CITY OF COLUMBIA ENGINEERING REGULATIONS
PART 28: DIGITAL DATA SUBMISSION STANDARDS
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CITY OF COLUMBIA ENGINEERING REGULATIONS
PART 28: DIGITAL DATA SUBMISSION STANDARDS

Updated: 02/16/2016

28.1 Standards

Purpose: The purpose of this document is to provide a set of standards for digital data that is submitted to the City of Columbia. The need for these standards has arisen due to the universal use of different technologies that aide the process of planning and development design review. Geographic Information Systems (GIS) and Computer Aided Drafting (CAD) have become prominent technologies that are used in the review process.

These standards are designed to assist in efficiently transferring data among consultants, the city, and other agencies (i.e. Richland/Lexington County, State, Federal, etc). In addition to making data more easily transferrable, these standards will also help to streamline the process in which data is entered into the GIS. This is extremely important because the City of Columbia is becoming more geocentrically focused in its approach to asset management. This inherently means that the city depends upon complete and spatially accurate data. The standards within this document will help to maintain the spatial accuracy of city assets. Much of this document is adopted from Richland County digital data submission standards as to make data more easily transferrable between the City of Columbia and the county since both entities have interests in each other's activities.

In addition to standard paper documents, any engineering plan that is submitted to the City of Columbia must have the additional digital files submitted:

- A completed original CAD drawing in .dwg or .dxf format. This file shall include all layers and graphic elements included in the submitted paper document (text, legend, scale, labels, etc.). This file will include features classified in the standard layers defined in Appendix A. If the drawing contains layers that are not included in Appendix A, then a list of these layers shall also be submitted (ASCII text file labeled: 'xlyrspec.txt'). The completed CAD drawing file should contain text in standard fonts that can be read without third-party software.

- A metadata text file containing information listed in Appendix B. This file includes submittal information as well as technical parameters that may be necessary to review if problems in data conversion occur. The ASCII text file will be labeled 'metadat.txt'.

- An ASCII text file containing elevation points. When submitting plans that include surveyed ground surfaces, a separate ASCII text file containing all elevation points shall be delivered.

- When possible, a personal geodatabase shall be provided with the appropriate feature datasets and feature classes containing the collected data. The horizontal and vertical positional accuracies should be included within the attribute table of each feature class. Any attributes to be collected in the field must be agreed upon by the City of Columbia and the contractor before the contract is approved.

These attributes shall be filled out as completely as possible. Any shortcomings shall be explained in a separate text file.

Additionally, digitally submitted data must meet the following requirements:

- The media on which the City of Columbia receives the data shall be stored either on a CD-ROM or DVD. The use of email and/or an FTP site will be reviewed on a case-by-case basis per the project manager. The deliverable must be labeled with: 1) a drawing title, 2) the type of drawing, 3) the submitter information, and 4) a date.

- All drawing elements shall be submitted referencing South Carolina State Plane (SCSP) Coordinates. Features in drawing files that are stored in drawing units must be translated to represent real world locations as referenced by SCSP coordinates. As specified in the SC Code of Laws Chapter 2, Title 27 (The South Carolina Coordinate Act, amended 31Mar89), elements referencing SCSP (formally identified as the South Carolina Coordinate System) will utilize the **North American Datum of 1983 (NAD83) HARN** for horizontal control and be measured in **International Feet (not US Survey Foot)**. Vertical control will reference the **North American Vertical Datum of 1988 (NAVD88)** and shall include measures using the **US Survey Foot**. The SCSP system includes a single zone identified as Federal Information Processing Standard zone 3900 (FIPS 3900). Caution must be exercised in performing all conversions involving submitted data to ensure the correct use of the International Foot. Errors in conversion can exceed four linear feet. It is not the intention of the City of Columbia to replicate legal surveys. With this in mind, control of plan features may be tied to the SCSP system using traditional surveying or GPS methods. The method employed to gain geodetic control shall be identified in the submitted 'metadata.txt' file.

- Drawing features shall include layer names as indicated in Appendix A. Features other than those thematically defined by the individual layer name/description shall not be included in that layer.

- No annotation shall be included in any feature layer and no feature shall be included in any annotation layer. Annotation for each layer shall be placed in annotation layers as specified in Appendix A.

- Closure is critical in converting drawing elements to GIS features. Parcels/lots (layer #2 PARCEL1), subdivision boundaries (layer#3: SUBDIV1), rights-of-way (layer #4: ROW1), and common areas (layer #5: COMAREA1), Buildings (layer #7: BLDG1), Pavement Edge (Layer #16: PAVEDGE1), Easements (layer #26: EAS), Building Setbacks (layer #27 EASBLD), Buffers (layer #28 BUFF), Floodplains (layer #30: FP), Floodway (layer #31: FW) Wetlands, (layer #32 WETLANDS) must be snapped closed

- No polylines or annotation shall be stored in blocks. Explode all blocks that do exist.

- All City of Columbia required layers shall be made visible prior to submission – all other layers can be turned off.

