CIVIL DESIGNER Sewer

Civil Designer's foul water (Sewer) module is a comprehensive inflow calculation, drainage infrastructure design and analysis software program for foul water or sewerage networks. It calculates the invert levels, slopes and diameters of the culverts, as well as the design flow, capacity and flow velocity of each culvert.

The program models a network with property connections consisting of both existing and new culverts, taking into account the hydraulic and geometric relationship between the different branches in the network. Attenuation is calculated at every manhole, resulting in a solution that is more cost-effective than simply adding the inflow peaks together.

Unit Flow Classes or Hydrograph Inflows

We support three inflow calculation methods:

- The Unit Flow method allows you to specify the number of contributing units of each class at every manhole
- The Harmon method uses unit inflow hydrographs to determine the flow in the network over a period of time (in most cases multiple inflows can be specified at each node)
- The Hydrograph method

Analyses Flow, Overflow, Capacity, Velocity and Flow Depth

You can use the pressure flow options to model the network under surcharge conditions. The program simulates a complex system of branches with surge tanks and overflows, so you can model the intricate networks typical of modern cities. Each model can have multiple sub-networks and outfalls. You can specify the outfall levels if you want to connect to existing systems. Alternatively, the program determines the best possible levels, slopes and pipe sizes, in accordance with the design parameters.

Flows Attenuated According to Total Contributing Population

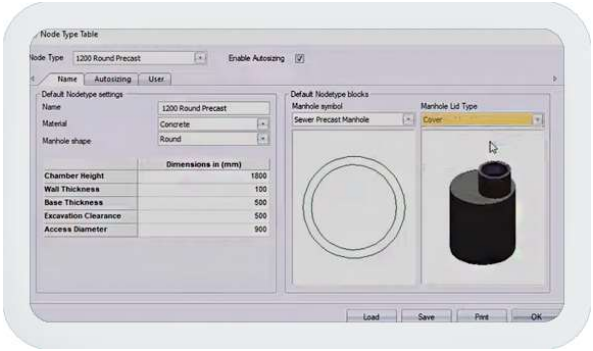
Calculate and attenuate peak design inflow according to the contributing population at that point in the network. In the Unit Flow method, the program keeps a total of all the units of each inflow class. At each node in the network, it calculates the total design flow, as well as the total contributing population. The design flow is then adjusted according to the attenuation curve.

Automatic Culvert Sizing Using Proportional Flow Depth

Culvert sizes are automatically selected from the culvert catalogue, per a specified proportional flow depth with a maximum user-defined flow depth of 80%.

3D Rendering of Node Structures.

Render node structures accurately, using the properties bar to graphically set the node angle from the angle of an indicated entity.



SABS 1200 Quantities with Bedding Material/Selected Backfill

Calculate culvert trench quantities with user-defined depth increments, according to SABS 1200. Quantities include excavation lengths, excavation

volumes with extra over for intermediate and hard material, culvert lengths, bedding material volume, and selected backfill volume. Ground profile information is automatically extracted from the supporting digital terrain model.

Infiltration by Percentage Flow or By Length of Culvert

Define extra inflow into the sewer network (due to stormwater ingress) as either a percentage of the sewer flow or a fixed inflow value per kilometre of sewer pipe.

Calculates Optimal Culvert Size, Slope, Inlet and Outlet Levels

Our foul water analysis calculates the optimal network by designing according to the specified minimum cover, minimum and maximum flow velocities, minimum and maximum allowable link slopes, and available link sizes from the link tables.

Standard & User Defined Culverts

Use the Link Tables to define up to 40 different link types or culverts between nodes. These links can be circular (pipes), rectangular (box culverts), portal/skew haunch, or custom link types. Custom link types allow you to input the depth to proportional flow and depth to proportional area curves, which allows you to use non-standard culvert shapes such as egg-shaped pipes or parabolic channels.

Proximity & Collision Clash Analysis Between any Design or Existing Elements

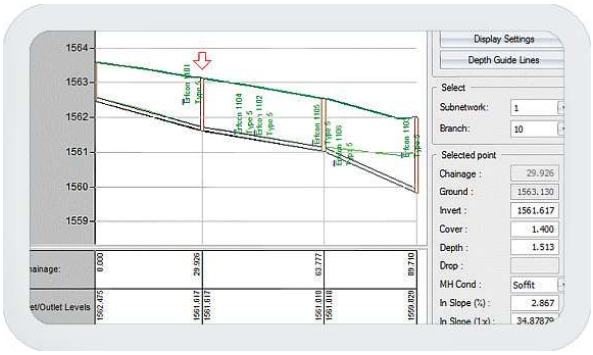
Check for clashes between any two services, such as sewer, storm, water, road layers or other existing services defined in the crossing services. Problem areas display on the layout drawing and you can display a long section of the chosen branch, as well as the crossing services, in the longitudinal section window. You can then adjust the invert levels and slopes of the affected culverts.

