

Surveying Units and Terms

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Here is our list of **units of measure, surveying terms, surveyors' slang and abbreviations, water descriptions, and trees.**

If you don't see your favorite obscure units or terms, please [let us know](#). We're happy to add to our list.

Units of Measure

- **Acre** - The (English) acre is a unit of area equal to 43,560 square feet, or 10 square chains, or 160 square poles. It derives from a plowing area that is 4 poles wide and a furlong (40 poles) long. A square mile is 640 acres. The Scottish acre is 1.27 English acres. The Irish acre is 1.6 English acres.
- **Arpent** - Unit of length and area used in France, Louisiana, and Canada. As a unit of length, approximately 191.8 feet (180 old French 'pied', or foot). The (square) arpent is a unit of area, approximately .845 acres, or 36,802 square feet.
- **Chain** - Unit of length usually understood to be *Gunter's chain*, but possibly variant by locale. See also *Rathbone's chain*. The name comes from the heavy metal chain of 100 links that was used by surveyors to measure property bounds.
- **Colpa** - Old Irish measure of land equal to that which can support a horse or cow for a year. Approximately an Irish acre of good land.
- **Compass** - One *toise*.
- **Cuerda** - Traditional unit of area in Puerto Rico. Equal to about .971 acres. Known as the "Spanish acre".
- **Engineer's Chain** - A 100 foot *chain* containing 100 links of one foot apiece.
- **Furlong** - Unit of length equal to 40 poles (220 yards). Its name derives from "furrow long", the length of a furrow that oxen can plow before they are rested and turned. See *Gunter's chain*.
- **Ground** - A unit of area equal to 2400 sq. ft., or 220 sq. meters, used in India.
- **Gunter's Chain** - Unit of length equal to 66 feet, or 4 poles. Developed by English polymath Edmund Gunter early in the 1600's, the standard measuring chain revolutionized surveying. Gunter's chain was 22 yards long, one tenth of a *furlong*, a common unit of length in the old days. An area one chain wide by ten chains long was exactly an acre. In 1595 Queen Elizabeth I had the mile redefined from the old Roman value of 5000 feet to 5280 feet in order for it to be an even number of furlongs. A mile is 80 chains.
- **Hectare** - Metric unit of area equal to 10,000 square meters, or 2.471 acres, or 107,639 square feet.
- **Hide** - A very old English unit of area, a hide was of variable size depending on locale and the quality of the land. It was the amount of land to support a family, and ranged from 60 to 180 acres. After the Norman conquest in 1066 it became standardized at around 120 acres.
- **Hundred** - An administrative area larger than a village and smaller than a county. In England it was 100 *hides* in size, and the term was used for early settlements in Virginia, Maryland, and Delaware.
- **Labor** - The labor is a unit of area used in Mexico and Texas. In Texas it equals 177.14 acres (or 1 million square varas).
- **League (legua)** - Unit of area used in the southwest U.S., equal to 25 labors, or 4428 acres (Texas), or 4439 acres (California). Also, a unit of length-- approximately three miles.
- **Link** - Unit of length equal to 1/100 chain (7.92 inches).
- **Morgen** - Unit of area equal to about .6309 acres. It was used in Germany, Holland and South Africa, and was derived from the German word Morgen ("morning"). It represented the amount of land that could be plowed in a morning.
- **Out** - An 'out' was ten chains. When counting out long lines, the chain carriers would put a stake at the end of a chain, move the chain and put a stake at the end, and so on until they ran "out" of ten stakes.
- **Perch** - See *pole*.

