

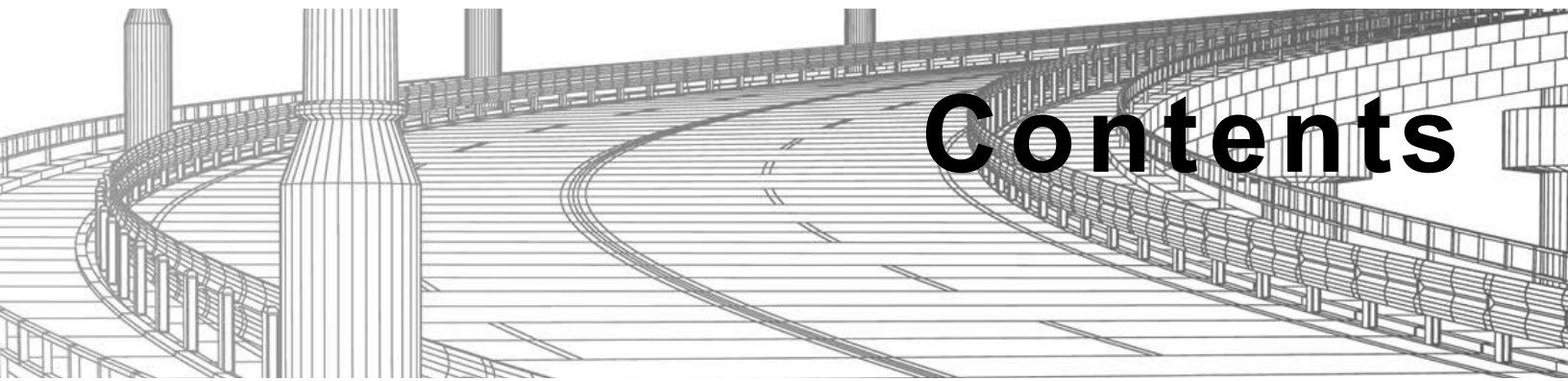
Autodesk®
Civil 3D® 2022
Fundamentals



Better Textbooks. Lower Prices.
www.SDCpublications.com

Visit the following websites to learn more about this book:





Contents

- Preface xiii**
- In This Guide xvii**
- Practice Files xix**
- Chapter 1: The Autodesk Civil 3D Interface 1-1**
 - 1.1 Product Overview..... 1-2**
 - 1.2 Autodesk Civil 3D Workspaces 1-3**
 - Start Tab 1-4
 - 1.3 Autodesk Civil 3D User Interface..... 1-7**
 - Practice 1a Overview of Autodesk Civil 3D and the User Interface 1-13**
 - 1.4 Autodesk Civil 3D Toolspace..... 1-19**
 - Prospector Tab..... 1-20
 - Settings Tab..... 1-23
 - Survey Tab..... 1-24
 - Toolbox Tab 1-24
 - 1.5 Autodesk Civil 3D Panorama 1-27**
 - Practice 1b Autodesk Civil 3D Toolspace..... 1-29**
 - 1.6 Autodesk Civil 3D Templates and Settings 1-37**
 - Drawing Settings in Detail..... 1-37
 - Practice 1c Autodesk Civil 3D Settings..... 1-48**
 - Chapter Review Questions..... 1-52**
 - Command Summary 1-53**

Chapter 2: Survey, Points, and Linework	2-1
2.1 Survey Workflow Overview	2-2
Workflow	2-2
2.2 Survey Figures	2-3
Figure Styles	2-3
Figure Prefix Database	2-4
Practice 2a Creating Figure Prefixes	2-6
2.3 Styles	2-7
2.4 Points Overview	2-12
Point Label Style	2-18
Practice 2b Point Marker Styles	2-25
2.5 Point Settings	2-33
2.6 Creating Points	2-35
Practice 2c Creating Autodesk Civil 3D Points	2-36
2.7 Description Key Sets	2-37
Practice 2d Creating a Description Key Set	2-41
2.8 Importing Survey Data	2-46
Import Points Only.....	2-46
Duplicate Point Numbers	2-48
Survey Toolspace	2-49
Import Points and Figures Using the Survey Database	2-49
Practice 2e Importing Survey Data	2-55
2.9 Reviewing and Editing Points	2-59
2.10 Point Reports	2-61
Practice 2f Manipulating Points and Point Reports	2-63
2.11 Point Groups	2-67
Defining Point Groups	2-67
Practice 2g Creating Point Groups	2-74
2.12 Lines and Curves	2-77
Practice 2h Beginning a Subdivision Project	2-81
Chapter Review Questions	2-85
Command Summary	2-87

