

## Creating Views

*One of the strongest* points of the Autodesk® Revit® Architecture platform is that it is one single model. This single model, however, has to be broken down into a tangible format that allows the user to navigate through a project. Chapter 1, “The Autodesk Revit World,” and Chapter 2, “Creating a Model,” featured the Project Browser (which is included in this chapter as well), but what is the Project Browser managing? Well, it’s simply managing views of the model. The browser also handles sheets, families, groups, links, and assemblies, but you’ll use it to open and work with the properties of views more than anything else.

Here’s an example: in the Project Browser, under Floor Plans, you’ll usually see Level 1. This is a view of the model that just so happens to be a floor plan. Under Elevations (Building Elevation), you’ll see East, North, South, and West elevations. These are exactly the same as the floor plans in the sense that they’re just views of the model.

This chapter covers the following topics:

- ▶ **Creating levels**
- ▶ **Creating and modifying building sections**
- ▶ **Adding wall sections**
- ▶ **Creating detail sections**
- ▶ **Creating callouts**
- ▶ **Creating and modifying a camera view**
- ▶ **Creating an elevation**

### Creating Levels

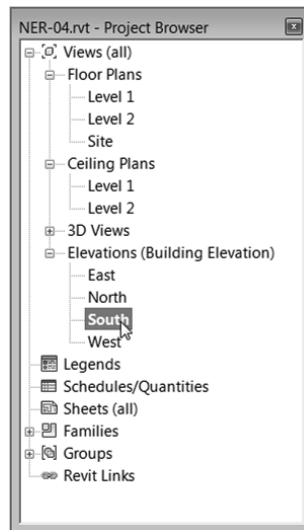
This chapter focuses on the creation of views and their relationship to the model. You’ll start with possibly the most important function in Revit:

creating levels. The power of Revit comes with the single-model concept. By adding levels to a model, you also add floor plans. This two-way interaction is what makes Revit the BIM choice for many users.

As you wander through the floor plans in the Project Browser, you'll see Level 1 and Level 2. Not every job you'll work on will have only a Level 1 and a Level 2. Your task in this section is to create new levels that are appended to floor plans.

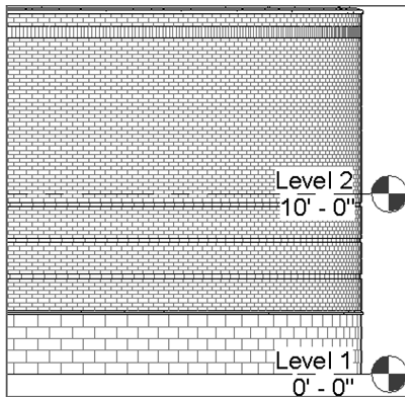
To follow along, open the model you've been working on, or go to [www.sybex.com/go/revit2017ner](http://www.sybex.com/go/revit2017ner) and browse to the Chapter 3 folder. Open the file called `NER-03.rvt`. If you want, you can use an actual project you're working on. You'll just have to replace any names and specific dimensions with ones that are applicable to your project. Perform these steps:

1. In the Project Browser, double-click the South elevation. It's located under Elevations (Building Elevation), as shown in Figure 3.1.



**FIGURE 3.1:** Finding an elevation in the Project Browser

Notice that at the right side of the building there are two symbols with a datum at the end. These are elevation markers. Unfortunately, right now they're somewhat obscured by the exterior wall. Zoom into this area, as shown in Figure 3.2.

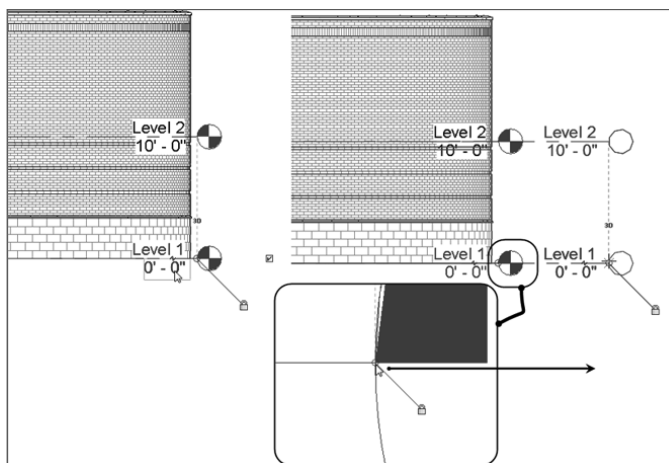


**FIGURE 3.2 :** When dealing with levels, it's a good idea to zoom in close so you can manipulate them.



**TIP** As you progress through the next few steps, if you don't see what is shown in the next two figures, try zooming in more and repeating the instructions.

- Pick (left-click) Level 1. Note that you get several blue icons and a lock. Where the actual level line intersects the datum bubble, there is a hollow blue circle (grip), as shown in Figure 3.3, except that your view is slightly obscured by the wall. Move the bubble so you can see the grip clearly.



**FIGURE 3.3 :** Picking the grip to drag the level out of the way

If you hover over any item in Revit Architecture and pause for a second, you'll see a tooltip. This will help you verify that you're selecting the correct item.

3. Left-click (pick) the grip, and hold the pick button on the mouse. You can now drag the bubble to the right.
4. When you get to a point where the level marker is outside the building, pick a spot to place the bubble and the annotation.
5. Press Esc.

Now that the levels are physically in a position where you can work on them, you can start building on them.

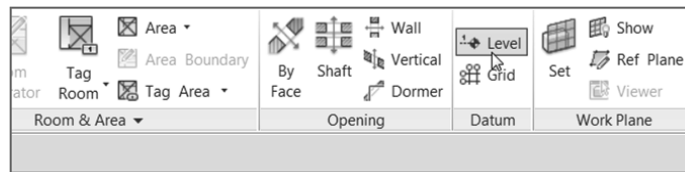
## Adding Levels

Adding an entirely new level in Revit Architecture is quite simple. However, you need to adhere to certain procedures in order to ensure that you add the levels correctly.

When you use the Level feature in Revit, you should follow two procedures. The first is to look at the Options bar after you start the command. The second is to click the Modify button or press Esc when you've finished. It's easy to get confused as to how Revit wants you to proceed with adding a level, and it's also easy to create multiple levels inadvertently. Remember, in Revit you're always in a command.

To add a level, follow these steps:

1. On the Datum panel of the Architecture tab, click the Level button, as shown in Figure 3.4.



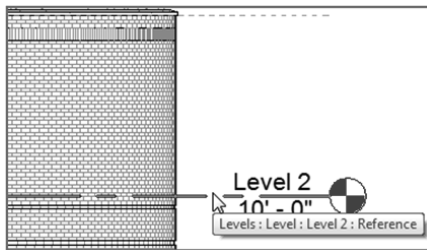
**FIGURE 3.4:** Adding a level from the Datum panel on the Architecture tab

2. On the Draw panel on the Modify | Place Level tab, you see that you can either draw a line or pick a line, as shown in Figure 3.5. Make sure Pick Lines is selected.



**FIGURE 3.5:** Choosing the options for the Level command

3. On the Options bar, make sure the Make Plan View option is selected.
4. At the end of the Options bar is the Offset field. Type 10' (3000 mm), and press Enter. Basically the approach here is to pick Level 2 and create a new level that is offset 10' (3000 mm) above (see Figure 3.5).
5. With the options set, hover your cursor over Level 2.  
When you come into contact with Level 2, a blue dotted line appears. If you move your cursor slightly above the Level 2 line, the blue alignment line appears above Level 2. If you inch your cursor slightly below Level 2, the blue alignment line appears below Level 2.
6. When you see the blue line appear above Level 2, pick the Level 2 line, as shown in Figure 3.6.

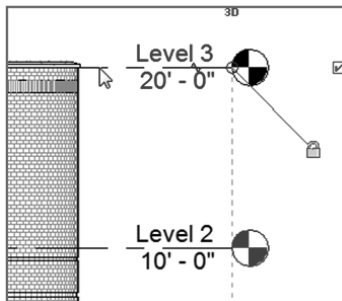


**FIGURE 3.6:** Waiting for the alignment to appear



**TIP** You may notice that speeding through the commands as you may have done in Autodesk® AutoCAD® isn't helping you at all in Revit. In Revit, you may need to slow down a bit and let Revit "do its thing." After you get the hang of the Revit behavior, you can speed up again.

You should now have a Level 3 at 20' (6000 mm), as shown in Figure 3.7.

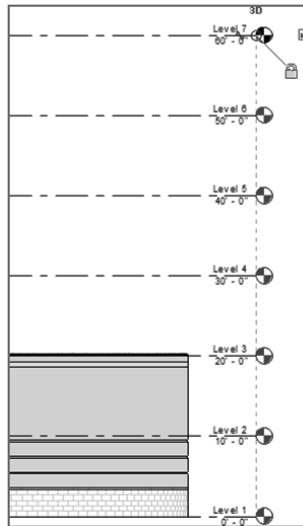


**FIGURE 3.7:** The completed Level 3. Remember, you're still in the Level command until you tell Revit to stop.



**WARNING** Just because you've created a new level, this doesn't tell Revit to shut down the command. Notice that the Options bar is still active and the Pick Lines icon still has the focus. If you start clicking around in the view area, you'll create levels. Every time you pick a point on the screen, a new level will appear. Also, Revit doesn't care if you have a level on top of another level. This situation can get ugly fast.

- With the Level command still running, create Levels 4, 5, 6, and 7. Your elevation should now look like Figure 3.8. Also, look at your Project Browser. It shouldn't have any levels other than Levels 1 through 7 and Site. You also have new levels under the Ceiling Plans category.



**FIGURE 3.8:** Levels 1 through 7 are complete.

- On the Select panel of the Ribbon, click the Modify button. You've safely terminated the Level command. (You could also press the Esc key on your keyboard to end the command.)

Now that you have some experience adding levels, it's time to investigate the physical level to see how it can be manipulated and modified.

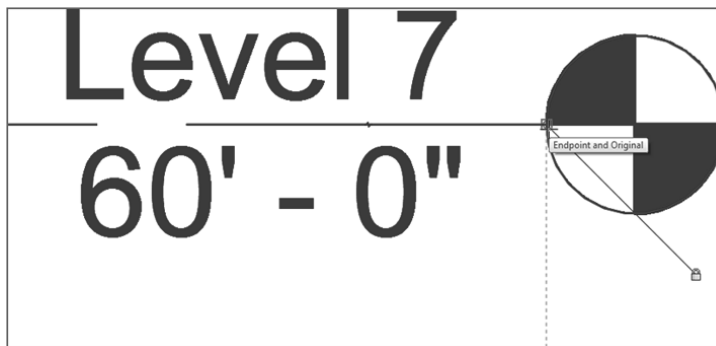
## Understanding the Composition of a Level

Levels have controls that enable the user to adjust the level's appearance. As stated throughout the book, when you select a family, multiple items turn blue.

The blue color indicates that these items can be modified. Also, if the level bubbles are blue, that means there is a plan with which the level is associated. If the bubble is black, then no plan is associated. When you select a level, a few additional items will appear.

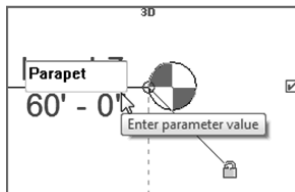
To investigate further, follow these steps:

1. Zoom in on Level 7.
2. Select Level 7 by picking (left-clicking) either the text or the level line. This puts the focus on the level line. Notice that the text turns blue. You know that any blue item can be modified (see Figure 3.9).



**FIGURE 3.9:** The selected level

3. Click the blue Level 7 text field. This enables you to edit the name of the level.
4. Type Parapet, as shown in Figure 3.10, and press Enter.



**FIGURE 3.10:** Renaming the level

5. Revit asks whether you want to rename any corresponding views. Click Yes (see Figure 3.11). Level 7 is now the Parapet level, as shown in Figure 3.12.

By renaming corresponding views, you tell Revit to keep the level and its corresponding view named accordingly.

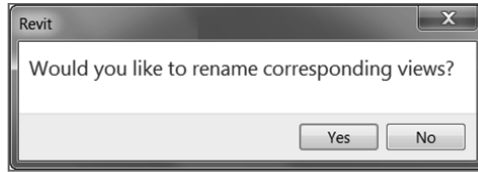


FIGURE 3.11: Click Yes to rename corresponding views.

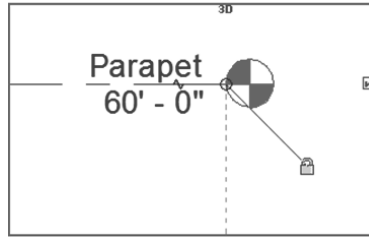


FIGURE 3.12: The renamed level

6. With the Parapet level still selected, click the 60'-0" (18000 mm) field.
7. Type 52' (16600 mm), and press Enter. This physically drops the level to the true elevation.

You now have two slightly overlapping levels. This can be fixed by manipulating some of the controls that appear when you select the level.

Press the Esc key a few times to clear any commands that may be active, and then follow these steps:

1. Select the Parapet level (if it isn't still selected from the previous exercise).
2. The blue items light up. One of them is the choice to add an elbow, as shown in Figure 3.13. Click it, and Revit bends the level.

Can't you just type over the dimension? In Revit, you can't have an inaccurate increment. If you type a new value to any increment, the model will change to reflect this new dimension.

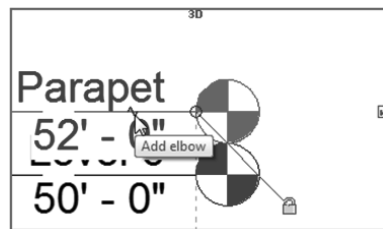
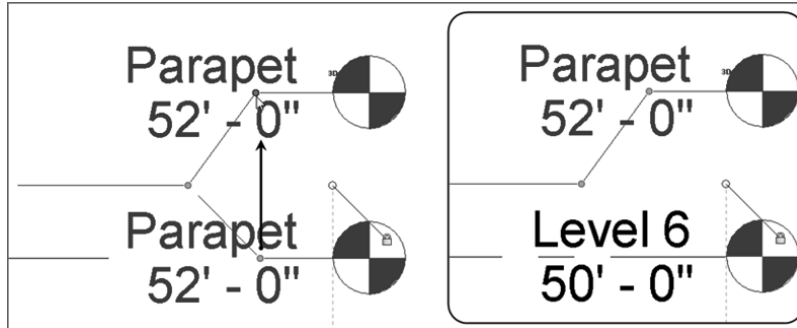


FIGURE 3.13: You can add an elbow to the elevation marker.

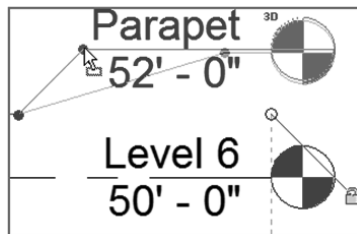


- Now that you've added the elbow, you need to move it. Notice the blue grip at each bend point. Pick the blue grip, as shown in Figure 3.14, and drag the Parapet level out of the level below.



**FIGURE 3.14:** Dragging the level to a new position by using the grips provided

- The line of the level is still in the way. The two blue grips are still available, pick and drag the horizontal line out of the way of the Parapet text, as shown in Figure 3.15.

