1873

EUGENE DIETZGEN CO.

DRAWING MATERIALS, MATHEMATICAL and SURVEYING INSTRUMENTS

Chicago New York San Francisco New Orleans Pittsburg Toronto

Distances from Center of Roadway for Cross-Sectioning
Roadway 16 feet wide. Side Slopes 1 on 1.
For Single Track Embankment.

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

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

This Field Book is manufactured of a High Grade 50% Rag Paper having a WATER RESISTING SURFACE, and is sewed with Bing Special Enamel Waterproof thread.

Made in U. S. A.

2- Alvarado Canyon Sewer. Above Adobe Falls

25 Change " " 402+00 to 407+77.40

27 " " 425+45.00 to 468+67.49

29 " " " 376+47.08 to 381+82.20

42 " " " 508+15.70 to = 538+10.30 / 537+65.30

48 Ties at = 382+37.13 old. Sta. / 6+74.11 New Sta.

49 " " = 409+03.27 New sta. / old. sta.

50 " " 457+59.79 old. Sta.

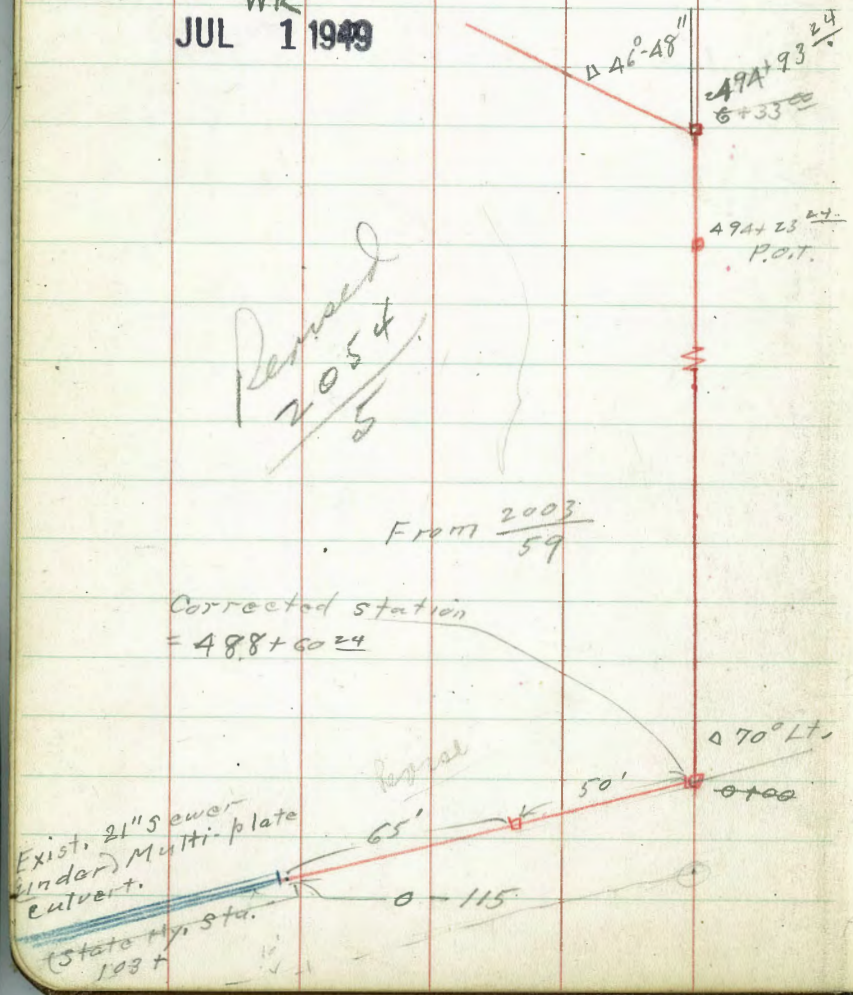
51 " " 512+60.09 " "

For final run see F.B 2040

Also see F.B 1629
" 1631
" 1703
" 2003
" 2054

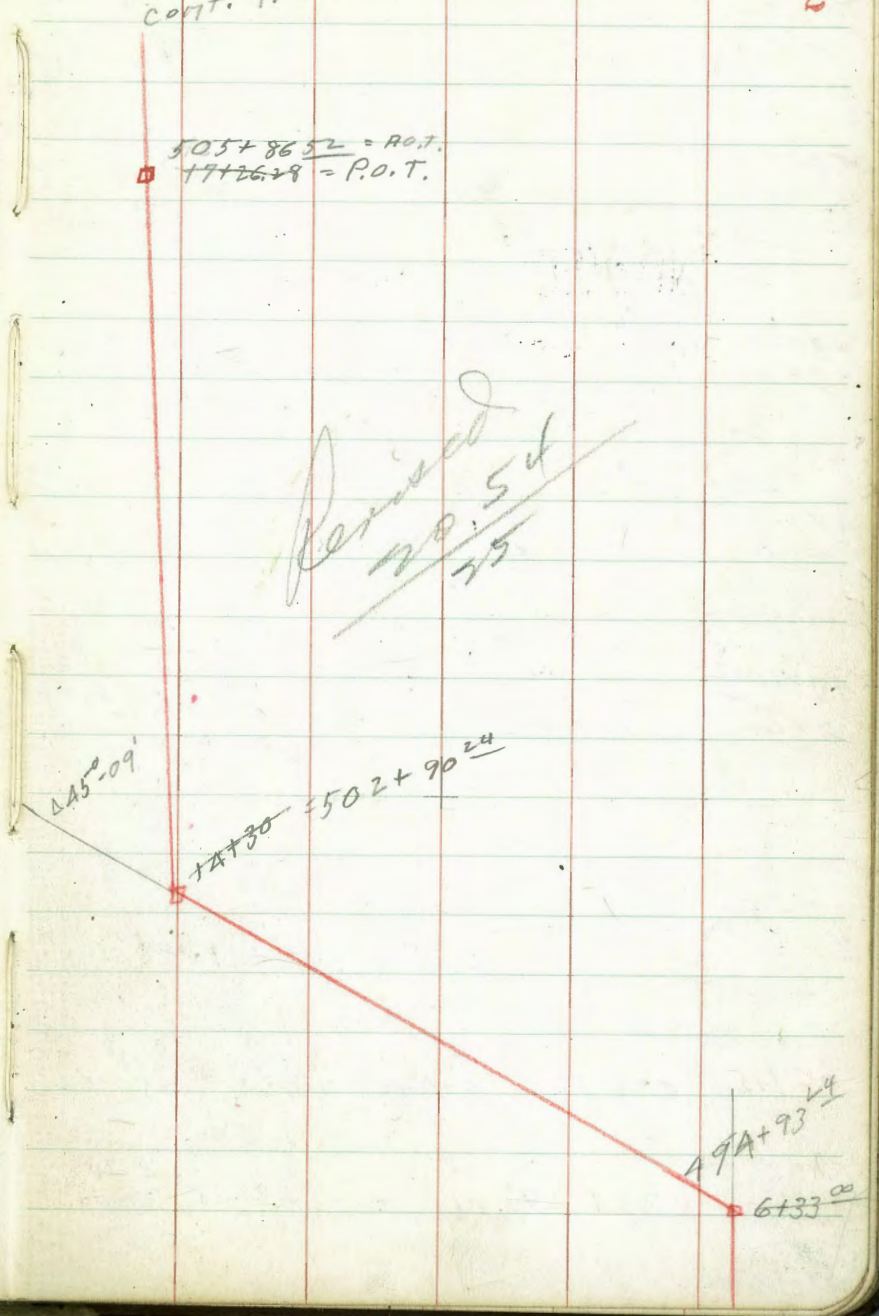
Prelim. Alvarado Canyon
Sewer. Ely. from State
Highway multiplate culvert
State Station 103+
Above Adobe Falls
1-5-49

Sommermeyer
McCoy
Jones



cont. P. 11

2



Sketch - R2

~~490+10~~
~~1+50~~

~~489+60~~
~~1+00~~

~~489+10~~
~~0+50~~

~~488+60~~ 24
0+00 - Δ 70° Lt.

B.M. #1

0-50 ← these 2 shots on old line. Not to be used 3/3/49

0-115 ← end of pipe under Const.

R.P. #1
FB 2003
17

	7.63	291.01	283.38

(289.50 State Data)

City Data.

284.7 ✓
6.3

284.8 ✓
6.2

285.0 ✓
6.0

284.38 ✓
6.63
Hub

283.38 ✓
7.63
Hub

City Datum

El. 277.9
INVERT

DTI 2003
17

291.01 City

492+60 4+00				288.4 ✓
				6.2
				⟨294.61⟩ ✓
T.P.	7.12	⟨294.61⟩ ✓	3.52	⟨287.49⟩ ✓
492+10 3+50				287.0 ✓
				4.0
491+60 3+00				285.8 ✓
				5.2
491+10 2+50				285.0 ✓
				6.0
490+60 2+00				284.9 ✓
				6.1
490+35 1+75				283.5 ✓
				7.5
		291.01		⟨291.01⟩ ✓

495+10
6+50

T.P. 6.93 ⟨298.23⟩ 3.31 ⟨291.30⟩ B.M.#2

stub
494+93 24
6+33 △ 46°-48' Lt.

494+60
6+00

494+23 24
5+63 1x1 P.O.T. (P.2.)

494+10
5+50

493+60
5+00

493+10
4+50

⟨294.61⟩

291.1
7.1
⟨298.23⟩

291.30
3.31
stub

290.8
3.8

290.37
4.24
stub

289.6
5.0

289.8
4.8

289.2
5.4
⟨294.61⟩

497+10 8+50	292.1 ✓ 6.1
496+60 8+00	290.5 ✓ 7.7
496+30 7+70	291.8 ✓ 6.4
496+10 7+50	289.9 ✓ 8.3
495+60 7+00	289.8 ✓ 8.4
495+35 6+75	289.8 ✓ 8.4
495+25 6+65	291.1 ✓ 7.1
	298.23 ✓
	298.27 ✓

T.P.	10.86	306.55 ✓	2.54	295.69 ✓
500+10 H+50				295.3 ✓ 2.9
499+60 H+00				294.7 ✓ 3.5
499+10 4+50				293.9 ✓ 4.3
498+60 4+00				293.8 ✓ 4.4
498+35 3+75				292.7 ✓ 5.5
498+10 3+50				293.1 ✓ 5.1
497+60 3+00				292.7 ✓ 5.5
		298.23 ✓		298.23 ✓

502 ~~462~~ 14+30.00	TiP.	11.34	⟨315.35⟩ ✓	2.51	⟨304.01⟩ ✓	B.M.#3
	Δ 45°09' Rt. (on hub.)					
502+60 ~~14+00~~						
502+35 ~~13+75~~						
502+10 ~~13+50~~						
501+60 13+00						
501+10 ~~12+50~~						
500+60 ~~12+00~~						
			⟨306.55⟩ ✓			

4

302.34 ✓
1.21

299.8 ✓
6.8

297.8 ✓
8.8

297.6 ✓
9.0

297.3 ✓
9.3

296.6 ✓
10.0

296.0 ✓
10.6

⟨306.55⟩ ✓

T.P.	10.66	(325.35) ✓	0.66	(314.69) ✓	
~~503+35~~ 16+75					313.4 ✓ 1.9
505+10 16+50					312.3 ✓ 3.0
~~504+60~~ ~~16+00~~					310.1 ✓ 5.2
504+40 15+80					304.1 ✓ 11.2
504+35 15+75					306.4 ✓ 8.9
504+05 15+45					306.4 ✓ 8.9
503+60 15+00					303.2 ✓ 12.1
		(315.35) ✓			(315.35) ✓

Levels Cont 2003/69

Chiseled square - Top of dam 0.5' North of spillway 5.24 (320.11) ✓ BM #4

506+10 — 322.0 ✓
17+50 — 3.4

505+86.52 — 321.44 ✓
17+26.28 = P.O.T. ixi stub. on stub. — 3.91

505+60 — 318.4 ✓
17+00 — 6.9

(325.35) ✓ — (325.35) ✓

Continued $\frac{2003}{60}$

R.P. 4/2

43 20

~~508~~ 508+59.54
~~19+99.30~~
Δ 40° 32' Rt

508+15 70
P.O.T.

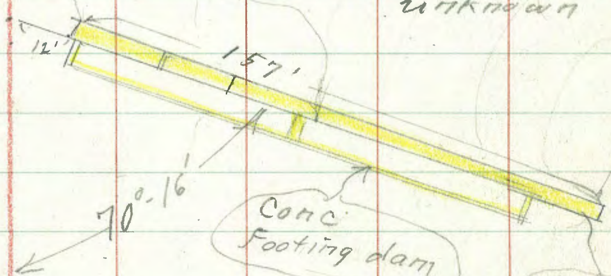
See P. 42

507+49 39 P.O.T.

1 75 Average with top of dam

Dam ~~is~~ has 12' high face in center. footing depth is unknown

506+57 90



~~17+26.28~~ P.O.T. (P 2)
505+86.52

From Page 2

7/9/49

Tie in line Crossing # 5 — 2003 / 16+25

Transit at "X" on all shots.
Pt. "A" from X
192 - Stadia vert = 2°-32'
No Boot

Pt. B.
214 Stadia 2°-40' vert.
5' Boot.

Pt. "C" Stadia 53' Level
π = 4.8 Rod = 9.2 "

Pt. "D"
526' Stadia
Vert 2°-49' - 10' Boot.

Δ = X π = 4.8	Hor. Dist	Stadia	Vert Δ	Ver Dif	El.
Pt. A	191.8	192.	2°-32'		
Pt. B.	213.8	214.	5' Boot 2°-40'		
Pt. C.	53.0	53'	Rod 9' 0°-00'		
Pt. "D"	525.4	526.	10' Boot 2°-49'		120.09

State Hy
Station = 81+30 ±

98°-08 → 65°

℄ State Hy.
1+65 2003/16
= N'ly End Crossing # 5

EL. = 186.58
USGS. 2003/16

188' calc.

113°-40'

EL. = 171 ±

53' level

144°-50'

EL. = 170 ±
X

EL. 165.9
C

ptn. "X" to "D"
526' Stadia
Vert. Δ = 2°-49'
Set on π. with
10' Boot.

