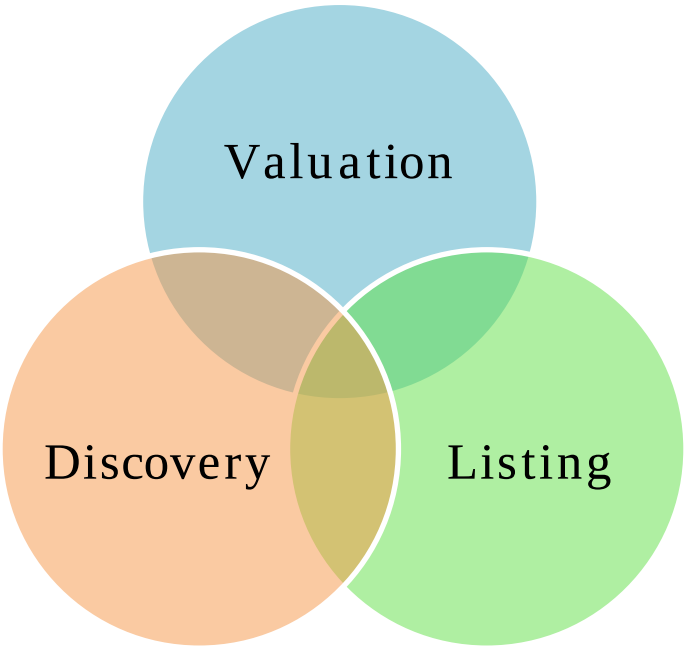
Chapter 5

Real Property Assessment-General

The assessment process consists of the three basic procedures of discovery, listing, and valuation as illustrated in the diagram below. Often the assessment process is thought of only in terms of valuation, but an assessment cannot even begin until it is known that certain assessable property exists (discovery) and it is made a matter of record (listing). *Therefore, discovery and listing form the foundation upon which all assessed values rest.*

Figure 5-1



Discovery of Realty

Property owners are not required by law to report their holdings to the assessor; therefore, the responsibility of discovering assessable real estate rests entirely with the assessor.

Mapping

Since land is the starting point for the discovery of real estate, maps and plats are indispensable to the assessor. It is not possible to properly assess a town, village, or city without accurate and up-to-date maps of all area within the taxing district. Maps aid in the location of property and show the size and shape of each parcel and other relevant features affecting value. In addition, they provide a documented, visual record of all real property while accounting for every square foot of property in the district.

The combined information of various types of maps greatly simplifies the job of the local assessor. There is a continual need for plat maps, road maps, topographic maps, soil maps, and aerial photos in locating, grading, and valuing land within the districts. Maps are of

different types, and usually each map is better suited for one particular purpose than any other. Maps that are of use to the assessor are:

1. **Base maps** - have sufficient points of reference, such as township or section lines, and other selected physical features to allow the plotting of other pertinent data upon the map such as sales, ownership lines, etc.

2. **Cadastral maps** - show the name of each property owner, shape and size of each parcel, location of roads, rivers, lakes, and farm sets or houses. Maps shown in commercially published plat books are cadastral maps.

3. **Contour maps** - show the configuration of a surface by means of contour lines representing regular intervals of elevation.

4. **Plat maps** – are of a specific area, such as subdivision, indicating the location and boundaries of individual properties.

5. **Soil association maps** – show the general patterns of the soil throughout the county and are helpful in studying the soil of a county in general. These maps do not give a detailed analysis of each property. They are a useful tool if a detailed soil survey has not been completed. Each soil association contains several different soils arranged in a characteristic pattern. In most places the pattern is related to the nature of the soil materials and to the shape of the land surface.

6. **Soil survey maps** - describe the soil types, show their location on a map, and tell what their productivity will be under different kinds of management. These maps are an invaluable tool in the classification of agricultural land.

7. **Tax maps** - show each separately owned parcel along with parcel numbers, acreages, lot and block numbers, subdivision names, dimensions, and street and road names.

8. **Topographic maps** - show a graphic representation of selected man-made and natural features of a part of the earth's surface plotted to a definite scale. The distinguishing characteristic of a topographic map is a portrayal of the shape and elevation of the terrain. They show the location and shape of mountains, valleys and plains, the network of streams and rivers, and principal man-made works such as highways, railroads, etc.

For sources of maps, refer to the appendix at the end of this chapter.

The value of good maps cannot be over emphasized. The maps should be a coordinated system, prepared in accordance with certain standards. The purpose of this section is to outline the basic requirements and specifications for a tax mapping system that will aid the assessor in performing the assessments and preparing a complete, accurate, and equitable assessment roll.

Tax Mapping

A base tax mapping system is achieved by dividing the district into geographical areas following the established and recognized permanent boundary lines of the Rectangular Survey System, i.e., township and range lines, section and quarter section lines. The use of these permanent divisions in the organization of the mapping and parcel numbering system creates parcel numbers that are in themselves a partial legal description identifying the township, section, and quarter section of each parcel. Also, by using fixed survey boundaries, the map boundaries become permanent. The base maps must be prepared to show in full detail all property, both subdivided and metes and bounds, and they must be based on complete research of the county deed records relating to real property.

The following outlines the basic requirements, planning, preparation, and maintenance of tax maps on a county-wide basis. Individual municipalities or counties desiring more detailed information on mapping and aerial photography specifications, contracting for mapping services, equipment and personnel suggestions, and so forth, should contact the Department of Revenue (DOR), Office of Assessment Practices.

Basic Tax Map Units

The standard map system recommended by the DOR contains the following units:

1. **County index map** - showing the survey townships, township and range lines, and locations of cities and villages for the entire county (See Figure 5-2).

2. **Township index map** - for each township area. These maps should be of sufficient scale to show all streets, railroads, lakes and rivers, as well as section lines and numbers. The map should show the area covered and page number of the detailed maps. City and school district boundaries may also be shown on these maps if desired (See Figure 5-3).

3. **Detailed tax maps -** these maps are prepared at the appropriate scales and coverage to show all property in the detail necessary to properly identify each parcel. Parcel numbers, acreages, lot and block numbers, subdivision names, dimensions, and street and road names are shown. These maps are to be prepared so as to be suitable for both office and field use (See Figure 5-4).

4. **County subdivision index** - there should be an alphabetical subdivision index for all recorded subdivisions in the county. The index should list the map book and pages where located, and also recording information of such subdivision.

5. **County certified survey index** - there should be an index for all certified surveys in the county. This index should list the map book and pages where located.

Figure 5-2

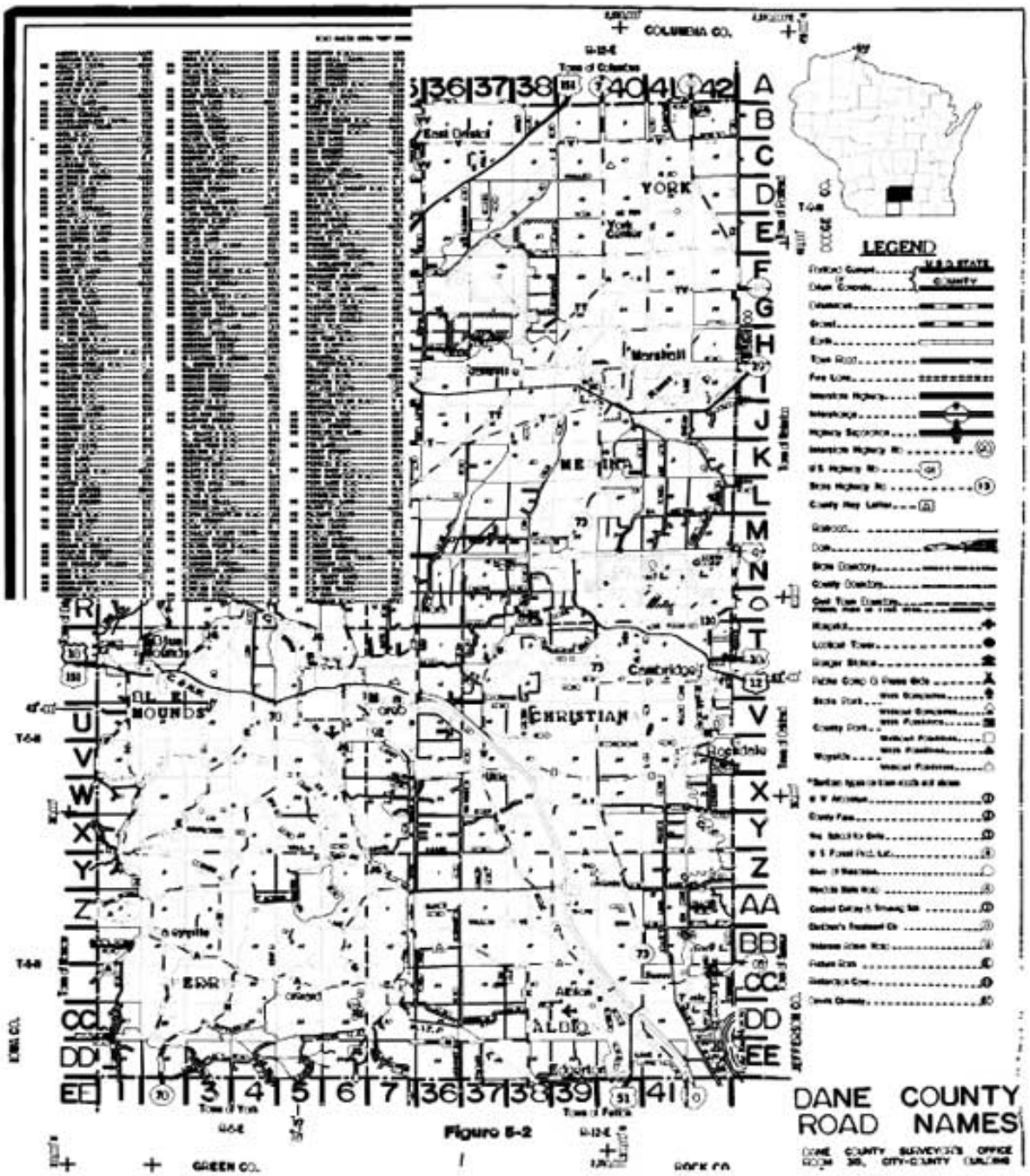

COLUMBIA CO.
YORK
Marshall
Cambridge
CHRISTIAN
MOUNDS
ERR
ALDO
LEGEND
DANE COUNTY
ROAD NAMES
Figure 5-2
GREEN CO.

Figure 5-3

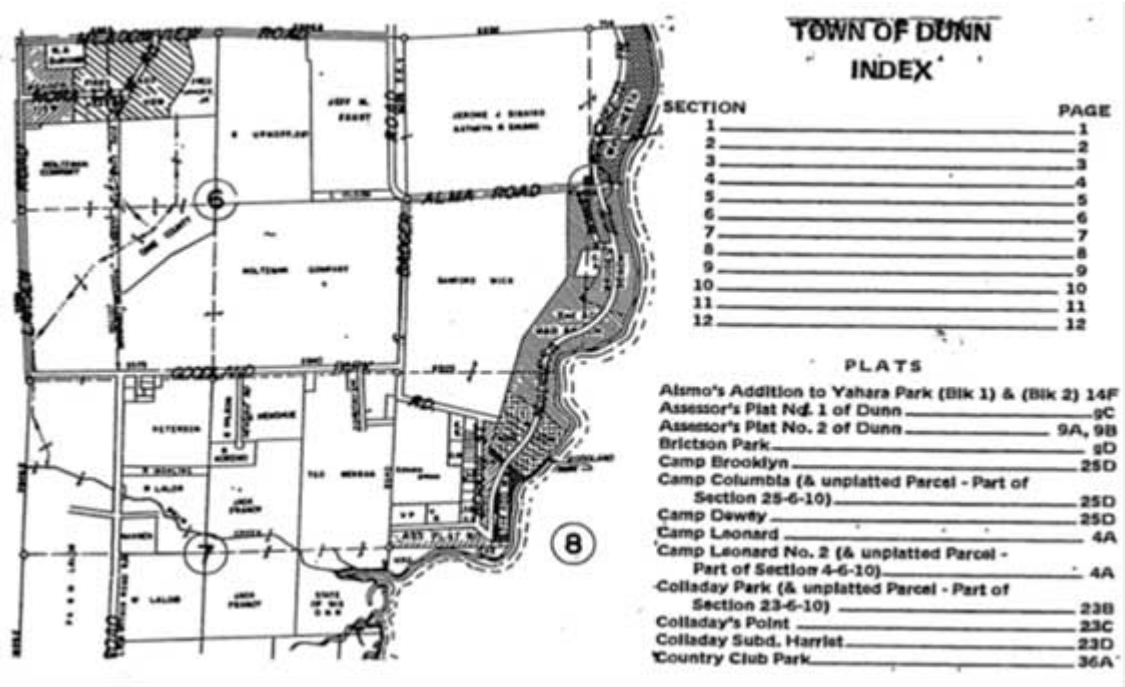
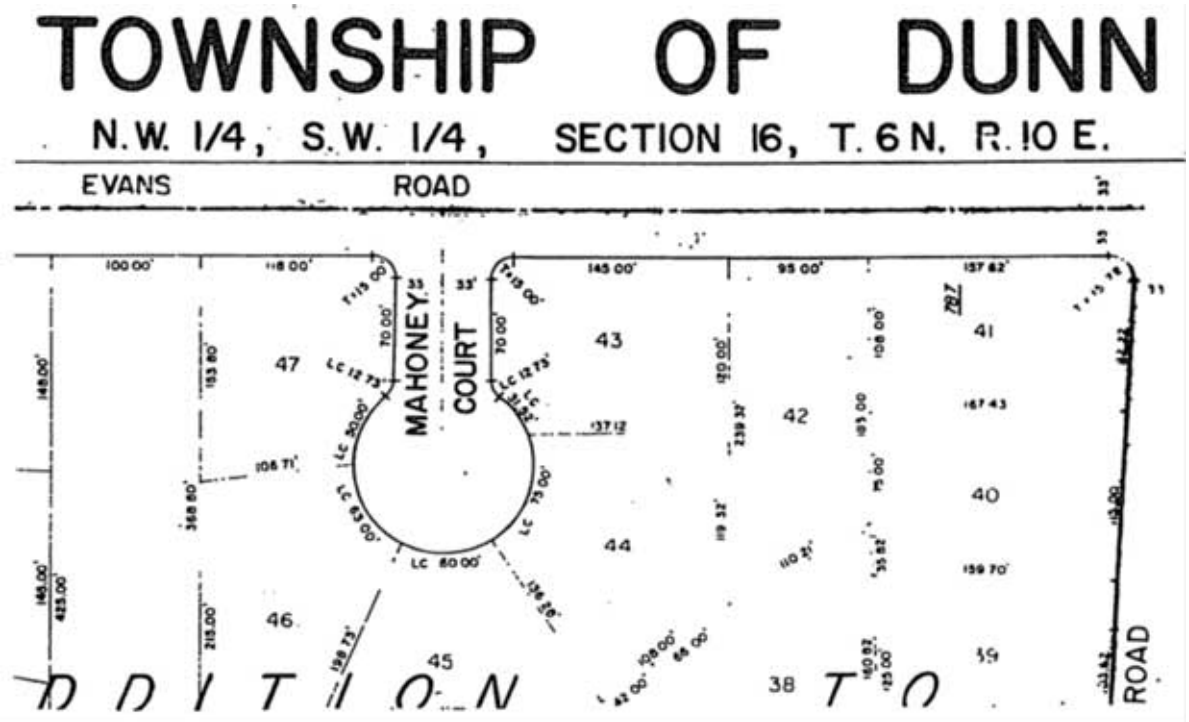


Figure 5-4



Preparation of Maps

The installation of a standard map system requires the compiling and coordinating of all the existing survey and property data into the final maps so they will be as accurate as possible. The system for the preparation of the maps can be best accomplished by the following method:

Planning

The first step is to analyze each area of the county to determine the scale at which it should be mapped. A county map should be marked to indicate the areas to be mapped at each scale. The following scales for maps are prescribed by the DOR:

- Map sheet size should be 15" by 20"
- Map Scales:
  - Urban - 1" = 100'
  - Suburban - 1" = 200'
  - Rural - 1" = 400'

This layout should be considered preliminary and may need revision as areas are actually mapped. A map drawn at too small a scale for the purpose it was intended will never be completely satisfactory.

Collection of Source Data

Under this step all descriptive data should be obtained. Some sources are: county highway maps, U.S. Geological Survey quadrangle maps, U.S. Public Land Survey maps, Department of Transportation (DOT) county and township highway maps, recorded subdivision plats, plats of certified surveys, railroad right-of-way maps, and city, village, or commercial publications. One of the most important single sources of information for preparing base maps is current, enlarged aerial photographs. Aerial photographs are relatively inexpensive and should be available in every assessor's office. While aerial photos do not offer the same degree of precision as actual ground surveys, they readily provide data on parcel size, location, land use, and surface cover such as forest, etc.

Information to be Shown on the Maps

As a minimum the maps should depict the following detail:

1. Each established parcel and its boundaries
2. Dimensions of the property
3. Acreage
4. Parcel numbers
5. Name of subdivision; tract number; section, township, range number; lot and block number; government lot numbers
6. Title and page number
7. Streets, railroads, rivers, lakes, streams, and their names

8. Major utility lines, churches, schools, cemeteries, airports, government lands, etc.
9. Scale
10. North line
11. Adjoining page number references

Layout of the Map

This step consists of carefully plotting at the proper scale all of the Rectangular Survey data. This is a difficult task as much of the data can be inaccurate and does not readily fit together; however, properly enlarged aerial photos are a great aid at this stage. It will be possible to trace the section corners and lines, streams, lakes, rivers, roads, railroads, and many property lines from aerials while checking against the available data for accuracy. Conflicts in property descriptions and boundaries should be noted for further research.

Parceling

After the base layouts have been prepared as accurately as possible, parcel lines for metes and bounds descriptions should be platted and the acreage calculated. Each description from the assessment rolls must be checked and laid out to account for each parcel of land in the county. Parcel numbers can now be assigned by block and individual parcel, then recorded and applied to the assessment roll and property record cards.

Checking

Upon completion, each map should be checked in every detail. Every word, figure, number, title, page number reference, and dimension should be carefully checked against the source data for accuracy and completeness. Maps needing correction are returned to the draftsman and re-checked after completion of the corrections.

Printing

After all corrections have been made, copies of the maps should be made for the Supervisor of Equalization and the assessors throughout the county. The copies should be punched and bound with hard covers and screw posts. Each book should be assembled to cover a township and contain the following items:

1. County subdivision index
2. County index map
3. Township index map
4. Detailed tax maps at appropriate scales
5. Outside label indicating contents

Filing and Care of Maps

Tax maps are official records of assessment data and are subject to constant use. County and city offices, title and abstract people, real estate brokers, surveyors, engineers, and taxpayers are interested in this information. Therefore, it is desirable that a set of maps be

made accessible to the public at a place where they can use the maps without interfering with office work. The master maps should be used only to reproduce additional copies or when they are being brought up-to-date by the draftsman and should be stored in a fireproof location. The masters represent a considerable investment of time and money and if damaged, lost, or destroyed would seriously hamper the work of the assessor. It may be a good idea to have a copy of the master map put on microfilm or microfiche. The DOR makes available specifications for micro-film/fiche records and should be contacted for further information in this regard.

Maintenance of Tax Maps

Once installed, the tax maps and all other assessment records must be kept current. This requires constant vigilance on the part of the assessor and the real property lister. All types of assessment records soon become out-of-date and the original value and investment are lost unless all changes and corrections are made. It is desirable to make changes as they occur, but if time does not permit this, changes should be made at least once a year.

Maintenance consists of two general phases. The first phase consists of indicating new property boundaries where an owner in the selling of one or more parcels of property subdivides property or by the filing of recorded subdivisions. This phase would also include the cutting up of property and changes necessitated by new highways or by changes in highways or other public works.

The second phase of the maintenance is the constant correction and improvement of the maps from new and more accurate survey data. Surveys may be made for many purposes and whenever new surveys are made they supply basic information for the correction of the maps. Such survey information should be used and the map books corrected accordingly.

The first phase will necessitate the assigning of new parcel numbers, while the second phase will generally not change any parcel numbers, but improve the accuracy of the maps and may give a more complete and accurate description of the property on the master map. In many counties the real property lister maintains the maps on a regular basis; however, the assessor should still be involved in the process and report any changes and corrections to the real property lister so the maps can be updated accordingly.

