

Autodesk® Revit® Architecture 2014

NO EXPERIENCE REQUIRED

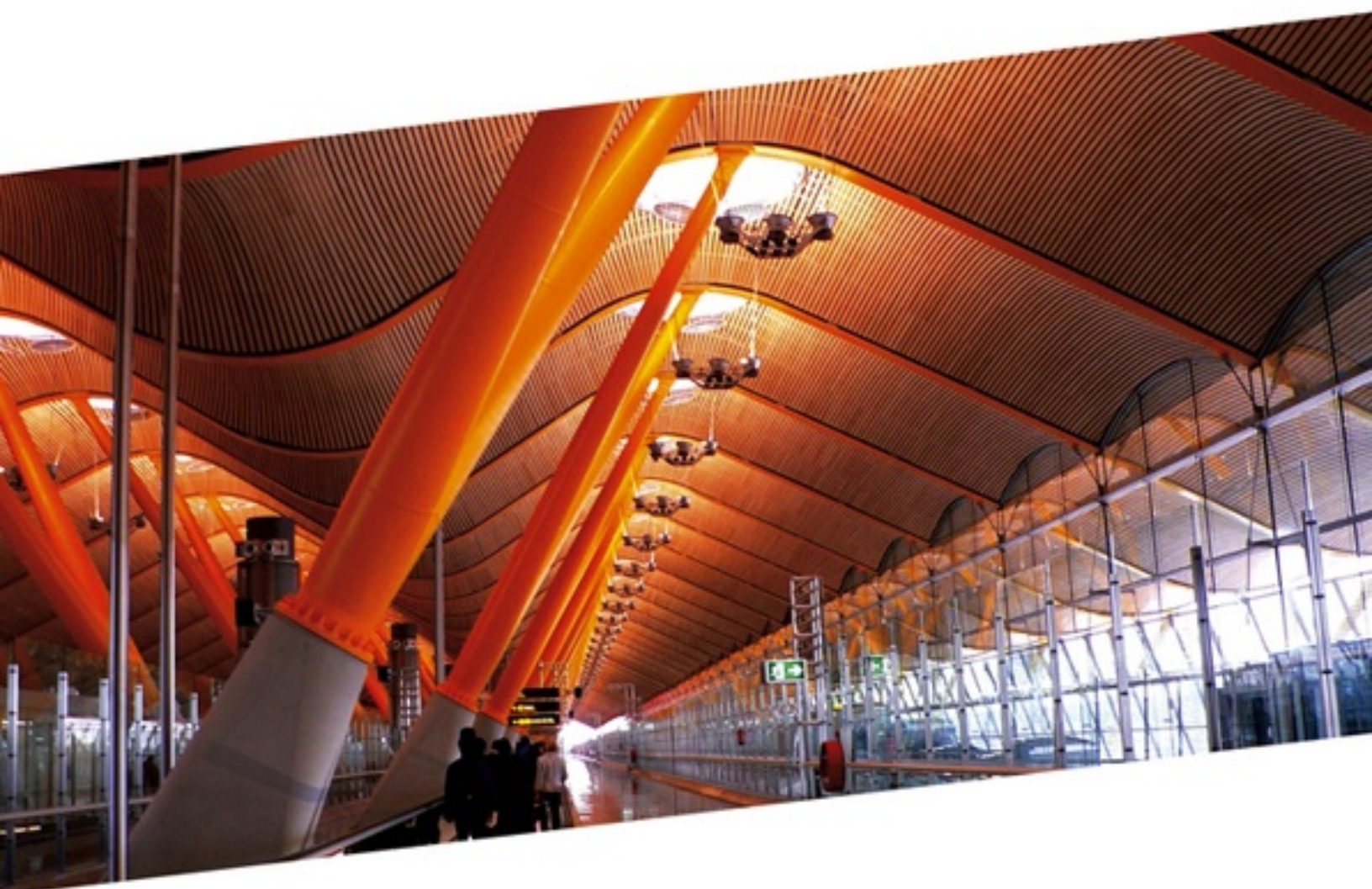


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AUTODESK® REVIT® ARCHITECTURE 2014

NO EXPERIENCE REQUIRED

Eric Wing



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Best regards,

A handwritten signature in black ink, appearing to read 'Neil Edde', with a stylized flourish at the end.

