



Autodesk® Revit® 2022 MEP Fundamentals

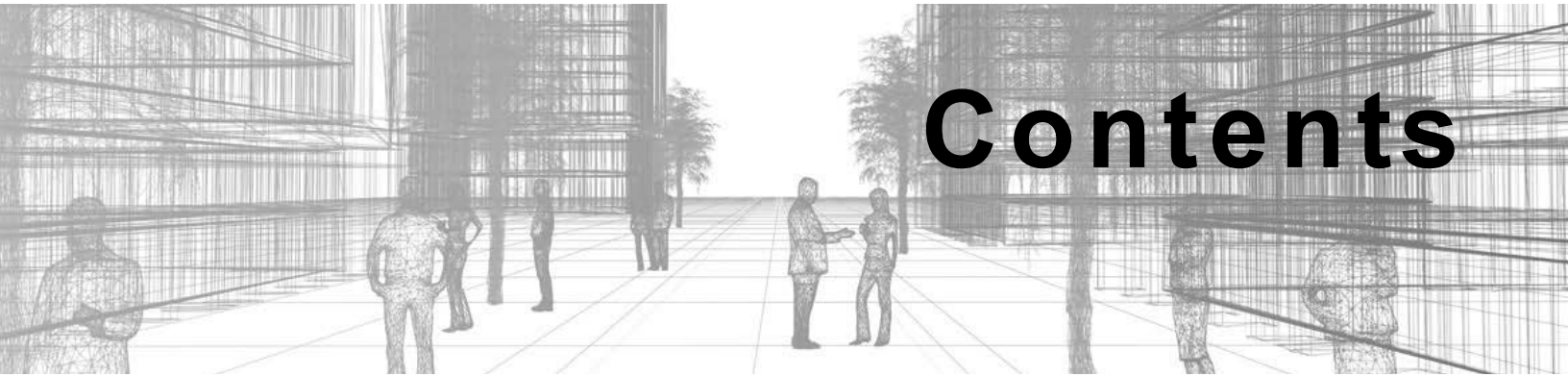
Visit the following websites to learn more about this book:



[amazon.com](https://www.amazon.com)

[Google books](https://books.google.com)

[BARNES & NOBLE](https://www.barnesandnoble.com)



Contents

- Preface xiii**
- In This Guide xvii**
- Practice Files xix**

- Introduction to BIM and Autodesk Revit**

- Chapter 1: Introduction to BIM and Autodesk Revit 1-1**
 - 1.1 BIM and Autodesk 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 Starting Projects 1-22**
 - Opening Projects 1-23
 - Starting New Projects 1-25
 - Saving Projects 1-26
 - 1.4 Viewing Commands 1-29**
 - Zooming and Panning 1-29
 - Viewing in 3D 1-31
 - Visual Styles 1-35
 - Practice 1a Open and Review a Project 1-36**
 - Chapter Review Questions 1-46**
 - Command Summary 1-48**

- Chapter 2: Basic Sketching and Modify Tools 2-1**
 - 2.1 Using General Sketching Tools 2-2**
 - Draw Tools 2-2
 - Drawing Aids 2-5
 - Reference Planes 2-9

