



PDHonline Course L144 (6 PDH)

Alabama Standards of Practice for Surveying (superseded by L174)

Instructor: Jerry Thacker, PLS, P.E. and John C. Huang, Ph.D.,

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PDH Online | PDH Center

5272 Meadow Estates Drive
Fairfax, VA 22030-6658
Phone: 703-988-0088
www.PDHonline.com

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STANDARDS of PRACTICE FOR SURVEYING IN THE STATE OF ALABAMA.

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RULE NO. 1.01

PURPOSE

The purpose of these rules is to establish standards for the practice of surveying in the State of Alabama.

RULE NO. 1.02

DEFINITIONS

As used in these rules, the following terms have the following meanings where the context permits:

- 1. Survey** shall mean the orderly process of determining data relating to the physical characteristics of the earth. It may be further defined according to the type of data obtained, to the methods and instruments used, and to the purpose(s) to be served. All surveys showing land boundary information must be in accordance with Rule 1.03. For purposes of this rule, types of surveys shall include, but not be limited to the following definitions:

- a. **Land or Boundary Survey** shall mean a survey, the primary purpose of which includes, but is not limited to, determining the perimeters of a parcel or tract of land by establishing or re-establishing corners, monuments, and boundary lines for the purposes of describing and locating fixed improvements, platting or dividing the parcel and preparing description(s) of the parcel of land.
- b. **Construction Layout Survey** shall mean the measurements made, prior to or while construction is in progress, to control elevation, horizontal position and dimensions, and configuration.
- c. **Record Survey or As-Built Survey** shall mean a survey performed to obtain horizontal and vertical dimensional (as required) data so that the constructed improvements may be located and delineated.
- d. **Geodetic Survey** shall mean a survey of areas and points affected by and taking into account the curvature of the earth and astronomic observations.
- e. **Control Survey** shall mean a survey which provides horizontal or vertical position data for the support or control of a subordinate survey or for mapping.
- f. **Topographic Survey** shall mean a survey of the natural and selected man-made features of a part of the earth's surface by remote sensing and/or ground measurements to determine horizontal and vertical spatial relations.
- g. **Hydrographic Survey** shall mean a survey having for its principle purpose the determination of data relating to bodies of water and which may consist of the

determination of one or several of the following classes of data: depth of water and configuration of bottom, directions and force of current, heights and times and water stages, and location of fixed objects for survey and navigation purposes.

h. Quantity Survey shall mean a survey for the purpose of obtaining measurements of quantity.

i. Right-of-Way and Easement Survey shall mean a survey for the purpose of obtaining specific rights into property for public or private use.

j. Closing or Loan Survey shall mean a survey for the purpose of securing a mortgage loan on property.

k. Specific Purpose Survey shall mean a survey performed for a specified purpose other than as defined above.

2. Corner shall mean a point on a land boundary at which two or more boundary lines meet.

3. Monument shall mean a man-made or natural object that is durable and occupies a defined position. This position may include but not be limited to the following: land corners, latitude and longitude positions, state plane coordinate positions, benchmarks, etc.

4. **Witness Monument** shall mean any monument that does not occupy the same defined position as the corner itself, but whose relationship to the monument is established.
5. **Reference Point** shall mean any defined position that is or can be established in relation to another defined position.
6. **Temporary Benchmark (TBM)** shall mean a temporary (not permanent) point set whose elevation above or below a stated datum plane is known.
7. **Benchmark** shall mean a relative permanent material object, natural or artificial, bearing a marked point whose elevation above or below a stated datum plane is known.
8. **Map of Survey, Plat of Survey, or other similar titles** shall mean any drawing of a parcel or tract of real property used for the purpose of depicting the results of a field survey. Each survey drawing shall state the type of survey or surveys it depicts.

