Richardson County

Section Corner Ties

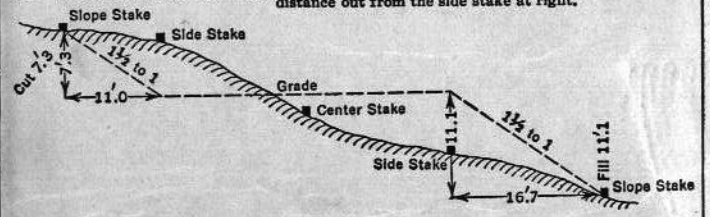
Field notes in the Nebraska State Surveyor’s Office from a project intended to tie U.S. Corps of Engineers Missouri River control to the PLSS. The field work was executed between 1960 and 1970.

Pages from the original books that were either blank or contained irrelevant information have not been included in this document.

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

Roadway of any Width. Side Slopes 1½ to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



Cut or Fill	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Cut or Fill
	Distance out from Side or Shoulder Stake										
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

KEUFFEL & ESSER CO., N. Y.

For Curve Tables see end of book.

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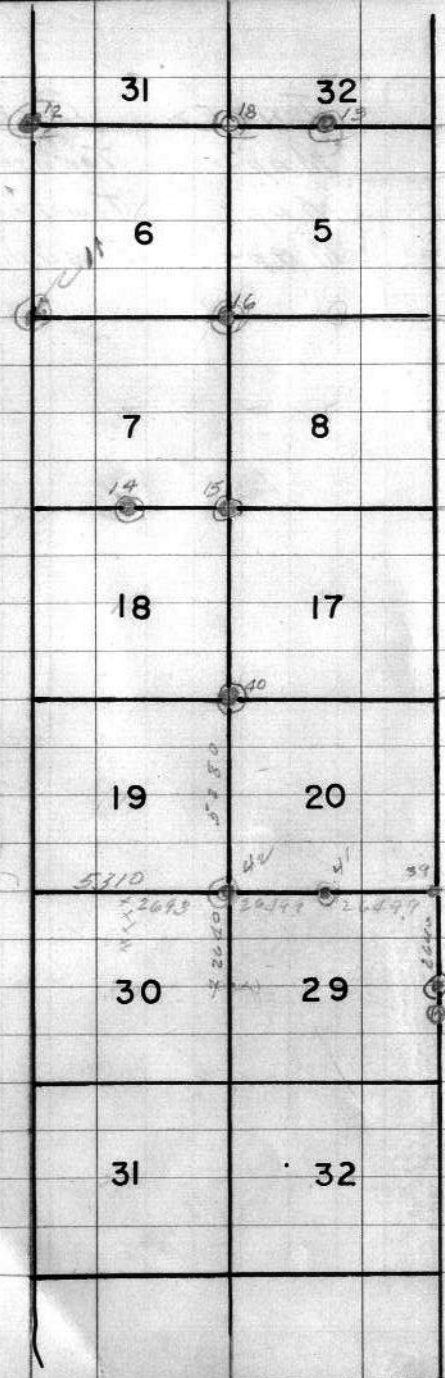
State House Room 2002
Lincoln Nebr.

The paper in this book **No. 364A** is made of **50%** high grade rag stock with a **WATER RESISTING** surface sizing.

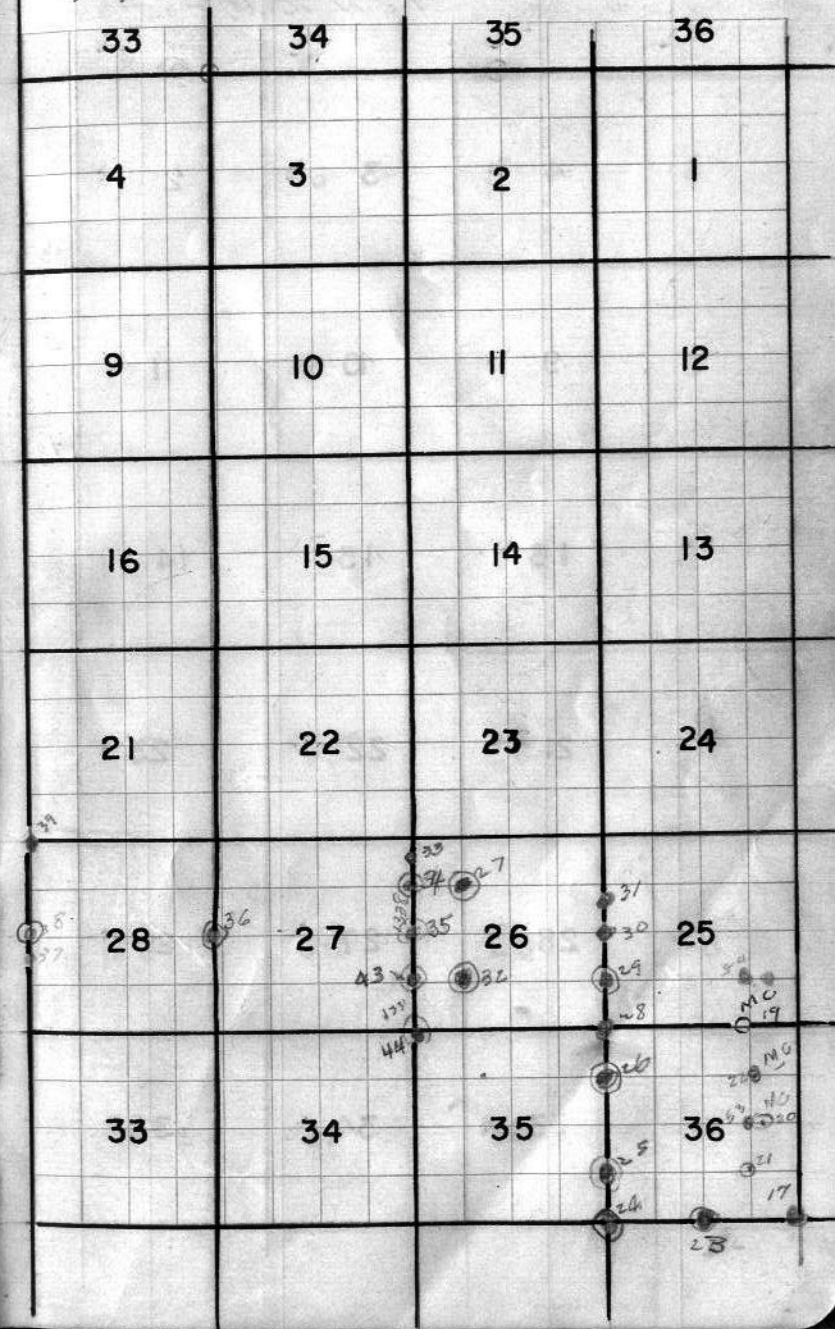
INDEX Richardson Co.

Map- Township 1 Range 18
Map- Township 2 Range 17-18
Map- Township 3 Range 16-17

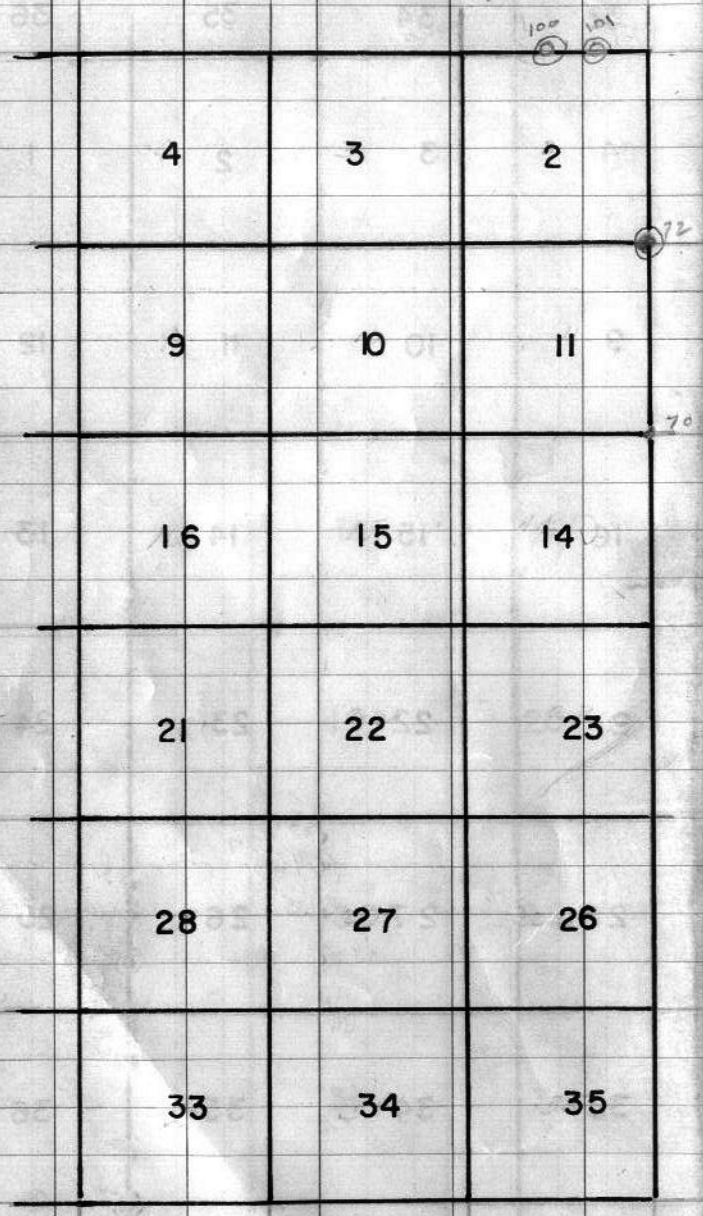
T 1 N
R 18 East.



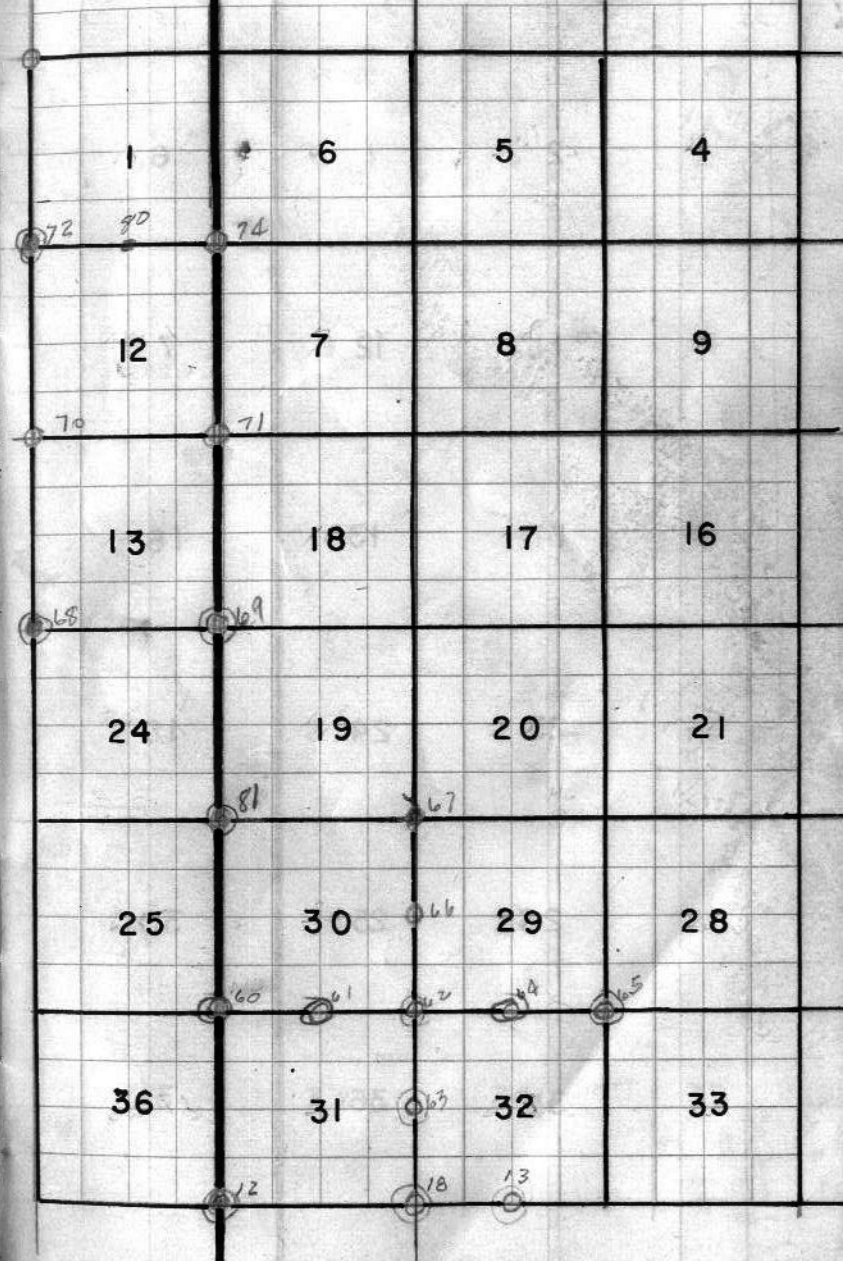
T 1 N R 18 E



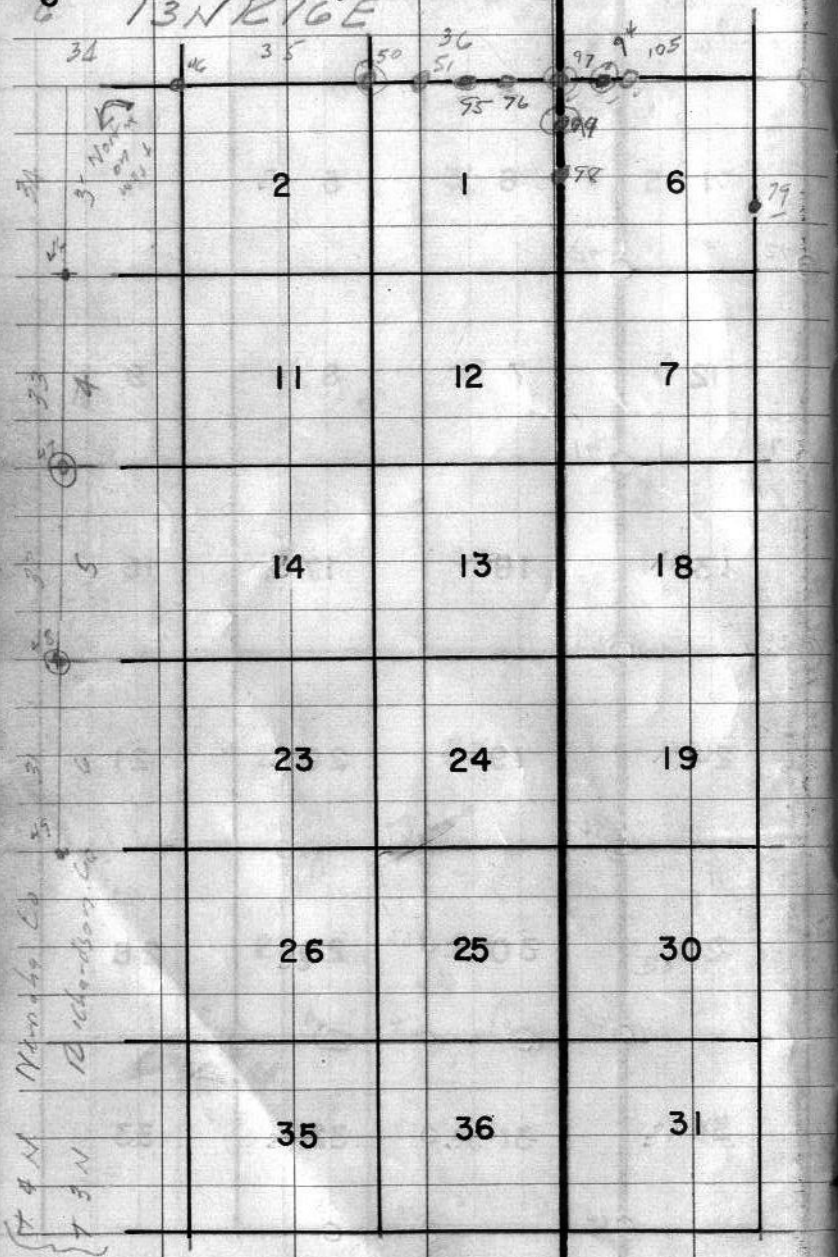
T2N R 17 East



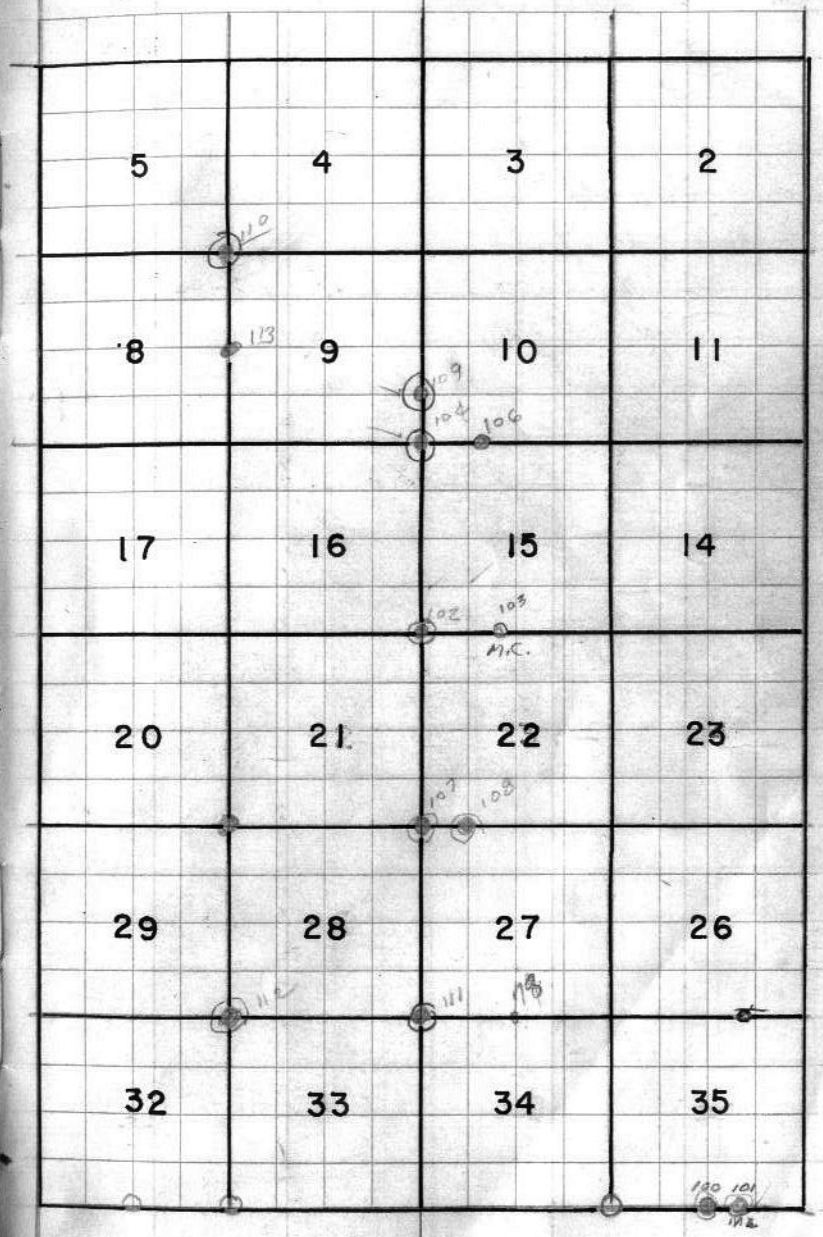
T2 Range 18 East



T3N R16E



T3N R17E.



