

2.3.6 BOUNDARY AND TOPOGRAPHIC SURVEY REQUIREMENTS

2.3.6.1 Standards

All surveys shall be performed by land surveyors registered in the State of Connecticut. The Survey must include all areas that may be subject to construction operations including access beyond paved roads and staging areas. Include sufficient area (minimum of 50' from the proposed limits of construction) to determine the consequences of drainage and wetlands.

The survey drawings shall be the same size as the contract design drawings.

Proposed work shall be indicated on screened survey drawings. The screening shall be such that there is sufficient differentiation between existing conditions and proposed work but not so much that the existing information is not legible.

Each sheet shall have the registration seal of the surveyor, a certification of the standard of accuracy, and the date of the survey. Any information obtained from other sources or maps shall be noted giving date and origin of the information.

The scale for surveys shall normally be the scale most used at that facility. Otherwise, it shall be 1" = 20' or 1" = 40'. In all cases, the scale shall be an engineering scale.

Where large property surveys are involved, a smaller scale may be used. All plans shall be oriented in a similar manner, the usual is North to the top of the sheet, this shall be consistent with all other drawings for the structure in similar orientation.

Where the area surveyed involves more than one sheet, a key plan and adequately marked "match lines" shall appear on each sheet.

The edges of all digitized maps must exactly match digitally with those of all adjacent maps.

The digital representation of the common boundaries for all graphic features must be exactly the same, regardless of level/layer. Each feature within a map theme must be represented by a single graphic element (e.g., polygon, line, or line string).

Lines and line strings which represent the same graphic element must be continuous (i.e., not broken or segmented), unless that segmentation reflects a specific visual line type. Lines/strings representing the same type of data must not cross except at intersections.

Polygons must be closed (i.e., the first x- and y-coordinates must exactly match the last x- and y-coordinates). Each polygon (i.e., buildings) must have a single unique centroid to which attributes (i.e., an attribute table) can be attached. Polygons of the same coverage must not overlap and must cover the area of interest completely (i.e., have no gaps in coverage).

All graphic elements that connect must exactly connect digitally, without overlaps or gaps.

Straight lines must be represented by only the beginning and ending x- and y-coordinate points. Line strings must not cross back on themselves or be of zero length.

2.3.6.2 Bench Marks

On all surveys showing elevations, a bench mark shall be established within the area covered by the survey from:

1. Existing bench marks, if any, if the survey is on the grounds of an existing facility. The Department of Public Works (DPW) has on file benchmarks within many of the facilities.
2. From USGS or USC&GS if the above is not available.
3. From town or city datum most used in the locality, if within the limits of a developed area.

A note on the survey shall cover a description of the established benchmark and the reference datum. The established benchmark shall be a reasonably permanent object located outside the contemplated construction area and preferably within 600 feet of the proposed construction.

2.3.6.3 Boundary Surveys

Where boundary lines are required, each boundary line of the lot shall be located and show accurately measured or computed lengths and directions based on the close traverse.

Where no permanent markers exist, permanent markers shall be installed at each corner and at the P.C. and P.T. of curves. Such permanent markers shall be 3 to 4 foot long ½ inch diameter steel rods, unless specifically instructed to install concrete monument posts. All markers and monuments to be set a minimum of 1 inch above the existing grade. The drawing shall show the names of streets and names of adjacent property owners with indications of the limit of adjacent owners property on the boundary line.

The standard of accuracy for boundary line surveys shall be Class A-2 as defined in the "Regulations of Connecticut State Agencies, Sections 20-300b-1 thru 20-300b-20" of the Connecticut General Statutes (CGS).

On boundary line surveys, a certified written description agreeing with measurements and courses given on the plot reading in a clockwise direction shall be submitted.

Deed references shall be noted on the map.

2.3.6.4 Topographic Surveys

The standard of accuracy for topographic surveys shall be either Class T-2 or T-3 as defined in the "Regulations of Connecticut State Agencies, Sections 20-300b-1 thru 20-300b-20" of the Connecticut General Statutes.

Where topography is required, the following requirements shall be applicable:

1. Contours at 2 foot intervals, except for flat areas where 1 foot contours or spot elevations will best show the ground elevations. At least two benchmarks and two control points shall be provided.

2. Elevation of floors, top of manhole frames, paved streets, curbs, culvert inverts and adjacent waterways.
3. Location of buildings, retaining walls, ditches, streams, stream channel encroachment lines, flood plain lines, manholes, catch basins, culverts, poles, fire hydrants, streets, drives, walks, fences, hedges, boundary of wooded sections, isolated trees with size and type, and any other man made or natural features which would interfere with or cause obstruction to developing the land for further construction.
4. The survey services shall include a record search for prior building and utility occupancy. The survey research shall include review of prior agency plans for the project area and a review of DEP aerial photos for the years 1950+ and 1970+ (20 years and 40 years prior to the survey). If prior occupation is found, the outline of the previous buildings shall be shown on the final survey.
5. Any obvious features which shows the location of utilities that are serving or could serve the area including inverts of storm and sanitary sewers at manholes. Include also inverts of steam lines, bottom of electrical duct bank(s) elevations, etc. at manholes.
6. Locations of existing underground structures and obtaining elevations of the same such as underground tanks, water lines and other utilities including valve boxes serving the area. Agency Utility plans shall be researched and the "recorded: u/g Utility data shall be shown.
7. On all surveys where topography only is required and there is no existing building, Street, or bounded property line within 300 feet of contemplated construction, two temporary base lines at right angles to each other with ties shall be established outside the contemplated work area. Ends of the base line shall be marked by 1 inch diameter rods driven 2 feet into the ground.
8. The topographic survey shall show the "as drilled" location of each boring and test pit. Refer to "Subsurface Investigation Requirements" in Section 2.3.7.
9. When wetlands, watercourses, or other waterbodies occur within the survey area, their limits shall be shown. Wetlands shall be delineated by a soil scientist. Refer to "Surficial Soil Investigation Requirements- Wetlands Delineation" Section 2.3.6.8.

2.3.6.5 Legend

A legend shall be provided

2.3.6.6 Consultant's Responsibilities

The consultant shall be responsible for including all general survey requirements in the survey proposal requests. In addition, the survey proposal requests shall indicate certain specific requirements such as a specific orientation, specific scale, a specific datum, etc., that complies with requirements previously mentioned. The surveyor is not the one to determine orientation, scale datum etc.

2.3.6.7 Submittals

One mylar of the completed survey must be submitted to the applicable DPW Team of the DPW prior to the project manager approving payment for the survey. Final mapping to be prepared in AutoCAD latest release. Surveys shall be provided in the Connecticut State Plane Coordinate System, feet, North America Datum of 1983 (horizontal), and North American Vertical Datum of 1988 (vertical). The completed survey shall also be submitted in an electronic format on a compact disk and submitted to:

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Technical Services – Environmental Planning
165 Capitol Avenue, Room 275
Hartford, Connecticut 06106
Phone: (860) 713-5706
Email: jeffrey.bolton@po.state.ct.us

2.3.6.8 Surficial Soil Investigation Requirements – Wetlands Delineation

Wetlands shall be delineated by a registered soil scientist (having a minimum of 3 years professional experience in soil science) in accordance with both Section 22a-38, CGS (Inland Wetlands Act), and the current federal delineation method, (Corps of Engineers Wetlands Delineation Manual).