

694

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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Please Return to
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Telephone Main 5161

542.41 = 542.51 7-12-46

542.44 = 542.51 2-20-46

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Indexed top. 72 - 4/4/46. mod

" p 77 5/23/46. mod

" 48 inches 7/18/46

GROSSMONT TUNNEL BOOK - (EL MONTE P.L.)

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PROPERTY LINE TIES

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TO 197+70⁵⁸ (RIVERVIEW PUMPING PLANT p. 15-16)

FINAL ALT ROUTE FROM STA 173+27²⁷ + 195+74⁰³
RIVERVIEW PUMP PLANT 17-20 17-20

LINE CHANGE EL MONTE P.L. STA 189+51⁷⁹
TO STA 199+18²³ NEAR RIVERVIEW PUMP PLANT 21

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CHECK LEVELS west of Tunnel 49

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CHECK LEVELS Tunnel 45-47

23-24

El Monte P.L. Relocation from
Lakaside sta. 112+50.5 to 50-61

(cont on next page)

Chic

H

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to be
of ro
exam
30.6

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448+32.06 AHEAD

$\frac{=}{439+43.82 \text{ BACK}}$ HUB ON 550 CONTOUR

438+82.38 E.G.

447+10.82 P.I.

Profile El Monte P.L. Sta 179+20 TO 192+50

			±	10 offset on Hub	
	7.60	386.77			379.17
179+20			7.7		379.1
T.P	11.45	397.73	0.49	386.28	
+50			10.70	6.1	387.0
+75			5.0		391.6
180+00			3.0	0.4	392.7
+50			2.8		394.7
+90			3.5		397.3
181+00			7.8	1.8	394.9
T.P	1.17	387.39	11.56	386.17	394.2
+25			2.6		389.9
+50			4.6	2.6	395.9
182+00			5.3	6.0	384.7
+50			4.6	5.1	382.7
183+00			3.1	2.6	382.0
+52			2.9	1.8	381.3
T.P	11.18	393.28	5.24	382.10	382.7
+75			5.8		384.2
T.P	12.83	406.07	0.04	393.24	384.7
184+00			11.6		384.4
+25			4.0		385.5
+50			0.0		387.5
T.P	12.75	418.76	0.06	406.01	394.5
+70			11.7		402.1
185			9.4		406.1
+50			2.4		407.1
T.P	12.61	430.14	1.23	417.53	411.4

Nelson
Leonard
Barragan 2

1-8-47
Clear - Warm

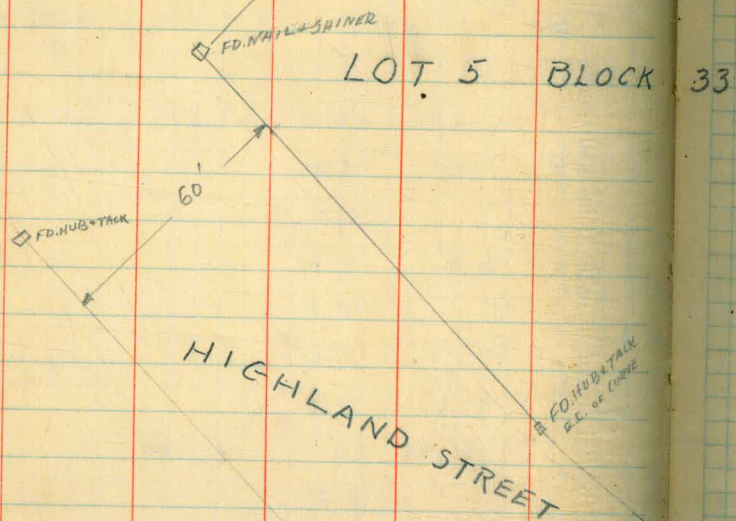
BM cor conc valve box RIVERVIEW PUMP PLANT

OH ROCK

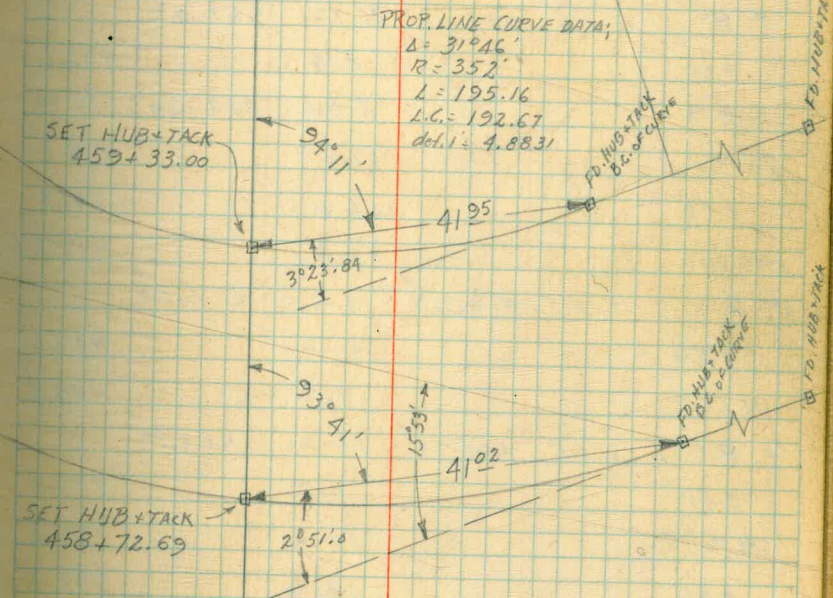
cont page(4)

OCT. 19, 1945
 S. F. PER
 H. A. R.
 PHILLIPS

3.



FD. HUB + TACK
 E.C. OF CURVE
 L. CHORD
 225.46
 225.51 (CONS)



PROP. LINE CURVE DATA:
 $\Delta = 31^{\circ} 46'$
 $R = 352'$
 $L = 195.16$
 $L.C. = 192.67$
 $del. 1' = 4.8831$

PROP. LINE CURVE DATA:
 $\Delta = 31^{\circ} 46'$
 $R = 412'$
 $L = 228.43$
 $L.C. = 225.51$
 $del. 1' = 4.1719$

Profile El Mont Pk.
 St 2 179+20 TO 192+50
 430114 Cont From P (2)

1-9-47
 clear - weather

Nelson
 Leonard
 Barragan

4

186+00			6.2		423.9
T.P.	11.18	490.74	0.58	429.56	
+50			8.4		432.3
+75			5.1		435.6
187+00			3.6		437.1
+50			2.7		438.0
+90			4.2		436.5
188+00			6.0		434.7
T.P.	0.12	429.14	11.72	429.02	
+50			5.4		423.7
CK.BM			5.84	423.30	423.30
189+00			17.0		412.1
+50			21.2		407.9
190+00			16.4		412.7
T.P.	0.25	416.54	12.85	416.29	
+50			2.3		414.2
191			7.2		409.3
T.P.	1.45	405.78	12.21	409.33	
+50			2.8		403.0
192+00			10.6		395.2
+50			13.6		392.2

NOV. 7, 1945
SEPER
WARD
PHILLIPS

5

FD. SPIKE

ESSEX
STREET

112° 52'

38.45

0° 32.56'

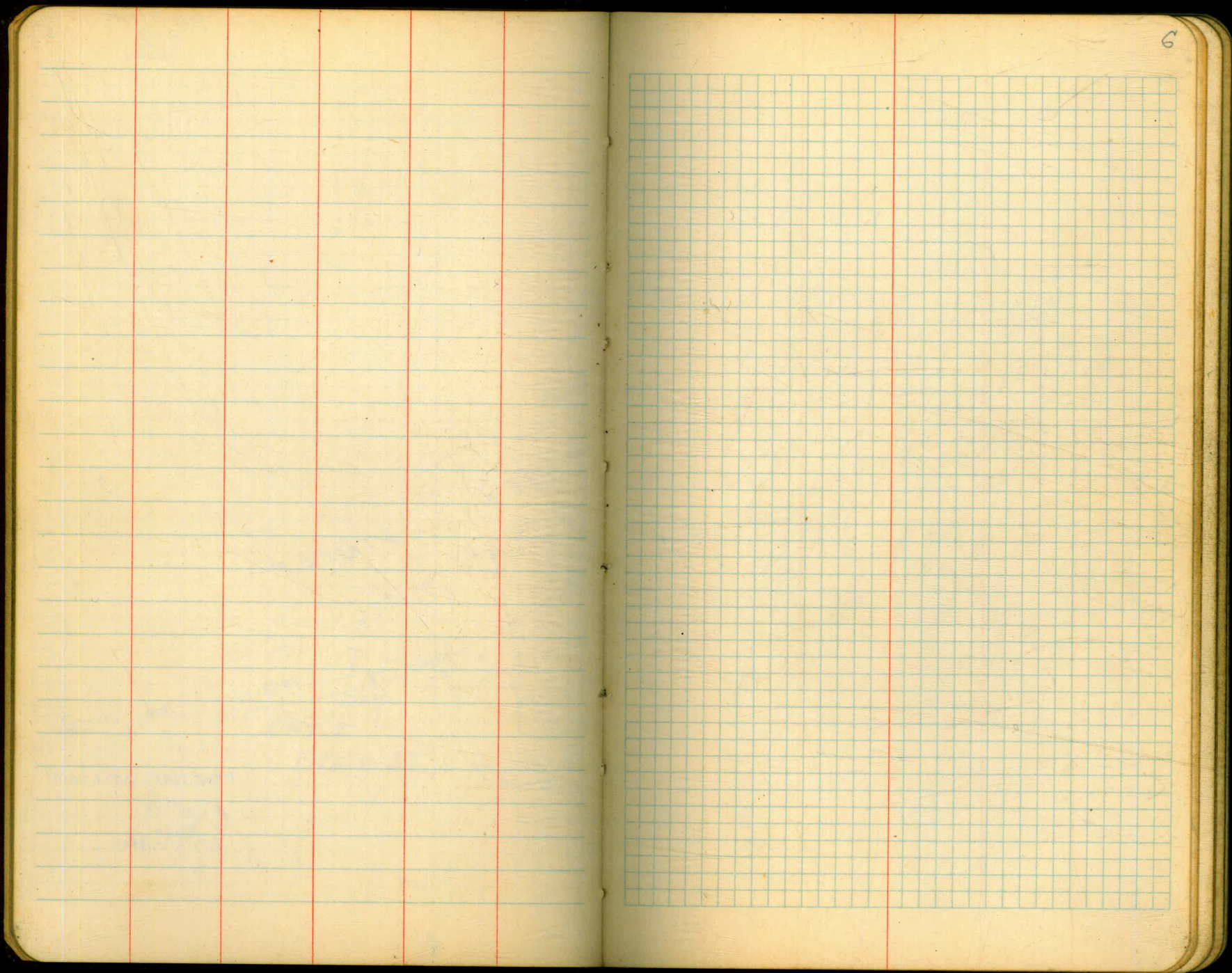
FD. HUB & TACK
B.C. of CURVE

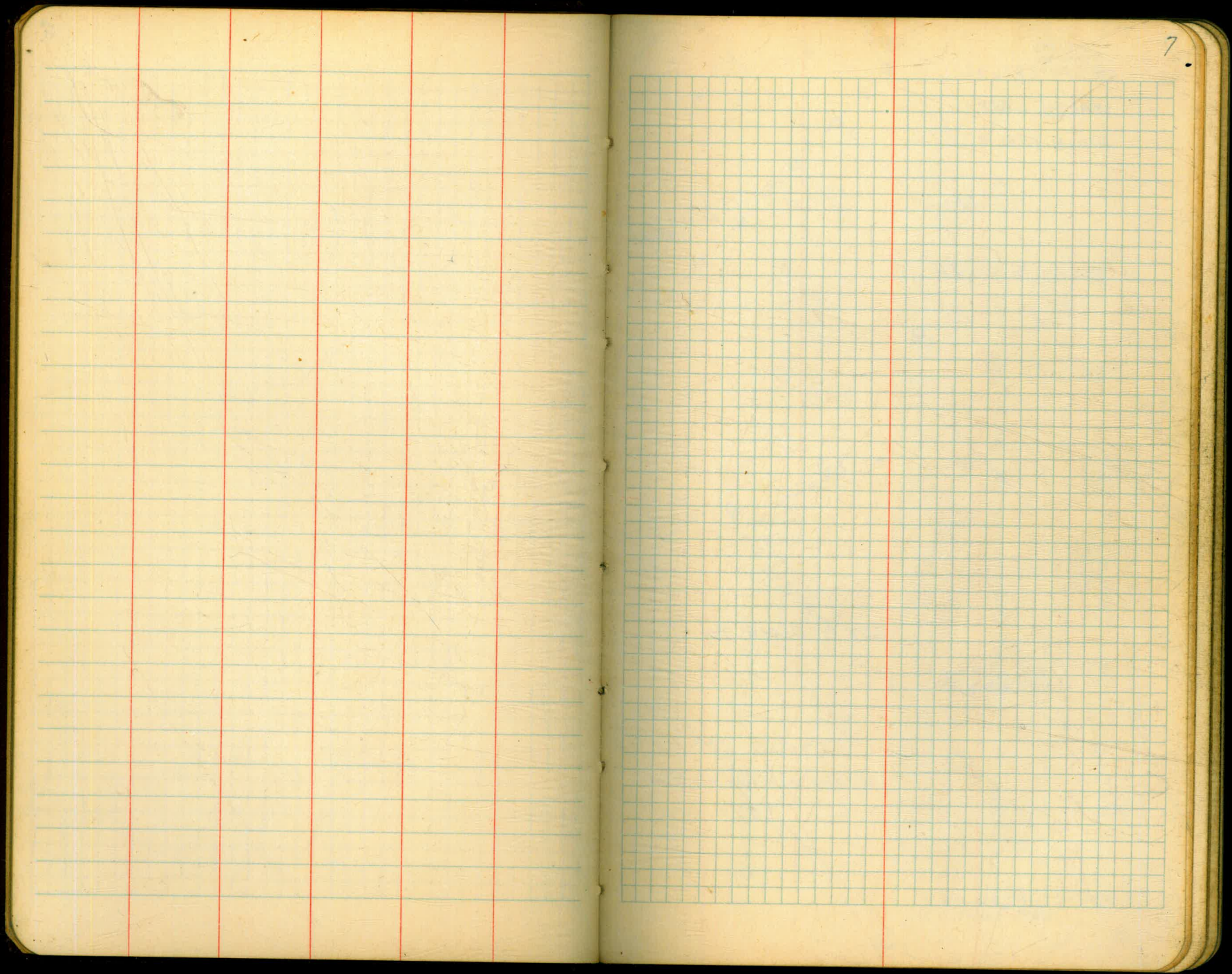
LOT 2
BLOCK 33

SET HUB & TACK
471+75.90

PROP. LINE CURVE DATA:

$\Delta = 15^{\circ} 56'$
 $R = 2030'$
 $\text{defl} = 0.8469$





DEC. 10, 1945

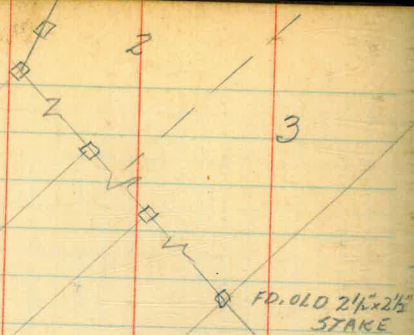
SUPER
LEONARD
CLINGER

8

FD. OLD 2 1/2" x 2 1/2"

STAKES WHERE

SHOWN THUS □



LOT 4 BLOCK 30

FD. OLD
2 1/2" x 2 1/2"
STAKE

26° 18'

