Works 2013

Profile design and Quantities calculation

WHITEPAPER

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Chapter

1 About the whitepaper

1.1 Purpose

Note that the procedures presented herein are not necessarily optimum. The purpose of this whitepaper is to demonstrate the main features and capabilities of the program through a small example.

Also note that the metric unit system is used in this example. This is not restrictive, as different unit systems can be used.

This whitepaper is an extension to the previous one, which demonstrates the design and calculation of a small storm network at Distomo village of the Viotia area.

In this whitepaper, the names of the streets will be added. In addition, the network conduits, excavations etc will be calculated and the profiles will be drawn. The names of the streets are given in the following table:

From - To junction	Street Name
A7 to A5	Armatolon
A4 to A3	Feakon
A3-4 to A1	Mesogeion

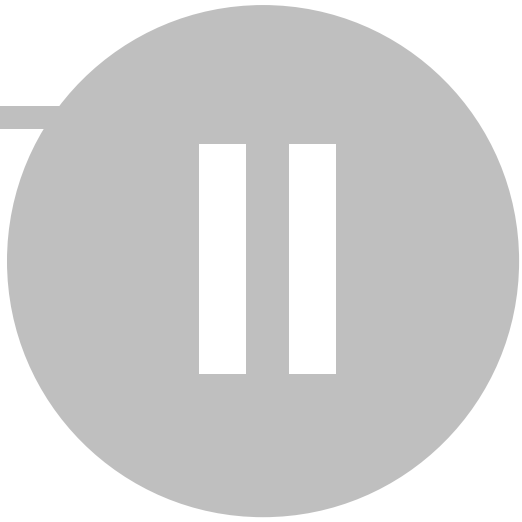
1.2 Software

In order to complete the example successfully, the following software is required:

- Sewer Networks v11.0.

Later versions of the aforementioned software may be incompatible with the structure of the example as it is presented herein.

