Chapter 2

Starting an Architectural Project

Learning Objectives

After completing this chapter, you will be able to:

- *Start a new architectural project*
- *Set units of various measurement parameters of a project*
- *Understand the concept of snaps, dimensions, and object snaps*
- *Save a project*
- *Modify parameters and settings of a project*
- *Close a project and exit Revit 2021*
- *Open an existing project*
- *Explore the building model using viewing tools*
- *Use navigation tools*



INTRODUCTION

In Revit, you can work on structural, architectural, and MEP (Mechanical, Electrical and Plumbing) projects on a single platform. The chapters in this textbook are specially written for professionals in architectural and space design field. In this chapter, you will learn about the tools and the processes involved in starting up a new architectural project.

STARTING A NEW ARCHITECTURAL PROJECT

Shortcut Key:	CTRL+N
File menu:	New > Project

In Revit, a project is considered as a single database that contains all information related to building design. Starting from geometry to construction data, each project file contains complete information of the building design. In a building design, the three dimensional models drawn using this software are called BIM (Building Information Model). BIM is a process involving the generation and management of digital representation of physical and functional features of different infrastructure elements.

To start an architectural project, choose **New > Project** from the **File** menu, as shown in Figure 2-1. On doing so, the **New Project** dialog box will be displayed, as shown in Figure 2-2. Using this dialog box, select an existing *.rte* template file format that can be used in the new project.

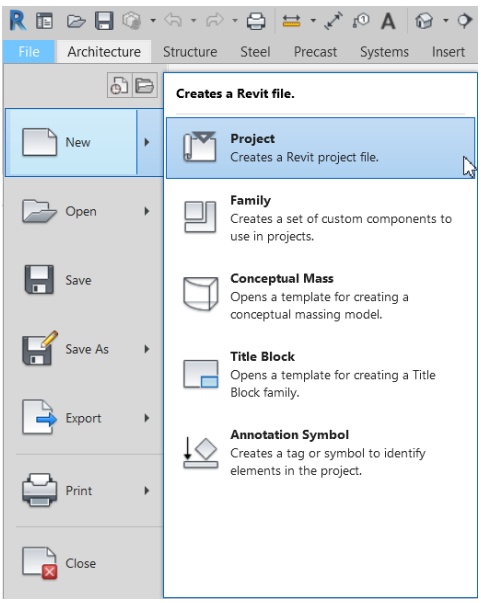

Figure 2-1 *Choosing the* ***Project*** *option*

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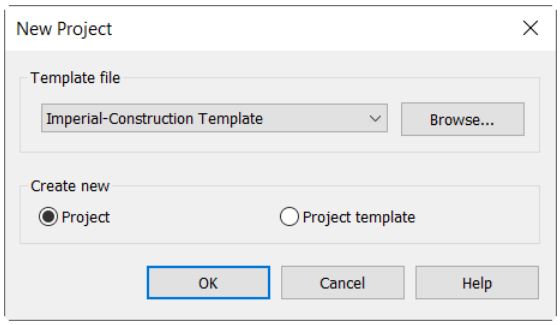


Figure 2-2 *The* ***New Project*** *dialog box*

A template file can be defined as a template which has various project parameters such as units and views, already saved in it. On using the template file, the new project file will adopt the same parameters as the template file. The difference between a template file and a project file is that the template file has a *.rte* extension, whereas the project file has a *.rvt* extension. You can either select any of the template files provided in Revit or create your own file. Any project file can be saved as a template file.

In the **New Project** dialog box, select the desired template file from the drop-down list in the **Template file** area. By default, the **Imperial-Construction Template** option is selected. To select a different template file which is not available in the drop-down list, choose the **Browse** button. On doing so, the **Choose Template** dialog box will be displayed. In this dialog box, browse to the **English-Imperial** or **English** (for Metric) folder, select a template file, and then choose the **Open** button; the selected template file will be added to the drop-down list in the **Template file** area.

In the **Create new** area of the **New Project** dialog box, two radio buttons will be displayed: **Project** and **Project template**. The **Project** radio button is selected by default. As a result, you will work on a new project. Alternatively, if you select the **Project template** radio button, you will work on a new project template.



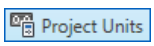
Note

If you select the ***None*** option from the ***Template File*** drop-down list in the ***New Project*** dialog box, a new project file will be created without a template file but with the default settings of Revit.

PROJECT UNITS

Ribbon: Manage > Settings > Project Units
Shortcut Key: UN





Units are important parameters in a project. While installing Revit, you are prompted to set the default unit as Imperial (feet and inches) or Metric (meters and millimeter). The default selection of units helps you open project with the specified/selected unit system. However, you can change the default unit set system. To set units,

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choose the **Project Units** tool from the **Settings** panel of the **Manage** tab; the **Project Units** dialog box will be displayed, as shown in Figure 2-3. Project units are grouped into seven disciplines: **Common**, **Structural**, **HVAC**, **Electrical**, **Piping**, **Energy**, and **Infrastructure**. Each discipline has a set of measurement parameters. You can select any of these disciplines from the **Discipline** drop-down list of this dialog box. In this drop-down list, the **Common** option is selected by default. As a result, various measurement parameters such as **Angle**, **Area**, **Length**, **Mass Density**, **Slope**, **Speed**, **Time**, **Volume**, and **Currency** will be displayed in the **Project Units** dialog box. The **Format** column in the dialog box displays the current unit format for the corresponding parameter. You can preview and select the possible digit grouping and decimal separators from the **Decimal symbol/digit grouping** drop-down list located at the lower left corner of the dialog box, refer to Figure 2-3. The options for settings measurement units are discussed next.

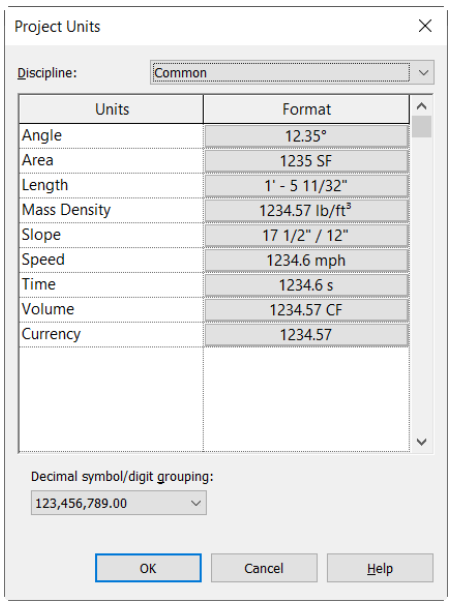

Figure 2-3 *The* ***Project Units*** *dialog box*

Angle Unit

The unit for angle can be set by using the **Units** drop-down list in the **Format** dialog box of the **Angle** parameter.

Area Unit

To assign a unit for measuring the areas of building elements, click on the **Format** column for the **Area** parameter; the **Format** dialog box will be displayed. In this dialog box, you can set the unit for measuring an area by selecting an option from the **Units** drop-down list. This drop-down list contains various options such as **Square feet**, **Square meters**, **Acres**, and so on. By default, the **Square feet** option is selected in this drop-down list. The settings for rounding, rounding increment, and units can be done by selecting the desired option from the respective drop-down list and edit boxes.

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Length Unit

To assign a unit for measuring the lengths of building elements in your project, click on the **Format** column corresponding to the **Length** parameter; the **Format** dialog box will be displayed, as shown in Figure 2-4. This dialog box displays different units of length and their settings. You can select the desired unit from the **Units** drop-down list in the dialog box. After selecting the desired unit, you can specify the rounding value for the selected unit. To do so, select the desired option from the **Rounding** drop-down list in the **Format** dialog box. Note that by default, the **Rounding increment** edit box in the **Format** dialog box is inactive. To make it active, select an option from the **Units** drop-down list and then select the **Custom** option from the **Rounding** drop-down list. Note the **Custom** option remains inactive for the **Feet and fractional inches**, **Fractional inches**, and **Meters and Centimeters** options of the **Units** drop-down list. The default value in the **Rounding increment** edit box is 1. You can change this value by entering a value in this edit box. Similarly, the **Unit symbol** drop-down list will be inactive for the **Feet and fractional inches**, **Fractional inches**, and **Meters and Centimeters** options of the **Units** drop-down list. From the **Unit symbol** drop-down list, you can select the measurement symbol that will be added to the unit of length. For example, if you select '**m**' as the measurement symbol, then '**m**' will be added to all metric length measurements. In case, you select **Feet and fractional inches** from the **Units** drop-down list in the **Format** dialog box, then you need to select the **Suppress spaces** check box to remove spaces in between the values when a length string is expressed in feet and fractional inches to denote a particular measurement.



Tip

*While selecting a rounding value from the **Rounding** drop-down list in the **Format** dialog box, you should consider the extent of detailing that may be required for the project. For projects that require too much detailing, a lower rounding value may be set. This parameter, however, can be modified at any stage during the project development.*

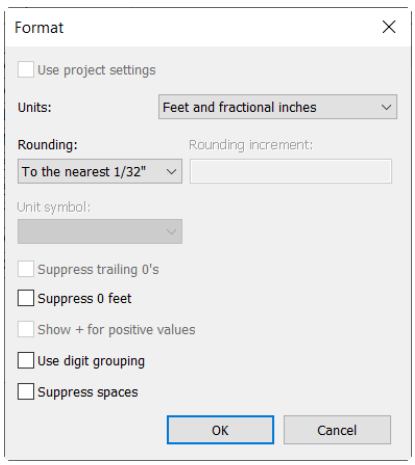

***Figure 2-4** The **Format** dialog box*

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Mass Density Unit

The mass density of building elements is required for structural analysis. In Revit, you can assign a unit for measuring mass density. To assign the unit of mass density, invoke the **Project Units** dialog box. In the **Format** column of this dialog box, choose the button corresponding to the **Mass Density** parameter; the **Format** dialog box will be displayed. In this dialog box, you can select different units from the **Units** drop-down list. Also, you can assign a unit symbol for the selected unit. To do so, click on the **Unit symbol** drop-down list and then select any of the options displayed.

Slope Unit

To specify the unit for the slope measurement, click in the **Format** column for the **Slope** parameter; the **Format** dialog box will be displayed. In this dialog box, you can specify the desired unit settings by selecting the required option from the **Units** drop-down list. The default selected option for the Imperial unit setting in the drop-down list is **Rise / 12"**.

Speed Unit

To specify the unit for speed, click in the **Format** column corresponding to the **Speed** parameter: the **Format** dialog box will be displayed. In this dialog box, you can select the desired unit of speed from the **Units** drop-down list. This drop-down list contains various options such as **Feet per minute, Meters per second**, **Feet per second**, **Kilometers per hour**, and **Miles per hour**.

Time Unit

To specify the unit for time, click in the **Format** column corresponding to the **Time** parameter; the **Format** dialog box will be displayed. In this dialog box, you can select the desired unit of time from the **Units** drop-down list. This drop-down list contains various options such as **Milliseconds**, **Seconds**, **Minutes**, and **Hours**.

Volume Unit

The units for volume can be set similar to that of the length and area. You can set the unit for the volume measurement by selecting any of the options from the **Units** drop-down list in the **Format** dialog box of the **Volume** parameter.

Currency Unit

The currency unit is used to set the unit of currency for its usage in the cost and estimation schedules. To set the unit of currency, invoke the **Project Units** dialog box and then choose the button displayed in the **Format** column corresponding to the **Currency** parameter; the **Format** dialog box will be displayed. From this dialog box, you can select the required type of currency symbol from the **Unit symbol** drop-down list.



Tip

*As soon as you change the units and choose the **OK** button to close the **Format** dialog box, the numbers and units shown for each measurement parameter in the **Project Units** dialog box are modified to the new settings. You can modify these settings and format them as per your requirement.*

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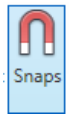
Note

*You can format the display of units represented on the screen using the **Project Units** dialog box. The actual values for these units in the project may be different. For example, if you set the wall length rounding to the nearest 1', the wall may show this rounded value, but the actual length of the wall might be in fractional feet.*

SNAPS TOOL

Ribbon: Manage > Settings > Snaps



The **Snaps** tool is one of the most productive tools available while creating and editing elements in a building model. This tool represents the ability of the cursor to snap or jump to the preset increments or specific object properties of various elements such as endpoint, midpoint, and so on. Invoke the **Snaps** tool from the **Settings** panel of the **Manage** tab; the **Snaps** dialog box will be displayed, as shown in Figure 2-5. This dialog box has three areas: **Dimension Snaps**, **Object Snaps**, and **Temporary Overrides**. These areas are discussed next.

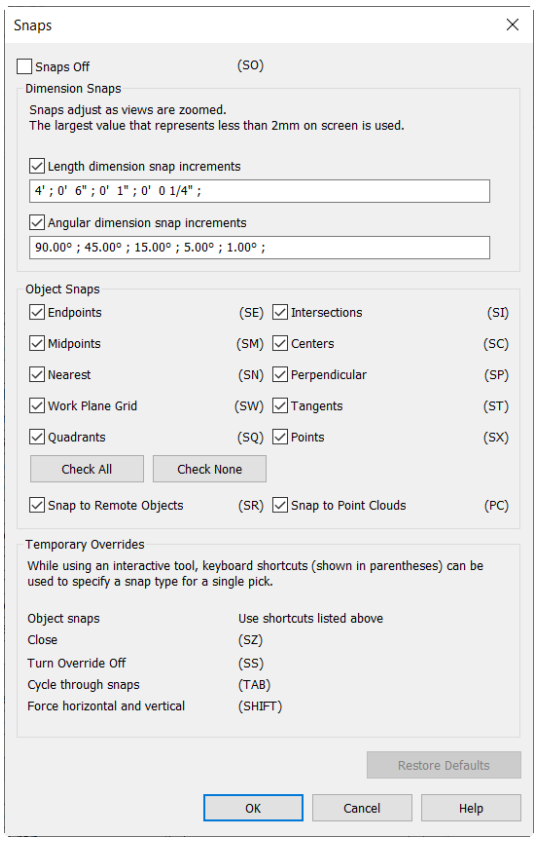


***Figure 2-5** The **Snaps** dialog box*

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Note

*The settings in the **Snaps** dialog box are applied to all the projects opened in the session but are saved in the project you are working on.*



Tip

The values that you will enter for dimension snapping should be set based on the scale and the amount of detailing required for the project. You may set smaller increments for working on a detail or a small portion of a building.

Dimension Snaps Area

In this area, you can set increments for placing elements or components in a project view. You can set increments for the length and angle dimensions. To set the increment of length dimension, select the **Length dimension snap increments** check box, if it is not selected by default, and then enter the increment values in the edit box below it. The default values entered in this edit box are: **4' ; 0' 6" ; 0' 1" ; 0' 0 1/4" ;** for Imperial (**1000 ; 100 ; 20 ; 5** ; for Metric). Note that every incremental value is separated by a semicolon (;). You can also set increments by typing the values separated by a semicolon. For example, to create an interior layout plan in which the length of the partitions is in 5'(1524 mm) modules, counter top width is 2'(609.6 mm), and the thickness of partitions is 4"(101.6 mm), you can enter the values for the dimension snaps as 5'; 2';4" for Imperial (1524; 609.6;101.6 for Metric). This will enable the cursor to move in these increments and help create the layout with relative ease.

In the **Dimension Snaps** area, snap increments for angular dimensions can be set by selecting the **Angular dimension snap increments** check box and then entering suitable values in the edit box below this check box. This setting is quite useful for projects that have radial geometry.



Tip

*The **Snaps** tool is frequently used not only while creating various building elements but also while editing and placing them. By efficiently using this feature, you can improve the performance and accuracy of your project and also make modeling much simpler.*

Object Snaps Area

In the **Object Snaps** area, you can specify various object snaps for using them in a project. Object snapping refers to the cursor's ability to snap to geometric points on an element such as endpoints, midpoint, perpendicular, and so on. It is useful for creating and editing elements. The advantage of using object snapping is that you can locate the appropriate point on a drawing object. When enabled, the appropriate object snap is displayed as soon as the cursor is near to an element. For example, it is virtually impossible to pick the exact endpoint to start a wall from an endpoint of an already drawn wall. But when you enable the **Endpoints** object snap, the cursor automatically jumps or snaps to the endpoint of this wall. This helps to start the new wall from the endpoint. This, besides making the drawing accurate, later helps in adding dimensions to the project.



Note

The object snapping works only with the objects that are visible on the screen. A tooltip, with the same name as the object snap, is also displayed when you bring the cursor close to the snap point.

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Various object snap modes available in the **Object Snaps** area are: **Endpoints**, **Midpoints**, **Nearest**, **Work Plane Grid**, **Quadrants**, **Intersections**, **Centers**, **Perpendicular**, **Tangents**, **Points**, **Snap to Remote Objects,** and **Snap to Point Clouds**.

The use of each object snap corresponds to its respective name. The **Work Plane Grid** snap option enables you to snap to a point on a reference plane already defined in the model. For example, you can place a furniture component exactly on the floor by snapping to the floor level reference plane. You can snap to the object that is closest to the cursor using the **Snap to Remote Objects** option. You can also snap points of a point cloud data object by selecting the **Snap to Point Clouds** check box. Each object snap mode has a geometrical shaped marker to identify it from the other object snaps. For example, the endpoint object snap is indicated by a square, midpoint by a triangle, nearest by a cross, and so on. To use an object snap mode, move the cursor over the object. You will notice a marker that appears as you move it close to the snap point. To select the appropriate snap point, click when the corresponding marker or tooltip is displayed.

In Revit, all the enabled object snaps work simultaneously. You can turn off all the snap options including the dimension snaps and object snaps by clearing the **Snaps Off** check box located at the top of the **Snaps** dialog box. Alternatively, you can type **SO** on the keyboard to turn them off and on while using a tool. The **Check All** and **Check None** buttons can be used to enable or disable the object snaps, respectively.

Temporary Overrides Area

The options in the **Temporary Overrides** area provide you the alternative of overriding snaps setting for a single use only. For example, if you have not selected the **Endpoints** object snap in the **Snaps** dialog box and you want to use this option while working with a tool, you need not open the **Snaps** dialog box and set this option. You can instead type the shortcut, **SE** to temporarily activate the endpoint object snap. Once you have used this object snap option, snapping to the endpoint is automatically turned off.

You can toggle between various object snap options available at the same location using the TAB key on the keyboard. Hold down the SHIFT key to create the elements vertically or horizontally. This restricts the movement of the cursor in the orthogonal directions only. Once you release the SHIFT key, the cursor resumes its movement in all directions. You can select the **Snaps Off** check box to disable all types of snapping.

SAVING A PROJECT

You must save your work before closing a project or exiting Revit 2021 session. You have the option of saving the project file in a permanent storage device, which may be a hard disk or a removable disk. Also, you must save your work at regular intervals to avoid loss due to any error in the computer's hardware or software.

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Saving the Project File

File menu: Save As > Project
Shortcut Key: CTRL+S

To save the project file to a desired location, choose **Save As > Project** from the **File** menu; the **Save As** dialog box will be displayed, as shown in Figure 2-6. Alternatively, you can save the project file by choosing the **Save** button from the **Quick Access Toolbar**. In the **Save As** dialog box, the **Save in** drop-down list displays the current drive and path in which the project file will be saved. The list box below the **Save in** drop-down list shows all the folders available in the current directory. The **File name** edit box can be used to enter the name of the file to be assigned to the project. The **Places List** area on the left of the **Save As** dialog box contains shortcuts for the folders that are frequently used.

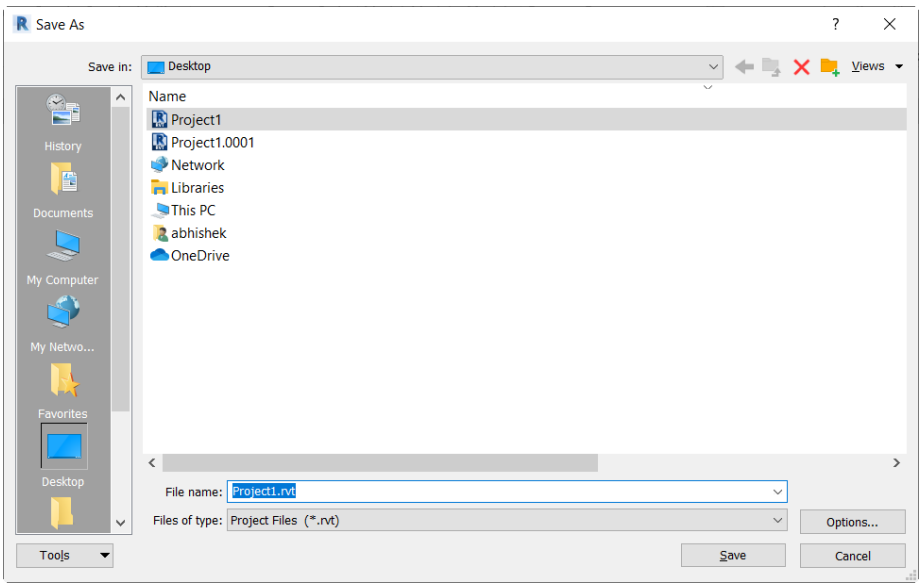

Figure 2-6 *The **Save As** dialog box*



Tip
The selection of a large number of backup files for storing may lead to consumption of resources in the hard disk.

Using the Options Button

You can use different features for saving a file by choosing the **Options** button from the **Save As** dialog box. On choosing this button, the **File Save Options** dialog box will be displayed, as shown in Figure 2-7. Using the **Maximum backups** edit box from this dialog box, you can specify the maximum number of backup files that you need to store for the project. In Revit, by default the non-workshared projects have three backup files and the workshared projects have twenty backup files. The options in the **Thumbnail Preview** area enable you to specify the image to be used as the preview of the project file that can be used at the time of opening a project file. You can specify the view of the model to be used as a preview image by selecting an option from the

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Source drop-down list. The **Active view/sheet** is the default option for previewing a project file. For example, to make the **Floor Plan: Level 1** the preview image, select it from the drop-down list. Whenever you select this project file, the preview will always show the **Floor Plan: Level 1**, irrespective of the last active view.

Select the **Regenerate if view/sheet is not up-to-date** check box to see the preview with the latest modifications.



Note

*Revit updates the preview image continuously. Therefore, selecting the **Regenerate if view/sheet is not up-to-date** check box can consume considerable resources.*

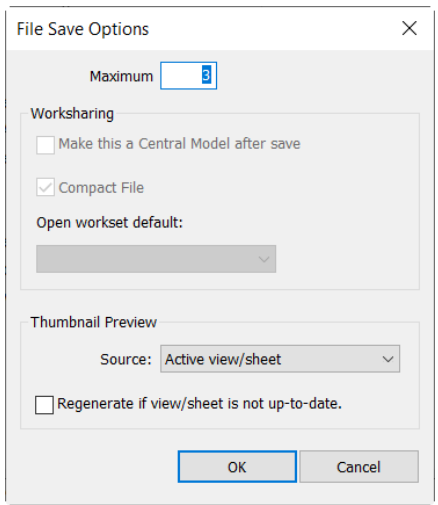

***Figure 2-7** The **File Save Options** dialog box*

Using the Save Tool

Once the project is saved using the **Save As** tool, you do not need to re-enter the file parameters to save it again. To save a project to a location, choose the **Save** tool from the **File** menu, as shown in Figure 2-8. While saving the project for the first time, the **Save As** dialog box is displayed, even if you invoke the **Save** tool. Alternatively, you can save your project by choosing the **Save** button without prompting you to re-enter the file name and path from the **Quick Access Toolbar**. As you save your project file, Revit 2021 updates it automatically.

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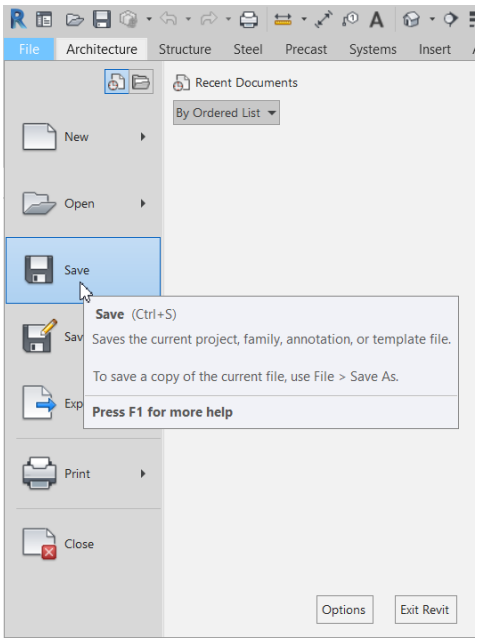

Figure 2-8 *Choosing the* ***Save*** *tool from the* ***File*** *menu*

CONFIGURING GLOBAL SETTINGS

In Revit 2021, you can configure global settings by using the **Options** dialog box. This dialog box can be invoked by choosing the **Options** button from the **File** menu. The **Options** dialog box, as shown in Figure 2-9, contains nine tabs: **General**, **User Interface**, **Graphics**, **Hardware**, **File Locations**, **Rendering**, **Check Spelling**, **SteeringWheels**, **ViewCube**, and **Macros**. The options in these tabs are discussed next.

General Tab

The **General** tab is chosen by default in the **Options** dialog box. This tab contains the following areas: **Notifications**, **Username**, **Journal file cleanup**, **Worksharing update frequency**, and **View options**, refer to Figure 2-9. These areas are discussed next.