Found 1¼" Axle 2½' Long

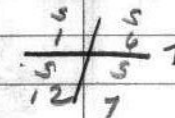
Est. by Ben Dale on Line & prop. distance - dated 1986 - Recorded in Range 17 Tie file County Surveyors Office, Richardson County Court House

Tied SW 47.6 Power Pole
E. 38.8 To Cor Fence Post
NE 42.2 Tele Pole
SW 35.5 Near Cor Conc. Head wall
NW 36.5 Near Cor Conc. Headwall
East 50.0' Conc. w/c
NE 46.6 Conc. w/c

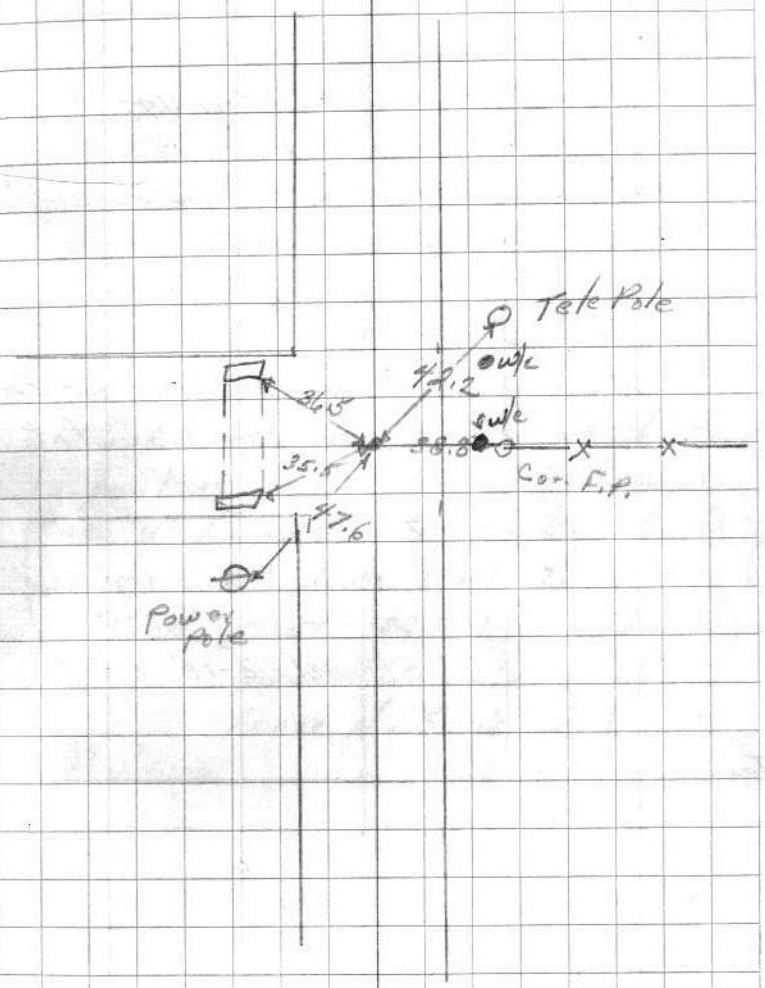
Willis 17 Jan 1965
Wayne

15 July 1965
Humphrey & Crew
Jim & Crew

Set Conc. Mon. on Top of Axle after Lowering Axle. Monument reads State of Nebr. - State Surveyor Survey Marker



SW Cor Sec 6 T1N R18E



NW COR. Sec 6 T1N R18E
on Range Line or SW cor. of 31-2-18

Found Iron Pipe
Recorded Book 2 Page 147

Witness 1/2 x 30" Rebar SW 46.6 under fence
1/2 x 30" Rebar NW 46.6
1/2 x 30" Rebar SW 100' under fence

Ben Dale Re-established corner 330' East
and in line with Two stones west at
20 rod & 120 rods
See Page 83
See B Field Book # 2 Pg. 36

31 - 2 - 18

Township Line

1 6

1/4 Sec Corner between Sec.
5 T1N R18E and Sec 32 T2N R18E

Found 2.5 & 2' pipe Set by
B Dale (Book 2 - Page 248)
(This 1/4 Corner seem to be considerable
too far South of the 1/2 running West)
See Timmerman's Book C page 252,

Witness 1/2 x 30 Rebar 3'
33' North & 33' West

Set Conc. Monument above L.Stone
L.Stone 18X12X4 - 2" x 24" pipe
& "V" Iron 24" Long Rather South
Side Conc.
Tied south 22.0' Conc w/c
west 22.0' Conc w/c
Fence N-S. is on Line

15 July 1965

Township Line

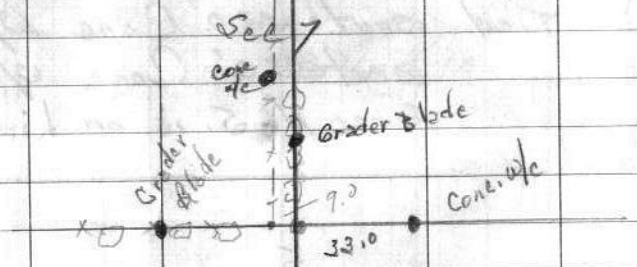
5

Timmerman Survey Said Corner was
over 3 rod South of correct
Location

1/4 Sec Corner between Sec
7 & 18 T1N R18E
Found Limestone and 1" Bolt 36"
and Witness Grader Blades
33 North & 33' West

Limestone 24X18X2 (original)
Set Conc. Monument on North Side
of Stone - Monument Marked
1/4 S.7 / S.18 State of Nebr.
State Surveyor
Survey Marker

Tied NNE 46.6 Conc. Monu. w/c
S 33.0' Conc. Monu. w/c
N 33.0' Grader Blade
W 33.0 Grader Blade



Humphrey
Johnson
Larson
Ogle-

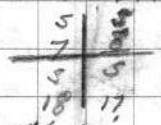
Sec 18

15 July 1965

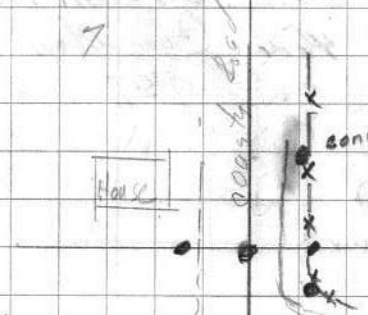
Sec Corner between Sec
7-8-17 & 18 T1N R18E
Found pipe and Two Witness
pipe 33 West & 33 East

B.C. Ogle - Re-establish Sec Cor By
prop. Measure N. S. E. & W
Book 2 Page 251

Set Conc. Monument on North Side of
pipe - Mon. Marked



Set Conc w/c NE 46.6
SE 46.6



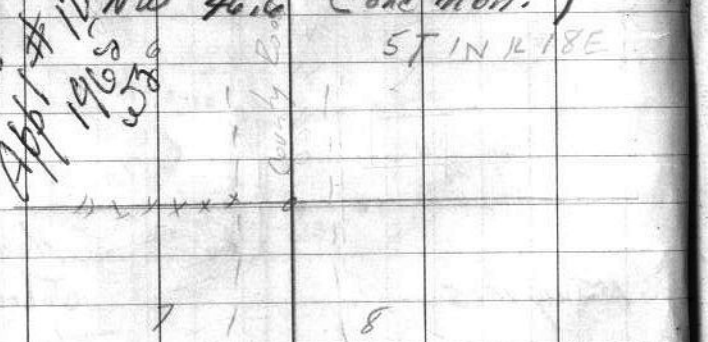
15 July 1965

Humphrey
Johnson
Larson
Ogle

Sec. 5-6-7-8 T1N R18E
~~Found~~ Rod Set by Stone by Shildneck
Recorded Book 1 page 89 1922
Found 1" pipe and
1¼ Pipe Witness 33 West
and 33 East
~~Drove ¾" pipe 466 N.W.~~
~~under Fence~~
Inline with Fence West

April 8, 1964 Found ¾" G.P.
Set ⅝" x 30" Rebar Inside G.P.
Tie checks above
Set Conc. on N. Side of G.P. -
Tied NE 50.0' Conc. Mon.
NW 46.6' Conc Mon.
15 July 65
Humphrey

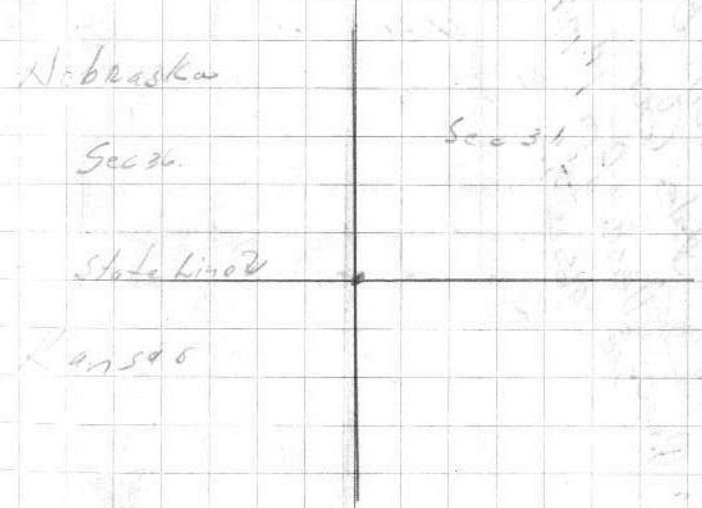
Described
Appl # 1227
1965
W3



1942 B.C Dale - re-Set Cor from
Ties. Set ¾" x 24" G.P.
Book 2 - Page 242

SE Sec Corner of Sec
36 T1N R18E.
Found Iron Monument.
Set by Leo Peterson to prepetuate
Corner Set by Jackson in 1854
on top of Bluff

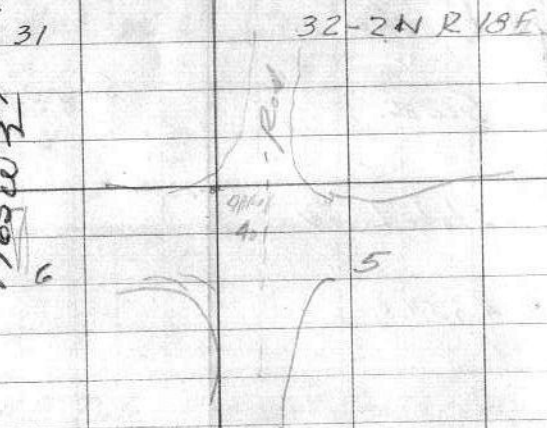
July 27, 1962



NW Cor Sec 5 T1N R 18E or
SW Cor Sec 32 T2N R 18E
See Page 116 JB
Established on line between
Sec Cor West & 1/4 Sec Cor East
Making Township Line East
44.2 South of Corner set by
Timmerman Dale
Witness 1/2 x 30 Rod West 33.0
1/2 x 30" Rod SW 46.6
Drove 1/2 x 30" for Corner
Book 2 Page 248

Pulled HJN Corner
7/15/65 JB

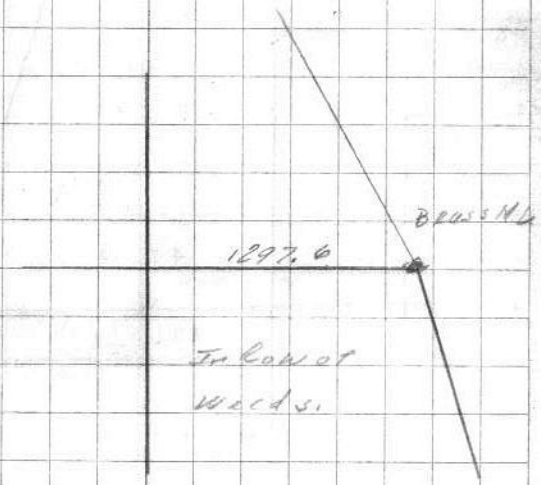
Remon Ben
Dale Cor
Desc Appl #1227
1965 WB
1942
Book 2 Page 248



East
Meander Corner between
Sec 525 MC. Found June 12, 1962
S 36

Found 1" pipe and Brass top
set 1927 by John S Knowles
General Land office.

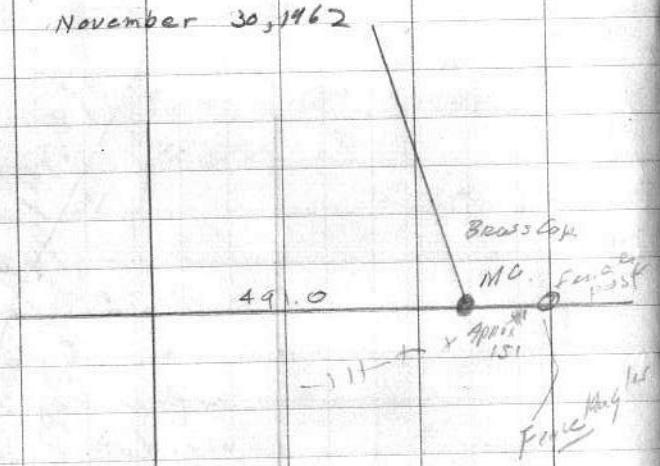
Witness with 1" pipes south 50'
and 1" pipe 100' on each side
of Road



Meander Corner East from
¼ Sec Corner West of Sec. 36-T-18E

Found Brass Cap 2' below surface.
Set by John S Knowles 1927
Witness with ½x30" Rebars 33. East
and 33' west.
SW Blazed 4" Elm 6.5
W " 5" Elm 12.5
SE 12" Cottonwood 23.7
S 5" Elm 16.0

November 30, 1962

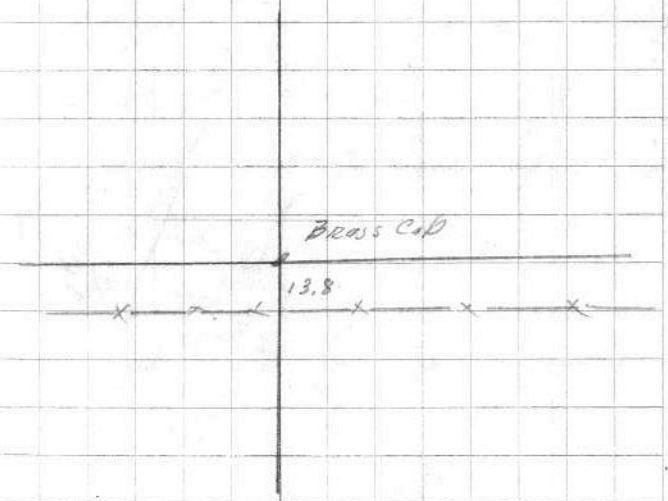


1/16 Corner in Center of SE 4

Found Brass cap and pipe about
1" above Ground. Sec 36-T1NR18E
Witness
24" Elm NE 22.4 Blazed Tree
15 Elm SE 29.7 Blazed Tree.

Set ½ x 30" Rebars 33 SE and
33 SSE.

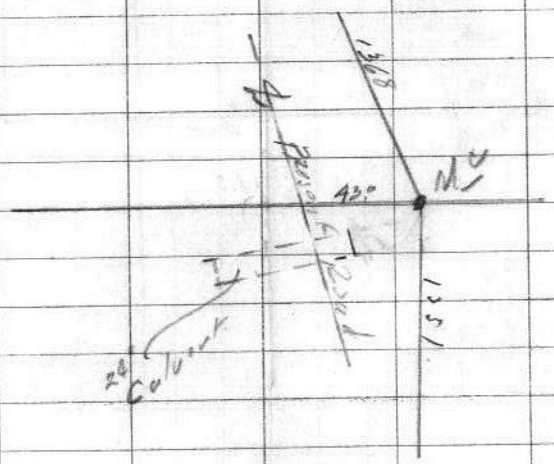
July 26, 1962



Meander Corner East From the West 1/4 corner of NE 4 of Sec. 36-1-18

Established by Retracing Knowles Survey
Set 1 1/4 x 20" pipe under surface in corn field.
Witness N-33 1" pipe on South Shoulder of Drive.
1/2 x 24" Re bar deep Flush 33' West on East Shoulder of Highway

July 26, 1963



South 1/4 Sec Corner Sec. 36-1-18 along the Kansas Nebraska Line.

