

EL CAPITAN
Pipe Line Survey
Transit Notes No 1

W185A

FIELD BOOK

385

A

17 ^{59 60} 17' 15" 45' 05"
 11 42 - 45" 45' 59"

2) $\frac{187^\circ}{93} \frac{11}{20}$

3) $\frac{180}{100-46}$
 $\frac{280-46}{93-}$

290
 16846
 16846
 3) $\frac{16846}{5615.3}$
 60) $\frac{5615.3}{280.765}$

Merid. alt at noon. Sept 24
 50° 30'

Min Curve Long as possible

Use Eastern Medium oil

90
 1344
 87616
 2) $\frac{187.12}{93-21}$

180
 9856 9856
 581.04 W
 73 115

7616
 1909L
 5810.0 W

5810.0 W
 29L
 58035 W

2952

5812.0 W

870 R

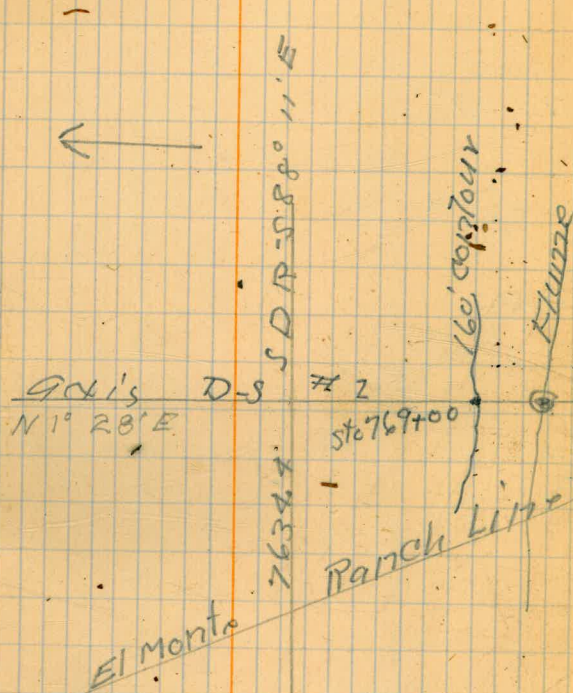
26 589-44 W

19 $\frac{00}{56}$

MICROFILMED

JAN 8 1965

24-49-30
1 18 30
26-07



observation on Polar's

ring set on line for

Sept 15-1925

Sta Course Dist Ang.

2+58.1 P.T.

2+0
 1+64. P.I.
 1+43.1 P.L.
 1+00

19°00 L

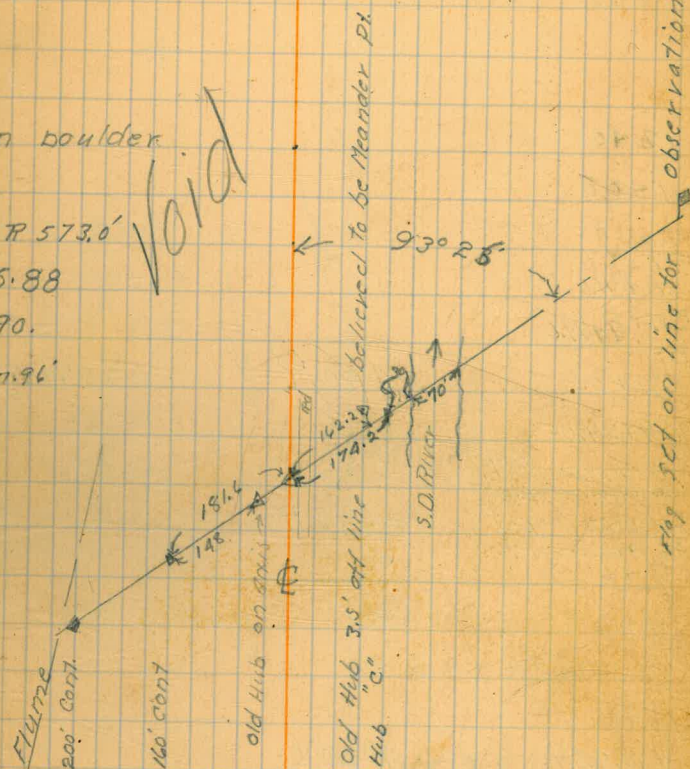
P.C. = 0+68.2

0+00

Party { C.M. Boren T
 W.P. Sprunt H.C.
 A.C. Leach R.C.
 H.S. Reynolds Flag

o on boulder

10° C R 573.0'
 T = 95.88
 L = 190.
 Ext. = 7.96'



Sta 0+0 is situated upon the axis of
 The D.S #2 at feet Northward
 From Δ on Hillside for 160' Contour

57.07

Sept 16 - 1925

Borch
Sprunt
Leach
Reynolds

Sta B.S Solar obs.
(1) $\frac{T}{q}$ V
12+00 10+00 H
(2) $\frac{T}{p}$ V
H

Time
Ti

12+00

11+00

P.T.

10+71.6

Ext 9+99.6

PI 10+00

14°00' R

10° Curve

PC 9+29.65

10+63.86 P.T.

9+88.8 Ext

10+00 PI

PC 9+83.86 P.C.

9+0

26°00' R

20° Curve

8+25

Pot

quit Here

4.15

P.M. Sept 15

8+00

7+0

6+67.5

4°20' L

6+00

Pot

5+00

4+00

3+50 $\frac{T}{H}$

1°00' L

3+0

Tan = 70.35

L = 140.

Ext Dist 4.3

R = 573.

~~Tan 66.14~~

~~LC 130.00~~

~~R = 286.5~~

~~Ext dist = 7.53~~

void

Revised

○ Rd 9' R + 12' R

Rd 2' R + 10' R

▽ Rd 18' R + 25' R



Sta L Bear Dist

1

Void

0+00 93°26'R

~~N 88°02' W~~

~~S 1°28' W~~

93°26' →

Dam Axis
S 1°28' W

19+56 POT

19+0

+60

+25

18+00

17+00

+60

+20

16+00

15+11.4 P.T.

14+50 P.I.

14+99.7 EXT

13+88.1 PC

14+00

13+75 Δ

13+0

12+00 Δ

11+0

10+00

VOID

4° 15' L

12° 26' L

10° 00' L

7° 40' R

Rd 33 + 41' R

Rd 1' + 9' R

Large wash →

Rd 4' R + 18' R

Rd 1' out 9' R

Rd 13' R + 21' R

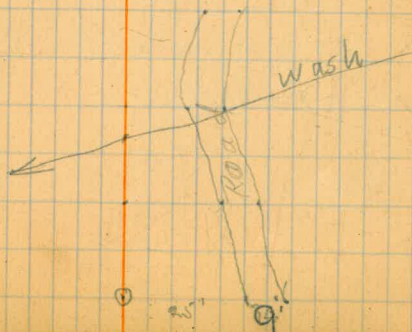
{ 10° CURVE
 Tan = 61.9
 EXT = 3.33
 LC = 123.33

WASH →

Sta L Bear Dist.

Void

8+50.9	1°03'4	57.1°52'W	
		57.2°5'W	186.9
1+64	19°03'0		
		N 88°02'W	164'
0+00	93°26'R		
		51°28'W	



Party

Borch
Sprunt
Leach
Reynolds
Correct
bearings Magnetic

Dist

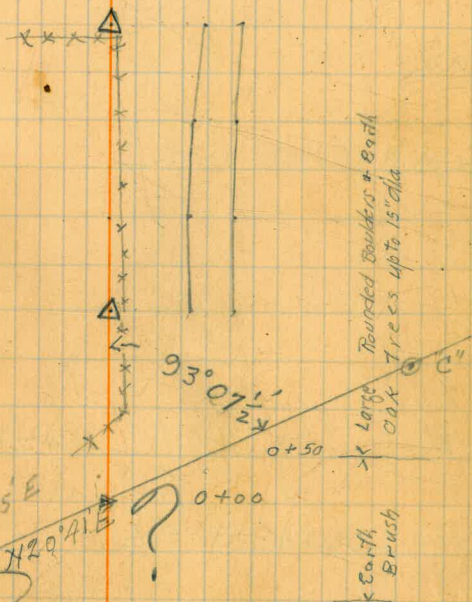
Sept 17-1925

All notes preceeding
This page
Are Revised as
Follows.

Note
For purposes of Topog. within 100 of Line
These Vertical lines are Regarded
as being 5' apart.

wash →

* 2d opening



Rounder boulders + Earth
Trees up to 15' dia

Earth
Brush

~~93 07 1/2~~
~~91 24~~

181.28
93.07
88.21

Class
Corner
Drainage

3+90



588° 18' W

249.0

3+51.3

S 69° 05' W 3° 04' R

S 72° 35' W

3+91

fence R angles

3+0

2+0

585° 14' W

177.2

1+74.1

S 66° 01' W 22° 20' L

S 69° 45' W

1+00

N 72° 21' W

174.1

0+00

588° 21' W

N 87° 50' W

Note the Bearing applies to the
Forward tangent.



Magnetic

Corrected

11+45

11+00

10+19.5

9+99.5 S 77° 39' W 14° 03' R N 83° 08' W 198.6
N 83° 08' W

9+00

7+99.8 S 63° 34' W 1° 34' L 199.7
S 82° 49' W
Mag 567° 25' W

7+10

7

6+86.1

P.O.T. S 84° 23' W

6+00.3 S 65° 10' W 3° 55' L
S 72° 43' W 199.5

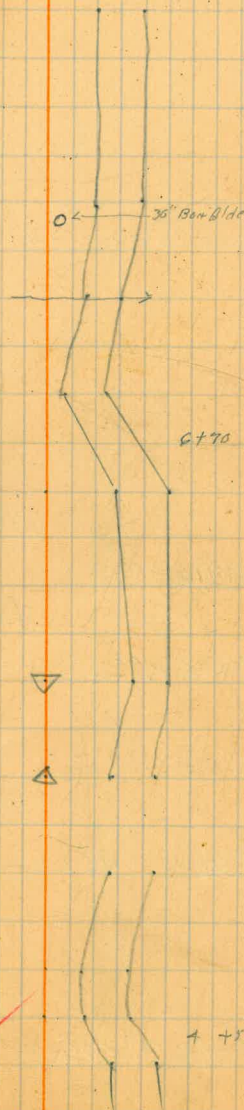
6+00

5+0 S 69° 05' W

4+98

4+0

old stero + 24 is C.R



Earth a few large boulders

Ax'd open

36' Boulder

Earth
Stumpac + Sage

4' x 4' opening

6+70

10
55
-15
40

Boulders + Earth
few small rocks

Class
Cover
Drainage

Magnetic

Correct

All checked to Here

16498.3

+20

16400

15400

14448

S62°49'W 10°20'L

S82°03'W

S82°05'W

250.3

S67°00'W

14407.6

S73°09'W 4°25'L

N87°37'W

S77°00'W

40.4

14400

13473

S77°34'W 7°43'L

N83°12'W

34.6

1340

11498.1

S85°27'W 7°39'R

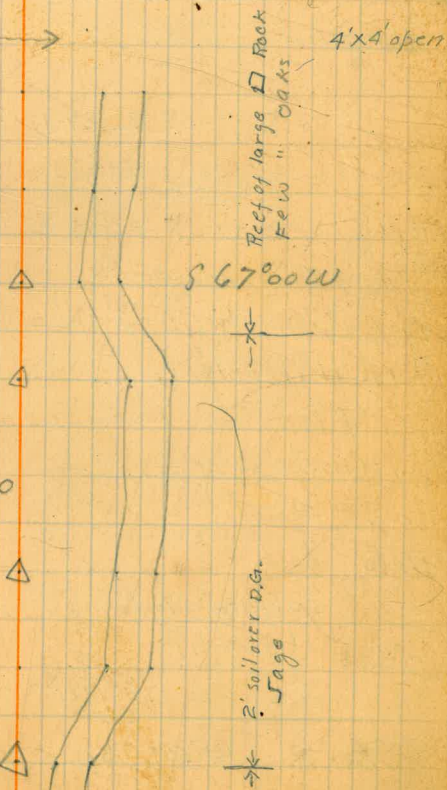
N75°29'W

S89°00'W

174.9

quit Here Sept 17

Needle Reads



Solar observation

at Damsite #2 Sept 17-1925

Telescope	Watch Time	Horizontal	Vertical	Sun's Limbs	
Direct	2-36-40	42°31'-30"	38°20'	q	1st
on	2-39-30	42°24'-00"	38°20'	b.	
Flag South	Means 2-38-05	42°27'-45"	38°20'		2nd
+	2-42-15	43°39'-00"	37°15'-30"	q	
Sun S.W.	2-43-50	43°18'-00"	37°30'-00"	b	2nd
Means	2-43-02	43°28'-30"	37°22'-45"		

Latitude = 32°45' Assumed = ϕ (Phi)
 Longitude = 116°47'57" = λ (Lambda)

2-38-05 42-27-45 38-20-00

2-43-02 43-28-30 37-22-45

Mean of all 2-40-33 42-58-07 37-51-22

Mean Watch time of obs = 2h 40'-33"

" Horizontal Long. From

Flag South 1°28'W to Sun S.W. = 42°58'-07" \diamond

" Observed Vert Ang = 37°51'-22" \diamond

Note V = observed vert ang
 h = " " - Refraction
 Z = (Zeta) = True zenith dist sun. center = $(90^\circ - h)$
 δ = Sun's Declination

Sta π "H" "C" on axis of Dam

$$\cos \frac{1}{2} A = \sqrt{\frac{\sin S \cos \delta + \cos \text{Codecl}}{\sin \text{Colat} \sin \text{Coalt}}}$$

watch time of obs 2h 40' 33" P.M.

Correction for Long + 12 12

Local Mean Time = 2-52-45" P.M.

Equation of time - 5-30

2-47-15 P.M.

$V = 37^\circ 51' - 22''$ $90^\circ 00' 00''$

Refraction $-14''$ $37^\circ 51' 09''$

$h = 37^\circ 51' - 13''$ $52^\circ 08' - 52'' = Z$

Sun's Decl Sept 17 - at Noon $2^\circ 21' 39.5''$

Hourly Change $-58''$

For 2h 47' 15" = $+162''$

$\delta = 2^\circ 19' 09''$

$90^\circ - \phi = 90^\circ - 32^\circ 45' = 57^\circ 15' = \text{Colat} - \text{Lassim} =$

$90^\circ - \delta = 90^\circ - 2^\circ 19' 09'' = 87^\circ 40' 51'' = \text{Codecl}$

$90^\circ - h = 90^\circ - 37^\circ 51' 13'' = 52^\circ 08' 47'' = \text{Coalt}$

28 = $197^\circ 04' 38''$

S = $98^\circ 17' 19''$

Codecl = $87^\circ 40' 51''$

S - Codecl = $10^\circ 36' 28''$

Log sin S = 9.995A Log sin Colat = 9.9248

" " S - Codecl = 9.2647 " " Coalt = 9.897A

9.2601 9.8222

9.4079 $\cos^2 \frac{1}{2} A = 9.71895 = \frac{1}{2} A = 58^\circ 26' A = 116^\circ 52'$

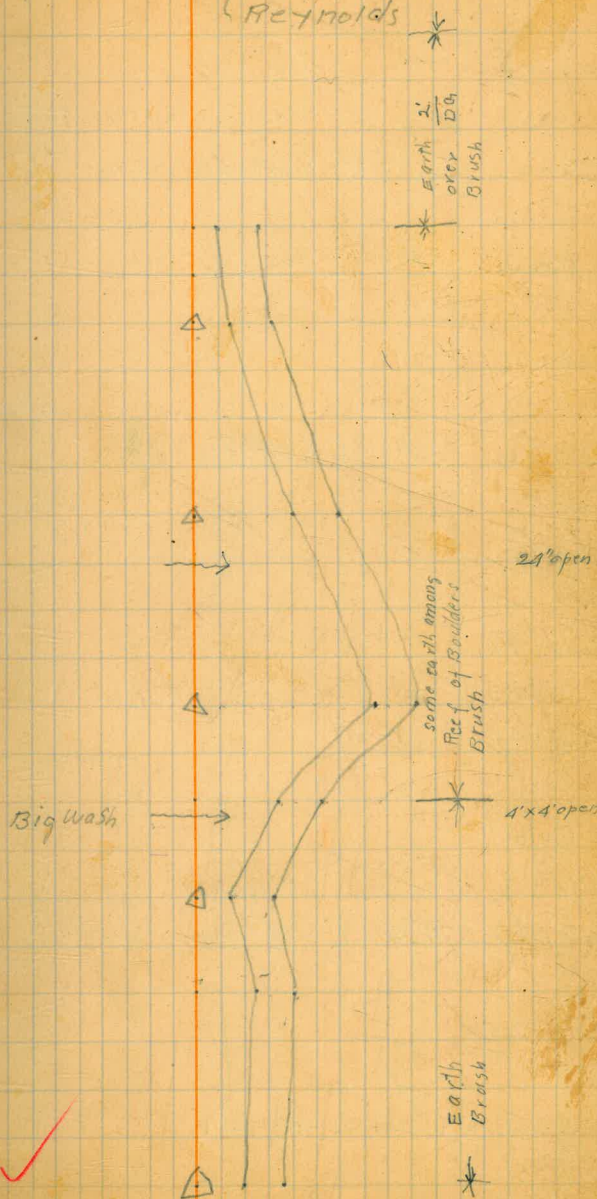
180°
116 52'

S 43 08 W = True bearing of Sun
 42 58 07 = Flag to Sun
 520 09 53 W = True bearing π to P = S 20° 09' 53" W.
 For observation upon Polaris which corrects this bearing to S 20° 40' 30" W

	Course	Magnetic	Corrected
+98.			
23+00	Pot	S 85° 20' W	243.8
22+00	✓	S 81° 01' W 23° 00' R	N 79° 49' W 223 N 79° 42' W
24 25 21+81.2	PI	23° 00' R	
21+00			
20+44.8	P.O.T.	S 61° 50' W	
7 20 20+00			S 77° 10' W 226.9 S 77° 18' W 245.7
+54.3	✓	S 58° 01' W 00° 16' L	S 62° 20' W
19+00 7 90	✓	✓	S 77° 32' W S 77° 34' W 124.4
18+29.9		S 58° 17' W 00° 20' R	S 62° 35' W
15			
17			S 77° 03' W S 77° 05' W 137.6
16+98.3	✓	✓	✓ S 57° 49' W 5° 00' L S 62° 10' W

