

**BROWARD COUNTY AVIATION DEPARTMENT (BCAD) ELECTRONIC MEDIA
SUBMITTAL REQUIREMENTS**
Last Revised 04/26/2017

Broward County Aviation Department (BCAD) utilizes electronic media as the principal way to develop, communicate and archive information concerning its various airport programs. Electronic media encompasses all methods of conveying digital information and files including e-mail, File Transfer Protocol (FTP), Compact Disc (CD) / Digital Video Disc (DVD), web-based file-sharing services, Universal Serial Bus (USB) and physical drives.

Prior to development of scope of services, BCAD will specify the deliverables to be provided via electronic media. **Prior to commencing work under any Contract, the Consultant/ Contractor must contact the Contract Administrator and/or designated Project Manager to verify they have a copy of the latest version of BCAD's Electronic Media Submittal Requirements, as well as any associated standards, specifications, procedures, or templates related to their scope of services.** BCAD modifies these documents as needed to make corrections and/or to keep up with latest industry trends, best practices, guidelines, standards and regulations, as well as to improve its internal processes. Some requirements below may not apply, or additional requirements may be needed, based on the nature of the scope of services and associated deliverables. Any deviations from the requirements below must be approved by BCAD's Contract Administrator or the Project Manager designated to approve or deny such requests.

Refer to BCAD GIS, CAD and BIM standards at:
<http://www.broward.org/Airport/Business/Standards>

(A) General Requirements:

- 1) All work, including surveying work, drawings, maps, details or other drawing information to be provided in electronic media by Consultant/Contractor shall be developed using computer-aided design (CAD), geographic information system (GIS), Building Information Modeling (BIM), and/or other software and procedures conforming to the following criteria. Electronic data submittals shall also include Portable Document Format (PDF) versions of specific pages and drawing sheets, as specified in the Contract.
- 2) All electronic media should be readable and function as intended without conversion or modification on the Microsoft Windows Operating System. All electronic media should be in their original editable file or data format, or accompanied by the original editable format (e.g., a PDF engineering drawing file must be accompanied by an original CAD file).

(B) Software Formats:

CAD Format

- 1) Provide all CAD data in Autodesk, Inc.'s AutoCAD release 2013 or later for Windows in native .DWG electronic file format. Consultants who do not use AutoCAD must ensure that translated DWGs that are provided can be used within AutoCAD.
- 2) Ensure that all digital files, data (e.g., constructs, elements, base files, prototype drawings, externally referenced files (XREFs), blocks, attribute links), and other files external to the drawing itself are compatible with the BCAD approved CAD and GIS software as noted above.

GIS Format

- 3) All GIS data shall be delivered in formats compatible with Esri ArcGIS version 10.1 or higher file geodatabase. Federal Aviation Administration Airports GIS (AGIS) data shall be submitted in Esri File Geodatabase format unless otherwise specified by BCAD.
- 4) All deliverables must include appropriate metadata conforming to BCAD and where applicable FAA standards. Metadata shall be in Extensible Markup Language (XML) format, unless specified otherwise in writing by the BCAD Contract Administrator or Project Manager.
- 5) When requested, the Consultant/Contractor will be required to ensure that all GIS data is formatted for successful submission to the FAA AGIS portal without any additional changes required by BCAD staff. Consultant/Contractor GIS and CAD data deliverables shall conform to the latest BCAD, and where applicable, FAA standards.
- 6) All database tables: conform to the structure and field-naming guidance provided by BCAD. Specifically, all database tables shall conform to applicable FAA and BCAD standards and guidelines. All databases shall be compliant with at least MS Access 2007 and/or other format (DBF, XML, Esri geodatabase, other) as requested by BCAD. Formats may change, at BCAD's request, depending on the particulars of the projects. Consultant/Contractor shall inform BCAD of the most suitable format for a given project and explain, in writing, the benefits of that format versus alternatives. BCAD has the final decision as to format regardless of Consultant's/Contractor's written explanation.