Neil Edde
Vice President and Publisher
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To my offspring, Cassidy and Jacob. Thanks for waiting patiently on the weekends as I work away.

Acknowledgments

Before I ever even pondered writing a technical book such as this one, I was the guy who bought them and studied them from the front to the back. This specific page, however, I always thought was somewhat superfluous... bordering on self indulgent. As I sit here now, after finishing 22 chapters, I can categorically say that the 750-word allotment only scratches the surface of the list of people close to me who have been tremendously inconvenienced by my unavailability and, conversely, by my temperament during the rare occasions when I was available. Of course, topping this list are my wife Jennifer and the kids; Cassidy and Jacob. You guys always come through for me, and there is no way I could have written a single chapter without your support; and yes, you get to go to Disney again like the last seven years!

Also, I'd like to thank Grandma and Baci for constantly watching and being with the kids.

On the technical side, thanks to Willem Knibbe for acquiring the book and working with me on my manuscript, and for his constant patience as I lumbered through each chapter. Thanks to Alberto Malagón for his thorough technical edits. Also, I would like to thank Richard Mateosian for keeping it all on track.

About the Author

Eric Wing lives in Syracuse, New York, with his family. He is the BIM services manager for C&S Companies, which is a full service engineering/architectural firm headquartered in Syracuse. Eric's degree is in construction; he earned it from Delhi University. In addition to writing this book, Eric has written *Autodesk® Revit® Architecture: No Experienced Required 2010, 2011, 2012, and 2013* and *Revit Structure Fundamentals 2010*, and he co-wrote *Mastering Revit Structure 2009*. Eric is also the author of the *Learning Revit* video tutorial, the *Custom Stairs* video tutorial, and the *Revit Families* video tutorial. Eric is an adjunct instructor at Clarkson University, teaching BIM and IPD. In addition to his writing, Eric is a globally recognized speaker, consultant, and trainer. He is also a bass player in a Syracuse band called Jemba when time permits.

Introduction

Why do you need a big, thick technical book? Well, it's true that the best way to learn is to just do it. But do you ever just *do* it and not fully *get* it? Books can serve either as the basis for learning or as supplements for your learning. No one book will teach you everything you need to know about a specific application, but you may never learn everything you need to know about an application without a book. When written appropriately, the book you purchase is there to start you off using good practices. If you have already begun, the book serves as a desktop reference. And last, a book can serve as confirmation that you're approaching an application in the correct manner.

The Autodesk® Revit® Architecture tool is no exception. Although this application has proven to be easy to learn and easy to get a feel for, it's still a deep, sometimes complicated application with many procedures that require step-by-step instructions to fully understand. And to be honest, some of these features just don't work in the real world.

This book has been written by an author who is "in the trenches" using Revit Architecture, Revit Structure, and Revit MEP simultaneously every day. So, yes, you could figure out all this information on your own, but sometimes it's nice to let someone else figure it out for you and pass that knowledge along to you in the form of a book.

Instead of lengthy paragraphs of text that ultimately lead to non-tangible information, this book addresses each subject in a step-by-step approach with more than 1,000 pictures and screenshots to make sure you're on track.

Also, this book also uses an actual project and relates to real-world scenarios. As you're following the step-by-step

procedures in the book, you'll be encouraged to try many techniques on your own and also to embellish the procedure to fit your own needs. If you would rather stick to the instructions, this book allows you to do so as well. The book's project uses a five-story office building with a link (corridor) to a three-story multiuse building. The book's website provides the model (plus additional families) you'll need for each chapter so that you can open the book, jump to your chapter of interest, and learn something! In addition, this book is flexible enough that you can substitute your own project if you don't want to follow the book's examples.

