TR21360

Managing Cross-Section Labels in AutoCAD Civil 3D with Live Corridors

Eric Arneson

Wisconsin Department of Transportation

Learning Objectives

- Learn the difference between automatic and manual labels
- Learn the interaction between assemblies, corridors, and code set styles
- Learn multiple methods for managing automatic labels in section-view groups
- Learn how to create and edit manual section view labels

Description

You've built some corridors in AutoCAD Civil 3D software. You've even created some surfaces from them. But when you get to the cross sections, you just can't get the labels right without some MTEXT or EXPLODES! This class will teach you all the tricks for creating and maintaining intelligent, dynamic cross-section labels. We'll examine all of the connections between corridor code set styles, marker label styles, assemblies, and section view groups. You'll learn how to keep cross-section labels readable and live from an entire corridor all the way down to a single custom label. This session features AutoCAD Civil 3D.

Your AU Expert(s)

Eric Arneson is part of a Wisconsin Department of Transportation (WisDOT) team that provides support, technical expertise, and future direction for highway engineering tools. Their scope of workflow ranges from receiving data from mapping/surveying through the entire design effort to construction. The team is currently implementing standards and workflows for creating 3D model surfaces as a primary deliverable in design and using those surfaces in highway construction projects. The team is also evaluating and implementing further expansion of intelligent modeling topics in highway design. Arneson has 20 years of experience with WisDOT in highway design, construction, geographic information system, and supporting engineering software.

The difference between automatic and manual labels

For both automatic and manual labels, there are a number of Civil 3D styles required to make them function to their fullest potential. Styles referred to here can be found in the wisdot16.dwt file contained here additional_21360_TR21360-Arneson-AU2016.zip

Current WisDOT Civil 3D resource files can be found here: WisDOT Civil 3D files

Grade and Elevation/Offset labels either can be automatic or manual. Automatic labels are managed by the Code Set Style and keep synchronized with changes to the corridor and section views. Manual labels keep synchronized with the section view, but not the corridor.

Automatic labels

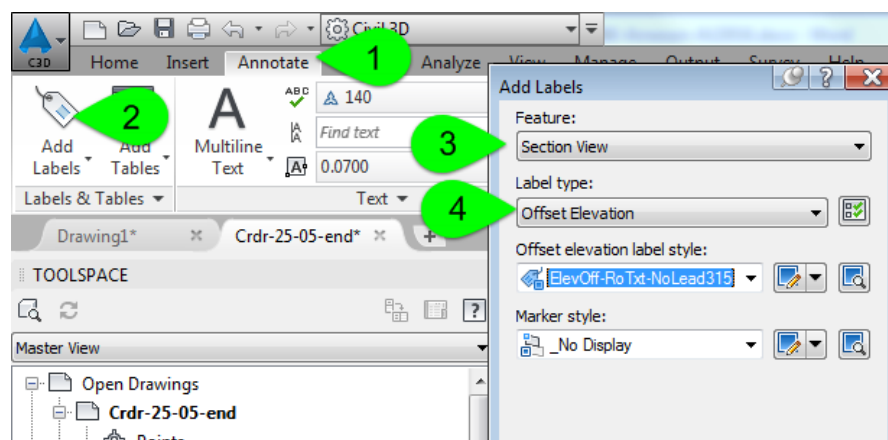Automatic labels use the following styles that pertain to cross sections:

1) Code set style

   a) Marker style/marker label style

   b) Link style/link label style

   c) Shape style/shape label style

Code set styles can be applied to many different objects. These objects include:

1) Subassemblies

2) Assemblies

3) Corridors

4) Section views (including the corridor section editor)

5) Section view groups

Manual labels

Manual section view labels can be accessed from the Annotate tab. They can only be applied to an individual section view.

MANUAL SECTION VIEW LABELS

The interaction between assemblies, corridors, and code set styles

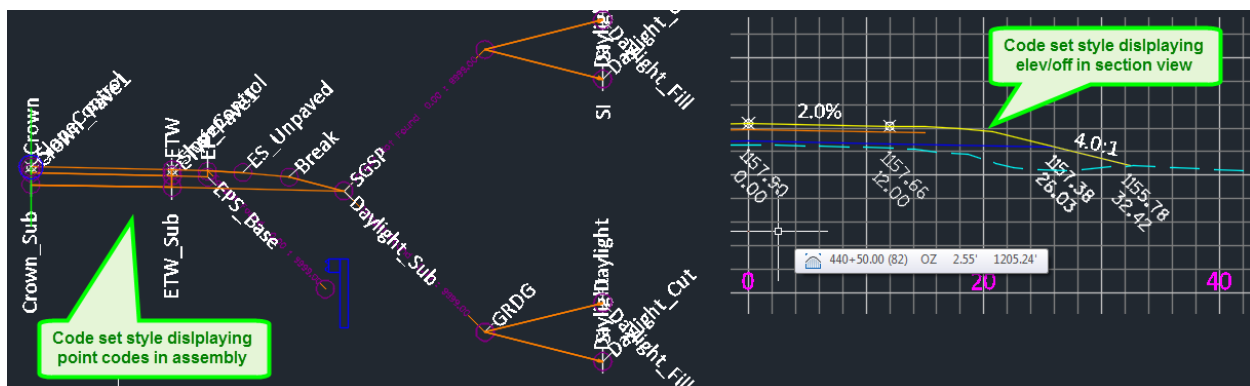## Subassembly point codes > Assemblies > Corridor code set styles

