

MENDON FIELD STREET



82 0020

Weatherproof Field Book

"Rite in the Rain" paper
32 pages

4⁵/₈" x 7¹/₄"

Keuffel & Esser Co., Morristown, N. J. 07960 Made in U.S.A.

11 JUNE 79

HOT, CLEAR

3

HUDSON PC. T

SEE JOB No. 2-77-003

WARD †

SETTING ϕ AND CROSS SECTIONING

LOWER 450 OF JOB.

SET ON ϕ OF H.W. 23 MEASURED FOLLOWING
ANGLES AND SET ϕ

TURNED λ OF $30^{\circ} 53' 30''$ FROM ϕ SOUTH = 230'

30 53 15" 30 53 15"

149 07 00

30 53 30"

180 00 45

30 53 45"

MEAS. 74.23 FROM PT "A" IN ROAD TO
PT "B" ABOVE FOREST SERVICE ROAD.

SO FROM "A" TO "B"

λ Horiz = $30^{\circ} 53' 30''$

VERT λ = $24^{\circ} 41'$

Horiz Dist. = 574.23'

SLOPE STAKES

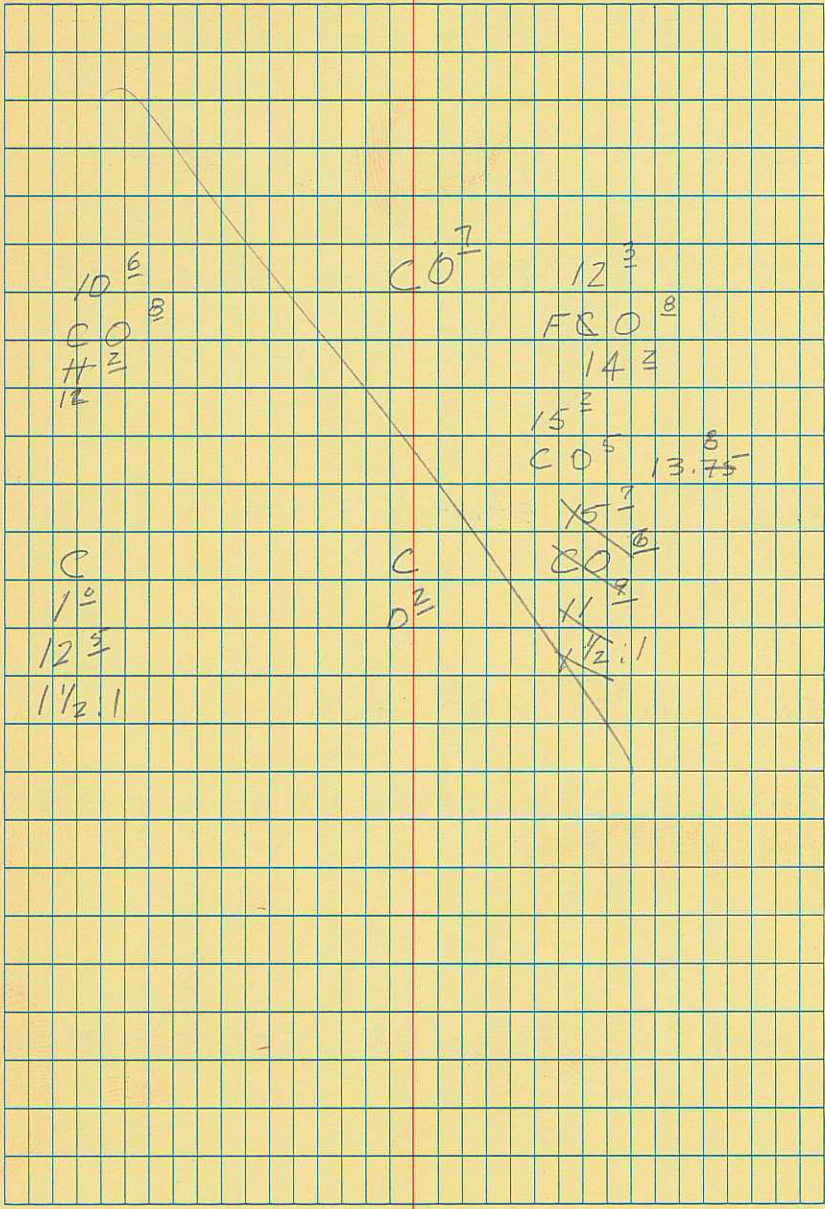
	B.S.	H.I.	FLEV	GRADE	GRADE	RODI	13
				11	10	11	11
1+50		42.65	32.15	31.50	11.3	11.15	11.5
1+00		19.15	42.65	27.45	27.25	15.40	15.7
BM	19.15	42.65	23.50				
1+00		43.32	15.85	27.25	16.3	16.10	16.3
BM	19.82	43.32	23.50				

