

**Section E**  
**NSPS MODEL STANDARDS**  
**FOR**  
**TOPOGRAPHIC SURVEYS**

Approved 3/12/02

**1. INTRODUCTION**

This standard is written to provide the professional surveyor (Surveyor) and the client with a guideline for producing an adequate topographic survey.

**2. APPLICATION OF THE STANDARD**

This standard applies to topographic surveys that are intended to show the contour of the earth's surface and/or the position of fixed objects thereon. The Surveyor in making topographic surveys uses accepted terrestrial or GPS surveying methods. This standard does not apply to topographic surveys using photogrammetric methods. Topographic surveys that additionally depict the location of property lines must also be in compliance with the current standard for property surveys.

**3. DEFINITIONS**

- A. Bench Mark is a relatively permanent material object, natural or artificial, bearing a marked point whose elevation above or below and adopted datum is known.
- B. A Contour is an imaginary line on the ground, all points of which are of the same elevation above or below a specified datum.
- C. The Parcel is the area designated by the client and is usually, but not necessarily, given by a legal description of the property.
- D. Utilities are services provided by governmental and private entities that provide the following: electric power, telephone, water, sanitary and storm sewer, gas, etc.

**4. RESEARCH AND INVESTIGATION**

The Surveyor shall acquire the elevation and datum of all bench marks to be used in the survey. The elevation used shall be based on a nationally accepted datum whenever practical or unless otherwise instructed by the client. The client shall specifically describe the parcel to be surveyed.

5. THE SURVEY

The topographic survey shall be performed on the ground to obtain the information required in this standard and any additional information requested by the client. The Surveyor shall select the equipment and procedures necessary to obtain the horizontal and vertical positional accuracy required by these standards.

6. THE PUBLISHED RESULT

A topographic map or plat shall be prepared that shall be of a scale, size and accurately to clearly show the results of the survey.

7. DATA

The surveyor shall locate and show on the topographic survey map or plat the following information:

- A. Existing contours lines indicating the shape and elevation of the land over the entire parcel in accordance with the following table, unless specifically excluded in the contract with the client:

Map or Plat Scale	Contour Interval
1" = 20'	1 foot
1" = 30'	1 foot
1" = 40'	1 foot
1" = 50'	1 foot
1" = 100'	1 or 2 feet
1" = 200'	2 or 4 feet
1" = 400'	4, 5 or 10 feet

- B. The location of permanent structures including retaining walls, bridges, and culverts.
- C. The location of street or road paving, entrance drive openings and sidewalks.
- D. Elevations on the top of curbs, gutters and sidewalks.
- E. The official street or road names and address numbers assigned to the parcel.
- F. North arrow and scale of drawing.
- G. Legend depicting the symbols and abbreviations used on the drawing.
- H. Spot elevations covering the entire survey limits showing high points, low points, grade changes, and at sufficient intervals to represent the general character of the terrain.
- I. Provide main floor elevations of buildings.
- J. Location and elevation of lakes, rivers, streams or drainage courses on or near the surveyed parcel.
- K. Description, location and elevation of bench marks used in the survey.
- L. All Optional items required in Section 9.

## 8. POSITIONAL ACCURACY

The following relative positional accuracies are provided as a guide for topographic surveys.

	<b>Vertical Positional Accuracy Feet</b>	<b>Horizontal Positional Accuracy Feet</b>
Contour line 1' interval	± 0.65 ft	± 1 ft
Contour line 2' interval	± 1.30 ft	± 2 ft
Contour line 4' interval	± 2.60 ft.	± 4 ft
Contour line 5' interval	± 3.20 ft	± 4. ft
Contour line 10' interval	± 6.50 ft	± 8 ft
Floor elevations	± 0.05 ft	± 1 ft
Spot paving elevations	± 0.05 ft	± 1 ft
Spot ground elevations	± 0.20 ft	± 2 ft
Sewer invert elevations	± 0.05ft	± 1 ft
Well defined planimetric features	± 0.10 ft	± 1 ft

Positional Accuracy is given at the 95 percent confidence level.