1) Subassemblies contain point codes. Some point codes in subassemblies are hard-coded and some can be edited by end users.

2) Assemblies aggregate subassemblies and are what are inserted into corridors.

3) Assemblies are inserted into corrdors by baseline (alignment) and region (station range)

4) Corridors have code set styles applied to them. However, code set styles on corridors really only control display of plan and model view.

> **Warning:** Remember that styles are independent to the DWG. Changes to code set styles and all the styles they contain will need to be imported to other DWGs and added to DWTs for future use.

Point codes/link codes display in design, elevation/offset and slopes in cross-sections

This means that point codes in subassemblies control automatic cross-section labels. This is good to understand for cross section generation, but it also means that during design you need to understand and manage point codes.

> **Tip: You will likely want at least 2 code set styles.** One that shows point codes (and possibly link codes) to use in design with assemblies and corridor section editor. The second one will display elevation/offset and slopes with cross-sections.
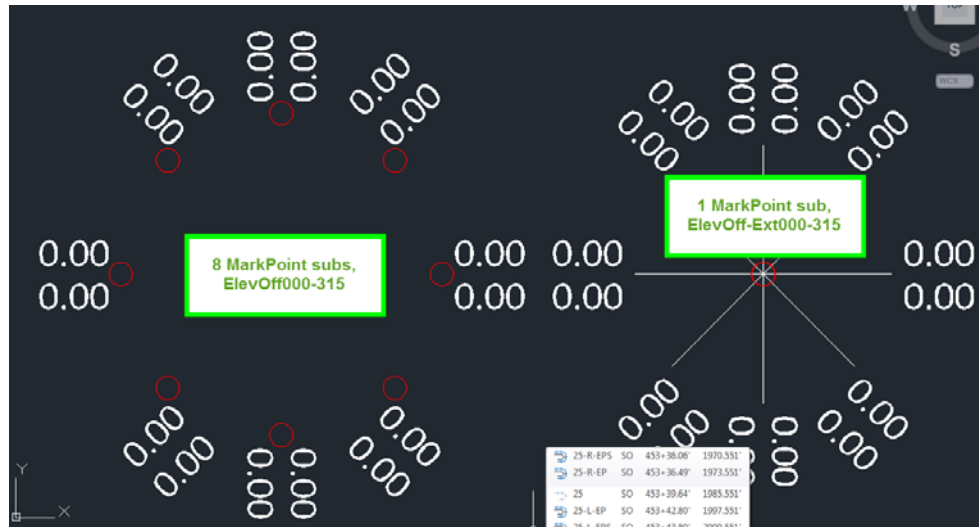

