

From Data Capture to Topo – Techniques & Best Practices for DTM – 4.0 Hours

Workshop Description

Summary

This class examines techniques using a variety of methods for field collection of data for digital terrain modeling (DTM). Covering methods to include conventional surveying, scanning and close-in photogrammetry, this session uses real project examples to explore the production of accurate terrain models with the greatest efficiency possible in the field. The session begins with detailed examples of the processing capabilities and requirements of popular software solutions. Once these requirements are established, the class examines traditional collection of point and breakline data, including interaction with field-to-finish solutions, laser scanning with dedicated and multi-purpose platforms, and the use of photographic solutions for breakline and surface production. Post-processing capabilities of terrain modeling software are also discussed, along with recommendations for transmittal of DTM data to end users.

Topics and Schedule

Digital Terrain Modeling (DTM) Concepts Overview

Basic Concept - Interpolation

Data Types Used in Constructing DTM

Point Data
Breakline Data
Hard Versus Soft Breaklines
Contour Data
Contour Data and Surface Optimization

Creating a Surface in Civil Programs

Adding Drawing Entity Data
Adding Contour Data
TIN Weeding - Filtering of Vertices on Contours
TIN Supplementing Factors - Adding Vertices to Polyline
Options for Minimizing Flat Areas
Software Control of Multiple Data Selections and Interaction with Accuracy

Adding Manual Breakline Data to the Surface

Creating Breaklines from Drawing Information
Civil 3D Interpolation Tool for Producing a 3D Polyline/Breakline
Adding Breaklines to the Surface

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Surface Creation from Field Data

- Breakline and Point Data Interaction
- Point Data Requirements
- Breakline Creation through Automated Linework
- Adding Breakline Data to the Surface
- Adding Point Data to the Surface
- Adding the Surface Boundary
- Pasting Surfaces

Surface Integrity and Data Security

- Surface Editing
- Locking to Protect from Accidental Editing

Field Linework Collection

- Overview of Alternatives in Various Programs
- Linework Field Coding
- Linework Processing within Software and Drawings

3D Scanning and Point Clouds

- Overview of Alternatives from Various Vendors
- Data Collection and Data Processing
- Surface Generation in Application Software
- Data Management and Interaction with CAD Software

Photo Processing and Close-In Photogrammetry

- Overview of Alternatives from Various Vendors
- Photo Processing and Surface Model Creation
- Surface Generation in Application Software
- Data Management and Interaction with CAD Software

Learning Objectives

1. Participants will be able to describe the process for building surfaces in civil survey application software from survey fieldwork, as illustrated using the sample survey project used in the course.
2. Participants will be able to describe the process of incorporating scan data into a surface as illustrated using the sample survey project used in the course.

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Learning Objectives (Continued)

- Participants will be able to describe the process for building breakline data for surface creation, either through field-to-finish processing or manual construction within a drawing, as illustrated using the sample survey project used in the course.
- Participants will be able to describe hierarchical controls and accuracy in processing terrain model data in civil survey application software as illustrated using the sample survey project used in the course.

FROM DATA CAPTURE TO TOPO – TECHNIQUES & BEST PRACTICES FOR DTM – HALF DAY	
Overall Course Length	4.0 Hours
Instructional Time	3.5 HOURS
PROFESSIONAL DEVELOPMENT HOURS (PDHs)	
New York State Land Surveyors	3.5 PDHs
New York State Professional Engineers	3.5 PDHs



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