The sources of data for maintenance are the following:

1. Recorded deeds
2. Recorded subdivisions
3. Recorded certified surveys and other recorded maps
4. Highway and road surveys, other government surveys, and miscellaneous types of surveys
5. Records of relocation and monumentation of section corners (sec. 59.635(8), Wis. Stats.)

Computer Assisted Mapping

In counties or municipalities with access to a computer, a computer assisted mapping system is a possibility. Through the use of a computer, all geographic information can be stored in a machine-readable (digital) database. The geographic information stored in the computer would include all data that is usually stored and used in map form. This information can then be used to actually produce maps.

A computer assisted mapping system allows large volumes of data to be easily stored and organized for ready reference. Printed reports can be produced as needed, and when maps are desired they can be rapidly and accurately prepared. When all geographic data is stored on a computer, the content of the maps is very flexible. The user can specify the type of map wanted, and the features to be included. The system makes it much easier to maintain current land data and maps.

When a complete set of tax maps is properly maintained, the assessor is provided with an accurate base for the assessment of property. *These maps form the foundation for a permanent parcel numbering system and are essential for correct legal descriptions.*

Legal Descriptions

It is important that every assessor have a thorough knowledge of the fundamentals involved in formulating and understanding legal descriptions. The purpose of a legal description is to establish a parcel's size and shape and to identify its location. Legal descriptions must be accurate, that is, they must describe the property intended. This is particularly important since real estate taxes represent a lien upon the property on which they are levied. *This lien is held against the legal description.*

Historical Background

The oldest method of describing property is by metes and bounds, which means literally the "measurement and boundaries" of a tract of land. A metes and bounds description defines a parcel by describing the courses (directions) and distances of its boundary lines. This system was originally used in surveying the original thirteen colonies as well as Maine, Vermont, West Virginia, Kentucky, Tennessee, Texas, and Hawaii. Because many of the original land grants in the United States were of irregular shape, it was considered sufficient if lands were described as bounded by natural or artificial features or monuments of the terrain, and if the names of adjacent property owners were given in the deeds. Rivers, lakes, rocks, trees, fences, ditches, posts, or any other identifying characteristics along the boundary of a property were used as monuments. While such descriptions were adequate at the time, they lacked permanency. Destruction or removal of monuments would make a resurvey of the property nearly impossible. This lack of permanency, combined with the failure of surveyors to make their survey notes a matter of public record, and the lack of uniformity in the surveying of large and irregular tracts of land gave rise to frequent boundary disputes and land litigation. It then became general practice to determine the lengths and directions of land boundaries by measurement with the link chain and surveyor's compass and to fix the corners with permanent monuments. Metes and bounds

descriptions are still used today to describe parcels that are irregular in shape and cannot be located except by describing the courses and distances of their boundaries.

After the close of the American Revolution and the adoption of the Federal Constitution, much of the land in this country became the property of the federal government through trades, purchase, or treaty. The federal government found itself with enormous tracts of undeveloped and uninhabited land, with few natural characteristics suitable for use as monuments in metes and bounds descriptions; therefore, it became necessary to devise some standard system of describing land that would be permanent and also make it possible to readily locate parcels. To meet this need, a committee headed by Thomas Jefferson developed a plan for dividing the land into a series of rectangles which became known as the U.S. Rectangular Survey System and was first authorized by the Continental Congress in the Land Ordinance of 1785. The Land Act of 1796 followed and was the first law relative to land surveys passed under the Constitution. This act made radical changes in the methods of survey as originally conceived. Congress amended the Land Act in 1800 and again in 1805, and by that time, the system was firmly established. A number of general instructions were issued during the period from 1805 to 1855 to the government surveyors and the general instructions of 1851 to 1855 set the general pattern of present day surveys.

The Rectangular Survey System

Under the Rectangular Survey System it was necessary for the government surveyors to find an *initial point* from which a survey of a particular area could start. These points were established whenever necessary under special instructions prescribed by the Commissioner of the U.S. General Land Office. In selecting an initial point, it was important to ensure prominence and easy identification of that point; therefore, surveyors generally selected some substantial landmark, such as the mouth of a river, as an initial point. The location of the initial point was then fixed astronomically. This means that an instrument reading established its position, which is based on observation of heavenly bodies, such as the sun, moon, or planets. The instrument reading was expressed in degrees, minutes, and seconds north or south of the equator and east or west of the Meridian of Greenwich.

After the initial point was established, a true meridian was run through that point, either north or south, or in both directions, as conditions required. A **true meridian** is a due north-south line, extending from the North Pole to the South Pole. A meridian that passes through an initial point are designated the principal meridian for that particular state or area. As additional areas were surveyed by the government, additional principal meridians were established. There are 35 principal meridians in the United States, and these meridians have been either named or numbered. The Fourth Principal Meridian, which lies about 50 miles west of Madison, controls descriptions of land in Wisconsin and is fixed astronomically at 90 degrees, 25 minutes, and 42.5 seconds west of the Meridian of Greenwich.

Once the principal meridian for a particular area was fixed, the surveyors then extended a due east and west line from the initial point at right angles to the meridian. This line was then designated as the **base line** for that particular area. As new areas were surveyed, additional base lines were established, or in some cases, an existing base line was extended

to form the base line for the new area to be surveyed. There are 32 base lines in the country. The base line established for the Fourth Principal Meridian is fixed astronomically at 42 degrees, 30 minutes north of the equator and is the boundary line separating Wisconsin and Illinois.

After the principal meridian and base line were established, it was then possible to use the point of intersection of the principal meridian and base line as the starting point for all surveys in that area. The initial point, then, represents the point from which the lines of the public surveys are extended.

In surveying the principal meridian and base line, permanent quarter section and section corners were established and monumented on each line at intervals of 40 chains (1/2 mile) and regular township corners were placed at intervals of 480 chains (6 miles). These corners are referred to as **standard corners.**

In performing the survey, government surveyors used the chain, which is four rods, or 66 feet in length. Independent linear measurements were taken either by two sets of chain men, or when this was not possible, by the duplication of each measurement by one set of chain men. Whenever a survey was performed, there were errors in measurement caused by such factors as curvature of the earth, surveying over a rough terrain, or measuring up or down a slope. To ensure the accuracy of the survey, allowable limits of error were established. When the discrepancy between two sets of measurements taken in the prescribed manner exceeded 20 links (13 feet) per mile, it was required that the line be remeasured to reduce the difference. The corners were then set at the mean distance. When successive independent tests of alignment, as determined by astronomical observations, indicated that the line had departed from the true meridian by more than three minutes, it was required that the necessary correction be made to reduce the angle of the error.

Next, **standard parallels**, which are also called “correction lines” were extended east and west, parallel to the base line, following the same procedure used in running the base line (see Figure 5-5). In Wisconsin, the first four standard parallels were run at intervals of 60 miles and the fifth standard parallel was run 36 miles north of the fourth standard parallel. A definite 24-mile spacing of these lines was adopted in 1855; however, in many of the early surveys they were not placed at regular intervals. The survey of Wisconsin began in 1831, which accounts for the irregular spacing of Wisconsin’s correction lines.

Once the standard parallels were established, **range lines** were then extended north from the standard township corners that were established at six-mile intervals along the base line and standard parallels (see Figure 5-6). These lines run true north, and as such, they converge progressing north, due to the curvature of the earth. Because of this convergence, when a range line was extended from a standard township corner, it did not intercept the next standard corner to the north. To compensate for this, instead of running a range line continuously due north, allowing the convergence to progressively increase, the range lines were terminated at the points of their intersection with the standard parallels. At this point of intersection a **closing corner** (also called a correction corner) was established (see Figure 5-7). The next segment of the range line was then run true north from the standard township corner that it would have theoretically intercepted had there been no convergence. As a result, range lines are broken lines, each segment being theoretically 60 miles long, except between the 4th and 5th standard parallels where they would be 36 miles

long. The spaces between range lines are called ranges, and are described as east or west of the principal meridian and are consecutively numbered from that line.

Figure 5-5

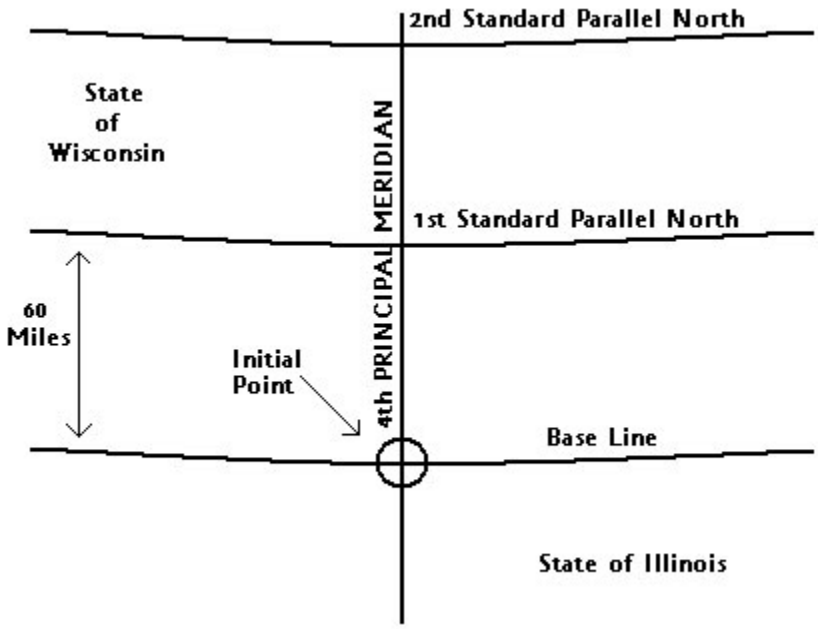


Figure 5-6

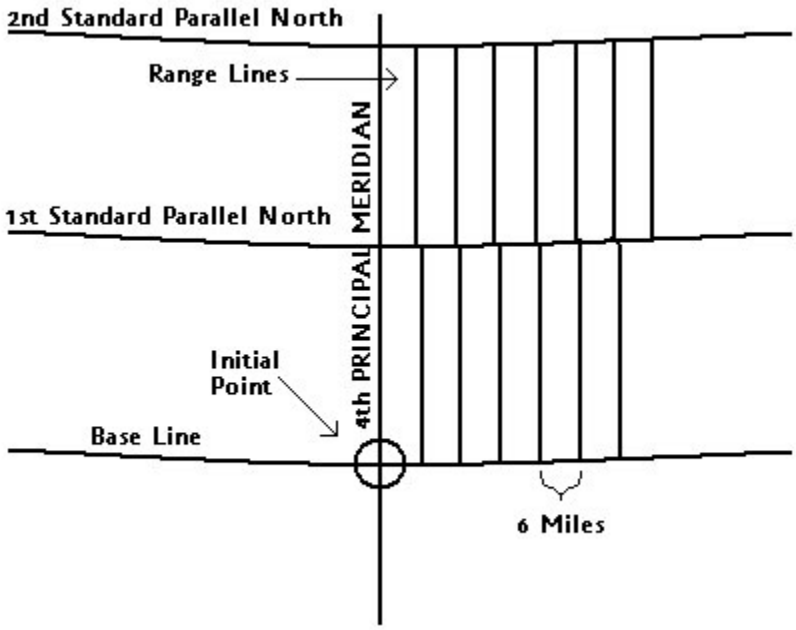


Figure 5-7

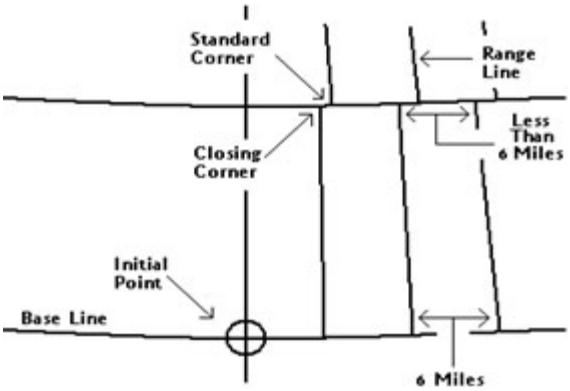
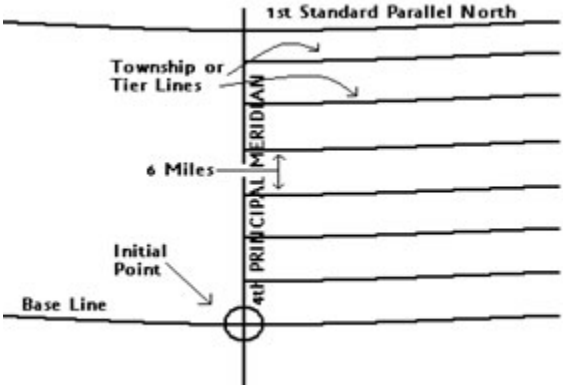


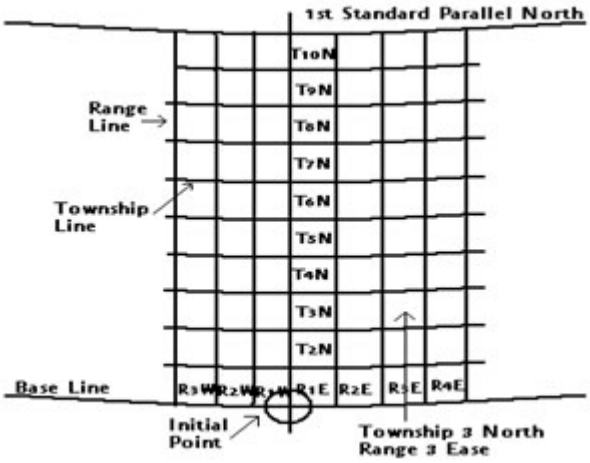
Figure 5-8



Next, **township lines** were extended east and west off the Fourth Principal Meridian at six-mile intervals, parallel with the base line (see Figure 5-8). The spaces between these lines are known as **tiers,** and they are numbered consecutively from the base line, and described as being north or south of the base line. Usually, for purposes of description, the word township is substituted for "tier".

The six-mile square tracts created by the range lines and township lines are known as **congressional townships.** A congressional township is not to be confused with a **civil township**, which is the unit of local government that governs a town. The number of its tier and range, and the name of the principal meridian designate a congressional township. For example, T 3 N, R 3 E, (read township three north, range three east) designates a township in the third tier north of the base line and the third range east of the principal meridian. If this township were located in Wisconsin, its description would be referenced to the initial point of the Fourth Principal Meridian and would be completely described as T 3 N, R 3 E of the Fourth Principal Meridian (see Figure 5-9).

Figure 5-9



Congressional townships contain as near as possible 23,040 acres and are further subdivided into thirty-six tracts called sections (see Figure 5-10). **Sections** contain as near as possible 640 acres. The thirty-six sections into which a township is subdivided are numbered, beginning with number one at the northeast corner of the township and proceeding west to number six, dropping south to number 7 and then proceeding east to number twelve, and so on until they number to thirty six in the southeast corner (see Figure 5-11). A section is legally described by giving its number, tier, range, and name of the principal meridian.

Figure 5-10

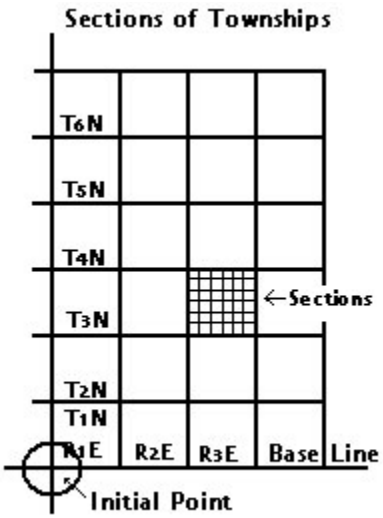
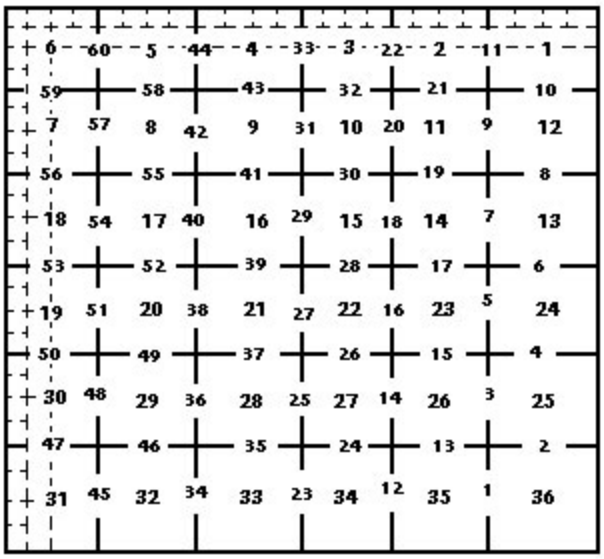


Figure 5-11

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

In subdividing townships into sections, the south and east boundaries of the township were the governing lines. The subdivisional survey was begun on the south boundary of the township at the section corner between sections 35 and 36. The line between sections 35 and 36 was run in a northerly direction, parallel to the east boundary of the township, with the quarter-section corner between sections 35 and 36 being set at 40 chains (1/2 mile), and the section corner common to sections 25, 26, 35, and 36, set at 80 chains (1 mile). From this corner a line was run eastward on a course calculated to be parallel with the south boundary of section 36 and a temporary quarter section corner was set at 40 chains. If this line intersected the east boundary of the township exactly at the corner of sections 25 and 36, it was marked and established as the true line. If the linear error of closure was within the allowable limits, the temporary quarter-section was made permanent by shifting it to a position midway between adjacent section corners. The limit of error for closure of a section is 66 feet. This process was repeated for the sections along the eastern side of the township until the western boundary of section one was established. Then the survey continued from the southern boundary of the township between sections 34 and 35 and progressed north in the same manner as described. This process was repeated for the remaining sections in the order shown in Figure 5-12.

Figure 5-12



Due to the curvature of the earth and errors of measurement, all sections cannot contain exactly 640 acres. To compensate for this discrepancy, and still have as many uniform sections of 640 acres as possible, any excess or shortage occurring in the measurements from south to north was placed in the northern portion of those sections bordering the north line of the township, and any excess or shortage occurring in the east to west measurements was added to or deducted from the row of sections at the west side of the township. Because these sections contain an irregular number of acres, they are known as **"fractional sections".** A township will generally contain 25 full sections and 11 fractional sections. The 11 fractional sections are sections 1 through 6 along the north side of the township and sections 7, 18, 19, 30, and 31 along the west side of the township.

The surveys discussed to this point were all performed by United States Surveyors; however, the further subdivision of sections into quarter sections and quarter-quarter sections was generally performed by surveyors in private practice. The **quarter section,** or 160-acre unit, was the most common subdivision. Quarter sections are designated as northeast, northwest, southwest, and southeast quarters of the section, in the order named; thus, each quarter section is uniquely described by denoting its direction from the center of the section. In describing the northeast quarter of Section 22, for example, its description becomes NE 1/4, Sec. 22, T 7 N, R 9 E of the Fourth Principal Meridian (see Figure 5-13). The lines that divide a section into quarters are sometimes referred to as quarter lines.

The further division of each quarter section into **quarter-quarter sections** of 40 acres each creates the most basic unit of land measurement and description reference in the rectangular survey system of land description. Each forty is indicated by its direction from the center of the quarter section, in the same order as the quarter sections, beginning with the northeast quarter of the northeast quarter of the section. In describing the crosshatched

forty in Figure 5-14, the description now becomes NE 1/4 of the NE 1/4, Sec. 22, T 7 N, R 9 E of the Fourth Principal Meridian. The lines that divide quarter sections into quarter-quarter sections are sometimes referred to as 1/16 lines.