- **Point** - A point of the compass. There are four cardinal points (North, South, East, West), and 28 others yielding 32 points of 11.25 degrees each. A survey line's direction could be described as a compass point, as in "NNE" (north northeast). To improve precision, the points would be further subdivided into halves or quarters as necessary, for example, "NE by North, one quarter point North". In some areas, "and by" meant one half point, as in "NE and by North".
- **Pole** - Unit of length and area. Also known as a *perch* or *rod*. As a unit of length, equal to 16.5 feet. A mile is 320 poles. As a unit of area, equal to a square with sides one pole long. An acre is 160 square poles. It was common to see an area referred to as "87 acres, 112 poles", meaning 87 and 112/160 acres.
- **Pueblo** - A Spanish grant of less than 1000 acres.
- **Rancho** - A Spanish grant of more than 1000 acres.
- **Rathbone's Chain** - A measuring *chain* two poles, or 33 feet, in length.
- **Rod** - See *pole*
- **Rood** - Unit of area usually equal to 1/4 acre.
- **Toise** - Traditional French unit of length equal to 6 old French 'pieds' or feet, or 6.4 English feet.
- **Vara** - Unit of length (the "*Spanish yard*") used in the U.S. southwest. The vara is used throughout the Spanish speaking world and has values around 33 inches, depending on locale. The legal value in Texas was set to 33 1/3 inches early in the 1900's.
- **Virgate** - An old English unit of area, equal to one quarter of a *hide*. The amount of land needed to support a person.

Standard Surveying Terms

- **Aliquot** - The description of fractional section ownership used in the U.S. public land states. A parcel is generally identified by its *section*, *township*, and *range*. The aliquot specifies its precise location within the section, for example, the northwest quarter of the southeast quarter.
- **Auditor's map** - was made by the County Surveyor at the request of the auditor for tax purposes. Many were made in the 1800's. Very little field work was done. The map was created by the use of various documents, piecing together other surveys, a few rough measurements in the field, etc. Generally, not accurate.
- **Azimuth** - The number of degrees from north (or other reference direction) that a line runs, measured clockwise.
- **Baseline** - In the U.S. Public land surveying system, a surveyed east-west (i.e. latitudinal) reference line, often hundreds of miles in length, from which *tiers* of *townships* are surveyed to the north and south. There are approximately two dozen baselines in the lower 48 states. See also *meridian*.
- **Bearing** - See *azimuth*. Bearings taken with a compass will be referenced to magnetic north unless otherwise noted.
- **Benchmark** - A survey mark made on a *monument* having a known location and elevation, serving as a reference point for surveying.
- **Call** - Any feature, landmark, or measurement called out in a survey. For example, "two white oaks next to the creek" is a call. So is "North 3 degrees East 120 poles".
- **Chain carrier** - An assistant to the surveyor, the chain carriers moved the surveying chain from one location to another under the direction of the surveyor. This was a position of some responsibility, and the chain carriers took an oath as "sworn chain carriers" that they would do their job properly.
- **Chord** - The straight line connecting the end points of an arc.
- **Condition** - See *Conditional line*.
- **Conditional line** - An agreed line between neighbors that has not been surveyed, or which has been surveyed but not yet granted.
- **Corner** - The beginning or end point of any survey line. The term corner does not imply the property was in any way square.
- **Declination** - The difference between magnetic north and geographic (true) north. Surveyors used a compass to determine the direction of survey lines. Compasses point to magnetic north, rather than true north. This declination error is measured in degrees, and can range from a few degrees to ten degrees or more. Surveyors may have been instructed to correct their surveys by a particular declination value. The value of declination at any point on the earth is constantly changing because the location of magnetic north is drifting. [More information](#)

about historical values of declination is available.