Notifications Area

The **Notifications** area provides you the option for setting reminders to save work at regular intervals. In this area, you can set the time interval at which Revit will remind you to save the project file. The default value for the **Save reminder interval** parameter is **30 minutes**. You can specify the time interval by selecting the interval option from the drop-down list corresponding to the **Save reminder interval** parameter. If you do not want a reminder, you can select the **No reminders** option from the drop-down list. Similarly, you can set the value for the **Synchronize with Central reminder interval** parameter.

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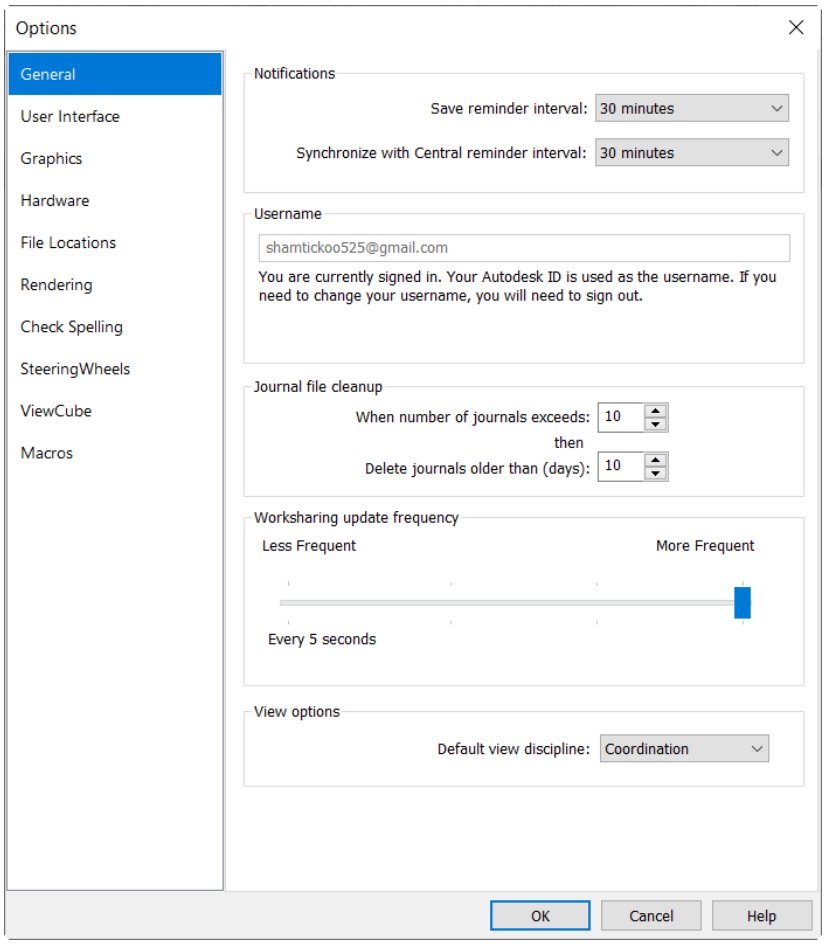

Figure 2-9 *Various areas in the* ***General*** *tab*

Username Area

In Revit, if you are not signed in as a user of Autodesk Account, then the system default username will be displayed. To enter a name in the **Username** area, you need to sign in to Autodesk 360. When you sign in, your Autodesk ID will be used as a username.



Tip

If you are not logged into an Autodesk account, you can directly enter a username.

Journal File Cleanup Area

Journal files are the text files that are used to resolve technical problems that may occur during the Revit session and they record every step during the session. Whenever you encounter any technical problem with the software, you can run this file to detect the problem as well as to recover the lost files or steps that had caused the problem. In Revit, these files are saved at the

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following default location: *C:\Users\<Username>\AppData\Local\Autodesk\Revit\Autodesk Revit 2021\Journals* for Windows 7/8 and for Window Vista users *C:\Documents and Settings\<Username>\Local Settings\Application* for Windows XP users. These files are saved each time you close the Revit 2021 session. As such the quantity of these files keeps on increasing until you remove these files from their location. To retain certain files and clean others, you can use the **Journal file cleanup** area in the **General** tab of the **Options** dialog box. This area contains two spinners: **When number of journals exceeds then** and **Delete journals older than (days)**. You can set the required values in these spinners to retain the files that are recently created. For example, if you need to delete journal files whose number exceeds 15, set the value in the **When number of journals exceeds** spinner to **15** and similarly, to delete journals older than 30 days, set the value in the **Delete journals older than (days)** spinner to **30**.

Worksharing Update Frequency Area

In this area, you can set the time interval for updating the project in a worksharing environment. To set the update frequency for worksharing, you can set the slider between **Less Frequent** and **More Frequent**.

View Options Area

In this area, you can set the default view discipline for the project. To do so, select an option from the **Default view discipline** drop-down list. The list of options available in this drop-down list are: **Architectural**, **Structural**, **Mechanical**, **Electrical**, **Plumbing**, and **Coordination**.

User Interface Tab

The **User Interface** tab contains following areas: **Configure**, **Ribbon tab Switching Behavior**, and **Visual experience**. Using the options in these areas, you can change the display of Revit user interface as per your choice. You can do so by selecting the **Dark** or **Light** option from the **Active theme** drop-down list in the **Visual experience** area. To customize the use of shortcut keys in a project, you can choose the **Customize** button corresponding to the **Keyboard Shortcuts** parameter in the configure area. You can also choose the **Customize** button corresponding to the **Double-click Options** parameter; the **Customize Double-click Settings** dialog box will be displayed, as shown in Figure 2-10.

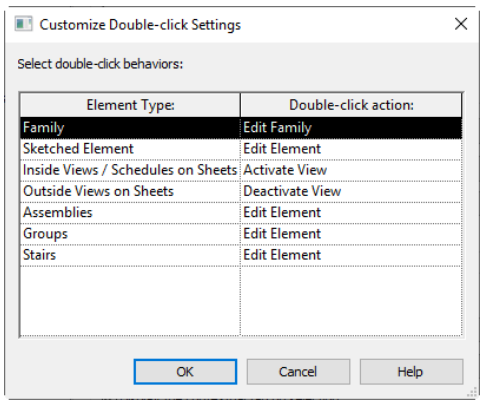

***Figure 2-10** The **Customize Double-click Settings** dialog box*

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In the **Configure** area of the **Options** dialog box, you can select an option from the **Tooltip assistance** drop-down list to set the extent of the tip that will be displayed with the cursor when it is close to a tool. The options in this drop-down list are **None**, **Minimal**, **Normal**, and **High**. By default, the **None** option is selected in this drop-down list. Note that the tooltip will appear more frequently in your drawing if you select **High** in the **Tooltip assistance** drop-down list. In the **Configure** area, the **Enable Recent Files page at home** check box is selected by default. As a result, the recent files will be displayed on starting the Revit software. You can clear this check box if you do not want to display the recent files at the startup. In the **Ribbon tab Switching Behavior** area, you can specify the tab to be displayed once you clear a selection or exit a tool. In this area, the **Project Environment** drop-down list contains two options: **Stay on the Modify tab** and **Return to the previous tab** options. Select the **Stay on the Modify tab** option to display the options in the **Modify** tab after exiting a tool or clearing a selection. Alternatively, you can select the **Return to the previous tab** option to display the last used tab after exiting a tool or clearing a selection. In the **Ribbon tab Switching Behavior** area, the **Display the contextual tab on selection** check box is selected by default. As a result, the contextual tab is displayed once you select a tool from the Revit interface.



Tip

When you rest the cursor on the project file name, a tooltip appears which provides you the information regarding the type and size of the project file.

Graphics Tab

The options in the **Graphics** tab enable you to assign colors to selections, highlights and alerts, and enable anti-aliasing for 3D views. In the **Graphics mode** area of this tab, the **Smooth lines with anti-aliasing** check box is selected by default. As a result, the **Allow control for each view in the Graphic Display Options dialog** and **Use for all views (control for each view is disabled)** options will be enabled. The selection of the **Allow control for each view in the Graphic Display Options dialog** check box will allow you to control the aliasing using the **Graphic Display Options** dialog box for each view. The **Graphic Display Options** dialog box can be invoked using the options in the **Visual Style** menu of the Status Bar. The list of features with the barred styles available in the **Visual Style** menu are given in the table below. On selecting the **Use for all view (control for each view is disabled)** option, all sketched lines will become smooth in all views.

Feature	Visual Styles			
	Hidden Line	Shaded	Consistent Colors	Realistic
Edges	----------	Barred	Barred	Barred
Fill Patterns	Barred	Barred	Barred	Barred
Shadows	Barred	Barred	Barred	Barred
Structural Hidden Lines	Barred	Barred	Barred	Barred
Mechanical Hidden Lines	Barred	Barred	Barred	Barred

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Note

*While navigating a camera view in the **Wireframe** view style, the fill patterns are not displayed in the model.*

In the **Colors** area of the **Graphics** tab, choose the button corresponding to the **Background** parameter to change the color of the background. The **Selection** parameter specifies a color that an element acquires when it is selected. The default color is **RGB 000-059-189**. To use any other color, click the button on the right of the **Selection** parameter to display the **Color** dialog box and then select the desired color. The **Pre-selection** parameter specifies the color of the highlighted elements. To use any other color for highlighting the element, click the button on the right of the **Selection** parameter and select the desired color from the **Color** dialog box displayed. Revit uses the **Alert** button to highlight elements when an error occurs. In the **Colors** area, the **Semi-transparent** check box is selected by default. As a result, you can make the selected elements semi-transparent and you can view the elements behind the selection. In the **Temporary dimension text appearance** area, you can select an option from the **Size** drop-down list to specify the size of the text to be used in temporary dimensions. In this area, you can set the background of the text in the temporary dimensions. To do so, select the **Opaque** or **Transparent** option from the **Background** drop-down list.

Hardware Tab

The options in the **Hardware** tab enables you to view information related to hardware setup and change related information for better navigation and rendering view. In the **Hardware setup** area of this tab, the **Use hardware acceleration** check box is selected by default. As a result, the hardware accelerators are enabled. Hardware accelerators help display the larger models faster on refreshing the views. In addition, the hardware accelerators help you speed up the process of switching between the windows of views.

File Locations Tab



The options in the **File Locations** tab can be used to display the link of the default template files present in the project. The options in this tab can also be used to set the path for the template files, user files, family template files that are accessed frequently, and the root path for the point clouds. Figure 2-11 shows various options in this tab.

The path for these files is set at the time of installing Revit. However, you can modify the location by choosing the corresponding **Browse** button and specifying a new path. The default template file location can be changed, in case you wish to use a custom made template file for your projects. Revit uses the default path for user files for saving or opening a project. You can also specify the default path for family template files and for the point clouds by using the corresponding **Browse** button.

In Autodesk Revit 2021, you can add a new template file for the workflows used for system analysis. To do so, choose the **Add Value** button under the **System analysis workflows:** area and specify the desired path for the new template file in the **Browse for System Analysis Workflow** dialog box. To modify the path of the default template file, click on the path given under the **Path** column corresponding to the desired workflow; the **Browse** button will be activated. Now, click on the **Browse** button; the **Browse for System Analysis Workflow** dialog box will be displayed. In this dialog box, specify the desired path for the template file.

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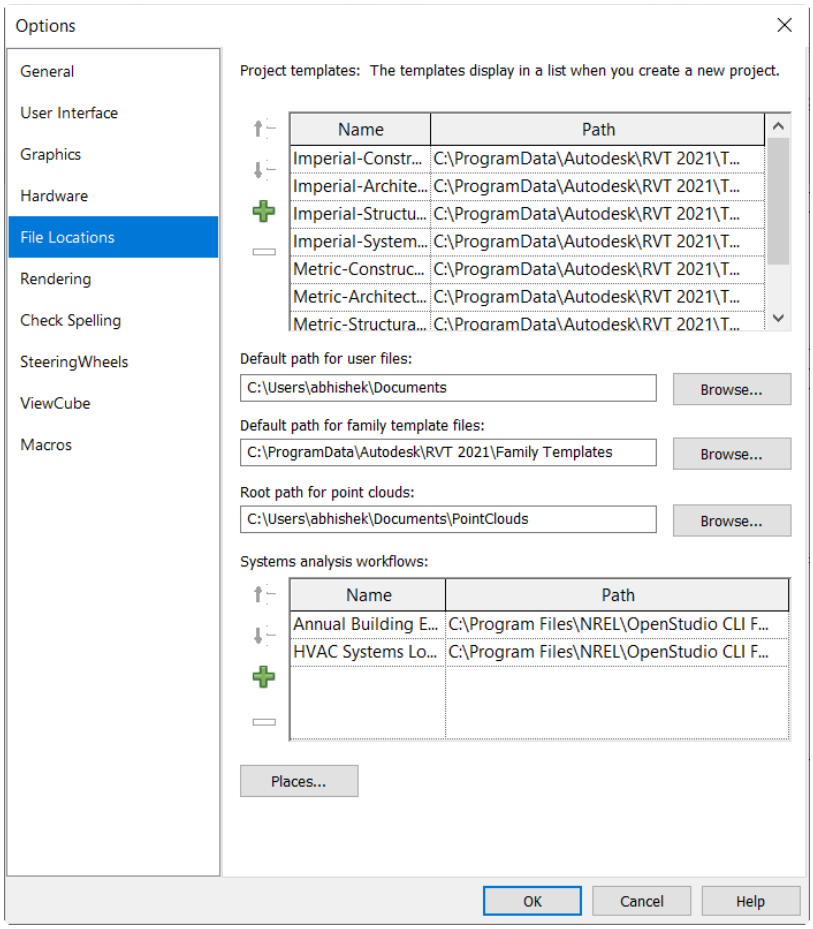

Figure 2-11 *Options in the* ***File Locations*** *tab*

Rendering Tab

The options in the **Additional Render Appearance Paths** section of this tab can be used to specify the path of images that are used in textures, bump map, and other procedural maps for rendering. These image files are not present in the software and therefore, you need to specify their paths to use them. To do so, choose the **Add Value** button in the **Additional render appearance paths** area and specify the required path in the displayed field or choose the **Browse** button; the **Browse For Folder** dialog box will be displayed. In this dialog box, select the desired path and choose the **Open** button to add the path to the field. In the **ArchVision content manager location** area of the **Rendering** tab, you can specify the location of the licensed additional RPC content from Archvision. In this area, the **Network** radio button is selected by default. As a result, you can provide the address of the licensed Archvision content in a network so that more than one user can access the content. To provide the network location of the RPC content, you can specify the IP address or the machine name in the **Address** edit box. Also, you can specify the port used by the Archvision Content Manager in the edit box next to the **Address** edit box. By default, the value entered in the **Port** edit box is **14931**. Alternatively, you can select the **Local** radio button in the **ArchVision content manager location** area of the **Rendering** tab, if the additional RPC content is available in the local drive of the computer. On selecting the **Local**

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radio button, you can specify the location of the local ACM executable file (*rcpACMapp.exe*) in the **Executable Location** edit box. To browse to the local ACM executable file, you can choose the **Browse** button; the **Browse for Template File** dialog box will be displayed. Select the desired executable file and then choose the **Open** button; the path of the file will be added and displayed in the **Executable Location** edit box. In the **Archvision content manager location** area, you can choose the **Get More RPC** button to connect to *https://www.archvision.com/revit* page and get additional RPC required for the project.

Check Spelling Tab

This tab provides you with the option to run spell check in the text and then rectify the errors. You can choose the **Check Spelling** from the **Options** dialog box to display its options. Various self-explanatory settings can be selected from the **Settings** list. You can choose the **Restore Defaults** button available below the **Settings** list to revert back to the default settings. In the **Main dictionary** area of this tab, you can select the type of dictionary to be used as main dictionary for the spelling check from the **Autodesk Revit** drop-down list. Apart from the main dictionary, you can also use additional dictionaries such as the personal and building industry dictionaries. This facilitates the use of various personal and industry related terms in the text matter of the project. There are many words that are not included in the main dictionaries but are frequently used in the building industry. For example, the abbreviation for architecture 'archi' is not available in the main dictionaries. The additional building industry dictionary has many such words and abbreviations that can be used in the text matter of the project without being prompted for errors while checking spellings. You can also add or remove words from your personal and building industry dictionary. Choose any of the **Edit** buttons available in the **Additional dictionaries** area to view the list of words. You can enter or remove any word from these lists using the cursor and keyboard. To run spell check in your drawing, choose the **Check Spelling** tool from the **Text** panel in the **Annotate** tab; the **Check Spelling** dialog box will be displayed, as shown in Figure 2-12, wherein you can rectify the spelling errors in the text by selecting the correct spelling and then choosing the **Change** button in the dialog box, refer to Figure 2-12. Alternatively, you can press the F7 key to display the **Check Spelling** dialog box, refer to Figure 2-12, and then make necessary corrections in the text.

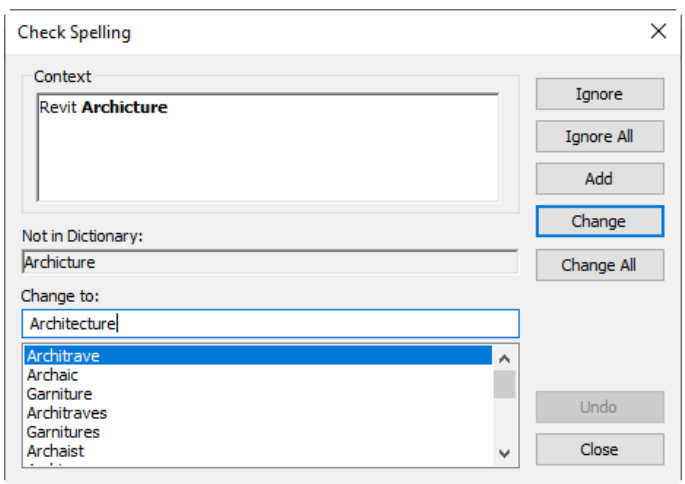

Figure 2-12 *The* ***Check Spelling*** *dialog box*

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SteeringWheels Tab

The options in the **SteeringWheels** tab in the **Options** dialog box are used to control the visibility, appearance, and operational tools of different types of SteeringWheels. This tab has seven different areas of control to use the SteeringWheels, as shown in Figure 2-13. These areas are discussed next.

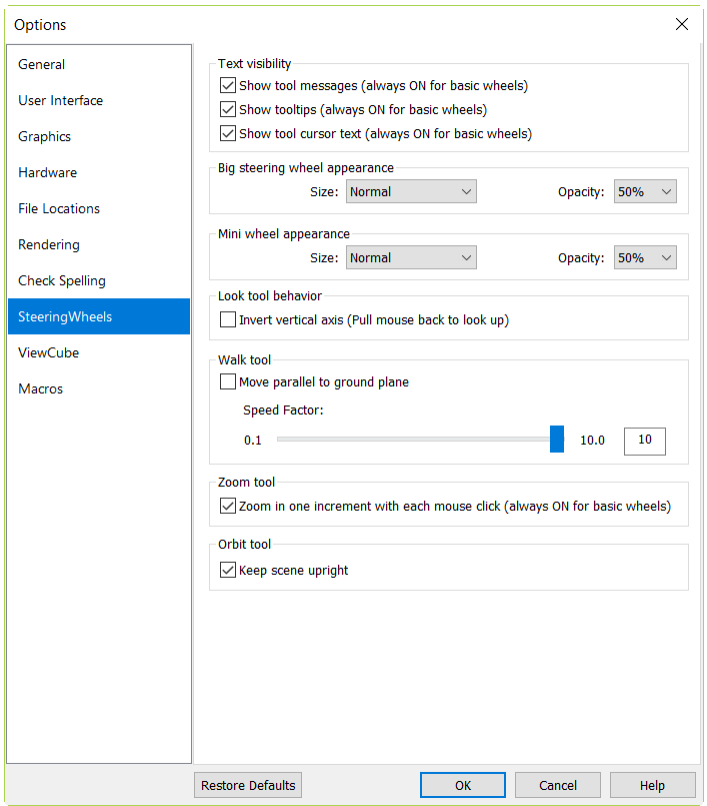

Figure 2-13 *The* ***SteeringWheels*** *tab of the* ***Options*** *dialog box*

Text Visibility Area

You can control the display of tool messages, tooltips, and tool cursor of the SteeringWheels. You can do so by using the options in the **Text visibility** area of the **SteeringWheels** tab. In this area, the **Show tool messages** check box is selected by default. As a result, the visibility of tool messages in the SteeringWheels is enabled. To display the tooltips along with the SteeringWheels, select the **Show tooltips** check box in this area. Similarly, to control the display of the cursor text when a tool is active, use the **Show tool cursor text** check box. Select this check box to display the cursor text when the tool is active.

Big Steering Wheel Appearance and Mini Wheel Appearance Areas

To set the size of the SteeringWheels, select the required option from the **Size** drop-down list in the corresponding areas and set its size to small, normal, or large. Similarly, you can set the transparency of the SteeringWheels by selecting the required option from the **Opacity** drop-down list.

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Look Tool Behavior and Walk Tool Areas

In the **Look tool behavior** area of the **SteeringWheels** tab, select the **Invert vertical axis** check box to change the movement of the view along the vertical axis while using the **Look** tool. Note that on selecting the check box, the view will move in the same direction as that of the cursor. In the **Walk tool** area of the **SteeringWheels** tab, use the **Speed Factor** slider to change the speed of the walk while using the **Walk** tool of the SteeringWheels. Select the **Move parallel to ground plane** check box, if it is not selected by default, to constrain the walk movement angle to ground plane.

Zoom Tool and Orbit Tool Areas

Select the **Zoom in one increment with each mouse click** check box in the **Zoom tool** area to enable the zooming operation with a single click. In the **Orbit tool** area, ensure that the **Keep scene upright** check box is selected. This helps maintaining the perpendicularity between the sides of the model and the ground plane while using the **Orbit** tool.

ViewCube Tab

The options in the **ViewCube** tab in the **Options** dialog box are used to edit various settings of the ViewCube. It has four different areas to modify the ViewCube: **ViewCube appearance**, **When dragging the ViewCube**, **When clicking on the ViewCube**, and **Compass**, as shown in Figure 2-14. These areas are discussed next.

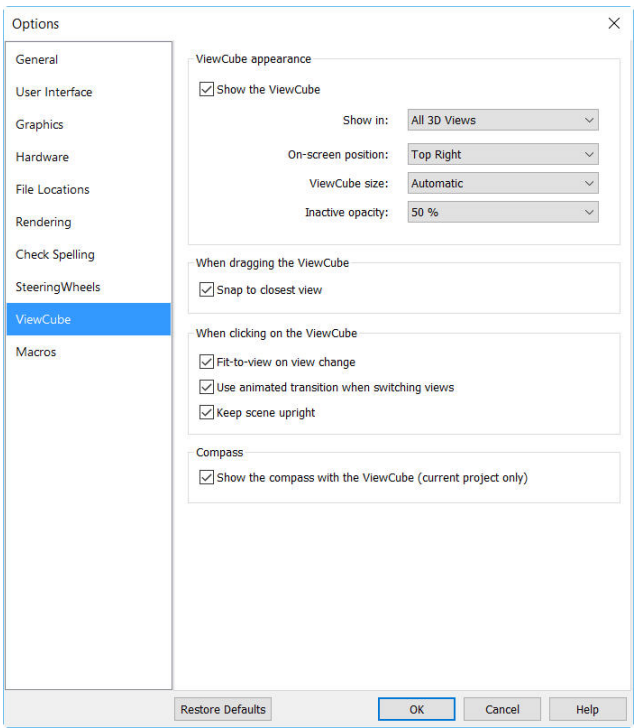

Figure 2-14 *The **ViewCube** tab of the **Options** dialog box*

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ViewCube Appearance Area

The appearance and display of the ViewCube can be controlled by the **ViewCube appearance** area in the **ViewCube** tab.

In the **ViewCube appearance** area, the **Show the ViewCube** check box is selected by default, so the ViewCube will be visible. If you clear this check box, the ViewCube will disappear and all options of the **ViewCube** in the **ViewCube appearance** area will be deactivated.

In the **ViewCube appearance** area, you can use various drop-down lists to align, resize, and change the transparency of the ViewCube. You can select an option from the **Show in** drop-down list to specify whether the ViewCube will be displayed in all 3D views or only in the active view. The **On-screen position** drop-down list is used to position the ViewCube on the screen. Similarly, you can resize the ViewCube by selecting the required option from the **ViewCube size** drop-down list. You can also set the opacity of the inactive ViewCube by selecting various options from the **Inactive opacity** drop-down list.

When Dragging the ViewCube Area

In this area, the **Snap to closest view** check box is selected by default. As a result, the closest ViewCube view orientation will be snapped.

When Clicking on the ViewCube Area

Select the **Fit-to-view on view change** check box in the **When clicking on the ViewCube** area to fit the view on screen while changing the viewing direction. The **Use animated transition when switching views** check box is selected by default in this area. As a result the view will change with animation. Clearing this check box will result in the change of view without any animation. Select the **Keep scene upright** check box to keep the sides of the ViewCube and the sides of the view perpendicular to the ground plane. Clear the check box to turn around the model in full 360-degree swing. Clearing this check box can be useful when you are editing a family.

Compass Area

The **Show the compass with the ViewCube** check box in the **Compass** area is selected by default. As a result, the compass along with the ViewCube will be visible in the drawing.

In the **ViewCube** tab, you can choose the **Restore Defaults** button to restore the default settings that were changed in its different areas.

Macros Tab

The options in the **Macros** tab can be used to set the security level for the **Macros** used in the project. The options in this tab are available in two areas: **Application macro security settings** and **Document macro security settings**. The various options in these areas are discussed next.

Application Macro Security Settings Area

In this area, the **Enable application macros** radio button is selected by default. As a result, the application macros in the project are enabled. To disable the application macros, select the **Disable application macros** radio button.

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Document Macro Security Settings Area

In this area, the **Ask before enabling document macros** radio button is selected by default. As a result, the document macros are disabled, but you will be prompted to enable them whenever you open a project that contains a macro. To enable document macros, select the **Enable document macros** radio button. Similarly, to disable a document macros in the project, select the **Disable document macros** radio button.



Tip

*If you disable the macros by selecting the **Disable application macros** radio button in the **Macros** tab of the **Options** dialog box, you will still be able to modify the code, although the modifications in the code will not change the current status of the macros.*

CLOSING A PROJECT

To close a project, choose the **Close** option from the **File** menu displayed, as shown in Figure 2-15. If you have already saved the latest changes, the project file will be closed. Otherwise, Revit will prompt you to save the changes by using the **Save File** confirmation box. You can save the changes by choosing the **Yes** button or discard them by choosing the **No** button. You can also choose the **Cancel** button to return to the interface and continue working on the project file. You can also use the **Close** button (**X**) in the drawing window to close the project.

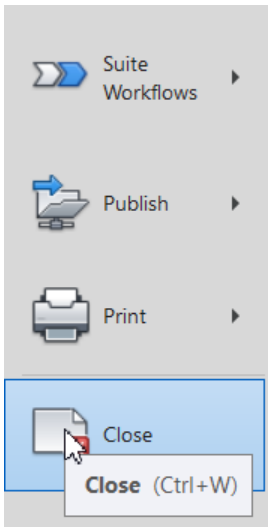

Figure 2-15 *Choosing the **Close** option*

EXITING REVIT

To exit the Autodesk Revit session, choose the **Exit Revit** button from the **File** menu. Even if the project is open, you can still choose the **Exit Revit** button to close the file and exit Revit. In case, the project has not been saved, it enables you to save the work through the **Save File** message box, as shown in Figure 2-16. If you choose the **No** button, all the changes that were not saved will be lost. You can also use the **Close** button (**X**) in the main Revit window to end the Revit session.

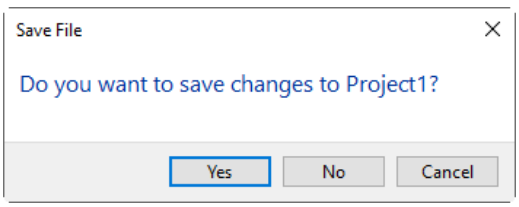

Figure 2-16 *The **Save File** message box*

OPENING AN EXISTING PROJECT

To open an existing project, you can use various options, such as the **Open** tool or the Windows explorer. These options are discussed in detail in the next section.

Opening an Existing Project Using the Open Tool

To open an existing project file, choose **Open > Project** from the **File** menu, as shown in Figure 2-17. Alternatively, you can open a project by choosing the **Open**

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button from the **Quick Access Toolbar** or by pressing CTRL+O. On doing so, the **Open** dialog box will be displayed, as shown in Figure 2-18. In this dialog box, you can open a particular project file by accessing the appropriate folder using the **Look in** drop-down list.

The **Preview** area of the **Open** dialog box shows the preview of the selected project file. It helps you select a particular file by viewing its contents, even if you are not sure about the file name. The window icons such as the **Views** menu placed along with the **Look in** drop-down list, help you select a project file based on its size, type, and the date when it was last saved. On choosing the **Thumbnails** option from the **Views** menu, you can preview the contents of the project files inside the selected folder in the file list area, refer to Figure 2-19.

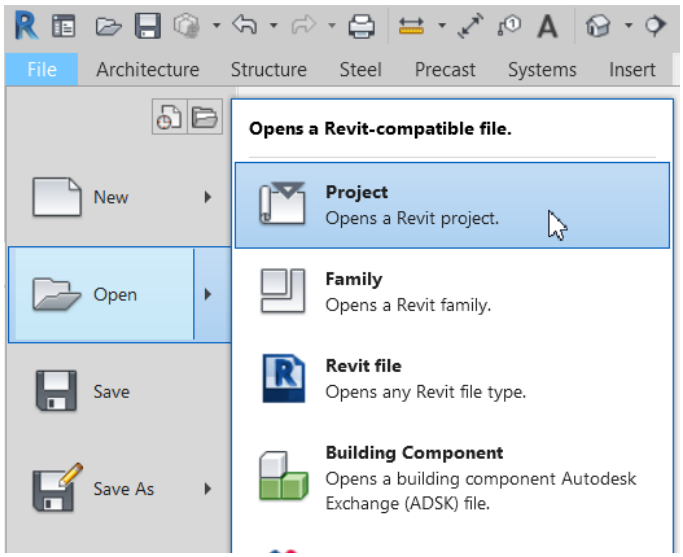

Figure 2-17 *Choosing the* ***Project*** *option from the* ***File*** *menu*

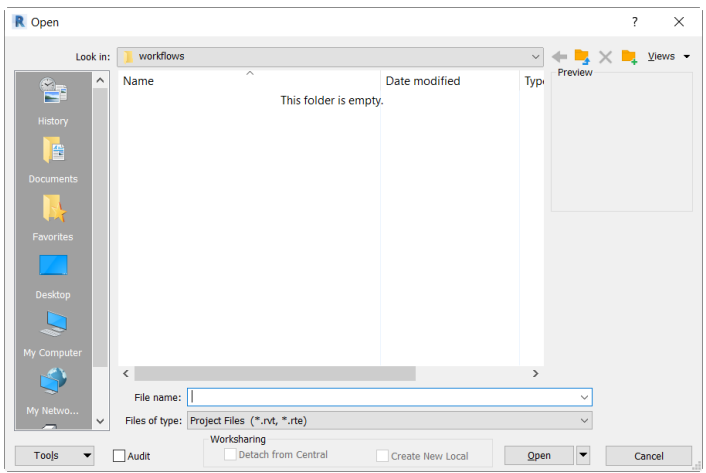

Figure 2-18 *The* ***Open*** *dialog box*

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Tip

*The **Preview** image acts as a thumbnail to identify a project file. You must select the view that will help you identify the project file easily.*

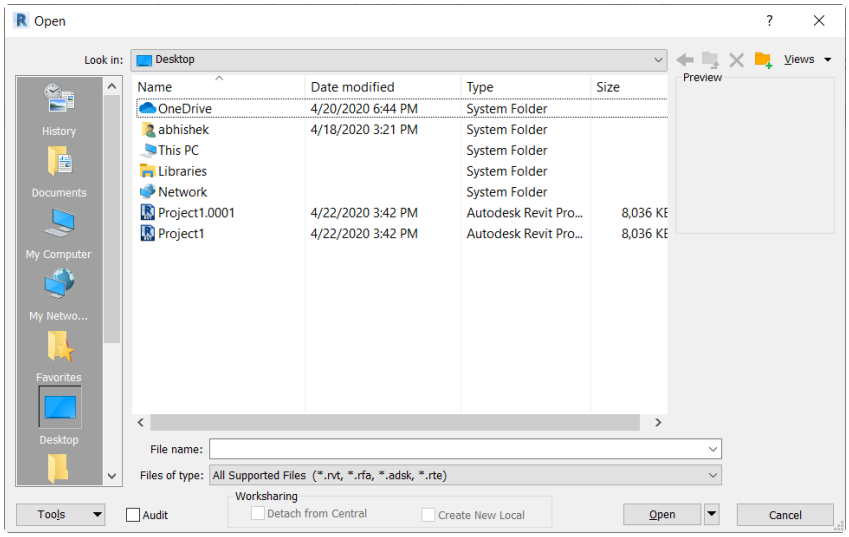

Figure 2-19 *Previewing the files in the **Open** dialog box*

The **Places** list is located on the left in the **Open** dialog box. You can add or remove folders from the **Places** list by choosing the **Options** button from the **File** menu. To do so, first close the **Open** dialog box and then choose the **Options** button from the **File** menu. On doing so, the **Options** dialog box will be displayed. Choose the **File Locations** tab from the dialog box, and then choose the **Places** button from it; the **Places** dialog box will be displayed, as shown in Figure 2-20.

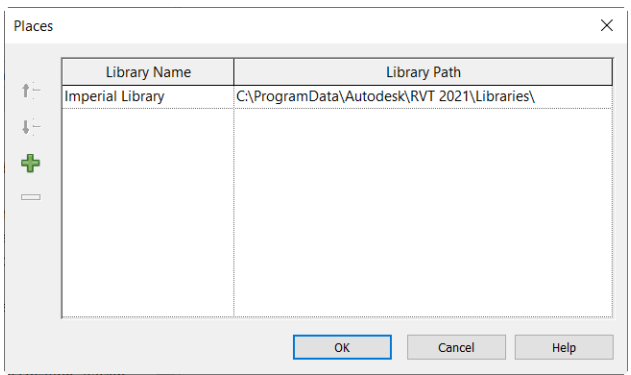

Figure 2-20 *The **Places** dialog box*

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The **Places** dialog box contains two columns: **Library Name** and **Library Path**. You can add or remove folders in the libraries list to create a list of frequently accessed folders. The four buttons on the left in the **Places** dialog box can be used to create or delete a library, or move it up and down in the list. To create a new library, choose the **Add Value** button which is third button from the top; a new library will be added to the defined path. By default, the name of the new library in the **Library Name** section will be **New Library2**. Change the name of the new library and then click in the **Library Path** column to display the browse button. Choose the browse button and select the folder to be added in the libraries list using the **Browse For Folder** dialog box. Choose the **Open** button after selecting the folder; the new folder gets added to the list. If required, choose the upward arrow button in the **Places** dialog box to move the folder up to the top of the list.

Similarly, you can choose the down arrow button to move it down. To delete any library, select the library and choose the **Remove Value** button. Choose the **OK** button in the **Places** dialog box to exit, and then close the **Options** dialog box. When you invoke the **Open** tool next time, the new folder icon will be displayed in the places list.

Once the file to be opened has been selected, its name will be displayed in the **File Name** edit box of the **Open** dialog box and its preview will be displayed in the **Preview** area.



Note

If you try opening an already opened file, which has been modified in the Revit session, a message box appears, prompting you to close the file first and reopen it. In case you open a file that has been created using an older version of Revit, the ***Program Upgrade*** *message box will be displayed. It mentions that the file is being upgraded to the latest file format and that this is a onetime process. Once the file is opened, it gets upgraded to Revit 2021 version.*



Tip

The names of the recently opened files are displayed in the ***File*** menu*. On starting Revit, you can click on the name of the project file that you wish to open.*

Using the Windows Explorer to Open an Existing Project

Apart from using the **Open** tool from the Revit interface, you can also open files directly from the **Windows Explorer** by using the methods discussed next.

A file can be opened by double-clicking on its icon in the **Windows Explorer**. It opens the project file in the latest Revit session. If Revit is not running, double-click on the file icon to start Revit and then open the file. Another method of opening a project file is by dragging the project file icon from the **Windows Explorer** and dropping it into the drawing window of the Revit interface. You can also select, drag, and drop more than one file in the drawing window. In this case, Revit prompts you to open the files in separate windows. Choose the **OK** button to open all the files in the same Revit session.



Tip

By default, the preview of a file is the last active view or sheet at the time it was last saved. You can set the preview to a particular view by using the ***Options*** *button in the* ***Save As*** *dialog box.*

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MODEL DISPLAY TOOLS

As described earlier, in Revit, you can create the building model using the 3D parametric elements. Various tools are provided to view the building model. Based on the requirement, you can use these tools to navigate and edit elements in the building model.

Using the Zoom Tools

The **Zoom** tools are used to enlarge or reduce a project view in the viewing area. To use these tools, you need to display the **Navigation Bar** in your drawing. Generally, the **Navigation Bar** is displayed by default. If it is not displayed, click on the down arrow on the **User Interface** drop-down in the **Windows** panel of the **View** tab; a drop-down list will be displayed, as shown in Figure 2-21. From the drop-down list, select the **Navigation Bar** check box if it is not selected; the **Navigation Bar** will be displayed in the viewing area. In the **Navigation Bar**, click on the down arrow below the **Zoom All to Fit** tool; a cascading menu will be displayed, as shown in Figure 2-22. This cascading menu displays different zooming options which are discussed next.

