Infrastructure pipe network design, calculation and analysis software
“One key advantage of Urbano Canalis & Hydra is the adaptation to local design conditions and standards. It eases and facilitates our design process, giving us the possibility to achieve the highest speed and quality.

Our designers that mastered Urbano can really optimize their work. For example, for a big settlement with more than 50 km of network, they can draw all long sections in a very short time. Hydraulic calculations are also easy and fast, so you can change parameters and check results many times.

Another important Canalis & Hydra advantage is the dynamic link between different project parts and elements, allowing corrections in one part to reflect automatically in other parts. This functionality provides a fast tool for exploring design alternatives and protects us from unintentional mistakes.”

*Eng. Katrin Najdenova, Manager, Aqua Ecoprocess Systems, Sofia, Bulgaria*
What is Urbano?

Urbano is a unique blend of design, calculation and analysis tools that strengthen your workflow, decrease design time and create new opportunities.

**Design**
Everything starts with a few simple actions: selecting a pipe from the catalog, drafting the first manholes and pipes, connecting to an existing pipe network.

Inevitably, designs grow. So to help you be productive, we have developed best in class design functions that cover all you drafting and documentation needs. Built from the ground up only for pipe network design, they offer unparalleled speed, accuracy and flexibility. The full design is saved in a standard .dwg file making drafting adjustments, project sharing and data backup as simple as possible.

**Calculation**
Determining catchment areas, calculating flows and executing hydraulic calculations make an important part of the design process.

That is why we provide several options to perform them. You can do all the calculations for sewage, stormwater and water distribution systems with the integrated calculation engines. Or, you can do the calculations with external software for advanced hydraulic modeling. Both workflows are supported and the results can be used anywhere in the program including long sections, labels and reports.

**Analysis**
Developing alternative design scenarios and selecting the optimal solutions is a complex task.

In order to make it simpler, we provide you with a comprehensive set of tools to search, filter, compare, sort, display and visualize design data. From the start of the project, you can use advanced functions like clash detection or network rules conformity checks, improving the quality of your design every step of the way. And to precisely inspect and edit every pipe and manhole, simply use the new responsive data tables.
“We chose Urbano, because it can be easily adapted to different needs.”

Stefan Heiler, M+G Ingenieure, Feldkirch, Austria
Why choose Urbano?

BIM for Infrastructure workflow integration with leading design, hydraulic modeling and GIS software.

With constantly increasing design requirements, you need a solution that fits right in. Whether you need to import a digital terrain model, an existing pipe network or hydraulic calculation results, Urbano provides the right functions. During project design, you can continue to exchange data with external software using a range of options.

Data exchange formats include .dwg, .shp, .tab, .txt, .xml, .rpt, .inp, OLE DB, ISYBAU (ASCII & XML) and more.

Superior tools for fast drafting, accurate documentation and improved project insight.

The ability to produce large amounts of design data is central to any project. But for projects that are developed over a longer period of time it is even more important to be able to change the drafted drawings quickly. Urbano provides superior tools for both tasks. As all the data is stored in a central data model, any design data has to be changed only once. Moreover, a data change in layout will cause an automatic update in all associated long sections. Almost as a side effect, the single data source creates accurate documentation with matching data in layout, long sections, labels and reports. Project insight can be further improved with analysis tools like thematic maps, queries and data tables.

Flexibility by design with configurations & templates, country specific catalogs and functions.

Configurations provide a great framework to increase productivity with Urbano. From simple to advanced, most Urbano functions use them. Configurations allow you to create custom long sections, labels, reports, data import/export settings, thematic maps, queries, clash detection analyses and trench designs. Most importantly, you can backup, share and import configurations by simply using drag&drop with the integrated desktop and network repository options. Similar to other program features, the equipment catalogs can be adapted and exchanged with other users. Finally, country specific functions add the needed local expertise and cover all specific drafting, calculation and documentation needs.
The Urbano software family offers the right solution for anyone dealing with pipe network design.

It can be used by pipe network designers, surveyors, road designers, drafters and GIS technicians for both new and reconstruction projects. Urbano is a versatile tool that can be adapted to different workflows and used in many ways.

Major Urbano products and add-on modules are listed in the table.

Urbano also includes additional product and module versions for many local markets. Be in contact with your local Urbano dealer about the best solution for your requirements.

Language versions include English, French, German, Spanish, Italian, Russian, Polish, Czech, Slovenian, Croatian, Serbian, Bulgarian and Turkish.

