

CIVIL EDITION

MICROSTATION fundamentals V8i EDITION



envision

SEE THE CAD POSSIBILITIES



Envision Group - Education

MicroStation V8i Fundamentals Exercise Workbook

Prepared by:
The Envision Group, Inc.
Copyright © 2009

envision

SEE THE CAD POSSIBILITIES



The Envision Group – About Us

The Envision Group is a provider of training solutions for MicroStation and select InRoads products. We also utilize our knowledge to assist with organization managing data and workflow tasks through consulting and/or outsourced CADD management roles. Additionally, we provide visualization services that assist in the conveyance of design concepts and alternatives. These services include but are not limited to: Illustration, solar studies, line-of-sight studies, and animation.

We offer training at our headquarters in Madison, at satellite locations around the country or on-site at your location.

For additional information, pricing, or schedules, visit our website at envisioncad.com or call 1-608-836-3903.

The Envision Group – Guaranteed Training

Our guarantee is simple.

Any student can retake any class at anytime for any reason without additional charge.

Bentley Systems, Inc.

Bentley Systems, Inc. is a technology provider for software solutions are used to design, engineer, build, and operate large constructed assets such as roadways, bridges, buildings, industrial and power plants and utility networks. Bentley's reach spans the globe, serving more than 300,000 professionals and more than 20,000 companies and organizations.

To contact Bentley visit www.Bentley.com or call 1-800-BENTLEY.



Copyright

Warning. Copyright 2009 The Envision Group, Inc. - Madison, Wisconsin.

ALL RIGHTS RESERVED WORLDWIDE. All portions of this manual including printed material, electronic data, notes, and supplemental handouts, unless otherwise specified, are the exclusive property of The Envision Group and are protected under United States and international copyright laws. No part of this document may be reproduced, adapted, translated, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.

We vigorously protect our copyright interests. By possessing this material, you agree that any infringement that you commit shall be considered a willful infringement and agree that the fair and reasonable fee for infringing use of any portion thereof shall be no less than US \$5,000 for each infringement.

Please note that all copies of this material, whether provided or sold, are documented and logged.

Please respect our copyright protections and encourage others to do the same. These materials were generated with a considerable investment of time and materials. Illegally copying this material deprives us of the compensation necessary for us to continue to provide you with a high level of service and the means to produce additional material for your benefit.

To discuss reproduction rights or to report a copyright violation or concern, E-mail info@EnvisionCAD.com, or call 1-608-836-3903.

Limitation of Liability

The Envision Group is not liable for any damages suffered resulting from use of this material. The Envision Group is not liable for any indirect, incidental, punitive, special or consequential damage (including loss of business, revenue, profits, use, data or other economic advantage) however it arises through use of, or use of information contained in, these materials.

You agree to hold the publisher of this material harmless from, and you agree not to sue the publisher for any claims arising from, use of this material or instruction from this material.

Trademarks

MicroStation, InRoads, InRoads Site, InRoads Survey, InRoads Bridge, InRoads Storm & Sanitary, InRoads Rail, and SelectCAD are registered trademarks of Bentley Systems, Inc. AutoCAD is a registered trademark of Autodesk, Inc. Windows is a registered trademark of Microsoft Corporation. Other brands and product names are trademarks of their respective owners.



Introduction

Welcome to MicroStation V8i Update training. This course was developed with the new user in mind. The format for this course is a lecture followed by a set of exercises for the student to accomplish. This will facilitate the learning process and allow the student to further experiment with the program.

Document Conventions

Several conventions are used throughout this document to indicate actions to be taken or to highlight important information. The conventions are as follows:

<u>Item</u>	<u>Meaning</u>
Place Text	a command name or a file that you are to select
Tools > Options	a command path that you are to select – usually from the pull-down menus
<i>Key in</i>	entering data with the keyboard
<i>Document name</i>	style used when referring to another document
Note: Text information about a command or process that you should pay particular attention to	
<i>Emphasis</i>	an important word or phrase
1. Numbered Steps	actions to be performed as part of the lab activities
<D> or Data	press the data button on the mouse
<R> or Reset	press the reset button on the mouse
<T> or Tentative	press the tentative button on the mouse



Tip: In various locations throughout this manual, the author has provided AutoCAD tips. These tips are designed to serve as a reference between AutoCAD and MicroStation terms.