Additional Deliverable Requirements

- 7) The term "compatible" means that data can be accessed directly by the target CAD and GIS software without conversion, translation, pre-processing, or post-processing of the electronic data files.
- 8) Non-geospatial database delivered with CAD/GIS files must be provided in relational database format compatible with Microsoft Access 2007 or higher, and other compatible format requested by BCAD. See Section (E) (1) below, "Non-Graphical Format", for additional requirements for non-geospatial databases.
- 9) Maintain all linkages of non-spatial data with spatial elements, relationships between database tables, and report formats. Consultant/ Contractor should work with BCAD to ensure linkages will conform with and match those already in place or generated to create such links.
- 10) All CAD and GIS files shall meet FAA spatial accuracy requirements and be georeferenced as follows:

North American Datum (NAD) 83, HARN, US Survey Feet State Plane Coordinate System,
Florida East Zone North American Vertical Datum (NAVD) 88, US Survey Feet

(C) Standards:

- 1) Standard plotted drawing size: 22 inch x 34 inch sheets unless otherwise specified by BCAD. All drawings shall be formatted to use the BCAD standard Cover Page and Title Block.
- 2) CAD files should be named as described in BCAD's CAD Standard.
- 3) Layering:
 - a) CAD layers must be named according to BCAD's CAD Standard.
 - b) Submission of layers that do not conform to the standards listed above will require a written request using the form specified in BCAD's CAD standard and advance written BCAD approval.

- c) All raster files shall be delivered in georeferenced TIFF and compressed SID or JPEG2000 formats. If files must be tiled, a reference map will be provided depicting the location of each tile image. All raster files shall be tiled if file size reaches a size in excess of what BCAD finds difficult to use.

4) Attribute Definitions:

- a) Obtain latest guidance from BCAD concerning attribute definition, database linking and other information embedding requirements prior to production of data. All database information shall conform to the latest versions of FAA ACs 150/5300-16, 17, and 18, and other BCAD standards. Additional attributes may be required at the discretion of BCAD.
- b) CAD data shall be attributed following Section 4.2, "Object Data", of the BCAD CAD Standard, and by utilizing the standard object data tables included in each BCAD CAD template file. The specific object data tables and attributes to be populated should be coordinated and established with the BCAD Project Manager and BCAD GIS. BCAD requires object data functionality in its CAD Standard to accommodate asset attribution and allow BCAD to simplify the data migration process from CAD to GIS.

5) Conformance:

- a) No deviations from BCAD's established CAD/GIS standards will be permitted unless prior written approval of such deviation has been received from BCAD's Contract Administrator.
- b) Pre-coordinate the development, use and submittal of photorealistic renderings, animations, presentations and other visualization/ information tools utilized during the design and construction process to ensure compatibility of submittal with County's uses and information systems.
- c) Building Information Modeling (BIM) files should conform to BCAD's BIM guidelines and standards.

(D) Digital Photography:

Provide digital photography files and other miscellaneous graphics in JPEG format, unless required in an alternate format such as that needed for CAD, GIS, and/or BIM.

- 1) Photographs should be oriented properly for viewing without rotating the image (i.e., "up" should appear at the top).
- 2) Exchangeable Image File Format (Exif) data should be embedded in the JPEG photo files and included the data on which the photo was taken. Exterior photos should also include tags indicating the latitude and longitude at which the photo was taken.

(E) Non-Graphic Format:

- 1) Provide database files in relational database format compatible with Microsoft Access 2007 or higher, and/or other compatible SQL format database including all tables, form and report formats, fonts, typefaces, bit-map and vector graphics and other information necessary for printing. Ensure integrity of relational database structure. Consultant/Contractor may be required to ensure that database formats conform to and can be integrated with other BCAD legacy applications and systems.

- 2) **ADA Compliance.** As used in this section, ADA means the Americans with Disabilities Act, 42 U.S.C. 126, *et seq.*, and any of its regulations, and includes any Florida statute or County ordinance, policy or regulation intended to comply with any provision or regulation of the ADA.
 - a) If requested by BCAD, The Consultant shall provide BCAD with fully ADA accessible electronic files (the ADA Files) for posting on County’s website, including but not limited to fl.net.
 1. The ADA Files may include but are not limited to contracts, flyers, reports, or newsletters.
 2. County, in its sole discretion, may approve or reject the format and content of the ADA Files before posting the files on County’s website.
 - b) If Consultant is creating a separate website as part of its contract, the website must be fully ADA accessible, including any attachments to the website. County, in its sole discretion, may approve or reject the format and content of the fully accessible ADA website, including any attachments to the website.

