

CLARIDON-BURTON
COUNTY ROAD
SEC. "B"

75

FIELD BOOK

1308

PLEASE RETURN TO
GEAUGA COUNTY ENGINEER
COURT HOUSE
CHARDON, O.
PHONE 250-X

610
BURTON- CLARIDON
SECTION "B"

COUNTY ROAD
CLARIDON TOWNSHIP
GEAUGA COUNTY, O.,

L . J . McNAUGHTON
COUNTY HIGHWAY SUPERINTENDENT
1916

(75)

Resurfacing notes - page 25

1
to
d.

much)

at the
end of
the
line

at the
end
of
the
line

8-11-16
Partly Cloudy
Warm

L.D. McNaughton - C₁
G.R. Haring - T.
K. McNaughton - C₂

Sta. Angle Bearing

10
+638 = 16°30' Lt. = Δ

9 D = 15°00'

PI. = 9+638

8 T = 55.54

PC. = 9+08.26

7 L = 1+10.00

PT. = 10+18.26

6 E = 4.0

5

4

3

2

1

0

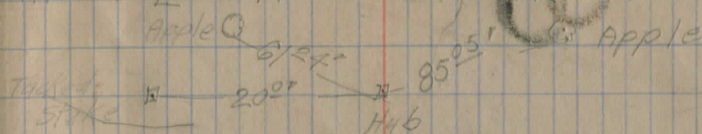
Use 465 EXT. (Magnetic) N. 20° - 25' E.

Lt.

Q

Rt.

Note: All offset stakes set 2.5' to Rt. of Q unless otherwise noted.



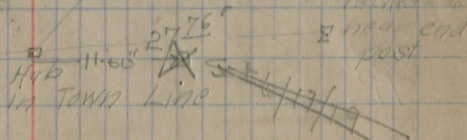
(Measurements taken on Tanager)

(Note - Rear end of chain not plumbed much)

Note:
Resurvey in 1935
See page 25

Tacked Stake
Hub
Strip
old fence

1960'



Sta. Angle Bearing

22

21

20

19

18

17

16

15

14

13

12

11

N. 40° 00' E (Magnetic)

Lt.

♀

RT.

2

Sta. Angle Bearing

35

34

33

32

31

30

29

28

27

26

+58° 00'

25

24

23

Lt.

£

Rt.

3

Tack in
Maple

27.95

Hub

11.00

71.80'

Tack
in Maple

Oct 6/11/19

Sta.	Angle	Bearing
------	-------	---------

48

47

46

45

44

43

42

41

40

39.

38

37

36

Lt

£

ft.

4

24.8
 7 5.2
 100.0

STA. ANGLE BEARING

60

59

58

57 + 245° 0' Δ

57

56

55

54

53

52

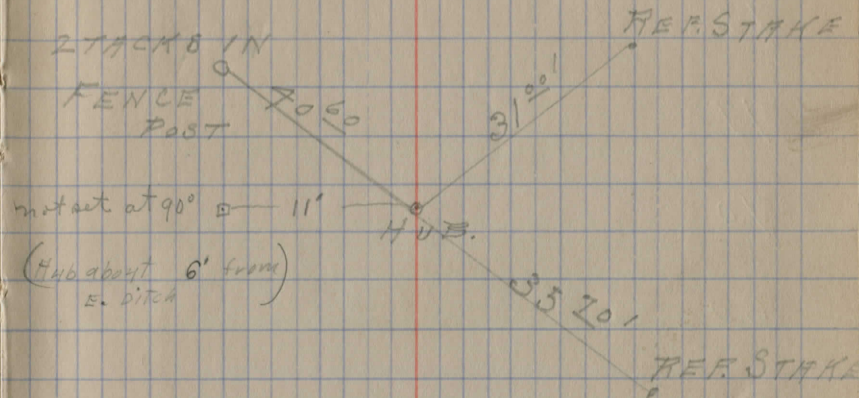
51

50

49

Kennedy
 McNaughton
 Welsh

5



STA. ANGLE BEARING

73

72

71

70

69

68

67

66

65

64

63

62

61

LT

C

RT

6

STA. ANGLE BEARING

86

85

84

83

82

81

80

79

78

77

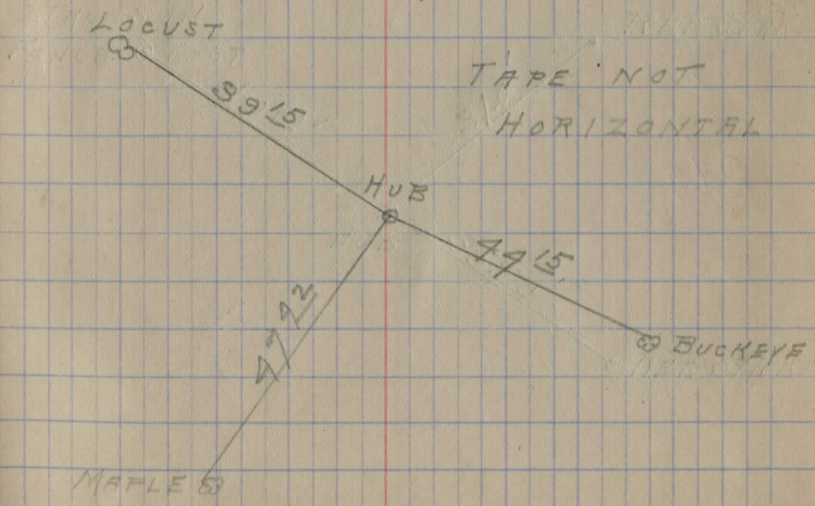
76+60°

74

76

75

74



STA. ANGLE BEARING

99

98

97

96

95

94

93

92

91

90

89

88

87

STA. ANGLE BEARING

112

111

110

109

108

107

106

105

104

103

102

101

100

9

R.P. = B.M.
NAIL IN ROOT OF TREE

52.15

34.18

R.P.

2-TACKS
ON 20" MAPLE

R.P. @
2-TACKS ON
8" MAPLE

TAPE NOT
HORIZONTAL

N. 4° E.

115+952

2 TRACKS
ROOT OF TREE 83.50

27.65
HUB

X ON STONE
HITCH POST

115

X ON FOUN.
CONCRETE PORCH
BRUCE'S

7 CLARIFON CENTER
2.50

114+28.10

30'
IRON PIN IN LINE
32 ✓

114

2 TRACKS ON
18" MAPLE

113

Topography

8-29-36

F. Hann
M. McNaughton

11

④
+15 25' T.P.

785
785
pipe
785

⑤
+85 ← 22' → Eng wire
+75 ← 24' → x
+20 ← 23' → wire
+20 ← 22' → wire

33' →

⑥
+75 ← 60' → 30' 40'
+35 ← 20' → 30'
+20 ← 20' → 30'
+10 ← 20' → 30'

T.H.H.

⑦
+33 ← 20' → end of P.L. +25
+33 ← 24' → fence

⑧ 26' →

+50 15' 30'

⑨
+35 23' T.P.

creek

+20
B

TOWN
0
Line
27

0-40 25' T.P.

H. E. J. Dietrich

12

11

10

R.L.?

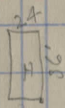
12

McVick

B.L. Stanton
R. Phillips

PL-1

Row of Maples



26' 20

25' 18

+50 28' 17

+46 16

+40 28' 13

11

+15 30' 12

10

+80 23' 9

+50 25'

+30

+20

10

+74

~~74~~

24

+50

23

22

+50

21

+65

20

+50

19

26'

+30

20

+50

18

+50

17

+46

16

+40

13

11

+15

13

12

11

+80

+50

+30

+20

10

10

10

28' T.P.

28' T.P.

28' T.P.

28' T.P.

28' T.P.

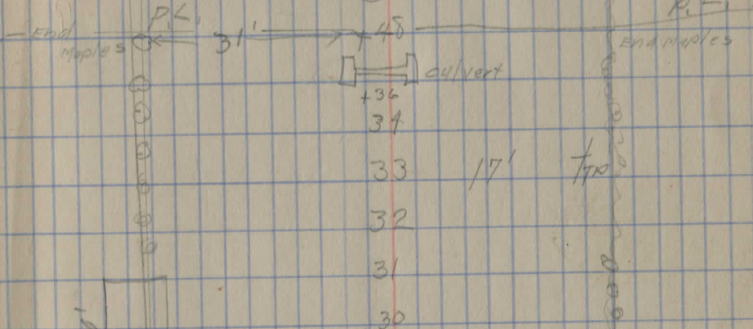
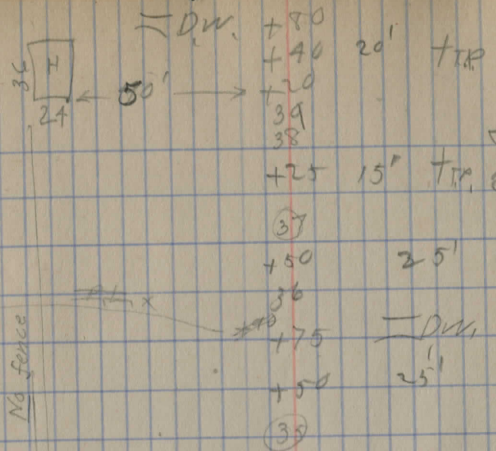
30' T.P.

23' T.P.

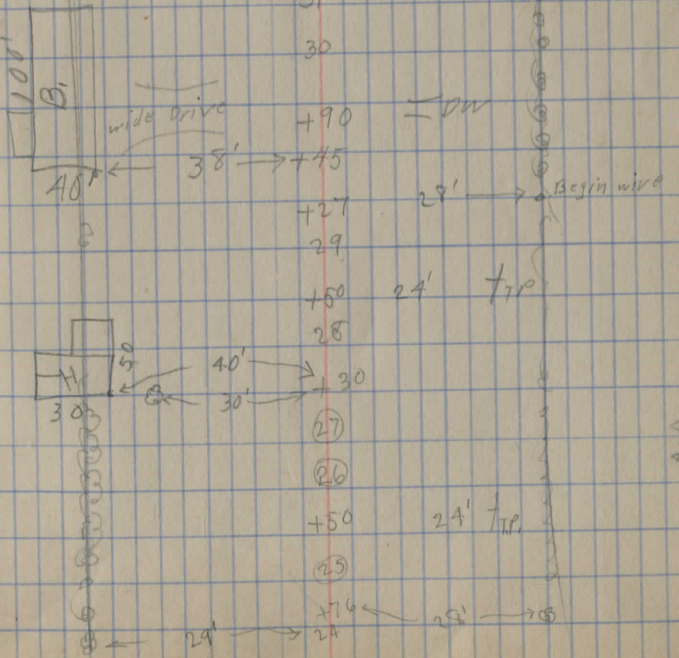
25'

M.A. Tuller ✓

Wells
McNish

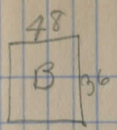


A.A. McNish

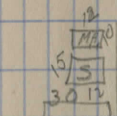
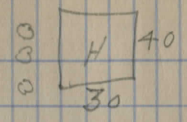


Dr. A. R. Warner
G. E. Andrews

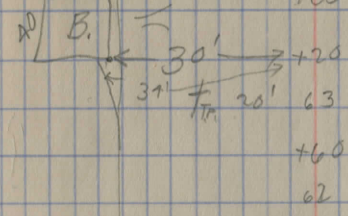
A.A. McNish



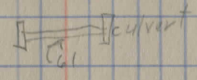
TR 20' +20
65
+10
+20
64



+96 2.0' B
+90 DW



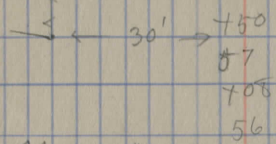
+20
63
+60 28'
62



+70 28' PL +70
+65 27' TR

B. W. Basu

60
59
+75 24' TR
58

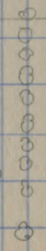


+50
57
+08 24' TR
56

PL +54

+54 PL
55
54

+75 25' TR
53 28
+60 15' B
52



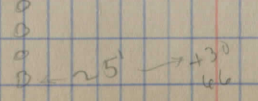
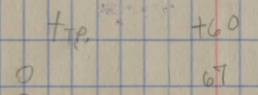
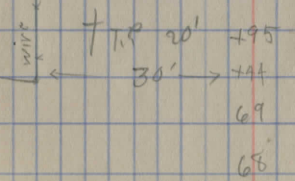
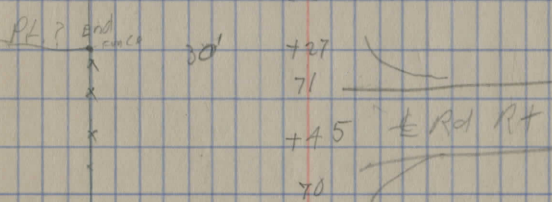
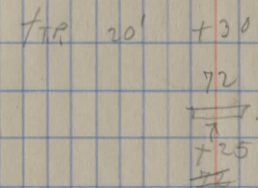
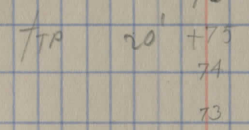
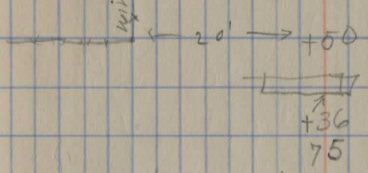
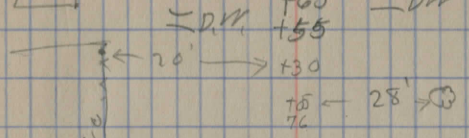
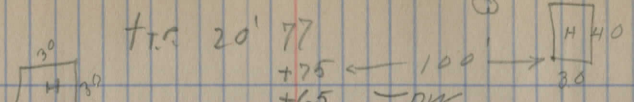
M. J. Wilmont
or
F. E. Wilmont

H. H. ENSIGN

B. W. Basu

M. J. Wilmont

B. W. Basu



W. Belden
H. H. H. H.

F. Wilmont

TIP 30 +50
91

90

TIP 30' +50
89

88

195

TIP 28' → 195
+50

87 ← 30'

86

85

84

83

82

81

80

79

78

77

76

75

74

73

72

71

70

69

68

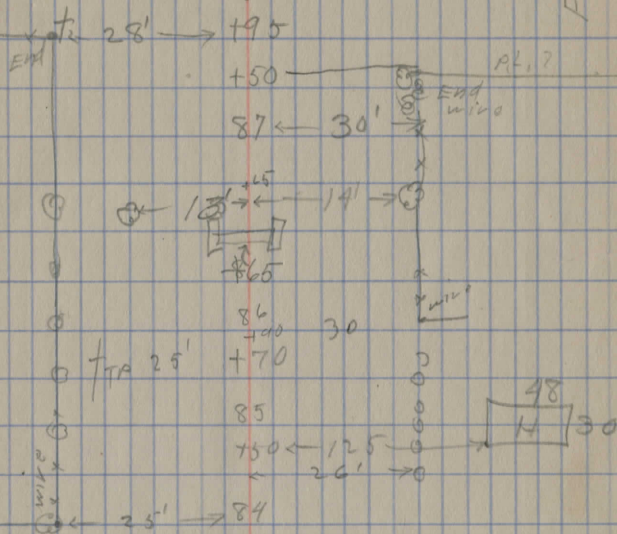
67

66

65

64

63



Fred Wilmont

TIP 25' +50
125

83

82

TIP 25' +30
81

80

79

78

77

76

75

74

73

P.L. 125

TIP 25' +30
79

78

77

76

75

74

P.L. 125

79

78

77

76

75

74

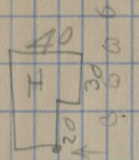
Fred Wilmont

J. Darrett

18

Chas. Burk

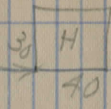
P.L. +45



+45

+40

80'



+42

80' → +45

DK +35

+25' +48

+40

+40

+40

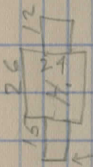
+40

+40

P.L. #32

Carl

Robert Warren



80' → +30

DK +05

97

+25 +85

+28

96

+28' +25

+33' +05

96

DK

+30

94

93+35 +28' +40

+25

92

F.A. Wilmont

L. Dayton

P.L.

F.A. Wilmont

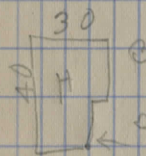
+75 P.L.



M. Wilmont

P.L. 8

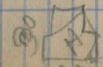
M. Morse



L. Marget

wilmont

P.L. +90



+75

+20 ← 60

+10

111

— DW +80

90' +20

110

OT/T.R. 20 +85

— DW

+80

+15

30' ⊙

109

+70 ← 80' ⊙

+50

+21



⊙ +12

OT/T.R. 25' +108

+80

+70

~~+80~~

~~+70~~

— DW +15

107

+60 ← 90' →

+40

+20

+05

+06

+75

TTR 25' → +89

+109

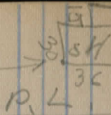
104

+90

+90

TTR 25' → +100

+110



P.L.

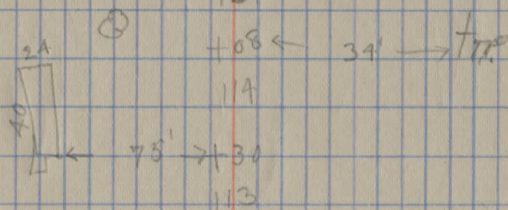
19

Parsong 50

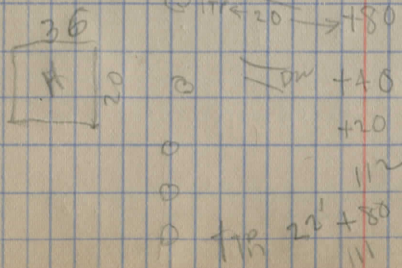
L. Marget

P.L. +05

Claydon Road East



PL. \oplus $\leftarrow 20 \rightarrow +180$



10/10/20
 10/11/20
 10/12/20
 10/13/20
 10/14/20
 10/15/20
 10/16/20
 10/17/20
 10/18/20
 10/19/20
 10/20/20
 10/21/20
 10/22/20
 10/23/20
 10/24/20
 10/25/20
 10/26/20
 10/27/20
 10/28/20
 10/29/20
 10/30/20
 10/31/20

10/10/20
 10/11/20
 10/12/20
 10/13/20
 10/14/20
 10/15/20
 10/16/20
 10/17/20
 10/18/20
 10/19/20
 10/20/20
 10/21/20
 10/22/20
 10/23/20
 10/24/20
 10/25/20
 10/26/20
 10/27/20
 10/28/20
 10/29/20
 10/30/20
 10/31/20

Section B.

Burton Claridon Center Road.

Resurfacing

Notes: sidestakes set 30" RT or East

8

7

6

5

4

3

2

1

0-21.5
I.P. Fd 1 under
raised to
flush

Spk SE side
CE 1#4275

Spk SW side
30" W. Ch

73.85

60.34

42.70

Sta 0+00 Beginning of Imp.

curve data $\left\{ \begin{array}{l} \Delta = 16^{\circ} 28' \\ D = 100 \\ T = 82.91 \\ E = 5.97 \\ L = 164.167 \\ P.T. = 0+61.41 \\ \quad \quad \quad 38.57 \end{array} \right.$

0+00 =

Sta 0+00 = Sta 81+50.82 sec A.

P291
21.50
11.91

25
RERUN April 24 52

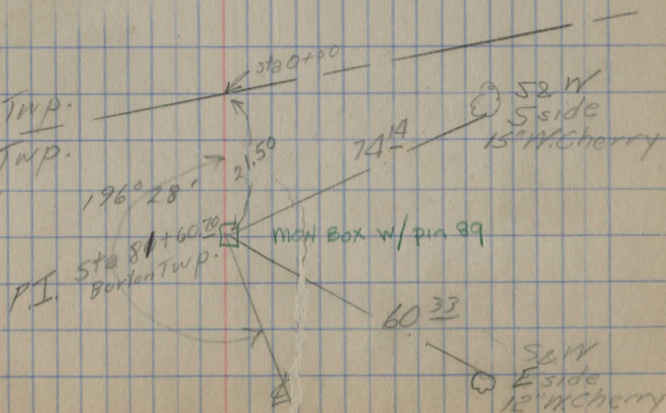
776

N 20° 30' E

11' span 4' height
concrete stone walls
Plw Lt.

1+23
125 19

Claridon Twp.
Burton Twp.



196° 28'

Sta 0+00

52 W
5 side
15" W. cherry

74.4

60.33

PI. Sta 81+60.70
Burton Twp.

