

W

029

Index

Pages	* 1 to 15	county road alignment in gorge
"	* 16	Pipe crossing co. road Sta 215+40 ²³ B.C.
"	* 17	Pipe Tie to County Road
"	18	
"		
"		
"	29	
"	30-48	LAKESIDE PIPE LINE 470+75 ² 559+65.35
"	49-76	REALIGNMENT, LAKESIDE PIPELINE

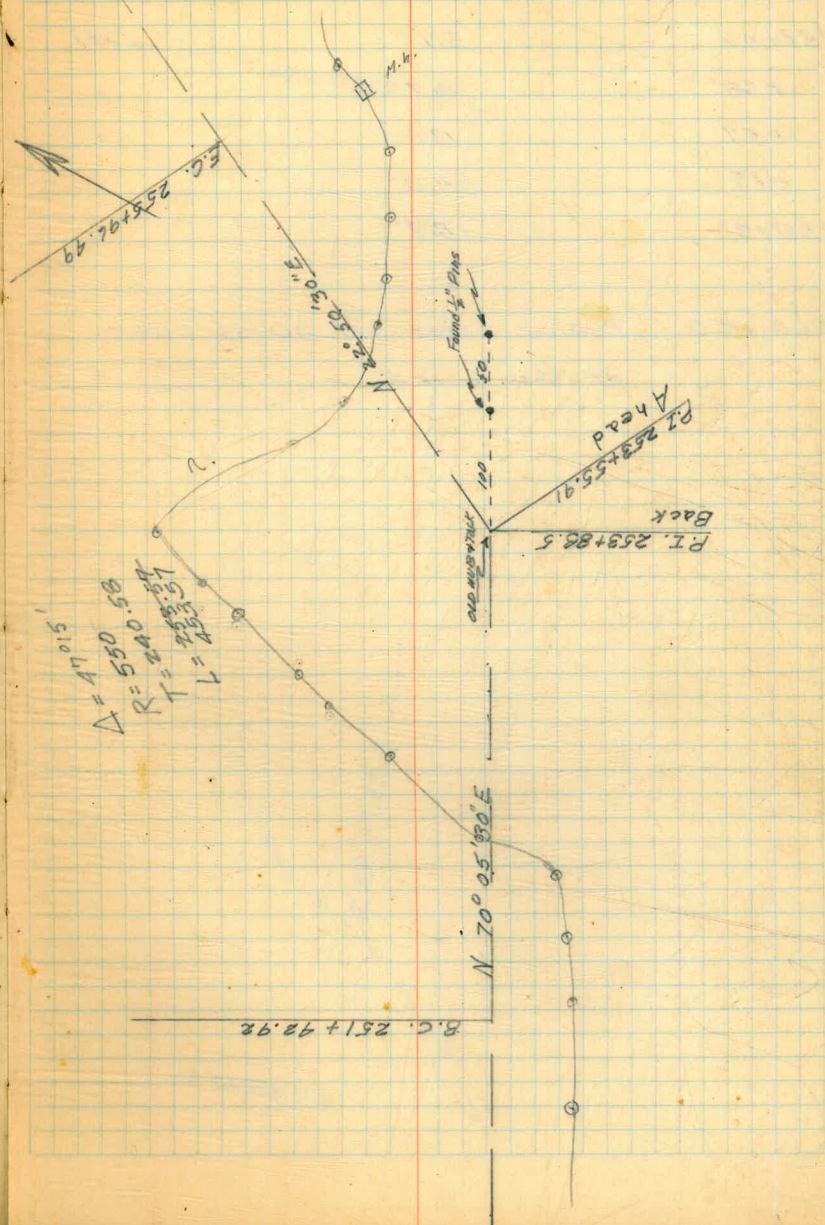
Index Unit 8

1-13	Location Existing 36" Pipe Line in Mission Gorge, by Dip Needle.
14 & 15	Cross sections County Road in Gorge.
17	Detail turnout Sta 49+37 Woodside Ave along near road alignment. later cap 30
30-48	(Pipe Line survey Sta 470 - 559 Void)
49-76	Sta 49+08 - 578+66 revised alignment.

Continued in Book 630

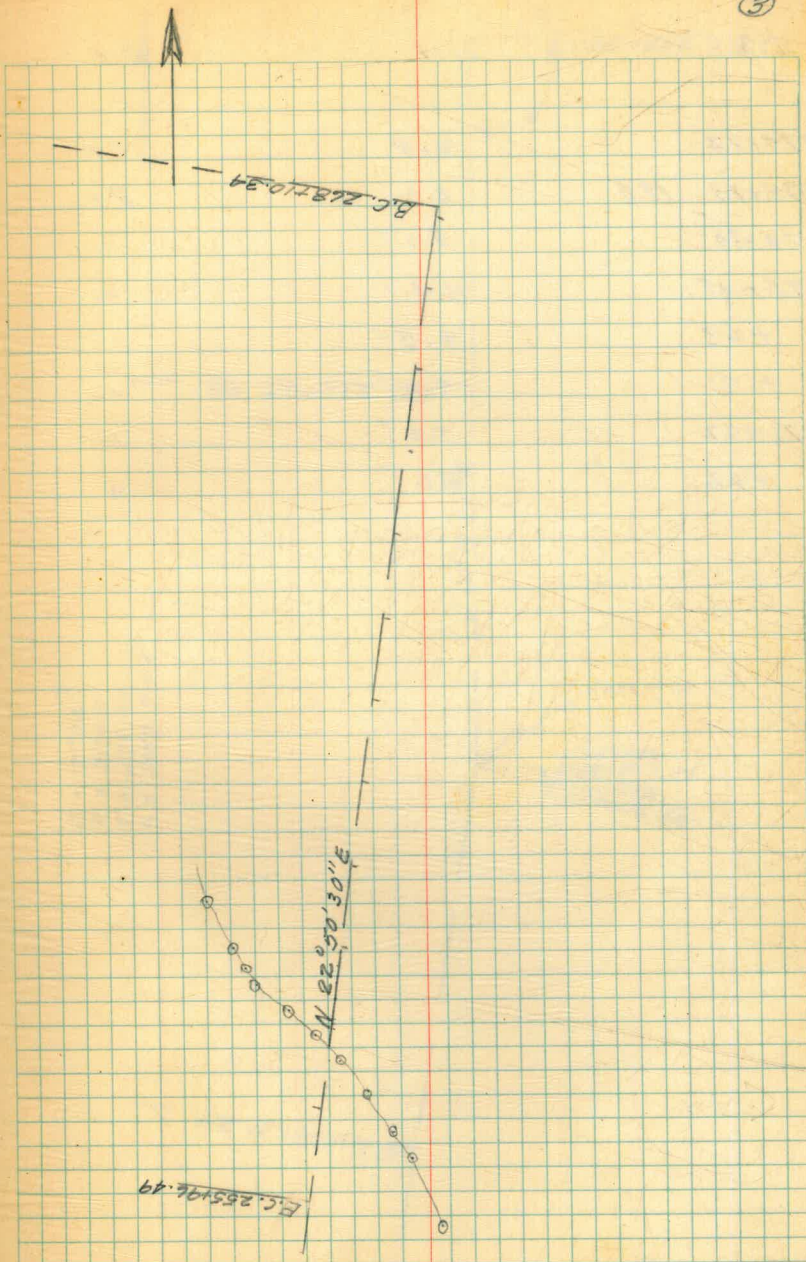
Dec. 4, 1941
 P. Barker ch/pev.
 Whitlock notes/X
 Gomez rod/ch.
 P. Barker Jr. #

STA.	Dist	Direction
252+87	13.0 ✓	Left
253+14	20.8 ✓	"
+28	25.2 ✓	"
+45	29.2 ✓	"
+59	33.7 ✓	"
+69	38.4 ✓	"
253+83.5	BACK STAS. 43.2 ✓	"
Ahead Stations		
254+00	" 23.2 ✓	Left
254+25	" 13.0 ✓	Left
+47	" 4.8 ✓	"
+71	" 3.2 ✓	Right
+90	" 7.5 ✓	"
255+17	12.8 ✓	"
+47	17.8 ✓	"
+83 M.H.	19.8 ✓	"
+95	18.0 ✓	"
256+36	15.5 ✓	"
+63	13.0 ✓	"
+90	10.0 ✓	"
257+14	6.0 ✓	"
+52	1.4 ✓	"
+81	2.0 ✓	Left

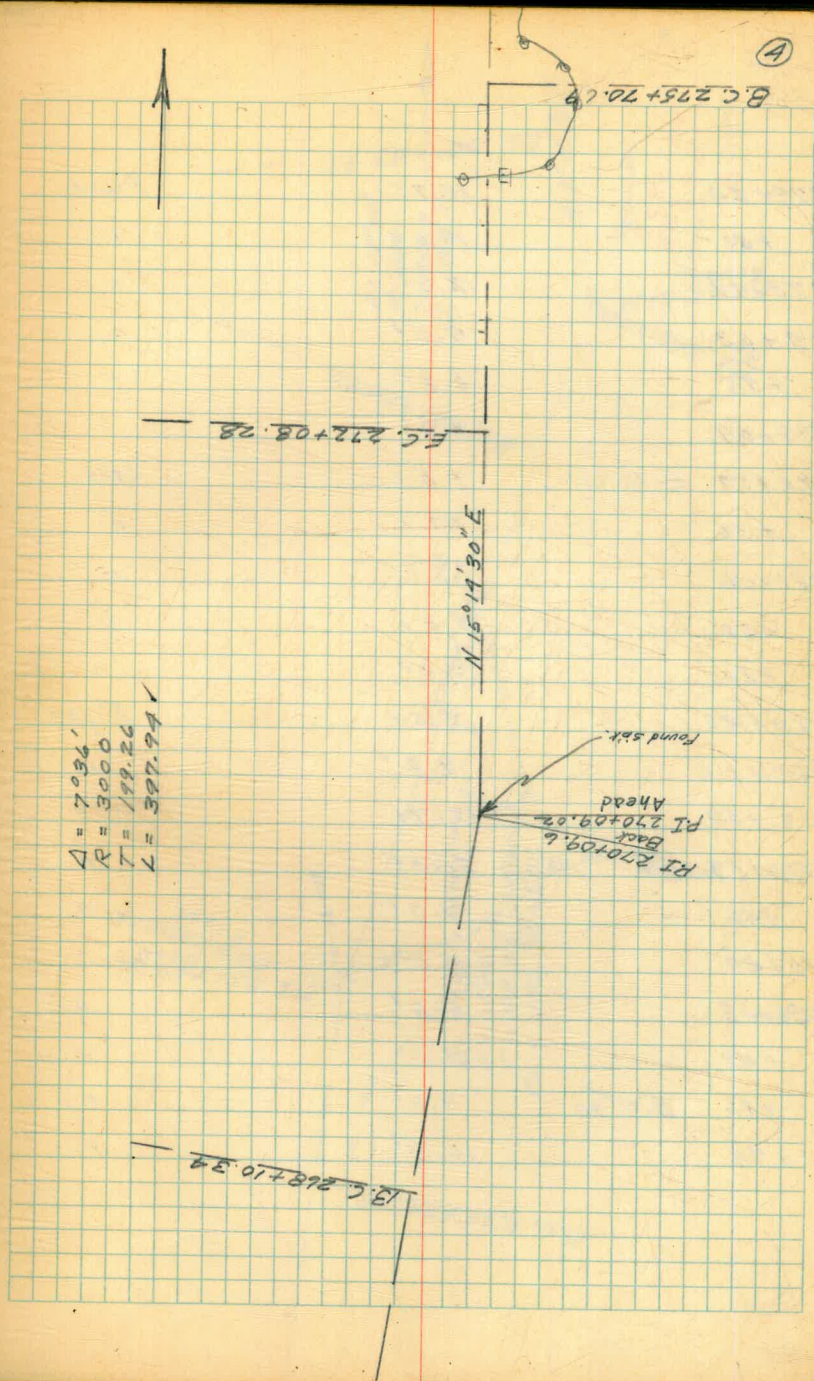


STA.	DIST.	DIRECTION.
258+06	5.7'	Left
+38	10.7'	"
+57	12.0'	"
+87	14.0'	"
259+21	17.9'	"

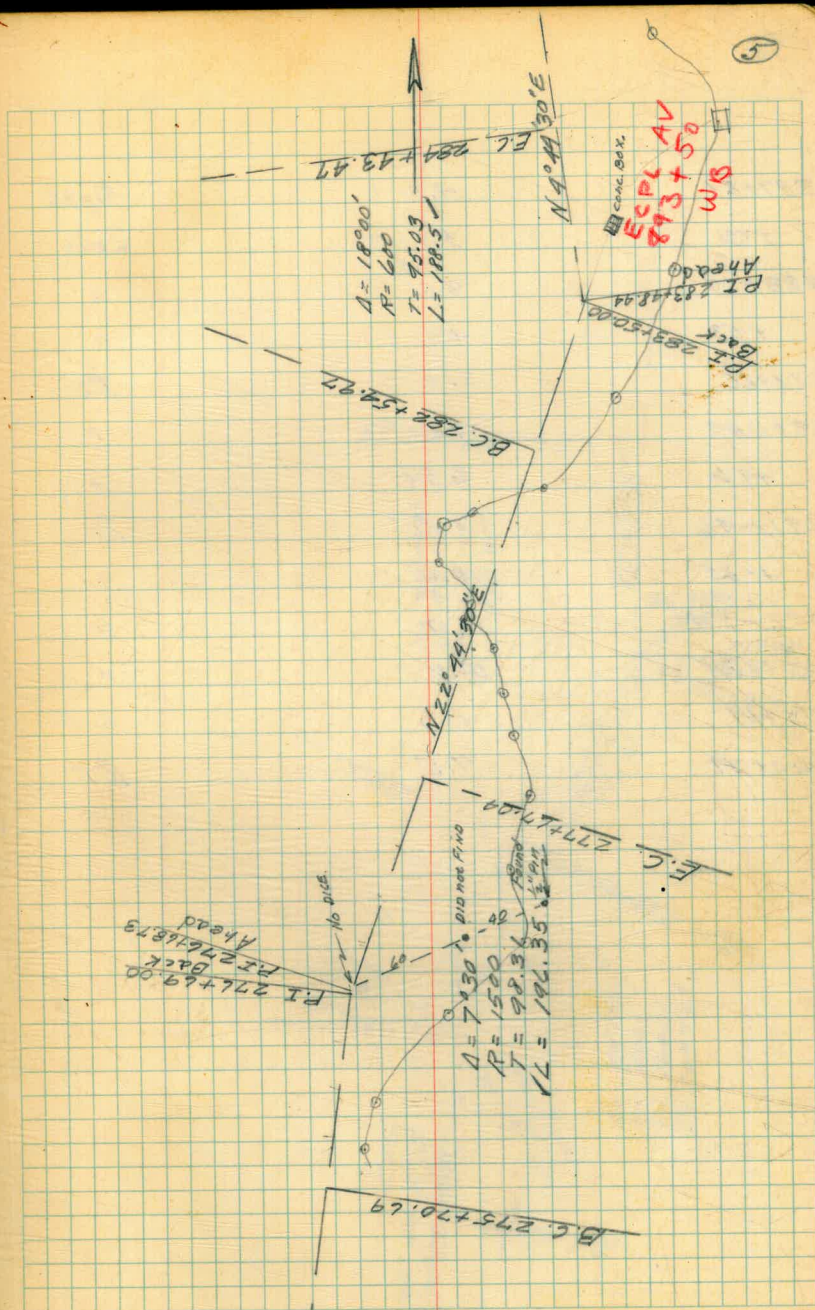
260+00 Pipeline takes off across country
at this point.



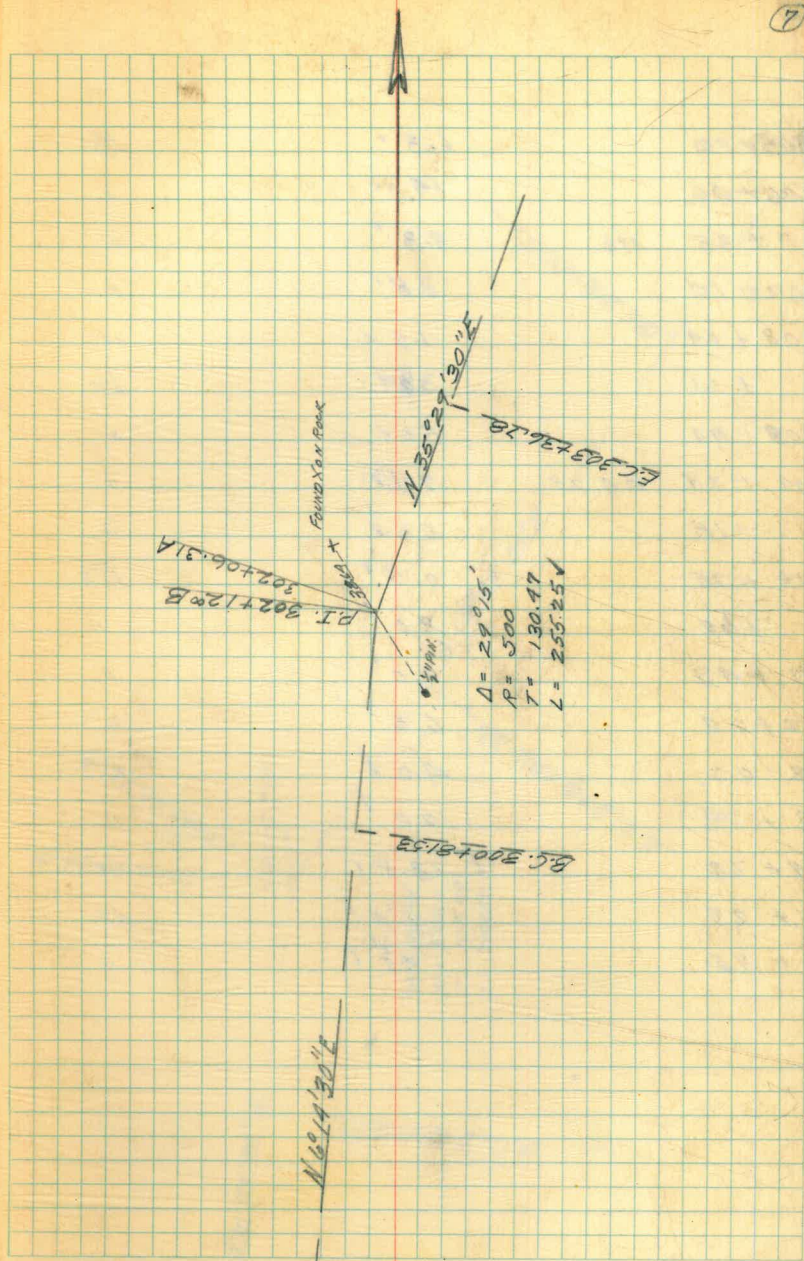
STA	DIST	DIR.
274+72	2.8'	LT
274+75 M.A.	2.0'	RT
274+80	8.0'	"
275+48	11.4'	"
+63	9.5'	"
+91	9.0'	"
276+22	5.0'	"
+62	13.0'	"



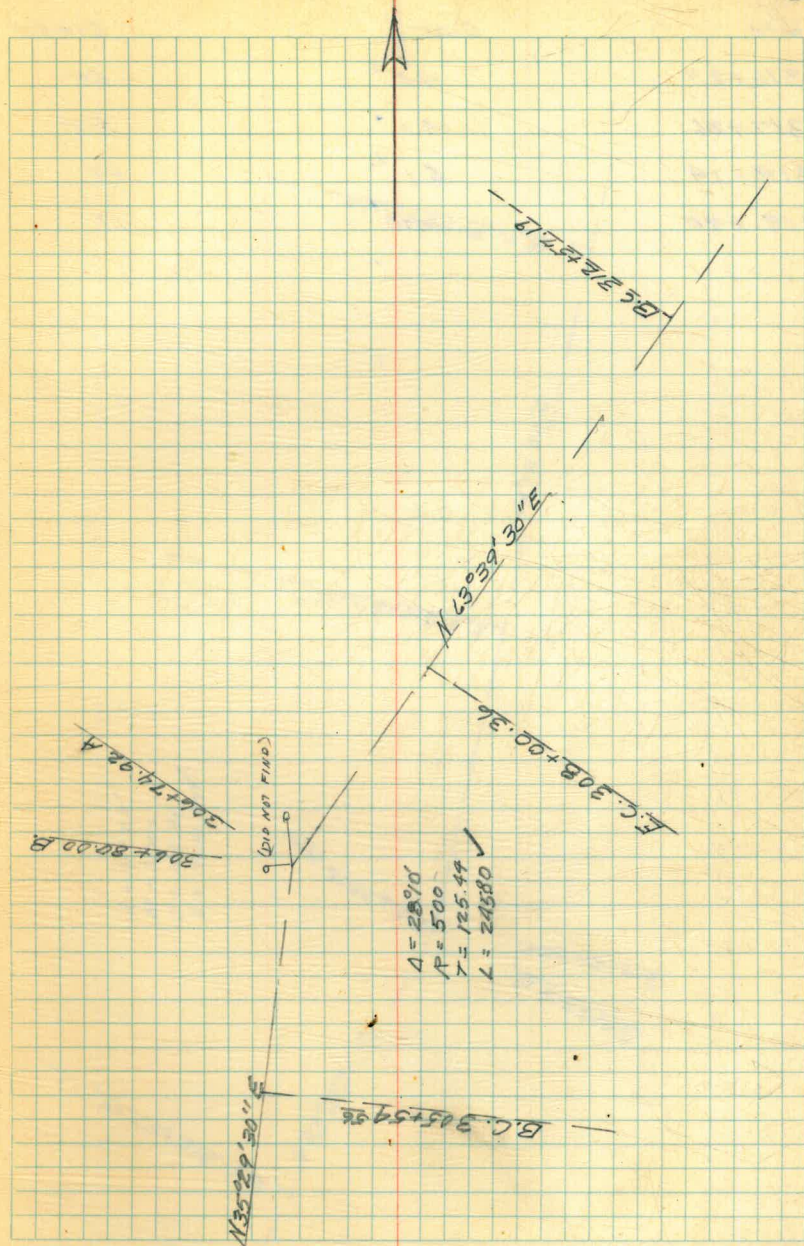
277+24		19.7 ✓	RIGHT
+81		19.0 ✓	"
278+52		12.3 ✓	"
279+03		9.5 ✓	"
+55		6.2 ✓	"
280+05		3.0 ✓	"
280+17	B.O.#31	1.5 ✓	Left
+56		1.7 ✓	"
281+06		7.2 ✓	"
+48		8.0 ✓	"
+81		5.0 ✓	"
282+46		2.5 ✓	Right
283+05		8.2 ✓	"
283+58		12.7 ✓	"
284+13	A.V.#45 116	21.0 ✓	"
+96		10.0 ✓	"
285+49		5.0 ✓	"
286+03		9.6 ✓	"
+47		13.0 ✓	"
+56	B.O.#30	9.0 ✓	"
+94		16.3 ✓	"



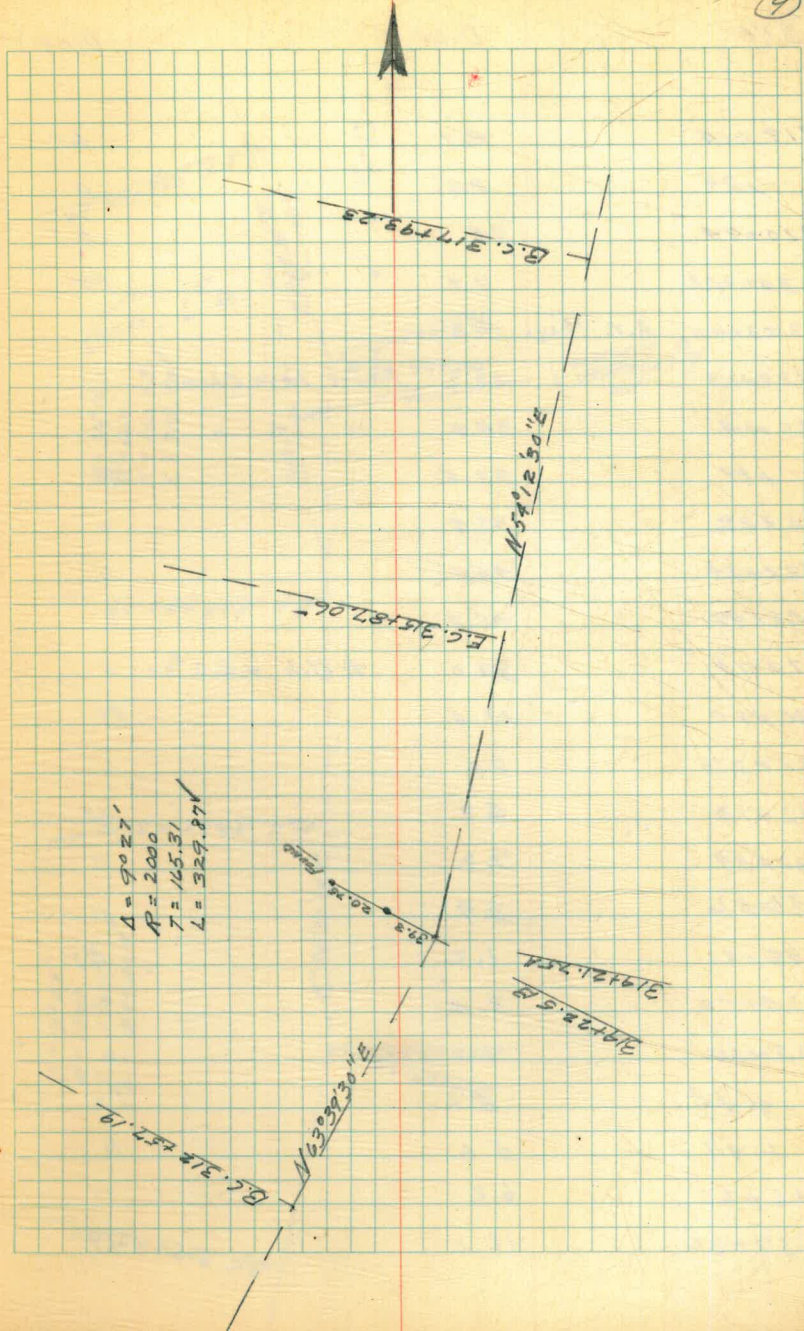
295+10	15.0 ✓	Pt
775	21.5 ✓	"
296+19	30.0 ✓	"
297+03	34.0 ✓	"
298+16	£ --	
747	9.0 ✓	Lt
778	19.0 ✓	"
787 B.O. 29	24.0 ✓	"
790	19.0 ✓	"
299+17	20.0 ✓	"
762	23.0 ✓	"
300+06	21.0 ✓	"
763	7.0 ✓	"
301+17	2.5 ✓	Pt.
781	14.0 ✓	"
302+30	15.0 ✓	"
789	9.5 ✓	"
303+19	9.5 ✓	"
748	8.0 ✓	"
786	5.5 ✓	"
304+40	£ ✓	
305+13	1.3 ✓	Pt.



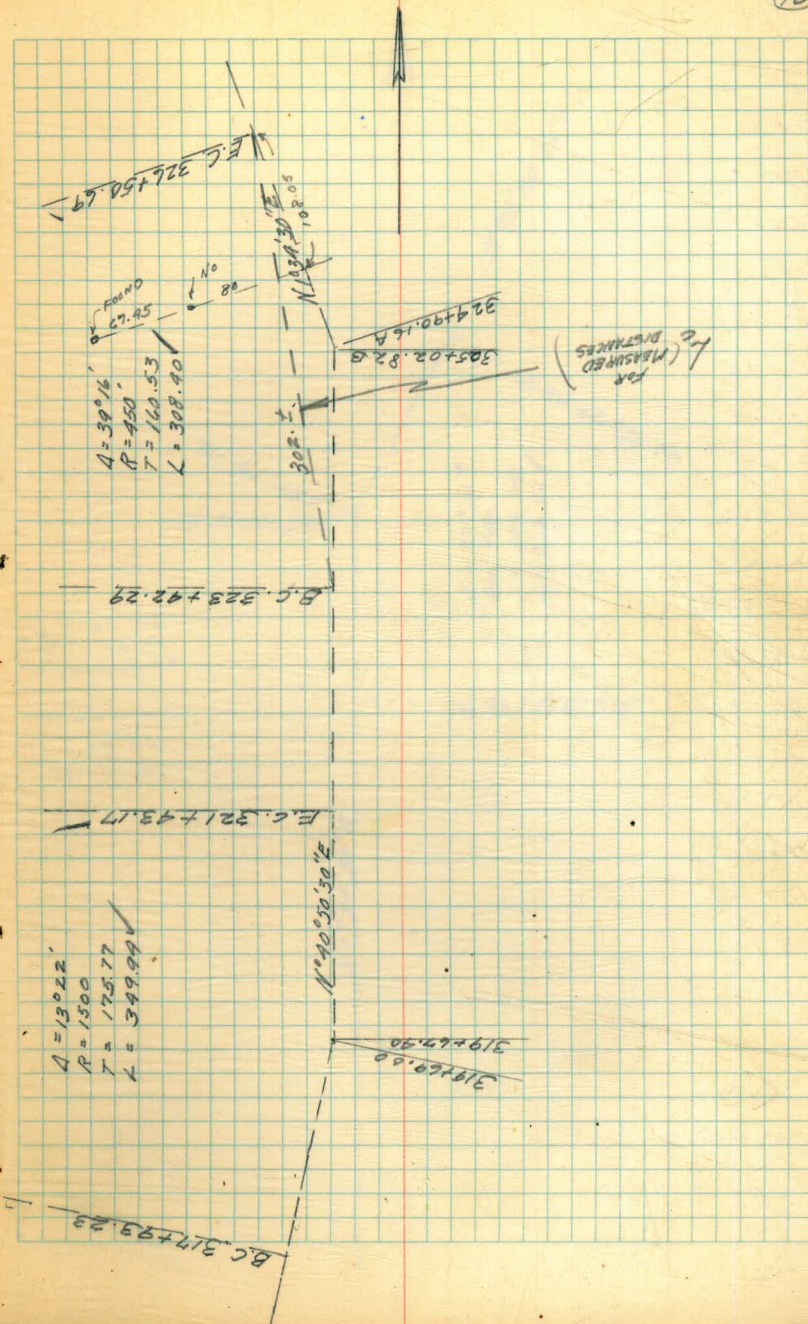
305+72	6.3'	Rt
306+06	19.0'	"
+ 35 116	9.3'	"
307+19	8.8'	"
308+09	1.2'	"
+ 61	3.2'	Lt
308+99	5.0'	"
309+31 B.O. 28	7.9'	"
+ 75	5.5'	"
310+15	0.5'	Rt
+ 67	8.0'	"
311+49	9.0'	"
312+00	6.5'	"
312+96	4.0'	Lt
313+79	12.0'	"
314+67	13.8'	"
315+23	8.5'	Lt
+ 75	7.5'	"



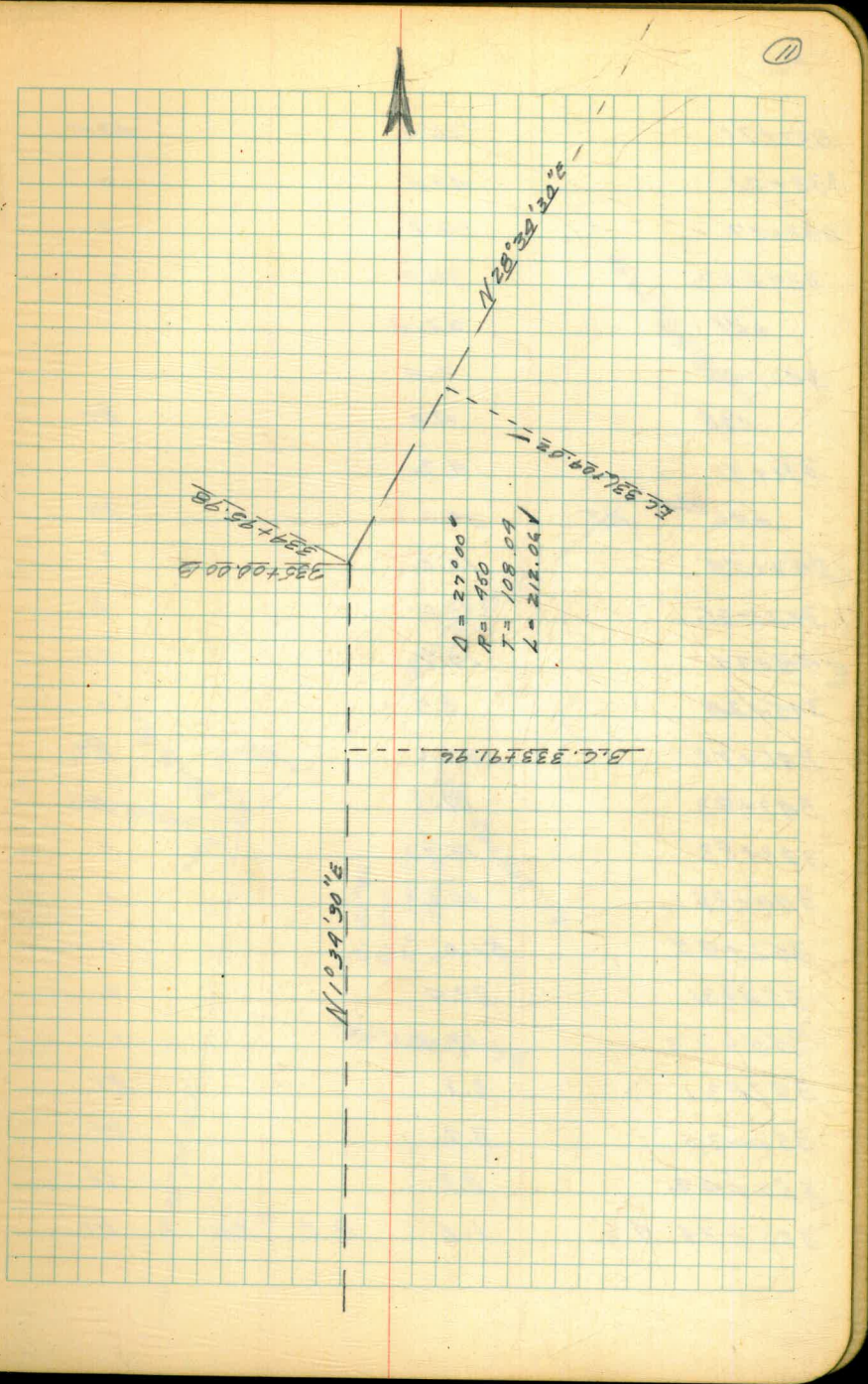
STA.	DIST	DIRECT
316+23	4.8	LT.
317+26	4.0	RT.
319+14	6.1	LT.
319+90	10.0	LT.



