PROPERTY DESCRIPTION SUPPLEMENT

RECTANGULAR SURVEY SYSTEM

U.S. SURVEYS AND U.S. MINERAL SURVEYS

METES AND BOUNDS DESCRIPTIONS

CURVE DESCRIPTION

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RECTANGULAR SURVEY SYSTEM

The Federal Government adopted the rectangular survey system (Government System) in 1785. This system consisted of a series of rectangles referenced to a particular point called an initial point.

Each initial point is designated by a name, for example, the Seward Initial Point. The initial point is the intersection of a base line and a principle meridian (see attached figure 12.1). A base line corresponds to parallels of latitude and extends east and west from the initial point. The principle meridian is equivalent to meridians of longitude and extends north and south from the initial point. Due to the fact that meridians of longitude gradually come together, or converge, as they approach the north and south poles, quadrangles were established to make corrections for the convergence of the meridians.

A quadrangel is formed by starting at the initial point, then following the base line for 24 miles to the first guide meridian (east or west of the initial point, see figure 12. 1). The guide meridian runs north from the base line 24 miles to a point on a line parallel to the base line. The lines parallel to the base line are called standard parallels and are referenced as either north or south of the base line. Each standard parallel is 24 miles from the base line or closest standard parallel. The point where the guide meridian intersects the standard parallel is less than 24 miles from the principle meridian due to adjustment for convergence. (Note in figure 12.1 that the guide meridians between the base line and the first standard parallel north do not coincide with the guide meridians and lines on the north side of the first standard parallel north. The first standard parallel south was inaccurately drawn, the guide meridians should never meet.) The approximate 24 mile by 24 mile square is a quadrangle.

Each quadrangle is divided into 16 areas that are 6 miles by 6 miles. These 36 square mile areas are townships. Townships are numberde by their location in reference to the initial point. The first tier of townships directly north of the base line is Township 1 North. The sucessive tiers are Township 2 North, Township 3 North, and so on. South of the base line the tiers are Township 1 South, Township 2 South, and so on. (See figure 12.1). Ranges are columns of townships which lie east and west of the principle meridian and are referenced by their location from the principle meridian as township tiers are to the base line; for example, the first column east of the principle meridian is Range 1 East, the second is Range 2 East and so on.

To designate a specific township in the rectangular system both the township and range information are given, for example, the darkened township in figure 12.1 is Township 3 North, Range 2 West (abbreviated as T.3 N.,R.2W.). When used

in a description the township and range designation must also include the name of the principle meridian such as the Fairbanks Meridian or the Seward Meridian. If the township described was near Fairbanks the correct description would be Township 3 North, Range 2 West, Fairbanks Meridian, Alaska.

Each complete township is divided into 36 square miles or 36 sections. Rows of sections are numbered in a serpentine manner beginning with section 1 in the northeast corner then going from right to left 2 through 6. Section 7 lies below section 6 (see figure 12.2). The second row of sections, 7 through 12, is numbered left to right. The direction of numbering alternates with each row, ending with section 36 at the southeast corner.

In each full section or square mile (1 mile = 5280 feet) there are 640 acres (1 acre = 43,560 square feet); however, due to convergence the sections on the west side of the township, sections 6,7,18,19,30 and 31, will be less thatn 640 acres becauise the adjustments for convergence are made in those sections. Any errors made in the survey of the township will be adjusted on the west and north rows of sections, therefore sections 1 through 6 may also contain more or less than 640 acres.

Sections are broken into fractional parts or aliquot parts when descriptions of areas less than square miles are used. Each section of the rectangular survey system has a monumented section corner at each corner. In addition on each exterior boundary there are markers halfway between each section corner. These markers are called quarter corners. (See figure 12.3). Section corners and quarter corners are properly labeled by naming the sections on each side of the corner. For example the northeast section corner of section 22 is called the section corner common to sections 14,15,22 and 23 of its appropriate township, range and meridian. The north quarter corner of section 22 is the quarter corner common to sections 15 and 22 of Township....

Lines are drawn between the north and south quarter corners and the east and west quarter corners dividing the section into quarters. Each quarter is designated in reference to its location from the lines drawn between the quarter corners. The quarter section lying east of the line between the north and south quarter corners and lying north of the line between the east and west quarter corners is the northeast quarter (abbreviated the $NE\frac{1}{4}$). Clockwise the other quarters are the $SE\frac{1}{4}$, $SW\frac{1}{4}$ and the $NW\frac{1}{4}$. (See figure 12.3).

