STANDARD SPECIFICATIONS FOR DIGITAL SUBMITTAL OF DOCUMENTS & ELECTRONIC DATA

FOR

IMPROVEMENT PLANS, FINAL PLATS, SITE PLANS, & GIS DATA

Document History

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1.0 INTRODUCTION

1.1 The City of Shreveport will leverage the increase use of digital mapping in public and private organizations to facilitate the development of more efficient and accurate digital records. Thus, this effort will ultimately improve efficiency in data collection and reduce duplication among different departments. Furthermore, the intent for this requirement is to:

1.1.1. Enable the production of digital data from the same file without modification.

1.1.2. Access to all available digital parcel and site development data.

1.1.3. Provide standards for which the submission of plans to the City of Shreveport will be made in electronic format.

1.1.4. Be consistent with the coordinate geometry (COGO) and reference to La. R.S. 50:7 Geographic Coordinate System (GCS) North American 1983, Datum North American of 1983 (NAD 83) State Plane Louisiana North FIPS 1701 Feet and tied to the City of Shreveport Control Network monuments as published by the Department of Engineering and Environmental Services. Vertical control points should follow the La. R.S. 50:17.3.1 North American Vertical Datum of 1988 (NAVD 88).

1.2 The Digital Submission Requirement applies specifically to all plans submitted and recorded by the City of Shreveport and will be verified in accordance with Digital Submittal Check List (Appendix C.) Individual survey descriptions are not specifically referenced in this requirement, but certainly will be encouraged and accepted.

1.3 If the applicant does not have the capability to submit digital files of the developed area, the City of Shreveport staff shall create the graphic Portable Document File (PDF) and recover the cost through plan check fees. The plan check fees, given in the table below, are based on the actual amount of staff time and facilities to input the line work data manually. This cost is per plan sheet in the set, excluding cover sheets, and detail sheets. This cost is above and beyond the cost of converting the line work information to GIS. This amount shall be added to the total cost of any plan submission fees.

Size Sheet	Cost/Sheet
D (24” x 36”) at 1” = 100’	$ 6.00

Plans submitted and accepted on sizes other than the standard 24" x 36" format, and failing to meet the Digital submission requirements will be charged the equivalent per square foot charged for the line density and clarity listed above.

In the event the applicant submitting development information to the City of Shreveport feels that compliance with the requirements stated above will create a hardship, applicant may appeal to City Engineer.

1.4 In addition to standard paper documents, digital files relating to any submission will accompany each document/plan delivered to the City of Shreveport. Digital files to be submitted include:

1.4.1. A completed original CAD drawing in .dxf, .dwg, or .dgn format or ESRI shapefiles (.shp plus related files) or file geodatabase (.gdb.) This file shall include all layers and/or graphic elements included in the submitted paper document whenever possible (text, legend, scale, labels, etc.)

1.4.2. An ASCII text, comma delimited file containing any elevation points will accompany submitting plans that include surveyed ground surfaces, the ASCII text file containing all elevation points shall be delivered as specified in 1.5.6.

1.4.3. The model space of the submitted drawing should contain entire project (showing property lines, improvements, etc.) and it should not be divided into sheets (used for plotting purposes.)

1.5 To expedite the conversion of CAD data into the City of Shreveport GIS, the following requirements shall be met:

1.5.1. Standard transfer media to be accepted will be a CD-ROM and/or DVD+R, compressed zip file by email, USB mass-storage device or any other media device compatible with the City's IT protocol at no additional cost to the City. The submitted media shall be labeled with: drawing number; project name or number; type of media; date of submittal; type of drawing (i.e. As-built, Preliminary, etc.); company name; contact information (name, affiliation); contact phone number; and email address.

1.5.2. All drawing elements shall be submitted referencing Louisiana State Plane Coordinates. Features in drawing files that are stormed in drawing units must be translated to represent real world location as referenced by La. R.S. 50:7 and La. R.S. 50: 17.3.1. Elements referencing Louisiana State Plane Coordinates will utilize the NAD 83 for horizontal control and be measured in US Survey Foot Feet (not international Foot). Vertical control will reference the NAVD 88 and shall include measured using the US Survey Foot. The Louisiana Coordinate system includes a single zone

identified as Federal Information Processing Standard zone 1701 (FIPS 1701). Caution must be exercised in performing all conversions involving submitted data to ensure the correct use of the US Survey feet. Errors in conversion **can not exceed four linear feet**. It is not the intention of the City of Shreveport to replicate legal surveys. With this in mind, control plan features must be tied to the Louisiana State Plane Coordinate system using traditional surveying or GPS methods. The method employed to gain geodetic control shall be identified in the submitted 'metadata.txt or 'metadata.xml' file as described in Appendix B.

