SEWER DIGITAL DATA SUBMISSION STANDARDS

2018

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Introduction

Citizens Energy Group (Citizens) has adopted Geographic Information System (GIS) technologies to store, manage, and maintain its assets. The design industry has implemented computer aided design and drafting (CAD) as a design/production tool. It is the goal of Citizens to implement these technologies to expedite the design and review processes within the administration, by developing standards and procedures for integration of digital engineering CAD drawings into the GIS environment while maintaining the integrity and positional accuracy of the data. Citizens will require Digital Plan Data and Digital GIS Data to be submitted based on the standards set forth in this document.

Note: *This document is in reference only to Citizens sewer assets superseding any and all City of Indianapolis Department of Public Works Digital Submission Standards (referring to sanitary and Citizens owned combined sewer system assets) and The City of Westfield (referring to sanitary sewer assets). Refer to City of Indianapolis Department of Public Works Digital Submission Standards and The City of Westfield Digital Submission Standards for assets such as MS4 Storm, Pavement, etc.*

Definitions and Terms

Citizens: Citizens Energy Group

Citizens Project Manager: Citizens representative responsible for maintaining communications with Contractor, Inspector, and Consultant/Developer as needed throughout the project

GIS Specialist: Citizens representative responsible for reviewing all *Digital GIS Data* submittals to ensure they meet Citizens' digital data submissions standards requirements

Inspector: Project representative responsible for collaborating with Contractor to review and verify *Redline Drawing* and collaborate with Consultant/Developer to produce *As-built Record Drawing*

Redline Drawing: Markup plans from Contractor identifying all differences from the Design Plans and how the project was built in the field including As-built locations of Sewer Mains and Appurtenances. Inspector will review and verify the information provided.

As-built Record Drawing: Revised drawing submitted by Consultant/Developer, which includes information from Inspector verified *Redline Drawings*

Record Drawing Digital GIS Data: Digital Data submitted by the Consultant/Developer, meeting digital data standards requirements, representing the project as it was built in the field

Reference Documents

1. Digital Data Submittal Checklist
2. CD Label template
3. Sample CAD file
4. As-built Checklist
5. Attribute Excel files
    a. Lateral
    b. Lift Station
    c. Main
    d. Manhole

Note: *Reference documents are available on the Citizens website under Permits & Forms*

Contents of Digital Data Submission

Files (checklist, PDF/tif, CAD, and Excel) are to be completed by the Consultant/Developer and shall be prepared per the most recent Sewer Digital Data Submission Standards provided on the Citizens website. These documents shall represent the project in the status in which it is submitted (planning, design, constructed).

Private development projects shall be submitted online through the Box.com folder specific to the project. For all other projects standard transfer media will be accepted. This includes CD-ROM and DVD disks. The disks shall be properly labeled using the provided CD label template with the following information, if applicable.

- Citizens project number
- Project name
- Type of submission (As-built Record Drawing, etc.)
- Citizens Project Manager or contact name
- Name of the firm or organization creating the submittal and contact name
- The submittal/creation date of the media

Digital GIS Data Submittals require the following information:

- PDF/tif format file of drawing plans and profiles

- CAD format file must be in *State Plane East projection, NAD 1983 State Plane Indiana East, US Feet* and compatible with ESRI ArcGIS (refer to supplied CAD file for layers and annotation placement)
- Excel attribute tables filled out completely and without modifications

Note: *Constructed or modified storm elements within the combined sewer system of Indianapolis may be assets of Citizens Energy Group and will be required to meet these standards for submission.*

Digital GIS Data Requirements

As-built Record Drawings

- **Complete set of as-built record drawings (PDF/tif formats)**

  This set of plans shall represent the project as constructed. When adjusting plans to reflect project as it was constructed, the original design is to be left intact and modification to actual construction information shall be marked up as cross-outs and/or revision clouds. It is also acceptable to adjust the plans by hand so as long as any mark-ups are clear and legible.

Note: *If the project is non-capital and assets are to be owned and operated by a private company, individual, association, or organization, PDF plans are to be stamped "PRIVATE" on each sheet submitted.*

As-built Locations

- **Digital file of all constructed/modified features (dwg/dgn/dxf formats)**

  Modified CAD file showing corrected locations of designed features, connections to existing features, required annotation, and other pertinent information regarding final constructed locations. Requirements for this file are as follows:

  a) All information for new or altered elements in the project and all accompanying geodetic control shall be placed into one CAD file. The features in drawing files will be translated to real world locations. The geodetic control chosen must correspond to the existing features within Citizens GIS (*State Plane East projection, NAD 1983 State Plane Indiana East, US Feet*).

