



Natural Resources Conservation Service

AutoCAD Civil 3D 2020

Civil 3D Intro

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Topics covered:

- **User Interface**
- **Drawing Navigation**
- **Model Space, Paper Space, Layouts and Viewports**
- **AutoCAD Options**

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User Interface

- Ribbon
- Tool Palettes
- Command Line
- AutoCAD Task Bar
- Dynamic Input
- Tool Tips
- Quick Access Toolbar
- Transparent Commands
- Model Space Viewports

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Ribbon

The ribbon organizes tools into logical groupings.

The ribbon provides a compact palette of all of the tools necessary to create or modify your drawing. It can be placed in the following places:

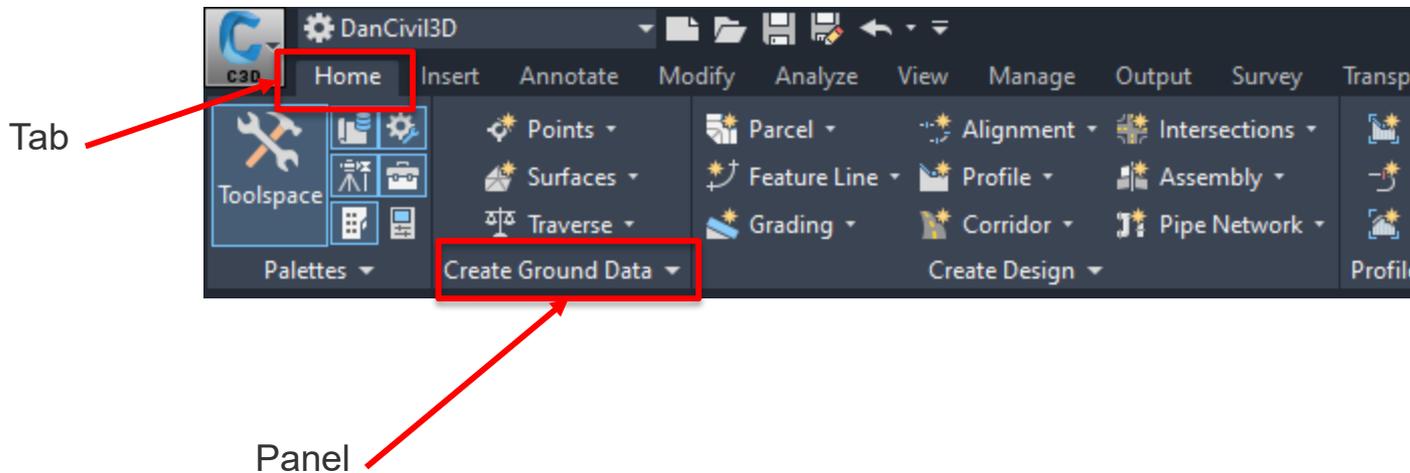
- Docked horizontally at the top of the drawing area (default)
- Docked vertically along the right or left edge of the drawing area
- Undocked, or floating within the drawing area or on a second monitor

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Ribbon

Ribbon Tabs and Panels

The ribbon is composed of a series of tabs, which are organized into panels that contain many of the tools and controls available in toolbars.

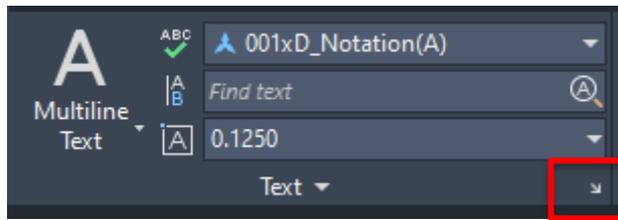


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Ribbon

Ribbon Tabs and Panels

Some ribbon panels provide access to a dialog box related to that panel. To display the related dialog box, click the dialog box launcher by the following icon, , in the lower-right corner of the panel



Dialog box launcher

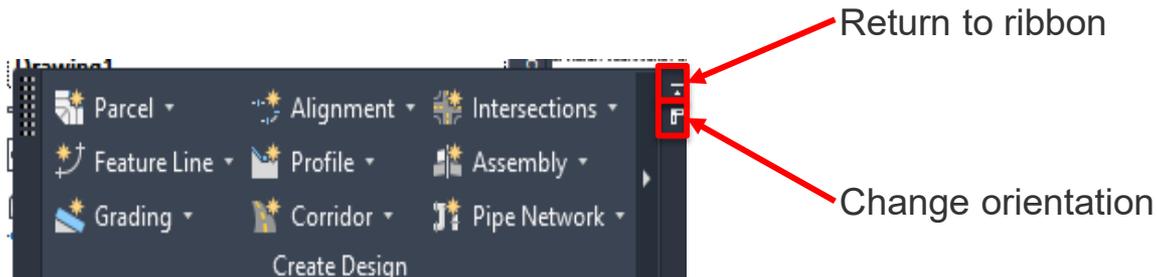
Note: You can control which ribbon tabs and panels are displayed. Right-click the ribbon and click or clear the names of tabs or panels listed on the shortcut menu.

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Ribbon

Floating Panels

You can pull a panel off a ribbon tab and into the drawing area or onto another monitor. The floating panel remains open until you return it to the ribbon, even if you switch ribbon tabs.



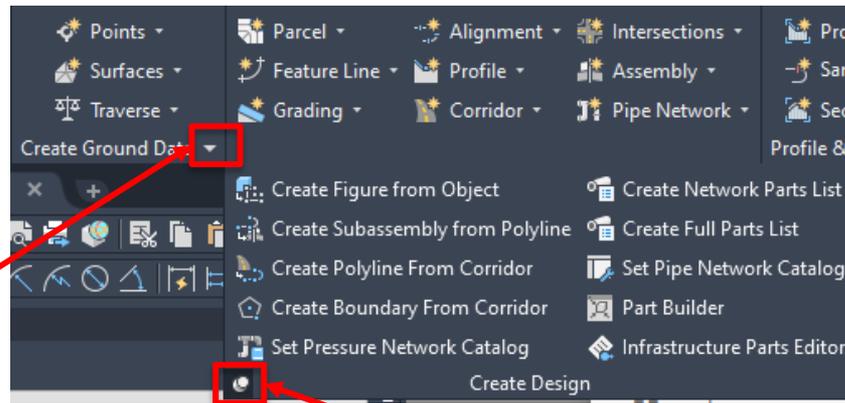
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Ribbon

Slide-out Panels

If you click the arrow in the middle of a panel title, , the panel will expand to display additional tools and controls. By default, slide-out panels automatically close when you click another panel. To keep a panel expanded, click the push pin, , in the bottom-left corner of the slide-out panel.

Panel expander icon



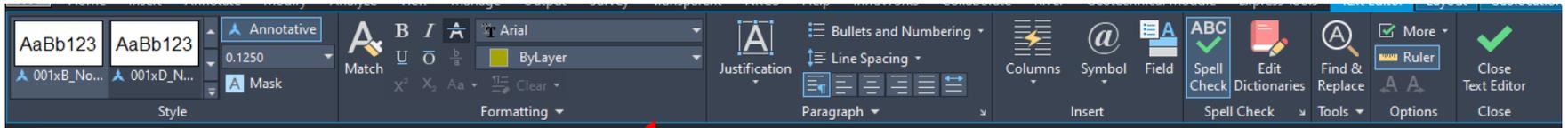
Panel, expanded and pinned

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Ribbon

Contextual Ribbons

When you select a certain type of object or start certain commands, a contextual ribbon tab is displayed instead of a toolbar or dialog box. The contextual tab closes when you end the command.

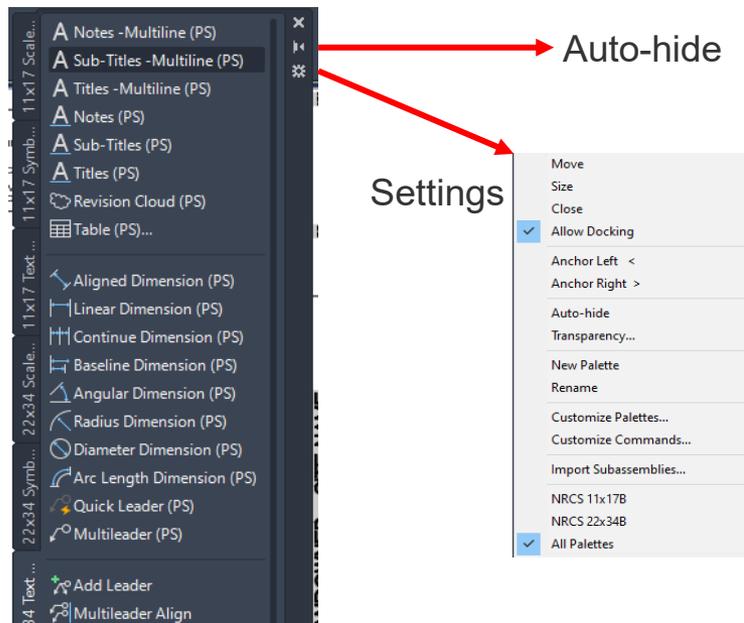


MTEXT command makes this contextual ribbon active

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Tool Palettes

- Use tool palettes to organize blocks, hatches, and custom tools in a tabbed window. You can build tool palettes using several methods.
- NRCS has a list of Tool Palettes already made in the customization profile



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Command Line

- The Command window accepts command and system variable input and displays prompts that guide you through the command sequence.
- You can also press Ctrl+9 to toggle the display of the command window.