RULE NO. 1.03

BOUNDARY SURVEY FOR FIELD AND OFFICE (MAP, PLAT, AND DRAWING)

1. The following certification (statement) shall be included on each survey plat or drawing:

"I hereby certify (or state) that all parts of this survey and drawing have been completed in accordance with the current requirements of the Standards of Practice for Surveying in the State of Alabama to the best of my knowledge, information, and belief."

Surveyor's Signature: _____

Alabama License Number _____ Date _____

- 2.** The licensed surveyor shall select the proper equipment and methods necessary to meet the relative error of closure permissible by these standards.
- 3.** Land or boundary surveys performed shall be accompanied by a drawing depicting the results of said survey.
 - a.** The plat shall be legibly drawn on any reasonably stable and durable drawing paper, vellum, linen, or film of reproducible quality. No plat or map shall have dimensions of less than 8-1/2 X 11 inches.
 - b.** All Survey drawings shall bear the name, street, mailing address, and telephone number of the firm issuing the drawing, along with the name and license number of the surveyor. A surveyor practicing independent of any firm shall have his or her name, street, mailing address, and telephone number on each drawing. All survey drawings shall reflect the date(s) of the field survey and also for any revision thereto. Either the survey drawing or the copies of the survey drawing shall have the signature of the licensed surveyor, and all copies issued shall have a raised, embossed seal or stamped seal.

- c. Each survey drawing shall state the type of survey it depicts.
 - d. Copies of a survey drawing provided for informational purposes only may be issued without the signature and seal of the licensed surveyor when it is clearly shown that the drawing is invalid without said signature and seal. It shall be a violation of this rule to use this section to circumvent the intent and purpose of these standards.
 - e. A designated "north arrow" and either a stated scale or graphic scale of the drawing shall be prominently shown upon the survey drawing.
4. A reference to all bearings shown shall be clearly stated on the drawing, (e.g., whether to "True North"; to "Grid North" as established by the National Ocean Survey; or to "Assumed North" based on a bearing as documented by a referenced deed or plat.) Such documentation could include, but is not limited to, a boundary line shown on a subdivision plat, a bearing shown on a road right-of-way plat, a bearing for a certain property line as called for in a deed, a bearing shown for a section line on a recorded survey plat, etc. References to "Magnetic North" should be avoided except in cases where a comparison is necessitated by a deed call. Where bearings are recited in the deed description or on an original plat of the land being surveyed, any difference in the deed or plat bearings with the bearing used shall be shown. In all cases, the bearings used shall be referenced to a well-established line.

5. Abbreviations and symbols

- a.** Abbreviations generally used by the public or in proper names that do not relate to matters of survey are excluded from the legend requirements.
- b.** Acceptable abbreviations and symbols on the face of the survey maps are as follows:

N = North

S = South

E = East

W = West

or any combination such as NE, SW, etc.

° = Degrees

' = Minutes when used in a bearing

" = Seconds when used in a bearing

' = Feet when used in distance

" = Inches when used in distance

AC or ac = Acres

± = More or less (or plus or minus)

R = Range

T = Township

SEC = Section

Metric Notations.

- c.** Any other abbreviations and symbols relating to survey matters shall be clearly shown within a legend or notes appearing with the drawing.
- 6.** The surveyor shall make an accurate determination of the boundary in as complete accord as possible with the description of the property surveyed. In case of a new parcel, the description shall be written to reflect accurately the boundary as surveyed and monumented by the surveyor.

 - a.** The survey shall be referenced to the source of information used in making that survey such as the recorded deed description, a recorded plat, an unrecorded plat with the deed references shown on the lots referenced, or any other instrument that describes the property surveyed. Any discrepancies between the survey map and such sources of information shall be shown.
 - b.** When a new parcel is being created, reference shall be made on the survey drawing and in the property description to the U.S. Public Land Survey corner(s) or

other corner(s) shown on a recorded plat. An unrecorded plat is acceptable if deed references are shown on the lots in reference.

