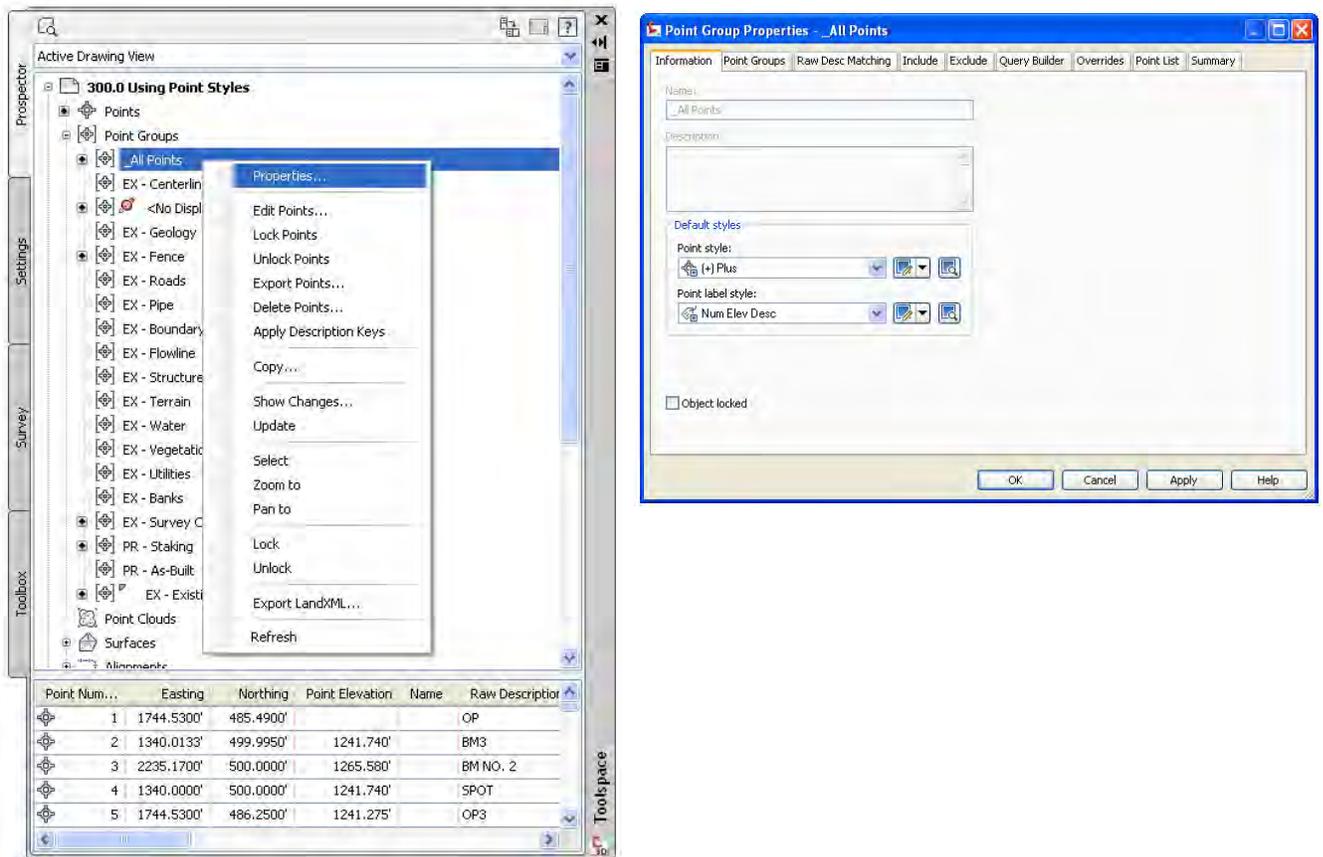


The visual display of the points in a point group is controlled through the use of point styles. There are two components to the point styles that control how points are displayed in the drawing. The first component is the point style which consists of the symbol that represents the insertion point for the point itself, such as the '+' symbol marker shown below. The second component is the point label style that displays information related to the point, such as the point number, elevation and description as shown in the figure below.



To change the styles associated with a point group, go to the *Prospector* tab on the *Toolspace*, right click on the point group whose style you want to change, and select *Properties...* Point styles associated with that point group can be changed in the *Default styles* section on the *Information* tab.



A summary of the default point and point label styles included in the Minnesota Civil 3D drawing template are included on the following page.

Point Styles

(+) Plus	
(o) Circle	
(x) Cross	
Bank	
Benchmark	
Borings	
Building	
Centerline	
Coniferous Tree	
Deciduous Tree	
Edge	
Fence	
Flowline	
Instrument Point	
Power Box	
Power Pole	
Property Line	
Right of Way	
Water Line	
Well	
Xbox	

Point Label Styles

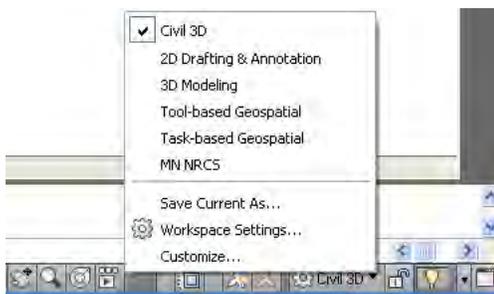
Boring Label (Uses Point Name field)	5
Desc	+ SPOT
Desc North East Elev	SPOT + 422.64 2279.59 1264.65
Elev	+ 1264.65
Elev Desc	+ 1264.65 SPOT
North East	+ 422.64 2279.59
North East Num Elev Desc	422.64 1114 2279.59 + 1264.65 SPOT
Num Elev	+ 1114 1264.65
Num Elev Desc	+ 1114 1264.65 SPOT

This guide covers the procedure for importing survey data from a text file containing survey point data. The point data in the text file is sorted into five columns, separated by commas, that contain the point number, the northing coordinate, the easting coordinate, elevation, and point description. This format is referred to as PNEZD comma delimited format. The point numbers in the first column of the text file must be in numeric format only, or an error will occur when you try to import the file into Civil 3D.