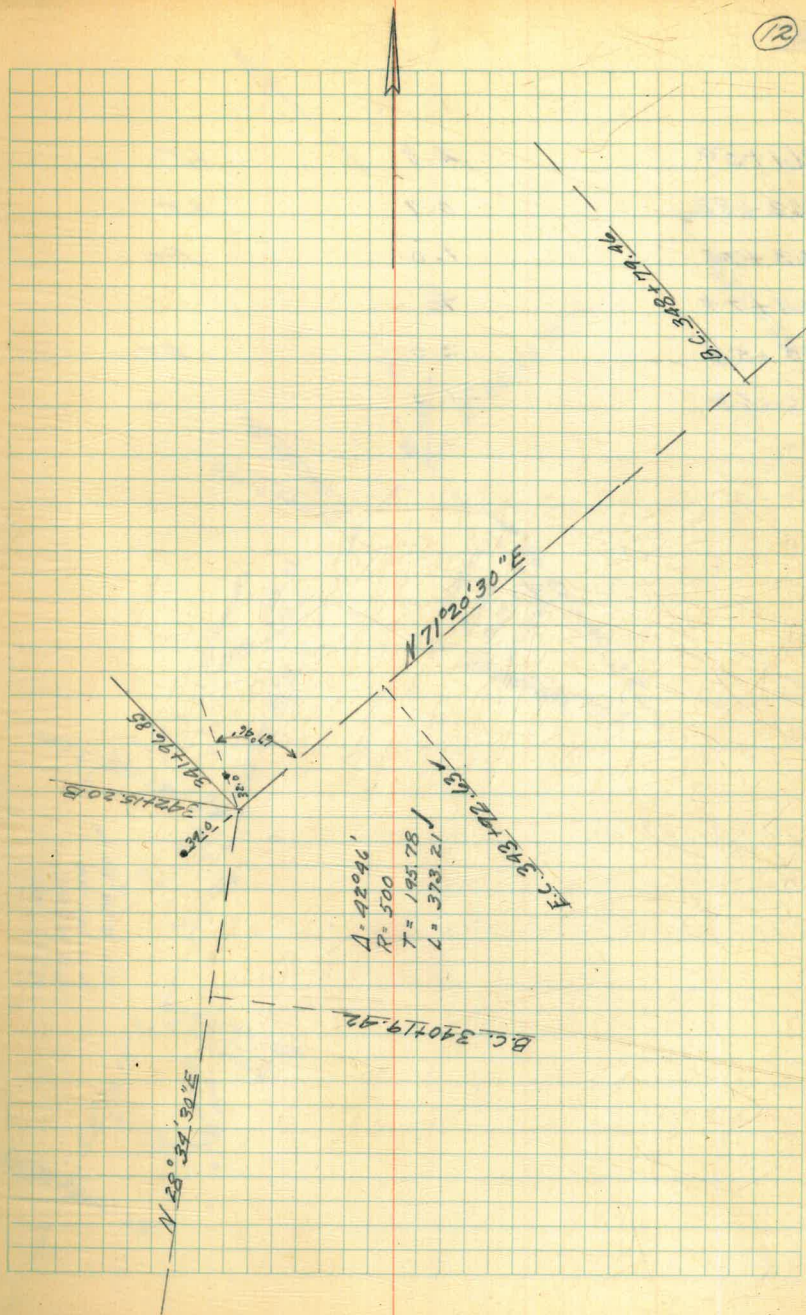
STA	DIST		DIRECT.
319+14	4.9	✓	LT
+89	8.0	✓	"
320+94	0.5	✓	"
322+08	2.8	✓	RT
323+40	A.V. 13' hgt. 19.0		"
329+13	22.2	FROM LONG CHORD	"
325+04	34.0	" " "	"
+88	32.5		RT
326+82	35.5		"
327+84	45.0		"
328+47	40.0		"
329+18	32.0	± 17.6 + 8.0 #27	"
330+20	18.6		RT
331+23	2.5		"
332+13	6.2		LT
332+84	7.2		"
333+36	3.9		"
338+91	1.2		RT
334+50	3.4		"
335+00	7.0		"
+48	3.1		LT
+99	5.6		"
336+60	6.6		"
337+26	13.0		LT



335+91.96
1.08 00
335+00.00
336+00.02
1.08 00
335+95.48

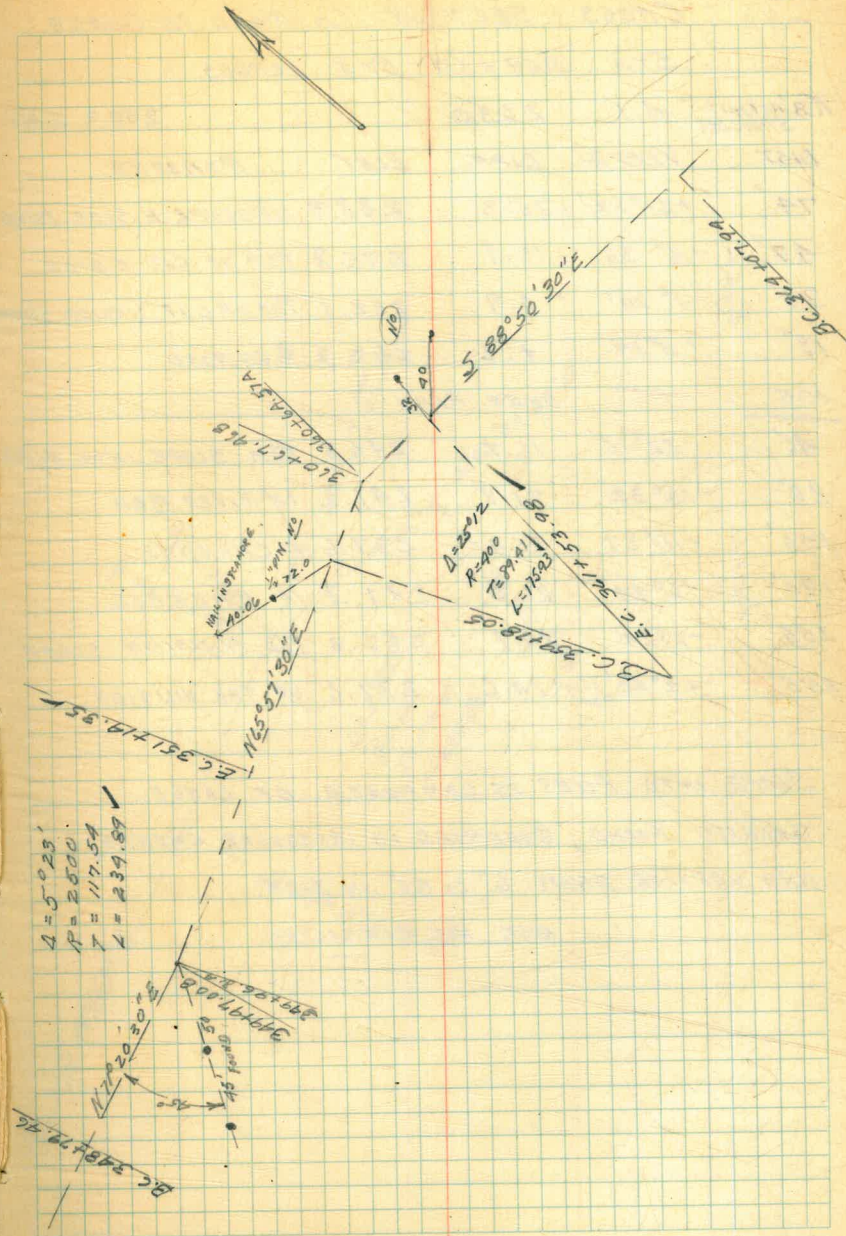


337+71	26.0	LEFT
338+21	43.5	"
338+87	59.8	"
339+53	39.9	"
+88	23.4	"
340+45	2.4	"
+68	4.4	RT.
341+31	14.2	"
+96 ⁸⁵ P.I.	34.0	RT.
342+59	13.0	"
343+36	13.0	L.
344+35	19.7	LT.
345+34	8.5	"
346+78	22.6	RT.
347+93	19.6	"
348+83	13.7	"
349+85	16.6	"
352+95	51.8	"
354+31	37.4	"
355+73	19.5	"
357+31	8.8	RT
358+35	3.2	RT
359+42	0.8	LT
360+34 M.h.	1.0	B.O. #26 RT



361+59	2.8	LT.
362+82	0.7	LT
363+74	1.0	PT.
364+74	£	
365+58	2.0	RT.
366+63	21.0	"

$361+59$
 $362+82$
 $363+74$
 $364+74$
 $365+58$
 $366+63$



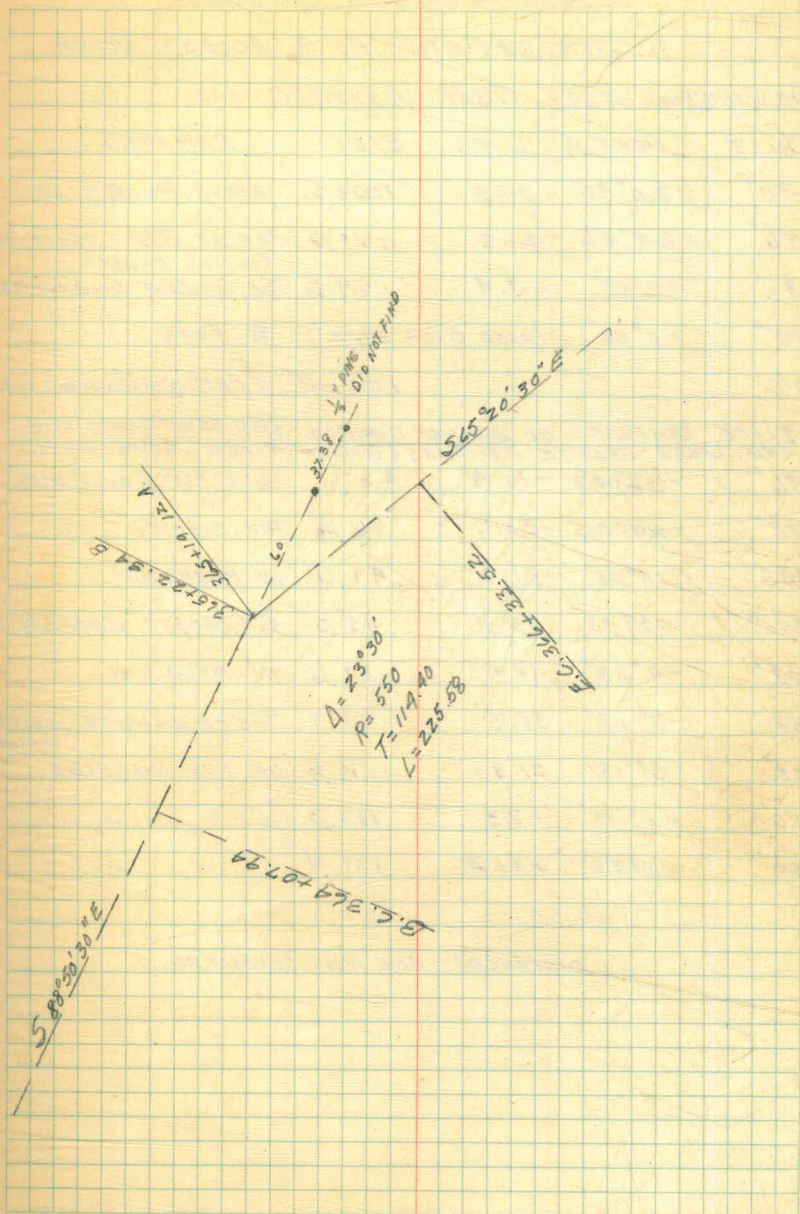
CROSS-SECTION CO. ROAD IN GORGE

STA 309+50 RTX ACROSS

DIST	VERTX	DIPP.	ELEV	REMARKS
π 3' FROM SHOULDER	4.1	263.0	258.9	USBM
74'	+21°32'	+25.3	288.3	UPSLOPE E. SIDE ROAD
47'	+16°33'	+12.8	275.8	TOP OF CUT E. SIDE
34'	-1°29'	-0.9	262.1	TOP OF CUT (INSIDE SHOULDER)
18'	+0°34'	+1.2	263.2	Ø OIL ROAD
105	—	OVER PIPE		
46'	-22°15'	16.2	246.8	TOE SLOPE INTO RIVER
80'	-16°32'	21.8	241.2	IN RIVER BED
140'	-10°37'	25.4	237.6	Ø CHANNEL
190'	-6°24'	21.2	247.8	IN RIVER BED
255'	-2°24'	-10.7	252.3	TOE HILLSIDE SLOPE
295'	+2°50'	+14.6	277.6	UP THE HILLSIDE

SLOPE INTO RIVER IS COMPOSED OF LARGE GRANITE ROCKS, QUARRIED IN IRREGULAR CHUNKS, AND VARYING FROM 6" to 60" IN SIZE.

DIST. NOT CORRECTED



CROSS-SECTION Co. ROAD

STA 287+75 RT. 4 ACROSS RIVER

715' W OF ROAD ELEV. ROAD ASSUMED 100'

DIST	VERT. & DIFF.	ELEV.	REMARKS
90'	+20°30' - 29.5	129.5	ABOVE RD. E. SIDE
56'	+24°06' + 21.0	121.0	TOP OF BANK ABOVE RD. (INSIDE SHOULDER)
31'	-0°48' - 0.4	99.6	TOE OF EAST EMBANKMENT
15'	+0°00' (ALSO OVER PIPE)		⊥ ROAD
0'		100.00	WEST SHOULDER RD.
SLOPE COMPOSED OF DE-COMP. GRANITE AND LARGE GRANITE BOULDERS (BROKEN) 1/2 WAY DOWN SLOPE INTO RIVER - SLOPE COVERED WITH ROCK 6" TO 60" DIAM.			
36'	-32°47' - 16.4	83.6	
78'	-29°20' - 33.6	66.4	TOE SLOPE
166'	-15°50' - 51.0	49.0	IN RIVERBED
255'	-12°48' 55.0	45.0	⊥ PRESENT CHANNEL
308'	-9°23' 48.4	51.6	IN RIVERBED
350'	-6°18' 38.3	61.7	TOE OF HILLSIDE (WEST SIDE OF RIVER)
378'	-3°13' 21.3	78.7	UP THE HILLSIDE
420'	+1°00' + 7.3	107.3	" " "
460'	+3°55' + 31.4	131.4	" " "

DISTANCES ARE NOT CORRECTED

CROSS-SECTION STA 338+87

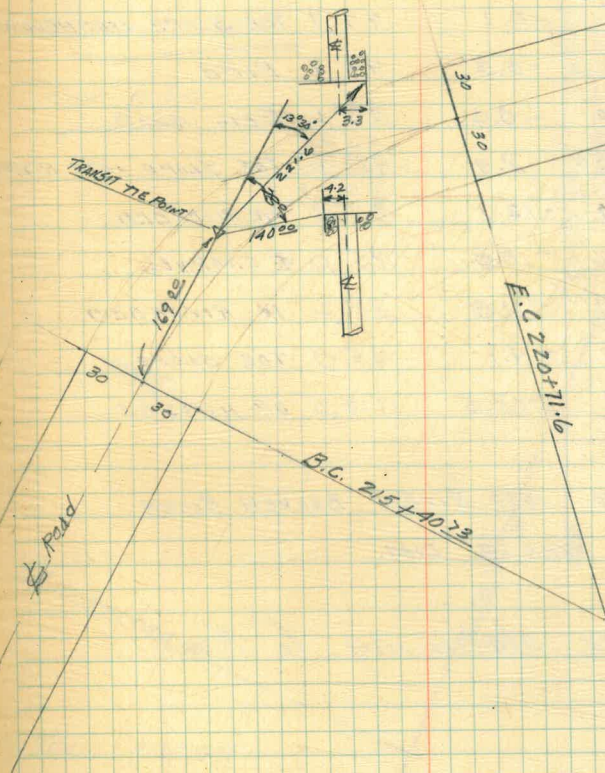
(OBSERVED) RT & BEARING (N63°W) RT & OFF FORWARD TAN.
DIST.

AT 94' W. OF E. Co. ROAD P.O.W. (9' W. OF OUT. SHOULDER)
Assume $H \pm I = 100.00$

DIST.	VERT. & DIFF	ELEV	REMARKS
140'	+9°15' +22.7	122.7	ABOVE E. P.O.W. E. SIDE
95'	+8°37' +14.2	114.7	E. Co. Rd. P.O.W.
70'	+8°11' +10.0	110.0	TOP BANK (CUT FOR ROAD)
63'	+1°10' +1.3	101.3	TOE BANK (IN. SHOULDER)
39'	+3°23' +2.3	102.3	E. OIL RD WY
9'	+18°29' +2.7	102.7	OUT. SHOULDER OF RD.
34' TO DOWN SLOPE			SLOPE IS COMPOSED OF
42'	-33°0' -19.0	81.0	SOLID GRANITE, IRREGULARLY BENCHED & LEDGED
85'	-39°30' -46.0	54.0	TOE SLOPE (BOTTOM ^{of} LEDGE)
118'	-28°05' -49.0	51.0	E. CHANNEL
144'	-18°12' -42.5	57.5	IN RIVER BED
225'	-9°51' -38.1	61.9	" " "
420'	-5°15' -38.3	61.7	TOE OF HILLSIDE SLOPE
450'	-2°08' -17.0	83.0	UP THE HILLSIDE
475'	+0°50' +6.9	106.9	" " "

PIPE CROSSING COUNTY RD.

These stations County Road
Not Unit #8



CROSS-SECTION 329+50

Rt. & OFF TANGENT.

T AT OUTSIDE SHOULDER 5' UP. Assume HI El. 100.00

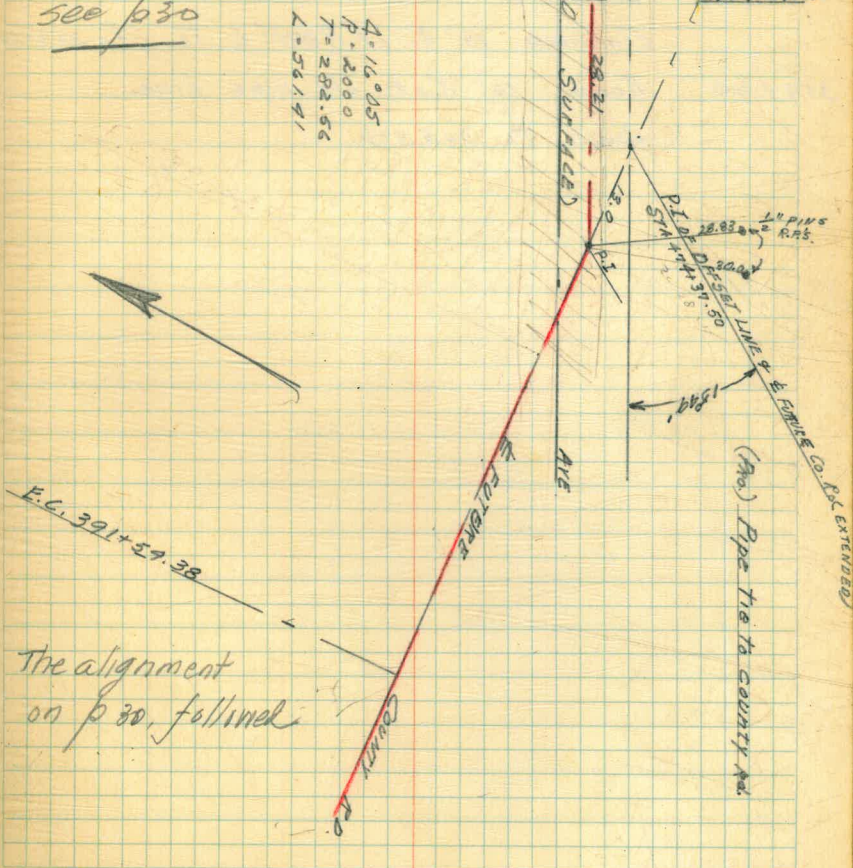
DIST	VERT	DIFF.	ELEV.	REMARKS
79'	+28°22'	30.3	130.3	ON E SLOPE ABOVE RD.
33'	+11°27'	6.4	106.4	TOP E. SIDE RD. CUT.
29'	-0°14'	-0.1	99.9	TOE SLOPE IN SHOULDER
18'	-1°00'	-0.3	99.7	PIPE
19'	-1°50'	-0.4	99.6	COIL ROAD
21'	-26°55'	-8.9	91.6	TOE SLOPE INTO RIVER
63'	-11°30'	-12.1	87.9	IN RIVER BED
118'	-7°16'	-15.0	85.0	IN CHANNEL
221'	-3°04'	-11.8	88.2	IN RIVER BED
285'	-0°49'	-4.1	95.9	TOE SLOPE
338'	+3°08'	+18.5	118.5	UP HILLSIDE

SLOPE INTO RIVER BROKEN ROCKS
NOT OVER 2' DIAM.

This page stationing, Co. Road

Stations this
page Pipe Line
Surrey Unit 8

see p 30



CO 7 1/2
3.5241
28.2088

X

4.16°05'
P. 2000
T. 282.56
L. 56.91

17

PIPE

479+00

479+09.21

WOODSIDE

DISEST LINE

(OILED SURFACE)

28.21

13.0

P.I.

AVE

COIL ROAD

COIL ROAD

COIL ROAD

COIL ROAD

COIL ROAD

COIL ROAD

COIL ROAD

COIL ROAD

Notes Re Alignment Co. Road Survey
Thru Gorge and Pipe Line Survey

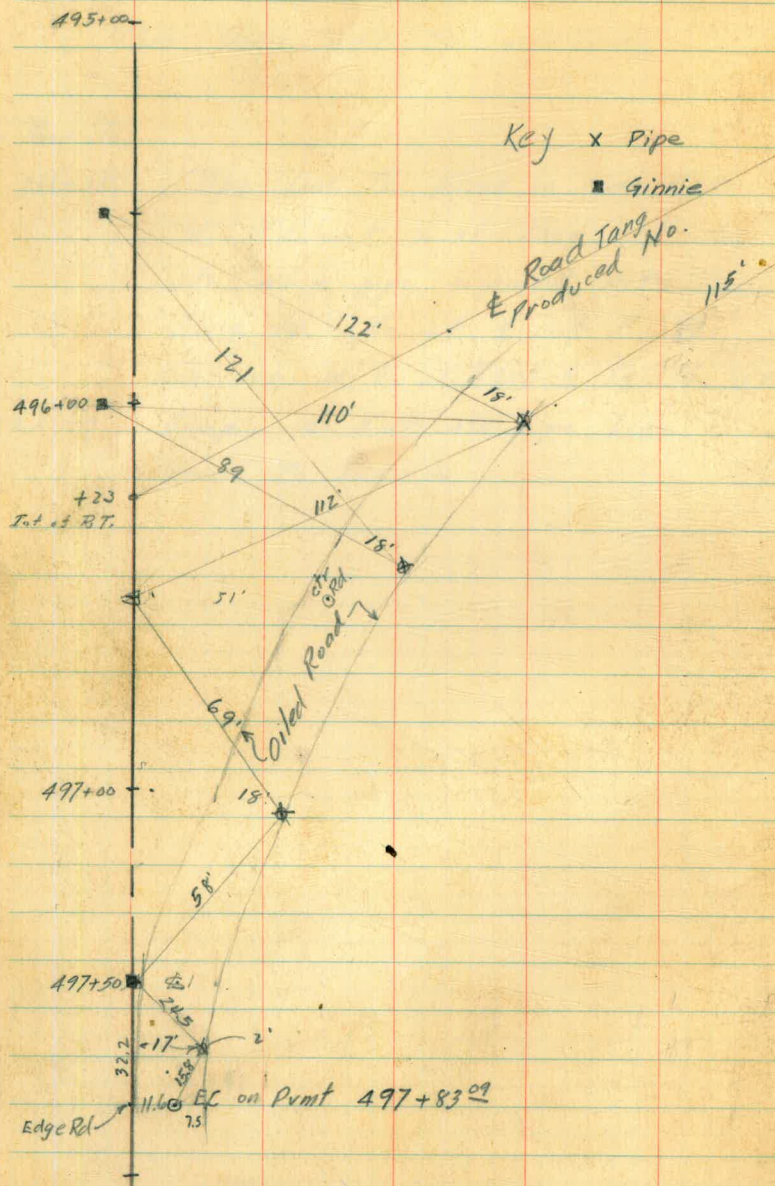
Co Road Sta.

E.C. 366+33⁵²

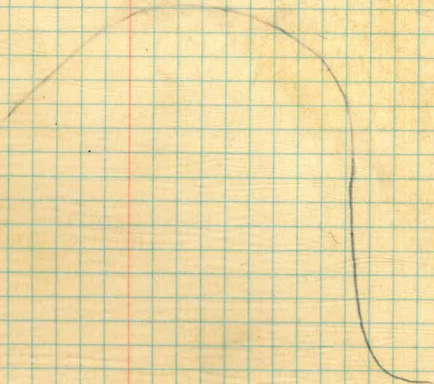
Pipe line to come in from East
15' NE of $\frac{1}{2}$ of Road. At this
sta warp pipe alignment into a
line 10' N. of $\frac{1}{2}$ of ROW
Continue 10' N. of ROW $\frac{1}{2}$ to Sta 359+00

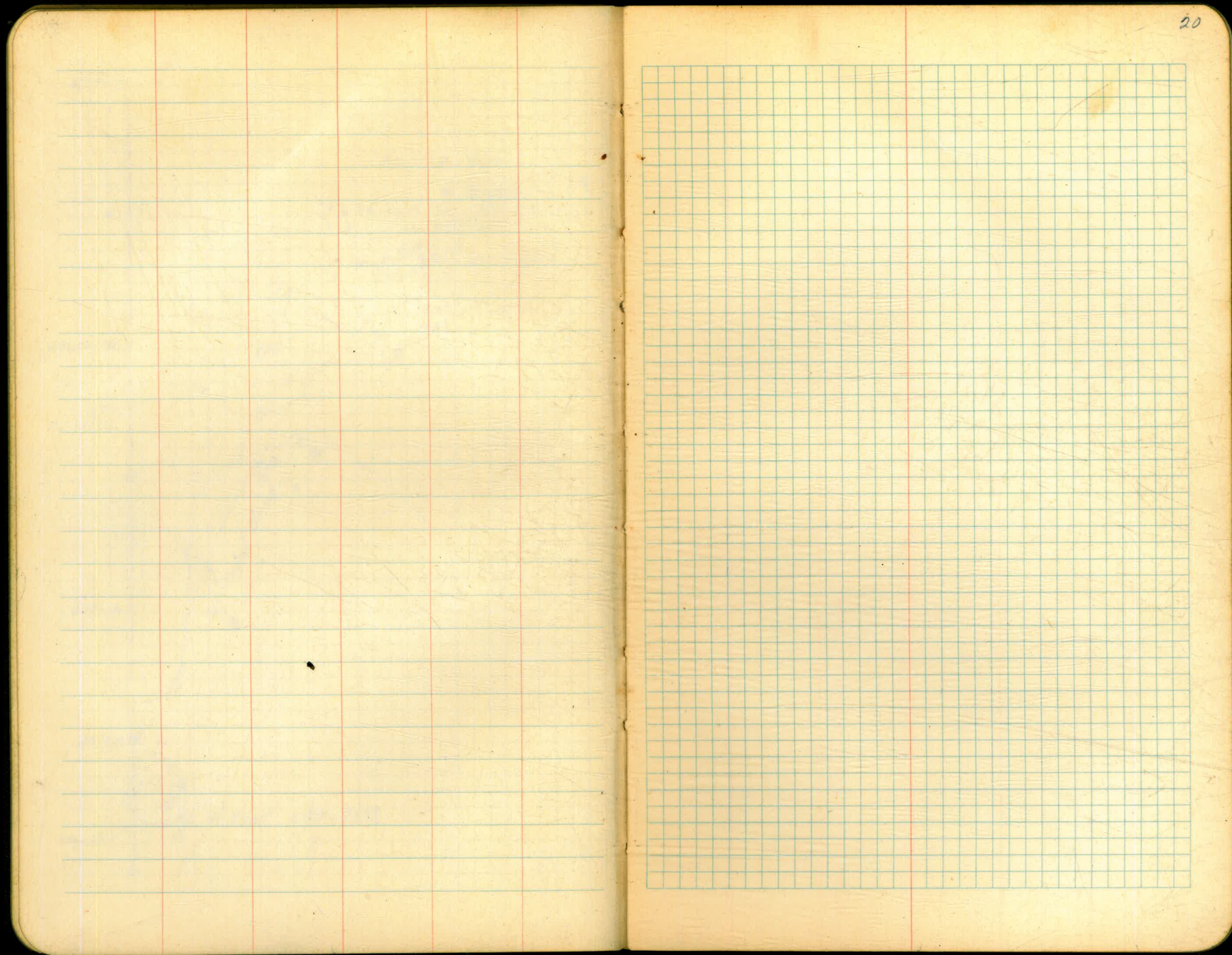
359+00

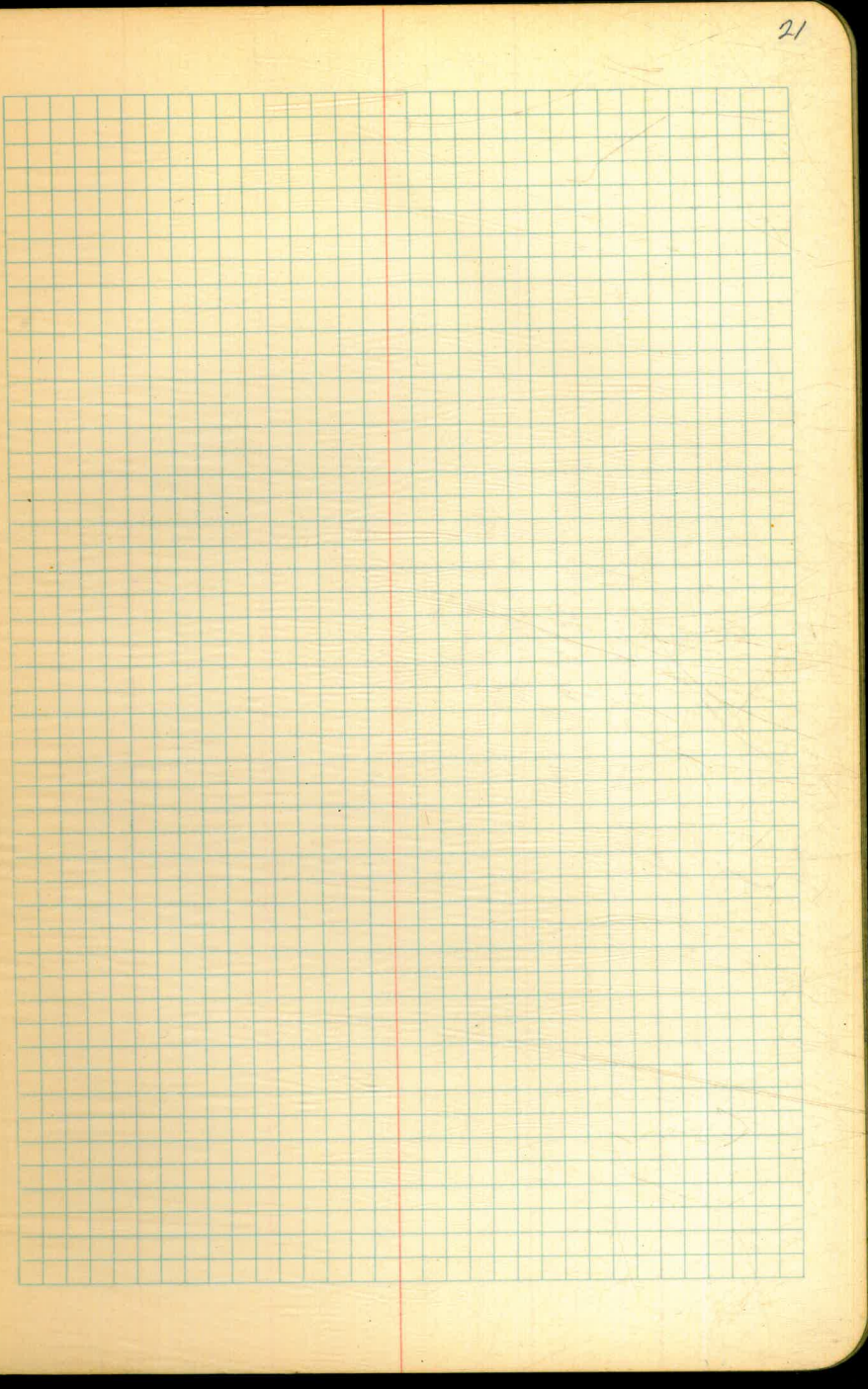
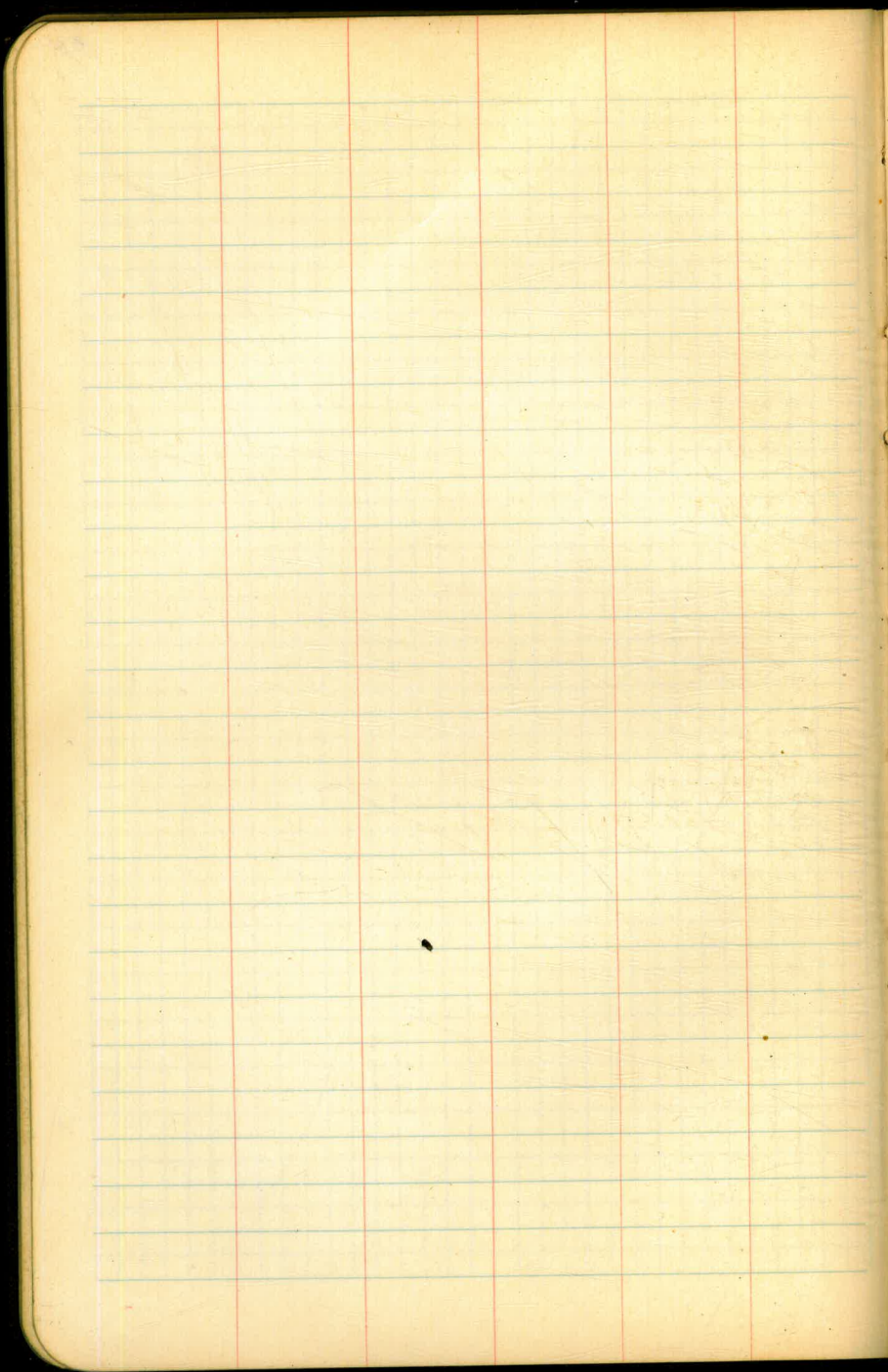
Keep 10' N. of old pipe line
down to 355+00

