

An Introduction to the Digital Data Submission Standards

The City of Indianapolis/Marion County has adopted GIS technologies to store, manage, and maintain geographic spatially-related data. Included in this data are representations of the City/County's storm and sanitary sewer systems, edges of pavement, sidewalks, parcels, rights-of-way, structures, etc. It is the goal of the City/County to use GIS and CAD technologies to expedite the design and review processes within the administration by developing standards and procedures for integrating digital-engineered drawings into the GIS environment while maintaining the integrity and positional accuracy of this data.

Digital submittals are comprised primarily of two parts:

- A. **CAD version of the working drawings, including plan/profile sheets, cross-sections, details, title sheet, etc.** These are not subject to the requirements set forth in the "Digital Data Submission Standards". These drawings will be checked for their ability to be opened and read, for their format, and their completeness. Specifically, the following requirements should be met:
 1. The submittal must include an index of drawings, preferably in a text format, or a notation directing the reviewer to an index on the title sheet.
 2. Only drawings relevant to the project's phase of submittal shall be included. For example, do not include "As-bid" drawings in an "As-built" submittal. Also, do not include drawings or documents that would not normally be included in the set of printed drawings, except for base drawings or drawings to be X-REF'ed (externally referenced).
 3. We would prefer you do not use symbols or linetypes, in CAD drawings, from third-party software, unless they are free domain property, as some of these will not be visible when opening the drawings.
 4. Include a label on the media indicating project name and number, company name, type of submittal (As-bid or As-built), date of submittal, and file format.
 5. Each individual drawing sheet should be in a separate drawing file. Avoid putting multiple sheet drawings in one file (cross section sheets may be combined, however).

- B. **An overall plan view of the affected construction area, showing the new construction, deletion or alteration of infrastructure and its related properties.** This drawing is subject to the requirements of the standards, and will be used by the City/County's GIS section to input data into the GIS system. There are some basic "rules" that apply to the process of creating the proposed or altered features within the overall plan drawing. These must be adhered to in order for the data to be efficiently downloaded into the GIS. These "rules" are as follows:
 1. The drawing shall be in State Plane coordinates with two points of geodetic control. (Refer to page 1 of the standards)
 2. New infrastructure features, such as manholes, inlets, or runs of sewer pipe are to each have unique identifiers number shown on the drawing. It is desirable that a single segment (the portion of sewer line between two structures) of sanitary sewer, for example, have the same number as its upstream structure. The identifier numbers should be visible on the drawing in a standard font and the lower left-hand corner of the text should touch the point or linear graphic feature to which it corresponds, unless legibility requires that the label be moved and accompanied by a leader arrow. The

- labels are to be on any layer other than the feature layer. A range of available numbers can be obtained from the GIS section by calling Sandeep Barre at 327-7865. You may also use your own numbering scheme as long as it follows the criteria mentioned above.
3. Sewer lines (sanitary and storm) are to be entered as a single line between structures, as opposed to double lines, or a continuous polyline running through structures. That is, each sewer or open channel section between structures must be a separate single-line entity. Avoid using polylines, except where turns in the line do not have structures, i.e., along force mains.
 4. Sanitary, storm and open channel lines must be digitized in the direction of their physical flow. The beginning point of the line would be its upstream end and the ending point its downstream end.
 5. The Digital Standards includes a list of specific layer names and layer colors (page 4). Features must be placed on their appropriate layers. CAD systems which use a numbering system for layers instead of names must also include a conversion chart explaining which layer number = layer name. Existing features must be in the color specified in the Standards. Proposed features may be in any other color, so long as it's not the same as the existing feature color.
 6. The end points of sewer or open channel lines must be snapped to the end points of connecting lines, with a structure node being snapped to the end points also. A point feature may be used to represent a structure, such as a manhole or inlet, or a symbol block may be used, as long as its insertion point is also at the point of intersection or end point of a line. In either case, its unique identifier number must be shown as a label on a separate layer.
 7. Miscellaneous features and text should be placed on separate layers, apart from those used by GIS.

The Department of Public Works will furnish the design consultant with the following, upon request:

1. Data file(s) of the existing GIS mapping in the vicinity of the project boundaries, or beyond, if so specified. These are commonly referred to as "IMAGIS" files (Indianapolis Mapping and Geographic Infrastructure System). The file(s) will be in the CAD format that is most compatible with the consultant's CAD software.
2. A copy of the most recent revision of the "Digital Data Submission Standards" in Adobe Acrobat format.
3. Blank database files to be used for the entry of attribute information into tables in dbase IV format (see explanation below).
4. Lookup tables with the appropriate abbreviations or terms for items to be entered into the dbase tables.
5. Other relevant files.
6. Sample storm sewer drawings and populated attribute tables.

Requests for data and standards tables should be made through the DPW project manager.

Beginning on page 6 of the standards are the requirements for filling in the attribute tables for sewer and signal structures and lines. The unique identifier numbers established on the overall plan must also be present in the tables in order to create a link between the graphics and the attribute data. Please note that some fields are required information, while others are not. Any

additional information that can be entered into the database that is not required would be most helpful and appreciated.

The Department will also furnish sample drawings and attribute tables to illustrate the requirements outlined here. The disk contains a storm sewer sample drawing in AutoCAD14 format (other formats may be requested), the associated attribute tables filled in, in dbase IV format and copied to Excel, and a copy of the digital standards.

Upon review of the digital submittals, the Department may be contacting the consultant to discuss any problems or omissions. It is in the Department's best interest to cooperate fully with the consultant in the resolution of problems. Questions regarding the standards should be made to either the DPW Senior Technician Specialist, or a representative of the GIS section. Contact names and numbers may be obtained through the DPW project manager.

It is important that the consultant read over the entire digital standards document to become as familiar with it's requirements as possible, and should be the first source of reference when questions arise. As a result of the digital submittal process, the City/County anticipates a shorter time period between the initial submittal of a project and its final approval. In addition, savings will result in the form of data input time, costs, and manpower, providing more efficient services at numerous levels of City/County operations.