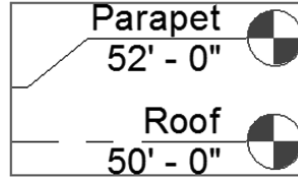


**FIGURE 3.15:** Making the final adjustments to the level

Now that you've established the Parapet level, let's make modifications to Level 6. Luckily, the procedures are the same as when you made the modifications to the Parapet level.

- Press Esc to clear any commands.
- Select Level 6.
- Pick the blue text that reads Level 6.
- Rename it Roof.
- Press Enter.
- Click Yes to rename the corresponding views.

7. Press Esc. Your levels should look like Figure 3.16.

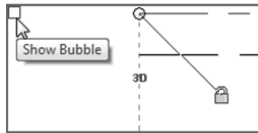


**FIGURE 3.16:** The Roof and Parapet levels

## Making Other Level Adjustments

I need to review three more adjustments before you can move on. As you may notice, the level lines are projected all the way to the other end of the east building. Only level heads and level data are displayed on the right side of the level line. You can control the other end of the level as well.

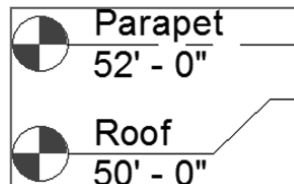
To follow along, pan over to the left side of the building, where the level lines seem to stop, as shown in Figure 3.17.



**FIGURE 3.17:** You can click the box that appears to turn on the level information at the other end of the building.

Then perform these steps:

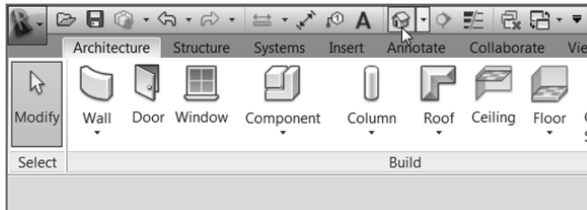
1. Select the Parapet level.
2. Pick the small blue box to the left of the level. Doing so turns on the level information at that end of the building (see Figure 3.17).
3. Turn on the Roof-level left-end bubble as well. Use the blue adjustment icons (elbow icons) to move the level out of the way (see Figure 3.18).



**FIGURE 3.18:** Controlling the visibility of the levels at the other end

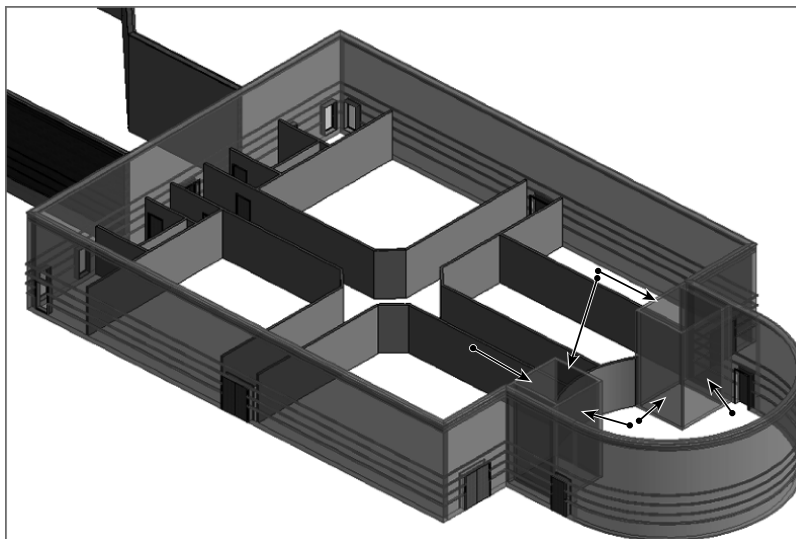
With the two upper levels established, you can constrain some walls up to these levels. Sometimes the best way to do this is to look at the model from a 3D view.

1. Click the Default 3D View icon on the Quick Access toolbar at the top of your screen, as shown in Figure 3.19.



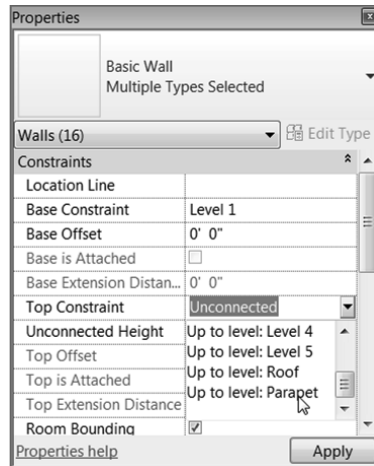
**FIGURE 3.19:** Clicking the Default 3D View icon

2. The next step is to select all the walls you want to be extended to the Parapet level. In this case, only the east building will go all the way up to this level. Select the exterior and the elevator shaft walls, as shown in Figure 3.20. (Be sure to select all the elevator shaft walls as well.) You must hold the Ctrl key to add to the selection. The walls turn blue when they're selected. You can also hover over one of the walls and press the Tab key. Once the walls are highlighted, pick a wall. All of the walls will be selected.

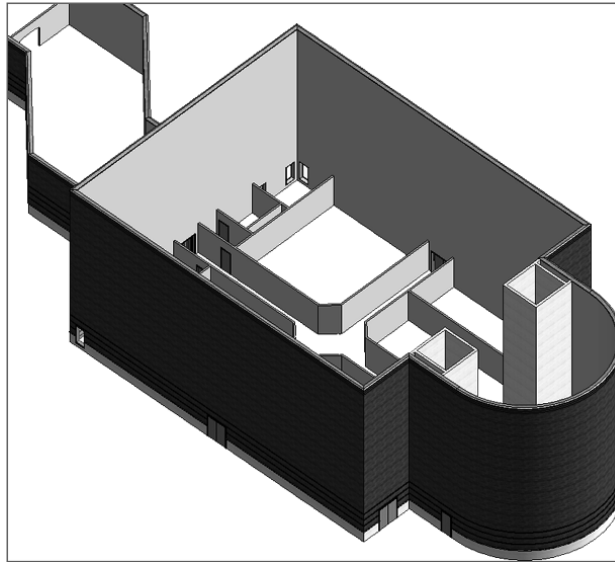


**FIGURE 3.20:** Selecting the walls that extend to the Parapet level

- In the Properties dialog, under the Constraints category, change Top Constraint to Up To Level: Parapet, as shown in Figure 3.21. Click Apply or move your cursor into the drawing window to set the property change. The walls should now extend to the Parapet level, as shown in Figure 3.22.

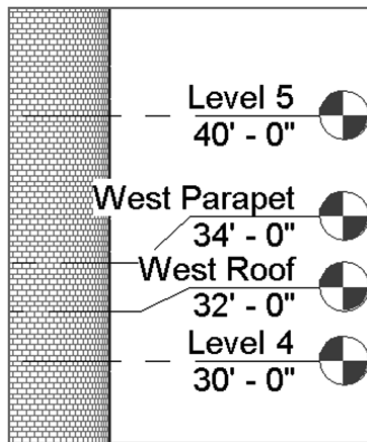


**FIGURE 3.21:** Setting the top constraint to Up To Level: Parapet



**FIGURE 3.22:** The walls on the east side of the building are now constrained to the Parapet level.

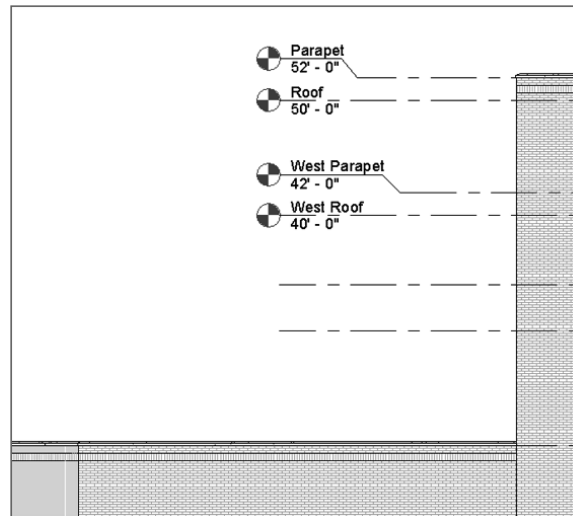
4. In the Project Browser, double-click the South elevation under Elevations (Building Elevation).
5. Start the Level command again.
6. Offset Level 4 up 4' (1200 mm). Remember, you're in the Level command. You must choose Pick Lines on the Draw panel. Also, you must specify an Offset value of 4'-0" (1200 mm) on the Options bar.
7. Offset another level up from the fourth level, 2'-0" (600 mm), and then press Esc a couple times to terminate the command.
8. Rename the 4'-0" (1200 mm) offset level **West Parapet**. Click Yes to rename corresponding views.
9. Rename the 2'-0" (600 mm) offset level **West Roof** (see Figure 3.23), and click Yes to rename corresponding views. You'll have to add elbows to the levels to see the names and elevations.



**FIGURE 3.23:** Adding two new levels for the west side of the building

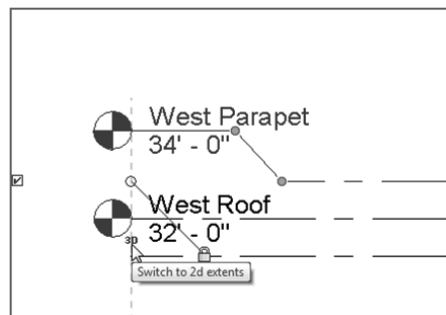
See? Adding levels isn't all that hard. You just need to know how Revit wants you to do it. Now that you've added some levels, you can go back and configure how they're displayed.

1. For the two new levels, uncheck the Show Bubble check box to the *right* of the level lines by clicking the Hide Bubble check box.
2. Display the bubbles to the *left* side of the level line by selecting the Show Bubble check box. The level should now look like Figure 3.24 (you have to add those elbows again).

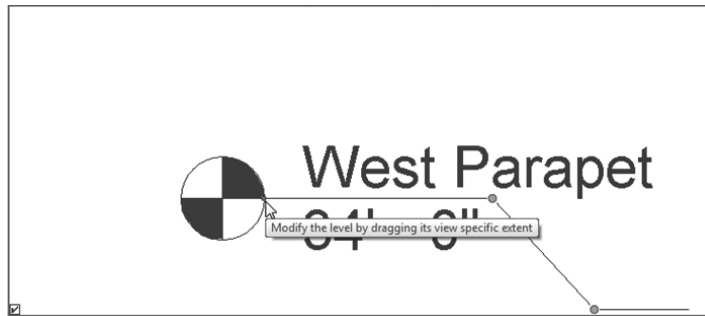


**FIGURE 3.24:** Using the display bubble toggles to switch the display to the appropriate side of the building

3. Staying focused on the left side of the building, select the West Parapet level.
4. Notice that some blue icons still appear. One of those icons reads 3D.
5. Pick (left-click) the 3D icon. It now reads 2D. The larger, hollow blue grip turns into a smaller, solid grip. You can now drag the level end without dragging the rest along with it. The 2D function also ensures that this modification doesn't affect other views (see Figure 3.25 and Figure 3.26).

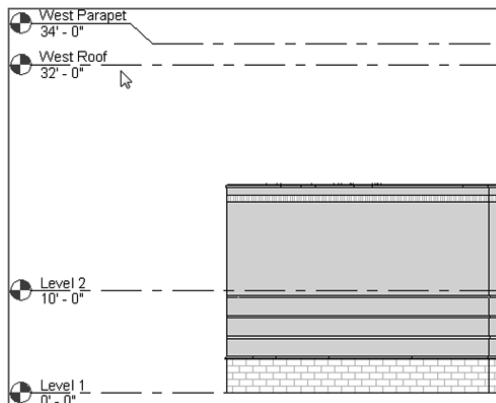


**FIGURE 3.25:** Turn off the 3D extents so you can drag the level end freely and without disturbing any other view.



**FIGURE 3.26:** The little blue grip enables you to drag the entire level.

6. Repeat the procedure for the West Roof level. Now both of the level ends are set for 2D extents. The blank ends at the right side are still set to 3D extents.
7. Select the West Parapet level, activating the grips.
8. Pick the blue grip, and drag the end to the left side of the building, approximately to the location shown in Figure 3.27. Notice that the two 2D lines are locked to one another.



**FIGURE 3.27:** You can drag the 2D level ends wherever you want them.

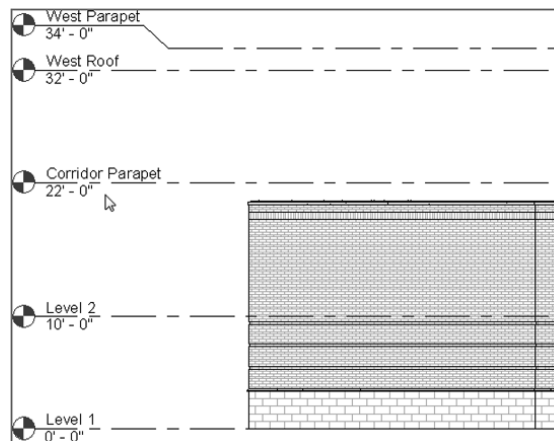
9. Drag the West Roof level to the left as well.
10. Turn on the left side for Levels 1 and 2.
11. Switch these levels to 2D, and drag them to align with the West Parapet and West Roof levels, as shown in Figure 3.27. (If you can't pick a level, hover over it with your cursor and press the Tab key. When the level highlights, pick it.)

12. Add another level 2' (600 mm) above Level 3, and call it Corridor Parapet. Click Yes to rename corresponding views.
13. Turn on the level information on the left side.
14. Turn off the level information on the right side.



**WARNING** On almost every project, you'll have to adjust a level's display in different views. Keep in mind that if the 3D button is left on, moving the level in the current view will also move it in other views—sometimes for the better and sometimes for the worse. Switching to 2D can eliminate aggravation.

15. On the left side, turn on the 2D extents.
16. Drag the left side of the line to an area approximately as shown in Figure 3.28.

