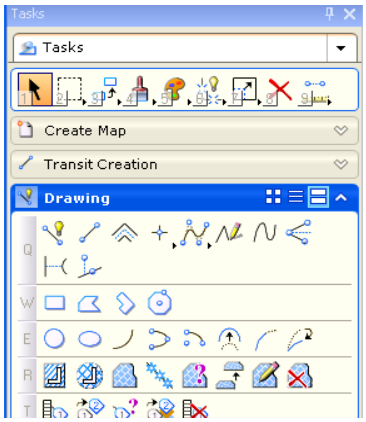
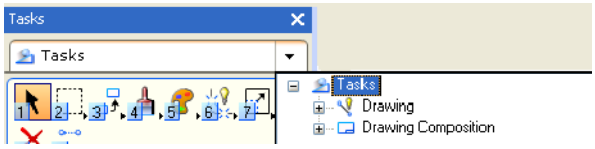
IBUG Fall User Group Meeting September 28th 2011

Get Your Hands on MicroStation V8i (SELECTseries 2)

Steven Rick

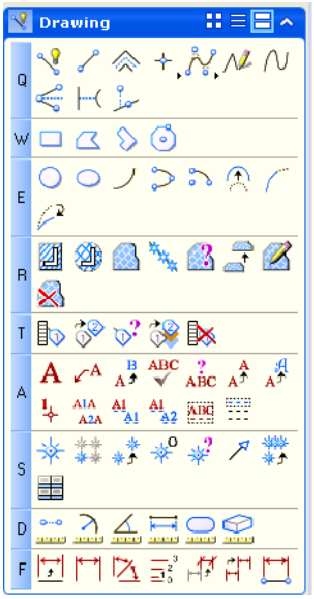
Tasks - The Tasks dialog is the default task navigation interface. It is docked to left side of the application window. The Main toolbox is embedded along the top.

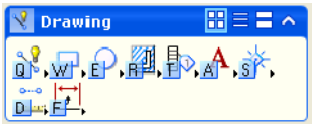


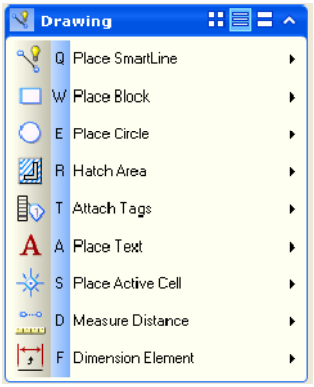


By default, the Tasks dialog is docked on the left side of the application window and the active task is the *Drawing* task. Other available tasks are shown as tabs. Clicking the arrow next to Tasks, at the top of the dialog, opens a menu that lists all tasks in a hierarchical tree. Clicking a task in the tree makes it the root task, hiding the other tasks. Using this mode, you can see all the tools in the sub-tasks.

The task tabs have icons that let you change the way tools are presented. The default layout mode is the Panel layout. You can click the icons to view the tools in Icon layout mode or List layout mode. Panel layout mode shows the tool icons and the keyboard shortcuts. In Icon layout mode, tasks appear most like traditional toolboxes. List layout mode provides the most information because the tool name is included. The icon belonging to the first tool in a task is displayed on the task's tab.







In the following exercise, Tasks will be explored and reviewed.

Exercise: Review Tasks

1. Start MicroStation, set workspace to *Examples/General/Default*
2. Open *User Interface.dgn*
3. Note and explore tasks on left side.
4. Note and explore layout options

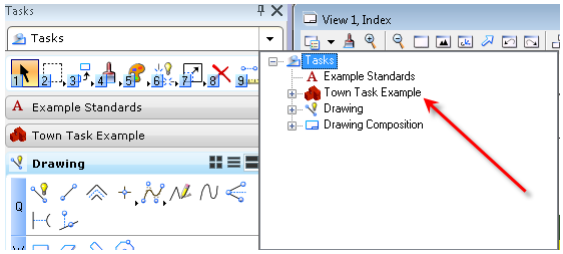
Workflow Tasks - A workflow can consist of one or more tasks. In most cases, a workflow consists of a collection of tasks organized in the order that you will use them to complete a project or job. Each task contains the tools you need to complete the task. Workflows have a Workflow icon on their tab. An example for building a town is given in the General project.

The *Drawing Composition* workflow task is made up of tasks organized in a logical order for working with drawing composition and dynamic views. Dynamic views is a name that encompasses related MicroStation features that make model analysis more interactive and intuitive. There are Organize (Project Explorer, link set, Select Elements with Links), Drawing, Design Composition (create a new file or model, attach references), Create Views (manage levels, clip volumes, saved views and view attributes), Sheet Composition (create sheet models and define sheet boundaries, attach references), and Annotate tasks.

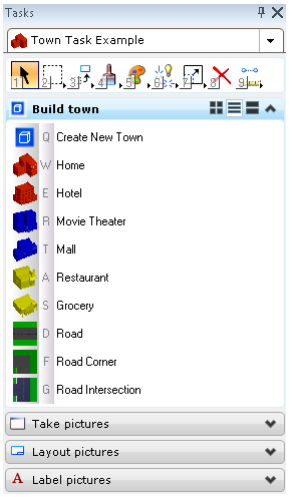
In the following exercise, a workflow will be explored.

Exercise: Review Workflows

1. Continue in *User Interface.dgn*
2. Expand the available tasks and choose *Town Task Example*

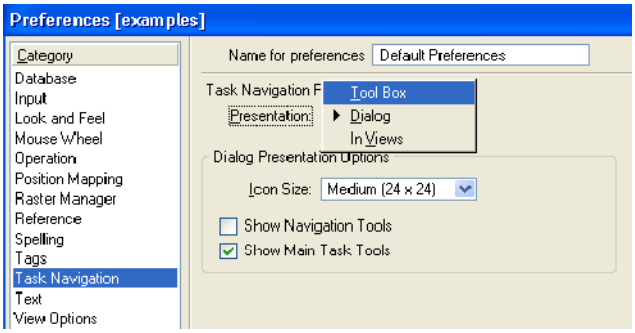


Note that this workflow consists of a *Build Town* task.



3. Select *Create New Town.* Choose *Design From Seed.* .
4. Explore the tasks contained within the Build Town workflow.
5. Set the view to TOP for easier placement of the town components.
6. Using the tools presented in the Build Town task, place several components.
7. Explore the remaining tool bars in the Town Task example.

Presentation Preferences - The size of the icons in the Tasks dialog can be set in the Task Navigation category of the Preferences dialog. A check box lets you show or hide the Main toolbox that is part of the Tasks dialog. You can also change the layout back to the V8 XM Edition default.

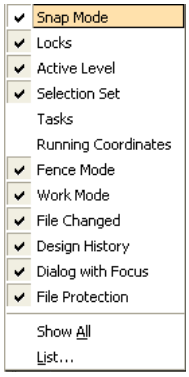


In the following exercise, the presentation of the tasks will be changed.

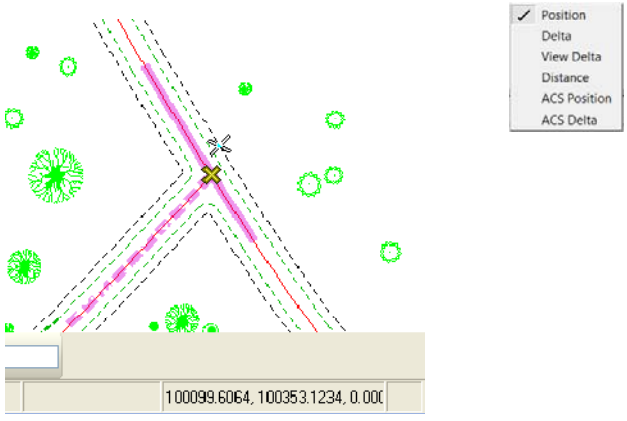
Optional Exercise: Presentation Preferences

1. Continue in *User Interface.dgn*
2. Select *Workspace* > *Preferences* > *Task Navigation* > *Presentation*
3. Change to *Tool Box.*
4. Dock the Tasks and Main toolboxes.
5. Close the file.

Status Bar - Right click in the status bar, away from the Message Center area, to open a menu that lets you select the sections of the status bar you want to display.



If you display the Running Coordinates section of the status bar, as you move the pointer, the coordinates of the current position display, related to the active snap mode. If you left click in the area, a menu opens. The Delta modes show the X, Y, and Z displacement from the last data point. The Distance modes show the distance and direction from the last data point. If you left click the Running Coordinates section then the following menu appears.



In the following exercise, the display of running coordinates will be enabled.