Found Lime stone ~~14 x 9 x 3~~ 18" x 12" x 2" original.

Witness ~~20" Elm Walnut 46.5 NE~~
10" walnut 27.5 NW
6" Hickory 12.3 SW

July 18-1962

Set Conc. Monument Marked State of Nebr. - State Surveyor - Survey Marker - 1/4 Sec 36 on Top of original L.stone after Lowering stone.

Tied: East 33.0' To Conc. W/C
West 33.0' To Conc. W/C

Humphrey & Johnson
Ogle-

14 July 1965

Sec Corner between Sec. 35 & 36 - T1 & 18E on Kansas Nebr. Line.

See Page 114

Found pipe and Brass Cap Set by Knowles in Aug. 1927

Found July 18, 1962

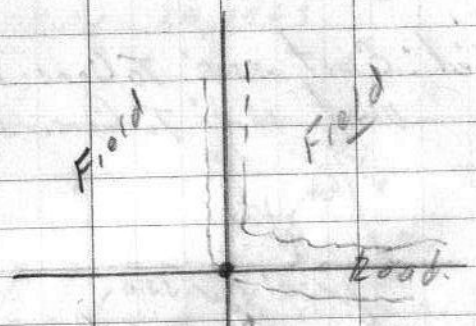
Witness with ~~1" pipes NW 33.0 NE 33.0 and SE 33.0~~

Retied NW 33.0' 3/4" G.P & 1/2" x 3' Rebar in Top

Ties destroyed WAH

SE 100' To 1/2" x 36" Rebar

15 Aug 1963



Set 2 - 1/2" x 36" Rebar on E & W - Side of Brass Cap.

Took out

WAH

East 1/16 Corner of SE 4

Sec 35 - 1 - 18

Found Original Limestone 12 x 12 x 2

Drove 1 1/4 x 20' Pipe on North side

& 1" x 24" Pipe on South Side

Witness E & W 33.0 with 1/2 x 24" Rebar -

1/2 x 24" Rebar NW on East side of Conn Crib In line with Fence E and W.

July 18, 1962

Set Conc. Monument on Top stone after Lowering Stone - Mon. Marked S 1/16 Sec 35

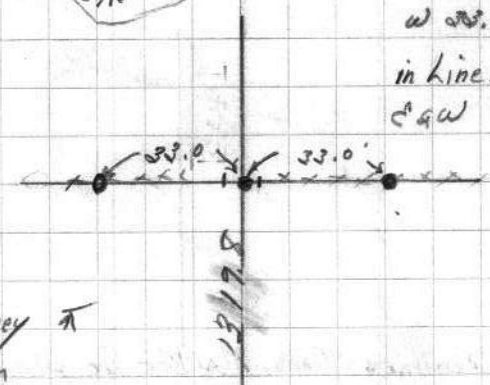
Sec 36 (S 35 | S 36) 1/4" x 20" Pipe on N. Side

& 1" x 24" on S. Side S 1/16

Tied E 33.0' Conc W/C

W 33.0' Conc W/C

in Line with fence E & W



Humphrey

Johnson

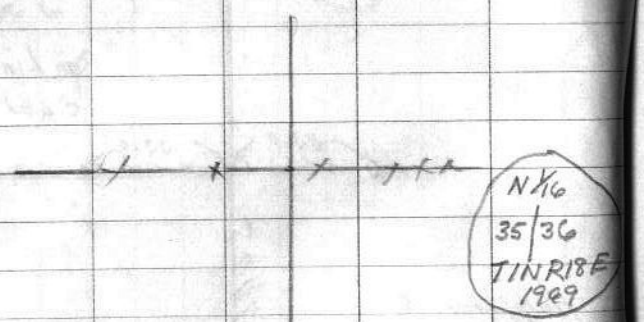
Ogle

14 July 1965

East 1/16 Corner of NE 1/4
of Sec. 35 - 1 - 18.

Reset 1" pipe 30" Long with
Fence for Corner
Retracing Knowles Survey.
Distances check.

Witness. 1/2 x 24" Re bar 330
East and 1/2 x 24" Rebar 330 West
Corner under Fence E & W
On North slope of hill.
November 28, 1962

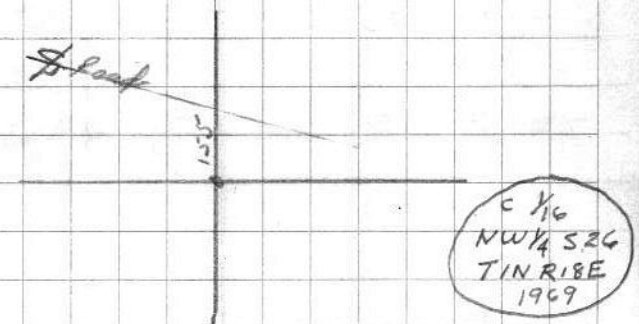


Set Standard Conc. Marker in place of 1" pipe
June 18, 1969
J. Puls

Center 1/16 Cor of NW 1/4 of
Sec 26 - 1 - 18.

Found 1" pipe - re-est. by Ben Duke
Book 2 page 258

Corner on top Bluff
Blazed 12" Oak NE 19.3
Blazed 6" Elm E 19.3 - Not There void
18" Oak SW 22.5 - Not There
10" Oak NW 18.0
April 2, 1962



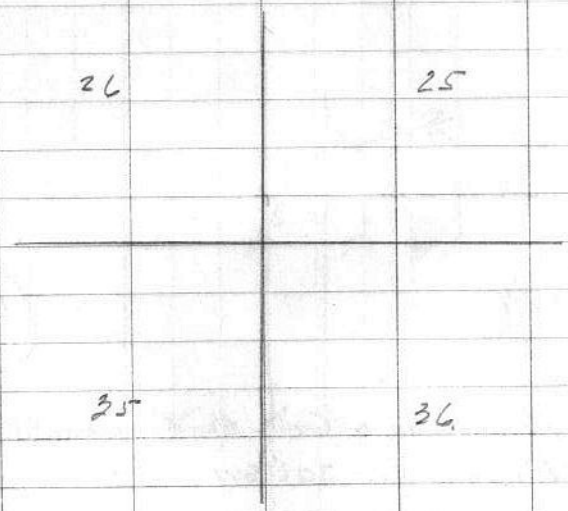
Set Standard Conc. Marker beside a brick.
Tied - Blazed 10" Tree 39.8' SW
" 24" " 27.8' SE
" 18" " 19.0 NE
" 18" " 18.4 NW

June 18, 1969
J. Puls

Sec Corner between
Sec 25-26-35 & 36 T1NR18E

Found Brass Cap set by
Knowles. about out of Ground
1' on North Slope

July 19, 1962



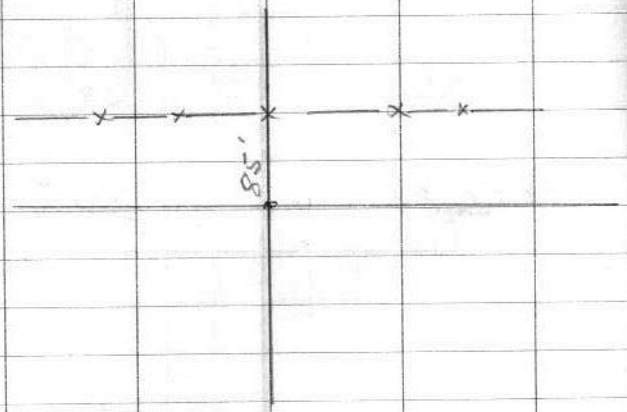
E 1/16 COR of SE 4 Sec 26
T1 N R18E

Found Original Stone on
North Slope Approx ½ way
to Bottom 6" of Slope above
Surface No Fences.

July 19 1962

1/4 Sec Corner between
Sec 25 & 26 T1N R18E

Found Brass cap set by Knowles
about washed out. Lower to
3" above surface. Corner
on North Slope
Witness
8" Elm NE 12.0
12" Oak NW 20.0
20" Elm SW 19.5
85' South of Fence running
E & West measured up slope
april 3, 1962

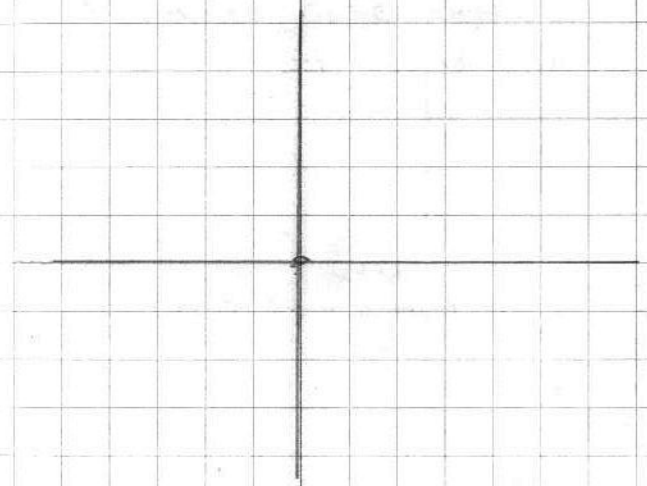


North Meander Corner. Between
Sec 25 & 26 T1N R18E

Established on line continued
from South Using Cor. Distance

Drove 1" x 6' Iron Axle
in Swamp Dist from
℄ of Road

april 3, 1962

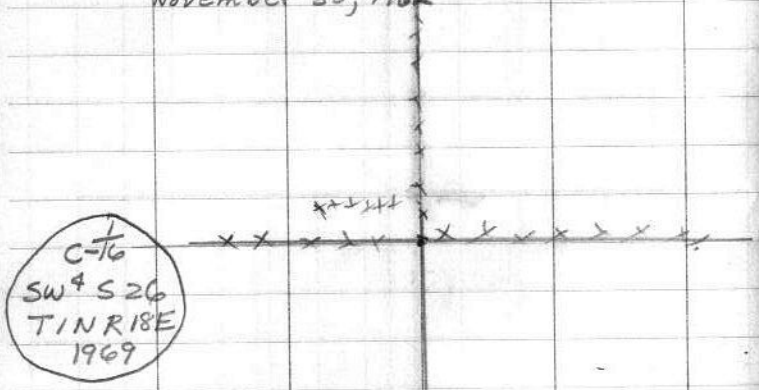


1/16 Cor in Cent of SW4
of Sec. 26 - T1N R18E

14x12x2

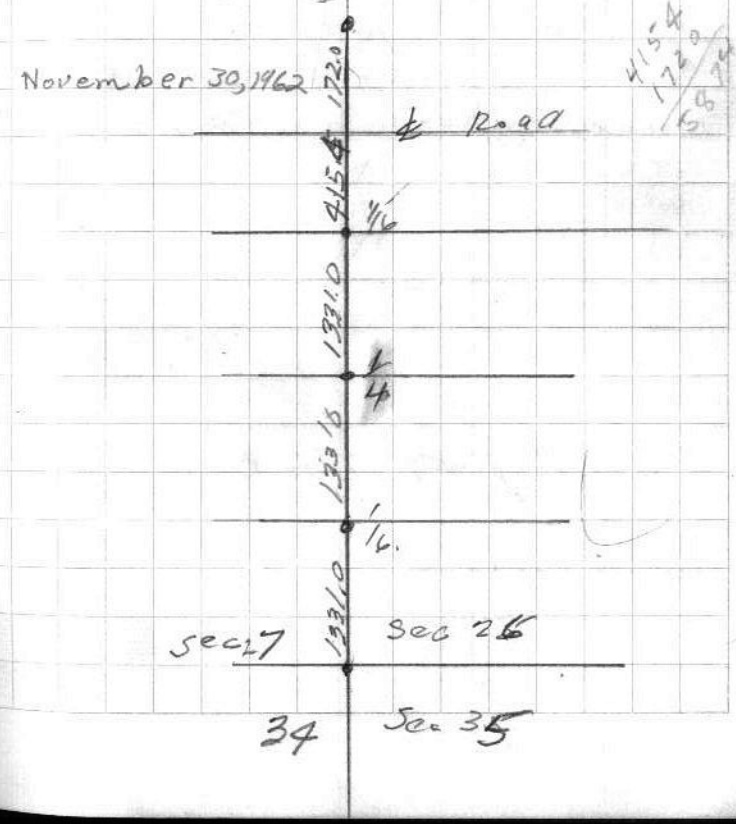
Found original Gov. Lime
sone. Under fence
running East & west.
Lane running is just East
of corner.
Witness

Drove 2" pipe 20" long on
north side of stone
2 pipes 33E 33' W in Fence
November 30, 1962



Set Standard Conc. Marker on East side
of original Limestone.
Removed 2" pipe + set 33' North as a tie
in Fence
June 18, 1969
J. Puls

North Meander Corner between
Sec. 26 & 27 T1N R18E.
Established By extending
Line South and using Gov.
Distance
Drove 1" pipe 5' long in Swamp.
172.5 North of center of
present Road where 1/2 x 24' Rebar
is Driven. ℄ of Road is 415.4
North of 1/16 Corner. #34
in this book



N 1/16 on West side NW 4
of Sec 26 T1NR18E
Found original Limestone
Found 2" pipe set by Ben Dale
for 1/16 Corner Book 2 page 258
I heavy Brush
Witness with 1/2, 20' Rebars
33.0 West in Fence Line E
33.0 NE along Ridge
12" oak NNW 33.0
8" Elm ENE 14.7

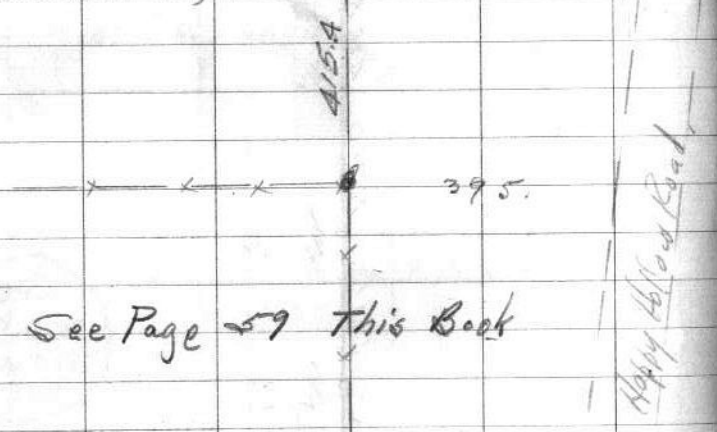
Main Road

November 29, 1962

415.4

395.

Happy Hollow Road



See Page 59 This Book

1/4 Sec Corner between
Sec 26 & 27 T1NR18E

Found original Limestone
Marked 1/4 (13 x 9 x 3)
July 10, 1962
~~Prove 3/4" x 30 Rebars 33' South and 33' West.~~
Set Standard Conc. Marker on N. Side
Marked S 27 | S 26 1/4 and 2" x 30" Pipe on N. Side
Conc.
Tied 33.0' South Conc w/c
33.0' West Conc w/c
on N. Side Cor. fence Post
Fence Running N-S-E-W.

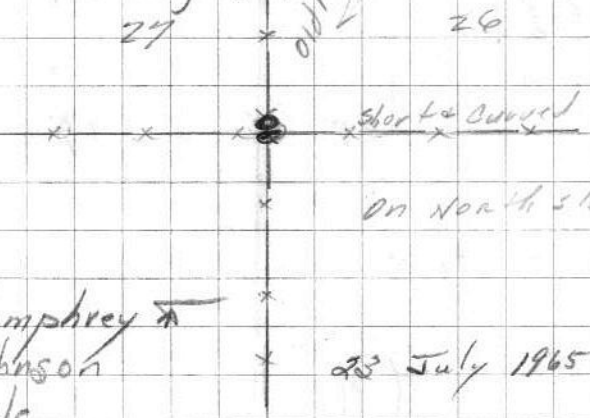
Happy Hollow Road
old Ben Dale

Bridge

27 26

Short & Curved

On North slope



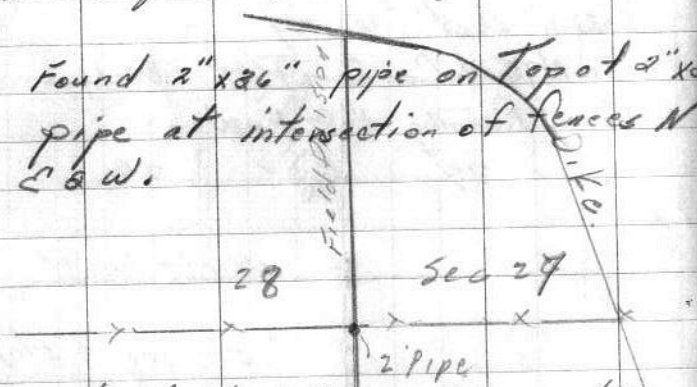
Humphrey
Johnson
Ogle
Larson

23 July 1965

36 1/4 Sec Corner between
Sec 27 & 28 T1N R18E
Found 2' pipe Set by Don Dale
Book 2 - Page 261
July 10, 1962
Witness ~~1/2 x 30 Rebar~~ Conc w/c 33 West
~~1/2 x 30 Rebar~~ Conc w/c 33 East

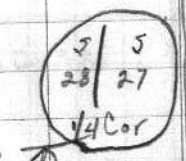
1944 - Ben Dale found Iron Pipe but
said He had no record of Pipe
Being Set for Corner - C.B. & Q. R.R.
used Pipe in Describing Land Purchase

Found 2"x36" pipe on Top of 2"x36"
pipe at intersection of fences N. -
E & W.



