

# Building Information Modeling

Building information modeling (BIM) is an integrated workflow built on coordinated, reliable information about a project from design through construction and into operations. The Revit platform is purpose-built software for building information modeling.

## Objectives

After completing this chapter, you will be able to:

- Describe building information modeling methodology.
- Describe bidirectional associativity.

# Lesson: Building Information Modeling

## Overview

This lesson describes building information modeling (BIM).

Applying building information modeling results in better drawings, shorter timelines, and improved productivity. It offers an opportunity for building industry professionals to design, construct, and operate buildings of higher quality at a lower cost.



## Objectives

After completing this lesson, you will be able to:

- Describe building information modeling.
- Describe bidirectional associativity.

# About Building Information Modeling

Building information modeling is a building design and documentation methodology. It enables you to create and manage information about a building project. The information about the building project is stored in a single building model. This ensures that the information is coordinated, consistent, and complete.

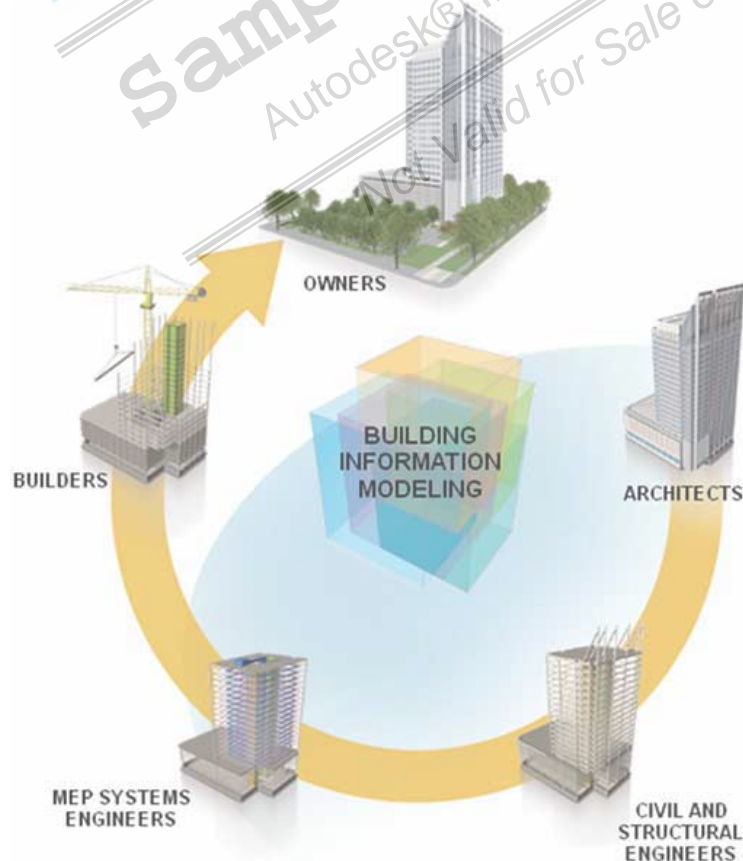
The building industry has traditionally illustrated building projects with manually created drawings. Information was added to these illustrations by using notes and specifications. With the advent of CAD technology, this process was automated. However, the output of manual drafting, graphics CAD systems, and object-oriented CAD systems remained the same: a graphic abstraction of an intended building design.

The development of the building information modeling methodology has turned this relationship around. Building information modeling software captures information about a building and then presents that information as 2D and 3D views, schedules, or in other required formats.

## Definition of Building Information Modeling

BIM is an integrated workflow built on coordinated, reliable information about a project from design through construction and into operations.

By adopting BIM, architects, engineers, contractors, and owners can easily create coordinated, digital design information and documentation; use that information to accurately predict performance, appearance, and cost; and reliably deliver the project faster, more economically, and with reduced environmental impact.



## Revit and Building Information Modeling

Revit is purpose-built software for building information modeling.

Traditional drafting and CAD software represent the geometry of a design by using stylized symbols from designated illustrations. Some examples of these illustrations may be a series of plans, elevations, and sections. These illustrations are essentially independent of one another.

Building information modeling software represents the design as a series of intelligent objects and elements such as walls, windows, and views. These objects and elements have parametric attributes. The information about these objects and elements is stored in a single building model. You can extract any number of different views of the data from the model.



The Revit platform is a building design and documentation system that supports the design, documentation, and even construction efforts required for a building project. Because of its parametric change technology, any change you make is automatically coordinated everywhere in your project, including model views, drawing sheets, schedules, sections, and plans.

### Building Information Tailored to the User

In building information modeling software, the building information is stored in a single building model instead of in a format predicated on a presentation format, such as a drawing file or a spreadsheet. The building information model presents information for editing and review in views and formats that are appropriate for and familiar to the user. Some examples of these formats are a 2D elevation or a 3D rendering.

Architects, for example, work on the information in the building model by using the conventions of the highly stylized, symbolic, and graphic language of building design. They may enter and review information in a format similar to architectural drawings, such as plans, sections, and elevations. Structural engineers work with the same data presented graphically in the form of framing and bracing diagrams. Therefore, the structural engineers' interface to data or the MEP engineers' is quite different from the architects' interface to data.

## Managing Change with Building Information Modeling

Building information modeling solutions manage iterative changes in a building model throughout the design, construction, and operation phases. A change to any part of the building model is replicated in all other associated parts.

Maintaining a single, internally consistent representation of the building can improve drawing coordination and reduce the number of errors in the documents. You can invest the time that you would otherwise spend manually checking and coordinating documents in making the building project even better. As a result, building documents can be of higher quality, and the costs of changes and coordination reduced. Building information modeling tools can enable the design, construction, and occupancy of the building to proceed with less friction and fewer difficulties than conventional tools.

## Capturing and Reusing Information

Building information modeling solutions capture and preserve information for reuse by third party industry-specific applications. Data is captured once as close as possible to its point of origin and stored so that it is available and can be presented whenever required.

For example, consider a personal financial management software application that captures information from your checkbook register as you write checks and make deposits. It stores and manages that information for a variety of purposes, such as to prepare your income tax return and to create a statement of your net worth. Building information modeling leverages data in a similar manner.

## Characteristics of Building Information Modeling

Work the way architects and designers and engineers think about buildings:

- Enjoy a more intuitive process with software that mirrors the real world.
- The building information model contains essential information about a project, so as you design, Revit software automatically creates accurate floor plans, elevations, sections, and 3D views, as well as area calculations, schedules, and quantity takeoffs.
- Gain better design insight through in-process visualization and analysis.

Capture early design thinking to better support design, documentation, and construction:

- Enhance conceptual building design efforts to gain better design insight earlier in the process.
- Support smarter, more sustainable design through the analysis of materials, quantities, sun position, and solar effects. Exchange building information with partner applications to perform energy analysis and better predict building performance.
- Provide essential BIM data for use in clash detection, construction analysis, and fabrication.

Improve your business through better-coordinated, higher-quality project work:

- Accelerate decision making and shorten production time.
- Minimize coordination mistakes and rework with fully parametric change management.
- Gain a competitive advantage with increased client satisfaction and greater profitability through more efficient project delivery.

## Example of Building Information Modeling

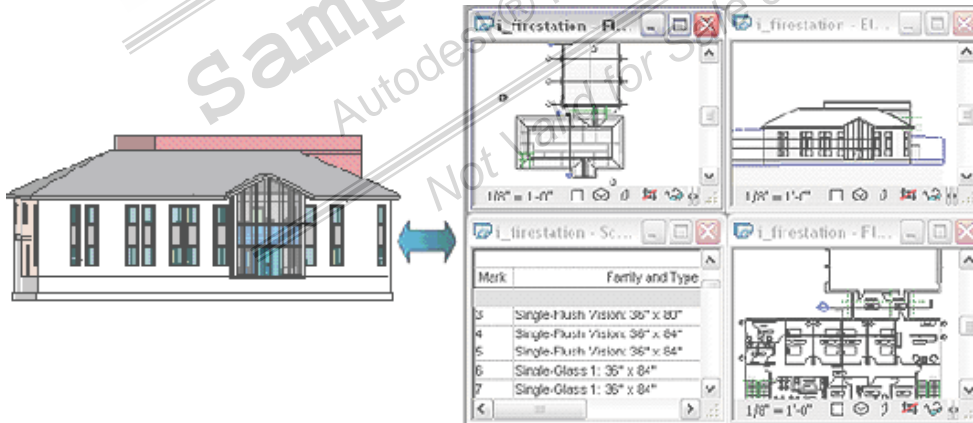
During the design of a building, if there is any change in the load conditions on the floor area, you may need to modify the design parameters of the structural system. Modifications could include an increase in the depth of beams or a change in beam profiles. A change in beam profiles may result in a change in the geometric parameters of these members in a 3D view. This change would also be reflected in plan and section views. Therefore, building information modeling ensures an effective interaction between the design and its representation.

