Contents

Points

These tutorials will get you started working with coordinate geometry (COGO) points, which are the basis for modeling land surfaces. These tutorials demonstrate how to import survey points into a drawing from a database, and how to classify a large set of points into more manageable groups.

Before you import a large set of points, it is a good idea to structure your drawing environment so that as the points are created, they are sorted into meaningful groups, with appropriate styles and other attributes.

Note:

All drawings used in these tutorials are available in the tutorials drawings folder. If you want to save your work from these tutorials, save the drawings to the My Tutorial Data folder so that you do not overwrite the original drawings.

Topics in this section

- **Tutorial: Creating Point Data**
  This tutorial demonstrates several useful setup tasks for organizing a large set of points.
- **Tutorial: Displaying and Editing Points**
  This tutorial demonstrates how to use point groups, layers, external references, and styles to display points. It also explains the various ways to edit points using standard AutoCAD tools.
- **Tutorial: Adding User-Defined Properties to Points**
  This tutorial demonstrates how to add custom properties to points.

Tutorial: Creating Point Data

This tutorial demonstrates several useful setup tasks for organizing a large set of points.

In this tutorial, you will learn about managing a set of points related to stormwater manholes and detention ponds. You will create description keys and point groups to sort the points as they are imported into a drawing. Then, you will import the points from an existing file.

Description keys can help you automate many point-handling tasks at the time that points are created or imported. A description key uses the raw description code of a point to determine how to process the point. For example, you can configure a description key to apply different styles or place points on different drawing layers.

You can classify a set of points into several *point groups*, based on the type of point, elevation, date of creation, source, or other criteria. Then you can run various queries or operations for point display against a point group, rather than the whole set.

Points can be *imported* from a text file or a Microsoft Access database. Data created in Autodesk Land Desktop can be migrated to AutoCAD Civil 3D by importing points directly from a project database.

You can create a large point set and organize it later. However, it is usually more efficient to classify points into several groups as they are being created.

Topics in this section

- **Exercise 1: Creating Description Keys**
  In this exercise, you will create description keys to sort the points as they are imported into a drawing.
- **Exercise 2: Creating Point Groups**
  In this exercise, you will create point groups to sort the points as they are imported into a drawing.
- **Exercise 3: Importing Points from a Database**
  In this exercise, you will import points from a database to a drawing that uses description keys to sort points into groups.

Exercise 1: Creating Description Keys

In this exercise, you will create description keys to sort the points as they are imported into a drawing.

Create a description key set

1. Open Points-1.dwg, which is located in the tutorials drawings folder.
2. In Toolspace, on the Settings tab, expand the Point collection.
3. Right-click Description Key Sets. Click New.
4. In the Description Key Set dialog box, Name field, enter **Stormwater Keys**.
5. In the Description field, enter **Stormwater manhole and pond points**.
6. Click OK.
   The new description key set is created.

Create description keys

1. In Toolspace, on the Settings tab, expand the Description Key Sets collection. Right-click **Stormwater Keys**. Click Edit Keys. The DescKey Editor vista is displayed in the Panorama window.
   In the DescKey Editor, you will enter the raw description codes, and specify how AutoCAD Civil 3D handles new points that have these codes. All entries in the Code column of the DescKey Editor are case sensitive.
2. In DescKey Editor, in the Code column, click the default entry. Change it to **POND***.
   The asterisk is a wild-card character. The asterisk causes any imported point with a description code that begins with POND, followed by any other characters, to be handled according to the settings in this table row.
3. In both the Style and Point Label Style columns, clear the check box to deactivate these settings.
   Clearing these settings allows you to control these settings by using point group properties.
   Note:

The Format column contains the entry $*, which specifies that a point's raw description is copied without changes and used for the full description in the point label. This is an acceptable setting for the POND points.

4. In the Layer column, select the check box. Click the cell to open the Layer Selection dialog box.
5. In the Layer Selection dialog box, select **V-NODE-STRM**. Click OK.

