



**US Army Corps
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ENGINEERING AND CONSTRUCTION BULLETIN

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Subject: Standardization of Computer Aided Design (CAD), Building Information Modeling (BIM) and Geographic Information Systems (GIS) Deliverables for Military Design and Construction Projects

Applicability: Guidance

1. The purpose of this ECB is to provide guidance concerning the final CAD, BIM and GIS deliverables received by the government for all Military Construction (MILCON) contracts. This ECB is applicable to all USACE Districts, Divisions and Laboratories and Army Installations executing MILCON contracts. This ECB is effective when issued.
2. References
 - a. Architectural, Engineering, and Construction (A/E/C) CAD Standard.
<https://cadbim.usace.army.mil/CAD>
 - b. Building Information Modeling Requirements, "Attachment A."
<https://cadbim.usace.army.mil/AttachmentA>
 - c. Building Information Modeling Requirements, "Attachment F."
<https://cadbim.usace.army.mil/AttachFCOSBIMAppSpec>
 - d. Defense Installation Spatial Data Infrastructure (DISDI), Geospatial Metadata Profile (DGMP). <http://www.acq.osd.mil/ie/bei/disdi.shtml>
 - e. Geospatial Positioning Accuracy Standards. "Content Standard for Digital Geospatial Metadata: Extensions for Remote Sensing Metadata," FGDC-STD-012-2002.
http://www.fgdc.gov/standards/projects/FGDC-standards-projects/csdgm_rs_ex/MetadataRemoteSensingExtens.pdf
 - f. Geospatial Positioning Accuracy Standards, "Part 3: National Standard for Spatial Data Accuracy," FGDC-STD-007.3-1998
<http://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part3/chapter3>

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- g. Geospatial Positioning Accuracy Standards, “Part 4: Architecture, Engineering, Construction, and Facilities Management,” FGDC-STD-007.4-2002
<http://www.fgdc.gov/standards/projects/FGDC-standards-projects/accuracy/part4/FGDC-endorsed-standard>
 - h. Spatial Data Standards for Facilities, Infrastructure and Environment (SDSFIE).
<http://www.sdsfie.org>
 - i. Tri-Service Building Information Modeling Resources.
<https://cadbim.usace.army.mil/BIM>
 - j. U.S. Army Installation Geospatial Information and Systems (IGI&S), Standard Geospatial Data Layer Quality Assurance Plans.
<https://www.us.army.mil/suite/folder/18872950>
3. This ECB does not provide specific guidance to a contractor on how to execute the CAD/BIM/GIS portion of the project. This ECB identifies the products to be delivered to the government as the final as-built drawings and data. The intent of the deliverable set is to provide the Installation with comprehensive geospatial information about the facility footprint and site features that exist outside the building(s). Obtaining drawings and data sets in a standard format ensures that the government can maximize the reuse of the data in facility management and Installation sustainment activities. The Installation shall coordinate with their local contractor or USACE support District to prescribe specific installation design guidance which should be included as requirements of the final deliverable.
4. Any CAD data developed as a result of executing MILCON contracts shall adhere to the Architectural/Engineering/Construction (AEC) CAD Standard. When data is collected using global position systems (GPS) technology to capture as-built conditions, the data shall comply with “Part 4: Architecture, Engineering, Construction, and Facilities Management” of the FGDC Geospatial Positioning Accuracy Standards. CAD deliverables shall include MicroStation (DGN) or AutoCAD (DWG) files. CAD symbols placed within the design/drawing file shall adhere to the A/E/C CAD Standard. CAD symbol libraries can be found on the Tri-Service CAD/BIM Technology Center website.
<https://cadbim.usace.army.mil/CAD>
5. All MILCON projects requiring BIM shall adhere to the Building Information Modeling Requirements as defined in Attachment A and Attachment F of the contract language. For engineering design projects using Bentley BIM software, the final electronic deliverable shall be in DGN format and the USACE BIM Workspace shall be used to execute the project. For engineering design projects using Autodesk BIM software, the final electronic

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deliverable shall be in Revit (RVT) format and the USACE BIM Templates shall be used to execute the project. BIM design resources can be found on the Tri-Service CAD/BIM Technology Center website. <https://cadbim.usace.army.mil/BIM>

6. Any electronic GIS data developed as a result of executing MILCON contracts shall adhere to the Spatial Data Standards for Facilities, Infrastructure and Environment (SDSFIE) Army Adaptation and be documented using the DISDI Geospatial Metadata Profile (DGMP) metadata standard. The electronic deliverables for GIS shall be in ESRI ArcGIS (Shapefile)/personal geodatabase, Bentley Map (Designfile), or Intergraph GeoMedia (Access Database). The deliverable shall specify the coordinate system, projection, datum(s), and units defined for the data layer and will be documented in the metadata. The vertical coordinate information shall be stored as a feature attribute when applicable and documented in the metadata.
7. Digital elevation model (DEM) mapping accuracy for the agreed upon scales will comply with “Part 3: National Standard for Spatial Data Accuracy” of the FGDC Geospatial Positioning Accuracy Standards. Quality assurance shall be performed in accordance with the Army IGI&S Standard Geospatial Data Layer Quality Assurance Plan (QAP) for Digital Elevation Model (DEM). <https://www.us.army.mil/suite/folder/18872950>
8. All geospatial deliverables (CAD or GIS format), whether obtained via survey or any other data collection process, shall be measured in feet or meters. The vertical datum and horizontal datum shall comply with the requirements specified in the Army IGI&S Standard Geospatial Data Layer Quality Assurance Plans. Specification for State Plane Coordinate System shall be provided to the contractor by the Installation. When data is collected using global position systems (GPS) technology, the data shall comply with “Part 3: National Standard for Spatial Data Accuracy” of the FGDC Geospatial Positioning Accuracy Standards. Quality assurance shall comply with the precision and accuracy requirements specified in the applicable QAP.
9. The IGI&S Program Office shall provide to the contractor, upon request, an SDSFIE-compliant GIS layer scheme to be used for populating the GIS deliverables required under the contract. The contractor shall populate the required information within the geodatabase scheme according to the Army IGI&S QAP.
10. All IGI&S data shall have appropriate metadata, conformal with the DISDI Geospatial Metadata Profile (DGMP). The data and metadata shall conform to the current version of the respective standards. Metadata content will accompany all electronic CAD, BIM and geospatial data submissions. A metadata file shall accompany, at minimum, each CAD, BIM or GIS data set. Metadata shall be delivered in XML file format compliant with the DGMP ISO 19139 Schema. The XML file schema shall be readable by software

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applications that use the XML format standard. The DGMP ISO 19139 Schema can be downloaded from the SDSFIE website. <http://www.sdsfie.org>

11. Points of contact for this bulletin are Ms Nancy Blyler, HQUSACE, 202-761-7755; Mr. Vince Nicchitta, OACSIM, 571-256-8160; and Mr. Edward Huell, CAD/BIM Technology Center, 601-634-4485.

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