System requirements
AutoCAD® / AutoCAD® Map 3D® / AutoCAD® Civil 3D®, from version 2010 to the latest release, for both *32bit and 64bit
Windows®: 8.1, 8, 7, *Vista, *XP

*if available for the appropriate version of AutoCAD® and/or Windows®

Urbano Canalis
Sewage & storm water design, calculation and analysis
Includes digital terrain modeling, layout and long section design, hydraulic calculation, sections plot preparation and reports

Urbano Hydra
Water distribution design, calculation and analysis
Includes digital terrain modeling, layout and long section design, snapshot hydraulic calculation, node designer and reports

Urbano Data
Import/Export to GIS systems and AutoCAD® Civil 3D®

Urbano Geo
Terrain cross sections, multiple pipe trenches and surveying tools

Urbano Polygon
Parcel design and analysis

Urbano Raster&Vector
Raster & Vector map management
“For our project design activities during the past 20 years, we have used software products from different manufacturers. We purchased Urbano Canalis software 2 years ago. Despite Canalis needs a few more steps to perfection, it certainly is a software with a great future.”

Gabriela Nosková and Miroslav Jílek, JV PROJECT VH s.r.o., Brno, Czech Republic
Urbano comes with an exceptional user interface.

Program functions can be selected and started from the side-docking Workspace, a Ribbon, a custom created toolbar or directly from the AutoCAD® command line. Functions open free floating windows. You can open and operate several floating windows at the same time.

The UI adapts to almost any user workflow, saving time and enhancing user experience.

Pipe networks created with Urbano automatically group basic elements i.e. nodes and sections, into a topological network system. There are five distinct network topology elements: node, section, branch, array and system. Arrays are editable and provide advanced features like drawing all long sections at once.

The network topology creates a unique advantage, the possibility to select and edit a large data set.

Data selection and data input represent a major distinction between Urbano and other programs. Urbano includes the selection of multiple topology elements, from node to node, from station to station, according to a query etc. You can even create custom selection sets based on standard selection types.

The built-in data selection & input functions increase design accuracy and significantly reduce design time.

Additional features:

Data tables
Data tables are the fastest solution for an overview of design data. They are based on configurations and can be created and adjusted freely. The contents can be copied to Microsoft Excel or to an AutoCAD® table.

User data and additional network data
A flexible way to add, import or export data associated with topology elements. User data is accessible like any other project data and can be used as part of any configuration. Additional network data can be associated with any station or station range – ideal for data describing pipe condition, damages and inspection results.

Queries
A simple way to create complex data sets for further analysis. A common use of queries is to filter data by using linked criteria. Based on configurations, queries can be used with data tables, thematic maps and styles.

Configurations

Configurations represent the stored settings and data of an Urbano function.

They are used to drive the output of many functions like long sections, labels, data tables, data import and export, pipe clash analysis and the automatic calculation of pipe inverts. You can have many different configurations of the same function. If you update a configuration that produces a part of the drawing e.g. long section, all instances of that configuration will be refreshed automatically.

Configurations used in the project are stored in the .dwg file. To exchange configurations with other Urbano users it is enough to exchange a .dwg file. Configurations can be stored on a local computer and on a network server.
Design & drafting features

Long sections are based on configurations thus making drawing fast and flexible and the results incredibly detailed.

You can use any data selection as the source and draw one or more long sections at the same time. Editing is the best part with multiple procedures to adjust manhole type, drop and position, pipe diameter, invert, slope and depth below terrain and representation features like colors, hatches, line types, label position and type, decorative blocks and data table contents.

The long sections drafting and editing features are a compelling reason to start using Urbano.

Accurate layout drawing is an important part of the Urbano project. You can use advanced features like the automatic setting of pipes, manholes, labels and terrain heights to reduce drafting time. Editing is very comfortable as any position change of pipes and nodes is automatically reflected in all connected long sections, labels, data tables. The layout pipe network can be displayed in different styles like pipes and manholes with real diameters, pipes drawn up to the edge of the manhole and in full 3D.

The layout drafting, editing and styling functions enable quick design changes while preserving overall project accuracy.

Labels are based on configurations, refresh automatically and can be set for sections, nodes, arrays and stations. The automatic label repositioning tool will produce a great looking draft of the full layout in a matter of seconds. To refine the results, you can repeat the procedure multiple times on any part of the network or move the labels manually.

The many labeling options are simple to use, and provide great results.

Additional features:

Terrain elevations and DTM
Supported DTM’s include AutoCAD® Civil 3D®, 3D Face and Terraform, the Urbano DTM module. Terrain elevations can be set by direct input, linear interpolation or text file import.

Trenches, cross sections and excavation report
Trench and cross section configurations can be edited and trench borders displayed in layout. The excavation report can be made to accurately show the various layer volumes.

