

*60<sup>th</sup> Annual*

# Kansas Land Title School

February 4/6, 2020

Wichita, Kansas

*LEGAL DESCRIPTIONS I and II*

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**“LEGAL” DESCRIPTION:** The writing of descriptions of land which is specifically directed to and for the purpose of delineating a certain area of land or space which cannot apply to such a condition anywhere else.

The use of the word “legal” pertains to the fact that the description must be able to withstand attack under law.

## LEGAL DESCRIPTIONS

### BACKGROUND AND FRAMEWORK

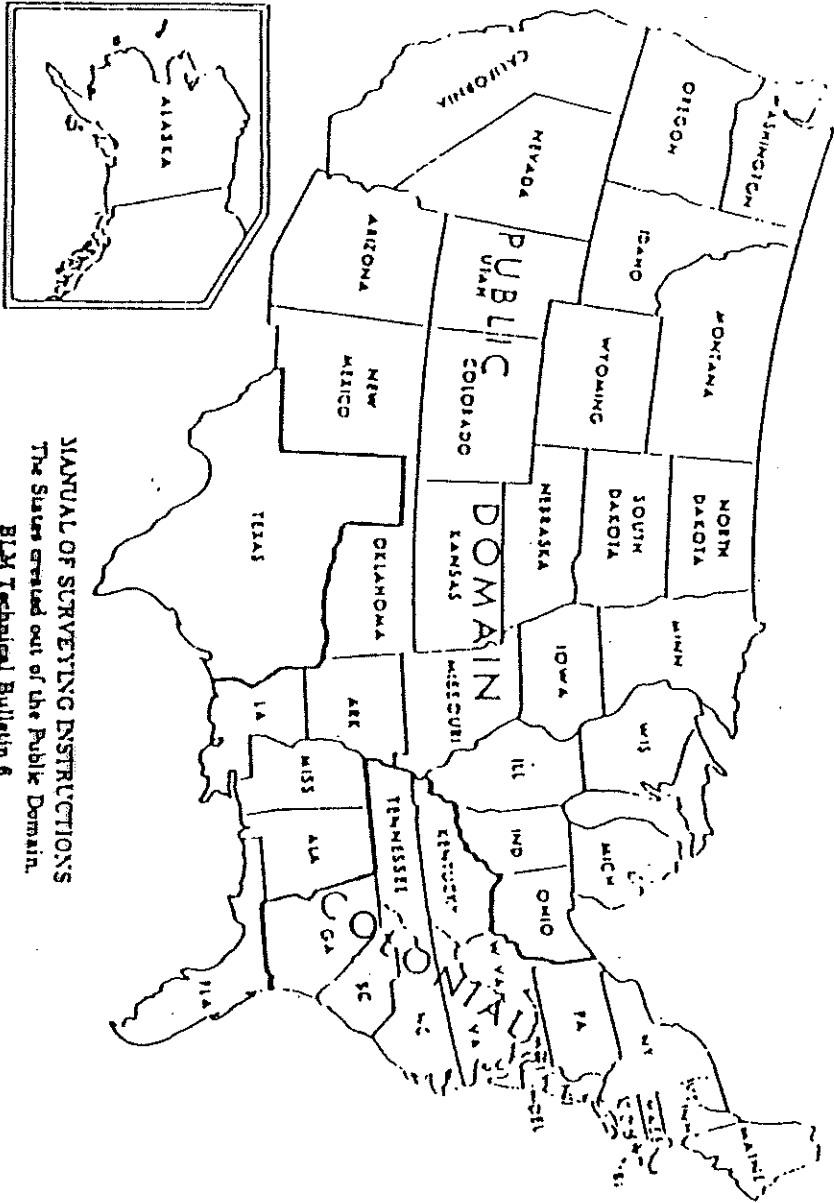
- A. History
- B. Public Lands
- C. Private Lands
- D. Transfers

### DESCRIPTIONS OF SECTION LAND

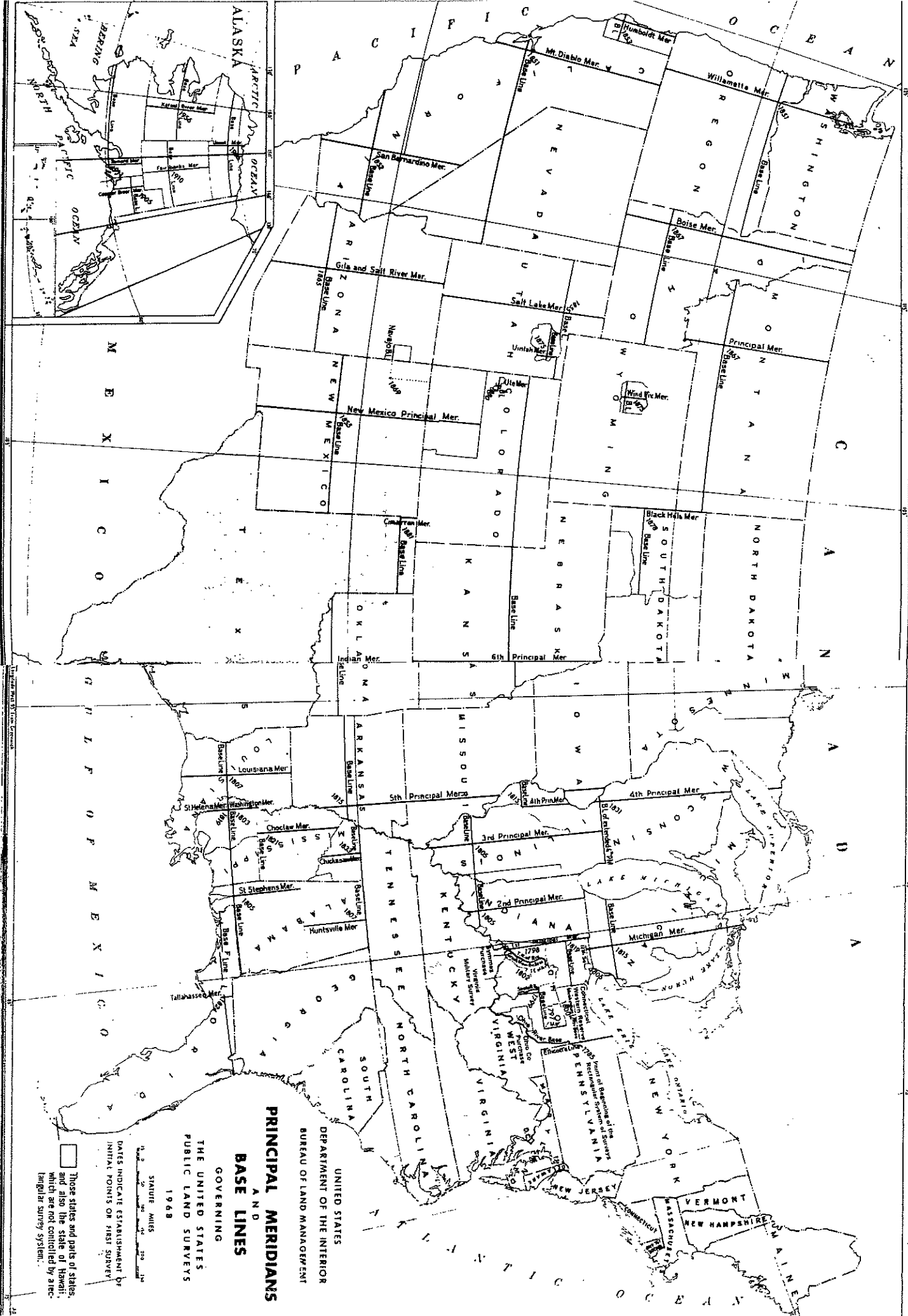
- A. Sections, Townships, Ranges,  
Principal Meridians
- B. Section Corners, Quarter Corners
- C. Private Surveys
- D. Division of Sections and Acreage
- E. Platting Sectionalized Land and  
Computing Acreage

### PLATTING METES AND BOUNDS DESCRIPTIONS

- A. Using the Scale
- B. Using the Protractor
- C. Monuments and Ties
- D. Platting Legal Descriptions



**MANUAL OF SURVEYING INSTRUCTIONS**  
The States created out of the Public Domain.  
BLM Technical Bulletin 6



**PRINCIPAL MERIDIANS  
AND  
BASE LINES**

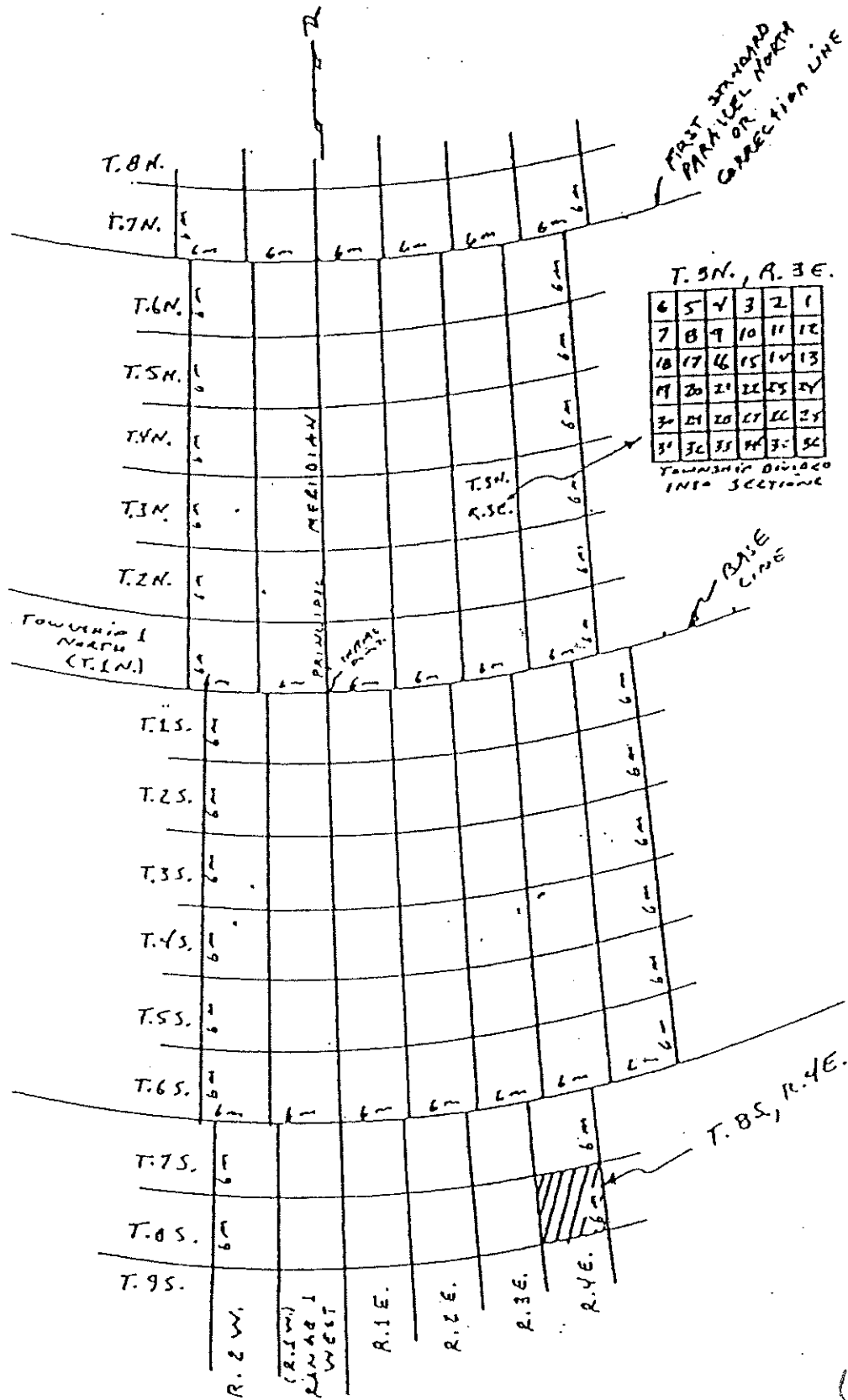
THE UNITED STATES  
GOVERNING  
PUBLIC LAND SURVEYS  
1968