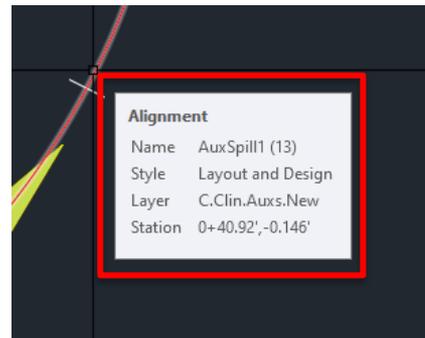
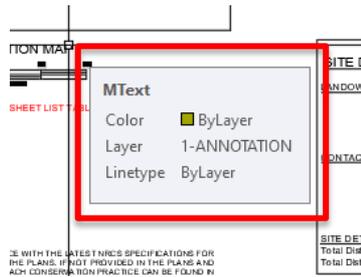


Customize

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Tool Tips

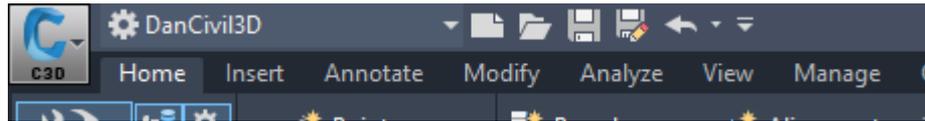
- Help to identify certain data about certain objects
- Can be customized through the CUI on what is displayed



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Quick Access Bar

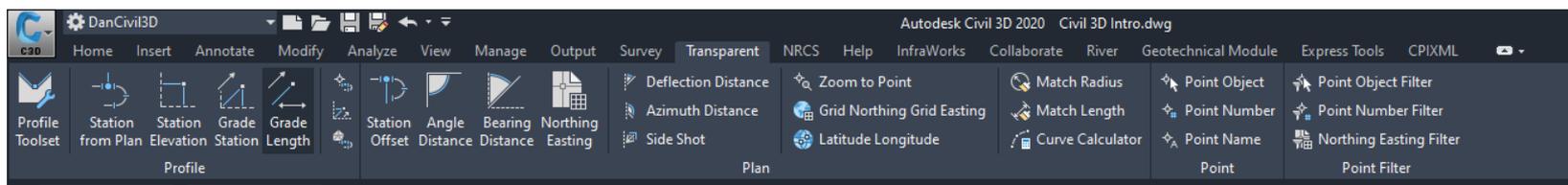
Can customize what items you want to be shown at the top of your screen



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Transparent Commands

- Use Autodesk Civil 3D transparent commands to enter a value based on known information when you are prompted for a point, a distance, or a radius.
- A transparent command can only be used within a running command.
- You can run transparent commands from the Transparent ribbon tab, from the context menu, by using a toolbar, or by entering a command.



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Transparent Commands

- Most Autodesk Civil 3D transparent commands are used to specify point locations within a larger operation, such as the creation of an alignment or a parcel lot line. Using these transparent commands, you can calculate the location for a point from information, such as angle and distance, or from point object information, such as a point number.
- When you enter a transparent command within a running command that accepts more than one point location (for example, the AutoCAD LINE command), you can enter a series of points in the same format without having to re-enter the transparent command. At any time, you can press Esc to terminate the transparent command and return control to the main command, where you can switch to another transparent command. Also, you can end the transparent command by terminating the main command.
- Some of the Autodesk Civil 3D transparent commands require a Z coordinate for the point elevation

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Model Space Viewports

- In model space, you can split the drawing area into one or more rectangular areas called *model space viewports*.
- Viewports are areas that display different views of your model. In large or complex drawings, displaying different views reduces the time needed to zoom or pan in a single view. Errors that you might miss in one view might be visible in another.



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Model Space Viewports

- You can modify the size, shape, and number of model space viewports in a viewport configuration
- Choose from several viewport configurations by clicking the [+] or [-] control in the top-left corner of a viewport.
- Drag the boundaries of viewports to adjust their size.
- Press CTRL while dragging viewport boundaries to display the green splitter bar and create new viewports.
- Alternatively, you can drag the outermost splitter controls.
- Drag a viewport boundary onto another boundary to remove a viewport.

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Drawing Navigation

- Mouse Buttons
- Named Views
- Setup Viewport
- Change Space
- Zoom Toolbar
- View Cube
- Navigation Bar
- In Canvas Controls

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Mouse Buttons

Left Button – Select objects by clicking them or by using a window or crossing method.

- To specify a rectangular selection area, click and release the mouse button, move the cursor, and click again.
 - To create a lasso selection, click, drag, and release the mouse button.
1. Do one of the following:
 - Select individual objects by clicking them.
 - Drag from left to right to select all objects that are entirely enclosed in the selection rectangle or lasso (window selection). Drag from right to left to select all objects that are crossed by the selection rectangle or lasso (crossing selection).
 2. Press Enter to end object selection.

Deselect objects by pressing shift and then clicking individual objects, or dragging across multiple objects. Press Esc to deselect all objects.

Note: When using lasso selection, you can press Spacebar to cycle between the Window, Crossing, and Fence object selection modes.

Right Button – Customize in the OPTIONS

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Mouse Buttons

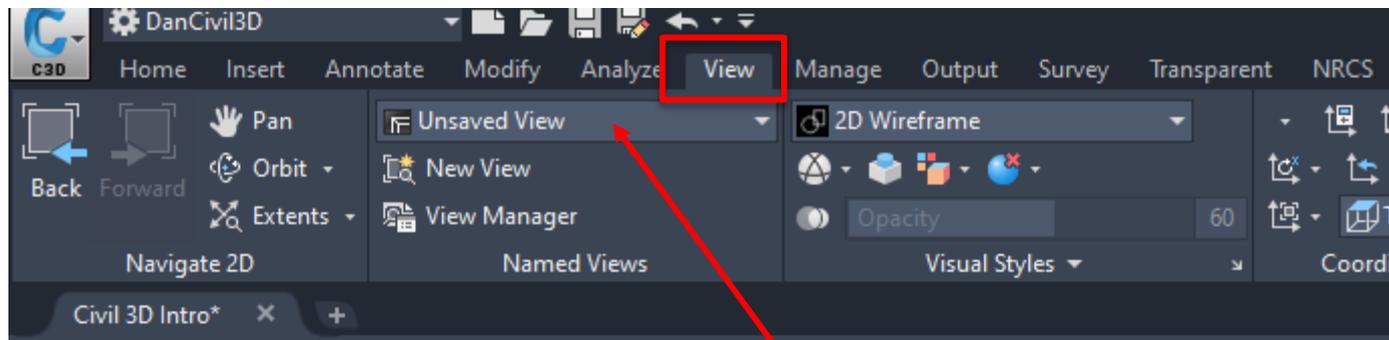
Middle Mouse Wheel

- Move wheel to ZOOM in and out
- Click and hold mouse wheel in to PAN
- Click and hold mouse wheel in while holding the SHIFT key to enter into 3D View

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Named Views

Used to save different views if you have a complex drawing that you want to have a quick way of viewing parts of the drawing



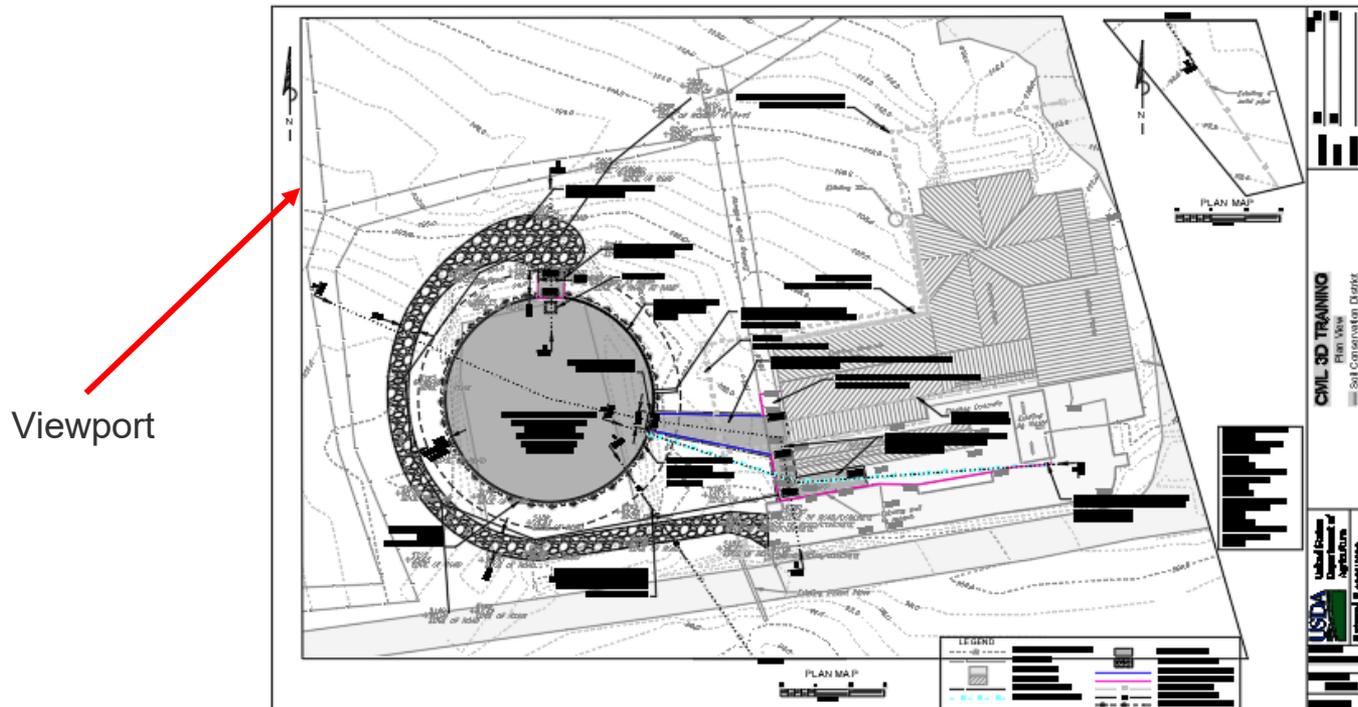
Named views

To return to the Default View where North is UP:
 Command Line...UCS, Enter <World>, Enter, type in PLAN, Enter, <Current>, Enter

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Setup Viewport

Establish a Viewport orientation and copy it from Paper space into Model space to give you a reference of how that view port has been set up.

