Conversion Training

MicroStation SS2

to

PowerGEOPAK SS4

MoDOT Function Key Assignments

F1 - Activates the MicroStation Help information

F2 - Activates the Civil Help information

F3 - Opens the View Attributes dialog

F4 - Closes down all currently active tools and deselects everything in the file

F5 - Toggles Off/On Constructions attributes under the View Attributes tool

F6 - Used to open View 2 in an Isometric rotation along with the Display Style representation set to Illustration. Used for 3d files only.

F7 - Activates the Analyze Point tool under the Terrain Model task. Also toggles on Civil Accudraw and sets the Civil Accudraw option to Station-Offset

F8 - Activates the Create Template tool under the Corridor Modeling task

F9 - Activates the Excel to MicroStation tool for importing data from the Quantab Excel sheet.

F10 - Creates a Display Set of the elements that you have selected within the file

F11 - Clears out an active Display Set

F12 - Blank

Ctrl+F1 - Converts the model properties for the line style scale from Global Line Style Scale to Annotation Scale. It will only convert the model that is currently active.

Ctrl+F2 - Activates the Saved Views tool

Ctrl+F3 - Activates a tool to exaggerate a terrain model. This will only work in a 3d file and it creates a temporary model for viewing purposes only.

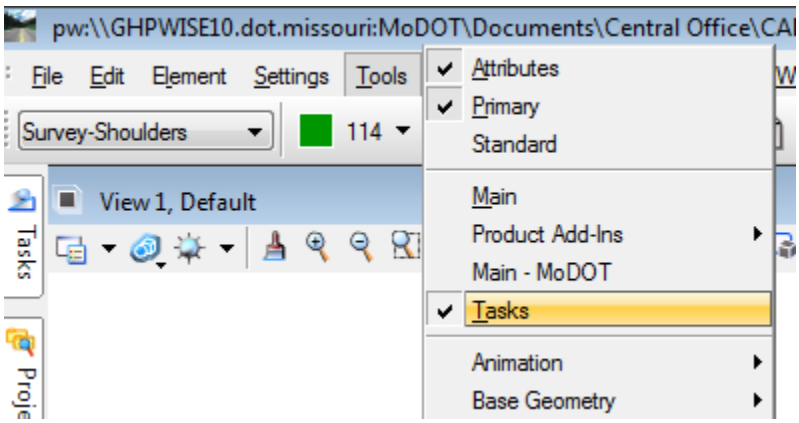
Shift+F1 - Activates the Redraw tool under the Survey task

Shift+F12 – Removes any unused fonts and compresses the file

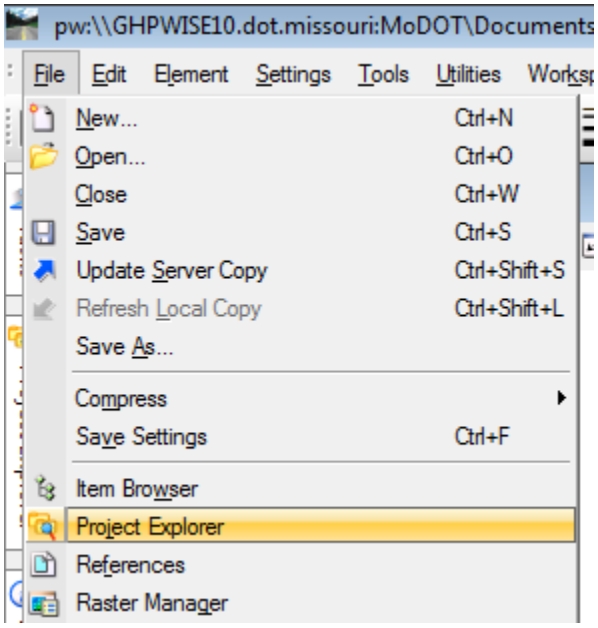
General Tips with PowerGEOPAK

If you accidentally closed out or remove the tabs for the Tasks, Project Explorer, Element Information, etc. tools, these are the locations to get those tools back out to use again in PowerGEOPAK.

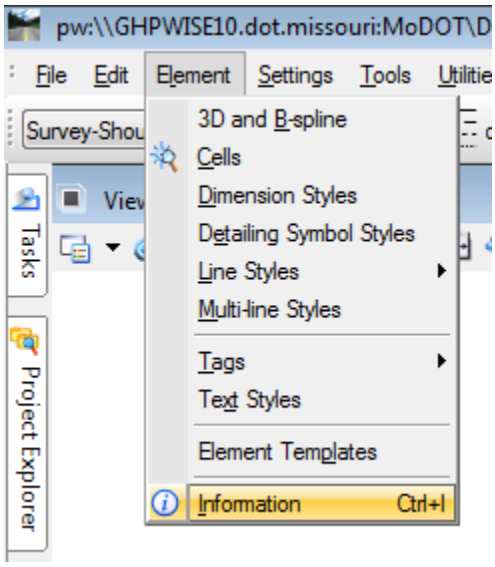
Tasks – Go to **Tools > Tasks** to activate again



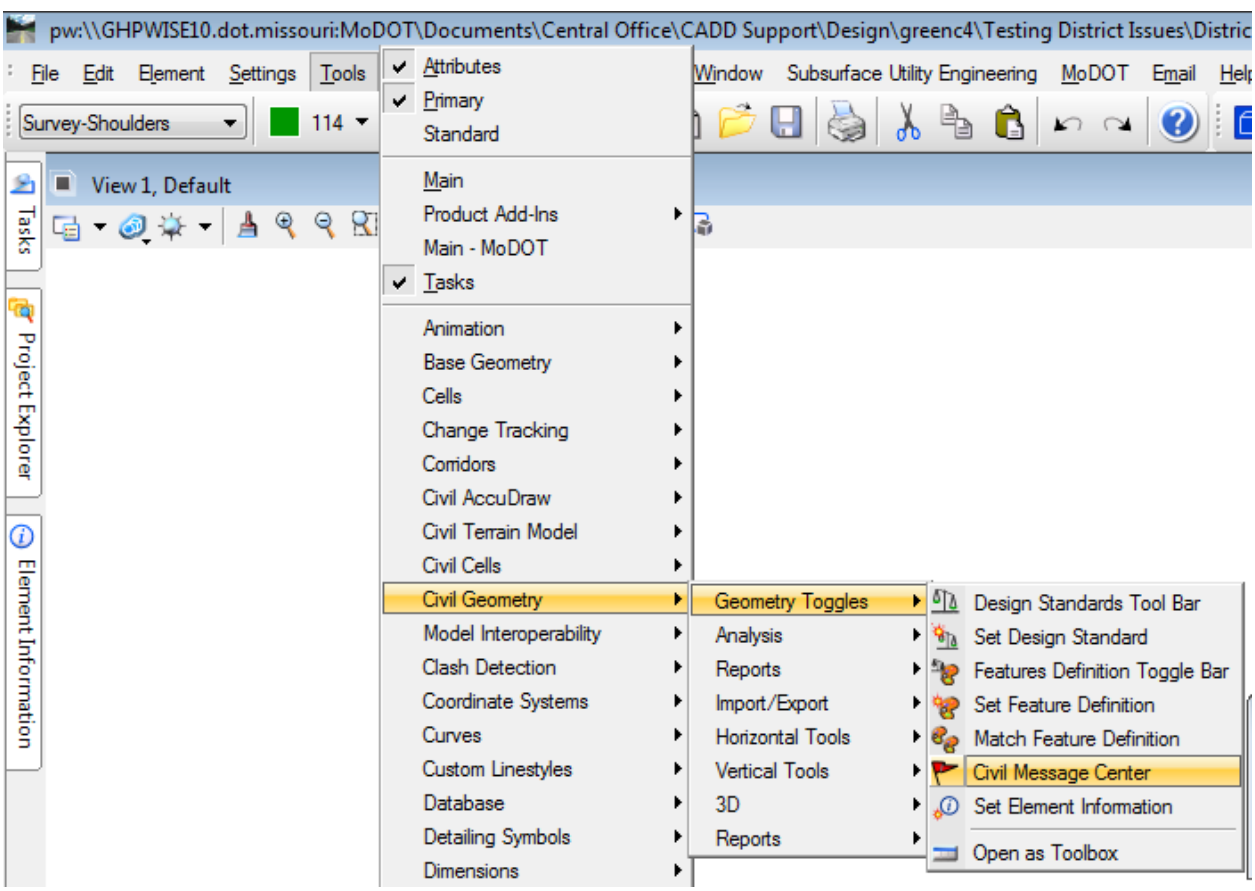
Project Explorer – Go to **File > Project Explorer** to activate again



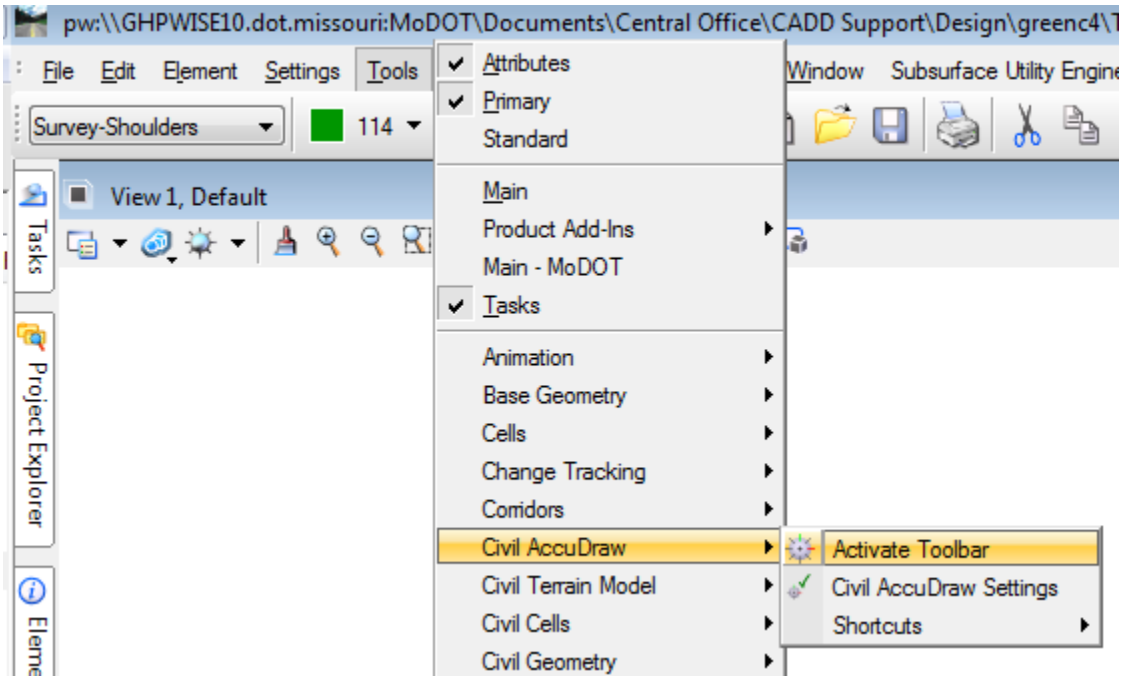
Element Information – Go to **Element > Information** to activate again



Civil Message Center – Go to **Tools > Civil Geometry > Geometry Toggles > Civil Message Center** to activate again
NOTE: This is also the location for the Designs Standards Toolbar, Features Definition Toggle Bar, etc. if they are accidentally closes or removed from the PowerGEOPAK Interface.



Civil Accudraw – Go to **Tools > Civil Accudraw > Activate Toolbar** to activate again



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Chapter 1

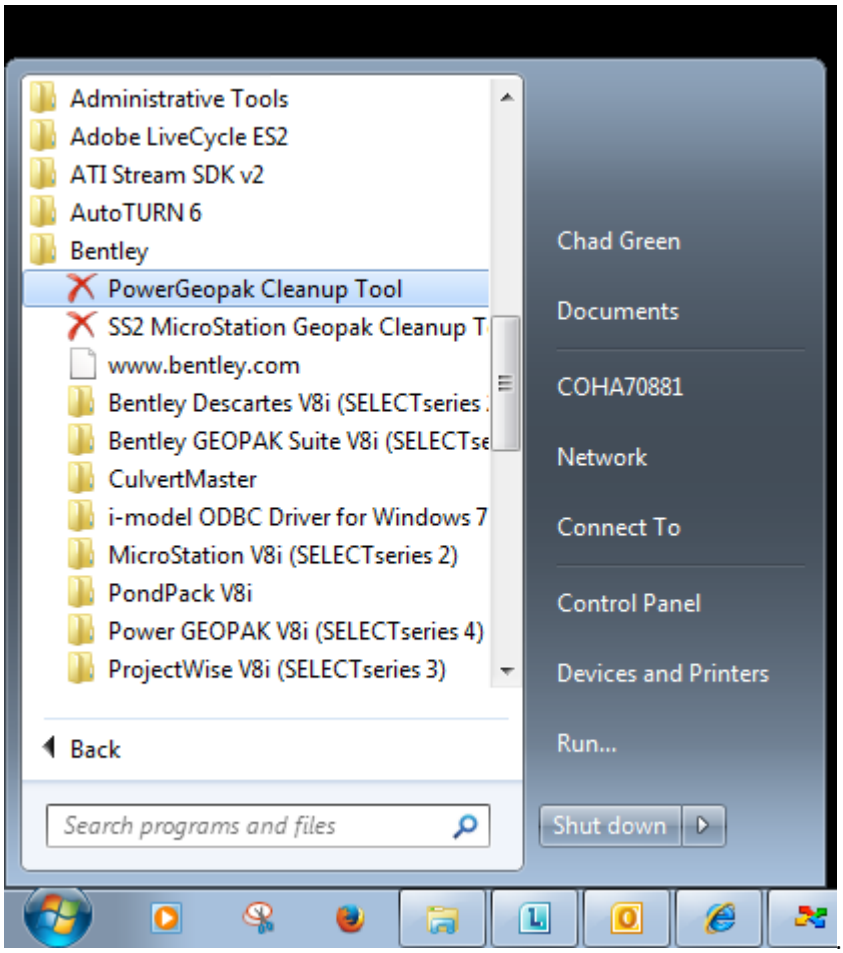
Instructions for after PowerGEOPAK and ProjectWise has been installed on your computer

Once PowerGEOPAK SS4 and ProjectWise SS3 has been installed on your computer, there will be a couple items that you will need to do.