MEN BOX w/ pin 89

SE W
E side
12" W. cherry

- 20
- 19
- 18
- 17
- 16
- 15
- 14
- 13
- 12
- 11
- 10
- 9
- 8

Short Station 10 - 11 = 98.50'

Curve Data

- $\Delta = 16^{\circ}30'$
- $D = 80$
- $T = 103.85$
- $E = 7.5$
- $L = 206.25$
- $PC = 8+59.25$
- $PT = 10+66.20$
- Correction = 1.50 short
- Def. Lt. $16^{\circ}30'$

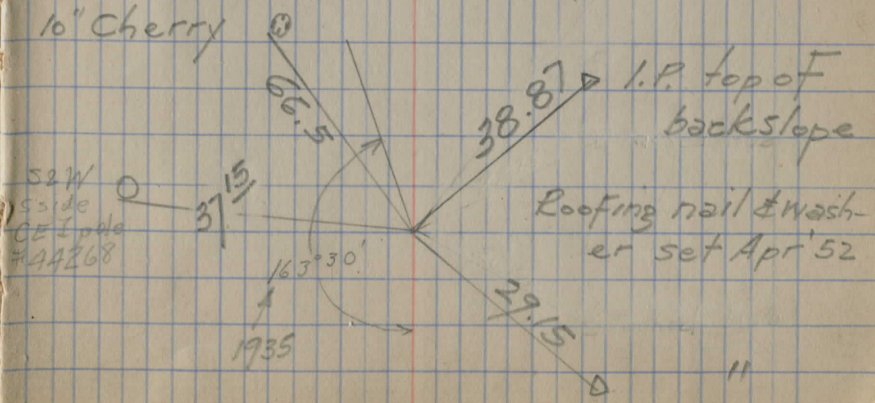
Hole in prv.

Sta 9+63.80

10+66 - 0°00'
 16+50 - 0°39'
 18+00 - 2°39'
 9+50 - 4°39'
 9+00 - 6°39'
 8+60 - 8°15'

Same correction

SW in SW side
 10" Cherry



30451 8014 new 12"

32

31

30

29

28

27

26

Sta 25 + 57.25

P.O.T.

spike
set

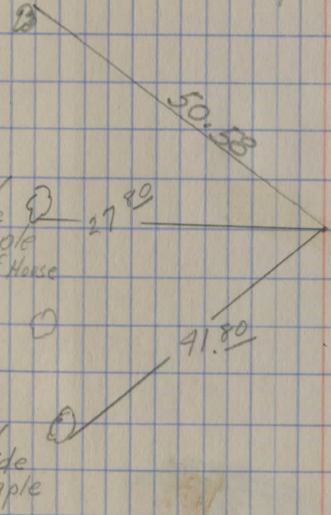
1.65 too far original

Fd.

4-24-52

SW
S side
15" Maple
5' 10" Set House

Spl. NE side 15" Maple



25

24

23

22

21

20

44

43

42

41

40

39

38

37

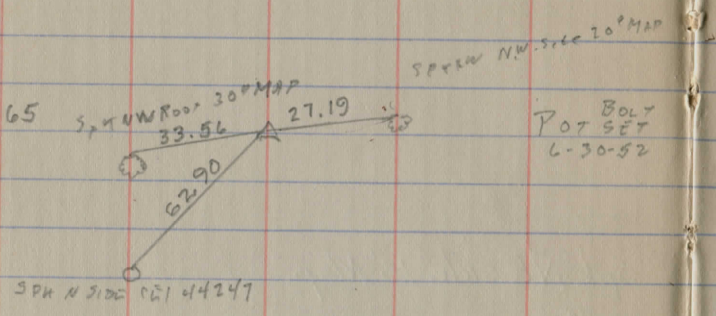
36

35

34

33

32



34775

56

55

54

53

52

51

50

50+19

49

48

47

46

45

44

67

66

65

64

63

62

61

60

59

58

Sta 57+46.85

P.O.T

57

56

CEI 44236

I.P.

57+46.85

I.P.

S&W

92.85

51.32

39.93

71.09

Roofing nailed
washer set

±1'E of Wedge

put

P.O.T

60+96

S&W
N side
CEI pole
44236S&W
S side
92" Maple
4' upSpike
setS&W
E side
CEI
pole

92.98

115.56

70.70

79

78

77
Sta 76 +60.⁰⁰ POT spike
5d

76
our point 1.2' ± to far north

75

74

73

72

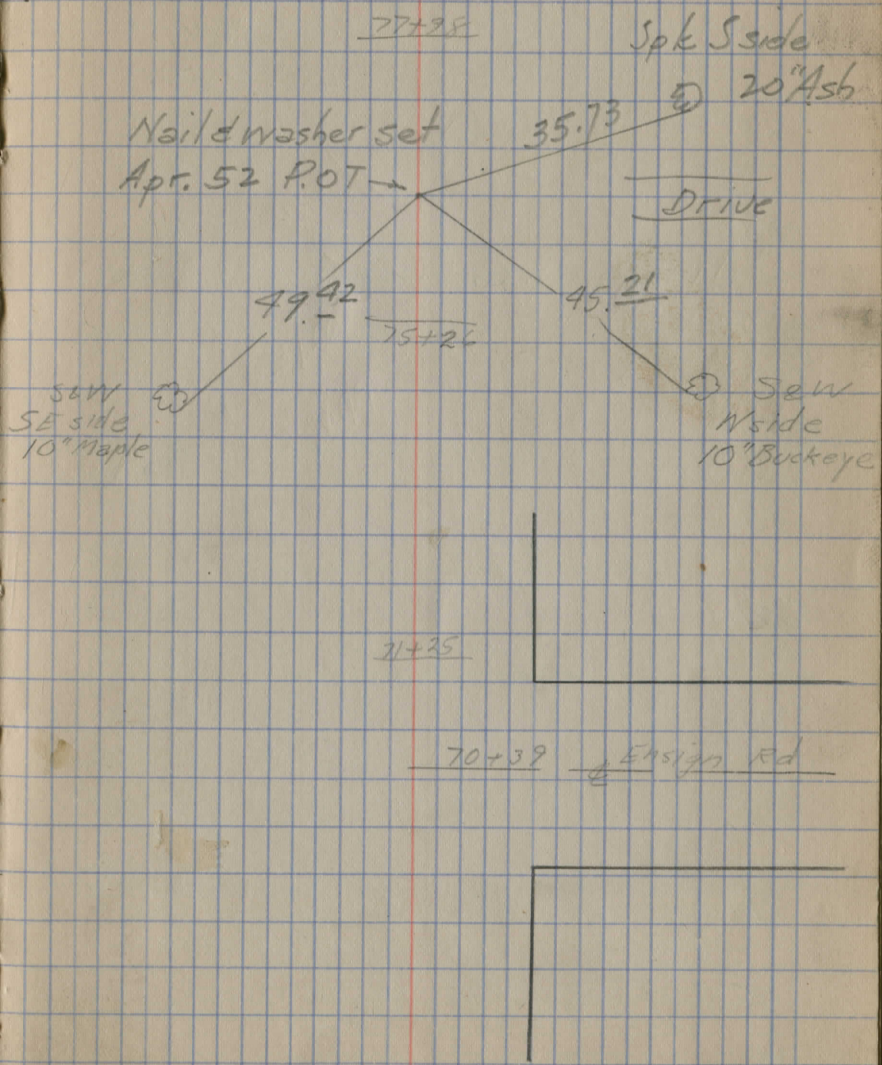
71

70

69

68

67



91

90

89

88

87

86

85

84

83

82

81

80

79

86+63

103 +00

Spk set 4-25-52

102

101

100

99

98

97

96

95

94

93

92

91

Spk SE side
13" Maple

93

47.30

29.50
27.18

S&W
N W side
12" Maple

51.43

Spk SE root
24" Maple

68.50

S&W
SW side
30" Maple

11.

94+29

Sta 114+28.28

114

Edge of Put = 114+19

113

112

111

110

109

108

107

106

105

104

103

cut in
concrete

2.164 miles

$$\begin{array}{r}
 5280 \overline{) 11426.78} \\
 \underline{1056} \\
 866 \\
 \underline{928} \\
 3387 \\
 \underline{3168} \\
 2198 \\
 \underline{2112} \\
 \hline
 \end{array}$$

cut in Conc.
Platform X 72.30

Mayfield Rd.

BM Spike 34
S. root
50" Elm.

7021

U.S. 322

18' Concrete Put.

Spike
SE side
15" Maple

45.18

179.55

7-1-52

114+0 Bolt set in
B. Top.

38.80

1. P. Fd + 10'
SE of Tel.

Spk SE root
18" map

27.55

107+82

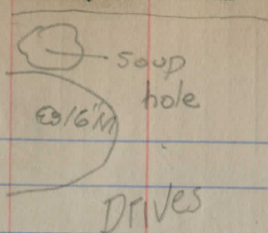
63.88

Spk SW
root 22"
Conifer

108+13

+75

+62



+50

+39

+27

Barn

30+10

33.5

Horse garage

+97

Drives

+75

+60

+46

+39

29+31

29+21

29+19

10" M

⊙

Bank gullied

12" M

22' —

28.5' ⊙ 14"

⊙ 14"

⊙ 20"

farm tile

29+02

28+87



+49

+39

+31

31+11

31+03

+

+

30" M

+

SWALE

⊙ 10" M

⊙ 24" M begin Fence Nlx

53' —

19' | —

End 8" Farm tile Barn

+89

21.5 | +

187

29 | ⊙

45

BM	7.60	102.60	100.00
34+32 CULVERT			99.8
33+0			99.4
32+0			98.5
+50			98.0
31+0			97.9
+93			
+50			97.7
30+0			97.2
+70			
+50			96.6
29+0			95.9
26+0			95.5
26+0			94.4

36

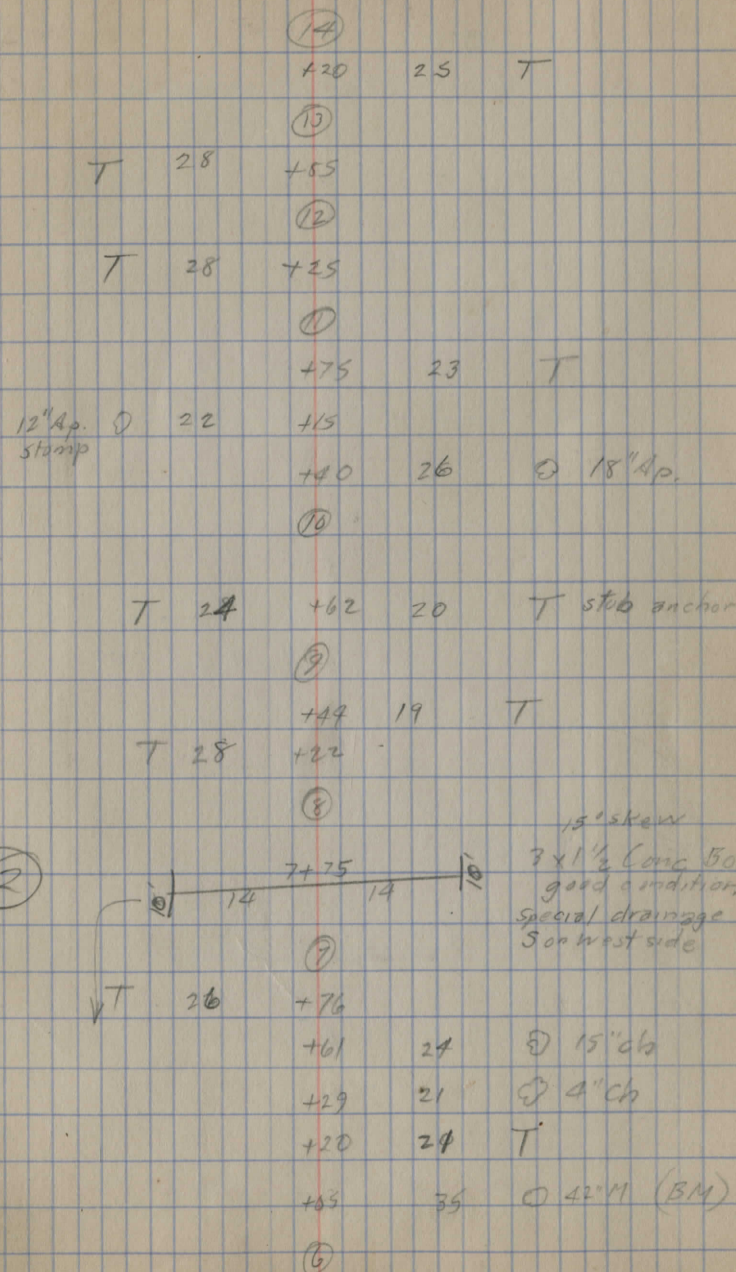
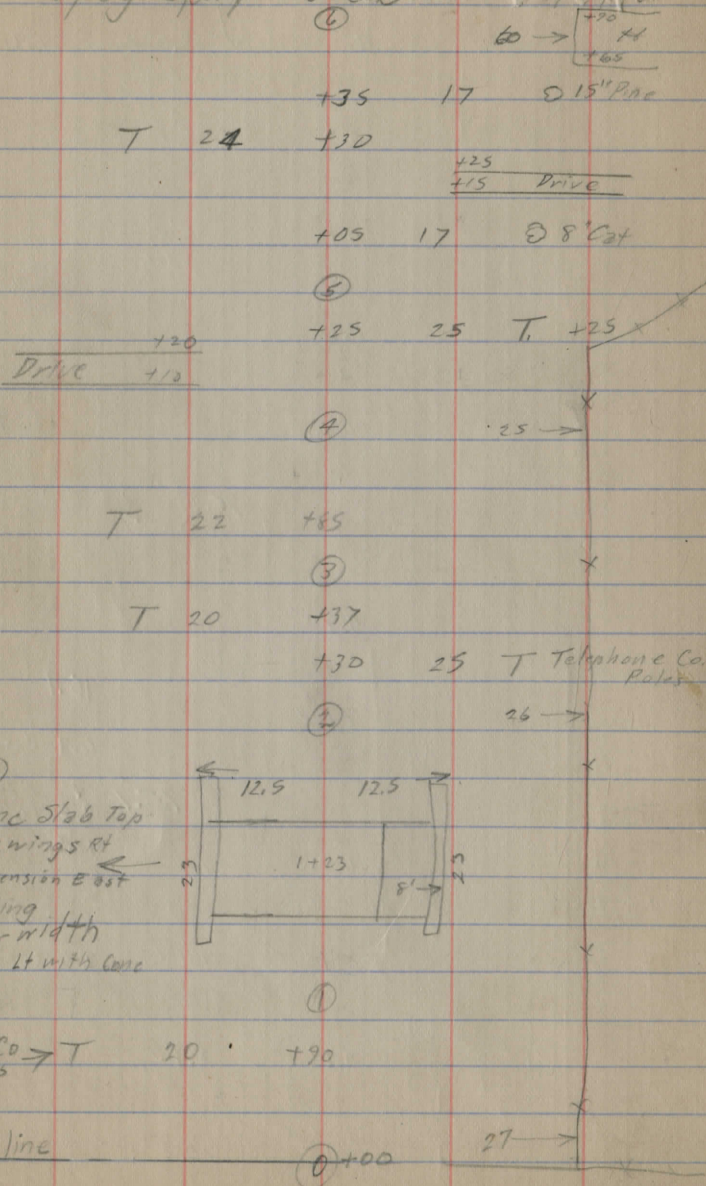
W E E

Spk W root 24" mag 29' RT 3/11

2.8	8.0	INLET FIL
3.2	5.8	ditch
4.1	5.4	ditch
4.6	5.4	ditch
4.7	5.9	ditch
	96.3	6.3 FL INLET 8" TILE
	5.5	500' HILL
4.9 ✓		97.1
		95.9
5.4 ✓		6.7 ditch 2' South
	95.1	7.5 10" C.I.P.
		18.5
6.0 ✓	7.0	
6.7 ✓	7.4 ✓	2.6 Top Bank
7.1 ✓	8.4 ✓	
8.2 ✓	10. ditch ✓	

Topography Sec B

4/25/35

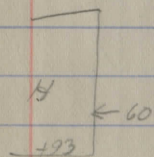


(19)
 15" M ⊙ 28 +97
 15" M ⊙ 28 +47
 +20
 Drive 710

15" M ⊙ 31 +62

(18)
 +85 22 ⊙ 4" Lo
 +70 22 ⊙ 4" Lo

T 28 +60
 +55 19 ⊙ 6" Lo
 +49 19 ⊙ 6" Lo
 +38 22 T



(17)
 24" Ap ⊙ 30 +93

+73 19 ⊙ 8" Lo
 +15 18 ⊙ 8" E

T 28 +62

(16)
 +32 23 T

(15)

T 28 +40

(14)

(22)
 15" M ⊙ +98
 12" M ⊙ +80
 12" M ⊙ +62
 15" M ⊙ +47
 +36 26 ⊙ 4" M.
 +34 24 T
 15" M ⊙ +28
 15" M ⊙ 28 +10 25 ⊙ 12" WC.
 +01 25 ⊙ 4" M

(21)
 12" M ⊙ +75
 12" M ⊙ +78
 12" M ⊙ +61
 T 28 +52
 12" M ⊙ +43
 12" M ⊙ +28 25 ⊙ 18 M

(20)
 15" M ⊙ 28 +99
 15" M ⊙ +84
 10" M ⊙ +69
 15" M ⊙ +55
 15" M ⊙ +40 25 T

6" M ⊙ 28 +25
 T 28 +10

(19)

T	28	+97	
		+93	⊙ 12" M
15" M ⊙		+90	
		+75	27 ⊙ 15" M
15" M ⊙	27	+70	
15" M ⊙		+62	
12" M ⊙		+35	
12" M ⊙		+15	
12" M ⊙		+02	
		(24)	
15" M ⊙		+52	
10" M ⊙		+64	
T	28	+58	
18" M ⊙	29	+45	
		+43	26 T
12" M ⊙		+30	
15" M ⊙		+15	
		(23)	
12" M ⊙		+98	
12" M ⊙		+86	
15" M ⊙	27	+62	
12" M ⊙		+46	
12" M ⊙		+30	
		+15	15 ⊙ large boulder 5x8
12" M ⊙		+10	
T	24	+03	
		(22)	

39

+88			
H			
	← 42	+49	26 ⊙ 10" M
+22		+32	23 T
36" A ⊙	26	+20	
		+10	25 ⊙ 4" M
		(27)	
		+90	30 ⊙ 18" W _B
		+69	30 ⊙ 10" W _B
		+50	27 ⊙ 12" M
T	28	+53	
18" M ⊙		+38	
		+50	
		+40	
12" M ⊙		+19	
		+12	⊙ 15" M
10" M ⊙		+01	
		(26)	
		+91	⊙ 10" M
10" M ⊙	27	+81	
		+73	27 ⊙ 12" M
15" M ⊙		+64	
		+59	⊙ 12" M
		+47	24 T
15" M ⊙		+45	
		+33	⊙ 15" M
15" M ⊙		+25	
		+10	⊙ 12" M
12" M ⊙		+02	
		(25)	

30+47
 Silo ← 45
 30+27

785
 Drive +25

790
 780 Drive

B +76
 Mark House ← 25 +60
 27 +52 ← 38 +59

8" M Ø 27 +75
 T 28 +24
 27 → +21
 +18 18 T
 +16 Ø 10" M
 +01 Ø 12" M
 (29) +87 27 Ø 12" M
 10" M Ø 26 +99
 12" M Ø 28 +80
 Gas pump Ø 25 +75
 +65
 S ← 45
 +52

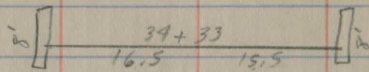
+47 27 Ø 8" PL
 12" M Ø 27 +35
 +25 Ø 6" PL
 T 28 +02 27 Ø 12" M
 (29) +79 27 Ø 12" M

(32)
 +99
 +96
 12" M Ø 3 490
 Drive +80 +83
 10" M Ø +75
 +65
 10" M Ø +57
 +46
 15" M Ø 29 +99
 +28
 12" M Ø +21
 +05 28 Ø 12" M
 +02 18" M Ø 29
 (3) Build new Hillside Culu. at 30+90
 (31) +91 21 T
 +94 25 Ø 30" Stump
 +85 28 Ø 10" M
 +80
 +70 Drive
 T 28 +74
 12" M Ø 29 +66
 +60 27 Ø 15" M
 +37 27 Ø 10" M B
 60' → +25
 (30) +99 27 Ø 10" M
 30+10
 33 → G
 +98

40
 Ø 12" M
 X
 Ø 10" M
 X
 Ø 15" M
 X
 Ø 15" M
 X
 Ø 10" M
 X
 Ø 12" M
 29' → X
 T
 Ø 30" Stump
 Ø 10" M
 Drive
 Ø 15" M
 Ø 10" M
 60' →
 +25
 Ø 10" M
 30+10
 33 → G
 +98

15" M \odot 28 +41 28 \odot 12" M

24" CIP \odot A & VSP
Conc. Headwalls
24" CIP 8" VSP



12" M \odot +25

12" M \odot +10

(34)

12" M \odot +92

T 28 +52

12" M +73

12" M \odot +55

8" M \odot +39

12" M \odot +15

(33)

+99 19 T

16" M \odot +86

16" M \odot +68 28

+51

12" M \odot +48

T 28 +37

+34

12" M \odot +30

+16

12" M \odot 29 +10

(32)