- **First station** - See *Point of Beginning*
- **Flag** - A bright plastic ribbon tied to a lath stake. Used to mark points along a survey line.
- **Gore** - A thin triangular piece of land, the boundaries of which are defined by surveys of adjacent properties. Loosely, an overlap or gap between properties. See also *strip*.
- **Landmark** - A survey mark made on a 'permanent' feature of the land such as a tree, pile of stones, etc.
- **Line Tree** - Any tree that is on a property line, specifically one that is also a corner to another property.
- **Merestone** - A stone that marks a boundary. See *monument*.
- **Meridian** - In the U.S. public land surveying system, a surveyed north-south (i.e. longitudinal) reference line, often hundreds of miles in length, from which *ranges* are surveyed to the east and west. There are approximately two dozen meridians in the lower 48 states. See also *baseline*.
- **Mete** - In the context of surveying, a measure, i.e. the direction and distance of a property line.
- **Metes and Bounds** - An ancient surveying system that describes the perimeter of a parcel of land in terms of its bearings and distances and its relationship to natural features and adjacent parcels.
- **Monument** - A permanently placed survey marker such as a stone shaft sunk into the ground.
- **Open line** - A survey line, usually the final one, that is not measured and marked (blazed) by the surveyor but is instead calculated.
- **Point of Beginning** - The starting point of the survey
- **Point of intersection** - The point where two non-parallel lines intersect. More specifically, the point where two tangents to a curved line intersect.
- **Plat** - A drawing of a parcel of land. More specifically, the drawing created by the surveyor that shows the field work, with bearings, distances, etc.
- **Plot plan** - A diagram showing the proposed or existing use of a specific parcel of land.
- **Protraction** - in the rectangular survey system, the representation of a boundary or corner not run, marked, or fixed by the field survey as evidenced by the field notes. For example, a surveyed section might be protracted into lots by someone in the office.
- **Quarter corner** - in the public land surveying system, a point halfway between the corners of a *section*. A section can be divided into four equal quarters by connecting its quarter corner points. A section's quarter corners are identified by the section line they are located on (north, south, east, west).
- **Range** - In the U.S. public land surveying system, a north-south column of *townships*, identified as being east or west of a reference longitudinal *meridian*, for example, Range 3 West. See *township*.
- **Searles Spiral** - A surveying technique used by railroad surveyors in the the late 1800s and early 1900s whereby they approximate a spiral by use of multiple curved segments.
- **Section** - In the U.S. public land surveying system, an area one mile square. See *aliquot*.
- **Strip** - A rectangular piece of land adjoining a parcel, created when a resurvey turns up a tiny bit larger than the original survey. The difference is accounted for by temperature or other effects on measuring chains. See also *gore*.
- **Tangent line** - A line that touches a circle at exactly one point and which makes a right angle with the circle's radius. For example, a circle that fills a square has four tangent points and the square's sides are tangent lines. An arc (curve) in a survey is part of a larger circle. One can construct tangent lines at the end points of the arc.
- **Tie line** - A survey line that connects a point to other surveyed lines.
- **Tier** - In the U.S. public land surveying system, an east-west row of *townships* identified as being north or south of a latitudinal *baseline*.
- **Total station** - A survey instrument that combines a theodolite and distance meter.
- **Township** - In the U.S. public land surveying system, an area six miles square, containing 36 *sections*. The townships are organized in *tiers* and *ranges*, identified with respect to a *baseline* and *meridian*. For example, Township 13 North Range 6 West describes a township's location.
- **Traverse** - 1) any line surveyed across a parcel, 2) a series of such lines connecting a number of points, often used as a base for triangulation.
- **Trocha** - Spanish for 'path'. In the southeast U.S. it is used for a cut or cleared survey line.
- **Witness Tree** - Generally used in the U.S. public land states, this refers to the trees close to a section corner. The surveyor blazed them and noted their position relative to the corner in his notebook. Witness trees are used as evidence for the corner location.
- **Zenith angle** - An angle measured from a vertical reference. Zero degrees is a vertical line pointing up, 90

degrees is horizontal, and 180 degrees is straight down.

Surveyors' Slang

Surveying, like any profession, has its special terms and slang. Some are just humorous, some help distinguish similar sounds (e.g. eleven and seven), and some are just plain strange!