2.2 Inserting Components	2-11
Loading Components	2-16
Purging Unused Components	2-18
Practice 2a Insert Components - Mechanical	2-19
Practice 2b Insert Components - Electrical	2-22
Practice 2c Insert Components - Plumbing	2-25
2.3 Selecting and Editing Elements	2-28
Selecting Multiple Elements	2-31
Filtering Selection Sets	2-33
Practice 2d Select and Edit Elements - Mechanical	2-36
Practice 2e Select and Edit Elements - Electrical	2-42
Practice 2f Select and Edit Elements - Plumbing	2-47
2.4 Working with Basic Modify Tools	2-51
Moving and Copying Elements	2-51
Rotating Elements.....	2-53
Mirroring Elements	2-56
Creating Linear and Radial Arrays	2-57
Practice 2g Work with Basic Modify Tools - Mechanical	2-61
Practice 2h Work with Basic Modify Tools - Electrical	2-64
Practice 2i Work with Basic Modify Tools - Plumbing	2-67
2.5 Working with Additional Modify Tools	2-71
Aligning Elements	2-71
Splitting Linear Elements	2-72
Trimming and Extending	2-74
Offsetting Elements.....	2-75
Practice 2j Work with Additional Modify Tools - All Disciplines	2-78
Chapter Review Questions	2-85
Command Summary	2-87
Chapter 3: Starting Systems Projects	3-1
3.1 Linking and Importing CAD Files	3-2
Introduction to Worksharing	3-6
3.2 Linking in Revit Models	3-8
Managing Links	3-10
Practice 3a Start a Systems Project - All Disciplines	3-13
3.3 Setting Up Levels	3-17
Modifying Levels	3-19
Creating Plan Views.....	3-22
3.4 Copying and Monitoring Elements	3-24

Practice 3b Copy and Monitor Elements - All Disciplines	3-27
3.5 Coordinating Linked Models	3-33
Practice 3c Coordinate Linked Models - All Disciplines	3-36
3.6 Batch Copying Fixtures	3-40
Batch Copying Fixtures	3-41
Practice 3d Batch Copy Fixtures - Mechanical	3-43
Practice 3e Batch Copy Fixtures - Electrical	3-46
Practice 3f Batch Copy Fixtures - Plumbing	3-50
Chapter Review Questions	3-53
Command Summary	3-55

Design Development Phase

Chapter 4: Working with Views	4-1
4.1 Modifying the View Display	4-2
View Control Bar	4-2
View Properties	4-3
Project Browser Organization	4-7
Hiding and Overriding Graphics	4-8
Temporarily Hide/Isolate	4-13
Using View Templates	4-14
MEP System Filters.....	4-16
4.2 Duplicating Views	4-18
Duplication Types.....	4-18
Practice 4a Duplicate Views and Set the View Display - Mechanical	4-21
Practice 4b Duplicate Views and Set the View Display - Electrical	4-25
Practice 4c Duplicate Views and Set the View Display - Plumbing	4-28
4.3 Adding Callout Views	4-31
Working with Crop Regions.....	4-35
Plan Regions.....	4-36
Practice 4d Add Callout Views - Mechanical	4-39
Practice 4e Add Callout Views - Electrical	4-42
Practice 4f Add Callout Views - Plumbing	4-45

4.4 Creating Elevations and Sections	4-48
Elevations.....	4-49
Sections	4-50
Modifying Elevations and Sections	4-51
3D Section Views	4-55
Practice 4g Create Elevations and Sections - Mechanical	4-58
Practice 4h Create Elevations and Sections - Electrical	4-61
Practice 4i Create Elevations and Sections - Plumbing	4-66
Chapter Review Questions	4-71
Command Summary	4-74
Chapter 5: Spaces	5-1
5.1 Preparing a Model for Spaces	5-2
5.2 Adding Spaces	5-6
Naming Spaces.....	5-7
Creating Individual Spaces	5-9
Space Properties.....	5-10
Practice 5a Add Spaces	5-11
5.3 Working with Spaces	5-16
Special Space Situations	5-17
Practice 5b Work with Spaces	5-22
5.4 Exporting for Energy Analysis	5-32
Exporting to gbXML.....	5-33
Practice 5c Export for Energy Analysis	5-40
Chapter Review Questions	5-47
Command Summary	5-49
Chapter 6: Basic Systems Tools	6-1
6.1 Connecting Components	6-2
Testing Connections	6-8
Practice 6a Connect Components - Mechanical	6-10
Practice 6b Connect Components - Electrical	6-14
Practice 6c Connect Components - Plumbing	6-16
6.2 Creating Systems - Overview	6-20
Selecting Systems.....	6-22
Using the System Browser with Systems.....	6-23
Practice 6d View and Create Systems - Mechanical	6-27
Practice 6e View and Create Systems - Electrical	6-31

