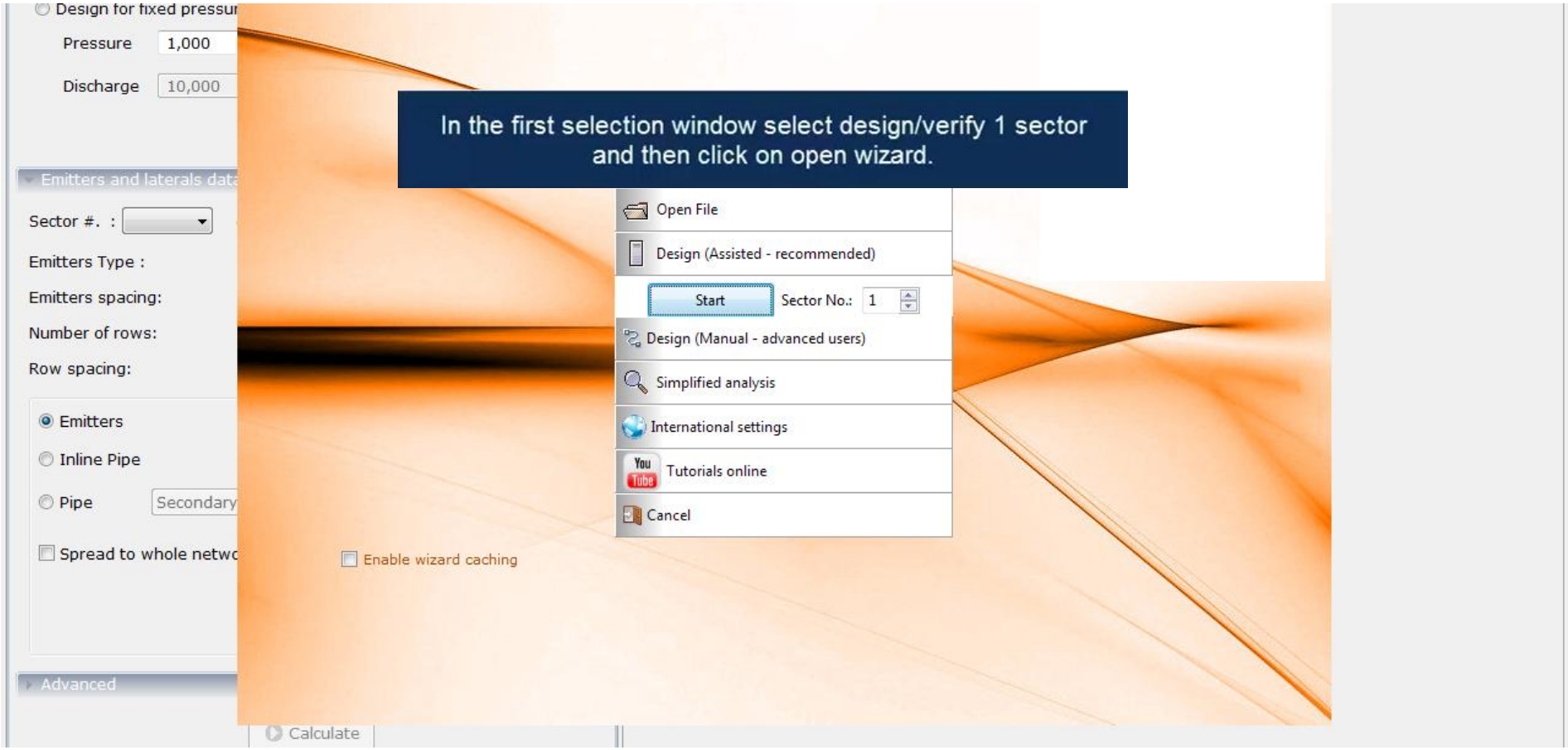
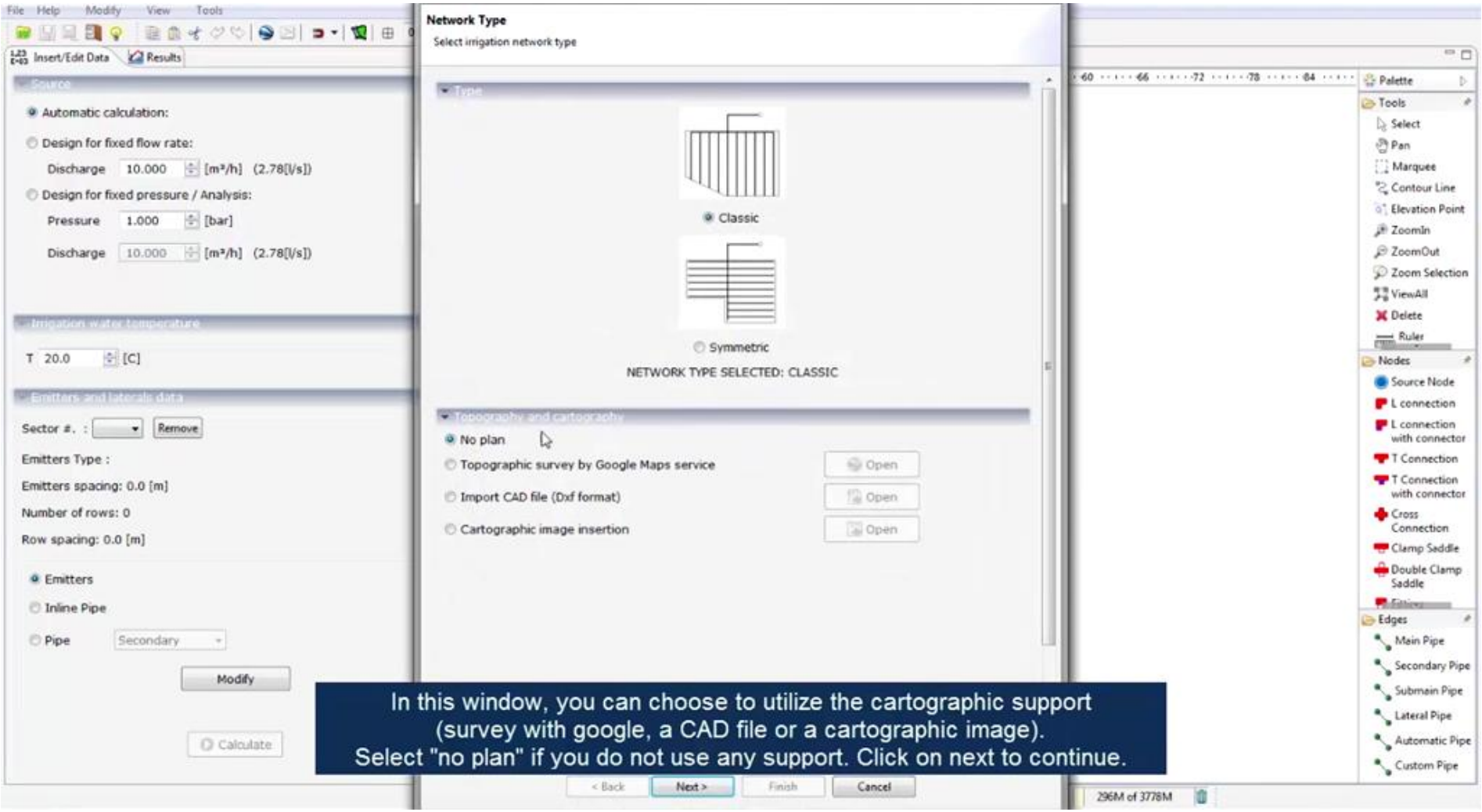
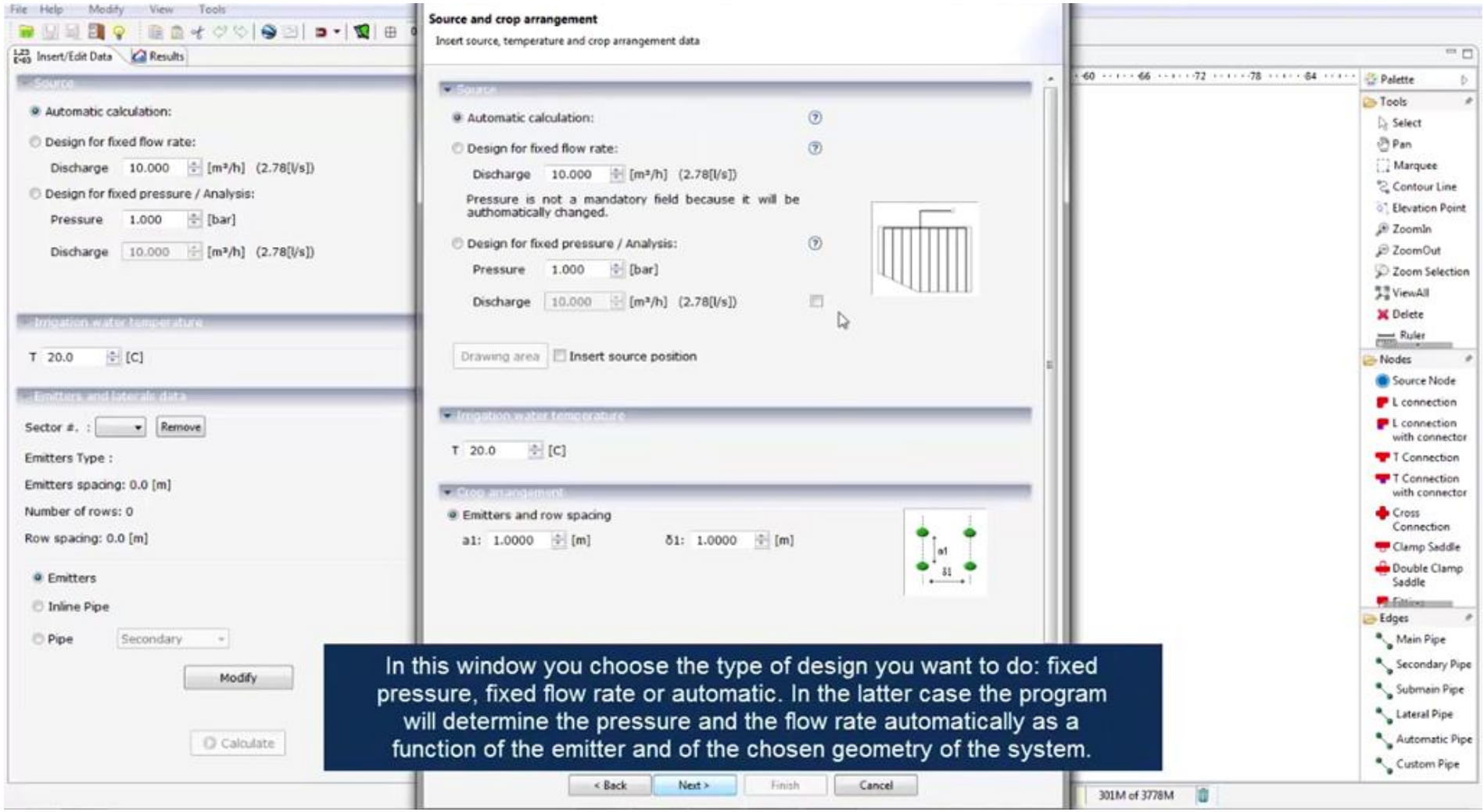
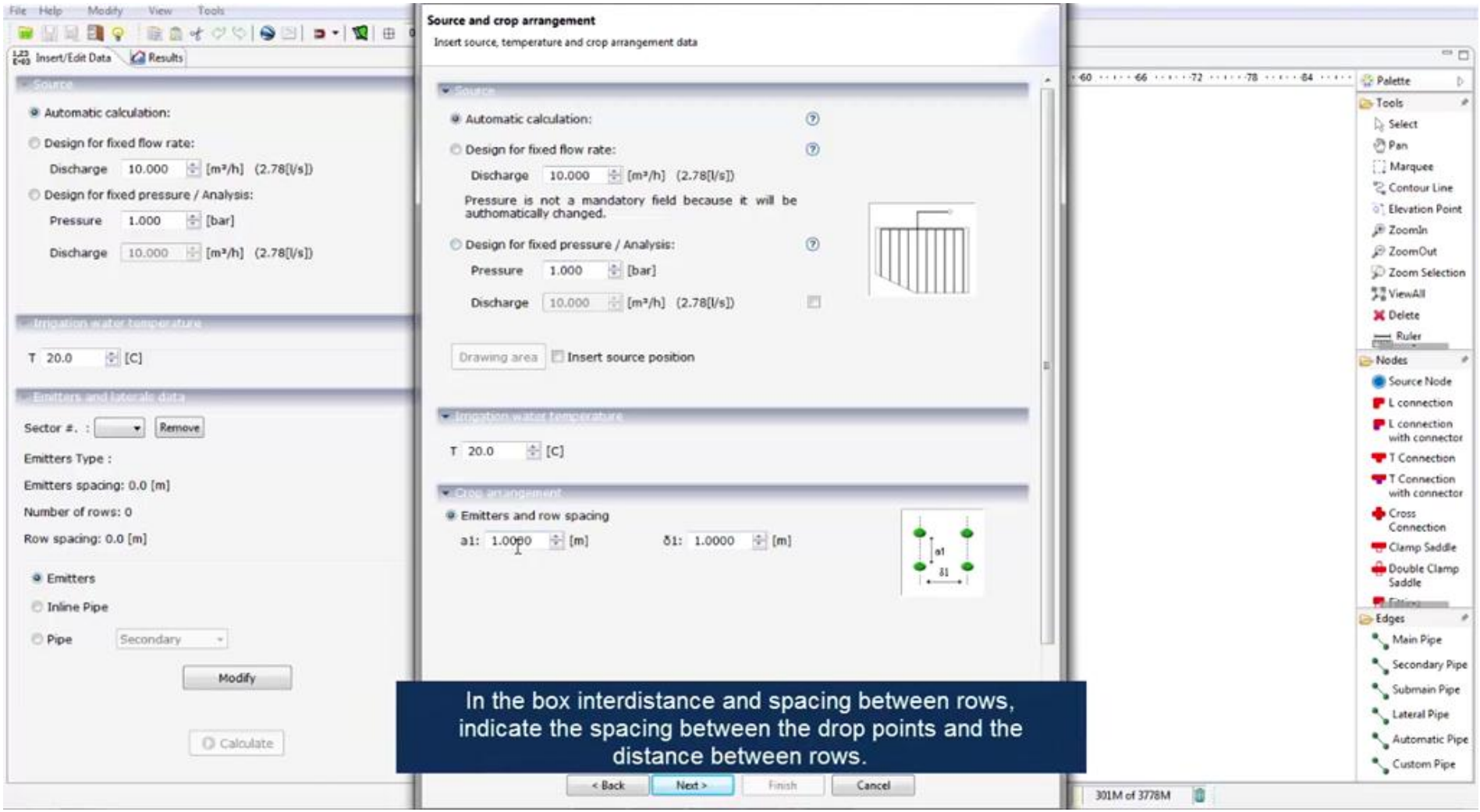
irriworks

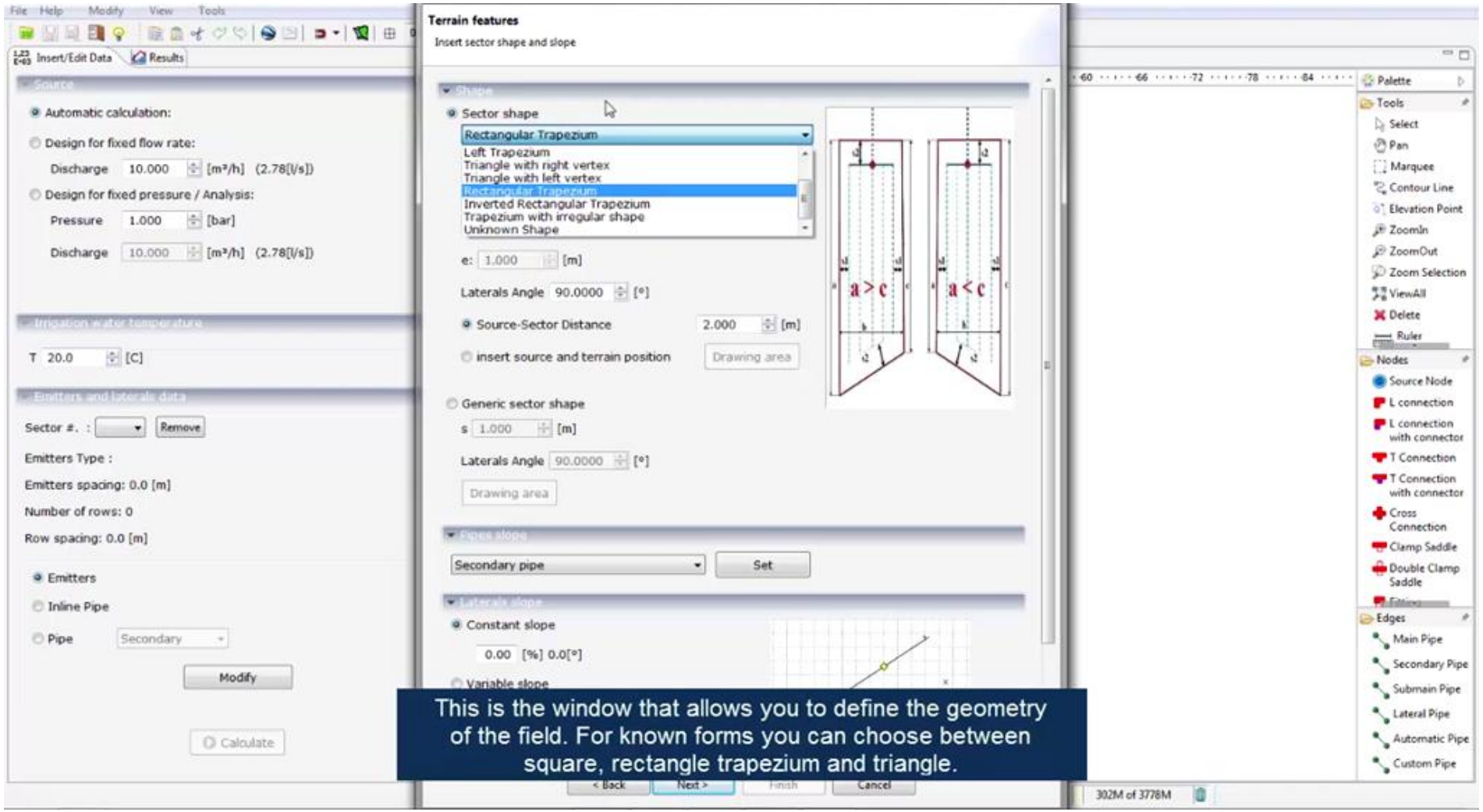
QUICK GUIDE


Design for fixed pressur
Pressure
1,000
Discharge
10,000
Emitters and laterals data
Sector #. :
Emitters Type :
Emitters spacing:
Number of rows:
Row spacing:
Emitters
Inline Pipe
Pipe
Secondary
Spread to whole netwo
Advanced
Calculate
In the first selection window select design/verify 1 sector and then click on open wizard.
Open File
Design (Assisted - recommended)
Start
Sector No.:
1
Design (Manual - advanced users)
Simplified analysis
International settings
Tutorials online
Cancel
Enable wizard caching

