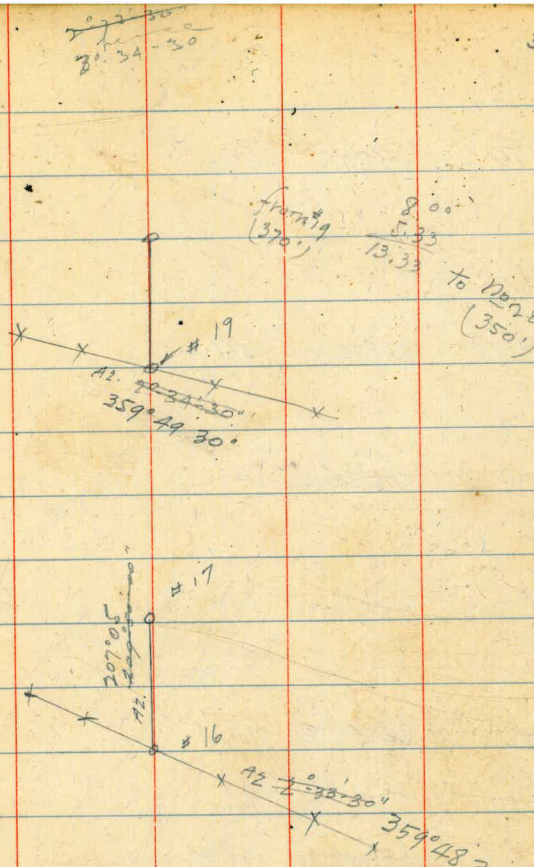


#23 #25 #27 (370)
#11 (370)
#28 (350)

Traverse of 370' Contour

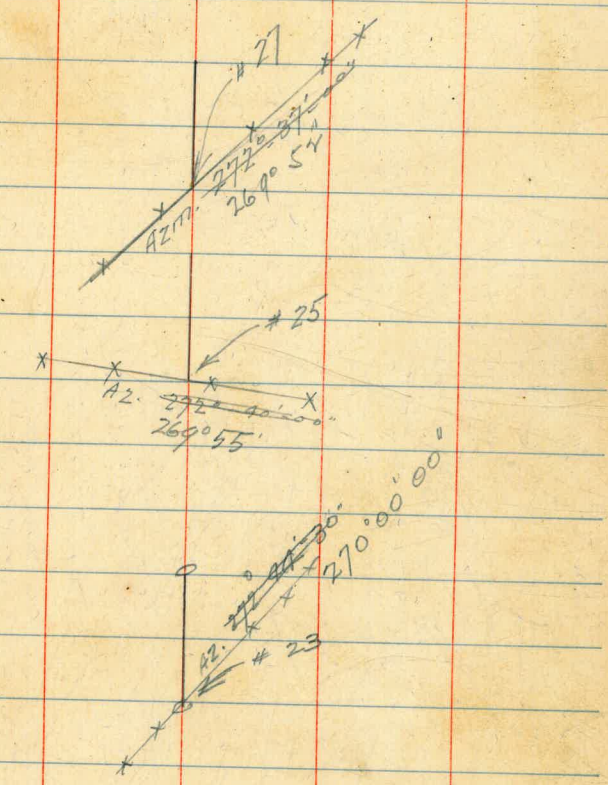
Sta.	Azm	Dist.	
225°20'	~~228°05'00"~~	903.2	
#19			
313°18'30	~~316°03'30"~~	563.9	
#18			
258°07'30"	~~260°52'30"~~	730.5	
#17			
207°05	~~209°50'00"~~	525.5	✓
#16			
261°21	~~264°06'00"~~	405.6	✓
#15			
319°14'	~~321°59'00"~~	361.2	
#14			
324°40'30"	~~327°25'30"~~	361.2	✓
#13			
274°29'30"	~~277°14'30"~~	645.2	✓
#12			
355°08'30"	~~357°53'30"~~	775.9	✓

316°03'30"
2°48'00
313 15 30



12/1/23 Traverse of 370 Contour

Sta.	Azm.	Dist
28		
216°18	~~219°03'00"~~	451.4
27		
223°35	~~226°20'00"~~	848.6
26		
342°03'	~~344°48'00"~~	644.6
25		
332°52'30"	~~335°37'30"~~	327.8
24		
240°12'	~~242°57'00"~~	588.7
23		
194°12'30"	~~196°57'30"~~	599.2
22		
21-A	~~132°01'30"~~ 229°16'30"	1013.9
21		
320°48'30"	~~323°33'30"~~	777.7
20		



West side Gum Grove.