101.88

SET HUB + JACK
STA. 484 + 98.11

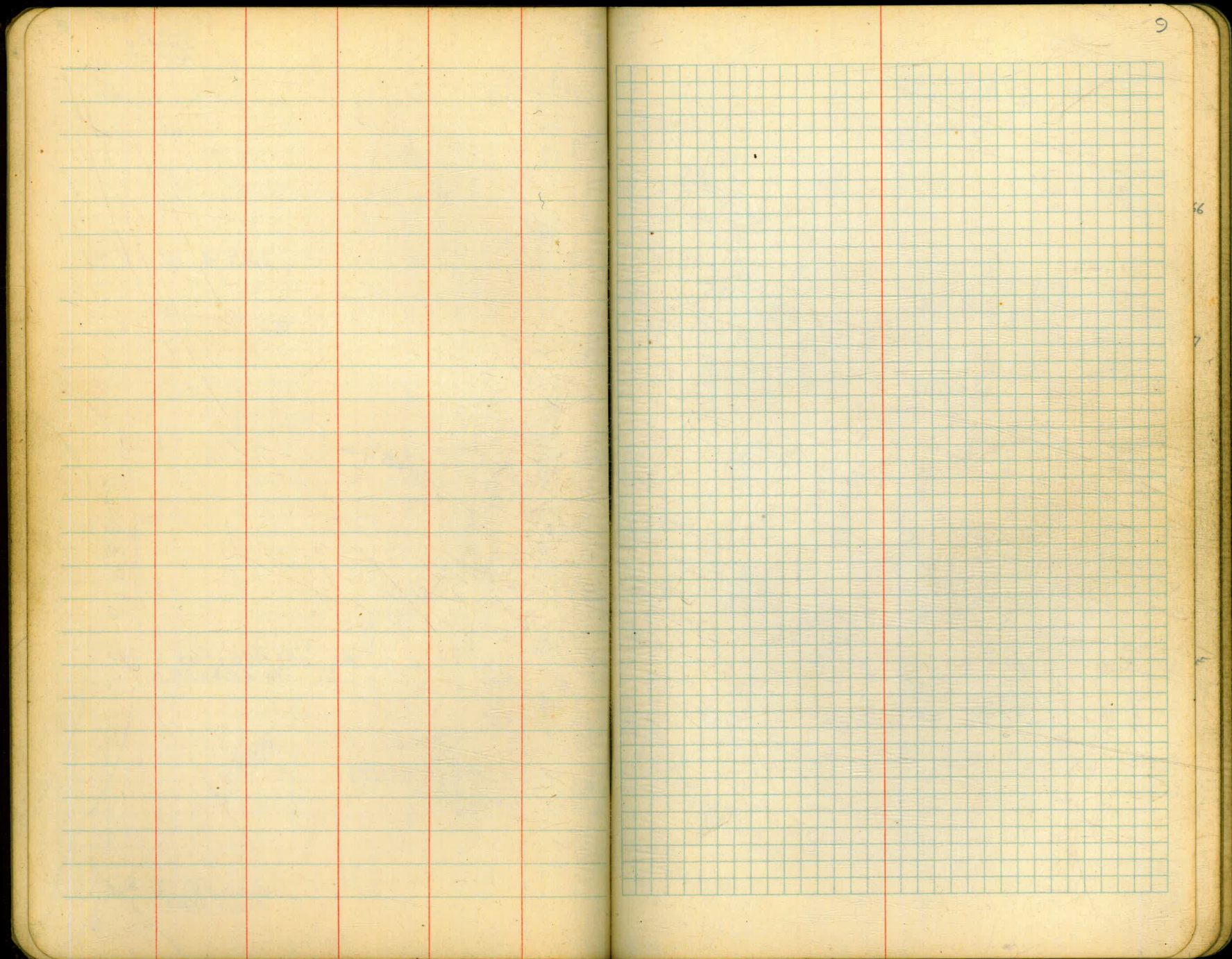
GARFIELD AVE

LOT 8 BLOCK 30

LOT #7 BLOCK 30
EL CAJON HEIGHTS
MAP # 593

FD. OLD 2 1/2" x 2 1/2"
BURNT STAKE

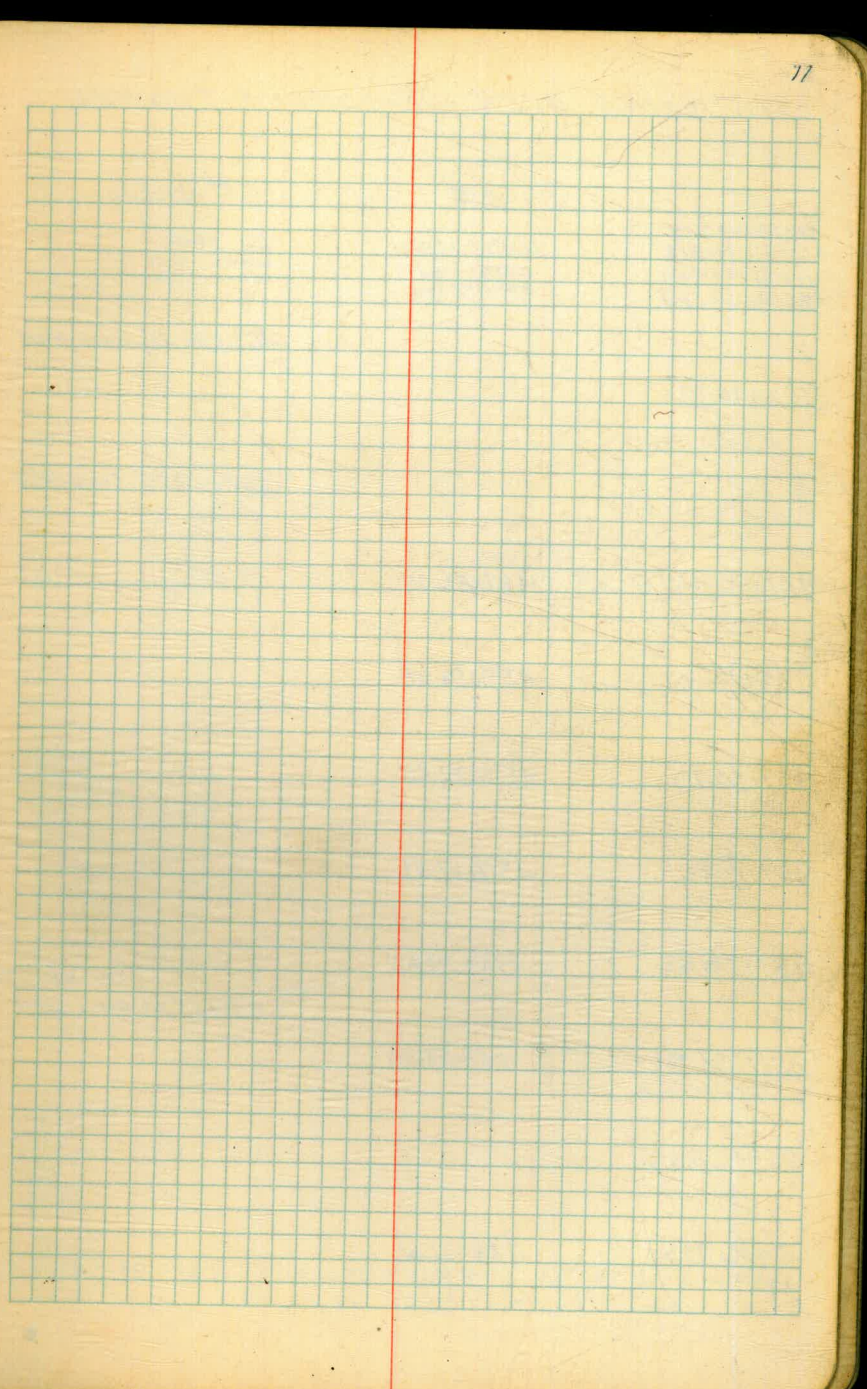
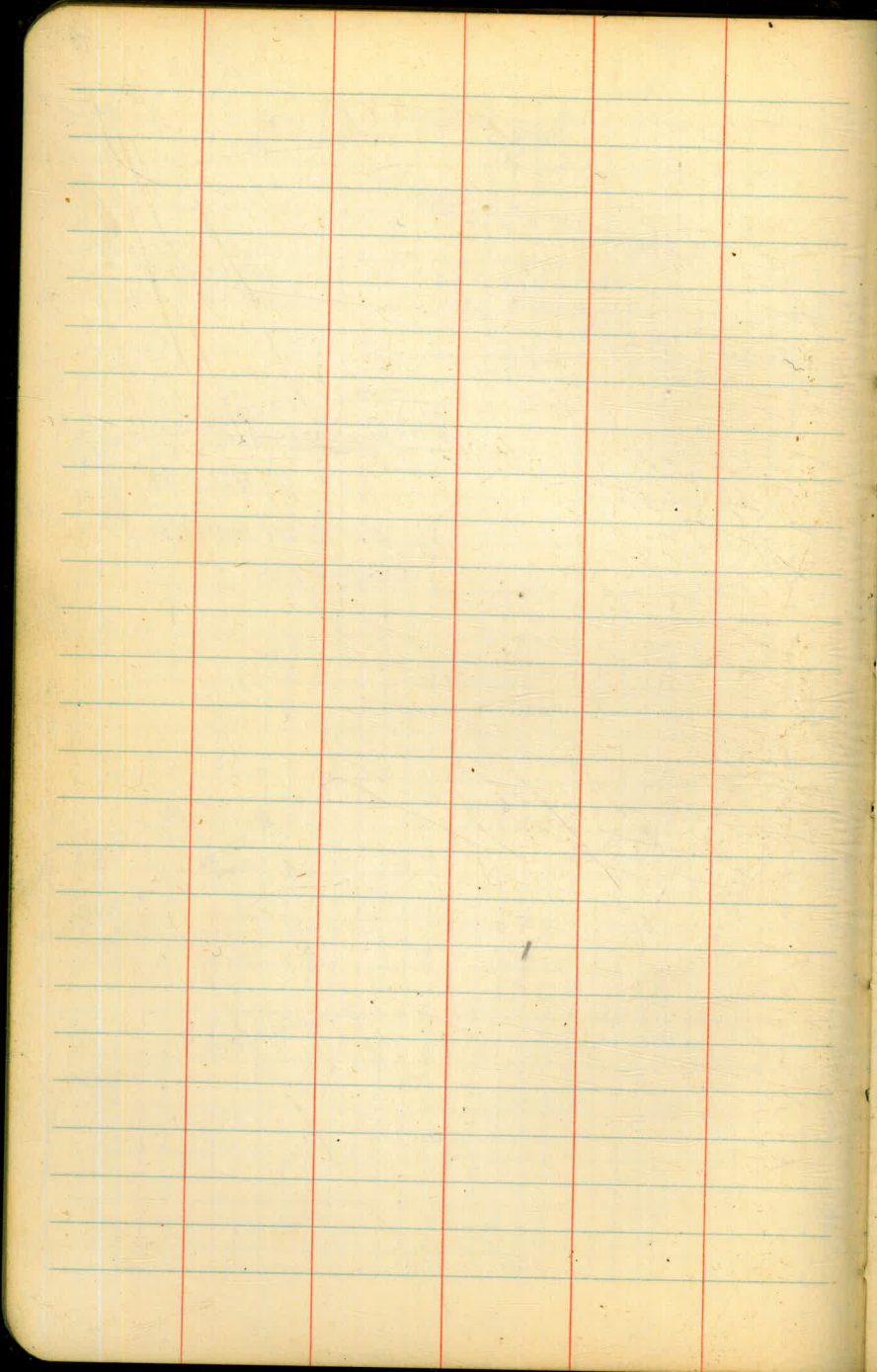
6



9

6

7



STATIONING OVER GROSSMONT TUNNEL

1 st COMBINATION SLOPE & HORIZ. MEASUREMENT FROM BOOK # 680	2 nd HORIZ. MEAS. WARD - Head PHILLIPS - Rear	3 rd checking Hor. Meas. WARD - Head PHILLIPS - Rear
462+40.34		463+96.24 CONC. MON.
		462+22.25 CONC. MON.
461+86.46	461+86.04	
459+90.48	459+90.28	
457+92.79	457+92.65	
457+17.45	457+17.37	
455+29.93	455+29.85	
451+53.93	451+53.88	SET JAN. 15, 1946 451+55.44 CONC. MON.
450+29.57		
448+32.06	448+32.06	

8-16-46 SET CONC. MONUMENT 13' RT STA 436+44
NELSON & EDWARD. FATHAN

1st 2nd 3rd

485+07.17

482+00.00

477+54.04

477+17.77

477+16.58

475+17.22

475+16.69

473+17.88

473+17.40

471+17.31

470+22.88

470+22.33

468+24.19

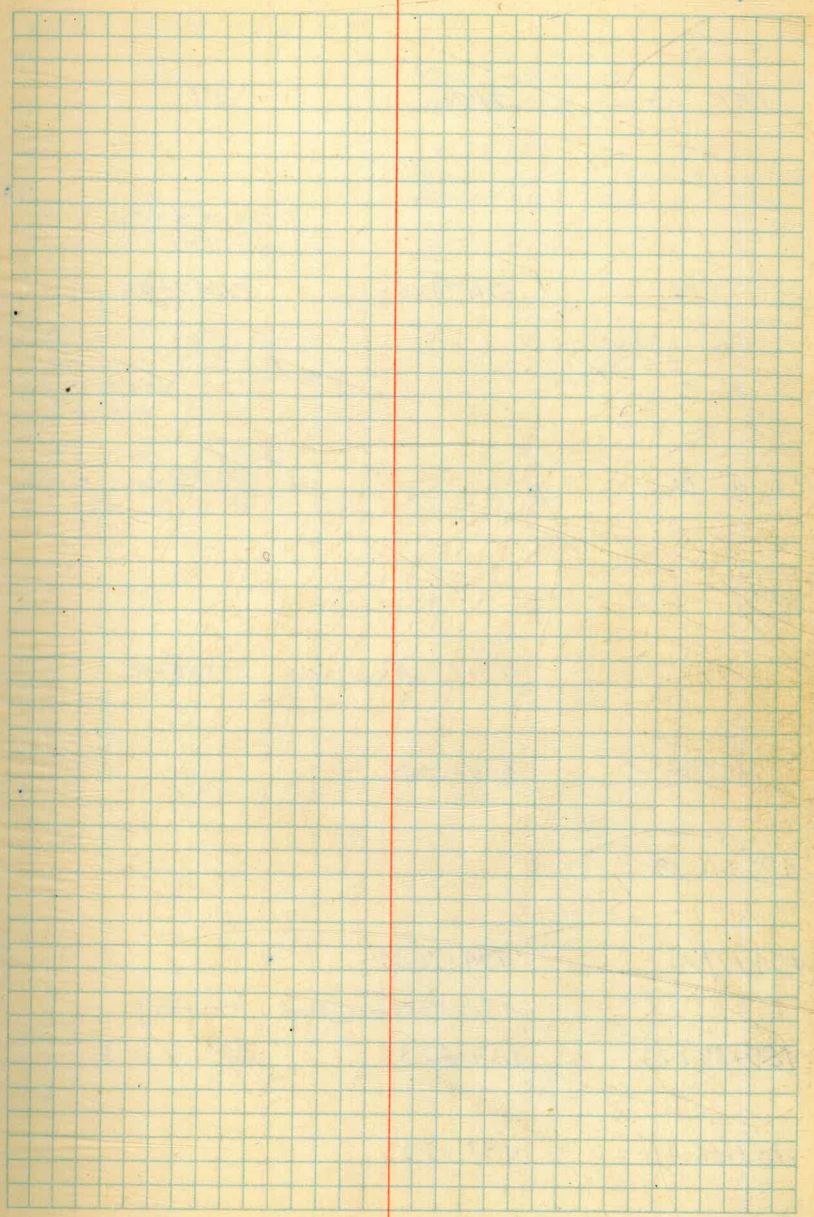
468+23.63

466+26.35

466+25.80

464+28.39

464+27.90



8-15-47 Clear Hot
Nelson - Leonard - Eaton

14

Line checked O.K.

CONC Mon at P.I. of curve
beyond west Portal

8-16-46 Set conc
MONUMENT STA 519+13.5
Nelson - Leonard - Eaton

A.M. Clear-Hot
P.M. Cloudy-Cooler

7-19-46 → 0.105'

check line by
Nelson &
Leonard
Eaton →

Rest of conc.
Monuments
check O.K.

1st	2nd	3rd
511+76.76	511+74.65	511+74.56
511+36.36		
509+37.24		
	508+87.58 (CONC. MON)	508+87.56
505+52.54	505+50.64	
496+76.39		
494+77.81	494+76.39	
	492+89.68 (CONC. MON)	492+89.70
489+83.62	489+82.33	489+82.26
487+06.43	487+05.23	

CHECKED BY KING PARTY

→ 0.17' *

EL MONTE P.L. ALTERNATE ROUTE FROM STA 175+50 TO STA 197+70⁵⁸ ON ORIGINAL LINE (RIVERVIEW PUMPING PLANT)

END 195+76⁸⁰ = 197+70⁵⁸ on orig line

1+26.75

MAG BEAR
S 41° 36' W

P.I. 194+50⁰⁵ A 5° 31' L

VOID see p. 16
Nelson 2-13-46

3+82.05

S 46° 00' W

P.I. 190+68⁰⁰ A 12° 13' L

2+68

S 58° 00' W

P.I. 188+00⁰⁰ A 11° 43' L

P.O.T. 187+04⁰⁰

P.O.T. 184+80⁶⁴

97+14

P.O.T. 181+00

P.O.T. 180+01⁷⁸

P.I. 178+29⁸⁶ A 1° 25' L

S 70° 00' W

279.86

S 73° 15' W

P.I. 175+50 A 16° 58' L

2-25-46 clear warm

Nelson & notes
Leonard chain 15
Rice chain

195+76⁸⁰ = 197+70⁵⁸ on orig.
line
← 5° 31'

P.I. 194+50⁰⁵
194+58 fence

193+42 fence

193+28 dirt road

Q-8 → 193+15

← 19 → 193+05

Row of 18" pine trees

192+07 fence

Q-10 → 183+38 5' tree

183+00 fence

Q-2 → 179+24 6" tree

Q-7.5 → 178+91 House

Q-25 → 178+35 24" tree

Q-4 → 178+13 12" tree

171+81 18" conc pipe & Hdwl

Q-10 → 176+03

177+83 6"x3' BOX CULV.
177+82 2" water pipe

177+42 Edge Pave

176+81 Edge Pavement

176+20 fence

STA 175+50 ON ORIGINAL LINE

Continued from P-15

VOID

SEE P. 17 ET SEQU.

Keyson

END
195+78⁹⁰ BACK = 197+70⁵⁸ AN on orig. line

P.I.
192+34⁴⁹ Δ = 12° 47' L

P.F.
190+68⁹⁰ Δ = 4° 58' L

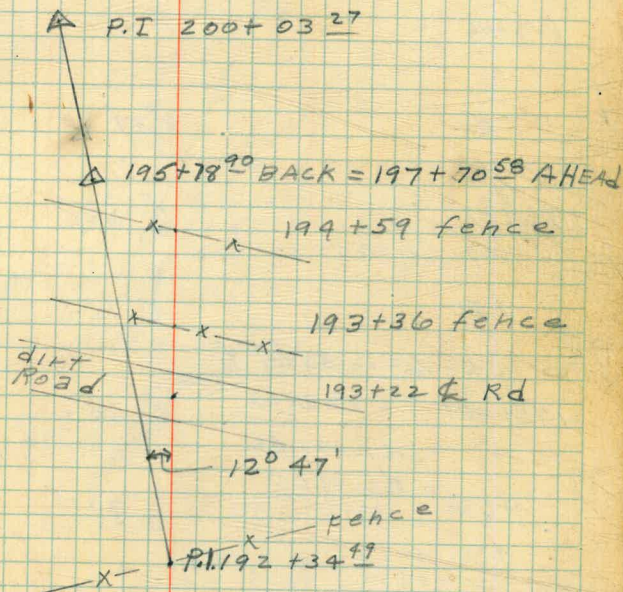
3-16-46

cloudy-cool

Nelson T-Notes

Leonard M — 16

Rice R —



Alignment alternate line from
Sta 173+27²⁷ Riverview Pump Plant (FINAL)

P.O.T 35
179+98

See FB 685 P57
for Profile

P.I. 64
178+26 $\Delta = 1^{\circ} 25' L$

E.C. 49
177+69

8° 27'

+50

8° 04' 30"

177+00

7° 07'

+50

6° 09' 30"

176+00

5° 12' 30"

+50

4° 15'

P.I. 175+50 $\Delta = 16^{\circ} 53' 30'' L$

175+00 $T = 222.73$ 3° 18'

L.C = 442.22

R = 1500

+50

2° 20' 30"

174+00

1° 23' 30"

+50

0° 26'

B.C. 27
173+27

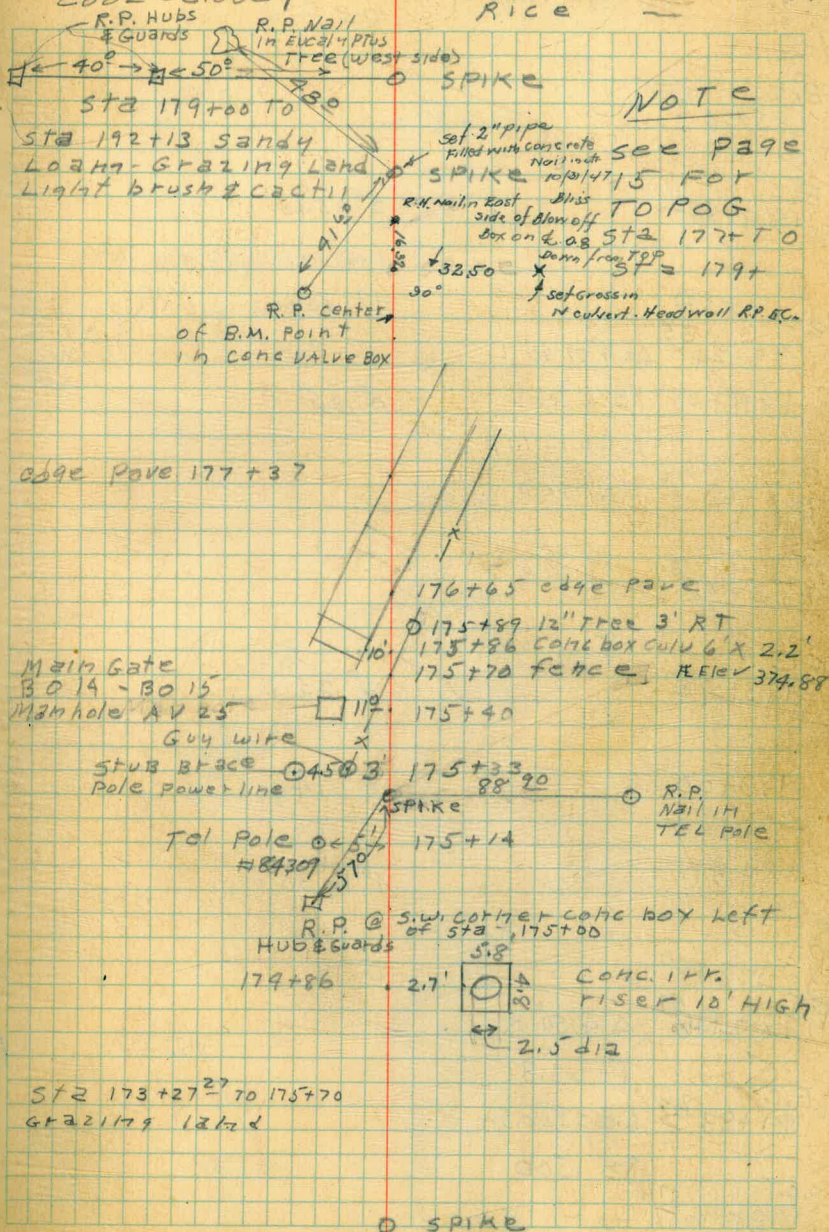
CONT FROM P. 55 THIS BOOK

JK

4-1-46
COOL - Cloudy

Nelson & Notes
Leonard
Rice

17



DEF

B.C.
185+70 ⁶¹E.C.
184+88 ¹¹

2° 25' 45"

P.T. +50

184+24 ⁵⁵ Δ = 4° 51' 30" L

1° 42'

184+00 T = 63.63

0° 45'

L.C. = 127.19

B.C.
183+60 ⁹² R = 1500P.O.T. ³⁴
183+52E.C.
183+09 ⁸⁰

2° 25'

183+00

2° 14'

+50

1° 16' 30"

P.T. 182+00

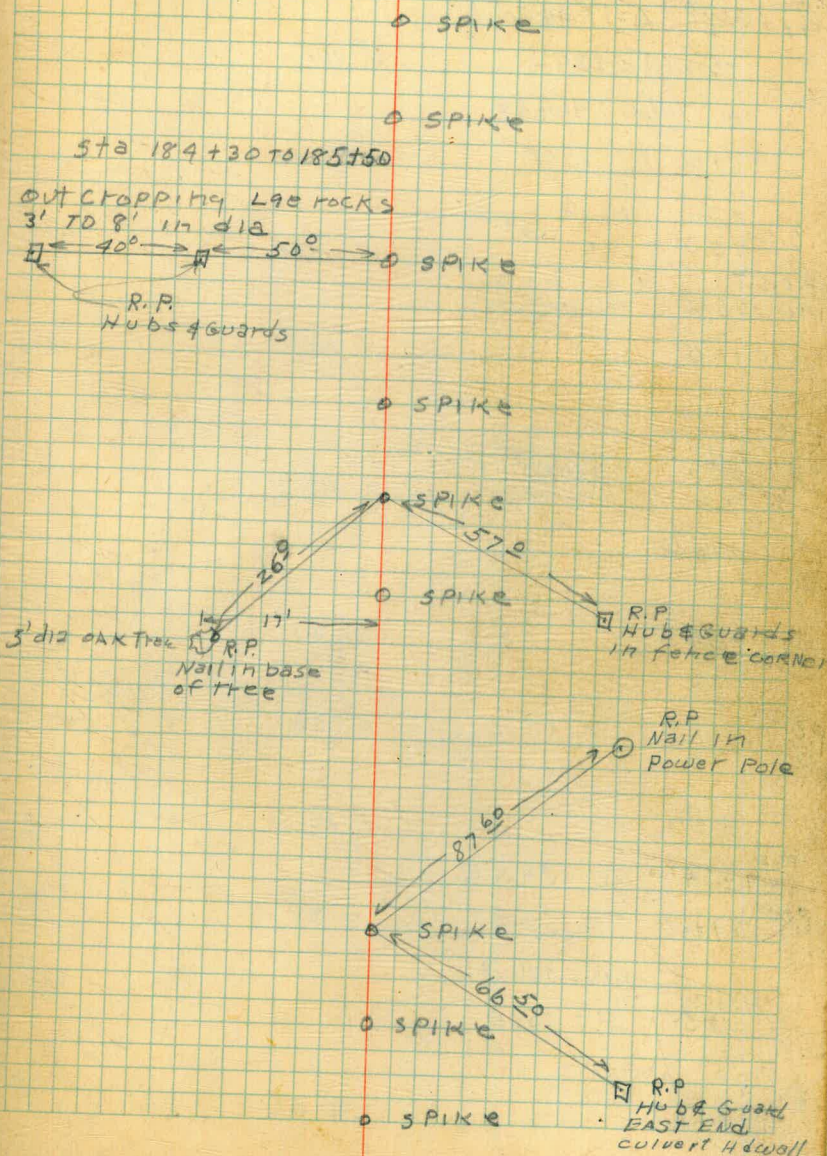
182+46 ⁵⁷ Δ 4° 50' R

0° 19'

T = 63.31'

B.C.
181+83 ²⁶ L.C. = 126.54

R = 1500

P.O.T. ⁵⁷
180+96Reference Hubs
4-29-46 clear-HotNelson X-Notes
Leonard
Rice 12

	DEF		
192+00	4° 49'		
P.I. 191+86 $\frac{10}{10}$	$\Delta = 17^\circ 49' 30'' L$		
+50	T = 239'	3° 47'	
	L.C. = 464.48		
191+00	R = 1500	2° 49' 30''	
P.O.C. +50	VOID	1° 52'	
P.O.S.T. 190+65 $\frac{13}{13}$	See page 21		
190+00		0° 55'	
B.C. 189+51 $\frac{99}{99}$	CONT P. 21 THIS BOOK		
E.C. 188+76 $\frac{92}{92}$		5° 51'	
+50		5° 20'	31'
P.O.C. 188+00		4° 23'	1° 25'
+50		3° 25' 30''	2 25 20
P.I. 187+24 $\frac{30}{30}$	$\Delta = 11^\circ 42' L$		
P.O.C. 187+00	T = 153.69	2° 28'	3 23
	L.C. = 306.31		
+50	R = 1500	1° 31'	4 20
186+00		0° 33' 27"	5 19 30

4-2-46
cool cloudy

Nelson's Notes
Leonard
RICE

X X 192+13 fence
O SPIKE

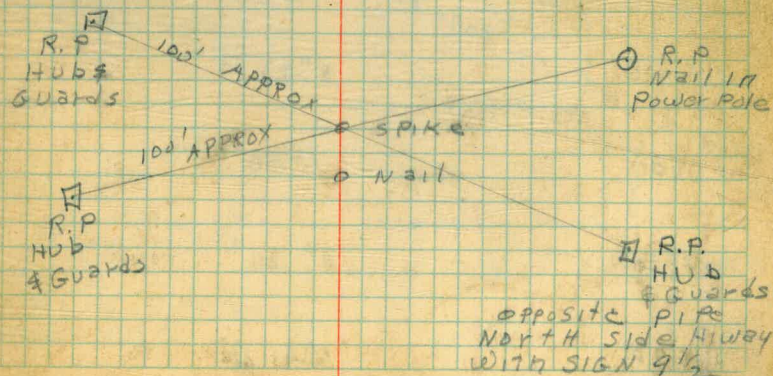
O Nail
O SPIKE

O SPIKE

O SPIKE

Sta 188+00 to 188+50
out croppin' rock
3' to 6' dia.

O Nail



CONT P. 57 THIS BOOK

NOTE: THIS EQU REVISED IN OFFICE TO CONTAIN
1.76' SHOWN IN EQU P. 21.