Set Standard Conc. Monument

Marke



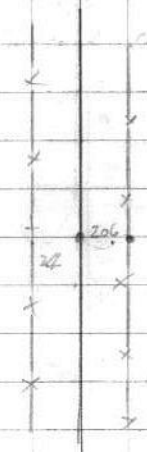
Humphrey
Johnson
Ogle
Kopf

21 July 1965

(N 1/64 Cor of SW 1/4 on W Line Sec 28) 37
27

South 1/64 Corner - of 1/4 Sec Line
between Sec. 28 & 29 T1N R18E
July 10, 1962
Found 1 1/4 pipe Witness East
20.6 according to B. Dale Survey
1939.
Drove 1" x 20 pipe for Corner

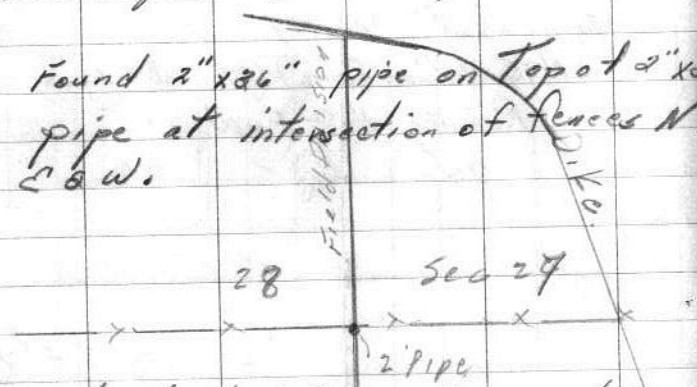
Page 261 - Book 2
Est. by Dale



36 1/4 Sec Corner between
Sec 27 & 28 T1N R18E
Found 2' pipe Set by Don Dale
Book 2 - Page 261
July 10, 1962
Witness ~~1/2 x 30 Rebar~~ Conc w/c 33 West
~~1/2 x 30 Rebar~~ Conc w/c 33 East

1944 - Ben Dale found Iron Pipe but
said He had no record of Pipe
Being Set for Corner - C.B. & Q. R.R.
used Pipe in Describing Land Purchase

Found 2"x36" pipe on Top of 2"x36"
pipe at intersection of fences N.-
E & W.



Set Standard Conc. Monument

Marke

5	5
28	27

1/4 Cor

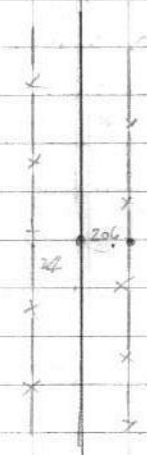
Humphrey
Johnson
Ogle
Hopf

21 July 1965

(N 1/64 Cor of SW 1/4 on W Line Sec 28) 37 27

South 1/64 Corner - of 1/4 Sec Line
between Sec 28 & 29 T1N R18E
July 10, 1962
Found 1 1/4 pipe Witness East
20.6 according to B. Dale Survey
1939.
Drove 1" x 20 pipe for Corner

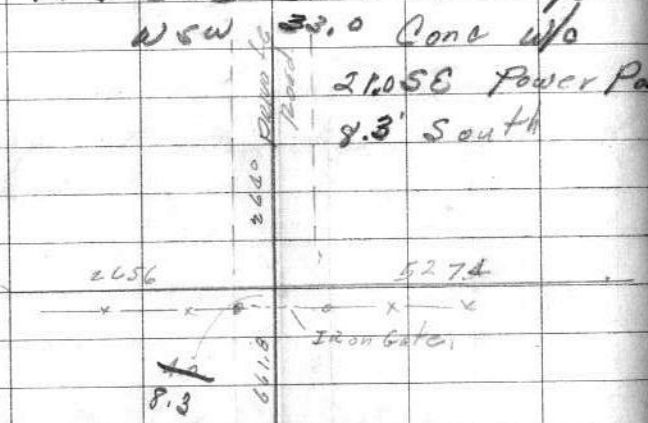
Page 261 - Book 2
Est. by Dale



1/4 Sec Corner between
Sec. 28 & 29 T1N R15E.

Found Corner established by
Frank Morris who returned
Survey by B. Ogle in 1939
Recorded in Book 2. July 10, 1962

Found 1/2" X 18" Rebar - Set Standard
conc. Monument for Corner & Rebar
on N. Side
Tied ESE 23.0' Conc. w/c
WSW 33.0 Conc w/o
21.0 SE Power Pole
8.3' South

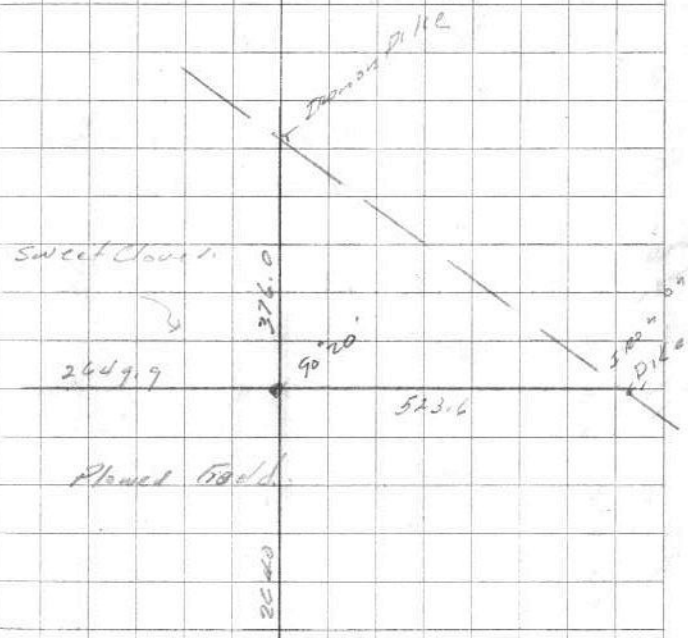


Humphrey
Ogle
Larson

22 July 1965

Sec Corner between Sec 20-21
28-29 T1N R15E
Found Corner established by
Frank Morris using measurement
Distances from South & West.
Drove 1 1/4 x 30" Pipe for Corner.

May 3, 1962



Sec. Cor 17-18-19-20 T1N R18E

Found pipe Re-est by B Dale

Book 2 page

July 9, 1962

Witness 8" C Fe Post SW 55.4

5" West gate post SW 65.6

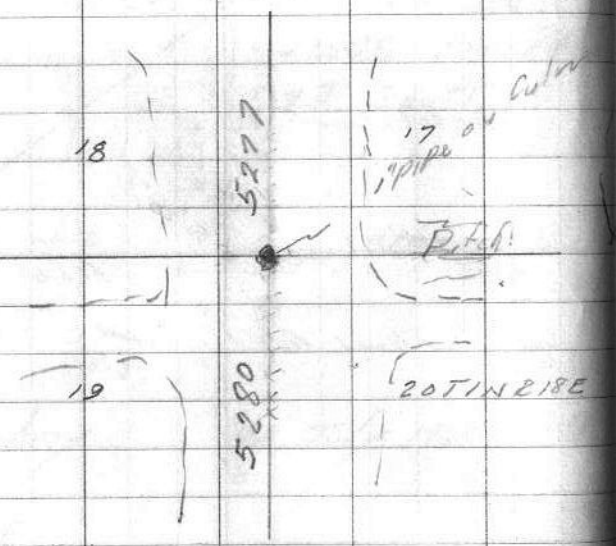
1¼ (2) west of W Gate Post 66.4

~~Witness with ½ x 30" Round Rebars~~

~~466 NE &~~

North Gate post Conc. Post SE 42.3

See Page 115 for Knew Corner Ties



¼ Sec Cor between Sec. 20 & 29 T1N R18E

Established on line & Midpoint

Dep 1¼ x 20' Pipe for Corner

~~Witness with ½ x 20 Rebars 33 E~~

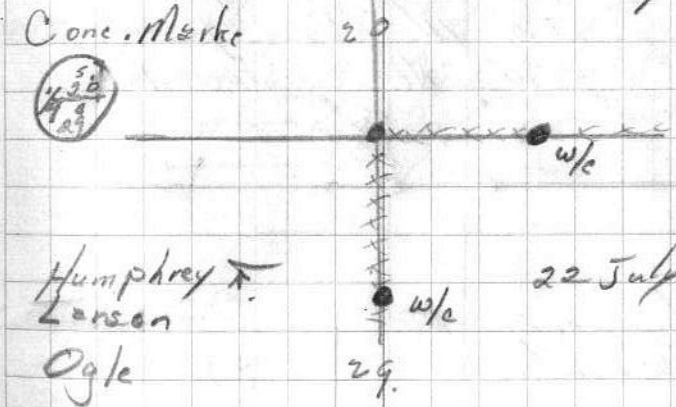
~~and 33 South~~

May 3, 1962

Set Standard Conc Mon. on N. Side of Pipe - 5" "T" fence Post on West side -

Tied: South 32.0' Conc w/c

East 33.0' Conc. w/c



Humphrey T. Larson

Ogle

22 July 1965

Sec Corner between 19 & 20
29 & 30 TIN R18E
I found Corner established
by Frank Norris who
used proportional Measurement
Witness 33.0' West Conc. W/C
May 3, 1962
Set Conc. on N. Side 1½" x 30"
Pipe. Conc. Had Brass Cap in
Top which read State of Nebr. State
Surveyor-Survey Marker. 19/20 30/29

Tied 46.6' NE Conc W/C
46.6' NW Conc. W/C
33.0' W Conc W/C 4"x4" sq.
25.0' ENE Cor. Fence Post

Humphrey
Johnson
Larson
Ogle

14 July 1965

East 1/16 Cor of SE 4 of
Sec 27 TIN R18E

Established on Line
This stone was Removed in
1933 and Axle driven. In 1934
Road was built and Axle driven
down - Road since cut and
Axle gone. Berry say the corner
in line with Fe East
Drove 1" pipe 3' long for
Corner and witness with 1" pipe
33.0 East & 33.0 West
Set Standard Conc. Monument on
N-Side of pipe Marked
Tied: 46.6 NE Conc. w/c
46.6 SE Conc w/c

July 10, 1962

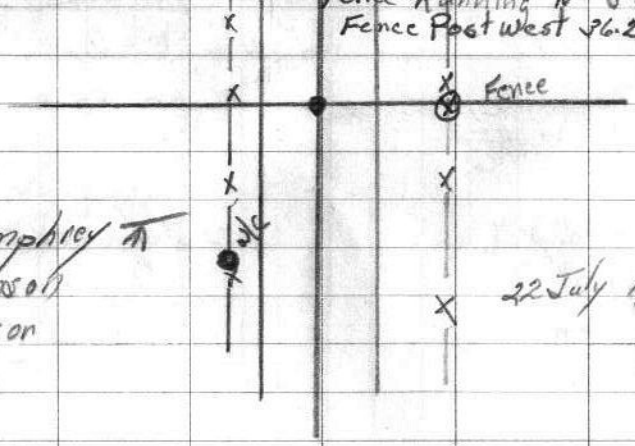
Humphrey
Ogle
Larson

22 July 1965

Sec Corner between
Sec 26 - 27 - 34 & 35
Found Limestone.
Witness N.W. Pipe 39.7
S.W. pipe 49.6'
Reset by B. Dale 1937
Book 1 page 242 July 11, 1962

Dug for stone with Grader - No stone found - Found 7/8" X 24" Rebar Believed to be corner as it fits measure as recorded by H. J. Morris
Set standard Conc. Marker Marked

Tied: SW 46.6 Conc. w/c
NW 46.6 Conc w/c
Fence Running N-S is East 26.2
Fence Running N-S is West 23'
Fence Post West 36.2'



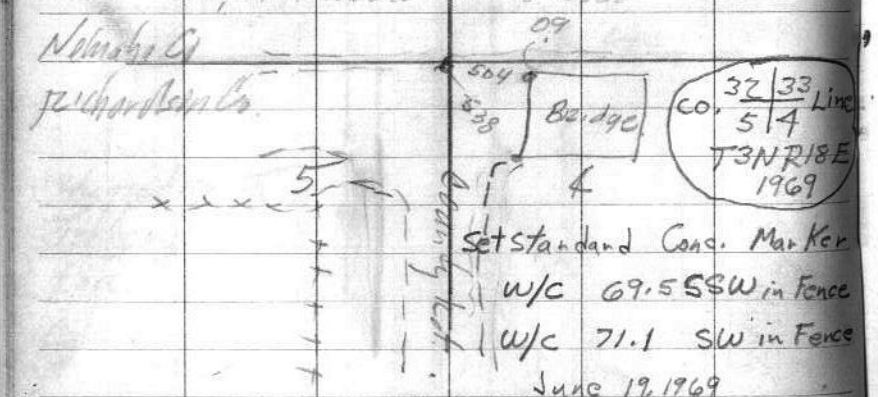
Humphrey
Johnson
Larson
Ogle

22 July 1965

T3N R16E

Sec Cor between Sec. 4-5
32-33 on Township Line
Found 1½ Pipe driven by Ben
Dale on So Side Original Stone.
Brought up with 1"x4' Pipe
and Witness. S SW. 100
WSW 100 with ½ x 24" Rebar
under Fence
Line of Bridge is So 0.9
Guard Angle Irons N. Rail
504 South Rail 538
Book 2 Page 114

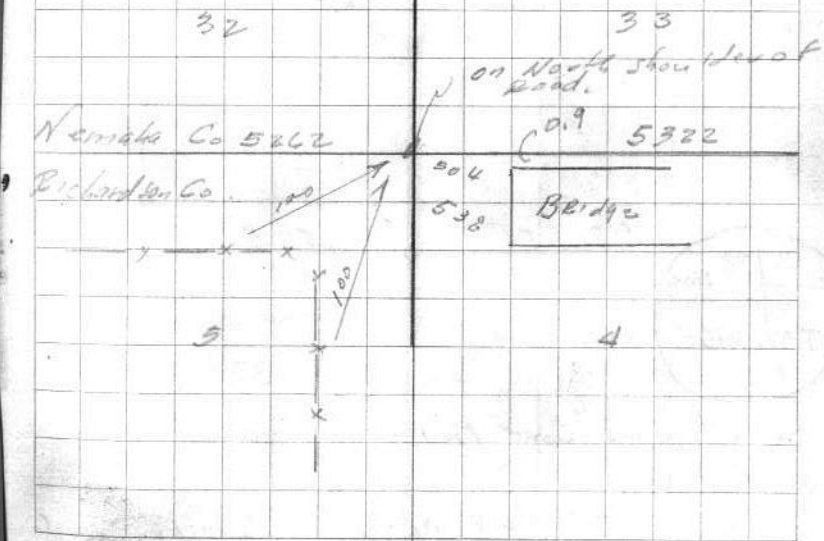
June 1962



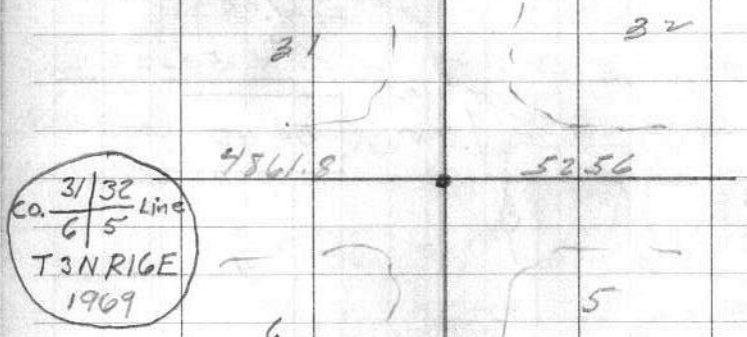
Same as 46

Sec Corner between Sec 32 & 33
T4N R16E on township Line
Found 1½ x 3' Pipe set by Ben Dale
South side of Original Stone 4'
under Surface. Brought up with 1" pipe
4' long.
Witness. ½ x 30" Rebar 100 SW.
½ x 30" Rebar WSW. 100'
Line of North Bridge Trust is 0.9 South
Guard Rail Angle Posts. North
Guard 504 South Guard. is 538
Richardson Co Records Book 2 page 114

June 1962



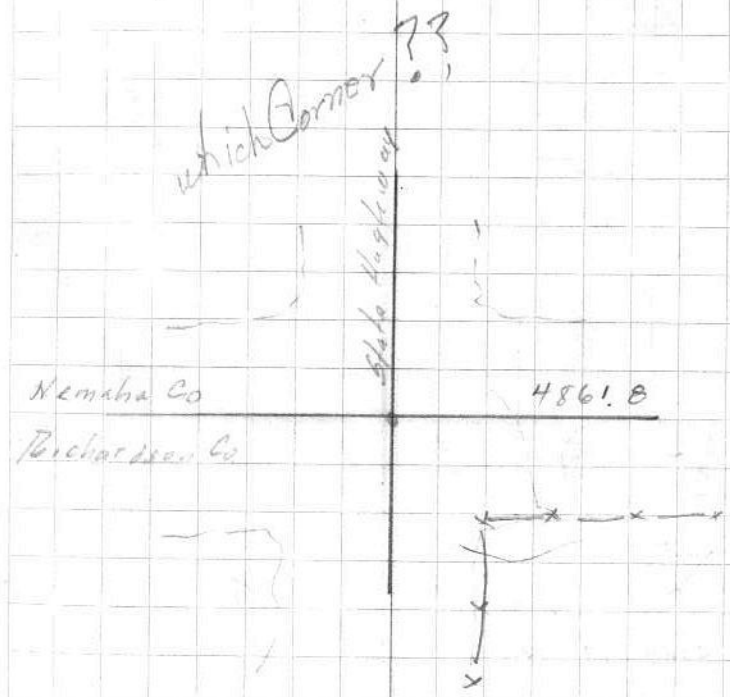
Sec Cor between Sec 31 & 32
on Township & Co. Line
Found PP Ties Used by Ben Dale
to preputate Original Corner and
check distances west from Survey
made by Stevensen. Also Checks
Survey made by Sh. who divided
sec. 6 by Error of splitting 4860.
Book C Page 390
Drove 1½ x 24" Pipe and
witness with ½" x 24" Rebars
SSW 100' WSW 100 Under Fence
PP NE 57.0
Brace P.P. NW 64.5
Telpole SW 48.0 June 1962