Figure 5-13

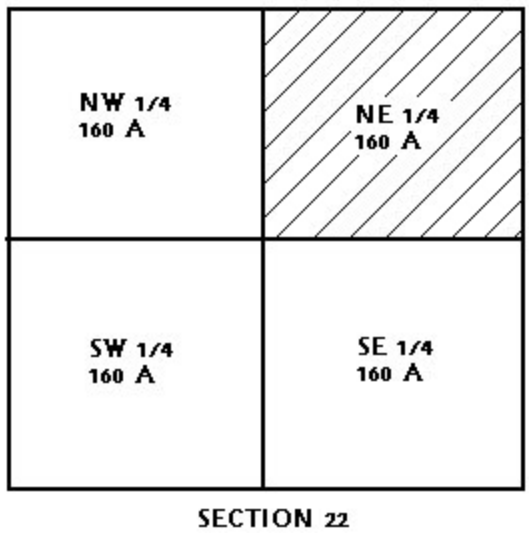
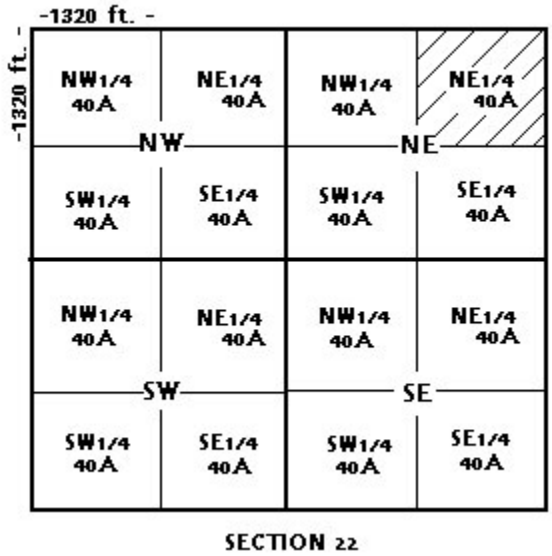


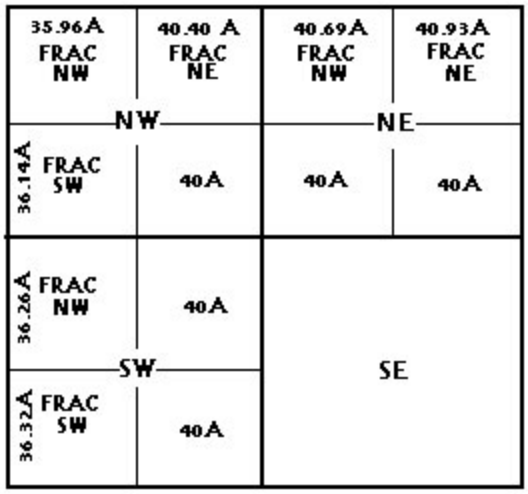
Figure 5-14



Fractional sections (sections 1 through 6, 7, 18, 19, 30, and 31) may contain more or less than 640 acres; their subdivision is treated somewhat differently than the subdivision of a standard section. For sections 1 through 6, each section is surveyed to make 320 acres in the south half. The north half is then divided so that the south half of the northeast quarter and the south half of the northwest quarter will each contain 80 acres. The remaining strip of land along the north side of the section is then divided into four fractional forties, the acreage of each always being 40 acres, more or less.

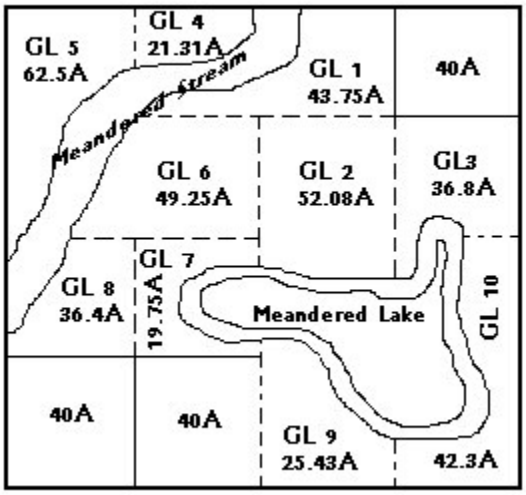
In fractional sections 6, 7, 18, 19, 30, and 31, the procedure is much the same except that the surplus or deficit acreage is placed in the west half of the section along the west line of the township and divided in the same manner as though it were along the north line of the township. Section 6, lying in the extreme northwest corner of the township would, therefore, contain fractional forties both along the north side and the west side. The fractional forties of fractional section 6 are illustrated in Figure 5-15.

Figure 5-15



Section 6

Figure 5-16



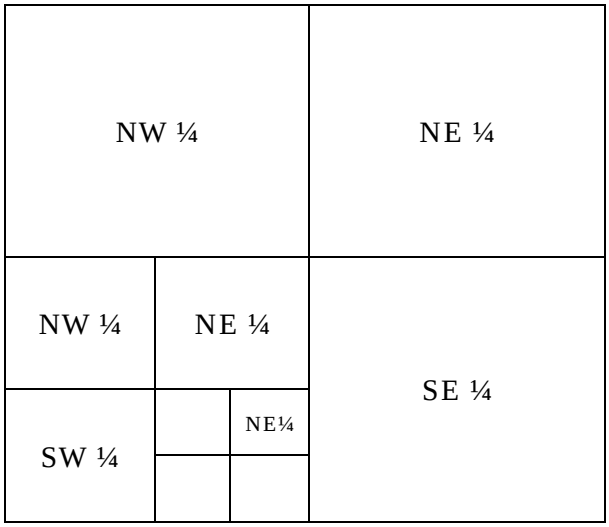
SE1/4. SECTION 36

On township maps, lands bordering on streams and bodies of water will be seen designated as government lots. In these government lots the water line of the stream or body of water has been meandered in the original government survey and the exact acreage of the lot to the water line set down. In the process of subdivision, the regular section lines are run to an intersection with the mean high-water mark of such a body of water, at which intersection corners called meander corners are established.

The traverse, which is run between meander corners, approximately following the margin of a permanent body of water is called a **meander line**, and the process of establishing such lines is called **meandering.** Meander lines are not ownership boundaries, but are lines run for the purpose of locating water boundaries approximately. Although the official plats show fractional lots as bounded in part by meander lines, ownership does not stop at such boundaries. Meander lines are run in surveying fractional portions of the public lands bordering on navigable waters to determine the quantity of land in the fraction. The acreages of government lots are listed on the section map, and the government lot number given to that parcel of land is the legal description of that parcel. Figure 5-16 illustrates meandered government lots.

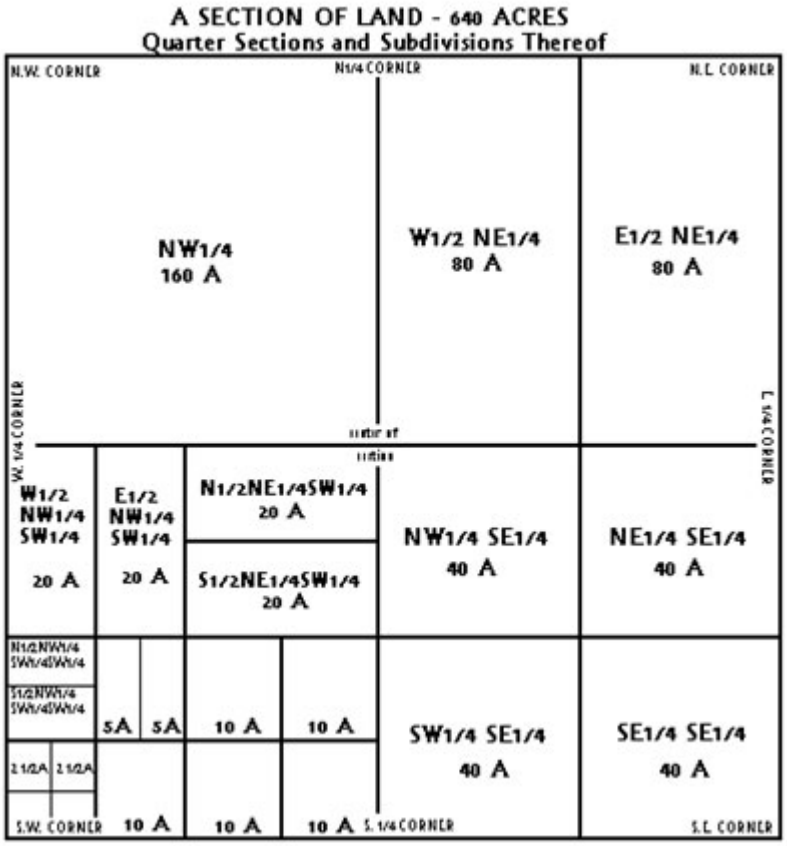
While the Rectangular Survey System may seem confusing, it's a matter of knowing the portion of a section and the township and range designated from the Principal Meridian and Base Line to locate a specific property. Take, for example, the description "The NE 1/4 of the SE 1/4 of the SW 1/4 of Section 22, T 7 N, R 9 E of the Fourth Principal Meridian." It is important to remember that the first unit of land mentioned (in this case the NE 1/4) is the property of primary interest, all subsequent quarter sections described relate only to the divisions necessary to locate the property. The key to locating the property described above is to read the description backwards, progressively narrowing its location first by section, then quarter section, then quarter-quarter section, etc. Figure 5-17 demonstrates this procedure.

Figure 5-17



There are many possibilities of land division and resulting descriptions see Figure 5-18 for some examples.

Figure 5-18



Metes and Bounds Descriptions

Metes and bounds descriptions are used to describe parcels that are irregular in shape and cannot be located with certainty except by description of their boundaries. In describing property by metes and bounds, it is important that the description begin at some known point that can be readily identified and relocated with certainty; it must give the direction, known as the course or bearing, and the distance of each boundary line; and it must follow the outer boundaries of the parcel until returning to the point of beginning. If the boundary of the parcel follows a prominent feature such as a river or stream, this should be stated in the description. The area or size of the parcel should also be stated.

A **known point** is any point that has a definite location which surveyors can locate with certainty. It is given at the beginning of a metes and bounds description so surveyors can locate that point and then proceed to the location of the parcel based upon the description given. Typical known points for rural land descriptions are section corners or quarter corners. The typical known points for platted areas are lot corners. Corners are permanently recorded and can readily be relocated if obliterated; therefore, when used as the known point in a description, they can help to make it more permanent and eliminate uncertainty concerning a parcel's boundaries.

The **point of beginning** is where the description of the parcel itself begins. The point of beginning is established in relation to the known point and should be completely described so a surveyor, having located the known point, can readily identify the point of beginning.

The **course or bearing** of each boundary line indicates the direction that the line runs from a given point. Boundary lines do not always run due north and south or due east and west, therefore the bearing is expressed by its angular relationship to each reference point and is given in the number of degrees, minutes, and seconds the boundary line varies to the east or west of a due north and south line. A circle is composed of 360 degrees, each degree is made up of 60 minutes, and each minute is composed of 60 seconds. A true north-south line (meridian) and a true east-west line divide a circle into four equal quadrants, each of which contains 90 degrees (see Figure 5-19). The bearing of a line is indicated by the quadrant in which the line falls and the acute angle (lying between 0 and 90 degrees) which the line makes with the north-south meridian in that quadrant as illustrated in Figure 5-20. For example, a line with a course of north 30 degrees West would lie in the northwest quadrant and would be 30 degrees west of the north-south meridian.

The distance of each boundary is given in linear measurements such as rods, chains, feet, and inches. Surveyors today generally give distances in feet; however, older descriptions can still be found which give distances in chains, links, rods, or furlongs. Some of the more commonly used measurements are as follows:

1 mile = 8 furlongs; 80 chains; 320 rods; 5,280 feet
1 furlong = 1/8 mile; 10 chains; 40 rods; 660 feet
1 chain = 4 rods; 66 feet; 100 links
1 rod = 25 links; 16 - 1/2 feet
1 link = 1/100 chain; 7.92 inches

The following is a typical metes and bounds description that meets all of the above described criteria. It describes a nearly rectangular parcel measuring approximately 100 feet by 200 feet (Figure 5-21). The description begins at a section corner (the known point) and the first two distances are given to tie the parcel description into that known point so surveyors can locate it in later surveys.

A parcel of land in Section 36, T 7 N, R 9 E, Dane County, Wisconsin, more particularly described as follows: Commencing at the northwest corner of said section, thence southerly along the west line of said section 175 feet; thence east 400 feet to the point of beginning of this description; thence north 87º east, 102 feet; thence south 1 east, 206 feet; thence south 87º west, 102 feet, thence north 1º west, 206 feet to the point of beginning.

Figure 5-19

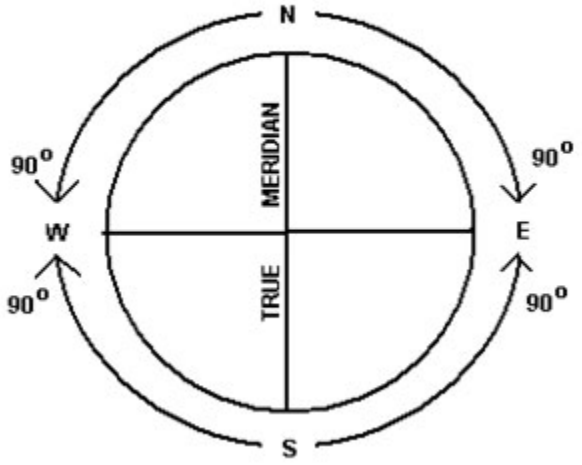
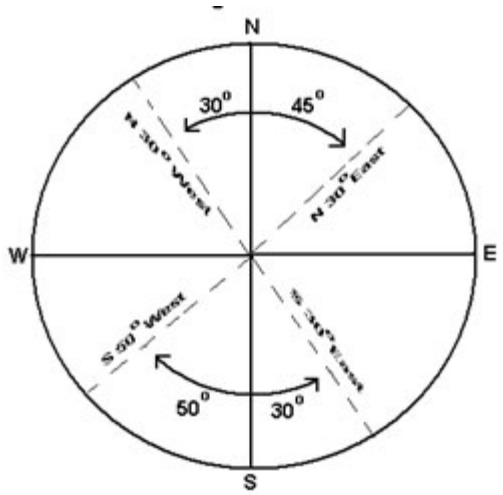


Figure 5-20



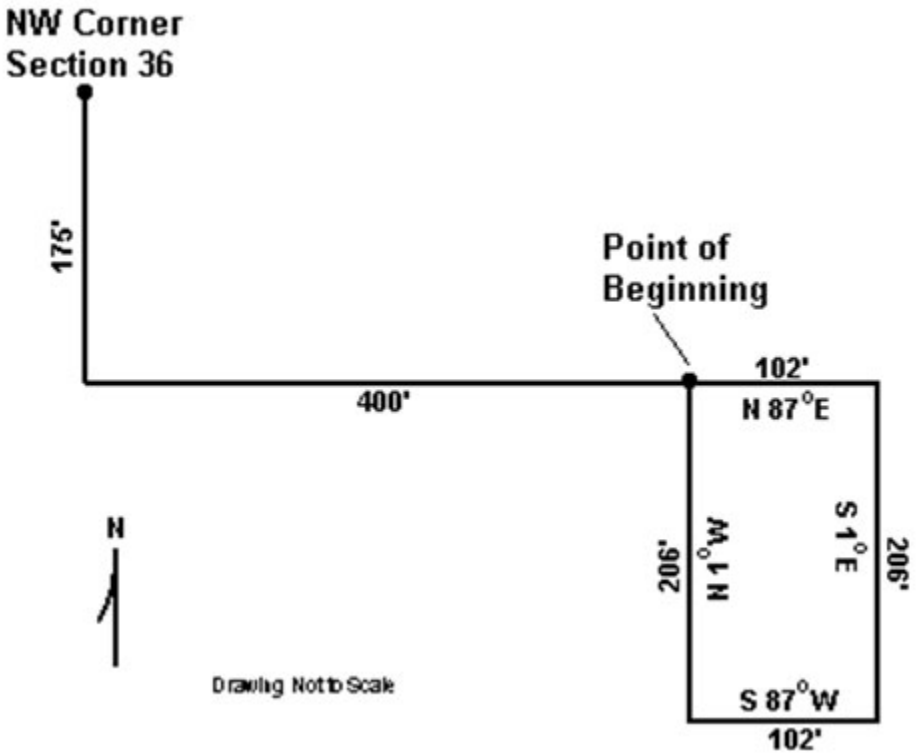


Figure 5-21

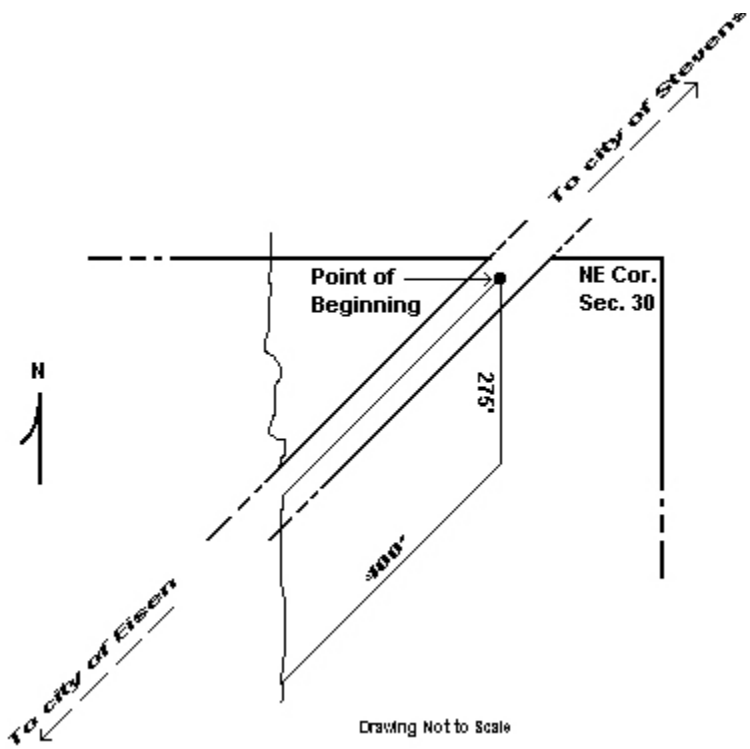
When a parcel of land borders on a lake, river, stream, highway etc., it is common for the description to be abbreviated by referencing known lines such as the centerline of a highway, or the irregular boundary of a body of water. Descriptions of land along public highways are generally interpreted to extend to the center of the highway unless the description specifically states otherwise.

For parcels abutting streams or rivers, the description is usually interpreted to mean that the boundary line is at the thread of the stream. The thread of a stream is the line midway between the two shorelines when the water is in its natural stage. In locating the thread of a stream, no account is taken of the main channel or current. For navigable lakes the boundary line extends to the edge of the lake, since the state is considered to hold title to the submerged portion. The following is an example of a description that uses a highway and creek as boundaries in describing a parcel of land.

"Commencing at a point on the highway between the City of Stevens and Eisen, which point is 250 feet west of the northeast corner of Section 30, Town 29 North, Range 4 East, thence along highway in a southwesterly direction 400 feet to the creek, thence southerly along the creek 275 feet, thence northeasterly parallel with the highway a distance of 400 feet, thence northerly 275 feet to the place of beginning. "

The description is illustrated in Figure 5-22.

Figure 5-22



In order to understand and work with metes and bounds descriptions, the user must be familiar with the various terms used in descriptions, the measurements for both distance

and area, and the dimension of the usual subdivision of a section. The appendix to this chapter contains definitions; information for computing area and acreage of parcels; and a listing of abbreviations used in condensing descriptions; all of which will aid the user in preparing, sketching, and computing the area of metes and bounds descriptions.

To prepare a metes and bounds description, it is essential to know how to correctly measure bearings. In Figures 5-23 and 5-24 assume that line NS (north-south line) represents a true meridian. In order to determine the bearings of lines OA and OB, the base of a protractor must rest on the north-south line with the curved side of the protractor facing east (see Figure 5-23); for lines OC and OD the base of the protractor again rests on line NS, but the curved side faces west (see Figure 5-24).