Sept 18

Boren
Sprunt
Leach
Reynolds



Magnetic

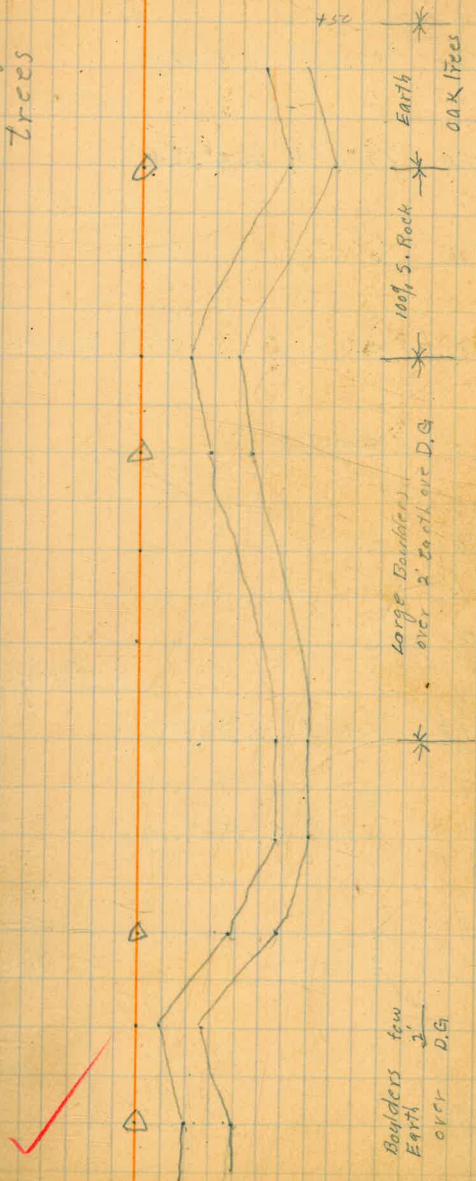
Correct

31+00				N 77° 31' W	
30+00	18° 40' R	S 83° 15' W	S 86° 50' W	N 77° 29' W	402.00
29+63.3	POT				
29+00				S 83° 49' W	
28+00	14° 26' L	S 64° 35' W	S 68° 20' W	S 83° 51' W	200
27+50					
27+25.6	POT			S 83° 30' W	
26+91	POT				
26+0				N 81° 45' W	
25+45	9° 40' R	S 79° 01' W	S 82° 45' W	N 81° 43' W	255
25+25				S 88° 35' W	
24+25	11° 41' L	S 69° 21' W	S 73° 10' W	S 88° 37' W	120.0

Local attraction

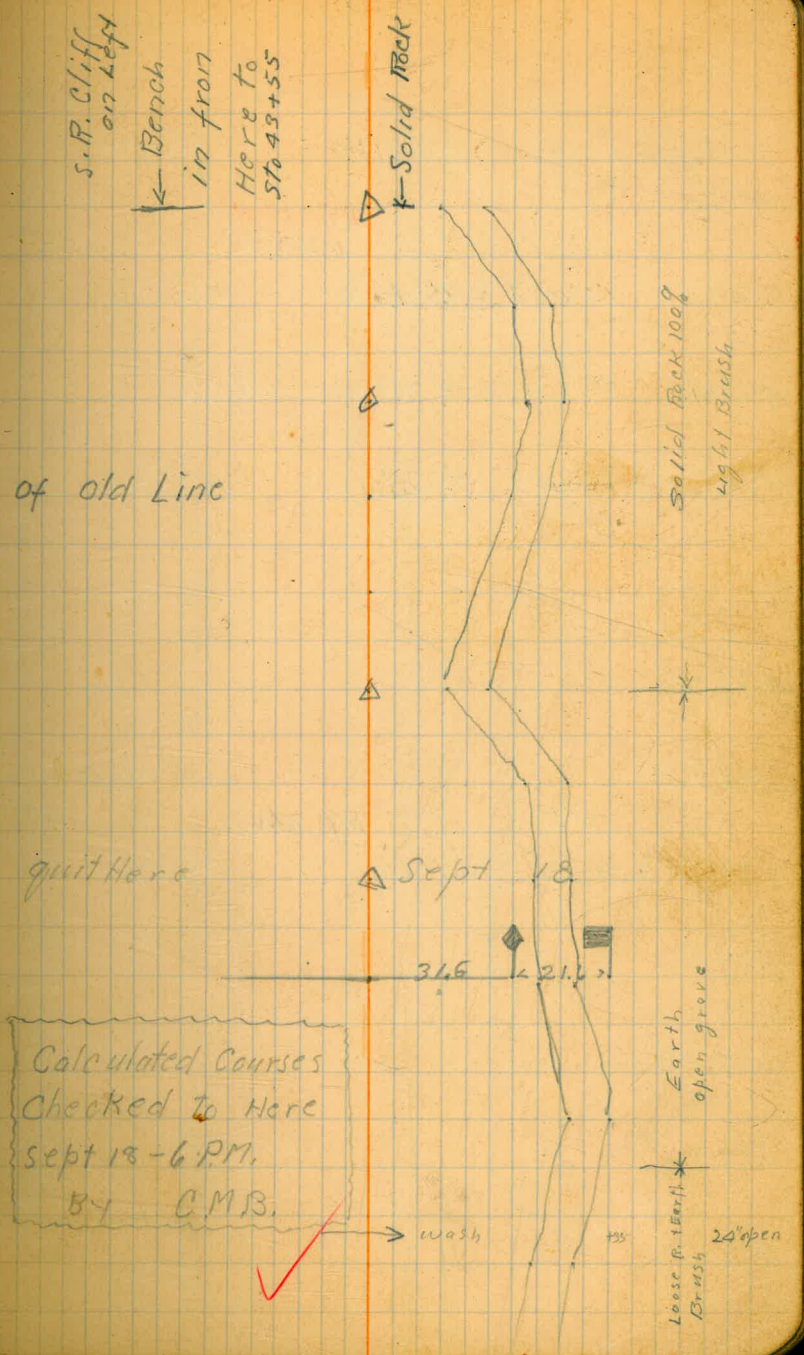
→ Open Timber
→ Large Like oak
Trees

Dense Bush
Large Rounded Boulders
Stoato to 3000



Boulders few
Earth over
D.G.

Station	Angle	Course	Distance	Notes
38+95	9° 19' R	N 73° 40' W	183.2	Correct Magnetic N 54° 26' W N 54° 24' W
38+00	14° 01' R	N 82° 59' W	95	N 63° 45' W N 63° 43' W
37+14	6° 00' L	S 83° 00' W	86	N 77° 44' W N 77° 44' W
37+02.7	our ϕ = old Δ 37+43			
37+00	P.O.T			
36+00	P.O.T			
35+00				
34+75	5° 45' R	S 89° 00' W	239	N 71° 46' W N 71° 44' W
34+02.3	boundary of forest			73.0
34+0				
33+00	P.O.T			S 82° 00' W
32+0				
31+95				



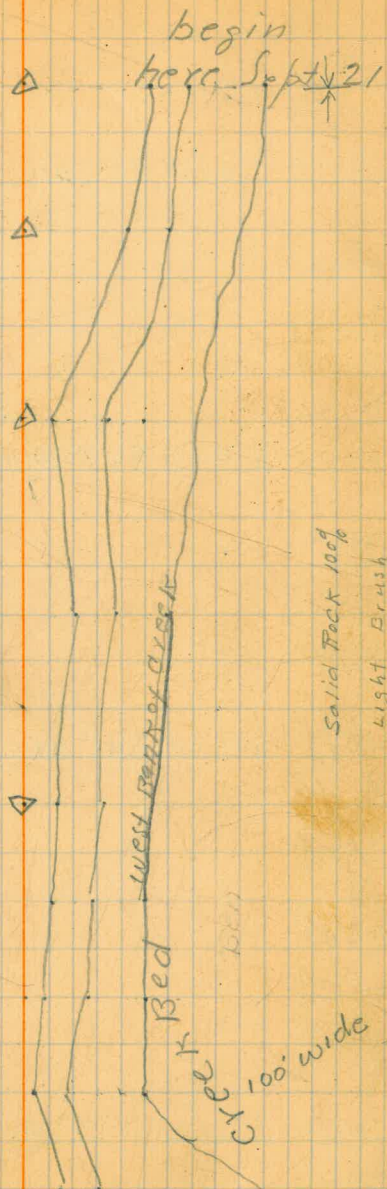
		Correct	Magnetic	
43+55	2° 40' L	S 83° 34' W	S 88° 00' W	234
43+0		N 77° 08' W N 77° 06' W		
42+71	10° 05' L	S 88° 14' W	N 89° 15' W	84
42+69.1	Old line = 43+07 old line.			
42+35.7	15° 51' L 15° 48' L	N 83° 41' W	N 78° 35' W	35.3
42+0				
41+00				
40+96.2	5° 51' ✓	N 48° 35' W N 48° 33' W		157.5
40+78.2	5° 56' R	N 67° 56' W	N 62° 43' W	
40+58				
40+38				
40+0				
39+52				

231-42
15-20
21
15-51

Solid Rock Cliff to

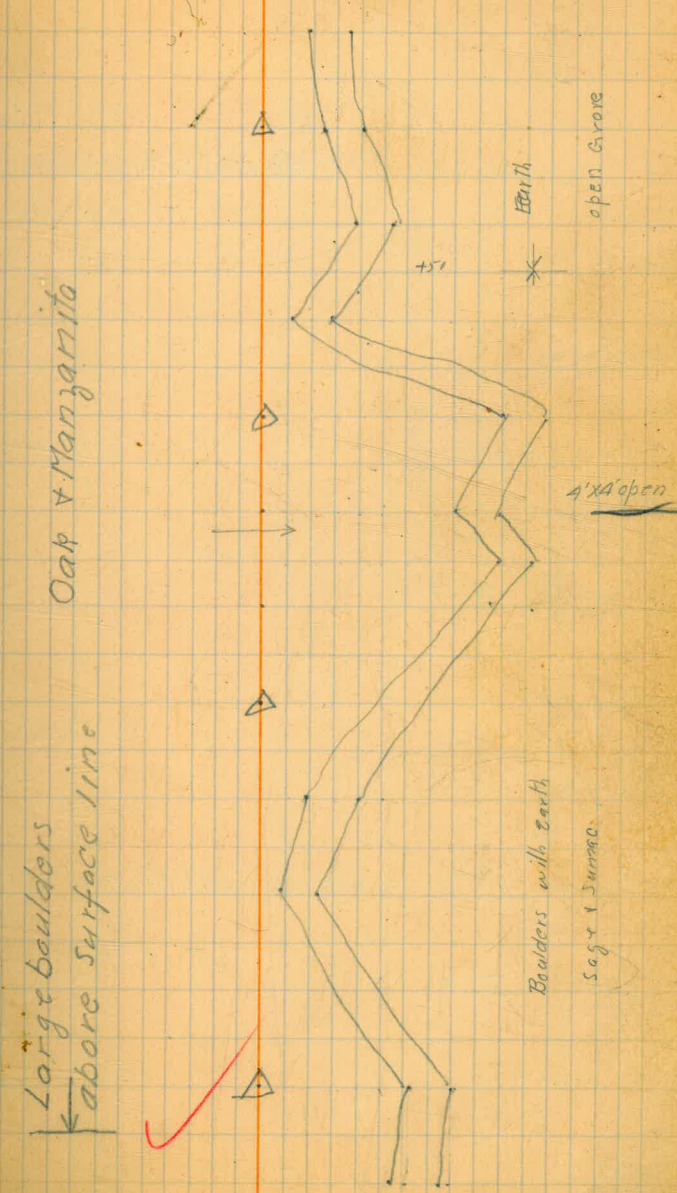
Pt. on tree

Bench in here.



	Correct	Mug	
53+00			327.0
		N63°58'W	241
		N63°56'W	
52+75	7°00' R	N83°16'W	N80°10'W
52+0			
51+0			230
		N71°58'W	
		N70°56'W	
50+45	8°40' R	S89°44'W	N87°00'W
50+00			
+70			
49+00			255
		N79°58'W	
		N79°36'W	
48+90	2°30' R	S81°04'W	S84°20'W
48+0			
47+0			
46+0			301
		N82°68'W	
		N82°06'W	
45+89	5°00' L	S78°34'W	S83°15'W
45+0			
44+0			

Boren
Sprunt
Leach
Reynolds } Sept
21



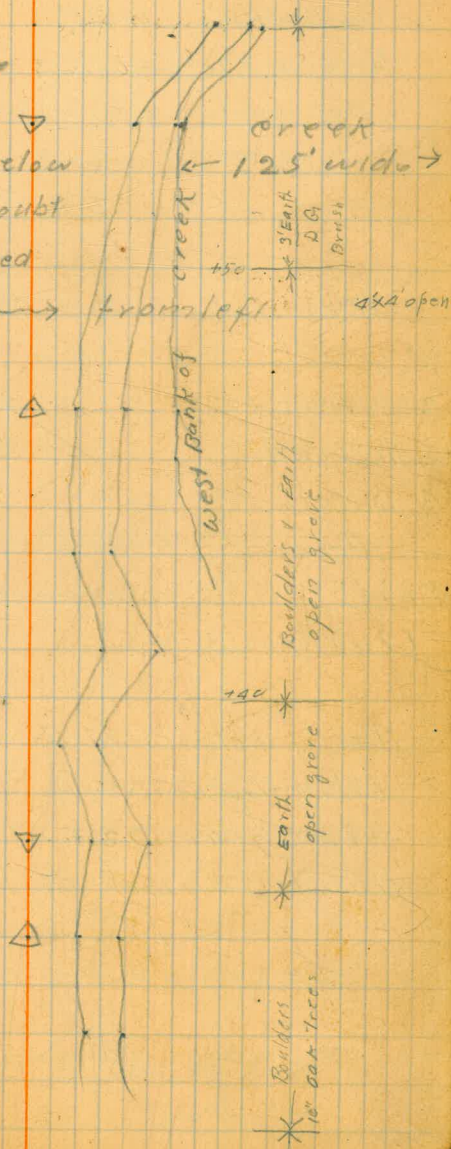
Correct Magnetic
Bearings

Dist

61+00				
60+15	10° 20' L	N 75° 46' W	N 54° 28' W	N 70° 10' W
60+0				
59+22				
59+04	Pot ✓			N 60° 35' W
59+0				
784	Pot			
58+00				
57+00				
56+02	19° 50' R	N 43° 26' W	N 49° 08' W	N 61° 20' W
55+16	Pot ✓			
55+0				
54+0				

- Note -

At Sta 60+15. Allowance
should be made for the
fact that the Road is below
High water. It will no doubt
be straightened & Raised
by cutting into the
hill.



Sept 21-1925

Sept 21. Gr E. Elongation
 of Polaris, Lat $40^\circ = 7^h 38.6 \text{ min PM.}$
 Reduced to Long $116^\circ 47' 57'' - 1.3 \text{ " "}$
 Red for Lat $33^\circ - 1.0 \text{ " "}$
 L.M.T $7^h 36.3 \text{ "}$

Telescope	Watch Time 120 th Merid
(1) Direct	7h-16 min PM
(2) Reversed	7h-19 " "
(3) Reversed	7h-21 " "
(4) Direct	7h-24 " "

Mean Time of observations
 120th Merid time $7^h 20 \text{ min}$

Az of Polaris at Elong 1925 - Lat 33
 From Ephemeris of the Sun & Polaris
 for the year 1925. Published by the
 U.S. Gen Land office.
 15 $1^\circ 18'.3$

Sept 21st 1925 at the axis of
 the Dam site #2 on the El. Capitan
 project in Lat N $33^\circ \pm$ Longitude
 $116^\circ 47' 57''$ West.

At 7-16 P.M. to 7-24 P.M. I observe
 polaris at East Elongation making
 4 observations two each with
 Telescope Direct, & Reversed. & marked
 the Range of same upon a tuth nailed
 to five hubs driven firmly in the ground.
 At 7.40 P.M. (watch time) I made
 a fifth observation upon polaris
 and observed that it had begun its
 transit back toward the west. This point
 I marked by setting a hub on the
 South bank of the creek.

Sept 22.

I Measured ^{Transit on 5h 00} $1^\circ 18'$ to west of the Mean
 point of Elongation Last night and set
 hub on Meridian North of Creek about
 18" East of Cottonwood tree 20" diam
 Ang from Meridian to Axis of dam
 is East $20^\circ 40' 30''$

Bearing of axis N $20^\circ 40' 30''$ East
 Variation of needle shows $14^\circ 55' E$

Correct Magnetic

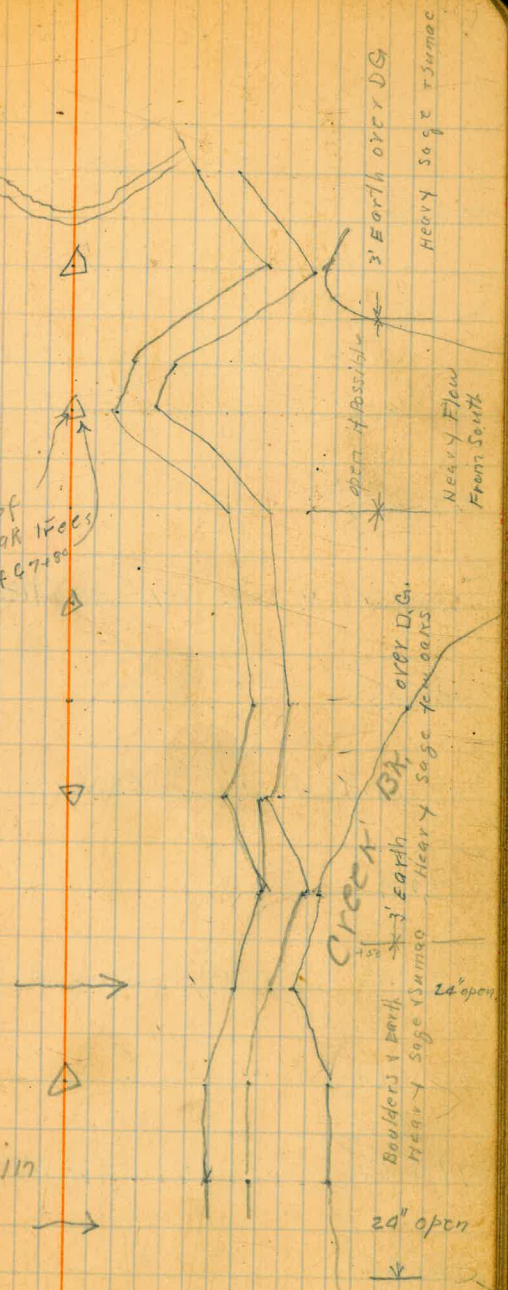
70+00
 69+92 Cross wagon trail to House South.
 69+00 $L6^{\circ}29' S 54^{\circ} 01' W$ $S73^{\circ}25' W$ $S58^{\circ}35' W$ 206
 68+00 $21^{\circ}46' L S 60^{\circ}36' W$ $S79^{\circ}54' W$ 120
 67+80 $S64^{\circ}35' W$
 67+30
 66+80 $4^{\circ}46' L S 82^{\circ}22' W$ $N78^{\circ}18' W$ $S86^{\circ}20' W$ 97
 66+00
 65+50 $19^{\circ}12' L S 87^{\circ}02' W$ $N73^{\circ}40' W$ $N89^{\circ}00' W$ 133
 65+00
 64+00
 63+31 POT $N54^{\circ}26' W$ 219
 63+00
 +60
 62+00

St 66400 to 67410
is an adobe concrete hill.

St 67730 to 68410
Keep at least 4' above ground surface to allow for passage of water to the South.

Clump of LIVE OAK TREES
38' S of 67+00

About 60' Rog
62+30 HW. drift in
Oak Linc



Correct.

77+00

76+75 Pot.