   This setting means that the POND points reference the V-NODE-STRM layer for their display attributes. In the next few steps, you create another description key.
6. In the Code column, right-click the **POND*** entry. Click New.
7. In the new description key, click the default Code entry and change it to **MHST***.
8. Set the same styles and layer as you did for POND* by repeating Steps 3 through 5.
9. In the Format column, enter **STORM MH**.

   This setting ensures that points with a raw description of MHST* (stormwater manholes) are labeled in the drawing as STORM MH.
10. Click ✔ to save the description keys and close the editor.

Exercise 2: Creating Point Groups

In this exercise, you will create point groups to sort the points as they are imported into a drawing.

This exercise continues from Exercise 1: Creating Description Keys.

Create point groups

Note:
This exercise uses Points-1.dwg with the modifications you made in the previous exercise.

1. In Toolspace, on the Prospector tab, right-click the Point Groups collection. Click New.
2. In the Point Group Properties dialog box, on the Information tab, in the Name field, enter **Detention Pond**. Optionally, enter a short description in the Description field.
3. On the Raw Desc Matching tab, select **POND***. Click Apply.

   This option specifies that all points with the POND* raw description are added to the Detention Pond point group.
   Notice how the description key setting is recorded on both the Include and Query Builder tabs. If you know SQL, you can see how you could add more criteria to the Query Builder tab to select a more specific set of points for the point group.
4. Click OK.
5. Create another point group by repeating Steps 1 through 4, but use the following parameters:

Name: **Storm Manholes**
Raw Desc Matching: **MHST***
Your drawing should now contain the same description keys and point groups shown in sample drawing *Points-1a.dwg*.

Note:
The _All Points point group is created automatically. A point can belong to other point groups in the drawing, but it is always a member of the _All Points point group.

Change the point group label style

1. In Toolspace, on the Prospector tab, expand the Point Groups collection.
2. Right-click the _All Points collection. Click Properties.
3. In the Point Group Properties dialog box, on the Information tab, change the Point Label Style to **Standard**.
4. Click OK to close the Point Group Properties dialog box.

To continue this tutorial, go to Exercise 3: Importing Points from a Database.

Exercise 3: Importing Points from a Database

In this exercise, you will import points from a database to a drawing that uses description keys to sort points into groups.

This exercise continues from Exercise 2: Creating Point Groups.

Import points from a database

Note:
This exercise uses Points-1.dwg with the modifications you made in the previous exercise from the tutorials drawings folder.

1. In Toolspace, on the Prospector tab, right-click Points. Click Create.
2. In the Create Points dialog box, click  . Expand the Default Layer parameter, then change the value to **V-NODE**.
3. In the Create Points dialog box, click  Import Points.
4. In the Format list, select External Project Point Database.
5. Click  . Browse to the tutorial folder. Select *points.mdb*. Click Open.
6. In the Import Points dialog box, clear the Advanced Options check boxes.
7. Click OK.
   The points are imported.
8. In Toolspace, on the Prospector tab, right-click the _All Points point group. Click Zoom To.

The points are displayed both in the drawing and in tabular form in the Toolspace list view. In the drawing window, if you move the cursor over a point, a tooltip displays basic data about the point. Notice that the two stormwater point groups appear to be empty. This is because they have not been updated with their new content. In the next few steps, you will see how AutoCAD Civil 3D provides several ways to check the point data before adding it to your drawing.

Update point groups

1. Right-click the Point Groups collection. Click Properties.

   The Point Groups dialog box is displayed. Point groups are listed here according to their display order, with the highest priority group at the top. Arrows at the side of the dialog box allow you to change the display order. The icon indicates that an update is pending for a point group.

2. To show the contents of the update for each point group, click . Review the list of points that the application is prepared to add to the Storm Manholes and Detention Pond point groups.

3. In the Point Group Changes dialog box, click Close.

4. To update the point groups, click . Click OK.

   Alternatively, you can right-click the Point Groups collection and click Update.
   The point groups update. Now, you can display their points in the list view and zoom to them in the drawing.