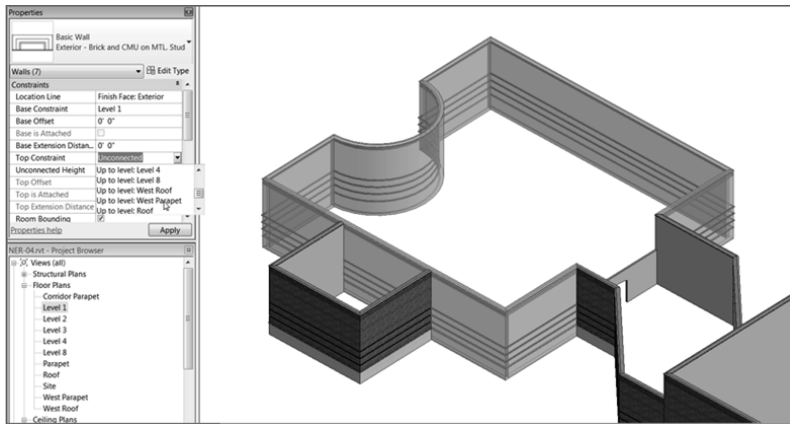


**FIGURE 3.28:** All the levels are in place for now.

Let's move these walls to their proper levels. Again, in this case it may be a little easier to go to a 3D view so you can get a good perspective on the results of constraining the tops of the walls. Perform the following steps:

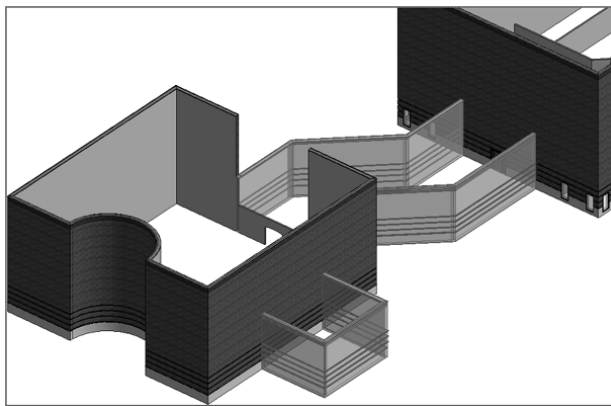
1. Click the Default 3D icon on the Quick Access toolbar.
2. In the 3D view, select the west side of the building, excluding the corridor and the three walls to the south, as shown in Figure 3.29. You should have seven walls selected. To check this, look in the lower-right corner of the Revit window. You see a filter icon with the number 7 next to it. (You need to press and hold the Ctrl key for multiple selections.)





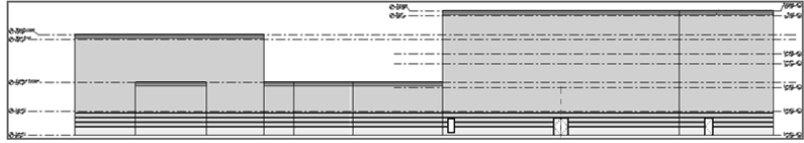
**FIGURE 3.29:** Selecting the west part of the building

3. In the Properties dialog, set Top Constraint to Up To Level: West Parapet. Click Apply or move your cursor into the view window.  
In the 3D view, your walls should grow to meet the new constraints.
4. Press Esc.
5. Select the corridor walls as well as the three south walls whose tops remain unconstrained. (You may need to rotate the view to see everything.)
6. In the Constraints category of the Properties dialog, set Top Constraint to Up To Level: Corridor Parapet (see Figure 3.30).



**FIGURE 3.30:** The final walls are constrained to the Corridor Parapet level.

- Go back to the South elevation. Set the top constraints of the selected walls to Corridor Parapet, as shown in Figure 3.31.



**FIGURE 3.31:** The final look of the building

- Save the model.

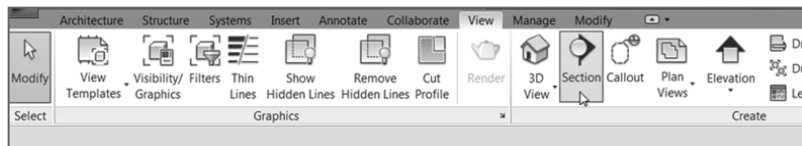
## Creating and Modifying Building Sections

As your model starts to develop, you'll begin to see areas that need further attention. (Certainly the area where the corridor hits the west building needs to be fixed.) This brings us to a good point. Sections in Revit Architecture, when placed into the model, not only help you build a set of construction documents but also help you work physically on the model. For example, you need to fix the east wall of the west wing. However, you don't have any good views established that focus directly on this area. This is the perfect place to add a section!

### Adding a Building Section

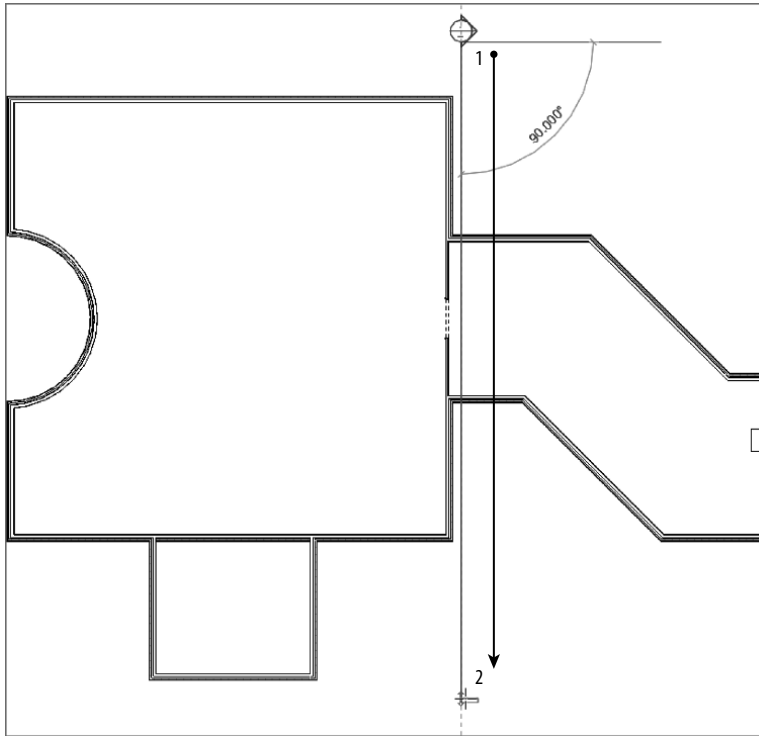
To add a section and some important wall-modify commands, follow these steps:

- Go to Level 1 Floor Plan, and zoom in on the area where the corridor meets the west wing of the building.
- On the Create panel of the View tab, select Section, as shown in Figure 3.32.



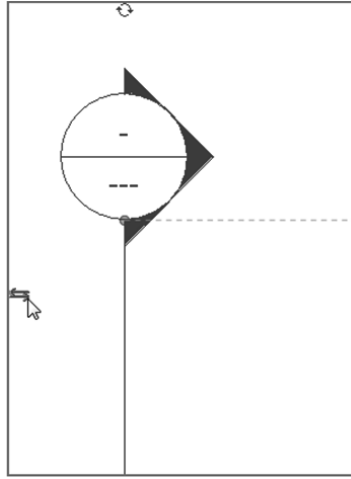
**FIGURE 3.32:** The Section command is found on the Create panel of the View tab.

3. A section takes two picks to place into the model. You must first pick the point for the head; then you pick a point for the tail. To place the section as shown in Figure 3.33, first pick a point above the corridor and to the right of the vertical wall.



**FIGURE 3.33:** Placing the section into the model

4. After you pick the first point, move your cursor straight down the view. When you're positioned directly below the bottom corridor wall, pick the second point (see Figure 3.33). If the section is facing the wrong way, that's fine. You'll fix that in a moment.
5. With the section placed, it looks like you need to flip it to face the wall you intended to modify. A few blue icons appear. You're interested in the icon that looks like two arrows. This is a *flip grip*. It's the same thing you saw in the doors and windows (see Figure 3.34).



**FIGURE 3.34:** After you select the section, you'll see the flip grip.

6. When you see the flip grip, pick it. It flips the section into the correct direction.



**WARNING** I may be jumping ahead, but here's a word of caution: if you cut a section in Revit Architecture and then place detail components and draft over the top of that section, you're stuck. Don't flip or move the section after you've drafted over the top of it. The results will be bad. The walls will move, but your line work won't, leaving you with a mess.

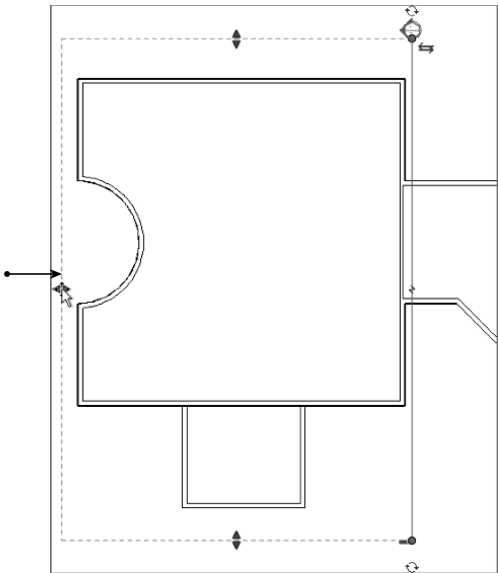
With the section flipped in the correct direction, a dashed line forms a box around part of the model, as shown in Figure 3.35. This forms the view extents of the section. Anything outside this box won't be shown.

7. The vertical dashed line (to the left) has a move arrow. Pick the move arrow, and drag the crop region into the area shown in Figure 3.35.

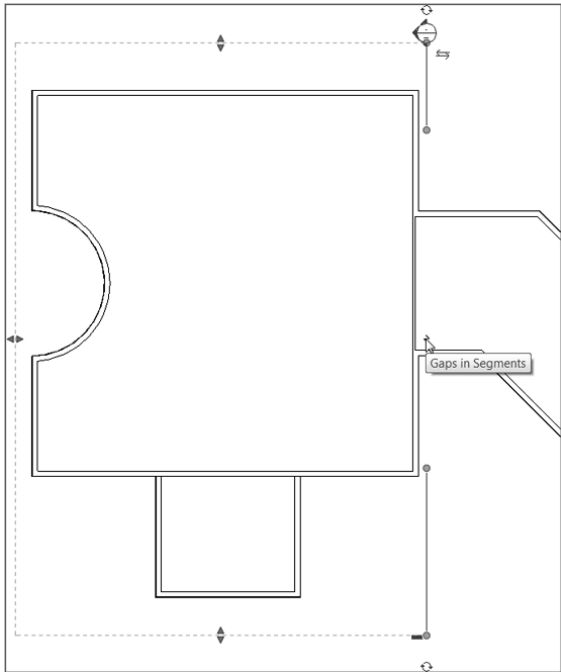


**NOTE** If the section isn't selected, you need to select it. You must pick the line of the section, not the bubble. When you pick the line, the section is selected.

8. With the section still selected, notice the small, blue break icon in the middle of the section (see Figure 3.36). Pick the break line (it's called the Gaps In Segments icon). The section is now broken, and you have grips controlling the ends of the break lines (see Figure 3.36).

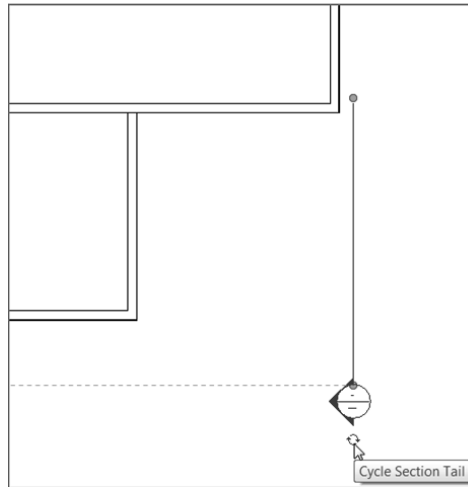


**FIGURE 3.35:** You can control how deep into the building you want the section to appear.



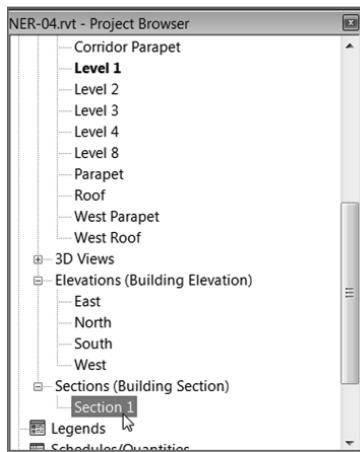
**FIGURE 3.36:** Adding a gap in the section. You can move your grips to be the same as the figure.

9. At each end of the section is a blue icon that resembles a recycle symbol. This controls what the section head displays. By selecting this icon, you can choose to have a section head, a tail, or nothing. At the tail of the section, cycle through until you get a section head (see Figure 3.37).



**FIGURE 3.37:** Cycling through the display choices

With the section cut, it's time to open the view you've created. In the Project Browser, you now see a new category called Sections (Building Section). In this category is a view called Section 1. When you cut the section, you added a view to the project. This view carries its own properties and can be drafted over (see Figure 3.38).



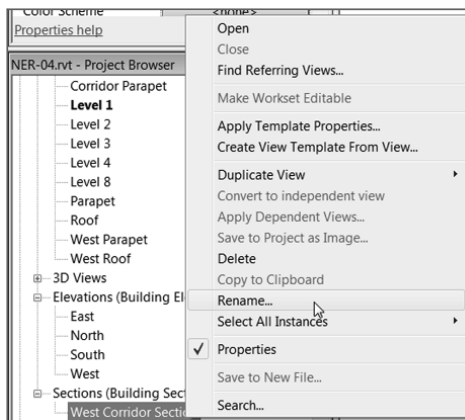
**FIGURE 3.38:** The Project Browser with the new section



**TIP** Be organized. Using BIM doesn't negate the need for basic organization. The first thing you should do when creating a section (or any new view, for that matter) is give it a name. If you don't and you leave your sections as Section 1, Section 2, Section 3, and so on, you'll find yourself wasting a lot of time looking for the right view.

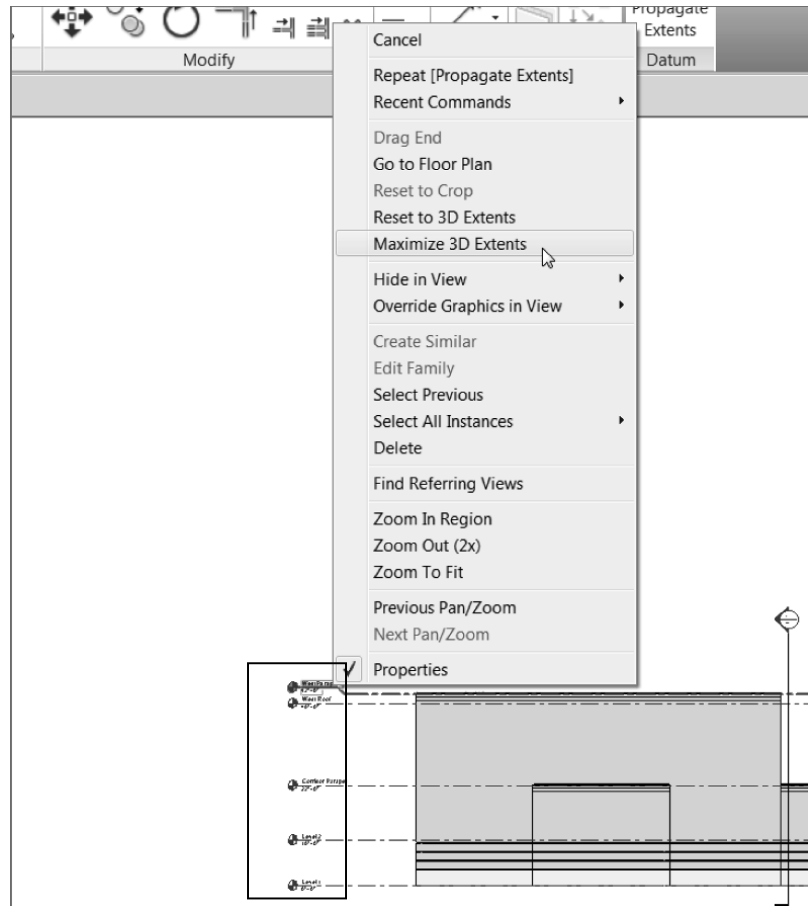
At this point, you need to name the section and open the view. You can also fix the gap in the wall while you're at it. Perform the following steps:

1. In the Project Browser, right-click Section 1.
2. Choose Rename from the context menu (see Figure 3.39).



**FIGURE 3.39:** You can rename the view by right-clicking in the Project Browser.

3. Change the name of Section 1 to West Corridor Section.
4. Click OK.
5. Double-click the West Corridor Section in the Project Browser. Doing so opens the section. You can see the two corridor walls and the west wing beyond.
6. Chances are that the section looks great, but no levels are displayed. If you can't see your levels, open the south elevation.
7. Select a window around the west levels, as shown in Figure 3.40.
8. With the levels selected, place your pointer directly on top of one of the levels, and right-click.