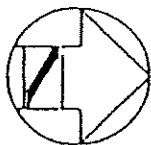
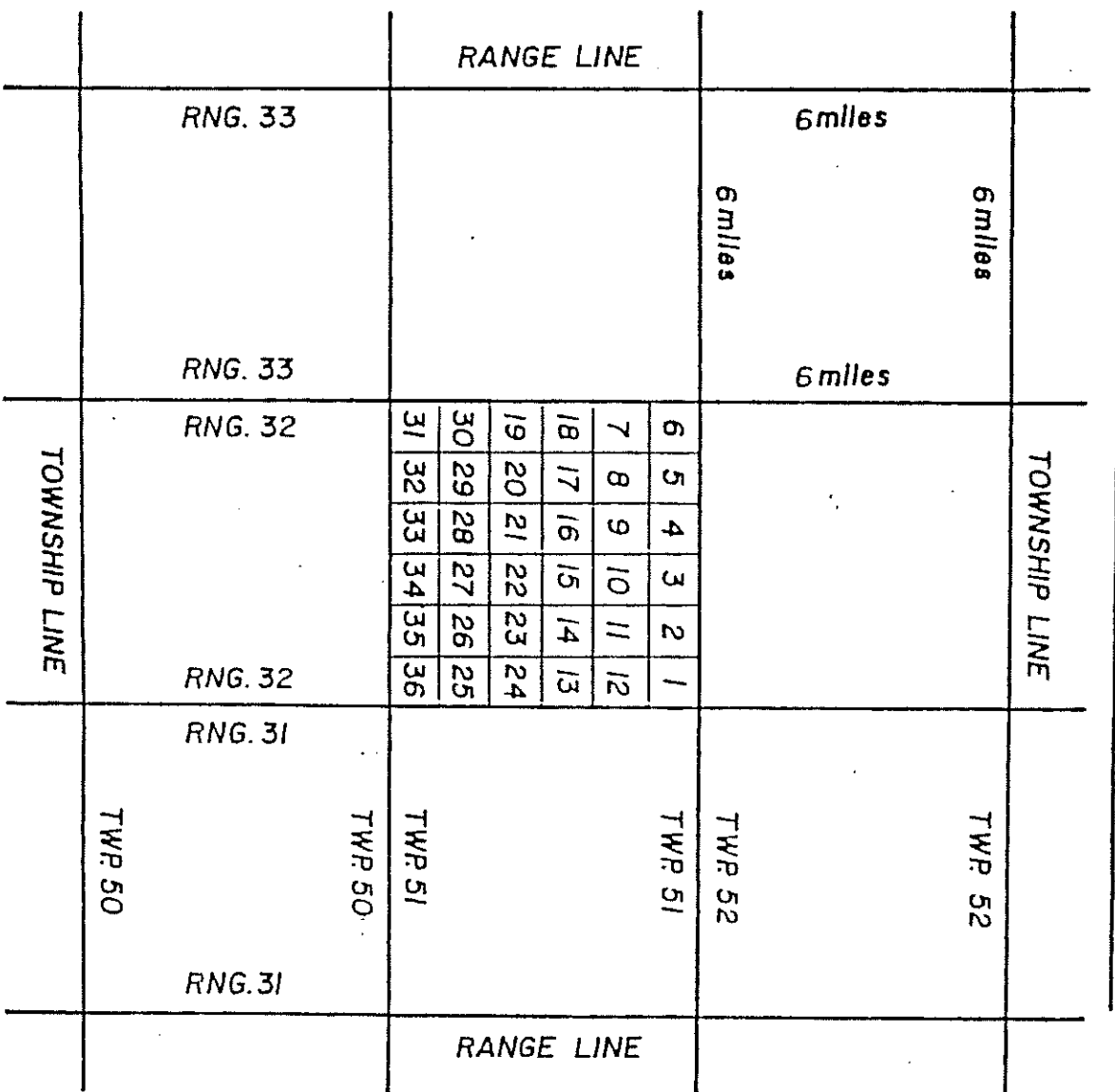
STATUTE MILES  
0 50 100 200

Those states and parts of states,  
and also the state of Hawaii,  
which are not controlled by a  
regular survey system.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

		First Guide				Meridian West							
First Standard					R4W								
					R3W								
					R2W	Base							
			Principal		R1W				Meridian				
		T4S	T3S	T2S	T1S	R1E	Line Parallel/Point	R2E		Meridian	T3N	T2N	T1N
	Parallel South				R3E		R4E						
		First Guide				Meridian East							





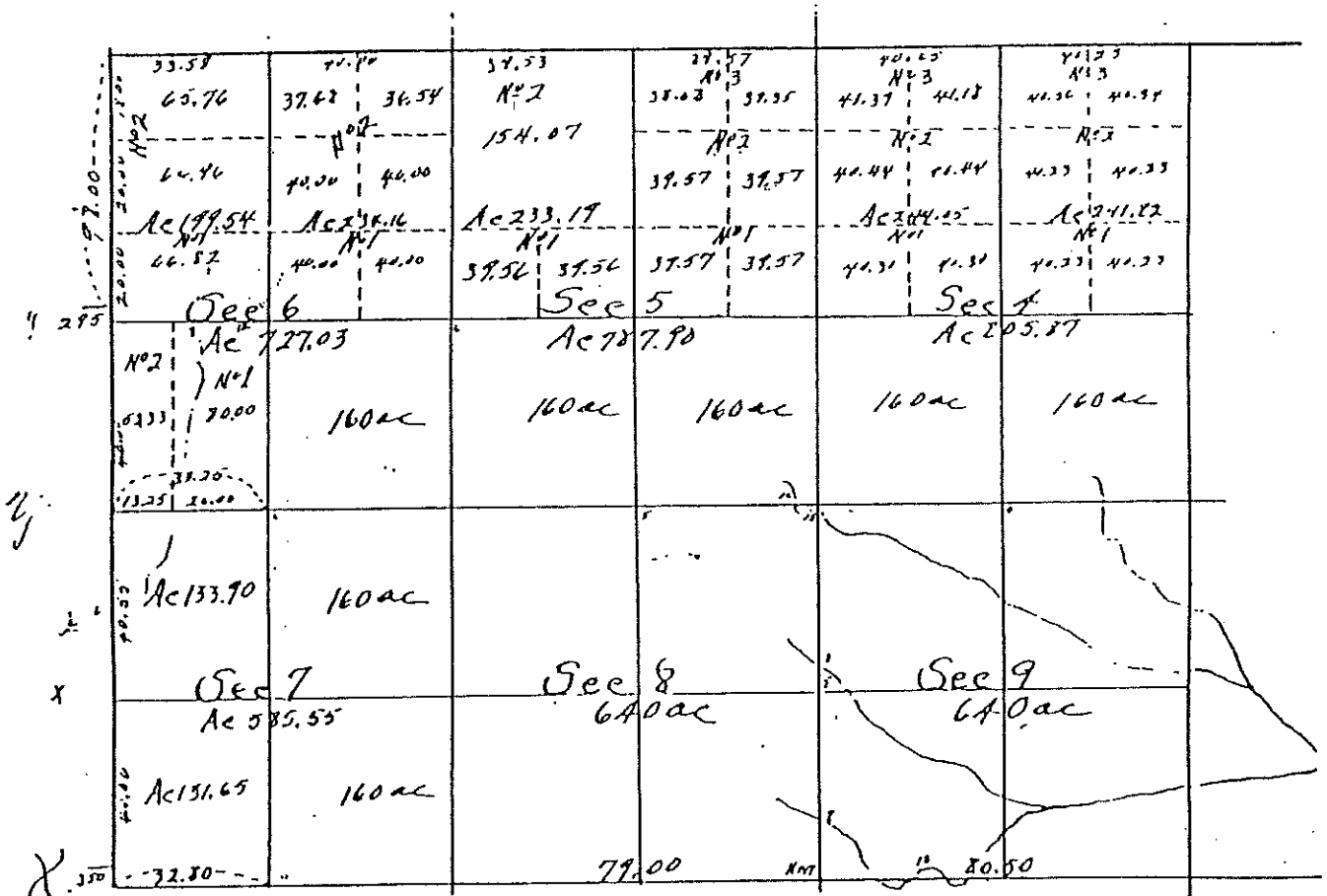


frac or		frac or		frac or		frac or	
2000	frac 4	2000	frac 3	2000	frac 2	2000	frac 1
2000	frac 5	2000	frac 6	2000	frac 7	2000	frac 8
2000	frac 9	2000	frac 10	2000	frac 11	2000	frac 12
2000	frac 13	2000	frac 14	2000	frac 15	2000	frac 16
2000	frac 17	2000	frac 18	2000	frac 19	2000	frac 20
2000	frac 21	2000	frac 22	2000	frac 23	2000	frac 24
2000	frac 25	2000	frac 26	2000	frac 27	2000	frac 28
2000	frac 29	2000	frac 30	2000	frac 31	2000	frac 32
2000	frac 33	2000	frac 34	2000	frac 35	2000	frac 36
2000	frac 37	2000	frac 38	2000	frac 39	2000	frac 40
2000	frac 41	2000	frac 42	2000	frac 43	2000	frac 44
2000	frac 45	2000	frac 46	2000	frac 47	2000	frac 48
2000	frac 49	2000	frac 50	2000	frac 51	2000	frac 52
2000	frac 53	2000	frac 54	2000	frac 55	2000	frac 56
2000	frac 57	2000	frac 58	2000	frac 59	2000	frac 60
2000	frac 61	2000	frac 62	2000	frac 63	2000	frac 64
2000	frac 65	2000	frac 66	2000	frac 67	2000	frac 68
2000	frac 69	2000	frac 70	2000	frac 71	2000	frac 72
2000	frac 73	2000	frac 74	2000	frac 75	2000	frac 76
2000	frac 77	2000	frac 78	2000	frac 79	2000	frac 80
2000	frac 81	2000	frac 82	2000	frac 83	2000	frac 84
2000	frac 85	2000	frac 86	2000	frac 87	2000	frac 88
2000	frac 89	2000	frac 90	2000	frac 91	2000	frac 92
2000	frac 93	2000	frac 94	2000	frac 95	2000	frac 96
2000	frac 97	2000	frac 98	2000	frac 99	2000	frac 100

Showing normal subdivision of sections.