1) Go to the **Start Menu > All Programs > Bentley** folder and run the **PowerGEOPAK Cleanup Tool**. This tool will remove certain files and copy necessary files back to the computer for PowerGEOPAK to run using the default MoDOT settings.

Follow the prompts when the tool runs.

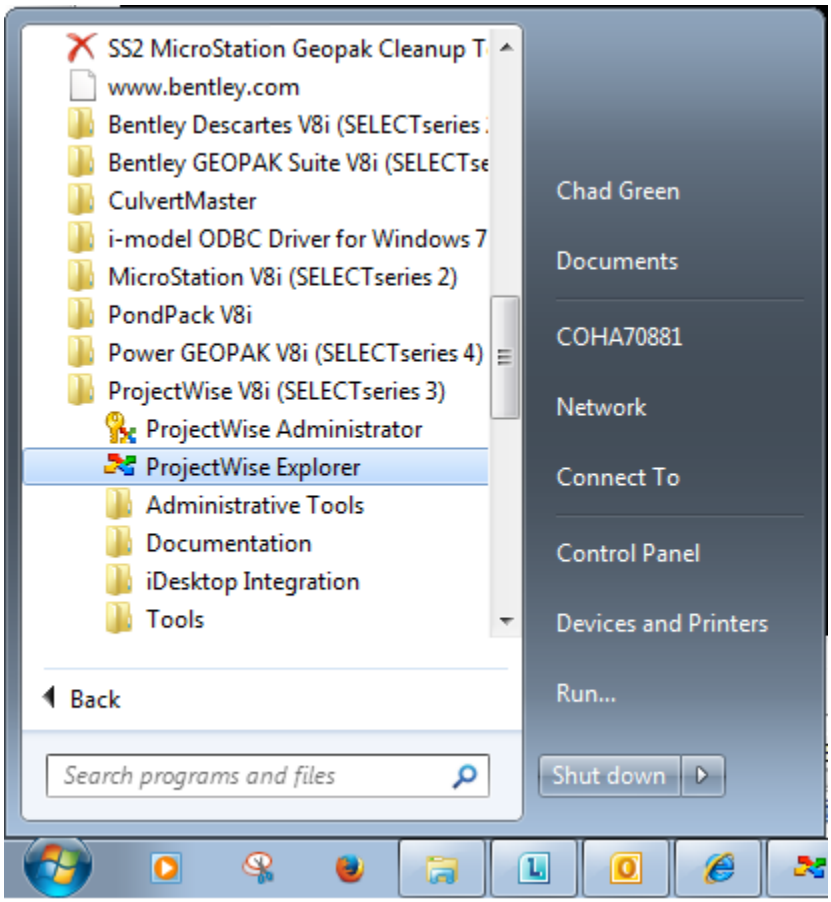
NOTE: This tool can be ran at any time if you having issues with PowerGEOPAK not running properly. Make sure you exit out to PowerGEOPAK first though before running the cleanup tool.



2) The existing ProjectWise icon on the desktop will not work after ProjectWise SS3 has been installed. Delete the icon on the desktop.

Go to the **Start Menu > All Programs > Bentley > ProjectWise V8i (SELECTseries 3)** folder and select **ProjectWise Explorer** to access the program.

If desired, you can create an icon on the desktop by right clicking over **ProjectWise Explorer** and select **Send to > Desktop (create shortcut)** option.



Instructions for Updating Existing DGN Files for the PowerGEOPAK Conversion

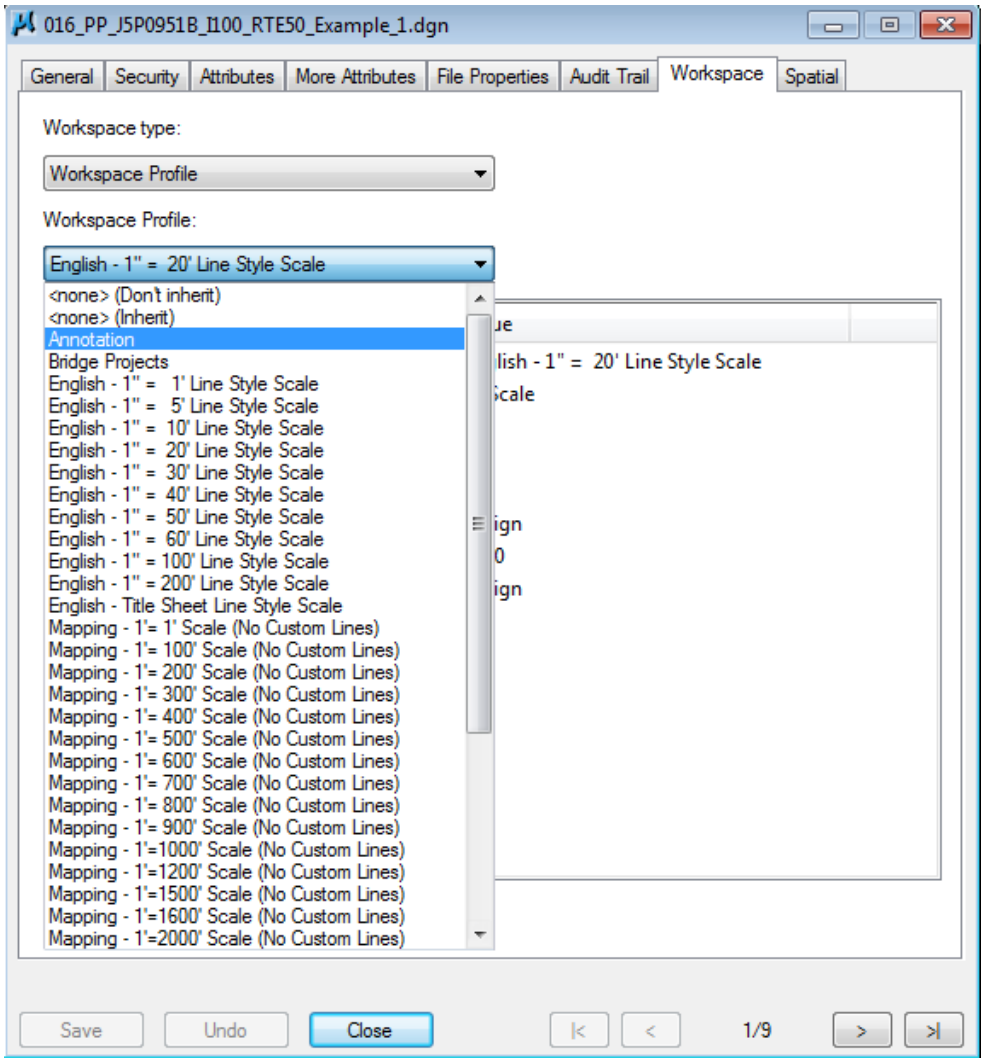
With the onset of PowerGEOPAK, a few workflows that we have come accustom to will need to change. To accommodate these changes, existing DGN files will need to be modified in order for them to work within PowerGEOPAK. These instructions will go through steps that need to be done to existing DGN files in order for those files to open and work properly in PowerGEOPAK.

1) Activate ProjectWise and navigate to the project you are working on.

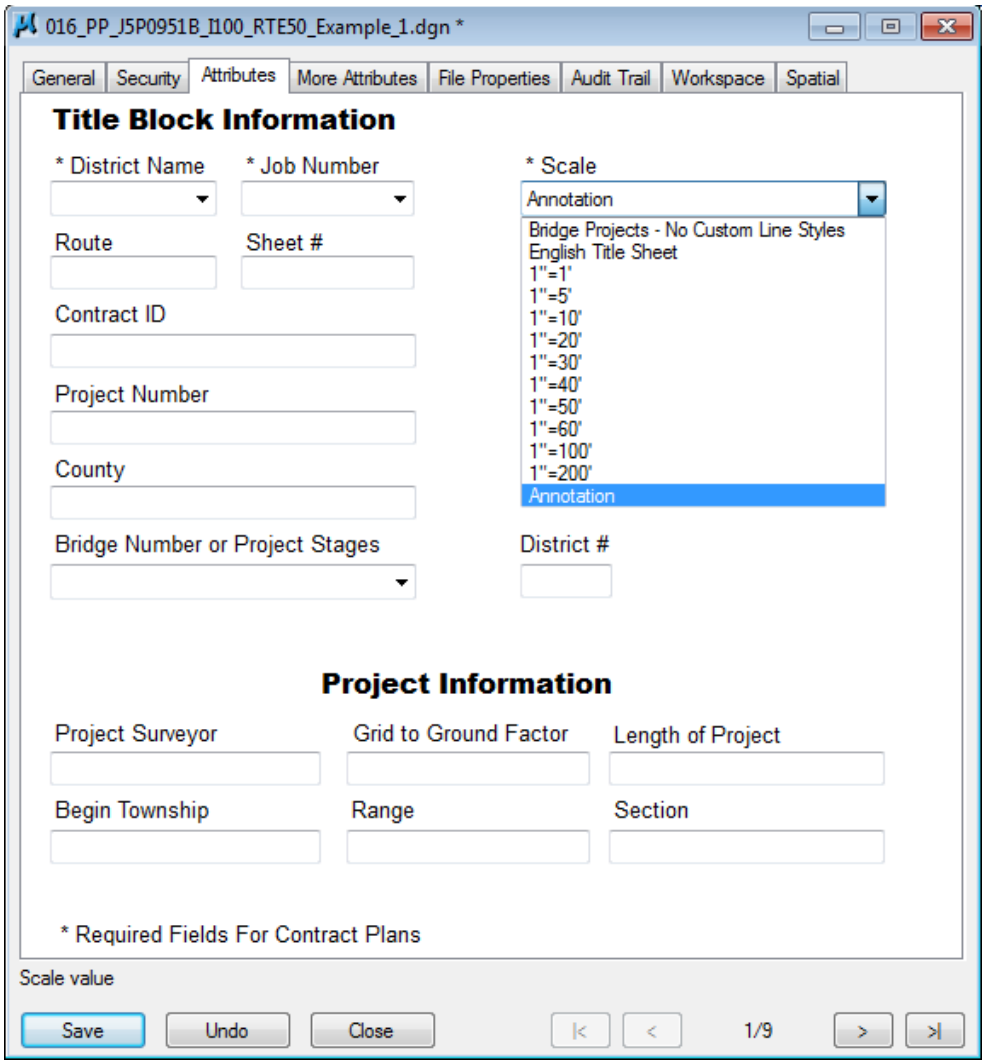
Right click over the dgn file and select **Properties**.

In the dialog box, select the **Workspace** tab. Change the Workspace Profile to **Annotation** so the dgn file can be opened in PowerGEOPAK.

Click **Save** to apply the changes to the file.



1a) Sometime during the design process, you will also need to change the Scale option to **Annotation** under the **Attributes** tab. This will allow the dgn file to process properly into a sealable Contract Plan PDF when the job is ready to be submitted.

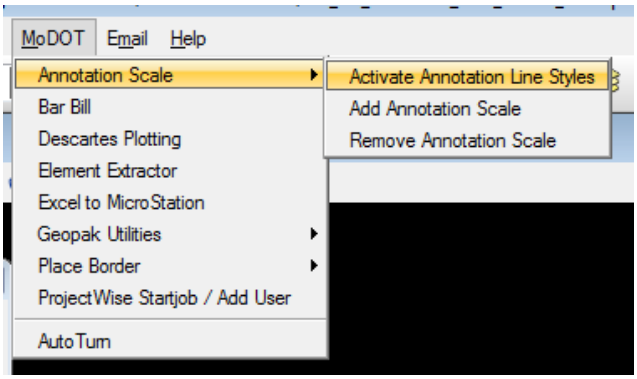


2) Open the dgn file.

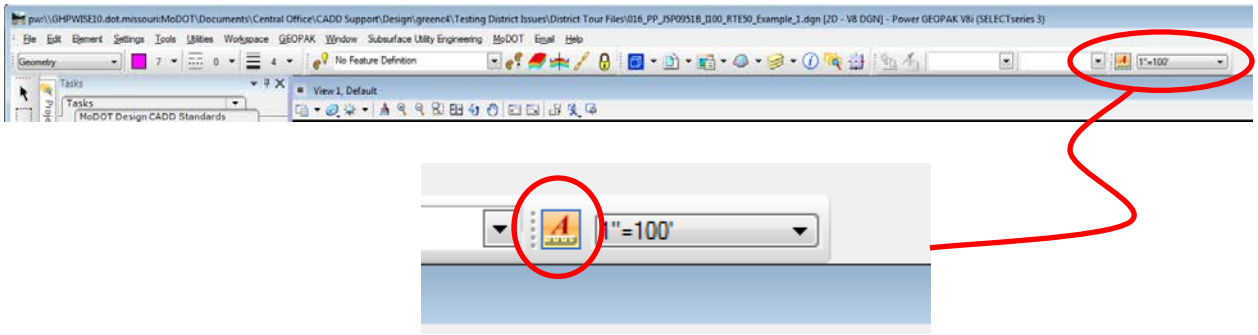
3) Once the file is open, convert the Line Style Scale option to Annotation Scale under the Model properties. Also toggle on the Annotation Scale in the Drawing Scale toolbox.

Both of these can be easily done by clicking **Ctrl+F1** on the keyboard. It will run a command that will turn on Annotation Scale and change the Model properties automatically.
Note: If you have changed the command for the function key of **Ctrl+F1**, this option will not work.

Another option is to go to **MoDOT > Annotation Scale > Activate Annotation Line Styles** to change the Model properties of the file.

