

State of Connecticut
Regulation of
Department of Consumer Protection
Concerning
Survey and Map Standards

Section 1. Sections 20-300b-1 through 20-300b-4, inclusive, of the Regulations of Connecticut State Agencies are hereby amended as follows:

Sec. 20-300b-1. General

There are many types of surveys. Choice of a *survey type* is made relative to the intent and purpose for which the survey is to be used. The *survey type* is intended to classify these criteria. When a map is prepared, the *survey type* shall be stated in the title of the map [and, in order to reflect the scope of service, may be clarified within the notes on the map]. The first note shall state the standards to which the survey was prepared, the applicable Class or Classes of Accuracy, the Type or Types of Survey, and the Boundary Determination Category or Categories.

Sec. 20-300b-2. Property/boundary and limited property/boundary surveys

(a) Property/Boundary and Limited Property/Boundary Surveys require sufficient investigation, study, field measurement and evaluation of factors affecting boundaries, real property interests and other relevant matters with respect to the subject real estate to enable the surveyor to render a professional opinion as to boundary locations and any conflicts therewith.

These surveys require the preparation of a detailed field survey and are intended to present the surveyor's property/boundary opinion. It is recognized that certain factors pertaining to boundary line determination are beyond the surveyor's purview and may require agreements between abutting property owners or action by the courts. Facts surrounding such circumstances shall be noted.

(b) Types of Property/Boundary Surveys

(1) Property Survey

A Property Survey is a type of survey which depicts or notes the position of boundaries with respect to:

- (A) locations of all boundary monumentation found or set;
- (B) apparent improvements and features, including as a minimum: dwellings, barns, garages, sheds, driveways, roadways, surface utilities, visible bodies of water and swimming pools;
- (C) record easements and visible evidence of the use thereof;
- (D) record and apparent means of ingress and egress;
- (E) lines of occupation, including as a minimum: fences, walls, hedges and yards;
- (F) deed restrictions pertaining to the location of buildings or other apparent improvements;
- (G) unresolved conflicts with record deed descriptions and maps;
- (H) all apparent boundary encroachments; and
- (I) monumentation required to be set at all corners created by a deflection angle of not less than 70 degrees between two consecutive courses and at intervals not to exceed 600 feet (180 meters) along the boundaries between said corners, except where natural or man-made monumentation defines or occupies the line. Refer to Section 20-300b-14 of these regulations for a description of acceptable monuments. Except when intended for use for Subdivision or Resubdivision applications, this

requirement may be waived only through written agreement between surveyor and client and with a notation on the map that all monumentation found or set has been depicted.

(2) Perimeter Survey

A Perimeter Survey is a type of survey which maps a strip along the boundaries, the minimum width of which shall be 15 feet (5 meters), oriented 10 feet (3 meters) within and 5 feet (2 meters) beyond the parcel limits. The purpose of this type of survey is to document the boundary locations by depicting and noting their position with respect to:

- (A) locations of all boundary monumentation found or set;
- (B) apparent improvements and features, including as a minimum: dwellings, barns, garages, sheds, driveways, roadways, surface utilities, visible bodies of water and swimming pools;
- (C) record easements and visible evidence of the use thereof;
- (D) record and visible means of ingress and egress;
- (E) lines of occupation, including as a minimum: fences, walls, hedges and yards;
- (F) unresolved conflicts with existing deed descriptions and maps;
- (G) deed restrictions pertaining to the location of buildings or other apparent improvements;
- (H) apparent boundary encroachments; and
- (I) monumentation required to be set at all corners created by a deflection angle of not less than 70 degrees between two consecutive courses and at intervals not to exceed 600 feet (180 meters) along the boundaries between said corners, except where natural or man-made monumentation defines or occupies the line. Refer to Section 20-300b-14 of these regulations for a description of acceptable monuments. This requirement may be waived only through written agreement between surveyor and client and with a notation on the map that all monumentation found or set has been depicted.

(c) Types of Limited Property/Boundary Surveys

(1) Existing Building Location Survey

An Existing Building Location Survey is a type of survey which depicts or notes the position of all buildings on the property with respect to boundaries, record easement lines and pertinent municipal setback requirements and deed restrictions. No other improvements or features need be depicted.

(2) Zoning Location Survey

A Zoning Location Survey is a type of survey which depicts or notes the position of existing or proposed improvements with respect to applicable municipal setback requirements. If existing record easements on the subject property may be affected, they shall be depicted. The purpose of this type of survey is to enable determination of compliance with said requirements. The specific scope of the improvements and matters being addressed by the survey shall be noted. Only those portions of the property, and improvements and features of the property pertinent to the issues being addressed [must] shall be depicted. [No other improvements or features need be depicted.]