- Submitted .dxf files shall contain only complete parcel polygon features. All partial polygons (parcel boundaries) shown for reference in drawings (.dwg files) are not to be included in the PARCEL layer (Appendix A). Such features can be included in an unnamed layer in the submitted .dxf file.

- All coordinates shall be delivered in a single, comma-delimited ASCII text file. Each line of the file shall contain easting, northing, and elevation values (in SCSP coordinates) for a single point as exampled below:
  Easting, Northing, Elevation
  2012374.63, 853633.30343, 447.52
  2012371.81, 853642.06532, 447.49
  2012370.56, 853651.25382, 447.62
  202369.81, 853660.04853, 448.02

- Additional layers (not identified in Appendix A) may utilize any open layer beyond the 60 reserved layers. As outlined above, a list of these layers shall also be submitted (ASCII text file labeled: 'slyrspec.txt')

28.2 Appendix A

Table 28-1. *Graphic File (.dxf) Specifications*

Color Number	Layer Name	Feature Type	Layer Description
1	BLDG1	Polyline	Building/structure outline or footprint
2	PARCEL1	Polyline	Parcel/lot boundaries
3	SUBDIV1	Polyline	Subdivision boundaries
4	ROW1	Polyline	Rights of way delineating private/public land boundary
5	COMAREA1	Polyline	Public areas such as street islands/community entrances
6	GCP1	Point	Ground control points (existing, surveyed, or GPSed)
7	POLE1	Point	Lamp poles, power poles, traffic light poles, etc.
8			
9			
10	GAS	Polyline	Gas pipe
11	ELECTR	Polyline	Electrical lines
12	TELCO	Polyline	Phone lines
13	CTVFIBR	Polyline	Cable TV and/or fiber datacom lines
14			
15			
16	PAVEDGE1	Polyline	Edge of pavement
17	CNTRLIN1	Polyline	Street/road centerlines (paved and unpaved)
18	SIDEWLK1	Polyline	Sidewalks (including ramps, if any)
19	CURB1	Polyline	Curb/gutter
20	CARPRK1	Polyline	Parking lots
21	RAIL1	Polyline	Railroads
22	HYDLIN1	Polyline	Linear hydrography, creeks/streams
23	HYDPOL1	Polyline	Polygonal hydrography, lakes/ponds
24			
25			
26	EAS	Polyline	Utilities, wildlife, transp., storm drainage/detention, etc.
27	EASBLD	Polyline	Building setback
28	BUFF	Polyline	Buffers (riparian, vegetation, etc.)
29			
30	FP	Polyline	Flood plain
31	FW	Polyline	Flood way
32	WETLAND	Polyline	Wetlands
33			
34			
35	SDLINK	Polyline	Storm drain culvert, ditch, pipe, etc.
36	SDNODE	Point	Storm drain structure (manhole, junction box, etc.)
37	SDTEXT	Text	Annotation describing storm drainage (SD) features
38			
39	SSLINK	Polyline	Sanitary sewer pipe

Color Number	Layer Name	Feature Type	Layer Description
40	SSNODE	Point	Sanitary sewer manholes, pumps, junctions, etc.
41	SSTEXT	Text	Annotation describing sanitary sewer (SS) features
42			
43	WTRLINK	Polyline	Water pipe
44	WTRNODE	Point	Water access/junction box, valves, etc.
45	FIREHYD	Point	Fire hydrant
46	WTRTEXT	Text	Annotation describing water service (WTR) features
47	CTOUR1	Polyline	Un-broken contour lines (* design/as-built)
48			
49			
50			
51	LOTNUM1	Text	Proposed parcel lot number
52	LOTDIM1	Text	Bearings, distances, acreage, and x/y of POB
53	SUBNAM1	Text	Subdivision name
54	RDNAME1	Text	Street/road name
55	RDNAME2	Text	Road number (Federal, State, County highways, etc.)
56	PAVTYPE1	Text	* Pavement type
57	RAILNAM1	Text	Railroad name
58	HYDNAM1	Text	Hydrographic feature name
59	EASTYPE	Text	Type of easement (utility, transp., wildlife, storm, etc.)
60	CTOURVAL	Text	Elevation of individual contours

* Level 56 - Pavement type (PAVTYPE1) shall include the following standard surface designations:

- Asphalt Concrete
- Bituminous Surfacing
- Concrete
- Gravel
- Dirt

28.3 Appendix B

Table 28-2. *Metadata Text File ('metadat.txt') Specifications*

Subdivision Name: Submittal Date:
County:
City:

Parent Parcel #:
Number of Lots:

Type of Geodetic Control:
- Monument Reference: Y / N
- Traverse to Monument
- Referenced Monument Name/Number:
- Distance to Monument:
- GPS
- Unit Type:
- PDOP of Control Points:
- Differentially Corrected: Y / N
- Elevation Reference: Y / N

Prepared by/Firm Name:

Engineer of Record:

Drawing/File Name:

Software/Version Used: