





# 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  $30.6 + (20 - 16) \div 2$  or 2 ft. added to 30.6 = 32.6. For slopes of 1 on 1½ see inside of back cover.

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10356  
681

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Book 681

Indexed to P 71 - 2/7/46  
" P 76 - 1/12/47  
" P 36 - 9/19/47  
" P 39 - 3/10/48

P.L.

SAN VICENTE - SECOND MAIN LOC.

P.L. Loc. San Vicente Second Main - thru Dixon yards;  
between caretakers house and garage to junction  
with existing line at Sta. 23+574 1-5  
Profile and X-sections - San Vicente P.L. 2<sup>nd</sup> Main 6-13  
Second Main alignment continued 14-34  
Property ties for easement thru Kuhner property 35  
  
Profile & X-sections - San Vicente 2<sup>nd</sup> Main 40-68  
San Vicente 2<sup>nd</sup> Main P.L. Alignment 6190<sup>00</sup> - 14125 69  
" " " " " Profile and X-sections - 70-71  
Check Survey from 0100 to 9186<sup>50</sup> San Vicente  
Second Main 73-74  
X Sec. 1<sup>st</sup> San Vicente Main 41+90 to 41+28 75-76  
Location Tentative of Spooling Meter valve chamber  
& 2<sup>nd</sup> San Vicente P.L. P. 5  
Line Change San Vicente 2<sup>nd</sup> Main P. 77  
Levels for above line change P. 78  
Well Survey S. V. 2<sup>nd</sup> Main vicinity 154736 P. 36  
Re. X Sec. East Tunnel Portal 438+22 to  
449+62 4<sup>th</sup> Tunnel Portal P-39



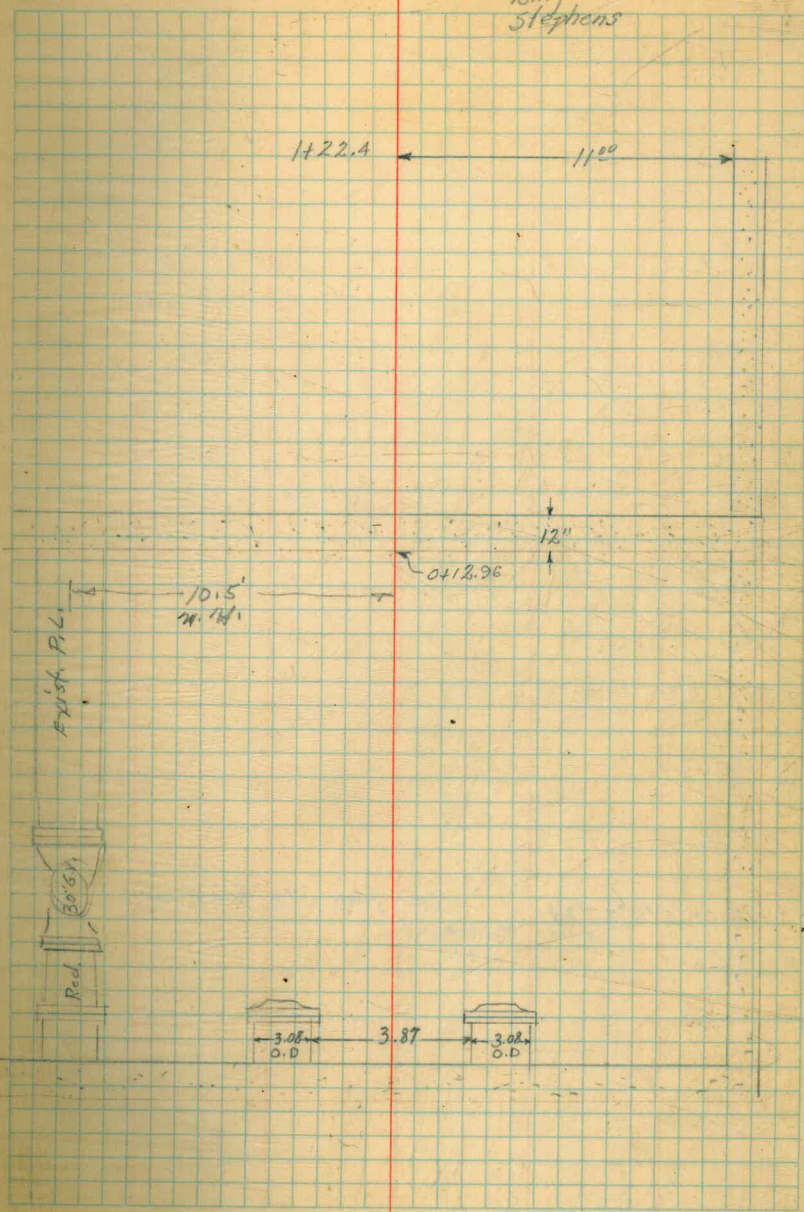
P.L. Loc. San Vicente Second Main

March 16, 1945

Soper  
King  
Stephens

0+00 = FLANGE OF OUTLET PIPE - SAN VICENTE DAM.

0-8758 First San Vicente P.L. (Book 666 page 10) = 0+00





3+18.00  $\Delta$  16° 22' RT  
23'  $\leftarrow$  checked 1/1/07  
3+17 68  
J.C.S.

See page 73 for R.P.'s



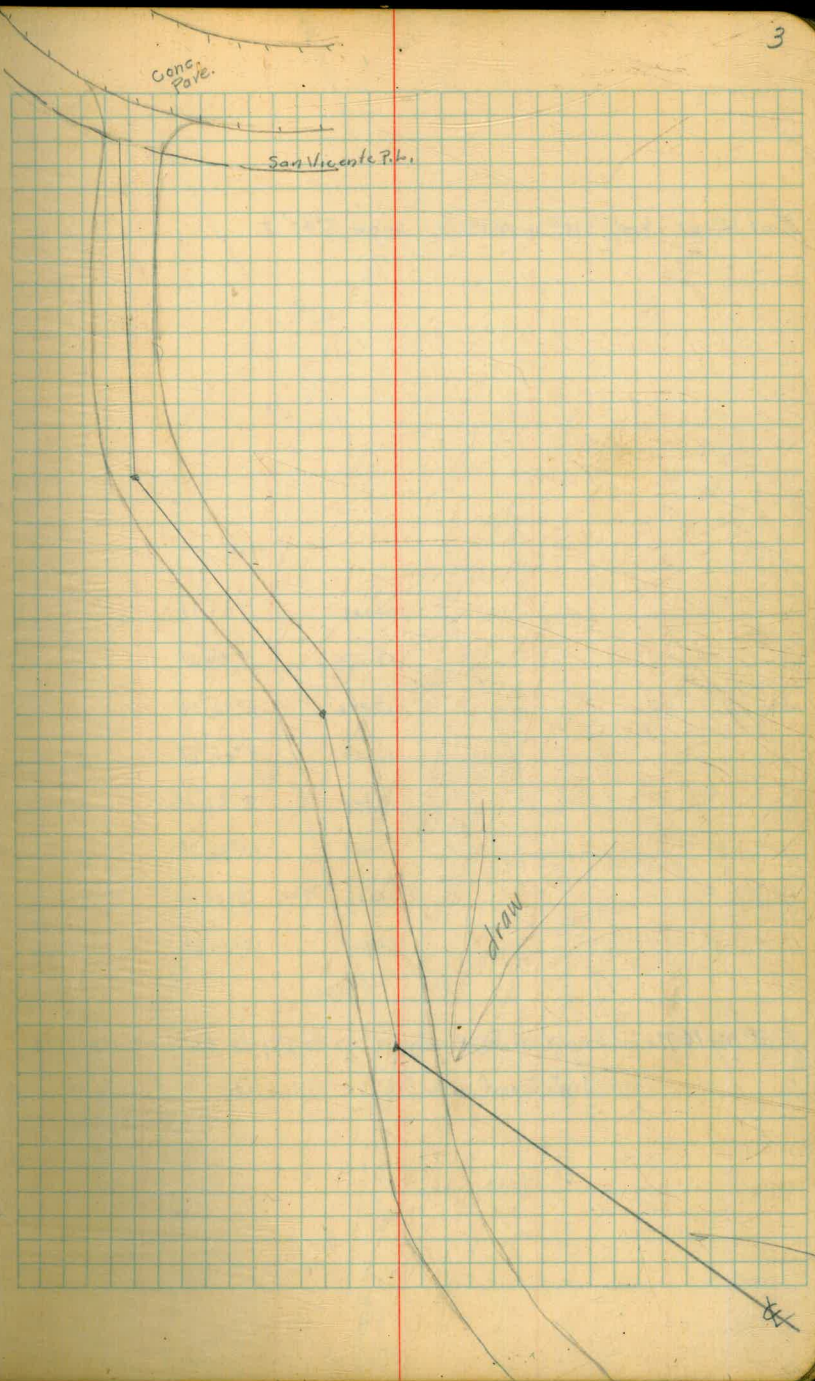
10+16.71 Intersection with existing San Vicente pipeline, sta  
8+77 as located with pipe locator

8+92.00 @ 23°00' RT

7+68.00 @ 25°00' Lt

6+90.00 @ 49°30' RT

Cont'd. on page 69



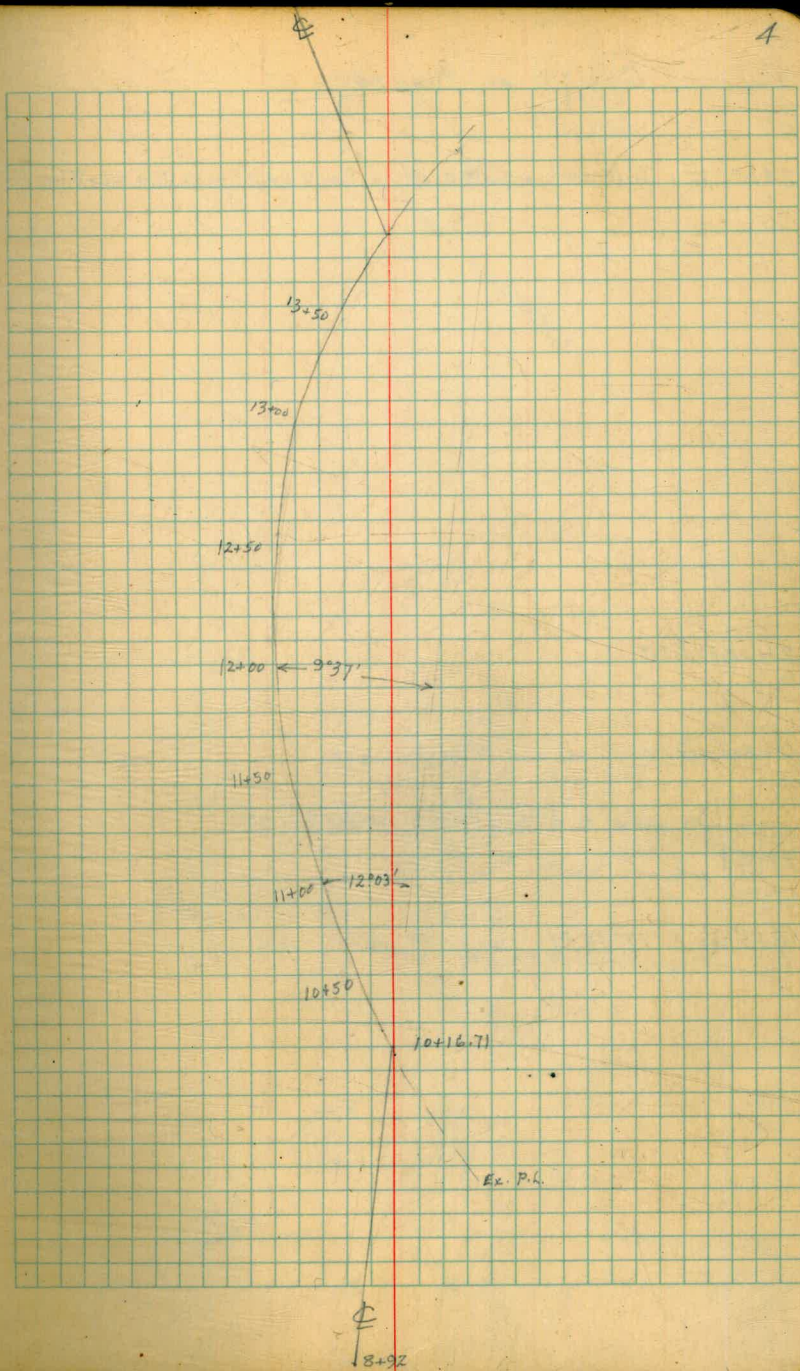


X at 14+00 - backsight on 10+16.71 - angle  $6^{\circ}40' \text{ Lt}$ .

14+00	$1^{\circ}03' \text{ Lt}$
13+50	$3^{\circ}40' \text{ Lt}$
13+00	$6^{\circ}10' \text{ Lt}$
12+50	$8^{\circ}00' \text{ Lt}$
12+00	$9^{\circ}37' \text{ Lt}$
11+50	$10^{\circ}32' \text{ Lt}$
11+00	$12^{\circ}03' \text{ Lt}$
10+50	$13^{\circ}56' \text{ Lt}$

X at 10+16.71 - backsight on 8+92, deflection angles to existing pipeline

This line used as basis for X-section





CONTD on Page 14

24+28.75 - Intersection with existing San Vicente pipeline sta 23+57.4

2:14:00 P.M.T.

19+85.2+ - POT 1x1" sub r optoc

~~15+75.4~~ L to E of Sparling Meter House  
19+38

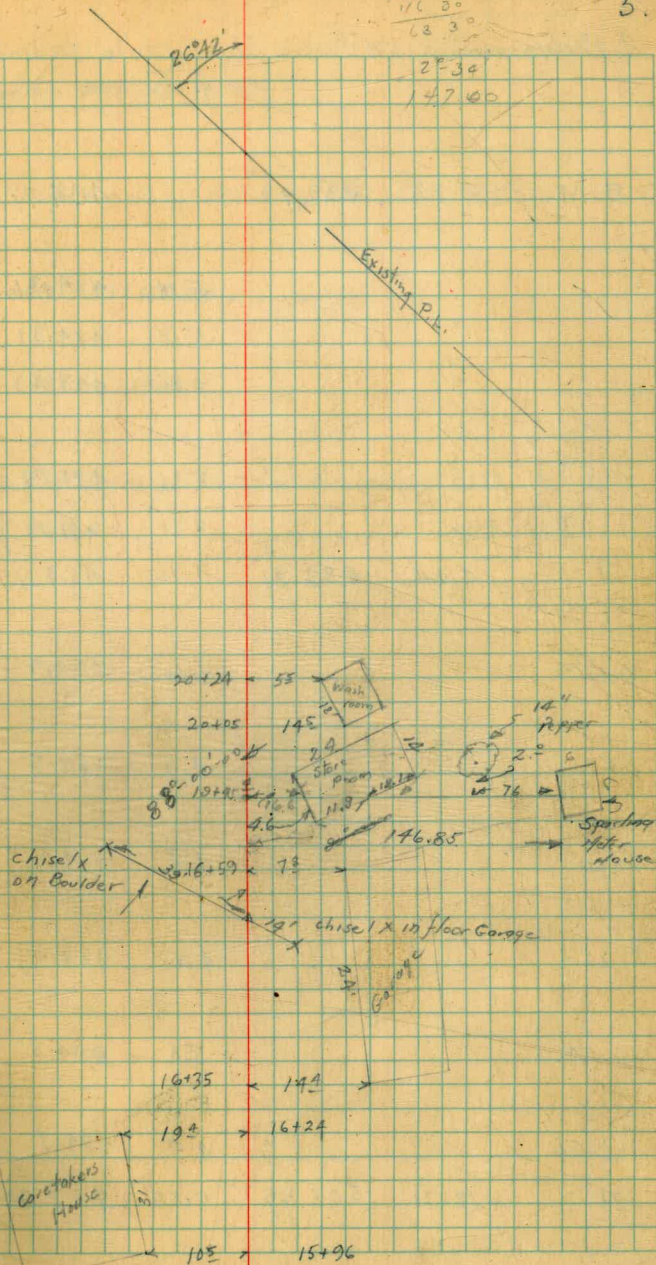
16+51.00  $\Delta$  10° 10' Rt. Jan 2-47  $\Delta$  EB OK

Checked in Field

179.60  
116.80  
62.80

5.

2° 30'  
147.00





Profile and x-sections San Vicente Second Main P.L.

B.M.	4.72	489.49		484.77
			5.18	484.31
			5.18	484.31
			9.86	479.63
			8.31	481.18
			8.31	481.18
TP	4.44	489.21	4.72	484.77
0+14			4.9	484.3
0+50			4.7	484.5
1+00			4.8	484.4
1+22.4			4.8	484.4
1+50			5.0	484.2
+60			4.5	484.7
TP	12.71	501.66	0.26	488.95

March 20, 1945

Soper - notes - chain

King - X

Stephens - red - chain

6

Notes reduced by M.W. Apr. 19, 1945

Top of conc. wall of spillway - East end of dam - Book 666-62

Top of center outlet - 3.08 o.d. pipe

" " West " " " "

Floor level - between outlets

Bottom of 40" x 38" opening ahead of center opening, 0+13

" " 40" x 38" " " " " " 0+13



Ground level - outside valve house



501.66 ✓

2+00			10.2	491.5 ✓
+30			6.1	495.6 ✓
+50			5.7	496.0 ✓
+62			4.7	497.0 ✓
TP	8.35	509.79 ✓	0.22	501.44 ✓
2+87			9.9	499.9 ✓
3+00			5.6	504.2 ✓
+18 Δ			5.3	504.5 ✓
+50			4.7	505.1 ✓
+80			4.4	505.4 ✓
+87			3.1	506.7 ✓
4+00			3.3	506.5 ✓
TP	2.50	509.05 ✓	3.24	506.55 ✓
4+50			2.2	506.9 ✓
+69			3.4	505.7 ✓
5+00			5.9	503.2 ✓
+10			6.9	502.2 ✓

7.



509.05 ✓

5+50		7.7	501.4 ✓
6+00		9.1	500.0 ✓
+38		11.7	497.4 ✓
TP	0.25	498.36 ✓	10.94 498.11 ✓
G+50		2.1	496.3 ✓
+57		3.1	495.3 ✓
+62		4.9	493.5 ✓
+74		3.7	494.7 ✓
+90 Δ		4.3	494.1 ✓
(Cont'd on pg. 70)			
7+00		5.2	493.2 ✓
+50		9.1	489.3 ✓
+68 Δ		10.6	487.8 ✓
TP	0.89	486.45 ✓	12.80 485.56 ✓
8+00		1.3	485.2 ✓
+50		7.1	477.4 ✓
8+92 Δ		11.0	475.5 ✓
TP	1.07	475.26 ✓	12.26 474.19 ✓

Lt.

€

Rt.

8

Note: These x sections taken with level, and plus rods are from the top.