Set Standard Conc. Marker 6" Deep
Re tied

"x" Nails in P.P.	56.8	NE	June 19 1969
"x" Nails in B.P.	64.5	NW	
"x" Nails in T.P.	47.9	SW	J. Puls
"x" Nails in T.P.	54.5	SE	

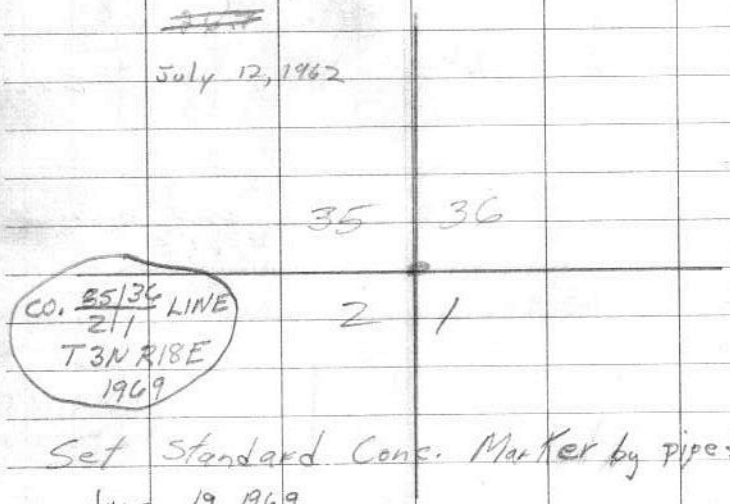
Sec Cor on Range & Township
Line
Found Witness Set by Stevensen
and Drove ½ x 24" Re bar for Corner
Wit. SE Nail in Co post 44.0
SW Center of PP 46.3
Telpole Anchor NW. 47.3
NE Angle Iron post 46.7



on county line
Sec 35-36 T4N R16E
Sec 1 & 2 T3N R16E
Found 1" pipe & Brick
Set by Lowson Application 378

Corner is by ~~[illegible]~~
Corner Fence post of Fence
running E & W and South
on North slope of hill in
among the Trees.
Ties, Triple 6" Box Elder. stump
4.0 S.W. ~~Oak~~ S.W. 25.8 Elm
~~[illegible]~~

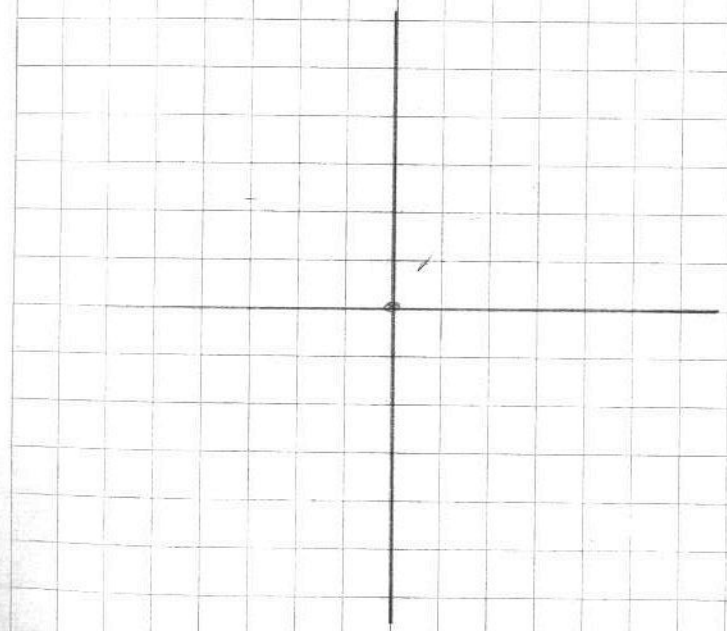
July 12, 1962



Set Standard Conc. Marker by pipe & stone
June 19, 1969
J. Puls

Sec 1/2 corner of SW of
Sec 36 on county line
T3N R16E
Found 3/4" pipe on west slope
in old Fence line 8" Oak
4.5 North East Hampton Trees
Set by Lowson Applic 378

July 12, 1962

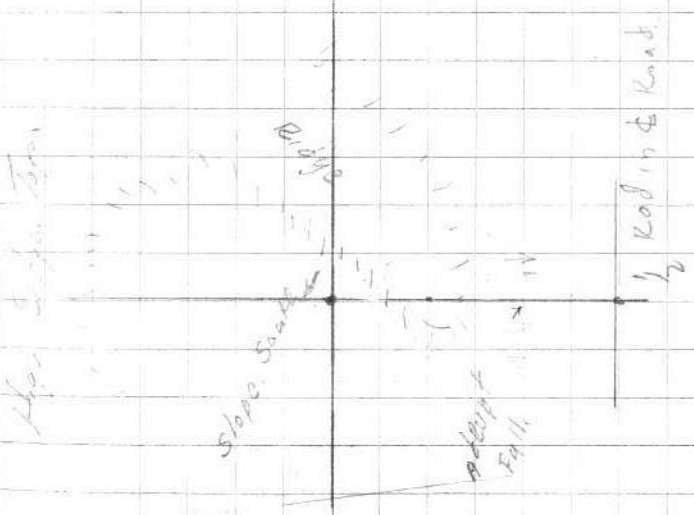


North 1/16 Corner of SE¼
of Sec 30 T 1 N R 18 E
Found Brass Cap set 1927
U.S. Survey

Blazed Trees
14" Oak bears N 63° W. 35 lks
18" Oak bears S 46° E 93 lks

July 26, 1963

C E 1/16 C
536
1927



west 1/16 cor of SE¼ of
Sec 25 T 1N R 18E

Found original Limestone

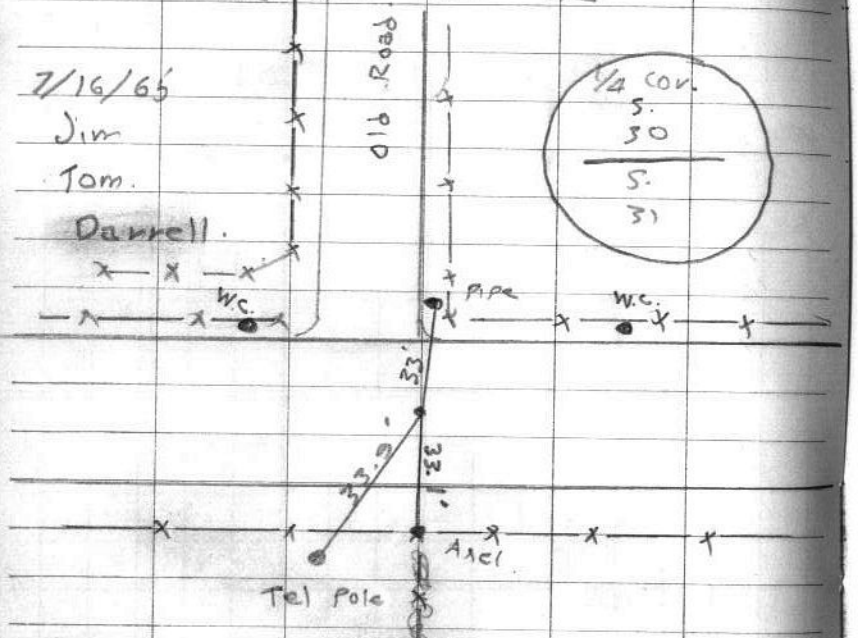
Tied South 5.0 to 30" Blazed
Elm. NE 11.0 to 5" Stump

Drov. 3/4 F Iron on North
Side of
Sulyiqnal

58 1/4 Cor Between Sec's 30 & 31 T1N R18E

Found 1" Hub With Red Head in Top Tied 33' North 1" Pipe.
Tie 34.3 South Fits a Post.
Set Std. Conc Marker.
Found Tie 33' North 1" Pipe
Found Tie 33' South Axel
Tied Conc W.C. 46.6' N.W.
Tied Conc W.C. 46.6' NE

7/16/65
Jim
Tom.
Darrell.

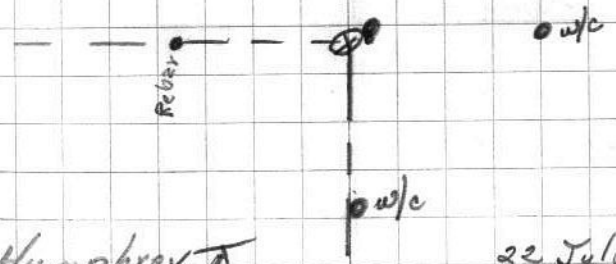


Dale Had Ties North and South in 1929 to original L. Stone - Recorded in old Survey Book Page 272 - County Surveyors office - Richardson County

N1/16 on West line Sec 24 T1N R18E

Found Well Point 1/2" x 2 1/2' on South side of original L. Stone 14 x 8 x 2 marked 1/16 on Side - 1/2" x 18 G.P. on North Side of Stone. Set Stone down and Set Standard Conc. Monument on Top of Stone. Set Well point on North Side of Stone & G.P. on South Side. Marked N1/16 Sec. 24 | Sec. 24

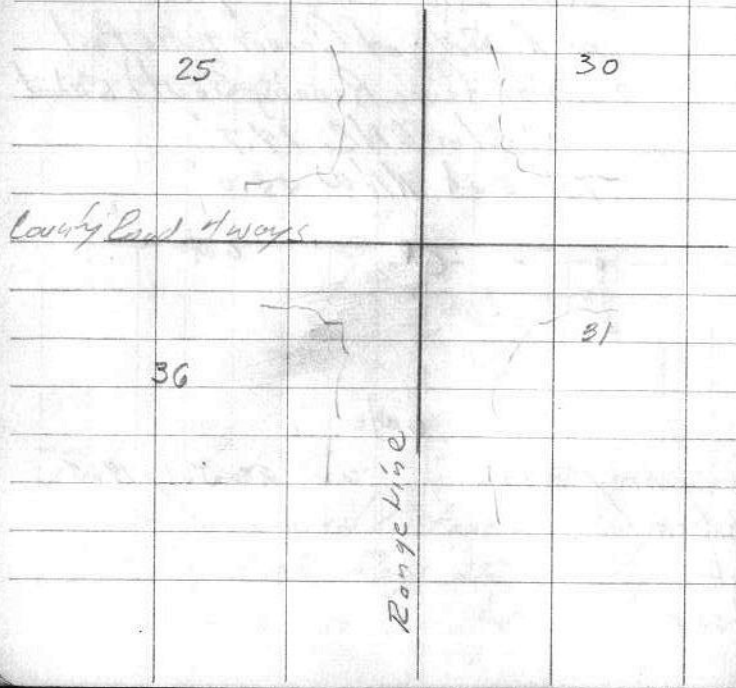
Tied: East 33.0' Conc. w/c
West 33.0' 1/2" x 24" Rebar
South 33.0' Conc. w/c
on N. Side of Corner fence Post with fence Running South & West
8" Elm ENE 14.7'
12" Oak NNW 33.0'



Humphrey
Johnson
Ogle
Larson

22 July 1965

60 Sec. Corner between Sec. 25, 36
T2N R17E and Sec. 30 & 31 T2N R18E
Found Lime Stone Blove 3 x 20'
Pipe for Corner.
Witness RR Spike in Cottonwood Tree 58.6 NW.
1/2 x 30" Rod NW 46
3/4 pipe SW 46
Nail top post corner 52.0 NE
april 19, 1962
See Page 117



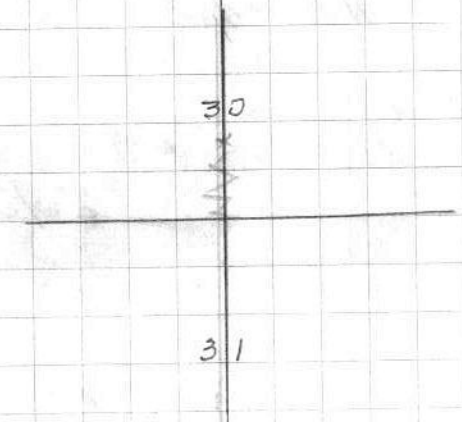
1/4 Sec Cor. between Sec 30 & 31
T2N R18E

Found 1" pipe.
Witness Fc post 3.3 South
and 1/2 x 30 Rebar 33.0 North
In line with Fence north

unkown who set 1" Pipe

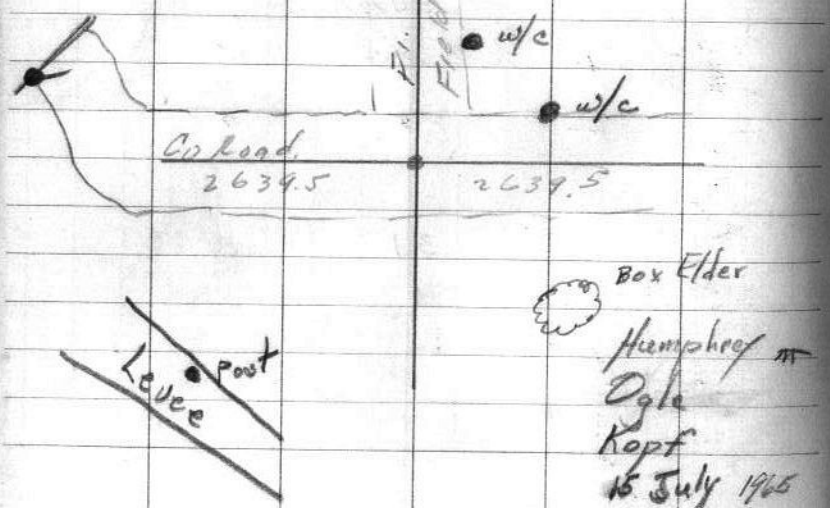
See Page 58 B

April 19, 1962



62

Sec Corner between Sec
29, 30, 31 & 32 T2N R18E
Found pipe 1" Established by
Frank Norris by proporational
Measurement. ~~Drove 1/2 x 30"~~
~~Re bar SW 46.6~~
Box Elder Tree SE 88.8
Inside Edge of South Bridge truss
W N.W. 380.2 April 19, 1962
Post on Levee S.W. 188.6
Set Standard Conc. Marker and
Set 1" pipe 26" Long on North Side
1"x24" pipe on South Side Conc.
Tied NNE 46.6' Conc. Marker
NE 46.6' Conc. Marker

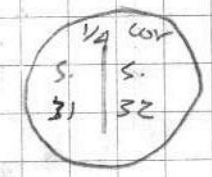


Humphrey
Ogle
Kopf
15 July 1966

63

1/4 Sec Corner between Sec
31 & 32 T2N R18E
Found witness pipes
33' West & 33' East.
In line with 1/4 Fence West
Corner is 1/2 x 30" Re bar
April 6, 1962
1936 - Book 2 P273
witness were made in 1936
when they had original corner
stone - Dale

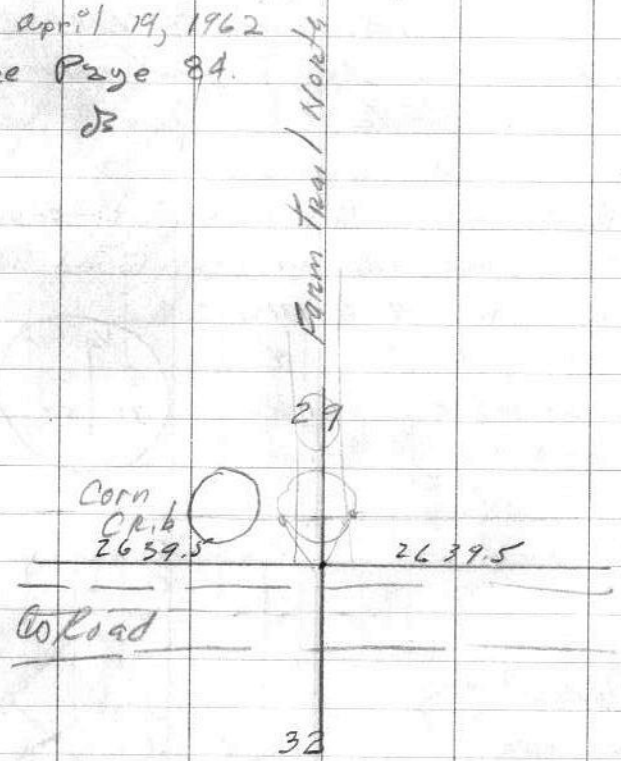
Found L.S. 16" x 15" x 6" on edge
Could NOT find rebar. Found WC's
Set W.C. 46.6 NW
Set W.C. 33' E
Set Std Conc Marker
on N. Side of Stone



7/15/65
Jim.
Tom, Dale.
Drew, Dick

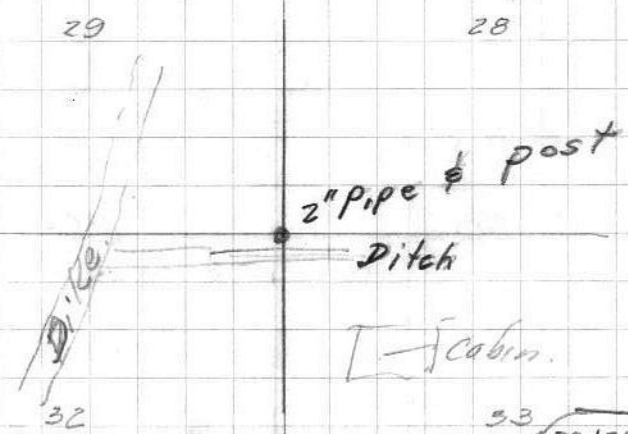
See Pg. 82
for sketch.