A

B

52°-00'

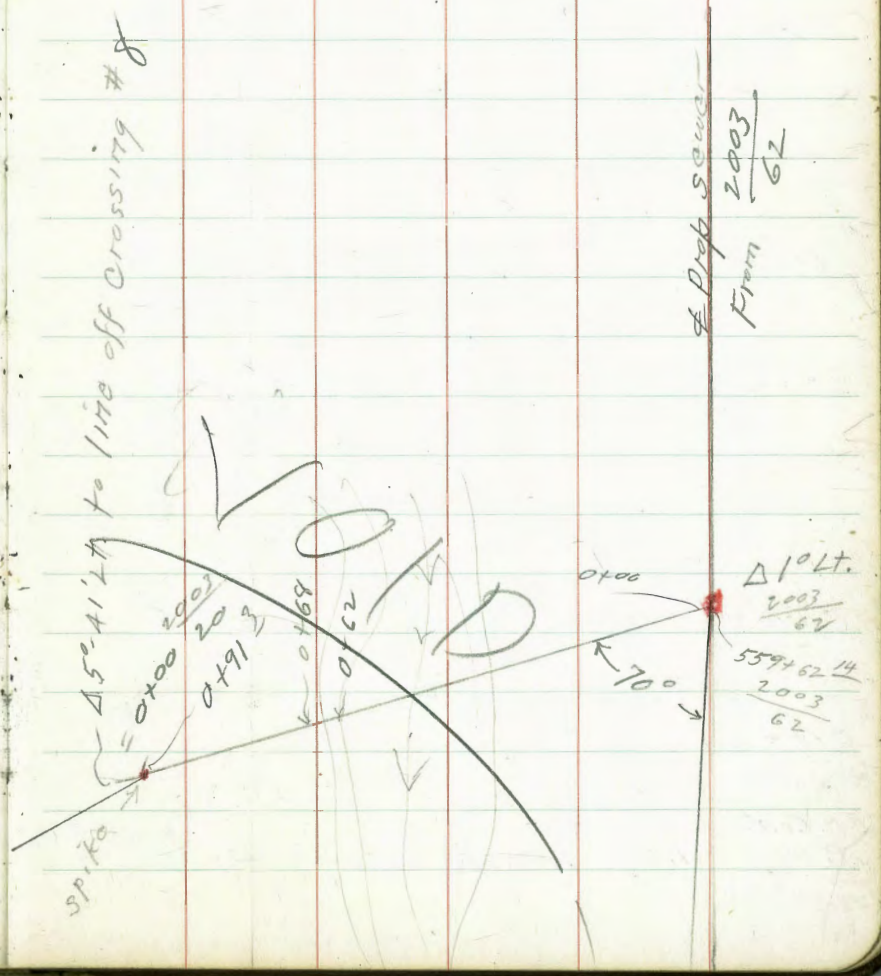
"D"

45 Ct + 43 36 Δ 32°-31'-30" Lt. 2003 / 49+53

3/9/49 Tie in Crossing #8 2003/20

0+91 3	= spike = 0+00 2003/20	3.1	373.2
+68		3.5	372.8
+62		6.8	3695
+26		5.2	370.4
0+00		4.6	371.1
559+62.14 2003 t.P. P78			
	4.60	376.32	371.72

See 2003/20



Profile Sewer branch line (# 7)

sketch 2003/61

Station		Elevation	Depth
2 + 70 ±	= Grd. End of exist pipe	357.7	4.6
2 + 40		356.5	5.8
2 + 00		357.0	5.4
1 + 50		356.4	5.9
1 + 00		355.7	6.6
+ 50		356.6	5.7
+ 20		356.1	6.2
0 + 10		353.6	8.7
0 + 00	= P.O.T.	355.30	7.05

B.M. P.O.T.
P. 76
2003 [illegible]

[illegible] + [illegible].30
7.05 362.35 ~~342.35~~

355.30 [illegible] 2003/76

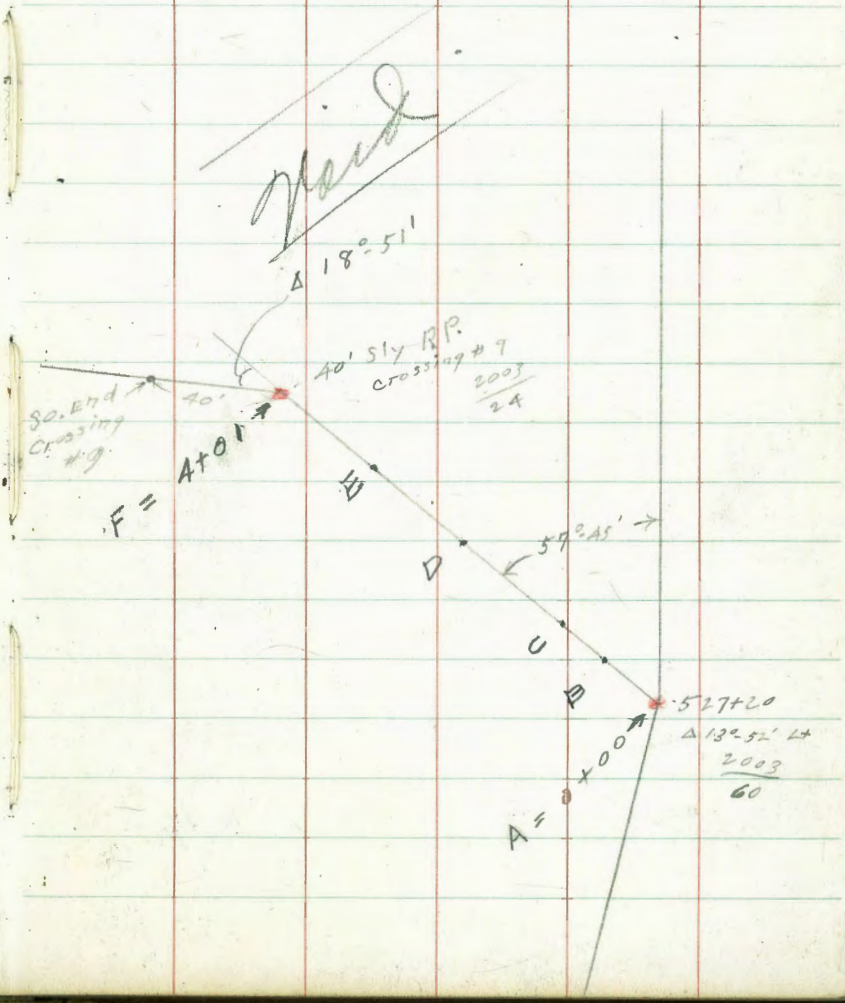
362.35
~~342.35~~

3/9/49 Prelim

Tie in Sewer Crossing #9 2003/24

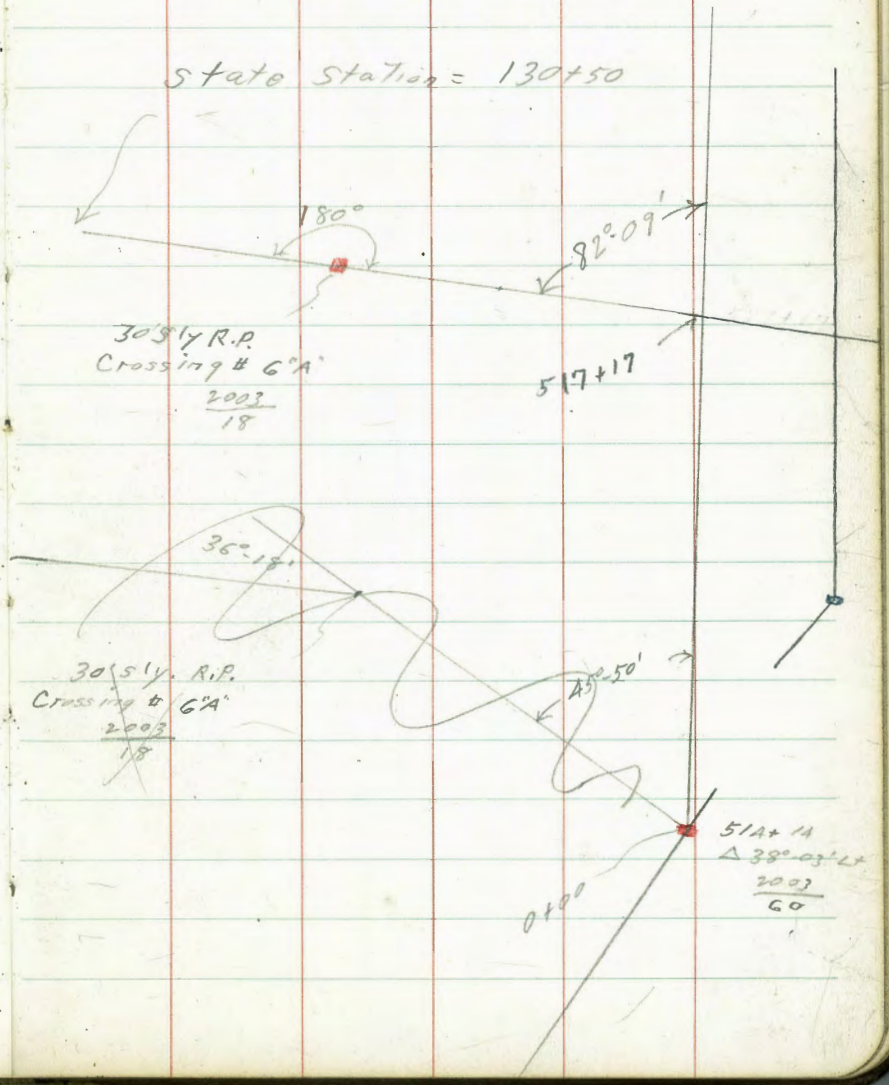
Distances and Elevations
Taken by Stadia From "F"

Point	Station	Elev.
A	0+00	335.41 2003/72
B	0+26	336.6
C	0+80	335.4
D	2+03	339.9
E	2+82	350.7
F	4+01	356.54 2003/24



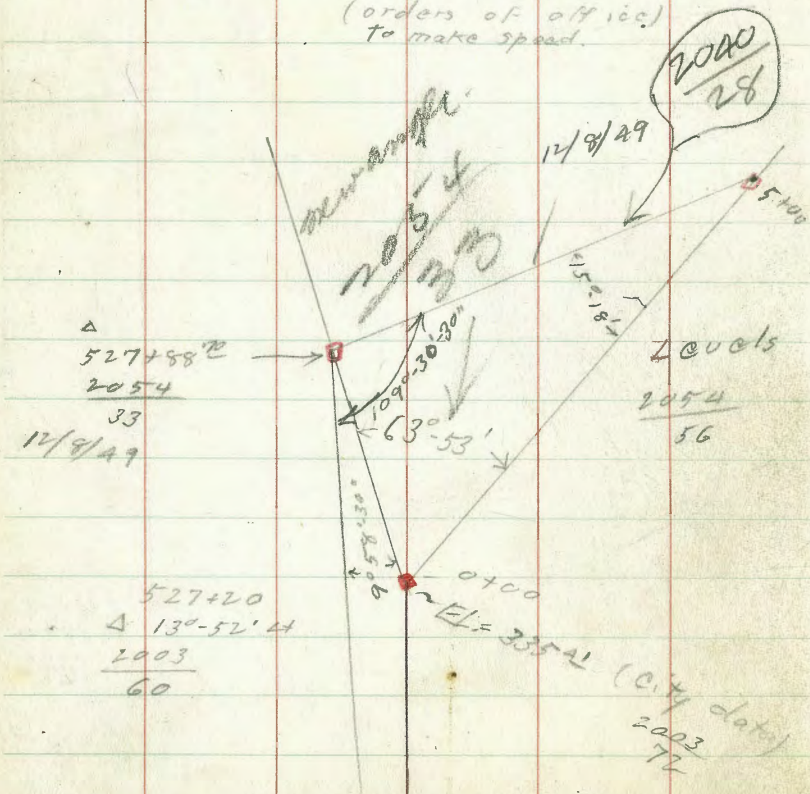
Tie in Crossing # 6 "A"

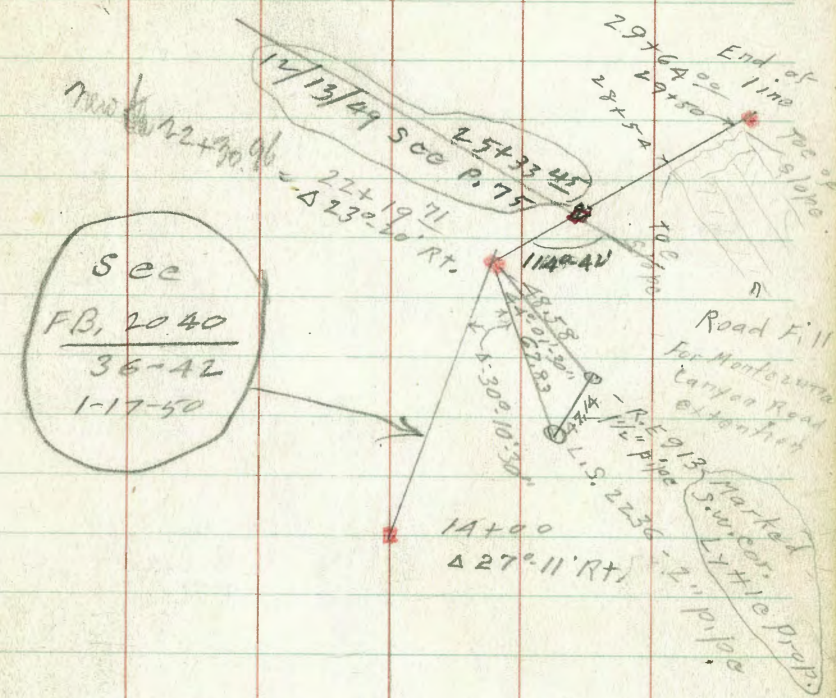
517 -				328.0
	5.4	333.4		Elev
517+17 on Main line = 0+00	stadia	vert. ∠	5.0	328.4
	93.0	0°-00'	4.5	328.9
	190.0	0°-00'	2.6	330.8
	272°	+1°-30'		
	367°	+2°-0'		

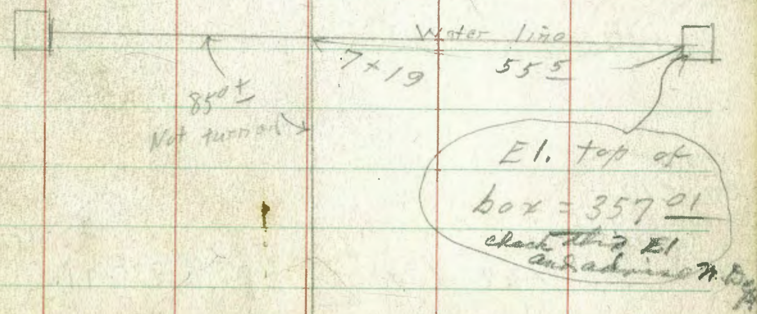


3/9/49 Branch to South East
from 527+20.00 to
(Canyon East of Catoctin St.)