(F) Delivery Media and Format:

- 1) Submit electronic media in conformance with this document when and as specified in Contracts and Work Authorizations.
- 2) Electronic data and files shall be provided on CD/DVD, as an e-mail attachment, via a Secure File Transfer Protocol (FTP) site, or via a password-protected web-based file sharing service (e.g., DropBox, Box, SharePoint, or Basecamp).
- 3) Large data or file sets, (e.g., high-resolution imagery in TIFF format) may be shipped via USB flash drive, external SSD drive, or external HDD drive. Drives must be scanned for viruses by the Consultant/Contractor, and certified as per submittal requirements in Section (H)(2)(c) below.
- 4) The electronic media shall be in the format which can be readily read and processed by the BCAD's target CAD/GIS systems.
- 5) The external label for physical media such as CD/DVD shall contain, as a minimum, the following information:
 - a) The Contract or Project number, title, and date. If a contract or project number has not yet been issued, then it is permissible to use a BCAD issued Request For Proposal (RFP) or Request for Letters of Interest (RLI) number.
 - b) The Facility Name (e.g. “Fort Lauderdale - Hollywood International Airport” or “North Perry Airport”)
 - c) The date of the submittal as well as the date on which the electronic data can be considered valid, if different than the submittal.
 - d) The sequence number and total number of physical media if more than once is required to provide the electronic data being delivered.
 - e) Special requirements for Sensitive Security Information (SSI):
 1. SSI transmitted by e-mail must be in a password-protected attachment. SSI is not

authorized for posting on the internet/intranet except for postings on secure sites as specifically authorized by the BCAD Project Manager.

2. The following text must appear on either (a), the exterior label of any media, (b) in the email body of any attachment, or (c) as a text file named README.TXT in the same secured online file-sharing service or FTP folder, containing SSI as defined by 49 CFR 1520. *WARNING: This record contains Sensitive Security Information that is controlled under 49 CFR parts 15 and 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR parts 15 and 1520, except with the written permission of the Administrator of the Transportation Security Administration or the Secretary of Transportation. Unauthorized release may result in civil penalty or other action. For U.S. government agencies, public disclosure is governed by 5 U.S.C. 552 and 49 CFR parts 15 and 1520.*

- 6) Before all files are placed on the delivery electronic digital media, the following procedures shall be performed:
 - a) Ensure that drawing sheets, viewports, paperspace, line weights, fonts, and other drawing components are correctly configured for BCAD's viewing and plotting.
 - b) Make sure all reference files are attached without device or directory specifications. Reference files should not be bound.
 - c) Compress and reduce all design files using compatible file compression/ decompression software approved by BCAD. If the file compression/decompression software is different from that approved by BCAD, then an electronic copy of the file compression/ decompression software shall be purchased and licensed for BCAD and provided to BCAD with the delivery media.
 - d) Include all files, both graphic and non-graphic, required for the project. All blocks not provided as BCAD-furnished materials must be provided to BCAD as a part of the electronic deliverables.
 - e) Make sure that all support files, such as those listed above, are in the same directory and that references to those files do not include device or directory specifications. Files opened on BCAD's computer systems must have referenced/linked support files, such as AutoCAD blocks and XREFs, automatically load without additional referencing/linking by BCAD staff.
 - f) Include any standard sheets (i.e., abbreviation sheets, standard symbol sheets, or other listing) necessary for a complete project. These shall conform to BCAD standard cover sheet and title block pages.
 - g) Do not bind or explode any drawing references such as blocks and XREFs.
 - h) Document any fonts, tables, or other similar customized drawing element(s) developed by Consultant/Contractor or not provided among BCAD furnished materials. The Consultant/Contractor shall obtain BCAD's approval before using anything other than BCAD's standard fonts, line types, tables, blocks, or other drawing elements available from BCAD.

(G) Drawing Development Documentation:

- 1) Provide the following information for each finished drawing:

- a) How the data were input (e.g., keyed in, downloaded from a survey total station instrument (include name and model), and other identification data).
- b) Brief drawing development history (e.g., date started, modification date(s) with brief description of item(s) modified, author's name, and other identifying data.).
- c) The names of the reference, blocks, symbols, details, tables, and schedule files required for the finished drawing.
- d) Layer assignments and lock settings.
- e) Text fonts, line styles\types used, and GIS layer file settings.
- f) Any additional information per FAA ACs and BCAD standards.

