

# 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.

## Objective

After completing this chapter, you will be able to:

Describe building information modeling and 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

### Introduction to 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.

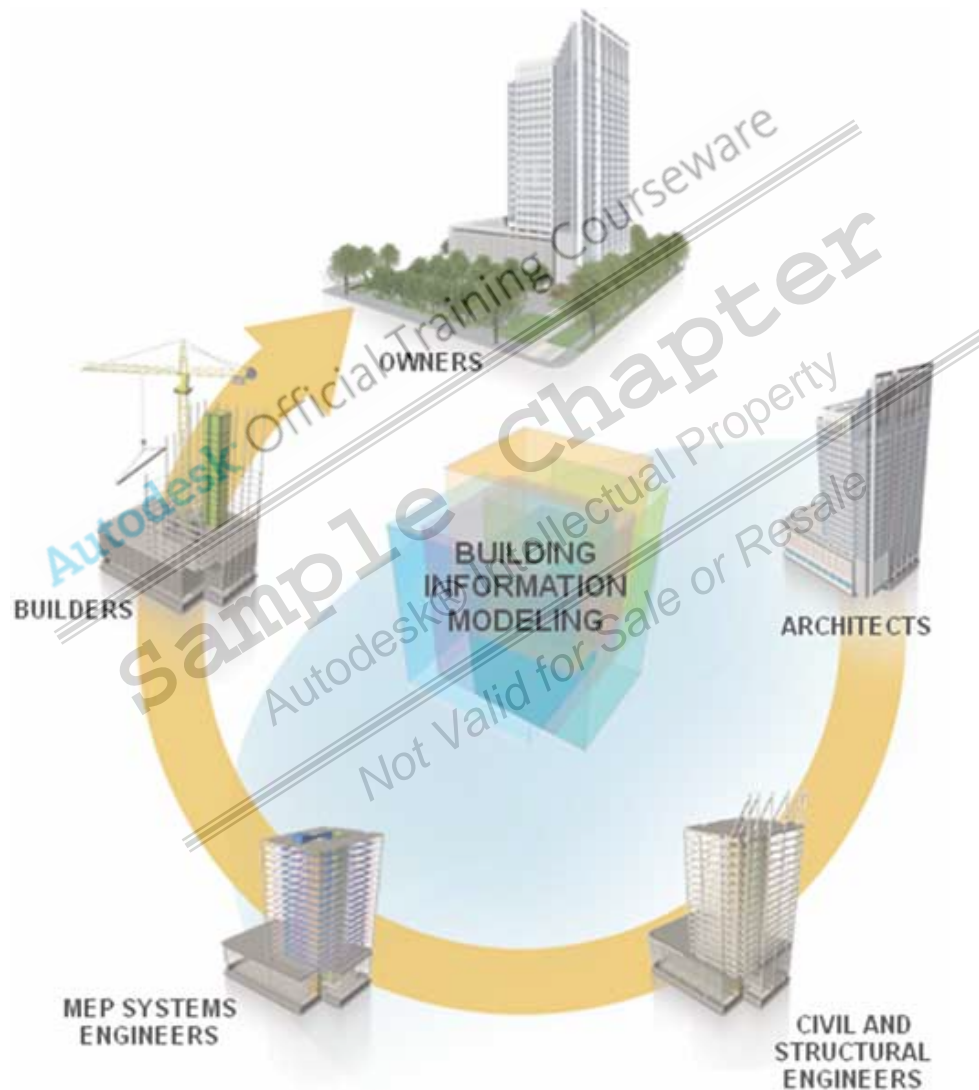
The building industry has traditionally illustrated building projects with manually created drawings. Information was added to these illustrations by using notes and specifications. With the advent of CAD technology, this process was automated. However, the output of manual drafting, graphics CAD systems, 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.

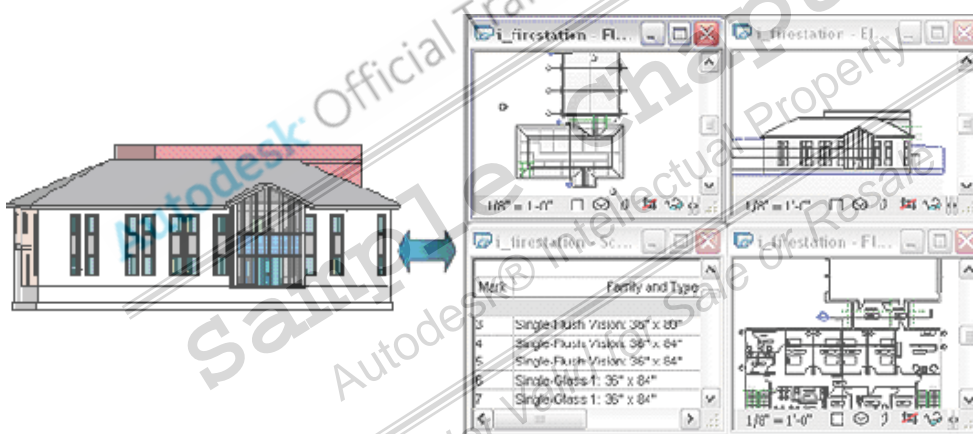
# About Bidirectional Associativity

## Introduction to 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.

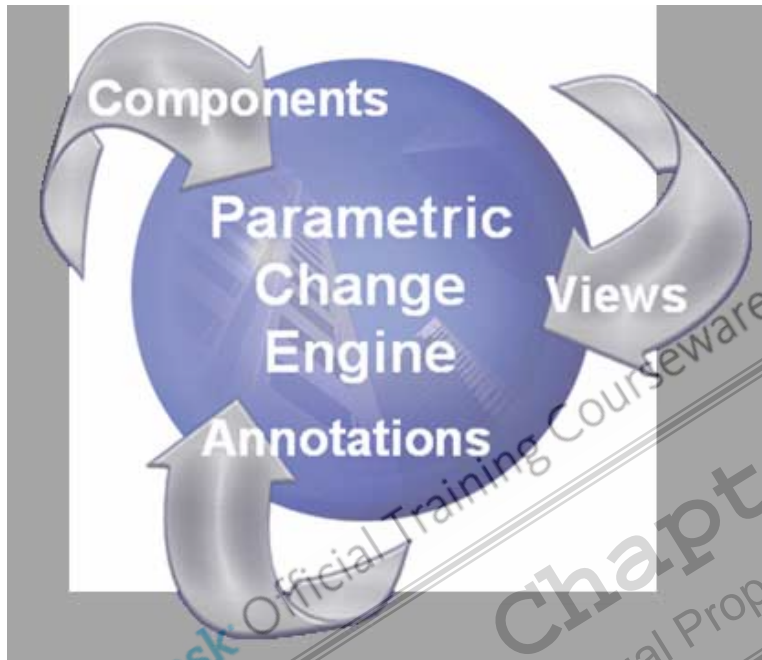


## Parametric Relationships

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 and bidirectional associativity.