Pipe clash and intersection analysis
A special interface to analyze, label and create reports based on complex infrastructure clashes and intersections of different Urbano systems like sewage, storm and water or with other pipe and cable infrastructures like gas, electricity, optical cables etc.

Now also with the option to view clashes in 3D!

Conversion of AutoCAD® objects

Pipe networks created with basic AutoCAD® objects like, lines, polylines and blocks can be converted to Urbano networks. Additional information stored in text or block attributes, can be converted to information like pipe diameters or terrain elevations.

Once part of an Urbano system, you can use all the design, editing and analysis tools at your disposal. Like in other projects, you can use export configurations to convert the network to external formats like .shp, AutoCAD® Civil 3D® or any OLE DB compatible database.

Conversion tools are part of every Urbano product and represent a powerful mechanism for restoring and utilizing old pipe network drawings.
Urbano Canalis will support your workflow from start to finish regardless of project type. You will benefit from the speed and accuracy of the dynamic design model while enjoying great design and drafting flexibility thanks to the configuration system. Data exchange with complementary software is built-in with more than a dozen supported file formats. To complete the offer, there is a full set of calculation and analysis tools at your disposal.

**Key functions**

**Long section and Invert design**
Urbano Canalis includes a comprehensive set of tools and configurations adapted to the specific requirements of sewage and stormwater long sections design. Special tools follow each step of the design process including data selection, long section and invert editing, long section management and preparation for plotting. You can move, delete or copy long sections and you can exchange the currently used configuration with another one. The change of any feature like color, text alignment, size, line type, block type, data to display etc. can be stored in a new configuration.

Invert editing is especially powerful. The program offers full interoperability of manual and automatic invert design tools. This brings unparalleled flexibility to pipe invert design. Manual editing is fully interactive enabling you to draw directly in the long section and preview the results of any editing operation before it is executed. You can use smart editing functions like insert a manhole directly in the long section, adjust the manhole drop or straighten the invert by line or by slope. The editing functions can be performed before or after the input of pipes and manholes.

Automatic pipe invert editing is based on a set of criteria that will produce a best fit solution. The criteria include maximum and minimum depth and slope, the preference to use drop manholes, existing lateral inlets and previously drawn pipe inverts. All criteria are set in a single window which makes it simple to retain control. A solution based on the criteria will be calculated and applied to the selected long sections. And the best thing is – all the settings can be stored in a configuration for additional use, editing and exchange with other team members.

**Prefabricated manholes**
Urbano includes the option to determine the exact prefabricated concrete elements that will be used in the building of a manhole. The included prefabricated elements catalog was created according to EN 1917-2005 and DIN V 4034-1 standards and can be extended with user created elements. The composition of elements is based on pipe inverts and manhole depth with dynamic control and adjustment of total manhole height. Based on the composed manholes you can create element lists and reports.

**House connections**
House connections can be created with manual and automatic drafting tools or by a conversion of CAD elements like lines and polylines. Additional options include setting terrain heights and invert elevations, positioning labels and selecting pipe type and diameter.

**Catchment & influence areas**
Catchment areas for rain flow calculations are created from closed areas drawn with lines or polylines. This also applies to sub-areas with different runoff coefficients like roofs or driveways. Influence areas for sanitary and industrial flows are created similarly to catchment areas and based on specific inhabitant density.

**Flow & hydraulic calculation**
The flow calculation manager handles various national and international methods like calculating rain flow with IDF curves, waste flow from influence areas, additional rain and foreign water flows, transit flows and total flow. Calculation results are based on configurations allowing you to track all inputs and outputs. Hydraulic dimensioning is performed according to Darcy-Weisbach and Prandtl-Colebrook equations.
“We use Urbano for more than a year for the purposes of design and calculation of sewage and water distribution networks as we can develop our projects with much less time than before. We are especially impressed with the ability to import our old network data to Urbano and edit them according to our needs.”

Andreas Höhenberger, HÖHENBERGER Engineering ZT GmbH, Oberwart, Austria
Urbano Hydra will support your workflow from start to finish regardless of project type. You will benefit from the speed and accuracy of the dynamic design model while enjoying great design and drafting flexibility thanks to the configuration system. Data exchange with complementary software is built-in with more than a dozen supported file formats. To complete the offer, there is a full set of calculation and analysis tools at your disposal.

Key functions

Automatic pipe diameter optimization
For water distribution networks, calculating and determining optimal pipe diameters is no straightforward task. Depending on network size and topology type, it can become increasingly complex and time consuming. The intricate dependencies of flow, velocity, pressure, flow direction and pipe diameter are especially demanding in loop network topologies.