Exercise: Status Bar

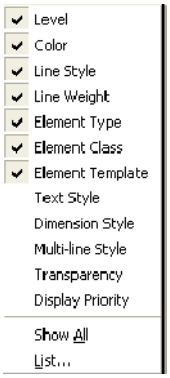
1. Continue in *User Interface.dgn*
2. Right click the status bar, and enable the display of *Running Coordinates*

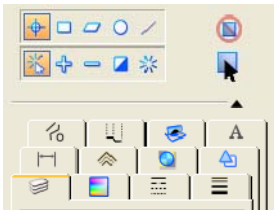
Docking - Docking indicators appear on the screen when you begin to move a dockable dialog. When you drag it over one of the docking indicators, it highlights an available docking region where the dialog will be placed along the corresponding edge of the application window. Release the mouse button when you like the position, and the dialog becomes docked there.

Element Selection - Enhancements to selection include additional options on the Element Selection tool and drag support during the use of manipulation tools.

The Shift key is a toggle that changes an inside selection to an overlap, or an overlap to an inside. Dragging the selection box from right to left is overlap and from left to right is inside.

Five attributes tabs, hidden by default, are added to the Element Selection tool.





To display them right click on the attributes tabs in the tool settings and turn on the desired attributes. And, after selecting a manipulation tool, you can select multiple elements by dragging a shape around them.

In the following exercise, changes to the Element Selection dialog will be explored.

Exercise: Element Selection

1. Set the following in the File Open dialog:

   User: Examples

   Project: General

2. Open *Element Manipulation.dgn*
3. Hover the cursor over any element in the bathroom and right click.
4. Select *Exchange* from the popup menu...
5. Select the *Element Selection* tool.
6. In the tool settings, right click and enable the display of the new tabs.
7. Drag a box around the graphics from left to right. Only those inside the box are selected.
8. Release the selection set.
9. Drag a box from right to left, and all overlapping graphics are added.
10. Release the selection set.

Exercise: Selecting elements for manipulation without creating a selection set

11. Select an element manipulation tool such as *Move.*
12. Now select the elements.

Modify Tools – The Trim Element tool has been renamed Trim Multiple, and Trim, Extend, and Trim and Extend modes have been added to the tool settings.

- Trim is the default mode and works basically the same as the old Trim Element tool.
- Extend mode is borrowed from the IntelliTrim tool.
- Trim and Extend is a new mode altogether which lets you trim and extend one or more elements at their intersection with the cutting element.

Regardless of which mode you are in, after you select the cutting element, the enhanced Trim Multiple tool lets you select multiple elements by dragging a selection line across them, so you can simultaneously trim, extend, or trim and extend them at their intersection with the cutting element.

The Extend Element to Intersection tool has been renamed Extend To Element. The default behavior of the enhanced Extend To Element tool remains the same as before. However, a new tool setting has been added which lets you invert the element identification behavior, so that the first element you identify is now the cutting element, and the second element you identify is the element that gets extended or shortened. When this tool setting is on, after you select the cutting element, you can select multiple elements by dragging a selection line across them to simultaneously extend and/or shorten them.

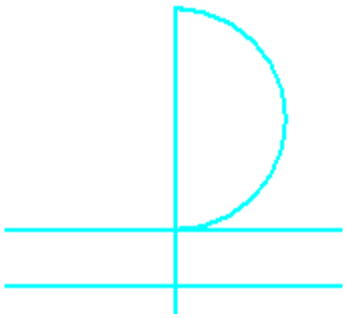
The Extend Two Elements to Intersection tool has been renamed Extend To Intersection, and has been enhanced to let you extend or shorten two elements of any type to their intersection.

In the following exercise, changes to the Trim tools will be explored.

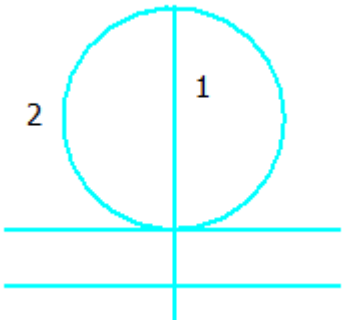
Exercise: Trim Elements

1. Open *MicroStation Essentials V8i.dgn*
2. From the Models dialog, navigate to: *Modifying Existing Elements Challenges*
3. Zoom to the grouping showing the cyan circles and lines.
4. Open Modify task as a toolbox.

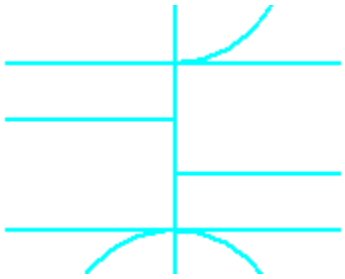
In the following steps, the left side of the circle will be trimmed off as shown below:



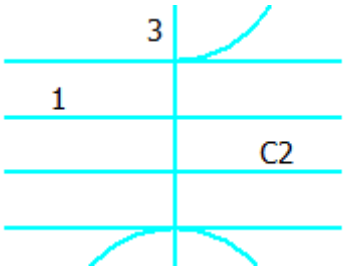
5. Select *Trim Multiple* with the Mode set to *Trim*
6. Enter a data point on the line, then a data point on the portion of the circle to remove.



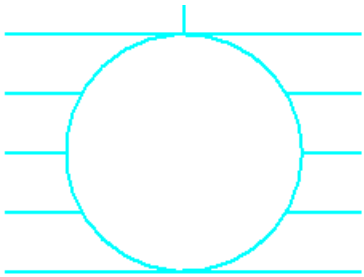
In the following steps, two horizontal lines will be trimmed as shown below. The right side of the top line will be removed, and the left side of the bottom line will be removed.



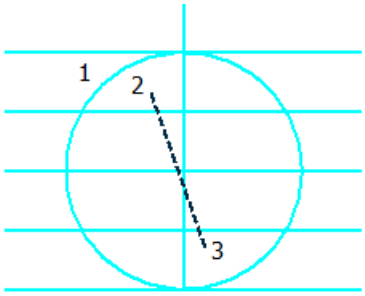
7. Select *Trim to Element,* with the *Select Cutting element first* turned off.
8. Enter a datapoint on the portion of an element that is to be deleted.
9. Hold the CTRL key down and enter subsequent datapoints on those portions to delete.
10. Release the CTRL key, and enter a data point on the cutting element.



In the following steps, the horizontal lines that pass through the bottom circle will be trimmed to result in the following:



11. Select *Trim Multiple* and set the mode to *Trim*
12. Select the lower circle.
13. Then drag a line through the elements to trim.

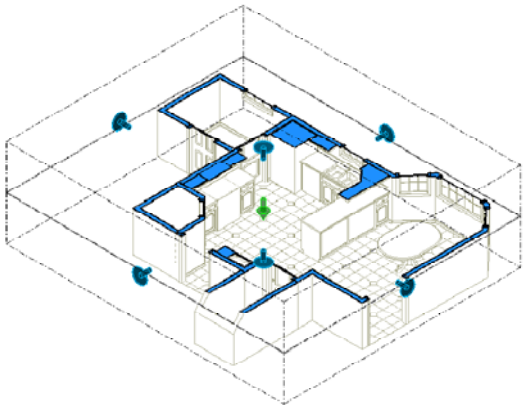


Clip Volumes - A clip volume encloses a space. You can create a clip volume to focus on certain parts of a model and hide the rest. When a clip volume is applied to a view, only elements that are located within the clip volume will display. The most common clip is called a section clip. A section clip is often associated to a section callout. The area outside the volume is called outside. A clip volume has a section plane passing through it. Material inside the volume that is behind the section plane is backward, while material that is in front of the section plane is forward. Section graphics are produced wherever the section plane intersects material inside the clip volume.

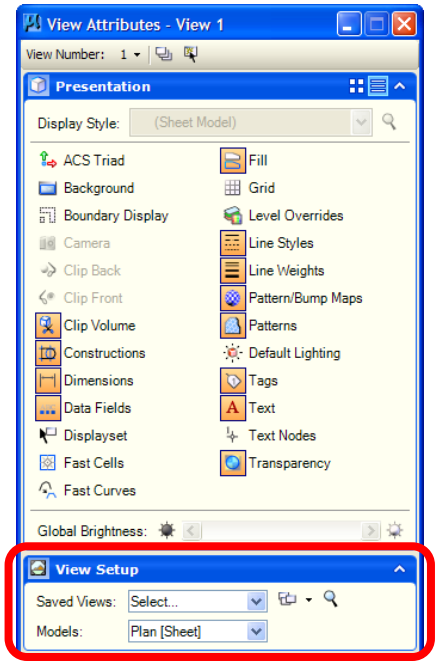
To create one, in the active view's view controls, click the Clip Volume tool, select Apply or Modify Clip Volume and set the tool settings.