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# Revit Structure Basics

Before you begin to use Revit® Structure, you need to become familiar with the interface and the structural elements and families used to create structural designs.

## Objectives

After completing this chapter, you will be able to:

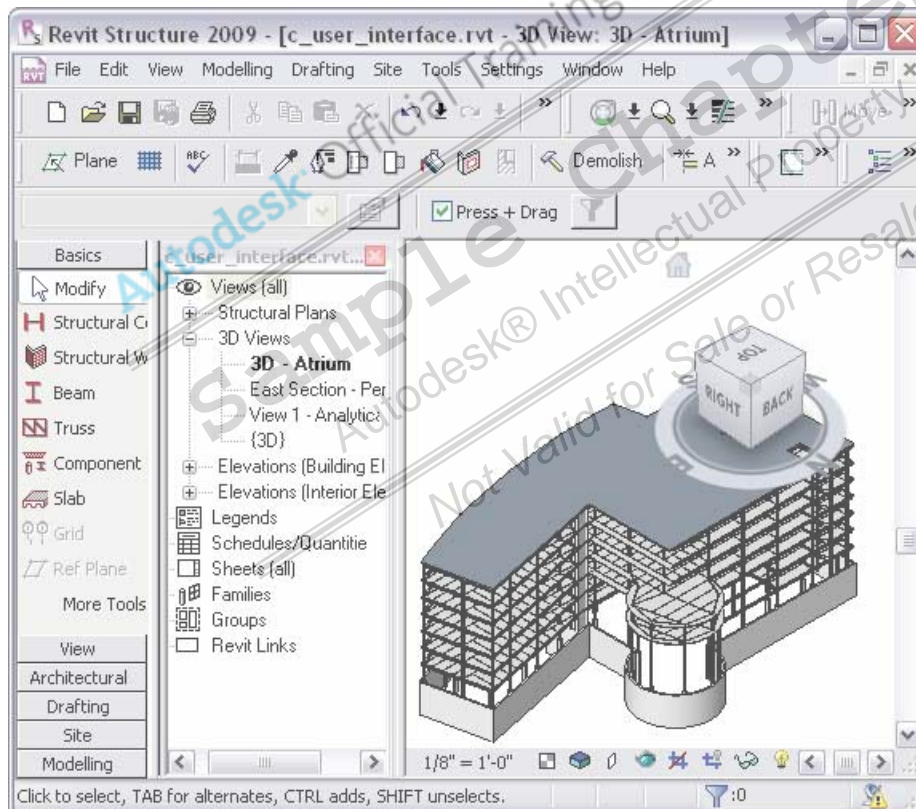
- Use different parts of the Revit Structure user interface.
- Work with different types of structural elements and families.

# Lesson: Exploring the User Interface

## Overview

This lesson describes how to use different parts of the Revit Structure user interface. You begin the lesson by learning about the parts of the user interface and the steps to display and hide 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 Structure provides a friendly user 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.



User interface with an open project file

## Objectives

After completing this lesson, you will be able to:

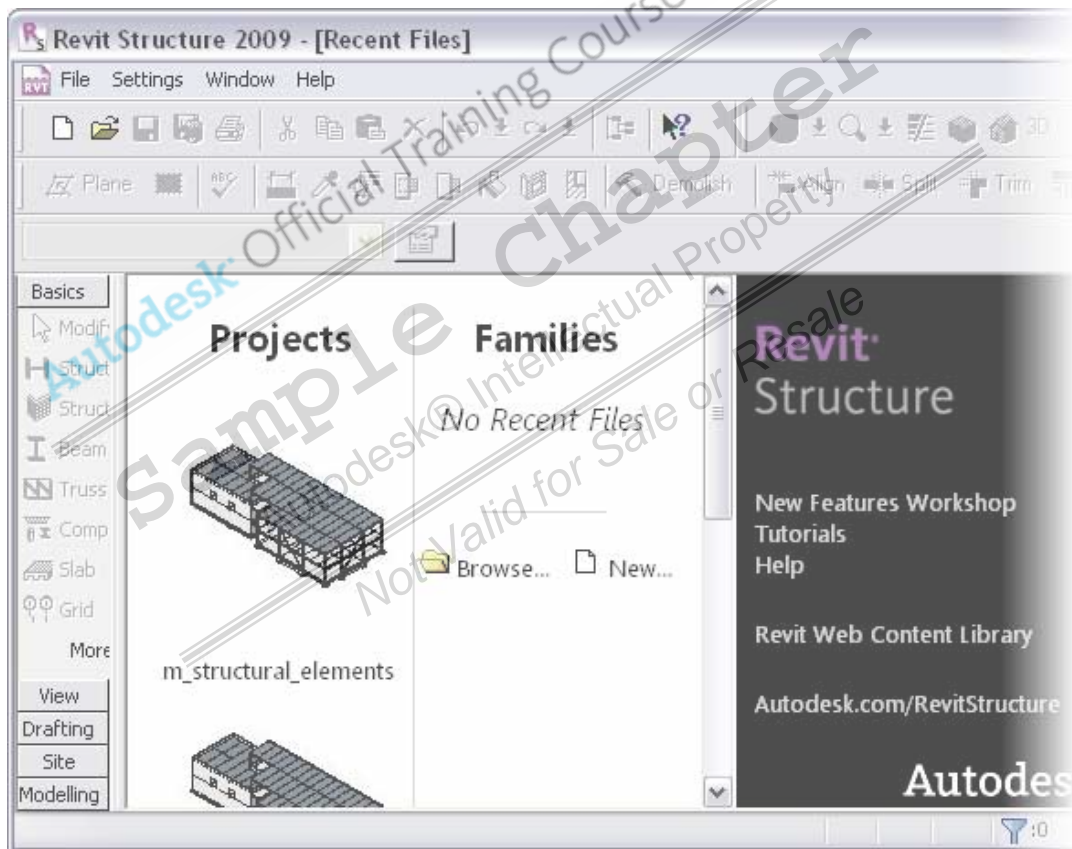
- Identify the different parts of the Revit Structure user interface.
- Display and hide the Design Bar tabs.
- State the recommended practices for exploring the Revit Structure user interface.
- Explore the Revit Structure user interface.