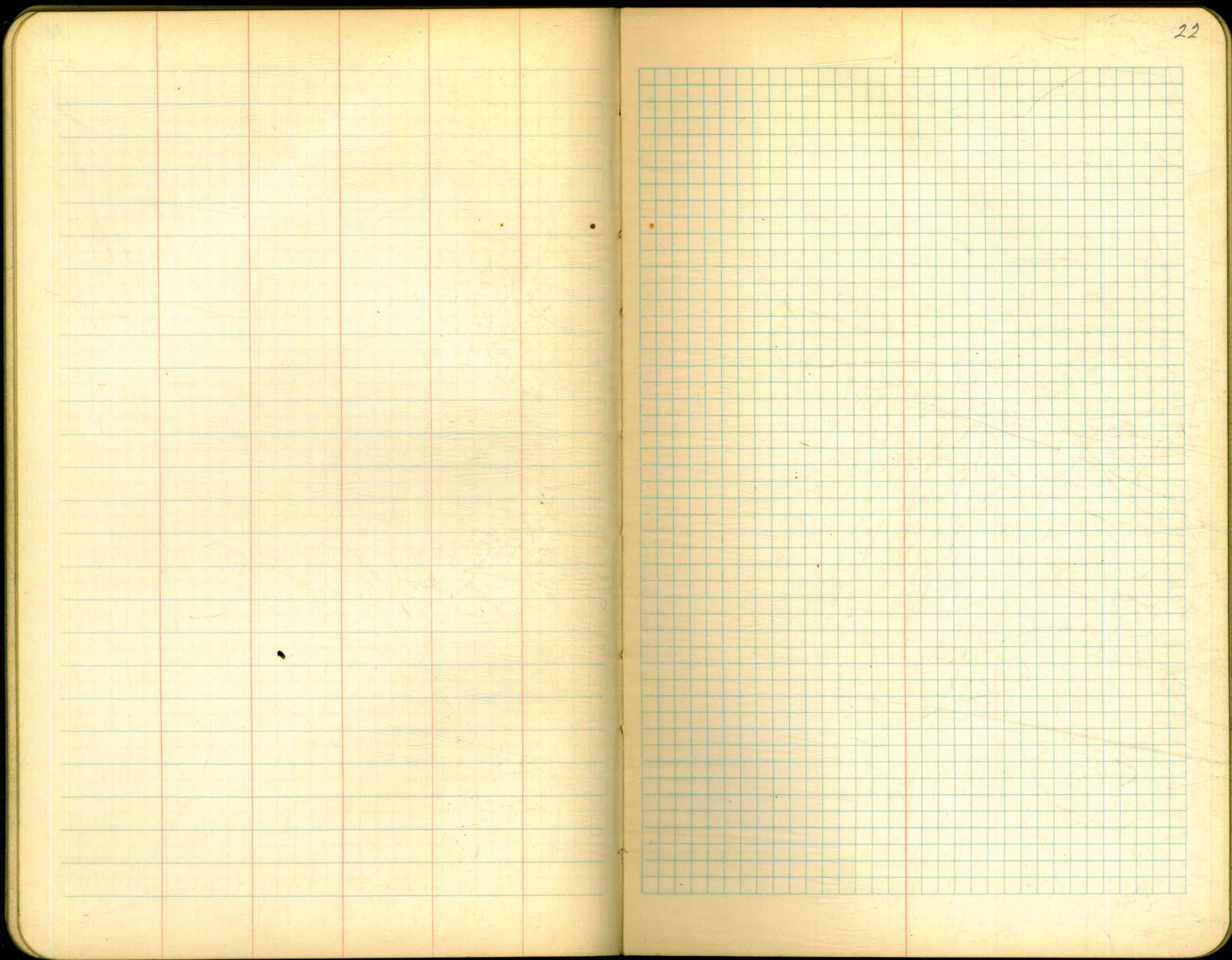


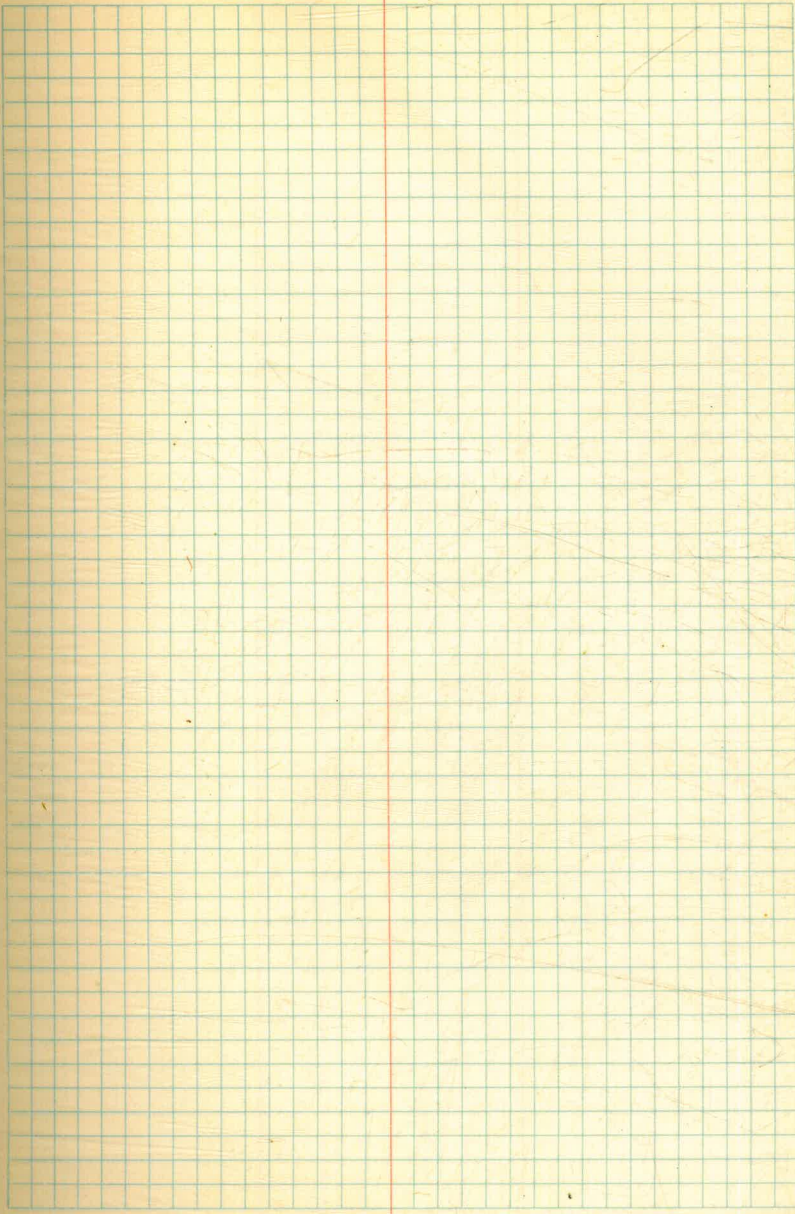
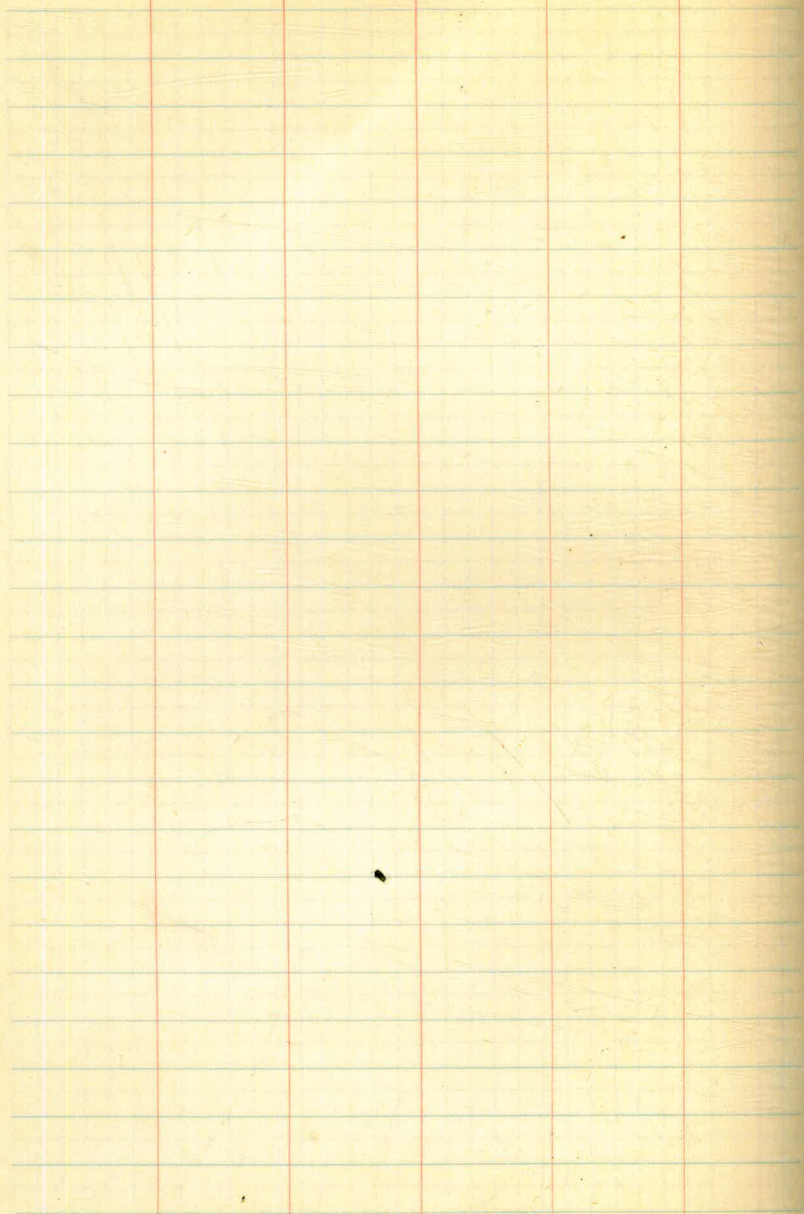
* Lt. From 496+50	112'	to	to	✓
" "	69'	to	"	✓
From 496+00	89'	to	"	✓
" "	110'	"	"	✓
* Lt. " 495+50	122'	"	"	✓
" "	121'	"	"	✓

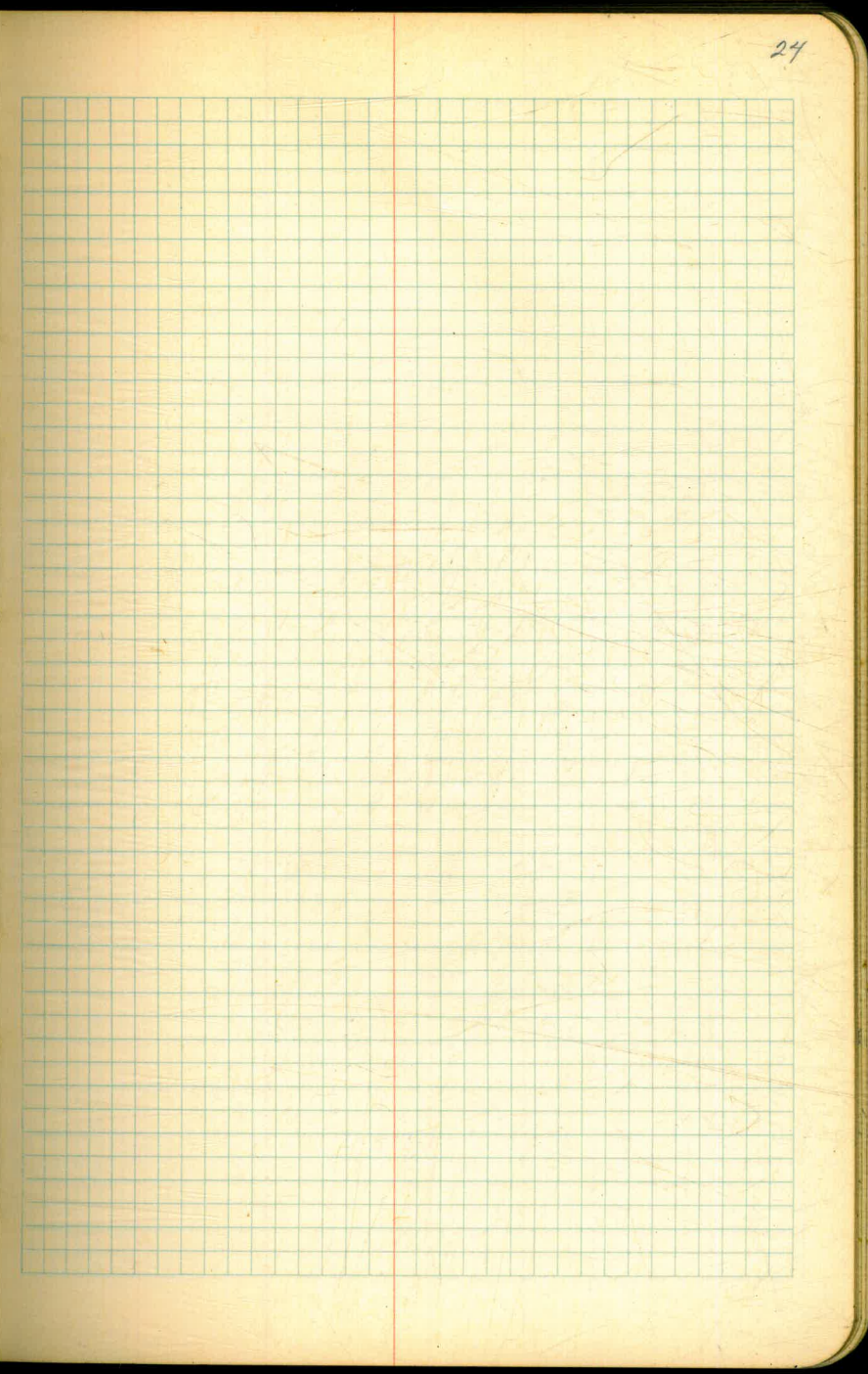
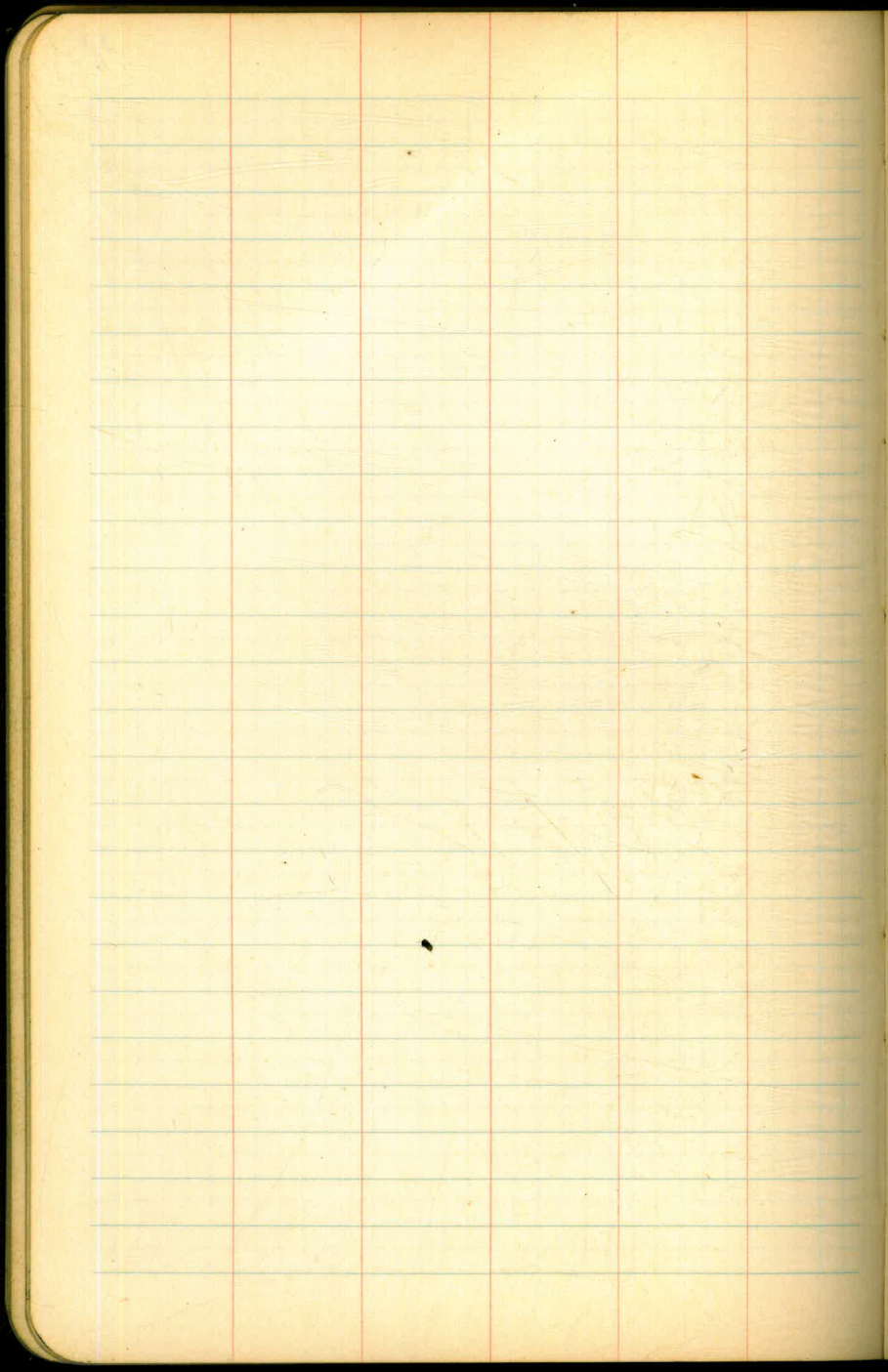


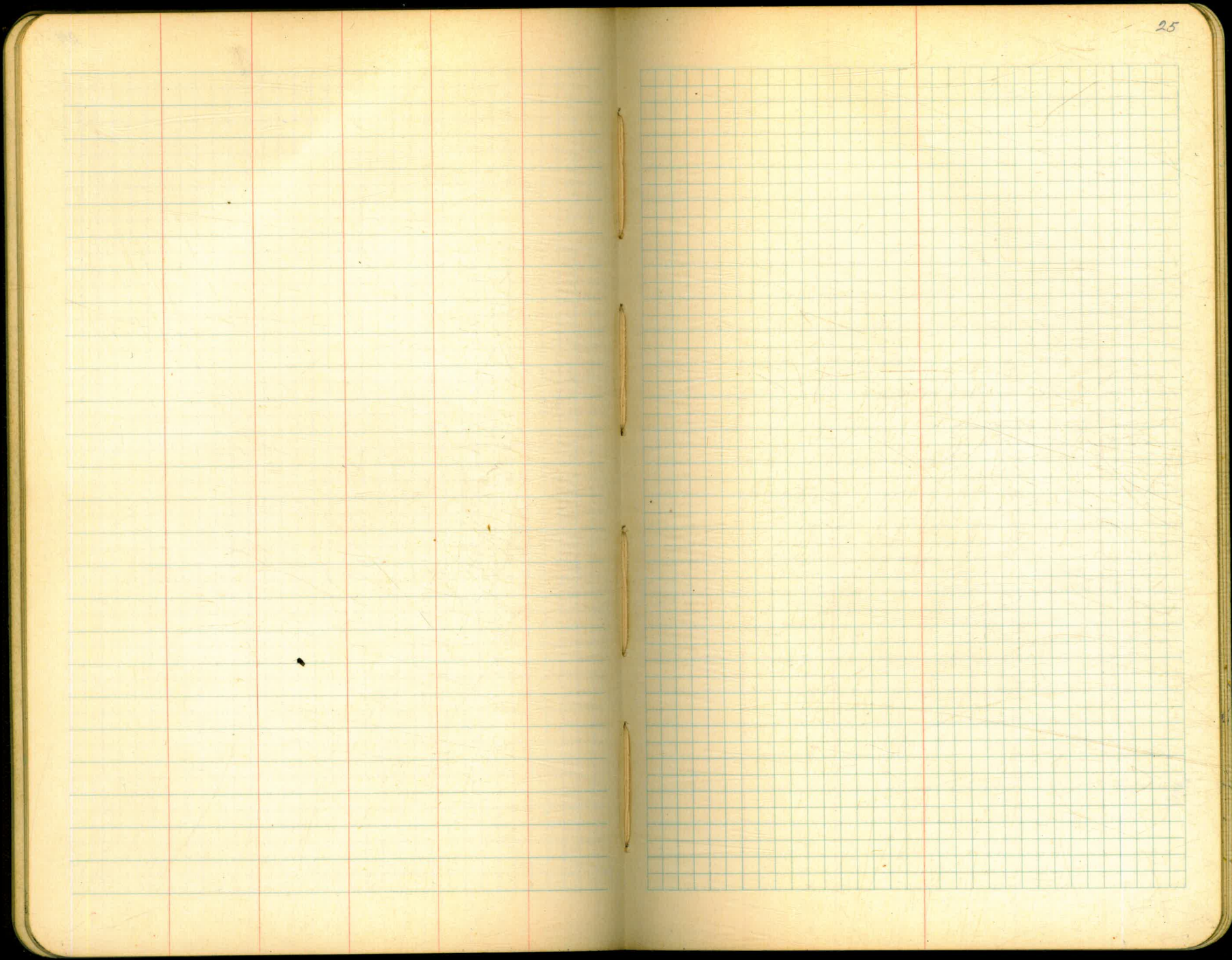


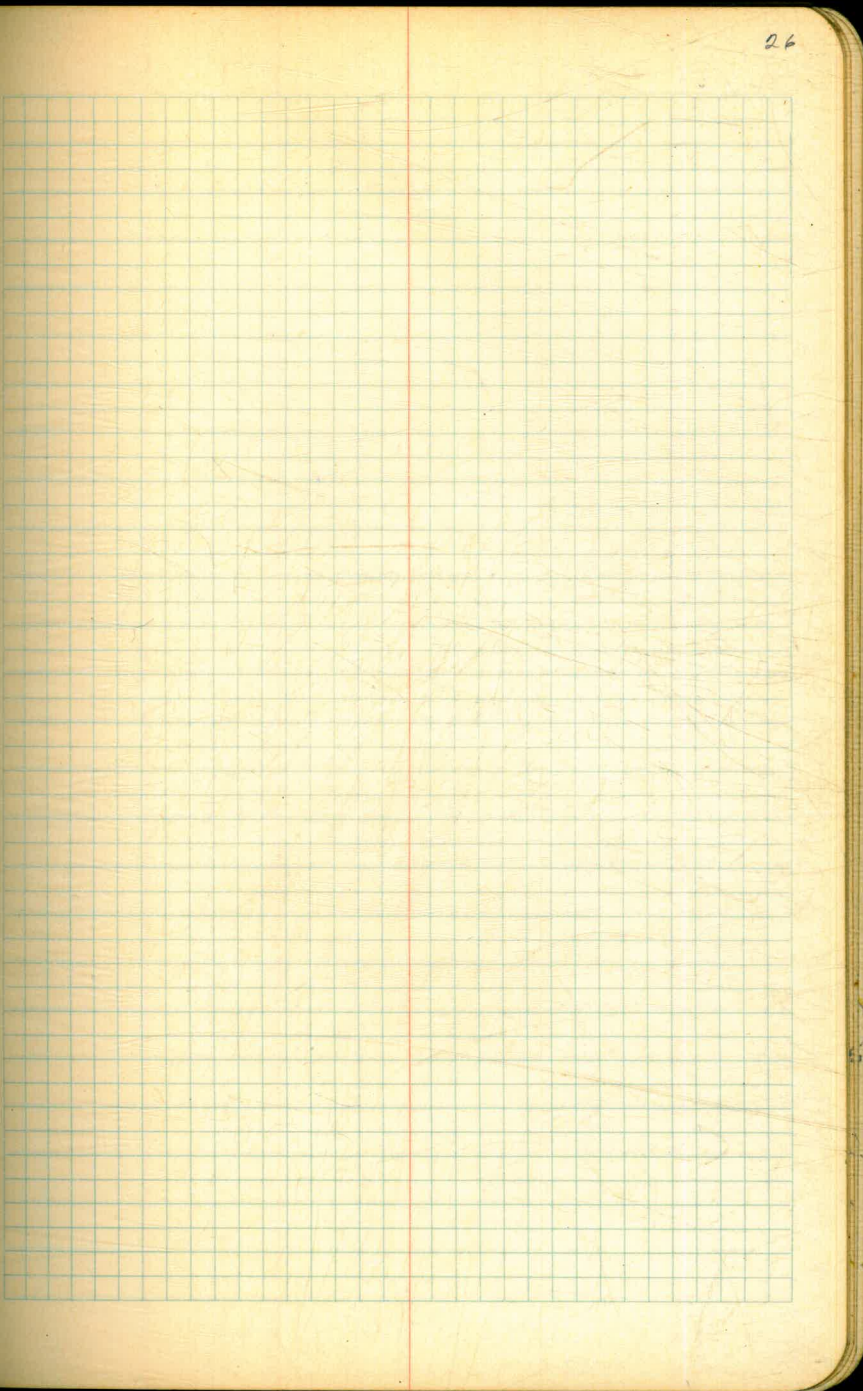
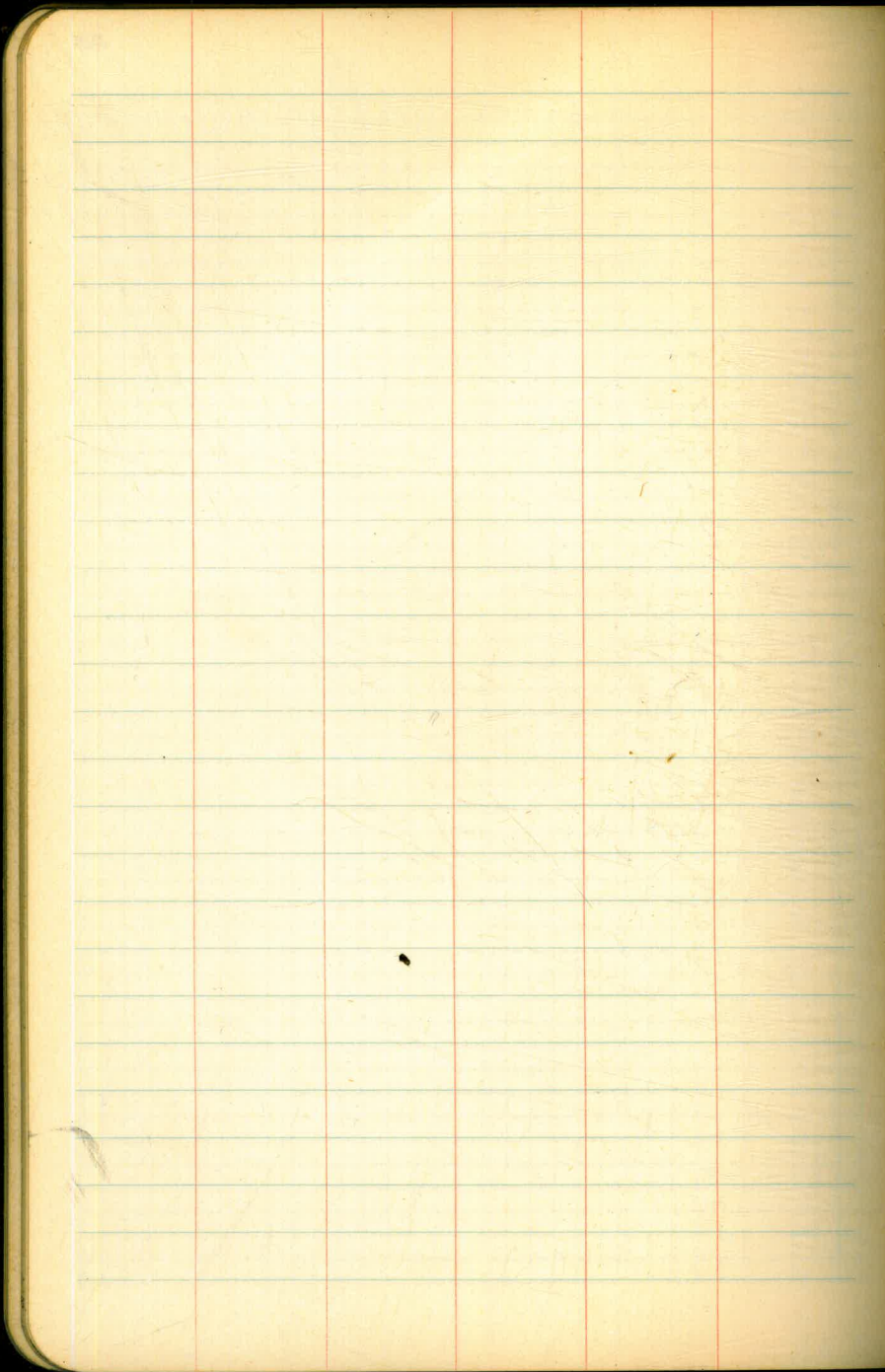


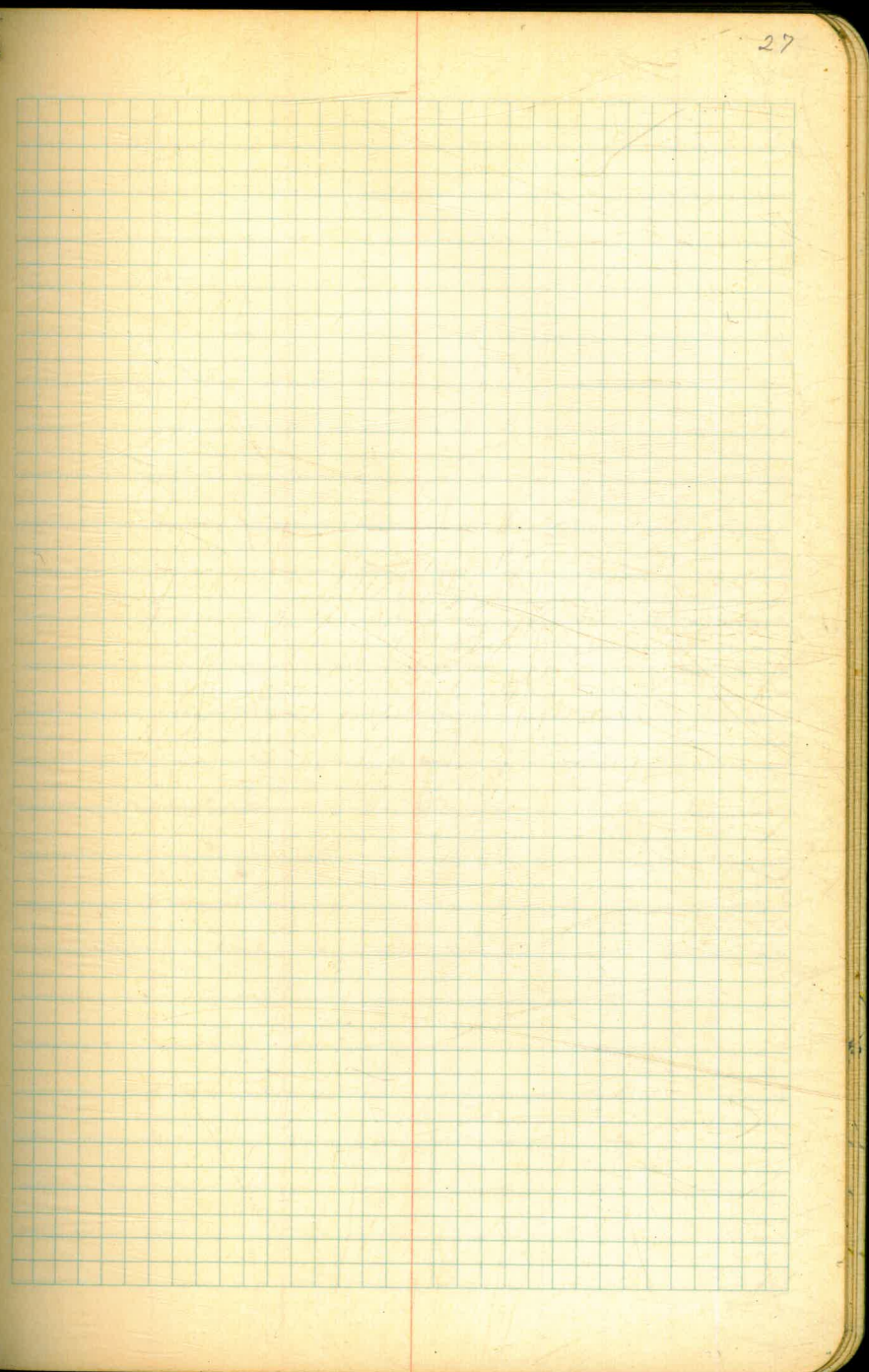
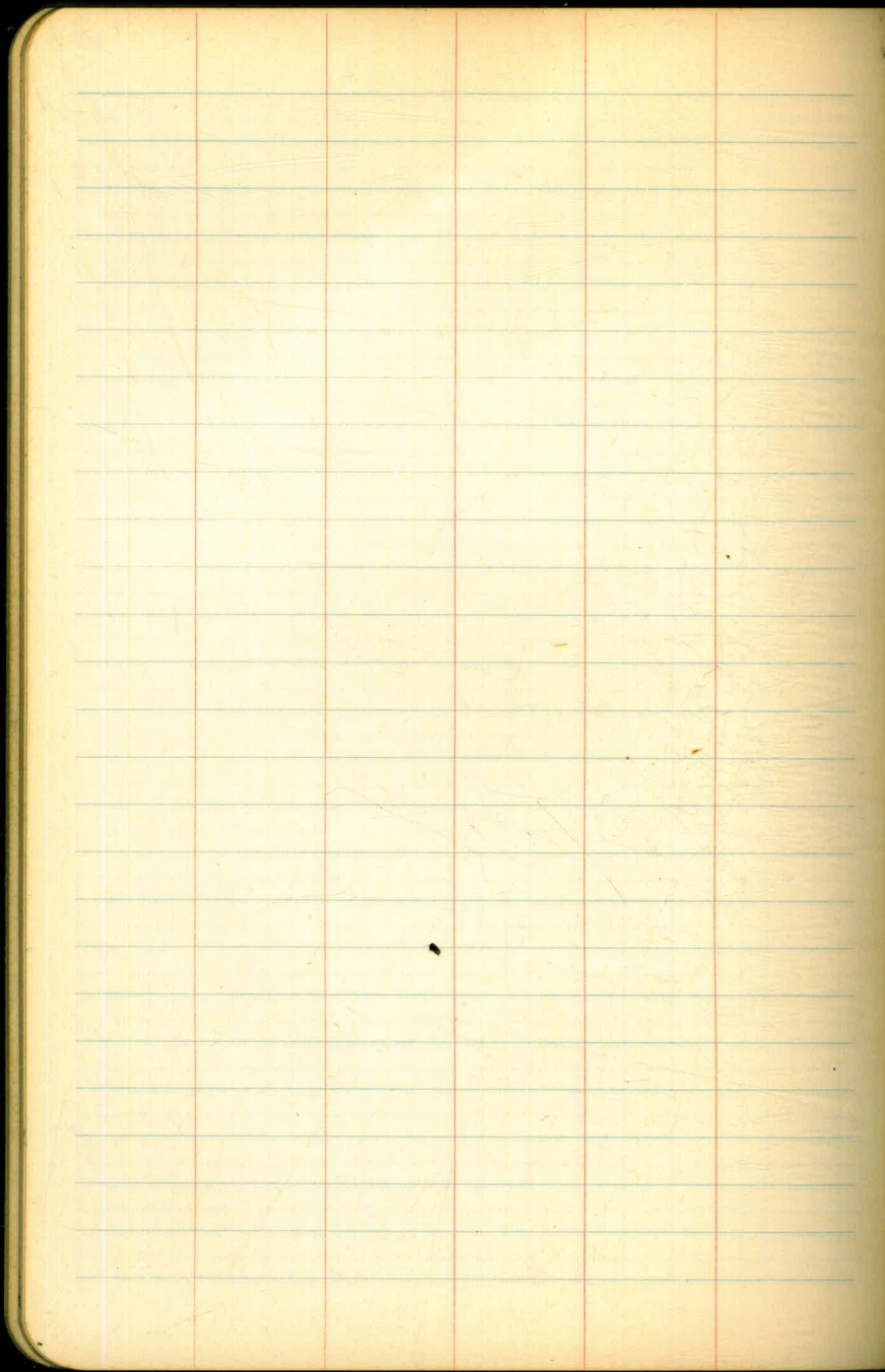