76+00

75+00 \checkmark

74+78 \checkmark $N88^{\circ}55'W$ 300
 $6^{\circ}20' L$ $S71^{\circ}41' W$ $N88^{\circ}53' W$ $S75^{\circ}25' W$

74+00

73+67.5 Pot El Monte Ranch gate post 4.5' N 110.5

73+0

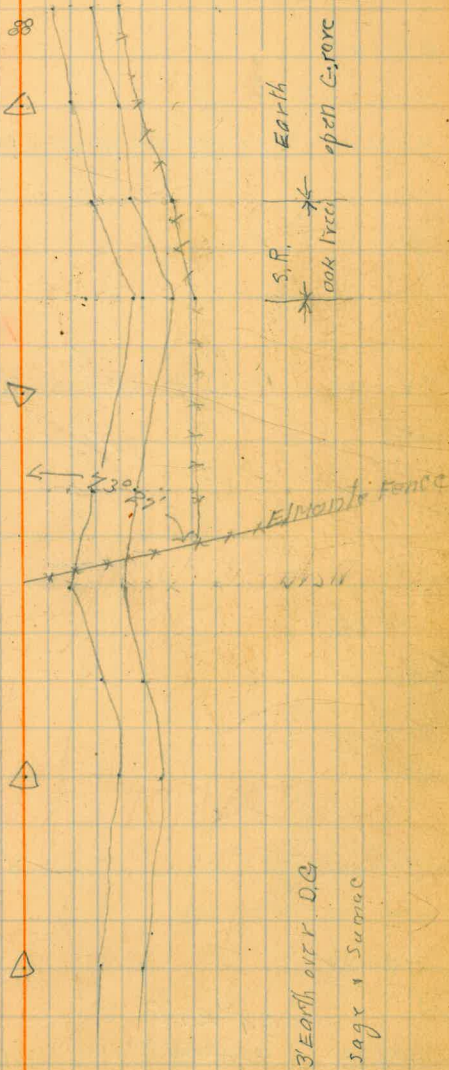
72+14 \checkmark $N82^{\circ}35'W$ 153.5
 $4^{\circ}42' R$ $S78.07'$ $N82^{\circ}33' W$ $S81^{\circ}50' W$
quit here Sept 22

72+00

71+06 \checkmark $N87^{\circ}17'W$ 108
 $19^{\circ}18' R$ $S73^{\circ}25' W$ $N87^{\circ}15' W$ $S77^{\circ}35' W$

70+98

cluster of trees
at 1117 + 97



Correct Magnetic

N65°21'W

N65°19'W

200.2

85+36.8

15°00' L

N85°06'W

N65°55'W

N80°25'W

=

961 St. 86+82

85+0

N50°21'W

N50°19'W

69.8

84+67

13°44' R

N70°06'W

N50°19'W

N65°50'W

67

84+0

POT

83+00

N64°05'W

717

82+83

12°11' R

N83°50'W

N64°03'W

N79°50'W

82

~~423~~

81+60

POT

81+0

+60

303.0

80+0

PI

79+80

N76°16'W

~~260~~

79+00

21°48' L

S83°59'W

N76°14'W

S88°10'W

78+0

34°27' R

N54°28'W

202

77+78

34°00' R

N74°13'W

N54°26'W

N70°00'W

N88°53'W

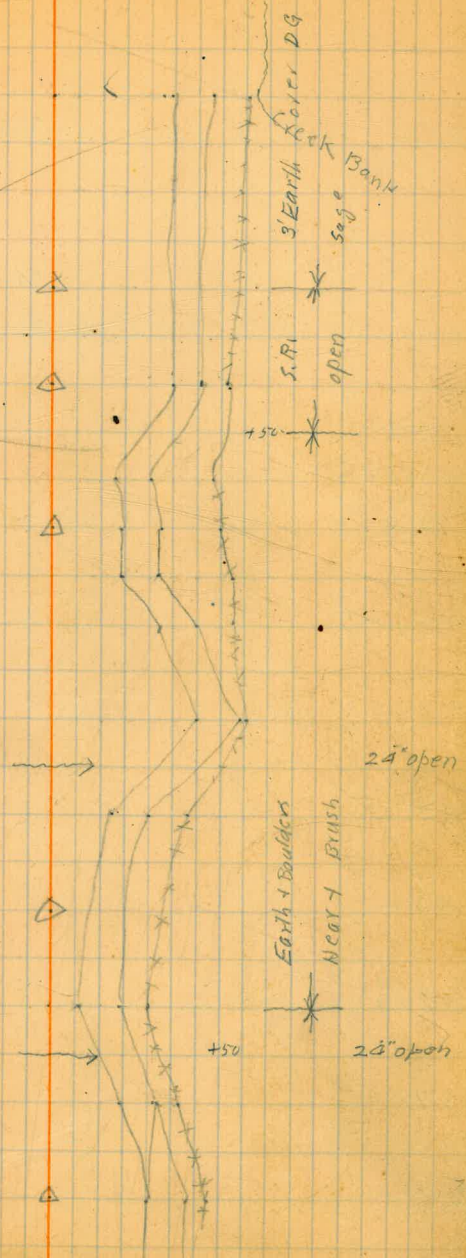
961 St. 86+82

82+83
79+80

303

79+80
77+78

202



Correct Magnetic

N55°15'W

285

94+00 8°36' LN75° 00' N55°13'W N70°45'W

93+00

N46°45'W N62°50'W

N46°43'W

200

92+00 18°36' R N66°30'W N47°1'W N62°05'W

91+00

90+15

90+03

89+95

89+25 Pot.

88+10

88+0

87+37 Pot

87+d

86+d

From St 84 to 92 the Material is
N65°15'W
a disintegrated granite bluffs. Shows signs of
sloughing into the river to RT

275

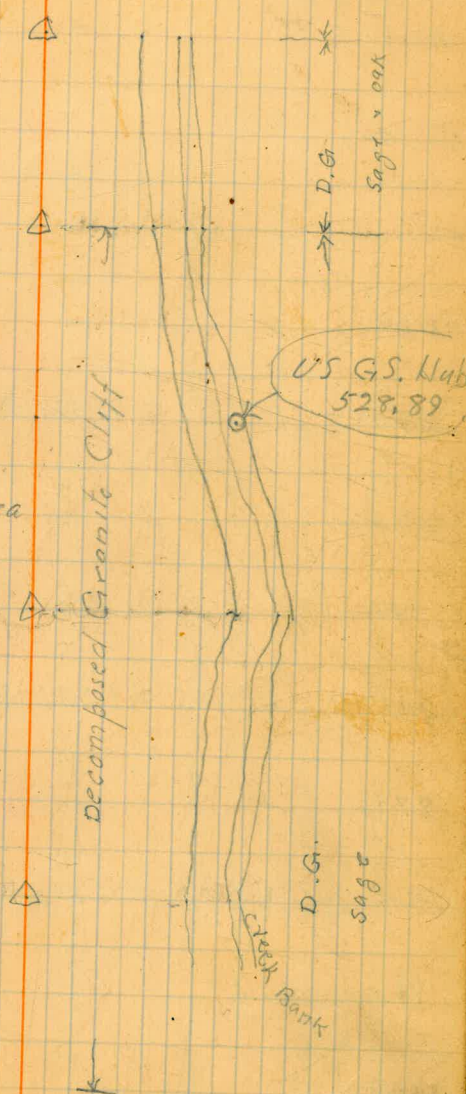
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Edge of Sloughed area

Sept 23-] 4.15 PM

188

Note
From St 92 to 109
Are Many Large Boulders
Timber is Scattered oak
& Sage



Magnetic

102400

+16 POT

N79°22'W

114

100+0

N79°24'W

181

99+35 11°12' L S 80°51'00" N 79°22' W S 85°40' W

99+0

98+0

N68°12'W

183

97+52 14°35' L N 87°57' W N 68°10' W N 83°30' W

97+00

N53°37'W

67

96+85 1°38' R N 73°22' W N 53°35' W N 49°00' W

96+00

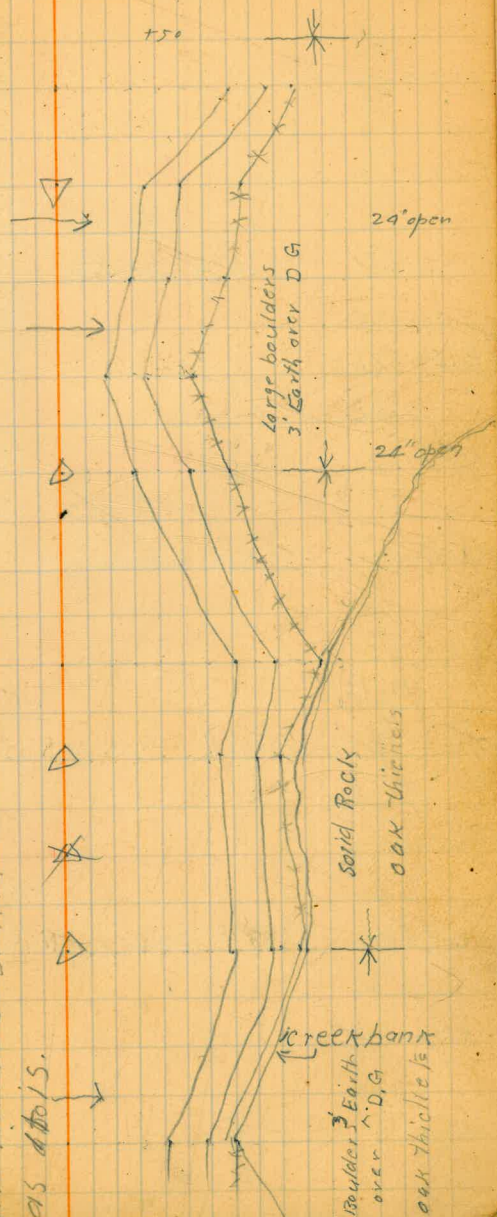
+0A

95+00

N53°13'W

X on Rock
old nub is N 2 5 ft

Note
Sta 94+00 to 97+52
Should be one tangent
Eliminate angle at
Sta 96+85. Two large
trees in line caused
the line to be slanted
as this.



109					
108		N34°14'W			
107+97	38°14' R	N34°26'W	N20°41'E	N42°W	481.1
107+0					
+72					
106+00		N72°28'W			
		N72°26'W			251
105+46	21°18' R	S87°46'W		N69°30'W	
105+00		S86°14'W			
		S86°16'W			77
104+69	18°00' L	S66°28'W	S71°10'W		
104+09		N75°46'W			
		N75°44'W			119
103+50	3°38' R	S84°28'W	N10°N	S89°25'W	
103+00					
					120
102+30	POT	N79°24'W	S85°20'W		

Magnetic

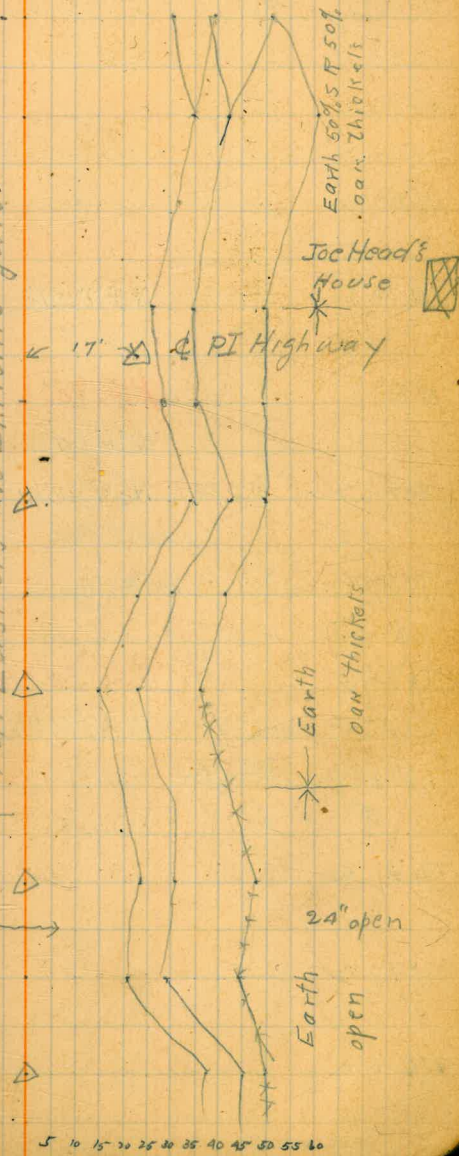
← Courses from here. Road to agree with the Bearing of Dam 104+15 of N20°41'E

Note

Mr Joe Head. owns the Ranch on the North of the Fence. At this point. He showed me two Hubs which he says are the Q of the Highway. The Great Western Developing Co (Spreckles) owns the point known as the horn and the Land South of Sta 104+69 and as far East as the El Monte gate.

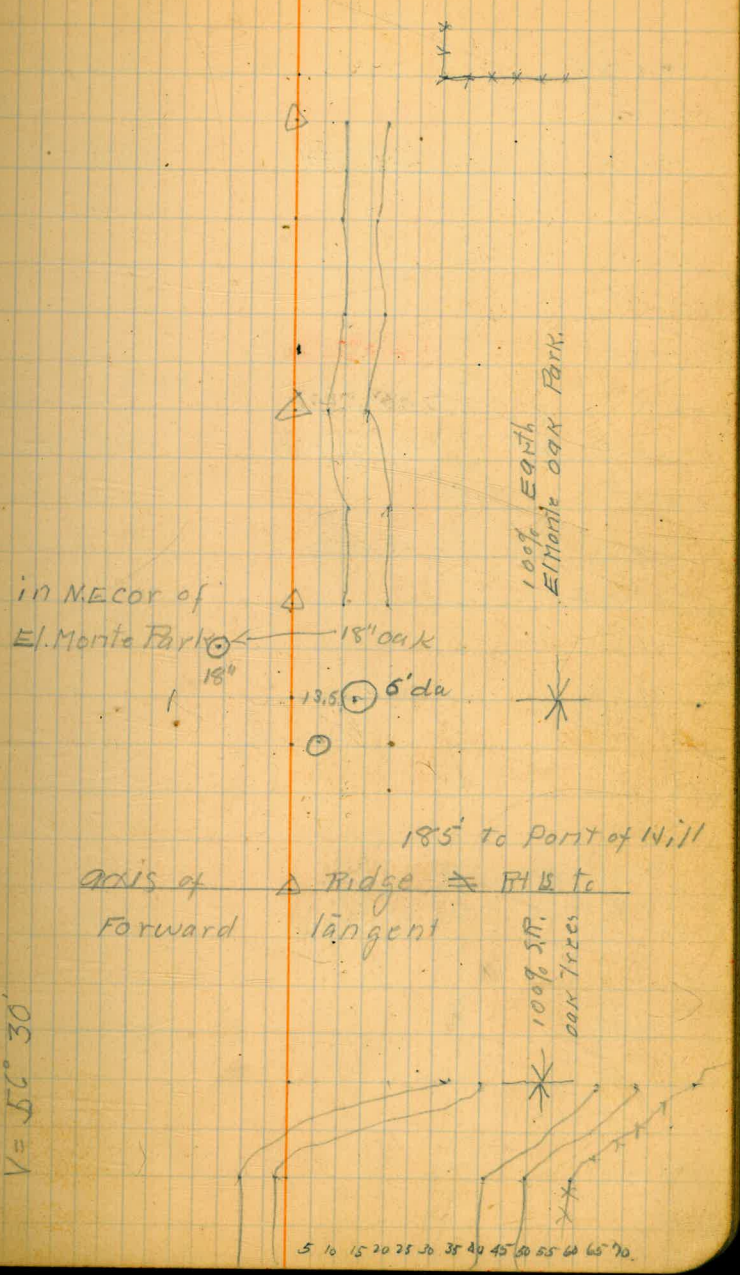
Note

Point at 104+69 should be eliminated by along from Sta 103+00 to 105+46



	Correct	Mag
+ 64		315
119+0	POT S84°34'W	
118+0		
117+00		
116+0	9°22' L S88°32' W 9°20' L S84°34' W	300 569°35' W
115	N87°06' W N86°04' W	127.7
114+72.3	48°14' L N87°38' W	879°45' W
+23	OAK tree	16.5' Left 18" dia
114+0	OAK "	13.3' R 6" dia
+25	" "	2' R 3" dia
113+0	N38°52' W	
	4°38' L N38°50' W	194.2
112+78.1	4°08' L	N53°00' W
112+00		
111		
110+0		

At st. 112+78.1 Sept 24 I observed the Sun on the Meridian at 11h 42' 45" 120th Merid Time
V = 50° 30'



Magnet

Cancel

129+45

S 43° 05' W

300

129+0 1° 26' L S 44° 07' W

S 29° 06' W

128+0

127+8A

S 44° 31' W

127+0

S 45° 33' W

269

126+31 2° 11' L S 47° 35' W

S 36° 25' W

126+0

125+90

125+0

124+0

123+73

123+0

122+75

S 71° 42' W

416

122+15 11° 50' L S 72° 44' W

S 57° 35' W

122+0

+47

121+00

120+0

Copied

24" oak

16'

9' oak

6'