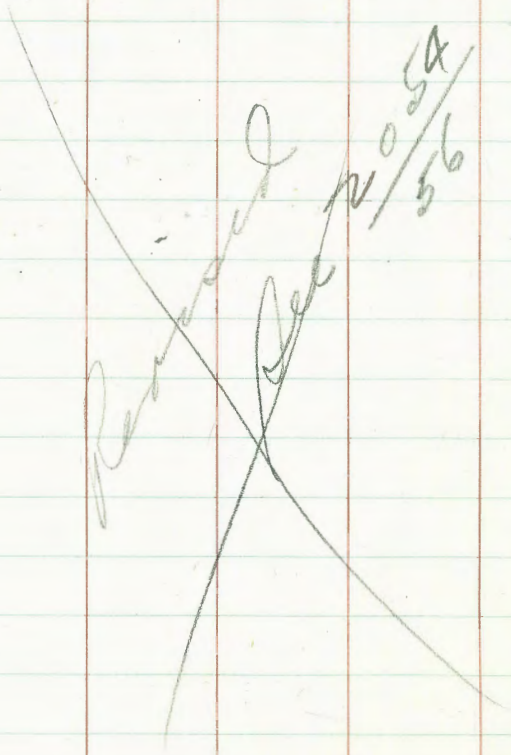
Rough chaining
(orders of office)
to make speed.





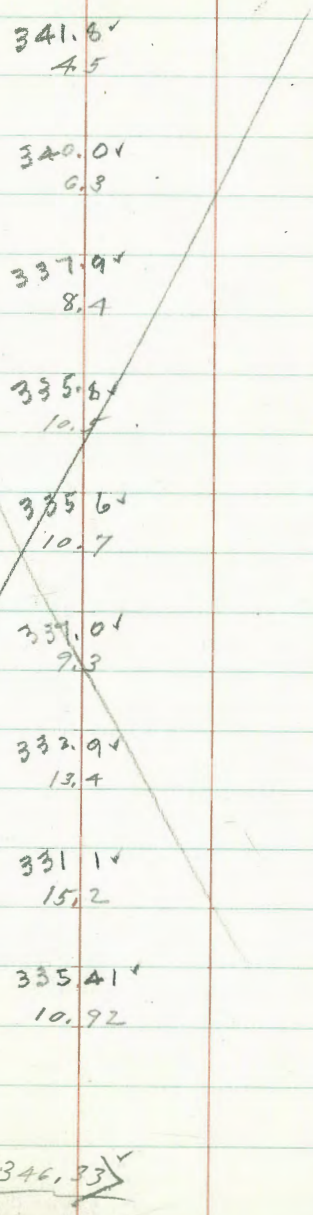


Levels Canyon East of Catalina Dr.



Rev'd Dec 2054/56

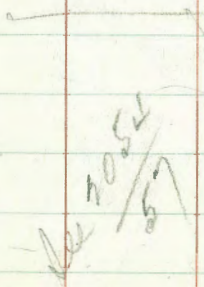
10.92 ⟨346.33⟩ ⟨335.41⟩ {527+20 / 2003 / 72



Dec 2054/56

⟨346.33⟩

7+19				351.8 ✓ 6.3
7+00	Aprox. Int. of water line (P.17)			351.7 ✓ 6.4
+75				350.1 ✓ 8.0
+13				349.4 ✓ 8.7
6+00				347.1 ✓ 11.0
5+70				348.2 ✓ 9.9
5+15				3,449 ✓ 13.2
4+90				345.8 ✓ 12.3
T.P.	12.35 ⟨358.10⟩ ✓	0.58	⟨345.75⟩ ✓	⟨358.10⟩ ✓
4+00				342.6 ✓ 3.7
	⟨346.33⟩ ✓			⟨346.33⟩ ✓



				℄
+55				359.1 ✓ 10.6
+45				360.8 ✓ 8.9
11+00				359.9 ✓ 9.8
10+10				357.9 ✓ 11.8
10+00				358.5 ✓ 11.2
+40				356.4 ✓ 13.3
T.P.	12.81	⟨369.71⟩ ✓	1.20	⟨356.90⟩ ✓ ⟨369.71⟩ ✓
+27				355.0 ✓ 3.1
9+00				356.0 ✓ 2.1
8+00				353.8 ✓ 4.3
		⟨358.10⟩ ✓		⟨358.10⟩ ✓

T.P.	12.10	(381.48) ✓	0.33	(369.38) ✓		
15+00						
+74						
+53						
14+00	Δ 27°-14' Rt.				B.M. #1	
+90						
+80						
+67						
13+00						
12+00						
11+65						
		(369.71) ✓				

℄

368.7 ✓
1.0

366.6 ✓
3.1

367.6 ✓
2.1

366.60 ✓
3.11 on Hub.

366.2 ✓
3.5

363.9 ✓
5.8

365.5 ✓
4.2

364.2 ✓
5.5

362.4 ✓
7.3

361.1 ✓
8.6

(369.71) ✓

Set B.M. 1½ Pipe R.E. 913
48.58 Rt. of 22+19 71 △ 5.12 376.36 B.M. #2

22+19 71 △ 23° 20' Rt. (P. 17) = 22+30.96

22+00

21+00

T.P. 11.60 392.08 1.00 380.48

20+00

19+00

18+00

17+00

16+00

381.48

385.1
7.0

384.8
7.3

382.7
9.4
392.08

380.3
1.2

378.6
2.9

375.8
5.7

373.4
8.1

372.4
9.1

381.48

28+54	Toe of Slope 22' Rt. = N.E. Cor. Fill.			
28+00				
27+00				
+74				
26+00				
25+50				
T.P.	12.70	(403.93)	0.85	391.23
25+00				
24+00				
23+00				
		(392.08)		

℄

397.9 / 6.0

396.4 / 7.5 / 12

397.5 / 6.4 / 22 / N. E. Cor. Toe of Fill

396.5 / 7.4

394.3 / 9.6

393.9 / 10.0

394.2 / 9.7

390.8 / 13.1

(403.93)

389.9 / 2.2

387.9 / 4.2

386.4 / 5.7

(392.08)

can check it back later.
in the bench lines
This difference is probably

S.W. B.P. Rolando & El. Cajon			0.85	452.04 (452.46)
T.P.	12.91	(452.89)	0.22	(439.98)
T.P.	12.71	(440.20)	0.45	(427.49)
T.P.	12.33	427.94	0.17	(415.61)
T.P.	12.28	(415.78)	0.43	(403.50)

29+64 End of line (P.17) B.M.#3

29+50 12' Rt. = S.E. Cor. fill. Toe of slope.

29+00 5' Rt. = Toe of slope of fill

(403.93)

399.13
4.80 on stub.

398.7 397.7 399.4
5.2 6.2/5 4.5/12
Toe slope

397.5 397.3
6.4 6.5/5
Toe slope

(403.93)

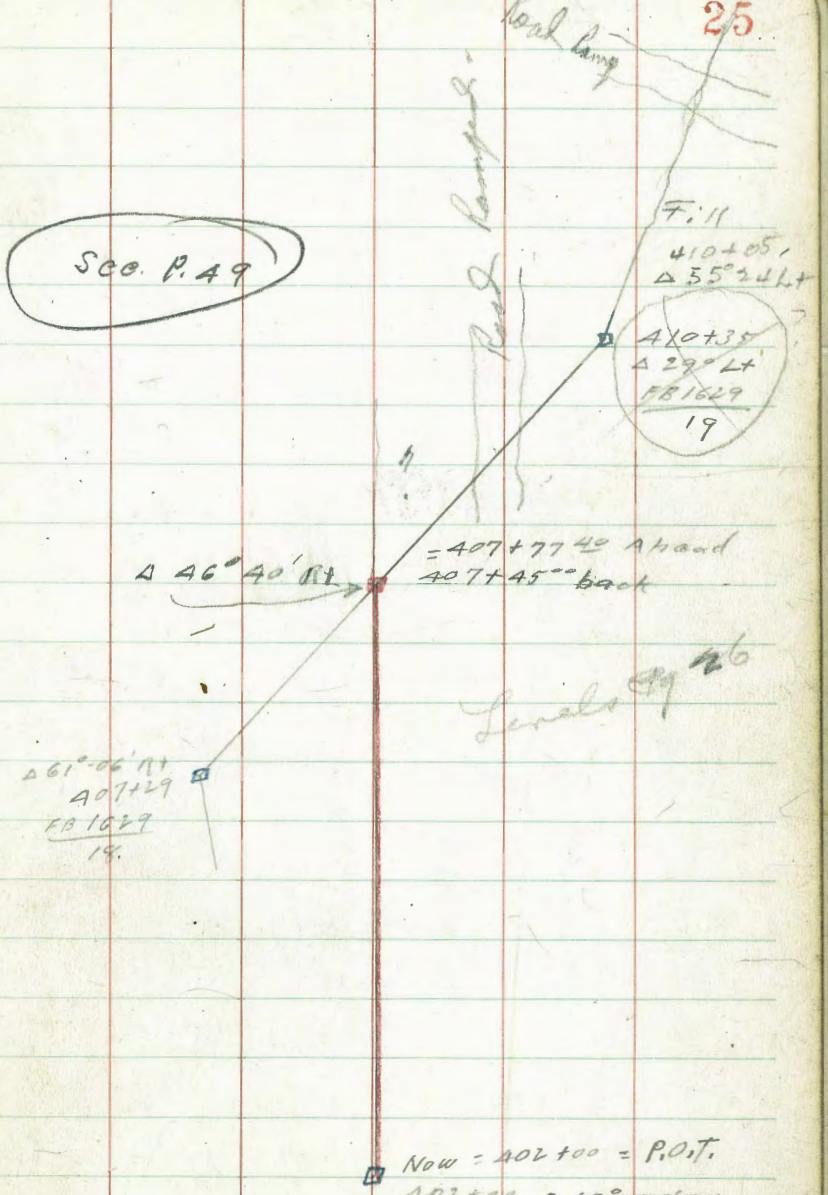
Change Alvarado Canyon line

402+00 P.O.T. to 407+77.40 = 407+45

7-5-49

Sommermeyer
Bunch
Clark

▷ = Set stub or hub.
□ = Fd. " "



Levels 7/5/49

402+00 to					
	9.42				
407+77.40 =			7.8	82.7 ✓	Tie to Former Hub 407+29 Hub 82.7
+45			5.2	85.3 ✓	
407			4.9	85.6 ✓	
+50			5.4	85.1 ✓	
406			7.0	83.5 ✓	
+50			9.2	81.3 ✓	
405			11.8	78.7 ✓	
404+50	24' Rt. EL = 77.8; 30' Lt. EL = 75.6		14.4	76.1 ✓	
404	30' Rt. EL = 78.2; 30' Lt. EL = 74.5		14.3	76.2 ✓	
+35	7' Rt. EL = 76.8; 15' Lt. EL = 73.9		15.7	74.8 ✓	
403			13.0	77.5 ✓	
+77			11.3	79.2 ✓	
+50			10.8	79.7 ✓	
402+00	9.42	90.57	—	81.1	
1629 / 18					

9/29/49 plotted on profile m.

Return 7/5/49

92.4 to main over pipe
+ 7.4
90.8 Hub at 410+05
+ 1.5 Top 2x4 stake over pipe
92.3

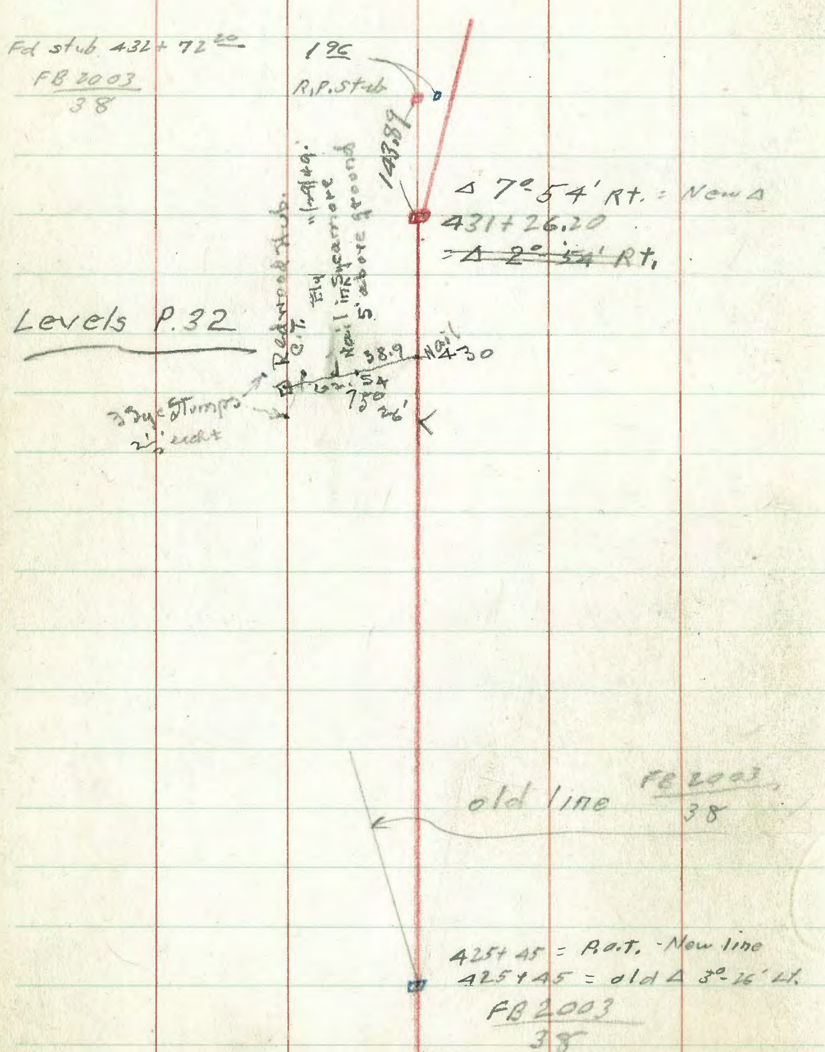
+87.98		11.7	80.6 ✓	
415		12.8	79.5 ✓	
414		14.3	78.0 ✓	
+93		14.0	78.3 ✓	
+80		5.4	86.9 ✓	
+71	℄ Prop Line Sundra.			
+62		5.5	86.8 ✓	
+50		12.2	80.1 ✓	
413		12.5	79.8 ✓	
412		12.1	80.2 ✓	
411		12.4	79.9 ✓	
+55		11.3	81.0 ✓	
+22		2.0	90.3 ✓	
410+05	△ Lt.	0.0	92.3 ✓	
+90		5.3	87.0 ✓	
+83	11-16-49 Uncover Tel Cap pipe = 92.3 − 5.9		86.4	Top Tel Cap Pipe
+80	Ramp. 20' Rt 3' Higher	2.5	89.8 ✓	
+66	11-17-49 Uncover Texas St Br. Cap 36" Conc Pipe			Top Pipe = 83.4
+50	20' Lt 3' Lower	0.8	91.5 ✓	
+30		1.5	90.8 ✓	
+07		5.6	86.7 ✓	
409+06		4.3	88.0 ✓	
	0.00	92.26		92.26 Hub 410+05

