**K+E**

MERIDIAN LINE

1974

No Points set from

82 0020

THIS SURVEY

# Weatherproof Field Book

-VOID-

"Rite in the Rain" paper

32 pages

4⅝" x 7¼"

MERIDIAN LINE

## CURVE FORMULAS

| | | |
|---|---|---|
| $T = R \tan \frac{1}{2} I$ | $R = T \cot \frac{1}{2} I$ | Chord def. $= \dfrac{\text{chord}^2}{R}$ |
| $T = \dfrac{50 \tan \frac{1}{2} I}{\text{Sin.} \frac{1}{2} D}$ | $R = \dfrac{50}{\text{Sin.} \frac{1}{2} D}$ | |
| $\text{Sin.} \frac{1}{2} D = \dfrac{50}{R}$ | $E = R \text{ ex. sec } \frac{1}{2} I$ | No. chords $= \dfrac{I}{D}$ |
| $\text{Sin.} \frac{1}{2} D = \dfrac{50 \tan \frac{1}{2} I}{T}$ | $E = T \tan \frac{1}{4} I$ | Tan. def. $= \frac{1}{2}$ chord def. |

The square of any distance, divided by twice the radius, will equal the distance from tangent to curve. very nearly.

To find angle for a given distance and deflection.

Rule 1. Multiply the given distance by .01745 (def. for 1° for 1 ft.) and divide given deflection by the product.

Rule 2. Multiply given deflection by 57.3, and divide the product by the given distance.

To find deflection for a given angle and distance. Multiply the angle by .01745, and the product by the distance.

## GENERAL DATA

RIGHT ANGLE TRIANGLES. Square the altitude, divide by twice the base. Add quotient to base for hypotenuse.

Given Base 100, Alt. 10. $10^2 \div 200 = .5$. $100 + .5 = 100.5$ hyp.

Given Hyp. 100, Alt. 25. $25^2 \div 200 = 3.125$. $100 - 3.125 = 96.875 =$ Base.

Error in first example, .002; in last, .045.

To find Tons of Rail in one mile of track: multiply weight per yard by 11, and divide by 7.

LEVELING. The correction for curvature and refraction, in feet and decimals of feet is equal to $0.574 d^2$, where d is the distance in miles. The correction for curvature alone is closely, $\frac{2}{3}d^2$. The combined correction is negative.

PROBABLE ERROR. If $d_1$, $d_2$, $d_3$, etc. are the discrepancies of various results from the mean, and if $\Sigma d^2 =$ the sum of the squares of these differences and n = the number of observations, then the probable error of the mean $= \pm 0.6745 \sqrt{\dfrac{\Sigma d^2}{n(n-1)}}$

### MINUTES IN DECIMALS OF A DEGREE

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

### INCHES IN DECIMALS OF A FOOT

| 1-16 | 3-32 | 1/8 | 3-16 | 1/4 | 5-16 | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 |
|---|---|---|---|---|---|---|---|---|---|---|
| .0052 | .0078 | .0104 | .0156 | .0208 | .0260 | .0313 | .0417 | .0521 | .0625 | .0729 |

