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Executive Summary

Name: Samuel Cech
Company: Stronger Christchurch Infrastructure Rebuild Team (SCIRT)
Name of Project: Sewer Collector Mains Design and Drafting
Awards Result: First Place (Tied)

The earthquakes around Christchurch in 2011 highlighted the considerable expense incurred in repairing deep property connections. The Christchurch City design standards were updated to allow for construction of collector sewer sub-mains for property connections.

Sam developed a macro that allowed users to add a secondary pipe to a drainage string that could be viewed in the Drainage Network Editor (DNE). The information of the sub-mains was stored as attributes on the main drainage string. Consequently, with a plot parameter file calling on the new parameters, drafting of the main pipe and sub-mains were able to be produced efficiently in the same drawing.

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Entry Form

Please email your completed entry to *innovation@12d.com*

Name:	Samuel Cech
Position:	Technical Manager
Company:	Eliot Sinclair and Partners Ltd
Name of Project:	Sewer Collector Mains design
Client:	SCIRT, ESP

Description of Project:

- Sewer Collector sub-main design and drafting

Description of problem faced / task undertaken:

- The recent earthquakes in Canterbury highlighted the cost of repairing deep property connections is expensive. The Christchurch City design standards have been updated 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 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.
- There are two parts to this item;
  a) the design – creation of 3d strings with pipe diameter, type and properties, and
  b) Drafting LS plots and combine Sewer main and sub-main pipes and information.

How the problem was solved:

- We have created a macro that allows users to add 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 we use these attributes to label information about the sub main and showing

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them in the same boxes as the main pipe.

- Design settings are available for users to automatically calculate inverts for the submain either by clearance to main pipe or depth from ground tin.
- 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.
- Our Clip-On submain macro and PPF files have achieved all the requirements by the client and consenting authority.

Relevant 12d screenshots and/or data attached:

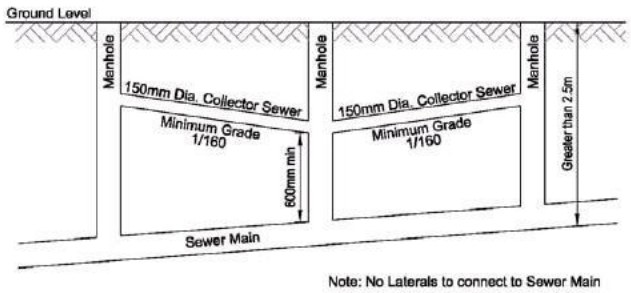
Macro available on the forum: http://forums.12dmodel.com/macro_view.php?m=65

NEW SUBCLAUSE

6.5.8 Collector sewers

Design collector sewers where the sewer main is deeper than 2.5m and laterals would discharge to the sewer main. Detail the collector sewers to collect from individual property laterals and discharge into the sewer main at manholes. The sewer main then effectively acts as a trunk sewer.

Design collector sewers parallel to the sewer main and preferably directly over and falling in the same direction as the sewer main. Design grades as detailed in clause 6.5.5 – Minimum gradients but ensure depths provide service to all properties. Where levels will constrain constructing a single grade, it is acceptable to fall the collector sewer against the sewer main grade as shown in figure 2.