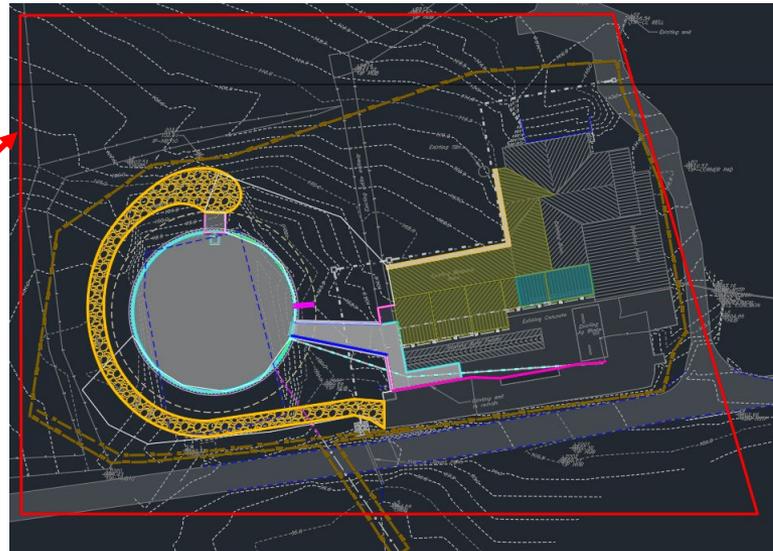


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Change Space

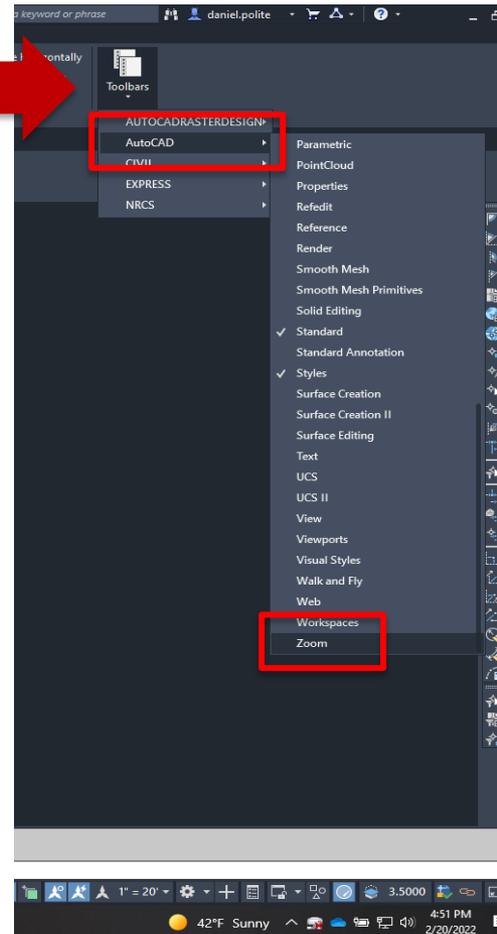
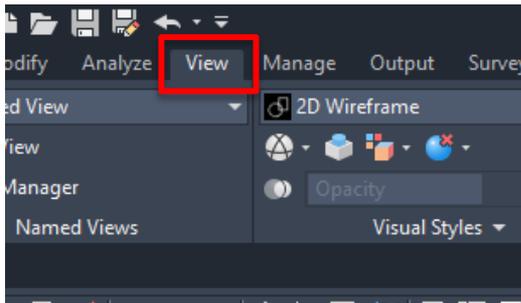
If you want to show a certain page setup view you can place that view into your model space by tracing around your current viewport in paper space. In the command line type...CHSPACE, <select the line you just created> and hit ENTER
Now you can open up modelspace and see the paper space shape that was just drawn in model space as a reference.

Viewport shown
in Modelspace



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Zoom Toolbar

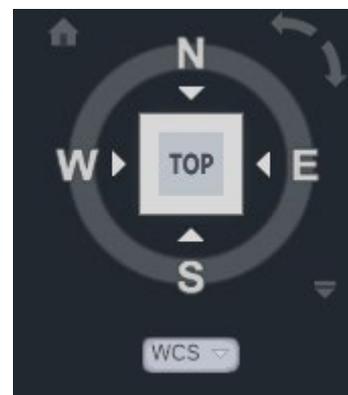
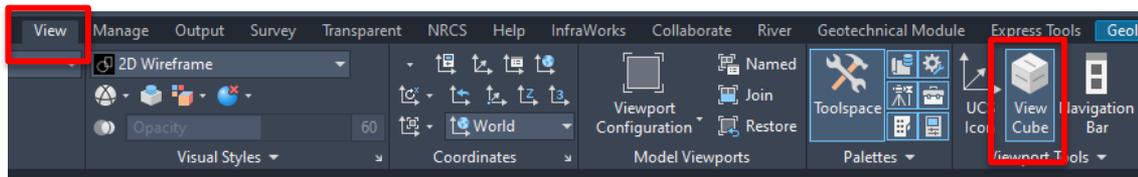


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View Cube

The ViewCube is a navigation tool that is displayed when you are working in 2D model space or 3D visual style. With ViewCube, you can switch between standard and isometric views.

The ViewCube is a persistent, clickable and draggable interface that you use to switch between standard and isometric views of your model. When you display the ViewCube, it is shown in one of the corners of the drawing area over the model in an inactive state. The ViewCube tool provides visual feedback about the current viewpoint of the model as view changes occur. When the cursor is positioned over the ViewCube tool, it becomes active. You can drag or click the ViewCube, switch to one of the available preset views, roll the current view, or change to the Home view of the model.



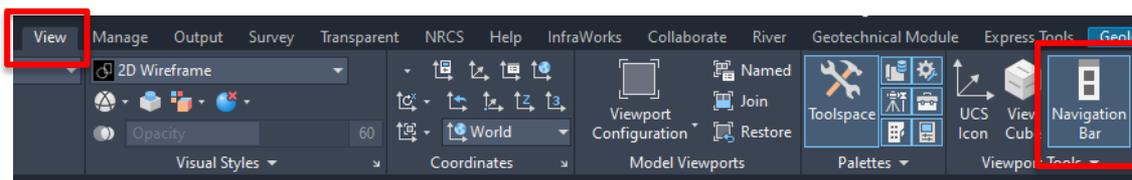
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Navigation Bar

The navigation bar is a user interface element where you can access both unified and product-specific navigation tools.

Unified navigation tools are those that can be found across many Autodesk products. Product-specific navigation tools are unique to a product. The navigation bar floats over and along one of the sides of the current drawing area.

You start navigation tools by clicking one of the buttons on the navigation bar or selecting one of the tools from a list that is displayed when you click the smaller portion of a split button.



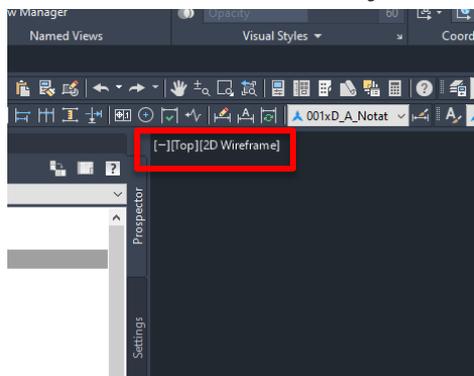
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In Canvas Controls

Viewport controls are displayed at the top-left corner of each viewport, and provide a convenient way of changing views, visual styles, and other settings.

You can click within each of the three bracketed areas to change the settings.

- Click the + or - to display options for maximizing the viewport, changing the viewport configuration, or controlling the display of navigation tools.
- Click Top to choose between several standard and custom views.
- Click 2D Wireframe to choose one of several visual styles. Most of the other visual styles are used for 3D visualization.



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Model Space, Paper Space, Layouts, and Viewports

- Model Space
- Paper Space
- Page Setup
- Display Model and Layout Tabs
- UCS
- Viewport Setup
- North Arrow

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Model and Paper Space

There are two distinct working environments, called "model space" and "paper space," in which you can work with objects in a drawing.

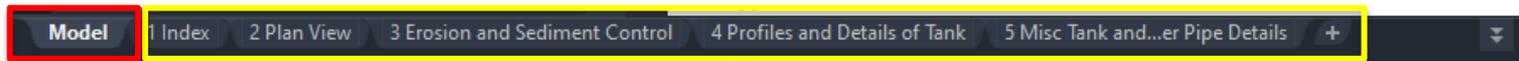
- By default, you start working in a limitless 3D drawing area called *model space*. You begin by deciding whether one unit represents one millimeter, one centimeter, one inch, one foot, or whatever unit is most convenient. You then draw at 1:1 scale.
- To prepare your drawing for printing, switch to paper space. Here you can set up different layouts with title blocks and notes; and on each layout, you create layout viewports that display different views of model space. In the layout viewports, you scale the model space views relative to paper space. One unit in paper space represents the actual distance on a sheet of paper, either in millimeters or inches, depending on how you configure your page setup.

Model space is accessible from the Model tab and paper space is accessible from the layout tabs.

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Model and Paper Space

- Click the Model tab in the lower-left corner of the application window.
- If the Model and layout tabs are hidden, set the LAYOUTTAB system variable to
- If you want to access model space from within a layout viewport on a layout tab, double-click inside the layout viewport. When you are done, you can click within any other layout viewport to make it the current one, or you can double-click anywhere else in the layout to return to paper space.
- Click either MODEL or PAPER on the status bar at the bottom of the application window.



