Settings and Styles

Overview

This lesson describes various settings and styles that are used in AutoCAD Civil 3D. A strong understanding of these basics leads to more efficient use of the software and more consistency in the creation of design and production drawings.

Objectives

After completing this lesson, you will be able to:

- Describe the types of Civil 3D objects and their interactions.
- Create styles that control the display of Civil 3D objects.
- Create styles to annotate Civil 3D objects.
- Make modifications to object and label styles.
- Copy styles from one drawing to another drawing.
- Change drawing level, parent level, and child level styles and settings.
- Use drawing settings and viewport scaling to control text size.
- Use command settings to set default styles and object naming templates.
- Create a drawing template (DWT) file with customized styles and settings.

Exercises

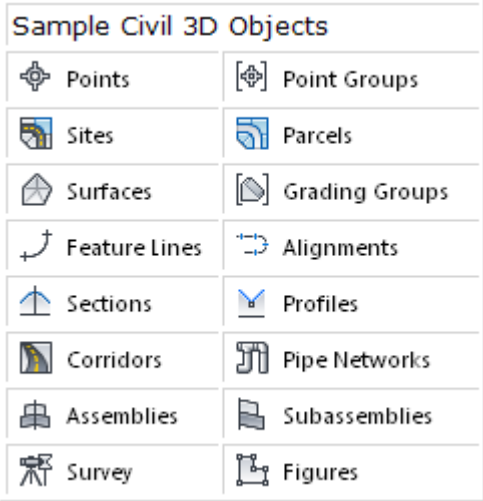
The following exercises are provided in a step-by-step format in this lesson:

1. Examine Existing Object Display Styles
2. Create Object Display Styles
3. Create Object Annotation (Label) Styles
4. Modify Object and Label Styles
5. Use Styles Hierarchy to Modify Styles and Settings
6. Modify Drawing Settings, Viewport Scaling, and Text Size

7. Use Command Settings to Set Default Styles, Naming Templates, and Parameters
8. Create a Custom Drawing Template (DWT) File

About Objects

Civil 3D is an object-oriented design environment that makes use of objects to display design components such as points, surfaces, alignments, profiles, pipe networks, and corridor models.



Objects are used to represent the survey, design, and construction elements you need to complete your site design or transportation design project. Objects have inherent properties that are used to control how the object is displayed and labeled, and how it functions.

Objects have relationships that enable them to react to each other. These dynamic relationships are referred to as object reactivity. A few of these object relationships are highlighted in the following table.

Objects	Functional relationship
Points and Surfaces	Changing the elevation of point objects results in automatic updates to surface objects that reference the point objects.
Alignments and Surface Profiles	Changing the position or geometry of an alignment results in an automatic update to the surface profile objects.
Surfaces and Surface Profiles	Changing a surface results in an automatic update to surface profile objects that reference that surface.
Assemblies and Corridors	Changing the geometry of the assembly object (typical section) results in an automatic update to the corridor (road model) object.
Parcels and Parcel Segments	Bisecting an existing parcel object with another parcel segment or alignment object subdivides the original parcel object into two parcel objects.
Grading Object and Surfaces	Moving a grading object or changing a target surface results in automatic updates to the daylight line.

You can automatically assign a name to objects when they are created. You can use object naming templates to facilitate the assignment of meaningful names to objects. You can override the name assigned with the object naming template. Object naming templates are defined and saved in a drawing template file.

For some objects, you can assign default input parameters. For example, you can specify default elevations and descriptions for points, maximum triangle length for a surface, or an assembly insertion frequency for corridor models.

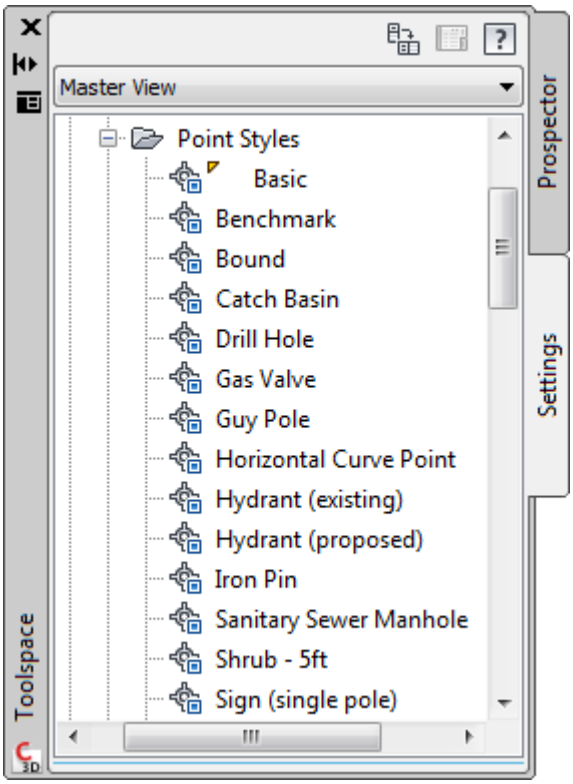
Objects are used to address all aspects of the planning, survey, and detailed design phases of site development and transportation projects.

