Modules [TC001 – TC027]

Each module below has been designed to run over a quarter of a day. Four modules can be delivered between 9:30 and 16:30 with two 15-minute breaks and a 1-hour lunch period.

[TC001] - The Civil 3D Environment
[TC002] - Introduction to Surfaces
[TC003] - Working with Surfaces.
[TC004] - Featurelines and Grading
[TC005] - Manipulating Multiple Surfaces
[TC006] - Alignments and Profiles
[TC007] - Corridor Modelling
[TC008] - Introduction to Pipe Networks
[TC009] - Visualisation Tools in Civil 3D
[TC010] - Sewers for Adoption V7
[TC011] - Basic Junction Design
[TC012] - Using Data Shortcuts (Part 1)
[TC013] - Using Data Shortcuts (Part 2)
[TC014] - Advanced Corridor Design (Part 1)
[TC015] - Advanced Corridor Design (Part 2)
[TC016] - Manual Junction Design
[TC017] - Tying in Junctions to existing ground
[TC018] - Advanced Grading
[TC019] - Advanced Alignments and Profiles (Part 1)
[TC020] - Advanced Alignments and Profiles (Part 2)
[TC021] - Cul-de-sac design
[TC022] - Speed Humps and Speed Tables
[TC023] - Revit to Civil 3D
[TC024] - Civil 3D to Revit
[TC025] - Advanced Featureline Manipulation
[TC026] - An Introduction to Infrastructure Parts Editor
[TC027] - Using Autodesk Inventor to create parts for Infrastructure Parts Editor
[TC028] - Exporting and manipulating Civil 3D models in Inventor

The following courses are each half a day. They are best delivered together as a 1-day course.

[TC101] - SUB ASSEMBLY COMPOSER
[TC102] - RETAINING WALLS IN CIVIL 3D

[TC001] – The Civil 3D Environment

Fifteen word overview: Essential best practices for beginning to work in Civil 3D

Fifty word outline: This module makes sure the trainee can setup Civil 3D to take advantage of best practices specific to the UK and Ireland. Important aspects of the software are introduced that will ensure the delegate has firm foundations to expand their knowledge of the software.

- The Civil 3D Interface
- Working with UKIE content
- Using the UKIE template
- Civil 3D Styles
- Managing Civil 3D Styles
- Working with Label Styles
- Analysis Styles
- 3D Object Viewer

[Hands On]: First Steps with Civil 3D – Working with Styles (UK housing project)

[TC002] - Introduction to Surfaces

Fifteen word overview: How to make ground models from scratch and using civil 3D specific workflows

Fifty word outline: Using the tools in civil 3D to import and filter raw survey data to create a working surface model. How to make Civil 3D design objects and use them to create a crisp clean starting point for your work.

- Importing DEM surfaces (LIDAR)
- Styling Surfaces
- Coordinates (OSGB)
- Importing COGO points to create a TIN surface
- Organising point display
- Making featurelines and using transparent commands.
- Creating breaklines from points
- Tools to query the surface

[Hands On]: Creating a surface from a point file (UK housing project)

[TC003] - Working with Surfaces.

Fifteen word overview: How to make a surface from a surveyors' topo drawing.

Fifty word outline: Take a typical surveyors' topo survey. Use the tools in civil 3D to create a surface based on the information contained within. Understanding some of the terminologies. Ensure the results are validated.

- Using drawings from a surveyor
- Drawing Objects, Breaklines and Boundaries
- Organising the data
- Surface Build and order
- Analysis Styles
- Visualising the site
- Principles of annotation
- Getting the most out of the surface

[Hands On]: Creating Surfaces from TOPO survey drawings (UK Ring Road)

[TC004] - Feature Lines and Grading

Fifteen word overview: How to create a grading line to make a ground pad and examine cut\fill volumes.

Fifty word outline: Taking a close look at civil 3D objects that help you with 3D design. Examine the use of these objects to create a ground pad that is graded into the existing ground. Use the tools to extract cut and fill information, including material volumes.

- Feature Lines made easy
- Assigning levels
- Quick Level editor
- Elevation Editor
- Grading Tools
- Volume Tools and Volume Surfaces
- Cut and Fill representation

[Hands On]: Grading, Creating a finished floor level (UK housing project)

[TC005] - Manipulating Multiple Surfaces

Fifteen word overview: This module will help you understand the relationship between more than one item in drawing.

Fifty word outline: Working with more than one object can be daunting. Ensuring multiple surfaces tie-in on a drawing is important. This module showcases techniques to check that multiple surfaces can co-exist together and builds on the principles of taking volume calculations from the model.

