

Chapter 6

Working with Profiles

Learning Objectives

After completing this chapter, you will be able to:

- *Understand the concept of profiles.*
- *Learn about the types of profiles.*
- *Create a Surface profile.*
- *Create a Layout profile.*
- *Create the Multiple, Stacked, and Quick Profiles.*
- *Create Profile label styles.*
- *Create band sets and band styles.*
- *Use Profile properties.*

PROFILES

The first important step in designing a road project is creating an alignment, and the second important step is to create profiles. Profiles represent surface levels or elevations at different intervals along a horizontal alignment. Also, they help you view terrain along the proposed road, highway, and so on. Profiles are graphic representations of the side view of surface elevations along the horizontal alignment, as shown in Figure 6-1. In AutoCAD Civil 3D 2009, the profile does not itself contain any information regarding the stations, elevations and grid lines. Instead, these information are stored and displayed separately in a profile view.

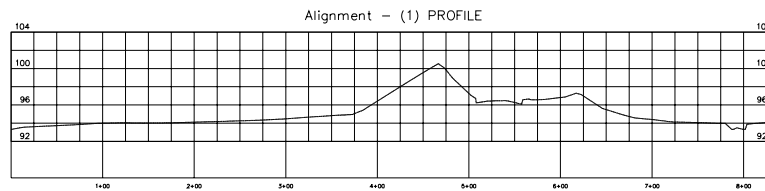


Figure 6-1 A profile created from the surface

The profile view displays and maintains the profiles along with its associated information such as the length, start and end points, and station and elevation data of the alignment it represents to. The profile view also creates and controls the actual grid in which the profile data will be displayed along with the bands of data you want to display.

The profiles are basic objects for building a corridor. The process to build corridors is explained in Chapter 9.

Types of Profiles

There are different types of profiles that are discussed next.

Existing Ground/Surface Profile

The Existing Ground (EG) profile is created from an existing surface and shows the variations in the surface elevation along the required path.

Finished Ground/Layout/Design/Proposed Profile

The Finished Ground (FG) profile is created from an existing profile view. This type of profile is used to create a profile based on certain design requirements. You can draft the FG profile using the **Profile Layout Tools** toolbar in the same way as you created an alignment using the **Alignment Layout Tools** toolbar. The only difference is that the profiles represent the vertical geometry. You will learn how to use the **Profile Layout Tools** toolbar later in this chapter.

Superimposed Profile

A Superimposed profile is created by superimposing one profile view on the other profile view.

Corridor Profile

A Corridor profile is created from the feature line of a corridor.

A profile can be displayed as a single profile view or multiple profile views. The single profile view displays the elevation variation of the required station range of an alignment in a single profile grid view. The multiple profile view displays the elevation levels of the shorter segments of the alignment in different multiple grid views.

Creating a Surface Profile

Menu: Profiles > Create Profile from Surface
Shortcut Keys: ALT+S+S

You can create a surface profile and analyze the elevations along a horizontal path. To create a surface profile or an **Existing Ground (EG)** profile, choose **Profiles > Create Profile from Surface** from the menu bar; the **Create Profile from Surface** dialog box will be displayed, as shown in Figure 6-2.

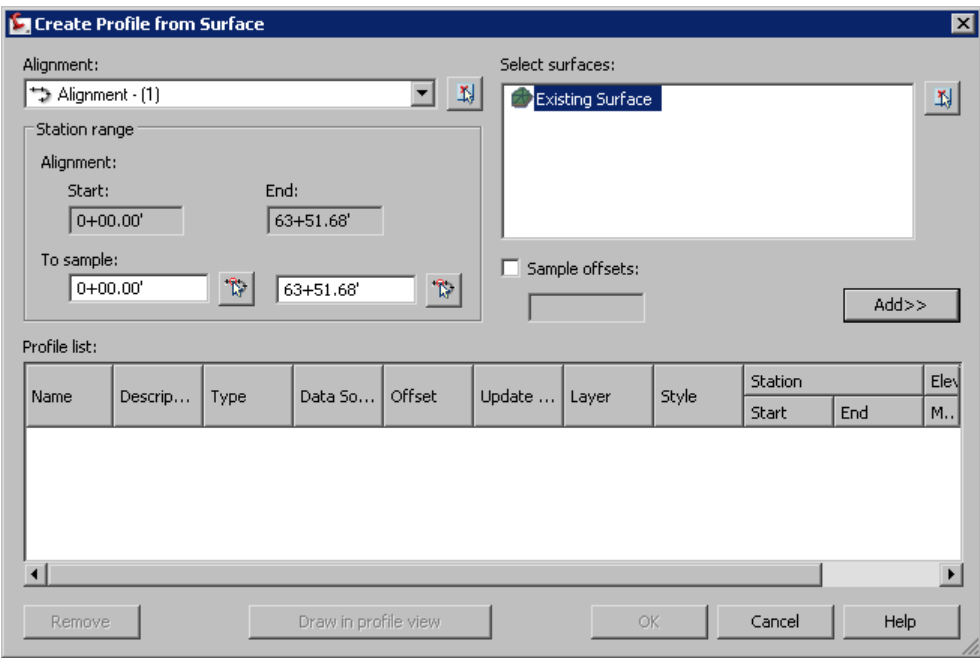


Figure 6-2 The Create Profile from Surface dialog box



Note
*The **Create Profile from Surface** dialog box will be invoked only after creating a surface and an alignment.*

From the **Alignment** drop-down list, select the required alignment along which you want to create the profile. Next, select the required surface from the **Select surfaces** list box. To select more than one surface, press and hold the CTRL key and select the required surfaces. If you need to create a profile for a particular station range, specify the start and end station values in the edit boxes in the **Station range** area. You can also choose the buttons on the right of the **To sample** edit boxes and pick the stations directly from the alignment. Now,

choose the **Add** button; the profile will be added in the **Profile list** table. You can also select the **Sample offsets** check box in this dialog box to include offsets in the profile. Enter the offset distance in the edit box that will be available after selecting the **Sample offsets** check box and choose the **Add** button to add the offset profile to the **Profile list**. Note that you can view and edit the profile data of the current profiles only. To remove a profile from the **Profile List**, select the profile from it and choose the **Remove** button. The profiles removed in this manner are not available for drawing in the profile view.

Now, if you choose the **OK** button, the **Create Profile from Surface** dialog box will be closed and the **Events Viewer** will be displayed with a message. At this stage, the profile is just sampled but not displayed and it will be added under the **Alignments > Profiles** collection in the **Prospector** tab.

To view the profile, it has to be drawn in the profile view. To create the profile view, choose the **Draw in profile view** button from the **Create Profile from Surface** dialog box; the **General** page of the **Create Profile View** wizard will be displayed, as shown in Figure 6-3. The different pages of this wizard are discussed next.

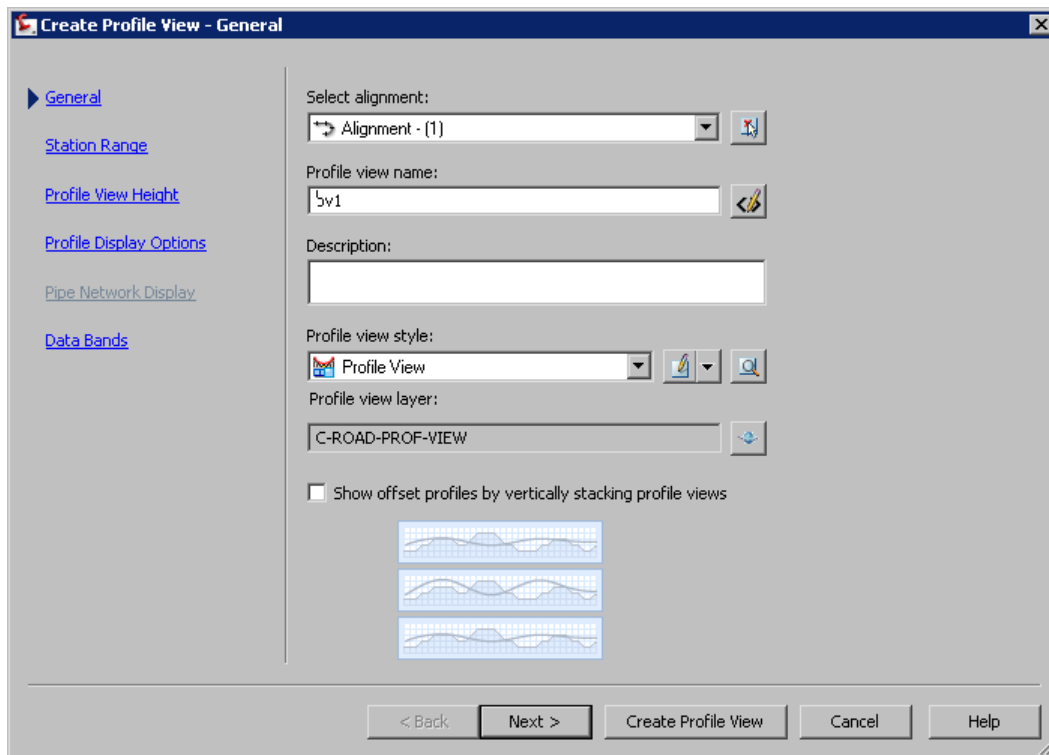


Figure 6-3 The **General** page of the **Create Profile View** wizard



Tip. You can also access the **Create Profile View - General** wizard by choosing **Profiles > Create Profile View** from the menu bar or by pressing and holding the **CTRL** key and then pressing the **S** and **V** keys.

General

This page is used to specify the basic profile view information such as the profile view name, style, its parent alignment, and so on. Select the name of the parent alignment from the **Select alignment** drop-down list. Alternatively, choose the **Select from drawing** button on the right of the **Select alignment** drop-down list to select the required alignment directly from the drawing. The profile view is created by sampling this alignment.

Next, enter a name for the profile view in the **Profile view name** edit box. Optionally, you can enter a brief profile description in the **Description** text box. The **Profile view style** drop-down list displays the default profile view style. You can select the required profile view style from this drop-down list. You can also create a new profile view style or edit the default view style. To do so, choose the down-arrow button on the right of this drop-down list to display a flyout. Next, choose the required option from the flyout to edit or create a new profile view style. The **Profile view layer** text box displays the default layer on which the profile view will be created. Choose the button on the right of this option to display the **Object Layer** dialog box. You can use this dialog box to modify the layer.

Selecting the **Show offset profiles by vertically stacking profile views** check box allows you to create stacked profile views. The stacked profile views are a collection of related profile views in which the offset profile views are drawn separately and placed vertically above or below the centerline profile view. Note that on selecting this check box, the **Stacked Profile** page will be displayed on the left pane of the wizard.

Once you have specified the basic profile information in the **General** page, choose the **Next** button; the **Station Range** page of the **Create Profile View** wizard will be displayed, as shown in Figure 6-4. This page is discussed next.

Station Range

This page of the wizard is used to specify the station range to which the profile view will be drawn. If your alignment is very long and you want to create a profile view for only few stations, you can do it by specifying the station range using the options in the **Station Range** page, refer to Figure 6-4.

In the **Station range** area of this page, the **Automatic** radio button is selected by default. This indicates that the profile view will be drawn from the first station to the end station of the parent alignment. Select the **User specified range** radio button in the **Station range** area to specify the station range as per your requirement; the corresponding edit boxes will be highlighted. Next, enter the start and end station values of the required station range in the edit boxes. Alternatively, choose the button on the right of the edit boxes to specify the station range by selecting the alignment stations directly from the drawing.

After specifying the station range in the **Create Profile View - Station Range** page, again choose the **Next** button; the **Profile View Height** page of the **Create Profile View** wizard will be displayed, as shown in Figure 6-5. This page is discussed next.

Profile View Height

This page is used to specify the height of the profile view and the settings for the split profile

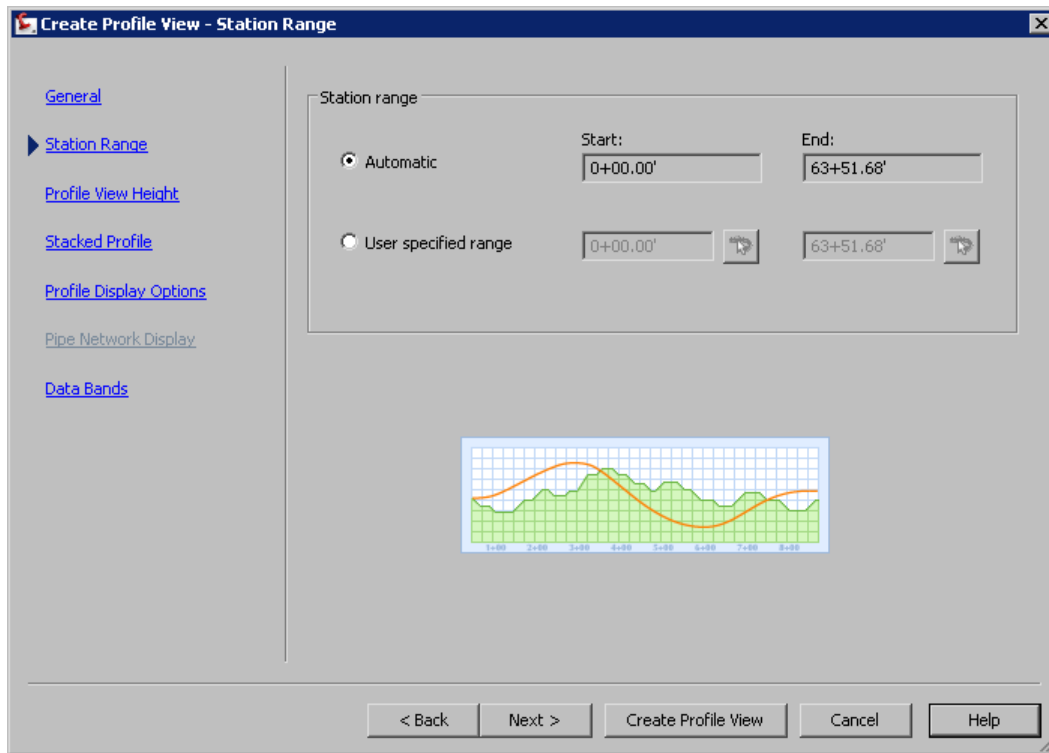


Figure 6-4 The Station Range page of the Create Profile View wizard

view, if required. In the **Profile view height** area, the **Automatic** radio button is selected by default and the full height of the highest profile view is displayed, refer to Figure 6-5.

You can select the **User specified** radio button in this area to specify the minimum and maximum heights of the profile view in the **Minimum** and **Maximum** edit boxes, respectively.

If the height of the profile view extends beyond the specified values, then the view will be split or clipped. The profile will be split based on the settings in the **Split profile view** area. The **Split profile view** check box in this page will be activated only on selecting the **User specified** radio button in the **Profile view height** area. Select the **Split profile view** check box to enable Civil 3D to split the profile, if the height of the profile exceeds the user specified value. This will enable the options in the **Split profile view** area.

Select the profile view style from the **First split view style** drop-down list to specify the display style of the first split profile view segment. The profile view styles control the display of the profile view by specifying the grid spacing, view direction, title of the profile views, and so on. You can create a new style for the first split profile view or edit the default profile view. To do so, choose the down arrow on the right of the drop-down list and select the required option from the flyout displayed.

Similarly, select the profile view styles for the intermediate and last split profile views from the **Intermediate split view style** and **Last split view style** drop-down lists, respectively. To

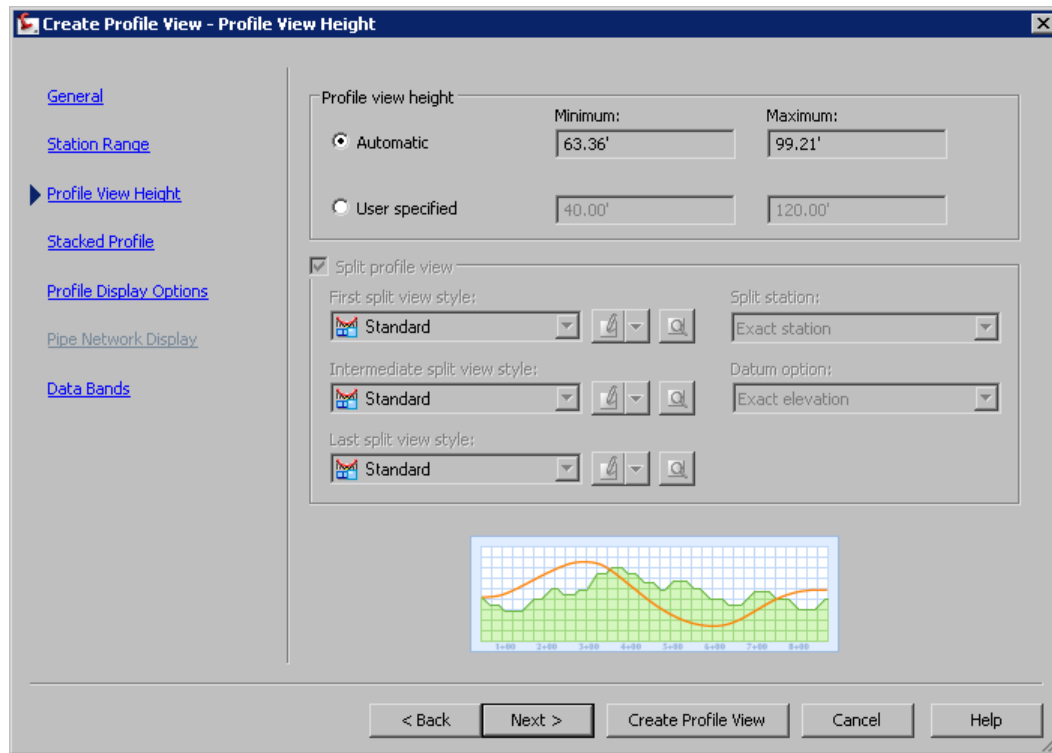


Figure 6-5 The Profile View Height page of the Create Profile View wizard

specify the horizontal location to split the profile view segment, select the required option from the **Split station** drop-down list. To specify the vertical location to split the profile view, select the required option from the **Datum option** drop-down list.

After specifying the profile height and split profile view settings in the **Profile View Height** page, choose the **Next** button; the **Stacked Profile** page of the **Create Profile View** wizard will be displayed only when the **Show offset profiles by vertically stacking profile views** check box is selected in the **General** page of the wizard. If this check box is cleared, the **Profile Display Options** page of the **Create Profile View** wizard will be displayed as the next page, as shown in Figure 6-6. The **Stacked Profile** page is discussed next.

Stacked Profile

This page is used to specify the settings for the stacked profile views. In this page, use the **Number of stacked views** spinner to specify the number of views to be create. You can specify any number from 1 to 9. Enter a positive value for the spacing between various profile views in the **Gap between views** edit box. The **Top view style** drop-down list displays the default style used for the top most profile view. Select the required style from this drop-down list. You can create a new style for the top profile view or edit the default style. To do so, click the down arrow button on the right of this drop-down list; a flyout will be displayed. Choose the **Create New** or **Edit Current Selection** option as per the requirement. Similarly, select a profile view style for the bottom view and middle view from the **Middle view style** and **Bottom view style** drop-down lists, respectively.

Note that the preview on the right of this page displays the total number of profile views specified. Now, choose the **Next** button; the **Profile Display Options** page of the **Create Profile View** wizard will be displayed. This page is discussed next.

Profile Display Options Page

This page of the wizard is used to view and change the settings of the profiles associated with the parent alignment. The **Select stacked view to specify options for** area of this page lists all stacked views and allows you to select the required profile view for which you want to specify the display options, refer to Figure 6-6. Note that this area is available only if the **Show offset profiles by vertically stacking profile views** check box is selected in the **General** page of the wizard. The number of profile views listed in this area depends upon the number specified in the **Stacked Profile** page.

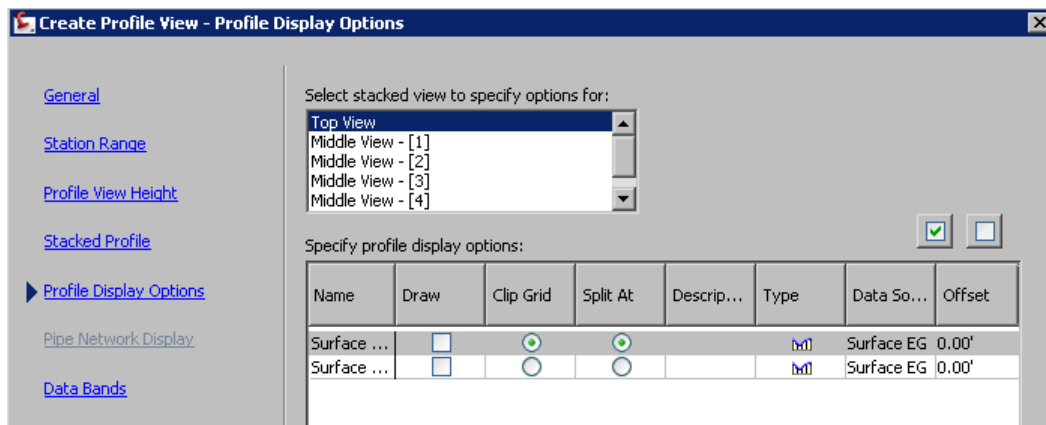


Figure 6-6 The *Profile Display Options* page of the *Create Profile View* wizard

The **Specify profile display options** area in this page allows you to specify the display options for the profile views associated with the alignment. The **Name** column in this area specifies the name of the profile views. The check boxes in the **Draw** column are used to select the profile that you want to draw in the profile view. You can select all check boxes in the **Draw** column by choosing the **Select All Profiles** button available at the top right corner of the **Specify profile display options** area. Note that this radio button will be available only in this page if the **Show offset profiles by vertically stacking profile views** check box is selected in the **General** page of the wizard. The **Clip Grid** column allows you to select the profile that will control the horizontal and vertical extents of the profile view grid by selecting the required radio button in this column. This option will be functional only if the **Grid Options** in the **Grid** tab of the **Profile View Style** dialog box are set to clip the grid in the profile view. You will learn more about the **Grid Options** and the **Profile View Style** dialog box later in this chapter. The **Split At** column specifies where to split from a profile view containing multiple profiles. For example, a profile view consists of both the existing ground profile and the finished ground profile. If you select the radio button for the existing ground profile, the split will occur at the existing ground elevation.

The **Description** column is used to provide the description of a profile. Click in this column and enter the required description about the profile. The **Type** column specifies the type of profile by displaying the respective icons.

**Note**

The profile icon with a blue line indicates a surface profile, the profile with a red line indicates a layout profile, the icon with an orange line indicates a superimposed profile, and the green colored icon indicates a corridor profile.

The **Data Source** column specifies the name of the surface whose profile is drawn in the profile view. In case of corridor profiles, it displays the name of the parent corridor. The **Offset** column specifies the offset distance from the centerline of the parent horizontal alignment. The **Update Mode** column specifies whether the surface profile is dynamic or static. To specify a surface as dynamic or static, click in this column and select the required update mode from the drop-down list for the surface profile only. The **Layer** column specifies the layer of the profile. To specify the layer, click in this column and select the required column from the **Layer Selection** dialog box displayed. Similarly, click in the **Style**, **Override**, and **Labels** columns and select the required profile style and profile label set from the dialog boxes displayed. Selecting the check box in the **Override** column allows you to override the profile style for the current profile only. The **Alignment** column specifies the parent alignment from which the profile is created. The **Station** columns specify the start and end station values of the profile, while the **Elevation** column specifies the minimum and maximum elevation values along a profile.

After setting the required parameters in the **Profile Display Options** page of the wizard, choose the **Next** button; the **Data Bands** page of the **Create Profile View** wizard will be displayed; else the **Pipe Network Display** page will be enabled, if there are pipe networks in the drawing.