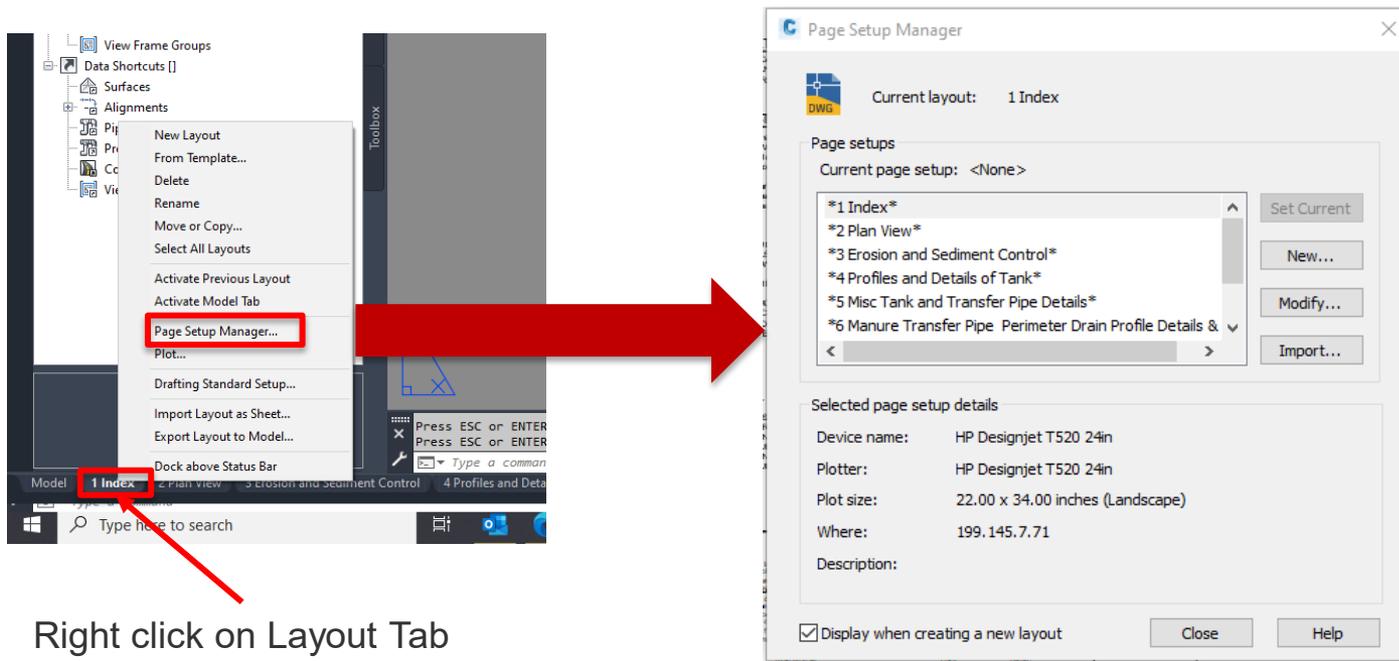
MODEL SPACE Tab

PAPER SPACE Tabs

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Page Setup

A page setup is a collection of plot device and other settings that determine the appearance and format of your final output. These settings are stored in the drawing file and can be modified and applied to other layouts.



Right click on Layout Tab

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Page Setup

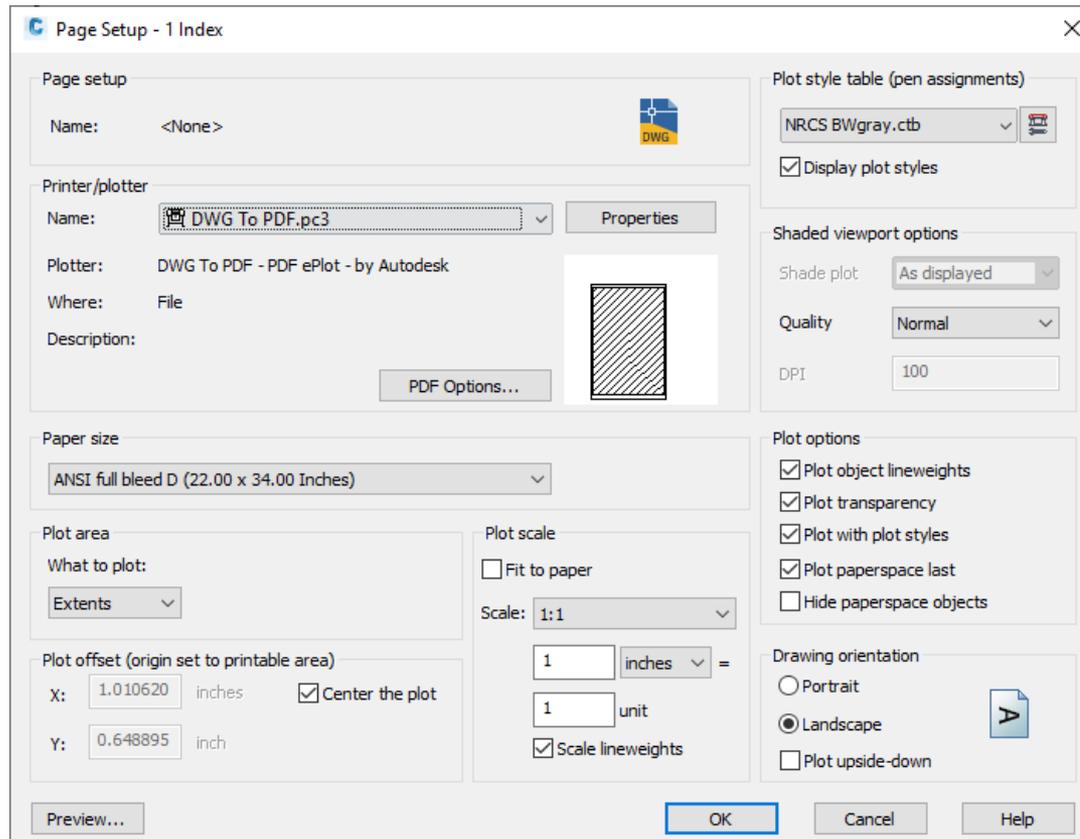
The Page Setup dialog box is displayed in the following cases:

- When you create a new page setup through the Page Setup Manager
- When you modify an existing page setup through the Page Setup Manager

The page setup settings that you specify are stored with the layout and can be applied to other layouts or imported into other drawings.

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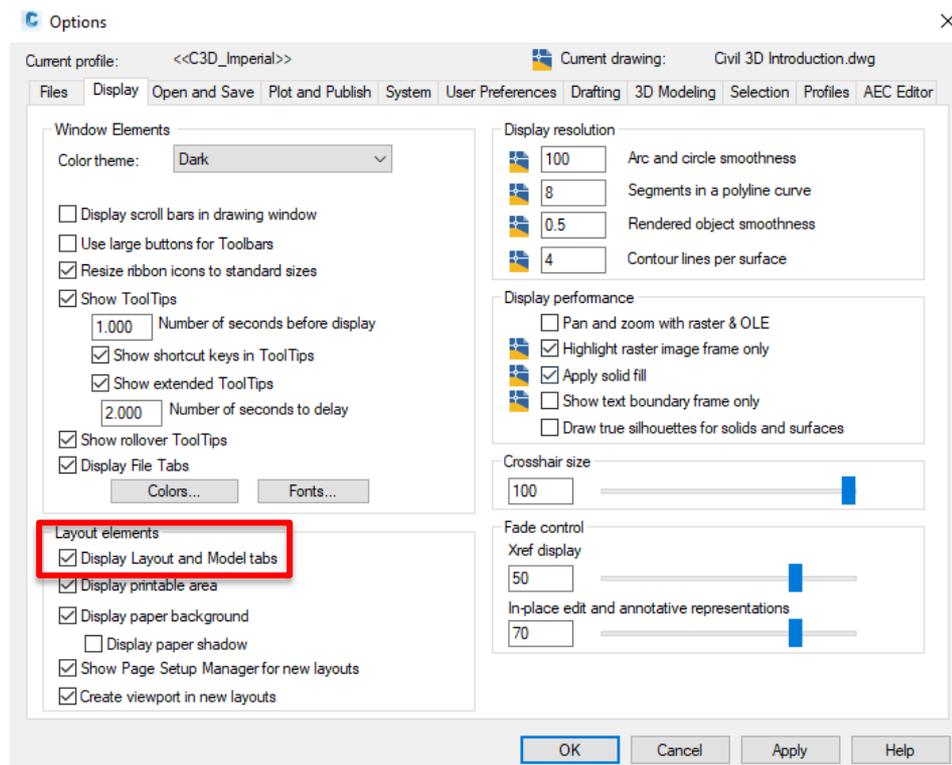
Page Setup



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Display Model and Layout Tabs

Right click and goto Options <Display Tab>



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UCS

The user coordinate system (UCS) establishes the location and orientation of a movable Cartesian coordinate system. The UCS is an essential tool for many precision operations.

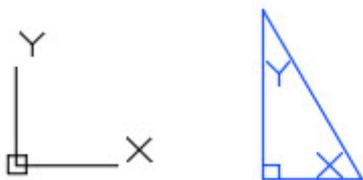
The UCS defines

- The *XY* plane, also called the *work plane* or construction plane, on which objects are created and modified
- The horizontal and vertical directions used for features like Ortho mode, polar tracking, and object snap tracking
- The alignment and angle of the grid, hatch patterns, text, and dimension objects
- The origin and orientation for coordinate entry and absolute reference angles
- For 3D operations, the orientation of work planes, projection planes, and the *Z* axis for vertical direction and axis of rotation

By default, the UCS icon appears in the lower-left corner of the drawing area for the *current* model viewport. The UCS in each paper space layout is displayed as a drawing triangle.

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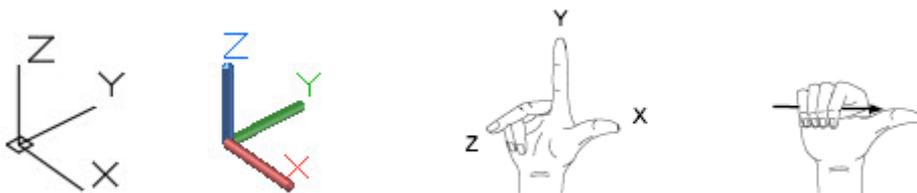
UCS



Note: A variety of color, size and style settings for the UCS are available from the UCSICON command. You can also turn it off when not needed.

Understand the UCS in 3D

When you create or modify objects in a 3D environment, you can move and reorient the UCS anywhere in 3D space to simplify your work. The UCS is useful for entering coordinates, creating 3D objects on 2D work planes, and rotating objects in 3D. The UCS icon changes automatically depending on the current visual style. The colorful 3D icon on the right displays when a 3D visual style is current.