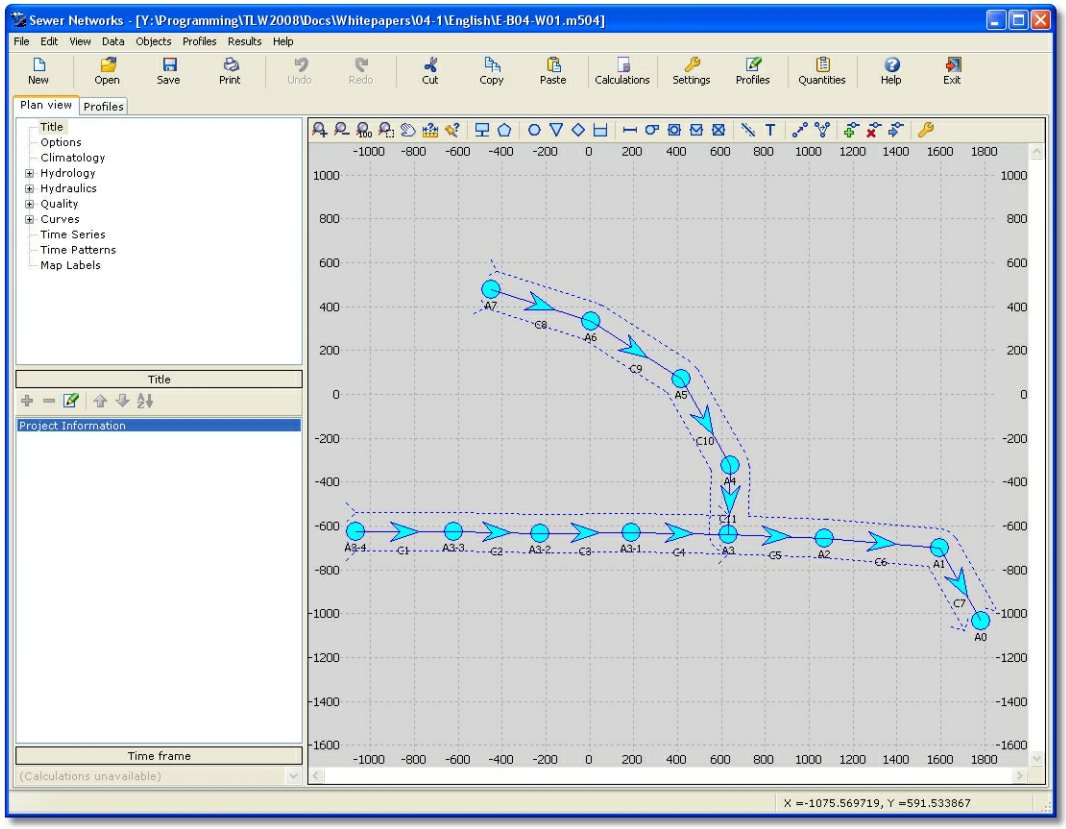
Chapter



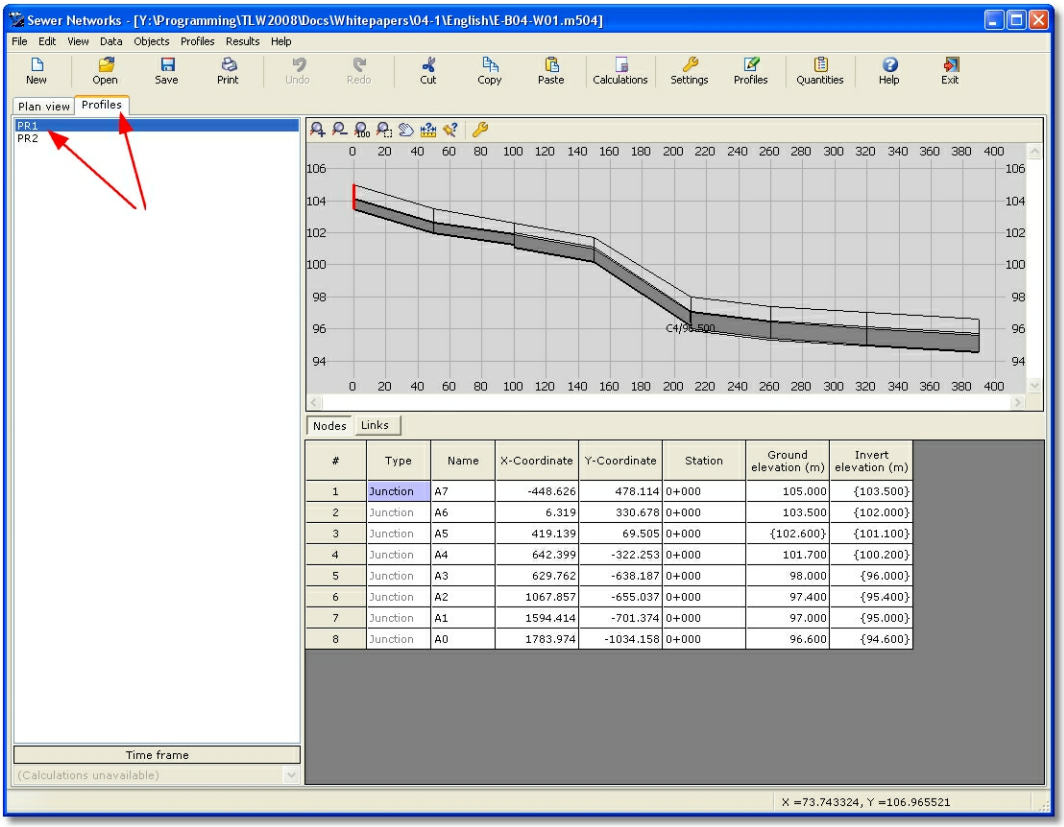
2 Steps

2.1 Step 01: Street Names

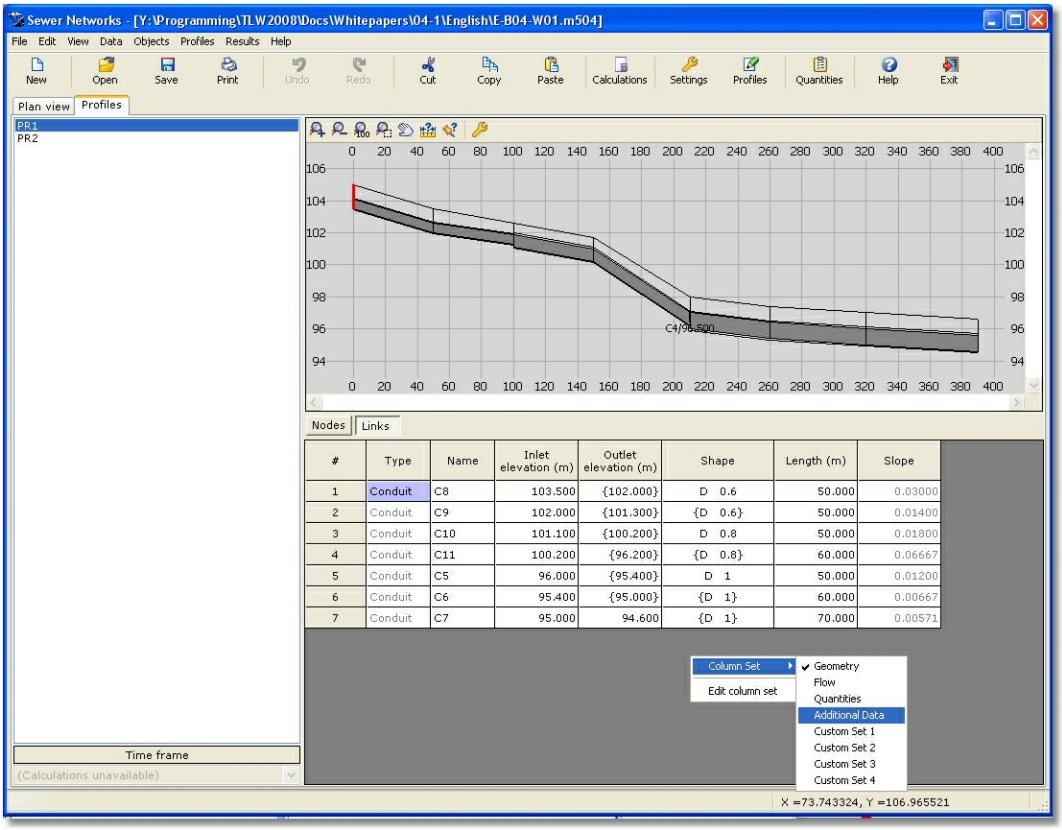
Load the file corresponding to whitepaper #1:



Click the **Profiles** tab and select the first profile named **PR1** from the list on the left:



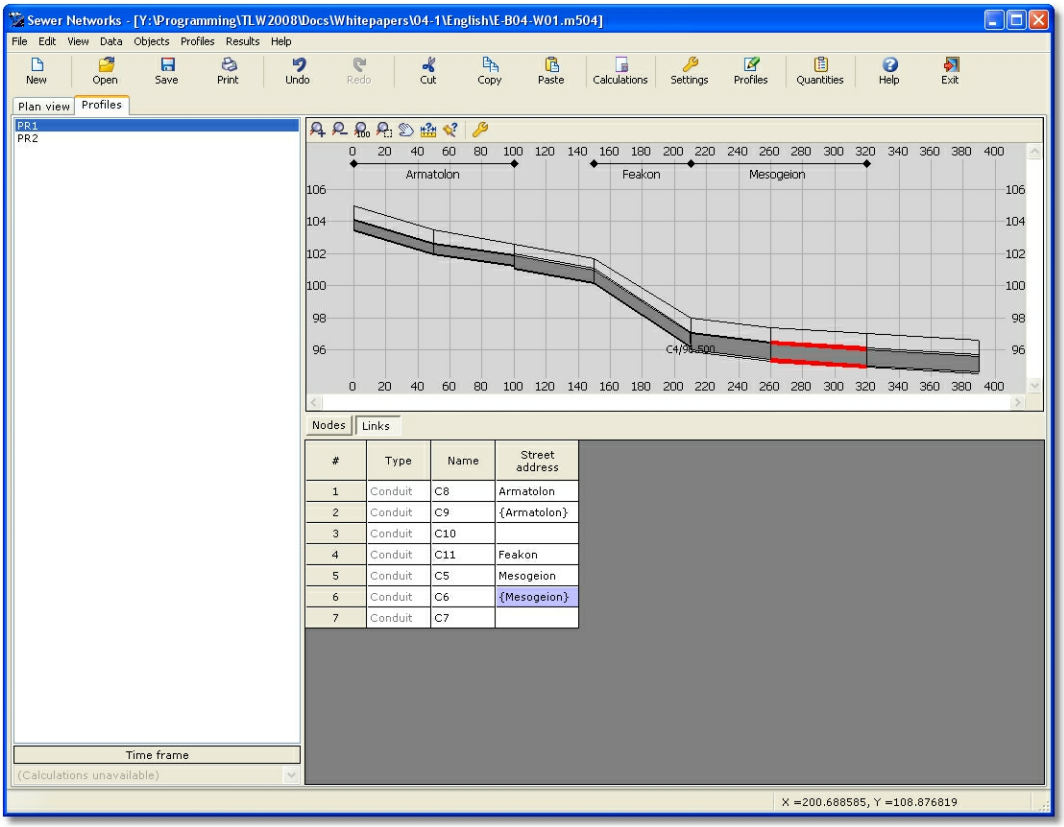
Select the **Links** tab. Right-click on the spreadsheet and from the menu select **Column Set > Additional Data:**