Although it has around 1,000 pages, this book doesn't waste time and space with examples of other people's triumphs, but is designed for you to open it to any random page and learn something.

Who Should Read This Book

Revit Architecture 2014: No Experience Required. Does that mean that if you've used Revit, you won't find this book advanced enough? No. This book is designed for anyone who wishes to learn more about Revit Architecture. The book is also intended for architects, architectural designers, and anyone who is using a CAD-based platform to produce architectural-based drawings.

What You Need

BIM can be tough on hardware. This book recommends that you have 8 GB of RAM with a 4 GHz processor. You should also be running at least 1 GB for your graphics. If you're under these specifications (within reason), in some cases

you'll be fine. Just realize, however, that when your model is loaded, your system may start slowing down and crashing.

All Revit applications are intended to run on a PC-based system. Windows 7 is recommended.

Free Autodesk Software for Students and Educators

The Autodesk Education Community is an online resource with more than five million members that enables educators and students to download—for free (see website for terms and conditions)—the same software used by professionals worldwide. You can also access additional tools and materials to help you design, visualize, and simulate ideas. Connect with other learners to stay current with the latest industry trends and get the most out of your designs. Get started today at www.autodesk.com/joinedu.

What Is Covered in This Book

Revit Architecture 2014: No Experience Required covers the full gamut of using the software and is organized as follows:

Chapter 1: The Autodesk Revit World This chapter introduces you to the Revit Architecture 2014 interface and jumps right in to modeling your first building.

Chapter 2: Creating a Model This chapter begins with placing walls, doors, and windows. It's designed to point you in the right directions in terms of using reference planes and all-around best practices.

Chapter 3: Creating Views This chapter shows you how to navigate the Revit Project Browser and create new

views of the model. Also, you'll learn how to create specific views such as elevations, sections, callouts, plans, and, our favorite, 3D perspectives.

Chapter 4: Working with the Autodesk Revit Tools In this chapter, you'll learn how to use the everyday drafting tools needed in any modeling application. You'll become familiar with such actions as trim, array, move, and copy. Although it seems remedial, this is one of the most important chapters of the book. It gets you on your way to the "Revit feel."

Chapter 5: Dimensioning and Annotating In this chapter, you'll learn how to annotate your model. This includes adding and setting up dimensions, adding and setting up text, and using dimensions to physically adjust objects in your model.

Chapter 6: Floors Yes! Just floors. In this chapter, you'll learn how to place a floor. You'll also learn how to add materials to a floor and how to pitch a floor to a drain.

Chapter 7: Roofs In this chapter, we'll discuss the ins and outs of placing roofs. You'll learn how to model flat roofs, sloping roofs, pitched roofs, and roof dormers. In addition, you'll learn how to pitch roof insulation to roof drains.

Chapter 8: Structural Items In this chapter, you'll delve into the structural module of Revit Architecture. The topics we'll cover include placing structural framing, placing structural foundations, and creating structural views.

Chapter 9: Ceilings and Interiors This chapter focuses predominately on interior design. Placing and modifying ceilings will be covered as well as adding specific materials to portions of walls and floors. You'll also learn how to create soffits.

Chapter 10: Stairs, Ramps, and Railings This chapter focuses on the creation of circulation items. You'll learn

how to create a simple U-shaped multistory staircase to start; then you'll move on to creating a custom winding staircase. From there, you'll learn how to create a custom wood railing. You'll add ramps to the model in this chapter, as well.

Chapter 11: Schedules and Tags In this chapter, you'll start bringing the BIM into your model. This chapter focuses on adding schedules and adding annotation tags to specific objects and materials in your model. Most important, in this chapter you'll learn how your model is parameter driven and how these parameters influence the annotations.

Chapter 12: Detailing In this chapter, you'll learn how to draft in Revit. The procedures allow you to draft over the top of a Revit-generated section or create your own drafting view independent of the model. You'll also learn how to import CAD to use as a detail.