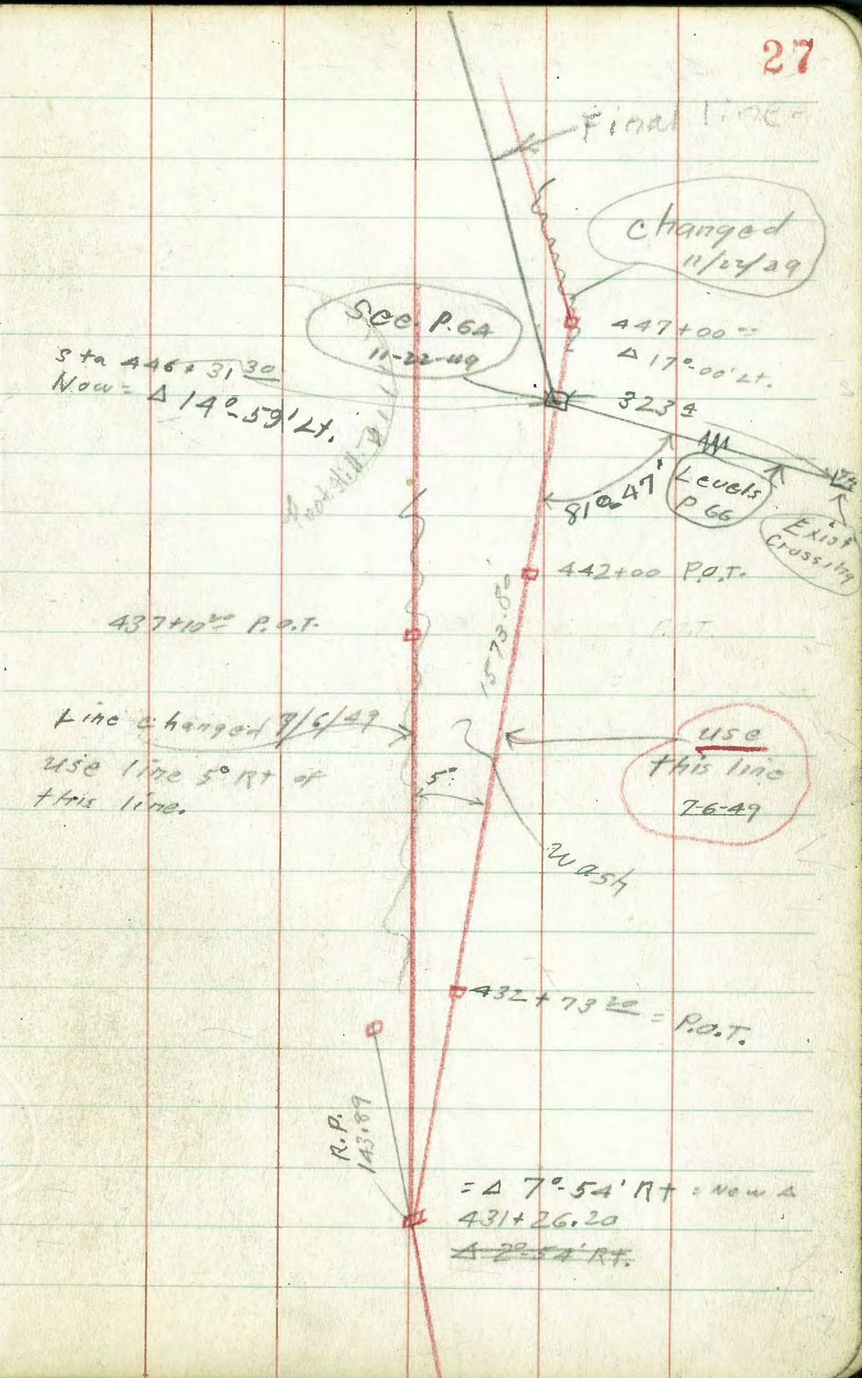
Reverse 1873 / 67

Line Change 425+45.00 to 468+47.58
FB 2003 / 38

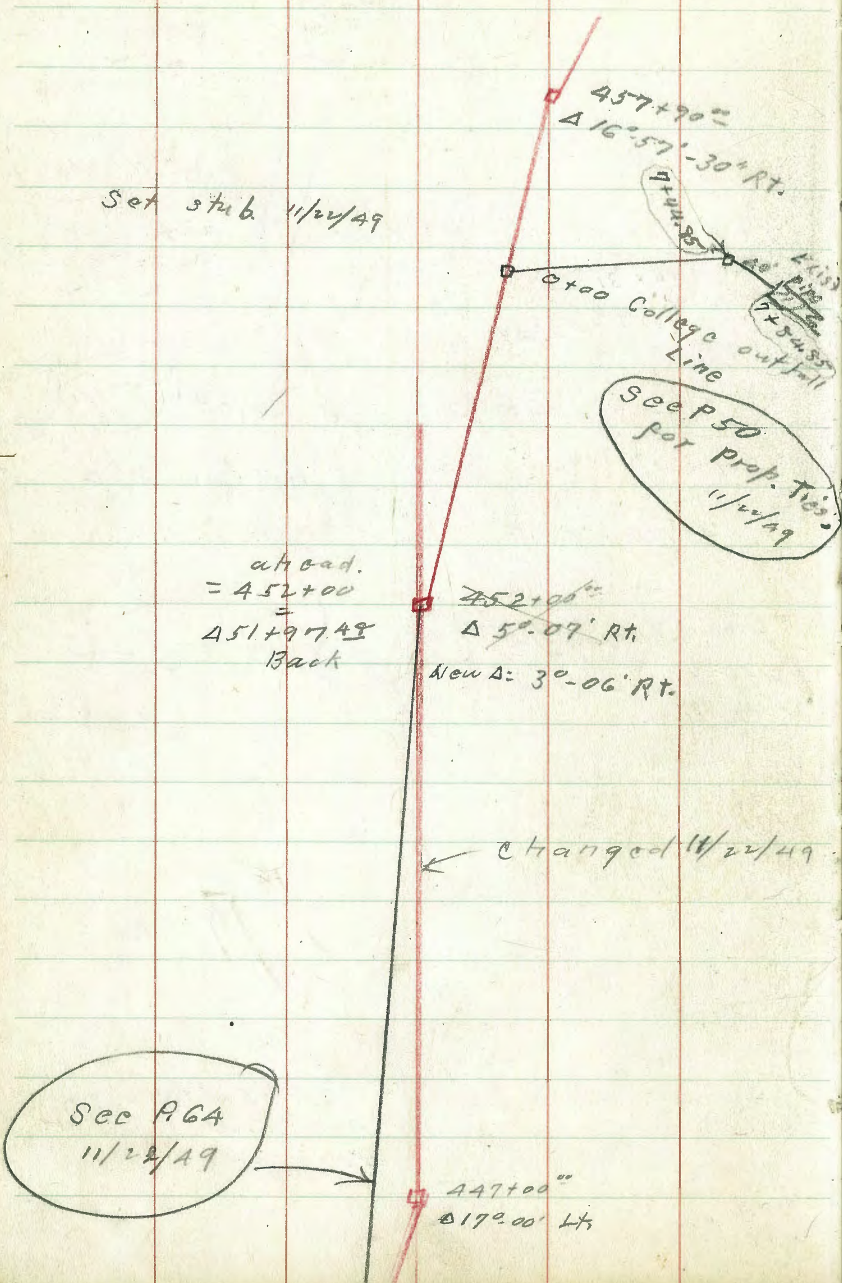
7/5/49

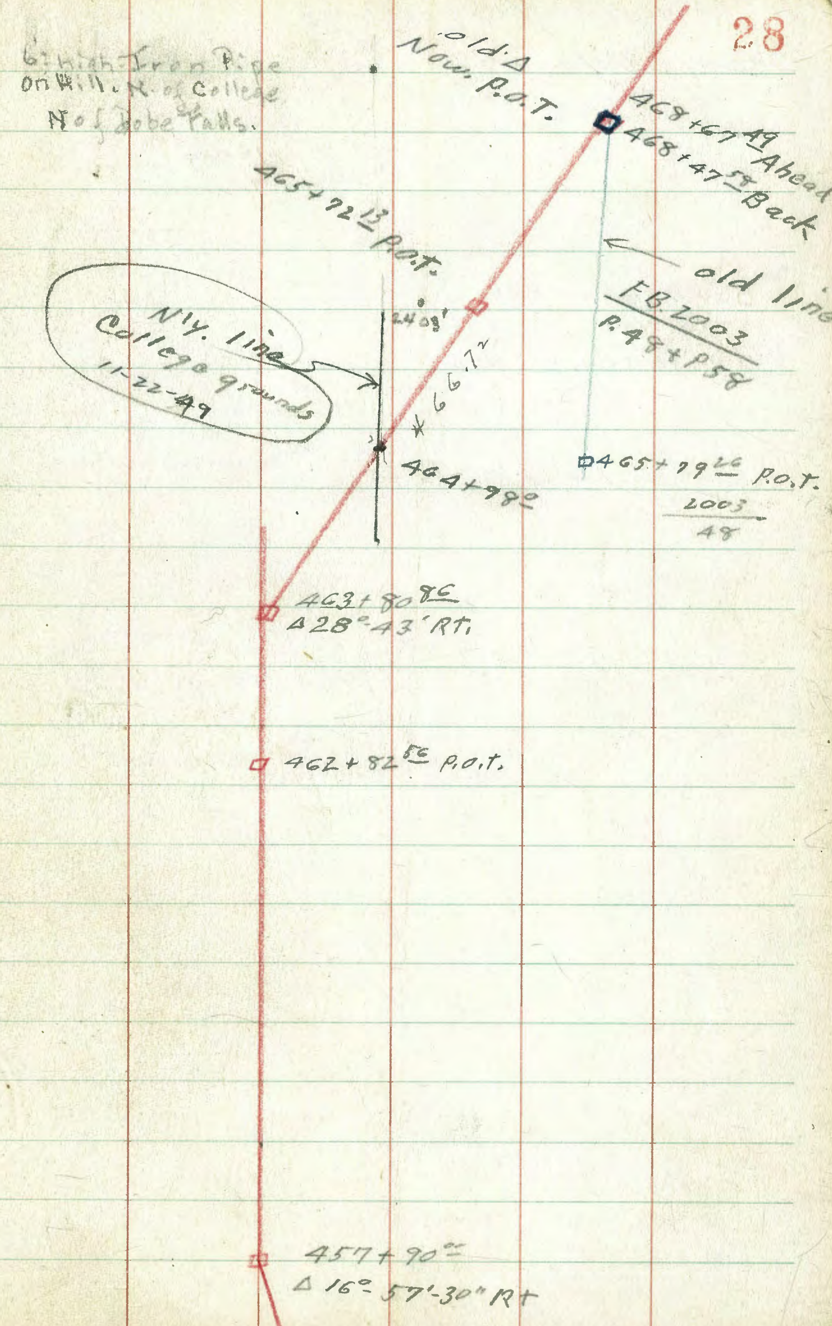
□ = Fd. Hub or stub
□ = Set. " " "





425+00 to 468+67.49





Alvarado Canyon line

Change 7/5/49 - 376+47.03 to 381+82.20

7/12/49

Sommermeyer
McCoy
W Moore

□ = Fd. stub or hub.
● = Fd. Nail
□ = set stub or hub.

Levels P. 30-

FB 2003
28

= 381+82.20 Ahead
= 381+80.78 Back
New Δ 1°-49' Lt.

30.05

381+52.15
old Δ
FB L003
28

Ties P. 48

Also P. 55

0°-55'

New
Δ 10-54 Rt.
376+47.08
old Δ - 2°-49' Rt.

FB 2003
28

change
376+47.08 to 381+82.20
sketch. P. 29

379 —

+80

+50

378 —

E.P. = Edge Pave.

+42 25' Lt. = Near Edge pave. - 10' wide

377 —

+65

+56 9' Lt. = Tel. pole

+54 8' Lt. = Pole (Power)

376+47.08 on stub.

stub 376+47.08
2003
33

5.60 (86.95) — 81.35

79.1 —
7.9
2
E.A

79.1 —
7.9

79.1 —
7.9

78.2 —
8.8
4.8
E.A

79.4 —
7.6

77.0 —
10.0
12
E.A

79.2 —
7.8
3

79.2 —
7.8

76.8 —
10.2
25
E.P.