The clip volume produces section graphics along the cut plane. The term section graphics refers to the lines, arcs, and curves displayed in a view after you create a clip volume that cuts through a solid, surface, or mesh. Curves are defined by the intersection between the clip volume faces and the original elements. You can modify the depths and clipping parameters of the clip volume by selecting the clip volume. The green arrow edit handle lets you move the clip plane laterally and flip the clip direction.

The side edit handles allow you to move the side clip distances and turn off the clipping of one or more sides.

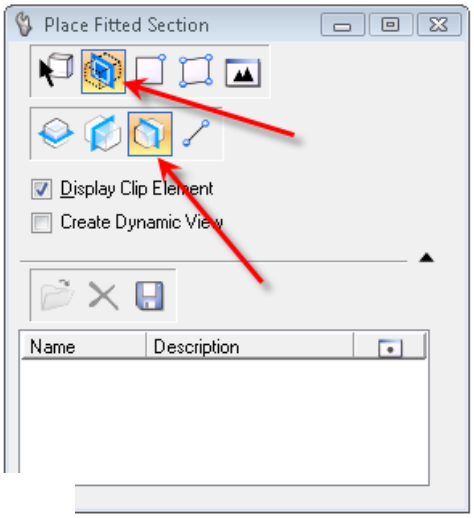


You can control the display of each category of geometry separately by assigning different display styles to each category in the Clip Volume Settings section of the View Attributes dialog. Each category has its own viewing symbology, can be turned on or off, and can be made locatable or not. Display styles are created and managed in the Display Styles dialog.

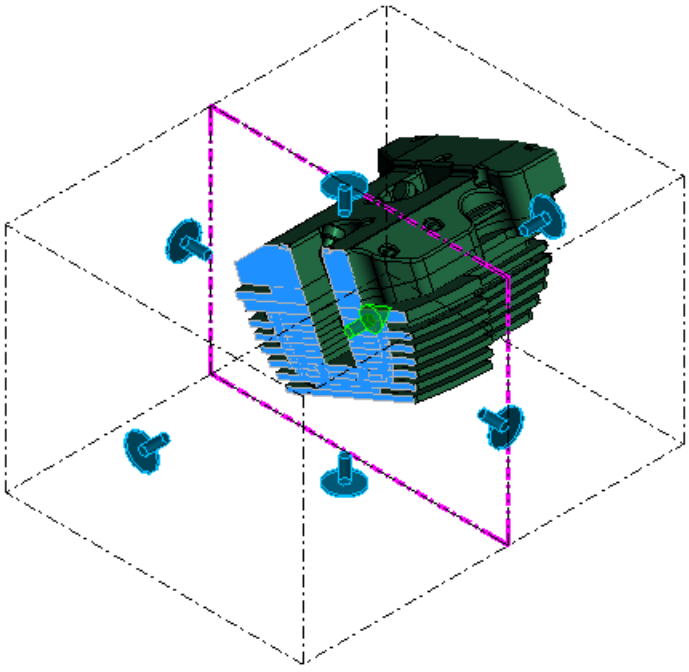


In the following exercise, a clip volume will be created.

Exercise: Create Clip Volume



1. Open *Graphics Display.dgn* and navigate to the *Engine* model
2. From the Saved View dialog, apply the *Illustration* view to View 1.
3. From the view control tool bar, select *Apply or Modify Clip Volume*
4. In the tool settings, select *Section Clip Tools* and *XZ Plane:*
5. Enter a data point on the view.
6. Drag the green bolt to define the section cut.
7. Enter a data point to accept the cut.



8. From the view control bar, choose *Clear Active Clip Volume*
9. Enter a data point on the view.

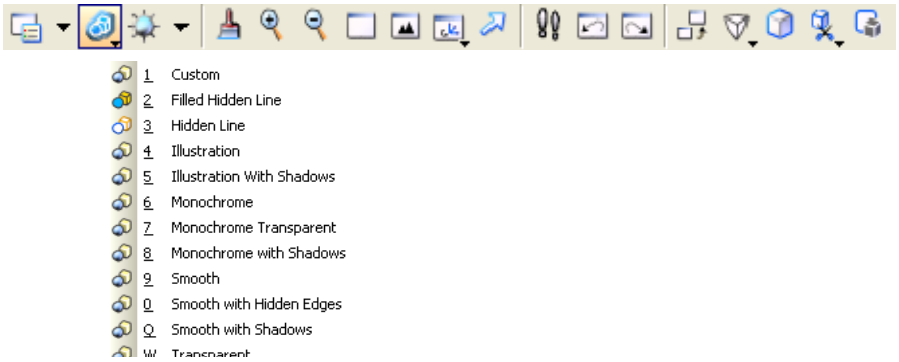
Display Styles - In the MicroStation V8 XM Edition you applied a view display mode with companion settings on a per-view basis. In MicroStation V8*i*, you apply a Display Style that includes the display mode and other settings, including optional overrides. A display style consists of a shading mode plus other settings and overrides that you can specify. Display styles are created and managed in the Display Styles dialog. They are typically saved as shared resources in DGN libraries. Display styles apply to saved and dynamic views, as well as normal views.

The following exercise explores the use of display styles.

Exercise: Use Display Styles

1. Continue in *Graphics Display.dgn.*

2. Click and hold on the View Display Mode icon in the view controls.



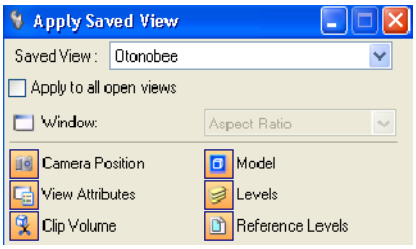
3. Try some of the default Display Styles.

4. Close the file.

Saved Views - A saved view is a view definition, which includes the level display for the active model and references, the clip volume, and other view attributes. The saved level display states are view specific and are copied from the source view window that was used to create the saved view. The view definition is given a name and saved in the DGN file. You create the definition by setting up a source view as a template and saving it. The saved view can be applied to a destination view window.

The Saved Views dialog is used to create, update, apply, import, and delete saved views and edit properties of saved views. The Saved Views dialog can be opened from the Primary Tools toolbox.

The Saved Views dialog's Apply Options section has been moved to a new tool settings window called Apply Saved View. Set the tool settings and enter a data point in the desired view or choose to display in all views.

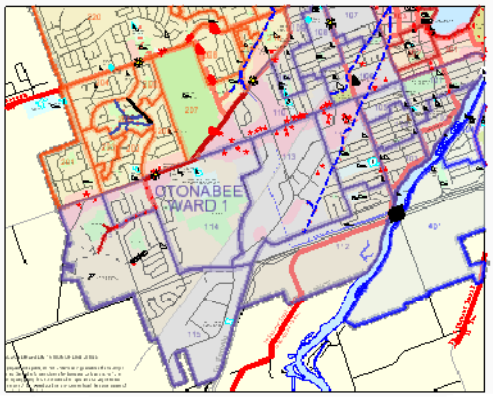


The saved view graphics can be selected with the Element Selection tool, or by a fence, and manipulated like a regular element. Picture frame graphics in the corners, help you to a Saved View, if the View Attribute Boundary Display is turned on.

In the following exercise, a saved view will be created and applied.

Exercise: Use the Saved View functionality

1. Change the workspace to *Examples / Geospatial*
2. From the Sheets folder, open *BSI200-M01-City.dgn*.
3. Zoom in to any portion of the map.



4. In the Saved View dialog, click *Create Saved View*, use the method *From View*, enter a name, and turn on *Associative Clip Volume*.
5. Enter a data point in the view to create the Saved View.

In the following exercise, the frame of a saved view will be modified.

Exercise: Saved view

1. Continuing in the same file, fit the view.
2. In the Saved Views dialog, click in the Show column. A frame displays showing the extents of the saved view.
3. Using the Element Selection tool, move and change the size of the frame.
4. Apply the saved view to the view.
5. In the Saved Views dialog, uncheck the Show column.
6. Fit the view

Note: An alternate workflow is to first create a named clip volume and then create a saved view of the clipped volume.

Right click context menus - MicroStation lets you customize its context menus. Context menus are the menus accessed by clicking the right mouse button, and custom context menus are added to the reset popup menu. You can create custom context menus by copying standard menus and menu items or by creating new menus and menu items. Right press menus allow dynamic functionality. The menu changes depending on what element type you right click. To right click on an element, you must put the pointer on the element and hold the right mouse button, reset button, for more than one-sixth of a second.