Each quarter contains 160 acres and can be further divided into smaller fractional parts. The quarter may have an east-west line dividing it into halves such as the north half of the southwest quarter ($N\frac{1}{2}SW\frac{1}{4}$) and the south half of the southwest quarter ($S\frac{1}{2}SW\frac{1}{4}$), each containing 80 acres. (See figure 12.3). Or there may be east-west and north-south lines dividing it into quarters such as the $SE\frac{1}{4}SE\frac{1}{4}$, $SW\frac{1}{4}SE\frac{1}{4}$, $NW\frac{1}{4}SE\frac{1}{4}$ and $NE\frac{1}{4}SE\frac{1}{4}$ each containing 40 acres. Smaller divisions may result in fractional parts such as the $S\frac{1}{2}N\frac{1}{2}SW\frac{1}{4}SE\frac{1}{4}$ containing 10 acres.

When describing a quarter section, 160 acres, which has had 10 acres sold from it, instead of describing it as the $NW\frac{1}{4}SW\frac{1}{4}$, $E\frac{1}{2}SW\frac{1}{4}$, $E\frac{1}{2}SW\frac{1}{4}SW\frac{1}{4}$, and the $SW\frac{1}{4}SW\frac{1}{4}SW\frac{1}{4}$ (see figure "A"), a simpler way is by exception: the $SW\frac{1}{4}$ excepting therefrom the $NW\frac{1}{4}SW\frac{1}{4}SW\frac{1}{4}$. Specifically name the part excepted. A common mistake is the failure to fully name the portion, such as the $SW\frac{1}{4}$ excepting the $NW\frac{1}{4}SW\frac{1}{4}$. This last description excludes 40 acres instead of 10 acres.

The proper description of the dark areas in figure 12.1, 12.2 and 12.3 would be the Southeast quarter of the Southeast quarter of Section 22, Township 3 North, Range 2 West, Fairbanks Meridian, Alaska and abbreviated as $SE\frac{1}{4}SE\frac{1}{4}$, Section 22, T.3 N.,R.2 W., F.M., Alaska.

Sometimes sections cannot be entirely divided into fractional parts due to such reasons as convergence, navigable water, other government survey boundaries, survey error and other reasons. The portions of the sections that cannot be divided into fractions are lotted. Special surveys are made of the problem areas and lot numbers are assigned to the surveyed areas. The lot numbers then become the proper description for that portion. The description of the area not crosshatched in figure "B" is Lots 3,4,5,6,7,8 and 9; the $SE\frac{1}{4}NE\frac{1}{4}$; and the $NE\frac{1}{4}SW\frac{1}{4}$ of Section 6, Township 4 South, Range 6 East, Seward Meridian. The area described contains 293 acres and not the 320 acres which the $W\frac{1}{2}$ an interior section such as section 22 would contain.

To complete a legal description using any form of description, the recording district (or county) and state where the land is located is required. An example is Lot 3 and the $NW\frac{1}{4}$ of Section 5 of Township 12 North, Range 3 West, Seward Meridian, Anchorage Recording District, State of Alaska.

U.S. SURVEYS AND U.S. MINERAL SURVEYS

Two other types of government surveys may be found in the western portion of the United States, U.S. Surveys and U.S. Mineral Surveys. These surveys are not part of the rectangular system, but were specific boundary surveys commissioned by the U.S. Government to survey lands that were not within the boundaries of the rectangular system. Each survey was given a specific number, for example, U.S. Mineral Survey 1760 for mining claims and U.S. Survey 5111 for homesteads and other forms of federal land appropriations. U.S. Survey 5111 is the proper designation for a specific parcel of land surveyed by the federal government. Unless the U.S. Survey contains lots and a specific lot is to be described, all that is required to describe the property is the U.S. Survey number.

METES AND BOUNDS

Metes and bounds means measures and boundaries and is the method used to describe irregular shaped or nonplatted land. (Plats are previously surveyed property maps which have been placed of record such as subdivision plats.) Metes are the measure of length (distance) and direction, (bearings). Bounds are the boundaries or limits named in the description. Figure F is a metes and bounds description.

The description begins at a known point which can be readily identified and relocated if it is destroyed. Section corners, quarter corners and monumented subdivision lot corners are examples of identifiable and relocatable points. From the known point a direction or course is taken for a certain distance or to an identifiable point, and repeated until the property has been enclosed. The primary feature of a metes and bounds description is that the described directions and distances will enclose the property and come together at the beginning point.