21-A (Not a contour point) (P.O.T.)

21 In Gum Grove

East side Gum Grove

Traverse of 370 Contour

180°00' 2°-45-00"

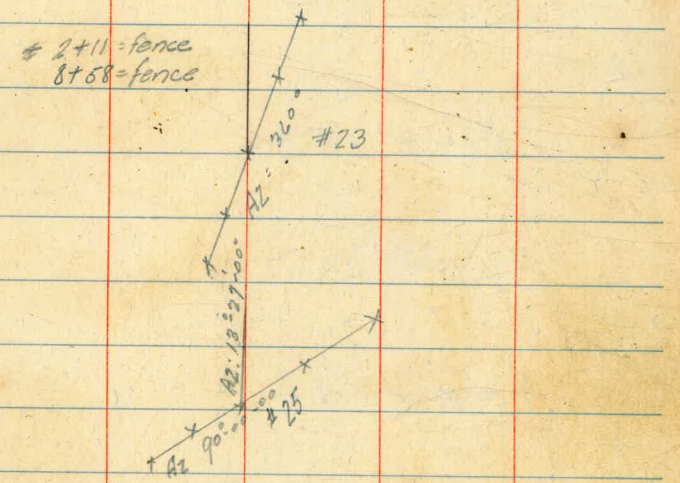
29

285°54' ~~288°39'00"~~ 149.7'

12/3/23 Traverse 350' Contour
Daniels - Transit
Thompson
McCormick 3 chain

Sta.	Azm	Dist.	
20			
	86°-36'-00"	525.0	✓
21			
	59°-29'-00"	375.7	✓
22			
	347°-36'-00"	881.2	✓
23			
	51°-22'-30"	554.5	✓
24			
	13°-27'-00"	776.1	✓
25			
	18°-45'-30"	427.0	✓
26			
	353°-59'-30"	341.9	✓
# 27			
	138°-31'-00"	516.6	✓
# 28			

21 in Peach Orchard.

