

Glossary of Terms Used in Boundary Surveying

Accretion The gradual accumulation of land by natural causes along a water boundary

Accuracy The amount of deviation from the true value of a measurement

Acquiescence When a land owner impliedly accepts a boundary location established by an abutter

Actual Possession Possession which consists of actual physical occupation of property

Adjoiner Abutting property

Aliquot Part In the PLSS, a standard division such as a half section, quarter section, half-quarter section, etc

Angle A figure formed by the intersection of two lines, and the measurement of the degree of separation between the two lines

Apportionment The distribution of excess or deficiency in a number of parcels which were all created simultaneously

Area The quantity of land contained within the boundaries of a parcel

Artificial Monuments A manmade marker such as a concrete bound, or drill hole

Avulsion The sudden removal or addition of land by the action of water

Azimuth The direction of a line relative to north (sometimes relative to south)

Backsight A target set up over a point where the instrument will set zero

Base Line In the PLSS, a line of latitude running through an initial point. Also, a random line used in a road layout

Bearing The direction of a line between 0° and 90° , measured clockwise or counterclockwise from north or south

- Blaze** A mark or marks on a tree trunk for marking a survey point or boundary point or line
- Boundary** See property line
- Break Tape** To make a horizontal measurement, usually while measuring up or down a slope, by using less than the full length of a tape
- Called-For** A monument or other evidence called out in a conveyance
- Chain** A distance of 66 ft.
- Chain of Title** A sequence of unbroken conveyances from the original title holder to the present title holder
- Chord or C** The straight line distance between the PC and PT of a curve
- Circle of Uncertainty** A circle which has a radius equal to the maximum probable error
- Closing Corner** In the PLSS, it is the intersection of a meridional line with a parallel between fixed corners
- Constructive Notice** Notice that is implied whether or not it actually exists
- Continuous** When used in relation to adverse possession, the possession must be unbroken
- Convergence** Where meridians become closer together as they progress northerly and southerly from the equator
- Coordinate System** A grid where the axes are 90° apart. Also called a Cartesian Coordinate System
- Corner** The location of intersecting boundary lines
- Curve Radius** The distance between the curve and the center of the circle
- Declination** The angular difference between true north and magnetic north
- Deed** A writing signed by the grantor conveying title from grantor to grantee
- Delta** The angle or deflection of a curve
- Differential Positioning** When used with GPS, a method whereby positional correctional data is transmitted from a GPS receiver at a fixed and known station to a rover such that the rover can calculate a more accurate position than it would be able to without the correction information
- Dominant Estate or Dominant Tenement** The land which an easement appurtenant attaches to
- Double Center** To set a point on a projection of a line by sighting the point with the telescope erect and inverted and splitting the difference between the two points

Double Proportionate Measurement In the PLSS, restoration of a lost corner by proportionate measurements in both east–west and north–south directions from existing monuments

Drill Hole A hole made in stone or concrete for the purpose of locating a point or property corner

Easement The right to use the land of another person

Easement Appurtenant An easement which attaches to the land not to an individual person

Easement by Implication When a conveyance does not explicitly call for the easement but the easement must have been intended

Easement Implied from Necessity When a grantor creates and conveys a land-locked parcel of land, an easement is implied over the grantor’s remaining land to a road

Easement Implied from Prior Use When a grantor creates and conveys a land-locked parcel of land and there was visible access such as a way leading over the grantor’s remaining land to a road, an easement is implied

Easement Implied from a Plat Common in subdivisions containing private roads, it addresses the rights which owners in a subdivision have over roads not necessarily required to access a public road

Easement in Gross An easement which is owned by a person and does not attach to the land

EDM Electronic Distance Measuring Device

Electronic Distance Measuring Device A device, usually attached to a total station, which uses light beams to precisely measure distance

Electronic Data Collector A small digital computer with a screen which connects to a total station or GPS receiver for the purpose of collecting data from the device. If the total station is servo driven the data collector can drive the instrument

Error of Closure The length or length and direction of the gap in a geometric figure where the end point is intended to be the same as the beginning point

Estoppel When a property owner induces an abutter to act in a way that is likely to damage the abutter’s interests. Detrimental reliance

Exclusive When used in relation to adverse possession, the possessor must not share the possession with the owner