(3) Improvement Location Survey

An Improvement Location Survey is a type of survey which depicts or notes the position, horizontally and, where required, vertically, between particular existing or proposed improvements with respect to the applicable municipal or statutory requirements. If existing record easements on the subject property may be affected, they shall be depicted. The purpose of this type of survey is to enable determination of compliance with said requirements. The specific scope of the improvements and matters being addressed by the survey shall be stated or a reference to said municipal or statutory requirement shall be noted [No other improvements or features need be depicted].

(4) Subdivision or Resubdivision Map

A Subdivision or Resubdivision Map is a map of a type of survey which depicts or notes the layout of lots and the associated public or private highways, easements and lands and is intended for submission to applicable regulatory entities. This map shall conform to the requirements of a Property Survey or be submitted along with a Property Survey. The monumentation requirements of

Article III of these regulations do not apply to the Original Survey portions.

(5) Easement Map

An Easement Map is [a map of] a type of survey which depicts and notes the position of [an] existing or proposed [easement] easements with respect to:

(A) boundary monumentation found or set;

(B) improvements and features, including as a minimum: dwellings, barns, garages, sheds, driveways, roadways, surface utilities, visible bodies of water, fences, walls, hedges, yards and swimming pools;

(C) other record easements and visible evidence of the use thereof; and

(D) unresolved conflicts with record deed descriptions and maps.

All visible encroachments shall be depicted or noted thereon. For boundaries intersected by the easement lines, the surveyor shall indicate the Boundary Determination Category used.

(6) Boundary Stake-Out

A Boundary Stake-Out is a type of survey which marks or monuments the physical position of property corners or lines. The surveyor shall issue a signed and sealed letter or sketch indicating the monuments or markers set and indicating the Boundary Determination Category used. No other features need be depicted.

(d) **Additional Requirements**

All survey types listed in subsections (b) and (c) of this section shall comply with the following:

(1) AA, A-1 or A-2 Classes of Horizontal Accuracy as defined in subsection (b) of Section 20-300b-11 of these regulations.

(2) monumentation or marker Location Requirements as defined in Section 20-300b-13 of these regulations;

(3) research requirements defined in Article IV of these regulations;

(4) distances along boundary or easement lines expressed to the nearest .01 of a foot (.003 meters), except where said lines are irregular and constantly changing, as along a body of water;

(5) directions, defined by angles, bearings or azimuths, along boundary or easement lines expressed to the nearest 10 seconds for Class A-2 and to the nearest 1 second for Class AA and A-1, except where said lines are irregular and constantly changing, as along a body of water;

(6) curved lines defined with the central angle, radius, arc length and tangent. For curves which are not tangent to an adjoining course, the information required to reproduce them shall be indicated. Lines which are radial shall be so noted;

(7) in areas where lines are irregular and constantly changing, as along a body of water, meander, tie or reference lines shall depict or note the position of points located along said lines and allow for a mathematical closure of the map;

(8) adjoining properties shall be identified by most recently published owners' names (N/F, now or formerly) or by subdivision map and lot numbers;

(9) areas noted in acres (hectares) or square feet (square meters);

(10) all monuments or markers set or found depicted and adequately described. When reference markers have been used, their position with respect to the boundary shall be indicated; and

(11) a north arrow shall be [shown] depicted on every sheet. The reference to grid, magnetic or north from another map, shall be noted. If magnetic, the date of the reading shall be noted.

(e) **Boundary Determination Categories**

The category used in determining property/boundary opinions for all survey types listed in subsections (b) and (c) of this section shall be identified within the title or notes on the map, and shall be one of the following:

(1) First Survey:

A First Survey is a survey of existing property lines made when the surveyor has not found a map

or other document of the subject property, such as a metes and bounds description which represents a previous surveyor's professional opinion. The volume and page containing the record description of the subject property shall be noted. If the surveyor has found a prior survey, the current survey is by definition, a Resurvey.

(2) Resurvey:

[A Resurvey is a survey of property lines made when the surveyor has found a prior survey of the subject property. After evaluation of the prior survey, within the context of field and record information, the Resurvey is prepared. The Resurvey may or may not agree with the prior survey.