About Settings and Styles

AutoCAD Civil 3D is an object-oriented design environment with defined interactions between civil design objects. When you modify object and label styles associated with an object, the display of the object automatically updates.

Whether you work for yourself, a small company, a large engineering firm, or a government agency, drawing settings and styles are among the most important elements for creating design files. Proper settings and styles can greatly aid in the efficiency and sharing of data. Significant time can be wasted creating layers in files and inserting common blocks, when the same tasks can be handled automatically with template drawing files.

You create and modify object and label styles in the Settings tab of Toolspace. Object styles are assigned to objects and control the display of objects. Every object in Civil 3D is displayed with an object style.



Label styles define the behavior, appearance, and content of labels. Label styles control the settings for the annotation and labeling of these objects.

Object and label styles can assign the display properties (color, linetype, and lineweight) from directly within the style. This is referred to as By Style. Object and label styles can also assign the display properties (color, linetype, and lineweight) from a layer. This is referred to as By Layer.

All Civil 3D label styles have a dragged state display property. This property controls the display of the label when it is dragged away from the object it is labeling.

All Civil 3D labels scale with the drawing setup scale. This means that you do not need to create multiple sets of text to suit different scale requirements.

All Civil 3D labels can be oriented to the object, view, or the world coordinate system.

Types of Label Styles

In the Toolspace Settings tree, the Label Styles collections contain one or more types of label styles that represent unique aspects of specific objects. You can create label styles for all objects, including points, surfaces, parcels, and alignments.

Points: You can create label styles for point objects to indicate information such as number, elevation, and description.

Surfaces: You can define label styles for surface objects such as slopes, spot elevations, watersheds, and contours.

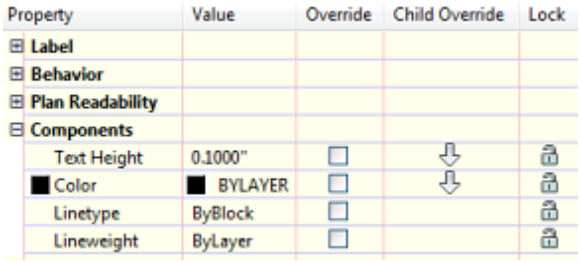
Parcels: You can create label styles for parcel objects such as areas, lines, and curves.

Alignments: You can create label styles for alignment objects such as stations, station offsets, lines, curves, spirals, and tangent intersections.

The following illustration shows a point style of an X with a point label style of point number, elevation, and description, all using different colors.

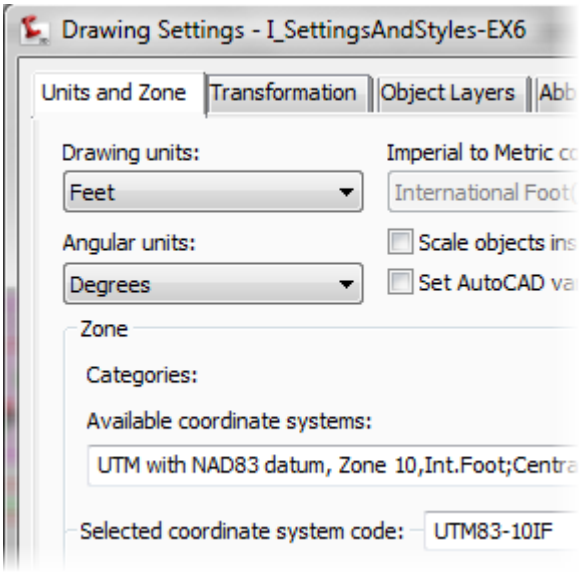
Style Hierarchy

Civil 3D is designed to handle individual objects, and at a higher level, collections of objects. Settings or styles that are set for a collection of objects are referred to as *parent*, or higher level settings. Individual objects, or *child*, settings can be altered to override a parent setting. The drawing level is the highest level, and settings altered at this level set the values for settings in the entire drawing.



Drawing Settings

Drawing Settings are important to check for a variety of reasons. You can set the units, the coordinate system, the model space scale, and a number of other parameters. These settings can be saved in a template file for future use.