Figure 5-23

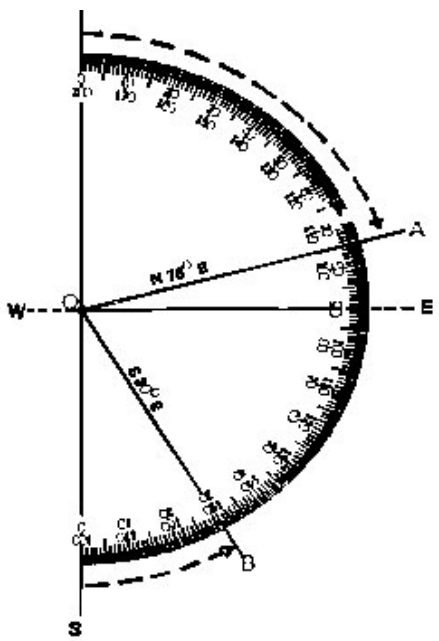
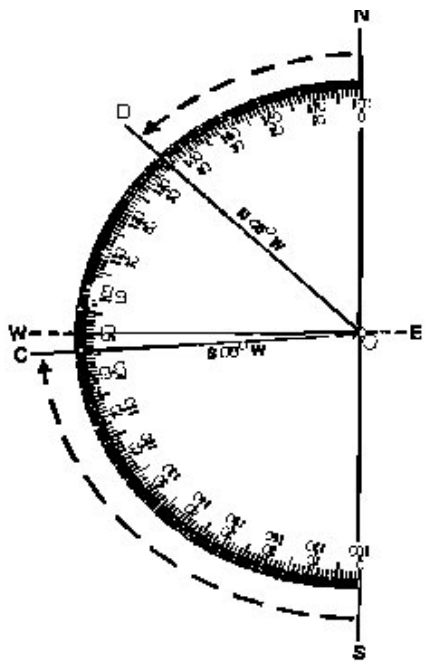


Figure 5-24

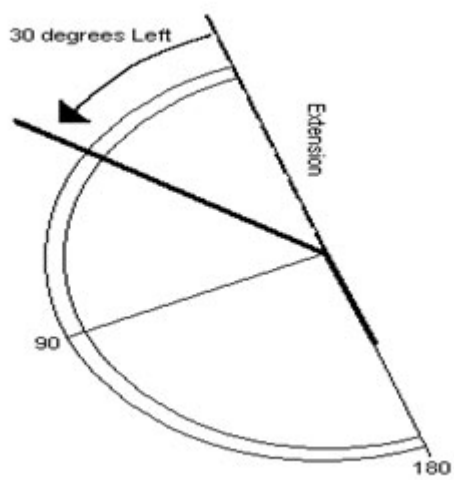


Remember that each bearing angle is acute, lying between 0 and 90 degrees, and is measured in terms of the angle it forms with line NS. The line OA is in the northeast quadrant and forms an angle of 75 degrees with line NS. The bearing of the line is read as north 75 degrees east and is written N 75º E. The bearings of lines OB, OC, and OD are respectively: S 30º E, S 86 W, and N 45º W. If the direction of the line is parallel with the meridian and north, it is written as N 0º or due north; if perpendicular to the meridian and east, it is written as N 90º E or due east.

In preparing a map of a metes and bounds description it is helpful to keep in mind that when reading compass bearings, the primary direction is always the first direction given, the secondary direction is always the last direction given, and the angle given moves from the first direction to the second direction through the given angle. Always remember to place the base of the protractor north and south to measure the degrees to the east or to the west of the north and south meridian. This practice ensures greater uniformity and avoids confusion that would result if some courses were measured north or south of an east and west true line.

The only exception to the above rule is when the description calls for the angle to be measured from an extension (prolongation) of the preceding line in the description; for example, “thence north 30 degrees to the left of an extension of the last described line”. In such a case, draw a dotted extension of the last described line; lay the protractor so that its center point rests at the end of the last described line, and the base line of the protractor rests exactly on the line and the dotted extension. Then count off 30 degrees to the left, place a pencil dot and connect it with the end of the last described line (see Figure 5-25).

Figure 5-25



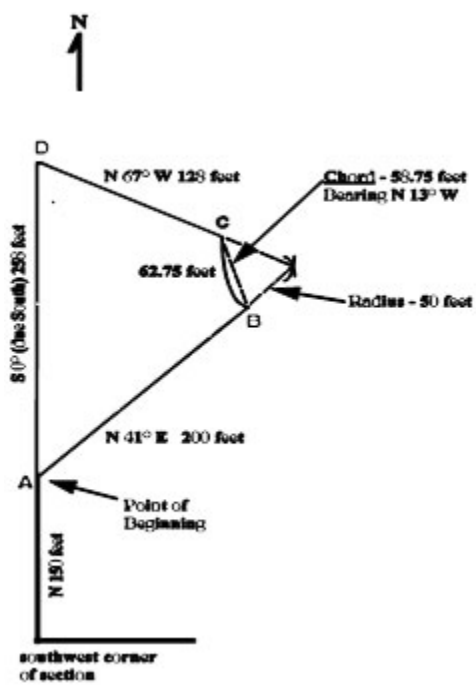
Frequently metes and bounds descriptions will describe a curved line and will therefore make reference to arcs and chords. The following is such a description with instructions for drawing a sketch of the tract of land described.

"Commencing at a point on the west line of said quarter section 150 feet north of the southwest corner of said quarter section; thence north 41 degrees east 200 feet to the point of a curve whose arc is 63 feet, having a radius of 50 feet lying to the east and a chord bearing north 14 degrees west 57 feet; thence north 67 degrees west 125 feet to a point on the west line of said quarter section; thence south 0 degrees (due south) on said west line 263 feet to the point of beginning."

Before sketching the description, the scale to be used must be determined. The scale will be dependent upon the size of the parcel described, and the size of the paper on which it is to be sketched. For the purposes of this example, a scale of 1" = 100' will be used. The general direction, which the tract will extend, must also be found so it can be determined whether to begin the sketch at the top of the page or at the bottom of the page. In reviewing the above description, it can be seen that the parcel lies north and east of the point of beginning, so the sketch will begin at the bottom left of the page.

To draw this description (see Figure 5-26), it must be considered one boundary at a time. Since the description begins at a point on the west line of the quarter section, 150 feet north of the southwest corner, first draw a part of the south quarter section line, and then draw part of the west quarter section line. Next proceed along the west section line 1 1/2 inches (representing 150 feet) north of the south quarter section line to the point of beginning (point A).

Figure 5-26



The next part of the description, "thence north 41 degrees east 200 feet" is actually the beginning of the land to be described. The information given prior to this was necessary in order to locate the tract. To continue, place a protractor with the rounded portion facing east so that its base line is due north and south with the center of the base line on the point of beginning. Then measure off 41 degrees to the east and make a mark to indicate the direction of the course. Now, with a ruler, draw a line from the point of beginning a distance representing 200 feet toward that mark.

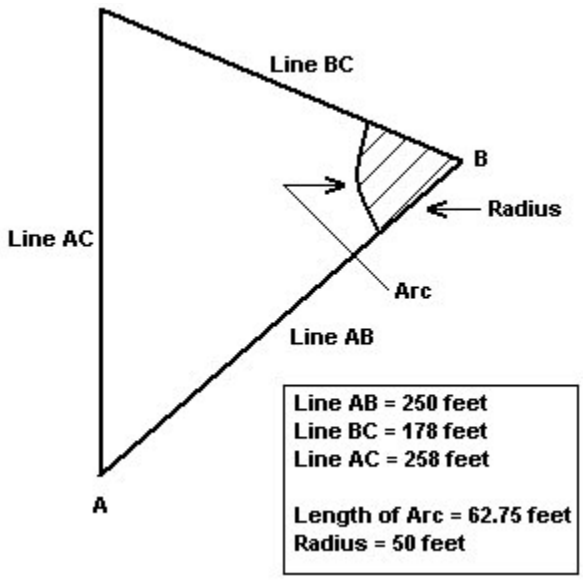
The description then proceeds along "a curve whose arc is 63 feet having a radius of 50 feet, lying to the east and a chord bearing north 14 degrees west, 57 feet." This portion of the description describes a curved line. When the chord bearing and length and the radius length of the arc are known, it is possible to construct the arc. To do this, place a protractor with the rounded portion facing west so that its base line is due north and south and the center of the base line is on the end of the last line drawn (point B). Then measure off 14 degrees to the west of an imaginary north and south meridian drawn through point B and make a mark indicating that direction. Then, with a ruler, draw a line from point B a distance representing 57 feet toward that mark. This line represents the chord. Next, set a compass to scale with a radius of 50 feet. Place the point end of the compass on point B and draw an arc in the area where the central angle will fall (to the northeast of point B), then repeat the procedure from point C. The intersection of these two arcs is the center of the circle which contains the arc described in this legal description. Set the pointed end of the compass at this point, and then draw the arc from point B to point C.

The description then moves "north 67 degrees west 125 feet to a point on the west line of said quarter section." Again, it is necessary to use a protractor, with the curved side facing west and the base line due north and south, with the center of the base line resting on point C. Then measure off 67 degrees to the west of an imaginary north and south meridian drawn through point C, making a mark to indicate the direction of the line. Then, using a ruler, extend the line in the direction marked, a distance representing 128 feet.

From that point (point D) the description proceeds "south 0 degrees (due south) on said west line 258 feet to the point of beginning." All that remains to complete the sketch is to extend the boundary line due south to the point of beginning.

Using the same example, it is now possible to compute the acreage of the description. While the parcel is irregular in shape, it can easily be converted to a triangle by simply extending lines AB and DC along the radius of the arc a distance of 50 feet. By doing this, we have now formed a triangle (see Figure 5-27). To determine the acreage of the parcel, compute the area of the triangle and then deduct the area of the sector (the pie shaped shaded area), which is not a part of the parcel.

Figure 5-27



The formula for computing the acreage of a triangle when the length of each of the three sides is known is found in the appendix to this chapter and is as follows:

let s = the perimeter of the triangle divided by 2 or

$$\frac{(a+b+c)}{2}$$

(a, b, and c represent the length of each of the sides of the triangle).

$$area = \sqrt{s(s-a)(s-b)(s-c)}$$

To compute the area then, we must first determine the value of s, which would be derived as follows:

$$s = \frac{250' + 178' + 258'}{2}$$

s = 343

Once s is known, it is then possible to calculate the area of the triangle using the above formula.

$$\begin{aligned} area &= \sqrt{343(343-250)(343-178)(343-258)} \\ &= \sqrt{343(93)(165)(85)} \\ &= \sqrt{447{,}383{,}475} \\ &= 21{,}151.44 \ square\ feet \end{aligned}$$

The area of the triangle, including the sector, which is not a part of the legal description, is 21,039.19 square feet.

Next compute the area of the sector as follows:

area of a sector	=	length of arc x 1/2 radius
	=	62.8' x 25'
	=	1,570 square feet

The 1,570 square foot area of the sector is then deducted from the area of the triangle, which leaves the area of the parcel.

21,151.44 – 1,570 = 19,581.44 sq. feet

The acreage of the parcel can easily be calculated by dividing the area by 43,560 square feet (1 acre):

$$\frac{19{,}581.44}{43{,}560} = .449 \text{ or } .45 \text{ acres}$$

By knowing how to sketch and compute the acreage of legal descriptions, the assessor is able to test questionable descriptions and determine whether they are ambiguous or incomplete. It is then possible to correct any errors or discrepancies that are found to exist.

Other Methods of Describing Property

Recorded Subdivisions

Under the rectangular survey system land is broken down into basic units of 40 acres; however, when a land owner desires to split a large acreage tract of land into lots for building sites, it becomes necessary to further subdivide the tract. Chapter 236 of the Wisconsin Statutes regulates the subdivision of land and establishes stringent survey standards. A subdivision is any division of land where five or more parcels of 1 1/2 acres or less are created at once, or by successive divisions within a five-year period.

Subdivision is accomplished by surveying the tract and preparing a plat, dividing the tract into blocks separated by streets, and then dividing the blocks into lots. The blocks are numbered consecutively and the lots within each block are likewise numbered or lettered in consecutive order.

There are stringent surveying requirements for subdivision. The law provides that external boundaries of a subdivision be monumented at all corners, curves, and angles along the boundary line. The internal boundaries must be monumented at all block corners, curves, and angles in any line. In addition, all lot corners and lot lines that extend to lakes or streams must be monumented. A land surveyor registered in this state must perform the survey and the error margin for closure of the survey must be less than 1:3,000. The law also establishes guidelines for minimum lot width and area, minimum street width, and public access to lakes and stream shore plats.

Statutes also provide that the name, location, and position of the plat be printed on the plat map and that the plat name not be a duplicate of any plat previously recorded in the same county or municipality. Among the data to be included is the exact location of the plat by distances and bearings with reference to corners established in the U.S. Public Land Survey, and also the government lot, recorded private claim, quarter section, section, township, range, and county. The final plat must also show the exterior boundaries of the subdivided land; all monuments erected, corners, and other points established in the field; the exact length and bearing of the exterior boundaries; and the boundary lines of all blocks, public grounds, streets, alleys, lots, and easements.

All subdivision plats must be approved by the municipal governing body, and in some cases, the county planning agency. Before submitting a final plat, the subdivider may be required by the approving authority to submit a preliminary plat in order to determine whether the final plat will meet layout requirements. The approving authority must then take action on the preliminary plat within 90 days of its submission. Failure of the approving authority to take action on the plat within that time constitutes approval of the preliminary plat. Once the preliminary plat has been approved, the final plat must be submitted within 6 months. The approving authority then has 60 days to approve or reject the final plat. If no action is taken on the plat during that time, it is automatically deemed to be approved.

When a plat is submitted for approval, copies are submitted by the approving authority to the Department of Administration, Plat Review Program and to the County Planning Agency. These agencies have 20 days to review the plat and either approve it or notify the subdivider and approving authority of objections to the plat. Approval of a plat is contingent upon its compliance with local ordinances, state laws, and other rules relating to health, safety, public improvements, utilities, etc.

Once prepared and approved, the plat is recorded in the Register of Deeds office. While the plat actually contains a metes and bounds description of the property surveyed, it is much simpler to identify a particular lot by referring to the lot, block, and subdivision name rather than describing the property by metes and bounds.

Section 236.28, Wis. Stats., provides that once a final plat has been recorded, the lots in that plat are described for all purposes by the name of the plat, and the lot and block within that plat.

If a detailed description of a particular lot is needed, it can easily be obtained by referring to the recorded subdivision in the Register of Deeds Office, which gives the description of each lot and block by survey. Maps of recorded subdivisions can be obtained from the Register of Deeds Office or from the County Surveyor's Office.

In summary, the requirements for the subdivision and subsequent development of land are very strict. In addition to the statutory requirements, there are very tight municipal regulations and controls governing subdivision. Most municipalities require that the subdivider construct roads, provide grading and erosion control, and install utilities before subdivided land can be sold. As a result, the subdivision process is time consuming and costly. This has perhaps contributed to the increasing use of certified surveys.

Certified Surveys

A certified survey can be used to divide land into not more than four parcels. Because certified surveys apply to only four parcels or less, they are not subject to the stringent controls that governs subdivisions, and are not as costly. This fact is evident by the increasing number of certified surveys being recorded.

Section 236.34, Wis. Stats., regulates the surveying, mapping, and recording of certified surveys. For a certified survey to be recorded, the requirements of this section must be met. Among the information to be included on the certified survey map are the external boundaries of the parcel surveyed, including the length and bearings; all monuments, corners or other points established in the field; all lots, consecutively numbered; the exact width of all easements; and all lake or stream shore meander lines.

When completed, certified survey maps are numbered consecutively and recorded by the Register of Deeds. Once recorded, the parcels of land included in the certified survey may be described by reference to the survey number, the volume and page of the recording, and the name of the county. Such a description is sufficient for all purposes, including assessment, taxation, and conveyance. If a more detailed description of a certified survey is needed, it can be found by referring to the volume and page of the recording in the Register of Deeds Office. The assessor should have copies of all certified survey maps. They can be obtained through the Register of Deeds Office or the County Surveyor's Office.

Assessor's Plats

In addition to plats prepared for purposes of developing a tract of land, sec. 70.27 Wis. Stats., gives the local governing body the authority to order an assessor's plat to be prepared.

"Whenever any area of platted or unplatted land is owned by 2 or more persons in severalty, and when in the judgment of the governing body having jurisdiction, the description of one or more of the different parcels thereof cannot be made sufficiently certain and accurate for the purposes of assessment, taxation or tax title procedures without noting the correct metes and bounds of the same, or when such gross errors exist in lot measurements or locations that difficulty is encountered in locating new structures, public utilities or streets, such governing body may cause a plat to be made for such purposes."

In preparing an assessor's plat, the surveyor lays out the boundaries of each parcel, street, alley, lane, roadway, and dedication to public or special use according to the records of the Register of Deeds, in the chronological order of their conveyance. A map is then prepared, and owners of the land included in the plat may view it and make known any disagreements with the boundaries. It is the duty of the surveyor making the plat to reconcile any discrepancies that may be revealed. When the boundary lines between adjacent parcels are mutually agreed upon in writing by the owners, the lines become the permanent boundaries, even though they may vary from the metes and bounds descriptions previously recorded. Such written agreements are recorded in the office of the Register of Deeds.

When completed, the assessor's plat is filed with the clerk of the governing body that ordered the plat. Within two days after the plat is filed, it is transmitted to the Plat Review Program where it is reviewed to ensure that it complies with the requirements of Chapter 236 of the Statutes. After the Department of Administration, Plat Review Program has certified the plat, it remains on file in the clerk's office for 30 days. During that time any person or public body having an interest in the plat may bring a suit to have the plat corrected. At the end of that time the plat is approved by the governing body and recorded in the office of the Register of Deeds. The costs incurred in preparing an assessor's plat may be charged to the land platted and collected as a special assessment on the land only.

Amendments or corrections to an assessor's plat may be made at any time by the governing body by recording with the Register of Deeds a plat of the area affected by the amendment or correction. Such an amendment must be made and authenticated in the same manner as an assessor's plat. When referring to a parcel which is described in an amendment to an assessor's plat, it is not necessary to refer to the specific amendment since any parcel described as being part of a plat refers to the plat along with all of its amendments.

Section 70.27(3), Wis. Stats., provides that once the assessor's plat has been recorded, reference to any land by lots and blocks as it appears on the plat is sufficient for purposes of assessment and taxation. Conveyances of lands included in an assessor's plat must be made by reference to the plat and are as effective to pass title to the land as if described by metes and bounds. If a more detailed description is needed, it can be obtained by referring to the recorded plat in the Register of Deeds Office.

Volume and Page

The law allows some leniency in the description of land on the assessment roll. Section 70.25, Wis. Stats., provides that in all assessment and tax rolls, and in all advertisement certificates, papers, conveyance, or proceedings for the assessment and collection of taxes, any description of land which indicates the land intended with ordinary and reasonable certainty and which would be sufficient between grantor and grantee in an ordinary conveyance shall be sufficient.

Where a more complete description may not be practical, an abbreviated description including the volume and page where recorded, and the section, village, or city where the property is situated shall be sufficient. While the law allows reference to the volume and page of county records where the deed to a parcel is recorded, this method should be used in only the most difficult cases. The chance for error in copying difficult descriptions may be greater than in copying the volume and page, but when a mistake is made in the volume and page, the description is almost always completely destroyed. A volume and page description in the assessment roll does not tell the assessor anything about the land parcel involved, except where to find it in the Register of Deeds Office. Such descriptions should only be used to supplement to some form of abbreviated description of the land parcel even if the accompanying description is only an approximation of the size of the parcel involved. The entire accurate description should always be kept in the assessor's working file.

Wisconsin Plane Coordinate System

Legal descriptions which are based on metes and bounds, the rectangular survey system, and lots and blocks are all tied into marks or monuments, which may be destroyed, moved, or obliterated. The state plane coordinate system provides a permanent method of identifying points and minimizes errors resulting from curvature of the earth.

Chapter 236.18, Wis. Stats., adopts a coordinate system as a supplemental method for defining and stating the positions or locations of points within Wisconsin. This system is known as the Wisconsin Coordinate System and is tied to the United States Coast and Geodetic Survey (USCGS) system of triangulation, which was established in 1807. (Since that time the USCGS has been renamed the National Oceanic and Atmospheric Administration.) Triangulation is a method of surveying based upon the trigonometric proposition that if three parts of a triangle are known (such as measurements of one side and two angles) the other three parts may be obtained through computation. The USCGS system of triangulation is a nation-wide system of monuments that serve as the basis for all geodetic land measurement in the United States. The monuments are arranged in a series of triangles, the angles and sides of which have been precisely measured. Through triangulation the USCGS has established thousands of these monuments for which position data and coordinates have been established. If a monument is obliterated or lost, its location can be redetermined through geodetic surveying.

Geodetic surveying, which takes into account the spherical shape of the earth, is highly specialized, requiring the use of special expensive equipment and complex mathematical calculations and reductions in which the ordinary land surveyor is not trained. In order to make the geodetic data of the national survey readily available to land surveyors, and to ensure that the locations of the monuments from the original land survey were permanently recorded, the USCGS developed State Coordinate Systems for each state.