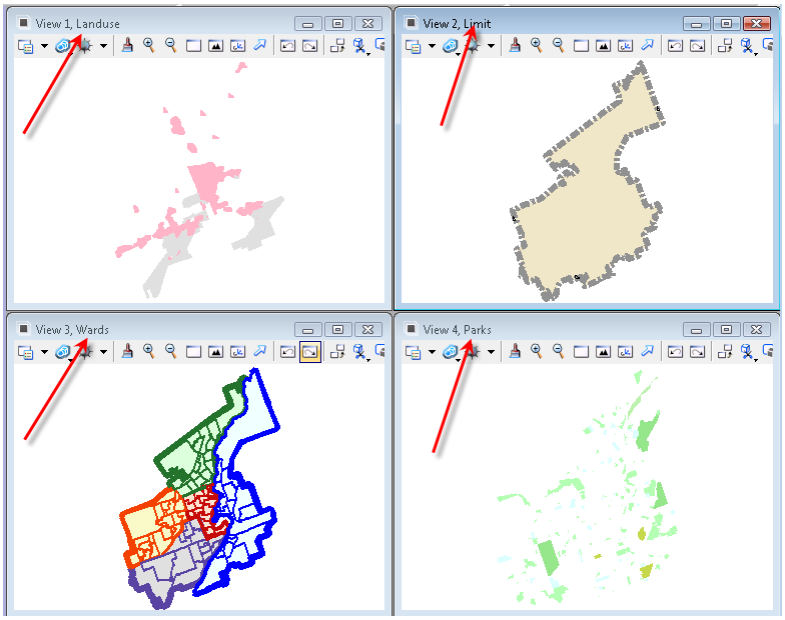
Exercise: Right Click menu

1. Open */sheets/BSI200-M06-Wards.dgn*
2. Select Element Selection
3. Right click on the frame around the logo at the upper left.
4. Choose *Fit to View* and enter a datapoint. The raster logo is fitted to the view.
5. Zoom out or fit the view to see the text *City of Peterborough*
6. With the Element Selection active, right click the text and choose *Edit Text*
7. Right click other elements taking note of available options.

View Attributes - The View Attributes dialog allows you to apply a selected display style to a specific view or to all views. Added sections allow you to set global brightness, apply a saved view to a model, and view the forward, back, cut, outside clip volume.

The following exercise illustrates how to view multiple models.

Exercise: Viewing multiple models



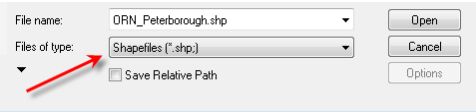
1. Open */Design/BSI200-R02-Land Acquisition.dgn* from the Design folder. This is a multi-model design file.
2. Open and tile Views 2 through 4.
3. Open the View Attributes dialog.
4. Expand the View Setup section at the bottom of the dialog.
5. At the top of the dialog, change the View Number to 2.
6. In the View Setup section, select the *Limit* model.
7. Change the View Number to 3.
8. In the View Setup section, select the *Wards* model.
9. Change the View Number to 4.
10. In the View Setup section, select the *Park* model.
11. Fit all views.

Shapefile - MicroStation V8i SS2 now supports the attachment and opening of SHP, and MIP/MIF files. Shapefiles require at least three files in the same directory, with the same name and with the following extensions: SHP (geometry), SHX (index), and DBF (attributes). Shapefiles can have an associated geographic coordinate system that's described in an accompanying PRJ file. To view this information in MicroStation, open the file as you would any other design file. When a shapefile, or other supported GIS files are opened in MicroStation, they are opened for "read-only" access, meaning you cannot save updates back to those formats.

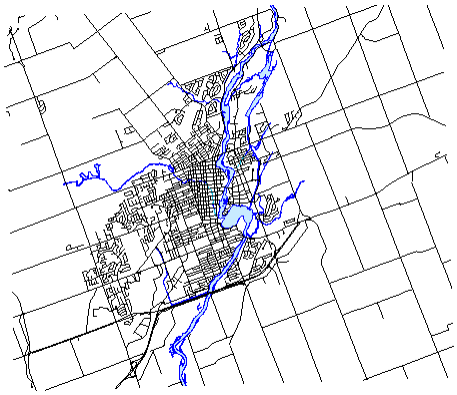
The following exercise describes how to attach and view graphical data in a shapefile.

Exercise: Attaching a SHP file

1. Navigate to *Examples/Geospatial*
2. Open *BSI200-R01-Environmental.dgn* from the Designs folder
3. Select *Attach Reference*.
4. Navigate to the */geospatial/data/shp/* folder and note the addition of *Shapefiles (*.shp)* in the Files of type option.



5. Select and attach *ORN_Peterborough.shp* with the Attachment Method set to *Geographic – Reprojected.*



6. Hover the cursor over an element from the attached SHP file and select *Exchange* from the right click menu. The file opens in read-only mode and in the projection defined by the accompanying PRJ file.

7. Close the file.

Geo-coordination - Geo-coordination features let you specify the position of design contents on the earth's surface. Once that position is established, a design can be coordinated with other data for which the geographic location is known. For more information, please refer to the following wiki article:

http://communities.bentley.com/Wiki/view.aspx/Assigning_A_Geographic_Coordinate_System

There are several ways to apply a geographic coordinate system to a model: By selecting a GCS from the library, by selecting a GCS from an attached reference, by selecting a GCS from an unrelated design, and by creating a GCS from placemarks

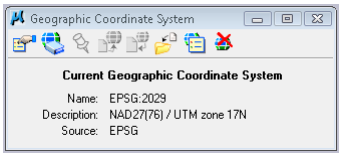
Geographic coordinate system (GCS) can be selected from MicroStation's extensive library of predefined GCSs. This is useful in the following cases: Existing data was drawn in a geographic coordinate system and you want to make MicroStation aware of that GCS. Data is correctly drawn in one specified GCS, but you want to reproject the data to a different GCS. Or, you want to designate the GCS to a new design file.

The following exercise illustrates how to apply a geographic coordinate system to a model.

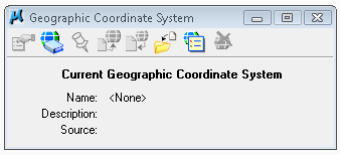
Exercise: Create a Geographic Coordinate System by choosing from the library

1. Remain in the Geospatial project and open /designs/*BSI200-R03-Public Works.dgn*
2. Review the existing geographic coordinate system by choosing *Tools* > *Geographic* > *Select Geographic Coordinate System.*

   This model is set to NAD27, UTM Zone 17N



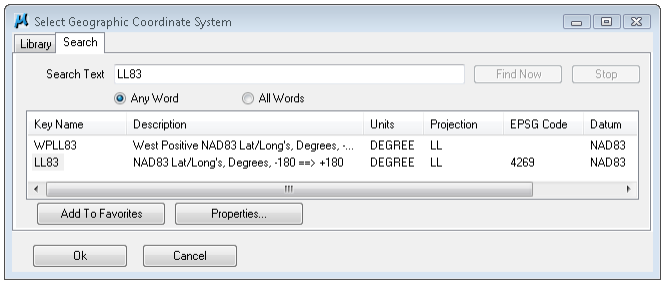
3. Remaining in this file, create a new 2D design model and notice the absence of a GCS.



4. If needed, select *Tools* > *Geographic* > *Select Geographic Coordinate System*

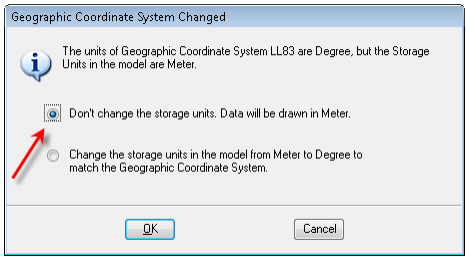
5. Select *From Library* and explore the library contents.

6. Using the Search tab, look for *LL83*, ensure that it's selected and click OK.



An information dialog will open which warns that the storage units of the model are different than the select coordinate system.

7. Choose the top option:



8. Save the settings.

MicroStation can reproject design data from one geographic coordinate system to another. This can be done permanently or temporarily, depending whether the GCS came from the active model or a referenced model. There are different situations in

which you may have to reproject the design data: When assigning a geographic coordinate system to a model that already has a GCS assigned. And, when attaching a reference model that uses another GCS than the active model to which it is attached.

When attaching a reference model that uses another geographic coordinate system than the active model to which it is being attached, MicroStation can reproject the design data in the reference model. This is being done only temporarily; the changed data are not written back to the referenced file. Because MicroStation knows the exact geographic location and orientation of both models, it can calculate the coordinates in the master model of any reference model point, as long as the geographic area of the reference model is within the useful range of the master model's geographic coordinate system.