1.5.3. 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. Only features elements are to be included on individual layers. Annotation for each layer shall be placed in annotation layers as specified in Appendix A. Additional layers (not identified in Appendix A.) may utilize any layer name. As outlined above a list of these layers shall also be submitted (ASCII text file labeled: 'xtrdata.txt'.)

1.5.4. Closure is critical in converting CAD elements to GIS features, all polygonal features (i.e. parcel boundaries) and shall be 'snapped' to closed and polyline features shall be 'snapped' to connect to each other.

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

1.5.6. All elevation points shall be delivered in a single comma-delimited ASCII txt file. Each line of the file shall contain values for a single point as follows utilizing the coordinate system in reference in 1.5.2:

Easting, Northing, Elevation, Location
2012374.63, 853633.30343, 447.52, Spot
2012371.81, 853642.06532, 447.49, NW Corner Building
2012370.56, 853651.25382, 447.62, SE Corner parking lot
202369.81, 853660.04853, 448.02

1.5.7. GIS data shall also include metadata created with accordance to the standards specified by The Federal Geographic Data Committee and a Data Model poster of the geodatabase schema (i.e. subtypes, domains, data types) in PDF format or Microsoft Visio format (i.e. .vsd, .vss, .vst, .vdx, .vsx, or .vtx.) Each element of the data model shall be identified with

distinct color backgrounds and related connections (i.e. ESRI Street and Address Data Model.)

2.0 FILE NAMING CONVENTIONS

The flies will be named according to the plan name with extension .DXF/.DWG for CAD type, .DGN for Microstation, .SHP (plus related files) for Shapefile, and .GDB for File Geodatabase. Examples:

Tract Map _____, _____

Minor Subdivision _____, _____

Improvement Plan _____, _____

Grading Plan _____, _____

3.0 DATA LAYERING REQUIREMENTS

All plans shall follow the previous specifications in 1.4 and 1.5 of these said standards. In additional, the following submittal format will be designated for each document submittal:

3.1 Final Maps, Parcel Maps, and Subdivision Plats:
Submittal will consist of the following:

3.1.1 file(s) of the entire map submittal area;
3.1.2 layers description as stated in Table 1., Appendix A. (digital file/hard copy)

3.2 Site Plans:
Submittal will consist of the following:
3.2.1 file(s) of the entire map submittal area;
3.2.2 layers description as stated in Table 2., Appendix A. (digital file/hard copy)

4.0 GIS INFORMATION SUBMISSION REQUIREMENTS & STANDARDS

4.1. GIS Data Deliverable Requirements:

All GIS data must adhere to the requirements and standards listed in this document.

4.1.1. Where possible, the contractor will utilize source GIS data provided by the City of Shreveport (City).
   a. The contractor shall be provided a copy of any GIS data required within an ESRI Local Government template (File Geodatabase or access to data via GIS services) through the City's FTP site or external hard drive at no additional cost to the City.
   b. The contractor shall consult with the City's GIS Administrator before populating the attribute tables to ensure the population matches the needs of the City. Feature class metadata are required for all updated or newly created layer.

4.1.2. The GIS deliverables shall be delivered on disc (CD-ROM or DVD) or external hard drive provided by the contractor at no additional cost to the City.

4.1.3. Reporting: The contractor shall provide a document (Excel format) that lists all the layers developed or updated for the task.

4.1.4. Maps: In addition to any hardcopy of softcopy maps delivered, all source maps (ESRI ArcGIS .mxds) for these maps shall be provided to the City.

4.1.5. In addition, a Data Model shall be provided for each dataset/feature class in accordance with 1.5.7 section of this document.

4.1.6. Acceptable data formats for GIS deliverables are, in order of preference: file geodatabase or shapefile (latest version), provided that the data adhere to the following requirements regarding the coordinate system, metadata, feature attribution and data integrity:
   a. Projected Coordinate System: All datasets need to be delivered as mention in section 1.1.4.
   b. Metadata: The contractor will deliver metadata for each feature class in accordance with the latest Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (CSDGM) (i.e. ISO 19115-2, 19115-1, & 19139) in an XML format. The following elements must be included as part of the deliverable:

