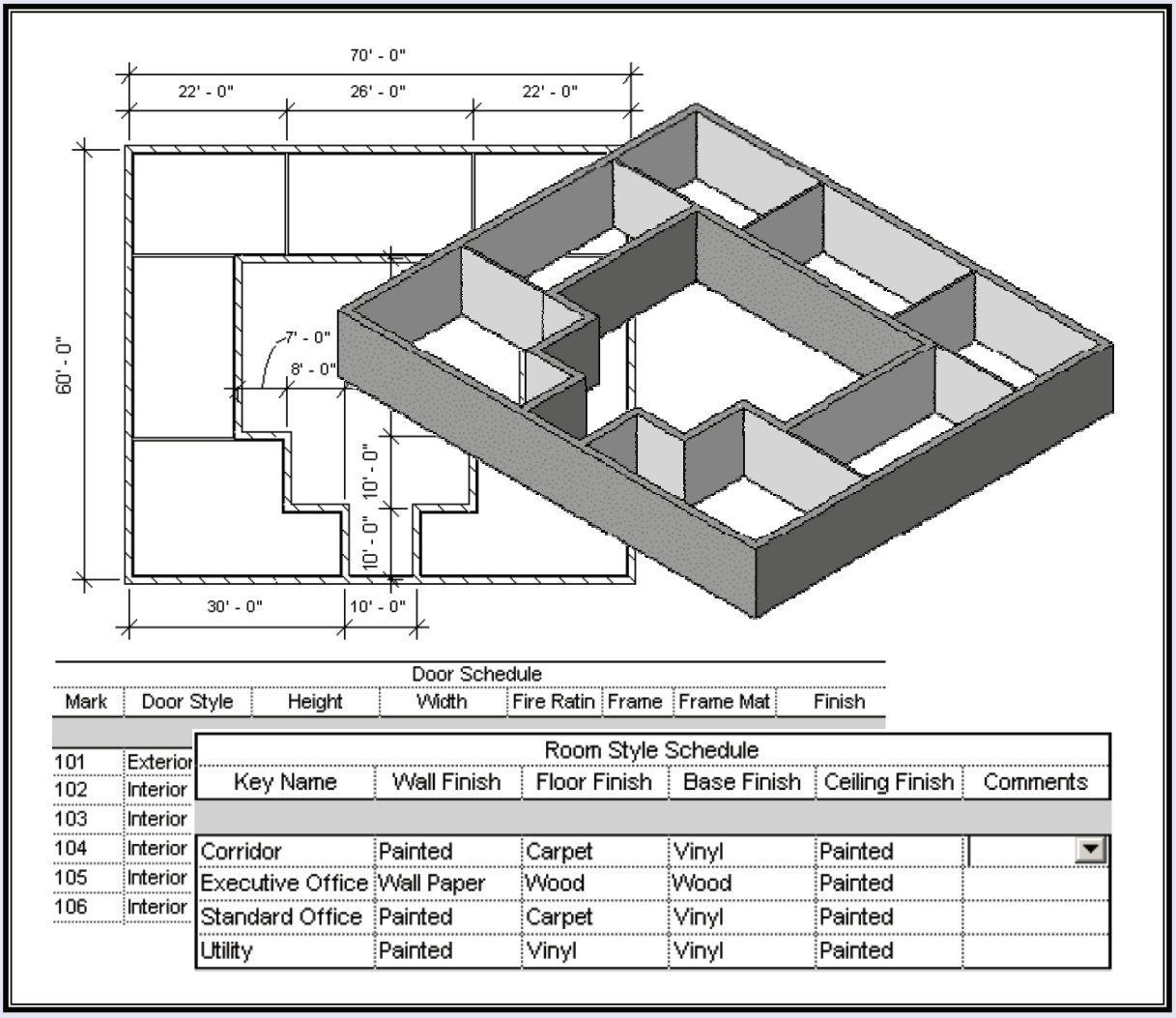
Revit® Architecture 2011

BIM Management



Door Schedule

Mark	Door Style	Height	Width	Fire Ratin	Frame	Frame Mat	Finish
101	Exterior						
102	Interior						
103	Interior						
104	Interior						
105	Interior						
106	Interior						

Room Style Schedule

Key Name	Wall Finish	Floor Finish	Base Finish	Ceiling Finish	Comments
Corridor	Painted	Carpet	Vinyl	Painted	
Executive Office	Wall Paper	Wood	Wood	Painted	
Standard Office	Painted	Carpet	Vinyl	Painted	
Utility	Painted	Vinyl	Vinyl	Painted	

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Chapter 1

Creating Custom Templates

In this chapter you learn how to prepare templates, create preset annotation styles, create title blocks, create object styles, and create materials and fill patterns.

This chapter introduces:

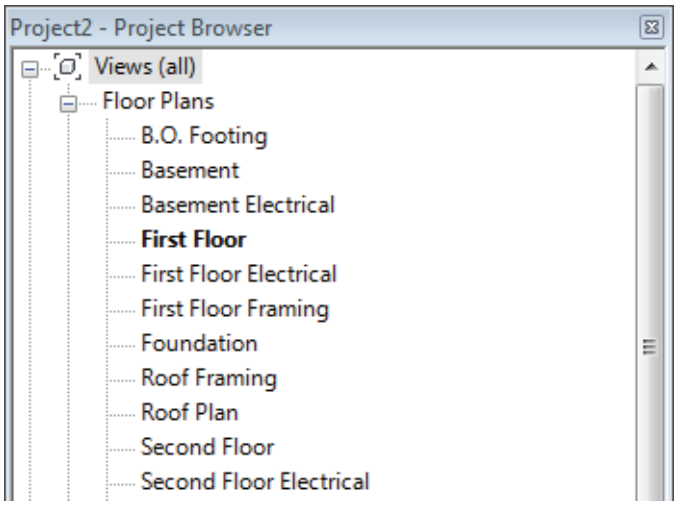
- ✓**Preparing Templates**
- ✓**Presetting Annotation Styles**
- ✓**Creating Title Blocks**
- ✓**Creating Object Styles**
- ✓**Materials and Fill Patterns**

1.1 Preparing Templates

A template is an existing project that holds information about component families, settings, and views, and sometimes geometry, all of which can be used to create a new project. You can have several templates for different types of buildings, such as residential, commercial, and industrial. If you do a lot of work for a specific client (e.g., a school system), you can create a template specifically for their projects with associated title blocks and other information. The aim is to save time with standards so that you can concentrate on the design.

Settings for Templates

Defining *Levels* in a template is helpful. They could be just a few basic floor plans for a residential project, as shown in Figure 1–1, or 100 stories for a high-rise.



Views Defined in the Residential Template

Figure 1–1

- Settings that are typically added to templates include Units, Snaps, Temporary Dimensions, Object Styles (Lineweights, Line color, and Line patterns), Line Styles, Materials, Fill Patterns, Annotation Styles (Text, Dimensions, Arrowheads, and Loaded Tags), Wall Types, Loaded Families, Views, Levels, Sheets, and Views on Sheets.

- To set the default template file, click Options in the Application Menu. In the Options dialog box, select the *File Locations* tab and select a file for the **Default t emplate file** option.

How to:

Create a Template File

The first step in customizing a template file is to create one where you can add the various settings, views, and other information. To save time, use an existing template that includes some of the basics rather than starting from scratch.

1. In the Application Menu, click (New).
2. In the New Project dialog box, select a template file to build from or select **None** for a blank project file.
3. In the *Create new* section, select **Project template**, as shown in Figure 1–2.

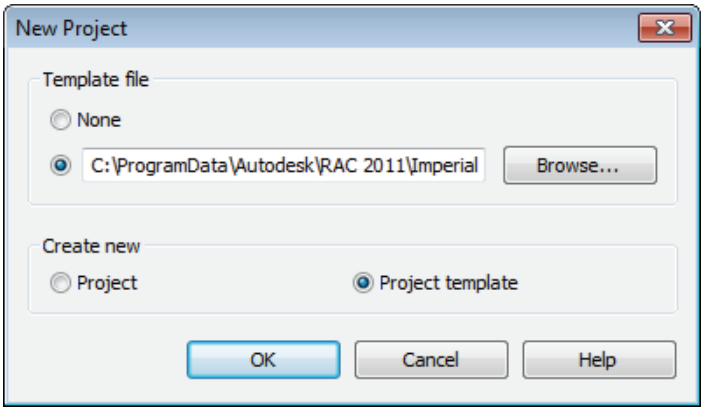


Figure 1–2

4. Click OK.
5. If you do not specify a template file, you are prompted to specify the initial unit system for the project: **Imperial** or **Metric**, as shown in Figure 1–3.

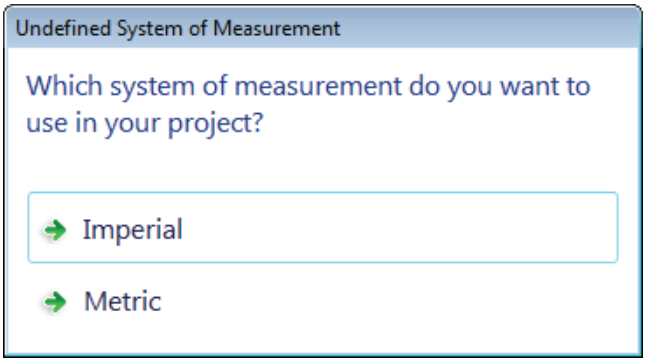


Figure 1–3

6. Add settings, families, views, and more as needed to the new file.
7. Save the template file.

- Project template files have the extension RTE.

Specifying Units

Even though you select Imperial or Metric units when you create the template, you can set up the Project Units with specific formats and options. For example, if you are working on a Civil project where everything is set up in feet, you would specify **Decimal Feet** as the *Length Format*. For an international metric project, you need to find out if the country typically uses Meters, Centimeters, or Millimeters as the length units.

How to:

Set Up Project Units

1. In the *Manage* tab>Settings panel, click (Project Units) or type **UN**.
2. In the Project Units dialog box, as shown on the left in Figure 1–4, in the *Format* column, click the button next to the type of units that you want to change. The related Format dialog box opens, as shown on the right in Figure 1–4.

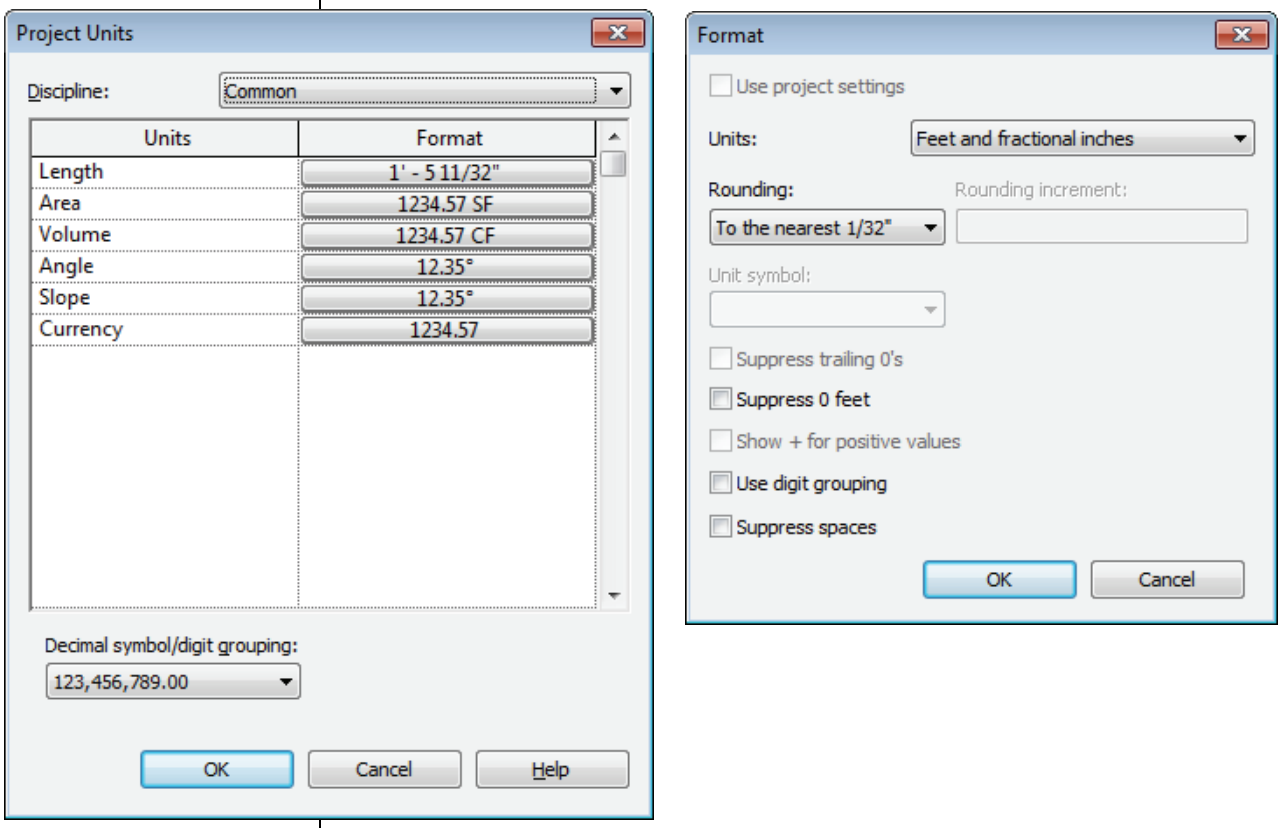


Figure 1–4

3. Select the *Units*, *Rounding*, and other options as needed.
4. If needed, select the *Discipline* (set to **Common** by default) and change the formats for each discipline. The other options are **Structural** and **Electrical**.
5. Click OK to close each dialog box.

Format Options

Each unit has specific formatting options. The option is grayed out if it is not applicable to that unit.

Units

Select the type of units in the *Units* drop-down list, as shown in Figure 1–5.

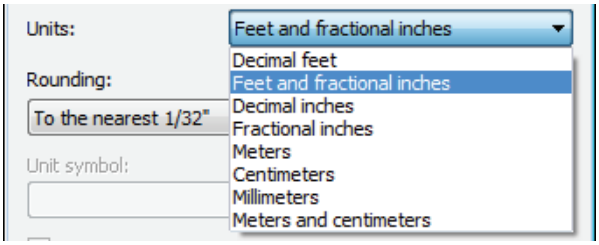


Figure 1–5

Rounding

Specify how tightly you want the dimensions to be rounded. The options depend on the *Units* you selected.

Unit Symbol

If you are using metric units, you can select from a unit symbol, such as **cm** for centimeters or **None**.

Suppress trailing 0's

(For decimal-based units) If selected, this option removes any trailing 0s. For example, it displays 1.5 instead of 1.50 if you are using two decimal places.

Suppress 0 feet

(Length and Slope only.) If selected, this option removes the 0 in front of a dimension in inches only. For example, instead of 0'-4", you see 4".

Use digit grouping

If selected, the unit uses the Decimal symbol/digit grouping specified in the Project Units dialog box, as shown in Figure 1–6.

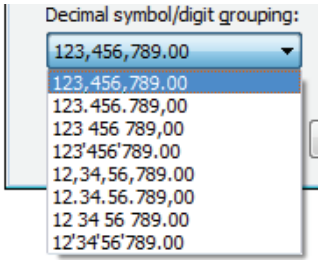


Figure 1–6

Suppress spaces

(Length and Slope only) If selected, this option removes the spaces between the feet and inches, so that a dimension reads 1'-2" rather than 1' - 2".

- The **Use project settings** and **Show + for positive values** options are grayed out when setting units for the project. This dialog box is also used when creating dimension styles or specifying label formats. At that point, the options are available.

Snap Settings

The Snaps dialog box controls *Dimension Snaps,* which are the increments you see in temporary dimensions, and *Object Snaps*, which are the points on elements that you can select . It also lists Temporary Overrides for which you can use a keyboard shortcut.

In the *Manage* tab>Settings panel, click (Snaps) to open the dialog box, as shown in Figure 1–7.

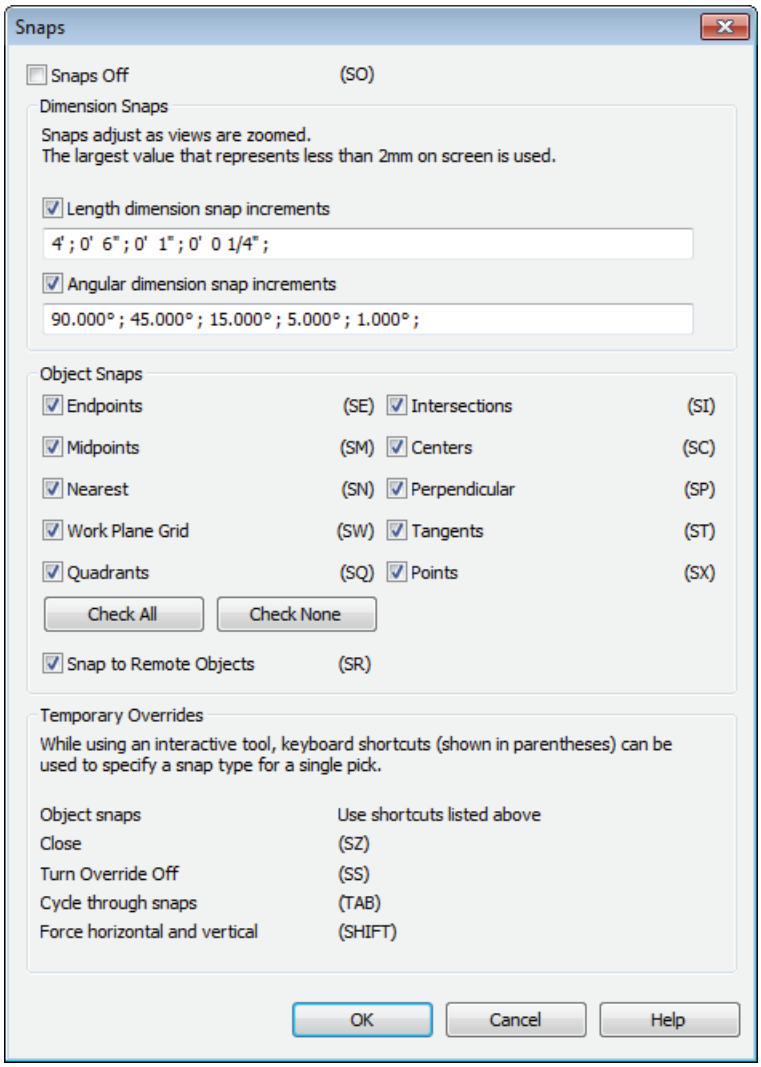


Figure 1–7

- If you want to snap to a specific type of snap, you can use the typed shortcuts you see listed in parentheses in the dialog box. Type the shortcut and the cursor only snaps to the type of snap you specify until you pick a point.

