

# Dartmouth Survey Standards

## A. Survey Mapping

1. Provide an accurate topographic, planimetric, utility map of as-built conditions, and mapped locations and elevations of constructed facilities / elements including as-built and exposed underground utilities. Survey work in progress as required to accurately locate constructed facilities / elements. Survey final condition of project extents at final acceptance.
  - a. Site related elements including:
    - Sidewalks, ramps, curbs, and gutters - indicate type and surface material.
    - Streets, drive ways, parking areas, labeled with material.
    - Fences, walls, steps, handrails, signs, site furniture and light fixtures labeled with material.
    - Live trees which have a trunk diameter of three inches (3”) or greater and all isolated or specimen trees. Measure tree trunk 3’ above grade. Indicate approximate trunk diameter, “drip line” and common name of tree.
    - Shrubs, show outlines of shrub masses.
    - Streams and bodies of water.
    - At-grade building footprints
  - b. Utility related elements and supporting infrastructure including:
    - Manholes, catch basins, drain inlets, cleanouts, vent stacks, tanks, underdrains, foundation drains, monitoring wells, detention/retention/filtration facilities, utility protection structures (pipe sleeves, concrete half-pipes, tunnels, etc.). Label type (sanitary or storm), dimensions and material of structure and cover/grate; pipe connections; sizes, materials, direction of flow and invert elevations. Locate and identify size, material, and invert elevations for culverts. Existing tunnels need not be surveyed unless the extents have been modified.
    - Water, gas, central steam, chilled water or other pressure lines, valve boxes, meter boxes, hydrants, tanks, fittings, etc. Label type, size, material, elevations at building walls and all intersections, connections and vertical angle changes.

- Manholes, handholes, utility poles, above and below ground ductbanks, conduits and direct buried cables including but not limited to power, street lighting, communications (containing public and private telcom services, fire, CATV, etc.), traffic control and sensors, fire and police call boxes, public communication or display facilities. Label utility as direct buried, in conduit, or concrete encased duct. Identify elevations at building walls and all intersections, connections and vertical angle changes. Label all utilities and associated duct banks or conduits with sizes and materials.
  - Existing and abandoned utilities exposed during construction. Show ends of abandoned utilities left in place and assumed continued direction of utilities. Label with information as listed above.
  - Building foundations
- c. The Project Extents shall cover any site or utility related element which was constructed or reconstructed during the project. Those elements not falling under this definition need not be included in the as-built survey. Exceptions to this may be made on a case by case basis.
2. Survey mapping shall be done under the personal supervision of a Surveyor, registered in and licensed by the State of New Hampshire, who shall certify under his/her seal the accuracy of the survey.
  3. Field Survey Accuracy:
    - Horizontal and Vertical mapping shall be ACSM Second Order Class II, 1 in 20,000.
    - Geodetic Surveys Marker OD1297 in College Park will be used as a common starting point for all surveys
    - [http://www.ngs.noaa.gov/cgi-bin/ds\\_mark.prl?PidBox=OD1297](http://www.ngs.noaa.gov/cgi-bin/ds_mark.prl?PidBox=OD1297)
  4. Coordinate base:
    - NAD83 StatePlane New Hampshire FIPS 2800 Feet, with elevations in NAVD '88 in feet.
  5. Each different feature shall be drafted on a separate named CAD level/layer in AutoCAD format using the following American Public Works Association (APWA) symbology of color, line style, line weight, and cells.

- White = Proposed Excavation*
- Pink = Temporary Survey Markings*
- Red = Electric Power Lines, Cables, Conduit and Lighting Cables*
- Yellow = Gas, Oil, Steam, Petroleum or Gaseous Materials*
- Orange = Communication, Alarm or Signal Lines, Cables or Conduit*

- *Blue = Potable Water*
- *Purple = Reclaimed Water, Irrigation and Slurry Lines*
- *Green = Sewer and Drain Lines*

6. Provide an ASCII file list of coordinates for all survey points including control, feature, and topographic in the following comma delimited format: Point number, Northing coordinate, Easting coordinate, Elevation coordinate, Point description.
7. Topography and spot elevations:
  - a. Topographic contours shall be accurately plotted at one foot (1') contour intervals.
  - b. Record spot grade elevations as follows:
    - i. Within natural ground and lawn and planted areas, spot elevations shall be shown to one-tenth of a foot (0.1'). Within all areas of built-up improvements such as pavements, curbs, steps, walls, utility and drainage systems or other site improvements, spot elevations shall be shown to one-hundredth of a foot (0.01').
    - ii. Existing grade at building corners; and thresholds and finished floor at all entrance, exit, or access points.
    - iii. Develop road cross sections at 50-foot intervals maximum, record spot elevations for all drive centerlines and all beginning radius of street intersections. For each cross section obtain elevations for front and back of existing sidewalk, top and bottom of curb, and centerline of the street. Obtain elevations for centerline intersection of all roads. Exceptions for this may be made on a case by case bases, if surveyor takes an appropriate number of defining shots along curbs, sidewalks, and centerlines so sections can be cut anywhere it is desired.
    - iv. For trees of three inches to eighteen inches (3" - 18") in diameter, record elevation at high and low side at base of trunk. For specimen trees of eighteen inches (18") or greater diameter, indicate four (4) spot elevations on the north, south, east, and west at base of each trunk to one-hundredth (.01) foot elevation.
    - v. Base, top, corners, and at cheek walls for all steps. Indicate elevations at top and bottom of walls at 20-foot intervals maximum.
    - vi. Rim elevations of all catch basins, drain inlets, manholes, valve boxes, slabs on grade. Inverts at all sewer pipes and culverts. Bottom of structure floor and sump.