

Autodesk® Revit®

MEP 2013

Fundamentals



Tutorial files on
enclosed CD

Table of Contents

Preface	vii
Setting up the Interface	ix
Chapter 1 Introduction to Autodesk Revit MEP	1-1
1.1 Building Information Modeling.....	1-4
Workflow and BIM.....	1-5
Views and Sheets	1-6
1.2 Overview of the Interface	1-7
1. Quick Access Toolbar.....	1-8
2. InfoCenter.....	1-9
3. Application Menu	1-9
4. Ribbon	1-11
5. Options Bar.....	1-12
6. Properties Palette	1-13
7. Project Browser	1-16
8. Drawing Area	1-18
9. View Control Bar.....	1-18
10. Status Bar	1-19
1.3 Standard Terminology.....	1-20
1.4 Starting Projects	1-22
Starting New Projects	1-23
Saving Projects.....	1-25
1.5 Viewing Commands.....	1-27
Zooming and Panning.....	1-27
Viewing in 3D.....	1-29
Visual Styles	1-31
Practice 1a Open and Review a Project.....	1-33
Chapter 2 Basic Drawing and Editing Tools.....	2-1
2.1 General Drawing Tools.....	2-4
Drawing Aids.....	2-6
Reference Planes	2-8
Draw Tools.....	2-9
2.2 Editing Elements.....	2-12
Selecting Elements	2-13
Modifying Multiple Elements	2-15

2.3 Basic Modifying Tools.....	2-20
Moving and Copying Elements	2-20
Rotating Elements	2-22
Mirroring Elements.....	2-23
Creating Linear and Radial Arrays.....	2-24
2.4 Helpful Editing Tools.....	2-28
Aligning Elements	2-28
Splitting Linear Elements	2-30
Trimming and Extending	2-31
Offsetting Elements	2-32
Practice 2a Helpful Editing Tools.....	2-36
Chapter 3 Starting Autodesk Revit MEP Projects	3-1
3.1 Linking in Architectural Projects	3-4
Managing Links.....	3-6
Practice 3a Starting an MEP Project	3-9
3.2 Copying and Monitoring Elements	3-12
Coordination Settings	3-14
Batch Copying Fixtures.....	3-15
Monitoring Elements	3-17
Working with Monitored Elements	3-18
Coordination Review.....	3-19
3.3 Setting Up Levels.....	3-22
Modifying Levels	3-25
Practice 3b Linking and Coordinating Projects	3-27
Chapter 4 Working with Views	4-1
4.1 Duplicating Views	4-4
Duplication Types	4-5
4.2 Adding Callout Views	4-7
Modifying Callouts	4-8
4.3 Setting the View Display	4-10
Underlays.....	4-10
View Range	4-11
Overriding Graphics in a View	4-12
Practice 4a Setting Up Duplicate Views and Callouts	4-17
4.4 Creating Elevations	4-22
Modifying the Elevation.....	4-23
4.5 Creating Sections	4-24
Modifying Sections.....	4-25
Practice 4b Creating Elevations and Sections	4-28

4.6 Working With Ceilings.....	4-32
Sketching Ceilings	4-33
Modifying Ceilings.....	4-34
Practice 4c Working with Ceilings.....	4-35
Chapter 5 Understanding Autodesk Revit MEP Systems	5-1
5.1 About MEP Systems.....	5-4
5.2 Working with Components	5-6
Loading Family Types.....	5-8
5.3 Creating Systems - Overview	5-10
Using the System Browser	5-13
5.4 System Graphics	5-18
Duct and Piping System Graphic Overrides	5-18
Using Graphic Override Filters	5-20
5.5 Connecting Components	5-22
Drawing Connections.....	5-23
Creating Automatic Layouts.....	5-25
5.6 Analyzing Systems	5-26
Checking Systems	5-27
System Inspector	5-29
Pressure Loss Reports	5-32
Duct and Pipe Sizing	5-34
Typical Schedules.....	5-35
Practice 5a Viewing and Analyzing Systems.....	5-36
Chapter 6 Spaces and Zones	6-1
6.1 Creating Spaces.....	6-4
Preparing a Model for Spaces	6-5
Creating Spaces	6-9
6.2 Working with Spaces.....	6-13
Special Space Situations	6-17
Practice 6a Working with Spaces	6-21
6.3 Creating Zones.....	6-38
Using the System Browser with Zones	6-40
6.4 Creating Color Schemes	6-43
Practice 6b Creating Zones	6-48
Chapter 7 Performance Analysis.....	7-1
7.1 Preparing a Project for Energy Analysis	7-4
Preparing Energy Analysis	7-6
7.2 Analyzing the Heating and Cooling Loads.....	7-12
7.3 Exporting for Secondary Analysis	7-16
Practice 7a Heating and Cooling Analysis.....	7-19