The column set named **Additional Data** will be activated. By default, this includes the street names of the links. Note that four predefined column sets are available, namely **Geometry, Flow, Quantities** and **Additional Data.** In addition, four custom sets are available. To select which columns appear in each set, right-click on the spreadsheet and select **Edit column set:**

Make the appropriate selections and press **Ok**.

Returning to the main form, type the street names in the corresponding cells:



Note that auto-fill is supported for the **Street address** column. The logical rule is to use the name of the previous link.

In the first cell, type **"Armatolon"**

Select the second cell and press **DEL.** This activates the auto-fill mode for this cell, which now is now displayed as "**{Armatolon}**". In general, the curly braces signify auto-fill. The curly braces refer to data input only and disappear in print-outs and drawings.

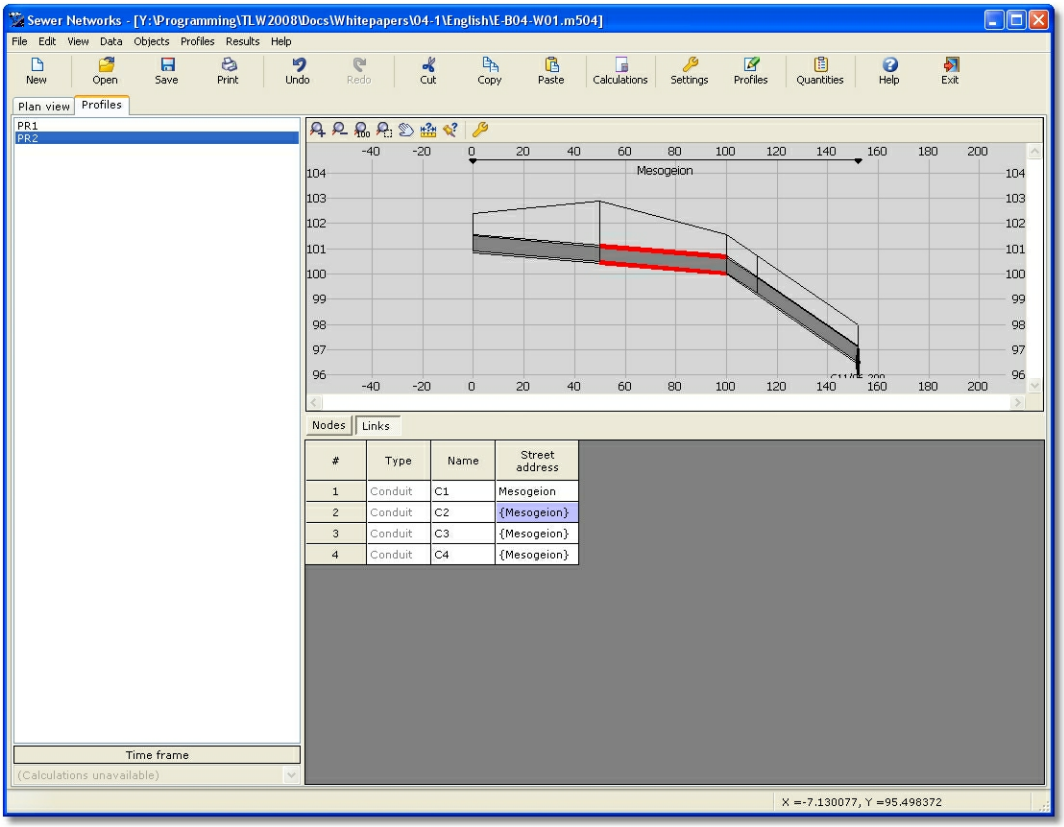
Leave the third cell empty.

Type "**Feakon"** in the fourth cell.

Type "**Mesogeion"** in the fifth cell.

Supposedly, you made a mistake and activated auto-fill in both the sixth and seventh cell. This may have happened, for example, if you selected both cells and pressed **DEL.** The last cell has no street name and auto-fill assigns a wrong value. To delete this field, type a space " ". The program understands that you want to deactivate auto-fill and leave the field empty.