5. Right-click a point group. Click Edit Points.

   The points are displayed in the Point Editor table. Review and change their attributes.
   Note:
   For information about changing the contents and display of the Panorama window, see the Using the Panorama Window tutorial.

To continue to the next tutorial, go to Displaying and Editing Points.

Tutorial: Displaying and Editing Points

This tutorial demonstrates how to use point groups, layers, external references, and styles to display points. It also explains the various ways to edit points using standard AutoCAD tools.

You can use *point groups* to organize points and to control their appearance in a drawing. While points are independent objects that do not have to be categorized into specific point groups, every point in a drawing is always part of the _All Points point group. The point group *display order* determines which point group's properties take precedence. For example, if a point belongs to a point group that is higher in the display order than the _All Points point group, the higher group's properties override the properties set in the _All Points point group.

The *point layer* controls the display attributes of the point. To see this, open the Point Group Properties dialog box, click the Point List tab, and look at the Point Layer column. This

column also appears in the Prospector list view when the point group is selected. The point layer can be assigned by using a description key. If a point layer is not assigned during creation, points are placed on the default point layer specified in the drawing settings.

An external reference drawing (*xref*) is a useful way to see points in relation to other surface features without adding these features to your drawing. You can reference another drawing and make it appear as an underlay in your current drawing. Then, you can detach the external drawing when you no longer need it.

Changing the point or label style of a point group can help you distinguish these points more easily from other points in the drawing.

Each point is an object that can be individually selected and manipulated. Point objects have commands, property attributes, and grip behavior that are similar to other AutoCAD entities.

Topics in this section

- **Exercise 1: Displaying an Externally Referenced Drawing**
  In this exercise, you will use a standard AutoCAD operation to display another drawing of the region around your set of points.
- **Exercise 2: Changing the Style of a Point Group**
  In this exercise, you will change the style of a point group. Point styles can help you distinguish the points more easily from other points in the drawing.
- **Exercise 3: Changing Point Group Display Order**
  In this exercise, you will use the point group display order to change the appearance of points.
- **Exercise 4: Removing an Externally Referenced Drawing**
  In this exercise, you will remove the externally referenced drawing that you added previously.
- **Exercise 5: Editing Points**
  In this exercise, you will move and rotate point objects to improve their position in the drawing.

Exercise 1: Displaying an Externally Referenced Drawing

In this exercise, you will use a standard AutoCAD operation to display another drawing of the region around your set of points.

This exercise continues from the Creating Point Data tutorial.

Display an externally referenced drawing

Note:
This exercise uses Points-1.dwg with the modifications you made in the previous exercise from the tutorials drawings folder.

1. Click Insert tab ➤ Reference panel ➤ Attach.
2. In the Select Reference File dialog box, make sure that Files Of Type is set to Drawing (*.dwg). Navigate to the tutorial drawings folder and open *Existing Basemap.dwg*. Select it and click Open.

3. In the External Reference dialog box, specify the following parameters:
   - Reference Type: **Overlay**
   - Insertion Point: **Cleared**
   - Scale: **Cleared**
   - Rotation: **Cleared**
4. Click OK.

   The basemap appears on the screen, allowing you to see the points of interest in relation to the road design and other contextual features. This external reference remains separate from your drawing. There is no risk of unexpected changes to your drawing. In a later exercise, you will learn how to detach the external reference.

Exercise 2: Changing the Style of a Point Group

In this exercise, you will change the style of a point group. Point styles can help you distinguish the points more easily from other points in the drawing.

This exercise continues from Exercise 1: Displaying an Externally Referenced Drawing.

Change the style of a point group

Note:
This exercise uses Points-1 dwg and Existing Basemap.dwg with the modifications you made in the previous exercise from the tutorials drawings folder.

1. Zoom in to the upper left area of the screen where you can clearly see the labels for several POND points and one or more STORM MH points. Notice that both types of points use the same marker style (X).
2. In Toolspace, on the Prospector tab, right-click the point group _All Points.
   Click Properties.
3. In the Point Group Properties dialog box, on the Information tab, change the Point Label Style to **<none>**.
4. Click OK.

