

# **Chapter 1**

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## ***Introduction to Autodesk Revit Architecture 2010***

### **Learning Objectives**

**After completing this chapter, you will be able to:**

- *Understand the basic concepts and principles of Revit Architecture 2010.*
- *Understand different terms used in Revit Architecture.*
- *Understand the parametric behavior of Revit Architecture.*
- *Start the Revit Architecture 2010 program.*
- *Learn about different components of the User Interface screen of Revit Architecture.*
- *Access Revit Architecture 2010 Help and Tutorials.*

## INTRODUCTION TO Autodesk Revit Architecture

Welcome to the realm of Autodesk Revit Architecture, a powerful building modeler that has changed the outlook of the building industry about computer aided designs. Autodesk Revit Architecture is a design and documentation platform that enables you to use a single, integrated building information model to conceptualize, design, and finally document a project. Its integrated parametric modeling technology is used to create the information model of a project, collect and coordinate information across all its representations. In Autodesk Revit Architecture, drawing sheets, 2D views, 3D views, and schedules are a direct representation of the same building information model. Using its parametric change engine, you can modify the design at any stage of a project. These changes are automatically made and represented in all views of a project, resulting in the development of better designs, along with an improved coordination. The use of Autodesk Revit Architecture provides a competitive advantage and a higher profitability to architects and building industry professionals.

## Autodesk Revit Architecture AS A BUILDING INFORMATION MODELER

The history of computer aided design and documentation dates back to the early 1980s when architects began using this technology for documenting their projects. Realizing its advantages, information sharing capabilities were developed, especially to share data with other consultants. This led to the development of object-based CAD systems in the early 1990s. Before the development of these systems, objects such as walls, doors, windows were stored as a non-graphical data with the assigned graphics. These systems arranged the information logically, but were unable to optimize its usage in a building project. Realizing the advantages of the solid modeling tools, the mechanical and manufacturing industry professionals began using the information modeling CAD technology. This technology enabled them to extract data based on the relationship between model elements.

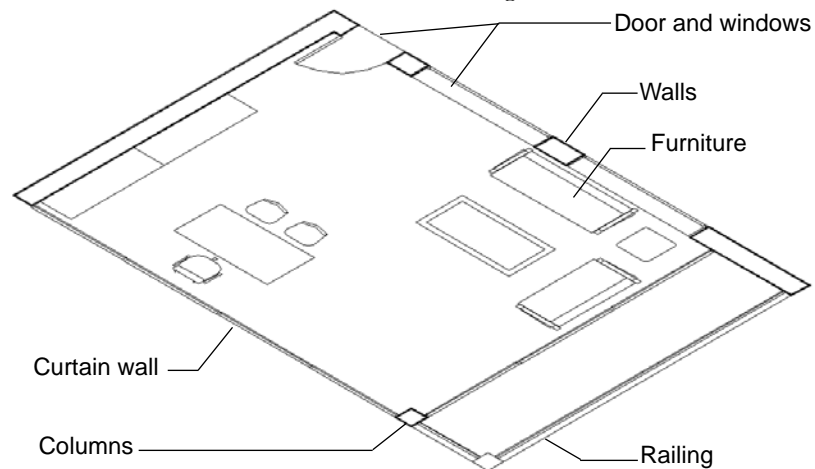
In 1997, a group of mechanical CAD technologists began working on a new software for the building industry. The Building Information Modeling (BIM) provided an alternative approach to building design, construction and management. This approach, however, required a suitable technology to implement and reap its benefits. In such a situation the use of parametric technology with the Building Information Modeling approach was envisaged as an ideal combination. They developed a software that was suitable for creating building projects. This led to the development of a software later came to be known as Autodesk Revit Building, and has now been changed to Autodesk Revit Architecture.

Autodesk Revit Architecture is a building design and documentation platform, in which a digital building model is created using the parametric elements such as walls, doors, windows, and so on. All building elements have inherent relationship with one another, which can be tracked, managed, and maintained by the computer.

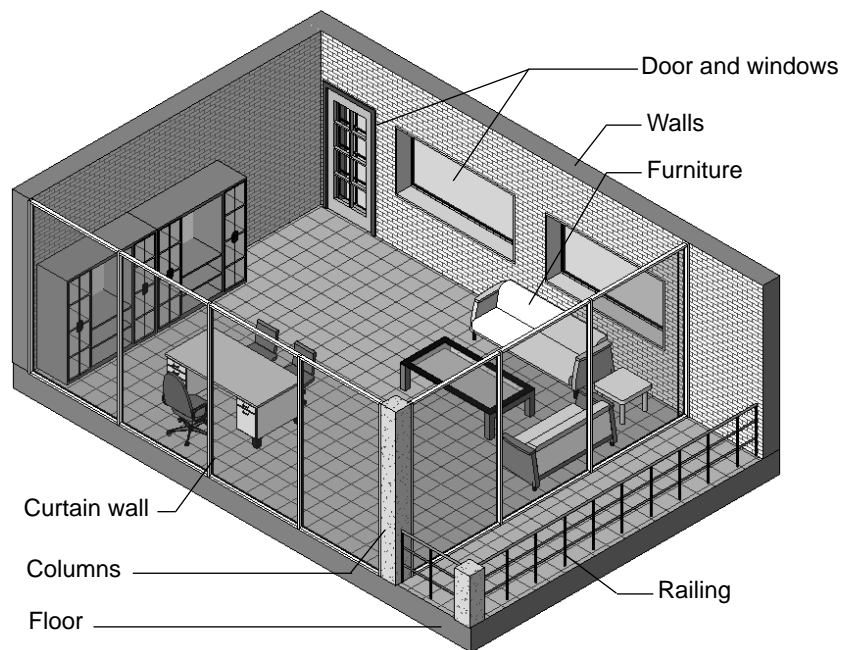
## BASIC CONCEPTS AND PRINCIPLES

Autodesk Revit Architecture enables you to envisage and develop a building model with actual 3D parametric building elements. It provides a new approach to the architectural thought and the implementation process. In a way, it replicates the way architects conceive a building. For

example, 2D CAD platforms mostly use lines to represent all elements, as shown in Figure 1-1. However, in Autodesk Revit Architecture, you can create a building model using 3D elements such as walls, floors, doors, and windows, as shown in Figure 1-2.



**Figure 1-1** CAD project created using 2D lines and curves



**Figure 1-2** Autodesk Revit Architecture project created using parametric building model

Using these 3D elements, you can visualize the architectural or interior project with respect to its scale, volume, and proportions. This enables you to study design alternatives and

develop superior quality design solutions. Autodesk Revit Architecture automates routine drafting and coordination tasks and assists in reducing errors in documentation. This, in turn, saves time, improves the speed of documentation, and lowers the cost for users.

## **Understanding the Parametric Building Modeling Technology**

A project in Autodesk Revit Architecture is created using the in-built parametric building elements. The term parametric refers to the relationship parameters between various building elements. Some relationships are made by Autodesk Revit Architecture itself, and others by the user. For example, doors, which have an inherent parametric relationship with walls, cannot be created without first creating a host wall. A door always moves with the host wall. Similarly, floors too are parametrically linked to walls. When you move walls, the floor extents are also modified automatically. Each building element has an in-built bidirectional associativity with many other elements in the project.

A building information model is created using different interdependent parametric building elements such as walls, floors, roof, ceiling, stairs, ramps, curtain walls, and so on. As they are bidirectionally associated elements, any change made in one element is automatically adopted by others. The integrated building information model thus created contains all data for a project. You can then create project presentation views such as plans, sections, elevations, and so on for documentation. As you modify the model while working in certain views, Autodesk Revit Architecture's parametric change engine automatically updates other views. This capability is, therefore, the underlying concept in Autodesk Revit Architecture.

Autodesk Revit Architecture's parametric change engine enables you to modify design elements at any stage of the project development. As changes are made immediately and automatically, it saves the time and effort of coordinating them in all other associated views, which, for most projects, is an inevitable part of the design process. Autodesk Revit Architecture's capability to coordinate between various aspects of the building design provides immense flexibility in the design and development process along with an error-free documentation.