The State Coordinate System eliminates many computation problems for local surveyors because it mathematically converts a spherical area (called a zone) into a flat surface. This is known as projection because it is accomplished by geometrically projecting corresponding points from a sphere to a plane surface. There are various types of projections, which are used for transforming a sphere to a plane; however, in Wisconsin a Lambert conic projection is used. Through the use of a Lambert projection, strips of the earth's surface 158 miles wide and of indefinite length (known as a zone), can be represented on a single plane projection, and errors of scale will not exceed the prescribed maximum error of one foot per 10,000, which is about one foot every two miles.

Because the size of each zone must be limited in order to remain within the allowable error limits, Wisconsin has three zones, the “North Zone,” “Central Zone,” and “South Zone.” Any descriptions using the coordinate system in Wisconsin must designate the zone.

In setting up a state plane coordinate system, an origin must be specified to which all points in the zone can be referenced. Two perpendicular reference lines are established for each zone, and the intersection is known as the “origin of coordinates.” The origin of coordinates in Wisconsin is at the intersection of the X and Y-axes for each zone. The Y axis for all three zones is the meridian 90º 00’ West Greenwich (which is the Fourth Principal

Meridian), and the X axis is the parallel 45º 10' north latitude, 43º 50' north latitude, and 42º 00' north latitude for the north, central, and south zones respectively. The point of origin is given the coordinates x = 2,000,000 feet and y = 0 feet.

All points in the triangulation network are marked with monuments and described in relation to the "origin of coordinates" so that the monuments may be readily recovered and used as starting points for local surveys. These monuments or stations usually consist of concrete shafts, four or five feet long, set nearly flush with the ground, with bronze disks in their tops to identify them and a small hole representing the exact position. Buried under each shaft is a short cylinder of concrete with another disk set in direct vertical lines with the surface disk.

Surveyors who desire to make use of these monuments may do so by using their plane coordinates, which are published by the USCGS. In practice, after obtaining plane coordinates, the land surveyor locates and uses one of the monuments as the known point of the survey. From this point a traverse is run to the nearest or most conveniently located corner of the land which is to be surveyed (the point of beginning) and the process is continued around the land back to its initial corner. Computations are made in much the same way as they would have been made had there been no station with state coordinates available, but with this difference: the survey starts with a known, not assumed, position and bearing, and takes account of each extra or additional traverse which was needed to connect the land survey to the state coordinate system. When completed, the survey and its computation has a state coordinated position for each of the corners of the land, and is keyed to the national geodetic survey. Land surveyors who tie their work into the geodetic survey by defining the positions of their land corners using plane coordinates provide indisputable evidence for the accurate restoration of their corners should they ever be destroyed.

The State Plane Coordinate System, while in existence for many years, has not been widely used. There are several reasons for this. Law requires that monuments be within 1/2 mile of the point of beginning of the land to be surveyed. While Wisconsin has a higher number of triangulation monuments than other states, they are located on the average, fifteen to twenty miles apart. This problem is compounded by the fact that installation of the monuments is not an easy task. It is necessary that 40' high towers be set up at each monument in order for the monuments to be established with precision. In addition, the computations required to transform the spherical distance to the plane coordinate system are very complex and would limit the number of surveyors willing and able to perform the surveys. Due to the limited number of surveyors available to work within the State Plane Coordinate System, and also the high degree of precision required, considerable time and expense would be necessary to restore or establish a sufficient number of monuments to make the system readily available at the local level.

Abandonment of Railroad Lines

In the process of discovering assessable real estate, one area that has been a problem to assessors is the abandonment of railroad lines. Numerous questions have arisen as to when railroad property is considered legally abandoned, and to whom it becomes assessable upon

abandonment. It is important to have a basic understanding of the process involved in abandonment of a railroad line by a railroad company because of the numerous possibilities involving ownership of these lands.

The process begins when a railroad indicates that it intends to abandon one or more of its lines. This is done by the railroad filing, as required by federal law, a map known as a "system diagram map" that indicates rail lines in the process of abandonment, rail lines the railroad expects to abandon, and the rail lines that are under study by the railroad for possible abandonment in the future. For purposes of assessment, railroad or railway property shall be deemed abandoned if:

1. A certificate or approval of abandonment has been issued by the Interstate Commerce Commission or any other federal or state agency having jurisdiction over the abandonment of such property and operations have been terminated in accordance with the certificate or approval; or

2. Such certificate or approval of abandonment is not required and the use of such property for railroad or railway purposes has been discontinued with the intent not to resume. Intent not to resume may be inferred from circumstances including, but not limited to, the following:

    a. If the property is not used for railroad purposes for two consecutive years.
    b. If the facilities on the property are removed or rendered unfit for service.
    c. If the property is used for other than railroad purposes.

The DOT has been designated by sec. 85.09, Wis. Stats., as the lead agency to determine on behalf of all state and local government whether railroad property has been abandoned, and whether it is in the best interest of the state to acquire such property. This legislation is commonly known as the "first right to acquire law." The DOT, acting on behalf of itself or on behalf of other state and local agencies, shall have the first right to acquire, for present or future transportation, recreation or scenic purposes, any property used in operating a railroad or railway, including rights-of-way and rails, ties, switches, trestles, bridges, and the like located thereon, which have been abandoned. Acquisition may be by gift, purchase, or condemnation in accordance with the procedures under sec. 32.05, Wis. Stats.

After the railroad has indicated that it will proceed with its abandonment intentions, the Wisconsin DOT will make a study, which includes a financial analysis, economic and environmental impact studies, and benefit/cost ratio comparisons of the subject rail line being abandoned. This is done so that the Wisconsin DOT can take a representative position at the Interstate Commerce Commission hearings, either to oppose, support, or remain neutral with regard to the proposed abandonment.

If the Interstate Commerce Commission decides to grant the request to abandon the railroad, it issues an appropriate notice by publication of this in the Federal Register. At this point the Wisconsin DOT, or any financially responsible party, has 15 days to submit an offer to acquire the line to both the owner of the railroad and to the Interstate Commerce Commission. Assuming no offers to acquire the abandoned lines are made, the Interstate

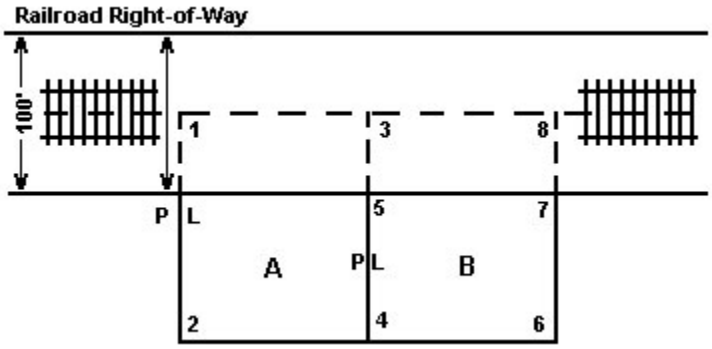
Commerce Commission will then issue a final certificate of abandonment. It is at this point that certain other claims of ownership to the property could come into play.

The railroad company is not always the owner to fee title of all the land upon which it operates its railroad. Often it operates over land by rights of easement only, or in other situations operates over the land only by rights adversely obtained. The adverse possession situations involve those lands where there is no record of title of any right being conveyed to the railroad company.

The Wisconsin DOT has taken the position that the rights of ownership to realty which the railroad operated over only by rights of easement or adverse possession reverts upon abandonment to the original owner, its heirs, successors, or assigns.

In Figure 5-28, property owner A's legal description defines the area labeled 1-2-3-4, which includes the 50 feet of railroad right-of-way. The original legal conveyance, conveying rights to the railroad when it was originally constructed, may have stated that the area could be used for railroad purposes but reverts back to the owner or successors upon the discontinuance of this rail purpose. Property owner B's description defines area 3-4-8-6. An examination of record title reveals that nothing can be found to show where anyone has conveyed any interest to the railroad. The Wisconsin DOT has taken the position that property owner B also owns the area 3-5-7-8 upon abandonment. Another situation may occur where the property description of property owner B may read 4-5-6-7. No record can be found to show that area 3-5-7-8 was ever conveyed to the railroad. The failure to have the latter area included in B's description may have been the result of an error in recording title through various sales and transfers over the past 100 years. The DOT has taken the position that property owner B has a claim on title even though there is a deficiency in the legal description. The burden of proof on a claim of ownership would lie with the railroad.

Figure 5-28



In summary, since the Interstate Commerce Commission issues a certificate of abandonment as a usual instrument in the railroad abandonment of rights-of-way, the railroad property is taxed for ad valorem purposes under Chapter 76 of the Wisconsin Statutes until this certificate is issued. Once a certification of abandonment is granted however, several subsequent conditions may prevail with the corresponding state/local taxing jurisdictional effects as noted in Figure 5-29.

Figure 5-29

	Condition as of January 1	State Utility Assessment Under Chapter 70	Local Assessment Under Chapter 70
#1	Acquired by D.N.R. for recreational purposes	No	No
#2	Acquired by state for possible future rail use	No	No
#3	Acquired for use by short line railroad under various ownership & operating agreements	May be taxable depending upon situation of new ICC license	No
#4	Become non-operating property of a railroad	No	Yes
#5	Reverts to adjoining land owner	No	Yes, unless it comes within exemption provisions of Chapter 70 such as church, school, etc.

Listing

After real property is discovered, the next step is to list the property. This involves collecting data on each parcel using property record cards and recording assessment information in the assessment roll. The DOR prescribes the forms required for the assessment and collection of general property taxes and furnishes each county designee with a sample of the forms. The county designee obtains the forms at county expense and furnishes them to the assessors, clerks, and treasurers.

Property Record Card Requirements

Section 70.32, Wis. Stats., specifies that real property shall be valued "… from actual view or from the best information that the assessor can practicably obtain …" Toward this end, a property record card must be maintained for every parcel of property.

The quality of any assessment hinges on the accuracy of the parcel data. The assessor must therefore make reasonable attempts to obtain and verify the data in each field. This includes sending a request by certified mail to the property owner for a physical viewing of the interior, if unable to gain entry during the normal course of field verification. In addition, when a property sells, the assessor must make reasonable attempts to verify the sale and property characteristics at the time of sale through an interview of the grantor and grantee and physical viewing of the property. If these attempts are not successful, the assessor must send inquiries to the appropriate parties by mail in order to obtain the necessary information for completing the property record card and/or evaluating the property characteristics at the time of sale. Only when both a physical viewing and mail

inquiry are unsuccessful, may the assessor resort to information that is available in the public domain, including MLS data and data on the internet

In order to develop accurate and equitable assessments and provide a sustainable defense, it is beneficial to complete the property record card in its entirety. Minimally, the property record card must contain the following information. Please refer to Volume 2 of the Wisconsin Property Assessment Manual for detailed property record card specifications.

Parcel:

- Parcel Number
- Legal Description
- Owner Name & Address
- Number of Acres by Class (if less than one acre, then area and/or dimensions)
- Total Acres for the Parcel
- Land Value by Class and Subclass, if appropriate
- Total Land Value for the Parcel
- Improvement Value by Class
- Total Improvement Value for the Parcel
- Total Value for Parcel (must agree with assessment roll)
- Document how the final value was determined, with a level of detail comparable to the pricing ladder on the State Prescribed Property Record Card (PA-500)
- Land sketch or parcel identified on parcel map

Major Buildings:

- Story Height
- Building Type/Style
- Exterior Wall Construction
- Age
- Basement
- Heating/Air Conditioning

Major Buildings, cont.:

- Living Accommodations
- Physical Condition Interior
- Physical Condition Exterior
- Other Features, for example:
- Residential: fireplaces, plumbing features, built in garages, etc.
- Commercial: sprinklers, elevators, fire proofing, roof type, etc.
- Quality of Construction
- Attachments
- Square Footage/Living Areas
- Building sketch with dimensions
- Land improvements
- Date of most recent interior viewing and identification of person who conducted viewing
- Date of most recent exterior viewing and identification of person who conducted viewing

Other Building Improvements:

- Structure Type
- Construction Type
- Size
- Quality
- Age
- Modifications, as provided for in Volume 2
- Condition

In order to maintain accurate property record cards, the assessor must complete the following on an annual basis and update the records as appropriate.

- Physically inspect new construction, annexed properties, and exempt status changes.
- Physically inspect properties affected by demolitions, fire, or remodeling and major building changes which typically require a building permit.
- Re-inspect improved properties under construction over a period of years.

- Re-inspect and review all sales, legal description changes, e.g. splits, and zoning changes to update parcel attributes and ensure a fair assessment.
- Review all classifications to determine eligibility for agricultural classification, agricultural forest land classification, and undeveloped land classification.

While the DOR does not prescribe a commercial property record card, the assessor may employ the PA-500 and PA-703 as these forms provide fields for capturing the aforementioned data that is required for all classifications. Nationally recognized commercial valuation firms, including those mentioned in the Appendix, will often specify commercial listing procedures and forms that may assist the assessor with further development of a commercial property record card.

Assessment offices that maintain property data records electronically must be able to generate a paper property record card. Paper property records are crucial for providing information to the public. When providing a property record card, every data field shall be provided along with all computations and adjustments that result in the final assessment. Ownership and retention of assessment records is discussed in Chapter 17.

Electronically produced property record cards need not duplicate the layout of state prescribed forms, which includes the PA-500, the PA-501, and the PA-703. However, electronic systems must allow for collection of each data field identified in the state prescribed forms. If there is a question of whether a computer generated record meets state requirements, the assessor should consult with the Bureau of Assessment Practices. The assessor will find additional information on electronic parcel data in Chapter 17 of this manual.

Whether property record cards are maintained electronically or on paper, all assessment data for an assessment year must be identified, benchmarked, and provided to the municipality. When a property's characteristics change, the assessor must clearly identify when the change occurred and the assessment year impacted. Furthermore, assessments must be documented at each point in the assessment cycle that includes the following.

- The assessment upon issuance of the notice of assessment.
- The assessment upon conclusion of the open book.
- The assessment upon conclusion of the Board of Review (BOR).

The finalized assessment information must then be provided to the municipality on an annual basis when the assessor signs the assessor's affidavit that is attached to the assessment roll.

Real Property Lister

Counties may provide for a county real property lister to prepare and maintain accurate ownership and description information for all real property parcels in the county. That information may include the following:

- Parcel numbers
- The owner's name and an accurate legal description as shown on the latest records of the office of the Register of Deeds
- The owner's mailing address
- The number of acres in the parcel if it contains more than one acre
- School district and special purpose codes

The real property lister provides this information for the use of municipal assessors, clerks, and treasurers, county offices, and any other person requiring that information. The real property lister also serves as the coordinator between the county and the municipalities for assessment and taxation purposes.

Because of the specialized nature of maintaining accurate, up-to-date maps and records, this function is best carried out at the county level. This allows the lister to make efficient use of the computers and other equipment, have ready access to documents and deeds recorded with the Register of Deeds, and provide a central location for real property records in the county.

Parcel Numbering

To more efficiently use assessment records, it is convenient to organize the assessment roll and other assessment files by parcel number (sometimes referred to as tax key numbers). A parcel numbering system is simply a method of referencing land parcels using a sequence of numbers and/or letters instead of complete legal descriptions. Just as a tax map is a graphic representation of a legal description, a parcel number is a simple numeric/alphabetic reference to the same legal description. The correlation of tax maps and the individual property records require that permanent numbers be assigned to all parcels within the district, whether taxable or exempt. These numbers are used on all tax maps, property record cards, assessment and tax rolls, tax bills, and other tax records. When all assessment and tax records are indexed according to permanent parcel numbers, an efficient, coordinated reference system results. The assessor is responsible for entering parcels on the assessment roll under sec. 70.23(1), Wis. Stats.

There are certain requirements, which must be met, in any good parcel numbering system. Desirable characteristics include (1) Uniqueness, (2) Permanence, (3) Simplicity, (4) Ease of Maintenance, (5) Convenience of Use, and (6) Reference to Geographic Location.

Uniqueness. The number assigned to identify a particular parcel should be unique to that parcel and no other, and each parcel should have only one parcel number assigned to it.

Permanence. Parcel numbers should be permanent, and change only when the boundaries of the parcel itself are changed. Changing parcel boundaries is generally handled either through the use of hyphen-suffix systems, or through retiring number systems. Under the hyphen-suffix system, the combination of parcels will result in a hyphenated parcel number. When a parcel is split, the new parcel is assigned the original number with an alphabetic or numeric suffix added. Under a retiring number system, whenever a parcel boundary changes, the parcel number is retired from use and a new parcel number assigned. Due to the inherent maintenance problems and the confusion, which may result

from the use of hyphenated or suffixed numbers, the retiring system is generally considered to be the better system. It is important that the parcel number be as permanent as possible; however, it must be flexible enough to adapt to future needs and advancing technology.

Simplicity. The parcel number should be easily understood and easy to use. The number of digits should be minimized and each digit should be numeric rather than a combination of numbers and letters. This makes it easier to generate the parcel number, particularly in districts utilizing data processing equipment. A parcel number that is uncomplicated and easily understood will help to reduce errors in its use.

Ease of maintenance. Any parcel numbering system must be kept up-to-date if it is to be useful. The ease of that maintenance is largely dependent upon the simplicity and permanence of the system. When the parcel numbering system cannot efficiently accommodate changes such as subdivision and consolidation of parcels, maintenance can become difficult.

Convenience of use. The parcel numbering system must serve as a convenience in both field and office operations. In the office, access to property records and files should be facilitated through the use of the parcel number. To accomplish this, the parcel numbers must be in some type of logical and sequential order. In the field, the parcel number should be in geographical order, allowing for systematic valuation procedures.

Reference to geographic location. A parcel numbering system, which is based on geographic location, makes it possible to describe and accurately locate a specific parcel using the parcel number alone. Such a system simplifies the handling of property records by replacing long, cumbersome legal descriptions with a parcel number.

With the advent of computer assisted assessment systems, it is becoming increasingly important that the parcel numbering system be suitable for both computerized systems and manual operations. In addition to the criteria previously discussed, to meet data processing requirements, the parcel number must also be capable of being sorted into a logical sequential order, and all numbers must have a uniform number of digits. The parcel number should also be composed of numeric characters since alphabetic characters and other symbols result in some loss in efficiency.

Parcel Systems

There are basically four different types of parcel numbering systems, all of which vary in terms of meeting the above criteria. They are: (1) Consecutive numbering systems (2) Map-page systems, (3) Coordinate systems and (4) Government survey systems.

Consecutive Numbering Systems

This type of system is the most basic and is characterized by the use of a continuous, consecutive series of parcel numbers throughout the district. Under this system, land splits and consolidations are either handled through the use of suffixes and hyphenated numbers, or the old parcel number is retired and an entirely new number assigned. Because the system is simple, it is easily understood and easy to use; however, maintenance problems

and confusion can result from the use of hyphenated/suffixed numbers. Hyphenated/suffixed numbers will also cause many problems when the system is computerized. In addition, a consecutive parcel number by itself makes no reference to the geographic location of the parcel, and the system often violates the criteria of permanence and uniqueness.

Map-Page Systems

Like the consecutive numbering system, a map-page system is relatively simple and easily used. Under this system, the assessment map itself is incorporated into the parcel number. The parcel number consists of a map book, page, and parcel identifier. A parcel number under this system would have a number such as 2-32-16, where 2 represents the book of maps where the parcel is found, 32 indicates the page in the book, and 16 identifies the parcel on that page. Map-page parcel numbers do reference a geographic area somewhat, and are convenient in the field when used in conjunction with the tax maps. Problems may arise in this system where extensive development is occurring, requiring remapping and the assignment of new parcel numbers; however, in stable areas, this system appears to be satisfactory.

Coordinate Systems

The coordinate system is a method of locating a point on the earth's surface based on its distance from each of two intersecting grid lines known as x and y axes. A coordinate parcel number is composed of the x and y coordinates and describes a parcel's distance east or west along the x axis and the distance north or south along the y axis. Parcel numbers under this system are composed of the coordinates for a single point, usually the approximate center of the parcel. Since the parcel number generally refers to the center of the parcel it describes, the geographic location of a parcel can be readily determined from the parcel number alone. This system tends to be somewhat complex and an understanding of coordinate systems is needed in order to fully utilize it. Once an understanding is achieved, however, the system is relatively simple to use and maintain. It also meets the criteria of uniqueness and permanence. This system also lends itself particularly well to automated systems since computers can be programmed to prepare maps and compute parcel numbers based upon coordinates.

