

Full Contents

Section 1: Overview Essentials

1.1 Introduction	3
Learning InRoads	3
Basic Rules	3
How to Use This Guide	4
Section Breakdown	5
<i>Section 1: Overview Essentials</i>	5
<i>Section 2: Production Essentials</i>	5
<i>Glossary</i>	5
<i>Index</i>	5
What's in a Chapter?	5
Font Conventions	6
<i>Italic</i>	6
<i>Bold</i>	7
<i>Bold and Italic</i>	7
<i>Small Caps</i>	7
<i>Underlined Small Caps</i>	7
How to Use the CD	7
Files on CD-ROM	7
<i>Training Folders</i>	8
<i>Training Files</i>	8
<i>Chapter Files</i>	10
Other CD Content	10
Software Information	10
AutoCAD versus MicroStation	10
Version Compatibility	11
Software File Paths	12
1.2 Orientation to InRoads	13
Chapter Prerequisites	14
InRoads versus CAD	14
<i>The CAD Platform</i>	14
<i>File Types</i>	14
<i>InRoads and CAD</i>	15
The InRoads Interface	16
The Menu Bar	16
The Workspace Bar	16
The Feedback Pane	17
Status Bar	17
Toolbars	18
The Surface Model	19
Surface Origins	19
Intelligent Models	20
Surface Display	21

Geometry	.....	22
COGO Points	.....	23
Horizontal Alignments	.....	23
Vertical Alignments	.....	24
Profiles	.....	25
Typical Sections	.....	26
Backbone	.....	26
Cut and Fill Conditions	.....	27
Layers and Components	.....	27
Surface Intelligence	.....	28
Roadway Models	.....	28
Express Modeler	.....	29
Roadway Designer	.....	29
Defining the Roadway	.....	30
Running the Modeler	.....	30
Superelevation	.....	32
Cross Sections	.....	34
Custom Cross Sections	.....	35
Cross Section Viewer	.....	35
Annotation	.....	36
Cross Section Editing	.....	36
Volumes	.....	36
Triangle Volume	.....	37
Grid Volume	.....	37
End-Area Volume	.....	37
Reporting	.....	38
XML Reporting	.....	38
Preferences	.....	40
Tools> Options	.....	41
The Managers	.....	41
Symbology Manager	.....	42
Features - Style Manager	.....	43
Geometry - Style Manager	.....	45
Preference Manager	.....	46
The Locks	.....	47
Pen and Pencil	.....	47
Locate Lock	.....	48
Snap Lock	.....	48
Station Lock	.....	49
Report Lock	.....	50
Feature Filter	.....	50
Chapter Challenge	.....	51
Quiz Questions	.....	51
1.3 Sample Project Defined	.....	53
Preliminary Design Statement	.....	53
Project Design Criteria	.....	53
Scope of Work Details	.....	54
<i>Typical Sections</i>	.....	55
<i>Concept Sketches</i>	.....	56
<i>Design Criteria</i>	.....	58
<i>Project Vicinity Map</i>	.....	60

1.4 Getting Going Now!	61
Chapter Prerequisites	62
Files Needed	62
Hands On—Get Going Now!	62
Hands-On—An Introduction	62
Orientation	62
Loading the Training Files	66
<i>Preparing and Opening InRoads</i>	66
<i>Project Defaults</i>	67
<i>Creating a New Project Default Configuration</i>	70
<i>Opening the Data</i>	71
Lock Settings	72
CAD File Preparation	73
Surface Review and Display	73
<i>Perimeter</i>	73
<i>Contours</i>	74
<i>Triangles</i>	76
<i>Update 3-D/Plan Surface Display</i>	77
<i>Surface Properties</i>	79
<i>Feature Properties</i>	80
<i>View Features</i>	81
Horizontal Geometry File Creation	84
<i>The Geometry Project</i>	84
<i>Horizontal Alignment</i>	86
<i>Vertical Alignment</i>	87
Horizontal Geometry Workspace Bar Review	88
<i>Workspace Bar Shortcuts - Review</i>	89
<i>Workspace Bar Shortcuts - View</i>	90
<i>View Stationing</i>	92
<i>Alignment Stationing</i>	93
<i>Horizontal Annotation</i>	95
Profiling	98
<i>Create Profile</i>	99
Vertical Geometry Viewing	104
<i>View Vertical</i>	104
<i>View Vertical Annotation</i>	105
Typical Sections	106
<i>Templates</i>	107
Roadway Modeling	110
<i>Express Modeler</i>	110
<i>Running the Express Modeler</i>	113
Creating Cross Sections	117
<i>Create Cross Sections</i>	117
<i>Cross Section Viewer</i>	120
Express Modeler and Cross Section Repetition	122
<i>Express Modeler Revisited</i>	122
<i>Cross Sections Revisited</i>	123
End-Area Volumes	124
<i>End-Area Volumes</i>	124
Chapter Challenge	128
Additional Exercises	128
Quiz Questions	128