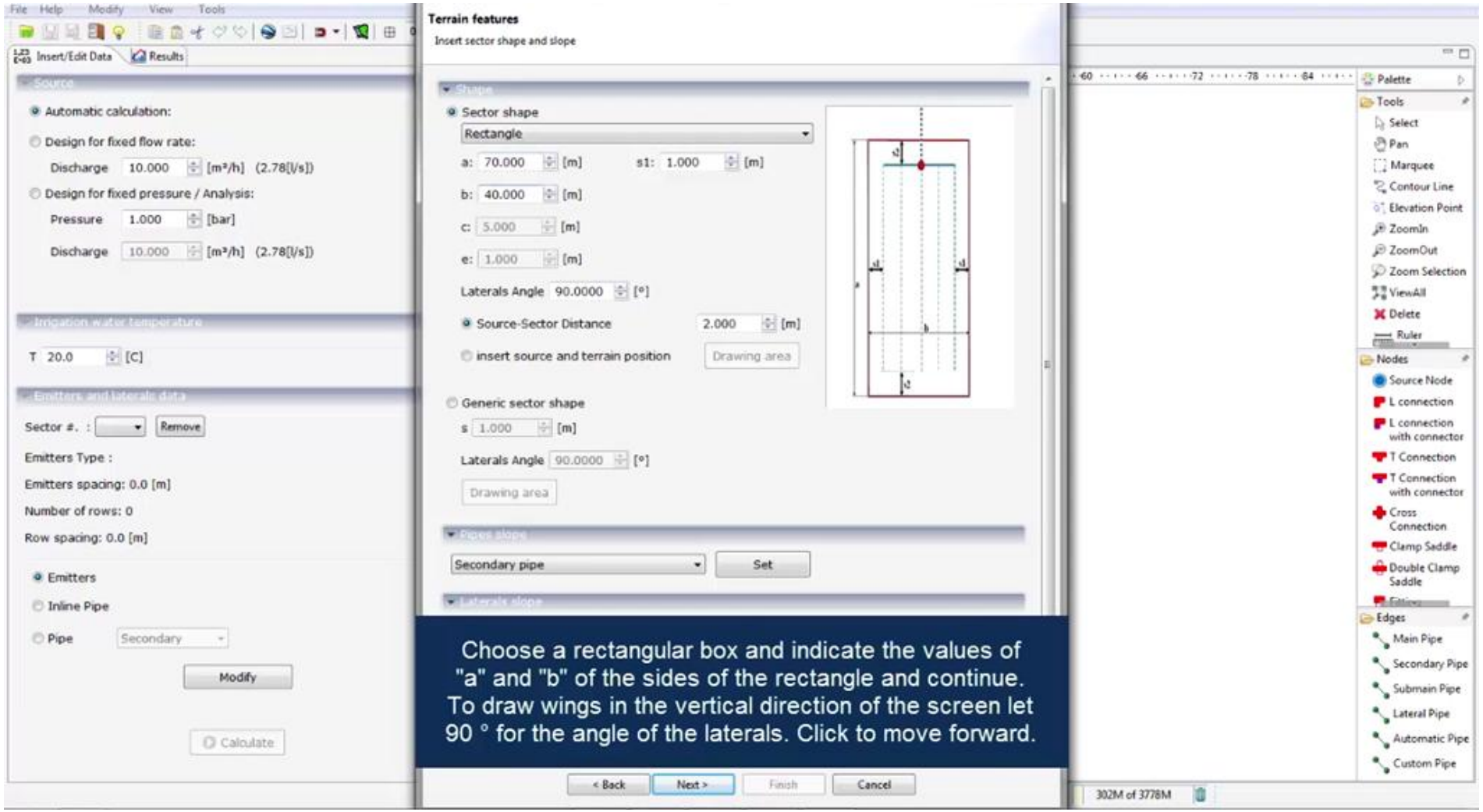

File Help Modify View Tools
Insert/Edit Data
Results
Source
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s])
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l/s])
Irrigation water temperature
T 20.0 [C]
Emitters and laterals data
Sector #. :
Remove
Emitters Type :
Emitters spacing: 0.0 [m]
Number of rows: 0
Row spacing: 0.0 [m]
Emitters
Inline Pipe
Pipe
Secondary
Modify
Calculate
Network Type
Select irrigation network type
Type
Classic
Symmetric
NETWORK TYPE SELECTED: CLASSIC
Topography and cartography
No plan
Topographic survey by Google Maps service
Import CAD file (Dxf format)
Cartographic image insertion
Open
Open
Open
In this window, you can choose to utilize the cartographic support
(survey with google, a CAD file or a cartographic image).
Select "no plan" if you do not use any support. Click on next to continue.
< Back
Next >
Finish
Cancel
Palette
Tools
Select
Pan
Marquee
Contour Line
Elevation Point
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Delete
Ruler
Nodes
Source Node
L connection
L connection with connector
T Connection
T Connection with connector
Cross Connection
Clamp Saddle
Double Clamp Saddle
Edges
Main Pipe
Secondary Pipe
Submain Pipe
Lateral Pipe
Automatic Pipe
Custom Pipe
296M of 3778M


Source and crop arrangement
Insert source, temperature and crop arrangement data
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s])
Pressure is not a mandatory field because it will be authomatically changed.