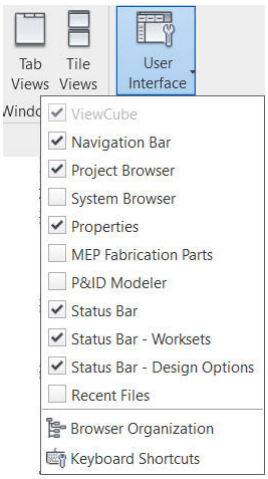

Figure 2-21 *A drop-down list displayed on clicking the* ***User Interface*** *drop-down*

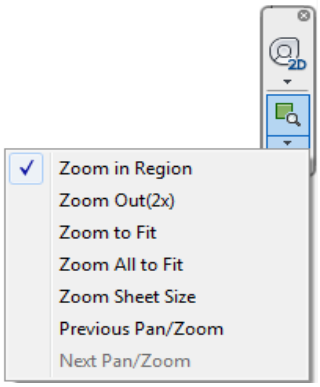

Figure 2-22 *Different zooming options in the cascading menu*

Zoom In Region

This tool is used to zoom in a specified area or window. When you invoke the **Zoom In Region** tool from the **Navigation Bar**, the cursor is replaced by a magnifying glass. To zoom into an area, you need to define a rectangular window by picking its diagonally opposite corners. You can click at a point to specify the start point of the window. When you move the cursor, a dynamic rectangular window is created whose one corner is the specified point and the other corner is attached to the cursor. Move the cursor across the area you want to enlarge. When the area is enclosed in the rectangle, click to specify the diagonally opposite corners of the zoom window. The specified portion of the current view is enlarged. For example, to work on the stairs of a building plan, you can invoke the **Zoom In Region** tool and click to specify the two opposite corners of the window, as shown in Figure 2-23. The resulting enlarged view is shown in Figure 2-24.

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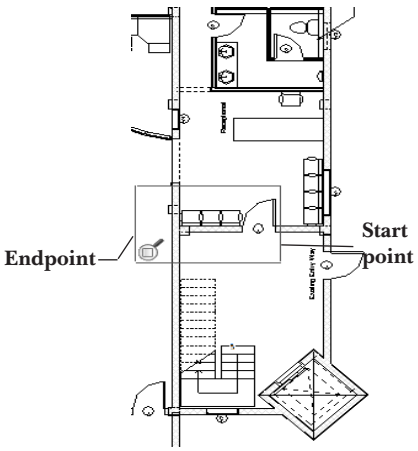

Figure 2-23 Specifying the corners of the zoom window

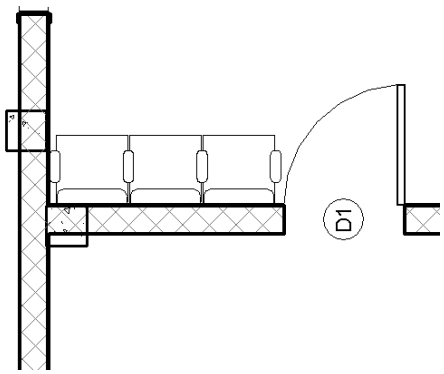

Figure 2-24 The resulting enlarged view

Zoom Out(2X)

This tool is used to zoom out of the existing view by twice the size of the current view. This means, when you invoke this tool, the new view will show twice the length and width of the original view.

Zoom to Fit and Zoom All to Fit

The **Zoom To Fit** tool is used to display all the contents of the project in the current view. On invoking this tool, the drawing window will adjust to show all the elements that have been created in a view. If there are multiple windows open with different zoom factors, invoke the **Zoom All to Fit** tool to perform **Zoom to Fit** in all the windows.

Zoom Sheet Size

The **Zoom Sheet Size** tool is used to fit the drawings in the default sheet size displayed in the **Paper** tab of the printer's **PDF Report Writer's Properties** dialog box. This dialog box will be displayed on choosing the **Properties** button in the **Print** dialog box. To invoke the **Print** dialog box, choose the **Print** option from the **File** menu or enter a shortcut key CTRL+P.

Previous Pan/Zoom and Next Pan/Zoom

The **Previous Pan/Zoom** tool reverts back to the last displayed view using zoom or pan, whereas the **Next Pan/Zoom** tool is a toggle tool to show the next displayed view.

Using the Orient Options

In Revit, you can view a building model in 3D from the preset viewpoints using the **Orient** options.

To use the **Orient** options, activate the 3D view by choosing the **Default 3D View** tool from **View > Create > 3D View** drop-down. Alternatively, you can activate the 3D view by double-clicking on **{3D}** under the **3D Views** head in the **Project Browser**. On doing so, the current view will orient to the default 3D view along with the ViewCube displayed at the upper-right corner of the drawing

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area. Now, place the cursor over the ViewCube and right-click; a shortcut menu will be displayed, as shown in Figure 2-25. Now, in the shortcut menu, click on the **Orient to a Direction** option; a cascading menu will be displayed, as shown in Figure 2-26. From this cascading menu, select the appropriate view that will be displayed in the drawing window.

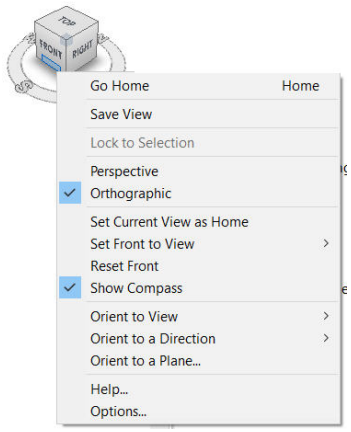

Figure 2-25 *Options in the shortcut menu of the* ***ViewCube***

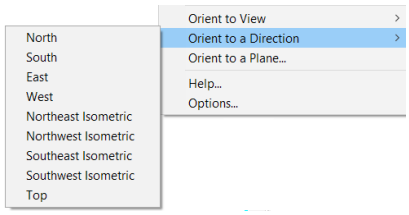

Figure 2-26 *Options in the cascading menu of the* ***Orient to a Direction*** *option*

Navigation Tools

Navigation tools in Revit help you navigate and maneuver into your model in different directions and views. The two navigation tools, **SteeringWheels** and **ViewCube**, are discussed next.

ViewCube

The **ViewCube** tool is an interactive 3D navigation tool that appears in all 3D views of a Revit project. By default, the **ViewCube** tool is visible at the top right corner of your drawing area.

The **ViewCube** navigation tool comprises of a cube, a compass ring at the base with various directions marked on it, and a home icon that helps you set the default view, as shown in Figure 2-27. The **ViewCube** navigation tool is displayed in your drawing area either in an active or an inactive state, as shown in Figures 2-28 and 2-29. By default, the ViewCube is in its inactive state and it appears partially transparent over your drawing area. Therefore it prevents the obstruction of the view of your model. Whereas, in its active state, the ViewCube appears opaque and distinct and obstructs the view of your model. You can change the size, on-screen placement, visibility of the compass, and the inactive opacity of the ViewCube as per your requirement. To do so, choose the **ViewCube** tab from the **Options** dialog box as discussed earlier. In the **ViewCube** tool, there are twenty-six defined areas comprising faces, edges, and corners. The twenty-six defined areas can be divided into three categories: corner, edge, and face, as shown in Figure 2-30. Out of the twenty-six defined areas, six areas represent the standard orthographic views of a model such as top, bottom, front, back, left, and right. The standard orthographic views are set by clicking on one of the faces on the ViewCube. The other twenty areas are defined to access the angular views of a model.

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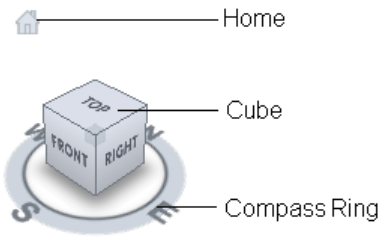

Figure 2-27 *The ViewCube and its components*



Figure 2-28 *The ViewCube in active state*



Figure 2-29 *The ViewCube in the inactive state*

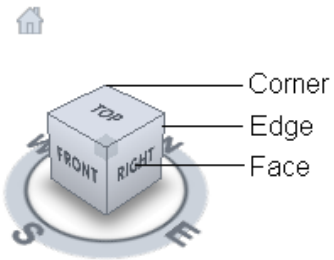

Figure 2-30 *Different areas on the ViewCube*

When you move the cursor on the faces, edges, or vertices of an active ViewCube, the corresponding area gets highlighted in dark-gray color. These highlighted regions are called hotspots. While using the ViewCube, you can click on these hotspots to orient your view as per your requirement.



Tip

You can link the ***Navigation Bar*** *to the ViewCube. To do so, choose the* ***Customize*** *button located at the bottom of the* ***Navigation Bar****; a flyout will be displayed. Choose the* ***Docking positions*** *option in the flyout; a cascading menu will be displayed. From the cascading menu, choose the* ***Link to ViewCube*** *option; the* ***Navigation Bar*** *will get linked to the ViewCube displayed.*

SteeringWheels

The **SteeringWheels** navigation tools are tracking menus that comprise of multiple navigation features in a single interface. Using the features in these tools, you can pan, zoom, walk, look, and adjust the view of your model as per your requirement. The **SteeringWheels** tool is divided into different sections known as wedges. Each wedge represents a unique function for navigation. To activate the **SteeringWheels** navigation tool in your model, press the F8 key. The **SteeringWheels** tool will appear according to the state of view in which you are working. If you are currently working in a 2D view, you can use the **2D SteeringWheels** tool. Similarly, you can use the **3D SteeringWheels** tool when you are working in the 3D view.

In Revit, you can access various types of SteeringWheels from the **Navigation Bar**. In the **Navigation Bar**, click on the down arrow below the default **Full Navigation Wheel** tool; a

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shortcut menu with various types of Steering Wheels will be displayed, as shown in Figure 2-31. To navigate the 2D view, you can use the 2D navigation wheel, as shown in Figure 2-32. The 2D navigation wheel has three navigation tools, **Zoom**, **Pan**, and **Rewind**. **Zoom** is a common navigation tool for enlarging or reducing the viewing scale of the model. You can use the **Pan** tool for traversing across the model view. The **Rewind** tool can be used to see the views of the previous zooming states which are saved temporarily.

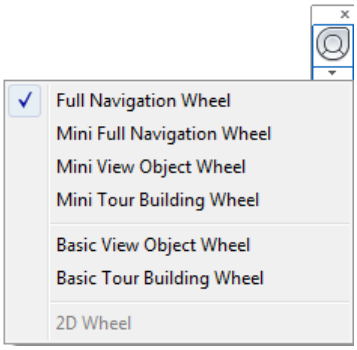

Figure 2-31 *Shortcut menu displaying various types of SteeringWheels*



Figure 2-32 *The 2D* ***Steering Wheels*** *navigation tool*

The **3D SteeringWheels** navigation tools help you navigate through your 3D views. Based on the size and appearance, the 3D SteeringWheels is categorized into two groups, Mini Steering Wheels and Big SteeringWheels.

The Mini SteeringWheels are classified into three types: **Mini Tour Building Wheel**, **Mini View Object Wheel**, and **Mini Full Navigation Wheel**, as shown in Figure 2-33. The **Mini View Object Wheel** has four distinct navigation tools: **Pan**, **Zoom**, **Rewind**, and **Orbit**. Similarly, the **Mini Tour Building Wheel** comprises of four unique navigation options: **Up/Down**, **Look**, **Walk**, and **Rewind**. The **Full Navigation Wheel** comprises of eight wedges with each wedge defining a unique navigation function. The **Mini Full Navigation Wheel** combines all the functions of the **Mini View Object Wheel** and the **Mini Tour Building Wheel**. The Big SteeringWheels has similar classification as that of the Mini SteeringWheels, as shown in Figure 2-34, and it has same navigation tools as that in the Mini SteeringWheels with the only difference in their appearances on screen.

As you put your cursor over any of the navigation tools, the tooltips and messages are displayed, as shown in Figure 2-35. The tooltips inform you regarding the tool that you want to use and provide instruction for using it. You can control the visibility of the tooltips and the tool messages while using the SteeringWheels by using the **Options** dialog box, as discussed earlier in this chapter.

While using the **SteeringWheels** navigation tool, you can activate the available navigation tools by clicking and holding the left mouse button over any one of the wedges. After holding the left mouse button and dragging it over the drawing area, you can use the selected navigation tool for reorienting your view. Now, to exit the selected navigation tool, release the left mouse button.