REVISED EQUATION $\frac{POT\ 197+70.58\ AHEAD =}{POT\ 195+75.79\ BACK}$

JK

P.O.T. 195+74⁰³ = P.O.T. 197+70⁵⁸ ORIGINAL line

CONT FROM P. 21, THIS BOOK

JK

E.G.
194+16 97

194+00

+50

193+00

+50

8° 52' 15"

8° 33' 30"

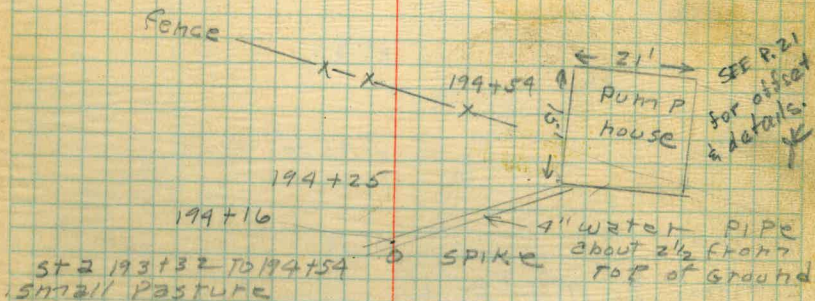
7° 36'

6° 39'

5° 41' 30"

void
see page 21

sta 194+54 TO
195+24⁰³ cultivated
land in crop



193+32 fence

ditto 193+18

16" pine tree ← 17 → 193+09

193+00 ← 9' → 20" pine tree

sta 192+13 TO 193+09
Garden Plot

Line Change sta 189+51.99 TO
sta 194+18.23 EL Monte P.L.
Near Riverview Pump Plant

CONT P. 20 THIS BOOK

NOTE: THIS EQUATION WAS ELIMINATED
IN OFFICE BY CARRYING THE 1.76' CONTAINED
THEREIN AHEAD TO THE NEXT EQUATION.

Keyed 5.146

P.O.T
194+18.23 BACK = 194+16.47 Ahead

EC 193+08.96 $8^{\circ} 52' 15''$

193+00 $8^{\circ} 33'$

+50 $6^{\circ} 45' 30''$

192+00 $4^{\circ} 58'$

P.I. 191+86.10 $\Delta = 17^{\circ} 44' 30''$ L

+50 T = 124.86 $3^{\circ} 10' 30''$

L.C. 247.72

191+00 R = 800 $1^{\circ} 23' 30''$

Post
190+65.13

BC 190+61.29

P.O.T
189+51.99

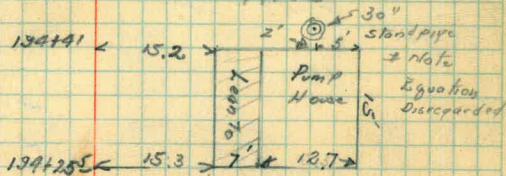
CONT FROM P. 19

4-19-46
clear-HOT

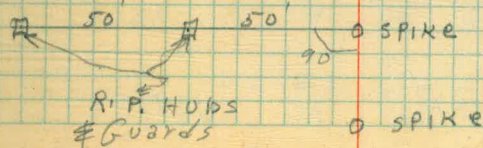
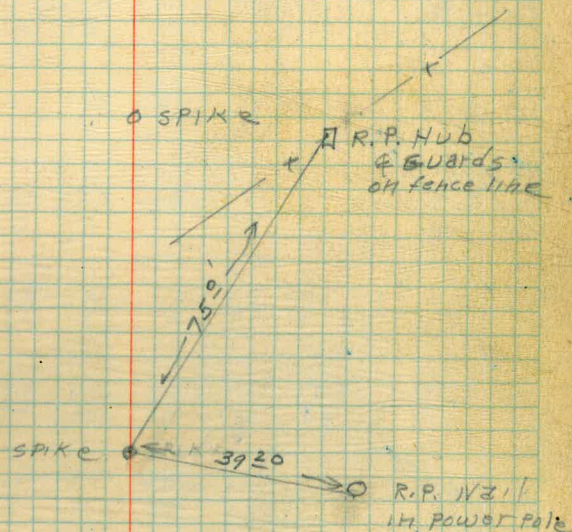
Nelson & notes
Leonard 21
RICE

Ref. points
4-30-46
clear-HOT

Nelson
Leonard
RICE



39.20



X sections EAST Portal
of Tunnel

438+50

E.C. 38
438+82

439+00

439+43.82
448+32.06

448+50

+80

+93

449+00

+50

+63

+93

450+00

+23

portal

581.5

+50

8-30-46
Clear HOT

Nelson
Leonard
Eaton

22

-3.2	-2.0	+0.8	+2.5	+2.2	+2.9	+3.7
25	15	4	11	14	17	25
-2.1	-0.9	+1.8	+3.5			
22	10	15	25			
-5.9	-1.5	-0.8	+0.7	+2.3		
25	16	10	10	25		
-1.8	-2.3	-0.9	+0.6	+2.1		
25	12	8	10	25		
-3.5	-3.4	-1.7	-1.1	+1.1	+2.5	
25	22	16	10	10	25	
-4.1	-1.5	+1.7	+4.0			
25	10	10	25			
-3.6	-5.0	-5.1	-1.7	+4.4	+6.3	
25	18	15	10	12	25	
-3.6	-3.8	-5.4	-6.0	-4.2	-3.1	+1.5 0.0 +3.5 +5.4
25	23	20	17	13	8	3 7 13 25
-6.1	-2.6	+2.4	+1.7	+4.5		
25	10	6	20	25		
-7.2	-3.4	+0.6	+5.7			
25	8	13	25			
-9.4	-3.4	+0.2	+5.6	+9.8		
25	21	14	11	25		
-5.2	-1.9	-2.1	+4.4	+9.1		
25	17	4	10	25		
-6.2	-6.8	+2.7	+7.3			
26	14	10	25			
-10.9	5.0	-3.0	+2.4	+6.6		
25	17	11	10	25		

CHECK LEVELS EAST PORTAL
TO WEST PORTAL

	0.650	543.580		542.930
T.P	1.568	532.273	12.875	531.705
T.P	5.400	536.113	1.560	530.713
T.P	5.230	535.058	6.285	529.828
T.P	2.107	533.555	3.610	531.548
T.P	2.020	523.065	12.510	521.045
T.P	1.226	511.244	13.047	510.018
T.P	0.325	499.949	11.620	999.629
T.P	3.505	499.956	8.498	491.451
T.P	10.657	498.683	6.930	488.026
T.P	9.832	508.360	0.155	498.528
T.P	10.350	517.615	1.095	507.265
T.P	8.595	526.145	0.065	517.550
T.P	10.270	535.975	0.440	528.705
T.P	10.302	545.417	0.860	535.115
T.P	10.545	555.657	0.305	545.112
T.P	11.730	567.217	0.170	555.987
T.P	10.187	577.314	0.090	567.127
T.P	9.685	586.859	0.140	577.174
T.P	9.480	595.609	0.730	586.129
T.P	9.690	605.249	0.050	595.559
T.P	9.140	614.204	0.185	605.064
T.P	9.572	623.121	0.655	613.549
T.P	9.530	632.236	0.415	622.706
T.P	5.885	636.061	2.060	630.176

9-3-96
clear - HOT

Nelsdr T
Leonard
Eaton

23

B.M. P.P. # 76981

636.061

T.P.	5.808	637.202	4.667	631.399
T.P.				
B.M.	1.783	636.345	2.640	634.562
T.P.	1.390	630.200	7.535	628.810
T.P.	0.300	622.245	8.255	621.945
T.P.	1.200	614.425	9.020	613.225
T.P.	0.825	606.900	8.350	606.075
T.P.	0.385	598.600	8.685	598.215
T.P.	1.305	593.043	6.862	591.738
T.P.	4.135	589.745	7.433	585.610
T.P.	9.390	591.785	7.350	582.395
T.P.	6.050	596.485	1.350	590.435
T.P.	3.655	597.035	3.105	593.380
CK B.M.			7.040	589.995 = 589.97

9-16-46
clear-coolNelson
Leonard
Phillips

24

Nail in
R.R. Telegraph Pole 4th Pole North of cone bridge

B.M. 50' RT Sta 511+76.76

SLOPE STAKES EAST

Portal (Tunnel)

	H.I	Grade Rod	INVERT Elev
11.15	559.08		549.00

439+32 5.1 5.1

439+43.82B
448+32.06 9.2

+50
T.P. 12.57 566.15 0.5 553.58

+75 10.9 17.2

449 9.9

+25
T.P. 12.10 578.16 0.9 566.06

+50 12.0 29.2

+75 8.3

450 4.5

+23 Left side
T.P. 12.05 589.47 0.79 577.42

+23 Right side 8.2 40.5

+40.5 5.6

9-10-46
Clear-Hot

Nelson
LEONARD
Eaton

25

542.93 B.M. P.P

Grade

3' OFFSET	3' OFFSET			
Grade	C0.6	C	C1.1	C1.6
	5.3	0.9	5.7	

C2.2	C2.6	C	C4.0	C4.1
	6.3	3.3	7.0	

C4.9	C	C	C7.6	C8.0
	5.2	6.3	8.8	
	7.6			

C3.9	C9.1	C	C9.0	C10.9
	7.1	7.3	9.5	

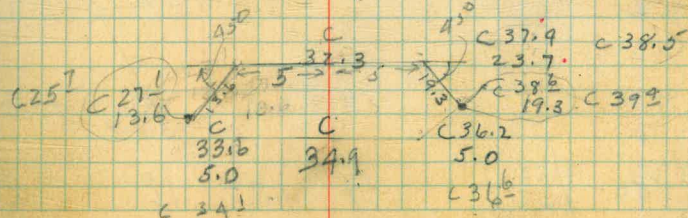
C9.1	C10.0	C	C	C12.4
	10.0	12.5	13.6	
			11.8	

C13.1	C14.0	C	C19.0	C19.0
	12.0	17.2	14.5	

C16.5	C17.3	C	C26.3	C27.3
	13.7	20.9	18.2	

C21.1	C22.6	C	C32.4	C33.5
	16.3	24.7	21.2	

C24.4 C24.3
17.2



SLOPE STAKES WEST
PORTAL (TUNNEL)

	Grade rod	Grade elev			
	1.47	591.44			589.97
512+49.6			7.6		
• 512+65			10.4	40.4	551.00
T.P	0.77	579.46	12.75	578.69	
• 513			2.7	28.11	551.35
• +50			6.0	27.6	551.85
• 514			8.8	27.1	552.35
• +50			11.2	26.6	552.85
T.P.	4.55	571.94	12.07	567.39	
• 515			5.0	18.6	553.35
• +50			5.4	18.11	553.85
• 516			5.6	17.6	554.35
• +50			7.0	17.1	554.85
• 517			6.9	16.6	555.35
• +50			4.7	16.1	555.85

9-10-46
1024-1407

Nelson
Leonard
Eaton

26

Station	Grade	Offset	Grade	Offset
589.97 B.M. RT STA 511+79.65				
C30.8			C31.0	C30.7
3' OFFSET	C29.5	5.0	C30.6	30.8
	14.8		5.0	30.7
C28.6	C28.6		C29.4	C29.4
	19.3		19.7	
		5'		
C25.4	C25.4		C26.1	C26.1
	17.7		18.1	
C21.4	C21.4		C21.5	C21.5
	15.7		15.8	
C17.9	C17.9		C18.5	C18.5
	14.0		14.3	
C15.5	C15.5		C15.9	C15.9
	12.8		13.0	
C13.8	C13.8		C13.3	C13.3
	11.9		11.7	
C12.7	C12.7		C13.2	C13.2
	11.9		11.6	
C11.7	C11.7		C12.3	C12.3
	10.9		11.2	
C9.3	C9.4		C10.0	C10.0
	9.7		10.0	
C9.2	C9.2		C10.4	C10.4
	9.6		10.2	
C10.2	C10.2		C12.4	C12.4
	10.1		11.2	

			G. R	G. E
	571.94			
518+00		3.0	15.6	556.35
+50		2.5	15.1	56.85
T. P	2.18	571.49	2.63	569.31
519+00		2.8	14.1	557.35
+50		3.7	13.6	57.85
520		4.7	13.1	58.35
+50		6.2	12.6	58.85
521		8.8	12.1	59.35
+50		10.4	11.6	59.85
+74			11.70	560.09

27

3' OFFSET

C11.6	C11.6 10.8	C12.6	C13.4 11.7	3' OFFSET C13.4
C11.9	C11.9 11.0	C12.6	C13.1 11.6	C13.1
ON ROCK 518+62				
C10.9	C10.9 10.5	C11.3	C12.4 11.2	C12.4
C9.2	C9.2 9.6	C9.9	C11.0 10.5	C11.0
C6.9	C7.1 8.6	C8.4	C9.1 9.6	C9.1
C5.6	C5.6 7.8	C6.4	C6.5 8.3	C6.5
C2.7	C 2.7 6.4	C 3.3	C9.1 7.1	C4.1
C0.5	C0.7 5.4	C1.2	C1.5 5.8	C1.5
		Grade	C0.5 5.3	C0.5

Grade stakes west portal
Grossmont Tunnel

	1.03	591.00		589.97
T.P	0.58	578.76	12.82	578.18
T.P	1.31	570.36	9.71	569.05
T.P.			5.47	564.89
T.P	4.60	563.63	11.33	559.03

513+00			8.50	12.28	551.35
514+00			7.54	11.28	552.35
515+00			6.64	10.28	553.35
516+00			5.24	9.28	554.35
	3.01	567.90		564.89	
517+00			8.72	12.55	555.35
518			8.12	11.55	
519			7.42	10.55	
520			6.40	9.55	
521			5.80	8.55	

10-2-46
clear-cool

Nelson
Leonard
Phillips
Griffith

28

3' offset Ginney 516+50

C 3.79

C 3.74

C 3.64

C 4.09

C 3.83

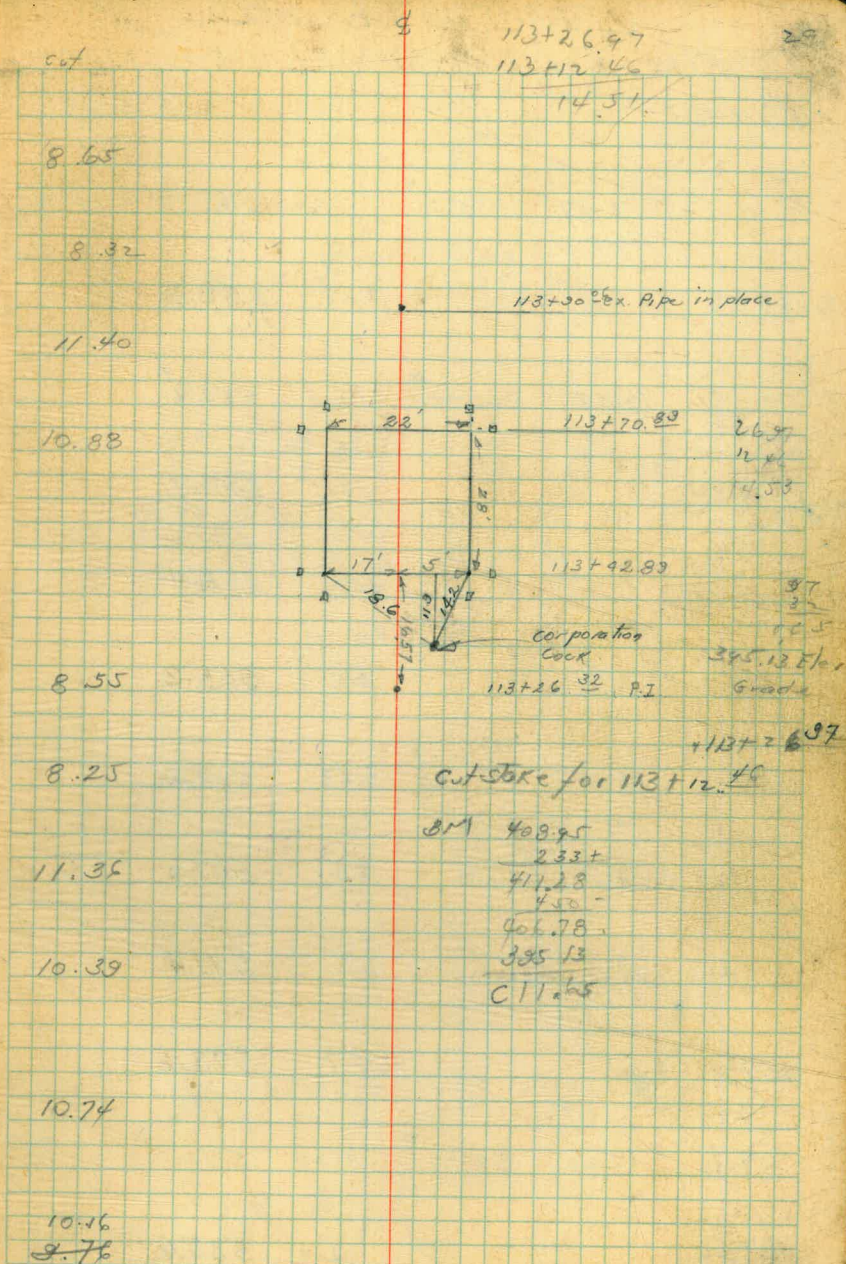
C 3.43

C 3.13

C 3.15

C 2.75

Bliss Leonard Fah	Grade Stakes for Valve Chamber at Lakeside on El Monte Pl. Sec 2			
BM.	+	x	Ele. Stake	Ele. Top Head
	2.68	411.63	408.95	408.95
N.W. Cor		7.98	403.65	395.0
SW Cor	Void	8.31	403.32	395.0
N.E. Cor		5.93	405.70	394.30
S.E. Cor		6.45	405.18	394.30
BM	2.16	411.11	408.95	
N.W. Cor		7.56	403.55	395.0
SW Cor		7.86	403.25	395.0
N.E. Cor		5.45	405.66	394.30
S.E. Cor		6.42	404.69	394.30
Pt. 13.5 from N.W. Cor		6.37	404.74	394.0
Pt 13.5 from SW Corner		7.35	403.76	395.6 394.0



ELMONTE PL.
PROFILE OVER PROPOSED GROSSMONT
TUNNEL

B.M.	12.87	555.80 ^x		548.93
448+50			3.5	552.3
T.P.	12.59	566.75 ^x	-1.64	554.16 ^x
+80			10.9	555.9
+93				555.0
449+00			10.4	556.4
+50			0.6	566.2
T.P.	12.59	577.71 ^x	1.23	565.12 ^x
+63 (EDGE OF OLD ROAD)			8.1	569.6
+93 (EDGE OF OLD ROAD)			6.3	571.4
450+00			4.1	573.6
+20				578.9
T.P.	12.40	589.77 ^x	-0.34	577.37 ^x
+50			4.2	585.6

LEE, KING 12-10-45
J. Wadell

X-SECTIONS
JAN. 14, 1946
SOPER
WADSELL
PHILLIPS

30

LIEZL LEVEL "10268

NOTE: THESE RODS ARE + 8 -
FROM ± ELEV.

Spike in P.P. # 76981

LT

48.3 50.0[±]
+1.8 -6.3 -6.3 -3.0 -4.0 -2.3
57 76 39 36 23 16

RT

54.8
+2.5 +5.2
25 50

57.0 47.9 48.5 50.7 52.5
+1.7 -2.0 -7.9 -5.2 -2.9
55.0 51.3 50.3 50.0 51.7 50.1 50.3 52.9
0.0 2.7 4.7 5.0 3.3 4.9 4.8 2.1
50 50 50 50 50 50 50 50
39 35 32 29 27 15 12
55.2 53.0 52.8 50.9 50.2 53.0 53.3
-1.2 -3.4 -3.5 -3.2 -6.2 -2.1 -3.1
50 40 33 31 17 13 4

58.8 ROAD ROAD
+2.9 +6.3 +5.9
55.7 59.0 61.7 63.9
+0.7 +7.0 +6.7 +6.3
57.6 57.0 60.3 64.4 63.3
+1.5 0.0 +3.2 +8.0 +6.3
5 7 73 36 49
66.8 ROAD 67.9 ROAD 71.5 ROAD 76.8 ROAD
+2.6 +1.7 +5.3 +10.5
6 20 28 50

58.3 62.4 66.5
-11.3 -7.2 -3.1
50 25 7

69.0 ROAD 74.5 ROAD 80.3 ROAD
-0.5 +4.3 +10.7
15 26 50

-9.7 -3.0 -0.3^{ROAD}
50 20 14

+4.8 +9.0 +15.0
11 26 50

NO XSECTION

450+20 -1.30 -2.6 -5.9 -5.9^{ROAD}
50 34 26 13 +6.3 +12.8
25 50

-16.9 -13.0 -10.0 -11.0 -4.9
50 42 35 25 14 +6.4 +12.8
25 49

		589.27 [*]		
T.P.	12.94	661.58 [*]	1.13	588.24 [*]
451+00			8.0	593.6
+50			2.0	599.6
T.B.M.	3.87	604.25 [*]	1.20	600.38 [*]
452+00			4.1	600.1
+50			3.5	600.7
453+00			2.9	601.3
+50			5.7	598.5
+94			0.8	603.4
454+00			0.4	603.8
+50			3.5	600.7
+90			6.9	597.3
455+00			8.9	595.3

LT

±

RT

31

$$\begin{array}{cccccc}
 & \text{ROAD} & & \text{ROAD} & & \\
 -14\frac{1}{2} & -14\frac{1}{2} & -11\frac{1}{2} & -10\frac{1}{2} & -8\frac{1}{2} & \\
 \frac{57}{57} & \frac{43}{43} & \frac{37}{37} & \frac{32}{32} & \frac{25}{25} & \\
 & & & & & +6\frac{6}{25} \quad +11\frac{1}{50}
 \end{array}$$

