Eric Wing

Revit® 2020 for Architecture

NO EXPERIENCE REQUIRED

Second Edition

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REVIT® 2020 FOR ARCHITECTURE

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NO EXPERIENCE REQUIRED

Eric Wing

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Revit® 2020 for Architecture: No Experience Required

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To my family, Jen, Cassidy, and Jacob.
Thanks for waiting patiently on the weekends,
and weeknights, and on vacations as I work away.

About the Author

Eric Wing lives in Syracuse, New York, with his family. He is the Director of BIM Services for C&S Companies, which is a full-service engineering/architectural firm headquartered in Syracuse. Eric's degree is from Delhi University in engineering and construction. Eric is also an author for LinkedIn Learning where he, at the time of this book's release, has 50 courses in all things BIM. Eric is also a professor at Syracuse University, where he teaches BIM at the School of Architecture as well at the School of Engineering.

About the Technical Editors

Kristen Collins is a licensed architect and interior designer specializing in projects that foster community and promote well-being. She is a senior project architect at a New York engineering firm as well as a wife and mother to three active boys. Following a passion to help people, she is actively involved in several non-profit organizations addressing homelessness, housing, and education.

Alberto Tono serves as the Design Technology Manager at Interim at HOK. He has a double MS degree in both Architecture and Engineering, and is a certified engineer in Italy and LEED AP. Prior to HOK, Alberto was working on large projects in the computational design space since 2014 for BIM workflow. His studies took him to Harbin Institute of Technology (HIT) in China and to Rene van Zuuk Architect Studio in the Netherlands. He is very keen on computational design and machine learning. These passions inspired him to found and help various communities: Deeplearningitalia, Italian Dynamo User Group, Bimhox, and Dreamship. He also is a speaker in several international conferences and universities. He is the co-founder of the Alumni University of Padua Chapter in the Bay Area that helps to connect his university with the Bay Area Ecosystem and the San Francisco Computational Design Institute. After his arrival in the United States, Alberto became a multi-awarded hackathons winner and speaker in several international conferences. With his wife, Hannah, they are running Dreamship, a non-profit for end-of-life children, which combines their passion for new technologies and healthcare, especially pediatrics.

Acknowledgments

With this book, I was relieved I wasn't actually fired! I was also relieved that I had a great chance to actually create a new volume of a book that was getting rather old, with new little tidbits peppered throughout. This book is basically brand new, with every word and figure carefully reviewed and poured over. This is the first time in years that I feel confident we made a great book.

When I say "we" I mean that I am the guy who belches out words and images, and that's pretty much it. My family sacrifices most because this is one of many jobs I have, so I am constantly working. It has been this way for my children's entire lives.

Second, I'd like to thank Kristen Collins for perfect technical edits that actually made the words and figures make sense. Before her edits they did not. Kristen also had to do these edits while working full time and even fuller time family!

Last but not least is the team I worked with at Wiley. Thanks to Devon Lewis for reaching out to me and getting me more chapters and, at the same time, giving me a schedule I could work under and not feel (too) pressured to just pump out chapters. Thank you very much to Adaobi Obi Tulton who exercised extreme patience, and was absolutely the best editor I have ever worked with. I pray Adaobi wants to work with me on the next volume of this book!

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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® 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 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 nontangible 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 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 hundreds of 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

Autodesk® Revit® 2020 for Architecture: 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

Building Information Modeling (BIM) can be tough on hardware. This book recommends that you have 16 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 10 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

Autodesk® Revit® 2020 for Architecture: No Experience Required covers the essentials of using the software and is organized as follows:

Chapter 1: The Autodesk Revit World This chapter introduces you to the Revit Architecture 2016 interface and jumps right into 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 direction 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: 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 12: 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 13: 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 14: 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 15: 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 16: 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 17: 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.

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.wiley.com/go/revit2020ner`.

Contacting the Author

As you're reading along, please feel free to contact me at ewing@cscos.com or ewing@syr.edu 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`.

Sybex strives to keep you supplied with the latest tools and information you need for your work. Please check the website at `www.wiley.com/go/revit2020ner`, where we'll post additional content and updates that supplement this book if the need arises.

CHAPTER 1

The Autodesk Revit World

I'm sure you've seen plenty of presentations on how wonderful and versatile this 3D Autodesk® Revit® 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 an individual designing a car would need. An electrical engineer wouldn't need the functionality that an architect would require. In Revit, however, the functionality I just mentioned is available, but it's tucked away so as not to interfere with your architectural pursuits.

NOTE **This book is designed to cut to the chase and show you how to use Revit in a step-by-step fashion without having to read through paragraph after paragraph of theory just to find the answer you're seeking. Datasets are provided on the book's accompanying website (`www.wiley.com/go/revit2020ner`), 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).

FIGURE 1.1 **You can launch Revit from the desktop icon.**