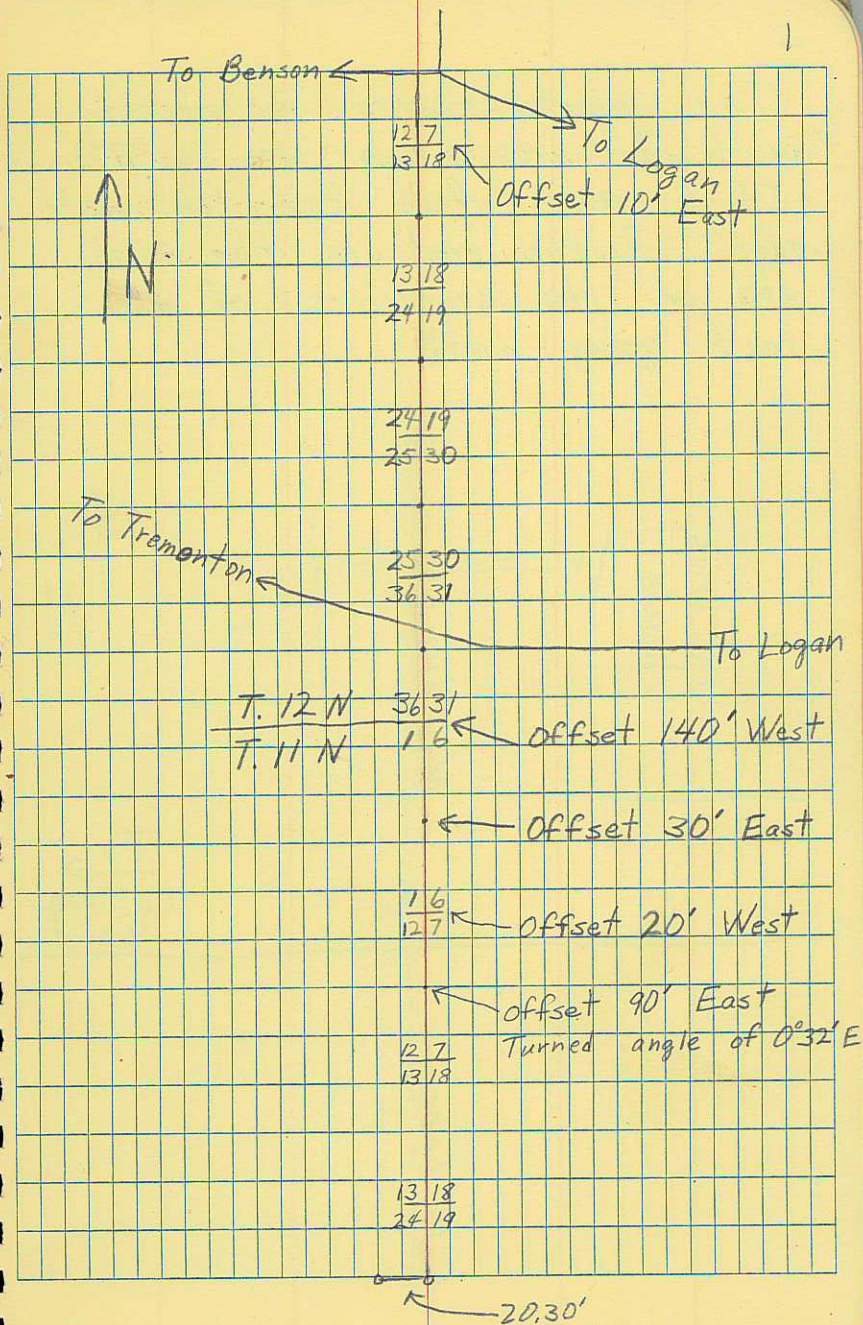| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| .0833 | .1667 | .2500 | .3333 | .4167 | .5000 | .5833 | .6667 | .7500 | .8333 | .9167 |

## INDEX

ALL NOTES IN THIS BOOK ARE VOID No POINTS ~~WILL~~ WERE SET.

This random search line for intermed-
iate points on the Salt Lake Meridian
was started at the north end
where two points were already
established at corners $\frac{12|7}{13|18}$ and 1/4 13|18
of Township 12 N to give us line.

Thus, to follow our steps, start
on page 16 and work backwards
to page 2.

Assuming that the two points
at the north end are on a true
north line the error of closure
is 168.25' East and 212.51' south
(long).

In all cases north is toward
the top of the page.



Page 1 — diagram labels:

To Benson
To Logan
$\frac{12|7}{13|18}$
Offset 10' East
$\frac{13|18}{24|19}$
$\frac{24|19}{25|30}$
To Tremonton
$\frac{25|30}{36|31}$
To Logan
T. 12 N $\frac{36|31}{1|6}$  T. 11 N
Offset 140' West
Offset 30' East
$\frac{1|6}{12|7}$  Offset 20' West
Offset 90' East
Turned angle of 0°32' E
$\frac{12|7}{13|18}$
$\frac{13|18}{24|19}$
20.30'
N

This quarter-corner is marked
with a brass hub set in 1973.
It is seven feet from the south
edge of the road in the road,
and on the centerline of the
road going north.

red brick house

Meridian

N

Salt Lake

To →
College
Ward
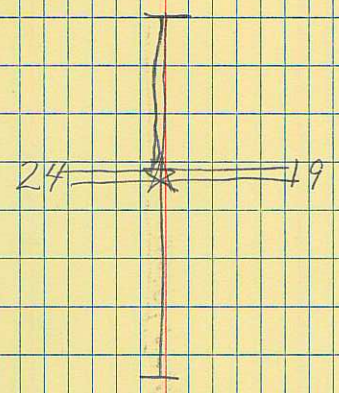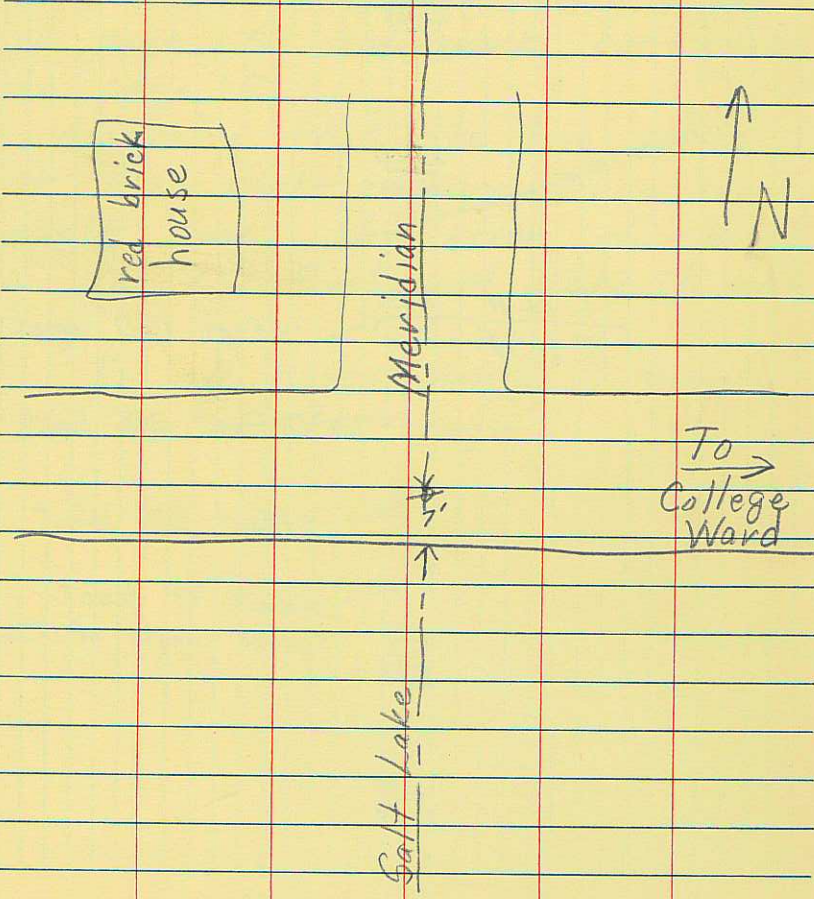
24 —★— 19