If the surveyor has found a prior survey of the subject property and, in the surveyor's professional opinion, determines it to be sufficient for reliance and update, the term Dependent Resurvey shall be used. The Dependent Resurvey places reliance on the prior survey while updating same to reflect current conditions.] A Resurvey is a retracement of the property lines of a prior survey and any subsequent Resurveys, in which the recovered markers and any other pertinent physical and record evidence are evaluated and found to be appropriate for reliance and updating. A Resurvey may be an update of one's own prior survey, or a survey of another surveyor. Referenced maps or descriptions of the property surveyed shall be noted, including recording data, map titles, dates and surveyor's names. If, in the course of conducting a Resurvey, the surveyor determines that the results will conflict with the record, the term Independent Resurvey shall be used, and the differences warranting the independent boundary opinion shall be noted.

(3) Original Survey:

An Original Survey is a survey indicating proposed property lines or parcels of land. The Boundary Determination Category of existing boundaries shall be indicated.

Sec. 20-300b-3. Control surveys

(a) **Horizontal Control Survey**

A Horizontal Control Survey is a type of survey [which establishes] establishing points on a horizontal coordinate system, such as latitude and longitude, state, municipal, or arbitrary coordinates. The horizontal control net shall comply with one of the Classes of Horizontal Accuracy defined in Section 20-300b-11 of these regulations.

(b) **Vertical Control Survey**

A Vertical Control Survey is a type of survey [which establishes] establishing bench marks in relation to an appropriate vertical datum. Vertical measurements shall comply with one of the Classes of Vertical Accuracy defined in Section 20-300b-11 of these regulations.

Sec. 20-300b-4. Topographic survey

(a) A Topographic Survey is a type of survey [which depicts] establishing the configuration (relief) of the earth's surface [(ground)] and the location of natural and artificial objects thereon. The Topographic and Vertical Classes of Accuracy, as defined in Section 20-300b-11 of these regulations, shall be noted. Bench marks shall be depicted or noted on all Class T-1, T-2 and T-3 Surveys. Survey datum and contour interval shall be depicted or noted.

(b) If property lines depicted do not present a surveyor's property/boundary opinion, there shall be a note clearly indicating this fact.

Sec. 2. Sections 20-300b-6 through 20-300b-8, inclusive, of the Regulations of Connecticut State Agencies are hereby amended as follows:

Sec. 20-300b-6. General location survey

(a) A General Location Survey is a type of survey which [roughly] depicts a parcel of land and particular improvements based on record research and compilation of data supplemented by limited field measurements. The specific content is a matter to be agreed upon between the client and the surveyor and clearly noted on the map.

(b) [This type of survey shall not be used to prepare property descriptions for conveyance.]

[(c)](b) If property lines depicted do not present a surveyor's property/boundary opinion, there shall be a note clearly indicating this fact.

[(d)](c) [Note #1] A prominent note on the map shall include: "This map was prepared from record research, other maps, limited field measurements and other sources. It is not to be construed as a Property/Boundary or Limited Property/Boundary Survey and is subject to such facts as said surveys may disclose."

Sec. 20-300b-7. Data accumulation plan

(a) A Data Accumulation Plan is a type of plan which depicts collected and correlated data of a particular type (or types) within a given area. Data Accumulation Plans may be depicted on a previously prepared map. The horizontal or vertical accuracy classes used in the preparation, and the specific scope of the matters being addressed, shall be noted.

(b) If property lines depicted do not present a surveyor's property/boundary opinion, there shall be a note clearly indicating this fact.

Sec. 20-300b-8. Compilation plan

(a) A Compilation Plan is a type of plan based on land record research and other sources of information which depicts the approximate size and shape of a parcel of land. This plan [may be] is derived from records only and not as a result of a field survey or measurements by the surveyor. The accuracy of this plan may vary with the quality of the data from which it has been compiled. All pertinent sources utilized shall be noted on the plan. Where said plan is created for a specific purpose, that purpose shall be noted in the Compilation Plan.

(b) [Note #1] A prominent note on this plan shall include: "This plan was compiled from other maps, record research or other sources of information. It is not to be construed as having been obtained as the result of a field survey, and is subject to such change as an accurate field survey may disclose."

Sec. 3. Sections 20-300b-10 and 20-300b-11 of the Regulations of Connecticut State Agencies are hereby amended as follows:

Sec. 20-300b-10. Geographic information system (GIS) land information system (LIS)

(a) (a) [Types of systems used for information data banks based on spatial requirements. Reference is made to a publication by the Federal Geodetic Control Committee titled *Multipurpose Land Information Systems: The Guide Book*.] A Geographic Information System (GIS) is a complex spatial information system used to capture, store, analyze, display, manage, share, and present data linked to geographic locations. The GIS may contain Authoritative Data which can be displayed and presented along with Non-Authoritative Data. A licensed surveyor shall differentiate between the Authoritative Data and the Non-Authoritative Data.