Data Bands

The **Data Bands** page is used to specify the properties of data band associated with the profile. You will learn about the data bands and data band sets later in this chapter. In this page, the **Select band set** drop-down list displays the default band set style for the profile view. You can select the required band set from this drop-down list. The **Location** drop-down list in the **List of bands** area is used to select the required option to add the data band in the profile view. You can place the data band either on the top or at the bottom of the profile view. The **Set band properties** table displays the band properties. The **Band Type** column specifies the type of data band such as profile data, vertical geometry data, superelevation data, pipe data, and so on. The **Style** column displays the name of the data band style assigned to the band set. Click in this column and select the required style from the **Pick band Style** dialog box displayed. The **Profile 1** and **Profile 2** columns display the names of the two profiles from which the band data is obtained. For example, if you select the Existing ground and Finished ground as profile 1 and profile 2, respectively, then each station in the data band will display the elevation values from both profiles. You can click in these columns and select the required profile. Choose the button in the **Geometry Points** column to display the **Geometry Points to Label in Band** dialog box. You can use this dialog box to select the alignment and profile geometry points that you want to label in the data band.

Once you have specified the profile information in all pages of the **Create Profile View** wizard, choose the **Create Profile View** button located at the bottom of the wizard; you will be prompted to specify the origin of the profile view. Click in the drawing area to specify the origin of the profile view; the profile view will be added in the drawing. Now, in the **Toolspace** palette, choose the **Prospector** tab and expand the **Alignments > Profiles** collection to view

the profile and profile view name. Next, expand the parent alignment and the **Profile Views** nodes; the profile view will be listed in the **Profile Views** node under the parent alignment collection. Thus, a surface profile is created by utilizing the elevation data of the surface at the points where the alignment crosses the lines of the TIN surface.

Creating a Layout or Criteria-Based Profile

Menu: Profiles > Create Profile by Layout
Shortcut Keys: ALT+S+L

The layout profiles are used to represent and view the design elevations along an alignment and are created on the existing profile grid view. A layout profile represents the proposed elevation changes to be made for a finished ground. The workflow to create a layout (Design profile) is similar to creating a criteria-based alignment using the Layout tools. You need to select and assign a design criteria file for the profile from which you can obtain the minimum K values. Remember that if you assign a design criteria file to the parent alignment, the same design criteria file will be assigned to the profile view. However, you can change the design criteria file to create the profile as per your design requirements.



Tip. The *K value* is the ratio of the curve length and the algebraic distance between the incoming and the outgoing tangents. The *K value* represents the horizontal distance at which the grade on the vertical curve changes by 1%. The American Association of State Highway Transport Officials (AASHTO) has established some minimum *K values* according to which the curves can be designed. The length of the curves should not be less than the minimum *K value* for a particular distance.

To create a layout profile, choose **Profiles > Create Profile by Layout** from the menu bar; you will be prompted to select a profile view. Select the profile view on which you want to create the design profile; the **Create Profile - Draw New** dialog box will be displayed, as shown in Figure 6-7.

In this dialog box, the **Alignment** edit box displays the name of the parent alignment. The **Name** edit box displays the default name of the profile. You can enter a new profile name in this edit box. Select the required profile style and profile label set from the drop-down lists in the **Profile style** and **Profile label set** areas, respectively. You can also set the required layer for the profile in the **Profile layer** area. The text box in this area displays the default layer assigned to the profile. You can assign a new layer to the profile by choosing the button on the right of the text box available in the **Profile layer** area.

The **General** tab in this dialog box is used to enter the basic information about the profile and select the required design criteria file for the layout profile. You can choose the **Design Criteria** tab and then select the **Use criteria-based design** check box to apply a new design criteria file or change the existing file. This design criteria file will provide the minimum K values required to create the design profile.

After you have specified the profile information and design criteria file in the **Create Profile - Draw New** dialog box, choose the **OK** button; the **Profile Layout Tools** toolbar will be displayed with the profile name, as shown in Figure 6-8. **Layout [1]** is the default profile name. Note that this profile name will be listed in the **Alignments** collection under the **Profiles** node in the **Prospector** tab of the **Toolspace** palette.

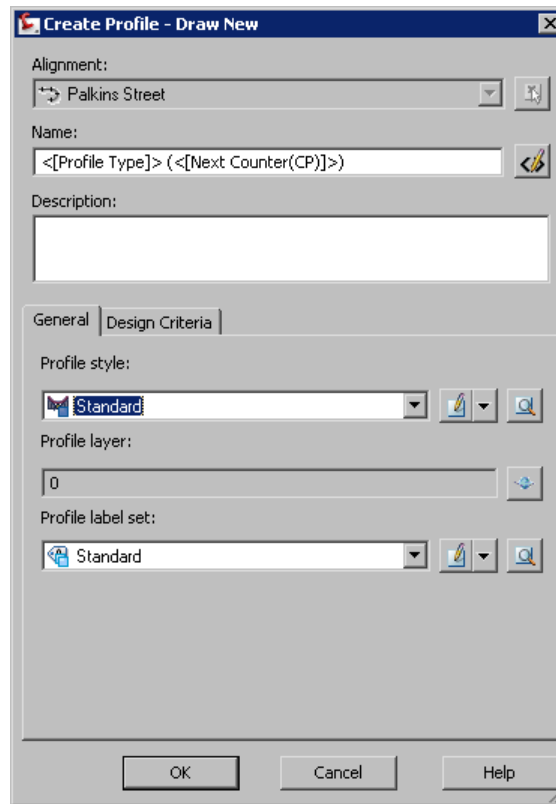


Figure 6-7 The *Create Profile - Draw New* dialog box



Figure 6-8 The *Profile Layout Tools - Layout [1]* toolbar

You can use the tools in the **Profile Layout Tools** toolbar to create a criteria-based profile design. The tools in the **Profile Layout Tools** toolbar can be used to create the layout profile and edit the surface profiles. You will notice that whenever you invoke any tool in this toolbar, the name of the tool will be displayed at the bottom of the toolbar. Some of the tools in this toolbar are discussed next.

Draw Tangents



Invoke the **Draw Tangents** tool from the toolbar to pick the points of vertical intersection (PVI) on the profile view to draw tangents between the points without any curves. Choose the down arrow on the right of this tool to display the flyout that contains other tools.

Draw Tangents With Curves



Invoke this tool to add a series of fixed tangents between the specified points. This tool also helps you add free curves automatically at the point of vertical intersection.

Curve Settings



Invoke this tool to specify the curve parameters that will be used while using the **Draw Tangents With Curves** tool. On invoking this tool, the **Vertical Curve Settings** dialog box will be displayed, as shown in Figure 6-9. This dialog box is used to select the curve type to be added between the tangents and to configure the curve settings accordingly.

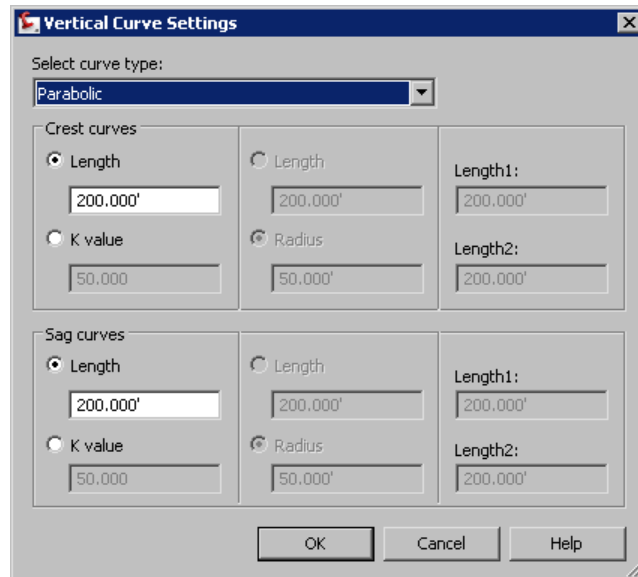


Figure 6-9 The Vertical Curve Settings dialog box

Fixed Tangents (Two points)



This tool is used to add tangents to the vertical profile by selecting the start and end points. Choose the down arrow on the right of this tool; a flyout will be displayed with other tangent creation tools. You can use the required tools to add tangents to the profile layout. For example, invoke the **Free Tangent** tool from this flyout to add a free tangent.

Fixed Vertical Curve (Three points)



This tool is used to add a curve to the profile by specifying three points.

Free Circular Curve (PVI Based)



AutoCAD Civil 3D 2009 provides you with a new type of free curve tool called as **Free Circular Curve (PVI Based)** tool. This tool is used to add a circular curve in the profile by specifying the length, radius, or a pass-through point. This tool is PVI-based, so the drawing must consist of points of vertical intersection (PVI). Invoke this tool from the toolbar and click near any PVI in a curve except the first and the last PVI. Next, specify the radius, length, or a pass-through point to add a circular curve.

You can use various other options to add the free vertical curves to the profile by invoking

the other free vertical curve tools that are available in the **Profile Layout Tools** toolbar. You can also use the **Floating Vertical Curve** tools to add floating curves to the profile.

Insert PVIs - Tabular



This tool is used to add the PVI data numerically in tabular form. To do so, invoke this tool; the **Insert PVIs** dialog box will be displayed. Select the required radio button from the **Vertical curve type** area of this dialog box to select the curve type and then specify the corresponding data in the columns. This tool helps you create points of vertical intersection (PVIs) at multiple locations at the same time.

Raise/Lower PVIs



Invoke this tool to display the **Raise/Lower PVI Elevation** dialog box. This dialog box is used to change the elevation of profiles. You can either change the elevation of the complete profile or of few PVIs within a particular station range. In the **Elevation change** edit box of the **Raise/Lower PVI Elevation** dialog box, specify a positive value to increase the elevation or a negative value to decrease the elevation of the profile or the PVIs. In the **PVI range** area, select the **All** radio button to modify the elevation of all PVIs, thereby changing the elevation of the entire profile or select the **Station range** radio button to specify the start and end station values; the elevation of the PVIs within the specified station range will be modified.



Tip. If the **Profile Layout Tools** toolbar is closed, select the profile from the drawing and right-click to display a shortcut menu. Now, choose the **Edit Profile Geometry** option from the shortcut menu to display the **Profile Layout Tools** toolbar again.

Copy Profile



Invoke this tool to display the **Copy Profile Data** dialog box. This dialog box is used to copy the entire profile or a part of the profile. The copy of the profile will be added in the **Profiles** node of the **Alignments** collection in the **Settings** tab of the **Toolspace** palette. This copy can then be used to create a new profile or overwrite an existing profile.

Display entity based data in grid and layout parameters editors



This tool is used in conjunction with the **Profile Grid View** tool in the **Profile Layout Tools** toolbar to edit the PVI or the entity parameter of a profile. When you open the **Panorama** window by invoking the **Profile Grid View** tool; by default, the PVI-based information will be displayed in it. You can use this tool to toggle between the PVIs or the entity based parameters of a profile, for either editing or viewing the information about it.

To view the information about the profile entities such as tangents, curves, and so on, choose the down arrow on the right of this tool; a flyout will be displayed with the PVI based option chosen by default. Choose the **Entity based** option from the flyout; the profile entities and their information will be displayed in the **Panorama** window.

You can use the required tools in the **Profile Layout Tools** toolbar and create a layout profile or edit the existing layout profile. Note that while drafting a layout profile, the violation icon

will be displayed on the entity that violates the minimum design criteria, as discussed in Chapter 5. You can rectify violation errors using the **Alignment Layout Parameters** and **Panorama** window. This is explained in detail later in this chapter.

Creating a Superimposed Profile

Menu: Profiles > Create Superimposed Profile
Shortcut Keys: ALT+S+U

In AutoCAD Civil 3D 2009, you can compare two profiles by superimposing one profile over the other. A superimposed profile is the one that is created by superimposing the profile of an alignment over the profile views of other alignments. Superimposing a profile help you study the variations in elevations of profiles. For example, you can superimpose a highway alignment profile over the pipe network alignment to view and compare the elevations.

To create a superimposed profile, choose **Profiles > Create Superimposed Profile** from the menu bar. On doing so, you will be prompted to select the source profile from the drawing area. Select the profile (indicated by red line in the profile view) that you want to superimpose and compare with the main profile. Next, you will be prompted to select the destination profile view. Select the profile view or any grid of the profile view on which you want to superimpose the source profile. On doing so, the **Superimpose Profile Options** dialog box will be displayed, as shown in Figure 6-10.

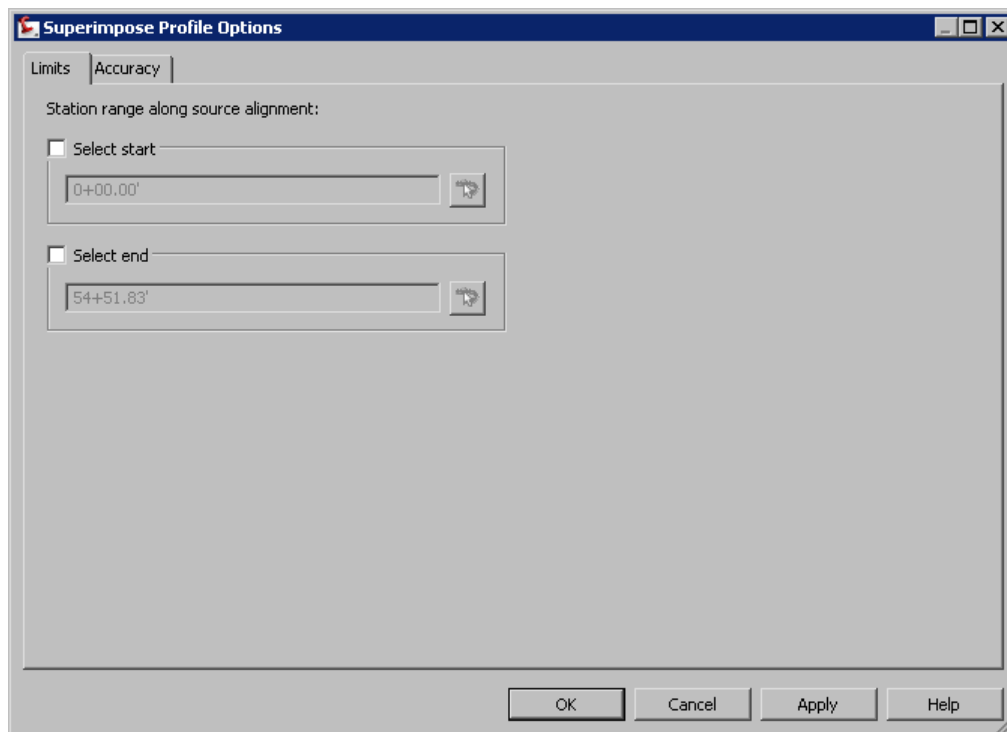


Figure 6-10 The *Superimpose Profile Options* dialog box

This dialog box is used to specify the station range of the profile to be superimposed by specifying the start and end station values of the profile. To do so, select the **Select start** check box in the **Limits** tab of this dialog box; the edit box below this check box will be activated. You can now enter the start station value numerically in this edit box. Alternatively, choose the button on the right of this dialog box to specify the station value directly from the drawing. Similarly, select the **Select end** check box and specify the end station value. Selecting these check boxes also prevents the superimposed profile to react whenever a change is made to the station range of the source profile, as the station range of the superimposed profile will remain fixed.

The **Accuracy** tab in this dialog box is used to specify the accuracy of curves in the superimposed profile. Enter the required mid-ordinate distance for both the horizontal and vertical curves in the respective **Horizontal** and **Vertical** edit boxes of the **Accuracy** tab, respectively. Smaller the value of this distance, more will be the number of line segments used to represent the curves. After specifying the required parameters, choose the **OK** button; the **Superimpose Profile Options** dialog box will be closed and the required profile will be superimposed. Figures 6-11 and 6-12 show the destination and source profiles, respectively. Figure 6-13 shows the superimposed profile created by superimposing the profile in Figure 6-12 over the profile in Figure 6-11.

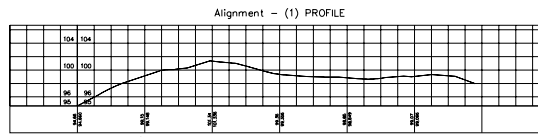


Figure 6-11 The profile view of Alignment 1

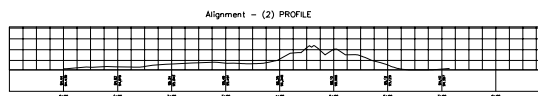


Figure 6-12 The profile view of Alignment 2

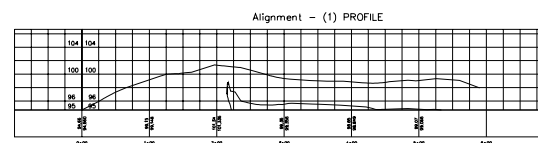


Figure 6-13 The Superimposed profile view of Alignment 2 over Alignment 1

Creating Multiple Profile Views

Menu: Profiles > Create Multiple Profile Views

Shortcut Keys: ALT+S+M

AutoCAD Civil 3D 2009 allows you to create multiple profile views by splitting the large profile view into smaller segments. To create multiple views, choose **Profiles > Create Multiple Profile Views** from the menu bar. On doing so, the **Create Multiple Profile Views** wizard with the default **General** page will be displayed, as shown in Figure 6-14. Different pages in this wizard are discussed next.

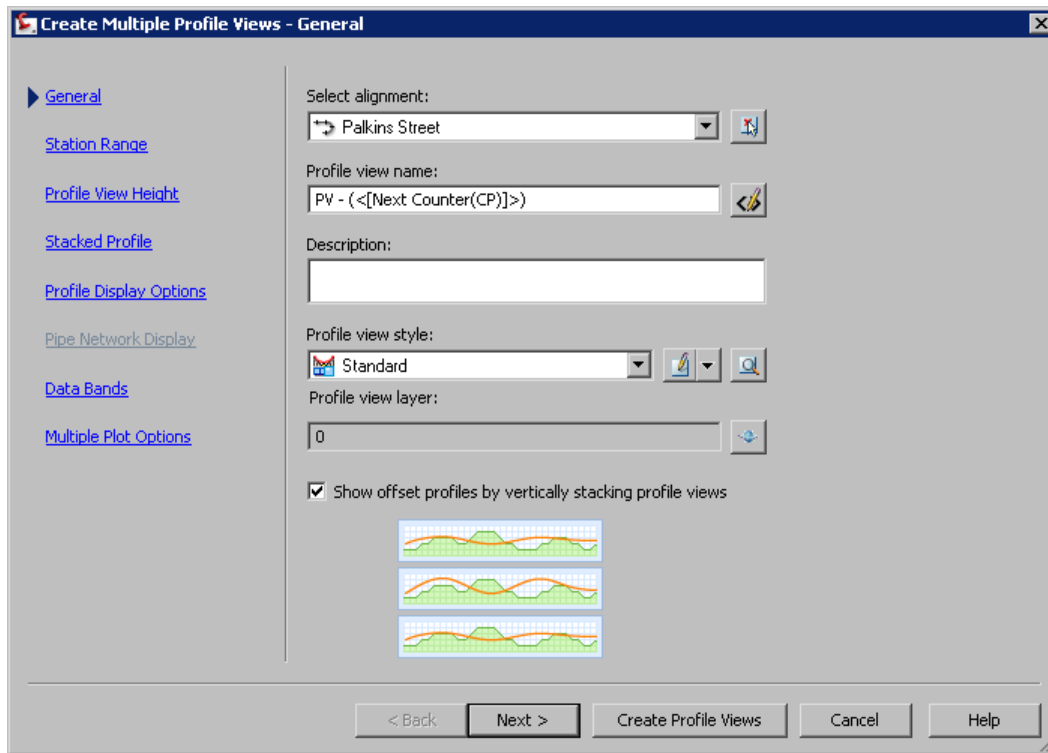


Figure 6-14 The **General** page of the **Create Multiple Profile Views** wizard

General

The **General** page is displayed by default and is used to specify the basic information about a profile such as name, parent alignment, and so on. The options in this page are same as discussed in the **General** page of the **Create Profile View** wizard. Select the alignment for which you want to create the profile views from the **Select alignment** drop-down list of the **General** page. Next, specify the profile name in the **Profile view name** edit box. Optionally, you can enter a brief description about the profile in the **Description** text box. Next, select the style for the profile views from the **Profile view style** drop-down list. After entering the required parameters, choose the **Next** button to display the **Station Range** page of the **Create Multiple Profile Views** wizard.

Station Range

In the **Station Range** page is used to specify the station range by which the profile view is drawn. In this area, by default, the **Automatic** radio button is selected implying that the profile view will be drawn according to the station range specified in the **Start** and **End** text boxes beside it. If you select the **User specified range** radio button in this area, the **Start** and **End** edit boxes, displayed on the right, will be activated. You can accept the default values or enter a numeric values in these edit boxes to limit the station range of the profile view. The **Length of each view** edit box in the **Station range** area specifies a length for each profile view segment in a multiple profile view. Now, choose the **Next** button to display the **Profile View Height** page of the **Create Multiple Profile Views** wizard. This page is discussed next.

Profile View Height

In this page, you can specify the height to which the profile view will be drawn. In the **Profile view height** area, the **Automatic** radio button, is selected by default, specifies that the height of the profile view is drawn to the full height of the highest profile. The **Maximum** and **Minimum** text boxes next to this radio button specify the limit of the height of the profile view.

You can select the **User specified** radio button to specify the height upto which the profile view is drawn. If a profile extends beyond the user-specified value, it is either split according to the **Split Profile View** settings or clipped.

Next, you will specify how to place the datum for all profiles within the profile view. To do so select the required option from the **Profile view datum by** drop-down list. Note that this drop-down list is activated only on selecting the **User defined** radio button. On selecting the **Minimum Elevation** option from the drop-down list, the profile datum values will be based on the lowest datum values of all profiles in the profile view. This option is useful for profiles that have high elevation variation. If you select the **Mean Elevation** option from the **Profile view datum by** drop-down list, the profile datum values will be based on the mean value of all profiles. On selecting this option, profiles will be drawn at the center of the profile views with an equal space at the top and bottom of the profile.

Next, select the **Split profile view** check box to split the profile, if the profile height extends beyond the value specified in the edit box in the **Profile View Height** area. In the **Split profile view** area, select the profile view styles, required for the first, intermediate, and end profile view segments, respectively. In this area, you can also specify the station and vertical locations where the profile view will split, using the **Split station** and the **Datum option** drop-down list, respectively. Now, after specifying the required parameters in the **Profile View Height** page of the **Create Multiple View** wizard, choose the **Next** button; the **Profile Display Profile Options** page will be displayed.

The options in the **Profile View Options** page are same as that of the **Data Bands** page in the **Create Multiple View** wizard as discussed earlier. After specifying various options in this page choose the **OK** button; the **Multiple Plot Options** page will be displayed.



Note

*In **Create Multiple View** wizard, if the **Show offset profiles by vertically stacking profile views** check box is selected in the **General** page, the **Stacked Profiles** page will be displayed before the **Profile View Height** page.*

Multiple Plot Options

This page is used to specify the layout of the plotted profile views. This page is available only for the multiple profile views. The **Draw Order** area of this page is used to specify whether you want to draw the profile view segments in different rows or columns. By default, the **By columns** radio button is selected in this area. As a result, the profile view segment is drawn in different columns. Select the **By rows** radio button to draw the profile view segments in different rows. You can specify the maximum number of profile view segments in a column by using the **Maximum in a column** spinner. The **Start corner** drop-down list is used to specify the direction to draw the profile views. For example, on selecting the **Upper right** option, the profile views will be drawn in a row starting from the upper right corner as indicated in the **Preview** area.