Chapter 13: Creating Specific Views and Match Lines In this chapter, you'll learn how to take advantage of the multitude of views you can create and how to control the visibility graphics of those views to create plans such as furniture and dimensional plans.

Chapter 14: Creating Sheets and Printing This chapter explores how to produce construction documents using Revit. The procedures include creating a new drawing sheet, adding views to a sheet, creating a title block and a cover sheet, and plotting these documents.

Chapter 15: Creating Rooms and Area Plans The focus of this chapter is creating rooms and areas. The procedures lead you through the placement of rooms, and you'll learn how to set the properties of those rooms. We'll also discuss how to create room separators and how to create gross area plans. This chapter also guides you through the creation of a color-fill floor plan.

Chapter 16: Advanced Wall Topics This chapter focuses specifically on the creation of compound walls. By using the Edit Assembly dialog, you'll learn how to add materials, split walls, and add sweeps and reveals such as parapet caps, brick ledges, and brick reveals. Creating stacked walls is also addressed.

Chapter 17: Creating Families This chapter focuses on the topic of creating families. The procedures start with a simple wall-sweep family and then move on to creating a door family with an arched header. You'll also learn how to create an in-place family.

Chapter 18: Site and Topography In this chapter, you'll learn how to place a topographical surface into your model. We'll discuss how to control point-by-point elevations in your site. Splitting and then creating subregions to create swales and berms will be covered. You'll also learn how to utilize an imported CAD site plan and place a toposurface over the top of the CAD lines. And we'll explore rotating your project to true north.

Chapter 19: Rendering and Presentation In this chapter, you'll learn how to use the Revit rendering tools built into the Revit GUI. This chapter also shows you how to create walkthroughs as well as solar studies.

Chapter 20: Importing and Coordinating Models This chapter focuses on the ins and outs (pun intended) of importing and exporting CAD formats as well as linking Revit Structure models. The procedures include configuring CAD layering settings as well as linking and importing AutoCAD for plans and sections. You'll also learn how to link Revit Structure and perform a Copy/Monitor operation as well as use Revit interference detection.

Chapter 21: Phasing and Design Options This chapter explains how to create an existing floor plan and then

moves through demolition into new construction. You'll also learn how to create alternates using design options.

Chapter 22: Project Collaboration In this chapter, you'll learn how to use Revit in a multiuser environment. The procedures in the chapter will lead you through activating worksharing and then creating a central model. You'll move to creating local user files as well as saving to the central model and placing requests to relinquish.

Included with the book are Revit Architecture project files that follow along with the instructions. Each chapter has one or more actual Revit models that have been completed up to the point of the instruction in that specific chapter—or even that specific section of the chapter—to allow you to jump in at any moment. Also included with the book are custom families that accompany the lessons as well as additional families and projects that you can download as a bonus. You can download the accompanying files at www.sybex.com/go/revit2014ner.

Contacting the Author

As you're reading along, please feel free to contact me at ewing@cscos.com, and I will be glad to answer any question you have. In addition, if you would like me to come speak or train at your firm, feel free to give me a shout. You can visit my company's website at www.cscos.com and click the BIM link. You can also go directly to www.bimnation.com

Sybex strives to keep you supplied with the latest tools and information you need for your work. Please check the website at www.sybex.com/go/revit2014ner, where we'll post additional content and updates that supplement this book if the need arises. Enter **Revit architecture** in the Search box (or type the book's ISBN—**9781118542743**), and click Go to get to the book's update page.

Chapter 1

The Autodesk Revit World

I'm sure you've seen plenty of presentations on how wonderful and versatile this 3D Autodesk® Revit® Architecture revolution is. You may be thinking, "This all seems too complicated for what I do. Why do I need 3D anyway?"

The answer is: you don't need 3D. What do you do to get a job out—that is, after the presentation when you're awarded the project? First, you redraw the plans. Next comes the detail round-up game we have all come to love: pull the specs together and then plot. This is a simple process that works.