SEE PAGE 9

LT

±

RT 5



GRADE ROD

B.S. HI/B ELEV ± GRADE

See Page 10

3+50 55.65 47.30 8⁶ 8³⁵ 8¹

3+00 55.65 43.75 11¹¹ 11¹ 11.90 12.2¹³

TP 13⁵⁵ 0⁵⁵ 42.10

2+50 42.65 38.85 40.16 11¹¹ 2.1 2.50 2.8¹³

2+00 42.65 35.55 35.75 11¹¹ 0 13 6.9 7.2

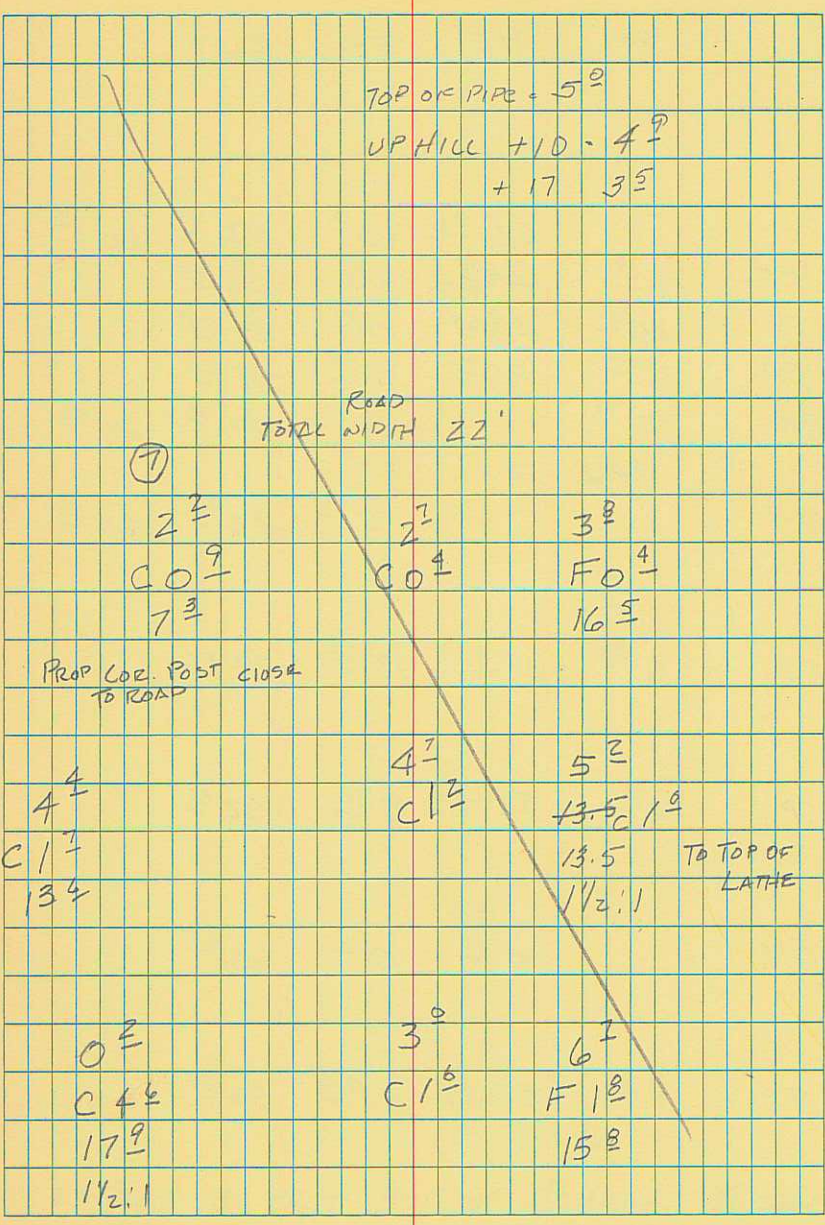
3³ 5⁷ 8⁵
 C5² C2⁷ CO²
 18² 13³

11⁸ 11⁹ 12¹⁵ ±
 CO³ G F3²
 17⁴ 17⁸
 1/2:1

3³ 7²
 FO⁷ FO² F4⁴
 12² 19⁴

6³ 7¹ 10⁵
 CO⁶ F80² F3³
 12² 17⁹
 1/2:1 1/2:1

	BS	HI	FS	ELEV	GRADE	GRADE ROD
DITCH						
SEE PAGE 11						
5+50					MATCH	
						←
5+00		59.9		56.76		6 16 3' 3' 3' 4'
						↔
4+50		59.87		54.00		11 9 12 6' 5' 6' 2'
Pipe 4+45		59.87				
	5' 5"					
TP		59.87		54.12		← 13 12 13
						11 0 12 13
4+00		55.65	52.65	51.00		4' 4.6' 4'



BM CHK AND ELEVATION.

	BS	HI	FS	ELEV
I		62 ⁹⁰	0 ⁴⁷	62 ⁴³ 60 ⁴⁵
TP	6 ¹⁹	67 ⁶³ ₅₇ ⁴⁵	4 ⁹²	58 ⁷³
TP	14 ⁸⁰	4 ⁵ 7 ⁶ ₄ ⁶	0 ⁸¹	46 ⁸³⁵
TP	8 ⁴⁴	39 ²⁰	1 ⁹⁸	37 ²²
BM	15 ⁷⁰			23 ⁵⁰ 23 ⁵⁰
	BACK UP			
BM			15 ⁷⁰	23 ⁶⁰ 23 ⁵⁰
TP	0 ²⁴	39 ³⁰	13 ⁶⁵	39.06
TP	0 ⁴⁰	52 ⁷¹	8 ⁸⁸	52 ³¹
BM		61 ¹⁹	0 ⁷⁴	60 ⁴⁵
TP	4 ⁸⁰	59.87	3 ⁴⁸	56 ³⁹
				BM

SET HUP BY EAST POST OF NATIONAL FOREST SIGN

12 JUNE SIDPE STAKES

HUDSON PC

WARD

STA	+	HI	-	GRADE ELEV	GRADE ROD
-----	---	----	---	---------------	--------------

X 1+50		42.65	32.15	31.50	$\frac{13}{11}$ $\frac{11}{13}$ 11.4 11.1 11.5 .5 .4
--------	--	-------	-------	-------	---

