

**SPECIFICATIONS FOR TOPOGRAPHIC AND PLANIMETRIC MAPPING,
INCLUDING GROUND, AIRBORNE, AND SPACEBORNE SURVEYS**

(a) General.

- (1) "Topographic surveys" are defined as surveys that have as their major purpose the determination of the configuration (relief) of the earth (ground) and the location of natural or artificial objects thereon.
- (2) "Planimetric mapping" is defined as producing a map that presents the horizontal positions only for the features represented. This is distinguished from a topographic map by the omission of relief in measurable form.
- (3) "Airborne and spaceborne surveys" are defined as the use of photogrammetry, LIDAR, IFSAR, or other similar measurement technologies for obtaining reliable information about physical objects and the environment, including terrain surface, through the process of recording, measuring, and interpreting images and patterns of electromagnetic radiant energy and other phenomena. This Rule establishes minimum allowable photogrammetric production procedures and standards for photogrammetric mapping and digital data production.

(b) Production procedures for topographic and planimetric mapping surveys shall be in accordance with the standards established by Part 3 of the Federal Geographic Data Committee (FGDC) Geospatial Positioning Accuracy Standard and applicable extensions and revisions. These standards are incorporated by reference including subsequent amendments and editions. The material is available from the FGDC at www.fgdc.gov at no cost. Reporting accuracy shall be in accordance with Part 1 of the FGDC geospatial standards.

(c) Topographic or planimetric maps, orthophotos, and related electronic data, unless marked as "Preliminary Map," shall meet one of the below classes, as contractually specified to FGDC Standards, or National Agriculture Imagery Program of the US Department of Agriculture (NAIP) Standards, or to State adopted base mapping standards for horizontal and vertical accuracies. The NAIP imagery standards are incorporated by reference including subsequent amendments and editions and may be accessed free of charge at http://www.fsa.usda.gov/Internet/FSA_File/naip_info_sheet_2013.pdf. In the absence of a specified standard, the surveyor shall conform the survey to the requirements for a Class B survey.

- (1) For horizontal accuracy, the five general classifications are:
 - (A) Class AA surveys. For Class AA surveys in North Carolina, the relative accuracy shall be equal to or no less than 0.033 meter (0.10 feet);
 - (B) Class A surveys. For Class A surveys in North Carolina, the relative accuracy shall be equal to or less than 0.5 meter (1.64 feet);
 - (C) Class B surveys. For Class B surveys in North Carolina, the relative accuracy shall be equal to or less than 1.0 meter (3.28 feet);
 - (D) Class C surveys. For Class C surveys in North Carolina, the relative accuracy shall be equal to or less than 2 meters (6.56 feet); and
 - (E) Class D surveys. For Class D surveys in North Carolina, the relative accuracy shall be equal to or less than 5 meters (16.40 feet).
- (2) For vertical accuracy, the three general classifications are:
 - (A) Urban and suburban vertical control surveys (Class A). Urban and suburban vertical control surveys include lands that lie within or adjoin a town or city. For Class A vertical control surveys in North Carolina, the vertical error in feet shall not exceed 0.10 times the square root of the number of miles run from the reference datum.
 - (B) Other vertical control surveys (Class B). Other vertical control surveys include all lands which are not covered by Class A as described in Part (A) of this Subparagraph. For Class B vertical control surveys in North Carolina, the vertical error in feet shall not exceed 0.20 times the square root of the number of miles run from the reference datum.
 - (C) Trigonometric vertical control surveys (Class C). Trigonometric vertical control surveys shall be used for vertical control for aerial and topographic mapping. The vertical error in feet shall not exceed 0.3 times the square root of the number of miles run from the reference datum.

(d) When the resulting product is a digital (electronic) data set, or a map or document that consists of more than one sheet or otherwise cannot be certified, a project report shall be certified. The report shall be marked "Preliminary" if applicable.

(e) Ground control for topographic and planimetric mapping projects shall be in North Carolina State Plane Coordinate System grid coordinates and distances when the project is tied to grid. A minimum of one permanent project vertical control point shall be shown.

(f) The project map or report shall contain the following information:

- (1) Date of original data acquisition;
- (2) Altitude of sensor and sensor focal length, as applicable;
- (3) Date of document or data set compilation;
- (4) If hard copy product is produced, the maps shall contain a north arrow, map legend, final document scale, including bargraph, and contour interval, as applicable;
- (5) Coordinate system for horizontal and vertical denoting SI or English units (i.e., NAD83, assumed, or other coordinate system);
- (6) A list or note showing the control points used for the project. The minimum data shown for each point shall include: physical attributes (e.g. iron rod, railroad spike), latitude and longitude (or X and Y Grid coordinates), and elevation, as applicable;
- (7) If other data is included, the source and accuracy of those items shall be indicated;
- (8) For topographic maps or data sets, contours in areas obscured by man-made or natural features shall be uniquely identified or enclosed by a polygon identifying the obscured area. The accuracies of the contours or of features in this obscured area shall be noted "No reliance is to be placed on the accuracy of these contours;"
- (9) A vicinity map depicting the project location on the first sheet of all hard copy maps or in the report accompanying digital files; and
- (10) The name of the client for whom the project was conducted.

(g) Nothing in this Rule shall be construed to negate or replace the relative accuracy standards found in Rules .1601 through .1608 of this Section.

(h) A certificate, substantially in the following form, shall be affixed to all maps or reports:

" I, _____, certify that this project was completed under my direct and responsible charge from an actual survey made under my supervision; that this _____ (insert as appropriate: ground, airborne or spaceborne) survey was performed at the ___ percent confidence level to meet Federal Geographic Data Committee Standards; that this survey was performed to meet the requirements for a topographic/planimetric survey to the accuracy of Class ___ and vertical accuracy when applicable to the Class ___ standard, and that the original data was obtained on _____(date)_____; that the survey was completed on ___(date)_____; that contours shown as [broken lines] may not meet the stated standard; and all coordinates are based on _____ 'NAD 83' and realization (date of adjustment of coordinate system) or 'NAD 27' and all elevations are based on _____ (NGVD 29, NAVD 88, or other)."

(i) Documents transmitted electronically shall have the computer-generated seal removed from the original file and a copy of the project report shall be certified and sent to the client. The electronic data shall have the following inserted in lieu of the signature and date:

"This document originally issued and sealed by (name of sealer), (license number), on (date of sealing). This electronic media shall not be considered a certified document. See the project report for certificate and seal."

History Note: Authority G.S. 89C-10; 89C-16; 89C-20;

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Pursuant to G.S. 150B-21.3A, rule is necessary without substantive public interest Eff. April 27, 2019.