Well, it worked until 3D showed up. Now we have no real clue where things come from, drawings don't look very good, and getting a drawing out the door takes three times as long.

That's the perception, anyway. I've certainly seen all of the above, but I've also seen some incredibly coordinated sets of drawings with almost textbook adherence to standards and graphics. Revit can go both ways—it depends on you to make it go the right way.

One other buzzword I'm sure you've heard about is **Building Information Modeling (BIM)**. Although they say BIM is a process, not an application, I don't fully buy into that position. Right now, you're on the first page of BIM. BIM starts with Revit. If you understand Revit, you'll understand Building Information Modeling.

This chapter will dive into the Revit graphical user interface (GUI) and tackle the three topics that make Revit ... well, Revit.

- The Revit interface
- The Project Browser
- File types and families

The Revit Interface

Toto, we aren't in CAD anymore!

If you just bought this book, then welcome to the Revit world. In Revit, the vast majority of the processes you encounter are in a flat 2D platform. Instead of drafting, you're placing components into a model. Yes, these components have a so-called third dimension to them, but a logical methodology drives the process. If you need to see the model in 3D, it's simply a click away. That being said, remember this: there is a big difference between 3D drafting and modeling.

With that preamble behind us, let's get on with it.

First of all, Revit has no command prompt and no crosshairs. Stop! Don't go away just yet. You'll get used to it, I promise. Unlike most CAD applications, Revit is heavily pared down, so to speak. It's this way for a reason. Revit was designed for architects and engineers. You don't need every command that a mechanical engineer would need. An electrical engineer wouldn't need the functionality that an architect would require. In the new Revit 2014 interface, the functionality I just mentioned is available, but it's tucked away so as not to interfere with your architectural pursuits.



NOTE The preceding paragraph is the longest one of the book. This book is designed to cut to the chase and show you how to use Revit Architecture in a step-by-step fashion without having to read through paragraph after paragraph just to find the answer you're seeking. Datasets are provided on the book's accompanying website (www.sybex.com/go/revit2014ner), but you can also use your own model as you go through the book. If you don't wish to read this book cover to cover, don't! Although I recommend going from front to back, you can use the book as a desk reference by jumping to a desired topic. The datasets will be added in phases to accommodate this type of usage. Either way, get ready to learn Revit!

You'll find that, as you get comfortable with Revit, there are many, many choices and options behind each command.