Customizing Shortcuts

You can use keyboard shortcuts for commands other than snaps. Hover your cursor over a tool, such as **Wall**, and display the tool tip to see the associated shortcut, as shown in Figure 1–8. Keyboard shortcuts can be customized.

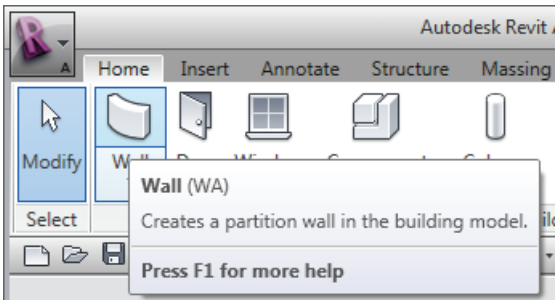


Figure 1–8

How to: Customize Keyboard Shortcuts

NEW IN 2011!

1. In the Application Menu, click Options.
2. In the Options dialog box, *User Interface* tab, *Configure* section, click Customize..., as shown in Figure 1–9.

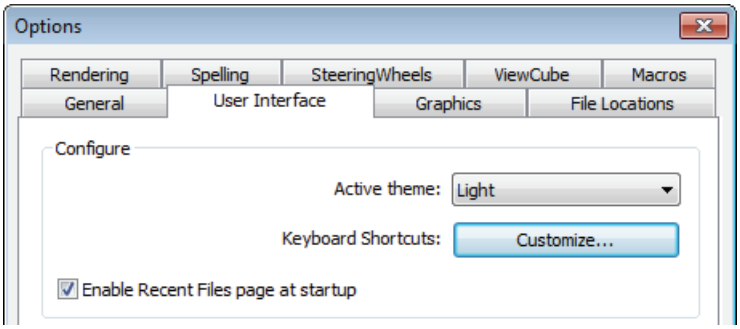


Figure 1–9

3. In the Keyboard Shortcuts dialog box, use the *Search* or *Filter* options to narrow the search, as shown in Figure 1–10.

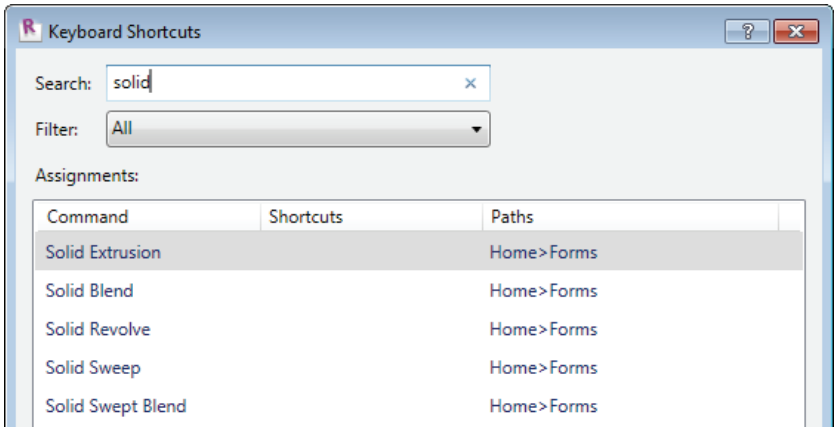
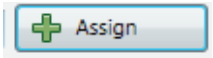


Figure 1–10

4. Select the command you want to add or modify.
5. In the *Press new keys* section, type in the shortcut you want to use, as shown in Figure 1–11, and click 

.

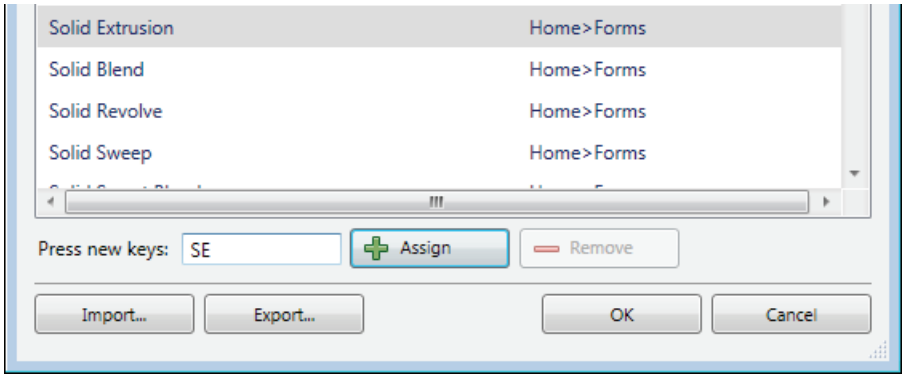
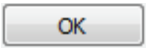


Figure 1–11

6. Click 

when you are finished.

- You can also remove shortcuts and import or export the shortcut file to be used in other copies of Revit.

Temporary Dimension Settings

Temporary dimensions display when you draw or edit building elements in Revit. By default, they measure from the center lines of walls to the center lines of openings, as shown in Figure 1–12.

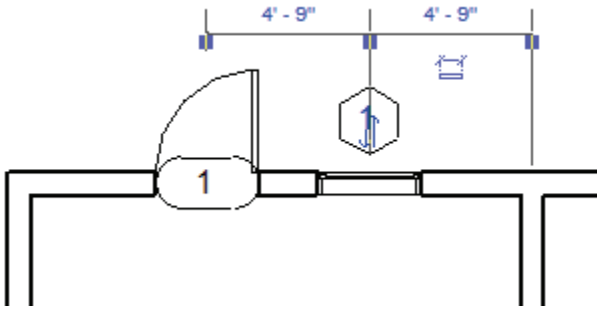


Figure 1–12

NEW IN 2011!

- When you move a witness line to another element or part of an element, the location is remembered within the current session of Revit.

You can control where dimensions are placed by default. In the *Manage* tab>Settings panel, expand (Additional Settings) and click (Temporary Dimensions) to open the Temporary Dimension Properties dialog box, as shown in Figure 1–13.

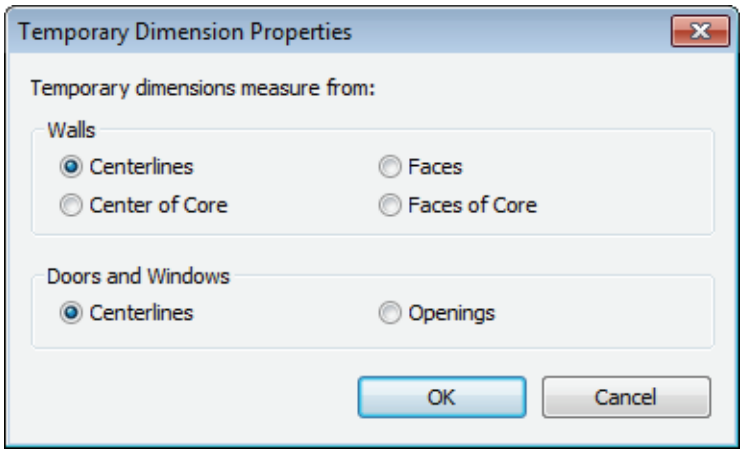


Figure 1–13

- Temporary dimensions can be attached to **Centerlines**, **Faces**, the center or face of the core objects in Walls, and the center lines or openings of Doors and Windows.
- You can set up these properties in the template file or modify them at any time. They do not affect existing elements in your project.

NEW IN 2011!

- You can control the size of the temporary dimension text in the Options dialog box on the *Graphics* tab, as shown in Figure 1–14.

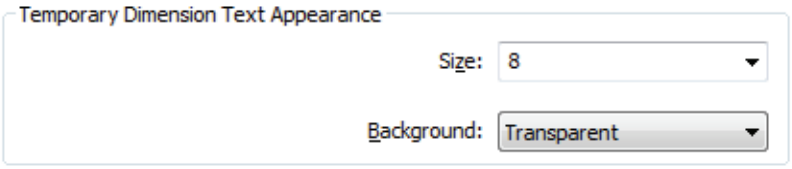


Figure 1–14

Practice 1a

Estimated time for completion: 10 minutes.

Preparing Templates

In this practice you will create a new template file, modify the units, snaps, and temporary dimensions, and add several new levels, as shown in Figure 1–15.

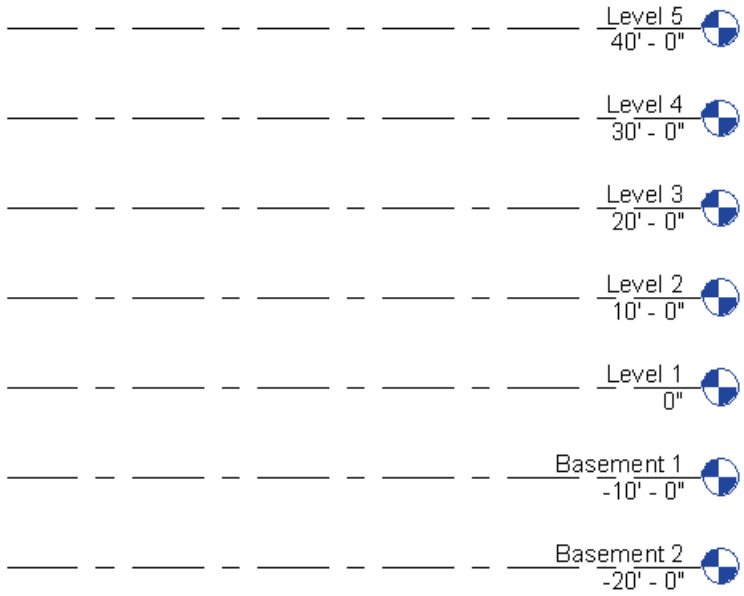


Figure 1–15

1. In the Application Menu, click (New).
2. In the New Project dialog box, select the default template file and **Project template**, as shown in Figure 1–16, and click OK.

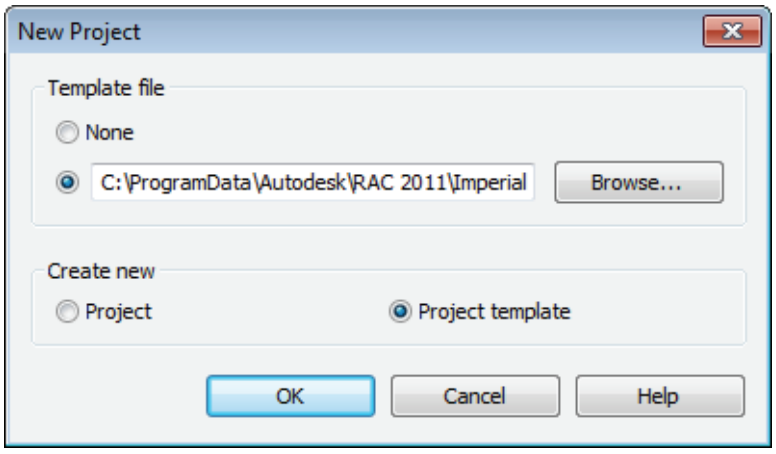
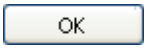


Figure 1–16

3. In the Quick Access Toolbar, click  (Save) and save the template in your class directory as **Midrise Template.rte**.

4. In the *Manage* tab>Settings panel, click  (Project Units) or type **UN**. In the Project Units dialog box, set the formats as follows:

Length:	
Units	Feet and Fractional Inches
Rounding	To the nearest 1/8”
Suppress 0 feet	Check
Angle:	
Rounding	0 decimal places

5. Click  to close the Units dialog box.

6. Set the Snaps and Temporary Dimensions as needed.

7. Switch to an elevation view and add three more levels above the current levels, at **10’-0”** apart. Add two more levels below Level 1 named **Basement 1** and **Basement 2**. These are also **10’-0”** apart. Creating the levels also creates their views.

   - If you draw the levels using  (Level), you can select the **Make Plan View** option in the Options Bar to create the associated views.
   - If you copy the existing levels, you need to create the plan views and ceiling plan views. In the *View* tab> Create panel, expand  (Plan Views) and click  (Floor Plan) and/or  (Reflected Ceiling Plan).

8. Switch back to the **Level 1** floor plan view and save the template.

1.2 Presetting Annotation Styles

Another set of elements you can customize in your template file is Annotation Styles. These range from how the arrowheads look to dimensions, text types, and tags, as shown in Figure 1–17.

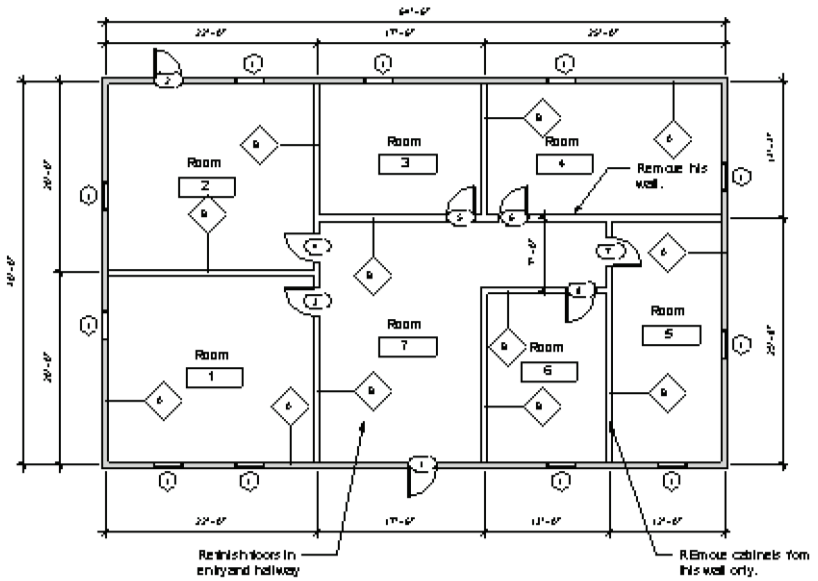


Figure 1–17

Text, Dimensions, and Arrowheads are all system families. This means they have a standard set of parameters, which you can modify and save as a type. Callout, Section, and Elevation tags can be modified slightly within Revit. Most tags are created using families.

Creating Text Types

Text types are used to standardize text formatting (such as the font, text height, etc.), as shown in Figure 1–18. They apply to both standard text and Model Text in Revit.

A FANCY FONT AT 1/4"

A HAND LETTERING FONT AT 1/8"

A HAND LETTERING FONT AT 5/32"

Figure 1–18

- The **Text** command places text at the height you need for the final plot (e.g., 1/8” high). The view scale controls the height of the standard text in the views.

- The **Model Text** command places text that is typically used on the building, such as the signage shown in Figure 1–19. Text types for Model Text should be the full height of the text and are not affected by the view scale.

Figure 1–19

How to:

Create a Text Type

1. Start the **Text** or **Model Text** command. (Place the **Model Text** and select it.)
2. In Properties, click Edit Type.
3. In the Type Properties dialog box, click Duplicate....
4. Type a new name.
5. Modify the parameters as needed for the new type, as shown for annotation text in Figure 1–20.

Type Parameters

Parameter	Value
Graphics	
Color	Black
Line Weight	1
Background	Opaque
Show Border	
Leader/Border Offset	5/64"
Leader Arrowhead	Arrow 30 Degree
Text	
Text Font	Arial
Text Size	1/4"
Tab Size	1/2"
Bold	
Italic	
Underline	
Width Factor	1.000000

Figure 1–20

6. Click Apply if you want to create another type.
7. Click OK twice if you are finished.

Dimensions

Dimensions are one of the more complex system families in terms of the number of parameters you can modify. You can create three typical types: linear, radial, and angular, as shown in Figure 1–21, as well as types for **Spot Elevation**, **Coordinate**, and **Slope**.

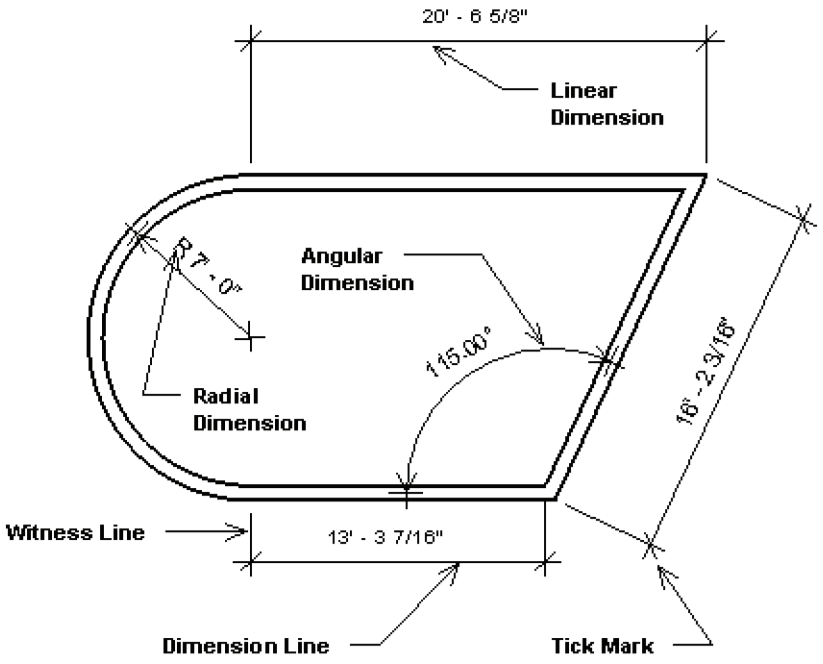


Figure 1–21

- Values for the parameters (such as text size, witness line extension, etc.) are the actual plot size for these elements. The view scale controls how large they are in the drawing.

How to:

Create Dimension Types

1. In the *Annotate* tab>Dimension panel, expand the Dimension panel title, as shown in Figure 1–22, and click  next to the dimension type you want to create.

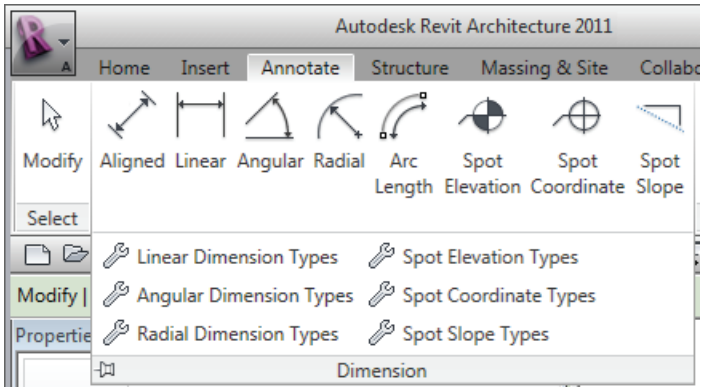


Figure 1–22

2. In the Type Properties dialog box, click Duplicate... to create a new type.
3. Modify the parameters as needed for the new type.
4. Click OK when you are finished.

Dimension Type Options

The dimension type parameters include the *Graphics* of the dimension (such as *Tick Mark* and *Line Weight*), as shown in Figure 1–23 for Linear dimensions, and the *Text* formatting (scroll down to view).

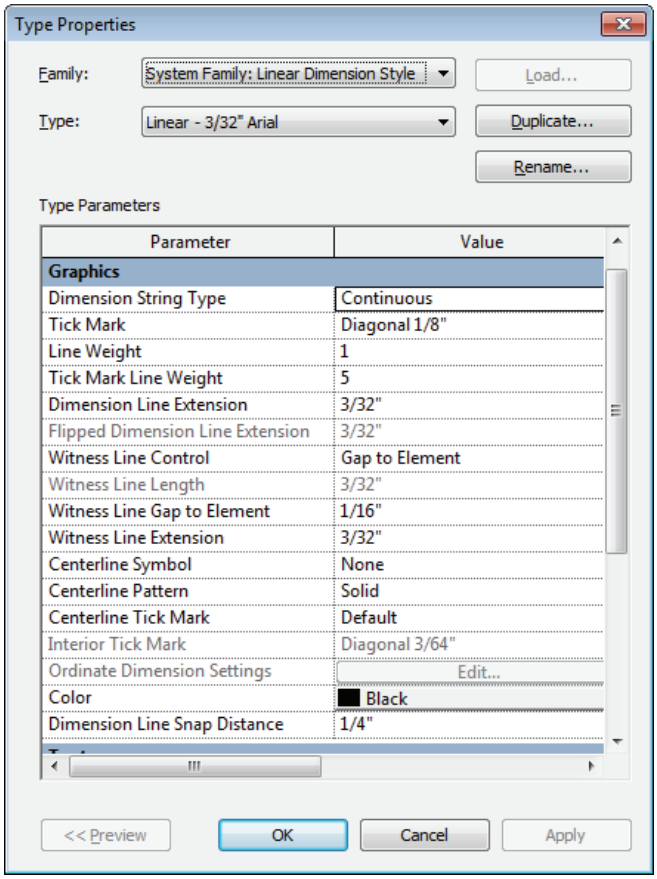


Figure 1–23

- You can specify a *Text Background* option. If you set the value to **opaque**, it automatically masks any elements behind the text. If it is set to **transparent**, anything the text overlaps is still visible.

- You can set the units for Linear/Radial dimensions and Angular dimensions. For example, if you are drawing a detail, you might want to create a dimension type that displays the distance in 1/16" inch rather than a project standard of 1/8".

- If you are dimensioning doors and windows by their widths rather than their centers, you can also have the opening height displayed with the dimension. Select the **Show Opening Height** option.

Arrowheads

A variety of arrowhead types are supplied with Revit, including open and filled arrow styles, tick marks, and dots. You can also create custom styles by duplicating an existing style and defining the parameters, such as the *Arrow Style* shown in Figure 1–24.

In the *Manage* tab>Settings panel, expand (Additional Settings) and click (Arrowheads) to open the dialog box.

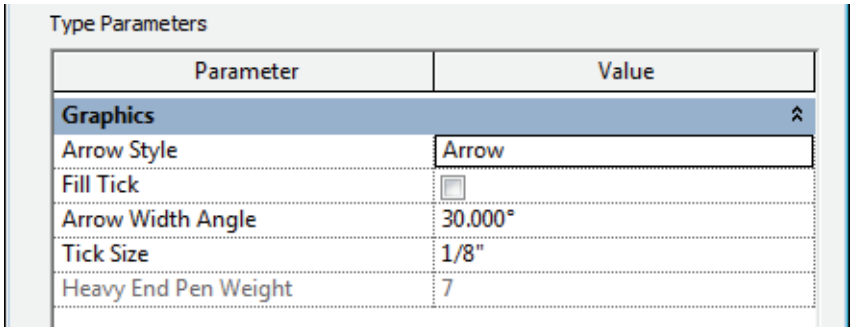


Figure 1–24

- Arrowheads are used by both text (with a leader) and dimensions.

Callout, Elevation, and Section Tags

Callout, Elevation, and Section tags can be modified to suit an office standard. In the *Manage* tab>Settings panel, expand (Additional Settings) and click (Callout), (Elevation), or (Section). Then, in the Type Properties dialog box, duplicate an existing tag and make changes to the type parameters.

The **Callout Tags** parameters specify a *Callout Head* and the *Corner Radius* of the callout box, as shown in Figure 1–25.

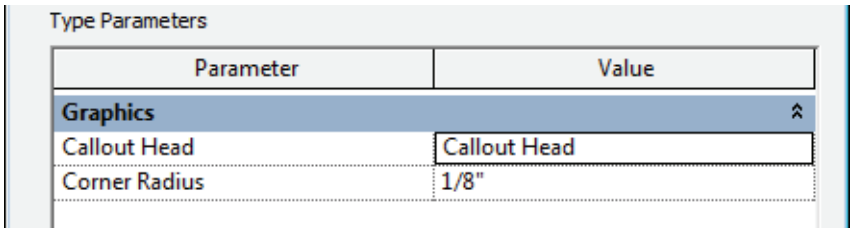


Figure 1–25

The **Elevation Tags** parameter is the *Elevation Mark*. You can choose from a variety of types that come with Revit, as shown in Figure 1–26. For example, you may want to set the exterior elevation mark to display a square body and the detail number on the sheet where it is placed.

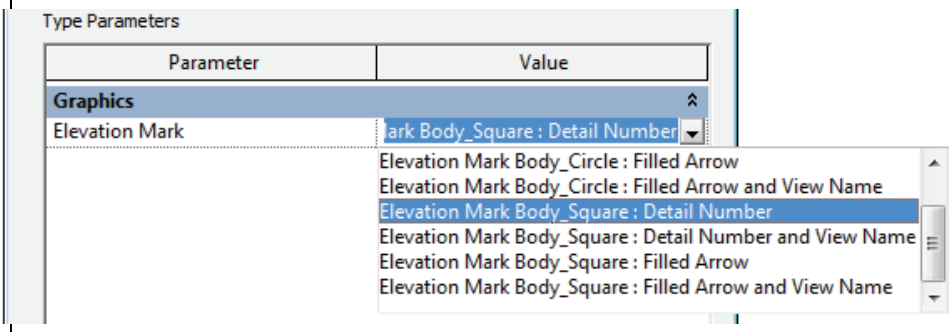


Figure 1–26

The **Section Tags** parameters include both the *Section Head* and *Section Tail*, as well as the *Broken Section Display Style*, as shown in Figure 1–27.

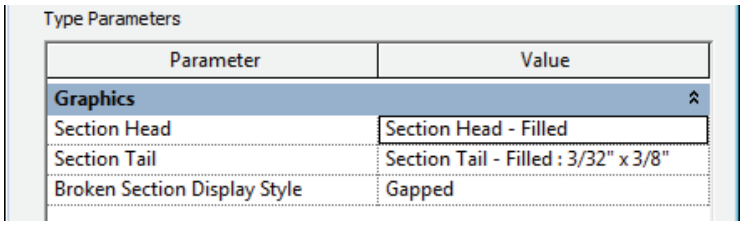


Figure 1–27

- Once you set up these tags, you can connect them with the tag types used in the (Callout), (Elevation), and (Section) commands. In Properties, click Edit Type and set up the type parameters, as shown for a Building Elevation in Figure 1–28.

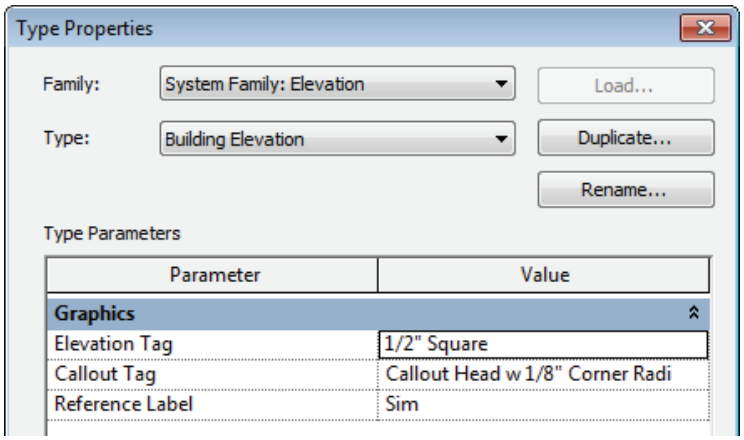


Figure 1–28

Loaded Tags

Tags are graphical information about elements in your drawing, such as the door, window, and wall tags shown in Figure 1–29. You can load tags from the Library to use in a project. Just as having text and dimension types set up is helpful, having the specific tags required for your projects set up in the template file is also helpful.

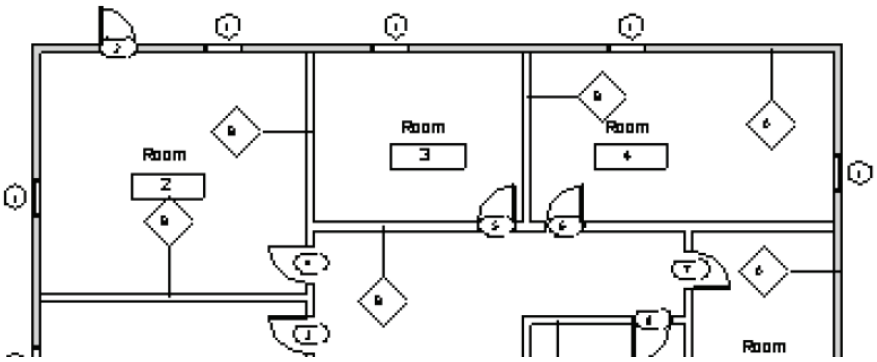


Figure 1–29

Tags are created as separate drawings and stored in the Library. In the Tags dialog box, you can easily load the tags you need from the Library into the project template, as shown in Figure 1–30. Therefore, when you start the **Tag** command, the one you need is available.

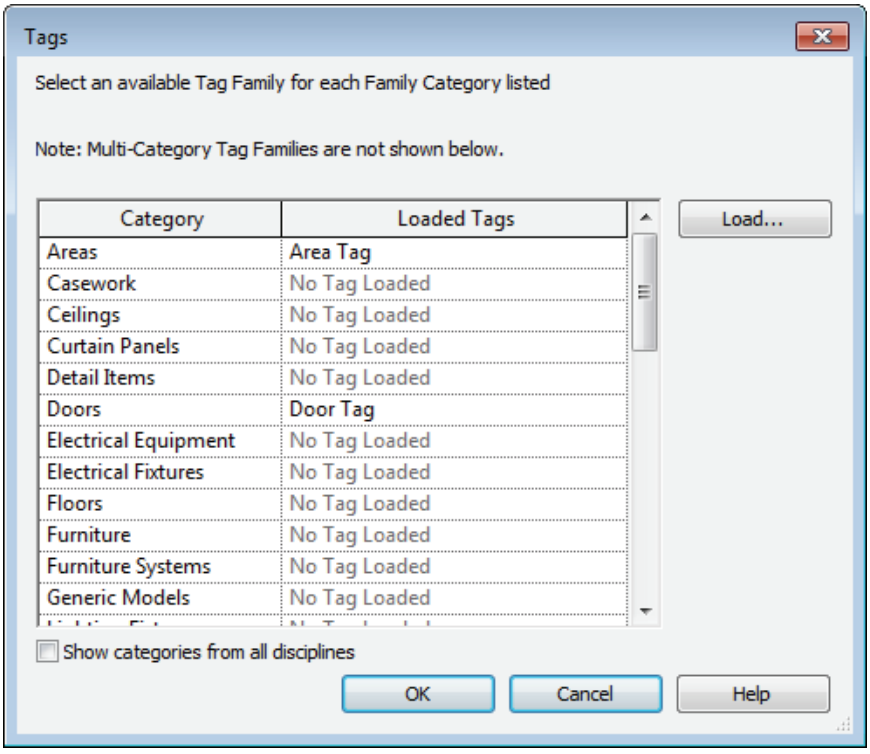


Figure 1–30

How to:

Specify Loaded Tags

1. In the *Annotate* tab>Tag panel, expand the panel title and click  (Loaded Tags).
2. In the Tags dialog box, click Load....
3. In the Library, open the *Annotations* folder.
4. Select the required tags and click Open. Hold down <Ctrl> to select multiple tags.
5. When you have loaded all of the tags that you typically need for a project, click OK.

Practice 1b

Estimated time for completion: 10 minutes.

Presetting Annotation Styles

In this practice you will create several text types, add a dimension style that uses arrows, as shown in Figure 1–31, and load typical tags into the template file.

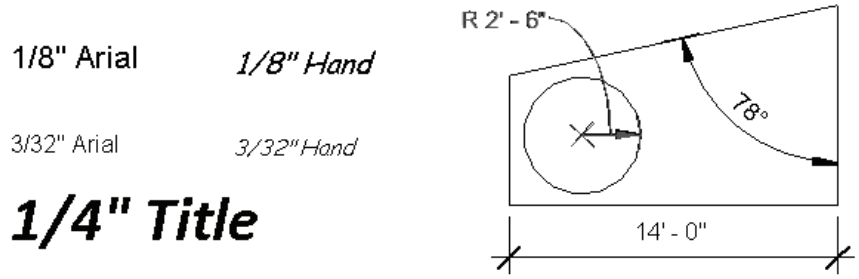


Figure 1–31

1. Continue working in the template **Midrise Template.rte**.

   If you did not complete the previous practice, open **Midrise Template-Annotation.rte** from your class folder.

2. Create the following text types:

1/8” Arial	Use the default, but set the *Height* to **1/8”**.
1/8” Hand	Use a hand-lettering *Font*, such as **Comic Sans MS**, and select *Italic*.
3/32” Hand	Same as above with a *Height* of **3/32”**.
1/4” Title	Use the font of your choice, in bold.

3. Create a dimension style that uses arrowheads for radial and angular dimensions. Modify other parameters if desired. You can create an additional arrow type if time permits.

4. Load the following tags into the template:

Architectural	Casework, furniture, and furniture systems
Civil	Parking and planting

5. Save the template.

1.3 Creating Title Blocks

Title blocks contain information about the company and consultants designing the project, project information, and sheet-specific information, as shown in Figure 1–32. This information might include but is not limited to the following: the project name, address, number, sheet number, revisions, and other parameters. Some of this information never change, some change by project, and some change for each sheet.

Labels and Revision Schedules are specifically used in title blocks.

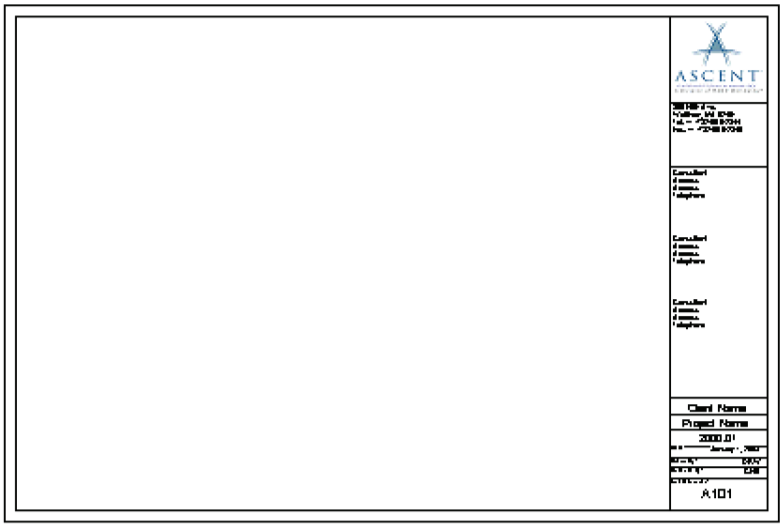


Figure 1–32

- You can create permanent information in the title block by sketching lines and adding text, symbols, and regions. The variable information is stored in labels.

