
**Rules of
Department of Economic
Development**

**Division 30—Missouri Board for Architects,
Professional Engineers and Professional Land Surveyors
Chapter 20—Mapping Survey Standards**

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Title 4—DEPARTMENT OF ECONOMIC DEVELOPMENT
Division 30—Missouri Board for Architects, Professional Engineers and Professional Land Surveyors
Chapter 20—Mapping Survey Standards

4 CSR 30-20.010 Definitions

PURPOSE: This rule defines the terms used in this chapter.

(1) A map is a graphic representation of the physical features (natural, artificial, or both) of a part of the whole of the earth's surface, by means of signs and symbols or photographic imagery, at an established scale, on a specified projection, and with the means of orientation indicated. A map may be in various forms such as printed maps, subdivision of land in the form of plats, or in graphic presentations on a computer screen such as in a Geographic Information System (GIS) or in a Land Information System (LIS).

(2) Horizontal map accuracy is defined as the root mean square (rms) error in terms of the project's planimetric survey coordinates (X,Y) for checked points as determined at full (ground) scale of the map. The rms error is the cumulative result of all errors including those introduced by the processes of ground control surveys, map compilation, and final extraction of ground dimensions from the map.

(3) Vertical map accuracy is defined as the rms error in elevation in terms of the project's elevation datum or well-defined points only.

(4) The rms error is defined to be the square root of the average of the squared discrepancies. In this case, the discrepancies are the differences in coordinate or elevation values as derived from the map and as determined by an independent survey of higher accuracy (check survey). Well-defined points are those that are easily visible and recoverable on the ground, such as: monuments or markers, bench marks, property boundary monuments; intersections of roads, railroads, etc.; corners of large buildings or structures (or center points of small buildings); etc. In general what is well defined will also be determined by what is plottable on the scale of the map within one one-hundredth inch (1/100"). Thus while the intersection of two (2) road or property lines meeting at right angles would come within a sensible interpretation, identification of the intersection of such lines meeting at an acute angle would obviously not be

practicable within one one-hundredth inch (1/100"). Similarly, features not identifiable upon the ground within close limits are not to be considered as test points within the limits quoted, even though their positions may be scaled closely upon the map. In this class would come timber lines, soil boundaries, etc.

AUTHORITY: section 327.041, RSMo Supp. 1993.* Original rule filed May 3, 1994, effective Dec. 30, 1994.

**Original authority:* 327.041, RSMo 1969, amended 1981, 1986, 1989, 1993, 1995, 1999.

4 CSR 30-20.020 Map Accuracy Standards

PURPOSE: This rule prescribes minimum acceptable mapping standards.

(1) Horizontal Accuracy.
 (A) Class I. The root mean square (rms) error of a map product shall be less than 0.01 of one inch (1") on the map or in the case of a metric map, 0.025 of one centimeter (1 cm) on the map.

EXAMPLE (Customary Units)

Scale	Limiting rms Value in Feet
1" = 20'	0.2'
1" = 50'	0.5'
1" = 100'	1.0'
1" = 200'	2.0'
1" = 400'	4.0'
1" = 1000'	10.0'
1" = 2000'	20.0'

EXAMPLE (SI Units)

Scale	Limiting rms Value in Meters
1 cm = 5m	0.125
1 cm = 10m	0.250
1 cm = 100m	2.50
1 cm = 200m	5.00

(B) Class II. The rms shall be twice that required for Class I.
 (C) Class III. The rms shall be three (3) times that required for Class I.

(2) Vertical Accuracy.
 (A) Class I. For Class I maps rms error in elevation shall be less than one-third (1/3) of the indicated contour interval for well-defined points only, and one-sixth (1/6) of the contour interval for spot heights.

(B) Class II. The rms error may be twice that required for Class I.

(C) Class III. The rms error may be three (3) times that required for Class I.

(3) Mixed Accuracy. A map may be compiled that complies with one (1) class of accuracy in elevation and another in planimetry.

AUTHORITY: section 327.041, RSMo Supp. 1993.* Original rule filed May 3, 1994, effective Dec. 30, 1994.

**Original authority:* 327.041, RSMo 1969, amended 1981, 1986, 1989, 1993, 1995, 1999.

4 CSR 30-20.030 Certification of the Map

PURPOSE: This rule prescribes the statement made by the surveyor of the map.

(1) Maps meeting the requirements of this standard shall note this fact on their legends with the statement that "This map complies with the Missouri Map Accuracy Standard." The class of accuracy shall also be noted.

(2) When a map is a considerable enlargement of a completed map, that fact shall be stated in the legend. The scale of the original map shall also be noted.

AUTHORITY: section 327.041, RSMo Supp. 1993.* Original rule filed May 3, 1994, effective Dec. 30, 1994.

**Original authority:* 327.041, RSMo 1969, amended 1981, 1986, 1989, 1993, 1995, 1999.