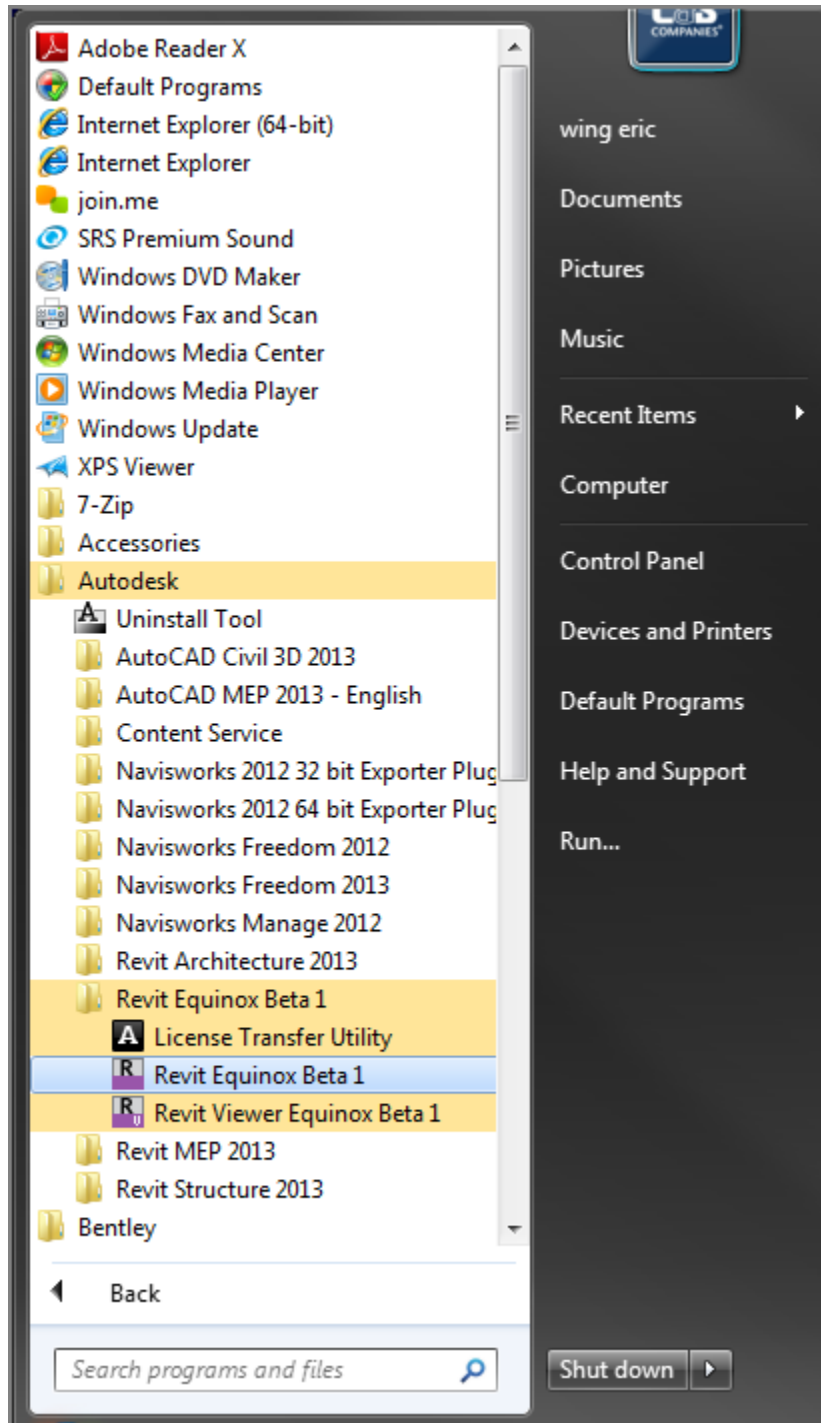
Let's get started:

- 1.** To open Revit, click the icon on your desktop (see [Figure 1-1](#)), or choose Start ⇒ All Programs ⇒ Autodesk ⇒ Autodesk Revit Architecture 2014 ⇒ Autodesk Revit Architecture 2014 (see [Figure 1-2](#)).

[Figure 1-1:](#) You can launch Revit Architecture from the desktop icon.



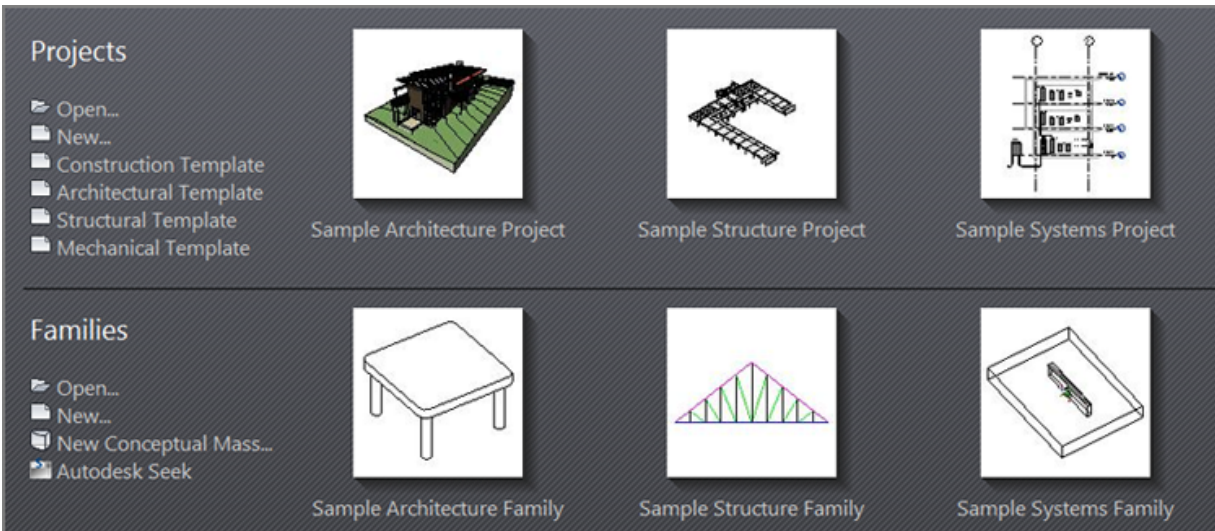
[Figure 1-2:](#) You can also launch Revit Architecture using the Windows Start menu (this illustration shows the Windows 7 operating system).