How to:

Create a Title Block

1. In the Application Menu, expand (New) and click (Title Block).
2. In the New Title Block - Select Template File dialog box, select a template file from the list and click Open. A new family drawing file opens and the Family tools display in the Ribbon, as shown in Figure 1–33.

You can choose from several preset sizes or create a custom size.

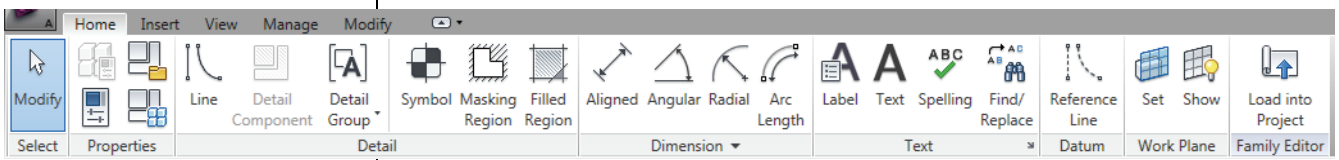


Figure 1–33

- If you select a template with a standard size, a rectangle of that size displays in the view.
- If you select **New Size**, a rectangle with dimensions displays. Edit the dimensions to modify the size.

3. Add dimensions, lines, filled regions, symbols, text, labels, etc., as needed.
4. Save the file and close it.

- Dimensions in the family file are not displayed when the title block is inserted.

Adding Labels

Labels are a special kind of text that is added to title blocks or tags that you can change without modifying the rest of the elements. For example, you would use annotation text for the words **Drawn By:** and a label for the initials of the person who did the drawing (by default displaying DRW in Figure 1–34), because that varies from drawing to drawing.

Figure 1–34

- The title block template comes with one text type and one label type already defined. You can create additional types in Properties. The Text and Label parameters are the same, but you must create separate types for each of them.

How to: Create a Label

1. In the Family Editor, in the *Home* tab>Text panel, click (Label).
2. In the *Modify|Place Label* tab>Format panel, specify the alignments: **Left**, **Center**, **Right**, **Top**, **Center Middle**, or **Bottom**, as shown in Figure 1–35.

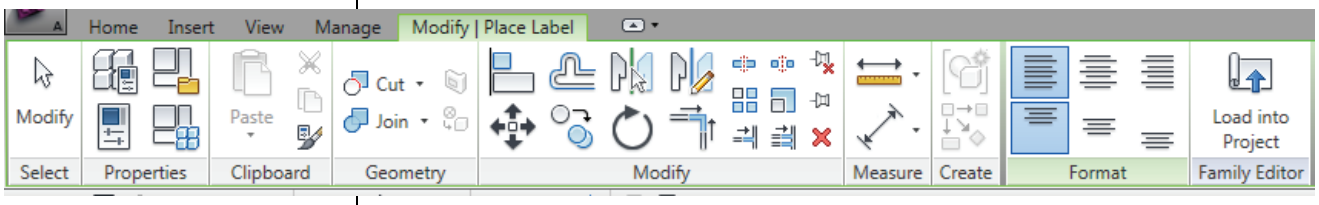


Figure 1–35

3. Click in the drawing area to place the label, as shown in Figure 1–36.

Figure 1–36

4. In the Edit Label dialog box shown in Figure 1–37, select a label in the *Category Parameters* list and double-click or click  (Add parameter[s] to label). You can select more than one by holding down <Ctrl>.

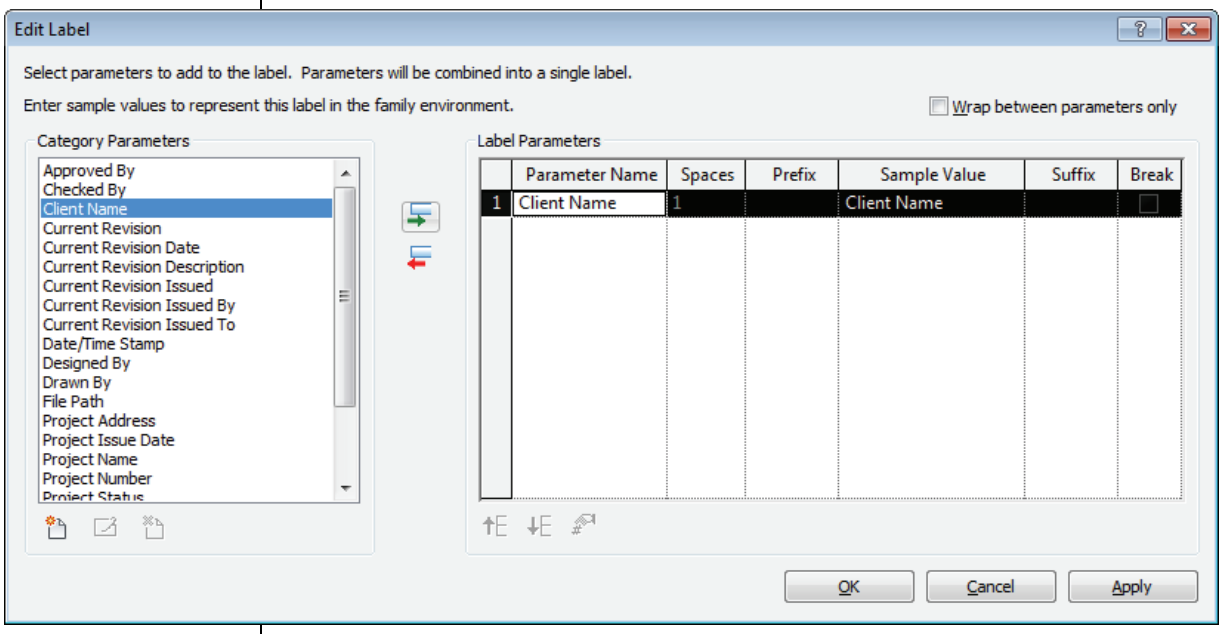


Figure 1–37

5. Enter the *Sample Value* and specify any other options as needed.
   - If you are using several parameters in one label, select the **Wrap between parameters only** and **Break** (in column) options to separate them while still permitting a word wrap.
   - Click  (Add Parameter) to create a new parameter for the project.
   - Click  (Move parameter up) and  (Move parameter down) to reorder multiple labels.
6. Click 

.

7. Rotate or stretch the label as needed (as shown in Figure 1–38), or select a point for an additional label.

Figure 1–38

8. Click (Modify) or press <Esc> twice to finish the command.

Adding Revision Schedules

A table of revisions included in a project and/or sheet is typically added to a company title block. In Revit you can create a Revision Schedule that is then linked to the Revision Table in the project.

How to:

Add Revision Schedules to Title Blocks

1. In the Family Editor, in the *View* tab>Create panel, click (Revision Schedule).
2. In the Revision Properties dialog box, select the fields you want to use. Several are already selected for you, as shown in Figure 1–39.

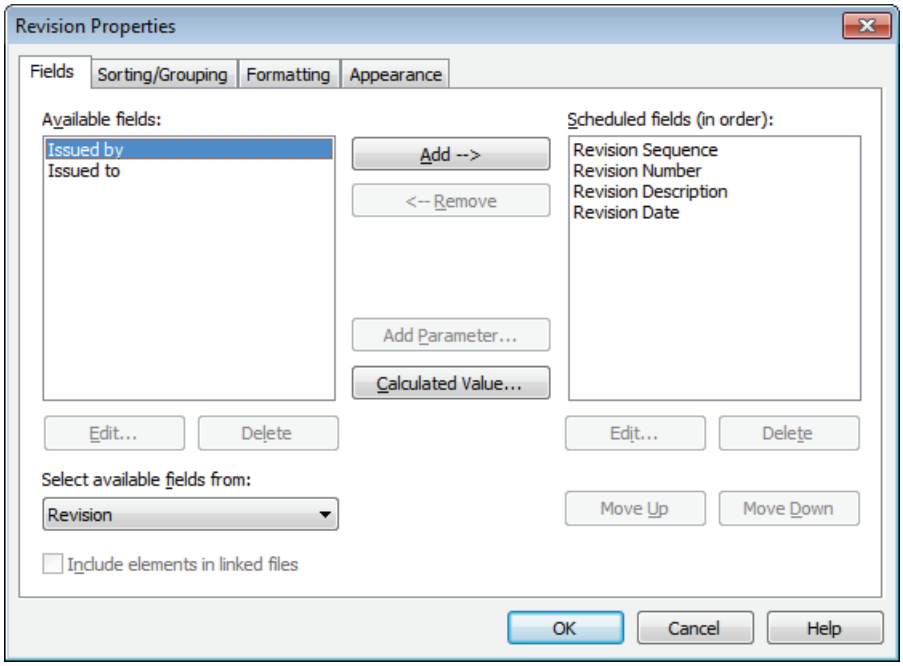


Figure 1–39

3. Modify the options in the *Sorting/Grouping* and *Formatting* tabs as needed.

4. In the *Appearance* tab, select how you want to build the schedule: from the **Top-down** or **Bottom-up**. You can also set the *Height* to **Variable** or **User-Defined**.
5. Click OK. The schedule view displays.
6. In the Project browser, open the Sheet view (it has no name).
7. Drag and drop the schedule onto the sheet and modify the controls, as shown in Figure 1–40.

*If the height is set to **User-Defined**, an additional control is displayed at the bottom of the schedule. Use it to set the height of the schedule.*

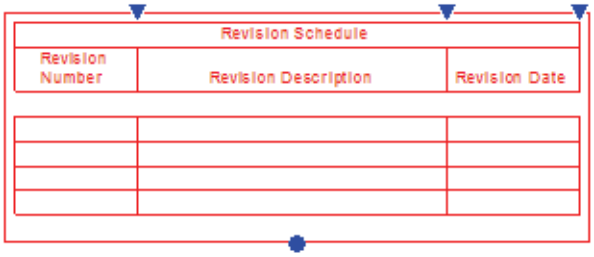


Figure 1–40

- In the Options Bar, you can change the *Rotation on the Sheet* to **None**, **90° Clockwise**, or **90° Counterclockwise**.

Using a Custom Title Block in a Template

You can set up templates using the custom title block in two ways. You can add all or most of the sheets typically needed in a project, or you can create a Sheet List Schedule that can be used to automatically create sheets when they are needed.

How to:

Load a Title Block into a Template

1. Open the template.
2. Return to the custom title block family. In the Family Editor panel, click (Load into Project).
3. In the Load into Projects dialog box, select the project you want the title block loaded into and click OK. If only one project is open, it is loaded into the project automatically.
4. The title block is now available when you create a sheet.

- If the title block family is not open in Revit, then you can use (Load Family) to access it or Load... in the New Sheet dialog box.

- When you save a title block, it should be on the network where everyone has access to it. That way, it is not deleted if someone reinstalls Revit. Set the default location for the family template files in the Options dialog box, in the *File Locations* tab, as shown in Figure 1–41.

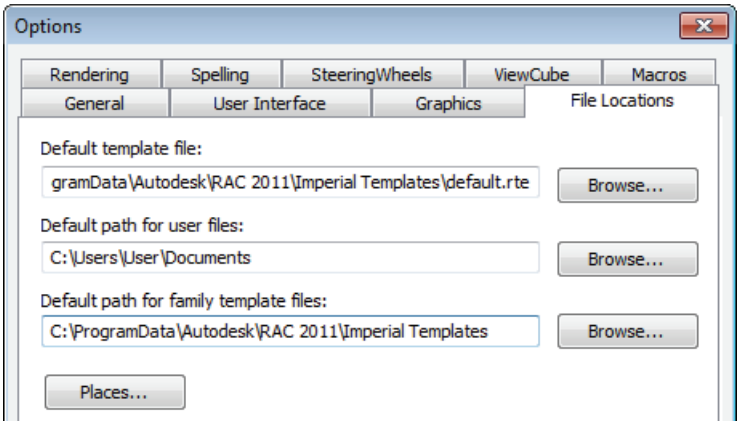


Figure 1–41

How to:

NEW IN 2011!

Create a Sheet List Schedule

1. Open a template file (or a project).
2. In the *View* tab>Create panel, expand (Schedules) and click (Sheet List).
3. In the Sheet List Properties dialog box, *Fields* tab, select the **Sheet Number** and **Sheet Name** and add them to the *Scheduled fields* list. Put them in the order shown in Figure 1–42.

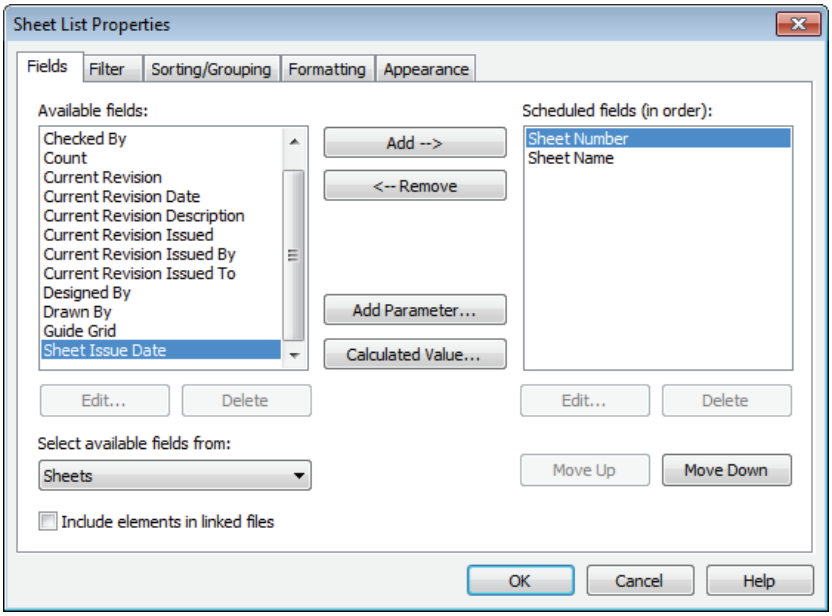


Figure 1–42

4. Depending on the complexity of your sheet naming scheme, you can also modify items on the *Filter* and *Sorting/Grouping* tabs.
5. Click OK when you are finished.
6. You are placed in the schedule view with the two parameters displayed. Stretch out the columns as shown in Figure 1–43.

Sheet List	
Sheet Number	Sheet Name

Figure 1–43

7. In the *Modify Sheet List* tab, as shown in Figure 1–44, in the Rows panel, click (New).

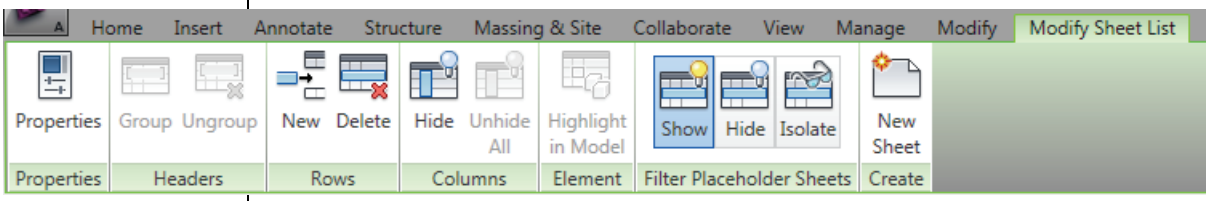


Figure 1–44

8. A new row is added below the schedule names. If no sheets are in the drawing, it comes in automatically as **A101** and **Unnamed**.
9. Add as many rows as you have sheets. If you are using a numbering scheme such as A1xx for site plans, A2xx for Floor Plans, A3xx for Detail plans, etc., then you should rename the sheet number for the first row of a set before creating more rows so that they increment automatically.
10. Enter the name of each sheet. Once you have added a new name, it is available in the drop-down list, as shown in Figure 1–45.

Sheet List	
Sheet Number	Sheet Name
A101	Site Plan
A102	Site Plan
A201	Floor Plan
A202	Floor Plan
A203	Floor Plan
A204	Unnamed
A301	Floor Plan
A302	Site Plan
A303	Unnamed
A304	Unnamed
A401	Unnamed
A402	Unnamed
A403	Unnamed
A404	Unnamed

Figure 1–45

How to:

NEW IN 2011!

Use Sheet List Tables

1. Create a new sheet. In the Sheet List Schedule view, in the *Modify Sheet List* tab>Create panel, click (New Sheet), You can also access the command on the *View* tab or right-click on *Sheets* in the Project browser.
2. In the New Sheet dialog box, select the placeholder sheets you want to use, as shown in Figure 1–46. To select more than one, hold down <Ctrl> or <Shift> as you select.