78.6 —
8.4
20

81.2 —
5.8

81.5 —
5.5

81.1 —
5.9

Also P. 55

81.35 —
5.60

(86.95)

381+82.20	Ahead	(1873 / P.29 + 2003/25)		
381+80.73	Back			
+74	= ℄ leave paving			
+50	4½ Lt. = ℄ Edge pave 14½ Rt. = " "			
381+21	= ℄ meets pave			
+75				
380+50				
T.P.	5.88	(86.70)	6.13	80.82
380 ~				
+56	7' Rt. = P. pole # Z79362			
+50				
379+36	0.5 Lt. = Edge pave.			
	(86.95)			

80.84 ✓
5.86
H.b.

81.2 ✓
5.5

81.7 ✓ 81.7 ✓ 82.1 ✓
5.0 / 4½ EP
5.0
4.6 / 14½ EP

81.9 ✓
4.8
EP

80.8 ✓ 82.0 ✓
5.7 / 5 EP
4.7

81.9 ✓
4.8
(86.70) ✓

79.5 81.0 ✓
7.5 / 3½ E.P.
6.0

80.2 ✓
6.8

79.8 ✓ 79.8 ✓
7.2 / 0½ E.P.
7.2

(86.95)

Change

425+45 to 468+67.49

sketch P. 27+28

T.P.	11.74	103.61	4.35	91.87
+53				
428+40				
+60				
427+20				
+90				
+80				
+46				
426				
425+45	7.10	96.22		89.12

2003
42

91.2
5.0
84.4
-11.8
82.4
13.8
91.2
5.0
80.7
15.5
80.7
15.5
90.4
5.8
89.2
7.0
89.12
7.10
96.22

432 ~		3.8	99.8
+ 80		4.0	99.6
+ 50		4.4	99.2
431+26.20	Δ 7°-54' Rt.	3.86	99.75
		St 46	
431 ~		4.7	98.9
+ 50		6.5	97.1
430 ~		8.0	95.6
+ 50		9.1	94.5
+ 25		11.2	92.4
429 ~		11.8	91.8
	103.61		103.61

435+30					94.4	7.8
+41					93.5	8.7
434+39					97.9	4.3
433+96					97.4	4.8
+90					91.0	11.2
433+04					89.7	12.5
+96					96.4	5.8
T.P.	1.78	102.19	3.20	100.41	M.O.T. 432+73.20	102.19
+77					99.0	4.6
432+30					98.6	5.0
						103.61

T.P.	6.71	111.38	2.84	104.67
440 ~				
439 ~				
438 ~				
+93				
+70	Cross wash (bears 45° t Left)			
+50				
437 ~				
436 ~				
435+36				
T.P.	9.12	107.51 102.19	3.80	98.39

	104.5
3.0	
	103.4
4.1	
	102.2
5.3	
	102.1
5.4	
	97.6
9.9	
	100.2
7.3	
	100.9
6.6	
	99.8
7.7	
	98.3
9.2	
107.51	

+36	Leave wash			
445 ~				
T.P.	11.61	114.69	8.30	103.08
+75				
444 ~				
443+10	Enter wash			
+50				
442 ~	4' Lt. = 18" Diam tree stub. P.O.T.			
441 ~				
440+50				

103.9
10.8
105.1
9.6
114.69
103.2
8.2
103.7
7.7
102.6
8.8
107.3
4.1
106.62
4.76
stub
105.3
6.1
103.3
8.1
111.38

451 ~				
T.P.	7.06	119.08	2.67	112.02
450 ~				
449 ~				
+ 70				
+ 45				
448 —				
447+00 ≈	Δ 17° Lt.			
+ 75				
+31.3 C	See P64 - 11/24/49			
446 —				
		114.69		

	113.6	
5.5		
	119.08	
	112.0	
2.7		
	109.6	
5.1		
	108.5	
6.2		
	106.9	
7.8		
	107.9	
6.8		
	109.49	
5.20		
Stub		
	107.8	
6.9		
	106.1	
8.6		
	114.69	

					115.0
+50				10.5	
T.P.	9.77	125.54	3.31	115.77	125.54
455~				4.1	115.0
454~				5.4	113.7
+45				5.9	113.2
+05				5.6	113.5
453~				6.9	112.2
+50				6.0	113.1
452~	= 74+28 Δ 5°07' Rt.			5.48	113.60
				Stub	
451+50				6.7	112.9
		119.08			119.08

459 ~		4.9	120.6 ~
458 ~		5.1	120.4 ~
457+90	Δ 16°-57'-30" Rt	4.99 stub.	120.55 ~
+80		4.2	121.3 ~
+65		5.7	119.8 ~
457+30		7.6	117.9 ~
+95		10.2	115.3 ~
+30		10.1	115.4 ~
456 ~		9.2	116.3 ~
	125.54		125.51

+12					126.2 / 8.9
464 ~					124.6 / 10.5
T.P.	11.86	135.09	4.05	123.23	135.09
↓					123.23 / 4.05 / Stub
463+80 86	Δ 28° 43' Rt.				
463 ~					123.0 / 4.3
462+82 56	R.O.T.				122.79 / 4.49 / Stub
462					121.8 / 5.5
461 ~					120.3 / 7.0
T.P.	8.24	127.28	6.50	119.04	127.28
460 ~					119.0 / 6.5
459+60					117.5 / 8.0
		125.54			125.54

468+67.49	Ahead	(P.28)			139.62
468+47.58	Back		4.52	139.57	2003
					63
468 ~					
+50					
467 ~					
+50					
466 ~					
+72 11	P.O.T. ½				
T.P.	10.02	144.09	1.02	134.07	
465 ~					
464+50		135.09			

	139.57
4.52	
	139.3
4.8	
	139.0
4.3	
	139.1
5.0	
	138.1
6.0	
	136.1
8.0	
	135.25
8.84	
Hub	
144.09	
	130.7
4.4	
	128.7
6.4	
135.09	

Line change from Little Murray Ely.

508+15.70 to { 538+10.30 Ahead
537+65.30 Back

7/19/49

Sommermeyer
McCoy
Allen
W. Moore

□ = Fd stub
□ = Set. stub

Same point as 514+14 2003/60

514+03.95
Δ - 39° 45' Lt

Levels P. 43

Revised

Ties P. 51

508+15.70
(From P. 11)
= New Δ

Δ 37° 46' Rt.

538+10.30 Ahead FB 2003 c1

537+65.30 Back
Δ 11°-01' Rt.

Revised

524+00 =
Δ 6°-56' Lt.

514+03.25
Δ 39°-45' Lt

Same point as 514+14.00 2003/60

508+15.70 to 537+65.30

Sketch - P. 42

5/19/49

515 ~

514+03.25 Δ 39°-45' Lt

514 ~

513 ~

T.P. 7.69 332.10 1.07 324.41

512 ~

511 ~

510 ~

509 ~

508+15.70 Δ 37°-46' Rt.

5.37 (325.48) — 320.11 BM. #4 P.10

Revised Location

327.0
5.1

326.15
5.95
5+46

326.2
5.9

326.2
5.9

(332.10)

Revised Location

324.8
0.7

322.4
3.1

321.4
4.1

320.3
5.2

321.28
4.20

(325.48)

T.P.	6.33	(337.15)	2.22	330.82
521~				
520+50				
520~				
519~				
518+70				
T.P.	2.51	(333.04)	1.57	330.53
518~				
517~				
516~				

Revised location

332.10

(337.15)

329.9
3.1

329.4
3.6

327.2
5.8

327.0
6.0

330.8
2.2

(333.04)

331.3
0.8

327.8
4.3

327.5
4.6

332.10

Revised location

450			340.8 5.6
529~			337.7 8.7
528~			337.0 8.5
T.P.	9.29	346.35 / 0.09	337.06 / 346.35
527~			336.7 9.5
526~			335.1 2.1
525~			333.5 3.7
524+00 = Δ 6°-56' Lt. (P.Av)			332.22 4.93 stub
523~			331.0 5.3
522~			331.4 5.8
		337.15	337.15

Revised Elevations

Revised Elevations

+40				345.4
			5.1	
+25				343.7
			6.8	
535+06				342.6
			7.9	
+85				345.3
			5.2	
534~				344.6
			5.9	
T.P.	6.60	350.51	2.44	343.91
			350.51	
533~				343.6
			2.8	
532~				342.4
			4.0	
531~				340.3
			6.1	
530~				341.0
			5.4	
		346.35		346.35

Revised location

= 538+10.30 Ahead
537+65.30 Back } = Δ 11°-01' Rt. (P. 42)