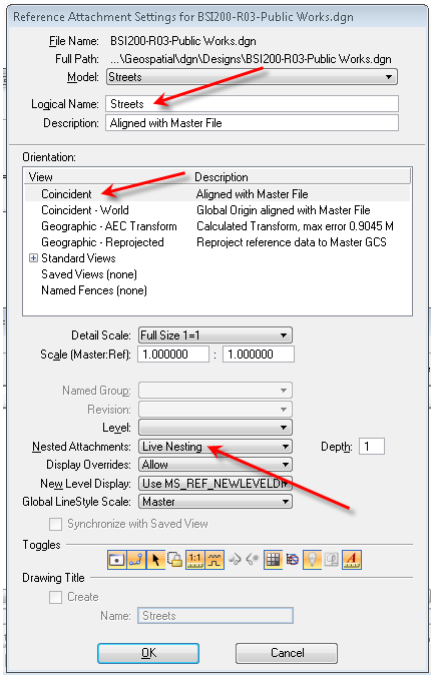
In the following exercise, a reference will be attached and reprojected.

Exercise: Reproject a reference

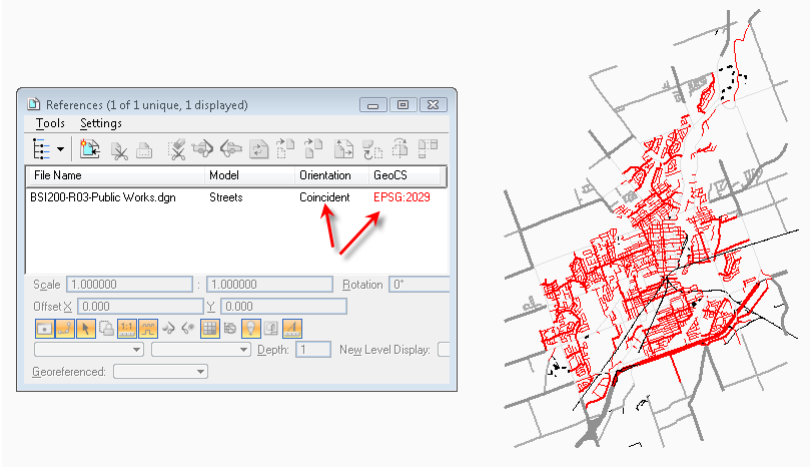
1. Continuing in *BSI200-R03-Public Works.dgn*, choose *Attach Reference*

2. Select the current file: *BSI200-R03-Public Works.dgn*, using the Interactive attachment mode.

3. Ensure that the *Streets* model is selected, set the orientation to *Coincident,* and turn on Live *Nesting*.



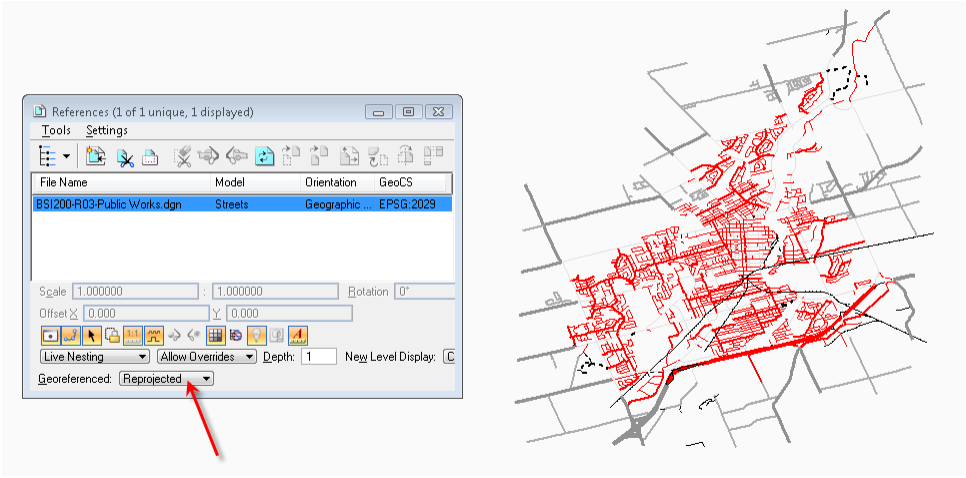
4. Click OK and fit the view.



The reference dialog provides important feedback regarding the attachment. In this case, it's attached coincidentally and the GeoCS column shows in red. This indicates that the model is not georeferenced to the coordinate system of the active model which is LL83.

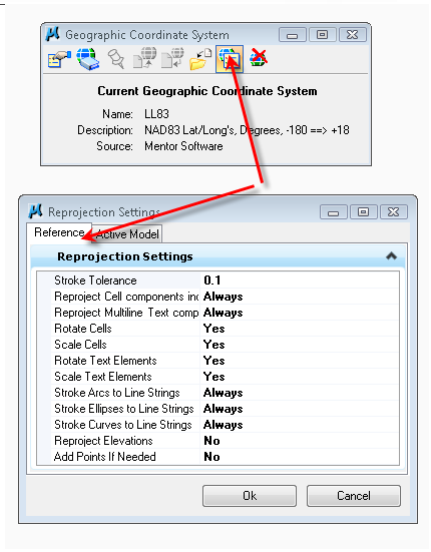
5. Change the Georeferenced option to *Reprojected* and fit the view if necessary.

The reference is reprojected to align with the coordinate system of the active model. This change is done in memory only; the physical graphics do not change location.



Note: This change can also be made upon the initial attachment or directly from the Orientation column of the Reference dialog.

In the event that the graphics are not reprojecting as expected, it may be necessary to adjust the Reprojection Settings:

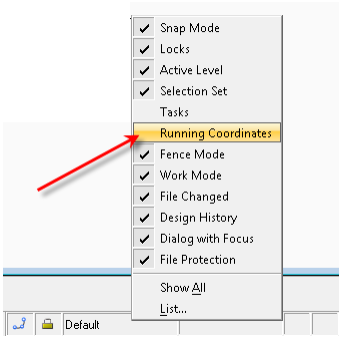


When you select the Geographic - Reprojected orientation option in the Reference Attachment Settings dialog, it projects all data in the reference model from the reference model's geographic coordinate system to the active model's geographic coordinate system. The reprojected data is stored only in memory, since the reference is not changed, so the reprojection calculations happen each time the reference is loaded. This increases the time required to open the active model.

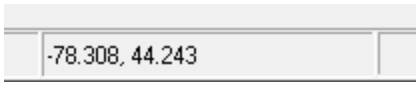
In the following exercise, the coordinates will be displayed in the status bar.

Exercise: Adjust display of coordinates

1. Continuing in the same file, right click on the right side of the status bar and enable the display of *Running Coordinates.*



As the pointer moves around the map, the status bar displays the latitude and longitude coordinates.



Data points can be entered in longitude, latitude by setting the active ACS to the geographic coordinate system and using the key-in POINT ACSABSOLUTE. You can enter the longitude and latitude in any of the following formats.

12.345 = 12.345 degrees

12^34.5 = 12 degrees, 34.5 minutes

12:34.5 = 12 degrees, 34.5 minutes

2d34.5 = 12 degrees, 34.5 minutes

12d34.5m = 12 degrees 34.5 minutes

12:34´56.7 = 12 degrees, 34 minutes 56 seconds

12:34´56.7" = 12 degrees, 34 minutes 56 seconds

12:34:56.7 = 12 degrees 34 minutes, 5675.7 seconds

12d34m56.7 = 12 degrees 34 minutes, 56.7 seconds

12d34m56.7s = 12 degrees 34 minutes, 56.7 seconds

Exercise: Display and enter coordinates in longitude, latitude format

1. Continuing in *BSI200-R03-Public Works.dgn,* navigate back to the *Streets* model.
2. Select Copy Element.
3. Snap to the endpoint of a line.

Note the coordinates in the right part of the status bar are similar to these: 711123.6152, 4902352.7432. The Cartesian XY coordinates of every point in the map are projected on the assigned geographic coordinate system. If a geographic coordinate system is assigned to a model, it appears in the Auxiliary Coordinates dialog. When it is made the active auxiliary coordinate system, data can be entered in longitude, latitude format, and coordinate readout can be set to show longitude and latitude.

4. Select *Utilities* > *Auxiliary Coordinates*.
5. In the Auxiliary Coordinates dialog, double click the geographic coordinate system in the list to make it the active auxiliary coordinate system.
6. To set the coordinate readout to show longitude and latitude, left click the coordinates field in the status bar and select *ACS Position.*

7. Select Copy Element and snap to the same endpoint again. The coordinates are displayed now in longitude, latitude format: -78.3558° , 44.2458° . Negative values for longitude indicate western hemisphere, and negative values for latitude indicate the southern hemisphere.
8. To change the readout of the coordinates select *Settings* > *Design File* > *Angle Readout* category.
9. Set the format to DD MM SS and the accuracy to 0.12, and then click OK.
10. View the coordinates again. They're displayed in degrees, minutes, and seconds.