(b) [If the information in the GIS/LIS is intended to relate to the surface of the earth, a surveyor

shall establish such positional relationship. The surveyor's professional judgment shall be used in determining all appropriate Classes of Accuracy.] Authoritative Data is data that: 1. has been created by, or under the direct supervision of, a licensed land surveyor, and depending upon the accuracy, may be deemed suitable for use in engineering design, the determination of property boundaries or the determination of locations of fixed works and topography; 2. is suitable for use in an official capacity for the enforcement of regulations that pertain to the locations of fixed works and topography; and 3. is suitable for use in an official capacity for the enforcement of regulations that pertain to the location of improvements and fixed works.

(c) Horizontal reference system, vertical reference system, and the Class or Classes of Accuracy, of the authoritative spatial data and boundary data shall be clearly stated. Any features or spatial data depicted on a GIS map that are stated to meet positional accuracies, standards or tolerances, such as map coordinate location or elevation versus field coordinates or elevation shall be considered Authoritative Data.

Sec. 20-300b-11. Classes of accuracy

(a) (a) [All surveys prepared in metric format shall use: 1 meter = 3.28083333 U.S. Survey feet.] Conversion to and from the metric system shall use the U.S. Survey Foot which is defined as one meter is equal to 39.37 inches. When converting meters to feet the conversion is exactly, 3937 divided by 1200, which when expressed to twelve places is 3.280833333333.

(b) Horizontal Accuracy

Each survey depicting horizontal locations shall conform to a Horizontal Accuracy Class the tolerance of which is defined as follows:

Class	Positional	Linear			Angular
		Feet	Meters	(Use the ratio for D>...)	
AA	1:15,000	±0.01’	±.003m	(1:22,500 @D>225’(69m))	±8”
A-1	1:10,000	±0.01’	±.003m	(1:15,000 @D>150’(46m))	±10”
A-2	1:5,000	±0.02’	±.006m	(1:7,500 @D>150’(46m))	±20”
B	1:1,000	±0.5’	±.15m	(1:1,500 @D>750’(229m))	±2’
C	±2’	±2’	±.6m		±30’
D	compilation of existing data-NOT A FIELD SURVEY				

Linear accuracies expressed as "±" apply to distances less than (<) those prescribed as a ratio. Additional accuracy standards for measurements made using Global Navigation Satellite Systems (GNSS) have relative positional accuracy of a ninety five percent level, and are defined as:

<u>Confidence Level</u>			
<u>Class</u>	<u>Accuracy</u>		<u>Minimum Spacing</u>
	<u>Feet</u>	<u>Meters</u>	
<u>G-A</u>	<u>0.033' + 1 PPM</u>	<u>1.0 cm + 1 PPM</u>	<u>500'</u>
<u>G-1</u>	<u>0.049' + 2 PPM</u>	<u>1.5 cm + 2 PPM</u>	<u>500'</u>
<u>G-2</u>	<u>0.067' + 3 PPM</u>	<u>2.0 cm + 3 PPM</u>	<u>335'</u>
<u>G-B</u>	<u>0.33' + 10 PPM</u>	<u>0.10 m + 10 PPM</u>	<u>N/A</u>

(c) Vertical Accuracy

Each survey depicting vertical location shall conform to a Vertical Accuracy Class the tolerance of which is defined as follows:

Class	Level Loop Closure Greater Than One Mile		Level Loop Closure Less Than One Mile	
	Feet	Meters	Feet	Meters
V-1	$\pm.02\sqrt{M}$	$\pm.005\sqrt{K}$	$\pm.006\sqrt{N}$	$\pm.002\sqrt{N}$
V-2	$\pm.035\sqrt{M}$	$\pm.008\sqrt{K}$	$\pm.010\sqrt{N}$	$\pm.003\sqrt{N}$
V-3	$\pm.05\sqrt{M}$	$\pm.012\sqrt{K}$	$\pm.020\sqrt{N}$	$\pm.006\sqrt{N}$

Class V-4* has a GNSS Vertical Accuracy (95% confidence level in feet) of 0.066 feet.

Class V-5* has a GNSS Vertical Accuracy (95% confidence level in feet) of 0.164 feet.