1+00		42.65	15.2	27.25	15.4 15.2
------	--	-------	------	-------	-----------

BM	19.15	42.65		23.5	
----	-------	-------	--	------	--

1+00		43.32	15.85	27.25	16.3 16.1
------	--	-------	-------	-------	-----------

BM	19.82	43.32		23.50	2°
----	-------	-------	--	-------	----

12³

F0⁸

14²

1 1/2:1

C0⁵

13⁸

1 1/2:1

C1⁰

12⁵

1 1/2:1

C0⁷

C

0⁷

10⁶

C0⁸

12²

C0⁵

13⁸

1 1/2:1

C1⁰

12⁵

1 1/2:1

PK NAIL @ OF H.W. 23 ELEV 23.50

BS	+	HI	-	GROUND ELEV	GRADE ELEV	GRADE ROD
TP	5 ⁷⁵	1 ⁵³		54.12		
4+00		55.65		52.65	51.00	13 0 11 4 ⁹ 4 ⁶ 4 ⁸
3+50		55.65			47.30	13 0 11 8 ⁷ 8 ³⁵ 8 ⁶
3+00		55.65			43.75	13 0 11 12 ² 11 ⁹ 12 ¹
TP	13 ⁵⁵	0 ⁵⁵		42.10		
2+50		42.65		38.85	40.16	13 0 11 2 ⁸ 2 ² 2 ²
2+00		42.65		35.55	35.75	13 0 11 7 ² 6 ⁹ 7 ²

6 ⁷	3 ⁰	0 ⁷
F1 ²	C1 ⁶	C4 ⁶
15 ⁸		17 ⁹
1 1/2:1		1 1/2:1
8 ⁵	5 ⁷	3 ³
C0 ²	C2 ²	C5 ⁷
13 ²		18 ⁹
1 1/2:1		1 1/2:1
15 ⁴	11 ⁹	11 ⁸
F3 ²	GRADE	C0 ³
17 ⁸		11 ⁴
1 1/2:1		1 1/2:1
7 ²	F0 ³	3 ⁵
F4 ⁴		F0 ⁷
19 ⁶		12 ⁰
1 1/2:1		1 1/2:1
10 ⁵	7 ⁴	6 ⁵
F3 ³	F0 ²	C0 ⁶
17 ⁹		12 ²
1 1/2:1		1 1/2:1

STA	+	HI / -	GROUND ELEV	GRADE ELEV	GRADE ROD 13 0 11
-----	---	--------	-------------	------------	----------------------

