4

Working with Architectural Objects

Learning Objectives

After completing this chapter, you will be able to:

- ***Use the Mirror and Align tools***
- ***Create AEC extended objects***
- ***Create doors and windows***

INTRODUCTION

In this chapter, you will learn to create the default objects and patch grids in 3ds Max. Also, you will learn to use the **Mirror** and **Align** tools while modeling the objects with the help of various primitives and default objects. In addition, you will learn to create doors and windows.

MIRROR TOOL

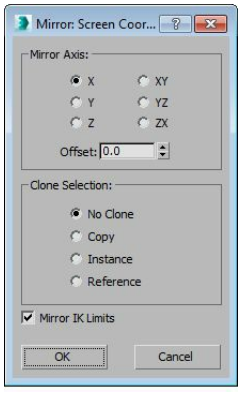
Menu bar: Tools > Mirror
Main Toolbar: Mirror

THE **MIRROR** TOOL IS USED TO MIRROR OR CLONE THE SELECTED OBJECT ABOUT THE CENTER OF THE CURRENT COORDINATE SYSTEM. YOU CAN ALSO MOVE THE OBJECT WHILE MIRRORING ITS ORIENTATION. TO MIRROR AN OBJECT, SELECT IT IN A VIEWPORT AND CHOOSE THE **MIRROR** TOOL FROM THE **MAIN TOOLBAR**; THE **MIRROR: SCREEN COORDINATES** DIALOG BOX WILL BE DISPLAYED, REFER TO FIGURE 4-1. SET THE PARAMETERS IN THIS DIALOG BOX AND CHOOSE THE **OK** BUTTON TO MIRROR THE OBJECTS. THE TWO AREAS IN THIS DIALOG BOX ARE DISCUSSED NEXT.

Mirror Axis Area

Select the **X**, **Y**, **Z**, **XY**, **YZ**, or **ZX** radio button in the **Mirror Axis** area to define the direction of the object while mirroring. By default, the **X** radio button is selected. The value in the **Offset** spinner defines the distance of the mirrored object from the original one.

Figure 4-1 *The* ***Mirror: Screen Coordinates*** *dialog box*



Clone Selection Area

The **Clone Selection** area is used to define the type of clone created by the **Mirror** tool. By default, the **No Clone** radio button is selected in this area. As a result, the selected object is mirrored but not retained. Select the **Copy** radio button to retain the selected object after mirroring. You can also change the position of the copied object by entering the required value in the **Offset** spinner in the

Mirror Axis area. Select the **Instance** radio button to mirror the selected object as an instance. Select the **Reference** radio button to mirror a reference of the selected object to a specified position.

An instance is a type of clone in which the changes are reflected when they are made in the original object. Also, if you make any change in the instanced object, then it will transfer to the original object.

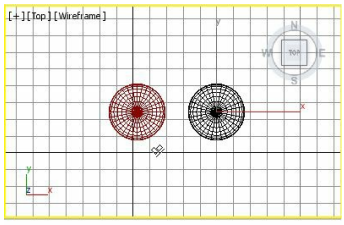
A reference object is similar to an instance object with the only difference that the changes made in the reference object are not reflected in the original object.

ALIGN TOOL

Menu bar: Tools > Align > Align
Main Toolbar: Align
Keyboard: ALT+A

The **Align** tool enables you to align the current object with the target object. To align an object using the **Align** tool, select the current object and then choose the **Align** tool from the **Main Toolbar**; the shape of the cursor will be changed, as shown in Figure 4-2. Move the cursor over the target object in the viewport and click on it; the **Align Selection (X)** dialog box will be displayed, refer to Figure 4-3. Here, **X** refers to the name of the target object. You need to use the options in the **Align Selection (X)** dialog box to align the objects. Various areas and options in this dialog box are discussed next.

Figure 4-2 *The align cursor in the Top viewport*



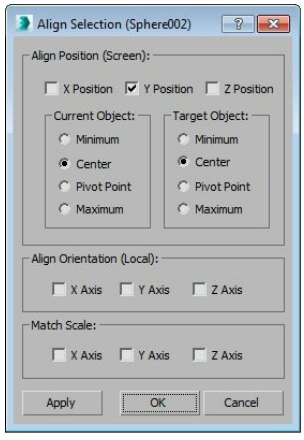


Figure 4-3 *The* ***Align Selection (Sphere001)*** *dialog box*

Align Position Area

You can select the check box(es) in this area to specify the axis along which you want to align the object.

Current Object/Target Object Group

The **Minimum**, **Center**, **Pivot Point**, or **Maximum** radio button in the **Current Object** and **Target Object** groups can be selected to specify different points on the current and target objects to be used for alignment.

Align Orientation Area

You can select the check box(es) in this area to specify the axis or axes about which you want to align the orientation. By default, all check boxes are cleared.

Match Scale Area

You can select the check box(es) in this area to match the scale axes values between the current and target object.

Note

*1. You should try different combinations of axes in the **Align Position** area. Also, try using different options in the **Current Object** and **Target Object** areas to notice the difference.*

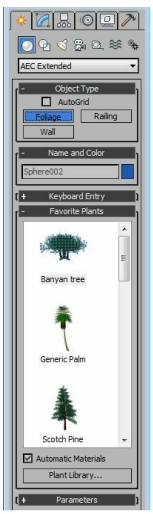
*2. If the objects have been not scaled before, the **Match Scale** area will not change the size of the objects.*

AEC EXTENDED PRIMITIVES

In 3ds Max, there are some in-built objects such as trees, railings, walls, and so on, which are known as AEC extended objects. The AEC extended objects are used in the architectural, engineering, and construction fields. All AEC extended objects can be created dynamically using the mouse or by entering the parameters in the **Keyboard Entry** rollout.

To create an AEC extended object, you need to choose **Create >**

***Figure 4-4** Various rollouts to create a tree*



Geometry in the **Command Panel**; the **Standard Primitives** option will be displayed by default in the drop-down list. Select the **AEC Extended** option from the drop-down list and activate the viewport in which you want to create the objects. Next, choose the corresponding tool from the **Object Type** rollout. In this section, you will learn to create and modify the AEC extended objects

using various tools available in the **Object Type** rollout.

Creating a Foliage

Menu bar: Create > AEC Objects > Foliage
Command Panel: Create > Geometry > AEC Extended >
Object Type rollout > Foliage

To create a foliage or a tree, activate the viewport in which you want to create it. Next, choose the **Foliage** tool from the **Object Type** rollout; the **Name and Color**, **Keyboard Entry**, **Favorite Plants**, and **Parameters** rollouts will be displayed, as shown in Figure 4-4.

In the **Favorite Plants** rollout, double-click on a tree; the selected tree will be displayed in the viewports. One of the sample trees is shown in Figure 4-5. Alternatively, you can create a tree by dragging it from the **Favorite Plants** rollout to the desired location in the viewport. Also, you can select one of the trees from the **Favorite Plants** rollout and then click in the viewport at the desired location to place it. You need to choose the **Zoom Extents All** tool to view the entire tree in the viewports.

Various rollouts used to create and modify the tree are discussed next.

Note

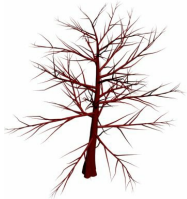
*1. The options in the **Name and Color** rollout are the same for all AEC extended objects.*

*2. The **Keyboard Entry** rollout is used to create various objects by entering the parameters using the keyboard. The method of creating these objects is the same as discussed earlier in Chapter 2. However, the railing object cannot be created using the keyboard, therefore, it does not have the **Keyboard Entry** rollout.*

Favorite Plants Rollout

The **Favorite Plants** rollout has a palette consisting of a list of default

***Figure 4-5** A tree created using the **Foliage** tool*



trees to create them in the viewport. By default, the **Automatic Materials** check box is selected. It is used to assign the default material to the trees. If you clear this check box and create a tree, then the tree created will not show any material. Also, the default color will be displayed in it. Choose the **Plant Library** button below the **Automatic Materials** check box; the **Configure Palette** dialog box will be displayed. This dialog box is used to provide information such as **Name**, **Fav.**, **Scientific Name**, **Type**, **Description**, and **# Faces** about all the default trees in the **Favorite Plants** rollout. You

can also use this dialog box to remove or add a particular plant from the palette in the **Favorite Plants** rollout. To do so, select the name of a plant from the **Configure Palette** dialog box and choose the **Remove from Palette** button; the status in the **Fav.** column will change to **no**. Now, choose the **OK** button; the removed plant will not be displayed in the **Favorite Plants** rollout. Similarly, to display a plant in the **Favorite Plants** rollout, select the name of the plant from the **Configure Palette** dialog box, and then choose the **Add to Palette** button; **no** will switch to **yes** in the **Fav.** column. Next, choose the **OK** button to save the changes.

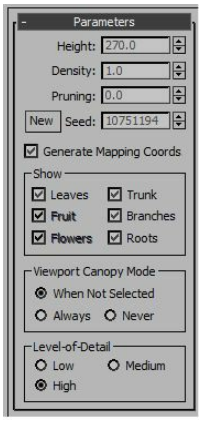
Note

*To modify the default material of the trees, you need to use the **Material Editor** dialog box, which will be discussed in detail in the later chapters.*

Parameters Rollout

The options in this rollout are used to modify the tree created using

***Figure 4-6** The Parameters rollout*



the **Foliage** tool. To do so, select the tree and choose the **Modify** tab in the **Command Panel**; the **Parameters** rollout will be displayed, as shown in Figure 4-6. Enter a new value in the **Height** spinner to modify the height of the tree. The value in the **Density** spinner varies from 0.0 to 1.0 and is used to specify the amount of leaves and flowers in the tree. The value in the **Pruning** spinner varies from -0.1 to 1.0 and is used to reduce the branches of the tree, refer to Figures 4-7 and 4-8.

Choose the **New** button to view the variation in the placement of leaves, branches, and the angle of trunk of the selected plant. When you choose the **New** button, the value in the **Seed** spinner changes accordingly, showing the possible variation in the selected tree. By default, the **Generate Mapping Coords** check box is selected. It is used to apply default mapping coordinates to the plant. The other areas in the **Parameters** rollout are discussed next.

***Figure 4-7** A tree with the **0** value in the **Pruning** spinner*

Figure 4-8 *A tree with the* ***0.5*** *value in the* ***Pruning*** *spinner*

Show Area

The options in this area are used to display leaves, trunk, fruits, branches, flowers, and roots. Select the check boxes to display the corresponding parts of a tree.

Note

The ***Show*** *area will display only those options which are relevant to the selected tree. For example, if you select a tree that does not have flowers, the* ***Flowers*** *check box will not be available.*

Viewport Canopy Mode Area

The options in this area are used to display the plant in the canopy mode in the viewports. The canopy of a plant is a type of covering area which covers the outermost parts of the tree such as leaves, branches, and trunk. By default, the **When Not Selected** radio button is selected. This button is used to display the tree in canopy mode in the viewport, when the tree is not selected. Select the **Always** radio button to display the tree always in the canopy mode, whether it is selected or not. Select the **Never** radio button to display the tree without canopy mode.

Level-of-Detail Area

This area is used to define how a tree will be displayed at the time of rendering. Select the **Low** radio button to display the lowest detail of a tree. It renders the tree in the canopy mode, as shown in Figure 4-9. Select the **Medium** radio button to render the tree with less number of faces in the branches and trunk, as shown in Figure 4-10. By default, the **High** radio button is selected. It is used to render the tree with all its faces in the branches and trunk. It will provide the highest detail of a tree, as shown in Figure 4-11.

Figure 4-9 *The tree with low level of detail at rendering*

Figure 4-10 *The tree with medium level of detail at rendering*

Figure 4-11 *The tree with high level of detail at rendering*

Creating a Railing

Menu bar: Create > AEC Objects > Railing
Command Panel: Create > Geometry > AEC Extended >
Object Type rollout > Railing

To create a railing, activate the viewport in which you want to create it and then choose the **Railing** tool from the **Object Type** rollout; the **Name and Color**, **Railing**, **Posts**, and **Fencing** rollouts will be displayed, as shown in Figure 4-12. Now, press and hold the left mouse button on the left side of a viewport and then drag the cursor to the right side to specify the length of the railing. Release the left mouse button to set the length. Now, move the cursor up to specify the height of the railing and click on the screen; the railing will be created in the viewports, refer to Figure 4-13. You may need to use the **Zoom Extents All** tool to view the entire railing.

Various rollouts used to modify the railing are discussed next.

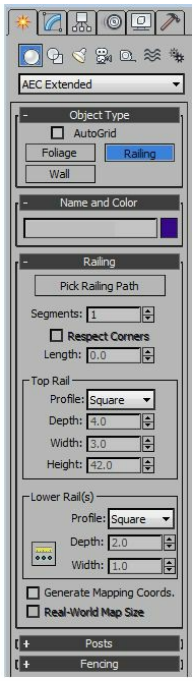
Railing Rollout

The **Pick Railing Path** button is used to create railing paths using the splines. To create a railing according to the railing path or the spline, first create a spline and a railing in the viewport. Next, select the railing and choose the **Modify** tab in the **Command Panel** and then choose the **Pick Railing Path** button in the **Railing** rollout and move the cursor over the spline in the viewport; the pick cursor will be displayed. Next, click on the spline; the railing will be aligned to the spline. Now, set a value in the **Segments** spinner to specify the number of segments in the railing. Select the **Respect Corners** check box to put the corners in the railing to match the corners of the railing path. The **Segments** spinner and the **Respect Corners** check box will be activated only if you create a railing using the railing path. The value in the **Length** spinner specifies the length of the railing. The areas in the **Railing** rollout are discussed next.

Top Rail Area

The top rail is the topmost part of the railing, refer to Figure 4-13. The options in the *Top Rail* area are used to modify the top rail. The **Profile** drop-down list is used to define the cross-section shape of the top rail. Select the **Round** or the **Square** option from the drop-down list to make the top rail round or square, respectively. Select the **none** option to remove the top rail from the railing. The values entered in the **Depth**, **Width**, and **Height** spinners specify the depth, width, and height of the top rail, respectively, refer to Figure 4-14.

Figure 4-12 *Partial view of various rollouts to create a railing*



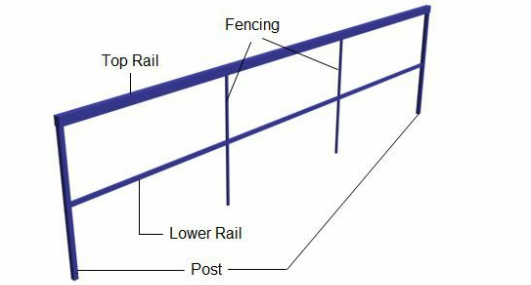


Figure 4-13 *The railing with different parts labeled*

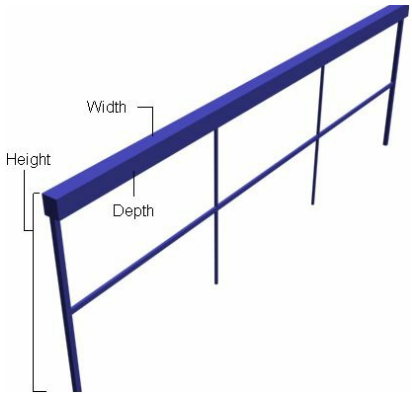


Figure 4-14 *The railing with different dimensions*

Lower Rail(s) Area

The lower rail is placed below the top railing, refer to Figure 4-13. The options  in the *Lower Rail* area are used to modify the lower rail of the railing. The options in the **Profile** drop-down list are used to define the shape of the cross-section of the lower rail. Select the **Round** or **Square** option from the drop-down list to make the lower rail round or square, respectively. Select the **none** option to remove the lower rail from the railing. The value in the **Depth** spinner specifies the depth of the rail, whereas the value in the **Width** spinner specifies the width of the lower rail. Choose the **Lower Rail Spacing** button on the left side of the **Lower Rail(s)** area; the **Lower Rail Spacing** dialog box will be displayed, as shown in Figure 4-15. In this dialog box, select the **Count** check box, if it is not already selected. The value in the spinner on the right of this check box specifies the number of lower rails in the railing. Choose the **Close** button to close the dialog box.

Posts Rollout

The posts are the left and right supports of the railing, refer

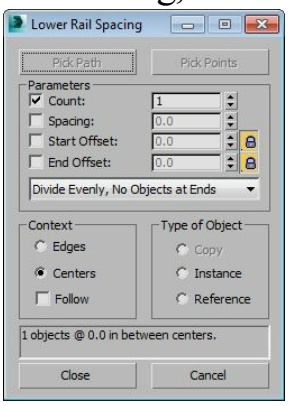


***Figure 4-15** The **Lower Rail Spacing** dialog box*

to Figure 4-13. The options in the **Posts** rollout are used to modify them. Most of the options in this rollout are the same as those discussed in the **Lower Rail(s)** area of the **Railing** rollout, except the **Extension** spinner. The value in the **Extension** spinner is used to extend the posts of the railing from the bottom of the top rail, as shown in Figure 4-16.

Fencing Rollout

The fencing is placed in between the posts of the railing, refer to Figure 4-13. The options in the **Fencing** rollout are used to modify it. The options in the **Type** drop-down list define the type of fencing in the railing. If you select the **(none)** option in the **Type** drop-down list, the fence will not be displayed and the options in the **Picket** and **Solid Fill** areas will become inactive. If you select the **Pickets** option in the **Type** drop-down list, then the pickets will be displayed in between the posts, as shown in Figure 4-17. Also, the **Picket** area will be activated in this rollout. If you select the **Solid Fill** option in the **Type** drop-down list, then the solid box type shape will be displayed in between the posts, as shown in Figure 4-18. Also, the **Solid Fill** area will be activated. The areas in the **Fencing** rollout are discussed next.

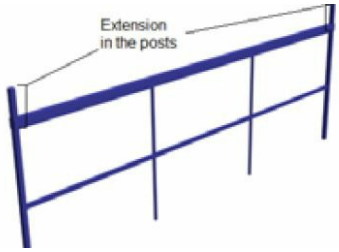


***Figure 4-16** The railing with the extension in the posts*

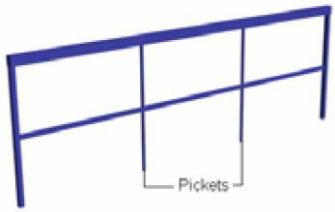


***Figure 4-17** The railing with the picket type of fencing*

Picket Area

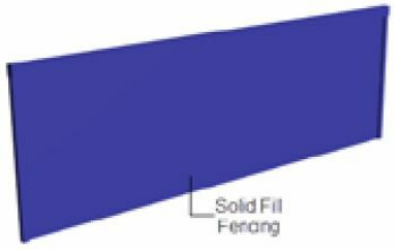
You need to select the **Pickets** option from the **Type** drop-down list to activate this area. The

Profile, **Depth**, **Width**, and **Extension** options in this area are the same as those discussed in the **Posts** rollout. The value in the **Bottom Offset** spinner is used to set the height of the picket from the bottom of the railing, refer to Figure 4-19.

Solid Fill Area

Select the **Solid Fill** option from the **Type** drop-down list to activate this area. The value in the **Thickness** spinner is used to set the thickness of the solid fill. The value in the **Top Offset** spinner is used to set the distance of the solid fill from the bottom of the top railing. The value in the **Bottom Offset** spinner is used to set the distance of the solid fill from the bottom of the railing. The value in the **Left Offset** spinner is used to set the distance of the solid fill from the left post. The value in the **Right Offset** spinner is used to set the distance of the solid fill from the right post, refer to Figure 4-20.

Figure 4-18 *The railing with the solid fill type of fencing*



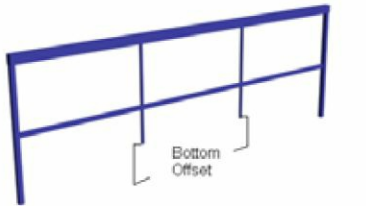


Figure 4-19 *The bottom offset in the picket fencing*

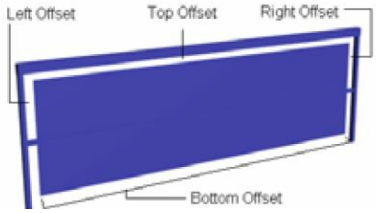


Figure 4-20 *Various offsets in the solid fill fencing*

Creating a Wall

Menu bar: Create > AEC Objects > Wall
Command Panel: Create > Geometry > AEC Extended >
Object Type rollout > Wall

To create a wall, activate the Top viewport and then choose the **Wall** tool from the **Object Type** rollout; the **Name and Color**, **Keyboard Entry**, and **Parameters** rollouts will be displayed, as shown in Figure 4-21. Now, in the **Parameters** rollout, set the width and height by entering values in the **Width** and **Height** spinners, respectively. Next, click on the left of the Top viewport to create the starting point of the wall. Drag the cursor to the right to define the length of the wall and then click on the screen. Now, right-click to exit the command; a wall segment will be created, as shown in Figure

4-22. If you want to create another segment of the wall in continuation, then you need to repeat the same procedure as followed for the first segment without right-clicking. Next, to create a closed wall, click on the starting point of the first wall segment; the **Weld Point?** message box will be displayed, as shown in Figure 4-23. Choose the **Yes** button in this dialog box; a closed wall will be displayed, as shown in Figure 4-24. Next, right-click to exit the command.

Figure 4-21 *Various rollouts to create a wall*

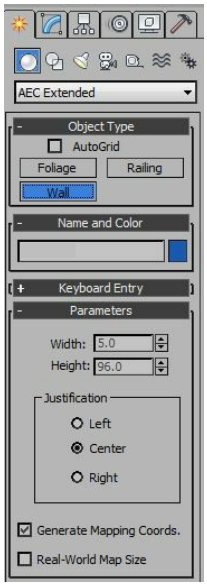


Figure 4-23 *The* ***Weld Point?*** *message box*

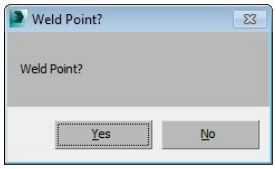


Figure 4-24 *A closed wall displayed*

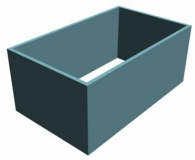
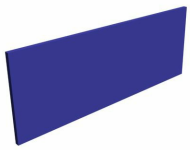


Figure 4-22 *The wall segment displayed*



Various rollouts used to modify the wall are discussed next.

Keyboard Entry Rollout

This rollout is used to create a wall by entering the parameters in the **Keyboard Entry** rollout. To do so, expand the **Keyboard Entry** rollout. Enter the values in the **X**, **Y**, and **Z** spinners to specify the position of the starting point of the wall segment in the viewport along the axes of the home grid or a grid object. Now, choose the **Add Point** button to add a point. Repeat the same procedure to create another segment. Next, choose the **Close** button to create a closed wall. Choose the **Finish** button to end the creation of the wall.

The **Pick Spline** button is used to create wall using the splines. To create a wall according to the wall path or the spline, first create a spline in the viewport. Next, choose the **Wall** tool from the **Object Type** rollout, and then choose the **Pick Spline** button in the **Keyboard Entry** rollout. Next, move the cursor over the spline in the viewport; the pick cursor will be displayed. Next, click on the spline; the wall will be created and aligned to the spline.

Note

The procedure of creating a spline is discussed in detail in Chapter 5.

Parameters Rollout

In this rollout, enter the values in the **Width** and **Height** spinners to define the width and height of the wall, respectively. The **Justification** area in the **Parameters** rollout is discussed next.

Justification Area

The options in this area are used to align the wall to its baseline. The baseline is the line between the front and back sides of a wall and it is equal to the thickness of the wall. By default, the **Center** radio button is selected in this area and is used to align the wall at the center of its baseline. Select the **Left** radio button to align the wall at the left edge of its baseline. Select the **Right** radio button to align the wall at the right edge of its baseline.

Edit Object Rollout

Select one of the walls in the viewport and choose the **Modify** tab in the

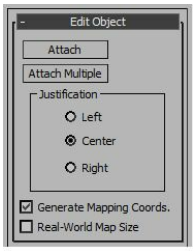


***Figure 4-25** The **Edit Object** rollout*

Command Panel; the **Edit Object** rollout will be displayed, as shown in Figure 4-25. In this rollout, the **Attach** button is used to attach multiple walls to each other in the scene. To do so, choose the **Attach** button; the button will be highlighted. Now, move the cursor over the wall in the viewport; the pick cursor will be displayed. Next, click on the wall to be attached with the selected wall; the walls will get attached to each other. When you select another wall, it will automatically take the same material as that of the selected wall. Choose the **Attach Multiple** button; the **Attach Multiple** dialog box will be displayed, with a list of all the walls in the viewport. From the list, select the multiple walls that you want to get attached by pressing and holding the CTRL key. Next, choose the **Attach** button; multiple walls will be attached to the selected wall.

CREATING DOORS

In 3ds Max, there are three tools to create the in-built doors. These tools are **Pivot**, **Sliding**, and **BiFold**. You can use these doors while creating houses, offices, rooms, and so on. To create doors,

you need to choose **Create > Geometry** from the **Command Panel**; the **Standard Primitives** option will be displayed in the drop-down list. Select the **Doors** option from the drop-down list and activate the viewport in which you want to create the doors. Next, choose the corresponding tool from the **Object Type** rollout. In this section, you will learn to create and modify different types of doors using various tools available in the **Object Type** rollout.

Creating a Pivot Door

Menu bar: Create > AEC Objects > Pivot Door

Command Panel: Create > Geometry > Doors > Object Type rollout > Pivot

The pivot door is joined or hinged only on one side. To create a pivot door, choose the **Pivot** tool from the **Object Type** rollout; the **Name and Color**, **Creation Method**, **Parameters**, and **Leaf Parameters** rollouts will be displayed, as shown in Figure 4-26.

Activate the Top viewport and press and hold the left mouse button on the left of the viewport. Now, drag the cursor to the right of the viewport and release the left mouse button to define the width. Next, move the cursor up or down to define the depth of the door and click on the screen to set the depth. Now, again move the cursor up or down to define the height of the door. Click on the screen; the pivot door will be created in all viewports, refer to Figure 4-27.

Figure 4-26 *Partial view of various rollouts to create a pivot door*

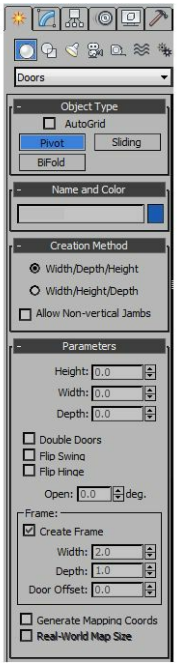


Figure 4-27 *The pivot door created in the viewport*

Various rollouts used to create and modify the pivot door are discussed next.

Creation Method Rollout

The options in this rollout are used to create the pivot door dynamically. You can create the pivot door using any of the two methods that are discussed next.

Width/Depth/Height

To create the door using this method, make sure the **Width/Depth/Height** radio button is selected. Now, first you need to define the width and depth of the door, and then you need to move the cursor to define the height, as discussed earlier while creating the pivot door dynamically.

Width/Height/Depth

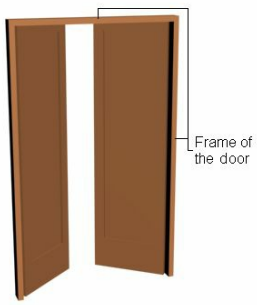
To create the door using this method, you need to select the **Width/Height/Depth** radio button. Now, first you need to specify the width and height of the door, and move the cursor to specify the depth. To do so, press and hold the left mouse button on the left side of the viewport, drag the cursor to the right of the viewport to specify the width of the pivot door, and release the left mouse button. Next, move the cursor up to define the height of the door and click on the screen to set the height. Next, move the cursor up or down to specify the depth of the door. Click in the viewport; the pivot door will be created in all viewports.

Parameters Rollout

The options in this rollout are used to modify the pivot door. Select the pivot door and choose the **Modify** tab in the **Command Panel**; the **Parameters** and **Leaf Parameters** rollouts will be displayed. Enter the new values in the **Height**, **Width**, and **Depth** spinners to modify the height, width, and depth of the pivot door, respectively. Select the **Double Doors** check box to create two pivot doors, one on the left and other on the right, as shown in Figure 4-28. Select the **Flip Swing** check box to change the direction of swing of the door. Select the **Flip Hinge** check box to change the placement of the joint or the hinge of the pivot door on the opposite side. When you select the **Double Doors** check box, the **Flip Hinge** check box becomes inactive. The value in the **Open** spinner is used to specify the amount in degree to which the door will open, refer to Figure 4-29. The **Frame** area in the **Parameters** rollout is discussed next.

Figure 4-28 *A double pivot door*

Figure 4-29 *An opened double door*



Frame Area

The options in this area are used to modify the frame of the pivot door. By default, the **Create Frame** check box is selected. If you clear the **Create Frame** check box, then the other options in this area will become inactive. Also, the frame will not be displayed in the door. Enter the values in the **Width** and **Depth** spinners to specify the width and depth of the frame of the pivot door. The value in the **Door Offset** spinner specifies the location of the door in reference to the frame.

Leaf Parameters Rollout

This rollout is used to modify the leaf of a door. Set a new value in

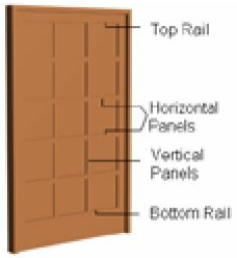


Figure 4-30 *The modified door leaf*

the **Thickness** spinner to modify the thickness of the leaf of the door. Enter a new value in the **Stiles/Top Rail** spinner to modify the frame of the door leaf on the top, left, and right side, as shown in Figure 4-30. Set a value in the **Bottom Rail** spinner to modify the frame at the bottom of the door leaf. The value in the **# Panels Horiz** spinner specifies the horizontal panels on the leaf of the door. The value in the **# Panels Vert** spinner specifies the vertical panels on the leaf of the door, refer to Figure 4-30. The value in the **Muntin** spinner is used to specify the width of the gap between the panels of the door leaf. The **Panels** area in the **Leaf Parameters** rollout is discussed next.

Panels Area

The options in this area are used to modify the panels on the door leaf. The three radio buttons in this area are discussed next.

None

Select the **None** radio button; the panels will not be displayed in the door leaf.

Glass

Select the **Glass** radio button to create the glass panels, refer to Figure 4-30. Also, the **Thickness** spinner will be activated. It is used to set the thickness of the glass panel.

Beveled

Select the **Beveled** radio button to create the beveled panels, as shown in Figure 4-31. When you select the **Beveled** radio button, the options under this radio button will be activated. The **Bevel Angle** spinner is used to define the angle between the outer surface of the door and the panel surface. The **Thickness 1** spinner is used to define the outer thickness of the panel. The **Thickness 2** spinner is used to define the thickness of the starting point of the bevel. The **Middle Thick** spinner is used to define the inner thickness of the panel. The **Width 1** spinner is used to define the

width of the starting point of the bevel and the **Width 2** spinner is used to define the inner width of the panel.

Figure 4-31 *A door with the beveled panels*

Creating a Sliding Door

Menu bar: Create > AEC Objects > Sliding Door

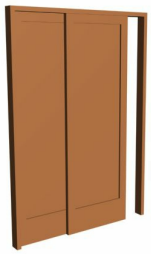
Command Panel: Create > Geometry > Doors > Object Type rollout > Sliding

A sliding door has two door components, one is fixed, whereas the other slides or moves over the fixed component to open. To create a sliding door, choose the **Sliding** tool from the **Object Type** rollout; the **Name and Color**, **Creation Method**, **Parameters**, and **Leaf Parameters** rollouts will be displayed.

To create the sliding door, follow the same procedure as you did for the pivot door; a sliding door will be created, as shown in Figure 4-32.

The options in the **Name and Color**, **Creation Method**, **Parameters**, and **Leaf Parameters** rollouts are the same as discussed in the pivot door. However, some options in the **Parameters** rollout are different and these are discussed next.

Figure 4-32 *A sliding door*



Select the **Flip Front Back** check box to choose the component that you want to place in the front. Select the **Flip Side** check box to change the fixed component to the sliding component.

Creating a BiFold Door

Menu bar: Create > AEC Objects > BiFold Door

Command Panel: Create > Geometry > Doors > Object Type rollout > BiFold

The bifold door has two door components and two joints in it. To

Figure 4-33 *A bifold door*

create the bifold door, choose the **BiFold** tool from the **Object Type** rollout; the **Name and Color**, **Creation Method**, **Parameters**, and **Leaf Parameters** rollouts will be displayed in the **Command Panel**. Now, create a bifold door dynamically using the same method as discussed for creating the pivot door; a bifold door will be created, as shown in Figure 4-33.

The options in the **Name and Color**, **Creation Method**, **Parameters**, and **Leaf Parameters** rollouts are the same as those discussed for the pivot door.

CREATING WINDOWS

In 3ds Max, there are six tools to create different types of default windows such as **Awning**, **Casement**, and so on. You can use these windows at various places for architectural designs.

To use these tools for creating the windows, choose **Create > Geometry** in the **Command Panel**; the **Standard Primitives** option will be displayed in the drop-down list. Now, select the **Windows** option from this drop-down list; various tools will be displayed in the **Object Type** rollout. In this section, you will learn to create various types of windows using these tools.

Creating an Awning Window

Menu: Create > AEC Objects > Awning Window

Command Panel: Create > Geometry > Windows > Object Type rollout > Awning

An awning window has one or more cases that are joined at its top. To create an awning window, choose the **Awning** tool from the **Object Type** rollout; the **Name and Color**, **Creation Method**, and **Parameters** rollouts will be displayed, as shown in Figure 4-34.

Activate the Top viewport and press and hold the left mouse button on the left side of the viewport, drag the cursor to the right side to specify the width of the window, and release the left mouse button. Next, move the cursor up or down to define the depth of the window and click on the screen. Now, move the cursor up or down to specify the height of the window. Click on the screen; the awning window will be created in all viewports, refer to Figure 4-35.

The options in the **Name and Color** and **Creation Method** rollouts are the same for all windows as those discussed in the pivot door.

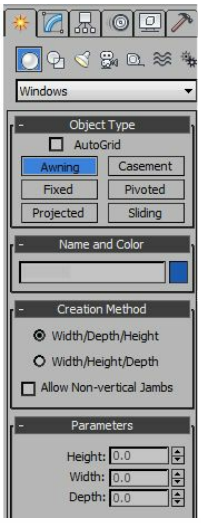
Parameters Rollout

The options in this rollout are used to modify the awning window. Select the awning window and choose the **Modify** tab in the **Command Panel**; the **Parameters** rollout will be displayed. Enter new values in the **Height**, **Width**, and **Depth** spinners to modify the height, width, and depth, respectively of the awning window. The areas in the **Parameters** rollout are used to modify the window. These areas are discussed next.

Frame

The options in this area are used to modify the frame of the window, refer to Figure 4-35. Enter a value in the **Horiz. Width** spinner to set the width of the horizontal (top and bottom) frames of the window. Enter a value in the **Vert. Width** spinner to set the width of the vertical (left and right) frames of the window. Similarly, enter a value in the **Thickness** spinner to set the overall thickness of the frame of the window.

Figure 4-34 *Partial view of various rollouts to create an awning window*



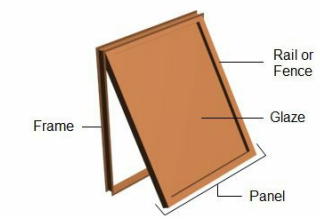


Figure 4-35 *An awning window*

Glazing

The **Thickness** spinner in this area is used to set the thickness of the glaze or the glass of the window, refer to Figure 4-35.

Rails and Panels

This area is used to modify the panel of the window. Enter a value

Figure 4-36 *An awning window with two panels*

in the **Width** spinner to set the width of the fence in the panel. Enter a value in the **Panel Count** spinner to set the number of panels in the window, as shown in Figure 4-36.

Open Window

The **Open** spinner in this area is used to open the window. Its value will be in percentage.

Creating a Casement Window

Menu bar: Create > AEC Objects > Casement Window

Command Panel: Create > Geometry > Windows > Object Type rollout > Casement

A casement window has one or more cases that are joined on the sides. To create the casement window, choose the **Casement** tool from the **Object Type** rollout; the **Name and Color**, **Creation Method**, and **Parameters** rollouts will be displayed. Create a casement window dynamically using the same method as discussed for creating the awning window. A casement window is shown in Figure 4-37.

Parameters Rollout

The options in this rollout are the same as those discussed for the **Awning** tool, except the **Casement** and **Open Window** areas. These areas are discussed next.

Casements Area

The options in this area are used to modify the panel of the window. Enter a value in the **Panel Width** spinner to set the width of the fence in the panel. By default, the **One** radio button is selected to create one panel in the window. If you want to create two panels in the window, as shown in Figure 4-38, you need to select the **Two** radio button.

Figure 4-37 *A casement window*

Figure 4-38 *A casement window with two panels*

Open Window Area

The **Open** spinner in this area is used to open the window. Its value will be in percentage. Select the **Flip Swing** check box to swap the swinging of the panel of the window.

Creating a Fixed Window

Menu bar: Create > AEC Objects > Fixed Window

Command Panel: Create > Geometry > Windows > Object Type rollout > Fixed

A fixed window cannot be opened. To create a fixed window, choose the **Fixed** tool from the **Object Type** rollout; the **Name and Color**, **Creation Method**, and **Parameters** rollouts will be displayed.

Next, activate the Top viewport and follow the same method as discussed for creating the awning window; a fixed window will be created, as shown in Figure 4-39.

Parameters Rollout

The options in this rollout are the same as those discussed in the **Awning** tool, except the **Rails and Panels** area. This area is discussed next.

Rails and Panels Area

This area is used to modify the panel of the window. Enter a value in the **Width** spinner to set the width of the fence in the panel. Set a value in the **#Panels Horiz** spinner to define the number of horizontal divisions in the panel. Similarly, set a value in the **#Panels Vert** spinner to define the number of vertical divisions in the panel. On selecting the **Chamfered Profile** check box, the rails are chamfered between the glazed panels, refer to Figure 4-40.

Figure 4-39 *A fixed window*

Figure 4-40 *A fixed window with horizontal and vertical divisions*

Creating a Pivoted Window

Menu bar: Create > AEC Objects > Pivoted Window

Command Panel: Create > Geometry > Windows > Object Type rollout > Pivoted

A pivoted window has only one panel that is joined at the middle of the frame. When you open this window, it will swing around the horizontal axis. To create a pivoted window, activate the viewport and choose the **Pivoted** tool from the **Object Type** rollout; the **Name and Color**, **Creation Method**, and **Parameters** rollouts will be displayed. Now, follow the same method as discussed while creating the awning window; a pivoted window will be created, as shown in Figure 4-41.

Parameters Rollout

Most of the options in this rollout are the same as discussed for the **Awning** tool, except the **Rails** and **Pivots** areas. These areas are discussed next.

Rails Area

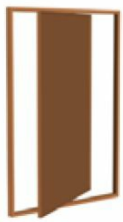
This area is used to modify the panel of the window. Enter a value in the **Width** spinner to set the width of the fence in the panel.

Pivots Area

When you open the window, by default it rotates about the horizontal axis. To rotate the window about the vertical axis, select the **Vertical Rotation** check box; the window will be vertically rotated, as shown in Figure 4-42.

Figure 4-41 *A pivoted window rotated around the horizontal axis*

Figure 4-42 *A pivoted window rotated around the vertical axis*



Creating a Projected Window

Menu bar: Create > AEC Objects > Projected Window

Command Panel: Create > Geometry > Windows > Object Type rollout > Projected

A projected window has three panels in which the top one remains

Figure 4-43 *A projected window*

still, and the other two swing in the directions opposite to each other. To create a projected window, activate the viewport and choose the *Projected* tool from the **Object Type** rollout; the **Name and Color**, **Creation Method**, and **Parameters** rollouts will be displayed. Now, follow the same method as discussed while creating the awning window; a projected window will be created, as shown in Figure 4-43.

Parameters Rollout

Most of the options in this rollout are the same as discussed for the **Awning** tool, except the **Rails and Panels** area. This area is discussed next.

Rails and Panels Area

This area is used to modify the panel of the window. Set the value in the **Width** spinner to specify the width of the fence in the panel. Set the value in the **Middle Height** spinner to define the height of the middle panel relative to the frame of the window. Similarly, set the value in the **Bottom**

Height spinner to define the height of the bottom panel relative to the frame of the window.

Creating a Sliding Window

Menu bar: Create > AEC Objects > Sliding Window

Command Panel: Create > Geometry > Windows > Object Type rollout > Sliding

A sliding window has two panels in which one remains still and the other one slides to open. To create a sliding window, activate the viewport and choose the **Sliding** tool from the **Object Type** rollout; the **Name and Color**, **Creation Method**, and **Parameters** rollouts will be displayed.

Now, create a sliding window dynamically using the same method as discussed while creating the awning window; a sliding window will be created, as shown in Figure 4-44.

Parameters Rollout

Most of the options in this rollout are the same as those discussed for the **Awning** tool, except the **Rails and Panels** and **Open Window** areas. These areas are discussed next.

Rails and Panels Area

This area is used to modify the panel of the window. Set the value in the **Rail Width** spinner to set the width of the fence in the panel. Set the value in the **#Panels Horiz** spinner to define the number of horizontal divisions in the panel. Set the value in the **#Panels Vert** spinner to define the number of vertical divisions in the panel. On selecting, the **Chamfered Profile** check box, the rails between the glazed panels will be chamfered, as shown in Figure 4-45.

Open Window

The **Open** spinner in this area is used to open the window and its value will be in percentage. By default, the **Hung** check box is selected. As a result, the panel slides in the vertical direction. Clear the **Hung** check box to slide the panel in the horizontal direction, refer to Figure 4-46.

Figure 4-44 *The sliding window*

Figure 4-45 *The sliding window with two horizontal and vertical chamfered divisions*

Figure 4-46 *The sliding window with the horizontal sliding*

CREATING STAIRS

In 3ds Max, there are four tools that are used to create different types of default stairs such as **LType Stair**, **Spiral Stair**, and so on. To invoke these tools, choose **Create > Geometry** in the **Command Panel**; the **Standard Primitives** option will be displayed in the drop-down list. Now, select the **Stairs** options from the drop-down list; various tools will be displayed in the **Object Type** rollout. In this section, you will learn to create various types of stairs using these tools.

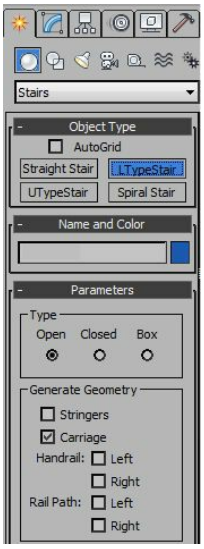
Creating L-Type Stairs

Menu bar: Create > AEC Objects > L-Type Stair

Command Panel: Create > Geometry > Stairs > Object Type rollout > L-TypeStair

The L-type stairs have two stairways that are jointed at right angles

Figure 4-47 *Partial view of various rollouts to create L-type stairs*



to each other. To create the L-type stairs, choose the **L-Type Stair** tool from the **Object Type** rollout; the **Name and Color**, **Parameters**, **Carriage**, **Railings**, and **Stringers** rollouts will be displayed, as shown in Figure 4-47.