Many times the known point does not coincide with the property corners. When this happens the known point will be described and directions and distances will be given to a point on the boundary of the land to be described. This point may be designated the True Point of Beginning or in some manner to specify that it is the initial point of the boundary description. It is not necessary to return to the known point when the boundary description is complete because the line from the True Point of Beginning to the known point has already been described.

Directions in a metes and bounds description are generally given in bearings. North-South and East-West axis are drawn across a circle dividing it into 4 quadrants of 90°. (See figure C). The quadrants are North-East, North-West, South-East, and South-West. A line from the center of the circle which coincides with the North axis is described simply as North. The same holds true for East, South and West. Lines other than those coinciding with the axis are described by the quadrant they are in and the measure of the angle from the North-South axis. The angles are measured in degrees (°), minutes ('), and seconds ("). There are 60" in 1' and 60' in 1°.

Line #1 in figure C is in the North-East quadrant and the angle between the North-South axis and line #1 is 30°. The bearing is described as North 30' East. Line #2 is South 60° East because it is in the South-East quadrant and the angle between the North-South axis and Line #2 is 60°. Bearings except for due North, East, South and West will always begin with North or South, then the angle measured from the North-South axis to the line, and then the other direction of the quadrant, East or West. If you are unfamiliar with bearings, consider each point on the boundary as the center of a circle with North-South and East-West axis and then determine the bearing.

Each line in a description has two bearings, the bearing depends on the direction of the survey or description. In figure D the bearing of the line going from point X to point Y is North 75°10'15" West (abbreviated N. 75°10'15" W.), but going from point Y to point X it is S. 75°10'15" E. The degrees, minutes and seconds will remain the same, only the quadrant will change with the reversal of direction. Standard practice is to describe the boundaries in a clockwise direction.

Distances are usually given in feet and hundredths of a foot; however, older surveys may be in chains (1 chain = 66 feet), rods (1 rod = 16.5 feet) and links (1 link = 7.92 inches and 25 links = 1 rod).

When there ambiguities in a description, the ambiguities will be resolved on the basis of:

1. The parties intent
2. A "call" to a monument
3. A distance
4. A course or bearing
5. Area

The land the parties intended to convey will control, but if the parties are unavailable the court will interpret the description based on the above priorities. For example, if the description includes a line described as: thence N. 88°55' W. along the section line between Sections 12 and 13 a distance of 500 feet to the section corner common to Sections 11, 12, 13 and 14 of Township 13 North, Range 3 West, Seward Meridian. Thus, if the actual bearing of the section line was West instead of N. 88°55' W., the naming of the section line, or the "call" to the section line, would cause the distance to be measured along the section line instead of the bearing of N. 88°55' W. used in the description. If the distance from the preceeding point to the section corner was actually 600 feet instead of 500 feet, the "call" to the section corner would control and the buyer would get 600 feet of property instead of 500 feet.

In their order of priority monuments are: (1) natural monuments (lakes, river meander lines, rock outcroppings, etc.), (2) artificial monuments (section corners, subdivision corners, street curbs, etc.) and (3) record monuments (recorded documents such as deeds, plats, etc.).

Except for Texas, if there is a conflict between a bearing and a distance, the distance will take precedence over a bearing. After bearings the last priority for interpreting a legal description is the area. The area is usually the least precise measurement of the description, but it may be used to solve ambiguities or errors. An incorrect fractional part description such as the NW$\frac{1}{2}$ of Section 15, ... containing 160 acres can be easily resolved using area. There is no such thing as a NW$\frac{1}{2}$; a NW$\frac{1}{4}$ generally contains 160 acres and a W$\frac{1}{2}$ or N$\frac{1}{2}$ of a section is usually 320 acres. Courts would resolve the erroneous description as actually being the NW$\frac{1}{4}$.

As a practical tip, calls to monuments should be used whenever appropriate to describe lines or points in a metes and bounds description.

CURVES

The area in metes and bounds descriptions which usually causes the most confusion is the description of curves.

A simple curve (See example E) consists of a point of curve, the P.C. or point where the curve starts, an arc or length of curve, L. or the distance along the curved line, and the point of tangent, P.T. or the point where the curve ends; however, each simple curve has certain other mathmatically defined points which may be used to describe it.

By definition a simple curve is one that has the same radius throughout. The radius, R., is the distance from the center of a circle to the curve on the outside. What this means is that every point on a simple curve is the same distance from the center of the circle, for example, if the radius is 50 feet, every point along a simple curve is 50 feet from the center of the circle.