Here we closed our line. The line we were on is the same as for the past 1½ miles, which was started on page six. For error of closure see page 2.
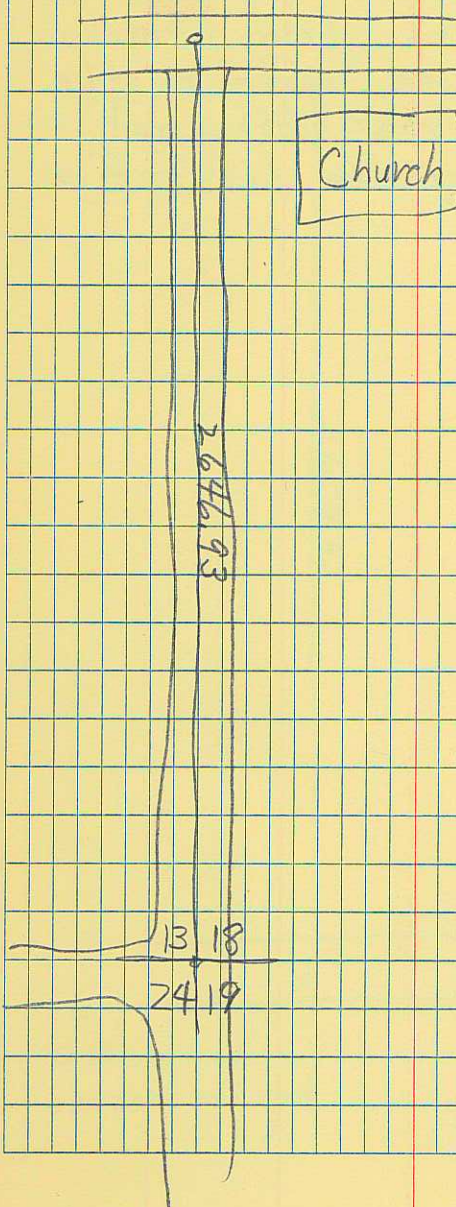
G. Foreman
P. Ward
July 22, 1974
Clear, 85°

| 13 | 18 |
|----|----|
| 24 | 19 |

2652.60'

Hub set in '73    20.30'

Continuation of line started
on page six

G. Foreman
P. Ward
July 22, 1974
Clear 85°

Church

2646.93

13 18
24.19

Here we shot straight down
a dirt road and from the
centerline of one road to the
centerline of the south road.
We are following the line set on
page six.