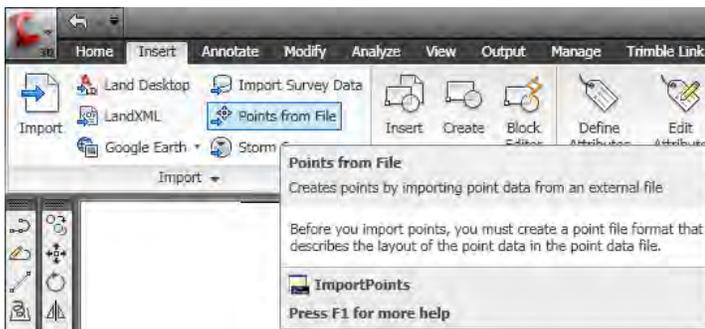
```
100,745.1372,933.2802,1275.5866,SPOT
101,695.2444,926.5438,1271.9057,SPOT
102,657.1006,932.2727,1267.7108,SPOT
103,631.4184,931.3466,1257.8583,SPOT
104,602.6458,929.6008,1253.2811,SPOT
105,566.2690,925.1058,1256.1897,SPOT
106,540.3683,923.0105,1261.0048,SPOT
107,513.2654,919.3450,1268.5872,SPOT
108,522.5083,934.3847,1264.7061,FNC
```

A. Import point data from the text file into a drawing

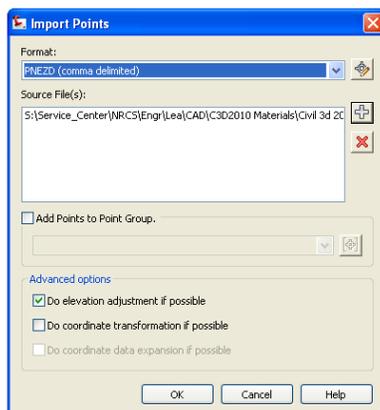
1. Make sure the Civil 3D workspace is loaded. To do this, check the workspace that is listed in the lower right hand corner of the window, as shown below. To switch a workspace, click on the down arrow next to the workspace name and select the workspace from the list.



2. Go to the *Import* panel on the *Insert* ribbon and select *Points from File*



3. The *Import Points* window will appear. Verify that the format is set to PNEZD (comma delimited)
4. Click on the plus sign to the right of the *Source File(s)* pane and select the text file that contains the survey data that you want to import. The window should look similar to the figure below.

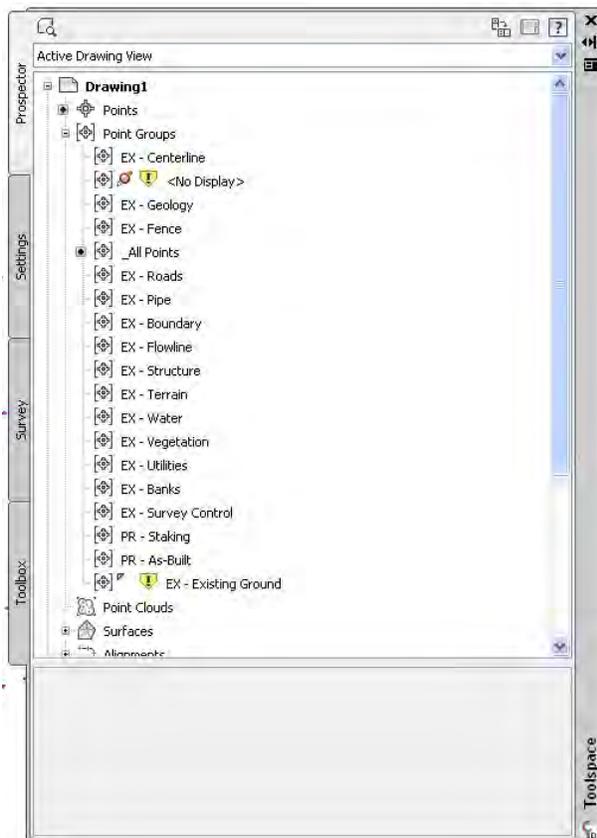


5. Click on the OK button to import the data into the drawing.
6. The point data will be imported into the drawing, although you may need to zoom out to see the point objects.