98.4	94.6	94.1	94.0	87.5
$\frac{0.0}{21}$	$\frac{3.8}{10}$	4.3	$\frac{4.4}{12.5}$	$\frac{10.9}{24.5}$
98.4	93.7	93.2	92.5	87.1
$\frac{0.0}{19}$	$\frac{4.7}{10}$	5.2	$\frac{5.9}{12}$	$\frac{11.3}{26.5}$
96.9	89.8	89.3	89.8	85.5
$\frac{1.5}{32.5}$	$\frac{1.6}{16}$	9.1	8.6	$\frac{13.2}{22.5}$
93.6	88.6	87.8	88.8	84.6
$\frac{4.9}{32}$	$\frac{7.9}{35}$	10.6	$\frac{9.6}{7}$	$\frac{13.8}{14}$
97.9	89.4	89.2	85.9	81.0
$\frac{+11.5}{20}$	$\frac{+2.9}{17}$	$\frac{+2.7}{10}$	$\frac{1.5}{6}$	$\frac{1.3}{8}$
84.7	78.2	78.1	77.9	79.0
$\frac{1.8}{40}$	$\frac{8.4}{27}$	$\frac{8.4}{17}$	$\frac{5.3}{11}$	$\frac{7.1}{8}$
84.2	78.0	74.4	75.8	75.7
$\frac{2.3}{47}$	$\frac{8.5}{25}$	$\frac{12.1}{10}$	$\frac{10.7}{6}$	$\frac{11.0}{8}$
				$\frac{10.8}{19}$
				$\frac{20.7}{34}$
				$\frac{21.3}{45}$
				65.2

Solid rock formation and large boulders

on split of angle

on base  
(not the other)



475.26

9+25		3.2	472.1	✓	
9+50		5.9	469.4	✓	
9+70		8.4	466.9	✓	
10+00		11.9	463.4	✓	
10+16.7 Δ		12.7	462.6	✓	
10+50		14.2	461.1	✓	
11+00		15.4	459.9	✓	
π	9.95	472.81	12.40	462.86	✓
11+50		13.7	459.1	✓	
12+00		14.0	458.8	✓	
12+50		13.7	459.1	✓	
13+00		13.8	459.0	✓	

Lt

±

Rt

9

97.5	83	H. 1. 475.26	72.1	72.0	74.3	65.8	64.8
+22.2	+13.0	+4.7	92.8	3.3	1.0	9.5	10.5
57	34	17	2.5	8	11	22	35

500.00	497.8	89.3	75.8	67.5	66.9	67.0	64.0
+29.7	+22.5	+14.0	+0.5	7.8	8.4	8.3	11.3
67	60	52	17	7	5	5	19

85.2	72.2	65.4	62.6
+9.0	3.1	9.9	12.7
46	26	77	

86.2	72.3	62.6	61.1
+10.9	2.0	12.7	12.2
44	27	15	

88.2	70.6	60.1	459.9
+12.9	4.7	15.2	15.4
52	27	8	

Solid rock formation and large boulders

on split of angle

Boulder 15x15x7 - 30' Lt of line between 11000 and 11150

84.8	75.8	67	59.4	59.1
+12.0	+3.0	6.1	13.4	13.7
46	33	15	75	
95.3	96.3	69.7	58.8	58.8
+22.5	+22.5	3.1	14.0	14.0
82	62	23	8	

92.4	92.4	73.3	59.7	59.1
+19.6	+19.6	6.5	13.1	13.7
62	41	18	5	

89.8	89.8	71.6	59.4	59.0
+17.0	+17.0	6.2	13.4	13.4
63	43	18	6	



472.81 ✓

13+50 13.8 459.0 ✓

14+00 14.5 458.3 ✓

14+20 Top of bank 13.3 459.5 ✓

(Cont'd. From Pg. 72)

14+42 Edge of road 2.4 470.9 ✓

14+78 4.7 468.1 ✓

14+88 0.2 472.6 ✓

TP 10.73 482.04 1.50 471.31 ✓

15+00 9.0 473.0 ✓

+35 10.1 471.9 ✓

+50 4.8 477.2 ✓

TP 10.45 491.22 1.27 480.77 ✓

+75 5.0 486.2 ✓

L4

E

R4

10

$$\begin{array}{r} 82.1 \\ +9.3 \\ \hline 91.4 \\ 55 \end{array}$$

$$\begin{array}{r} 82.1 \\ +9.3 \\ \hline 91.4 \\ 50 \end{array}$$

$$\begin{array}{r} 76.5 \\ +3.7 \\ \hline 80.2 \\ 50 \end{array}$$

$$\begin{array}{r} 76.5 \\ +3.7 \\ \hline 80.2 \\ 58 \end{array}$$

$$\begin{array}{r} 76.5 \\ +3.7 \\ \hline 80.2 \\ 30 \end{array}$$

$$\begin{array}{r} 87.8 \\ +15.0 \\ \hline 102.8 \\ 35 \end{array}$$

$$\begin{array}{r} 87.8 \\ +15.0 \\ \hline 102.8 \\ 45 \end{array}$$

$$\begin{array}{r} 87.8 \\ +15.0 \\ \hline 102.8 \\ 75 \end{array}$$

$$\begin{array}{r} 87.8 \\ +15.0 \\ \hline 102.8 \\ 57 \end{array}$$

$$\begin{array}{r} 87.8 \\ +15.0 \\ \hline 102.8 \\ 37 \end{array}$$

$$\begin{array}{r} 87.8 \\ +15.0 \\ \hline 102.8 \\ 46 \end{array}$$

$$\begin{array}{r} 87.8 \\ +15.0 \\ \hline 102.8 \\ 25 \end{array}$$

$$\begin{array}{r} 87.8 \\ +15.0 \\ \hline 102.8 \\ 25 \end{array}$$

$$\begin{array}{r} 87.8 \\ +15.0 \\ \hline 102.8 \\ 25 \end{array}$$

$$\begin{array}{r} 87.8 \\ +15.0 \\ \hline 102.8 \\ 25 \end{array}$$

$$\begin{array}{r} 87.8 \\ +15.0 \\ \hline 102.8 \\ 25 \end{array}$$

$$\begin{array}{r} 87.8 \\ +15.0 \\ \hline 102.8 \\ 25 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

$$\begin{array}{r} 70.8 \\ 2.0 \\ \hline 72.8 \\ 19 \end{array}$$

split of angle

14+42

14+78

14+88

15+00

15+35

15+50

H.I. 482.04

$$\begin{array}{r} 90.0 \\ +8.0 \\ \hline 98.0 \\ 37 \end{array}$$

$$\begin{array}{r} 90.0 \\ +8.0 \\ \hline 98.0 \\ 15 \end{array}$$

$$\begin{array}{r} 90.0 \\ +8.0 \\ \hline 98.0 \\ 15 \end{array}$$

$$\begin{array}{r} 90.0 \\ +8.0 \\ \hline 98.0 \\ 15 \end{array}$$

$$\begin{array}{r} 90.0 \\ +8.0 \\ \hline 98.0 \\ 15 \end{array}$$

$$\begin{array}{r} 90.0 \\ +8.0 \\ \hline 98.0 \\ 15 \end{array}$$

$$\begin{array}{r} 90.0 \\ +8.0 \\ \hline 98.0 \\ 15 \end{array}$$

$$\begin{array}{r} 90.0 \\ +8.0 \\ \hline 98.0 \\ 15 \end{array}$$

$$\begin{array}{r} 90.0 \\ +8.0 \\ \hline 98.0 \\ 15 \end{array}$$

$$\begin{array}{r} 73.0 \\ 17.1 \\ \hline 90.1 \\ 24 \end{array}$$

$$\begin{array}{r} 73.0 \\ 17.1 \\ \hline 90.1 \\ 24 \end{array}$$

$$\begin{array}{r} 73.0 \\ 17.1 \\ \hline 90.1 \\ 24 \end{array}$$

$$\begin{array}{r} 73.0 \\ 17.1 \\ \hline 90.1 \\ 24 \end{array}$$

$$\begin{array}{r} 73.0 \\ 17.1 \\ \hline 90.1 \\ 24 \end{array}$$

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$$\begin{array}{r} 73.0 \\ 17.1 \\ \hline 90.1 \\ 24 \end{array}$$

$$\begin{array}{r} 73.0 \\ 17.1 \\ \hline 90.1 \\ 24 \end{array}$$

$$\begin{array}{r} 73.0 \\ 17.1 \\ \hline 90.1 \\ 24 \end{array}$$

$$\begin{array}{r} 73.0 \\ 17.1 \\ \hline 90.1 \\ 24 \end{array}$$



Hot -

March 21, 1945

11.

Super  
King  
Stephens

	491.22 ✓			
16+00			3.2	488.0 ✓
+51 <sup>00</sup> Δ			3.7	487.5 ✓
+68			4.2	487.0 ✓
+78			8.3	482.9 ✓
+92			9.2	482.0 ✓
+93			10.9	480.3 ✓
17+00			11.3	479.9 ✓
+11			12.0	479.2 ✓
+18			13.0	478.2 ✓
TP	0.56	479.07 ✓	12.71	478.51 ✓
+25			6.9	472.2 ✓
+50			12.8	466.3 ✓
TP	0.52	466.75 ✓	12.84	466.23 ✓
18+00			11.2	455.6 ✓
+25			12.1	454.7 ✓
+50			12.3	454.5 ✓
+72			12.4	454.4 ✓
+78			9.7	457.10 ✓
+88			12.0	454.8 ✓
TP	2.44	457.48 ✓	11.71	455.04 ✓

edge of road

edge of road

Pile of concrete + rock from testing laboratory



457.48 ✓

19+00	3.1	454.4 ✓
+50	3.7	453.8 ✓
20+00	4.1	453.4 ✓
+50	4.0	453.5 ✓
+75	4.0	453.5 ✓
21	4.8	452.7 ✓
+50	4.6	452.9 ✓
22	5.1	452.4 ✓
+50	5.4	452.1 ✓
23	5.4	452.1 ✓
+50	6.1	451.4 ✓
24	6.7	450.8 ✓
+28.75	6.7	450.8 ✓
	6.4	451.1 ✓

Cont'd on page 40

clean base - offset for 23.50 - elev 451.1



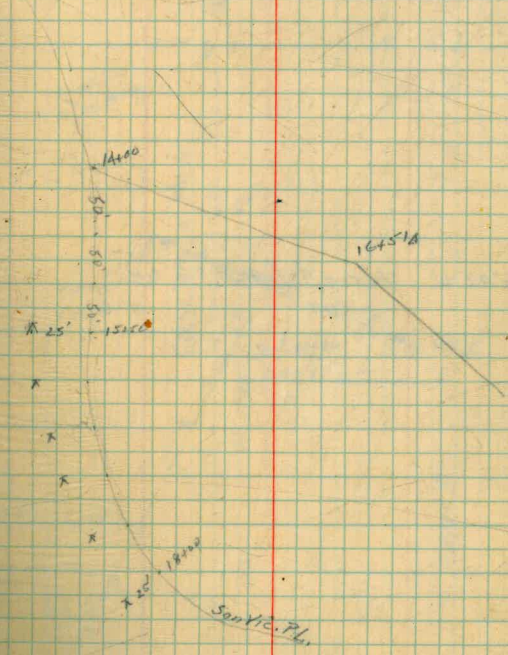
Additional x-sections on point below caretakers house at

Station	H.I.	457.4	457.3	457.2	457.1	457.0
15450	462.7	4.4 25	4.4 33	+16° 48	+17°30' 70	
16400	463.2	457.4 5.3 25	457.3 5.3 30	472.8 +13°55' 40 30	476.8 +15°15' 50 48	488.6 +23°05' 63 58
1450	463.2	457.4 5.4 25	457.3 5.2 34	477.1 +18°25' 44 42	509.7 +27°30' 95 80	
17400	462.8	457.1 496.1 5.7 25	457.0 486.1 5.7 33	473.2 +14°30' 42 41	492.2 +21°10' 83 77	
150	462.2	457.2 5.0 25	457.1 5.0 32	463.1 +1°30' 35	481.2 +15°15' 75 72	
18400	461.5	456.3 5.2 25	456.7 4.8 40	458.3 3.2 45	461.5 0.0 57	

19485<sup>2</sup> - P.O.T. 1x1" stub

San Vicente 2nd PL

Note: These stations were continued on around the points on top of the existing San Vic. P.L., from the angle point of 14400 - page 4  
 Transit points were 25' Pt of pipe line.





25+98.07 F.C.

$\Delta = 5^{\circ}10' \text{ Rt}$

$R = 985'$

$L = 88.82'$

25+09.25 B.O.

24+95.55  $\Delta 26^{\circ}42' \text{ Lt}$  checked 1/2/97 MEB OK.

24+28.75

CONT'D FROM PAGE 5

March 29 1945

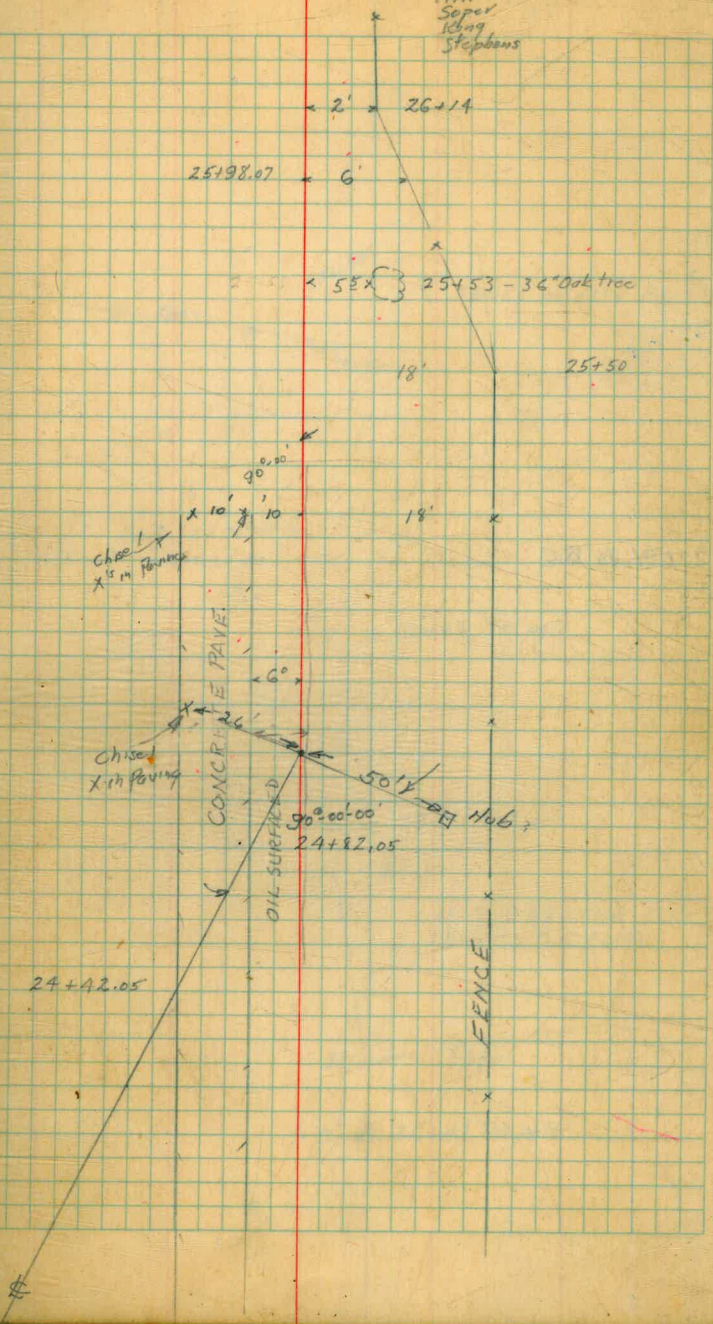
Hill

Super

Chung

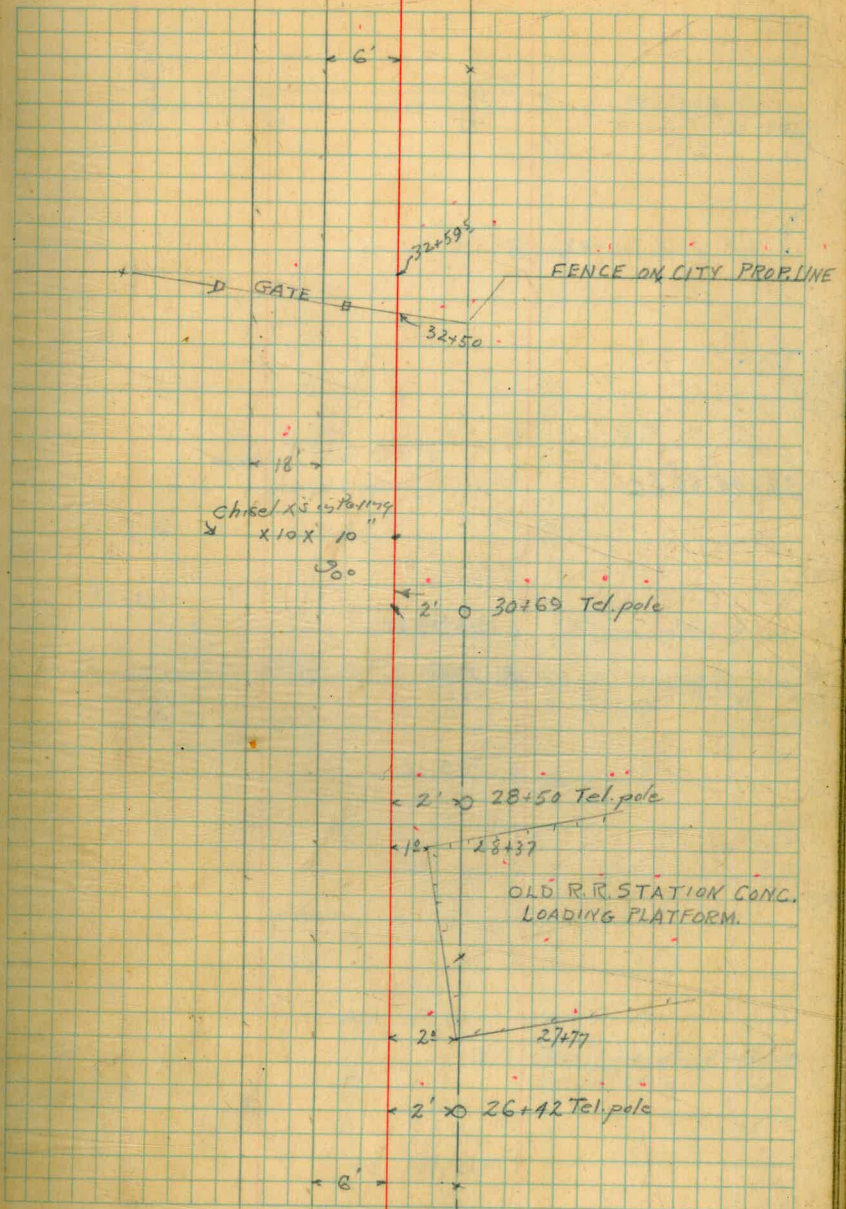
Stephens

14





30+91.80 B.C.



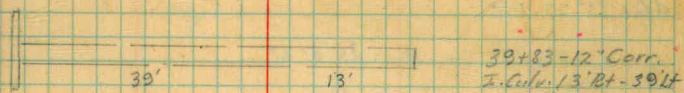


38+00.86 EC

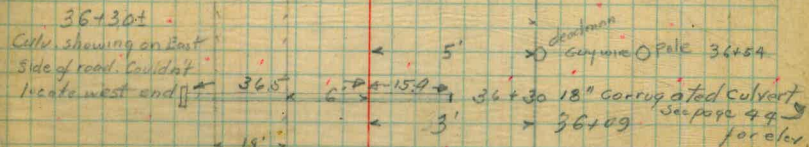
 $\Delta = 20^{\circ} 28' R$ 

R = 1985'

L = 709.06

7'  $\circ$  39+14 Power Pole

chisel  $90^{\circ}$   
 X 516 90' ring  
 X 10 x 10



34+00 115

24" I.D. CONC. BOX  
CULV.

33+58

33+65

Note: Floor of box culvert extends  
 one foot beyond handwall.



46+35.27 E.C.

A = 36°31' LT

R 415'

L 264.49

43+70.78 P.R.C.