- 7.** All changes in direction, including curves, shall be shown on the survey drawing by angles, bearings, or azimuths, and will be in the same form as the description or other recorded document referenced on the drawing. Curved lines shall show the radii, arc distances, and central angles, or radii, chord distances, and chord bearings. If a non-tangent line is not definable as a simple circular curve, compound circular curve, or spiral, that fact shall be noted upon the drawing with sufficient measurements shown upon the drawing to position the line. When intersecting lines are non-radial to a curve, sufficient angular data shall be shown to relate the line to the curve.
- 8.** Surveys of a part of a lot (s) in a recorded subdivision shall be re-subdivided with proper certificate. Surveys of a subdivision lot (s) or a part thereof shall show the following upon the drawing:

 - a.** The lot (s) and block number (s) or other recorded subdivision designations, including those of adjoining lots;
 - b.** A comparison between recorded directions and distances with field measured directions and distances; and
 - c.** All dimensions called for in the property description of the parcel surveyed and the excluded part of the lot (s) shall be shown upon the drawing and the parcels numbered (e.g. Lot 1 and 1A).

- 9.** Surveys of parcels described by metes and bounds shall show the following upon the survey drawing:
- a.** The location of the boundary that depicts the most definitive and defensible relationship (as interpreted by the surveyor) between the record evidence (e.g., deed, plat, etc.) and the physical evidence (e.g., monumentation and other evidence that is indicative of occupation and/or possession discovered during the survey);
 - b.** All information called for in the property descriptions, such as point of commencement, course bearings and distances, and point of beginning;
 - c.** A comparison between recorded directions and distances and field measured directions and distances on the boundary when they vary.
- 10.** Open and notorious evidence of boundary lines, such as fences, walls, buildings, or monuments shall be shown upon the drawing together with dimensions sufficient to show their relationship to the boundary line (s).
- 11.** Visible encroachments onto or from adjoining property or abutting streets shall be indicated with the extent of such encroachments shown or noted upon the drawing. No sub-surface features are required to be located unless information of their existence and location is furnished to the surveyor by the client.
- 12.** Visible evidence of easements or right-of-ways on/or across the lands surveyed shall be located or noted and shown upon the drawing. For other easements or right-of-ways to be shown, the surveyor must be furnished a copy of the instrument that

describes the easement or right-of-way. If streets or street right-of-ways abutting the land surveyed are not physically open, a note to this effect shall be shown upon the drawing.

13. Location of fixed improvements within the boundary, if required, shall be shown upon the map, and their position shall be dimensioned and referenced to the boundaries, either directly or by offset lines.
14. Cemeteries and burial grounds located within the boundaries of the property surveyed shall be located and shown upon the drawing if observed or if knowledge of their existence and location is furnished to the surveyor. However, a detailed survey of the limits of the cemetery is not required according to this rule.
15. The surveyor shall make a determination of the position of the boundary of the property and shall set monuments as defined herein, unless monuments already exist at such corners. All monuments, found or placed, shall be described on the survey drawing with data given to show their location upon the ground in relation to the boundary lines. When the property corner cannot be set, a witness monument shall be placed with data given to show its location upon the ground in relation to the boundary lines or corner. The monument descriptions shall state the size, material, and cap identification of the monument, as well as whether the monument was found or set. When a parcel has a natural and/or artificial feature such as a bluff, river, lake, beach, marsh, stream, or other irregular boundary as one or more of its boundaries, then a monumented meander or survey line shall be established either directly along

or near the feature. Dimensions shall be shown between the meander or survey line and the boundary line sufficient to show the relationship between the two.

16. A typical boundary monument or witness monument set shall:

- a.** be composed of a durable material;
- b.** have a minimal length of 18 inches;
- c.** have a minimum diameter of ½ inch (Number 4 rebar is acceptable);
- d.** be identified with a durable marker or cap bearing the Alabama License Number of the land surveyor or the company Certificate of Authorization Number;
- e.** be detectable with conventional instruments for finding ferrous or magnetic objects;
and
- f.** be a durable and identifiable alternative monument when a cases arises due to rock or other physical obstruction so that neither a boundary monument nor a witness monument can practicably be set in accordance with (a)-(e).