Government Survey Based Systems

This system of parcel numbering is based on the Rectangular Survey System. Parcel numbers under the Rectangular Survey System are developed utilizing the township, range, section, quarter section, and quarter-quarter section numbers, along with individual parcel numbers which are assigned to each tract, and they readily provide the geographical location of each parcel. Parcel numbering systems based on the Government Rectangular Survey System are relatively easy to understand and maintain, meet the criteria of uniqueness, and are fairly permanent.

Recommended System

Under sec. 16.967, Wis. Stats., the Wisconsin Land Information Board has developed a standard parcel numbering system based on the Rectangular Survey System. The system contains 13 digits, which combine the township number, range number, section number, quarter section number, quarter-quarter section number and a parcel number. Figure 5-30 illustrates the parcel numbering system.

- The first digit identifies whether parcels lie east or west of the Fourth Principal Meridian. The number 4 identify parcels east of the Meridian and the number 2 identify parcels west of it.

- The second and third digits identify how far north of the Base Line the township is located.

- The fourth and fifth digits identify the range number from the Fourth Principal Meridian.

- The sixth and seventh digits identify the section number. A 0 must precede sections 1 through 9.

- The eighth digit identifies the quarter section with 1 = Northeast, 2 = Northwest, 3 = Southwest, and 4 = Southeast.

- The ninth digit identifies the quarter-quarter section with 1 = Northeast, 2 = Northwest, 3 = Southwest, and 4 = Southeast.

- The last four digits identify the individual parcel.

Figure 5-30

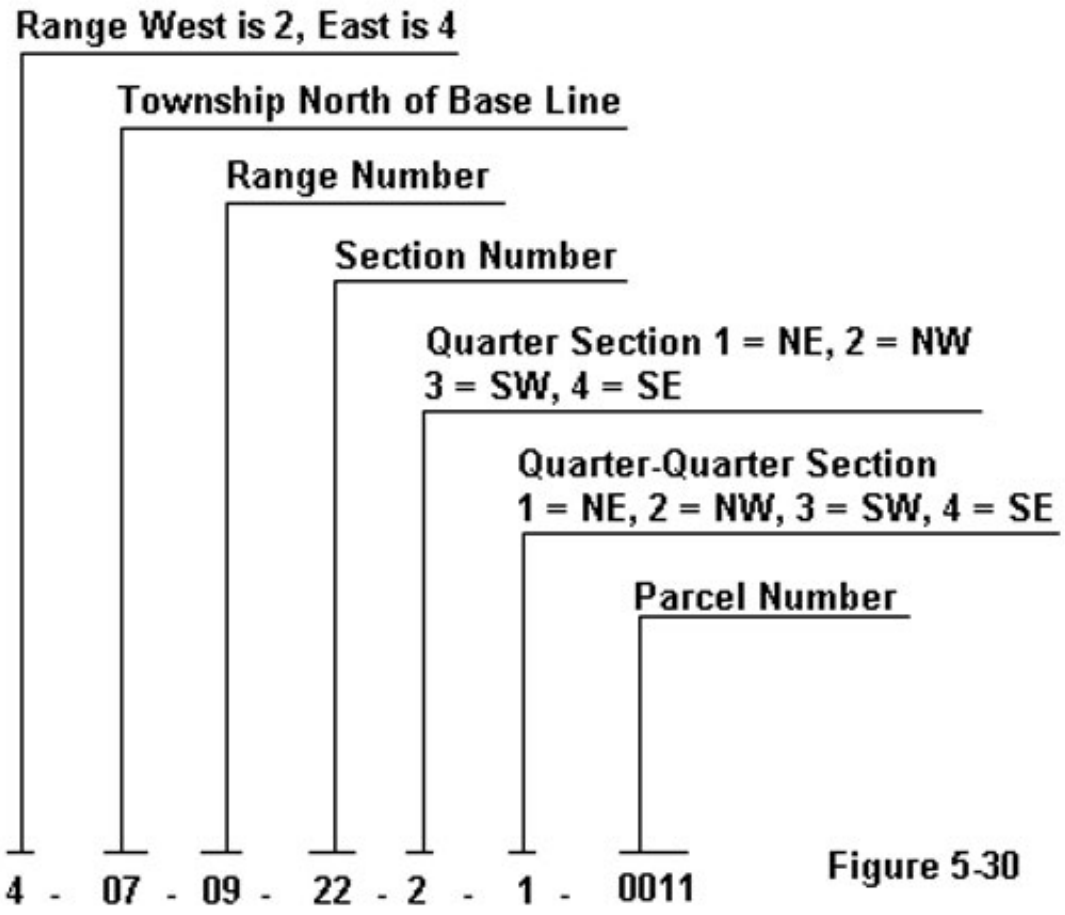
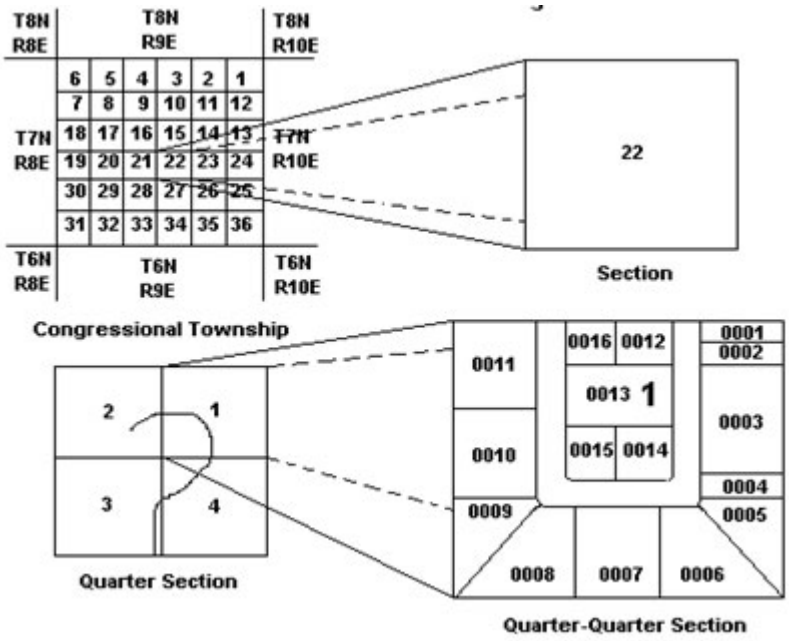


Figure 5-31 identifies the parcel number 4-07-09-22-2-1-0011. The number 4 shows that the parcel is east of the Fourth Principal Meridian. The numbers 07-09 identify Township 7 North Range 9 East. The number 22 identify Section 22, the number 2 identify the northwest quarter section, and the number 1 identifies the northeast quarter-quarter section. The quarter-quarter section is subdivided into 16 lots, thus the last 4 numbers, 0011, identify lot 11.

Figure 5-31



The two-digit county and three digit municipality codes can be used at the beginning of the parcel number. While these codes may not be necessary for use within the municipality, they must be used when data is shared over several municipalities, such as in a Geographic Information System (GIS).

School district numbers are not part of the parcel numbering system because school district boundaries change rapidly and would require frequent changes to the parcel number. This defeats the permanency requirement and makes system maintenance difficult.

Parcels located in more than one-quarter section or quarter-quarter sections are numbered with the quarter section, or quarter-quarter section, containing the greater portion of the parcel. If part of the parcel is sold or subdivided, and the new parcel is located wholly within one-quarter section, or quarter-quarter section, a new parcel number is assigned to identify the location.

When parcels are combined or split, the old parcel numbers are retired and new parcel numbers created, since using the old parcel number causes confusion as to whether it identifies the old parcel or the new parcel.

A cross-reference list of retired parcel numbers must be maintained to provide an historical record for the municipality and for other purposes such as title searches.

The recommended parcel numbering system contains all of the requirements of uniqueness, permanence, simplicity, ease of maintenance, convenience of use, and reference to geographic location mentioned earlier in this chapter.

Preparation of the Assessment Roll

Although the duties for real property listing are defined in sec. 70.09, Wis. Stats., the responsibility for preparing a complete and accurate assessment roll lies with the assessor. Before entering new construction on the assessment roll, the assessor needs to equate the value to the level of assessment.

Where Real Property Assessed

Section 70.12, Wis. Stats., provides that "Except in cities of the first class, all real property not expressly exempt from taxation shall be entered upon the assessment roll in the assessment district where it lies." Cities of the first class have been excluded from this section because the commissioner of assessments has the authority to divide the city into smaller administrative or assessment districts and also to direct that the assessments of real property be made without regard to the boundaries of the districts.

To Whom Real Property Assessable

Section 70.23, Wis. Stats., requires that the assessor enter upon the assessment roll opposite the name of the person to who assessed a correct and pertinent description of each parcel of real property. Since the tax roll is prepared from the assessment roll, it is important that the correct name appear in the assessment roll whenever possible.

Section 70.17, Wis. Stats., outlines how the name listing is handled for a variety of situations. It states that real property shall be entered in the name of:

1. The owner, if known to the assessor,

2. Otherwise, to the occupant thereof if ascertainable,

3. And, otherwise, without any name.

4. The person holding the contract or certificate of sale of any real property contracted to be sold by the state but not conveyed (by Jan.1st) shall be deemed the owner for such purpose.

5. The undivided real estate of any deceased person may be entered to the heirs of such person without designating them by name.

6. The real estate of an incorporated company shall be entered in the same manner as that of an individual. Improvements on leased lands may be assessed either as real or personal property.

Description of Property

Section 70.23(1), Wis. Stats., says that "The assessor shall enter upon the assessment roll ... a correct and pertinent description of each parcel of real property in the assessment district..." Every assessment requires a legal description of the property sufficient to convey

title to a grantee in a tax deed. This is necessary to protect the local district from having a non-collectable tax charged back by the county. Only correct descriptions should appear on the assessment roll to ensure that taxpayers pay taxes on their property alone.

Procedure for Entering Descriptions in the Assessment Roll

Unplatted Property

Regular government descriptions of land should be entered in the assessment roll opposite the name of the person to who assessed. The preferred order in locating quarter sections is counter clockwise as follows: northeast quarter, northwest quarter, southwest quarter, and southeast quarter. Parts of the quarter section are described observing the same order as illustrated in Figure 5-32.

Figure 5-32

Not more than one section should be put on one page of the assessment roll. Where a government forty is subdivided and owned by two or more persons, the several parts should be entered in regular order following the proper position in the assessment roll. In other words, each part of the forty should be described and entered on the roll before proceeding to enter the description of the following forty. If an individual owns several forties, list each forty on a line in the assessment roll giving the appropriate description for each forty.

When a portion of a forty is subdivision, a listing should be made in the forty giving the name of the subdivision and the acreage taken by it. A typical listing could simply be "Sunnyside Subdivision- 16.5 acres." Listings such as these merely serve to account for the full acres within each forty. Without such listings completing the inventory of the full acreage of a forty, property could be left off the roll because it is assumed to be accounted for in some other place.

Irregular descriptions such as government lots or metes and bounds should be listed in the same order as indicated above for regular government forties. The number of acres in each parcel should be entered after each description, and the total number of acres in the section should be checked with the known actual amount. The acreage for town roads and older county trunks and state highways should be included in each parcel so the acreage will total correctly. However, the land upon which the new county trunks, state highways and interstate highways are being built is being acquired in fee ownership by the county and State of Wisconsin and must be deducted. In cases where land is owned to the centerline of a town, county, or state road, assessors should assess land that is located between the right-of-way boundary and the centerline of a road as undeveloped unless such land is being used as productive (tillable or pasture) farmland as of the assessment date.

Platted Property

Plats of lands of an unincorporated village, lying within any town, shall be entered in one part of the roll in alphabetical order by subdivision name and in regular order within each subdivision as to lots and blocks. Each block in the subdivision should be entered in order, beginning with Block 1 or A. All lots in such blocks should be entered in order before any lot in another block. The same rule applies to cities and villages. Assessment rolls should be indexed to show the page on which each subdivision is entered.

Descriptions referring to certified survey maps by volume and page should also list the forty or government lot, section, town and range in which the map is located as a bare minimum. A more desirable listing would also include a brief indication of the size of the parcel involved. Whenever a description has been split by a certified survey map, an entry should follow that description in the assessment roll listing the number of the certified survey map and the acreage taken up by the survey map from the forty, government lot or outlot. This also applies to subdivisions where a lot or parcel of the subdivision has been divided by a certified survey map.

Exempt Property

The assessor should list every description of exempt real property and its acreage in the assessment roll. This property is not subject to the regular property tax; however, some exempt property is subject to special taxation.

Private forest cropland is privately owned forest land which is exempt from the general property tax because it is part of a special state forestry program. The assessor must value this property, but only for the record, not for current taxation purposes. Under certain circumstances these values could be used in the future to calculate taxes on property withdrawn from the program. All other exempt property is not valued.

Simplified System of Description

Section 70.86, Wis. Stats., provides that, “The common council or other governing body of any city in this state may at its option adopt a simplified system of describing real property in either the assessment roll or the tax roll or in both the assessment roll and tax roll of such city, and may likewise from time to time amend or change such simplified system.” In 1932, 21 Opinion of Attorney General 92 interpreted this to authorize a simplified system of

describing real estate in assessment or tax rolls if the descriptions indicate the real estate intended with ordinary and reasonable certainty. Before any simplified system of describing real property is established, it is recommended that the municipality coordinate its system with the county real property lister and the county treasurer.

Combining Descriptions

There are times when it is convenient for the assessor to combine descriptions of parcels, making one assessment rather than several. The law establishes guidelines for the combining of descriptions.

Section 70.23(2), Wis. Stats., says that when two or more tracts owned by the same person are improved or occupied with buildings so that they are practically incapable of separate valuation, they may be entered in the assessment roll as one parcel. In some municipalities, the legal descriptions have been combined so that all contiguous parcels in a section which are owned by the same person are described in one legal description. When property is described in this manner, the assessor may have several 40's described in one legal description on the assessment roll. Such legal descriptions should be broken down by 40's on the property record cards to be sure that all property has been accounted for, and to allow taxpayers to more readily compare assessments if they wish to do so.

Section 70.28, Wis. Stats., provides that no assessment of real property shall be held invalid for the reason that several contiguous parcels are assessed together as one parcel when owned by the same person at the time of the assessment.

Number of Acres

Section 70.23(1), Wis. Stats., requires that the assessor enter upon the assessment roll, along with the name and description, the number of acres in each tract containing more than one acre. It is a good practice to enter the acreage of all parcels, even if less than one-acre. This helps the assessor to account for all the land in the district and helps to eliminate omitted property.

Classification of Real Property

Sections 70.32(2) and (3), Wis. Stats., provide for the classification of real property according to its use. Land use classification is required in a form that will allow comparability between localities and regions, and that will also permit the study of trends over time in individual areas. In order to achieve these goals, it is essential that land use classification be uniform within and between individual municipalities. The statutory land use classification established in Wisconsin provides for a uniform system of use classification which, when adhered to properly, helps to achieve comparability in property tax land use statistics.

For purposes of land use classification, the following definitions of parcel are provided. These combined definitions apply to the narrative throughout this manual, including the expanded definitions of use classification that follow. The instructions to clerks and

assessors in the assessment roll prescribed by the Wisconsin DOR also use the combined definitions to define a parcel for the purpose of preparing a parcel count of real property.

A parcel is a contiguous area of land described in a single description in a deed or as one of a number of lots on a plat; separately owned, either publicly or privately; and capable of being separately conveyed. For ease of listing data, a segment of a street, highway, railroad right-of-way, pipeline, or other utility easement may be treated as though it were a parcel.

Another definition of parcel, as derived from sec. 70.25, Wis. Stats., is "any description of land which shall indicate the land intended with ordinary and reasonable certainty and which would be sufficient between grantor and grantee in an ordinary conveyance…"

A parcel may also be described as two or more legal parcels (as previously defined) whose descriptions have been consolidated by the assessor into a single description. This definition is established by sec. 70.28, Wis. Stats., which states that "No assessment of real property which has been or shall be made shall be held invalid or irregular for the reason that several lots, tracts, or parcels of land have been assessed and valued together as one parcel and not separately where the same are contiguous and owned by the same person at the time of assessment." It is common for a person or a corporation to acquire title to two or more contiguous parcels and then to operate or develop them as a single establishment. If use classification is properly administered within the given definitions of a parcel there should be no problem with record keeping. The overall use of the various single parcels in such an operating "establishment" will control the classification of the separate deed parts.

Assessment rolls in rural areas assembled by 40's (the quarter-quarter section of the Rectangular Survey System) are good examples of an establishment (farm) being divided into separate descriptions for record keeping purposes. These separate descriptions, however, do not change the use classification.

Following the definitions of a parcel and of an establishment previously given, and in keeping with secs. 70.25 and 70.28, Wis. Stats., the assessor must first determine the predominate use, or determine if there are multiple uses which can be individually identified and separated. If a predominate use is determined, the parcel is entered in the assessment roll as a single entry with one overall use classification. If multiple uses are identified, separate use classifications are entered in the roll for each use, or in some cases, separate use classifications and descriptions may be warranted for each of the various uses.

If the recorded description does not fit the above determinations, the assessor may either combine recorded descriptions (sec. 70.28, Wis. Stats.), or create separate descriptions and calculate their acreages (sec. 70.25, Wis. Stats).

In each county a real property lister is available to assist in the preparation of descriptions for parcels. For the determination of proper use classification the statutory assessor is solely responsible, subject to the guidelines presented here.

To assist assessors in uniform listing of individual land parcels into the proper land use classes, the following expanded definitions for each of the eight classes of real property are provided. The annual determination of use for property tax classification is controlled by the use as found as of the assessment date, January 1.

Class 1 = Residential
Class 2 = Commercial
Class 3 = Manufacturing
Class 4 = Agricultural
Class 5 = Undeveloped Land
Class 5m = Agricultural Forest
Class 6 = Productive Forest
Class 7 = Other

Residential Classification (Class 1)

The residential class includes any parcel or part of a parcel of untilled land that is not suitable for the production of row crops, on which a dwelling or other form of human abode is located. It also includes vacant land in cities and villages where the most likely use would be for residential development. Mobile homes assessed as real property are classified as residential. Apartment buildings of up to three units are also classified as residential.

Apartment buildings of four or more units, hotels, summer resorts, and mobile home courts should be classified as commercial property.

Wherever possible, a single classification should be used, depending upon the predominate use of the property. There will be times when the assessor may find it helpful to split a parcel when classifying multiple use establishments. Examples are: a farm with a full set of buildings and an "extra" house not needed in the operation of the farm (agricultural and residential parcels, but only if the extra house is situated as to be feasible to break it away from the rest of the farm operation with a separate legal description); a forty acre wooded parcel with a house and yard (forest and residential); a gas station and garage with a separate dwelling unit (commercial and residential).

Commercial Classification (Class 2)

The commercial classification includes all land and improvements primarily devoted to buying and reselling goods for a profit. It also includes the providing of services in support of residential, agricultural, manufacturing, and forest uses. Whenever possible, the discussions of the various use classifications have identified situations which involve the providing of services, and state when such should be classified as commercial.

The following types of properties should be classified as commercial:

1. Apartments of four or more units.
2. Non-operating quarries and pits which are not depleted. (Depleted quarries and pits should be included in Class 5-Undeveloped Land.)
3. Mobile home parks and courts.
4. Stores with apartments above the store(s).
5. Hunting and fishing clubs, camping and picnic areas when clearly operated as a commercial enterprise or as a club for members only.
6. Flooded lands behind dams when defined by definite project boundaries.

7. Golf courses.
8. Commercial Greenhouses.

In situations where mixed commercial and manufacturing operations are involved the state manufacturing assessors will determine whether the property is to be classed as manufacturing and will provide the municipal assessor with a description of the property so classified.

Manufacturing Classification (Class 3)

Section 70.995, Wis. Stats., State assessment of manufacturing property.

(1) Applicability.

(a) In this section "manufacturing property" includes all lands, building, structures and other real property used in manufacturing, assembling, processing, fabricating, making, or milling tangible personal property for profit. Manufacturing property also includes warehouses, storage facilities or offices in support of the manufacturing property, and all personal property owned or used by any person engaged in this state in any of the activities mentioned, and used in such activity, including raw materials, supplies, machinery, equipment, work in process, and finished inventory when located at the site of such activity. Establishments engaged in assembling component parts of manufactured products are considered manufacturing establishments if the new product is neither a structure nor other fixed improvement. Materials processed by a manufacturing establishment include products of agriculture, forestry, fishing, mining and quarrying. For the purposes of this section, establishments engaged in mining metalliferous minerals are considered manufacturing establishments.