- **Balls** - Slang for numeric .00, as in 4-balls (4.00)
- **Beep** - Verb. To use a magnetic detector to look for iron pipe, etc.
- **Boot** - To raise the levels rod some number of inches so as to be visible to the instrument man, e.g. "Boot 6!" means "raise it 6 inches."
- **Blue topping** - In road or grading work the surveyor sets stakes and paints their tops blue to represent the required elevation. Graders then work to just cover the blue tops of the stakes.
- **Box** - Data collector.
- **Bug** - To use a magnetic locator to search for an iron pipe.
- **Bullseye** - Zero degrees of inclination.
- **Burn** - See *shoot*
- **Burn one** - Measure from the one foot mark on the tape rather than from the end of the tape in order to increase the accuracy of the measurement.
- **Bust** - Closure error, i.e. the amount by which the survey fails to perfectly close.
- **Cap** - A metal or plastic cover on the end of a rebar or pipe, typically stamped or printed with the surveyor's license number or other identifier.
- **Cut line** - To clear vegetation for a line of sight between two survey control points.
- **Double nickel** - Slang for .55, as in 6-double nickel (6.55)
- **Dummy or dummy-end** - The base or zero end of a tape or chain, as in "hold dummy at the face of the curb."
- **Dump** - Download data from the data collector.
- **EDM** - Electromagnetic Distance Measurement device, the instrument used by modern surveyors that replaces the use of measurement chains. It determines distance by measuring the time it takes for laser light to reflect off a prism on top of a rod at the target location.
- **Ginney** - A wooden dowel 6-9 inches in length with a sharpened end. Set in the ground to mark survey points.
- **Glass** - The *EDM* prism.
- **Gun** - Originally, a transit, but potentially any measurement instrument in use, e.g. theodolite, *EDM*, or Total Station.
- **Hours** - Degrees
- **Hub and Tack** - A 2" by 2" stake that is set in the ground and that contains a nail ("tack") that precisely marks the point being set.
- **Jigger** - Transit (Australia and New Zealand)
- **Legs** - Tripod
- **Pogo** - Prism pole
- **Pole** - Approximate unit of measure (about 0.1 foot) used for stake out, e.g. "Move a pole to the left and drive that hub in"
- **Punk** - See *railroad*.
- **Railroad** - Slang for eleven, as in 42-railroad (42.11)
- **Rodman** - The person holding the rod with the *EDM* prism. This person is the modern version of a chain carrier or chain man.
- **Shoot** - Measure distance with an *EDM*
- **Spike** - Usually a 60 penny nail used to mark survey points in hard ground.
- **Stob** - In the southeast U.S., a wooden stake or post, but in modern surveying, a piece of rebar used to mark a property boundary.
- **Tie** - To locate something with the transit or other measuring device.
- **Top** - Slang for eleven. See *railroad*.
- **Trip** - Slang for triple digits, as in trip5 means 555, and 43trip7 means 43.777

- **Turn** - The rodman is told to stay in place while the gun or level is moved to a new location.
 - **Zero** - Zero degrees, minutes, and seconds. A perfect zero.
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Surveyors' Abbreviations

You might find the following corner descriptions on a plat drawing.

- **B.R.L.** - Building restriction line.
 - **CIP** - Capped iron pin
 - **EIP** - Existing iron pipe
 - **FD** - Found
 - **IPF** - Iron pipe found
 - **IRF** - Iron rod found
 - **L.O.D.** - Limit of Disturbance. The area to be cleared, graded, etc.
 - **LS** - Licensed Surveyor #
 - **MAG** - New concrete nails are magnetic nails and are stamped with MAG on the head and are easier to find with metal detectors.
 - **N/F** - Now or formerly
 - **NPP** - Nail in power pole
 - **NTCFP** - Nail on top of corner fence post
 - **NTFP** - Nail on top of fence post
 - **PI** - *Point of intersection*
 - **PK** - Point Known, *PK nail*
 - **PK nail** - A concrete nail made by Parker Kaelon, stamped PK, that marks a survey point. See also *hub and tack*.
 - **R/C** - Rod and cap, or rebar and cap
 - **R/W** - Right of way
 - **SR** - Steel rebar
 - **SRS** - Steel rod set (rebar or other steel)
 - **WC** - Witness corner
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Water Terms

- **Arroyo** - A small steep-walled (usually) dry watercourse with a flat floor. A gulch or gully. Chiefly in the U.S. southwest.
- **Bank** - Edge of a stream.
- **Bed and banks** - For property lines that cross a body of water, this term is used to explicitly refer to the bottom of the water.
- **Bottom** - Land along a river.
- **Branch** - Small stream.
- **Brook** - Small stream.
- **Creek** - Small stream.
- **Drain** - Small dry stream or gully.
- **Draughts of** - (pronounced drafts). See *waters of*.
- **Drean** - See *drain*.
- **Ford** - Shallow part of a stream or river where one could cross.
- **Fork** - Meeting point of two streams. "In the fork of" means between two branches.
- **Gut** - A narrow passage between hills. A stream in such a passage. A *drain*.
- **Head** - The *source* of a stream.
- **Headwaters** - The smallest streams that combine to make a larger stream.
- **Kill** - (Dutch) Creek.
- **Lower** - Toward the mouth of a stream. Further down along its course. Opposite of *upper*.