5+50 MATCH GRADE

5+00		59.9	56.76	16 0 6 3 ² 3 ¹ 3 ¹
------	--	------	-------	--

4+50		59.87	54.00	12 0 11 6 ² 5 ² 6 ¹
------	--	-------	-------	---

PIPE 4+45

9² ON HUB 4+00 b
11
8² ON TELEPHONE CABLE

at station

50.0 ELEV CABLE

50.7 ELEV of 3+50

3+50 - STA OF CABLE
BREAK

at

3²
= 0 4
16 5

2¹
C 0⁴

①
2² Corner post
CLOSE TO
ROAD
C 0⁹
7³

5²
C 1²
13 5

4¹
C 1²

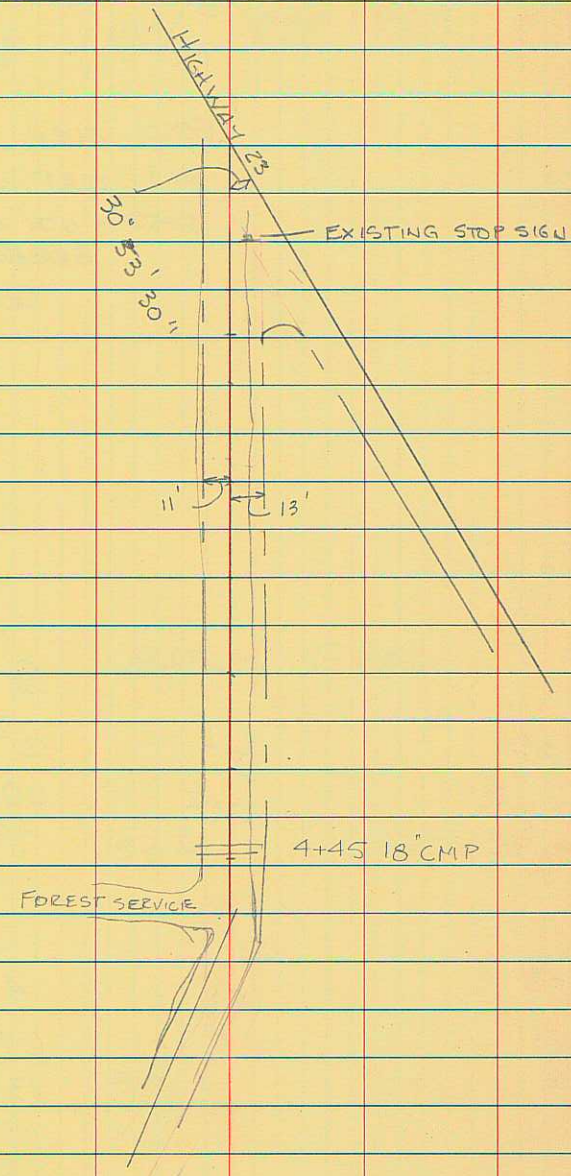