Top 2x2 hub - 451+57.64 @ Tunnel

604.25

455+10 4.3 600.0

T.P. 12.69 616.17^x 0.77 603.48^x

+50 2.5 613.7

T.P. 12.85 ~~627.38~~^{628.38^x} 0.64 615.53^x

+86 2.0 626.4

456+08 1.5 626.9

T.P. 12.11 ~~639.15~~^{640.15^x} 0.34 ~~627.84~~^{628.04^x}

T.P. 12.77 ~~651.32~~^{652.32^x} 0.60 ~~638.55~~^{639.55^x}

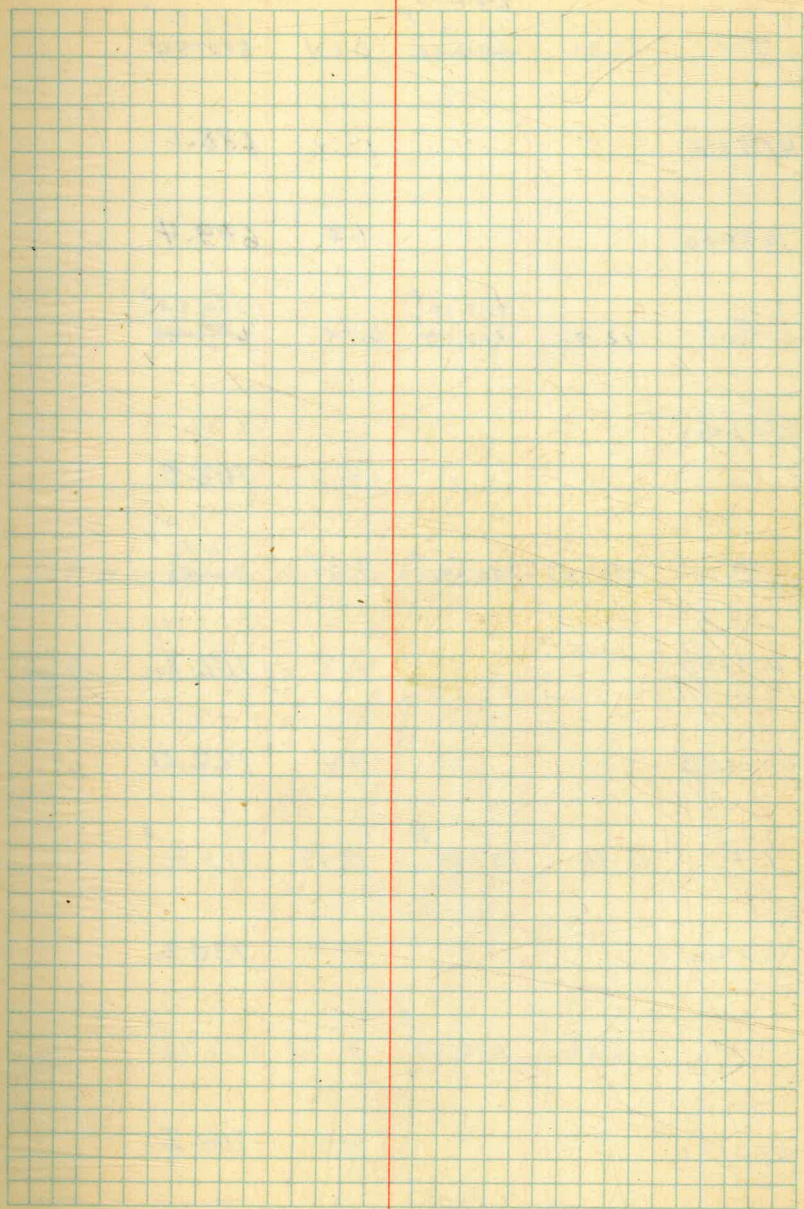
+50 4.8 647.5

T.P. 12.80 ~~663.58~~^{664.58^x} 0.54 ~~650.78~~^{651.78^x}

T.P. 12.78 ~~675.45~~^{676.45^x} 0.91 ~~662.67~~^{663.67^x}

457+00 8.9 667.5

T.P. 12.50 ~~687.08~~^{688.08^x} 0.87 ~~674.58~~^{675.58^x}



T.P.	12.83	688.08^x 687.02 700.67 ^x 699.67	0.24	687.84^x 686.84
457+50			12.6	688.1
458+00			1.3	699.4
T.P.	12.90	713.13 ^x 712.13	0.44	700.23 ^x 699.23
458+50			4.3	708.8
B.M.	12.45	725.41 ^x	0.17	712.96 ^x 711.96
459+00			12.7	712.7
459+50			3.4	722.0
T.P.	12.96	737.88 ^x	0.49	724.92 ^x
460+00			7.7	730.2
T.P.	12.82	750.20 ^x	0.50	737.38 ^x
460+50			8.7	741.5

Set B.M. spike in tree 458+75 - 35' R/H

On Concrete Paving

		750.20 ^x		
T.P.	12.67	762.15 ^x	0.72	749.48 ^x
461+00			11.6	750.6
461+50			2.2	760.0
T.P.	12.81	773.93 ^x	1.03	761.12 ^x
462+00			3.2	770.7
T.P.	9.33	782.92 ^x	0.34	773.59 ^x
462+50			5.0	777.9
463+00			4.8	778.1
463+50			6.6	776.3
B.M.	0.93	776.81 ^x	7.04	775.88 ^x
464+00			1.3	775.5
464+50			6.3	770.5
T.P.	0.05	763.92 ^x	12.94	763.87 ^x

Highest Point

Set B.M. On Mon. Sta. 463+96.24

Oil Road

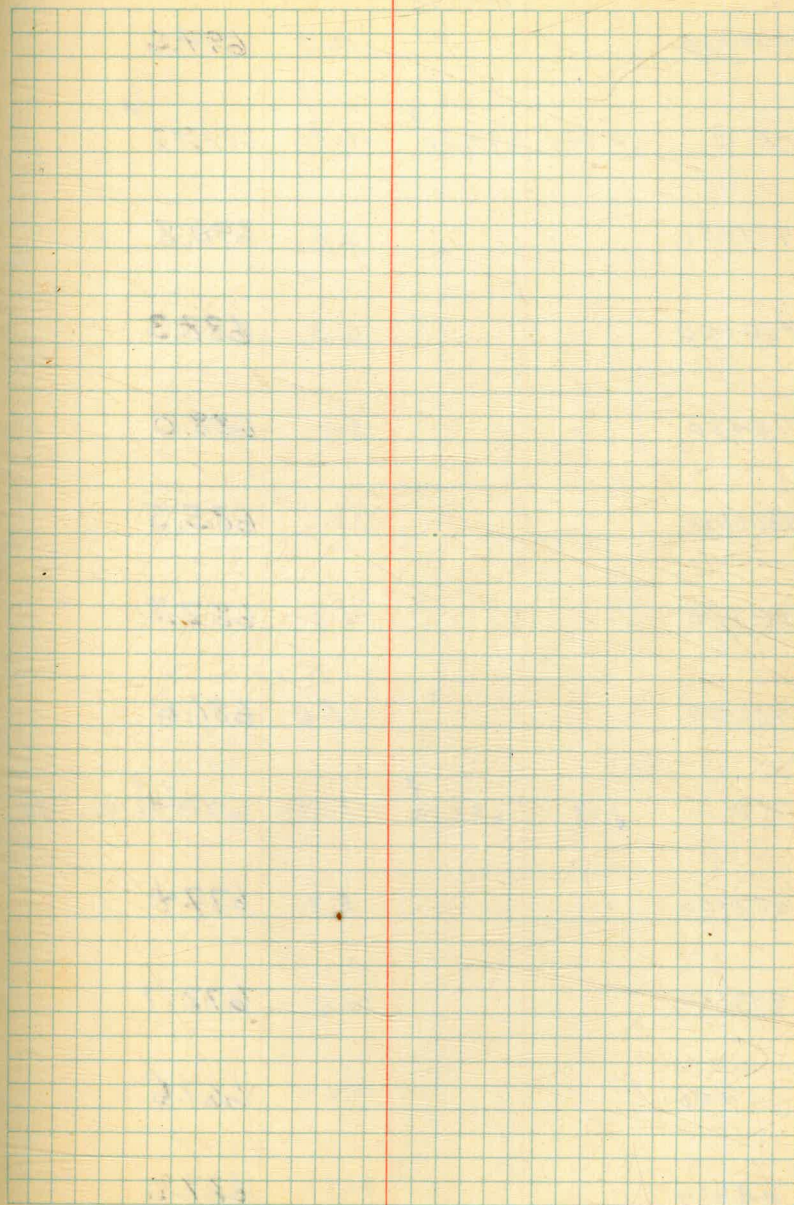
		763.92 ^x		
465+00			1.8	762.1
465+50			8.1	755.8
T.P.	0.91	752.86 ^x	11.97	751.95 ^x
466+00			4.7	748.2
466+50			10.9	742.0
T.P.	0.57	740.98 ^x	12.45	740.41 ^x
467			6.7	734.3
T.P.	0.22	728.37 ^x	12.83	728.15 ^x
467+50			1.7	726.7
468+00			10.1	718.3
T.P.	0.59	716.40 ^x	12.56	715.81 ^x
468+50			3.4	713.0
469+00			10.5	705.9

		716.40 ^x		
T.P.	0.60	705.78 ^y	11.22	705.18 ^x
469+50			5.5	700.3
470+00			10.0	695.8
T.P.	0.88	694.48 ^x	12.18	693.60 ^y
470+50			2.1	692.4
471+00			6.5	688.0
471+50			12.3	682.2
T.P.	0.67	682.53 ^x	12.62	681.86 ^y
B.M.			3.36	679.17 ^x
472+00			5.6	676.9
472+50			11.5	671.0
473+00			1.1	681.4
T.P.	11.60	692.88 ^x	1.25	681.28 ^y

On 2x2i Hub STA. 471+80.16

On oiled Paving

		692.88 ^x		
473+50			5.9	687.0
474+00			2.9	690.0
T.P.	12.64	704.75 ^x	0.77	692.11 ^y
474+50			10.5	694.3
475+00			5.8	699.0
475+50			2.7	702.1
476+00			2.2	702.6
T.P.	5.72	706.88 ^x	3.59	701.16 ^x
476+50			2.0	704.9
477+00			2.4	704.5
477+50			3.7	703.2
478+00			5.1	701.8
478+50			9.1	697.8



		706.88 ^x		
479+00			12.3	694.6
T.P.	0.62	694.60 ^y	12.90	693.98 ^x
479+50			3.8	690.8
480+00			6.3	688.3
480+50			6.6	688.0
481+00			9.1	685.5
481+50			11.9	682.7
482+00			13.0	681.6
T.P.	1.13	682.72 ^y	13.01	681.59 ^x
482+50			5.3	677.4
483+00			10.0	672.7
+50			15.1	667.6
484+00			21.7	661.0

On Hub Sta. 482+00

		682.72 ^x		
484+50			19.4	663.3
485+00			15.6	667.1
+50			10.6	672.1
486+00			6.7	676.0
+50			2.0	680.7
487+00			0.1	682.6
T.P.	8.03	689.96 ^x	0.79	681.93 [✓]
487+50			7.7	682.3
488+00			5.3	684.7
488+50			6.9	683.1
489+00			6.6	683.4
489+50			5.5	684.5
490+00			5.3	684.7

689.96^x

490+50 6.4 683.6

491+00 6.9 683.1

491+50 8.4 681.6

492+00 10.8 679.2

492+50 13.2 676.8

B.M. 0.03 677.78^x 12.21 677.75^x

493+00 0.9 676.9

493+50 3.4 674.4

494+00 6.1 671.7

494+50 8.0 669.8

495+00 10.6 667.2

T.P. 1.19 666.83^x 12.14 665.64^x

495+50 4.7 662.1

Top Concrete Mon. Sta. 492+89.58

		666.83 ^x		
496+00			9.3	657.5
T.P.	0.69	654.68 ^x	12.84	653.99 ^x
496+50			3.8	650.9
497+00			11.0	643.7
T.P.	7.24	651.19 ^x	10.73	643.95 ^x
497+50			15.6	635.6
498+00			8.4	642.8
498+50			3.8	647.4
499+00			3.4	647.8
499+50			2.3	648.9
500+00			4.1	647.1
500+50			5.4	645.8
501+00			7.3	643.9

		651.19 ^v		
501+50			7.6	643.6
T.P.	1.61	642.72 ^x	10.08	641.11 ^x
502+00			1.7	641.0
502+50			4.2	638.5
503+00			7.6	635.1
503+50			9.7	633.0
504+00			10.1	632.6
T.P.	1.98	633.82 ^x	10.88	631.84 ^x
504+50			3.0	630.8
505+00			3.8	630.0
505+50			3.4	630.4
506+00			5.4	628.4
506+50			6.8	627.0

		633.82 ^x		
507+00			8.5	625.3
507+50			10.8	623.0
T.P.	0.48	622.10 ^x	12.20	621.62 ^x
508+00			0.5	621.6
508+50			3.6	618.5
509+00			6.9	615.2
509+50			9.7	612.4
T.P.	0.74	610.27 ^x	12.57	609.53 ^x
510+00			2.1	608.2
510+50			6.8	603.5
511+00			12.3	598.0
T.P.	0.96	598.54 ^x	12.69	597.58 ^x
511+50			5.5	593.0

598.54^x

511+74⁶⁵

8.90 589.6

B.M.

8.60 589.94^x 589.97

On Concrete Mon.

2x2 Hub 50' Right of Sta. 511+74⁶⁵

DEC. 29, 1945

45

SOPR R. NOTES
WADSWORTH RD
PHILADELPHIA

CHECK LEVELS FROM B.M. AT EAST TUNNEL PORTAL TO B.M.

AT WEST TUNNEL PORTAL

B.M.	6.73	549.66		542.93
TP	10.02	556.08	3.60	546.06
TP	12.53	568.49	0.12	555.96
TP	12.55	580.88	0.16	568.33
TP	12.98	593.39	0.47	580.41
TP	12.24	604.54	1.09	592.30
TP	12.01	616.08	0.47	604.07
TP	11.16	627.21	0.03	616.05
TP	10.56	637.73	0.04	627.17
TP	12.97	650.37	0.33	637.40
TP	8.77	657.78	1.36	649.01
TP	9.17	666.81	0.14	657.64
TP	9.66	676.44	0.03	666.78
TP	12.57	688.60	0.41	676.03
TP	8.40	696.61	0.39	688.21
TP	3.45	692.23	7.83	688.78
TP	7.83	696.44	3.62	688.61
TP	10.17	704.25	2.36	694.08
TP	0.38	693.69	10.94	693.31
TP	0.78	681.60	12.87	680.82
TP	0.10	668.60	13.10	668.50
TP	0.09	655.99	12.70	655.90
TP	1.31	644.71	12.59	643.40

LIETZ LEVEL # 10268

NAIL IN POWER POLE # 76981 THIS ELEV. WAS ESTABLISHED
FROM A U.S.C. + G.S. B.M. AT SANTEE

		644.71		
TP	0.01	631.88	12.84	631.87
TP	0.11	619.09	12.90	618.98
TP	0.39	608.76	10.72	608.37
TP	0.28	601.03	8.01	600.75
TP	1.01	591.50	10.54	590.49
TP	12.74	594.24	10.00	581.50
TP	6.17	595.90	4.51	589.73
CK ON B.M.			5.94	589.96

CHECK LEVELS WEST OF TUNNEL PORTAL →

B.M.	1.16	591.13		589.97
TP	0.64	579.21	12.56	578.57
TP	0.64	566.89	12.96	566.25
TP	1.43	558.15	10.17	556.72
CK ON EC. 523+59.09			2.7	555.4 o.k.
TP	4.91	551.51	11.55	546.60
CK ON BC 537+13.15			6.5	545.0 o.k.
* TP	2.54	546.21	7.84	543.67
CK ON STA 549+00			9.8	536.4 Rec. 536.3
TP	5.06	540.56	10.71	535.50
CK ON STA 553+50			12.9	527.7 Rec. 527.6
TP	4.19	532.58	12.17	528.39
CK ON STA 562+00			9.3	523.3 Rec. 523.1
TP	1.09	525.01	8.66	523.92

REC. KEY. 589.97 - PAGE 44 THIS BOOK

GURLEY LEVEL

		525.01			
TP	0.32	512.27	13.06	511.95	
TP	3.06	504.66	10.67	501.60	
CK ON STA 579+00			11.4	495.3	REC. 493.09
TP	2.36	494.06	12.96	491.70	
TP	0.91	482.20	12.77	481.29	
CK ON STA 590+00			9.9	472.3	REC. 472.1
TP	8.00	481.56	8.64	473.56	
CK ON B.M.			3.11	478.45	

TP*					
FROM PAGE 46	4.44	548.11		543.67	
			3.95	544.16	
			1.61	546.50	

TP*					
FROM PAGE 46	2.22	545.89		543.67	
TP	1.90	538.58 580.58	9.21	536.68	
			7.68	530.90	
TP	0.83	527.65	11.76	526.82	
			8.41	519.24	
			10.40	517.25	

NAIL IN TEL. POLE RT. STA 0-95 REC. ELEV. 478.24

CK ON TP BOOK 690 PAGE 12 - REC. 544.06

CK ON TP " 690 " 10 REC. 546.42

COULD NOT FIND TP ON PAGE 14

CK ON B.M. BOOK 690 PAGE 15 REC. ELEV. 530.80

CK ON TP BOOK 690 PAGE 16 REC. 519.11

" " " 690 " " 517.12

COULD NOT FIND TP ON PAGE 19

LINE CHANGE "T" LINE EL MONTE PL.
 STA 113+85 TO 132+75.60 (Lake side)
 (SEE BOOK 598 PAGE 97 FOR PROFILE)

P.I
 132+75.60 B = Δ = 4° 32' L
 132+73.68 A

P.I
 131+48.68 Δ = 4° 32' R

P.I
 125+50 Δ = 4° 41' R

P.I
 123+50 Δ = 4° 39' L

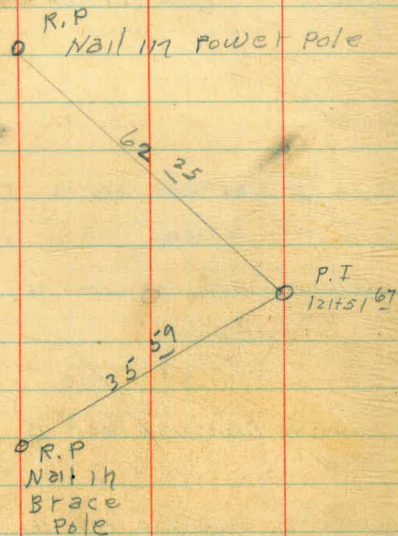
P.I
 121+51.67 Δ = 0° 10' L

P.O.T
 117+00

P.I 114+50 Δ = 5° 21' L

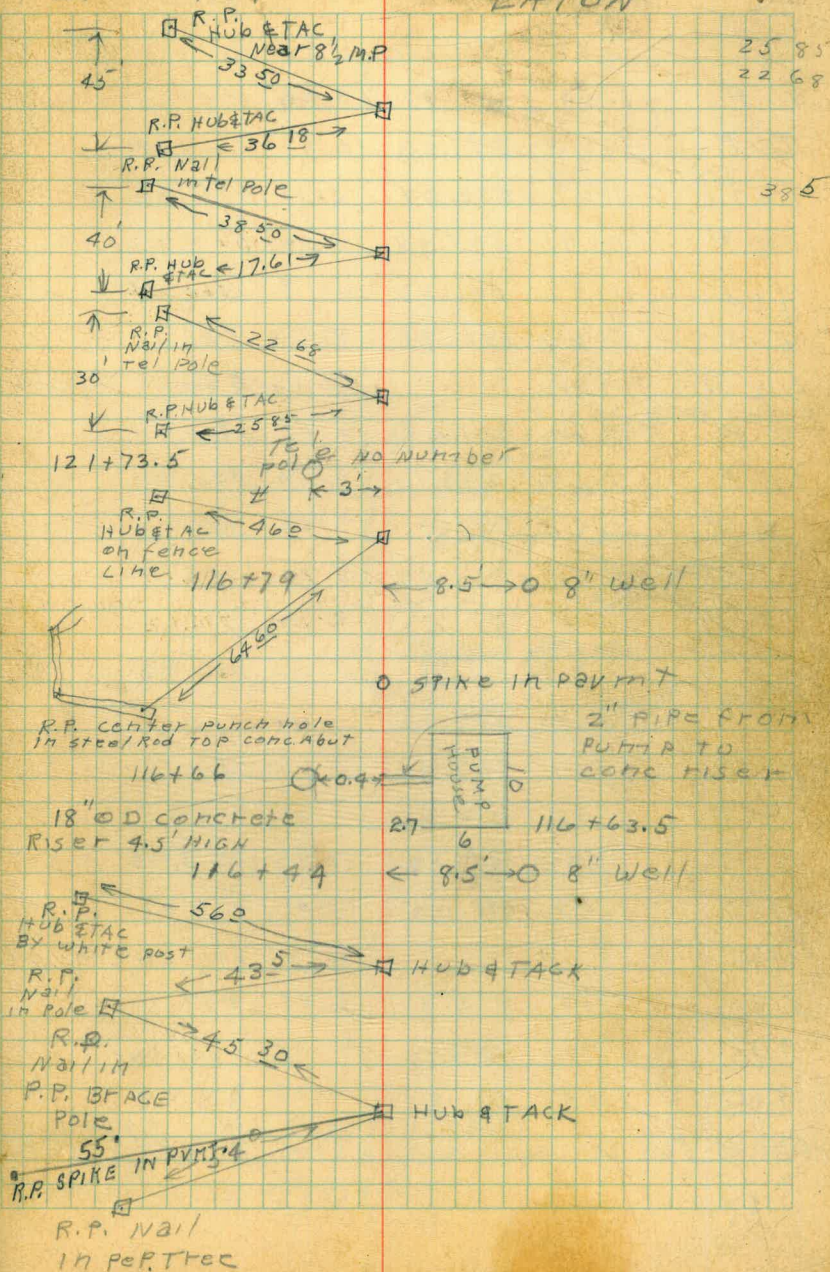
P.I 113+85 Δ = 5° 18' R

P.I
 113+26.32



7-16-46
 Clear-HOT

Nelson
 LEONARD
 EATON 48



CHEC Levels west of Tunnel

	T	H.I	-	Elev
	1.29	591.26		589.97
T.P.	1.59	579.79	13.06	578.20
T.P.	2.55	571.43	10.91	568.88
T.P.	4.69	573.01	3.11	568.32
T.P.	0.91	565.88	8.04	564.97
T.P.	0.89	561.03	5.74	560.14
T.P.	0.69	552.38	9.33	551.70
CK BM			7.69	544.69 = 549.64
T.P.	5.74	551.44	6.68	545.70
T.P.	5.17	549.12	7.99	543.95
T.P.	4.20	548.88	4.44	544.68
T.P.	3.65	544.32	8.21	540.67
T.P.	5.34	541.46	8.20	536.12
CK BM			10.53	530.93 = 530.80
T.P.	0.57	528.96	13.07	528.37
T.P.	4.61	525.51	8.06	520.90
T.P.	0.95	519.60	7.86	517.65
T.P.	1.30	507.23	12.67	503.93
T.P.	3.83	498.05	13.01	494.22
CK 579+00			4.79	493.26 = 493.09
T.P.	2.30	493.41	6.94	491.11
T.P.	5.70	488.16	10.95	482.46
T.P.	1.45	481.89	7.72	480.44
CK B.M.			9.21	472.68 = 472.49

9-16-46
Clear-W3447

Nelson
Leonard
Phillips

49

B.M. 50' RT STA 511+76.76

B.M. Fence cor LT STA 530+17

544.64 BM

+ 1.98

546.62

- 4.64

541.98

Nail in Cottonwood
Tree 100' LT
530+00+

Copied off plans - (Leonard)

Beatty 12-3-57

33 RT STA 570+20 (Rock)

Spike STA 595+31.75 (Pot)
NOTE Elev used for line ahead from
this B.M. 472.70

Bliss
Waddell
Phittas
Davies
Jan 22-46
C. 1001 1200 PM

ELMONTE PL. LOC.
Location Proposed Pipe Line from
Sta 11210³⁵ To sta. 299+94.40

Δ 5°-30'-00

R 1500

T 72.05

L 143.49

Def 1

120+50³⁵ BC RT

VOID
SEE P. 73
THIS BOOK
Kaysor

581°-09'-00W

569.65

114+81²⁰ LRT 45°-00'-00"