Changing the drawing units from feet to meters or vice versa in the Drawing Settings dialog box does not result in a rescale of the drawing from feet to meters. In civil engineering design, you typically keep in mind whether an AutoCAD drawing unit refers to one foot or one meter. The value in this dialog box changes the AutoCAD units variable, which affects the length values generated for object label styles and also controls the optional scaling of objects inserted from other drawings with different units. It is a good idea to try and work at a model space scale that is similar to your final output scale.

The settings in the Zone section of this dialog box affect which datum, projection, and coordinate system are being used in the drawing. If the coordinates do not align with any larger coordinate system and are strictly local coordinates, this should be set to No Datum, No Projection.

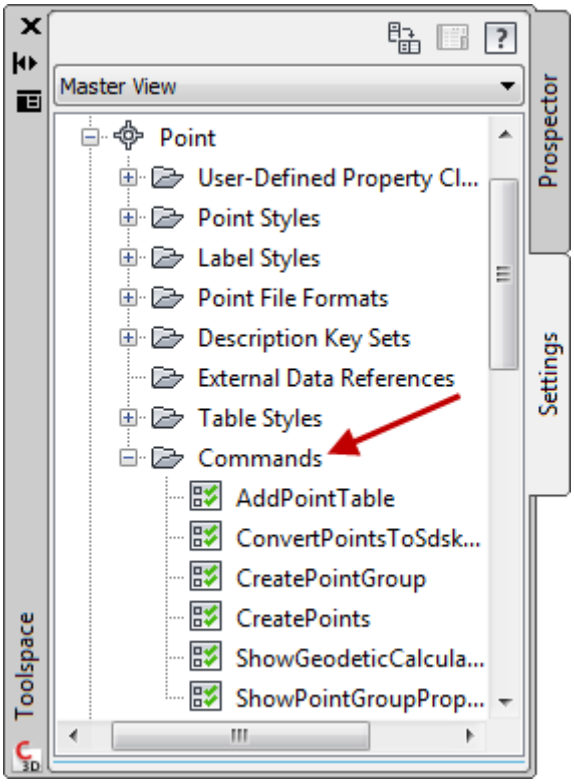
Viewport Scaling and Text Size

Most plotting is done from a layout (paper space) and not model space. The scale of the viewport(s) in the layout tab defines the scale on the printed paper. The text height settings in the Settings tab refer to the plotted height on paper, not the height of the text in model space. Text in model space can appear to be very large or small depending on the model space scale

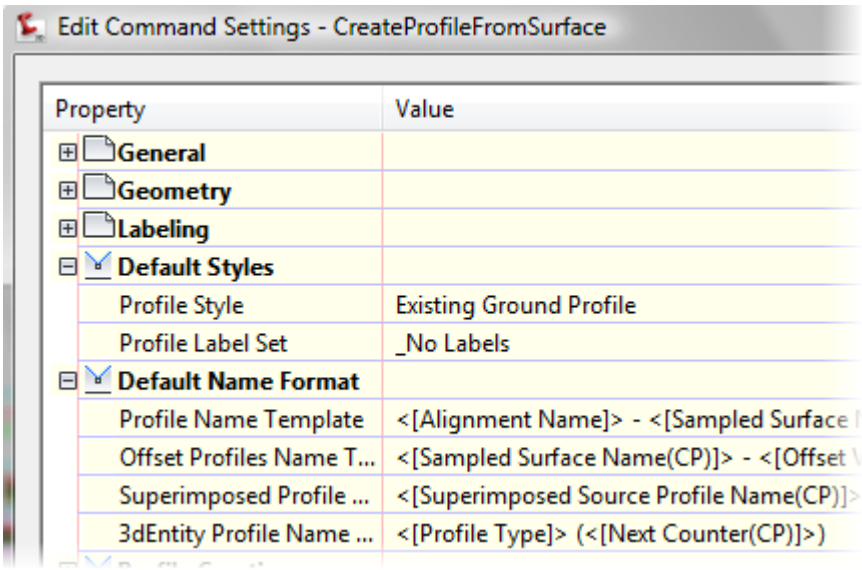
setting. It is good practice to set the model space scale the same, or close to, the final plotted scale.

About Command Settings

Every feature category has command settings that can be found by expanding the Commands tree for the feature in the Settings tab of the Toolspace window.



Command settings exist for every feature command. You modify command settings to assign default parameters such as styles, naming conventions, and algorithm parameters for objects. For example, the following illustration shows some of the command settings for the Create Profile From Surface command.



About Template Files

Drawing templates are among the most important elements to understand when creating and producing engineering and construction drawings. Configuring drawing templates based on your corporate or client's standards results in greater efficiency when creating drawings and sharing data. Standardized components are essential for consistency in engineering and construction drawings. Hence, all new drawings are created from drawing templates.