51'  
A = 8°15' RT

R = 985

L = 152.14

42+18.64 B.C.

chisel X 5 in Paving  
X 10 X 10

8' -> 46+28 Tel. pole

7' -> 45+34 Power pole

chisel X 5 in Paving  
X 10 X 10

set at 90° to Tang to Curve

18' -> C

9' -> 42+31 Power pole

chisel X 5 in Paving  
X 10 X 10

39'

4'

41+85-12" Conc. I. Culv.  
42' RT = 34' H



51+34.48  
51+33.70 P.O.T.

49+99.09  $\Delta 28^{\circ}42'RT$  (Contd. from pg. 77)

49+05  $\Delta 45^{\circ}00'LT$  from tangent to curve

$\Delta = 32^{\circ}16'LT$

$R = 615'$

T

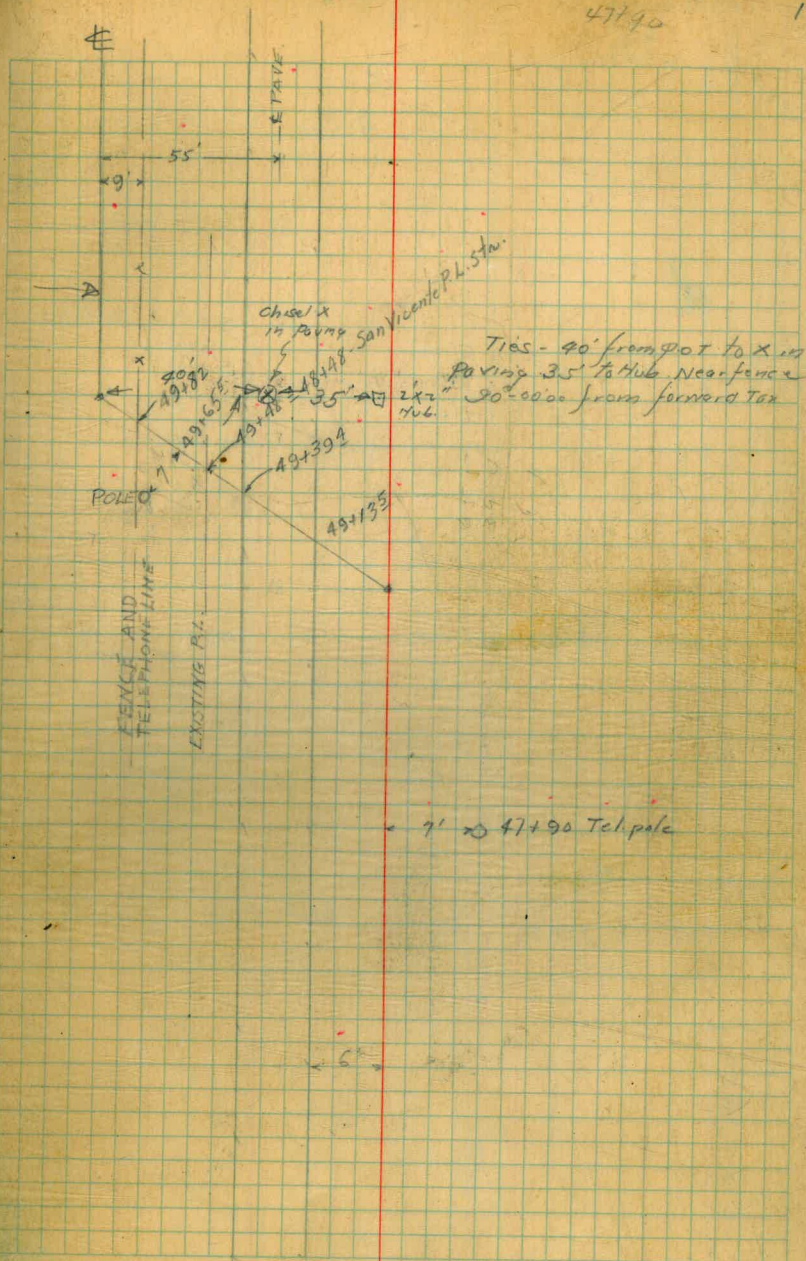
$L = 396.39$

VOID

47+33.27 B.C. (Contd. on pg 77)

47+90

18





March 30 1945 19  
Soper  
King  
Stephens

FENCE 66150

66125 Well  $\circ$  32  
and pump

66122 Power Pole  $\circ$  26'

FENCE 65174

65168 Power Pole  $\circ$  12'

65130  $\circ$  24  
Standpipe

65130  $\&$  12' Gate

DIRT ROAD

62196  $\&$  14' Gate

FENCE


$\&$  PAVEMENT

55'



78+36-12" tree 6' →

13'	⊗	77+96	"	"
15'	⊗	77+71	"	"
16'	⊗	77+61	willow tree	
← 16' →		77+00		
12'	⊗	76+98	"	"
11'	⊗	76+92	willow tree	

73+96  25  
4'x4' Motor house

72+44 Willow Tree ⊗ 21'

72+35 Willow Tree ⊗ 21'

72+25 Power Pole or 16' →

FENCE 70+33

69+25 24' Willow ⊗ 25'



80+82.35 @ 0'05" M

86+66-24" Tree @ 17

86+54-30" Palm @ 19

FENCE 86+52

FENCE 8445

78+23 - dirt road

x 12' x 87+00

x 17'

55'

79+03 @ 16 Gate

PAVEMENT



15' → 105+00  
8' → 104+82 - Power Pole

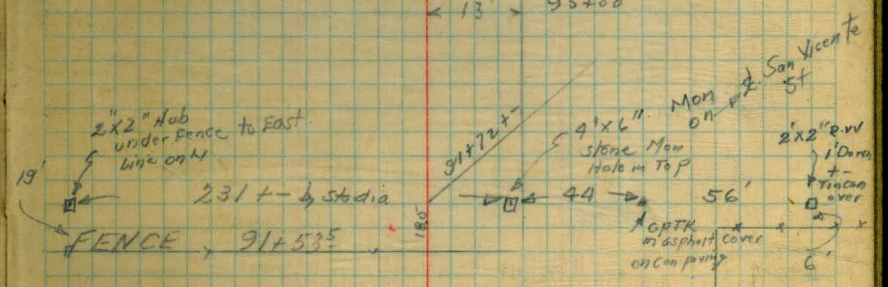
FENCE → 104+67

Dirt road

104+60 - 14' Gate

14' → 100+00

13' → 95+00



91+39 - 20' dirt road



118+74.11 Δ 0°07' Rt

118+86 - 2" water line (steel)

118+75.6 V. Irrig. line  
18" O.D. Conc. Pipe



8 V. Irrig. line  
pipe

15E

12'

Conc. Stand pipe 115+37

FENCE

115+30

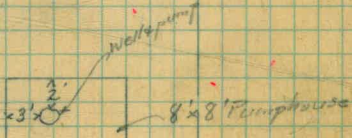
16E

115+00

FENCE

36" Concrete Stand pipe

105+09 - 8" steel pipe  
18" above ground



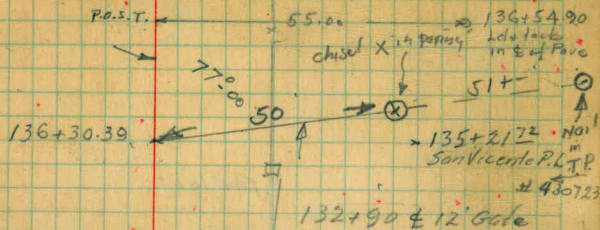
105+02



136+54.90 P.O.S.T.

136+30.39 C.

FENCE 136+55.6



FENCE 132+84

126+06 G.V. on Ferry line

126+045

ditto road

125+46

< 16 > 125+00

122+55 - 16" 60' Conc. Pipe

FENCE 122+33

FENCE 122+20



143+31.43 E.C.

$\Delta = 40^\circ 16' \text{ Rt}$

$R = 1000'$

$T = 365.61$

$L = 701.04'$

$d/s^1 = 1.719$

$d/s^2 = 1.25944$

143+31.43 -  $20^\circ 05.0$

143 -  $19^\circ 10.9$

+50 -  $17^\circ 45.0$

142 -  $16^\circ 19.0$

+50 -  $14^\circ 53.1$

141 -  $13^\circ 27.1$

+50 -  $12^\circ 01.2$

140 -  $10^\circ 35.3$

+50 -  $9^\circ 09.3$

139 -  $7^\circ 43.4$

+50 -  $6^\circ 17.4$

138 -  $4^\circ 51.5$

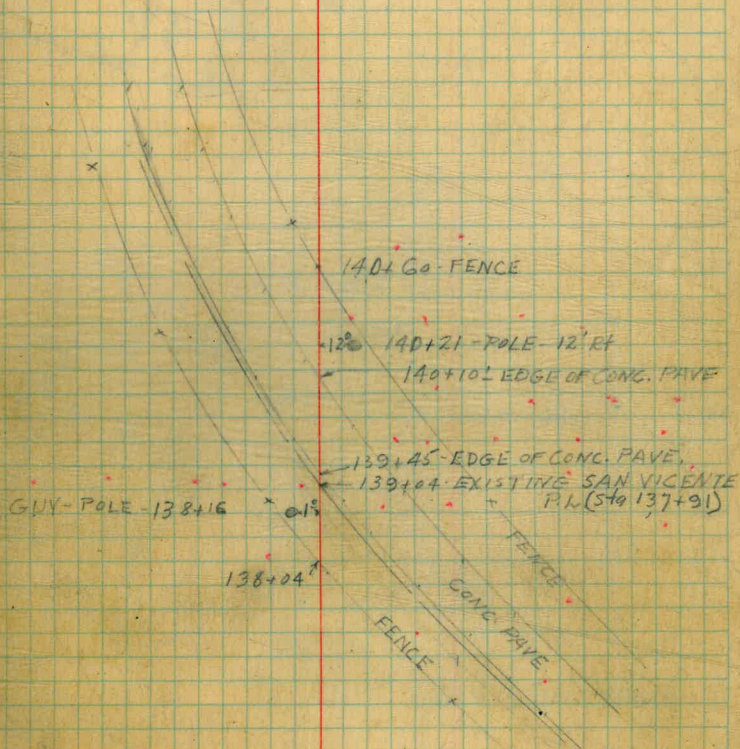
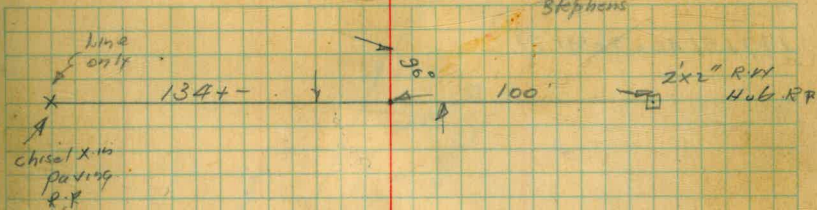
+50 -  $3^\circ 25.5$

137 -  $1^\circ 59.6$

136+50 -  $0^\circ 33.6$

April 24 1945 25

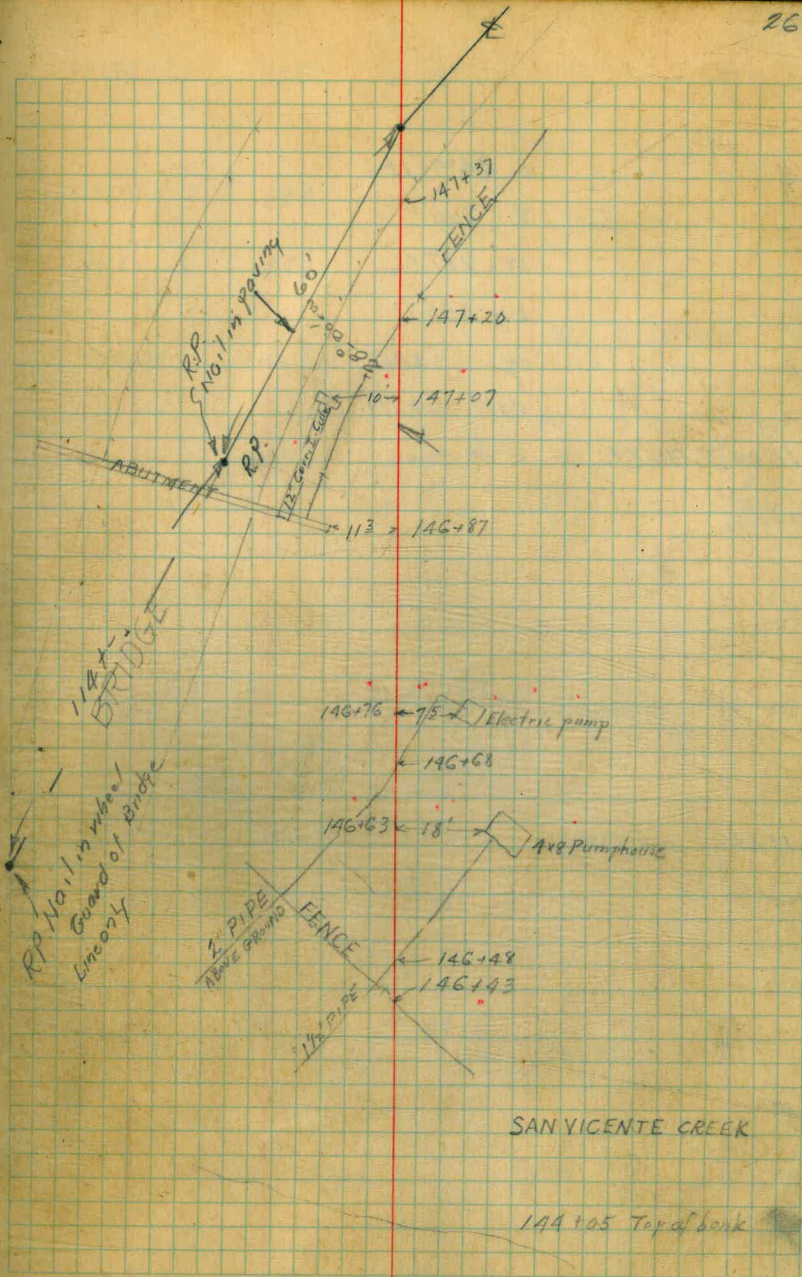
Bill  
Stephens





147+51.40a 20' 91' Rt.

26





$\Delta = 44^\circ 40' Lt$

$R = 700'$

ST. = 287.56

$L = 545.71$

def. 50' = 2.456

def. 50' = 2° 02.777

154+35.90 B.C.

152+93.10 P.O.T.

27

156

105

18°

155+50

174

155

225

154+50

255

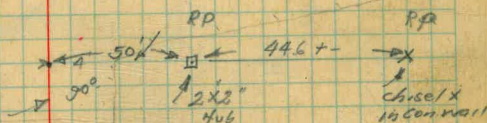
155+72

OIL SURFACE

CONC. MON.

B.C.

26'



154+255 4" Steel Water line - 8" deep by locator



43'

19.5'

154+01 to 18" Corrugated  
Iron Culvert

152+93.10

2500

CONC. MON.

OIL PAVING

394

65'

18" Corrug. I. Culv.

150+96

147+97.30

2500

CONC. MON.

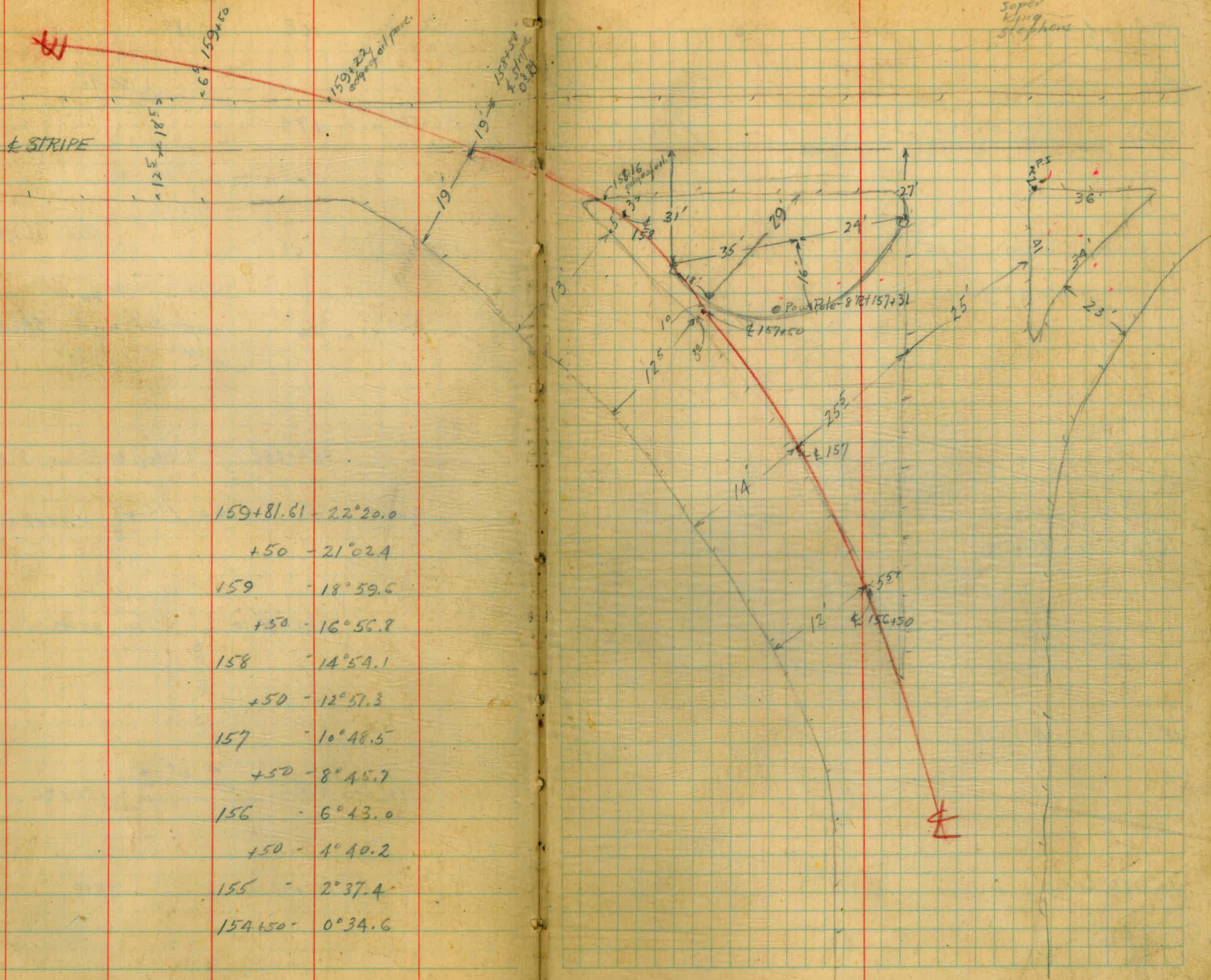
4°

±



April 5 1945  
 Hill  
 Soper  
 King  
 Stephens

28



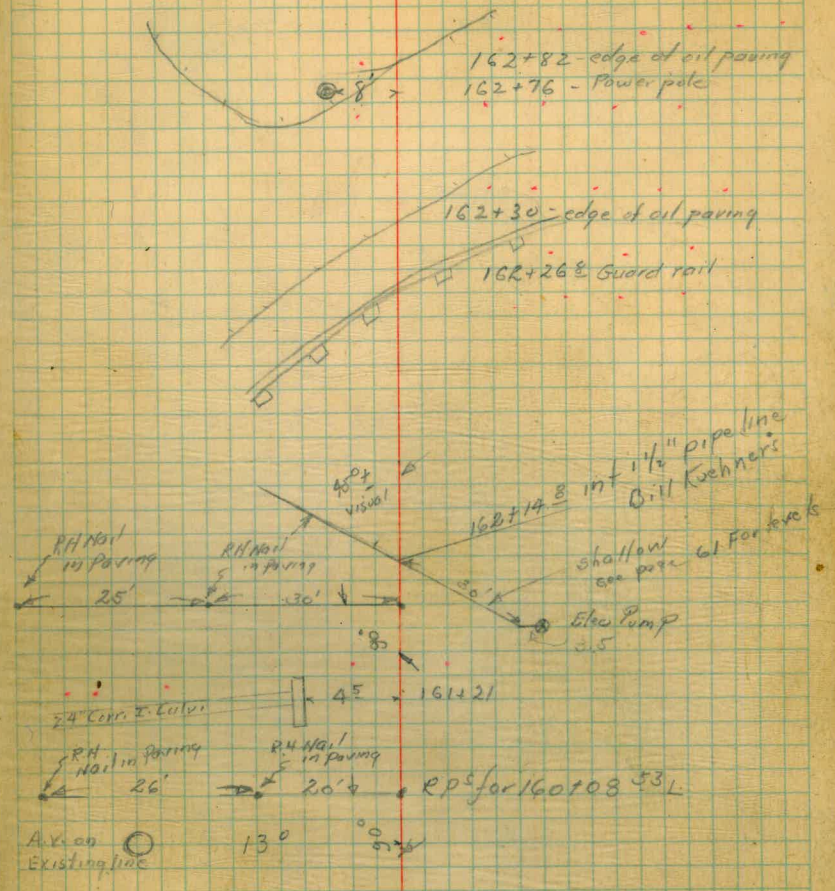
159 + 81.61 - 22° 20.0  
 + 50 - 21° 02.4  
 159 - 18° 59.6  
 + 50 - 16° 56.8  
 158 - 14° 54.1  
 + 50 - 12° 57.3  
 157 - 10° 48.5  
 + 50 - 8° 45.7  
 156 - 6° 43.0  
 + 50 - 4° 40.2  
 155 - 2° 37.4  
 154 + 50 - 0° 34.6



