

## Eliot Sinclair and Partners Ltd

END USER: Samuel Cech  
CLIENT: Eliot Sinclair and Partners Ltd

### 12d DIMENSIONS:

- Water

# Sewer Collector Mains Design

RIDER GRADE & TYPE		
MAIN GRADE & TYPE	Grade 1 in 300 DN 150 uPVC pipe	
H.A.D.	24.000	
RIDER INVERT LEVEL		
DEPTH TO RIDER INVERT LEVEL		
COVER LEVEL	31.000	31.243
MAIN INVERT LEVEL	27.220 27.220	27.386 27.387
DEPTH TO MAIN INVERT LEVEL	3.84 3.83	3.87 3.87
DISTANCE	0.00	43.75
Sewer 01		

## Project Summary

Sewer Collector sub-main design and drafting.

## The Challenge

The 2012 earthquakes in Canterbury highlighted the high cost of repairing deep property connections. The Christchurch City design standards were updated as a result of this disaster, to allow for construction of collector sewer sub-mains for property connections. When these collector pipes are located within the same trench directly above the main pipe, difficulties arise in DNE and PPF options within 12d Model. It is possible using existing DNE tools to design the sub-main and main DNE networks separately and plot individual XS for each pipe. However, this causes issues with the construction when contractors want to see all the information about that trench on one section. City design officers checking these plans want to see pipes and their grades, inverts types, *etc.* on one plan for ease of checking. It is also the requirement by the local city council and their Design Standards.

Therefore, it was necessary for the team to create an innovative way around this challenge. There are two parts to this:

- Design – creation of 3D strings with pipe diameter, type and properties
- Drafting LS plots and combine Sewer main and sub-main pipes and information.

The client had an added difficulty with designing a process that can be quickly and easily implemented with large number of users working on earthquake recovery works.

## The Solution

The team created a 12d Model macro that allows users to add a secondary pipe to a DNE network pipe, draws a superstring for visualisation and drafting purposes, and stores design information as attributes on the DNE drainage string. Within the PPF editor, they used these attributes to label information about the sub-main, showing them in the same boxes as the main pipe.

Design settings were available for users to automatically calculate inverts for the sub-main, either by clearance to main pipe or depth from ground TIN.

## The Result

The team's Clip-On sub-main macro and PPF files achieved all the requirements by the client and consenting authority. Their innovative use of 12d Model gave them the results they needed for this important project.

## For more information

To find out more about how you can create better designs faster with the 12d Model solution for civil engineering design, visit [www.12d.com](http://www.12d.com).



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### Roads and Highways

12d Model's design option is the smarter solution for the design, modification and maintenance of Road and Highway projects.

Enjoy advanced 3D tools to design local and major roads, intersections, roundabouts, highways, interchanges and much more.



### Ports and Dredging

12d Model is the solution for port infrastructure and dredging, easily managing the very large datasets and complex volume calculations often required by these projects.

A complete range of flexible and customisable volume calculation tools allow teams to extract and present the information quickly and easily.



### Land Development

12d Model is the most versatile solution for the creation of sustainable land development projects, including residential, commercial and industrial developments, recreational areas, landfills, and agriculture projects.

Easily manage all aspects of your land development project from earthwork quantities, road design utilities and drainage design.



### Airport Infrastructure

12d Model provides a solution for the design, construction and analysis of new airports, as well as the upgrade and maintenance of existing runways and airport infrastructure.

Easily manage large airport infrastructure projects and share data across multi-disciplinary teams.



### Rail

12d Track has been specifically designed for the survey, design and construction of light, heavy and high speed rail projects.

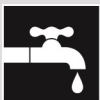
Extensive railway tools in 12d Track allow the rail designer to quickly and easily design their projects. These options are built on the existing 3D modelling and design tools available in 12d Model.



### Mining Infrastructure

12d Model's powerful set of exploration, site investigation, survey and analysis tools are crucial for the initial design, construction and ongoing operation of mining projects.

Comprehensive tools for the survey, design and construction of access roads, railways, earthworks and services allow for the coordinated design and management of mining infrastructure from within 12d Model.



### Drainage, Sewer and Utilities

12d Model provides comprehensive tools for the design, analysis and optimisation of stormwater and sewer projects using rational, dynamic (hydrograph) and 2d drainage methods.

Powerful clash detection management allows for efficient 3D modelling of service networks such as gas, electricity, telecommunications and water prior to construction.



### Surveying

12d Model is a complete surveying package providing the tools to manage all facets of surveyed data including LIDAR, topographical, as-built, conformance, traversing, geodetics, data mapping, labelling and much more.

The 12d Field option runs on a ruggedized tablet and gives the user access to full 12d Model functionality, allowing you to take the entire project into the field with the most comprehensive pick-up and set-out tools.



### Oil and Gas

12d Model assists with the design, construction and mapping of oil and gas pipelines, original site exploration and the wide range of infrastructure required for oil and gas projects.

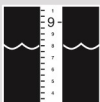
Accurate 3D modelling and the ability to share data between users allow teams to quickly and easily coordinate designs.



### Construction

12d Model is the ultimate software for construction with powerful set-out options, direct interfaces to machine control and detailed conformance reporting and auditing.

Manage 3D data and control volumes, quantities and progress claims with 12d Model. Set-out your project and undertake conformance and as-built surveys live on-site using 12d Field.



### Rivers, Dams and Hydrology

12d Model handles very large datasets and interfaces with a wide range of analysis packages, making it perfect for flood studies and the management of rivers and dams.

12d has partnered with industry leading analysis software, allowing users to apply 2D drainage analysis from within 12d Model.



### Environmental

12d Model's ability to handle very large datasets combined with flexible and comprehensive 3D analysis and modeling tools make it perfect for a wide variety of environmental projects.

Existing workflows can adopt 12d Model easily as it allows users to directly interface with GIS systems and most software packages and file formats.

## Why Choose 12d?

- Powerful data processing & intelligent functionality.
- Modular, easy to update & completely customisable.
- Seamless integration with major industry software and hardware.
- Used in over 55 countries worldwide.
- Friendly support & training from industry experts.

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12d Model