Express Easement A written easement

Fee An ownership interest in real property

Fee Simple Absolute Absolute and exclusive ownership of land

- Field Book** A small bound or loose leaf book used to record survey field data
- First Guide Meridian East and West** Meridians established 24 miles east and west of the principal meridian
- Foresight** A target or prism to which an instrument will measure an angle and/or angle and distance
- Give Line** The process by which a person holds a prism pole or plumb bob string over a point so it can be sighted by the instrument
- Global Navigation Satellite Systems (GNSS)** A constellation of satellites and ground stations owned by the United States and Russia used for the positioning of receivers on the earth's surface
- Global Positioning Systems (GPS)** A constellation of satellites and ground stations owned by the United States used for the positioning of receivers on the earth's surface
- Grantor** One who conveys land or some interest in land
- Grantee** One who acquires land or some interest in land
- Grid North** The direction of the north-south grid lines on a state plane coordinate system
- Gun** A common name for a transit, theodolite or total station
- Horizontal Measurement or Horizontal Distance** A measurement made in a plane which is parallel to the horizon
- Hostile** When used in context with adverse possession and prescription, the possession must be adverse to the interests of the owner
- Incorporate** To make a part of
- Initial Point** In the PLSS, a fixed point from which townships are established
- Instrument** A surveying instrument such as a transit, theodolite or total station
- Instrument Person** The person charged with the responsibility for the care and use of an instrument such as a level, transit, theodolite or total station
- Intention of the Parties to the Conveyance** What the grantor and grantee agreed to at the time of the conveyance
- Intervisible** The ability to visually see between points
- Junior and Senior Rights** Rights in property acquired through a sequence of conveyances by a common grantor
- L or LC** The length of a curve
- Latitude and Departure** Latitude is the distance measured northerly on a coordinate grid. Departure is the distance measured easterly on a coordinate grid

- Legal Description** The portion of a deed which describes the property or interest in property being conveyed
- Line** The direction in which the instrument vertical cross hair is pointing
- Link** 1/100 of a Chain (0.66 ft.)
- Littoral Rights** Property rights related to water boundaries along an ocean or lake
- Locate** Using an instrument to turn an angle and measure a distance to a target or other object
- Locus** The property at issue. The property being surveyed
- Lost Corner** In the PLSS, where the location of the corner cannot be determined from marks or evidence, so that it must be replaced by measurements from other corners
- Low Distortion Projection** A two dimensional rectangular coordinate system located at an elevation designed to minimize distortion between measurements made on the ground and those on the coordinate system
- Magnetic Dip** The angular downward tilt of a compass needle as measured from horizontal
- Magnetic North** The direction in which the magnetic needle of a compass points
- Mean High Water** The average of all high water heights observed over a 19 year period
- Meander Corner** In the PLSS, an intersection of a meander line with a section or township line
- Meander Line** In the PLSS, a series of traverse lines at mean high water
- Measure Angle** To use an instrument to measure an angle
- Meridians** North–south lines converging at the north and south poles
- Metes and Bounds** A method of describing the limits or boundaries of a parcel of land by distance and direction and by reference to physical monuments
- Monument** A physical object used to fix the location of a property corner or line
- Natural Monument** A naturally occurring boundary marker such as a boulder, stream or tree
- Obliterated Monument** In the PLSS, where there is no remaining evidence of a monument but there is evidence of its location
- Occupied Point** A point on which the instrument or GPS receiver is set
- On Line** A condition whereby a target, prism pole, plumb bob, etc. is in line with the vertical cross hair of an instrument

Open and Notorious When related to adverse possession and prescription, the possession must be so openly visible that it would be obvious to the owner

Optical Plummet An optical device including a right angle prism which allows a tribrach to be precisely centered over a point

Original Survey A survey in which new boundaries are created

Overburdening an Easement Use of an easement which was not contemplated when the easement was created

Overloading an Easement Use of an easement to service land which was not contemplated when the easement was created

Parole Evidence Spoken Testimony

Party Chief or Crew Chief The person in charge of a survey crew

Personal Property Anything subject to ownership that is not real property

PC Point of Curvature. The point where a curve begins

Pile of Stones A heap of stones used to mark a property corner or sometimes placed at intervals along property lines

Pin A small metal cylinder usually of copper, brass or aluminum which is expanded into a hole in stone or concrete for marking a property corner

Plan, Survey Plan, Plat or Map A drawing showing the results of a survey

Point on Line A point set on an existing line

Positional Dilution of Precision (PDOP) In GPS or GNSS, a number indicating the effect of satellite geometry on the accuracy of measurements

Physical Evidence Also called Real Evidence. Physical objects such as monuments, roads, lakes and rivers

Planimeter A mechanical instrument used to trace the boundary of a plane figure for the purpose of calculating its area

PLSS The Public Land Survey System. A rectangular system of dividing land used in the western United States

Point of Beginning Used in deed descriptions to describe the point at which a meets and bounds description begins

Post-Processing When used in conjunction with static GPS, it is a software method used to adjust and calculate the coordinates of points which were previously occupied by GPS receivers

Practical Location Where the location of a boundary is not determined from a writing but by agreement, acquiescence, or occupation

Precision The deviation in a series of repeated measurements to the same point or between the same points