161+30.22 Δ 7°00' RT

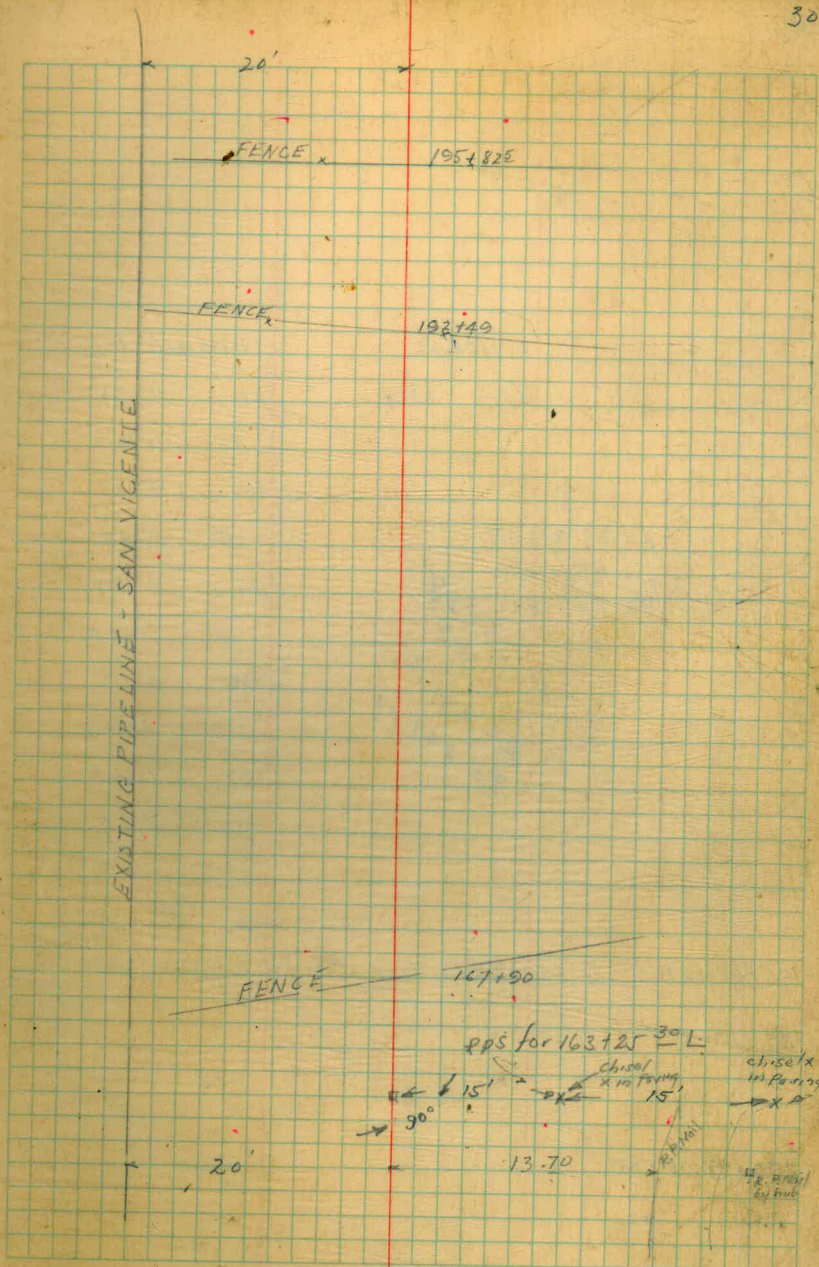
160+08.53 Δ 4°19' L

159+81.61 E.C.





163+25.300 8'43" H.





R=1106.52

defl = 1.554

 $\Delta = 25^{\circ} 26' 17''$ 

L = 491.27

T = 249.81

$\Delta = 25^{\circ} 27''$   
 M.M.  
 $L = 491.27$   
 $T = 249.87$

201+29.29 12°43.5

201 11°57.9

+50 10°40.2

200 9°22.5

+50 8°04.8

199 6°47.1

+50 5°29.4

198 4°11.7

+50 2°54.0

197 1°36.3

196+50 0°18.6

196+38.02 B.C. L: 29°57' RT is tangent to following curve

196+22.95 P.O.T.

10'

100  
 12-43-30  
 4-57-90  
 0-45-00

EXISTING SAN VICENTE PIPELINE

P.O. Hub  
 Locality  
 R.P.'s  
 SPIKE in Parag.  
 55'-  
 Near  
 Standard Oil Co's  
 Fence  
 51'  
 10-20-00

20'

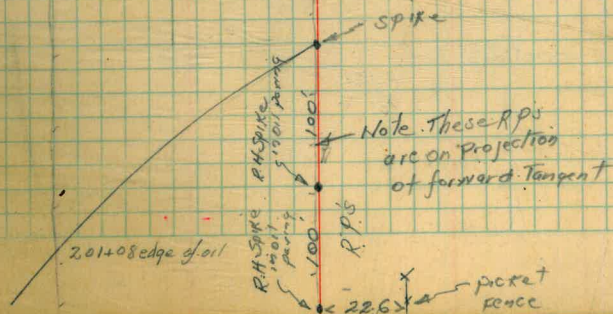
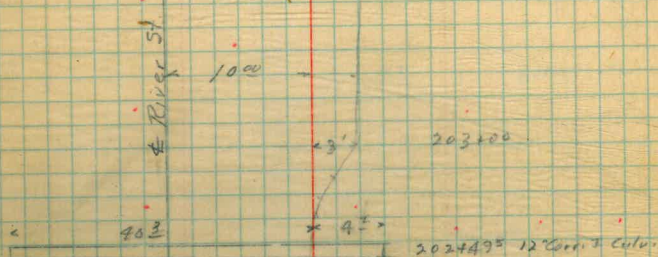
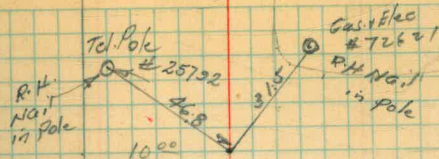


207+90.80  $\Delta$   $0^{\circ}10'Lt$ .

204+29.29  $53^{\circ}37'Lt$

at 201+29.29, back sight on 20429, angle  $53^{\circ}37'Lt$

201+29.29 P.O.C.





April 10 1945

Hill

Soper

Ring

Stephens

33

92 0 210+73 Power Pole

82



TREES

← 83



← 93 0 209+73 Power Pole

299

208+16.4 12" Corr. I. Culet

195







San Vicente 2nd P.L.  
 Property ties for easement thru lot #75 - El Cajon Valley  
 Lands

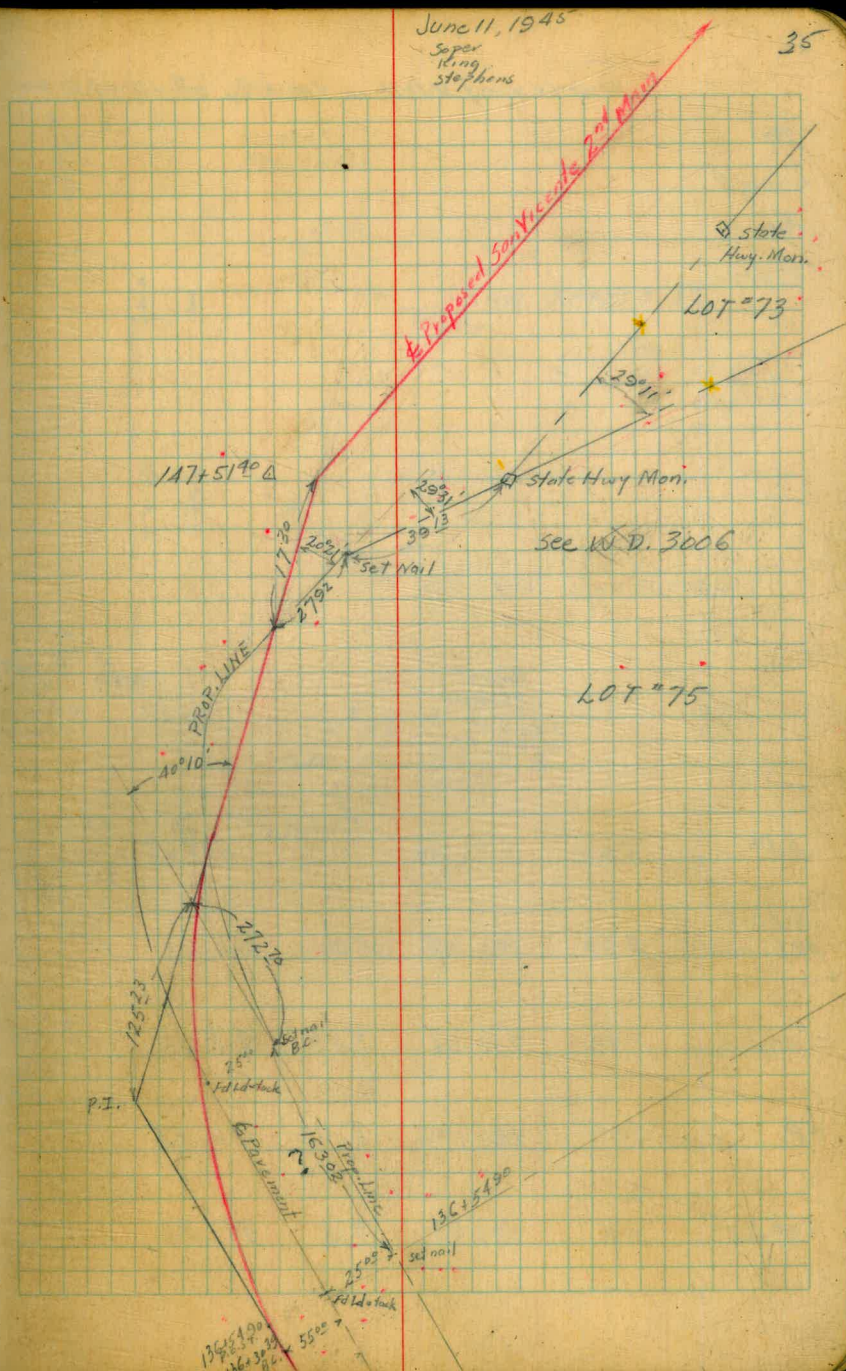
147+5140 A

136+5490 P.O.S.T

June 11, 1945

Super  
 King  
 Stephens

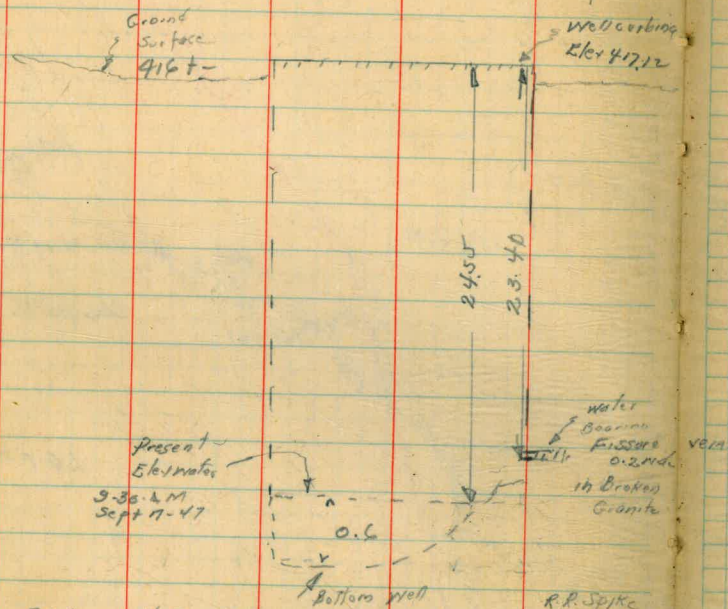
35





Survey of Well in vicinity of 154735.9

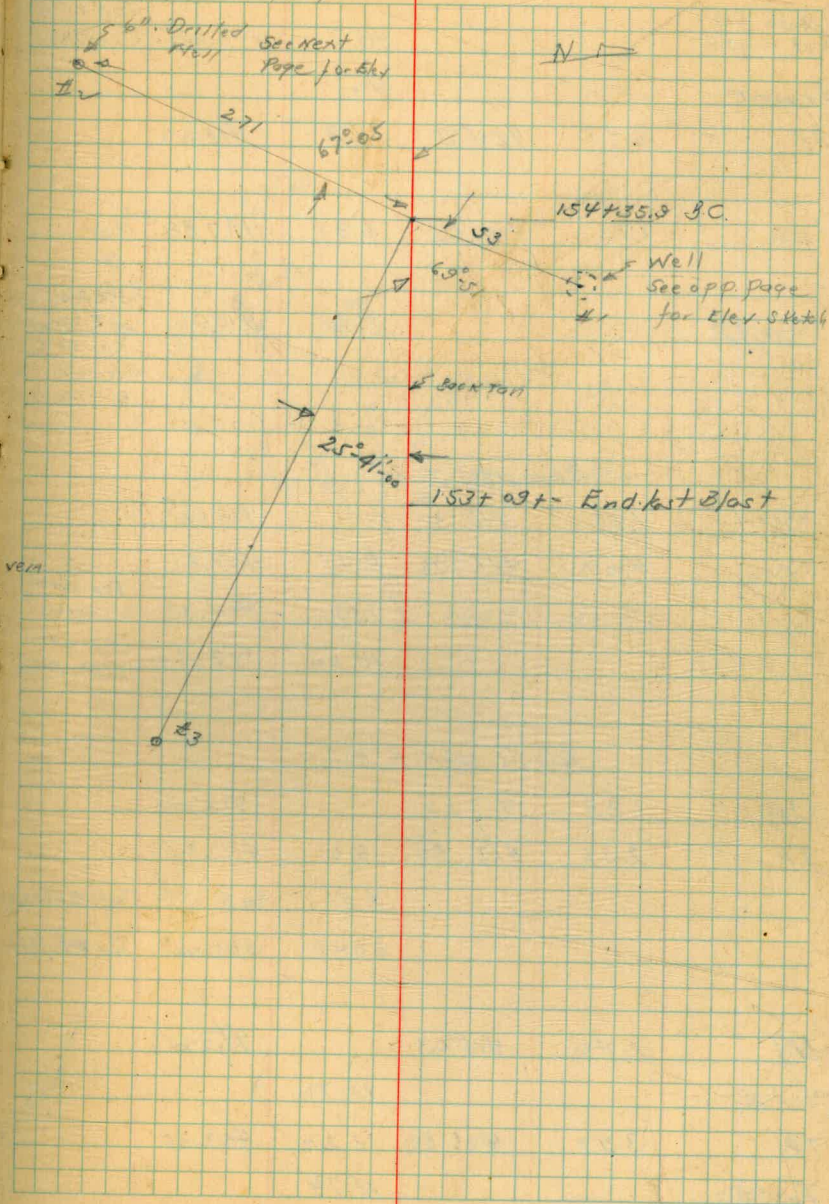
Bliss  
Leonard  
Baker  
3/17/47



B.M	506	417.52		412.46	R.R. Spike in Fords Car 136000 Sec Pat. 57 #70305 P.P.
set B.M RR Spike in pp.	2.80	416.42	3.90	413.62	
Set B.M	5.98	419.61	2.79	413.63	Spike in Bridge Piling San Vicente Creek Bridge N. Side. E. End
T.P.	5.24	421.76	3.09	416.52	
Set B.M	4.11	421.69	4.18	417.58	

San Vicente 2<sup>nd</sup> Main

30





T  
421.69

9:30 AM  
Sept 17 1947

Ground

TP. 675 424.75 3.69 418.00

TP. 1.73 419.61 6.87 417.88

Check BM.

8.95 410.66

Seepage W.  
PP # 73 Cap  
Nail on E.  
Side pole  
8" x 16" x 76

Elevs. Well # 2

BM 1.31 419.31 418.00

TP. 4.07 411.33 11.45 407.86

Top.