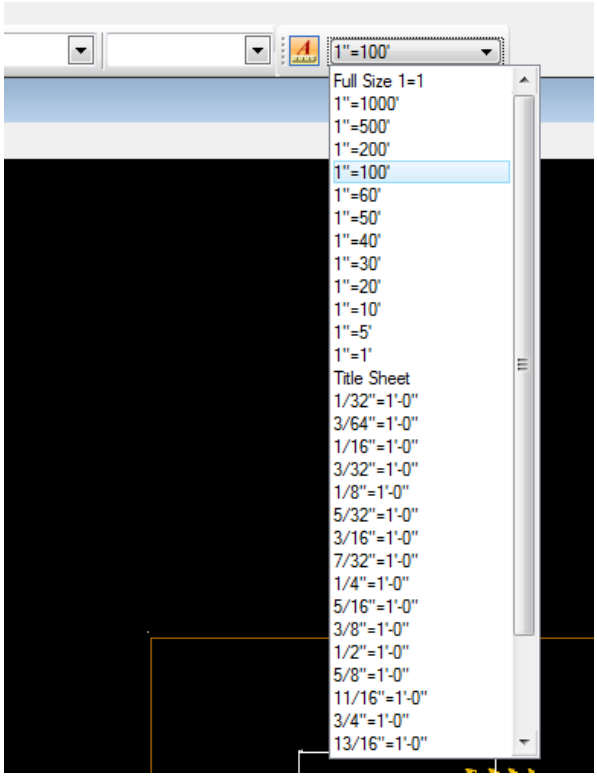


Also go and toggle on the **Annotation Scale icon** in the Drawing Scale toolbox.



4) Go the Drawing Scale toolbox and change the scale to match the scale of the border attached to the file.

Note: This is the only step you will need to do when working on newly created files. The workspace profile and Model properties for annotation scale have already been configured in the seed files with the proper settings.



5) You are finished!!! You can begin working on the file again.

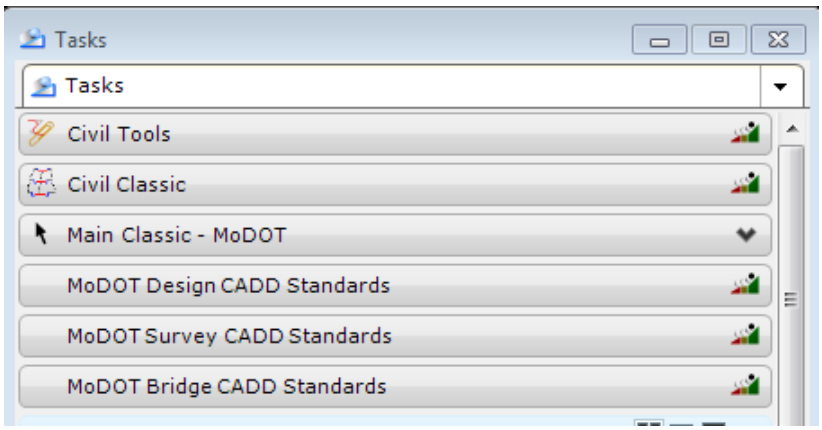
Chapter 2

Tasks & Drawing Scale

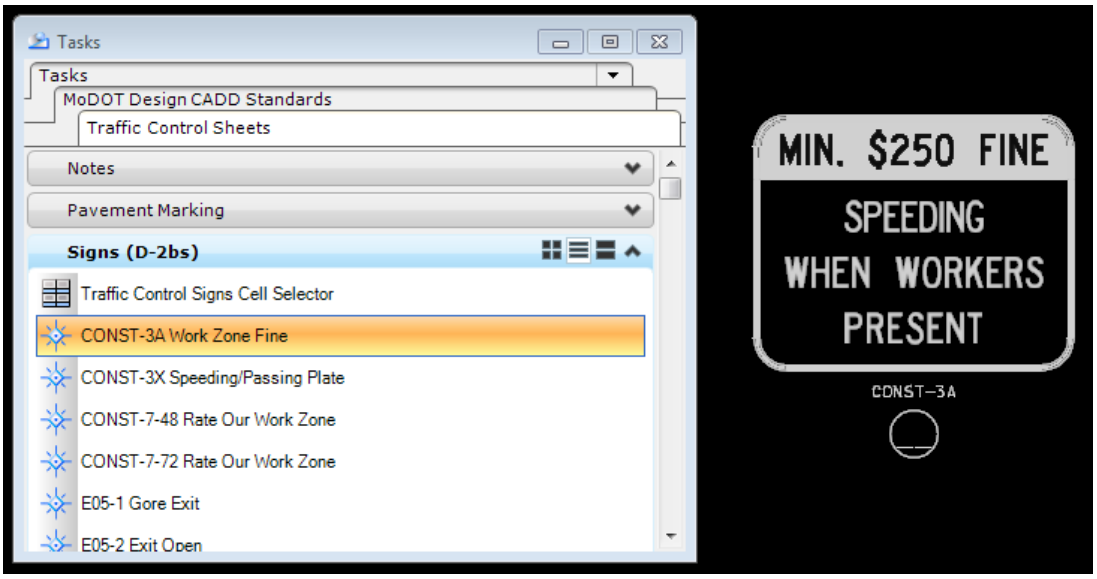
2.1 Overview of Tasks

A task is a set of tool references grouped to facilitate a particular job. A sequence of tasks can be grouped into a workflow. By defining and grouping tasks into workflows, you can create a task-based user interface. The tool references grouped into a task can be standard MicroStation tools, custom tools, or a mixture of both types. The task's tool references can be grouped into standard MicroStation toolboxes, custom toolboxes, or a combination of both types. Therefore the interface will contain all the tools and toolboxes you need to complete your work, grouped the way you want them.

MoDOT utilizes Tasks for the CADD Standards to enable their users to place standardize items such as line styles, line weights, colors, text styles, dimension styles, patterns, cells, and scales. The Tasks enables the user to place geometry with the correct element attributes and it will also invoke the recommended tool with a single mouse click. The Tasks have been broken out into 3 different groups – Design, Survey, and Bridge.

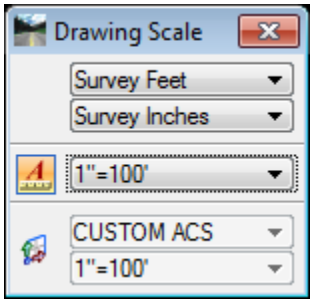


Each group is then broken out into other groups to make it easy to find the correct tasks for the operation that you are doing at that time. Once you select the appropriate Task, it will call up the appropriate tool to use and also change the attributes and/or other settings to the correct MoDOT standards.

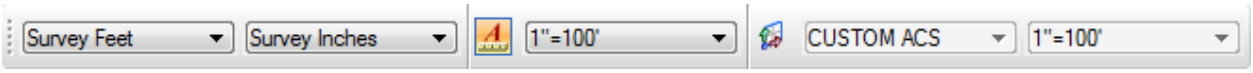


2.2 Overview Drawing Scale (Annotation Scale)

The Drawing Scale window is a dockable window that contains controls for viewing and/or modifying working units, the annotation scale factor, the Annotation Scale Lock, the active Auxiliary Coordinate System (ACS), ACS scale, and ACS scale lock. These settings are particularly relevant to the process of creating sheet models for drawing production. This window opens when **Settings > Drawing Scale** is chosen.

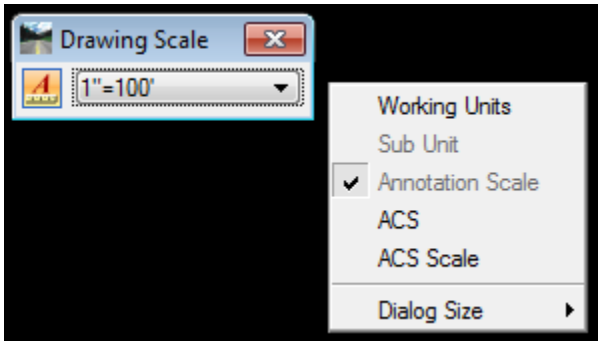


Undocked Drawing Scale window



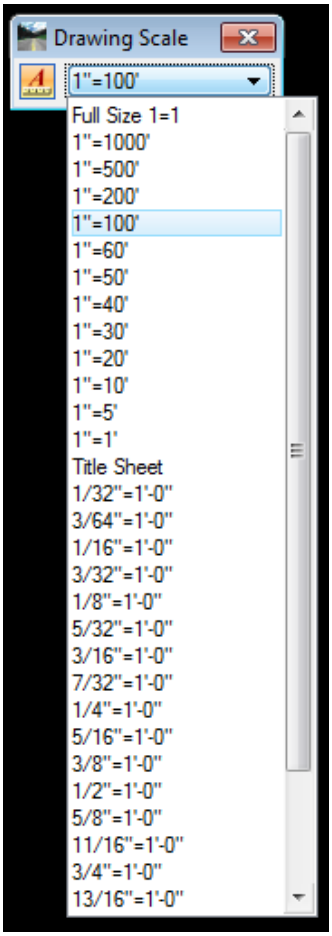
Docked Drawing Scale Window

The selection of controls displayed in the Drawing Scale window can be customized by right-clicking in the window. The technique is the same as that for showing and hiding tools in toolboxes.

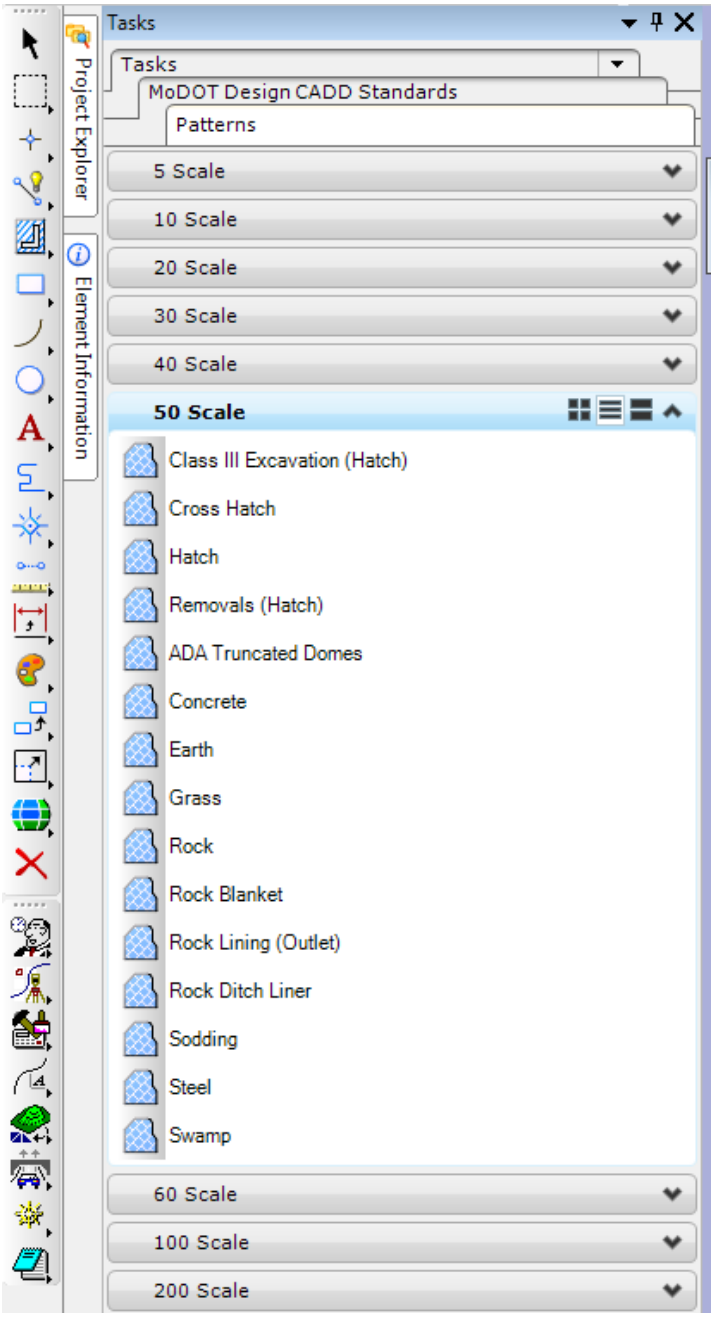


For MoDOT standards, the Annotation Scale in the Drawing Scale tool has been customized to include all Design files scales and all Bridge file scales. The Annotation Scale should be set to the scale of the border placed into the file.

The Annotation Scale will control the size of cells , text, or dimensions placed and the display of custom linestyles (guardrail line, r/w lines, utility lines, etc.) in the file. It can also control the size of geometry for reference files in the active file if necessary.

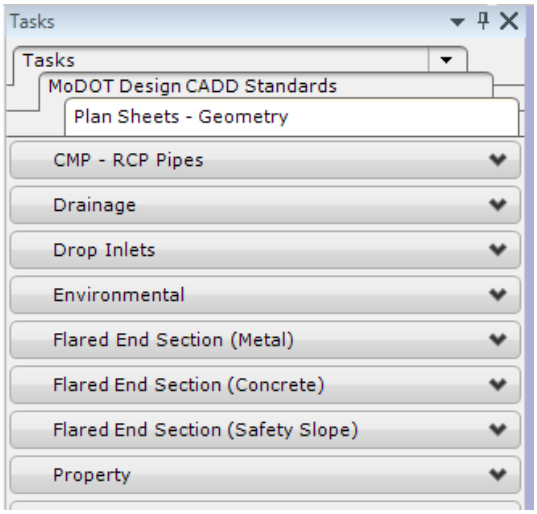


The exception for annotation scale for scaling everything in the file is patterns. In the MicroStation software, hatching and patterns have not been configured to use annotation scale in this version. Therefore, hatching and patterns have been broken out into separate groups in the Task listing that include all the scales needed. Once the hatching or pattern has been applied to an area, it will stay that scale regardless of the annotation scale applied to the file.