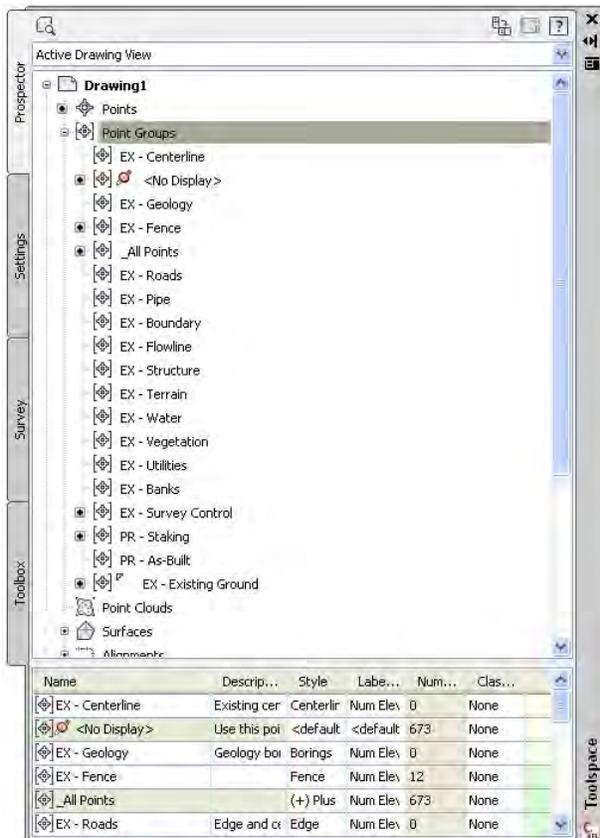
B. Check your point groups

1. After the point data is imported into the drawing, you may need to update the point groups to make sure the points are properly sorted. Go to the Prospector tab on the Toolspace and expand the listing of Point Groups.
2. If you see any yellow shield icons with an exclamation point inside of it beside any of the point groups in the list, your point groups are out of date and need to be updated. See the figure below and to the left. Right click on *Point Groups* and select *Update* from the menu. The point groups will be updated and the points sorted into the groups as shown in the figure below and to the right.

Before Updating Point Groups



After Updating Point Groups

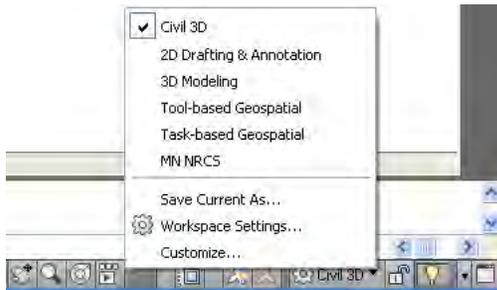


This guide covers the procedure for linking to survey data that is stored in an external text file. In this example, the text file contains survey data in PNEZD comma delimited format, as shown in the sample below. The data contained in this text file will be included in the definition for an Existing Ground surface.

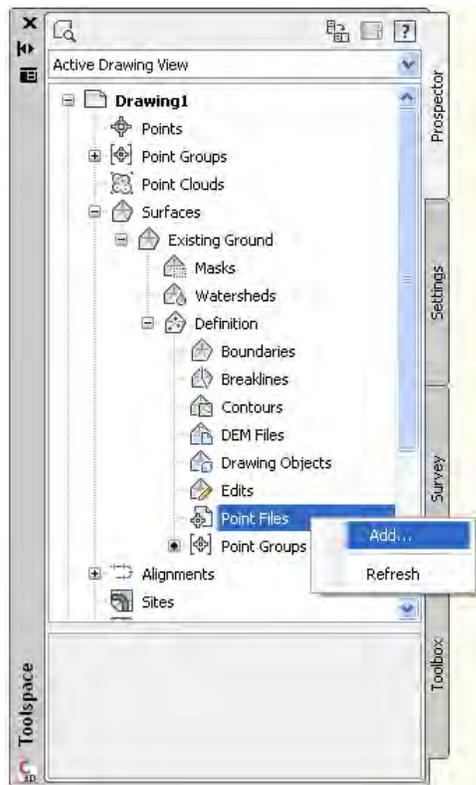
```
100,745.1372,933.2802,1275.5866,SPOT
101,695.2444,926.5438,1271.9057,SPOT
102,657.1006,932.2727,1267.7108,SPOT
103,631.4184,931.3466,1257.8583,SPOT
104,602.6458,929.6008,1253.2811,SPOT
105,566.2690,925.1058,1256.1897,SPOT
106,540.3683,923.0105,1261.0048,SPOT
107,513.2654,919.3450,1268.5872,SPOT
108,522.5083,934.3847,1264.7061,FNC
```

NOTE: Keep in mind that when you link point data into a drawing using this procedure, that the points will not be inserted into the drawing so you will not be able to use points to develop linework such as fences and breaklines.

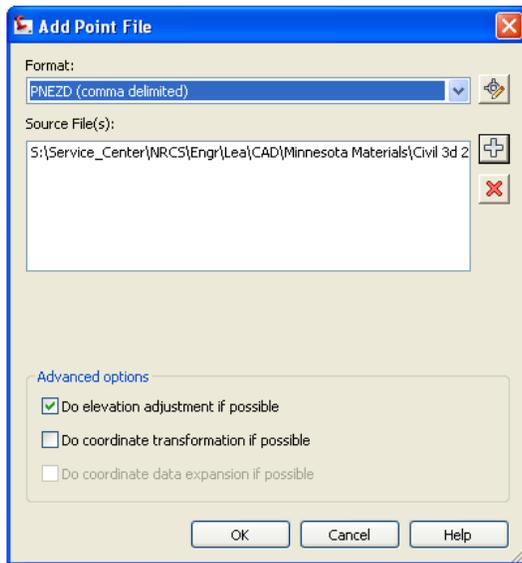
1. Make sure the Civil 3D workspace is loaded. To do this, check the workspace that is listed in the lower right hand corner of the window, as shown below. To switch a workspace, click on the down arrow next to the workspace name and select the workspace from the list.



