

Terrain Modeling, Contouring and Analysis in AutoCAD Civil 3D – 4.0 Hours

Workshop Description

Summary

This class, offered at selected survey conferences, examines the creation of Digital Terrain Models, or Surfaces, in AutoCAD® Civil 3D®, with an emphasis on producing highly-accurate models as efficiently as possible from survey data. Since the Civil 3D Surface is also the basis for contouring and analysis within the program, better surfaces yield better contouring and analysis as results.

The class reviews the data types for terrain modeling – point, breakline and contour data - and how their use is facilitated with survey data transferred into the drawing from field work. The class will examine how breakline data can be captured and included in the Civil 3D TIN, using not only Civil 3D tools but from other solutions, including Carlson and SmartDraft. The course will examine various strategies for filtering point data for inclusion in the Civil 3D Surface, including Point Groups, Description Keys and other tools. Major topics also include the assessment of surface accuracy and surface editing, techniques for improving the quality of contouring, surface presentation and annotation styles, and the use of surfaces in analysis functions, such as slope and drainage assessment.

Topics and Schedule

Digital Terrain Modeling (DTM) Concepts Overview

Basic Concept - Interpolation
DTM in Civil 3D Introduction
Operational Aspects of Civil 3D Introduction

- Processing Data
- Building a Civil 3D Object

Data Types Used in Constructing DTM

Point Data Breakline Data Contour Data

Critical Civil 3D Surface Feature Settings

Civil 3D – Infinitely Customizable Program (Advantage and Disadvantage)
Settings Control Each Feature or Element
Critical Surface Feature Settings
Examining Surface Feature Settings
Importance of Surface Default Style
Surface Command Settings
Triangulated Irregular Networks (TINs) Versus Grid Models
Building a Surface from More than One Data Type in Civil 3D
Producing TINs with Exceptionally High Quality

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Starting the Surface in Civil 3D

Methods for Creating the Existing Aerial Surface
Adding Spot Elevation Data
Adding Contour Data
TIN Weeding - Filtering of Vertices on Contours
TIN Supplementing Factors - Adding Vertices to Polylines
Options for Minimizing Flat Areas

Adding 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

Surface Integrity and Data Security

Surface Editing
Adding Boundaries to Suppress/Show/Hard Clip Data
Processing the Boundary as a Non-destructive Breakline
Locking to Protect from Accidental Editing

Continuing with Additional Field Data

Creating Breaklines – and Exception
Point Data Requirements
Layer Considerations
Isolating Display of Points for Breaklines Options

- Point Group Display Order
- Layer Management

Drawing the Breaklines

Alternative for Creating Breaklines

Creating the Surface

Adding Breakline Data to the Surface

Adding Point Data to the Surface

Adding the Surface Boundary

Pasting Surfaces

Pasting Surfaces to Create the Existing Combined

Copying the Aerial Surface
Pasting the Road Sections Surface

Surface Status Indications in the Prospector

Contouring Surfaces

Surface Labeling

Setting Styles and Creating Contour Labels Placing a Spot Elevation Label

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Learning Objectives

- 1. Participants will be able to describe the process for building surfaces in Civil 3D from survey fieldwork as illustrated using the sample survey project used in the course.
- 2. Participants will be able to describe surface display and annotation controls exercised by Civil 3D styles as illustrated using the sample survey project used in the course.
- 3. 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.
- 4. Participants will be able to describe methods for assessing surface accuracy and performing surface editing as illustrated using the sample survey project used in the course.

TERRAIN MODELING, CONTOURING AND ANALYSIS IN AUTOCAD CIVIL 3D — 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













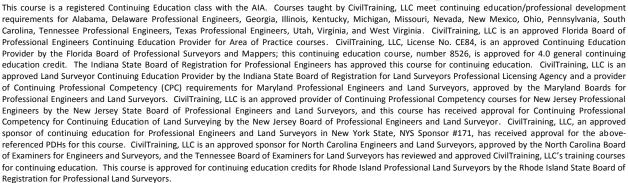












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