CODE SET STYLES FOR DESIGN AND CROSS-SECTIONS

Multiple label styles can be applied to different point codes

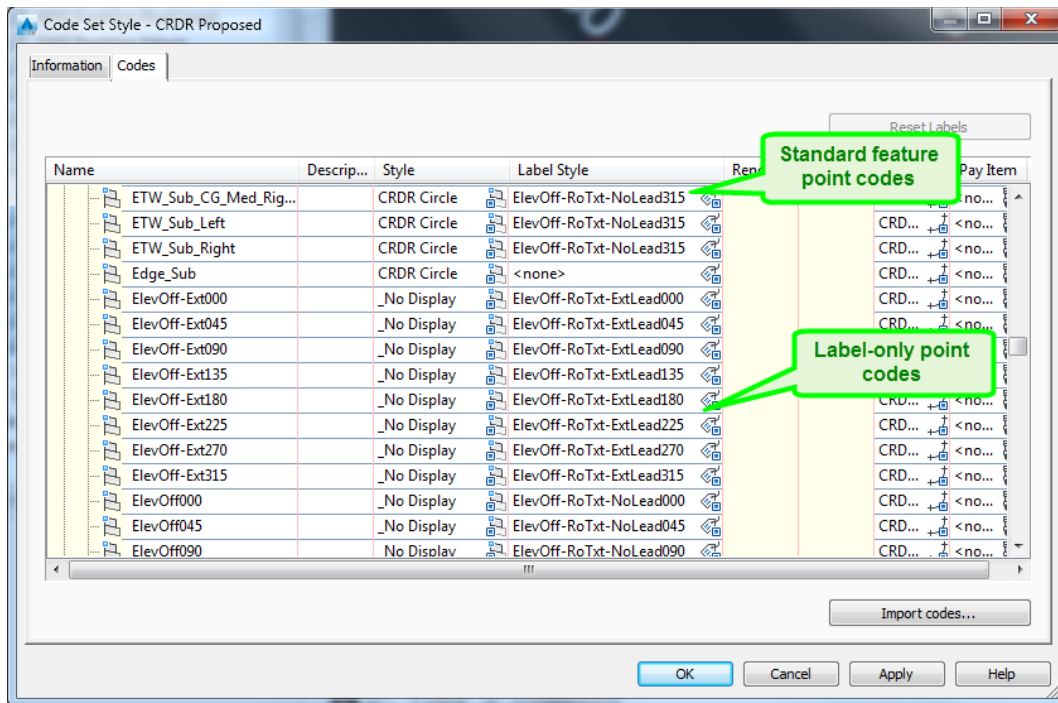It is very unlikely that one labeling code set style with one point label style will fulfill your labeling needs.

• Having a variety of label styles gives flexibility to assigning different label styles to different point codes.

FULL LIBRARY OF MARKER LABEL STYLES

Point code	Regular label style	Extended label style
ElevOff000	ElevOff-RoTxt-NoLead000	ElevOff-RoTxt-ExtLead000
ElevOff045	ElevOff-RoTxt-NoLead045	ElevOff-RoTxt-ExtLead045
ElevOff090	ElevOff-RoTxt-NoLead090	ElevOff-RoTxt-ExtLead090
ElevOff135	ElevOff-RoTxt-NoLead135	ElevOff-RoTxt-ExtLead135
ElevOff180	ElevOff-RoTxt-NoLead180	ElevOff-RoTxt-ExtLead180
ElevOff215	ElevOff-RoTxt-NoLead225	ElevOff-RoTxt-ExtLead225
ElevOff270	ElevOff-RoTxt-NoLead270	ElevOff-RoTxt-ExtLead270
ElevOff315	ElevOff-RoTxt-NoLead315	ElevOff-RoTxt-ExtLead315

- Code set styles can then also be edited so that different point codes can have different labels for a variety of needs.

- Points and links can also have multiple codes assigned to them at the same time. So in addition to multiple labels, it is recommended to have associated point codes that are specifically used for adding labels when needed. This can be accomplished through adding point codes to existing subs or inserting MarkPoint subs.

FULL LIBRARY OF MARKER LABEL STYLES

Multiple methods for managing automatic labels in section-view groups
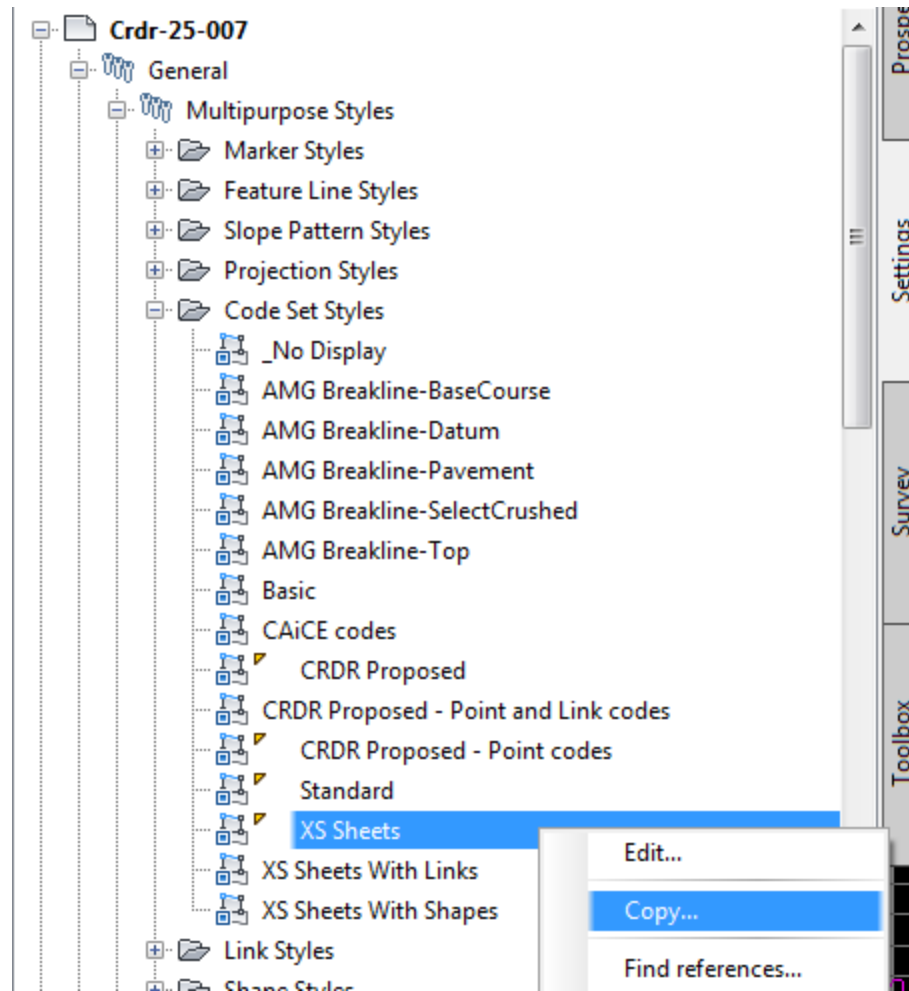
Create modified code set style to apply to section view or section view group
This is a good method for:

1) Creating a completely different look for different scenarios (urban vs rural, staged vs ultimate)

2) Creating an option to switch from standard point code labeling to only label type point codes.

It is good practice to make a copy of a standard code set style before editing it. That way, the original code set style is always available if mistakes are made.

Toolspace > Settings tab > General > Multipurpose Styles > Code Set Styles > right-click selected style > Copy

COPY CODE SET STYLE

Custom code set styles should be named either for the section view group they are being applied to or some unique feature that they have. Some examples would be XS Sheets - Mainline stage 2, XS Sheets - ElevOff left only.
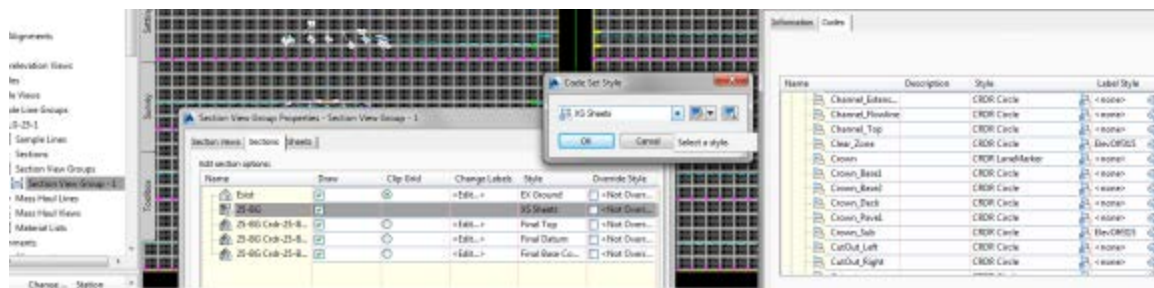
Add, remove, change marker label styles on section view group
This method is good for:

1. Making changes to specific point codes across an entire section view group or selected section views.

Open a code set style for editing. That can either be done from:

1) **Toolspace > Settings tab > General > Multipurpose Styles > Code Set Styles**

2) Section View Group properties

    a) **Right-click on the Section View Group for the cross-sections > Properties > Sections tab > Style for the referenced corridor > Select the code set style > Edit Style**

EDIT CODE SET STYLE

Grade labels are associated with links. Elevation Offset labels are associated with point codes. Label styles can be changed for any point or link codes used in the section view group.

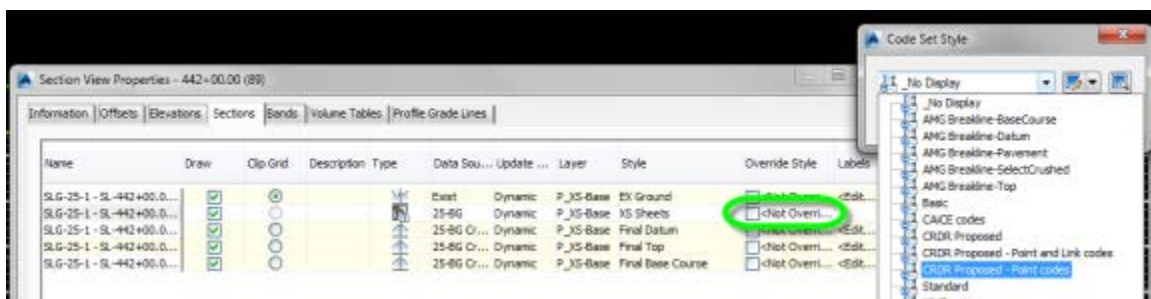**Tip:** View a section with point and/or link codes visible while working on code set style edits.