TABLE OF CONTENTS

The Envision Group – About Us ii
The Envision Group – Guaranteed Training..... ii
Bentley Systems, Inc..... ii
Copyright..... iii
Limitation of Liability iii
Trademarks..... iii
Introduction iv
Document Conventions iv
TABLE OF CONTENTS.....v
1. MicroStation Basics..... 1-3
 What is a MicroStation Design File? 1-3
 Starting MicroStation 1-3
 MicroStation Manager 1-3
 Creating Drawings..... 1-5
 From MicroStation Manager 1-6
 From the Graphics Environment 1-6
 Using Seed Files..... 1-7
 Opening Drawings 1-8
 From MicroStation Manager 1-8
 From the Graphics Environment 1-8
 From Recent File History 1-9
 Saving Drawings 1-11
 Automatic Save 1-11
 Save Settings..... 1-12
 Closing Drawings..... 1-12
 Lab 1 – MicroStation Basics 1-13
 Objectives 1-13
 Start MicroStation 1-13
 Using MicroStation Manager..... 1-14
 Create New Design Files 1-17
 Open Existing Files 1-21
 Initiate the Save Settings Command 1-24
 Close the Design File..... 1-24
 Chapter 1 Review Questions..... 1-25
2. The MicroStation Graphics Environment..... 2-1
 MicroStation Interface..... 2-1
 Menu Pull-Down Options 2-2
 Tool Boxes and Tasks 2-2



Table of Contents

Primary Tools Tool Box	2-3
Standard Tool Box	2-12
Attributes Tool Box	2-13
Tasks Toolbox	2-15
Tasks	2-16
Main task tools	2-18
Task tabs 2D and 3D.....	2-20
Positional Keyboard mapping	2-22
Main toolbar	2-22
Task Navigation	2-23
Opening Tool Boxes and Tool Frames	2-24
Closing Tool Boxes and Tool Frames	2-25
Showing/Hiding Tools	2-26
Docking/Detaching Tool Boxes and Tool Frames.....	2-27
Tool Settings.....	2-28
Status Bar	2-31
Additional Keyboard Focus	2-32
Workmodes	2-33
DGN Workmode	2-33
V7 Workmode	2-34
DWG Workmode	2-34
Key-In Window.....	2-35
Mouse Mechanics.....	2-36
Mouse Wheel Preferences.....	2-40
Transparent Dialogs.....	2-41
Transparent Dialog Preference.....	2-42
Delete Element Tool	2-43
Undo.....	2-44
Redo	2-45
DGN File Settings	2-45
User Preferences	2-46
Modal Dialog Box	2-47
Nonmodal Dialog Box.....	2-48
Lab 2A – MicroStation Design Environment	2-49
Objectives.....	2-49
Open the Design File.....	2-49
Mouse Mechanics Review.....	2-50
Reset.....	2-51
Show and Hide Icons/Tools.....	2-52
“Dock” Tool Boxes.....	2-53
Undock Tool Boxes from the Perimeter.....	2-54
Explore the Task dialog.....	2-54
Examine the Contents of the Status Bar	2-60
Open Tool Boxes	2-67