Now, activate the Top viewport. Press and hold the left mouse button on the left side of the viewport, drag the cursor to the right side of the viewport to specify the length of the first stairway of the stairs, and then release the left mouse button. Next, move the cursor up or down to define the length of the second stairway of the stairs and then click on the screen. Now, move the cursor up to specify the overall height of the stair and then click on the screen; the L-type stairs will be created in the viewport, as shown in Figure 4-48.

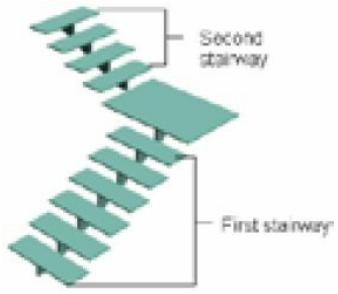


Figure 4-48 *The L-type open stairs created*

Various rollouts used to create and modify the L-type stairs are discussed next.

Parameters Rollout

The options in this rollout are used to modify the L-type stairs. To do so, select the L-type stairs and choose the **Modify** tab in the **Command Panel**; the **Parameters**, **Carriage**, **Railings**, and **Stringers** rollouts will be displayed. The **Parameters** rollout has a number of options which can be used to modify the stairs. These options are discussed next.

Type Area

The options in this area are used to define the type of stairs. By default, the **Open** radio button is selected, and therefore the stairs with open steps are created, refer to Figure 4-48. Select the **Closed** radio button to create the stairs with closed steps, as shown in Figure 4-49. Select the **Box** radio button to create a support for the steps of the stairs, as shown in Figure 4-50.

Figure 4-49 *The L-type closed stairs*

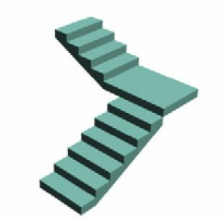
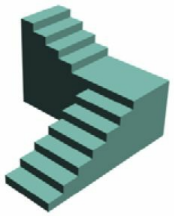


Figure 4-50 *The L-type box stairs*



Generate Geometry Area

The options in this area are used to modify the stairs by incorporating the geometry shapes. Select the **Stringers** check box to create the left and right support for the steps of the stairs, refer to Figure 4-51. Select the **Carriage** check box to create support for the steps of the stairs. Select the **Left** and **Right** check boxes in the **Handrail** group to create the left and right handrails, as shown in Figure 4-51.

Layout Area

The options in this area are used to modify the dimensions of the stairs. Enter a value in the **Length 1** spinner to set the length of the first stairway. Similarly, enter a value in the **Length 2** spinner to set the length of the second stairway. The value in the **Width** spinner is used to set the width of the overall steps in the stairs. Enter a value in the **Angle** spinner to set the angle between the second stairway and the landing of the stairs. Figure 4-52 shows an L-Type stair with its *Angle* value set to zero.

Rise Area

There are three spinners in this area. These spinners are controlled by choosing the buttons available on their left side. When you choose one of the buttons, the spinner on the right side of that

button becomes inactive. You can modify only two spinners at a time. Enter a value in the **Overall** spinner to define the height of stairways. The **Riser Ht** spinner is used to set the height of the risers in the stairs. The **Riser Ct** spinner is used to set the number of risers in the stairs. The riser is the gap between the steps in a stairway.

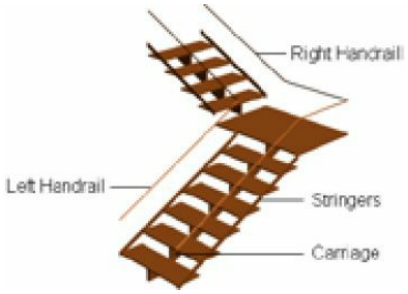


Figure 4-51 *The L-Type stairs with handrails, carriage, and stringers*

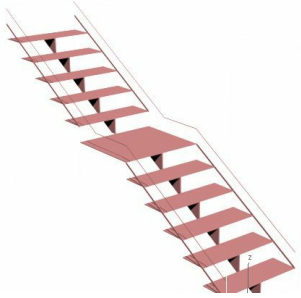


Figure 4-52 *The L-Type stairs with* ***Angle*** *value set to zero*

Steps Area

Enter a value in the **Thickness** spinner to modify the thickness of the steps of the stairs. This spinner is activated only if the **Open** radio button is selected in the **Type** area. Select the check box on the left side of the **Depth** spinner; the **Depth** spinner will become active. Set a value in the **Depth** spinner to modify the depth of the steps of the stairs.

Carriage Rollout

To activate the options in this rollout, make sure the **Carriage** check box in the **Generate Geometry** area of the **Parameters** rollout is selected. In the **Parameters** area of the **Carriage** rollout, enter a value in the **Depth** spinner to set the depth of the carriage. Enter a value in the **Width** spinner to set the width of the carriage. Choose the **Carriage Spacing** button just below the **Width** spinner; the **Carriage Spacing** dialog box will be displayed. Select the **Count** check box, if it is not already selected. The value in the spinner on the right side of the **Count** check box specifies the number of carriages in the stairs. Set the required value and then choose the **Close** button to close the dialog box. The **Spring from Floor** check box in this rollout is used to control the starting point of the carriage from the floor.

Railings Rollout

To activate the options in this rollout, you need to select one of the **Handrail** check boxes in the **Generate Geometry** area of the **Parameters** rollout. Enter a value in the **Height** spinner to set the height of the railing from the steps of the stairs. The **Offset** spinner is used to set the offset of the railing from the ends of the steps. The value in the **Segments** spinner is used to set the number of segments in the railing. The more the number of segments, smoother will be the railing. The value in

the **Radius** spinner is used to set the radius of the railing.

Stringers Rollout

To activate the options in this rollout, you need to select the **Stringers** check box in the **Generate Geometry** area of the **Parameters** rollout. Enter a value in the **Depth** spinner to set the distance of the stringers from the floor. The value in the **Width** spinner is used to set the width of the stringers. The **Offset** spinner is used to set the distance of the stringers from the steps. The **Spring from Floor** check box is used to control the starting point of the stringers from the floor.

Creating Spiral Stairs

Menu bar: Create > AEC Objects > Spiral Stair

Command Panel: Create > Geometry > Stairs > Object Type rollout > Spiral Stair

The spiral stairs have a spiral shaped staircase. To create the spiral stairs, choose the **Spiral Stair** tool from the **Object Type** rollout; the **Name and Color**, **Parameters**, **Carriage**, **Railings**, **Stringers**, and **Center Pole** rollouts will be displayed. To create the spiral stairs dynamically, activate the Top viewport. Next, click on a point in the viewport to specify the center of the spiral stair, hold the left mouse button, and drag it downward to specify the radius and width. Release the left mouse button and move the cursor up or down to specify the overall rise in the height. Then, click on the screen; the spiral stairs will be created in the viewport. Different types of spiral stairs are shown in Figures 4-53, 4-54, and 4-55.

Figure 4-53 *The spiral stairs*

Figure 4-54 *The closed spiral stairs*

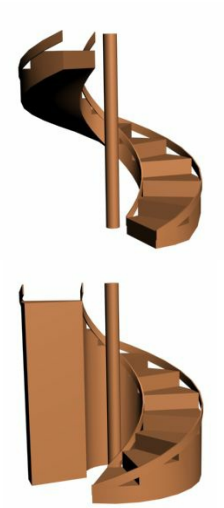


Figure 4-55 *The spiral box stairs*

Note

*The options in the **Carriage**, **Railings**, and **Stringers** rollouts for the **Spiral Stair**, **Straight Stair**,*

*and **U-Type Stair** tools will be same as discussed for the **L-Type Stair tool**.*

Parameters Rollout

In this rollout, the **Type**, **Rise**, and **Steps** areas are the same as discussed for the **L-Type Stair** tool. However, the **Generate Geometry** and **Layout** areas are different and these areas are discussed next.

Generate Geometry

The options in this area are used to modify the stairs by incorporating the geometry shapes. Select the **Stringers** check box to create the left and right supports for the steps of the stairs. Select the **Carriage** check box, if it is not already selected to create support for the steps of the stairs. Select the **Center Pole** check box to create a pole at the center of the stairs, refer to Figure 4-53. Select the **Inside** and **Outside** check boxes in the **Handrail** area to create the handrails on both sides.

Layout

The options in this area are used to modify the dimensions of the stairs. Select the **CCW** radio button, if not already selected, to rotate the stairs in the counterclockwise direction. Select the **CW** radio button to rotate the stairs in the clockwise direction. Enter a value in the **Radius** spinner to set the radius of the spiral stairs. Enter a value in the **Revs** spinner to set the number of revolutions of the stairs. The value in the **Width** spinner is used to set the width of the spiral stairs.

Center Pole Rollout

To activate the options in this rollout, you need to select the **Center Pole** check box in the **Generate Geometry** area of the **Parameters** rollout. In the **Parameters** area of the **Center Pole** rollout, set a value in the **Radius** spinner to set the radius of the center pole. Set the value in the **Segments** spinner to set the number of segments of the center pole. Select the check box on the left side of the **Height** spinner to activate it and set the value in this spinner to define the height of the pole.

Creating Straight Stairs

Menu bar: Create > AEC Objects > Straight Stair
Command Panel: Create > Geometry > Stairs > Object Type rollout > Straight Stair

The straight stairs have only one stairway. To create the straight stairs, activate the Top viewport and choose the **Straight Stair** tool from the **Object Type** rollout; the **Name and Color**, **Parameters**, **Carriage**, **Railings**, and **Stringers** rollouts will be displayed.

Press and hold the left mouse button on the left side of the viewport and drag the cursor to the right side of the viewport to specify the length of the stairs. Release the left mouse button and then move the cursor up or down to define the width of the stairs and click on the screen to set the width. Next, move the cursor up or down to specify the height of the stairs. Click in the viewport; the straight stairs will be created in all viewports, as shown in Figure 4-56. You can also create the closed and box straight stairs in the same way as described in the L-type stairs, refer to Figures 4-57 and 4-58.

Figure 4-56 *The straight stairs*

Figure 4-57 *The straight closed stairs*

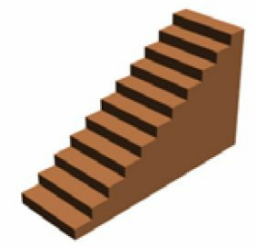


Figure 4-58 *The straight box stairs*

Parameters Rollout

In this rollout, all areas are same as discussed in the **L-Type Stair** tool, except the **Layout** area and this area is discussed next.

Layout Area

The options in this area are used to modify the dimensions of the stairs. The value in the **Length** spinner is used to set the length and the value in the **Width** spinner is used to set the width of the stairs.

Creating U-Type Stairs

Menu bar: Create > AEC Objects > U-Type Stair
Command Panel: Create > Geometry > Stairs > Object Type rollout > U-TypeStair

The U-type stairs have two stairways parallel to each other in U shape. To create the U-type stairs, activate the Top viewport and choose the **U-Type Stair** tool from the **Object Type** rollout; the **Name and Color**, **Parameters**, **Carriage**, **Railings**, and **Stringers** rollouts will be displayed.

Next, press and hold the left mouse button on the left side of the viewport, drag the cursor to the right side to specify the length of the stairs, and then release the left mouse button. Now, move the cursor up to define the width of the stairs and the distance between the two stairways. Click on the screen to set the width. Next, move the cursor up or down to specify the rise of the stairs. Click on the screen; the U-type stairs will be created in all viewports. Different U-type stairs are shown in Figures 4-59, 4-60, and 4-61.

Figure 4-59 *The U-type stairs*

Figure 4-60 *The U-type closed stairs*

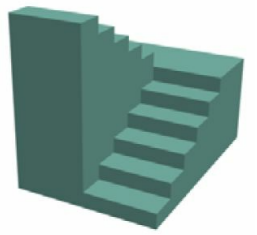


Figure 4-61 *The U-type box stairs*

TUTORIALS

Tutorial 1

In this tutorial, you will create a nature scene, as shown in Figure 4-62, using the AEC extended objects and standard primitives. **(Expected time: 30 min)**

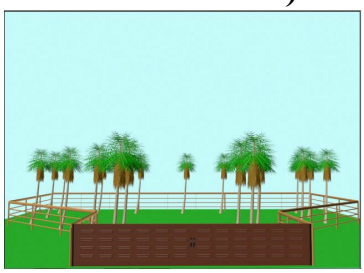


Figure 4-62 *The nature scene*

The following steps are required to complete this tutorial:

a. Create the project folder.
b. Create floor.
c. Create railings.
d. Create trees.
e. Create gate.
f. Save and render the scene.

Creating the Project Folder

Create a new project folder with the name *c04_tut1* at *\Documents\3dsmax2015* and then save the scene with the name *c04tut1*, as discussed in Tutorial 1 of Chapter 2.

Creating Floor

In this section, you will create a floor using the *Plane* tool.

1. Activate the Top viewport. Choose **Create > Geometry** in the **Command Panel**; the **Standard Primitives** option is displayed in the drop-down list. Choose the **Plane** tool from the **Object Type** rollout.

2. In the **Keyboard Entry** rollout, set the parameters as follows:

Length: **1485.0** Width: **1605.15**

3. Choose the **Create** button from the **Keyboard Entry** rollout; a plane is displayed in viewports. Now, choose the **Zoom Extents All** tool to display the entire plane in the viewports.

4. In the **Name and Color** rollout, enter **floor**; the plane is named as *floor*.

5. Use the color swatch in the **Name and Color** rollout to modify the color of *floor* to green.

6. Activate the Perspective viewport and set the view using the **Zoom** and **Orbit** tools, as shown in Figure 4-63.

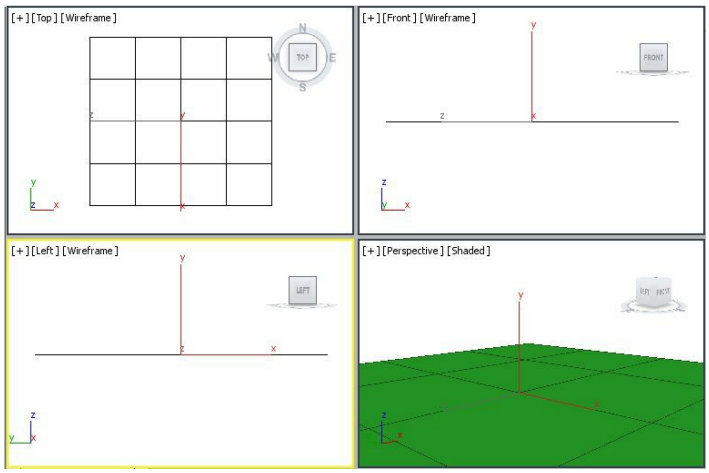


Figure 4-63 *The floor geometry after using the* ***Zoom*** *and* ***Orbit*** *tools*

Creating Railings

In this section, you will create railings around *floor* using the **Railing** tool.

1. Choose **Create > Geometry** in the **Command Panel**; a drop-down list is displayed below the **Geometry** button. Select the **AEC Extended** option from the drop-down list and then choose the **Railing** tool from the **Object Type** rollout.

2. Activate the Top viewport. Next, move the cursor to the upper left corner of *floor*, press and hold

the left mouse button, and drag the cursor to the upper right corner of *floor* to specify the length of the railing. Release the left mouse button to set the length, and then move the cursor up to specify the height of the railing. Click on the viewport; a railing is created.

3. In the **Name and Color** rollout, enter **railing01** and press ENTER.

4. Use the color swatch to modify the color of *railing01* and enter the values as follows:

Red: **177** Green: **88** Blue: **26**

5. Make sure *railing01* is still selected. Choose the **Modify** tab in the **Command Panel**; the **Railing**, **Posts**, and **Fencing** rollouts are displayed.

6. In the **Railing** rollout, set the parameters as follows:

Length: **1400.0**
Top Rail area
Profile: **Round** Depth: **10.0**
Width: **3.0** Height: **100.0**

Lower Rail(s) area
Profile: **Round** Depth: **4.0**
Width: **3.0**

7. Choose the **Lower Rail Spacing** button in the **Lower Rail(s)** area; the **Lower Rail Spacing** dialog box is displayed. Make sure the **Count** check box is selected. Next, set the value **3** in the spinner on the right side of the **Count** check box and choose the **Close** button; the railing is displayed in all viewports, as shown in Figure 4-64.

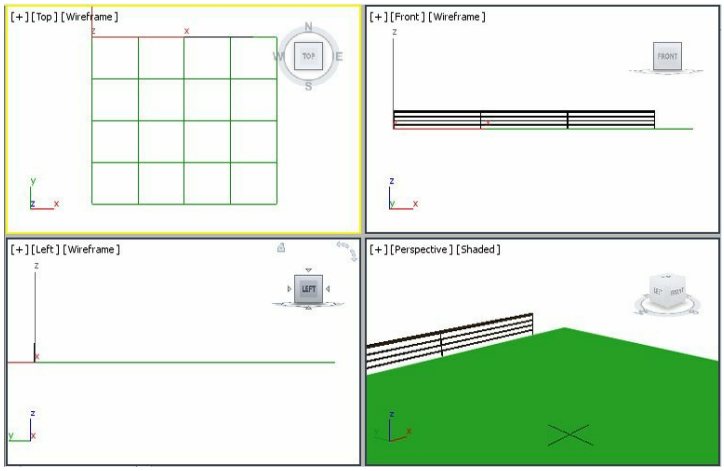


Figure 4-64 *The railing01 displayed in viewports*

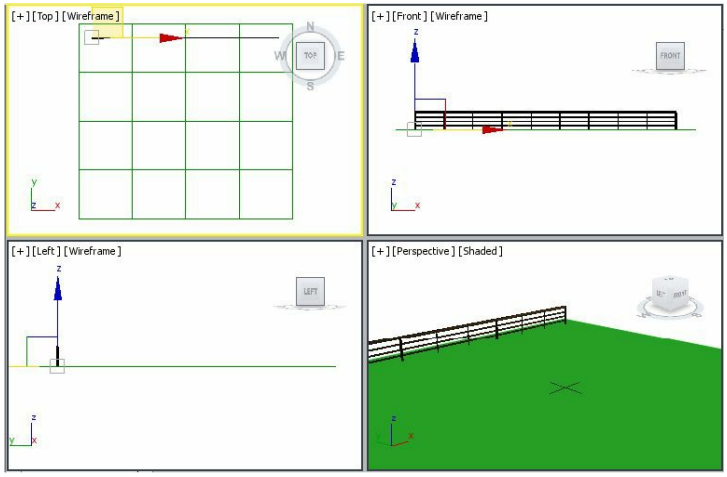
8. In the **Posts** rollout, set the values as follows:
Profile: **Round** Depth: **7.0**
Width: **5.0** Extension: **2.0**

9. Choose the **Post Spacing** button in the **Post** rollout; the **Post Spacing** dialog box is displayed. Make sure the **Count** check box is selected. Next, set the value **4** in the spinner on the right side of the **Count** check box and choose the **Close** button.
10. In the **Fencing** rollout, select **(none)** from the **Type** drop-down list.

Note
*If you want to add fencing to the railing, then select the type of fencing from the **Type** drop-down list and set the parameters in the respective area.*

11. Make sure *railing01* is selected in the Top viewport. Now, choose the **Select and Move** tool from the **Main Toolbar** and align the railing manually, as shown in Figure 4-65.

Figure 4-65 *The railing01 geometry in viewports after aligning it in the Top viewport*



Next, you need to create one more railing.

12. Activate the Top viewport and choose the **Railing** tool. Create one more railing at the right angle of *railing01* using the same method as discussed for creating *railing01*, refer to Figure 4-72.

Note
When you create another railing, all dimensions of railing01, except the length and height, will be taken automatically.

13. In the **Name and Color** rollout, enter **railing02**.

14. Assign the same color to *railing02* as was assigned to *railing01*.

15. Make sure *railing02* is selected. Next, choose the **Modify** tab in the **Command Panel**; the **Railing**, **Post**, and **Fencing** rollouts are displayed.
16. In the **Railing** rollout, set the parameters as follows:

Length: **600.0**

Top Rail area
Height: **100.0**

17. Choose the **Select and Move** and **Select and Rotate** tools and align *railing02* in the viewports, as shown in Figure 4-66.

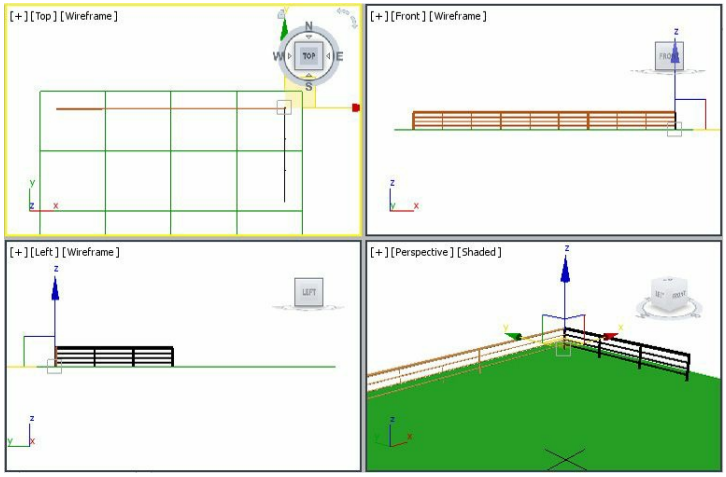


Figure 4-66 *The railing02 geometry in viewports after alignment*

Next, you need to copy *railing02*.

18. Activate the Top viewport. and make sure *railing02* is selected. Next, place the cursor over the vertical axis. Press and hold the SHIFT key and drag *railing02* downward until the value in the **Y** spinner in the Coordinate display becomes around **-601**. Release the left mouse button and the SHIFT key; the **Clone Options** dialog box is displayed.

19. In the **Clone Options** dialog box, make sure the **Copy** radio button is selected. Set the value in the **Number of Copies** spinner to **1** and enter *railing03* in the *Name* text box. Next, choose the **OK** button; *railing 03* is created, as shown in Figure 4-67.

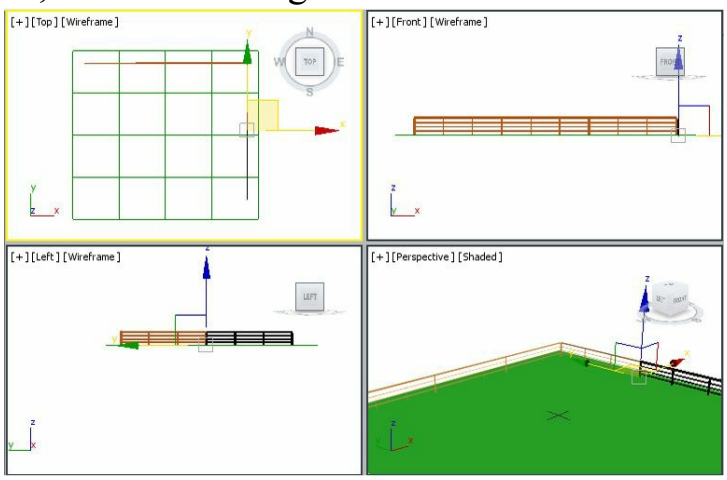
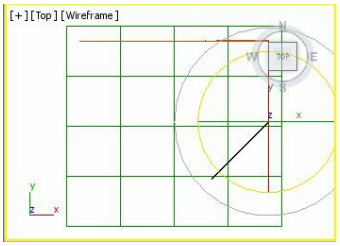


Figure 4-67 *The railing03 geometry after alignment*

20. Activate the Top viewport and select *railing03*. Choose the **Select and Rotate** tool, move the cursor over the Z-axis, and rotate it to -45 degrees in the clockwise direction, as shown in Figure 4-68.

Figure 4-68 *The railing03 geometry rotated in the Top viewport*



Note
While rotating railing03, choose the ***Angle Snap Toggle*** *tool from the* ***Main Toolbar*** *to measure the angle of rotation in increments.*

Now, you need to create the fourth railing.

21. Activate the Top viewport and create another railing starting from the endpoint of *railing03*.
22. In the **Name and Color** rollout, enter **railing04**.

23. Assign the same color to *railing04* as was assigned to *railing01*.

24. Make sure *railing04* is selected. Choose the **Modify** tab in the **Command Panel**; the **Railing**, **Post**, and **Fencing** rollouts are displayed.

25. In the **Railing** rollout, set the parameters as follows:

Length: **325.0**
Top Rail area
Height: **100.0**

26. Make sure *railing04* is aligned in viewports, as shown in Figure 4-69.

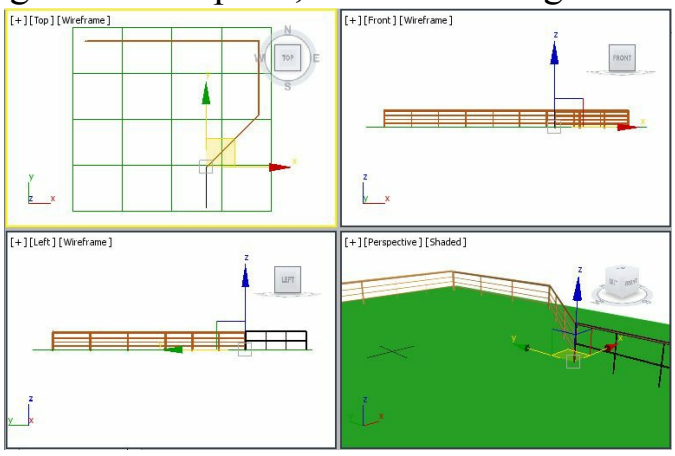


Figure 4-69 *The railing04 geometry aligned in viewports*

27. Select *railing02*, *railing03*, and *railing04* from the Scene Explorer; three railings are selected in the viewports.

28. Make sure the Top viewport is activated and then choose the **Mirror** tool from the **Main Toolbar**;

the **Mirror: Screen Coordinates** dialog box is displayed. In the **Mirror Axis** area of this dialog box, make sure the **X** radio button is selected. In the **Offset** spinner, set the value **-980**. In the **Clone Selection** area, select the **Copy** radio button and choose the **OK** button; the copy of all the railings created earlier is displayed and they are automatically named as *railing005*, *railing006*, and *railing007*, refer to Figure 4-70.

29. Adjust the view in the Perspective viewport using the tools in the viewport navigation controls, refer to Figure 4-70.

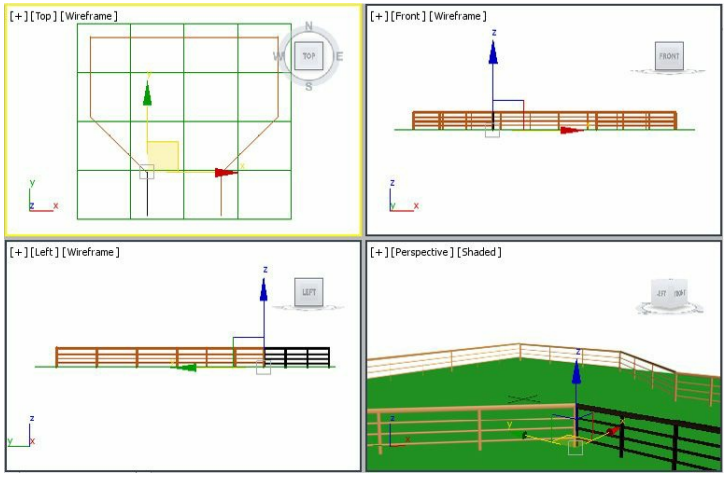


Figure 4-70 *The railings geometry displayed in viewports*

Creating Trees

In this section, you will create the trees using the **Foliage** tool.

1. Choose **Create > Geometry** in the **Command Panel**; a drop-down list is displayed below the **Geometry** button. Select the **AEC Extended** option from the drop-down list and then choose the **Foliage** tool from the **Object Type** rollout.

2. Activate the Top viewport. In the **Favorite Plants** rollout, double-click on **Generic Palm**; the tree is created and displayed in all viewports.

Note

*If the **Generic Palm** tree is not displayed in the palette of the **Favorite Plants** rollout, then choose the **Plant Library** button at the bottom of the rollout; the **Configure Palette** dialog box is displayed. Double-click on the **Generic Palm** tree; the **yes** option is displayed in the **Fav.** column, indicating that the tree will be available in the palette. Next, choose the **OK** button.*

3. In the **Name and Color** rollout, enter **tree01**; the tree is named as *tree01*.

4. Make sure *tree01* is still selected. Choose the **Modify** tab in the **Command Panel**; the **Parameters** rollout is displayed.
5. In the **Parameters** rollout, set the following parameters:

Height: **300.0**
Use the default values for other options.

6. In the Top viewport, choose the **Select and Move** tool and move *tree01* toward *railing01* in all viewports, as shown in Figure 4-71.

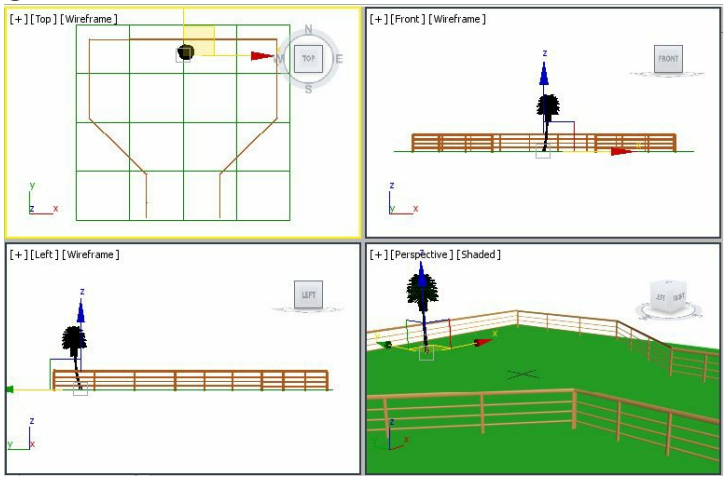


Figure 4-71 *Alignment of tree01 in viewports*

7. Create multiple copies of *tree01* in the Top viewport and align them using the **Select and Move** tool, as shown in Figure 4-72.

Creating Gate

In this section, you will create a gate using the *Pivot* and the *Cylinder* tools.

1. Choose **Create > Geometry** in the **Command Panel**; a drop-down list is displayed below the **Geometry** button. Select the *Doors* option from the drop-down list and then choose the **Pivot** tool from the **Object Type** rollout.

2. Activate the Top viewport and press and hold the left mouse button on the left of the viewport. Now, drag the cursor to the right of the viewport and release the left mouse button to define the width. Next, move the cursor up to define the depth of the door and click on the screen to set the depth. Now, again move the cursor up to define the height of the door. Click on the screen; the pivot door is created in all viewports.

3. In the **Name and Color** rollout, enter **gate**.
4. Use the color swatch to modify the color of *gate* and enter the values as follows:

Red: **49** Green: **13** Blue: **6**

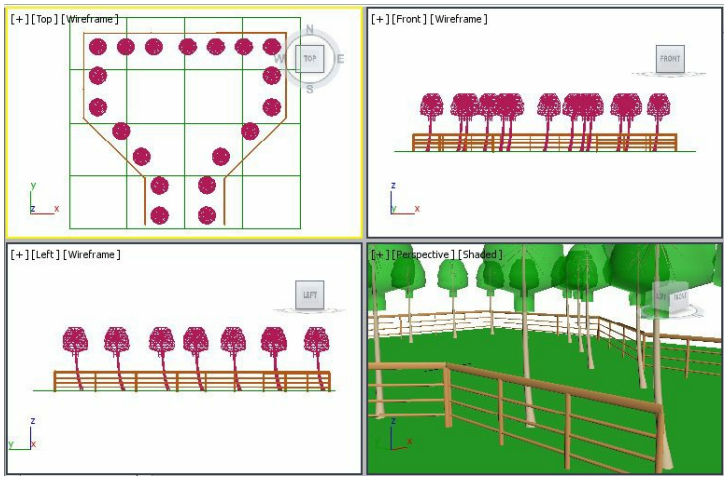


Figure 4-72 *Multiple copies of tree01 created and aligned in viewports*

5. In the **Parameters** rollout, set the following parameters:

Height: **92** Width: **532** Depth: 9.234
Open: *20*

Also, select the *Double Doors* and *Flip Swing* check boxes.

6. In the *Leaf Parameters* rollout, set the following parameters:

Thickness: *7.7* Stiles/Top Rail: *6.48* Bottom rail: *13.44*
#Panels Horiz.: *6* #Panels Vert.: *4*

7. In the *Panels* area, select the *Beveled* radio button and then set the following parameters:

Thickness 1: *0.74* Thickness 2: *1.96* Middle Thick.: *0.991*
Width 1: *4.871* Width 2: *1.364*

8. Align *gate* using the *Select and Move* and *Select and Rotate* tools, as shown in Figure 4-73.
Make sure that there is equal space at both sides of *gate* to place the rods to be created later.

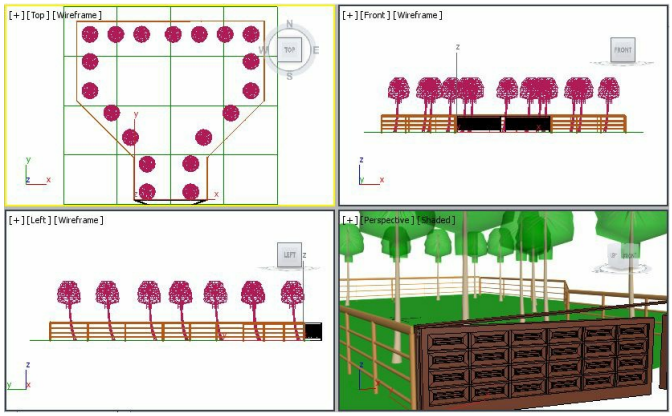


Figure 4-73 *The gate geometry aligned in viewports*

9. In the *Parameters* rollout, set *0* in the *Open* spinner to close *gate*.

Next, you will create rods at both sides of *gate*.

10. Activate the Top viewport. Make sure the *Geometry* button is chosen in the *Command panel*. Next, select *Standard Primitives* from the drop-down list located below it. Now, choose the *Cylinder* tool from the *Object Type* rollout.

11. In the *Keyboard Entry* rollout, set the parameters as follows:

Radius: *2.4* Height: *94*

Choose the *Create* button; a cylinder is created.

12. In the **Name and Color** rollout, enter **rod1**. Also, assign black color to it.

13. Align *rod1* in the viewports, as shown in Figure 4-74.

14. Create a copy of *rod1* as done earlier and align it, as shown in Figure 4-75.

Next, you will create handles for *gate*.

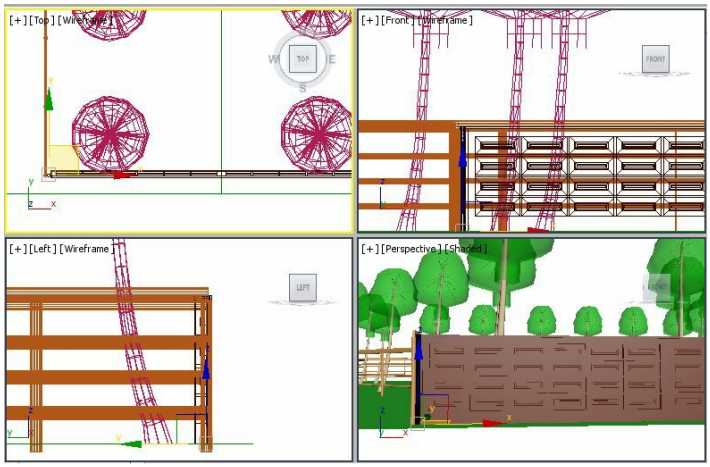


Figure 4-74 *The rod1 geometry aligned in viewports*

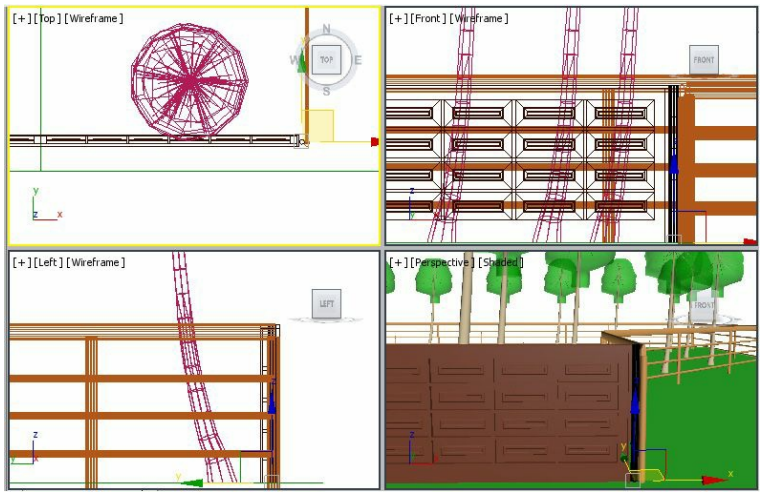


Figure 4-75 *The rod2 geometry aligned in viewports*

15. Activate the Top viewport. Choose **Create > Geometry** in the **Command Panel**. Make sure that the **Standard Primitives** option is selected in the drop-down list and then choose the **Cylinder** tool from the **Object Type** rollout.
16. In the *Keyboard Entry* rollout, set the parameters as follows:

Radius: *1.5* Height: *35*

Choose the *Create* button; a cylinder is created.

17. In the **Name and Color** rollout, enter **handle1** and press ENTER. Also, assign black color to it.

18. Make sure *handle1* is selected. In the *Parameters* rollout, set *15* in the *Height Segments* spinner.

Next, you will apply *Bend* modifier to *handle1*.

19. Make sure *handle1* is selected and then choose **Modifiers > Parametric Deformers > Bend** from the menu bar; the **Bend** modifier is displayed in the modifier stack. Also, the **Parameters** rollout is displayed in the **Modify** tab.

20. In the **Parameters** rollout of the **Bend** modifier, set the values as follows:
Bend Area
Angle: **180** Direction: **270**

Bend Axis area
Make sure the **Z** radio button is selected.

21. Activate the Perspective viewport. Next, align *handle1* using the *Select and Place* tool, as shown in Figure 4-76.

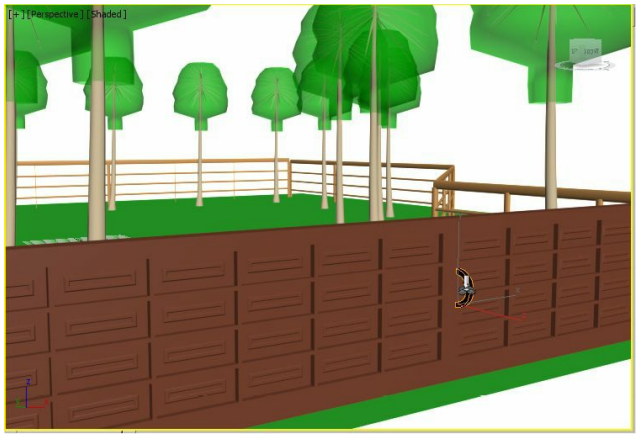


Figure 4-76 *The handle1 geometry aligned*

22. Activate the Front viewport and create a copy of *handle1* and align it, as shown in Figure 4-77.

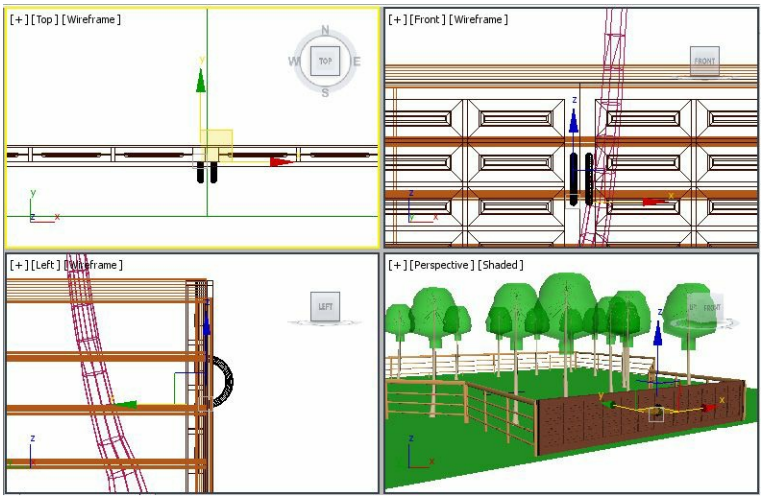


Figure 4-77 *The copy of handle1 aligned*

Saving and Rendering the Scene

In this section, you will save the scene and then render it. You can also view the final rendered image of this scene by downloading the *c04_3dsmax_2015_rndr.zip* file from *www.cadcim.com*. The path of the file is as follows: *Textbooks > Animation and Visual Effects > 3ds Max > Autodesk 3ds Max 2015: A Comprehensive Guide*

1. Change the background color of the scene to light blue, as discussed in Tutorial 1 of Chapter 2, using the following parameters:

Red: **145** Green: **241** Blue: **244**

2. Choose **Save** from the **Application** menu.

3. Activate the Perspective viewport. Next, choose the **Render Production** tool from the **Main Toolbar**; the **Rendered Frame** window is displayed. This window shows the final output of the scene, refer to Figure 4-78.

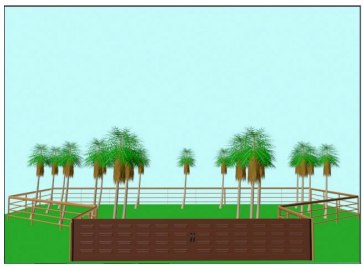


Figure 4-78 *The final output at rendering*

Tutorial 2

In this tutorial, you will create a scene shown in Figure 4-79 using the AEC extended objects and the standard primitives. **(Expected time: 30 min)**

Figure 4-79 *The room model*

The following steps are required to complete this tutorial:

a. Create the project folder.
b. Create the floor.
c. Create railings.
d. Create the room.
e. Create the window.
f. Create the foot support.
g. Create the door.
h. Create trees.
i. Save and render the scene.

Creating the Project Folder

Create a new project folder with the name *c04_tut2* at *\Documents\3dsmax2015* and then save the file with the name *c04tut2*, as discussed in Tutorial 1 of Chapter 2.

Creating the Floor

Start Autodesk 3ds Max and reset it as described earlier; a new screen with default settings is displayed. Next, you need to use the **Plane** tool from **Standard Primitives** to create the floor of the scene.

1. Activate the Top viewport and choose **Create > Geometry** in the **Command Panel**; the **Standard Primitives** option is displayed in the drop-down list. Choose the **Plane** tool from the **Object Type** rollout.

2. In the **Keyboard Entry** rollout, set the parameters as follows:

Length: **1100.0** Width: **1200.0**

3. Choose the **Create** button from the **Keyboard Entry** rollout; a plane is created in all viewports. Choose the **Zoom Extents All** tool to display the entire plane in all viewports.

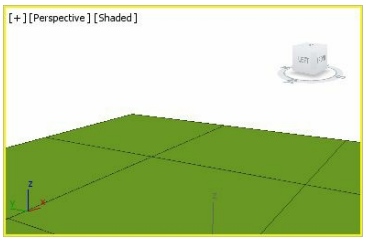
4. In the **Name and Color** rollout, enter **floor**; the plane is named as *floor*.

5. Modify the color of the floor by using the following values:

Red: **61** Green: **135** Blue: **6**

6. Activate the Perspective viewport and press the G key to hide grids in it. Also, set the view using the *Zoom* and *Orbit* tools, as shown in Figure 4-80.

Figure 4-80 *The floor geometry in the Perspective viewport*



Creating Railings

In this section, you will create railings around *floor* using the **Railing** tool.

1. Activate the Top viewport and create a railing starting from the upper left corner of *floor* to its upper right corner.
2. In the **Name and Color** rollout, enter **railing01**.

3. Use the color swatch and change the color of *railing01* by entering the values as follows:
Red: **177** Green: **88** Blue: **27**

4. Make sure *railing01* is still selected. Choose the **Modify** tab in the **Command Panel**; the **Railing**, **Post**, and **Fencing** rollouts are displayed.

5. In the **Railing** rollout, set the values as follows:

Length: **1200.0**

Top Rail area
Profile: **Round** Depth: **15.0**
Width: **13.0** Height: **100.0**

Lower Rail(s) area
Profile: **Round** Depth: **7.0** Width: **7.0**

6. Choose the **Lower Rail Spacing** button in the **Lower Rail(s)** area; the **Lower Rail Spacing** dialog box is displayed. Select the **Count** check box, if it is not already selected, and set the value **3** in the spinner on the right side of the **Count** check box and choose the **Close** button.

7. In the **Posts** rollout, set the values as follows:
Profile: **Round** Depth: **10.0**
Width: **5.0** Extension: **0.0**

8. Choose the **Post Spacing** button in the **Post** rollout; the **Post Spacing** dialog box is displayed. Select the **Count** check box, if not already selected, and set **5** in the spinner on the right of the **Count** check box. Next, choose the *Close* button.

9. In the **Fencing** rollout, select *(none)* from the *Type* drop-down list.
10. Choose the **Select and Move** tool and align *railing01* in viewports, as shown in Figure 4-81.
11. Create the other railings of the same dimension, except the length, to surround *floor*. Also, activate the Perspective viewport and set the view using the **Pan**, **Zoom**, and **Orbit** tools, as shown in Figure 4-82.

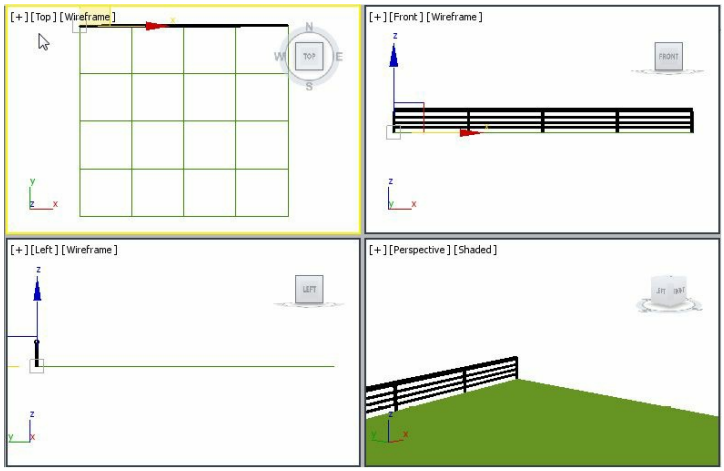


Figure 4-81 *The railing01 geometry in viewports after alignment*

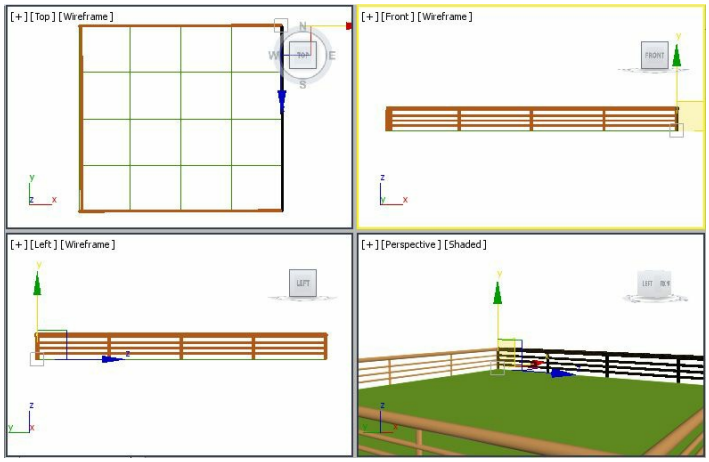


Figure 4-82 *The railings geometry displayed in viewports*

Creating the Room

In this section, you will create the walls of the room using the **Wall** tool.

1. Activate the Top viewport. Choose **Create > Geometry** in the **Command Panel**; a drop-down list is displayed below the **Geometry** button. Select the **AEC Extended** option from the drop-down list and then choose the **Wall** tool from the **Object Type** rollout.
2. In the **Parameters** rollout of the wall, set the values as follows:

Width: **5.0** Height: **230.0**

3. Click on the upper left side of *floor* to specify the starting point of the wall. Drag the cursor toward the right to define the length, and then click on the viewport; a wall segment is created. Next, create another segment of the wall in continuation at the right angle of the first segment. Repeat the same procedure to create a wall of rectangular shape, refer to Figure 4-83. Now, click on the starting point of the first wall segment; the **Weld Point?** message box is displayed. Choose the **Yes** button to weld the end points of the wall. Next, right-click to end the creation of the wall.

Note

*You can modify the wall using the tools in the **Select and Scale** flyout in the **Main Toolbar**.*

4. In the **Name and Color** rollout, enter **wall** and press the ENTER key.

5. Use the color swatch and change the color of *wall* by entering the values as follows:
Red: **248** Green: **231** Blue: **120**
6. Choose the **Select and Move** tool and align *wall* in viewports, as shown in Figure 4-83.

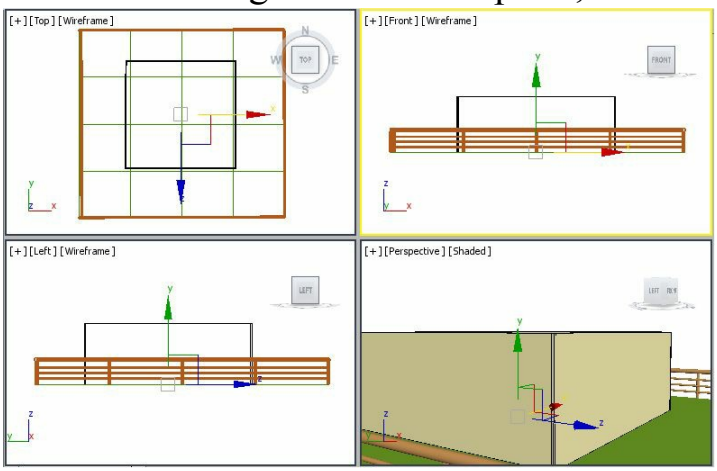


***Figure 4-83** The wall geometry displayed in viewports*

7. Select **Standard Primitives** from the drop-down list below the **Geometry** button. Choose the **Box** tool from the **Object Type** rollout to create the roof of *wall*.

8. Activate the Top viewport and create a box.

9. In the **Name and Color** rollout, enter **roof**.

10. Change the color of *roof* by entering the values as follows:

Red: **143** Green: **225** Blue: **87**

11. In the **Parameters** rollout, set the values in the **Length** and **Width** spinners to cover the upper portion of the wall. Set the value **5.0** in the **Height** spinner.

12. Choose the **Select and Move** tool and align *roof* at the top of the wall in all viewports, refer to Figure 4-84.

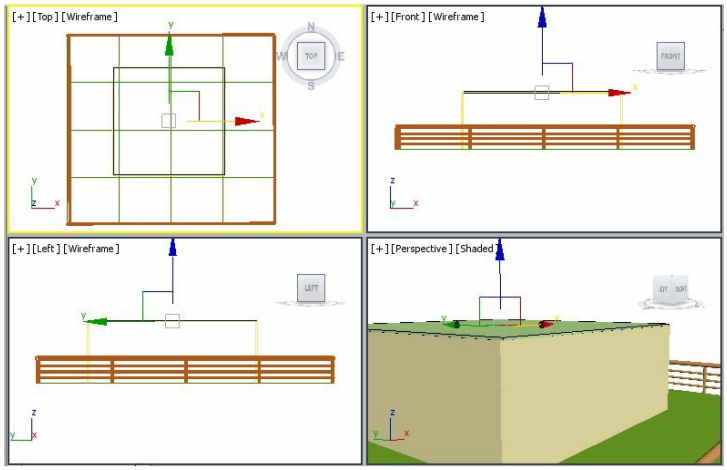


Figure 4-84 *The roof geometry in viewports after alignment*

13. Create a copy of *roof* as discussed earlier. Next, rename it as *room floor* and align it on *floor*.

Note

You may need to change the length and width of room floor to align it on floor.

14. Change the color of *room floor* to dark brown.

15. Activate the Front viewport and select *roof*.

16. Choose the **Mirror** tool from the **Main Toolbar**; the **Mirror: Screen Coordinates** dialog box is displayed. In the **Mirror Axis** area of this dialog box, select the **Y** radio button. Next, set the value in the **Offset** spinner to **10**. In the **Clone Selection** area, select the **Copy** radio button and choose the **OK** button; *roof001* is displayed at the top of *roof*.

17. In the **Name and Color** rollout, modify the name as *roof fencing*.

18. Use the color swatch to change the color of *roof fencing* by entering the values as follows:

Red: **243** Green: **93** Blue: **47**

Make sure *roof fencing* is still selected.

19. Right-click on the *Select and Uniform Scale* tool; the **Scale Transform Type-In** dialog box is displayed. Now, in the **Offset: Screen** area, set the value **105** and press ENTER; *roof fencing* is scaled, as shown in Figure 4-85. Close the dialog box.

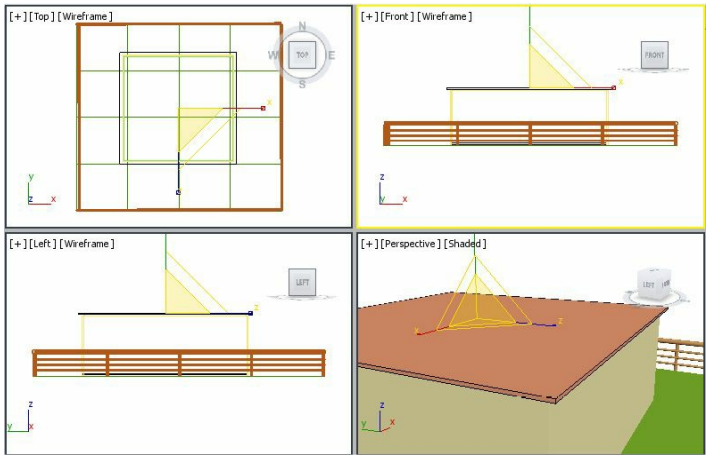


Figure 4-85 *The roof fencing geometry after scaling in the Front viewport*

Next, you need to create fencing for the corners of *wall*.

20. Activate the Top viewport and choose the **Box** tool. In the **Keyboard Entry** rollout, set the values as follows:

Length: **6.0** Width: **1.0** Height: **230.0**

21. Choose the **Create** button; a box is displayed in viewports.

Note
You may need to adjust the height of the box created, if you have modified the size of the wall earlier.

22. In the **Name and Color** rollout, enter **fc01**; the box is named as *fc01*.

23. Assign the same color to *fc01* that was assigned to *roof fencing*.

24. Choose the **Select and Move** tool and align *fc01* with *wall*, as shown in Figure 4-86.

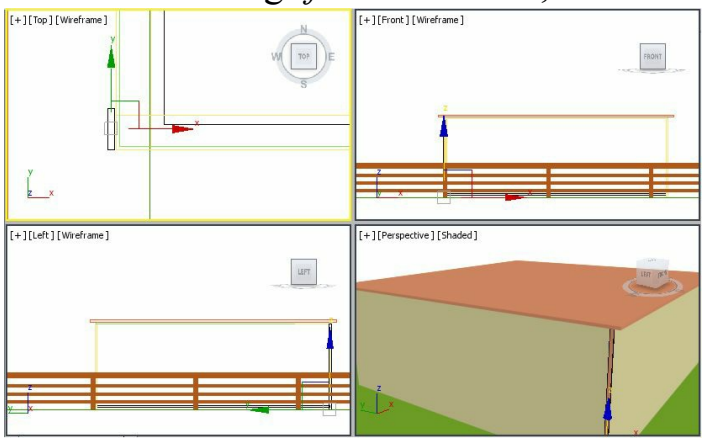


Figure 4-86 *The fc01 geometry in the Top viewport after alignment*

25. Make sure *fc01* is selected in the Top viewport and choose the **Select and Rotate** tool. Now, press and hold the SHIFT key, move the cursor over the Z-axis, and rotate it until the value in the **Z**

spinner in the coordinate display becomes **90**; the copy of *fc01* is created and gets rotated. It is automatically named as *fc002*.

26. Choose the **Select and Move** tool and align *fc002* with *wall*, as shown in Figure 4-87.

27. Select both *fc01* and *fc002* by pressing and holding the CTRL key and group them as *fencing01*.

28. Select *fencing01* and create its three copies. The copies are automatically named as *fencing002*, *fencing003*, and *fencing004*. Now, align them at the corners of *wall* using the **Select and Rotate** and **Select and Move** tools, refer to Figure 4-88. Also, you can use the **Zoom** tool to view the corners of *wall*.