Contact Details

Contact information for the data steward Person

Organization

Position

Telephone

Email

Description – characterization of the data
Abstract
Purpose
Time Period - explains how current the dataset is
Currently Reference
Date
Keywords – word/phrase descriptors of the data
Data Quality
Positional Accuracy – accuracy assessment of the data
Horizontal Accuracy Report
Vertical Accuracy Report (if applicable)
Source Information – list of sources and a short citation of each
Source Citation (Details)
Title Originator
Publication Date
Process Step – an explanation of how/when the data was created
Process Description
Process Date
Spatial Reference
Horizontal Coordinate System
Vertical Coordinate System (if applicable) – vertical datum information
Datum Name
Distance Units

c. The contractor shall employ appropriate QA/QC standards to ensure that data is topologically correct, accurate, and complete (to include):
    - No erroneous overshoots, undershoots, dangles or intersection in the line work.
    - Point and line features will be snapped together where appropriate to support networks. For example, do not break linear features for labeling or other aesthetic purposes.
    - Lines should be continuous and point features should be digitized as points. For example, point features, such as manholes, should not be drawn using only a circle (polygon) to represent its location. Preferably, use an attribute block symbol that has an intersection point in the center of the manhole.
    - No sliver polygons.
    - Digital representation of the common boundaries for all graphic features must be coincident, regardless of feature layer.

- Geometric network connectivity must be maintained for utility networks as current version of the ESRI Local Government Information Model for Utilities, Transportation, etc.
- A summary of the methods used to correct inconsistencies and any remaining errors by case should be included in the metadata under the 'Logical Consistency Report' and 'Completeness Report' sections.

d. Data accuracy standards for all deliverables will be in accordance with those set forth in the section entitled 'Field Collection Procedures' and 'Data Collection Procedures'. All deliverables should include an accuracy report in the metadata.

4.1.7. Field Collection Procedures

a. Where field data collection is stipulated in the contract, the contractor shall utilize conventional and other methods, such as a total station, or Global Positional System (GPS) in accordance with the applicable Geospatial Position Accuracy Standards published by the Federal Geographic Data Committee (FGDC).
b. At a minimum, the contract shall provide, resource grade GPS collection at an accuracy level of +/- <1 m. and shall use differential correction to target accuracies of +/- .5 m.
c. Where appropriate (as stipulated in the contract or as otherwise determined by the City GIS Administrator), the contractor shall use survey grade GPS, at an accuracy level of +/- 20cm. Global Positioning System (GPS) data collection activities will be based on a post-processed environment using an accurately sighted base station. Base station files for post processing acquired locally (off-site CORS Continuous Operating Reference Station) will be verified for accuracy.
d. GPS data on the location of utility lines and other features shall be captured at a minimum every 50ft and at each turn or bend in the line and processed as a line feature type. GPS data on the location of utility points and other features should be captured at the centroid of the feature unless signal obstruction or access prohibits; otherwise points will be captured at a uniform distance and direction from the centroid and the offset captured in the metadata for that feature. Data on polygon features will be collected at every vertex of the feature and processed as a polygon.
e. All survey-grade data collected shall be provided to the City in a digital format with an attached Survey Report identifying survey method, equipment list, calibration documentation, survey layout, description of control points, control diagrams, quality control report and field survey data.

f. A digital Survey Control Database will be produced for all survey control points established under the contract, including the horizontal and vertical order and coordinate location of each point.
g. Where Digitizing/Conversion is stipulated in the contract, the contractor shall digitize/convert features from designated sources (including remotely sensed data, hardcopy scans and vector data) to support various GIS applications.

4.1.8. Data Collection Procedures
All data collection must include:
a. Feature Attributes: The contractor shall identify the necessary attributes (specified by the City GIS Administrator) for all new/updated/edited features first by field verification and then by existing sources.
b. Feature Attributes should have a Foreign Key and Unique ID clearly identified.
c. Table relationships should be clearly stated and defined as stated in section 1.5.7 of this document.
d. Metadata must include accuracy statement at the 90% or 95% confidence interval. Accuracy statements should include the method of determination, preferably from a recognized standard such as National Standard for Spatial Data Accuracy (NSSDA).

4.1.9. Review Process: The City shall review the submitted data and documentation within one month to QA the data. The City will then forward the contractor the information for completion. The contractor will have one month to make any corrections and produce the final deliverable. Failure to adhere to any of the stated delivery specifications could result in rejection of deliverables and nonpayment. Contractors should, at the minimum, submit data and documentation samples at 25% and 75% project completion to avoid the rejection of final deliverables.

APPENDIX A.