The **Gap between adjacent profile views area** is used to specify the space between adjacent profile views in a row or column in plotted units. To specify the space between the adjacent profile views, enter the required spacing values in the **Row** and **Column** edit boxes. After you have specified the required information in the **Create Multiple Profile Views** wizard, choose the **Create Profile Views** button; the wizard will close and you will be prompted to specify the origin of the profile view. Click in the drawing area at the required location; multiple views will be created in the drawing, as shown in Figure 6-15.

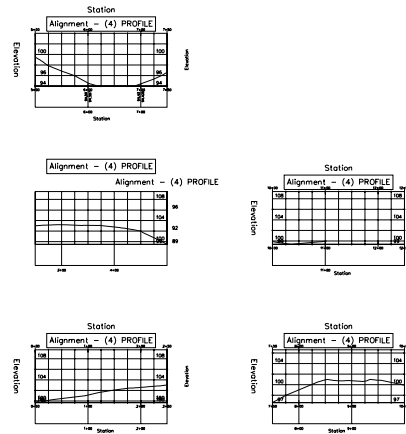


Figure 6-15 Multiple profile views

Creating a Quick Profile

Menu: Profiles > Quick Profile
Shortcut Keys: ALT+S+Q

AutoCAD Civil 3D 2009 allows you to create a quick profile and analyze the surface elevations without creating alignments. You can create a quick profile in just few steps by first selecting the object along which you want to create the profile or the cross-section and then selecting the surface from which you want to create the profile. The quick profile can be created along a line, polyline, feature line, lot line, or even by picking points on a surface.

Before you create a quick profile, you must create a polyline or a line along which you want to create the profile to analyze the elevations. To create a quick profile, choose **Profiles > Quick Profile** from the menu bar; you will be prompted to select the object along which you want to create the profile. Select the required object; the **Create Quick Profiles** dialog box will be displayed, as shown in Figure 6-16.

In the **Create Quick Profiles** dialog box, the **Surfaces to sample** area lists all existing surfaces in the drawing and allows you to select the required surface from which you want to create the profile. By default, the **Select all surfaces** check box is selected in this area. You can clear the check box in the **Select** column, if you do not want to create the quick profile from a particular surface. The **Profile Style** column in the **Surfaces to sample** area specifies the current style for the profile. Click in this column; the **Pick profile style** dialog box will be displayed. Select the required profile style from this dialog box.

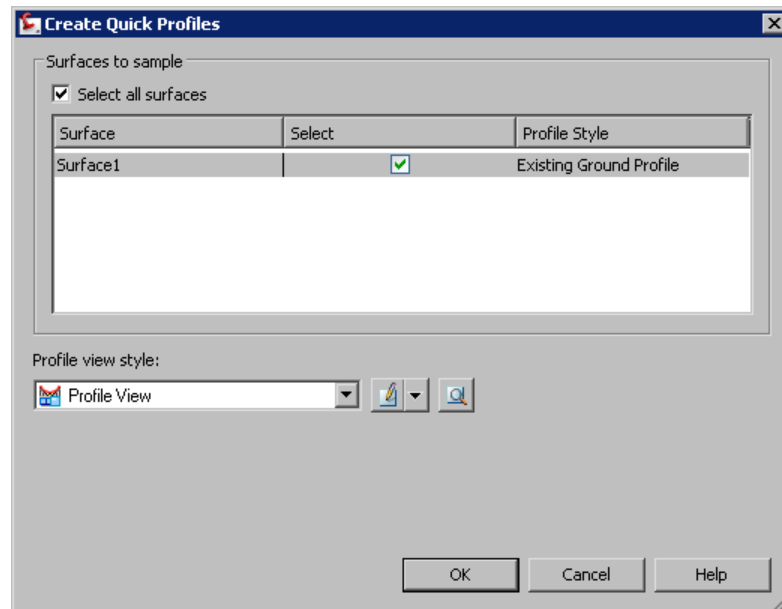


Figure 6-16 The Create Quick Profiles dialog box

Next, select the required style for the profile view from the **Profile view style** drop-down list and choose the **OK** button; you will be prompted to specify the origin of the profile view. Click in the drawing to place the profile view at the required location; the quick profile will be created.



Note

*If you have selected a 3D object, the **Draw 3D entity profile** area will be displayed in the Create Quick Profiles dialog box.*

You can also create a quick profile by selecting points on the required surface. To do so, choose **Quick Profile** from the menu bar, enter **P** at the *Select object or [by Points]:* prompt. On doing so, you will be prompted to select the points. Follow the prompts displayed and click at the required location to pick points. Press ENTER to end the command and display the **Create Quick Profiles** dialog box. Now, select the required surface from this dialog box and choose the **OK** button, the quick profile will be created. Click at the required location in the drawing area to place the required quick profile view.

CREATING A PROFILE DESIGN CRITERIA

Menu: Profiles > Design Criteria Editor

The steps for creating a new design criteria for the design-based profile are the same as explained in Chapter 5 for creating the design-based alignment. You can create new design criteria using the **Design Criteria Editor** dialog box. Also, you can edit or create new design checks as per the requirement.

To create a new design criteria, choose **Profiles > Design Criteria Editor** from the menu bar; the **Design Criteria Editor - _AutoDesk Civil 3D Imperial Roadway Design Standards.xml** dialog box will be displayed as shown in Figure 6-17. Remember that the *_AutoDesk Civil 3D*

Imperial Roadway Design Standards.xml is the name of the default design criteria file that will be assigned to profiles. Before you create a new design criterion, choose the **Save As** button and save the default design criteria file with a different name and location. Now, expand the **Profiles > Minimum K Tables > AASHTO 2001 Standard** collections to display the three options for the stopping sight, passing sight, and headlight sight distances under it. Select any of the options; the speeds and K values will be displayed in columns on the right pane of the dialog box, refer to Figure 6-17.

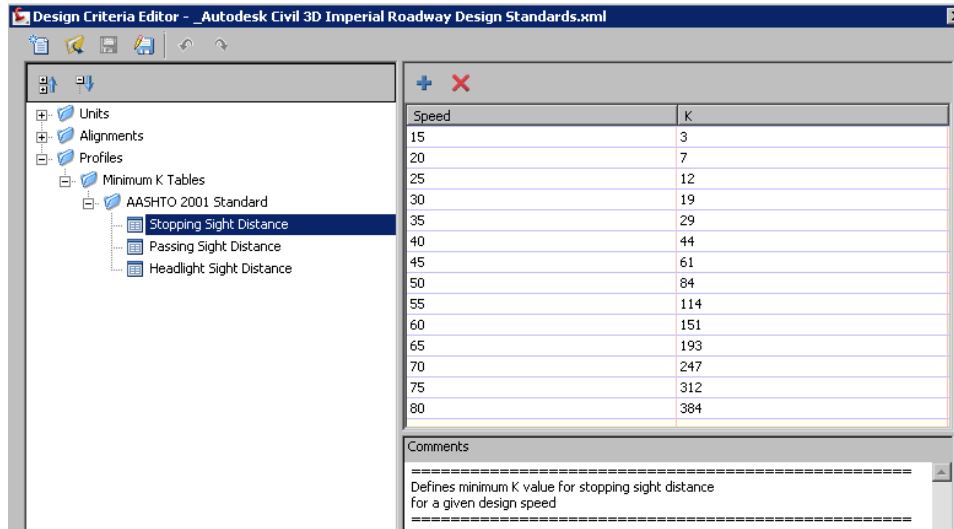


Figure 6-17 Partial view of the *Design Criteria Editor* dialog box showing the minimum *K* values at different speeds.

To create a new table, right-click on **Minimum K Tables** and choose **New Minimum K Table** from the shortcut menu displayed; a new table will be added in the collection. Now, right-click on the new table added and choose the required option to create a **New Stopping Sight Distance** table, **New Passing Sight Distance** table, or a **New Headlight Sight Distance** table. Next, select and click on the first row of the Speed column and enter the required speed. Also, specify the *K* for the specified value in the **K** column. Similarly, continue entering the speed values in the **Speed** column and their corresponding *K* values in the **K** column.

After you have created the minimum *K* values table, choose the **Save and Close** button; a message box will be displayed informing you about the unsaved changes. If you have not saved the changes made in the file, choose the **Save changes and Exit** option to close the **Design Criteria Editor** dialog box. Note that instead of creating a new table for the design criteria, you can also edit the values in the existing tables in the default design criteria file and save them with a different name at a different location.

EDITING LAYOUT/DESIGN PROFILES

You can edit the design profile geometry and profile design criteria of a project at any stage. Civil 3D is compatible enough to quickly adjust to the changes made in the profile. You can edit the geometry of a profile either by grip editing, or by using the **Profile Layout Parameters** dialog box, the **Panorama** window and various other tools of the **Profile Layout Tools** toolbar. The editing of the profiles is described next.

Using the Profile Layout Tools

Menu: Profiles > Edit Profile Geometry

Shortcut Keys: ALT+S+E

The profile layout tools are used to edit the profile by editing the PVI and profile entities individually. To begin with, choose **Profiles > Edit Profile Geometry** from the menu bar; you will be prompted to select the profile. Select the required profile; the **Profile Layout Tools** toolbar will be displayed.



Tip. Alternatively, select the required layout profile from the profile view, join the drawing area and right-click; a shortcut menu will be displayed. Choose **Edit Profile Geometry** from the shortcut menu.

To edit the Points of Vertical Intersections (PVI) in the Layout profile, ensure that the **PVI based** tool is invoked in the **Profile Layout Tools** toolbar to display only the PVI data in the **Panorama** window and the **Profile Layout Parameters** dialog box. Next, invoke the **Panorama Grid View** tool from the toolbar; the **Panorama** window with the **Profile Entities** tab with all PVI in the profile will be displayed, refer to Figure 6-18.

No.	PVI Station	PVI Elevation	Grade In	Grade Out	A (Grade Change)	Pr
1	-0+20.00'	101.078'		-1.86%		
2	0+70.00'	99.403'	-1.86%	0.98%	2.84%	
3	0+90.50'	99.603'	0.98%	0.37%	0.61%	
4	1+58.50'	99.853'	0.37%	-1.25%	1.62%	
5	1+67.50'	99.740'	-1.25%	-1.03%	0.22%	
6	2+15.00'	99.253'	-1.03%	-2.46%	1.44%	
7	2+49.50'	98.403'	-2.46%	6.23%	8.69%	
8	2+80.00'	100.303'	6.23%	-1.69%	7.91%	
9	3+69.00'	98.803'	-1.69%	1.29%	2.98%	
10	4+31.00'	99.603'	1.29%			

Figure 6-18 The Profile Entities tab of the Panorama window

You can edit the station, elevation, and grade values for the PVI by double-clicking on the existing values and replacing them with the required values. To view and edit only the selected PVI, invoke the **Select PVI** tool from the toolbar and click near the required PVI in the drawing; the PVI data of only the corresponding PVI will be displayed in the **Panorama** window.

You can also view and edit the PVI data such as its elevation and grade in the **Profile Layout Parameters** dialog box. To do so, invoke the **Profile Layout Parameters** tool from the toolbar; the **Profile Layout Parameters** dialog box will be displayed. Now, select the required PVI in the **Number** column of the **Panorama** window; the PVI data of the selected PVI will be displayed in the **Profile Layout Parameters** dialog box. You edit the PVI station, grade, and the PVI elevation values in this dialog box. To view the properties of another PVI, again invoke the **Select PVI** tool and click near the required PVI in the drawing. As you continue clicking near the PVI, the data will be displayed in the **Profile Layout Parameters** dialog box.

To edit the profile entities, choose the down arrow on the right of the **PVI based** tool and then choose **Entity based** from the flyout displayed. This will help you view only the entity data in the **Panorama** window and the **Profile Layout Tools** toolbar.

Editing Profiles Using Grips

One of the easiest methods of editing the geometry of a profile is using the grips that is displayed on selecting a layout profile. You can edit both the profile PVI and profile entities using the grips displayed on selecting the design profile. Before you do so, ensure that you have invoked the required **PVI Based** or **Entity Based** tool from the **Profile Layout Tools** toolbar. Now, select the required profile from the profile view to activate profile grips; the square, circular, and triangular shaped grips will be displayed.

The square grip, if displayed at the end of the tangent, helps you to simultaneously modify the tangent length and the grade. Identify such a grip from the profile and select it; the grip turns red. Move the grip to change the length of the tangent as required. If the square grip is displayed at the midpoint of the tangent, then you can change the location of the tangent without affecting the tangent length and grade, but the location of the adjacent PVI and grade of the adjacent tangents will also be modified. To move the tangent to a new location, select the square grip at the midpoint of the tangent; the grip will turn red in color and you will be prompted at the command line to specify the stretch point. Now you can specify a new location by entering a value at the command line or using the dynamic input. You can also enter the value using the **Panorama** window or the **Profile Layout Parameters** dialog box.

The circular grip enables you to modify the radius and the triangular grip is used to modify the PVI at the point of intersection (marked by red color). Select the respective grips and stretch them to edit the geometry of the profile.

PROFILE AND PROFILE VIEW STYLES

You can control the appearance of a profile and its components by creating a profile style. You must remember that the profile styles and profile view styles are two separate entities. The profile styles and profile view styles are created and managed in the **Settings** tab of the **Toolspace** palette. The procedure to do so is discussed next.

Creating a Profile Style

To create a new profile style, choose the **Settings** tab of the **Toolspace** palette. Expand **Profile > Profile Styles** collection to view the default profile styles. Now, select and right-click on **Profile Styles** to display the shortcut menu. Choose **New** from the shortcut menu; the **Profile Style - New Profile Style** dialog box will be displayed, as shown in Figure 6-19. This dialog box is used to create a new profile style. The tabs in this dialog box are discussed next.

The Information Tab

This tab is chosen by default and is used to view and specify the general information about a style such as the name of the style, description, and so on. Enter the required name of the style in the **Name** edit box. Optionally, you can enter a short description for the style in the **Description** text box.

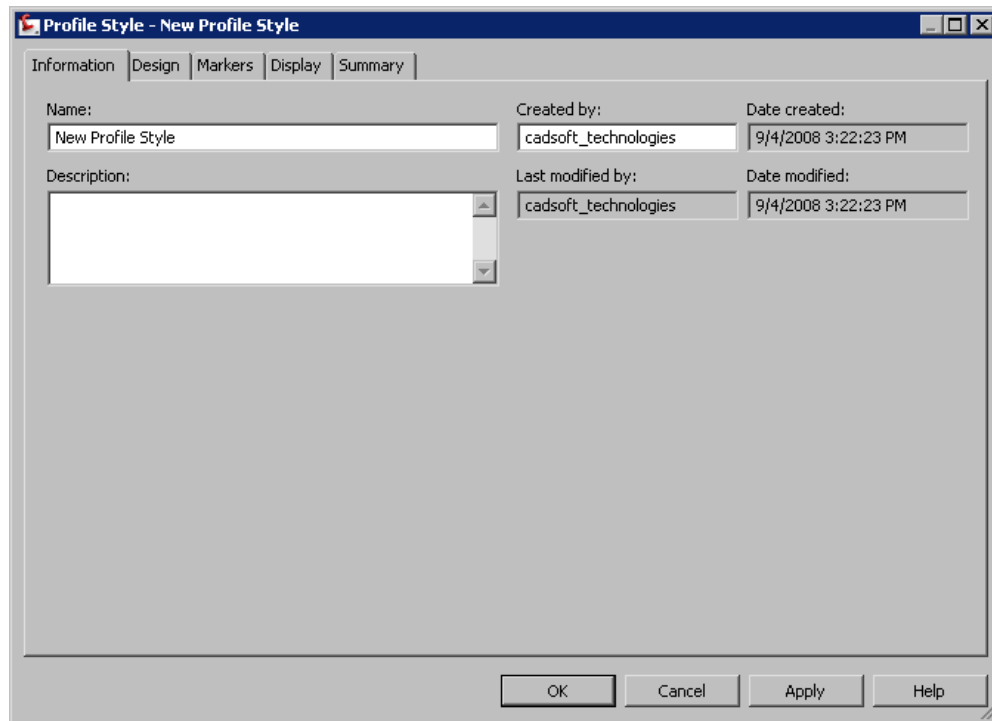


Figure 6-19 The Profile Style - New Profile Style dialog box

The Design Tab

This tab is used to specify the distance between the curve segments for a clear 3D display of the alignment data. Enter the required distance in the **Curve tessellation distance** edit box. Remember that smaller the value entered, smoother will be the display of the 3D curve.

The Markers Tab

This tab is used to control the display of the markers representing different points in the profile. The **Profile points** area of the **Name** column displays the names of various points in the profile and the **Marker Style** column displays the marker styles used to represent these points. You can select a marker style for points from the **Pick Marker Style** dialog box that is displayed when you double-click in the **Marker Style** column. If you do not want to display the points in the profile, set the marker style to **None**.

The options in the **Arrowhead** area are used to set the size, type, and display of the arrowhead for the profile direction. Select the required arrowhead style from the **Type** drop-down list and set the size of the arrowhead by selecting the required option from the **Size options** drop-down list.

The Display Tab

This tab is used to set the visibility and format of the profile components such as lines and curves. Select the required view from the **View Direction** drop-down list. The **Component display** area displays the names of different profile components in the **Component Type** column. By default, the visibility of all components is turned on which is indicated by the

yellow colored bulb icon in the **Visible** column. To turn off the visibility of a component, click on the bulb icon in the **Visible** column. Similarly, you can click on the default values in the **Layer**, **Color**, **Lineweight**, **LT Scale**, and **Linetype** columns and change the values of different components as required.

The Summary Tab

This tab displays different properties of a profile and is used to review and adjust the values of the profile style. Expand the required collection in this tab to review the values associated with the profile style. You can edit the values, if required. Note that only the values displayed in black color can be edited.

After setting the required parameters, choose the **OK** button, the **Profile Style - <style name>** dialog box will be closed and the style will be added in the **Profile styles** node of the **Settings** tab. Now, you can assign this newly created style to a profile by using the **Profile Properties** dialog box. Alternatively, you can use the **Create profile - Draw New** dialog box to assign the newly created style to a new profile.

Creating a Profile View Style

The profile view style controls the display of the grid in which the profile is drawn. The profile view styles also control the grid and profile annotations. Like the profile style, the profile view styles are also created and managed in the **Settings** tab.

To create a profile view style, expand **Profile View > Profile View Styles** in the **Settings** tab; the existing profile view styles will be displayed. Next, right-click on the **Profile View Styles**; a shortcut menu will be displayed. Choose **New** from the shortcut menu; the **Profile View Style - New Profile View Style** dialog box will be displayed, as shown in Figure 6-20.

You can use this dialog box to create a customized profile view style by changing the default settings in different tabs of this dialog box. The tabs in the **Profile View Style - New Profile View Style** dialog box are discussed next.

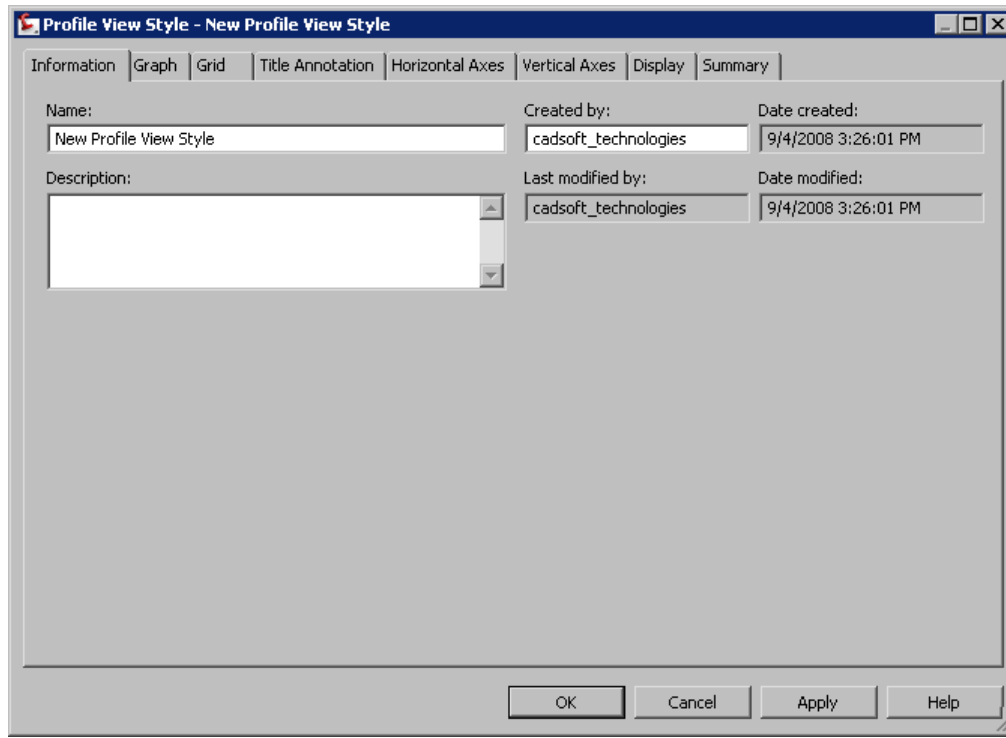
The Information Tab

This tab is used to view and enter the general information about the profile view style. Enter a name for the style in the **Name** edit box. Optionally, you can enter a short description in the **Description** text box.

The Graph Tab

This tab is used to specify the vertical scale and the direction of the profile view. The options in the **Vertical Scale** area help you set the scale for the profile view so that the elevations are clearly visible in it. You can set the vertical scale by selecting the required scale option from the **Vertical scale** drop-down list. The vertical scale is a ratio of horizontal scale and vertical exaggeration. Note that you can also specify a scale other than those available in the drop-down list. To do so, select the **Custom** option from the **Vertical scale** drop-down list and enter the required scale in the **Custom** scale edit box.

The **Current horizontal scale** text box specifies the overall drawing scale. This value cannot be edited directly in this dialog box. The horizontal scale can be edited only in the **Drawing**



*Figure 6-20 The **Profile View Style - New Profile View Style** dialog box*

Settings dialog box. Vertical exaggeration value is specified in the **Vertical Exaggeration** edit box. Enter the required value in the **Vertical exaggeration** edit box. This value specifies by how much the elevation values need to be increased in the profile view to gain greater visibility. You can either enter 1 for no change in scale or a value greater than 1 to increase the scale. The elevation values in the profile view are multiplied by this value. A greater value results in the increase of the amount of exaggeration in the profile view.

The **Profile view direction** area in this tab specifies the direction of the profile in the profile view. By default the direction is set from left to right such that the lowest station number starts from the left and the highest station number is on the right. To reverse the direction, select the **Right to left** radio button in this area. On doing so, the highest station number will be aligned to the right and the smallest station number station number to the left side.

The Grid Tab

This tab is used to specify the options to clip, pad, and offset the axis in the profile grid view. The **Grid options** area in this tab allows you to select the grid type that you want to clip. By default, the **Clip vertical grid** check box is selected. This specifies that all the vertical grid lines will always be clipped or trimmed and will be drawn below the profile line. The graphic below this check box shows the preview of the profile view with vertical clipping of the grid. If you select the **Clip to highest profile(s)** check box, the vertical grid lines in the profile view will be drawn to the highest profile in the profile view. On selecting the **Omit grid in padding areas** check box, the horizontal grid lines will not be drawn in the padding areas in the left and right side of the profile view.

Similarly, select the **Clip horizontal grid** check box to clip the horizontal grid. Figure 6-21 shows the clipping of vertical grid lines and Figure 6-22 shows the profile view with the both horizontal and vertical grid lines clipped after selecting the **Clip horizontal grid**, **Clip vertical grid**, and the **Omit grid in padding areas** (for horizontal grids) check boxes.