Close Tool Boxes	2-68
Lab 2B – Additional Exercises	2-69
Objectives	2-69
Open the Design File.....	2-69
Key-in Browser	2-69
Primary Toolbar	2-74
PopSet	2-75
Explore V7 and DWG Workmodes.....	2-78
Chapter 2 Review Questions.....	2-83
3. Viewing Your Drawing	3-1
Viewing Tools and How to Access Them.....	3-1
View Control Toolbar.....	3-1
View Control Tool Box.....	3-2
View Control Floating Menu	3-2
Viewing Tools and Commands	3-3
View Windows	3-9
Opening and Closing View Windows	3-9
Arranging View Windows.....	3-10
View Groups.....	3-13
What is a View Group?	3-13
View Groups Tool Box	3-13
View Group Drop-Down Menu	3-13
Manage View Group Icon	3-14
View Toggles.....	3-14
Saved Views.....	3-15
Accessing the Saved View Dialog Box	3-15
Creating Saved Views	3-16
Editing Saved View Properties	3-17
Deleting Saved Views.....	3-17
Updating Saved Views	3-18
Importing Saved Views.....	3-18
Recalling Views	3-19
View Attributes.....	3-19
Lab 3A – Viewing your Drawing	3-20
Objectives	3-20
Open the Design File.....	3-20
Using the Viewing Tools	3-21
Working with Multiple Views.....	3-26
Working with Saved Views	3-29
Creating View Groups.....	3-35
Lab 3B – Additional Exercises	3-39
Objectives	3-39
Open the Design File.....	3-39
View Clip Volume and Mask	3-39
View Attributes	3-44



Table of Contents

Mouse Practice	3-46
Chapter 3 Review Questions.....	3-48
4. Drawing Basics.....	4-1
Starting a Drawing Command	4-1
Basic Drawing Tools.....	4-2
Linear – Task toolbox	4-3
Polygons – Task toolbox	4-11
Circle Toolbox	4-16
Lab 4 – Drawing Basics.....	4-22
Objectives.....	4-22
Open the Design File.....	4-22
Use Elements from the Linear Tool Box	4-23
Use Elements from the Circles Tool Box.....	4-32
Use Elements from the Polygons Tool Box	4-38
Chapter 4 Review Questions.....	4-46
5. Locks and Snapping	5-1
What is a MicroStation Lock?.....	5-1
Activating Locks	5-1
Locks Dialog Box	5-2
Lock Toggles Dialog Box.....	5-3
Frequently used Locks	5-4
Axis Lock	5-4
Unit Lock	5-5
Graphic Group Lock	5-6
Snap Lock	5-6
Association Lock	5-6
Active Depth Lock.....	5-6
Snapping	5-7
What is a Snapping?	5-7
Snapping with the Tentative Button.....	5-8
Snapping with AccuSnap	5-9
Snap Modes.....	5-9
Activating a Snap Mode	5-10
Snap Mode Button Bar	5-11
Default vs. Active Snap Mode	5-18
Multi-snap Sets.....	5-20
AccuSnap Settings.....	5-21
Lab 5 – Locks and Snapping	5-23
Objectives.....	5-23
Open the Design File.....	5-23
Change the Default Snap Mode	5-23
Use AccuSnap with other Drafting Tools.....	5-25
Change the Divisor Setting.....	5-40
Locks	5-43



Chapter 5 Review Questions..... 5-50

6. AccuDraw 6-1

- AccuDraw Basics 6-1
- Toggle AccuDraw 6-1
- AccuDraw Window 6-2
 - Rectangular Configuration Mode..... 6-2
 - Polar Configuration Mode 6-2
- AccuDraw Compass 6-3
 - Rectangular Compass..... 6-3
 - Polar Compass..... 6-3
 - Compass Orientation 6-4
 - Relocating the Compass Origin 6-5
- Compass Axes 6-6
 - “On-the-Fly” Axis Indexing 6-6
 - Axis Indexing using Smart Lock..... 6-7
 - Nudging the Compass Axis 6-8
- AccuDraw Settings 6-9
- Lab 6A – AccuDraw 6-10
 - Objectives 6-10
 - Open the Design File..... 6-11
 - Set Design File Settings..... 6-11
 - Set AccuDraw Settings 6-12
 - Create the Mail Box Front View..... 6-13
 - Create the Mail Box Side View 6-26
- Lab 6B – AccuDraw 6-34
 - Objectives 6-34
 - Open the Design File..... 6-35
 - Set Design File Settings..... 6-35
 - Set AccuDraw Settings 6-36
 - Create the Guardrail Barrier..... 6-37
- Challenge Lab 1 - AccuDraw..... 6-59
- Tip: When entering inches or subunits into the AccuDraw dialog use a semicolon then enter the number <:24> or two decimal points and then the number <..24>..... 6-59
- Challenge Lab 2 - AccuDraw..... 6-60
- Chapter 6 Review Questions..... 6-61