Graphical Functions

Define and modify sewer manholes, culverts and erf connections graphically, and accurately offset them from Cadastral Boundaries. With the click of a mouse, you can easily insert nodes and links, make changes to an existing layout by moving a node, change the flow direction, or query a node or link. You can draw pipes using parallel offsets to CAD entities, with manholes automatically inserted according to user-defined lengths. These manholes, which can be represented with user-defined symbols, allow for multiple inlet levels and are sized accordingly.

Generate Layout Plans with Pipe Schedule and Long Sections

Production drawings, such as plans with pipe schedules and long sections with title blocks and company logos etc, with little or no CAD editing. You can customise the layout of production drawings according to your specific company standards. You can also automatically display crossing services from other modules on plans, long and cross-sections.



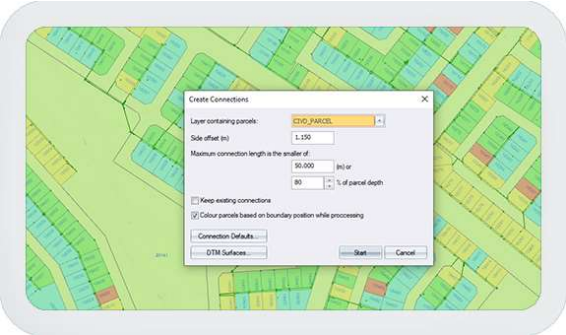
Dynamic Time Simulation with Multiple Inflow Hydrographs

The Inflow Hydrograph method uses unit inflow hydrographs to determine the flow in the network over time. You can specify any time increment, and view up to 10 hydrographs on a common set of axes to see how the flows from various branches interact with each other.

Automatic Property Connection Creation & Drainage Analysis Using Minimum Property Level

Individual property connections are automatically created in the best suited corner, at customisable offsets from the property's boundaries. This location is determined by both the proximity to the main line link and the property's lowest point, to effectively drain future dwellings. Connection types, including road reserve, inside or outside the

property, are indicated on a colour map during creation, with 5000 connections created in just 25 seconds.



Drawing Title Block Templates (Sheet Files)

Our powerful drawing templates (sheet files) allow you to define exactly what the final production drawings should look like saving you hours of postproduction CAD editing. Use our sheet files to generate production drawings with detailed title blocks, north signs, grids, company logos, annotations, data lists, scale bars and more, so your plotting requires little, if any, CAD editing. Sheet files allow the precise placement of all the design elements in your title block with customisable settings, so you no longer have to cut and paste your design into your title block.

Pump Stations with up to 4 Pumps with Various Controls

Create pump stations containing up to four pumps with different characteristics and separate sets of control levels. The pump control levels work in combination with the pump station sump, for which you must define a depth-storage curve and initial depth.

Model existing network from GIS

Import and convert GIS data directly into a sewer/ wastewater network model.

Full Compatibility with DWG And Other Formats

As a founding member of the Open Design Alliance, our inside knowledge of the DWG drawing structure ensures high compatibility when loading and saving DWG and DXF drawing formats. We also support the loading of Caddie CEX, Arcview SHP, Microstation DGN and Ultimate CAD UCX files, which gives you unprecedented flexibility to move between drawings without worrying about incompatibilities and data exchange problems.

Bitmaps and Cadastral Backdrops

View the network with a bitmap or cadastral data backdrop. Alternatively, display the site contours and slope shading to decide on an optimum network layout.

Automatic Insertion of Multiple Manholes

Insert multiple manholes with even spacing (user defined), where pipes are longer than a specified maximum length.

Vertical Alignment Editor Design Options

Use the Vertical Alignment Editor to change pipe type and sizes, move, delete and insert (including multiple nodes with even spacing) nodes, and indicate incoming pipes. It is also possible to measure the distance (in chainage) between two indicated points.

BIM IFC File Export

Use Industry Foundation Classes (IFC) to customise geometric and attribute information according to the requirements of the recipient, thereby improving efficiency in any BIM workflow. Prior to export, you can set up custom IFC files, assign the appropriate northern or southern coordinate system and specify the extents of the shared data. Allocate data to one or more IFC files and incorporate all or selected portions of the proposed infrastructure services associated with a project.

Crossing Services Displayed on Plan, Long and Cross-Sections

Existing services databases (sewer pipes, storm water culverts, water networks, electrical layouts and telecommunication cables, etc) can be imported or added into Civil Designer to indicate crossing positions of the pipes/cables on road, sewer, storm and water services.

Dynamic Updating of Production Drawings

Production drawings are dynamically updated as you change your design. If you want to create archive copies, simply use the Publish function.

Did you know:

- We have a library of FAQ support videos for your reference: **www.civildesigner.com/videos/**
- You can book online Civil Designer training: **www.civildesigner.com/training-centre/**
- We provide introductory self-learning videos: **www.civildesigner.com/training-centre/**

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