# Revit Structure User Interface

Revit Structure 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 Structure 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

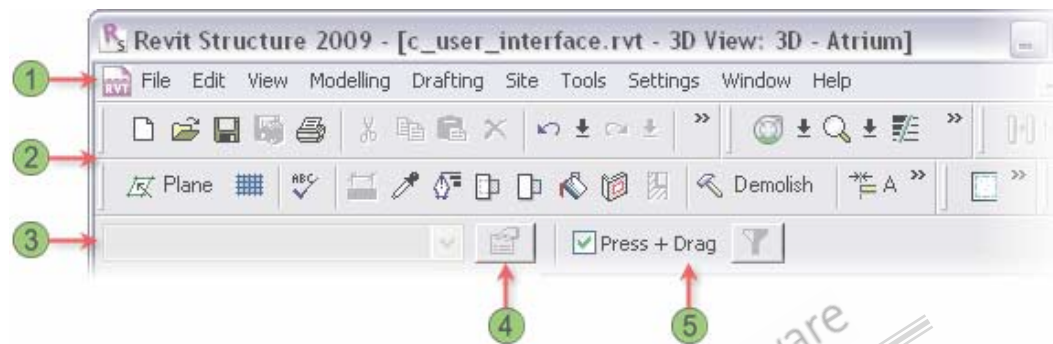
When you launch the software, a startup window named Recent Files is displayed. The left pane of the window contains links to the recently accessed project files and family files. The right pane contains links to help files, tutorials, and Web content.



Recent Files window

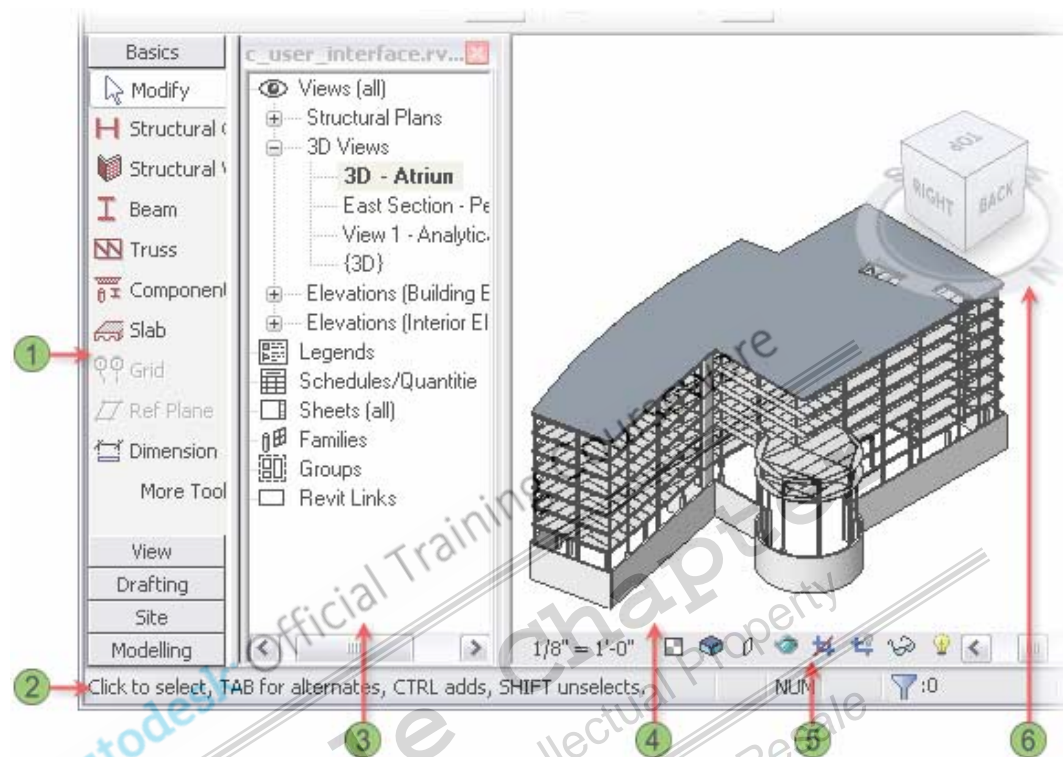
## User Interface Elements

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



- |   |                           |   |
|---|---------------------------|---|
| ① | <b>Menu bar</b>           | Displays menus with commands to define settings and perform standard functions.   |
| ② | <b>Toolbars</b>           | Provide buttons for standard functions and the frequently used tools.   |
| ③ | <b>Type Selector</b>      | Lists the type of the elements selected either on the Design Bar or in a view. Selecting a different element changes the options available in the list. |
| ④ | <b>Element Properties</b> | 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 | <b>Options Bar</b>        | 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 Slab, Floor, or Ramp. 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 object 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 window** Displays the view that you have selected in the Project Browser. Views can be tiled or maximized to fill the view window.
- 5 View Control Bar** Provides shortcuts to common view parameters such as View Scale, Detail Level, Model Graphics Style, and other view instance parameters that are commonly modified.
- 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 Properties, and other commands related to the current task being performed. For example, if you select a beam placed in a structural model and then right-click in the view window, the context menu displays commands such as Select All Instances and Edit Family.



