



Policy 17

SURVEY CONTROL SYSTEM REQUIREMENTS

The purpose of this policy is to clarify plat requirements relative to section **44-92.2** of the *Knoxville-Knox County Minimum Subdivision Regulations* and for the use of the City of Knoxville's Survey Control System. The City of Knoxville's Survey Control System is currently based on the **NAD83 (2011/PA11/MA11) Epoch 2010.00**. To assist surveyors in tying surveys in the City of Knoxville to the System, the Department of Engineering has established a network of survey control monuments (points) within the city. New points continue to be established and published as needed and as resources permit. Information published for each point includes the date established, datum, northing and easting coordinates, latitude and longitude, elevations, scale factor, convergence angle, azimuth point numbers, description, and location information, etc. This information is published by the Engineering Department and is available at www.knoxvilletn.gov/government/city_departments_offices/engineering/civil_engineering_division/survey_control_points/.

Section **0820-03-.07(1)(c)** in the *Standards of Practice*, contained in the *Rules of Tennessee State Board of Examiners for Land Surveyors*, addresses north arrow requirements for general property surveys. It states the following:

"The North arrow shall be shown, and shall be correlated with, the courses or bearings, with the source of reference clearly indicated."

These rules can be obtained at <http://share.tn.gov/sos/rules/0820/0820.htm>.

Section **44-92.2** of the *Knoxville-Knox County Minimum Subdivision Regulations* defines those surveys that must be tied and rotated to the City of Knoxville survey control system. It also defines the information that must be shown on the plat. It states the following:

"All subdivisions within the City of five (5) or more lots and all resubdivisions within the City which combine or alter five (5) or more lots that have a property line or iron pin located within 2,000 feet of an approved control point in the City Survey Control System shall be tied to the system. All other subdivisions within the City that have a property line or iron pin located within 200 feet of an approved control point in the City Survey Control System shall be tied to the system.

Coordinates of the approved control point shall be shown on the plat and all bearings shown on the plat shall be oriented to the survey control system. The tie line shall show the bearing and distance between the approved control point and the subdivision."

The information required by the Standards of Practice and the Minimum Subdivision Regulations must be included on all survey plats. In addition, when a survey is tied to the City of Knoxville's survey control system, the following information will also be required:

1. The survey shall be tied to an approved survey control point and rotated to the **grid bearing** between that point and a nearby second approved survey control point. This **grid bearing** shall be the bearing computed between the published coordinates of these two points. These points become the **base control points** for the survey.
2. A **tie line** from a property corner to the **closest base control point** shall be shown. The **tie line** shall include the **grid bearing** and measured **ground distance** of the line. **Ground distance** is defined as

the horizontal distance between two points as measured at ground datum. When grid distances are shown on the survey plat the corresponding **ground distance** shall also be shown and each adequately identified or noted.

3. **Beginning January 1, 2010**, plats required to be tied to the City's survey control system shall include a reference to the *horizontal datum* that the published coordinates are based on. The published coordinates are based on the **NAD83 (2011/PA11/MA11) Epoch 2010.00** datum, which may also be noted as **NAD83 (2011)** for the North American Continent. On **June 6, 2014**, the City performed an adjustment of these published coordinates. There shall be a 90 day grace period beginning on June 6, 2014 in which the published data prior to this adjustment may still be used on submitted plats. However, all plats subject to Policy 17, and submitted after **September 4, 2014**, shall be referenced to the current system, unless otherwise approved by the Engineering Director
4. The *point identification number* and the latest published *north* and *east coordinate* of the *base control point* at the end of the *tie line* shall be labeled on the plat verbatim as published, including *all* digits after the decimal point. The *horizontal datum* in Item 3 above shall be noted on the plat.
5. The *grid north meridian* shall be identified properly. When labeling the north arrow, "**GRID NORTH (NAD83 (2011))**", is preferred to labels such as "NAD-83", "SPCS", "Tennessee Lambert Grid", etc. Do not label the North arrow as "KGIS" or any variation thereof. A statement shall be on the plat indicating the horizontal datum reference, for example **NAD83 (2011/PA11/MA11) Epoch 2010.00** or **NAD83 (2011)**, which is the accepted abbreviation in North America..
6. To explain the basis for the *grid north meridian*, the following note shall be shown on the plat. This note also clarifies that distances are horizontal at ground datum and have not been converted to *grid distances* by applying a datum adjustment factor.

"GRID NORTH is based on a bearing of X Deg° Min' Sec" Y from City Control Point # _____ to # _____ . Distances have not been reduced to grid."

At the surveyor's discretion, a note may be added to the grid north statement to explain the difference in coordinates due to the adjustment by the City effective June 6, 2014.

If added the note should read as follows:

"Survey control data is based on a City of Knoxville adjustment effective June 6, 2014"

7. If a published elevation for an approved control point is labeled on the plat, the proper *vertical reference datum* must also be labeled, for example "NGVD29" or "NAVD88". Both elevations are included in the published data. Elevations shall be labeled verbatim as published, including all digits after the decimal point.

When selecting the *base control points* for a survey, the integrity of those points should be confirmed at the beginning of the survey by carefully inspecting the points and measuring and comparing the *ground distance* between them to the *grid distance* computed from the published coordinates. **When utilizing the city control system, ground distances should be longer than grid distances by a factor of approximately 1.0001 (about 0.10 feet longer per 1,000 feet). Please report any missing, disturbed, or otherwise unusable control points to the City Surveyor by calling (865) 215-6100.**

Survey control data for the City of Knoxville Survey Control System is published and maintained by the Department of Engineering. This data is available at

www.knoxvilletn.gov/government/city_departments_offices/engineering/civil_engineering_division/survey_control_points.

It is also available through the Technical Services office (phone 865-215-2103) located in Room 462 of the City County Building at 400 Main Street, Knoxville, Tennessee 37901.