## About Bidirectional Associativity

A key feature of Revit is bidirectional associativity, which ensures that changes to any part of the design are immediately reflected in all associated parts.

### Definition of Bidirectional Associativity

Bidirectional associativity is the ability of the building information model to coordinate changes made in any view and propagate these changes out to all other views. Bidirectional associativity is applied automatically to every component, view, and annotation. For example, a change in the dimensions of a wall is reflected in all elements such as windows, doors, ceilings, and electrical outlets; all of which are associated with the wall and influenced by the change in the dimensions of the wall. These elements are also affected by the constraints and alignments that have been established for the wall. Revit helps ensure that building sections and elevations are immediately available, up-to-date, and accurate.

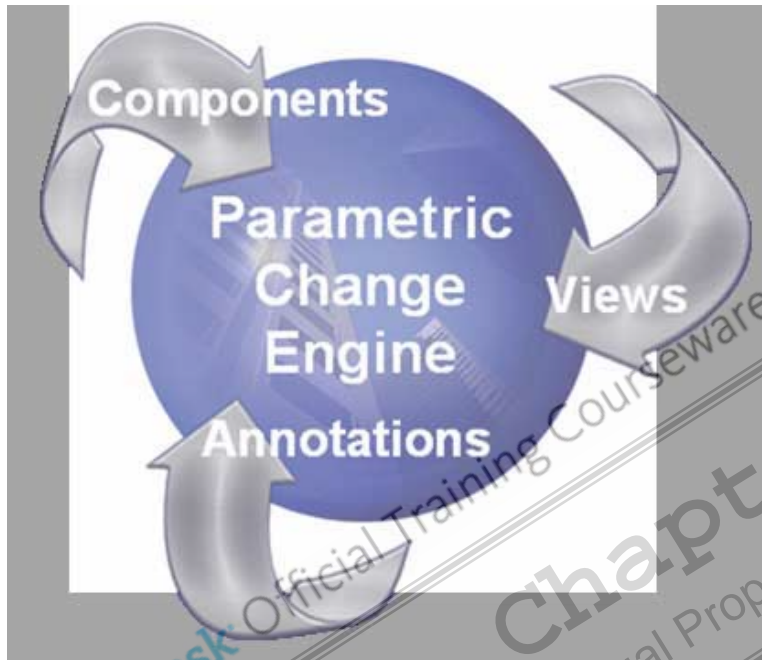


### Parametric Relationships

The term parametric refers to the relationships among the elements of a building model. These relationships enable the software to coordinate and manage the changes made to the building model. The relationships are created either automatically by the software or by you. In mathematics and mechanical CAD, the numbers or characteristics that define these relationships are called



parameters; therefore, the operation of the software is called parametric. It is these parametric relationships that deliver fundamental coordination and productivity benefits provided by the building information modeling methodology.



## Updating the Building Model

A fundamental characteristic of building information modeling software is the ability to coordinate changes and maintain consistency. You do not have to intervene to update drawings or links. When you change something, the bidirectional associativity feature of the software determines the elements that are affected by the change and propagates that change to any affected elements.

## Examples of Bidirectional Associativity

- Flip a section line and all views update.
- Draw a wall in plan and it appears in all other views including material takeoffs.
- Change a beam type or an electrical fixture type in a schedule and the change propagates throughout the graphical and non-graphical views.

## Examples of Parametric Relationships

- A floor is attached to the enclosing walls. When a wall moves, the floor updates to remain connected to the walls.
- A series of equidistant windows have been placed along a wall. When the length of the wall changes, the windows redistribute to remain equidistant across the length of the wall.
- A relationship has been established between a column and a HVAC duct system to ensure that a design requirement or code requirement is maintained. When the column is moved, the duct system moves with it.

# Chapter Summary

Having completed this chapter, you can:

- Describe building information modeling methodology.
- Describe bidirectional associativity.

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**Sample Chapter**

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# Revit MEP Basics

Before you begin to use Revit® MEP, you need to become familiar with the user interface and the types of elements and families you will be using to create your designs. In this chapter, you will be introduced to these Revit MEP basic concepts. You will also use these concepts to work most efficiently with Revit MEP throughout your learning and design process.

## Objectives

After completing this chapter, you will be able to:

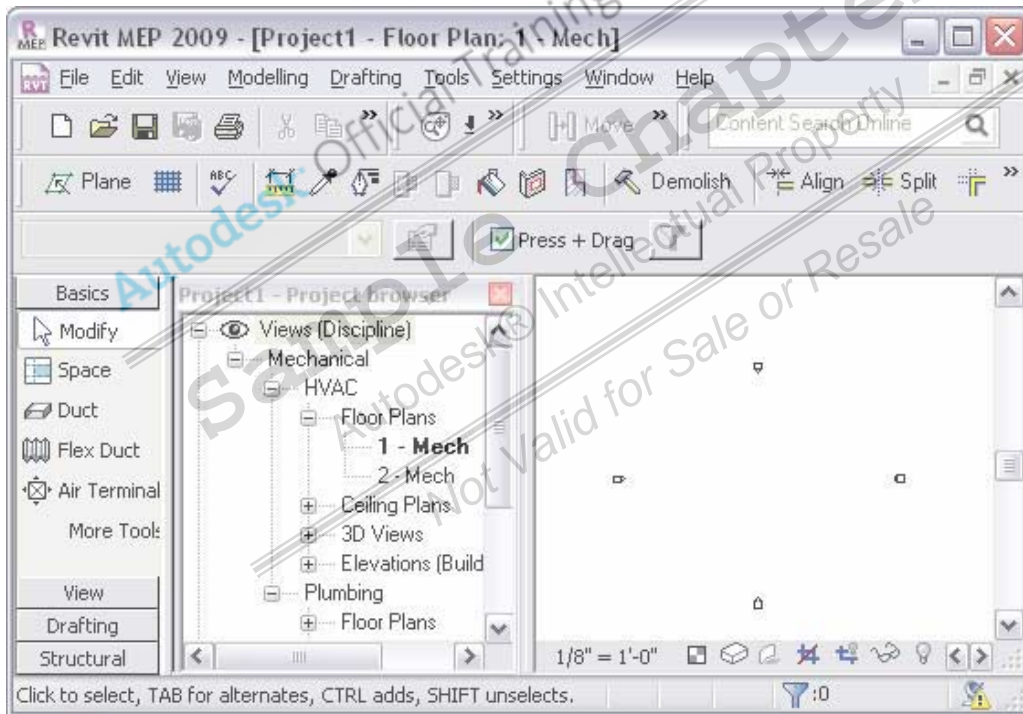
- Use the different parts of the Revit MEP user interface.
- Work with different types of Revit elements and families.

# Lesson: Exploring the User Interface

## Overview

This lesson describes how to use the different parts of the Revit MEP user interface. You begin the lesson by learning about the parts of the user interface and the tabs on the Design Bar. Next, you learn some recommended practices for exploring the user interface. The lesson concludes with an exercise on exploring the different parts of the user interface of the software.

Revit MEP provides a user friendly interface where most of the commands and tools are available on the menu bar. In addition, the Design Bar, toolbars, View Control Bar, and context menus provide quick access to the commonly used commands and tools. The status bar provides information and tips that assist you while working. A familiarity with the user interface helps you work with the software more efficiently.



Revit MEP user interface with an open project file

## Objectives

After completing this lesson, you will be able to:

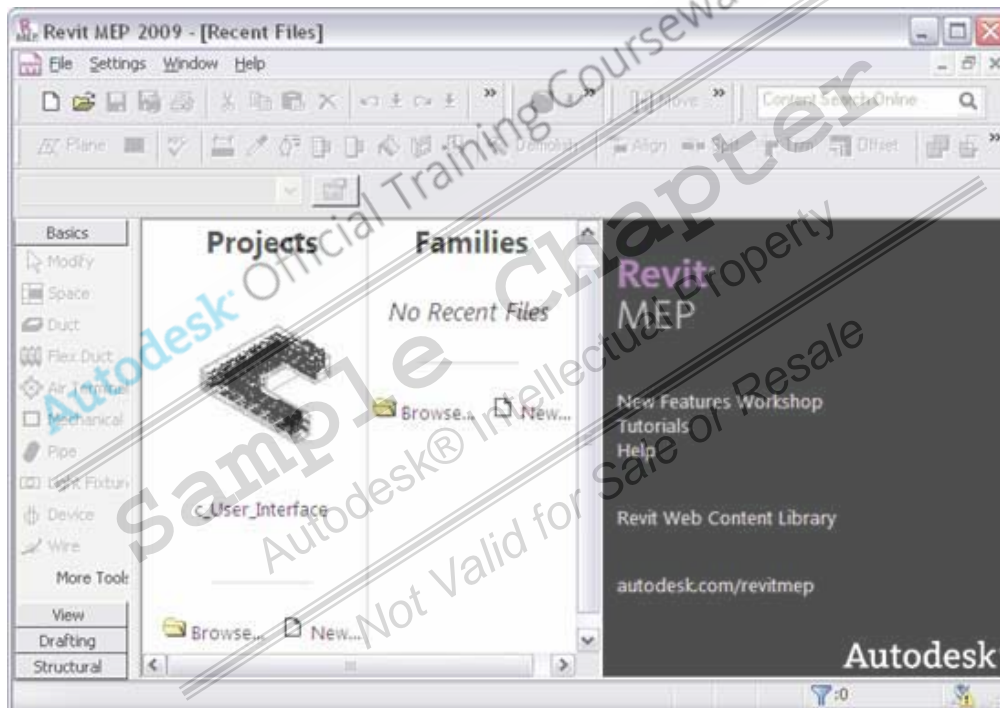
- Identify the different parts of the Revit MEP user interface.
- Describe the Design Bar tabs.
- State the recommended practices for exploring the Revit MEP user interface.
- Explore the Revit MEP user interface.

# Revit MEP User Interface

Revit MEP is a powerful design application that uses the building information modeling methodology and runs on the Microsoft Windows operating system. Similar to any Windows application, the Revit MEP user interface includes menus, toolbars, dialog boxes, and windows that you can use to perform various tasks. You can use the mouse to select commands from the menus or toolbars.

## Recent Files Window

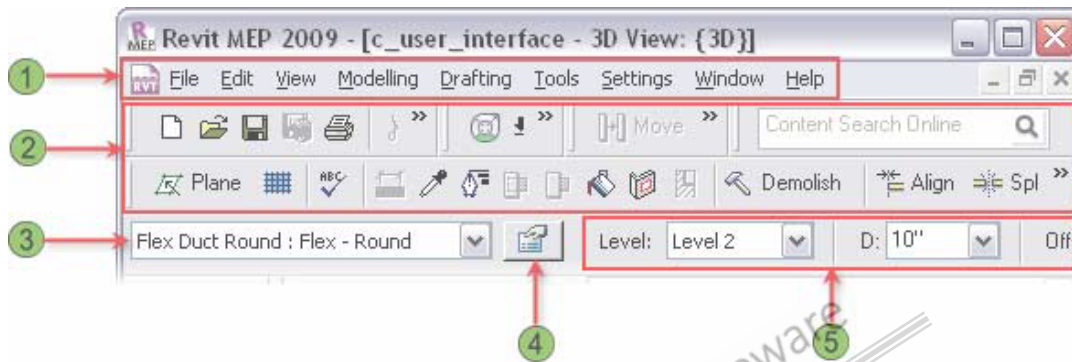
When you launch the software, a startup window named Recent Files is displayed. The left pane of the window contains links to the recently accessed project files and family files. The right pane contains links to help files, tutorials, and Web content.



Recent Files window

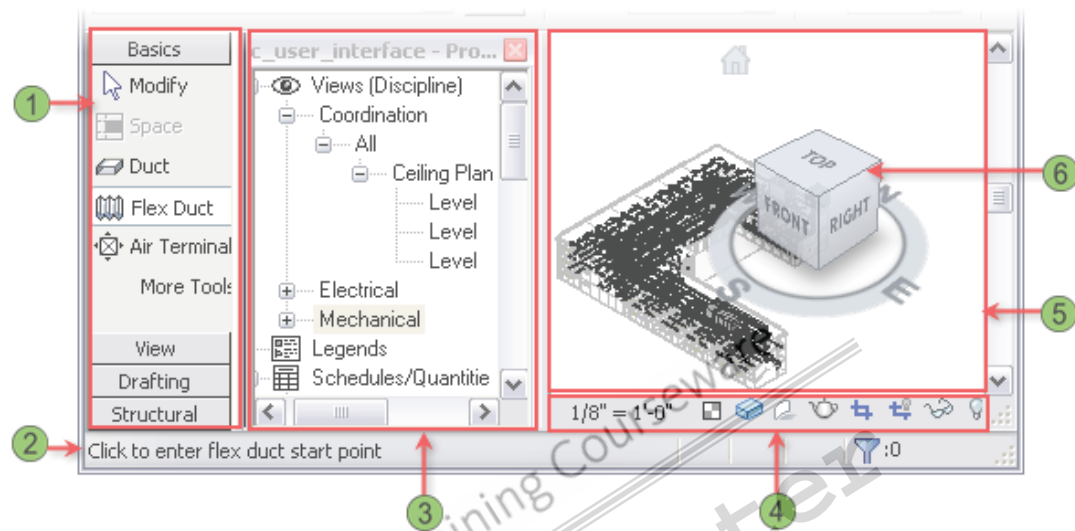
## User Interface Elements

The following illustration shows the menu bar and the toolbars in the user interface.



- 1 **Menu bar** Displays menus with commands to define settings and perform standard functions.
- 2 **Toolbars** Provide buttons for standard functions and frequently used tools.
- 3 **Type Selector** Lists the types of the element selected either on the Design Bar or in a view. Selecting a different element changes the options available in the list.
- 4 **Element Properties** Opens the Element Properties dialog box to display the properties of the object selected in the Type Selector list or in the current view.
- 5 **Options Bar** Displays context-sensitive options for the currently selected command.

The following illustration shows the Design Bar, Project Browser, status bar, and other elements in the user interface.



- 1 Design Bar** Displays multiple tabs that provide quick access to various commands. The standard tabs on the Design Bar are replaced by special tool palettes when you select commands such as Create Mass or Family Editor. These special tool palettes provide additional functions for creating and editing the elements with which you are working.
- 2 Status Bar** Displays the name of the family and element type when you position the cursor over an element in the view window. It also displays tips and hints when you use a command. The Filter Counter displays the number of items in a selection set.
- 3 Project Browser** Displays a tree view of a logical hierarchy for all views, schedules, sheets, and families in the current project.
- 4 View Control Bar** Provides shortcuts to commonly used view commands, such as View Scale and Model Graphics Style.
- 5 View Window** Displays the view that you have selected in the Project Browser. Views can be tiled or maximized to fill the entire view window.
- 6 View Cube** Provides an orientation control for 3D views.

## Context Menus

Context menus are displayed when you right-click an object or an area in the user interface. These menus list common commands, such as Zoom, and other commands related to the current task being performed. For example, if you select a duct placed in a drawing and then right-click in the view window, the context menu displays commands such as Draw Duct and Draw Flex Duct.

# Design Bar

The Design Bar is displayed on the left of the main window. You can use the Design Bar to quickly access commands that help you design a project.

## Design Bar Tabs

The Design Bar has 14 tabs. The Basics, View, Drafting, and Structural tabs are visible by default when you first launch the software. You can display or hide the remaining tabs, as required. Your selection of the Design Bar tabs persists between drawing sessions.



Design Bar tabs

The following table lists the tabs on the Design Bar and briefly describes the commands that are available on each tab.

Tab	Available Commands
<b>Basics</b>	Commonly used commands, such as Modify, Door, Wall, and Window, and the commands from other Design Bar tabs for creating annotation symbols, dimensions, reference planes, and grid lines.
<b>View</b>	Commands for creating new views, such as floor plans, sections, elevations, and schedules.
<b>Architectural</b>	Commands for adding architectural elements to a building model.
<b>Drafting</b>	Commands for creating documentation symbols and detailing.
<b>Rendering</b>	Commands for rendering a 3D model.
<b>Massing</b>	Commands for creating conceptual massing studies and transforming them into building components.
<b>Room and Area</b>	Commands for creating rooms and areas.
<b>Structural</b>	Commands for adding structural elements to a 3D model.



Tab	Available Commands
<b>Construction</b>	Commands, such as Site Components, Phases, and Schedules/Quantities, which are used by construction managers and estimators.
<b>Mechanical</b>	Commands for creating mechanical elements.
<b>Electrical</b>	Commands for creating electrical elements.
<b>Piping</b>	Commands for creating piping elements.
<b>Plumbing</b>	Commands for creating plumbing elements.
<b>Fire Protection</b>	Commands for creating fire protection elements.

## Guidelines for Exploring the User Interface

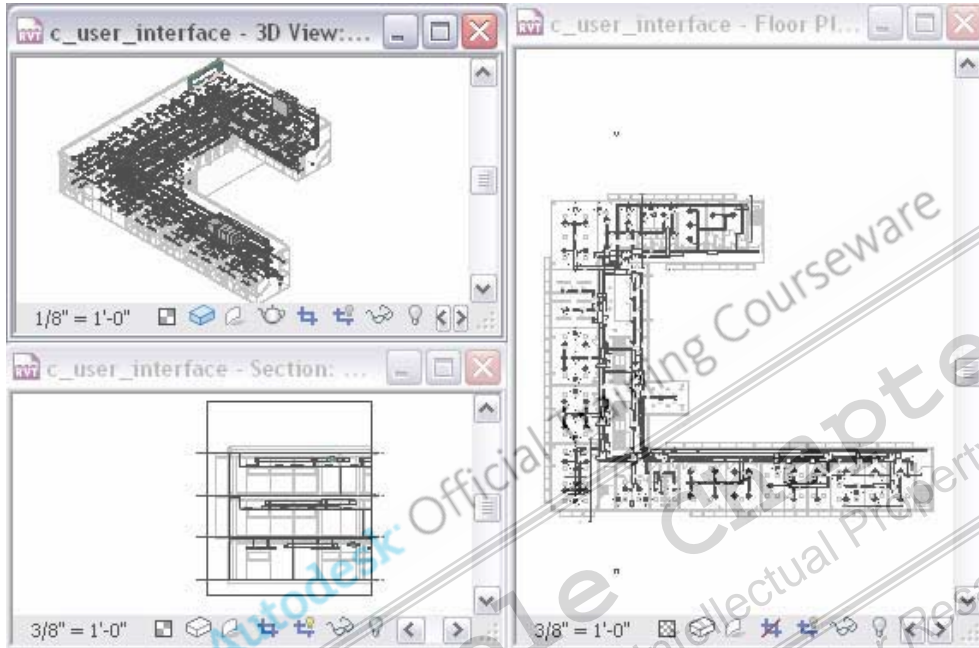
The following are the recommended practices for exploring the Revit MEP user interface.

- Use the Design Bar to quickly access commonly used commands.
- Use the Options Bar to quickly select various command-specific tools.
- Use the Project Browser to create, delete, change, or switch between views. By following this practice, you can quickly manage the views in a project.
- Read the hints and tips displayed on the status bar when you select a command. The hints and tips provide valuable information about using the command.
- Hide the Project Browser when working on a big drawing to expand the view window and display a larger part of the drawing.
- Hide or expand Design Bar tabs by right clicking the Design Bar and selecting tabs that are not required so that you can see all the tools at one time on each tab.

## Exercise: Explore the Revit MEP User Interface

In this exercise, you explore the different parts of the user interface.

Your organization is standardizing on Revit MEP. You need to explore and learn the user interface before you start work on a project.



The completed exercise



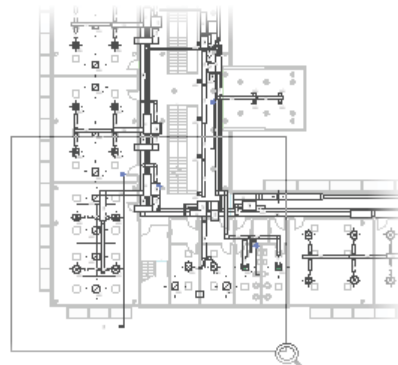
### Completing the Exercise

To complete the exercise, follow the steps in this book or in the onscreen exercise. In the onscreen list of chapters and exercises, click *Chapter 2: Revit MEP Basics*. Click *Exercise: Explore the Revit MEP User Interface*.

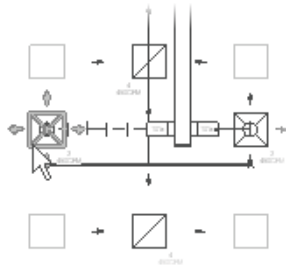
1. Open *c\_user\_interface.rvt*. The file opens in the 3D view of a building model that has been created already.

**NOTE:** This exercise uses a common dataset file. Imperial units are used in the building model to teach the concepts of the lesson. These units do not affect running this exercise using the metric version of the software. Metric images may vary slightly from those shown here.

2. In the Project Browser, under Views (Discipline), Mechanical, HVAC, Floor Plans, double-click Level 2 HVAC Plan to open the view.  
**NOTE:** Adjust the Project Browser window so you can view it clearly
3. On the View toolbar, click Zoom In.
4. Draw a selection box around the lower-left corner of the building to zoom in to that area.

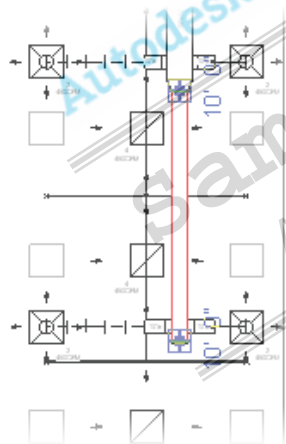


5. In the lower-left room, move the cursor over an air terminal to highlight it. The air terminal type is displayed in the tooltip and on the status bar.



6. In the lower-left room:

- Move the cursor over the rectangular duct beside the air terminal to highlight the duct.
- Click the duct to select it. The duct color changes to indicate the selection and the duct type is displayed in the Type Selector list.



7. On the Options Bar, click Element Properties to the right of the Type Selector list.

8. In the Element Properties dialog box:

- You can view and modify properties of elements in the model.
- Notice the duct properties in this case.

**Element Properties**

Family: System Family: Rectangular Duct

Type: Mitered Elbows / Tees

Type Parameters: Control all elements of this type

Parameter	Value
<b>Construction</b>	
Roughness	0.0003'
<b>Mechanical</b>	
Elbow	Rectangular Duct Elbow - Mitered
Preferred Junction Type	Tee
<b>Instance Parameters - Control selected or to-be-created elements</b>	
<b>Constraints</b>	
Horizontal Justification	Center
Vertical Justification	Middle
Reference Level	Level 2
Offset	10' 0"

- Click Cancel to close the dialog box.