Context menu

## Displaying and Hiding the Design Bar Tabs

### 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 building project.

### Design Bar Tabs

The Design Bar has nine tabs. The Basics, View, Drafting, Site, and Modelling 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 nine 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 from other Design Bar tabs, such as Modify, Structural Column, Structural Wall, Beam, and Slab, and the commands for creating annotation symbols, dimensions, reference planes, and gridlines.
<b>View</b>	Commands for creating new views such as floor plans, sections, elevations, and schedules.
<b>Architectural</b>	Commands such as Wall, Door, Stairs, and Railing for adding architectural elements to a 3D model.
<b>Drafting</b>	Commands such as Dimension, Text, Tag, and Symbol for creating documentation symbols and detailing.
<b>Rendering</b>	Commands such as Render View for creating still pictures or walkthrough animations of a 3D model.
<b>Site</b>	Commands such as Toposurface, Subregion, Graded Region, and Parking Component for creating a 3D site model with topography and landscaping elements.
<b>Massing</b>	Commands such as Create Mass, Place Mass, and Wall by Face, which are used for creating conceptual massing studies and transforming them into structural components.
<b>Modelling</b>	Commands such as Structural Column, Structural Wall, and Truss for modeling elements that represent the actual 3D geometry of a building. This tab contains advanced tools, such as Beam System, Foundation, and Rebar.
<b>Construction</b>	Commands such as Site Component, Phases, and Schedules/Quantities, which are used by construction managers and estimators.

## Procedure: Displaying and Hiding Design Bar Tabs

The following steps describe how to display and hide the Design Bar tabs.

1. Click Window menu > Design Bars.
2. In the Show Design Bars dialog box, select or clear the check box for the tab that you want to display or hide.

**NOTE:** You can also right-click the Design Bar and click a tab name from the context menu to display or hide the tab. A check mark is displayed next to the displayed tabs.

## Guidelines for Exploring the User Interface

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

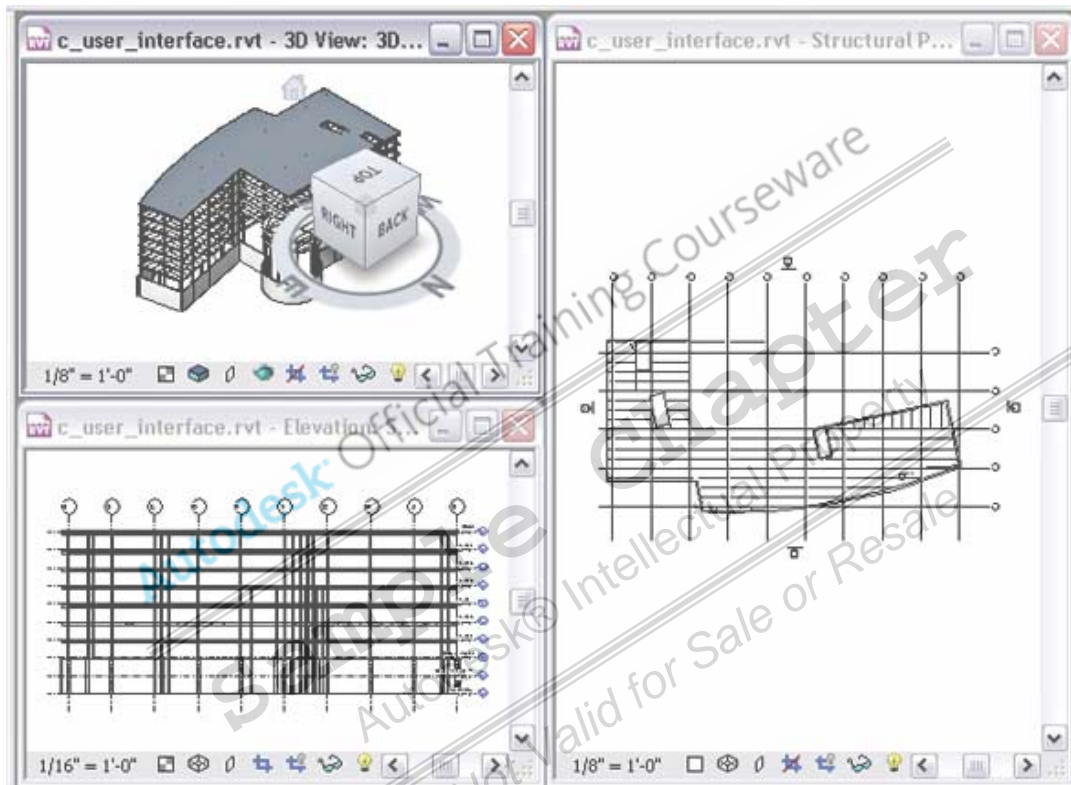
- Examine the parts of the user interface for information about the drawing elements and commands. The Options Bar, status bar, content menus, Design Bar, and the toolbars change constantly to provide commands and information for working with the selected objects or commands. Learning to read the information displayed in different parts of the user interface helps you work more efficiently and comfortably with the software.
- Increase familiarity with the uses of the Project Browser. It can be moved or hidden to expand the view window, used to create, delete, or toggle between views, and place instances of families. Learning to use the Project Browser makes the workflow smoother.
- Deactivate the less frequently used Design Bar tabs if the available screen resolution is limited. Doing this allows you to display all the commands on each frequently used Design Bar tab. This practice also enables you to use the Design Bar commands in fewer mouse clicks.

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## Exercise: Explore the Revit Structure User Interface

In this exercise, you explore the different parts of the Revit Structure user interface, select elements in a structural model, view the properties of the selected elements, and view the structural model in different views.

Your organization has decided to use Revit Structure for a building project. You need to explore and learn the user interface before you start working on the project.



The completed exercise

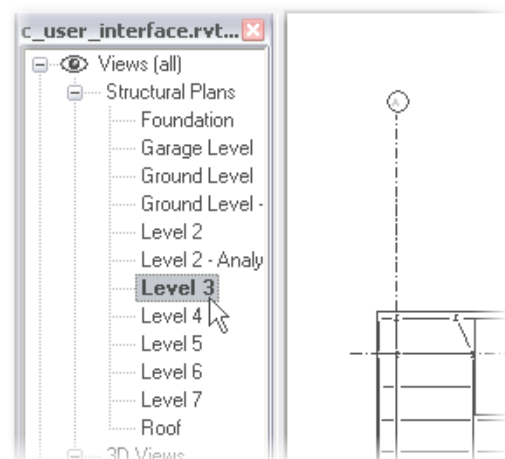


### Completing the Exercise

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 Structure Basics*. Click *Exercise: Explore the Revit Structure User Interface*.