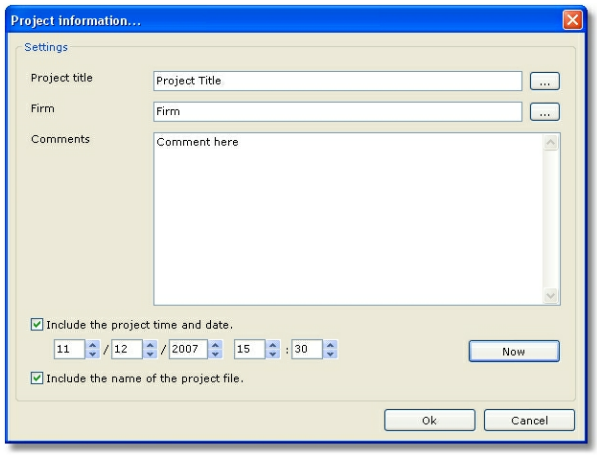
Follow the same procedure for the street names of profile **PR2**:



2.2 Step 02: Quantities

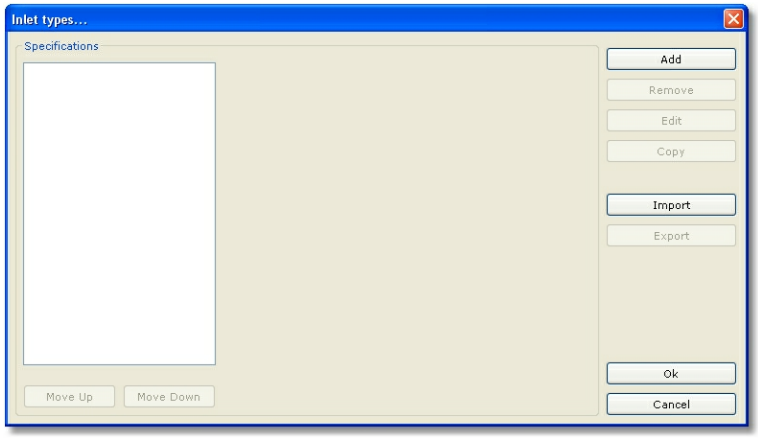
The program can calculate the necessary conduits, excavations etc of the whole network with a touch of a button.

First, you should input the project information. From the menu, select **Data > Project info:**

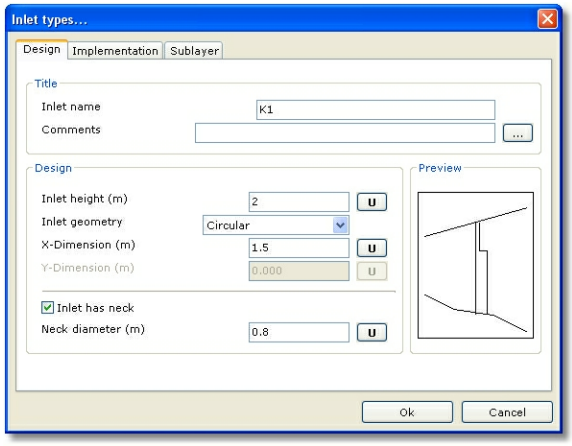


Make the appropriate changes and press **Ok.**

In order for the program to calculate the quantities properly, we need to define manhole and trench specifications. Note that we have already defined conduit shapes in the first whitepaper. From the menu, select **Data > Manhole specifications:**

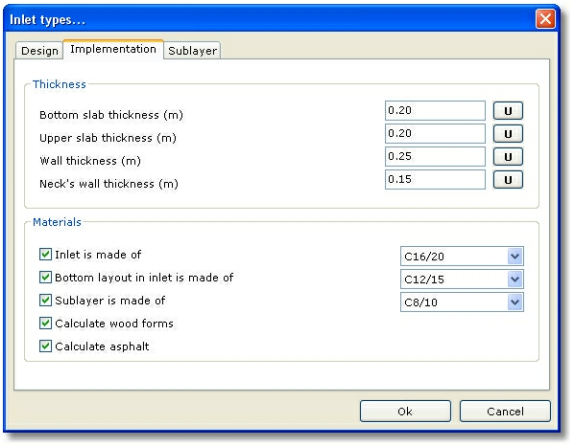


Press **Add:**

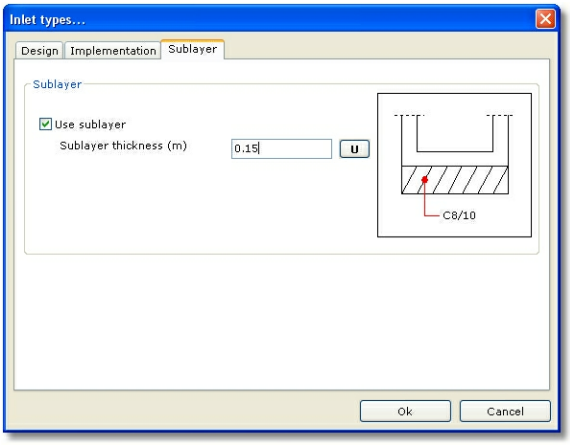


Type the inlet name, e.g. **K1.** Select circular inlet, with X-dimension (external diameter) equal to **1.5m** and **height** equal to **2m**. The **inlet has neck** with **diameter** equal to **0.8m**.

Select the **Implementation** tab and input the data as follows:



Select the **Sublayer** tab and input the data as follows:

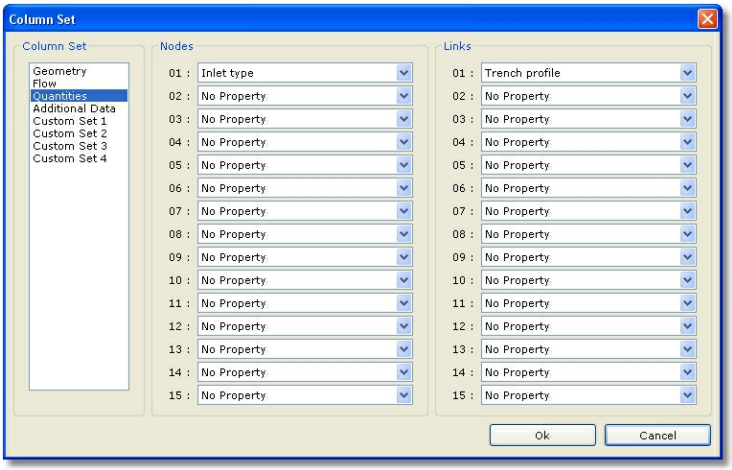


Press **Ok** to store the new specification.

Note that this procedure needs not be repeated for each project. After you have defined a full set of manhole specifications, select **Export** to export the data to an external file. This file may be imported by pressing the **Import** button in other projects.

Press **Ok** to close the manhole specification form.

