PipeMate

Gravity Sewer/Stormwater Design and Draughting Software
for Civil Engineers

TECHNoCAD | *Civil Engineering Software* | *Fully Integrated with AutoCAD®*

Description

TECHNoCAD urban design software is a suite of PC based programs for the design and automated draughting of civil engineering urban services. Incorporated in this suite are software packages that cover all aspects of civil engineering services design such as Roads, Sewer reticulation, Stormwater reticulation and Water supply.

All the packages have been written with knowledge gained in the civil design office where the need for fully automated draughting, rather than manually manipulated computer aided draughting, was identified as the only way of increasing design and draughting productivity.

PipeMate is the gravity sewer and stormwater software solution of the TECHNoCAD urban design software.

The purpose of the software is to provide an intuitive graphical approach to sewer and stormwater reticulation design and analysis, whereby basic information pertaining to the reticulation system is gleaned directly from the AutoCAD drawing. In addition, PipeMate gives you *final working layout and longitudinal section drawings with the minimum amount of manual input*. The designer works from within AutoCAD, the world's leading CAD software, building the drawings as the design process proceeds.

Work smarter

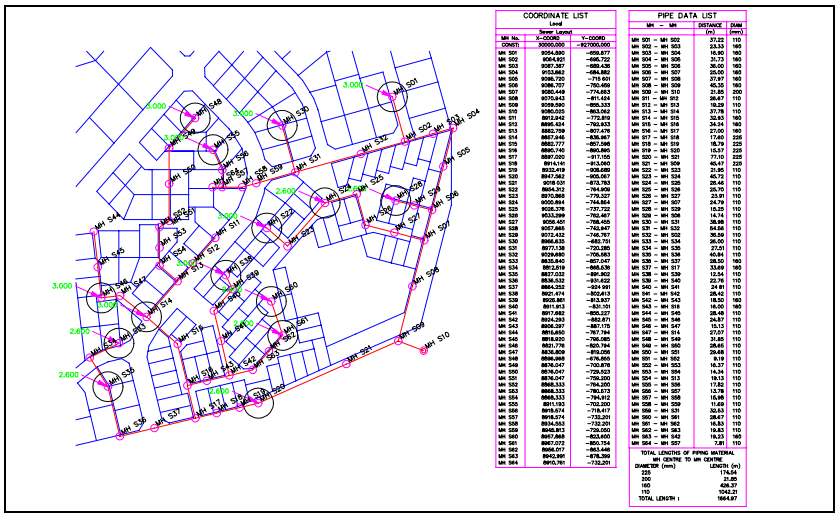
Pipe networks are co-ordinated and layout and longitudinal section drawings are created automatically from parameters chosen by the designer. All manhole numbering and pipe numbering is done for you.

Quantities are also calculated, both for piping and manholes. In addition trench excavation volumes are also available.

As you are working in AutoCAD, you can easily add extra notes, background images or attach reference files etc. prior to plotting the final working drawings. Let PipeMate do all the previously boring and mundane work!

Horizontal layout drawings

The designer simply has to draw lines representing the gravity pipe network in plan in AutoCAD, connecting the plots/stands as required, creating a 'dendritic' drainage network in the process. Line endpoints indicate manhole requirements - you do not have to draw any of the manholes; PipeMate does it all for you. Simply draw a circle to indicate the position of the outfall. Enter inflows into your network graphically.