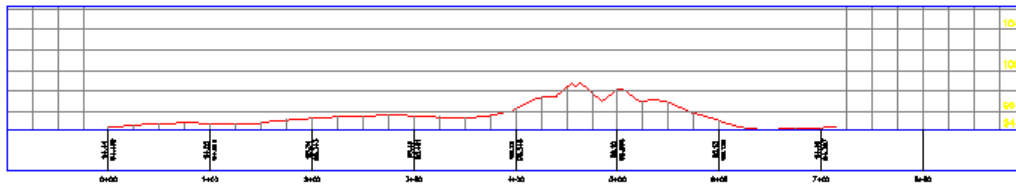


Figure 6-21 Vertical Clipping

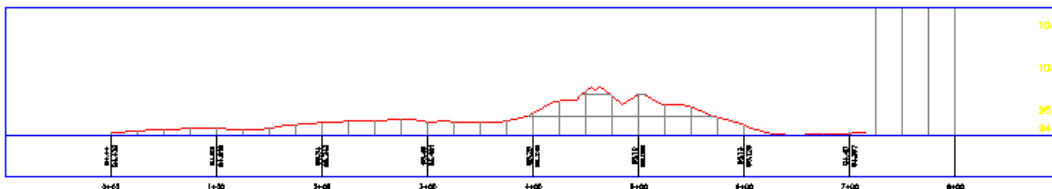


Figure 6-22 Horizontal and Vertical clipping

The **Grid padding (major grids)** area allows you to specify the distance or the major grid blocks that can be added to the profile view to increase its extents. Enter the number of major grid blocks to be added above the profile in the **Above maximum elevation** edit box; the profile grid view will be extended accordingly. Similarly, you can enter a value in the **To left**, **To right**, and **Below Datum** edit boxes to add the major grid blocks on the left, right, and bottom of the profile view, respectively. Similarly, specify the offset values for the axis in the **Axis offset (plotted units)** area. Now that the axis offset distance is specified in terms of plotted units, which are further based on the drawing units and the scale of the drawing specified in the **Drawing Settings** dialog box.

Title Annotation Tab

This tab is used to control the appearance of the graph view and the titles along the axis of the view. In the **Graph view title** area of this tab, select the text style for the title from the **Text style** drop-down list. Specify the text height in the **Text height** edit box. The **Title content text** box displays the content of the title. To modify the content, choose the button on the right of this text box, the **Text Component Editor - Title Text** dialog box will be displayed. You can use this dialog box to modify the content of the title. The options in the **Title position** area are used to specify the position of the title of the profile view. Select the location and the specify the justification of the title from the **Location** and the **Justification** drop-down lists, respectively. Optionally, you can specify the horizontal and the vertical offset values from the specified location and justification in the **X offset** and **Y offset** edit boxes, respectively. Select the **Border around the title** check box to draw a border around the title. On doing so, the **Gap** edit box will be enabled and you can specify the distance between the border and the title in this edit box.

Similarly, you can modify the default settings for the titles along the axis of the graph view. The titles of the axes will be displayed only if the visibility of the **Left Axis Title** and the **Right Axis Title** layers is turned on the **Display** tab.

The Horizontal Axes Tab

This tab is used to specify the settings for the tick marks placed along the top or bottom of the horizontal axis. Select the **Top** or **Bottom** radio button to select the axis along which you want to modify the settings for the tick marks.



Note

*Before you specify the settings for the tick marks, make sure that you have turned on the display of the required **Top**, **Bottom**, **Left**, or **Right** axis as well as the **Major** and **Minor** tick marks in the **Display** tab.*

In the **Major tick details** area, you can specify the interval or spacing between the Major ticks in the **Interval** edit box. You can specify the length of the tick marks in the **Tick size** edit box. From the **Tick Justification** drop-down list, select the position of the Major ticks to place them on the left, right or center of the axis. Next, enter a value in the **Text Height** edit box to specify the height of the text used to label the ticks. The **Tick label text** edit box specifies the label content of the ticks. To modify the property on the basis of which the tick marks are labeled, choose the button on the right of this edit box; the **Text Component Editor - Major Tick Text** dialog box will be displayed. Select the style for the tick label text from the **Text style** edit box. If you want the label text to incline at a certain angle to the axis, specify the angle for the rotation in the **Rotation** edit box. Similarly, you can specify the distance between the label and the tick marks horizontally in the **X offset** edit box. A negative value will move the label toward the left by the specified distance and a positive value will move the label to the right of the axis.



Note

*You can display the annotations for both the **Major** and **Minor** axes in the left and right directions of the profile view by turning on the visibility of the **Left Axis Annotation Major** and **Left Axis Annotation Minor** layers in the **Display** tab.*

In the same way, you can modify the default settings of the Minor tick marks and the label text in the **Minor tick details** area of this tab.

The Vertical Axes Tab

This tab is used to specify the settings for the tick marks placed along the left and right of the vertical axis. Options available in this tab are same as explained in the **Horizontal Axes** tab. You can select the **Tick and label at start** check box to place the tick mark and the tick label at the first station along the vertical axis.

The Display Tab

This tab is used to control the visibility and display of the components that form a profile view. Before specifying the settings for the appearance of any component, make sure that you turn on the component in the **Display** tab, so that you can easily view the changes made in the settings after choosing the **Apply** button.

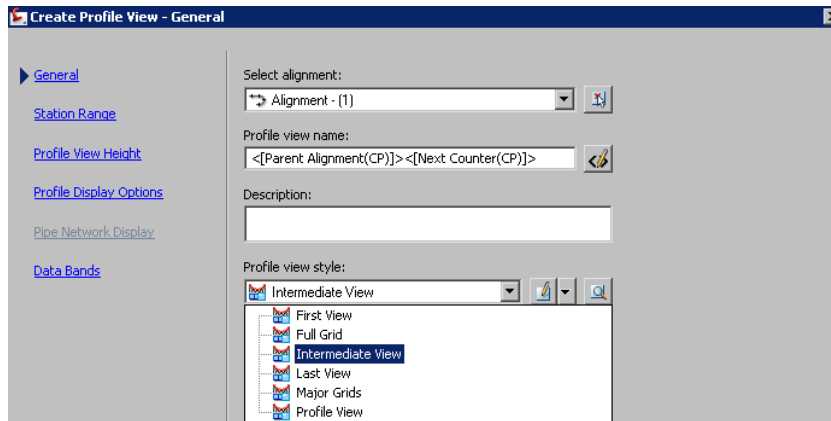
The Summary Tab

This tab helps you quickly review and change the settings specified in various tabs. In this tab, you can modify only those values that are highlighted in black.

Once you have specified the settings for the profile view style, choose the **Apply** button to view the changes or choose the **OK** button to close the **Profile View Style - New Profile View Style** dialog box. On doing so, the profile view style name will be added in the **Settings** tab. Now, if you want to view the style in the **Settings** tab, expand **Profile View > Profile View Styles** nodes in the **Settings** tab.

Assigning the Profile View Style

You can assign a profile view style to the profile view by selecting the desired style from the **Profile view style** drop-down list available in the **Create Profile View - General** wizard, as shown in Figure 6-23.



*Figure 6-23 Selecting the profile view style from the **Profile view style** drop-down list in the **Create Profile View - General** wizard*

Note that you can access this wizard only while creating the profile by using the **Create Profile from Surface** option.

Alternatively, to assign the required profile view style, select the profile view from the drawing area and right-click; a shortcut menu will be displayed. Choose **Profile View Properties** from the shortcut menu; the **Profile View Properties - <Profile name>** dialog box will be displayed. In this dialog box, select the required profile view style from the **Object style** drop-down list, as shown in Figure 6-24. Next, choose the **Apply** button to view the changes. Choose the **OK** button to close the dialog box.

PROFILE LABELS

You can label a profile by using the in-built profile label styles. The layout profiles can be labeled automatically using the **Create Profile - Draw New** dialog box, but you need to use the **Edit Labels** command to label other profiles. To label the layout profiles, select the

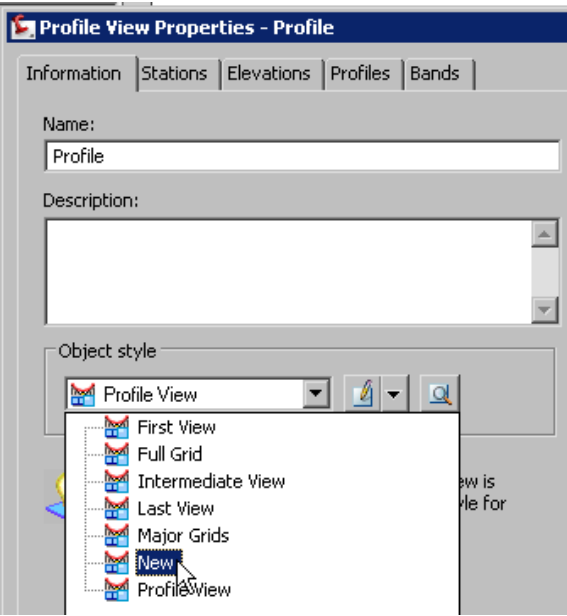


Figure 6-24 Partial view of the **Profile View Properties - Profile** dialog box displaying the profile view style in the **Object style** drop-down list



Tip. You can also invoke the **Profile View Properties** dialog box by choosing the **Prospector** tab and expanding the **Alignments** collection. Now, expand the parent alignment node and then expand the **profile Views** node under it to display the desired profile view. Select the desired profile view and right-click to display a shortcut menu. Choose the **Properties** option from the shortcut menu to display the **Profile View Properties** dialog box of the selected profile view.

Complete Label Set option from the **Profile label set** drop-down list of the **Create Profile - Draw New** dialog box, as shown in Figure 6-25. This label set consists of labels for the lines, grade breaks, sag curves, and crest curves. Next, choose the **OK** button. Once you draw the layout profile, all the lines, grade breaks, sag, and crest curves in the profile will be labeled automatically.

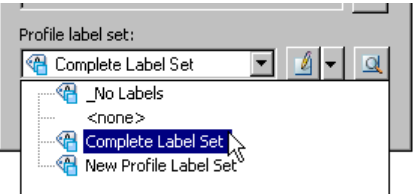


Figure 6-25 Selecting the profile label style from the **Profile label set** drop-down list

To label other profiles such as Surface profiles, Superimposed profiles, and so on, select the profile (represented by a red line) in the profile view and right-click to display the shortcut menu. Choose **Edit Labels** from the shortcut menu; the **Profile Labels - <profile name>** dialog box will be displayed, as shown in Figure 6-26.

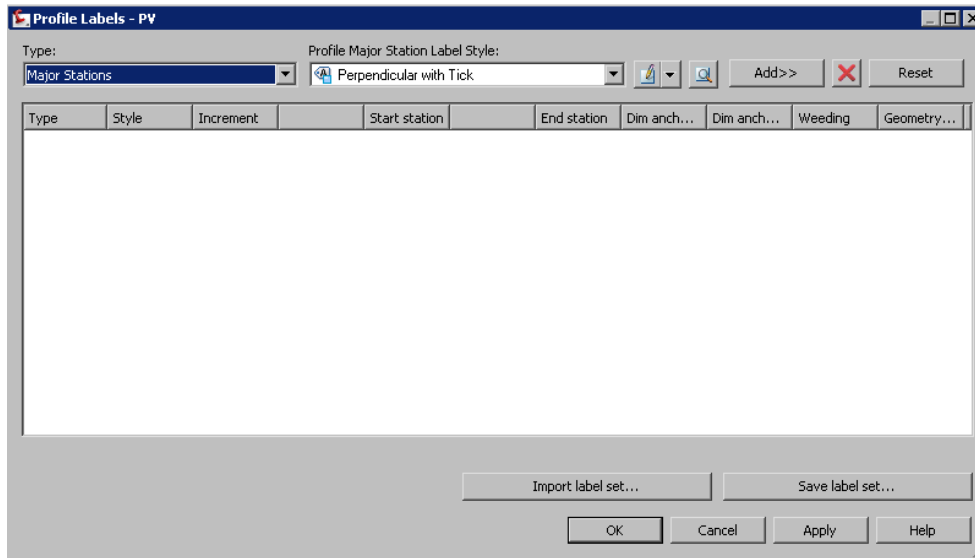


Figure 6-26 The *Profile Labels - PV* dialog box

Select the type of label to be added in the profile view from the **Type** drop-down list. Next, select the corresponding label style from the **Profile <type> Label Style** drop-down list on the right of the **Type** drop-down list. Next, choose the **Add** button to add the selected label type and label style in the table to create a label set. Similarly, select the other types and their styles and add them in the table to create various label sets. Choose the **OK** button; the labels will be added to the profile in the profile view.

Creating a New Profile Label Style

You can label the major and minor stations, sag and crest curves, horizontal geometry points, grade breaks, and lines in a profile view. You can also create your own label style to label all these components and then add them to label set.

To create a new label for a curve, expand **Profile > Label Styles** node from the **Settings** tab. Next, select and right-click on **Curve** in the **Label Style** collection to display a shortcut menu. Choose **New** from the shortcut menu; the **Label Style Composer - New Profile Curve Label Style** dialog box will be displayed, as shown in Figure 6-27.

You can create a label style for the curves by assigning the required values to various options in the **General** and **Layout** tabs. You can modify the values of the required properties and view the changes in the **Preview** area displayed in the **General**, **Layout** and the **Dragged State** tabs. Once you have defined the settings and specified the name of the new curve label style, choose the **OK** button; the new curve label style will be added in the **Curve** node of the **Profile** collection. To view the label style name, expand **Profile > Label Styles > Curve** in the **Settings** tab.

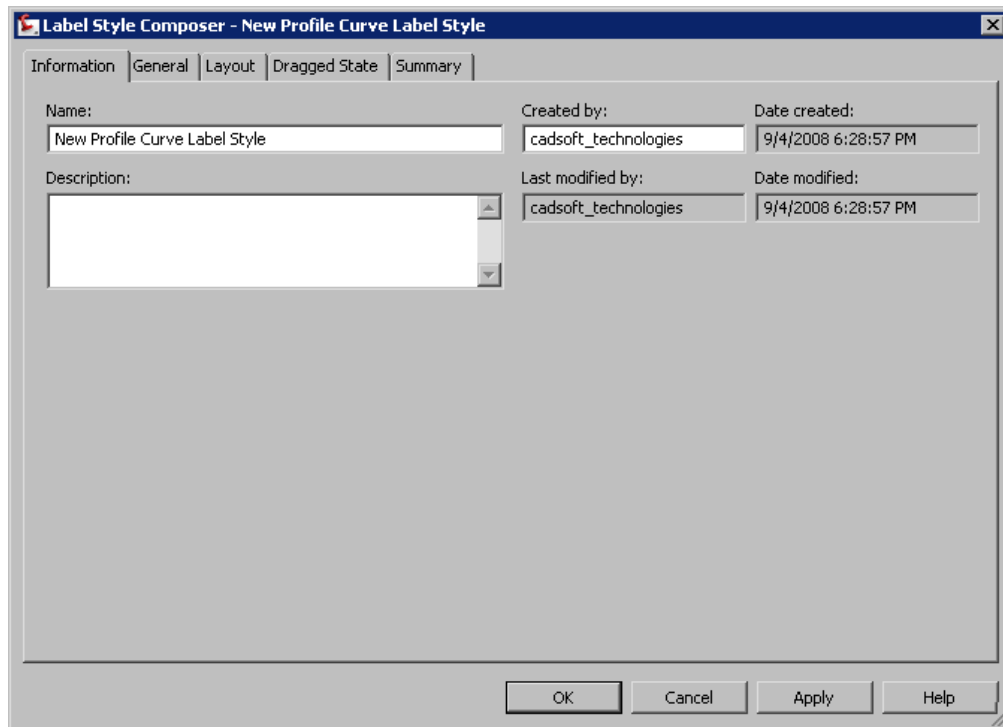


Figure 6-27 The Label Style Composer - New Profile Curve Label Style dialog box

Similarly, you can create your own label styles for other profile components such as Lines, Station, and Grade Breaks listed in the **Profile** collection of the **Settings** tab. Once you have created new label styles, you can add them to a label set and save the label so that you can retrieve it and use it again when required.

Creating a Label Set

To create a label set, expand **Profile > Label Styles** of the **Settings** tab. Right-click on **Label Sets** in the **Label Styles** node of the **Profile** collection; a shortcut menu will be displayed. Choose **New** from the shortcut menu; the **Profile Label Set - New Profile Label Set** dialog box will be displayed, as shown in Figure 6-28.

In this dialog box, by default, the **Information** tab is chosen. In this tab, you can enter a name for the label set in the **Name** edit box. Optionally, you can specify the description about the label set in the **Description** edit box. Next, choose the **Labels** tab and select **Crest Curves** from the **Type** drop-down list, as shown in Figure 6-28. Next, select the label style from the **Profile Crest Curve Label Style** drop-down list. Now, choose the **Add** button to add **Crest Curves** and the selected label style in the label set. On doing so, the selected label type and label style will be added and displayed in the table.

Similarly, you can select the label type and the label styles for other types of labels such as major stations, minor stations, and choose the **Add** button to add them in the label set. You

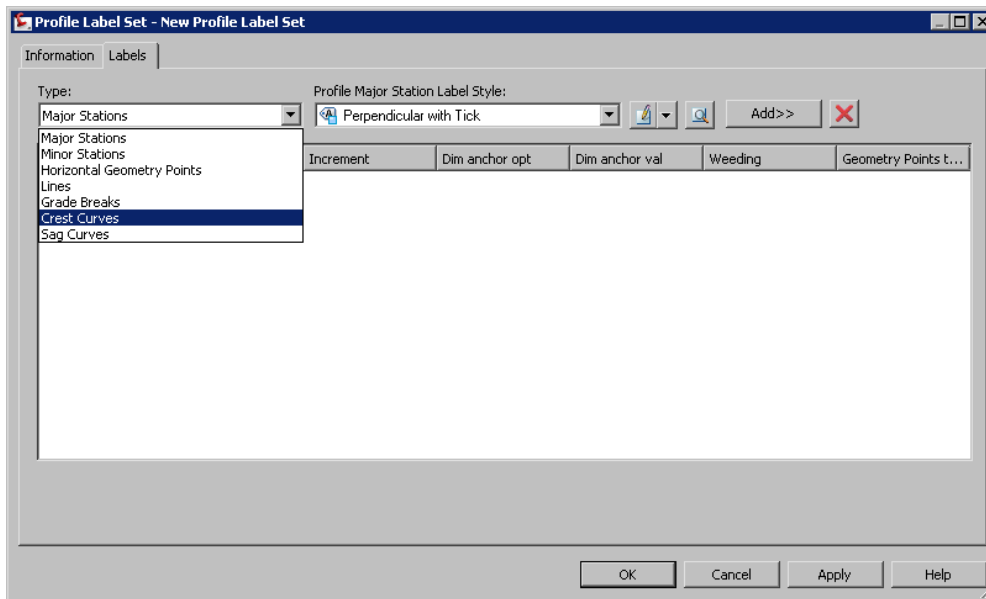


Figure 6-28 The Crest Curves option selected from the Type drop-down list in the Labels tab of the Profile Label Set - New Profile Label Set dialog box

can then use this label set to label the components with the selected label styles. Once you have created the label set, choose the **OK** button. The label style will be added in the **Profiles > Label Styles > Label Sets** collection in the **Settings** tab.

Assigning Labels to a Profile

Menu: Profiles > Add Profile View labels > Add/Edit Profile Labels

Shortcut Keys: ALT+S+D+A

You can assign labels to a profile view as a label set. To do so, choose **Profiles > Add Profile View labels > Add/Edit Profile View Labels** from the menu bar; you will be prompted to select a profile from the drawing. Select the required profile line in the profile view grid; the **Profile Labels - <profile name>** dialog box will be displayed.

To assign a label set consisting of the required label types and label styles, choose the **Import label set** button in the **Profile Labels - <profile name>** dialog box. On doing so, the **Select Style Set** dialog box will be displayed, as shown in Figure 6-29.

You can use this dialog box to select the required label set and assign it to a profile. After selecting the required label set from the **Select Style Set** dialog box, choose the **OK** button to close the **Select Style Set** dialog box; the label types and their corresponding styles will be displayed in the **Profile Labels - <profile name>** dialog box. Choose the **Apply** button to assign the labels and view them in drawing. Choose the **OK** button to close the **Profile Labels - <profile name>** dialog box.

To assign a label set to a layout profile, choose **Profiles > Profiles by Layout** from the menu bar; you will be prompted to select a profile view from the drawing. Select the desired profile

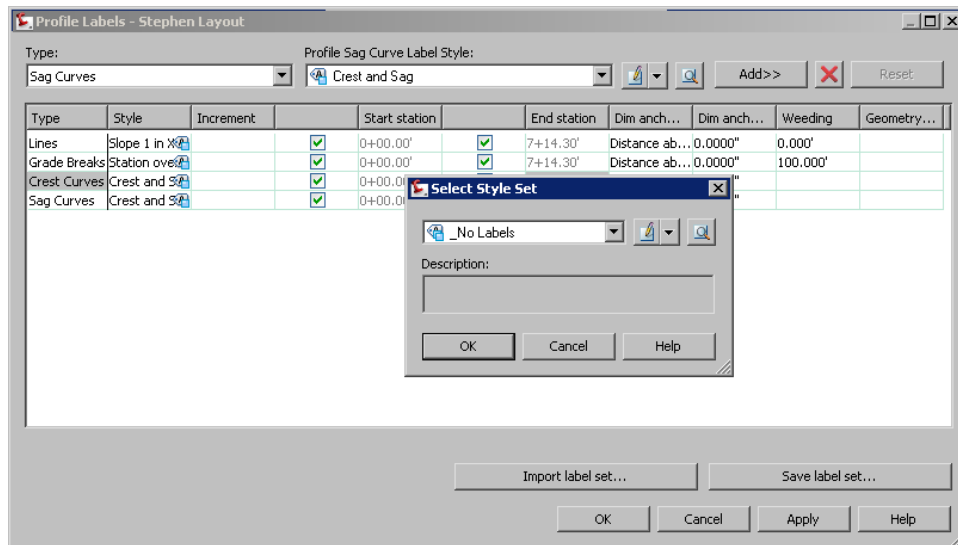


Figure 6-29 The **Select Style Set** dialog box displayed on choosing the **Import label set** button from the **Profile Labels - <profile name>** dialog box

view from the drawing; the **Create Profile - Draw New** dialog box will be displayed. Now, select the required label set from the drop-down list displayed in the **Profile label set** area of this dialog box and choose the **OK** button; the profile displayed in the drawing will be automatically labeled.



Tip. You can also assign labels to a profile view as a label set using another method. To do so, select the profile from the profile view grid in the drawing and right-click to display a shortcut menu. Choose **Edit Labels**; the **Profile Labels - <profile name>** dialog box will be displayed. This dialog box will help you to create the label set.

Creating a New Profile View Label Style

It is important to understand that the profile and profile views are two different things. Profiles are represented by a red line in the profile view. The profile view is the grid on which the profile is drawn. AutoCAD Civil 3D 2009 has some in-built profile view label styles for both profile and profile views. These styles can be accessed from the **Profile** and **Profile View** collections in the **Settings** tab.

To create a new profile view label style, expand **Profile View > Label Styles** in the **Settings** tab of the **Toolspace** palette. The profile labels are used to label the station elevation and depth of the station from the profile. Thus, you can create two types of profile view label styles, **Station Elevation** and **Depth**. The **Station Elevation** labels are used to label the elevation of a particular station from the datum. The **Depth** labels help you label the depth and can be used in earthwork projects involving cut and fill. The **Station Elevation** label displays the station and its elevation at a selected point in a profile view. The **Depth** label displays the difference of elevation between the two points selected in a profile view. To create a new label style to label the station elevation of the profile view, first, select and right-click on the **Station Elevation** option under the **Label Styles** node of the **Profile View** collections in the **Settings**

tab. On doing so, a shortcut menu will be displayed. Choose **New** from the shortcut menu; the **Label Style Composer - New Profile Station and Elevation Label Style** dialog box will be displayed.