\odot 12" M (B4)

\odot 12" M

\odot 12" M

\odot 12" M

\odot 12" M

\odot 15" M

\odot 12" M

\odot 12" M

\odot 15" M

\odot 12" M

\odot 10" M

\odot 10" M

T 28 +90

26 \rightarrow X

785
Drive +75

+42 +66

22 \odot 4" E

\odot 10" M 31 +32

17 T

4 \odot 6" Cat 31 +05

\leftarrow 60

X

+05

+03

22 \odot 6" E

(39)

T 28 +30

(38)

26 \rightarrow X

+40

20 \odot 4" M

+20

18 T

+20

23 \odot 18" WC

+02

23 \odot 18" WC

(37)

T 28 +85

+62

24 \odot 18" WC

+45

25 \odot 18" M

(36)

Drive +65
+55

+85

+75 Drive

200 \rightarrow X

+38

+34

+46

25 \odot 12" A

+32

24 T

+10

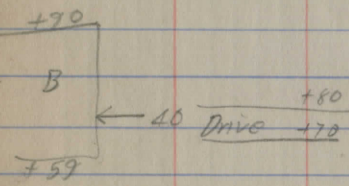
18 T

(35)

		+95	25	⊙ 12" M	
10" M ⊙		+80			
		+78		⊙ 12" M	
		+60	25	⊙ 10" M	
24" M ⊙	30	+25			
24" M ⊙	30	+10			
		(43)			
T	28	+89			
		+10	27	⊙ 15" M	
		+01	17	T	H
		(22)		75 →	
		+90	27	⊙ 12" M + 77	
24" M ⊙	30	+72	28	→	+70
		+65		⊙ 3" Ch	
		+56	23	⊙ 3" Ch	
15" M ⊙		+35			
T	28	+25			
(64) 24" M ⊙		+16			
		(41)			
		+70	25	⊙ 2-4" M	
3" Pl ⊙	30	+45			
		+42	19	⊙ 12" M	
3" Pl ⊙	30	+31			
3" Pl ⊙	30	+15			
		(20)			

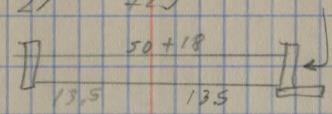
		(46)			
		+91	26	⊙ 10" M	
10" M ⊙		+86			
T	28	+80			
		+76		⊙ 10" M	
10" M ⊙	27	+71			
10" M ⊙		+59		⊙ 12" M	
		+45		⊙ 12" M	
12" M ⊙		+42			
		+29	26	⊙ 12" M	
12" M ⊙		+24			
		+10		⊙ 12" M	
10" M ⊙	27	+05			
		(45)			
		+98	26	⊙ 15" M	
12" M ⊙		+88			
		+79		⊙ 10" M	
16" M ⊙		+72			
		+62			
12" M ⊙	30	+55			
		+47	17	T	
		+44	25	⊙ 36" E	
T	28	+25		⊙ 12" M	
		+10		⊙ 12" M	
		(44)			

				X
	+26		8	10" M
12" M	28	+05	9	10" M
	(48)			
12" M		+93		
	+93	17	□	← water through 4+3
8" M		+78		
	+72	25	○	10" M
8" M		+66		
10" M		+50	25	→ +64
T	28	+40		
12" M		+30		
	+35		○	6" M
	+15		○	10" Lo
12" M	28	+10		
	+01		○	10" Lo
	(47)			
	+70	24	○	10" Lo H
	+74	17	T	+72
	+56		○	15" M
12" M		+50	+40	
10" M		+35	230	Drive
	+23		○	12" M
10" M		+20		
12" M		+05	○	12" M
	(46)			



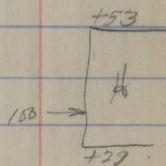
				+55	22	T
15" M		36		+52		
15" M		29		+23		
	+23		□	50+18		
				13.5	135	
12" M			□	+10		
			X	(50)	27	→
12" M		28		+95	26	○
12" M				+80		○
10" M				+65		○
10" M				+50		○
10" M				+35		○
				+20		○
				+16		
(54) 12" M			X			
			T	38	+10	
				+02	28	○
				(49)		
10" M		28		+09		
			←	29	+85	18
	+73		○	10" M	27	+73
						X
10" M				+55		
	48+47		(5)			X
Build new colv 3x2 90° Drainage W-gard						
12" M				+48		
10" M				+23		X

Remove
3x2 Conc Box
Poor condition



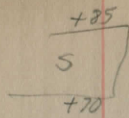
+41x

10" M O +93
 10" M O +90
 10" M O +73
 T 28 +65 20 T
 dead 10" O +55
 +43
 15" M O +25
 10" M O +05
 +02 26 O 12" A
 (53)
 12" M O 29 +73
 16" M O +75
 12" M O +60
 +50 14 O 8" ^{PC} ~~Ap.~~
 +30 20 T
 12" M O +25
 T 28 +05
 (52)
 10" M O +90
 10" M O +75
 10" M O 29 +58
 10" M O +40
 10" M O +24
 10" M O +01
 (51)
 12" M O 29 +86
 +69 26 O 12" M
 T 28 +62



⊙ 12" M

T 28 +85
 12" Ap. O 30 +10
 (59)
 +55 24 T
 +20
 +10 Drive
 XT 28 +35
 (58)
 +47 ← 30
 (57)
 T 28 +80
 +10 22 T
 (56)
 +58 30 O 15" T^h (34)
 18" M O 29 +40
 T 28 +24
 12" M O +05
 (55)
 +82
 +65 28 O 12" M
 12" M O 28 +58
 +45
 10" M O +40
 12" M O +23
 +10
 10" M O +05
 (54)
 O 12" M

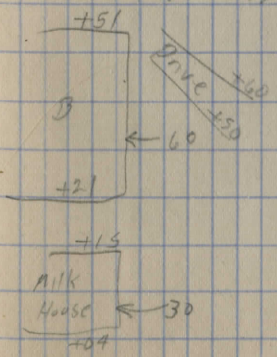


+85
+75 Drive

+75		+65	25	⊙ 10" N.	
S	← 30				
+30		+30	26	⊙ 14" Ap.	
		+10	26	⊙ 12" Pc	
X		(63)			
		+58		⊙ 12" Ap	
10" Pc ⊙	30	+98			
Td T	22	+76			
side Anchored CEI cross on next pole	CEI T	26	+58		
	8" Ap ⊙	30	+79		
		+68		⊙ 6" H	
	12" Ap ⊙	30	+60		
		+20	26	⊙ 6" E	
	12" Ap ⊙	30	+10		
		(62)			
	8" Bnd ⊙	30	+90		
		+47	18	⊙ 2-16" E	
		+34	25	⊙ 6" E	
	T	28	+79		
		(61)			
2 1/2 x 5 Stench Box					
Cable fair condition	←	+96			
Conc extension East 8'	17	145			
Conc. pole					
		+60	24	T	
		(60)			

24 → +65
Tel poles cross
on next pole

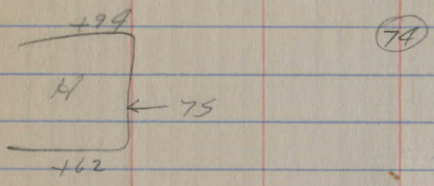
				(67)	
				(68)	
	T	20	+95		
			+90	28	T
			(67)		
	16" Ap ⊙	30	+95		
(BM)	18" E ⊙	30	+80		
	10" Ap ⊙		+62		
	10" Ap ⊙	30	+45		
			+25	28	T
			(66)		
			+53	26	⊙ 10" Ap.
	T	19	+45		
			(65)		
	Tel Co T	19	+81		
			+57	26	T CEI
			+39	25	⊙ 10" M
			+14	25	⊙ 15" M
			+42		
			+07		
			(64)		
			+95	19	⊙ 20" M



Milk House
← 30
+04

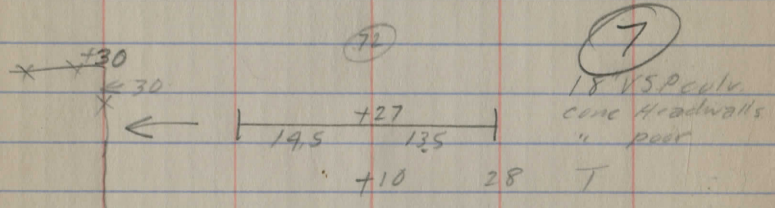
(75)
T 21 +73

+25
Drive +13
+10 28 T



(74)
+49 28 T

T 22 +25



(72)
T 22 +28
Drainage

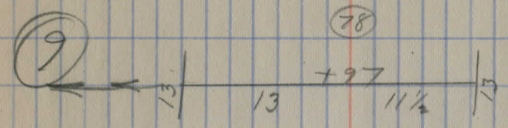
Ensign Rd

+65
Drive +93
(70)

+46 X ← 30
+46 28 T

(69)

(79)
+96 29 3 10" M (BM)
+70 29 3 12" M
+50 28 T

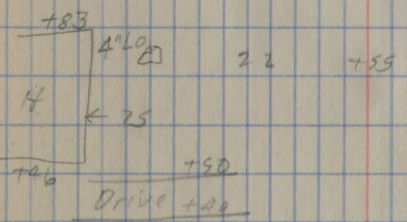


3 x 2 1/2 Stone Box
culv. good condition

+40 28 T
+28 30 3 12" M +15

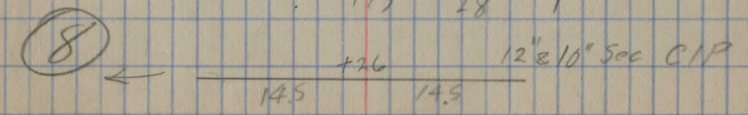
T 22 (97)
+78 30 3 8" M
90" → +70

+70
Toe Drive

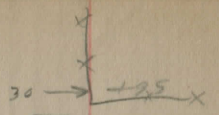
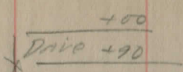


+25 28 3 8" Buck
10" M 3 24 +18
+05 27 3 12" M

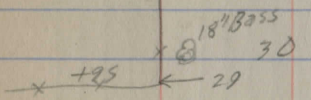
(76)
+75 28 T



(75)

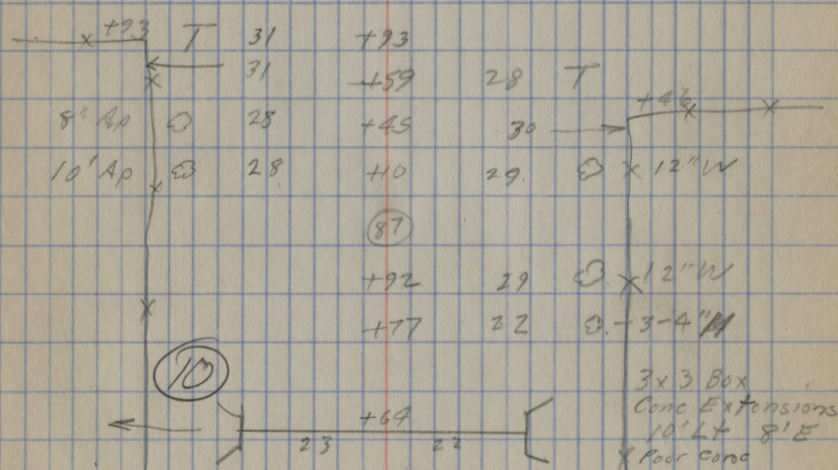


+79	28	T
+74	30	⊙ 10" M
+70		T 29
+46		⊙ 10" M
+25		15" M ⊙ 25
+20	25	⊙ 10" M +102
(85)		
+94		⊙ 12" M $\begin{matrix} 100 \\ \rightarrow \\ H \\ +1.5 \end{matrix}$
+65	25	⊙ 15" M (BM)
+43	25	⊙ 15" M
+30	28	T
+20	25	⊙ 10" M
(84)		
+97		155 Drive
+95		+75 Drive
+25		T 22
(83)		
+82	28	T
(82)		
+32	28	T
+25		T 22
(81)		
(80)		
+83	28	T
+25		T 22
(79)		



T 22
(83)
+82 28 T
(82)
+32 28 T
T 22
(81)
(80)
+83 28 T
T 22

+05	28	T
(92)		
+35		T 22
(91)		
+55	28	T
(90)		
+55		T 24
+10	28	T
(89)		
(88)		
+93		T 31
+59	28	T
+45	30	8" Ap ⊙ 28
+10	29	10' Ap ⊙ 28
(87)		
+92	29	⊙ 12" W
+77	22	⊙ -3-4" M
(10)		
+64	23	22
+58		10" E ⊙ -20
+30	25	⊙ 12" M
+16	25	10" M ⊙ 25
+06		10' W ⊙ 32
(86)		



(99)

130 PL

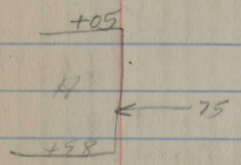
+30 28 T

+30
+20 Drive

+15 26 ⊙ 12" M

(98)

60 → +62



T 18

+40 26 ⊙ 15" M

(84) 24" M ⊙ 21

+25

+10 26 ⊙ 18" M

+05
Drive +95

(97)

+60 28 T

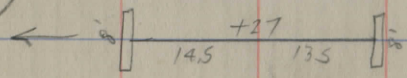
+27 Pop L ?

(96)

T 21

+35
+10 28 T

(11)



3x 1/2 Cone Box
Fair conditions

(95)

(94)

+55 28 T

T 22

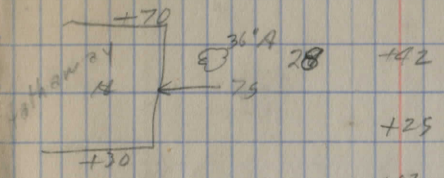
+33

(93)

(109)

36" A ⊙ 27 +75

T 15 +75



+25 28 T

+02 35 ⊙ 24" M

(103)

+92 35 ⊙ 24" M
75 → +41
+48

10" M ⊙ 25 +85

+30
10" M ⊙ 25 +55

+40 30 ⊙ 18" M

H ← 75

+03

+35
+25 Drive

(102)

+55
Drive +75

12" M ⊙ 24 +65

T 19 +42

28 T

5" M ⊙ 26 +35

(101)

15" M ⊙ 25 +85

(100)

+90 28 T

T 18 +51

x x +27

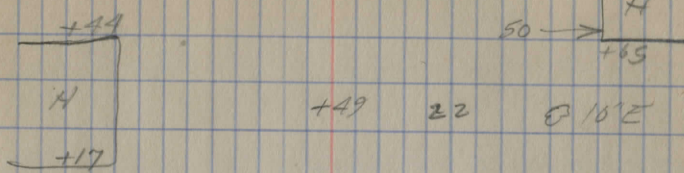
(99)

8" M Ⓟ		+75	
3" E Ⓞ		+60	<u>+75</u>
8" M Ⓞ		+90	<u>+65 Drive</u>
10" M Ⓞ	25	+25	
			<u>+20</u>
Drive		+05	

(BM) 36" E Ⓞ	28	+88	(107)
Cobb. H	15" W Ⓞ	26	+50
	← 75		
		+42	
4" M Ⓞ	25	+20	<u>+30</u>
		+12	<u>+20 Drive</u>
	28	T	
		<u>+02</u>	RL(?)

Margaret

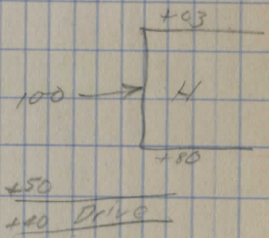
Boyl H	← 75		
		+12	
		+36	
		+95	(105)
Drive		+85	
X	X	+78	
		+75	
Drive		+65	
15" M Ⓞ	25	+15	
			(104)



8" Buck Ⓟ	25	+25	
		+10	
		(110)	
(13)	6" tile	+83	
	T	18	+90
		17	
36" Cat Ⓞ		+87	
12" M Ⓞ		+70	
4" M Ⓞ		+56	
4" M Ⓞ	25	+40	28 T
10" M Ⓞ	25	+23	
12" M Ⓞ	25	+02	
		(109)	

15" Cor IP
stone catch Basin

6" ↓ 6" ↓



(12)	10" M Ⓞ	25	+25	
			+12	
		12.5		
		12		
			(108)	
	15" M Ⓞ	25	+99	
	T	16	+92	28 T

3x3 Stone Box
culv. poor condition
Replace & lower

Tel Co. line crosses
next pole

(113)

+84 28 T

12" Cat 25 T 15 +76

+55

+55 30 10" M

Drive +45

10" M 25 +40

+35

H ← 75

+12

+70 30 10" M

12" M 25 +08

+25

+15

Drive

(112)

+95 30 10" M

T 12 +89

10" M 25 +70

30 24" WC

+60 30 10" M

36" E 25 +45

50 → sch

+12

+10 28 T

(111)

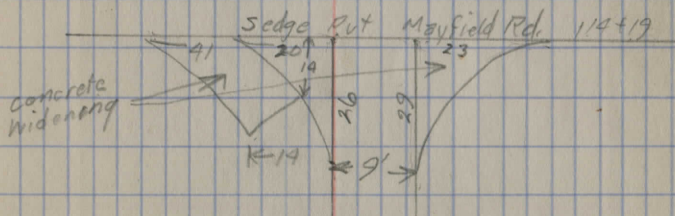
+10

+85 Drive

30" Cat 35 +92

+80

Drive +70



+05. 31 T

(114)

12" M 25 +92

+65

H ← 85

+38

(117)

Culvert 48+47 Burton-Claridon
Claridon Twp.

RD

NOV 17 1938

52

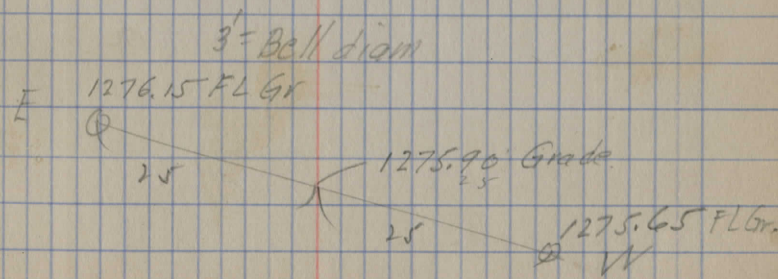
Grabner
Richards

L	HI	
5.48	1285.02	1279.54
		5.10 1279.92
		6.95
		7.40
		1275.9
		2.87 1276.15
		5.87 1275.65

B.M. #6 Sta 49+15
 ± Permit
 Ditch East
 " West
 bottom Exc, Grade & RD
 " Grade 25' E ± Cut 6'-0"
 " " 25' W ± Cut 3'-6"

Culv. at 90° to C.

85.02	9.37	28
75.65	3.50	85.02
9.37	5.87	76.15
	11.4	8.87
		5.63
		3.50
		9.13



Sta 60496
 Culvert 60+90 Claridon Twp
 Burton-Claridon Rd

605 1303.69

023 1291.87 1205 1291.64

644 1285.43

140 1277.9

11.8 1280.1

937

'

1297.64

#4
 BM 66+90 spike E Root 18" Elm

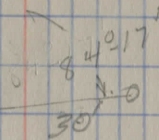
E Pavmt

Fl. West

FL East

Stake E Cut 2'-6"

Stake W Cut 1'-6" 30'



V
 North

1291.87

80.

11.87

9.37

2.50

1225

91.87

78.0

13.87

12.37

1.50

1280.0 = FL

E Q.

30'

1278.0 = FL

30'

W

Culvert Burton-Clarendon rd
sta 77+97 C " Imp
+ H.I.

0.46 1307.29

5.30 1302.0
10.1 1297.2
10.1 1297.2
5.3 1296.5
9.3 1296.0

1306.83

BM #3

± Pave

FL E

FL W

C 5'-6" FL Gr. East

C 2'-0" FL " West

Culv. at 90° to E

78+90 Sp. W. Root 12" Map

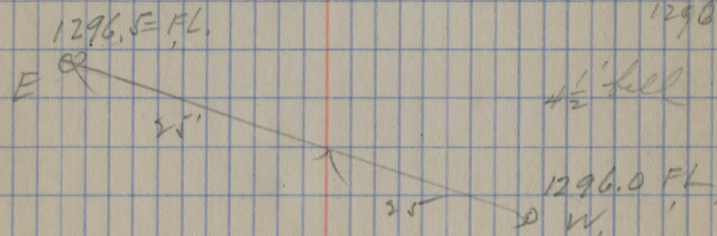
1307.3
1296.
11.3
9.3

9.15

1307.3
96.5
10.8
5.3
5.5

4.85

1302
5.5
1296.5



Burton - Claridon
Sta 75+23 Culvert staked
11-17-38
H.I.

