

USACE - Civil 3D 2022 Standards

Updates from 2020 to 2022 Standards

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PREPARED FOR:



**US Army Corps
of Engineers®**
Engineer Research and
Development Center

Table of Contents

Introduction	3
Base CAD Standards	3
Standard Paths	3
Templates	3
Drawing and Sheet Templates (.dwt files)	3
Sheet Set Templates	4
AutoCAD Styles	4
Layers	5
Linetypes	9
Blocks	9
Civil 3D Standards	12
General Styles	12
Points	12
Surfaces	13
Sites and Parcels	13
Grading	13
Alignments	13
Profiles and Profile Views	13
Sections and Section Views	14
Gravity Networks, Pipes, and Structures	14
Pressure Networks, Pipes, Fittings, and Appurtenances	14
Survey	14

Introduction

Below is a list of the changes that have been made during the migration and updating of USACE's Civil 3D standards from 2020 to the new 2022 version. This list is broken down into changes that were made to base AutoCAD drafting standards and Civil 3D Standards.

Base CAD Standards

Standard Paths

- USACE CAD Standards now packaged in a folder called "USACE Civil 3D 2022 Standards".
- USACE AutoCAD Profile and custom icon updated to point to the correct paths for working with USACE standards on a U:\ drive.
- Second USACE AutoCAD Profile and custom icon created to point to correct paths for working with USACE standards on a hard drive (C:\Program Data\)

Templates

Drawing and Sheet Templates (.dwt files)

- New subfolder created under the "Templates" folder called "Plan Production and Sheet Creation".
 - All Sheet Templates and Sheet Set Templates moved from the "Templates" folder to this new subfolder.
- The word "Template" removed from the names of all Sheet Template files.
- Scales lists cleaned in both main, Imperial templates to remove "Obsolete" scales where possible.
 - One "Obsolete" scale remains after a number of troubleshooting steps. This scale should not be used.
- North Arrow added to all sheets/viewports for Plan, Plan over Plan, and Plan over Profile in all 4 Plan and Profile Templates.
- All templates updated to set all layers on, thawed, and unlocked.
- PLINEGEN variable set to 1 in all templates.
- "PDF-6.0 ANSI D" Layout removed from both main Metric templates.
- Location-specific information removed from Titleblocks in all main templates.
- 3 new sets of Discipline-specific Templates have been created:
 - Survey
 - Navigation & Marine Design
 - Site Design
- 4 new templates exist for each Discipline for necessary plotting and units:
 - USACE Civil 3D 2022 <Discipline>_Imperial_CTB
 - USACE Civil 3D 2022 <Discipline>_Imperial_STB
 - USACE Civil 3D 2022 <Discipline>_Metric_CTB

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- USACE Civil 3D 2022 <Discipline>_Metric_STB
- New subfolder created under the “Templates” folder called “Discipline-Specific Templates”.
 - All 12 Discipline-specific templates are stored in this folder.
- All Sheets in Sheet templates updated to add Drawing Area Title block and North Arrow (where applicable).
- New metric Sheet Templates created using ISO A1 sheet size.
 - USACE Civil 3D 2022 Metric_ISO A1_CTB_PlanProf Sheets.dwt
 - USACE Civil 3D 2022 Metric_ISO A1_CTB_Section Sheets.dwt
 - USACE Civil 3D 2022 Metric_ISO A1_STB_PlanProf Sheets.dwt
 - USACE Civil 3D 2022 Metric_ISO A1_STB_Section Sheets.dwt
- Layouts for “10 Scale” added to all Sheet Templates

Sheet Set Templates

- Sheet Set Templates recreated (total of 4).
 - AEC_Sheet Set_Imperial (CTB)
 - AEC_Sheet Set_Imperial (STB)
 - AEC_Sheet Set_Metric (CTB)
 - AEC_Sheet Set_Metric (STB)
- Sheet Set Templates no longer contain subsets.
- Additional custom Sheet Properties added to Sheet Set.
- Sheet Sets point to block called “Drawing Area Title” as the “Label Block for Views”.
- Sheet Sets point to the “ANSI D” layout in the corresponding “Plan and Profile Sheets” template files as the “Sheet Creation Template”
- AEC_Project_Data and “AEC_Sheet_Info” blocks updated in all 12 templates to tie fields directly to current Sheet Set.

