

TSPS Manual of Practice Requirements for Category 6 - Topographic Survey

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1. Purpose. A topographic survey is the service performed to determine the configuration, relief, or elevations of a portion of the earth's surface, including the location of natural and/or man-made features thereon. The preparation of a topographic survey requires the expert skill of a Registered Professional Land Surveyor well versed in techniques used to prepare reliable topographic maps. A topographic survey is not a boundary survey, although some approximate property lines may be delineated. The limits of the topographic survey will be determined based on the intended use.

2. Fieldwork. Fieldwork, for collecting data on-the-ground or field-verifying remote sensing data, shall be performed using equipment and techniques capable of attaining the precision required by these standards. Surveying instruments shall be calibrated and/or adjusted according to manufacturer's specifications and in good working order.

- A. Temporary Benchmark.** A minimum of two benchmarks shall be placed at the site of the topographic survey.
- B. Water Features.** Water features situated within the project limits and observed while performing fieldwork shall be located.
- C. Visible Improvements.** Visible improvements observed within the project area while conducting the survey shall be located. These improvements include, but are not limited to, the following:
 - a. Buildings.** Buildings observed while conducting fieldwork shall be located. Examples include, but are not limited to, houses, barns, sheds, offices, storage facilities, and other structures. Finished floor elevations should be collected when appropriate.
 - b. Roads.** Visible evidence of roads, streets, highways, alleys, or other public or private ways abutting or crossing the project area shall be located. Examples include, but are not limited to, centerline, back of curb, edge of pavement (absent curbing), curb cuts, driveways, culverts (with flow line & sizes when appropriate), and bridges.
 - c. Fences.** Fences observed while performing fieldwork shall be located and defined.
 - d. Water Wells.** Evidence of water wells and storage tanks observed while performing fieldwork shall be located.
 - e. Utilities.** Visible evidence of utilities observed while performing fieldwork shall be located. Examples include, but are not limited to, antennas, utility poles, guy wire anchors, cleanouts, septic tanks, pedestals, pipeline markers/signs, transformers, manhole covers, and electric, gas, and water meters. The surveyor is not responsible for locating buried utilities that are not visible, unless the surveyor

has agreed to do so in writing. Invert flowlines and pipe sizes for manholes and inlets should be obtained when appropriate.

- f. Energy Production.** Visible evidence of non-residential energy production on the property shall be located. Examples include, but are not limited to, oil and/or gas wells, wind turbines, solar panels, and other associated permanent equipment.
- D. Cemeteries.** Cemeteries, if (a) observed while conducting fieldwork or (b) disclosed in documents obtained by or provided to the surveyor, must be located and shown on the survey. If a cemetery has multiple graves, the cemetery may be identified by its perimeter.
- E. Topographic Data.** The topographic data used for the survey may be collected by any means so long as the data is capable of attaining the precision required for the project.

3. Survey Plat. The survey plat, sometimes also referred to as a drawing or topographic map, shall be drawn in a manner that provides a clear and unambiguous representation of the improvements and topographic features located therein.

- A. Fieldwork.** Any survey data collected in accordance with Section 2 above shall be depicted on the survey plat if a plat is prepared. See plat exception in Section 4 below.
- B. Sheet Size.** The minimum sheet size for the plat is 8.5 by 11 inches.
- C. Scale.** The plat shall be drawn at a standard engineering scale that is legible. Details or inserts shall be used when necessary.
- D. Topographic Data.** Topographic data may be presented using one or more of the following formats:
 - a. Contour Lines.** Contour lines are interpolated from topographic data to provide an approximation of the elevation contour as it exists on the ground. Contours shown on the survey plat may include contour and index contour lines. Index contours should be labeled and displayed as heavier lines at appropriate intervals of five feet (or multiples thereof).
 - b. Spot Elevations.** Spot elevations, plotted on a grid of appropriate size, can be an effective way to demonstrate topographic data. Spot elevations are most suitable for relatively flat terrain and heavily timbered areas but can be used in almost any situation. The horizontal location of the spot elevations should be clearly depicted on the plat. Such locations may be depicted with a dot, small "x" mark, "+" mark, etc. The marked spot shall be accompanied by the appropriate elevation.
 - c. Surface Model.** The three-dimensional representation of the topography may be provided in a .tin file or some other surface model file.
- E. Lines.** Lines shown on the plat shall be drawn using a line weight, width, or color that makes the lines distinguishable.
- F. Survey Control.**
 - a. Horizontal Control.** The horizontal control used for the topographic survey shall be noted on the plat and based on one of the following:
 - i. Grid.** Grid control (bearings & coordinates) shall be based on a Texas Coordinate System approved by the Texas Legislature as defined by the Natural Resource Code.

- [illegible]

This survey substantially complies with the current Texas Society of Professional Surveyors Manual of Practice requirements for a Category 6, Condition ___, Topographic Survey.

- 4. Survey Report.** In lieu of a survey plat, data may be provided to the client via a digital data set. The data set shall be accompanied by a survey report containing the following:

A. Survey Control.

- a. Horizontal Control.** The horizontal control used for the topographic survey shall be noted on the survey report and based on one of the following:
- i. Grid.** Grid control (bearings & coordinates) shall be based on a Texas Coordinate System approved by the Texas Legislature as defined by the Natural Resource Code.
 - ii. Record.** A record bearing shall be based on found and accepted monuments called for in an instrument or plat of public record. The source of the record information shall be noted on the survey.
 - iii. Geodetic.** The Geodetic meridian as observed within one mile of the surveyed site.

- b. Vertical Control.** The vertical control shall reference (i) a published vertical datum, (ii) published benchmarks, or (iii) if assumed, the assumed project elevation datum point shall be stated.
 - c. Project Control Point.** Each project control point, also known as a benchmark, shall be shown on the plat with a locative and physical description of the monument and the elevation.
- B. Additional Requirements.** The survey report shall also include the following:
 - a.** Data acquisition date(s)
 - b.** Registrant's name and RPLS number
 - c.** RPLS seal, signature, and date of completion
 - d.** Firm name and TBPLS firm registration number, if applicable
 - e.** Legend of symbols, abbreviations, and/or lines, if applicable
 - f.** The title "Topographic Survey Report"
- C. Notes.** Notes, if used, should be applicable for the intended use of the survey. Notes should address or clarify information relevant to the survey.
- D. Certification.** All survey reports shall include a certification. Each surveyor may determine the preferred wording for the certification, but all certifications shall contain the following language in the certification:

The survey data set accompanying this report substantially complies with the current Texas Society of Professional Surveyors Manual of Practice requirements for a Category 6, Condition ___, Topographic Survey.

5. Tolerances. See Appendix B for Category 6 survey tolerances.