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l/s])
Drawing area
Insert source position
Irrigation water temperature
T 20.0 [C]
Crop arrangement
Emitters and row spacing
a1: 1.0000 [m]
δ1: 1.0000 [m]
Emitters and lateral data
Sector #. :
Remove
Emitters Type :
Emitters spacing: 0.0 [m]
Number of rows: 0
Row spacing: 0.0 [m]
Emitters
Inline Pipe
Pipe
Secondary
Modify
Calculate
In this window you choose the type of design you want to do: fixed pressure, fixed flow rate or automatic. In the latter case the program will determine the pressure and the flow rate automatically as a function of the emitter and of the chosen geometry of the system.
< Back
Next >
Finish
Cancel
Palette
Tools
Select
Pan
Marquee
Contour Line
Elevation Point
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Delete
Ruler
Nodes
Source Node
L connection
L connection with connector
T Connection
T Connection with connector
Cross Connection
Clamp Saddle
Double Clamp Saddle
Edges
Main Pipe
Secondary Pipe
Submain Pipe
Lateral Pipe
Automatic Pipe
Custom Pipe
301M of 3778M


Source and crop arrangement
Insert source, temperature and crop arrangement data
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s])
Pressure is not a mandatory field because it will be authomatically changed.
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l/s])
Drawing area
Insert source position
T 20.0 [C]
Emitters and row spacing
a1: 1.0000 [m]
δ1: 1.0000 [m]
In the box interdistance and spacing between rows, indicate the spacing between the drop points and the distance between rows.
< Back
Next >
Finish
Cancel



This is the window that allows you to define the geometry of the field. For known forms you can choose between square, rectangle trapezium and triangle.