   Labels for all points that do not have a label style set in another point group are hidden. The point markers are still visible because markers are controlled by the point style, which you did not change.
5. In Toolspace, on the Prospector tab, right-click the point group **Storm Manholes**.
   Click Properties.
6. In the Point Group Properties dialog box, on the Information tab, change the Point Style to **Storm Sewer Manhole**.
7. Click OK.

   The stormwater manhole points are now marked with the symbol defined in the Storm Sewer Manhole point style.

To continue this tutorial, go to Exercise 3: Changing Point Group Display Order.

Exercise 3: Changing Point Group Display Order

In this exercise, you will use the point group display order to change the appearance of points.

Change the point group display order

Note:
This exercise uses Points-1 dwg and Existing Basemap.dwg with the modifications you made in the previous exercise from the tutorials drawings folder.

1. In Toolspace, on the Prospector tab, expand the Point Groups collection.

   Notice the order of the point groups in the Prospector tree. The point group display order determines how points that belong to more than one point group are displayed in a drawing. When a drawing is opened or regenerated, AutoCAD Civil 3D searches down the point group display order to determine how the point will appear.
   For example, if a point belongs to all three groups, AutoCAD Civil 3D will first look in the Storm Manholes point to determine if a point label style has been assigned to that point group. If it has not, AutoCAD Civil 3D will look in the Detention Pond point group, and then the _All Points group until the point label style setting is found.

2. In Toolspace, on the Prospector tab, right-click the Point Groups collection.
   Click Properties.

3. In the Point Groups dialog box, select the **Storm Manholes** point group.

4. Click  to move the **Storm Manholes** point group to the bottom of the display order.

5. Click OK.

   Notice that the point style for the STORM MH points has changed to an X, and the label has disappeared. This happened because when the Storm Manholes point group was placed below the _All Points point group, the _All Points point group's point style and point label style settings took precedence over those of the Storm Manholes point group.

6. In Toolspace, on the Prospector tab, right-click the _All Points point group.
   Click Properties.

7. In the Point Group Properties dialog box, on the Overrides tab, select the Point Label Style box. Click OK.

   This option ensures that the Point Label Style setting of the point group overrides the Point Label Style setting of the individual points included in the point group.

8. In Toolspace, on the Prospector tab, right-click the Point Groups collection.
   Click Properties.

9. In the Point Groups dialog box, select the _All Points point group. Click  to move the _All Points point group to the top of the display order.

10. Click OK.

    Notice that all point labels in the drawing are hidden. This happened because the _All Points point group's point label style set to **<none>**, and you placed the _All Points point group at the top of the display order.

To continue this tutorial, go to Exercise 4: Removing an Externally Referenced Drawing.

Exercise 4: Removing an Externally Referenced Drawing

In this exercise, you will remove the externally referenced drawing that you added previously.

This exercise continues from Exercise 1: Displaying Point Groups.

Remove an externally referenced drawing

Note:
This exercise uses Points-1 dwg and Existing Basemap.dwg with the modifications you made in the previous exercise from the tutorials drawings folder.

1. Click any entity in Existing Basemap.dwg to select the whole drawing.
2. Right-click, and click Xref Manager.
3. In the External References dialog box, right-click the reference name **Existing Basemap**. Click Detach.

   The reference drawing disappears from view.
4. Close the External References dialog box.

To continue this tutorial, go to Exercise 5: Editing Points.

Exercise 5: Editing Points

In this exercise, you will move and rotate point objects to improve their position in the drawing.

Change the point style

Note:
This exercise uses Points-1 dwg and Existing Basemap.dwg with the modifications you made in the previous exercise from the tutorials drawings folder.