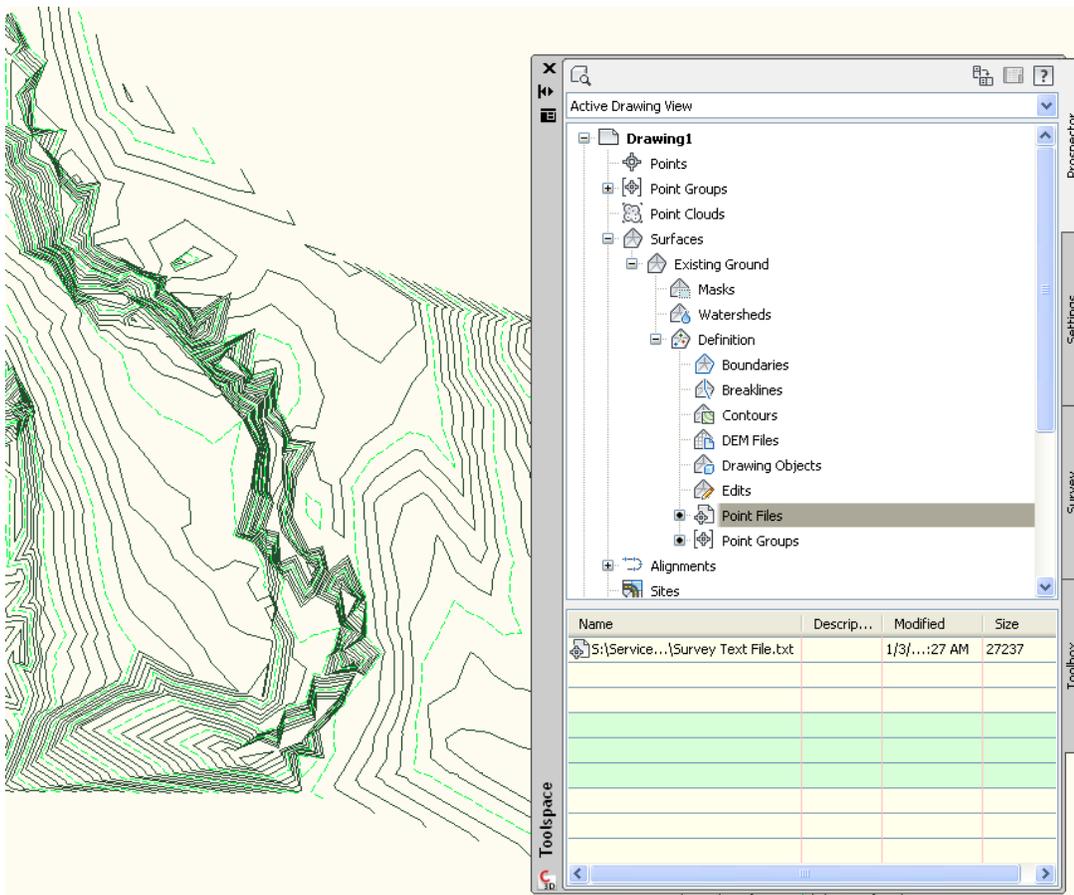
2. Go to the *Prospector* tab in *Toolspace* and expand the listing of surfaces in the drawing.
3. Expand the menu under the *Existing Ground* surface, and then expand the *Definition* menu for that surface.
4. Right click on the *Point Files* category under the surface definition and select *Add...* from the menu.



5. In the *Add Point File* window, select the PNEZD (comma delimited) format. Click on the  button and browse to the text file that contains the survey data.



6. Click on the *OK* button to establish the link to the point file.
7. The survey data contained in the text file will be included in the definition for the Existing Ground surface, and the surface can be displayed in the drawing.



The Minnesota Civil 3D drawing template contains a set of default point groups that have been set up to automatically organize points from survey data gathered using the Minnesota standard survey point codes. For more information on the Minnesota standard survey point codes, refer to Quick Reference Guide *100.0 Minnesota Standard Survey Point Codes*.

The following sections summarize the point groups provided in the Minnesota standard drawing template, and lists the raw descriptions matching codes that are used to control which point codes are included in the group.

_All Points

Description: All points in the drawing are included in this point group
 Point Style: (+) Plus
 Point Label Style: Num Elev Desc
 Point Codes Included: All

<No Display>

Description: This point group is used to turn off the display of all points in the drawing. Refer to Quick Reference Guide *312.0 Controlling the Display of Point Groups* for more information on controlling point display in a drawing.
 Point Style: <none>
 Point Label Style: <none>
 Point Codes Included: All

EX - Banks

Description: Top and bottom of bank lines and slopes
 Point Style: Bank
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 33*, EBL*, 34*, EBR*, 35*, BNKL*, 36*, BNKR*, 37*, WL*, 82*, TS*, 83*, BS*

EX - Boundary

Description: Estimated property lines and easement lines, right of way, and edges of fields and wetlands.
 Point Style: Edge
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 25*, PL*, 26*, EL*, 27*, ROW*, 28*, EFLD*, 29*, EWET*

EX - Centerline

Description: Centerlines of structures and features such as roads
 Point Style: Centerline
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 15*, CLDAM*, 30*, CLW*, 31*, CLDRAW*, 32*, CLDITCH*, 40*, CLR*, 42*, CLFR*, 44*, CLD*, 46*, RD*, 48*, CLRR*

EX – Existing Ground

Description: Point group used to develop the Existing Ground surface. Shots that may not have been taken on the ground surface, such as benchmarks, well casings, and shots taken on pipe or conduits, are automatically removed from the point group.
 Point Style: (+) Plus
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: All
 Exclude Raw Description Matching: 01*, TBM*, 02*, BM*, 03*, IP*, 04*, TP*, 05*, RP*, 06*, PPIN*, 07*, EPIN*, 17*, WELL*, 39*, H2O*, 51*, RCPTOP*, 53*, CMPTOP*, 54*, PVC*, 55*, HDPE*, 59*, TILEFL*, 78*, PED*
 Exclude Point Numbers Matching: 10000 - 11000