File Help Modify View Tools
Insert/Edit Data
Results
Source
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s])
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l/s])
Irrigation water temperature
T 20.0 [C]
Emitters and laterals data
Sector #. :
Remove
Emitters Type :
Emitters spacing: 0.0 [m]
Number of rows: 0
Row spacing: 0.0 [m]
Emitters
Inline Pipe
Pipe
Secondary
Modify
Calculate
Terrain features
Insert sector shape and slope
Shape
Sector shape
Rectangle
a: 70.000 [m]
s1: 1.000 [m]
b: 40.000 [m]
c: 5.000 [m]
e: 1.000 [m]
Laterals Angle 90.0000 [°]
Source-Sector Distance 2.000 [m]
insert source and terrain position
Drawing area
Generic sector shape
s 1.000 [m]
Laterals Angle 90.0000 [°]
Drawing area
Pipes slope
Secondary pipe
Set
Laterals slope
Choose a rectangular box and indicate the values of "a" and "b" of the sides of the rectangle and continue. To draw wings in the vertical direction of the screen let 90 ° for the angle of the laterals. Click to move forward.
< Back
Next >
Finish
Cancel
Palette
Tools
Select
Pan
Marquee
Contour Line
Elevation Point
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Delete
Ruler
Nodes
Source Node
L connection
L connection with connector
T Connection
T Connection with connector
Cross Connection
Clamp Saddle
Double Clamp Saddle
Edges
Main Pipe
Secondary Pipe
Submain Pipe
Lateral Pipe
Automatic Pipe
Custom Pipe
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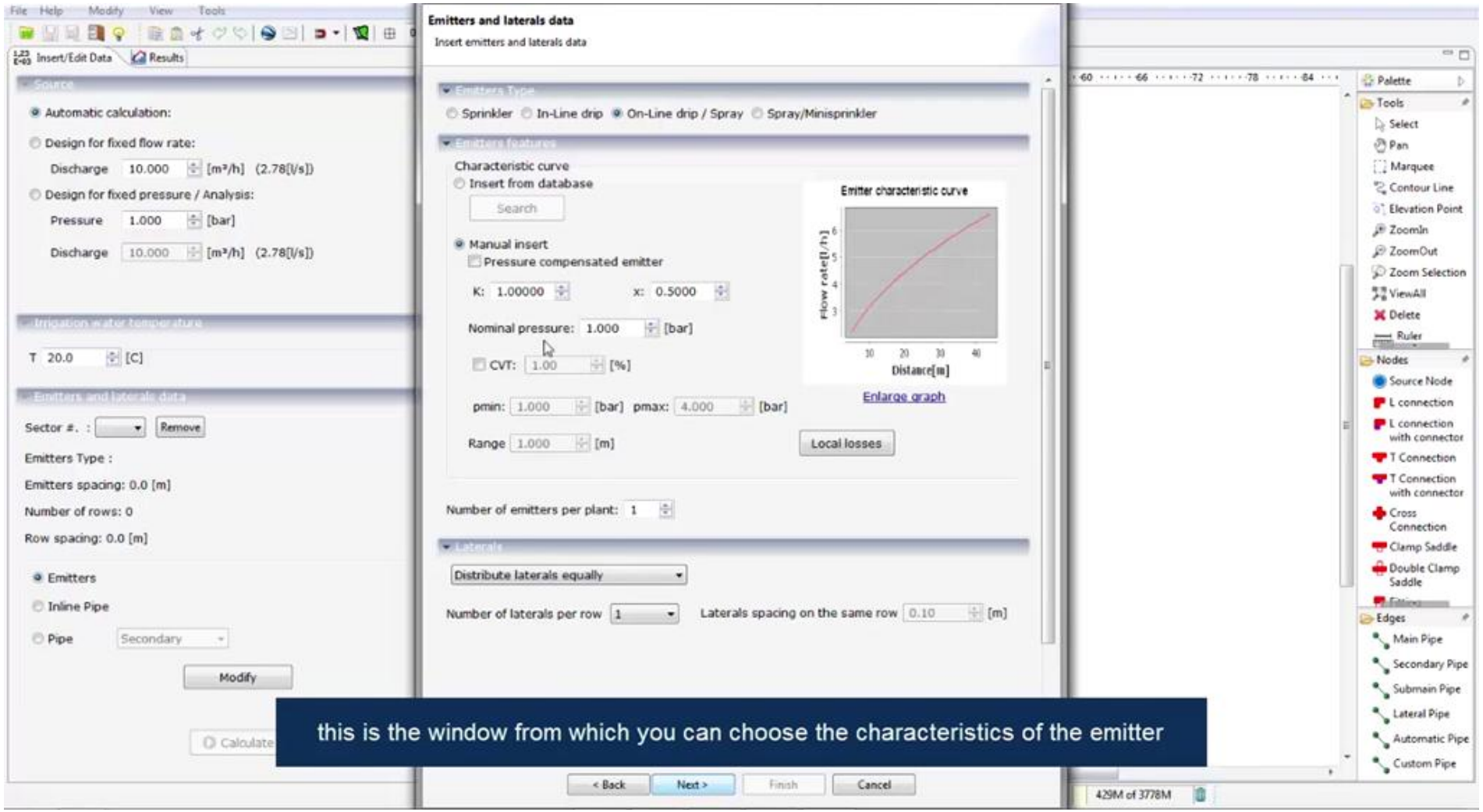
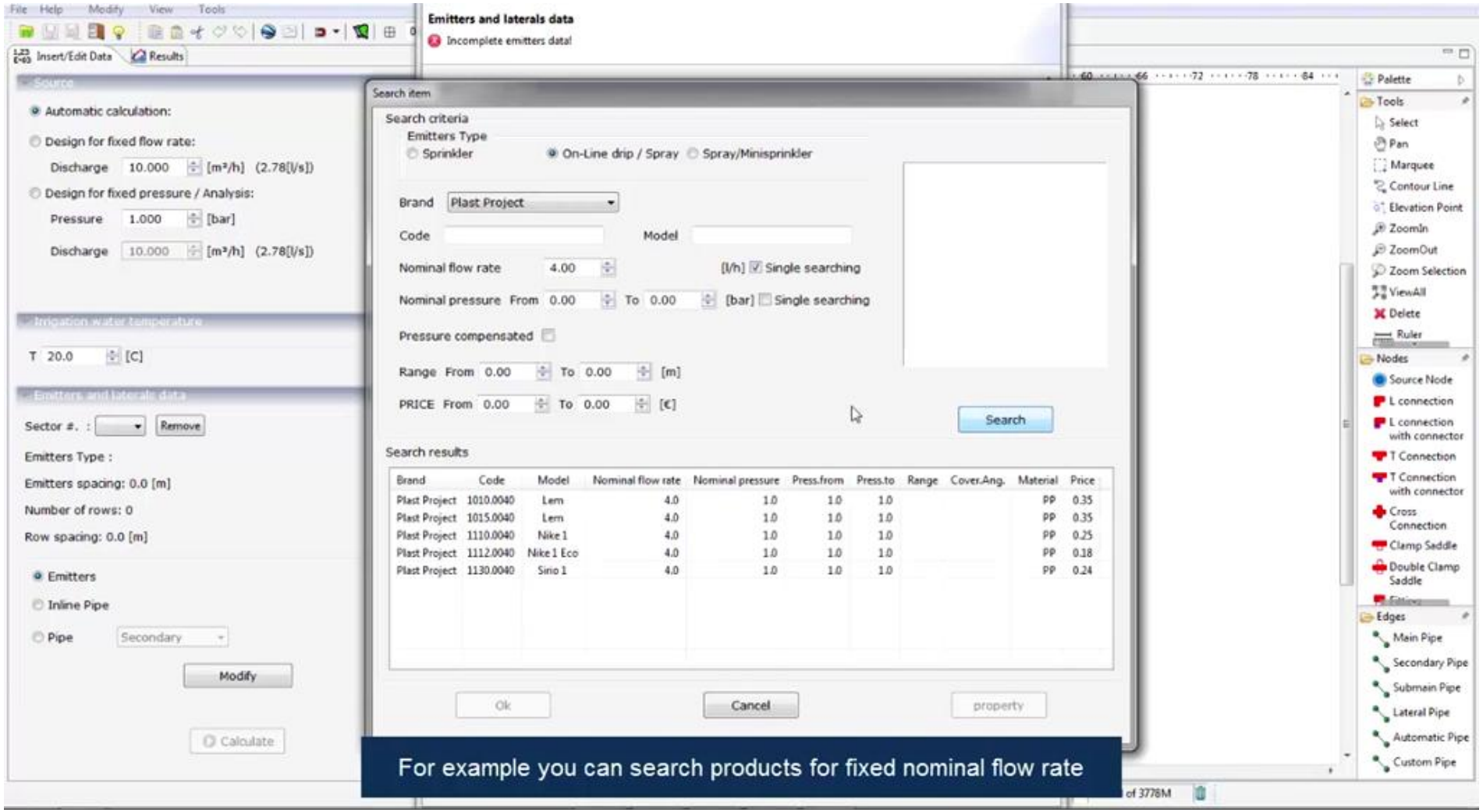
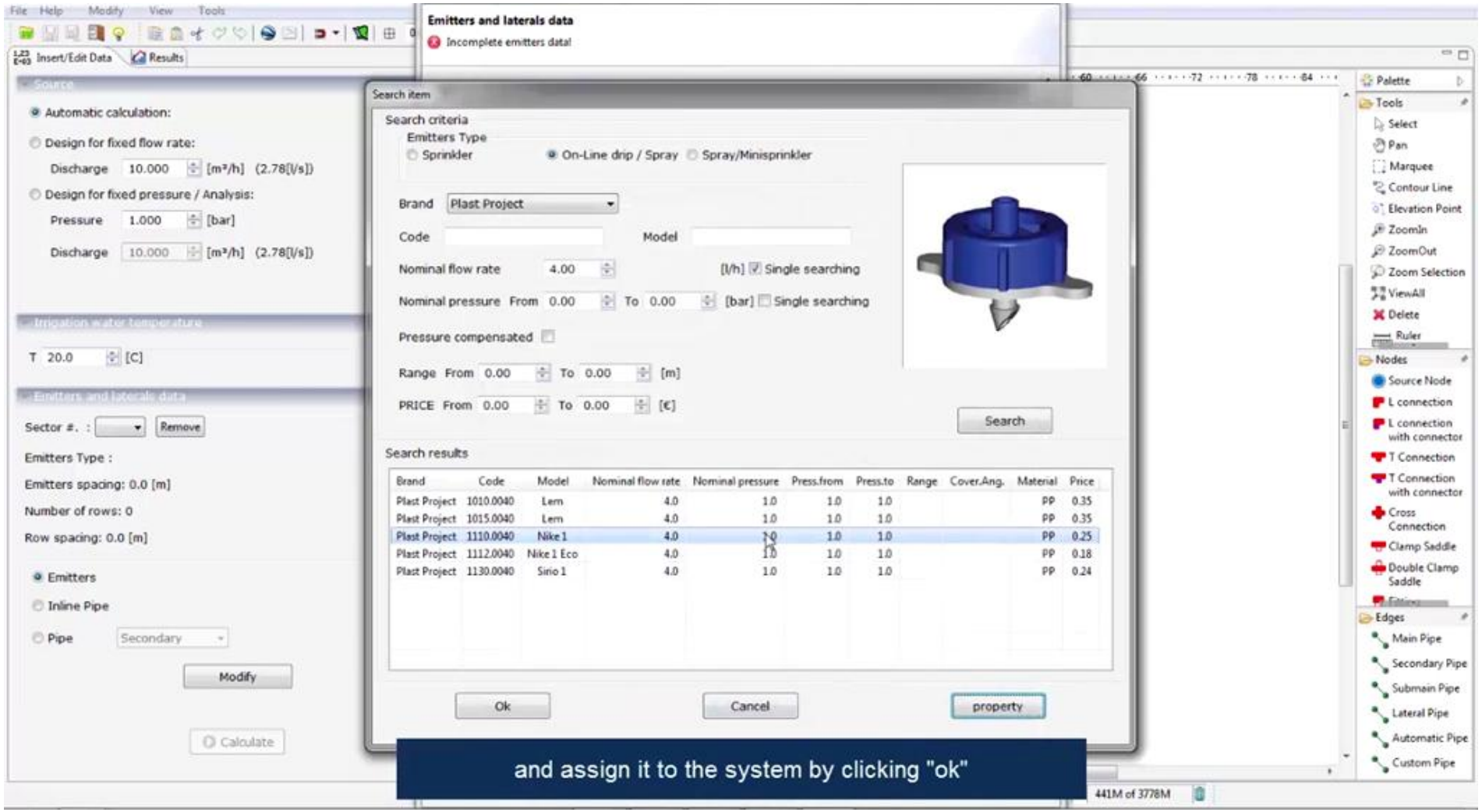
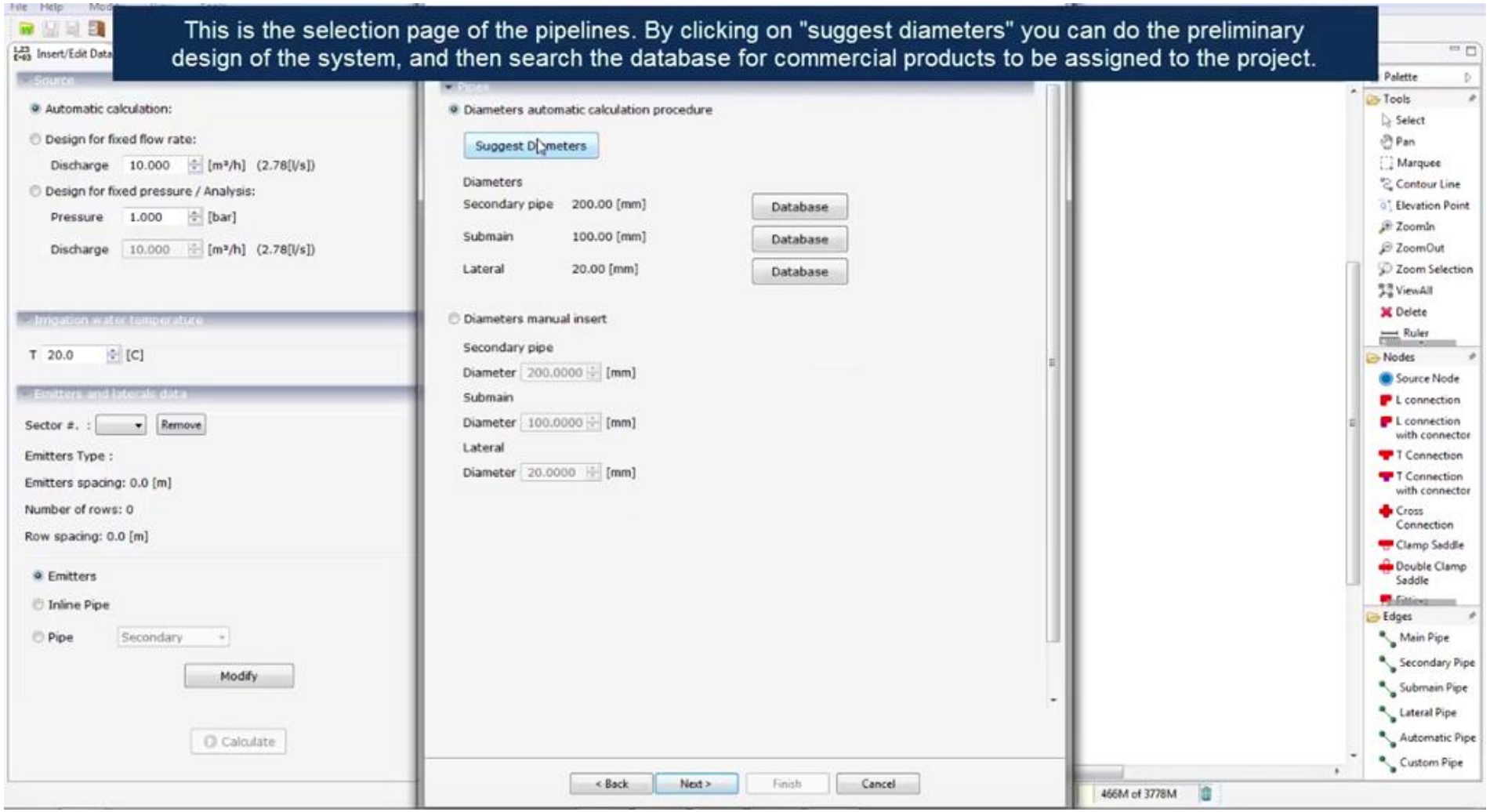


this is the window from which you can choose the characteristics of the emitter


Emitters and laterals data
Incomplete emitters data!