7.55 404.38

Top well  
6" casing

19.60 392.33

Top of  
water table

Elevs. Well # 3

BM 1.29 419.29 418.00

TP. 2.53 413.80 8.02 411.27

8.91 404.89

Top well casing

20.01 393.79

Top water table

BM 1.40 415.03 413.63

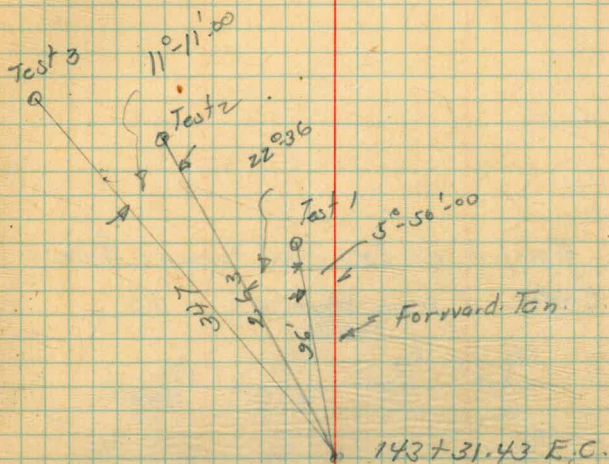
Test #1 19.72

TP. 3.99 406.80 12.22 402.81

Test #2 11.74

37

Sec sketch





406.80

Test #3

11.97

T.P. 12.34 415.47 3.67 403.13

check BM 184 413.63

Reprofile + X. Sec. East Tunnel Portal  
Continued from Page 37

449 6.2 547.7

150 4.9 549.0

+62 <sup>48</sup> Tunnel Portal 5.3 548.6

4

50  
145  
200

38

LT

RT

			553.85		
			495		
			+1.8		
			6		
			0		
			49.0		
			0		
			3		
			48.6		
			0		
			3		
			56.0		
			+7.4		
			5		
			56.6		
			+8.0		
			10		
			70.0		
			+21.4		
			16		

61.9  
+73.3  
12

63.7  
14.7  
12

53.9  
+6.2  
11

52.0  
+3.0  
6

55.8  
+2.2  
5

49.6  
0  
3

51.3  
+3.6  
5

49.0  
0  
5

59.9  
+12.2  
14

54.9  
+8.9  
10

69.4  
+20.4  
15



Re Profile El Monte PL. Sec 2  
 from Sta 438+22 to 449+62 Tunnel

BM	1092	553.85	542.93
438+22		3.5	550.4
+40		3.4	50.5
+50		3.6	50.3
438+65		4.3	49.6
+80 <sup>38</sup> EC		4.3	49.6
439		4.4	49.5
+18		4.6	49.3
+25		4.4	49.5
+30		4.6	49.3
439+43 <sup>82</sup> Back = 448+32 <sup>00</sup> Abscd		4.5	49.4
448+50		4.9	49.0
+80		5.4	48.5
+93		5.5	48.4

Continued on Page 38

Portal Lt

Portal Lt	RT
470 -3.4 50	522 +1.8 Not Ground 51.4 +0.9 10
467 -3.7 50	52.4 +1.3 17
479 -2.5 21	52.9 +2.4 21
489 -1.5 14	
471 -3.2 60	51.1 +0.8 8
481 -2.2 53	53.4 +0.1 25
481 -2.2 47	
478 -2.5 43	
478 -2.5 35	
470 -0.5 27	
485 -1.1 42	51.0 +1.4 11
485 -1.1 41	51.3 +1.7 13
484 -1.2 39	55.2 +5.6 33
484 -1.2 36	
484 -1.2 29	
485 -1.1 15	53.2 +3.5 27
474 -2.3 12	56.6 +7.0 43
491 -0.8 7	
515 +2.0 60	49.7 +0.2 15
498 +0.3 44	50.8 +1.3 22
494 -0.1 37	52.6 +3.1 32
490 -0.5 22	54.0 +3.5 38
490 -0.5 18	
528 +3.5 60	49.3 +0.2 11
494 +0.1 50	49.9 +0.6 28
499 +0.6 46	49.9 +0.6 51
499 +0.6 37	54.8 +5.5 42
493 +0.3 18	
492 -0.1 13	
500 +0.5 50	49.5 +0.2 11
504 +0.9 43	49.7 +0.2 22
509 +1.4 38	50.5 +1.0 34
506 +1.1 23	54.9 +5.2 50
491 -0.9 8	
492 -0.3 4	
515 +2.2 44	49.5 +0.2 8
514 +2.1 39	49.7 +0.4 17
513 +2.0 37	50.3 +1.0 33
510 +1.7 23	54.5 +5.2 50
493 +0.3 11	
487 -0.6 6	
504 +1.0 35	49.8 +0.4 16
490 -0.4 6	50.2 +0.8 25
510 +2.0 16	53.3 +4.3 Top cut Bank 8
500 +1.0 10	58.2 +2.7 Top cut Bank 12
530 +4.5 9	59.8 +11.4 Top Bank 13
490 +0.5 5	
534 +5.0 10	
494 +1.0 6	



Profile + x-sections San Vicente Second Main Ph

Cont'd from page 12

B.M.	2.26	457.86		455.60
TP	3.65	454.49	7.02	450.84
			3.4	451.1
24+42.05			3.6	50.9
			3.6	50.9
24+82.05			3.9	50.6
24+95.55			4.5	50.0
Edge Pav. C/L			4.0	50.5
25+09.25			4.5	50.0
G/L			4.2	50.3
25+50			4.6	49.9
G/L			4.5	50.0
10' R/L			4.3	50.2
25+98.07			4.9	49.6
G/L			4.6	49.9
3' R/L			4.2	50.3
10' R/L			4.2	50.3

April 2 1945 40

Soper  
Kling  
Stephens

Nail in power pole - West of City Camp. Book 601 page 35

ck on offset 23450 Rec. 451.1

Edge of pave

E " "

edge of pave



454.49 ✓

26+50	4	4.0	450.5	✓
2' LT		4.9	49.6	✓
6' LT		4.8	49.7	✓
3' RT		3.4	51.1	✓
10' RT		2.7	51.8	✓

27+00		4.8	49.7	✓
1' LT		5.1	49.4	✓
6' LT		4.9	49.6	✓
2' RT		3.5	51.0	✓
10' RT		3.1	51.4	✓

27+50	4	4.7	49.8	✓
1' LT		5.1	49.4	✓
6' LT		5.1	49.4	✓
2' RT		3.6	50.9	✓
10' RT		3.6	50.9	✓

28+00	4	4.9	49.6	✓
1' LT		5.3	49.2	✓
6' LT		5.3	49.2	✓
2' RT		3.7	50.8	✓
10' RT		3.5	51.0	✓

41.



		454.49 ✓		
28+50 ♀			4.8	449.7 ✓
2' Lt			5.5	49.0 ✓
6' Lt			5.4	49.1 ✓
2' Rt			3.6	50.9 ✓
10' Rt			3.2	51.3 ✓
TP	5.03	454.00 ✓	5.52	448.97 ✓
29+00 ♀			4.4	49.6 ✓
6' Lt			5.1	48.9 ✓
29+50 ♀			4.4	49.6 ✓
6' Lt			5.1	48.9 ✓
30+00 ♀			4.4	49.6 ✓
6' Lt			5.1	48.9 ✓
30+50			4.1	49.9 ✓
6' Lt			5.1	48.9 ✓
30+91.80			4.2	49.8 ✓
6' Lt			5.1	48.9 ✓
31+00			4.3	49.7 ✓
6' Lt			5.1	48.9 ✓

Lt -

♀

Rt.

Note: These sections are + and - from Elev.

$$\begin{array}{r} 449.1 \\ -0.5 \\ \hline 448.6 \end{array}$$

$$\begin{array}{r} 451.1 \\ +1.5 \\ \hline 452.6 \end{array}$$

$$\begin{array}{r} 451.6 \\ +2.0 \\ \hline 453.6 \end{array}$$

$$\begin{array}{r} 448.8 \\ -0.8 \\ \hline 448.0 \end{array}$$

$$\begin{array}{r} 450.5 \\ +0.9 \\ \hline 451.4 \end{array}$$

$$\begin{array}{r} 450.7 \\ +1.4 \\ \hline 452.1 \end{array}$$

$$\begin{array}{r} 448.8 \\ -0.8 \\ \hline 448.0 \end{array}$$

$$\begin{array}{r} 450.0 \\ +0.4 \\ \hline 450.4 \end{array}$$

$$\begin{array}{r} 448.8 \\ -1.1 \\ \hline 447.7 \end{array}$$

$$\begin{array}{r} 449.4 \\ -0.5 \\ \hline 448.9 \end{array}$$

$$\begin{array}{r} 448.7 \\ -1.0 \\ \hline 447.7 \end{array}$$

$$\begin{array}{r} 449.0 \\ -0.2 \\ \hline 448.8 \end{array}$$



454.00 ✓✓

31450 5.0 449.0 ✓

6' Lt 5.1 48.9 ✓

32400 4.9 49.1 ✓

6' Lt 5.1 48.9 ✓

32450 5.4 48.6 ✓

6' Lt 5.1 48.9 ✓

33100 5.5 48.5 ✓

6' Lt 5.1 48.9 ✓

33445 5.0 49.0 ✓

+52 7.7 46.3 ✓

+55 7.7 46.3 ✓

+57 5.8 48.2 ✓

8.18 445.82 ✓

34200 5.5 48.5 ✓

6' Lt 5.0 49.0 ✓

34450 5.2 48.8 ✓

6' Lt 4.8 49.2 ✓

Lt

Rt

43

$$\begin{array}{r} 448.5 \\ -0.5 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 449.2 \\ +0.2 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 448.7 \\ -0.7 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 449.6 \\ +0.6 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 448.9 \\ -0.9 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 449.0 \\ +0.4 \\ \hline 3 \end{array}$$

$$\begin{array}{r} 448.6 \\ +0.6 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 448.5 \\ +0.5 \\ \hline 10 \end{array}$$

Fl. line of 2'x4' box culvert to Lt of 33452



454.00

35+00		4.7	449.3 ✓
6' Lt		4.5	49.5 ✓

35+50		4.3	49.7 ✓
-------	--	-----	--------

6' Lt		4.2	49.8 ✓
36+30	36.5 Lt	6.6	47.4 ✓
	15.4 Rt	8.1	45.9 ✓

36+00		4.0	50.0 ✓
-------	--	-----	--------

6' Lt		3.7	50.3 ✓
-------	--	-----	--------

36+50		3.7	50.3 ✓
-------	--	-----	--------

6' Lt		3.4	50.6 ✓
-------	--	-----	--------

TP	5.94	456.77	3.17	450.83 ✓
----	------	--------	------	----------

37+00		6.4	50.4 ✓
-------	--	-----	--------

6' Lt		5.8	51.0 ✓
-------	--	-----	--------

37+50		5.9	50.9 ✓
-------	--	-----	--------

6' Lt		5.7	51.1 ✓
-------	--	-----	--------

38+00.86 E.C.		5.5	51.3 ✓
---------------	--	-----	--------

6' Lt		5.5	51.3 ✓
-------	--	-----	--------

38+50		5.3	51.5 ✓
-------	--	-----	--------

6' Lt		5.4	51.4 ✓
-------	--	-----	--------

Lt

E

Rt

44

$450.3$   
 $\frac{0.6}{10}$   
 $449.8$   
 $\frac{0.6}{4}$     $\frac{2.0}{5}$     $\frac{2.3}{10}$   
 $448.4$   
 $448.1$   
 $450.0$   
 $\frac{0.9}{35}$     $\frac{3.0}{7}$     $\frac{3.5}{10}$     $\frac{4.0}{20}$   
 $447.9$   
 $447.1$   
 $446.9$   
 $450.9$   
 $\frac{0.4}{6}$     $\frac{2.3}{11}$     $\frac{2.8}{20}$   
 $447.0$   
 $446.5$   
 $451.1$   
 $\frac{0.4}{5}$     $\frac{2.2}{10}$     $\frac{2.8}{20}$   
 $447.3$   
 $446.7$



	456.77 ✓		
39+00	5.0	451.8 ✓	
6' Lt	5.2	51.6 ✓	
39+50	4.8	52.0 ✓	
6' Lt	5.0	51.8 ✓	
	7.2	49.6 ✓	
	10.7	46.1 ✓	
40+00	4.7	52.1 ✓	
6' Lt	5.0	51.8 ✓	
40+50	4.1	52.7 ✓	
6' Lt	5.0	51.8 ✓	
41+00	4.3	52.5 ✓	
6' Lt	5.0	51.8 ✓	
41+50	4.4	52.4 ✓	
6' Lt	5.0	51.8 ✓	
	7.4	49.4 ✓	
	10.7	46.1 ✓	
42+00	4.7	52.1 ✓	
6' Lt	4.8	52.0 ✓	

Lt	451.5	RT 491.8	46.3	45
	$-\frac{03}{5}$	$-\frac{40}{10}$	$-\frac{50}{20}$	
	451.7	451.7	445.1	creek bottom
	$-\frac{03}{4}$	$-\frac{63}{12}$	$-\frac{69}{22}$	
Fl line 12' culv. 39' Lt 39+83				
" " " " 13' Rt " "				
	$-\frac{10}{9}$	445.6	445.6	creek bottom
	451.8	445.8	445.0	
	$-\frac{09}{4}$	$-\frac{60}{9}$	$-\frac{77}{20}$	creek bottom
	451.9	445.8	444.7	creek bottom
	$-\frac{08}{4}$	$-\frac{67}{8}$	$-\frac{78}{20}$	
	452.0	444.7	444.7	creek bottom
	$-\frac{07}{3}$	$-\frac{62}{3}$	$-\frac{72}{13}$	$-\frac{72}{20}$
Fl line 12' culv. 34' Lt 41+85				
" " " " 4' Rt 41+85				
	451.7	444.5	444.3	creek bottom
	$-\frac{07}{3}$	$-\frac{76}{10}$	$-\frac{78}{20}$	



456.77 ✓

42+18.64BC	4.7	452.1 ✓
6'LT	4.6	52.2 ✓
42+50	3.9	52.9 ✓
6'LT	4.3	52.5 ✓
43+00	3.9	52.9 ✓
6'LT	3.9	52.9 ✓
43+50	3.4	53.4 ✓
6'LT	3.5	53.3 ✓
43+70.78P.R.C.	3.2	53.6 ✓
6'LT	3.3	53.5 ✓
44+00	3.1	53.7 ✓
6'LT	3.2	53.6 ✓
TP	2.70	456.50 ✓
	2.97	453.80 ✓
44+50	2.6	53.9 ✓
6'LT	2.6	53.9 ✓
45+00	2.4	54.1 ✓
6'LT	2.5	54.0 ✓

Lt e Rt

46

$$\begin{array}{r} \times 52.2 \\ - 0.2 \\ \hline 2 \end{array}$$

$$\begin{array}{r} \times 45.5 \\ - 2.4 \\ \hline 11 \end{array}$$

$$\begin{array}{r} \times 43.9 \\ - 9.0 \\ \hline 30 \end{array}$$

$$\begin{array}{r} \times 44.7 \\ + 0.8 \\ \hline 7 \end{array}$$

$$\begin{array}{r} \times 44.00 \\ - 8.9 \\ \hline 19 \end{array}$$

$$\begin{array}{r} \times 43.9 \\ + 0.5 \\ \hline 7 \end{array}$$

$$\begin{array}{r} \times 43.7 \\ - 9.2 \\ \hline 23 \end{array}$$

$$\begin{array}{r} \times 43.7 \\ 0.0 \\ \hline 7 \end{array}$$

$$\begin{array}{r} \times 42.9 \\ - 10.0 \\ \hline 23 \end{array}$$

$$\begin{array}{r} \times 43.9 \\ 0.0 \\ \hline 30 \end{array}$$

$$\begin{array}{r} \times 45.9 \\ - 8.0 \\ \hline 18 \end{array}$$

$$\begin{array}{r} \times 43.1 \\ - 1.0 \\ \hline 16 \end{array}$$

$$\begin{array}{r} \times 46.1 \\ - 8.0 \\ \hline 16 \end{array}$$

$$\begin{array}{r} \times 46.1 \\ - 8.0 \\ \hline 20 \end{array}$$



456.50 ✓

45450	2.3	454.2 ✓
6' Lt	2.3	54.2 ✓
46100	2.7	53.8 ✓
6' Lt	2.7	53.8 ✓
46+35.27 EG	2.9	53.6 ✓
6' Lt	3.4	53.1 ✓
46+50	3.5	53.0 ✓
6' Lt	3.7	52.8 ✓
47100	4.9	51.6 ✓
6' Lt	5.0	51.5 ✓
47+33.27 BC (Cont'd on pg. #78)	5.9	50.6 ✓
6' Lt	6.1	50.4 ✓
47+50	6.6	49.9 ✓
6' Lt	6.8	49.7 ✓
48+00	8.9	47.6 ✓
6' Lt	8.9	47.6 ✓
48+50	10.9	45.6 ✓
6' Lt	10.7	45.8 ✓

↑  
 Void.  
 ↓

Lt

47

Rt  
 0.95 x 2.2 ✓  
 9.0  
 - 6.4  
 10  
 2.53.8 ✓  
 0.0  
 11

0.0 x 51.6 ✓  
 4  
 5.7  
 8  
 0.0 x 55.9 ✓  
 5.7  
 8  
 0.0 x 55.6 ✓  
 5.7  
 12.

0.0 x 9.9 ✓  
 10  
 12

0.0 x 7.6 ✓  
 10  
 12  
 0.0 x 41.2 ✓  
 15  
 7

0.0 x 2.9 ✓  
 2.7  
 9  
 0.0 x 1.6 ✓  
 4.9  
 14



	456.50 ✓		
49+00		12.3	444.2 ✓
6 Lt		12.3	444.2 ✓
49+05.00 A		12.5	444.0 ✓
	2.15	445.85 ✓	12.80 443.70 ✓
49+13.5		1.9	444.0 ✓
49+39.4		3.1	442.8 ✓
	<u>VOID</u>		
+50		3.4	442.5 ✓
+58		2.6	443.3 ✓
+82		3.0	442.9 ✓
+85		4.3	441.6 ✓
+99.09 A	Cont'd. from pg. 78	4.5	441.4 ✓
50+00		4.5	441.4 ✓
+50		4.2	41.7 ✓
51		4.0	41.9 ✓
+50		4.2	41.7 ✓
52		4.4	41.5 ✓
+50		4.7	41.2 ✓
53		5.1	40.8 ✓

48.

$$\begin{array}{r} 442.2 \\ - 2.0 \\ \hline 440.2 \end{array}$$

$$\begin{array}{r} 442.6 \\ - 1.6 \\ \hline 441.0 \end{array}$$

441.8 ✓  
 RTA to forward tangent  

$$\begin{array}{r} 2.3 \\ - 1.1 \\ \hline 1.2 \end{array}$$

$$\begin{array}{r} 2.0 \\ - 2.5 \\ \hline -0.5 \end{array}$$

Nail in power pole 90' RT 49+25 Rec. elev 443.67

$$\begin{array}{r} 444.0 \\ 0.0 \\ \hline 10 \end{array}$$



145.85

53+50			6.2	439.7 ✓
54			6.6	39.3 ✓
+50			6.5	39.4 ✓
55			6.6	39.3 ✓
+50			6.8	37.1 ✓
P	3.71	442.81	6.75	439.10 ✓
56			3.6	39.2 ✓
+50			3.5	39.3 ✓
57			3.9	38.9 ✓
+25			3.9	38.9 ✓
+38			2.2	40.6 ✓
+50			2.3	40.5 ✓
58			2.8	40.0 ✓
+50			3.1	39.7 ✓
59			3.2	39.6 ✓
+50			3.4	39.9 ✓
60			3.8	39.0 ✓
+12			4.7	38.1 ✓
+50			4.7	38.1 ✓
61			5.0	37.8 ✓
+50			5.3	37.5 ✓
62			5.5	37.3 ✓
+50			5.6	37.2 ✓
63			5.4	37.4 ✓



		442.81 ✓		
π	1.56	441.89 ✓	2.48	440.33 ✓
63	150		4.8	437.1 ✓
64			5.3	36.6 ✓
+50			5.4	36.5 ✓
65			5.3	36.6 ✓
+50			6.5	35.4 ✓
+55			7.2	34.7 ✓
66			7.5	34.4 ✓
+50			7.5	34.4 ✓
+80			8.7	33.2 ✓
67			9.3	32.6 ✓
+50			9.1	32.8 ✓
68			9.4	32.5 ✓
+50			9.4	32.5 ✓
69			9.6	32.3 ✓
+50			9.0	32.9 ✓
70			9.3	32.6 ✓
+20			9.5	32.4 ✓
π	2.32	439.57 ✓	4.64	437.25 ✓
70+50			9.2	30.4 ✓
+65			9.8	29.8 ✓
71			9.5	30.1 ✓
+50			9.6	30.0 ✓
72			8.2	31.4 ✓
+50			8.7	30.9 ✓



		439.57		
72+80			8.6	431.0 ✓
+85			7.5	32.1 ✓
73			7.7	31.9 ✓
+50			8.2	31.4 ✓
74			8.8	30.8 ✓
+50			8.7	30.9 ✓
75			8.9	30.7 ✓
+50			9.0	30.6 ✓
76			9.2	30.4 ✓
+50			9.6	30.0 ✓
77			9.6	30.0 ✓
TP	3.70	436.67	6.60	432.97 ✓
77+50			6.7	30.0 ✓
78			7.1	29.6 ✓
+25			6.8	29.9 ✓
+50			5.1	31.6 ✓
+65			4.1	32.6 ✓
79			4.4	32.3 ✓
+50			4.9	31.8 ✓
80			5.2	31.5 ✓
+50			5.4	31.3 ✓
+82.35A			5.6	31.1 ✓
81			5.8	30.9 ✓
+50			5.3	31.4 ✓
82			5.9	30.8 ✓



