

CHAPTER 9
SURVEYING TERMS AND ABBREVIATIONS

Surveying Terms 9-2

Standard Abbreviations 9-6

A) ***SURVEYING TERMS***

Accuracy - The degree of conformity with a standard, or the degree of perfection attained in a measurement. Accuracy relates to the quality of a result, and is distinguished from precision, which relates to the quality of the operation by which the result is obtained.

Adjusted Position - An adjusted value for the horizontal or vertical position of a survey station, in which discrepancies due to errors in the observed data are removed. This adjustment forms a coordinated and correlated system of stations.

Bench Mark - A relatively permanent object, natural or artificial, bearing a marked point whose elevation above or below an adopted datum is known. Usually designated as a BM, such a mark is sometimes further qualified as a PBM (permanent bench mark), or as a TBM (temporary bench mark).

Contour Line - An imaginary line on the ground, all points of which are at the same elevation above or below a specified datum.

Contour Interval - A predetermined difference in elevation (vertical distance) at which contour lines are drawn. The contour interval is usually the same for maps of the same scale.

Contour Map - A map that portrays relief by means of contour lines.

Control - A system of points whose relative positions have been determined from survey data. See: basic control, horizontal control, vertical control, and picture point.

Control Point - A point whose position (horizontal or vertical) has been determined from survey data, and is used as a base for a dependent survey.

Control Station - A station whose position (horizontal or vertical) has been determined from survey data, and is used as a base for a dependent survey.

Control Survey - A survey which provides positions (horizontal or vertical) of points to which supplementary surveys are adjusted.

Coordinates - Linear or angular quantities, or both, which designate the position of a point in relation to a given reference frame.

Correlate - To remove discrepancies that may exist among survey data, so that all parts are interrelated without apparent error. The terms coordinate and correlate are usually applied to the harmonizing of surveys of adjacent areas or of different surveys to cover the same area. Two or more such surveys are coordinated when they are computed on the same datum; they are correlated when they are mutually adjusted.

Data Collector - Electronic Field Notebook

A) ***SURVEYING TERMS (CONTINUED)***

Datum - A reference element such as a line or plane, in reference to which the positions of other elements are determined. See: Horizontal Datum, Level Datum, and Vertical Datum.

Discrepancy - (1) The difference between duplicate or comparable measures of a quantity. (2) The difference between computed values of a quantity obtained by different processes in the same survey.

DTM, Digital Terrain Model - A representation in graphic form, on the computer, of the terrain through the area being surveyed.

Easting - One of the two values indicating the position of a point on a grid system. The easting coordinate is abbreviated: E. See: Grid Coordinates.

Feature Codes – The abbreviation used to define an object collected during a radial survey.

Fixed Elevation - An elevation obtained, either as a result of tide observations or previous adjustment of leveling, which is held at its accepted value in any subsequent adjustment.

Fixed Position - An adjusted value of the position of a point on the earth. The positions obtained by the adjustment are called adjusted positions, and when used as control for other survey work they are called fixed positions.

Grid - A network composed of two sets of equidistant parallel lines intersecting at right angles.

Grid Azimuth - An azimuth measured from grid north.

Grid Coordinates - The numbers of a coordinate system that designate a point on a grid.

Grid Declination - The angular difference in direction between grid north and true north at any given place.

Grid Distance - The straight line distance between two points, obtained by computations from their grid coordinates.

Grid Position - The grid coordinates of a point.

Ground Control - In photomapping, control obtained from surveys as distinguished from control obtained by photogrammetric methods.

Guard Stake- A stake driven near a point usually sloped with the top of the guard stake over the point. The guard stake protects, and its markings identify the point.

Horizontal Control - Control stations whose grid coordinates are known.

A) ***SURVEYING TERMS (CONTINUED)***

Horizontal Datum - In plane surveying, the grid system of reference used for the horizontal control of an area; defined by the easting and northing of one station in the area, and the azimuth from this selected station to an adjacent station.

Horizontal Position - The grid position of a horizontal control point.

Hub - A wooden stake set in the ground, with a tack or other marker to indicate the exact position. A guard stake protects and identifies the hub.

Latitude - (1) The angular distance north or south of the equator. (2) In plane surveying, the amount that one end of a line is north or south of the other end. As the plane coordinates of a point are known as the easting and northing of the point, the latitude is the difference between the northings of the two ends of the line, which may be either plus or minus. See: Departure.

Level Datum - A level surface to which elevations are referred. The generally adopted level datum for leveling in the United States is mean sea level. For local surveys, an arbitrary level datum is often adopted and defined in terms of an assumed elevation for some physical mark (benchmark).

Level Net - Lines of spirit leveling connected together to form a system of loops or circuits extending over an area. Also called a vertical control net.