(H) Submittal:

- 1) Submit as Project Record Documents, conforming to requirements above, and as required for project phase submittals and project record documents. Where Electronic Project Record Documents are required, Consultant will provide BCAD one set of AutoCAD electronic file format contract drawings, to be used for as-built drawings. In addition, provide scanned PDF's of the signed and sealed as-built AutoCAD file(s).
- 2) Submit electronic media with a transmittal letter containing, as a minimum, the following information:
 - a) The information included on the external label of each media unit, along with the total number of units being delivered, and a list of the names and descriptions of the files on each one.
 - b) Brief instructions for transferring the files from the media.
 - c) Certification that all delivery media are free of known computer viruses. A statement including the name(s) and release date(s) of the virus-scanning software used to analyze the delivery media, the date the virus-scan was performed, and the operator's name shall also be included with the certification. The release or version date of the virus-scanning software shall be the current version which has detected the latest known viruses at the time of delivery of the digital media.
 - d) The following "File Development and Project Documentation Information" as an enclosure or attachment to the transmittal letter provided with each electronic digital media submittal.
 - (1) Documentation of the plot file for each drawing which will be needed to be able to duplicate the creation of the file by BCAD at a later date. This documentation shall include configuration settings (e.g., drawing size and configuration), and any other special instructions.
 - (2) List of any deviations from BCAD's standard layer/level scheme and file-naming conventions.
 - (3) List of all new symbol blocks created for project, which was not provided to Consultant/Contractor with the BCAD-furnished materials.
 - (4) List of all new figures, symbols, tables, schedules, details, and other blocks created for the project, which were not provided to Consultant/Contractor with the BCAD-furnished materials, and any associated properties.

- (5) List of all database files associated with each drawing, as well as a description and documentation of the database format and schema design. All information shall conform to BCAD standards.
- (6) All metadata per BCAD, FAA, and FDOT requirements and those of other entities if specified by BCAD.
- (7) Provide the following information for each finished drawing in a PDF document:
 - (a) How the data was inputted (e.g., keyed in, downloaded from a survey total station instrument (include name and model), and other identification data).
 - (b) Brief drawing development history (e.g., date started, modification date(s) with brief description of item(s) modified, author's name, and other identifying data).
 - (c) The names of the reference, blocks, symbols, details, tables, and schedule files required for the finished drawing.
 - (d) Layer assignments and lock settings. Refer to layering standards Section (C)(3)(b) for layer list documentation requirements.
 - (e) Text fonts, line styles\types used, and GIS layer file settings.

(I) Ownership:

- 1) County will have ownership, including any copyright, of information and materials developed under these and other contractual requirements, including but not limited to reports, listings, and all other items pertaining to the work created or developed under the Contract with Broward County.
- 2) Ownership rights under the contract are rights to use, re-use, duplicate, or disclose text, data, drawings, and information, in whole or in part, in any manner and for any purpose whatsoever without compensation to or approval from Consultant/Contractor.
- 3) BCAD will, at all reasonable times, have the right to inspect the work and will have access to and the right to make copies of the above-mentioned items.
- 4) All text, electronic digital files, data, and other products generated under this contract shall become the property of County except where otherwise limited within the Contract.

(J) BCAD-Furnished Materials to the Consultant/Contractor:

- 1) BCAD may make various electronic files available to the Contractor during the Pre-Construction and Construction phases of the Project. "Consultant" or "Consultant/Contractor" refers to the planning, engineering, design, and/or survey firm or entity. "Contractor" refers to the firm or entity performing actual construction. To this end, BCAD shall make the following information available to the Contractor in electronic format:
 - a) Work files: Selected work product files, reports, spreadsheets, databases, specifications, drawings and other documentation of Consultant's work in progress may be provided to the Contractor, Managing General Contractor, or other County consultant on an as required basis.
 - b) Where electronic media submittals of final site surveys are required, BCAD will provide electronic copies of any existing site survey data.

- c) BCAD will supply Consultant with all necessary BCAD standard cover page and title block files and formats, GIS schema, CAD layering.

(K) Other Digital Information:

- 1) A variety of digital information may be generated by participants in the design process including BCAD, Consultant, sub consultants, Contractor, subcontractors, BCAD's commissioning authority, local jurisdictional authorities, and other project team members.
- 2) Consultant/Contractor shall facilitate and participate wherever possible in this digital exchange of information by conforming to the standards expressed above.