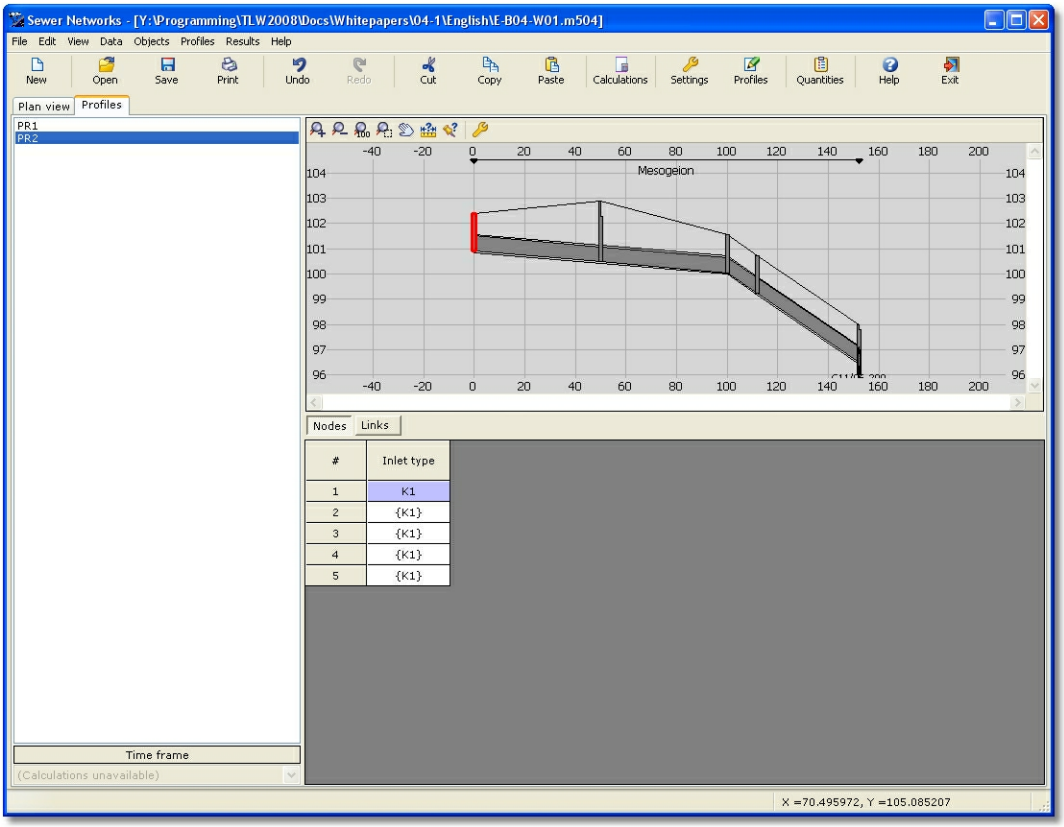
In the main form, select the **Profiles** tab. Right-click on the spreadsheet and from the menu select **Edit column set:**



Select the **Quantities** column set on the left. Select the **Inlet type** for the nodes and the **Trench profile** for the links. Press **Ok.**

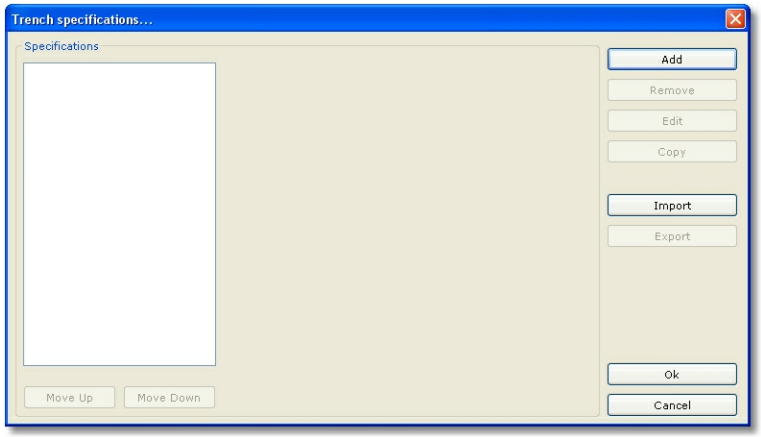
Right-click on the spreadsheet and from the menu select **Column set > Quantities.** The sheet will display the columns that you have just selected.

Select both profiles **PR1, PR2** successively and in the **Node** tab, select **K1** as the inlet type of all junctions. You can activate auto-fill, as usual. The logical rule is using the inlet type of the previous junction:

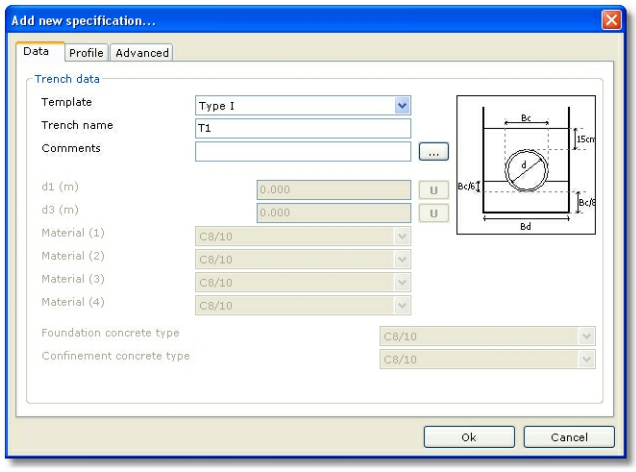


Note that the profile sketch includes the manholes with their actual dimensions. You may use the CAD tools from the toolbar, such as zoom, pan, distance etc to obtain useful information.