Note: The UCS icon follows the traditional right-hand rule in determining positive axis directions and rotation directions.

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UCS

The UCS in Paper Space

You can move and rotate the UCS in paper space on a layout; however, the UCS in paper space is restricted to 2D operations. By default, the UCS icon appears in the lower-left corner of the layout. You can change its default location with the UCSICON command.

Understand the World Coordinate System (WCS)

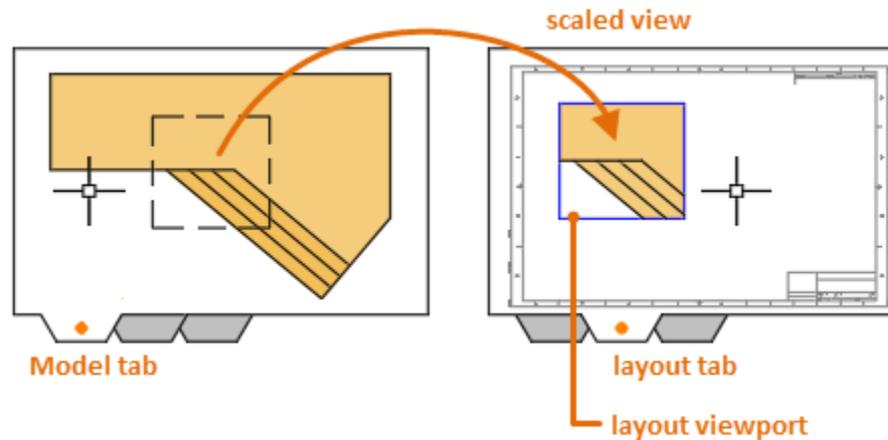
All objects in a drawing are defined by their coordinates in the World Coordinate System (WCS), a permanently fixed Cartesian coordinate system. The UCS is initially coincident with the WCS in new drawings. The squares in the lower-left corners of each of the icons indicates that the UCS icon is currently coincident with the WCS.

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Viewport Setup

Layout viewports are objects that display views of model space. You create, scale, and place them in paper space on a layout.

On each layout, you can create one or more layout viewports. Each layout viewport is like a closed circuit TV monitor of a view of the model at a scale and orientation that you specify.



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Viewport Setup

Create Layout Viewports

When you use the MVIEW command to create a new layout viewport, you specify the view that you want to display in it with one of several methods:

- Click the diagonal corners of a rectangular area, and the extents of model space are displayed automatically.
- Specify the Named option to use a previously saved model-space view.
- Specify the New option for temporary access model space to define a rectangular area.
- Choose the Object option and select a closed object such as a circle or closed L-shaped polyline to convert into a layout viewport.

Note: It is important to create layout viewports on their own layer. When you are ready to output your drawing, you can turn off that layer to display the layout viewport without its boundary.

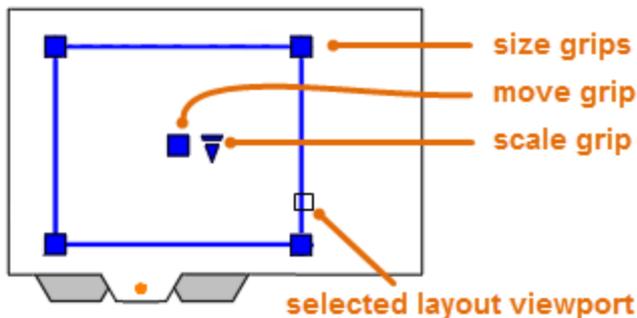
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Viewport Setup

Modify Layout Viewports

After you create a layout viewport, you can change its size and properties, and also scale and move it as needed.

- For control of all the properties of a layout viewport, use the Properties palette.
- For the most common changes, select a layout viewport and use its grips.



Note: Because they are objects, you can also use editing commands such as COPY, MOVE, and ERASE on layout viewports.

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Viewport Setup

Locked Layout Viewports

To prevent accidental panning and zooming, each layout viewport has a Display Locked property that can be turned on or off. You can access this property from the Properties palette, the right-click menu when a layout viewport is selected, a button on the Layout Viewports tab on the ribbon, and a button on the status bar when one or more layout viewports are selected.

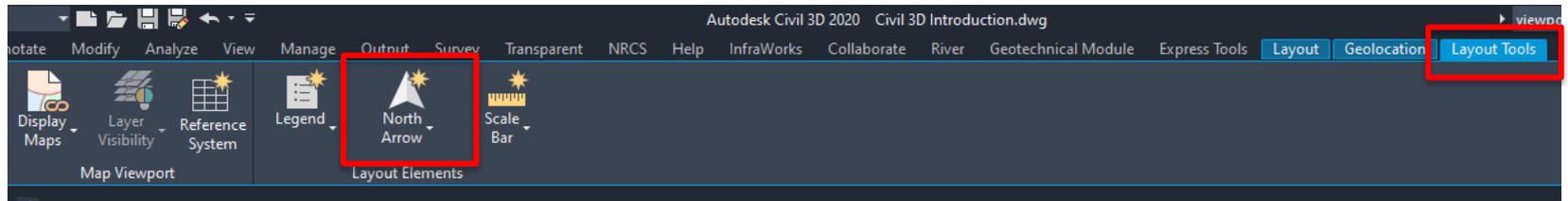
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North Arrow

Dynamic North Arrow

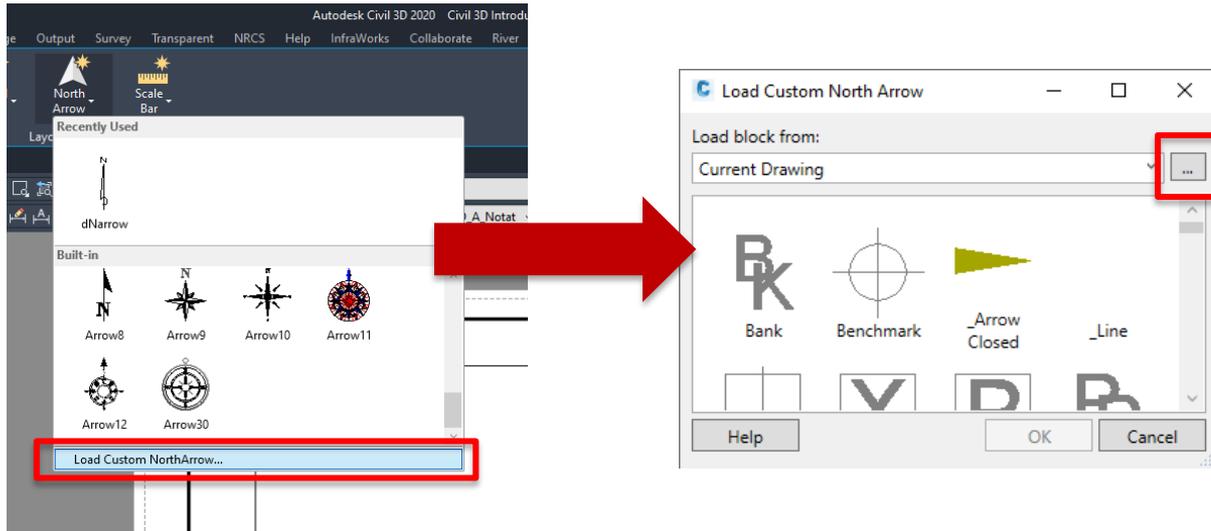
The NRCS .dwt has dynamic North Arrows
It will be added to the Maryland Templates

To Load the Dynamic North Arrow



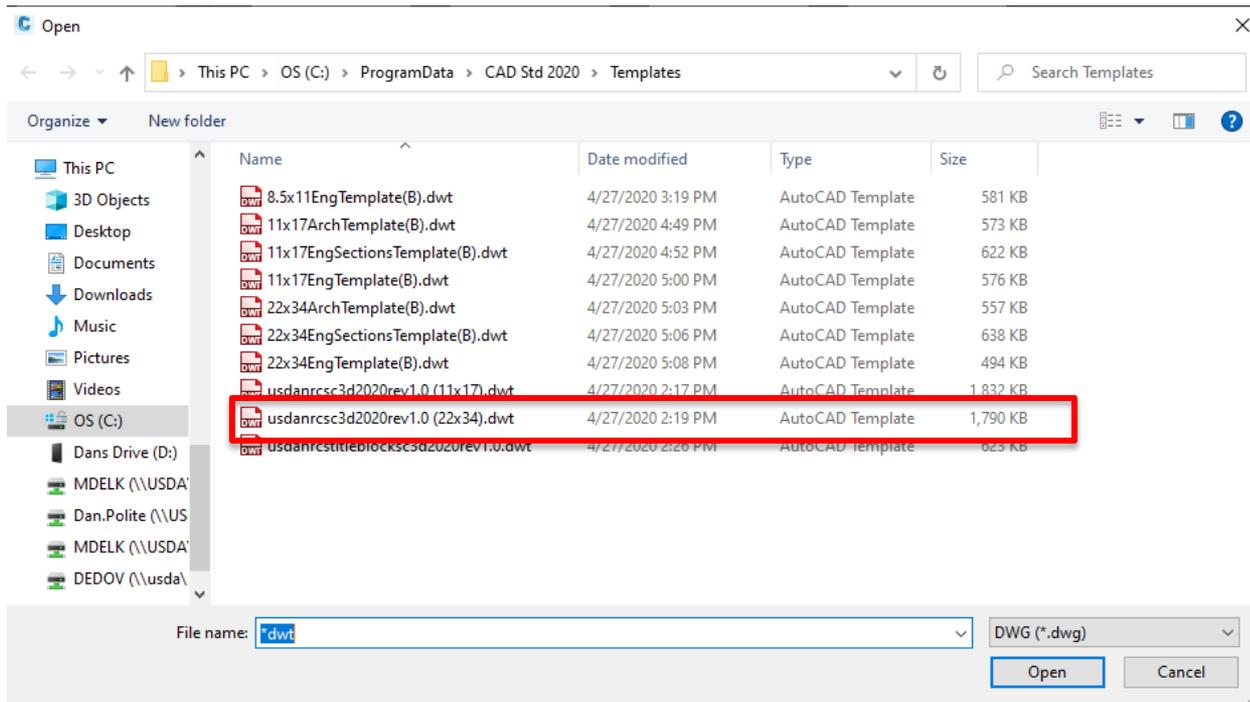
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North Arrow