0.46	1307.29		1306.83
4.45	1307.92	3.82	1303.47
		5.00	1302.9
		7.8	1300.1
		10.2	1297.7
		5.52	1299.4
		9.52	1297.4

Culvert 90° to Rd &

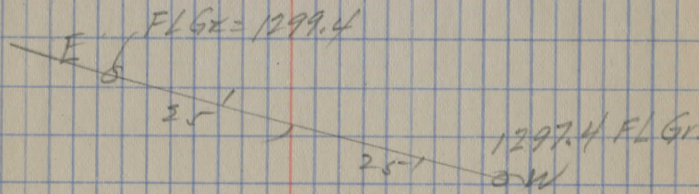
& Park,
FL E,
F.L. W.
Cut 3'-00" F.L. Grade E
Cut 1'-00" FL " W.

5.34

1307.92
<u>1299.4</u>
8.52
<u>5.32</u>
3.10

1302.9
<u>3.5</u>
1299.4

1307.92
<u>1297.4</u>
10.52
<u>9.52</u>
1.00



Burton-Clairdon Rd. p. Culvert
Sta 108+12
H.I.

277 1316.95

505 1311.90

8.7

9.1

12.4

6.05 1307.9

1307.4

1314.18

11-17-38

Culvert at 90° to Φ

B.M. No 1

Φ Par

FL E

FL W

100' West

Cut 3'-00" FL E

Cut 1'-6" FL W

Pipe 36 outside
no bell

3'-0
1'-0
4'-0

1316.95

07.9

5.25

9.05

6.05

Cut 3'-00"

16.95
07.40
9.55
Cut = 11.50
8.05

Cut 3'-00"

FL

1307.9 Gr.

E



25'

25'

Cut 1'-00"
1307.4 FL Gr.

W

JUNE 30 1950 TEMPLE LEWIS - MAYNARD
 CH#3 SEC SIDE STAKES SET 12' W of E for STABILIZATION OF WEST HALF ROAD
 N. line BURTON TWP W
 Northernly in Claridon

57
 MOST STAKES REJECT AT 15' 7-9-52

0+0 12' W of Tang

1+22 INSIDE TOP W Edge TOP INSIDE
 CORR 10.33 0.7 CONC 9.0 11.3 CURB BRIDGE

2+0 0.5 2 Edge 0.3

4+0 TOP 0.4

6 Top Conc 0.9 0.8

8 0.2 0.8 CONC

9+65.47 MEASURED FROM REF'S Pg 26 THIS BOOK P.I.

10 TOP W Edge 10.0 CONC 14.9 off W edge CONC

12 T .3 .7 C

14 T .3 .6 C

16 T .2 .4 C

18 T .2 .4

20 T .3 ?

20+94.18 JUGGLED IN SET BOLT POT

22 TOP

24 TOP .2 BENT Spur Rd POT.

25+157.90

26 .7 TOP

28 TOP

30 TOP .2

32 TOP .3 CONC .2 TOP

34 TOP .2

36 Top Conc .6 .3

38 TOP .2

40 TOP .3

41+82.65 JUGGLED SET BOLT POT.

w ← E

42 TOP .8
 44 TOP CONC 1.0 .4
 46 TOP .4
 48 TOP CONC .9 .7
 50 TOP CONC 1.3 .7
 52 TOP CONC .8
 54 TOP CONC 1.4 .9
 56 TOP CONC 1.2 .8

STAGE #1
+10

57+46.18

POT
R.N.H. P.J

+1' E edge
 -1' W edge

76+59.57

78

78+50

82 CONC .4 TOP .9
 84 " 1.0 " 1.5
 86 " " 1.0

75+0 9'6" W edge W edge E edge
 7.35 6.46 6.47

76+90 → 8.04 7.56 7.52
 6.39 5.72 5.56
 8.14 7.21 7.32

88 top 1.0
90 " 0.7
96 " 0.5
98 Conc 0.0 " 0.5
102 " 0.0 " 0.3

102 + 198.67 P.O.T. = edge Conc

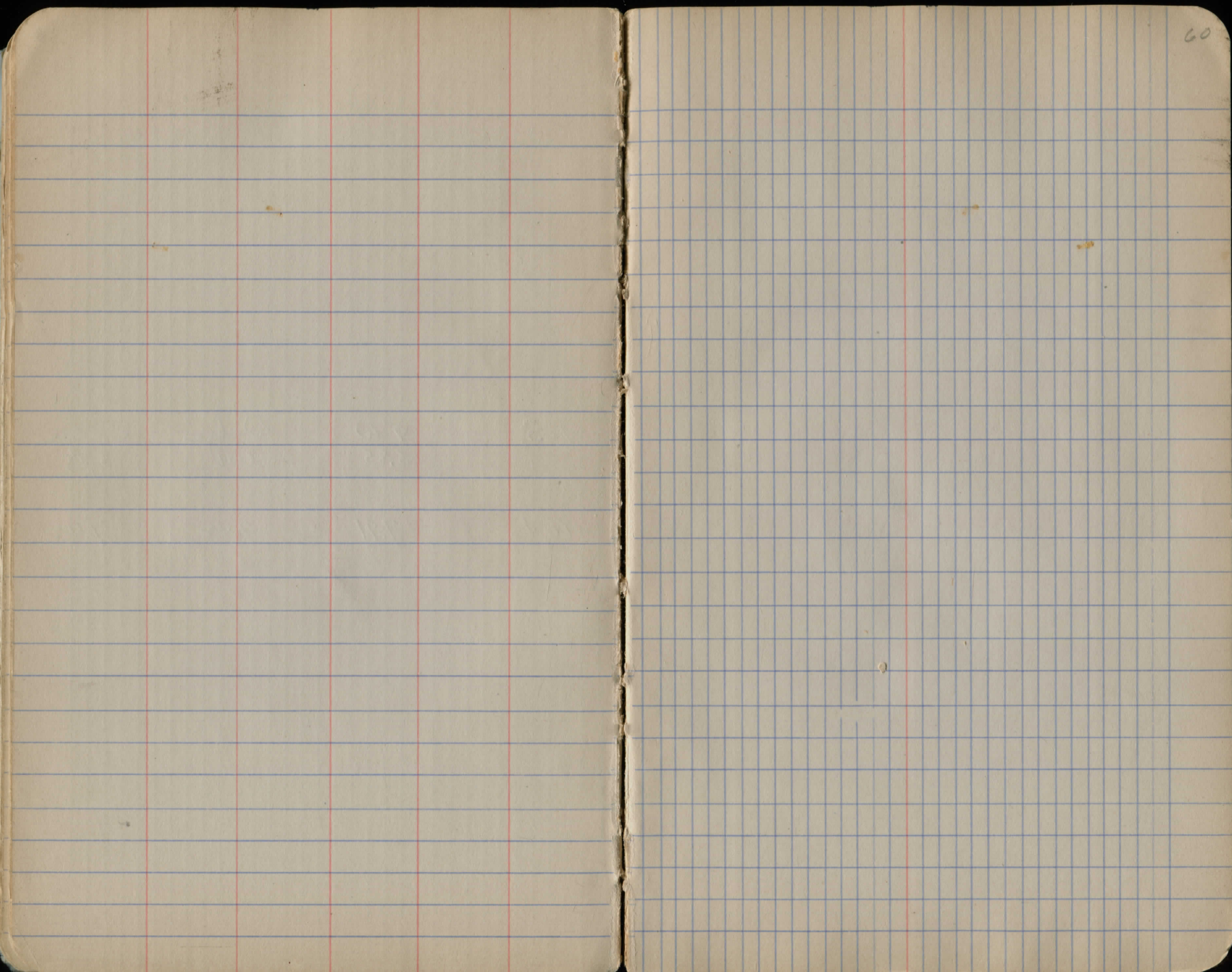
104 Conc 0.0 Top 0.4

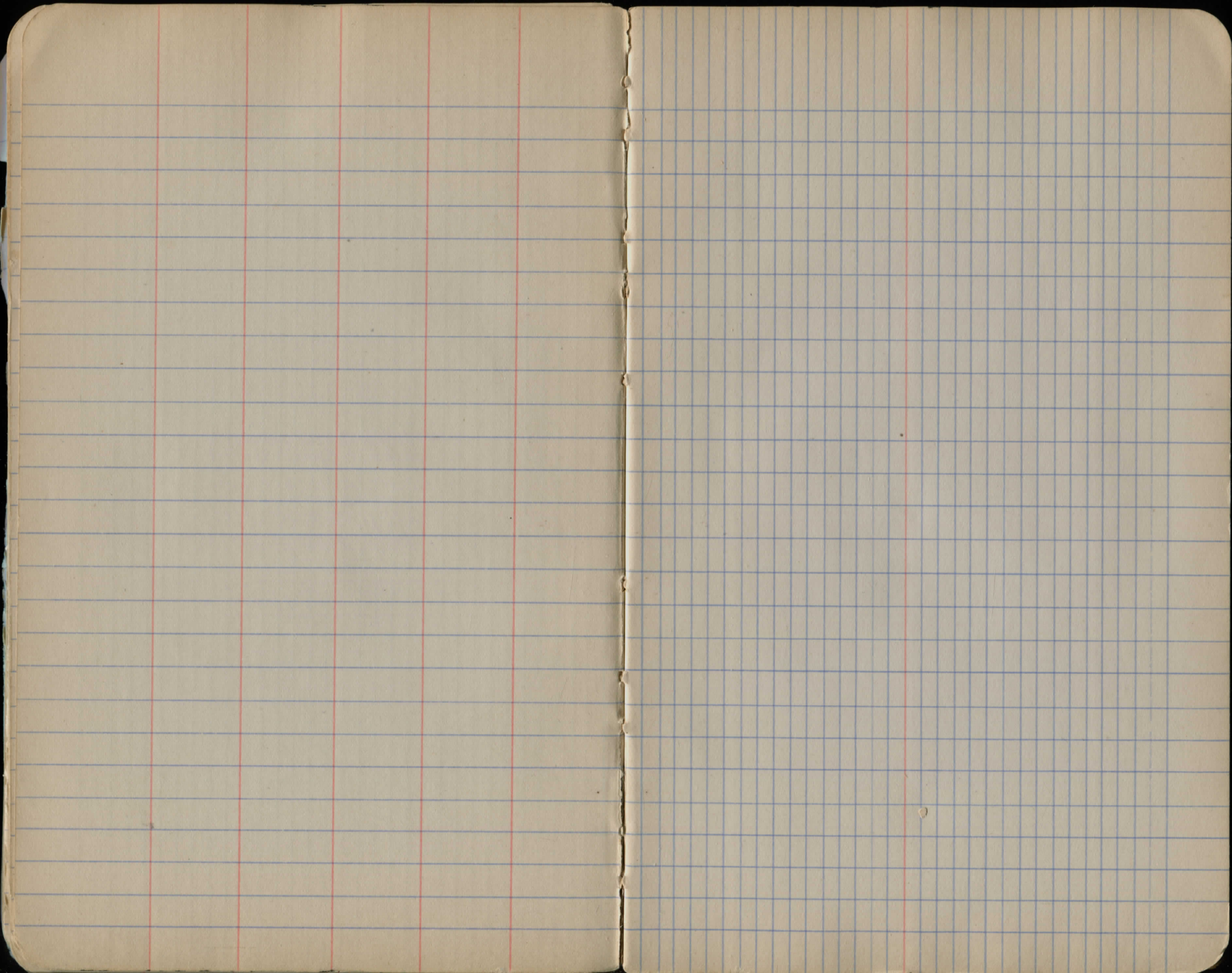
~~105~~

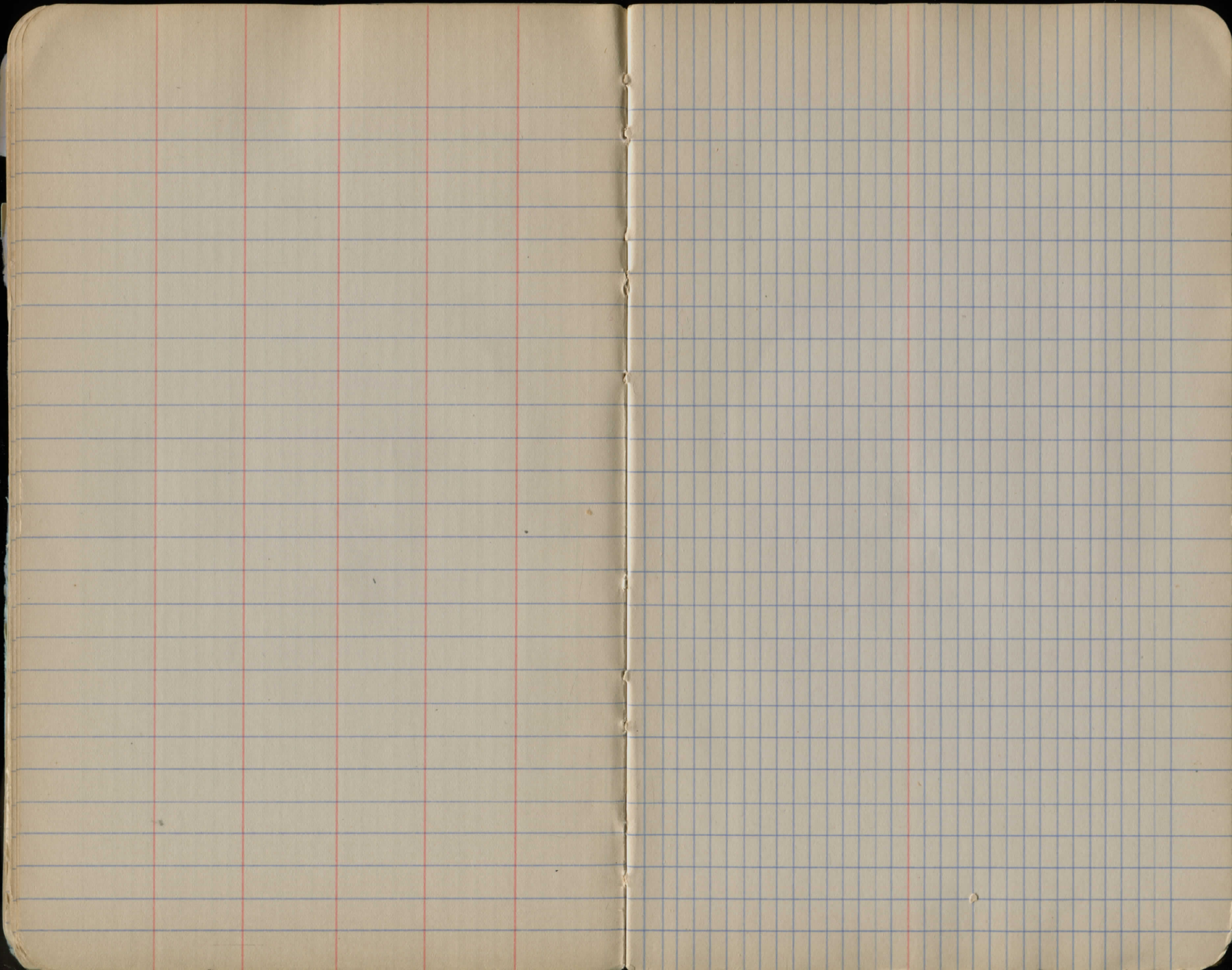
106 Conc 0.0 Top .5
108 " 0.0 " .3
110 " 0.2W " 0.0
112 " 0.2 " " 0.0