You will enter a point with coordinates in longitude, latitude format.

11. Select *Place Circle* and move the input focus to the AccuDraw window by pressing the space bar.
12. Type the AccuDraw shortcut M or P to open the Data Point Keyin dialog.
13. Select *ACS (ax=)* from the menu to enter ACS dependent coordinates.
14. To define the center of the circle type the following coordinates and press Enter:

    -78°20, 44°19

(To type a degree symbol °, press Alt + 0176 on the numeric pad of the keyboard.)

15. Click in the view to define the radius of the circle.

Drawing models - A new model type called a drawing model is now available. The Drawing model is an intermediate model between the 3d model and the Sheet model. It is the first place one would need to start thinking about annotation and output scale. It is also bigger than a sheet, meaning it is used to layout annotate information or setup design information that spans multiple sheets. It does not contain a border.

Some of the important properties of a drawing model are as follows.

• A drawing model is always 2D.

• It does not have a sheet boundary.

• The default background color of a drawing model is gray.

• A reference attached to a drawing model is 1:1 coincident.

• Drawing titles should not be placed in a drawing model because their fields cannot be updated.

• Annotations can be placed in a drawing model.

• You can pre-specify the detail scale of a drawing model. When a drawing model is attached to a sheet, the drawing model's annotation scale is used as the attachment's default detail scale.

Dynamic Views - The term dynamic views refers to a method of composing drawings that is a new approach to managing projects. Dynamic views can help you to do the following: automate sheet creation, keep MicroStation files up to date by creating responsive drawings, eliminate errors in design and documentation and manage changes across MicroStation files.

The delivered Drawing Composition workflow is critical to understanding dynamic views. This workflow is designed to take you through the process from beginning to end, so tasks are arranged in the Tasks dialog from top to bottom. Tasks are arranged in order in the Tasks dialog, from top to bottom.

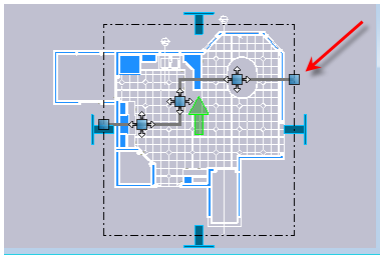
- *Organize* the project data. At this stage, you use Project Explorer, which is a catalog of your project resources or a hyperlinked table of contents.
- The *Drawing* task is in every workflow. It is there to help you with any other drawing activities.
- *Design Composition*. At this stage, you create a collection of references at full scale (1:1) to use in several designs, design compositions, or sheet compositions.
- *Create Views (2D*). At this stage, you compose all the section, detail or plan views in the project. These views should have linked callouts and placeholder fields so that, when the views are added to a sheet, they are automatically updated as work commences.
- *Sheet Composition*. At this stage, you create sheets that represent finished geometric work ready for publication. Typically, this is where print scale is taken into consideration.
- *Annotate.* Add final annotations such as any informational geometry, hatching, dimensions, callouts, and text to the sheet to produce a finished product.

In the following exercise, dynamic views will be explored.

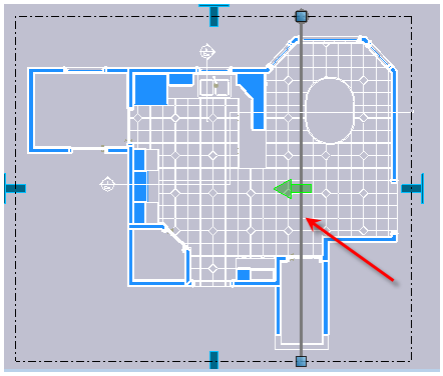
Exercise: Exploring dynamic views

1. Set the following in the File Open dialog: *Project*: General
2. Open *Drawing Composition.dgn*.

   This file shows the effects of dynamic views, contained in a single file. All models are in this file, and all references are models in this file. This is not a typical work flow, but lets you see the effects easily.
3. Make the *Drawing Composition* workflow active in the Tasks dialog.
4. Click *View 4's* title bar to make it the active view.
5. Select *Element Selection* and select the horizontal section line.

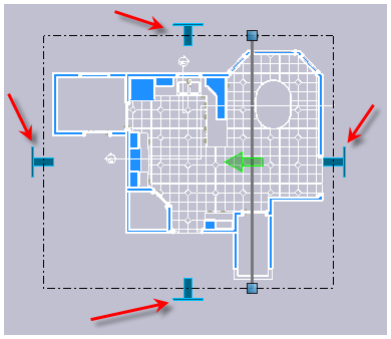


   Note that the dashed boundary around the area is the clip volume
6. Move a handle to change the position of the section line. Note that the other views update.
7. Click the vertical section line.



8. Select and move the green arrow on the vertical section line and observe the results.
9. Right click on the *green arrow* and select *Flip Direction*. Now you can move the other way.

10. Select one of the *clip volume's bolt handles* of the and move it to see the graphics update



Note: Bolt handles show the area up to the clip volume, but not beyond. Arrow handles will show beyond the clip volume. Toggle between both handle types by right clicking the handle and selecting Toggle Cropping.

11. Open the various models and examine each model's References, Saved Views, Clip Volumes, and View Attributes.

Exercise: Add a detailing symbol

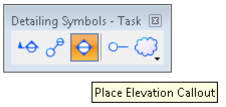
1. Continuing in *Drawing Composition.dgn*, click the *Annotate* task.
2. Select *Place Elevation Callout*, with the following tool settings:

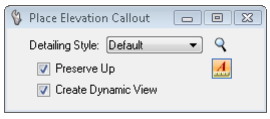
   Detailing Style: Default

   Preserve Up: Enabled

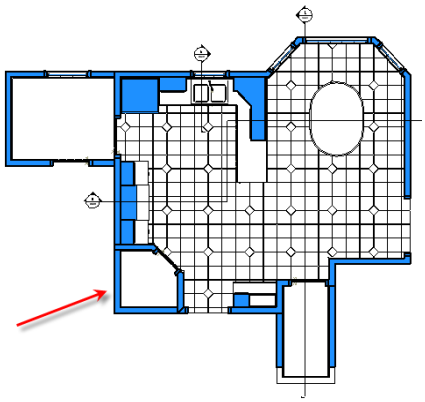
   Create Dynamic View: Enabled

   Annotation Scale lock: Enabled





3. In View 1, the Plan model, select the outer wall on the lower left side.

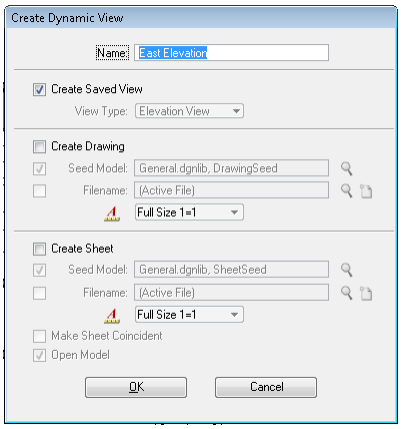


4. Place the elevation callout to the left of the building by entering a data point.

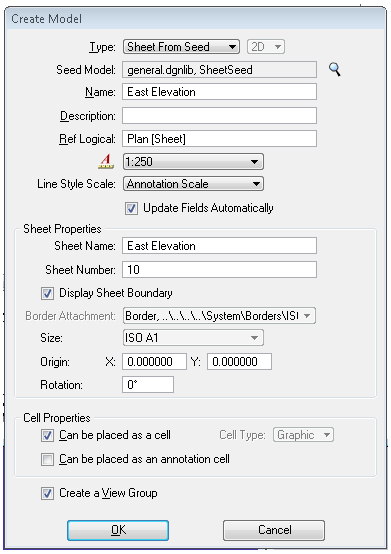
5. Drag to the right, past the other side of the building, to establish the clip volume, and enter a second data point. The Create Dynamic View dialog opens.

