

Autodesk®

Revit® 2024 Structure Fundamentals



Better Textbooks. Lower Prices.
www.SDCpublications.com

Visit the following websites to learn more about this book:



Contents

Preface	xi
In This Guide	xiii
Practice Files	xv

Introduction to Autodesk Revit and Project Setup

Chapter 1: Introduction to Revit	1-1
1.1 BIM and Revit	1-2
Workflow and BIM	1-3
Revit Terms	1-4
Revit and Construction Documents	1-5
1.2 Overview of the Interface	1-6
1.3 Opening and Saving Projects	1-27
Opening Projects	1-28
Saving Projects	1-29
1.4 Viewing Commands	1-31
Zooming and Panning	1-31
Viewing in 3D	1-33
ViewCube	1-38
Visual Styles	1-40
Select and Identify Elements in a Project	1-42
Practice 1a: Open and Review a Project	1-43
Chapter Review Questions	1-50
Command Summary	1-52

Chapter 2: Starting a Structural Project		2-1
2.1	Selecting a Project Template	2-2
2.2	Linking and Importing Files	2-4
	Linking and Importing Raster Image Files	2-7
	Linking and Importing PDF Files	2-9
2.3	Linking in Revit Models	2-11
2.4	Modifying Imported/Linked Files	2-13
	Managing Links	2-16
	Modifying the Visibility of Imported/Linked Files	2-17
Practice 2a: Start a Project and Link Files		2-20
2.5	Setting Up Levels	2-25
	Modifying Levels	2-27
	Creating Plan Views	2-30
Practice 2b: Set Up Levels		2-32
2.6	Creating Grids	2-39
	Modifying Grid Lines	2-42
Practice 2c: Add Grids		2-45
Chapter Review Questions		2-51
Command Summary		2-53
Chapter 3: Working with Views		3-1
3.1	Understand the Project Browser	3-2
	Displaying Views in the Project Browser	3-4
3.2	Duplicating Views	3-7
3.3	Modify How the View Displays	3-10
	View Control Bar	3-10
	View Properties	3-11
	Hiding and Overriding Graphics	3-14
	Visibility/Graphic Overrides	3-16
	View Templates	3-18
Practice 3a: Duplicate Views and Set the View Display		3-20
3.4	Adding Callout Views	3-22
	Working with Crop Regions	3-24
	Plan Regions	3-26
Practice 3b: Add Callout Views		3-29

3.5	Creating Elevations and Sections	3-31
	Elevations.....	3-32
	Sections	3-34
	Modifying Elevations and Sections.....	3-35
	3D Section Views.....	3-38
	Practice 3c: Create Elevations and Sections	3-42
	Chapter Review Questions	3-49
	Command Summary	3-52

Chapter 4: Revit Families **4-1**

4.1	About Revit Families	4-2
	The Different Kinds of Families.....	4-3
	Working with Component Families	4-5
4.2	Loading Components	4-6
	Placing Components.....	4-9
	Using Snaps	4-10
	Snap Overrides	4-11
	Snaps Settings.....	4-12
4.3	Modifying Components	4-13
4.4	Creating Additional Family Types in a Project	4-16
	Structural Elements.....	4-17
	Practice 4a: Load Families	4-18
	Chapter Review Questions	4-21
	Command Summary	4-22

Chapter 5: Basic Sketching and Modify Tools **5-1**

5.1	Adding General Model Elements	5-2
	Draw Tools.....	5-3
	Drawing Aids.....	5-6
	Reference Planes	5-7
	Editing Building Model Elements.....	5-10
	Selecting Multiple Elements	5-12
	Measuring Tool.....	5-15
	Filtering Selection of Multiple Elements	5-16
	Practice 5a: Sketch and Edit Elements	5-18
5.2	Working with Basic Modify Tools	5-25
	Moving and Copying Elements.....	5-25
	Rotating Elements	5-27
	Mirroring Elements.....	5-29
	Creating Linear and Radial Arrays.....	5-30
	Aligning Elements.....	5-33