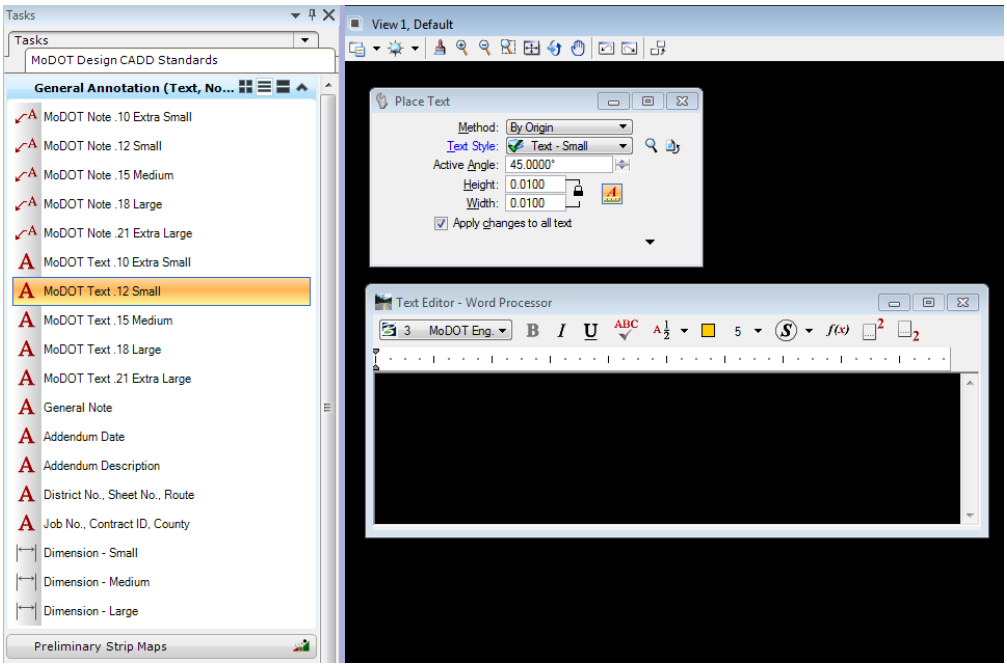
2.3 Activating the CADD Standard Tasks

The CADD Standards are activated by selecting the appropriate Tasks. The Tasks may be broken out into Groups that contain tasks that are associated to that Group like CMP-RCP Pipes, Drainage, Drop Inlets, etc.



Once you navigated to the proper Group, select the Task as needed.

Selecting a Task with a single mouse button click will allow that item to be placed on the correct level, color and weight. Using the Task also keeps the user from having to attach a cell library or look up what level items are to be placed so that everyone at MoDOT is placing the same cells on the same levels. This also keeps the user from having to set text heights, widths and spacing. Dimensions are also incorporated in the Task to set the correct text attributes, arrowhead sizes and other dimension attributes properly.



When viewing the Tasks under a certain group, you will see icons on the left side of the Task. These are indicators that basically tell you what tool it will call up when you select that Task.

Hovering over the Tasks will also show you what tool it will call up when you select that Task.

Place Note

Place Text

Dimension

Place Cell

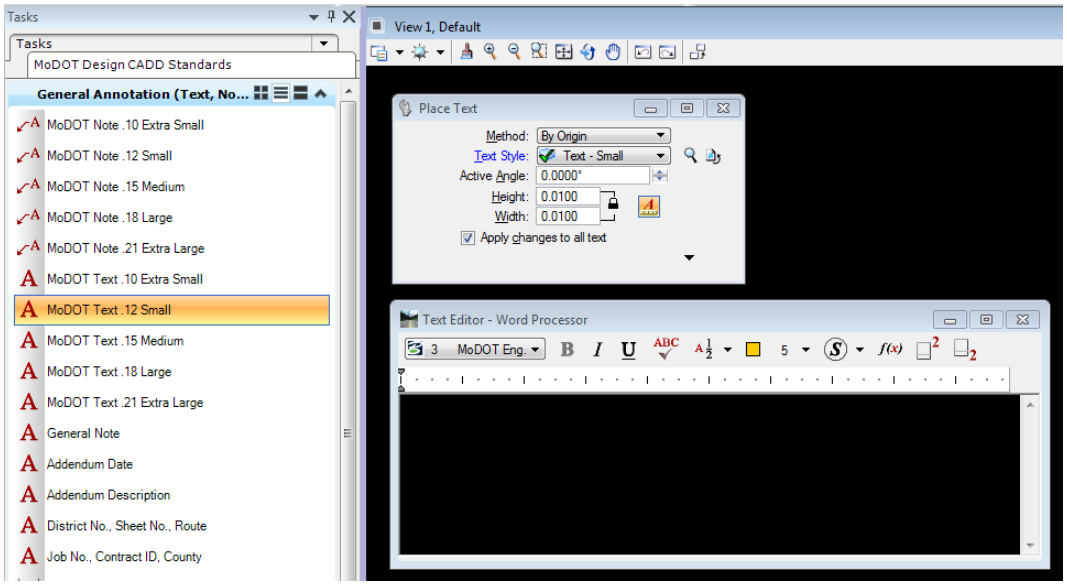
Area Pattern

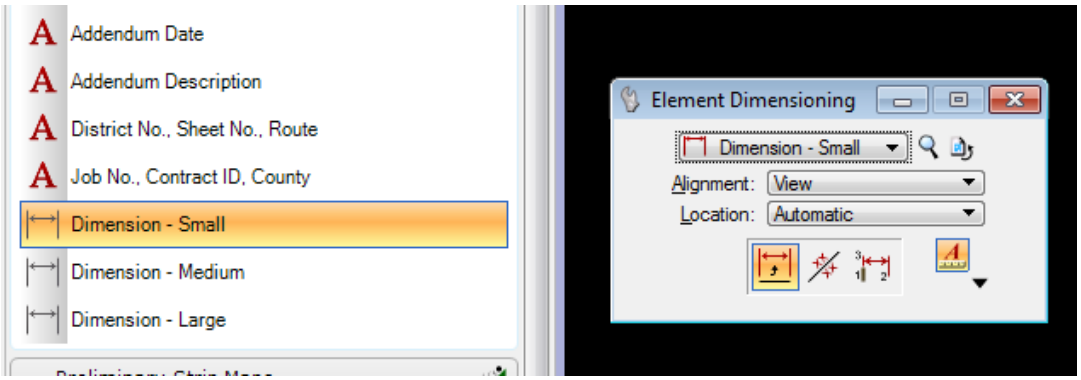
Place SmartLine

MultiLine

Place Curve

Tasks that are associated to the Place Text tool or the Place Dimension tool will have a style applied to that Task. Styles are named sets of attributes, such as font, width, height, color, arrowheads, etc. that allow you to place text or dimensions within a file in a consistent and automated manner. The text and dimensions styles are stored in read-only DGN Libraries to allow management of text attributes and dimension attributes throughout the department.





Once a style has been used, it will embed itself in the file. This allows the file to be easily transferred to another department or company that may not have our MoDOT CADD setup, like a utility company.

Since styles will embed themselves in the file, the style can be modified or changed to whatever settings needed for that text or dimension to be placed. These settings will stay applied to the text style or dimension, unless you select a certain text or dimension task. Then it will pull the style from the DGN Library for that text or dimension you need to place in the file.

Chapter 3

Civil AccuDraw

3.1 Overview

Civil AccuDraw performs many of the same functions as MicroStation AccuDraw but has greatly expanded capabilities for the civil designer. It allows the user to define a point location at any stage of any placement tool (MicroStation or other civil applications) and accepts input that results in more sophisticated point locations

There are many benefits in using Civil AccuDraw. It extends the drafting power of MicroStation by providing Civil point location methodologies in all the MicroStation and Civil commands. It will also eliminate the need to create temporary construction geometries just to perform more complex point locations.

In general, Civil AccuDraw works in a similar way to MicroStation AccuDraw. However there are some differences and some limitations that will be addressed in future versions.

Differences

- Smart lock (<Enter>) is not supported in Civil AccuDraw. Similar functionality is possible by key-in and locking a value corresponding to the compass point.
- Spacebar does not switch Civil AccuDraw modes. It opens the mnemonic pop-up which provides similar and additional functionality.
- O shortcut is subtly different. MicroStation AccuDraw reads the cursor position at the instant that O is pressed. Civil AccuDraw waits for a DP. In addition, in Civil AccuDraw, the O shortcut also serves to pick the base element for station or offset ordinates. Once chosen this element is remembered for the duration of the session or until changed by user.
- In Civil AccuDraw, the delta Z origin can be set independent of the XY origin.
- When in a 3D model, the Civil AccuDraw compass always considers X, Y and Z as separate and distinct. For example, using Civil AccuDraw in a side view, the Y and Z ordinates will dynamically track values. On the other hand, MicroStation AccuDraw would still call the ordinates X and Y even though in a side view. Keeping the ordinates distinct and separate lays the groundwork for future enhancements where other Z ordinates such as slope will be introduced.

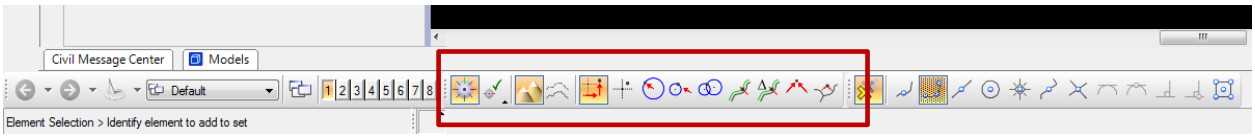
Limitations

- Simultaneous use of Civil AccuDraw and MicroStation AccuDraw will cause errors.
- Switching between Civil AccuDraw and MicroStation AccuDraw while values are locked may cause errors.
- Angle input:
  The use of d, m and s for degree, minute and seconds delimiters is not supported.
  Input angle in the form DD^MM.mm is improperly interpreted as DD^00’MM.mm”.
- Stationing:Station-offset using a closed B-spline may be incorrect. Civil AccuDraw cannot consume the stationing on alignments stored in GPK, ALG nor FIL files. The graphical elements representing these alignments can be selected but Civil AccuDraw will interpret the starting station as zero.
- When using Civil AccuDraw and viewing the shortcuts list, there may be shortcuts listed which have no function in Civil AccuDraw. Civil AccuDraw shares the shortcuts.txt file with MicroStation AccuDraw and some of the shortcuts are not relevant or have not been implemented in Civil AccuDraw.
- In the shortcuts list, if ordinates are station-offset and you choose Set Origin, clicking Run has no effect.
- Alternate Coordinate Systems (ACS) are not recognized by Civil AccuDraw.
- Civil AccuDraw will override DGN Settings > Grid Lock. This is by design. Toggle Civil AccuDraw off if the grid lock function is required. Similar functionality can be achieved within Civil AccuDraw by setting the round off values in Civil AccuDraw settings.

3.2 Working with Civil AccuDraw

Activating Civil Accudraw

By MoDOT default, the Civil Accudraw toolbar is active and located at the bottom on the MicroStation window.



The toolbar can also be activated by going to *Tools > Civil Accudraw > Activate Toolbar.*

To activate Civil Accudraw, toggle on the Civil Accudraw icon.

Note: It is advisable to disable MicroStation AccuDraw if you are using Civil AccuDraw. This is to avoid confusion between the functionality of the different tools.

As much of the functionality is similar between Civil AccuDraw and MicroStation AccuDraw, consult this help in conjunction with MicroStation help for further details.

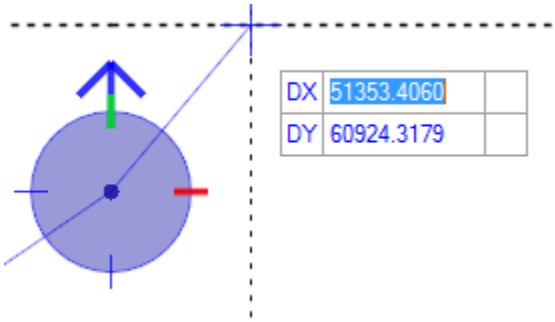
Coordinate Display

The coordinates of the current cursor position are displayed by default in a floating dialog. You can switch between the floating or fixed dialogs using the up and down arrow keys. The contents of the dialog will depend upon the current ordinate system selected. For example, the default system of Distance and Direction will display distance and angle. If the model is 3D, Z will also be displayed.

Only one dialog is displayed at a time.

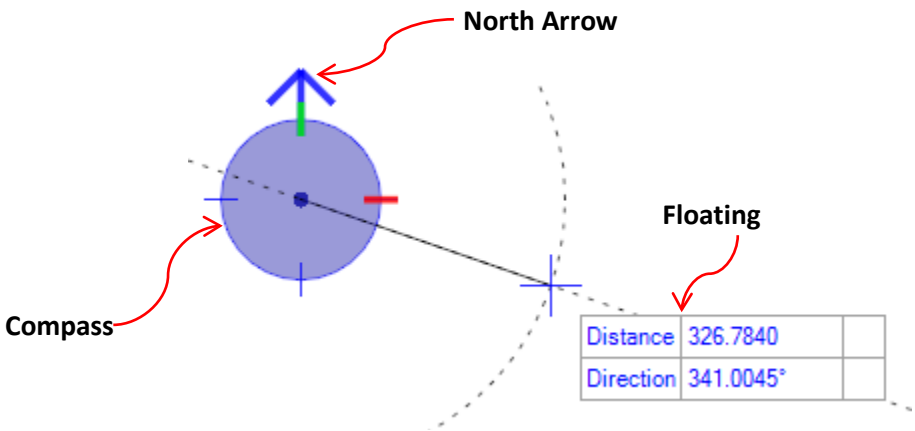
Floating Dialog

The floating dialog is displayed close to the current position of the cursor. As the cursor moves, the dialog moves and is automatically updated with the new coordinate information. Press the down arrow to switch to the fixed dialog.

