

Pipes

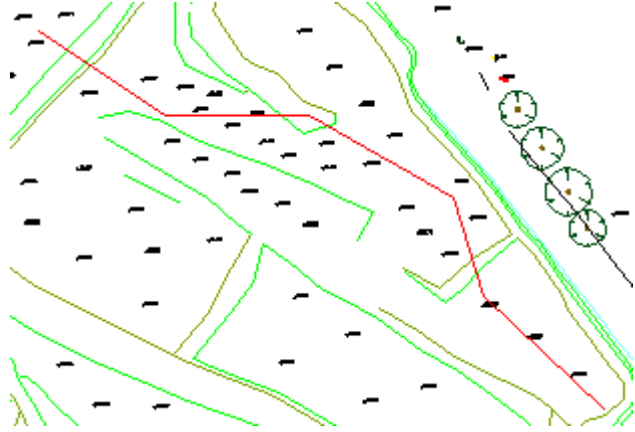
Water supply

Starting with a ground model representing the existing site and a 2D Polyline representing the alignment of a water supply pipeline.

Step 1

Create and draw existing long section

Ground Modelling, Create Section ensuring that **Special Chainages** is "on". Menu item *Sections, Draw Section* to draw the section and then to show the vertices of the 2D Polyline use *Sections, Superimpose, Section*.



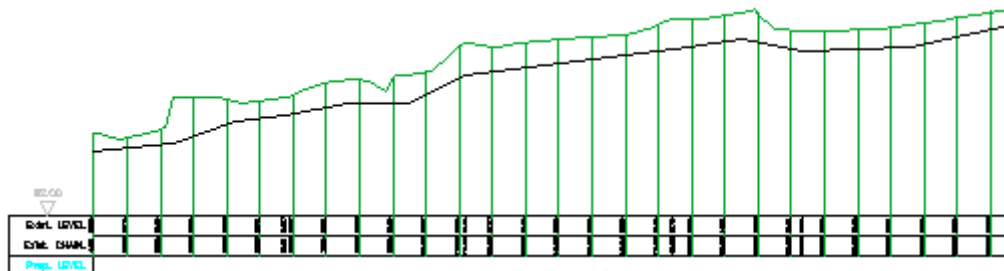
Pipe alignment shown in red over survey drawing

To mark regular chainages use menu item *Design, Horizontal, Extract geometry* with the only output options for typical use being **Mark Chainages** and **Mark Elements**

Step 2

Vertical Design

Construct the vertical alignment (representing the invert, centre or top of the pipe) with the help of the tools in the "middle chunk" of the *Sections* menu taking care to use object snaps etc. to respect the horizontal vertex positions. The end result should be a 2D Polyline as shown in black :-



To annotate the design and enable the subsequent representation of the pipe in 3D use menu item *Design, Vertical, Extract geometry* with **Level locations Options** set to "Polyline Vertices only" and enter the output .vtg file name.

Level locations

Options: Polyline Vertices only

Chainages CLs Interval: 10.000
 TPs MHs

Curve Specific

Arc Intensifiers Interval: n/a
 Use parabolic formula Interval: n/a
 Fine tune (0.9 to 1.1) n/a

Output options

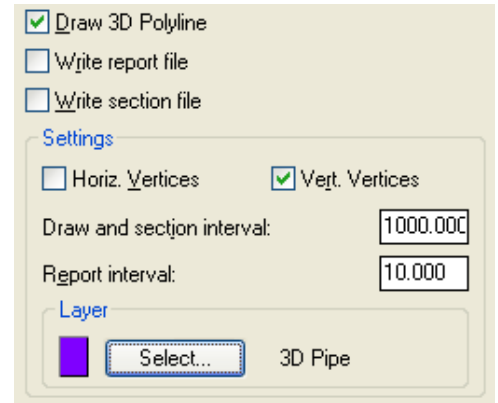
Write .vtg file Draw Section Setup...
 Write .vld output file

Step 3

Draw pipe in 3D

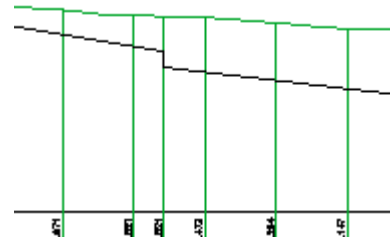
Menu item *Design, Strings, 3D Draw* with settings shown here :-

Note these settings.



Drainage

This is the same sequence as water supply above but of course the 2D Polyline representing the pipe alignment (invert) must have appropriate gradients and may include backdrop conditions as shown :-



After Step 3 it is possible to add simple manhole blocks onto the 3D Polyline with menu item *3D Polyline, Fix manhole invert levels*.

Cover levels may be calculated from a model and added to the block attributes by *Ground Modelling, Drape, Manholes*

Cover levels for manholes within a road may be calculated from a Master String and specified gradient and added to the block attributes by *Design, Strings, Drape Manholes onto Road surface*.

Block name:	KT-Fmh
Number	100
Cover Level	16.583
IL in	15.570
IL out	15.059

Information in manhole block attributes