1. Open *c\_user\_interface.rvt*. The file opens in the 3D - Atrium view.

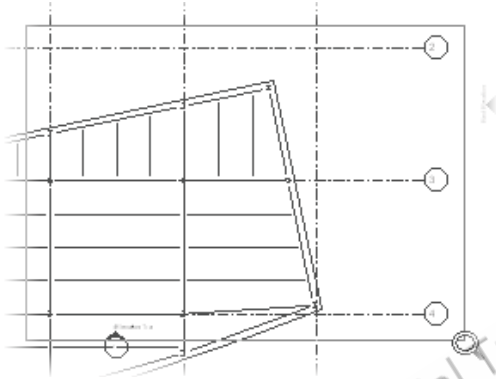
2. In the Project Browser, under Views (All), Structural Plans, double-click Level 3.



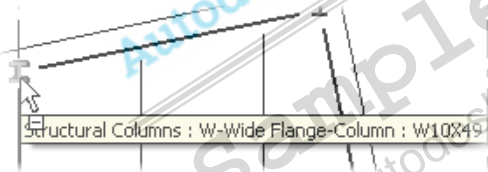
3. On the View toolbar, click Zoom In.



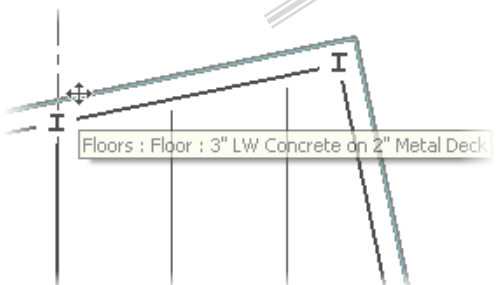
4. In the view window, drag the cursor over the northeast corner of the drawing to zoom in between grid lines H and K and 2 and 4.



5. Move the cursor over a column to highlight the column. The column type is displayed in a tooltip and the status bar.



6. Select the edge of the floor slab above the column, as shown. Notice that the floor type is displayed in the Type Selector list.



7. On the Options Bar, click Element Properties.



8. In the Element Properties dialog box:
  - Notice the type and instance parameters of the floor element.
  - Click Cancel to close the dialog box.

9. On the Design Bar, Modelling tab, click Structural Wall. The Options Bar displays tools and options for sketching new walls, and the cursor changes its shape to a pencil indicating that you can begin sketching a wall.

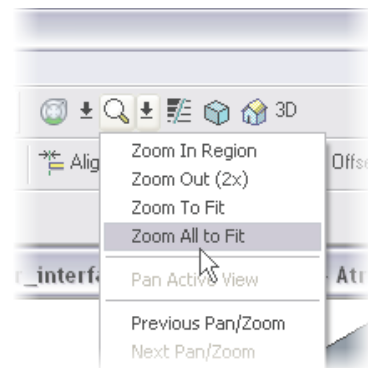
**Tip:** If the Modelling tab is not visible on the Design Bar, right-click the Design Bar. Click Modelling.

10. In the Project Browser, under Elevations (Building Elevation), double-click South Elevation. The Structural Wall command ends and the view window displays the south elevation view of the structural model.
11. In the Project Browser, under 3D Views, double-click 3D - Atrium.
12. On the View Control Bar, click Model Graphics Style > Wireframe.



The view window displays the structural model with all edges and lines, but without any surfaces.

13. On the View Control Bar, click Model Graphics Style > Shading with Edges. The view window displays the shaded structural model.
14. Click Window menu > Tile. All the open views are displayed.
15. On the View toolbar, click Zoom All to Fit.



All the windows are updated to display the drawings in the center.

16. Close the file without saving.

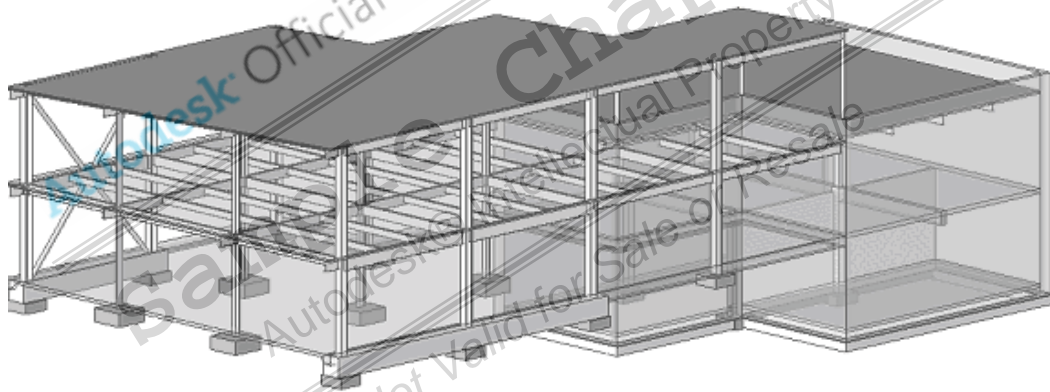
# Lesson: Working with Structural Elements and Families

## Overview

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

Structural elements, such as columns and beams, represent different parts of a building structure. Revit Structure provides standard collections of similar types of elements called families. For example, a structural model can contain different types of columns. The columns of different sizes but of a common profile can form a family.

You can create new families and easily modify the existing ones.



Structural model with columns from one family

## Objectives

After completing this lesson, you will be able to:

- Describe structural elements.
- Describe families.
- State the recommended practices for working with structural elements and families.
- Work with structural elements and families.

# About Structural Elements

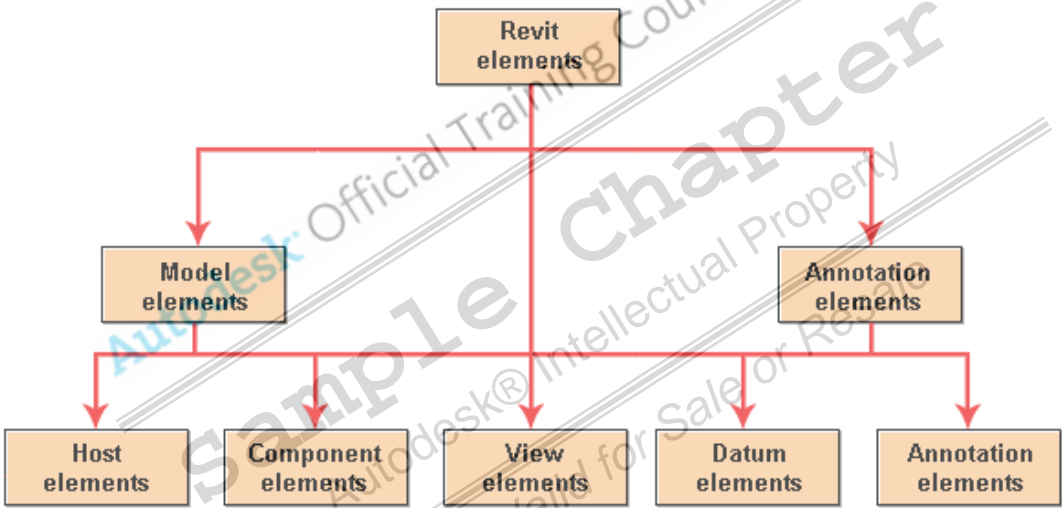
A structural model comprises different structural elements, such as beams, columns, walls, and foundations.