123.06

S 36°-09'-00W

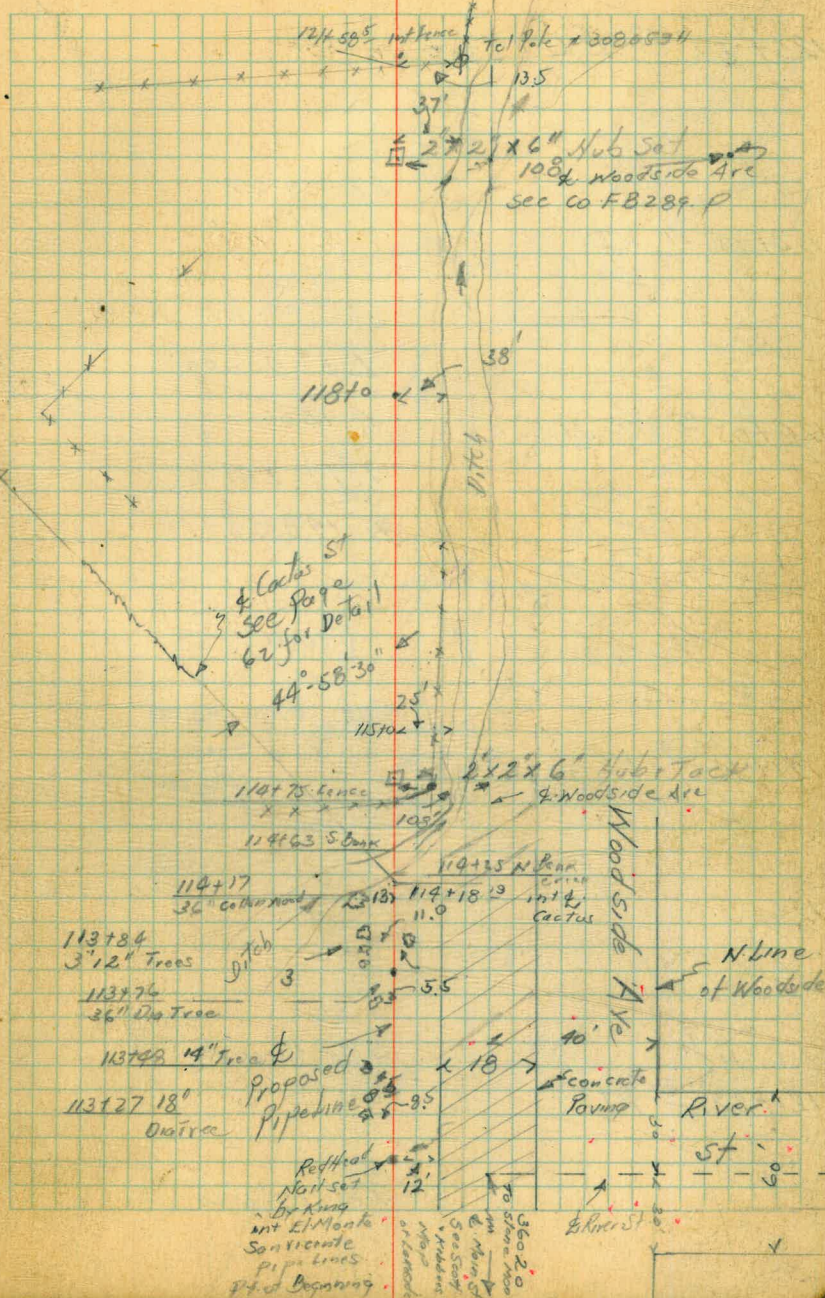
113+58¹¹ LRT 45°-00'-00"

107.69

Bearings Derived
581°-09'-00W from Co. Highway
Alignment

117+58³¹ Int El Monte + San Vicente Sec of B. 289
Pipe Line

112+35³¹ Int San Vicente Pt of Boundary
+ El Capitan Pipelines



125753.38 E.C.

S 80°-59'00" W

124179.27 P.I.

Δ 5°-40'-00"

124405.03 EC St

R 1500

T 74.29

L 148.35

VOID

SEE P. 66 TO 70

THIS BOOK

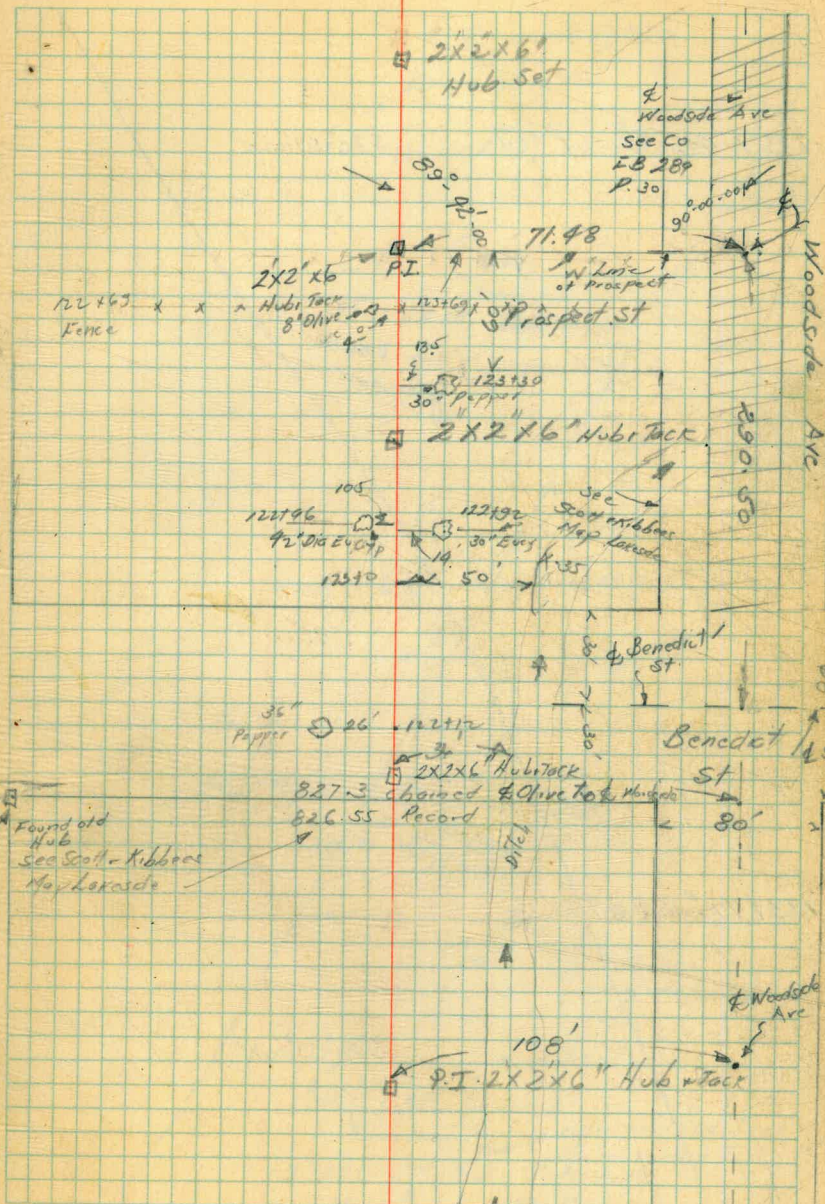
Keyser

121794.84 EC

S 86°-39'-00" W

121722.90 P.I.

S 81°-09'00" W



135+48.28 P.O.T. S80°59'00" W

VOID

SEE P. 66-70.
THIS BOOK
Keyston

171.17

133+77.11 P.O.T.

823.73

S80°59'00" W

6' 136+14 18" Olive
135+85 18" Olive
20' 135+5 19" Olive
2'x2'x6" Hub + Tack

18' 135+24 20" Olive
9.5' 132 24" Olive

134+81
5' 134+63 24" Olive

134+28 24" Olive on E

134+12
22'

Dirt Roadway

2.5' concrete

4' curb

133+89

2'x2' Hub

10'

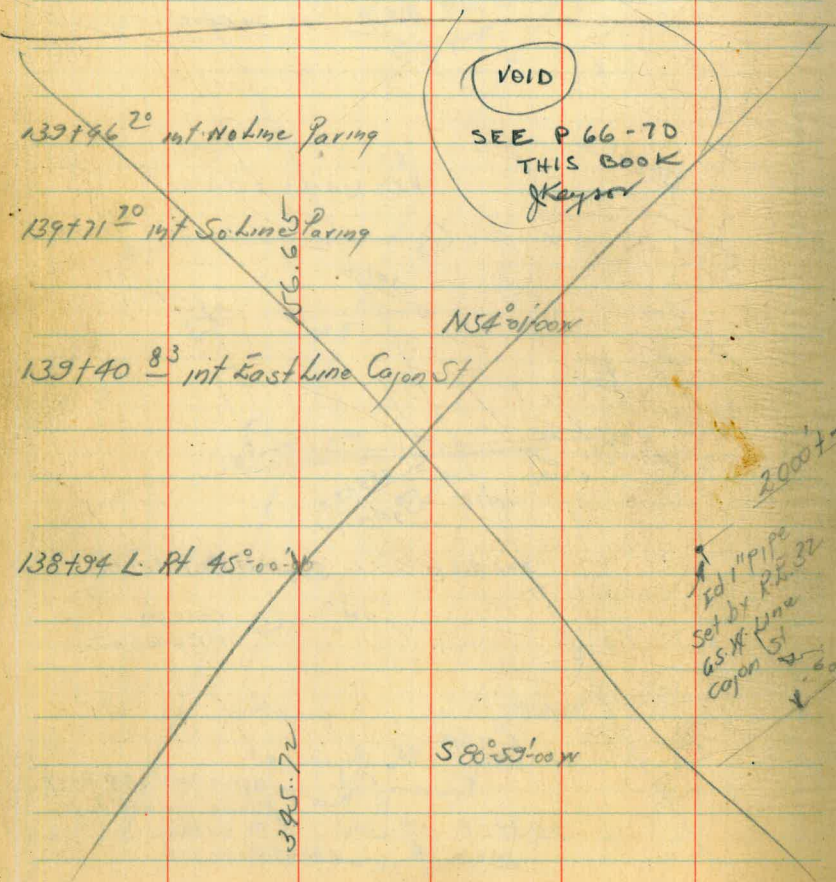
132+78 10" EUCO.

133+70 30" Eucalyptus

4" steel pipe
31' 9.5' 123+97
pump house
Open well .65' Deep
Wood curbed Top
to Bottom
129+38 7' 16.8' small power pole

S81°06'00" W

140+50⁶⁵ L. Pt. 44°53'00"



VOID
SEE P 66-70
THIS BOOK
Kaylor

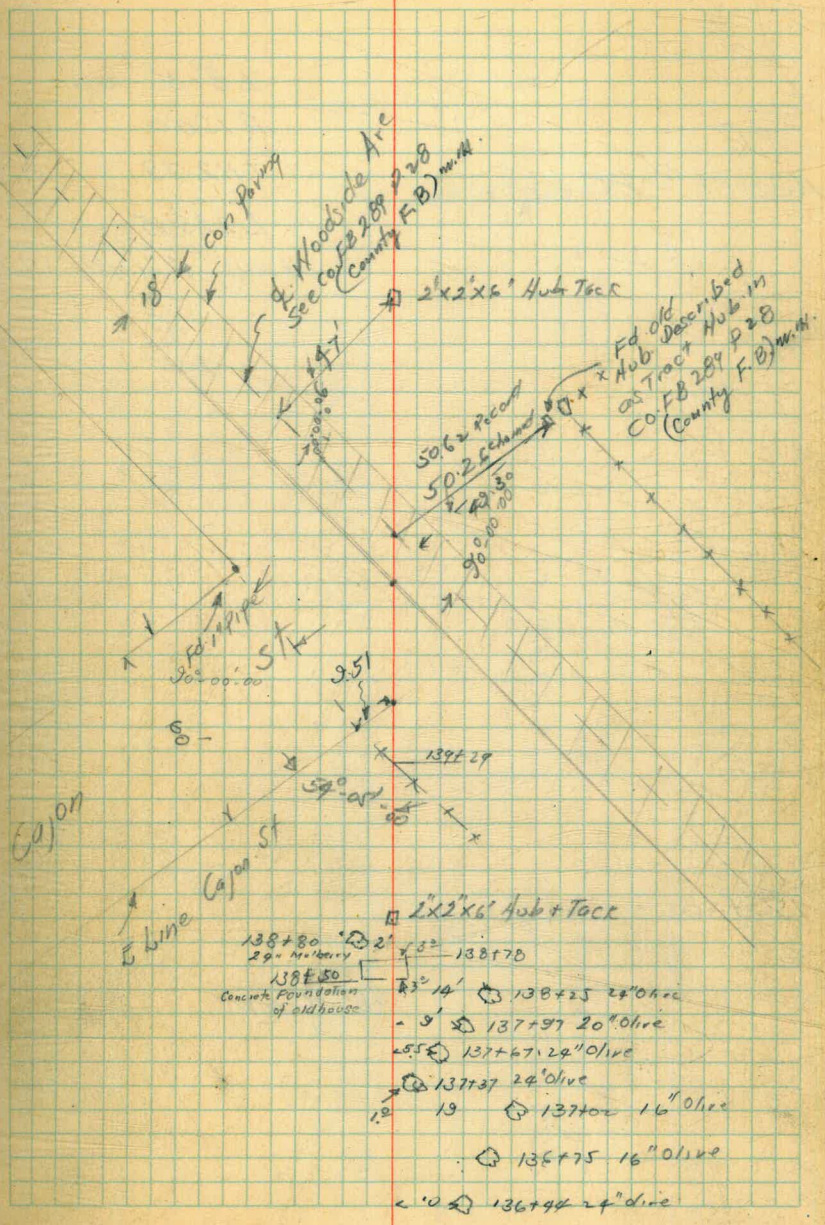
139+66²⁰ int. No. line Paring

139+71⁷⁰ int. So. line Paring

139+40⁸³ int East line Cajon St

138+94 L. Pt. 45°00'00"

S80°59'00" W



Woods de Arc
See Co. FB 289 P 28
(County F.B.) W.M.

Ed. old Described
as Tract Hub in
Co. FB 289 P 28
(County F.B.) W.M.

- 138+80 22' x 32' 138+70
- 138+50 Concrete Foundation of old house
- 138+25 24" olive
- 137+97 20" olive
- 137+67 24" olive
- 137+37 24" olive
- 137+02 16" olive
- 136+75 16" olive
- 136+44 24" olive

Ed 1" pipe
Set by P.L. 32
65' N. line
Cajon St
2'-00"

2000±

Cajon

E. line Cajon St

138+80 22' x 32' 138+70
138+50
Concrete Foundation
of old house

2x2x6 Hub + Tack

- 138+25 24" olive
- 137+97 20" olive
- 137+67 24" olive
- 137+37 24" olive
- 137+02 16" olive
- 136+75 16" olive
- 136+44 24" olive

$\Delta 8^{\circ} 36' 00$

R 1500

T 112.79

L 225.15

Det per ft = 0.01451

163+88 ⁵⁶ BC

1338.56

150+50

P 0.7

999.35

581-06' 00 W

♀

59

□ 2"x2"x6" Huber Tack

□ 2"x2"x6" Huber Tack

VOID

SEE P. 17 THIS BOOK. J. Keyser

~~175+00 P.O.T.~~

NOTE

FOR ALTERNATE
Route (MOM - sta
173+27²¹ TO STA 195
+74⁰³ see pages
17-20 This book

CONT P. 17 THIS BOOK JK

886.29

166+13.21 E.C. ↓

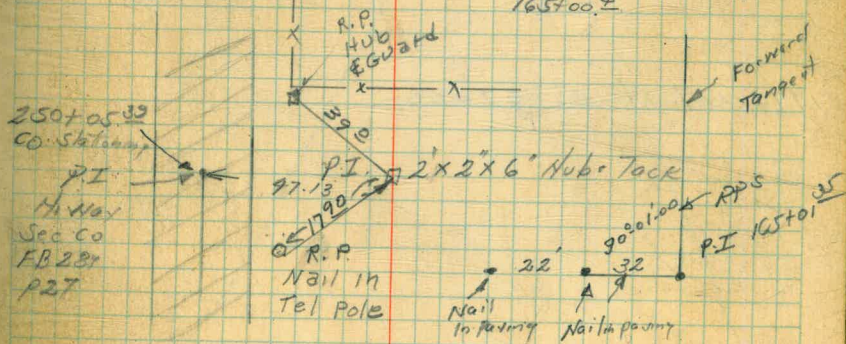
165+00.4 mt 10" steel water Main
5.89°-42'-00" W River view
Mutual Water Co
165+01.35 P.I. Δ 8°-36'-00"

581°-06'-00" W

28 → 175+39.80-14 Main Gate
3015. M.H. Δ 4.25
2x2x6" Hub & Tack

5.2x10.1
Concrete Slab
w. 3" rebar loc
174+87
Stand Pipe

See photo
for BM
2x2x6" Hub & Tack
BM. 381.20
4.55 f
5.47 TOP
38.575
10" Water Main
1657.00.4
377.22



250+05.33
CO. Stationing
P.I.
H Way
Sec Co
FB 281
P27

2x2x6" Hub & Tack
90° 00' 00" RPS
Nail in Paving
Nail in Paving

184734⁸⁹ BC-LT

$\Delta 37^{\circ}59'00''$ LT

R 1447.46

Dist $3^{\circ}57'30''$ R.R. Curve

L 953.57

T = EE

VOID
SEE P. 17 ET SEQU.
THIS BOOK.
Keyton

663.22

$S 79^{\circ}24'00''$ W

177770⁸⁹ LT $45^{\circ}25'00''$

70.84

$N 55^{\circ}11'00''$ W

177700 L.R. $35^{\circ}07'00''$

200'

⊕ → K 15' →
old SDAE
RR

□ 2x2x6" Hub & Tack

□ 2x2x6" Hub & Tack

CONT FROM P. 20 THIS BOOK

NOW POT

S 41°-55'-00" W

1977-70. ⁵⁸ LAT 95°-30'-00"

VOID
SEE P. 17 ET SEQU
THIS BOOK.
Keyord

1877-20 mt. fence
200.78

1967-82 ²⁵ Int. & County Highway

S 3°-35'-00" E

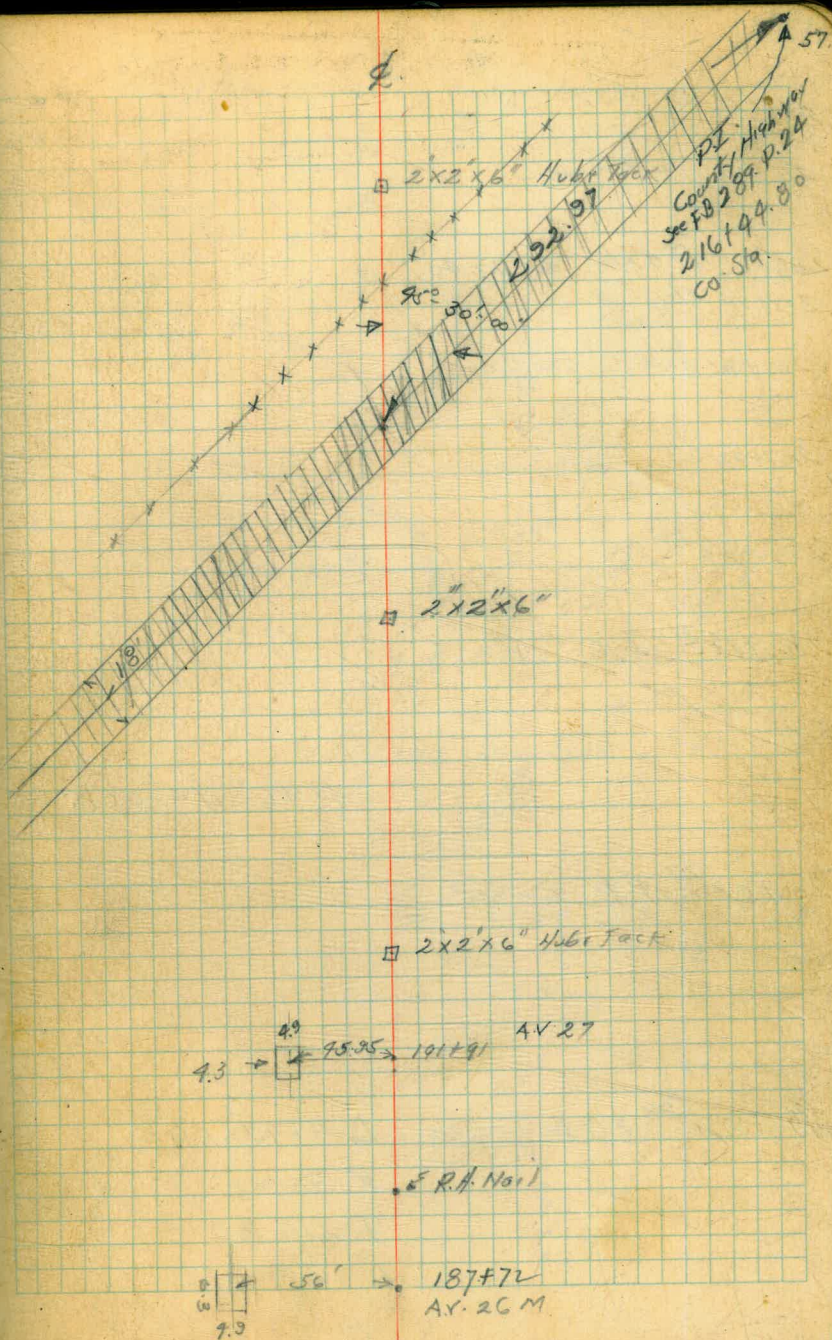
1957-70 L 14-45'-00" 00

176.37

S 41°-25'-00" W

1937-93 ⁶³ E.C. R.R. Curve

1897-50 P.O.C.



217+66 33 P.O.T

216+86 1st Fence

208+06 P. Pole # 72407

207+98 Elec Pump
& Well

207+81 1st 6" station line

207+73 Pump House

203+37 46

202+13 31 E.C.

203+37 46
202+13 31
1 24.15

S 46°-44'-00" N

200+03 27 P.I.

197+92.98 B.C.H.