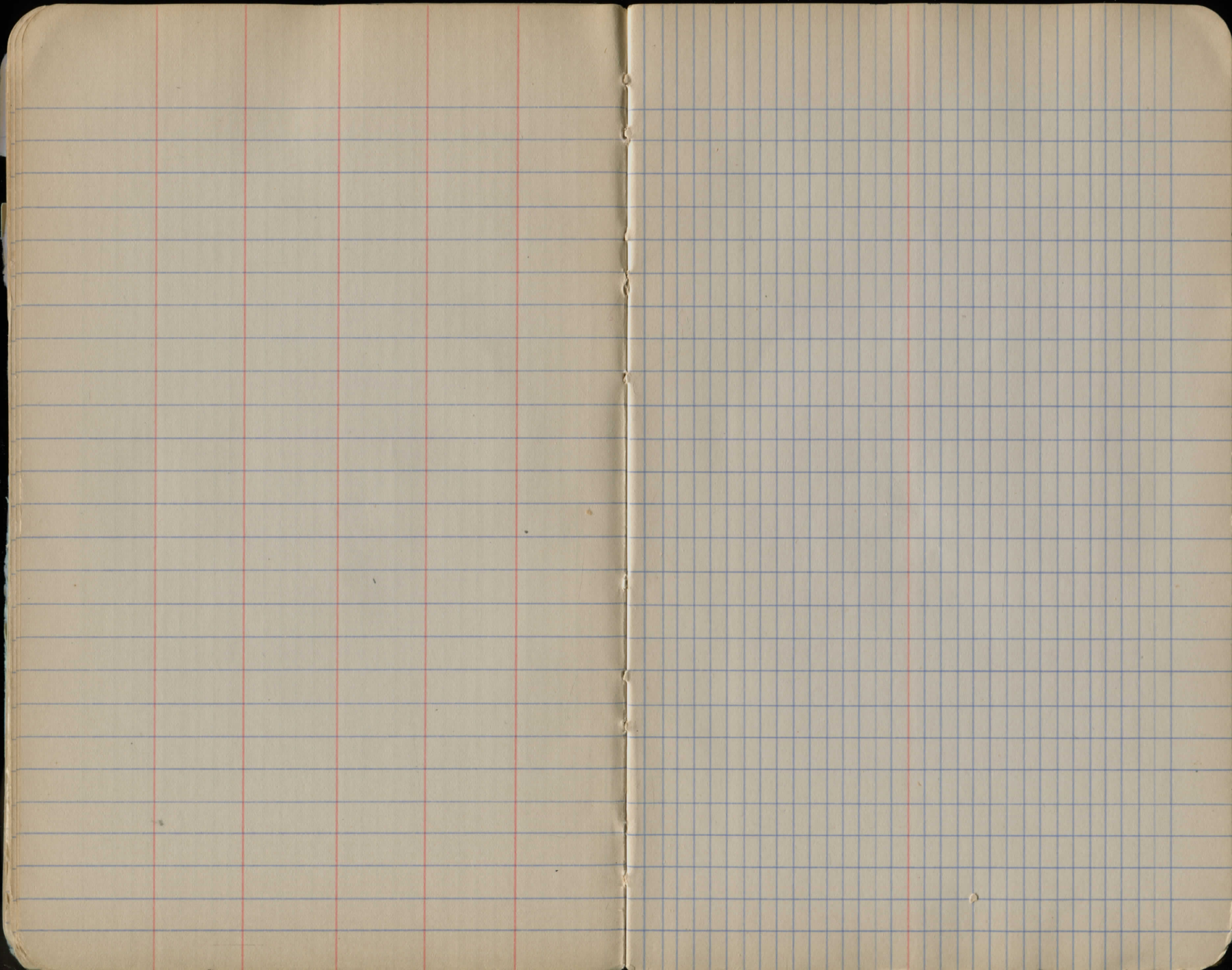
103 9'W Wedge Edge
5.85 5.43 5.43

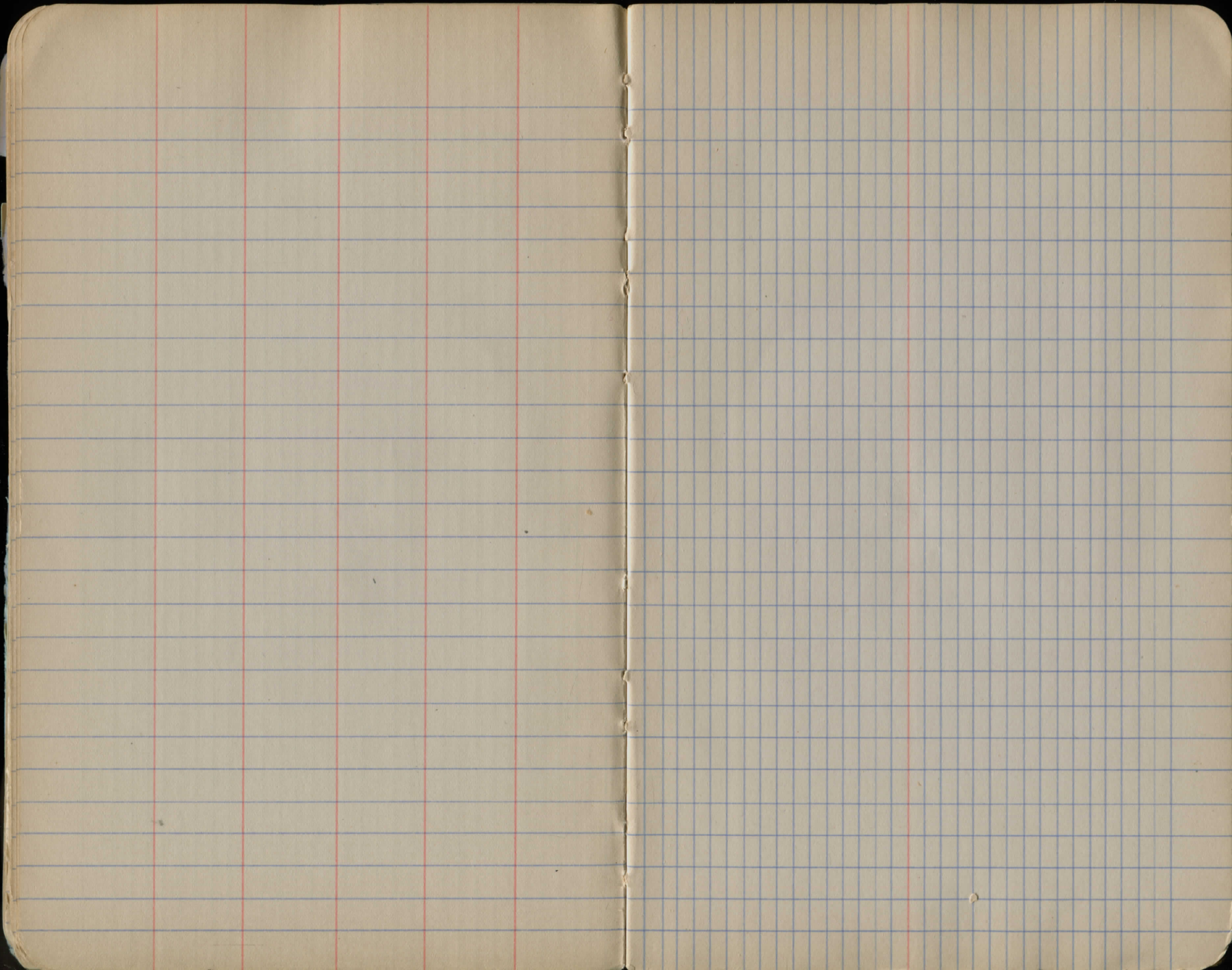
104 7.91 7.42 7.42

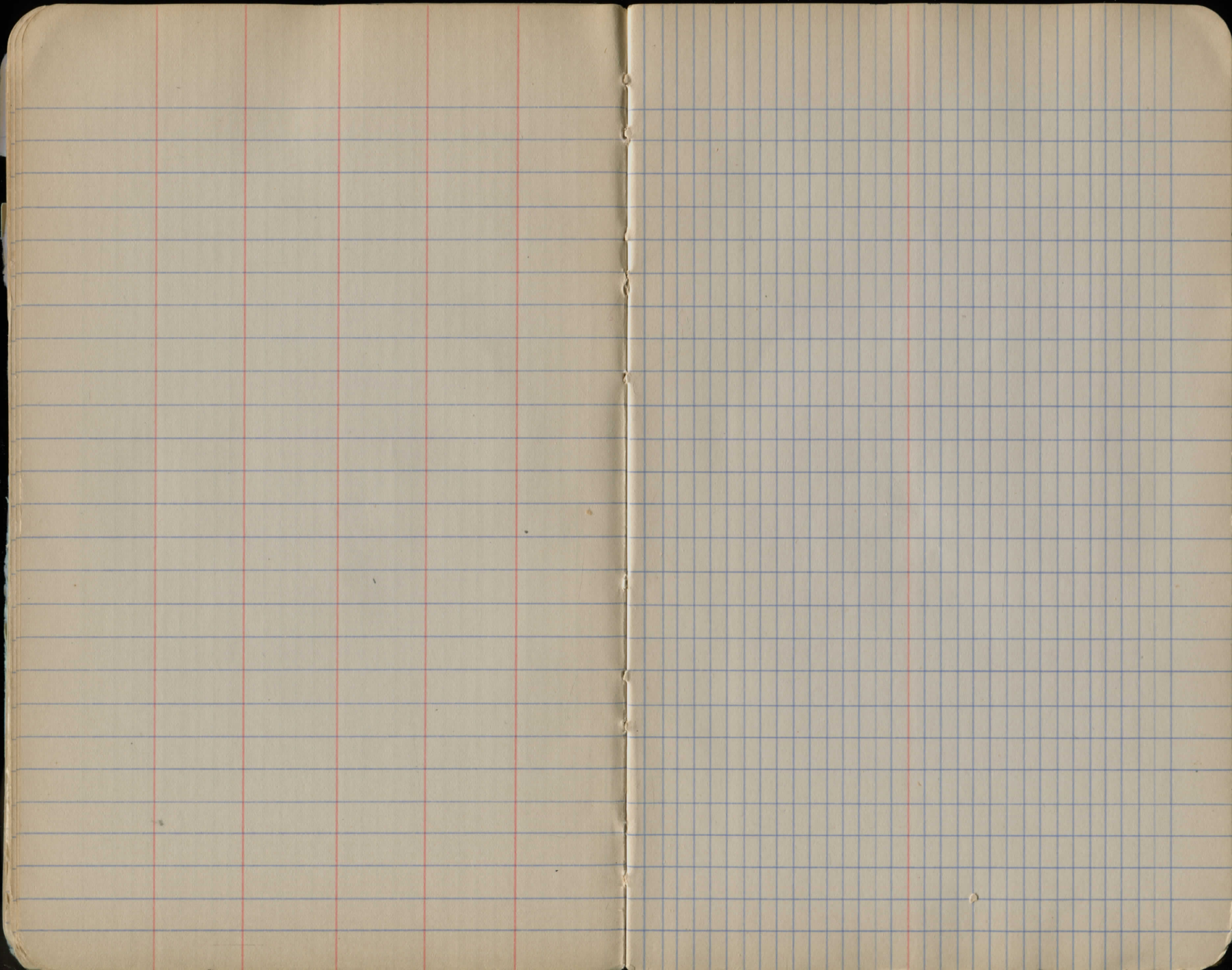


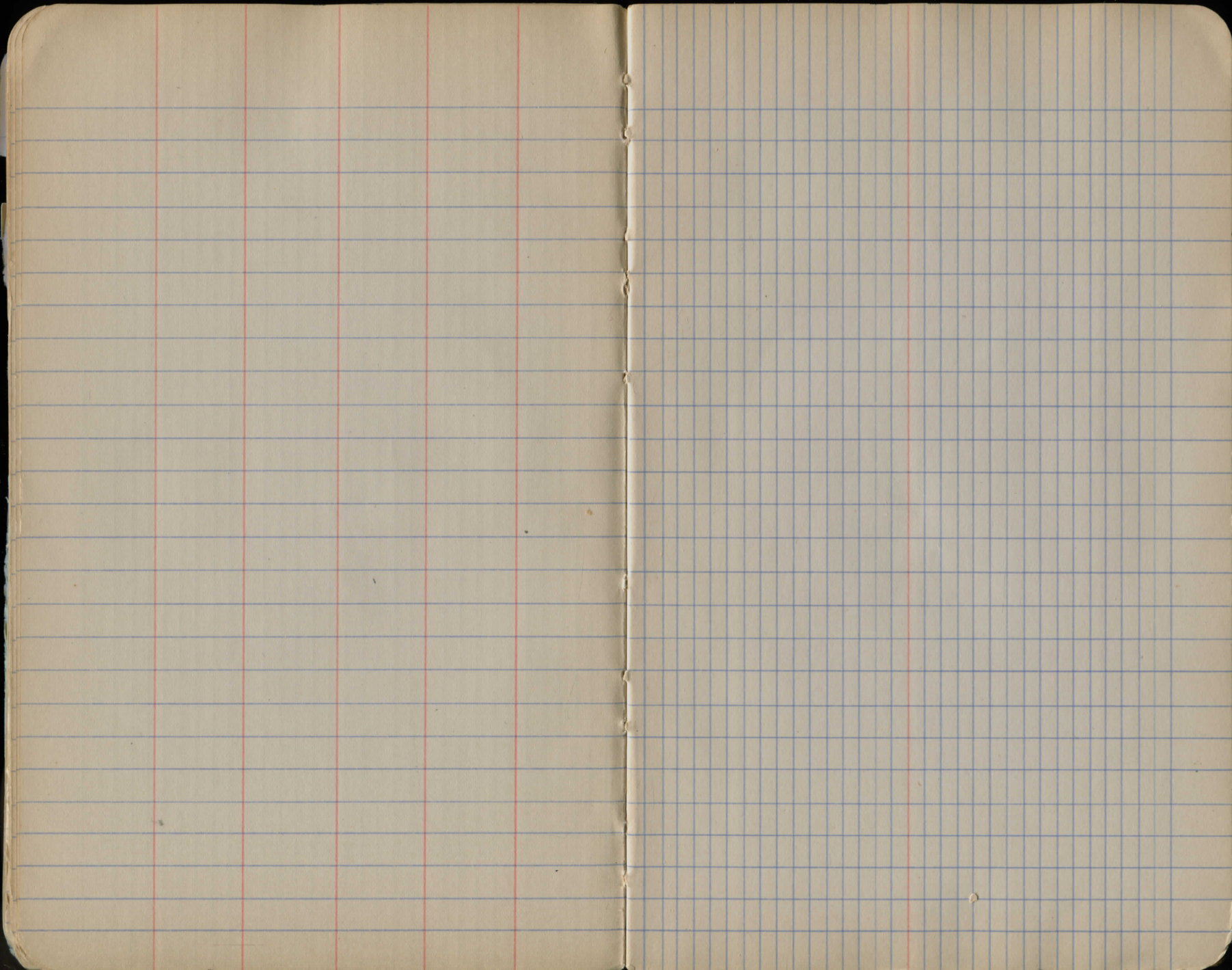


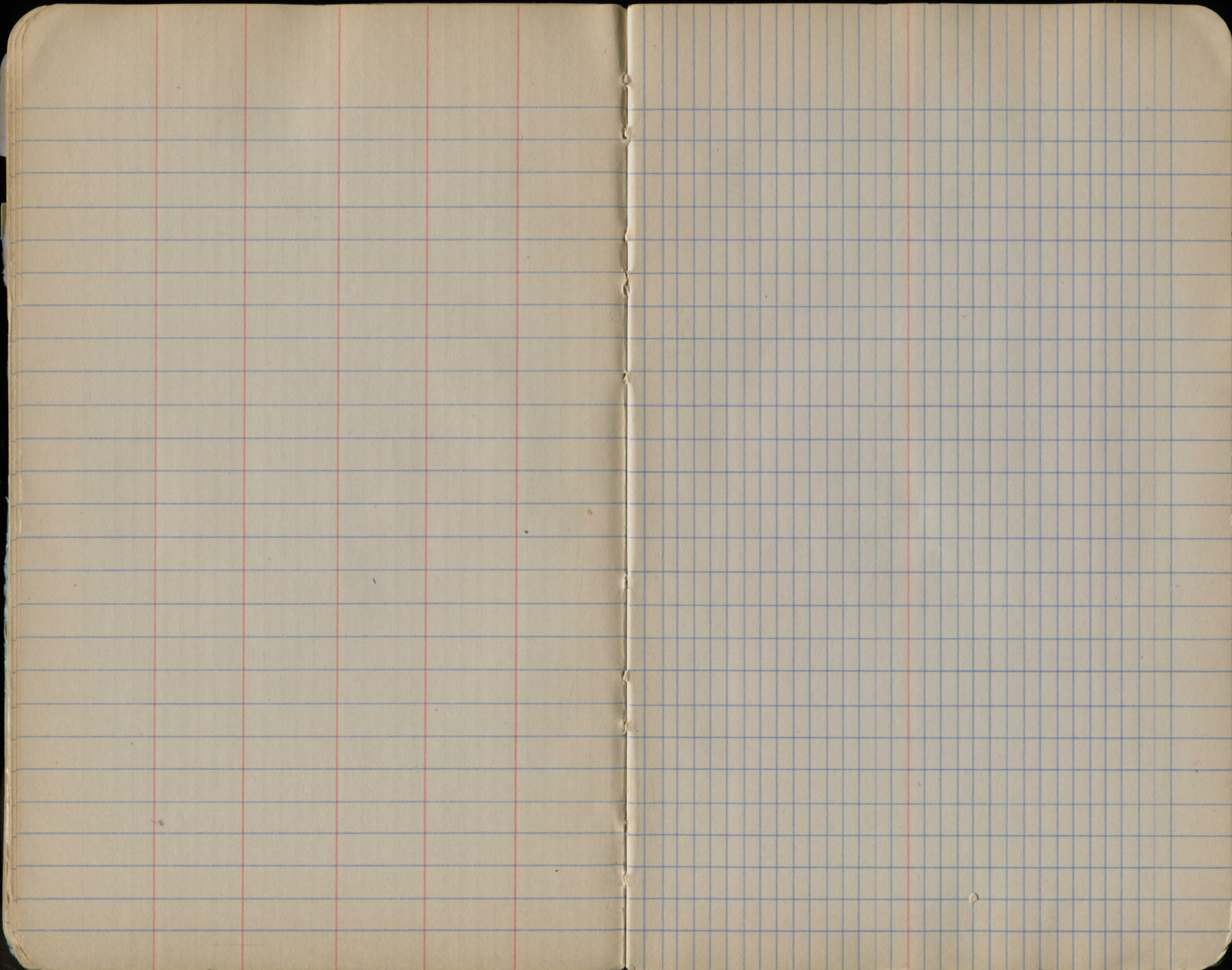


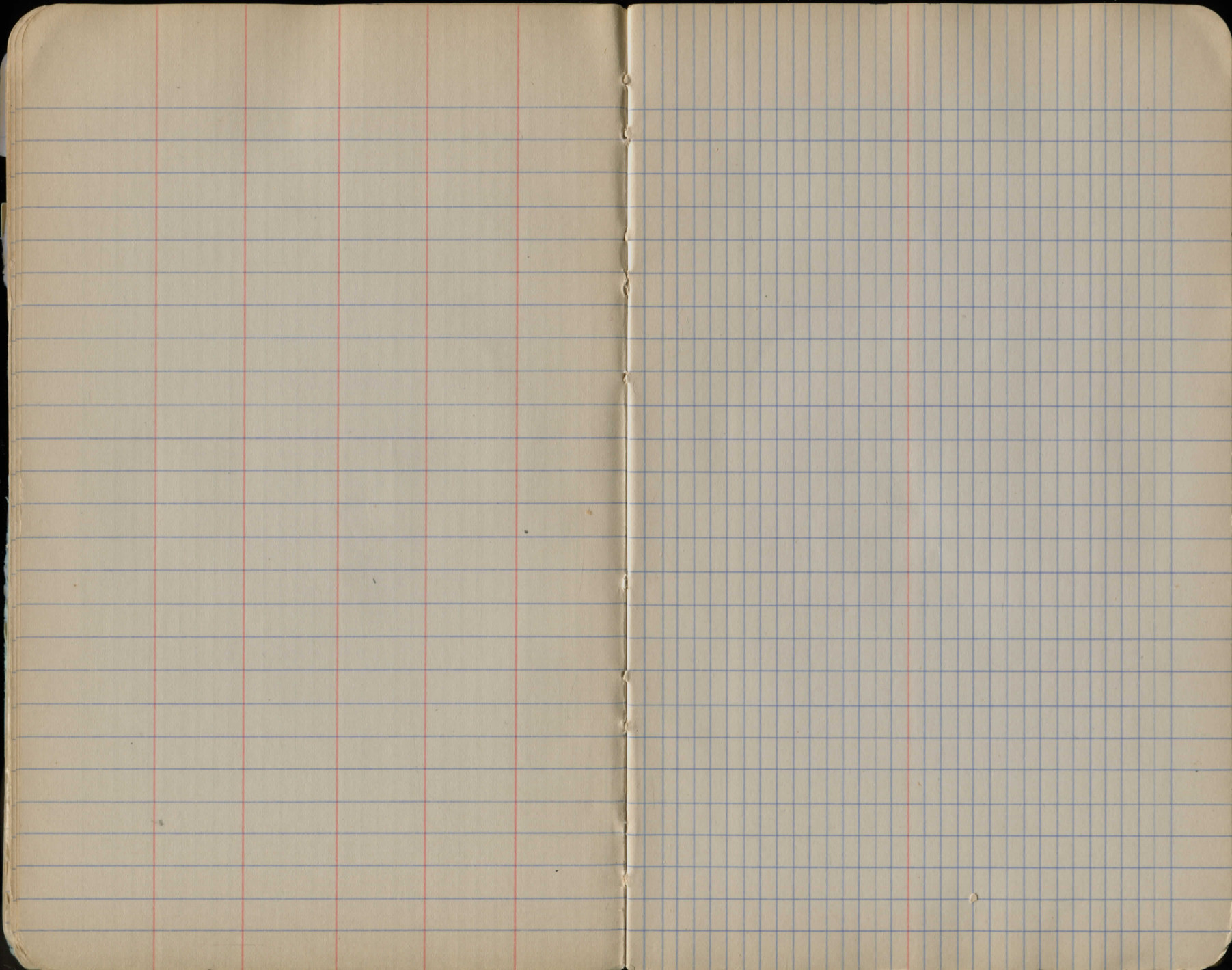


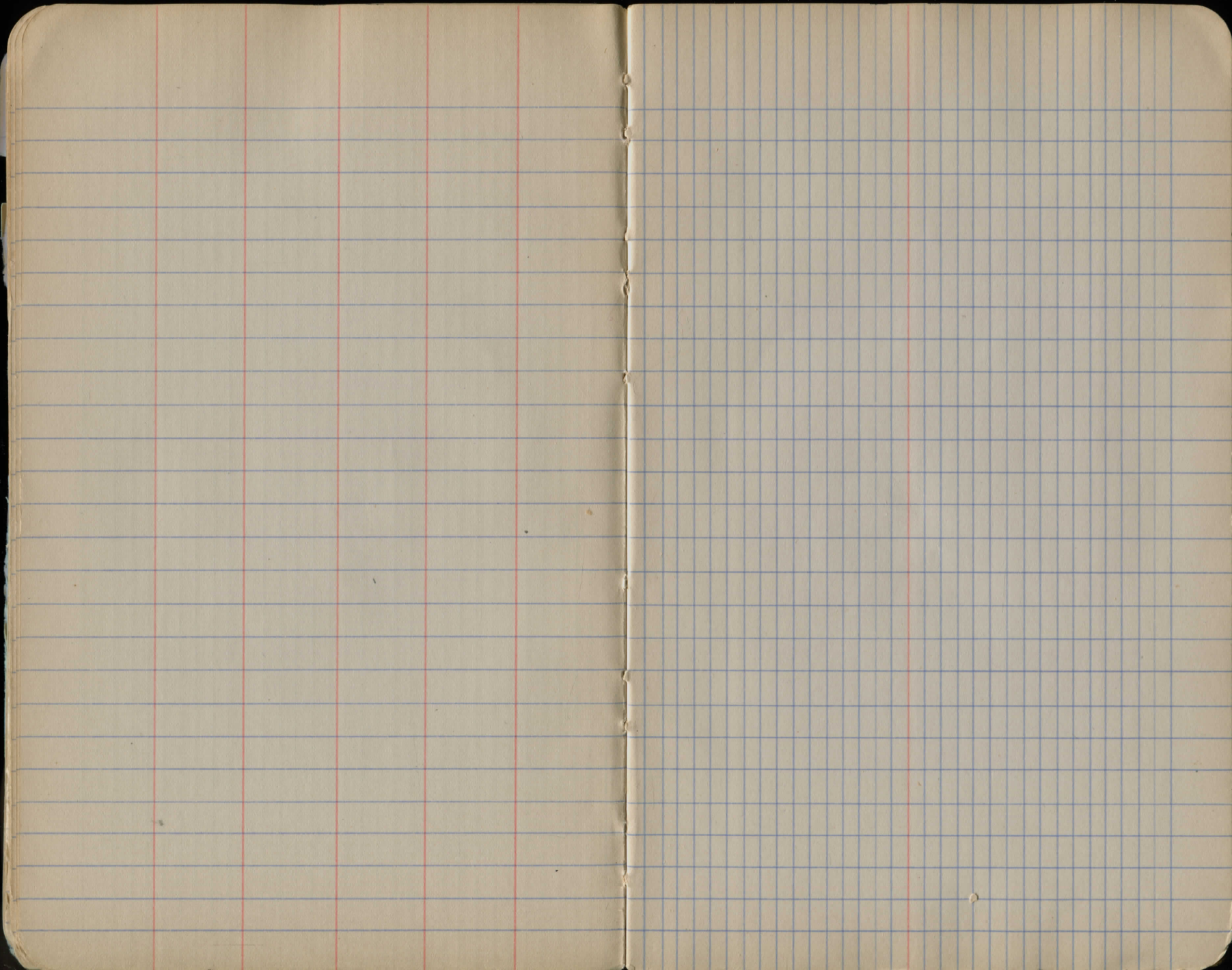


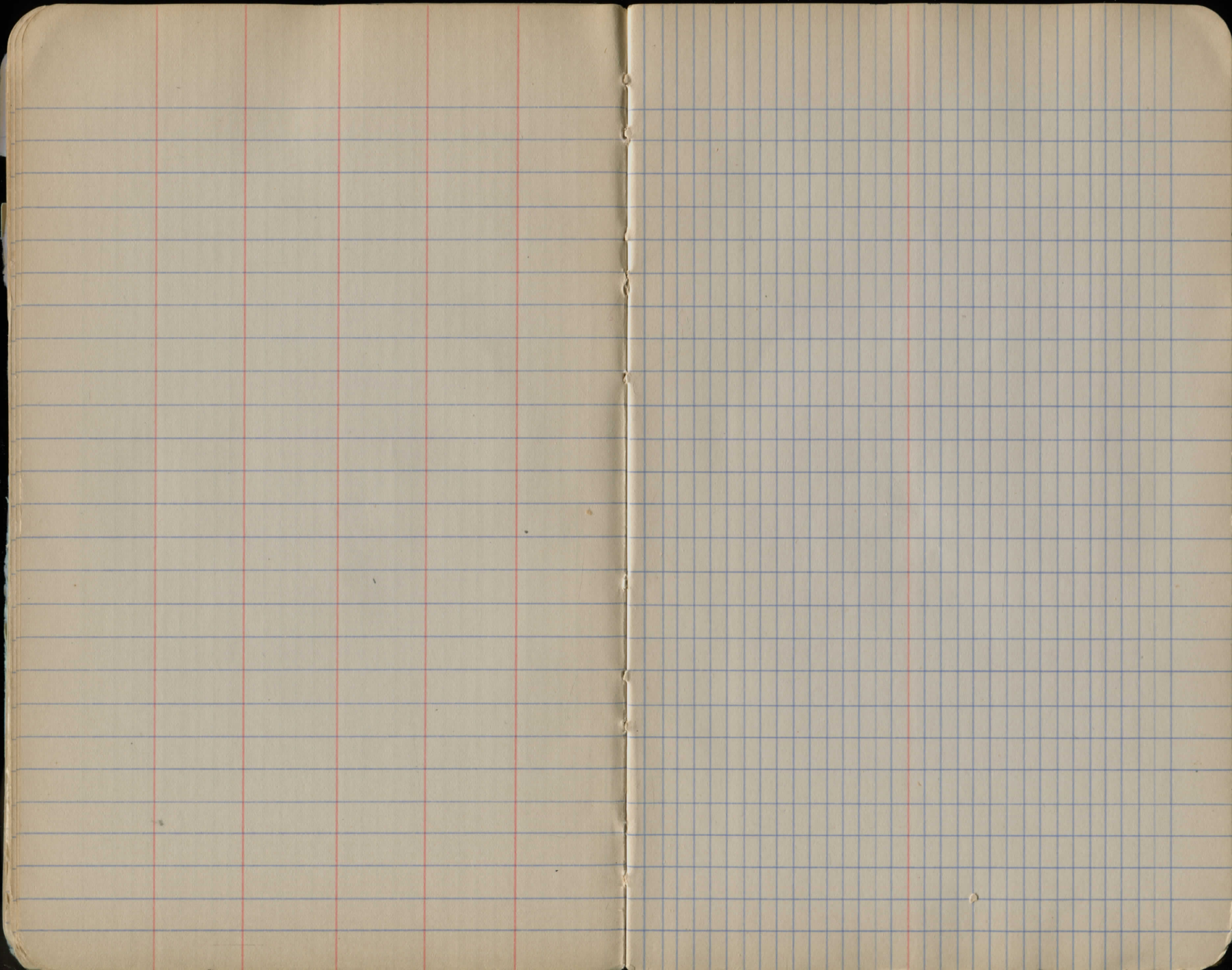


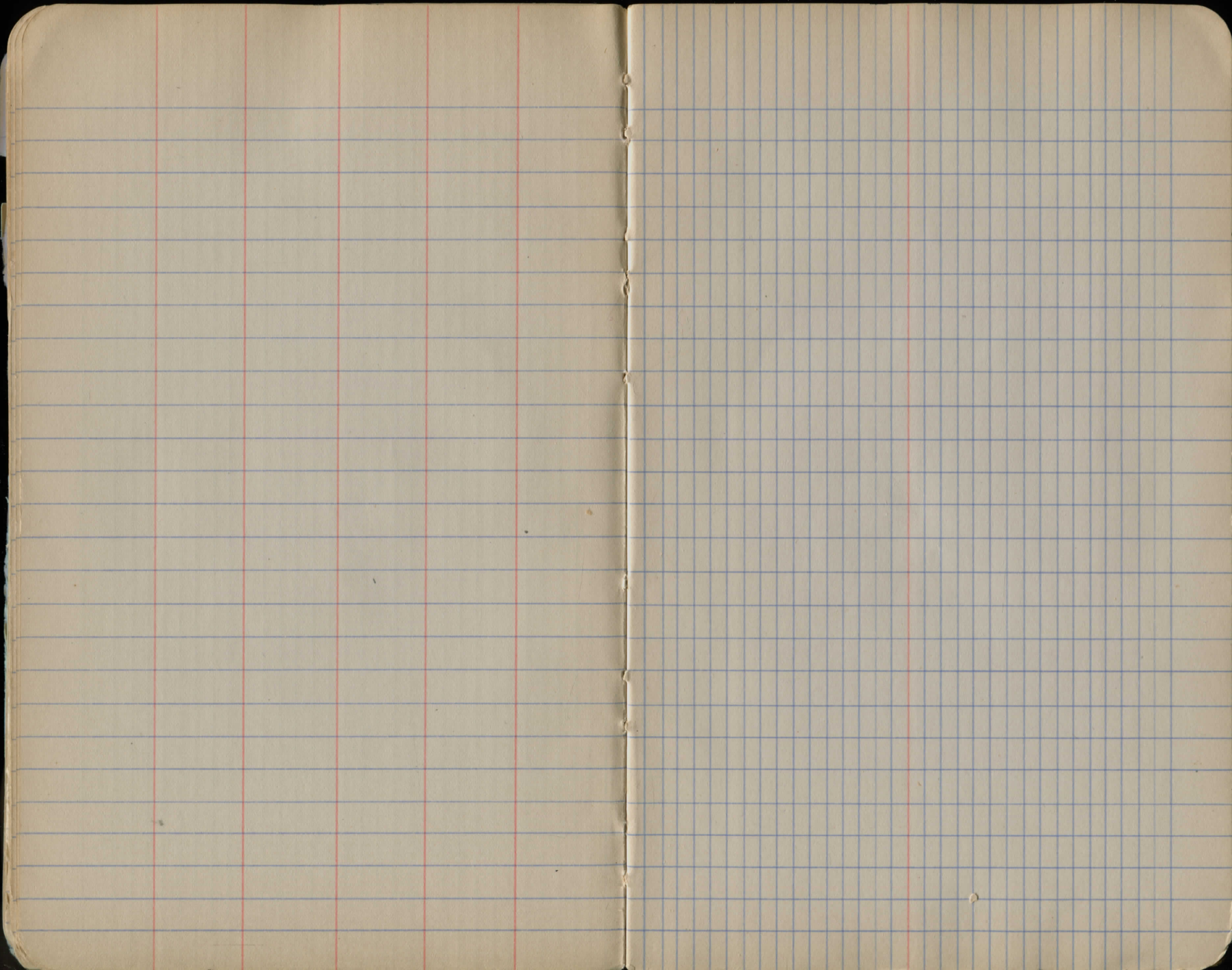


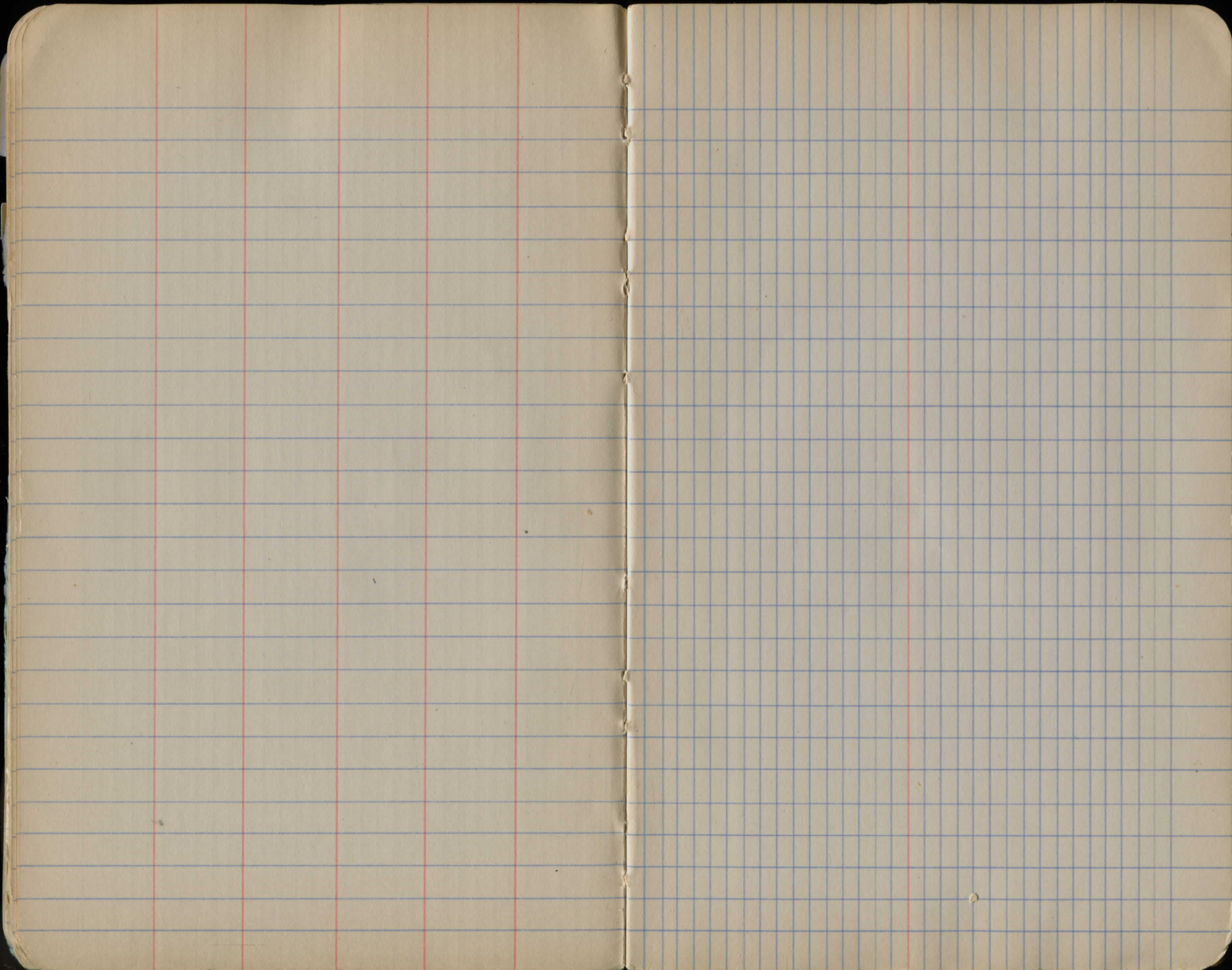






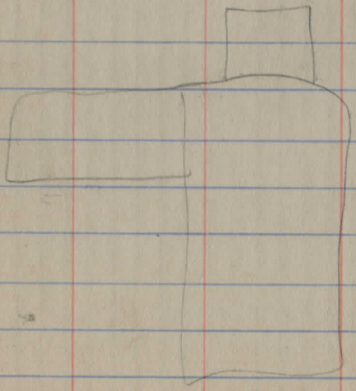
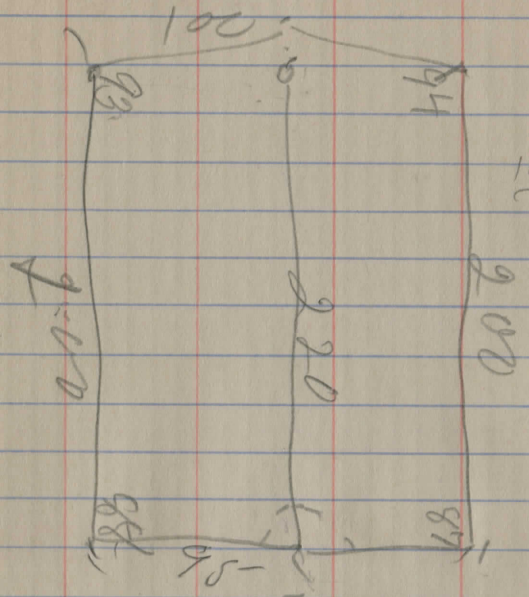






104
 104
 416
 104
 10816
 16.00

16
 75
 80
 102
 108
 1200
 105
 120



DIRECTIONS FOR USE OF TABLES

TABLE No. 1.

Distance of slope stake from side or shoulder
 stake for any width roadway, slope 1 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 both

IMPROVED TABLES

AND

INFORMATION

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 corrections.
 Degree of curve with a given I may be found
 by dividing tangent (or external), opposite I 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.

TABLE II—Continued
TRIGONOMETRIC FORMULAE (continued)

In any triangle:

Given a, b, C; to find c, B, A.

Use Law of Lines.

Given A, B, c; to find a, b, C.

Use Law of Lines.

Given a, b, c; to find A, B, C.

$$\text{Let } \frac{a+b+c}{2} = s, \sqrt{\frac{(s-a)(s-b)(s-c)}{s}} = r$$

$$\cos \frac{1}{2} A = \sqrt{\frac{s(s-a)}{bc}}$$

$$\tan \frac{1}{2} A = \frac{r}{s-a}$$

$$\tan \frac{1}{2} B = \frac{r}{s-b}$$

$$\tan \frac{1}{2} C = \frac{r}{s-c}$$

Area of a triangle:

$$\text{Area} = \frac{1}{2} ab \sin C$$

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

PRISMOIDAL FORMULA.

$$\text{Vol.} = \frac{h}{6} (B+b+4M)$$

h = altitude; b, B = bases; M = midsection

TABLE III
INCHES AND FRACTIONS OF AN INCH IN DECIMALS OF A FOOT

	0	1	2	3	4	5	6	7	8	9	10	11	
$\frac{1}{16}$	.0052	.0885	.1719	.2552	.3385	.4219	.5052	.5885	.6719	.7552	.8385	.9219	$\frac{1}{16}$
$\frac{1}{8}$	.0104	.0938	.1771	.2604	.3438	.4271	.5104	.5938	.6771	.7604	.8438	.9271	$\frac{1}{8}$
$\frac{3}{16}$	.0156	.0990	.1823	.2656	.3490	.4323	.5156	.5990	.6823	.7656	.8490	.9323	$\frac{3}{16}$
$\frac{1}{4}$	.0208	.1042	.1875	.2708	.3542	.4375	.5208	.6042	.6875	.7708	.8542	.9375	$\frac{1}{4}$
$\frac{5}{16}$	.0260	.1094	.1927	.2760	.3594	.4427	.5260	.6094	.6927	.7760	.8594	.9427	$\frac{5}{16}$
$\frac{3}{8}$	.0313	.1146	.1979	.2813	.3646	.4479	.5313	.6146	.6979	.7813	.8646	.9479	$\frac{3}{8}$