Section 2: Production Essentials

2.1 Starting Up	133
Chapter Prerequisites	133
Knowledge Prerequisites	133
Data Prerequisites	134
Files Needed	134
Hands On—Starting Up	134
Selecting a CAD Platform	134
Starting InRoads	135
<i>InRoads Versus CAD</i>	135
The InRoads Interface	137
<i>The Menu Bar</i>	137
<i>The Workspace Bar</i>	137
<i>The Feedback Pane</i>	138
Project Defaults	140
<i>Creating a New Configuration</i>	140
Application Add-ins	142
<i>Variable Manager</i>	143
Exiting InRoads	144
Chapter Challenge	145
Additional Exercises	145
Quiz Questions	146
2.2 Settings, Styles and Symbology	147
Chapter Prerequisites	147
Knowledge Prerequisites	147
Data Prerequisites	147
Files Needed	148
Hands on — The Managers	148
<i>Managers Overview</i>	149
Using the Symbology Manager	150
<i>Using Named Symbology - Part 1</i>	152
<i>Using Named Symbology - Part 2</i>	154
<i>Using Named Symbology - Part 3</i>	155
Introduction to Intelligent DTM's	156
Style Manager - DTM Features	156
<i>Style - Surface Display</i>	159
Style Manager - Geometry	159
<i>Geometry Style - Details</i>	162
Creating a New Geometry Style	165
<i>General Information</i>	166
<i>Assigning Symbology</i>	166
<i>Assigning New Symbology</i>	169
<i>Defining the Settings</i>	172
Geometry Styles - Assigning	173
Preferences	175
<i>Preference Manager</i>	177
<i>Changing the Default Preference</i>	178
<i>Preferences Expanded</i>	179
Chapter Challenge	183
Additional Exercises	183
Quiz Questions	184

2.3 Surface Essentials	185
Chapter Prerequisites	185
Knowledge Prerequisites	185
Data Prerequisites	185
Files Needed	185
Hands On—Surface Essentials	186
Getting Started with Surfaces	186
DTM Basics	186
<i>Surface—New</i>	187
<i>The Basic DTM Point Types</i>	188
<i>Surface Properties</i>	188
The Existing Surface	189
<i>Feature Properties</i>	189
<i>The Three Feature Characteristics</i>	190
The InRoads Locks	191
Surface Viewing	191
<i>Perimeter</i>	191
<i>Contours</i>	191
<i>Triangles</i>	192
<i>Update 3-D/Plan Surface Display</i>	192
<i>View Features</i>	193
Text Import Wizard - ASCII DTM Data	194
<i>Confirming Data Import</i>	204
<i>Processing Imported Surface Data</i>	204
<i>Viewing Imported Surface Data</i>	205
Triangulation	206
<i>Triangulate Surface</i>	207
Saving Surfaces	209
Chapter Challenge	209
Additional Exercises	209
Quiz Questions	209
2.4 Horizontal Geometry	211
Chapter Prerequisites	211
Knowledge Prerequisites	211
Data Prerequisites	211
Files Needed	212
Hands On—Geometry	212
Project Scope Orientation	212
The Geometry Project File	212
<i>Opening Existing Geometry</i>	213
Geometry—Examination	214
<i>Workspace Bar Assessment</i>	214
<i>Feedback Pane Assessment</i>	214
<i>Viewing Assessment—Preparation</i>	215
<i>View Horizontal Alignment</i>	216
<i>Point Symbology</i>	216
<i>Review Horizontal Alignment</i>	221
<i>View Stationing</i>	223
<i>Viewing Assessment - Continued</i>	224
<i>Review Geometry Points</i>	224
<i>Horizontal Annotation—Cogo Points</i>	225
Horizontal Layout Discussion	228
<i>Layout Methods</i>	228