EX - Fence

Description: Fence lines, gates and fence corners
 Point Style: Fence
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 20*, FX*, 21*, FC*, 22*, FJ*, 23*, FE*, 24*, FG*

EX - Flowline

Description: Flowlines of pipes, conduits and tile lines
 Point Style: Flowline
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 50*, RCPINV*, 52*, CMPINV*, 56*, APRON*, 58*, OUTLET*, 59*, TILEFL*

EX - Geology

Description: Geology bore hole locations
 Point Style: Borings
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: *09, BORE*, TH*

EX - Pipe

Description: Pipes, conduit, tile lines and culverts
 Point Style: (x) Cross
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 50*, RCPINV*, 51*, RCPTOP*, 52*, CMPINV*, 53*, CMPTOP*, 54*, PVC*, 55*, HDPE*, 56*, APRON*, 57*, INTAKE*, 58*, OUTLET*, 59*, TILEFL*

EX - Roads

Description: Edge and centerline of roadways and railroads
 Point Style: Edge
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 41*, ER*, 43*, EFR*, 45*, ED*, 47*, FLDA*, 49*, ERR*

EX - Structure

Description: Buildings, concrete, bituminous pavement, dams, wells, walls, and other structures
 Point Style: Building
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 10*, BLD*, 11*, BLDC*, 12*, CON*, 13*, CONC*, 14*, BIT*, 15*, CLDAM*, 16*, EDAM*, 17*, WELL*, 18*, WALL*, 19*, STRUC*

EX – Survey Control

Description: Permanent and temporary benchmarks, instrument points, turning points, and property or easement pins or markers
 Point Style: Benchmark
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 01*, TBM*, 02*, BM*, 03*, IP*, 04*, TP*, 05*, RP*, 06*, PPIN*, 07*, EPIN*

EX – Terrain

Description: Watershed divides, slope breaks, top and bottom of slopes, and high or low spots
 Point Style: (+) Plus
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 80*, WD*, 81*, SB*, 82*, TS*, 83*, BS*, 84*, LS*, 85*, HS*

EX – Utilities

Description: Buried and above ground utilities
 Point Style: (o) Circle
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 70*, PP*, 71*, PLO*, 72*, PLB*, 73*, TEL*, 74*, GAS*, 75*, WATER*, 76*, FIBER*, 77*, UTIL*, 78*, PED*, 79* GW*

EX – Vegetation

Description: Cropping or vegetation changes, edge of woods, tree lines, trees, shrubs, brush and rock piles
 Point Style: (+) Plus
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 60*, CC*, 61*, VC*, 62*, EWOOD*, 63*, TREEL*, 64*, CTREE*, 65*, DTREE*, 66*, SHRUB*, 67*, BRUSH*, 68*, ROCK*

EX – Water

Description: Centerline of waterways, draws and ditches, water lines, water surfaces, and ground shots in water
 Point Style: (+) Plus
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 30*, CLW*, 31*, CLDRAW*, 32*, CLDITCH*, 33*, EBL*, 34*, EBR*, 35*, BNKL*, 36*, BNKR*, 37*, WL*, 38*, CSWET*, 39*, H2O*

PR–As-Built

Description: As-built survey points on constructed structures
 Point Style: (+) Plus
 Point Label Style: Num Elev Desc
 Include Point Numbers Matching: 10000-11999

PR–Staking

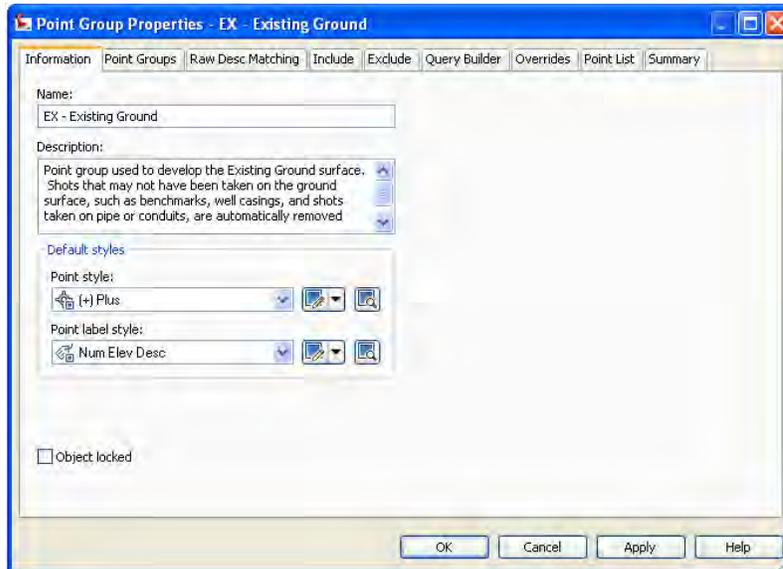
Description: Point group that can be used to export to a data collector for stakeout
 Point Style: (+) Plus
 Point Label Style: Num Elev Desc
 Include Raw Description Matching: 01*, TBM*, 02*, BM*, 03*, IP*, 04*, TP*, 05*, RP*, 06*, PPIN*, 07*, EPIN*
 Include Point Numbers Matching: 9000-9999

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Point groups are controlled through the *Point Group Properties* window. Right click on the point group name and select *Properties...* to open the Point Group Properties window for that point group. Below is a summary of the most commonly used tabs in the Point Groups Properties window and some of the settings that can be controlled in those tabs.