Power pole 2' R

5 10 15 20 25 30 35 40 45 50 55 60 65 70

5' oak

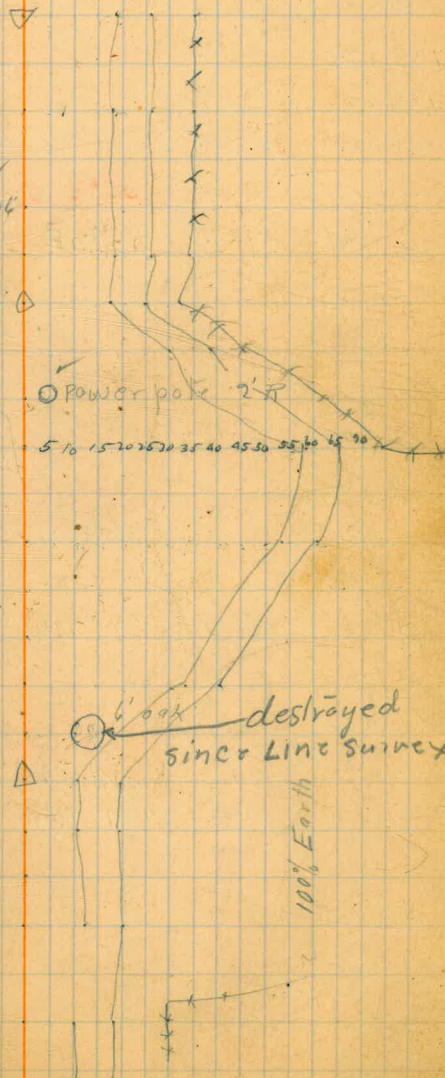
6' oak

destroyed
since Line Survey

6' diatr 11.5 Left

100% Earth

IN EIMONIC PART

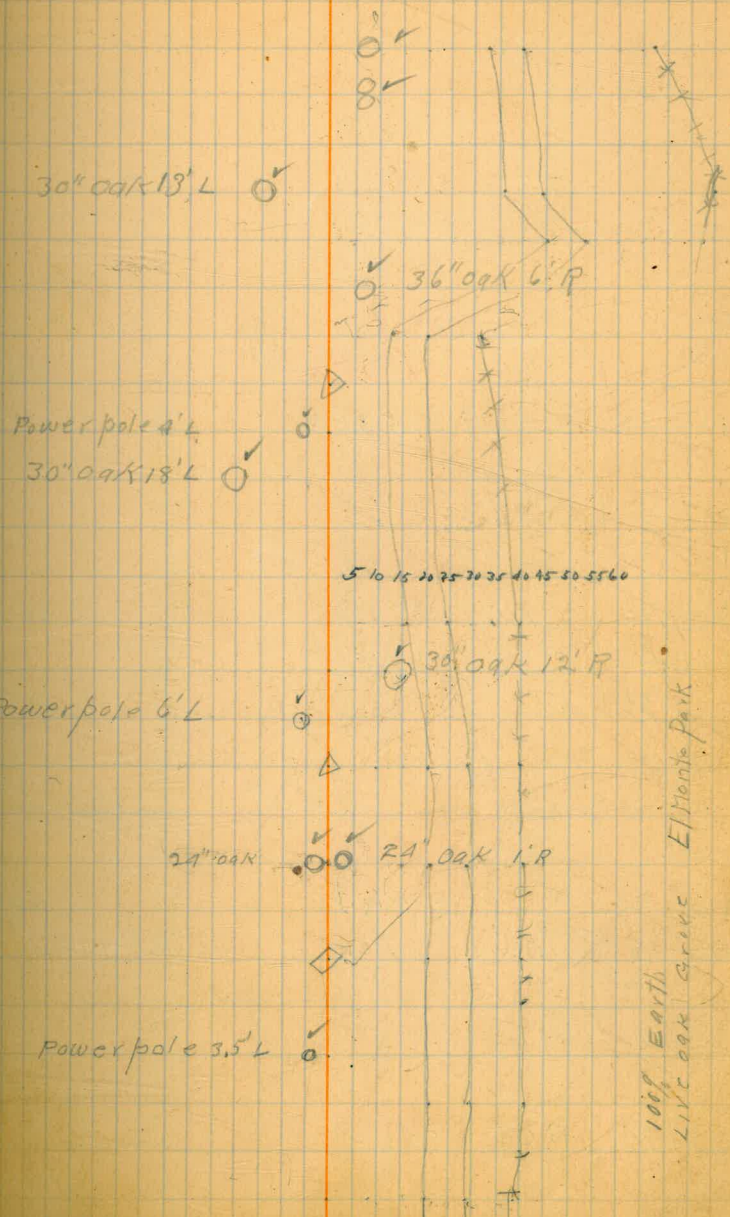


Correct

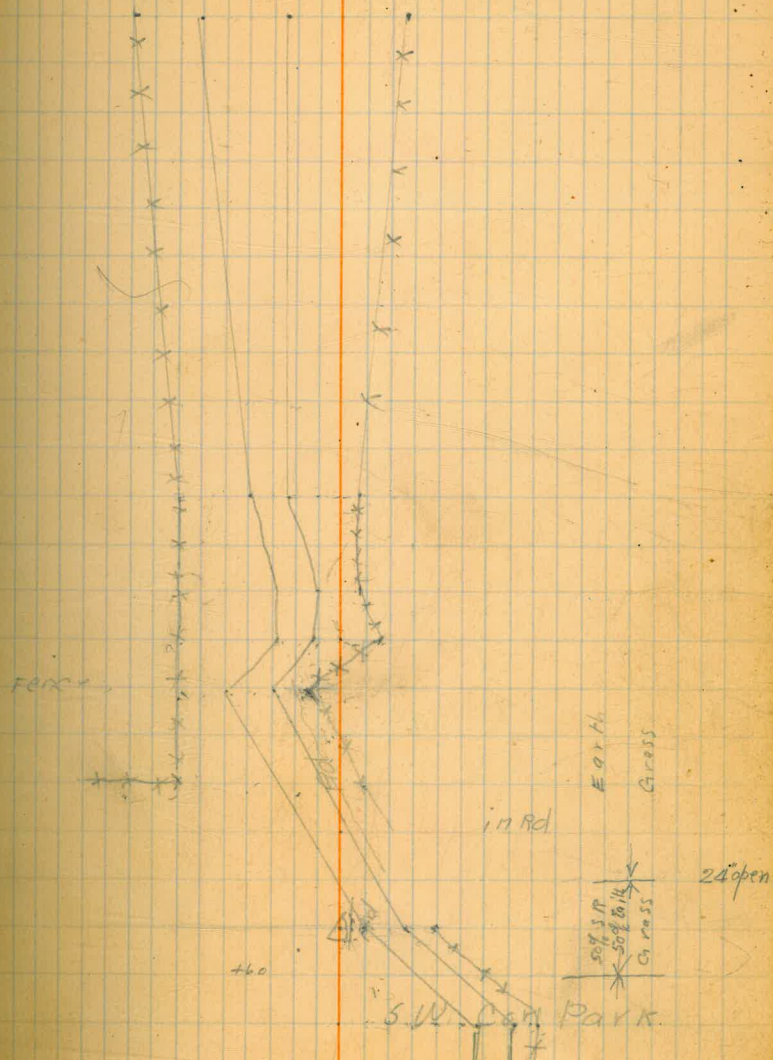
139752			24" oak 5'R	150
129450	POT	S5°50'E		
139749			24" oak 5'R	
139700				
138770				
13870				
137773				
1377		S6°52'E		
137708	51°16' L	S5°50'E		242
137702				
+52				
13670				
135700		S44°24'W		
+22		S45°26'W		
+11.5	✓	Began hpre	Sept 26	308
134700	2°00' L	S47°29'W		
		S45°25'W		
13370				
	✓	S46°25'W		200
13270	3°20' R	S45°25'W		
131701				
13170				
		S44°04'W		
13070				

Power line attracts
Needle

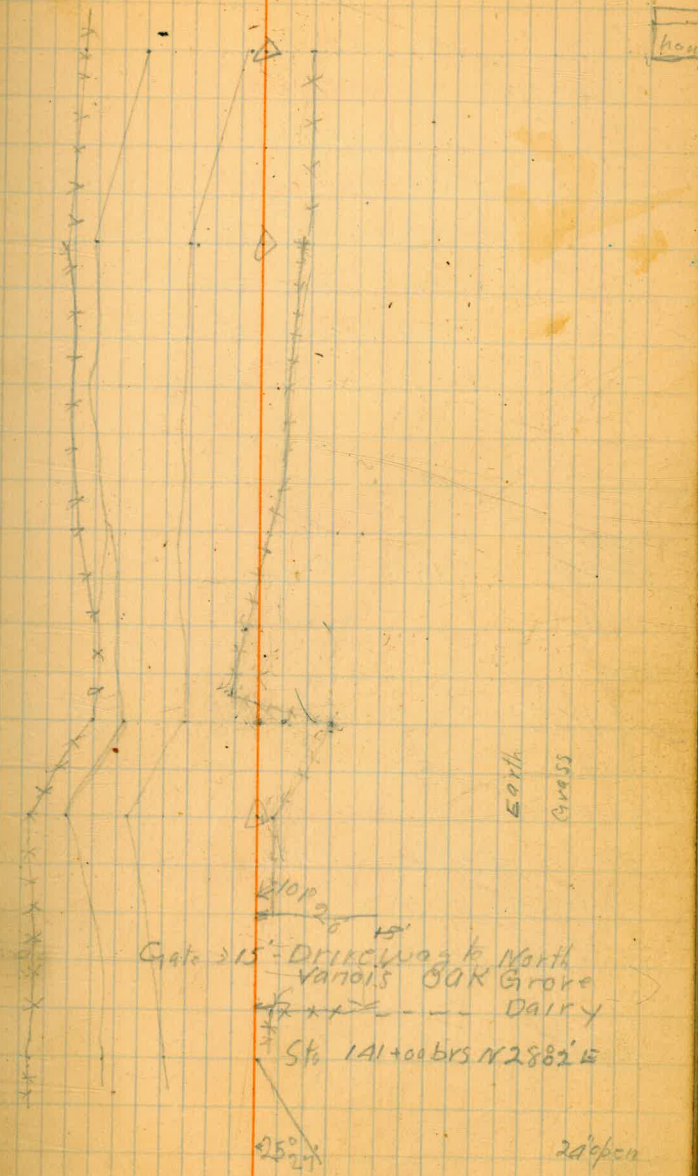
From Sta 1264 to 137408
Should be one tangent



9
 8
 147+0 S55°31'W
 146
 145+32 25°28' P S55°31'W ✓ S54°29'W ✓ 553
 145+00 S39°10'W
 144+0 S30°03'W ✓ 164
 143+68 62°19' P S13°15'W
 +56
 142 S33°18'E ✓ 268
 +56 S32°16'E
 141+00 26°26' L S48°35'E
 140+0
 139+50 POT S6°52'E ✓ 150
 S5°50'E



	Comer	Magnet
	S99°33'W	
159 + 64	24°51' R S50°35'W RA 40' R S49°31'W	332 S24°00'W
159		
	S24°42'W	109
157 + 59	14°31' L S25°44'W	S9°00'W
7		
6		
157 + 63		
5		
4		
	S39°13'W	
	S40°15'W	459
153 + 00	13°51' L S39°13'W	S28°35'W
2		
151 + 04		
151 + 0		
	S53°04'W	
+89	S54°06'W	215
150 + 85	1°25' L S55°01'W	S38°45'W
150 + 0		



So

Mag

Correct

168+00

S47°44'W

S48°46'W

267

167+33

16°51'L S47°42'W

S31°40'W

Topography From this Sta

167+00

back taken on split ls at PI

For ward it is taken at Rt

166+0

L to back tang.

165+0

S64°35'W

252

164+81

23°55'R S65°37'W

S48°30'W

+45

X Fence

164+00

489

X Fence Runs to R

163+36

Fence

163+06

S40°40'W

281

162+00

8°53'L S41°42'W

S22°33'W

161+00

160+0

159+0

S50°35'W

L. Berlinger

Farm buildings

Silo

Pub. Hi. Way

Roadway

100% Earth

Grass

20' open

BY DRIVE
BY DRIVE

W.J. Kuhner

W.J. Kuhner
owner

10 5 15 20 25 30 35 40 45 50 55 60

Magnetic

Correct

17740

17640

17540

S42°43'W

✓

S48°45'W

332

174+68

17° 09' L S 12° 10' W

S26° 30' W

174+0

S59°52'W

168

173+00

30° 57' L S 60° 54' W

S42° 10' W

31.48' L

N89° 11' W

93

172+07

31° 53' L N 88° 09' W

S72° 50' W

172+0

17170

N57° 23' W

✓

N56° 21' W

139

170+69

74° 53' R N 7° 50' W

N 79° 25' W

68

170+0

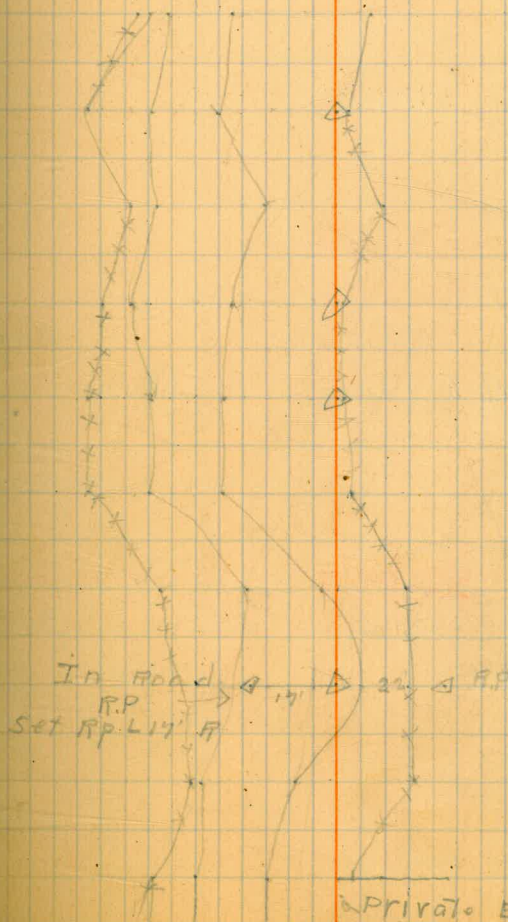
POT

S47° 44' W

S48° 46' W

169+0

+ 91



Earth 100%
Grass

Private Entrance

24' open

50 45 40 35 30 25 20 15 10 5

Correct
S38°02'W
S39°04'W
189+00 1°43' R S38°21'W S21°50'W 500

8

7

6

Pot

S37°21'W

300

5

4

S36°19'W

S37°21'W

300

189+0
+90
+80
2+40

3°15' R

S37°21'W

S20°10'W

Forma bldg



Power poles

10' x 10'

12" concrete pipe

3" Iron pipe

PR DRIVE 1/4"

12" below surface

Earth 100%

Grass

1
+06
S33°04'W

S34°06'W

300

180+00

9°39' L

S33°21'W

S17°10'W

179+0

200

178+0

Pot

S43°45'W

2 Omitted

1

200 + 0

199 + 00 POT

+10

199

7

6

5

194 + 00 Dot

3

2

1

190

539°04'W

quit here at 4 PM. Sept 28 Begin here Sept 29

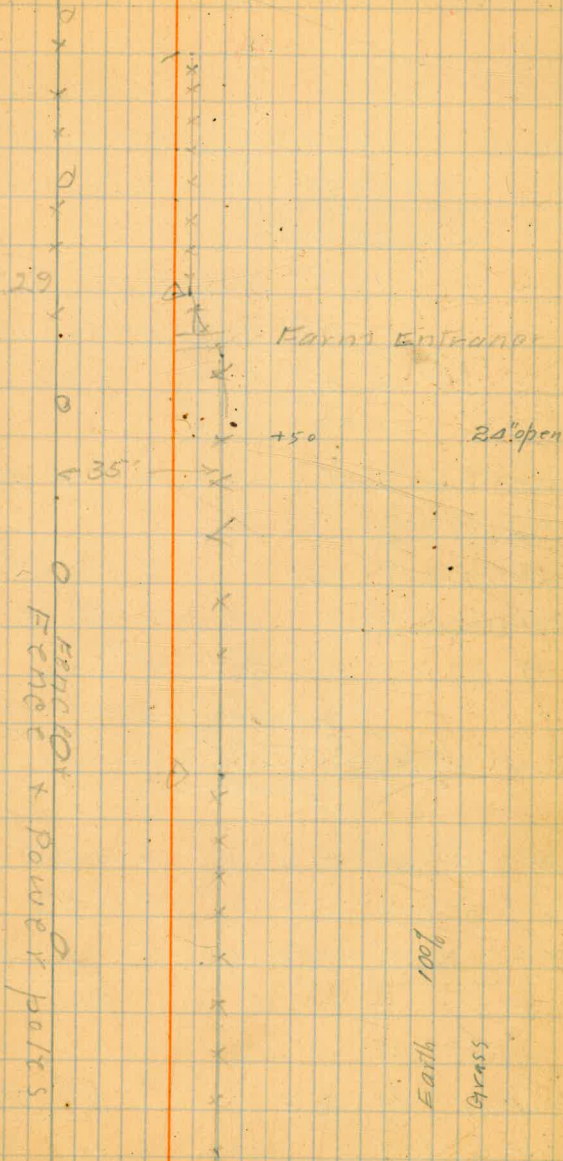
538°02'W

539°04'W

500

~~600~~

500



Observation	Telescope	Sun	Watch time	Vertical	Horizontal Angle Flag to Sun
1st	Direct	☉	3:19:10	27° 37' 00"	28° 55' 00"
2nd	Reverse	☉	3:22:50	26° 32' 30"	30° 09' 30"
Mean			3:21:00	27° 04' 45"	29° 32' 15"

$$V = 27^{\circ} 04' 45''$$

$$- \quad 1' 58'' \text{ (Refraction)}$$

$$+ \quad 0' 8'' \text{ (Parallax)}$$

$$h = 27^{\circ} 2' 55''$$

Greenwich Meek. Noon Sept 28 = $1^{\circ} 55' 73''$ (South)
 Correction for 7.7 hrs Long $+ 18' 12''$
 Time past Noon 3.3 $+ 18' 12''$
 Change per hour $58.42'' = 2^{\circ} 03' 19.3''$ (South)
 increasing $\delta = \rightarrow$

$$\cos \frac{1}{2} A = \frac{\sin s \cdot \sin (s - \text{Codecl})}{\sin \text{CoLat} \cdot \sin \text{CoAlt}}$$

$$90^{\circ} - \phi = 90^{\circ} - 32^{\circ} 45' 31'' = 57^{\circ} 14' 29'' = \text{CoLat}$$

$$90^{\circ} - \delta = 90^{\circ} - 02^{\circ} 3' 19.3'' = 87^{\circ} 56' 40.7'' = \text{Codecl}$$

$$90^{\circ} - h = 90^{\circ} - 27^{\circ} 02' 55'' = 62^{\circ} 57' 05'' = \text{CoAlt}$$

$$RS = 212^{\circ} 14' 53''$$

$$S = 106^{\circ} 07' 26''$$

$$\text{Codecl} = 90^{\circ} - \delta = 92^{\circ} 03' 19''$$

$$s - \text{Codecl} = 14^{\circ} 04' 07''$$

Sept 28 1925
 Observation of Sun to Check
 Azimuth.

$$\text{Log Sins} = 9.982572$$

$$\text{Log Sin } S - \text{Codecl} = 9.385697$$

$$\underline{\quad \quad \quad 9.368269}$$

$$\text{Log Sin CoLat} = 9.924775$$

$$\text{Log Sin CoAlt} = 9.951602$$

$$\underline{\quad \quad \quad 9.876377}$$

$$\text{Log cos}^2 \frac{1}{2} A = 9.368269$$

$$\text{Log cos} \frac{1}{2} A = 9.876377$$

$$\frac{1}{2} A = 55^{\circ} 50'$$

$$A = 111^{\circ} 40'$$

Sun bears $N 111^{\circ} 40' W = S 68^{\circ} 20' W$
 Ang from flag to Sun = $29^{\circ} 32' 15''$
 True bearing to flag $S 38^{\circ} 47' 45'' W$

Calculated bearing $S 39^{\circ} 04' W$
 according to Transit Line $St. 199+00$
 Lim. Error $0^{\circ} 16' 15''$

Computed By C. M. Boren
 Checked By A. C. Leach
 Sept 28-1925

06

Correct

430
+27
+20

Fence

212700

211700

21070

209700 POT

S86°16'W

S68°50'W

400

8

207

206785

S85°08'W

206775

S86°16'W

266

206734

47°06'P

S85°31'W

S68°35'W

6

S38°02'N

205700

POT

S39°04'W

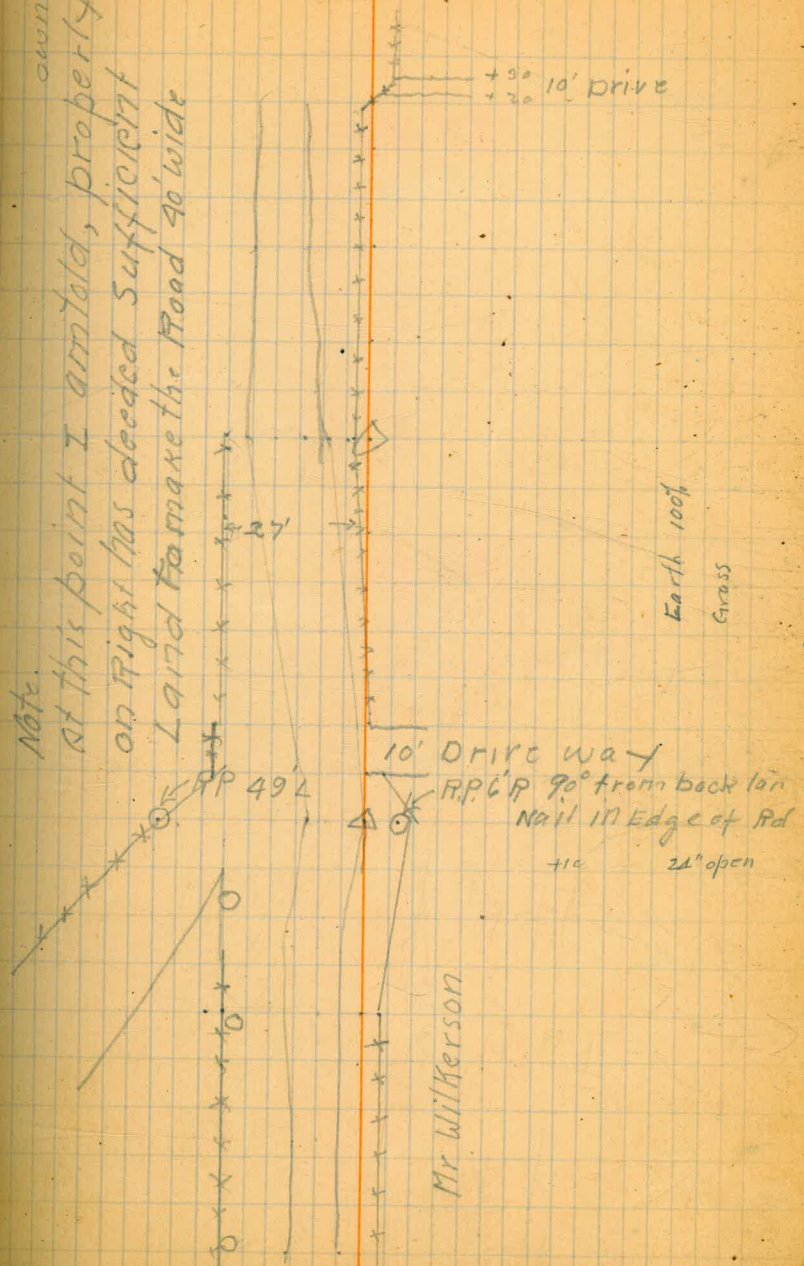
134

20470

203

Note.