## 9. OPTIONAL ITEMS

The following items may be included in the requirements to be shown on a topographic survey if specifically and mutually agreed upon by the client and surveyor:

- A. Boundary survey of the parcel. (Must comply with boundary survey standards)
- B. Plot the location of easements and rights-of-way as shown on the recorded subdivision plat and all easements evidenced by a recorded document provided by the client. The reference book and page, or document number of each shall be shown.
- C. Vicinity map with subject property highlighted.
- D. Observable evidence of site use as a solid waste dump, sump or sanitary landfill.
- E. Observable evidence of recent earth moving work, borrow or fill.
- F. Location and the top elevation of soil borings or monitoring wells if ascertainable. (Performed by others)
- G. Cross-section of offsite drainage courses for engineering studies.
- H. Location and elevation of at least one bench mark within the limits of the survey.
- I. Existing contours shall not be drawn but the drawing shall show existing elevations in both directions over the parcel at 25-foot intervals in rough ground and 50-foot intervals on level ground and spot elevations at any abrupt changes.

- J. Elevations at the inside of walk, top of curb, and gutter at approximately one-inch (1") intervals at the final map scale.
- K. Dimensions of curb, sidewalk, and gutter lines or ditch lines and centerline of all streets, alleys or roads adjoining the parcel. Indicate type of paving surface and condition.
- L. Location, width and elevation at both ends of all existing sidewalks. Include a description of the kind and general condition of the sidewalk.
- M. Location, diameter, and species of all trees over a \_\_\_\_\_ inch diameter.
- N. Perimeter outline only of thickly wooded areas unless otherwise directed.
- O. Electric utilities – the location of power poles, guy wires, anchors, vaults, etc., on the parcel or in the streets, roads, alleys, or railroad right of way adjoining the parcel.
- P. Storm, sanitary or combined sewers – the location of all observable manholes and other structures such as culverts, headwalls, catch basins and clean-outs on the parcel or in streets, roads alleys or railroad right of way adjoining the parcel. Include elevations of the top and bottom of manholes and catch basins. Show type, size, direction of flow and invert elevation of all pipes or culverts.
- Q. Water – the location of any water valves, standpipes, regulators, fire hydrants, etc. that are visible on the parcel.
- R. Gas – the location of all valves, meters, and gas line markers that are visible on the parcel. Show elevation on top of any valves.
- S. Telephone – the location of all poles, manholes, boxes, etc that are visible on the parcel.
- T. Street lighting – the location of all lamp poles, boxes etc
- U. Heating – the location of all steam manholes and vaults that are visible on the parcel.
- V. Location and dimensions of any existing buildings, tanks, fences, miscellaneous structures, driveways, or other obstructions on the parcel.
- W. Location and description of any building or major structure on adjoining land that is not more than \_\_\_\_\_ feet outside the parcel being surveyed
- X. Location and elevation of the 100 year floodplain, if applicable for the surveyed parcel.
- M. Location and elevation of swamps, or wetland limits if determined by other experts.
- Y. Location of visible rock formations.
- Z. Information about the utilities providing service to the parcel. This shall include as a minimum the name of the corporation, address, phone number, fax number and type of service.

## 10. ELECTRONIC DATA DISTRIBUTION

The client may request the Surveyor to provide the survey data in an electronic format. These formats include such files as CADD drawing files, digital terrain model (DTM) files, or digital elevation model (DEM) files. When the Surveyor provides these files, they are only for the benefit of the client on this specific survey. In every case the surveyor shall also provide a signed and sealed hard copy drawing or representation of the survey. This drawing shall be the official plat or map and shall be deemed to be correct and superior to the electronic data. The electronic data file shall also contain a statement that the file is not a certified document and that the official document was issued and sealed by (*name and registration number of the Surveyor*) on (*date*).

The Surveyor may also need to address additional liability issues in appropriate contract language.