Mean Sea-Level - The average height of the sea for all stages of the tide. Mean sea level at numerous tide-gauging stations usually forms the basis of a level datum for large areas.

Meridian - A north-south line from which longitudes (or departures) and azimuths are reckoned.

Monument - Any object or collection of objects (physical, natural, artificial) that indicates the position on the ground of a survey station.

Northing - One of the two values indicating the position of a point on a grid system. The northing coordinate is abbreviated: N. See: Grid Coordinates.

Occupied Station - A traverse or triangulation station over which a theodolite or an engineer transit is set up for the measurement of angles at this station. Also, a station at which angles have been so measured.

Offset Line - A supplementary line close to, and usually parallel to a main survey line to which it is referenced by measured offsets. When the line for which data is desired is in such position that it is difficult to measure over it, the required data is obtained by running an offset line in a convenient location and measuring offset from it to salient points on the other line.

Order of Accuracy - A mathematical ratio defining the general accuracy of the measurements made in a survey. The orders of accuracy for surveys are divided into four classes named: first-order, second-order, third-order, and fourth-order.

Parallax - A change in the position of the image of an object with respect to the telescope cross hairs when the observer's eye is moved. This can be practically eliminated by careful focusing.

A) ***SURVEYING TERMS (CONTINUED)***

Permanent Bench Mark - A benchmark of as nearly permanent character as it is practicable to establish. Usually designated benchmark.

Picture Point - In surveying, a terrain feature that is easily defined on an aerial photograph, and whose horizontal or vertical position has been determined by survey measurements. Picture points are marked on the aerial photographs by the surveyor and are used by the photomapper.

Plane Coordinates - See: Grid Coordinates.

Plane Survey - A survey in which the effect of the curvature of the earth is almost entirely neglected, and computations of the relative positions of the stations are made using the principles of plane geometry and plane trigonometry.

Position - The place occupied by a point on the surface of the earth. Data that defines the location of a point with respect to a reference system.

Precision - The degree of refinement in the performance of an operation, or the degree of perfection in the instruments and methods used when making measurements. Precision relates to the quality of the operation by which a result is obtained, and is distinguished from accuracy, which related to the quality of the result.

Prime Meridian - An initial or zero median from which longitudes are reckoned. At an international conference in 1884, the Greenwich Meridian was adopted by most countries as the prime meridian for the earth.

Prime Vertical - A vertical circle perpendicular to the plane of the celestial meridian. The plane of the prime vertical cuts the horizon in the east and west points.

State Plane Coordinate System - A coordinate system that accounts for grid lengths, sea level factors, and grid azimuths.

Systematic Errors - An error that, as long as conditions are unchanged, will always have the same magnitude and the same algebraic sign.

Target - Any object to which the instrument is pointed. A target may be a plumb bob or cord, a nail in the top of a stake, a taping arrow, a range pole, a pencil, or any other object that will provide a sharply defined, stationary point or line. A target is usually placed vertically over an unoccupied transit station.

Tie - A survey connection from a point of known position to a point whose position is desired.

Total Station - An electronic theodolite that provides both angle and distance measurements and displays them automatically.

Transit Station - A mark over which the instrument is, has been, or will be accurately positioned for use.

Turning Points – Temporary points of know elevation.

Vertical Control - Established benchmarks.

B) STANDARD ABBREVIATIONS

3R	Resurfacing, Restoration and Rehabilitation (projects)
ALG	Intergraph software alignment /geometry file
CAD	Computer Aided Drafting
CADD	Computer Aided Drafting & Design
CL	Center Line
COMMS	Program to transfer data to and from Sokkia Data Collector
DGN	MicroStation graphics file (design file)
DOT	Department of Transportation
DSCON	Discontinuity
DTM	Digital Terrain Model
EDM	Electronic Distance Meter
EFB	Electronic Field Book
FWD	Fieldworks fieldbook file
HI	Height of Instrument
GPS	Global Positioning System
MRM	Mile Reference Marker
NAD	North American Datum
NAVD	North American Vertical Datum
NGS	National Geodetic Survey
PC	Point of Curvature
PCEMS	Pre-Construction Engineering Management System
PI	Point of Intersection (Survey)
POST	Point on Semi-Tangent
POT	Point on Tangent
PT	Point of Tangency
ROW	Right of Way
RTK	Real Time Kinematic
SDR	Survey Data Recorders
SDDOT	South Dakota Department of Transportation
STIP	Statewide Transportation Improvement Plan
TBM	Temporary Bench Mark
TIN	Triangulated Irregular Network

TP Turning Point

B) STANDARD ABBREVIATIONS

TS&L Type, Size and Location of Bridges

USC&GS United States Coast and Geodetic Survey

USGS U. S. Geological Survey