Digital Submission Standard

Appendix B

Submission Standard (https://www.mass.gov/service-details/massgis-standard-for-digital-plan-submission-to-municipalities). Language used in this modified standard was taken from the MassGIS version.

Under this standard, plans produced using computer aided drafting and design (CADD) software, must be accompanied by a digital file containing a subset of the features in the CADD file. This subset of features is referred to as the Standard Digital File or SDF (see page 2 of MassGIS Digital Submission Standard for further detail about SDF).

The SDF is not simply a copy of the CADD file used to print development plans. It does not include information about bearings (distances are required), the title block, border, or notes from the CADD file.

- The SDF cannot be required if the development plans being submitted to a municipality were prepared by hand.

- Only features present in the source CADD file for the project for which approval is sought must be included in the SDF.

The SDF will be used as a source for maintaining map features and associated information in the GIS database of any municipality using this standard.

The printed plan will remain the official document.

The SDF must meet the following requirements;

1. Plan View

    a. The required subset of CADD file layers of the affected construction area shall be submitted, in plan view, as one comprehensive drawing file. Plan view is defined as all "entities" on the same plane of zero elevation in the drawing coordinate space.

2. File Format

    a. File format shall be the AutoCAD DWG (alternatively ASCII DXF) file format; most GIS software can read DWG or DXF file format. DXF files can be created by all the major CADD and GIS packages.

3. Delivery Method

    a. The SDF shall be delivered on a CD-ROM disk, digitally or any other media as specified by the municipality implementing this standard.

    b. The delivered SDF should include the following information;

        i. Project or subdivision name.

        ii. The name of the land owner and of the preparer of the plan/SDF.

        iii. The name and version of the CADD software used to create the SDF.

    iv. Project address or, if no address, a descriptive location.

    v. The date or dates when the survey work was performed.

4. <u>Graphic Specifications</u>

  a. Reference to external CADD layers ("XREF") <u>must </u>be removed and the referenced information included directly in the SDF.

  b. The SDF must be created in the "World Coordinate System" in model space (or the Massachusetts Coordinate System, see below), it must have a one-to-one (1:1) DWG scale, where one (1) drawing unit = one (1) U.S. Survey Foot. The coordinate system base must be the same as the AutoCAD system coordinate base or equivalent with the north rotation up. In other words the project (N,E,Z) should equal the CADD (Y,X,Z). The North Rotation must be 0°.

  c. When the SDF is in the Massachusetts Coordinate System, all of requirement 'b' above applies.

  d. When creating line features that represent polygons in a GIS, CADD users must snap end points of lines together and must make sure polygons close (e.g. property boundaries).

  e. All line features shall be of a continuous line-type, such that each individual line/pipe feature (i.e. each segment) is only broken at the ends where a node/structure is located.

  f. Straight lines must be represented by only the beginning and ending x- and y-coordinate points. The <u>exception </u>to this is a line developed from multiple traverses on the <u>same </u>bearing where the coordinates differ only in the "z" values. <u>Line strings must not cross back on themselves or have a zero length (i.e., points).</u>

  g. All point features (see FEATURE TYPE in Table 1) shall be entered using standard point/node symbols.

5. <u>Adobe PDF Format File</u>

  a. A copy of the original CADD file that was the source of the layers in the SDF file must accompany the SDF; this copy must be in <u>Adobe PDF format. </u>This requirement ensures that the municipality receiving the SDF has an electronic reference copy of the original CADD File that cannot be altered electronically and that fully and appropriately credits the source of the SDF.

6. <u>SDF Coordinate System</u>

  a. The coordinate system of the SDF must be the Massachusetts Coordinate System, North American Datum 1983, with units of U.S. Survey Feet. The vertical datum must be North American Vertical Datum 1988, <u>unless </u>the municipality using this standard requires that the local vertical datum be used.

    i. <u>If the local vertical datum is required</u>, the city or town <u>must </u>provide a conversion factor between the local vertical datum and NAVD88. This

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> conversion factor should be developed using the North American Vertical Datum Conversion (VERTCON) algorithm.

b. If a temporary benchmark (TBM) is created, it must be shown and labeled in the SDF.

c. The horizontal and, as applicable, vertical accuracy of the features in the SDF must match those of the surveyed locations depicted on the printed plan to which the SDF is a companion submission.

d. The plan in the SDF shall be submitted with a minimum two points of spatial reference.

  i. The two points of spatial reference for the SDF are only required if useable reference points are within 750 feet (via survey traverse) of the project's boundaries.

  ii. These reference points can be one or both of the following types, depending on what is available in a community:

   1. FGDC Second Order, Class II (FGDC-STD-007.4-2002 Table A-1) or better survey control monument locations.

   2. The centers of manholes, fire hydrant spindles, or catch basins; utility poles may also serve as reference points. Alternatively or in addition, a municipality may choose to provide photo-identifiable points (e.g., ends of specific parking stripes, junctions of lines painted on publicly accessible outdoor basketball or tennis courts) from their orthophoto base map that are currently visible on the ground.

  iii. Features being referenced must appear in the SDF; their locations must be determined as part of completing the field survey work for the project depicted in the SDF.

  iv. The points selected for reference in the SDF must be separated by as much distance as is possible given the features available to choose from.