Surveying 101 - Glossary

A

accuracy – the degree of conformity with a standard; relating to the quality of a result (in contrast to the quality of the method for obtaining the result or precision); see also precision

aerial survey – performed using aerial photography (also known as a photogrammetric survey)

B

boundary survey – determines lengths and directions of boundary lines and the area of a specified or limited area of land bounded by these lines; establishes the positions of boundary lines on the ground (also known as a property or land survey)

C

construction survey – executed to locate or lay out engineering works, usually based on a set of design documents

control survey – establishes horizontal or vertical positions of arbitrary points that can be returned to as reference points

E

easement – where parties other than the property owner have limited rights granted for a specific purpose (e.g., utility easements or access easements)

elevation – the vertical distance of a point above or below a given reference level surface

Electronic Distance Measuring Instruments (EDMs) – electronic surveying systems based on invariant velocity of light or electromagnetic waves in a vacuum that are classified by their range capabilities, with the long-range EDMs measuring distances up to 40 miles with extremely high relative accuracy

elevation difference – the vertical distance between two level surfaces containing two points from which to measure

encroachment – all or part of one property owner's structure occupying another's property or a municipality's right of way

encumbrance – real property interest or partial right (e.g., liens, restrictions, easements, reservations) that reduces ownership value, but does not hinder ownership transfer

exception – (in title insurance) land portions containing encumbrances, where free and clear title is conditional; (in legal descriptions) land portions included in a larger parcel's description but then subsequently excluded

G

geodetic surveying – Projecting all distances and horizontal angles onto the surface of the spheroid that represents mean sea level on the earth

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Global Positioning System (GPS) – electronic surveying system based on signals emitted from multiple satellites to a receiver location at the point to be measured

H

horizontal line – a line that is perpendicular to the vertical line at a given point; unlimited horizontal lines exist at any point

horizontal angle – the angle measured in a horizontal plane between two vertical planes; effective only at the point at which the measurement is made or at any point vertically above or below it

horizontal distance – the distance between two points projected onto a horizontal plane, which can only be defined at one point

horizontal plane – a plane that is perpendicular to the vertical line at a point; there can be only one horizontal plane through a given point

hydrographic survey – determines the configuration of the bottom of a body of water

I

improvement – typically some type of manmade structure; unrelated to whether or not the structure "improves" the real or aesthetic value of the property

L

legal description – a unique description for a specific land parcel that is sufficient to locate the property without oral testimony

level surface – a continuous surface perpendicular to the direction of gravity at all point, such as a large body of still water

M

measurement – an estimated value subject to error (in contrast to a true theoretical value, which can only be attained through repetition and statistical analysis)

monument – a physical marker indicating location of a position; see also offset monument

O

oblate spheroid – a solid obtained by rotating an ellipse on its shorter axis (a squashed ball); earth's rotational axis serves as the shorter or minor axis with earth being an oblate spheroid rather than a true spheroid (a ball)

offset – a point located at the extension of a line and marking the direction of the line; a short distance that preserves the position of a line when points marking the line itself might be disturbed

offset monument – a physical marker placed on the extension of a line to provide a more durable monument than might be possible for marking a specific position

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P

Photogrammetric survey – see aerial survey

plane surveying – projecting all distances and horizontal angles onto one assumed horizontal plane; using a single reference plane where the survey is of limited extent

precision – The quality of the methods, instruments, and operational performance used when taking measurements; indicates result uniformity or ability to reproduce the same results thereafter

R

range – a north-south strip of townships, each six miles square, numbered east and west from a specified meridian in a U.S. public land survey

right of way – a parcel of land with a designated use (e.g., highway, street, canal, ditch, etc.) that is granted by deed or easement for construction and maintenance

S

section – a land unit equal to one square mile (2.59 square kilometers), 640 acres, or 1/36 of a township

station – a precise point from which measurements in surveying are made

T

tolerance – a mathematical term that indicates allowable variation from a standard or specified conditions; an indication of a measurement's accuracy and precision (see also accuracy, precision)

topographic survey – determines the configuration of the ground

township – a public land surveying unit of 36 sections or 36 square miles

tract – a specified or limited area of land

V

vertical angle – an angle measured in a vertical plane; known as a plus or positive vertical angle and/or an elevation angle if measured upward from a horizontal line or plane; known as a minus or negative vertical angle and/or a depression angle if measured downward from a horizontal line or plane

vertical line – the line that follows the direction of gravity at any point on the earth's surface; the direction which a string will assume if a weight is attached to the string, and the string is suspended freely at the point
vertical plane – any plane that contains the vertical line at a given point; unlimited vertical planes exist at a given point

X

XYZ coordinates – three numbers, grouped together, which designate a point's position in relation to a common frame of reference; typically X and Y coordinates fix the point's horizontal position, Z indicates elevation