537 ~

536 ~

350.51

Revised location

348.27
2.24
346.0
3.7
346.2
4.3

350.51

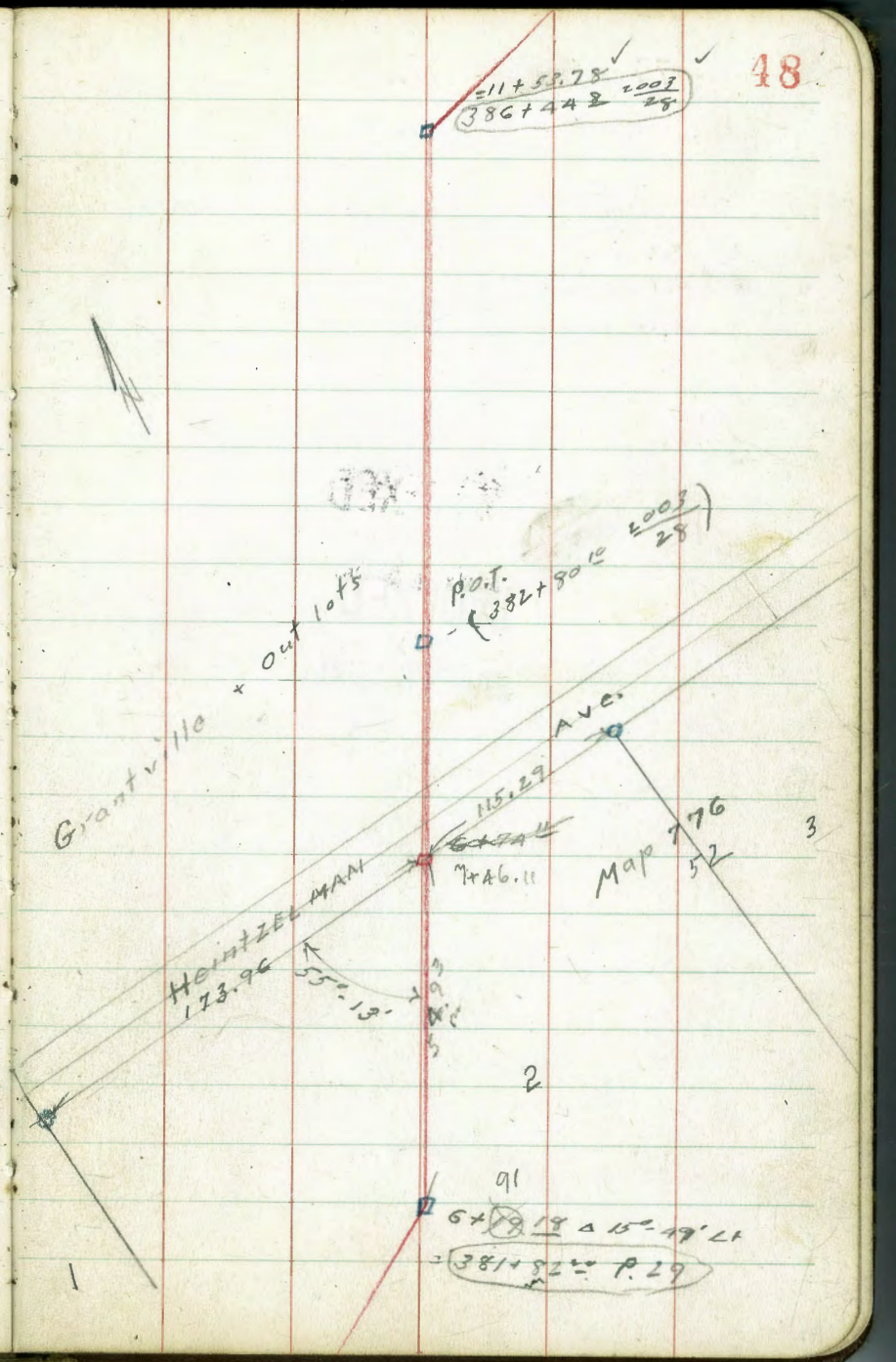
Ties Grantville + Out. lots

Map 776

8/29/49

○ = Fd pipe or pin
⊡ = Fd Hub
□ = Set Hub

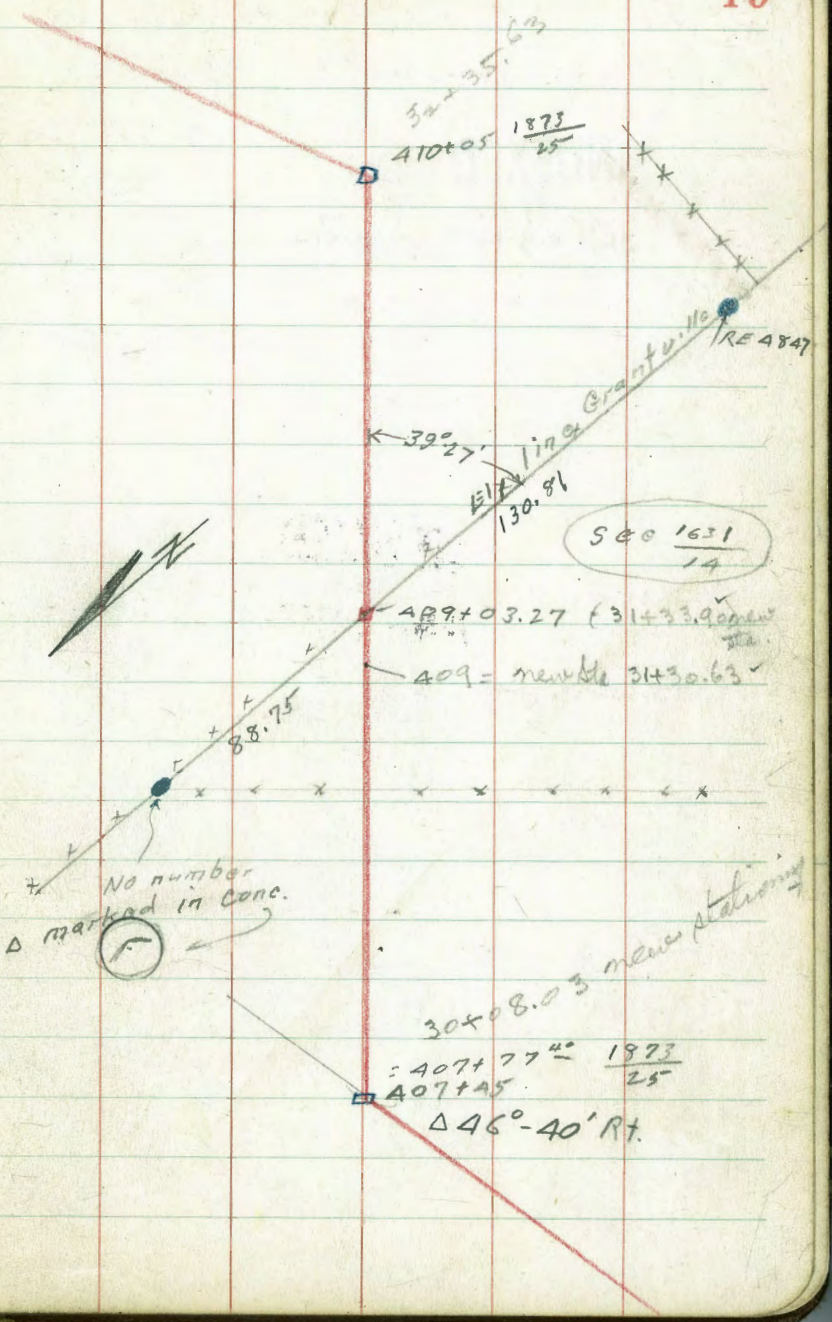
Sommermeyer
McCoy
Allen
Rorer



Ties East. line Lot 53
Grantville + out lots

8/20/49

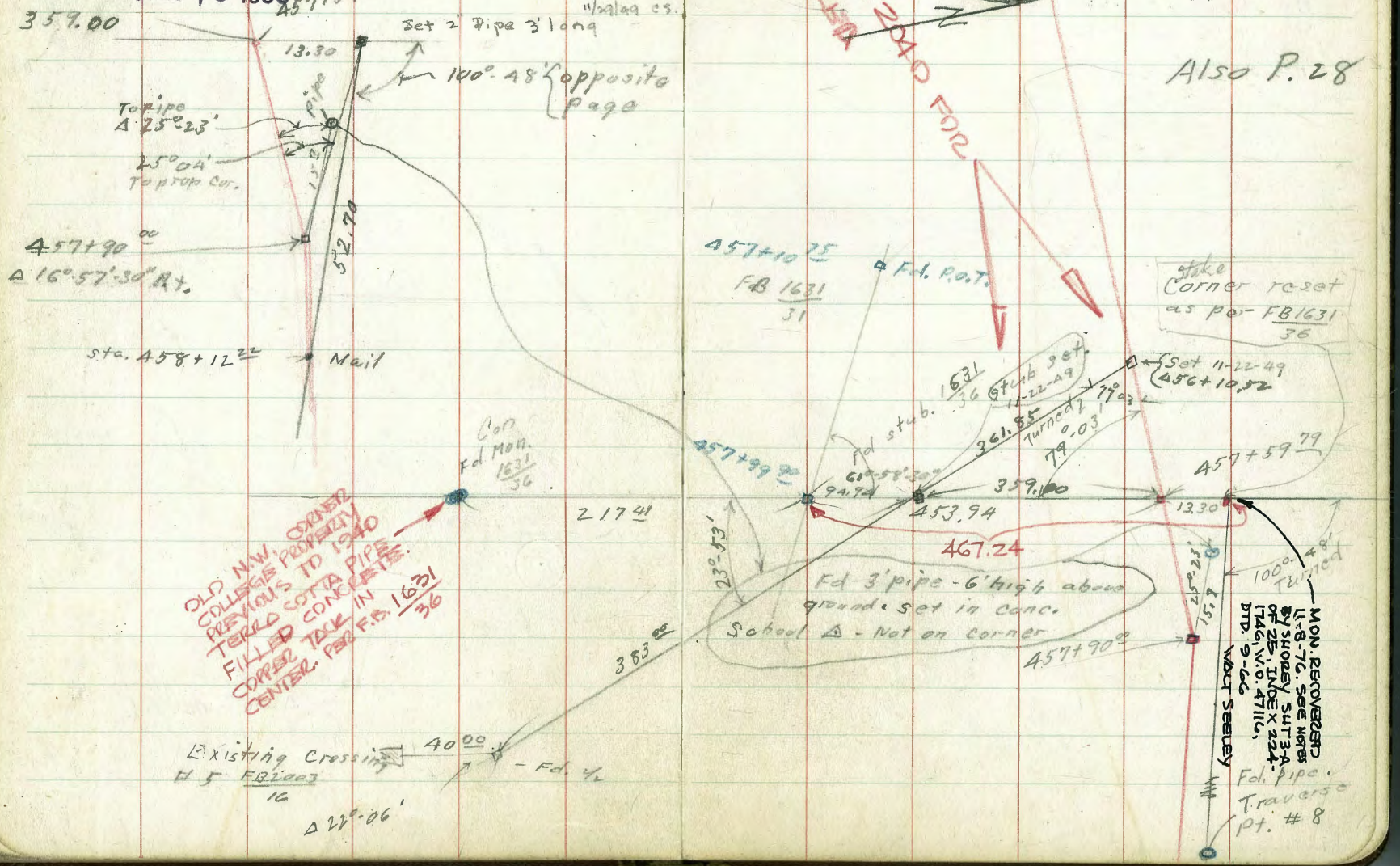
▣ = Fd. Hub
● = Fd Conc. Filled 2" pipe
□ = Set. Hub.



Tie - Wly. line State College

Sta. 457+59 79

8/30/49



Ties at Sta. 512+60.09

Ely. line of college grounds

8/30/49

Sommermeyer
McCoy
Allen
Rorer

■ = Fd. Mon. #1880 (N. Glover)
▣ = " ½ or stub.
□ = set stub.

Tie to state Hy. - Made 11/30/49

set stub
11/30/49

514+03.95
Δ 39°-45' Lt. (P.42)

B.C curve Lt.
Fd. state Hy. Mon
11/30/49

Sewer Manhole

Scc 20.54/25

15'

46°-02'

72.85

218.16 chained

291.16 (1-9-49)

Large palm.

512+60.09
Intersect Ely. line
State College Grds.

332.22 chained

79°25'

374.34 Map.

386.62 Map

Highway

Sly. line 376.13

N.W. line State grounds College

L. Hle

Mur-ray

Lake

E.C. curve Rt.
Fd. state Hy. Mon.
11-30-49

508+15.70
Δ 37°-46' Rt. (P.42)

Additional notes on Location of fences, Bldgs. etc. 9/29/49

381+52.15 to.

see 2003/28

+92 4' Rt = Cor. shed

+91 = barb. wire fence.

+83 9' Rt. = Cor. shed

+63.2 = 2' Rt. = 6" diam. olive

383+55 chicken wire fence

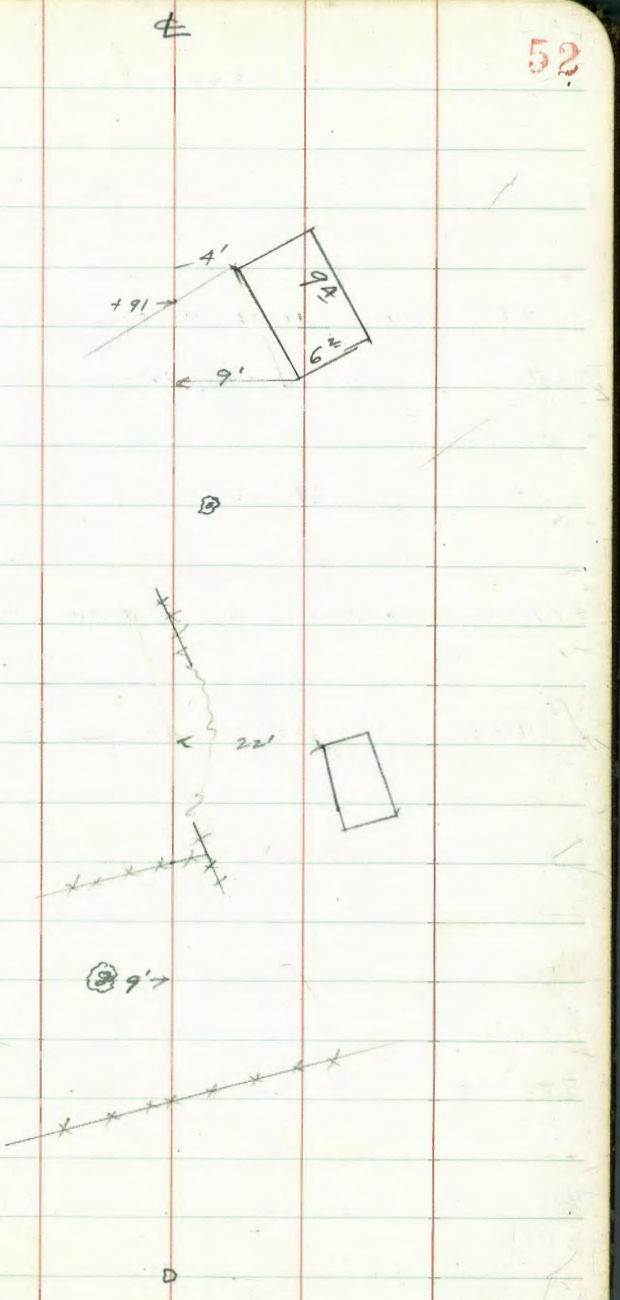
383+48 22' Rt. = Cor. House

383+42 = chicken wire fence

382+99 - 9' Lt. = Pepper tree Tripple trunk (12" diam)

382+49 cross chicken wire fence

381+52.15
Δ 16°-45'-30" Lt. 2003/28 + 1873/29



Station same as in $\frac{1631}{12}$

9/29/49

391 +74

+61 10' Rt. = End board fence

391+56 $\frac{72}{}$ = Δ 11°-41' Lt.

+14 4' Rt. = start board fence

+11 11' Rt. = Cor shed

391+02 8' Rt. = Cor. shed

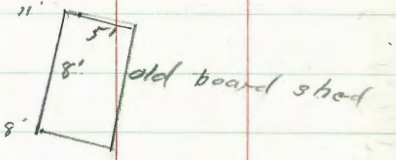
+98 7' Rt. = Power pole

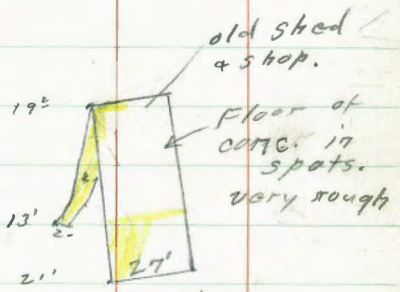
390+75 19½' Rt. = cor. shed

+54 13' Rt. = start conc. wall

390+25 21' Rt. = cor shed

388+90 $\frac{75}{}$ Δ Rt. 55°-56' $\left(\frac{1631}{12}\right)$





9/29/49

394+45	31.5	Rt. ℄ Circular water trough. 4' outside diam		
T.P.	1.53	(79.72)	11.30	(78.19)
393+71.61	0.68	(89.49)	—	88.81

P.O.T. 1631 / 13+20

69.3 71.3 74.1 72.8 74.6 78.7

10.4/50 8.4 5.6/33.5 6.9/35 5.1/70 1.6/100

Ord.

(79.72) Top of cone.

89.49

9-29-49

See P. 30

+93 12' Lt. = Pole # 519746H

+73 14' Lt. = deadman

+40

375+15 Top of bank

375+01 Toe of bank

374+89.6 2003 / P33

376+47.8 P. 30 7.57 (88.92) ↓ — 81.35 on △ stub

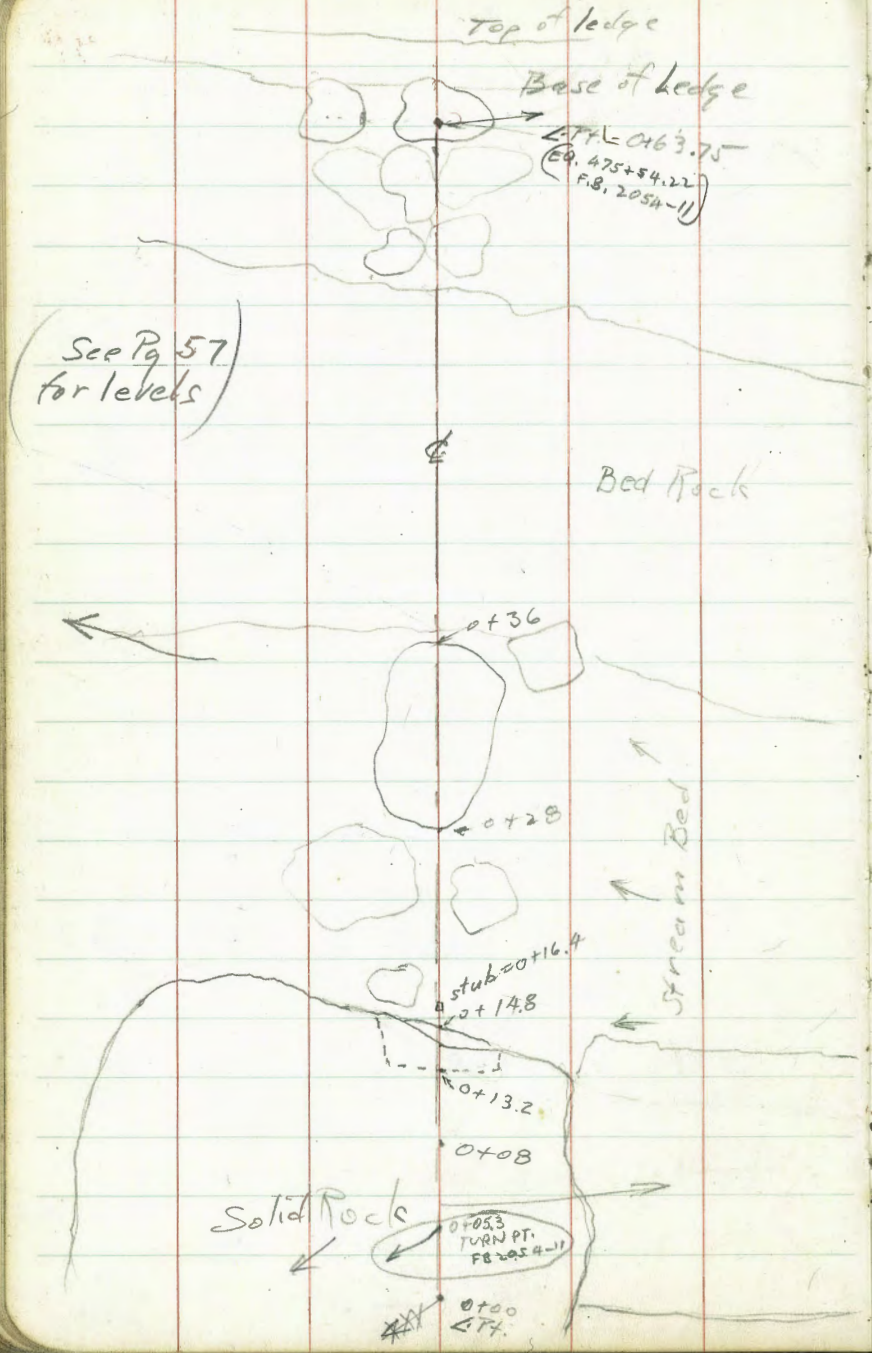
85.1 ✓
3.8

85.0 ✓
3.9

80.1 ✓
8.2

80. ↓ ✓
8.5

(88.92) ↓


Top of ledge
Base of ledge
℄ Trk = 463.75
(Eq. 475+54.22
F.B. 2054-11)
(See Pg 57 for levels)
℄
Bed Rock
0+36
0+28
Stream Bed
stub = 0+16.4
0+14.8
0+13.2
0+08
Solid Rock
0+05.3
TURN PT.
FB 2054-11
0+00
℄ Trk.