AutoCAD Styles

- Text Style “A130 USACE” removed.
- All Dimension Styles and Multileader Styles other than those beginning with “AEC-” removed.
- Dimension Styles and Multileader Styles updated to use 0.1” or 3mm text and arrowhead size.
- All Multileader Styles in all main templates updated to ensure the “Middle of Top Line” option is used for the attachment.
- All Multileader Styles in Metric templates resized to appropriate Metric sizes.
- New Table Style created in all main templates for Survey Control Points (G_SCHD_Survey_Control_Points_USACE)

Layers

- All Layers in CTB templates updated with colors that more closely match the true colors used for the same layers in the STB templates.
- All Layers used as “Object Layers” for Civil 3D Objects renamed to have the prefix “CM-”.
- All Layers other than Civil, General, Geotechnical, and Survey layers removed from all templates.
- All remaining Layers with names matching those in the AEC Standards were updated to have properties matching those in the AEC Standards with the exception of the following where different values were necessary:
 - V-TOPO-MAJR
 - V-TOPO-MAJR-IDEN
 - V-TOPO-MINR
 - V-TOPO-MINR-IDEN
- Layer “V-SITE-FNCE” removed from all templates. “V-SITE-FENC” remains.
- Layer “C-ELEV” removed from all templates.
- Two separate, new drawings created that hold all layers to be used with the Design Center to insert only desired layers into drawings. One drawing is set up with STB layers, and the other is setup with CTB layers. The layers in these drawings include the following:
 - Architectural (A-)
 - Geotechnical (B-)
 - Civil (C- and CM-)
 - Electrical (E-)
 - Fire Protection (F-)
 - General (G-)
 - Hazardous Materials (H-)
 - Interiors (I-)
 - Mechanical (M-)
 - Plumbing (P-)
 - Structural (S-)
 - Telecommunications (T-)
 - Survey (V-)

Note: For more information on using these drawings along with the Design Center to copy layers into design drawings, see the “Applying and Using USACE Civil 3D 2022 Standards.docx” document provided with the standards.

- All B-, C-, G-, and V- layers reviewed against the A/E/C standard. Colors, linetypes, and lineweights updated as necessary in all templates.
 - Exceptions to this are “V-TOPO-MAJR”, “V-TOPO-MAJR-IDEN”, “V-TOPO-MINR”, and “V-TOPO-MINR-IDEN”. The colors for these were purposefully changed in the previous standards release and maintain these changed values.
- Layer documentation and “STB to CTB Conversion.scr” script file updated to reflect the changes.

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- Layer V-SITE-VEGE-TREE added with a Continuous Linetype. All other properties match that of V-SITE-VEGE.
- New Layer Filter called "Civil 3D Object Layers" added to all main templates that isolate "CM-*" layers.
- New Layers added to main templates for Dredging and Overdepth:

LAYER NAME	DESCRIPTION
C-DRED-LIMIT-OVDP	Dredge Limits – Allowable Overdepth
C-DRED-LIMIT-REQD	Dredge Limits - Required

- Additional new Layers created in main templates for Survey use:

LAYER NAME	DESCRIPTION
V-CHAN-NAID	Navigation Aids
V-CHAN-NAID-IDEN	Navigation Aids - Annotation
V-FLOD-PNTS	Floodwall survey points
V-FUEL-PNTS	Liquid fuel survey points
V-GTHP-PNTS	Geothermal heat pump system survey points
V-HTCW-PNTS	Hight temperature/chilled water system survey points
V-INDW-PNTS	Industrial wastewater survey points
V-IRRG-PNTS	Irrigation piping and equipment survey points
V-JNTS-PNTS	Construction, contraction, and expansion joint survey points
V-LEVE-PNTS	Levee survey points
V-MILR-PNTS	Military range survey points
V-NGAS-PNTS	Natural gas survey points
V-OBST-PNTS	Obstruction survey points
V-OVRN-PNTS	Overrun area survey points
V-PADS-PNTS	Pad survey points
V-POWR-PNTS	Power device survey points
V-PRIM-PNTS	Primary electric cable survey points
V-PRKG-PNTS	Parking lot survey points
V-PROP-PNTS	Property survey points
V-PVMT-PNTS	Pavement survey points
V-RAIL-PNTS	Railroad survey points
V-RIVR-PNTS	River survey points
V-ROAD-CURB-PNTS	Curb and gutter survey points
V-ROAD-PNTS	Road outline survey points
V-RRAP-PNTS	Riprap survey points
V-RUNW-PNTS	Runway survey points
V-SAMP-PERC	Percolation test hole
V-SAMP-VERT	Vertical core hole location
V-SECD-PNTS	Secondary electric cable survey points
V-SITE-PNTS	Site feature survey points
V-SPCL-PNTS	Special system survey points
V-SSWR-PNTS	Sanitary sewer survey points
V-STRM-PNTS	Storm sewer survey points
V-TAXI-PNTS	Taxiway survey points
V-TRAF-PNTS	Airfield traffic area survey points
V-UTIL-DEVC	Connectors, reducers, regulators, vents, backflow preventers, valves
V-UTIL-IDEN	Identifier tags, symbol modifier, and text
V-UTIL-JBOX	Junction boxes