- Information

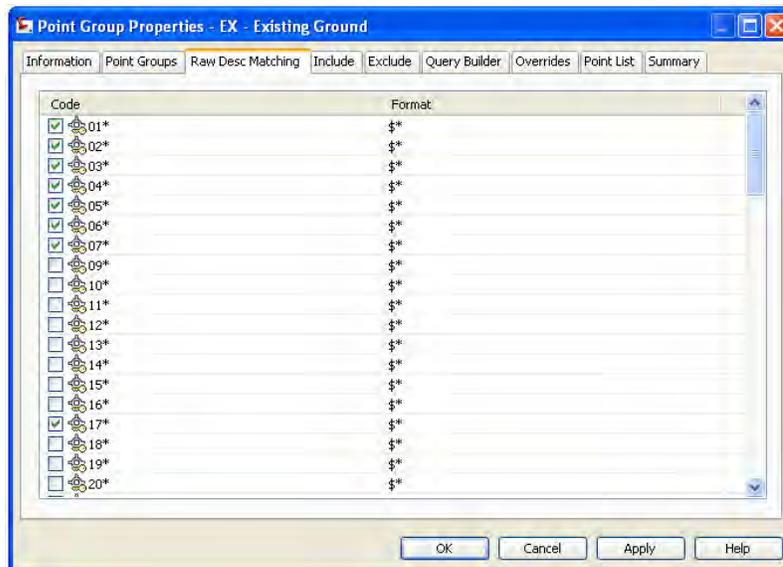
In this tab, you can provide a name and description for the point group and specify the point style and point label style that are used to control the display of the point in the drawing.



- Raw Desc Matching

In this tab, you can select from a list of survey codes to be included in the point group. These codes are established by the description keys that are provided with the Minnesota drawing template. These survey codes are described in more detail in Quick Reference Guide *100.0 Minnesota Standard Survey Point Codes*.

Description keys are used to control point labeling, styles, the layer the point is placed on, and a variety of other parameters. To see a listing of the description keys included with the Minnesota drawing template, go to the Settings tab in Toolspace and expand the lists for <drawing name> → Point → Description Key Sets

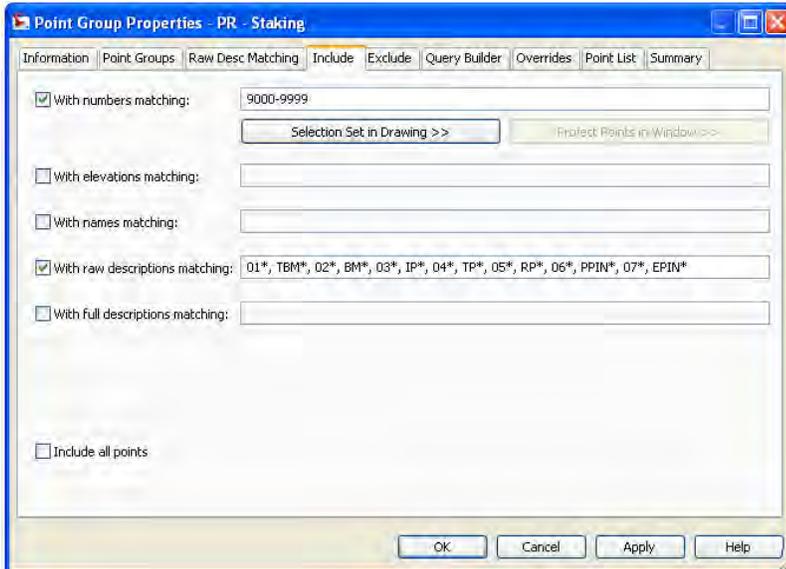


- Include

In this tab you control the points included in the point group based on characteristics such as point number, elevation, point name, raw description or full description.

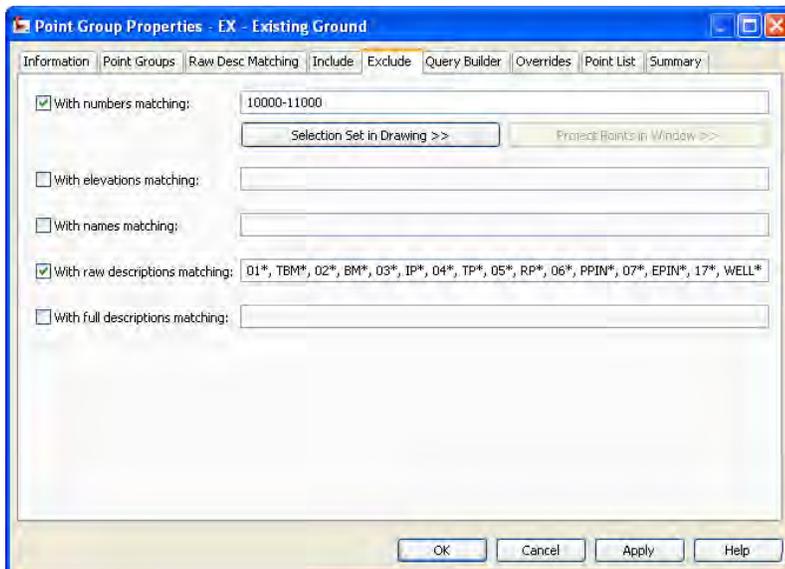
Individual point numbers are separated by commas, and point number ranges are specified by providing the beginning and ending point number separated by a dash.