Chapter 3: Surfaces	3-1
3.1 Surface Process	3-2
3.2 Surface Properties	3-8
3.3 Contour Data	3-11
Weeding Factors	3-12
Supplementing Factors	3-13
Contour Issues	3-14
Minimizing Flat Triangle Strategies	3-15
3.4 Other Surface Data	3-16
DEM Files.....	3-16
Drawing Objects.....	3-16
Point Files	3-16
Point Groups	3-17
Point Survey Queries	3-17
Figure Survey Queries	3-17
Practice 3a Creating an Existing Ground Surface	3-18
3.5 Breaklines and Boundaries	3-26
Breaklines	3-27
Practice 3b Add Additional Data to an Existing Ground Surface	3-33
3.6 Surface Editing	3-41
Line Edits	3-43
Point Edits	3-43
Simplify Surface	3-44
Smooth Contours	3-45
Smooth Surface	3-46
Copy Surface	3-47
Surface Paste.....	3-47
Raise/Lower Surface.....	3-47
Adjusting Surfaces Through Surface Properties	3-48
Copy Deleted Dependent Objects.....	3-48
3.7 Surface Analysis Tools	3-49
Viewing a Surface in 3D.....	3-49
Surface Preview in the Prospector.....	3-50
Quick Profile.....	3-52
Practice 3c Surface Edits	3-53
3.8 Surface Labels	3-65
Contour Labels	3-66
Spot and Slope Labels	3-66
3.9 Surface Volume Calculations	3-67
Volumes Dashboard.....	3-67
Bounded Volumes.....	3-67
Volume Reports	3-68
Grid Volume or TIN Volume Surface.....	3-68

3.10 Surface Analysis Display	3-69
Analysis Settings	3-71
Analysis Data Display	3-72
Practice 3d Surface Labeling and Analysis	3-73
Chapter Review Questions	3-79
Command Summary	3-82
Chapter 4: Project Management	4-1
4.1 Design Development	4-2
4.2 Templates	4-3
Creating Template Files	4-3
4.3 Managing Styles	4-4
Import	4-4
Drag and Drop Method	4-4
Purge	4-6
Reference	4-6
4.4 Styles in Depth	4-9
4.5 Online Maps Service	4-12
Practice 4a Autodesk Civil 3D Styles	4-14
4.6 Autodesk Civil 3D Projects	4-23
Single-Design Drawing Projects	4-23
Multiple Drawings Sharing Data Using Shortcuts	4-23
Autodesk Docs Design Collaboration	4-24
Multiple Drawings Sharing Data with Autodesk Vault	4-24
4.7 Sharing Data	4-25
4.8 Using Data Shortcuts for Project Management	4-26
Update Notification	4-28
Removing and Promoting Shortcuts	4-29
Data Shortcut Workflow	4-29
Workflow Details	4-30
Advantages of Data Shortcuts	4-31
Limitations of Data Shortcuts	4-31
Practice 4b Starting a Project	4-32
Practice 4c Manage File Sizes with Data Shortcuts	4-38
Chapter Review Questions	4-49
Command Summary	4-51
Chapter 5: Alignments	5-1
5.1 Roadway Design Overview	5-2
5.2 Autodesk Civil 3D Sites	5-3

5.3 Introduction to Alignments	5-4
Criteria-Based Design	5-6
Alignment Types	5-7
Alignment Segment Types	5-8
Practice 5a Creating Alignments from Objects	5-10
5.4 Alignments Layout Tools	5-16
Alignment Editing	5-18
Practice 5b Creating and Modifying Alignments	5-19
5.5 Alignment Properties	5-25
Station Control Tab	5-25
Design Criteria Tab	5-25
5.6 Labels and Tables	5-27
Alignment Point Labels	5-27
Independent Alignment Labels.....	5-31
Alignment Table Styles	5-33
Practice 5c Alignment Properties and Labels	5-34
Chapter Review Questions	5-42
Command Summary	5-43
Chapter 6: Profiles	6-1
6.1 Profiles Overview	6-2
Repositioning and Deleting Profile Views	6-3
6.2 Create a Profile View Style	6-4
6.3 Create Profiles from Surface	6-12
6.4 Create Profile View Wizard	6-14
Practice 6a Working with Profiles Part I	6-19
6.5 Finished Ground Profiles	6-27
6.6 Create and Edit Profiles	6-29
Superimposing Profiles	6-30
Transparent Commands	6-31
Assigning Profile Band Elevations	6-33
Profile Segment Types	6-34
Profile Labels	6-34
Practice 6b Working with Profiles Part II	6-37
Practice 6c Working with Profiles Additional Practice	6-47
Chapter Review Questions	6-54
Command Summary	6-55