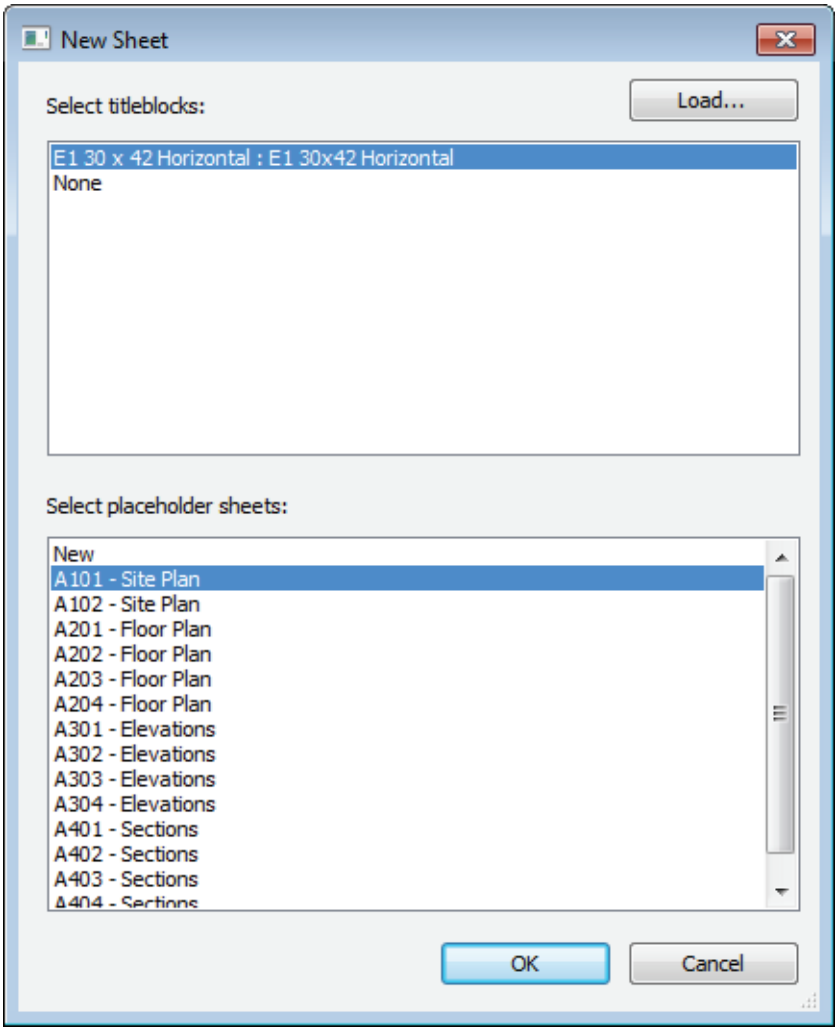


Figure 1–46

3. Click OK. The new sheets are created in the project.

- This sheet list is available in all projects based on the template where it was created.
- You can import the sheet list schedule into another project, but it does not import the associated sheets. That is because they are part of the project, not the schedule view.

Practice 1c

Estimated time for completion: 15 minutes.

Creating Title Blocks

In this practice you will create a new title block by adding lines, text, labels, a logo, and a Revision Schedule, as shown in Figure 1–47. You will then load it into a template file and create several standard sheets as well as a Sheet List Schedule.

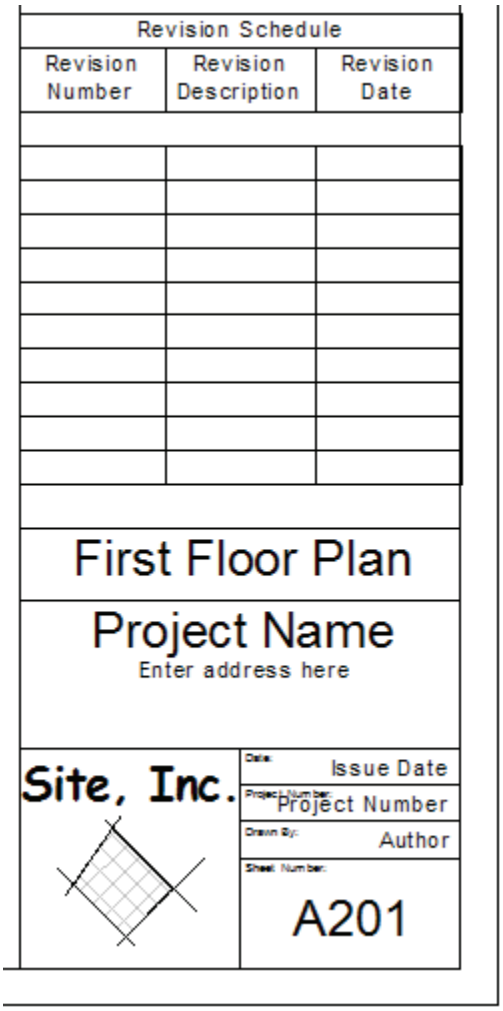


Figure 1–47

Task 1 - Create a title block.

1. In the Application Menu, expand (New) and click (Title Block).
2. Load the **D-sized** template.

3. In the *Home* tab>Detail panel, click (Line) and create lines on the inside of the existing rectangle **1/4"** away from the top, bottom, and right sides. Draw a line **1"** away on the left margin. Trim the lines as needed.

4. Draw lines in the lower right corner of the title block, as shown in Figure 1–48.

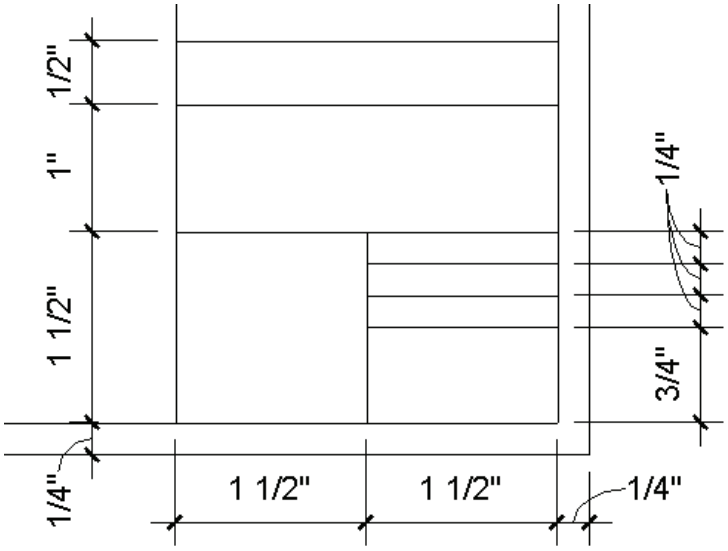


Figure 1–48

5. In the *Home* tab>Text panel, click (Text).

6. In Properties, click Edit Type and create the following Text types:

Type Name	Font	Size	Bold	Background
Arial 1/16"	Arial	1/16"	No	Transparent
Logo	Your choice	1/4"	Yes	Transparent

7. In the *Home* tab>Text panel, click (Label).

8. In Properties, click Edit Type and create the following Label types:

Type Name	Font	Size	Bold	Background
Arial 1/8”	Arial	1/8”	No	Transparent
Arial 1/4”	Arial	1/4"	No	Transparent

9. Using the graphic shown in Figure 1–49 and the steps outlined below, add text, labels, and graphics to the title block.

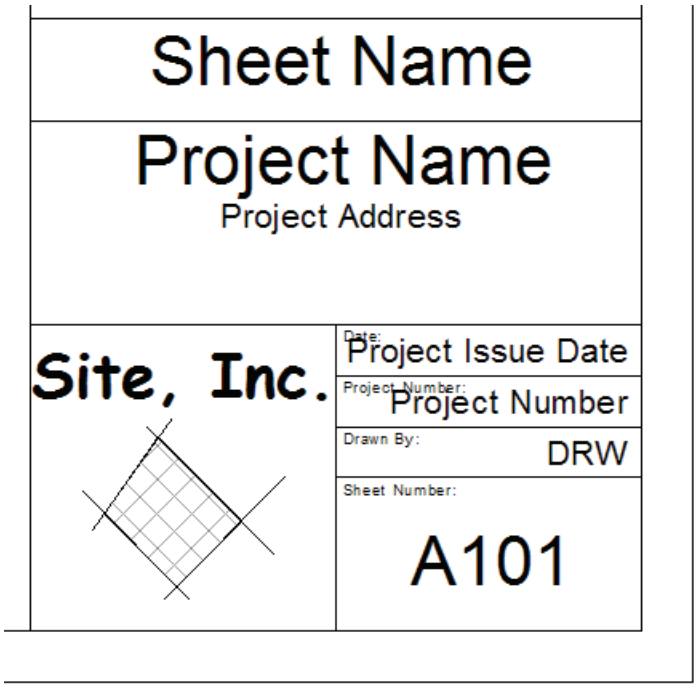


Figure 1–49

- Use (Text) with the *text type* **Arial 1/16"** to add text in the lower right spaces for the *Date*, *Project Number*, *Drawn By*, and *Sheet Number*.
- Use (Label) with the *label type* **Arial 1/4”** and (Align Center) justification to add the *Sheet Name*, *Project Name*, and *Sheet Number*. Move and stretch the labels to fit in the title block.
- Using the *label type* **Arial 1/8”** and (Align Center) justification, add the *Project Address* below the *Project Name*.
- Using the *label type* **Arial 1/8”** and (Align Right) justification, add the *Project Issue Date*, *Project Number*, and *Drawn By*.
- Add the **Logo** text in the box on the lower left side, shown as Site, Inc. in the title block. Draw lines and add a filled region for a graphic logo as needed.

10. Save the title block in your class directory with the name **TBLK-D.rfa**.

Task 2 - Add a Revision Schedule.

1. In the title block Family Editor, in the *View* tab>Create panel, click (Revision Schedule).
2. In the Revision Properties dialog box, *Fields* tab, set up the fields as shown in Figure 1–50.

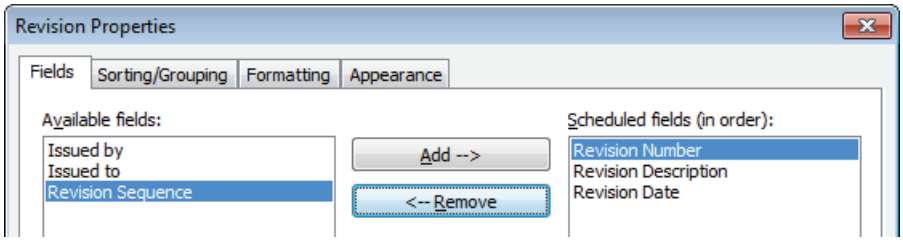


Figure 1–50

3. Accept the defaults for the *Sorting/Grouping* and *Formatting* tabs.
4. Select the *Appearance* tab and change the *Height* to **User defined**.
5. Click OK.
6. In the Project browser, expand *Views (all)* to see the *Schedules* and *Sheets (all)* sections, as shown in Figure 1–51. In the *Sheets (all)* section, open the **-** view.

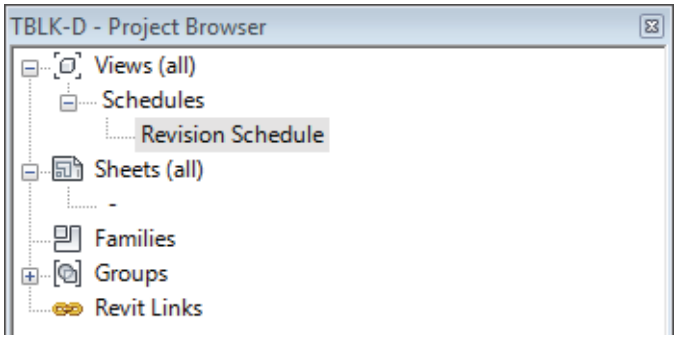


Figure 1–51

7. Drag and drop the Revision Schedule onto the sheet.

8. Move it above the sheet name and resize it to display several lines, as shown in Figure 1–52.

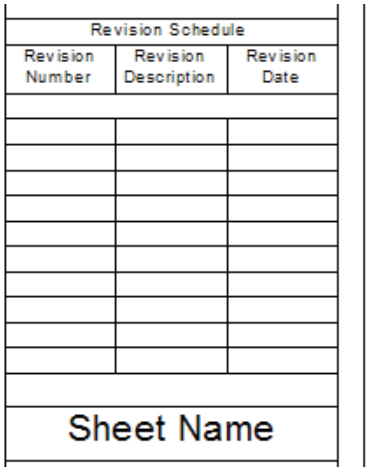


Figure 1–52

9. Save and close the title block.

Task 3 - Set up sheets in a template using the new title block.

1. Open the template **Midrise Template.rte** that you created in the previous practice.

   If you did not complete the previous practice, open **Midrise Template - Title Block.rte** from your class folder.

2. In the *View* tab>Sheet Composition panel, click (Sheet).
3. In the Select a title block dialog box, click Load... . Navigate to your class folder, select **TBLK-D.rfa** that you just created, and click Open .

   If you did not complete the previous task, open **TBLK-D-1.rfa** from your class folder.

4. Select the title block that you just loaded and click OK .

No elements are on the view, but it acts as a placeholder on the sheet. Elements are displayed as they are drawn.

5. In the Project browser, select the sheet and rename it to **A101 – Site Plan**.
6. Open the new sheet view. Drag the **Site** floor plan view onto the sheet.
7. Create another sheet with the new title block and name it **A201 – First Floor Plan**.

8. Open this sheet view. Drag the **Level 1** floor plan view onto the sheet, as shown in Figure 1–53.

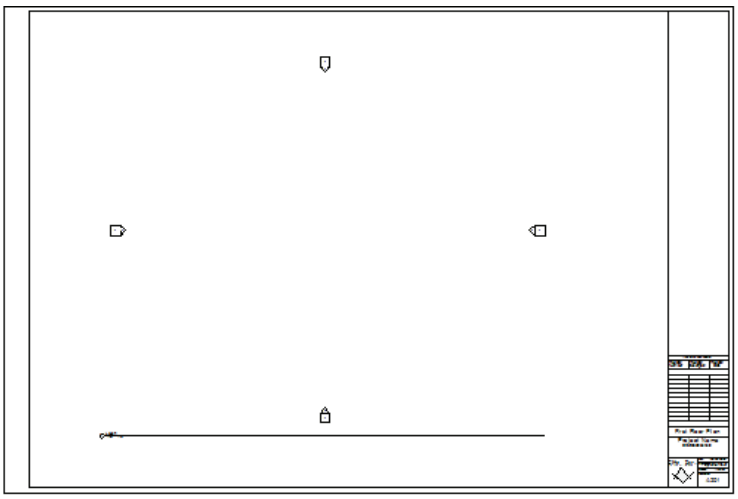


Figure 1–53

Task 4 - Create a Sheet List.

1. In the *View* tab>Create panel, expand (Schedules) and click (Sheet List).

2. In the Sheet List Properties dialog box, *Fields* tab, select the **Sheet Number** and **Sheet Name** and add them to the *Scheduled fields* list, as shown in Figure 1–54.

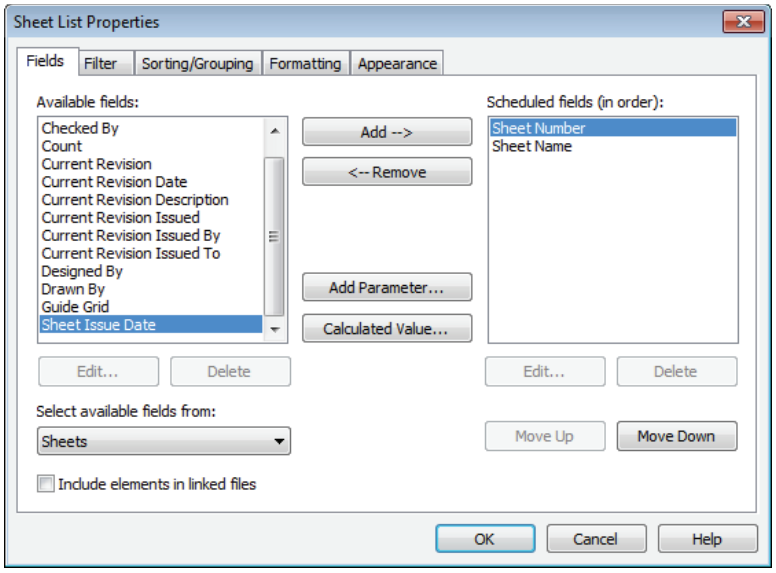
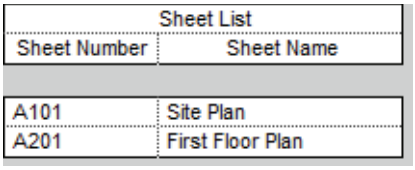


Figure 1–54

3. Click OK.

4. The Sheet List schedule opens with the two existing sheets listed. Stretch out the columns, as shown in Figure 1–55.

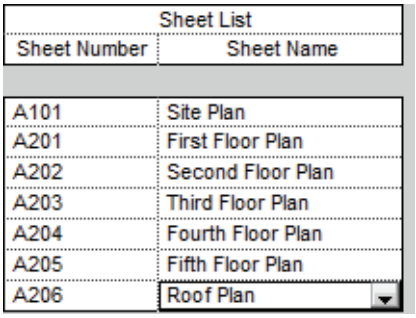


Sheet List	
Sheet Number	Sheet Name
A101	Site Plan
A201	First Floor Plan

Figure 1–55

5. In the *Modify Sheet List* tab>Rows panel, click (Row).

6. Add floor plans to match the levels, as shown in Figure 1–56.



Sheet List	
Sheet Number	Sheet Name
A101	Site Plan
A201	First Floor Plan
A202	Second Floor Plan
A203	Third Floor Plan
A204	Fourth Floor Plan
A205	Fifth Floor Plan
A206	Roof Plan

Figure 1–56

7. In the *Modify Sheet List* tab>Create panel, click (Sheet). The list of plans you added to the Sheet List display, but the sheets already in the project do not, as shown in Figure 1–57.