- Pasting Techniques
- Tying in using Feature Lines.
- Checking tools
- Volume representation
- Bulking Factor
- Data Extraction

[Hands On]: Reclamation of Pit Pond (UK land reclamation project)

[TC006] - Alignments and Profiles

Fifteen word overview: An essential module designed to introduce delegates to creating long sections and making new design profiles.

Fifty word outline: One of the most import tools is the ability to create profiles of the ground model. This module takes the delegate through the procedure to ensure they are comfortable with the process and are able to query the data into tables that show the profile levels.

- Creating Alignments from scratch
- Using objects to create Alignments
- Making surface profiles
- Designing new vertical designs
- Design Criteria
- Tools to aid the design
- Transparent commands
- Working with databands
- Superimposing profile data

[Hands On]: Road and Kerb Alignments with Vertical Design (UK Ring Road)

[TC007] - Corridor Modelling

Fifteen word overview: Introduction to road design. Taking you through the basic steps to construct a road model.

Fifty word outline: A great introduction to how roads are built in Civil 3D. The delegate will find out how to work with the building blocks that create a road corridor. They will then be shown how to sample sections through the road and create setting out reports.

- Using stock assemblies (DMRB)
- Creating custom assemblies
- Making a corridor
- Updating a corridor
- Sample Line Groups
- Making a corridor surface
- Making Multiple Section Views
- Setting out reports

[Hands On]: Basic Corridor Design and Annotation (UK Ring Road)

[TC008] – Designing Pipe Networks

Fifteen word overview: A definitive guide in how to design pipe networks.

Fifty word outline: This module is the one you need to cover the skills required to design pipe networks in Civil 3D. The detailed notes will take the delegate through all the processes required to produce, from scratch, a drainage design.

- Catalogues (UKIE)
- Parts lists and style assignment
- Pipe and Structure rules
- Drawing in from scratch
- Using transparent commands
- Using existing objects
- Managing multiple networks
- Modifying the network
- Rename and Export to Micro-drainage (WINDES)
- Pipe and Structure Reports

[Hands On]: Designing a gravity fed pipe network (UK Estate Project)

[TC009] - Visualisation Tools in Civil 3D [TC009]

Fifteen word overview: Using Civil 3D to make your project look good in 3D.

Fifty word outline: Add a bit of pinnace to the model to make it easier to understand and visually pleasing for the client. Use aerial photography to show off your model and add street signs, lampposts and trees.

- Analysis Styles
- Using Aerial Photography
- Using the UK 3D block library
- Assigning 3D blocks to the surface
- Driving along an Alignment
- Best practices to visualise a corridor
- Tips and Tricks to show off your work

[Workshop]: Visualising your project.
[Hands On]: 'Showing off' your road corridor and junction (UK Housing Project)

[TC010] – Pipe Networks: Sewers for Adoption V7

Fifteen word overview: Focusing on the delivery of a pipe network that meets the standards set out in the SFAv7 manual

Fifty word outline: This module takes you through building a SFAv7 based pipe network. It uses the catalogues introduced in Civil 3D 2020, but this can be provisioned in 2019 or 2018. It also takes you through techniques to customise the SFAv7 catalogue.

- SFAv7 Catalogue (UKIE2020,2019,2018)
- Using the default catalogue
- Pipe rules
- Making your own catalogue
- Customising the structural parts in Parts Editor

[Hands On]: Designing Storm and Foul pipe networks to SFAv7 (UK Estate Project)

[TC011] - Basic Junction Design

Fifteen word overview: Quick and easy junctions

Fifty word outline: Using the junction wizard is a quick and easy method of junction design. Introducing the tools and working with standard sections will make the creation of simple junctions a painless task.

- Preparing to use the Junction Design tools in Civil 3D
- Using the Junction wizard.
- Quick corridors
- Kerb Returns and Offset Parameters
- Modifying the defaults
- T Junctions and Cross Roads
- Widenings

[Hands On]: Basic Junction design for Estate Roads (UK Housing Estate Project)

[TC012] - Using Data Shortcuts (Part 1)

Fifteen word overview: How to link your drawings together to ensure large projects can be managed well.

Fifty word outline: Working with a large datasets can present challenges, but with data shortcuts the workflows help you get a grip of the big picture. Linking together a large road corridor model, we explore techniques and best practices.

- Overview of how data shortcuts should be used
- Working with DREFs
- Navigating large models
- Overriding styling
- Best Practices
- Updating and making the data available
- Linking between multiple drawings

[Hands On]: Using data shortcuts to aid working on a large road model (Newark Link Road Project)

[TC013] - Using Data Shortcuts (Part 2)

Fifteen word overview: Detailing the workflow of sharing models

Fifty word outline: This module looks at the detail of using and sharing large models. We look at all the things that we can achieved my sharing data and linking together models. This full workflow is outlined using small drawing sets.

- Overview of how data shortcuts should be used
- Breaking the link
- Fixing broken links
- Updating the shortcuts
- Best Practices
- Digging deep to replace an dedit shortcut links
- What to do when it all goes wrong

[Hands On]: Using data shortcuts to aid working on a large road model (Newark Link Road Project)

[TC014] - Advanced Corridor Design (Part 1)

Fifteen word overview: Take your basic road design skills forward

Fifty word outline: Building on the skills developed in previous modules we will introduce techniques that will expand the delegates skill set. We will explore the possibilities of linking your design to varying channel lines that will influence width and height.

- Corridor Regions
- Sub Assembly targeting principles
- Offset and Vertical Design targeting
- Using the section editor
- Making the best use of corridor Surfaces

[Hands On]: Advanced Corridor Design (UK Ring Road)

[TC015] - Advanced Corridor Design (Part 2)

Fifteen word overview: Take your basic road design skills forward

Fifty word outline: Building on the skills developed in previous modules we will introduce techniques that will expand the delegates skill set. We will explore the possibilities of linking your a design to varying channel lines that will influence width and height.

- Corridor Regions
- Sub Assembly targeting principles
- Offset and Vertical Design targeting
- Using the section editor
- Making the best use of corridor Surfaces

[Hands On]: Advanced Corridor Design (UK Ring Road)

[TC016] - Manual Junction Design

Fifteen word overview: Step-by-step guide to designing junctions from scratch

Fifty word outline: A comprehensive guide to building a junction from scratch. For times when the quick and easy method doesn't cut the grade. Hardcore junction design using basic tried and trusted techniques.

- Principles of designing a junction from scratch
- Corridor Baselines
- Corridor Regions for junctions
- How junctions are targeted
- Ensuring everything is tied in

[Hands On]: Manual Junction Design (UK Estate Road)

[TC017] - Tying in Junctions to existing ground

Fifteen word overview: Join a new road into an existing road network

Fifty word outline: You may know how to design a junction, but when you have to ensure it links into, and does not interfere with, an existing carriageway, you have a different set of considerations.

- Working with an existing carriageway
- Important geometry points
- Assembly control
- Offset Alignment control
- Checking the finished design
- Tips and Tricks

[Hands On]: Creating a junction with an existing carriageway (UK Housing Project)

[TC018] - Advanced Grading

Fifteen word overview: Taking ground modelling skills to the next level.

Fifty word outline: We will look, in detail, at how Civil 3D grades into the existing ground using featurelines. Revisiting a previous ground model, we will develop advanced techniques (some undocumented) to build on the skills of creating grades using multiple components.

- Using tools to help design featurelines
- Labelling techniques
- Creating grades with multiple components
- Saving quick profile views
- Best practices for hardstanding design
- Building a car park island

[Hands On]: Grading and design tools (UK based project)

[TC019] - Advanced Alignments and Profiles (Part 1)

Fifteen word overview: Digging deep into 2D and 3D profile design

Fifty word outline: You may only currently be using the very basic tools for 2D and 3D profile design, but this module will challenge you to explore the detail to create more intelligent working profiles to convey design intent.

- Creating an intelligent Alignment
- Working with design criteria
- Making a design set check
- Creating profiles using extended toolsets
- Limiting the grade on a profile.

[Hands On]:Alignments and Profiles, drawing techniques (various UK projects)

[TC020] - Advanced Alignments and Profiles (Part 2)

Fifteen word overview: Looking at an expanded set of Alignment and Profile creations tools.

Fifty word outline: This module is an overview of all the extra tools that allow you to bring your road design skills to the next level. It will showcase the stuff that allows you to expand your horizons and let the creative mind explode the endless possibilities.

- Offset Alignments
- Best Fit Alignments
- Best Fit Profiles
- Linked Widenings
- Unlinked Widenings
- Tools to define a Widening
- Labelling Tools
- Reporting (Combined Geometry – UKIE)
- Saving databand sets

[Hands On]: Creating a dynamic carriageway (UK Ring Road)

[TC021] - Cul-de-sac design

Fifteen word overview: How to create a cul-de-sac at the end of a road

Fifty word outline: Focusing on best practices, this module showcases the principles of cul-de-sac design in civil 3D. Working with linking into a road end, the delegate will learn how to create a final, compound, surface based around a the constraints of the design.

- Designing a Cul-de-sac
- Best geometry practices
- Tying in the design (Multiple methods)
- Hammerhead design
- Considerations for a more complex design

[Hands On]: Creating a cul-de-sac (UK Housing Estate)
[Workshop]: Designing a complex turning area

[TC022] - Speed Humps and Speed Tables.