6. In the Create Dynamic View dialog, turn on *Create Saved View.*

7. Change the Name to *East Elevation* and click OK.



8. Open the *Saved Views* dialog to see that the East Elevation saved view was created.



Exercise: Test dynamics

1. Continuing in *Drawing Composition.dgn*, create a new Sheet model:

   Type: Sheet from Seed

   Seed Model: general.dgnlib, SheetSeed

   Name: East Elevation

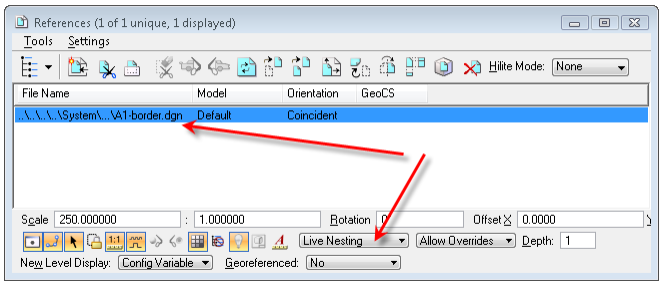
   Annotation Scale: 1:250

   Update Fields Automatically: Enabled

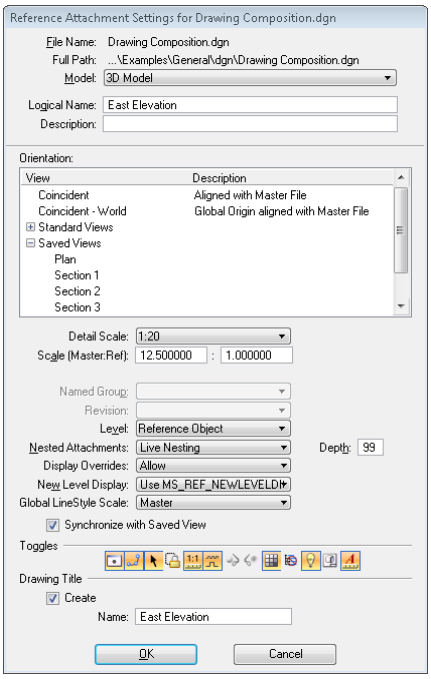
   Sheet Name: East Elevation

   Sheet Number: 10

Note: If the border attachment fails to show, turn on Live Nesting.



2. In the East Elevation model, open the Saved Views dialog.
3. Drag and drop *East Elevation* into View 1.



4. Set the following in the Reference Attachment Settings dialog:

   Detail Scale: 1:20

   Level: Reference Object

   Synchronize with Saved View: Enabled

   Use Active Annotation Scale (Toggle): Enabled

   Drawing Title: Create: Enabled

   Drawing Title Name: East Elevation

5. Click OK and position the view on the sheet.
6. Return to the previous model.
7. In *View 4*, open the *View Attributes* dialog.
8. Set Models to *East Elevation*.
9. In View 1, Plan, right click on the Elevation callout and choose Rotate.
10. Rotate the callout by 120 degrees and note the effect on View 4.
11. Close the file.

The dynamic views workflow can be automated using the Create Dynamic View dialog. Different workflows can be completed by using the Create Saved View, Create Drawing, and Create Sheet check boxes. The dialog opens when you use any of the following tools and the Create Dynamic View check box is enabled in the tool settings; Place Section Callout, Place Detail Callout, and Place Elevation Callout, Create Saved View, and Create Clip Volume.

Activate Reference: You can edit a reference from within the active model. When a reference is activated, only operations on the activated reference are permitted. By default, all elements in other references, as well as the active model, are displayed with an override color. You can control whether or not an override color is used, and what the color is, with the Active Reference Override Color preference (*Workspace* > *Preferences* Reference category, Active Reference Override Color

Exercise: Activate a reference for in-place editing

Set the following in the File Open dialog:

Project: Civil

Open */Drawings/BSI400-HorizontalAlignmentDrawing.dgn*.

1. With Element Selection active, right press on a curve representing the creek and select *Activate*
2. Change the creek to colour 7, weight 2.
3. Change the tree line to colour 2, weight 2
4. Right click on a changed element and choose *Deactivate*
5. Close the file

References and levels - You can attach a reference to a level in the DGN workmode. This option is critical when attaching a saved view as a reference. The reason is that a saved view can only store the reference level setting of a reference attachment. To keep the saved view and reference synchronized, you must choose a level when attaching a saved view as a reference.

Exercise: Using saved views, references and levels to synchronize

1. Change the workspace project to *Building*
2. Create a new 3D file in the /sheets/ folder.
3. Use ...\Workspace\System\seed\seed3d.dgn as the seed file, and name the file Saved *View as Reference.dgn.*
4. In the Models dialog, create a new sheet model:

   Type: Sheet 2D

   Name: Saved View

   Scale: Full Scale

5. Open the References dialog.

Attach *Drawings**BSI300-GroundFloorPlan.dgn* with the following attachment settings:

Model: Ground Floor Plan

Orientation: Saved Views > PlanClip

Detail Scale: 1:50

Level: Markup

Nested Attachments: Live Nesting Depth: 3

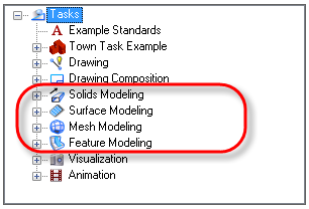
Synchronized with Saved View: Enabled

Drawing Title > Create: Enabled

Drawing Title Name: Corner Plan

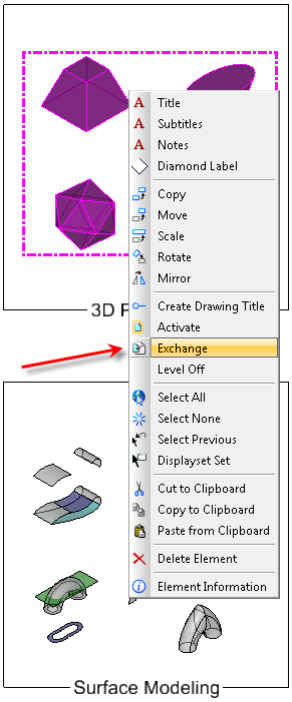
6. Place the reference in the center of the sheet.
7. Note the corner column and the detail marker. Note there is no text on the saved view.
8. Open *Drawings**BSI300-GroundFloorPlan.dgn*.
9. Zoom in to the lower left corner so you can see the text.
10. Select Utilities > Saved Views.
11. Double click *PlanClip* to apply it to View 1.
12. Turn on *A-Z000-G-Anno and Z-Z001-G-Iden* levels.
13. Zoom out if necessary to see the changes.
14. Select *PlanClip* and click *Update Saved View Settings* in the Saved Views dialog.
15. Turn on *Update Camera Position*
16. Enter a data point in the view.
17. Return to the sheet model in the new file to see that the referenced saved view has updated.
18. Select File > Close when you are done.

3D Design Modeling - Most of the 3D modeling tools have been reorganized with separate toolboxes for solids and surfaces, features and meshes.



For example, in previous versions of MicroStation, you had the choice of making a 3D primitive either a solid or a surface. In MicroStation V8i, this option has been split into two separate tool boxes: Primitive Solids and Primitive Surfaces.

Several solid modeling tools have been enhanced and new tools have been included for creating and modifying solids. For example four new solid primitives have been added: Pyramid, Elliptical Cone, Ellipsoid and Polyhedron.

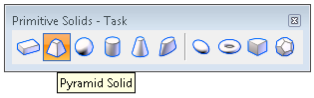


In the following exercises, several 3D tools will be explored.

Exercise: Pyramid Solid

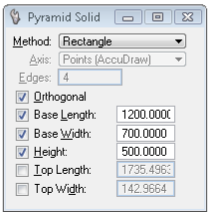
1. Continuing in the *Examples/General* workspace, open *Solids.dgn.*

2. Hover the pointer over the 3D object in the top right tile, and select *Exchange* from the right-click menu.



3. To assist with the visualization of the objects, set the View Display Style to *Illustration*.

4. From the Solids Modeling task, choose Pyramid Solid from the Primitive Solids tool box. Or choose *Tools* > *Solids* > *Primitive Solids* > *Pyramid* with the following settings:



   Method: Rectangle

   Orthogonal: Enabled

   Base Length: 1200

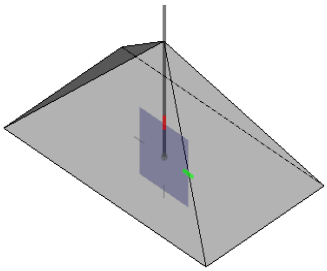
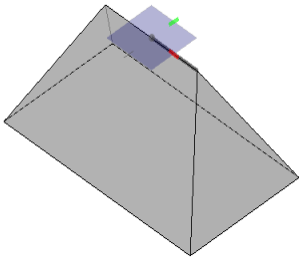
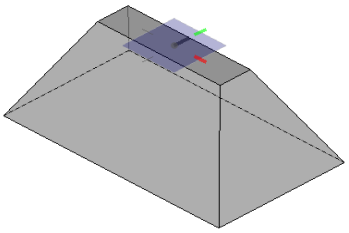
   Base Width: 700

   Height: 500

5. Follow the prompts; enter a data point to define the length.

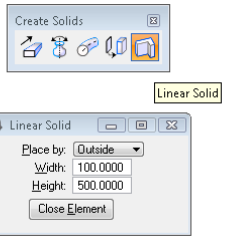
6. Enter a data point to define the width.