10/10/49. #1 Bridge Site
NO. 20129
H. Newcomb
McCoy
W. Moore

Profile of Sewer X-ing of Wash
Above Sta. 473+96.66 (2003/58)
as Recommended by H. Cole
(See Pg 56 for Sketch)

		Lt.	℄	Rt.
0+15	Bottom of Wash. (Gravel)	198.1 ✓ 21.5 / 10	213.3 ✓ 6.3 / 5	213.3 ✓ 6.3 / 3.
+14.8	Lower level of Rock forming Niche	204.0 ✓ 15.6 / 2	208.9 ✓ 15.7	204.9 ✓ 14.7 / 5.5
+14	Overhang on ℄	207.1 ✓ 12.5 / 2.0	207.1 ✓ 12.5	207.1 ✓ 12.5 / 1.8
+13.5	Break at edge of Rock	214.0 ✓ 5.6 / ✓	213.2 ✓ 6.2	212.2 ✓ 7.4 / 1
+13.2	Underhang forming Niche in Rock	207.6 ✓ 12.0 / 2.0	207.6 ✓ 12.0	207.6 ✓ 12.0 / 1.8
0+08	High pt. (± 3' Higher)	214.8 ✓ 4.8 / ✓	215.1 ✓ 4.5	214.4 ✓ 5.2 / 4
0+00	Proposed ℄ out of X-ing Solid Rock	214.6 ✓ 5.0 / 5	214.5 ✓ 5.1	213.3 ✓ 6.3 / 5
Stake at 473+96.66 2003/63	1.05 (219.61) ✓			(218.56) ✓

	Lt.	℄	Rt.
		Face of Ledge	Broken Ledge
		Edge of Rock	Solid Rock

(219.61) ✓

		Lt.	℄	Rt
0+63.7	3' x 3' x 4' Rock over ⌊ Pt. 3' Lt. Large Boulder	216.1 3.5 / 10 Ledge	215.9 3.7 / 5.0	217.2 7.4 / 7.8	211.5 8.1 (Natural Ledge Approx)	214.8 4.8 / 2	215.8 3.8 / 10 Ledge
+57	center of Group of Large Rocks	216.4 3.2 / 10 Conchal Ledge	215.6 4.0 / 3	208.2 11.4 Toe on Bed Rock	208.4 11.2 / 8	215.1 4.5 / 9 Ledge	214.4 5.2 / 10
0+49	Section across Bed Rock		11.7 / 10 Face of Ledge	208.3 11.3	11.4 / 10		
+36	Begin Exposed Bedrock - End L.R. 2' Rt. 4' x 6' Loose Rock	205.9 13.7 / 11	207.6 12.0 / 5 Stream Bed	208.2 11.4	205.4 14.4 / 5	207.7 11.9 / 10	
+33	High point of Large Rock			211.6 8.0			
0+28	Begin Large Rock	200.0 19.6 / 12	208.0 11.6 / 11 Large Piece of Ledge	208.3 11.3 / 3	206.1 13.5 / 5	206.1 13.5	210.4 9.2 / 2 L.R.	204.4 15.2 / 3	206.0 14.6 / 5 Stream Bed
0+14.4	Stub. 2' Ht. 4'x4' Boulder			204.6 15.4					

(219.61)

Lt. ℄ Rt

0+68 Face Ledge at top

220.6 ✓
+1.0

0+66 Base of Ledge (Projection of ℄)

218.9 216.5 212.0 ✓ 214.2 215.4
0.7 / 10 — 3.1 ✓ — 7.6 — 5.4 / 1 — 4.2 / 10

⟨219.61⟩ ✓

10/10/49 Profile of Sewer Xing of Wash Above 480 + 15.68 as Recommended by M. Cole (see pg 63 for Sketch) 2003 WO 20129

		Lt.	℄	Rt.
0+08	On Lower Ledge	246.0 12/12	248.0 10/10	245.0 13.0/8 — 242.5 15.5 — 241.0 17.0/3.0 Dirt — 241.9 16.1/2.0 Edge Ledge — 241.8 16.2/5.4 Base of Ledge to Sounds — 245.8 12.2/2.1 Side of Ledge to Sounds
0+07	Extreme of Overhang		250.6 7.4	
0+05	Junction of Bottom of Overhang and Lower Ledge		250.2 7.8 — 247.6 15.4	
0+04.7	Edge Ledge	257.1 0.9/10	254.1 3.9/2 — 253.6 4.4	252.6 5.4 — 245.6 12.4/6.4 — 250.4 7.6/10
0-06	On Solid Ledge		257.1 0.9/10 — 255.4 2.6	253.5 4.5/10
0+00 = 480+15.68 + 200.3 = 480+16.20 (see FB 2054-16)	X in Rock (℄ 3' up)	256.3 1.7/10	256.3 1.7/6.5 — 255.2 2.8/60 — 254.4 3.6	252.8 5.2/9 — 250.8 7.2/11
Stub at 480+78.5 = 200.3 = 66	1.25 ⟨258.05⟩	256.8	⟨258.05⟩	

0+45	Top of Broken Cube of Rock	19.0 / 7 / 10 / 6	25.1 / 6.3 / 30 Top Corner Ledge	24.7.7 / 10.3 / 5.5	24.2.8 / 1.5 / 2 Edge Broken Cube	24.4.8 / 15.2	23.9 Rt / 18.1 / 0.5 Bed Rock	24.0.2 / 17.8 / 8 Toe Loose Rock	24.3.9 / 19.1 / 10
0+44	Corner Ledge (Corner loose Cube of Rock)	24.0.16 / 17.9 / 10	23.8.3 / 18.7 / 5	240.0 / 18.0 Sand at Toe		240.2 / 17.8 Toe			
0+30			17.7 / 10	240.0 / 18.1		17.8 / 10			
0+24			18.7 / 10	240.0 / 18.0		18.0 / 10			
0+20	℄ Low Water Channel	238.7	19.3 / 10	238.0 / 20.0		238.3 / 19.7 / 5 in low channel		240.0 / 18.0 / 10	
0+13.7	Edge Lower Ledge	239.7 / 19.3 / 10.2 stream bed	245.1 / 12.9 / 10	242.0 / 16.0		239.3 / 18.7 / 0.4	237.9 / 0.1 / 10 Low Channel		
0+12			245.5 / 12.5 / 10	242.2 / 15.8	241.3 / 16.7 / 3.7 Corner Lower Ledge		239.4 / 18.6 / 4.0 Stream Bed	239.0 / 19.0 Open Stream Bed	

(258.0)

0+67	Upslope on Projection of Same line
Stub 0+56.8	Proposed ℄ Lt.
0+54	On Natural Slope
+49 to +50	Loose Boulder
0+47	
0+46.8	Back edge of Broken Cube of Ledge

Lt. ℄ Rt.

262.3 | 262.05 | 263.2 | 261.0

+4.3 / 10 | +4.0 | +5.2 / 6 | +3.0 / 10 Solid Rock

255.0 | 255.5 | 254.1 | 253.8 | 254.8 | 254.8

3.0 / 10 | 2.5 / 3 | 3.9 | 4.2 / 1.1 | 3.1 / 8 | 3.2 / 10

Natural Slope (Loose Rocks Between) Solid

254.1 | 253.6 | 251.4 | 251.4 | 248.8

3.7 / 10 | 1.4 / 4 | 6.6 | 6.6 / Broken Rock | 9.6 / 10

Solid Ledge

253.4
4.6

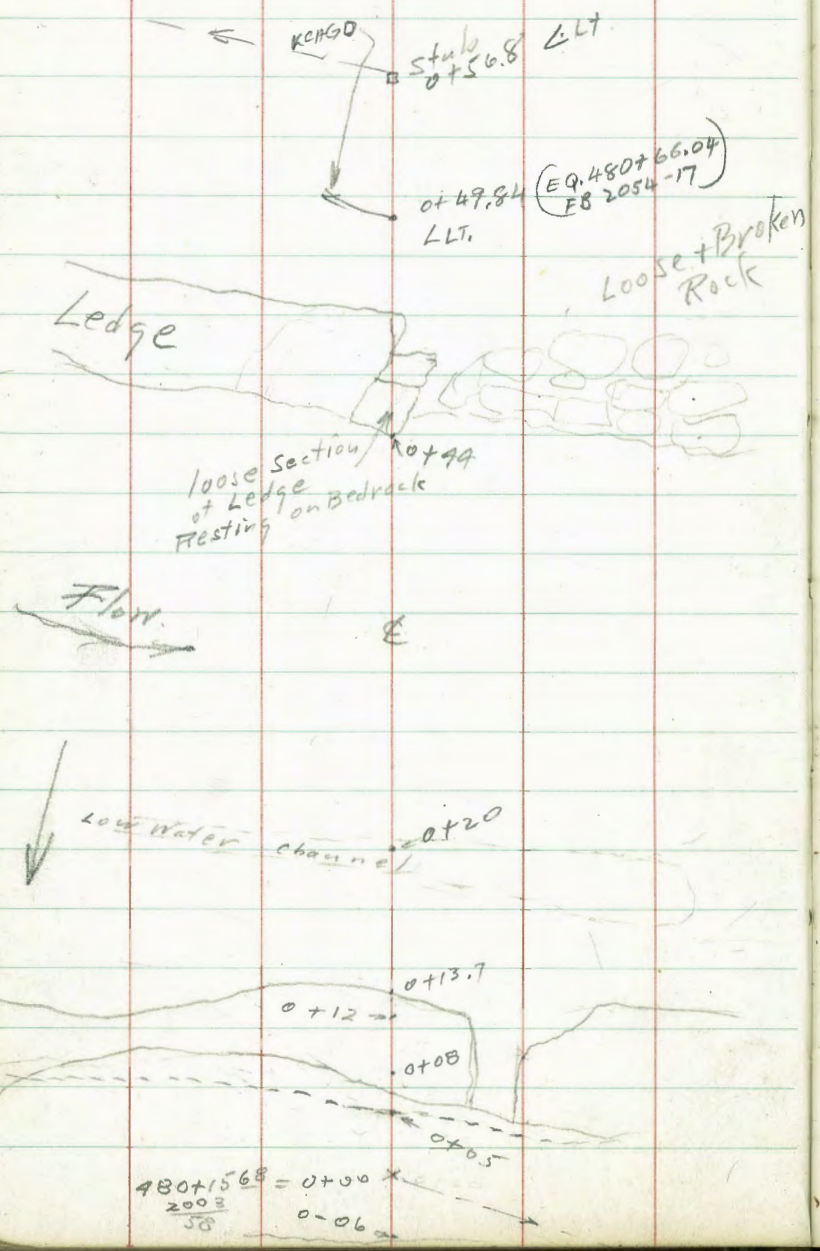
239.5 | 250.9 | 251.6 | 252.0 | 247.4 | 246.8 | 245.1

18.5 / 11 | 7.1 / 10 | 6.4 / 7 | 6.0 / 1.1 | 10.6 | 11.2 / 4.0 Edge Ledge | 12.9 / 10 Loose Rock

243.3
14.7

[258.05]

(See Pg. 60 for Levels)



11-22-49

Levels $446+31^{39}$ to $451+97^{48}$

+38

+18

448 ~

+85

+67

+28

447 ~

+62

$446+31^{39}$ Δ = 14°-59' Lt.

5.09 ⟨114.58⟩ ✓ — ⟨109.49⟩ ✓ 447+00 R.37

108.1 ✓
6.5

106.4 ✓
8.2

106.9 ✓
7.7

108.6 ✓
6.0

105.6 ✓
9.0

108.4 ✓
6.2

108.[illegible] ✓
6.4

107.5 ✓
7.1

106.67 ✓
7.91
Stub

⟨114.58⟩ ✓

11/24/49

(= old Sta. 452+00 Δ 5°-07' Rt. P.28)

451+97 43 : Δ 3°.06' Rt.

+50				
451 ~				
450+50				
T.P.	7.19	⟨120.01⟩ ✓	1.76	⟨112.82⟩ ✓
450 ~				
+50				
449 ~				
448+50				
		⟨114.58⟩ ✓		

113.6 ✓
6.40
Hub.

113.9 ✓
6.1

114.3 ✓
5.7

113.5 ✓
6.5
⟨120.01⟩ ✓

112.7 ✓
1.9

111.6 ✓
3.0

109.9 ✓
4.7

108.8 ✓
5.8

⟨114.58⟩ ✓

Levels 446+31.30 11-22-49

Sly. to Crossing #4 (2003-P15)

3+23.4 = Start. @ existing sewer crossing

3 —

2+50

T.P. 12.84 (131.21) 0.73 (118.37) T.P.