Choose the **General** tab in this dialog box to specify the general properties of the label style such as text style, visibility, and so on. Choose the **Layout** tab to specify the format of the label components; as well as create and edit them. In the **General** category of the **Layout** tab, specify the required name, anchor point, and anchor component for the label of the station and elevation component. In the **Text** category of the **Layout** tab, click in the **Value** field of the **Contents** property and choose the browse button displayed. On doing so, the **Text Component Editor - Contents** dialog box will be displayed. You can use this dialog box to edit the label content, if required. Next, in the **Label Style Composer** dialog box, you can set the color, text height, attachment, and other properties of the label style. After doing so, choose the **OK** button to close the **Label Style Composer - < Label Style name>** dialog box. The new label style will be added in the **Station elevation** node.

Similarly, you can create a new **Depth** label style. To do so, right-click on **Depth** and choose **New** from the shortcut menu; the **Label Style Composer - New Profile Depth Label Style** dialog box will be displayed. You can invoke this dialog box to create a new depth label style. After creating the new depth label style, choose the **OK** button to close the **Label Style Composer - New Profile Depth Label Style**. The label style will be added in the **Depth** node in the **Settings** tab.

Adding Profile View Labels/Spot Labels

Menu: Profiles > Add Profile View Labels > Add Profile View Labels
Shortcut Keys: ALT+S+D+V

To add the profile view labels, choose **Profiles > Add Profile View Labels > Add Profile View Labels** from the menu bar; the **Add Labels** dialog box will be displayed, as shown in Figure 6-30.

To add the station elevation labels to the profile view, first ensure that **Profile View** is selected in the **Feature** drop-down list in the **Add Labels** dialog box, select **Station Elevation** from the **Label type** drop-down list. Select the required label style from the **Station elevation label style** drop-down list for the selected label type. From the **Marker style** drop-down list, select the marker to mark the station in the profile view grid that you want to label. Next, choose the **Add** button; you will be prompted to select a profile view. Select the required profile view; you will be prompted to specify the station. Note that a red line attached to the cursor will be displayed. Click in the profile view at the required location where you want to specify the station. Next, click again to specify the elevation; the station value and its elevation will be displayed in the profile view.

To add the depth labels to the profile view, select **Depth** from the **Label type** drop-down list in the **Add Labels** dialog box and select the required label from the **Depth label style** drop-down list. Choose the **Add** button and follow the prompts; the **Depth** labels will be added at the specified positions. Once you have added the labels, choose the **Close** button to close the **Add Labels** dialog box.

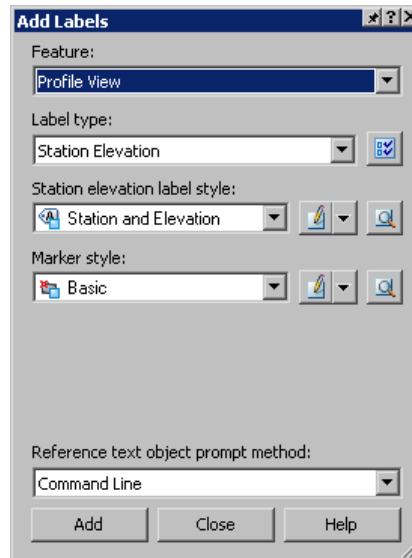


Figure 6-30 The Add Labels dialog box

Alternatively, you can directly add the **Station Elevation** and **Depth** labels in the profile view by first choosing **Profiles > Add Profile View Labels** from the menu bar and then choosing the **Station Elevation/Depth** option from the shortcut menu displayed. You will be prompted to select the profile view and then the station and elevation or depth. Select the desired profile view from the drawing and then specify the station and elevation or depth at which you want to add these labels. On doing so, the labels are assigned to the profile view.

BAND SETS AND BAND STYLES

Civil 3D allows you to add profile data such as profile, superelevation, cut and fill depths, vertical geometry, and so on in a consolidated form of band in the profile view. Band set is a collection of such profile data bands and band styles. Figure 6-31 shows a profile view with a band set at the bottom of the profile view.

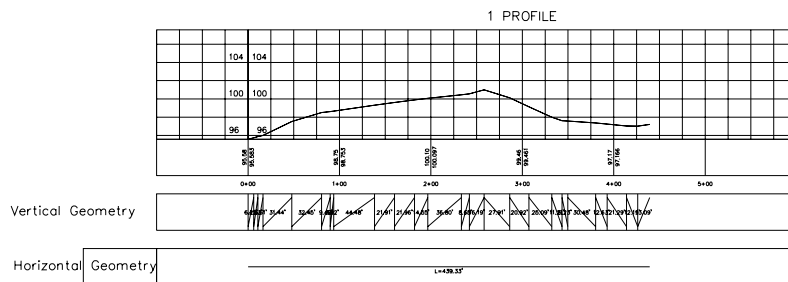


Figure 6-31 Profile view with the profile band

The profile bands can display the profile data for both the **Existing Ground** and the **Finished Ground** profiles. To create a profile view band style, expand **Profile View > Band Styles** in the **Settings** tab of the **Toolspace** palette. Next, select the **Band Sets** node and right-click; a shortcut menu will be displayed. Choose **New** from the shortcut menu; the **Band Set - New Profile View Band Set** dialog box will be displayed. Specify a name for the new band set in the **Name** edit box. Next, choose the **Bands** tab. Select the required band type from the **Band type** drop-down list and select the respective band style from the **Select band style** drop-down list. Now, choose the **Add** button; the **Geometry Points to Label in Band** dialog box will be displayed. This dialog box is used to select the profile and alignment geometry points that you want to label in the data band. The alignment geometry points that can be labeled are displayed in the **Alignment Points** tab and the profile geometry points are displayed in the **Profile points** tab of the dialog box. By default, all alignment and profile geometry points available in their respective tabs are selected. If required, you can clear the check boxes for the geometry points that you do not want to label. After specifying the required settings, choose the **OK** button to close the **Geometry Points to Label in Band** dialog box and return to the **Band Set - New Profile View Band Set** dialog box. Again, choose **OK**; the **Band Set - New Profile View Band Set** dialog box will be closed and the new band set will be added in the **Band Set** node. Expand the **Profile View > Band Styles > Band Set** node in the **Settings** tab to view the new band set style added.

Creating a Band Style (Framing a Band)

You can create a new band style for each individual band type component and add it in the band set. For example, to create a new style for the display of the vertical geometry data, expand **Profile View > Band Styles > Vertical Geometry** in the **Settings** tab to view the in-built style for the **Vertical Geometry**. To create a customized style, right-click on the **Vertical Geometry** node a shortcut menu will be displayed. Choose **New** from the shortcut menu; the **Vertical Geometry Band Style - New Vertical Geometry Band Style** dialog box will be displayed. The tabs in this dialog box are discussed next.

The Information Tab

In this tab, you can specify a name for the new band style in the **Name** edit box. Optionally, you can enter a short description about the style in the **Description** edit box.

The Band Details Tab

You can use this tab to design the format and contents of the band style. Select the text style for the band title from the **Text style** drop-down list, as shown in Figure 6-32. Various areas and options in this tab are discussed next.

Title Text

The **Title Text** area is used to specify the title, color, size, and other properties of the band title. From the **Title Text** area of the **Band Details** tab, choose the **Compose label** button; the **Label Style Composer - Band Title** dialog box will be displayed, as shown in Figure 6-33. In this dialog box, you can modify the title, color, size, and other properties of the band title in the **Text** category of this dialog box. To modify the title, click on the **Value** field of the **Contents** property; a button will be displayed on the right. Choose this button; the **Text Component Editor - Contents** dialog box will be displayed, as shown in Figure 6-34. Delete the existing title in the **Preview** window and specify the required band title. You can choose the **Format** tab in the **Text Component Editor - Contents** dialog box and specify the settings

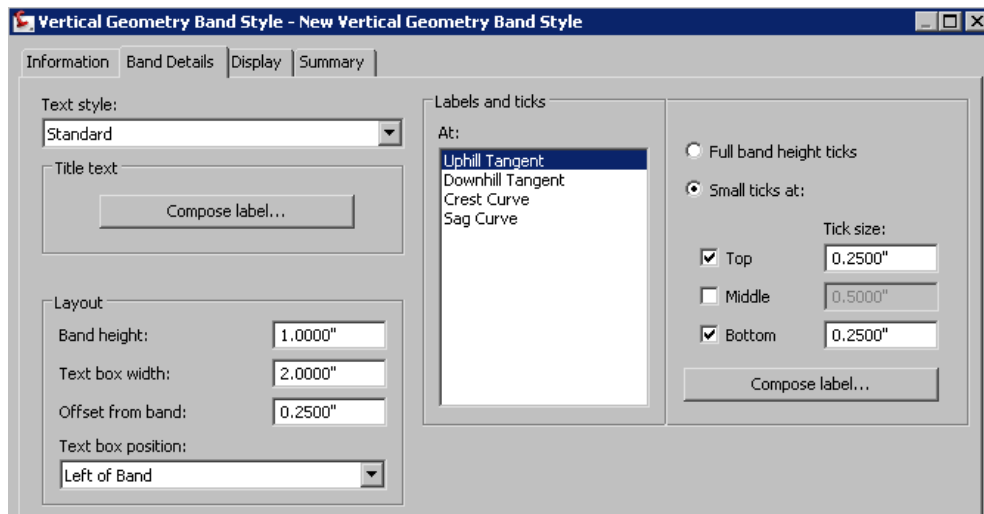


Figure 6-32 Partial view of the **Band Details** tab in the **Vertical Geometry Band Style - New Vertical Geometry Band Style** dialog box

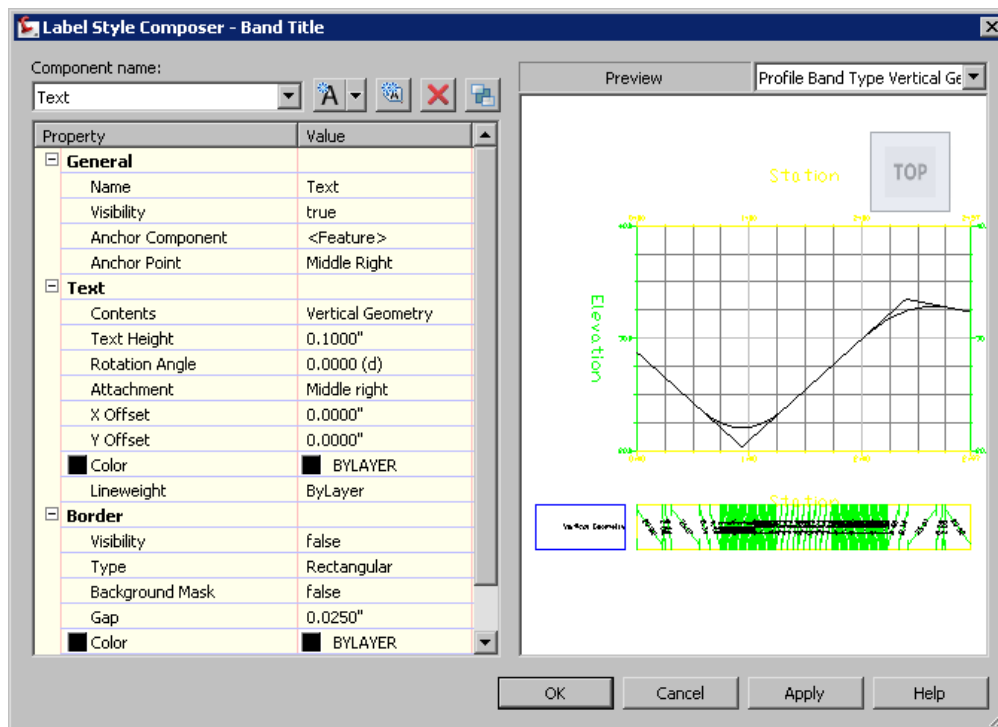


Figure 6-33 The **Label Style Composer - Band Title** dialog box

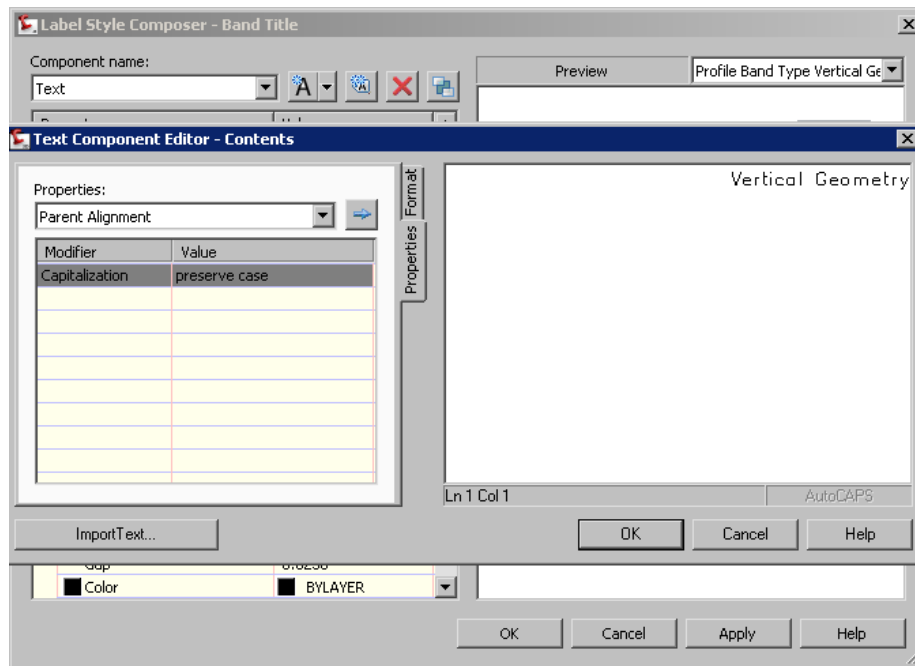


Figure 6-34 The Text Component Editor - Contents dialog box

for the format of the band title. Once you have modified and formatted the band title, choose the **OK** button; the new title will be displayed in the **Value** field of the **Contents** property and in the **Preview** window. After modifying the default settings for the band title, choose the **OK** button to close the **Label Style Composer - Band Title** dialog box.

Labels and ticks Area

The options in the **Label and ticks** area are used to specify the location and size of the ticks and labels in a profile view. The location where you add the labels and ticks differs according to the band label style selected. For creating vertical geometry band style, the ticks and labels can be added at different locations such as at uphill and downhill tangents, crest and sag curves. Similarly, for creating a band style for the horizontal geometry, you can add the ticks and labels at tangents, curves, or spirals.

After selecting the location, select the required options on the right of this area to specify the tick size. You can enter the tick size in the **Tick Size** edit boxes.

Layout Area

The options in the **Layout** area are used to specify the dimensions of the band and also the size and position of text box relative to the band. You can specify the band height in the **Band Height** edit box. Specify the width of the text box for the band title in the **Text box width** edit box. Specify the distance of the text box from the band in the **Offset from band** edit box. Select the position of the text box in respect to the band from the **Text box position** drop-down list. Once you have specified the settings for the new style for the **Vertical Geometry** band, choose the **OK** button. The band style will be added in the **Vertical Geometry** node of the **Band Styles** collection.

Choose the **Compose label** button to preview or edit the label text for the selected location. On choosing this button, the **Label Style Composer** dialog box will be displayed. You can use this dialog box to review or edit the label text properties and the content of the label text.

The Display Tab

This tab is used to set the display properties of the band style components in the selected view direction. You can select the required view direction from the **View Direction** drop-down list. Similarly, you can set the visibility and other display properties of the profile view band style components listed in the **Component Display** area of this tab. You can set also different properties of the band style components such as the band border, band title box, ticks, and so on in this tab.

The Summary Tab

This tab is used to review and edit the values of the band style, if required. You can expand the required collections and edit the values in black.

After specifying and customizing the band style properties, choose the **OK** button to exit the **Vertical Geometry Band Style** dialog box. The new vertical geometry band style will be added in the **Vertical Geometry** node in the **Settings** tab. Similarly, you can create other band styles. Now, to assign the created band style, select the required profile view from the drawing and right-click; a shortcut menu will be displayed. Choose **Profile View Properties** from the shortcut menu; the **Profile View Properties** dialog box for the selected profile will be displayed. Choose the **Bands** tab and then select **Vertical Geometry** from the **Band type** drop-down list. Choose the **Add** button to add it into the table. Next, select the band style from the **Select band style** drop-down list. Choose the **Apply** button to update the profile and view the changes. Next, choose the **OK** button to close the **Profile View Properties** dialog box.

Similarly, you can create a band style for all band types, add them to a band set, and apply the band set consisting of the required band types and band styles to the profile view.

PROFILE PROPERTIES

You can view the profile properties and the design criteria of the profile using the **Profile Properties** dialog box. To invoke the **Profile Properties** dialog box, select a profile from the drawing and right-click to display a shortcut menu. Choose **Profile Properties** from the shortcut menu displayed; the **Profile Properties - <profile name>** dialog box will be displayed, as shown in Figure 6-35.

In this dialog box, the **Information** tab displays the profile name. You can edit the profile name by specifying a new name in the **Name** edit box. Optionally, you can enter a short description in the **Description** text box. Select the required profile style from the **Object style** drop-down list.

The **Profile Data** tab displays the structural profile data such as the profile name, profile type, data source of the profile, offset distance from centerline of the parent horizontal alignment, the update mode of the profile, and start and end stations of parent horizontal alignment. You can also modify the profile style, update mode, and layer of the profile in this tab.

The **Design Criteria** tab helps you to view the design criteria used to create the design profile. If a design criteria is not already applied to the profile, select the **Use criteria-based**

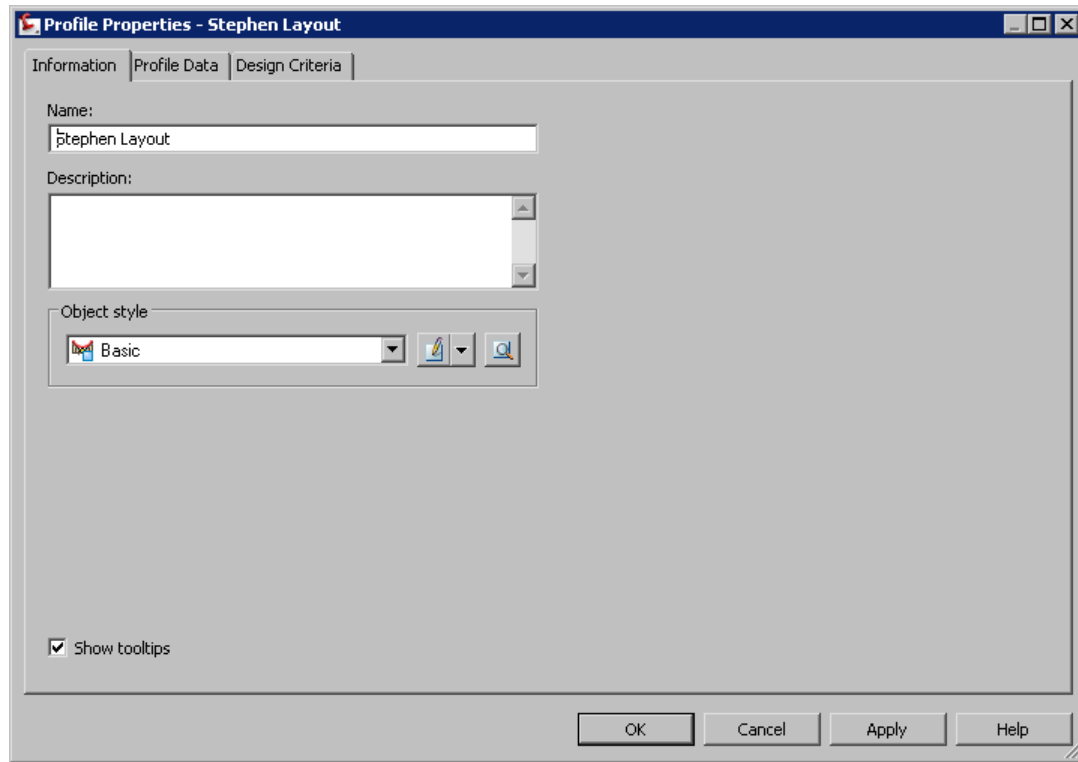


Figure 6-35 The *Profile Properties - Stephen Layout* dialog box

design check box and select the design criteria file. To apply a design check, select the **Use design check set** check box and select the required design check set from the **Use design check set** drop-down list.



Note

If the parent horizontal alignment is not assigned with any design criteria, you cannot assign a design criteria to the profile.

PROFILE VIEW PROPERTIES

A profile view also has its own properties. To view or edit the profile properties, select the required profile view grid in the drawing and right-click to display a shortcut menu. Choose **Profile View Properties** from the shortcut menu; the **Profile View Properties - <profile view name>** dialog box will be displayed, as shown in Figure 6-36.

The **Information** tab in this dialog box is used to view or edit the profile view name and the profile view style. Enter the required name in the **Name** edit box and select the required profile view style from the **Object style** drop-down list.

The **Stations** tab is used to view or edit the station range of the profile view. To modify the profile view range, select the **User specified range** radio button and choose the button on the right of the first edit box to pick the first station of the range from the drawing. Similarly, choose the button on the right of the second edit box and select the end station from the drawing directly.

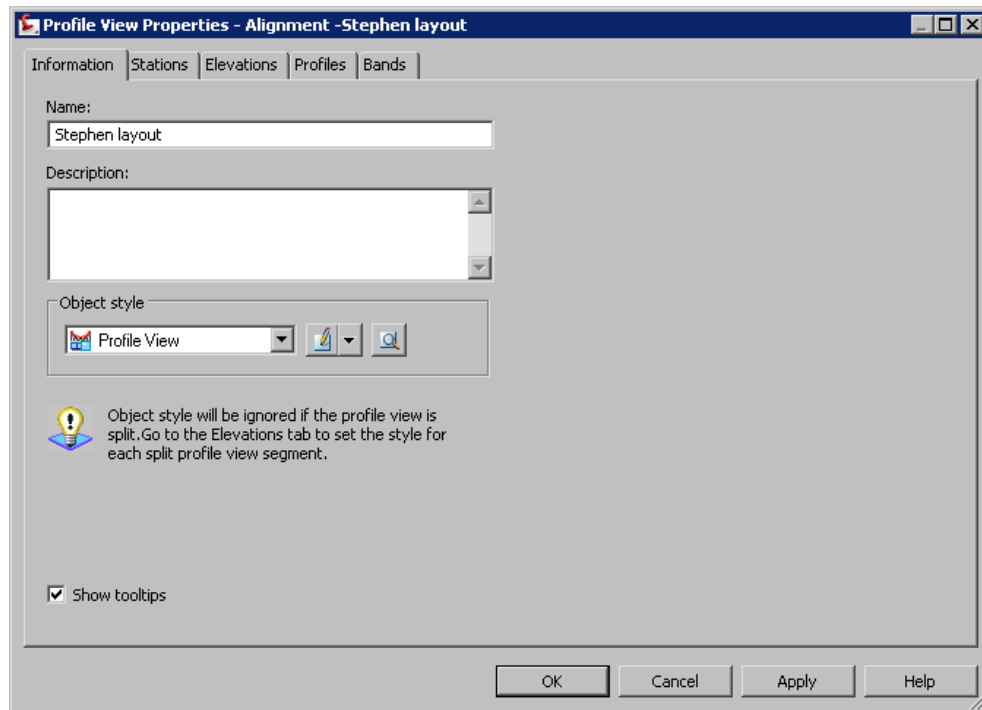


Figure 6-36 The *Profile View Properties - Alignment - Stephen layout* dialog box

Now, choose the **Apply** button; the profile view will be modified based on the new station range.