Autodesk Revit Architecture also provides a variety of in-built parametric element libraries that can be selected and used to create a building model. It also provides you with the flexibility of modifying properties of these elements or create your own parametric elements, based on the project requirement.

## **Terms used in Autodesk Revit Architecture**

Before using Autodesk Revit Architecture, it is important to understand the basic terms used for creating a building model. Various terms in Autodesk Revit Architecture such as project, level, category, family, type, and instance are described next.

### **Autodesk Revit Architecture Project**

A project in Autodesk Revit Architecture is similar to an actual architectural or interior project. In an actual project, the entire documentation such as drawings, 3D views, specifications, schedules, cost estimates, and so on are inherently linked and read together. Similarly, in Autodesk Revit Architecture, a project not only includes the digital 3D building model but

also its parametrically associated documentation. Thus, all components such as the building model, its standard views, architectural drawings, and schedules combine together to form a complete project. A project file contains all project information such as building elements used in a project, drawing sheets, schedules, cost estimates, 3D views, renderings, walkthroughs, and so on. A project file also stores various settings such as environment, lighting, and so on. As data are stored in the same file, so it becomes easier for Autodesk Revit Architecture to coordinate the entire database.

## Levels in a Building Model

In Autodesk Revit Architecture, a building model is divided into different levels. These levels may be understood as infinite horizontal planes that act as hosts for different elements such as roof, floor, ceiling, and so on. The defined levels in a building model can, in most cases, relate to different floor levels, or stories of the building project. Each element that you create belongs to a particular level.

## Subdivisions of Elements into Categories and Subcategories

Apart from building elements, an Autodesk Revit Architecture project also contains other associated elements such as annotations, imported files, links, and so on. These elements have been divided into the following categories:

<b>Model Category</b>	: Consist of various building elements used in creating a building model such as wall, floor, ceiling, roof, door, window, furniture, stairs, curtain systems, ramps, and so on
<b>Annotation Category</b>	: Consist of annotations such as dimensions, text notes, tags, symbols, and so on
<b>Datum Category</b>	: Consist of datums such as levels, grids, reference planes, and so on
<b>View Category</b>	: Consist of interactive project views such as floor plans, ceiling plans, elevations, sections, 3D views, renderings, and walkthroughs

In addition to these four categories, other categories such as **Imported**, **Workset**, **Filter**, and **Revit Categories** can also exist, if the project has imported files, enabled worksets, or linked Autodesk Revit Architecture projects, respectively.

## Families in Autodesk Revit Architecture

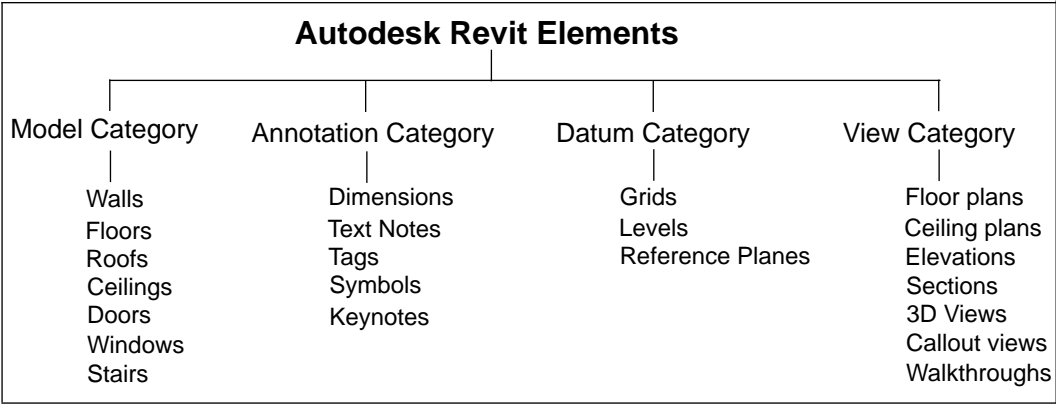
Another powerful concept in Autodesk Revit Architecture is family. A family is described as a set of elements of the same category that can be grouped together based on certain common parameters or characteristics. Elements of the same family may have different properties, but they all have common characteristics. For example, **Double Hung** is a single window family, but it contains different sizes of double hung windows. Family files have a *.rfa* extension. You can load additional building component family from the libraries provided in Autodesk Revit Architecture package.

Families are further divided into certain types. Type or family type, as it is called, is a specific size or style of a family. For example, **Double Hung : 36" x 48"** is a window type. All uses of the same family type in a project have same properties. Family and family types can also be used to create new families using the **Family Editor**.

Instances are the actual usage of model elements in a building model or annotations in a drawing sheet. A family type, created in a new location, is identified as an instance of the family type. All instances of the same family type have same properties. Therefore, when you modify the properties of a family type, the properties of all its instances also get modified. The family categorization of Revit elements is given below:

- Model Category** : Wall
- Family** : Basic Wall
- Family type** : Brick on Mtl. Studs
- Instance** : Particular usage of a family type

The hierarchy of building elements in Autodesk Revit Architecture plays an important role in providing the flexibility and ease of managing a change in the building model. Figure 1-3 shows the hierarchy of categories and families in a typical Autodesk Revit Architecture project. The following is another example of the terms described in this section.



*Figure 1-3 Hierarchy of Autodesk Revit Architecture categories and families*

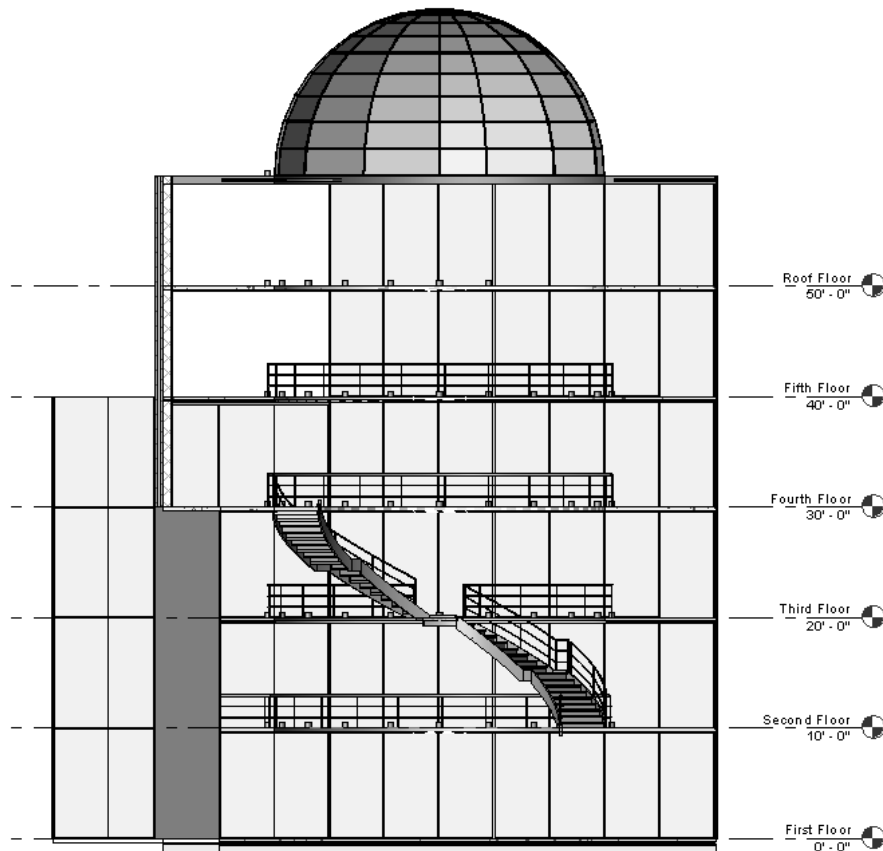
### Creating a Building Model Using Parametric Building Elements

Another classification of categories of elements followed in Autodesk Revit Architecture is based on their usage. Autodesk Revit Architecture uses five classes of element: host, component, annotation, view, and datum. Hosts are the element categories that form the basic structure of a building model and include model elements such as walls, floor, roof, and ceiling. Components are the elements that are added to host elements or act as stand-alone elements such as doors, windows, and furniture. Annotations are the 2D, view-specific elements that add content to the project documentation such as dimensions, tags, text notes, and so on. Views represent various orientations of a building model such as plans, elevations, sections, 3D views, and so

on. Datum refers to the reference elements that assist you in creating a building model, which include grids, levels, reference planes, and so on.

There is no specific methodology available for creating a building model in Autodesk Revit Architecture. It provides you with the flexibility of generating the building geometry based on the project requirement, design complexity, and other factors. However, the following steps describe a general procedure that may be followed for creating an architectural building models using the built-in parametric elements provided in Autodesk Revit Architecture.

The first step is to create the exterior walls of a building at the predefined lowest level (level 1). Next, create interior walls at that level and add components to the building model. Then, define the upper levels based on the story height of the building. You can also link the control height of the walls to the levels and extend the exterior walls to their full height. Next, create floors and roof using the defined levels. Add the site topography to the building model and then add site components to complete the building project. You can then create drawing sheets with the desired views for its presentation. Autodesk Revit Architecture also provides tools to create rendered 3D views and walkthroughs. Figure 1-4 shows an example of a building section with various building elements and annotations.



**Figure 1-4** Building section showing building elements and levels

## Visibility/Graphics Overrides, Scale, and Detail Level

Autodesk Revit Architecture enables you to control the display and graphic representation of a single element or the element category of various elements in project views by using the visibility and graphics overrides tools. You can select a model category and modify its linetype and detail level. This can also be done for various annotation category elements and imported files. These settings can be done for each project view based on its desired representation. You can also hide an element or an element category in a view using the **Hide in view** and **Isolate** tools. You can override the graphic representation of an element or an element category in any view using the **Visibility/Graphics** tool.

The scale is another important concept in an Autodesk Revit Architecture project. You can set the scale for each project view by selecting it from the available list of standard scales such as 1/16"=1'0", 1/4"=1'0", 1"=1'0", 1/2"=1'0", and so on. As you set a scale, Autodesk Revit Architecture automatically sets the detail level appropriate for it. There are three detail levels provided in an Autodesk Revit Architecture project: **Coarse**, **Medium**, and **Fine**. You can also set the detail level manually for each project view. Each detail level has an associated linetype and the detail lines associated with it. The details of annotations such as dimensions, tags, and so on are also defined by the selected scale.

## Extracting the Project Information

A single integrated building information is used to create and represent a building project. You can extract project information from a building model and create area schemes, schedule, and cost estimates, and then add them to the project presentation.

Autodesk Revit Architecture also enables you to export the extracted database to the industry standard Open Database Connectivity (ODBC) compliant relational database tables. The use of the building information model to extract database information eliminates the error-prone method of measuring building spaces individually.

## Creating an Architectural Drawing Set

After creating the building model, you can easily arrange the project views by plotting them on drawing sheets. Drawing sheets can also be organized in a project file based on the established CAD standards followed by the firm. In this manner, the project documentation can easily be transformed from the conceptual design stage to the design development stage and finally to the construction document stage. The project view on a drawing sheet is only a graphical representation of the building information model and therefore, any modification in it is immediately made in all associated project views, keeping the drawings set always updated.

## Creating an Unusual Building Geometry

Autodesk Revit Architecture also helps you conceptualize a building project in terms of its volume, shape, and proportions before working with actual building elements. This is possible by using the **Massing** tool, which enables you to create quick 3D models of buildings and conduct volumetric and proportion study on overall masses. It also enables you to visualize and create an unusual building geometry. The same massing model can then be converted into a building model with individual parametric building elements. It provides continuity in the generation of building model right from sketch design to its development.



## **Flexibility of Creating Special Elements**

Autodesk Revit Architecture provides a large number of in-built family types of various model elements and annotations. Each parametric element has the associated properties that can be modified based on the project requirement.

Autodesk Revit Architecture also enables you to create the elements that are designed specifically for a particular location. The in-built family editor enables you to create new elements using family templates. This provides you with the flexibility of using in-built elements for creating your own elements. For example, using the furniture template, you can create a reception desk that is suitable for a particular location in the design.

## **Creating Structural Layouts**

Autodesk Revit Architecture's structural tools enable you to add structural elements to a building model. An extensive in-built library of structural elements has been provided in Autodesk Revit Architecture. You can add structural columns, beams, walls, braces, and so on to the project. Thus, structural consultants can also incorporate their elements in the basic architectural building model and check for inconsistency, if any.

## **Working on Large Projects**

In Autodesk Revit Architecture, you can work on large projects by linking different building projects together. For a large project that consists of a number of buildings, you can create individual buildings as separate projects and then link all of them into a single base file. The database recognizes the linked projects and includes them in the project representation of the base file.

For example, while working on a large educational institution campus, you can create separate project files for academic building, administration area, gymnasium, cafeteria, computer centre, and so on, and then link them into the base site plan file. In this manner, large projects can be subdivided and worked upon simultaneously.

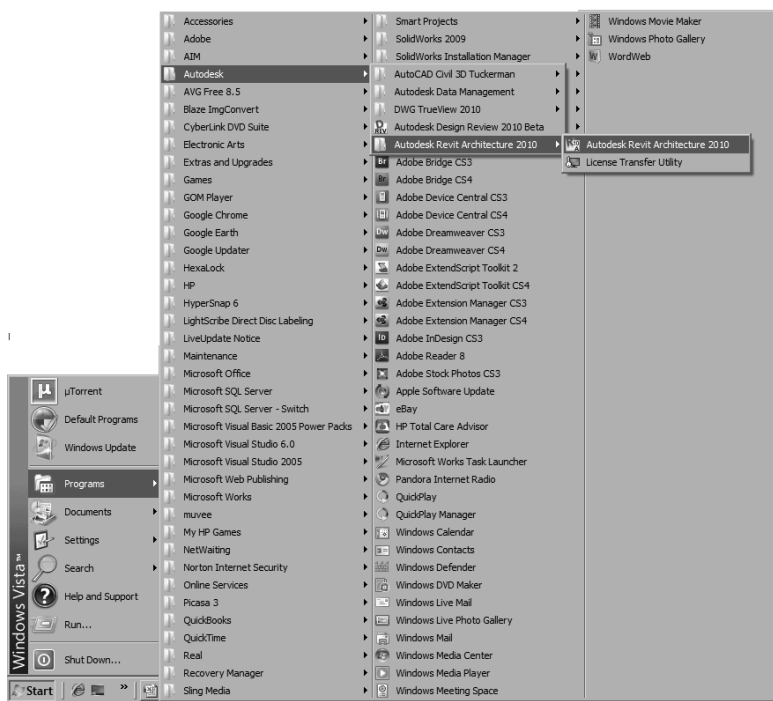
## **Working in Large Teams and Coordinating with Consultants**

Worksets, in Autodesk Revit Architecture, enable the division of the building model into small editable set of elements. The worksets can be assigned to different teams working on the same project and then their work can easily be coordinated in the central file location. The effort required to coordinate, collaborate, and communicate the changes between various worksets is taken care of by computer. Various consultants working on a project can be assigned a workset with a set of editable elements. They can then incorporate their services and modify the associated elements.

For example, a high rise commercial building project can be divided into different worksets with independent teams working on exterior skin, interior walls, building core, toilet details, finishes, and so on. The structural consultants can be assigned the exterior skin and the core workset, in which they can incorporate structural elements. Similarly, the rest of the teams can work independently on different worksets.

# STARTING Autodesk Revit Architecture 2010

When you turn on your computer, the operating system is automatically loaded. You can start Autodesk Revit Architecture by double-clicking on the **Autodesk Revit Architecture 2010** icon on the desktop or from the windows taskbar by choosing the **Start** button at the lower left corner of the screen (default position). Next, choose **Programs > Autodesk > Autodesk Revit Architecture 2010 > Autodesk Revit Architecture 2010**, as shown in Figure 1-5. Note that this path is for the Windows Vista operating system

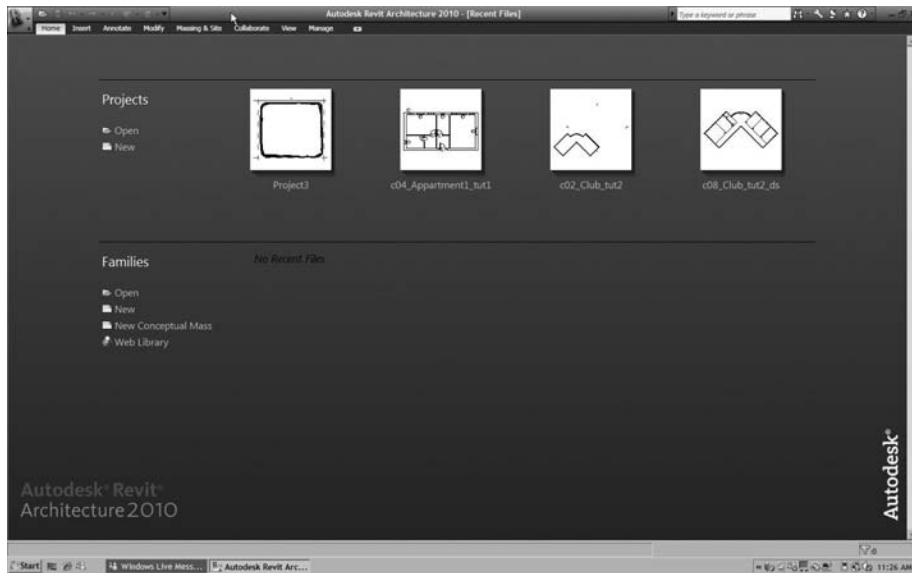


*Figure 1-5 Starting Autodesk Revit Architecture 2010 using the taskbar shortcut menu*

 **Note**  
*The path for starting Autodesk Revit Architecture depends on the Operating System being used.*

On doing so, the inactive interface screen with the **New Workshop Features** dialog box will be displayed. Select any of the required radio buttons from the window and choose the **OK** button; the **New Workshop Features** will be closed and the interface screen will be displayed, as shown in Figure 1-6. The screen has two sections: **Projects** and **Families**. The **Projects** section allows you to open a new or an existing project and the **Families** section allows you to open a new or existing family.

To open an existing project file, choose the **Open** button from the **Projects** section; the **Open** dialog box will be displayed. Browse to the respective location in the dialog box and select the required file. Now, choose the **Open** button to open the file.



**Figure 1-6** The interface screen display of Autodesk Revit Architecture 2010

To open a new project file, choose the **New** option from the **Projects** area of the interface; the **New Project** dialog box will be displayed. Make sure that the **Project** radio button is selected in the **New Project** dialog box and choose the **OK** button; the project file will open and the interface screen will be activated.

## USER INTERFACE

In Autodesk Revit Architecture 2010, the user interface has been completely redesigned. As compared to Autodesk Revit Architecture 2009, the toolbar, menu bar, and Design Bar have been replaced by the ribbon in Autodesk Revit Architecture 2010. The ribbon, contains task-based tabs and panels that streamline the architectural workflow and optimize the delivery time of a project. In Autodesk Revit Architecture 2010, when you select an element in the drawing area, the ribbon displays a contextual tab that comprises of tools corresponding to the selected element. Autodesk Revit Architecture is similar to many other Microsoft Windows based programs. Its main parts are **Ribbon**, **Options Bar**, **Project browser**, **Drawing Area**, **Status Bar**, and **View Control Bar**, as shown in Figure 1-7.



### Note

*In Autodesk Revit Architecture 2010, you cannot switch between the menu-based interface of Revit Architecture 2009 and the ribbon-based interface of Autodesk Revit Architecture 2010.*

## Invoking Tools

To perform an operation, you can invoke the required tools by using any one of the following two options:

**Ribbon:** You can invoke all necessary tools from the ribbon.

**Shortcut Keys:** Some tools can also be invoked using keys on the keyboard.

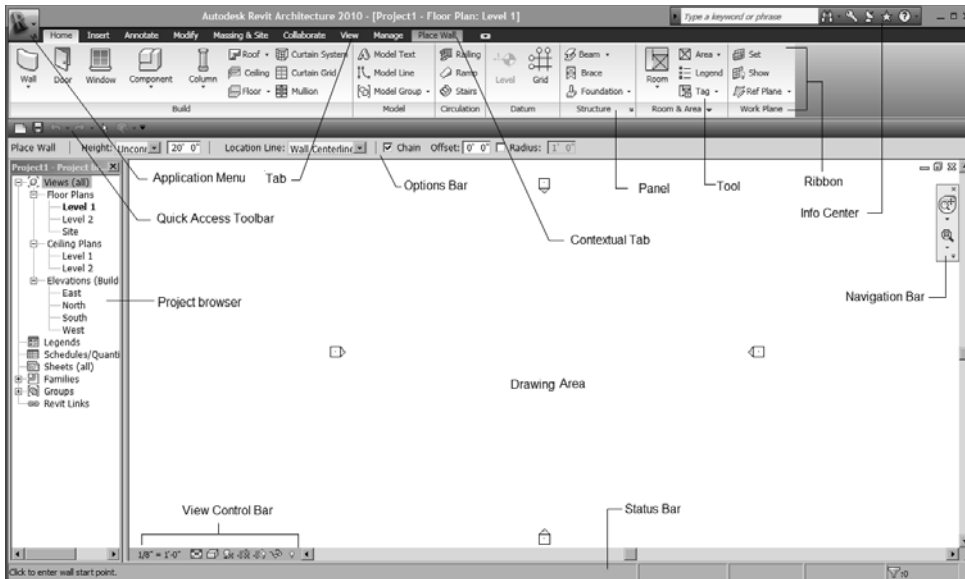


Figure 1-7 Autodesk Revit Architecture 2010 user interface screen

## Title Bar

The Title bar, docked on the top portion of the user interface, displays the program's logo, program's name, name of the current project, and the view opened in the viewing area. **Project 1- Floor Plan: Level 1** is the default project and view.

## Ribbon

The ribbon, shown in Figure 1-8, is a new interface that is used to invoke tools. When you create or open a file, the ribbon is displayed at the top in the screen. It comprises of task-based tabs and panels, refer to Figure 1-8, which provides all tools necessary for creating a project. The tabs and panels in the ribbon can be customized according to the need of the user. This can be done by moving the panels and changing the view states of the ribbon (changing the ribbon view state is discussed ahead in this chapter). The ribbon has three types of buttons; namely, general button, drop-down button, and split button. These buttons can be used from the panels.

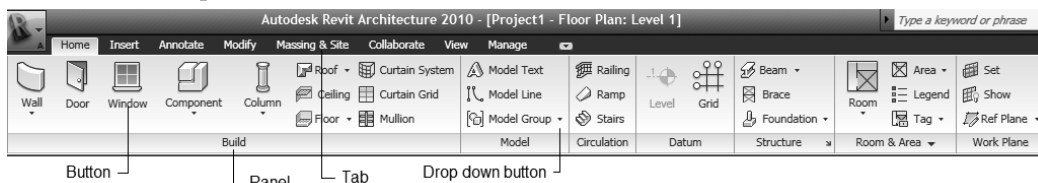


Figure 1-8 Different components of a ribbon



**Tip:** Tooltips appear when you rest the cursor over any tool icon in the ribbon. The name of the tool appears in the box, assisting you to identify each tool icon.

Moving the Panels

In the ribbon, you can move a panel and place it anywhere in the screen. To do so, click on the panel label in the ribbon, hold the mouse and drag the panel to a desired place on the screen. Next, use the tools of the moved panel and place the panel back to the ribbon. To do so, place the cursor on the moved panel and choose the **Return Panels to Ribbon** button from the upper right corner of this panel, as shown in Figure 1-9; the panel will return to the ribbon.

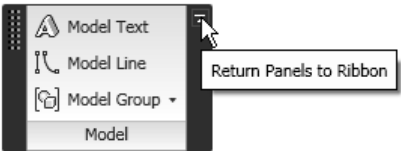


Figure 1-9 Choosing the *Return Panels to Ribbon* button

Changing the View States of the Ribbon

The ribbon can be displayed in three view states by selecting any of the following three options: **Show Full Ribbon**, **Minimize to Panel Tiles**, and **Minimize to Tabs**. To use these options, move the cursor and place it over the down arrow on the right of the **Manage** tab (refer to Figure 1-10) in the ribbon; the down arrow will be highlighted. Now, right-click on the down arrow; a flyout will be displayed. Place the cursor over the **Minimize** option in the flyout; a cascading menu will be displayed, as shown in Figure 1-10. On choosing the **Show Full Ribbon** option from the cascading menu, the entire ribbon will be displayed. If you choose the **Minimize to Panel Tiles** option, the ribbon will display the tabs and panel labels. On choosing the **Minimize to Tabs** option, the ribbon will display only the tabs.

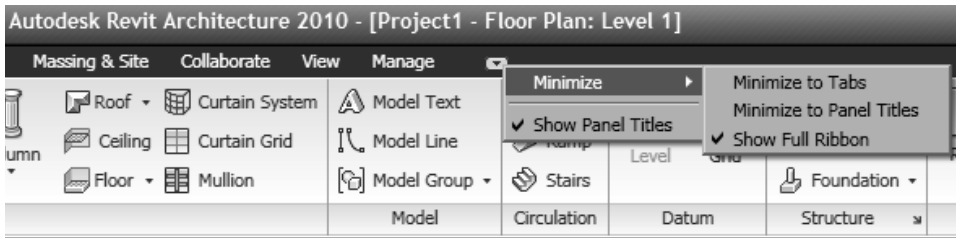


Figure 1-10 Various options in the cascading menu for changing the view state of the ribbon

The following table describes various tabs in the ribbon and their functions:

Tab	Description
Home	Contains tools for creating building model
Create	This tab is only available in <b>Family Editor</b> . It contains tools that are used to create a family
Insert	Contains tools to insert or manage secondary files such as raster image files and CAD files
Annotate	Contains tools for documenting a building model such as adding texts and dimensions
Modify	Contains tools for editing elements and the selected data

Massing & Site	Contains tools for modeling and modifying conceptual mass and site elements
Collaborate	Contains tools for collaborating the project with other team members (internal and external).
View	Contains tools used for managing and modifying the current view and also for switching views.
Manage	Contains tools for specifying the project and system parameters, and settings.

### Contextual Tabs in the Ribbon

These tabs are displayed when you use certain tools or select elements. These tabs contain a set of tools that relates only to the context of that tool or element.

For example, when you invoke the **Window** tool, the **Place Window** contextual tab is displayed. This tab shows three panels: **Selection**, **Element**, and **Model**. The **Selection** panel contains the **Modify** tool. The **Element** panel consists of the **Element Properties** button and the **Type Selector (Change Element Type)** drop-down list. The **Model** panel consists of necessary tools that are used to load model families or create the model of a window in a drawing. The contextual ribbon tab closes when the tool invoked to displayed this tab is closed.

### Application Frame

The application frame helps you manage projects in Autodesk Revit Architecture. It consists of **Application** button, **Application Menu**, **Quick Access Toolbar**, **InfoCenter**, and **Status Bar**. These are discussed next.

#### Application Button



The **Application** button is displayed at the top-left corner of the Revit interface. This button is used to display **Application Menu** as well as close it.

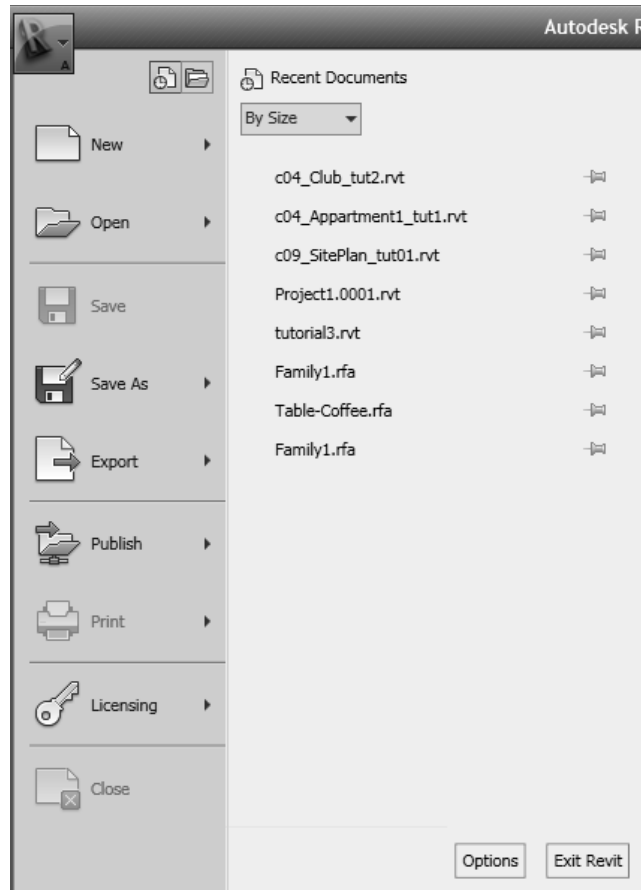
#### Application Menu

The **Application Menu** contains the tools that provide access to many common file actions such as **Open**, **Close**, and **Save**. Click the down arrow on the **Application** button to display tools. Alternatively, press ALT+F to display tools in the **Application Menu**, as shown in Figure 1-11.

#### Quick Access Toolbar

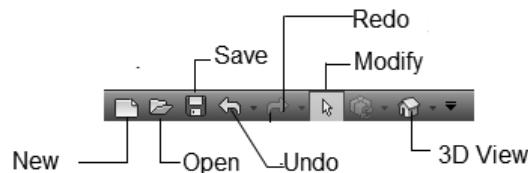
The **Quick Access Toolbar**, as shown in Figure 1-12, contains options to undo and redo changes, open and save a file, create a new file, and so on.

By default, the **Quick Access Toolbar** contains the following options: **New**, **Open**, **Save**, **Redo**, **Undo**, **Modify**, and **3D View**. You can customize the display of **Quick Access Toolbar** by adding more tools and removing unwanted tools. To add a button from the panel of the ribbon



*Figure 1-11 The Application Menu*

to **Quick Access Toolbar**, place the cursor over the button; the button will be highlighted. Next, right-click; a flyout will be displayed. Choose **Add Quick Access Toolbar** from the flyout displayed; the highlighted button will be added to **Quick Access Toolbar**.



*Figure 1-12 The Quick Access Toolbar*

## InfoCenter

You can use **InfoCenter** to search information related to Revit Architecture (Help), display the **Subscription Center** panel for subscription services and product updates, and display the **Favorites** panel to access saved topics. Figure 1-13 displays various tools in **InfoCenter**.

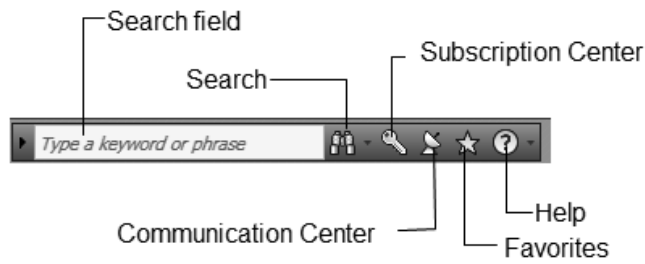


Figure 1-13 The InfoCenter

### View Control Bar

The **View Control Bar** is located at the lower left corner of the drawing window, as shown in Figure 1-14. It can be used to access various view-related tools. The **Scale** button shows the scale of the current view. You can choose this button to display a flyout that contains standard drawing scales. From this flyout, you can then select the scale for the current view. The **Detail Level** button is used to set the detail level of a view. You can select the required detail level as: **Coarse**, **Medium**, and **Fine**. Similarly, the **Model Graphics Style** button enables you to set the display style. The options for setting the display style are: **Wireframe**, **Hidden Line**, **Shading**, and **Shading with Edges**.

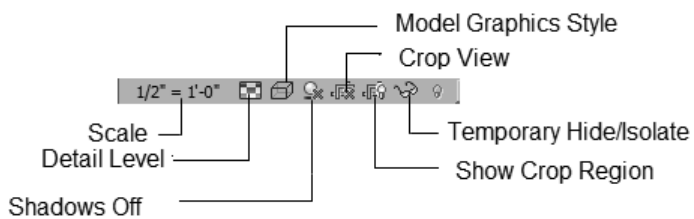


Figure 1-14 The View Control Bar

### Status Bar

The **Status Bar** is located at the bottom of the interface screen. When the cursor is placed over an element or component, the **Status Bar** displays the name of the family and type of the corresponding element or components. It also displays prompts and messages to help you use the selected tools.

### Options Bar

The **Options Bar** provides information about the common parameters of the component type and the options for creating or editing it. The **Options Bar** changes its appearance based on the type of component selected or being created. You can also modify the properties of the component by entering a new value in the edit box for the corresponding parameter in the **Options Bar**. For example, the **Options Bar** for the **Wall** tool displays various options to create a wall, as shown in Figure 1-15.



Figure 1-15 The Options Bar with different options to create a wall



## Type Selector (Change Element Type)

The **Type Selector** drop-down list is located in the **Element** panel of the tab for the currently invoked tool. For example, on invoking the **Wall** tool, the **Place Wall** tab will be displayed. From the **Type Selector** drop-down list in the **Element** panel of this tab, you can select the required type of the wall. The **Type Selector** drop-down list has been referred as the **Change Element Type** drop-down list from Chapter 2 to Chapter 5 of this textbook.

The content in the **Type Selector** drop-down list keeps on changing, depending upon the current function of the tool or the elements selected. When you place an element or a component in a drawing, you can use the **Type Selector** drop-down list to specify the type of element or component. You can also use this drop-down list to change the existing type of a selected element to a different type.

## Drawing Area

The Drawing Area is the actual modeling area, where you create and view the building model. It covers the major portion of the interface screen. You can draw various building components in this area using the pointing device. The position of the pointing device is represented by the cursor. The Drawing Area also has the standard Microsoft Windows functions and buttons such as close, minimize, maximize, scroll bar, and so on. These buttons have the same function as that of the other Microsoft Windows-based program.

## Project browser

The **Project browser** is located below the ribbon. It displays project views, schedules, sheets, families, and groups in a logical, tree-like structure, as shown in Figure 1-16 and helps you to open and manage them. To open a view, double-click on the name of the view, or drag and drop the view in the Drawing Area. You can close the **Project browser** or dock it anywhere in the Drawing Area.



### Note

If the **Project browser** is not displayed on the screen, choose the **View** tab from the ribbon and then choose **Windows > User Interface**. Next, select the **Project browser** check box from the flyout displayed.

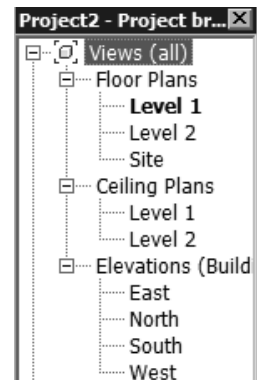


Figure 1-16 The **Project browser**

The **Project browser** can be organized to group the views and sheets based on the project requirement. For example, while working on a large project with a number of sheets, you can organize the **Project browser** to view and access specific sheets.



### Note

In the **Project browser**, you can expand or contract the view listing by selecting the '+' or '-' sign, respectively. The current view in the drawing window is highlighted in bold letters. The default project file has a set of preloaded views.

## Keyboard Accelerators

In Autodesk Revit Architecture, accelerator keys have been assigned to some of the frequently used tools. These keys are shortcuts that you can type through the keyboard to invoke the corresponding tool. Accelerator keys corresponding to a tool appear as a tooltip when you move the cursor over the tool.



**Tip:** As you become accustomed to using Autodesk Revit Architecture, you will find these **Keyboard Accelerators** quite useful because they save the effort of browsing through the menus.

## DIALOG BOXES

Certain Autodesk Revit Architecture tools, when invoked, display a dialog box. The dialog box is a convenient method of accessing and modifying parameters related to that tool. For example, when you choose **Save As > Project** from **Application Menu**, the **Save As** dialog box is displayed, as shown in Figure 1-17. A dialog box consists of various parts such as the dialog label, radio buttons, text or edit boxes, check boxes, slider bars, image box, and tool buttons, which are similar to other windows-based programs. Some dialog boxes contain the [...] button, which displays another related dialog box. There are certain buttons such as **OK**, **Cancel**, and **Help**, which appear at the bottom of most of the dialog boxes. The names of the buttons imply their respective functions. The button with a dark border is the default button.

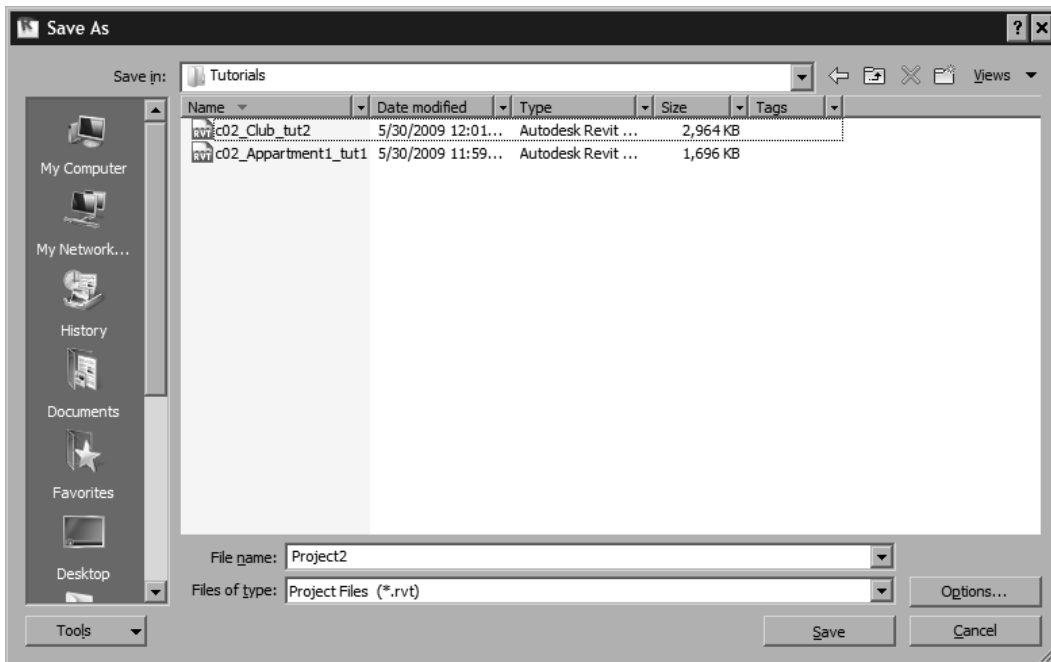


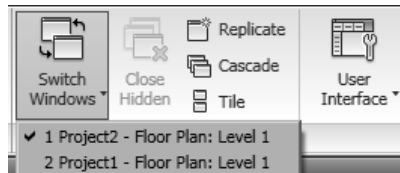
Figure 1-17 The **Save As** dialog box

## MULTIPLE DOCUMENT ENVIRONMENT

The multiple document environment feature allows you to open more than one project at a time in a single Autodesk Revit Architecture session. This is very useful when you want to work on different projects simultaneously and make changes with reference to each other.

