

Autodesk® Revit® 2018 {R1} MEP Fundamentals

Student Guide
Metric - 1st Edition

Preface	ix
In this Guide	xi
Practice Files	xv
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	1-18
Opening Projects	1-19
Starting New Projects	1-21
Saving Projects	1-22
1.4 Viewing Commands	1-24
Zooming and Panning	1-24
Viewing in 3D	1-26
Visual Styles	1-29
Practice 1a Open and Review a Project	1-32
Chapter Review Questions	1-40
Command Summary	1-42
Chapter 2: Basic Sketching and Modify Tools	2-1
2.1 Using General Sketching Tools	2-2
Drawing Aids	2-2
Reference	2-6
Planes	2-6
2.2 Inserting Components	2-8
Loading Components	2-12
Practice 2a Insert Components	2-14

2.3	Selecting and Editing Elements	2-19
	Selecting Multiple Elements	2-22
	Filtering Selection Sets	2-24
	Practice 2b Select and Edit Elements	2-26
2.4	Working with Basic Modify Tools	2-31
	Moving and Copying Elements	2-31
	Rotating Elements	2-33
	Mirroring Elements	2-35
	Creating Linear and Radial Arrays	2-36
	Practice 2c Work with Basic Modify Tools	2-40
	Chapter Review Questions	2-46
	Command Summary	2-49
Chapter 3: Basic Systems Tools		3-1
3.1	Connecting Components	3-2
	Testing Connections	3-7
	Practice 3a Connect Components	3-9
3.2	Working with Additional Modify Tools	3-15
	Aligning Elements	3-15
	Splitting Linear Elements	3-17
	Trimming and Extending	3-17
	Offsetting Elements	3-19
	Practice 3b Work with Additional Modify Tools	3-21
3.3	Creating Systems - Overview	3-28
	Using the System Browser	3-32
	Practice 3c View and Create Systems	3-36
	Chapter Review Questions	3-42
	Command Summary	3-44
Chapter 4: Starting Systems Projects		4-1
4.1	Linking in Revit Models	4-2
	Managing Links	4-4
	Practice 4a Start a Systems Project	4-6
4.2	Setting Up Levels	4-9
	Creating Plan Views	4-11
4.3	Copying and Monitoring Elements	4-13
	Practice 4b Copy and Monitor Elements	4-15
4.4	Batch Copying Fixtures	4-20
	Batch Copying Fixtures	4-22
	Practice 4c Batch Copy Fixtures	4-24

4.5 Coordinating Linked Models	4-27
Practice 4d Coordinate Linked Models	4-30
Chapter Review Questions	4-33
Command Summary	4-35
Chapter 5: Working with Views	5-1
5.1 Setting the View Display	5-2
Hiding and Overriding Graphics	5-2
System Filters	5-8
View Properties	5-10
5.2 Duplicating Views	5-16
Duplication Types	5-16
Practice 5a Duplicate Views and Set the View Display	5-19
5.3 Adding Callout Views	5-22
Modifying Callouts	5-23
Practice 5b Add Callout Views... ..	5-25
5.4 Elevations and Sections	5-28
Elevations	5-29
Sections	5-30
Modifying Elevations and Sections	5-32
Practice 5c Create Elevations and Sections	5-36
Chapter Review Questions	5-42
Command Summary	5-44
Chapter 6: Spaces and Zones	6-1
6.1 Preparing a Model for Spaces	6-2
6.2 Adding Spaces	6-7
Space Separation Boundaries	6-9
Space Properties	6-10
Practice 6a Add Spaces	6-12
6.3 Working with Spaces	6-16
Special Space Situations	6-17
Practice 6b Work with Spaces	6-21
6.4 Creating Zones	6-30
Using the System Browser with Zones	6-32
6.5 Applying Color Schemes	6-34
Practice 6c Create Zones	6-37
Chapter Review Questions	6-43
Command Summary	6-46

Chapter 7: Heating and Cooling Loads Analysis	7-1
7.1 Preparing a Project for Heating and Cooling Loads Analysis	7-2
Preparing Energy Analysis	7-3
7.2 Analyzing the Heating and Cooling Loads	7-7
Practice 7a Heating and Cooling Analysis	7-11
Chapter Review Questions	7-19
Command Summary	7-20
Chapter 8: HVAC Networks	8-1
8.1 Adding Mechanical Equipment and Air Terminals	8-2
Mechanical Equipment	8-2
Air Terminals	8-4
Practice Sa Add Mechanical Equipment and Air Terminals	8-1 0
8.2 Adding Ducts and Pipes	8-15
Mechanical Settings	8-16
Adding Ducts and Pipes	8-17
Creating Parallel Pipes	8-21
Practice Sb Add Ducts and Pipes	8-23
8.3 Modifying Ducts and Pipes	8-29
Adding Fittings & Accessories	8-30
Duct and Pipe Sizing	8-32
Converting Ducts and Pipes	8-33
Adding Insulation and Lining	8-35
Modifying the Justification	8-37
Practice Se Modify Ducts and Pipes	8-38
Chapter Review Questions	8-47
Command Summary	8-50
Chapter 9: Plumbing Networks	9-1
9.1 Adding Plumbing Fixtures and Equipment	9-2
Mechanical Equipment	9-2
Plumbing Fixtures	9-4
Practice 9a Add Plumbing Fixtures and Equipment	9-7
9.2 Adding Plumbing Pipes	9-15
Adding Pipes	9-17
Sloped Piping	9-20
Creating Parallel Pipes	9-21
Practice 9b Add Plumbing Pipes	9-23