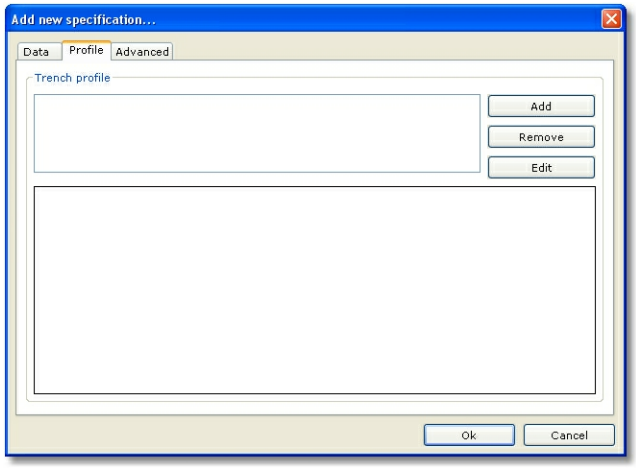
In similar manner, we will define trench specifications. Select **Data > Trench specifications:**



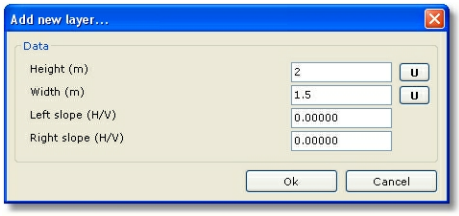
Press **Add**. In the **Data** tab, select **Type I** template and type **T1** as the trench name**:**



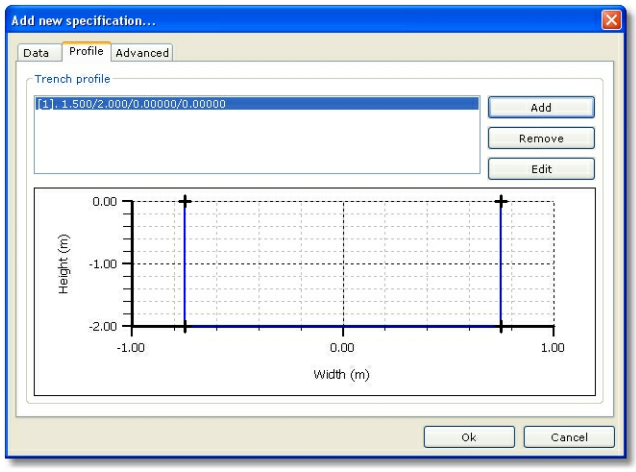
Select the **Profile** tab**:**



To define the trench profile, press **Add.** The profile is defined as a set of trapezoidal layers, from bottom to top. In this example, we will add a single layer with width of 1.5m and vertical slopes in both sides:

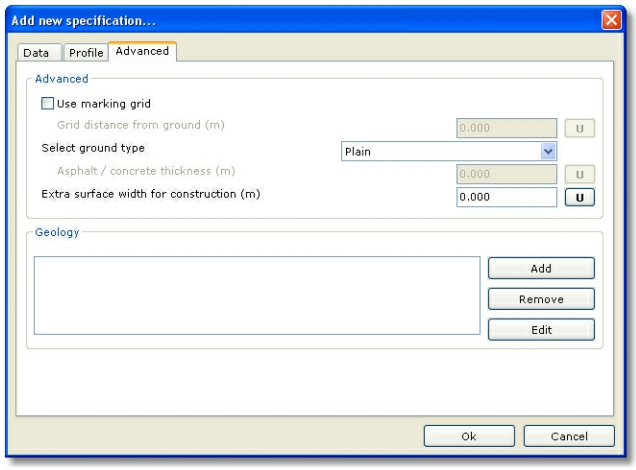


For simplicity, we will apply this trench specification to all conduits, irrespectively of their diameter. Obviously, the trench should depend, among others, on the width of the conduit. The program draws the trench profile:

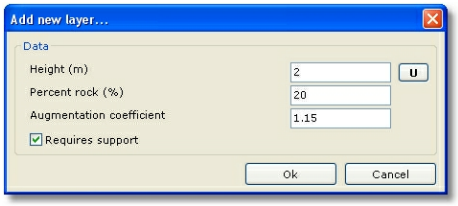


Note that if the total height of the profile is insufficient, the program automatically extends the topmost layer as necessary.

Select the **Advanced** tab:



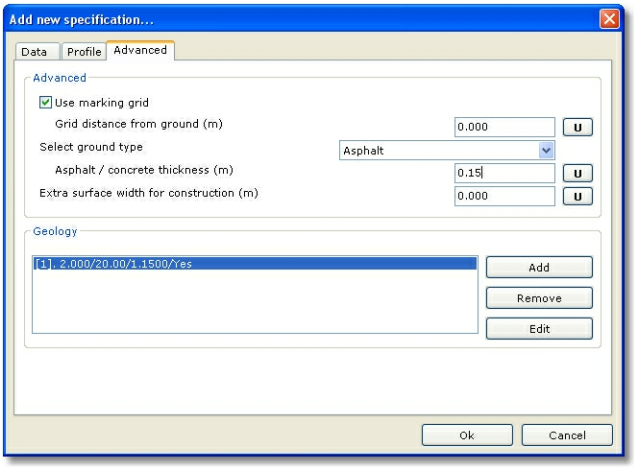
To define the geological profile, press **Add.** The geological profile is defined in layers, from top to bottom. In this example, we will add a single layer with height of 2m, 20% rock percentage, augmentation coefficient equal to 1.15 and need for support:



Note that if the total height of the profile is insufficient, the program automatically extends the bottommost layer as necessary.

Press **Ok** to store the new layer.

Select **Use marking grid**, **Asphalt** as **Ground type** and **asphalt thickness** equal to **0.15m**:

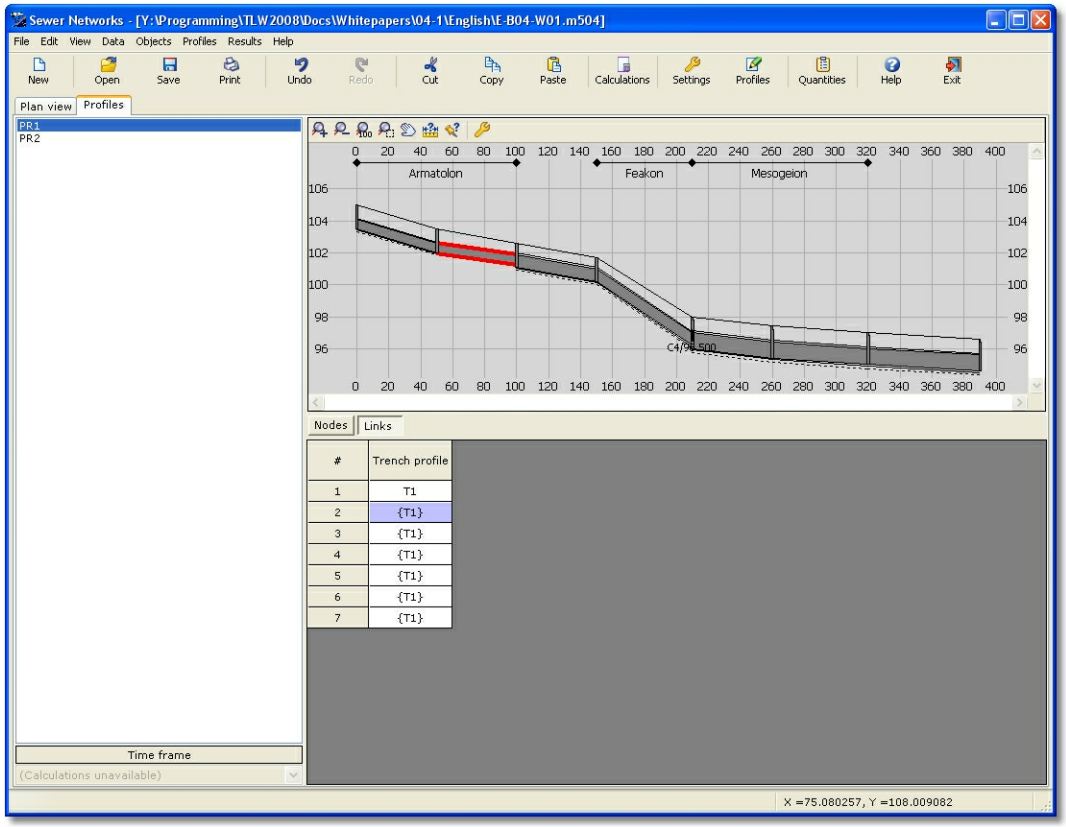


Press **Ok** to store the new specification.

Note that this procedure needs not be repeated for each project. After you have defined a full set of trench specifications, select **Export** to export the data to an external file. This file may be imported by pressing the **Import** button in other projects.

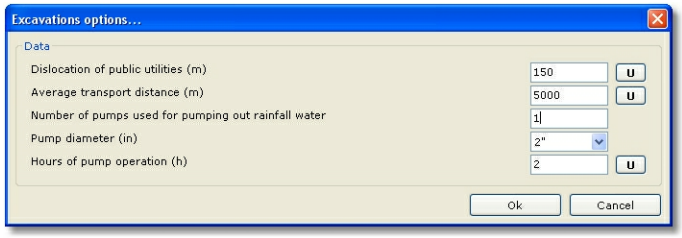
Press **Ok** to close the trench specification form.

Select both profiles **PR1, PR2** successively and, in the **Links** tab, select **T1** as the trench profile for all conduits. You can activate auto-fill, as usual. The logical rule is using the trench type of the previous conduit:



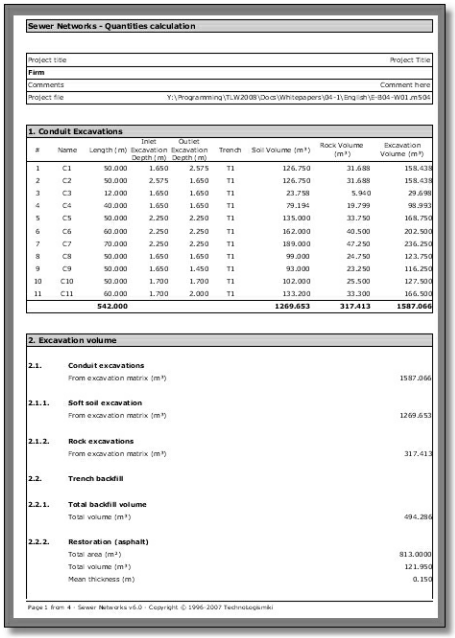
Note that the profile sketch includes the excavation level (in dotted line).

To conclude the data input regarding the quantities, from the menu select **Data > General Data > Excavation options:**



Input the data as shown in the picture.

At this point, the data input regarding the quantities is concluded. Select **Results > Quantities** to calculate the quantities of the whole network. A full report will be compiled and sent to the print manager:



Sewer Networks - Quantities calculation

Project title	Project Title
Firm	
Comments	Comment here
Project file	Y:\Programming\TLW2008\Docs\Whitepapers\04-1\English\E-804-W01.mS04

1. Conduit Excavations

#	Name	Length (m)	Inlet Excavation Depth (m)	Outlet Excavation Depth (m)	Trench	Soil Volume (m³)	Rock Volume (m³)	Excavation Volume (m³)
1	C1	50.000	1.650	2.575	T1	126.750	31.688	158.438
2	C2	50.000	2.575	1.650	T1	126.750	31.688	158.438
3	C3	12.000	1.650	1.650	T1	23.758	5.940	29.698
4	C4	40.000	1.650	1.650	T1	79.194	19.799	98.993
5	C5	50.000	2.250	2.250	T1	135.000	33.750	168.750
6	C6	60.000	2.250	2.250	T1	162.000	40.500	202.500
7	C7	70.000	2.250	2.250	T1	189.000	47.250	236.250
8	C8	50.000	1.650	1.650	T1	99.000	24.750	123.750
9	C9	50.000	1.650	1.650	T1	93.000	23.250	116.250
10	C10	50.000	1.700	1.700	T1	102.000	25.500	127.500
11	C11	60.000	1.700	2.000	T1	133.200	33.300	166.500
		542.000				**1269.653**	**317.413**	**1587.066**

2. Excavation volume

2.1.	**Conduit excavations**	
	From excavation matrix (m³)	1587.066
2.1.1.	**Soft soil excavation**	
	From excavation matrix (m³)	1269.653
2.1.2.	**Rock excavations**	
	From excavation matrix (m³)	317.413
2.2.	**Trench backfill**	
2.2.1.	**Total backfill volume**	
	Total volume (m³)	494.286
2.2.2.	**Restoration (asphalt)**	
	Total area (m²)	813.0000
	Total volume (m³)	121.950
	Mean thickness (m)	0.150