Practice 5b: Work with Basic Modify Tools	5-35
5.3 Working with Additional Modify Tools	5-42
Splitting Linear Elements	5-42
Trimming and Extending.....	5-43
Offsetting Elements	5-45
Practice 5c: Work with Additional Modify Tools	5-47
Chapter Review Questions	5-51
Command Summary	5-55

Design Development

Chapter 6: Adding Columns	6-1
6.1 Adding Columns	6-2
Modifying Columns	6-8
6.2 Adding Isolated Footings	6-11
Practice 6a: Place Structural Columns	6-13
6.3 Copying and Monitoring Elements	6-15
Practice 6b: Copy and Monitor Elements	6-19
6.4 Coordinating Linked Models	6-25
Practice 6c: Coordinate Linked Models	6-29
Chapter Review Questions	6-32
Command Summary	6-34

Chapter 7: Foundations	7-1
7.1 Modeling Walls	7-2
7.2 Modifying Walls	7-11
Wall Joins	7-14
Editing Wall Profiles	7-15
Wall Openings.....	7-16
7.3 Adding Wall Footings	7-19
Practice 7a: Model Walls and Wall Footings	7-23
7.4 Adding Isolated Footings	7-27
Working with Custom Families.....	7-29
Practice 7b: Add Isolated Footings	7-32
Chapter Review Questions	7-38
Command Summary	7-42

Chapter 8: Structural Framing		8-1
8.1	Modeling Structural Framing	8-2
	Beam Systems.....	8-4
	Adding Bracing	8-8
	Cross Bracing Settings	8-9
	Practice 8a: Model Structural Framing	8-11
8.2	Modifying Structural Framing	8-20
	Sloping and Offsetting Beams.....	8-22
	Adding Beam Cantilevers and Cutbacks	8-24
	Changing the Cutback.....	8-26
	Changing Justifications.....	8-27
	Attaching a Column to a Beam.....	8-31
	Applying Beam Coping.....	8-32
	Editing Beam Joins	8-33
	Practice 8b: Modify Structural Framing	8-35
8.3	Adding Trusses	8-39
	Attaching Trusses to Roofs.....	8-40
	Setting Framing Types in Trusses.....	8-41
	Practice 8c: Add Trusses	8-43
	Chapter Review Questions	8-49
	Command Summary	8-51
Chapter 9: Adding Structural Slabs		9-1
9.1	Modeling Structural Slabs	9-2
	Modifying Slabs.....	9-5
	Slab Edges	9-7
	Joining Geometry	9-8
	Practice 9a: Model Structural Slabs	9-9
9.2	Creating Shaft Openings	9-17
	Practice 9b: Create Shaft Openings	9-19
	Chapter Review Questions	9-22
	Command Summary	9-24

Chapter 10: Structural Reinforcement	10-1
10.1 Structural Reinforcement	10-2
Setting the Rebar Cover Depth	10-3
Reinforcement Settings	10-5
Rebar Visibility	10-10
10.2 Adding Rebar	10-12
Sketching Rebar Shapes	10-19
Multi-planar Rebar	10-20
Free-Form Rebar	10-22
10.3 Modifying Rebar	10-24
3D Rebar Shapes	10-30
Rebar Coupler	10-33
Practice 10a: Add Rebar	10-35
10.4 Reinforcing Walls, Floors, and Slabs	10-43
Area Reinforcement	10-44
Path Reinforcement	10-47
Fabric Reinforcement.....	10-49
Modifying Area, Path, and Fabric Reinforcement.....	10-55
Practice 10b: Reinforce Structural Elements	10-58
Chapter Review Questions	10-68
Command Summary	10-71