A tangent, T., is a line that touches a circle at only one point. By drawing a line from the center of a circle to to the curve a radii is made. At the point where the radii touches the curve there is a tangent that touches the circle only at that point. The tangent is perpendicular, or at a right angle to the radii. For each simple curve there two tangents of equal length which touch the curve, one at the P. C. and one at the P.T. Where these two equal tangents meet is called the point of intersection, P.I.

On each curve a straight line is drawn from the P.C. to the P.T., this line is called the long chord, or L.C. Another measurement is the central angle or deflection angle, I or Δ , which is the angle between the radii to the P.C. and the P.T. There is also a degree of curvature, D, which is the angle between the radii for every 100 feet along the arc of the curve.

The purpose of the above information is to define the various parts of a simple curve so that data such as the following can be used:

Δ = 17°25'26' Lt.
D = 4°
R = 1,432.40'
L = 435.60'
T = 219.49'
L.C. = 375' (rough estimate)

Any two of the above can be used in a legal description to describe a curve. A curve may be described as: ... thence N. 20°30' E. a distance of 15 feet to the point of curve; thence northeasterly 435.60 feet along the arc of a curve

to the left (right or left are used to indicate the direction the curve takes from the point of curve) which has a radius of 1,432.40 feet and a central angle of 17°25'26" to the point of tangent; thence ....

There several types of curves but generally the same data will be used for property descriptions.