GOVERNMENT PLAT

Township 32 North of the Base Line, Range 13  
East of the 5th P.M.



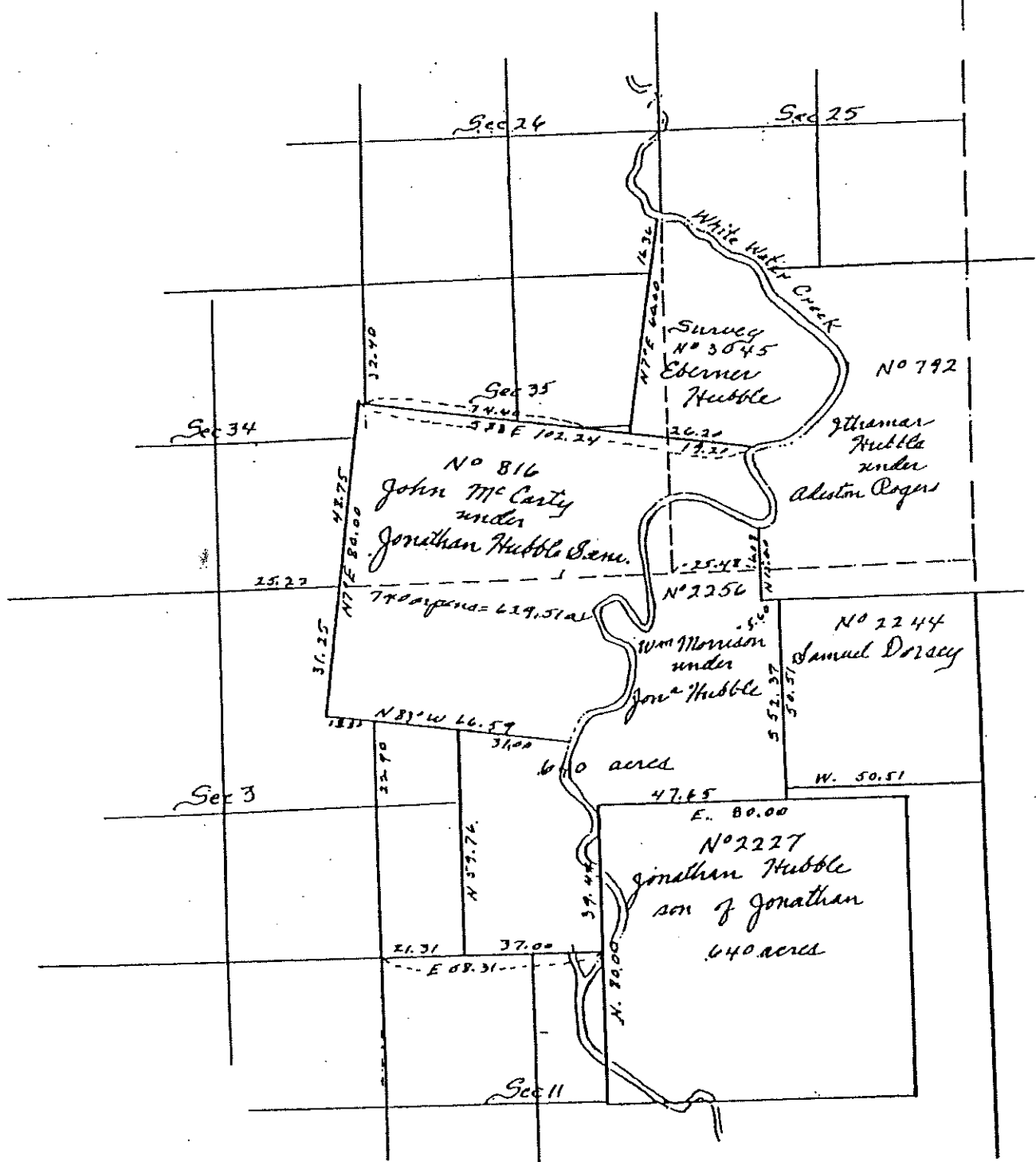
Office of the Surveyor General for Illinois  
and Missouri, St. Louis July 17, 1858.

The above plat of Township 32 North Range 13  
East of the 5th principal Meridian is  
correctly copied from the authenticated plat  
of said township on file in this office.

Jno. Loughborough, Surveyor General

On file in County Clerk's Office at Jackson,  
Missouri.

Township 30 North of the base line Range 11 East of the 5th. P. M.  
 Township 31 North of the base Line Range 11 East of the 5th. P. M.



Office of the Surveyor General for Illinois and Missouri,  
 Saint Louis July 17th, 1858.

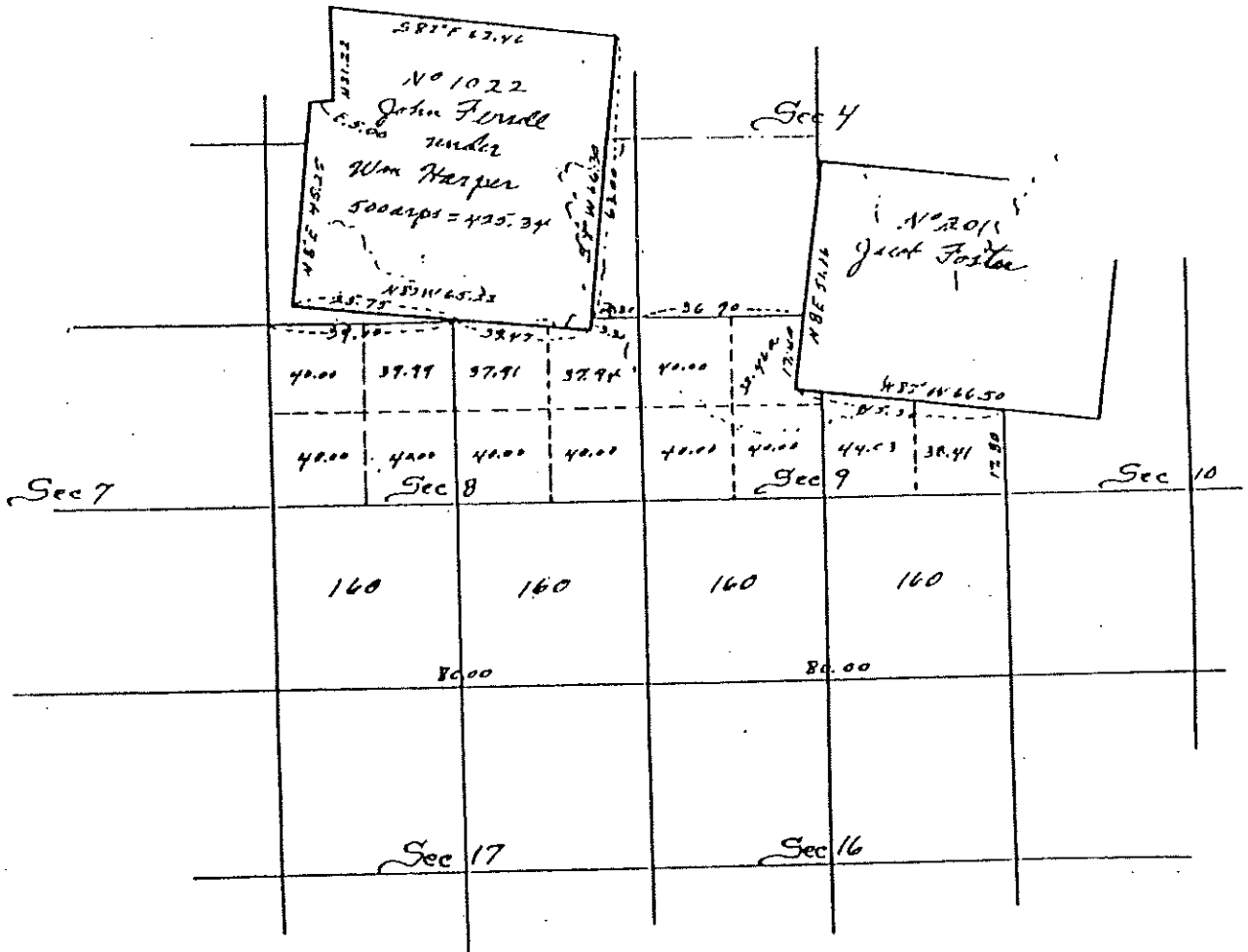
The above plat of Twps 30 & 31 North, Range 11 East of the 5th Principal Meridian is correctly copied from the authenticated plat of said township on file in this office.

Jno. Loughborough,  
 Surveyor General.

Office of the Surveyor General for Illinois and Missouri,  
 Saint Louis July 17th, 1858.

On file in County Clerk's office, Jackson, Mo.

Township 30 North of the Base line Range 12 East of the 5th P. M.