At this point I am told, properly
owner on right has decided sufficient
Land to make the Road 90' wide



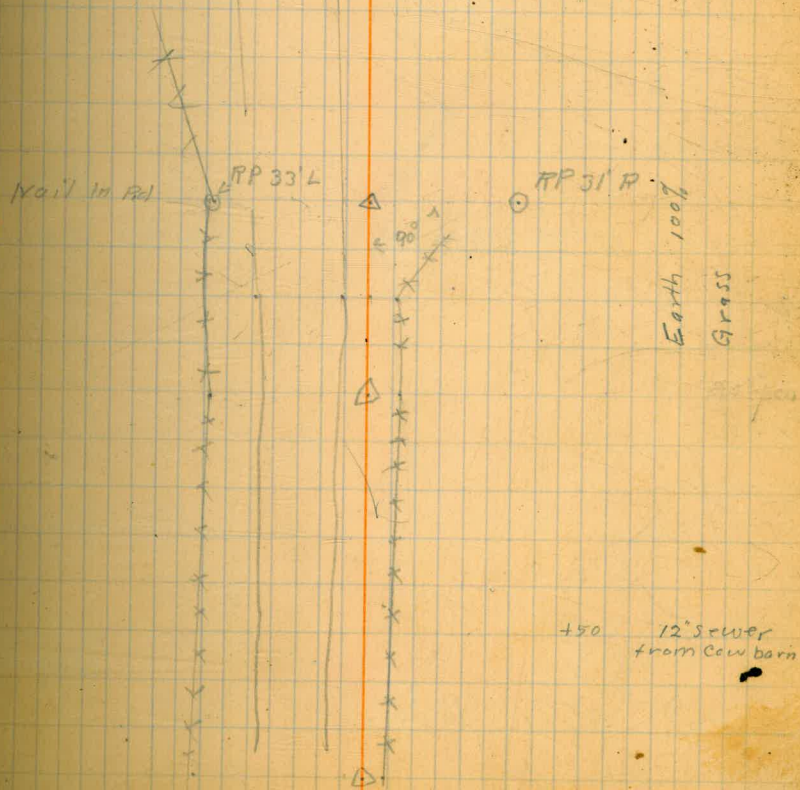
Mr. Wilkerson

Earth 100ft
Grass

10' DRIVE WAY
PP 492
Nail in Edge of Rd
110 21' open

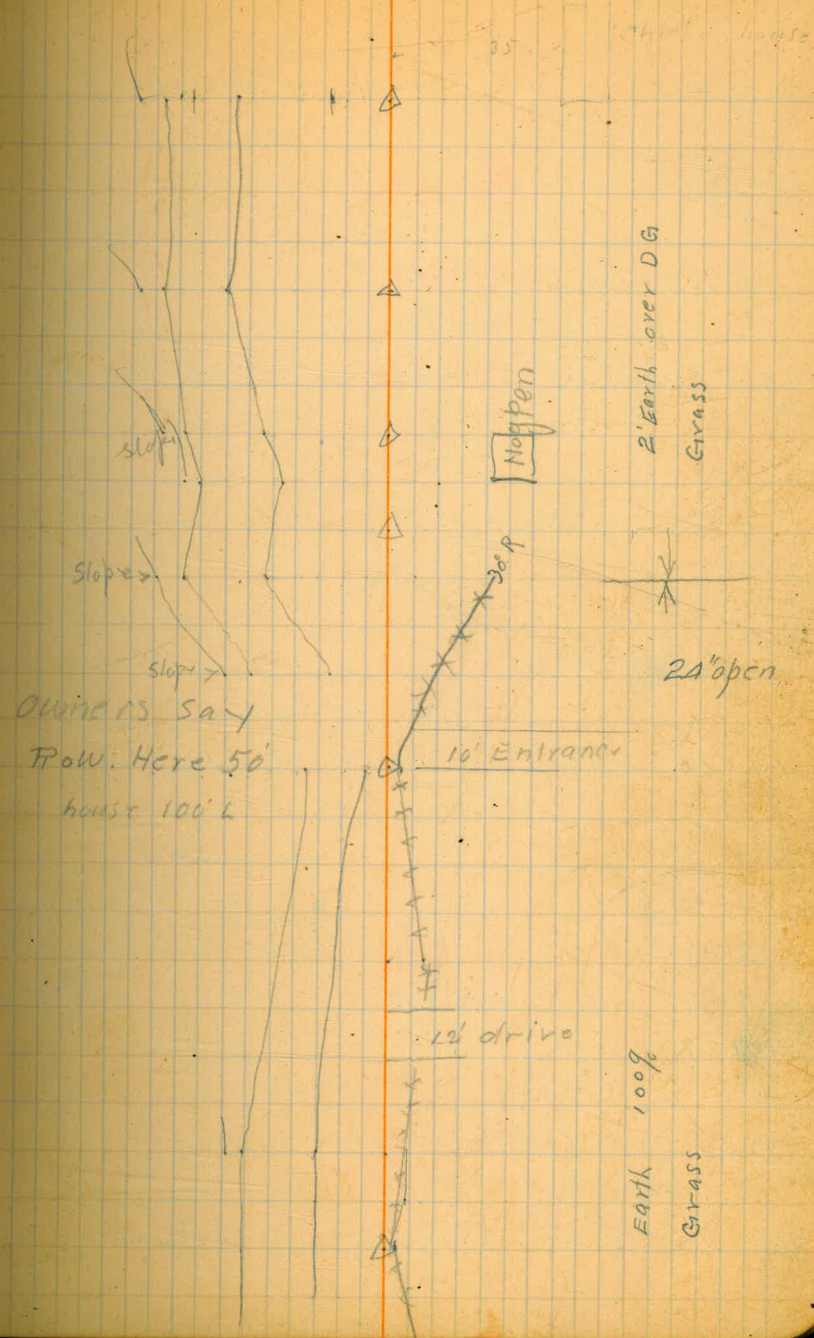
+30
+20 10' Drive

229+00	✓ N70°13'W	85
782	204' L N69°11'W	N85°00W
2		
1		
22070		
219+0	✓ N49°32'W	957
	N48°36'W	
218+25	45°20'R	N65°10W
218+0		
770		
217+00	Pot	125
	S85°08'W	
6		
5		
4		
213+00	Pot	400
	S86°10W	

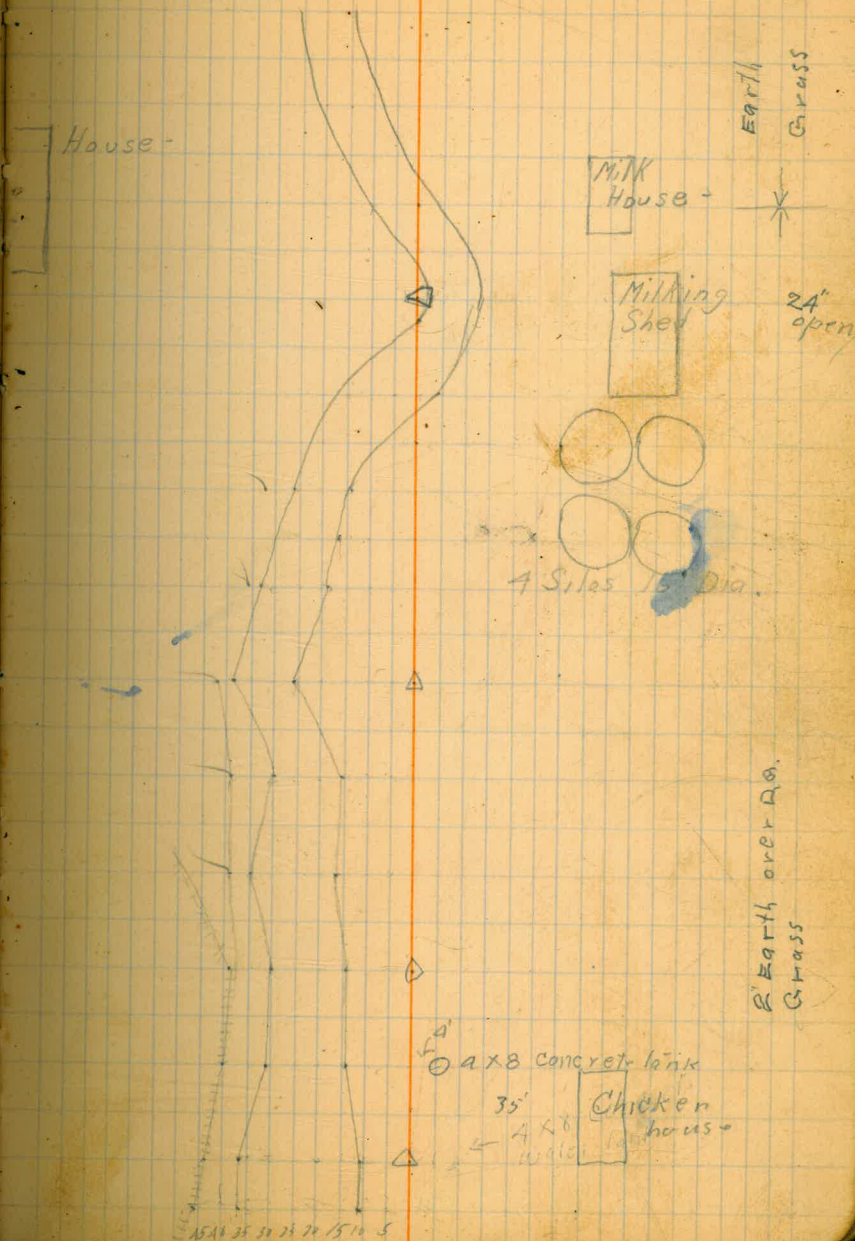


			Magn.	
232+35	6°32'	S 73°58'W	S 58°10'W	80
2				
		S 79°28'W		
1		S 80°30'W		210
+25	19°14'	S 79°28'W	S 60°10'W	
230 + 0		N 81°16'W		83
+42	22°00'	N 80°14'W	S 83°35'W	
9				57
+65	Pot	N 58°14'W		
8				
7				
		N 59°16'W		209
226+81	57°00'	N 58°14'W	N 74°30'W	
220				
225+0				
199				
+36				
224+0				
		S 63°44'W		314
223+67	46°03'	S 64°46'W	S 48°30'W	

LIVE OAK GROVE TO RIGHT OF THE



242+0	Concrete	Mag. Bear.
241+00		
240+00	S73°30'W	
	S74°32'W	295
239+30	71°14'R 4W	S58°00'W
239+00		
+70	Silos tanks on RT	
238+00		
237+00	S2°16'W	
	S3°18'W	280
236+50	30°12'L S-39W	S12°45'E
236+0		
235+0	S32°28'W	
	S33°30'W	195
234+55	15°57'L S32°11'W	S17°40'W
234+0	S48°19'W	
	S49°21'W	140
233+15	24°36'L S	S33°00'W
233		



Mag. Bear.

248+00

+82

+70

+58

+43

247+40

247+00

246+00

245+00

+30

+20

244+10

244+00

243+00

242+00

$S70^{\circ}32'W$

$19^{\circ}32'R$ $S71^{\circ}34'W$

~~$25^{\circ}28'R$~~ ~~$S72^{\circ}$~~

232

$S56^{\circ}10'W$

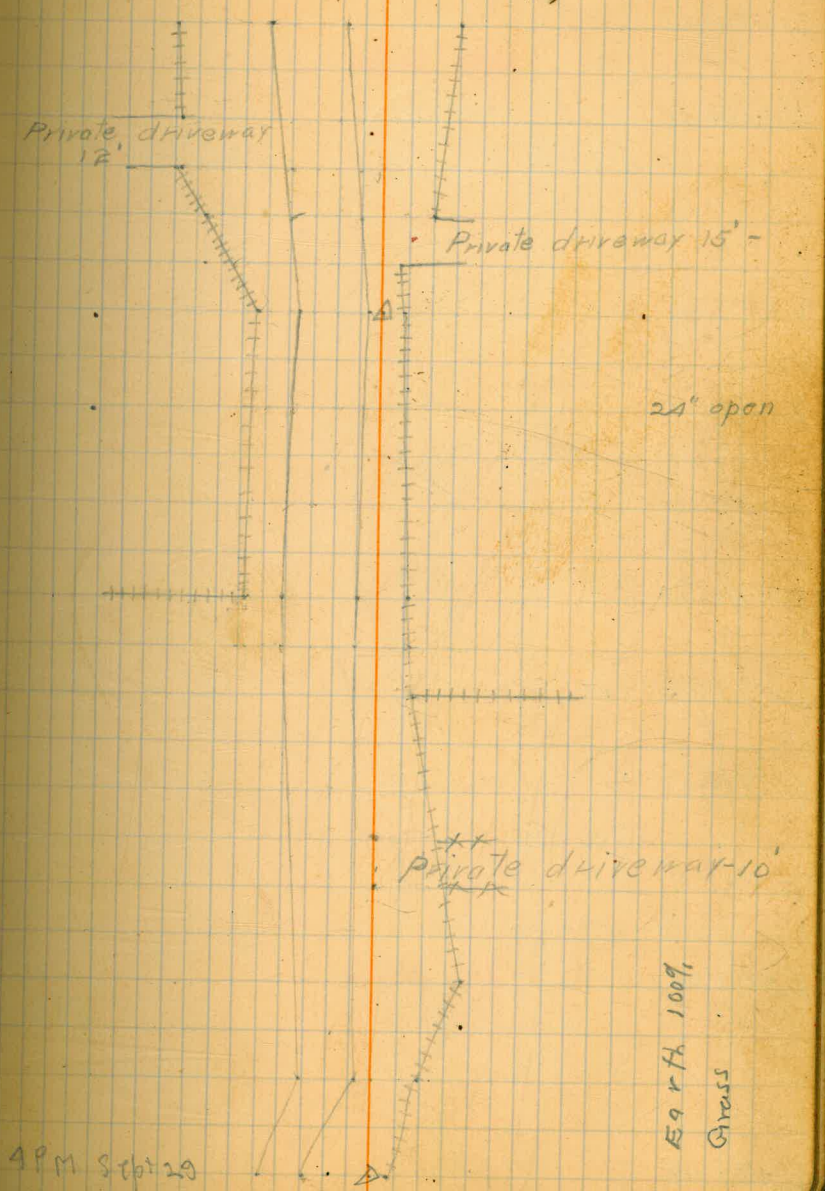
$S52^{\circ}02'W$

$S51^{\circ}00'W$

$2230L$ $S52^{\circ}02'W$

515

$S35^{\circ}00'W$



Conceal

Mag. Bear.

260+00

N53°36'W.

259+00

N52°34W

345

+55 49°4R N 16.1

N71°00W

258+00

257+00

256+00

255+00

+10

254+00

S 78° 12' W

253+00

252+00

251+00

+07

250+00

S77°10'W

S78°12'W

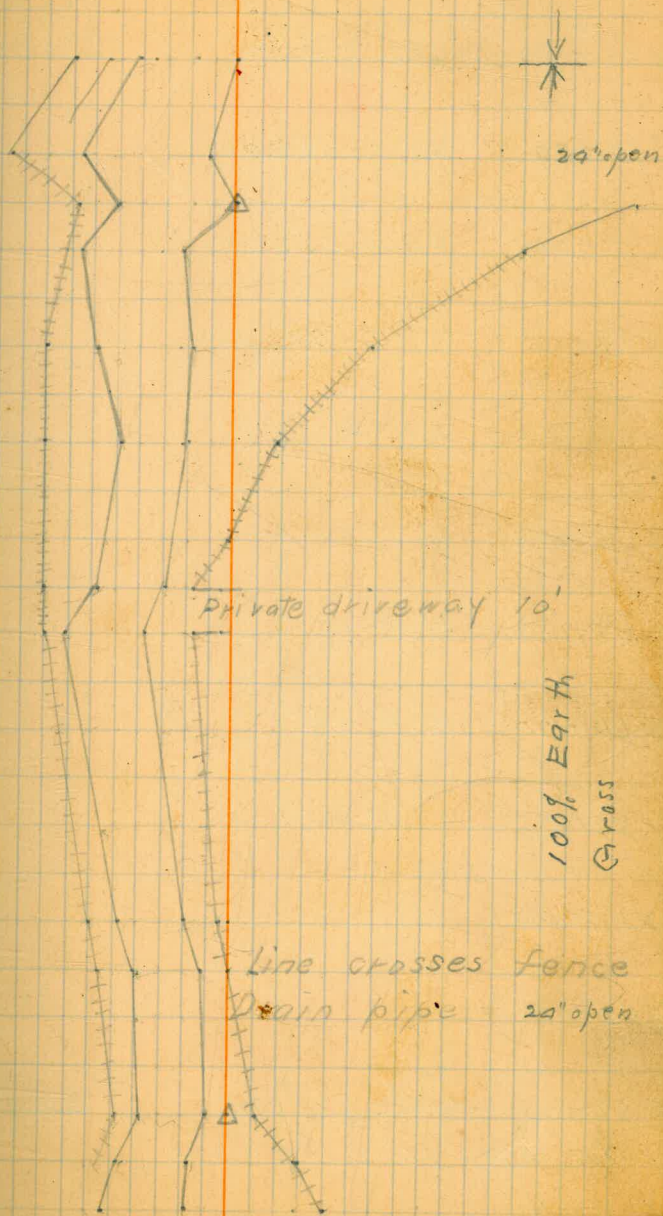
883

+72 6°38'R S 21°01'W

S62°00W

249+00

248+45



Not over 7' external
272+50 $17^{\circ}59' L S 50^{\circ}10' W$

$S 49^{\circ}08' W$

Mag. Bear. 300
 $S 34^{\circ}20' W$

272+00 25' R stake

271+00 22' R stake

270+00 22' R stake

269+00 22' R nail

268+00 11' R nail

267+00 10' R nail

266+00 18' R nail

265+00 23' R nail

264+00

263+00

262+00 $59^{\circ}17' L S 68^{\circ}09' W$

$S 67^{\circ}07' W$

1050
 $S 50^{\circ}50' W$

Not over 10' external

261+00

Nail in stone cliff R.P. 10.2' L

Hub edge of road R.P. 23.0' R



100% S.R. (Very Hard)

No corner

subject to overflow

Tack in stone cliff R.P. 19.4' R

Hub edge of road R.P. 27.0' R

Mag. Bear.