Collector Sewer

CCC infrastructure design standards – waste water

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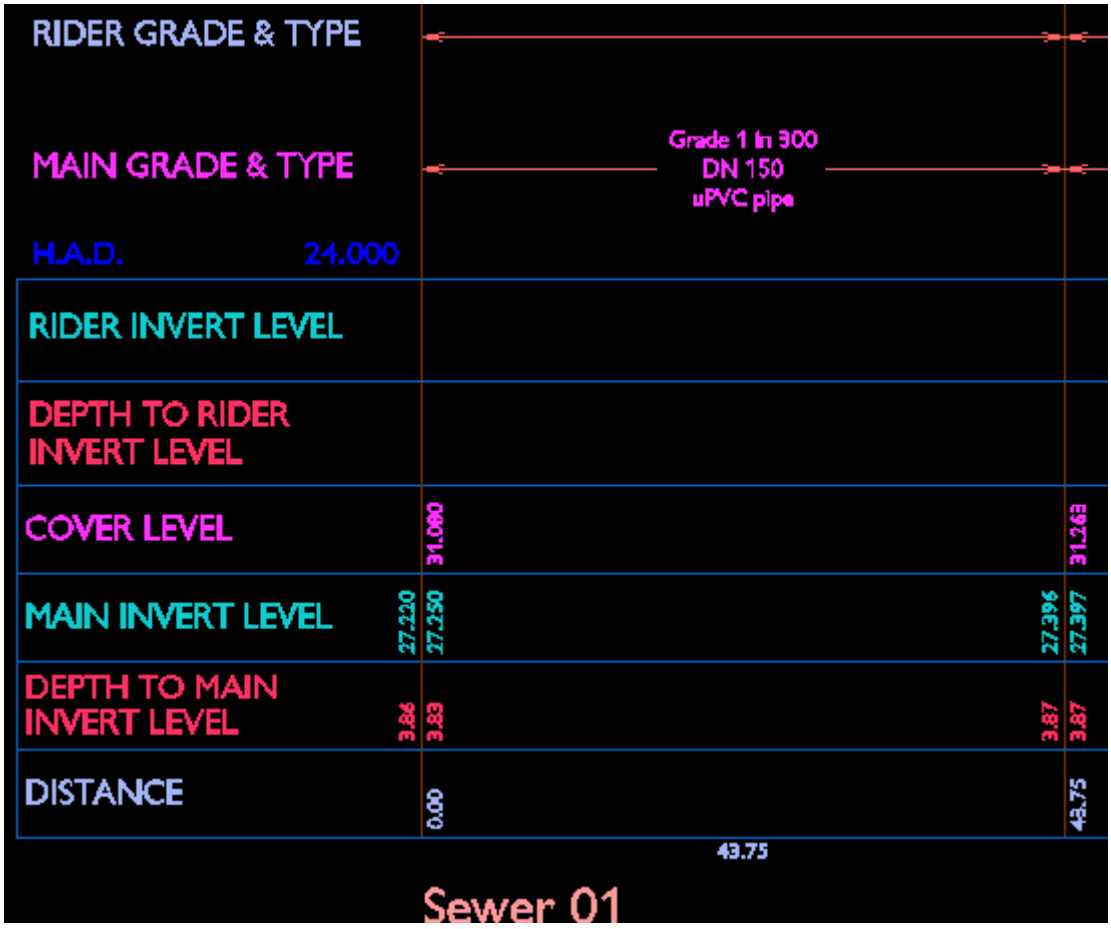

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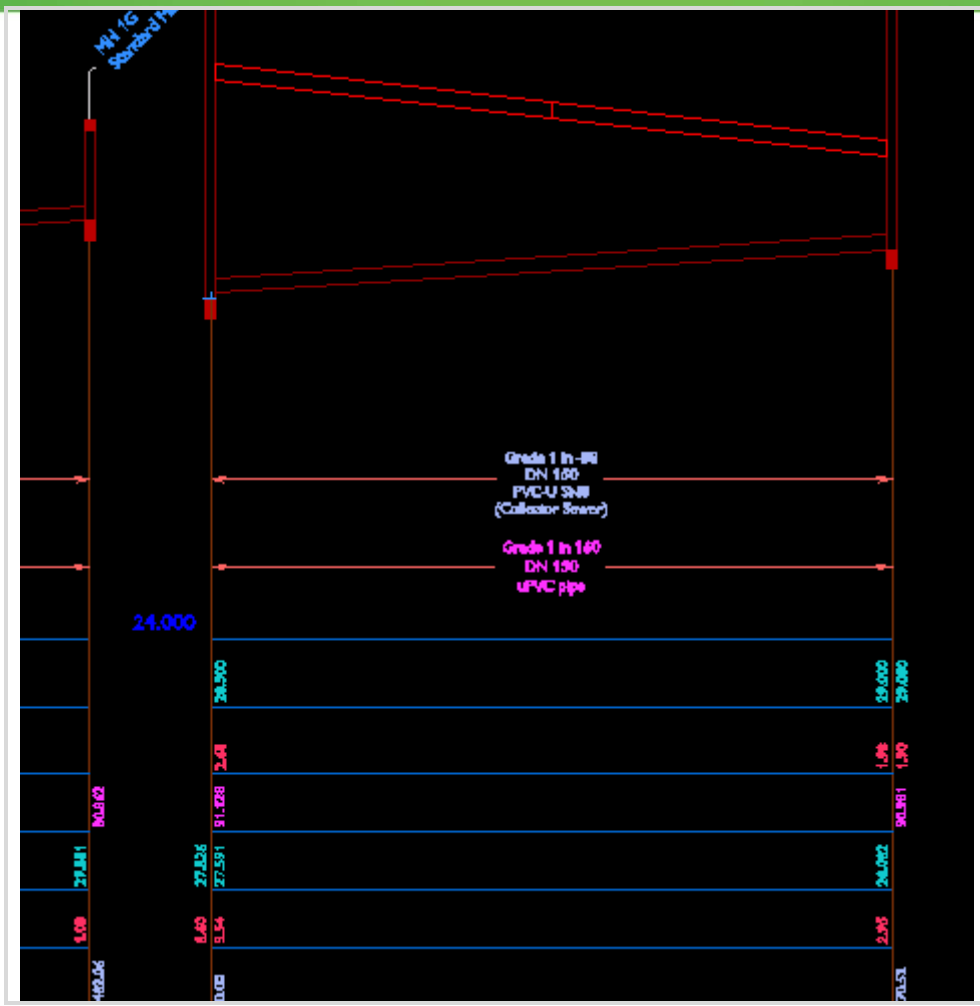

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