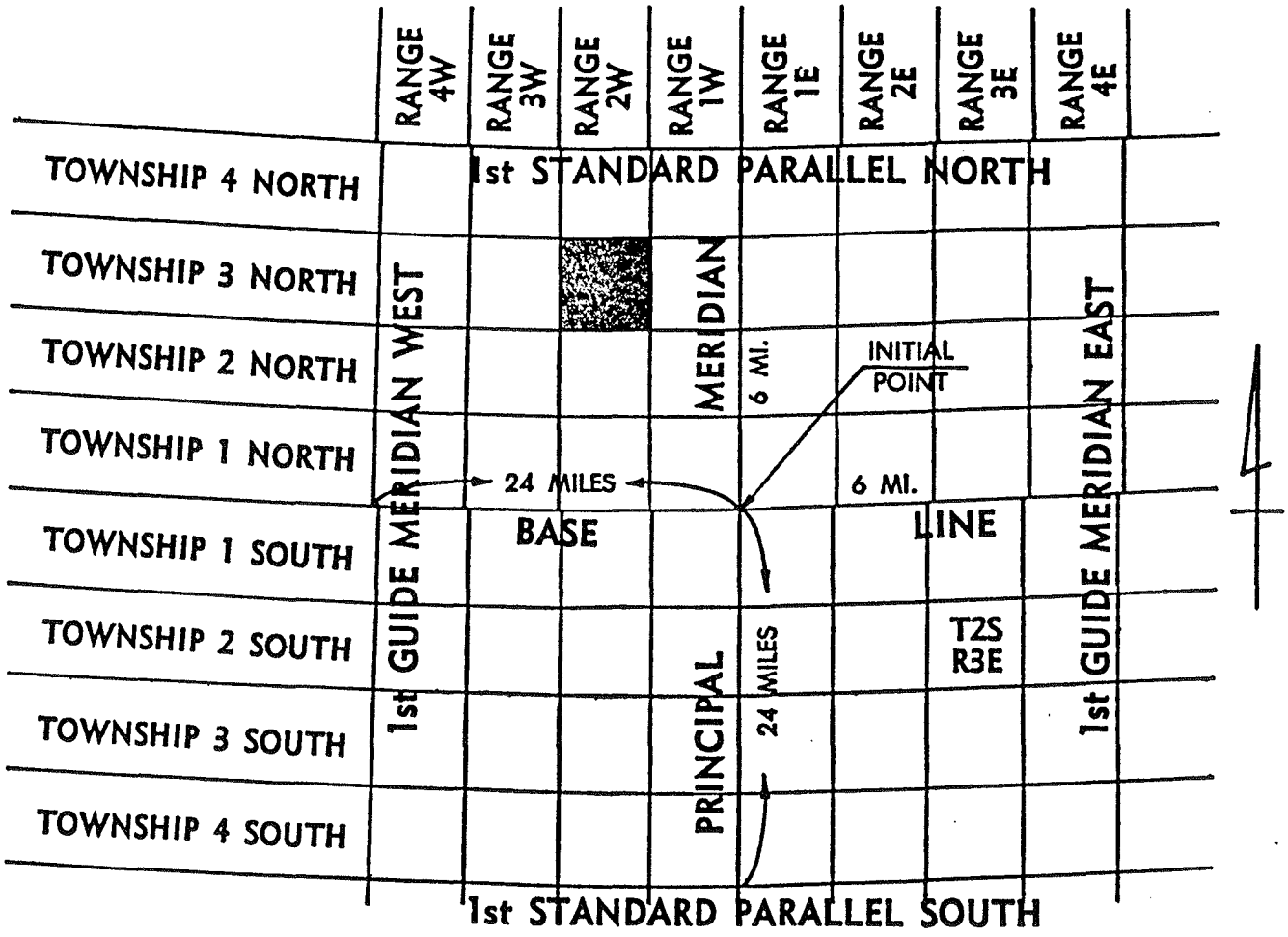


FIGURE 12.1—STANDARD RECTANGULAR SYSTEM

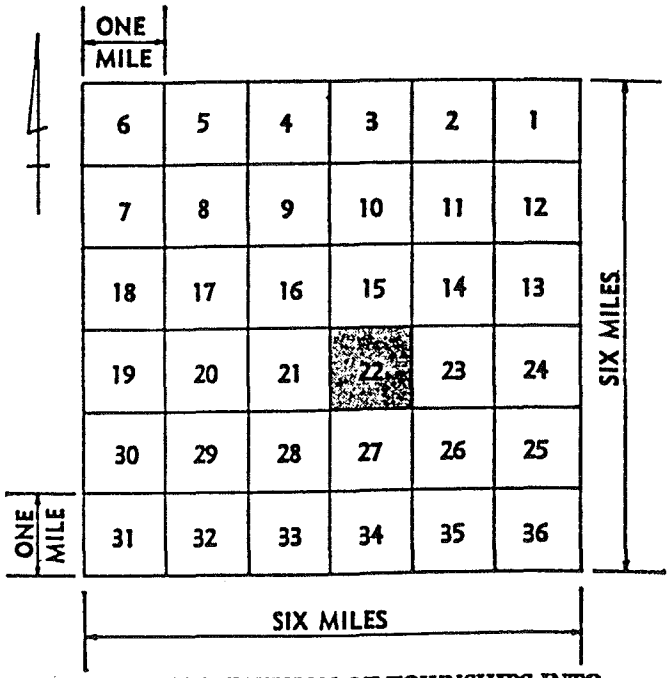