283+00

S17°43'W

S18°45'W

267

282+00

35°59' L 100W

S1°50'W

Not over 20' external

281+00

5' L stake

280+00

S53°42'W

S54°44'W

300

279+00

12°56' L S8°02' W

S37°35' W

278+00

137

P.D.T. S67°46' W

S51°25' W

128

277+00

276+00

16' R nail

S66°38' W

350

275+50

1730' R S67°40' W

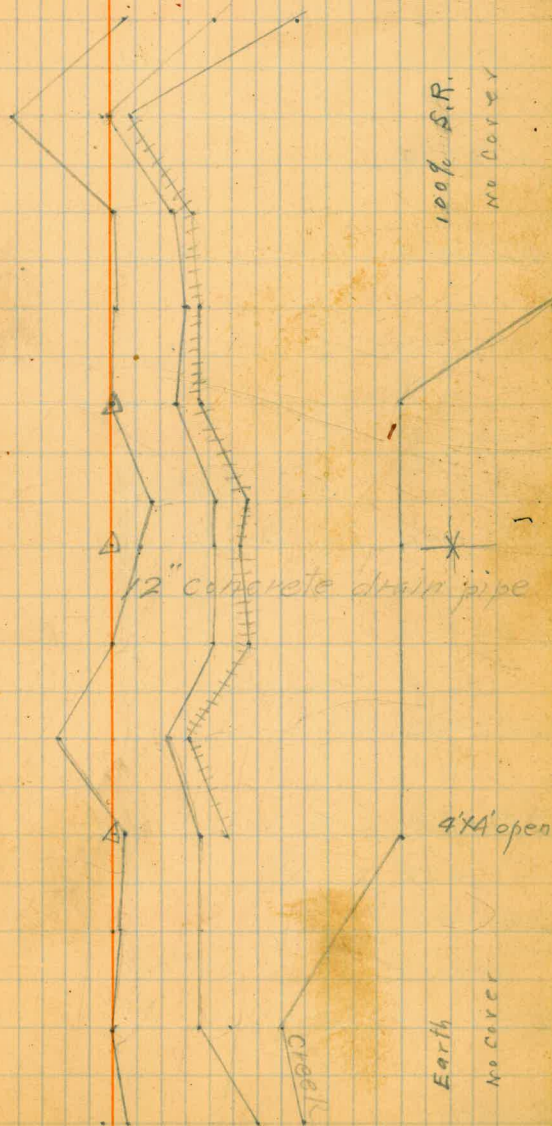
S51°40' W

275+00

274+00

273+00

S58°10' W



Mag. Bench

Note: Irregularities of Mag. readings probably due to Power line.

666

S27°36'W

373

S34°36'W

Large wash from L

Wash from L

22467
373

294+00

293+00

292+00

291+00

290+00

289+00

288+00

288+00

287+00

286+00

285+00

284+67

284+00

S43°50'W

S42°49'W

S43°50'W

7°51' L

S50°40'W

S51°41'W

3257R



1' Earth
S.R.

Grass



24' open

1' Earth
S.R.

Grass



100% S.R.
NO CORE

Drain pipe



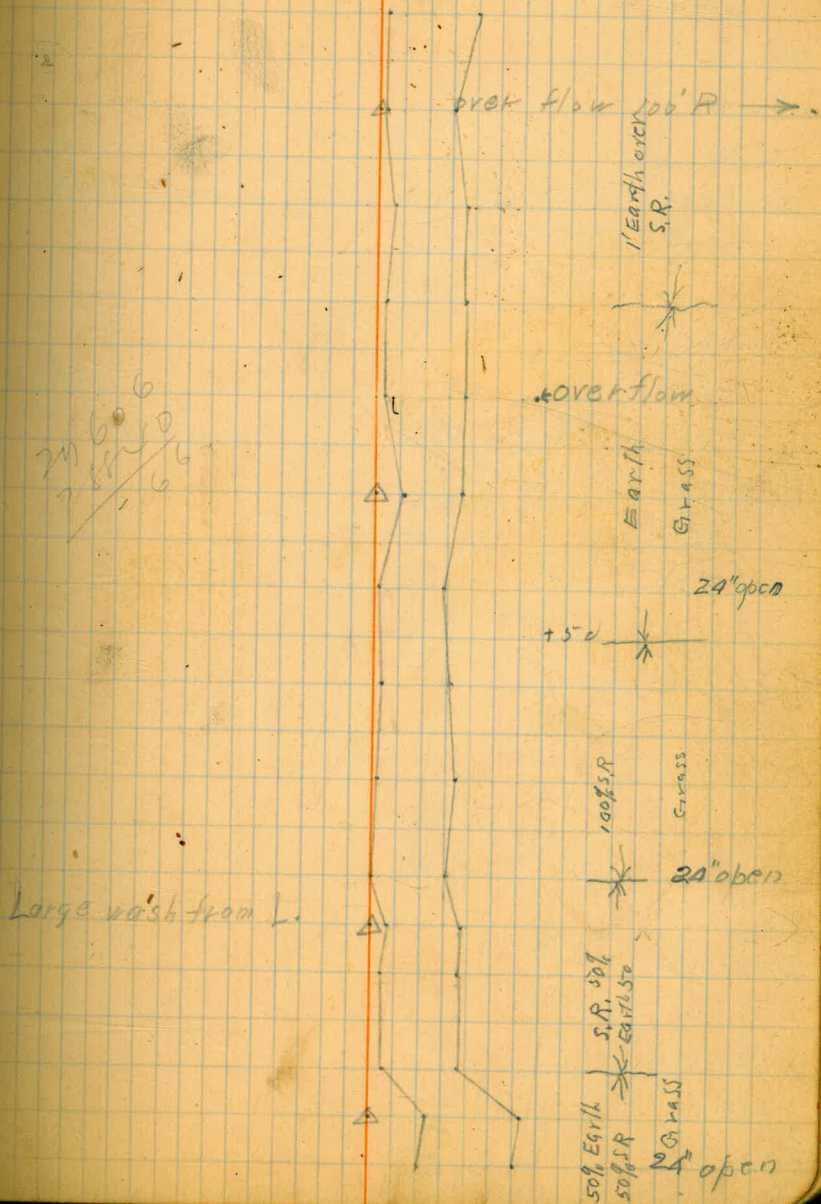
4'x4' open

4-100% Earth
Grass



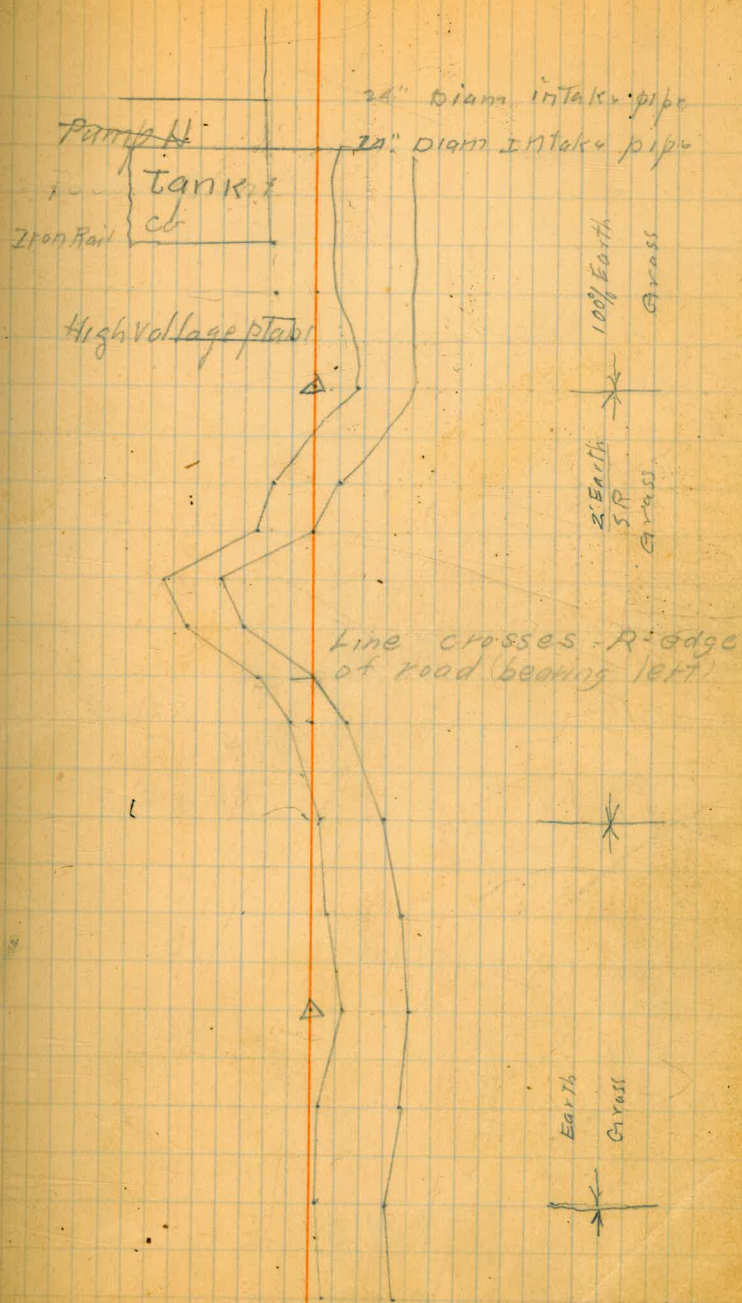
Station	Notes	Bearing	Distance	Mag. Bear.
306+00	✓	S79°07'W	382	
305+55	7°07' L	S80°04'W	S63°16'W	
305+00				
304+00				
303+00				
302+00	7°16' R	S86°14'W S87°16'W	355 S69°50'W	
301+00	7' L stake			
300+00				
299+00	2' L stake			
298+00	4' L stake	S76°58'W S79°59'W	437	
297+00				
296+00	27°12' R	S70°01'W S71°02'W	257	
295+00		S53°50'W		

Boren
Sprunt
Leach
Reynolds - Oct. 1



+27
 +27
 316+00
 +94
 +74
 315+00 This point is being shot off ^{1316.3} ~~1316.3~~
 +83.7 POT S49°15'W
 314+00
 +84 S48°14'W 148.5
 +135.2 A2°38' L S49°15'W S32°20'W
 313+00
 +50
 312+00
 311+00
 310+00 N89°08'W 398.2
 +37 N88°07'W N74°51'W S74°30'W
 309+00
 308+00
 307+00 S80°09'W

Mag. Bear.



Mag

6
5
4
+25
3
+92
2

320 + 0
9
318 + 0
+73
+60
+25
317 + 00
+80
+60

POT S49°15'W

6" pipe east Iron pipe

S48°19'W
S49°15'W

Front House



80'

well + W. Mill

2" water pipe

Private Entry

6" pipe (water)

Dirt Road

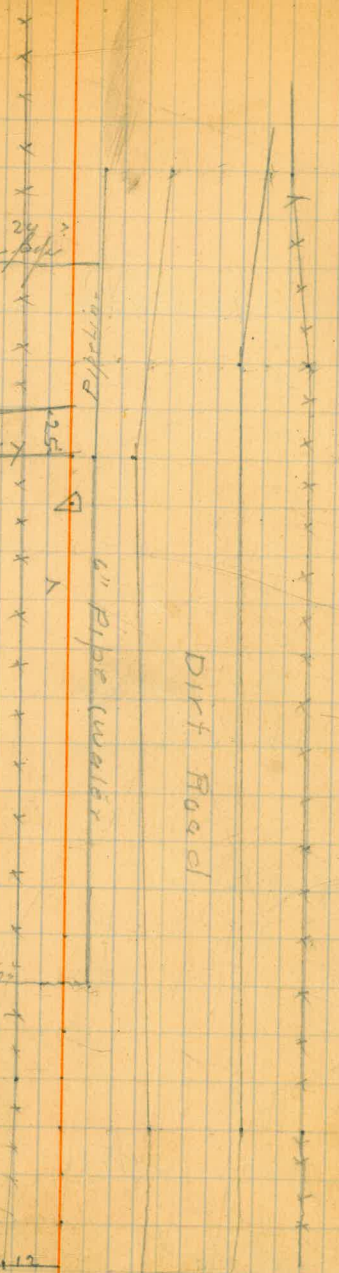
24" open
grass
100' long

6" water pipe

Bunk W

24" open

Power H



+68

7

6

✓ S25°31'W
22°43' S26°32'W

590

335+10

5

4

3

335+10

313+35.2

2174.8

+75 POT S49°15'W

+70 POT

2

copied to here

330+0

9

4

POT

S48°14'W
S49°15'W

710

327+00

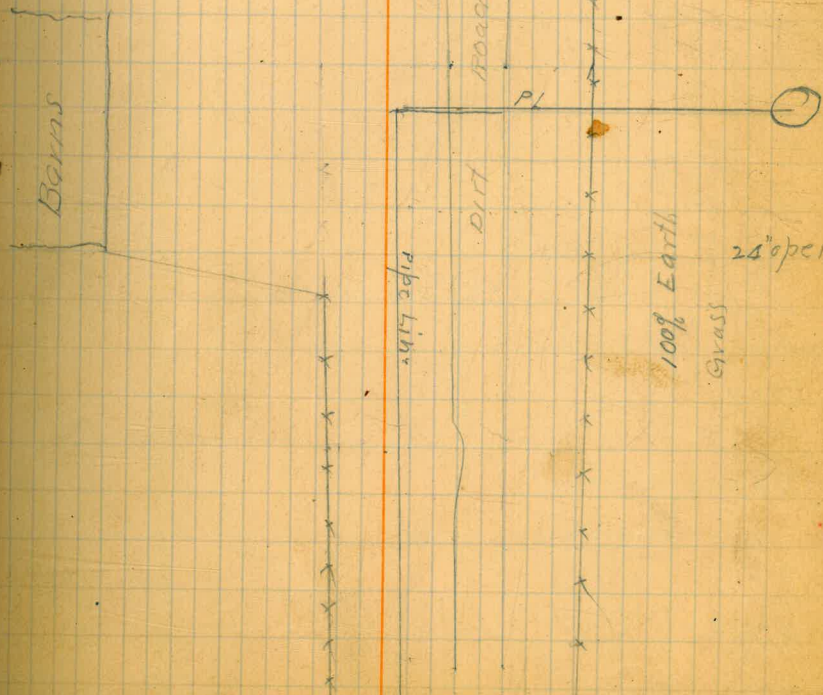
S49°15'W

Pk Drive

Not over 12 External Δ

24' open

A Trotting
House



9

8

7

6

782 0°29' R S 27°01' W

+15

5

4

3

2

1

POT. S 26°37' W

240+1

309+0

+15

338+0

S 27°01' W

S 26°00' W

518

482

fence x 2

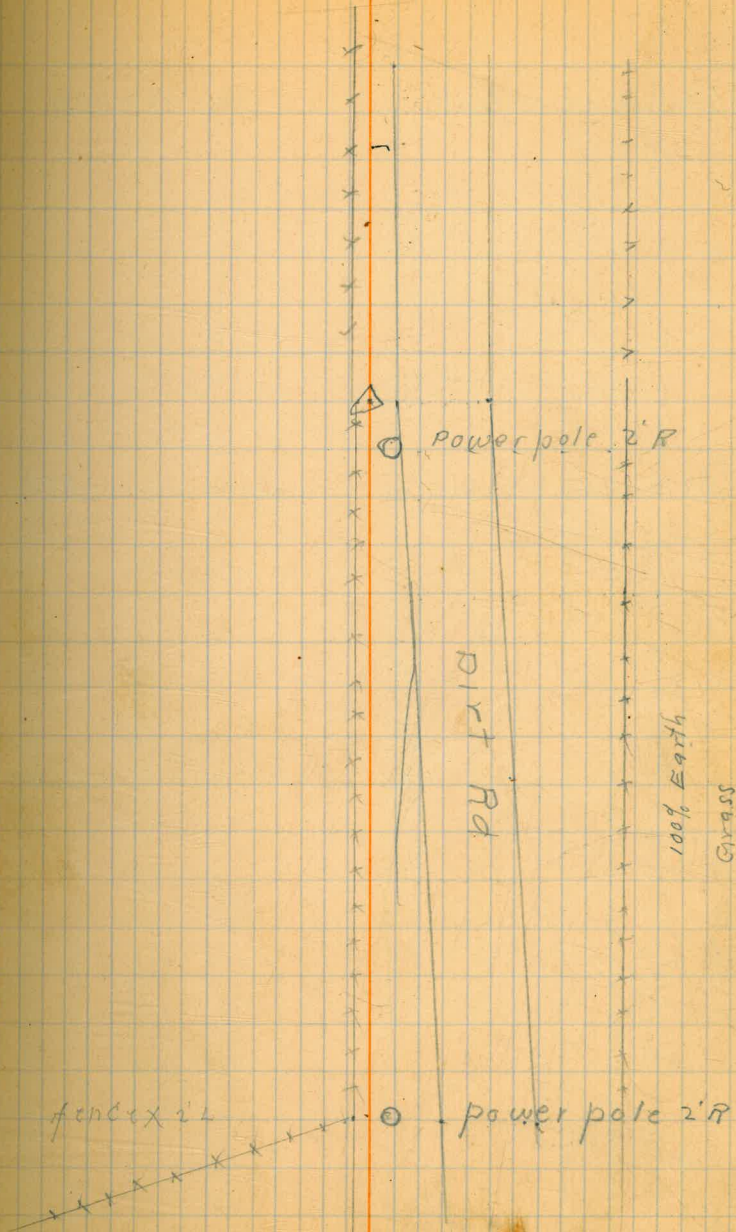
power pole 2' R

power pole 2' R

R 17' R

100% Earth

556.5



+ 28

5

4

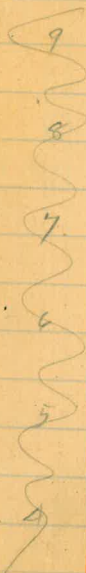
3

2

+ 15

1. POT

350



5 26000' W
5 25001' W

500

349+92

R^{1/2} X 16' open

Bridge in Road

○ Power pole 2' 19' Road to

100% Earth
Grass

Rd.