436.67 ✓

82+50	6.2	430.5 ✓
83	6.4	30.3 ✓
+50	6.6	30.1 ✓
84	6.7	30.0 ✓
+50	7.1	29.6 ✓

TP	2.42	433.35 ✓	5.74	430.93 ✓
85			4.0	29.4 ✓
+50			4.2	29.2 ✓
86			4.5	28.9 ✓
+50			3.8	29.6 ✓
+65			4.7	28.7 ✓
87			4.9	28.5 ✓
+50			5.6	27.8 ✓
88			5.3	28.1 ✓
+50			5.2	28.2 ✓
89			5.6	27.8 ✓
+50			6.4	27.0 ✓
90			6.5	26.9 ✓
+50			7.0	26.4 ✓
91			7.3	26.1 ✓
+50			7.3	26.1 ✓
+53			5.1	28.3 ✓
			3.93	429.42 ✓

cl on B.M. Nailin power, pale 74 Rt. 90240 Pac. 429.37 Book Col page 54



433.35 ✓

91+90			7.1	26.3 ✓
92			6.9	26.5 ✓
+35			7.6	25.8 ✓
+41			10.8	22.6 ✓
+50			11.7	21.7 ✓
+60			9.1	24.3 ✓
TP	3.90	431.23 ✓	6.02	427.33 ✓
93			7.5	23.7 ✓
+50			7.0	24.2 ✓
94			6.5	24.7 ✓
+50			6.9	24.3 ✓
95			7.2	24.0 ✓
+50			7.1	24.1 ✓
96			7.3	23.9 ✓
+50			7.4	23.8 ✓
97			8.5	22.7 ✓
+50			8.3	22.9 ✓
98			8.2	23.0 ✓
+50			8.3	22.9 ✓
99			8.5	22.7 ✓
+50			9.0	22.2 ✓
100			9.5	21.7 ✓
+50			9.5	21.7 ✓
TP	2.47	426.39 ✓	7.31	423.92 ✓
101			5.2	21.2 ✓



426.39 ✓

101+50			5.8	420.6 ✓
102			5.7	20.7 ✓
+50			5.5	20.9 ✓
103			5.2	21.2 ✓
+50			5.5	20.9 ✓
104			5.5	20.9 ✓
+50			5.9	20.5 ✓
102			6.0	20.4 ✓
105			5.1	21.3 ✓
			3.3	23.1 ✓
+18			5.1	21.3 ✓
+50			6.6	19.8 ✓
106			6.2	20.2 ✓
+50			6.6	19.8 ✓
107			7.0	19.4 ✓
+50			7.4	19.0 ✓
108			7.4	19.0 ✓
+50			7.4	19.0 ✓
109			7.4	19.0 ✓
IT	4.59	425.50 ✓	5.48	420.91 ✓
109+50			6.6	18.9 ✓
110			6.4	19.1 ✓
+50			6.6	18.9 ✓
111			6.5	19.0 ✓

Top of 8" steel pipe (above ground level) sta 105+09



425.50 ✓

111 +50			6.6	418.9 ✓
112			6.6	18.9 ✓
+50			6.6	18.9 ✓
113			6.7	18.8 ✓
+50			6.8	18.7 ✓
114			6.8	18.7 ✓
+50			6.9	18.6 ✓
115			7.0	18.5 ✓
+20			6.9	18.7 ✓
+30			4.9	20.6 ✓
+37			6.1	19.4 ✓
			7.0	18.5 ✓
+50			6.1	19.4 ✓
116			6.4	19.1 ✓
+50			6.6	18.9 ✓
117			6.8	18.7 ✓
+50			6.9	18.6 ✓
118			7.0	18.5 ✓
+50			7.1	18.4 ✓
+74.11 Δ			7.3	18.2 ✓
TP	3.30	422.00 ✓	6.80	418.70 ✓
			5.0	417.0 ✓
			4.8	17.2 ✓

55

Top of 12" Conc. Inq. pipe 115+37 - (15" O.D.)

cb on B.M. Nail in power pole 74' H 118+74. Rec elev 418.70 Back 601-61

Top of 15" O.D. Conc. Inq. pipe 118+77.6

" " 2" steel pipe 118+86



472.00 ✓

119			4.0	418.0 ✓
+50			4.1	17.9 ✓
120			4.3	17.7 ✓
+50			4.6	17.4 ✓
121			4.8	17.2 ✓
+50			5.0	17.0 ✓
122			5.3	16.7 ✓
+23			5.0	17.0 ✓
			6.5	15.5 ✓
+50			5.4	16.6 ✓
123			5.8	16.2 ✓
+50			5.8	16.2 ✓
124			6.0	16.0 ✓
+50			6.1	15.9 ✓
125			6.4	15.6 ✓
+50			5.7	16.3 ✓
126			5.8	16.2 ✓
			7.7	14.3 ✓
TP	3.83	419.51 ✓	6.32	415.68 ✓
126+50			3.8	415.7 ✓
127			4.1	415.4 ✓
+50			4.5	415.0 ✓
128			4.8	414.7 ✓
+50			5.0	414.5 ✓

Top of 16" O.D. Conc. Irrig. pipe Lt. of 122+35

Top of 18" O.D. Conc. Irrig. pipe 126+06



April 10 1945  
Soper  
King  
Stephans

57

	419.51 ✓		
129		5.1	414.4 ✓
+50		5.5	14.0 ✓
130		5.6	13.9 ✓
+50		5.7	13.8 ✓
131		5.7	13.8 ✓
+50		6.0	13.5 ✓
132		5.9	13.6 ✓
+50		6.0	13.5 ✓
+92		6.0	13.5 ✓
133		5.7	13.8 ✓
+50		6.3	13.2 ✓
134		6.4	13.1 ✓
+50		6.6	12.9 ✓
135		6.6	12.9 ✓
+50		6.9	12.6 ✓
136		7.1	12.4 ✓
+53.60		7.1	
TP		7.05	412.46 ✓
	4.42	416.88 ✓	
136+30.39 B.C.		4.7	412.2 ✓
+50		4.5	12.4 ✓
137		4.8	12.1 ✓
+50		4.8	12.1 ✓
138		4.3	12.6 ✓
+50		4.6	12.3 ✓

\*R.R. spike in Fence cor. to Rt



416.88 ✓

139		5.1	411.8 ✓
+45		4.6	12.3 ✓
+50		4.6	12.3 ✓
140		4.7	12.2 ✓
+10.1		4.7	12.2 ✓
+40		5.7	11.2 ✓
+50		5.3	11.6 ✓
+57		4.7	12.2 ✓
141		5.3	11.6 ✓
+50		5.4	11.5 ✓
142		5.5	11.4 ✓
+50		5.7	11.2 ✓
143		6.0	10.9 ✓
+31.43		6.0	10.9 ✓
+50		6.3	10.6 ✓
144		6.6	10.3 ✓
+05		6.7	10.2 ✓
TP	919	416.08 ✓	9.99 406.89 ✓
144+25		13.8	402.3 ✓
+50		14.0	402.1 ✓
145		14.0	402.1 ✓
+45		13.9	402.2 ✓
+50		13.4	402.7 ✓
+85		9.3	406.8 ✓
146		8.5	407.6 ✓

58







421.12 ✓

154+35.90	3.3	417.8 ✓
+50	3.1	18.0 ✓
155	3.0	18.1 ✓
+50	2.1	19.0 ✓
156	1.4	19.7 ✓
+50	1.0	20.1 ✓
157	1.4	19.7 ✓
+50	1.4	19.7 ✓
158	1.2	19.9 ✓
+16	0.7	20.4 ✓
+50	1.2	19.9 ✓
159	2.5	18.6 ✓
+22	3.2	17.9 ✓
+50	4.4	16.7 ✓
+81.61 50	5.2	15.9 ✓
160+08.53 ✓	4.1	17.1 ✓
TP	4.98	416.14 ✓

4.19 420.33 ✓

160+25	2.7	17.6 ✓
+50	4.2	16.1 ✓
161	8.3	12.0 ✓

April 12, 1945

Saper  
King  
Stephens

60.

$$\begin{array}{r}
 416.3 \\
 -0.2 \\
 \hline
 17.5 \\
 \end{array}
 \quad
 \begin{array}{r}
 417.2 \\
 +0.5 \\
 \hline
 417.7 \\
 -1.2 \\
 \hline
 416.5 \\
 -1.5 \\
 \hline
 415.0 \\
 \end{array}
 \quad
 \begin{array}{r}
 416.3 \\
 -0.4 \\
 \hline
 415.9 \\
 +0.5 \\
 \hline
 416.4 \\
 -0.8 \\
 \hline
 415.6 \\
 +1.0 \\
 \hline
 416.6 \\
 \end{array}
 \quad
 \begin{array}{r}
 416.2 \\
 -1.2 \\
 \hline
 415.0 \\
 +0.8 \\
 \hline
 415.8 \\
 +0.5 \\
 \hline
 416.3 \\
 -1.2 \\
 \hline
 415.1 \\
 +1.0 \\
 \hline
 416.1 \\
 \end{array}$$

$$\begin{array}{r}
 416.3 \\
 -1.3 \\
 \hline
 415.0 \\
 -0.7 \\
 \hline
 414.3 \\
 \end{array}
 \quad
 \begin{array}{r}
 414.6 \\
 -3.0 \\
 \hline
 411.6 \\
 +1.3 \\
 \hline
 412.9 \\
 -1.9 \\
 \hline
 411.0 \\
 +2.8 \\
 \hline
 413.8 \\
 \end{array}
 \quad
 \begin{array}{r}
 418.1 \\
 +0.5 \\
 \hline
 418.6 \\
 +1.0 \\
 \hline
 419.6 \\
 -1.0 \\
 \hline
 420.6 \\
 +1.0 \\
 \hline
 421.6 \\
 \end{array}
 \quad
 \begin{array}{r}
 418.1 \\
 +1.0 \\
 \hline
 419.1 \\
 +1.0 \\
 \hline
 420.1 \\
 +1.0 \\
 \hline
 421.1 \\
 \end{array}$$



	420.33 ✓		
161+12		9.0	411.3 ✓
+20		10.9	409.4 ✓
		11.4	408.9 ✓
161+25		9.5	410.8 ✓
+30.22		9.5	410.8 ✓
+50		9.6	10.7 ✓
+57		9.6	10.7 ✓
+70		8.1	12.2 ✓
162		7.8	12.5 ✓
+148	1 1/2" Water pipe Top 36 ft.	10.63	09.70
+50		8.5	11.8 ✓
+90		8.3	12.0 ✓
163		10.2	10.1 ✓
		9.67	410.66 ✓
TP	2.01	409.37 ✓	12.97 407.36 ✓

6.7  
414.3  
414.1  
425.1  
429.3 6'

FL line 24" Cu. 45' LT 161+21

	414.3		
	414.2		
	414.3		
	414.7		
	413.4		
	411.8		
162+90			
405.8			
	413.8		
	410.9		
	410.5		
	410.3		
	410.5		
	410.2		
	410.9		
	411.8		
	412.0		
	409.6		
	410.1		

Ch. on B.M. Nail in zinc pipe 8' LT 162+76  
Book 60th Page 70 Rec. elev 410.68



		409.37 ✓		
163+13			+0.7	410.1 ✓
+25.3			0.2	409.2 ✓
+50			6.9	402.5 ✓
164			10.7	398.7 ✓
TP	5.81	404.51 ✓	10.67	398.70 ✓
164+50			8.8	395.7 ✓
165			9.0	95.5 ✓
+50			9.0	95.5 ✓
166			9.0	95.5 ✓
+10			8.8	95.7 ✓
+15			7.1	97.4 ✓
+50			7.7	96.8 ✓
167			8.5	96.0 ✓
+45			8.5	96.0 ✓
+75			7.7	96.8 ✓
168			9.0	95.5 ✓
TP	4.44	400.54 ✓	8.4	396.10 ✓
168+10			5.8	394.7 ✓
+50			6.1	394.4 ✓

62.

$$\begin{array}{r} -57 \\ 14 \\ \hline 409.4 \end{array}$$

$$\begin{array}{r} 0.0 \\ 15 \\ \hline 410.1 \end{array}$$

$$\begin{array}{r} -60 \\ 16 \\ \hline 403.2 \end{array}$$

$$\begin{array}{r} +10 \\ 25 \\ \hline 410.2 \end{array}$$

$$\begin{array}{r} +12 \\ 13 \\ \hline 410.9 \end{array}$$

$$\begin{array}{r} 400.5 \\ -20 \\ 20 \\ \hline 399.0 \end{array}$$

$$\begin{array}{r} 400.5 \\ -20 \\ 11 \\ \hline 399.0 \end{array}$$

$$\begin{array}{r} 402.5 \\ 0.0 \\ 2 \\ \hline 402.5 \end{array}$$

$$\begin{array}{r} 409.7 \\ +7.2 \\ 12.8 \\ \hline 409.7 \end{array}$$

$$\begin{array}{r} 409.7 \\ +7.2 \\ 20 \\ \hline 409.7 \end{array}$$

$$\begin{array}{r} +13 \\ 10 \\ \hline 400.2 \end{array}$$

$$\begin{array}{r} 395.7 \\ 0.0 \\ 10 \\ \hline 395.7 \end{array}$$

$$\begin{array}{r} 395.7 \\ 0.0 \\ 20 \\ \hline 395.7 \end{array}$$



400.54 ✓

169			5.8	394.7 ✓
+50			5.2	95.3 ✓
170			5.1	95.4 ✓
+50			4.3	96.2 ✓
171			4.5	96.0 ✓
+50			4.8	95.7 ✓
172			4.8	95.7 ✓
+50			5.2	95.3 ✓
173			5.2	95.3 ✓
+50			4.8	95.7 ✓
174			4.6	95.9 ✓
+50			4.8	95.7 ✓
175			4.9	95.6 ✓
+50			4.4	96.1 ✓
176			4.9	95.6 ✓
+50			4.2	96.3 ✓
177			3.7	96.8 ✓
+50			3.5	97.0 ✓
178			3.6	96.9 ✓
+50			3.2	97.3 ✓
179			3.8	96.7 ✓
TP	1.48	401.82 ✓	3.20	397.34 ✓
179+50			6.2	95.6 ✓
180			5.2	96.6 ✓
+50			5.0	96.8 ✓



401.82<sup>✓</sup>

181			5.0	396.8 ✓
+50			5.6	96.2 ✓
182			5.9	95.9 ✓
+50			5.6	96.2 ✓
183			5.0	96.8 ✓
+50			5.1	96.7 ✓
184			4.5	97.3 ✓
+50			5.0	96.8 ✓
185			5.7	96.1 ✓
+50			5.8	96.0 ✓
186			6.2	95.6 ✓
+50			6.1	95.7 ✓
187			6.6	95.2 ✓
+50			6.8	95.0 ✓
188			6.7	95.1 ✓
+50			7.0	94.8 ✓
TP	5.11	399.83 <sup>✓</sup>	7.10	394.72 ✓
189			5.6	94.2 ✓
+25			5.4	94.4 ✓
+50			4.0	95.8 ✓
190			3.4	96.4 ✓
+50			4.2	95.6 ✓
191			4.5	95.3 ✓
+35			4.8	95.0 ✓
+50			5.3	94.5 ✓



399.83 ✓

192		6.2	393.6 ✓
+25		5.0	94.8 ✓
+50		5.0	94.8 ✓
193		4.9	94.9 ✓
+50		4.8	95.0 ✓
194		4.7	95.1 ✓
+50		5.5	94.3 ✓
195		6.0	93.8 ✓
+50		5.3	94.5 ✓
TP	5.17	402.98 ✓	2.02 397.81 ✓
+82		7.1	395.9 ✓
196		5.3	97.7 ✓
+12		3.3	99.7 ✓
+30		4.5	98.5 ✓
+38.02 B.c.		5.8	97.2 ✓
+50		4.7	98.3 ✓
197		4.5	98.5 ✓
+50		4.4	98.6 ✓

65

394.5	0.0 15	394.5	0.0 15
395.9	0.0 15	398.9	0.0 15
396.2	-15 15	399.2	+33 17
396.2	-15 15	399.6	+13 4
396.6	-31 15	399.6	+13 14
396.6	-31 15	399.7	0.0 15
396.9	-16 15	399.0	+0.5 15
397.2	0.0 15	398.8	+1.5 3
397.2	-14 10	398.6	+1.2 17
397.2	-14 2	398.3	0.0 15
398.5	0.0 15	398.5	0.0 15



402.98 ✓

198	5.0	398.0 ✓
+50	52	97.8 ✓
199	5.7	97.3 ✓
+50	5.9	97.1 ✓
200	6.0	97.0 ✓
+50	6.2	96.8 ✓
201	5.9	97.1 ✓
+29.29	6.4	96.6 ✓

7.27 405.32 ✓ 4.93 398.05 ✓

201+50	8.4	396.9 ✓
202	8.2	97.1 ✓
	11.2	94.1 ✓
	10.9	94.4 ✓

202+50	8.4	96.9 ✓
203	7.6	97.7 ✓
+50	6.3	399.0 ✓
204	5.3	400.0 ✓
+50	4.7	400.6 ✓
205	4.2	401.1 ✓
+50	4.0	401.3 ✓
206	3.8	401.5 ✓
+50	3.2	402.1 ✓
207	2.6	402.7 ✓

66.

ck on B.M. Nail in pines pole Pt Rec also 397.98 Book Col-73

Fl. line 12" Corr. I Calc. 43 RA 202+495

Fl. line 12 " " " 402 11 "



		405.32 ✓		
TP	7.40	410.24 ✓	2.48	402.89 ✓
207.50			6.9	403.3 ✓
+ 90.80			6.1	04.1 ✓
208			6.0	04.2 ✓
			8.2	02.0 ✓
			7.2	03.0 ✓
208.50			5.5	04.7 ✓
209			5.2	05.0 ✓
+ 50			5.1	05.1 ✓
210			5.0	05.2 ✓
+ 50			4.8	05.4 ✓
211			4.5	05.7 ✓
+ 50			4.0	06.2 ✓
212			3.2	07.0 ✓
+ 50			2.2	08.0 ✓
TP	8.25	416.31 ✓	2.18	408.06 ✓
213			8.0	08.3 ✓
+ 50			7.5	08.8 ✓
214			6.9	09.4 ✓
+ 50			6.3	10.0 ✓
215			5.9	10.4 ✓
+ 45.40			5.6	10.7 ✓

Fl. Area 13" Core, J. Culm, 1962 208+164

" " " 299.11



	416.31 ✓		
215+50	5.6	410.7 ✓	
216	5.9	10.4 ✓	
+45.40	6.9	09.4 ✓	
150	7.1	09.2 ✓	
217+00.87	8.9	07.4 ✓	
	7.43	408.88 ✓	
	9.2	07.1 ✓	

ck on B.M. Nail in pole. Rec. elev. 408.95

Edge of pavement 12' ahead of 217+00.87











17463 ✓

10+00	9.5	465.1 ✓
+50	11.9	462.7 ✓
+86	14.0	460.6 ✓
11+00	11.4	463.2 ✓
+13	9.4	465.2 ✓
+50	11.0	463.6 ✓
+62	12.6	462.0 ✓
+82	12.4	462.2 ✓
12+00	12.0	462.6 ✓
+06	14.3	460.3 ✓
+20	13.2	461.4 ✓
+50	8.4	466.2 ✓
+87	9.8	464.8 ✓
13+00	6.2	468.4 ✓

10+00	H 475.6 +105 23	470.1 ✓	464.1 ✓	RT 462.4 ✓	71
10+50	475.6 +129 23	472.6 ✓	461.8 ✓	460.7 ✓	
10+86	473.6 +130 20	467.5 ✓	459.1 ✓	458.6 ✓	
11+00	473.2 +102 16	466.0 ✓	459.7 ✓	459.2 ✓	
11+13	At base of large boulder +138 20	478.2 ✓	459.9 ✓	459.3 ✓	459.2 ✓
11+50	+130 23	476.6 ✓	458.9 ✓	458.6 ✓	
11+62	+145 25	476.5 ✓	458.9 ✓	458.3 ✓	
11+82	+135 30	475.2 ✓	459.2 ✓	458.60 ✓	
12+00	475.6 +130 24	466.9 ✓	458.9 ✓	458.4 ✓	
12+06	+153 24	475.6 ✓	459.9 ✓	457.5 ✓	
12+20	481.4 +200 25	479.9 ✓	459.1 ✓	458.4 ✓	
12+50	+185 16	474.9 ✓	459.9 ✓	458.9 ✓	
12+87	+130 15	477.2 ✓	459.9 ✓	458.9 ✓	
13+00	490.0 +255 30	edge of road 491.9 ✓	459.8 ✓	459.0 ✓	
	+235 30	491.4 ✓	459.7 ✓	457.0 ✓	456.5 ✓



474.63 ✓

13+15

11.3

463.3 ✓

+50

10.9

463.7 ✓

14+00

12.0

462.6 ✓

14+22 <sup>33</sup>back  
14+25 <sup>52</sup>abd.