(b) Materials used by a manufacturing establishment may be purchased directly from producers, obtained through customary trade channels or secured without recourse to the market by transfer from one establishment to another under the same ownership. Manufacturing production is usually carried on for the wholesale market, for interplant transfer or to order for industrial users rather than for direct sale to a domestic consumer.

(c) Manufacturing shall not include the following agricultural activities:

1. Processing on farms if the raw materials are grown on the farm
2. Custom gristmilling
3. Threshing and cotton ginning

(d) Except for the activities under sub. (2), activities not classified as Manufacturing in the Standard Industrial Classification Manual, 1987 edition, published by the U.S. Office of Management and Budget are not Manufacturing for this section.

(2) Further Classification. In addition to the criteria set forth in sub. (1), Wis. Stats., property shall be deemed prima facie manufacturing property and eligible for assessment under this section if it is included in one of the following major group

classifications set forth in the standard industrial classification manual, 1987 edition, published by the U.S. printing office. For the purposes of this section any other property described in this subsection shall also be deemed manufacturing property and eligible for assessment under this section:

a. 10 - Metal mining
b. 14 - Mining and quarrying of non-metallic minerals, except fuels
c. 20 - Food and kindred products
d. 21 - Tobacco manufacturers
e. 22 - Textile mill products
f. 23 - Apparel and other finished products made from fabrics and similar materials
g. 24 - Lumber & wood products, except furniture
h. 25 - Furniture and fixtures
i. 26 - Paper and allied products
j. 27 - Printing, publishing and allied industries
k. 28 - Chemicals and allied products
l. 29 - Petroleum refining and related industries
m. 30 - Rubber and miscellaneous plastic products
n. 31 - Leather and leather products
o. 32 - Stone, clay, glass and concrete products
p. 33 - Primary metal industries
q. 34 - Fabricated metal products, machinery and transportation equipment
r. 35 - Machinery, except electrical
s. 36 - Electrical & electronic machinery, equipment and supplies.
t. 37 - Transportation equipment
u. 38 - Measuring, analyzing and controlling instruments; photographic, medical and optical goods; watches and clocks
v. 39 - Miscellaneous manufacturing industries
w. 7395 - Photofinishing laboratories
x. Scrap processors using large machines processing iron, steel or nonferrous scrap metal and whose principal product is scrap iron and steel or nonferrous scrap metal for sale for remelting purposes
y. Processors of waste paper, fibers or plastics using large machines for recycling purposes.
z. Hazardous waste treatment facility, as defined in sec. 144.61(14), Wis. Stats. unless exempt under sec. 70.11(21, Wis. Stats.)

(3) For purposes of subs. (1) and (2), Wis. Stats., "manufacturing, assembling, processing, fabricating, making, or milling" includes the entire productive process and includes such activities as the storage of raw materials, the movement thereof to the first operation thereon, and the packaging, bottling, crating, or similar preparation of products for shipment.

(4) Whenever real property or tangible personal property is used for one, or some combination of the processes mentioned in subs. (3), Wis. Stats., and also for other purposes, the DOR, if satisfied that there is substantial use in one or some combination of such processes, may assess the property under this section. For all purposes of this

> section the DOR shall have sole discretion for the determination of what is substantial use and what description of real property or what unit of tangible personal property shall constitute "the property" to be included for assessment purposes, and, in connection herewith, the department may include in a real property unit, real property owned by different persons. Vacant property designed for use in manufacturing, assembling, processing, fabricating, making, or milling tangible personal property for profit may be assessed under this section or under sec. 70.32, Wis. Stats., and the period of vacancy may not be the sole ground for making that determination. In those specific instances where a portion of a description of real property includes manufacturing property rented or leased and operated by a separate person which does not satisfy the substantial use qualification for the entire property, the local assessor shall assess the entire real property description and all personal property not exempt under sec. 70.11(27), Wis. Stats. The manufacturing machinery and equipment shall be valued by the DOR under subs. (7) (c), Wis. Stats., and shall qualify for exemption under sec. 70.11(27), Wis. Stats. The applicable portions of the standard manufacturing property report form under subs. (12), Wis. Stats., as they relate to manufacturing machinery and equipment shall be submitted by such person.

Further information on businesses, activities, and property that are and are not classified as manufacturing is provided in Chapter 10.

Prior to January 1 the DOR notifies each assessor of the manufacturing property within the municipality that will be assessed by the DOR that year. The legal descriptions for manufacturing properties are still listed in the assessment roll; however, this is done to account for all property in the municipality. Following the legal description, manufacturing properties are coded "3. State Assessed Manuf." The local assessor does not assess these parcels.

Agricultural Classification (Class 4)

This classification includes land devoted primarily to agricultural use. In 1995, significant statutory revisions were made that changed the classification and assessment of agricultural land. Land classified as agricultural cannot include buildings or improvements.

Effective January 1, 2003, Wisconsin Act 109 amended sec. 70.32(2)(c)1 Wis. Stats., defining agricultural land as "land exclusive of buildings and improvements and the land necessary for their location and convenience, that is devoted primarily to agricultural use as defined by rule." This statute does not change the current definition of agricultural land, but clarifies that the land under agricultural buildings is excluded from Class 4.

Class 7, "Other," includes the buildings and improvements and the land necessary for their location and convenience. Specific discussion on agricultural classification and valuation can be found in Chapter 11.

The classification of agricultural production covers land (farms, ranches, dairies, nurseries, orchards, cranberry bogs, etc.) devoted primarily to the production of crops, plants, vines, or trees (excluding forestry operations); and in keeping, grazing, or feeding of livestock for the sale of livestock or livestock products (excluding serums), for livestock increase, or for value

increase. Livestock as used here includes cattle, sheep, goats, hogs, and poultry. Also included are animal specialties such as horses, rabbits, bees, pets, and fur-bearing animals in captivity, and fish in captivity. Agricultural production also includes sod farms, mushroom cellars, medicinal plants growing under sash or lath, and the production of bulbs, flower and vegetable seeds, vegetables, melons, berry crops, and grapes. The buildings and dwellings associated with growing, production, and associated services enumerated above are classified as "Other" (Class 7).

Farms are utilized for agricultural production. A farm may consist of a single tract of land, or a number of separate tracts, which may be held under different tenures. For example, the farmer may own one tract and another rented. It may be operated by the owner or with the assistance of members of the household or hired employees, or it may be operated by a partnership, corporation, or other type of organization. When a landowner has one or more tenants, renters, croppers, or managers, the lands operated by each are considered a farm.

A farmer is a person whose primary occupation is the cultivation of the soil to produce a crop. The income derived from the sale of crops and products is not as a merchant, since the farmer does not buy and sell the same for the purpose of obtaining income, nor as a manufacturer, since raw materials are not worked into wares suitable for use. A farmer is a grower.

Where two distinct uses are present, two classifications are needed. For example, someone purchases 40 acres and builds a new home or remodels an existing home for residential use and farms or rents out the land. The house, outbuildings, and land necessary for location and convenience of buildings should be classified as "Other" (Class 7), and the balance of the acreage classified as agricultural, agricultural forest, forest, or undeveloped as the case may be.

Undeveloped Land (Class 5)

The 2003 Wisconsin Act 33 changed the name of class 5 to Undeveloped. Swampland or wasteland is defined by statute to include bog, marsh, lowland brush, uncultivated land zoned as shoreland under sec. 59.692, Wis. Stats., and shown as a wetland on a final map under sec. 23.32, Wis. Stats., or other nonproductive land not elsewhere classified. This class also includes land which because of soil or site conditions does not produce and is not capable of producing; such as rock outcropping, borrow pits, abandoned, depleted quarries, and other land not used and with no potential for use. In a few areas of central Wisconsin certain swamp lands produce a species of moss which grows in the wild state, is harvested and has a commercial use. This crop is very slow growing, is not cultivated, and is not regarded as an agricultural pursuit. Such lands should be classified as Undeveloped Land.

Lakebeds of natural occurring, navigable waters are owned by the state and are considered undeveloped land even though the acreage may be listed in the deed of property owned by individuals.

Revision of sec. 70.32(2)(a), Wis. Stats., excludes buildings and improvements from undeveloped lands.

Agricultural Forest (Class 5m)

Sec. 70.32(2)(c)1d, Wis. Stats., which defines the "agricultural forest" class of property, was amended by 2003 Wisconsin Act 230. The following definition of "agricultural forest" is effective January 1, 2005.

Sec. 70.32(2)(c)1d, Wis. Stats., defines "agricultural forest" as "land that is producing or is capable of producing commercial forest products, if the land satisfies any of the following conditions: a. It is contiguous to a parcel that has been classified in whole as agricultural land under this subsection, if the contiguous parcel is owned by the same person that owns the land that is producing or is capable of producing commercial forest products. In this subdivision, 'contiguous' includes separated only by a road. b. It is located on a parcel that contains land that is classified as agricultural land in the property tax assessment on January 1, 2004, and on January 1 of the year of assessment. c. It is located on a parcel at least 50 percent of which, by acreage, was converted to land that is classified as agricultural land in the property tax assessment on January 1, 2005, or thereafter."

"Agricultural forest" classification examples are provided in Appendix 11-D, Agricultural Forest.

NOTE: The 2004 assessment roll needs to be kept to meet the requirement in sec. 70.32(2)(c)1d Wis. Stats.

Forest Lands (Class 6)

This class includes land, which is producing, or capable of producing commercial forest products. Forest land can no longer include buildings and improvements.

Productive forest lands and related services in this classification are determined primarily on the use of the land. It is recognized that other activities, e.g., recreation, hunting, fishing, and limited occasional grazing of livestock may also be taking place within these forested areas. These types of activities are considered secondary in nature and not controlling.

Forest lands include those forested areas which are being managed or set aside to grow tree crops for "industrial wood" or to obtain tree products such as sap, bark, or seeds. Forested areas with no commercial use made of the trees, including cutover are also to be included in this classification. Cherry orchards, apple orchards, and Christmas tree plantations are classified as agricultural property.

Lands designated Forest Crop Land and Managed Forest Land by entry order of the Department of Natural Resources are entered separately in the assessment roll (See Chapter 6 - Real Property Assessment-Special). Improvements on Forest Crop Lands and Managed Forest Land are to be listed as personal property (secs. 77.04(1), and 77.84, Wis. Stats.)

Small, vacant tracts with trees are seldom considered to have forestry use as they are rarely held for timber production. These small acreage parcels better lend themselves to residential land values and use.

Establishments primarily engaged in performing services related to timber production, wood technology, forest economics and marketing, and other forestry services such as cruising timber, fire fighting, pest control, and reforestation, should be classified as commercial. The lands and buildings associated with these forestry services should be separately described in the listing process and entered upon the roll in their proper use classification.

Forested areas primarily held for hunting, trapping, or in the operation of game preserves, should be classified as forest unless clearly operated as a commercial enterprise or exempt.

Other Classification (Class 7)

Effective January 1, 2003 Wisconsin Act 109 created sec. 70.32(2)(c)1m, Wis. Stats. defining "Other." Section 70.32(2)(c)1m, Wis. Stats. states, " 'Other,' as it relates to par. (a) 7, means buildings and improvements; including any residence for the farm operator's spouse, children, parents, or grandparents; and the land necessary for the location and convenience of those buildings and improvements."

This statute change provides that residences located directly on land that is part of the farm operator's farm operations are to be classed as "Other." Residences of the farm operator's spouse, children, parents or grandparents are eligible. Land and improvements classified "Other" are valued at their market value.

Chapter 11 contains definitions and examples of how "Other" is applied.

School District

The DOR under its duties of prescribing assessment roll forms as provided in sec. 70.09(3), Wis. Stats., requires the assessor to fill in on the assessment roll the number of the school district in which each description lies. Since the tax roll is prepared from the assessment roll, this is helpful to the clerk, who is required to enter on the tax roll the school district in which each property is located.

Correction of Assessment Roll

Errors occurring on the assessment roll include valuation errors, palpable errors and omitted property. The statutes provide several opportunities for the examination of the roll by municipal officials and the public and the correction of the roll by officials. Section 70.43, Wis. Stats., permits the assessor to correct any palpable errors discovered on the previous year's assessment roll. Section 70.44, Wis. Stats., directs the assessor to add any property omitted during the two previous years to the current roll. The assessment roll is available for open examination under sec. 70.45, Wis. Stats., and changes are made "to perfect the assessment roll". The assessor's affidavit is then affixed and the roll delivered to the clerk. Section 70.52, Wis. Stats., directs the clerk to examine the roll and "correct all double assessments, imperfect descriptions and other errors apparent upon the face of the roll, and strike off all parcels of real property not liable to taxation". That section also directs the clerk to "add to the roll any parcel of real or personal property omitted by the assessors".

Section 70.47(6), Wis. Stats. directs the BOR to "correct all apparent errors in description or computation, and shall add all omitted property". With the preparation of the tax roll, sec. 70.73, Wis. Stats., directs that if the clerk or treasurer discover personalty assessed to the wrong person or parcels belonging to multiple owners assessed together as one parcel "the assessment roll shall be corrected." Section 74.05, Wis. Stats., permits the correction of the tax roll "resulting from a palpably erroneous entry in the assessment roll."

The assessor can correct any palpable error discovered and acknowledged by the assessor on the current assessment roll prior to the signing of the affidavit. Valuation errors discovered after the affidavit (sec. 70.49, Wis. Stats.) has been signed can only be corrected at the BOR.

The Correction of Palpable Errors

Valuation errors are not palpable errors and cannot be "corrected" under sec. 70.43, Wis. Stats. Palpable errors as listed in sec. 74.33, Wis. Stats. include:

1. a clerical error in the description of the property or the computation of the tax;
2. an assessment which included real property improvements that did not exist on the assessment date;
3. the assessment of exempt property;
4. the assessment of property which was not located in the taxation district;
5. a double assessment;
6. an arithmetic, transpositional or similar error.

A palpable error occurring on the previous year's assessment roll, found prior to this year's, BOR, can be corrected. A sample of the form for correcting sec. 70.43, Wis. Stats., palpable errors is included in the WPAM Forms Chapter. The prior assessment, corrected assessment and amount of the adjustment are noted on the form. The BOR certifies the adjustment amounts and the sec. 70.43, Wis. Stats. corrections become a separate section of the current assessment roll. A marginal note describing the correction is made on the previous roll. The tax to be collected or refunded is determined from the previous year's net tax rate (Net Mill Rate) taking into account credits issued under sec. 79.10, Wis. Stats. Notice of appeal rights to the BOR is sent to the property owner.

The BOR cannot meet until the assessment roll is prepared (usually denoted by signing of the affidavit); and, sec. 70.43, Wis. Stats. palpable errors section is not part of the assessment roll until the adjustment amounts are certified by the BOR; therefore, the assessor has until the first meeting of the BOR to prepare any palpable errors found on last year's roll for correction under sec. 70.43, Wis. Stats.

See Chapter 17 for an example of the correction of a palpable error.

Omitted Property

The assessor cannot intentionally omit taxable property from the assessment roll. However, on occasion, a property is inadvertently omitted from assessment because it is assumed to be exempt or is completely missed. Real or personal property omitted from assessment in

either of the two prior years may be added to and valued on the current assessment roll. Any property discovered to have been omitted for 2010 after the BOR has adjourned, will be assessed and taxed in 2011 as "omitted for 2010".

An assessor enters omitted property on the current roll once for each year the property was omitted from assessment. Each entry shall include a designation that the property was "omitted for the year 20_ _ (giving year of omission)." The omitted property is valued "according to the assessor's best judgment." The tax to be collected is determined from the previous year's net tax rate taking into account credits issued under sec. 79.10, Wis. Stats. Notice of appeal rights to the BOR is sent to the property owner.

Section 70.44, Wis. Stats., does not permit correction of errors in valuation. Only this statute covers those situations in which the assessor inadvertently omits real or personal property from assessment. Further discussion of omitted property is included in the Real Property and Personal Property sections (21.3 and 21.4) of the Legal Reference chapter of this manual.

Summary

The actual listing of property consists of making the following entries on the property record cards and assessment roll:

- Name of owner
- School district in which each tract lies
- Statutory classification of each tract according to its use
- Legal description of tract and number of acres

Statutory Provisions are Directory

Section 70.555, Wis. Stats., states that "directions herein given for the assessing of lands and personal property and levying and collecting taxes shall be deemed directory only, and no error or informality in the proceedings of any of the officers entrusted with the same, not affecting the substantial justice of the tax, shall vitiate or in anywise affect the validity of such tax or assessment." In 38 Opinion of Attorney General 600 (1949) it was held that errors in descriptions in the tax roll were considered as not affecting the substantial justice of the tax and were subject to correction under sec. 74.61, Wis. Stats., or cancellation action by the county board with charge back of tax under sec. 75.25, Wis. Stats.

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Sources of Maps Useful to the Assessor

Aerial Photographs:

United States Department of Agriculture
Agricultural Stabilization and Conservation Service
(There is an ASCS office in each county in the state)

Special Services
Wisconsin Department of Transportation
P.O. Box 7916
Madison, Wisconsin 53707

Regional and/or County Planning or Zoning Office

Base or Section Maps:

County Clerk's Office
County Real Property Lister
County Surveyor's Office
Regional and/or County Planning or Zoning Office

Computerized Mapping Information:

State Cartographer's Office
144 Science Hall
University of Wisconsin
Madison, Wisconsin 53706

Contour Maps:

University of Wisconsin
Geological and Natural History Survey
Madison, Wisconsin 53706

Certified Surveys:

County Register of Deeds Office
County Surveyor's Office

Government Surveys:

Commissioners of Public Lands
110 E. Main Street
Madison, Wisconsin 53703

Plat Books:

Commercial Mapping Companies
County Clerk's Office
County Real Property Lister

Recorded Subdivisions:

County Surveyor's Office
County Register of Deeds Office

Soil Association Maps:

United States Department of Agriculture
Soil Conservation Service
(There is an SCS office in each county in the state.)

University of Wisconsin
Geological and Natural History Survey
Madison, Wisconsin 53706

Soil Survey Maps:

United States Department of Agriculture
Agricultural Stabilization and Conservation Service
Soil Conservation Service
(There is an ASCS and SCS office in each county in the state)

University of Wisconsin
Soil Science Department
Madison, Wisconsin 53706

Soil Survey Maps, cont.:

University of Wisconsin Extension Services
County Office

Topographic Maps:

University of Wisconsin
Geological and Natural History Survey
Madison, Wisconsin 53706

Wetland Maps:

United States Department of Agriculture
Soil Conservation Service
(There is an SCS office in each county in the state.)

Definition of Terms Used in Surveys and Descriptions

A **magnetic meridian** is the direction in the horizontal plane taken by a magnetized needle when it comes to rest in the earth's magnetic field.

A **true meridian** is that meridian through a given point joining the north and south poles of the earth's axis.

An **assumed meridian** is the direction chosen by consideration of convenience for any particular survey, locality, or purpose.

The **declination** of the needle is the angle, which that line makes with its reference meridian, whether the meridian be a true, magnetic or assumed meridian.

The **bearing** of a line is the angle, which that line makes with its reference meridian, whether the meridian be a true, magnetic, or assumed meridian.

The **magnetic bearing** of a line is the acute angle that it makes with the magnetic meridian.

The **true bearing** of a line is the acute angle that it makes with the true meridian.

The **azimuth** of a line is the clockwise angle that it makes with the north end of a true or assumed meridian.

The sum of the interior angles of any closed figure is always 360 degrees.

Each **degree** consists of 60 minutes.

Each **minute** consists of 60 seconds.

A **circle** is that set of all points a given distance from a given point.

The given point of a circle is called the **center** of the circle.

The **radius** of a circle is a straight line drawn from the center of the circle to any given point on the circle.

The **circumference** of a circle is the length of the circle, or the distance around the circle.

A **chord** of a circle is a straight line whose end points lie on the circle. (If the line also passes through the center of the circle, the common reference is then diameter.)

An **arc** is that part of a circle measured between two given points on the circle.

A **central angle** of a circle is an angle whose vertex is the center of the circle and whose sides contain two radii.