Practice 6f View and Create Systems - Plumbing	6-35
Chapter Review Questions	6-38
Command Summary	6-39
Chapter 7: HVAC Systems	7-1
7.1 Adding Mechanical Equipment and Air Terminals	7-2
Mechanical Equipment	7-2
Air Terminals	7-4
Practice 7a Add Mechanical Equipment and Air Terminals	7-11
7.2 Adding Ducts and Pipes	7-18
Mechanical Settings	7-19
Adding Ducts and Pipes	7-20
Creating Parallel Pipes	7-25
Practice 7b Add Ducts and Pipes	7-28
7.3 Modifying Ducts and Pipes	7-35
Adding Fittings and Accessories	7-36
Duct and Pipe Sizing	7-38
Converting Ducts and Pipes	7-39
Adding Insulation and Lining	7-41
Modifying the Justification	7-42
Practice 7c Modify Ducts and Pipes	7-44
Chapter Review Questions	7-54
Command Summary	7-57
Chapter 8: Plumbing Systems	8-1
8.1 Adding Plumbing Fixtures and Equipment	8-2
Mechanical Equipment	8-2
Plumbing Fixtures	8-4
Practice 8a Add Plumbing Fixtures and Equipment	8-7
8.2 Adding Plumbing Pipes	8-15
Adding Pipes	8-17
Sloped Piping	8-20
Creating Parallel Pipes	8-21
Practice 8b Add Plumbing Pipes	8-24
8.3 Modifying Plumbing Pipes	8-32
Pipe Fittings and Accessories	8-32
Changing the Slope	8-35
Converting Pipes	8-35
Adding Insulation	8-36
Modifying the Justification	8-37
Practice 8c Modify Plumbing Pipes	8-39

8.4 Adding Fire Protection Systems	8-48
Practice 8d Add Fire Protection Systems	8-49
Chapter Review Questions	8-53
Command Summary	8-55
Chapter 9: Advanced Systems for HVAC and Plumbing	9-1
9.1 Creating and Modifying Systems	9-2
Modifying Systems	9-5
Practice 9a Create and Modify HVAC Systems	9-7
Practice 9b Create and Modify Plumbing Systems	9-11
9.2 Creating Automatic Layouts	9-15
Practice 9c Create Automatic HVAC Layouts	9-19
Practice 9d Create Automatic Plumbing Layouts	9-27
9.3 Testing Systems	9-33
Showing Disconnects	9-34
System Inspector	9-37
Duct and Pipe Color Fill Legends.....	9-39
Practice 9e Review HVAC Systems	9-42
Practice 9f Test Plumbing Systems	9-50
Chapter Review Questions	9-55
Command Summary	9-57
Chapter 10: Electrical Systems	10-1
10.1 About Electrical Systems	10-2
Electrical Settings.....	10-3
10.2 Placing Electrical Components	10-5
Electrical Equipment	10-5
Electrical Devices.....	10-6
Lighting Fixtures.....	10-6
Practice 10a Place Electrical Components	10-12
10.3 Creating Electrical Circuits	10-16
Editing Circuit Paths.....	10-18
Adding Wires.....	10-20
Practice 10b Create Electrical Circuits	10-23
10.4 Setting Up Panel Schedules	10-33
Creating Panel Schedules.....	10-34
Modifying Panel Schedules	10-35
Practice 10c Set Up Panel Schedules	10-36
Practice 10d Modify Electrical Circuits	10-39

10.5 Adding Cable Trays and Conduit	10-48
Creating Parallel Conduit Runs	10-52
Modifying Cable Tray and Conduit	10-53
Adding Fittings	10-56
10.6 Testing Electrical Layouts.....	10-57
Practice 10e Add Conduit.....	10-61
Chapter Review Questions.....	10-65
Command Summary	10-67