Urbano Hydra solves this problem for both branch and loop network topologies with the use of advanced hydraulic calculation methods. The automatic pipe diameter optimization procedure is based on a genetic algorithm that mimics the natural selection process to calculate an optimal solution. In this case, the algorithm tries to determine optimal pipe diameters based on a required flow velocity in the water distribution network. You set and control all input values, calculation settings and required results making the process simpler to understand and manage. The results can be further refined using post-processing and editing tools. Harnessing the power of the new automatic pipe diameter optimization calculation will significantly increase productivity and quality of the final design.

Connection to EPANET and other hydraulic modeling software
EPANET is the worldwide standard software for hydraulic calculations of water distribution networks and most hydraulic modeling software use the EPANET file format to exchange data. Urbano can be used to determine all pipe network information including water demands, pipes, valves, pumps, reservoirs etc. The prepared data can then be exported to any EPANET compatible software for hydraulic modeling. The modeling results can be imported to Urbano and become part of the project.

Hydraulic calculation
Urbano uses the EPANET engine for a snapshot hydraulic calculation. This action requires the same data input as if you were to export the data to EPANET. The snapshot calculation can be performed to get some basic understanding of the network in a short amount of time.

Long section and invert design
Urbano Hydra includes a comprehensive set of tools and configurations adapted to the specific requirements of long section design for water distribution networks. Special tools follow each step of the design process including data selection, long section and invert editing, long section management and preparation for plotting. You can move, delete or copy long sections and you can exchange the currently used configuration with another one. The change of any feature like color, text alignment, size, line type, block type, table data and more, can be stored in a new configuration.

Invert editing is especially powerful offering full interoperability of manual and automatic invert design tools. You can take advantage of a new function that enables the automatic determination of pipe inverts with respect to reducing the number of needed air release and sludge release valves. This brings unparalleled flexibility to pipe invert design.

Node assembly schema design
You can create detailed node schematics based on network nodes and a catalog of assembly elements e.g. fittings and valves. You can create custom parametric elements or elements from AutoCAD® blocks. A table with part name and quantity is generated automatically.
"Using Hydra and Canalis we have fast and reliable results, the ability to view intersections of systems and hydraulic calculations of the network in minutes. We estimate the design efficiency with Hydra and Canalis to be about 10 km of network per day."

Marius Andrei, S.C RAJA S.A., Constanța, Romania
Urbano Data enables you to create data import and export configurations to take advantage of a full BIM workflow.

**Key functions**

**Data import and export**
Urbano solves the issues of reliable data exchange between different software systems with import and export configurations. You can create custom configurations for every project and data source. This also makes it easy to test the import or export procedure in case you are dealing with a complex data structure. The imported data of nodes and sections is used to draw a pipe network directly. You can then proceed with editing and analysis in the usual way. Import and export configurations can be stored, exchanged with the .dwg file or reused as a starting point for a new project solution. Supported data exchange formats include .shp (ESRI ArcGIS), .tab (MapInfo), Text files and OLE DB databases like Oracle, MS SQL, Access and PostgreSQL.

**Linking to external data sources**
If you want to use data from an external source but do not want to import the data and increase the file size, you can create a data link. This way the data is read directly from the external data source while the project size remains constant. Links are based on configurations and the supported data formats are the same as for the import/export.

**Linking to external documents**
For such purposes, you can create a configuration that will link an external file e.g. picture or video, to a node or section.
Terrain cross sections, multiple pipe trenches and surveying tools

Key functions

Cross sections
You can create dynamic cross sections that include terrain features and all infrastructure networks. Cross sections are based on configurations and are automatically refreshed on any change in layout or long sections. You can create multiple terrain lines, hatch cut and fill surfaces and add custom object symbols. The calculation of surfaces and volumes is based on the specified terrain lines.

Trench for multiple infrastructure networks
A new tool enables the creation of complex trenches with multiple benching that can accommodate more than one infrastructure network e.g. water, storm, gas, electricity. You can create cross sections and excavation calculations based on the trench settings.

Points and connections
Points can be imported from various sources like .txt files and OLE DB databases. You can create additional points using polar or orthogonal measurements, interpolation, arc intersection or conversion from 3D points and linear objects. Connecting lines can be created in 2D or 3D, as lines or polylines, with different line types and styles. You can create long sections based on any connection line.
Urbano Polygon provides advanced creation, editing and analysis of parcel topologies.

It includes an advanced analysis that determines the exact parcels of a pipe run.