12.7

461.9 ✓

K on old sta 1400

16.2

458.4 ✓ Rec.  
458.3

(Cont'd. on P.10)

72

	LL	R1	
13+15	484.3 edge of road +21° 30	484.3 +21° 24	479.3 +10° 8
13+50	486.5 +22° 27	486.5 +21° 19	485.5 ✓
14+00	475.6 +13° 21	474.6 +12° 13	474.6 ✓
14+22	474.9 +13° 23	472.9 +11° 14	472.9 ✓
			460.6 -12° 4
			458.9 -9° 6
			458.1 -5° 20
			458.2 -5° 20
			457.6 -5° 20
			457.6 -5° 20
			460.2 -12° 20

on split of angle



Check Survey San Vicente 2<sup>nd</sup> Mar 17

6789<sup>52</sup> L:RT 37°-12'-30"

4+00

3+17<sup>68</sup> L:RT 16°-23'-00"

1+22.4 Fd Nail. See Sopers alignment Notes Page 1.

0+13.26 outside face wall

0+00



Bliss Notes

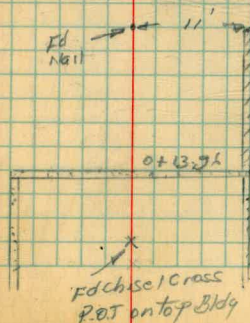
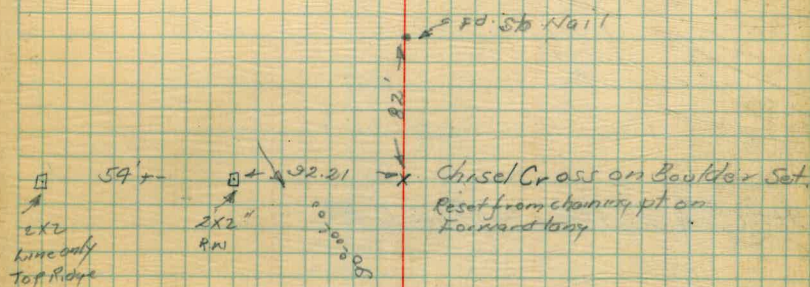
King X

Phillips

Nenow

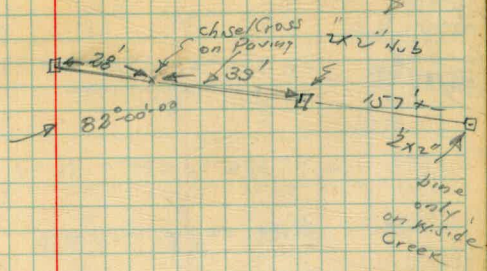
1/2/47

Clear, Cold, windy

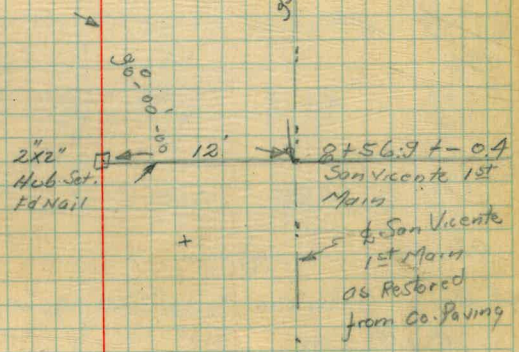




PPS for 9786 54



2.0' x 2.0' Hub  
out stake  
9750  
San Vicente  
1st Main



9786 54 L 4°53'33" ± BC RT



H.11  
Bliss notes  
King &  
Phillips.  
Nienow  
1/27 + 70  
Fossiliferous  
1/9/47 EE.

Cross Sections to the Left & Rt of  
San Vicente 1st Main from 41+40 to 46+28

150		6.0	452.9	✓	
150		5.9	453.0	✓	
+35	Begin live Granite	5.9	453.0	✓	
+17		5.9	453.0	✓	
44		6.0	452.9	✓	
150		6.1	452.8	✓	
+26		6.0	452.9 EE		
+10 <sup>27</sup>	PRC	6.0	452.9	✓	
93		6.0	452.9	✓	
+50		5.7	453.2	✓	
42		6.3	452.6	✓	
+53 <sup>98</sup>	BC pt	6.9	452.0	✓	
41+40		7.1	451.8	✓	
TP	6.52	458.92	0.74	452.40	✓
BM	9.47	453.14		443.67	✓
	+	π	-	\$ Elev.	

D.C. mm 5' Dist  
over-burden

Dist

Lt

E. Pt. 75  
Pc

497.6 44.7 80	494.3 41.2 68	489.8 36.3 50	482.0 29.1 38	478.3 25.4 24	473.5 +20.5 17	+54.0 +11 10	+70	453.2 +0.3 6
	491.0 38.0 76	486.1 33.1 58	473.0 +30 50	470.2 +20.0 26	455.0 +18.2 18	+8.0 +2.0 8	+50	453.3 +0.3 6
	486.6 33.6 70	477.4 +22.4 50	472.5 19.5 25	471.0 +18.0 15	456.6 +3.6 9	+40.7 +0.7 6	453.2 +0.2	
466.5 33.5 70	463.6 32.6 64	478.6 25.6 50	475.7 +22.7 50	470.5 +17.5 38	457.0 +9.0 20	453.7 +0.7 11		453.2 +0.2 6
		484.9 32.0 65	476.1 23.2 50	474.3 +21.0 38	468.1 +15.2 20	453.2 +0.3 11	+41.0	453.2 +0.3 6
		480.6 27.8 70	474.9 +22.1 50	474.9 +13.6 19	466.4 +0.3 9	453.1 +0.3 6	453.2 +0.4	
480.2 27.3 70	474.7 21.8 50	466.7 +13.0 19	458.2 +5.3 11	453.9 +1.0 6			453.2 +0.2 6	
	480.5 27.6 70	474.7 +21.8 50	467.0 +14.1 18	458.0 +4.1 13	453.4 +0.5 8		453.2 +0.3 6	
479.9 27.0 70	474.5 +21.8 50	471.5 +18.6 33	467.5 +19.6 19	457.9 +3.0 7	453.6 +0.7 8	453.2 +0.3 6		
	483.1 23.8 70	474.1 +23.9 50	473.1 18.9 35	466.6 +15.2 20	458.3 +4.1 14	454.2 +1.0 9	+50	453.2 +0.3 6
	477.2 +22.6 70	472.6 +26 50	469.6 +17.0 35	467.4 +4.8 19	455.6 +3.0 15	453.2 +0.6 11	4210	452.9 +0.3 6
		469.7 +17.7 64	467.4 +15.4 50	466.7 +14.7 34	462.7 +10.7 20	453.4 +1.4 12	+453.98	452.3 +0.3 6
		458.3 +6.5 20	457.8 +6.0 15	452.0 +0.2 7	41+40	452.1 +0.3 6		

PP # 72,967

Lt

E. Pt.  
on Par. 199



6

Check BM 10.61 442.65 - 472.907 P.P. #

T.P. 2.93 454.26 7.59 451.33 ✓

46+28 8.5 450.4 ✓

46+03 7.7 451.2 ✓

194 7.5 451.4 ✓

468 Jet live decomposed granite 6.9 452.0 ✓

155 E.C. 6.6 452.3 ✓

+44 6.5 452.4 ✓

+29 6.3 452.6 ✓

+16 6.2 452.7 ✓

45 6.1 452.8 ✓

44+93 6.1 452.8 ✓

44+85 458.92 - 61 452.8 ✓

+ T - B.E.K.

DE with some large boulders

live granite

479.5 ✓	471.7 ✓	466.1 ✓	463.1 ✓	455.6 ✓	453.5 ✓	451.7 ✓	446.28 ✓	440.8 ✓
+25.3	+20.5	+19.9	+11.3	4.6	+2.3	+0.5	46+03	+0.3
72	36	37	23	10	6	6		451.5
481.8 ✓	475.4 ✓	480.4 ✓	466.9 ✓	459.4 ✓	452.4 ✓	451.9 ✓	446.28 ✓	440.8 ✓
+30.2	+28.9	+19.0	+15.5	+8.0	+1.0			+0.5
72	54	37	22	12	7	139		451.5
493.8 ✓	487.1 ✓	482.1 ✓	480.9 ✓	475.9 ✓	471.4 ✓	453.3 ✓	452.7 ✓	452.7 ✓
91.2	85.1	30.0	41	+23.9	+19.9	+1.3	468	+0.4
67	50	41		16	8			6
496.9 ✓	489.9 ✓	485.4 ✓	477.4 ✓	463.3 ✓	453.0 ✓	452.7 ✓	452.7 ✓	452.7 ✓
+44.0	+37.0	133.1	+25.1	+11.0	+0.7	455.6	+0.4	6
70	50	36	22	10	7			6
498.7 ✓	494.2 ✓	492.1 ✓	489.2 ✓	481.2 ✓	480.1 ✓	453.9 ✓	452.8 ✓	452.8 ✓
46.3	41.8	39.7	36.8	+28.9	+27.7	1.5	444	+0.4
67	60	50	40	22	20	3		6
497.9 ✓	490.9 ✓	483.4 ✓	479.4 ✓	477.9 ✓	453.0 ✓	453.0 ✓	453.0 ✓	453.0 ✓
45.3	+38.3	+30.8	26.8	+25.3	+0.9	451.24	+0.4	6
67	50	27	21	17	6			6
499.3 ✓	491.3 ✓	484.7 ✓	479.6 ✓	477.3 ✓	457.9 ✓	453.7 ✓	453.1 ✓	453.1 ✓
+46.6	+38.6	+32.0	+27.1	+24.6	+5.2	451.9	451.6	+0.4
72	50	32	22	19	13	7		6
499.4 ✓	491.9 ✓	482.2 ✓	478.6 ✓	458.5 ✓	453.8 ✓	453.2 ✓	453.2 ✓	453.2 ✓
47.1	39.1	29.4	25.8	+5.7	+1.0	451.00	+0.4	6
75	50	21	17	8	6			6
497.9 ✓	490.2 ✓	484.2 ✓	478.7 ✓	462.3 ✓	453.2 ✓	453.3 ✓	453.3 ✓	453.3 ✓
45.1	+37.4	31.4	+25.9	+9.5	+0.4	451.00	+0.5	6
75	50	28	17	8	5			6
497.5 ✓	487.7 ✓	481.2 ✓	476.7 ✓	458.4 ✓	452.8 ✓	453.3 ✓	453.3 ✓	453.3 ✓
44.7	34.9	+23.5	23.9	+5.6	0.0	451.00	+0.5	6
74	50	33	11	3	7			6

Lt

Rt. 401.00



Hill

Bliss notes

# San Vicente 2<sup>nd</sup> Main Line Change

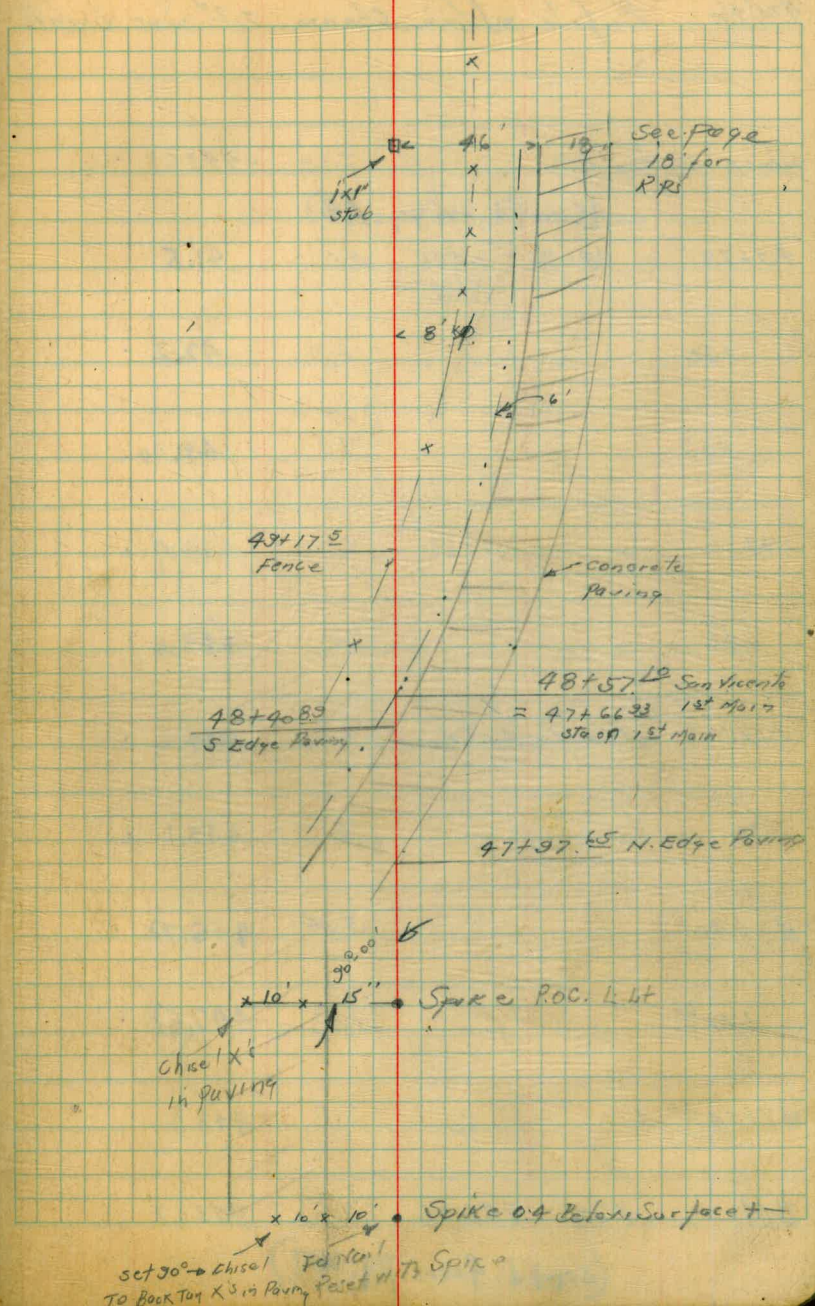
King Super Also.  
Phillips Jan/21/47  
Nixon Worm

49+78.81 = 49+99.03 P.O.T. (Cont'd. on pg. 18)  
= L. 2071000'

49+46 Tel Pole # 306350 8' RT

47+84.20 P.O.C. L.L. 27-55'-00 To top to curve  
Note: This L is set C'RT + parallel  
to ex paving. Does not make a true curve

47+33.27 B.C. See page 18



set 90° - chisel for use  
to back top X's in paving. P.O.C. with spike



4/21/46 Profile of line change 2<sup>nd</sup> San Vicente P.L.

Check starting BM 7.39 443.67

(Cont'd. on pg. 48)

49+78<sup>81</sup> = 49+39<sup>89</sup> = POT. 9.6 41.5  
L on original location

+50 8.9 42.2

+35 7.1 44.00

49 6.2 444.9

+75 7.5 443.6

+57.1 int San Vicente 1<sup>st</sup> Main 6.5 444.6

+50 6.0 445.1

48+40<sup>89</sup> 5.34 445.72

+37<sup>65</sup> 3.38 447.68

47+84<sup>20</sup> L 2.8 448.3

BM 7.39 451.06 443.67

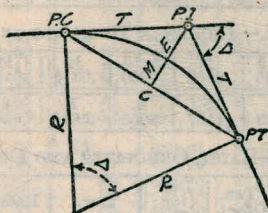
(cont'd. from pg. 47)



1955  
1917  
1972

# DIETZGEN'S RAILROAD CURVE AND REDUCTION TABLES

Copyright, 1914, by Eugene Dietzgen Co., New York City



### CURVE FORMULAS

- Radius= $R = \frac{50}{\sin \frac{D}{2}}$  (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)  $= R \text{vers} \frac{\Delta}{2}$  (6)  
 External= $E = T \tan \frac{\Delta}{4}$  (7)  $= R + \cos \frac{\Delta}{2} \cdot R$  (8)  $= R \text{exsec} \frac{\Delta}{2}$  (9)  
 Long Chord= $C = 2 R \sin \frac{\Delta}{2}$  (10)  $\Delta$  = Central Angle

### EXPLANATION AND USE OF TABLES

**Stations.**—Given P. I.—Sta. 161+60.35 to find Sta. of P. C. and P. T.  $\Delta = 62^\circ 10'$   $D = 8^\circ 20'$ . From Table IV for  $1^\circ$  curve  $T = 3454.1$  and  $\div 8\frac{1}{3} = 414.49$  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 =  $\frac{1}{2} D$  for 100 ft.,  $\frac{1}{4} D$  for 50 ft., etc. For  $c$  ft. = (in minutes)  $.3 \times C \times D^\circ$  or = defl. for 1 ft. from Table III  $\times C$ . For Sta. 158 of above curve =  $.3 \times 54.5 \times 8\frac{1}{3} = 136.2'$  or  $2^\circ 16.2'$ , or =  $2.50 \times 54.5 = 136.2'$  from Table III. For Sta. 159 deflection angle =  $2^\circ 16.2' + 8^\circ 20' \div 2 = 6^\circ 26.2'$ , etc.

**Externals.**—May be found in similar manner to tangents. Thus  $E$  for curve above is 115.37. For from Table IV for  $1^\circ$  curve  $E = 960.6$  for  $8^\circ 20' = 960.6 \div 8\frac{1}{3} = 115.27$  and from Table V correction = .10 or  $E = 115.37$  ft. Or suppose  $\Delta = 32^\circ$  and  $E$  is measured and found to be 42 ft. What is  $D$ ? From Table IV  $E = 230.9$  and  $\div 42 = 5.5$  or  $D = 5^\circ 30'$ .