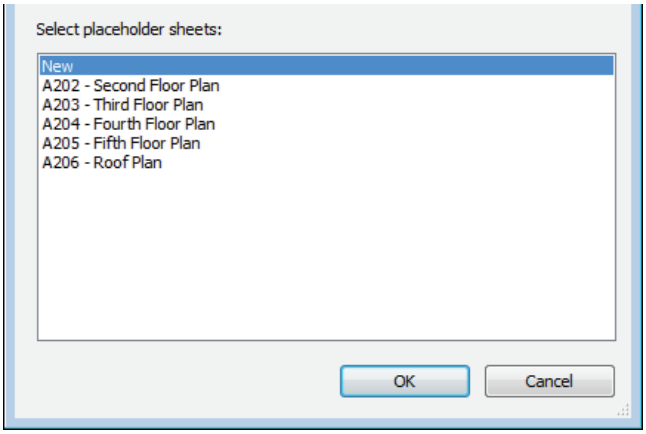


Figure 1–57

8. Cancel out of the dialog box.

9. If time permits, create additional placeholder sheets for various other views.

10. Open the **Level 1** floor plan view.

11. Save the template.

1.4 Creating Object Styles

Every element in Revit contains object styles that control how its components display in various views. For example, the *Doors* element includes the *Elevation Swing*, *Frame/Mullion*, *Glass*, *Hidden Lines*, *Opening*, *Panel*, and *Plan Swing* as components, as shown in Figure 1–58. The *Elevation Swing* is set to a light line weight, displayed in black with a dashed line pattern. It does not have any material attached to it, but the *Glass* component does.

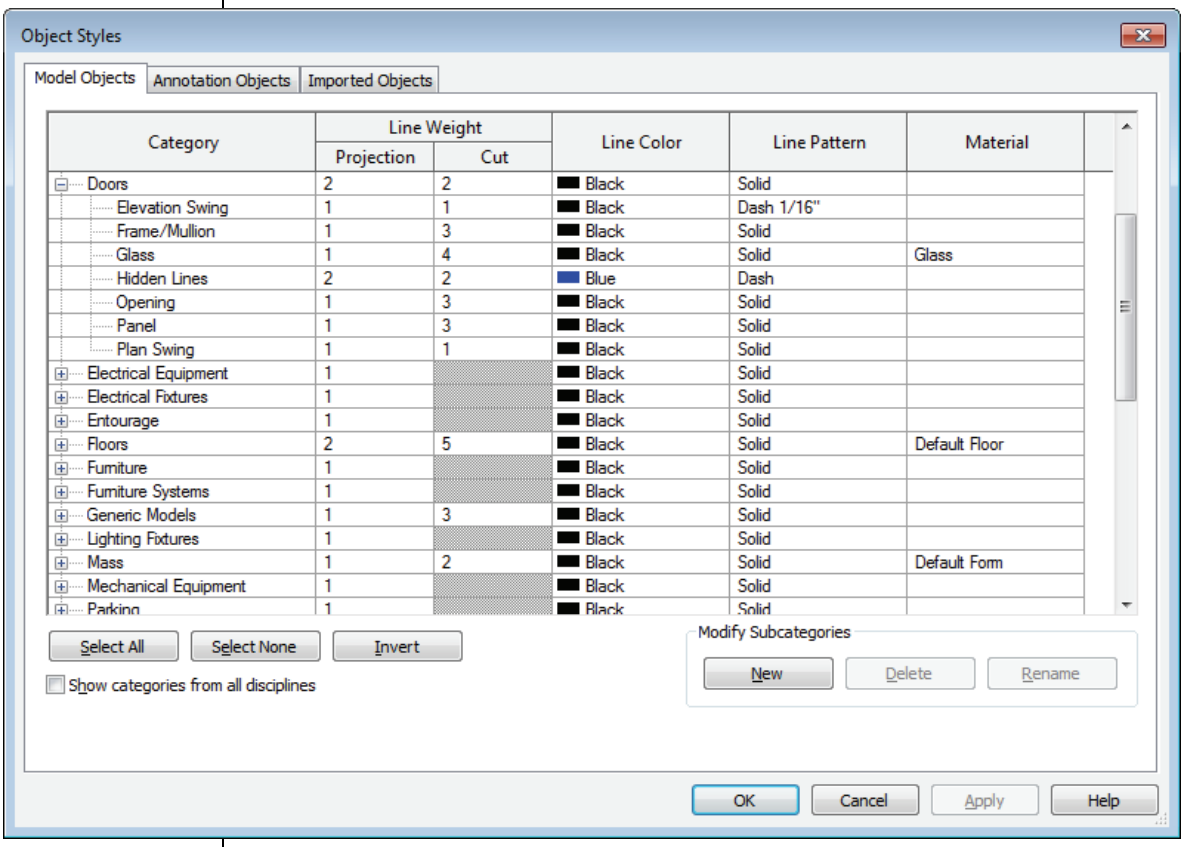


Figure 1–58

- In the *Manage* tab>Settings panel, click (Object Styles) to open the Object Styles dialog box.
- To modify an object style, select the element to change and then select an option in the appropriate column in the drop-down list or dialog box.

Line Weights

Line weights for model elements can be set for a **Projection** (in elevations) or **Cut** (in section and plan). For example, a wall displays a heavy line weight while the door and window cuts are lighter, as shown in Figure 1–59.

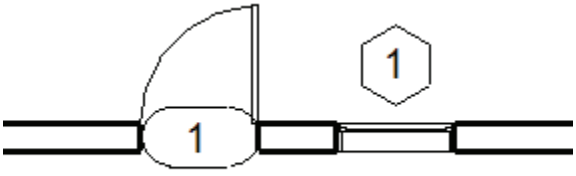
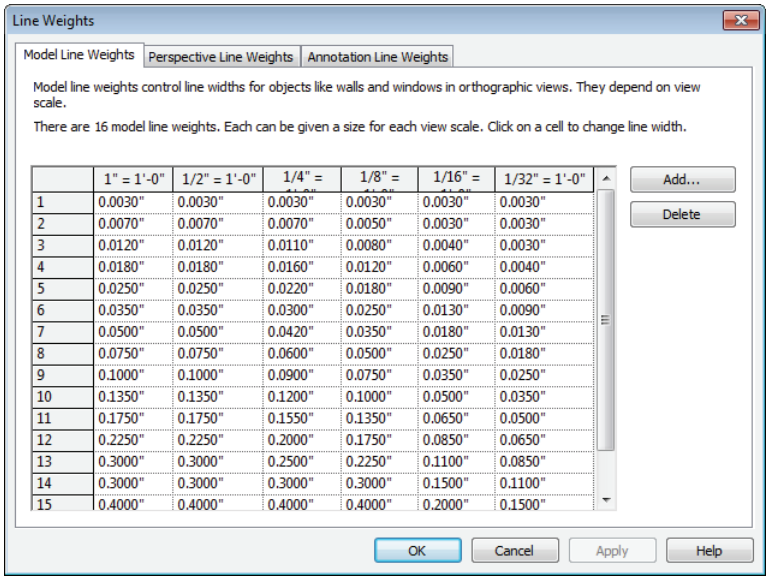


Figure 1–59

- Annotation elements are only set for projection.

Hint: Setting Line Weights

In the *Manage* tab>Settings panel, expand  (Additional Settings) and click  (Line Weights) to open the Line Weights dialog box, as shown in Figure 1–60. It contains three tabs: *Model Line Weights* (vary by scale), *Perspective Line Weights* (control elements like walls and windows in perspective views), and *Annotation Line Weights* (not dependent on the scale).



	1" = 1'-0"	1/2" = 1'-0"	1/4" =	1/8" =	1/16" =	1/32" = 1'-0"
1	0.0030"	0.0030"	0.0030"	0.0030"	0.0030"	0.0030"
2	0.0070"	0.0070"	0.0070"	0.0050"	0.0030"	0.0030"
3	0.0120"	0.0120"	0.0110"	0.0080"	0.0040"	0.0030"
4	0.0180"	0.0180"	0.0160"	0.0120"	0.0060"	0.0040"
5	0.0250"	0.0250"	0.0220"	0.0180"	0.0090"	0.0060"
6	0.0350"	0.0350"	0.0300"	0.0250"	0.0130"	0.0090"
7	0.0500"	0.0500"	0.0420"	0.0350"	0.0180"	0.0130"
8	0.0750"	0.0750"	0.0600"	0.0500"	0.0250"	0.0180"
9	0.1000"	0.1000"	0.0900"	0.0750"	0.0350"	0.0250"
10	0.1350"	0.1350"	0.1200"	0.1000"	0.0500"	0.0350"
11	0.1750"	0.1750"	0.1550"	0.1350"	0.0650"	0.0500"
12	0.2250"	0.2250"	0.2000"	0.1750"	0.0850"	0.0650"
13	0.3000"	0.3000"	0.2500"	0.2250"	0.1100"	0.0850"
14	0.3000"	0.3000"	0.3000"	0.3000"	0.1500"	0.1100"
15	0.4000"	0.4000"	0.4000"	0.4000"	0.2000"	0.1500"

Figure 1–60

You can customize the line weights in each tab and add scales as needed for the model line weights.

Line Color

When you select the **Line Color** option in Object Styles or elsewhere, the Color dialog box opens, as shown in Figure 1–61.

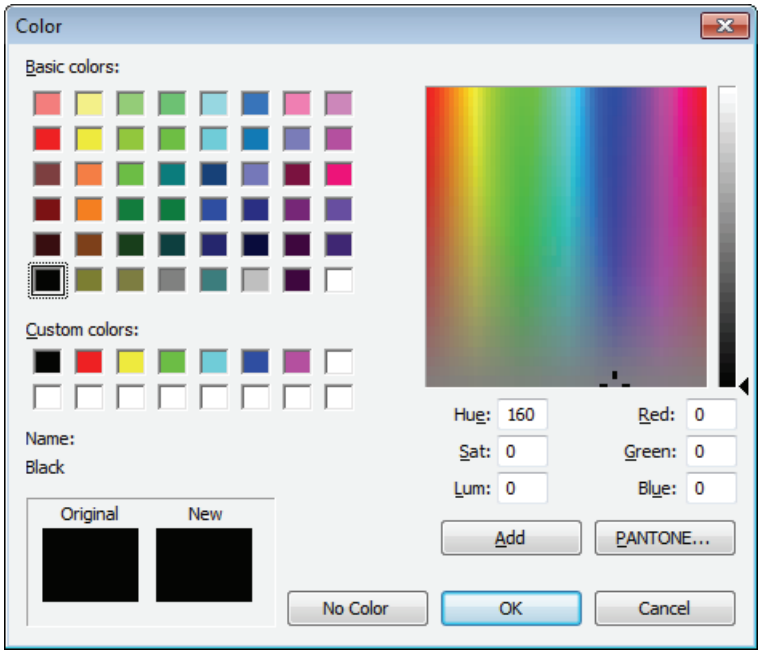


Figure 1–61

You can select from thousands of colors, including options from the Pantone color system, as shown in Figure 1–62. Typically, most elements in Revit are black for printing purposes. When you shade and render, the elements take on the color of the assigned material. Therefore, these dialog boxes are opened when you create materials.

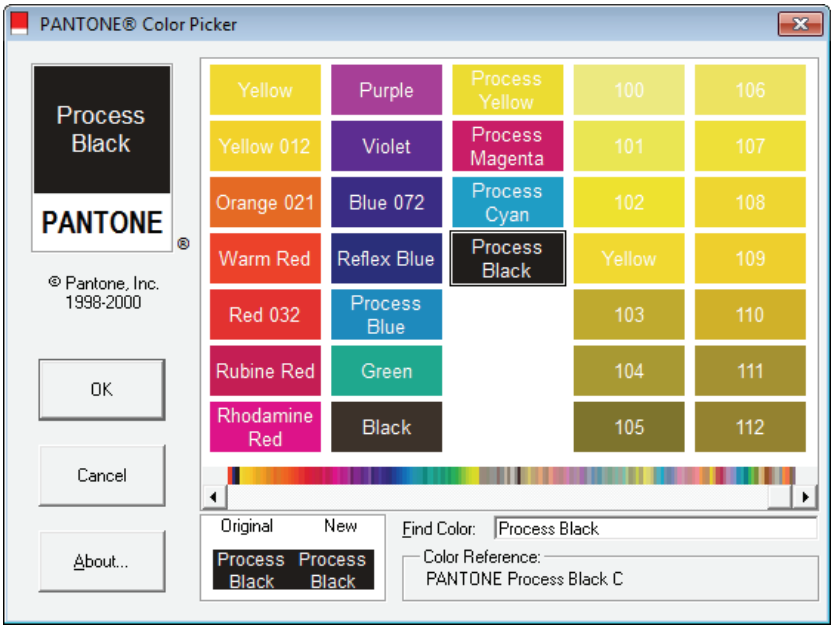


Figure 1–62

Line Patterns

Line Patterns can be specified for various components in the Object Styles dialog box. In the example in Figure 1–63, you see the line pattern **Dash 1/16"** used for the elevation door swing and the line pattern **Dash Dot 3/16"** used for the callout bubble.

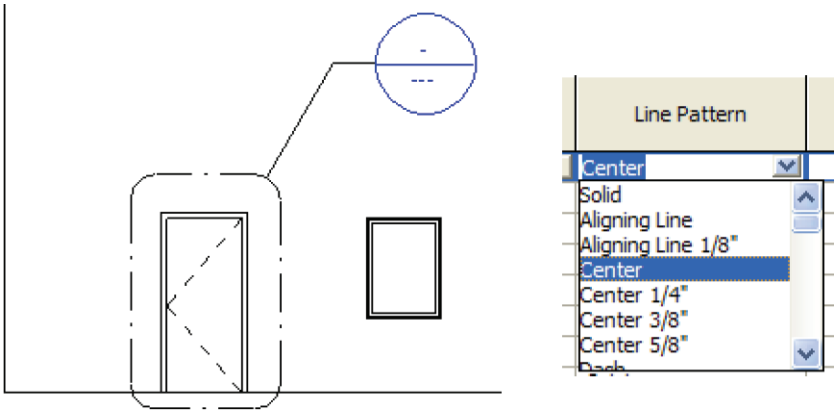


Figure 1–63

How to:

Create Line Patterns

A wide variety of patterns are supplied with Revit and you can create your own with a series of dashes, spaces, and dots.

1. In the *Manage* tab>Settings panel, expand (Additional Settings) and click (Line Patterns) to open the Line Patterns dialog box.
2. In the Line Patterns dialog box, click New and type a name for the pattern.
3. In the Line Pattern Properties dialog box, add a list of dashes, spaces, and/or dots and specify their values, as shown in Figure 1–64. *Space* is always the option after a dash or dot. You do not have to enter a value for dots.

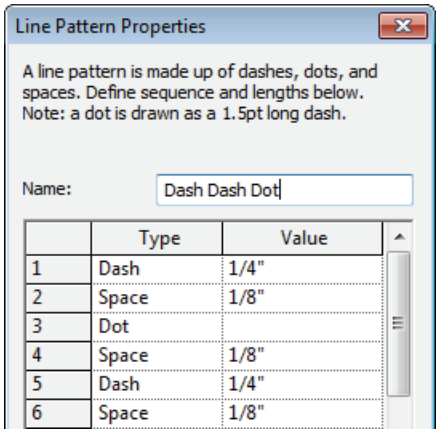


Figure 1–64

Line Styles

Line styles are a specific type of object style used with the sketching tools. They are not part of the Object Styles dialog box, but are created in a similar way.

In the *Manage* tab>Settings panel, expand (Additional Settings) and click (Line Styles). In the Line Styles dialog box, as shown in Figure 1–65, specify the *Line Weight*, *Line Color*, and *Line Pattern* for each line style.

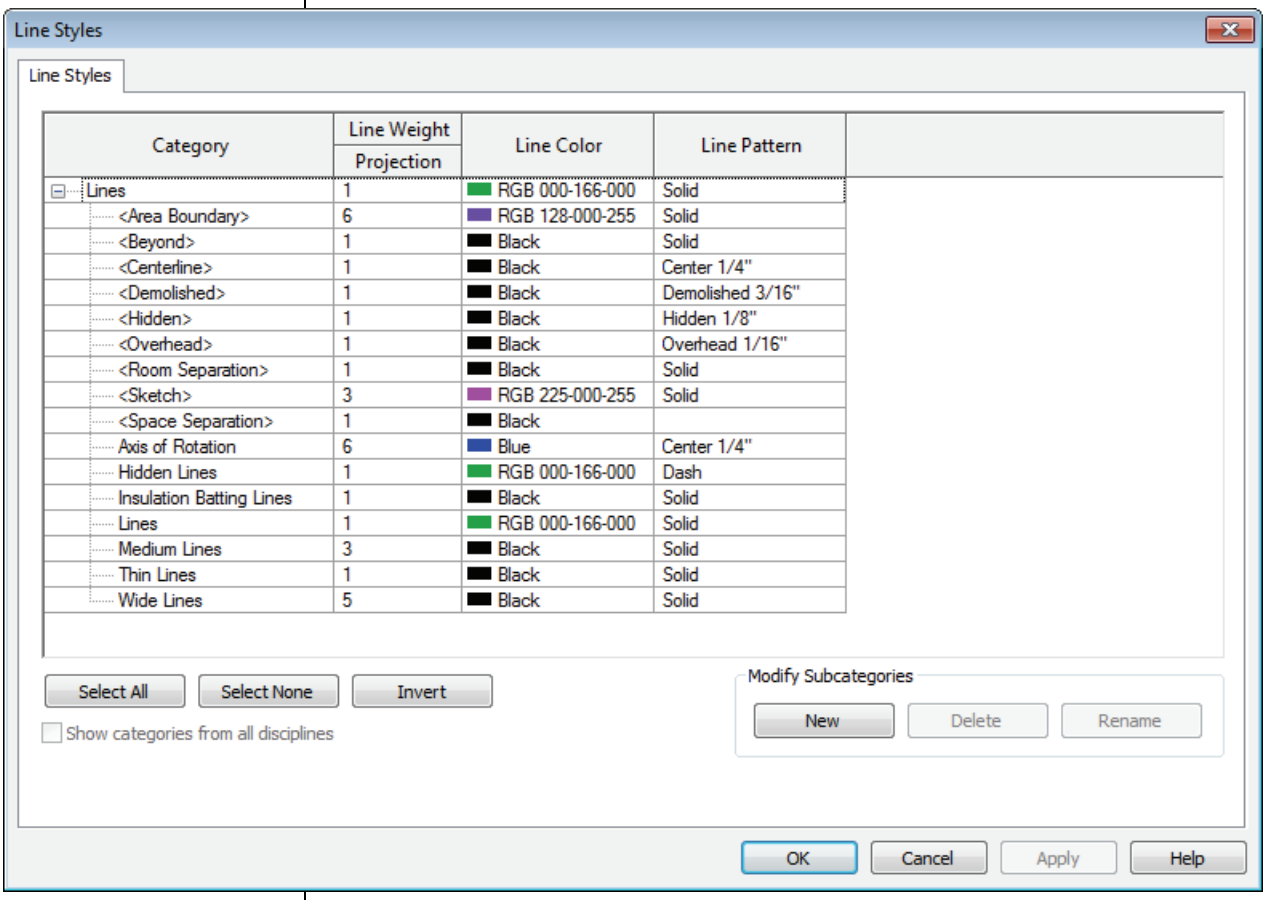


Figure 1–65

1.5 Materials and Fill Patterns

When you shade or render Revit models, their appearance depends on the materials that have been associated with the elements, as shown in Figure 1–66. Materials can be assigned to an element using object styles, family types, or they can be assigned directly to the faces. You can use materials supplied with Revit or create custom materials.