4⁴
C 1⁷
13 6

1 1/2 : 1

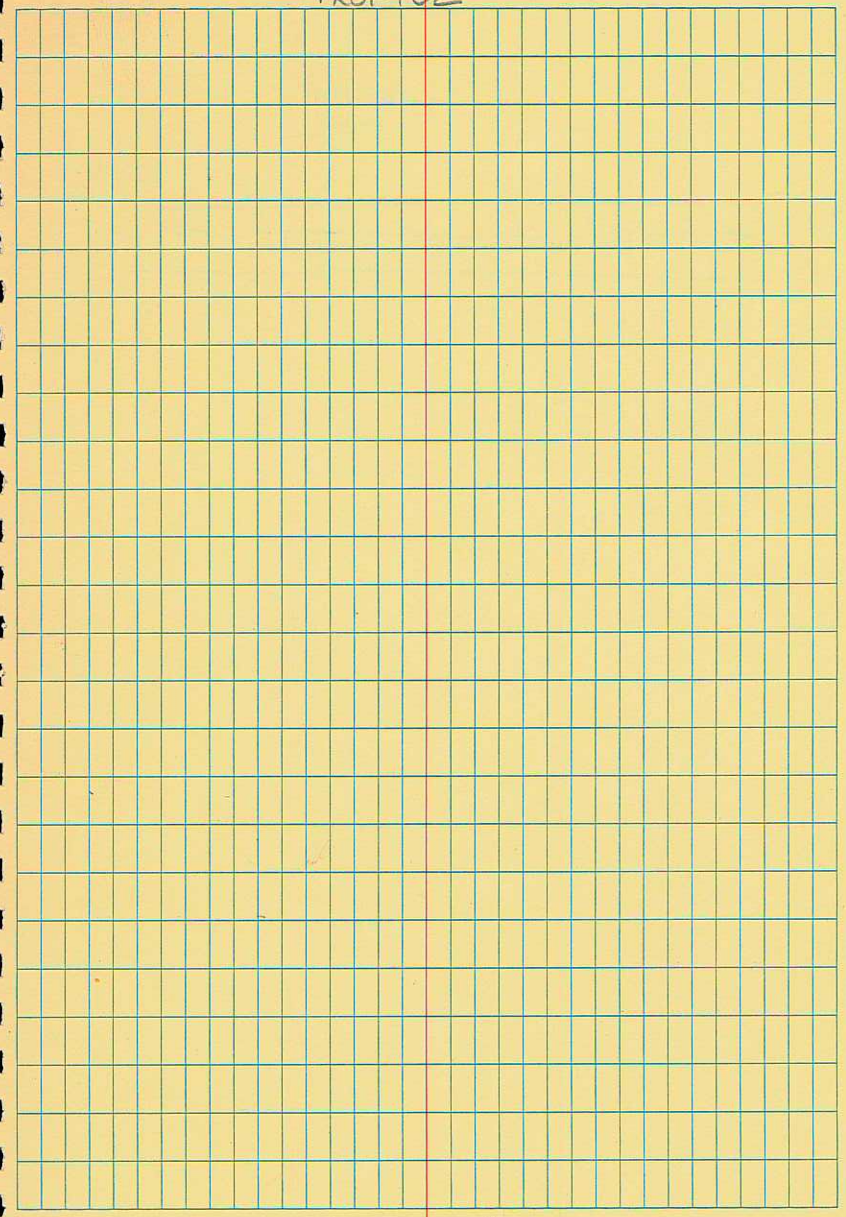
FROM TOP OF
LATHE

UPHILL TOP OF 18" CMP = 5⁰
+10 UPHILL = 4²
+17 UPHILL = 3⁵

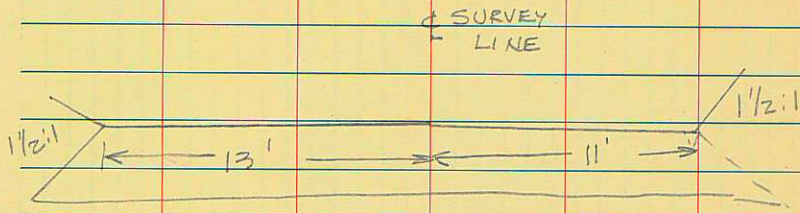
PLOT PLAN



PROFILE



TYPICAL SECTION.



19 JUNE 79

COUNTY FORCES STARTED IN MORNING,
MED TOOK OUT SLOPE STAKES IN FIRST
PASS AND DECIDED TO NOT TAKE SO MUCH
OUT BETWEEN 4+00 - 5+00.
CUT DOWN BETWEEN 4+00 - 3+00 AND