Asterisks can be used as wildcard characters when specifying raw description and full description matching. For example, a raw description matching code of 01* will select any text that starts with the string 01. This would include '01 TBM' and '01TBM' but not 'TBM 01'.



- Exclude

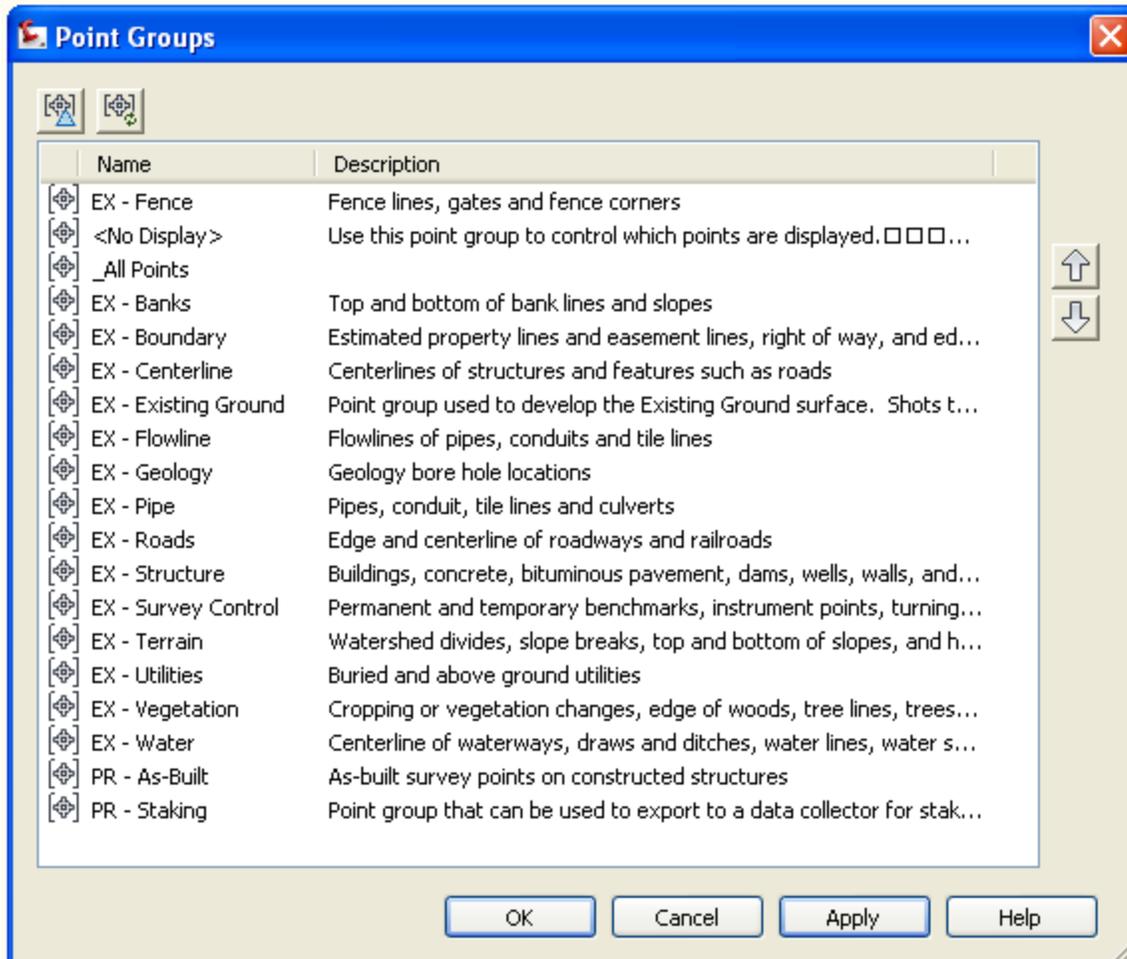
This tab is used to exclude specific points from the point group. This is useful when creating a point group that will be used to create a surface in order to exclude points that do not lie on the ground surface such as pipe flowlines, the top of slabs or well casings, or points with a zero elevation. An example of this is shown below, which is a point group used to develop an existing ground surface. The same rules for specifying point numbers and using wildcards apply on the *Exclude* tab as on the *Include* tab.



The display of points can be manually controlled by turning off the display of points styles and point label styles in individual point groups, but there is another method to more quickly control point display.

Right click on the Point Groups heading in the Prospector tab and select *Properties...* to open the Point Groups window. Civil 3D controls the display of points based on the order they are listed in this window, starting at the bottom of the list and working upward. In other words, the display properties of a group at the bottom of the list will be overridden by the display properties of the groups above it.

To further explain how the display order in the Points Groups window works, refer to the image below. The *<No Display>* group is set up by default to turn off the display of points. Since the *<No Display>* group is near the top of the points group list, its display properties (no display) will overwrite, or suppress, the display of all of the other point groups in the listing below it. Only one point group, the *EX - Fence* group, is listed above the *<No Display>* group, so the points in the *EX - Fence* group will be the only ones to be displayed in the drawing.