<i>Project Orientation</i>	229
Final Road Layout	229
Chapter Challenge	229
Additional Exercises	229
Quiz Questions	230
2.5 Profiling	231
Chapter Prerequisites	231
Knowledge Prerequisites	231
Data Prerequisites	232
Files Needed	232
Hands On—Profiling	232
Creating Profiles	233
Updating the Profile Overview	234
Updating the Profile	237
Chapter Challenge	238
Additional Exercises	238
Quiz Questions	238
2.6 Vertical Geometry	241
Chapter Prerequisites	241
Knowledge Prerequisites	241
Data Prerequisites	241
Files Needed	241
Hands On—Vertical Geometry	242
Vertical Layout Discussion	243
<i>Layout Methods</i>	243
<i>Vertical Alignment Layout Prerequisites</i>	243
View and Review	244
<i>View Vertical Annotation</i>	245
Chapter Challenge	246
Additional Exercises	246
Quiz Questions	246
2.7 Typical Sections	249
Chapter Prerequisites	250
Knowledge Prerequisites	250
Data Prerequisites	250
Files Needed	250
Hands On—Typical Sections	251
Creating a Template Library	251
Opening a Template Library	254
Reviewing a Template Library	254
Viewing Templates	257
<i>View Controls</i>	259
Styles and the Intelligent DTM	260
Components	262
Components Expanded	264
Template Review	265
<i>Template CAD Display</i>	267
<i>Template Layers</i>	270
Component Constraints	273
<i>More on Constraints</i>	275
New Template #1	276
<i>New Template Placeholder</i>	276

<i>Template Section Details</i>	277
<i>Drag and Drop Insertion Point</i>	278
<i>Template Options</i>	279
<i>Last Minute Settings</i>	280
<i>Dragging and Dropping Components</i>	281
<i>Last Edit Undo / Redo</i>	283
<i>Component Mirroring</i>	283
<i>Template #1 Completion</i>	286
<i>Adding Cut / Fill Slopes</i>	288
<i>Component Merging</i>	291
<i>Constraint Release</i>	294
<i>End Condition Testing</i>	298
Create Template Command Summary	299
New Template #2	300
<i>Saving Templates</i>	300
Additional Template Topics	301
<i>Preparation</i>	301
<i>Add Details Step by Step</i>	301
<i>Multiple Passes</i>	302
<i>Independent Control Notes</i>	302
<i>Copy Typical Sections</i>	303
Chapter Challenge	304
Additional Exercises	304
<i>Template Basics Checklist</i>	305
Component Creation	306
Simple Components	306
<i>Preparation</i>	306
<i>Construction and Placement</i>	309
<i>Component Properties</i>	312
<i>Point Properties</i>	313
<i>Using a Simple Component</i>	316
<i>Simple Component - Template Review</i>	319
Simple Components Continued	322
<i>Template Construction</i>	325
Template Points - Names	327
Constrained Component #1	330
<i>Component Curb Details</i>	331
<i>Component Construction</i>	332
<i>Component Review</i>	336
Unconstrained Components	337
<i>Unconstrained Component #2</i>	340
Component Construction	341
<i>Bike Path / Walkway</i>	341
End Conditions	342
<i>Fill Slope Creation</i>	342
<i>Set Dynamic Origin</i>	347
<i>Reset Dynamic Origin</i>	349
<i>Dynamic Origin Alert</i>	349
<i>Cut Slope Creation</i>	350
Building Template #1	351
<i>Template Drag and Drop</i>	352
<i>End Condition Testing</i>	354
<i>End Condition #3</i>	357
<i>Add Additional End Condition</i>	359