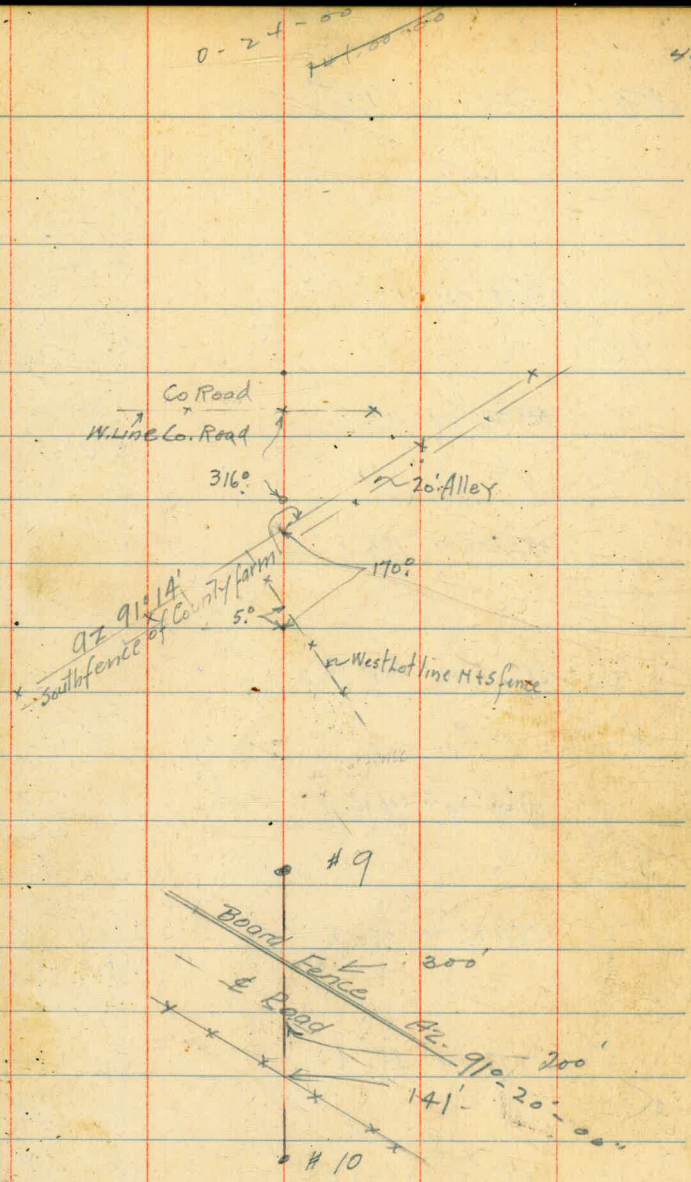


12/3/23

Sta	Azm.	Dist	
11			
	323°38'-00	356.9	
12			
	289°34'-30"	507.9	
13			
	41°16'00"	223.0	
14			
	5°-00-30"	197.4	
15			
	75°45'00"	674.5	
16			
	14°43'-00"	362.4	√
17			
	144°52'00"	395.7	√
18			
	189°23'00"	514.5	√
19			
	78°43'30"	609.0	√

12/3/23

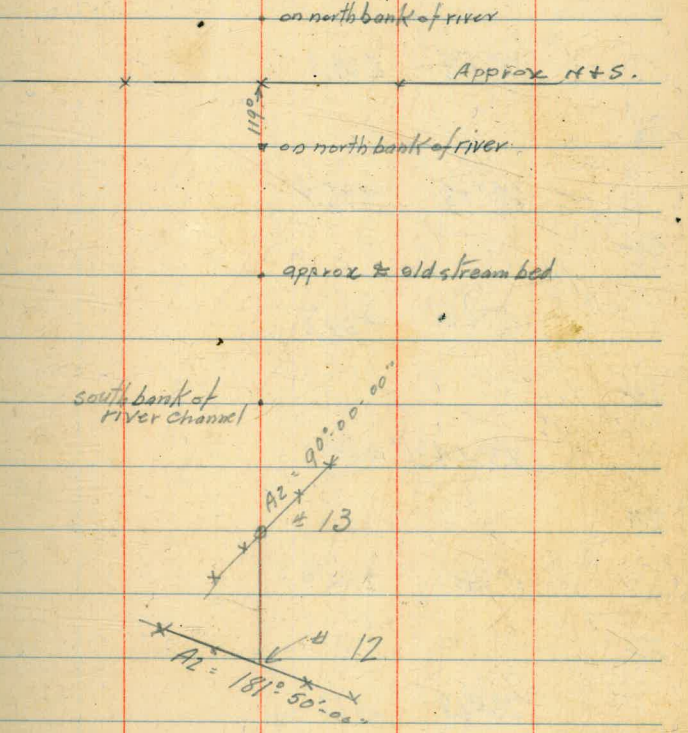
Sta.	Azm	Dist.
1		
2+3 omitted		
	72°24	373.5
4		
	63°55'30"	361.2
5		
	66°57	555.1
6		
	130°-00'-00"	358.5
7		
	65°-14'-00"	430.8
8		
	18°-20'-30"	303.6
9		
	296°-57'-00"	433.1
10		
	55°-32'-00"	590.4