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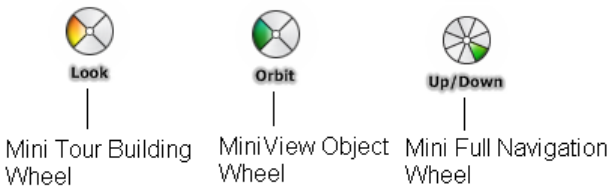

Figure 2-33 *Types of Mini SteeringWheels for 3D Views*

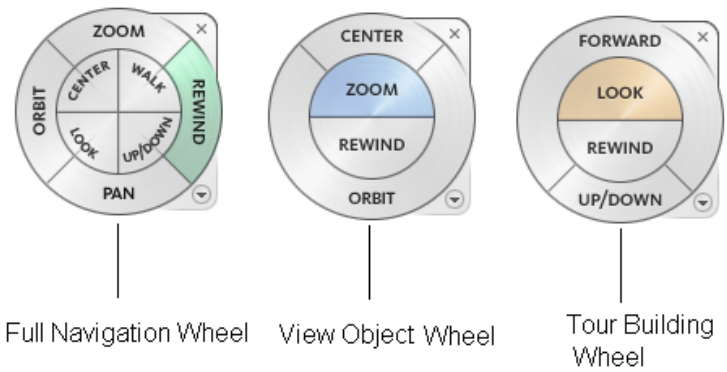

Figure 2-34 *Appearance of Big SteeringWheels*



Figure 2-35 *Appearance of the tooltip displayed with the* ***SteeringWheels***

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Other Display Options

Revit provides five options to view the building model in different modes of shading. You can select these options by choosing the **Visual Style** button from the **View Control Bar** and then selecting the desired option from the shortcut menu that will be displayed. There are six options that are available in the shortcut menu and these are discussed next.

Wireframe : Displays the model with all the lines and edges without surfaces.

Hidden Line : Displays the model with lines and edges that are visible.

Shaded : Displays the building model with the surfaces shaded with respect to the material shading and default lighting effect.

Consistent Colors : Displays the building model in different consistent colors, making the model more aesthetic.

Realistic : Displays the realistic view of the model with textures visible in the elements. In this view style, you can specify and visualize the effect of artificial lights and photographic exposure lighting schemes in the project. The use of this style is helpful for quick presentation, where you do not want to render the image using mental ray.

Ray Trace : Displays the real time ray trace render view. When you select an option from the **View Control Bar**, Autodesk Revit starts rendering the model in a photorealistic Style. Initially, the render quality is low, but it improves after sometime.



Note

By default, these options affect the current view only. However, you can save the shading effects by saving the shaded view in the project file.

TUTORIALS

In the tutorials of this chapter, you will work on three projects: an apartment complex, a club building, and a residential building. However, some portions of these three projects will be completed in the tutorials and the rest will be given as exercises that need to be completed by the students themselves. The tutorials and exercises form a sequence, and therefore, to complete these projects, you need to complete both the tutorials and exercises in the previous chapters. The following tutorials will familiarize you with the tools and concepts discussed in this chapter such as starting Revit, opening a new project, setting units, setting snaps, saving, and closing a project.

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Tutorial 1 Apartment 1

In this tutorial, you will create a new project file for the *Apartment 1* project with the following parameters: **(Expected time: 15 min)**

1. Template file-
   For Imperial *default.rte*
   For Metric *DefaultMetric.rte*
2. Project Units-
   For Imperial **Feet and fractional inches** Rounding- **To the nearest 1/2"**
   For Metric **Millimeters** Rounding- **0 decimal places**
3. Length dimension snap increment-
   For Imperial **5' ; 2'6"; 3"; 0'1/2"**
   For Metric **1500 ; 750 ; 75 ; 10**
4. File name to be assigned-
   For Imperial *c02_Apartment1_tut1.rvt*
   For Metric *M_c02_Apartment1_tut1.rvt*

The following steps are required to complete this tutorial:

a. Start Revit 2021 session.
b. Use the template file for the project.
   For Imperial *default.rte*
   For Metric *DefaultMetric.rte*
c. Set the project units using the **Format** dialog box.
   For Imperial **Feet and fractional inches**
   For Metric **Millimeters**
d. Set the length dimension snap increment using the **Snaps** dialog box.
   For Imperial **5'; 2'6"; 3"; 0'1/2"**
   For Metric **1500 ; 750 ; 75 ; 10**
e. Set **Endpoint**, **Midpoint**, **Nearest**, **Perpendicular**, **Work Plane Grid**, **Snap to Remote Objects**, **Snap to Point Clouds**, and **Intersection** as the object snaps in the **Snaps** dialog box.
f. Save the project using the **Save As** tool.
   For Imperial *c02_Apartment1_tut1.rvt*
   For Metric *M_c02_Apartment1_tut1.rvt*
g. Close the project.

Starting Revit 2021

1. Start Revit 2021 by choosing **All Programs > Autodesk > Revit 2021 > Revit 2021** from the **Start** menu (for Windows 10 versions). Alternatively, double-click on the Revit 2021 icon on the desktop. As a result, the program is loaded and the user interface screen is displayed.

2. Choose **New > Project** from the **File** menu; the **New Project** dialog box is displayed.

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Using the Template File

To use the template file for the project, you need to access the appropriate folder and then select the required template file.

1. In the **New Project** dialog box, choose the **Browse** button from the **Template file** area; the **Choose Template** dialog box is displayed showing a list of the template files available in the **English-Imperial** folder.

2. In the **Choose Template** dialog box, select the **default** template file from the **English-Imperial** folder (**DefaultMetric** template file from the **English** folder), refer to Figure 2-36 and then choose the **Open** button; the **Choose Template** dialog box closes and the selected template file is applied to the new project.

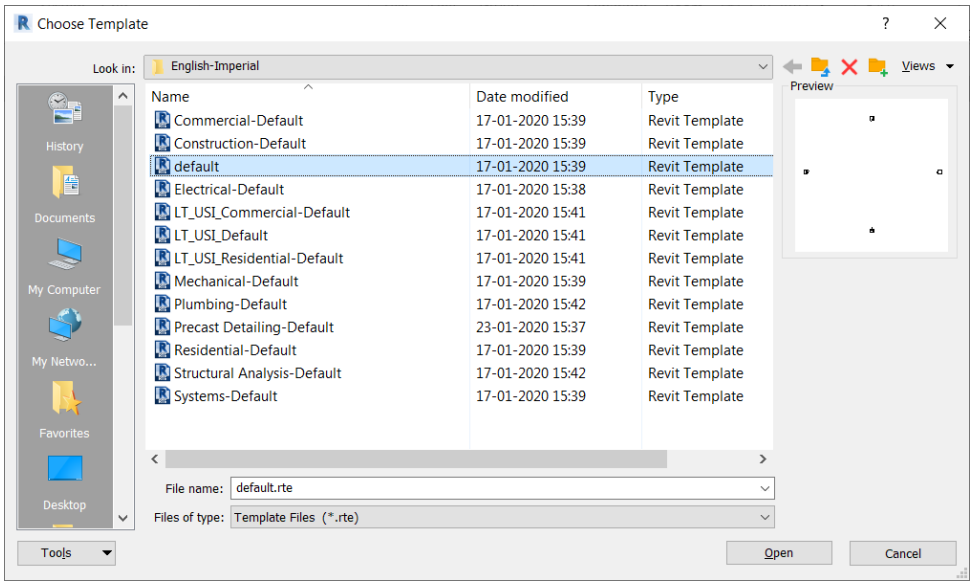

Figure 2-36 *The* ***Choose Template*** *dialog box with the* ***default*** *file selected*

3. Ensure that the **Project** radio button is selected in the **New Project** dialog box. Next, choose the **OK** button from the dialog box; the *default.rte* (for Metric *DefaultMetric.rte*) template file is loaded. Notice that the **Project Browser** now shows different levels and views that have already been created in the selected template.

Setting Units

You can set units for various measurement parameters using the **Project Units** dialog box.

1. Choose the **Project Units** tool from the **Settings** panel of the **Manage** tab; the **Project Units** dialog box is displayed.

2. Click on the **Format** column next to the **Length** parameter; the **Format** dialog box is displayed.

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3. In the **Format** dialog box, select the required option from the **Units** drop-down list, if not selected by default.
   For Imperial **Feet and fractional inches**
   For Metric **Millimeters**

4. Click on the **Rounding** drop-down list in this dialog box and select the required option, as shown in Figure 2-37.
   For Imperial **To the nearest 1/2"**
   For Metric **1 decimal place**

5. Choose the **OK** button; the **Project Units** dialog box is displayed. Choose the **OK** button; the specified units are applied and the dialog box is closed.

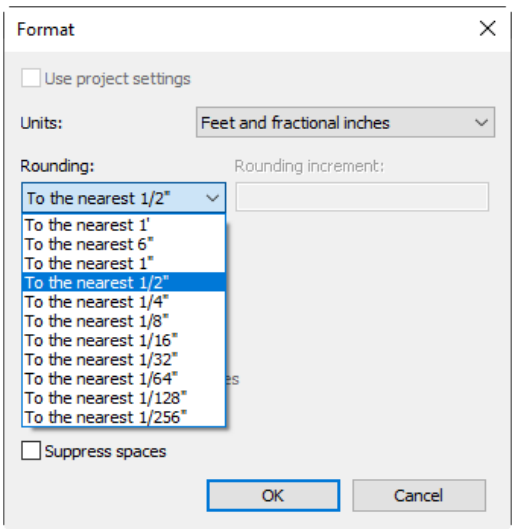

Figure 2-37 *Selecting the* ***To the nearest 1/2"*** *option in the* ***Format*** *dialog box*

Setting the Dimension and Object Snaps

To set the dimension and object snaps, use the **Snaps** tool. These settings are based on the type of the project and the amount of detailing required.

1. Choose the **Snaps** tool from the **Settings** panel of the **Manage** tab; the **Snaps** dialog box is displayed. In the **Length dimension snap increments** edit box, enter the following values.
   For Imperial **5'; 2'6"; 3"; 0'1/2";**
   For Metric **1500 ; 750 ; 75 ; 10;**

2. In the **Object Snaps** area, clear the **Quadrants**, **Centers**, **Tangents**, and **Points** check boxes. Leave other check boxes selected. Choose the **OK** button; the settings are applied and the **Snaps** dialog box is closed.

3. Select the **Temporary Dimensions** option from **Manage > Settings > Additional Settings** drop-down list; the **Temporary Dimension Properties** dialog box is displayed. In this

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dialog box, ensure that the **Centerlines** radio button is selected in the **Walls** and **Doors and Windows** areas.

4. Choose the **OK** button; the **Temporary Dimension Properties** dialog box is closed.

Saving the Project

The project parameters set in the previous steps are an integral part of the project file. To save this project file with these settings, use the **Save** tool.

1. Choose the **Save** tool from the **File** menu; the **Save As** dialog box is displayed.

2. In this dialog box, browse to the *C* drive and then create a folder with the name **rvt_2021**.

3. Open the *rvt_2021* folder and then create a sub-folder with the name *c02_revit_2021_tut*. Next, open the created folder and save the file with the following name.
   For Imperial *c02_Apartment1_tut1*
   For Metric *M_c02_Apartment1_tut1*
   Notice that the **Files of type** drop-down list shows **Project Files (*.rvt)** as the default option refer to Figure 2-38.

4. Choose the **Save** button to save the project with the name *c02_Apartment1_tut1.rvt*. The project is saved at the specified location.

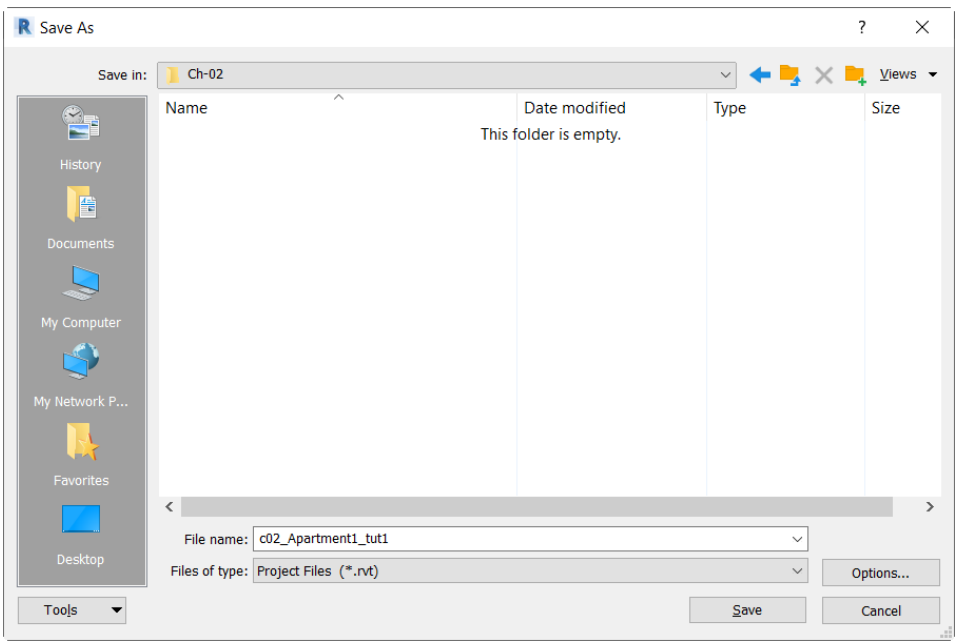

Figure 2-38 *Saving the project using the* ***Save As*** *dialog box*

Closing the Project

1. To close the project, choose the **Close** option from the **File** menu.

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Tutorial 2 Club

In this tutorial, you will create a new project file for the *Club* project using the following project parameters. **(Expected time: 15 min)**

1. Template file-
   For Imperial *Commercial-Default.rte*
   For Metric *DefaultMetric.rte*
2. Project Units-
   For Imperial **Feet and fractional inches**
   For Metric **Millimeters**
3. Length dimension snap increment-
   For Imperial **10';2'6";1'; 0'3"**
   For Metric **3000; 750; 300; 75**
4. Object snaps to be set- all available object snaps
5. File name to be assigned-
   For Imperial *c02_Club_tut2.rvt*
   For Metric *M_c02_Club_tut2.rvt*

The following steps are required to complete this tutorial:

a. Start Revit 2021 session.
b. Use the template file by accessing the **English- Imperial** templates folder.
   For Imperial *Commercial-Default.rte*
   For Metric *Construction-DefaultMetric.rte*
c. Set the project units using the **Project Units** dialog box.
   For Imperial **Feet and fractional inches**
   For Metric **Millimeters**
d. Set the length dimension snap increment in the **Snaps** dialog box.
   For Imperial **10';2'6";1'; 0'3"**
   For Metric **3000 ; 750 ; 300 ; 75**
e. Select the option for rounding.
   For Imperial **To the nearest 1/4"**
   For Metric **2 decimal places**
f. Enable all the object snaps using the **Snaps** dialog box.
g. Save the project using the **Save As** tool.
   For Imperial *c02_Club_tut2.rvt*
   For Metric *M_c02_Club_tut2.rvt*
h. Close the project.