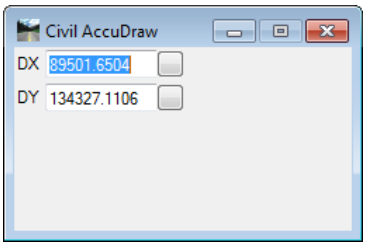


Fixed Dialog
The fixed dialog is a normal dialog and can be repositioned or docked. As the cursor moves, the dialog is automatically updated with the new coordinate information. Press the up arrow to return to the floating dialog.

Fixed Dialog versus Floating Dialog
The default operation of Civil AccuDraw is with a floating dialog at the cursor for feedback and input of ordinate values as shown below.



Pressing the down arrow or the appropriate quick drop-down icon on the keyboard switches to a fixed dialog.

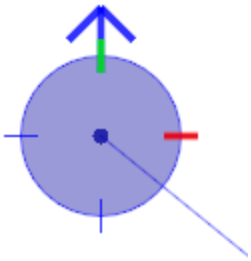


The up arrow or quick drop down can toggle back to floating dialog.

Compass

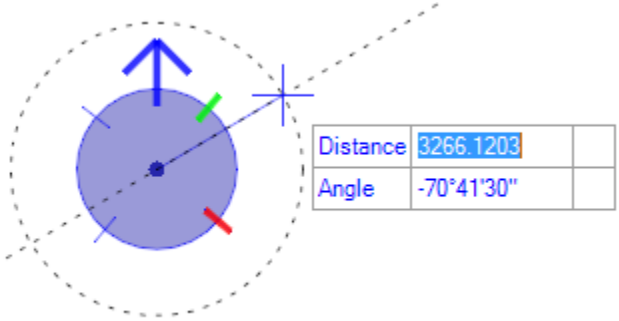
The center of the compass indicates AccuDraw's origin point. The Civil AccuDraw compass is only displayed when Civil AccuDraw is active. It can also be disabled in *Settings > Operation* tab.

The compass is always circular and is marked by a number of tics. The default is 4 compass points, this can be changed in *Settings > Operation* tab.



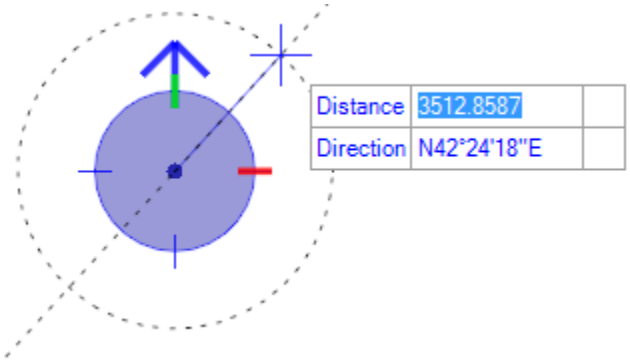
Compass Shortcuts
The compass can be rotated with the V, B, T, RQ, RE shortcuts. The north arrow on the compass will always point to north as defined in *Settings > Design File > Angle Readout*.

If the Civil AccuDraw settings have context sensitive turned on, then the compass auto-rotates in a similar fashion to MicroStation AccuDraw:



Note that rather than Direction being shown, the label and value are now an angle. This is because the context is based on the direction of the preceding line segment rather than an absolute direction.

Use the T (Top) shortcut or the corresponding drop-down to return to a pure direction.



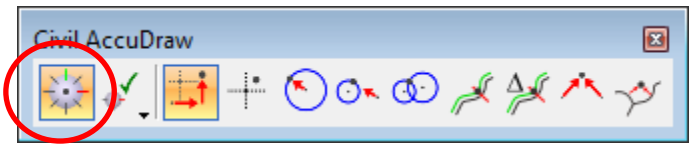
The angle/direction settings used in Civil AccuDraw are taken from the DGN settings. See *Settings > Design File Settings > Angle Readout* category topic of MicroStation help.

Tips when using with MicroStation or Civil Geometry tools

- Selecting the **Tab** key while in an entry field will change focus.
- Selecting **Enter** will set the value in the field and lock it
- Selecting the **End** key will unlock the field
- Selecting the **Left or Right Arrow key** will move through the favorite options.
- Selecting the **Down key** will bring up the associated command entry dialog in addition to the heads up display.
- Selecting the **Up key** will remove the command entry dialog and just display the heads up display.
- Selecting the **O key** will allow to select a reference element or point for using certain civil accudraw commands like Station-Offset, Offset-Offset, Distance-Distance, etc.
- To input a Bearing in the direction field for civil accudraw, the following are valid forms:
    - **12:34'56**
    - **12:34'56"**
    - **12:34:56**
    - **12^34'56**"

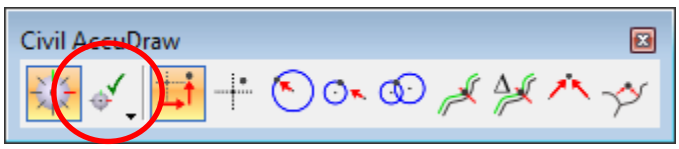
3.3 Civil AccuDraw toolbar

This tool box consists of a icons to toggle Civil AccuDraw and access the Civil AccuDraw commands.



Toggle Civil Accudraw

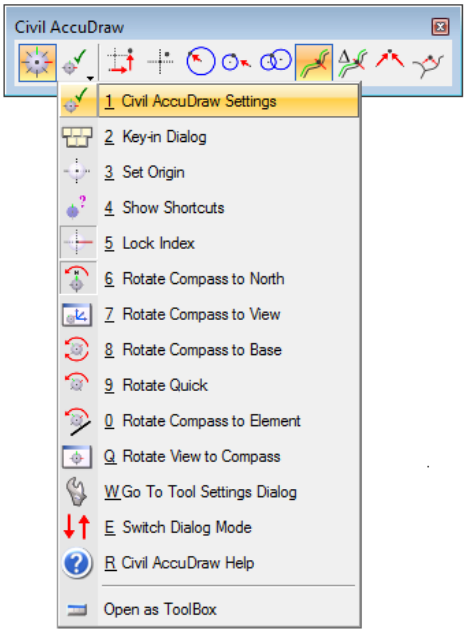
To activate or deactivate Civil Accudraw

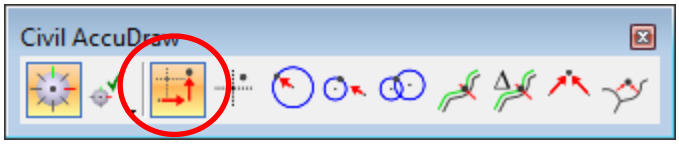


Civil Accudraw Settings

To access the Civil Accudraw settings dialog. See Civil Accudraw Settings section for more information.

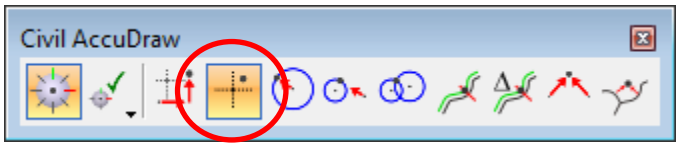
A quick drop-down menu will be display when holding down the left mouse button over the icon. This provides access to many Civil Accudraw shortcuts.





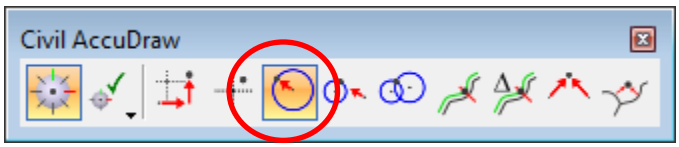
DX - DY

To set the order of ordinate entry to the difference in X coordinate then the difference in the Y coordinate, with both sharing the same common point of origin.



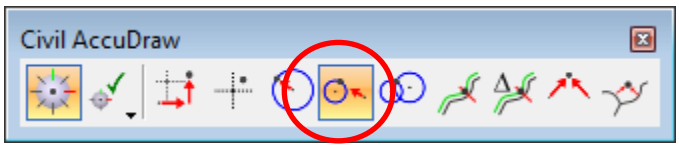
X-Y

To set the order of entry based on absolute X-axis and Y-axis, with both sharing the same point of origin.



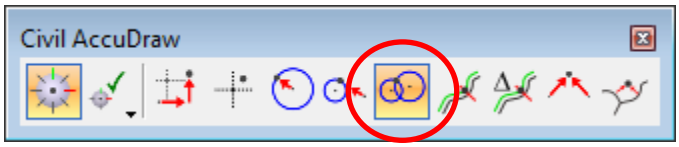
Distance & Direction

To set the order of ordinate entry to distance then direction, with both sharing the same point of origin.



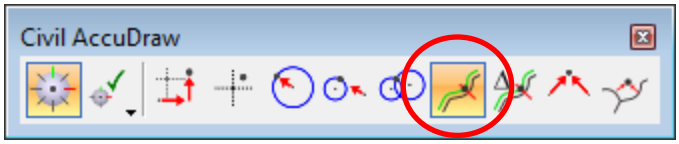
Distance & Direction Unlinked

To set the order of entry to distance for the first ordinate then direction for the second ordinate, without a common point of origin.

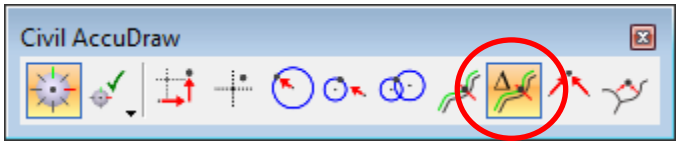


Distance & Distance

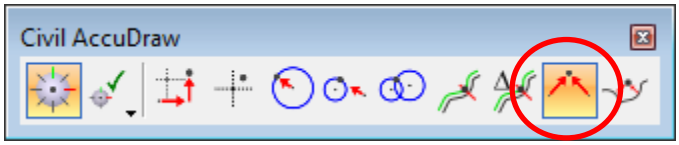
To set the order of entry to distance for the first ordinate then distance for the second ordinate, without a common point of origin.



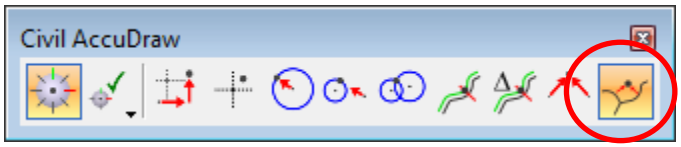
Station & Offset
To set the order of ordinate entry to station identification then offset value, with both sharing the same point of origin.



Delta Station & Offset
To set the order of ordinate entry to station identification based off a XY coordinate then offset value, with both sharing the same point of origin.



Direction & Direction
To set the order of entry to direction for the first ordinate then direction for the second ordinate, without a common point of origin.



Offset & Offset
To set the order of entry to offset for the first ordinate then offset for the second ordinate, without a common point of origin.

3.4 Civil Accudraw Coordinate Systems

Horizontal Ordinates

With MicroStation AccuDraw, the user is limited to X-Y (rectangular) or Distance-Direction (polar) coordinate systems. With Civil AccuDraw, the user may define an ordinate system from virtually any combination of the following ordinates.

Note: Some combinations are not allowed simply because they do not make sense. For example: Dx - Dx

X: Absolute value of X coordinate
Y: Absolute value of Y coordinate
Dx: Delta X (change in X) from compass origin
Dy: Delta Y (change in Y) from compass origin
Distance: Horizontal distance from the compass origin
Direction: Direction (as per Settings > Design Settings > Angle Readout) from the compass origin.
Station: The distance measured along an element. Any graphic linear element may be used. Use the Origin shortcut to choose the element.
Offset: The distance measured perpendicular from an element. Any graphic linear element may be used. Use the Origin shortcut to choose the element.

Sample Systems

Some examples of ordinate systems that may be useful:

- X-Y
- Dx-Dy from same origin
- Dx-Dy from different origin
- Distance-Direction from same origin
- Distance-Direction from different origins
- Distance-Distance
- Station-Offset from same or different base elements
- Offset-Offset
- Direction-Offset
- Distance-Station

Angle Syntax

The input for angle and direction fields follows the *MicroStation Settings > Angle Readout* settings.

Valid forms

Valid forms for the various settings are as follows:

DD.DDDD, Radians or Grads - Use the customary decimal input.
DD MM SS or DD MM - The following delimiters are supported between degrees, minutes and seconds:

- Colon - For example DD:MM:SS
- ^ (caret) to designate degrees, minute (’r;) and second (”r;) - For example DD^MM’SS”

The following are not supported in the current version:

- A space between degrees, minutes and seconds because space launches the Civil AccuDraw popup menu
- Use of d, m and s to designate degrees, minutes and seconds.

Examples

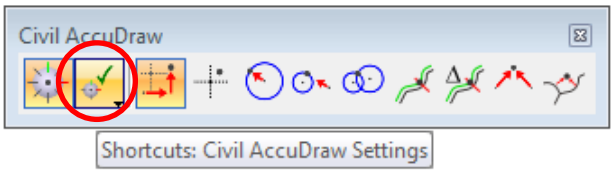
The following are all valid forms for 12 degrees, 34 minutes, 56 seconds:

- 12:34’56
- 12:34’56”
- 12:34:56
- 12^34’56”

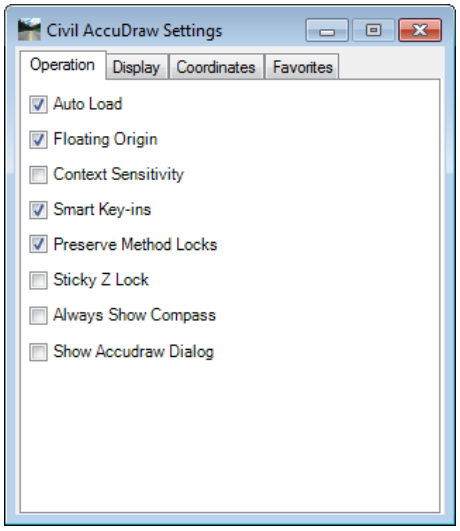
3.5 Civil Accudraw Settings

There are various Civil AccuDraw settings to enable you to customize the functionality and appearance of the Civil AccuDraw tools.