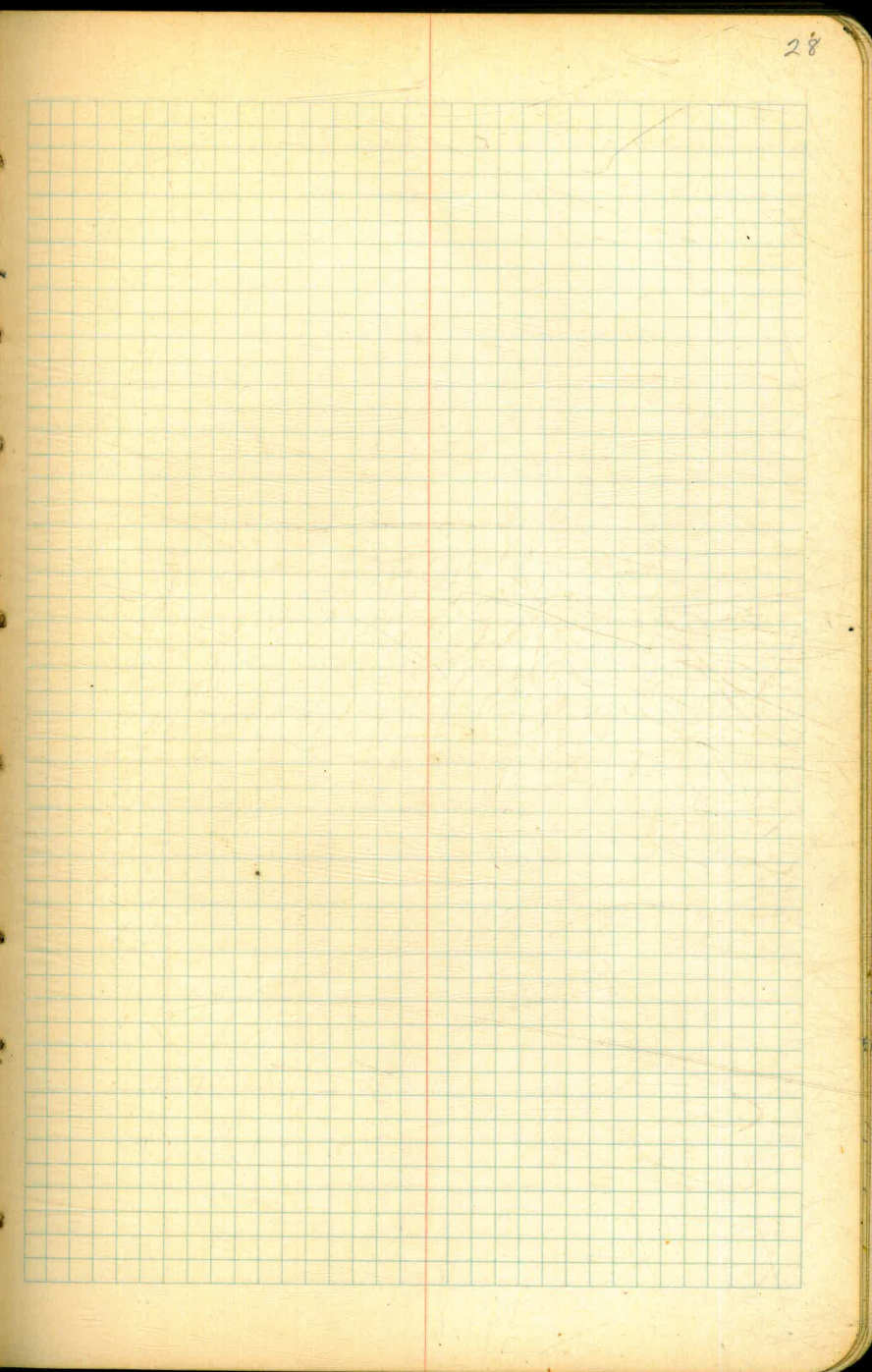
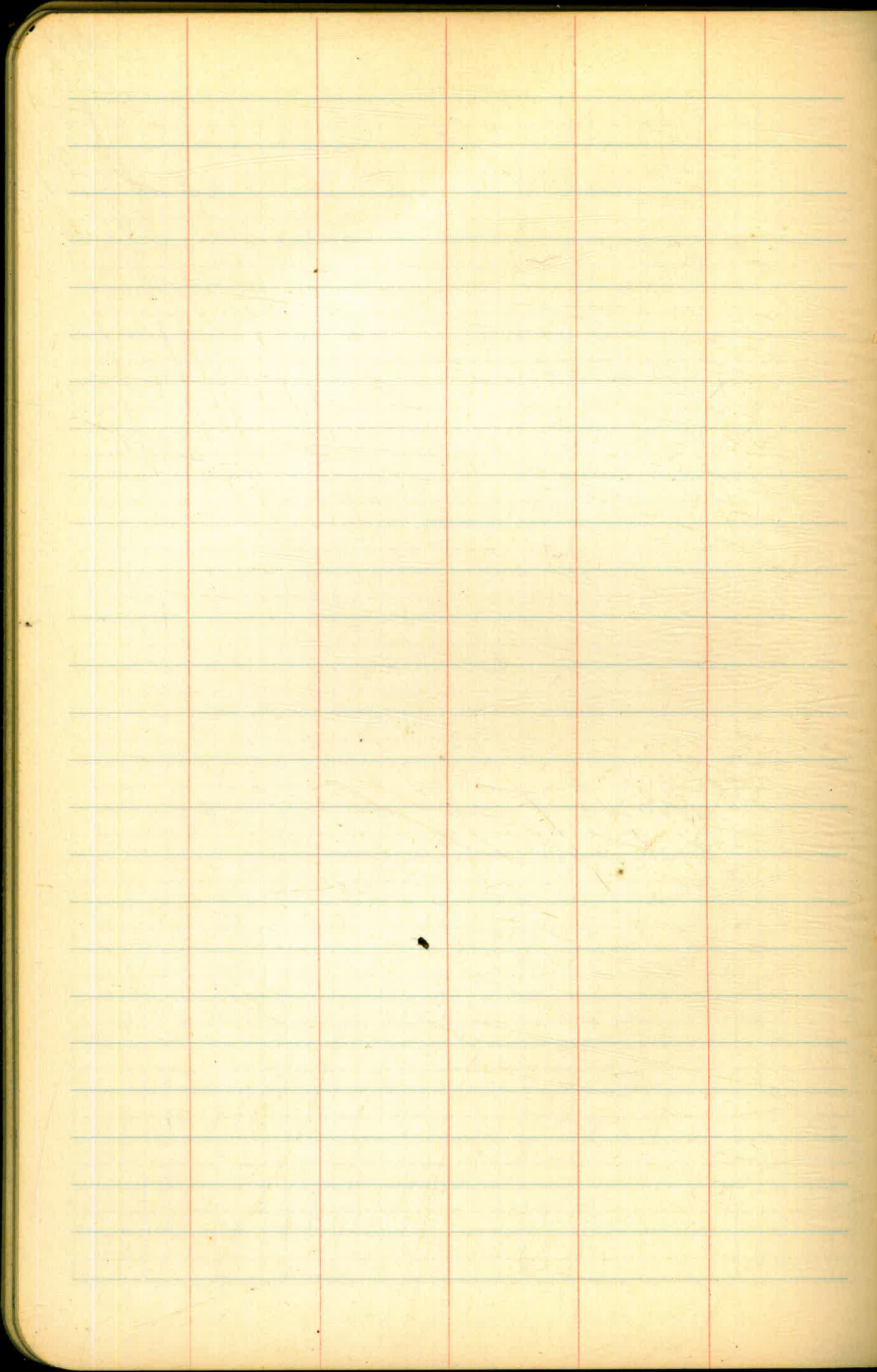


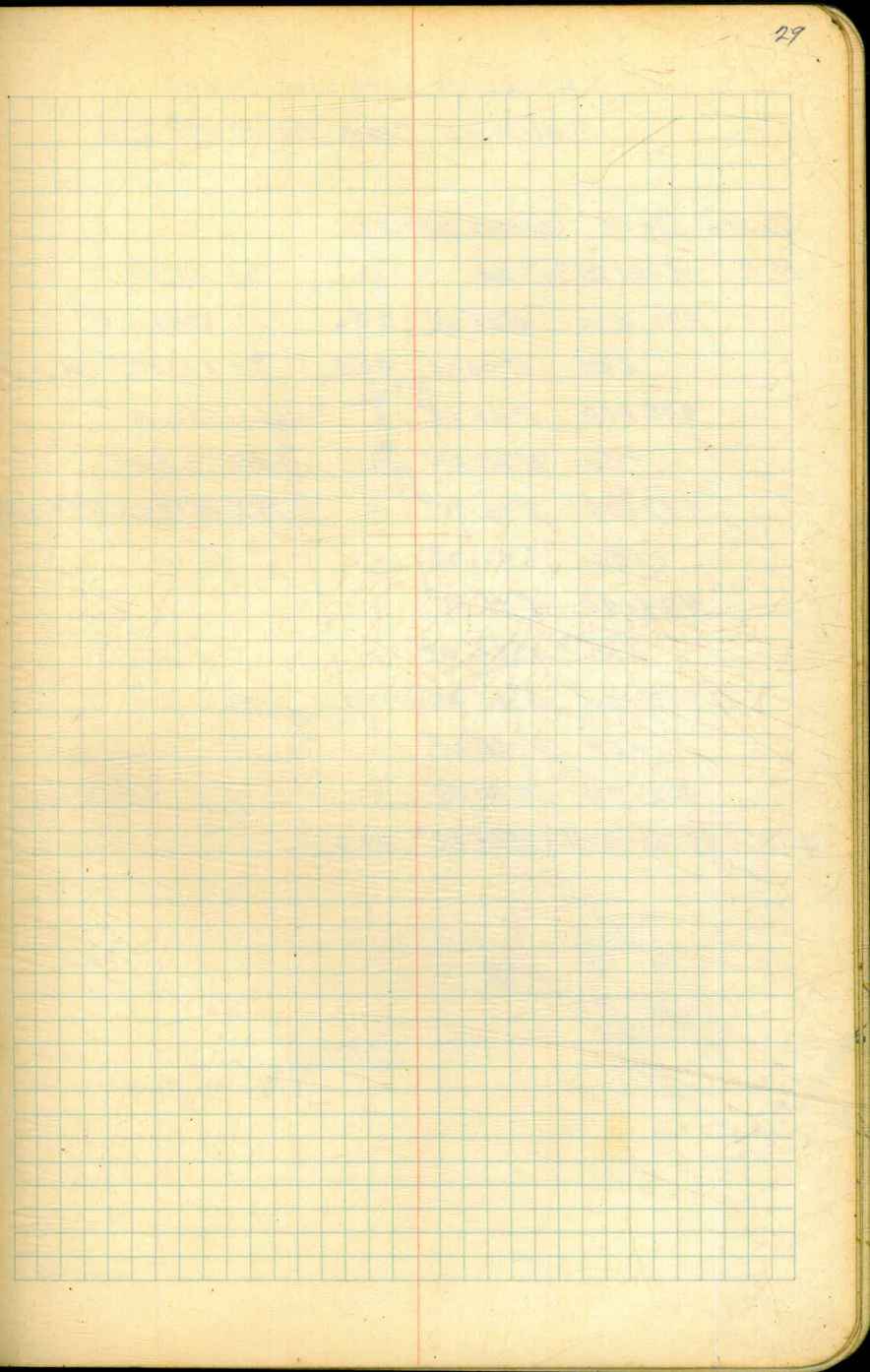
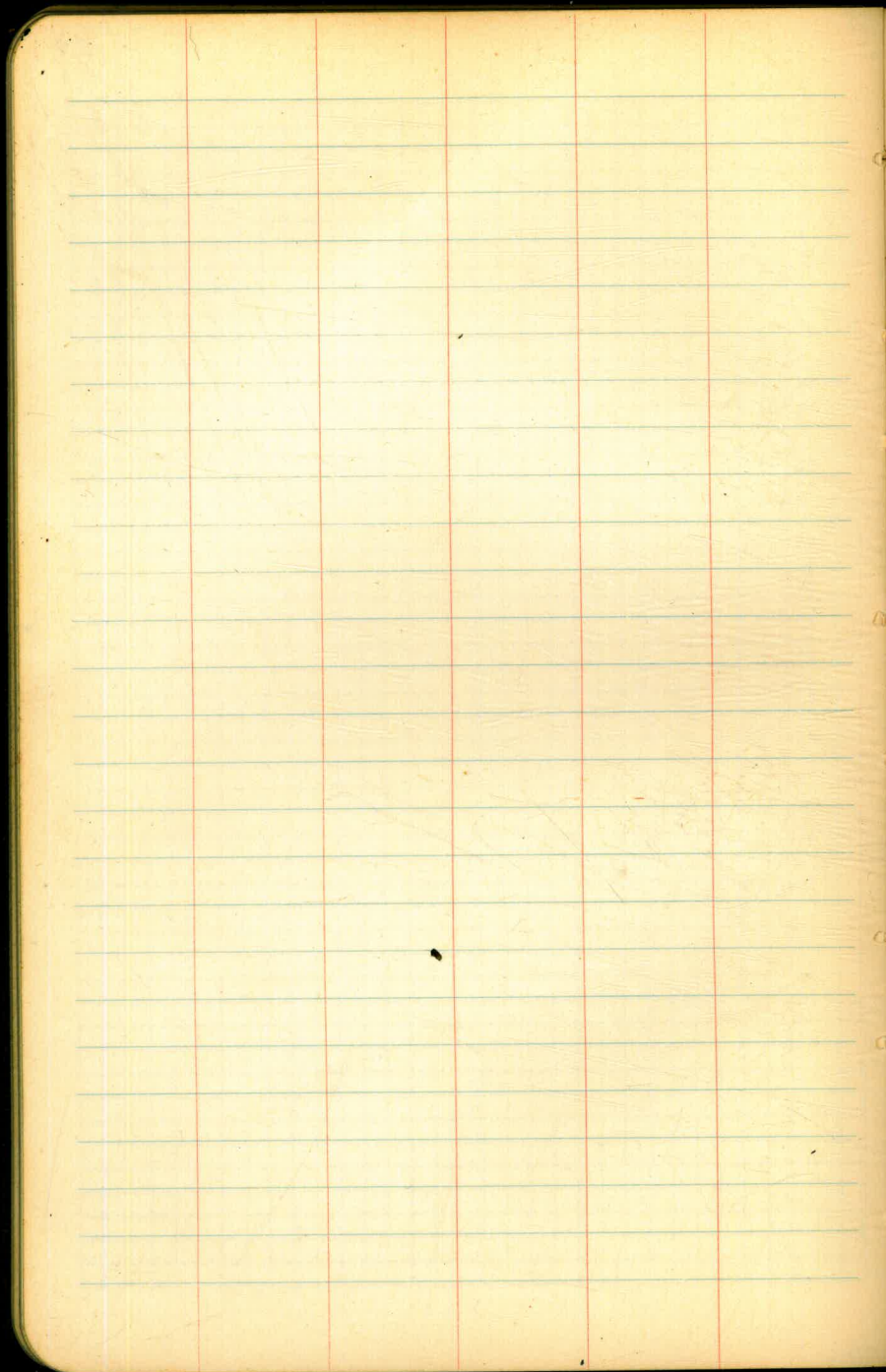












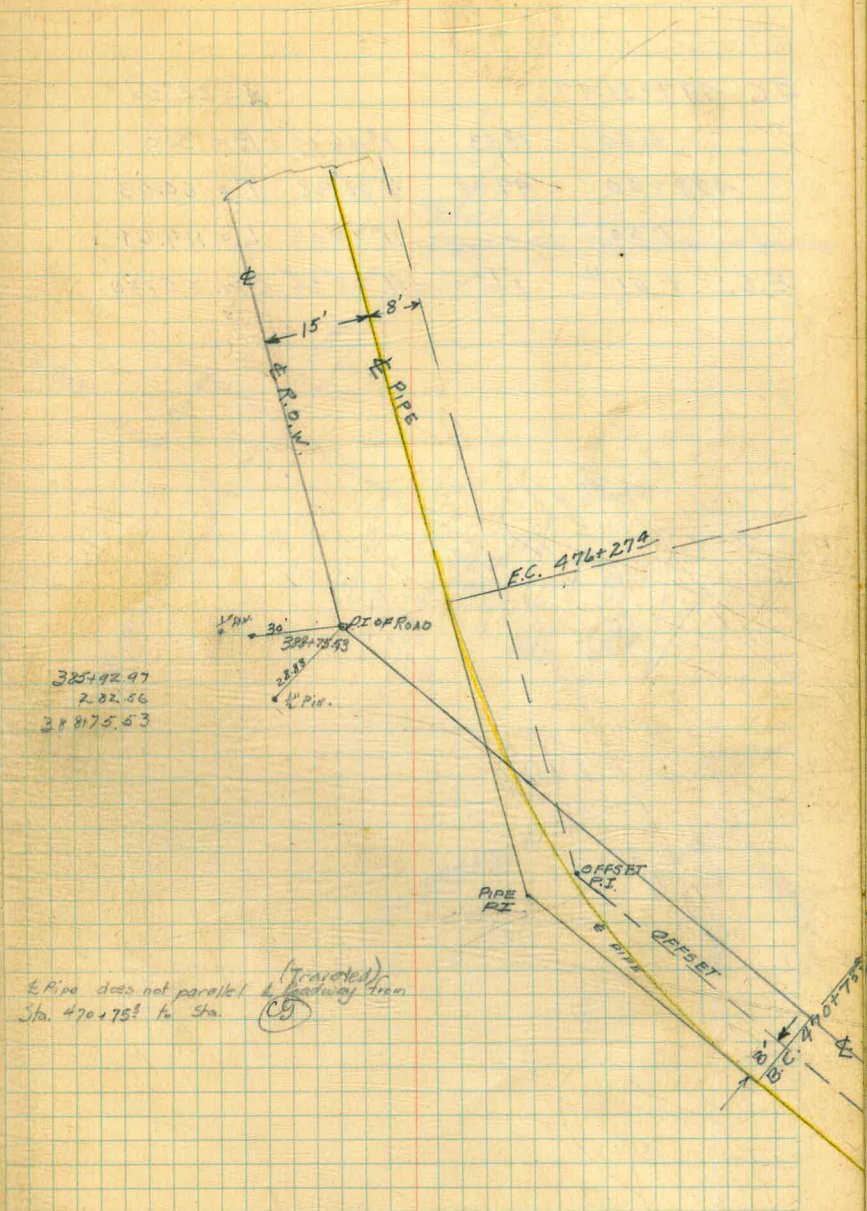
LAKESIDE PIPE LINE SURVEY
CONTINUED FROM F.B. #627 (C)

CURVE DATA (OFFSET CHORDS)

B.C.	def	ch.	$\Delta = 15^\circ 49'$
470+75.3			
471+00	$0^\circ 21' 18''$	24.6	$R = 2000 (L)$
+50	$1^\circ 04' 16''$	49.8	$T = 277.82 (276.7) \text{ offset}$
472+00	$1^\circ 47' 14''$	"	$L = 552.11$
+50	$2^\circ 30' 22''$	"	$d/A = 0.859'$
473+00	$3^\circ 13' 10''$	"	$P.I. 473+52.00 \text{ (OFFSET)}$
+50	$3^\circ 56' 08''$	"	
474+00	$4^\circ 39' 06''$	"	
+50	$5^\circ 22' 04''$	"	
475+00	$6^\circ 05' 02''$	"	
+50	$6^\circ 48' 00''$	"	
476+00	$7^\circ 30' 58''$	"	
EC.	$476+27.9$	$7^\circ 54' 29''$	27.3

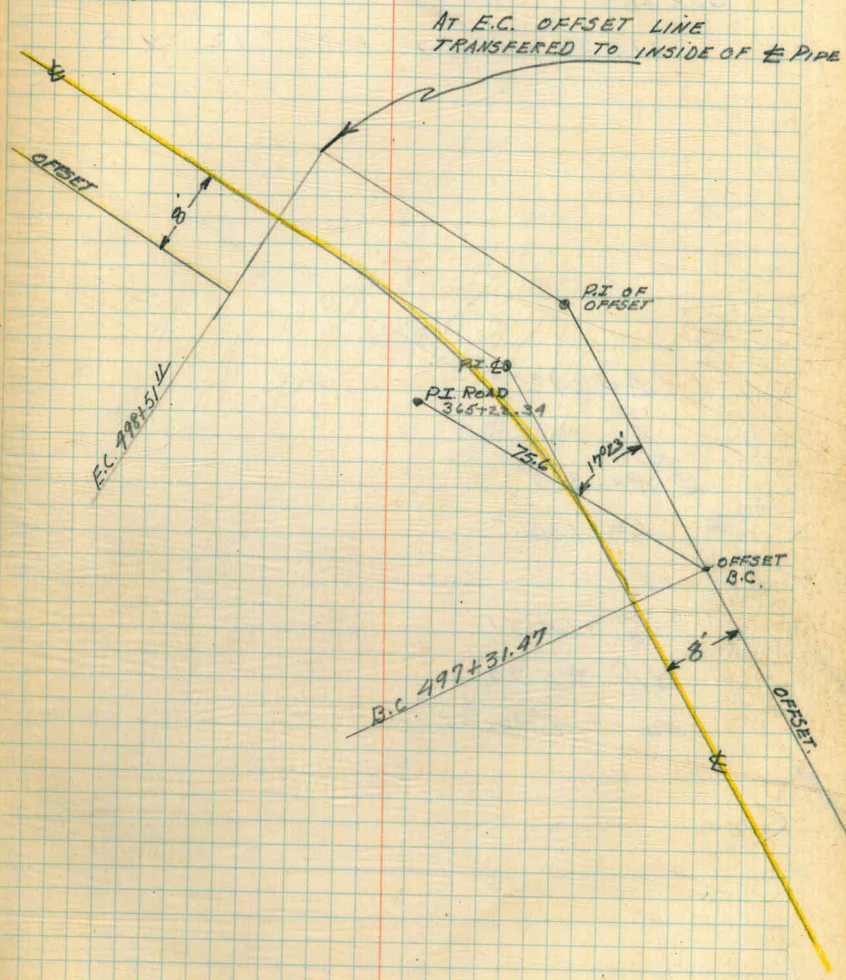
DEC. 17, 1991
P.S. BARKER; PARTY

30



B.C. 497+31.47		$A = 22^{\circ}51'$
+ 50	18.53	$1^{\circ}46'10" R = 300$
498+00	49.99	$6^{\circ}32'38" T = 60.63$
+ 50	"	$11^{\circ}19'06" L = 119.64$
E.C. + 51.47	111	$11^{\circ}25'30" d/m. = 5730$

VOID
See Page 49



B.C. 501+89.30	10.69	10.41	10° 01' 18"
502+00	49.94	48.57	5° 47' 47"
+50	49.94	" "	10° 34' 16"
503+00	19.30	18.78	12° 24' 58"
E.C. +19.32			

$$\Delta = 24^{\circ} 50'$$

$$\frac{\Delta}{2} = 12^{\circ} 25'$$

$$R = 300$$

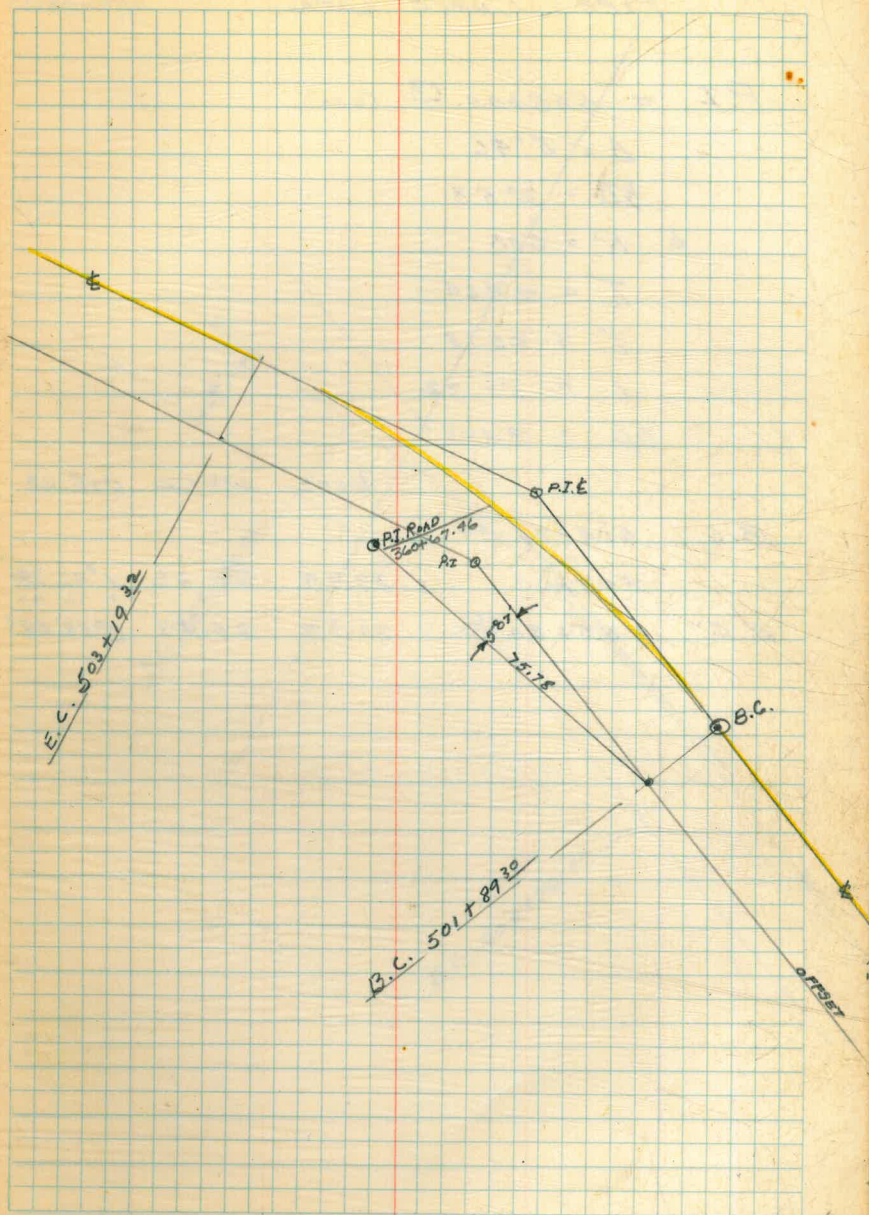
$$L = 130^{\circ} 02'$$

$$T =$$

$$T_0 = 64.51$$

$$df = 5.73$$

$$50 = 4^{\circ} 46' 29''$$



~~PIPE CURVE DATA.~~

~~P.I = 505+00.73 (OFF)~~

~~$\Delta = 5^{\circ}46$~~

~~$\frac{1}{2}\Delta = 2^{\circ}53$~~

~~$\pm R = 500$~~

~~$T_0 = 24.69$~~

~~$T = 25.18$~~

~~$L = 50.32$~~

~~$D/E = 3.438$~~

\pm CHD OFF CHD def. \pm

B.C. 504+76.04

505+00

23.95

23.36

$1^{\circ}22'22''$
 $1^{\circ}30'32''$

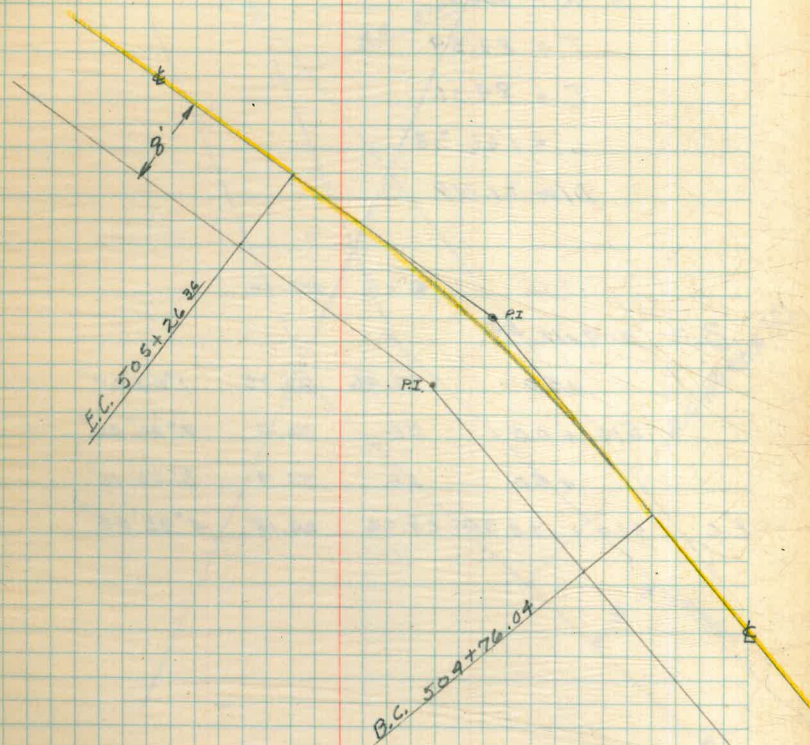
E.C. 505+26.36

26.35

25.95

$2^{\circ}52'59''$

DEC. 17, 1941
PAUL BARKER
& PTY.
CLEAR-WARM.



PIPE CURVE DATA

$P.I. = 509+96.60$

$\Delta = 9^{\circ}32'$

$\frac{\Delta}{2} = 4^{\circ}46'$

$R = 1000'$

$T = 83.39$

$T_0 = 84.06$

$L = 166.38$

$D/P = 1.719$

± ch. OFF. ch.

B.C. $509+12.59$

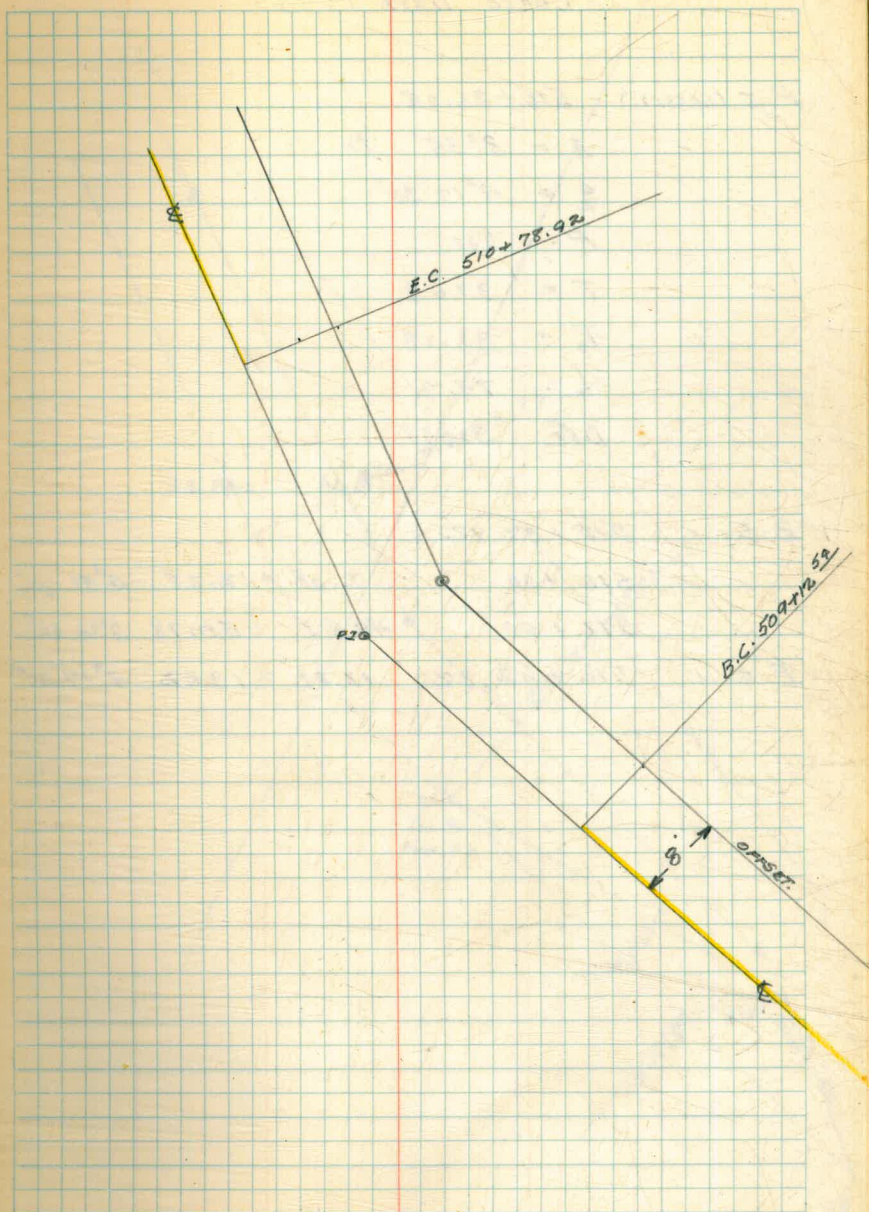
+50 37.46 37.75 $1^{\circ}04'24''$

$510+00$ 50 50.4 $2^{\circ}30'20''$

+50 50 50.4 $3^{\circ}56'16''$

E.C. $510+78.92$ 28.92 29.18 $4^{\circ}45'58''$

DEC. 13, 1991
BARRAGE PT.



DEC. 18, 1941

35

CURVE DATA

P.I (OFFSET) 516+26.05

$\Delta = 8^{\circ}35'$ Tr.

$\frac{\Delta}{2} = 4^{\circ}17'30''$

R = 500

T = 37.53

$T_0 = 38.13$

L = 77.9

D/F 3.438

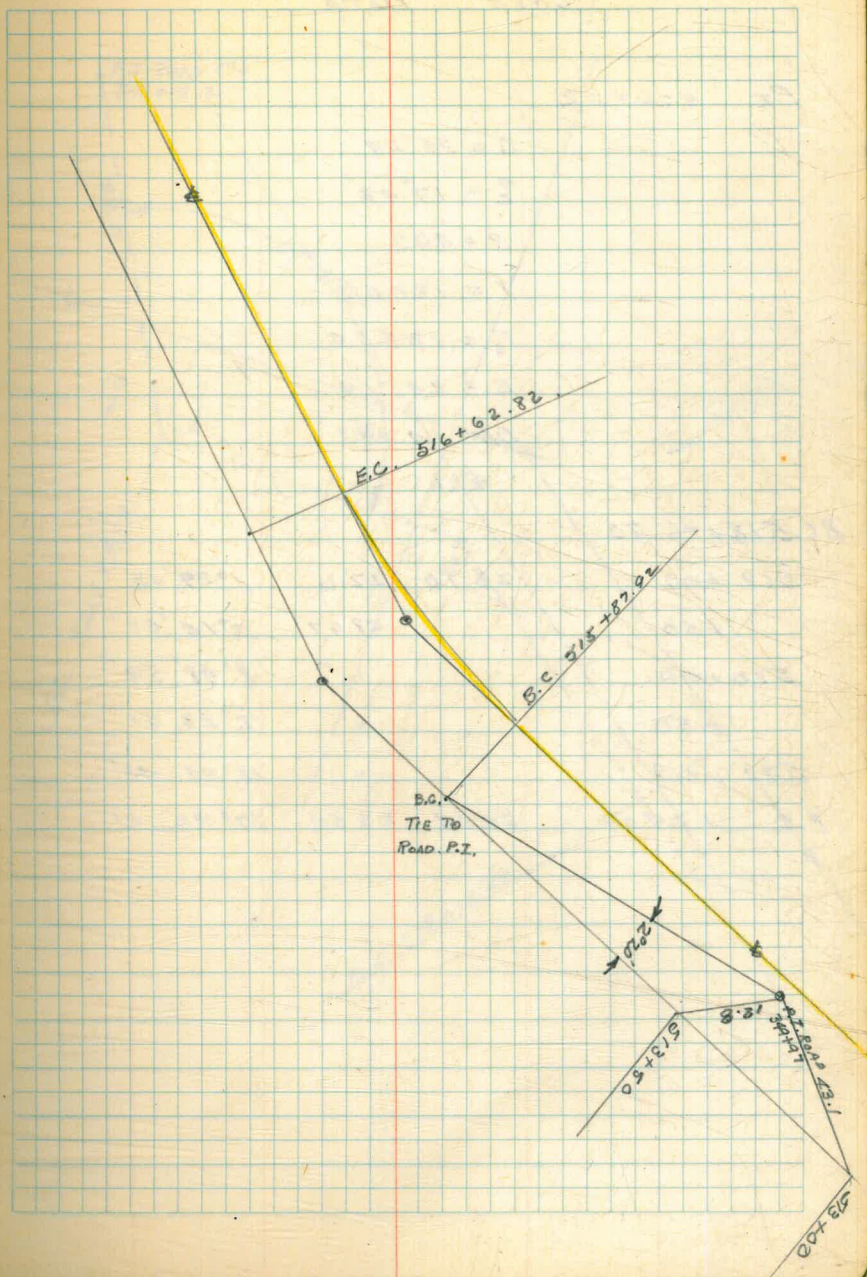
rch. off. ch.