LAYER NAME	DESCRIPTION
V-UTIL-METR	Meters
V-UTIL-MHOL	Manhole
V-UTIL-MONT	Monitoring wells
V-UTIL-POLE	Utility Pole
V-UTIL-VALT	Vaults
V-WATR-PNTS	Water supply survey points
V-WELL-PIZO	Piezometers
V-WELL-RELF	Relief wells
V-WETL-PNTS	Wetland survey points

Linetypes

- All Linetype names in both Imperial and Metric Linetype files changed to remove Division numbering.
 - Linetype names also updated in all templates.
- All Linetypes that display text or shapes set to 0.1" in Imperial Linetypes and 3mm in Metric Linetypes.
 - Linetypes updated in linetype files as well as all templates.
- Metric Linetypes updated with appropriate sizing.
 - Linetypes updated in metric linetype file as well as all metric templates.
- Two new linetype added to both Imperial and Metric Linetype files called TREELINE_L and TREELINE_R.
 - The necessary SHX file included in the Support Files folder under the Standards folder structure.
 - New linetypes inserted into all main templates.
 - TREELINE_L assigned as the Linetype for the "V-SITE-VEGE" layer in all main templates.
- M6 Dash Dot Linetype fixed in Linetype files and all necessary templates.
- Additional custom Linetypes created in Linetype file and added to templates where necessary.
 - Perforated Subdrain
 - Non-Perforated Subdrain
 - Federal Navigation Channel
 - Ordinary High Water
 - Mean Low Low Water
 - Mean Low Water
 - Mean High Water
 - Mean High High Water
 - Storm Drain
 - Foundation Drain
 - Underground Power
 - Overhead Power
 - Jet Petroleum
 - Jet Petroleum
 - Unleaded Gas
 - Diesel Gas

Blocks

- Number prefixes removed from all block names in the templates.
- New dynamic blocks for annotations added to all templates.
- All Imperial templates now include both ENG and ARCH scale blocks. The Metric templates now only include a single metric scale block.

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- “Drawing Area Title” dynamic block fixed to allow extension of line.
- Revision block added to all main templates.
- All blocks (except the newly added annotation blocks) not in use by AutoCAD or Civil 3D Styles removed from all templates.
- Separate drawings called “USACE Blocks - Imperial” and “USACE Blocks - Metric” created to house all blocks removed from the templates.
 - These files are located in the “Blocks” folder under the main standards folder.
- New block library files called “USACE Annotation Blocks - Imperial” and “USACE Annotation Blocks - Metric” created to house all standard annotation blocks.
 - These files are located in the “Blocks” folder under the main standards folder.
- “Guy Wire” block updated to shift insertion point to the correct location.
- New blocks added for Buoy - Light, Buoy - Port, and Buoy - Starboard.
- Grid Tick blocks created and added to the “USACE Annotation Blocks - Imperial” and “USACE Annotation Blocks - Metric” library drawings.

Documentation

- All documents updated to reflect updated standards, additional templates, and other changes made.
- New documents created in the “Documents” folder illustrating plot samples for lines and hatches based on colors (CTB) and plot styles (STB)
 - Civil 3D 2022 - Plot Style Pen Samples - CTB.pdf
 - Civil 3D 2022 - Plot Style Pen Samples - STB.pdf
 - Civil 3D 2022 - Plot Style Pen Samples - Combined.pdf
- Sections added to “USACE 2022 Standards Workstation Setup Instructions” document containing instructions for using USACE Civil 3D 2022 standards from C:\Program Data and/or other location on a local drive.
- Section added to “USACE Civil 3D 2022 Template Document v5.0 - PART 1” document outlining and describing the newly added Point Groups
- Section added to “USACE Civil 3D 2022 Template Document v5.0 - PART 1” document listing all Layer filters and sub filters.
- Appendix added to “USACE Civil 3D 2022 Template Document v5.0 - PART 1” document providing names and examples of all custom USACE Blocks, Annotation blocks, and Titleblocks.
- Additional sections created in “Applying and Using USACE Civil 3D 2022 Standards” document:
 - Using the Treeline Linetypes (L and R)
 - Descriptions of each template
 - How to create new drawings using the templates
 - Using Plan Production Sheet Templates for Civil 3D Plan Production
 - Using Plan Production Sheet Templates for standard Plan sheet creation.
 - Changing the style of only ONE Profile Curve Label when they are split across multiple profiles

USACE // Civil 3D 2016 - 2020 Standards Update

- Inserting layers through Design Center.
- Using the "Normal" Style in the STB to plot certain layers in color
- Using True Colors in CTB drawings to plot certain layers in color
- Using Sheet Sets

