

Autodesk Civil 3D for Wet Utilities Networks: Water, Sewer and Stormwater Design

1. Target Audience

This course is intended for civil engineers, utility designers, infrastructure professionals, CAD/BIM technicians, drainage engineers and Civil 3D users involved in designing underground water, sanitary sewer and stormwater networks.

Prerequisites

Participants should have:

- Basic knowledge of AutoCAD or Autodesk Civil 3D
- Basic understanding of civil drawings and underground utilities
- Familiarity with surfaces, alignments and profiles is helpful but not mandatory

2. Course Objective

The objective of this course is to provide practical skills for creating, modifying, analysing and documenting wet utility networks using Autodesk Civil 3D. The course covers the complete workflow for gravity pipe networks and pressure networks, including sanitary sewer, storm drainage and potable water systems.

3. Course Outcomes

After completing this course, participants will be able to:

- Prepare survey, surface and alignment data for utility design.
- Configure pipe catalogues, parts lists, rules, styles and labels.
- Create sanitary sewer and storm drainage gravity networks.
- Create potable water distribution pressure networks.
- Display and edit utilities in plan, profile and section views.
- Check slopes, cover, elevations, crossings and design conflicts.
- Generate utility schedules, quantity reports and construction drawings.
- Complete an integrated wet utilities design project.

4. Course Outline

The course comprises **32 hours of theory, demonstrations and hands-on lab exercises** divided into eight modules. Participants will complete a practical project covering sanitary sewer, storm drainage and water distribution networks.

Table of Contents

Module 1: Introduction to Wet Utilities and Civil 3D Workflow

- Understanding wet utilities: potable water, sanitary sewer and stormwater
- Gravity networks versus pressure networks
- Civil 3D interface and utility network tools
- Project templates, units and coordinate systems
- Organising utility drawings, layers and external references
- Overview of the complete utility design workflow

Module 2: Base Data, Surfaces and Utility Corridors

- Importing survey data and existing utility information
- Creating and reviewing existing-ground surfaces
- Surface analysis, watersheds and catchments
- Creating utility alignments and surface profiles
- Identifying utility routes and connection points
- Establishing horizontal and vertical design controls

Hands-on Exercise: Prepare a surface, alignment and profile for a proposed utility corridor.

Module 3: Pipe Network Standards, Parts and Styles

- Understanding pipe catalogues and network parts
- Creating gravity and pressure network parts lists
- Selecting pipes, structures, fittings and appurtenances
- Configuring pipe rules for slope, cover and size
- Creating plan, profile and model styles
- Creating pipe, structure and pressure-network labels
- Overview of Part Builder and Content Catalog Editor

Hands-on Exercise: Configure parts lists, rules, styles and labels for a wet utilities project.

Module 4: Sanitary Sewer Gravity Networks

- Planning sanitary sewer routes and connection locations
- Creating sewer networks by layout and from objects
- Placing sewer pipes, manholes and structures
- Defining pipe sizes, slopes, cover and invert elevations
- Editing networks in plan and profile views
- Applying design rules and checking rule violations
- Creating sanitary sewer labels and schedules
- **Hands-on Exercise:** Design a sanitary sewer network with pipes, manholes and profiles.

Module 5: Stormwater Drainage Networks

- Understanding stormwater collection and conveyance systems
- Creating catchments and reviewing flow paths
- Placing inlets, catch basins, manholes and outfalls
- Creating and editing storm drainage pipe networks
- Setting pipe slopes, sizes, cover and structure elevations
- Displaying storm networks in plan, profile and section views
- Reviewing the workflow for hydraulic analysis and external analysis tools

Hands-on Exercise: Create a storm drainage network from collection points to the outfall.

Module 6: Potable Water Pressure Networks

- Understanding pressure network components and terminology
- Creating pressure networks using layout and path-based methods
- Placing water mains, fittings, valves and hydrants
- Creating branches, bends and network connections
- Controlling pipe depth and minimum cover
- Editing pressure networks in plan and profile views
- Labelling water mains and appurtenances

Hands-on Exercise: Create a potable water distribution network with valves, fittings and hydrants.

Module 7: Network Coordination, Analysis and Quality Checks

- Coordinating water, sewer and storm networks
- Checking horizontal and vertical utility clearances
- Reviewing pipe crossings and interference locations
- Checking slopes, cover, inverts and structure elevations
- Using interference checks for gravity networks
- Troubleshooting disconnected parts and rule violations
- Applying data references and project coordination workflows

Hands-on Exercise: Identify and correct conflicts between multiple utility networks.

Module 8: Documentation & Quantities

- Creating utility plan and profile sheets
- Creating profile views, bands and utility annotations
- Generating pipe, structure and appurtenance tables
- Extracting pipe lengths, sizes and structure quantities
- Producing material and network reports
- Applying drawing standards and quality-control checks
- Creating construction-ready utility drawings
- Integrated final project covering water, sewer and stormwater systems