64 1/4 Sec Corner between
Sec. 29 & 32 T2N R18E
Found 1/2 x 30" Re bar
set by Frank Norris
Co Surveyor on Line
and Mid point.
Witness 1" pipe N W 37.2
" 1" pipe NE 30.3
April 19, 1962
See Page 84.
JB



Sec Corner between Sec 28-29
32 & 33 T2N R18E
Found 1" pipe Established
by Frank Norris Co Surveyor
Tied ~~1" Rod 33' North.~~
R.L.D. ENE 77.0
Cor. Cabin SE 159.5
Cor. SSE 136.2
Iron 2" Pipe Int point .05
71.5

April 12, 1962



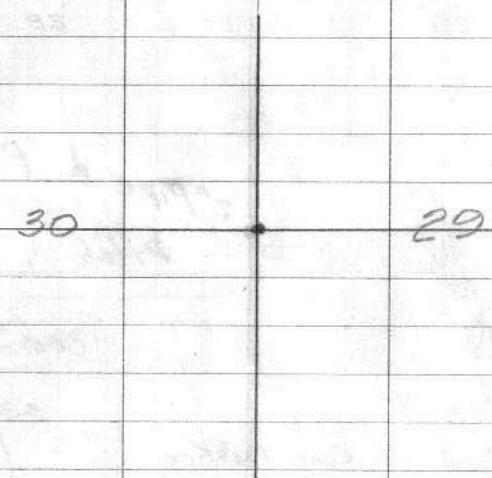
Set Stand and Conc. Marker
Blazed "X" nails in Tree 74.3 NE
Blazed "X" nails in Tree 91.3 SE

29 | 28
32 | 33
T2N R18E
1969

June 19, 1969
J. Puls

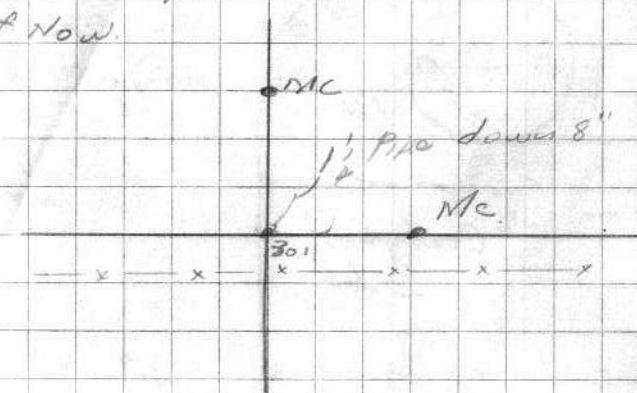
1/4 Sec. Corner between Sec.
29 & 30 T2N R18E

april 6, 1962
Found Iron Rod 2 1/2" Dia set by
Frank Norris County Surveyor
who established it on Line
and mid point between Sec.
Corners N & S.
No ties as in plowed Field
set 3/4 x 5' Pipe are corner
which is buried under plow
depth.



Sec Corner between Sec.
19, 20 29 & 30 T2N R18E

april 6, 1962
Found Pipe set by Frank
Norris County Surveyor
who Rerun Line from the
West.
Witness - SW 1/2 x 30" 33' in Fence
SE 33' and ESE 46.6
From this Corner both M.C. Corner
N & E could be Set but as them
Came in plowed field not set as
of Now.

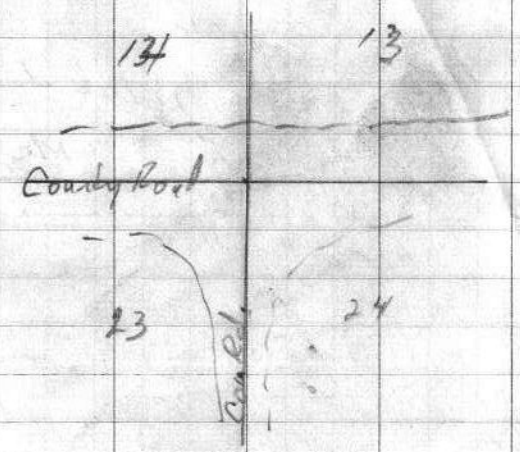


68

Sec Corner between
13-14-23-24 T2N R19E

Found Ties and Prove 1/2
x 30" Rebar for corner.
Set by Timmerman 1900 Book 2 page 196
Witness 1/2 x 24" Rebar NE 33.0
1/2 x 24" Rebar NE 46.6
End Culv. Pipe NW 28.0
P.P. SW 52.0
April 17, 1962

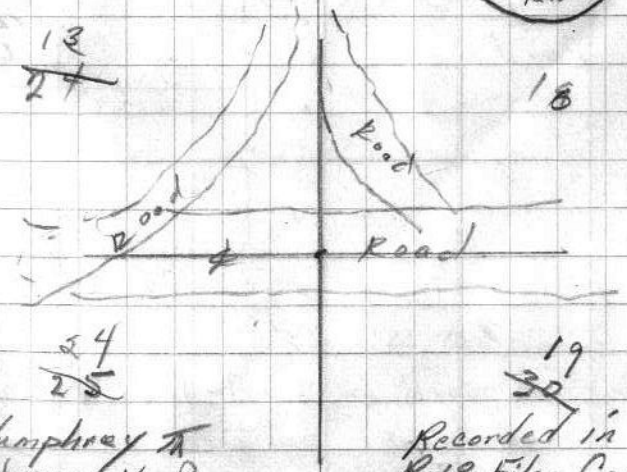
See Page 118



69

Sec. Corner between Sec. 13-24
T2N R19E and Sec. 19 & 18 -
T2N R18E

Found 3/4" x 30" Rebar.
Established by Frank E. Norris
Set Standard Conc. Monument for
Corner & 3/4" x 30" Rebar on N. Side
April 16, 1962
Witness. N W Iron T post. 48.9
~~1/2" x 24" Rebar 100' SW.~~
East-Guy post of Tele Line 32.0
P.P. SE 45.0
46.6' SE Conc. w/c
100.0 SW Conc w/c



Humphrey
Johnson-Kopf
Larson
Ogle
20 July 1965

Recorded in
R-18 Files Court House

Sec Corner 11 & 12 14, 13
T2N R17E.
Found Pipe set by B Dole
Book 3 page 156 who Found
Original Stone.
Witness - 1½ pipe 33 East
N W. 2" pipe 56.4
April 19, 1962

check with

No Ties could be found - June 19, 1969 - J. Pals

Sec Corner 12 & 13 T2N R17E
and 7 & 18 T2N R18E.

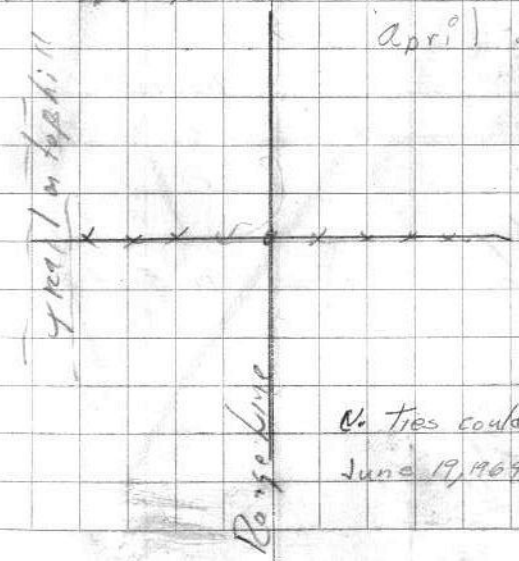
Found 1" Axle Set in
Fence Running East & West.

On East Slope a Hill.

Witness ¾ x 24" Rebar 33 west
¾ x 24 Rebar 33 East

Frank Norris - Book 2 - Page 196 -
Said - Axle good for line & distance
but No Record

April 26, 1962



No Ties could be found
June 19, 1969 - J. Pals

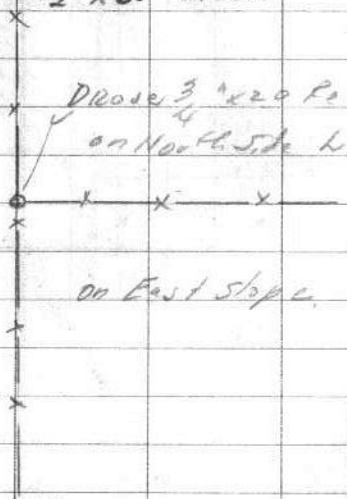
Sec Corner Sec. 1 & 2 - 11 & 12
T2N R17E.

Found original Limestone on
North side of Corner Fe post.

Witness 1/2 x 30 Rebar 23 East
33 E South.
6" Elm SW 10.3. April 24, 1962

Set Stand. Conc. Mon. on N side of stone
Marked

Tied N-33.0' To Conc. w/c
W-33.0' To Conc w/c
S 33.0' To 1/2" x 30" Rebar
E 33.0 To 1/2" x 30" Rebar



7' 11 12
T2N R17E

Humphrey
Johnson
Ogle
Kopf

21 July, 1965

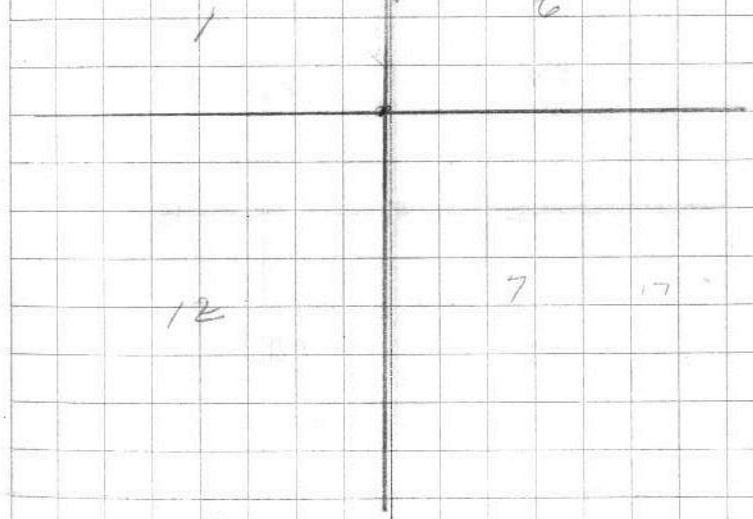
Sec Corner on Range Line
Sec Sec 13-24 T2N R17E and
Sec 18-19 T2N R18E

Found Pipe Re-est. by Ben Dale
1 1/2 Rod N W. 49.9
1 1/2 Rod SW. 56.2
N Gate Post 38.5 SE

Book 2 Page 196

Sec Corner on Range Line
Sec 1 & 12 T2N R17E
Sec 6 & 7 T 2 N R 18 E
Found 1" pipe April 24, 1962

Checked for Corner 9 April 1969
But Could Not Locate 1" Pipe. These
Possibilities falls in Plowed Field. M.C.
and ¼ Cor is West of this Point
which is considered by me as
a theoratic or proposed Corner.
Dayne A. Humphrey

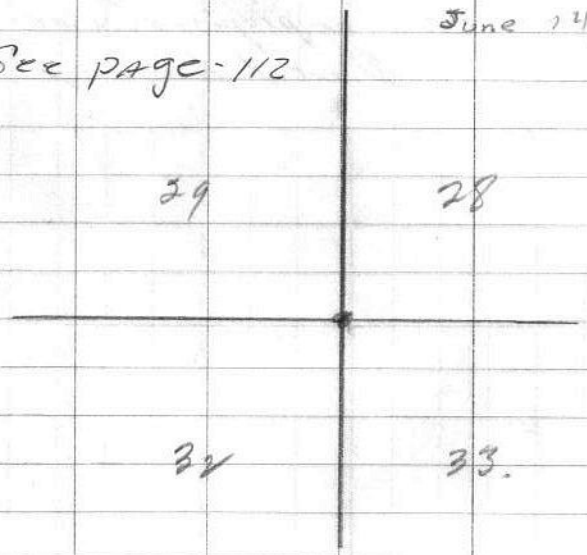


Sec Corner between 28, 29 - 32 - 33
T 3 N R 17 E

Found pipe.
~~Witness NW. SW cor HW 753~~
SW. P.P 6.8
NE close Corn HW 759

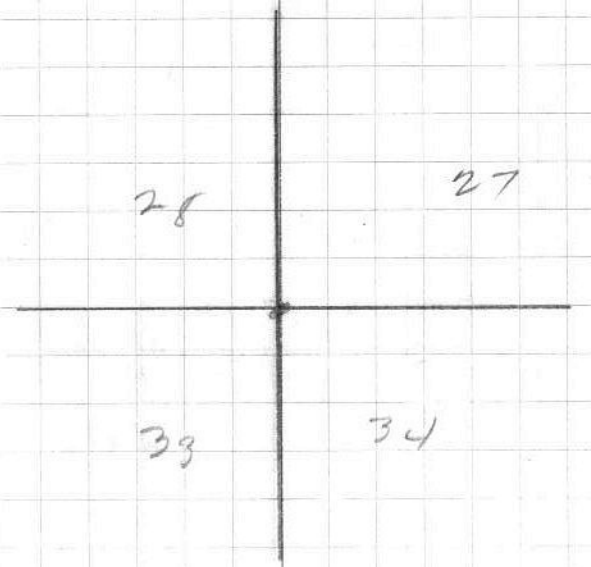
1928 - B.C. Dale & M. J. Turner
Found Red Granit stone - Set Pipe
June 14, 1962

See page - 112



Sec Corner. Sec. 27 - 28 - 33 - 34
T 3 N R 17 E
Found Limestone & pipe
Witness: SW. South End culv. 21.8
NE N End culv. 56.8
SE S End culv. 39.6

See Page 111

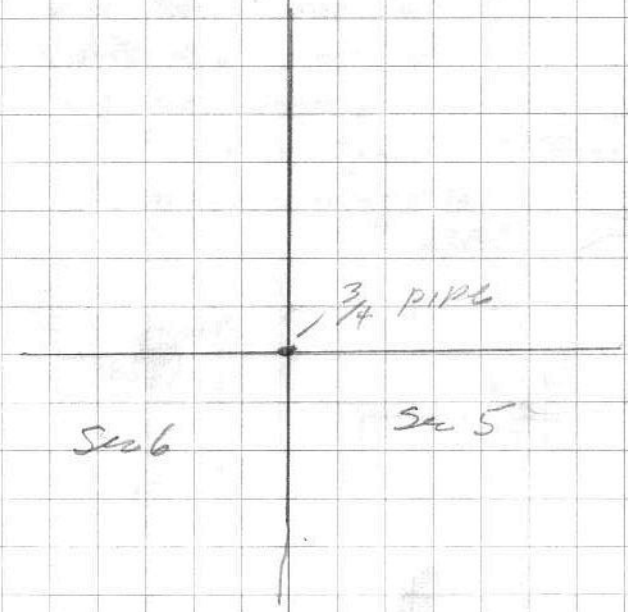


1/4 Sec Corner between 27 & 34
T 3 N 17 E

Found Pipe

No Record

Found MC Pipe Set by Lawson
Applied 378
Witness East 14" Elm 20.0
NW 6" Elm 8.0 used for Corner
post of Fence Running NW & SW
About 100 up from toe of
Bluff. (on Top Bluff curved
Fence South)
May 11, 1962



¼ Cor Between Sec 1 & 12 T2N R17E

Established by extending the fence line east from the Sec Cor of Sec 1, 2, 11, & 12 T2N R17E.

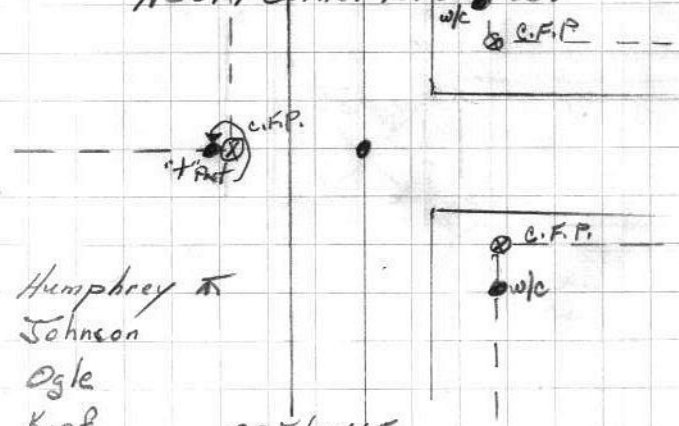
Set ⅝" X 30" Rebar

april 24, 1962
Tied NE 9.5' To Nail in C.W. Tree
SW 15.2' To Nail in Clump of Three Elm

NW Cor Sec 30 T2N R18E

Found "X" Gear Iron Post 33.0' West and ¾" X 24" Pipe in the corner - Set Conc. Monument in Place of Pipe and set pipe on N. Side of Conc. Conc. Marked

SE 48.0 Power Pole
33.2' West Corner fence Post
Tied NE 46.6' Conc w/c
SE 46.6' Conc. w/c
SE 41.5' Corner fence Post
West 33.0' "X" Iron Post (Gear)
NE 39.4 Corner fence Post



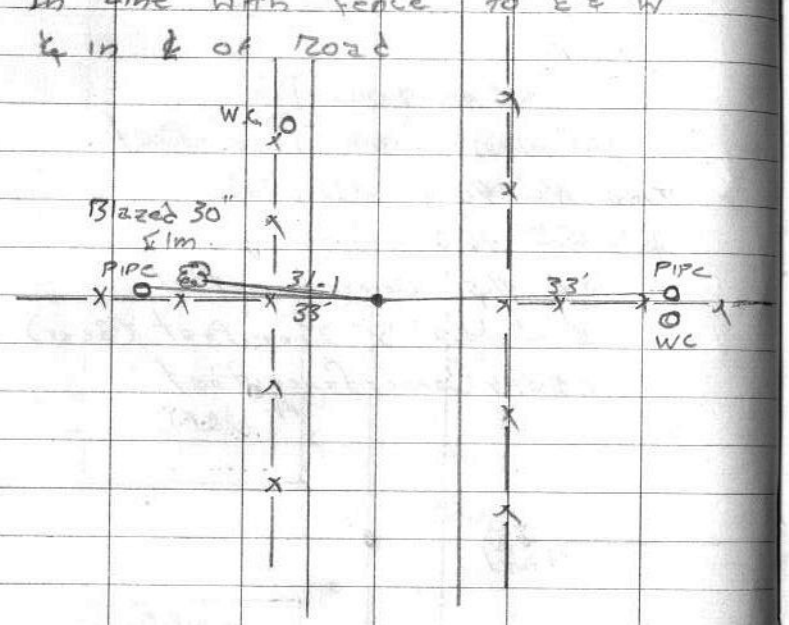
Humphrey
Johnson
Ogle
Kopf

20 July 1965

1/4 Cor Between Sec's 31 & 32
T2N R 18E. See Pg. 63.