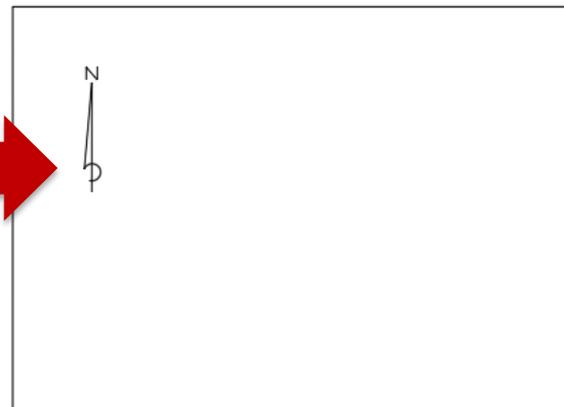
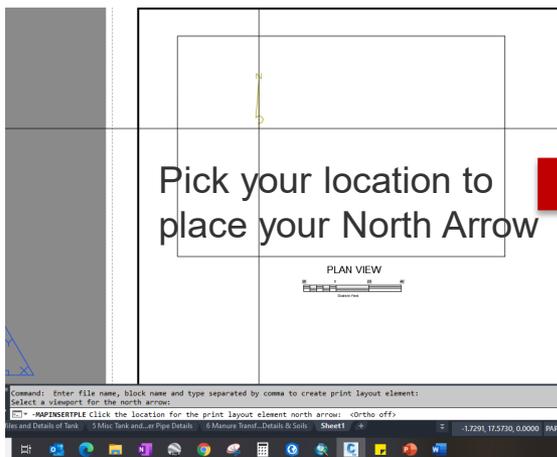
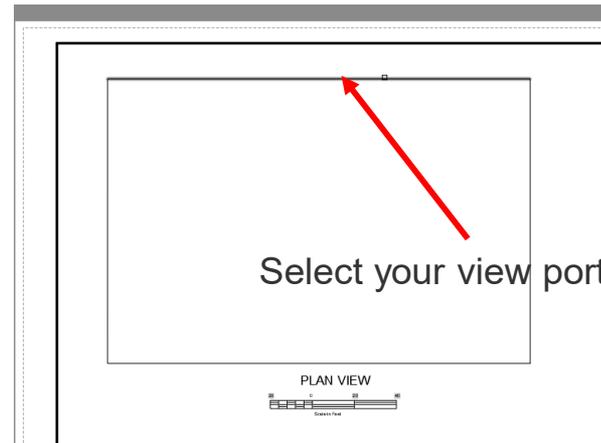
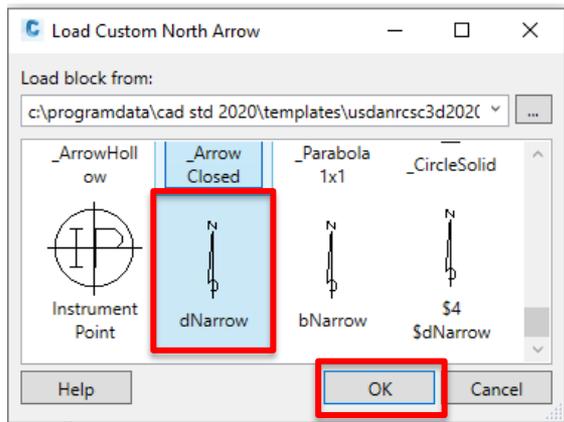
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North Arrow



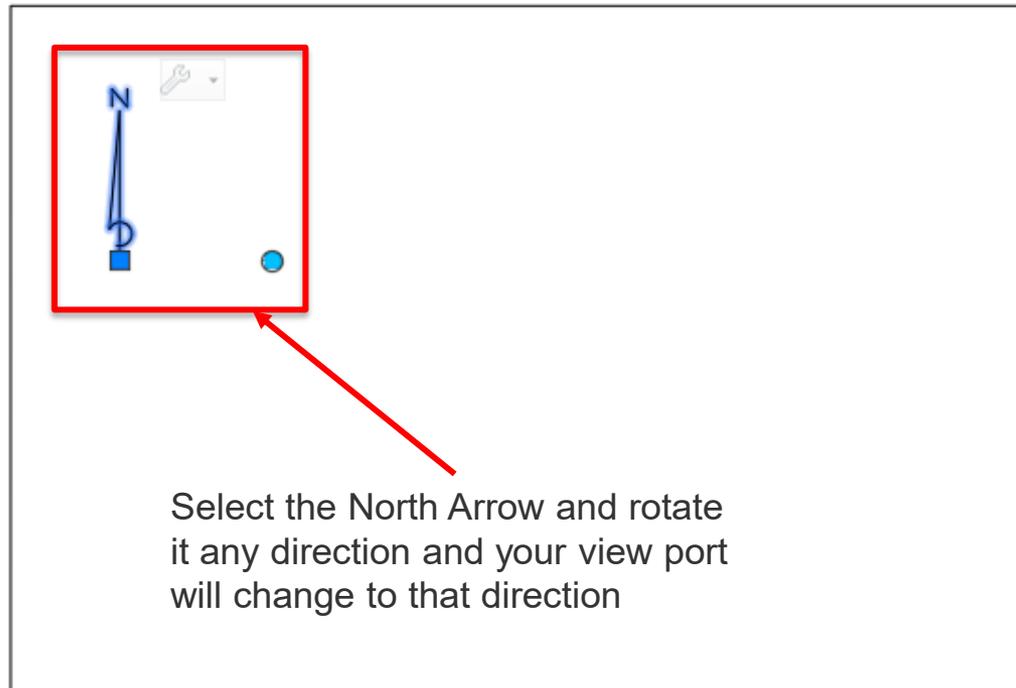
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North Arrow



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North Arrow



PLAN VIEW

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North Arrow



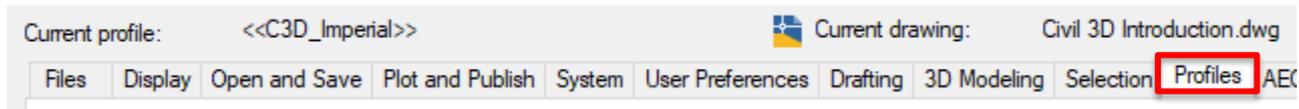
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AutoCAD Options

- User Profile
- Files Tab
- Display Tab
- Open and Save Tab
- User Preferences Tab
- Drafting Tab
- Selection Tab
- Coordinate Tracker

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User Profile



Using Profiles to save colors and other configuration options.

AutoCAD can save your user interface-the screen colors and other options you can configure within the Options dialog-as a profile. If you or someone else subsequently makes changes to the interface, you can restore your desired settings by restoring a profile that you previously saved.

You control user profiles using tools in the Options dialog. To display the Options dialog, either right-click and choose **Options...** from the shortcut menu, or expand the **Application Menu** and click the **Options** button. Either method will open the Options dialog.

Note that saving a user profile is different from syncing your settings with the A360 cloud service. But user profiles can be synced with the cloud, along with other settings.

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User Profile

In the **Options** dialog, switch to the **Profiles** tab. When you first display this tab, notice that the list of available profiles already includes an unnamed profile. This profile contains all of the current settings. To save the current settings as a new profile, click the **Add to List...** button. AutoCAD displays an **Add Profile** dialog. Enter the name you want to assign to the new profile. In this case, name the new profile **My AutoCAD Default**. You can also add a description if you wish, to help you remember what this profile represents. Then, click **Apply & Close**.

Note that when you add a new profile to the list, the profile you create automatically contains all of the current program settings. There is nothing else that you need to do. Select the new profile and then click **Set Current** to make it the current profile. Notice that at the top of the dialog you can see that the current profile is now set to **My AutoCAD Default**.

If you want to make changes to the interface and save those changes as a new profile, first create a new profile, then make it the current profile, and then make your changes. Those changes will be saved to the current profile.

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User Profile

You can also export and import profiles. To export a profile, select it in the list and then click the **Export...** button. AutoCAD opens the **Export Profile** dialog. Notice that AutoCAD saves the profile with a .arg file extension and by default assigns it the same name as the current drawing. You can enter a more descriptive name to help you identify the file and save it to any folder. For now, simply click **Save** to save the profile to the current folder.

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User Profile

Once exported, that ARG file can be copied to other computers and then imported so that you can use previously defined profiles on other systems. This is a great way to apply the same configuration to multiple computers, or to ensure that if you get a new system, you can quickly configure a new installation of AutoCAD so that it uses the same settings you had laboriously established on your old system. To import a profile, click **Import...** AutoCAD displays the **Import Profile** dialog. Select the profile you just exported and click **Open**. AutoCAD displays an **Import Profile** dialog. Here, you can enter a different profile name and an optional description. For now, simply click **Apply & Close**. The new profile is immediately added to the list of available profiles.

You can also select a profile in the list and then click **Rename...** to rename that profile. You can also delete any profiles you previously created, except for the current active profile. Select the profile you just imported and then click **Delete**. The program asks if you are sure you want to delete this profile. Click **Yes**. AutoCAD immediately warns that you cannot delete a profile that is in use. Click **OK**.