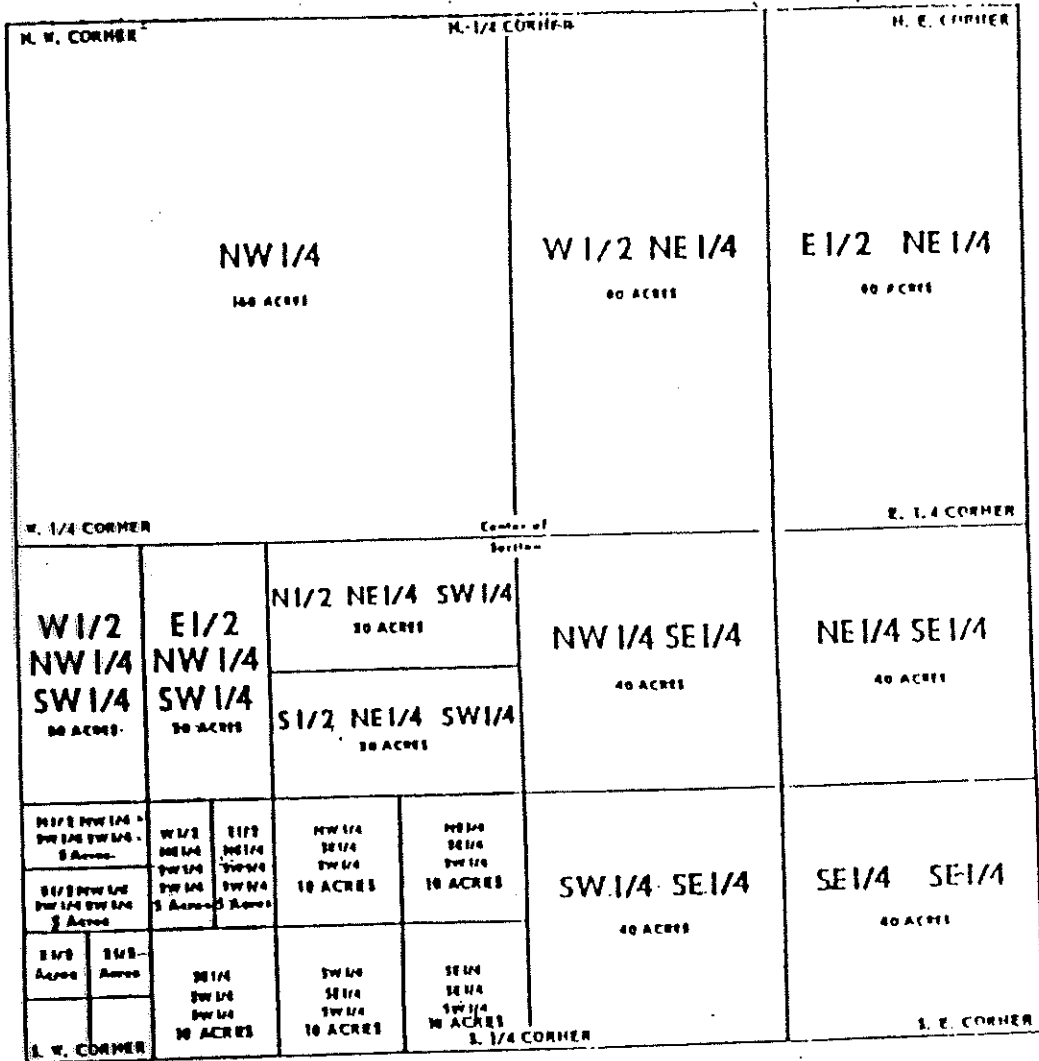


Office of the Surveyor General for  
 Illinois and Missouri,  
 Saint Louis July 17th, 1858.

The above plat of Township 30 North Range 12 East of the 5th, Principal Meridian is correctly copied from the authenticated plat of said township on file in this office.

Jno. Loughborough,  
 Surveyor General.

On file in the County Clerk's Office,  
 at Jackson, Mo.



- A Section of Land = 640 Acres
- An Acre contains 43,560 square feet
- A Section = 1 square mile
- A Mile = 320 rods, 80 chains or 5,280 feet
- A Rod = 16 1/2 feet
- A Chain = 4 rods or 66 feet
- A Link = 1/100 of a Chain or 7.92 inches

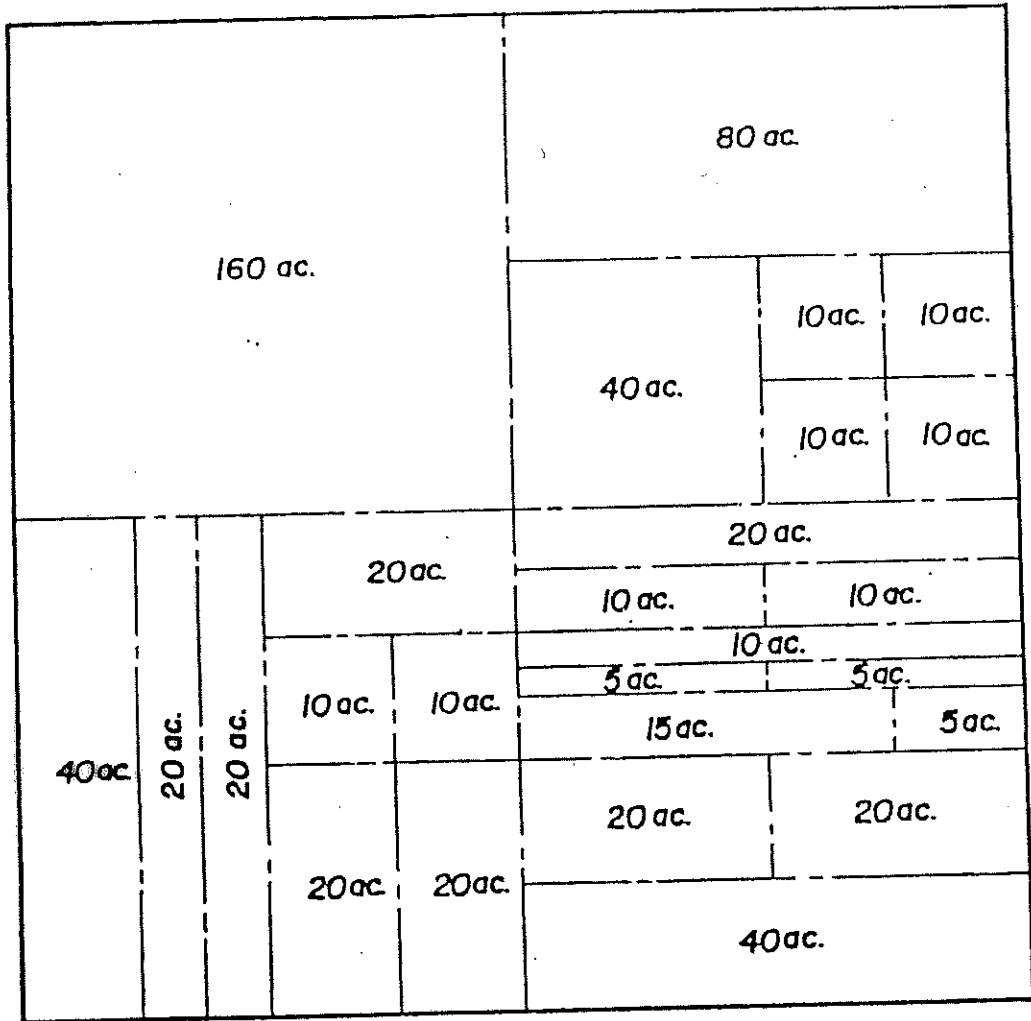
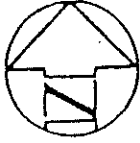
SECTION

TOWNSHIP

RANGE

				NW <sup>1</sup> / <sub>4</sub> NE <sup>1</sup> / <sub>4</sub>	NE <sup>1</sup> / <sub>4</sub> NE <sup>1</sup> / <sub>4</sub>
		NW <sup>1</sup> / <sub>4</sub>		N <sup>1</sup> / <sub>2</sub> SW NE	NW SE NE
				S <sup>1</sup> / <sub>2</sub> SW NE	SE SE NE
W <sup>1</sup> / <sub>2</sub> NW SW	E <sup>1</sup> / <sub>2</sub> NW SW	N <sup>1</sup> / <sub>2</sub> NE SW	W <sup>1</sup> / <sub>2</sub> NW SE	E <sup>1</sup> / <sub>2</sub> NW SE	NE <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub>
		S <sup>1</sup> / <sub>2</sub> NE SW			
		S <sup>1</sup> / <sub>2</sub> SW	W <sup>1</sup> / <sub>2</sub> SW SE	E <sup>1</sup> / <sub>2</sub> SW SE	SE <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub>

Section - 640 ac.  
 1/4 Section - 160 ac.  
 1/4 Section - 40 ac.  
 1/4 Section - 10 ac.



## Select Units of Linear and Square Measure

1 U.S. survey foot	= $\frac{1200}{3937}$ meters
1 U.S. standard foot	= 0.3048 meters
1 line	= $\frac{1}{8}$ inch*
1 foot	= 12 inches
1 yard	= 3 feet
1 rod, pole, perch	= $16\frac{1}{2}$ feet <sup>1</sup>
1 chain	= 66 feet
1 chain	= 100 links
1 chain	= 4 rods, poles, perches
1 mile	= 80 chains
1 mile	= 5,280 feet
1 nautical mile	= 6,080.27 feet <sup>2</sup>
1 rood	= $\frac{1}{4}$ acre
1 acre	= 43,560 sq. feet
1 acre	= 10 sq. chains
1 sq. mile	= 640 acres
1 compass, row	= 6 feet*
1 French foot	= 1.0657 feet*
1 toise	= $\frac{1}{30}$ arpent
1 toise	= 6.3944 feet*
1 arpent	= 191.994 feet (GLO definition)
1 arpent	= 191.83 feet*
1 arpent sq. meas.	= 0.8448 acres*
1 vara	= $33\frac{1}{3}$ inches*
1 hand	= 4 inches
1 span	= 9 inches
1 cubit	= 18 inches
1 step	= $2\frac{1}{2}$ feet*
1 pace	= 5 feet*
1 fathom	= 6 feet
1 furlong	= 10 chains
1 league	= 3 miles*

\* These units may vary greatly depending upon local custom.

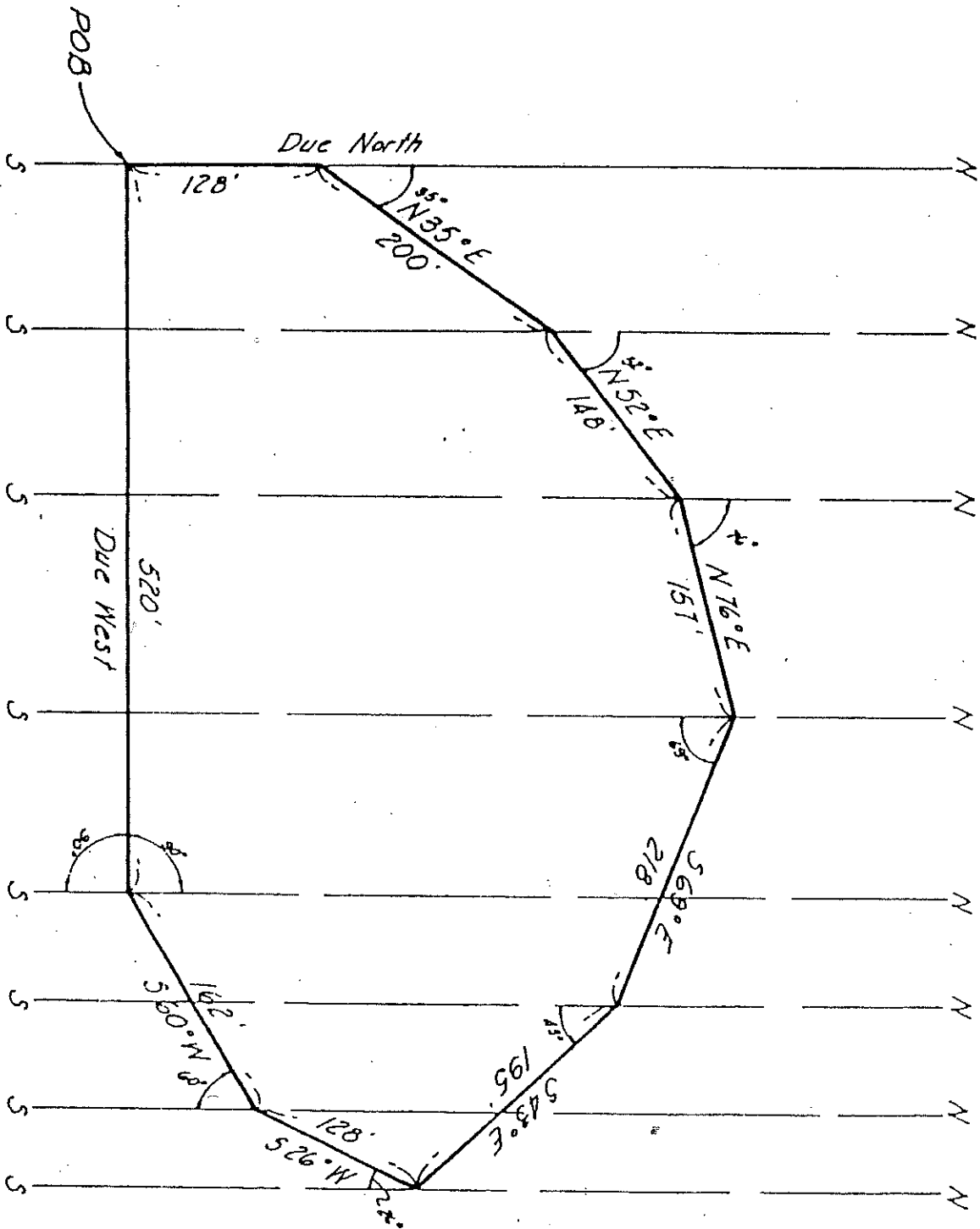
- 
1. Feet listed in this table are U.S. survey feet, unless otherwise noted.
  2. This distance is a function of the spheroid in use and will vary. Some report this distance as 6,076.10 feet.