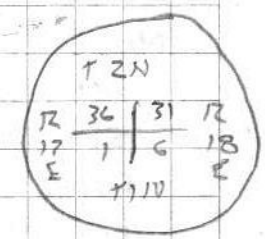
april 6, 1962

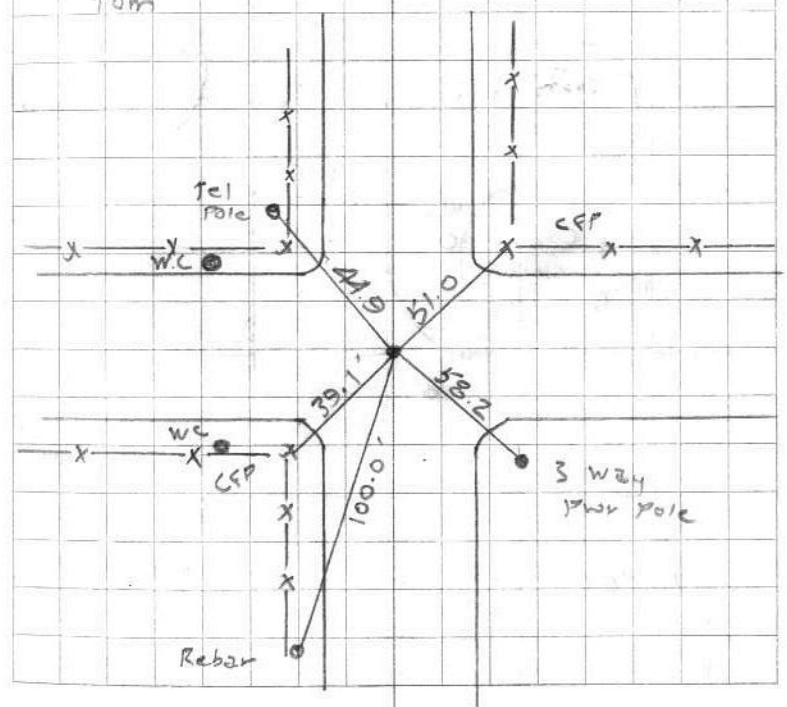
In line with fence to E & W
¼ in ¼ of road



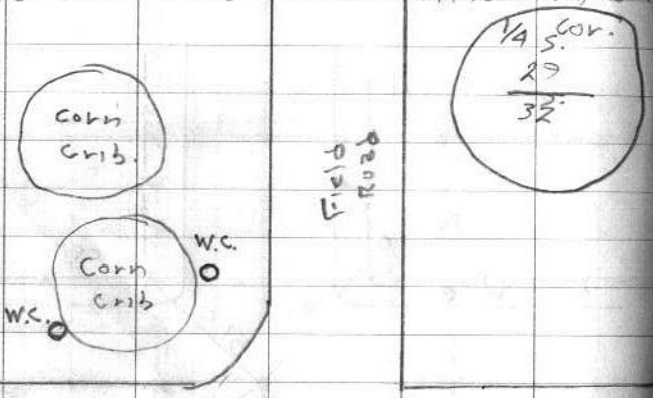
Township Corner Between T1N & T2N
R17E & R18E Sec's 31, 36, 1 & 6

Found 2" Pipe 6" Long
Hexagonal Axel 12" Long 1" dia.
Set 5/8 conc Marker.
Set conc W.C. N.W. 46.6
Set conc W.C. S.W. 46.6
7/15/65
Jim
Drew
Tom





84 1/4 Cor Between Sec's
29 & 32 T2N R18E
Found 1½" Pipe 2½' Long.
½" Rod 2' Long bent on end.
Set Std. Conc Marker for
Corner Put Pipe & Rod on
North side of Marker
Set W.C. conc. 33' N.
Set Conc WC. 33' NW.
Found 1" Pipe N 30.7'
Did Not find other Witness Pipe.



7/16/65
Jim
Tom.
Darrell

North 1/16 of NW Sec 6 T3N R17E

Replaced using line and distances of Lawson, also his Two points

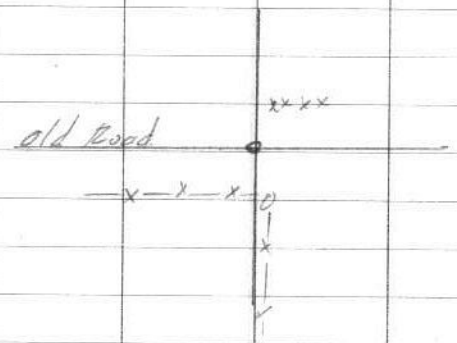
May 1, 1962

Drove 1 1/4 pipe for corner. 2' west of Fence Running South

Corner post SE 14.2

Post NE 16.0

on West Slope of Hill.



1/4 Sec Corner between Sec 1 & 36 on County Line

Found 3/4" pipe Set by Lawson Applic 278.

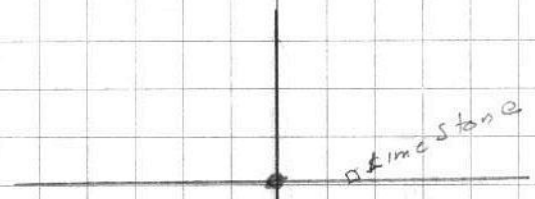
on North Slope

Witness 24" Elm NW 11.0

20" oak WNW 27.5

Found 18" x 13" x 6" Lime Stone upright. East 21.6

May 1, 1962



S 1/16 Corner of SE¼ Sec 36
T4N R17E

Found ¾" Iron Pipe Set
by Lawson Applic. 378.
on West slope near bottom
of Draw
Witness 24" Elm NW. 6.0
24 Oak W. 46.0
20" Elm W. 38.0

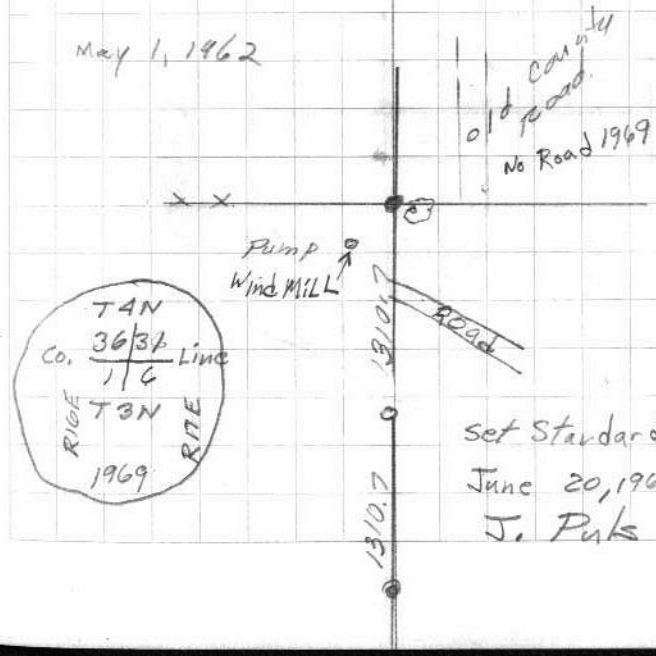
May 1, 1962

Sec Corner Sec 1, 6, 31 & 36
Ts 3 & 4 N Rs 16-17E

Found Brick after Extending
Line from South from ¼ Sec Cor.
over 1/16 Corner.

Witness SW. Pump 39.7
North 4" Elm 27.0
30" Elm 3.7 SE.
Drove ¾" Rod and Buried
brick on North Side
Marked H. N 1962

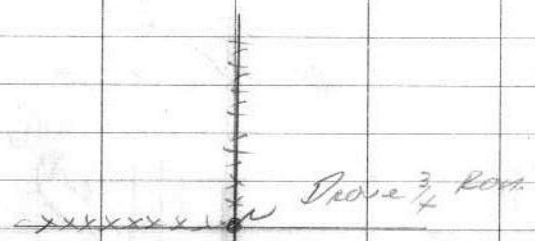
May 1, 1962



set Standard Conc. Marker
June 20, 1969
J. Puks

1/4 Sec Corner between Sec
1 - 6 - T3N R17E

Found Brick (pipe gone)
Set by Lowson Application 378
April 5, 1962
A 30" Linden tree is S81°W
5.3'
This tree was used for Original
Gov. Corner Lowson in Strait
Line Established it over 5.3 to the East



Narner is 1' North & 06
East of Corner post

West 1/16 Cor of NW 4 Sec 6
T3N R 17E

Found 3/4" Pipe Set by Lowson
Application 378

~~Witness 20" Elm N.W. 17.8'~~
on North side Fence Running
E & W 27' West of Curved
Fence Running South

April, 5, 1962

Set Standard Conc. Marker
June 20, 1969
J. Puls

S 1/4 Sec Corner Sec 35-3-17

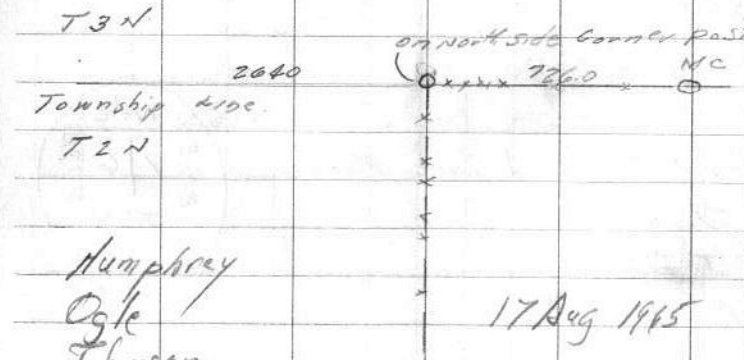
Found original Limestone
14 x 9 x 4

May 4, 1962

Drove 1/2 x 30" Rebar on north side
of Limestone

Set Standard Conc Mon. on N.
Side stone Marked 1/4 T3N S.35 / S.2 T2N R17E

Tied: East 33.0' Conc. w/c
South 33.0' Conc w/c



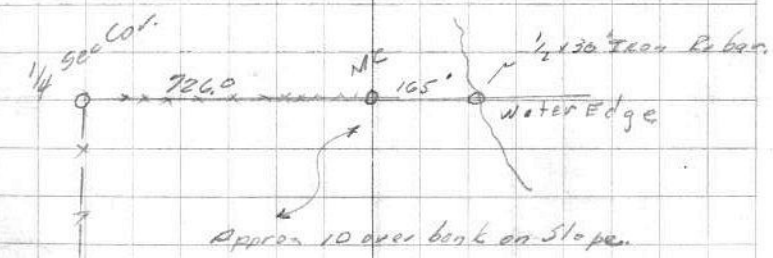
Humphrey
Ogle
Johnson
Larson
Umburger

17 Aug 1965

Meander Corner between Sec 35-3-17
and Sec. 2 T2N R17E

Found original limestone
24" x 10" x 4"

May 4, 1962
Drove 1/2" x 30 Rebar on North side
of Lime stone
Set Stand. Conc. Mon. on N. Side
Stone & Rebar
Tied 33.0' West Conc. w/c
50.0' NW Conc. w/c



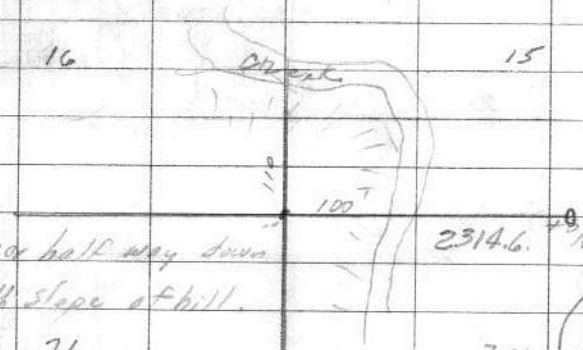
Humphrey
Ogle
Johnson
Umburger
Larson

17 Aug 1965

Sec Corner between Sec
15-16-21-22 T3N R17E

Found 1" pipe & limestone
Set by Deputy State Surveyor
Dawson Application # 378

Witness -
Blazed 12" Walnut NW 28'
~~Blazed 12 Elm N 17.0~~
~~Blazed 8 Oak SE 7.0~~
~~Blazed 6 Elm SW 13.0~~



Corner half way down
North slope of hill.

16 | 15
21 | 22
T3N R17E
1969

May 2, 1962
Blazed Tree 32.6 W
Blazed Tree 30.4 SW
Stump 14.6 E

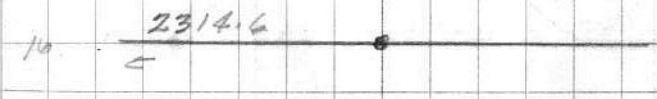
Set Standard Conc. Marker
June 20, 1969
J. Pulz

Meander Corner between
Sec. 15 & 22 T3N R17E

Found 3/4" Pipe
of Dawson Survey Application # 378

Dug Conc. Marker 6"x6"x3'.
Witness
1/2 x 30 Rebar 100 SE under Fence
1/2 x 30 " " 100 NE under Fence
Fence North & South 77 East.
36" Oak Bears West 30.0'

May 2, 1962



Sec Cor. between Sec.
9-10-15-16 - T3NR17E

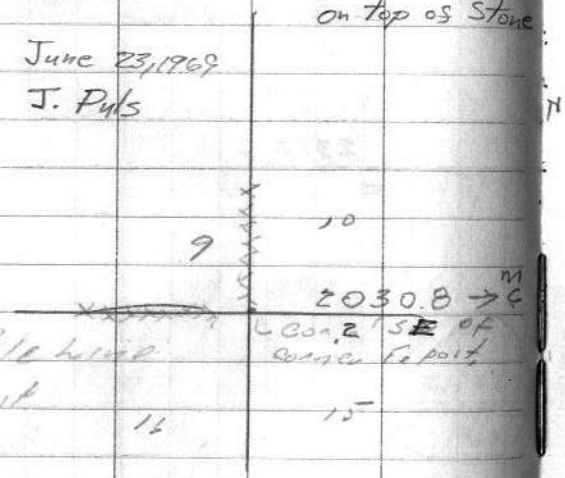
Found 1/4 pipe set by Lawson
Application 378
Brought up to surface with
1/2 x 30 re bar and set 1/2 x 30 re bar
33' North & 33' West under Fence

May 1, 1962

Set Standard Conc. Marker in place of rebar
on top of Stone

9/10
10/15
T3NR17E
1969

June 23, 1969
J. Puls

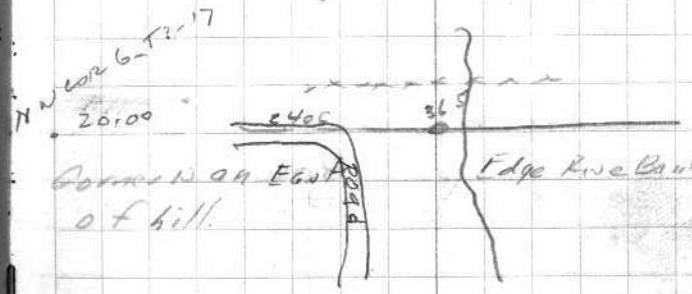


2' North of Pole line
Running East

Meander Corner on County
Line. (County Line) Township Line
East side North Side
1" Iron & Brass
Found M.C. Corner set by
Lawson Application 378.

Witness 33' North 1/2 x 30" re bar
33' East 1/2 x 30 Rebar
Blazed Elm NW 13.8
" " SW 11.0

May 1, 1962

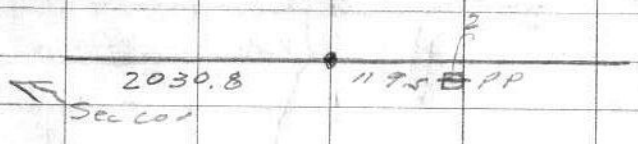


Set Standard Conc. Marker beside pipe
June 20, 1969

J. Puls

T4NR17E
M.C.
Co. Line
T3NR17E
1969

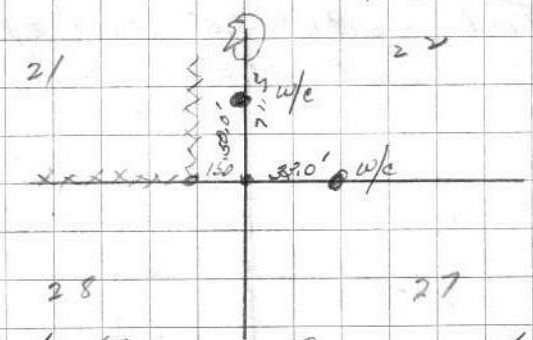
Meander Corner
between Sec 10 & 15 T3N R7E
West East Corner distance
and dug about 1' below sand
and Found Rotted Cedar post
believed to be original as in
notes.
Drove 2 - 1/2 x 30" Rebars for
Corner. Power pole East 119.5
and South 2' of Pole line
This comes in Plowed Field
May 2, 1962



Joel W

Sec Cor. 21-22-27-28 T3N R7E

Found 1/2 pipe and Brick set
by Lawson Appl 378.
Brought up with 1/2 x 30 Rebar
Witness.
Blazed Maple Tree 24" 71.5 North
1/2 x 30" Re bar 33 west
1/2 x 30" Rebar 46.6 N.W.
Corner Fence 15.0 West
May 9, 1962



Set Stand Conc. for Corner & Set 1/4" x
36" pipe on South Side Conc brick
South of pipe
Tied 33.0' East Conc w/c
60.0' North Conc w/c

Humphrey
Johnson
Ogle
Larson
Umburger.