B.C. 515+87.92

516+00 12.08 = 12.28 $0^{\circ}41'37''$

516+50 49.98 = 50.78 $3^{\circ}33'30''$

E.C. 516+62.82 12.82 = 13.02 $4^{\circ}17'30''$



CURVE DATA

P.I. 520+02

$\Delta = 35^{\circ}29'$

$\frac{\Delta}{2} = 17^{\circ}42'$

$R = 400$

$T = 127.66$

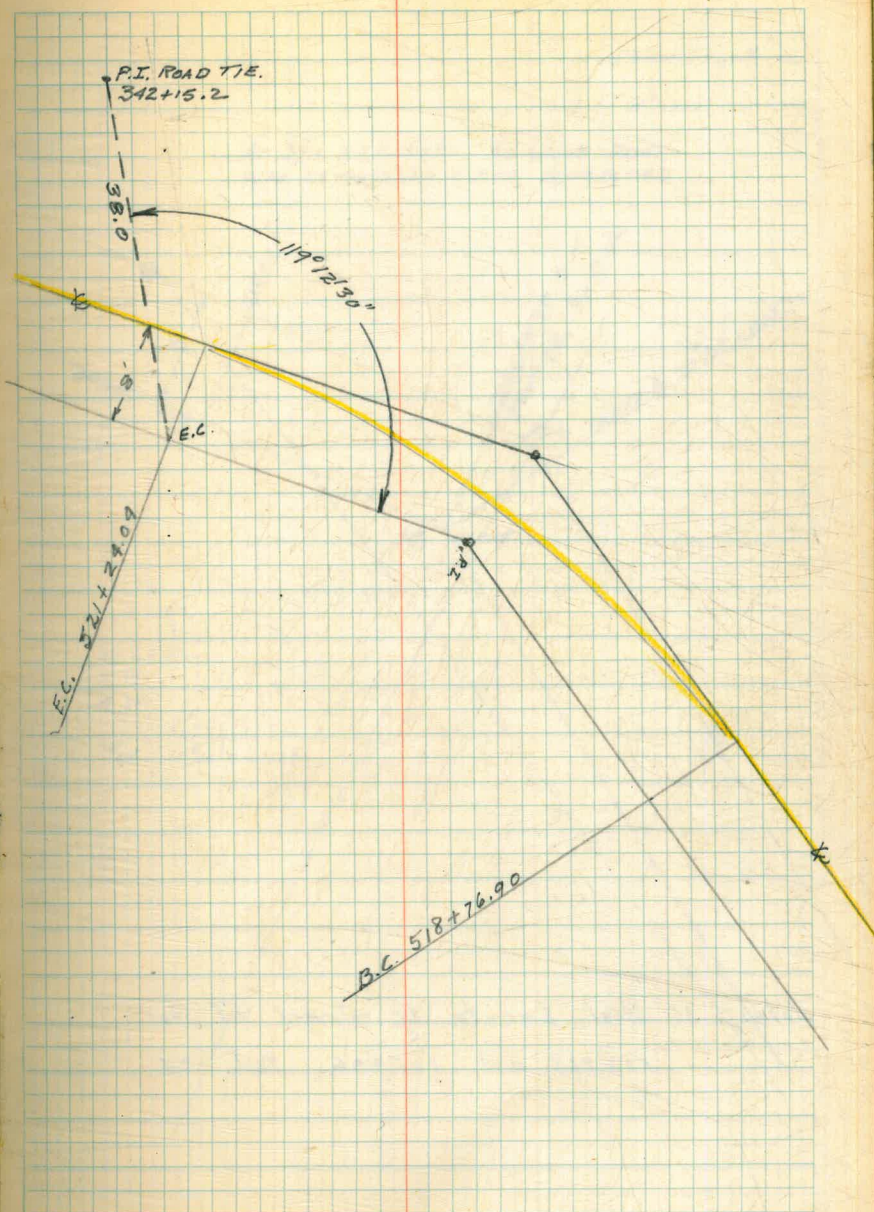
$T_0 = 125.10$

$L = 247.19$

$O/P = 4.297$

E.C.

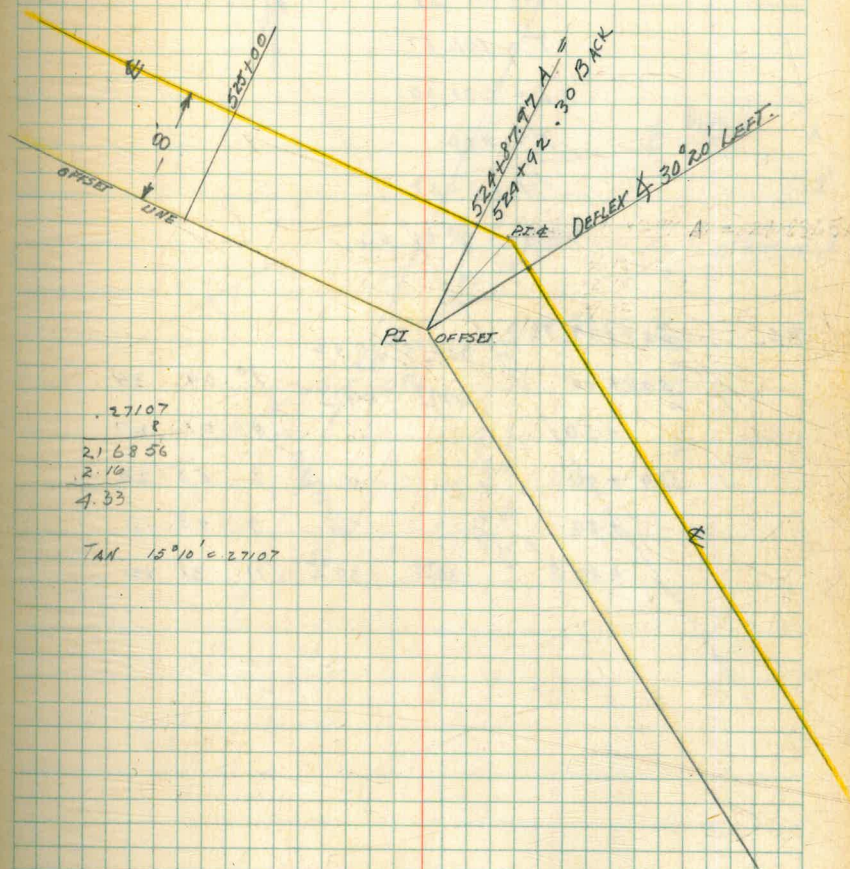
B.C. 518+76.90

519+00 23.10 22.6 $1^{\circ}39'15''$ +50 48.97 $2^{\circ}14'07''$ 520+00 " $8^{\circ}48'59''$ +50 " $12^{\circ}23'51''$ 521+00 " $15^{\circ}58'43''$ E.C. +24.09 24.09 23.59 $17^{\circ}42'01''$ 

524+87.97

30° 20

AT STA 524+87.97 AN ANGLE POINT
WAS ESTABLISHED. STA. CORRECTED.



Note: 36" Steel Line to be relocated bet. Stas
523+65 and 525+76 Dist. 211

Curve Data

PI = 528+80.00

$\Delta = 23.02$

$\frac{P}{V} = 11.31$

$T = 101.88$

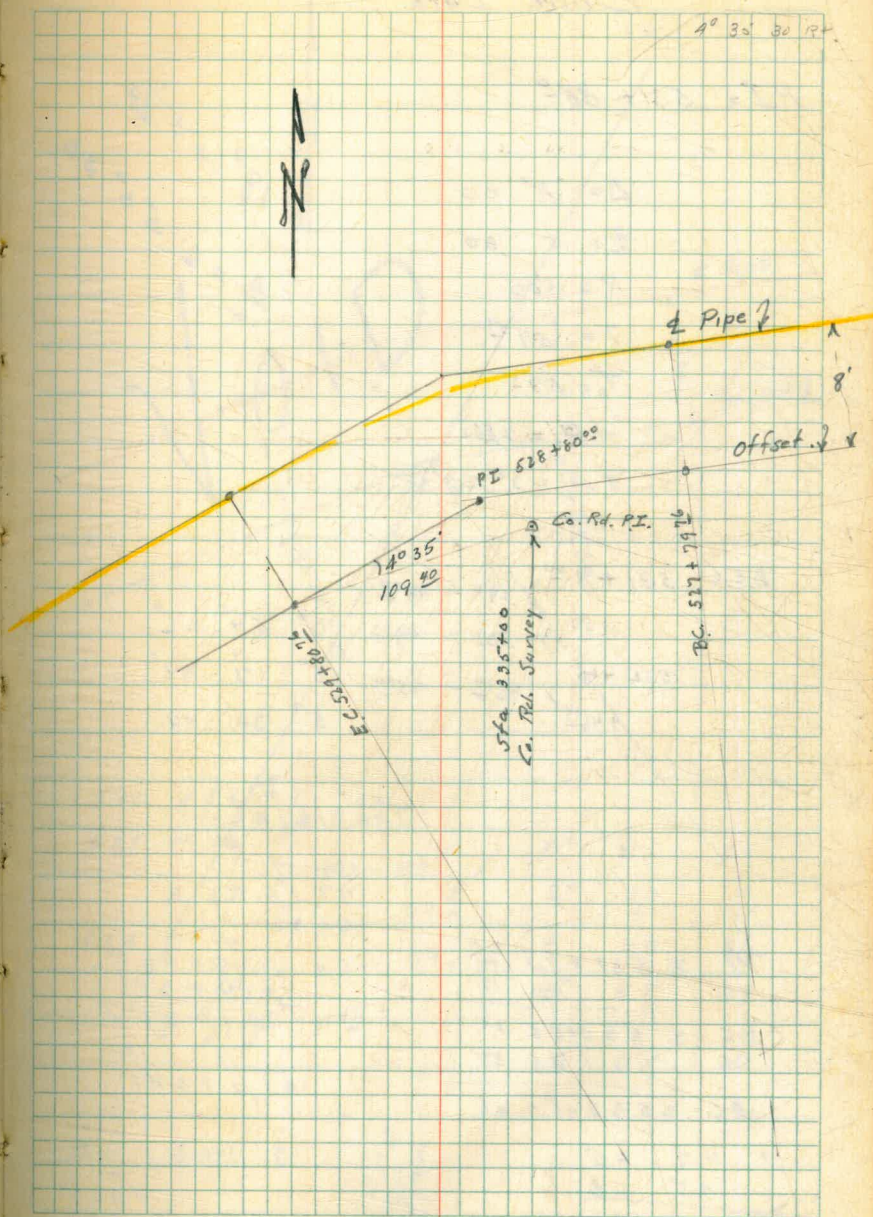
$L = 201.00$

$R = 500$

$d/47 = 3.438$

$d/50 = 2^{\circ} 51' 53$

St. No.	Chord	Offset	Station
527+79.76	2024	19.92	
528+00	4998	49.18	10 09 34
+50	"	"	4 01 27
529+00	"	"	6 53 20
+50	"	"	9 45 13
+80.76	3076	30.26	11 31 00



Curve Data

PI = 531 + 88°

$\Delta = 11^\circ 00'$

$\frac{\Delta}{2} = 5^\circ 30'$

$R = 600$

$T = 57.27$

$T_0 = 57.00$

$\frac{1}{4}H = 28.65$

$\frac{1}{4}S_0 = 20.2315$

$D = 18^\circ 51' 44''$
 $\frac{\Delta}{2} = 6^\circ 50' 30''$

BC = 531 + 81.00

+ 50

532 + 00

+ 46.19

190 - 1874

500 - 4933

4619 - 4560

$0^\circ 54' 26''$

$3^\circ 17' 41''$

$5^\circ 30' 00''$

Tan .12146

8

97.168

194.34

2268.928

0148.353

2417.281

193.38248

PI = 531 + 85.25

97.17

BC = 530 + 88.08

193.38

EC = 532 + 81.46

1 47 25

25 46

2 13 11

315
 215
 1575
 915
 430
 6725

2.149

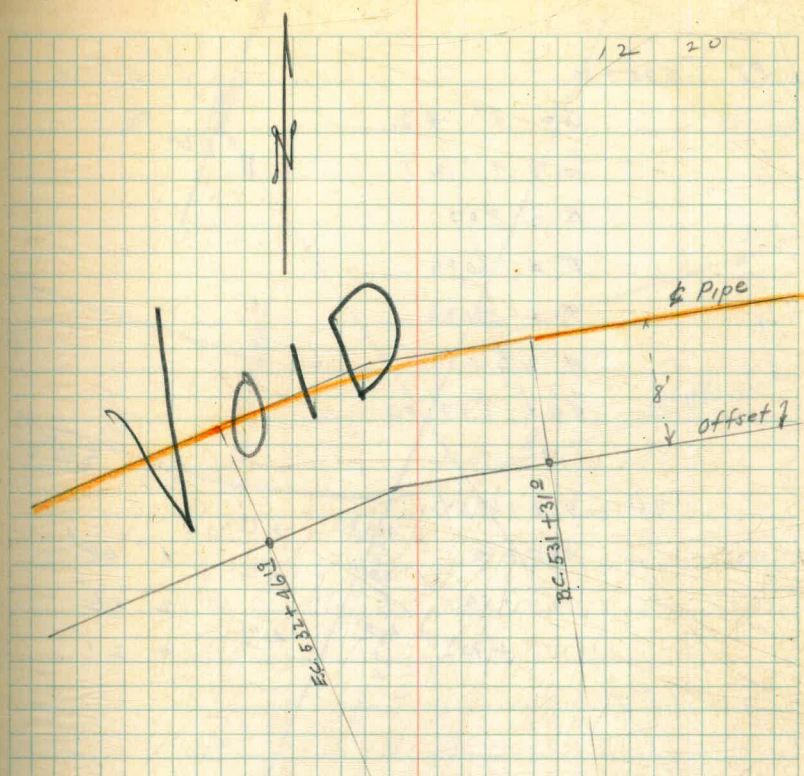
210

12

430

215

2550



530 + 88.08

531 + 0

+ 50

532 + 0

+ 50

+ 81.46

11.92

50 - 495

50 - 495

50 - 495

50 - 495

3146

$0^\circ 25' 40''$

$2^\circ 13' 11''$

$4^\circ 00' 36''$

$5^\circ 48' 01''$

$7^\circ 05' 30''$

$\frac{8 \times 50}{800}$

PI. 535+30

$$\Delta = 8^\circ 42'$$

$$\frac{\Delta}{2} = 4^\circ 21'$$

$$R = 800$$

$$T = 60.86$$

$$T_0 = 61.46$$

$$d_1 = 2.149$$

$$d_{50} = 1.4743$$

E = 8.4'

11° 02' R

$$B.C. = 534 + 66.54$$

$$535 + 00$$

$$+ 50$$

$$+ 90'$$

$$31.46 - 31.76$$

$$50.00 - 50.00$$

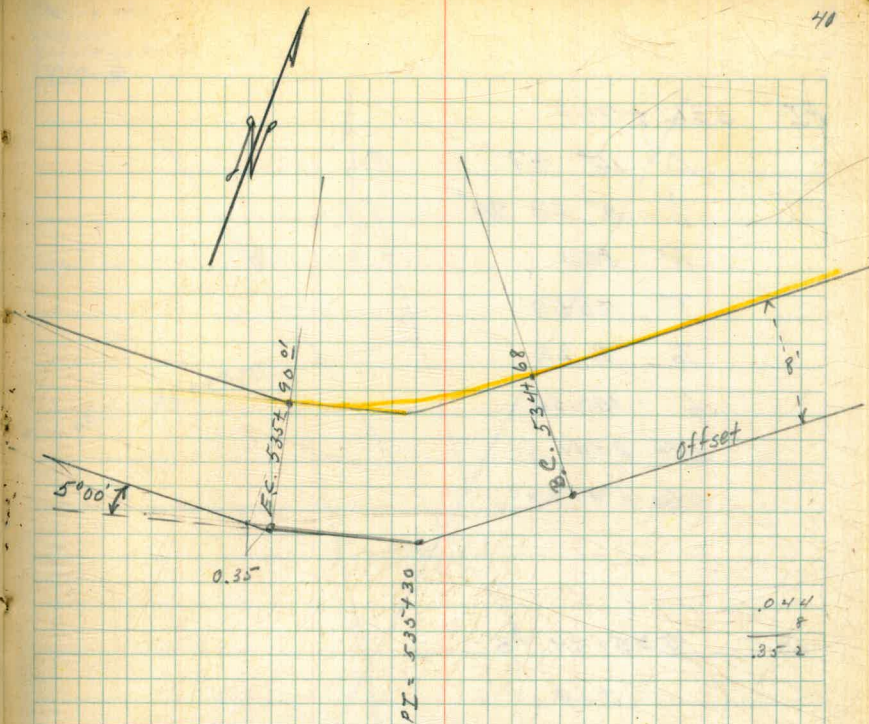
$$40.01 - 40.01$$

$$1^\circ 09'$$

$$2^\circ 56'$$

$$4^\circ 21'$$

At E.C. 535+90' x 5° 00' Rt.



11 02

14 35

17 24

11 28

9 49

PI 536 + 76°

$\Delta = 10^\circ 47'$ RT.

$\frac{A}{2} 5^\circ 23' 30''$

R 800

T 75.50

T_0 76.22

L 150.56

D/F 2.149

D/50 $1^\circ 47' 27''$

B.C. 535 + 99.78

+ 00

536 + 50 50.22 50.74 $1^\circ 47' 55''$

+ 00

50 50.5 $3^\circ 35' 22''$

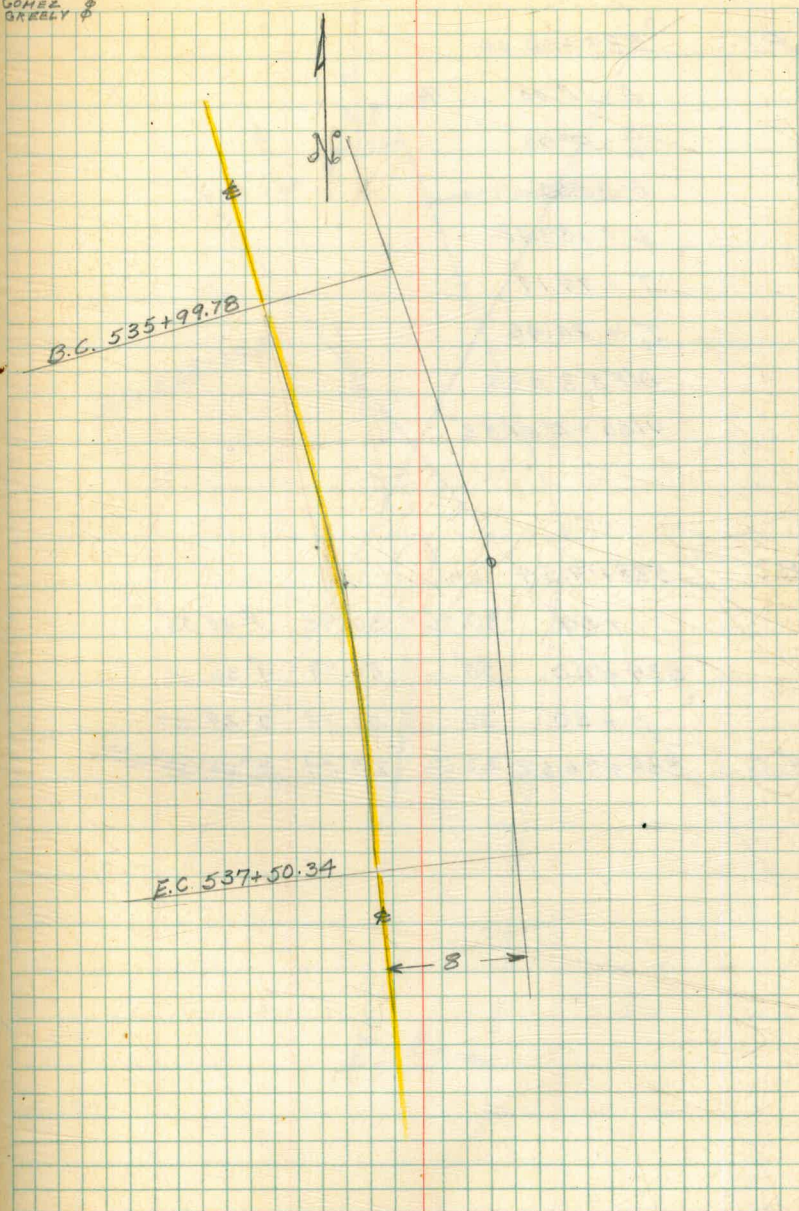
537 + 50

50 =

E.C. + 50.34 0.34 50.85 $5^\circ 23' 30''$

Dec 19, 1941
WHITLOCK
BARKER JR. &
GOMEZ &
GREELY &

71

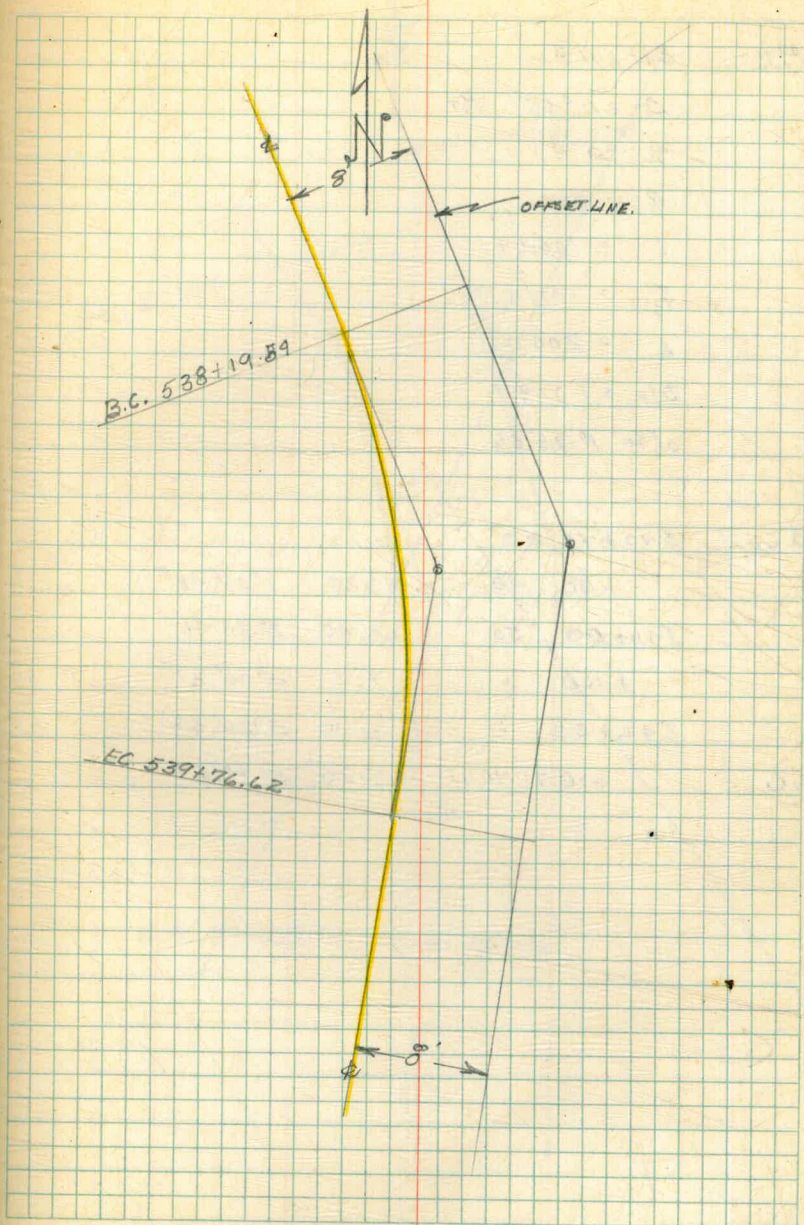


12/19/91

42

~~P.I. 539+00.00
 $\Delta = 18^{\circ}00'$ Pt
 $\frac{A}{2} = 9^{\circ}00'$
 $R = 500'$
 $L = 157.08$
 $T = 79.19$
 $T_0 = 80.46$
 $D/F = 3.438$
 $D/50 = 2^{\circ}51'53''$~~

B.C.	538+19.54	ch		
	+50	30.46	30.95	$1^{\circ}44'43''$
	539+00	50'	50.78	$4^{\circ}36'36''$
	+50	50	50.78	$7^{\circ}28'29''$
E.C.	539+76.62	26.62	27.04	$8^{\circ}59'59''$

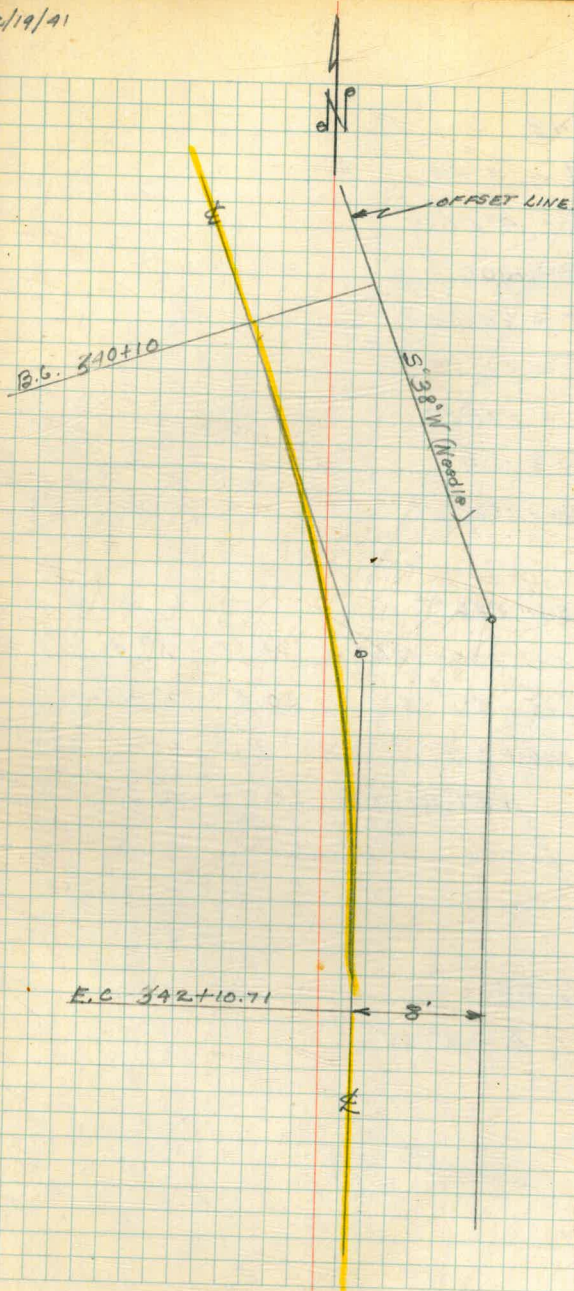


~~P.I. 341+11.5
 $\Delta = 11^{\circ}30'$ Rt.
 $\alpha = 5^{\circ}45'$
 $R = 1000$
 $T = 100.69$
 $T_0 = 101.5$
 $L = 200.71$
 $DIF = 1.719$
 $0/50 \ 1^{\circ}25'56''$~~

B.C.	340+10.00			
	+50	40'	40.30	$1^{\circ}08'45''$
	341+00	50'	50.40	$2^{\circ}34'41''$
	+50	"	"	$4^{\circ}00'37''$
	342+00	"	"	$5^{\circ}26'33''$
E.C.	+10.71	10.71	10.80	$5^{\circ}44'57''$

12/19/41

43



P.I. 545+43

$$\Delta = 9^{\circ}49' \text{ RT}$$

$$\frac{\Delta}{2} = 4^{\circ}54'30''$$

$$R = 1000$$

$$T = 85.86$$

$$T_0 = 86.55$$

$$L = 171.33$$

$$O/P = 1.719$$

$$O/S_0 = 1^{\circ}25'56''$$

B.C. 544+56.45

$$+00 \quad 43.55 \quad 43.91 \quad 1^{\circ}19'46''$$

$$545+50 \quad 50 \quad 50.4 \quad 2^{\circ}40'42''$$

$$546+00 \quad " \quad " \quad 4^{\circ}06'38''$$

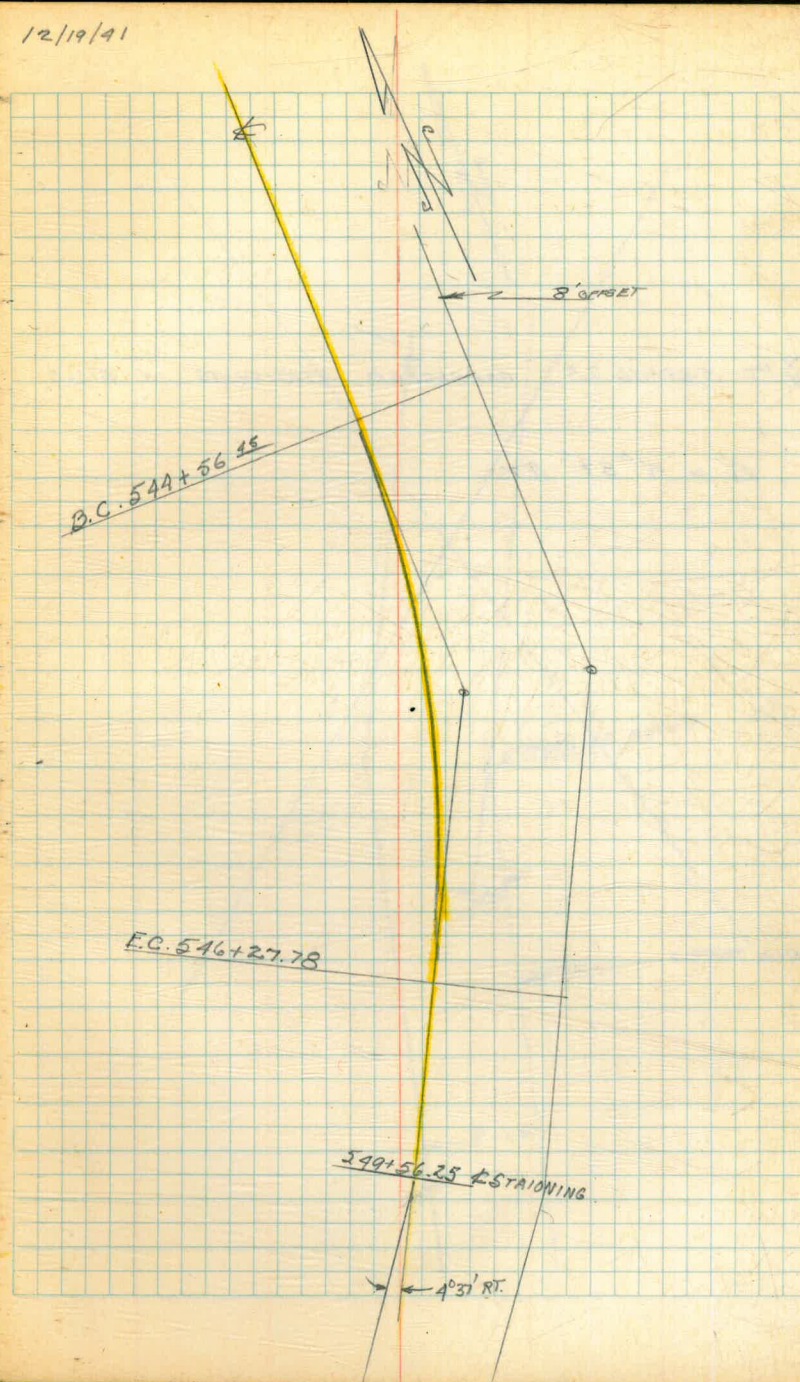
E.C. 546+27.78 27.78 28.0 4^{\circ}54'27''

X P.I. 549+56.25

$$\Delta = 4^{\circ}37' \text{ RT}$$

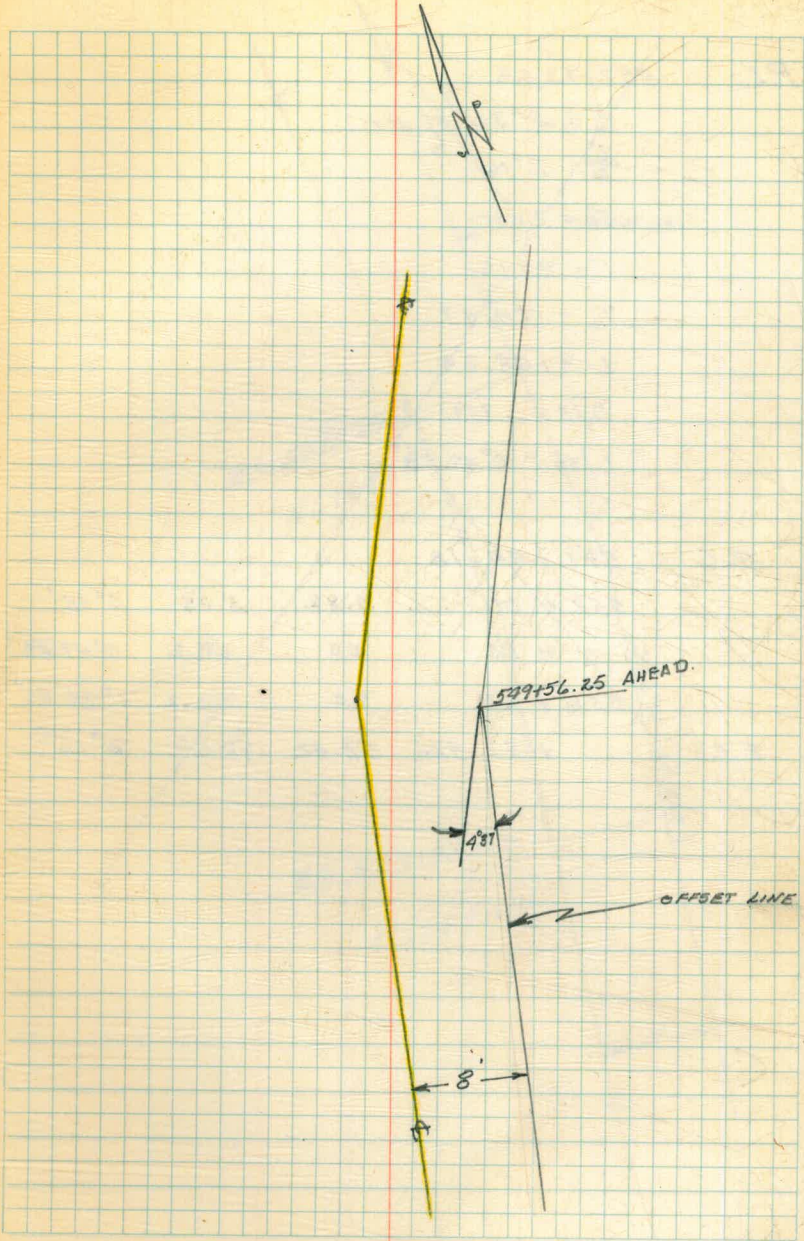
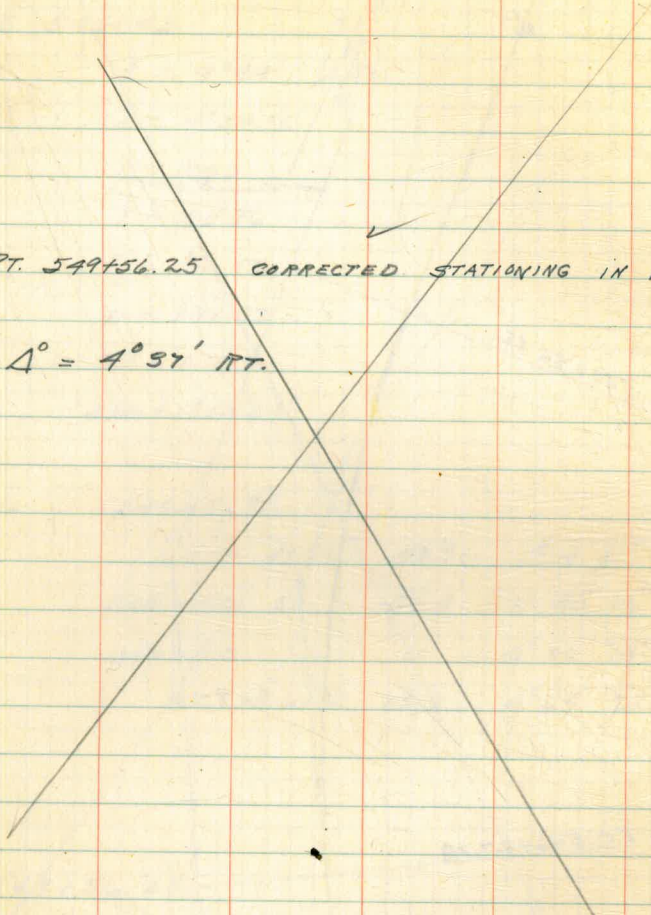
12/19/41

44



~~X~~ PT. 549456.25 CORRECTED STATIONING IN FIELD.