COMMON ABBREVIATIONS USED  
ON SURVEYS

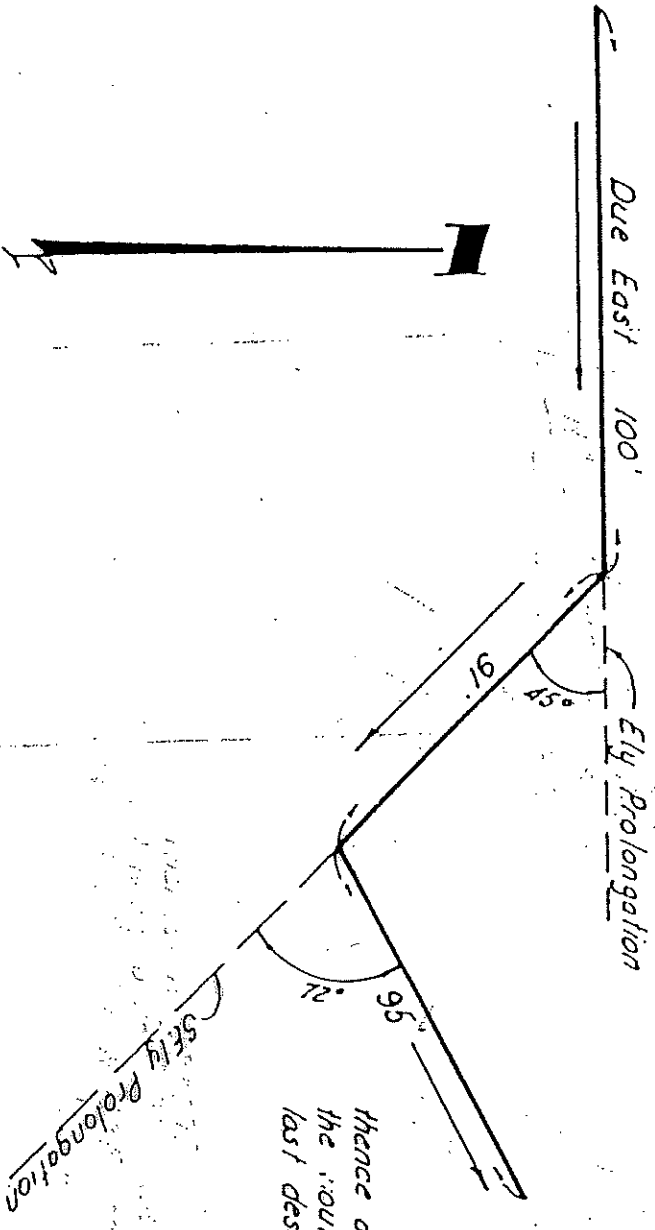
$\mathcal{P}$	=	property line
$\mathcal{B}$	=	boundary line
$\mathcal{C}$	=	centerline
Elev. or El.	=	elevations
$\phi$	=	of the
—	=	thence (in description)
M.H.	=	manhole
F/L	=	flow line
POB	=	point of beginning
P.C.	=	point of curve
P.T.	=	point of tangency
P.I.	=	point of intersection
P.R.C.	=	point of reverse curve
P.C.C.	=	point of compound curve
I.B.	=	iron bar
R. or Rad.	=	radius or radial
Tang.	=	tangent
Ch.	=	chord
I.T.B.	=	initial tangent bearing
San. S.	=	sanitary sewer
S.S.	=	storm sewer
Lt. Std.	=	light standard
U.G.	=	underground
conc.	=	Concrete
asph.	=	asphalt
typ.	=	typical
tel.	=	telephone
-p-	=	power line
-t-	=	telephone line
-w-	=	water line
-s-	=	sewer line
-g-	=	gas line
g.m.	=	gas meter
w.m.	=	water meter
w.v.	=	water valve

# BEARINGS



# DEFLECTION ANGLES

thence deflecting  $45^\circ$  to the right from the Easterly prolongation of the last described course 91 feet;

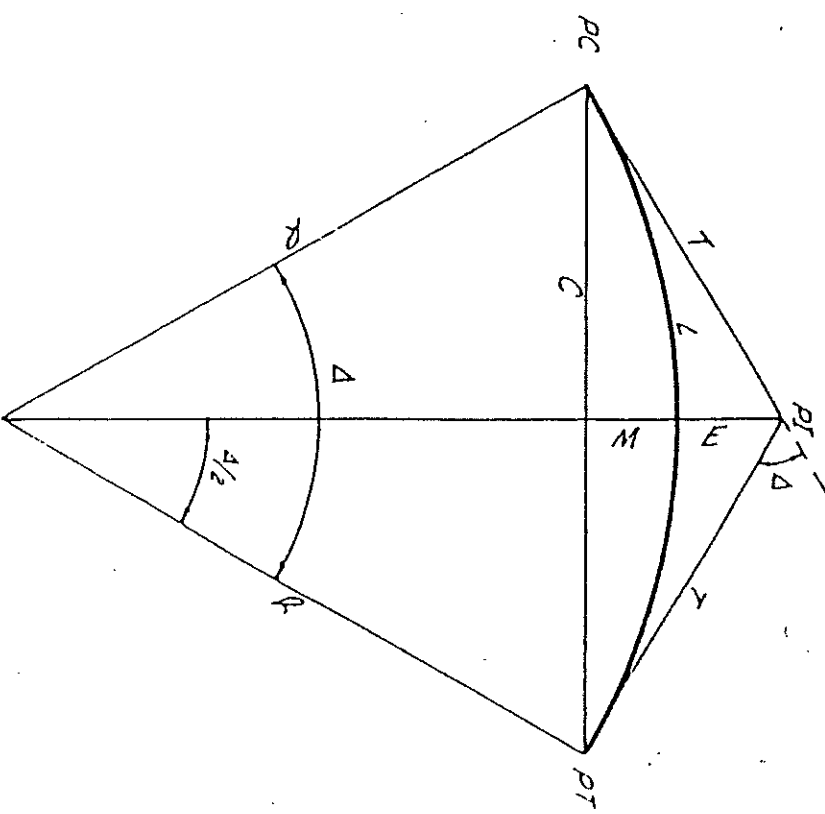


thence deflecting  $72^\circ$  to the left from the southeasterly prolongation of the last described course 95 feet.

# SIMPLE CURVES

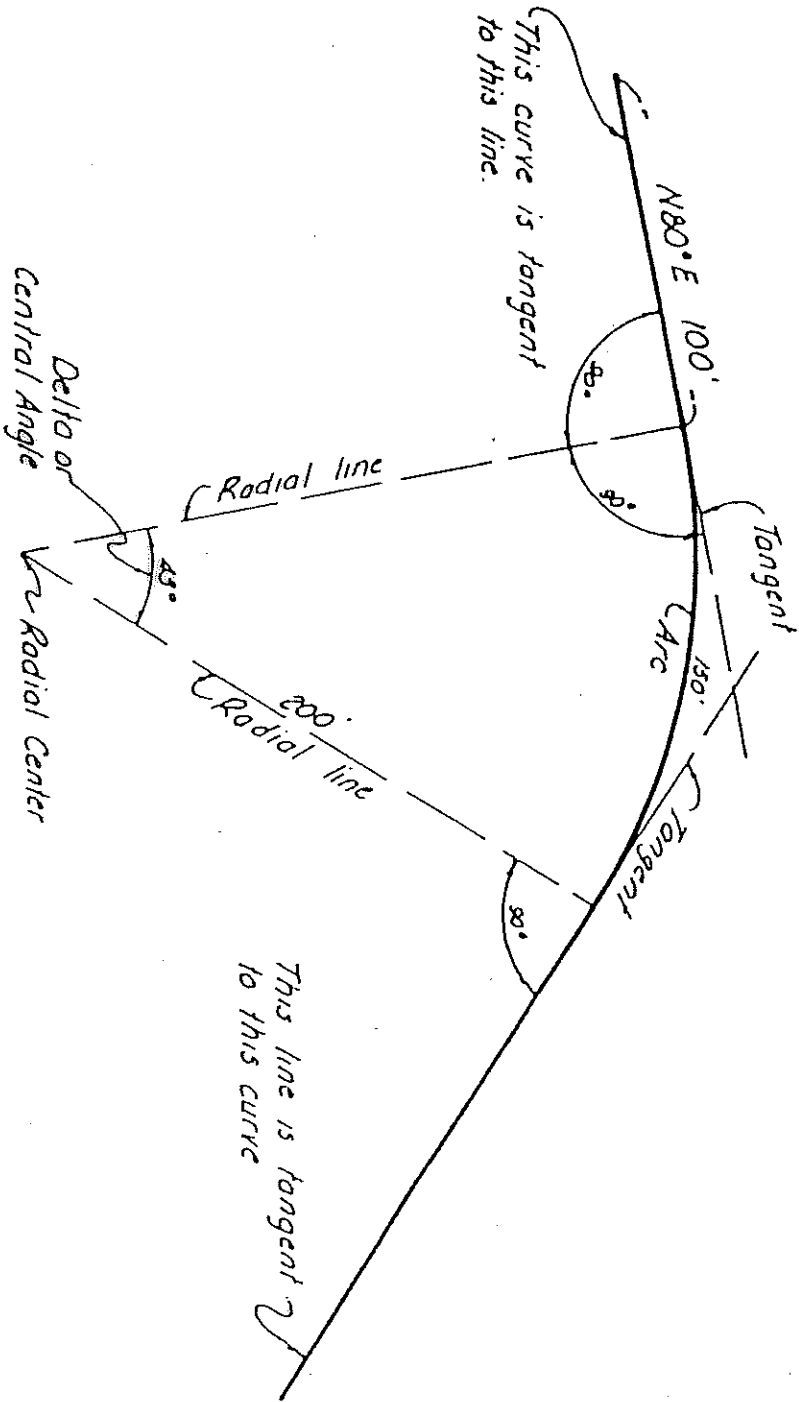
## DEFINITIONS:

- R. Radius
- L. Length
- T. Tangent
- C. Chord
- $\Delta$ . Central Angle
- M. Middle Ordinate
- E. External Ordinate
- PC. Point of Curve
- PI. Point of Intersection
- PT. Point of Tangent

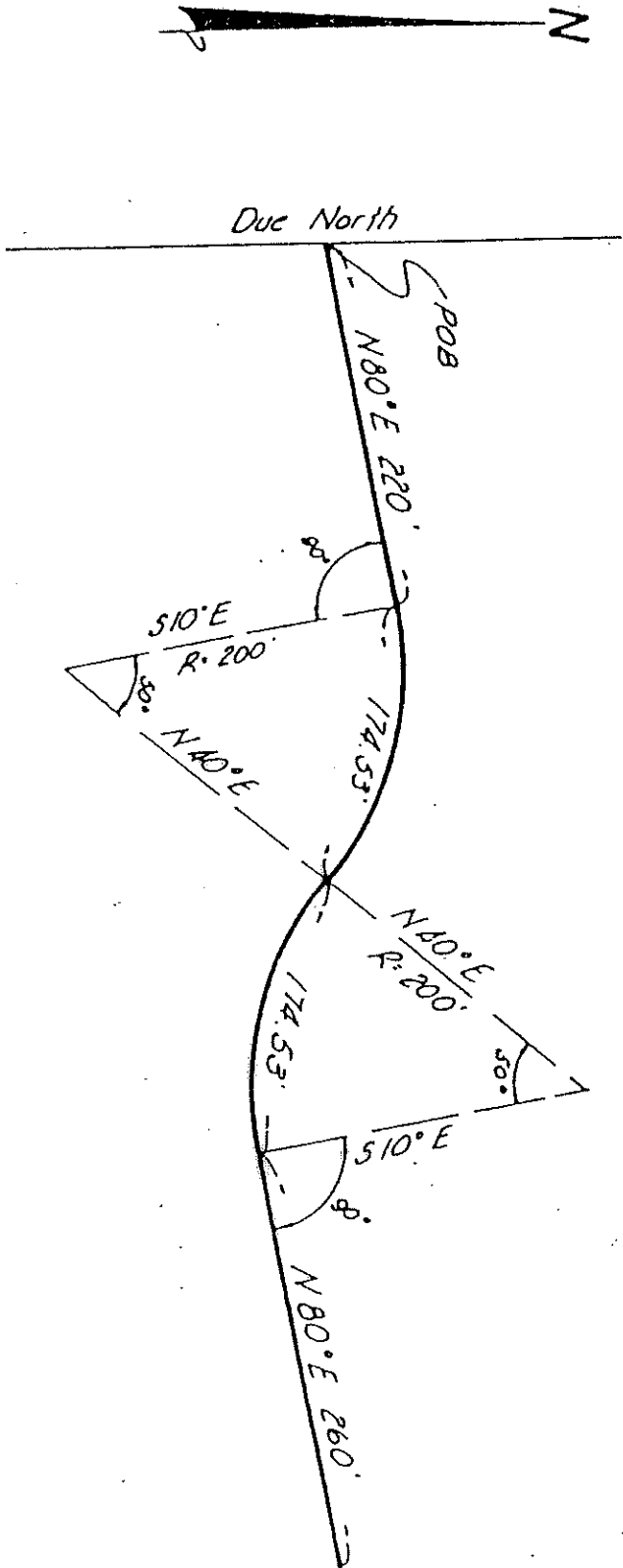


# TANGENT CURVE

thence Easterly on a curve to the right, tangent to the last described course and having a radius of 200 feet, an arc distance of 150 feet;

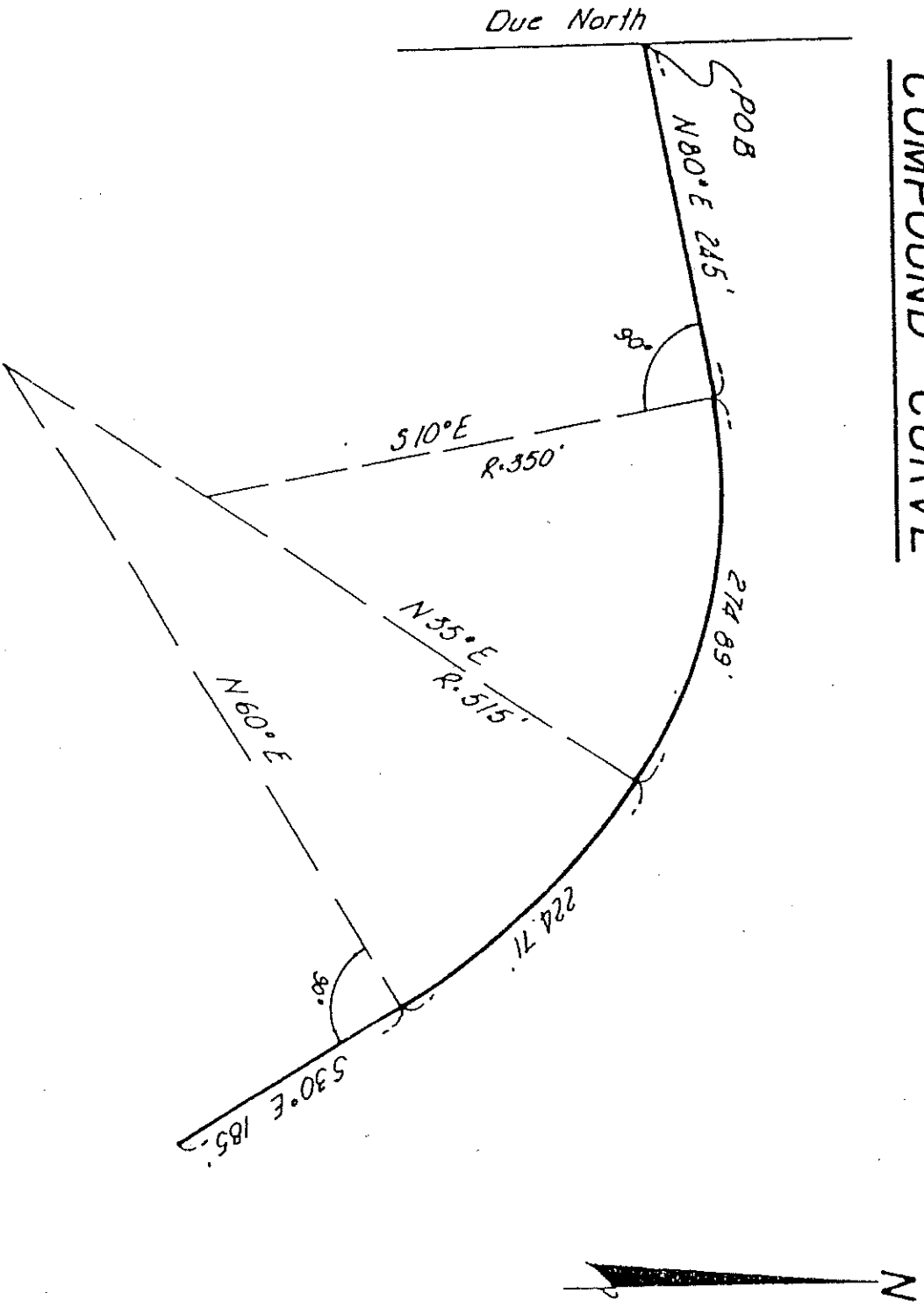


# REVERSE CURVES



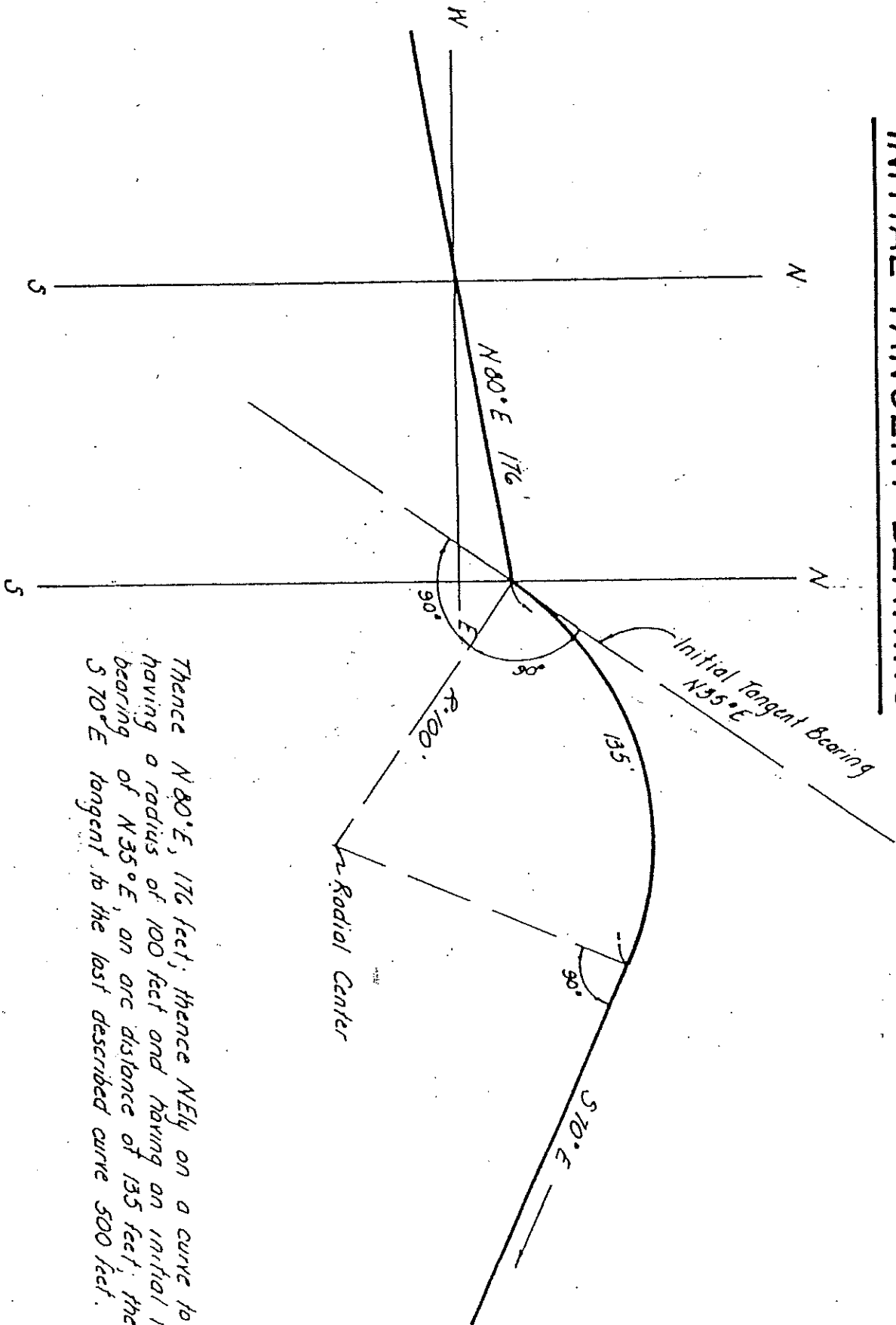
From the point of beginning, run thence N 80° E, 220'; thence Nely, Ely & Sely on a curve to the right, tangent to the last described course and having a radius of 200', an arc distance of 174.53' to a point of reverse curve, thence Sely, Ely & Nely on a curve to the left, having a radius of 200', an arc distance of 174.53'; thence N 80° E tangent to the last described curve, 260'.