18 Aug 1965

108

North 1/16 Corner of NW Sec
27 T 3 N R 17 E

Found 2" Pipe.
Set by Ben Dale who established
it on True East and Gov.
bustance - May 9, 1962

Set Stand. Conc. Marked
W1/16 5.22 / 5.27 on North Side 2" pipe

Tied South 33.0' Conc w/c
East 33.0' Conc w/c

1326.0

Humphrey
Johnson
Ode
Larson
Umburger

18 Aug 1965

East 1/4 of SE¼ Sec. 9 - T3NR17E

May 2, 1962
Found 1/4 Pipe and Brick
Set by Lawson 1927 Application
378
Set witness 1/2 x 30" Rebar 33 East
1/2 x 30" Rebar 33 South

Set Standard Conc. Marker on top of Brick
June 23, 1969 J. Puls

S1/16
9/10
T3NR17E
1969

Corner 1' North
2' West
of Cor post

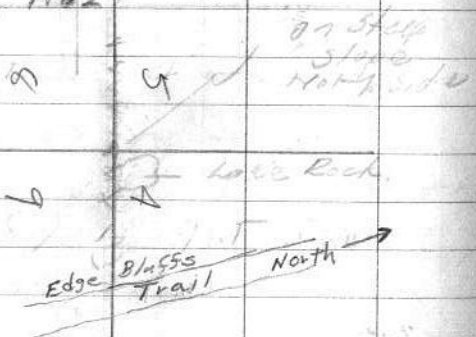
To Sec Corner
1324.0

Sec Corner between Sec
4, 5, 8 & 9 T3N R17E

Found Brick Set by Lawson
Applic 378 in 1927
County Records Book 2 page 223
Set witness in Fence Line
33' W & 33 E with 3/4" Re bars 30"

Set 1' Pipe for Corner and
brought up with 1/2" x 30" Rebar
Additional Ties.
x on Rock E 17.0
x on Rock ESE 18.7
Fence Running E & W is 9.7
south of corner

May 8, 1962



5|4
8|9
T3N R17E
1969

Set Standard Conc. Marker on top of Brick
June 23, 1969 J. Puls

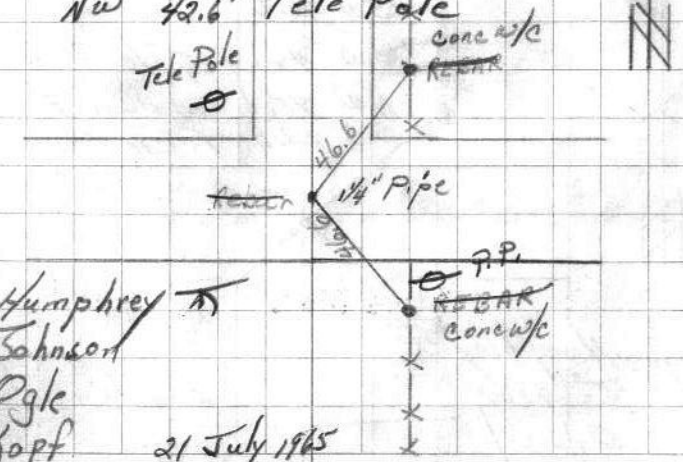
Sec. Cor Between 28, 27, 33, 34
T3N R17E

1961 - B.C. Dale dug 6' Hole
with dozer & uncovered stone 10"x9"x12"
Set 1 1/4"x5' pipe by stone 5/8"x10"
Rod by pipe
Book 2 - Page 238
Found 1 1/4" Pipe 3 ft deep - Set
Conc. Mon. on Top of Pipe Marked

28|27
33|34
T3N R17E

Note: H.J. Norris Rebar 1.0'
N.E. of Pipe - Pulled Rebar &
also Tie Rebars -

Tied NE 46.6' Conc w/c
SE 46.6 Conc w/c
SE 43.5 Power Pole
NW 42.6' Tele Pole



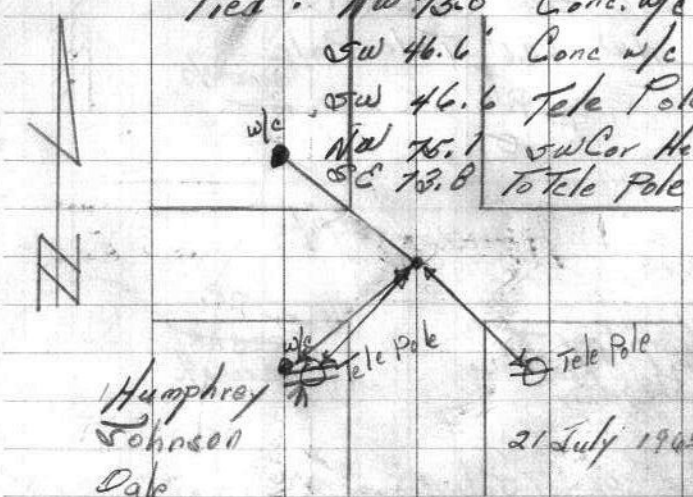
Humphrey
Johnson
Ogle
Kopf 21 July 1965

Sec. Cor Between 28, 29, 32, & 33
T3N R17E

B.C. Dale (8-13-61) Set 5/8"
Bolt on Top of Pipe 1½"
Book 2 Page 239

-See Page 76 This Book
Note: (No Stone found)
Found 5/8" Bolt on Top of ½" x 20" Rebar
That was on Top of 1½" x 26" Pipe - Lowered
1½" Pipe & Set Standard Conc. Mon. on
Top of pipe - Set Rebar & Bolt on
N-Side of Conc. June 14, 1962

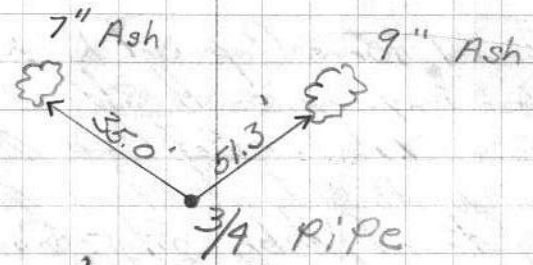
Tied: NW 75.0' Conc. w/c
SW 46.6' Conc w/c
SW 46.6 Tele Pole
NW 75.1 SW Cor Head Wall
SE 73.8 To Tele Pole



Humphrey
Johnson
Ogle
Kopf

21 July 1965

¼ Cor Between Sec. 8 & 9
T3N R17E



Est Void

Set 3/4" Pipe

Tied: 35.0' NW TO
7" Ash

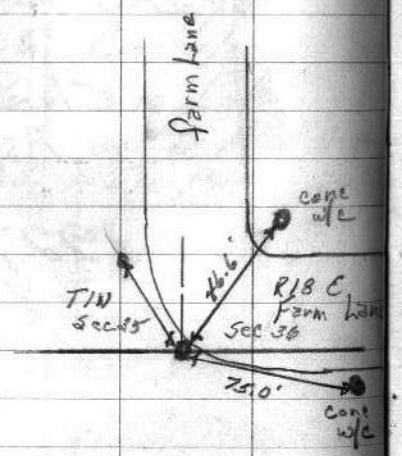
51.3' NE TO 9"
Ash

1927 (Lawson's Ties)

Sec Cor. Between Sec 35 & 36
T1N R18E - On Nebr. & Kansas
Line

Found Brass Cap Set by Knowles
Aug 1927. on South Side of Limestone
10"x8"x1½' . - Set Cone Monument
on North Side of Stone Marked
State of Nebr. - State Surveyor -
Survey Marker. S. 35 | T1N R18E S. 36 in Brass
Cap..

Tied C.S.C. 75.0' To Conc. W/C
N.C. 46.6' To Conc. W/C



Humphrey
Johnson
Ogle

14 July 1965

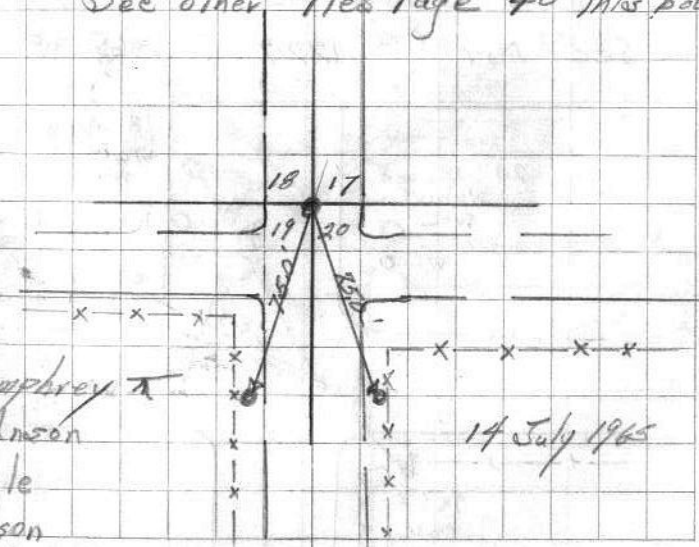
SW Cor Sec 17 T1N R18E

Dug for Corner but couldn't find pipe
Ties all checked same location -
Set Conc. Monument Marked State
of Nebr. - State Surveyor - Survey
Marker

S 18	S 17
S 19	S 20

T1N R18E

Tied SW 75.0' To Conc. W/C
SE 75.0' To Conc. W/C
See other Ties Page 40 This Book



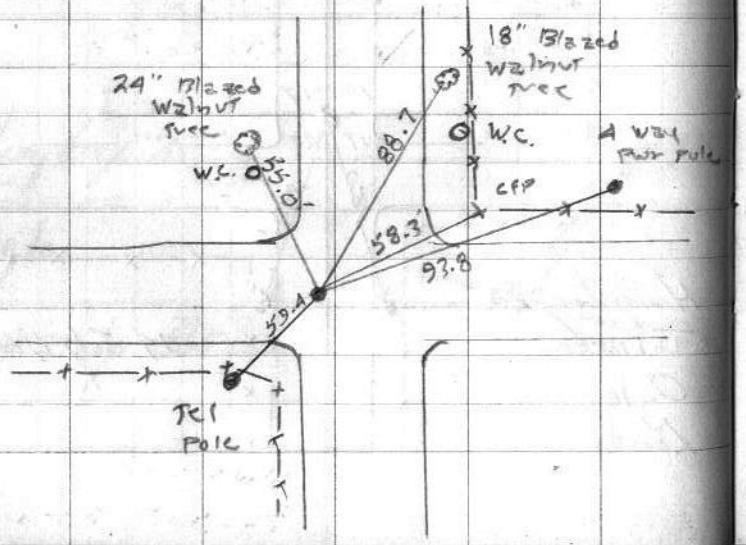
Humphrey
Johnson
Ogle
Larson

14 July 1965

Cor Between Sec's 31 & 32 T21N
5 & 6 T1N R18E
Dug out Ben Dale's Corner
Found 3/4" x 2' Pipe over
1/2" x 2' Pipe set Both
Pipe Below Std. Conc Marker
Marked
7/15/65
Jim.
Drew.
Tom.
Dick.

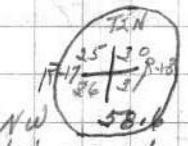
Set Conc W.C. NE 75.0'
Set Conc W.C. NNW 46.6'

See Appl. # 1227, 1965 WB

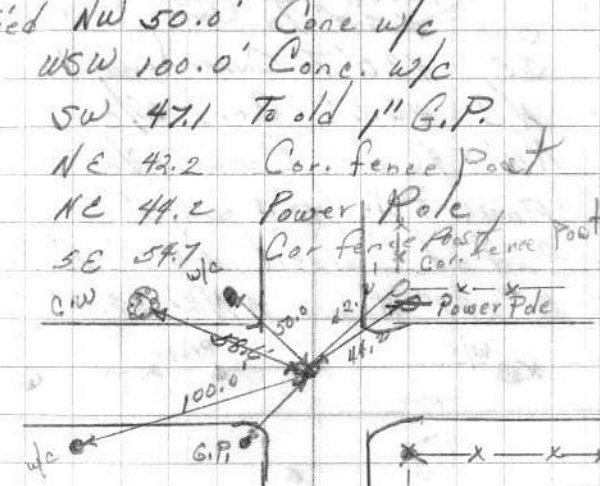


NW Cor Sec 31 T2N R18E

Dug for L. Stone - No stone found - Found 3/4"x20" Pipe in 2" Sleeve over hexigon shaft 2½' Long. Set Standard Conc Monument and put sleeve and shaft on N. Side - 3/4 Pipe on South Side - Monument Marked



WNW Cottonwood Tree 30"
Tied NW 50.0' Conc w/c
WSW 100.0' Conc. w/c
SW 47.1 To old 1" G.P.
NE 42.2 Cor. fence Post
NE 44.2 Power Pole
SE 54.7 w/c Cor fence Post
CW



16 July 1965

Humphrey M
Johnson
Larson

Dale Est. on Line & Prop. Measure N-S.
Recorded in R17 File County Surveyors Office

NW Cor Sec 24 T2N R17E

Found 1/2" X 30" Rebar on Top of 8" spike which was on Top of old Rod 12" x 1/2" which was on Top of caste Iron window weight and old post. Set Standard Conc. Monument for corner Marked : other Items on North Side of Stone

14	13
23	24

T2N R17E

SW ~~45.3'~~ To Corner fence Post

Tied SE 49.0' To Corner fence Post

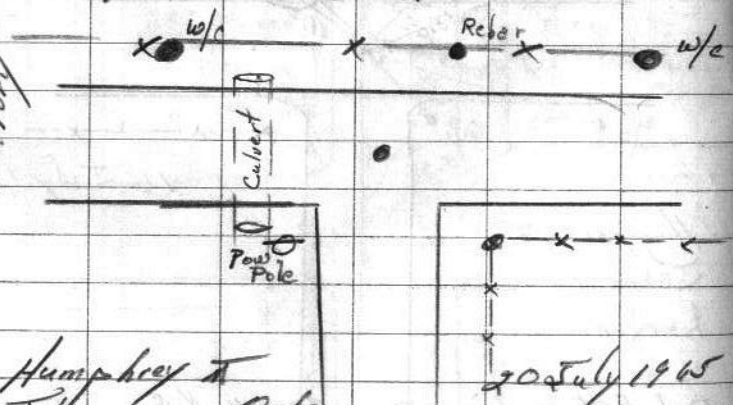
NE 46.6' Conc W/c

NW 46.6' Conc. W/c

Power Pole SW 52.0'

End of Culvert 28.0' NW

1/2" x 24" Rebar NNW 33.0'



See Page 68 for History

Humphrey II
Johnson - Ogle
Larson - Kopf

20 July 1965

Point (Rebar) in ℄ Road
w/c (conc.) 33.0' West ℄ on
Line

1927 M.C. 173.8' East of ℄
of Road Stand Conc. Mon.
Marke TIN RAE Sec 31 M.C

M.C. In Slough Nothing Set
Set w/c on Line 100.0' West

Fred Shaw

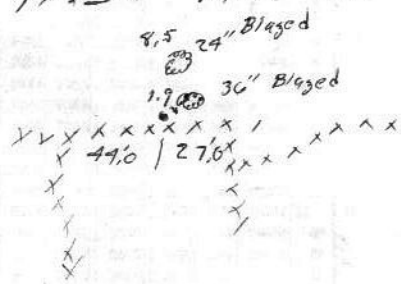
Julian 3752

C 1/16
NW¼ S26
T1N R18E
1969

SW 30.8 10" Tree
SE 27.8 24" Tree
NE 19.0 18" Tree
NW 18.4 18" Tree

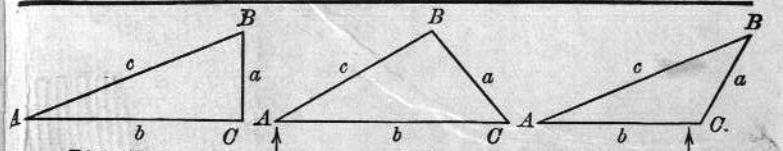
"X" 74.3 N

"X" 91.3 = 14 in Cottwood - SE



Blazed NW 28.3
" W 32.6
" SW 30.4
E 14.6 stump

TRIGONOMETRIC FORMULÆ



Solution of Right Triangles

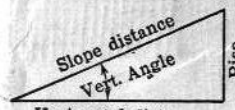
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\text{cosec} = \frac{c}{a}$

Given	Required	
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	$B = 90° - A,\ b = a \cot A,\ c = \frac{a}{\sin A}.$
A, b	B, a, c	$B = 90° - A,\ a = b \tan A,\ c = \frac{b}{\cos A}.$
A, c	B, a, b	$B = 90° - A,\ a = c \sin A,\ b = c \cos A,$

Solution of Oblique Triangles

Given	Required	
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A},\ C = 180° - (A + B),\ c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a},\ C = 180° - (A + B),\ c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180° - C,\ \tan \frac{1}{2}(A - B) = \frac{(a-b) \tan \frac{1}{2}(A+B)}{a + b},$ $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a+b+c}{2},\ \sin \frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{b\,c}},$ $\sin \frac{1}{2}B = \sqrt{\frac{(s-a)(s-c)}{a\,c}},\ C = 180° - (A+B)$
a, b, c	Area	$s = \frac{a+b+c}{2},\ \text{area} = \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	$\text{area} = \frac{b\,c \sin A}{2}$
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° 10′. From Table, Page IX. cos 5° 10′ = .9959. Horizontal distance = 319.4 × .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. Cosine 5° 10′ = .9959. 1 — .9959 = .0041. 319.4 × .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.

MADE IN U. S. A.