BURDEN WAS PLACED ON EAST SIDE OF
ROAD.

HIT TELEPHONE CABLE AT 10:20.
WAS 0' BELOW SURFACE AT 3+50.
STARTED LOWERING PIPE AT 4+40.

STATE OF UTAH TO COME UP AND LOOK
AT INTERSECTION AND MAY DONATE PIPE.

LARSON

ALPHA

SORENSEN

"GRAIN"

- ED MUIR - SOUTH OF GRAIN

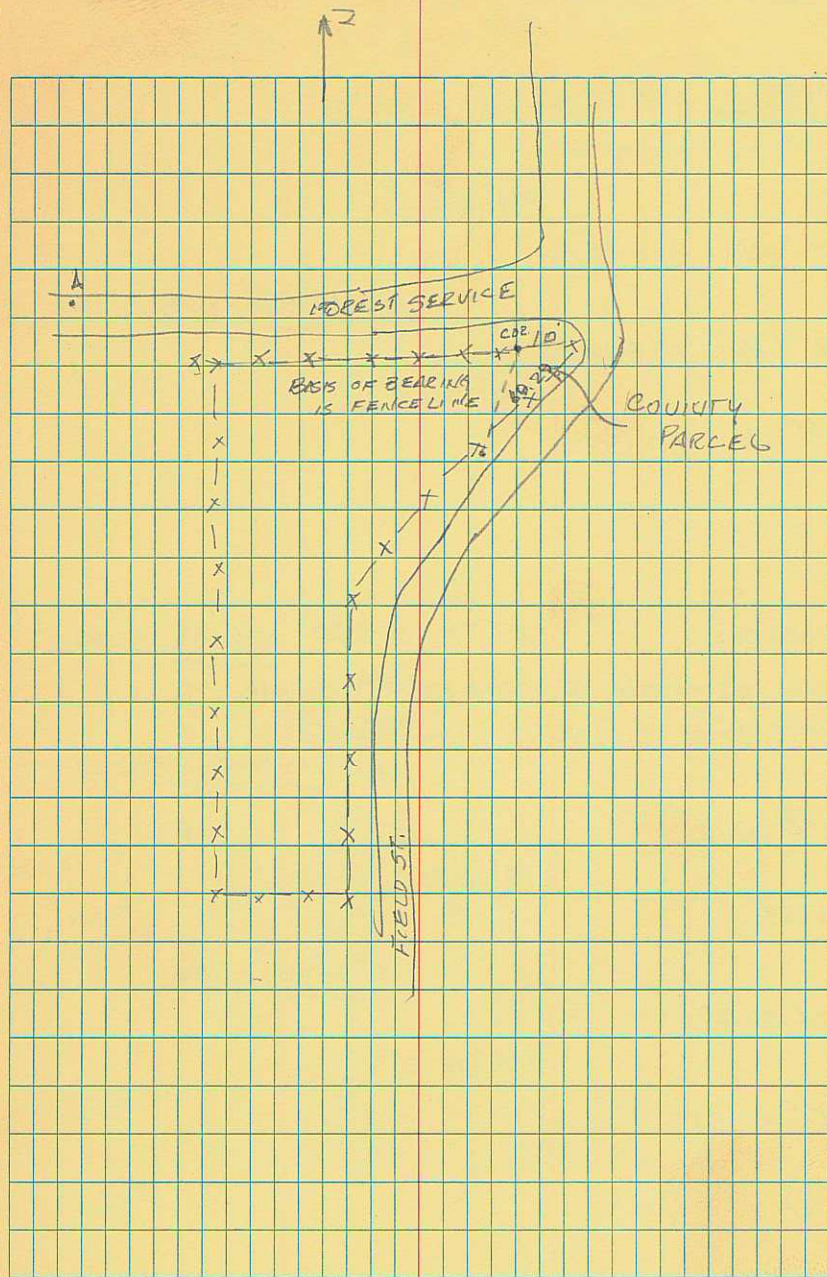
Said line run with his line
West. Forest Service set his line
long time ago