Civil 3D Standards

General Styles

- Master Object Layers updated in both the Imperial and Metric templates.
- All “Plot Styles” in all Civil 3D Styles of STB files set to “ByLayer”.
- All Label Styles in the Imperial templates set to use the Arial text style and a text height of 0.1”.
- All Label Styles in the Metric templates set to use the Arial text style and a text height of 3.00mm.
- All Label Styles in all main templates set to “ByLayer” for both Linetype and Lineweight. These values are locked down and cannot be changed in individual styles.
- Code Set Styles updated and expanded in all 4 main templates.
 - Edits made to Marker Styles, Link Styles, and Code Set Styles
 - Marker Label and Link Label styles changed to be created at 0.1” in Imperial templates and 3mm in Metric Templates
 - Child styles for these checked to ensure smaller text used.
 - Additional Feature Line Styles created to illustrate Corridor edges.
 - New Code Set Style created showing only Corridor edge linework for plotting Plan.
 - New Code Set Styles created for sections using large and small labels respectively.

Points

- New Point Table Style created for Survey Control Points in all 4 main templates.
- All Point Label Styles in the metric templates set to display 3 decimal places for the elevation.
- Point Label Style “V_Desc_N_E_Elev” updated in all main templates to allow stacking of text in the correct order.
- New Point Label Style created to force positive or negative sign to always be shown.
- New Point Label Styles created for Soundings that will always show as red or blue.
- New Point Label Style created for only show positive but no negative.
- New Point Label Styles created for RIM elevations and INVERT elevations.
- New basic Point Label Styles created for use with Proposed Points.
- Names of all “BECH-” Point Styles changed to “CHAN-“.
 - Layers used in these Point Styles changed to use the corresponding “CHAN-“ layers.
- New Point Styles added for Bouys:
 - CHAN_Buoy - Light - Green (USACE)
 - CHAN_Buoy - Light - Red (USACE)
 - CHAN_Buoy - Port - Green (USACE)

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- CHAN_Buoy - Port - Red (USACE)
- CHAN_Buoy - Starboard - Green (USACE)
- CHAN_Buoy - Starboard - Red (USACE)
- New Point Styles added for Proposed Point Creation
 - C_AFLD_Light - Approach
 - C_AFLD_Light - Runway
 - C_AFLD_Light - Taxiway
 - C_AFLD_Light - Threshold
 - C_BORE_Proposed Boring Location
- Point Groups added to all main templates:
 - Obstructions
 - Navigation Aids
 - No Show
 - No Show (overrides)
 - Points to Triangulate
 - Soundings Above Depth
 - Soundings Below Depth
 - Soundings for Shallow-Beach
 - Survey Control Points
- New Description Ket Set “Create Point Codes (USACE)” created for the placement of proposed Airfield and Boring locations.

Surfaces

- Surface Spot Elevation Label Styles updated to use smaller dot for a leader tip when a dragged state.
- Surface Slope Linetypes set to “ByLayer”

Sites and Parcels

- All Sites removed from all main templates to eliminate phantom Parcels.

Grading

- <none>

Alignments

- New Station and Offset Label Style added that also shows Elevation.

Profiles and Profile Views

- Profile Curve Label Styles created in all templates for use when a curve is shown across multiple Profile Views.
- Profile View Style that has 100x Exaggeration with a vertical spacing of 5’ created and placed in necessary templates.

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- Profile View Styles updated to turn on the axis titles for the bottom axis and both vertical axes.
 - Sizes for the titles are set to 0.2" in Imperial templates and 5mm in Metric Templates.
- Profile View Styles in Metric templates updated to be more appropriate for use with Meters.

Note: For information on how to make use of these Styles, refer to the "Applying and Using USACE Civil 3D 2022 Standards.docx" document provided with the standards.

Sections and Section Views

- Created new Section Styles
 - C_SECT_Required Depth (USACE)
 - C_SECT_Allowable Overdepth (USACE)
- Section View Styles in Metric templates updated to be more appropriate for use with Meters.

Gravity Networks, Pipes, and Structures

- <none>

Pressure Networks, Pipes, Fittings, and Appurtenances

- <none>

Survey

- "Sample" Equipment Database removed.
- "Sample" Figure Prefix Database removed.
- Description Keys for PHOTOC* and MON updated to correct layers.
- New Description Key set created for Numeric codes.
- Format of Description Key "BEECHTREE" was fixed and set to "BEECHTREE"
- EOREFUSE Description Key created to correspond with Figure Prefix.
- Figure Prefix Database updated to match codes in the Description Key Sets
- New Figure Prefix Database created for Numeric codes.
- Codes in alphanumeric Description Key set edited to remove the *
 - STUMP
 - TBC
 - WELL