FIGURE 12.2—DIVISION OF TOWNSHIPS INTO SECTIONS

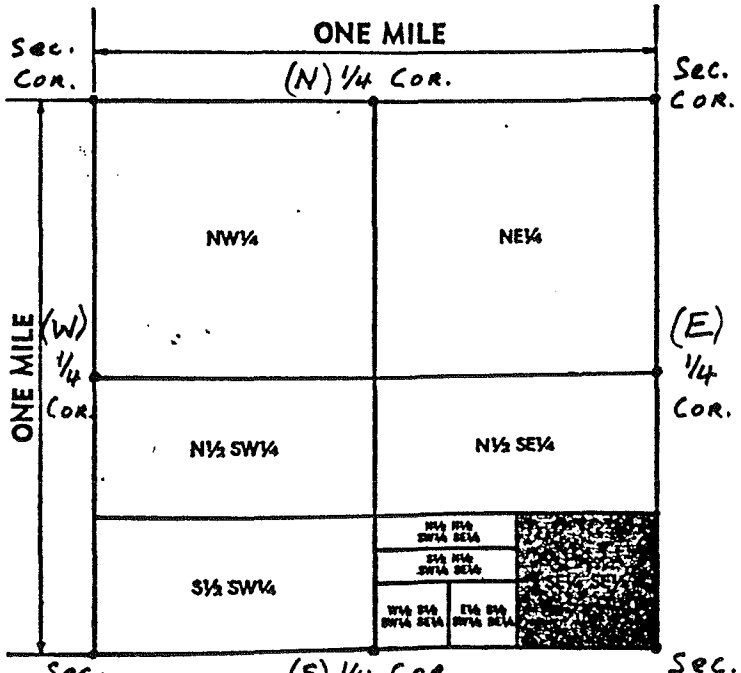


FIGURE 12.3—FRACTIONAL PARTS OF A SECTION

SECTION 10