16 JULY 79 SURVEY OF CORNER FROM
 ODELL BODRERO HOT, CLEAR

SET 5/8" x 4' REBAR AT POINTS 10' WEST
 AND 69.29' SOUTH OF REBAR MARKING
 CORNER ON ROAD CORNER BEING NE COR.
 OF PROPERTY OWNED BY ODELL BODRERO.

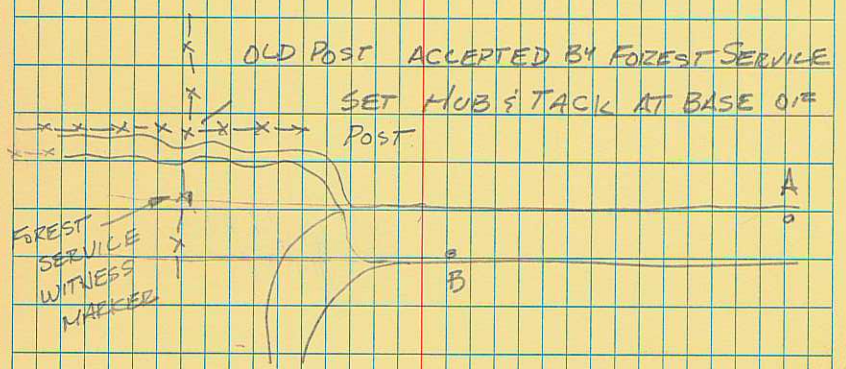
THEN TIED CORN PROPERTY TO NW
 CORNER OF SECTION 17 T12N R1W

A			
DISTANCE	960.02	+ 82.57	<u>952.76</u> USE
CLOSE HORIZON	177 16 45		
	+ 180		
	180° 00' 00"		
	2° 43' 45"		
	177° 16' 15"		
	2° 43' 15"		
	2° 43' 30"		USE
	2° 43' 15"		
CORNER	00° 00' 00"		



SECTION	CORNER			
		1589.61	273°15'	1587.05 USE
CLOSE HORIZON		355°45'05"	359°59'55"	
2 ND FR		180°00'00"		
		184°14'50"		
1 ST FR		355°45'10"		
			184°14'57" USE	
2 ND FL		184°15'05"		
		184°15'05"		
1 ST FL		00°00'00"		
B				
		71 60		
DISTANCE		609.70	275°33'	606.85 = USE
			359	
5°52'15"			359°31'58"	
180°00'15"				
		174°06'35"		
5°53'40"				
			174°06'43" = USE	
174°06'50"				
		174°06'50"		
00°00'00"				
A				

AN



STATION	EX. $\frac{1}{2}$ EL.	Prop. $\frac{1}{2}$ EL.	CUT	FILL
0+18	22.73	22.7		
0+50	23.93	23.0		
1+00	28.33	27.25		
1+50	32.76	31.50		
2+06	36.66	35.75		
2+50	40.16	40.16		
3+00	44.49	43.75		
3+50	50.66	47.30		
4+00	52.96	51.00		
4+40	55.06	53.5		
4+80	56.40	55.60		
5+00	56.76	56.76		
5+50	59.86			
6+00	63.16			
6+50	66.06			
7+50	72.29			
7+88	74.49			
8+00	75.19			
8+50	77.49			

18" CMP STA. 4+40

+50 23.0

4+15 52.0

365' = .0795 SLP.