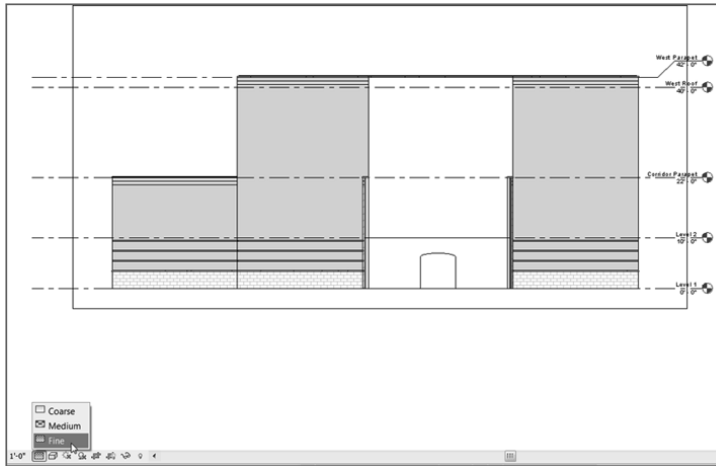
**FIGURE 3.40:** By choosing Maximize 3D Extents, you can control the visibility of the levels in other views.

9. Select Maximize 3D Extents, as shown in Figure 3.40.
10. Go back to the West Corridor Section to clean up the levels so they're to the right of the building and the Parapet level isn't overlapping the level below (see Figure 3.41).



**NOTE** Notice that when you're adjusting the levels in the section, the 2D icon appears. This means any adjustments made here won't affect any other views. In a sectional view, Revit automatically makes the levels 2D. In an elevation view, however, Revit makes the levels 3D. If you want to make adjustments in an elevation, it's a good idea to turn these into 2D extents.





**FIGURE 3.41:** On the View Control bar, set Fine as the detail level.

11. On the View Control bar, select Fine for the detail level, as shown in Figure 3.41. (Making adjustments like this to a view will become second nature to you soon.)

Cutting a section is immensely helpful in terms of viewing the model from any perspective you want. To go even further, when you cut a section, you can also work on your model by modifying any item in the section.

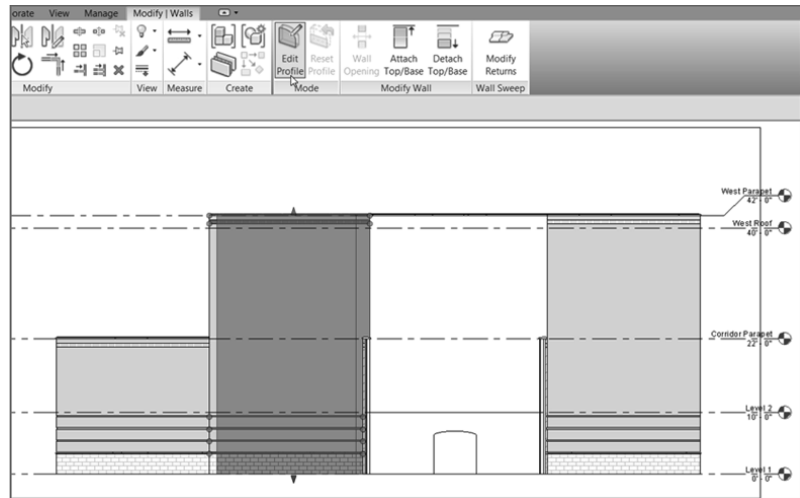
## Making Building Modifications in a Section

Now that you've had a good look at this side of the west wing, it's obvious that this wall needs to be repaired. In Revit Architecture, you can make a modification to a building in any view. This is good and bad. Just remember that everything you do has a downstream effect on the entire model.

The following procedure will guide you through making a modification to a wall's profile while in a section view:

1. In the Project Browser, find the West Corridor Section and open it by double-clicking the name West Corridor Section (if it isn't open already).
2. In this section, select the east wall of the west wing, as shown in Figure 3.42.
3. After you select the wall, click the Edit Profile button in the Modify | Walls tab.

◀ In Revit Architecture, you can also double-click the annotation that refers to the view you want to open. For example, if you want to open the West Corridor Section and you're in a plan, all you have to do is double-click the section bubble, and the view will open. If you're in the section and you want to go back to a floor plan, you can double-click a datum bubble, and Revit will open that view.

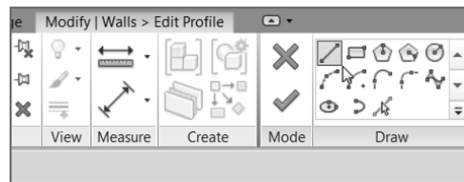


**FIGURE 3.42:** Selecting the wall to be modified and clicking Edit Profile

After you select a wall, you can access options to modify that wall. Edit Profile is one of those options.

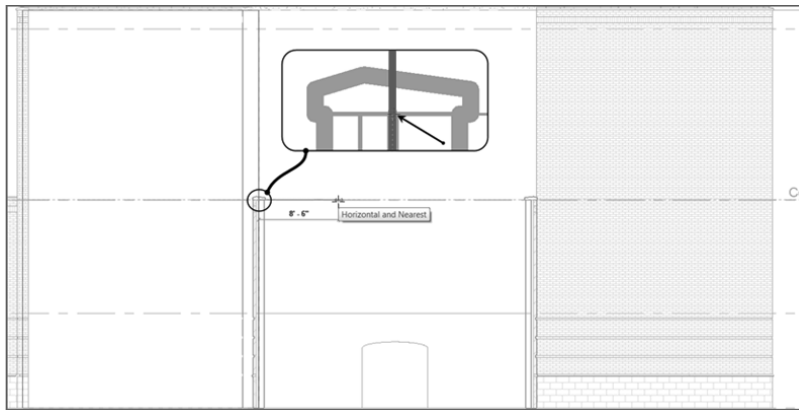
You're presented with a magenta outline of the wall. This magenta outline can be modified to alter the wall's profile. On the Ribbon, Edit Profile has been added to the title of the Modify | Walls tab. This enables you to focus on the modification at hand.

4. On the Draw panel of the Modify | Walls > Edit Profile tab, select the Line button, as shown in Figure 3.43.



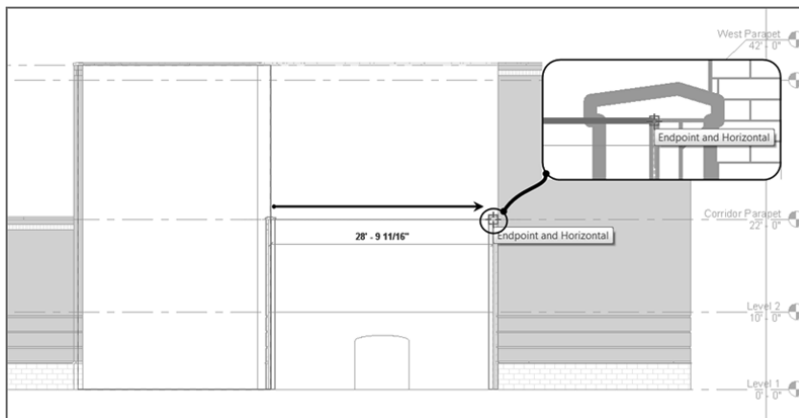
**FIGURE 3.43:** Adding lines to alter the wall's profile

5. With the Line command running, move your pointer to the vertical magenta line on the right where it intersects the Corridor Parapet level, as shown in Figure 3.44.
6. When you see that you're snapped and aligned with the magenta line and the Corridor Parapet level, pick this point. Your line starts.



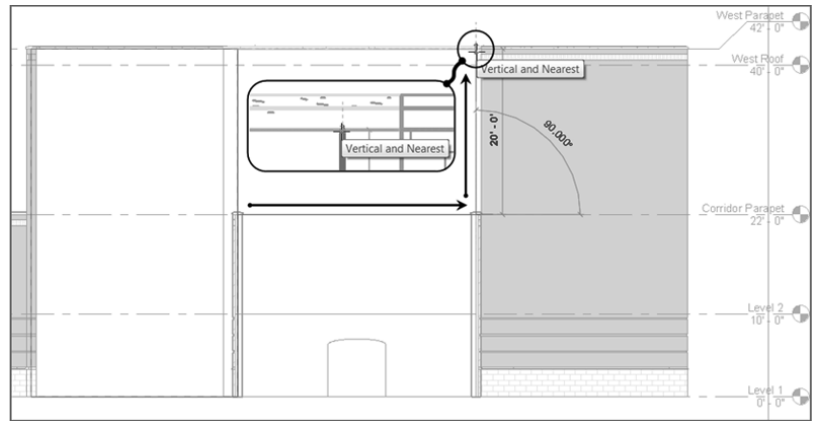
**FIGURE 3.44:** Revit aligns your cursor to levels, enabling you to sketch a new profile accurately.

7. Draw the line to the right until you intersect with the centerline of the corridor wall, as shown in Figure 3.45.



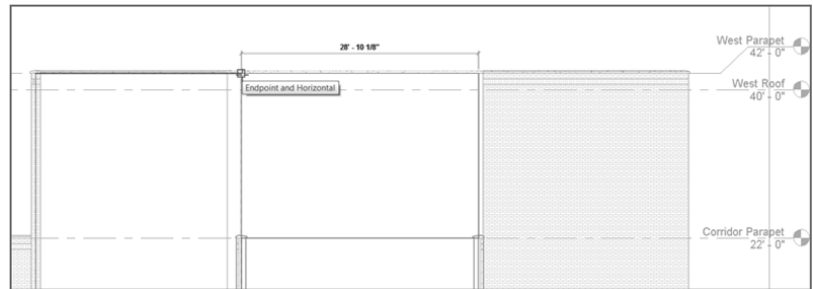
**FIGURE 3.45:** Drawing the line from the left wall to the right

8. When you see the snap icon appear, pick this point (see Figure 3.45).
9. Draw the line straight up the wall to the top. Make sure you don't snap to the top of the parapet cap. The point you want is to the top of the brick, as shown in Figure 3.46. (All you're doing here is sketching the profile of the wall.)



**FIGURE 3.46:** Drawing another line from Level 3 to the bottom of the Corridor Parapet level

10. Continue drawing the line from right to left, across the top of the wall. Snap to the endpoint of the wall to the left, as shown in Figure 3.47.

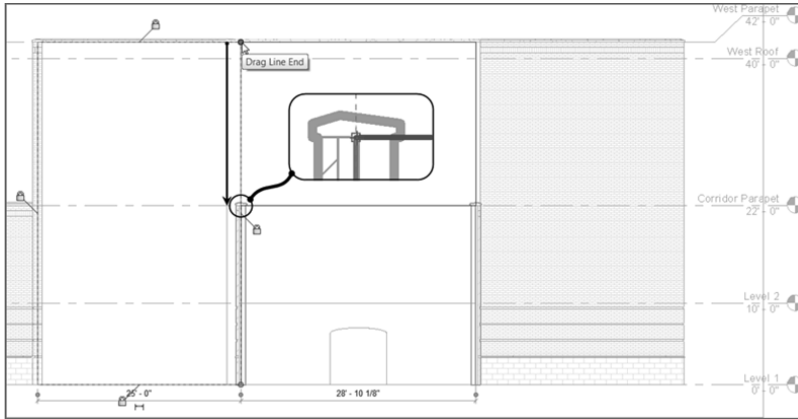


**FIGURE 3.47:** Drawing the line across the top

11. Press the Esc key, or click the Modify button on the Select panel.
12. Pick the vertical line to the left that goes from the bottom of the wall to the top.
13. Pick the top blue grip, and stretch the line down to Level 3.  
You now have a closed loop, as shown in Figure 3.48.

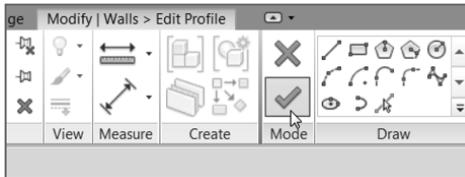


**WARNING** If you don't have a perfectly closed, continuous loop with your magenta lines, Revit won't allow you to proceed to finish altering the profile of this wall. Make sure you have no gaps, overlaps, or extra line segments aside from the six lines you need to form the wall's outline.

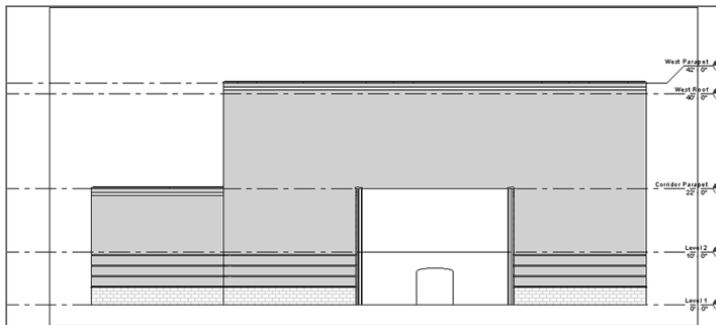


**FIGURE 3.48:** Closing the wall by using grips to stretch the line

14. On the Wall panel of the Modify | Walls > Edit Profile tab, click Finish Edit Mode, as shown in Figure 3.49. Your finished wall profile should look like Figure 3.50.