## Definition of Structural Elements

Structural elements are the fundamental blocks of a building structure.

## Element Categories

Revit elements are divided into five categories: Host, Component, View, Datum, and Annotation. The following illustration shows the hierarchy of element categories.



The following table briefly describes each category.

Category	Description
<b>Model</b>	Elements such as walls, windows, columns, and beams that are used to model a structural design.
<b>Annotation</b>	Elements such as dimensions, tags, reference planes, and grids that are used to document a structural design.
<b>Host</b>	Elements such as walls, slabs, roofs, stairs, and ramps that form the basic built-in-place structure of a model.
<b>Component</b>	Elements such as beams, columns, braces, and foundations that fill the details of a structural model.
<b>View</b>	Elements such as structural plans, sections, and schedules that are dynamic representations of a structural model. These elements have their own properties and can be modified or deleted. View elements control the annotation elements placed in a view. If you delete a view, the annotations placed in the view are deleted. View elements do not control host and component elements.



Category	Description
<b>Datum</b>	Elements such as levels, column grids, and reference planes that establish a context for host and component elements. These elements help put together a structure.
<b>Annotation</b>	Two-dimensional elements such as dimensions, text notes, section tags, and object tags that are visible only in the specified view of a structural model. These elements help create structural documentation.

## Element Instances

When you place an element in a structural model, the individual element is called an instance of that element type. The instances of an element type have certain common parameter values. Element instances are divided into the following classes.

Class	Description
<b>Model</b>	Elements such as walls, roofs, columns, and beams that represent physical parts of a structure. Host and component element instances belong to this class. Model element instances are placed at specific locations in a structural design.
<b>Annotation</b>	Elements such as dimensions and tags that establish context or add supplementary information to a view. Annotation and datum element instances belong to this class. Annotation elements are placed at specific locations in a drawing sheet.
<b>View</b>	Elements such as plans, elevations, sections, 3D views, and schedules that dynamically represent parts of a structural model. If you make any changes to a model in one view, it is automatically updated in the other views.

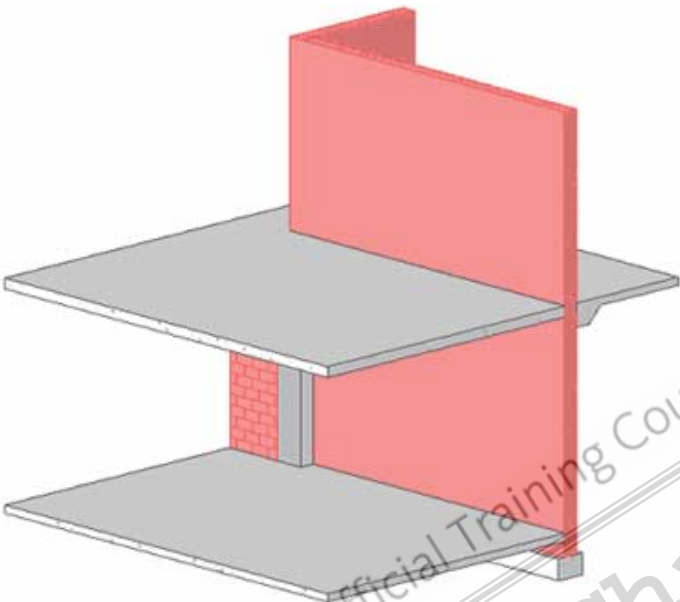
## Elements as Objects

Structural elements such as walls, columns, and beams are called objects. The properties of these objects, such as structure and behavior, are called parameters. These properties simplify the process of creating a structural model. For example, when you draw a wall element in Revit Structure, you do not need to ensure that the wall layer is active as in a conventional CAD application. In addition, you do not need to draw the faces and internal structural details of the wall element separately. The wall element behaves as a wall and has all the visual attributes of a wall, such as the required lineweight and color. You can join the wall element to other walls, connect it structurally to floors and ceilings, and place windows and doors in it.

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

## Example of Structural Elements

The following illustrations show wall elements, wall instance parameters, and wall type parameters.



Wall elements

**Element Properties**

Family: System Family: Basic Wall

Type: Exterior - 10" Concrete

Type Parameters: Control all elements of this type

Parameter	Value
<b>Construction</b>	
Structure	<input type="text"/> Edit...
Wrapping at Inserts	Do not wrap
Wrapping at Ends	None
Width	0' 10"
Wall Function	Exterior

Instance Parameters - Control selected or to-be-created elements

Parameter	Value
<b>Constraints</b>	
Location Line	Core Face: Exterior
Base Constraint	BASEMENT
Base Offset	-1' 6"
Base is Attached	<input type="checkbox"/>
Base Extension Distance	0' 0"
Top Constraint	Up to level: SECOND FLOOR

Wall instance parameters

**Type Properties**

Family: System Family: Basic Wall

Type: Exterior - 10" Concrete

Type Parameters:

Parameter	Value
<b>Construction</b>	
Structure	<input type="text"/> Edit...
Wrapping at Inserts	Do not wrap
Wrapping at Ends	None
Width	0' 10"
Wall Function	Exterior
<b>Graphics</b>	
Coarse Scale Fill Pattern	Diagonal crosshatch
Coarse Scale Fill Color	Black
<b>Identity Data</b>	
Keynote	
Model	
Manufacturer	
Type Comments	

Wall type parameters

# About Families

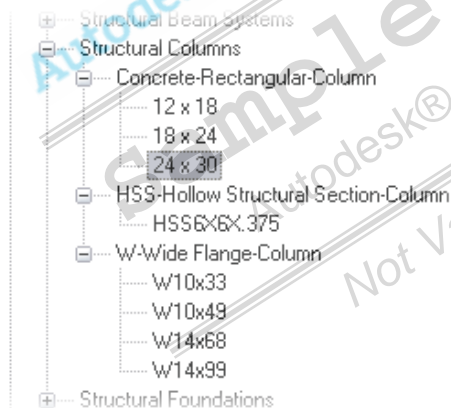
Families are classes of elements within a category that group elements with a common set of parameters, identical use, and similar graphical representation. Revit Structure contains various predefined families, which you can use in your projects. You can modify these predefined families to suit project requirements. You can also create custom families by using templates for beams, columns, and foundations.