Search item
Search criteria
Emitters Type
Sprinkler
On-Line drip / Spray
Spray/Minisprinkler
Brand
Plast Project
Code
Model
Nominal flow rate
4.00
[l/h]
Single searching
Nominal pressure From 0.00 To 0.00 [bar]
Single searching
Pressure compensated
Range From 0.00 To 0.00 [m]
PRICE From 0.00 To 0.00 [€]
Search
Search results
Brand Code Model Nominal flow rate Nominal pressure Press.from Press.to Range Cover.Ang. Material Price
Plast Project 1010.0040 Lem 4.0 1.0 1.0 1.0 PP 0.35
Plast Project 1015.0040 Lem 4.0 1.0 1.0 1.0 PP 0.35
Plast Project 1110.0040 Nike 1 4.0 1.0 1.0 1.0 PP 0.25
Plast Project 1112.0040 Nike 1 Eco 4.0 1.0 1.0 1.0 PP 0.18
Plast Project 1130.0040 Sirio 1 4.0 1.0 1.0 1.0 PP 0.24
Ok
Cancel
property
Insert/Edit Data
Results
Source
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s])
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l/s])
Irrigation water temperature
T 20.0 [C]
Emitters and laterals data
Sector #. :
Remove
Emitters Type :
Emitters spacing: 0.0 [m]
Number of rows: 0
Row spacing: 0.0 [m]
Emitters
Inline Pipe
Pipe
Secondary
Modify
Calculate
Palette
Tools
Select
Pan
Marquee
Contour Line
Elevation Point
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Delete
Ruler
Nodes
Source Node
L connection
L connection with connector
T Connection
T Connection with connector
Cross Connection
Clamp Saddle
Double Clamp Saddle
Edges
Main Pipe
Secondary Pipe
Submain Pipe
Lateral Pipe
Automatic Pipe
Custom Pipe
For example you can search products for fixed nominal flow rate



and assign it to the system by clicking "ok"


This is the selection page of the pipelines. By clicking on "suggest diameters" you can do the preliminary design of the system, and then search the database for commercial products to be assigned to the project.
Insert/Edit Data
Source
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s])
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l/s])
Irrigation water temperature
T 20.0 [C]
Emitters and lateral data
Sector #. :
Remove
Emitters Type :
Emitters spacing: 0.0 [m]
Number of rows: 0
Row spacing: 0.0 [m]
Emitters
Inline Pipe
Pipe
Secondary
Modify
Calculate
Pipes
Diameters automatic calculation procedure
Suggest Diameters
Diameters
Secondary pipe 200.00 [mm]
Submain 100.00 [mm]
Lateral 20.00 [mm]
Database
Database
Database
Diameters manual insert
Secondary pipe
Diameter 200.0000 [mm]
Submain
Diameter 100.0000 [mm]
Lateral
Diameter 20.0000 [mm]
< Back
Next >
Finish
Cancel
Palette
Tools
Select
Pan
Marquee
Contour Line
Elevation Point
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Delete
Ruler
Nodes
Source Node
L connection
L connection with connector
T Connection
T Connection with connector