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User Profile

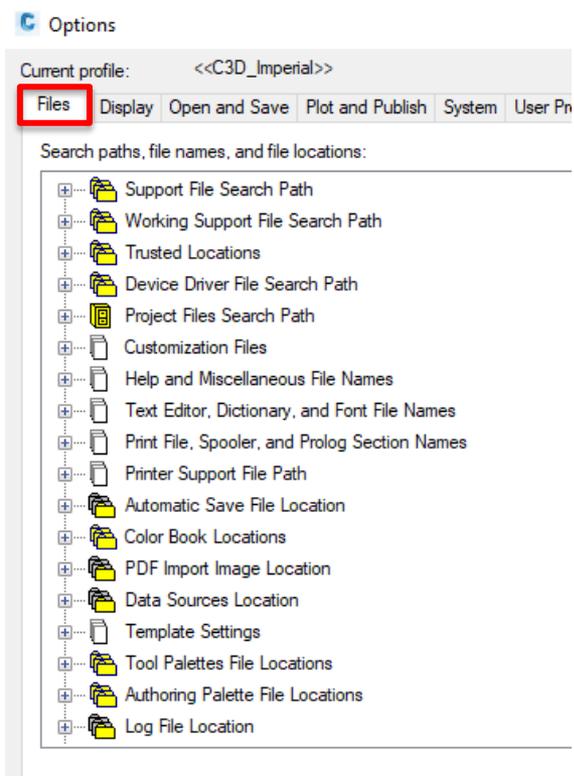
Note that profiles only store the settings you change in the Options dialog, as well as any toolbars that you may have open when you create the profile. It will not save the current ribbon state or any palettes that you may have open. But those changes can be saved as part of a custom workspace.

Also note that if you were to select a profile in the list and then click the **Reset** button, AutoCAD would reset the values in that profile back to the system default settings and store those default settings as part of that profile.

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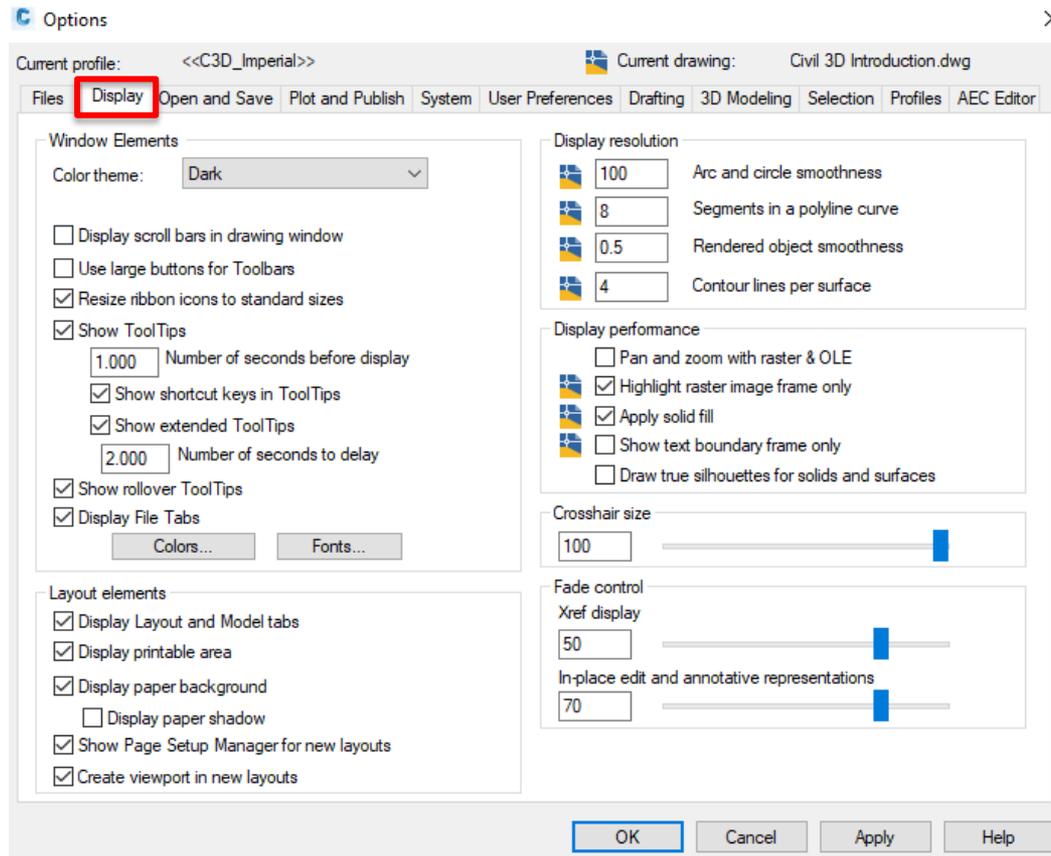
Files Tab

- Automatic Save File Location
- Printer Support File Path
- Template Settings
- Tool Palettes File Locations