P.K. nail   12  7
in center   13  18
of road

26 39.97

G. Foreman
P. Ward
July 22 1974
Clear, 85°

Paved Road

P.K. nail in
center of road

College Ward      LDS.
Young Ward    Church

From this point we turned an angle of 0°32'00" in order to head straight down the road rather than take offsets every half mile to avoid trees, etc. This angle was turned from a 90' east offset.
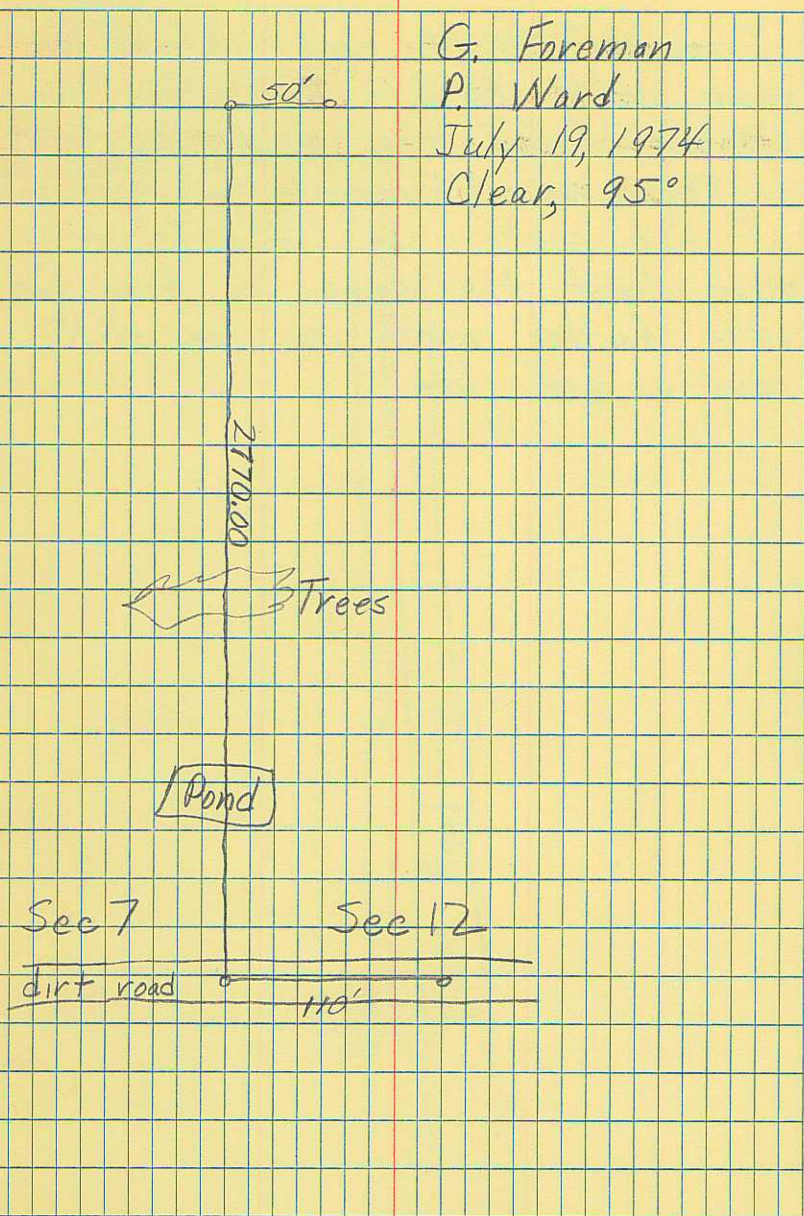


G. Foreman
P. Ward
July 22, 1974
Clear, 85°

Sec. 12    Sec. 7

0°32'00"

2647.94

12 | 7
13 | 18

Paved road

6
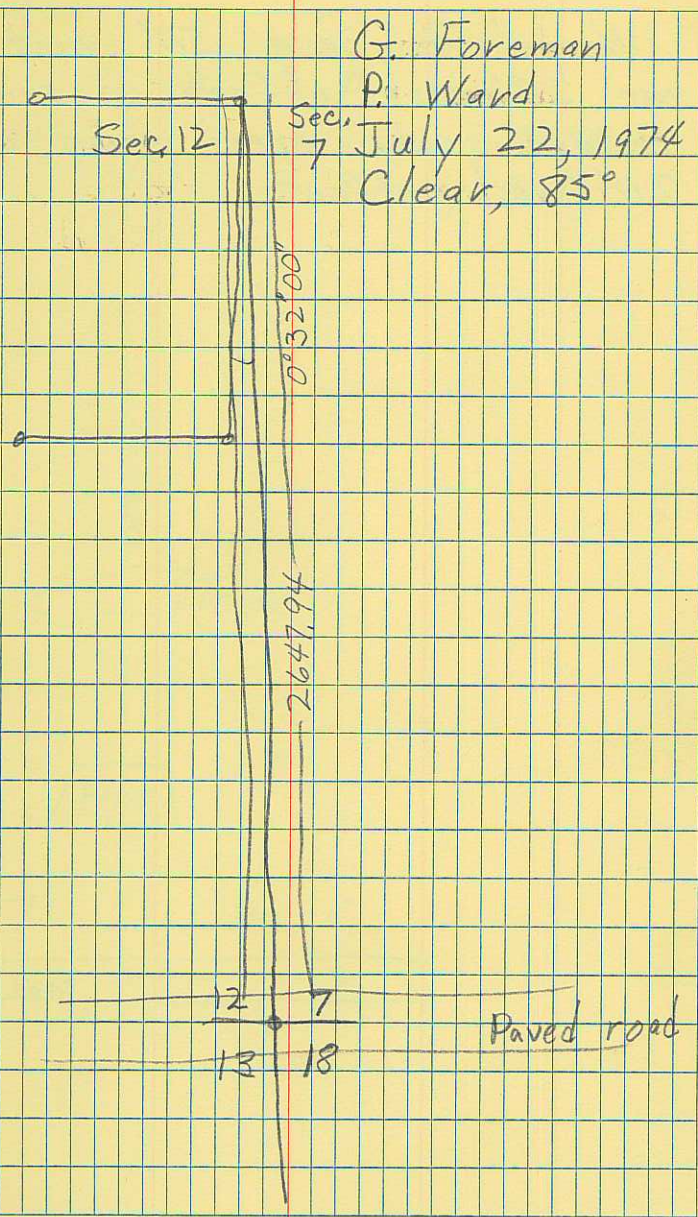
We had to move 50' west from our 30' east offset to see through some trees giving a net 20' west offset.