Fifteen word overview: You have designed the road scheme. Now its time to add the speed measures.

Fifty word outline: with many options available, we will explored the best ways to add speed humps to road layouts and speed tables to road junctions.

- Methods of adding a basic speed bump
- Creating a 'Speed Table' on a junction
- Working with Corridor Codes to aid design
- Final surfaces and visualization techniques

[Hands On]: Estate Road speed tables (UK Housing Estate)

[TC023] – Revit to Civil 3D

Fifteen word overview: Bring your Revit Model into Civil3 3D.

Fifty word outline: Using a shared coordinate system we will explore the published workflow of bringing a Revit model into Civil 3D.

- Overview of Revit
- Shared Coordinate System
- Acquiring the tools
- Bringing your Revit model into Civil 3D
- Best Practices

[Hands On]: Bringing a Revit Model into Civil 3D (UK Housing Project)

[TC024] – Civil 3D to Revit – Pushing out from Civil 3D

Fifteen word overview: Take a Civil 3D Surface or a corridor model and import it into Revit

Fifty word outline: Using a shared coordinate system and other methods we will explore a number of processes that allow you to get your Civil 3D data into Revit as either a Topo model or a solid.

- Shared Coordinate System
- Best Practices
- Using BIM 360
- Creating a Revit topographical surface
- Using Revit Site Designer
- Extracting and importing solids

[Hands On]: Transferring Civil 3D models into Revit (UK Housing Project)

[TC025] - Advanced Featureline Manipulation

Fifteen word overview: Looking in detail at how multiple featurelines interact

Fifty word outline: This modules explores the interactions between featurelines and how to prioritise one. It also examines the usage of sites and give practical examples of how these objects can be used in your design

- Advanced editing techniques
- How featurelines interact
- Using featureline priority
- Moving featurelines between sites
- Using featurelines for kerb drops

[Hands On]: Designing a traffic island

[TC026] - An Introduction to Infrastructure Parts Editor

Fifteen word overview: An overview of the functionality you can expect when using IPE

Fifty word outline: Opening the box of the Infrastructure Parts editor can be quite daunting. This module outlines the processes to create new assemblies from an existing parts catalogue. It will take you through manipulating existing designations and publishing this back into Civil 3D

[Workshop]: Manipulating manhole assemblies in IPE

[TC027] – Using Autodesk Inventor to create parts for Infrastructure Parts Editor

Fifteen word overview: We will introduce Autodesk Inventor and look at the prerequisites for creating IPE models.

Fifty word outline: We will use Autodesk Inventor to design basic geometry for an underground structure. We will then examine the requirements to link to together multiple parts to ensure a final assembly can be published and manipulated in IPE.

[Workshop]: Creating manholes structures from scratch in IPE

[TC028] – Exporting and manipulating Civil 3D models in Inventor

Fifteen word overview: Looking at how we can manipulate a Civil 3D model inside Autodesk Inventor

Fifty word outline: We will import a civil 3D corridor model into Autodesk Inventor and use some basic Inventor tools to add structural solid details. We will then take this model and send it back to Civil 3D.

- Overview of Inventor
- Neutralising the coordinate system
- Working with a solid modeller
- Importing back to Civil 3D

[Hands On] – Improving a corridor model with Autodesk Inventor (UK site design)

Other modules – The following modules may need notice prior to delivery

[TC029] – Boreholes – The Geotechnical Module * (needs updating)

- Acquiring the tools
- Importing AGS files
- Examining the data
- Creating multiple surfaces
- Volumes
- Profiling

[Hands On] – Working with Boreholes (UK Shrewsbury Dataset)

[TC030] – Importing data from MX * (needs updating)

Acquiring the tools
Bringing in string data

[Workshop] – Based around delegates own data

[TC031] – Roundabouts * (not ready yet) (workshop)

[TC032] – Using the Generic Sub Assemblies for custom corridor design * (not ready yet)

[TC034] - Using open source data * (workshop)

The following courses are each half a day. They are best delivered together as a 1-day course. That is either [TC101] + [TC102] or [TC101] + [TC103].

[**TC101] - SUB ASSEMBLY COMPOSER**

Overview
The interface
Defining flowcharts
Creating Geometry
Linking Points
Creating Variables
Testing
Using conditional commands
Importing into Civil 3D

[TC102] - RETAINING WALLS IN CIVIL 3D

Best Practices
Feature line possibilities
Use of generic sub assemblies
Using 'Sub Assembly' composer
Variable footings

[TC103] - RAIL AND TUNNEL DESIGN * (some notice may be needed for this as my notes need improving)

Rail Alignments
Tunnel in Sub Assembly composer.
Working with CANT inside sub assembly composer