Sometimes, you may need to incorporate certain features from one project into the other. With the help of multiple document environment, you can open multiple projects and then use the **Cut**, **Copy** and **Paste** tools from the **Clipboard** panel of the **Modify (type of element)** tab to transfer the required components from one project to another. These editing tools can also be invoked by using the CTRL+C and CTRL+V keyboard shortcuts.

To access the opened projects, choose **Windows > Switch Windows** from the **View** tab; a flyout will be displayed showing the name of different project files opened, as shown in Figure 1-18. Like other Microsoft Windows-based programs, you can select and view the opened projects using the **Cascade** and **Tile** options from the **Windows** panel of the **View** tab. The cascaded view of projects is shown in Figure 1-19.



**Figure 1-18** Choosing the *Switch Windows* option

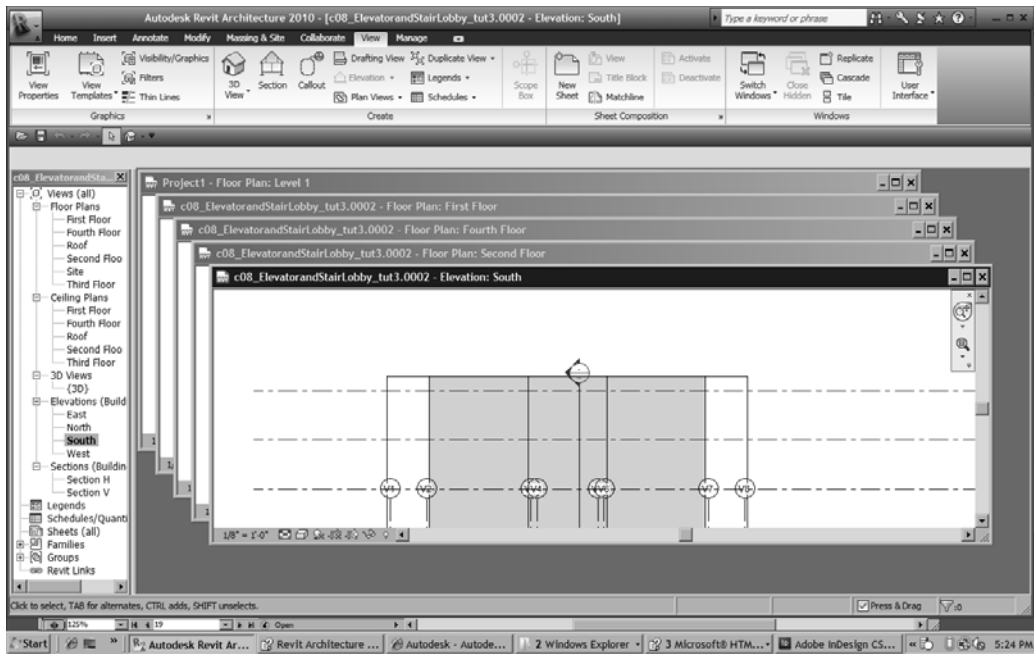


**Tip:** You can open a number of views at the same time. The **Tile** and **Cascade** options in the **Windows** panel of the **View** tab are used to arrange the views.

## INTEROPERABILITY OF Autodesk Revit Architecture

The models or geometries created in Revit Architecture can easily be exported to AutoCAD based programs, such as 3ds Max and Max Design, in the DWG file format. This enables you to visualize and create photorealistic exterior and interior renderings for your project designs. You can also transfer drawings from Revit Architecture to Google SketchUp to visualize your projects in a better way. Revit Architecture 2010 comes with Google Earth plugin for publishing Revit models to it.

Revit Architecture 2010 follows a wide range of industry standards and supports various CAD file formats such as DWF, DGN, DWG, DGN, IFC, SKP, and SAT. For image files, it supports JPG, TIFF, BMP, PNG, AVI, PAN, IVR, and TGA file formats. Besides these, the formats that are supported by Revit Architecture include ODBC, HTML, TXT, gbXML, XLS, and MDB. Revit Architecture is compatible with any CAD system that supports the DWG, DXF, or DGN file format. Revit Architecture can import the models and geometries as ACIS solids. This enables designers to import models from AutoCAD Architecture and AutoCAD MEP (Mechanical, Electrical, and Plumbing) software and to link and import 3D information to Revit Architecture. This feature makes Autodesk Revit Architecture 2010 an efficient, user-friendly, and compatible software.



*Figure 1-19 The cascaded view of the project*

## BUILDING INFORMATION MODELING AND Autodesk Revit Architecture 2010

Building Information Modeling (BIM) is defined as a design technology that involves the creation and use of coordinated, internally consistent, and computable information about a building project in design and construction. BIM covers spatial relationships, geographic information, quantities, and properties of building components. Using this technology, you can demonstrate the entire life cycle of a building project starting from the process of construction, facility operation, and information about quantities and shared properties of elements. BIM enables the circulation of virtual information model from the design team to contractors and then to the owner thereby adding changes and their knowledge to update the model at each stage of transfer. The ability to keep information up-to-date and make it available in an integrated digital environment enables the architects, owners, builders, and engineers to have clear vision of the project before the commencement of actual construction. It enables them to make better and faster decisions as well as to improve the quality and profitability of projects. Autodesk Revit Architecture 2010 is a specially designed platform based on BIM. Revit Architecture 2010 is the best example of the BIM technology. Revit Architecture's parametric model represents a building as an integrated database of coordinated information. In Revit, change anywhere is change everywhere. Any change made in your project at any stage is reflected in the entire project, and also, due to the parametric behavior of elements, the project is updated automatically according to the changes made anywhere in the project. Also, the integration of Revit Architecture with the available in-built commercial tools such as solar studies, material takeoffs, and so on greatly simplifies the project design and reduces the time consumed by these analyses, thereby enabling faster decision making.

## Autodesk Revit Architecture HELP

Autodesk Revit Architecture provides help to easily understand various tools and methods used in it. To access the help feature, click on the down arrow on the right of the **Help** button in **InfoCenter**; a drop-down menu containing help options will be displayed, as shown in Figure 1-20. The help options are discussed next.



*Figure 1-20 A drop-down menu displaying help options*

## Autodesk Revit Architecture 2010 Help

On choosing the **Help** button from the **InfoCenter**, the **Revit Architecture Help** dialog box will be displayed, as shown in Figure 1-21. You can access help on various tools and other aspects of the program in a number of ways by using the F1 key. The four tabs provided in this dialog box to facilitate your search are discussed next.



**Tip:** You can also search for a topic using wildcards (\* , ? ) and boolean operators (AND, OR, NEAR, NOT). These boolean operators can be accessed by clicking on the right arrow next to the edit box.

### Contents Tab

The **Contents** tab is chosen by default and displays the help topics by titles, pertaining to different sections of Autodesk Revit Architecture such as **Using Help**, **Start a New Project**, and so on, refer to Figure 1-21. To select a title, click on the corresponding book icon or choose the '+' sign on the left; the icon will become an open book with a '-' sign and a list of topics associated with that category will be displayed. Click on the '+' sign to expand the subheadings, until you reach the help topic that has a question mark '?' displayed in it. Next, select the topic to display the information about it in the display window present on the right of the dialog box.