7. Enter a data point to define the height.
8. Enter a data point to define the top width.
9. Finally, enter a data point to define the top length.

The following new Solid Modeling Tools have been added: Linear Solid, Replace Face, and Draw On Solid.

Exercise: Linear Solid

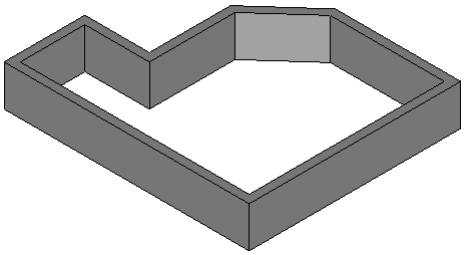


1. Continue in the *Primitives* model of *Solids.dgn*
2. Select *Linear Solid* from the Create Solids tool box. Or choose *Tools* > *Solids* > *Create Solids* > *Linear Solid*
3. Use the following settings:

   Place By: Outside

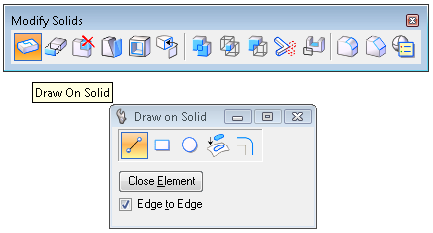
   Width: 100

   Height: 500



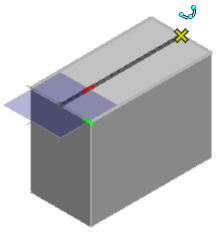
4. Follow the prompts and enter a series of data points to define the shape of the solid.

All 3D modeling tools now have a unified workflow that covers that way that you select items for creation and modification and how you can modify them interactively. You can select edges and faces for modification, and use interactive handles to control 3D objects.

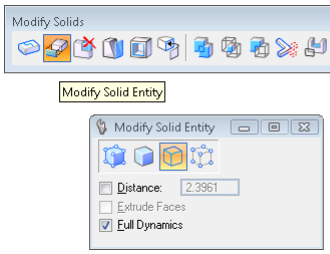


Exercise: Draw on Solid / Pull Edge

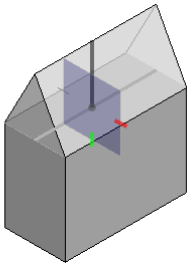
1. Open *3D Push Pull Modeling.dgn.*
2. Navigate to the model titled *Draw Line on Solid*
3. From the *Modify Solids* toolbox, choose *Draw on Solid (Tools > Solids > Modify Solids > Draw on Solid)*
4. Adjust the setting to be *Draw Line* with *Edge to Edge* enabled.



5. On the left solid, enter a two data points from edge to edge on the top face.
6. From the Modify Solids tool box, choose *Modify Solid Entity* with the following settings: *Mode:* Edge and *Full Dynamics:* on



7. Follow the prompts, select the edge to modify and enter a data point to fix its new location.

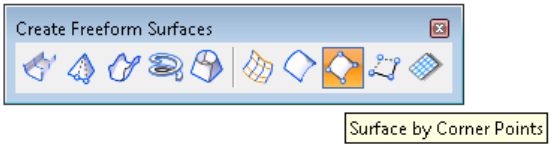


The following new surface modeling tools are located in the Create Freeform Surfaces, Modify B-spline Surfaces and Surface Utilities tool boxes: Loft Surface by Vertices, Surface by Edge Curves, Surface by Corner Points, Surface Handlebar, Twist Surface, Planar Slice, Unroll Developable Surface, Mesh modeling creation and modification tools.

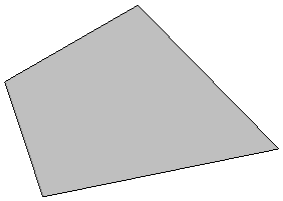
Exercise: Surface by Corner Points / Surface Handlebar

1. Open *3D – Surfaces.dgn* and navigate to any of its design models.

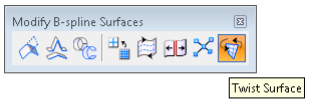
2. From the *Surface Modeling* task, choose *Surface by Corner Points* from the *Create Freeform Surfaces* tool box. (*Tools* > *Surfaces* > *Create Freeform Surfaces* > *Surface by Corner Points).*

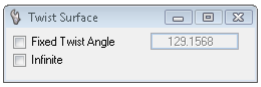


3. Follow the prompts and define four corners.



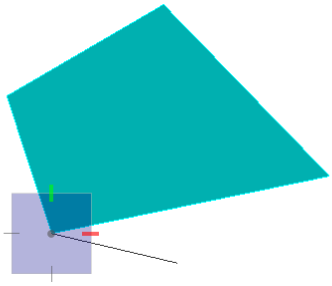
4. From the *Modify B-spline Surfaces* tool, choose the *Twist Surface* tool. The settings can remain unchecked.



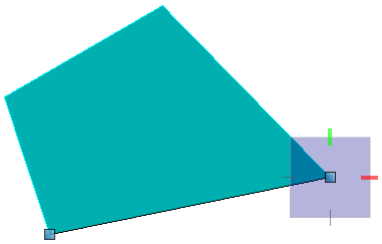


5. Identify the B-spline surface or mesh element.

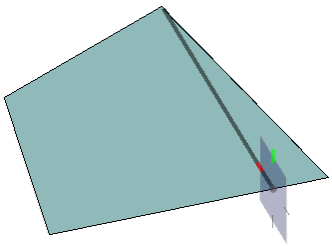
6. Enter a data point to define the start of the axis. For example, the lower left corner.



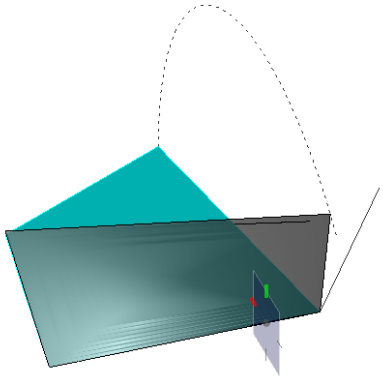
7. Enter a data point to define the end of the axis. For example, the lower right corner.

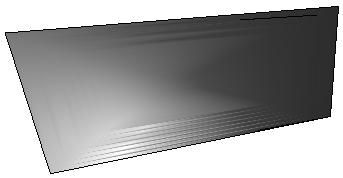


8. Enter a data point to define the reference point for the start of the twist. For example, the upper right corner.



9. Enter a data point to define the end reference point for the twist.





Design Review - To facilitate the design review process, MicroStation allows you to view markup elements, such as annotation text, freehand redlining, pen and area highlighting.

You can use MicroStation to view markups made by ProjectWise Navigator.

The Markups dialog is used to view markups made in a design by ProjectWise Navigator. A markup can be annotation text, freehand redlining, pen and area highlighting.

The Markups dialog is divided into two sections. The top section displays information about the markup. The bottom section automatically displays any changes made to the properties of the markup.

If you use MicroStation to open an *.overlay.dgn file, the Markups dialog offers additional options such as deleting a markup or switching to a review mode. Used to: manage all the markups in an overlay file, add and manage comments for the markups, activate markups by double-clicking the markup in the list box. Double-clicking a markup opens a preview window, which displays the model and the markup information.

i-Models - A Bentley i-model is a container for open infrastructure information exchange and enables bi-directional feedback in dynamic workflows. An i-model can be information-rich meaning that it contains geometry as well as all business data which does not require the source application to be available. You can compose information-rich i-models from multiple 2D and 3D geometry and data sources in a single lightweight container. Every i-model is self describing, which means that source application features are not required to display or describe the business information stored within.

Exercise: Publish a file

1. Set the following in the File Open dialog:

   User: examples

   Project: Building

2. In the *Designs* folder, open *Design-Composition.dgn*

3. Open the references dialog and take note of the references listed.

4. Select *File > Publish i-model*.

5. Enable *both Force republishing of all files* and *Create a Package*

6. Click OK. The files are processed.

7. Select *File* > *Close*.

8. Delete all the dgn.i.dgn files *except* the package Design-Composition.i.dgn.

9. Open *Design-Composition.i.dgn.*

10. Note the file contents.

11. Open the references dialog and take note of the references listed.

12. The referenced files are .i.dgn files. Even though the actual files were deleted, the package file contains the data.

13. Close the file.

Thank you!