The **Elevations** tab is used to view or edit the vertical range of the profile view and also specify the settings to split the profile view.

TUTORIALS

Tutorial 1

Existing Ground Profile

In this tutorial, you will create a ground profile by sampling a surface across the given alignment. You will also create an offset profile and a staggered/split profile view, as shown in Figure 6-37.

(Expected time: 30 min)

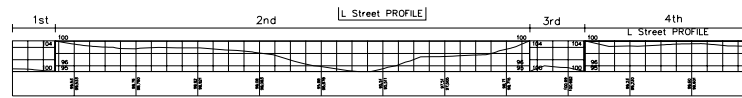


Figure 6-37 The *split profile view*

The following steps are required to complete this tutorial:

- Download *civil-3d-2009-c06-tut-1.dwg* from the http://www.cadcim.com/civil_3d_2009/civil_3d_2009.htm link.

- b. Create a profile using the **L Street (1)** alignment.
- c. Create a split profile using the **L Street** alignment.
- d. Name the profile view
- e. Draw the profile view.
- f. Save the file.

Opening the File

1. Choose **File > Open** from the menu bar; the **Select File** dialog box is displayed.
2. Browse to the required location where you have saved the *civil-3d-2009-c06-tut-1.dwg* and choose the **Open** button to open the file. The file consists of a surface (**Surface 1**) and two alignments, **L Street** and **L Street (1)**, as shown in Figure 6-38.

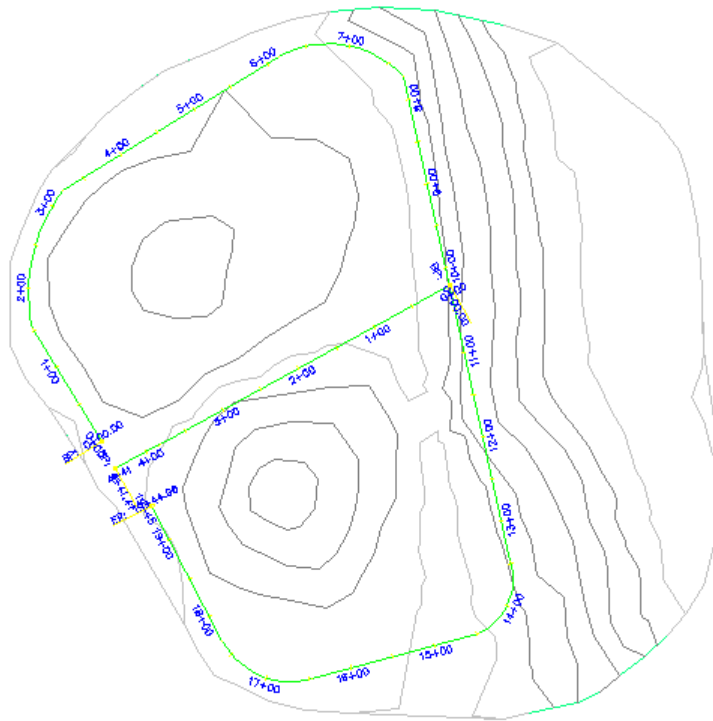


Figure 6-38 The view of surface (Surface 1) and the alignments

Creating a Profile

You will now create an existing ground profile created from the surface profile by sampling the given surface along the given **L Street** alignment.

1. Choose **Profiles > Create Profile from Surface** from the menu bar; the **Create Profile from Surface** dialog box is displayed.
2. Select **L Street (1)** from the **Alignments** drop-down list, if it is not already selected.
3. Select **Surface 1** from the **Select Surfaces** area and choose the **Add** button to add the profile in the **Profile list** area.

4. Select the **Sample offsets** check box to enable the **Sample offsets** edit box.
5. Enter **20** in the **Sample offsets** edit box and again select **Surface 1** from the **Select Surfaces** area.

**Note**

On entering a negative offset value, the offset profile will be displayed below the original profile.

6. Choose the **Add** button to add the offset profile in the **Profile list** area.

Creating a Profile View

Once you have sampled the surface, you need to draw the profile in a profile view.

1. Choose the **Draw in Profile View** button at the bottom of the **Create Profile from Surface** dialog box; the **Create Profile View - General** wizard is displayed.
2. **Select L Street (1)** from the **Select alignment** drop-down list.
3. In the **Profile view name** edit box, enter **Street 1**.
4. Accept the default profile view style and choose the **Profile View Height** option on the left of the wizard; the **Profile View Height** page of the **Create Profile View** wizard will be displayed.
5. Select the **User specified** radio button from the **Profile view height** area of the **Profile View Height** page.
6. Enter the minimum and maximum values in the respective edit boxes on the right of the **User Specified** radio button in this area, as shown in Figure 6-39.

Profile view height	
<input type="radio"/> Automatic	Minimum: 97.75' Maximum: 101.62'
<input checked="" type="radio"/> User specified	Minimum: 97.00' Maximum: 107.00'

Figure 6-39 User specified values for the profile view height

7. Choose **Create Profile View** button from the **Profile View Height** page of the **Create Profile View** wizard, you are prompted to select the origin of the profile view.
8. Click in the drawing area to place the profile view in the selected origin; the profile view and the offset are created, as shown in Figure 6-40.

The two profiles, the offset profile and the original profile, are added in the **Profiles** node of the parent **L Street (1)** alignment collection as **Surface1 - 20.000** (at 20' offset) and **Surface1 - Surface (1)** in the **Prospector** tab, as shown in Figure 6-41. To view the profile, expand **Alignments > L Street (1) > Profiles** in the **Prospector** tab of the **Toolspace** palette.

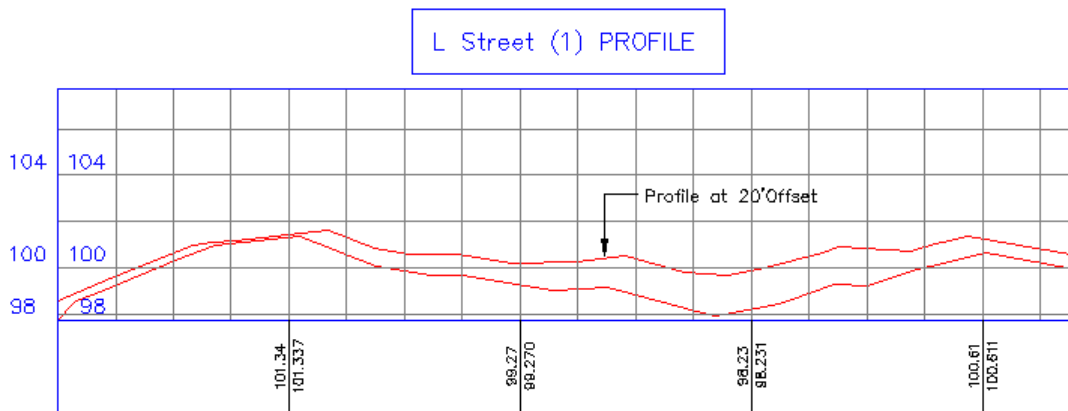


Figure 6-40 The L Street (1) Profile view with an offset profile

The profile view is added in the **Profile Views** node as **Street 1**, as shown in Figure 6-42. To view the profile view of the created profile, expand **Alignments > L Street (1) > Profile Views** in the **Prospector** tab.

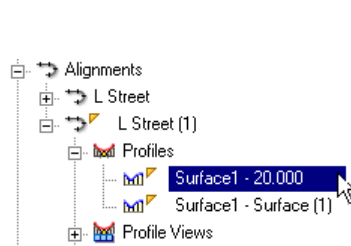


Figure 6-41 Added profiles in the Profiles node of the L Street (1) alignment

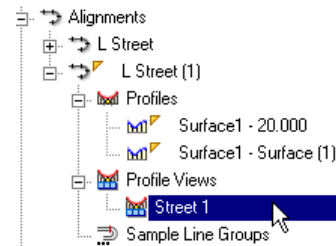


Figure 6-42 The Street 1 profile view in the Profile Views node of the L Street (1) alignment

Creating a Split/Staggered Profile View

In case of long profiles, you can split the profile view in different parts to view and fit the profile in the drawing.

1. Choose **Profiles > Create Profile View** from the menu bar; the **Create Profile View - General** wizard is displayed. Ensure that **L Street** is selected in the **Select alignment** drop-down list.
2. Enter **View L** in the **Profile view name** edit box.
3. Select **Full Grid** from the **Profile view style** drop-down list.
4. Choose the **Next** button; the **Create Profile View - Station Range** page of the wizard is displayed.
5. In the **Station range** area, select the **User specified** radio button, if not selected.

6. In the **Station range** area, select the button on the right of the first edit box to pick the first station from the drawing.
7. Zoom in the drawing and click at **6+00** station tick mark to pick the first station.
8. Similarly, choose the button on the right of the second edit box and click at **18+00** station tick mark to pick the end station to sample.

**Note**

The exact position of the station is not necessary and the values can differ slightly.

9. Choose the **Next** button to display the **Profile View Height** page of the **Create Profile View** wizard.
10. In the **Profile view height** area, select the **User specified** radio button, if it is not selected. Ensure that the **Split profile view** check box is selected.
11. Set the values in the **Profile view height** and **Split profile view** areas, as shown in Figure 6-43.

Figure 6-43 Specifying the profile view height settings for split profiles

12. Choose the **Next** button in the **Create Profile View** wizard to display the **Profile Display Options** page of the wizard. Make sure that the check box in the **Draw** column and the radio buttons in the **Clip Grid** and **Split At** columns are selected.
13. Next, choose the **Create Profile View** button in the **Profile Display Options** page of the **Create Profile View** wizard; the *Select profile view origin* prompt is displayed at the command line.
14. Click in the drawing area to specify the origin of the profile view; the profile view is displayed, as shown in Figure 6-44. The profile is split in four views.

This completes the tutorial.

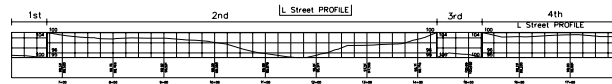


Figure 6-44 The Split profile view for the **L Street** alignment

Saving the File

1. Choose **File > Save As** from the menu bar; the **Save Drawing As** dialog box is displayed.
2. Browse to the *My Documents\civil_3d* folder.
3. Save the file as *c06-tut-1a*.

Tutorial 2

Layout Profile

In this tutorial, you will create a layout profile, using the **Profile Layout** tools and the design criteria, as shown in Figure 6-45. Also, you will learn to rectify the design error.

(Expected time: 30 min)

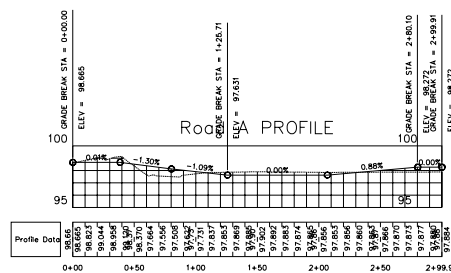


Figure 6-45 The **Road A** profile view

The following steps are required to complete this tutorial:

- a. Download the *civil-3d-2009-c06-tut2.dwg* file from the http://www.cadcim.com/civil_3d_2009/civil_3d_2009.htm link.
- b. Invoke the **Create Profile by Layout** command to display the **Profile Layout Tools** toolbar.
- c. Use the tools from the **Profile Layout Tools** toolbar to create a layout profile as per the design.
- d. Edit the design error
- e. Save the file.

Opening the File

1. Choose **File > Open** from the menu bar; the **Select a Drawing** dialog box is displayed.
2. Browse to the location where you have saved the file and choose the **Open** button to open the file. The *civil-3d-2009-c06-tut-2.dwg* file consists of a surface and **Road A** profile view.

Creating a Layout Profile

1. Choose **Profiles > Create Profile by Layout** from the menu bar; you are prompted to select a profile view.
2. Select the **Road A** profile view from the opened drawing; the **Create Profile - Draw New** dialog box is displayed.
3. Enter **Profile A** in the **Name** edit box of this dialog box.
4. In **General** tab of this dialog box, accept the default profile style and then choose the **Design Criteria** tab.
5. In the **Design Criteria** tab, select the **Use criteria-based design** check box to apply the design criteria to the layout profile. Accept the default values in this tab. The design criteria values are obtained from a design criteria file that is provided with Civil 3D 2009 and is applied automatically when you select the **Use criteria-based design** check box.
6. Choose the **OK** button; the **Create Profile - Draw New** dialog box is closed and the **Profile Layout Tools - Profile A** toolbar is displayed.

Using Profile Layout Tools

1. Note that the **Draw Tangents without Curves** tool is invoked by default. Invoke the **Draw Tangents without Curves** tool from the toolbar; you are prompted to specify the start point.
2. Turn on the **OSNAP** (F3) option and zoom in the profile view.
3. Move the cursor to the center of the first circle in the profile view and click on it to specify the start point.
4. At the *Specify end point* prompt, click at the center of the second circle, as shown in Figure 6-46. Note that a Cyan colored tangent is created connecting the centers of the two circles.

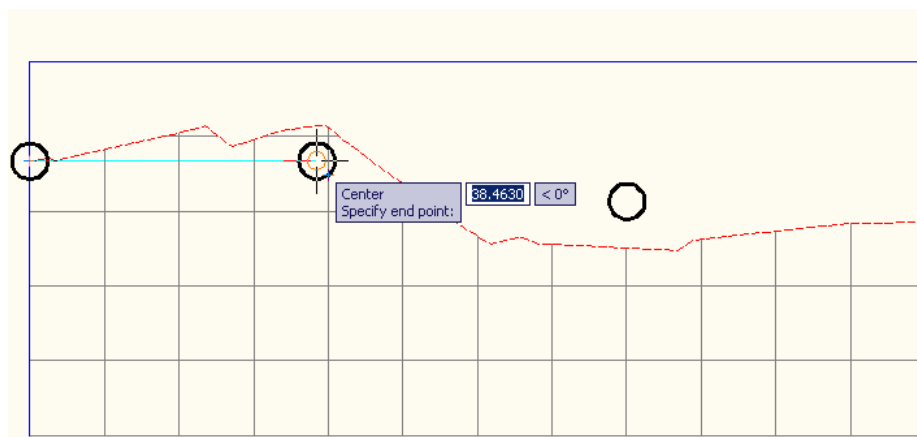


Figure 6-46 Specifying the first and the second points of first tangent

5. Similarly, continue creating a tangent by snapping it to the centres of all circles.
6. Right-click after you have snapped to the center of the last circle. Thus, you have created a profile consisting of tangents connecting the point of vertical intersections (PVIs), as shown in Figure 6-47.

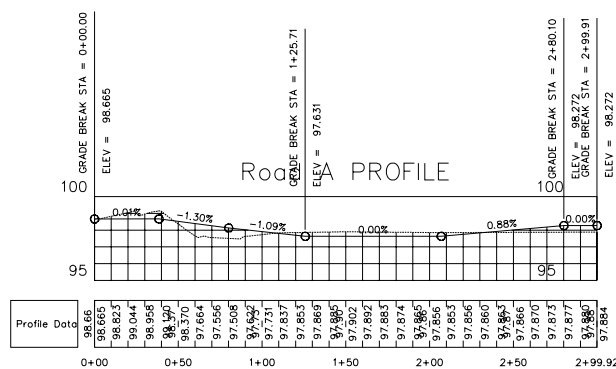


Figure 6-47 The layout profile

Now, you will add curves to tangents using different tools from the **Profile Layout Tools** toolbar.

Adding Curves

1. Choose the down arrow on the left of the **Draw fixed parabola by three points** tool and choose the **Free Vertical Curve (Parameter)** tool from the flyout, as shown in Figure 6-48.
2. Zoom in to the second circle on the left of the profile view to add a curve and select the tangent entering the second circle; you are prompted to select the next entity.
3. Now, select the tangent that leaves the second circle on the right; the *Specify curve length or [Radius/K] <150.043>* prompt is displayed at the command line.

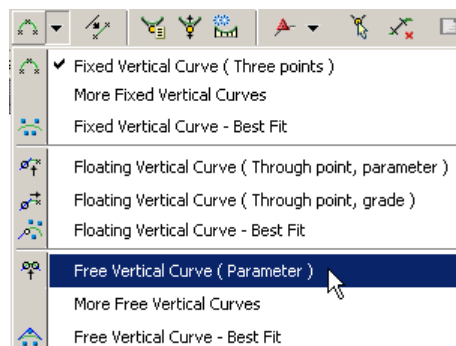


Figure 6-48 Invoking the **Free Vertical Curve (Parameter)** tool

4. Enter **R** for radius at the command line and press ENTER; you are prompted to specify a radius.

**Note**

The default radius values displayed at the command line are obtained from the design criteria file and can vary depending on the design criteria file assigned to the project.

5. Enter **5000** at the command line and press ENTER; a free vertical curve is added between the tangents on the left and right of the second circle. Note that a violation symbol is displayed on the curve, as shown in Figure 6-49.

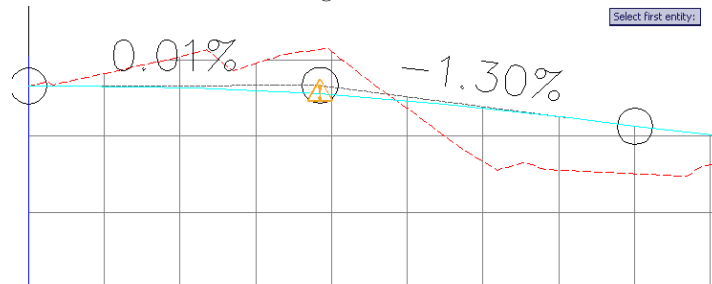



Figure 6-49 The vertical curve with the violation symbol on it

6. Now, choose the down arrow on the left of the **Free Vertical Curve(Parameter)** tool and choose **More Free Vertical curves > Free Vertical Parabola (PVI based)** from the cascading menu; you are prompted to pick a point near a PVI. 
7. Zoom in to the fifth circle from the left of the profile view and click on the second grid on the left of the fifth circle, as shown in Figure 6-50.

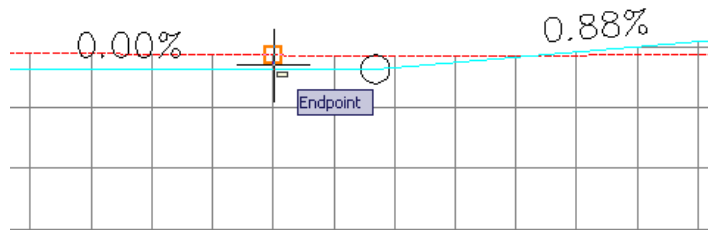


Figure 6-50 Picking a point near a PVI

The center of the fifth circle is a Point of Vertical Intersection. Thus, you have picked a point near a PVI. On doing so, the *Specify curve length or [Passthrough/K] <100.659'>:* prompt is displayed at the command line.

8. Press ENTER to accept the default value of the curve length displayed at the command line; a free PVI-based curve is added between the tangents and it is labeled, as shown in Figure 6-51.

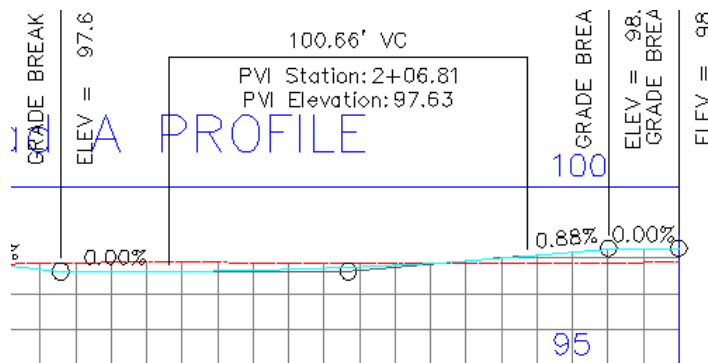


Figure 6-51 The Free Vertical Curve (PVI based) added between the tangents


- 9 Now, right-click in the drawing to end the command. Thus, you have created a layout profile with tangents and free vertical curves. Now, you will correct the violation error.



Tip. If you have closed the **Profile Layout Tools** toolbar, select the layout profile (Cyan colored) from the profile view in the drawing and right-click. Choose **Edit Profile Geometry** from the shortcut menu displayed.

Correcting the Violation Error

In this section, you will rectify the violation errors.

1. Invoke the **Entity based** tool from the **Profile Layout Tools** toolbar. 
2. Next, invoke the **Profile Layout Parameters** tool to display the **Profile Layout Parameters** dialog box.
3. Zoom at the violation error and move the cursor over the violation symbol; a tooltip message showing the type of error is displayed, as shown in Figure 6-52. In this case, the message reads minimum K value for Stopping Sight Distance criteria is violated.

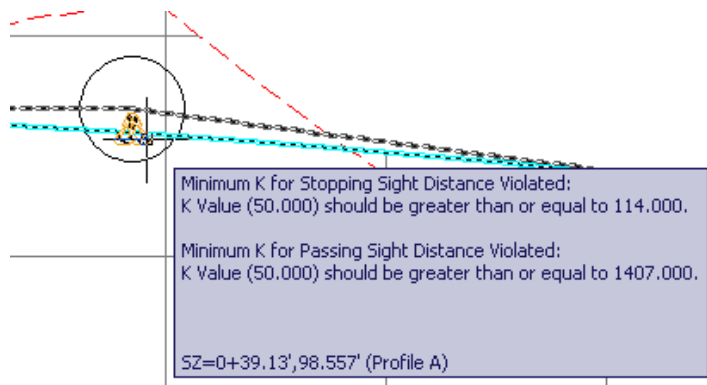


Figure 6-52 The tooltip displayed with the violation message

4. Now, invoke the **Select Entity** tool and select the curve on which the violation error is displayed; the curve parameters and their values will be displayed in the **Profile Layout Parameters** dialog box, as shown in Figure 6-53.

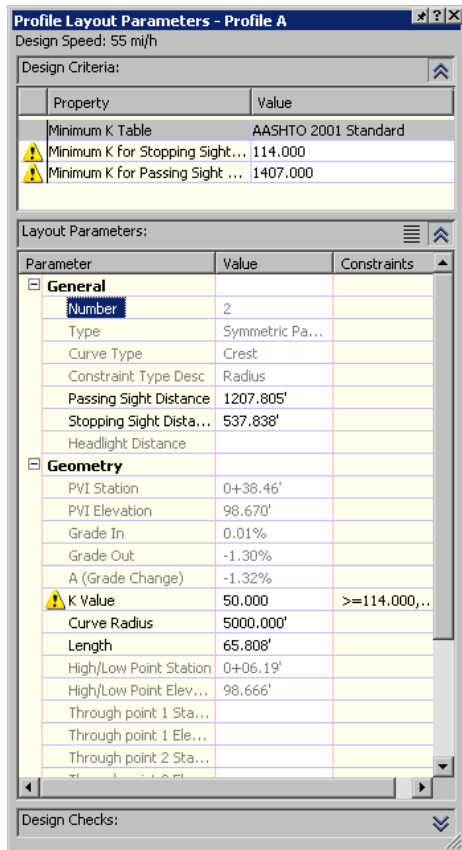


Figure 6-53 The **Profile Layout Parameters** dialog box

In this dialog box, you can see that a violation symbol is displayed along with the **K Value** parameter. This symbol is displayed at the top of the dialog box showing that the minimum K value is violated for both the Stopping Sight distance and the Passing Sight Distance. You can also see that the minimum K value required to meet the criteria is displayed in the tooltip and also, in the **Constraints** column. Therefore, in this case, the violation symbol will be removed only if the K value for both the rules is satisfied. The minimum K value required for the Stopping Sight Distance should be greater than or equal to 114.00, and the minimum K value for the Passing Sight Distance is 1407.00. You cannot satisfy both the requirements in this case as there are two types of design criteria violation at the same station.