You can open Settings by selecting the icon from the Civil AccuDraw tool box.



Operation tab



Auto Load
On: Civil AccuDraw starts when MicroStation is loaded.

Note: It is highly recommended that MicroStation AccuDraw is set to NOT auto load if Civil AccuDraw is used.

Floating Origin
On: the origin moves to the last point placed.
Off: the origin remains fixed.

Context Sensitivity
On: the compass rotates in response to the context of various tools.
Off: the origin remains fixed

Smart Key-Ins
On: Civil AccuDraw interprets a number as positive or negative, depending on the direction of the pointer from the compass.
XY ordinates only: Smart Key-ins cause Civil AccuDraw to move the focus to either the x or the y field depending on the pointer position.

Preserve Method Locks
On: the locked values remain locked after switching the ordinate methods. For example, using station-offset ordinates and a lock station of 1+00, switch to distance-direction ordinates. Station 1+00 will remain locked while inputting distance-direction. The resulting effect will be a distance-direction-station lock.

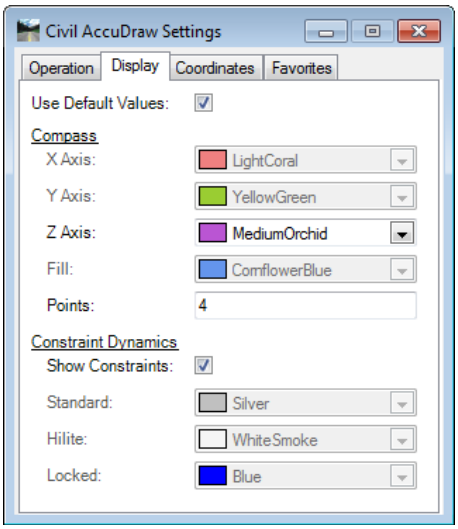
Sticky Z Lock
On: inputs to Z ordinates remain locked (sticky) until they are changed. This is useful in a 3D DGN to control the Z ordinate. For example, input 100.00 for the Z ordinate and the value remains constant until changed.
Off: the Z ordinate follows the cursor dynamics.
This also controls whether the origin for delta Z measurements follows the XY origin or is independent of XY.

On: the origin for delta Z is completely independent of the XY origin. For example, the user can set the origin for dXdY measurements from point A and set dZ to be measured from a second point B. The Z origin does not change until reset by the user. The effect will be apparent when drawing a linestring. When drawing a linestring, the dynamic orientation of the compass will adjust to align with the most recent line segment. The Z origin will remain fixed wherever the user placed it at in the beginning.

Note: When Accudraw ordinates are set to X,Y the sticky Z toggle does not apply. This is because, by definition, XY mode is always assumed to be absolute.

Always Show Compass
On: the compass is always visible.
Off: the compass is only visible when the appropriate input is required.

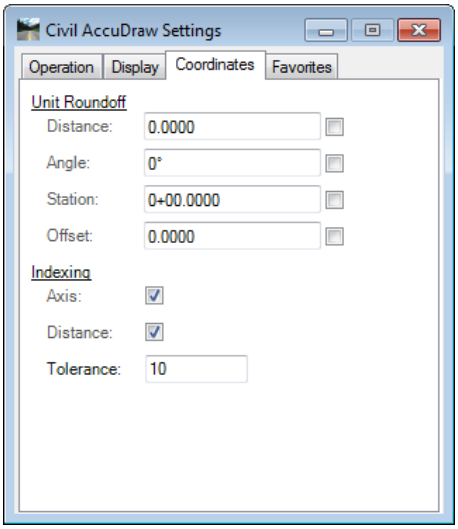
Display tab



Compass
X Axis: Sets the color of the positive X axis tick mark on the compass.
Y Axis: Sets the color of the positive Y axis tick mark on the compass.
Fill: Sets the fill color of the compass circle.
Points: Sets the number of compass points indicated by tic marks. In addition to tic marks, the axis locks are also honored on the tic marks.

Constraint Dynamics
Show Constraints: Shows dynamic feedback for the ordinate systems in use. For example, with Distance-Direction ordinates a circle indicating distance and a line indicating direction is displayed.
Standard: The color of the constraint dynamics.
Hilite: The color of constraint dynamics when they are constrained by an axis lock.
Locked: The color of the dynamics when they are locked by a user key-in.

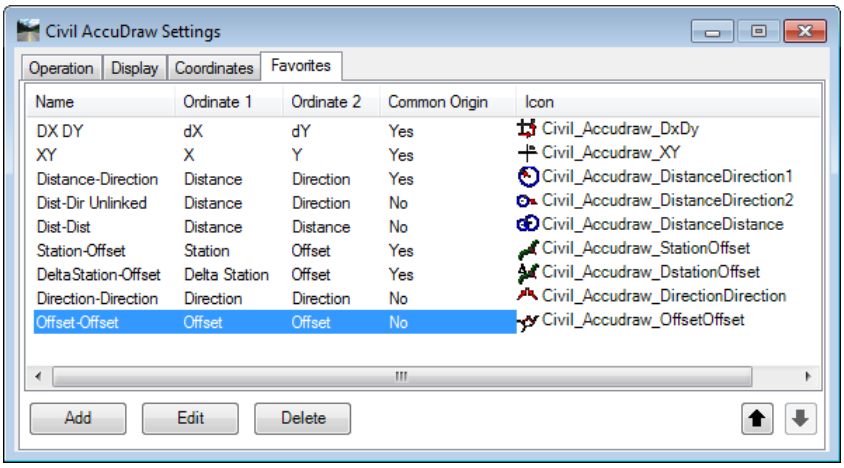
Coordinates tab



Unit Round-off
Defines a stepping value so that ordinate values are rounded to an even increment. Separate round off values are available for distance, angle, station and offset. The distance value also affects coordinates. Check the tick box beside each setting to enable it.

Indexing
Axis: If ON and if you get close to a compass point then the Civil AccuDraw dynamics lock onto the compass point direction.
Distance: If ON and if you get close to a recall distance then the dynamics lock to the recalled value.
Tolerance: For indexing, how close the cursor must be to the item in question when the indexing takes effect

Favorites tab



The **Favorites** tab allows for the configuration of the most commonly used ordinate systems. It is one of the primary differentiators between Civil AccuDraw from MicroStation AccuDraw. The favorite selected determines what input fields are available during the placement of an element.
Most logical combinations of ordinates are allowed. See the section *Civil Accudraw Coordinate Systems > Horizontal Ordinates* for an explanation of the ordinate types.

Name: The user defined name of the designated coordinate system

Ordinate 1: The type of ordinate set for the first ordinate. (Available ordinates are X, Y, Distance, Direction, Station, Offset, Dx, Dy)

Ordinate 2: The type of ordinate assigned to ordinate 2.

Common Origin: If YES, the two ordinates have the same origin. If NO, the two ordinates are measured from different origins. For example, for a Station-Offset ordinate system where Common Origin is set to YES, the station and offset are both measured from the same alignment. If NO then the station is measured from one alignment and the offset is measured from a different alignment.

Icon: The icon displayed on the Civil AccuDraw tool box. Usually a suitable icon is selected automatically, but you can define any icon.

Key	Description
<Left/right arrow keys>	Cycles through a list of options for field in focus.
<Down arrow>	Expand to fixed dialog and suspend dynamics.
<Up arrow>	Collapse floating dialog and resume dynamics.
<Tab>	Advance to next input field in panel
<Shift><Tab>	Return to previous input field in panel
<Enter>	Locks the value after entering a key-in value. Pressing <Enter> when a value is already locked will increment the value. Note: Due to differences in MicroStation AccuDraw and Civil AccuDraw <Enter> does not provide smart lock. Use LI shortcut instead.
<End>	Unlocks the current locked value.
<Shift><End>	Clear all locks
<Space>	Opens the quick pop-up tool box which is a duplicate of the quick drop-down tool box items except in an on-the-fly context.
O	Choose base element for Station and Offset ordinates. Civil AccuDraw waits for a DP before accepting a point. (See Differences)
V	Set compass rotated with positive Y axis up the screen
T	Set compass rotation oriented to north
F	Not currently supported. Sets compass orientation to front
S	Not currently supported. Sets compass orientation to side
B	Set compass to base rotation. Same as V unless a custom compass rotation has been previously set with RQ or RE. In this case B returns compass rotation to the stored RQ or RE rotation.
E	Not currently supported. Cycles compass rotation.
X	Locks the X ordinate value
Y	Locks the Y ordinate value Key-in: civilcoord lock y
Z	Locks the Z ordinate value
D	Locks distance ordinate value
A	Locks angle ordinate value
LI	Toggles lock index. If ON, and the cursor is within tolerance, the directions will lock onto the nearest compass tic and distances will lock at a previous recalled distance. If OFF, neither of these locks are active.
RQ	Not currently supported. Provides quick rotation of the compass to a dynamically selected orientation.

Key	Description
RE	Orients the compass to an element.
RV	Rotates the view to match the current compass rotation
RA	Not currently supported.
RC	Not currently supported.
RX	Not currently supported.
RY	Not currently supported.
RZ	Not currently supported.
?	Show shortcuts
~	Not currently supported.
GT	Go to tool settings. (MicroStation > Settings > Tool Settings.) Forces focus to the dialog of the active tool. Moving the cursor switches focus back to Civil AccuDraw.
GK	Open the Key-in dialog
GS	Open Civil AccuDraw Settings
GA	Not currently supported.
WA	Not currently supported.
P	Data Point Key-in
M	Multi Point Key-in
I	Intersect Snap
N	Nearest Snap
C	Center Snap
K	Snap Divisor
HA	Civil AccuDraw on hold.
HS	Toggle AccuSnap
HU	Not currently supported.
Q	Quit Civil AccuDraw

Chapter 4

Models

4.1 Overview

When you draw or place elements in a DGN file, you are creating a **model**. A model is a container for elements. It can be either 2D or 3D, and is stored as a discrete object within the DGN file. It may be helpful to think of a DGN file as a stack of papers, with each paper being a model.

When you first create a new DGN file from one of the seed files, this provides the empty container setup with a default model ready for you to create your design. If you use a 2D seed file, then the default setup is 2D, while a 3D seed file defaults to a 3D setup. In either case, you can create both 2D and 3D models in the open DGN file. Every model has its own set of eight views. The model whose views are displayed or available for display at a given time is the active model.

You can create three types of models — design, sheet, and drawing. The Sheet model option is not supported in the MoDOT Environment. This is due to when the creation of contract plans pdf files are created through ProjectWise, it will only read the top model in the Model dialog listing for creating the pdf file.

- **Design model** — consists of design geometry and can be either 2D or 3D. A design model can also be used as a reference or placed as a cell. By default, the view windows of a design model have black backgrounds.

- **Sheet model** — (NOT supported in the MoDOT Enviroment) a type of model that serves as an electronic drawing sheet. It typically consists of design model references that are scaled and positioned to create a printable drawing. By default, the view windows of a sheet model have white backgrounds.

- **Drawing Model** — a subset of a 2D or 3D design model, used to apply annotations, dimensions, callouts, and other embellishments to a design. By default, the view windows of a drawing model have gray backgrounds.

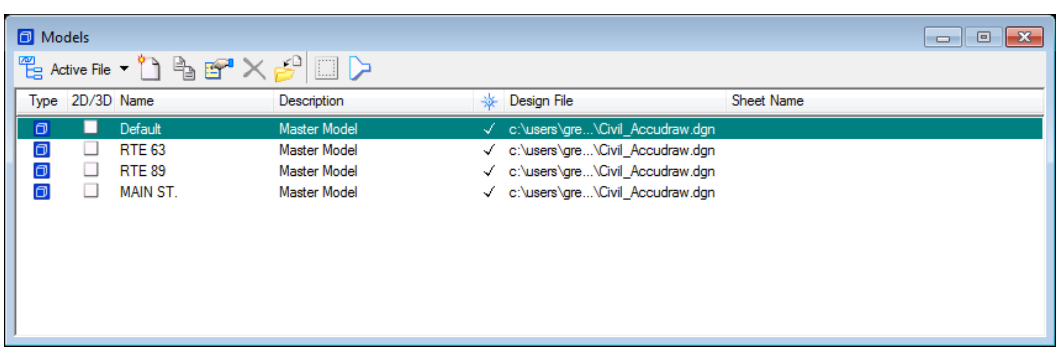
Using the **Models** dialog (File > Models), you can create and switch quickly between models in a DGN file.

Alternatively, you can use the **View Groups** window to rapidly switch between models visited in the current design session. These can include models in other DGN files.

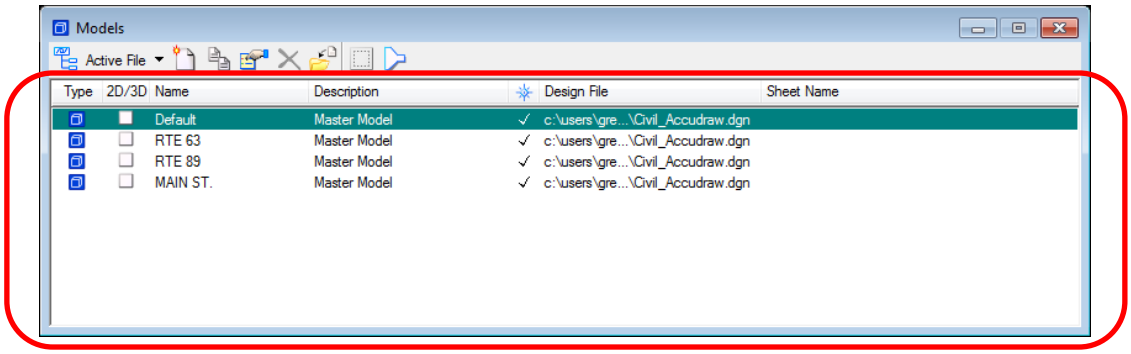
4.2 Models dialog

Used to create, manage, and switch between models in the open DGN file. It will open when **File > Models** is chosen or when the ***Models*** icon in the Primary Tools toolbox is clicked.