$\Delta^\circ = 4^\circ 37' \text{ RT.}$

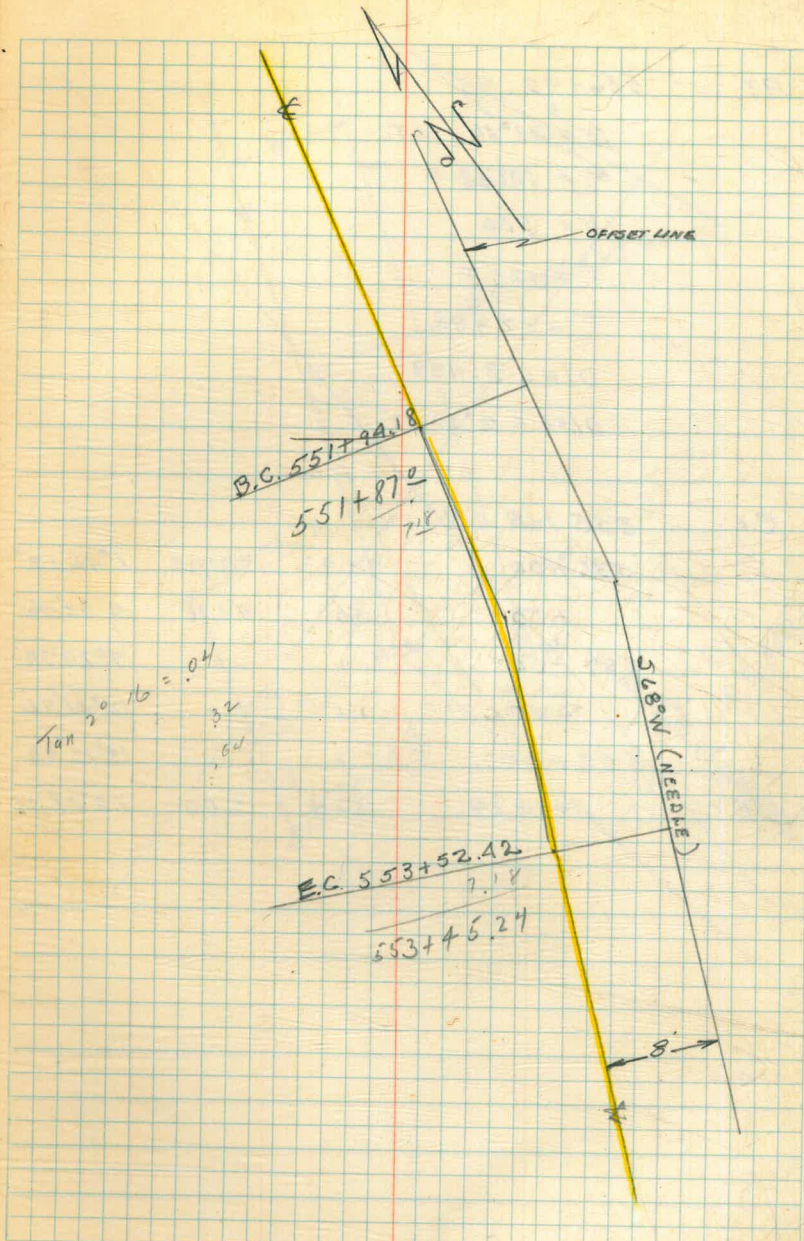


DEC 17, 1941

46

P.I. 552+73.65
 $\Delta = 4^{\circ}32'$ RT.
 $\frac{\Delta}{2} = 2^{\circ}16'$
 $R = 2000$
 $T = 79.16$
 $T_0 = 79.47$
 $L = 158.24$
 $D/P = .859$
 $D/50 = 0^{\circ}42'58''$

B.C.	551+94.18			
	552+00	5.82	5.85	$0^{\circ}05'$
	+50	50	50.2	$0^{\circ}47'58''$
	553+00	50	50.2	$1^{\circ}30'56''$
E.C.	+52.42	52.42	52.63	$2^{\circ}16'$

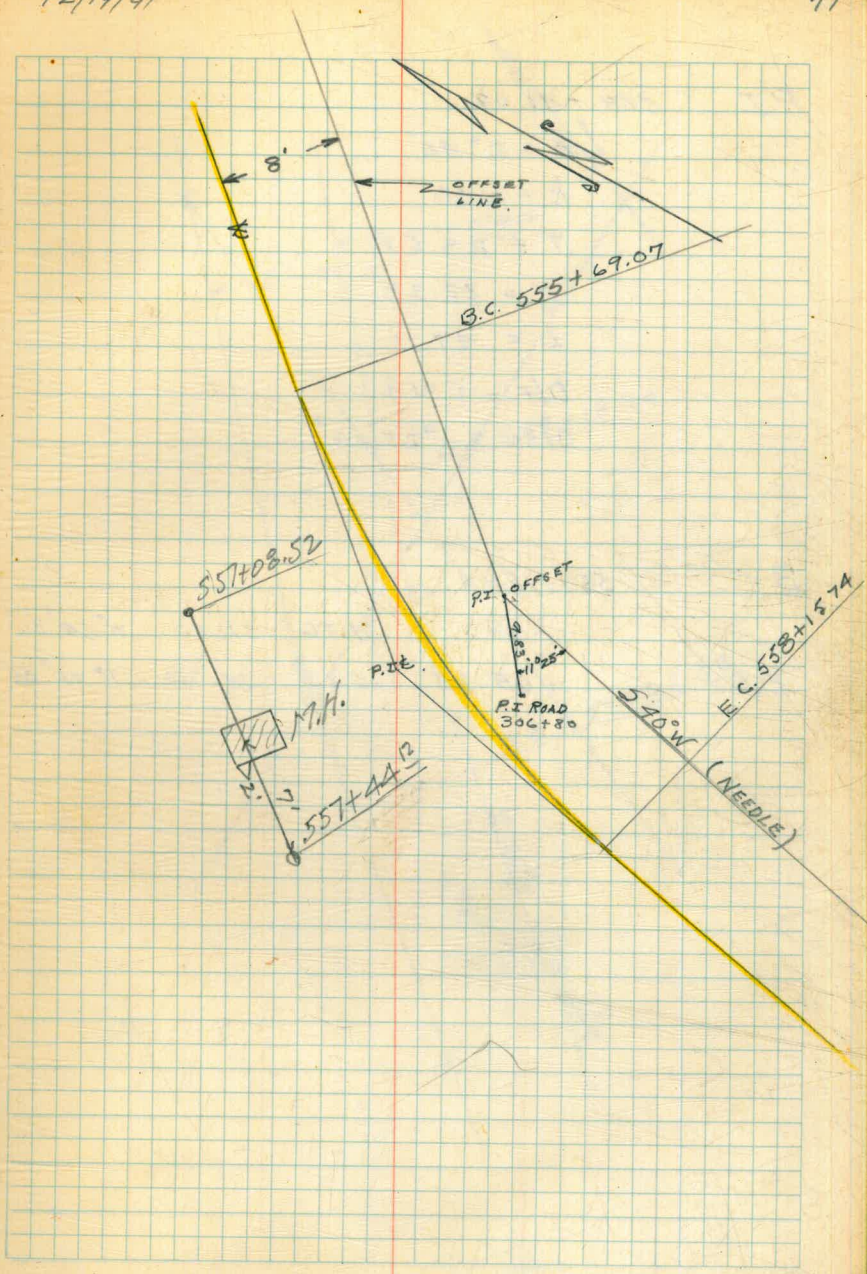


12/19/91

47

~~P.I. 556+92.95
 $\Delta = 28^{\circ}16'$ LT.
 $\frac{\Delta}{2} = 14^{\circ}08'$
 $R = 500$
 $T = 125.9$
 $T_0 = 123.88$
 $D/F = 3.438$
 $D/50 = 2^{\circ}51'53''$~~

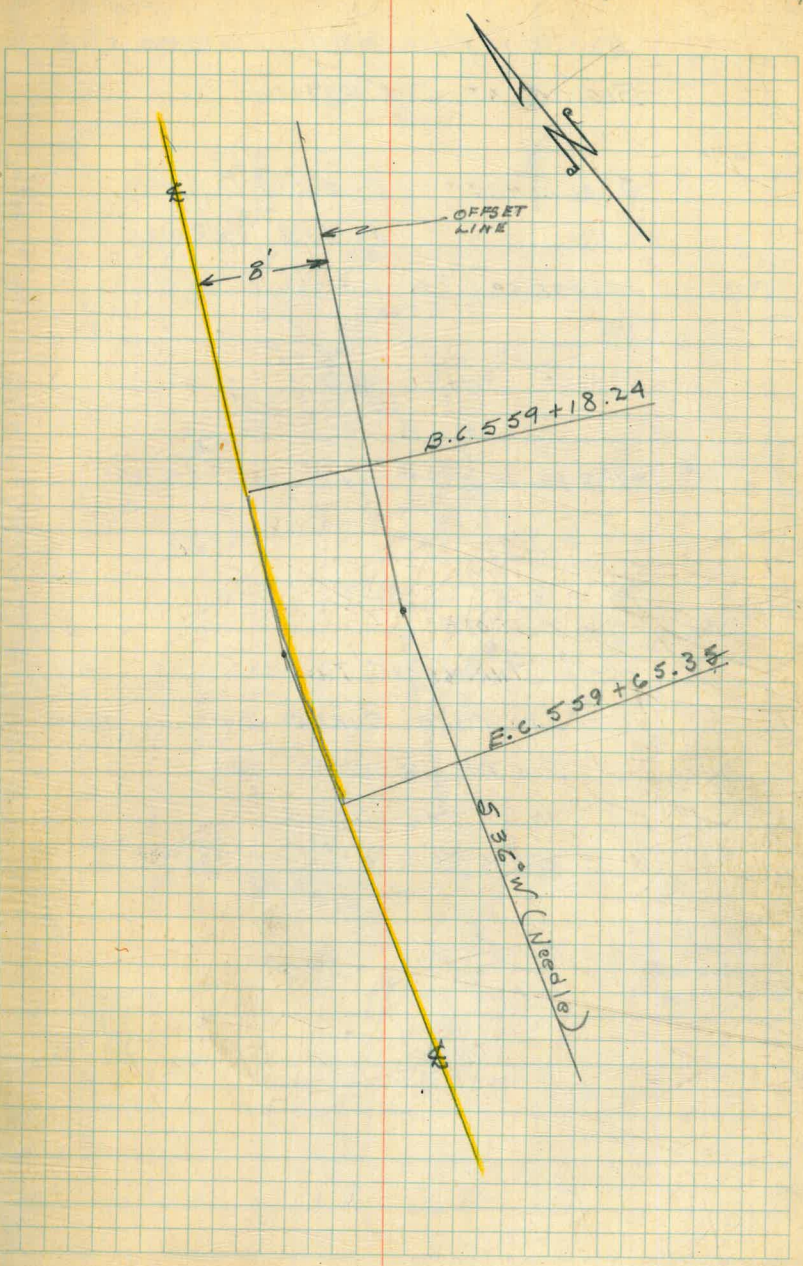
B.C.	555+69.07			
	556+00	30.93	30.45	$1^{\circ}46'13''$
	+50	50	49.18	$4^{\circ}38'06''$
	557+00	"	"	$7^{\circ}29'59''$
	+50	"	"	$10^{\circ}21'52''$
	558+00	"	"	$13^{\circ}13'45''$
F.C.	+15.74	15.74	15.50	$14^{\circ}08'01''$



P.I. 559+41.62
 $\Delta = 2^{\circ} 42'$
 $R = 1000$
 $T = 23.57$
 $T_0 = 23.38$
 $L = 47.11$
 $D/F = 1.719$
 $D/50 = 1^{\circ} 25' 56''$

B.C. 559+18.24
 +50 31.76 31.50 $0^{\circ} 54' 36''$
 E.C. +65.35 15.35 15.23 $1^{\circ} 20' 59''$

Sec pg
 . A9



REVISED ALIGNMENT LAKESIDE PIPE LINE
 BEGINNING AT STA. 497+08.69

ALIGNMENT $\Delta = 5^{\circ}30'41''$ $L = 74.40$
 $R = 775$ $L_c = 74.37$

B.C. 497+08.69 E.C. OFF CH.

497+50 41.31 40.9 1032'

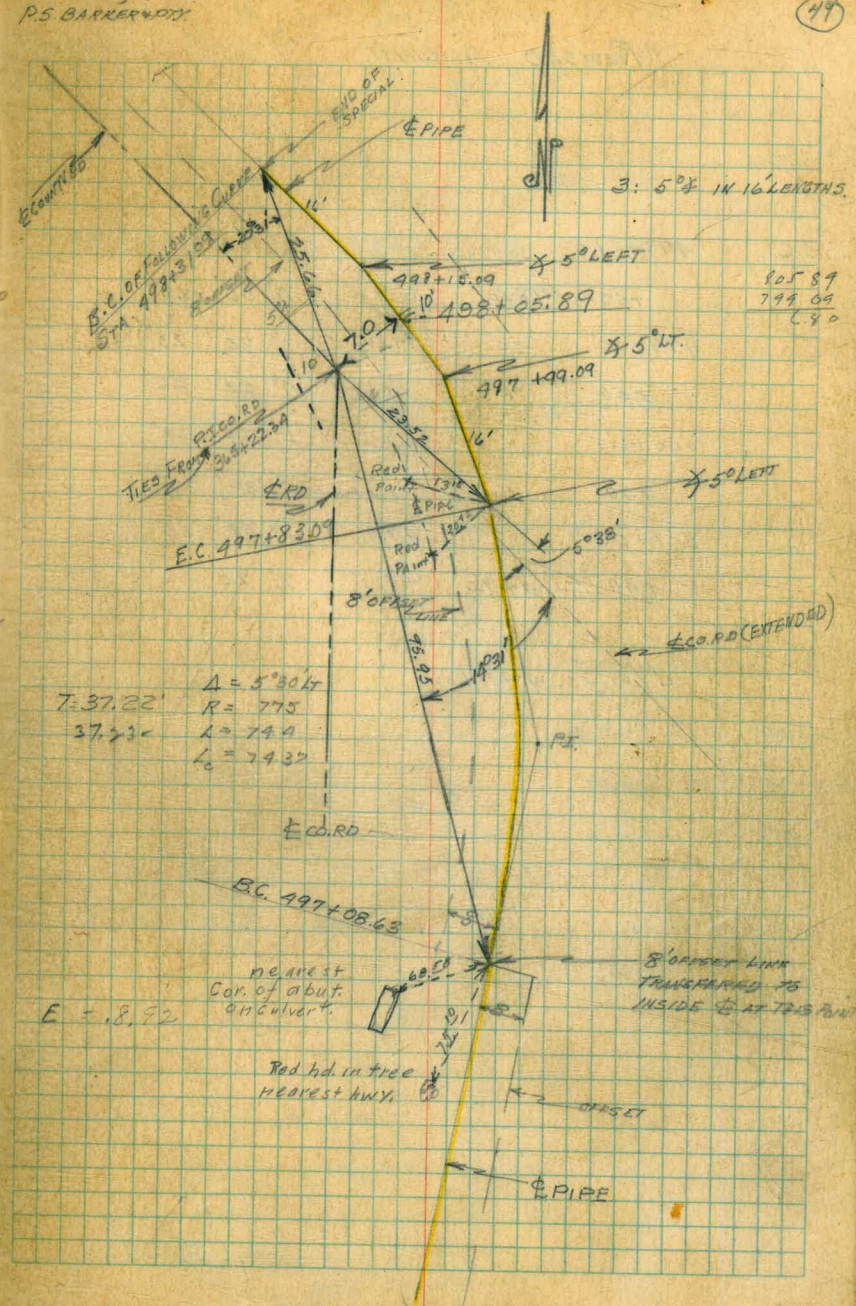
E.C. 497+83.09 33.09 32.8 2°45'

NOTE:
 THROUGHOUT THIS
 REVISED SURVEY BOTH
 THE Δ & THE 8' OFFSET WERE
 RAN ON THE GROUND -
 (WHITEHEADS FOR Δ) (PREDTORS' OFF)

36407.94
 114.40
 36522.34

DEC. 29 1941
 P.S. BARKER & CO.

49



$\Delta = 5^{\circ}30'41''$
 $R = 775$
 $L = 74.40$
 $L_c = 74.37$

E = 18.92

REVISED ALIGNMENT

B.C.	498+31.09	BACK = 498+28.90	AHEAD (W.O.B)
+50	18.91	18.90	0° 08' 20"
499+00	50	49.9	0° 30' 23"
+50	"	"	0° 52' 26"
500+00	"	"	1° 14' 29"
+50	"	"	1° 36' 32"
501+00	"	49.9	1° 58' 35"
+44.72	44.72	44.6	2° 20'

$d/r = .4409$

$.0814487 \times 3875.5$

12/29/41

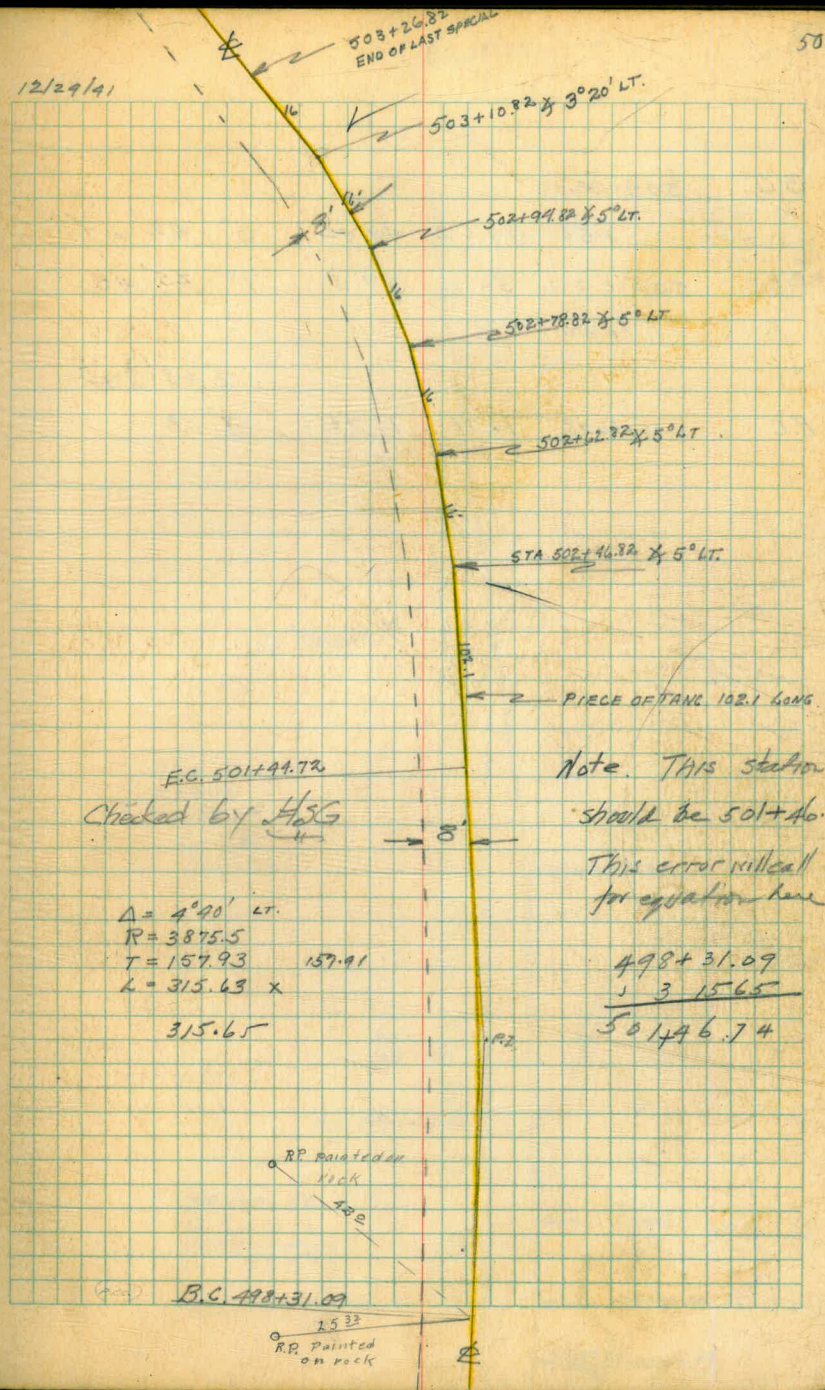


FIG. 501+44.72
Checked by HSG

$\Delta = 4^{\circ} 40' \text{ LT.}$
 $R = 3875.5$
 $T = 157.93$
 $L = 315.63 \times$
 315.65

B.C.	504+00.38			
	+50	49.62	49.92	0° 42' 47"
	505+00	50	49.8	1° 25' 45"
	+50	"	"	
				2° 08' 43"
E.C.	505+66.78	16.78	16.70	2° 23'

12/29/21

B.C. 509+11

(5)

509 11
505 66.78
344.22

F.C. 505+66.78

$\Delta = 4^\circ 46'$ Lt.
 $R = 2000$
 $T = 83.29$ ✓
 $L = 166.4$
 166.39

P.I. 504+83.62

R.P. Red head
in SYC. tree

R.P. Painted
on rock
2/20

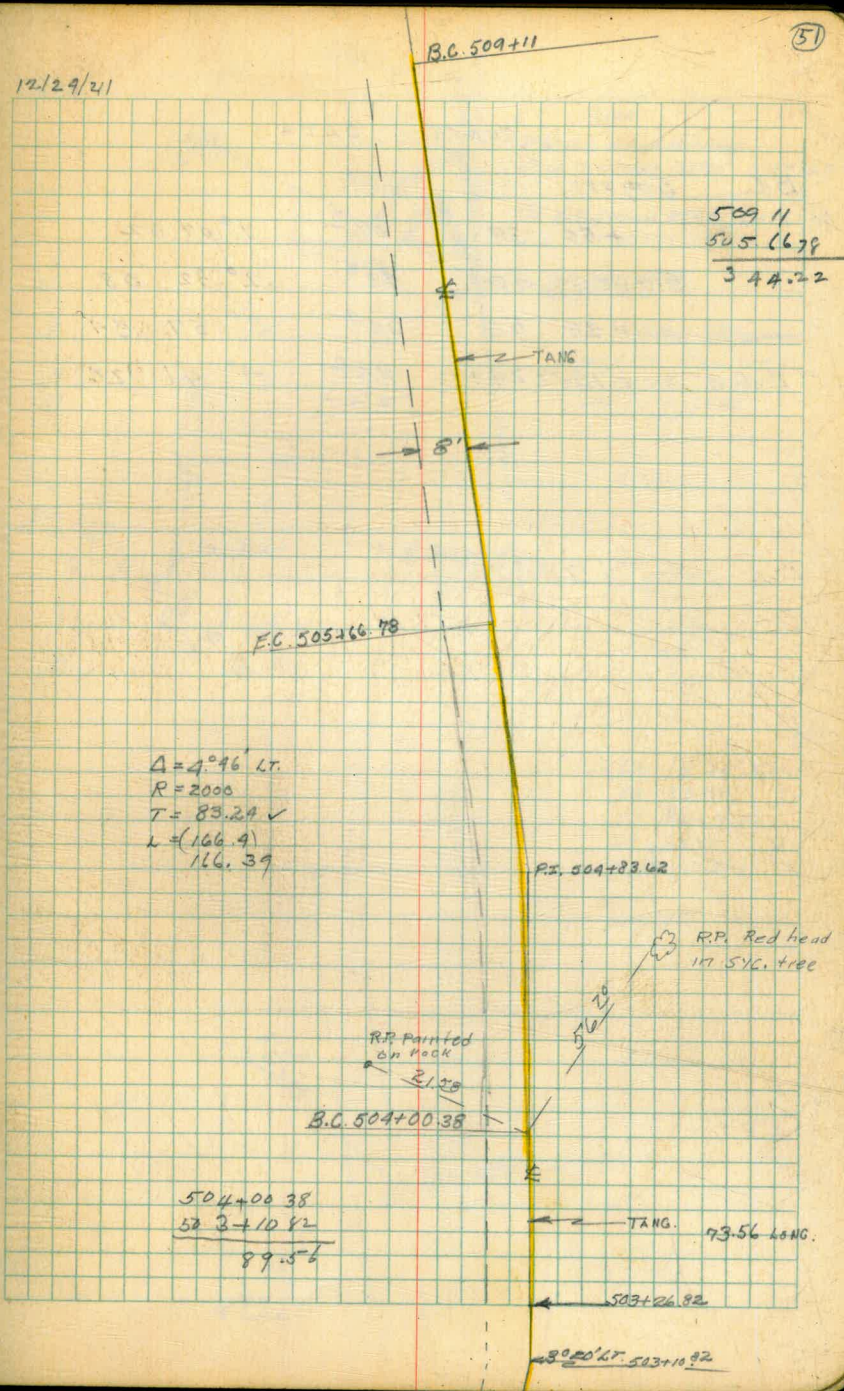
B.C. 504+00.38

504+00.38
523+10.42
89.56

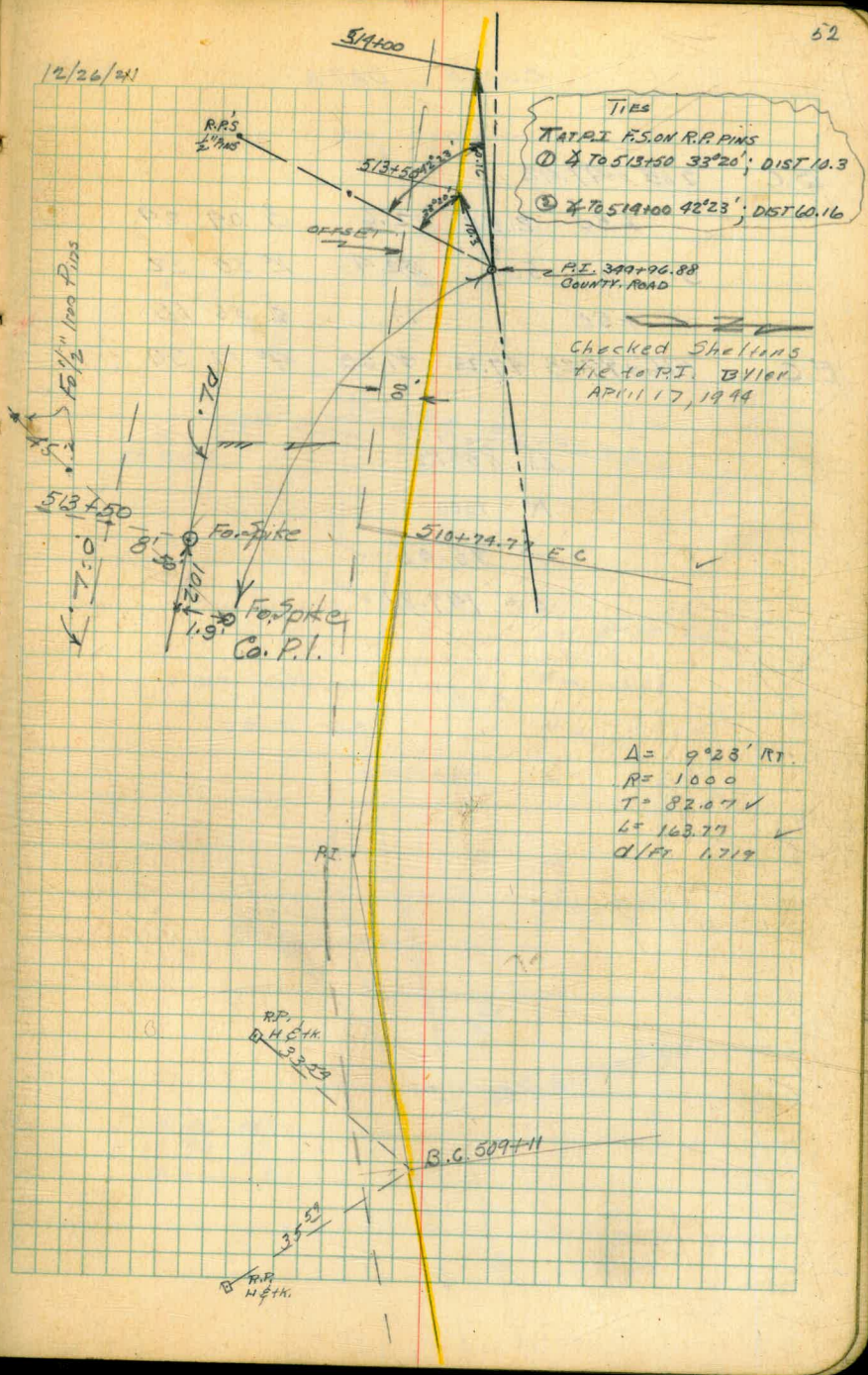
TANG. 93.56 LONG.

503+26.82

48° 20' Lt. 503+10.92



	CURVE	DATA	
BC	509+11		
	+50	39	39 ³ 1° 07' 02"
	510+00	50	50 ² 2° 32' 58"
	+50	50	50 ² 3° 57' 54"
E.C.	+74.77	29.77	25° 4° 41' 26"



CURVE DATA

B.C. 515+47.42
 +50 2.58 2.6 8° 09' 29"
 516+00 50 50.9 1° 30' 22"
 +50 19.5 2° 56' 15"
 E.C. 516+97.23 47.23 47.60 4° 17' 30"

Δ 8° 35' RT

R 1000

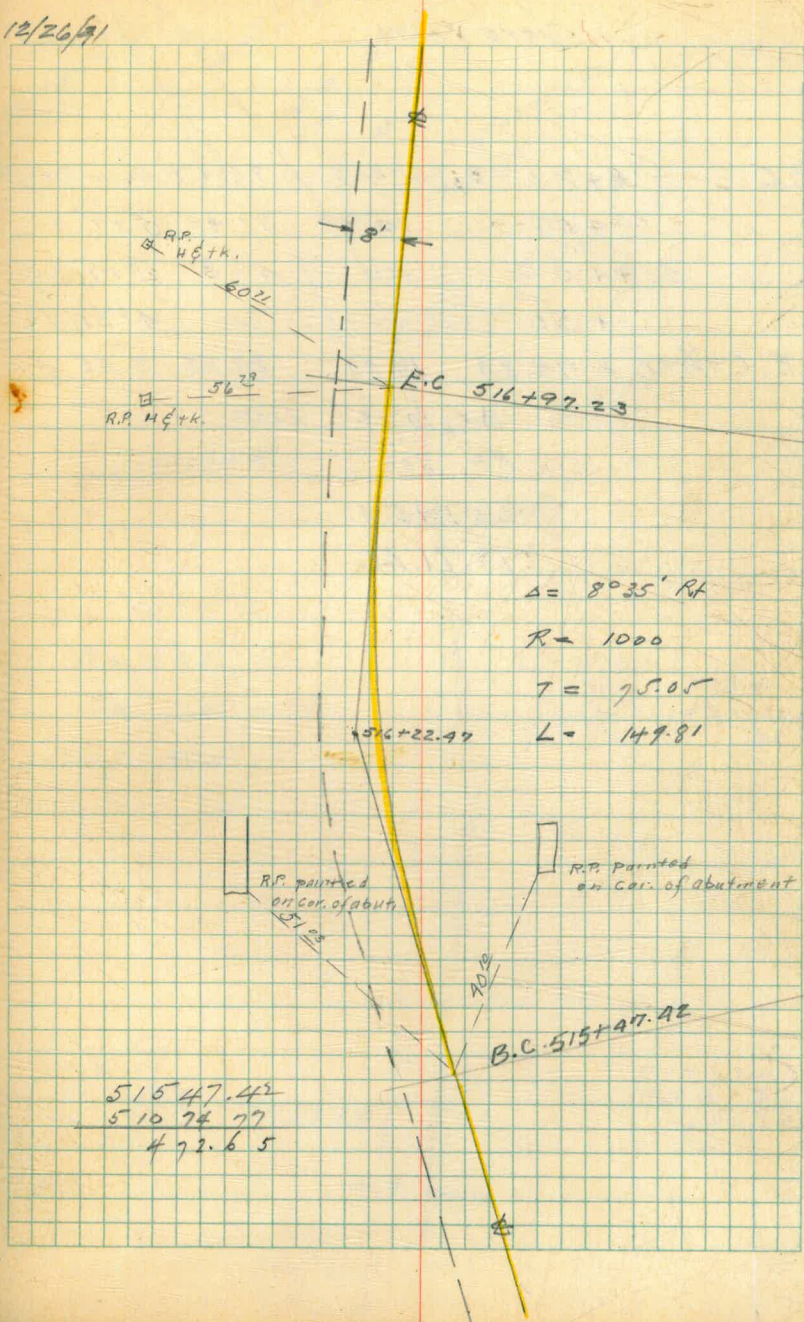
T 75.05 ✓

L = 149.81 ✓

4° 20' Total def. ahead from

B.C. Byler

12/26/91



$\Delta = 8^{\circ} 35' \text{ RT}$

R = 1000

T = 75.05

L = 149.81

CURVE DATA

B.C 518+37.43 ahead = 518+34.71 Back (Byler)

+50	12.57	12.45	0°27'09"
519+00	50	49.5	2°17'30"
+50	"	"	1°01'56"

E.C + P.T. + 79.84 29.84 29.55 5°05'59"

$\Delta = 10^{\circ}12'$ LEFT

R = 800

L = 142.41

T = 71.40

$\Delta = 10^{\circ}12' L$

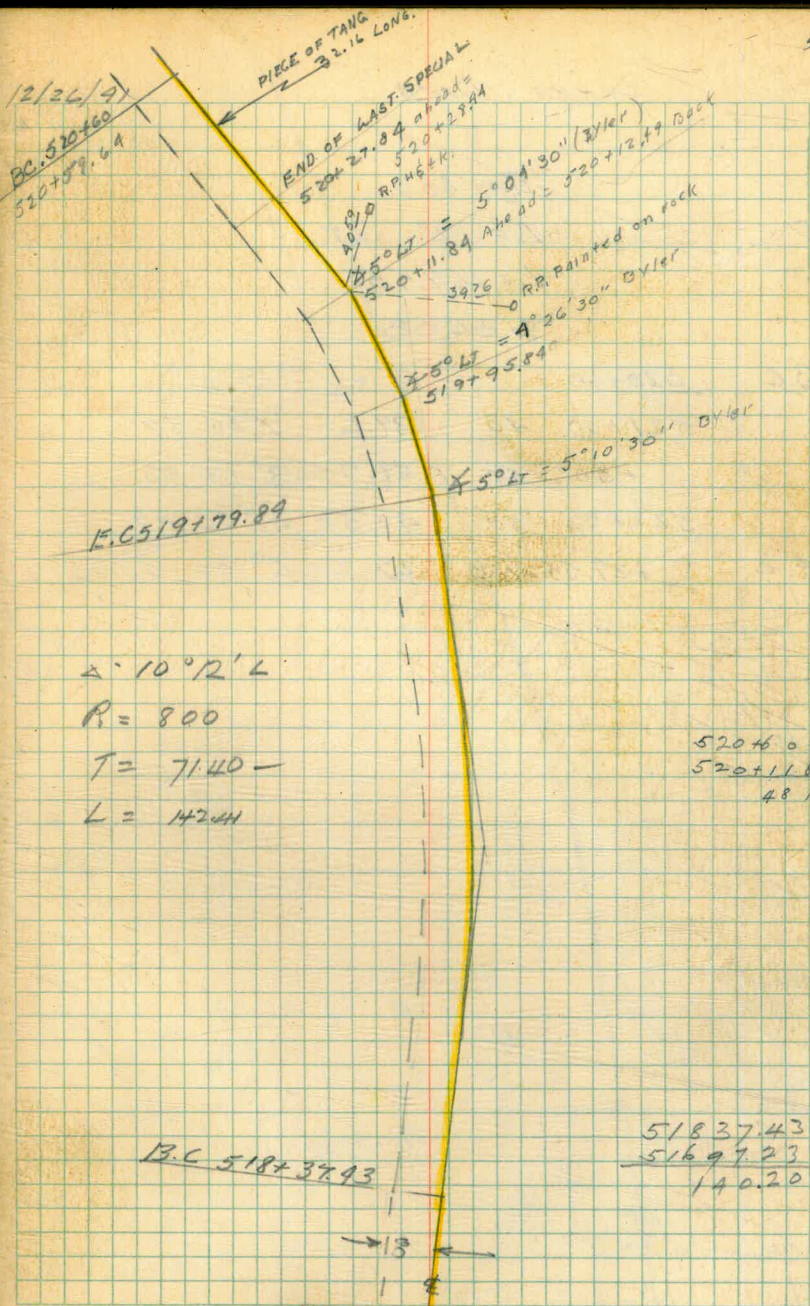
R = 800

T = 71.40

L = 142.41

B.C 518+37.43

51837.43
51699.23
140.20



CURVE DATA

$R = 800$

$\Delta = 12^\circ$ LT.