## Definition of Families

A family is a collection of objects with similar characteristics. These characteristics are represented by instance and type parameters. Instance parameters are specific to a particular instance of an object in a structural model, whereas type parameters apply to all objects of a particular type.

Different elements within a family may have different values for some or all properties; however, the set of properties is the same. Each element with a different value is a new type within a family. For example, a beam with a specific profile can be of different sizes and all beams of different sizes are new types within the beam family. Similarly, rectangular columns can be considered as one family, though the columns belonging to the family are available in different styles and different sizes within those styles.

The following illustration shows different types of columns belonging to the Structural Columns family.



## Component and System Families

There are two types of families, component families and system families.

Component families are families for which you can specify the parameters and graphical representations. The extensive library of component families includes annotation components, 2D detail components, and 3D model components. You can create component families by using family templates or by loading existing component families into a project. You can also modify the existing component families. A special type of component family is an in-place family, which is specific to the project in which it is created and edited. An example of an in-place family is a tapered column.

System families are families that have a predefined set of parameters and graphical representation. The system family library includes walls, dimensions, roofs, floors, and levels. You cannot load or create system families as separate files. However, you can modify existing system families to suit project

requirements or organization standards. To create new system families, you use predefined system families, which belong to the specific system within a project. For example, although the behavior of a wall is predefined, you can still create different types of walls with different compositions. You can also transfer system families between projects.

The following table shows an example of an element, a family, a type, and an instance.

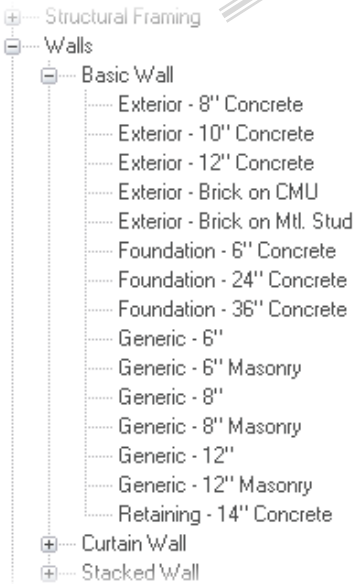
Option	Example
Element	Wall
Family/System family	Basic Wall
Type	Exterior - 12" Concrete
Instance	Actual user-drawn wall in a project

### Example of Families

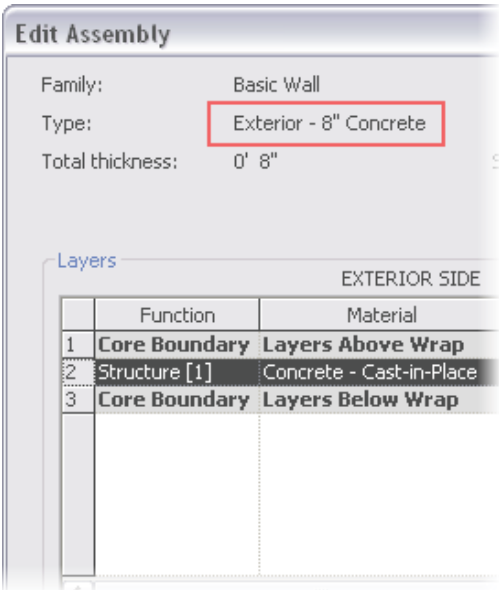
The following illustrations show a wall instance, different wall families, and a wall family type.



Wall instance



Wall families



Wall family type

# Guidelines for Working with Structural Elements and Families

The following recommended practices help you work efficiently with structural elements and families.

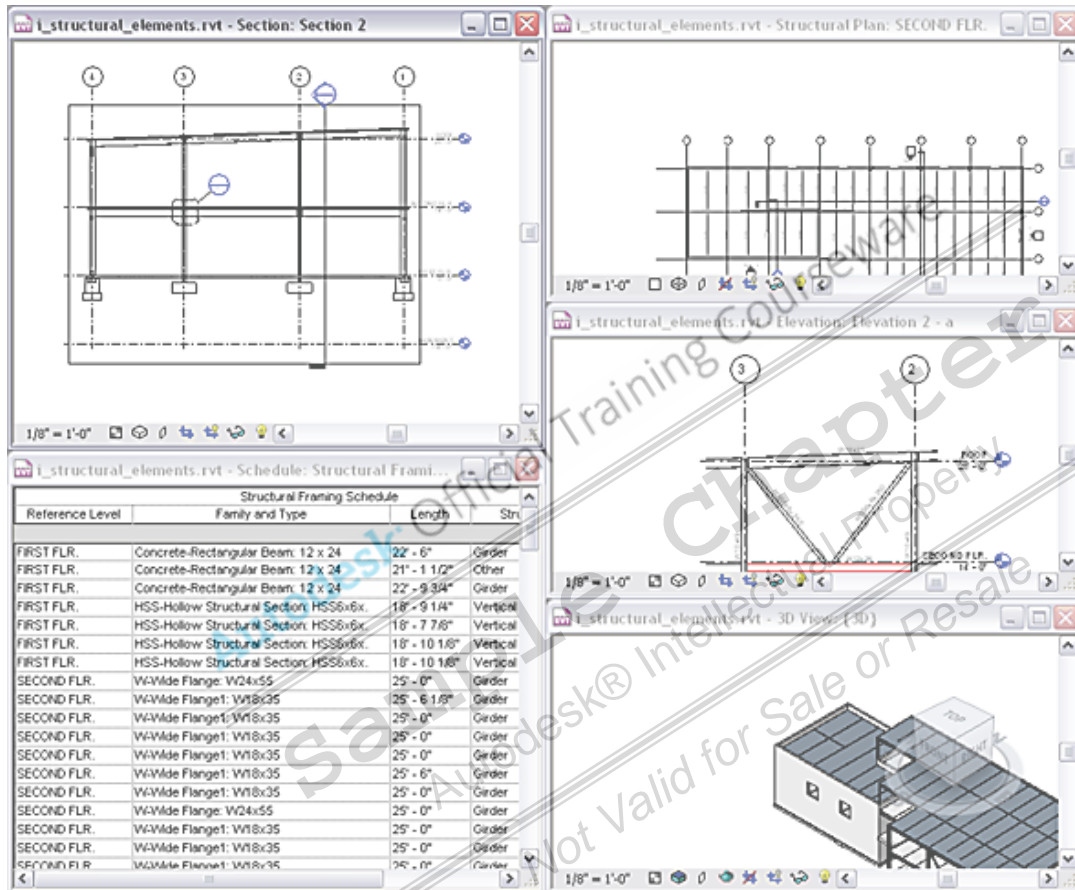
- Familiarize yourself with the predefined and custom content libraries. This enables you to reuse existing elements and saves the time and effort that goes into creating a library from scratch.
- Save the family in the appropriate library folder after you modify a structural element to create a new type within a family. This makes the new family type available across projects and to other users, if required.
- Avoid clicking the elements in a view while studying the view so that you do not modify elements by mistake. You can determine element families and types by placing the cursor over an element.