$\frac{7}{16}$	.0365	.1198	.2031	.2865	.3698	.4531	.5365	.6198	.7031	.7865	.8698	.9531	$\frac{7}{16}$
$\frac{1}{2}$	.0417	.1250	.2083	.2917	.3750	.4583	.5417	.6250	.7083	.7917	.8750	.9583	$\frac{1}{2}$
$\frac{9}{16}$	.0469	.1302	.2135	.2969	.3803	.4635	.5469	.6302	.7135	.7969	.8802	.9635	$\frac{9}{16}$
$\frac{5}{8}$	.0521	.1354	.2188	.3021	.3854	.4688	.5521	.6354	.7188	.8021	.8854	.9688	$\frac{5}{8}$
$\frac{11}{16}$	.0573	.1406	.2240	.3073	.3906	.4740	.5573	.6406	.7240	.8073	.8906	.9740	$\frac{11}{16}$
$\frac{3}{4}$	.0625	.1458	.2292	.3125	.3958	.4792	.5625	.6458	.7292	.8125	.8958	.9792	$\frac{3}{4}$
$\frac{13}{16}$	.0677	.1510	.2344	.3177	.4010	.4844	.5677	.6510	.7344	.8177	.9010	.9844	$\frac{13}{16}$
$\frac{7}{8}$	.0729	.1563	.2396	.3229	.4063	.4896	.5729	.6563	.7396	.8229	.9063	.9896	$\frac{7}{8}$
$\frac{15}{16}$	.0781	.1615	.2448	.3281	.4115	.4948	.5781	.6615	.7448	.8281	.9115	.9948	$\frac{15}{16}$
1	.0833	.1667	.2500	.3333	.4167	.5000	.5833	.6667	.7500	.8333	.9167	1.000	1
	0	1	2	3	4	5	6	7	8	9	10	11	

TABLE IV
USEFUL RELATIONS.

Lineal feet	×.00019	= miles
Lineal yards	×.0006	= miles
Square inches	×.007	= square feet
Square feet	×.111	= square yards
Square yards	×.0002067	= acres
Acres	×4840	= square yards
Cubic inches	×.00058	= cubic feet
Cubic feet	×.03704	= cubic yards
Links	×.22	= yards
Links	×.66	= feet
Feet	×1.5	= links

$$360^\circ = 21600' = 1296000''$$

$$\text{Radius} = \text{arc of } 57.2957790''$$

$$\text{Arc of } 1^\circ (\text{radius} = 1) = .017453292$$

$$\text{Arc of } 1' (\text{radius} = 1) = .000290888$$

$$\text{Arc of } 1'' (\text{radius} = 1) = .000004848$$

$$\pi = 3.141592654$$

$$\sqrt{\frac{1}{4}} = 0.564190$$

$$\frac{\pi}{4} = 0.785398163$$

$$\sqrt[3]{\frac{6}{\pi}} = 1.240700982$$

$$\frac{\pi}{6} = 0.523598776$$

$$\pi^2 = 9.869604401$$

$$\sqrt{\frac{4}{\pi}} = 1.128379167$$

$$\frac{1}{\pi^2} = 0.101321184$$

$$\frac{\pi}{6} = 0.523598776$$

$$\sqrt{\pi} = 1.772453851$$

$$\frac{4\pi}{3} = 4.188790205$$

$$\frac{1}{\pi} = 0.3183099$$

Curvature of Earth's surface = about 0.7 feet in 1 mile

Curvature in feet = 0.667 (Dist. in miles)²

Difference between arc and chord length, 0.05 feet in 11½ miles

$$\text{Probable error of a single observation} = 0.6754 \sqrt{\frac{Mv^2}{n-1}}$$

Error in chaining of 0.01 feet in 100 feet:

Due to—

1. Length of tape error of 0.01 feet
2. Alignment. One end 1.4 feet out of line
3. Sag of tape at centre of 0.61 feet.
4. Temperature difference of 15°
5. Difference of pull of 15 lbs.