12/4/23

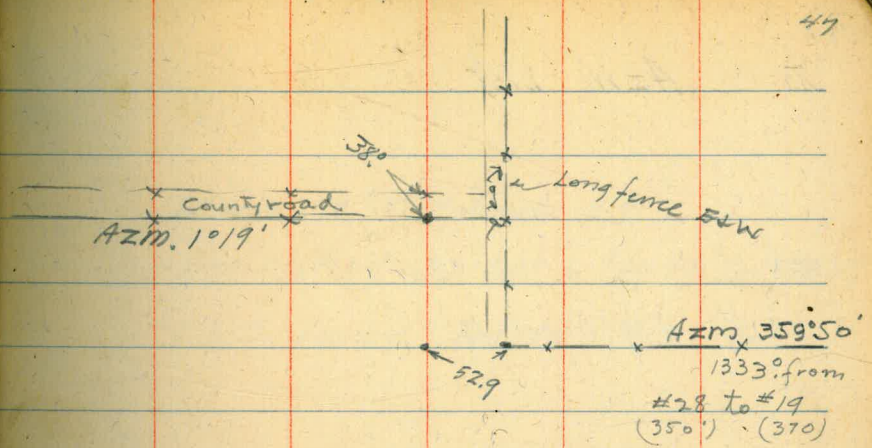
Sta	Azm	Dist.	
10			
	43°-00'-30"	281.5	
9			
	353°-42'-00"	375.3	
8			
	334°-05'-00"	175.1	✓
7			
	287°-51'-00"	409.7	
6			
	63°-15'-00"	1098.9	✓
5			
	289°-32'-00"	594.9	✓
4			
	17°-31'-00"	896.2	
3			
	44°-04'-00"	441.3	✓
2			
	30°-07'-00"	182.0	✓

20		
	281°42'30"	468.3
19		
	274°31'30"	603.8
18		
	262°29	758.0
17		
	265°05'30	311.1
16		
	277°59	331.1
15		
	48°5 W	423.5
14		
	38°28'30"	536.8
13		
	64°20'-00"	199.5
12		
	89°-52'-00"	357.3
11		
	52°-45'-00"	250.3



12-3-28

Sta.	Azm.	Dist.
	249°18'30"	571.4
29		
	230°40'	807.1
28		
	280°53	687.5
27		
	2°59'	537.8
26		
	62°08	435.4
25		
	75°22'	424.8
24		
	93°44'30"	484.1
23		
	1°23'	214.6
22		
	284°08	281.1
21		
	263°52'	770.1



Sta	Azm	Dist.
~~38~~		
	359°-08'-30"	446.9
37		
	234°-25'-00"	283.4
36		
	229°-05'-30"	497.1
35		
	268°-30'-00"	305.5
34		
	7°-51'-00"	643.8
33		
	341°-57'-00"	177.3
32		
	242°-23'-30"	1209.0
31		
	286°-14	828.9
30		

Dist from Sta #37 to fence 2.4'

Dist from Sta #37 - 350' Cont. to #29 370' Cont = 446.9

N & S Fence (Error = 0°-11'-30")