  b) Acceptable control includes section corners and quarter section corners. State Plane coordinates exist for most quarter section corners in Marion and surrounding counties. Control assistance can be obtained by contacting the County Surveyor's Office. It is a requirement that the control used be referenced and shown in the plan drawing. If point of control is located *within* the project limits, it should be symbolically indicated and annotated

in the design file. If the nearest control is located well *outside* of the project area, then it should be tied to another geodetic control point used and a reference tie annotated and indicated. Any land survey information, such as basis of bearings and or any assumptions must be submitted and annotated on the submitted file.

c) Features shall be submitted on the specified layer shown below. CAD systems which use a numbering system for layers instead of names shall also include a conversion chart explaining which layer number corresponds to the appropriate GIS layer name:
   1. Sanitary Structures (SANSTR)
   2. Sanitary Sewer Mains (SANSEWER)
   3. Sanitary Laterals (SANLAT)
   4. Sanitary Easements (SANEASE)
   5. Geodetic Control (CNTRL)

d) Altered existing features shall use a different color than the new/improved infrastructure. It is at the discretion of the submitting firm as to colors.

e) Only layers that contain data shall be included in submission.

f) All sanitary lines are to be entered as a single line between structures, as opposed to double lines or a continuous polyline running through structures, i.e. each sewer section between structures must be a separate single line segment. Avoid using polylines, except where turns in the line do not have structures present (including valves), i.e. along force mains or instances where flexible pipe is used to follow a curved path.

g) All sanitary lines must be digitized in the direction of their physical flow. The beginning point of the line shall be its upstream end and the ending point shall be its downstream end.

h) All lateral lines shall be drawn from the right-of-way lateral cleanout perpendicular to the sanitary main. End point of the lateral line shall snap to the sanitary main. If the lateral is not perpendicular to the main, lateral alignment shall be shown as constructed.

i) Structures and the endpoints of lines shall be input as points or nodes only.

j) The end points of sewer lines shall be snapped to nodes.

k) New or altered infrastructure features, such as manholes and runs of sewer pipe are to each have a unique identifying number, DSGN_ID (Design Identification) shown in the drawing. For existing infrastructure use Citizens established UNITID (Asset Identification – Citizens assigned) for those structures.

l) It is required that a single segment (the portion of sewer line between two structures) of sanitary sewer have the exact same UNITID/DSGN_ID as its upstream structure.

m) The UNITID/DSGN_ID 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.

n) Do not use AutoCAD "leaders" as these are not visible to GIS. Instead, use a simple line on a separate layer apart from those used by Citizens GIS.

o) Miscellaneous features and text (except UNITID/DGSN_ID) should be placed on separate layers, apart from those used by Citizens GIS.

Additional Notes:

Existing sewer facilities found on site/in the field may not be present within the GIS data provided and should be identified and noted as such when submitting the Digital GIS Data drawing by inserting text or a callout on a layer apart from those used by Citizens GIS.

It is not necessary to submit all CAD files and external references along with the final modified horizontal alignment. These files are not incorporated into GIS or archived.

Attribute Tables

- **Excel file of attributes of all constructed/modified features. (xls format)**

  Many of Citizens' sanitary features have a significant number of descriptive attributes stored in GIS. These attributes are derived from the Record Drawings submitted to Citizens. Approved Excel attribute tables contain the fields and validated data which is needed to be provided to Citizens regarding new or modified sanitary assets. The files have been developed implanting data validation and embedding formulas to assist with proper population.

  Each record in the file shall be assigned a unique DSGN_ID, which will correspond to text labels in the CAD file showing the referenced feature. The unique numbers for each feature shall be listed within the DSGN_ID column, with the corresponding attributes for each feature provided in the corresponding rows. This will allow Citizens GIS personnel to sort and import this data into GIS and assign the data to appropriate features imported from the submitted design file. All attributes are required for new or modified features.

  The Excel files shall be returned in the same file format as was given, and any modifications to table structure and/or format may result in a rejection of the submission. Each table contains a

Field Descriptions tab which describes each field name and contents. All attribute fields with a 'YES' flag under the 'Required' column must be populated with the appropriate data for Citizens to accept the entire As-built submission.

Record Drawing Digital GIS Data Submittal Review

A letter of Acceptance or Rejection will be provided to the Citizens Project Manager for each Digital Submission after initial review for completeness.

Rejected Submittal

- The Consultant/Developer shall correct and re-submit the incorrect portions of the submittal as detailed in the Rejection letter for re-review.
- After the re-submittal is reviewed and if accepted, a letter of Acceptance will be issued.

Revision History

- Released for Approval within Citizens Energy Group – 9/12/2013
- Excel attribute table revision – 10/02/2013
- Standards document and Excel attribute table revision – 3/17/2014
- Standards document revision – 9/28/2018