**Key functions**

**Polygon topology**
Polygon topology is a special type of data structure used for creating parcels or zones. You can create a polygon topology in an automated procedure by converting existing lines and polylines. The automated procedure will always create parcels that conform to the requirements. You can use post-processing cleanup and editing tools on all non-conforming lines and polylines. Additional information like parcel number, type and owner can be imported from a database or converted from AutoCAD® texts. You can use standard Urbano tools to edit, label, search, query and analyze the parcels.

**Polygon/Pipe intersections**
This is a special analysis type that allows you to detect intersection points between pipe networks and parcels. The results of the intersection can be stored in custom data variables which can be added to long section configurations. This will, for instance, allow you to control the type of parcel a pipe run is going through. The Polygon/Pipe connection is dynamic and any change in the pipe run or the parcel will be refreshed automatically in all data views.

**Analysis tools**
Urbano includes a number of specific parcel analysis tools. To improve project insight you can perform buffer, union, intersection and overlay analyses. You can create analysis reports using thematic maps and data tables.
Urbano **Raster & Vector** provide productivity tools for working with large amounts of raster and vector maps.

Key improvements over a traditional workflow include image grouping, smart display tools and layer filtering.

**Supported raster file types** - .tfw, .jgw, .ecw and GeoTIFF

**Supported vector file types** - .dwg, .dgn, .dwf and .pdf

### Key functions

**Grouping**

Images can be imported one by one, by reading a folder structure or from a database. Groups can be made according to any criteria e.g. image scale, content or location. Each group is named which makes it easy to select and display appropriate images.

**Smart display options**

By default, maps are displayed only with a polygon boundary and the image name. This enables the program to display thousands of image boundaries and still retain great performance. There are several methods for displaying the maps e.g. picking images from the drawing or the list, displaying all images crossed by a line or a polygon or displaying all images visible in the current view.

**Layer filtering for vector images**

While attaching files you can use content filtering e.g. you can filter attached files based on layer. This enables you to use general purpose maps with many infrastructure types and still keep full control over the level of detail that is displayed in the drawing.
Advantages of using **Urbano** with the Autodesk® Infrastructure Design Suite

Urbano pipe networks are based on standard AutoCAD® elements: lines and blocks. Any additional data is stored directly in the .dwg file.

The synergy of Urbano and Autodesk® products creates clear-cut advantages:

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<tr>
<th>Autodesk product</th>
<th>Advantage with Urbano</th>
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<tbody>
<tr>
<td>AutoCAD®</td>
<td>Conversion of Line, LW Polyline, 2D Polyline, 3D Polyline to Urbano sections.</td>
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<td></td>
<td>Conversion of Blocks to Urbano Nodes</td>
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<td></td>
<td>Conversion of Text and Block attributes to Urbano data like invert elevations, pipe diameters, channel names etc.</td>
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<td></td>
<td>Use of standard AutoCAD® tools for additional annotations and plot preparation.</td>
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<tr>
<td>AutoCAD® Map 3D®</td>
<td>Import/export of existing pipe networks from/to a database.</td>
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<td></td>
<td>Project amendment with digital terrain models or terrain heights, long sections, trenches, cross sections and more</td>
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<tr>
<td>AutoCAD® Civil 3D®</td>
<td>Direct use of AutoCAD® Civil 3D®'s digital terrain model.</td>
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<td>Bidirectional data exchange for pipes and structures</td>
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<tr>
<td>Autodesk® Infraworks™</td>
<td>Export of Urbano networks to AutoCAD® Civil 3D® and Infraworks™.</td>
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<tr>
<td>Autodesk® Navisworks®</td>
<td>Export of Urbano pipe networks as 3D solid objects for additional clash analysis</td>
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“Urbano Hydra/Canalis is suitable for large infrastructure projects. The software is multifunctional and gives freedom to a designer to develop complex calculations and designs. Urbano Hydra/Canalis helped us to develop water supply and sewerage designs with a very short design time and with the best quality.”

Dr. Eng. Atanas Paskalev, Manager, Aquapartner LTD, Sofia, Bulgaria
“With Urbano, we already designed more than 4000 km of sewage and water distribution networks. From our point of view, Urbano software is the complete solution.”

Andrei Bulumete, Chief Designer, Romair Consulting, Bucharest, Romania
Urbano is being developed for more than 20 years with a firm dedication to meeting customer needs. The program is accompanied by numerous learning resources, dedicated technical support teams and excellent customer care. With the support of our authorized resellers we currently deploy the program in more than 10 language versions to more than 20 countries worldwide.

StudioARS was founded in 1990 in Croatia. Since the very beginning our goal has been the implementation of advanced CAD and engineering technologies. Our development is based on Autodesk® technology and we develop modern, reliable and flexible solutions for everyday work.