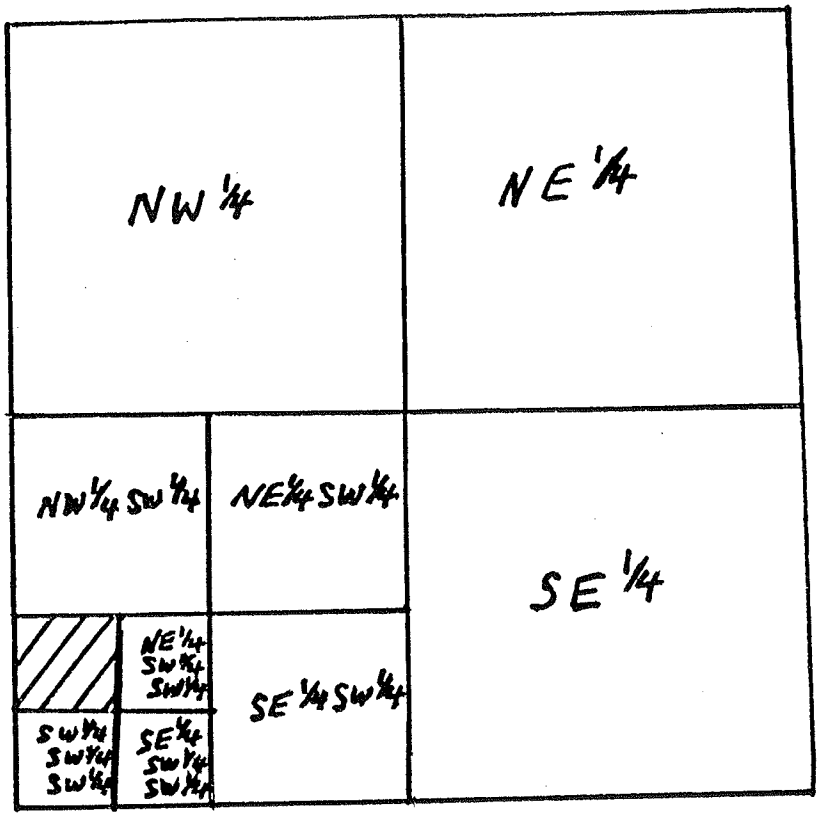


Figure A

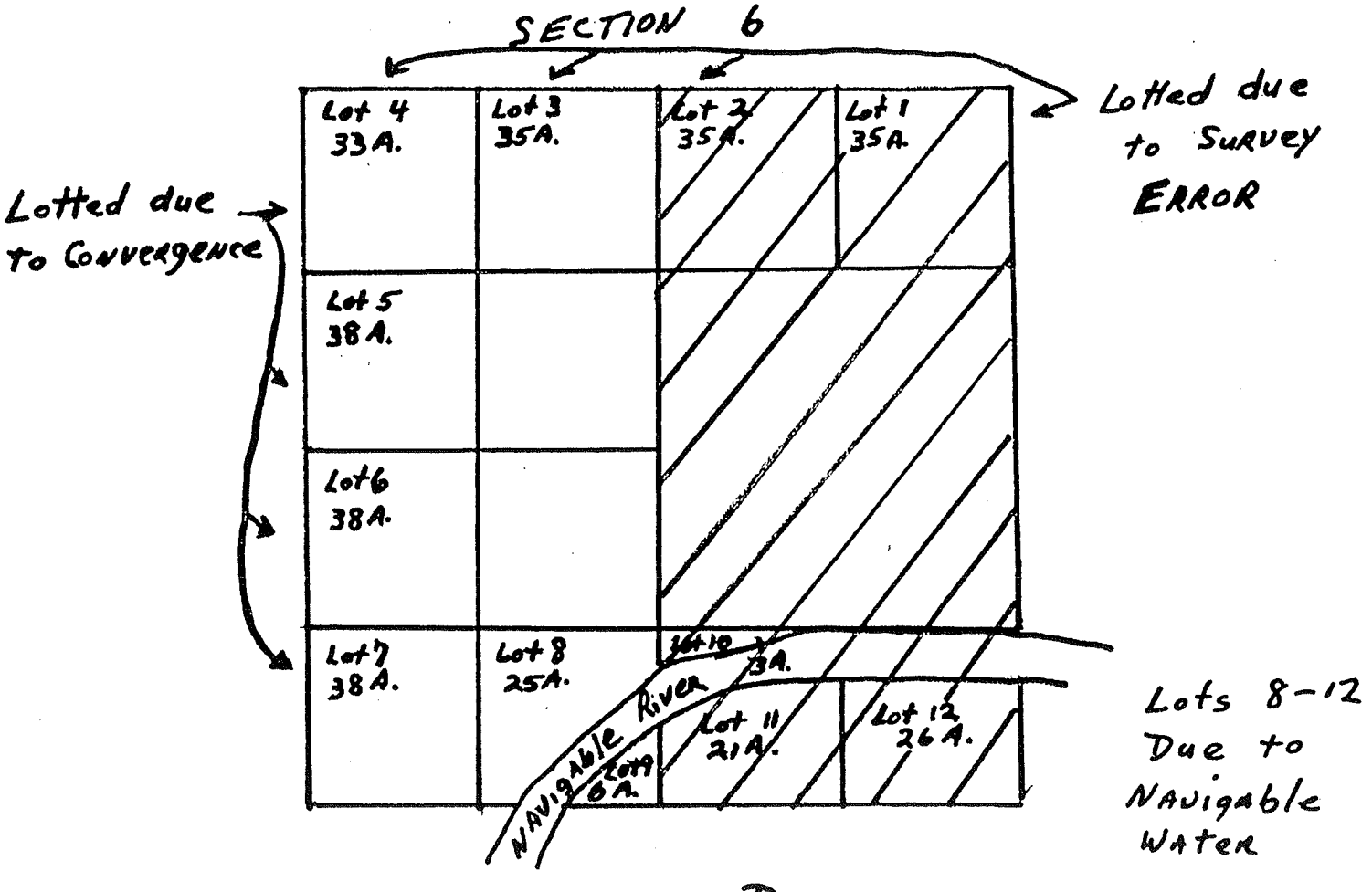
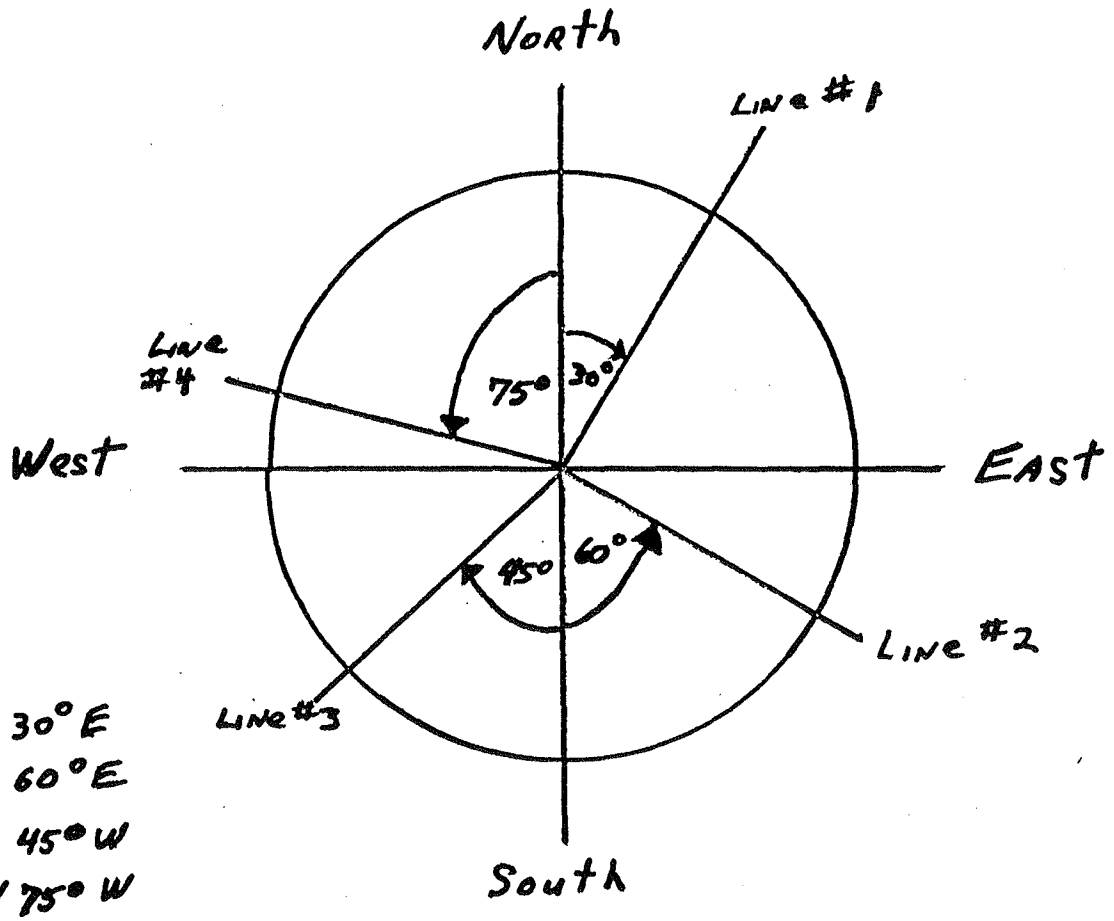