100% Earth
Grass

10' Drive Left

Note

~~From Sta 360+90 P.I. the
Corrected bearing
is used.
see opposite Page~~

Fro

+92

+50

360+0

+81

9

8

7

+50

356+00 POT

+ +55

S 26°01'W

S 11°35'W

492

Bearing from Transit notes

S 26°01'W

Bearing from observation on Polaris 26°07'30"

26°01'30"

Error = 00°06'30"

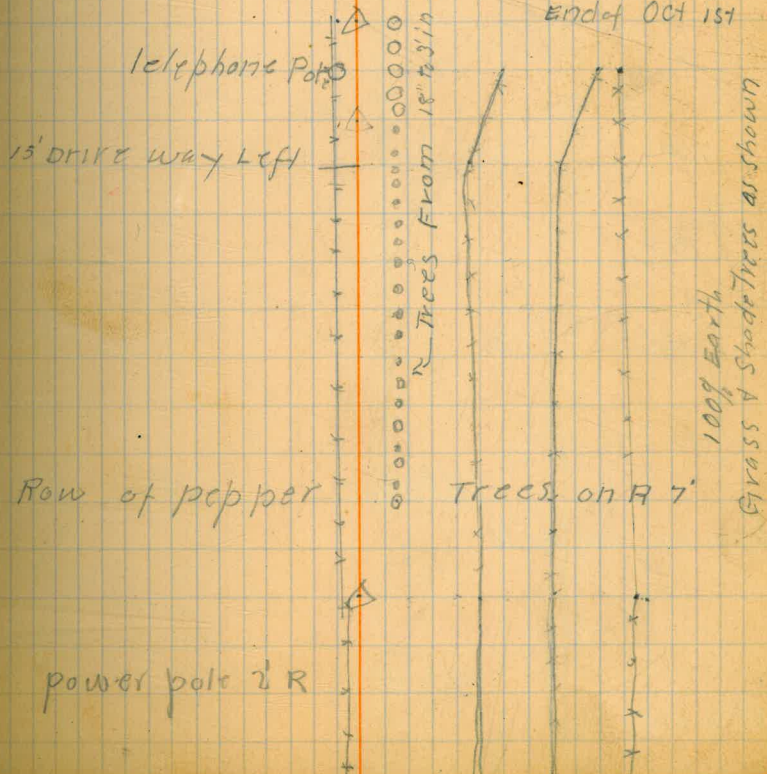
OCT 10th 1925

R Sta 356+00 P.O.T.

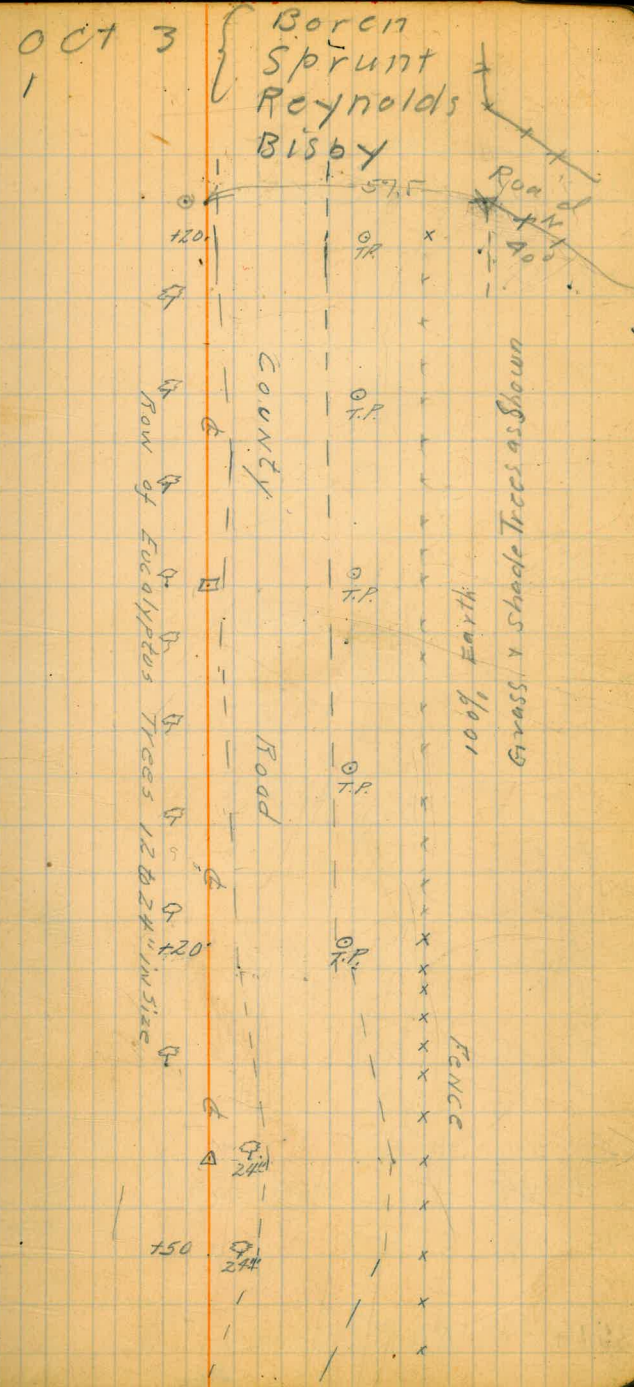
6:35 PM to 7:15 PM

I observed Polaris at E.E.

& Marked its Range upon the bridge
on Oct 3 7:10 A.M. I Measured
1'8" to the Left of Polaris as MK'd on
bridge & set Hub under the Fence West
of Rd. Angle between Meridian
& Tangent Sta 356+0 is 26°07'30"
showing Error in Line = (opposite Page)

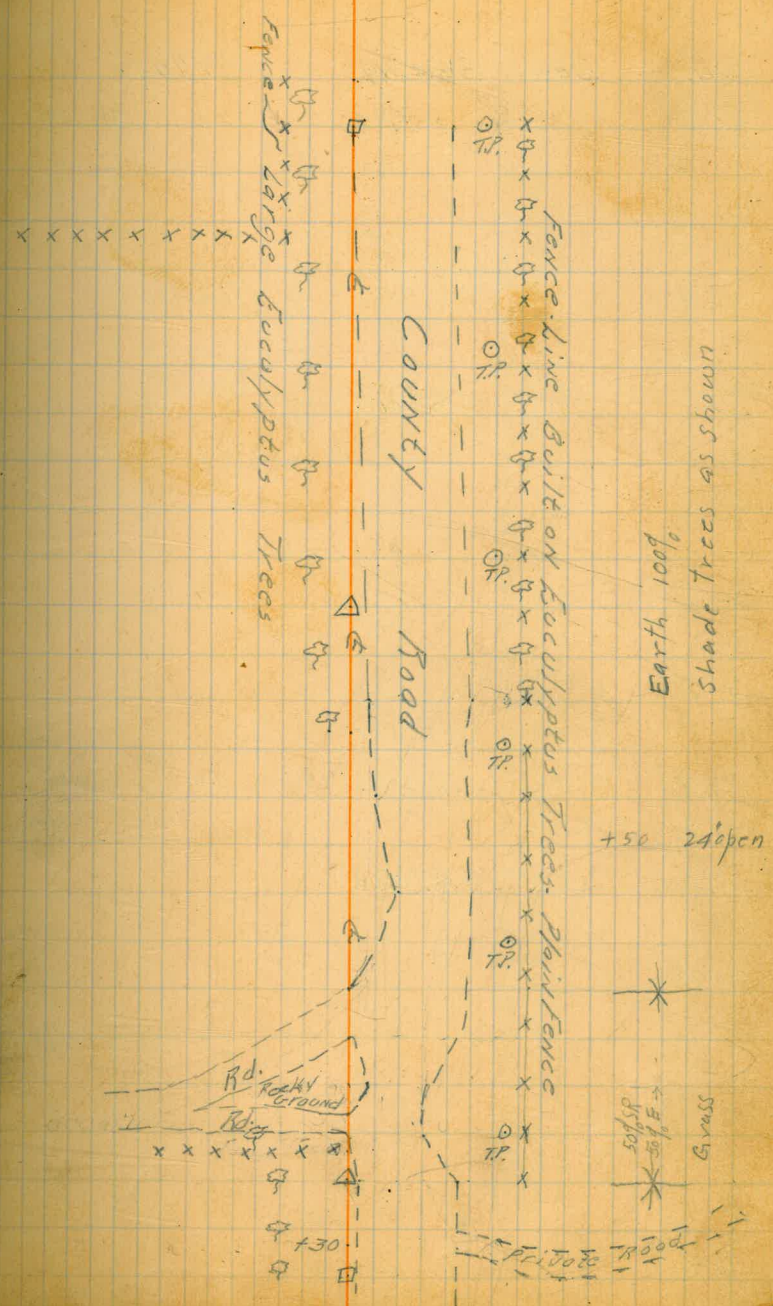


183 Property Cor 9X9 to Rt 57.5
 370+00
 9
 8
 7
 6 P.O.T $S80^{\circ}40'W$ 500
 5 P.T.
 4
 3
 2
 1 $S80^{\circ}40'W$
 $S81^{\circ}21'W$ 566'0" W 508
 360+02 $S4^{\circ}40'R$
 $S26^{\circ}00'W$ 492
 $S27^{\circ}01'W$
 356+00 P.O.T



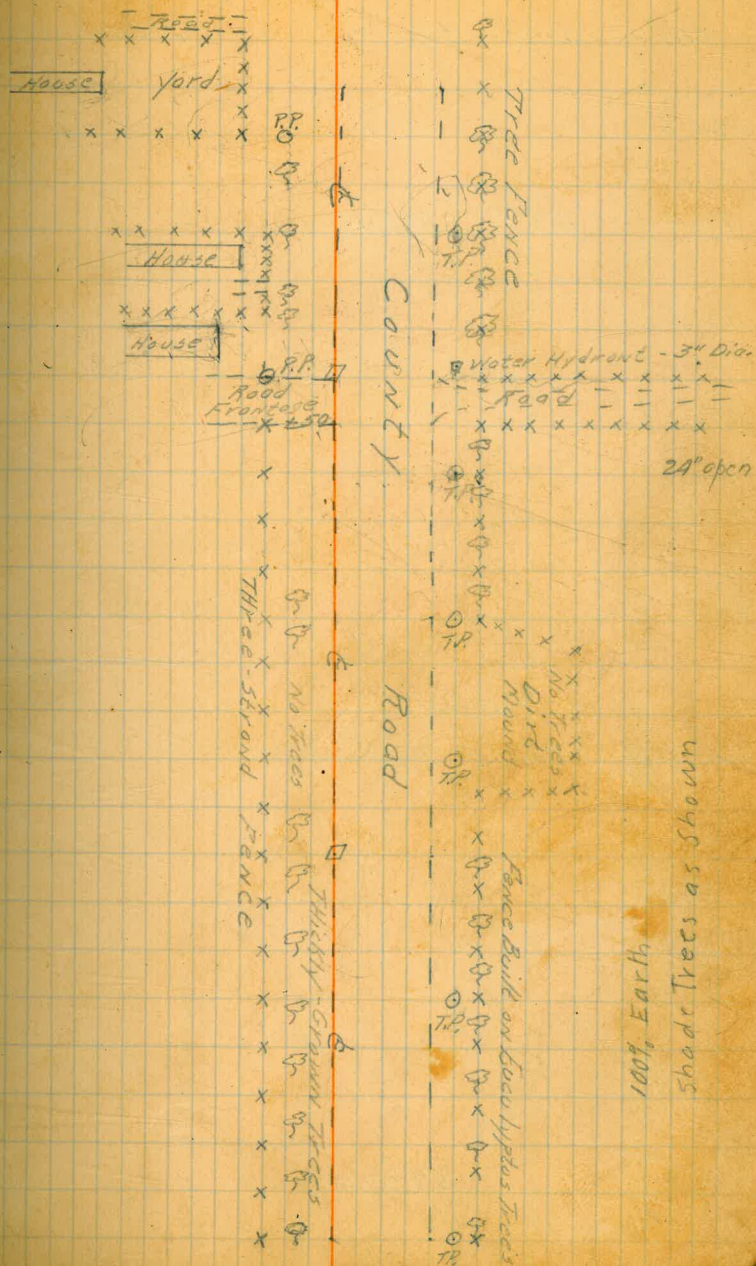
Sta.	Def.	Bearing	Mag.
383	P.O.T.	S82°00'W	500
382			
381			
380			
379		S80°59'W	500
378	10224	S80°00'W	566-15W
377			
376			
375			
374			
373	+43	S82°21'W	600
372+00	1°41' R	S83°22'W	
371+00	POT	S80°40'W	700

Topog.



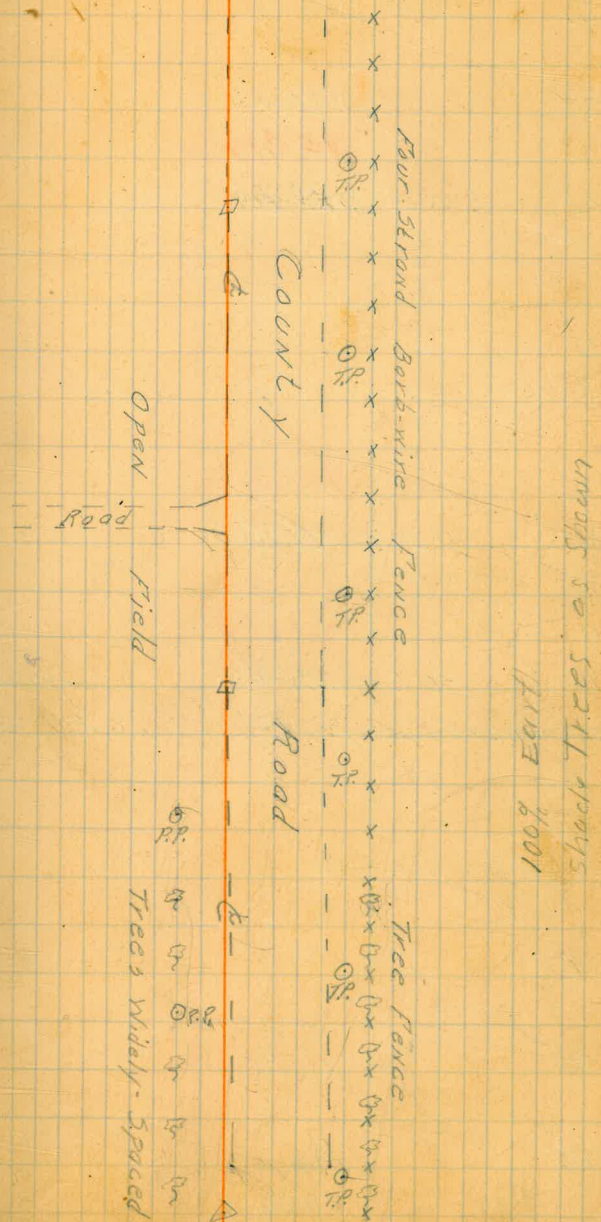
Sta.	Dist.	Bearing	Mag.
396			
395			
394			
393	P.O.T.	S 80° 59' W	900
		S 82° 00' W	
392			
391			
390			
389			
388	P.O.T.	S 80° 59' W	500
		S 82° 00' W	
387			
386			
385			
384			

Topog.



100% Earth
Shade Trees as Shown

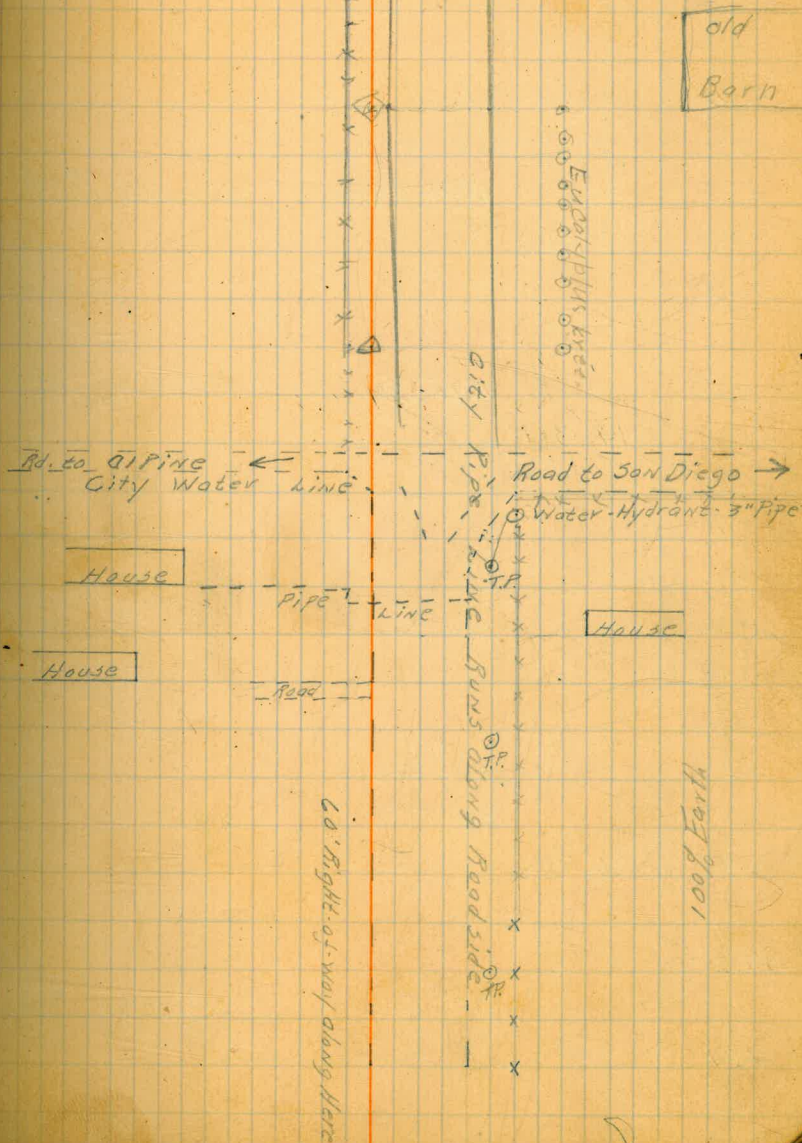
Sta.	Def.	Bearing	Mag.
408		S80°40'W	700
407	P.O.T.	S81°11'W	
406			
405			
404			
403		S80°40'W	
402	0-19 th 58 th	S81°11'W	301
401	Bearing to Lakeside Water Tank	S15°49'W	References: 29 th R.R. at R.R. 10 th L.L. L.S. Co. Back Town
400			
399			
398		S80°59'W	
397	+53 Pot	S82°00'W	



Sta.	Deft.	Bearing	Mag.
418		N42°36'W	
		N43°37'W	N58°20'W 140
+20°	L33°51'	N42°36'W	
417			
416			
416		N9°46'W	178
+42°	89°34' R	N8°45'W	N24°30'W
415		S80°41'W	142
414	P.O.T.	S81°41'W	567-10W
Bearing to Lakeside Water Tank			552-55E
413			
412			
411			
410			
409		S81°41'W	

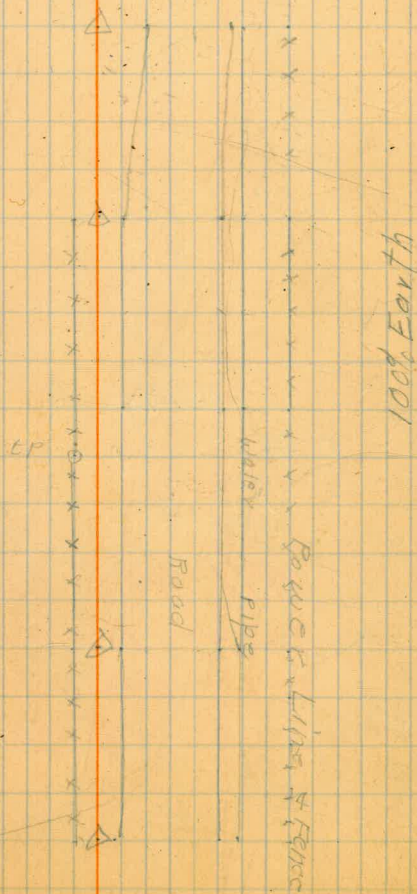
Topog.
 Begon Sta 417+20
 At 1 P. O'clock P.M. Oct 15
 All forenoon Rain

Baren
 Sprunt
 Meynold
 Bisbey



Sta.	Deflt.	Bearing	Mag.
432			
+95		End of fence on L	
+30		Kibbey's well 20 L	
+22		Power pole 6 ft W ✓	
		N46°15'W N46°14'W	N62°40'W 398
+16		19°41'R	
4			
		N66°56'W	
433		N65°55'W	N82°15'W 181
+35		17°31'R	
427			
2			
426			
421+00			
+25			
		N84°27'W	
420		N83°26'W	
		S89°32'W	S81°30'W 282
4233		16°09'L	
		N68°18'W	
419+01		N67°17'W	N83°40'W 93
+60		24°41'L	

Topog.