9.3	Modifying Plumbing Pipes	9-30
	Pipe Fittings & Accessories	9-30
	Changing the Slope	9-33
	Converting Pipes	9-33
	Adding Insulation	9-34
	Modifying the Justification	9-36
	Practice 9c Modify Plumbing Pipes	9-37
9.4	Adding Fire Protection Networks	9-46
	Practice 9d Add Fire Protection Networks	9-47
	Chapter Review Questions	9-51
	Command Summary	9-53
Chapter 10: Advanced Systems for HVAC and Plumbing		10-1
10.1	Creating and Modifying Systems	10-2
	Modifying Systems	10-5
	Practice 10a Create and Modify HVAC Systems	10-7
	Practice 10b Create and Modify Plumbing Systems	10-10
10.2	Creating Automatic Layouts	10-14
	Practice 10c Create Automatic Duct Layouts	10-18
	Practice 10d Create Automatic Plumbing Layouts	10-24
10.3	Testing Systems	10-29
	Showing Disconnects	10-30
	System Inspector	10-33
	Duct and Pipe Color Fill Legends	10-35
	Analyzing Systems with Schedules	10-37
	Practice 10e Test HVAC Systems	10-39
	Practice 10f Test Plumbing Systems	10-48
	Chapter Review Questions	10-53
	Command Summary	10-55
Chapter 11: Electrical Systems		11-1
11.1	About Electrical Systems	11-2
	Electrical Settings	11-3
11.2	Placing Electrical Components	11-5
	Electrical Equipment	11-5
	Electrical Devices	11-6
	Lighting Fixtures	11-6
	Practice 11 a Place Electrical Components	11-12

11.3 Creating Electrical Circuits	11-16
Adding Wires	11-18
Practice 11 b Create Electrical Circuits	11-20
11.4 Setting up Panel Schedules	11-27
Creating Panel Schedules	11-28
Modifying Panel Schedules	11-29
Practice 11 e Set Up Panel Schedules	11-30
11.5 Adding Cable Trays and Conduit	11-33
Creating Parallel Conduit Runs	11-37
Modifying Cable Tray and Conduit	11-38
Adding Fittings	11-41
11.6 Testing Electrical Layouts	11-42
Practice 11 d Add Conduit..	11-46
Chapter Review Questions	11-50
Command Summary	11-52
Chapter 12: Creating Construction Documents	12-1
12.1 Setting Up Sheets	12-2
Sheet (Title Block) Properties	12-4
12.2 Placing and Modifying Views on Sheets	12-5
Practice 12a Create Construction Documents	12-11
12.3 Printing Sheets	12-16
Printing Options	12-16
Chapter Review Questions	12-20
Command Summary	12-22
Chapter 13: Annotating Construction Documents	13-1
13.1 Working with Dimensions	13-2
Modifying Dimensions	13-5
Setting Constraints	13-8
Practice 13a Add Dimensions	13-12
13.2 Working with Text	13-15
Editing Text	13-17
Spell Checking	13-21
Creating Text Types	13-22
13.3 Adding Detail Lines and Symbols	13-23
Using Symbols	13-25

Practice 13b Annotate Construction Documents.....	13-27
13.4 Creating Legends	13-33
Practice 13c Create Legends	13-35
Chapter Review Questions	13-37
Command Summary	13-39
Chapter 14: Adding Tags and Schedules	14-1
14.1 Adding Tags	14-2
Tagging in 30 Views	14-7
Practice 14a Add Tags - Mechanical and Electrical	14-8
14.2 Working with Schedules	14-14
Modifying Schedules	14-15
Modifying a Schedule on a Sheet	14-16
Practice 14b Work with Schedules - Mechanical	14-18
Practice 14c Work with Schedules - Electrical	14-23
Chapter Review Questions	14-27
Command Summary	14-28
Chapter 15: Creating Details	15-1
15.1 Setting Up Detail Views	15-2
Referencing a Drafting View	15-4
Saving Drafting Views	15-5
15.2 Adding Detail Components	15-8
Detail Components	15-8
Repeating Details	15-10
15.3 Annotating Details	15-12
Creating Filled Regions	15-12
Adding Detail Tags	15-15
Practice 15a Create a Fire Damper Detail	15-17
Practice 15b Create a Floor Drain Detail ..	15-24
Chapter Review Questions	15-25
Command Summary	15-27
Appendix A: Introduction to Worksets	A-1
A.1 Introduction to Worksets	A-2
Saving Workset- Related Files	A-4
Command Summary	A-6

Appendix 8: Additional Tools	8-1
8.1 Linking and Importing CAD Files	8-2
8.2 Loading from Autodesk Seek	8-6
8.3 Defining Color Schemes	8-8
8.4 Custom Duct and Piping Types	8-11
8.5 Work with System Graphics	8-13
System Graphic Overrides	8-13
Using Graphic Override Filters	8-15
8.6 Pressure Loss Reports	8-17
8.7 Guide Grids and Sheets	8-20
8.8 Revision Tracking	8-21
8.9 Annotating Dependent Views	8-26
Annotating Views	8-27
8.10 Importing and Exporting Schedules	8-29
8.11 Creating Building Component Schedules	8-31
Fields Tab	8-32
Filter Tab	8-33
Sorting/Grouping Tab	8-34
Formatting Tab	8-35
Appearance Tab	8-36
Schedule Properties	8-37
Command Summary	B-38
Appendix C: Autodesk Revit MEP Certification Exam Objectives	C-1
Index	Index-1