98
88

$$\begin{array}{r}
 4 \\
 55.65 \\
 15.20 \\
 \hline
 39.85 \\
 \hline
 40.85
 \end{array}$$

41.85

$$\begin{array}{r}
 55.65 \\
 67 \\
 \hline
 89 \\
 \hline
 4 \\
 50.00
 \end{array}$$

412 2510



FOREST SERVICE
ROAD INTER. EL. 56.76

EX. 18' CMP

PROP. 18' CMP 10' EXT REQ'D
E. EL. 51.00

50.0

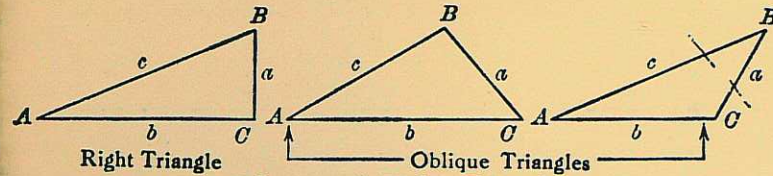
$$\begin{array}{r} 70 \\ 55.65 \\ \hline 14.35 \\ \hline 50.00 \end{array}$$

$$\begin{array}{r} 51.9 \\ 51.0 \\ \hline 45.1 \end{array}$$

$$\begin{array}{r} 55.65 \\ 51.0 \\ \hline 50.00 \end{array}$$

MADE IN U.S.A. 10 X 10 1/2 IN. 78 8030

TRIGONOMETRIC FORMULAS



Solution of Right Triangles

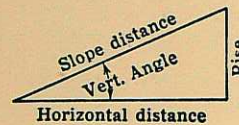
For Angle A . $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

Given	Required	Formulas
a, b	A, B, c	$\tan A = \frac{a}{b} = \cot B$, $c = \sqrt{a^2 + b^2} = a \sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B$, $b = \sqrt{(c+a)(c-a)} = c \sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90^\circ - A$, $b = a \cot A$, $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90^\circ - A$, $a = b \tan A$, $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90^\circ - A$, $a = c \sin A$, $b = c \cos A$

Solution of Oblique Triangles

Given	Required	Formulas
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$, $C = 180^\circ - (A + B)$, $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180^\circ - C$, $\tan \frac{1}{2}(A - B) = \frac{(a - b) \tan \frac{1}{2}(A + B)}{a + b}$ $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a + b + c}{2}$, $\sin \frac{1}{2}A = \sqrt{\frac{(s - b)(s - c)}{bc}}$ $\sin \frac{1}{2}B = \sqrt{\frac{(s - a)(s - c)}{ac}}$, $C = 180^\circ - (A + B)$
a, b, c	Area	$s = \frac{a + b + c}{2}$, $\text{area} = \sqrt{s(s - a)(s - b)(s - c)}$
A, b, c	Area	$\text{area} = \frac{bc \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = $5^\circ 10'$. Since $\cos 5^\circ 10' = .9959$, horizontal distance = $319.4 \times .9959 = 318.09$ ft.
Horizontal distance also = Slope distance minus slope distance times (1 - cosine of vertical angle). With the same figures as in the preceding example, the following result is obtained. $\cos 5^\circ 10' = .9959$. $1 - .9959 = .0041$. $319.4 \times .0041 = 1.31$. $319.4 - 1.31 = 318.09$ ft.

When the rise is known, the horizontal distance is approximately the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance = $302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.