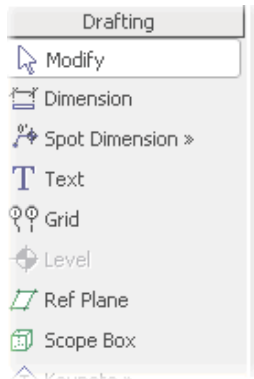
9. Notice that the Options Bar displays commands for modifying the selected duct.

W: 12" H: 12" Offset: 10' 0"

10. On the Design Bar, Basics tab, click Duct. Notice that the Options Bar displays options such as Auto Connect, Justification Setting, and On/Off Tag on Placement for placing new ducts. The Options Bar dynamically changes depending on the tool being selected.

11. On the Design Bar:

- Click the Drafting tab. Notice the tools that are available on the Drafting tab.



- Click through the other tabs on the Design Bar and notice the tools available.
- Right-click the Design Bar to see other tabs currently hidden.

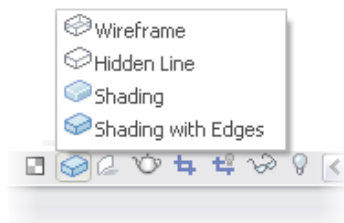
**NOTE:** The Basics tab is an assortment of commonly used tools from all the other tabs.

12. In the Project Browser, under Views (Discipline), Mechanical, HVAC, Sections (Building Section), double-click Room 214 Section to open the view.

13. In the Project Browser, under Views (Discipline), Mechanical, HVAC, 3D Views, double-click {3D} to open the 3D view.

14. On the View Control Bar:

- Click Model Graphics Style to open the associated list.



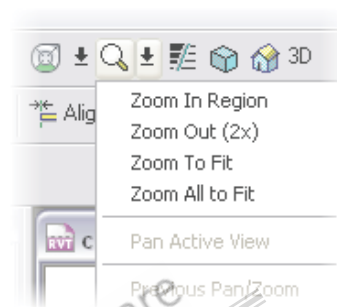
- Click Wireframe to change the view to wireframe.

15. Click Model Graphics Style > Shading with Edges to change the view again.

16. Click Window menu > Tile to display all the views that you have opened.

17. On the View toolbar:

- Click the arrow to the right of the Zoom In tool to display the zoom options list.



- Click Zoom All to Fit. Notice that each view is zoomed to fit within its tiled window.

18. Close the file without saving.

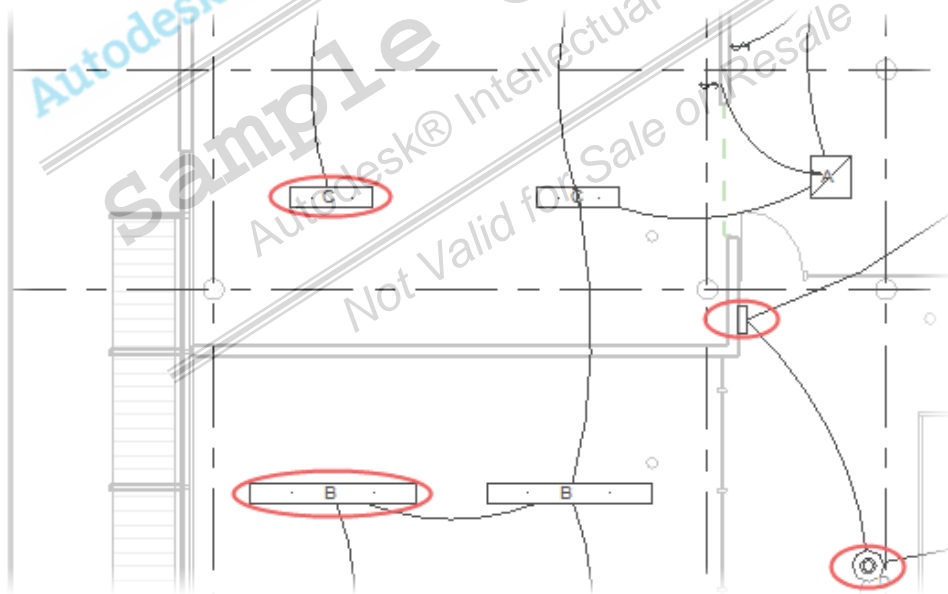
# Lesson: Working with Revit Elements and Families

## Overview

This lesson describes how to work with different types of Revit elements and families. You begin the lesson by learning about different types of building elements. Then, you learn about families and the recommended practices for working with Revit elements and families. The lesson concludes with an exercise on working with Revit elements and families.

You create a building model by adding elements to it, such as electrical and mechanical equipment. Revit MEP provides collections of similar types of elements, called families. You can create your own families and modify them without any additional programming. For example, a building model has different types of lights, such as wall mounted and ceiling mounted, which can be of different sizes. The ceiling mounted lights of different sizes can form a single family.

In the following illustration, the 1'x4' C light fixture and 1'x8' B light fixture belong to a single family. The wall hung light fixture and the pendant light fixture belong to different families in the lighting device category.



## Objectives

After completing this lesson, you will be able to:

- Describe the different types of building elements.
- Describe families.
- State the recommended practices for working with Revit elements and families.
- Work with Revit elements and families.

# About Building Elements

You use elements, such as lights, air terminals, plumbing fixtures, and air handling units, to create a building design. You can place, create, and modify these elements based on design requirements.

## Definition of Building Elements

Revit building elements are the building blocks of a project and you add them when you are developing the project. When you place an element in a model, the individual element is called an instance of that element type. An instance has some parameter values in common with the element type. Instances can be broadly classified into three classes: model, annotation, and view.

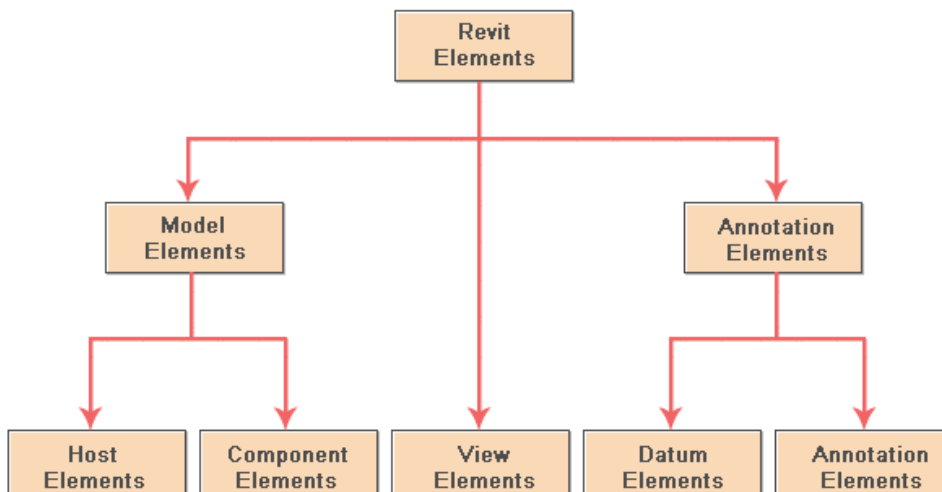
The following table briefly describes each instance class.

Instance Class	Description
<b>Model</b>	Elements, such as lights, air terminals, plumbing fixtures, and air handling units, that help in the 3D representation of the building design. The host and component element instances belong to this class. Model elements have a specific location in the building.
<b>Annotation</b>	Elements, such as dimensions, tags, and elevation symbols, that establish context or add supplementary information to document a building design. The datum and annotation element instances belong to this class. Annotation elements have a specific location on a drawing sheet.
<b>View</b>	Elements, such as plans, elevations, sections, 3D views, and schedules, that dynamically represent the parts of a building model. Changes made to part of the model in one view are automatically updated in all views that contain this part.

## Building Element Types

The building elements are categorized as host, component, view, datum, and annotation.

The following illustration shows the categories of building elements.





The following table describes these categories briefly.

Element Type	Description
<b>Host</b>	Elements, such as walls, floors, roofs, and ceilings, that form the basic built-in-place structure of a building.
<b>Component</b>	Elements, such as lights, air terminals, plumbing fixtures, and air handling units, that fill out the details of a building design.
<b>Datum</b>	Elements, such as levels, column grids, and reference planes, that establish a context for project objects. These elements help put together a building.
<b>Annotation</b>	View-specific 2D elements, such as dimensions, text notes, and section tags. These elements help produce building documentation.
<b>View</b>	Elements such as plans, sections, and schedules that dynamically represent a building model. These elements have their own properties and can be modified or deleted. View elements also control the annotation elements placed on a view. If you delete a view, you will lose the annotations placed in the view. View elements do not control the model elements.

## Revit Elements as Objects

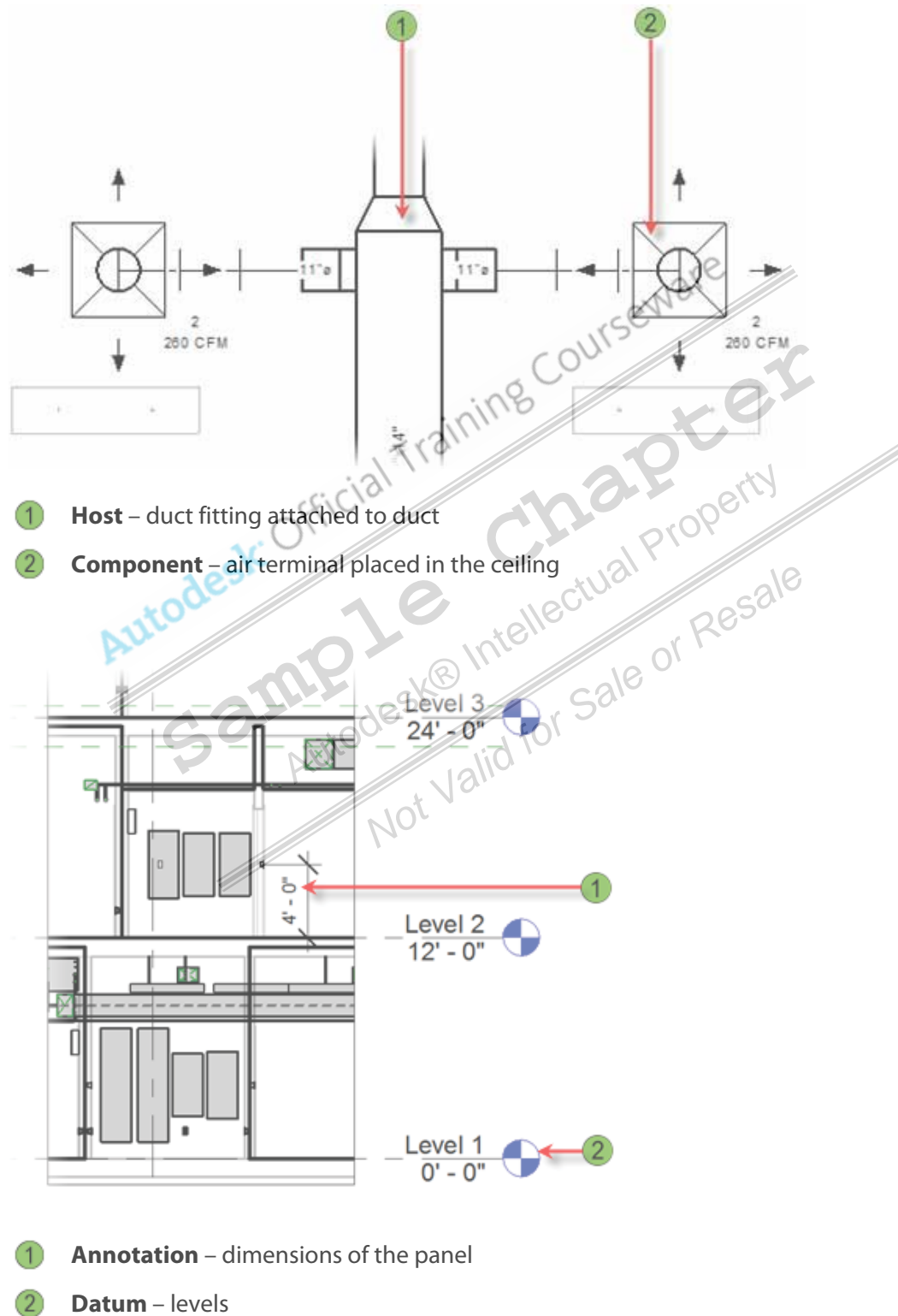
Elements such as ducts and pipes are recognized as actual objects. The properties of these objects, such as structure and behavior, are called parameters. These properties simplify the process of creating a building model.

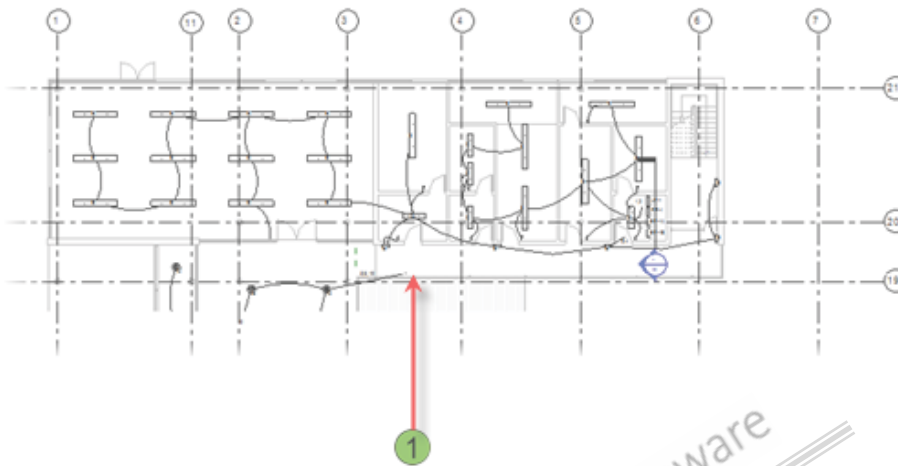
For example, when you draw a duct element, you do not need to ensure that the duct layer is active as in the case of a conventional CAD application. You also do not need to separately draw the faces of this element. The element is part of the duct category and has all the visual attributes of a duct, such as the required lineweight and color. The element also behaves like a duct. You can join it to other ducts, connect it to mechanical equipment or air terminals, and place fittings in it.

In addition, intelligence is programmed into elements so that their behavior is affected by the relationships they share with other elements.

## Example of Building Elements

The following illustration shows various building elements.





**1 View – plan view**

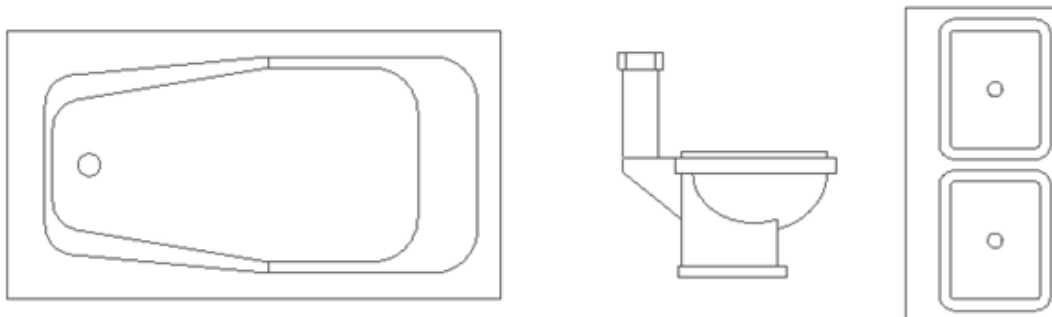
## About Families

Families are groups of similar elements. In Revit, there are a large number of predefined families that you can use in your project. You can modify these predefined families to better suit project requirements. You can also create new families for your project by using templates for mechanical equipment, plumbing fixtures, or electrical equipment.

