

# **12D MODEL 'BASIC CIVIL DESIGN' TRAINING COURSE CONTENT**

## **Course C1. Basic Civil Design Training Course (Three days)**

No prior knowledge is assumed except for basic Windows concepts and the use of Windows Explorer. This Course covers all Basic knowledge items needed to use 12d for Civil Design..

### **Day 1**

Overview of mouse usage and configuration, 12d menus, string concepts.

Discuss folder structure (Working folder and Project folder)

Data input and mapfiles

Triangulation - Tin (Surface) creation

Creation and use of View model lists (.vml files)

Tin Inquiry tools

Inquiring on and understanding String data

Snap toolbar settings

String creation and the Alignment editor

Template creation

Basic Apply function and template design

Recalc concepts

Perspective view Operations

Text auto turn on when zooming

Points Edit and Strings Edit Menu Operations

- point heights and grading tools
- join and join many
- link clip, split, head to tail etc
- parallel, translate

Introduction to the CAD menu and CAD control bar

### **Day 2**

Review of Day 1 and Student assignment to repeat above operations

Advanced Template Design using the Apply Many concepts

MTF edit operations

- stopping templates at intersections, superelevation,
- widening and grading links etc in detail
- template verses non-template design
- templates in general terrain modelling (non road design)

String Drive/Walk in Perspective views

Wetlands type work - how to create ponds and generally get started

Creating batters, dam walls and excavating ponds in a wetlands environment

View plotting - Plan, Section and Perspective View plotting

Sheets of long sections

Sheets of cross sections

Plan plotframes and multiple plan sheets

Basic Plotting issues

- use of unique colours and how to display and use more than the 16 base colours
- plotting via Windows and using plotter mapping files (.pmf)
- mono and grey scale issues
- plotting to CAD (mm) as distinct from transferring to CAD (real world units)
- use of seed files for transfer of colours and linestyles e.g. BYLAYER
- customised layer names or layer names by colours
- BYLAYER or hardcoded linestyles and colours
- reading corporate standard ppf files from the user library and saving locally

Intro to Wetlands design, how to create lakes etc.

### **Day3**

Creating Boxing strings from a finished road surface

Intro to setting up corporate Boxing Definitions

Intro to Super Strings

Use of the CAD menu and CAD control bar to create and edit Super Strings and Text

Student assignment – typical use of CAD menu commands when laying down design strings

How to start framing up multiple roads and intersections

Create kerb returns using intelligent panels

Grade the kerb returns

Apply templates on kerb returns

Complete the design of an intersection, check for crossing breaklines and remove any problems

Create culdesac

Grade a culdesac

Apply a template around a culdesac lip

Create tin of road formation

Null (removal) of unwanted triangles using various techniques

Create tin Boundary automatically

Volumes

- End area volume quantities

- Exact volume quantities

Supertin properties and how to create them

Fencing (merging surfaces)

Create final design surface tin

Using polygons to colour tins realistically

String Drive using Opengl Perspective views

Draping strings

Assigning heights to lot boundary corners

Contour creation, labelling and smoothing as a function

Labelling contours at user defined locations

Labelling chainages on centrelines

Tin presentation

- meshing

- grid of tin points

View Concepts

- Extend, corridor, 2 point profiles, dynamic profiling, continuous xsections

String Inquiry tools

- slope between strings, measure slope areas, measure height differences

Tools to assess data quality

- View, Model, and individual string information tools

Cuts

- manually created cross sections

Global operations - inquire, change, duplicate, convert, translate, text

The following are covered if time permits...

Drafting tools in 12d

- labelling horizontal and vertical alignments and kerb returns

- labelling with bubbles at quarter points for complex kerb returns

Extending strings and extrapolating heights

Transfer 12d data in world coords to CAD and customisation issues

- use of string names determines the layer in CAD

- BYLAYER or hardcoded linestyles and colours

- use of AutoCAD template files for transfer of colours and linestyles BYLAYER