There are 2 methods to accomplish this in a typical cross sections file.

Method 1:

1) Select a section view by clicking on the station value of the section

2) Right-click and select "Section View Properties…" in the Sections tab,

Method 2:

1) Override the style of the corridor section.

SECTION VIEW CODE SET STYLE OVERRIDE
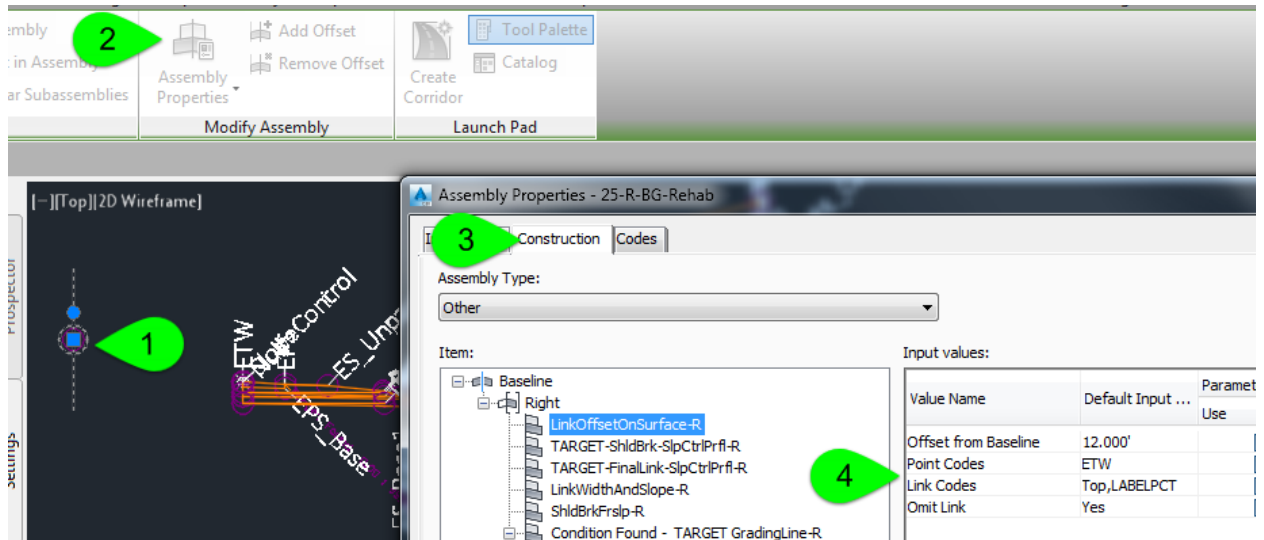
Custom point codes and marker label styles

This method is good for:

1) Changing the layout of an elevation/offset label for a point code or codes within an entire assembly.

2) Making a modification to a code set style that you want to apply to multiple cross sections.

Changing point codes

This needs to be done in the file that contains the assemblies in modelspace.

Select Assembly > Contextual ribbon > Modify Assembly panel > Assembly Properties button > Construction panel > Select subassembly > Modify point and link codes
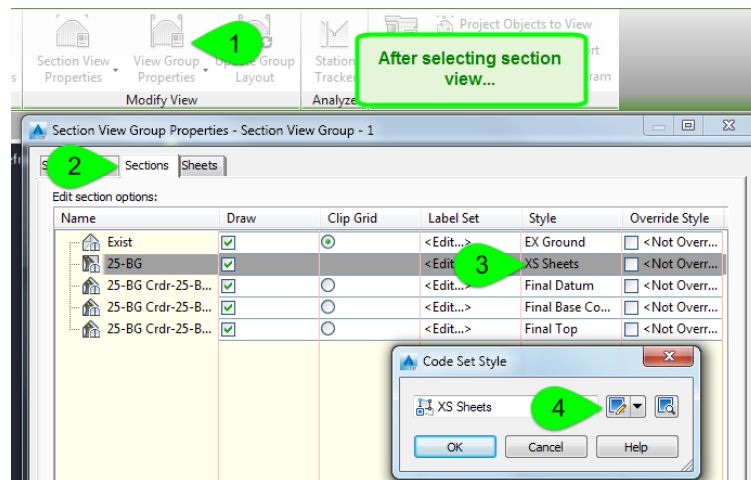
CHANGE POINT CODES IN ASSEMBLY

Changing marker label styles

This needs to be done in the file containing cross-sections.