2. After you start Revit, you'll see the Recent Files window, as shown in [Figure 1-3](#). The top row lists any projects on which you've been working; the bottom row lists any families with which you've been working. The column to the right allows you to view some tutorial

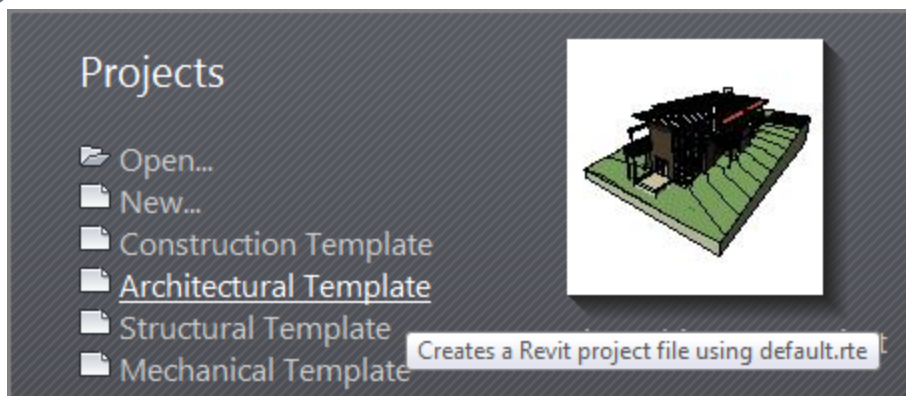
videos. If you have time, I recommend investigating this feature.

Figure 1-3: The Recent Files window lists any recent projects or families on which you've worked.



3. If you're firing up Revit for the first time, you'll see some sample projects, some sample families, and a getting started video. On the left side of the Projects and the Families categories, you're provided with choices for what type of project or family you would like to start (see [Figure 1-4](#)).

Figure 1-4: You can create a new model or browse for an existing one.