Standards for such items as layer names, block symbols, label conventions, and profile plots help organizations manage drawings that are shared between different groups or individuals. Clients for civil engineering firms have requirements for standards to fit their particular needs, and companies must submit design drawings using these standards. Frequently, companies do not pay sufficient attention to standardization or to analyzing drawing content. Without standardization, sharing data, copying objects, or inserting objects from one drawing to another is more difficult.

The buildingSMART alliance (www.buildingsmartalliance.org) is a consortium that promotes the use of common standards and open interoperability throughout the architecture, engineering, and construction (AEC) industry. The alliance supports the United States National CAD Standard (NCS) (www.buildingsmartalliance.org/ncs/), a consensus standard for organizing facility drawing information. AutoCAD Civil 3D contains several template drawing files created to conform to the NCS standards.

There are several template settings you can configure, both for AutoCAD elements and for Civil 3D elements. Some of the AutoCAD standardized elements in a drawing template include:

- Layer names and visibility settings (color, linetype, lineweight, and so on).
- Block definitions.
- Text and dimension styles.
- Page setup definitions with viewports and title blocks.
- Miscellaneous system variables.

Some of the Civil 3D standardized elements in a drawing template include:

- Object and label styles.
- Drawing settings.
- Command and feature settings.

Drawing templates are preconfigured by a corporate CAD manager (or team) and should be centrally located on a network for all users to access. It is the role of the CAD manager to maintain the drawing templates, not that of the individual users.

Key Terms

Object Styles	Object styles control the display of Civil 3D objects. Every object has an assigned object style. Different object styles serve different purposes during the design process.
Label Styles	Label styles control the display of the annotation assigned to objects. Label styles are chosen when objects are created. You can change the labels assigned to an object anytime. You choose different label styles to annotate different types of information.
AutoCAD Standard Settings and Styles	For example; layer names and visibility settings, text styles, dimension styles, paper space layout definitions, and symbol definitions.
Civil 3D Standard Settings and Styles	Drawing settings, object styles, label styles, predefined point groups, and predefined surfaces.
Style Hierarchy	Settings and styles are saved in a descending hierarchy. Drawing settings and styles are the top level, followed by collection settings, and then individual settings. Lower level settings and styles can override a higher level default value.
Viewport	A layout (paper space) object that allows a view into model space for plotting purposes. A viewport's scale determines the final plotted scale on paper. A layout can have multiple viewports with different shapes and scales.
Command Settings	Command settings are available for each feature object in the Settings tab of Toolspace. These settings assign default parameters such as styles, naming conventions, and algorithm settings for the objects.
Template Files	Template files can contain standard AutoCAD settings, layers, linetypes, and text style definitions. In addition, template files can include any Civil 3D drawing information in either the Settings tree (including Civil 3D settings, styles, label styles, tables, description keys, and point import/export formats) or the Prospector tree (including any Civil 3D object, such as point groups). Template files have a .dwt extension and should be located on a network drive for all users to share.

Assessment

Challenge Exercise

Instructors can provide a challenge exercise for students based on this lesson.

Questions

1. What is a child override?
2. Which scale setting affects the plotted layout?
3. How does the text height value affect the drawing?
4. How do you modify the current point style marker to reference an AutoCAD block?
5. Why do you use the Purge command?
6. What is the major advantage of creating a custom template file?
7. Why is it important to create and work with standards?

Answers

1. A child override is an arrow in a high level style or setting that indicates that a lower level collection or individual style or setting differs from and will override the higher level style or setting.
2. The viewport scale setting determines the plot scale for the layout.
3. In any label style, the text height setting determines the plotted height on paper.
4. In the Settings tab, in the Point/Point Style, find the current point style. Right-click and click Edit. Click the Marker tab. Click Block and select a block to use. Click OK.
5. Drawings hold a lot of information internally; for example, layers and blocks. Purging unused blocks or layers creates a smaller, more organized drawing or template file.
6. A custom template file can hold all the settings, styles, and parameters that are commonly used for similar projects. Creating a new drawing using this template file can automatically create the layers and blocks and bring in the settings and styles that you want to use.
7. Sharing data, increasing efficiency, and conforming to client submission standards are all good reasons to use a consistent set of standards for your drawings. Standards can be set up in template drawing files for easy use.

Lesson Summary

This lesson focused on how to set up and modify settings and styles as a consistent standard for a company or a particular client. Object naming, layer naming, label and object styles, drawing settings, and using the hierarchy of settings and styles are all covered to emphasize the importance of standardization in design and production. Template drawing files should be set up to reflect the standards required for internal and/or external (client) requirements.