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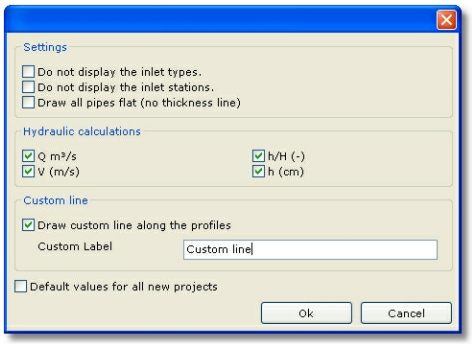
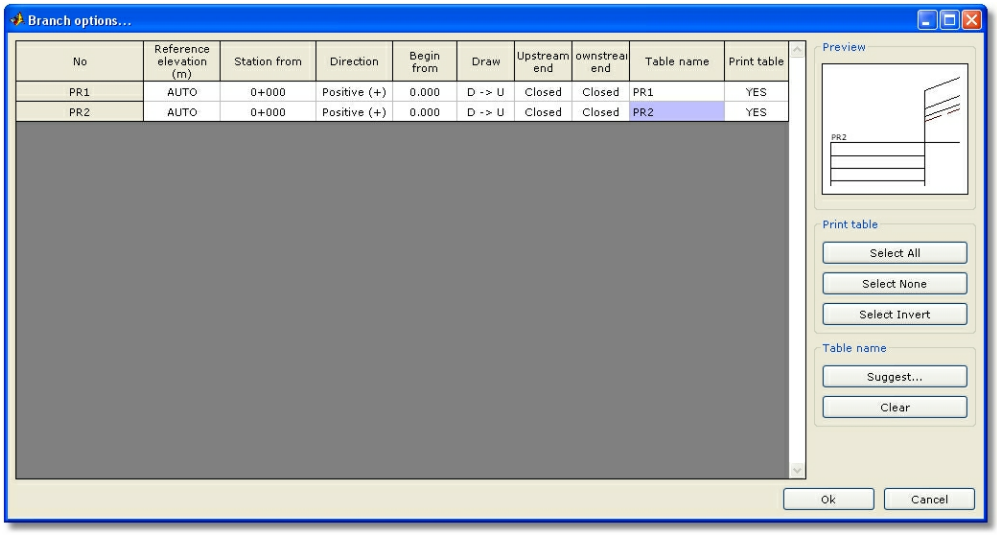
2.3 Step 03: Profile Drawing

The program is able to create profile drawings automatically. To modify the way the profiles are drawn, from the menu select **Results > Profiles > Options:**



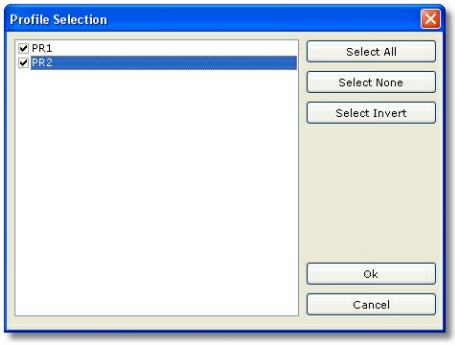
After making the appropriate selections, press **Ok.**

Additional options are available from the menu **Profiles > Profile options:**

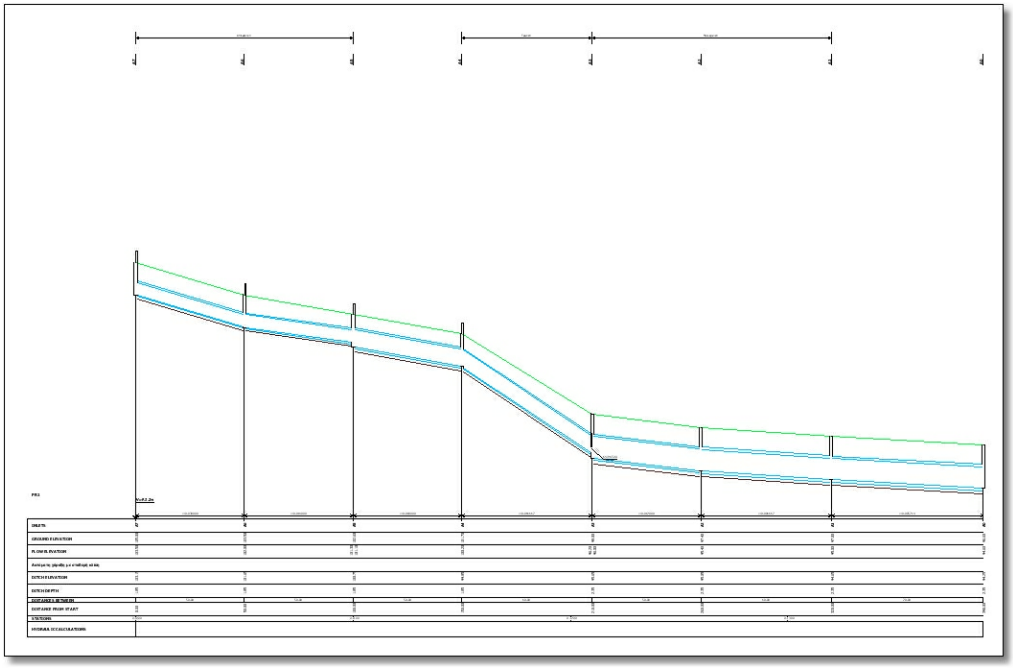


After making the appropriate selections, press **Ok.**

To create the profile drawings, from the menu select **Results > Profiles > Design:**



Select the profiles that you want to include in the drawing and press **Ok.** The drawings are prepared and sent to the profile designer:



Chapter

3 Help

3.1 Technical support

Technical Support

TechnoLogismiki offers technical support 24 hours per day, 365 days per year, through the Web site where you can get information on the latest programs and services.

Support by e-mail

Please use the dedicated e-mail addresses for better customer service:

- for questions regarding sales: sales@technologismiki.com
- for questions regarding the usage of programs: support@technologismiki.com
- for any other question or comment: info@technologismiki.com

The normal response time is within two business days. If your inquiry cannot be answered via e-mail, a customer service representative will contact you via telephone.

Interactive Support

Business days, 09:00 - 17:00 Eastern European Time:

- Telephone [3 lines]: ++30-210-656-4147
- FAX: ++30-210-654-8461
- Address: 5, Imitou str, Cholargos, 15561, Athens, Greece.