G. Foreman
P. Ward
July 19, 1974
Clear, 95°

50'

2770.00

Trees

Pond

Sec 7                    Sec 12
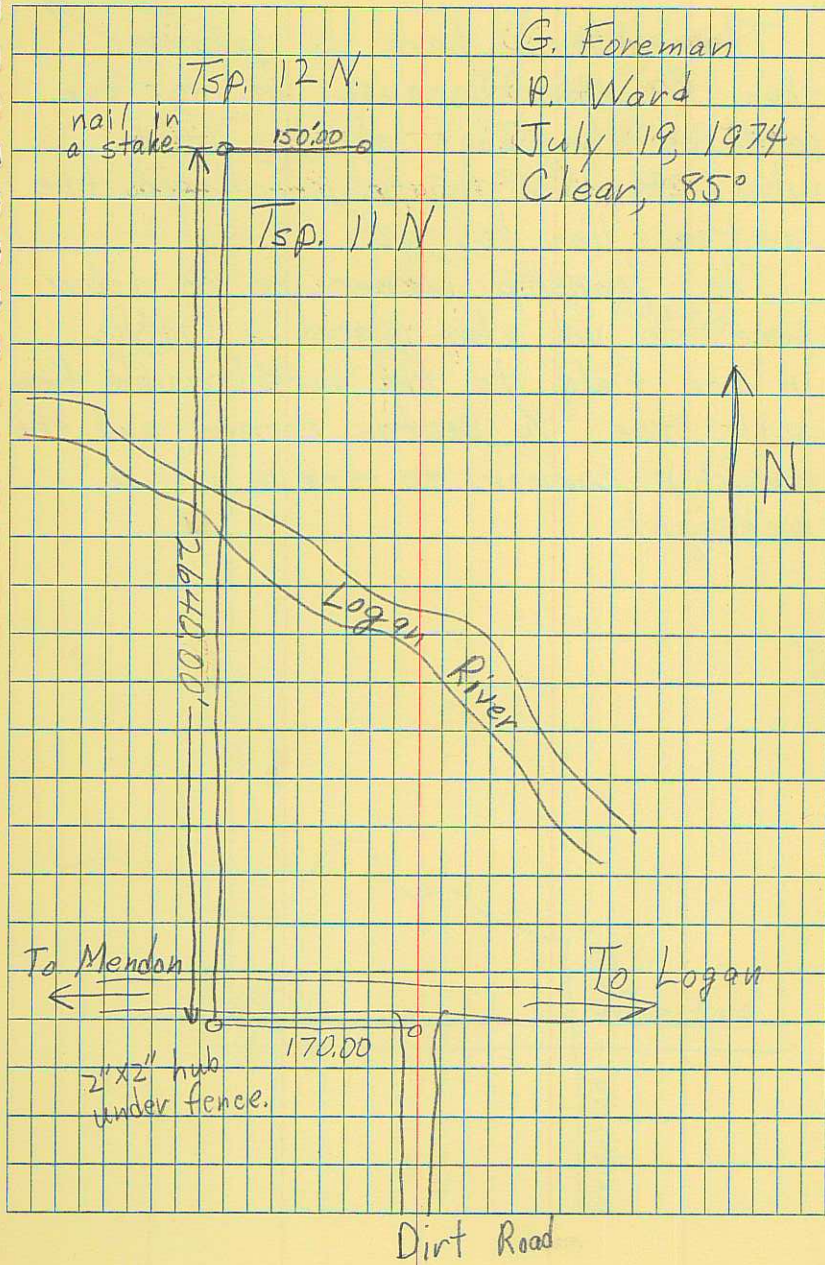
dirt road          110'

From our 30 ft. east offset we
went south 2640.00 feet. This line
did not follow the road but went
slightly west. However the foresights
at the south end of the valley
were almost the same as from two
miles farther north so we still
have a good line.