STADIA REDUCTION FORMULAE.

$$\text{Horizontal Distance} = R - R \sin^2 a + C \cos a$$

$$\text{Vertical Distance} = R \frac{1}{2} \sin 2a + C \sin a$$

distance from Object glass to cross hairs

$$R = \text{Reading} \times \frac{\text{distance between cross hairs}}{\text{distance from Object glass to center of instrument.}}$$

C = distance from Object glass to cross hairs + distance from Object glass to center of instrument.

a = angle of elevation for mid Reading

TABLE VI (continued)
SINES, COSINES, TANGENTS, COTANGENTS (continued)

deg.	sin 0'	tan 0'	sin 10'	tan 10'	sin 20'	tan 20'	sin 30'	tan 30'	sin 40'	tan 40'	sin 50'	tan 50'	deg.
46	7193	1.0355	7214	1.0416	7234	1.0477	7254	1.0533	7274	1.0599	7294	1.0661	43
47	314	.0724	333	.0786	353	.0850	373	.0913	392	.0977	412	.1041	42
48	431	.1106	451	.1171	470	.1237	490	.1303	509	.1369	528	.1436	41
49	547	.1504	566	.1571	585	.1640	604	.1708	623	.1778	642	.1847	40
										1.2203			
50	660	1.1918	7679	1.1988	7698	1.2059	7716	1.2131	7735	.2647	7753	1.2276	39
51	771	.2349	790	.2423	808	.2497	826	.2572	844	.3111	862	.2723	38
52	880	.2799	898	.2876	916	.2954	934	.3032	951	.3597	969	.3190	37
53	986	.3270	8004	.3351	8021	.3452	8039	.3514	8056	.4106	8073	.3680	36
54	8090	.3764	107	.3848	124	.3934	141	.4019	158	.4641	175	.4193	35
55	192	.4281	208	.4370	225	.4460	241	.4550	258	.5204	274	.4733	34
56	290	.4826	307	.4919	323	.5013	339	.5108	355	.5798	371	.5301	33
57	387	.5399	403	.5497	418	.5597	434	.5697	450	.6426	465	.5900	32
58	480	.6003	496	.6107	511	.6212	526	.6319	542	.7090	557	.6534	31
59	572	.6643	587	.6753	601	.6864	616	.6977	631		646	.7205	30
60	660	1.7321	8675	1.7437	8689	1.7556	8704	1.7675	8718	1.7797	8732	1.7917	29
61	746	.8040	760	.8165	774	.8291	788	.8418	802	.8546	816	.8676	28
62	829	.8807	843	.8940	857	.9074	870	.9210	884	.9347	897	.9486	27
63	910	.9626	923	.9768	936	.9912	949	2.0057	962	2.0204	975	2.0353	26
64	988	2.0503	9001	2.0655	9013	2.0809	9026	.0965	9038	.1123	9051	.1283	25
65	9063	.1445	075	.1609	088	.1775	100	.1943	112	.2113	124	.2286	24
66	135	.2460	147	.2637	159	.2817	171	.2998	182	.3183	194	.3369	23
67	205	.3559	216	.3750	228	.3945	239	.4142	250	.4342	261	.4545	22
68	272	.4751	283	.4960	293	.5172	304	.5386	315	.5605	325	.5826	21
69	336	.6051	346	.6279	356	.6511	367	.6746	377	.6985	387	.7228	20
70	397	2.7475	9407	2.7725	9417	2.7980	9426	2.8239	9436	2.8502	9446	2.8770	19
71	455	.9042	465	.9319	474	.9600	483	.9887	492	3.0178	502	3.0475	18
72	511	3.0777	520	3.1084	528	3.1397	537	3.1716	546	.2041	555	.2371	17
73	563	.2709	572	.3052	580	.3402	588	.3759	596	.4124	605	.4495	16
74	613	.4874	621	.5261	628	.5656	636	.6059	644	.6470	652	.6891	15
75	659	.7321	667	.7760	674	.8208	681	.8657	689	.9136	696	.9617	14
76	703	4.0108	710	4.0611	717	4.1126	724	4.1653	730	4.2193	737	4.2747	13
77	744	.3315	750	.3897	757	.4494	763	.5107	769	.5736	775	.6382	12
78	781	.7046	787	.7729	793	.8430	799	.9152	805	.9894	811	5.0658	11
79	816	.1446	822	5.2257	827	5.3093	833	5.3955	838	5.4845	843	.5764	10
80	9848	5.6713	9853	5.7694	9858	5.8708	9863	5.9758	9868	6.0844	9872	6.1970	9
81	877	6.3138	881	6.4348	886	6.5606	890	6.6912	894	.8269	899	.9682	8
82	903	7.1154	907	7.2687	911	7.4287	914	7.5958	918	7.7704	922	7.9530	7
83	925	8.1443	929	8.3450	932	8.5555	936	8.7769	939	9.0098	942	9.2553	6
84	945	9.5144	948	9.7882	951	10.0718	954	10.385	957	10.711	959	11.059	5
85	962	11.430	964	11.826	967	12.250	969	12.706	971	13.197	974	13.727	4
86	976	14.300	978	14.924	980	15.605	981	16.350	983	17.169	985	18.075	3
87	986	19.081	988	20.206	989	21.470	990	22.903	992	24.542	993	26.432	2
88	994	28.636	995	31.242	996	34.368	997	38.189	997	42.964	998	49.104	1
89	9998	57.290	9999	68.750	9999	85.940	9999	114.58	1.000	171.88	1.000	343.77	0
	60'	60'	50'	50'	40'	40'	30'	30'	20'	30'	10'	10'	deg.
	cos	cot	cos	cot	cos	cot	cos	cot	cos	cot	cos	cot	deg.

TABLE VII
RODS IN FEET AND INCHES

Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches	Rods	Feet Inches
1	16-6	21	346-6	41	676-6	61	1006-6	81	1336-6
2	33-0	22	363-0	42	693-0	62	1023-0	82	1353-0
3	49-6	23	379-6	43	709-6	63	1039-6	83	1369-6
4	66-0	24	396-0	44	726-0	64	1056-0	84	1386-0
5	82-6	25	412-6	45	742-6	65	1072-6	85	1402-6
6	99-0	26	429-0	46	759-0	66	1089-0	86	1419-0
7	115-6	27	445-6	47	775-6	67	1105-6	87	1435-6
8	132-0	28	462-0	48	792-0	68	1122-0	88	1452-0
9	148-6	29	478-6	49	808-6	69	1138-6	89	1468-6
10	165-0	30	495-0	50	825-0	70	1155-0	90	1485-0
11	181-6	31	511-6	51	841-6	71	1171-6	91	1501-6
12	198-0	32	528-0	52	858-0	72	1188-0	92	1518-0
13	214-6	33	544-6	53	874-6	73	1204-6	93	1534-6
14	231-0	34	561-0	54	891-0	74	1221-0	94	1551-0
15	247-6	35	577-6	55	907-6	75	1237-6	95	1567-6
16	264-0	36	594-0	56	924-0	76	1254-0	96	1584-0
17	280-6	37	610-6	57	940-6	77	1270-6	97	1600-6
18	297-0	38	627-0	58	957-0	78	1287-0	98	1617-0
19	313-6	39	643-6	59	973-6	79	1303-6	99	1633-6
20	330-0	40	660-0	60	990-0	80	1320-0	100	1650-0

TABLE VIII
LINKS IN FEET AND INCHES

Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches	Links	Feet Inches
1	0-7.92	18	11-10.56	35	23-1.20	52	34-3.84	69	45-6.48
2	1-3.84	19	12-6.48	36	23-9.12	53	34-11.76	70	46-2.40
3	1-11.76	20	13-2.40	37	24-5.04	54	35-7.68	71	46-10.32
4	2-7.68	21	13-10.32	38	25-0.96	55	36-3.60	72	47-6.24
5	3-3.60	22	14-6.24	39	25-8.88	56	36-11.52	73	48-2.16
6	3-11.52	23	15-2.16	40	26-4.80	57	37-7.44	74	48-10.08
7	4-7.44	24	15-10.08	41	27-0.72	58	38-3.36	75	49-6.00
8	5-3.36	25	16-6.00	42	27-8.64	59	38-11.28	76	50-1.92
9	5-11.28	26	17-1.92	43	28-4.56	60	39-7.20	77	50-9.84
10	6-7.20	27	17-9.84	44	29-0.48	61	40-3.12	78	51-5.76
11	7-3.12	28	18-5.76	45	29-8.40	62	40-11.04	79	52-1.68
12	7-11.04	29	19-1.68	46	30-4.32	63	41-6.96	80	52-9.60
13	8-6.96	30	19-9.60	47	31-0.24	64	42-2.88	81	53-5.52
14	9-2.88	31	20-5.52	48	31-8.16	65	42-10.80	82	54-1.44
15	9-10.80	32	21-1.44	49	32-4.08	66	43-6.72	83	54-9.36
16	10-6.72	33	21-9.36	50	33-0.00	67	44-2.64	84	55-5.28
17	11-2.64	34	22-5.28	51	33-7.92	68	44-10.56	85	56-1.20

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=10°	I	T	E	I=20°	I	T	E	I=30°
1°	50.00	.218	+	11°	551.70	26.500	+	21°	1061.9	97.577	+
10'	58.34	.297	5° C.	10'	560.11	27.313	5° C.	10'	1070.6	99.155	5° C.
20'	66.67	.388	T	20'	568.53	28.137	T	20'	1079.2	100.75	T
30'	75.01	.491	T	30'	576.95	28.974	T	30'	1087.8	102.35	T
40'	83.34	.606	.03	40'	585.36	29.824	.06	40'	1096.4	103.97	.10
50'	91.68	.733	E	50'	593.79	30.686	E	50'	1105.1	105.60	E
2°	100.01	.873	.001	12°	602.21	31.561	.006	22°	1113.7	107.24	.013
10'	108.35	1.024		10'	610.64	32.447		10'	1122.4	108.90	
20'	116.68	1.188		20'	619.07	33.347		20'	1131.0	110.57	
30'	125.02	1.364		30'	627.50	34.259		30'	1139.7	112.25	
40'	133.36	1.552		40'	635.93	35.183		40'	1148.4	113.95	
50'	141.70	1.752		50'	644.37	36.120		50'	1157.0	115.66	
3°	150.04	1.964	10° C.	13°	652.81	37.070	10° C.	23°	1165.7	117.38	10° C.
10'	158.38	2.188	T	10'	661.25	38.031	T	10'	1174.4	119.12	T
20'	166.72	2.425	.06	20'	669.70	39.006	.13	20'	1183.1	120.87	.19
30'	175.06	2.674	E	30'	678.15	39.993	E	30'	1191.8	122.63	E
40'	183.40	2.934	.003	40'	686.60	40.992	.011	40'	1200.5	124.41	.025
50'	191.74	3.207		50'	695.06	42.004		50'	1209.2	126.20	
4°	200.08	3.492		14°	703.51	43.029		24°	1217.9	128.00	
10'	208.43	3.790		10'	711.97	44.066		10'	1226.6	129.82	
20'	216.77	4.099		20'	720.44	45.116		20'	1235.3	131.65	
30'	225.12	4.421		30'	728.90	46.178		30'	1244.0	133.50	
40'	233.47	4.755		40'	737.37	47.253		40'	1252.8	135.35	
50'	241.81	5.100		50'	745.85	48.341		50'	1261.5	137.23	
5°	250.16	5.459	T	15°	754.32	49.441	T	25°	1270.2	139.11	T
10'	258.51	5.829	.09	10'	762.80	50.554	.19	10'	1279.0	141.01	.29
20'	266.86	6.211	E	20'	771.29	51.679	E	20'	1287.7	142.93	E
30'	275.21	6.606	.004	30'	779.77	52.818	.017	30'	1296.5	144.85	.038
40'	283.57	7.013		40'	788.26	53.969		40'	1305.3	146.79	
50'	291.92	7.432		50'	796.75	55.132		50'	1314.0	148.75	
6°	300.28	7.863		16°	805.25	56.309		26°	1322.8	150.71	
10'	308.64	8.307		10'	813.75	57.498		10'	1331.6	152.69	
20'	316.99	8.762		20'	822.25	58.699		20'	1340.4	154.69	
30'	325.35	9.230		30'	830.76	59.914		30'	1349.2	156.70	
40'	333.71	9.710	20° C.	40'	839.27	61.141	20° C.	40'	1358.0	158.72	20° C.
50'	342.08	10.202	T	50'	847.78	62.381	T	50'	1366.8	160.76	T
7°	350.44	10.707	.13	17°	856.30	63.634	.26	27°	1375.6	162.81	.39
10'	358.81	11.224	E	10'	864.82	64.900	E	10'	1384.4	164.86	E
20'	367.17	11.753	.006	20'	873.35	66.178	.022	20'	1393.2	166.95	.051
30'	375.54	12.294		30'	881.88	67.470		30'	1402.0	169.04	
40'	383.91	12.847		40'	890.41	68.774		40'	1410.9	171.15	
50'	392.28	13.413		50'	898.95	70.091		50'	1419.7	173.27	
8°	400.66	13.991		18°	907.49	71.421		28°	1428.6	175.41	
10'	409.03	14.582		10'	916.03	72.764		10'	1437.4	177.55	
20'	417.41	15.184	25° C.	20'	924.58	74.119	25° C.	20'	1446.3	179.72	25° C.
30'	425.79	15.799	T	30'	933.13	75.488	T	30'	1455.1	181.89	T
40'	434.17	16.426	.16	40'	941.69	76.869	.32	40'	1464.0	184.08	.49
50'	442.55	17.065	E	50'	950.25	78.264	E	50'	1472.9	186.29	E
9°	450.93	17.717	.007	19°	958.81	79.671	.028	29°	1481.8	188.51	.065
10'	459.32	18.381		10'	967.38	81.092		10'	1490.7	190.74	
20'	467.71	19.058		20'	975.96	82.525		20'	1499.6	192.99	
30'	476.10	19.746		30'	984.53	83.972		30'	1508.5	195.25	
40'	484.49	20.447		40'	993.12	85.431		40'	1517.4	197.53	
50'	492.88	21.161		50'	1001.7	86.904		50'	1526.3	199.82	
10°	501.28	21.887	30° C.	20°	1010.3	88.389	30° C.	30°	1535.3	202.12	30° C.
10'	509.68	22.624	T	10'	1018.9	89.888	T	10'	1544.2	204.44	T
20'	518.08	23.375	.19	20'	1027.5	91.399	.39	20'	1553.1	206.77	.59
30'	526.48	24.138	E	30'	1036.1	92.924	E	30'	1562.1	209.12	E
40'	534.89	24.913	.008	40'	1044.7	94.462	.32	40'	1571.0	211.48	.49
50'	543.29	25.700		50'	1053.3	96.013	.034	50'	1580.0	213.86	.078

T = R tan ½ I

E = R exsec ½ I

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=40°	I	T	E	I=50°	I	T	E	I=60°
31°	1589.0	216.3	+	41°	2142.2	387.4	+	51°	2732.9	618.4	+
10'	1598.0	218.7	5° C.	10'	2151.7	390.7	5° C.	10'	2743.1	622.8	5° C.
20'	1606.9	221.1	T	20'	2161.2	394.1	T	20'	2753.4	627.2	T
30'	1615.9	223.5	.13	30'	2170.8	397.4	.17	30'	2763.7	631.7	.21
40'	1624.9	226.0	E	40'	2180.3	400.8	E	40'	2773.9	636.2	E
50'	1633.9	228.4	.023	50'	2189.9	404.2	.037	50'	2784.2	640.7	.056
32°	1643.0	230.9		42°	2199.4	407.6		52°	2794.5	645.2	
10'	1652.0	233.4		10'	2209.0	411.1		10'	2804.9	649.7	
20'	1661.0	235.9		20'	2218.6	414.5		20'	2815.2	654.3	
30'	1670.0	238.4		30'	2228.1	418.0		30'	2825.6	658.8	
40'	1679.1	241.0		40'	2237.7	421.4		40'	2835.9	663.4	
50'	1688.1	243.5		50'	2247.3	425.0		50'	2846.3	668.0	
33°	1697.2	246.1	10° C.	43°	2257.0	428.5	10° C.	53°	2856.7	672.7	10° C.
10'	1706.3	248.7	T	10'	2266.6	432.0	T	10'	2867.1	677.3	T
20'	1715.3	251.3	.26	20'	2276.2	435.6	.34	20'	2877.5	682.0	.42
30'	1724.4	253.9	E	30'	2285.9	439.2	E	30'	2888.0	686.7	E
40'	1733.5	256.5	.046	40'	2295.6	442.8	.075	40'	2898.4	691.4	.112
50'	1742.6	259.1		50'	2305.2	446.4		50'	2908.9	696.1	
34°	1751.7	261.8		44°	2314.9	450.0		54°	2919.4	700.9	
10'	1760.8	264.5		10'	2324.6	453.6		10'	2929.9	705.7	
20'	1770.0	267.2		20'	2334.3	457.3		20'	2940.4	710.5	
30'	1779.1	269.9		30'	2344.1	461.0		30'	2951.0	715.3	
40'	1788.2	272.6		40'	2353.8	464.6		40'	2961.5	720.1	
50'	1797.4	275.3		50'	2363.5	468.4		50'	2972.1	725.0	
35°	1806.6	278.1	T	45°	2373.3	472.1	T	55°	2982.7	729.9	T
10'	1815.7	280.8	.40	10'	2383.1	475.8	.51	10'	2993.3	734.8	.63
20'	1824.9	283.6	E	20'	2392.8	479.6	E	20'	3003.9	739.7	E
30'	1834.1	286.4	.070	30'	2402.6	483.4	.116	30'	3014.5	744.6	.168
40'	1843.3	289.2		40'	2412.4	487.2		40'	3025.2	749.6	
50'	1852.5	292.0		50'	2422.3	491.0		50'	3035.8	754.6	
36°	1861.7	294.9		46°	2432.1	494.8		56°	3046.5	759.6	
10'	1870.9	297.7		10'	2441.9	498.7		10'	3057.2	764.6	
20'	1880.1	300.6		20'	2451.8	502.5		20'	3067.9	769.7	
30'	1889.4	303.5		30'	2461.7	506.4		30'	3078.7	774.7	
40'	1898.6	306.4		40'	2471.5	510.3		40'	3089.4	779.8	
50'	1907.9	309.3		50'	2481.4	514.3		50'	3100.2	784.9	
37°	1917.1	312.2	.53	47°	2491.3	518.2	.68	57°	3110.9	790.1	.84
10'	1926.4	315.2	E	10'	2501.2	522.2	E	10'	3121.7	795.2	E
20'	1935.7	318.1	.093	20'	2511.2	526.1	.151	20'	3132.6	800.4	.225
30'	1945.0	321.1		30'	2521.1	530.1		30'	3143.4	805.6	
40'	1954.3	324.1		40'	2531.1	534.2		40'	3154.2	810.9	
50'	1963.6	327.1		50'	2541.0	538.2		50'	3165.1	816.1	
38°	1972.9	330.2		48°	2551.0	542.2		58°	3176.0	821.4	
10'	1982.2	333.2		10'	2561.0	546.3		10'	3186.9	826.7	
20'	1991.5	336.3		20'	2571.0	550.4		20'	3197.8	832.0	
30'	2000.9	339.3		30'	2581.0	554.5		30'	3208.8	837.3	
40'	2010.2	342.4		40'	2591.0	558.6		40'	3219.7	842.7	
50'	2019.6	345.5		50'	2601.1	562.8		50'	3230.7	848.1	
39°	2029.0	348.6	.117	49°	2611.2	566.9	.189	59°	3241.7	853.5	.283
10'	2038.4	351.8	E	10'	2621.2	571.1	E	10'	3252.7	858.9	E
20'	2047.8	354.9		20'	2631.3	575.3		20'	3263.7	864.3	
30'	2057.2	358.1		30'	2641						