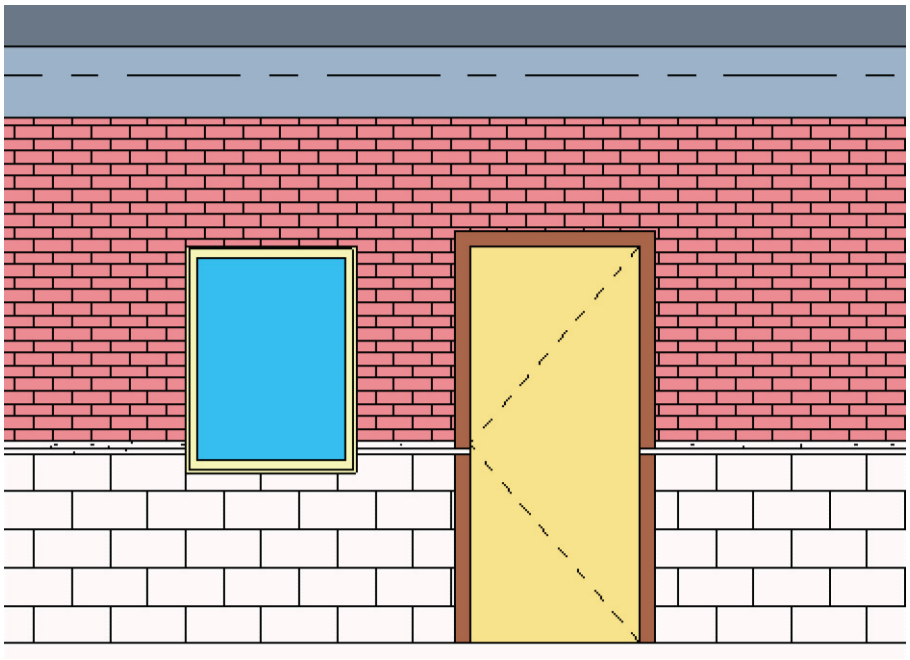


Figure 1–66

- Materials can be assigned in several ways: using  (Paint) on faces, setting it in the layers of system families (such as walls and floors), and in object styles. You also assign materials when you create other component families, such as doors and furniture.
- New materials are only stored in the project. Therefore, if you are creating materials to be used again, create them in a template file.

NEW IN 2011!

- Materials used in Revit are consistent with materials used in AutoCAD, Inventor, and 3ds Max.

How to:

Create a Material

1. In the *Manage* tab>Settings panel, click (Materials). The Materials dialog box opens, as shown in Figure 1–67. Select a material from the list, similar to the one you want to create.

Use the Search field to find a material or narrow the material list by Material Class to help you find materials quickly.

The dialog box can be resized.

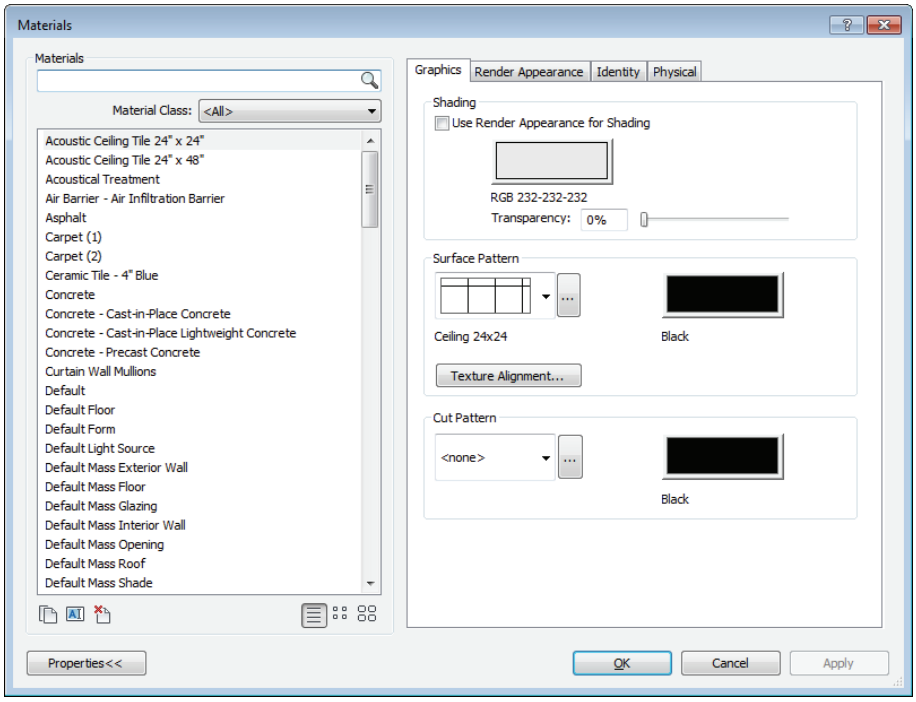


Figure 1–67

2. In the Materials dialog box, click (Duplicate). Type a new name for the material.
3. In the *Graphics* tab, set up the *Shading*, *Surface Pattern*, and *Cut Pattern* as needed.
4. In the *Render Appearance* tab, set up the rendering design, including the properties of the elements to be rendered.
5. In the *Identity* tab, set up information such as the related keynote, model, manufacturer, and other schedule-related items.
6. In the *Physical* tab, specify the type of properties. Predefined types are **Generic** (no properties), **Concrete**, **Steel**, and **Wood**.
7. Click Apply and add additional materials as needed.
8. Click OK when you are finished.

The Graphics Tab

In the *Graphics* tab shown in Figure 1–68, you set how a material displays in either shade or hidden line mode.

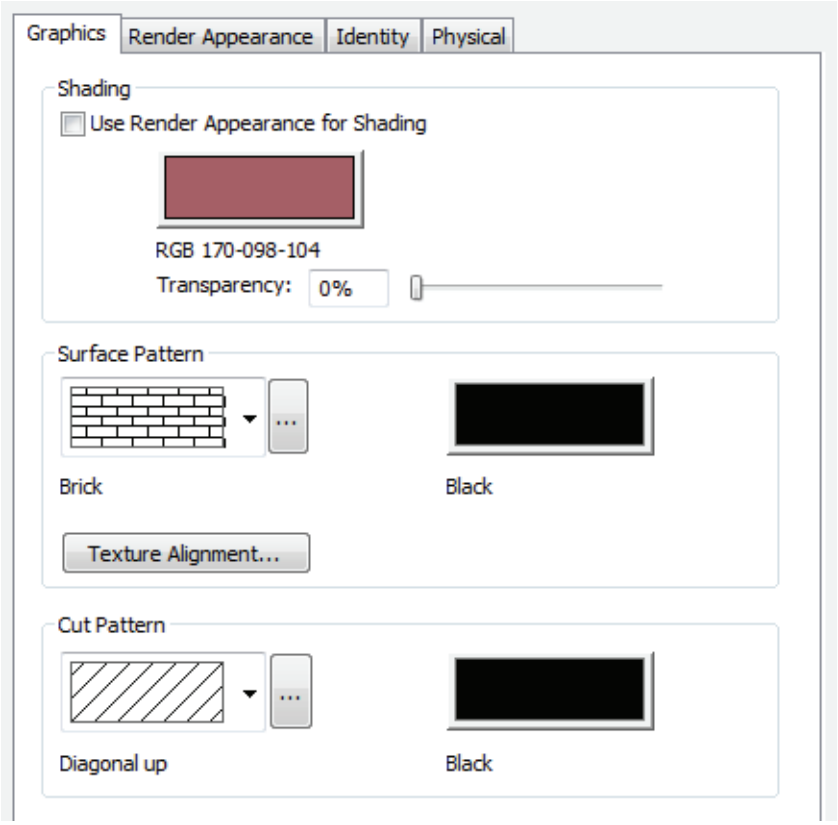


Figure 1–68

- The *Shading* section controls how the material displays when an element is shaded. If you want the shaded view to resemble the rendered view, select the **Use Render Appearance for Shading** option. The color and other options are modified to match the Render Appearance selection. Alternatively, you can set up a color and transparency ratio.

- The *Surface Pattern* and *Cut Pattern* sections enable you to select a fill pattern and color to display on a surface or in a section cut. Surface patterns stay true to size. Cut patterns are drafting patterns, which change size according to the view scale.

The Render Appearance Tab

In the *Render Appearance* tab, you set up the many aspects of a rendered material. You can choose how to display the preview of the material, as shown in Figure 1–69.

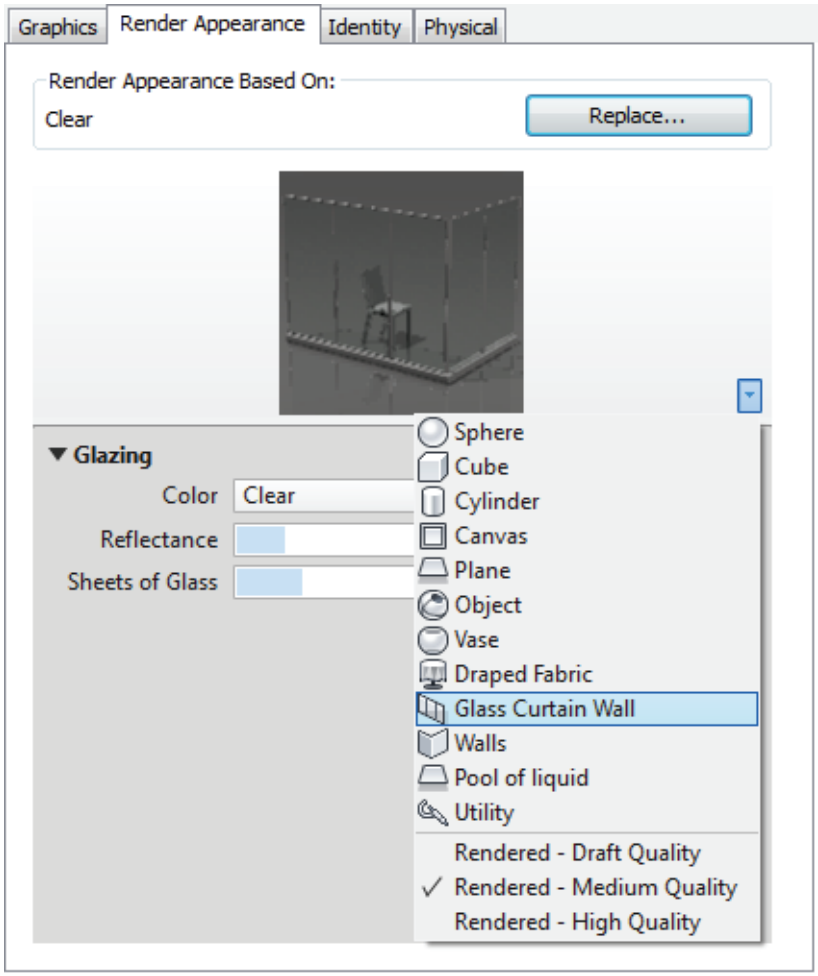


Figure 1–69

- In the *Render Appearance Based On* section, click Replace... to open the Render Appearance Library. An extensive list of rendered materials are available within Revit.
- Once you have selected the render appearance, you can modify the *Preview* as needed and define the *Glazing Properties*. The properties change according to the type of material selected.

The Identity Tab

In the *Identity* tab, you set up the *Material Class*, *Description*, *Product Information*, and *Keynote* for the material, as shown in Figure 1–70. This information can be used in material takeoff schedules.

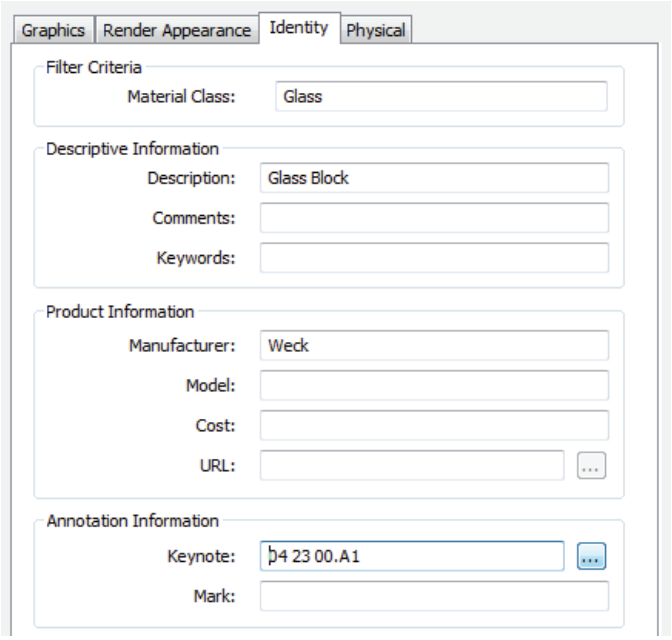


Figure 1–70

The Physical Tab

In the *Physical* tab, you can specify information about the physical properties of the material, as shown in Figure 1–71. Several types are created, including **Steel**, **Wood**, and **Concrete**. You can create custom types by filling out the modifiable parameters and clicking Save As....

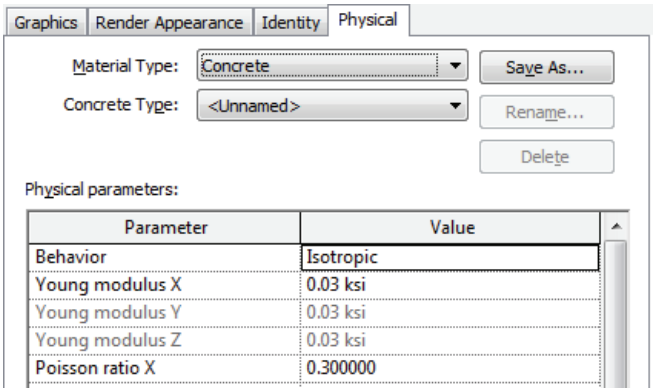


Figure 1–71

Creating Fill Patterns

Fill patterns are used by the various Filled Region commands and material specifications. In the *Manage* tab>Settings panel, expand (Additional Settings) and click (Fill Patterns). Select from two types: **Drafting** and **Model**.

Drafting patterns are symbolic. The view scale controls the size of the pattern. Basic patterns include hatching and cross-hatching, as well as designs that show material (such as aluminum or concrete), as shown in Figure 1–72. These are used in details and in plan or section cuts.

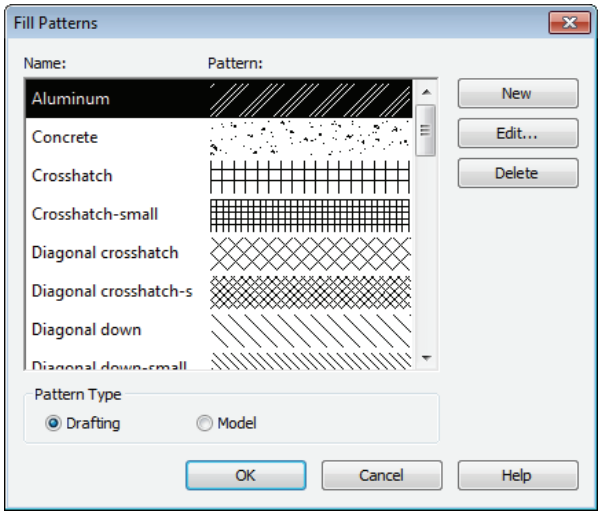


Figure 1–72

Model patterns are full scale to the actual elements they represent. They do not change if the view scale changes. You can select brick, various sizes of tile, lines that are a specific distance apart, roof shakes, etc., as shown in Figure 1–73. These patterns are primarily used in elevation and plan views.