Prescription Acquiring an easement through use, not by virtue of a writing

Principal Meridian In the PLSS, a line of longitude running through an initial point

Prism A glass reflector also called a corner cube prism, which is used to reflect light from an EDM back to the EDM so that the distance between the EDM and the Prism can be measured

Prism Offset An adjustment to the distance measured between an EDM and a prism used to account for the speed and path of light and the mounting of the prism

Prism Pole A portable extendable pole used for mounting a prism commonly used for measuring to physical evidence

Private Street A street which may be used only by those having deeded rights

Privity A mutual or successive relation between parties to the same real property

Property Line The limit of ownership of land held by title deed or by marks of enclosure if possession is without title deed. It is also called a boundary

PT Point of Tangency. The point where a curve ends

Public Street A street over which the general public has a right of access

Quadrant One quarter of a circle: 90°. Used in surveying to refer to the four quadrants: Northeast, Southeast, Southwest and Northwest

Rangefinding Optically measuring distance using stadia hairs in a surveying instrument telescope

Real Property Land and things affixed to the land

Rebar Steel concrete reinforcing bar sometimes placed into the ground as a means of locating a property corner

Record Boundaries Boundaries described in a deed or plan

Record Evidence Written evidence recorded with a public agency such as deeds and plans

Record Monuments A boundary marker called for in a deed such as the name of an abutter

Reference Station When used with RTK GPS, a GPS receiver located at a fixed and known point which is capable of transmitting correction data to a GPS rover

Reflectorless Total Station A total station which is able to measure distances to an object without the need for using a prism

Reliction The increase in land by permanent withdrawal of water along a water boundary

Reserved Easement An easement created by a grantor that reserves a right to use property of the grantee

Responsible Charge Direct control and supervision of a person working under a licensed land surveyor

Reticle Horizontal and vertical cross hairs in a surveying instrument telescope used to accurately sight a target

Retracement Survey A resurvey of an original survey

Riparian Rights Property Rights along a river or stream

Road A way used for travel. Same as Street

Robotic Total Station A total station containing servo motors which are capable of positioning the horizontal and vertical axes in order to measure to evidence and transmit data to a remote data collector

Rod A distance of 16.5 ft.

Rod Person Usually, the least experienced crew member. Often, the person who uses a prism pole to locate evidence

Rover A GPS receiver located on a prism pole or tripod which is moved around from point to point for the purpose of locating evidence or setting points. It normally receives correction data from a reference station

Scope of an Easement The type of use allowed by an easement

Section In the PLSS, a portion of a township approximately one mile square containing 640 acres

Servient Estate or Servient Tenement The land burdened by an easement appurtenant

Set an Angle To set a specific angle on an instrument

Set Up The process of positioning and leveling a tripod or prism pole and bipod over a point

Sexagesimal System A system based on 60, where each degree contains 60 minutes and each minute contains 60 seconds

Shot A term describing the procedure of an instrument measuring an angle and a distance to a target or other object

Sideshots Leaving zero set on a backsight and taking shots on multiple targets

Single Proportionate Measurement In the PLSS, restoring a lost corner by using proportionate measurements along a line from other recovered monuments

Stadia Hairs Short horizontal cross hairs in a surveying instrument telescope precisely positioned above and below the horizontal cross hair used for rangefinding

Standard Parallels In the PLSS, parallels established 24 miles north and south of base lines

State Plane Coordinate System One or more two dimensional rectangular grids established by a state for locating points

Statute of Frauds A law requiring that the conveyance of interests in land by evidenced by a writing signed by the grantor

Street A way used for travel. Same as Road

Street Line The sideline of a street or way

Survey Foot 1,200/3,937 miles

Tacking When used in relation to adverse possession and prescription, the occupation by predecessors in title can be used, along with the possession of the present occupier to satisfy the time period established by the statute of limitations

Taking a Shot When a total station is used to measure the angle and distance to a point

Tangent A line that touches a curve such that it is perpendicular to a radius line of the curve. Also, an extension of a street line from the PC or PT of a curve

Tangent Screws Fine positioning screws on a surveying instrument horizontal and/or vertical axis

Target A device usually containing a prism and/or highly visible markings which is set over a point and which enables an instrument to sight and measure to the point

Temperature Adjustment A correction applied to a distance made using a steel tape and based on the difference between ambient temperature and 68 °F

Thalweg The deepest part of a stream

Theodolite A mechanical and optical device having graduated glass circles which can measure horizontal and vertical angles. A theodolite may have optical encoders used to read the circles

Thread The middle of a stream

Tie Line A dimensioned survey line, usually not a property line, used to connect boundaries. Tie lines are often used along an irregular and roughly dimensioned water boundary as a means of connecting the accurately described points of a boundary