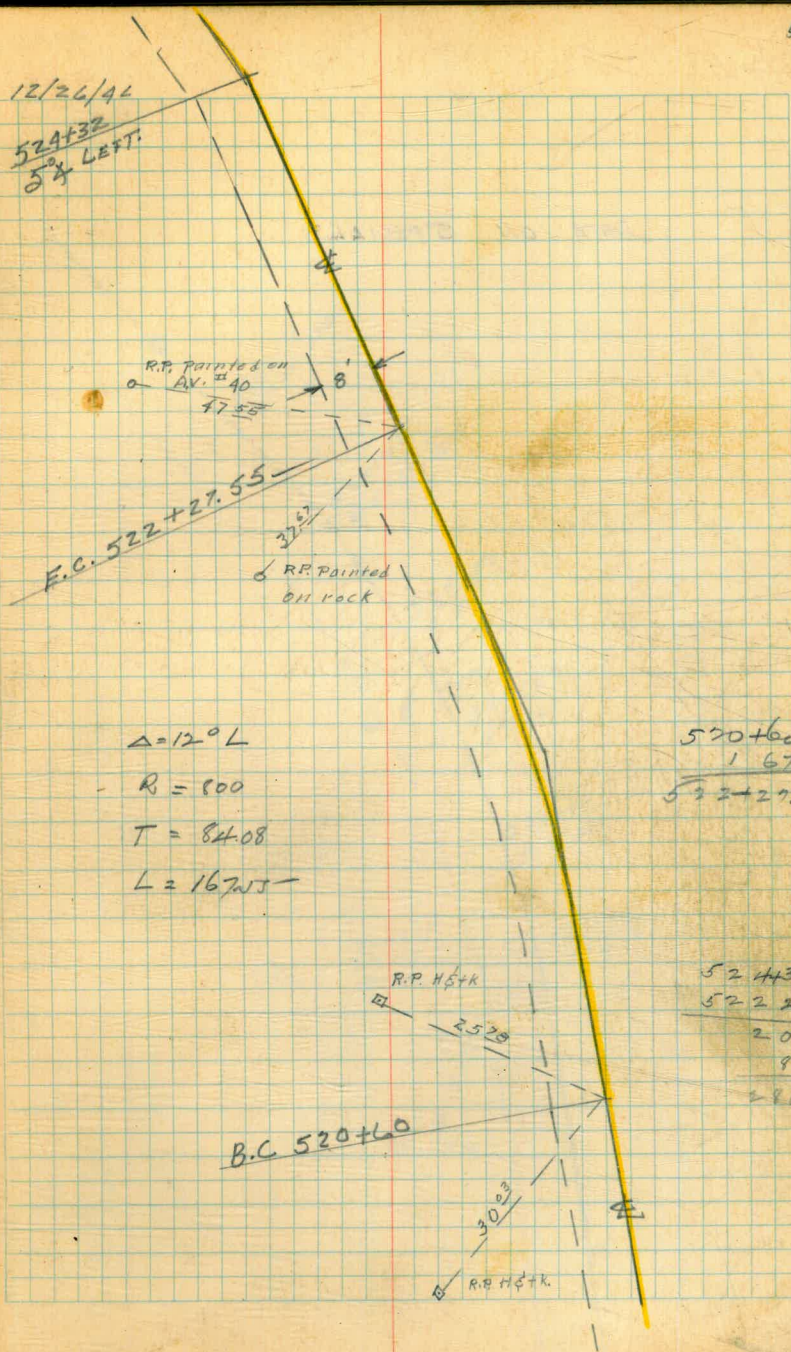
$L = 167.55$

$T = 84.08$

BC	520+60			
	521+00	40	39.6	$1^\circ 25' 57''$
	+50	50	49.5	$3^\circ 13' 23''$
	522+00	50	49.5	$5^\circ 00' 49''$
E.C.	+27.55	27.55	27.2	$6^\circ 00' 00''$

20+2302
16755
2130.57

12/26/46
529+32
5° LEFT



$\Delta = 12^\circ L$

$R = 800$

$T = 84.08$

$L = 167.55$

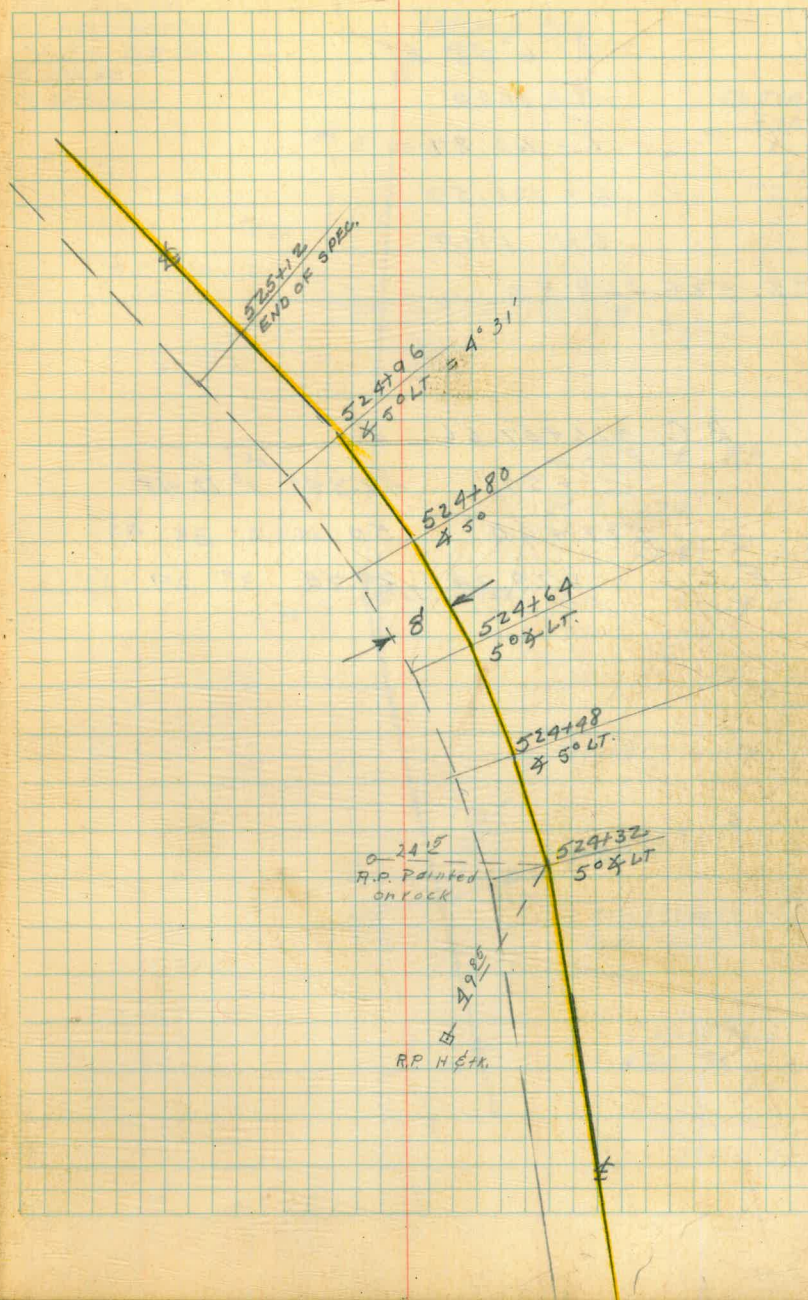
520+60
+ 167.55
522+27.55

522+27.55 ✓
522+27.55
+ 204.15
524+52.65
288.53

DATA ON SPECIALS

12/27/41

36



$$\Delta = 6^{\circ} 58' \text{ RT}$$

$$R = 1000$$

$$T = 60.87$$

$$L = 121.59$$

$$D/F \ 1.719$$

$$P.I. \ 526+68.53$$

$$B.C. \ 526+07.66 \ \text{Ech.}$$

$$+50 \quad 42.34^{\circ} \quad 10 \ 12 \ 48$$

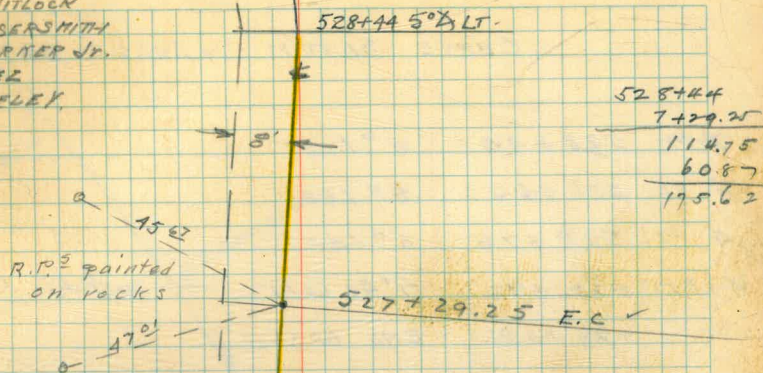
$$527+00 \quad 50=50.42^{\circ} \ 38 \ 44$$

$$E.C. \quad +29.25 \quad 29.25 \quad 3^{\circ} \ 29' = 333' 30''$$

BY 1/1

12/27/41
P.S. BARKER
A.M. WHITLOCK
E.A. HESSERSMITH
P.S. BARKER JR.
A. GOMEZ
F. GREELEY

(57)



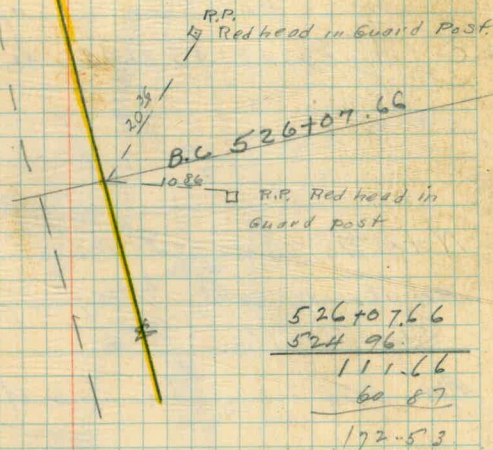
$$\Delta = 6^{\circ} 58' \text{ RT}$$

$$R = 1000$$

$$T = 60.87 \checkmark$$

$$L = 121.59 \checkmark$$

$$P.I. = 526+68.53$$



CURVE DATUM + ANGLE DATA

* PT. 528+44 5° LEFT
 * PT. 528+60 5° LEFT
 * PT. 528+76 5° LEFT
 * PT. 528+92 4°40' LEFT — checked 5°
 529+08 END OF SPEC.

$\Delta = 13^{\circ}51'$ $L = 193.37'$
 $R = 800$ $T = 97.17'$

B.C	530+88.08			
	531+00	11.92	11.82	0° 25' 46"
	+50	50	49.5	2° 13' 11"
	532+00	"	"	4° 00' 36"
	+50	"	"	5° 48'

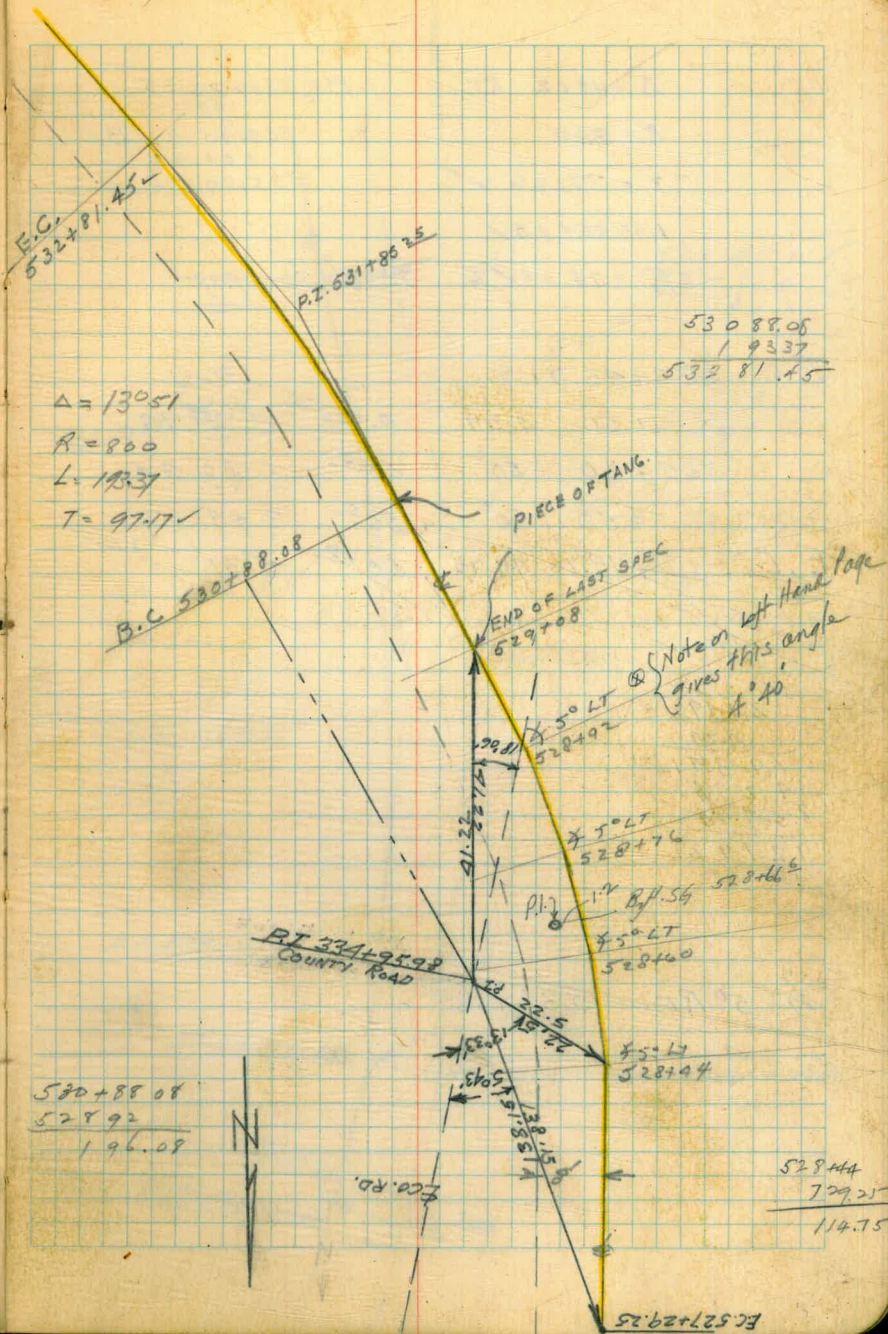
E.C 532+81.45 31.45 31.15 6° 55' 27"

Note Tie shown from County P.I. to 528+44 is an obvious error, it probably should be from Stn 528+60.

23 Apr. H.S.G. locates P.I. as 120' L. of Stn 528+60

12/27/41/

58



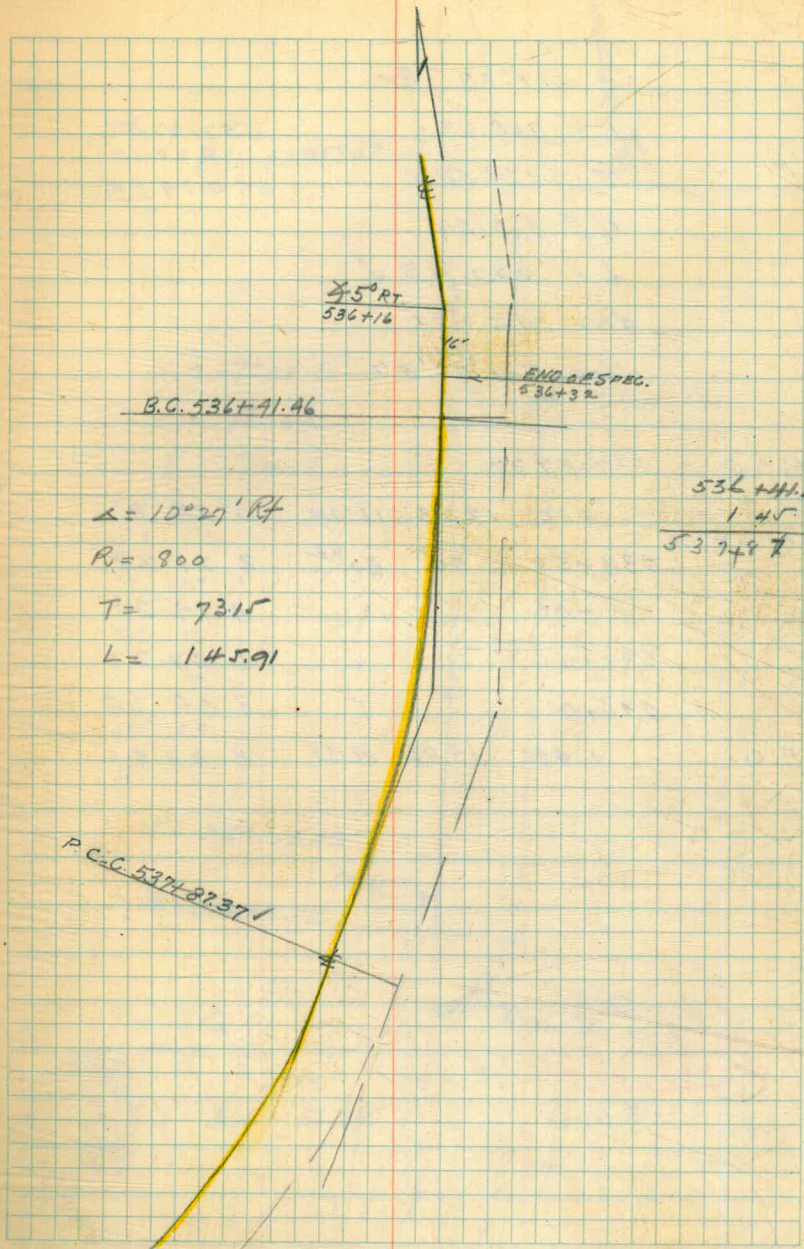
$R=800 \Delta=10^{\circ}27' Rt$
 $T=73.89 \quad L=145.91$
 73.15

B.C	536+41.46			
	+50	8.54	8.42	0'18"21"
	537+00	50°	50.5	2'05"47"
	+50	50°	50.5	3'53"13"
E.C	+87.37	37.37	37.7	5'13"31"

2.149
 $\underline{864}$
 8596
 10745
 $\underline{1719.2}$
 1835246

12/29/41

20



$\Delta=10^{\circ}27' Rt$
 $R=800$
 $T=73.15$
 $L=145.91$

$536+41.46$
 145.91
 $\underline{537+87.37}$

12/29/41

61

$\Delta = 17^{\circ}08' \text{ RT}$

$R = 760.63$

$T = 114.58 \checkmark$

$T_0 = 115.80$

$L = 227.45 \checkmark$

$d/ft = 2.259$

$d/ft = 1^{\circ}52'57''$

537+87.37

227.45

540+14.82

P.C.C. 537+87.37

+00	12.63	12.7A	0° 28' 31"
538+50	50°	50 ⁵³	2 21 28"
+00	"	"	4 14 25"
539+50	"	"	6 07 22"
540+00	"	"	8 00 19"
E.C.	+14.82	14.82	14.95
			8 33 45"

P.C.C. 537+87.37

$\Delta = 17^{\circ}08' \text{ R}$

$R = 760.63$

$T = 114.58$

$L = 227.45$

537+87.37

227.45

540+14.82

E.C. 540+14.82

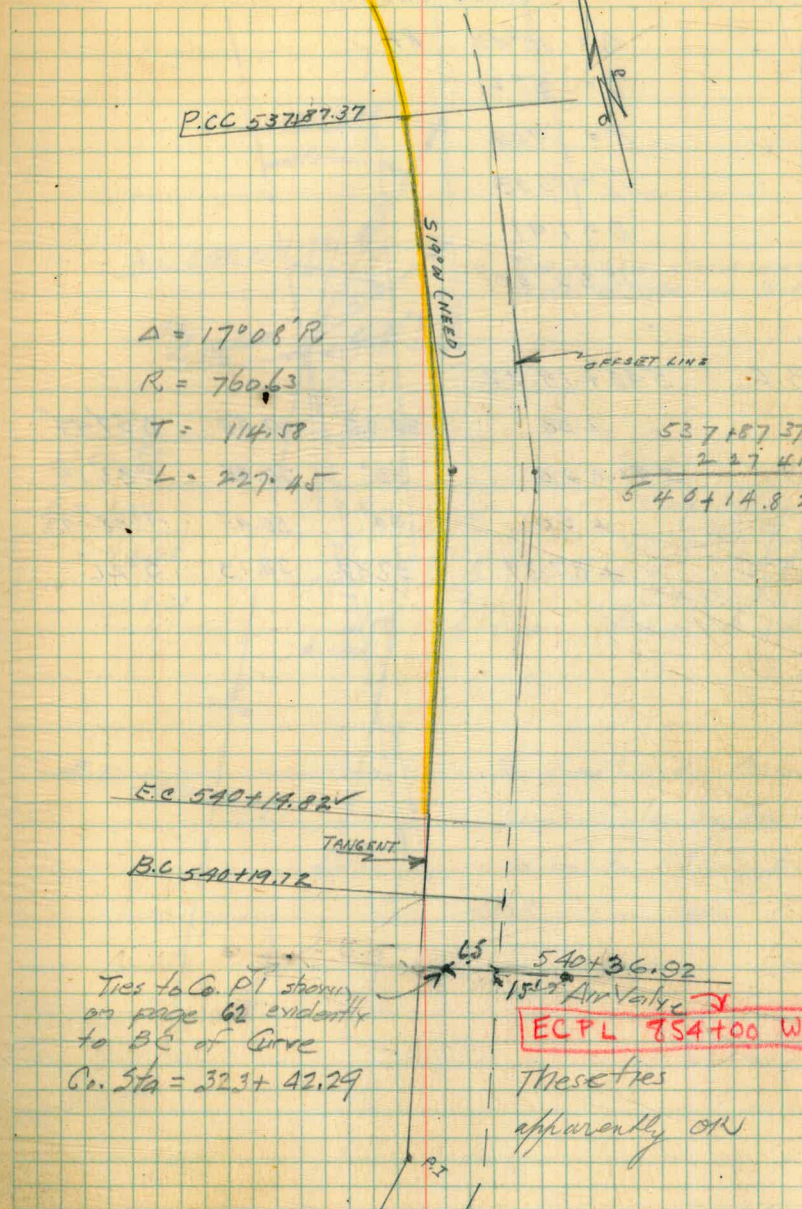
TANGENT

B.C. 540+19.72

Ties to Co. PI shown
on page 62 evidently
to B.C. of Curve
Co. Sta = 323+42.29

ECPL 754+00 WB

These ties
apparently OK



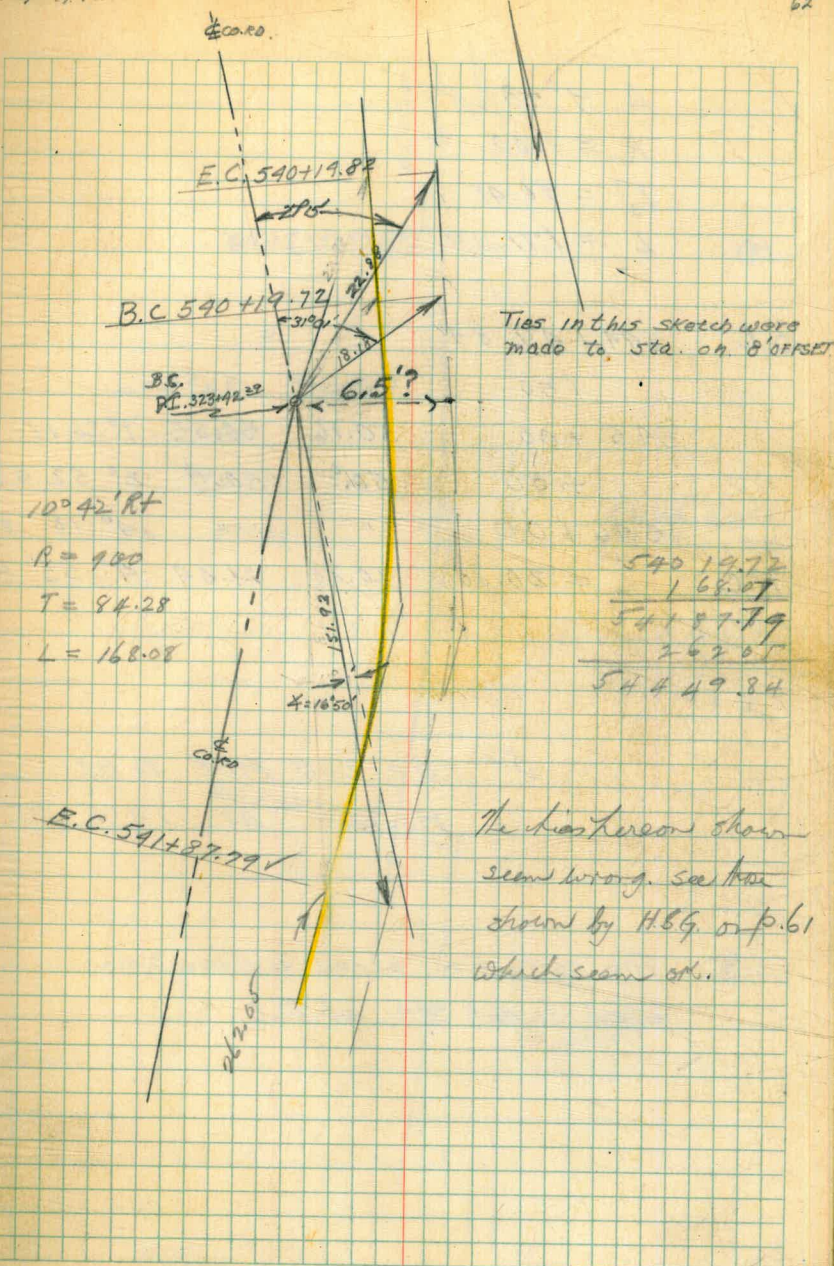
CURVE DATUM

$\Delta = 10^{\circ}42'$ Rt.
 $\frac{\Delta}{2} = 5^{\circ}21'$
 $R = 900$
 $T_0 = 85.03$
 $D = 1.91$
 $1^{\circ}35'30''$

B.C.	540+19.72			
	+ 50	30.78	30.58	0°57'49"
	541+00	50°	50.45	2°33'19"
	+ 50	50°	50.45	4°08'49"
E.C.	+ 87.79	37.37	38.13	5°21'

12/29/91

62



12/29/41

63

$$\Delta = 9^{\circ}48' \text{ PT.}$$

$$R = 1000$$

$$T_0 = 86.41$$

$$\textcircled{*} L = \textcircled{171.09} \times 171.04$$

B.C. 544+49.84

+50

545+00 50.16 50.55 1°26'11"

+50 50.0 50.9 2°52'08"

546+00 " " 4°18'05"

E.C. +20.88 20.88 21.04 4°53'59"

547+50 OLD PIPE TO BE

MOVED AT THIS PT

⊗ The correct L. seems to have been used to get sta at E.C.

B.C. 544+49.84

R.

$$\Delta = 9^{\circ}48' \quad \frac{\Delta}{2} = 4^{\circ}54'$$

$$R = 1000$$

$$T = 85.93$$

$$L = 171.04$$

E.C. 546+20.88

$$\begin{array}{r} 5444 \quad 49.84 \\ 5417 \quad 87.79 \\ \hline 272.05 \end{array}$$

$$\begin{array}{r} 544 \quad 49.84 \\ 1 \quad 171.04 \\ \hline 546 \quad 20.88 \end{array}$$

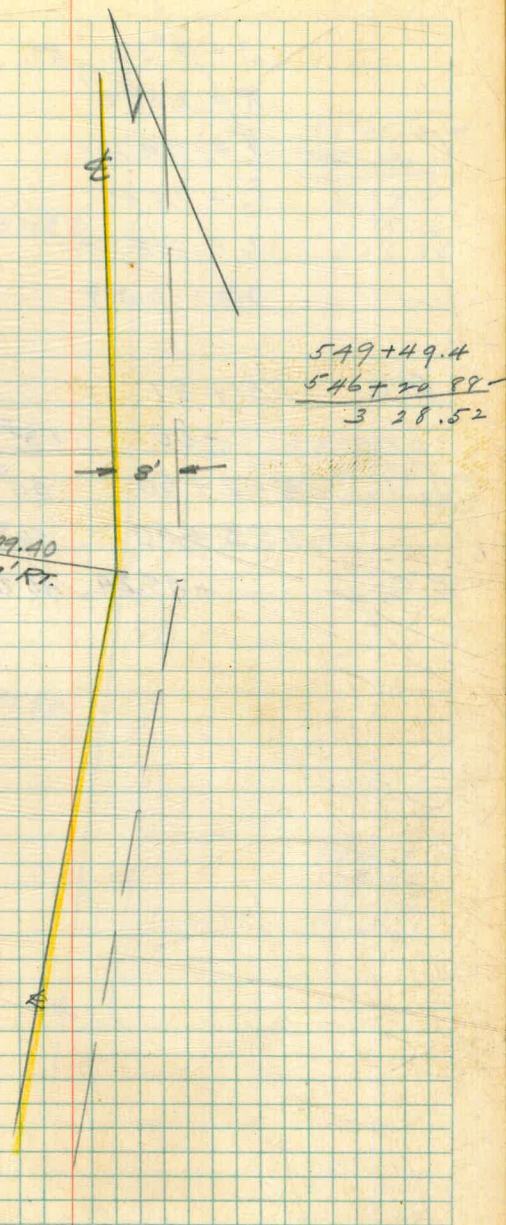
55187
54949.40
023560

12/29/41

64

P.I. 549+49.4 \times 4037' RT

CORRECTION FOR CHAINING
MADE IN THE FIELD.



$$\Delta = 6^{\circ} 02' \text{ Lt.}$$

$$R = 1000$$

$$T = 52.7 \checkmark$$

$$L = 105.3 \checkmark$$

$$B.C. = 557+49.12$$

$$+ 50 \quad 5.88 \quad 585 \quad 8^{\circ} 10' 06''$$

$$558+00 \quad 50 \quad 49.6 \quad 10^{\circ} 36' 02''$$

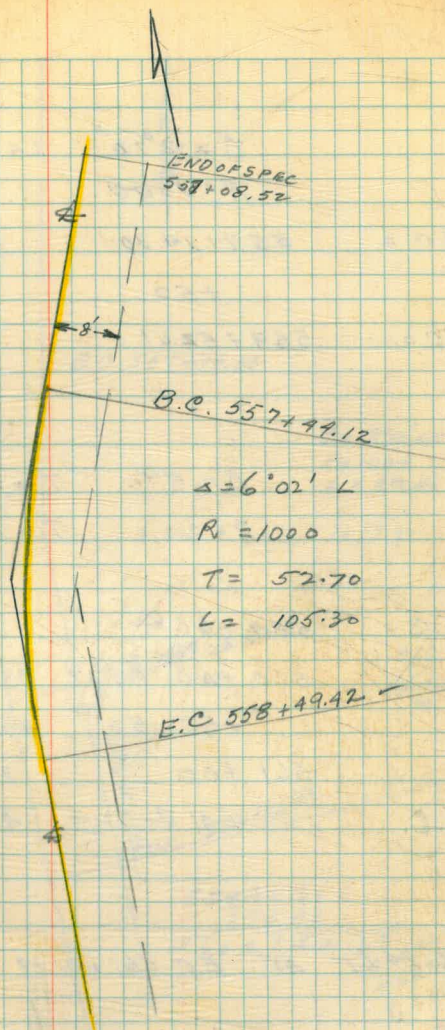
$$E.C. \quad + 49.42 \quad 49.42 \quad 49.03 \quad 3^{\circ} 00' 59''$$