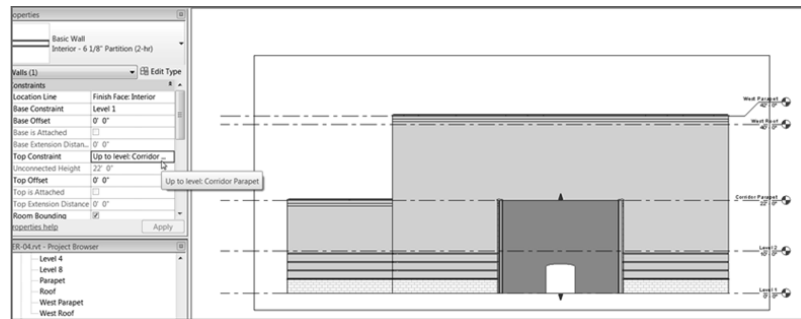
**FIGURE 3.49:** Clicking Finish Edit Mode



**FIGURE 3.50:** The finished wall profile

There is one thing left to do before you leave this section: select the two-hour fire-rated partition wall that is constrained only to Level 2. Now that you've opened up this area, the wall can go up to Level 3. To constrain the top of this wall to Corridor Parapet, follow these steps:

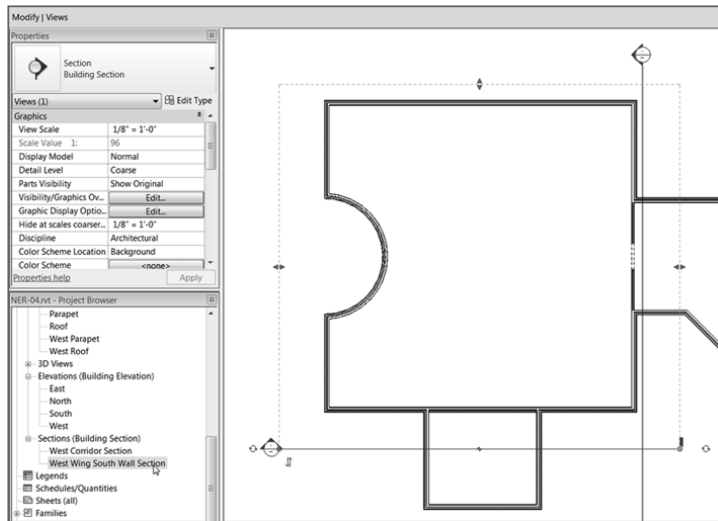
1. Select the internal (white) wall with the arched opening, as shown previously in Figure 3.50.
2. In the Properties dialog, change Top Constraint to Up To Level: Corridor Parapet, as shown in Figure 3.51.



**FIGURE 3.51:** Choosing the properties to change a wall's constraints is becoming old hat!

3. The partition wall now meets the brick exterior wall.
4. In the Project Browser, double-click Level 3 Floor Plan view.
5. Change the detail level to Fine. (Remember, this option is on the View Control bar at the bottom of the screen.)
6. On the View tab, click the Section button.
7. Place a section as shown in Figure 3.52. Make sure the extents are similar to the figure.
8. In the Project Browser, right-click the new section and rename it **West Wing South Wall Section**. You'll use this section in Chapter 4, "Working with the Autodesk Revit Tools."

Adding entire building sections is a great way to break down the model quickly into large segments. Another type of section, a wall section, enables you to view smaller portions of the item being detailed.



**FIGURE 3.52:** Adding another section to modify another wall

## Adding Wall Sections

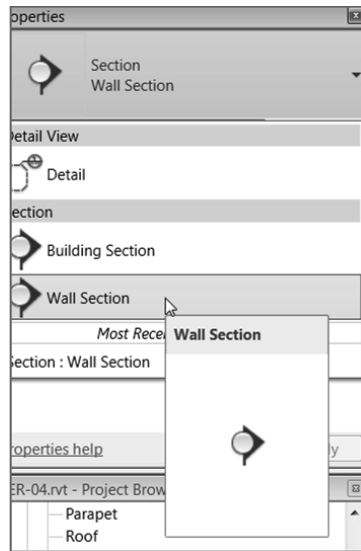
A *wall section* is basically the same as a building section. The only difference is that when you place a wall section, Revit holds the extents to a much smaller area. When you add a building section, Revit wants to extend to the farthest geometry. That being said, a wall section is usually placed to show only the item being cut but not the geometry beyond.

To place a wall section, follow this procedure:

1. Double-click Level 1 in the Project Browser.
2. On the View tab, pick the Section button (the same one you picked for the building section).
3. In the Properties dialog box, select Wall Section, as shown in Figure 3.53.

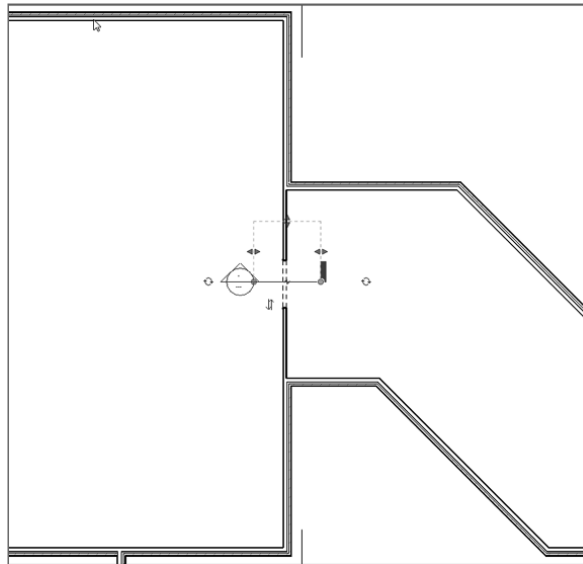


**WARNING** If you're directed to go to a specific floor plan and your view looks nothing like the one shown in the book, you need to make sure you aren't in a ceiling plan. Notice in the Project Browser that you have floor plans and ceiling plans. The two are quite different. Make sure you're in a floor plan.



**FIGURE 3.53:** Changing the type of section from Building Section to Wall Section

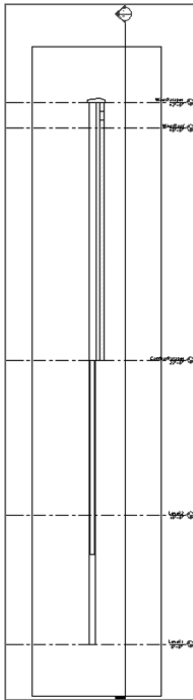
4. Add the section through the corridor wall that was modified in the previous section of this chapter, as shown in Figure 3.54.



**FIGURE 3.54:** The wall section in the plan



5. Right-click the new section in the Project Browser. It's in a category called Sections (Wall Section).
6. Select Rename.
7. Call the new section Corridor Entry Section. Click OK.
8. Open the Corridor Entry Section.
9. Change the scale to  $1/2'' = 1'-0''$  (1:20 mm).
10. Change the detail level to Fine. Your section should look like Figure 3.55.



**FIGURE 3.55:** The finished wall section

11. Save the model.

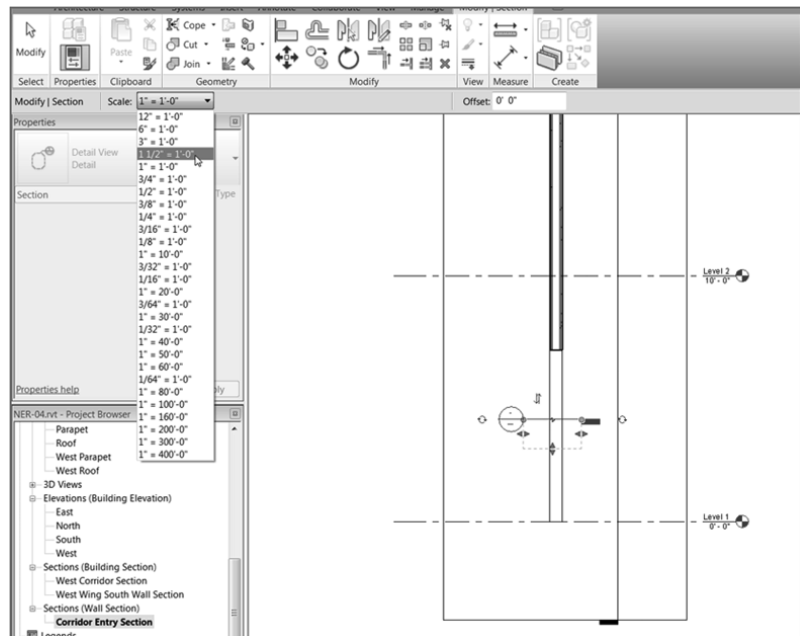
You're narrowing down the types of sections you can use, and it's time to venture into a specific type of section that can enable you to create a plan-section detail.

## Creating Detail Sections

There is a third type of section we need to discuss: the detail section. Revit refers to this type of section as a *detail view*, so that's how we'll start addressing it.

To add a detail section, perform the following steps:

1. Open the view called Corridor Entry Section (if you don't have it open already).
2. On the View tab, select Section (yes, the same section you've been using all along).
3. In the Properties dialog box, select Detail View: Detail.
4. Place a section horizontally below the head of the opening, as shown in Figure 3.56. Make sure the section is flipped so it's looking downward.



**FIGURE 3.56:** Creating a plan section detail

5. In the Project Browser is a new category called Detail Views (Detail). Expand the tree, and you see your new detail. It's usually called Detail 0, depending on the number of details that have been added to the model previously.

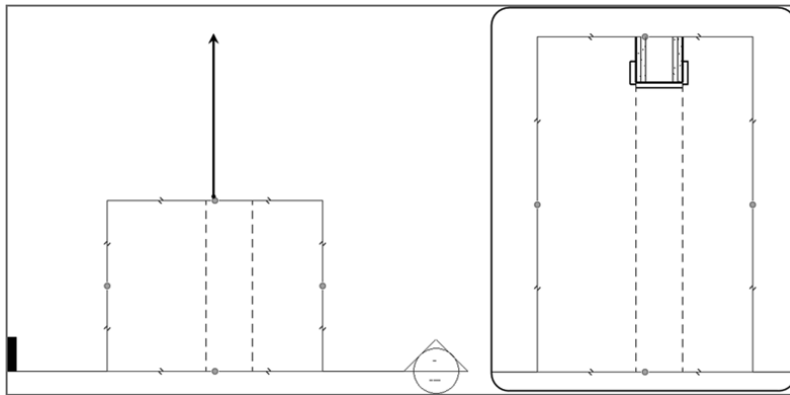
6. Right-click Detail 0, and select Rename.
7. Rename the detail **Plan Detail at Corridor Opening**, and click OK.
8. Open the Plan Detail at Corridor Opening view.
9. Change the scale to  $1' 1/2" = 1'-0"$  (1:5 mm).

With the detail open, you may be able to see only two dashed lines. This is because the crop region needs to be expanded, as explained in the next section.

## Using Crop Regions

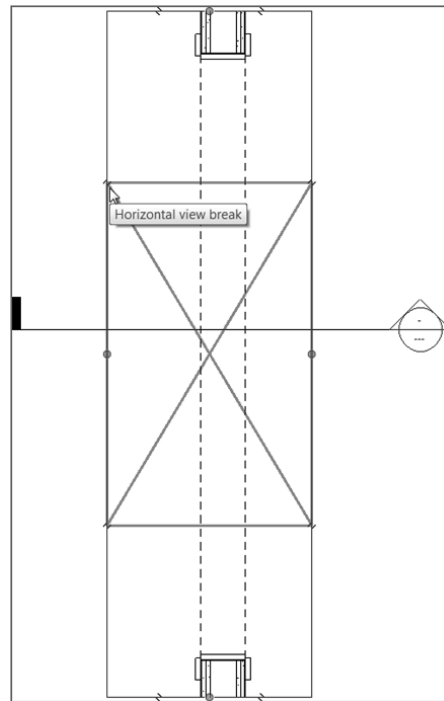
The border that surrounds the detail is called a *crop region*. It dictates the extents of the specific view you're in. You can adjust this crop region and use it to your advantage. To learn how to make adjustments to the crop region, follow these steps:

1. Select the window surrounding the detail, as shown in Figure 3.57.



**FIGURE 3.57:** Stretching the crop region to view the detail

2. You see four blue dot grips at the midpoint of each line. Pick the top grips, and stretch the top region up until you can see the opening jamb (see Figure 3.57).
3. Repeat the process for the bottom so you can see the entire opening.
4. With the crop region still selected, notice the break icons similar to the make-elbow icons in the level markers. Pick the break icon, as shown in Figure 3.58. Slice part of the section away, resulting in two separate cropped regions.



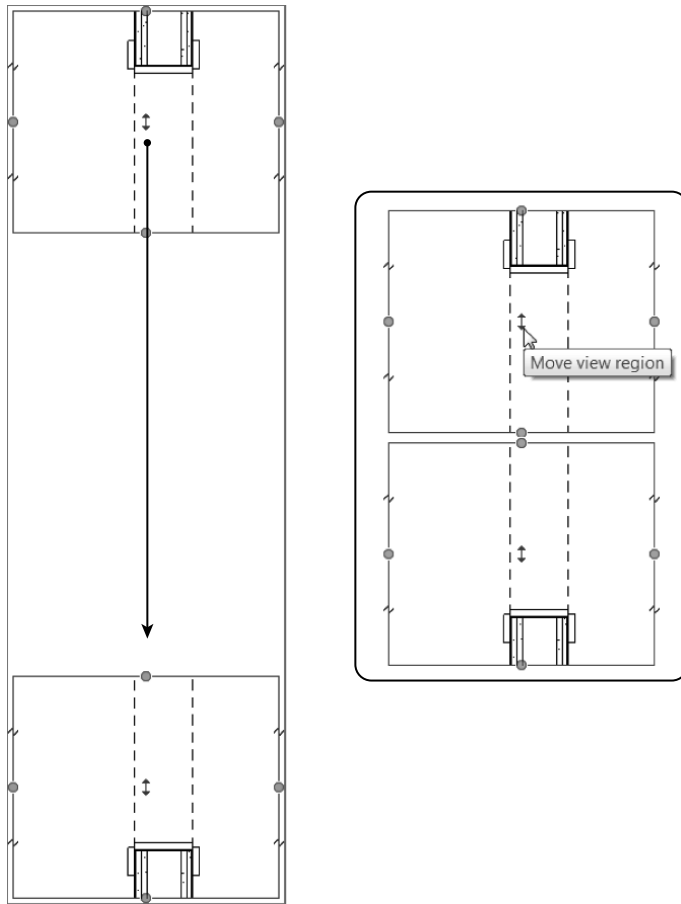
**FIGURE 3.58:** Splitting the section

5. Within the cropped regions are blue move icons. If you don't see blue icons, as shown in Figure 3.59, you need to select the crop region again.
6. Slide the sections closer together by clicking the top icon and moving the section down. (Be careful; if you slide them too close together, you'll get a warning telling you that the two regions are being joined back to one.)
7. Save the model.

You now have nice control over how the details are shown. Let's go back and learn how to make the section marker more aesthetically pleasing.

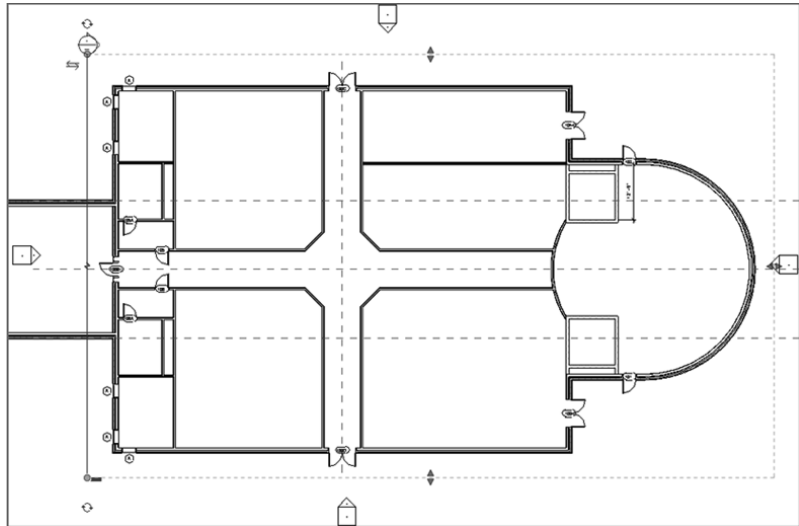
## Splitting a Section Segment

One more section item, and then you're finished! Sometimes you need to split (or *jog*) a section. You do this to show items that aren't necessarily in line with one another. You can accomplish this in Revit Architecture as follows:



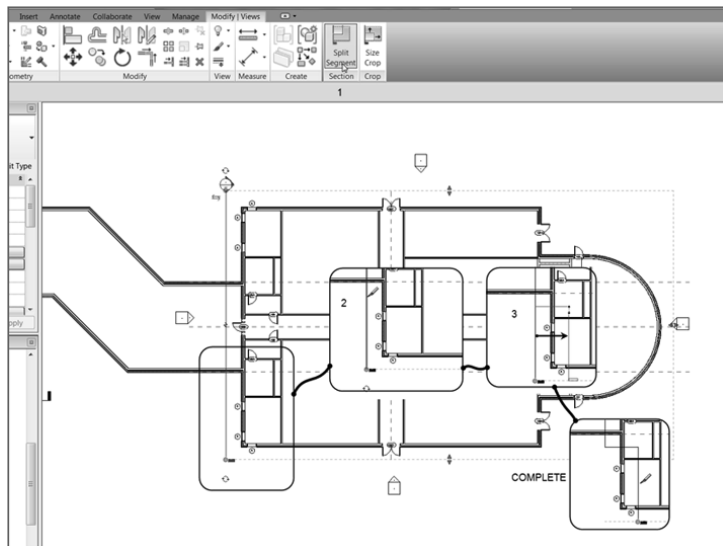
**FIGURE 3.59:** Sliding the view regions tighter together

1. Open the Level 1 floor plan.
2. On the View tab, click the Section button. (You can also grab a section from the Quick Access toolbar.)
3. In the Type Selector, select Building Section.
4. Pick a point above the corridor that connects to the east wing of the building for the section head, and then pick a point well below the bottom of the corridor, as shown in Figure 3.60.
5. In the Project Browser, find the section you just made and rename it East Corridor Section.



**FIGURE 3.60:** Adding another section to the model

6. Select the new section marker.
7. On the Section panel of the Modify | Views tab, click the Split Segment button.
8. Pick a point along the section line just below the corridor, as shown in Figure 3.61.



**FIGURE 3.61:** Jogging a section calls for splitting the segment.

9. Move your cursor to the right. A jog appears in the section; place the jog into the building. The section is now jogged into the building. Press Esc twice to clear the command.

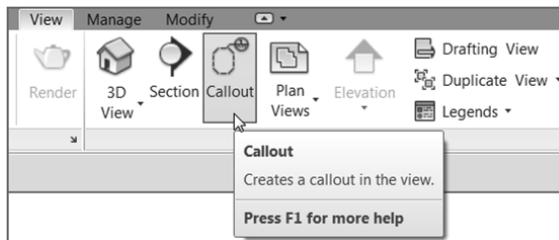
Finally! You're finished with sections. Just remember that by adding a section to the model, not only are you preparing to build your construction documents, but you're also enabling access to specific elements, thus allowing you to make modifications you otherwise could not have made.

## Creating Callouts

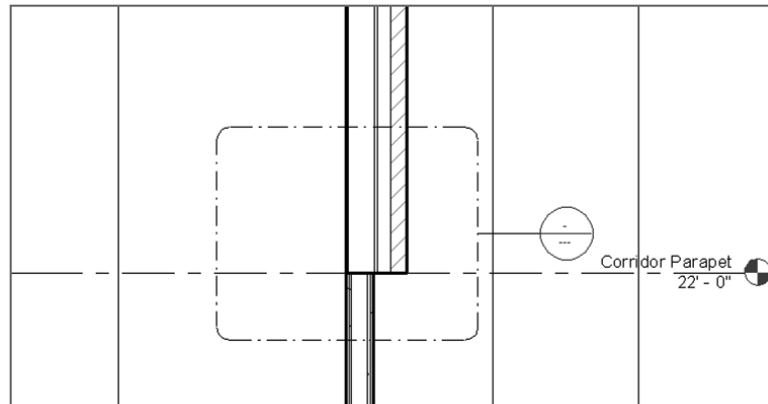
Creating an enlarged area of your model will be a task on every project you tackle. Luckily, in Revit Architecture, not only are callouts easy to add to your model but they also directly link to the view to which they refer. This is crucial for project coordination. Another nice thing about callouts is that you can make modifications to the callout view independent of the host view from which you pull the information. The biggest change you make is the scale. Yes, your callout can be at a different scale from the main floor plan.

Here's the procedure for adding callouts:

1. In the Project Browser, under Sections (Wall Section), open the Corridor Entry Section.
2. Find the View tab on the Ribbon.
3. On the View tab, click the Callout button, as shown in Figure 3.62.
4. Pick a window around the area where the corridor firewall meets the exterior wall with the brick façade, as shown in Figure 3.63.
5. In the Project Browser, there is a new Sections (Wall Section) item. Its name is Callout of Corridor Entry Section—which is fine just the way it is. Press Esc.

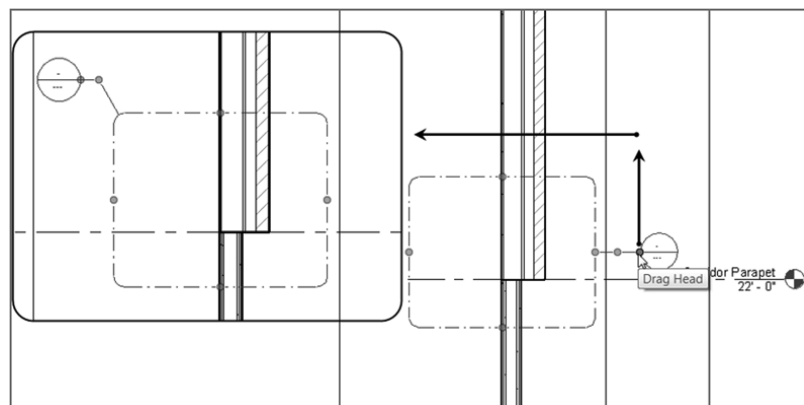


**FIGURE 3.62:** The Callout button is located on the View tab.



**FIGURE 3.63:** The callout area is directly related to the view it's calling out.

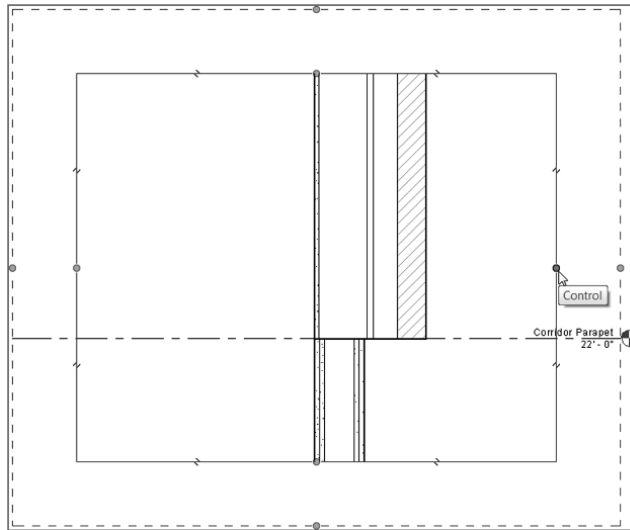
6. Select the callout you just added by picking any point along the line. A bunch of blue grips appear. These grips enable you to stretch the shape of the callout.
7. Pick the grip that connects the callout bubble to the leader coming from the callout window.
8. Drag the bubble to the location shown in Figure 3.64.
9. Pick the blue midpoint grip on the leader and create an elbow, as shown in Figure 3.64.



**FIGURE 3.64:** Adjusting callouts will be a common task.



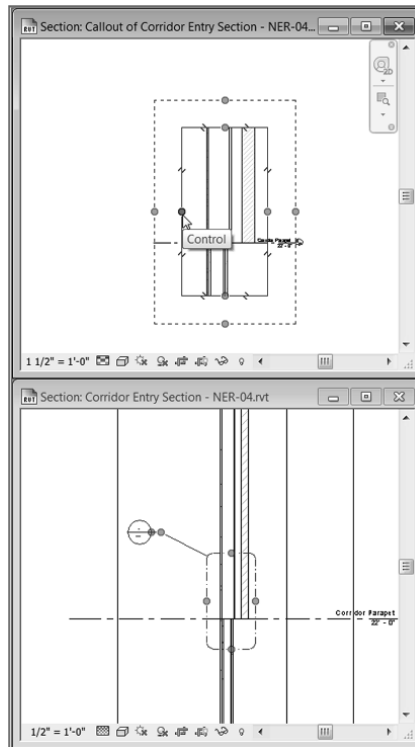
10. In the Project Browser, find Callout Of Corridor Entry Section under the Sections (Building Section) category, and open the view. (You can also double-click the callout bubble to open the view.)
11. With the section open, select the crop region, as shown in Figure 3.65.
12. Change the scale to  $1' 1/2" = 1'-0"$  (1:5 mm).



**FIGURE 3.65:** Selecting the crop region

After you select the crop region, you see an additional region that consists of a dotted line. This is called an *annotation region*, and it gives you a gutter in which to place text outside the area that is physically being cropped.

13. Type WT. This tiles the windows you have open.  
The callout window is selected in the Corridor Entry Section along with the crop region in your callout. That's because the two objects are one and the same (see Figure 3.66).



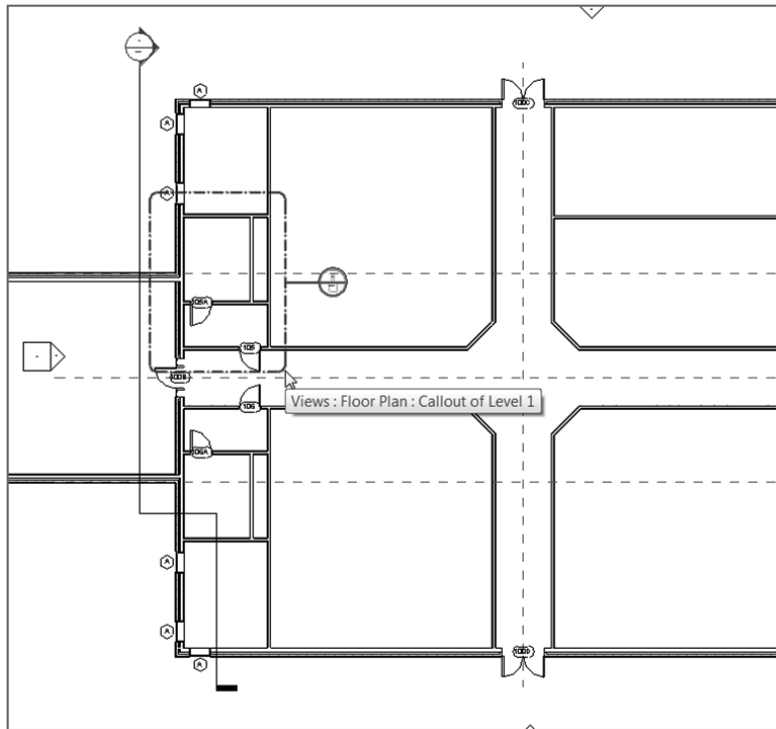
**FIGURE 3.66:** Modify the crop region by selecting it and stretching the grip.

14. Stretch the crop region closer to the actual wall, as shown in Figure 3.66.
15. Save the model. You'll use this detail in future chapters to get the model ready for construction documents.

Now that you've created a callout for a detail, let's go to the plan and create some callouts there. It would be nice to have some typical lavatory callouts as well as a typical elevator callout.

1. In the Project Browser, go to Floor Plan Level 1. (It may need to be maximized because you tiled the windows in the previous exercise.) Make sure it's a floor plan, not a ceiling plan.
2. Zoom in on the area shown in Figure 3.67.

The crop region and the callout outline are the same. If you modify one, the other changes accordingly.



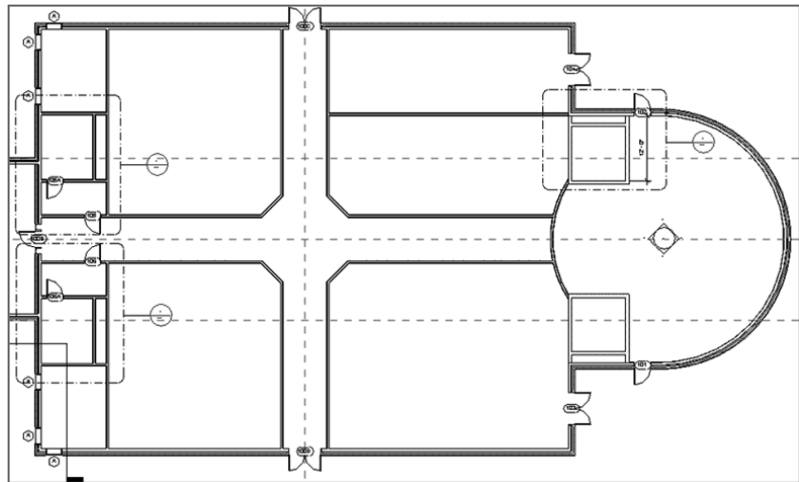
**FIGURE 3.67:** Creating a plan callout

3. On the View tab, select Callout.
4. Pick a window around the lavatory, as shown in Figure 3.67.
5. In the Project Browser, under the Floor Plans category is Callout Of Level 1. Right-click Callout Of Level 1, and select Rename.
6. Rename it Typical Men's Lavatory.
7. Open the Typical Men's Lavatory view. Choose Zoom To Fit.
8. The detail level is set to Coarse. Change it to Fine. Note that the callout is placed in the Project Browser under the category where it was created; you won't see a "callouts" category.



**T I P** You may have noticed that you've been opening quite a few views. It's a good idea to close the views you don't need open, because they could slow you down a tad. To close views, choose **Window > Close Hidden Windows**.

9. Save the model.
10. Open the Level 1 floor plan.
11. Create a callout for the women's room below the corridor (directly below the men's room).
12. Name the new callout **Typical Women's Lavatory**.
13. Create one more callout around the elevator shaft in the east wing, as shown in Figure 3.68.



**FIGURE 3.68:** The plan showing the three typical callouts

14. Name the new callout **Typical Elevator Shaft**.

The boring views are out of the way! Let's create some perspective views of the model. Creating these views is just as easy but requires a specific procedure in which you'll take advantage of the camera function.

## Creating and Modifying a Camera View

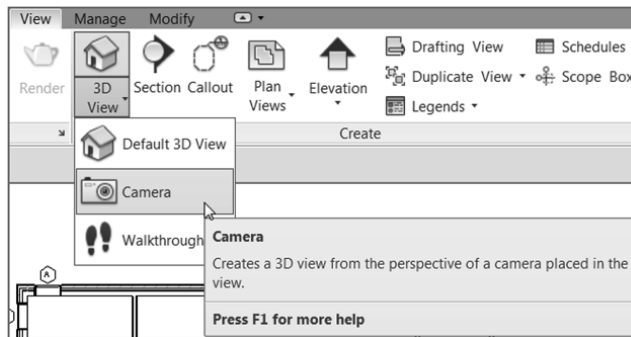
The camera view is the view with which you'll have by far the most fun. Revit Architecture seems to lend itself naturally to this type of view.