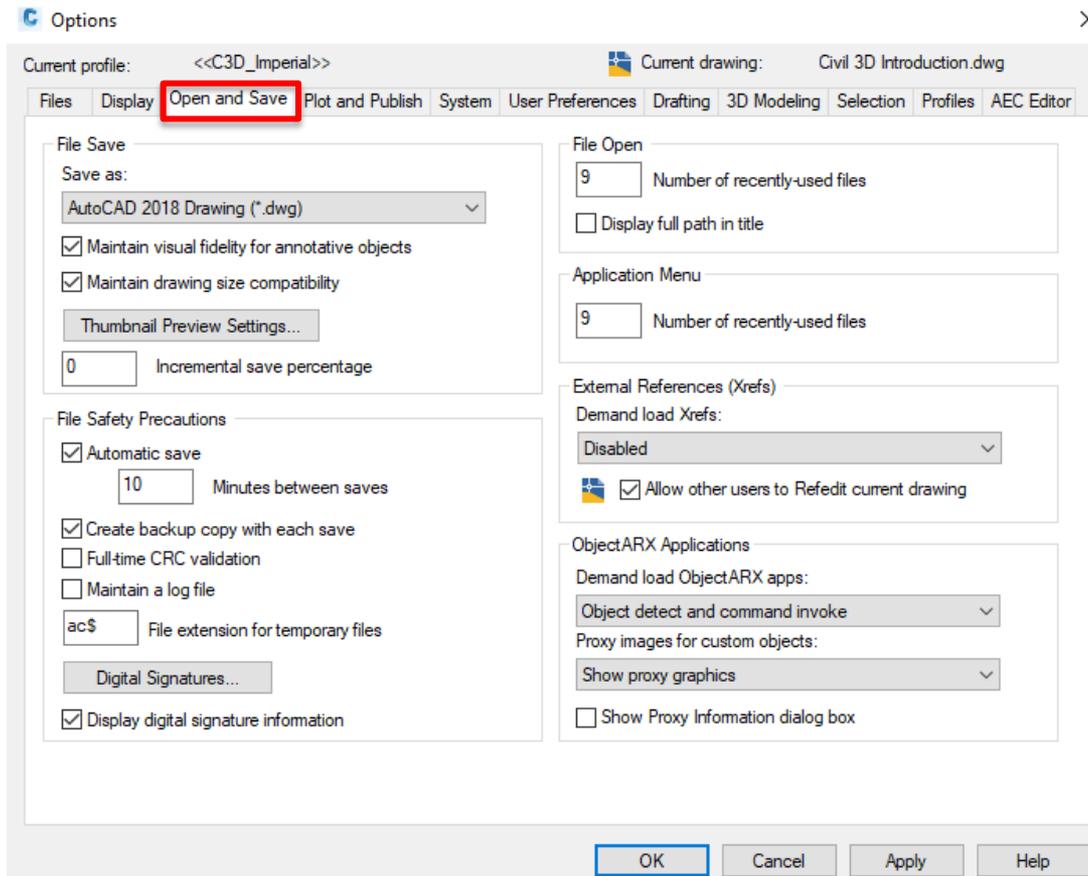
Natural Resources Conservation Service

Display Tab



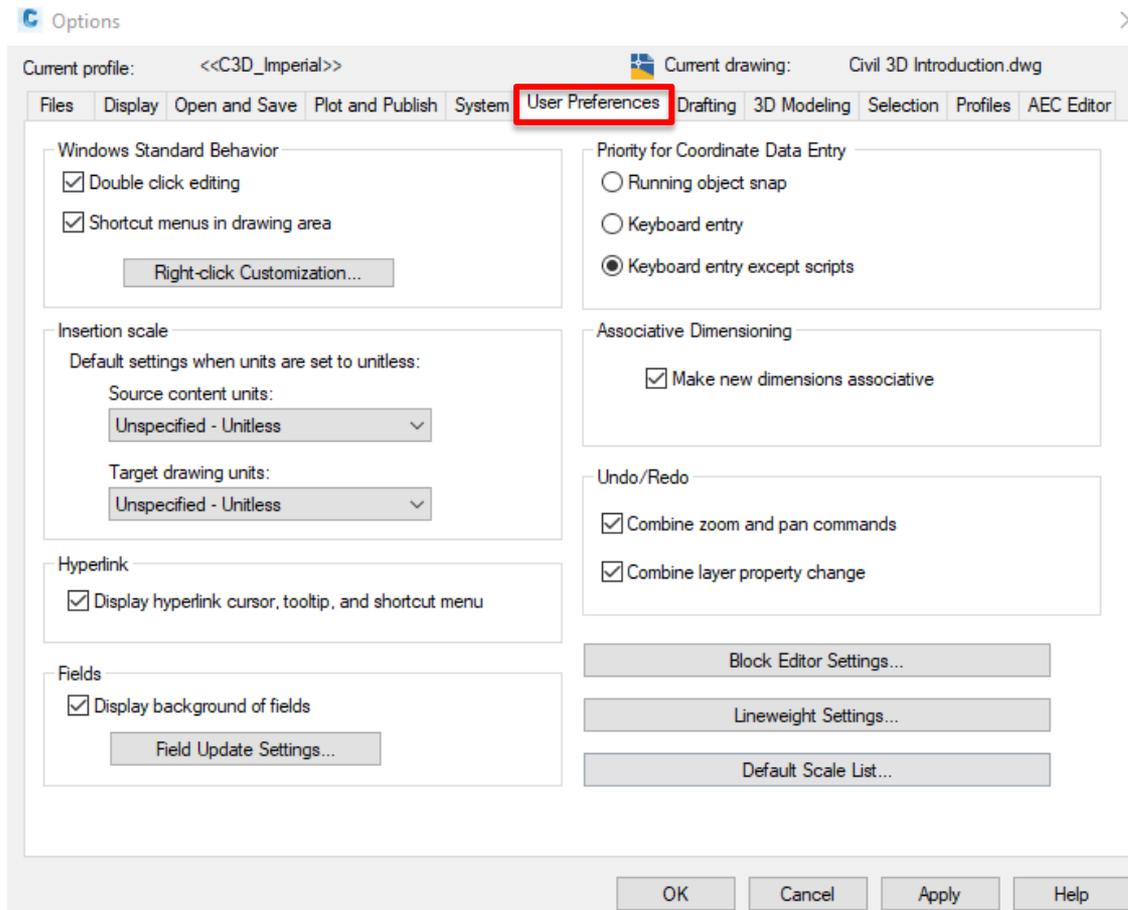
Natural Resources Conservation Service

Open and Save Tabs



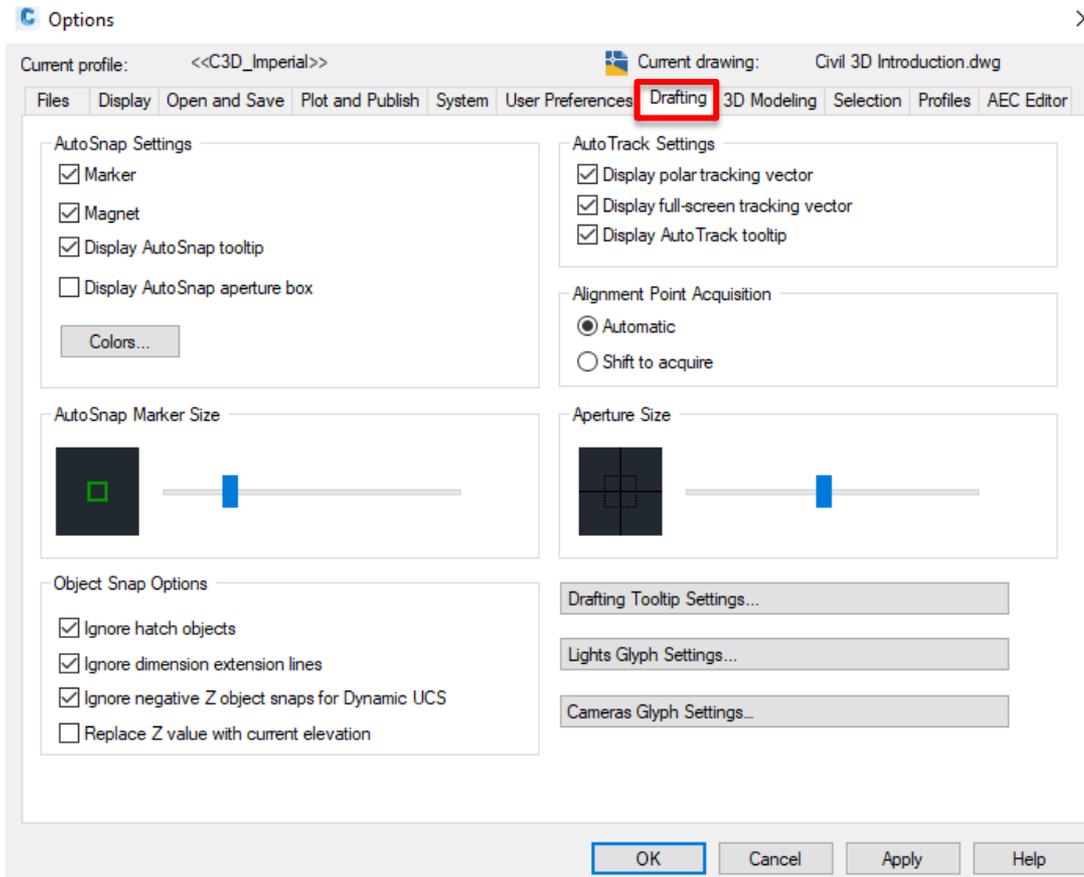
Natural Resources Conservation Service

User Preferences Tab



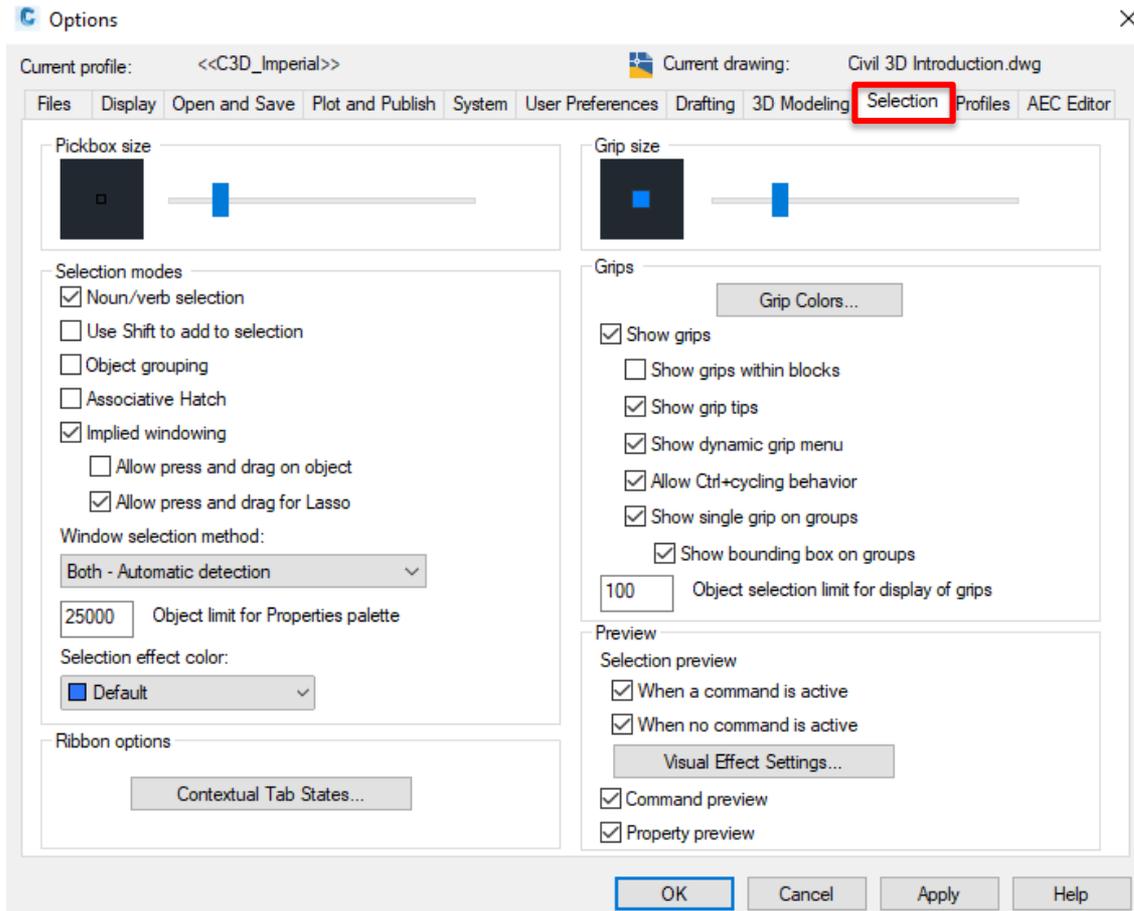
Natural Resources Conservation Service

Drafting Tab



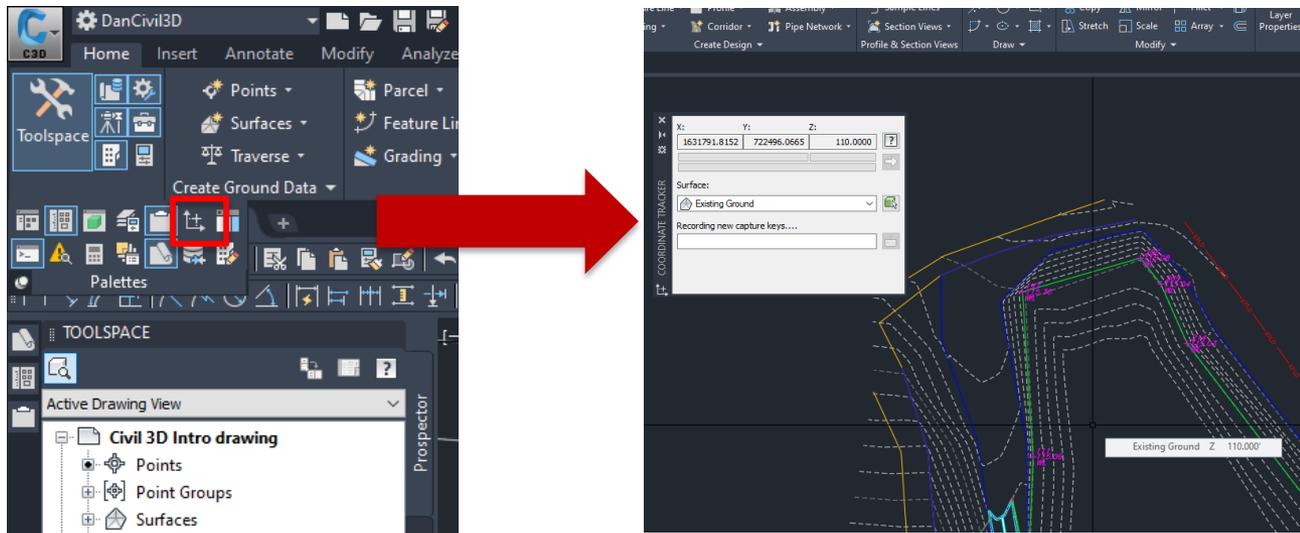
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Selection Tab



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Coordinate Tracker



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Things to Know

- If you have a question – ASK!
- There are always multiple ways to do the same thing – use the one(s) that work best for you
- Keep in mind the goal of what you are using AutoCAD/Civil 3D for
- Use help sources
- This program can be as simple or as complicated as you would like it to be
- Spend time using the program and, whenever possible, with other people who use the program

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Questions?