Figure B



Line #1 N 30° E
Line #2 S 60° E
Line #3 S 45° W
Line #4 N 75° W

Figure C

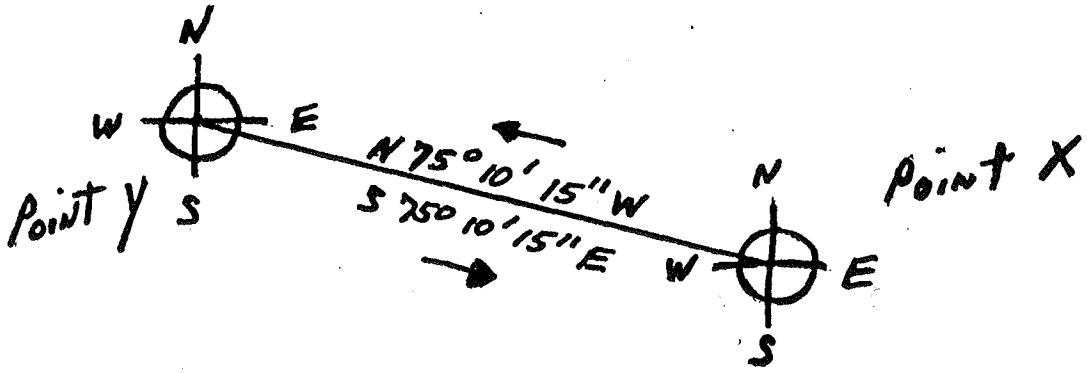
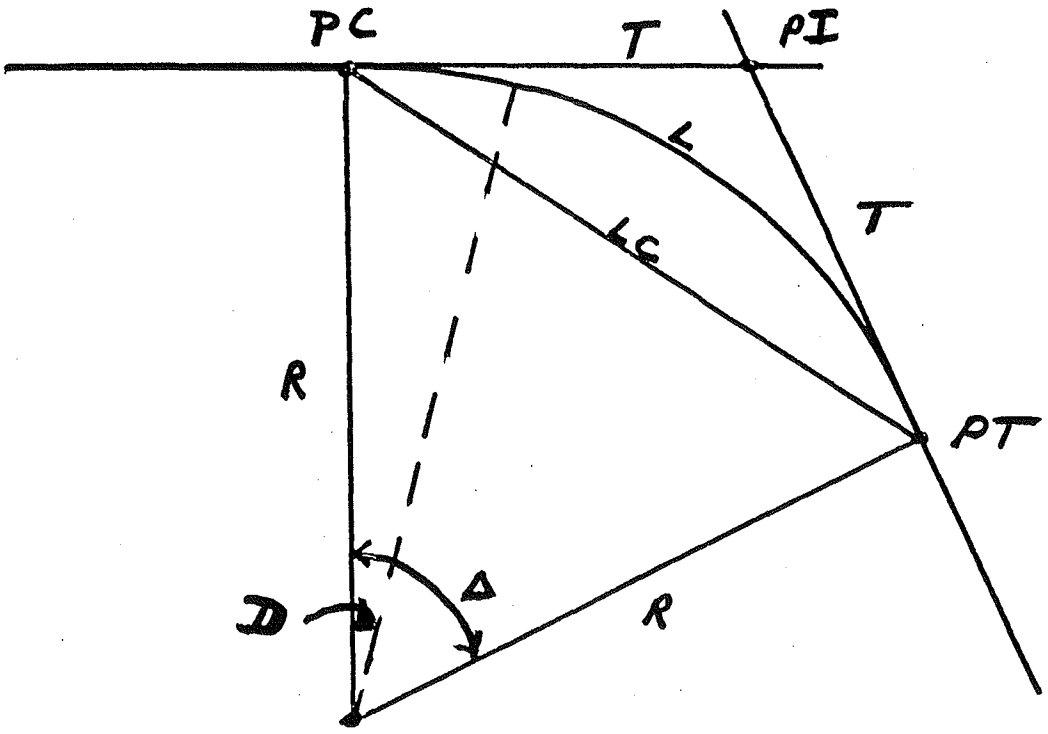


Figure D

Simple Curve



PC = Point of Curve

T = Tangent

P.I. = Point of Intersection

L = Arc or Length of curve

LC = Long Chord

R = Radius

PT = Point of Tangent

Δ = Deflection Angle or Central Angle

D = Degree of Curve

Figure E