Cross Connection
Clamp Saddle
Double Clamp Saddle
Edges
Main Pipe
Secondary Pipe
Submain Pipe
Lateral Pipe
Automatic Pipe
Custom Pipe
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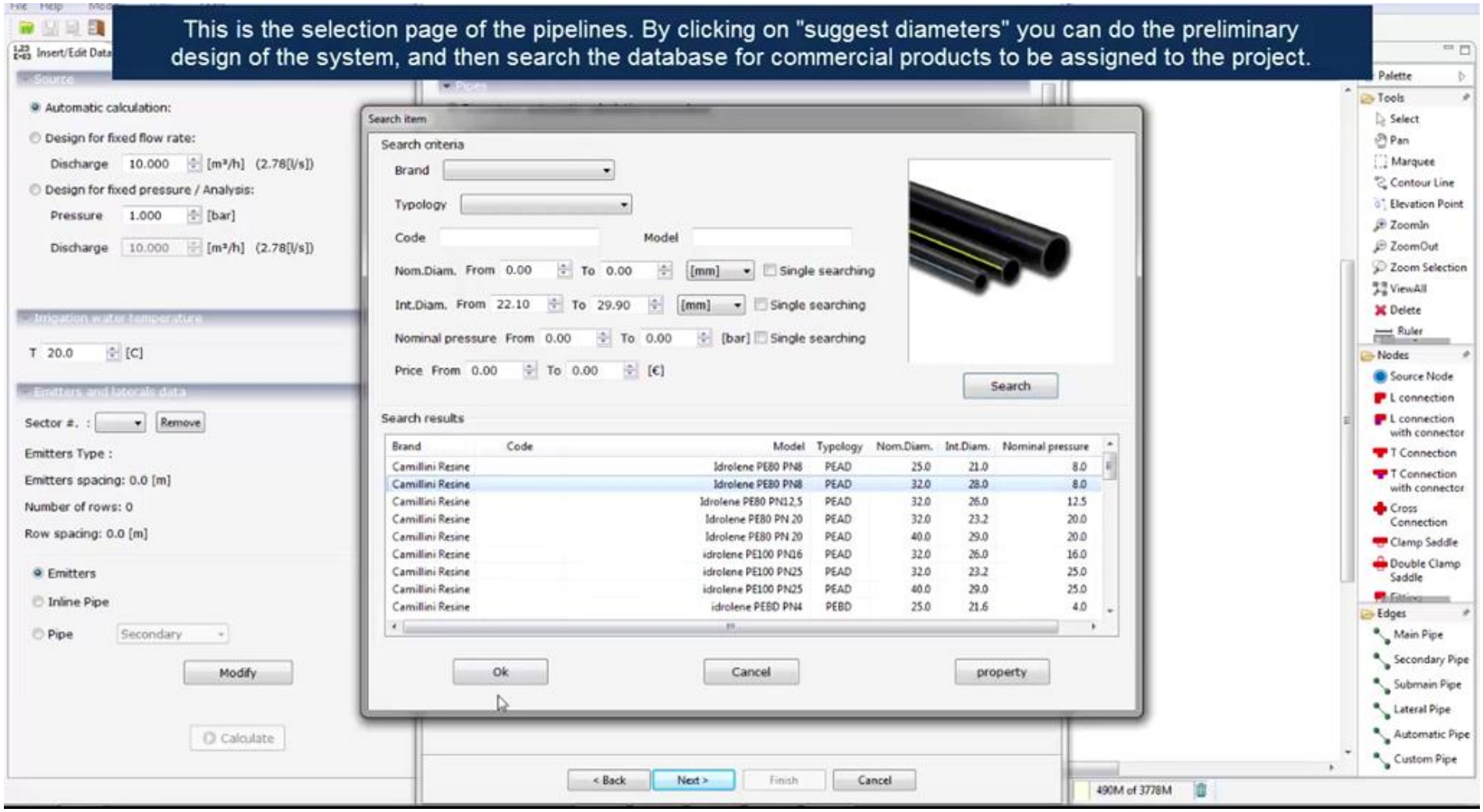
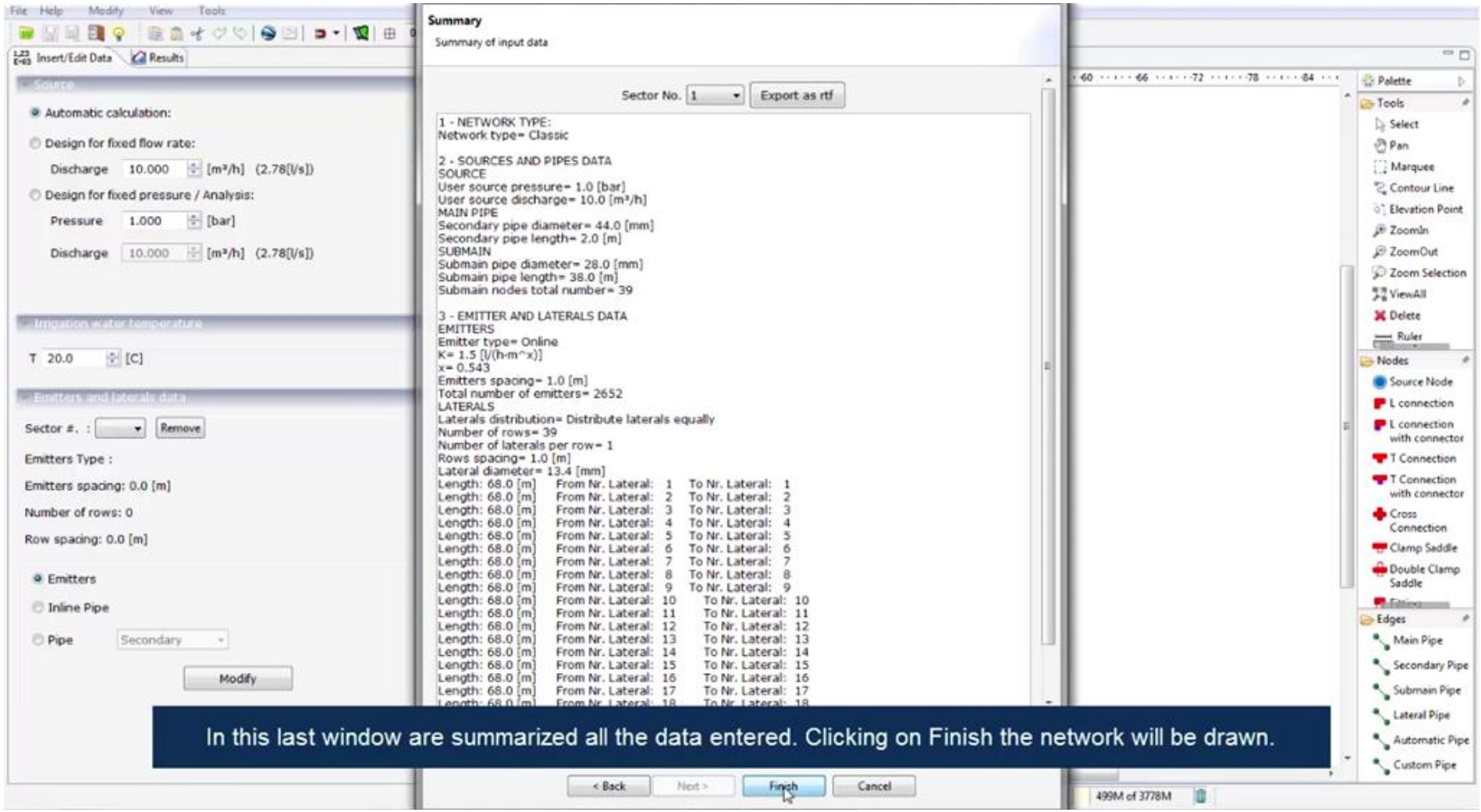
This is the selection page of the pipelines. By clicking on "suggest diameters" you can do the preliminary design of the system, and then search the database for commercial products to be assigned to the project.




File Help Modify View Tools
Insert/Edit Data
Results
Source
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s])
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l/s])
Irrigation water temperature
T 20.0 [C]
Emitters and laterals data
Sector #. :
Remove
Emitters Type :
Emitters spacing: 0.0 [m]
Number of rows: 0
Row spacing: 0.0 [m]
Emitters
Inline Pipe
Pipe
Secondary
Modify
Summary
Summary of input data
Sector No. 1
Export as rtf
1 - NETWORK TYPE:
Network type= Classic
2 - SOURCES AND PIPES DATA
SOURCE
User source pressure= 1.0 [bar]
User source discharge= 10.0 [m³/h]
MAIN PIPE
Secondary pipe diameter= 44.0 [mm]
Secondary pipe length= 2.0 [m]
SUBMAIN
Submain pipe diameter= 28.0 [mm]
Submain pipe length= 38.0 [m]
Submain nodes total number= 39
3 - EMITTER AND LATERALS DATA
EMITTERS
Emitter type= Online
K= 1.5 [l/(h·m^x)]
x= 0.543
Emitters spacing= 1.0 [m]
Total number of emitters= 2652
LATERALS
Laterals distribution= Distribute laterals equally
Number of rows= 39
Number of laterals per row= 1
Rows spacing= 1.0 [m]
Lateral diameter= 13.4 [mm]
Length: 68.0 [m] From Nr. Lateral: 1 To Nr. Lateral: 1
Length: 68.0 [m] From Nr. Lateral: 2 To Nr. Lateral: 2
Length: 68.0 [m] From Nr. Lateral: 3 To Nr. Lateral: 3
Length: 68.0 [m] From Nr. Lateral: 4 To Nr. Lateral: 4
Length: 68.0 [m] From Nr. Lateral: 5 To Nr. Lateral: 5
Length: 68.0 [m] From Nr. Lateral: 6 To Nr. Lateral: 6
Length: 68.0 [m] From Nr. Lateral: 7 To Nr. Lateral: 7
Length: 68.0 [m] From Nr. Lateral: 8 To Nr. Lateral: 8
Length: 68.0 [m] From Nr. Lateral: 9 To Nr. Lateral: 9
Length: 68.0 [m] From Nr. Lateral: 10 To Nr. Lateral: 10
Length: 68.0 [m] From Nr. Lateral: 11 To Nr. Lateral: 11
Length: 68.0 [m] From Nr. Lateral: 12 To Nr. Lateral: 12
Length: 68.0 [m] From Nr. Lateral: 13 To Nr. Lateral: 13
Length: 68.0 [m] From Nr. Lateral: 14 To Nr. Lateral: 14
Length: 68.0 [m] From Nr. Lateral: 15 To Nr. Lateral: 15
Length: 68.0 [m] From Nr. Lateral: 16 To Nr. Lateral: 16
Length: 68.0 [m] From Nr. Lateral: 17 To Nr. Lateral: 17
Length: 68.0 [m] From Nr. Lateral: 18 To Nr. Lateral: 18
In this last window are summarized all the data entered. Clicking on Finish the network will be drawn.