17. The bearings and distances shown on the drawing or plat of survey shall be substantiated by field measurements. The accuracy of the field measurements shall be premised upon the type of survey and the current or expected use of the land. The accuracy of the measurements shall be statistically verified by the results of a closed traverse. The relative error of closure permissible shall be no greater than the following:

Commercial/High Risk:

Linear--1 foot in 10,000 feet

Angular--15 seconds times the square root of the number of angles;

Suburban:

Linear--1 foot in 7,500 feet

Angular--20 seconds times the square root of the number of angles;

Rural:

Linear--1 foot in 5,000 feet

Angular--30 seconds times the square root of the number of angles.

Side ties from a traverse point on the closed traverse to locate or set monuments that are not points on the closed traverse shall be substantiated by measurements from a second traverse point or by a redundancy of measurements from a traverse control point.

RULE NO. 1.04

VERTICAL CONTROL AND TOPOGRAPHIC SURVEYS

1. All surveys in this class shall show the datum, including a description, location, and elevation of the benchmark(s) upon which the survey is based.

2. **Vertical Control Surveys:** The level loop closure in feet should not exceed .05 times the square root of distance in miles.
3. **Topographic Surveys:** The horizontal position of physical features shall be plotted to 1/20th inch of the final map scale. If a test profile is run over the mapped area in the field, the profile shall be correct within one-half of the contour interval 80% of the time, and the remainder shall not be in error more than the contour interval. A surveyor shall be required to run test profiles if he/she is to certify to the information shown on a topography survey obtained by aerial mapping.

RULE NO. 1.05

CONSTRUCTION LAYOUT, RECORD OR AS-BUILT, AND QUANTITY SURVEYS

1. **Construction Layout surveys:** Construction staking shall be based on controls established using the standards as defined in Sections 1.03 and 1.04 of these rules. The stakes provided shall be adequate in number, position, and elevation so that the physical item can be constructed from the plans as designed.
2. **Record Surveys or AS-Built Surveys:**
 - a. Record Surveys or As-Built Surveys shall obtain field measurements of vertical (where required) or horizontal dimensions, so that the constructed facility can be located as constructed. The drawing shall clearly show by symbols, notations or delineations, those constructed facilities located by the field survey.

- b.** The horizontal accuracy shall be such that it may be determined whether the constructed facility encroaches upon adjoining properties or whether it is properly placed on the property, in right-of-ways, or in easements provided for the facility. The vertical and horizontal accuracy shall be such that it may be determined whether the facility was constructed with substantial accuracy.
- 3. Quantity Surveys:** The surveyor may measure and compute quantities, as requested, by obtaining horizontal and vertical dimensions adequate to graphically delineate geometric configurations and/or dimensions that can be mathematically computed.

RULE NO. 1.06

GEODETIC SURVEYS

1. Horizontal Control Surveys

- a. Conventional Geodetic Control Surveys** shall conform to the Standards and Specifications for Geodetic Control Networks (1984) published by the Federal Geodetic Control Committee. The classification of horizontal control points shall follow the particular order and class warranted by the computed distance accuracy.
- b. Static GPS Geodetic Control Surveys** shall conform to the Geometric Geodetic Accuracy Standards and Specifications for using GPS Relative Positioning Techniques (August 1989) found at <http://www.ngs.noaa.gov/FGCS> and published by the Federal Geodetic Control Committee. The classification of horizontal control points shall follow the order and class warranted by the precision of processed

vectors, and the positional tolerance of the geodetic control used to constrain the vectors.