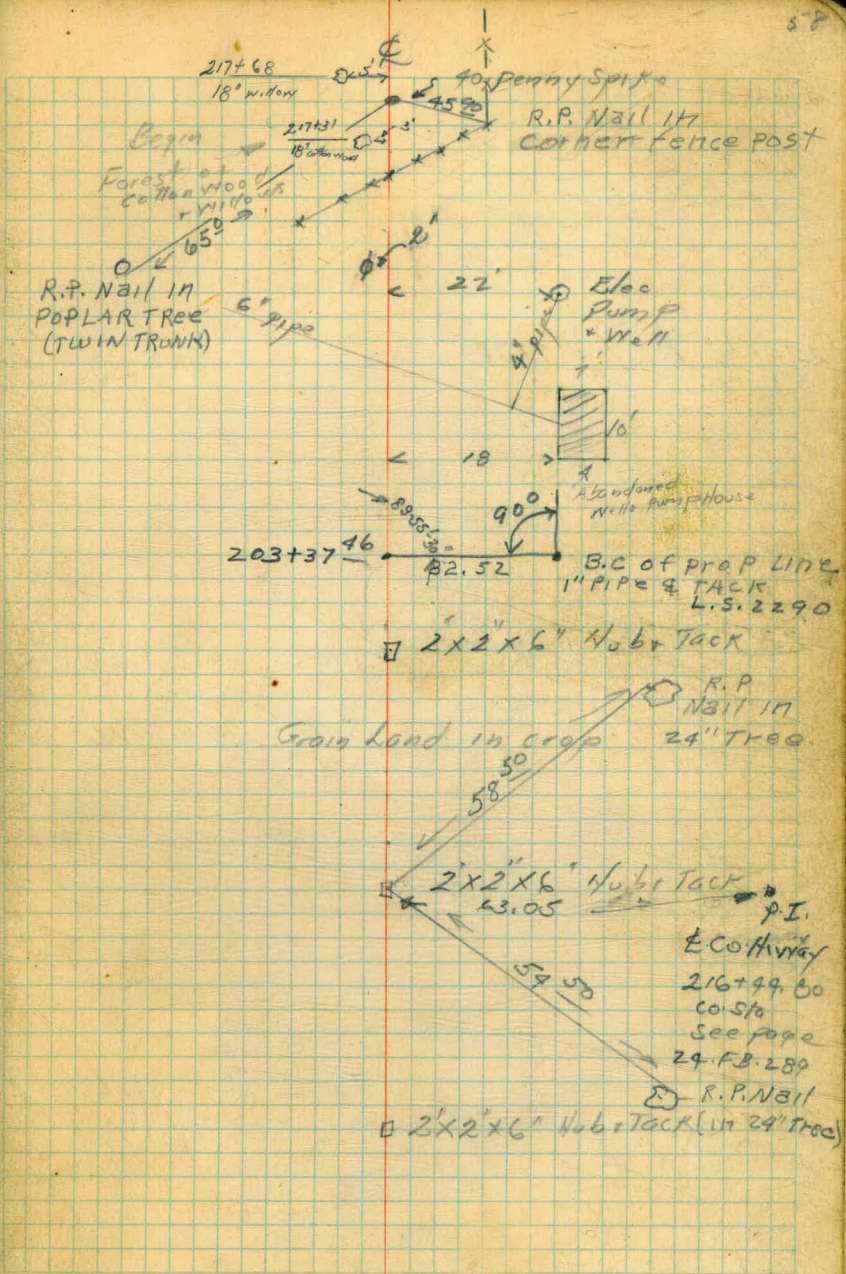
Δ 4°-49'-00

R 5000

T 210.29

L 420.33

22.90



226+29⁶³ P.O.T. ↑

224+60 P.P. # 73743

570.20

221+19.43 P.O.T. Small Nail ↑

S 46°-44'-00" W

373.10

40²⁵ 50⁰⁰ ← to penny Spike
900
Pasture Land
R.P. Hubs
GUB165
13'

63'

2.5' 221+63
Clump (3) 11" willows
15' 221+33
10" willow 18'
2.5' 221+21
24" willow
Nail → 221+09.20" willow 0.5 P.T.E.
220+92 0.5' 1.5' 20" willow
8" willow
2.5' 220+72
16" willow 12' 8" willow
18' 220+60
24" willow
2.5' 220+31 28" willow
10' 220+23
6.5' 18" cottonwood
220+19
16" willow
220+06 1" willow 12'
220+00 16" cottonwood 9'
219+82 16' 16" cottonwood
90" willow
219+75 8'
2 16" willows
219+20 9' 11' 219+20
2 10" cottonwoods 20" cottonwood
219+17 18" cottonwood 8'
219+10 12'
12" willow
218+90 30' cottonwood

Pasture Land

$\Delta 32^{\circ} 28' 00$

R 2000

T 582.31

L 1133.30

Def 1: 0.8594

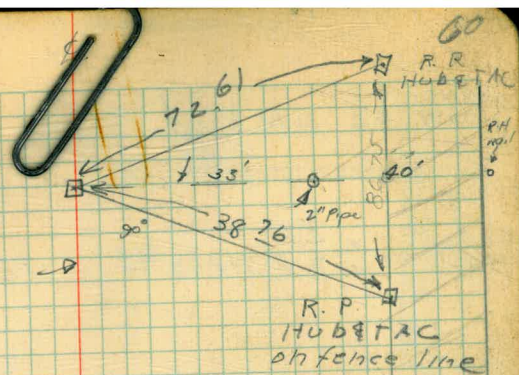
238+58 ¹⁰ 80.17

238+43.60 El Capitan f. L.
x 11/4/47

1228.47

546-99-00W

228+22 int Fence



Grain load in crop

18 8
17

63'

17

2.50
1/2 acre



CONT P.5 BOOK 685

Note subtract 381.5 ft from 251+66.52
for true dist. from Lakeside

EC.
249+31⁴⁰ = 251+66⁵² Sect. B. 685 P5 Equation at 125+31.14

2x2x6 Hub. Tack

L Co
Hills
18'
Paving

248 to 5 4' steel water main

EC 16° 14'

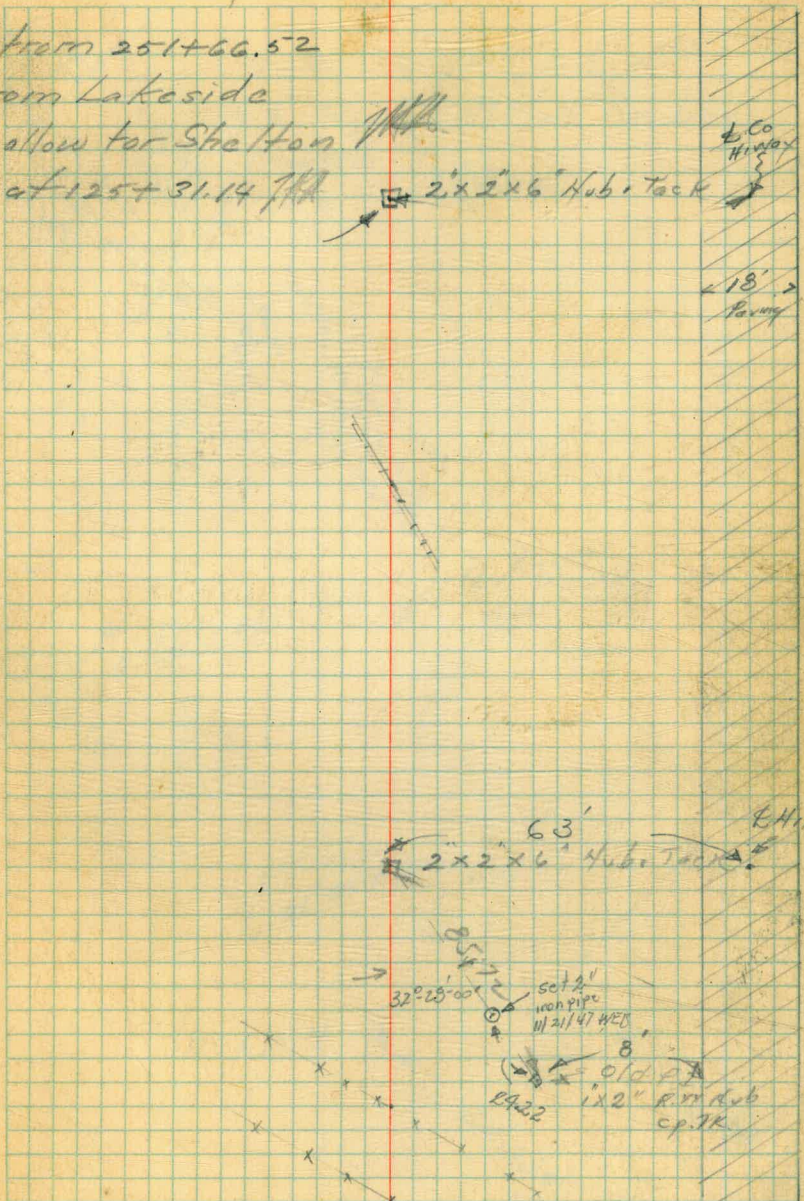
S 14° - 16' - 00" W

+50	15° 38' 30"
249	14° 55' 30"
+50	14° 12' 30"
249	13° 29' 30"
+50	12° 46' 30"
247	12° 03' 30"
+50	11° 20' 30"
246	10° 37' 30"
+50	9° 54' 30"
245	9° 11' 30"
+50	8° 28' 30"
244	7° 45' 30"
+50	7° 03'
243	6° 20'
+50	5° 37'
242	4° 54'
+50	4° 11'
241	3° 28'
+50	2° 45'
240	2° 02'
+50	1° 20'
239	0° 36'

244+40 4' PI

240+72 Barbed wire fence

240+34 5' Barbed wire fence



L Hills

set 2' iron pipe 11/21/47 W.E.B.

8' old 1x2' R.M. Hub cp. JK

SAVE

399.71
395.13
4.58

P.I. 244+40

396.40
45.13
1.27

85.72
25.61
60.11

21.67
3.17
18.50

South edge pav
P.I.
I.D.

R.P.
HUB
& Guards

25.61
23.83
2.78

113+90.06
21.57

113+68.39
3.17
113+71.56

399.71
394
5.71

6.16
5.71

399.71/5.02
394.69

399.71
394.3
5.41

139+13.55

P.I. X 50 X 50 X

Hubs
& Guard along fence

399.71
390.7
5.01
4.71
4.2

SAVE

200'
APPROX

HUBS
& GUARDS

200'
APPROX

300'
APPROX

200'
APPROX

HUBS
& GUARDS

38
58

EC. 249+91.40

200'
APPROX

518

$$\begin{array}{r}
 5 \ 18 \\
 4 \ 41 \\
 \hline
 4 \ 32 \\
 13 \ 9 \ 1A
 \end{array}$$

$$\begin{array}{r}
 5 \ 21 \\
 10 \\
 4 \ 39 \\
 \hline
 4 \ 32 \\
 13 \ 102 \\
 \hline
 13 \ 91 \\
 11 \\
 \hline
 7 \\
 4
 \end{array}$$

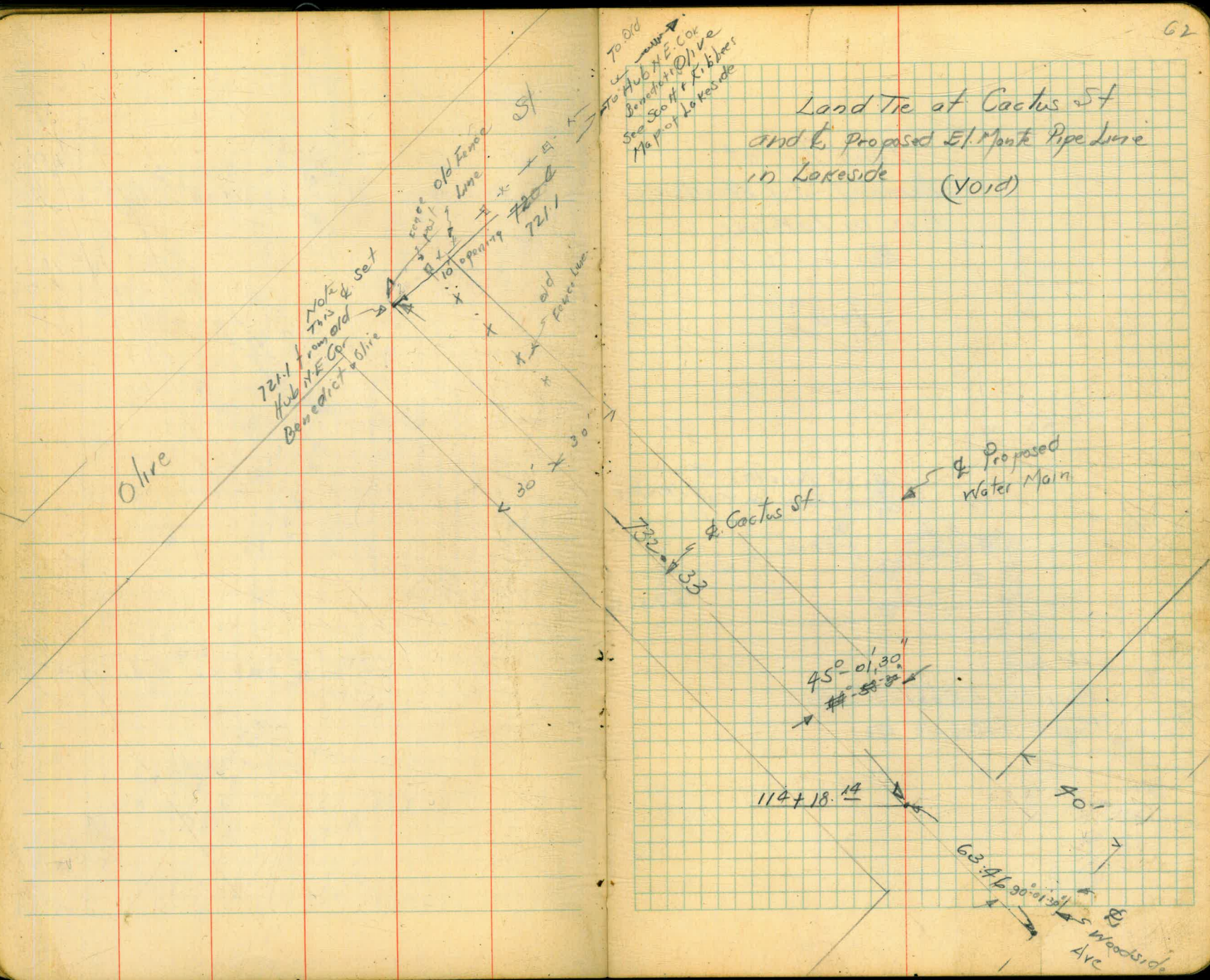
$$\begin{array}{r}
 5 \ 18 \\
 4 \ 41 \\
 \hline
 4 \ 32 \\
 13 \ 91
 \end{array}$$

$$\begin{array}{r}
 5 \ 21 \\
 10 \\
 4 \ 39 \\
 \hline
 4 \ 32 \\
 13 \ 102 \\
 \hline
 13 \ 91 \\
 11 \\
 \hline
 7
 \end{array}$$

9 22
 9 32
 9 36
 9 30
 9 34
 9 32
 9 30

Land Tie at Cactus St and Proposed El. Mark Pipe Line in Lakeside (VOID)

To Old
Hub NE Cor
Benedict Olive
see 50 H & K blks
Map of Lakeside



Olive

721.1 from old
Hub NE Cor
Benedict Olive

old fence
line

St

721.1

old
fence line

30' x 30'

Cactus St

Proposed
Water Main

$45^{\circ}-01'-30''$

$114+18.14$

40'

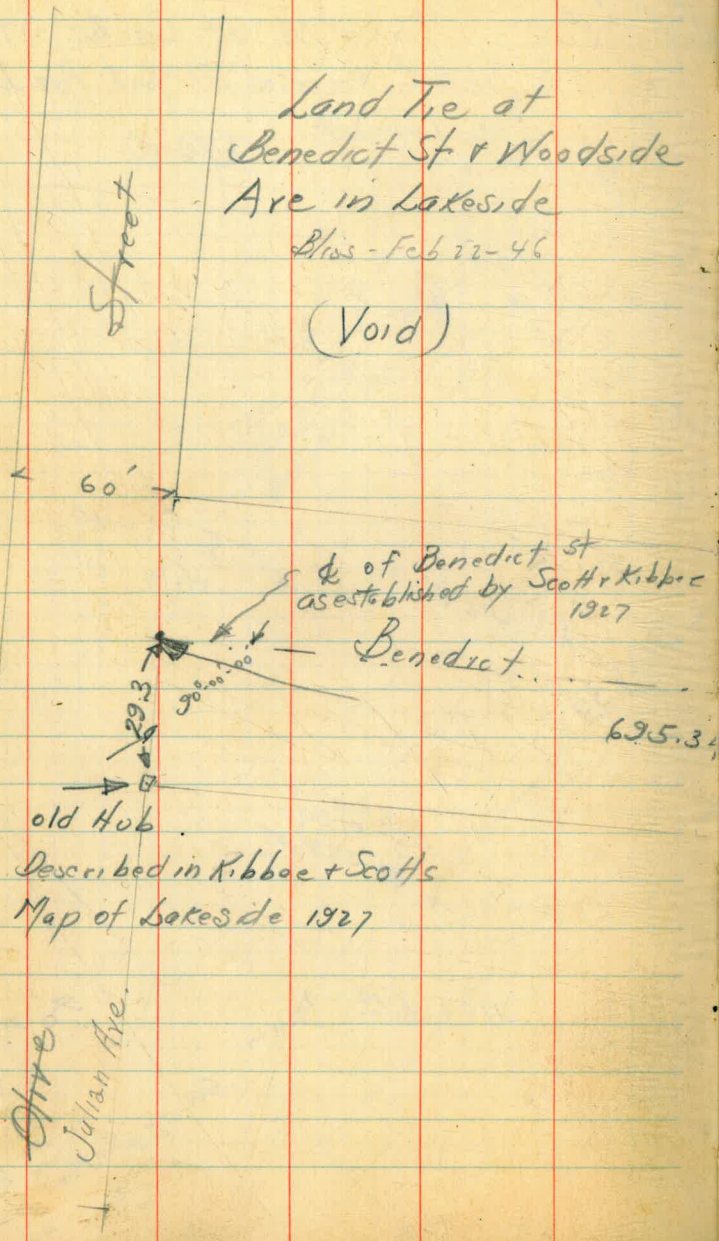
$63^{\circ}-46'-30''$

Woodside
Ave

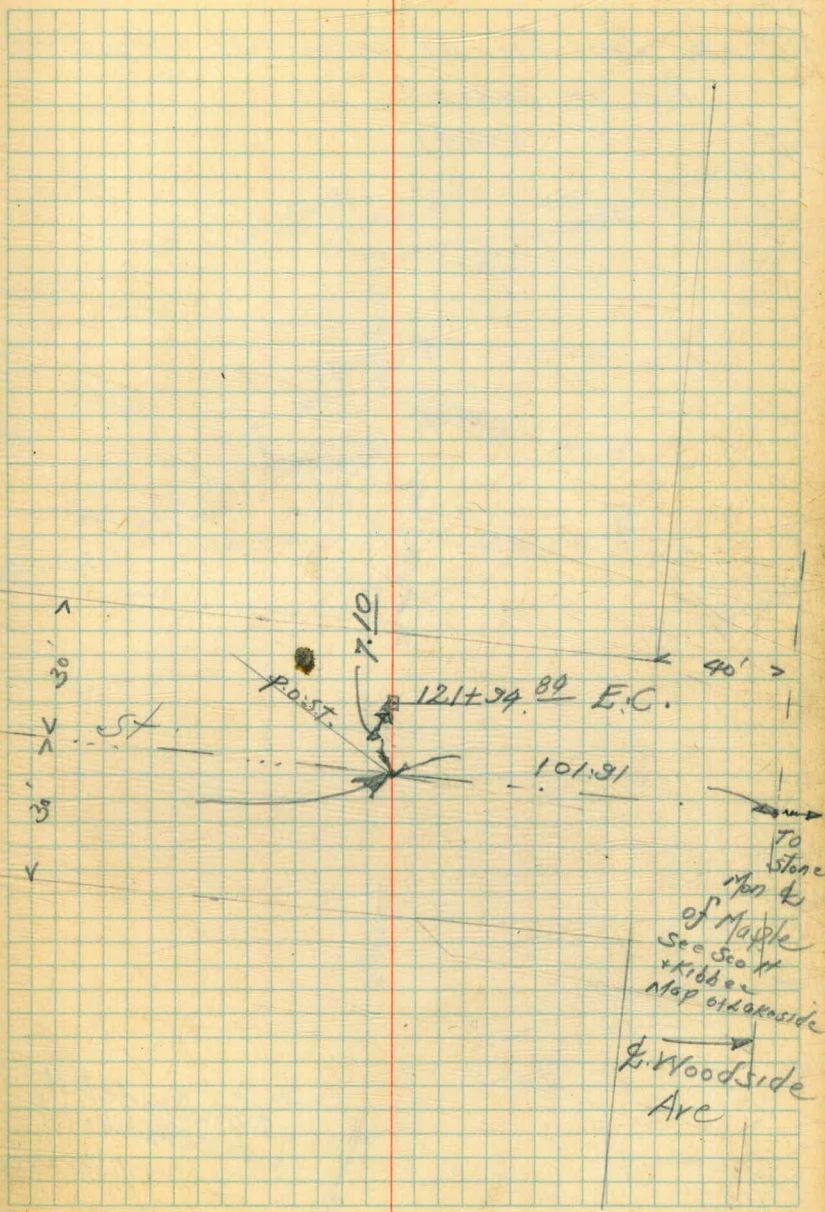
Land Tie at
Benedict St & Woodside
Ave in Lakeside

Bliss - Feb 22-46

(Void)



Described in Kibbee & Scott's
Map of Lakeside 1927



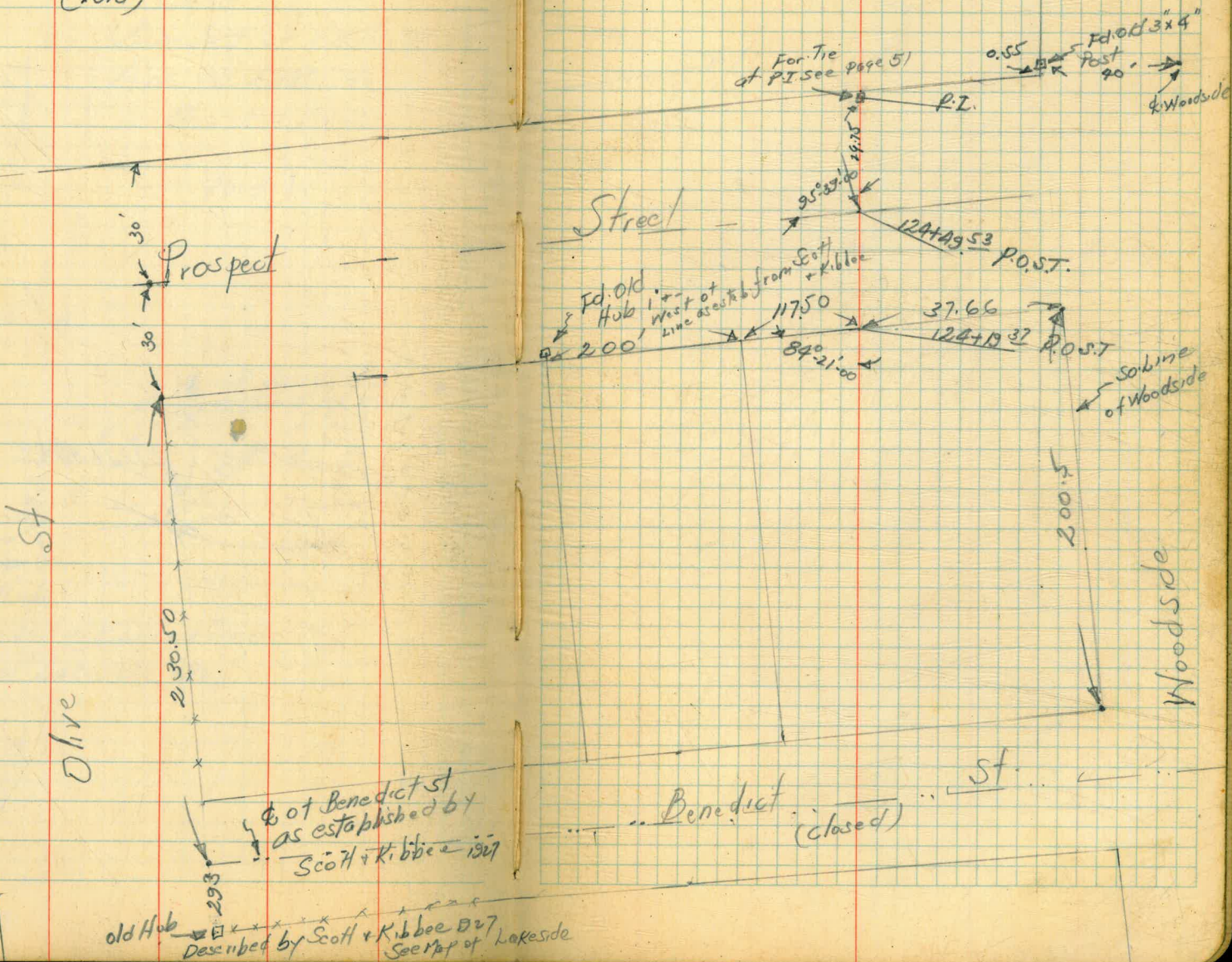
To Stone
Map of
of Maple
See Scott
& Kibbee
Map of Lakeside
q Woodside
Ave