Each DGN file contains one or more models, each of which has its own set of eight views. You can create a model as a 2D or 3D Design type, as a 2D Drawing type or as a 2D or 3D Sheet type. Sheet models let you attach references to create a set of working drawings for the model file. Icons at the top of the Models dialog give you access to its various functions.



To	Select in Models dialog
Displays the models in the active design file. Click the down arrow and select Active Link Tree to see the available link sets.	*Models in Active Design File*
Opens the **Create Model dialog**, which lets you create a new model in the open DGN file	*New*
Opens the **Copy Model dialog**, which lets you make a copy in the open DGN file of the model selected in the list box.	*Copy*
Opens the **Model Properties dialog**, for the model selected in the list box. This dialog is used to modify properties of models contained in the open DGN file.	*Edit*
Deletes the model selected in the list box.	*Delete*
Opens the Import Model From File dialog, which is similar to the Open dialog. This lets you select a DGN or DWG file from which to select the model to import. After clicking OK, the **Select Models dialog** opens from which you can select the model to import into the open DGN file.	*Import*



The "Lists area" will lists the models in the open DGN file. An icon displays next to the model name indicating whether the model is 2D or 3D. You can edit the model name and description by triple-clicking on the selected model name in the list box. To copy, delete, or adjust properties of a model, you must first select it here. Double-clicking a model here makes it the active model.

You can customize the columns displayed in the list box by right-clicking in the title row of the list box and using the menu to select which options are displayed. Items that can be displayed are:

- Type — Icon signifying a Sheet, Design, or Drawing model.
- 2D/3D — Icon signifying a 2D or 3D model.
- Name — Name of model.
- Description — Description for model.
- Is Cell — If checked, the model can be placed as a cell
- Cell Type — If a cell, the type of cell.
- Is Annotation Cell — If checked, model is an annotation cell.
- Design File — Location and name of DGN file.

4.3 View Groups dialog

The View Groups dialog is used to manipulate view groups and view windows and to navigate between models that have been active at some point during the current design session.

A view group is a named collection of eight view windows that allows you to set up your desktop to display your preferences, including number of open view windows, window size, and view orientation. Most commonly, each view group is associated with a model, making it easy to access and navigate through different models in the active DGN file, via the View Group drop-down menu.

You can also associate different models to the same view group by creating multi-model view groups. Multi-model view groups allow you to view more than one model or saved view from the same DGN file in separate views. You can create a view group that displays from one to eight different models.

Where, during a design session, you activate models in more than one DGN file, you can also use the View Groups window to easily navigate the current session's model history in multiple files. That is, you can switch between models you have activated, regardless of the files in which those models reside.

To	Select in View Groups
Lets you access the previous model in the session history by clicking the left arrow. Alternatively, you can click the down arrow and select a previously accessed model from a drop-down list.	*Previous*
Lets you access the next model in the session history by clicking the right arrow. Alternatively, you can click the down arrow and select the next model from a drop-down list	*Next*
Clicking the down arrow displays a drop-down list of all models accessed, from which you can select a model to open.	*All Models Visited*
This field displays the name of the view group as well as the model with which it is associated. The option menu allows you select a different view group.	RTE 63 Views *View Group Listing*
Opens the **Manage View Groups dialog**, which is used to create, edit and delete view groups.	*Manage View Groups*
Click the numbered buttons to open or close individual view windows (equivalent to choosing the numbered items in the Window menu's Views submenu.)	1 2 3 4 5 6 7 8 *View Toggles*

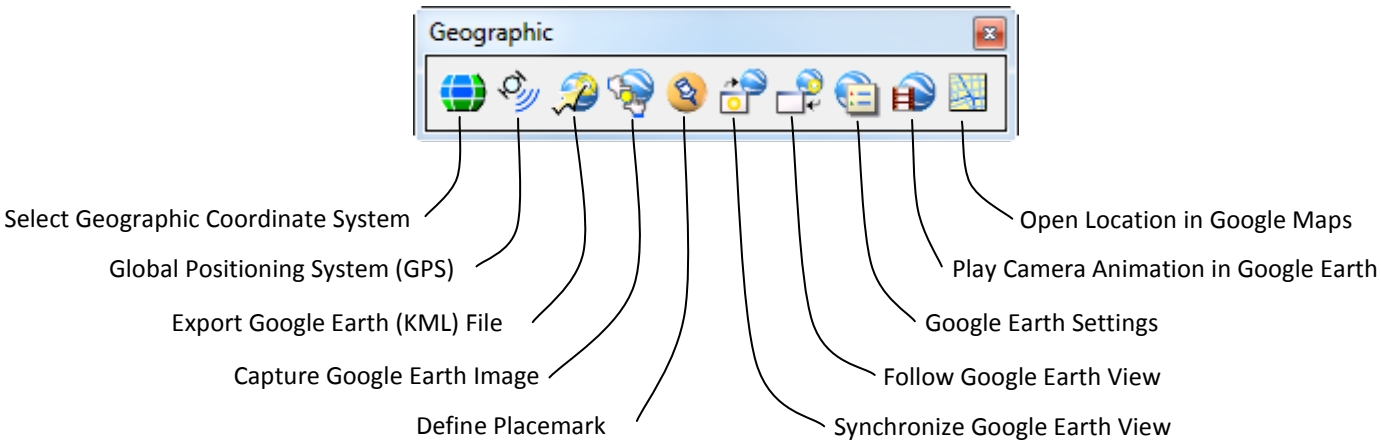
For more information about **Models**, please refer to the PowerGEOPAK help documentation (F1) or contact CADD Support.

Geographic Coordinate Systems

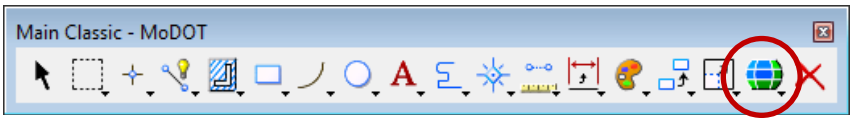
5.1 Overview

- Understand the use of the **Geographic Tools** and how they can be utilized in a MicroStation file.

5.2 Geographic Toolbar

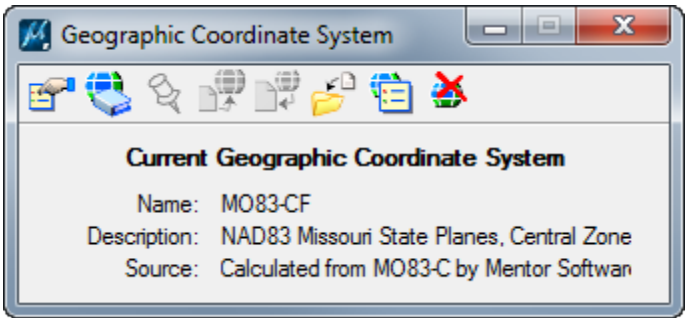


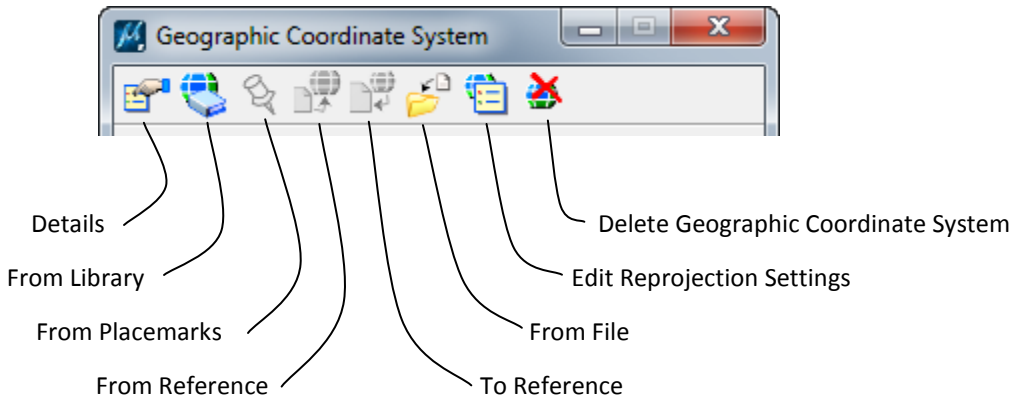
The **Geographic Toolbar** contains tools for interacting with a Global Positioning System (GPS) or Google Earth. This toolbar can be accessed from the **Tools >> Geographic** pull down in MicroStation. It can also be accessed in the MoDOT Main toolbar.



5.3 Select Geographic Coordinate System

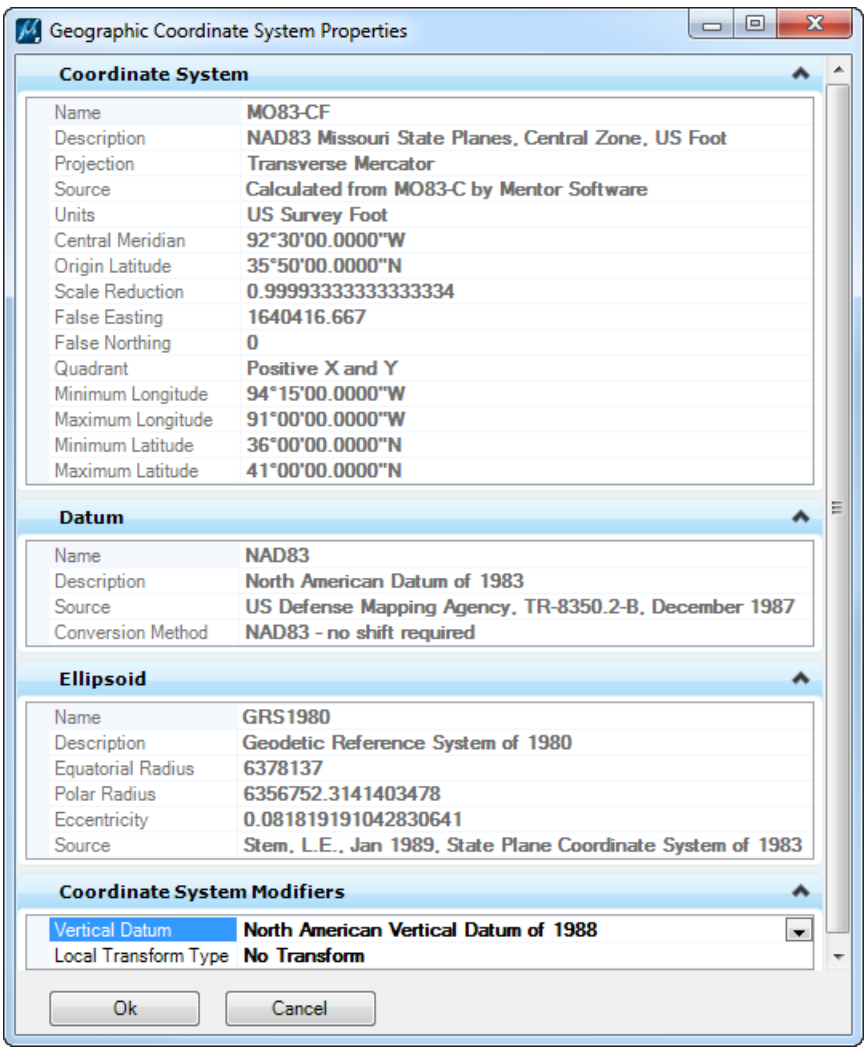
This tool is used to open the Geographic Coordinate System dialog, which is used to select a geographic coordinate system (GCS) from a library of predefined geographic coordinate systems.





5.3.1 Details

This tool opens the Geographic Coordinate System Properties dialog box. It is used to display the properties of a geographic coordinate system (GCS) that is attached to the MicroStation file.



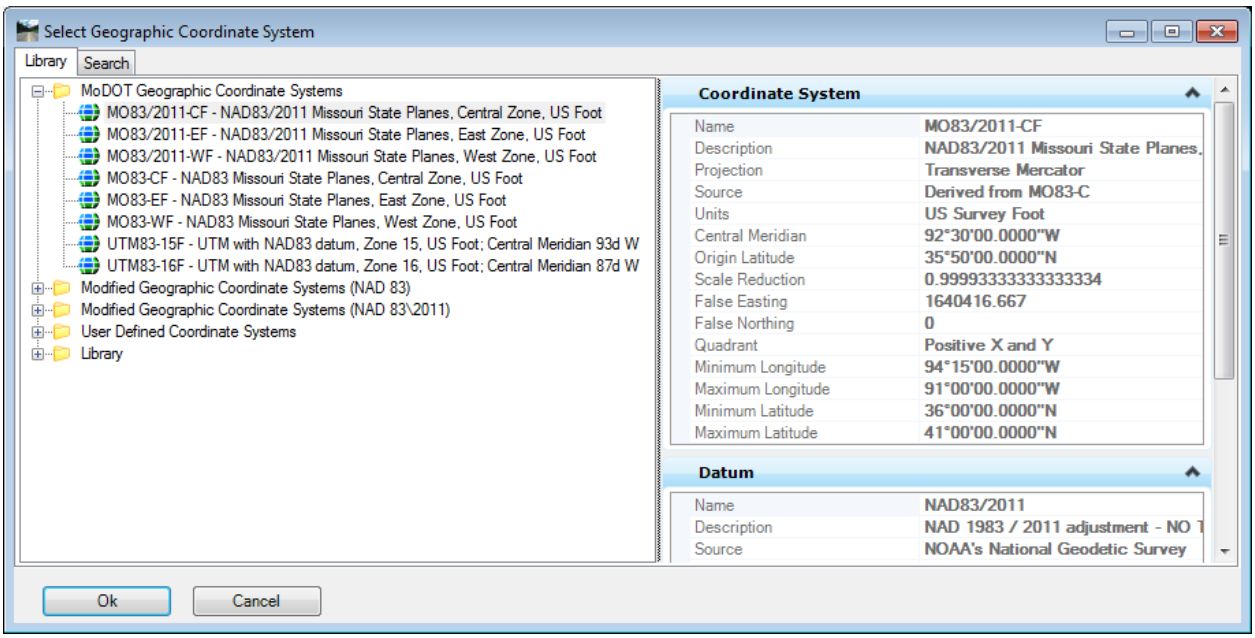
5.3.2 From Library

This tool is used to select a geographic coordinate system (GCS) from MicroStation's library of predefined geographic coordinate systems.