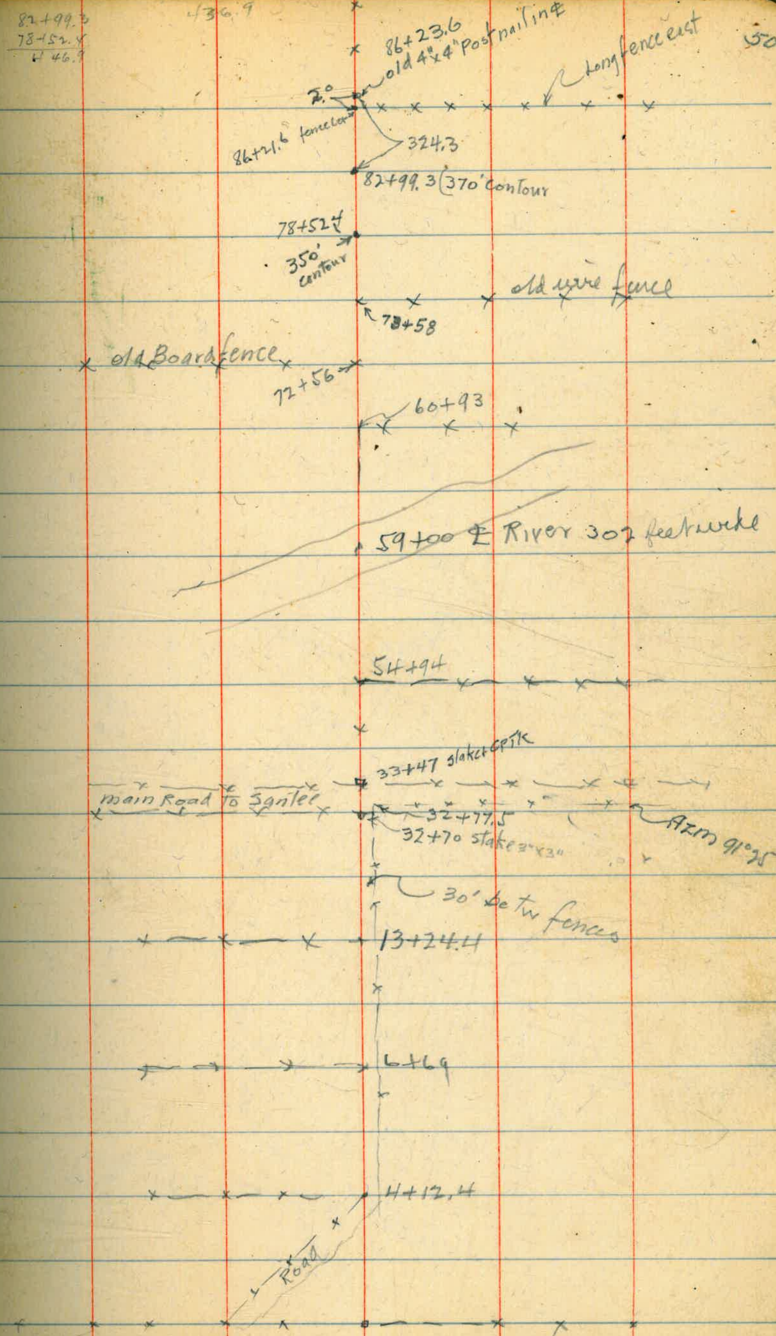
82+99.3
322.3
86+21.6
2.0
86+23.6

79+00
47.5
78+52.5

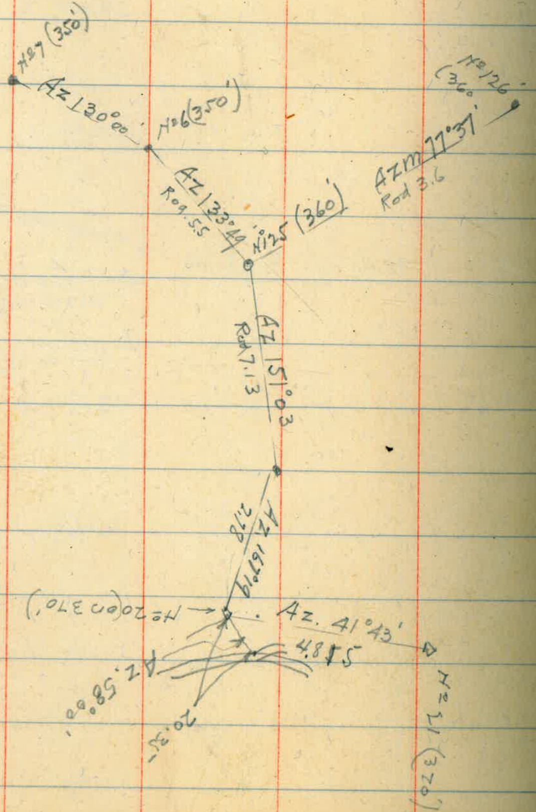
82+99.4
78+52.5
446.9

82+99.3
78+52.4
446.9

436.9



1425
713.2


No 7 (350')
Az 130°00'
No 6 (350')
Az 133°49
Rod 9.55
No 125 (360')
No 126 (360')
Azm 77°37'
Rod 3.6
Az 151°03
Rod 7.13
Az 167°19
3.18
No 20 (on 370')
Az. 41°43'
4.855
Az. 58°00'
20.35
No 21 (370')