2 —

+50

1+23.4 (Aprox ℄ old line)

1 —

+50

+19

0+00 = 446+31.30 (P. 64) sketch-P 27.

12.43 (119.10) — (106.67) 446+01.30 P 64

℄

130.6
0.6 End.

129.9
3.3

123.0
8.2
(131.21)

116.9
2.2

112.5
6.6

111.5
7.6

110.3
8.8

110.5
8.6

109.9
9.2

106.7
12.43

(119.10)

66

11/28/49.
C.S.
N.

Levels

F.B. 2003
37

413+to 433+

T.P.	6.00	⟨91.60⟩ ✓	12.21	⟨85.60⟩ ✓	
415 —					
+89	22' Rt. = outlet 48" Culvert				
+75					
+60					
414 —					
+70					
+87	Δ 2°-32' Lt.				
413+57	35+87.63				
	5.55	⟨97.81⟩ ✓	—	⟨92.26⟩ ✓	Also in Hub. A10+25 2003 39

Sketch N 0° 00' W

2003
1

4

67

84.7 ✓
13.1

80.4 ✓ 80.26 ✓
12.4 17.55
22
I.E.

80.1 ✓
17.7

85.0 ✓
12.8

86.7 ✓
11.1

86.8 ✓
11.0

88.8 ✓
9.0
Cond.

88.9 ✓
8.9

⟨97.81⟩ ✓N

T.P.	12.14	(93.88) ✓	9.86	(81.74) ✓
420~				
419~				
				(+0.33 / 90.51 / 90.84 } = state)
State B.M. (130' off. state ℄)				6.12
Aprox 64' Lt. of. 418~			6.88	(84.72) ✓
418~				
+52	$12\frac{3}{}$	Rt. = outlet 42" Culvert		
417~				
B.P. S.E. Car Blow off value Box Lt. 416+07			10.45	81.15
416~				
+80				
415+54				
		(91.60) ✓		

℄

81.1 ✓
10.5

80.3 ✓
11.3

80.1 ✓
11.5

79.6 ✓
12.0

80.10 ✓
11.50
12.2
I.E.

80.1 ✓
11.5

80.8 ✓
10.8

81.1 ✓
10.5

86.3 ✓
5.3

(91.60) ✓

428 ~					91.9 ✓
					8.1
427+44.20	stub.	R.O.T.			92.2 ✓
T.P.	6.59	⟨99.99⟩ ✓	0.48	⟨93.40⟩ ✓	7.80
					⟨99.99⟩ ✓
427 ~					92.5 ✓
					1.4
426 ~					90.0 ✓
					3.9
425 ~					88.1 ✓
					5.8
424 ~					84.1 ✓
					9.8
423 ~					83.7 ✓
					10.2
422 ~					82.7 ✓
					11.2
421 ~					81.8 ✓
					12.1
		⟨93.88⟩ ✓			⟨93.88⟩ ✓

				℄
+92				98.4 ✓ 1.8
+70				97.9 ✓ 2.1
+38				96.0 ✓ 4.0
431+26.50	△	RT		94.42 ✓ 7.58
+05				94.00 ✓ 8.0
431 ~				96.4 ✓ 3.6
430+90				98.1 ✓ 1.9
Set B.M. on Hub 62.57 Lt 430+00		6.07	(93.92) ✓	
430 ~				95.4 ✓ 4.6
429 ~				93.4 ✓ 6.6
		(99.99) ✓		(99.99) ✓

				−0.09		
BM #68				95.93		
1629 / 11	spike in tree		3.97	96.02 ✓		
					89.5 ✓	
+07					10.5	
					95.5 ✓	
433 —					7.5	
					98.3 ✓	
+85					1.7	
					91.1 ✓	
+73					8.9	
					91.3 ✓	95.5 ✓
+55	12.8' Rt. : outlet 42" culvert.				8.7	4.5
						12.8
						I.E.
					99.1 ✓	
432+13					7.9	
					99.99 ✓	
		(99.99) ✓				

Levels Connection to #5 Freeway Sking (Photo Page 50.) 11-29-49 $0 McCoy Track K.

5+00			5.7	134.4 ✓	
+40			8.6	131.5 ✓	
+68			12.3	127.8 ✓	
5+75			10.8	129.3 ✓	
T.P.	12.82	⟨140.14⟩ ✓	1.10	⟨127.32⟩ ✓	
6+20			2.0	126.4 ✓	
6+50			5.0	123.4 ✓	
6+75			6.9	121.5 ✓	
7+00			8.5	119.9 ✓	
7+33			12.2	116.2 ✓	
7+44.85 to South A56+10.5 ✓			12.05	116.37 ✓	
			5.36	123.06 ✓	Top Pipe S.W. Cor. State Bal Coop
Stub A57+90 Page 39	7.87	⟨128.42⟩		⟨120.55⟩	

2+30			9.3	153.7	
2+55			12.0	151.1	
T.P.	12.21	(163.05)	0.07	(150.84)	
3+00			2.4	148.5	
3+50			2.7	148.2	
3+83 [illegible]			3.32	147.59	ground
4+05			11.0	139.9	
4+29			12.6	138.3	
4+[illegible]			11.[illegible]	139.6	
T.P.	11.96	(160.91)	1.19	(138.95)	
4+50			1.2	138.9	
4+80			4.5	136.6	
		(140.14)			

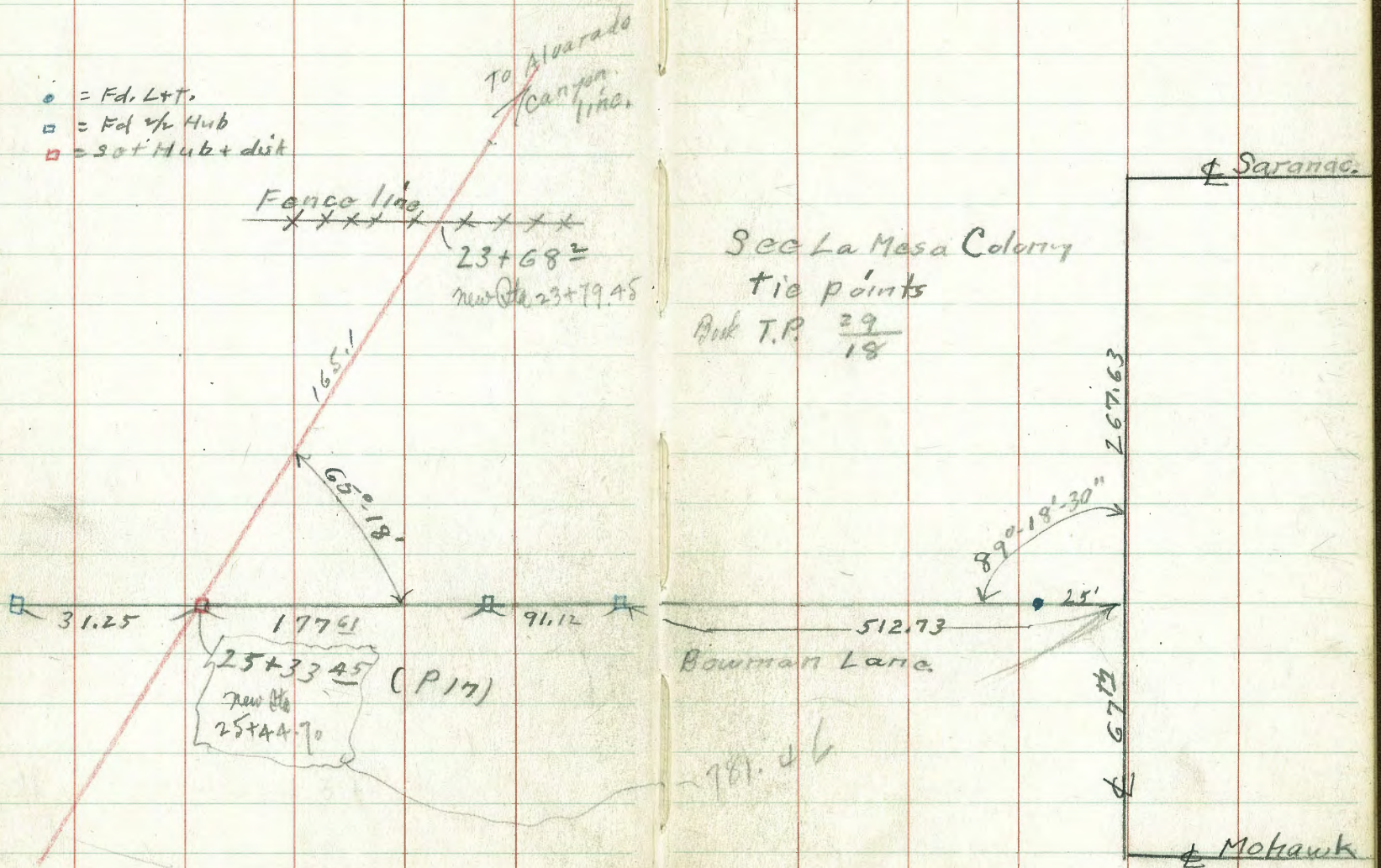
Sketch Page 50.

0 – 50				Toe Freeway Fill 30 high.
0 – 40	#5 Xing Freeway. Est. end of Pipe	+2.2	185.9	
0 = Hub 40' Hwy #5 Xing + on Extension of Xing. Δ 22° 06' Lt		5.29	⟨178.40⟩	2003 25
+25		4.3	179 4	8" Tree on
+60		5.0	178.7	
0+91.3 – Pot. 9.35	⟨183.69⟩	1.24	⟨174.34⟩	
1+00		2.2	173.4	
1+15		5.8	169.8	
1+40		8.7	166.9	162.4 155.4 13.2 20.4 R 9 R 14 Creek
T.P.	12.84	⟨175.58⟩	0.31	⟨162.74⟩
1+75		0.6	162.4	
2+06		5.4	157.6	
		⟨169.05⟩		

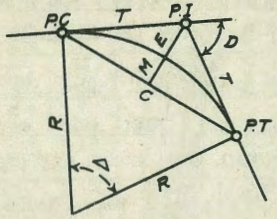
186.58
2.00
184.51
6.12
178.39

Ties at 25+33.45 (P. 17)

12-13-49



DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES



CURVE FORMULAS

Radius=R=$\frac{50}{\text{sin. } D/2}$ (1) Degree of Curve=D and sin. $\frac{D}{2}=\frac{50}{R}$ (2)

Tangent=T=R tan $\frac{\Delta}{2}$ (3) Length of Curve=L=$100\frac{\Delta}{D}$ (4)

Middle ordinate=M=R(1—cos. $\frac{\Delta}{2}$) (5)=Rvers $\frac{\Delta}{2}$ (6)

External=E=T tan $\frac{\Delta}{4}$ (7)=R ÷ cos. $\frac{\Delta}{2}$—R (8)=R exsec $\frac{\Delta}{2}$ (9)

Long Chord=C=2 R sin. $\frac{\Delta}{2}$ (10) Δ=Central Angle

EXPLANATION AND USE OF TABLES

Stations.—Given P. I.=Sta. 161+60.35 to find Sta. of P. C. and P. T. Δ=62° 10′ D=8° 20′. From Table IV for 1° curve T=3454.1 and ÷8⅓=414.49 ft. From Table V correction=.36 or T=414.85 ft. P. C.=Sta. P.I.—T=157 +45.50. Also from (4) L=746.00 and P. T.=Sta. P. C.+L=164+91.50.

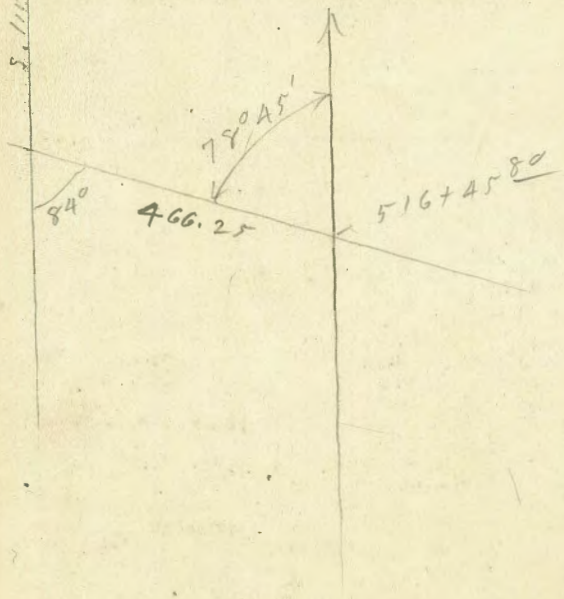
Offsets.—Tangent offsets vary (approximately) directly with D and with square of the distance. Thus tangent offset for Sta. 158 on above curve is 2.16 ft. found as follows. From Table III tangent offset for 100 ft.=7.27 ft. Distance=158—Sta. P. C.=54.50, hence offset=7.27 $(54.50 \div 100)^2$=2.16 ft. Also square of any distance divided by twice the radius equals (approximately) the distance from tangent to curve. Thus $(54.50)^2 \div (2 \times 688.26)$=2.16 ft.

Deflections.—Deflection angle=½ D for 100 ft., ¼ D for 50 ft., etc. For c ft.=(in minutes) .3 x C x D° or=defl. for 1 ft. from Table III x C. For Sta. 158 of above curve=.3 x 54.5 x 8⅓=136.2′ or 2° 16.2′, or=2.50 x 54.5=136.2′ from Table III. For Sta. 159 deflection angle=2° 16.2′ +8° 20′ ÷2=6° 26.2′, etc.

Externals.—May be found in similar manner to tangents. Thus E for curve above is 115.37. For from Table IV for 1° curve E=960.6 for 8° 20′=960.6 ÷8⅓=115.27 and from Table V correction=.10 or E=115.37 ft. Or suppose Δ=32° and E is measured and found to be 42 ft. What is D? From Table IV E=230.9 and ÷42=5.5 or D=5° 30′.

5 - 4321 70109
431 26.20
14389

508+59.54
1570
4384
43,00
97.04



DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

Roadway 16 feet wide. Side Slopes 1 on 1½

For Single Track Embankment.

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

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

MADE IN U.S.A.