**Select Section view > Contextual ribbon > Modify View panel > View Group
Properties button > Sections panel > Select style > Edit style button**

CHANGE CODE SET STYLE IN SECTION VIEW GROUP

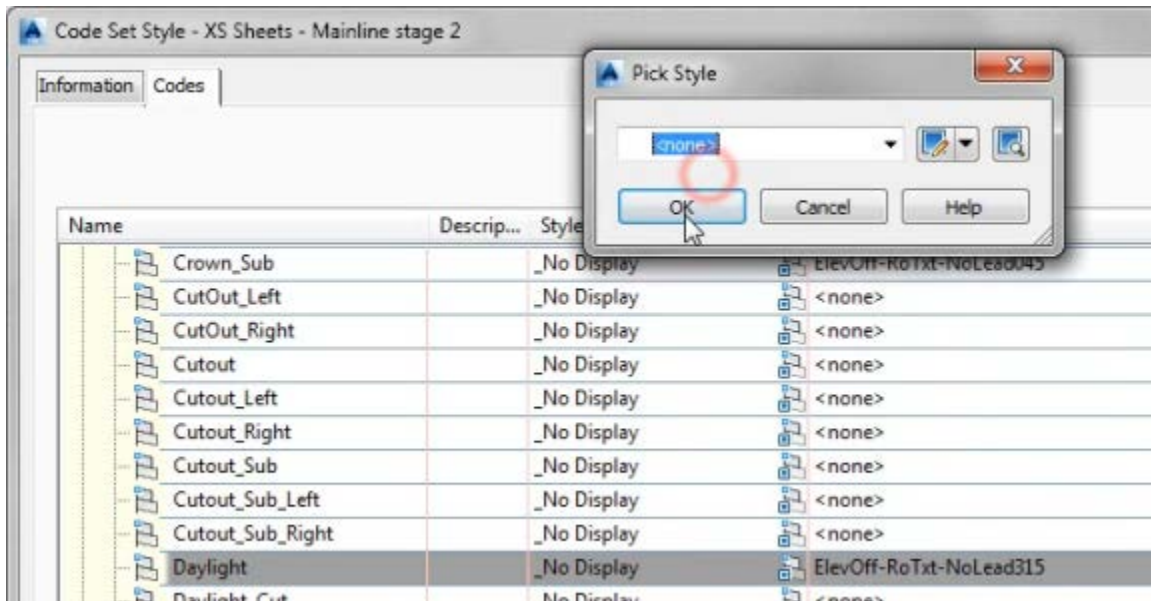Add a MarkPoint sub to an assembly with an elevation/offset point code

This method is good for:

1) Placing elevation/offset labels at points in assemblies that do not have point codes assigned
   to them.

2) Providing a method to label the same point on the left and right sides differently.

MarkPoint is a subassembly that places a point code in an assembly at whatever location can
be snapped to. It is located on the Generic subassembly tool palette. In conjunction with the
custom point marker label styles, MarkPoint will allow placing an elevation/offset label anywhere
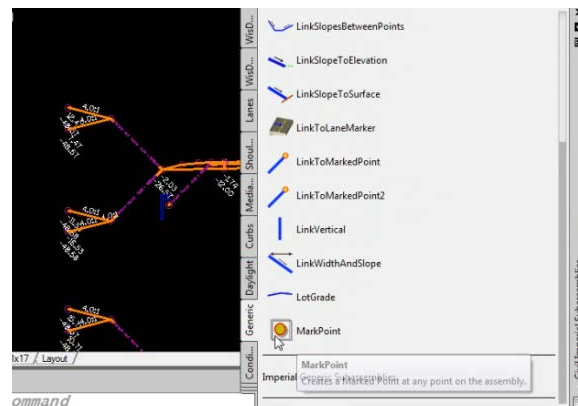on a section without building unwanted corridor feature lines.

1) Toolspace > Prospector > Right-click the code set style to edit > Codes tab > Click Style > Edit style button
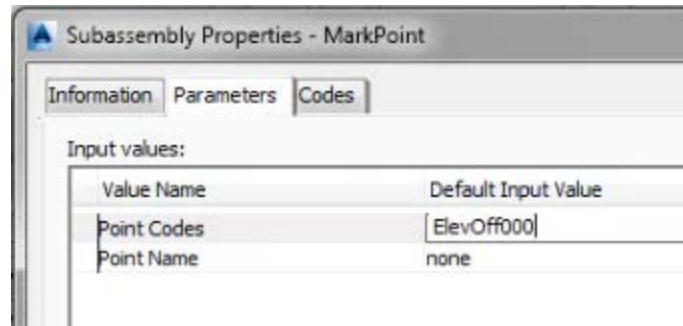

EDIT POINT CODE LABEL STYLE

The MarkPoint subassembly is found in **Tool Palettes > Civil Imperial Subassemblies > Generic > MarkPoint**

Click the subassembly to select it and click the location on the assembly in the file where the label is to be placed.