Rod Readings for 370 Contour

AVID

~~5.05~~		
	5.05	4.41
~~4.76~~	4.76	7.82
	9.00	7.74
~~9.00~~	3.26	9.41
	4.60	2.33
~~3.26~~	3.49	6.25
	9.33	4.63
~~4.60~~	2.80	1.53
	4.26	11.04
	7.15	H.I. = 370.00 + 11.04 = 381.04
	3.70	
	3.56	5.58
	8.13	9.66
	11.03	

Chocolate X Sections

6+00	586 00/10	589 +3.0/70	594 +10/85	T.S. 596 +10./170
4+50	586 T.S. 0.0/35	T.S. +2.0/110		
3+00	T.S. +7.0/45			
1+00	T.S. 00/35			
0+00	T.S. 00/60			

Finished 4:30 PM Oct 18-1921

27+50

27

26+10

24+00

21+00

18+00

17+50

13+90

12

8+70

39+00

37+65

36+40

36

35+79

34+10

32+70

31+40

29+85

28+40

chocolate x sections

53+15°	694 T.S. 00 10	691.2	T.S 694 00 40	
52+00	686 T.S 00 10	686.1	T.S 686 00 40	
51	689 TS +5.0 35	683.5	TS 684 +3.0 40	
48	677 T.S +6.0 75	V 76 +5.0 40	V 77 00 70	677.4 T.S 673 +7.0 75
47+45		666.3	T.S V68 00 10.0	
46+20	662 T.S. 00 65	662.4	T.S 666 +4.0 75	
44+80	663 T.S. +4.0 60	659.0	T.S 662 +3.0 45	
43+09	661 +6.5 45	654.6	T.S 658 +3.0 70	
42+00	658 T.S +4.0 60	653.6	T.S. 657 +3.0 60	
40+70	652 +1.0 50	650.9	T.S 651 00 75	

Levels chocolate East ...

0+00 = 53+15	60 Elev	691.74
1+25	9.0	700.7
2+30	15.5 / 3.6	707.2
2+75	19.1 / 5.0	710.8
3+78.9 = 665 Contour	21.1	713.2

7420
4??
1609

0+00			
1+25	00/75	700.7	00/7
2+30	00/70	710.8	00/00
2+75 Facing north	00/75	713.2	00/15
3+78.9 = 760' Cont.			

691.7

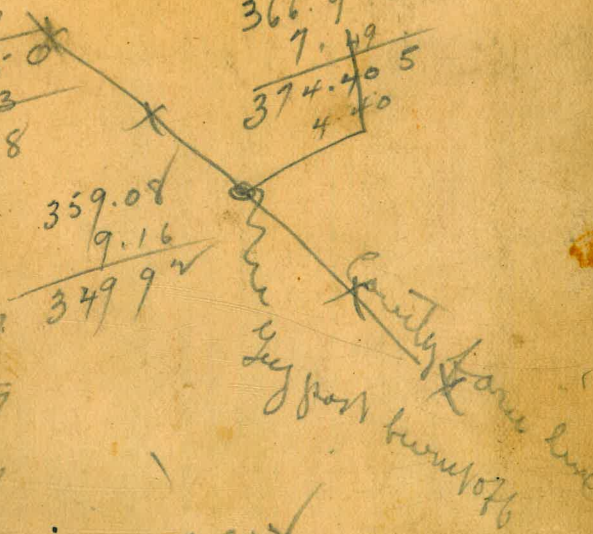
181
85

92-48
180
272-48-60
43-30
4 30

Pole 75284

370.000
0.72
370.720
12 37
358.350
0.73
?? 08
368
5 34
375.031

369.915
3
366.915
7.49
374.405
4.40



359.08
9.16
349.92

365.627
7.95
373.577
10.93
362.647
5.165
367.812
6.357
374.169
10.66
384.829
5.53
379.299
3.33
382.629
70
14.63

367.81
6.357
361.455
10.66
372.115
5.53
366.585
3.33
369.915

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1½ TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.		61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

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