### Definition of Families

A family integrates elements that have the same parameters, identical use, and similar graphical representation. Elements within a family may have different parametric values, but the set of parameters are the same, including their names and meanings. For example, plumbing fixtures of different types, such as bath tub, toilet, and sink, are generally placed in different families. Within the toilet family, there may be variations in height, size, or manufacture. Families can be further classified into component families and system families.

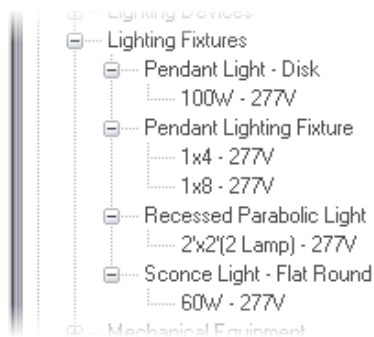
The following illustration shows an example of different types of plumbing fixture families.



## Family Types

Every family can contain multiple types of elements. For example, families of light fixtures might be created based on usage or shape, such as Pendant, Recessed, or Sconce. In addition, each family contains types of various sizes, such as a 60W - 277V pendant light or a 2'x4'(2 Lamp) - 277V recessed parabolic light.

The following illustration shows light fixture families in a project file, each with different types of light fixtures listed by size.



## Component and System Families

Component families are families of common components and symbols used in the building design that have standard sizes, configurations, and parameters. You can load component family files into a project or create them using family templates. You can also define properties and graphical representations for component families. Most families are component families.

System families have predefined parameters and graphical representations. They include ducts, dimensions, pipes, wiring, and levels. System families are not available as files for loading into a project, nor can you create them.

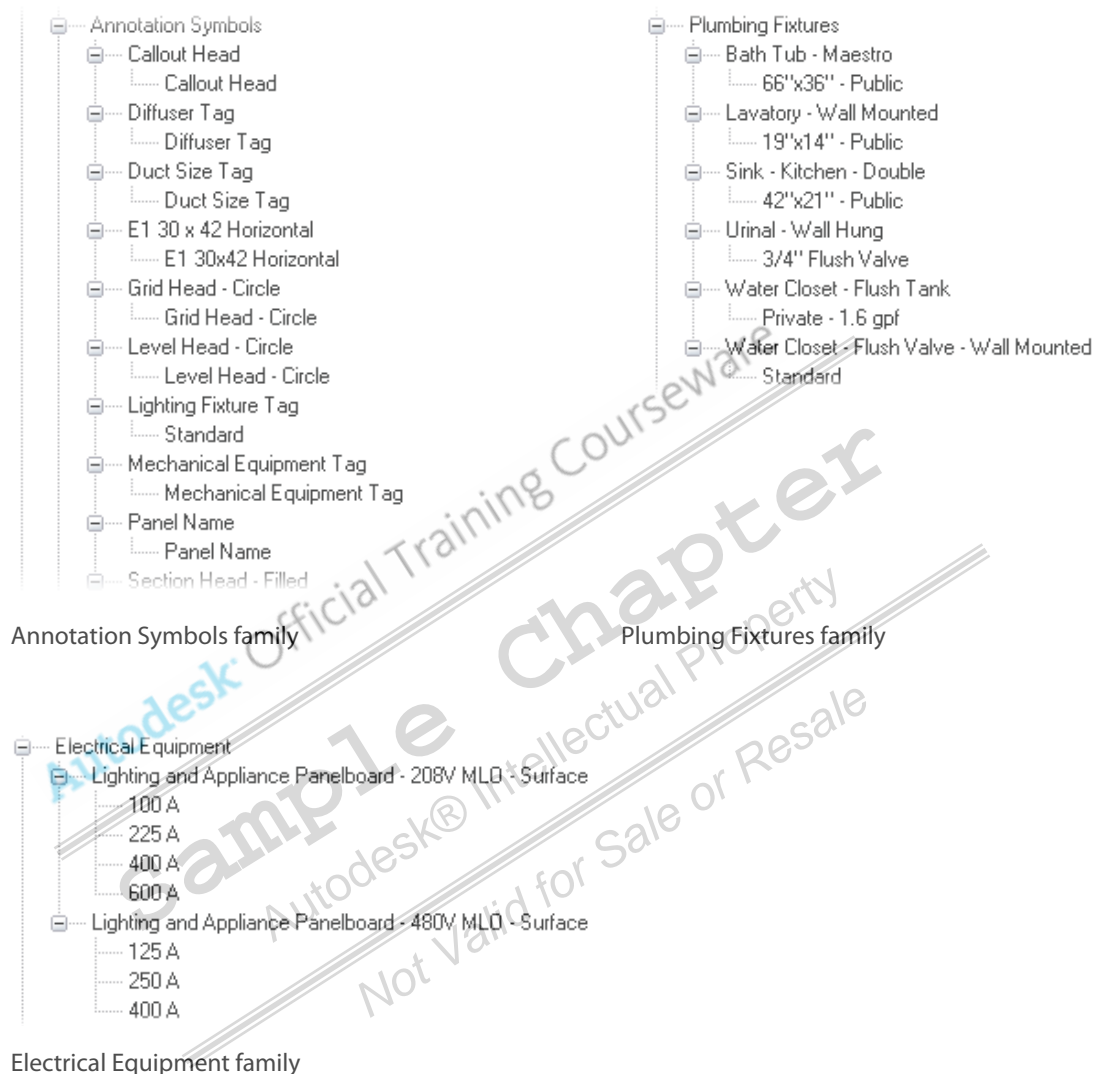
You can modify the existing system families to suit project requirements or company standards. You can use a predefined system family to generate new families, which then belong to that system family within the project. For example, the behavior of a duct is predefined in the system. However, you can create different types of ducts with different compositions. You can also transfer system families between projects, if required.

## Example of Families

The following table gives an example of family, type, and instance for a duct object.

Family	Example
Family/System Family	Ducts: Round Duct
Type	Taps
Instance	Actual user-drawn duct in a project

The following illustrations show some of the families in the Project Browser. You can load these component families from the libraries.



## Guidelines for Working with Revit Elements and Families

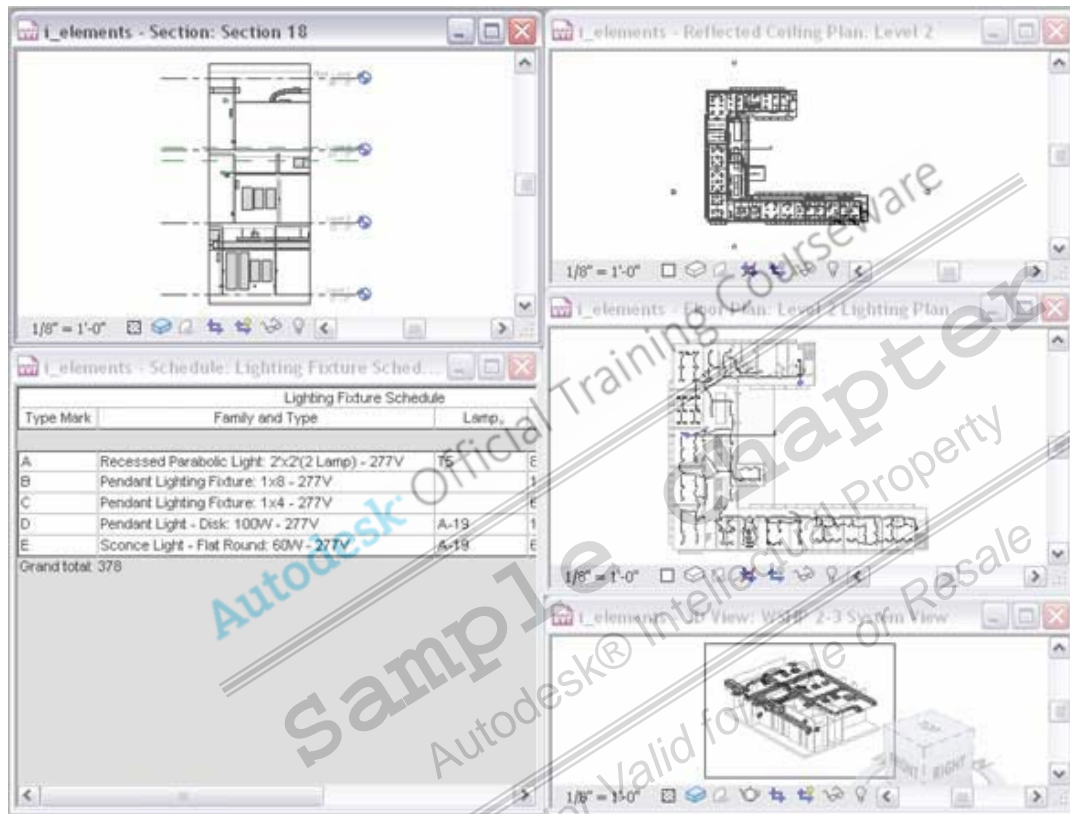
The following guidelines help you to work efficiently with Revit elements and families.