7. Modifying and Manipulating Elements 7-1

- Manipulate Toolbox 7-1
 - Modify Tool Box..... 7-8
- Lab 7 – Modification and Manipulating Elements..... 7-14
 - Objectives 7-14
 - Open the Design File..... 7-14
 - Manipulate Elements in the Site Layout 7-14



Table of Contents

Modify Elements in the Site Layout	7-30
Challenge Lab - Modifying and Manipulating Elements	7-54
Chapter 7 Review Questions.....	7-55
8. Element Selection.....	8-1
Fence Tool Box.....	8-2
Select By Attributes	8-6
Lab 8 – Element Selection.....	8-7
Objectives.....	8-7
Open the Design File	8-7
Using the Element Selection Tool	8-7
Working with Fences	8-11
Use Copy/Move Fence Contents to File Command.....	8-18
Using Element Selection Options	8-21
Using the Select By Attributes Utility.....	8-29
Challenge Lab - Element Selection	8-31
Chapter 8 Review Questions.....	8-32
9. Complex Elements and Grouping.....	9-1
MicroStation Groups.....	9-1
Temporary Group.....	9-1
Semi-Permanent Group.....	9-1
What is a Complex Element?	9-1
Creating Complex Element Status.....	9-1
Groups Tool box.....	9-1
Dropping Complex Element Status	9-4
Groups Tool box.....	9-4
Fence Tool box.....	9-5
Graphic Groups	9-6
What is a Graphic Group?	9-6
Quicksets.....	9-8
Named Groups	9-10
Permanent Group	9-11
Lab 9 – Complex Elements and Grouping.....	9-13
Objectives.....	9-13
Open the Design File	9-13
Create a Complex Chain	9-13
Create a Complex Shape	9-21
Dropping Complex Status	9-25
Managing Groups	9-26
Managing Graphic Groups	9-28
Chapter 9 Review Questions.....	9-31
10.Levels and Attribute Control	10-1
What is a MicroStation Level?	10-1



Active Level..... 10-1
 Setting/Changing the Active Level 10-2

Display of Levels..... 10-3
 Attributes Tool Box..... 10-3
 Level Display Dialog Box..... 10-4

Managing Levels..... 10-5
 Level Manager Dialog Box..... 10-5
 What is “Locking” a Level? 10-13
 What is a “Frozen” Level? 10-15

Change Attributes Tool Box 10-16

Element Information 10-20

Lab 10A – Managing and Utilizing Levels 10-21
 Objectives 10-21
 Open the Design File..... 10-21
 Add Levels to the Design File and Assign Level Attributes 10-21
 Export Existing Levels..... 10-24
 Delete Levels..... 10-25
 Import Levels 10-26
 Change the Display of Levels 10-28
 Change the Active Level..... 10-35
 Create and Manage Level Filters 10-36

Lab 10B –Attribute Control 10-43
 Objectives 10-43
 Open the Design File..... 10-43
 Turn on View Attributes Options..... 10-44
 Change the Element Symbology 10-46
 Change the Element Symbology using ByLevel Symbology 10-51
 Use the Change Element Attributes Tool..... 10-56
 Use the Match All Element Settings Tool 10-64
 Use Level Display as an Aide in Changing Attributes of Existing Elements 10-70
 Implement Level Overrides..... 10-76

Challenge Lab - Levels and Attribute Control 10-82

Chapter 10 Review Questions..... 10-83

11. Annotating Drawings 11-1
 Text Styles 11-1
 Text Styles Dialog Box..... 11-1

Text Tool Box 11-2

Lab 11 – Annotating Drawings 11-12
 Objectives 11-12
 Open the Design File..... 11-12
 Create Text Styles 11-13
 Place Text using the Place Text Tool..... 11-17
 Place Leader Notes..... 11-37
 Edit Existing Text 11-43
 Match and Change Text Attributes of Existing Text..... 11-47