- **Meander** - "with the meanders of the stream" means the survey line follows the twists and turns of the stream.
 - **Mouth** - The place where a stream enters another, larger stream.
 - **Narrows** - Narrow part of a stream.
 - **River** - Large stream.
 - **Run** - Small stream.
 - **Shoal** - Shallows.
 - **Spring** - A pool or other source of water that feeds a stream.
 - **Swamp** - In the southeastern U.S., a stream, particularly one that has swampy parts. A marsh.
 - **Thalweg** - 1. An imaginary line connecting the lowest points of a valley. 2. The line connecting the lowest points of a stream's channel. 3. The surface midline of a channel.
 - **Thread** of a creek. A figurative expression used to signify the center line of the main channel of a stream when the flow rate is low.
 - **Upper** - Toward the head of a stream. Further up along its course. Opposite of *lower*.
 - **Vly** - (Dutch) Swampy lowland.
 - **Waters ("watters") of** - In the drainage of. On the branches of.
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Trees

- **Alder** -
- **Ash** - has tough, straight-grained wood
- **Aspen** - a type of *poplar*
- **Basswood** - see *linden*
- **Beech** - smooth gray bark and small edible nuts
- **Birch**, (burch) -
- **Black gum** - see *tupelo*
- **Blackjack** - a type of small *oak*
- **Black oak** -
- **Black walnut** -
- **Box elder** -
- **Box oak** -
- **Buckeye** -
- **Buffaloberry** -
- **Cedar** -
- **Cherry** -
- **Chestnut** - American chestnut has been virtually destroyed by blight.
- **Chestnut oak** - has leaves resembling a chestnut
- **Chittamwood** - see *Woolly Bumelia*
- **Cottonwood** -
- **Dogwood** -
- **Elder** -
- **Elm** -
- **Fir** -
- **Gum** - subtypes: black, sweet
- **Hackberry** - has cherry-like fruit
- **Hawthorn** -
- **Hazel** -
- **Hemlock** -
- **Hickory**, hiccory, hickry - has edible nuts and hard wood
- **Hornbeam** - has hard, heavy wood
- **Ironwood** - see *hornbeam*
- **Juniper** -
- **Larch** -

- **Laurel** -
- **Lightwood** - highly resinous pine, suitable for stakes
- **Live oak** -
- **Lowerwood** - transcription error for *sourwood*
- **Maple**, (maypole)
- **Mountain birch** -
- **Oak**, (oake) - subtypes: black, box, chestnut, live, pin, post, red, scrub, shrub, Spanish, swamp white, white
- **Pawpaw** -
- **Persimmon** - has plum-like fruit
- **Pine** -
- **Pin oak** -
- **Pohiccory** - see *hickory*
- **Ponderosa pine** -
- **Poplar**, popular -
- **Post oak** - wood used for posts
- **Red cedar** -
- **Red oak** -
- **Sapling**, (saplin) - young tree
- **Sassafras** - bark used in medicines and beverages
- **Scrub oak** - usually found in dry, rocky soil
- **Serviceberry** - (sarvisberry)
- **Sour gum** - see *tupelo*
- **Sourwood** - sorrel tree
- **Spanish oak** -
- **Spruce** -
- **Sugar tree** - sugar maple
- **Sumac** - (shumac)
- **Swamp white oak** - heavy, hard wood used in shipbuilding, furniture, etc.
- **Sweet gum** - hard reddish brown wood used for furniture
- **Sycamore** -
- **Tamarack** - an American larch having reddish brown bark
- **Tamarisk** - small shrub found in the southwest
- **Tupelo** -
- **Walnut** - black
- **White oak** -
- **Wooly Bumelia** - leaves resemble a live oak with a fine fur-like fuzz on the underside.
- **Yew** -

Sources

You can find definitions for most of these units, terms, and words in any good unabridged dictionary. There are also books dealing with units of measure and surveying.

- Wm. Johnston, "For Good Measure".
- Untitled. Book listing State and Federal Laws relating to measures.
- Funk & Wagnall's Unabridged Dictionary, 1963
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- Oxford English Dictionary
- Robert's Dictionnaire de la Langue Francaise, 1979
- Discussions with Mr. Galtjo Geertsema, Land Surveyor; Ms. Patricia Law Hatcher, lecturer on land records.
- "Land and Property Research in the U.S", Wade Hone, 1997
- Contributions from surveyors.

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