Construction Documentation

Chapter 11: Creating Construction Documents	11-1
11.1 Setting Up Sheets	11-2
Sheet (Title Block) Properties.....	11-4
11.2 Placing and Modifying Views on Sheets	11-5
Open Sheet.....	11-8
11.3 Swapping Views on a Sheet	11-10
Duplicating Sheets	11-15
11.4 Modifying Views and View Titles	11-17
Practice 11a: Set Up Sheets	11-21
11.5 Printing Sheets	11-29
Printing Options.....	11-29
Export Views and Sheets to PDF.....	11-34
Chapter Review Questions	11-35
Command Summary	11-37

Chapter 12: Working with Annotations		12-1
12.1 Working with Dimensions		12-2
Modifying Dimensions		12-5
Setting Constraints		12-9
Multi-Rebar Annotation		12-14
Practice 12a: Work with Dimensions		12-17
12.2 Working with Text		12-22
Editing Text		12-25
Spell Checking		12-29
Creating Text Types		12-30
Practice 12b: Work with Text		12-32
12.3 Adding Detail Lines and Symbols		12-38
Using Symbols		12-39
Structural Specific Symbols		12-39
12.4 Creating Legends		12-42
Practice 12c: Create Legends		12-45
Chapter Review Questions		12-51
Command Summary		12-53
Chapter 13: Adding Tags and Schedules		13-1
13.1 Adding Tags		13-2
Tagging in 3D Views		13-10
Beam Annotations		13-11
Practice 13a: Add Tags and Symbols		13-15
13.2 Working with Schedules		13-19
Building Component Schedules		13-19
Schedule View Properties		13-29
Filtering Elements from Schedules		13-31
Modifying Schedules		13-32
Modifying a Schedule on a Sheet		13-34
Split a Schedule Across Multiple Sheets		13-34
Filter by Sheet		13-36
Practice 13b: Work with Schedules		13-38
13.3 Graphical Column Schedules		13-44
Modifying Graphical Column Schedules		13-45
Practice 13c: Create a Graphical Column Schedule		13-48
Chapter Review Questions		13-51
Command Summary		13-52

Chapter 14: Creating Details		14-1
14.1	Setting Up Detail Views	14-2
	Referencing a Drafting View	14-5
	Saving Drafting Views	14-6
14.2	Adding Detail Components	14-9
	Detail Components	14-9
	Repeating Details	14-11
14.3	Annotating Details	14-13
	Creating Filled Regions	14-13
	Adding Detail Tags	14-16
	Linework	14-17
	Practice 14a: Create a Detail Based on a Section Callout	14-18
	Practice 14b: Create a Bracing Detail	14-26
	Practice 14c: Create Additional Details	14-29
	Chapter Review Questions	14-31
	Command Summary	14-33
Appendix A: Additional Tools for Design Development		A-1
A.1	Selection Sets	A-2
A.2	Purging Unused Elements	A-5
A.3	Editing Wall Joins	A-6
A.4	Creating Slab Types	A-8
A.5	Creating Rebar Types	A-10
A.6	Introduction to Revit Worksharing	A-12
	Worksharing Definitions	A-13
	Saving a Workshared Project	A-16
	Command Summary	A-19
Appendix B: Additional Tools for Construction Documents		B-1
B.1	Working with Guide Grids on Sheets	B-2
B.2	Revision Tracking	B-4
	Issuing Revisions	B-9
B.3	Annotating Dependent Views	B-10
	Annotating Views	B-11
B.4	Material Takeoff Schedules	B-14
B.5	Importing and Exporting Schedules	B-15
B.6	Creating a Repeating Detail	B-17

B.7	Keynoting and Keynote Legends	B-19
	Keynote Legends	B-22
	Command Summary.....	B-24
Appendix C: Project - Concrete Structure		C-1
	Practice C1: Start a Structural Project	C-2
	Practice C2: Create Foundation Elements.....	C-6
	Practice C3: Frame a Concrete Structure.....	C-9
	Index.....	Index-1