TABLE IV.—TANGENTS AND EXTERNALS TO A 1° CURVE.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
31°	1589.0	216.3	41°	2142.2	387.4	51°	2732.9	618.4
10'	1598.0	218.7	10'	2151.7	390.7	10'	2743.1	622.8
20'	1606.9	221.1	20'	2161.2	394.1	20'	2753.4	627.2
30'	1615.9	223.5	30'	2170.8	397.4	30'	2763.7	631.7
40'	1624.9	226.0	40'	2180.3	400.8	40'	2773.9	636.2
50'	1633.9	228.4	50'	2189.9	404.2	50'	2784.2	640.7
32	1643.0	230.9	42	2199.4	407.6	52	2794.5	645.2
10'	1652.0	233.4	10'	2209.0	411.1	10'	2804.9	649.7
20'	1661.0	235.9	20'	2218.6	414.5	20'	2815.2	654.3
30'	1670.0	238.4	30'	2228.1	418.0	30'	2825.6	658.8
40'	1679.1	241.0	40'	2237.7	421.4	40'	2835.9	663.4
50'	1688.1	243.5	50'	2247.3	425.0	50'	2846.3	668.0
33	1697.2	246.1	43	2257.0	428.5	53	2856.7	672.7
10'	1706.3	248.7	10'	2266.6	432.0	10'	2867.1	677.3
20'	1715.3	251.3	20'	2276.2	435.6	20'	2877.5	682.0
30'	1724.4	253.9	30'	2285.9	439.2	30'	2888.0	686.7
40'	1733.5	256.5	40'	2295.6	442.8	40'	2898.4	691.4
50'	1742.6	259.1	50'	2305.2	446.4	50'	2908.9	696.1
34	1751.7	261.8	44	2314.9	450.0	54	2919.4	700.9
10'	1760.8	264.5	10'	2324.6	453.6	10'	2929.9	705.7
20'	1770.0	267.2	20'	2334.3	457.3	20'	2940.4	710.5
30'	1779.1	269.9	30'	2344.1	461.0	30'	2951.0	715.3
40'	1788.2	272.6	40'	2353.8	464.6	40'	2961.5	720.1
50'	1797.4	275.3	50'	2363.5	468.4	50'	2972.1	725.0
35	1806.6	278.1	45	2373.3	472.1	55	2982.7	729.9
10'	1815.7	280.8	10'	2383.1	475.8	10'	2993.3	734.8
20'	1824.9	283.6	20'	2392.8	479.6	20'	3003.9	739.7
30'	1834.1	286.4	30'	2402.6	483.3	30'	3014.5	744.6
40'	1843.3	289.2	40'	2412.4	487.2	40'	3025.2	749.6
50'	1852.5	292.0	50'	2422.3	491.0	50'	3035.8	754.6
36	1861.7	294.9	46	2432.1	494.8	56	3046.5	759.6
10'	1870.9	297.7	10'	2441.9	498.7	10'	3057.2	764.6
20'	1880.1	300.6	20'	2451.8	502.5	20'	3067.9	769.7
30'	1889.4	303.5	30'	2461.7	506.4	30'	3078.7	774.7
40'	1898.6	306.4	40'	2471.5	510.3	40'	3089.4	779.8
50'	1907.9	309.3	50'	2481.4	514.3	50'	3100.2	784.9
37	1917.1	312.3	47	2491.3	518.2	57	3110.9	790.1
10'	1926.4	315.2	10'	2501.2	522.2	10'	3121.7	795.2
20'	1935.7	318.1	20'	2511.2	526.1	20'	3132.6	800.4
30'	1945.0	321.1	30'	2521.1	530.1	30'	3143.4	805.6
40'	1954.3	324.1	40'	2531.1	534.2	40'	3154.2	810.9
50'	1963.6	327.1	50'	2541.0	538.2	50'	3165.1	816.1
38	1972.9	330.2	48	2551.0	542.2	58	3176.0	821.4
10'	1982.2	333.2	10'	2561.0	546.3	10'	3186.9	826.7
20'	1991.5	336.3	20'	2571.0	550.4	20'	3197.8	832.0
30'	2000.9	339.3	30'	2581.0	554.5	30'	3208.8	837.3
40'	2010.2	342.4	40'	2591.0	558.6	40'	3219.7	842.7
50'	2019.6	345.5	50'	2601.1	562.8	50'	3230.7	848.1
39	2029.0	348.6	49	2611.2	566.9	59	3241.7	853.5
10'	2038.4	351.8	10'	2621.2	571.1	10'	3252.7	858.9
20'	2047.8	354.9	20'	2631.3	575.3	20'	3263.7	864.3
30'	2057.2	358.1	30'	2641.4	579.5	30'	3274.8	869.8
40'	2066.6	361.3	40'	2651.5	583.8	40'	3285.8	875.3
50'	2076.0	364.5	50'	2661.6	588.0	50'	3296.9	880.8
40	2085.4	367.7	50	2671.8	592.3	60	3308.0	886.4
10'	2094.9	371.0	10'	2681.9	596.6	10'	3319.1	892.0
20'	2104.3	374.2	20'	2692.1	600.9	20'	3330.3	897.5
30'	2113.8	377.5	30'	2702.3	605.3	30'	3341.4	903.2
40'	2123.3	380.8	40'	2712.5	609.6	40'	3352.6	908.8
50'	2132.7	384.1	50'	2722.7	614.0	50'	3363.8	914.5

49+99.09  
49+05  
94.09

TABLE IV.—TANGENTS AND EXTERNALS TO A 1° CURVE.

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
61°	3375.0	920.2	71°	4086.9	1308.2	81°	4893.6	1805.3
10'	3386.3	925.9	10'	4099.5	1315.6	10'	4908.0	1814.7
20'	3397.5	931.6	20'	4112.1	1322.9	20'	4922.5	1824.1
30'	3408.8	937.3	30'	4124.8	1330.3	30'	4937.0	1833.6
40'	3420.1	943.1	40'	4137.4	1337.7	40'	4951.5	1843.1
50'	3431.4	948.9	50'	4150.1	1345.1	50'	4966.1	1852.6
62	3442.7	954.8	72	4162.8	1352.6	82	4980.7	1862.2
10'	3454.1	960.6	10'	4175.6	1360.1	10'	4995.4	1871.8
20'	3465.4	966.5	20'	4188.5	1367.6	20'	5010.0	1881.5
30'	3476.8	972.4	30'	4201.2	1375.2	30'	5024.8	1891.2
40'	3488.3	978.3	40'	4214.0	1382.8	40'	5039.5	1900.9
50'	3499.7	984.3	50'	4226.8	1390.4	50'	5054.3	1910.7
63	3511.1	990.2	73	4239.7	1398.0	83	5069.2	1920.5
10'	3522.6	996.2	10'	4252.6	1405.7	10'	5084.0	1930.4
20'	3534.1	1002.3	20'	4265.6	1413.5	20'	5098.9	1940.3
30'	3545.6	1008.3	30'	4278.5	1421.2	30'	5113.9	1950.3
40'	3557.2	1014.4	40'	4291.5	1429.0	40'	5128.9	1960.2
50'	3568.7	1020.5	50'	4304.6	1436.8	50'	5143.9	1970.3
64	3580.3	1026.6	74	4317.6	1444.6	84	5159.0	1980.4
10'	3591.9	1032.8	10'	4330.7	1452.5	10'	5174.1	1990.5
20'	3603.5	1039.0	20'	4343.8	1460.4	20'	5189.3	2000.6
30'	3615.1	1045.2	30'	4356.9	1468.4	30'	5204.4	2010.8
40'	3626.8	1051.4	40'	4370.1	1476.4	40'	5219.5	2021.1
50'	3638.5	1057.7	50'	4383.3	1484.4	50'	5234.9	2031.4
65	3650.2	1063.9	75	4396.5	1492.4	85	5250.2	2041.7
10'	3661.9	1070.2	10'	4409.8	1500.5	10'	5265.6	2052.1
20'	3673.7	1076.6	20'	4423.1	1508.6	20'	5281.0	2062.5
30'	3685.4	1082.9	30'	4436.4	1516.7	30'	5296.4	2073.0
40'	3697.2	1089.3	40'	4449.7	1524.9	40'	5311.9	2083.5
50'	3709.0	1095.7	50'	4463.1	1533.1	50'	5327.4	2094.1
66	3720.9	1102.2	76	4476.5	1541.4	86	5343.0	2104.7
10'	3732.7	1108.6	10'	4489.9	1549.7	10'	5358.6	2115.3
20'	3744.6	1115.1	20'	4503.4	1558.0	20'	5374.2	2126.0
30'	3756.5	1121.7	30'	4516.9	1566.3	30'	5389.9	2136.7
40'	3768.5	1128.2	40'	4530.4	1574.7	40'	5405.6	2147.5
50'	3780.4	1134.8	50'	4544.0	1583.1	50'	5421.4	2158.4
67	3792.4	1141.4	77	4557.6	1591.6	87	5437.2	2169.2
10'	3804.4	1148.0	10'	4571.2	1600.1	10'	5453.1	2180.2
20'	3816.4	1154.7	20'	4584.8	1608.6	20'	5469.0	2191.1
30'	3828.4	1161.3	30'	4598.5	1617.1	30'	5484.9	2202.2
40'	3840.5	1168.1	40'	4612.3	1625.7	40'	5500.9	2213.2
50'	3852.6	1174.8	50'	4626.0	1634.4	50'	5517.0	2224.3
68	3864.7	1181.6	78	4639.8	1643.0	88	5533.1	2235.5
10'	3876.8	1188.4	10'	4653.6	1651.7	10'	5549.2	2246.7
20'	3889.0	1195.2	20'	4667.4	1660.5	20'	5565.4	2258.0
30'	3901.2	1202.0	30'	4681.3	1669.2	30'	5581.6	2269.3
40'	3913.4	1208.9	40'	4695.2	1678.1	40'	5597.8	2280.6
50'	3925.6	1215.8	50'	4709.2	1686.9	50'	5614.2	2292.0
69	3937.9	1222.7	79	4723.2	1695.8	89	5630.5	2303.5
10'	3950.2	1229.7	10'	4737.2	1704.7	10'	5646.9	2315.0
20'	3962.5	1236.7	20'	4751.2	1713.7	20'	5663.4	2326.6
30'	3974.8	1243.7	30'	4765.3	1722.7	30'	5679.9	2338.2
40'	3987.2	1250.8	40'	4779.4	1731.7	40'	5696.4	2349.8
50'	3999.5	1257.9	50'	4793.6	1740.8	50'	5713.0	2361.5
70	4011.9	1265.0	80	4807.7	1749.9	90	5729.7	2373.3
10'	4024.4	1272.1	10'	4822.0	1759.0	10'	5746.3	2385.1
20'	4036.8	1279.3	20'	4836.2	1768.2	20'	5763.1	2397.0
30'	4049.3	1286.5	3					



0685

0698

0698

0669

0669

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16

25

X

TABLE VIII.—NATURAL TRIGONOMETRICAL FUNCTIONS.

Angle	Sine.	Tan.	Cotg.	Cosin.	Angle	Sine.	Tan.	Cotg.	Cosin.	
0°	0	0	∞	1	90°	1	∞	0	0	
10	.0029	.0029	343.3	.99998	50	.7660	.7660	.7660	.6428	
20	.0058	.0058	171.9	.99998	40	.6428	.6428	.6428	.3572	
30	.0087	.0087	114.6	.99996	30	.5000	.5000	.5000	.8660	
40	.0116	.0116	85.94	.99993	20	.3420	.3420	.3420	.9343	
50	.0145	.0145	68.75	.99989	10	.1736	.1736	.1736	.9848	
1	.0175	.0175	57.29	.99985	89	.9848	.9848	.9848	.1736	
10	.0204	.0204	49.10	.99979	50	.7660	.7660	.7660	.6428	
20	.0233	.0233	42.96	.99973	40	.6428	.6428	.6428	.3572	
30	.0262	.0262	38.19	.99966	30	.5000	.5000	.5000	.8660	
40	.0291	.0291	34.37	.99958	20	.3420	.3420	.3420	.9343	
50	.0320	.0320	31.24	.99949	10	.1736	.1736	.1736	.9848	
2	.0349	.0349	28.64	.99939	88	.9848	.9848	.9848	.1736	
10	.0378	.0378	26.43	.99929	50	.7660	.7660	.7660	.6428	
20	.0407	.0407	24.54	.99917	40	.6428	.6428	.6428	.3572	
30	.0436	.0437	22.90	.99905	30	.5000	.5000	.5000	.8660	
40	.0465	.0466	21.47	.99892	20	.3420	.3420	.3420	.9343	
50	.0494	.0495	20.21	.99878	10	.1736	.1736	.1736	.9848	
3	.0523	.0524	19.08	.99863	87	.9848	.9848	.9848	.1736	
10	.0552	.0553	18.07	.99847	50	.7660	.7660	.7660	.6428	
20	.0581	.0582	17.17	.99831	40	.6428	.6428	.6428	.3572	
30	.0610	.0612	16.35	.99813	30	.5000	.5000	.5000	.8660	
40	.0640	.0641	15.60	.99795	20	.3420	.3420	.3420	.9343	
50	.0669	.0670	14.92	.99776	10	.1736	.1736	.1736	.9848	
4	.0698	.0699	14.30	.99756	86	.9848	.9848	.9848	.1736	
10	.0727	.0729	13.73	.99735	50	.7660	.7660	.7660	.6428	
20	.0756	.0758	13.20	.99714	40	.6428	.6428	.6428	.3572	
30	.0785	.0787	12.71	.99692	30	.5000	.5000	.5000	.8660	
40	.0814	.0816	12.25	.99669	20	.3420	.3420	.3420	.9343	
50	.0843	.0846	11.83	.99644	10	.1736	.1736	.1736	.9848	
5	.0872	.0875	11.43	.99619	85	.9848	.9848	.9848	.1736	
10	.0901	.0904	11.06	.99594	50	.7660	.7660	.7660	.6428	
20	.0929	.0934	10.71	.99567	40	.6428	.6428	.6428	.3572	
30	.0958	.0963	10.39	.99540	30	.5000	.5000	.5000	.8660	
40	.0987	.0992	10.08	.99511	20	.3420	.3420	.3420	.9343	
50	.1016	.1022	9.788	.99482	10	.1736	.1736	.1736	.9848	
6	.1045	.1051	9.514	.99452	84	.9848	.9848	.9848	.1736	
10	.1074	.1080	9.255	.99421	50	.7660	.7660	.7660	.6428	
20	.1103	.1110	9.010	.99390	40	.6428	.6428	.6428	.3572	
30	.1132	.1139	8.777	.99357	30	.5000	.5000	.5000	.8660	
40	.1161	.1169	8.556	.99324	20	.3420	.3420	.3420	.9343	
50	.1190	.1198	8.345	.99290	10	.1736	.1736	.1736	.9848	
7	.1219	.1228	8.144	.99255	83	.9848	.9848	.9848	.1736	
10	.1248	.1257	7.953	.99219	50	.7660	.7660	.7660	.6428	
20	.1276	.1287	7.770	.99182	40	.6428	.6428	.6428	.3572	
30	.1305	.1317	7.596	.99144	30	.5000	.5000	.5000	.8660	
40	.1334	.1346	7.429	.99106	20	.3420	.3420	.3420	.9343	
50	.1363	.1376	7.269	.99067	10	.1736	.1736	.1736	.9848	
	Cosin.	Cotg.	Tan.	Sine.	Angle.	Cosin.	Cotg.	Tan.	Sine.	Angle.

XI

TABLE VIII.—NATURAL TRIGONOMETRICAL FUNCTIONS.

Angle	Sine.	Tan.	Cotg.	Cosin.	Angle	Sine.	Tan.	Cotg.	Cosin.	
16	.2756	.2867	3.487	.96126	74	.4067	.4452	2.246	.91355	
10	.2734	.2899	3.450	.96046	50	.4094	.4487	2.229	.91236	
20	.2812	.2931	3.412	.95964	40	.4120	.4522	2.211	.91116	
30	.2840	.2962	3.376	.95882	30	.4147	.4557	2.194	.90996	
40	.2868	.2994	3.340	.95799	20	.4173	.4592	2.177	.90875	
50	.2896	.3026	3.305	.95716	10	.4200	.4628	2.161	.90753	
17	.2924	.3057	3.271	.95635	73	.4226	.4663	2.145	.90631	
10	.2952	.3089	3.237	.95554	50	.4253	.4699	2.128	.90507	
20	.2979	.3121	3.204	.95472	40	.4279	.4734	2.112	.90383	
30	.3007	.3153	3.172	.95389	30	.4305	.4770	2.097	.90259	
40	.3035	.3185	3.140	.95306	20	.4331	.4806	2.081	.90133	
50	.3062	.3217	3.108	.95223	10	.4358	.4841	2.066	.90007	
18	.3090	.3249	3.078	.95140	72	.4384	.4877	2.050	.89879	
10	.3118	.3281	3.048	.95057	50	.4410	.4913	2.035	.89752	
20	.3145	.3314	3.018	.94974	40	.4436	.4950	2.020	.89623	
30	.3173	.3346	2.989	.94891	30	.4462	.4986	2.006	.89493	
40	.3201	.3378	2.960	.94807	20	.4488	.5022	1.991	.89363	
50	.3228	.3411	2.932	.94724	10	.4514	.5059	1.977	.89232	
19	.3256	.3443	2.904	.94641	71	.4540	.5095	1.963	.89101	
10	.3283	.3476	2.877	.94557	50	.4566	.5132	1.949	.88968	
20	.3311	.3508	2.850	.94474	40	.4592	.5169	1.935	.88835	
30	.3338	.3541	2.824	.94391	30	.4617	.5206	1.921	.88701	
40	.3365	.3574	2.798	.94307	20	.4643	.5243	1.907	.88566	
50	.3393	.3607	2.773	.94224	10	.4669	.5280	1.894	.88431	
20	.3420	.3640	2.747	.94141	70	.4695	.5317	1.881	.88295	
10	.3448	.3673	2.723	.94057	50	.4720	.5354	1.868	.88158	
20	.3475	.3706	2.699	.93974	40	.4746	.5392	1.855	.88020	
30	.3502	.3739	2.675	.93891	30	.4772	.5430	1.842	.87882	
40	.3529	.3772	2.651	.93807	20	.4797	.5467	1.829	.87743	
50	.3557	.3805	2.628	.93724	10	.4823	.5505	1.816	.87603	
21	.3584	.3839	2.605	.93641	69	.4848	.5543	1.804	.87462	
10	.3611	.3872	2.583	.93557	50	.4874	.5581	1.792	.87321	
20	.3638	.3906	2.560	.93474	40	.4899	.5619	1.780	.87178	
30	.3665	.3939	2.539	.93391	30	.4924	.5658	1.767	.87036	
40	.3692	.3973	2.517	.93307	20	.4950	.5696	1.756	.86892	
50	.3719	.4006	2.496	.93224	10	.4975	.5735	1.744	.86748	
22	.3746	.4040	2.475	.93141	68	.4999	.5774	1.732	.86603	
10	.3773	.4074	2.455	.93057	50	.5025	.5812	1.720	.86457	
20	.3800	.4108	2.434	.92974	40	.5050	.5851	1.709	.86310	
30	.3827	.4142	2.414	.92891	30	.5075	.5890	1.698	.86163	
40	.3854	.4176	2.394	.92807	20	.5100	.5930	1.686	.86015	
50	.3881	.4210	2.375	.92724	10	.5125	.5969	1.675	.85866	
23	.3907	.4245	2.356	.92641	67	.5150	.6009	1.664	.85717	
10	.3934	.4279	2.337	.92557	50	.5175	.6048	1.653	.85567	
20	.3961	.4314	2.318	.92474	40	.5200	.6088	1.643	.85416	
30	.3987	.4348	2.300	.92391	30	.5225	.6128	1.632	.85264	
40	.4014	.4383	2.282	.92307	20	.5250	.6168	1.621	.85112	
50	.4041	.4417	2.264	.92224	10	.5275	.6208	1.611	.84959	
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Please Return to  
City of San Diego Water Dept.  
Room 268 Civic Center  
Telephone Main 5161

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DISTANCES FROM CENTER OF ROADWAY FOR  
CROSS-SECTIONING.

Roadway 16 feet wide. Side Slopes 1 on 1 1/2  
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.