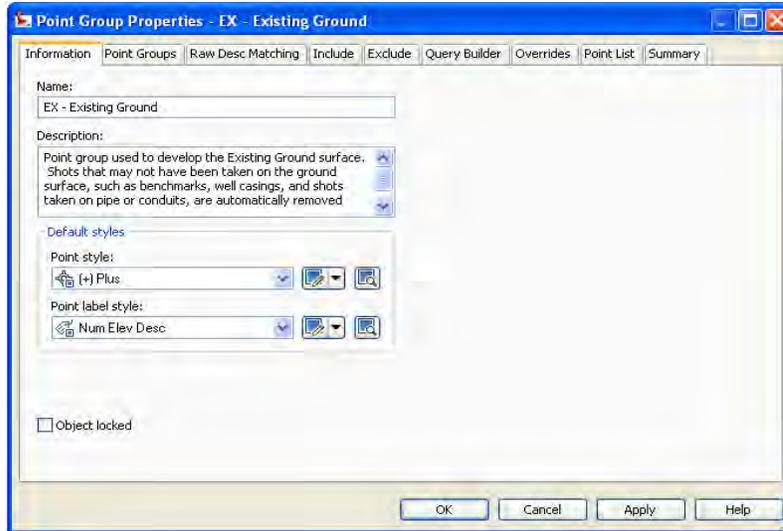
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To create a new point group, right click on the *Point Groups* header on the *Prospector* tab in *Toolspace* and select *New...* This will open the *Point Group Properties* window where you will establish the settings that control the point group. Below is a summary of the commonly used tabs in the *Point Groups Properties* window and some of the settings that can be controlled in those tabs.

An existing point group can also be copied by right clicking on a point group and selecting *Copy...* from the shortcut menu. The new point group that is created can then be modified by right clicking on it and selecting *Properties...* to open the *Point Group Properties* window.

- Information

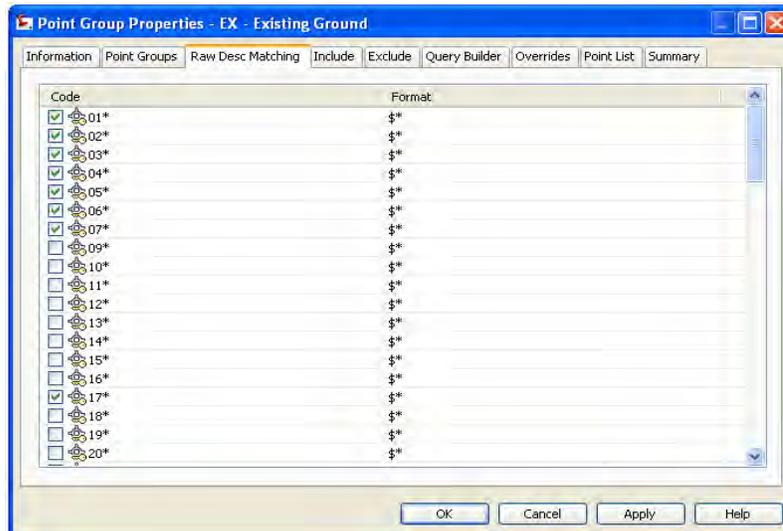
In this tab, you can provide a name and description for the point group and specify the point style and point label style that are used to control the display of the point in the drawing.



- Raw Desc Matching

In this tab, you can select from a list of survey codes to be included in the point group. These codes are established by the description keys that are provided with the Minnesota drawing template. These survey codes are described in more detail in Quick Reference Guide *100.0 Minnesota Standard Survey Point Codes*.

Description keys are used to control point labeling, styles, the layer the point is placed on, and a variety of other parameters. To see a listing of the description keys included with the Minnesota drawing template, go to the Settings tab in *Toolspace* and expand the lists for <drawing name> → Point → Description Key Sets

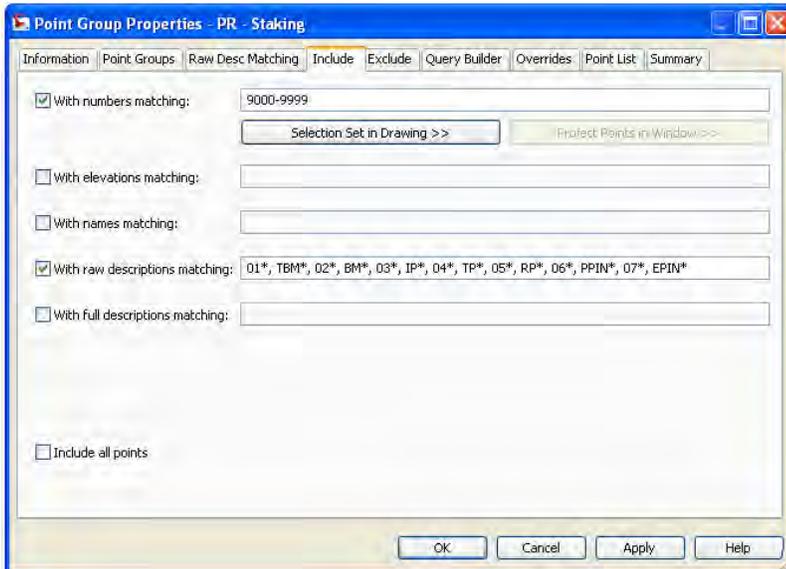


- Include

In this tab you control the points included in the point group based on characteristics such as point number, elevation, point name, raw description or full description.

Individual point numbers are separated by commas, and point number ranges are specified by providing the beginning and ending point number separated by a dash.

Asterisks can be used as wildcard characters when specifying raw description and full description matching. For example, a raw description matching code of 01* will select any text that starts with the string 01. This would include '01 TBM' and '01TBM' but not 'TBM 01'.



- Exclude

This tab is used to exclude specific points from the point group. This is useful when creating a point group that will be used to create a surface in order to exclude points that do not lie on the ground surface such as pipe flowlines, the top of slabs or well casings, or points with a zero elevation. An example of this is shown below, which is a point group used to develop an existing ground surface. The same rules for specifying point numbers and using wildcards apply on the *Exclude* tab as on the *Include* tab.