Construction Documents Phase

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
Practice 11a Create Construction Documents	11-13
11.3 Printing Sheets.....	11-21
Printing Options.....	11-21
Export Views and Sheets to PDF	11-25
Chapter Review Questions.....	11-26
Command Summary	11-28
Chapter 12: Annotating Construction Documents	12-1
12.1 Working with Dimensions	12-2
Modifying Dimensions	12-4
Setting Constraints.....	12-9
Practice 12a Work with Dimensions - Mechanical	12-14
Practice 12b Work with Dimensions - Electrical	12-16
Practice 12c Work with Dimensions - Plumbing	12-19
12.2 Working with Text	12-21
Editing Text	12-24
Spell Checking	12-28
Creating Text Types.....	12-28
12.3 Adding Detail Lines and Symbols	12-30
Using Symbols	12-31
Practice 12d Annotate Construction Documents -	
All Disciplines.....	12-32
Practice 12e Annotate Construction Documents - Mechanical	12-36
Practice 12f Annotate Construction Documents - Electrical	12-38

Practice 12g Annotate Construction Documents - Plumbing	12-40
12.4 Creating Legends	12-42
Practice 12h Create a Key Plan - All Disciplines	12-45
Practice 12i Create Legends - Mechanical	12-48
Practice 12j Create Legends - Electrical	12-50
Practice 12k Create Legends - Plumbing	12-52
Chapter Review Questions	12-54
Command Summary	12-56
Chapter 13: Adding Tags and Schedules	13-1
13.1 Adding Tags	13-2
Tagging in 3D Views	13-10
Practice 13a Add Tags - Mechanical	13-11
Practice 13b Add Tags - Electrical	13-14
Practice 13c Add Tags - Plumbing	13-18
13.2 Working with Schedules	13-21
Modifying Schedules	13-22
Modifying a Schedule on a Sheet	13-24
Split a Schedule Across Multiple Sheets	13-25
Practice 13d Work with Schedules - Mechanical/Plumbing	13-27
Practice 13e Work with Schedules - Electrical	13-36
Chapter Review Questions	13-43
Command Summary	13-44
Chapter 14: Creating Details	14-1
14.1 Setting Up Detail Views	14-2
Referencing a Drafting View	14-4
Saving Drafting Views	14-5
14.2 Adding Detail Components	14-8
Detail Components	14-8
Repeating Details	14-11

14.3 Annotating Details	14-13
Creating Filled Regions	14-13
Adding Detail Tags	14-16
Practice 14a Create a Fire Damper Detail - Mechanical.....	14-19
Practice 14b Create a Meter Pedestal Detail - Electrical.....	14-27
Practice 14c Create a Floor Drain Detail - Plumbing.....	14-36
Chapter Review Questions.....	14-41
Command Summary	14-43
Appendix A: Additional Tools	A-1
A.1 Building Type Settings	A-2
A.2 Defining Color Schemes.....	A-4
A.3 Custom Duct and Piping Types	A-7
A.4 Work with System Graphics.....	A-9
System Graphic Overrides	A-9
Using Graphic Override Filters	A-11
A.5 Pressure Loss Reports.....	A-13
A.6 Guide Grids and Sheets	A-16
A.7 Revision Tracking	A-17
Issuing Revisions	A-22
A.8 Annotating Dependent Views	A-23
Annotating Views	A-24
A.9 Importing and Exporting Schedules	A-27
A.10 Creating Building Component Schedules	A-29
Embedded Schedules	A-38
Schedule Properties.....	A-39
A.11 Keynoting and Keynote Legends	A-40
Keynote Legends	A-43
Command Summary	A-45
Appendix B: Introduction to Worksharing	B-1
B.1 Introduction to Worksharing.....	B-2
Worksharing Definitions	B-2
Saving a Workshared Project.....	B-6
Command Summary	B-8

Appendix C: Zones	C-1
C.1 Creating Zones	C-2
Using the System Browser with Zones	C-4
C.2 Applying Color Schemes.....	C-7
Practice C1 Create Zones	C-10
Chapter Review Questions.....	C-16
Command Summary	C-18
Index	Index-1