- c. **GPS Surveys** may be based on other techniques such as kinematic, pseudokinematic, rapid static, on-the-fly kinematic, the use of CORS receivers, or other new methods and technologies. The applicable standards and procedures used in such surveys shall be placed on the survey map.
- d. State plane coordinates shall be clearly referenced to the appropriate horizontal datum on the survey map. The NAD 27 datum is obsolete for use in contemporary geodetic surveys, and the use of 1927 State Plane Coordinates is not recommended when conducting GPS-based geodetic surveys. Use of the North American Datum of 1983 is recommended with GPS since this datum is earth-centered. State plane coordinates calculated using NAD 83 should be clearly referenced as 1983 State Plane Coordinates. Guidelines for the computation and use of 1983 State Plane Coordinates are published in NOAA Manual NOS NGS 5, State Plane Coordinate System of 1983. When state plane coordinates are use, the following information shall be depicted on the map of survey:
 - (1) The horizontal and/or vertical datum (s) used.
 - (2) The method used to derive information such as GPS or conventional survey.
 - (3) A combined or correctional factor.
 - (4) Coordinates

e. If state plane coordinates have been translated by use of a combined factor or elevation factor for use on the earth's surface topography, such fact shall be stated on the survey map.

2. Vertical Control Survey

- a. Should the GPS geodetic survey require GPS leveling to establish precise elevations (orthometric), the standards and practices used to develop such elevations shall be placed on the survey map. To verify accuracy, the surveyor shall check a representative sample of these elevations using conventional leveling techniques.
- b. The National Geodetic Vertical Datum of 1929 (NGVD 29) was not developed for use with GPS and should not be used for GPS leveling. The North American Vertical Datum of 1988 (NAVD 88) and the latest models of the geoid are related in such a way as to facilitate GPS leveling. These later datums should be used.

RULE NO. 1.07

MISCELLANEOUS

- 1. Descriptions defining land boundaries by metes and bounds, written by a land surveyor for conveyance or other purposes, shall be complete and shall provide definitive identification of boundary lines. The initial point in the description shall be

tied to either a U.S. Public Land Survey corner, a recorded corner, or some other well established survey point.

2. Re-establishment of U.S. Public Land Survey corners and subdivision of sections should be accomplished in accordance with "Restoration of Lost or Obliterated Corners and Subdivision of Sections, 1974" prepared by the U.S. Department of Interior.
3. If, during a construction project, an interim record or as-built survey is made for the purpose of locating partially completed new improvements by a surveyor or survey firm who performed a boundary survey at the beginning of the project, corner monuments need not be immediately reset if disturbed by the ongoing construction; however, at the end of the construction project, when the final record or as-built survey is being performed to locate the completed improvements, all corner monuments must be reset if disturbed during the construction project. In all other cases, when a record or as-built survey is performed for the purpose of locating either existing, partially completed, and/or completed improvements, the boundary shall also be surveyed. All corner monuments shall be set if not already existing.
4. When more stringent standards than those set forth herein are required by federal, state or local governmental agencies, the survey shall comply with those standards. When more stringent survey standards or requirements than those set forth herein are mandated by the client and agreed to by the surveyor, the survey shall comply with those survey standards, providing said survey requirements are within the scope of the surveyor's expertise.

5. Surveys, which are performed for a specific stated purpose other than as defined in Section 1.02, 1 (a)-(k) herein, shall be permitted where unusual conditions make impracticable or impossible the performing of a survey as defined in Section 1.02, 1 (a)-(k). Such specific stated purpose and unusual conditions shall be clearly shown upon the drawing. Surveys performed in accordance with this section shall not be construed to constitute a variance of any other rule, but shall conform to all applicable standards as set forth herein.
6. When special conditions exist that effectively prevent the survey from meeting these standards, the special conditions and any necessary deviation from the standards shall be noted upon the drawing. It shall be a violation of this rule to use special conditions to circumvent the intent and purpose of these standards.
7. Additions or deletions to survey drawings by any other person (s) than the signing party or parties is prohibited without written consent of the signing party or parties.

- End -