# COMPOUND CURVE



From the point of beginning, run thence  $N 80^\circ E$  245', thence  $N 60^\circ E$  185', then  $S 30^\circ E$  185', on arc distance of 274.89' to a point of compound curvature, thence  $S 60^\circ E$  185', on arc distance of 224.71' to a point of compound curvature, thence  $S 30^\circ E$  185', on arc distance of 185', having a common tangent with the last described curve, a radius of 515', on arc

# INITIAL TANGENT BEARING



Thence  $N 80^\circ E$ , 176 feet; thence NELY on a curve to the r. having a radius of 100 feet and having an initial tangent bearing of  $N 35^\circ E$ , an arc distance of 135 feet; thence  $S 70^\circ E$  tangent to the last described curve 500 feet.



HOMEWORK FOR 1<sup>st</sup> DAY

Using 1" = 100', measure these distances: 50', 150', 325', 510' and 645'

0  
0

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Using 1" = 20', measure off: 25', 44', 61', 89' and 120'

0  
0

---

Using 1" = 30', measure off: 31', 56', 79', 102', 140' and 200'

0  
0

---

Using 1" = 40', measure off: 26', 49', 83', 100', 137' and 182'

0  
0

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Using 1" = 50', measure off: 31', 70', 110', 144', 162', 205' and 250'

0  
0

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Using 1" = 60', measure off: 44', 81', 126', 172', 216', 280' and 345'

0  
0

---

Using 1" = 150', measure off: 50', 175', 300', 430', 570', 715' and 910'

0  
0

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Metes & Bounds Legal Descriptions  
Day 2

1. Take up homework and answer any questions regarding same.
2. Explain what a "bearing" is and how to plot a bearing.
3. Make up examples for them to plot.
4. Hand out homework on "bearings".

Scale 1" = 100'

HOMEWORK FOR 2<sup>nd</sup> DAY

On separate sheet, plot the following courses:

1. Thence due North 100 feet; thence North  $45^{\circ} 30' 00''$  East 200 feet to the point of termination
2. Thence due East 150 feet; thence North  $26^{\circ} 15' 00''$  West 175 feet; thence North  $62^{\circ} 30' 00''$  West 100 feet to the point of termination.
3. Thence South  $58^{\circ} 00' 00''$  East 200 feet; thence North  $10^{\circ} 15' 00''$  West 105 feet; thence North  $89^{\circ} 30' 00''$  West 100 feet to the point of termination.
4. Thence South  $88^{\circ} 00' 00''$  East 200 feet; thence South  $2^{\circ} 15' 00''$  West 200 feet; thence North  $88^{\circ} 00' 00''$  West 200 feet; thence North  $2^{\circ} 15' 00''$  East 200 feet to the point of termination.
5. Thence due South 150 feet; thence South  $87^{\circ} 15' 00''$  East 25 feet; thence North  $55^{\circ} 30' 00''$  East 115 feet; thence North  $34^{\circ} 30' 00''$  West 10 feet to the point of termination.
6. Thence due West 100 feet; thence South  $15^{\circ} 30'$  East 50 feet; thence due South 50 feet; thence due East 100 feet; thence due North 50 feet; thence North  $15^{\circ} 30'$  West 50 feet to the point of termination.
7. Thence North  $62^{\circ}$  East 150 feet; thence South  $28^{\circ}$  West 100 feet; thence North  $85^{\circ} 30'$  West 50 feet; thence North  $35^{\circ} 15'$  West 25 feet to the point of termination.
8. Thence due East 34 feet; thence South  $62^{\circ} 30'$  East 50 feet; thence South  $45^{\circ} 30'$  East 50 feet; thence South  $80^{\circ} 15'$  East 100 feet to the point of termination.
9. Thence South  $43^{\circ} 15'$  East 50 feet; thence South  $62^{\circ} 30'$  East 50 feet; thence North  $88^{\circ} 15'$  East 100 feet; thence North  $1^{\circ} 45'$  West 100 feet; thence South  $74^{\circ}$  West 20 feet to the point of termination.
10. Thence North  $86^{\circ} 30'$  West 200 feet; thence South  $2^{\circ} 30'$  West 175 feet; thence North  $79^{\circ} 15'$  East 55 feet; thence North  $82^{\circ} 45'$  East 80 feet; thence North  $6^{\circ} 15'$  West 25 feet to the point of termination.

Metes & Bounds Legal Descriptions  
Day 3

1. Take up homework and answer questions regarding same.
2. Explain "deflection angles", how they differ from "bearings" and how to plot them.
3. Make up examples for them to plot.
4. Hand out homework on "deflection angles".

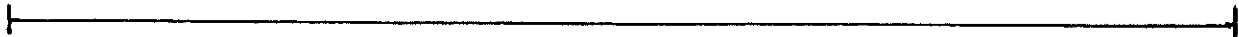
Scale 1" = 100'

HOMEWORK FOR 3<sup>rd</sup> DAY

On another sheet of paper, draw a sketch of the following:

1. Thence due North 100 feet; thence deflecting to the right  $79^{\circ} 00' 00''$  a distance of 150 feet; thence deflecting to the right  $15^{\circ} 30' 00''$  a distance of 25 feet to the point of termination.
2. Thence due South 50 feet; thence deflecting to the left  $84^{\circ} 15' 00''$  a distance of 65 feet; thence deflecting to the left  $20^{\circ} 00' 00''$  a distance of 100 feet to the point of termination.
3. Thence North  $87^{\circ} 15' 00''$  East a distance of 125 feet; thence deflecting to the right  $23^{\circ} 15' 00''$  a distance of 100 feet; thence deflecting to the right  $36^{\circ} 30' 00''$  a distance of 85 feet; thence deflecting to the right  $17^{\circ} 00' 00''$  a distance of 45 feet to the point of termination.
4. Thence South  $88^{\circ} 15' 30''$  West a distance of 160 feet; thence deflecting to the left  $49^{\circ} 15' 30''$  a distance of 55 feet; thence deflecting to the left  $33^{\circ} 15' 00''$  a distance of 115 feet; thence deflecting to the left  $54^{\circ} 30' 00''$  a distance of 175 feet to the point of termination.
5. Thence due North a distance of 125 feet; thence deflecting to the right  $87^{\circ} 30' 00''$  a distance of 200 feet; thence deflecting to the right  $25^{\circ} 30' 00''$  a distance of 150 feet; thence deflecting to the left  $15^{\circ} 15' 00''$  a distance of 75 feet to the point of termination.
6. Thence South  $26^{\circ} 15' 00''$  East a distance of 135 feet; thence deflecting to the left  $18^{\circ} 30' 00''$  a distance of 95 feet; thence deflecting to the right  $38^{\circ} 00' 00''$  a distance of 250 feet to the point of termination.
7. Thence North  $82^{\circ} 30' 00''$  East a distance of 140 feet; thence deflecting to the right  $7^{\circ} 30' 00''$  a distance of 140 feet; thence deflecting  $90^{\circ} 00' 00''$  to the left a distance of 50 feet to the point of beginning.
8. Thence due South a distance of 115 feet; thence deflecting to the left  $53^{\circ} 00' 00''$  a distance of 45 feet; thence deflecting to the left  $82^{\circ} 00' 00''$  a distance of 62 feet; thence deflecting to the right  $90^{\circ} 00' 00''$  a distance of 100 feet to the beginning.
9. Thence due East a distance of 65 feet; thence due South a distance of 100 feet; thence South  $39^{\circ} 30' 58''$  East a distance of 120 feet; thence deflecting to the left  $92^{\circ} 00' 00''$  a distance of 200 feet to the point of beginning.
10. Thence South  $74^{\circ}$  East a distance of 200 feet; thence deflecting to the left  $26^{\circ} 00' 00''$  a distance of 175 feet; thence deflecting to the right  $130^{\circ} 30' 45''$  a distance of 300 feet to the point of beginning.
11. Using a scale of 1" = 200', mark off the following distances: 150' - 320' - 500' - 670'

0'



Metes & Bounds Legal Descriptions  
Day 6

1. Take up homework and answer questions regarding same.
2. Review "tangent" curves.
3. Explain "reverse curves".
4. Make up examples for them to plot.
5. Explain "compound" curves.
6. Make up examples for them to plot.
7. Hand out homework.

Scale 1" = 100'

HOMEWORK FOR 6<sup>th</sup> DAY

1. thence North 80 degrees East 150 feet; thence Northeasterly on a curve to the left, tangent to the last described course, having a radius of 200 feet and a central angle of 28 degrees, an arc distance of 100 feet; thence Northeasterly tangent to the last described curve 175 feet to point of termination.
2. thence South 60 degrees West 125 feet; thence Southwesterly on a curve to the right, tangent to the last described course, having a radius of 250 feet and a central angle of 44 degrees, an arc distance of 195 feet; thence Westerly tangent to the last described curve 130 feet to point of termination.
3. thence due East 90 feet; thence Easterly on a curve to the left, tangent to the last described course, having a radius of 310 feet, and a central angle of 29 degrees, an arc distance of 160 feet to point of reverse curve; thence Northeasterly on a curve to the right, having a common radial line with the last described curve, having a radius of 280 feet and a central angle of 45 degrees, an arc distance of 220 feet; thence Easterly tangent to the last described curve 180 feet to point of termination.
4. thence due West 140 feet; thence on a curve to the right, tangent to the last described course, having a radius of 230 feet and a central angle of 22 degrees, an arc distance of 90 feet to point of compound curve; thence Northwesterly on a curve to the right, having a common radial line with the last described curve, having a radius of 170 feet and a central angle of 67 degrees, an arc distance of 200 feet; thence Northerly tangent to the last described curve 55 feet to point of termination.
5. thence South 75 degrees East a distance of 100 feet; thence deflecting to the left 25 degrees a distance of 175 feet; thence on a curve to the right, tangent to the last described course, having a radius of 160 feet and a central angle of 71 degrees, an arc distance of 200 feet to a point of compound curve; thence Southeasterly on a curve to the right, having a common radial line with the last described curve, having a radius of 230 feet and a central angle of 40 degrees, an arc distance of 160 feet to a point of reverse curve; thence Southerly on a curve to the left, having a common radial line with the last described curve, having a radius of 200 feet and a central angle of 34 degrees, an arc distance of 120 feet; thence Easterly tangent to the last described curve 70 feet to point of termination.