Taking a camera view essentially tells Revit to look at a certain area from a perspective vantage point. Like a section or a callout, such a view may never see the light of day in terms of going on a drawing sheet, but camera views are perfect to see how a model is coming along from a realistic point of view.

## Adding a Camera View

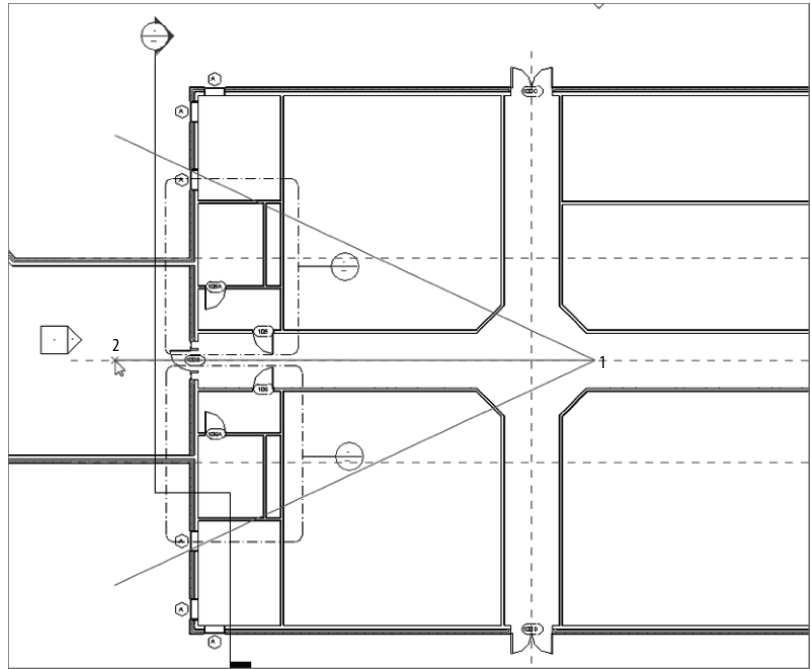
To create a camera view, follow these steps:

1. Go to the Level 1 floor plan.
2. On the View tab, click the drop-down arrow in the 3D View button and select Camera, as shown in Figure 3.69. (You can also access this on the Quick Access toolbar.)

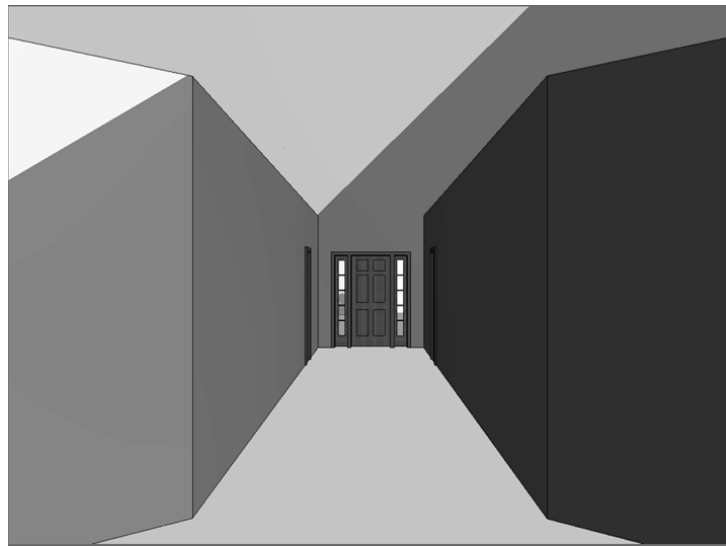


**FIGURE 3.69:** Adding a camera view

3. Pick a point in the main corridor of the east wing, and move your cursor to the left—down the hallway. You want to take a perspective view as if you were standing in the intersection of the two main corridors, as shown in Figure 3.70.
4. The second point you pick will specify how far the camera reaches into the building. Pick a point past the corridor doors, as shown in Figure 3.71.
5. Unlike when you're placing a section or a callout, Revit automatically opens the new 3D view. This doesn't mean it automatically has a useful name. In the Project Browser, you see a new view in the 3D Views category. It's called 3D View 1. Right-click 3D View 1, and name it East Wing Corridor Perspective.



**FIGURE 3.70:** Placing the camera view in the main corridor



**FIGURE 3.71:** The perspective view down the east wing corridor

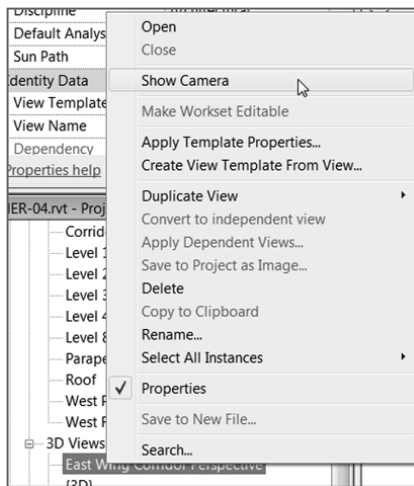
6. On the View Control bar located at the bottom of the view, change Visual Style to Realistic.
7. Two buttons to the right is the Shadows button. For a perspective view, turning on shadows is OK if the view is relatively small. In this example, go ahead and turn them on.

When the camera is in place, you may find it difficult to modify at first. You can do quite a bit to the view, but the following section focuses on modifying the actual camera in the plan.

## Modifying the Camera

After you place the camera in the model, Revit doesn't leave behind any evidence that the camera is there. If you need to make adjustments or see the location from which the view is being taken, perform the following steps:

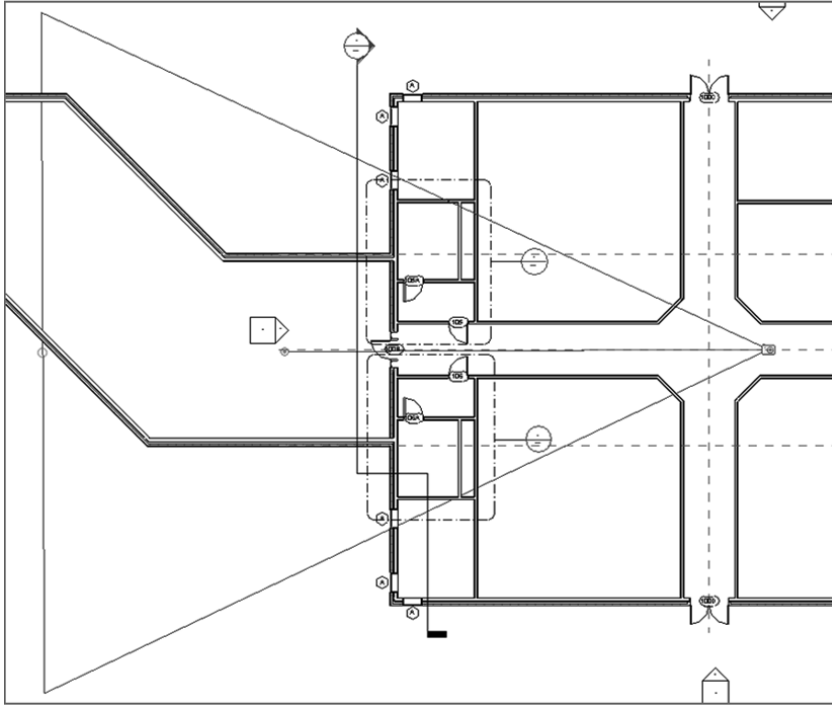
1. Open the Level 1 floor plan.
2. In the Project Browser, right-click the East Wing Corridor Perspective view in the 3D Views category, and select Show Camera, as shown in Figure 3.72.



**FIGURE 3.72:** By finding the view in the Project Browser, you can tell Revit to show the camera in the plan.

The camera appears in the plan temporarily so you can see it. In the view, the camera icon is a triangle and a straight line. You can physically move the

camera, and you can also adjust the grip on the midpoint of the triangle to swivel and to look farther into the model. Figure 3.73 shows the perspective view.

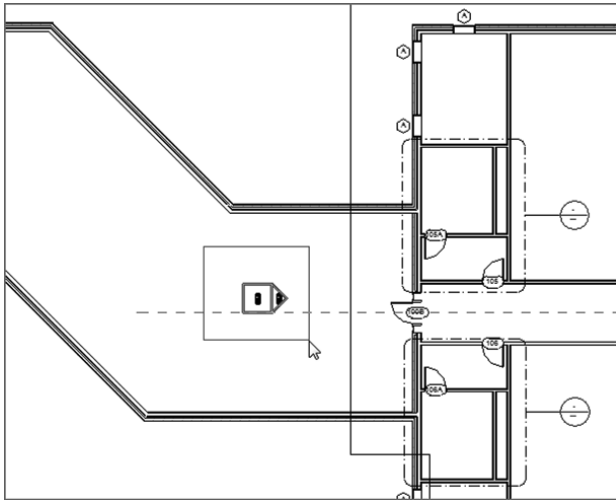


**FIGURE 3.73:** The perspective view

## Creating an Elevation

I saved the best view—or at least, the most popular—for last. Elevations are essential for any project. They're so essential, in fact, that Revit provides four of them before you place a single wall into the model. The four shapes that represent houses that were in the model at the beginning of the book are elevation markers, as shown in Figure 3.74. These markers are typically handy but are most certainly now in the way. The first thing you need to do is to move one of them out of the way. The second thing you need to do is to create a few new ones!



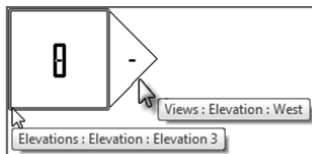


**FIGURE 3.74:** The elevation marker is right in the way!

To start manipulating elevations, follow these steps:

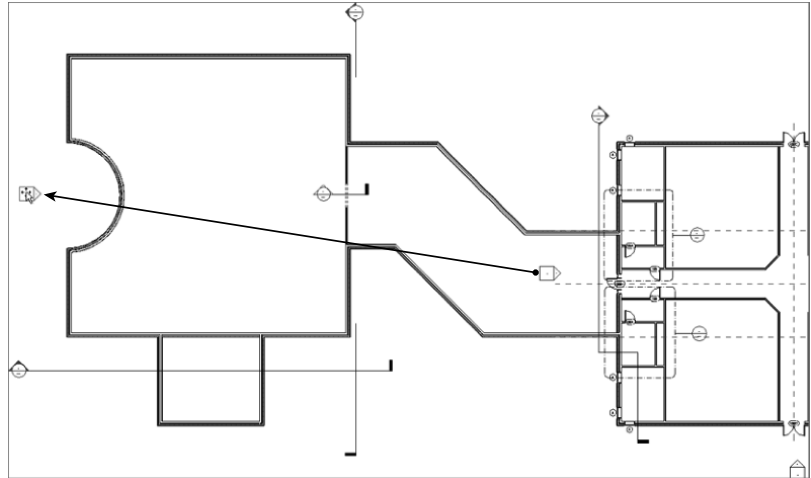
1. Go to the Level 1 floor plan. In the eastern part of the corridor is an elevation. Yours may be in a slightly different location than the book's example, but it needs to be moved nonetheless (see Figure 3.74).

You're about to move the elevation marker. To do so, however, you need to break down what an elevation marker comprises. It's actually two separate items: the square box is the elevation, and the triangle is the part of the marker that activates the view, as shown in Figure 3.75. To move this elevation marker, you must pick a window around both items and move them together. If you don't, the view will stay in its original location, leaving you wondering what is wrong with your elevation.



**FIGURE 3.75:** The elevation marker is broken down into two pieces. You need to move both together by picking a window around the entire symbol.

2. Pick a window around the elevation marker. Make sure you aren't picking any other items along with it.
3. Move your mouse over the selection. Your cursor turns into a move icon with four move arrows, as shown in Figure 3.76.

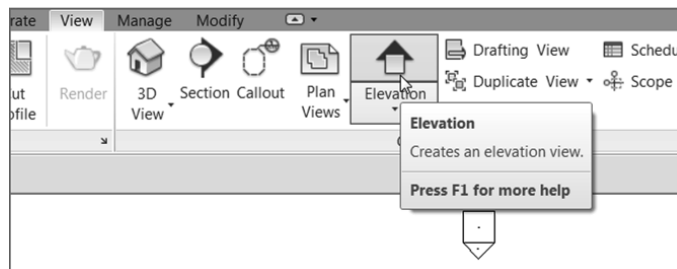


**FIGURE 3.76:** You can drag the elevation marker when the entire item is selected.

4. Drag the elevation marker to the west side of the building (see Figure 3.76).

Now that the elevation marker is out of the corridor, it's time to make a new one. To do so, make sure you're in the Level 1 floor plan, and follow these steps:

1. On the View tab, click the Elevation button, as shown in Figure 3.77.
2. In the Type Selector, make sure Exterior Elevation is current.



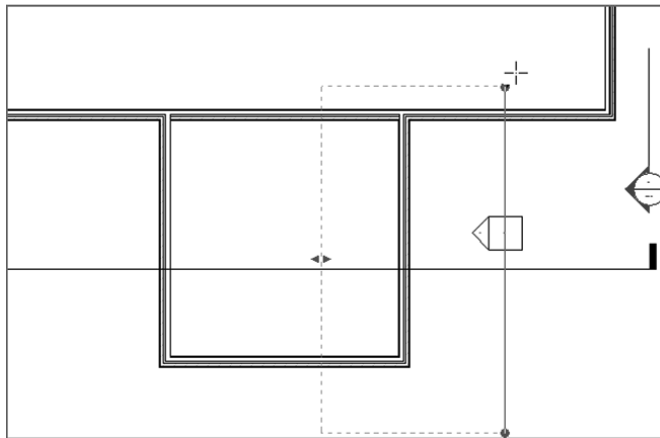
**FIGURE 3.77:** The Elevation button on the View tab

3. Move your cursor around the perimeter of the building. Notice that the elevation marker follows the profile of the exterior walls. This is a great thing!



**WARNING** When you're creating an elevation of a radial wall or nonlinear item, be sure you know the exact angle at which you're placing the elevation marker. When you're in the elevation view, you may get a false sense of the true dimensions based on the view's perspective. Draw a reference plane if you need to, and then place the elevation on that plane.

4. Pick a place for the elevation, as shown in Figure 3.78, and press Esc to terminate the command.



**FIGURE 3.78** : The elevation is placed. You can select the view arrow and move the extents of the elevation into the building.

5. When the elevation is placed, select the triangle. You see the same extents window that you saw in the previous section (see Figure 3.78). This controls how deep into the model you're viewing, and it also shows you the length of the section. Because you placed this elevation up against a wall, Revit stops the extents of the elevation at that wall.
6. Pick the top grip, and stretch the elevation past the wall, as shown in Figure 3.78.
7. In the Project Browser under Elevations (Building Elevation) is a new elevation. Right-click it, and rename it **West Wing Southeast Elevation**.