- Familiarize yourself with the default content libraries in the software and those created by other users in your organization. Then you will be able to reuse existing elements, instead of creating a library from scratch.
- When you modify a Revit element, save the family back to the library folder. This makes the new family type available across projects and to other users as well.
- Avoid clicking the elements in a view so that you do not accidentally modify any element.
- Move the cursor over an element to determine its family and type.

## Exercise: Work with Revit Elements and Families

In this exercise, you work with different types of building elements, families, and views. You also change the parameter of a light fixture.

You are working on a multistory office building project. You identify the elements and their families in the project.



The completed exercise



### Completing the Exercise

To complete the exercise, follow the steps in this book or in the onscreen exercise. In the onscreen list of chapters and exercises, click *Chapter 2: Revit MEP Basics*. Click *Exercise: Work with Revit Elements and Families*.

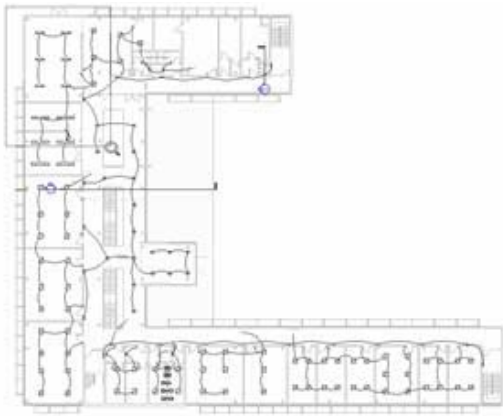
1. Open *i\_elements.rvt* or *m\_elements.rvt*. The file opens in the 3D view.

**NOTE:** The illustrations for the metric dataset will be slightly different from those shown here.

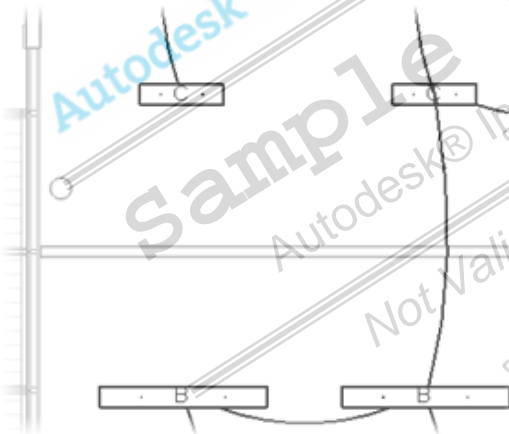
2. In the 3D view:
  - Move the cursor over the host building elements, such as ducts and pipes, to highlight them. Notice the information displayed on the status bar.
  - Move the cursor over the component elements, such as air terminals and light fixtures, placed in the host elements to highlight them. Notice the information displayed on the status bar.
3. In the Project Browser, under Views (Discipline), Electrical, Lighting, Floor Plans, double-click Level 2 Lighting Plan to open the view.



4. On the View toolbar, click Zoom In.
5. Draw a selection box around the upper-left corner of the building to zoom in to that area.

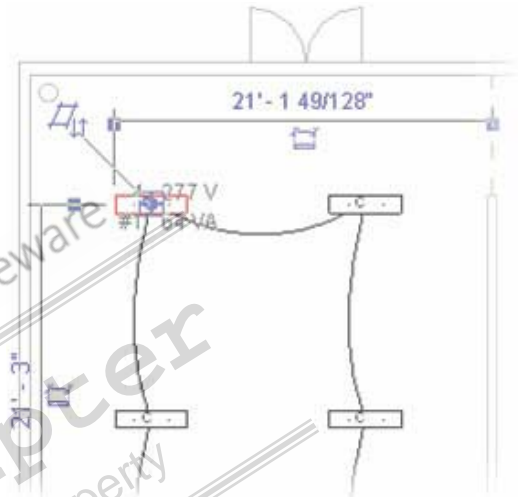


6. In the view window, move the cursor over the type B and type C light fixtures to highlight them. Notice that the light fixtures are from the same family but have different sizes.



7. In the imperial version, select the type C light fixture, which is on the upper left.

In the metric version, select the type C light fixture adjacent to the B light fixture on the upper-left.



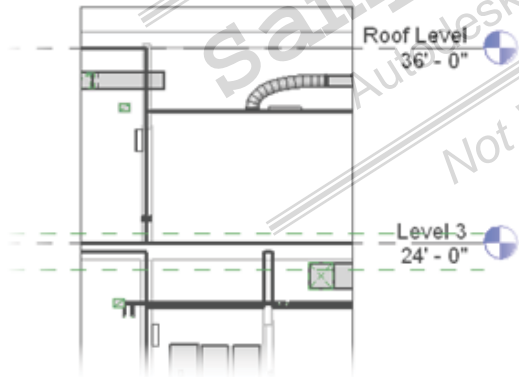
8. Select Pendant Lighting Fixture : 1x8 - 277V (M\_Pendant Light - Linear - 2 Lamp : 2400mm - 277V) from the Type Selector list to change the light fixture size. Notice the change in the size and the type tag of the light fixture.
9. In the Project Browser, under Views (Discipline), Coordination, All, Ceiling Plans, double-click Level 2 (Level 2 Ceiling Plan in the metric version) to open the ceiling plan view. The light fixture you changed is still selected.
10. On the Design Bar, Basics tab, click Modify to clear the selection and activate the Modify tool.
11. In the view window, move the cursor over various light fixtures. Notice the information displayed on the status bar.

12. In the Project Browser, under Schedules/Quantities, double-click Lighting Fixture Schedule to display the schedule in the view window. The lighting fixture schedule displays details such as Type Mark, Family and Type, Lamp, Wattage, and Count.

Type Mark	Family and Type	Lamp	Wattage	Count
A	Recessed Parabolic Light: 2'x2'(2 Lamp) - 2	T5	80 W	164
B	Pendant Lighting Fixture: 1'x8' - 277V		128 W	63
C	Pendant Lighting Fixture: 1'x4' - 277V		64 W	20
D	Pendant Light - Disk: 109W - 277V	A-19	100 W	63
E	Sconce Light - Flat Round: 60W - 277V	A-19	60 W	68
Grand total: 378				378

**NOTE:** The schedule view itself is a view element, and each row displays certain properties of a light fixture. The light fixture is a component element.

13. In the Project Browser, under Views (Discipline), Electrical, Lighting, Sections (Building Section), double-click Section 18 to open the sectional view.
14. In the view window, move the cursor over various datum elements, such as levels. Notice the information displayed on the status bar.



15. Click Window menu > Tile. All the open view elements are displayed.

16. On the View Toolbar:

- Click the arrow to the right of the Zoom In tool.
- Select Zoom All to Fit from the Zoom options list. Notice that each view is zoomed to fit its tiled window.

**NOTE:** In the tiled view window, click in the Type Mark C cell in the Schedule view. Notice carefully, how this selects the fixture in all the different views where it is present. Try the other scheduled fixtures.

17. Close the file without saving.

# Chapter Summary

You have now been introduced to the Revit MEP user interface. You understand that elements and families are the parametric building blocks and now you can begin to create designs in Revit MEP.

Having completed this chapter, you can:

- Use the different parts of the Revit MEP user interface.
- Work with different types of Revit elements and families.

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