1. Locate point 992 near the left side of the drawing.

   Notice that the label for point 992 is obscured by the hatching. In the next few steps, you will change the point marker style. You will rotate the point marker so that it is parallel with the nearby road, and then move the label to a more readable location.
2. Select point **992**. Right-click. Click Properties. The AutoCAD Properties palette displays the properties of individual points.
3. Under Information, select **Catch Basin** in the Style property.

Rotate the point

1. In the drawing window, hover the cursor over the grip.

   A menu of options is displayed. These options are related to the point marker, as well as the point object, which consists of both the point marker and the point label.

   Tip:
   To rotate a group of points, use the AutoCAD ROTATE command. To rotate a point marker or point label, you can enter rotation angle on the Properties palette.

2. Click Rotate Label and Marker.

3. Rotate the point clockwise until the point marker is parallel to the edge of the road, then click to position the point.

   The point marker now matches the angle of the road, but the label is still obscured by the hatching. You will correct this in the following steps.

Drag the point label

1. Hover the cursor over the grip.

   A menu of options is displayed. These options are related to the point label.

2. Click Toggle Sub Item Grips.

   This toggles the display of the drag label grip. Three grips are available. These grips can be used to drag each line in the point label independently.

3. Hover the cursor over the grip.

4. Click Toggle Sub Item Grips.

5. Hover the cursor over the grip.

6. Click Move Label.

7. Drag the label down and to the left, until it is in an unobstructed area. Click to place the label in its new orientation.

To continue to the next tutorial, go to Adding User-Defined Properties to Points.

Tutorial: Adding User-Defined Properties to Points

This tutorial demonstrates how to add custom properties to points.

A *user-defined property* can be any useful attribute, such as date of acquisition or source. To create user-defined properties, you first create a property classification, which is a container for one or more related properties.

If you want to define a value for a point, but the applicable property does not exist, you can define it as a custom, user-defined property.

You assign classifications and their associated properties to the points in your drawing using point groups. After you have added the user-defined properties to a point group, you can add values for each property either by editing the properties of individual points or by importing values from an external point file.

Topics in this section

- **Exercise 1: Creating User-Defined Properties**
  In this exercise, you will learn how to create a user-defined property classification and add items to it.
- **Exercise 2: Creating a Label Style That Displays a User-Defined Property**
  In this exercise, you will create a label style that displays user-defined property information for a point.
- **Exercise 3: Assigning User-Defined Properties to Points**
  In this exercise, you will use point groups to associate user-defined properties with points in your drawing.
- **Exercise 4: Importing Points with User-Defined Properties**
  In this exercise, you will create a custom point file format, and then import point information that includes user-defined properties from an external file.
- **Exercise 5: Querying User-Defined Property Information**
  In this exercise, you will create a point group. The list of points included in the group is determined by a query that contains user-defined properties.

Exercise 1: Creating User-Defined Properties

In this exercise, you will learn how to create a user-defined property classification and add items to it.

Create a user-defined property classification

1. Open Points-4a.dwg, which is located in the tutorials drawings folder.

   The drawing is similar to the ones you used earlier in the Points tutorials, except only the points for storm manholes and the detention pond are visible.

2. In Toolspace, on the Settings tab, expand the Point collection. Right-click User-Defined Property Classifications. Click New.

3. In the User-Defined Property Classification dialog box, enter **Manhole UDP**.

4. Click OK.

The new classification is created and added to the list of user-defined property classifications.

5. Repeat Steps 2 to 4 to create an additional user-defined property classification named **Trees**.

Define classification properties

1. On the Settings tab, expand User-Defined Property Classifications. Right-click **Manhole UDP**. Click New.
2. In the New User-Defined Property dialog box, for Name, enter **MH_Pipe In Invert**.
3. In the Property Field Type list, select Elevation.
4. Use the default values for all other properties. Click OK.
   The property is added to the list of Manhole UDP properties.
5. Repeat Steps 1 to 4 to add additional properties to the **Manhole UDP** classification, using the following parameters:

   Note:
   The next exercise uses Points-4b.dwg, which contains all of the properties and classifications. To save time, you can skip Steps 5 and 6 and proceed to Exercise 2: Creating a Label Style That Displays a User-Defined Property.