Table of Contents

Copy and Increment Text using the Copy/Increment Text Tool	11-53
Create Enter Data Fields	11-56
Manually Add Text to Empty Enter Data Fields	11-58
Automatically Fill Text into Empty Enter Data Fields	11-61
Challenge Lab - Annotating Drawings	11-64
Chapter 11 Review Questions.....	11-65
12.Models.....	12-1
What is a MicroStation Model?	12-1
Model Basics.....	12-1
Design and Sheet Models	12-1
Activating a Model	12-2
Active File and Link Set Mode	12-3
Creating a Model	12-4
Copying a Model.....	12-5
Editing Model Properties.....	12-6
Deleting a Model.....	12-6
Importing a Model.....	12-7
Define Sheet Boundary.....	12-7
Model Filter.....	12-8
Lab 12 – Models.....	12-9
Objectives.....	12-9
Open the Design File.....	12-9
Activate a Model	12-10
Edit the Properties of a Model	12-14
Create a New Design Model	12-15
Create a New Model by Copying an Existing Model	12-17
Import a Model into the Active Design File.....	12-19
Chapter 12 Review Questions.....	12-21
13.Cells.....	13-1
What is a Cell?	13-1
Types of Cells	13-1
Cell Library.....	13-1
Cell Library Dialog Box	13-1
Creating a Cell	13-3
Cells Tool Box	13-4
Cell Selector	13-8
Lab 13 – Cells.....	13-9
Objectives.....	13-9
Open the Design File.....	13-9
Attach the Signs - Plan View Cell Library.....	13-9
Create a Cell by Saving the Graphics to an Attached Cell Library	13-11
Place Plan View Cells into the Drawing	13-18



Detach the Signs - Plan View Cell Library 13-22
Attach the Signs - Front View Cell Library..... 13-23
Place Front View Cells into the Drawing 13-24
Create a Cell by Copying a Model inside the Cell Library File 13-30
Utilize the Cell Selector File Utility 13-36
Chapter 13 Review Questions..... 13-40

14.Patterning and Hatching 14-1

Patterns Tool Box 14-1

Lab 14 – Patterning and Hatching..... 14-7

Objectives 14-7
Open the Design File..... 14-7
Create a Concrete Pattern using the Element Method 14-7
Create an Associative Earth Pattern using the Element Method 14-10
Create an Earth Pattern using the Points Method..... 14-13
Create a Rock Pattern using the Points Method 14-14
Create an Earth Pattern using the Flood Method..... 14-16
Create a Concrete Pattern using the Flood Method 14-17
Create a Hatch and Crosshatch..... 14-19
Create a Hatch and Crosshatch locating Interior Features and Text 14-23
Create Multiple Hatches in one Hatching Operation 14-30
Create Hatches by Matching the Attributes of Existing Hatches 14-34

Challenge Lab – Patterning and Hatching..... 14-39

Chapter 14 Review Questions..... 14-40

15.Dimensioning 15-1

Dimension Tools..... 15-1

Dimension Styles..... 15-2

Dimension Styles Dialog Box..... 15-2

Dimension Tool Box 15-3

Editing Dimension Text 15-7

Modifying Dimensions..... 15-8

Lab 15 – Dimensioning..... 15-9

Objectives 15-9
Open the Design File..... 15-9
Create Dimension Styles..... 15-9
Dimension the Roadway Detail using the Linear Dimension Tool 15-14
Add a Dimension to a Dimension String 15-17
Delete a Dimension from a Dimension String..... 15-18
Change the Attribute Settings of a Dimension 15-19
Element Dimension Tool and the Linear Dimension Tool 15-21
Copy a Dimension 15-30
Reassociate a Dimension..... 15-31
Modify a Dimension..... 15-33
Edit Dimension Text 15-35
Change the Settings of a Dimension Style..... 15-37