M or K = The length of the level loop in miles/kilometers

N = The number of instrument setups in the level loop

* GNSS only. The surveyor expresses their opinion that the differences between heights resulting from repeat observations would not exceed the state accuracy levels.

(d) Topographic Survey Accuracy

Each Topographic Survey shall conform to a Topographic Accuracy Class the tolerance of which is defined as follows:

Class	Horizontal Position		Contour Interval Test
	Feet	Meters	
T-1	$\frac{1}{40}$ of map scale	$\frac{1}{1500}$ of map scale	90% within $\frac{1}{2}$ contour interval
T-2	$\frac{1}{40}$ of map scale	$\frac{1}{1500}$ of map scale	80% within $\frac{1}{2}$ contour interval

T-3 This class of topographic map applies to photogrammetric maps for which the surveyor provides the horizontal and vertical control. Refer to the “National Map Standards for Photogrammetric Mapping” for requirements.

T-D This class of map standard applies to [a] topographic [map] maps compiled from various sources of information not necessarily verified by the surveyor.

In using Topographic Accuracy Class T-1 or T-2, the surveyor is expressing confidence that should a test profile be run in the field, a plotted comparison with a profile scaled from the map shall be in agreement within the above criteria and the remainder shall be within the contour interval.

Sec. 4. Section 20-300b-13 of the Regulations of Connecticut State Agencies is hereby amended as follows:

Sec. 20-300b-13. Location requirements

The following standards shall apply to location requirements:

- (1) There shall be a minimum of three monuments, markers or a combination thereof[.];
- (2) Each monument or marker found or set shall be adequately described and noted[.];
- (3) Of the three minimum monuments or markers, two shall be within 600 feet (180 meters) of the boundary and each other[.]; and
- (4) [Every point along the boundary, with the exception of meander lines, shall be within 600 feet (180 meters) of a monument or marker.] Each boundary monument shall be within 600 feet of two other boundary monuments or a boundary monument and a reference marker. Meander lines need not

be monumented.

Sec. 5. Section 20-300b-16 of the Regulations of Connecticut State Agencies is hereby amended as follows:

Sec. 20-300b-16. Land records research

- (a) Land Records Research shall include, but not be limited to, the following:
 - (1) an examination of the record descriptions of the property being surveyed;
 - (2) an examination of the record descriptions of the adjoining parcels;
 - (3) an examination of record surveys and subdivision maps of the land being surveyed and of adjoining parcels;
 - (4) an examination of tax assessor's plats and records;
 - (5) an examination of pertinent easements and other documents; and
 - (6) an examination of Probate Court records, when applicable.
- (b) All surveys presenting the surveyor's property/boundary opinion, except Dependent Resurveys, shall include a record search of the surveyed property's chain of title, with deeds going back not less than 40 years. Dependent Resurveys shall include a record search of the surveyed property's chain of title with deeds going back at least as old as the date of the survey relied upon.
- (c) The 40-year minimum requirement is not to be construed as a flat period of time to search a title. To determine the original intended boundary locations, most surveys require research well beyond the statutory 40-year period.
- (d) Identifying the owner of the property on the survey shall not constitute a certification as to the absolute ownership of the property. It shall however, indicate a record name or names in which the property stood at the time of the survey, without stating [all the] other interests which may pertain to the ownership of the property.

Sec. 6. Section 20-300b-18 of the Regulations of Connecticut State Agencies is hereby amended as follows:

Sec. 20-300b-18. Map drafting standards

- The following standards shall apply to all survey maps and plans:
- (1) the surveyor shall use map-making materials of a durable nature;
 - (2) all lettering shall be legible when reproduced;
 - (3) whenever more than one sheet is used, each sheet shall contain clearly labeled match lines and indicate both the number of each sheet and the total number of sheets;
 - (4) both a word scale and a graphic scale shall be depicted;
 - (5) a North arrow (with appropriate source reference) shall be depicted on every sheet;
 - (6) the first note shall state the standards to which the survey was prepared, the applicable Class or Classes of Accuracy, the Type or Types of Survey, and the Boundary Determination Category or Categories;
 - (7) when applicable, horizontal datum and vertical datum shall be noted;
 - (8) mapped features shall be depicted to an accuracy of 1/40 of map scale for surveys in feet and 1/1500 of map scale for surveys performed in metric measure; and
 - (9) when applicable, documents used in preparation shall be noted.

R-39 Rev. 02/2012

Statement of Purpose

These proposed regulations update and modernize the standards by which maps and surveys are created.

Existing regulation sections are being modified by the text within this proposed regulation.