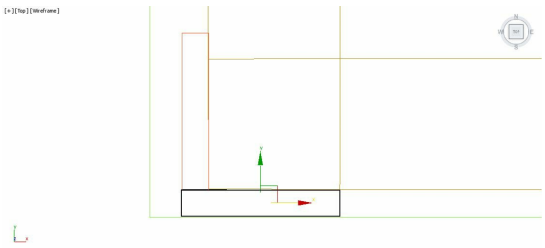


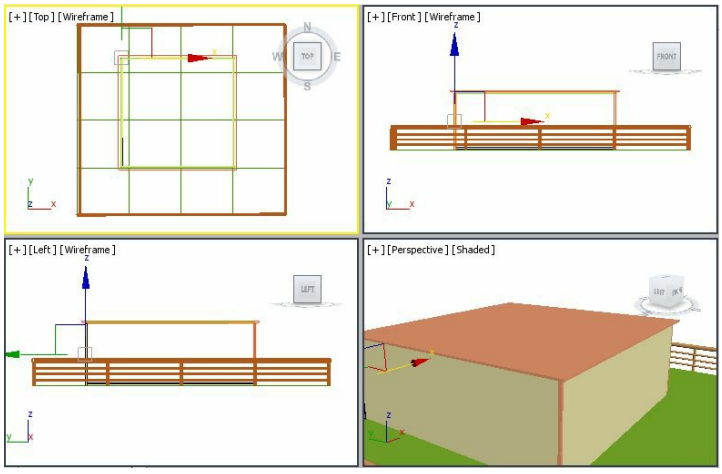
Figure 4-87 *The fc002 geometry in the Top viewport after alignment*

29. Choose the **Maximize Viewport Toggle** tool to view the four viewports, as shown in Figure 4-94.

Note

*You can also use the **Mirror** tool to create copies of fencing01.*

Figure 4-88 *The fencing geometry at the four corners of wall in viewports*



Creating the Window

In this section, you will create a window by using the **Awning** tool.

1. Activate the Top viewport and select *wall* from the *Scene Explorer*. Next, choose **Create** > **Geometry** in the **Command Panel**; a drop-down list is displayed. Select the **Windows** option from

the drop-down list and then choose the **Awning** tool from the **Object Type** rollout.

2. Press and hold the left mouse button and click on the left side of *wall*. Drag the cursor downward to specify the width of the window and then release the left mouse button. Next, move the cursor to the left to define the depth of the window, and then click on the viewport. Now, move the cursor to the left to specify the height of the window and then click on the viewport; an awning window is created in viewports.

3. In the **Name and Color** rollout, enter **window**; the window is named as *window*.

4. Use the color swatch to change the color of *window* by entering the following values:

Red: **135** Green: **59** Blue: **8**

5. Make sure *window* is selected. Choose the **Modify** tab in the **Command Panel**; the **Parameters** rollout is displayed.

6. In the **Parameters** rollout, set the values as follows:

Height: **148.826** Width: **106.116** Depth: **10.0**
Frame area
Horiz. Width: **8.94** Vert. Width: **8.94** Thickness: **0.5**
Glazing area
Thickness: **0.25**

Rails and Panels area
Width: **14.554** Panel Count: **3**
Open Window area
Open: **25**

You may need to adjust the height, length, and width of *window* according to *wall* size in your scene.
7. Use the **Select and Move** tool to align *window* on *wall* in viewports, as shown in Figure 4-89.

Creating the Foot Support

In this section, you will create a box primitive to create the foot support.

1. Activate the Top viewport and create a box. Next, choose the *Modify* tab.

2. In the **Parameters** rollout, set the values as follows:

Length: **157.098** Width: **135.743** Height: **10.0**
3. In the **Name and Color** rollout, enter **foot support** and press ENTER.

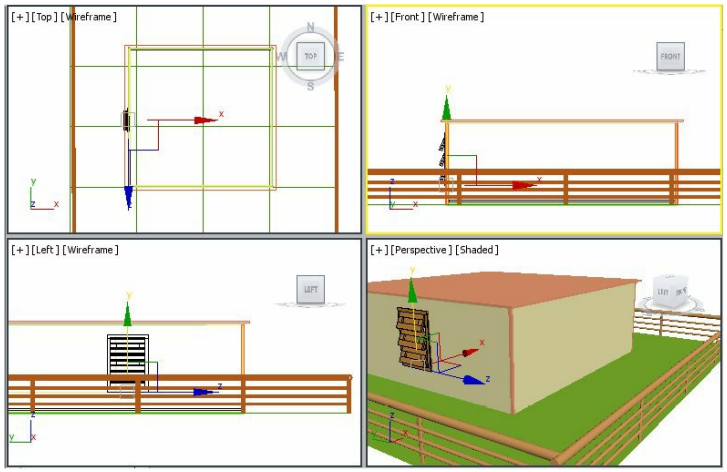


Figure 4-89 *The window geometry in viewports after alignment*

4. Use the color swatch to change the color of the foot support by entering the values as follows:

Red: **241** Green: **249** Blue: **200**

5. Align *foot support* with the front side of *wall* in viewports, as shown in Figure 4-90.

Creating the Door

In this section, you will create a door by using the **Pivot** tool.

1. Activate the Top viewport and select *wall* from the *Scene Explorer*. Next, choose **Create > Geometry** in the **Command Panel**; a drop-down list is displayed below the **Geometry** button. Select the **Doors** option from the list and choose the **Pivot** tool from the **Object Type** rollout.

2. Press and hold the left mouse button and click on the front side of *wall* and then drag the cursor to the right to specify the width of the door, and then release the left mouse button. Next, move the cursor upward to define the depth of the door, and then click on the viewport. Now, move the cursor upward again to specify the height of the door and then click on the viewport; the pivot door is created in viewports.

3. In the **Name and Color** rollout, enter **door** as the name of the pivot door and assign it the same color that was assigned to *window*.

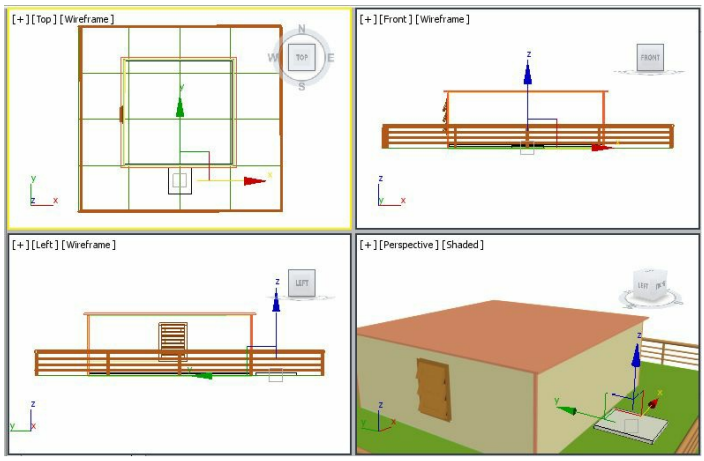


Figure 4-90 *The foot support geometry in viewports after the alignment*

4. Make sure *door* is still selected. Choose the **Modify** tab in the **Command Panel**; the **Parameters** and **Leaf Parameters** rollouts are displayed.

5. In the **Parameters** rollout, select the **Flip Swing** check box and set the values as follows:

Height: **200.0** Width: **120.341** Depth: **12.0**
Open: **30**

6. In the **Frame** area of the *Parameters* rollout, make sure the **Create Frame** check box is selected and the values *2.0*, *1.0*, and *0.0* are specified for the *Width*, *Depth*, and *Door Offset* spinners, respectively.
You may need to set the height and width of the door according to the size of the *wall* in your scene.

7. In the **Leaf Parameters** rollout, make sure the value *2.0* is specified in the *Thickness* spinner and then set the remaining values in the rollout as follows:

Bottom Rail: **20.0** # Panels Horiz: **3** # Panels Vert: **4** Muntin: **3.265** Stiles/Top Rail: *10*

8. In the *Panels* area of the *Leaf Parameters* rollout, select the *Beveled* radio button and make sure the value *45* is specified in the *Bevel Angle* spinner.

Thickness 1: **9.46** Thickness 2: **10.0** Middle Thick: **3.0** Width 1: **3.0** Width 2: **3.0**

9. Align *door* in all viewports, as shown in Figure 4-91.

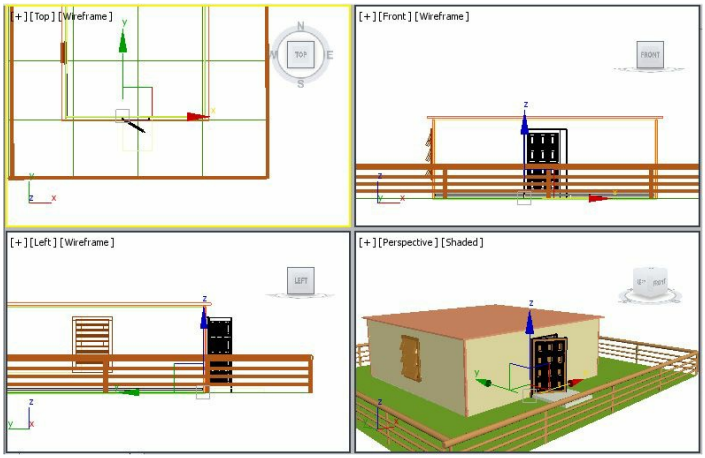


Figure 4-91 *The door geometry in viewports after alignment*

Creating the Trees

In this section, you will create trees by using the **Foliage** tool from **AEC Extended**.

1. Choose **Create > Geometry** in the **Command Panel**; a drop-down list is displayed. Select the **AEC Extended** option and choose the **Foliage** tool from the **Object Type** rollout.

2. Activate the Top viewport. Double-click on the **Banyan tree** in the **Favorite Plants** rollout; a tree is displayed in all viewports.

3. In the **Name and Color** rollout, enter **tree01** as the name of the tree.

4. Make sure *tree01* is still selected. Choose the **Modify** tab in the **Command Panel**; the **Parameters** rollout is displayed.

5. In the **Parameters** rollout, set the values as follows:

Height: **120.0**

Level-of-Detail area
Select the **Medium** radio button.

Use the default values for other options.

6. Choose the **Select and Move** tool and align *tree01* in the Top viewport, as shown in Figure 4-92.

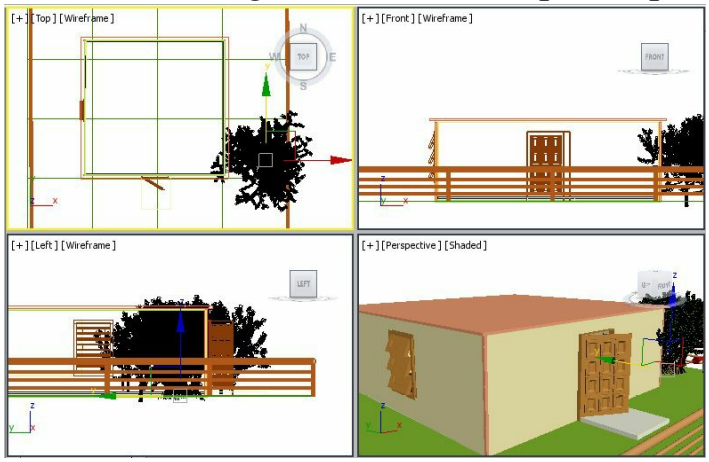


Figure 4-92 *The tree01 geometry displayed in viewports after alignment*

Now, you need to create another tree.

7. Activate the Top viewport. Choose the **Create** tab in the **Command Panel** and make sure the **Foliage** tool is chosen. Now, double-click on the **American Elm** tree from the **Favorite Plants** rollout; the tree is displayed in all viewports.

8. In the **Name and Color** rollout, enter **tree02** as the name of the new tree.
9. Choose the **Modify** tab in the **Command Panel**; the **Parameters** rollout is displayed.

10. In the **Parameters** rollout, set the values as follows:

Height: **300.0**
Use the default values for other options.

11. Choose the **Select and Move** tool and align *tree02* in viewports, as shown in Figure 4-93.

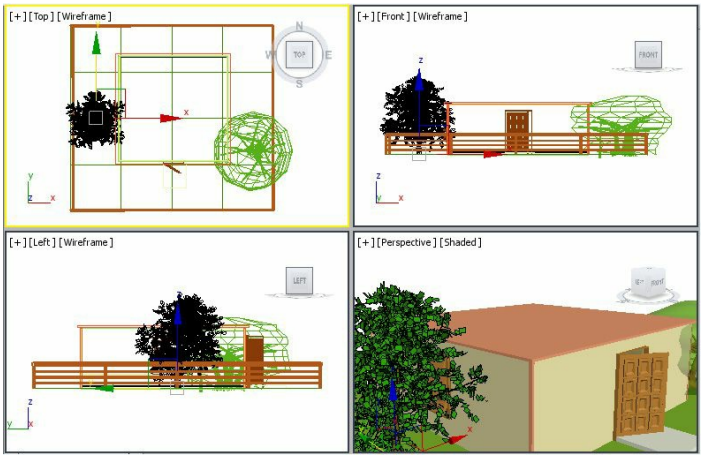


Figure 4-93 *The tree02 geometry in viewports after the alignment*

Saving and Rendering the Scene

In this section, you will save the scene and then render it. You can also view the final rendered image of this scene by downloading the *c04_3dsmax_2015_rndr.zip* file from *www.cadcim.com*. The path of the file is as follows: *Textbooks > Animation and Visual Effects > 3ds Max > Autodesk 3ds Max 2015: A Comprehensive Guide*

1. Change the background color of the scene to light blue, as discussed in Tutorial 1 of Chapter 2, using the following parameters:

Red: *145* Green: *241* Blue: *244*

2. Choose *Save* from the **Application** menu.

3. Activate the Perspective viewport. Next, choose the **Render Production** tool from the **Main Toolbar**; the **Rendered Frame** window is displayed. This window shows the final output of the scene, refer to Figure 4-94.

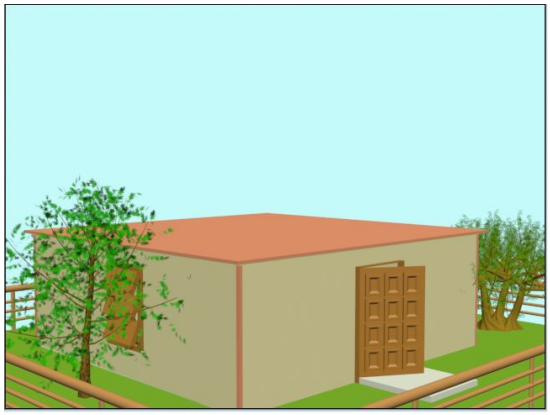


Figure 4-94 *The final output of the scene at rendering*

Self-Evaluation Test