A **secant** is a straight line that extends beyond the circle but intersects the circle at two points.

A **tangent** is a straight line that intersects a circle at only one point.

The **point of tangency** is that point at which a tangent intersects a circle.

An **interior angle** is an angle formed by two lines which angle is enclosed by the other sides of a closed figure.

An **exterior angle** is an angle formed by two lines which angle is not enclosed by the other sides of a closed figure.

A **deflection angle** is that angle which any line makes with the proceeding line, if the proceeding line were extended. A deflection angle may be to the right or to the left and any reference to the deflection of an angle must indicate whether it is to the right or left. This is indicated by use of the letter R or L.

An **angle to the right** is the clockwise angle at any vertex between the back line and the forward line.

A line that is drawn **perpendicular** to another line is one which forms an exact angle of 90 degrees with its reference line.

Two lines that are **parallel** to each other remain the same distance apart for their entire length.

On the drawing of a circle,

Point O is the center of the circle.

Point T is the point of tangency of the tangent line ATG.

Line DOT is the diameter of the circle.

Line RO is a radius of the circle.

Line SROE is a secant of the circle.

Line ATG is a tangent of the circle.

Line RT is a chord of the circle.

The distance from R to point T measured on the circle is an arc of the circle.

The angle formed by the intersection of the lines
RO and OD is a central angle of the circle.

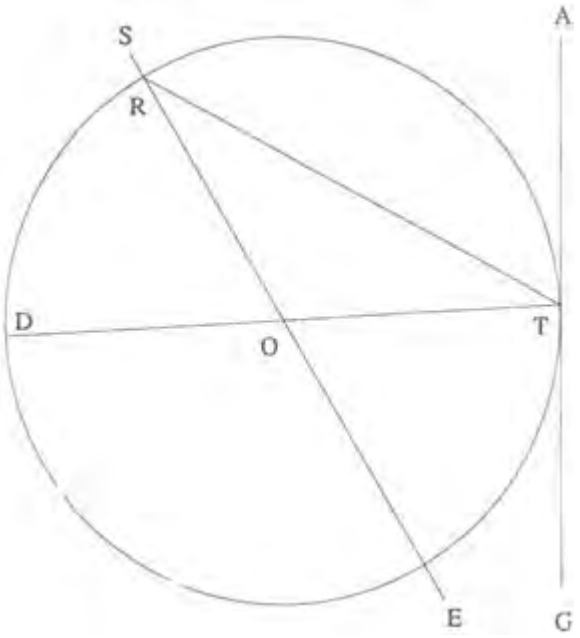


Table of Measures

Linear Measure

1 foot ..... 12 inches
1 yard ..... 3 feet or 36 inches
1 rod ..... 5 1/2 yards or 16 1/2 feet or 198 inches
1 furlong ..... 40 rods or 220 yards or 660 feet or 7,920 inches
1 mile ..... 5,280 feet or 63,360 inches

Surveyor's Linear Measure

1 link ..... 7.92 inches
1 rod ..... 25 links
1 chain ..... 4 rods or 100 links or 66 feet
1 furlong ..... 10 chains
1 mile ..... 8 furlongs or 80 chains or 320 rods

Square Measure

1 square foot ..... 144 square inches
1 square yards ..... 9 square feet or 1,296 square inches
1 square rod ..... 30 1/4 square yards or 272 1/4 square feet or 625 square links
1 square chain ..... 16 square rods
1 acre ..... 10 square chains or 160 square rods or 4,840 square yards or 43,560 square feet
1 square mile ..... 640 acres

Cubic Measure

1 cubic foot ..... 1,728 inches
1 cubic yard ..... 27 cubic feet
1 cord foot ..... 16 cubic feet
1 cord of wood ..... 8 cord feet or 128 cubic feet
1 perch of stone or masonry ..... 24 3/4 cubic feet

Angles and Arcs

1 minute ..... 60 seconds
1 degree ..... 60 minutes
1 right angle ..... 90 degrees
1 quadrant ..... 90 degrees
1 circumference ..... 360 degrees

Other Measurements

1 span ..... 9 inches
1 hand ..... 4 inches
1 knot ..... 6,086 feet
1 fathom ..... 6 feet
1 stone ..... 14 pounds

Scale Conversions

Scales	Foot/Inch	Miles/Inch	Acres/Sq. inch
1:20,000	1,666.667	0.316	63.769
1:24,000	2,000.00	0.379	91.827
1:31,680	2,640.00	0.500	160.00
1:48,000	4,000.00	0.758	367.309
1:62,500	5,208.33	0.986	622.744
1:125,000	10,416.667	1.973	2,490.980
1:250,000	20,833.333	3.946	9,963.907
1:500,000	41,666.667	7.891	39,855.627
1:1,000,000	83,333.333	15.783	159,422.507

Scale Conversion Formulas

$$\text{Foot/Inch} = \frac{\text{Scale}}{12} \qquad \text{Mile/Inch} = \frac{\text{Scale}}{63{,}360}$$

$$\text{Inch/Mile} = \frac{63{,}360}{\text{Scale}} \qquad \text{Ac/Sq.in.} = \frac{(\text{Scale})^2}{43{,}560} \times 144$$

Meters/In. = Ft./In. x 0.3408

Computing acreage

In computing acreage there are several formulas that can be used.

1. Multiply the length by width and divide the answer by 43,560 (square feet in one acre). That gives the number of acres in a parcel.

2. If a legal description is in acreage and one dimension of the property is known: multiply the number of acres by 43,560; divide by the known dimension to get the second dimension of the parcel.

2. If dimensions of a parcel are both in chains, multiply length by width and divide by 10 for number of acres.

3. If dimensions of a parcel are both in rods; multiply length by width and divide by 160 for number of acres.

Subdivision Possibilities of an Acre of Land Into Lots

Size of lot in feet	Width of street in feet	Width of alley in feet	Length of block in feet	Number of lot per acres	Percent of area saleable
25 x 100	40	12	350	12.37	71
25 x 100	60	20	300	10.64	61
25 x 125	66	16	594	9.44	68
30 x 110	45	12	360	9.30	70
33 x 132	50	12	330	7.00	70
37 ½ x 125	50	12	375	6.57	70
40 x 140	50	12	320	5.50	70
40 x 140	60	12	320	5.12	66
50 x 150	50	12	400	4.18	72
50 x 150	60	12	400	4.07	70
55 x 165	55	12	385	3.49	72
66 x 198	50	No	462	2.67	80

Areas of Plane Surfaces

Nomenclature

a, b, c, d	— Lengths of Sides
A	— Area
d, d_1, d_2	— Diameters
e, f	— Lengths of Diagonals
h	— Vertical Height or Altitude
l, l_1, l_2	— Length of Arc
L	— Lateral Length or Slant Height
n	— Number of Sides
θ	— Number of Degrees of Arc
p	— Perimeter
r, r_1, r_2, R	— Radii

RIGHT TRIANGLE

$p = a + b + c$

$c^2 = a^2 + b^2$

$b = \sqrt{c^2 - a^2}$

$A = \frac{ab}{2}$

EQUILATERAL TRIANGLE

$p = 3a$

$h = \frac{a}{2}\sqrt{3} = .866\,a$

$A = a^2\frac{\sqrt{3}}{4} = .433\,a^2$

GENERAL TRIANGLE

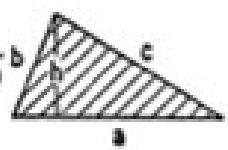
Let $s = \frac{a + b + c}{2}$

$p = a + b + c$

$h = \frac{2}{a}\sqrt{s(s-a)(s-b)(s-c)}$

$A = \frac{ah}{2}$

$A = \sqrt{s(s-a)(s-b)(s-c)}$



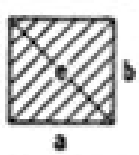
SQUARE

$a = b$

$p = 4a$

$A = a^2 = .5e^2$

$e = a\sqrt{2} = 1.414\,a$



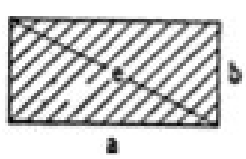
RECTANGLE

$p = 2(a + b)$

$e = \sqrt{a^2 + b^2}$

$b = \sqrt{e^2 - a^2}$

$A = ab$



GENERAL PARALLELOGRAM OR RHOMBOID; AND RHOMBUS

Rhomboid—opposite sides parallel

$p = 2(a + b)$

$e^2 + f^2 = 2(a^2 + b^2)$

$A = ah$

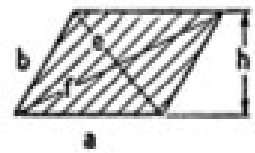
Rhombus—opposite sides parallel and all sides equal

$a = b$

$p = 4a = 4b$

$e^2 + f^2 = 4a^2$

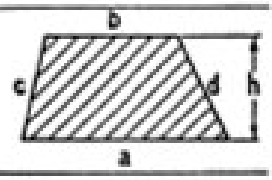
$A = ah = \frac{ef}{2}$



TRAPEZOID

$p = a + b + c + d$

$A = \frac{(a + b)}{2}h$

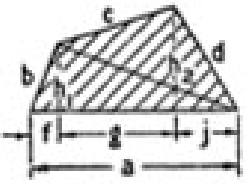


TRAPEZIUM

$p = a + b + c + d$

A = Sum of Areas of two major triangles

$A = \frac{(h_1 + h_2)g + fh_1 + jh_2}{2}$



REGULAR POLYGON

Let n = number of sides

$p = na$

$a = 2\sqrt{R^2 - r^2}$

$A = \frac{nar}{2} = \frac{na}{2}\sqrt{R^2 - \frac{a^2}{4}}$

$= n \times$ Area of each triangle

CIRCLE

$p = 2\pi r = \pi d = 3.1416d$

$A = \pi r^2 = \frac{\pi d^2}{4} = .7854d^2$

$= \frac{p^2}{4\pi} = .07958p^2$

HOLLOW CIRCLE or ANNULUS

$A = \frac{\pi}{4}(d_2^2 - d_1^2) = .7854(d_2^2 - d_1^2)$

$= \pi(r_2^2 - r_1^2)$

$= \pi\frac{d_1 + d_2}{2}(r_2 - r_1)$

$= \pi(r_1 + r_2)(r_2 - r_1)$

Abbreviations and Terms Used in Condensing Descriptions

Abandon ..... ABND
About.....ABT
Above described ..... ABV DESC
Abstract .....ABS
According to the recorded plat ... ACRP
Acre ..... A, AC
Addition .....ADD
Additional .....ADDL
Adjacent .....ADJAC
Adjoining.....ADJ. ADJN
Administrator .....ADMR
Administrator's Deed..... ADMR D
Agreement .....AGMT
Ahead .....AH
Along ..... ALG
Amount .....AMT
And others ..... ET AL
And wife..... ET UX OR & W
Angle .....ANG
Angle point..... A/P
Annexed ..... ANXD
Approved..... APPVD OR APVD
Arbitrary..... ARB
Assessor's plat .....ASR PLT
Assignment of land contract.....ALC
Assume..... (A)
At..... @
Auxiliary reference line.....AR
Avenue .....AV
Azimuth ..... AZ

Ban.....BK
Base line ..... B/L
Bearing long chord .....BLC
Bearing tree.....BO
Before.....BEF
Begin or beginning ..... BEG
Beginning at a point.....BAP
Beginning of curve.....BC
Being.....BNG
Between ..... BET OR BETW
Block ..... BLK
Board..... BRD
Book .....BK
Boulevard.....BLVD
Bound.....BND
Boundary..... BDY
Boundaries .....BDRS
Bounded .....BDD
Brook .....BRK
Buildings ..... BLDGS

Cemetery..... CEM
Cemetery deed .....CEM D
Cemetery plat ..... CEM PLT
Center.....CEN
Center angle.....C/A
Center line ..... C/L, CL
Center of section .....CEN/S
Certain .....CERT
Certificate .....CTF
Certificate of descent ..... CTF DES
Certified .....CTFD
Certified survey ..... CTFD SUR
Chain..... CH
Chains ..... CHS
Chord..... CH
City..... C
Commence..... COM
Commencing ..... COMG
Commencing at a point..... CAP
Commercial .....COMM
Common .....COMM
Company .....CO
Computed.....COMP
Concave .....CONC
Concrete .....CONC
Condition.....COND
Consideration.....CONSIDE
Construction..... CONST
Contain or contained .....CONTD
Contains .....CONTS
Containing ..... CONT
Continue..... CONT
Continuing ..... CONT
Convey..... CONV
Corner .....COR
Corners.....CORS
Corporation .....CORP
Correction..... CORR
Correction deed.....CORR D

County.....CO
County and city..... C & C
County surveyor ..... CO SUR
County trunk highway ..... CTH
Court ..... CT
Cover or covering..... COV
Creek.....CR
Curve.....CUR

Decree ..... DEC
Dedicated or dedication .....DED
Deed .....D OR DD
Deeds..... DDS
Degree..... DEG or °
Degree of curve ..... D
Describe, description, described . DESC
Described as follows ..... DAF
Distant ..... DIST
District ..... DIST
Ditch .....DIT
Division ..... DIV
Document.....DOC
Drive .....DR
Driveway..... DWY

Each .....EA
Easement .....ESMT
East .....E
Easterly.....ELY
Egress ..... EGR
Elevation.....ELV
Entitled ..... ENTLD
Escrow.....ESC
Establish ..... ESTB
Estate.....EST
Except, excepting, exception ..... EX
Executor.....EXCTR
Executrix..... EXCTRX
Existing..... EXST
Extended.....EXTD
Extension .....EXTN

Federal Aid Project.....FAP
Feet, foot ..... FT
Filed .....FLD
Final degree.....FD
Following .....FOL
Forest crop land.....FCL

Foundation .....FDN
Fourth 1/4
Fraction.....FR
Fractional.....FRL
From .....FR

General land office survey .....GLO
Government ..... GVT
Government lot .....GVT L
Grant deed ..... GT DD
Granted .....GTD
Grantee .....GTEE
Grantor..... GTR
Guarantee ..... GUAR
Guide meridian .....GM

Half 1/2
Having.....HAV
Herein described ..... HD
Heretofore ..... HTOFOR
Hereunto ..... HUNTO
Highway .....HWY
Highway conveyance..... HWY CONV
Horizontal .....HOR

Improvement.....IMP
Inch .....IN or "
Inches ..... INS
Include, included, or including ....INCL
Inclusive.....INCL
Incorporated.....INC
Information ..... INFO
Ingress..... INCR
Instruction ..... INSTR
Instrument ..... INSTR
Interest.....IN
Intersection .....INTER
Intersection angel I
Intersection with interstate
highway.....INTER/W
Interstate highway ..... IH
Iron pin, iron pipe .....IP

Joint .....JT
Jointly .....JTLY
Joint tenancy .....JT
Judgment ..... JGD
Junction .....JCT
Juncture .....JCR

Known ..... KN
Known as .....KN AS

Land .....LD
Land contract..... LC
Latitude .....LAT
Lease .....LSE
Left..... LT
Length of curve L
Lessee..... LSEE
Licensed surveyor..... LS
Limited highway easement ..... LHE
Line .....LI OR LN
Link.....LK
Lis Pendes..... LP
Location monument..... LM
Long chord LC
Longitude..... LONG
Lot L
Lying ..... LYG
Lying and being ..... LYD & BNG

Magnetic ..... MAG
Man hole .....MH
Manufactured .....MFG
Maximum.....MAX
Marked..... MKD
Meander corner..... MC
Measured .....(M) MEAS
Memorandum ..... MEMO
Mentioned ..... MEN
Meridian .....MER
Metes and bounds..... M & B
Mile ..... MI
Mile corner..... MC
Minimum .....MS
Mineral survey.....MS
Minutes .....' or M
Miscellaneous .....MISC
Month.....MO
Monument..... MON
More or less..... M OR L
More particularly..... MP
Mortgage .....MTG
Motel .....MO
Municipal..... MCPL

Necessary..... NEC

North .....N
Northeast ..... NE
Northeasterly.....NELY
Northerly..... NLY
Northwest ..... NW
Northwesterly .....NWLY
Number ..... NO

Official.....OFCL
Official records.....OR
Office of Register of Deeds.....ORD
Original ..... ORIG
Other .....OTH
Other property .....OP
Outlot .....OL

Page..... P
Paid .....PD
Parallel.....PRL
Parallel to.....=
Parallel with ..... P/W
Parcel .....PCL
Part ..... PT
Partial .....PTL
Particularly ..... PART
Parties.....PTIES
Partition .....PRTN
Party.....PTY
Pavement ..... PVMT
Permanent ..... PERM
Personal estate..... P EST
Place ..... PL
Plat .....PLT
Point ..... PT
Point of beginning..... POB
Point of commencement..... POC
Point of curvature .....PC
Point of tangency ..... PT
Point of intersection..... PI
Point of compound curve..... PCC
Point of reverse curve ..... PRC
Point of curve ..... POC
Portion..... POR
Possession .....POSN
Preliminary ..... PRELIM
Premises..... PREM
Principal.....PRIN
Principal meridian ..... PRIN MER
Private.....PVT

Private drive ..... PD
Project ..... PROJ
Prolong ..... PROL
Prolongation ..... PR OL
Property ..... PROP
Property line ..... PL
Public ..... PUB
Public land ..... PL

Quarter 1/4
Quarter quarter 1/4 1/4
Quarter quarter line 1/4L
Quarterly 1/4ly
Quiet title ..... QT
Quit claim ..... QC
Quit claim deed ..... QCD

Radius ..... R or RAD
Railroad ..... RR
Railway ..... RY or RWY
Range ..... R
Range line ..... R/L
Ranges ..... RS
Real estate ..... REST
Record ..... REC
Record of survey ..... R OF S
Reference line ..... REF/L
Reference monument ..... RM
Regarding ..... RE
Regular ..... REG
Relocated ..... REL
Replat ..... REP
Report ..... REEP
Required ..... RQD
Reserve ..... RES
Reservation ..... RESVN
Residential ..... RES
Resolution ..... RESOL
Restaurant ..... REST
Restrict ..... RESTR
Resubdivision ..... RESUB
Reversion ..... REV
Right ..... RT
Right of way ..... ROW or R/W
Right angles ..... RA
Right angles to ..... R/A
River ..... RIV
Road ..... RD
Roadway ..... RDWY

Rods ..... RDS
Running ..... RUN or RUNG

Said ..... SD
Sanitary ..... SAN
Scaled ..... (S)
School ..... SCH
Second ..... " or S or 2ND
Section ..... S or SEC
Section corner ..... S/C
Section line ..... S/L
Series ..... SER
Sheriff's deed ..... SD
Signature ..... SIG
Sixteenth section 1/16
South ..... S
Southeast ..... SE
Southeasterly ..... SELY
Southerly ..... SLY
Southwesterly ..... SWLY
Special meander corner ..... SMC
Square ..... SQ
Stake ..... STK
Stamps ..... STPS
Standard ..... STD
Standard parallel ..... STAN PAR
Starting ..... STG
State trunk highway ..... STH
Station ..... STA
Street ..... ST
Subdivision ..... SUB
Subject ..... SUBJ
Supervisor ..... SUPER

Tangent ..... TAN
Tangent length of curve ..... T
Tax deed ..... TD
Tax exempt ..... TX
Tax sale ..... TXS
Temporary ..... TEMP
Terminate ..... TERM
Termination of joint tenancy ... T JTEN
Termination of life estate ..... T LEST
Thence ..... TH
Thereof ..... THRF
Thereon ..... THON
Therefore ..... THFRE
Through ..... THRU
Together ..... TOG

Together with ..... TOG/WI
Town ..... T or TN
Township..... T or TP or TWP
Tract..... TR
Triangulation.....TRI
Trust deed.....TD

Under .....UND
Undivided .....UND
Unincorporated..... UNINC
United States Coast and
Geodetic Survey .....USC & GS
United States Geological Survey USGS
United States highway..... US HWY

Vacated ..... VAC
Variation..... VAR
Vendee ..... VDE
Vendor..... VDR
Village.....VIL
Volume..... VOL

Warranty deed.....WD
West .....W
Westerly.....WLY
Which or whence.....WH
With ..... WI
Witness corner.....WC
Witness point..... WP

Yard .....YD
Year.....YR

N 1/4 corner N1/4C
S 1/4 corner..... S1/4C
E 1/4 corner..... E1/4C
W 1/4 corner..... W1/4C