Starting Autodesk Revit 2021 and Opening a New Project

1. Start a new Autodesk Revit 2021 session by double-clicking on the Revit 2021 shortcut icon on the desktop. On doing so, the user interface screen is displayed. In case, the Revit 2021 session is already running, this step can be ignored and the project file can be opened directly.

2. Choose **New > Project** from the **File** menu; the **New Project** dialog box is displayed.

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Using the Template File

As given in the project parameters, you need to use the *Commercial-Default.rte* template file for Imperial and *DefaultMetric.rte* in this project.

1. In the **New Project** dialog box, choose the **Browse** button; the **Choose Template** dialog box is displayed. In this dialog box, select the **Commercial-Default** template file from the **English-Imperial** templates folder (**DefaultMetric** from **English** folder) and then choose **Open**; the selected template file is assigned to the project. Next, choose **OK**; the template file is loaded.

   Notice that the **Project Browser** now shows several levels that are preloaded in the template file.

Setting Units

You can set units for various measurement parameters using the **Project Units** dialog box.

1. Choose the **Project Units** tool from the **Settings** panel of the **Manage** tab; the **Project Units** dialog box is displayed, as shown in Figure 2-39.

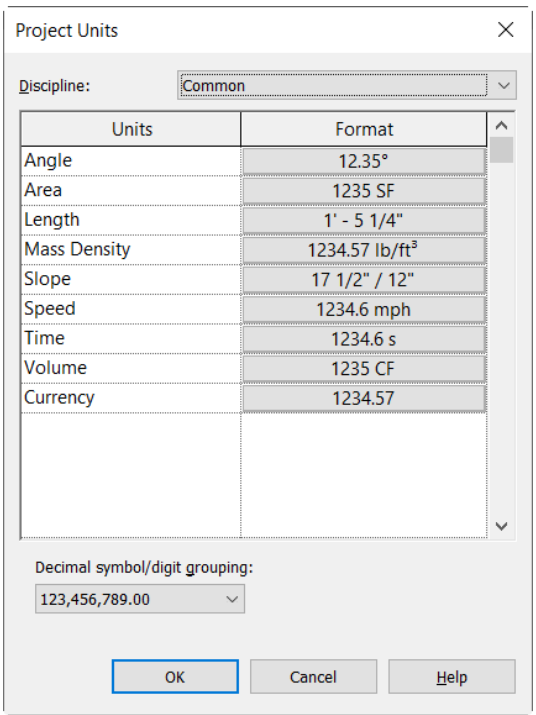

***Figure 2-39** The **Project Units** dialog box*

2. Click on the **Format** column next to the **Length** unit; the **Format** dialog box is displayed. In this dialog box, make sure that the **Feet and fractional inches** option for Imperial or **Millimeters** option for Metric (default option) is selected in the **Units** drop-down list.

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3. Next, select the required option from the **Rounding** drop-down list.
   For Imperial **To the nearest 1/4"**
   For Metric **2 decimal places**

4. Choose **OK** to return to the **Project Units** dialog box. Next, choose the **OK** button to apply the settings and return to the user interface screen.

Setting Dimensions and Object Snaps

In this section of the tutorial, you need to access and modify the settings in the **Snaps** dialog box. Further, you need to specify the dimension snap increment and enable all the object snap options.

1. Choose the **Snaps** tool from the **Settings** panel of the **Manage** tab; the **Snaps** dialog box is displayed, as shown in Figure 2-40.

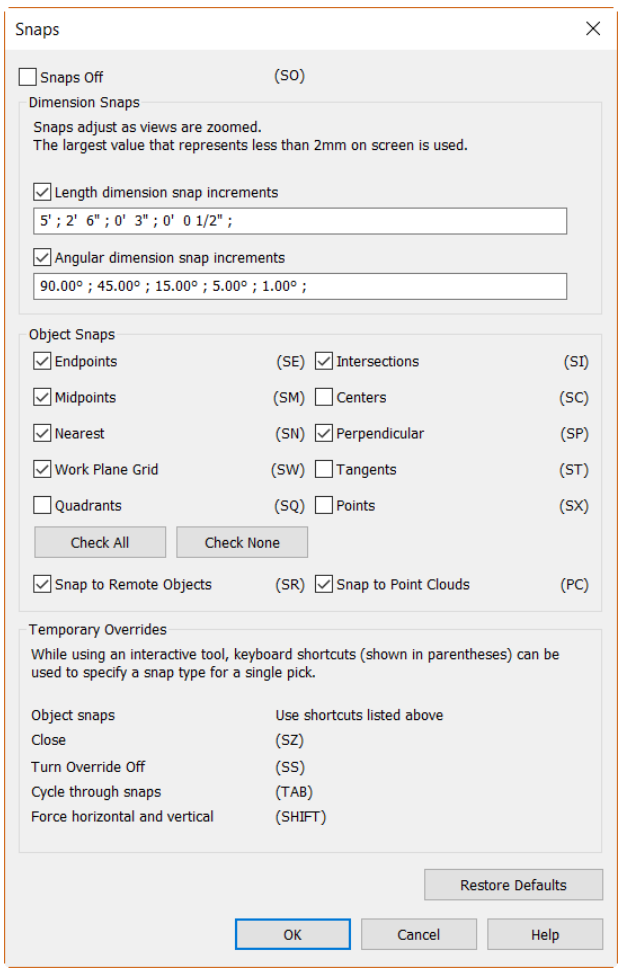

Figure 2-40 *The* ***Snaps*** *dialog box*

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2. In the **Object Snaps** area, ensure that all the check boxes for snapping are selected.

3. In the **Length dimension snap increments** edit box, enter the following values.
   For Imperial **10'; 2'6"; 1'; 0'3";**
   For Metric **3000 ; 750 ; 300 ; 75**
   Choose the **OK** button; the settings are applied and the **Snaps** dialog box is closed.

4. Choose the **Temporary Dimension** option from **Manage > Settings > Additional Settings** drop-down list; the **Temporary Dimension Properties** dialog box is displayed. In this dialog box, ensure that the **Centrelines** radio button is selected in the **Walls** and **Doors and Windows** areas.

5. Choose the **OK** button; the **Temporary Dimension Properties** dialog box is closed.

Saving the Project

In this section, you will save the project and the settings using the **Save** dialog box.

1. Choose **Save As > Project** from the **File** menu; the **Save As** dialog box is displayed.

2. Browse to the *c02_revit_2021_tut* sub-folder in the *rvt_2021* folder and enter the required file name in the **File name** edit box. Notice that the **Files of type** drop-down list shows **Project Files (*.rvt)** as the default option.
   For Imperial **c02_Club_tut2**
   For Metric **M_c02_Club_tut2**

3. Choose the **Save** button to save the project**.** The project is saved at the specified location.

Closing the Project

1. Choose the **Close** option from the **File** menu.

Self-Evaluation Test

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

1. The keyboard shortcut for the **Save** tool is _____.

2. You can use the _____ tab of the **Options** dialog box to specify the location of the default template file.

3. The _____ button in the **Save As** dialog box can be used to specify the maximum number of backup(s) for a project file.

4. The _____ option of Revit enables you to override the snap settings for a single pick only.

5. You can add folders to the _____ list in the **Save As** dialog box to access the frequently used folders directly.

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6. You can open only one Revit project at a time. (T/F)

7. In Revit, all the enabled object snaps work together. (T/F)

8. While saving a project file for the first time, the **Save As** dialog box is displayed on choosing the **Save** tool from the **File** menu. (T/F)

9. A project file can be opened by double-clicking on the file name in the **Windows Explorer**. (T/F)

10. You can save any project file as a template file. (T/F)

Review Questions

Answer the following questions:

1. Which of the following options cannot be used for object snapping?

(a) **Endpoint** (b) **Work Plane Grid**
(c) **Dimension** (d) **Centers**

2. Which of the following keys can be used to toggle between the object snap options available at the same point?

(a) TAB (b) CTRL
(c) ALT (d) F3

3. Which of the following shortcut keys is used to activate the SteeringWheels?

(a) F2 (b) F6
(c) CTRL (d) F8

4. Which of the following conditions are inherited from the new projects of the project template?

(a) Levels (b) Workflow Settings
(c) Families (d) Library Structure

5. Which of the following dialog boxes helps to set the units of project?

(a) **Format** (b) **Snaps**
(c) **Options** (d) **Project Information**

6. You can modify the project unit settings anytime while the project is in progress. (T/F)

7. The file name and path of a project have to be specified each time you save a project. (T/F)

8. You cannot control the visibility of the tooltip assistant. (T/F)

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9. The **Save reminder interval** drop-down list available in the **General** tab of the **Options** dialog box is used to specify the time interval between the reminder prompts to save a project file. (T/F)

10. If changes made to a project file have not been saved, Revit prompts you to save the changes when you choose the **Close** tool from the **File** menu. (T/F)

11. You cannot control the display of tooltips and tool cursor of the SteeringWheels. (T/F)

12. You can add words to Revit dictionaries for checking spellings. (T/F)

EXERCISES

Exercise 1 Apartment 2

Create a new project file for the *Apartment 2* project with the following parameters:

(Expected time: 15 min)

1. Template file-
   - For Imperial **default.rte**
   - For Metric **DefaultMetric.rte**
2. Project Units-
   - For Imperial **Feet and fractional inches**
   - For Metric **Millimeters**
3. Length dimension snap increment-
   - For Imperial **5'; 2'6"; 3"; 0'1/2"**
   - For Metric **1500 ; 750 ; 75 ; 10**
4. File name to be assigned-
   - For Imperial *c02_Apartment2_ex1.rvt*
   - For Metric *M_c02_Apartment2_ex1.rvt*

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Exercise 2 Elevator and Stair Lobby

Create a new project file for the *Elevator and Stair Lobby* project with the following parameters: **(Expected time: 15 min)**

1. Template file-
   - For Imperial **default.rte**
   - For Metric **DefaultMetric.rte**
2. Project Units-
   - For Imperial **Feet and fractional inches**
   - For Metric **Millimeters**
3. Length dimension snap increment-
   - For Imperial **5'; 1'; 3"; 0'1"**
   - For Metric **1500 ; 300 ; 75 ; 25**
4. File name to be assigned-
   - For Imperial *c02_ElevatorandStairLobby_ex2.rvt*
   - For Metric *M_c02_ElevatorandStairLobby_ex2.rvt*

Exercise 3 Residential Building

Create a new project file for the project with the following parameters:

(Expected time: 15 min)

1. Template file-
   - For Imperial default.rte
   - For Metric **DefaultMetric.rte**
2. Project Units-
   - For Imperial **Feet and fractional inches**
   - For Metric **Millimeters**
3. Length dimension snap increment-
   - For Imperial **4' ; 0' 6" ; 0' 1" ; 0' 0 1/4" ;**
   - For Metric **1200 ; 150 ; 25 ; 5**
4. Name for saving the file-
   - For Imperial **c02_residential_ex3.rvt**
   - For Metric **M_c02_residential_ex3.rvt**

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Answers to Self-Evaluation Test

1. CTRL+S, **2**. **File Locations**, **3**. **Options**, **4**. **Temporary Overrides**, **5**. **Places**, **6**. F, **7**. T, **8**. T, **9**. T, **10**. T

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