There are two ways to solve this problem. The first one is to assign a new design speed at the station where the curve starts violating the criteria. The second option is to annotate the station range of the curve as the No Passing Zone. You can try any of these two ways and proceed further. In the current tutorial, even assigning a new design speed at the

station, where the alignment begins, will not solve the problem. So you will have to follow the second option.

Thus, you have completed this tutorial and created a Layout Profile, as shown in Figure 6-54.

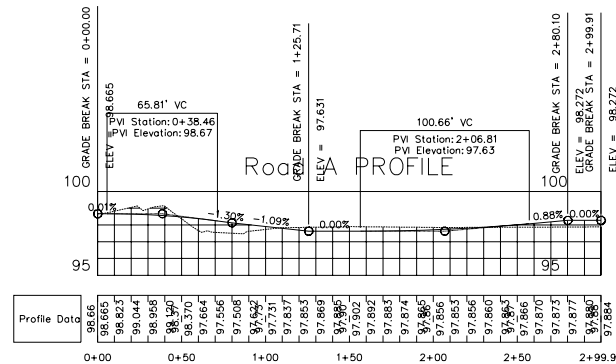


Figure 6-54 The completed layout profile

Saving the File

1. Choose **File > Save As** from the menu bar; the **Save Drawing As** dialog box is displayed.
2. Browse to the *My Documents\civil_3d* folder.
3. Save the file as *c06-tut-2a*.

Tutorial 3

Superimposed Profile

In this tutorial, you will create a superimposed profile and view the elevation difference between two profiles. You will also create multiple views and stacked profile views, as shown in Figures 6-55. **(Expected time: 30 min)**

The following steps are required to complete this tutorial:

- Download the *civil-3d-2009-c06-tut-3.dwg* file from the http://www.cadcam.com/civil_3d_2009/civil_3d_2009.htm website.
- Superimpose the **Street 2** profile over the **Andrews Drive** profile view.
- Create multiple views of the **Andrews Drive** profile view.
- Save the file.

Opening the File

1. Choose **File > Open** from the menu bar; the **Select Drawing File** dialog box is displayed.
2. Browse to the location where you have saved the *civil-3d-2009-c06-tut-3.dwg* and choose the **Open** button to open the file. The file consists of a surface and two profile views,

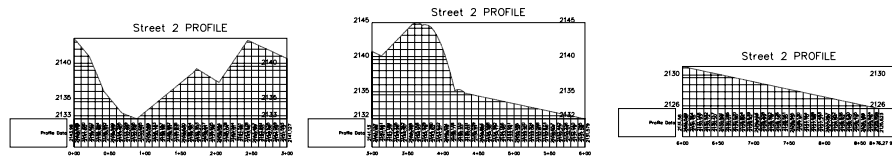


Figure 6-55 The Multiple profile views

Andrews drive and **Street 2** profile views, as shown in Figure 6-56. You will now superimpose **Street 2** profile over the **Andrews Drive** profile view.

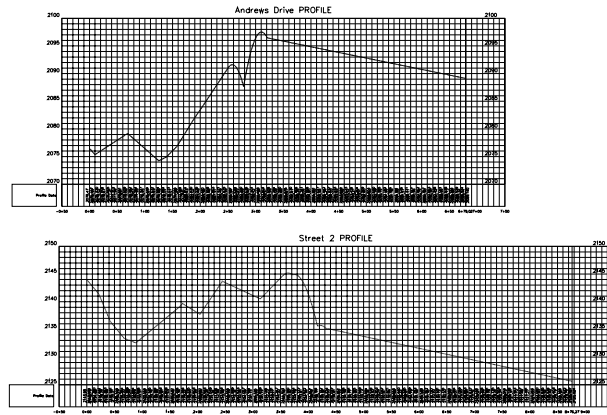


Figure 6-56 The Andrews Drive and the Street 2 profile views

Superimposing the Profile

1. Choose **Profiles > Create Superimposed Profile** from the menu bar; you are prompted to select the source profile.
2. Select the profile from the **Street 2** profile view; you are prompted to select the destination profile view.
3. Next, select the **Andrews Drive** profile view to superimpose the **Street 2** profile; the **Superimpose Profile Options** dialog box is displayed.
4. Select the **Select start** and **Select end** check boxes in the **Limits** tab of the **Superimpose Profile Options** dialog box.
5. Choose the **OK** button; the **Superimpose Profile Options** dialog box is closed and the profile information of the **Street 2** profile is superimposed over the **Andrews Drive** profile view as shown in Figure 6-57.

Creating Multiple Views

Now you will create multiple views for the **Street 2** profile.

1. Choose **Profiles > Create Multiple Profile Views** from the menu bar. The **General** page of the **Create Multiple Profile Views** wizard is displayed.

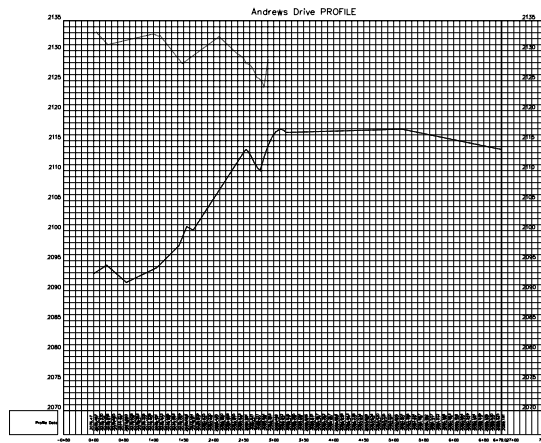


Figure 6-57 The Andrews Drive profile superimposed on the Street 2 profile

2. Select **Street 2** from the **Select alignment** drop-down list displayed in the **General** page of this wizard.
3. Similarly, enter **Street 2 profile** in the **Profile view name** edit box in the same page.
4. Choose the **Next** button to display the **Station Range** page.
5. Enter **300** in the **Length of each view** edit box for each of these views. The length of each view can be decided based on the station range along the horizontal axis and the number of views to be created.
6. Next, choose the **Multiple Plot Options** option from the left of the wizard to display the **Multiple Plot Options** page.
7. In the **Gap between the adjacent profile views** area of this page, enter **50** in both the **Row** and **Column** edit boxes.
8. In the **Multiple Plot Options** page of the wizard, ensure that the **By rows** radio button is selected in the **Draw order** area and the value in the **Maximum in a row** edit box is set to **4**.
9. Now, choose the **Create Profile Views** button; you are prompted to specify the origin of the profile view. Click in the drawing area to add multiple profile views. Thus, you have created the multiple profile views.
10. Now, select the first profile view and right-click; a shortcut menu is displayed. Choose **Edit Profile View Style** from the shortcut menu; the **Profile View Style - Basic** dialog box is displayed.
11. Choose the **Grid** tab and select the **Clip vertical grid** and **Clip horizontal grid** check boxes in the **Grid option** area.

12. Choose the **OK** button; the dialog box is closed and the profile views will be clipped, as shown in Figure 6-58.

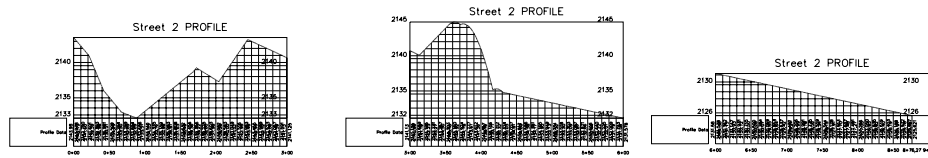


Figure 6-58 The Multiple views for the *Street 2* profile

Creating Stacked Views

Now, you will create stacked views for the **Andrews Drive** alignment.

1. Choose **Profiles > Create from Surface** from the menu bar; the **Create Profile from Surface** dialog box is displayed.
2. Select **Andrews Drive** from the **Alignment** drop-down list, **Surface contours** from the **Select surfaces** area, and then choose the **Add** button; the profile name is added in the **Profile list** table.
3. Next, choose the **Draw in profile view** button; the **Create Profile from Surface** dialog box is closed and the **Create Profile View - General** wizard is displayed.
4. Enter **Andrews Stacked** in the **Profile view name** edit box.
5. Now, select the **Show offset profiles by vertically stacking profile views** check box; the **Stacked Profile** option is displayed on the left side of the wizard.
6. Choose the **Stacked Profile** option from the **Stacked Profile** page of the wizard.
7. Set the stacked views number to **3** using the **Number of Stacked Views** spinner and enter **10** in the **Gap between the profiles** edit box.
8. Choose the **Next** button; the **Profile Display Options** page is displayed.
9. Ensure that **Middle View** is selected in the **Select stacked view to specify options for area**
10. Next, select the second check box in the **Draw** column of the **Specify profile display options** area.
11. Now, select the **Top View** from the **Select stacked view to specify options for area**.
12. Select the first check box in the **Draw** column of the **Specify profile display options** area.
13. Similarly, select the **Bottom View** and the third check box in the **Draw** column.

14. Choose the **Create Profile Views** button; the **Create Profile View- ProfileDisplay Options** wizard is closed and you are prompted to specify the origin of the profile view.
15. Click at the required location; the three stacked profile views are created, as shown in Figure 6-59.

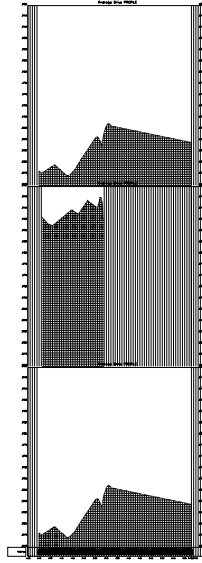


Figure 6-59 The top, middle, and bottom stacked profile views

This completes the tutorial.

Saving the File

1. Choose **File > Save As** from the menu bar; the **Save Drawing As** dialog box is displayed.
 2. Browse to the *My Documents\civil_3d* folder.
 3. Save the file as *c06_tut_3a*.
-

Tutorial 4

Profile Labels

In this tutorial, you will create profile labels and profile view labels. You will assign these labels to the profile and profile views, respectively, as shown in Figure 6-60.

(Expected time: 30 min)

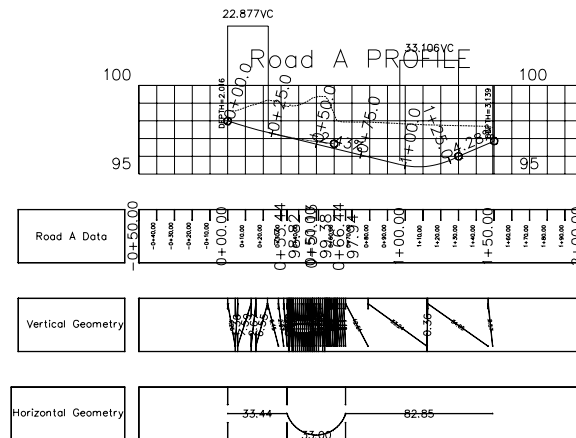


Figure 6-60 The Road A profile view with the data bands

The following steps are required to complete this tutorial:

- Download the *civil-3d-2009-c06-tut-4.dwg* file from the http://www.cadcam.com/civil_3d_2009/civil_3d_2009.htm website and save it at the required location.
- Create a new profile label style.
- Create a new profile view style.
- Assign the created profile style to the profile and profile view.
- Save the file as *c06-tut-4a.dwg*.


Opening the File

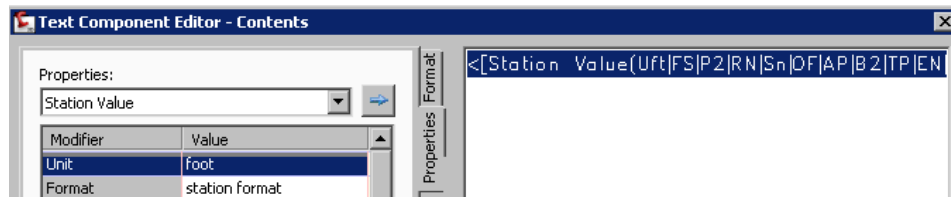
- Choose **File > Open** from the menu bar; the **Select File** dialog box is displayed.
- Navigate to the location where you have saved the *Civil-3d-2009-c06-tut-4.dwg* file and choose the **Open** button to open the file. The file consists of the **Road A** layout profile and the **Road A** profile view of the specified station range.

Creating a New Profile Label Style

Now, you will create a new label style for different components of the profile and then add them to a label set.

- Choose the **Settings** tab from the **Toolspace** palette and expand the **Profile** collection.
- Next, expand **Label Styles > Stations** from the **Profile** collection.

3. Right-click on **Major Station** and choose **New** from the shortcut menu displayed; the **Label Style Composer - New Profile Major Station Label Style** dialog box is displayed.
4. Enter **Road A Major** in the **Name** edit box of the **Label Style Composer - New Profile Major Station Label Style** dialog box.
5. Choose the **Layout** tab from the dialog box.
6. Click in the **Value** column for the **Contents** property to display a button.
7. Choose the button displayed on the right of the **Value** column to access the **Text Component Editor - Contents** dialog box. 
8. Select the text displayed in the **Text Editor** window, as shown in Figure 6-61, and delete it.



*Figure 6-61 Partial view of the **Text Component Editor - Contents** dialog box displaying the selected text in the **Text Editor** window*

9. Next, click in the **Value** column of the **Precision** modifier, a down arrow is displayed.
10. Choose the down-arrow displayed and select **0.1** from the drop-down list, as shown in Figure 6-62.

Modifier	Value
Unit	foot
Format	station format
Precision	0.1
Rounding	1
Decimal character	0.1
Circle	0.01

*Figure 6-62 Selecting the value for the **Precision** modifier*

11. Next, choose the arrow button on the top right to add the value selected in the **Text Editor** window.
12. Choose the **OK** button; the **Text Component Editor - Contents** dialog box is closed.
13. Set the following values of the properties in the **Label Style Composer** dialog box.

Text Height: **0.1500"**

Color: **blue**

14. Choose the down-arrow on the right of the **Create Text Component** button to display a flyout, and select the **Tick** option from the flyout as shown in Figure 6-63; the tick

component is added in the component type list and its properties are displayed in the **Properties** column.

15. Next, click in the **Value** column for the **Block name**; a button is displayed on the right.

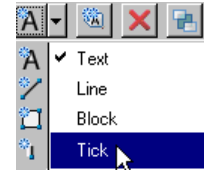


Figure 6-63 Choosing the **Tick** component

16. Choose the button displayed; the **Select a Block** dialog box is displayed.
17. Select **AeccTickLine** from the dialog box and choose the **OK** button to exit the dialog box.
18. Choose the **OK** button to exit the **Label Style Composer - Road A Major** dialog box. The **Road A Major** label style is added in the **Major Station** node of the **Settings** tab, as shown in Figure 6-64.

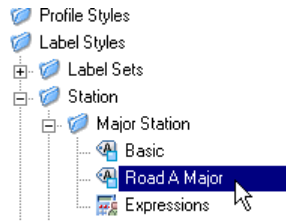


Figure 6-64 The added **Road A Major** style in the **Major Station** node

You have finished creating a new label style for the major stations of the profile. Now, you will create a new label style to label the **Line** component of the profile.

19. Select the **Line** node in the **Label Styles** collection and right-click on it to display a shortcut menu.
20. Choose **New** from the shortcut menu displayed; the **Label Style Composer** dialog box is displayed.
21. Enter **Road A Line** in the **Name** edit box of the dialog box displayed.
22. Choose the **Layout** tab and set the values as follows:

Text Height: **0.1400"** Color: **red**

23. Choose the **Dragged State** tab and set the value of the **Color** property in the **Dragged State Components** category to **green**.
24. Choose the **OK** button; the **Label Style Composer - Road A Line** dialog box is closed and the **Road A Line** label style is added in the **Line** node of the **Settings** tab.

25. Similarly, right-click on the **Curves** node in the **Label Styles** collection and choose **New** from the shortcut menu displayed; the **Label Style Composer** dialog box is displayed.
26. Enter **Road A Curve** in the **Name** edit box of the dialog box.
27. Choose the **Layout** tab; the **Dimension Line** component type is selected by default.
28. Set the value of the **Color** property of the default **Dimension Line** component to **red** in the **Component name** drop-down list to **red**.
29. Next, select **Start Line**, **End Line**, and **Length** from the **Component name** drop-down list and set their color to **red**.
30. Choose the **OK** button; the **Label Style Composer** dialog box is closed and the **Road A Major** label style for curve is added in the **Curves** node of the **Settings** tab.

You have finished creating label styles for the major station, line, and curve components of the profile.

Creating a Label Set

After creating the label styles for the required components, you will now add these styles into a label set to assign them simultaneously to the profile.

1. Right-click on the **Label Sets** node in the **Label Styles** collection and choose **New** from the shortcut menu displayed; the **Profile Label Set - New Label Set** dialog box is displayed.
2. Enter **Road A Label Set** in the **Name** edit box of the dialog box.
3. Next, choose the **Labels** tab. By default, the **Major Station** option is selected in the **Type** drop-down list of this tab.
4. Select the **Road A Major** style from the **Profile Major Station Label Style** drop-down list, as shown in Figure 6-65.

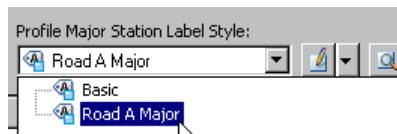


Figure 6-65 Selecting the *Road A Major* style

5. Now, choose the **Add** button to add the selected label style to the label set.
6. Next, select **Lines** from the **Type** drop-down list and the corresponding **Road A Line** label style from the **Profile Tangent Label Style** drop-down list.
7. Choose the **Add** button to add the selected label type and label style to the label set.

8. Similarly, add **Sag Curves** type and **Road A Curve** style in the table, as shown in Figure 6-66.

Type	Style	Increment	Dim anchor opt	Dim anchor val	Weeding
Major Stations	Road A Major	100.000'	Distance above	1.5000"	
Lines	Road A Line		Distance above	1.5000"	0.000'
Sag Curves	Road A Curve		Distance above	1.5000"	

Figure 6-66 Adding labels and label styles in the table

9. Change the **Increment** value for the **Major station** to **25.000'**.
10. Now, choose the **OK** button; the **Profile Label Set - Road A** dialog box is closed and the **Road A** label set is added in the **Label Sets** node.

You have finished creating the label styles and then adding them in the label set.

Assigning the Profile Label Style

1. Select the required profile (Cyan colored layout profile) and right-click to display a shortcut menu.
2. Choose **Edit Labels** from the shortcut menu; the **Profile Labels - Profile A (1)** dialog box is displayed.
3. Choose the **Import label set** button located at the bottom right corner of **Profile Labels - Profile A (1)** dialog box; the **Select Style Set** dialog box is displayed.
4. Select the **Road A Label Set** option from the drop-down list displayed in the **Select Style Set** dialog box, as shown in Figure 6-67.

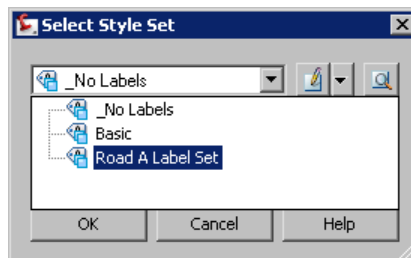


Figure 6-67 The Road A Label Set option selected from the drop-down list in the Select Style Set dialog box

5. Choose the **OK** button to close the dialog box; the labels of the label set are displayed in tabular format in the **Profile A (1)** dialog box.
6. Next, choose the **Apply** button to assign the label set to the profile and view the change.

7. Choose the **OK** button to close the **Profile Labels - Profile A (1)** dialog box. You will notice that all major stations are labeled at an increment of 25.000 in blue color with a precision of **0.1**, as shown in Figure 6-68.

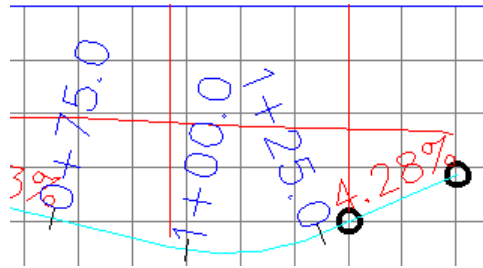


Figure 6-68 The major stations at the specified increment

Creating a Profile View Label Style

You have created a profile style. Now, you will create a new profile view style. To begin with, you will create a label style for spot labels such as **Station Elevation** or **Depth**.

1. Expand **Profile View > Label Styles** in the **Settings** tab.
2. Right-click on the **Depth** node; a shortcut menu is displayed.
3. Choose **New** from the shortcut menu displayed; the **Label Style Composer - New Profile Depth Label Style** dialog box is displayed.
4. Enter **Road A Depth** in the **Name** edit box of the dialog box; the name of the dialog box changes to **Label Style Composer - Road A Depth**.
5. Choose the **Layout** tab; the properties of the **Line** component are displayed by default.
6. Set the color of the **Line** component to **magenta**.
7. Select **Depth** from the **Component name** drop-down list; the corresponding properties are displayed in the **Property** column.
8. Set the **Text Height** to **0.0700'** and the **Color** to **magenta**.
9. Choose the **OK** button; the **Label Style Composer - Road A Depth** dialog box is closed and **Road A Depth** style is added in the **Depth** node of the **Settings** tab.
10. To add the depth label to the profile view, choose **Profiles > Add Profile View Labels > Add Profile View Labels** from the menu bar; the **Add Labels** dialog box is displayed.
11. Select **Depth** from the **Label type** drop-down list, as shown in Figure 6-69.

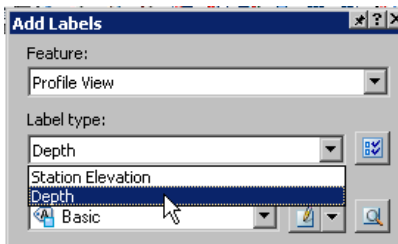


Figure 6-69 Selecting the **Depth** label type

12. Select the **Road A Depth** from the **Depth** label style drop-down list.
13. Now choose the **Add** button; you are prompted to select a profile view.
14. Select the **Profile A** profile view from the drawing.
15. Click at the center of the first circle in the profile view, as shown in Figure 6-70.

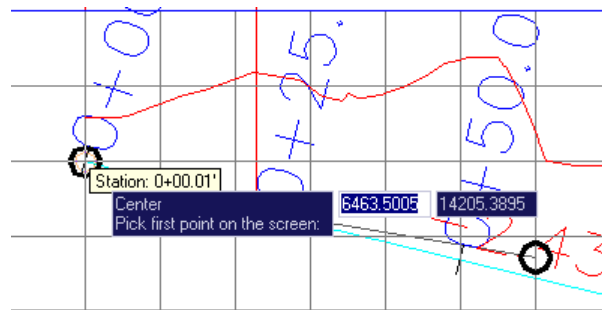


Figure 6-70 Selecting the center of the circle



Note

Turn on the **OSNAP** option to pick the center point of the circle.

16. Next, drag the cursor upwards and click on the top axis of the profile view to specify the second point; the depth between the two points picked in the profile view is displayed in the **Depth** label, as shown in Figure 6-71.
17. Similarly, add a depth label by picking the center point of the last circle and a point on the top axis, as shown in Figure 6-72.
18. Choose the **Close** button to close the **Add Labels** dialog box.

Creating a Band Style

1. Expand **Profile View > Band Styles > Profile Data** in the **Settings** tab of the **Toolspace** palette.
2. Right-click on the **Profile Data** node to display a shortcut menu.