**Tip:** The **Help** and '?' buttons can be used to provide assistance related to the contents of the dialog box.

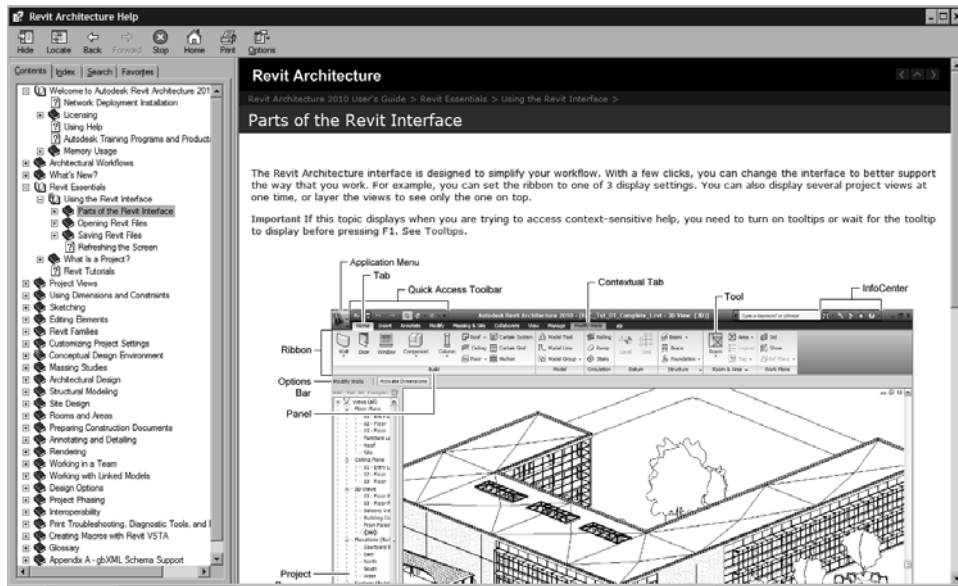


Figure 1-21 The Revit Architecture Help dialog box

## Index Tab

The **Index** tab displays the complete index of tools and options of Autodesk Revit Architecture in an alphabetical order. To search for information about a tool or an option, type the name of the tool or its related word in the edit box. As you type the letters for the search in the edit box, the listing in the list area keeps on changing, displaying possible topics with those initials. If Autodesk Revit Architecture finds any reference to the word entered, it will automatically be highlighted in the list area. You can choose the **Display** button below the list area to view information on a specific subject.

## Search Tab

The **Search** tab is used to access the help files related to certain keywords. Three check boxes: **Search previous results**, **Match similar words**, and **Search titles only** have been provided in this tab to narrow down the search to a specific topic. On typing the keyword in the edit box, you can select one or more of these options and then choose the **List Topics** button. A list of help files related to the keyword entered appears. Choose the topic from the **Select topic** list box and then choose the **Display** button to view its help. The listed topics for the typed word appear with ranks in the **Select topic** list box. A search is ranked according to the number of matching words found in that topic.

## Favorites Tab

Using the **Favorites** tab, you can create a list of favorite topics that you need to access frequently. The **Current Topic** edit box displays the topic that you last viewed in any other tab of Autodesk Revit Architecture Help. Use the **Add** button to include that title in your list of favorite topics. Similarly, you can add other topics to this list and create an information database. You can remove a topic from the list by using the **Remove** button. You can also choose the **Display** button to view the help files related to each topic.

**Note**

*The list of favorite topics created by you is saved at the time of quitting the Autodesk Revit Architecture session and becomes available for your reference in future sessions.*

## Context Sensitive Help

If you need help specific to a selected tool or a dialog box, Autodesk Revit Architecture provides several options to access the relevant information. Many dialog boxes contain the **Help** button and can be used to view help on that dialog box and related topics. If the **Help** button is not available, you can press the F1 key, while the dialog box is open, to access the related information.

To inquire about a tool button, place the cursor over the button of a tool, a **Help** message box will be displayed. Now, you can press the F1 key to view more help contents pertaining to the button, in a separate window.

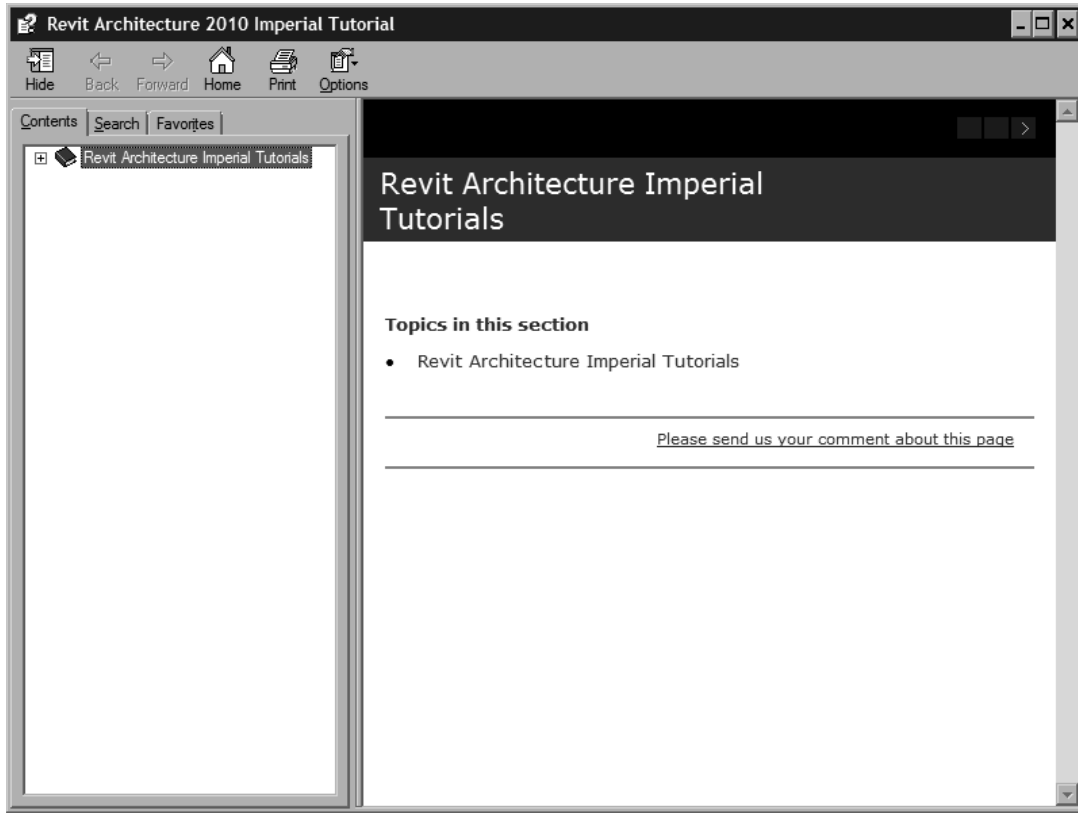
To turn off the **Help** tooltips for buttons, choose **Application Menu > Options**; the **Options** dialog box will be displayed. In the **General** tab of this dialog box, select the **None** option from the **Tooltip assistance** drop-down list in the **Notifications** area. Now, choose **OK** to close the **Options** dialog box.

## User Interface Overview

To take a quick lesson on how Autodesk Revit Architecture works, choose **Help > User Interface Overview** from the **InfoCenter**; the **Revit Architecture User Interface Overview** window will be displayed. In this window, choose the **A4** or **Letter** button placed at the lower right corner of the window; a PDF file will open. This file that takes you through the user interface of Autodesk Revit Architecture 2010 that will let you understand the placement of basic tools in Autodesk Revit Architecture.

## Tutorials

The imperial tutorial exercises and datasets are available on the Autodesk website. To access them, you need to download the tutorial files and datasets from the website. To do so, choose **Help > Tutorials** from **InfoCenter**. The **Revit Architecture 2010 Imperial Tutorial** window will be displayed, as shown in Figure 1-22. Follow the instructions displayed in the window to access the Revit tutorials and datasets. Once you have downloaded the tutorials and datasets from the website, the **Revit Architecture 2010 Imperial Tutorial** window will be displayed every time you access the tutorials. **Revit Architecture 2010 Imperial Tutorial** window has a link **Developing Your Designs, Documenting Your Projects**, and so on. It has three tabs: **Context**, **Search**, and **Favorites** to help you access the relevant information. These tabs have functions similar to the tabs in the **Revit Architecture Help** dialog box.



*Figure 1-22 The Revit Architecture 2010 Imperial Tutorial dialog box*