Torrens System A system of title registration, usually managed by the state

Total Station An electronic digital surveying instrument used to measure horizontal and vertical angles and distances, with provision for electronic storage of data and/or transmission of data to external devices

- Township** In the PLSS, a quadrangle having sides approximately 6 miles in length which correspond to the parallels and meridians
- Tracking Total Station** A total station which is capable of locking onto a prism or other device and tracking it as it moves
- Transit** A mechanical and optical device used to measure horizontal and vertical angles
- Traverse** A series of randomly located survey lines run in order to locate evidence and set property corners
- Trespass** The intentional intrusion or invasion of the land of another person
- Tribrach** A fixture attached to the top of a tripod which can be leveled and positioned and used to attach surveying instruments and other measuring devices to the tripod
- Tripod** A fixture having three, usually adjustable, legs used to support surveying instruments and other measuring devices
- True North** A direction parallel to the earth's axis which points toward the north pole
- Turn Angle** To use an instrument to measure or set an angle
- Unwritten Title** Ownership of property that is not evidenced by written title
- Variable Width Street** A street which does not have a fixed width
- Variation** A measure of how magnetic north varies with time
- Vernier** A specially divided scale used to increase the precision of reading the horizontal or vertical circle of a surveying instrument
- Wiggle In** To make a series of adjustments to the occupied point so that it eventually becomes located at the desired location
- Witness Corner** In the PLSS, a point on a survey line near a corner used when it is not practical to monument the corner itself
- Written Evidence** Documents such as deeds and plans
- Zero Instrument** The process of setting an instrument's zero on a target

Further Readings

- [ACS89] American Congress on Surveying and Mapping and the American Society of Civil Engineers. (1989). *Definitions of surveying and associated terms*.
- [Bre42] Breed, C. B. (1942). *Surveying*. New York: Wiley.
- [BrH51] Breed, C. B., & Hosmer, B. L. (1951). *The principles and practice of surveying*. New York: Wiley.
- [BrH26] Breed, C. B., & Hosmer, G. L. (1926). *Principles and practice of surveying: Volume II, higher surveying*. New York: Wiley.
- [BrW84] Brinker, R. C., & Wolf, P. R. (1984). *Elementary surveying*. New York: Harper & Row Publishers.
- [Bro69] Brown, C. M. (1969). *Boundary control and legal principles*. New York: Wiley.
- [BRW81] Brown, C. M., Robillard, W. G., & Wilson, D. A. (1981). *Evidence and procedures for boundary location*. New York: Wiley.
- [BLM09] Bureau of Land Management, United States Department of the Interior. (2009). *Manual of surveying instructions*. Washington, DC: Government Printing Office.
- [CSW93] Cunningham, R. A., Stoebeck, W. B., & Whitman, D. A. (1993). *The law of property* (2nd ed.). St. Paul, MN: West Publishing Co.
- [DaF40] Davis, R., & Foote, F. S. (1940). *Surveying theory and practice*. New York: McGraw-Hill Book Co.
- [FGC98] Federal Geodetic Control Subcommittee, Federal Geographic Data Committee. (1998). *Geospatial positioning accuracy standards*.
- [Har90] Harbin, L. H. (1990). *Land surveyor reference manual*. San Carlos, CA: Professional Publications Inc.
- [KaB84] Kavanaugh, B. H., & Bird, G. (1984). *Surveying: Principles and applications*. Reston, Virginia: Reston Publishing Company Inc.
- [Lon02] Dr. Londe, M. D. (2002). *Bureau of land management, standards and guidelines for cadastral surveys using global positioning methods*.
- [Mad84] Madson II, T. S. (1984). *The mathematics of land surveying; land surveyor's seminar*. Gainesville, Florida: Land Surveyor's Seminar.
- [McC76] McCormac, J. C. (1976). *Surveying*. New York: Prentice-Hall.
- [MiS77] Mitchell, H. C., & Simmons, L. G. (1977). *The State coordinate systems (a manual for surveyors)*. U.S. Department of Commerce, Coast and Geodetic Survey, Special Publication No 235.
- [Mof75] Moffitt, F. H. (1975). *Surveying* (6th ed.). New York: Intext Educational Publishers.
- [Rab74] Rabin, E. H. (1974). *Fundamentals of modern real property law*. Mineola, NY: The Foundation Press Inc.

- [Ray39] Rayner, W. H. (1939). *Elementary surveying*. New York: Van Nostrand Co.
- [Sie79] Siedel, G. J. (1979). *Real estate law*. Eagan, MN: West Publishing Company.
- [VeR97] Vernon, R. C., & Robert, C. B. (1997). *Professional surveyor's manual*. New York: McGraw Hill.
- [WSD04] Washington State Department of Natural Resources. (2004). *Standards and guidelines for land surveying using global positioning system methods*.

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