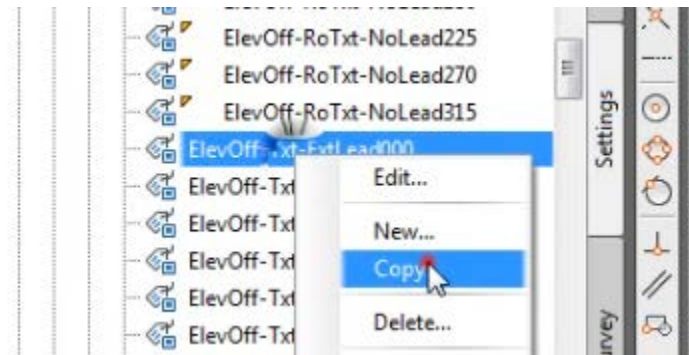

INSERT MARKPOINT SUBASSEMBLY

Select the subassembly and change the Point Code of the MarkPoint subassembly to the style of label desired.

CHANGE MARKPOINT POINT CODE

Create and use custom marker label style in code set style

Similar to creating custom code set style, custom marker label styles can be created by copying standard marker label styles and modifying them. These styles can then be applied to point and link codes in a custom code set style.

1) **Toolspace > Settings tab > Multipurpose styles > Label styles > Marker**

2) Click a style that is very similar to what you want,

3) **Right-click > Copy** to make a custom label style.
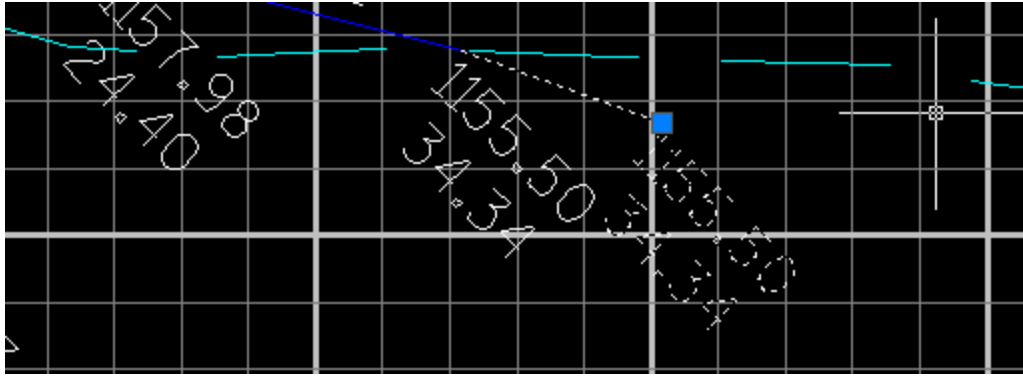

COPY EXISTING MARKER LABEL STYLE

Modifying individual automatic labels in a section view

This method is good:

1) If only a few labels need to be modified in a section view group. If more than 10-20 labels need to be modified in the same way, methods that can modify multiple labels at once should be considered.

   Dragging a label

   A single automatic label can be selected in a section view with a Ctrl+Click. Once selected, a blue grip will appear that can be dragged to a more visible location.
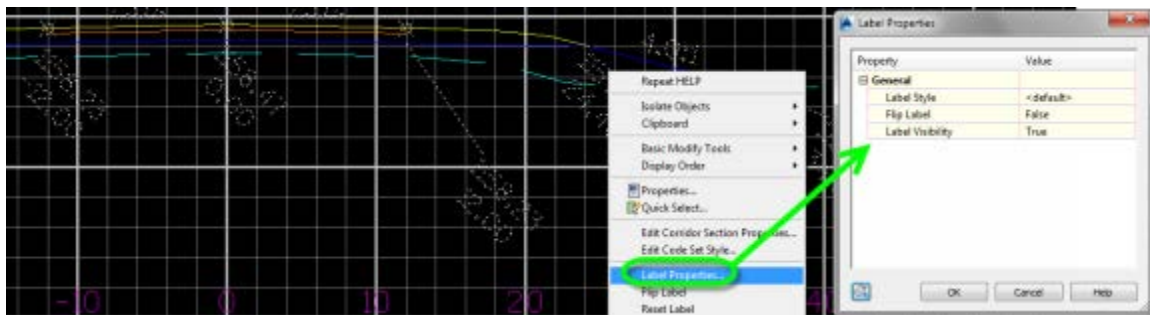
DRAGGING A SINGLE SECTION LABEL

Tip: Be careful of objects snaps (osnaps) when dragging labels. To avoid snapping to grid lines or surface links, either turn osnaps off (F3 toggle on/off) or temporarily override osnaps with Shift+Right Click.