Chapter 7: Assemblies	7-1
7.1 Assembly Overview	7-2
Assemblies	7-2
Subassemblies	7-3
Subassembly Composer	7-6
7.2 Modifying Assemblies	7-8
Attaching Subassemblies	7-8
Detaching Subassemblies	7-11
Copying Assemblies	7-11
Modifying Subassemblies	7-11
Select Similar Subassemblies	7-12
Getting More Information on Subassemblies	7-13
Practice 7a Creating Assemblies	7-14
Practice 7b (Optional) Creating Assemblies Additional Practice	7-21
7.3 Managing Assemblies	7-25
Identifying Assemblies	7-25
Sharing Assemblies	7-26
Practice 7c Managing Assemblies	7-27
Chapter Review Questions	7-35
Command Summary	7-36
Chapter 8: Corridors	8-1
8.1 Creating a Corridor	8-2
Target Mapping	8-4
Corridor Frequency	8-5
8.2 Corridor Properties	8-6
Information Tab	8-6
Parameters Tab	8-6
Codes	8-7
Feature Lines	8-8
Slope Patterns	8-8
Corridor Contextual Ribbon	8-9
Exporting Corridors	8-9
Practice 8a Creating Corridors	8-11
8.3 Designing Intersections	8-25
General Tab	8-26
Geometry Details Tab	8-27
Corridor Regions Tab	8-27
Practice 8b Intersections	8-29

8.4 Roundabouts	8-41
Roundabout Standards	8-41
Creating Roundabouts	8-41
Heads Up Display	8-45
Practice 8c Roundabout with Corridor	8-46
8.5 Corridor Section Review and Edit	8-51
Practice 8d Corridor Section Editor	8-54
8.6 Corridor Surfaces	8-56
Overhang Correction	8-57
Surface Boundaries.....	8-57
Practice 8e Corridor Surfaces	8-58
8.7 Sample Line Groups	8-64
Modifying Sample Line Groups	8-67
Practice 8f Creating Sample Lines	8-68
8.8 Section Volume Calculations	8-73
Earthwork Volumes	8-73
Mass Haul	8-74
Material Volumes	8-74
Quantity Takeoff Criteria	8-74
Define Materials	8-75
Practice 8g Compute Materials	8-76
Chapter Review Questions	8-87
Command Summary	8-89

Chapter 9: Grading	9-1
9.1 Grading Overview	9-2
9.2 Feature Lines	9-4
Feature Line Contextual Tab	9-4
Elevation Editor	9-5
Practice 9a Creating Feature Lines	9-7
9.3 Create Design Surfaces from Feature Lines	9-19
Practice 9b Create the Interim Design Surface	9-21
9.4 Grading Tools	9-23
Grading Creation Tools Toolbar	9-23
Practice 9c Create Grading Groups	9-24
9.5 Modifying Autodesk Civil 3D Grading	9-34
Grading Styles	9-34
Feature Line Labels	9-34
Grading Criteria	9-34
Grading Criteria Set	9-35
Grading Volumes	9-36
Practice 9d Modify Grading and Calculate Volumes	9-37
Chapter Review Questions	9-48
Command Summary	9-49
Chapter 10: Pipe Networks	10-1
10.1 Pipes Overview	10-2
10.2 Pipes Configuration	10-4
Practice 10a Configuring Pipe Networks	10-15
10.3 Creating Networks from Objects	10-23
Practice 10b Creating Pipe Networks by Objects	10-25
10.4 The Network Layout Toolbar	10-28
Practice 10c Creating Pipe Networks by Layout	10-30
10.5 Network Editing	10-37
Pipe (and Structure) Properties	10-37
Swap Part	10-38
Connect/Disconnect From Part	10-38
Practice 10d Editing Pipe Networks	10-39
10.6 Annotating Pipe Networks	10-45
Pipe Networks in Sections	10-46
Pipe Network Reports and Tables	10-47