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

TABLE IX. TANGENTS AND EXTERNALS TO A 1° CURVE

I	T	E	I=70°	I	T	E	I=80°	I	T	E	I=90°
61°	3375.0	920.2	+	71°	4086.9	1308.2	+	81°	4893.6	1805.3	+
10'	3386.3	925.9	5° C.	10'	4099.5	1315.6	5° C.	10'	4908.0	1814.7	5° C.
20'	3397.5	931.6	T	20'	4112.1	1322.9	T	20'	4922.5	1824.1	T
30'	3408.8	937.3	.25	30'	4124.8	1330.3	.30	30'	4937.0	1833.6	.30
40'	3420.1	943.1	E	40'	4137.4	1337.7	E	40'	4951.5	1843.1	E
50'	3431.4	948.9	.080	50'	4150.1	1345.1	.110	50'	4966.1	1852.6	.149
62°	3442.7	954.8	10° C.	72°	4162.8	1352.6	10° C.	82°	4980.7	1862.2	10° C.
10'	3454.1	960.6	.51	10'	4175.6	1360.1	.61	10'	4995.4	1871.8	.200
20'	3465.4	966.5	E	20'	4188.5	1367.6	E	20'	5010.0	1881.5	E
30'	3476.8	972.4	.159	30'	4201.2	1375.2	.220	30'	5024.8	1891.2	.268
40'	3488.3	978.3	T	40'	4214.0	1382.8	T	40'	5039.5	1900.9	T
50'	3499.7	984.3	15° C.	50'	4226.8	1390.4	15° C.	50'	5054.3	1910.7	15° C.
63°	3511.1	990.2	20° C.	73°	4239.7	1398.0	20° C.	83°	5069.2	1920.5	20° C.
10'	3522.6	996.2	.151	10'	4252.6	1405.7	.210	10'	5084.0	1930.4	.299
20'	3534.1	1002.3	E	20'	4265.6	1413.5	E	20'	5099.0	1940.3	E
30'	3545.6	1008.3	.159	30'	4278.5	1421.2	.220	30'	5113.9	1950.3	.363
40'	3557.2	1014.4	T	40'	4291.5	1429.0	T	40'	5128.9	1960.2	T
50'	3568.7	1020.5	15° C.	50'	4304.6	1436.8	15° C.	50'	5143.9	1970.3	15° C.
64°	3580.3	1026.6	20° C.	74°	4317.6	1444.6	20° C.	84°	5159.0	1980.4	20° C.
10'	3591.9	1032.8	.151	10'	4330.7	1452.5	.210	10'	5174.1	1990.5	.299
20'	3603.5	1039.0	E	20'	4343.8	1460.4	E	20'	5189.3	2000.6	E
30'	3615.1	1045.2	.159	30'	4356.9	1468.4	.220	30'	5204.4	2010.8	.363
40'	3626.8	1051.4	T	40'	4370.1	1476.4	T	40'	5219.7	2021.1	T
50'	3638.5	1057.7	15° C.	50'	4383.3	1484.4	15° C.	50'	5234.9	2031.4	15° C.
65°	3650.2	1063.9	20° C.	75°	4396.5	1492.4	20° C.	85°	5250.3	2041.7	20° C.
10'	3661.9	1070.2	.151	10'	4409.8	1500.5	.210	10'	5265.6	2052.1	.299
20'	3673.7	1076.6	E	20'	4423.1	1508.6	E	20'	5281.0	2062.5	E
30'	3685.4	1082.9	.159	30'	4436.4	1516.7	.220	30'	5296.4	2073.0	.363
40'	3697.2	1089.3	T	40'	4449.7	1524.9	T	40'	5311.9	2083.5	T
50'	3709.0	1095.7	15° C.	50'	4463.1	1533.1	15° C.	50'	5327.4	2094.1	15° C.
66°	3720.9	1102.2	20° C.	76°	4476.5	1541.4	20° C.	86°	5343.0	2104.7	20° C.
10'	3732.7	1108.6	.151	10'	4489.9	1549.7	.210	10'	5358.6	2115.3	.299
20'	3744.6	1115.1	E	20'	4503.4	1558.0	E	20'	5374.2	2126.0	E
30'	3756.6	1121.7	.159	30'	4516.9	1566.3	.220	30'	5389.9	2136.7	.363
40'	3768.5	1128.2	T	40'	4530.4	1574.7	T	40'	5405.6	2147.5	T
50'	3780.4	1134.8	15° C.	50'	4544.0	1583.1	15° C.	50'	5421.4	2158.4	15° C.
67°	3792.4	1141.4	20° C.	77°	4557.6	1591.6	20° C.	87°	5437.2	2169.2	20° C.
10'	3804.4	1148.0	.151	10'	4571.2	1600.1	.210	10'	5453.1	2180.2	.299
20'	3816.4	1154.7	E	20'	4584.8	1608.6	E	20'	5469.0	2191.1	E
30'	3828.4	1161.3	.159	30'	4598.5	1617.1	.220	30'	5484.9	2202.2	.363
40'	3840.5	1168.1	T	40'	4612.2	1625.7	T	40'	5500.9	2213.2	T
50'	3852.6	1174.8	15° C.	50'	4626.0	1634.4	15° C.	50'	5517.0	2224.3	15° C.
68°	3864.7	1181.6	20° C.	78°	4639.8	1643.0	20° C.	88°	5533.1	2235.5	20° C.
10'	3876.8	1188.4	.151	10'	4653.6	1651.7	.210	10'	5549.2	2246.7	.299
20'	3889.0	1195.2	E	20'	4667.4	1660.5	E	20'	5565.4	2258.0	E
30'	3901.2	1202.0	.159	30'	4681.3	1669.2	.220	30'	5581.6	2269.3	.363
40'	3913.4	1208.9	T	40'	4695.2	1678.1	T	40'	5597.8	2280.6	T
50'	3925.6	1215.8	15° C.	50'	4709.2	1686.9	15° C.	50'	5614.2	2292.0	15° C.
69°	3937.9	1222.7	20° C.	79°	4723.2	1695.8	20° C.	89°	5630.5	2303.5	20° C.
10'	3950.2	1229.7	.151	10'	4737.2	1704.7	.210	10'	5646.9	2315.0	.299
20'	3962.5	1236.7	E	20'	4751.2	1713.7	E	20'	5663.4	2326.6	E
30'	3974.8	1243.7	.159	30'	4765.3	1722.7	.220	30'	5679.9	2338.2	.363
40'	3987.2	1250.8	T	40'	4779.4	1731.7	T	40'	5696.4	2349.8	T
50'	3999.5	1257.9	15° C.	50'	4793.6	1740.8	15° C.	50'	5713.0	2361.5	15° C.
70°	4011.9	1265.0	20° C.	80°	4807.7	1749.9	20° C.	90°	5729.7	2373.3	20° C.
10'	4024.4	1272.1	.151	10'	4822.0	1759.0	.210	10'	5746.3	2385.1	.299
20'	4036.8	1279.3	E	20'	4836.2	1768.2	E	20'	5763.1	2397.0	E
30'	4049.3	1286.5	.159	30'	4850.5	1777.4	.220	30'	5779.9	2408.9	.363
40'	4061.8	1293.6	T	40'	4864.8	1786.7	T	40'	5796.7	2420.9	T
50'	4074.4	1300.9	15° C.	50'	4879.2	1796.0	15° C.	50'	5813.6	2432.9	15° C.

T = R tan ½ I

E = R exsec ½ I

I	T	E	I=100°	I	T	E	I=110°	I	T	E	I=120°
91°	5830.5	2444.9	+	101°	6950.6	3278.1	+	111°	8336.7	4386.1	+
10'	5847.5	2457.1	5° C.	10'	6971.3	3294.1	5° C.	10'	8362.7	4407.6	5° C.
20'	5864.6	2469.3	T	20'	6992.0	3310.1	T	20'	8388.9	4429.2	T
30'	5881.7	2481.5	.43	30'	7012.7	3326.1	.51	30'	8415.1	4450.9	.62
40'	5898.8	2493.8	E	40'	7033.6	3342.3	E	40'	8441.5	4472.7	E
50'	5916.0	2506.1	.200	50'	7054.5	3358.5	.268	50'	8468.0	4494.6	.360
92°	5933.2	2518.5	10° C.	102°	7075.5	3374.9	10° C.	112°	8494.6	4516.6	10° C.
10'	5950.5	2531.0	.51	10'	7096.6	3391.2	.61	10'	8521.3	4538.8	.62
20'	5967.9	2543.5	E	20'	7117.8	3407.7	E	20'	8548.1	4561.1	E
30'	5985.3	2556.0	.159	30'	7139.0	3424.3	.200	30'	8575.0	4583.4	.360
40'	6002.7	2568.6	T	40'	7160.3	3440.9	T	40'	8602.1	4606.0	T
50'	6020.2	2581.3	15° C.	50'	7181.7	3457.6	.538	50'	8629.3	4628.6	15° C.
93°	6037.8	2594.0	20° C.	103°	7203.2	3474.4	20° C.	113°	8656.6	4651.3	20° C.
10'	6055.4	2606.8	.151	10'	7224.7	3491.3	.61	10'	8684.0	4674.2	.62
20'	6073.1	2619.7	E	20'	7246.3	3508.2	E	20'	8711.5	4697.2	E
30'	6090.8	2632.6	.159	30'	7268.0	3525.2	.200	30'	8739.2	4720.3	.360
40'	6108.6	2645.5	T	40'	7289.8	3542.4	T	40'	8767.0	4743.6	T
50'	6126.4	2658.5	15° C.	50'	7311.7	3559.6	.538	50'	8794.9	4766.9	15° C.
94°	6144.3	2671.6	20° C.	104°	7333.6	3576.8	20° C.	114°	8822.9	4790.4	20° C.
10'	6162.2	2684.7	.151	10'	7355.6	3594.2	.61	10'	8851.0	4814.1	.62
20'	6180.2	2697.9	E	20'	7377.8	3611.7	E	20'	8879.3	4837.8	E
30'	6198.3	2711.2	.159	30'	7399.9	3629.2	.200	30'	8907.7	4861.7	.360
40'	6216.4	2724.5	T	40'	7422.2	3646.8	T	40'	8936.3	4885.7	T
50'	6234.6	2737.9	15° C.	50'	7444.6	3664.5	.538	50'	8965.0	4909.9	15° C.
95°	6252.8	2751.3	20° C.	105°	7467.0	3682.3	20° C.	115°	8993.8	4934.1	20° C.
10'	6271.1	2764.8	.151	10'	7489.6	3700.2	.61	10'	9022.7	4958.6	.62
20'	6289.9	2778.3	E	20'	7512.2	3718.2	E	20'	9051.7	4983.1	E
30'	6307.9	2792.0	.159	30'	7534.9	3736.2	.200	30'	9080.9	5007.8	.360
40'	6326.3	2805.6	T	40'	7557.7	3754.4	T	40'	9110.3	5032.6	T
50'	6344.8	2819.4	15° C.	50'	7580.5	3772.6	.538	50'	9139.8	5057.6	15° C.
96°	6363.4	2833.2	20° C.	106°	7603.5	3791.0	20° C.	116°	9169.4	5082.7	20° C.
10'	6382.1	2847.0	.151	10'	7626.6	3809.4	.61	10'	9199.1	5107.9	.62
20'	6400.8	2861.0	E	20'	7649.7	3827.9	E	20'	9229.0	5133.3	E
30'	6419.5	2875.0	.159	30'	7672.9	3846.5	.200	30'	9259.0	5158.8	.360
40'	6438.4	2889.0	T	40'	7696.3	3865.2	T	40'	9289.2	5184.5	T
50'	6457.3	2903.1	15° C.	50'	7719.7	3884.0	.538	50'	9319.5	5210.3	15° C.
97°	6476.2	2917.3	20° C.	107°	7743.2	3902.9	20° C.	117°	9349.9	5236.2	20° C.
10'	6495.2	2931.6	.151	10'	7766.8	3921.9	.61	10'	9380.5	5262.3	.62
20'	6514.3	2945.9	E	20'	7790.5	3940.9	E	20'	9411.3	5288.6	E
30'	6533.4	2960.3	.159	30'	7814.3	3960.1	.200	30'	9442.2	5315.0	.360
40'	6552.6	2974.7	T	40'	7838.1	3979.4	T	40'	9473.2	5341.5	T
50'	6571.9	2989.2	15° C.	50'	7862.1	3998.7	.538	50'	9504.4	5368.2	15° C.
98°	6591.2	3003.8	20° C.	108°	7886.2	4018.2	20° C.	118°	9535.7	5395.1	20° C.
10'	6610.6	3018.4	.151	10'	7910.4	4037.8	.61	10'	95		

TABLE X.
MIDDLE ORDINATES OF RAILS
Length of Rail (feet)

C o /	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch	C o	R Feet	30 Inch	28 Inch	26 Inch	24 Inch	22 Inch	20 Inch
0-20	17189	.08	.07	.06	.05	.04	.03	8	716.8	1.88	1.64	1.42	1.20	1.01	.84
0-40	8594	.16	.14	.12	.10	.08	.07	9	637.3	2.12	1.84	1.60	1.35	1.14	.94
1-0	5730	.24	.20	.18	.15	.13	.10	10	573.7	2.36	2.05	1.78	1.50	1.27	1.04
1-20	4297	.31	.27	.23	.20	.17	.13	11	521.7	2.59	2.26	1.95	1.65	1.39	1.15
1-40	3438	.39	.34	.29	.25	.21	.17	12	478.3	3.83	2.47	2.15	1.81	1.54	1.26
2-0	2865	.47	.41	.35	.30	.25	.20	13	441.7	3.05	2.66	2.30	1.96	1.66	1.36
2-20	2456	.55	.48	.41	.35	.29	.23	14	410.3	3.30	2.87	2.48	2.10	1.78	1.46
2-40	2149	.63	.55	.47	.40	.33	.27	15	383.1	3.54	3.08	2.68	2.26	1.91	1.57
3-0	1910	.71	.62	.53	.45	.38	.31	16	359.3	3.76	3.28	2.83	2.40	2.04	1.67
3-20	1719	.78	.68	.59	.50	.42	.35	17	338.3	4.00	3.48	3.02	2.57	2.16	1.78
3-40	1563	.86	.75	.65	.55	.46	.38	18	319.6	4.21	3.67	3.18	2.70	2.28	1.87
4-0	1433	.94	.82	.71	.60	.50	.42	19	302.9	4.45	3.89	3.36	2.86	2.41	1.98
4-20	1323	1.02	.89	.77	.65	.55	.45	20	287.9	4.70	4.09	3.55	3.00	2.54	2.09
4-40	1228	1.10	.96	.83	.70	.59	.48	22	262.0	5.16	4.44	3.84	3.30	2.80	2.29
5	1146	1.18	1.03	.89	.75	.63	.52	24	240.5	5.64	4.92	4.20	3.59	3.04	2.50
6	955.3	1.41	1.23	1.06	.90	.76	.62	26	222.3	6.07	5.29	4.58	3.88	3.29	2.70
7	819.0	1.65	1.44	1.24	1.05	.89	.73								

TABLE XI.
SHORT RADIUS CURVES

Radius Feet	Chord Feet	Central Angle	Deflection Angle	Deflection for 1 Foot
35	10	16-26	8-13	49.3
45	10	12-46	6-23	38.3
50	15	17-16	8-38	34.5
60	15	14-22	7-11	28.8
75	15	11-30	5-45	23.0
100	20	11-30	5-45	17.3
120	20	9-34	4-47	14.3
150	20	7-39	3-49	11.5
190	25	7-32	3-46	9.15
200	25	7-10	3-35	8.6
225	25	6-25	3-12	7.7
240	25	5-58	2-59	7.2
250	25	5-44	2-52	6.9
275	25	5-12	2-36	6.2
288	50	9-58	4-59	6.0
300	50	9-32	4-46	5.7
350	50	8-12	4-06	4.9
376	50	7-40	3-50	4.6
400	50	7-10	3-35	4.3
410	50	7-00	3-30	4.2

To find length of curve divide angle from P. C. to P. T. by central angle of chord and multiply by length of chord.

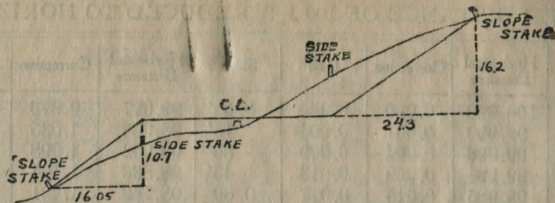
TABLE XII.
INCLINED DISTANCE OF 100 FT. REDUCED TO HORIZONTAL

Slope	Horizontal Distance	Correction	Rise	Slope	Horizontal Distance	Correction	Rise
0°00'	100.000	0.000	0.000	8°00'	99.027	0.973	0.139
15'	99.999	0.001	0.004	15'	98.965	1.035	0.143
30'	99.996	0.004	0.009	30'	98.902	1.098	0.148
45'	99.991	0.009	0.013	45'	98.836	1.164	0.152
1 00	99.985	0.015	0.017	9 00	98.769	1.231	0.156
15	99.976	0.024	0.022	15	98.700	1.300	0.161
30	99.966	0.034	0.026	30	98.629	1.371	0.165
45	99.953	0.047	0.031	45	98.556	1.444	0.169
2 00	99.939	0.061	0.035	10 00	98.481	1.519	0.174
15	99.923	0.077	0.039	15	98.404	1.596	0.178
30	99.905	0.095	0.044	30	98.325	1.675	0.182
45	99.885	0.115	0.048	45	98.245	1.755	0.187
3 00	99.863	0.137	0.052	11 00	98.163	1.837	0.191
15	99.839	0.161	0.057	15	98.079	1.921	0.195
30	99.813	0.187	0.061	30	97.992	2.008	0.199
45	99.786	0.214	0.065	45	97.905	2.095	0.204
4 00	99.756	0.244	0.070	12 00	97.815	2.185	0.208
15	99.725	0.275	0.074	15	97.723	2.277	0.212
30	99.692	0.308	0.078	30	97.630	2.370	0.216
45	99.657	0.343	0.083	45	97.534	2.466	0.221
5 00	99.619	0.381	0.087	13 00	97.437	2.563	0.225
15	99.580	0.420	0.092	15	97.338	2.662	0.229
30	99.540	0.460	0.096	30	97.237	2.763	0.233
45	99.497	0.503	0.100	45	97.134	2.866	0.238
6 00	99.452	0.548	0.105	14 00	97.030	2.970	0.242
15	99.406	0.594	0.109	15	96.923	3.077	0.246
30	99.357	0.643	0.113	30	96.815	3.185	0.250
45	99.307	0.693	0.118	45	96.705	3.295	0.255
7 00	99.255	0.745	0.122	15 00	96.593	3.407	0.259
15	99.200	0.800	0.126	15	96.479	3.521	0.263
30	99.144	0.856	0.131	30	96.363	3.637	0.267
45	99.087	0.913	0.135	45	96.246	3.754	0.271

For each foot take one one-hundredth of each reading.

TABLE XIII.
MINUTES IN DECIMALS OF A DEGREE.

0 30"	.00833	10' 30"	.17500	20' 30"	.34167	30' 10"	.50833	40' 30"	.67500	50' 10"	.84167
1 00	.01667	11 00	.18333	21 00	.35000	31 00	.51667	41 00	.68333	51 00	.85000
30	.02500	30	.19167	30	.35833	30	.52500	30	.69167	30	.85833
2 00	.03333	12 00	.20000	22 00	.36667	32 00	.53333	42 00	.70000	52 00	.86667
30	.04167	30	.20833	30	.37500	30	.54167	30	.70833	30	.87500
3 00	.05000	13 00	.21667	23 00	.38333	33 00	.55000	43 00	.71667	53 00	.88333
30	.05833	30	.22500	30	.39167	30	.55833	30	.72500	30	.89167
4 00	.06667	14 00	.23333	24 00	.40000	34 00	.56667	44 00	.73333	54 00	.90000
30	.07500	30	.24167	30	.40833	30	.57500	30	.74167	30	.90833
5 00	.08333	15 00	.25000	25 00	.41667	35 00	.58333	45 00	.75000	55 00	.91667
30	.09167	30	.25833	30	.42500	30	.59167	30	.75833	30	.92500
6 00	.10000	16 00	.26667	26 00	.43333	36 00	.60000	46 00	.76667	56 00	.93333
30	.10833	30	.27500	30	.44167	30	.60833	30	.77500	30	.94167
7 00	.11667	17 00	.28333	27 00	.45000	37 00	.61667	47 00	.78333	57 00	.95000
30	.12500	30	.29167	30	.45833	30	.62500	30	.79167	30	.95833
8 00	.13333	18 00	.30000	28 00	.46667	38 00	.63333	48 00	.80000	58 00	.96667
30	.14167	30	.30833	30	.47500	30	.64167	30	.80833	30	.97500
9 00	.15000	19 00	.31667	29 00	.48333	39 00	.65000	49 00	.81667	59 00	.98333
30	.15833	30	.32500	30	.49167	30	.65833	30	.82500	30	.99167
10 00	.16667	20 00	.33333	30 00	.50000	40 00	.66667	50 00	.83333	60 00	1.00000

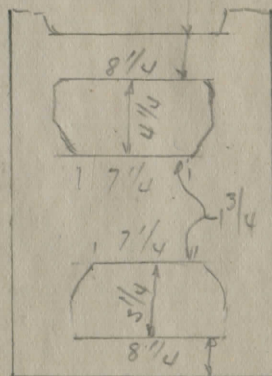


DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING.

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
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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.



15 1/2 x 11 3/4 x 7 3/4

10-42 LT

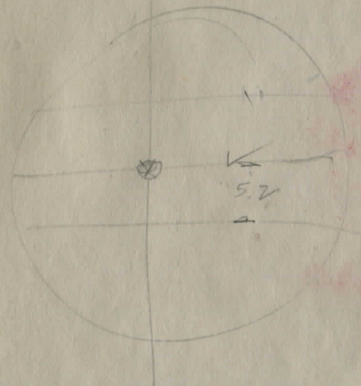
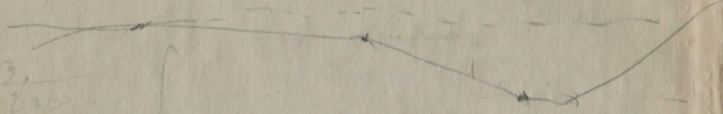
103
898

$$\begin{array}{r} 162 \\ 29 \\ \hline 648 \\ 324 \\ \hline 3888 \end{array}$$

$$\begin{array}{r} 81 \\ 14 \\ \hline 53 \overline{) 1754} \\ 212 \end{array}$$

$$\begin{array}{r} 24 \\ 40 \\ \hline 960 \end{array}$$

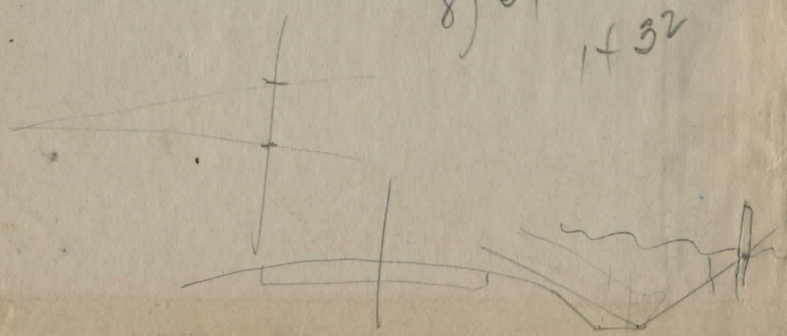
1-36
639
8-15



10.4

1040

$$\begin{array}{r} 716 \\ \hline 8 \overline{) 5730} \\ 1432 \end{array}$$



PLEASE RETURN TO
GEAUGA COUNTY ENGINEER
COURT HOUSE
CHARDON, O.
PHONE 250-X



A. Mergret
Prisoned (Cong)
School special No. 2

J. Barrett
H. G. Barber
N. Morse
M. J. Wilmont
W. B. Bruce
L. ENSIGN