G. Foreman
P. Ward
July 19, 1974
Clear, 90°

To Mendon ← → To Logan
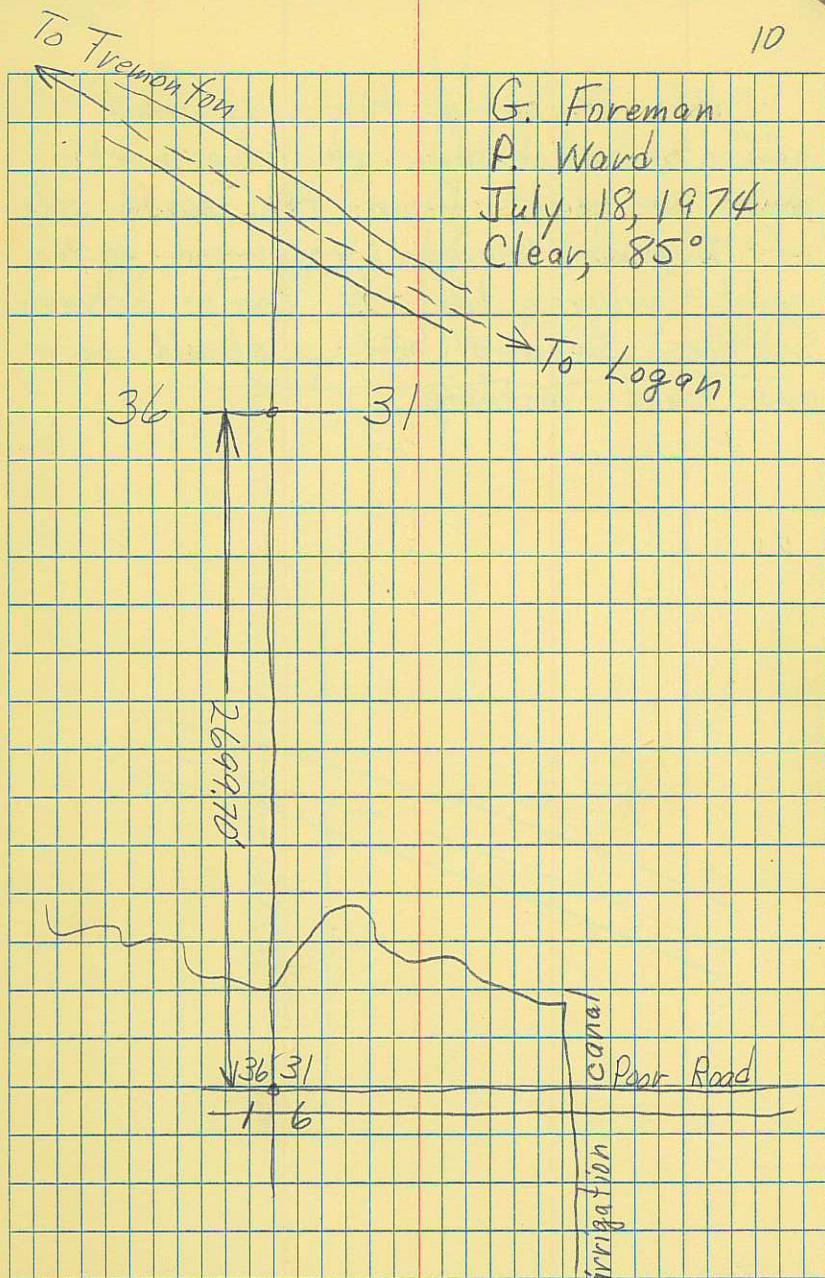
170.00'

2640.00'

Dirt Road

50'k
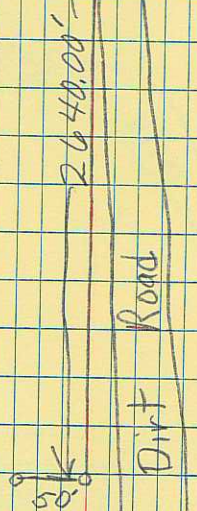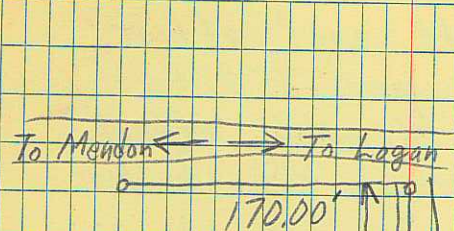
From our 10 ft. east offset
line we had to move 150 feet
west for a 140 ft. west offset
line to get through the willows
on Logan river.
 2640 feet placed us on the
edge of the right of way, from
which we moved 170 feet east
to give a net offset of 30
feet east.



Tsp. 12 N.

G. Foreman
P. Ward
July 19, 1974
Clear, 85°

nail in
a stake         150.00

Tsp. 11 N

Logan River

N

To Mendon                    To Logan

2640.00'

170.00

2"x2" hub
under fence.

Dirt Road

The distance here is greater
than ½ mile because we set our
point on the edge of the road
where the USGS map showed the
section line to go.
   The township corner is in a low
place so we also placed a lathe
in the field to the north visible from
both the ¼ section corner and the
township corner to serve as a
backsight.