HOMEWORK FOR 6<sup>th</sup> DAY

Please plot the following legal description on the attached sheet of paper.

Part of the West half of the Northwest quarter of Section 25, Township 49, Range 32, in Independence, Jackson County, Missouri described as follows: Beginning at a point on the North line of the West half of the Northwest quarter of Section 25, Township 49, Range 32 which is South 89 degrees 57 minutes 34 seconds West a distance of 276.60 feet from the Northeast corner thereof, said point also being on the Westerly right-of-way line of Phelps Road; thence South 53 degrees 45 minutes 39 seconds East a distance of 156.17 feet to the point of curve of a curve to the right having a radius of 313.67 feet and a central angle of 52 degrees; thence in a Southeasterly and Southerly direction along said curve a distance of 287.34 feet to the point of tangent of said curve; thence South 1 degree 16 minutes 26 seconds East a distance of 323.10 feet; thence South 88 degrees 43 minutes 34 seconds West a distance of 529.47 feet; thence North 26 degrees 40 minutes 31 seconds West a distance of 752.87 feet to a point on the North line of said half quarter section; thence North 89 degrees 57 minutes 34 seconds East a distance of 606.03 feet to the point of beginning.



Metes & Bounds Legal Descriptions  
Day 7

1. Take up homework and answer questions regarding same.
2. Make up examples for them to plot, incorporating bearings, deflection angles, tangent curves, reverse curves and compound curves.
3. Hand out homework.

Metes & Bounds Legal Descriptions  
Day 8

1. Take up homework and answer questions regarding same.
2. Explain "initial tangent bearings".
3. Make up examples and plot on blackboard as they watch and listen.
4. Make up examples for them to plot.
5. Hand out homework.

Scale 1" = 200'

HOMEWORK FOR 8<sup>th</sup> DAY

MAKE A DRAWING OF THE FOLLOWING:

1. thence North 15 degrees East a distance of 150 feet; thence Northeasterly on a curve to the right, tangent to the last described course, having a radius of 300 feet and a central angle of 76 degrees, an arc distance of 400 feet.
2. thence South 5 degrees East a distance of 200 feet; thence Southeasterly on a curve to the left, tangent to the last described course, having a radius of 275 feet and a central angle of 67 degrees, an arc distance of 325 feet.
- ✓ 3. thence South 86 degrees East a distance of 200 feet; thence Northeasterly on a curve to the right, having a radius of 250 feet and an initial tangent bearing of North 30 degrees East and a central angle of 34 degrees, an arc distance of 150 feet.
- ✓ 4. thence South 34 degrees East a distance of 250 feet; thence Southeasterly on a curve to the left, tangent to the last described course, having a radius of 400 feet and a central angle of 28 degrees; an arc distance of 200 feet to a point of compound curve; thence Southeasterly and Easterly on a curve to the left, having a common radial line with the last described curve, having a radius of 200 feet and a central angle of 43 degrees, an arc distance of 150 feet.
- ✓ 5. thence North 40 degrees East a distance of 250 feet; thence Northeasterly on a curve to the right, tangent to the last described course, having a radius of 275 feet and a central angle of 62 degrees; an arc distance of 300 feet to a point of reverse curve; thence Easterly and Northeasterly on a curve to the left, having a radius of 275 feet and a central angle of 62 degrees, an arc distance of 300 feet.
6. thence South 25 degrees West a distance of 250 feet; thence Southerly on a curve to the left, tangent to the last described course, having a radius of 325 feet and a central angle of 35 degrees, an arc distance of 200 feet.
7. Using a scale of 1" = 400', mark off the following distances: 350', 425', 575', 800', 1100', 1500' and 2200'.
8. Using a scale of 1" = 50', mark off the following distances: 60', 135', 150', 180', 225' and 285'.
9. Using a scale of 1" = 60', mark off the following distances: 30', 100', 140', 200', 325' and 360'.
10. Using a scale of 1" = 10', mark off the following distances: 8', 17', 22', 29', 36', 45' and 62'.

(Scale 1" = 100')

ON ANOTHER SHEET, DRAW THE FOLLOWING:

1. Thence North  $65^{\circ}$  East 320 feet; thence Northeasterly on a curve to the right, tangent to the last described course, having a central angle of  $23^{\circ}$  and having a radius of 250 feet, an arc distance of 100 feet.
2. Thence South  $52^{\circ}$  East 270 feet; thence Southeasterly on a curve to the right, tangent to the last described course, having a central angle of  $65^{\circ}$  and having a radius of 265 feet, an arc distance of 300 feet.
3. Thence South  $89^{\circ}$  West 320 feet; thence Southwesterly on a curve to the left, tangent to the last described course, having a central angle of  $93^{\circ}$ , and having a radius of 185 feet, an arc distance of 300 feet.
4. Thence due North 150 feet; thence <sup>Northwesterly</sup> on a curve to the right, tangent to the last described course, having a central angle of  $43^{\circ}$  and having a radius of 200 feet, an arc distance of 150 feet.
5. Thence due South 225 feet; thence Southeasterly on a curve to the left, tangent to the last described course and having a central angle of  $57^{\circ}$ , a radius of 300 feet, an arc distance of 300 feet.

Scale 1" = 100'

HOMEWORK FOR 8<sup>th</sup> DAY

All that part of the North  $\frac{1}{2}$  of the Northeast  $\frac{1}{4}$  of Section 7, Township 48, Range 32, being partially in Kansas City and partially in Raytown, and wholly in Jackson County, Missouri, described as follows: Beginning at a point 50 feet North and 200 feet West of the Southeast corner of said  $\frac{1}{2}$   $\frac{1}{4}$  section; thence due West and parallel to the South line of said  $\frac{1}{2}$   $\frac{1}{4}$  section a distance of 115.00 feet; thence North 0 degrees 10 minutes 00 seconds West, and parallel to the East line of said  $\frac{1}{2}$   $\frac{1}{4}$  section, a distance of 470.00 feet; thence North 81 degrees 05 minutes 42 seconds East, a distance of 208.58 feet, to a point on the Westerly right-of-way line of U.S. Highway No. 50 (as now established); thence Southeasterly along said Westerly right-of-way line, along a curve to the right having a radius of 1106.29 feet, an initial tangent bearing of South 20 degrees 20 minutes 08 seconds East and a central angle of 12 degrees, an arc distance of 240.62 feet, to the intersection of said Westerly right-of-way line, and the West line of Blue Ridge Boulevard Extension (as now established); thence South 0 degrees 10 minutes 00 seconds East, along last said right-of-way line, a distance of 119.38 feet, to a point 200.00 feet North of the South line of said  $\frac{1}{2}$   $\frac{1}{4}$  section; thence West and parallel to the South line of said  $\frac{1}{2}$   $\frac{1}{4}$  section, a distance of 150.00 feet; thence South 0 degrees 10 minutes 00 seconds East, and parallel to the East line of said  $\frac{1}{2}$   $\frac{1}{4}$  section, a distance of 150.00 feet, to the point of beginning.

Scale 1" = 100'

HOMEWORK FOR 9th DAY

1. thence North 60 degrees East 260 feet; thence Southwesterly on a curve to the left, having an initial tangent bearing of South 55 degrees West, a radius of 240 feet and a central angle of 43 degrees, an arc distance of 180 feet; thence Southerly tangent to the last described curve 100 feet.
2. thence South 20 degrees West 185 feet; thence Northwesterly on a curve to the left, having an initial tangent bearing of North 48 degrees West, a radius of 300 feet and a central angle of 40 degrees, an arc distance of 210 feet; thence Westerly tangent to the last described curve 80 feet.
3. thence North 33 degrees West 120 feet; thence Northwesterly on a curve to the right, having an initial tangent bearing of North 80 degrees West, a radius of 215 feet and a central angle of 42 degrees, an arc distance of 160 feet; thence Northerly tangent to last described curve 100 feet.
4. thence South 15 degrees East 200 feet; thence Northeasterly on a curve to the right, having an initial tangent bearing of North 5 degrees East, a radius of 310 feet and a central angle of 44 degrees, an arc distance of 240 feet; thence Northerly tangent to the last described curve 110 feet.
5. thence North 30 degrees East 150 feet; thence South 60 degrees East 200 feet; thence Northeasterly on a curve to the left, having an initial tangent bearing of North 30 degrees East, a radius of 320 feet and a central angle of 29 degrees, an arc distance of 165 feet; thence Northerly tangent to the last described curve 50 feet.

Scale 1" = 50'

TEST FOR 10th DAY

A part of the South one-half (S.  $\frac{1}{2}$ ) of Section 24, Township 50, Range 33, located in Kansas City, Jackson County, Missouri more particularly described as commencing at the Southwest corner of said Section 24; thence North  $64^{\circ} 49' 13''$  East a distance of 3705.08 feet, to the POINT OF BEGINNING, said point being the Northeast corner of Tract "J" in Executive Park, Fourth Plat, thence North  $87^{\circ} 44' 03''$  West, along the North line of said tract "J", a distance of 392.95 feet; thence North  $2^{\circ} 15' 57''$  East, a distance of 676.58 feet; thence South  $87^{\circ} 44' 03''$  East, a distance of 215.00 feet; thence along a curve to the right, radius of said curve being 230.00 feet and having a central angle of 70 degrees, a distance of 281.00 feet; thence South  $17^{\circ} 44' 03''$  East, a distance of 126.51 feet; thence along a curve to the left, radius of said curve being 170.00 feet and having a central angle of 51 degrees, a distance of 150.89 feet to a point of reverse curvature; thence along a curve to the right, having a common tangent with the last described curve, having a radius of 200 feet and a central angle of 40 degrees, an arc distance of 139.63 feet, to a point of compound curvature; thence along a curve to the right, having a common tangent with the last described curve, having a radius of 100 feet and a central angle of 30 degrees; an arc distance of 52.36 feet, to a point of reverse curvature; thence along a curve to the left, having a common tangent with the last described curve, having a radius of 131.50 feet and a central angle of 90 degrees, an arc distance of 206.56 feet; thence South  $02^{\circ} 15' 57''$  West, 10650 feet to the Northeast corner of Tract "B", in said Fifth Plat; thence deflecting  $90^{\circ} 41' 20''$  to the right from the Southerly prolongation of the last described course, and along the North line of said Tract "B", a distance of 214.29 feet; thence South  $74^{\circ} 32' 31''$  West, continuing along the North line of said Tract "B", a distance of 74.50 feet to the Northwest corner of said Tract "B", said point also being on the Northerly line of Tract "L" in said Fourth Plat; thence Northerly and Westerly, along said Northerly line of Tract "L", along a curve to the left, the initial tangent to which bears North  $18^{\circ}$  West, radius of said curve being 75.91 feet and a central angle of 146 degrees, a distance of 193.24 feet, to its intersection with the East line of Tract "J", in said Fourth Plat; thence North  $2^{\circ} 15' 57''$  East, along the East line of said Tract "J", a distance of 104.29 feet, to the POINT OF BEGINNING.