Name	Property Field Type
MH_Material	String
MH_Diameter	Dimension
MH_Pipe In Diameter	Dimension
MH_Pipe In Material	String
MH_Pipe Out Invert	Elevation
MH_Pipe Out Diameter	Dimension
MH_Pipe Out Material	String

6. Repeat Steps 1 to 4 to add properties to the **Trees** classification using the following parameters:

Name	Property Field Type
Tree_Common Name	**String**
Tree_Genus	**String**
Tree_Species	**String**
Tree_Diameter	**Dimension**
Tree_Height	**Distance**

To continue this tutorial, go to Exercise 2: Creating a Label Style That Displays a User-Defined Property.

Exercise 2: Creating a Label Style That Displays a User-Defined Property

In this exercise, you will create a label style that displays user-defined property information for a point.

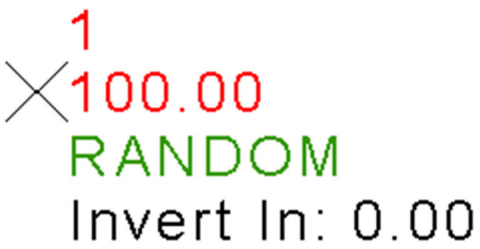
This exercise continues from Exercise 1: Creating User-Defined Properties.

Create a label style that displays user-defined property information

1. Continue working on Points-4a.dwg, with previous changes you made.
2. In Toolspace, on the Settings tab, expand the Point collection. Expand the Label Styles collection.
3. Under Label Styles, right-click **Standard**. Click Copy.
4. In the Label Style Composer, on the Information tab, for Name, enter **Manhole UDP**.
5. On the Layout tab, in the Preview list on the upper right side of the tab, select Point Label Style.

   Now, any edits you make to the point label style will be displayed in the preview pane.
6. Click  to create a text component for the label.
7. For the new text component, specify the following parameters:
   - Name: **Invert In**
   - Anchor Component: **Point Description**
   - Anchor Point: **Bottom Left**
   - TextAttachment: **Top Left**
8. Under Text, for Contents, click the default value. Click  .
9. In the Text Component Editor – Contents dialog box, on the Properties tab, specify the following parameters:
   - Properties: **MH_Pipe In Invert**
   - Precision: 0.01
10. Click  .
11. In the text editing window, delete the text “Label Text” from the label. Enter **Invert In:** before the property field, which is enclosed in angle brackets(<>). The text in the editor should look like this:

    Invert In: <[MH_Pipe In Invert(Uft|P2|RN|AP|GC|UN|Sn|OF)]>
12. Click OK.
13. In the preview pane, your label should look like this:



14. Click OK.

To continue this tutorial, go to Exercise 3: Assigning User-Defined Properties to Points.

Parent topic: Tutorial: Adding User-Defined Properties to Points

Exercise 3: Assigning User-Defined Properties to Points

In this exercise, you will use point groups to associate user-defined properties with points in your drawing.

This exercise continues from Exercise 2: Creating a Label Style That Displays a User-Defined Property.

Assign user-defined properties to points

1. Continue working on Points-4a.dwg, with previous changes you made.
2. In Toolspace, on the Prospector tab, click Point Groups.
3. In the item view, click the **Storm Manholes** entry. In the Classification column, select **Manhole UDP**.

Apply the user-defined property point label style

1. In the Prospector tree view, expand Point Groups. Click **Storm Manholes**.
2. In the item view, right-click in a column heading.
3. Clear the check mark from all items in the list, except the following:
   - **Point Number**
   - **Point Label Style**
   - **MH_Pipe In Invert**
   - **MH_Pipe In Material**

   Clearing the check boxes turns off the display of columns you do not need to see for this exercise.
4. Click the row for point **307**.
5. Click the Point Label Style cell to display the Select Label Style dialog box.
6. In the Select Label Style dialog box, select **Manhole UDP** as the label style. Click OK.