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## Exercise: Work with Structural Elements and Families

In this exercise, you view different types of structural elements, families, and types of families. You also change the parameters of a beam.

In your project, you want to view the different types of structural elements and families in different views.



The completed exercise



### Completing the Exercise

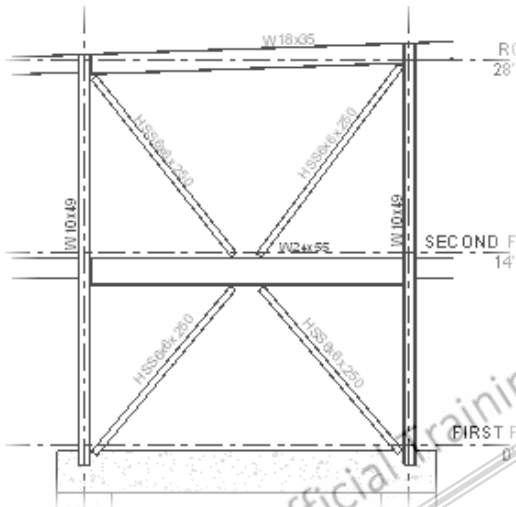
To complete the exercise, follow the steps in this book or in the onscreen exercise. In the onscreen list of chapters and exercises, click *Chapter 2: Revit Structure Basics*. Click *Exercise: Work with Structural Elements and Families*.

1. Open *i\_structural\_elements.rvt* or *m\_structural\_elements.rvt*. The file opens in the 3D view. The 3D view shows a steel frame and a concrete structure that contains host structural elements, such as slabs and walls. Component elements, such as slab edges and openings that are placed in the host elements, are also displayed.

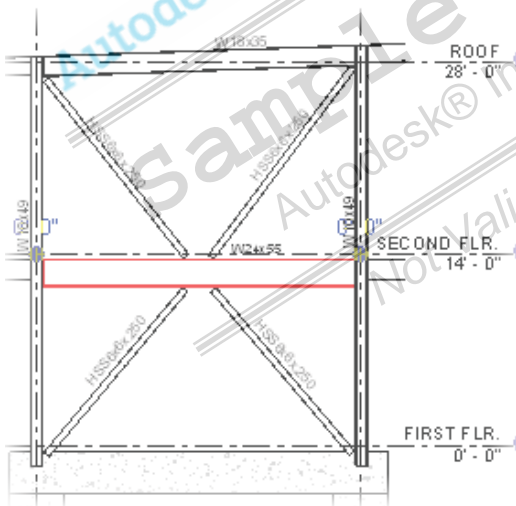
**NOTE:** The illustrations for the metric dataset will be slightly different from those shown here.



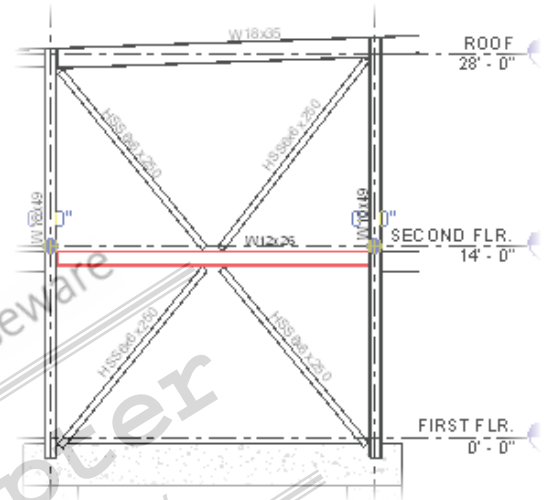
2. In the Project Browser, under Views (All), Elevations (Building Elevation), double-click Elevation 2 - a. Beams belonging to the same family but having different sizes are displayed in the view window.



3. Select the beam below the SECOND FLR. level.



4. Select W-Wide Flange1 : W12x26 (M\_W-Wide Flange : W310X38.7) from the Type Selector list to edit the beam type. Notice that the beam depth is updated.



5. In the Project Browser, under Views (All), Structural Plans, double-click SECOND FLR. to open the second floor drawing in the plan view. The view shows component, annotation, datum, and view elements.

6. In the Project Browser, under Schedules/Quantities, double-click Structural Framing Schedule. The framing schedule with details, such as Reference Level, Family and Type, Length, and Structural Usage, is displayed.

The schedule displays the Family Name and Type for component elements placed in the project. Reference Level, Length, and Structural Usage are instance parameters for the component elements.

7. In the Project Browser, under Views (All), Sections (Wall Section) ((Building Section)), double-click Section 2. The datum elements, such as levels and column grid, and annotation elements, such as section line and callout, are displayed.
8. Click Window menu > Tile. All the open views are displayed.
9. Close the file without saving.

# Chapter Summary

You have now been introduced to the Revit Structure user interface. You also learned to work with different types of structural elements and families.

Having completed this chapter, you can:

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

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