12/29/41

67

$$\begin{array}{r} 557+49.12 \checkmark \\ \underline{49.52} \\ 51.60 \\ \underline{52.70} \\ 104.30 \end{array}$$

$$\begin{array}{r} 557+49.12 \\ \underline{105.30} \\ 558+49.42 \end{array}$$



$$B.C. 557+49.12$$

$$\Delta = 6^{\circ} 02' L$$

$$R = 1000$$

$$T = 52.70$$

$$L = 105.30$$

$$E.C. 558+49.42 \checkmark$$

$$\Delta = 2^{\circ}10' \quad L = 37.81$$

$$R = 1000$$

$$B.C. = 559+14.80$$

$$+50$$

$$E.C. = 559+52.61$$

$$\Delta = 5^{\circ} \quad T_0 = 86.98 \quad D/A = .85949$$

$$R = 2000 \quad T = 87.32 \checkmark$$

$$B.C. = 559+66.66$$

$$560+00 \quad 33.37 \quad 33.25 \quad 0^{\circ} \quad 28 \quad 42$$

$$+50 \quad 50^{\circ} \quad 49.80 \quad 1^{\circ} \quad 11 \quad 42$$

$$561+00 \quad " \quad " \quad 1^{\circ} \quad 59 \quad 42$$

$$E.C. \quad +41.19 \quad 41.19 \quad 41.01 \quad 2^{\circ} \quad 30'$$

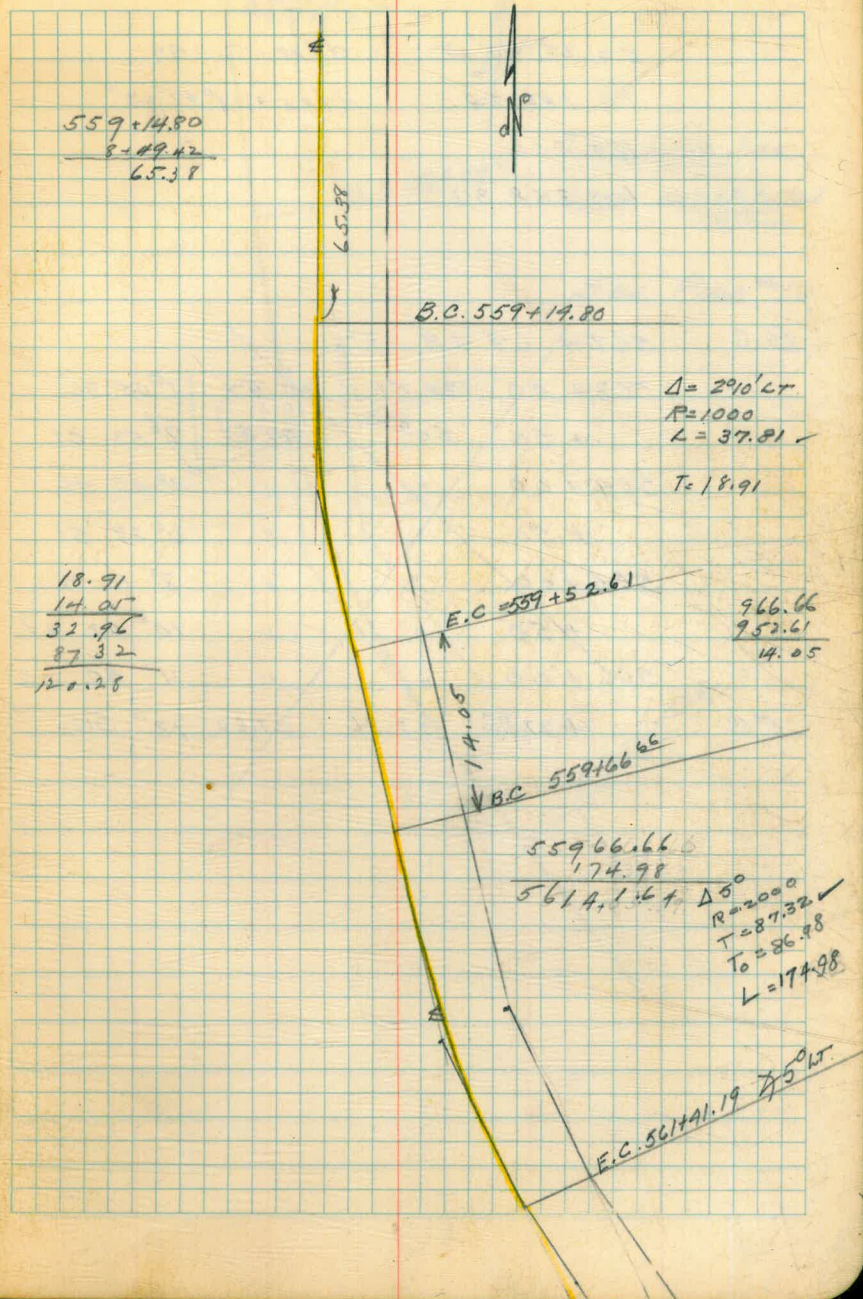
$\times 5^{\circ} LT$ AT E.C. 561+41.19

$\times 5^{\circ} LT$ AT STA 561+57.19

$\times 3^{\circ}37' LT$ AT STA 561+73.19

12/30/41

68



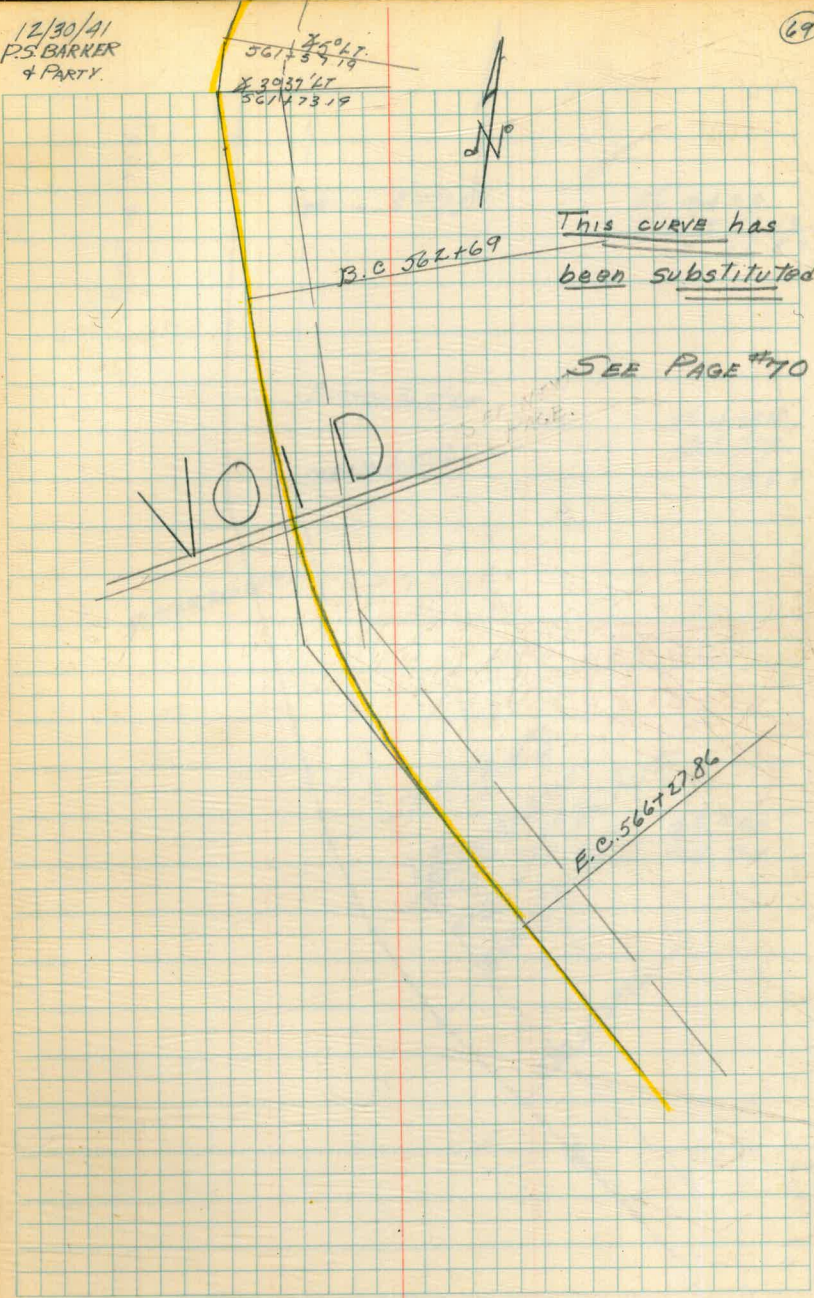
$\Delta = 25^{\circ}40'27''$ $d/PT = 2.199$
 $T = 182.24$ $d/50 = 1^{\circ}47'25''$
 $R = 800$
 $L = 358.37$

B.C.	562+69.49			
	563+00	30.51	30.21	1^{\circ}05'36''
	+50	50^{\circ}	49.5	2^{\circ}53'01''
	564+00	"	"	4^{\circ}40'46''
	+50	"	"	6^{\circ}27'51''
	565+00	"	"	8^{\circ}15'16''
	+50	"	"	10^{\circ}02'41''
	566+00	"	"	11^{\circ}50'06''
E.C.	+27.86	27.86	27.60	12^{\circ}50'

12/30/41
 P.S. BARKER
 & PARTY.

~~561+54.19~~
~~250' LT.~~
~~3032' LT.~~
~~561+73.19~~

(69)



12/30/41

70

(516006.00 ft)

80 FT SET
LINE

564400
56173.19
2 26.81

564100 X 5° LT

564184
64716
.68.0

564116 X 5° LT

564132 END SPEC.

ECPL
878+50 WB

564184 X 5° LT

B.O. # 29
CONC. M.H.

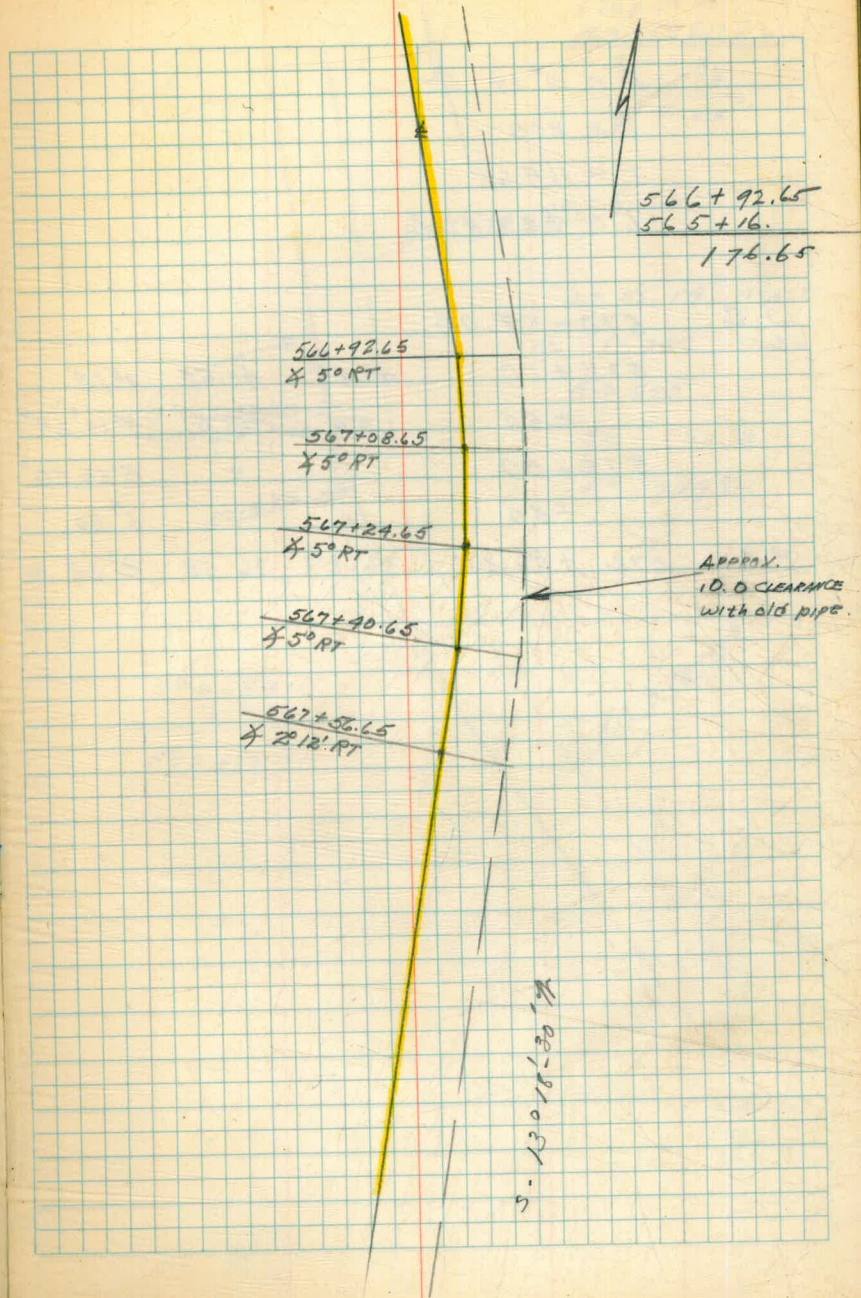
36" Pipe
6'

565116 X 5° LT

END OF SPEC.

12/30/41

71



$$\Delta = 16^{\circ}19' \text{ LT}$$

$$R = 800$$

$$T = 114.69$$

$$L = 227.82 \checkmark$$

B.C. 570+59.05

571+00 40.95 40.55 10'28"

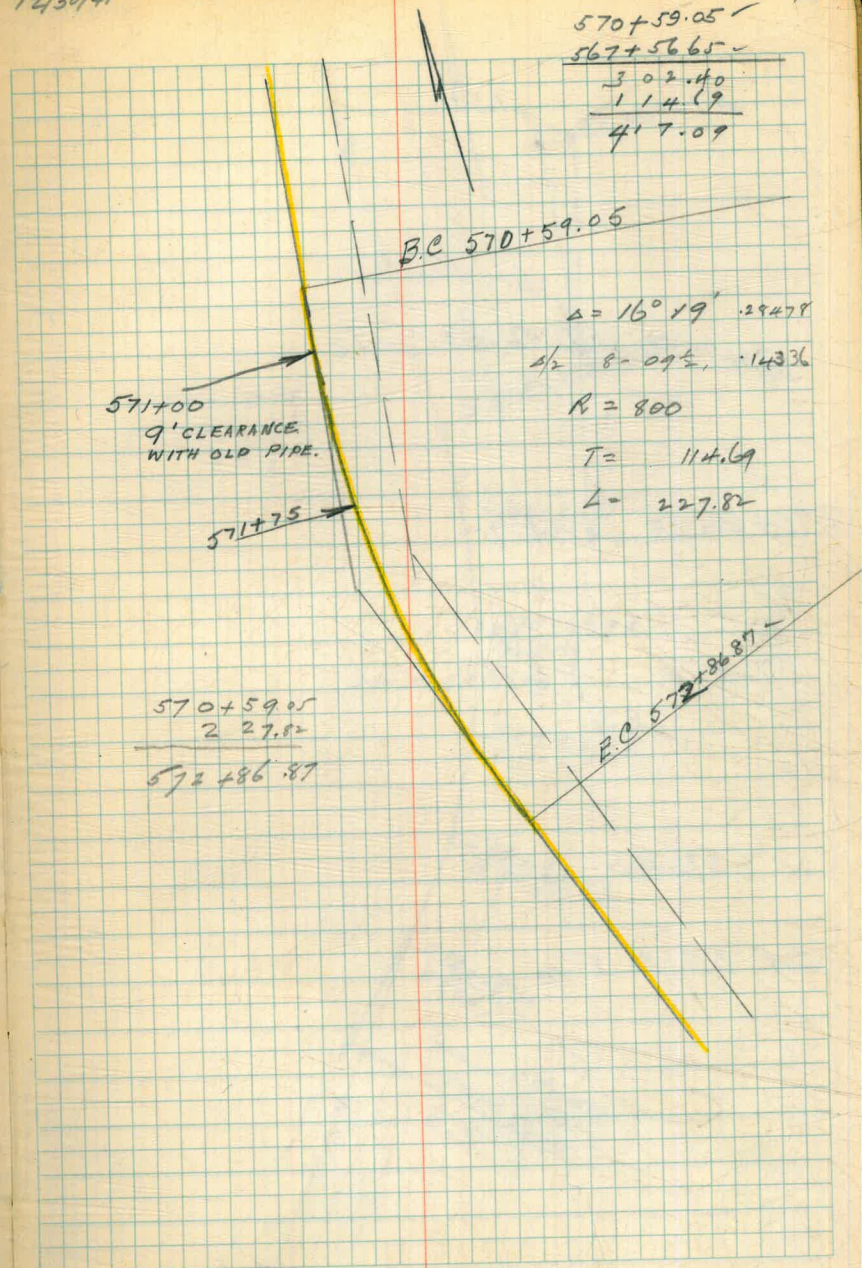
+50 50' 49.5 30'15"25"

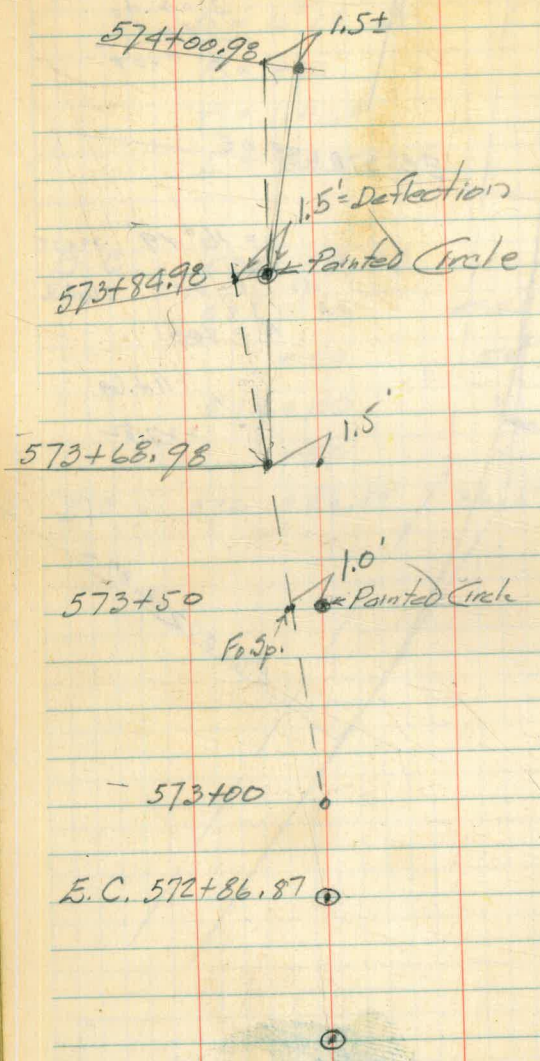
572+00 " " 50'02"50"

+50 " " 6'50"

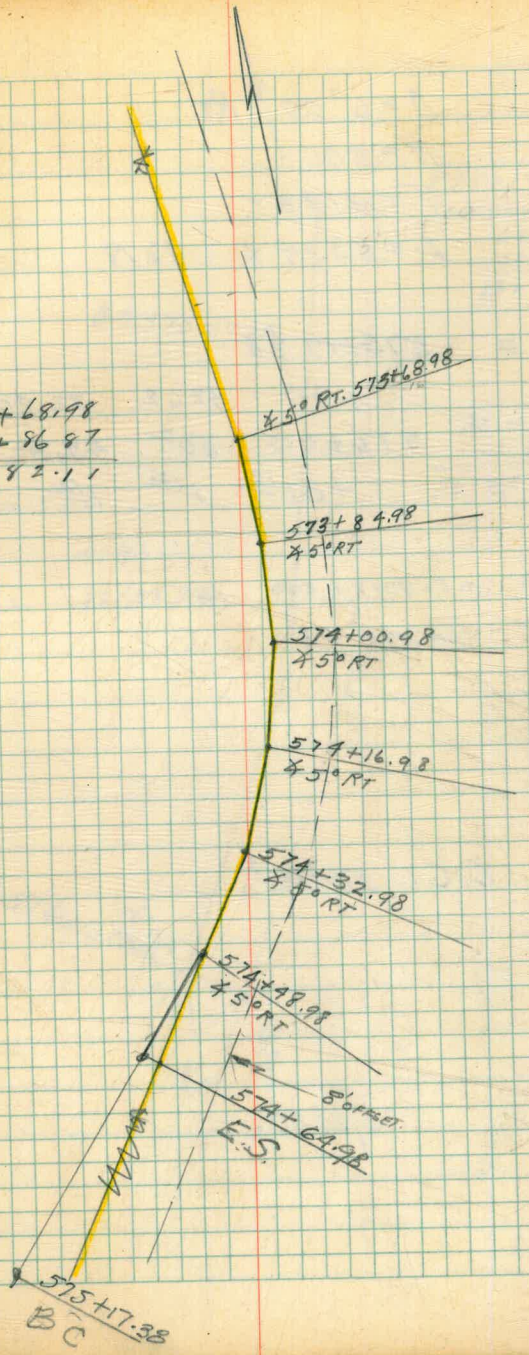
E.C. 572+86.87 36.87 36.55 8'09"30"

12/30/41





573+68.98
 572+86.87
 82.11



$$\Delta = 6^{\circ}00' \text{ Rt.}$$

$$R = 800$$

$$T = 41.93$$

$$L = 83.74 \times 83.78$$

$$B.C. = 575+17.38$$

$$+50 \quad 32.62 \quad 32.30 \quad 1^{\circ}10' 42''$$

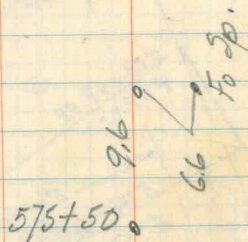
$$576+00 \quad 50^{\circ} \quad 49.5 \quad 2^{\circ}58' 17''$$

$$E.C. = +01^{12} \quad 1^{12} \quad 1^{12} \quad 3^{\circ}00'$$

$$T = .0524078 \times 800 = 41.93$$

$$L = .1047148 \times 800$$

$$E.C. \quad 576+01^{12}$$



12/30/41

74

$$\begin{array}{r} 575+17.38 \\ 4+48.98 \\ \hline 68.40 \\ 41.93 \\ \hline 110.33 \end{array}$$

$$B.C. 575+17.38$$

$$\Delta = 6^{\circ}00'$$

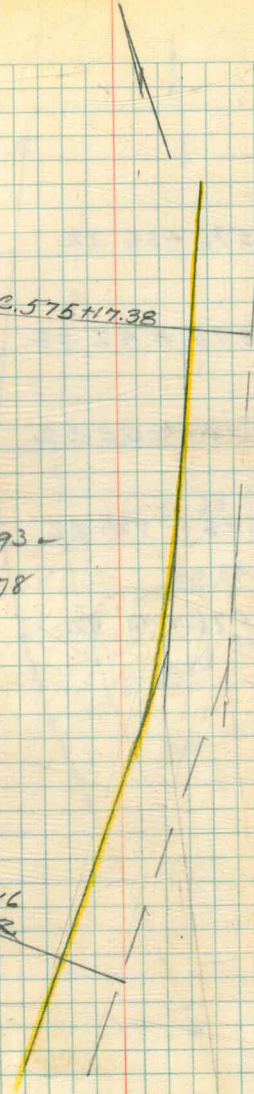
$$R = 800$$

$$T = 41.93$$

$$L = 83.78$$

$$\begin{array}{r} 75+17.38 \\ 83.78 \\ \hline 76+01.16 \end{array}$$

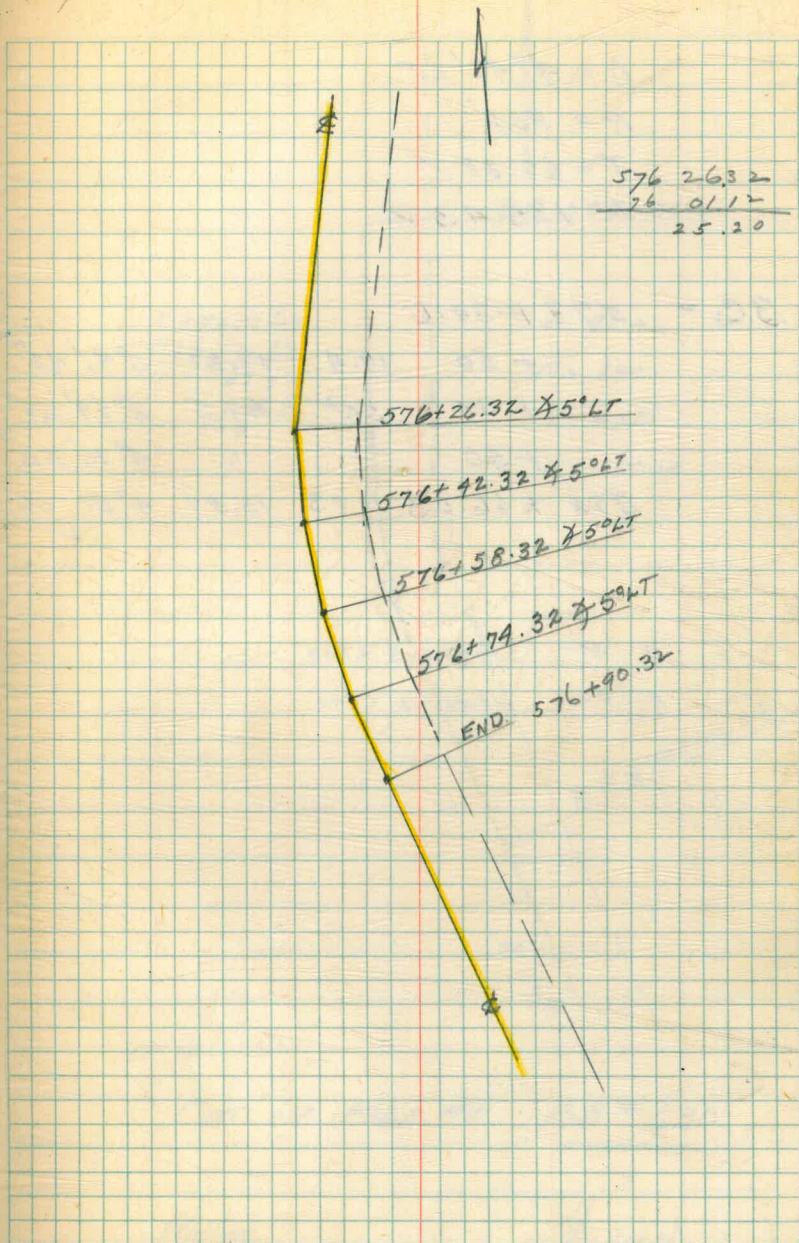
$$E.C. 576+01^{12}$$



12/30/41

75

 $\times 5^\circ \text{LT}$ $576 + 26.32$
 $\times 5^\circ \text{LT}$ $576 + 42.32$
 $\times 5^\circ \text{LT}$ $576 + 58.32$
 $\times 5^\circ \text{LT}$ $576 + 74.32$

 END. $576 + 90.32$


$$\Delta = 9^{\circ}42' \text{ LT}$$

$$R = 800'$$

$$T = 67.88 \checkmark$$

$$L = 135.43 \checkmark$$

$$B.C. = 577+30.6$$

$$+ 50 \quad 19.4 \quad 19.21 \quad 0^{\circ}41'42''$$

$$+ 00 \quad 50^{\circ} \quad 49.5 \quad 2^{\circ}29'27''$$

$$+ 50 \quad " \quad " \quad 4^{\circ}16'52''$$

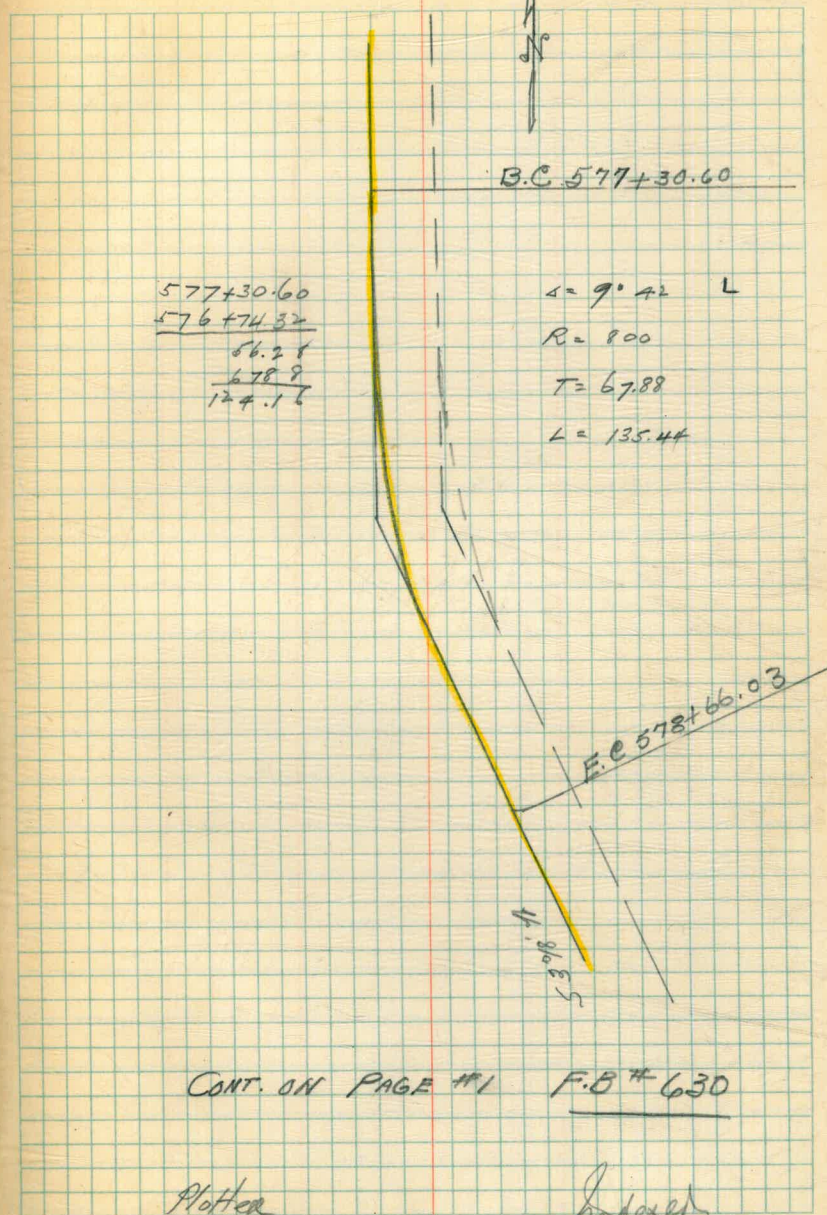
$$578 + 66.03 \quad 16.03 \quad 15.87 \quad 4^{\circ}51'06'' \checkmark$$

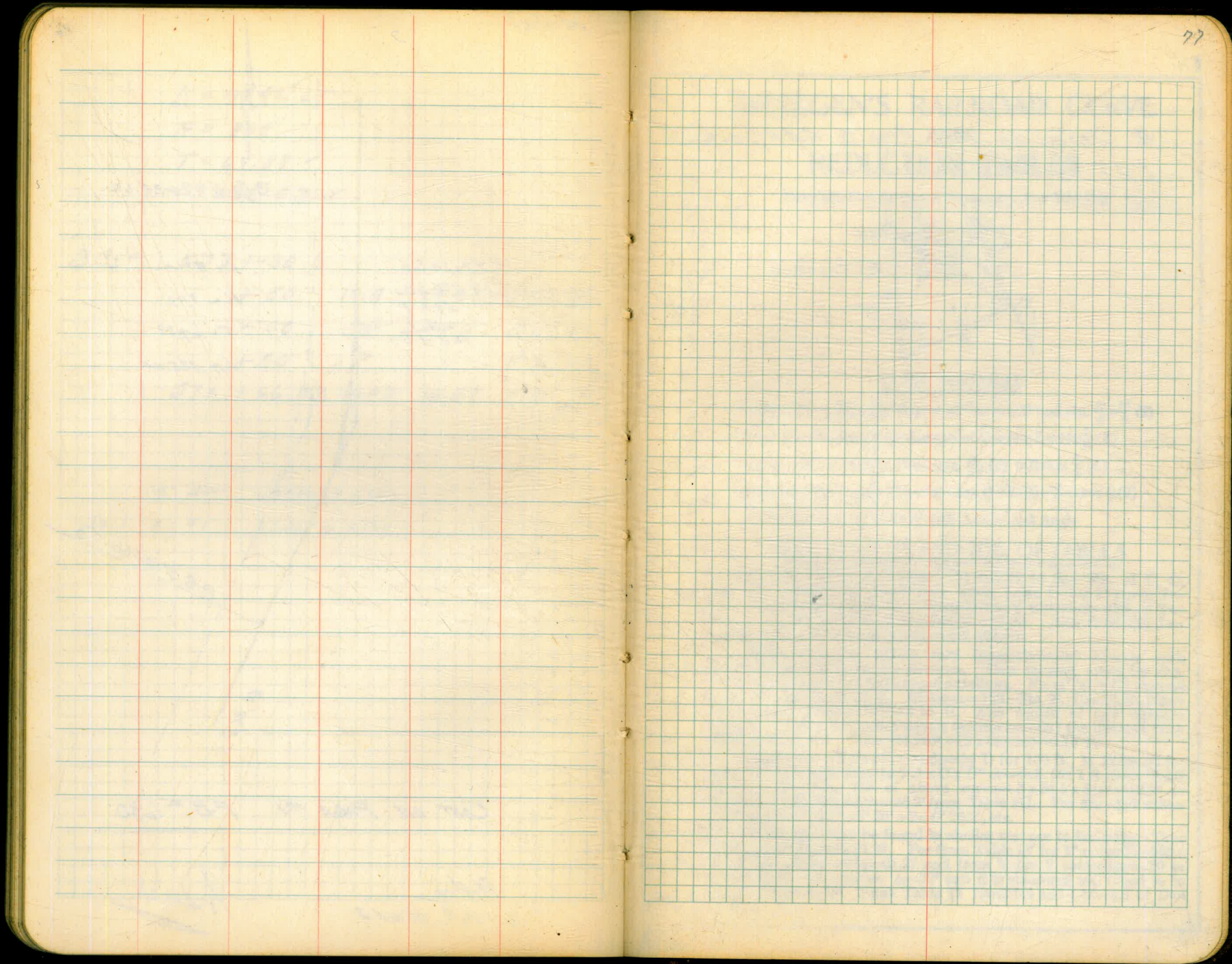
$$9^{\circ}42' \quad .1692969 \times 800 \quad -$$

$$\tan 4^{\circ}51' \quad .0848512 \times 800 \quad -$$

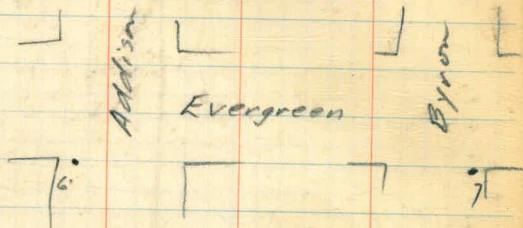
12/30/41/

76



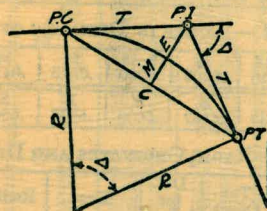


A Crosses on MH Ring @ Addison & Ever.
LVT on SE Cor.



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 $\sin. \frac{D}{2} = \frac{D}{R}$ (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) $= R \div \cos. \frac{\Delta}{2} - R$ (8) $= R \text{exsec} \frac{\Delta}{2}$ (9)

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

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 $+8\frac{1}{2}=414.49$ 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.

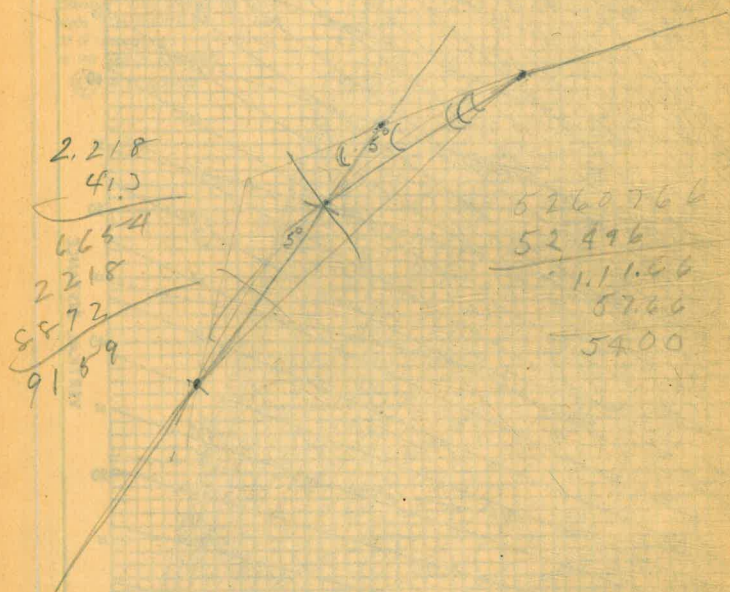
Deflections.—Deflection angle= $\frac{1}{2} D$ for 100 ft., $\frac{1}{4} D$ for 50 ft., etc. For c ft.=(in minutes) $.3 \times C \times D^\circ$ or=defl. for 1 ft. from Table III $\times C$. For Sta. 158 of above curve= $.3 \times 54.5 \times 8\frac{1}{2}=136.2'$ or $2^\circ 16.2'$, or= $2.50 \times 54.5=136.2'$ 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 91.37. For from Table IV for 1° curve $E=960.6$ for $8^\circ 20'=960.6 \div 8\frac{1}{2}=91.27$ and from Table V correction=.10 or $E=91.37$ 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 $D=5^\circ 30'$.

309+50 ±

287+50 ±

549+49^a * 4°37' RT.



2,218
41.3
6654
2218
5872
9159

5260766
52496
111.66
57.66
5400

268 + 10.34
255 + 96.49

12 13.85

.4407

.4465

58

.4436

50
221800

10 11.84
16 60
28 44

282 + 54.97
277 + 67.04
487.93

519 95.84
16 65
520 1249

N

95.84
16 65
512 49

7984
16 65
9649

300,8153
289,9938
108215

305.54.56
303.36.78
217.72

27.89
31.80
59.69

359 + 78.05
351 + 14.35
0 63.70

348 + 79.46
343 + 72.63
54 8683

50
541

281 42.92
249 15.93
226.99

551+87 B.C.

295+1019

2 0320

297+13.34

536+16 X 5° RT

132 END

251+42.92

2 40.58

299+15.93

253+83.50

75x190

34
03
102

378 378 216

907

29

272+08.28

328.92

524.32

275+70.69

98.31

276+69.00

308.80

290.5

180.05

287+99.07

1 04.66

285+99.34

1 04.66

286+94.91

287+99.07

1 02.17

284+01.24

248+86

249+74

16

50

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.

MADE IN U.S.A.