7. Repeat Steps 4 to 6 to apply the **Manhole UDP** for point **667**.

Specify user-defined property values

1. For point **307**, click the **MH_Pipe In Invert** cell. Enter **93.05**.
2. Right-click the row for point **307**. Click Zoom To.
   The value is displayed with the other point information in the drawing window.
3. For point **667**, click the **MH_Pipe In Invert** cell. Enter **93.00**.
4. Right-click the entry for point **667**. Click Zoom To.

To continue this tutorial, go to Exercise 4: Importing Points with User-Defined Properties.

Exercise 4: Importing Points with User-Defined Properties

In this exercise, you will create a custom point file format, and then import point information that includes user-defined properties from an external file.

This exercise continues from Exercise 3: Assigning User-Defined Properties to Points.

Create a point file format for importing user-defined properties

1. Continue working on Points-4a.dwg, with previous changes you made.
2. In Toolspace, on the Settings tab, expand the Point collection. Right-click Point File Formats. Click New.
3. In the Point File Formats – Select Format Type dialog box, select User Point File. Click OK.
4. In the Point File Format dialog box, specify the following properties:
   - Format Name: **Manhole Data**
   - Comment Tag: **#**
   - Format Options: **Delimited By**
   - Delimited By: , (a comma)
5. In the table of column names, click the first column heading (labeled <unused>).
6. In the Point File Formats – Select Column Name dialog box, in the Column Name list, select Point Number. Click OK.
7. Repeat steps 5 and 6 to name additional columns using the following values:
   - Column 2: **MH_Material**
   - Column 3: **MH_Diameter**
   - Column 4: **MH_Pipe In Invert**
   - Column 5: **MH_Pipe In Diameter**
   - Column 6: **MH_Pipe In Material**
   - Column 7: **MH_Pipe Out Invert**

- Column 8: **MH_Pipe Out Diameter**
- Column 9: **MH_Pipe Out Material**

8. Click OK.

Import user-defined property data from a text file

1. In Toolspace, on the Prospector tab, ensure that the Point Groups collection is expanded, and select the **Storm Manholes** group.

   In the item view, note that this group contains only nine points, and some of the data columns are blank.

2. In Toolspace, on the Prospector tab, right-click Points. Click Create.
3. In the Create Points dialog box, click Import Points.
4. In the Import Points dialog box, in the Format list, select **Manhole Data**.
5. Click . Browse to the tutorial folder. Select manhole_data.txt. Click Open.
6. Click OK.
7. In the Duplicate Point Number dialog box, in the Resolution list, select Merge. Click OK.

   The point data is imported.

8. On the Prospector tab, click the **Storm Manholes** point group.

   The point data from the file import is displayed in the item view, including specific values for manhole data.

9. Close the Create Points dialog box.

To continue this tutorial, go to Exercise 5: Querying User-Defined Property Information.

Exercise 5: Querying User-Defined Property Information

In this exercise, you will create a point group. The list of points included in the group is determined by a query that contains user-defined properties.

This exercise continues from Exercise 4: Importing Points with User-Defined Properties.

Create a point query

1. Open Points-4e.dwg, which is located in the tutorials drawings folder.
2. In Toolspace, on the Prospector tab, right-click Point Groups. Click New.
3. In the Point Group Properties dialog box, on the Information tab, for Name, enter **Storm Manholes - Invert In**.
4. On the Query Builder tab, select Modify Query.

5. Right-click the Query Builder table. Click Insert Row.
6. Click the row you created. Click Name in the Property column. In the Property list, select **MH_Pipe In Invert**.
7. Click the Operator value. In the Operator list, select < (less than).
8. Click the Value value. Enter **93**.
9. Click OK.
10. On the Prospector tab, click **Storm Manholes - Invert In**.

    A list of points that match your query is displayed in the item view. Points number 307 and 667 are excluded, because in a previous exercise you set their values for MH_Pipe In Invert to 93.05 and 93.00.

Parent topic: Tutorial: Adding User-Defined Properties to Points