Change a label style or visibility
Selecting an automatic label to change its style or visibility is different than dragging it.

1) Click on the entire label set to select it.

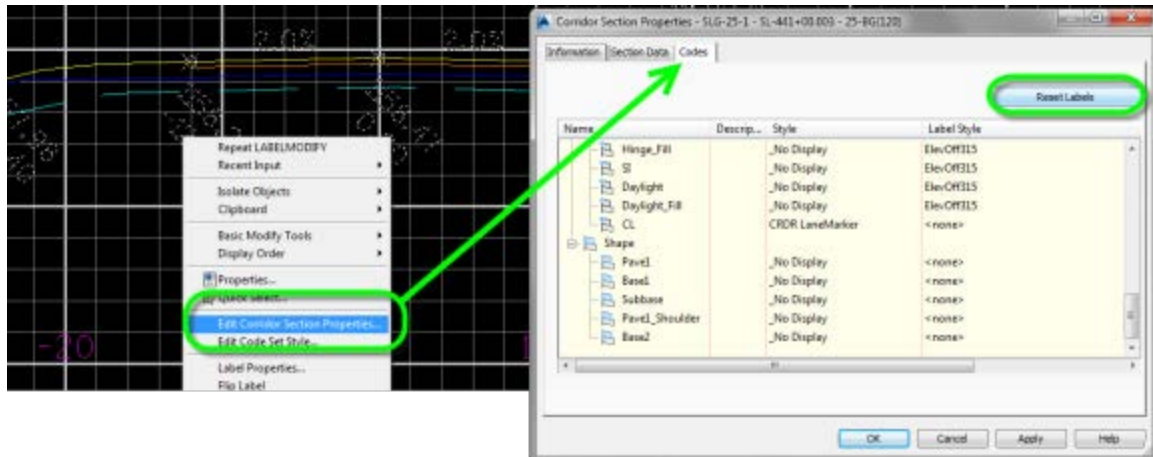2) Right-click over the label to be changed.

CHANGING THE PROPERTIES OF A LABEL

3) From the Label Properties dialog box, the style, flip, and visibility of the label can be changed.

Warning: Once a label is made invisible, it cannot be selected for editing. To retrieve the label:

4) Click the section view labels to select them

5) **Right-click > Edit Corridor Section Properties… > Codes tab > Reset Labels button.**

6) **OK > OK**
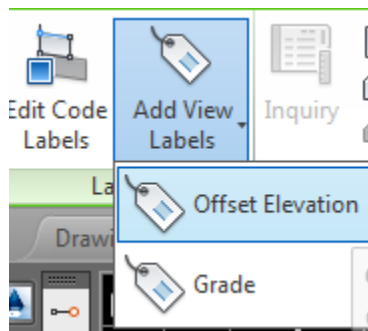
This will reset all of the labels for the section view.

RESET LABELS ON A SECTION VIEW

How to create and edit manual section view labels

This method is good if only a few labels need to be modified in a section view group and the corridor is no longer changing. If more than 10-20 labels need to be created in the same way, using the MarkPoint sub in the corridor assemblies should be considered.
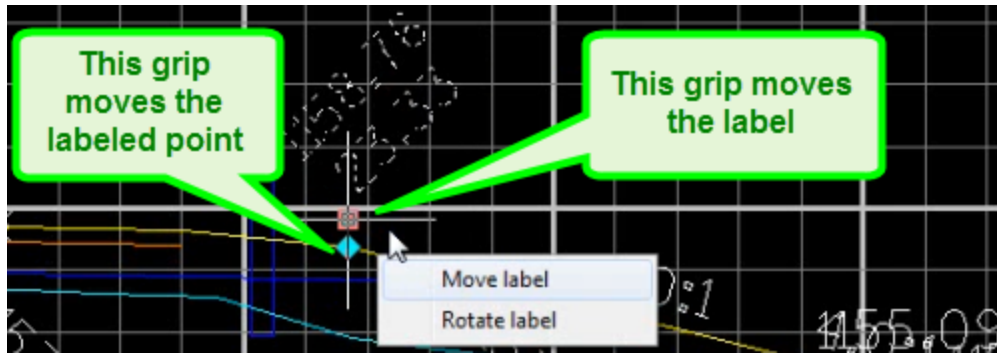
Creating and editing manual section view labels

Click on the section view labels to select them. Labels can then be added from the contextual ribbon.

ADD MANUAL OFFSET/ELEVATION SECTION VIEW LABEL

Manual labels can be dragged and changed with standard grips similar to automatic labels. In addition, manual labels can be moved. The diamond grip moves the point being labeled. The square grip drags and rotates the label.

MOVING SECTION VIEW POINT AND LABEL

Warning: Manual labels that are moved do not stay dynamic to the corridor.