<i>End Condition Re-Test</i>	359
Building Template #2	360
Merging Components	360
Component Summary	361
<i>Component Types</i>	361
<i>Terminology</i>	361
<i>Component Concept #1</i>	362
More on Point Controls	362
Create Your Own	363
Quiz Questions	363
2.8 Corridor Modeling	365
Chapter Prerequisites	366
Knowledge Prerequisites	366
Data Prerequisites	366
Files Needed	366
Hands On—Corridor Modeling	366
Opening Earlier Data	367
New Roadway Design File	367
Saving the Roadway Design File	368
The Project File	369
Modeling Basics	372
<i>Prerequisites</i>	372
The Roadway Designer	372
<i>Menu Commands</i>	372
<i>Corridor Management</i>	374
Project Scope	375
Adding Template Drops	377
<i>Continuing Template Drops</i>	379
End Condition Exceptions	380
Saving the Roadway Design File	382
Corridor Review	383
<i>Transition Bands</i>	384
<i>Connecting Transition #1 Points</i>	387
<i>Connecting Transition #2 Points</i>	391
Pre-Processing the Corridor	392
Create Surface	394
<i>Name and Preference</i>	395
<i>New Surfaces for Each Corridor</i>	396
<i>Empty Design Surface</i>	396
<i>Add Exterior Boundary</i>	397
<i>Densify Curves</i>	397
<i>Triangulate</i>	397
<i>Create Surface(s) from</i>	398
<i>Add Transverse Features</i>	398
<i>Display Features in Plan View</i>	399
<i>Final Set-up</i>	399
Creating the Design Surface	400
Surface Properties	402
Saving the Design Surface	403
Viewing Roadway Features	404
Updating the Project File	406
Chapter Challenge	408
Additional Exercises	408

Superelevation Basics	409
<i>Fundamentals of Superelevation</i>	409
<i>Superelevation Slope Rate</i>	410
<i>Superelevation Transition Locations</i>	411
InRoads Superelevation	412
<i>AASHTO Wizard - Step 1, Criteria</i>	414
<i>Rate Calculator</i>	416
<i>AASHTO Wizard - Step 1 Revisited</i>	420
<i>AASHTO Wizard - Step 2, Definitions</i>	422
<i>AASHTO Wizard - Step 2 Revisited</i>	426
<i>AASHTO Wizard - Step 3, Controls</i>	429
<i>Point Controls</i>	432
<i>Deleting Conflicting Point Controls</i>	436
<i>Viewing the Superelevation</i>	437
<i>Editing the Superelevation - Rate</i>	440
<i>Editing the Superelevation - Transitions</i>	444
<i>Superelevation Rollover Locks</i>	446
<i>Superelevation Report</i>	452
<i>Creating the Surface DTM</i>	455
<i>Viewing the Superelevation Diagram</i>	457
<i>Superelevation Design Complexities</i>	464
<i>Use of Spirals</i>	464
Various Superelevation Related Tips	465
<i>Working with Superelevation Alternatives</i>	465
<i>Superelevation and Alignment Adjustments</i>	466
<i>Superelevation and Compound Curves Note</i>	466
Quiz Questions	466
2.9 Cross Sections	469
Chapter Prerequisites	469
Knowledge Prerequisites	469
Data Prerequisites	469
Files Needed	469
Hands On—Cross Sections	470
Creating Cross Sections	471
Cross Section Viewer	473
Adding and Displaying New Features (Optional)	473
<i>Symbology Manager</i>	474
<i>Style Manager</i>	476
<i>Adding Geometry to the DTM</i>	477
<i>Feature Properties</i>	480
<i>Drape Surface</i>	480
Updating the Cross Sections Overview	482
<i>Styles and Cross Sections</i>	484
Updating the Cross Sections	485
<i>Display On</i>	485
<i>Refreshing</i>	485
<i>Component Updating</i>	486
Chapter Challenge	487
Additional Exercises	487
Quiz Questions	487
Glossary	489
Index	501