Pipe network layout and setting out data produced automatically

When you have created your drainage reticulation layout, simply 'window' the network in AutoCAD and PipeMate calculates the following automatically:

- Manholes are numbered for you and sorted in branch order
- Pipes are numbered and sorted
- Manhole / pipe topology automatically determined
- Manholes are co-ordinated to the required co-ordinate system
- Pipe lengths calculated and totalled

A layout drawing is automatically produced for any desired scale (PipeMate takes care of all your text sizes), and the following is drawn for you, all on separate layers:

- Manholes
- Manhole number text at a selected rotation angle to the horizontal
- Pipe number/diameter text placed midway above each pipe
- Pipe length text placed midway below each pipe
- A co-ordinate list for all manholes
- A pipe data list for all pipes giving:
  - 'From' manhole - 'To' manhole
  - Pipe length
  - Pipe diameter
- A summary of total pipe lengths by diameter

Network pipe branching

PipeMate will automatically compute a pipe branching configuration for you. This branching configuration can then be viewed graphically. The designer has the option to accept PipeMate's branching or to change the branching. Once again, this is easily done by simply picking the pipes that make up your required branching arrangement.

Hydraulic design

Hydraulic design of the gravity sewers can be done with determination of drop manholes, pipe diameter choice from schedules

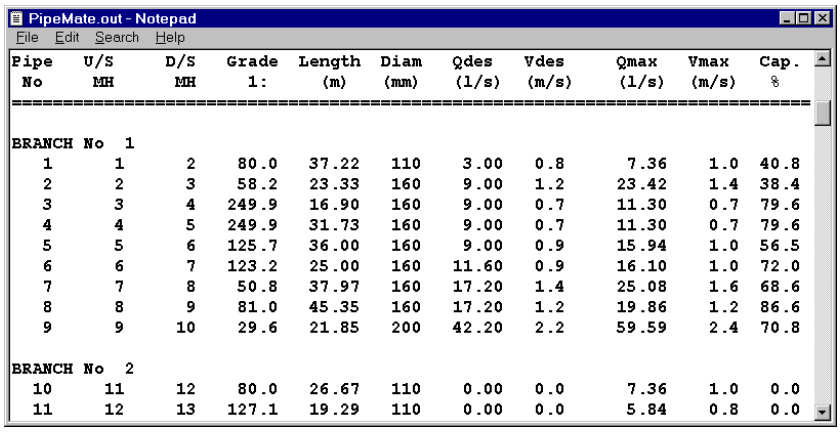
of commercially available sizes (user-definable), starting and flattest pipe grades per pipe diameter and minimum cover required.

In addition the user can specify:

- Minimum manhole drop
- Maximum depth of flow in pipe for design purposes
- Depth categories for manhole and pipe earthworks excavation quantities
- Pipe Manning's 'n' value

PipeMate computes the required pipe sizes *for all branches* in the network including calculations to ensure that all interconnecting pipe branches 'tie-up'. This unique feature alone can save you many hours of manual work. Imagine being able to have a whole network designed for you by simply pressing a button!

Hydraulic results include design flow/velocity, maximum flow/velocity, capacity %, grade, length etc. for every pipe in each branch. Low/high velocities are highlighted. A schedule of piping quantities is extracted.



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Pipe No	U/S MH	D/S MH	Grade 1:	Length (m)	Diam (mm)	Qdes (l/s)	Vdes (m/s)	Qmax (l/s)	Vmax (m/s)	Cap. %
BRANCH No 1										
1	1	2	80.0	37.22	110	3.00	0.8	7.36	1.0	40.8
2	2	3	58.2	23.33	160	9.00	1.2	23.42	1.4	38.4
3	3	4	249.9	16.90	160	9.00	0.7	11.30	0.7	79.6
4	4	5	249.9	31.73	160	9.00	0.7	11.30	0.7	79.6
5	5	6	125.7	36.00	160	9.00	0.9	15.94	1.0	56.5
6	6	7	123.2	25.00	160	11.60	0.9	16.10	1.0	72.0
7	7	8	50.8	37.97	160	17.20	1.4	25.08	1.6	68.6
8	8	9	81.0	45.35	160	17.20	1.2	19.86	1.2	86.6
9	9	10	29.6	21.85	200	42.20	2.2	59.59	2.4	70.8
BRANCH No 2										
10	11	12	80.0	26.67	110	0.00	0.0	7.36	1.0	0.0
11	12	13	127.1	19.29	110	0.00	0.0	5.84	0.8	0.0

Typical hydraulic results

Longitudinal section draughting

Longitudinal sections can be designed and drawn of the sewer/stormwater branches with the capability of being able to enter ground profile data from many sources e.g. Digital terrain models (DTM's), site peg surveys, archive manual drawings, contour drawings etc. This feature makes it more versatile in that not all designs justify aerial photography, global surface surveys or the digitising in of existing layout drawings. However, by making use of the transparent in-memory link to a SurfMate surface, ground elevations along all branches can be picked up with the press of a button! Breaklines in a TIN (triangulated irregular network) surface will be picked up accurately on longitudinal sections.

Features of longitudinal sections include:

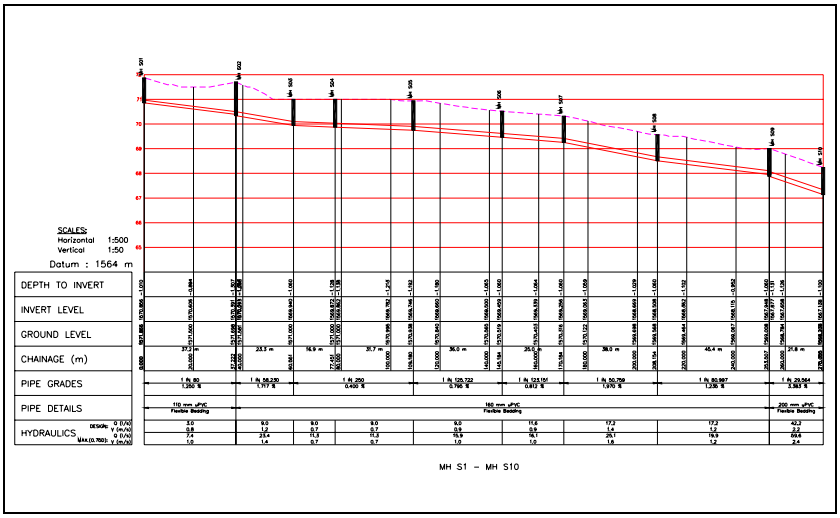
- Choice of any horizontal or vertical scales
- Extraction of longitudinal section ground profiles automatically from a SurfMate DTM. Annotation on the longitudinal section at any chosen interval
- Optional manual entry of ground level information (if DTM not available)
- Dynamic preview and editing of ground profile files and sewer profile files with ability to force inverts, pipe grades or drops. Move pipes in the drawing and the design data updates; revise the design data and the drawing updates
- Ground and invert levels interpolated if required at constant chainage intervals
- Ground and invert levels determined at special chainages such as pipe or road crossings
- Manhole inverts and pipe grades either designed automatically or else entered manually by specifying either:
  - Manhole invert
  - Pipe grade
  - Drop manhole
- Longitudinal sections annotated automatically with pipe specifications, diameters and bedding specifications. Hydraulic information also placed automatically on longitudinal section.
- User customisable presentation of longitudinal sections
- User able to draw 'partial' longitudinal sections; simply tell PipeMate the required 'starting' manhole and 'ending' manhole

Output is in high quality final drawing format inside AutoCAD. This allows for further editing and enhancement if required prior to plotting.

Quantities calculations

Earthworks quantities are calculated in user selectable depth categories for both the "design" mode and "analysis" mode. Output includes:

- Pipe length and pipe diameter for each pipe in each branch in the network
- Pipe earthworks excavation quantities listed per branch for each diameter and depth category
- Cumulative quantities for all branches in the network
- Number of manholes per depth category and total number in network



Ready to plot, fully detailed longitudinal sections

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PIPE EARTHWORK EXCAVATION QUANTITIES
====================================
(NB: POSITIVE = EXCAVATION CUT)
CONSTANT ADDED TO ALL DEPTHS:  .15  m

BRANCH No : 1
DIAMETER         DEPTH CATEGORY                    TRENCH LENGTH (m)
   110 mm   From  0.000 m  to  0.500 m                   35.30
   160 mm   From  0.000 m  to  0.500 m                  210.68
   200 mm   From  0.000 m  to  0.500 m                   21.85
   110 mm   From  0.500 m  to  1.000 m                    1.92
   160 mm   From  0.500 m  to  1.000 m                    5.60
                                          TOTAL:        275.35

BRANCH No : 2
DIAMETER         DEPTH CATEGORY                    TRENCH LENGTH (m)
   110 mm   From  0.000 m  to  0.500 m                   83.74
   160 mm   From  0.000 m  to  0.500 m                   81.26
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Excavation quantities: per branch and summarised for whole network

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```
MANHOLE DEPTHS:
DEPTH CATEGORY                No of Manholes
-------------------------------------------
From  0.000 m  to  0.500 m  :        54
From  0.500 m  to  1.000 m  :         5
From  1.000 m  to  1.500 m  :         5
-------------------------------------------
                     Total  :        64

TOTAL LENGTHS OF PIPING MATERIAL
    MH CENTRE TO MH CENTRE
 DIAMETER (mm)      LENGTH (m)

    225                174.54
    200                 21.85
    160                426.37
    110               1042.21
----------------------------
Total Length    :     1664.97
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```

Manhole and pipe quantities for whole network

- Length of piping material by diameter for the complete network
- Total length of piping for all network
- Output can be written directly to Microsoft Excel software, neatly formatted

Hydraulic Analysis

This allows the hydraulic analysis of an existing system (as opposed to the *design* of a new system) where the pipe sizes are known and the designer wishes to calculate the hydraulic capacities of the existing network and produce longitudinal sections.

Longitudinal sections can be drawn of an existing sewer or stormwater network with the capability of being able to enter ground profile data from many sources e.g. Digital terrain models (DTM's), site peg surveys, archive manual drawings, contour drawings etc. This feature makes it more versatile in that not all designs justify aerial photography, global surface surveys or the digitising in of existing layout drawings.

Hydraulic analysis of the gravity sewer/stormwater network can be carried out allowing for drop manholes, varying diameters and pipe grades, varying Manning "n" values and flows.

Clash Detection

Automatic determination and visualisation of pipe network clash detection can be done with other networks in 3-D, such as clash detection between a stormwater network and a sewer network.

House connections

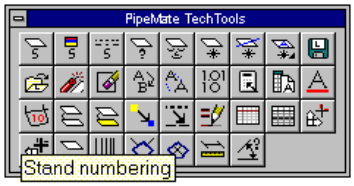
House connections from each Plot/Stand to the main sewer can be calculated and shown on all longsections.

Utility crossings

Utility services such as water lines, cables, telecom lines etc can automatically be shown on long-sections when simply indicated in plan.

Toolbox

Also included with PipeMate is the TECHNoCAD toolbox featuring lots of useful draughting functions.



On-line help

PipeMate has a full-featured HTML style on-line help with indexing and search features.

Hardware requirements

- Pentium 4 processor based computer (the faster the better!)
- RAM - sufficient to run AutoCAD software; Autodesk recommendation is 1GB or greater
- Hard disk capacity - program files need approx. 2MB; always ensure that you have more than 250MB free when running AutoCAD software
- Graphics resolution - minimum resolution 1024 x 768 or greater

Software requirements

- AutoCAD Release 2007/2008/2009 & 2010 supported. Also Autodesk Map 2007/2008/2009 & 2010 & AutoCAD Civil 3D 2010 supported
- Operating systems: Windows XPPro/Vista (32-bit)

Contact Details

TECHNoCAD Civil Engineering Software:
Tel: +27-11-803-8834
Fax: +27-11-803-3452
Email: sales@technocad.co.za
Web: www.technocad.co.za

AutoCAD 2010 Compatible

Autodesk Authorised Developer