

USACE Autodesk Civil 3D Template

CAD/BIM Technology Center

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USACE Civil 3D Template & Supporting Material

1.1 Purpose

Advanced Modeling for the United States Corps of Engineers (USACE) not only includes Building Information Modeling (BIM) but Civil Information Modeling (CIM). Taking advantage of current software advances to provide capabilities for using computer models on projects allows more integrated engineering, analysis, design and documentation and improves the quality and delivery of Civil engineering projects.

To assist the designers with the setup and implementation of this complex software, standard templates are needed that have been prepared to allow users to focus on the design, planning and implementation of the project instead of project configuration. Proper symbology must be set up for different CIM processes: Hydrology, Navigation, Port, Coastal, Harbor and River control and protection. Customization as needed for special situations is a simple and quick process.

The USACE Civil 3D standards provide support for designers using Autodesk® Civil 3D® software to create Advanced Modeling infrastructure projects for the U.S. Army Corps of Engineers. Since the diversity of USACE Civil projects are so great, these standards provide a collection of the most commonly needed object style settings based on several different model object types.

The USACE Civil 3D Templates provide preset layer settings (layer color, line styles, colors, line weights) as well as custom civil and survey Styles. Civil modeling involves design “objects” such as alignments, surfaces, profiles, assemblies, sections, piping systems and their various annotation settings. As an example, surfaces are used to represent topography, slope analysis, surface points, TIN, watershed analysis, and more. Profiles are built from an alignment and a surface. Typical section Assemblies such as Levees, roads, and dredged areas are assigned to the alignment and profile and integrated to the site to connect back into the site surface at the edges.

A Levee object can be created along an alignment based on a designed profile that is linked to an existing or proposed site. Changes to the Levee system can be made by adjusting the profile or elevation or levee section. Related views are automatically updated similar to the process of adding a door to a BIM floor plan and having the door added automatically in the appropriate elevation, section, and door schedule. Profile views and sections are created from this set of information with correct symbology applied. Annotation labels extract information from the object that they are assigned to without having user interpretation. Placing a ground elevation point can return the point location (Northing, Easting, vertical elevation) as well as any other information associated with the point (Head Wall, Gravel, Gas Meter, ID number, user attributes...). Correct symbols based upon the AEC CAD Standards are set as part of the annotation label configuration.

The “USACE Civil 3D 2022 Template Document v5.0” provides written descriptions of the complete configuration settings and styles that have been created for the USACE Civil 3D Standards. It is a reference guide and not an instruction manual for the use of Autodesk® Civil 3D® software or a tutorial for understanding how the civil objects should be created and used. The user should be familiar with the software and the process of modeling civil projects.

Questions may be submitted to “USACE Civil 3D Template Team” or to “USACE CAD/BIM Knowledge Management Portal”.

1.2 BACKGROUND

The Center has been responsible for setting policy and strategies to assist the USACE districts and clients regarding CAD/BIM technology. The Center is seeking to assist civil designers with Headquarters' requirements for Civil Information Modeling. This will take advantage of the software intelligent modeling processes for Civil design projects. The software for achieving this is very complex – much more so than previous CAD software. For this reason, the software can be time consuming to set up initially for a project. Making use of the provided templates with standards integrated will make the designers more efficient with the software in terms of both engineering and document production. Autodesk® Civil 3D® is a modeling software that is growing in its use by the Corps for Civil projects. However, its progress has been hampered due to the additional time it takes to set up the design environment for the engineers. Because of the ability to use the software for standard CAD production, there is a strong tendency to not fully use the modeling process and instead, use the traditional CAD process that users are more comfortable with.

1.3 Template Content

This is an update to the Civil 3D 2020 Imperial and Metric base templates as well as other standards content.

The two-part documentation manual has been updated (*USACE Civil 3D 2022 Template Document v5.0 - PART 1.pdf* and *USACE Civil 3D 2022 Template Document v5.0 - PART 2.pdf*) that contains detailed information on the Templates and style settings.

2 USACE Civil 3D Template Implementation Demonstration

2.1 Additional Template Implementation Information

The purpose of the project was to **use** the initial USACE Civil 3D template and demonstrate the use as a base project template for a test project. The engineering capabilities of the software can be more effectively demonstrated and the manager will have a better understanding of the setup and implementation of the template for a specific project.

The Guide covers detailed information on the basics of setting up a project, creating shortcuts, use of additional data files such as survey files, GIS, geotechnical, images. There are examples of creating sidewalks, building pads, grading and retention ponds.

Standard use of creating objects such as alignments, profiles, profile views, sections, corridors and intersections are addressed.

Download document from : [USACE Civil 3D Template Implementation Guide](#)

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