To Tremonton

G. Foreman
P. Ward
July 18, 1974
Clear, 85°

To Logan

36        31

2699.70'

36 | 31
1 | 6

irrigation    canal    Poor Road

Still following the ten foot
offset established at the north
end we shot from the south side
of Logan's sewage reservoir to the
point where the ¼ corner between
sections 36 and 31 should be
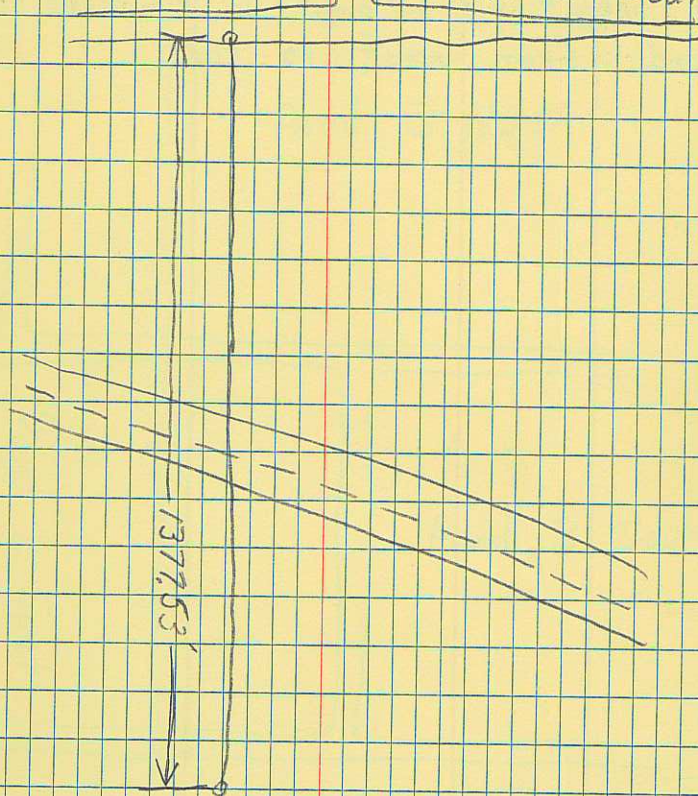and found nothing.



Pond 2 South

G. Foreman
P. Ward
July 18, 1974
Clear, 85°

Pond 3 South

1377.53'

We set up on the north edge of Logan municipal waste reservoir and used previously established foresight and backsite to give line. We then shot the distance across the reservoir at about 10:30 a.m. I numbered the ponds from west to east.

G. Foreman
P. Ward
July 18, 1974
Clear, 80°

Pond 3 North

Pond 2 North

Pond 2 South

3466.09'

Pond 3 South
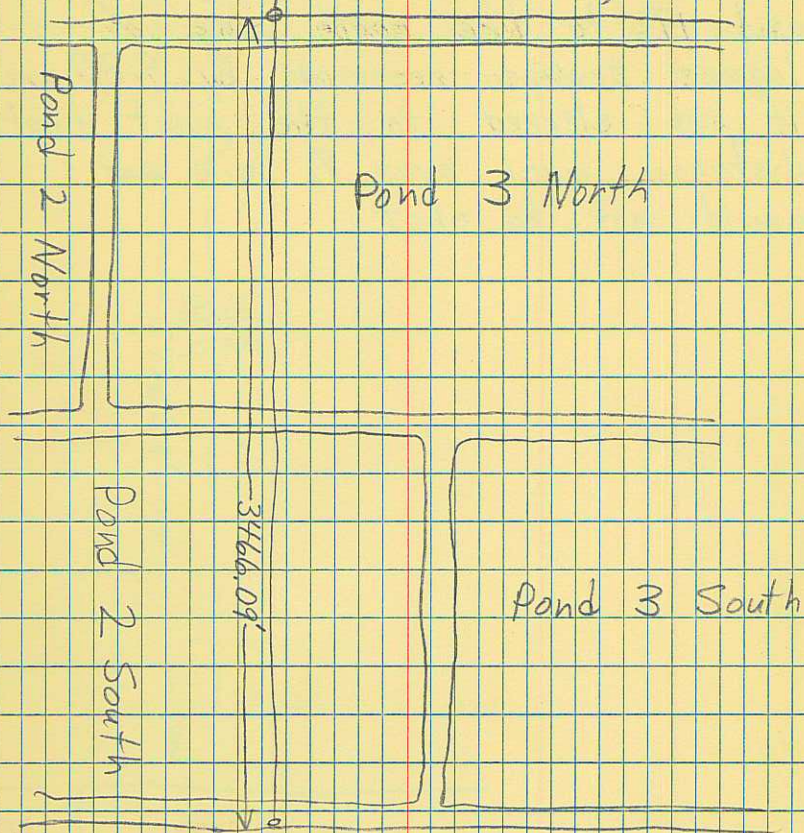
It was cloudy early this morning
which enabled us to shoot the
long distance from our assumed
¼ corner between sections 24
and 19 to the north side of
Logan's sewage reservoir. By 9:30 a.m.
it had cleared to the point that
distances much over ½ mile ~~cot~~
could not be shot.