This is useful when:

- Existing data was drawn in a geographic coordinate system (for example a state plane or country grid coordinate system) and you want to make MicroStation aware of that GCS.
- Data is correctly drawn in one specified GCS, but you want to reproject that data to a different GCS.
- You want to designate the GCS for a new design file.

CADD Support has provided groups called ***MoDOT Geographic Coordinate Systems, Modified Geographic Coordinate Systems (NAD 83,*** and ***Modified Geographic Coordinate Systems (NAD 83\2011)*** which contain the most commonly used coordinate systems for MoDOT projects, depending on the district boundaries**.**



For projects that use a “modified” coordinate system instead of the standard coordinate system or “county wide” coordinate system, you will need to copy and modified the standard coordinate system to match the applied projection factor (grid to ground factor) for the project. These “modified” geographic coordinate systems will saved to the ***User Defined Coordinate Systems*** folder for future use.

5.3.3 From Placemark

This tool allows you select a GCS defined by placemarks when using structure-centric coordinate systems. Geographic placemarks, cells containing a name, longitude, latitude, and altitude, indicate the geographic positioning of your design. The longitude, latitude, and altitude fields specify the geographic position relative to the WGS 84 datum, which is the datum reported by GPS devices and also used by Google Earth. The corresponding position in the design file is specified by the placement point of the cell. The scale and rotation of the cell does not affect its meaning as a geographic placemark.

At least two placemarks are required to calculate this GCS and should span the entire range of interest. Placemarks are created using the Define Placemark Monument tool.

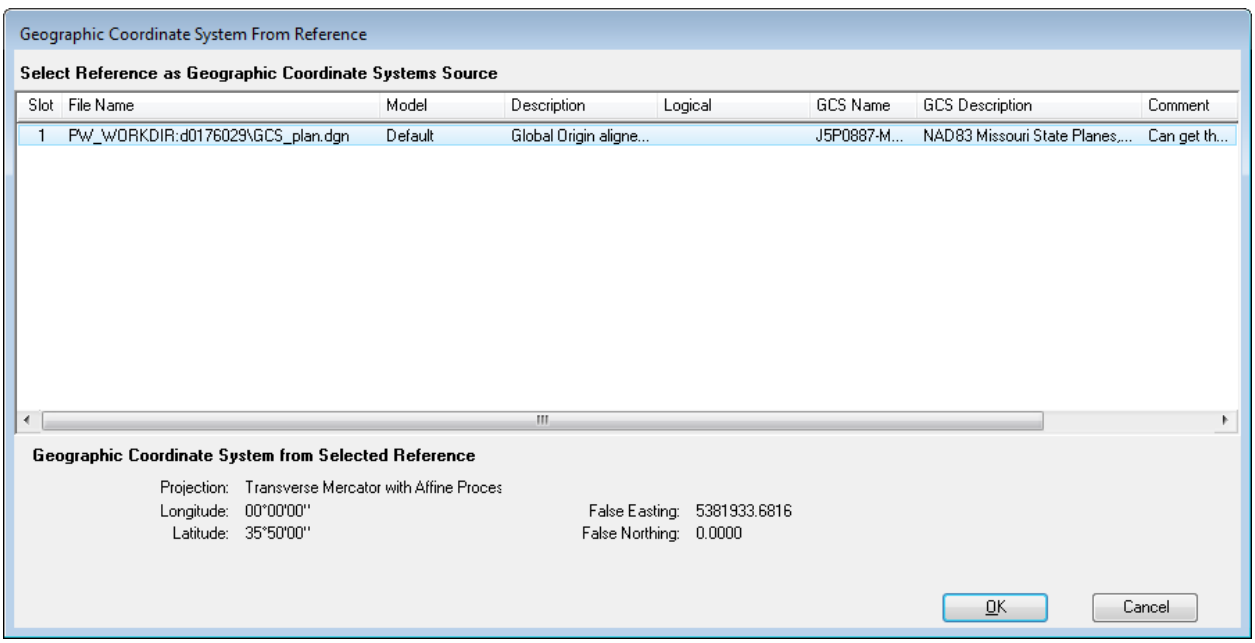
A Geographic Coordinate System calculated from placemarks is only as accurate as the placemark data used to calculate it. If you use a calculated GCS to reference other geolocated designs, errors could be cumulative. Therefore, treat measurements between features in referenced designs as approximate.

5.3.4 From Reference

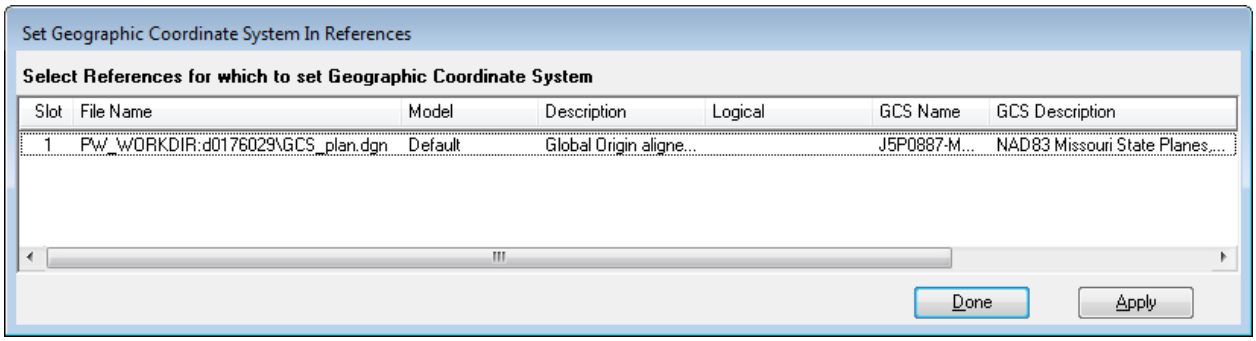
This tool is used to assign the GCS of an attached reference to the active model. You can use references to orient your active model when the attached reference has a standard GCS specified and has not been scaled or rotated, or when a reference with a computed Azimuthal Equal Area GCS is attached without scaling (it can be moved and/or rotated).

If a geographic coordinate system, with an attached reference, has a geographic referencing mode turned on, the reference cannot be used as a source for the GCS. Its position is calculated from its GCS and the active model´s current GCS so selecting it as a source will not change the current GCS. The Comment column provides the reason a particular attachment cannot be used as a GCS source.

5.3.5 To Reference



This tool is used to set the geospatial coordinate systems (GCS) of attached references based on the GCS of the active model. If the GCS is selected from the standard library, it can be used to set the GCS for coincident, unscaled, and unrotated reference attachments. If the GCS is calculated from placemark monuments, it can be used to set the GCS for unscaled references.

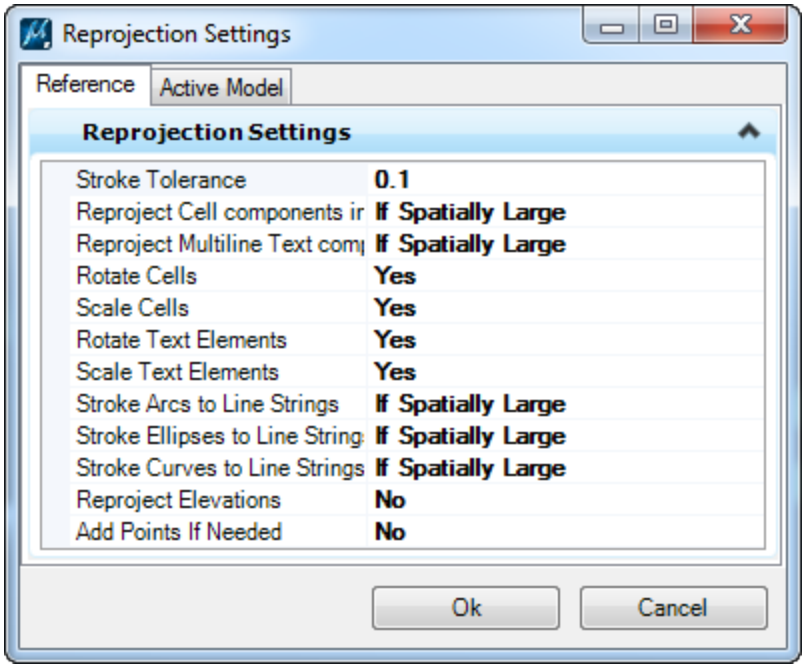


5.3.6 From File

This tool allows you to apply a GCS from a model in another design file to your current file, even if it is not attached as a reference.

5.3.7 Edit Reprojection Settings

This tool is used to specify the settings for reprojection. The tabs let you set the reprojection settings differently for references and for the active model.



5.3.8 Delete Geographic Coordinate System

This tool deletes the geographic coordinate system attached to a MicroStation file.

It does not delete the geographic coordinate system from the MoDOT Geographic Coordinate Systems library or the MicroStation predefined library.

5.4 Global Positioning System (GPS)

This tool is used to access a Global Positioning System (GPS) connected to your computer.

5.5 Export Google Earth (KML) File

This tool is used to export MicroStation geometry into a file format (KML) that Google Earth can use to see the MicroStation geometry.

The settings that affect the export of a model are contained in the Google Earth Tools Settings dialog.

The geometry is exported as WYSIWYG (what you see is what you get). That is, the view attributes and level settings are taken from the active view. If Render Mode is set to From View, in the Google Earth Export Settings dialog, then the display mode also is taken from the active view. It is, therefore, important to set up the view as you would like it to display in Google Earth. Output should be minimized to include only necessary data. The display of unnecessary levels should be turned off. If text and dimensions are to be excluded from the output file then their view attributes should be disabled.

Typically, Wireframe display mode is appropriate for 2D models, while for most 3D models it is desirable to set the output display to Smooth.

5.6 Capture a Google Earth Image

This tool will capture a Google Earth image that can be utilized in a MicroStation file. You can only use this option in a 3d MicroStation file.

5.7 Define Placemark Monument

This tool is used to associate a geographical location to a Monument point in a model.

Placemark monuments are simply cells named “KmlPlacemark” with enter-data fields that display the name, longitude, latitude, and altitude of the monument. The origin of the cell represents the location of the placemark in the model. Multiple placemarks may be entered, and you can use the Active Scale setting to control the size of the placemark cells.

5.8 Synchronize Google Earth View

This tool is used to have Google Earth navigate to the current MicroStation view. If Google Earth is not open when the tool is used, it will be opened automatically.

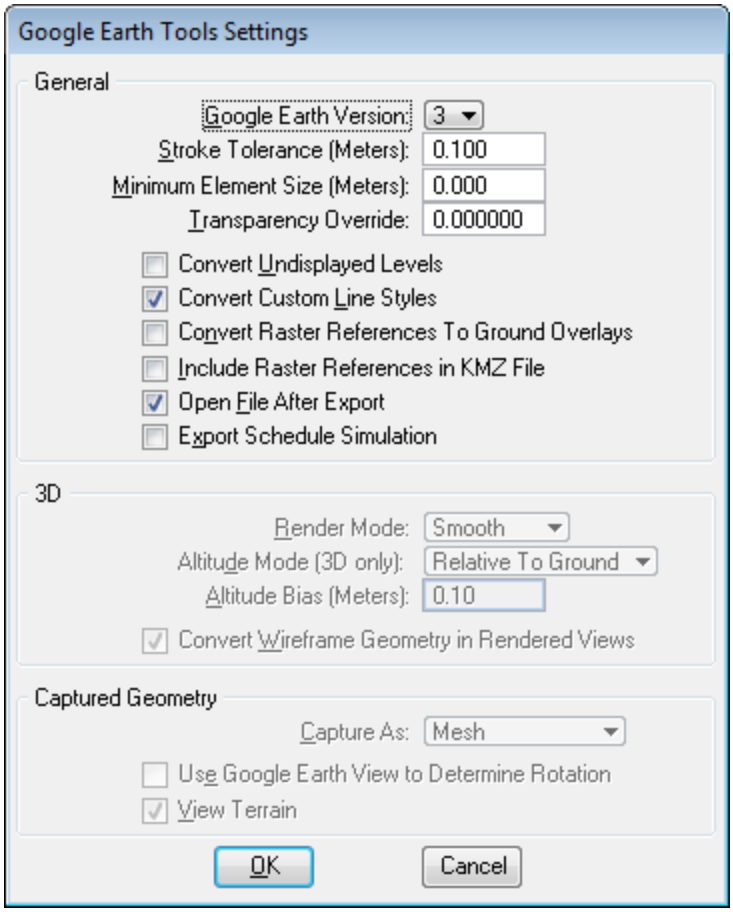
As Google Earth supports only a limited camera model with a fixed lens length and restricts the camera to pointing downward only, the Google Earth views will not always match the MicroStation view exactly, but should provide a relatively good approximation for most views.

5.9 Follow Google Earth View

This tool is used to match the active MicroStation view to the current Google Earth view location. This tool works only if the model's view location is geographically close to the current Google Earth location.

5.10 Google Earth Tool Settings

This tool is used to control the settings and operation of the Google Earth tools. These options determine how the KML gets created from the MicroStation drawing and if Google Earth opens after exporting the MicroStation geometry to the KML file.



5.11 Play Camera Animation in Google Earth

This tool is used to play a camera animation in Google Earth. Camera animations only, are supported.

After you have created a camera animation, you need only to geo-locate your model in some way, such as by defining a Placemark. There is no need to export geometry to Google Earth.

5.12 Open Location in Google Maps

This tool is used to open Google Maps with the selected location in the center of the map. When you enter a data point, the location is opened in the Google Maps web site in the browser.