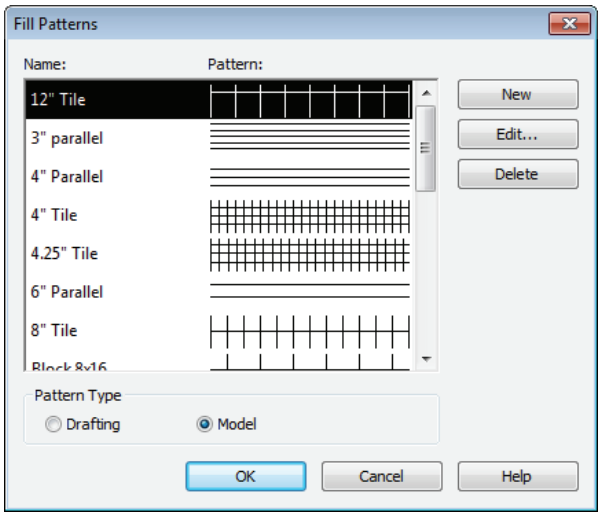


Figure 1–73

How to:

Create a New Simple Fill Pattern

1. In the *Manage* tab>Settings panel, expand (Additional Settings) and click (Fill Patterns).
2. In the New Pattern dialog box, select the type of pattern you want to create: **Drafting** or **Model**.
3. Click New.
4. In the New Pattern dialog box, specify the *Orientation* of the pattern to the Host Layers and specify the *Simple* pattern style, as shown in Figure 1–74.

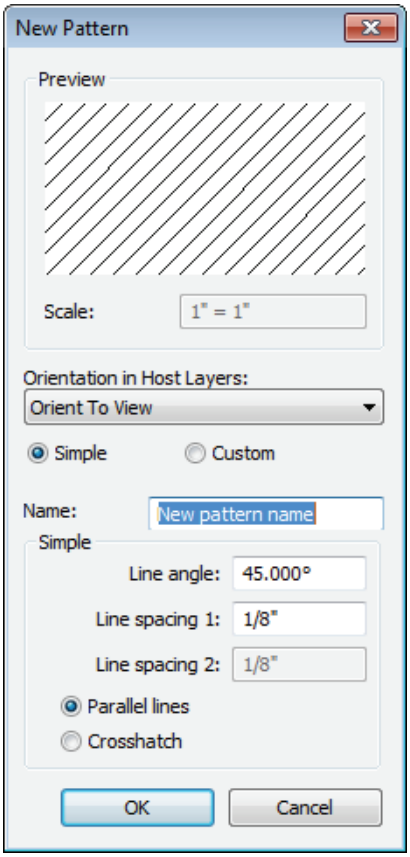


Figure 1–74

5. Type a name for the new pattern.
6. Type values for the *Line angle* and *Line spacing*, and select the **Parallel lines** or **Crosshatch** option.
7. Click OK to finish. The pattern can now be used to create a filled region type or used in a material.

- Filled regions can have either **Opaque** or **Transparent** backgrounds. This is set up in the Type Properties of the filled region.

How to:

Create a New Custom Fill Pattern

1. In the *Manage* tab>Settings panel, expand (Additional Settings) and click (Fill Patterns).
2. In the Fill Patterns dialog box, select the type of pattern you want to create: **Drafting** or **Model**.
3. Click New.
4. In the New Pattern dialog box, select the **Custom** option, as shown in Figure 1–75.

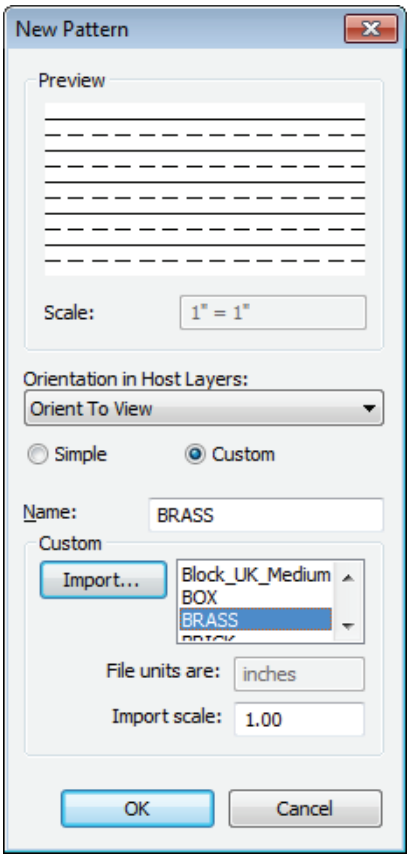


Figure 1–75

5. Click Import... and select a PAT file. This file can be created specifically for Revit or it can be based on an AutoCAD PAT file.
6. Once the file is imported, a list of available patterns is displayed. Select the pattern. The name is automatically assigned. You can change the name after it has been selected.
7. Set the scale as needed.
8. Click OK to finish.

Importing Patterns from AutoCAD

Pattern files (PAT) can be imported from AutoCAD, such as the Escher pattern shown in Figure 1–76.

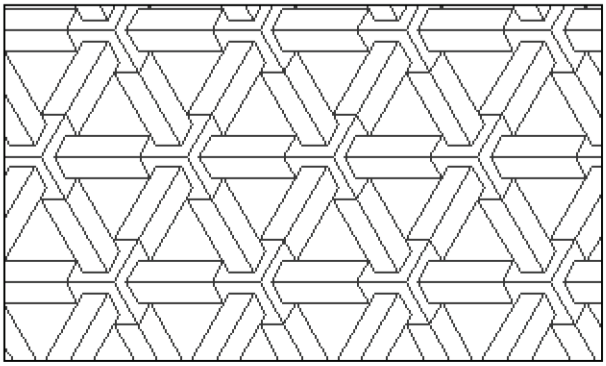


Figure 1–76

One change must be made in the pattern file for it to be usable in Revit. Open the PAT file and add the following line after the title of a custom hatch, as shown in Figure 1–77.

```
*AR-HBONE, Standard brick herringbone pattern @ 45 degrees
;%TYPE=MODEL
45,          0,0,          4,4,                                  12,-4
135,      2.828427125,2.828427125,   4,-4,          12,-4
```

Figure 1–77

- A line with a semicolon in front it is ignored by AutoCAD, while the type is specified for Revit.
- Any pattern in the **Acad.pat** file can be automatically brought in as a drafting pattern. However, you must add the string above to specify model patterns.

Practice 1d

Estimated time for completion: 25 minutes.

Creating Object Styles, Materials, and Patterns

In this practice you will modify the object style of doors and door tags, as shown in Figure 1–78, and create a new line style. You will also create a fill pattern, two materials using the fill pattern, and two floor types using the materials.

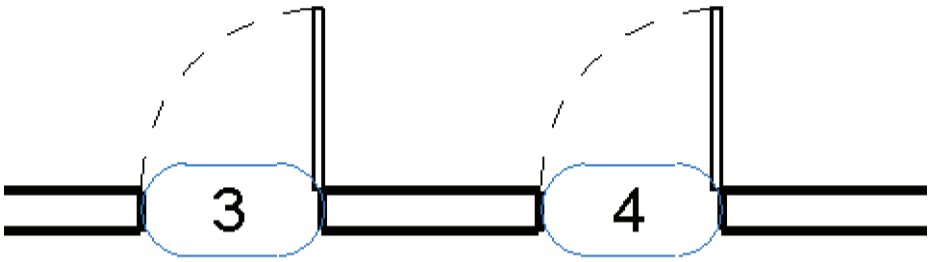


Figure 1–78

Task 1 - Modify object styles.

1. Continue working in the template file **Midrise Template.rte**.

   If you did not complete the previous practice, open **Midrise-Template-Object-Styles.rte** from your class folder.

2. In the *Floor Plans* section, open the **Level 1** view. Draw a wall and place a door in it. This is just for viewing purposes and will be deleted later.

3. In the *Manage* tab>Settings panel, click (Object Styles).

4. In the Object Styles dialog box, change the **Doors>Plan Swing** subcategory to display with a dashed line pattern.

5. In the *Annotation Objects* tab, change the **Door tag** to display with a color.

6. Click OK to apply the changes. The door swing and tag change.

7. Add another door to the wall. It should display the same object styles.

8. Delete the wall and doors.

Task 2 - Create line styles.

1. In the *Manage* tab>Settings panel, expand (Additional Settings) and click (Line Styles).
2. In the Line Styles dialog box, click New and create a new line style named **Property Line** as a **Subcategory** of **Lines**.
3. Set the *Line Weight Projection* to **6**.
4. Select a *Color* for the line.
5. Set the *Line Pattern* to **Dash Dot Dot 1/8”**, as shown in Figure 1–79.

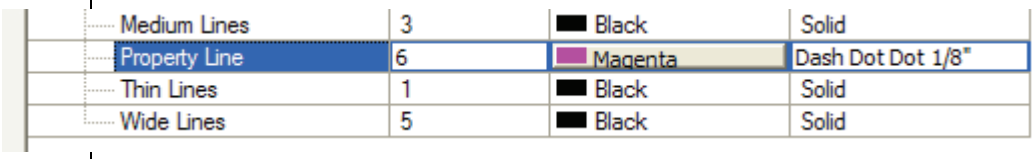


Figure 1–79

6. Click OK to close the dialog box.
7. In the *Home* tab>Model panel, click (Model Line). In the Line Style panel, set the *Line Style* to **Property Line**.
8. Draw some lines using this style and one other style to see the difference.
9. Delete the lines.
10. Zoom to fit.
11. Save the template file.

Task 3 - Create a fill pattern.

1. Continue working in the template file.
2. In the *Manage* tab>Settings panel, expand (Additional Settings) and click (Fill Patterns).
3. In the *Pattern Type* section of the dialog box, select the **Model** option. Click New.

4. In the Add Surface Pattern dialog box, select the **Custom** option and click Import....
5. In the Import Fill Pattern dialog box, from your class directory, select **Acad_For_Revit.pat** and click Open.
6. Three model patterns are available. Select **AR-HBONE**.
7. In the *Name* field, rename the pattern to **Herringbone**.
8. Click OK twice to finish.

Task 4 - Create materials.

1. In the *Manage* tab>Settings panel, click (Materials).
2. Select any material and click (Duplicate). Name the material **Herringbone – Brick**.
3. In the *Graphics* tab, select the **Use Render Appearance for Shading** option. This automatically assigns a color and other information, similar to the render color for shading.
4. Set the *Surface Pattern* to the new **Herringbone** pattern.
5. Set the *Cut Pattern* to **Diagonal Down**.
6. In the *Render Appearance* tab, click Replace....
7. In the Render Appearance Library dialog box, type in **herringbone** in the search field, as shown in Figure 1–80. (Do not press <Enter>.)

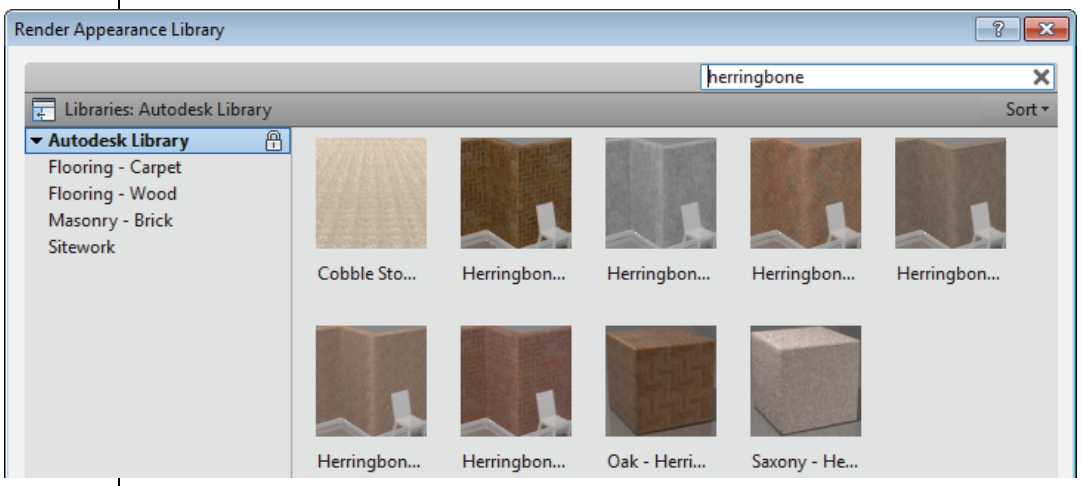


Figure 1–80

8. Select the **Herringbone-Gray** swatch and click OK.

9. In the *Identity* tab, set the *Material Class* to **Brick** and the *Keynote* to **32 14 00.A1 4"x8"x 1 1/2" Brick Paver** (under **Division 32**), as shown in Figure 1–81.

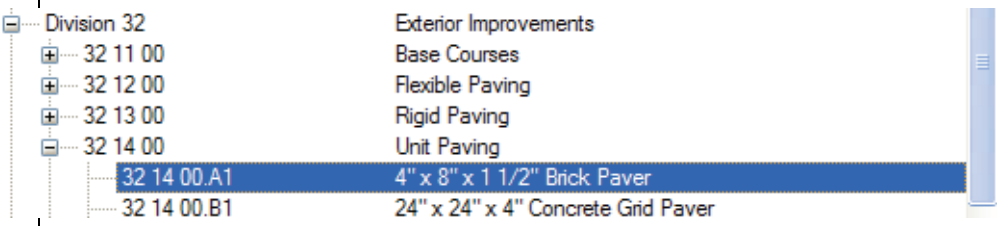


Figure 1–81

10. Click Apply.

11. Duplicate the new material and name it **Herringbone – Wood**.

12. In the *Graphics* tab, set the *Cut Pattern* to **None**.

13. In the *Render Appearance* tab, click Replace....

14. Find the material **Oak-Herringbone** and click OK.

15. In the *Identity* tab, set the *Material Class* to **Wood** and set the *Keynote* to **09 64 00.B1 - 3/8" Hardwood Flooring** (under **Division 09 – Finishes**).

16. Click OK to close the Materials dialog box.

Task 5 - Test the new fill pattern and materials.

1. Open a floor plan view and draw a simple floor (not walls).

2. In Properties, set the floor style to **Wood Joist 10" – Wood Finish**.

3. Click Edit Type.

4. In the Type Properties dialog box, create a new floor type named **Wood Joist 10" – Wood Herringbone**.

5. Next to the *Structure* parameter, click Edit....

6. In the Edit Assembly dialog box, set the *Finish 1[4]* material to **Herringbone – Wood**, as shown in Figure 1–82.

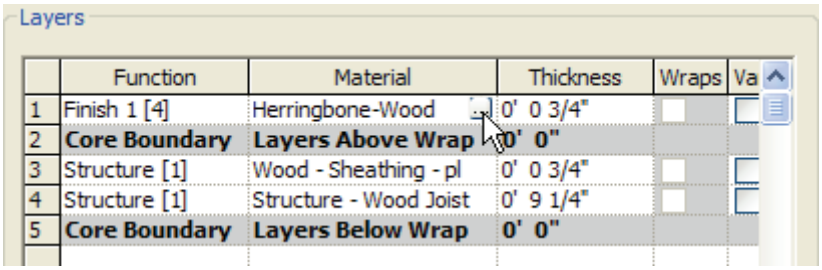


Figure 1–82

7. Click OK.

8. Duplicate this floor type and name it **Wood Joist 10” – Brick Herringbone**.

9. Edit the structure of this floor type. Set the *Finish 1* material to **Herringbone – Brick** and click OK twice to close the dialog boxes.

10. Zoom in on the floor you created. You should see the herringbone pattern.

11. Turn on (Shaded with Edges) to see the color of the floor.

12. Modify the floor and change it to the other Herringbone floor type. The floor color changes because the material has changed, as shown in Figure 1–83.

Figure 1–83

13. Delete the floor and **Zoom to Fit**.

14. Save the file.

Chapter Review Questions

1. What are the various types of units you can set up in a template?

2. Where do you set up a new text type? A new dimension type?

3. What is a label?

4. What is the difference between a line pattern and a line style?

5. What are the two types of fill patterns and how do they differ?

6. In the Materials dialog box, what is the purpose of the **Use Render Appearance for Shading** option?

Command Summary

Button	Command	Location
	**Options**	■ **Application Menu**
	**Project Units**	■ **Ribbon:** *Manage* tab>Settings panel ■ **Shortcut:** UN
	**Snaps**	■ **Ribbon:** *Manage* tab>Settings panel
	**Temporary Dimensions**	■ **Ribbon:** *Manage* tab>Settings panel>expand Additional Settings
	**Dimension Types** ■ **Linear** ■ **Angular** ■ **Radial** ■ **Spot Elevation** ■ **Spot Coordinate** ■ **Spot Slope**	■ **Ribbon:** *Annotate* tab> Dimensions panel>expand the panel title
	**Arrowheads**	■ **Ribbon:** *Manage* tab>Settings panel>expand Additional Settings
	**Loaded Tags**	■ **Ribbon:** *Annotate* tab>Tag panel>expand the panel title
	**Floor Plan**	■ **Ribbon:** *View* tab>Create panel> expand Plan Views
	**Reflected Ceiling Plan**	■ **Ribbon:** *View* tab>Create panel> expand Plan Views
	**Label**	**Family Editor** ■ **Ribbon:** *Create* tab>Text panel
	**Text**	**Family Editor** ■ **Ribbon:** *Create* tab>Text panel
	**Revision Schedule**	**Family Editor** ■ **Ribbon:** *View* tab>Create panel
	**New Title Block**	■ **Application Menu:** expand New>Title block
	**Materials**	■ **Ribbon:** *Manage* tab>Settings panel

	**Object Styles**	■ **Ribbon:** *Manage* tab>Settings panel
	**Line Weights**	■ **Ribbon:** *Manage* tab>Settings panel>expand Additional Settings
	**Line Patterns**	■ **Ribbon:** *Manage* tab>Settings panel>expand Additional Settings
	**Line Styles**	■ **Ribbon:** *Manage* tab>Settings panel>expand Additional Settings
	**Fill Patterns**	■ **Ribbon:** *Manage* tab>Settings panel>expand Additional Settings
	**Callout Tags**	■ **Ribbon:** *Manage* tab>Settings panel>expand Additional Settings
	**Elevation Tags**	■ **Ribbon:** *Manage* tab>Settings panel>expand Additional Settings
	**Section Tags**	■ **Ribbon:** *Manage* tab>Settings panel>expand Additional Settings