G. Foreman
P. Ward
July 18, 1974
Clear, 76°

1900N

24 | 19
25 | 30

5716.38'

Pond 2 North

Pond 3 North

13
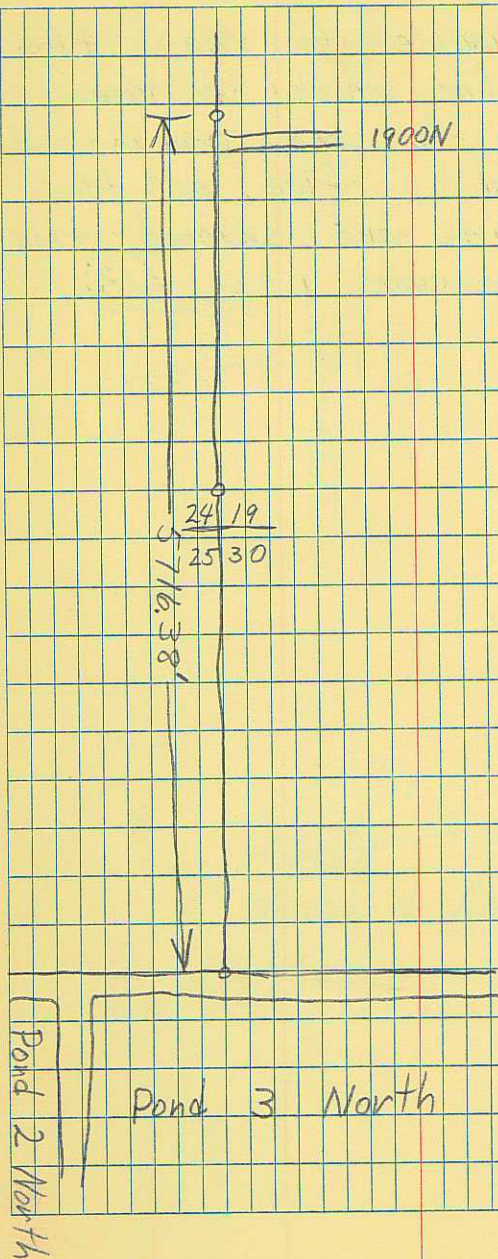
We were unable to reach the corner ~~of~~ for which we were searching due to the marsh and bog. We tied a flag on the fence for line and skipped this Point. See previous page. (13)

G. Foreman
P. Ward
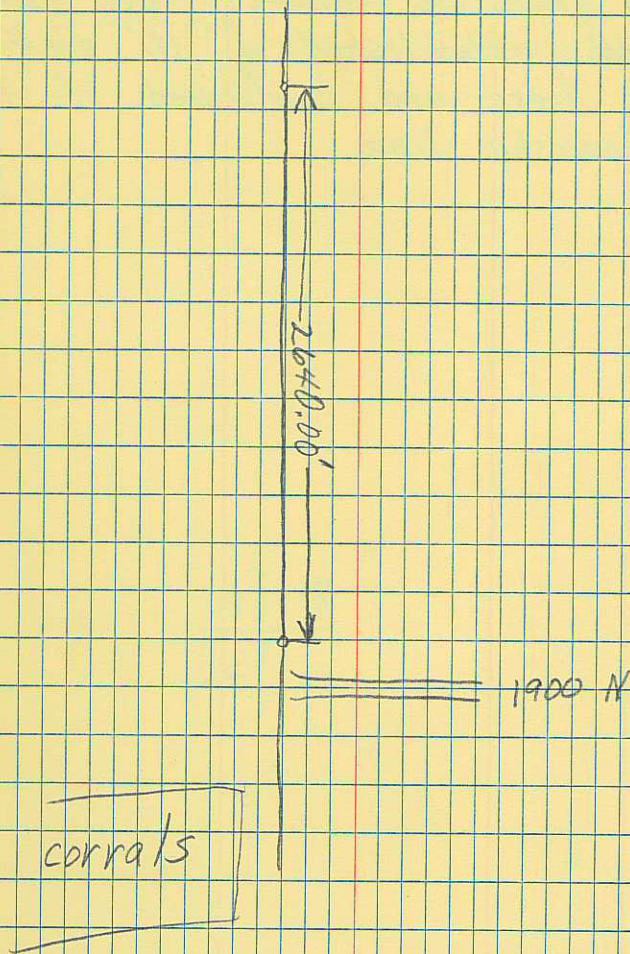July 17, 1974
Clear, 90°

Corral

25.28±

× Flag on Fence

24 | 19
25 | 30

Marsh & Bog

Continuation of random line established on page 17. The line is down the west edge of the road.

2640.00'

1900 N

corrals

Using the $\frac{12|7}{13|18}$ corner and the 13/18 ¼ corner we established the random line to follow to the south end. We established a 10' east offset here and continued it to the township line.

Brass Hub ¼ on steel pipe →

13 | 18

13 | 18
24 | 19

G. Foreman
P. Ward
July 17, 1974
Partly cloudy, 90°

We sat on the south edge of the right of way and shot the distance to the two hubs already established. We then set a ten foot offset east of each hub to avoid the utilities poles. We then sat on the offset of the south hub and used the north offset to give line to work on south.



To Benson

To Logan

2847950'

5484.87'

G. Foreman
P. Ward
July 17, 1974
Partly Cloudy, 85°