Bliss notes
King - Feb 25-46
Paris
Paris

El Monte Line Tie at Prospect St. & Woodside
Ave. in Lakeside
(Yard)

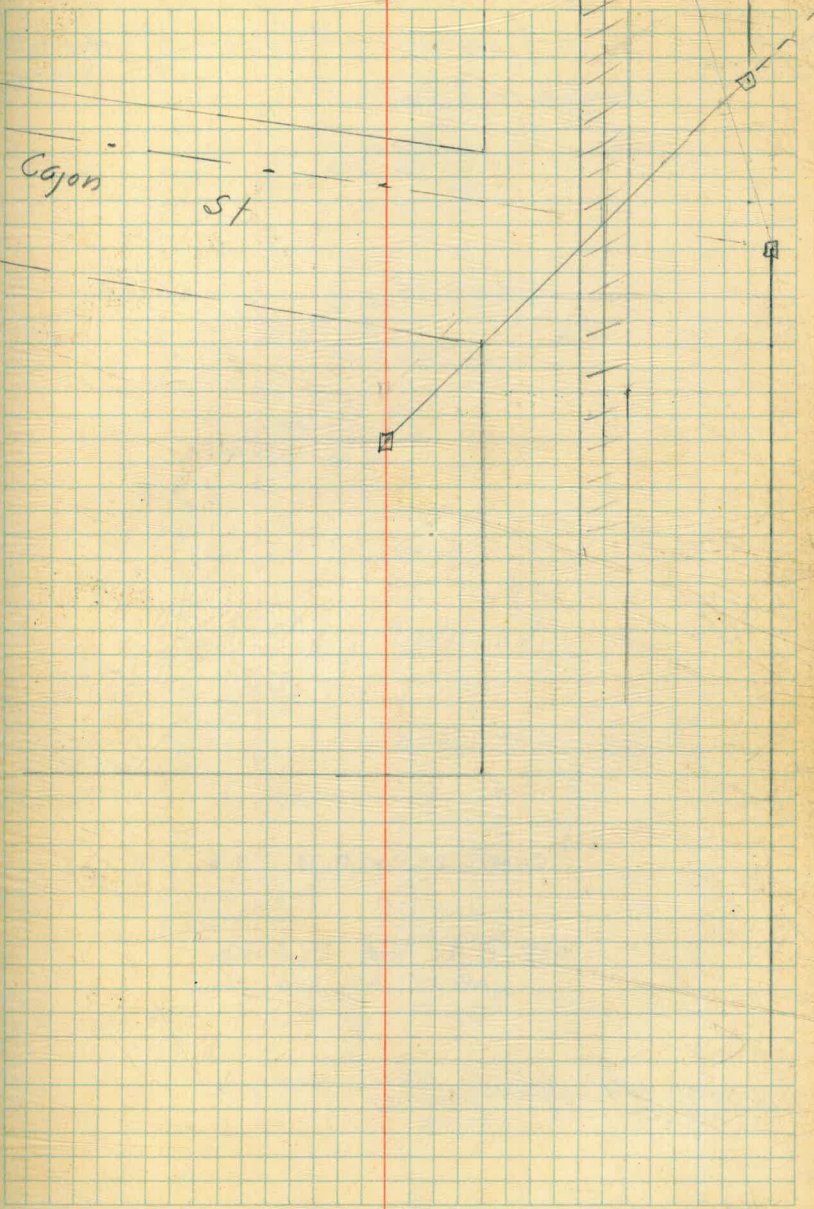
on Sem. Jan

64



not Benedict St. as established by Scott & Kibbee 1907
old Hub described by Scott & Kibbee B27 See Map of Lakeside

118' x 21' 65



Cajon

st

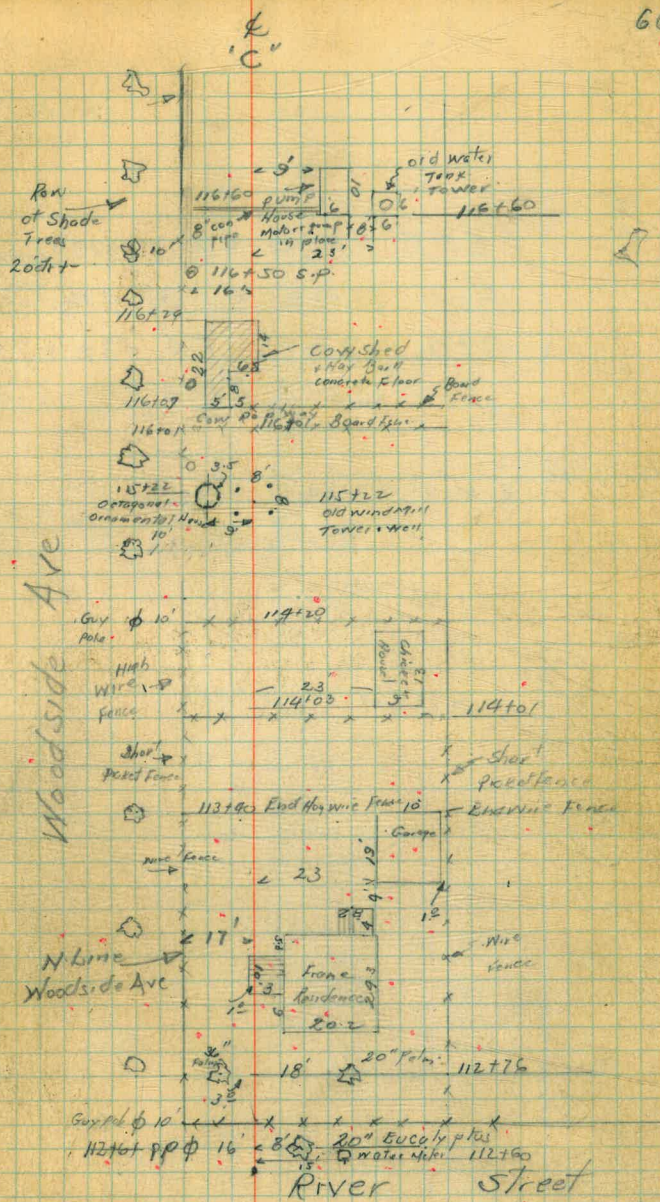
Class Notes
 King X
 Davis Chas
 Phillips
 Feb 28, 1946

Alter nate Location El Monte
 Pipe Line C" Line North of Woodside
 Ave from 112+55³¹ To 139+63³¹ - 140+50⁶⁵
 "A" Line
 Levels in FB 692 P1.

CONT FROM P. 73 THIS BOOK. JK

SEE P. 73 FOR REVISED
 LAYOUT AT BEGINNING JK

112+55.31 Pt. of Beginning



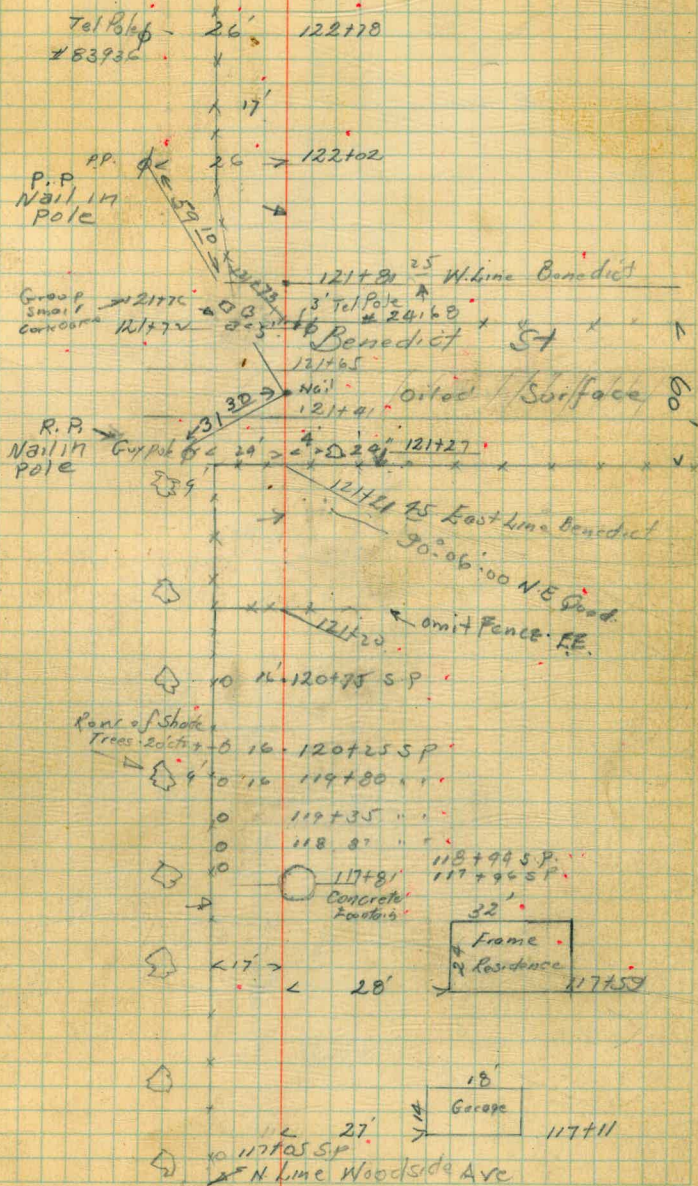
(SEE PAGE 48 THIS BOOK
 FOR LINE CHANGE
 STA 113+85 TO 132+75.60
 NELSON)

121+51.42 L 4.0°-07'-00" Benedict St.

Reference points
 4-30-96
 clear w/177

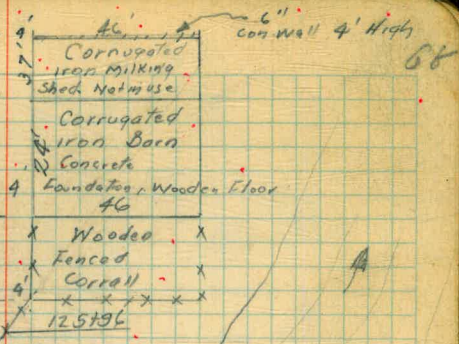
Nelson
 Leonard
 Rice

67



127109

127105 ϕ
Tel Pole # 83728

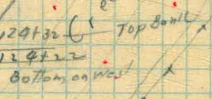


Tel Pole # 83729 ϕ

125765

T.P. 83730 ϕ

124722



123491 Bottom Bank

123428

Top Bank intersect Fence

Los Cochis

17'

122793 ϕ

122785

68

36"
 Frame
 Res.

67
 13075
 130

130+75 3' work concrete 11' → 130+66

13' 18' 130+50

Driveway 130+45 Olive Grove

13' 18' 130+36

13' 18' 130+17

13' 18' 130+0

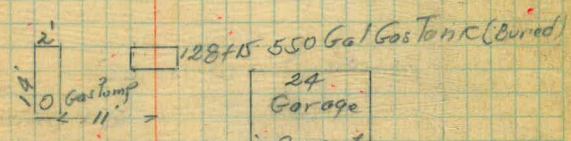
129+88 Driveway

129+67 12' Palm Tree

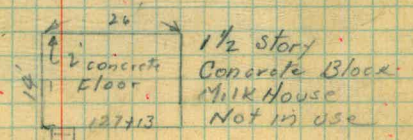
27' 129+18 Orange Tree

36" Eucalyptus 129+14

26' 128+80
 TP # 83927



127+65 ← 10' →



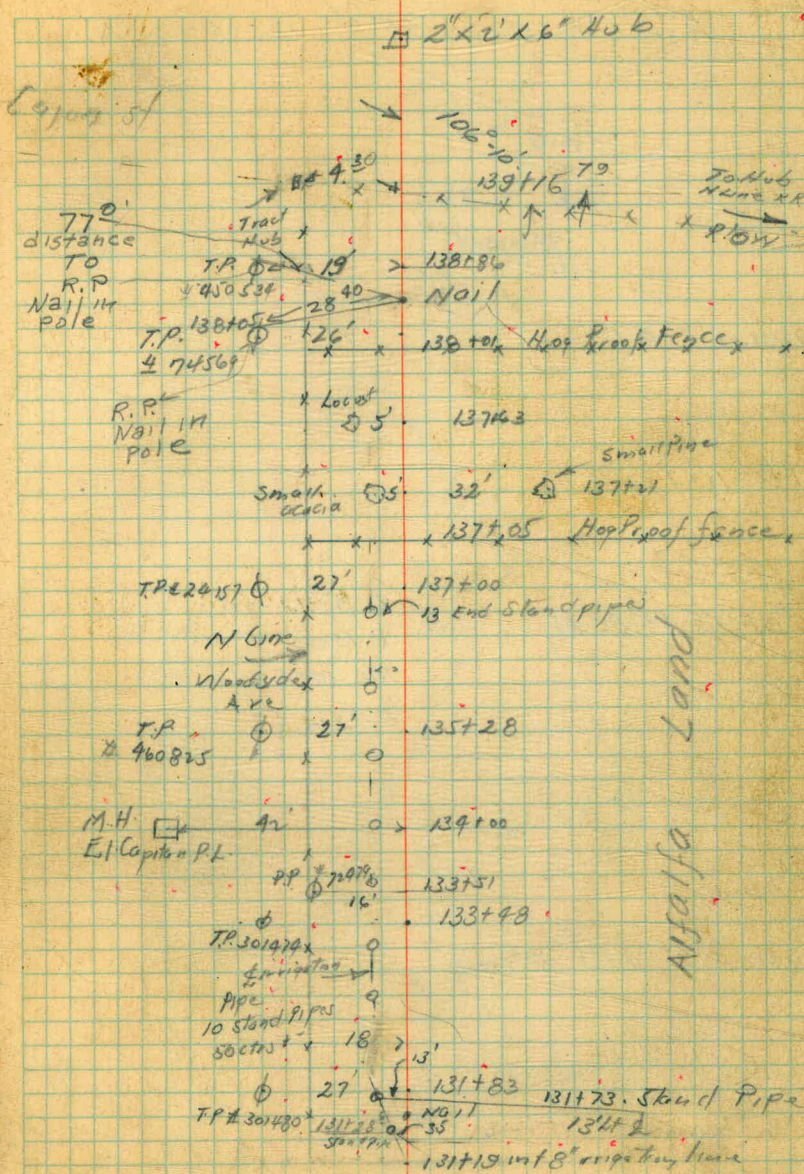
127+03
 1.5
 1.5

139+68 = "C" = 140+50 = "A" L. Pt 6°-18'-00"

138+15 L. Lt 7°-11'-00"

131+50 P.O.T.

70



Feb 23/46 El Monte PL.
Alternate "B" Line from 114+81.20/
A line to 125+97.99 "B" = 125+88.85 "A" line

VOID

SEE P. 73

Keyser

122+37 \approx E.C.

P.I. 121+29.97

120+22.45 BC RT

Δ 8°-12'00

R 1500'

Tan 107.52

L 214.67

115+05.29 L RT 45°-00'-00

Q "B"

71

• Nail

□ □

• Nail

← "A" D - Original
line

□ IT

□ 114+81.20

VOID

SEE P. 73

Keyson

125197 ⁴⁹ E.C. = 125188 ⁸⁵

129178 ¹¹ P.T.

123178 ⁴⁰ BC. LT.

Δ 8° 22' 00
R. 1500
T. 109.71
L. 219.04

EB

72

• Nail

← 222. Hub

Prospect

St

• Nail

Bliss Notes
King T
Davis
Phillips
4/23/46

Line Change Woodside - River Sts
Lakeside - El Monte Pipe Line, Profile Levels
Level Book 692 - P. 10

113+26³² P.I. L.H. 60°-00'-00"

112+71 N. Side Woodside Paving

112+50.2 S. Side Woodside Paving

112+36²⁵ = P.I. A 60°-00'-00"

112+26⁴⁰ Ahead
= 112+71⁴⁹ Back 80.

112+55³¹

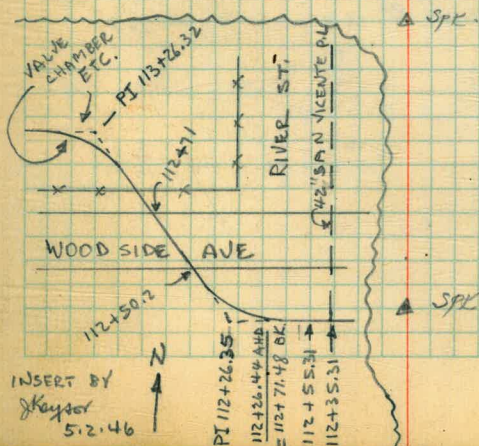
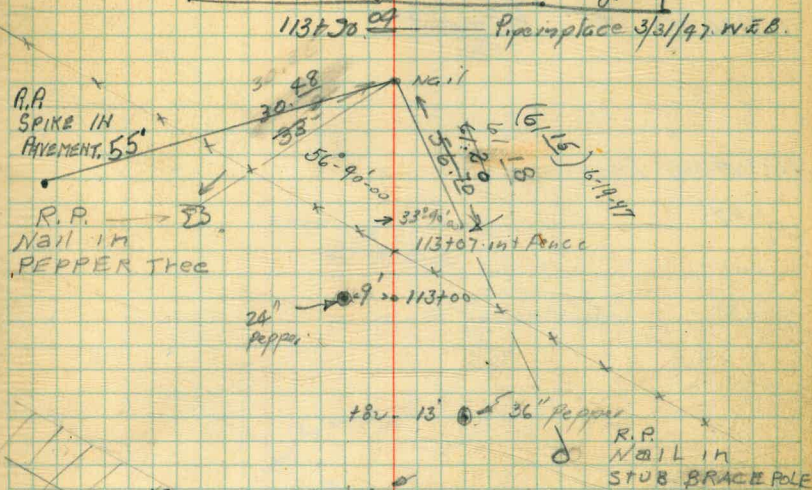
(BEGINNING OF WORK) JK

REFERENCE POINT
4-30-46
CLEAR - WATER

Nelson
Leonard
Rice

73

CONT P. 66 THIS BOOK JK



Bliss
King
Ph 11.00
5/19/46

Line Change Woodside & River St
Lakeside Levels Book 692 p. 12

113+26³² P.I. 60°-00'-00" LT

113+67 int Fence

+97

+85

+70⁷⁵ N. Edge Paving

20.50
10
30.5

+50²⁵ S. Edge Paving

112+36²⁵ - P.I. 60°-00'-00" RT

36.5
10
46.5

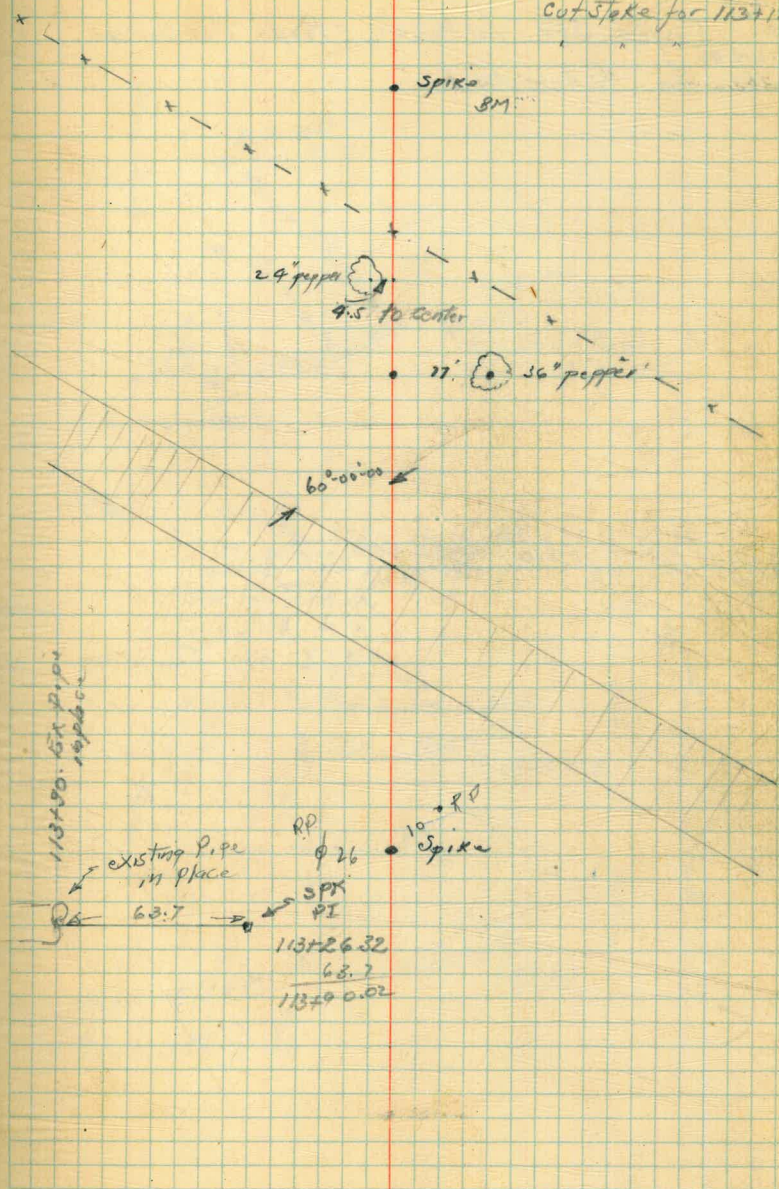
112+71⁹⁸ = 112+26⁹⁴

36.17
10
46

112+35³¹ E. River St

74

Cut Stake for 113+12.46



Bliss Notes

King 7

Ph. 11. ps

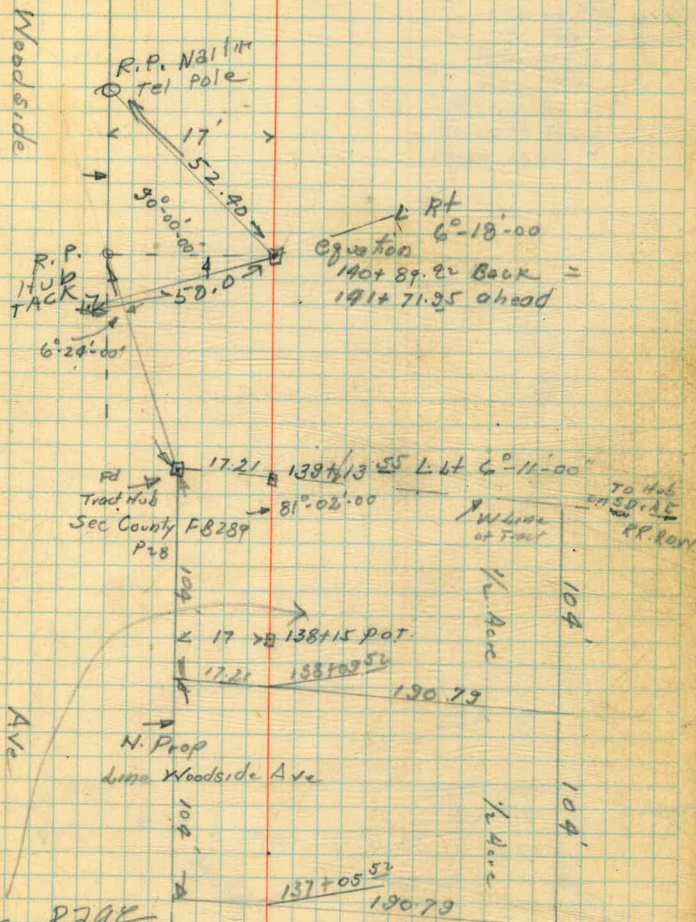
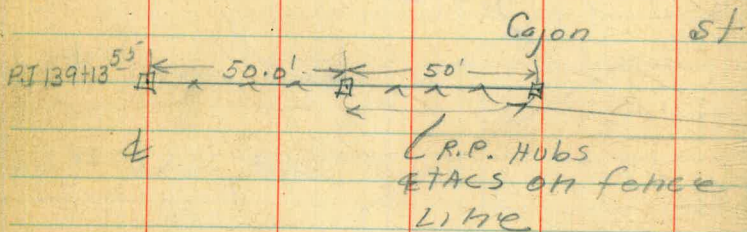
Davis

March 19-46

Threatening rain 1/2 Aero tracks

Line Change Woodside Ave +

Cajon Sts. Lakeside. + Prop. Ties through



SEE PAGE 70 FOR R.P.

