

Day 3 Table of Contents

Note to Self-Paced Users of the Day 3 Seminar Handbook	<i>i</i>
Title Page and Notices	1
Author's Note	2
Some Handbook Acronyms and Terminology	3
Day 3 Quick Reference Index	4
Model Day 3 Seminar Class Outline	13
Program Overview	15
A Toolbox for Creating Earthwork Models	15
AGTEK Site Modeling Products Compared	16
Should AGTEK 3D Users Upgrade to AGTEK 4D?	18
Start-Up Options Menu	20
Shader Support (AGTEK 4D)	20
Plan View Shading Resolution	20
Manage Image Cache (AGTEK 4D)	21
AGTEK Data File Maintenance	22
Data Entry Guides	23
AGTEK 3D	23
Earthwork 4D	24
Gradework 4D	25
Modeling Subsurface Strata	27
Strata Modeling Overview	27
Sample Strata Bore Map and Logs	28
Strata Layers List Entries	29

Day 3 Table of Contents (Cont.)

Modeling Subsurface Strata (Cont.)

Effect on Volume Report	29
Unknown Termination Material	31
Cut Compaction Factors	31
Reversing and Repeating Materials	32
Groundwater	33
More Strata Materials Than Layers List Lines	34
Strata Bore Hole Entries	35
Importing Strata Surface Elevation Data	38
Strata Break Line Entries	39
Editing Bore Logs, Break Lines, Strata Layers List	40
Strata Interpolation Options	41
Change Strata Surface Colors	41
Freeze Strata Layers Option	42
Clip Strata Utility	42
Strata Volume Calculations	43
Strata Volume Reporting	44
Strata Volume Report (AGTEK 4D)	44
Rock Undercut Volume (Cut Area Method)	44
Volume Report with Cut Compaction Factors	45
Volume Report with No Compaction Factors	46
Volume Report with Fill Compaction Factor	47
Calculation of Volume-Weighted Fill Factor	48

Day 3 Table of Contents (Cont.)

Modeling Subsurface Strata (Cont.)	
Strata Volumes and Stripping Areas	49
Strata Volumes with Straight-Slope Interpolation	51
Viewing Strata Cut Maps	52
Display Strata Cut Map Colors as Background Image (Gradework 4D)	53
“Stripping” the Surface Strata Material	55
Volume of a Strata Seam	60
Balancing Onsite Cut and Fill	64
Adjustments to Import/Export Volume	64
Raise/Lower Amount per Volume Report	65
Raise/Lower Entire Site	65
Raise/Lower Specific Data Lines	66
Edit Tie-In to Existing Street	68
Identifying Work Areas with Cut-Fill Lines	73
Stripping Area Conflict at Strata Cut	73
Model Subsidence Loss at Fill Areas	75
Stripping Areas by Cut/Fill Depth	78
Waste Areas by Depth of Cover	84
Modeling Vertically-Staged Earthwork	91
Overview of Available Modeling Tools	91
Six Approaches to a Soil Undercut	93
(1) Transfer Subgrade Utility	93
(2) New Surface and Stage Into Utilities (AGTEK 4D)	98

Day 3 Table of Contents (Cont.)

Modeling Vertically-Staged Earthwork (Cont.)	
(3) Apply Survey Utility	105
(4) Stage Over-Ex Utility	112
(5) Apply Template Utility (AGTEK 4D)	125
(6) Over-Ex Guide (Gradework 4D)	139
Modeling for Retaining Wall Cut Back	146
Create <i>Diff</i> Calculation Surface with Lowest Surface Utility	146
Create Wall Cut Back Model (AGTEK 4D Method)	150
Apply Template Utility for Wall Cut Back Lines and Staged Wall-Cut Surface	150
Balance Region to Limit Calculation Area	153
Calculate Wall Cut Back and Backfill Volumes	154
Backfill Volume by Vertical Interval Option	155
Measure Wall's Face Area for Backfill Adjustments	156
Generate Wall Profile	157
Rock Undercut Volumes (Subtraction Method)	158
Refusal Rock Undercut Volume	159
Raise/Lower Function	159
Overlying Material Undercut Volumes	160
Delineate Removal Area with Cut/Fill Line	160
Cut/Fill Line as Report Region Reference	161
Import Report Region from One Job File into Another	162
Recap of Undercut Volumes	163
Variable-Depth Removal of Expansive Clay	165

Day 3 Table of Contents (Cont.)

Modeling Vertically-Staged Earthwork (Cont.)	
Clay Removal Typical Section	168
Cut-Fill Line for Removal Transition	170
Stage Over-Ex Utility for Partial Surface	172
Excluding Above-Grade Removal Areas	173
Copy/Paste Bottom of Clay Surface	176
Stage Over-Ex Utility to Merge Surfaces	177
Enter Balance Region to Limit Calculation Area	179
Calculate Balance Region and Report Region Volumes	180
Evaluate Reported Volumes	181
Appendix A – How to Get Help, Training, Program Updates	183
Getting Help	183
Getting Trained	185
Getting Program Updates	186
Appendix B – Keyboard Shortcuts	189
Import (CAD Transfer) Mode	189
Edit Mode	191
Entry Mode	196
Profile View Mode	200
Plan View Mode	202
3D View Mode	205
Volume Report Mode	208
Haul Report Mode	209

Day 3 Table of Contents (Cont.)

Appendix B – Keyboard Shortcuts (Cont.)	
Print View Mode	210
Appendix C – Download and Use Day 3 Seminar Training Files	211
Appendix D – Catalog of Day 3 Handbook Web Resources	215
Appendix E – Strata Modeling Considerations in AGTEK 3D	223
Strata Volume Report	223
Strata Volumes and Stripping Areas	224
Strata Volumes with Straight-Slope Interpolation	227
Strata Volumes when Existing Surface is Modified	229
Appendix F – Soil Undercut with New Surface Utility in AGTEK 3D	231
Appendix G – Manually Create a Lowest Surface Model	237
Appendix H – Create Wall Cut Back Model in AGTEK 3D	247
Offset Line Utility for Wall Cut Back Lines	251
Edit Cut Back Lines Projected above Cut Back Grade	252
Stage Over-Ex Utility for Staged Wall-Cut Surface	253
Balance Region to Limit Calculation Area	255
Calculate Wall Cut Back and Backfill Volumes	256
Appendix I – “Painting” Balance Regions for Haul Planning	257
Enter Balance Regions	257
Edit Balance Regions	261
Haul Lines and Horizontal Haul Report	262
Horizontal Slice Report	263
Additional Notes & Manipulations	264

Day 3 Table of Contents (Cont.)

Appendix I – “Painting” Balance Regions for Haul Planning (Cont.)	
Non-Linear Haul Information	265
Strata Volumes at Balance Regions	266
Appendix J – Shrink/Swell Adjustments	269
Three Volume/Density States of Soil	269
Estimated Shrink/Swell	269
Soils Report Densities	270
Densities Not Provided	271
Mixed Onsite Fill Materials	272
Measured (Actual) Shrink/Swell	272
Shrinkage on Remove/Scarify/Re-Compact Volumes	273
Subsidence Loss Adjustment	273
Bump the Fill Factor	274
Rule of Thumb Adjustments	274
Compaction Depth Formula	274
Topo Method	275
Haul Swell Adjustment	275
References and Comments	279
Appendix K – Volume Calculation Error and Warning Dialogs	281
About the Author and Seminar Instructor	283
Seminar Attendee Survey	285
Tear-Out Plan Sheet for Modeling Subsurface Strata Exercise	287