Practice 10e Annotating Pipe Networks.....	10-48
10.7 Pressure Pipe Networks	10-54
Practice 10f Create a Pressure Pipe Network.....	10-62
Chapter Review Questions.....	10-78
Command Summary	10-79
Chapter 11: Plan Production	11-1
11.1 Final Design.....	11-2
11.2 Plan Production Tools	11-3
Overview for Plan/Profile Sheets	11-3
Overview for Section Sheets.....	11-4
More Information.....	11-4
11.3 Plan Production Objects	11-5
View Frames	11-6
View Frame Groups	11-6
Match Lines.....	11-6
11.4 Plan Production Object Edits.....	11-7
Name.....	11-7
Description	11-7
Object Style.....	11-7
View Frame Geometry Properties Edits.....	11-8
Match Line Geometry Properties Edits	11-9
Practice 11a Plan Production Tools - View Frames.....	11-10
11.5 Creating Sheets.....	11-18
Practice 11b Plan Production Tools - Sheet Generation.....	11-19
11.6 Section Views	11-24
Section View Wizard	11-24
Practice 11c Plan Production Tools - Sections.....	11-27
11.7 Sheet Sets.....	11-35
Sheet Set Manager Palette	11-36
Structuring Sheet Sets	11-37
Editing Sheet Sets.....	11-37
Sheet Set Manager Properties.....	11-39
Practice 11d Plan Production Tools - Sheet Sets	11-41
Chapter Review Questions.....	11-52
Command Summary	11-54

Chapter 12: Quantity Takeoff and Visualization	12-1
12.1 Civil 3D Multi-view Blocks	12-2
Practice 12a Adding Detail to Drawings.....	12-6
12.2 Pay Items	12-10
Practice 12b Integrated Quantity Takeoff	12-12
12.3 Visualization	12-21
12.4 3D Navigation Tools.....	12-23
ViewCube.....	12-23
Steering Wheel.....	12-26
12.5 Managing Views in 3D	12-29
12.6 Corridor Visualization	12-33
Line of Sight Analysis.....	12-34
12.7 Share	12-37
Practice 12c Visualizing Corridors	12-39
Chapter Review Questions.....	12-45
Command Summary	12-46
Appendix A: Additional Information	A-1
A.1 Opening a Survey Database.....	A-2
A.2 Point Cloud Surface Extraction	A-3
Attach Point Cloud	A-3
Surfaces from Point Clouds	A-8
Practice A1 Create a Point Cloud Surface	A-12
A.3 3D Solid Surface from TIN Surface.....	A-14
Practice A2 3D Surface Solids and Label Adjustments.....	A-16
A.4 Design Data	A-21
Parcel Size.....	A-21
Road Design Criteria.....	A-22

Appendix B: Project Explorer	B-1
B.1 Introduction to the Project Explorer	B-2
B.2 Project Explorer User Interface	B-4
Practice B1 Project Explorer Interface	B-9
B.3 Civil 3D Object Management	B-13
Practice B2 Edit Civil 3D Pipe Objects	B-18
B.4 Reports and Object Sets	B-24
Practice B3 Reports and Object Sets	B-26
Chapter Review Questions	B-33
Command Summary	B-34
Appendix C: Parcels	C-1
C.1 Introduction to Parcels	C-2
ROW Parcel	C-4
Parcel Style Display Order	C-4
Parcel Properties.....	C-6
Parcel Labels and Styles.....	C-7
Create Parcels from Objects	C-8
Creating Right-of-Way Parcels.....	C-8
Practice C1 Create Parcels from Objects	C-9
C.2 Creating and Editing Parcels by Layout Overview	C-17
C.3 Creating and Editing Parcels	C-20
Freehand.....	C-22
Slide Line	C-22
Swing Line.....	C-22
Free Form Create.....	C-22
Practice C2 Create Parcels by Slide Angle	C-24
C.4 Renumbering Parcels	C-29
Practice C3 Rename/Renumber Parcels	C-30
C.5 Parcel Reports	C-37
C.6 Parcel Labels	C-39
C.7 Parcel Tables	C-42
Practice C4 Reporting On and Annotating the Parcel Layout	C-44
Chapter Review Questions	C-51
Command Summary	C-53
Index	Index-1