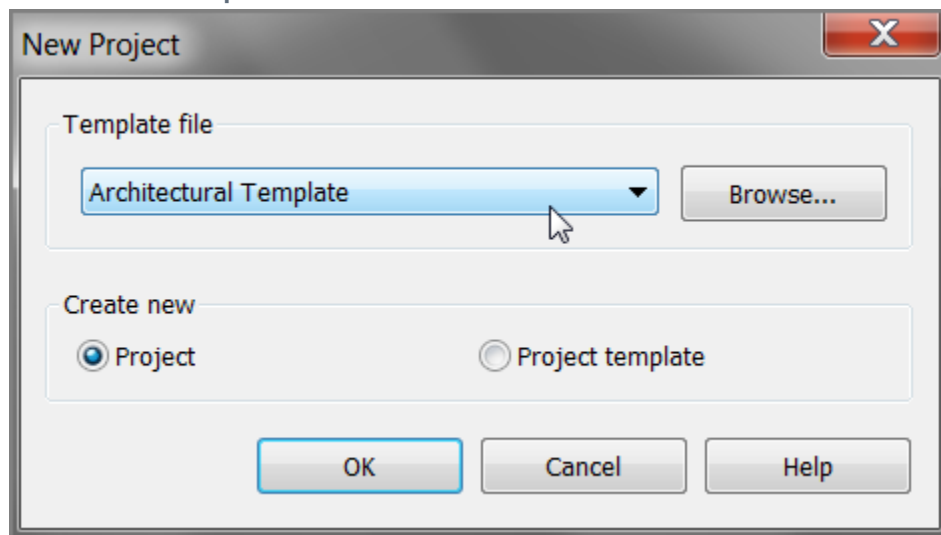


4. In the upper-left corner of the Revit window, you'll see a big purple R. This is commonly known as the

Application Icon. Click the purple *R*, and choose New ⇒ Project.

5. The New Project dialog shown in [Figure 1-5](#) opens. Click the Template File drop-down menu, and select Architectural Template. If you're a metric user, click the Browse button. This will open Windows Explorer. Go up one level, and choose the US Metric folder. Select the file called DefaultMetric.rte.

Figure 1-5: The New Project dialog allows you to start a new project using a preexisting template file, or you can create a new template file.



Now that the task of physically opening the application is out of the way, we can delve into Revit. Revit has a certain feel that Autodesk® AutoCAD® converts, or MicroStation converts, will need to grasp. At first, if you're already a CAD user, you'll notice many differences between Revit and CAD. Some of these differences may be off-putting, while others will make you say, "I wish CAD did that." Either way, you'll have to adjust to a new workflow.

The Revit Workflow

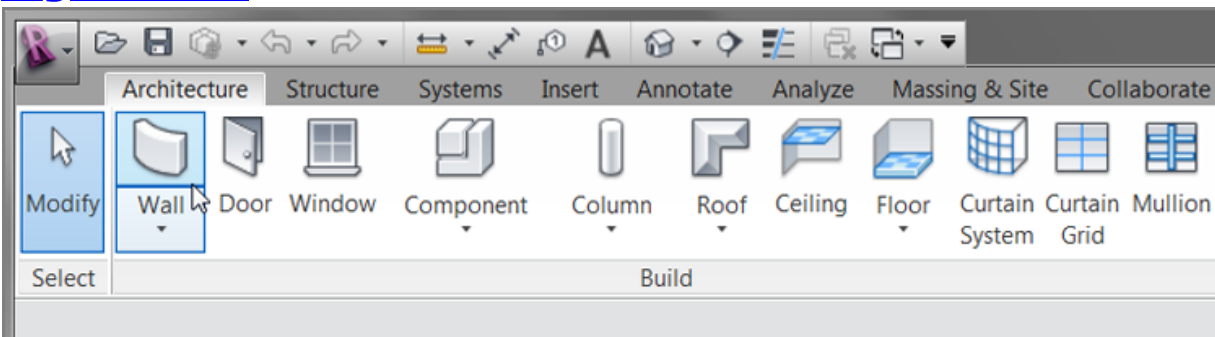
This new workflow may be easy for some to adopt, whereas others will find it excruciatingly foreign. (To be honest, I

found the latter to be the case at first.) Either way, it's a simple concept. You just need to slow down a bit from your CAD habits. If you're new to the entire modeling/drafting notion, and you feel you're going too slowly, don't worry. You do a lot with each click of the mouse.

Executing a command in Revit is a three-step process:

- 1.** At the top of the Revit window is the Ribbon. A series of tabs is built into the Ribbon. Each tab contains a panel. This Ribbon will be your Revit launch pad! Speaking of launch pads, click the Wall button on the Architecture tab, as shown in [Figure 1-6](#).

Figure 1-6: The Ribbon is the backbone of Revit.



- 2.** After you click the Wall button, notice that Revit adds a tab to the Ribbon with additional choices specific to the command you're running, as shown in [Figure 1-7](#). You may also notice that Revit places an additional Options bar below the Ribbon for even more choices.

You'll hear this throughout the book: always remember to look at your options. With no command prompt, the Options bar will be one of your few guides.

Figure 1-7: The Options bar allows you to have additional choices for the current command.