Table 1. Final Maps, Parcel Maps, and Subdivision Plats

Item No	Layer Name	Feature Type	Layer Description
1-1	Acreage	Text	Total Acreage, Total Lot Acreage, Total ROW acreage
1-2	Base	Text	North arrow,
1-3	Citylimits	Polyline/Polygon	City limit boundry
1-4	Coord	Point	Coordinate values and tic marks
1-5	Coordtext	Text	Coordinate text
1-6	Dimension	Text	All plat dimensions
1-7	Flood	Polyline/Polygon	100 year flood lines
1-8	Floodtext	Text	Flood plain text
1-9	Floodway	Polyline/Polygon	100 year floodway lines
1-10	Hatch	Point	Hatching and shading
1-11	Lots	Polyline/Polygon	Lot lines, setbacks, servitudes (each lot to be a closed polygon)
1-12	Lottext	Text	Lot Numbers and other lot text
1-13	Mon	Point	Monument markers
1-14	Montext	Text	Monument text
1-15	Plattext	Text	Plat text (Title, preamble, declarations, etc)
1-16	POS	Polyline	Procedure of survey lines
1-17	ROW	Polyline/Polygon	ROW lines (ROW to be a closed polygon)
1-18	ROWcl	Polyline	Center line of the ROW
1-19	Servitude	Polyline/Polygon	Public/private servitudes
1-20	Streams	Polyline/Polygon	Watercourse
1-21	StreetCL	Polyline	Street centerline
1-22	Thalweg	Polyline/Polygon	Watercourse thalwegs

Table 2. Site Plans

In addition to the items shown in Table 1 the following will be included in the Site Plan submittal.

Item No.	Layer Name	Feature Type	Layer Description
2-1	Detention	Polyline/Polygon	Detention Facilities
2-2	Existdrives	Polyline/Polygon	Existing Driveways
2-3	Existfences	Polyline/Polygon	Existing Fences
2-4	Existfootprint	Polyline/Polygon	Footprints of Existing buildings
2-5	Existgrd	Text	Existing grade text
2-6	Existingcurb	Polyline/Polygon	Existing Curbs
2-7	Existpavedge	Polyline/Polygon	Existing Pavement Edge
2-8	Existwalks	Polyline/Polygon	Existing Sidewalks
2-9	Fingrd	Text	Finished grade text
2-10	GAS	Polyline	Utilities – gas distribution
2-11	Geogno	Text	Assessor parcel ID number
2-12	Propdrives	Polyline/Polygon	Proposed Driveways
2-13	Propfence	Polyline/Polygon	Proposed Fences
2-14	Propfootprint	Polyline/Polygon	Proposed Footprint
2-15	Propwalks	Polyline/Polygon	Proposed Sidewalks
2-16	UtilelecOH	Polyline	Utilities – electrical: overhead
2-17	Utilsewer	Polyline	Utilities – sewer main
2-18	UtiltelOH	Polyline	Utilities – telephone: overhead
2-19	UtiltelUG	Polyline	Utilities – telephone: underground
2-20	UtiltvOH	Polyline	Utilities – cable TV: overhead
2-21	UtiltvUG	Polyline	Utilities – cable TV: underground
2-22	Utilwater	Polyline	Utilities – water supply

APPENDIX B.

Metadata Text File ('metadata.txt') Specifications for CAD

Subdivision Name: _____ Submittal Date: _____

Parish: _____ 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: _____

APPENDIX C.

CAD Digital Submittal Check List

Format of Data for Digital Submittal

- ☐ (Autodesk) .DWG format. Version: _____
- ☐ (Autodesk) .DXF format. Version: _____
- ☐ (Microstation) .DGN format. Version: _____
- ☐ (Shapefile) .SHP, .SHP.XML, .SBX, .SBN, .SHX, .DBF, .PRJ. format Version: _____
- ☐ (File Geodatabase) .GDB format. Version: _____

Basis of Bearings and Coordinate Reference

Horizontal Control:

☐ Geographic Coordinate System (GCS) North American 1983, Datum North American of 1983 (NAD 83) State Plane Louisiana North FIPS 1701 Feet

Vertical Control:

☐ North American Vertical Datum of 1988 (NAVD 88).

Data Layering Requirements

	File of the entire map submittal area	**Layers description file/sheet ('xtrdata.txt')**
Final Maps, Parcel Maps, and Subdivision Plats	☐	☐
Site Plans	☐	☐
Improvement Plans	☐	☐

Media Information Requirements

☐ Drawing No.: _____

☐ Project Name/No.: _____

☐ Media Type: _____ ☐ Date: ___ / ___ / ____

Type of Drawing: ☐ Draft ☐ Preliminary ☐ Final

☐ Company: _____

☐ Contact Name: _____

☐ Telephone No.: (_____) - _____ - _____

☐ Email Address: _____

Submittal Number

☐ MPC Zoning Number: _____

☐ MPC Case Number: _____

GIS Ancillary Data

☐ Metadata (.XML)

☐ Poster of Data Model (.PDF or referenced Microsoft Visio Format)

Note: *The Digital Submittal Checklist must be turned in along with the digital drawing to complete the submittal process.*