Bliss Notes

King A

Phillips

Davis

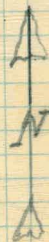
March 5-6-46

Proposed Tie El Monte Pipe Line

Southerly line of Bearn Estate

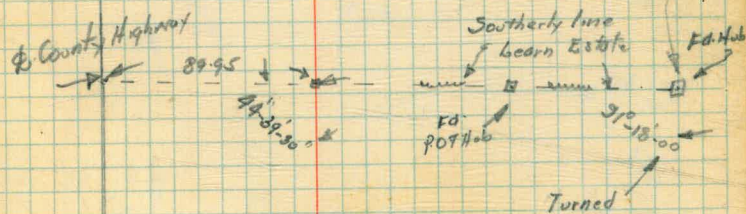
76

Ed. 3x3
Charred Post
2" Pipe
Referred to on
Harry Steeles Map
as being the N.E.
corner of Rancho El Cajon
Map # 1483



1666.7 feet

Lot 2.



Proposed
Pipeline

Bliss notes

King T

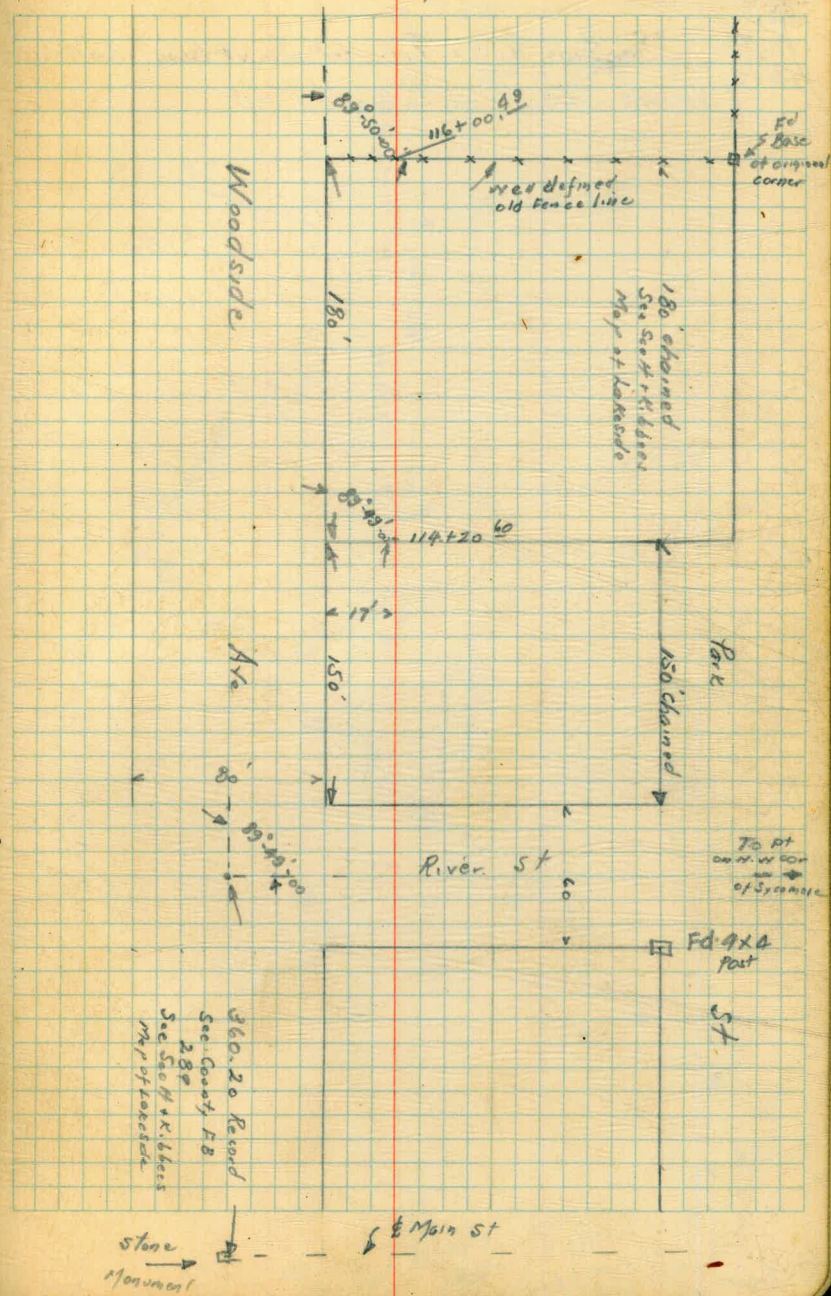
Davis

Phillips

March 6-96

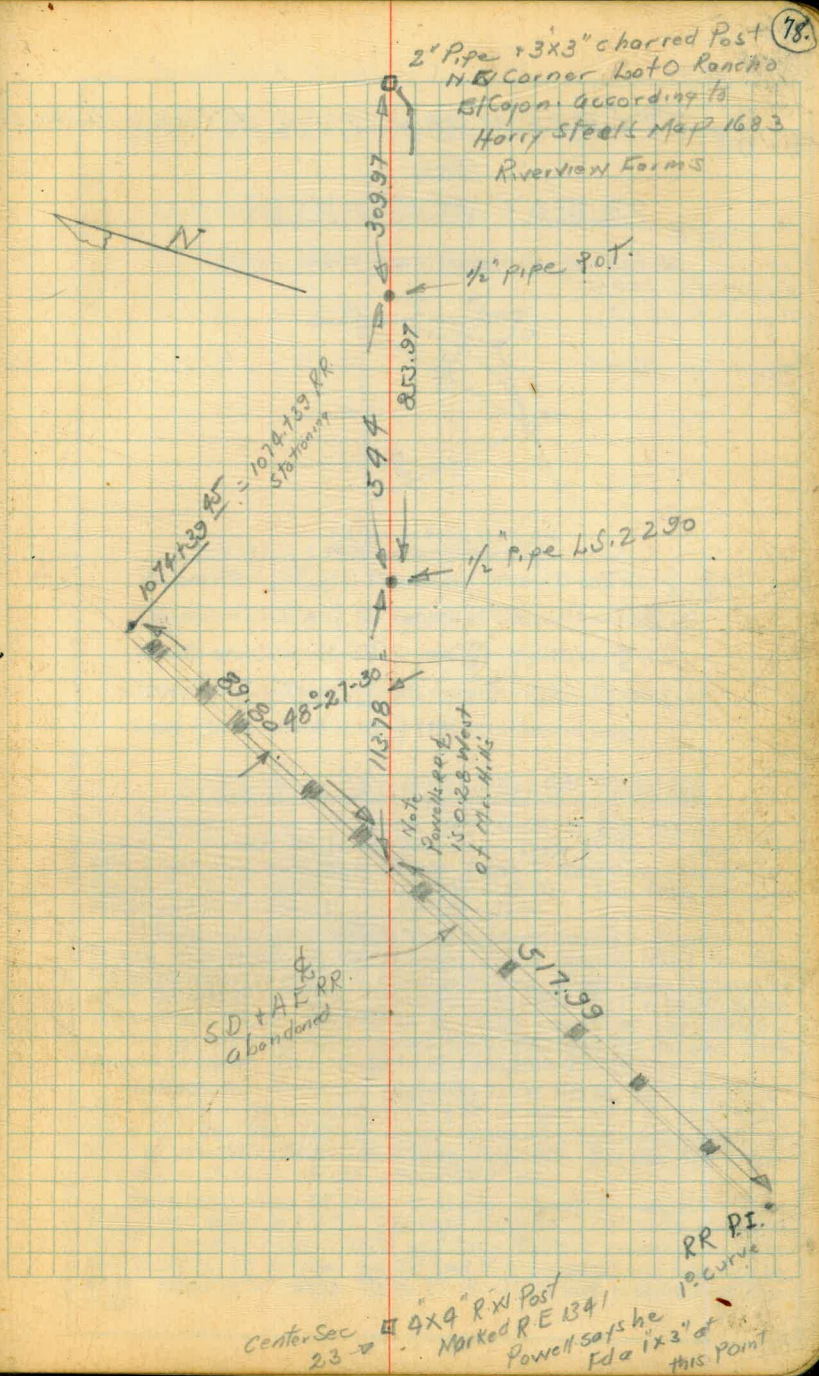
Property Ties in the Vicinity of Woodside Ave + River St. in Lakeside

El Monte
Pipeline



April
Bliss Notes
Leonard
Phillips

4/8/47 Section Line Tie on South Line Lakeside
Farms. To check Powell's Map



4/23/47

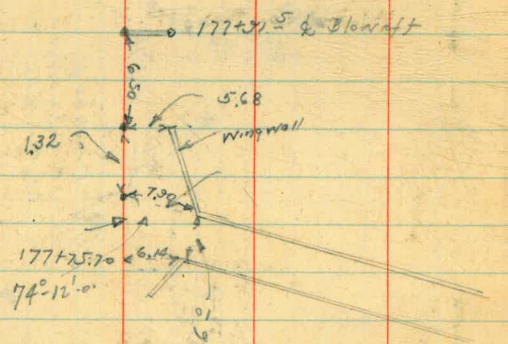
Notes

at River view Pump plant EIM/onto PL Sec 2
Phillips

177+82.5	2.93	382.10	379.17	
Flow of culvert		8.75	373.25	
177+91.5. Base of P		12.82	369.28	-75.64
Top of Pipe 18"				368.53
Top of Flange		12.58	369.52	-10.64
				368.52

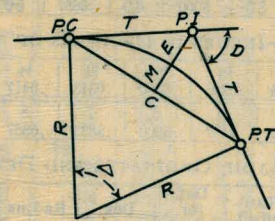
8" Pipe

178+26.64 P.I.



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 $= E = T \tan \frac{\Delta}{4} = R \div \cos \frac{\Delta}{2} - R$ (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° 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 = $158 - \text{Sta. P. C.} = 54.50$, 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° 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 I.—MINUTES IN DECIMALS OF A DEGREE.

1'	.0167	11'	.1833	21'	.3500	31'	.5167	41'	.6833	51'	.8500
2	.0333	12	.2000	22	.3667	32	.5333	42	.7000	52	.8667
3	.0500	13	.2167	23	.3833	33	.5500	43	.7167	53	.8833
4	.0667	14	.2333	24	.4000	34	.5667	44	.7333	54	.9000
5	.0833	15	.2500	25	.4167	35	.5833	45	.7500	55	.9167
6	.1000	16	.2667	26	.4333	36	.6000	46	.7667	56	.9333
7	.1167	17	.2833	27	.4500	37	.6167	47	.7833	57	.9500
8	.1333	18	.3000	28	.4667	38	.6333	48	.8000	58	.9667
9	.1500	19	.3167	29	.4833	39	.6500	49	.8167	59	.9833
10	.1667	20	.3333	30	.5000	40	.6667	50	.8333	60	1.0000

TABLE II.—INCHES IN DECIMALS OF A FOOT.

1/16	3/32	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	7/8
.0052	.0078	.0104	.0156	.0208	.0260	.0313	.0417	.0521	.0625	.0729
1	2	3	4	5	6	7	8	9	10	11
.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167

TABLE III.—RADI, ORDINATES AND DEFLECTIONS.

Deg.	Radius	Mid. Ord.	Tan Offset	Def. for 1 Foot	Deg.	Radius	Mid. Ord.	Tan Offset	Def. for 1 Foot
0° 10'	34377.5	.036	.145	0.05	7°	819.02	1.528	6.105	2.10'
20	17188.8	.073	.291	0.10	20	781.84	1.600	6.395	2.20
30	11459.2	.109	.436	0.15	30	764.49	1.637	6.540	2.25
40	8594.42	.145	.582	0.20	40	747.89	1.673	6.685	2.30
50	6875.55	.182	.727	0.25	8	716.78	1.746	6.976	2.40
1	5729.65	.218	.873	0.30	20	688.16	1.819	7.266	2.50
10	4911.15	.255	1.018	0.35	30	674.69	1.855	7.411	2.55
20	4297.28	.291	1.164	0.40	40	661.74	1.892	7.556	2.60
30	3819.83	.327	1.309	0.45	9	637.28	1.965	7.846	2.70
40	3437.87	.364	1.454	0.50	20	614.56	2.037	8.136	2.80
50	3125.36	.400	1.600	0.55	30	603.80	2.074	8.281	2.85
2	2864.93	.436	1.745	0.60	40	593.42	2.110	8.426	2.90
10	2644.58	.473	1.891	0.65	10	573.69	2.183	8.716	3.00
20	2455.70	.509	2.036	0.70	30	546.44	2.292	9.150	3.15
30	2292.01	.545	2.181	0.75	11	521.67	2.402	9.585	3.30
40	2148.79	.582	2.327	0.80	12	499.06	2.511	10.02	3.45
50	2022.41	.618	2.472	0.85	30	478.34	2.620	10.45	3.60
3	1910.08	.655	2.618	0.90	30	459.28	2.730	10.89	3.75
10	1809.57	.691	2.763	0.95	13	441.68	2.839	11.32	3.90
20	1719.12	.727	2.908	1.00	30	425.40	2.949	11.75	4.05
30	1637.28	.764	3.054	1.05	14	410.28	3.058	12.18	4.20
40	1562.88	.800	3.199	1.10	30	396.20	3.168	12.62	4.35
50	1494.95	.836	3.345	1.15	15	383.07	3.277	13.05	4.50
4	1432.69	.873	3.490	1.20	30	370.78	3.387	13.49	4.65
10	1375.40	.909	3.635	1.25	16	359.27	3.496	13.92	4.80
20	1322.53	.945	3.718	1.30	30	348.45	3.606	14.35	4.95
30	1273.57	.982	3.926	1.35	17	338.27	3.716	14.78	5.10
40	1228.11	1.018	4.071	1.40	18	319.62	3.935	15.64	5.40
50	1185.78	1.055	4.217	1.45	19	302.94	4.155	16.51	5.70
5	1146.28	1.091	4.362	1.50	20	287.94	4.374	17.37	6.00
10	1109.33	1.127	4.507	1.55	21	274.37	4.594	18.22	6.30
20	1074.68	1.164	4.653	1.60	22	262.04	4.814	19.08	6.60
30	1042.14	1.200	4.798	1.65	23	250.79	5.035	19.94	6.90
40	1011.51	1.237	4.943	1.70	24	240.49	5.255	20.79	7.20
50	982.64	1.273	5.088	1.75	25	231.01	5.476	21.64	7.50
6	955.37	1.309	5.234	1.80	26	222.27	5.697	22.50	7.80
10	929.57	1.346	5.379	1.85	27	214.18	5.918	23.35	8.10
20	905.13	1.382	5.524	1.90	28	206.68	6.139	24.19	8.40
30	881.95	1.418	5.669	1.95	29	199.70	6.360	25.04	8.70
40	859.92	1.455	5.814	2.00	30	193.18	6.583	25.88	9.00

NOTE. Chord Deflection = 2 times tangent deflection.

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

Central Angle	Tangent	External	Central Angle	Tangent	External	Central Angle	Tangent	External
1°	50.00	.22	11°	551.70	26.50	21°	1061.9	97.57
10'	58.34	.30	10'	560.11	27.31	10'	1070.6	99.16
20	66.67	.39	20	568.53	28.14	20	1079.2	100.75
30	75.01	.49	30	576.95	28.97	30	1087.8	102.35
40	83.34	.61	40	585.36	29.82	40	1096.4	103.97
50	91.68	.73	50	593.79	30.68	50	1105.1	105.60
2	100.01	.87	12	602.21	31.56	22	1113.7	107.24
10	108.35	1.02	10	610.64	32.45	10	1122.4	108.90
20	116.68	1.19	20	619.07	33.35	20	1131.0	110.57
30	125.02	1.36	30	627.50	34.26	30	1139.7	112.25
40	133.36	1.55	40	635.93	35.18	40	1148.4	113.95
50	141.70	1.75	50	644.37	36.12	50	1157.0	115.66
3	150.04	1.96	13	652.81	37.07	23	1165.7	117.38
10	158.38	2.19	10	661.25	38.03	10	1174.4	119.12
20	166.72	2.43	20	669.70	39.01	20	1183.1	120.87
30	175.06	2.67	30	678.15	39.99	30	1191.8	122.63
40	183.40	2.93	40	686.60	40.99	40	1200.5	124.41
50	191.74	3.21	50	695.06	42.00	50	1209.2	126.20
4	200.08	3.49	14	703.51	43.03	24	1217.9	128.00
10	208.43	3.79	10	711.97	44.07	10	1226.6	129.82
20	216.77	4.10	20	720.44	45.12	20	1235.3	131.65
30	225.12	4.42	30	728.90	46.18	30	1244.0	133.50
40	233.47	4.76	40	737.37	47.25	40	1252.8	135.35
50	241.81	5.10	50	745.85	48.34	50	1261.5	137.23
5	250.16	5.46	15	754.32	49.44	25	1270.2	139.11
10	258.51	5.83	10	762.80	50.55	10	1279.0	141.01
20	266.86	6.21	20	771.29	51.68	20	1287.7	142.93
30	275.21	6.61	30	779.77	52.89	30	1296.5	144.85
40	283.57	7.01	40	788.26	53.97	40	1305.3	146.79
50	291.92	7.43	50	796.75	55.13	50	1314.0	148.75
6	300.28	7.86	16	805.25	56.31	26	1322.8	150.71
10	308.64	8.31	10	813.75	57.50	10	1331.6	152.69
20	316.99	8.76	20	822.25	58.70	20	1340.4	154.69
30	325.35	9.23	30	830.76	59.91	30	1349.2	156.70
40	333.71	9.71	40	839.27	61.14	40	1358.0	158.72
50	342.08	10.20	50	847.78	62.38	50	1366.8	160.76
7	350.44	10.71	17	856.30	63.63	27	1375.6	162.81
10	358.81	11.22	10	864.82	64.90	10	1384.4	164.86
20	367.17	11.75	20	873.35	66.18	20	1393.2	166.95
30	375.54	12.29	30	881.88	67.47	30	1402.0	169.04
40	383.91	12.85	40	890.41	68.77	40	1410.9	171.15
50	392.28	13.41	50	898.95	70.09	50	1419.7	173.27
8	400.66	13.99	18	907.49	71.42	28	1428.6	175.41
10	409.03	14.58	10	916.03	72.76	10	1437.4	177.55
20	417.41	15.18	20	924.58	74.12	20	1446.3	179.72
30	425.79	15.80	30	933.13	75.49	30	1455.1	181.89
40	434.17	16.43	40	941.69	76.86	40	1464.0	184.08
50	442.55	17.07	50	950.25	78.26	50	1472.9	186.29
9	450.93	17.72	19	958.81	79.67	29	1481.8	188.51
10	459.32	18.38	10	967.38	81.09	10	1490.7	190.74
20	467.71	19.06	20	975.96	82.53	20	1499.6	192.99
30	476.10	19.75	30	984.53	83.97	30	1508.5	195.25
40	484.49	20.45	40	993.12	85.43	40	1517.4	197.53
50	492.88	21.16	50	1001.7	86.90	50	1526.3	199.82
10	501.28	21.89	20	1010.3	88.39	30	1535.3	202.12
10	509.68	22.62	10	1018.9	89.89	10	1544.2	204.44
20	518.08	23.38	20	1027.5	91.40	20	1553.1	206.77
30	526.48	24.14	30	1036.1	92.92	30	1562.1	209.12
40	534.89	24.91	40	1044.7	94.46	40	1571.0	211.48
50	543.29	25.70	50	1053.3	96.01	50	1580.0	213.86

43.5
113+715
29
1131435 III

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

Table with columns: Central Angle, Tangent, External, Central Angle, Tangent, External, Central Angle, Tangent, External. Rows range from 31° to 40°.

Handwritten notes: 11.2, 19.79, 20000

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

Table with columns: Central Angle, Tangent, External, Central Angle, Tangent, External, Central Angle, Tangent, External. Rows range from 61° to 90°.

Handwritten notes: 63.7, 50, 80, 30, 12, 63

145

238458.10
145
23843.60

589.97
1003

591.00
12.82

578.18
58

578.76
9.71

569.05
1.31

570.36
11.33

559.03
4.60

563.63

47.13

30.18

16.95

43.7

113+26.32

63.7

113+90.02

73.68

26.32

100.00

17

7.6 - 1027 Fence

31° 10.5

236 ch. 11 trans fence

$$\begin{array}{r} 2000 \overline{) 1718.87} \\ \underline{1000 } \\ 1168 \\ \underline{1168 } \\ 0000 \\ 17870 \end{array}$$

$$\begin{array}{r} 85.00 \\ 26.32 \\ \hline 58.68 \end{array}$$

$$\begin{array}{r} 81.03 \\ 32.52 \\ \hline 113.55 \end{array}$$



$$\begin{array}{r} 26.46 \\ 26.46 \\ \hline 52.92 \end{array}$$

26.46 L 19°-00

12.94 off

40 . 48.85 L 12°-30

$$\begin{array}{r} 30 \\ 50 \\ \hline 80 \end{array}$$

1127 7148

2124353

36.48

9.31

46.99

$$\begin{array}{r} 36.25 \\ 26.46 \\ \hline 62.71 \end{array}$$

1.5

.7 = 5.870

1.5

29.0

5.0

87.0

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 $41.9 + (20 - 16) \cdot 2$ or 2 ft. added to 41.9 = 43.9. For slopes of 1 on 1 see inside of front cover.

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