Chapter 8 HVAC Systems.....	8-1
8.1 About HVAC Systems	8-4
8.2 Adding Air Terminals and Mechanical Equipment	8-5
Air Terminals.....	8-5
Mechanical Equipment	8-10
8.3 Adding Ductwork	8-12
Modifying Ducts	8-17
Working with Fittings.....	8-21
Practice 8a Adding Air Terminals and Ductwork	8-24
8.4 Creating Duct Systems	8-38
8.5 Automatic Ductwork Layouts	8-41
Mechanical Settings.....	8-41
Automatic Ductwork.....	8-42
Practice 8b Adding and Analyzing Duct Systems.....	8-47
Chapter 9 Hydronic Piping Systems	9-1
9.1 About Hydronic Piping Systems	9-4
9.2 Adding Mechanical Equipment	9-5
Mechanical Settings-Piping	9-6
9.3 Drawing Piping.....	9-8
Creating Parallel Pipes	9-12
Modifying Pipes	9-13
Working with Fittings and Accessories	9-16
9.4 Creating Hydronic Systems.....	9-17
9.5 Automatic Piping Layouts	9-20
Practice 9a Working with Hydronic Systems	9-25
9.6 Fire Protection Systems.....	9-31
Practice 9b Working with Fire Protection Systems	9-32
Chapter 10 Plumbing Systems	10-1
10.1 About Plumbing Systems	10-4
Modifying Views for Plumbing.....	10-5
10.2 Adding Plumbing Fixtures	10-8
Reference Planes	10-9
10.3 Drawing Piping for Plumbing Systems.....	10-11
Modifying Plumbing Pipes	10-17
Plumbing Pipe Fittings and Accessories.....	10-17
10.4 Working with Plumbing Systems	10-19
Automatic Layouts	10-20
Plumbing Schedules	10-22
Practice 10a Working with Plumbing Systems	10-23

Chapter 11 Electrical Systems	11-1
11.1 About Electrical Systems.....	11-4
Electrical Settings	11-6
11.2 Placing Electrical Components	11-8
Electrical Equipment	11-8
Electrical Devices	11-9
Lighting Fixtures	11-12
11.3 Creating Electrical Circuits.....	11-15
Creating Power Circuits	11-16
Create a Switch System	11-17
Create Other Circuits	11-18
Practice 11a Inserting Electrical Components and Creating Circuits.....	11-19
11.4 Cable Trays and Conduit	11-29
Creating Parallel Conduit Runs	11-33
Modifying Cable Tray and Conduit	11-34
Adding Fittings	11-37
11.5 Electrical Panel Schedules	11-38
Create Panel Schedules	11-38
Modifying Panel Schedules	11-39
Practice 11b Adding Conduit and Panel Schedules	11-40
Chapter 12 Creating Construction Documents	12-1
12.1 Setting Up Sheets	12-4
Sheet (Title Block) Properties	12-6
12.2 Placing and Modifying Views on Sheets	12-8
Working with Guide Grids	12-10
Modifying Views on Sheets.....	12-12
Working Inside Views	12-14
12.3 Adding Revisions	12-16
Practice 12a Creating Construction Documents.....	12-18
12.4 Printing Sheets	12-22
Printing Options	12-22
Chapter 13 Annotating Construction Documents.....	13-1
13.1 Working with Dimensions.....	13-4
Modifying Dimensions.....	13-6
13.2 Working with Text.....	13-11
Setting the Paragraph Format	13-13
Spell Checking.....	13-14
Creating Text Types	13-14
13.3 Detail Lines and Symbols	13-16
Using Symbols.....	13-17

13.4 Creating Legends	13-18
Practice 13a Annotating Construction Documents	13-20
Chapter 14 Tags and Schedules	14-1
 14.1 Adding Tags	14-4
Tagging in 3D Views.....	14-6
Tagging Multiple Elements	14-7
Practice 14a Adding Tags.....	14-11
 14.2 Working with Schedules	14-17
Modifying Schedules.....	14-18
Modifying a Schedule on a Sheet.....	14-20
Importing and Exporting Schedules.....	14-21
 14.3 Creating Schedules	14-23
Building Component Schedules.....	14-24
Reusing Schedules.....	14-30
Practice 14b Air Terminal Schedule	14-31
Practice 14c Plumbing Fixture Units Schedule.....	14-37
Practice 14d Average Estimated Illumination Schedule	14-46
Chapter 15 Detailing	15-1
 15.1 Setting Up Detail Views.....	15-4
Connecting a Callout to a Drafting View	15-6
Saving a Drafting View	15-7
 15.2 Creating Details	15-9
Detail Lines	15-9
Detail Components	15-10
Annotating Details.....	15-12
 15.3 Patterning	15-15
Practice 15a Detailing	15-18
Index.....	Index-1