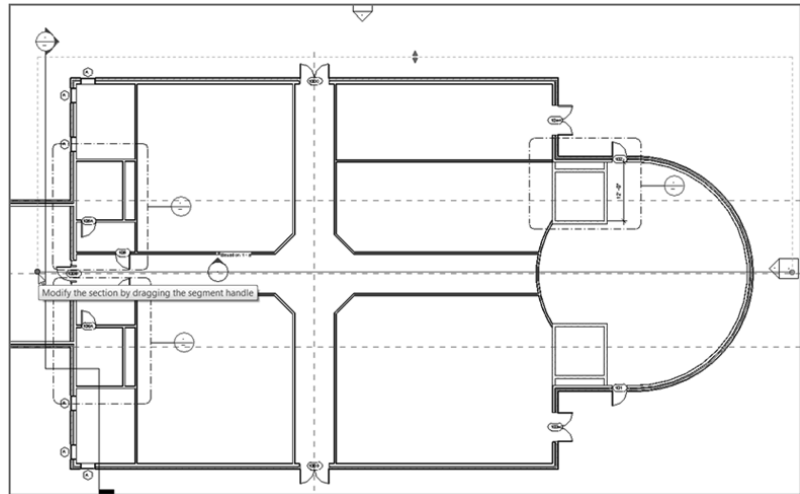
8. Open the elevation.
9. On the View Control bar, change the scale to  $1/4" = 1'-0"$  (1:50 mm).
10. On the View Control bar, set the detail level to Fine. (You can also set these in the Properties dialog at any time.)
11. Save the model.

You've added a new exterior elevation. You can add an interior elevation as well. It's just as easy and much more fun!

## Interior Elevations

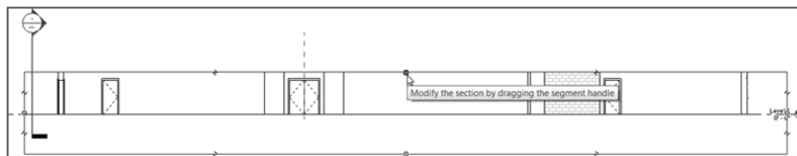
The difference between an exterior elevation and an interior elevation is the same as the difference between a building section and a wall section. Both interior and exterior elevations are executed the same way: by selecting the View tab on the Design bar. The only difference is that you can make a choice between the two in the Type Selector in the Options bar. To add an interior elevation, perform these steps:

1. Go to the Level 1 floor plan.
2. On the View tab, click the Elevation button.
3. In the Type Selector, choose Elevation : Interior Elevation, and place it in the area shown in Figure 3.79.



**FIGURE 3.79:** Adding an interior elevation and making the adjustments

4. Hover your cursor in the corridor near a point shown in the middle of Figure 3.79. Notice that when you move your cursor up, the arrow flips up. When you move your pointer down, the arrow flips down.
5. Make sure the arrow in the elevation target is pointing up, and then pick a point along the horizontal corridor, as shown at the right of Figure 3.79, to place the elevation. Once it's placed, press Esc to terminate the command.
6. After you place the elevation, select the arrow. Notice that the extents are outside the building. (This occurs in most cases. If it doesn't, you're good to go.) Select the elevation again and, on the left side, pick the blue grip and drag the left extent to the point shown at the left in Figure 3.79. Repeat the process for the right side as well.
7. In the Project Browser, there's a new elevation under the Elevations (Interior Elevation) category. Right-click the new elevation (Revit will call it Elevation 1 – a or something similar), and call it **East Wing Corridor North Elevation**.
8. Open the new view called East Wing Corridor North Elevation.
9. Notice that the crop region extends all the way up to the parapet. Select the crop region, and drag the top down to Level 2, as shown in Figure 3.80.



**FIGURE 3.80:** Stretching the grip down to crop the view

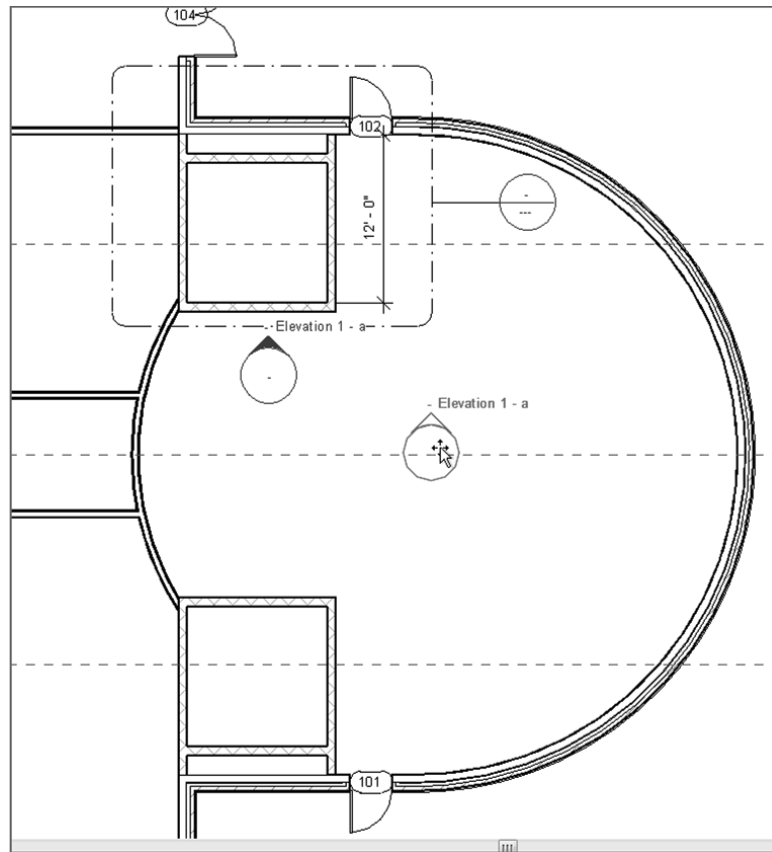
In the elevation's view, you can drag the crop region down to show only that floor. If you would rather see all of the floors, perhaps you should use a section rather than an elevation.



**NOTE** If you had floors already placed in the model, Revit would create the interior elevation so that it extended only to this geometry. Because you don't have floors, Revit doesn't know where to stop. If you happen to place an elevation without floors and put them in later, Revit won't make the adjustment. You'll have to adjust the interior elevation manually for the new floors.

Let's create some more elevations.

1. Go to Floor Plan Level 1. Zoom into the east wing entry area, as shown in Figure 3.81.



**FIGURE 3.81:** Add the elevation marker as shown here, and then move it to a new location.

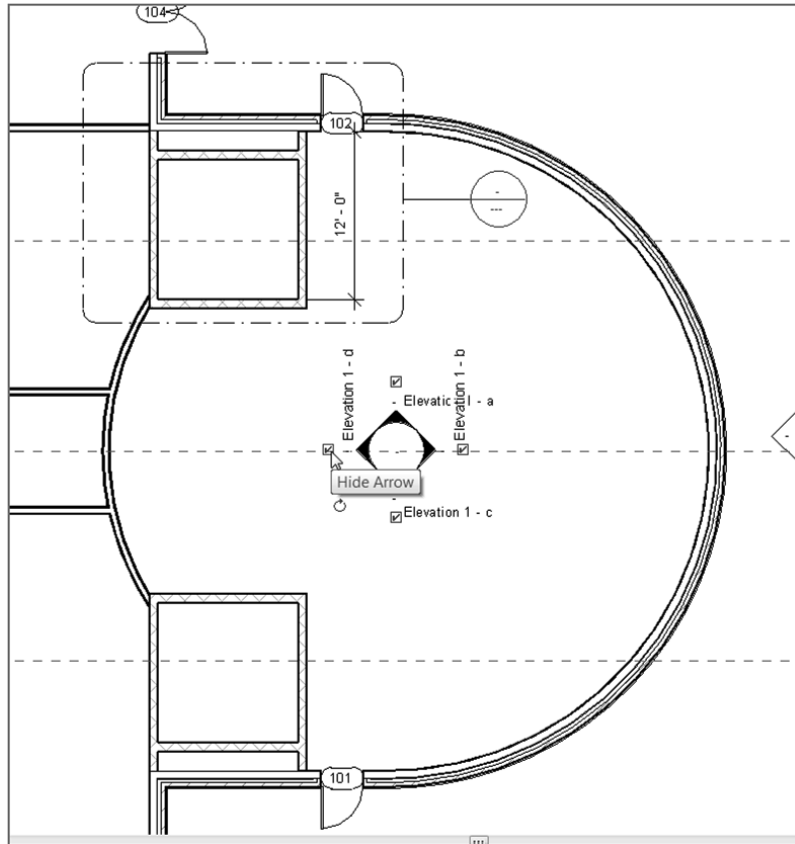
2. On the View tab, click the Elevation button.
3. Place an elevation marker in an area similar to the one shown in Figure 3.81, and then move it to the center of the lobby.



**TIP** Notice that when you're trying to place the elevation in the entry area, it seems to wander all over the place. This is because the elevation is trying to locate the radial geometry. The safest bet in this situation is to find a straight wall and aim the elevation at that wall. In this case, you should aim the elevation at the bottom of the elevator shaft. When the elevation marker is in place, you can then move it to where you need it to be.

4. With the elevation marker centered in the lobby, select the round bubble. Four blue boxes appear, as shown in Figure 3.82. These boxes

let you turn on multiple views. Turn on all four views, as shown in Figure 3.82.



**FIGURE 3.82** Turn on all four views in the lobby.

With the four elevations turned on, you have some naming to do! Up to this point, you have been going to the Project Browser to rename the elevations. Let's explore another way to rename an elevation and to view its properties as well.

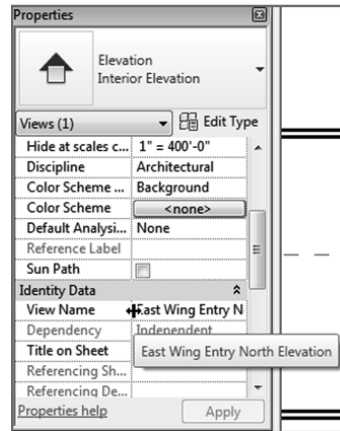
## Elevation Properties

With each view comes a new set of properties. For example, when you made the perspective view of the corridor, you set Visual Style to Shaded, and you turned on shadows. Normally, in an interior elevation, you don't want to do this. Revit allows you to have separate view properties on a view-by-view basis.

To access the View Properties dialog, follow these steps:

1. On the interior elevation with the four arrows, select only the arrow facing up (north).
2. The Properties dialog provides a wealth of information about that view. You have a multitude of options as well. Find the View Name option under the Identity Data heading, and change it to **East Wing Entry North Elevation**, as shown in Figure 3.83.

By changing the value in the Properties dialog, you are, in effect, changing the name in the Project Browser. Again, change something in one place, and it changes in another.

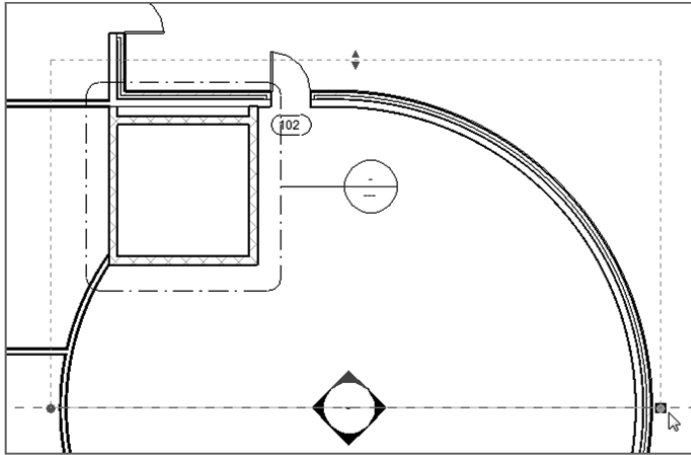


**FIGURE 3.83:** Changing the View Name setting to East Wing Entry North Elevation

3. Select the East Wing Entry North Elevation again. Notice that the view's extents are stretching past the entry atrium. Pick the blue grips at the end of the elevations, and bring them into the atrium area, as shown in Figure 3.84. Also, drag the view limit up to show the radial exterior wall (see Figure 3.84).
4. Click the elevation arrow facing left (west).
5. Change View Name to East Wing Entry West Elevation.
6. Click the arrow facing down (south).
7. Change View Name to East Wing Entry South Elevation.
8. Click the arrow facing right (east).
9. Change View Name to East Wing Entry East Elevation.



10. Select each elevation, and adjust the view's extents as you did for the north elevation.
11. Save the model.



**FIGURE 3.84:** Making the adjustments to bring the view back into a reasonable range

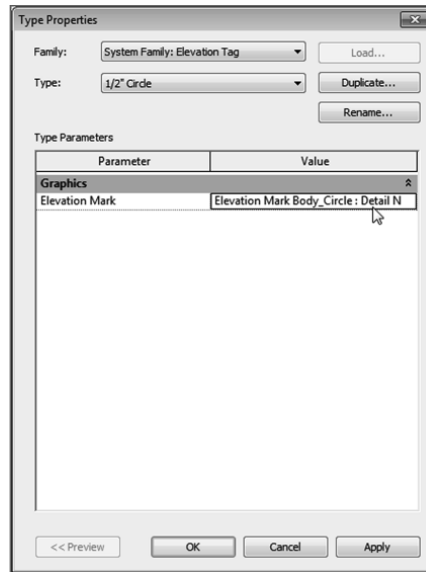
The actual view names appear in the plan. This is nice, but unfortunately it leaves no room for anything else other than the view. Plus, no construction documents have these names right in the plan (at least, none that I have ever seen). You can turn off this feature.

Now that you can place and modify annotations, let's delve into their physical properties.

## Annotation Properties

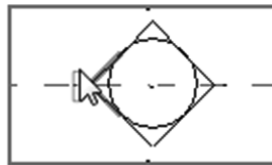
Annotations all have properties you can modify. To change the elevation symbol properties, follow these steps:

1. On the Manage tab, click Settings > Additional Settings > Elevation Tags.
2. At the top of the Type Properties dialog, you see Family: System Family: Elevation Tag. Below that is Type. Change Type from 1/2" (13 mm) Square to 1/2" (13 mm) Circle (see Figure 3.85).



**FIGURE 3.85:** Modifying the properties for the elevation markers

3. In Type Parameters, under Graphics, change Elevation Mark to Elevation Mark Body\_Circle : Detail Number.
4. Click OK.
5. Save your work.
6. Zoom back in on the elevation markers. They should look like Figure 3.86.



**FIGURE 3.86:** The revised, less-obtrusive elevation markers



**NOTE** It's Revit time! No longer will you see "dumb" placeholder information in a tag. When you create your construction documents and put these views on sheets, Revit will automatically fill out tags with the correct information. To take it one step further, you can tell Revit not to print these annotations if the views they represent aren't on a sheet.

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The ability to add elevations is a must. As you can see, physically adding an elevation is simple. It does, however, take practice to manipulate elevations to look the way you want.

## Are You Experienced?

### Now you can...

- ✓ create levels and constrain walls to stretch or shrink if the level's elevation information changes in any way
- ✓ cut wall sections and building sections through the model
- ✓ create detail views, allowing you to add plan sections through a wall or a building section
- ✓ create a callout view and control the crop region
- ✓ add a camera to the model, giving the user a nice perspective of a certain area
- ✓ create interior and exterior elevations within the model