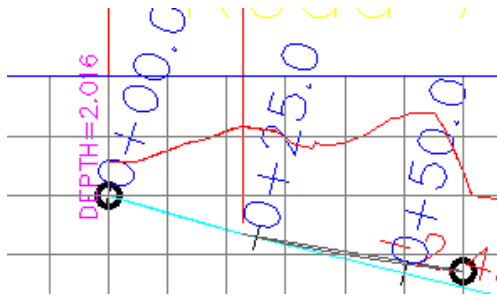


Figure 6-71 The depth label displaying the depth between two points selected at the first circle

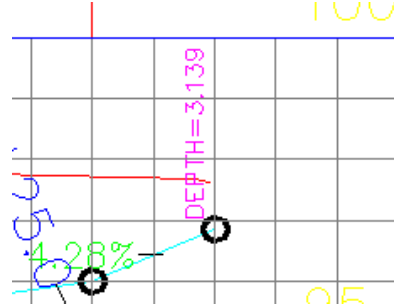


Figure 6-72 Depth label added at the last circle in the profile view

3. Choose **New** from the shortcut menu; the **Profile Data Band - New Profile Data Band Style** dialog box is displayed.
4. Enter **Road A Data** in the **Name** edit box of the dialog box.
5. Choose the **Band Details** tab.
6. From the **Title text** area, choose the **Compose label** button to display the **Label Style Composer - Band Title** dialog box.
7. Click on the value for the **Contents** property for the text to display a button on the right.
8. Choose the button displayed to invoke the **Text Component Editor - Contents** dialog box.
9. Delete the text from the **Text Component Editor** window and enter **Road A Data** in the editor window, as shown in Figure 6-73.

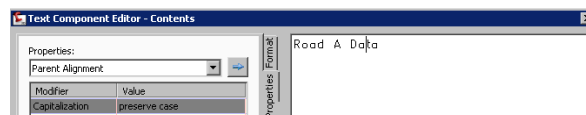


Figure 6-73 Entering **Road A Data** in the editor window

10. Choose **OK** to return to the **Label Style Composer - Band Title** dialog box.
11. Now, set the **Color** to **red** in the **Value** column.
12. Choose the **OK** button to close the **Text Component Editor** dialog box and return to the **Profile Data Band Style - New Profile Data Band Style** dialog box.
13. In the **Layout** area of this dialog box, set the values as follows:

Band height: **0.7500"** Text box width: **1.5000"** Offset from band: **0.2000"**

14. From the **Labels and ticks** area, select **Major Station** from the list and then select the **Small ticks at** radio button displayed at right of the list.
15. Select the **Top** check box and clear all other check boxes. Next, set the tick size to **0.1500"** in the **Tick size** edit box.
16. Next, choose the **Compose label** button below the **Bottom** check box to display the **Label Style Composer - Major Station** dialog box.
17. Set the value of the **Text Height** property of the **Station Value** component to **0.1300"**.
18. Select **Profile 1 Elevation** from the **Component type** drop-down list and choose the **Delete component** button placed on the right of the **Component name** drop-down list.
19. Choose the **OK** button to close the dialog box.
20. Similarly, select **Minor Station** from the **Labels and ticks** area in the **Profile Data Band Style - New Profile Data Band Style** dialog box. Also, select the **Small ticks at** radio button and the **Bottom** check box to place the ticks.
21. Clear all other check boxes in this area and enter **0.1500"** in the **Text size** edit box on the right of the **Bottom** check box.
22. Choose the **Compose label** button; the **Label Style Composer - Minor station** dialog box is displayed.
23. In this dialog box, set the **Text Height** to **0.0500"** and the **Color** to **red**.
24. Select **Profile 1 elevation** from the **Component type** drop-down list and choose the **Delete component** button to delete it.
25. Choose the **OK** button to close the **Label Style Composer - Minor station** dialog box.
26. Similarly, in the **Profile Data Band Style - New Profile Data Band Style** dialog box, set the tick size for **Horizontal Geometry Point**, **Vertical Geometry Point**, and **Station Equation options** displayed in the list in the **Labels and ticks** area to **0.1500"** with the same settings as discussed for the **Major Station** option in the previous steps.
27. Choose the **Display** tab.
28. For the **Band Border** and **Band Title Text** components, modify the color to **red** in the **Color** column of the **Component display** area.
29. Choose the **OK** button to close the **Profile Data Band style - Road A Data** dialog box.

You have finished creating a style for the **Profile Data** band.

30. Next, right-click on the **Vertical Geometry** node in the **Band Styles** collection in the **Settings** tab; a shortcut menu is displayed.
31. Choose **New** from the shortcut menu; the **Vertical Geometry Band Style - New Vertical Geometry Band Style** dialog box is displayed.
32. Enter **Road A Vertical** in the **Name** edit box.
33. Choose the **Band Details** tab and set the following values in the respective edit boxes of the **Layout** area of this tab:
- Band height: **0.7500"** Text box width: **1.5000"** Offset from band: **0.2000"**
34. Next, select **Downhill Tangent** from the **Labels and ticks** area and repeat steps 20-23.
35. Next, choose the **Display** tab.
36. For the **Band Border** component, change the color to **blue** in the **Color** column.
37. Choose the **OK** button to close the **Vertical Geometry Band Style - Road A Vertical** dialog box. You have finished creating a band style for the **Vertical Geometry** band.
38. Similarly, create a **Road A Horizontal** band style for the **Horizontal Geometry** of the profile using the **Horizontal Geometry Band Style - New Horizontal Geometry Band Style** dialog box and set the parameters as given below:
- Name: **Road A Horizontal** Band height: **0.7500" (Information Tab)**
- Text box width: **1.6000" (Band Details Tab)**
- Offset from band: **0.2000"**
- Band Border color: **magenta (Display Tab)**
- Band Title Box: **magenta**
39. Choose the **OK** button to close the **Horizontal Geometry Band Style - Road A Horizontal** dialog box.

Creating a Band Set

Now, you will create a band set and add the created label styles to the band set.

1. Expand **Profile View > Band Styles** in the **Settings** tab.
2. Right-click on the **Band Sets** node to display a shortcut menu.
3. Choose **New** from the shortcut menu; the **Band Set - New Profile View Band Set** dialog box is displayed.

4. Enter **Road A Band Set** in the **Name** edit box.
5. Choose the **Bands** tab.
6. Select **Profile Data** from the **Band type** drop-down list, if it is not selected and select the **Road A Data** style from the corresponding **Select band style** drop-down list.
7. Choose the **Add** button; the **Geometry Points to Label in Band** dialog box is displayed.
8. Choose the **OK** button to accept all the points selected by default and then close the dialog box; the **Profile Data** and the **Road A Data** style are added to the table.
9. Similarly, add **Vertical Geometry**, **Horizontal Geometry**, and their respective styles to the table, as shown in Figure 6-74.

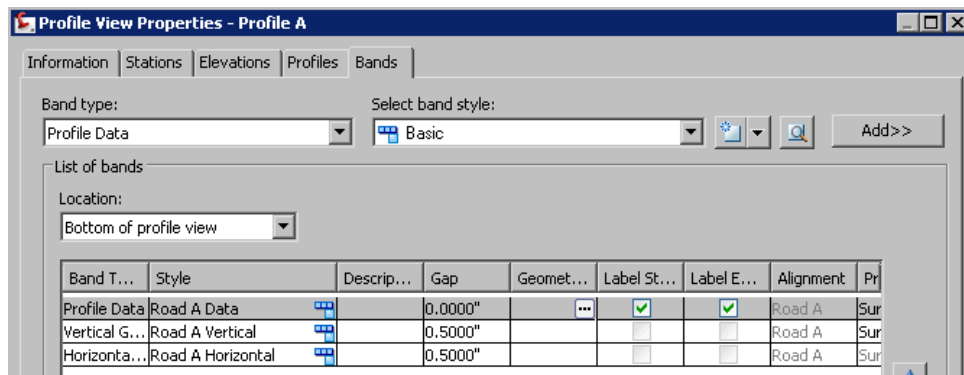


Figure 6-74 Partial view of the **Bands** tab of the **Band Set - Road A Band Set** dialog box

10. Choose the **OK** button; the **Band Set - Road A Band Set** dialog box is closed and the **Road A Band Set** is added to the **Band Set** node in the **Settings** tab.

Assigning the Band Set

1. Select the **Road A** profile view from the drawing and right-click to display a shortcut menu.
2. Choose **Profile View Properties** from the shortcut menu displayed, as shown in Figure 6-75. On doing so, the **Profile View Properties - Profile A** dialog box is displayed.
3. Choose the **Bands** tab and then choose the **Import band set** button from the **Bands** tab; the **Band Set** dialog box is displayed, as shown in Figure 6-76.
4. Select **Road A Band Set** from the drop-down list.
5. Choose the **OK** button; the **Band Set** dialog box is closed and the band styles are added in the table.

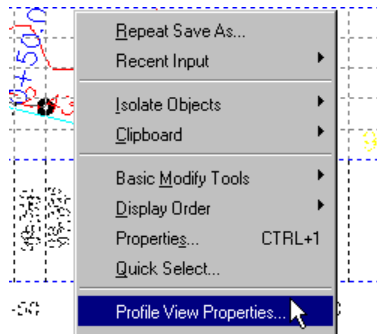


Figure 6-75 Choosing the **Profile View Properties** option

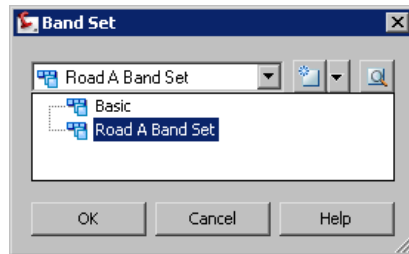


Figure 6-76 The **Band Set** dialog box

6. Choose the **Apply** button to assign the **Road A** band set styles to the profile and then choose **OK** to close the dialog box. The specified bands are added to the drawing with the selected band styles, as shown in Figure 6-77.

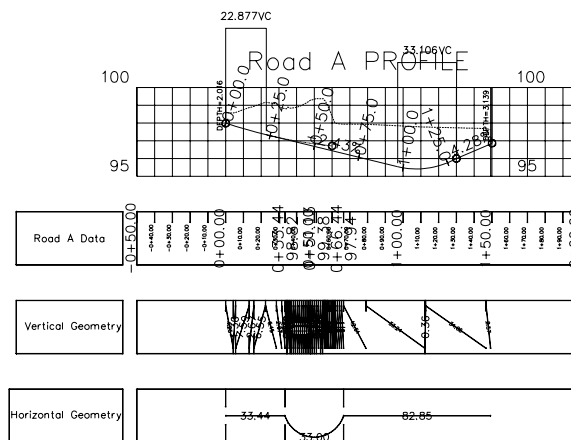


Figure 6-77 The **Road A** profile view with the specified data bands added

This completes the Tutorial 4 of this chapter

Saving the File

1. Choose **File > Save As** from the menu bar; the **Save Drawing As** dialog box is displayed.
2. Browse to *My Documents\civil_3d* folder.
3. Save the file as *c06-tut-4a*.

Tutorial 5

Editing Profiles

In this tutorial, you will edit a Layout profile shown in Figure 6-78, using different editing methods. (Expected time: 30 min)

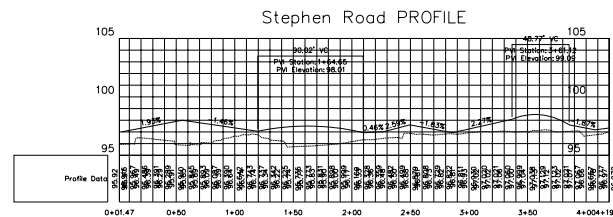


Figure 6-78 The Stephen Road Layout profile

The following steps are required to complete this tutorial:

- Download the *civil-3d-2009-c06-tut-5.dwg* file from the http://www.cadcam.com/civil_3d_2009/civil_3d_2009.htm link and save it at the required location.
- Use the Grip edits to edit the profile.
- Use the **Profile Parameters** dialog box and the **Panorama** window to edit the profile.
- Save the file as *c06-tut-5*.

Opening the File

- Choose **File > Open** from the menu bar; the **Select File** dialog box is displayed. Open the *civil-3d-2009-c06-tut5.dwg* file that you have downloaded and saved at the required location. The file consists of a TIN surface named, **Surface 1**, the **Stephen Road** profile view and a Layout profile.

Editing the Stephen Layout Profile



- Choose **Profiles > Edit Profile Geometry** from the menu bar; you will be prompted to select a profile from the drawing.
- Select the **Stephen layout** profile displayed in **Cyan** color from the **Stephen Road** profile view; the **Profile Layout Tools - Stephen layout** toolbar is displayed, as shown in Figure 6-79.
- Select the **Stephen layout** profile to display the profile grips and invoke the **Profile Layout Parameters** tool from the toolbar; the **Profile Layout Parameters - Stephen layout** dialog box is displayed. 
- Now, invoke the **Select PVI** tool and click near the PVI at station 0+55. On doing so, the **Profile Layout Parameters** dialog box is populated with the parameters of the selected PVI, as shown in Figure 6-80. 



Figure 6-79 The *Profile Layout Tools - Stephen layout* toolbar

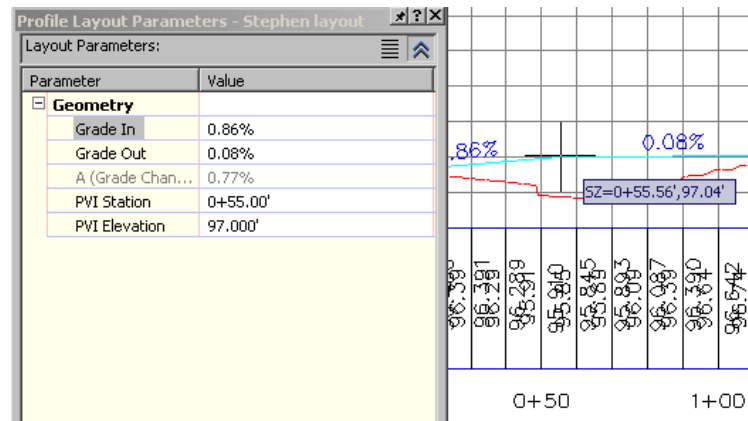


Figure 6-80 The *Profile Layout Parameters* dialog box displaying the parameters of the selected PVI

- Modify the values of the parameters as given below:

PVI Station: **0+55.00'**

PVI Elevation: **98.000'**

- After you specify these parameters, press ENTER.



Note

You have modified the parameters of a single PVI using the *Profile Layout Parameters* dialog box. You can modify only those values that are highlighted in black color. The other values are derived by in-built mathematical calculations and therefore, cannot be modified.

- Close the **Profile Layout Parameters** dialog box.
- Next, choose the **Profile Grid View** button from the **Profile Layout Tools** toolbar; the **Panorama** window with the **Profile Entities** tab is displayed.
- Modify the value of the **PVI Elevation** for the first PVI, as shown in Figure 6-81.
- Similarly, modify the values of the 6th, 7th, and 8th PVI Elevation values to **97.000'**.
- Close the **Panorama** window.
- Now, invoke the **Raise/Lower PVIs** tool from the **Profile Layout Tools** toolbar; the **Raise/Lower PVI Elevation** dialog box is displayed, as shown in Figure 6-82.
- Enter **-1.000'** in the **Elevation change** edit box and select the **Station range** radio button from the **PVI range** area.

No.	PVI Station	PVI Elevation	Grade In	Grade Out	A (Grade Change)	Profile Cur
1	0+03.19'	97.000'				
2	0+55.00'	98.000'	1.93%	-1.46%	3.39%	
3	1+19.64'	97.054'	-1.46%			
4	1+64.65'	97.670'	1.37%	-1.63%	3.00%	
5	2+09.66'	96.935'		0.46%		
6	2+26.93'	97.014'	0.46%	2.59%	2.13%	
7	2+49.45'	97.598'	2.59%	0.91%	1.68%	
8	2+85.91'	97.931'	0.91%	0.30%	0.61%	
9	3+36.74'	98.083'	0.30%			
10	3+61.12'	98.169'	0.35%	-2.30%	2.65%	
11	3+85.51'	97.607'				

Figure 6-81 Modifying the PVI Elevation value in the Panorama window displaying the PVIs

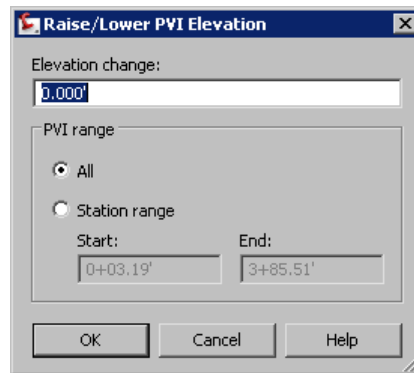


Figure 6-82 The Raise/Lower PVI Elevation dialog box

14. Enter **2+50.00'** and **3+00.00'** in the **Start** and **End** edit boxes respectively to lower the elevation value of the PVIs lying within the specified station range.
15. Choose the **OK** button; the dialog box is closed and the PVIs are lowered by the value specified in the **Elevation change** edit box.



Note

You can specify a positive value in the **Elevation change** edit box to raise the elevation of PVIs.

Entity Based Editing of the Profile

1. Choose the down-arrow on the right of the **PVI based** button in the **Profile Layout Tools** toolbar and choose the **Entity based** option from the flyout, as shown in Figure 6-83.
2. Now, choose the **Profile Layout Parameters** button from the **Profile Layout Tools** toolbar; the **Profile Layout Parameters** dialog box is displayed.
3. Choose the **Select Entity** button from the **Profile Layout Tools** toolbar.

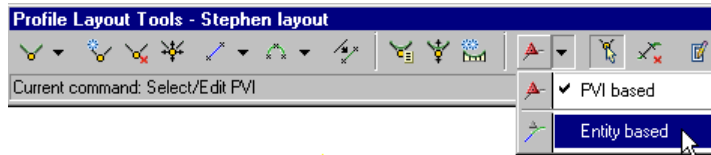


Figure 6-83 Selecting the **Entity based** option from the **Profile Layout Tools** toolbar

4. Press and hold the CTRL key and select the curve from the profile view, as shown in Figure 6-84. On doing so, the **Profile Layout Parameters** dialog box is populated with the selected curve parameters.

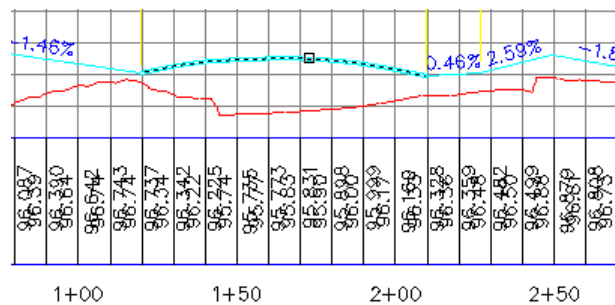


Figure 6-84 Selecting the curve to view its parameters

5. Modify the value for **Curve Radius** to **2500.000'**, as shown in Figure 6-85.
6. Close the **Profile Layout Parameters** dialog box.

Grip Editing of the Profile

1. Select the profile from the profile view to display the profile grips.
2. Select the circular grip of the curve at the end of the profile and drag the cursor downward, as shown in Figure 6-86.
3. Enter **5** at the command line and press ENTER; the curve is lowered by the specified value.

This completes the tutorial. You have finished editing the **Stephen layout** profile using the **Profile Layout Tools** toolbar and profile grips.

Saving the File

1. Choose **File > Save As** from the menu bar; the **Save Drawing As** dialog box is displayed.
2. Browse to the *My Documents\civil_3d* folder.
3. Save the file as *c06-tut-5a*.



Figure 6-86 *Selecting the circular curve grip*

Self-Evaluation Test

Answer the following questions and then compare them to those given at the end of this chapter:

1. Profiles represent the surface levels or the elevations at different intervals along a horizontal alignment. (T/F)
2. Profile can be displayed as a single profile view only. (T/F)
3. The _____ profile is used to create a profile based on certain design requirements.
4. You can create a Layout profile by choosing **Profiles > Create Layout Profile** from the menu bar. (T/F)
5. The _____ dialog box is used to create the Surface profile.
6. The _____ dialog box helps you create a temporary profile to view elevation information along a line, polyline, feature or lot line, survey figure, or surface.
7. In the _____ edit box, specify a positive value to increase the elevation or a negative value to decrease the elevation of the profile or the PVIs.
8. The _____ tool is used to change the elevation of the profile.
9. The **Profile Style - New Profile Style** dialog box is used to create a new profile style. (T/F)
10. The Layout profiles can be labeled automatically using the _____ dialog box.

Review Questions

Answer the following questions:

1. Civil 3D has separate in-built styles for both the profile and the profile view. (T/F)
2. The _____ dialog box is used to view the properties of the selected profile.
3. The _____ tool is used to add the PVI data numerically in the **Insert PVIs** dialog box.
4. The display and appearance of a profile is controlled by the _____.
5. The _____ style controls the display of the grid representation of the profiles.
6. Expand the **Profile View > Band Styles > Band Set** nodes in the _____ tab to view the new band style.

7. In the _____ area of the **Station Range** page, specify the station range by specifying the start and end station values.
8. To add the profile view labels, choose **Profiles > Add Profile View Labels > Add Profile View Labels** from the menu bar to display the _____ dialog box.
9. The _____ dialog box is used to view and modify the layout parameters of the selected profile component.
10. One of the easiest methods of editing the geometry of a profile is by using the _____.

Exercises

Exercise 1

Download the *civil-3d-2009-c05-ex-1.dwg* file from the http://www.cadcim.com/civil_3d_2009/civil_3d_2009.htm link and create a split profile, as shown in Figure 6-87 using the parameters given next.

(Expected time: 30 min)

1. Profile View name: **ST. Road**
2. Profile View height: Minimum: **94.483'** Maximum: **101.483'**
3. Split Profile View : **Default settings**
4. Save the drawing as *civil-3d-2009-ex-1a*.

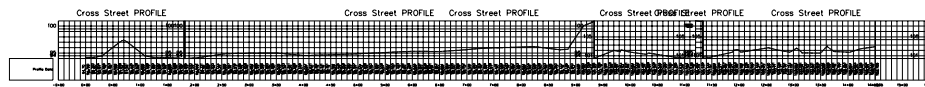


Figure 6-87 A split profile

Exercise 2

Use the *c06-tut2.dwg* file created in Tutorial 2 of this chapter and create a Layout profile using the following tools and parameters. Refer to Figure 6-88 to draft the Layout profile.

(Expected time: 30 min)

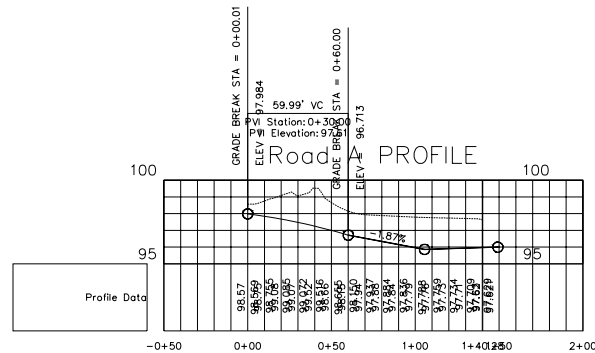


Figure 6-88 The Road A 2 Layout profile

1. Profile name: **Road A 2**
2. Profile style: **Default**
3. Profile label set: **Default**

Profile Layout Tools:

1. Curve: **Fixed Curve (Two points, parameter)**
 Curve type: **Crest**
 Curve radius: **35**
2. **Convert AutoCAD Line and Spline tool**

Answers to Self-Evaluation Test

1. T, 2. F, 3. Layout, 4. T, 5. Create Surface Profile, 6. Create Quick Profiles, 7. Elevation change, 8. Raise/Lower PVI, 9. T, 10. Create Profile - Draw New