Table of Contents

Challenge Lab 1 - Dimensioning	15-38
Challenge Lab 2 - Dimensioning	15-39
Chapter 15 Review Questions.....	15-40
16.Measuring.....	16-1
Measure Tool Box.....	16-1
Lab 16 – Measuring.....	16-5
Objectives.....	16-5
Open the Design File	16-5
Use the Measure Distance Tool.....	16-5
Use the Measure Radius Tool.....	16-11
Use the Measure Angle Tool.....	16-12
Use the Measure Length Tool	16-14
Use the Measure Area Tool.....	16-16
Chapter 16 Review Questions.....	16-19
17.Referencing.....	17-1
What is a Reference?	17-1
Reference Dialog Box	17-1
References Tool Box	17-2
Additional Reference Tools	17-8
Lab 17 – Referencing.....	17-9
Objectives.....	17-9
Open the Design File	17-9
Control the Display of the Attached Reference	17-9
Attach a Plan Reference	17-11
Attach a Sheet Border Reference.....	17-14
Attach the Profile Reference	17-20
Manipulate the Profile References.....	17-23
Attach the Profile Elevations.....	17-25
Chapter 17 Review Questions.....	17-32
18.Printing	18-1
Print Dialog Box	18-1
General Settings	18-2
Printer and Paper Size.....	18-3
Print Scale and Position.....	18-10
Print Attributes	18-11
Print Preferences.....	18-12
3D Plotting Options.....	18-13
Pentables.....	18-14
Pen Table Options.....	18-15
Element Output Actions	18-16
Print Organizer.....	18-17
Print Organizer Dialog	18-17
Print Definition Settings	18-18



Print Styles	18-19
Lab 18 – Printing.....	18-20
Objectives	18-20
Open the Design File.....	18-20
Scaling the Printing Graphics.....	18-20
Define the Print Boundary	18-21
Select a Printer Driver.....	18-22
Create a Logical Name for the References	18-24
Create a Pen Table.....	18-25
Edit the Pen Table.....	18-26
Adjust the Print Settings	18-33
Check the Print Attributes.....	18-37
Preview the Print	18-39
Print to PDF File Format	18-40
Challenge Lab 1 - Printing.....	18-43
Chapter 18 Review Questions.....	18-44
19.3D Basics	19-1
Drawing in 2D	19-1
2D Design Plane	19-1
Drawing in 3D	19-2
3D Design Cube.....	19-2
Active Depth	19-3
Display Depth	19-4
3D Drawing Tools	19-5
INDEX	vi



Each manual includes a dataset that can be downloaded from our website.

Contact us if you would like the lab files for this E-book.
608-836-3903

www.EnvisionCAD.com



envision

TRAINING

SEE THE CAD POSSIBILITIES

TRAINING

Bentley Systems® MicroStation®

- MicroStation V8 2004 Edition Upgrade
- MicroStation V8 2004 Edition Fundamentals
- MicroStation V8 2004 Edition Power Users
- Mastering MicroStation AccuDraw
- MicroStation Everything 3D
- MicroStation V8 XM Edition Upgrade
- MicroStation V8 XM Edition Fundamentals
- MicroStation V8i Edition Upgrade
- MicroStation V8i Edition Fundamentals
- CADscript Fundamentals
- Bentley Map V8i Fundamentals

Bentley Systems® InRoads®

- InRoads Upgrade
- InRoads Fundamentals
- InRoads Site
- InRoads Survey

Autodesk® AutoCAD Civil 3D®

- AutoCAD Civil 3D Fundamentals
- AutoCAD Civil 3D Roadway Design
- AutoCAD Civil 3D Interchange Design
- AutoCAD Map 3D Fundamentals

MANUALS for PURCHASE

MicroStation V8 2004 Edition Fundamentals	\$95
MicroStation V8 XM Edition Update	\$65
MicroStation V8 XM Edition Fundamentals	\$125
MicroStation V8i Edition Update	\$65
MicroStation V8i Edition Fundamentals	\$125
CADscript Fundamentals	\$65
Bentley Map V8i Fundamentals	\$65
Customized Manuals	Contact us

** Fundamentals Manuals Available in Civil and Architectural Disciplines*

SERVICES

Consulting

We can help you analyze what software to buy, what systems to run, and what equipment and configurations to implement. We can also help establish CADD standards and procedures, develop custom applications, provide ongoing user support, and project assistance.

Programming

Maximize your productivity with our custom programming services. Eliminate tedious and repetitive tasks. Reduce errors. Add new functionality. Integrate your Autodesk and Bentley products with other applications.