6
5
4
3
2
1
8
7
6
5

Pot

Pot

43.0
+ 24
+ 44
4284.14

58°14'W } S 65°20'W
51°48'L

Note

All notes in this
book after, Stc 428+14
are abandon
C.M.B.

pu. Dike
Left

Rows of trees

Paved Road 14 wide

Row of trees

In open land

100% Earth

7

6

5 POT

4

3

2

1

440+00 20' DRIVE Left
S80°56'W S64°45'W

+77 0°28'L

9

+60 CROSS Canal

8

7



POWER LINES

COOP. FENCE

TELEPHONE POLES



14 X 9 1/2 opening

side trees

8

581° 07' W

565° 00' W

+12 0° 20' R

7

6

5

4

3

2

1

+8.5

drive way left

+10

580° 47'

564° 00' W

450+00

0° 09' R

9

8

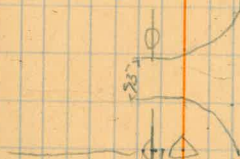
4 Rd to Boston

Care pavement

Telephone Line

Oliver
Grove

287



482+03 8°20'N S 89°27'W 5.73°15W

2

1

480+00

9

8

7

476+00

5

4

3

2

+30 POT

1

470+85 2x4 concrete curb in Rd

R.R. 400' North
P/O of Pavement

School
Grounds

Per Line

River View
Public
School
Road South

Road North

Concrete Pavement

Power Lines

Per Line

in gate way

2 RT of Lin.

3

2

1

+ 10

490+00

S 89° 43' W

S 74° 00' W

489+50 0° 17' L

9

488+

8

West

+ 50 0° 33' R

7

6

5

4

3

(tree in line)



2
+79
1
500+00
9
8
+ 39 13°44'
7
495 +98
+98
+12
-
495 +80
+90
4

S75°59'W

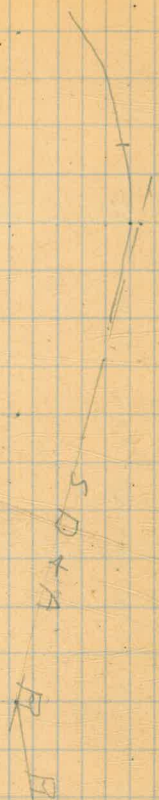
S60°30'W

0
0
0
0
0
0
0

201
LINE

105

△



△

Conc
culv
3X6

Mag

529°00' E

+50

RR Sand loader
S 44° 38' W

512400 2° 54' R

1

51040

9

S 41° 44' W

+54 14° 56' L

8

7

6

5

S 56° 50' W

S 40° 30' W

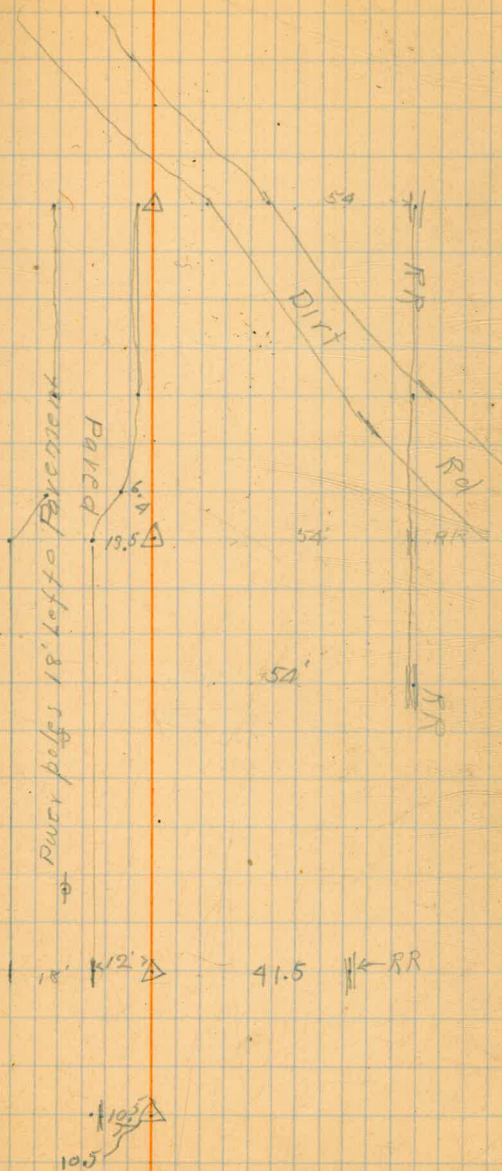
+76 19° 09' L

4

+99 Pot

3

75' R



4

3

2

546°32'W

+92 1°54'R 546°32'W

1

520+0

9

~~545°25'W~~

544°38'W

8

7

6

5

514+00

513

Note at about Sta 520 to Sta 540

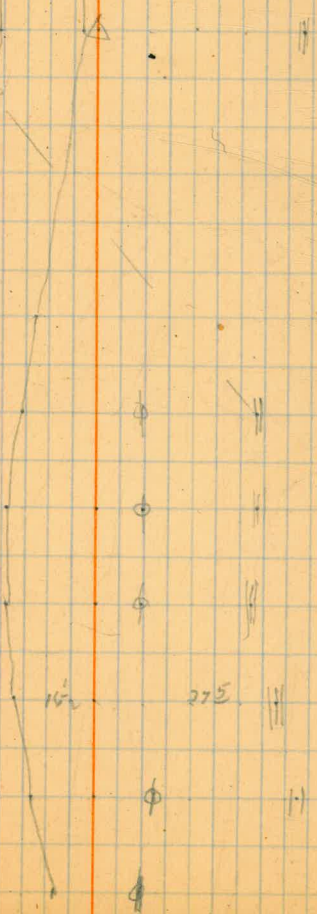
I employ by the Section Foreman

that in 1916 the RR washed

out. The RR has since been Ripped

the RR fill so that perhaps the

flood danger is past.



6

5

4

3

2

1

530

9

8

7 Pot

6

525

↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑

Paradise Road 18'

6 R

547+90 POT

+80

4

5

545 to 545 water from field

4 East over flows paved Rd.

3

+85

Power Line Comes in from the East & crosses line

3

542+00 POT

1

340+0

+38

+20

} 4'x16' culv under R.R.

9

8

+89

36"

LI Drain pipe under

7+00 POT

Powerpole 1995
RR Spike BM #14
E1. 361.922

R 12' P

Paved Rd 18'

D 17' P

Rd 45°

Rd Extends 2 R of this

560

9

+93

drive to R

8

7

POT

6

+35

18" C.I.P. Cully 5' out

+ ramp par.

5

4

3

2

POT

1

550

POT

9

548

Parad Rd. 18'

RR

R.P. 27 L

⊙

R.P. 19 L

⊙

R.P. 27 L

⊙

R.P. Hub R 19'

2 to

5617 0

RP 28L 0, Δ RP 5' R || CRR
45' R

92.05
46.0130
44.1.30
57.01

30° 46'

N 73.01 W
38.14
34.47
38.45
48.19
59

585.91 W
43.20
19.05

5 42.87 W
9.10 W
33.27 51.14
44.24
4.52

118.33
59.17 30
130.09
49

N 53.29 E
23.27
N 28.02 E
39.43
19.81
2 19.32 R

28.58
20

A 34° 45'
B

V II

3.20
 1.43

 1.43

N 41 30 W
 24 41 L

 N 11 62 W

69 50
 46 03

 14 47

S 73° 19' W
 24 36

 54 56
 4 3 W

DIRECTIONS FOR USE OF TABLES

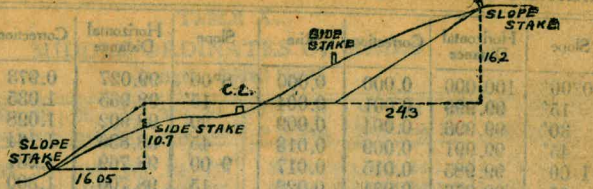
TABLE No. 1.

Distance of slope stake from side or shoulder stake for any width roadway, slope $1\frac{1}{2}$ to 1. If ground is nearly level, the cut or fill at side stake is located by the double entry method in left column and top row. The number in body of table in same row and column gives distance

level estimate the difference in elevation between the side stake and slope stake, lower target by this amount if cut, elevate if fill. Add this amount to cut or fill and distance in table. Set up rod and level. The number in table should cut target. If it does not make the slight adjustment

TABLE No. 2.

To find Tangent and External for curve of any other degree, divide by degree of curve and add correction found in column of correction. Degree of curve with a given L may be found by dividing tangent (or external), opposite L by given tangent (or external). The distance from a point on the tangent to the curve is very nearly the square of the tangent length divided by twice the radius.



DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

SLOPE 1 1/2 TO 1. ROADWAY OF ANY WIDTH.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0 00	0 15	0 30	0 45	0 60	0 75	0 90	1 05	1 20	1 35	0
1	1 50	1 65	1 80	1 95	2 10	2 25	2 40	2 55	2 70	2 85	1
2	3 00	3 15	3 30	3 45	3 60	3 75	3 90	4 05	4 20	4 35	2
3	4 50	4 65	4 80	4 95	5 10	5 25	5 40	5 55	5 70	5 85	3
4	6 00	6 15	6 30	6 45	6 60	6 75	6 90	7 05	7 20	7 35	4
5	7 50	7 65	7 80	7 95	8 10	8 25	8 40	8 55	8 70	8 85	5
6	9 00	9 15	9 30	9 45	9 60	9 75	9 90	10 05	10 20	10 35	6
7	10 50	10 65	10 80	10 95	11 10	11 25	11 40	11 55	11 70	11 85	7
8	12 00	12 15	12 30	12 45	12 60	12 75	12 90	13 05	13 20	13 35	8
9	13 50	13 65	13 80	13 95	14 10	14 25	14 40	14 55	14 70	14 85	9
10	15 00	15 15	15 30	15 45	15 60	15 75	15 90	16 05	16 20	16 35	10
11	16 50	16 65	16 80	16 95	17 10	17 25	17 40	17 55	17 70	17 85	11
12	18 00	18 15	18 30	18 45	18 60	18 75	18 90	19 05	19 20	19 35	12
13	19 50	19 65	19 80	19 95	20 10	20 25	20 40	20 55	20 70	20 85	13
14	21 00	21 15	21 30	21 45	21 60	21 75	21 90	22 05	22 20	22 35	14
15	22 50	22 65	22 80	22 95	23 10	23 25	23 40	23 55	23 70	23 85	15
16	24 00	24 15	24 30	24 45	24 60	24 75	24 90	25 05	25 20	25 35	16
17	25 50	25 65	25 80	25 95	26 10	26 25	26 40	26 55	26 70	26 85	17
18	27 00	27 15	27 30	27 45	27 60	27 75	27 90	28 05	28 20	28 35	18
19	28 50	28 65	28 80	28 95	29 10	29 25	29 40	29 55	29 70	29 85	19
20	30 00	30 15	30 30	30 45	30 60	30 75	30 90	31 05	31 20	31 35	20
21	31 50	31 65	31 80	31 95	32 10	32 25	32 40	32 55	32 70	32 85	21
22	33 00	33 15	33 30	33 45	33 60	33 75	33 90	34 05	34 20	34 35	22
23	34 50	34 65	34 80	34 95	35 10	35 25	35 40	35 55	35 70	35 85	23
24	36 00	36 15	36 30	36 45	36 60	36 75	36 90	37 05	37 20	37 35	24
25	37 50	37 65	37 80	37 95	38 10	38 25	38 40	38 55	38 70	38 85	25
26	39 00	39 15	39 30	39 45	39 60	39 75	39 90	40 05	40 20	40 35	26
27	40 50	40 65	40 80	40 95	41 10	41 25	41 40	41 55	41 70	41 85	27
28	42 00	42 15	42 30	42 45	42 60	42 75	42 90	43 05	43 20	43 35	28
29	43 50	43 65	43 80	43 95	44 10	44 25	44 40	44 55	44 70	44 85	29
30	45 00	45 15	45 30	45 45	45 60	45 75	45 90	46 05	46 20	46 35	30
31	46 50	46 65	46 80	46 95	47 10	47 25	47 40	47 55	47 70	47 85	31
32	48 00	48 15	48 30	48 45	48 60	48 75	48 90	49 05	49 20	49 35	32
33	49 50	49 65	49 80	49 95	50 10	50 25	50 40	50 55	50 70	50 85	33
34	51 00	51 15	51 30	51 45	51 60	51 75	51 90	52 05	52 20	52 35	34
35	52 50	52 65	52 80	52 95	53 10	53 25	53 40	53 55	53 70	53 85	35
36	54 00	54 15	54 30	54 45	54 60	54 75	54 90	55 05	55 20	55 35	36
37	55 50	55 65	55 80	55 95	56 10	56 25	56 40	56 55	56 70	56 85	37
38	57 00	57 15	57 30	57 45	57 60	57 75	57 90	58 05	58 20	58 35	38
39	58 50	58 65	58 80	58 95	59 10	59 25	59 40	59 55	59 70	59 85	39
40	60 00	60 15	60 30	60 45	60 60	60 75	60 90	61 05	61 20	61 35	40
41	61 50	61 65	61 80	61 95	62 10	62 25	62 40	62 55	62 70	62 85	41
42	63 00	63 15	63 30	63 45	63 60	63 75	63 90	64 05	64 20	64 35	42
43	64 50	64 65	64 80	64 95	65 10	65 25	65 40	65 55	65 70	65 85	43
44	66 00	66 15	66 30	66 45	66 60	66 75	66 90	67 05	67 20	67 35	44
45	67 50	67 65	67 80	67 95	68 10	68 25	68 40	68 55	68 70	68 85	45
46	69 00	69 15	69 30	69 45	69 60	69 75	69 90	70 05	70 20	70 35	46
47	70 50	70 65	70 80	70 95	71 10	71 25	71 40	71 55	71 70	71 85	47
48	72 00	72 15	72 30	72 45	72 60	72 75	72 90	73 05	73 20	73 35	48
49	73 50	73 65	73 80	73 95	74 10	74 25	74 40	74 55	74 70	74 85	49
50	75 00	75 15	75 30	75 45	75 60	75 75	75 90	76 05	76 20	76 35	50

Computed by L. Leland Locke.

5 88.15 W
51.45
88-50

48 26
51.14
2-50

27 Hydraulic Gradient
13 30 El. 595 at Ds. Falls 0.2%

1 128° = 20° 40' 30"
1 28
19-12-30

N 75° 00' 30" W 82-59 W
19 12 30
47-30 00
+ 4 01
97-40

78-34
2-30
81-04 W

N 87° 00' W

86 59
20
95-19 N 82 59 W
9 19

N 73 40 W
5 50

N 67 51 W
15 51

N 83-41 W
10-05

99-46

586-19 W
2-40

88-34 W

583-
5

578-34 W

(81° 30')
54° 32' W
Sta. 272+50

109
 28
 59 # 7 43.01 1A.50 90 15 48
 2) 43.27 10.05 61.9 64.4 31 36
 73.5 40 93 -06 13.88.1 83-14
 19.72 71.6 133 61.665 88.1 83.14
 93 04 28.4 90 06 86.54 +49.70 19.50
 82.01 14-01 13.88 2.57 53-24
 70-21 83 1.233 28.84
 90 99 -01 15.114 82.59 84
 9.00 80 7.01 9.19
 82-09 11.4 73-40
 26.9 3.0 2 86.56 38.45 88.6 75.40
 43.12 273.01 12.22
 38.14 88-00 88-00
 83-15 83-15 77.87 83 14
 85-53 85-45 89-00 63 26
 39 20 80 20 10 28E 73-09 71.47
 64 86.1 89-00 33.4 70-20
 35.7 63-49 63-49
 78.2 91.2 69.1 89.44
 18 96.2 65 10 94-44
 63.49 1.34 90
 73.40 63-36 6 46
 55.0 58-49 68.25 14-03 77-39
 67.50 65.35 5.10 7.38 89-14
 31.40 18.20 84.15 85 17 89 14
 12.30 67.50 67.50 19 50
 15 33 12 18.30 62.49 47.50
 18.30 123.5-09 15.51 83-01
 63-24

Shoehair
Geo. Star

20 1322.8 (46.14 10 5 83 37 W
 90 12.0 +10 12 11
 38.45 122 70 500 10 169 96 10
 15 120
 19.03 1036 29688
 158 581.40 28.62 180
 17 05 41.9 190.7 86 10
 89 60 83 50
 1705 10.082 55 16.8 11 79 0.1
 878.07 66.10 19-12 100 36 14
 9+33.80 812432.5
 1.30 20 12000 130 73 01
 85.06 18.36 10 + 2.0 20 38 14
 64-30 10 27 0.97 60 34+47 W
 26 07 0.5 47 20 5730 286.5
 7.52 1.3 40 20.41
 1 52 105.47 130 9 13
 65 64 174.13 W 120 19
 21-48 100
 9+93.8 94 01 180 96.01 69.05
 65 10. 83.59 3.55
 9+98.8 70.35 65-1 0
 9+29.63 1+10 N87 57 W
 10+71.6 11 12
 9.296 45
 70 99 09
 91996 12.20 90 9 09
 80.57
 580 50 W 12.333 587 46
 3 39 93.0 19-13
 534 48 91.28 106-59
 2 1.39 90 1.39
 990 16.59 88 21
 13 30 30 173 01 W