< Back
Next >
Finish
Cancel
Palette
Tools
Select
Pan
Marquee
Contour Line
Elevation Point
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Delete
Ruler
Nodes
Source Node
L connection
L connection with connector
T Connection
T Connection with connector
Cross Connection
Clamp Saddle
Double Clamp Saddle
Edges
Main Pipe
Secondary Pipe
Submain Pipe
Lateral Pipe
Automatic Pipe
Custom Pipe
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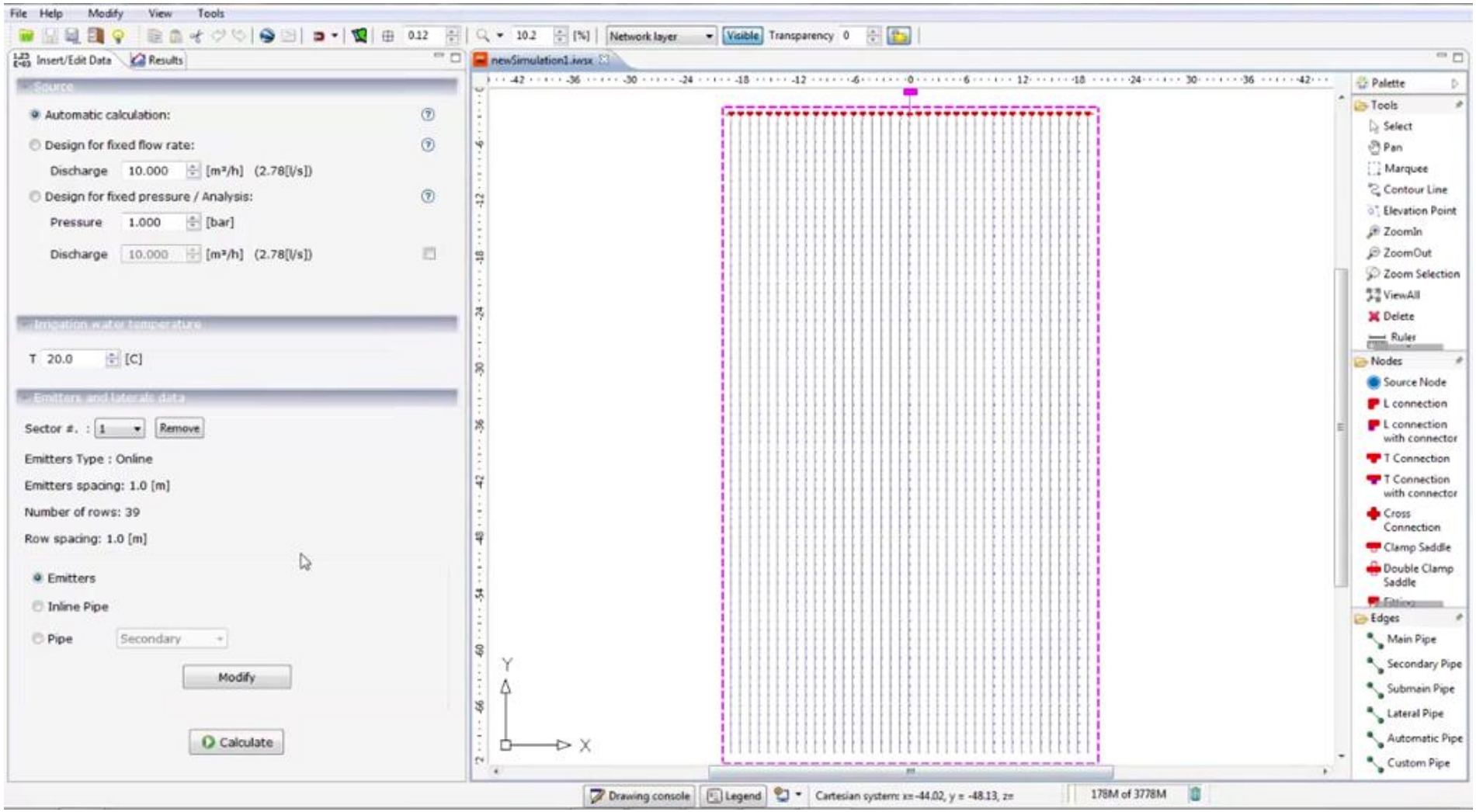
File Help Modify View Tools
Insert/Edit Data
Results
Source
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s])
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l/s])
Irrigation water temperature
T 20.0 [C]
Emitters and lateral data
Sector #. : 1
Remove
Emitters Type : Online
Emitters spacing: 1.0 [m]
Number of rows: 39
Row spacing: 1.0 [m]
Emitters
Inline Pipe
Pipe
Secondary
Modify
Calculate
newSimulation1.iwsx
Network layer
Visible
Transparency
Palette
Tools
Select
Pan
Marquee
Contour Line
Elevation Point
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Delete
Ruler
Nodes
Source Node
L connection
L connection with connector
T Connection
T Connection with connector
Cross Connection
Clamp Saddle
Double Clamp Saddle
Edges
Main Pipe
Secondary Pipe
Submain Pipe
Lateral Pipe
Automatic Pipe
Custom Pipe
Drawing console
Legend
Cartesian system: x=-44.02, y = -48.13, z=
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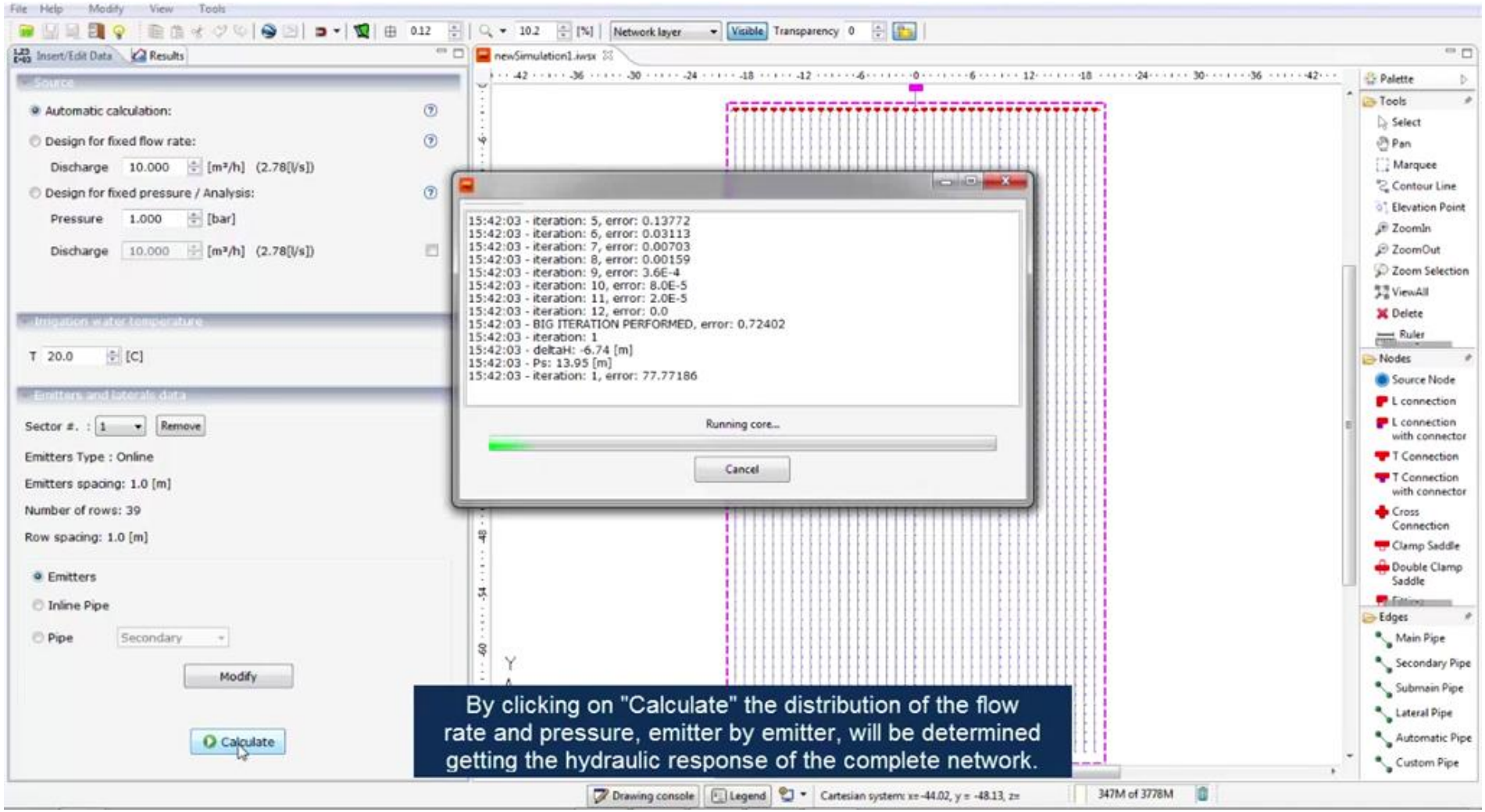
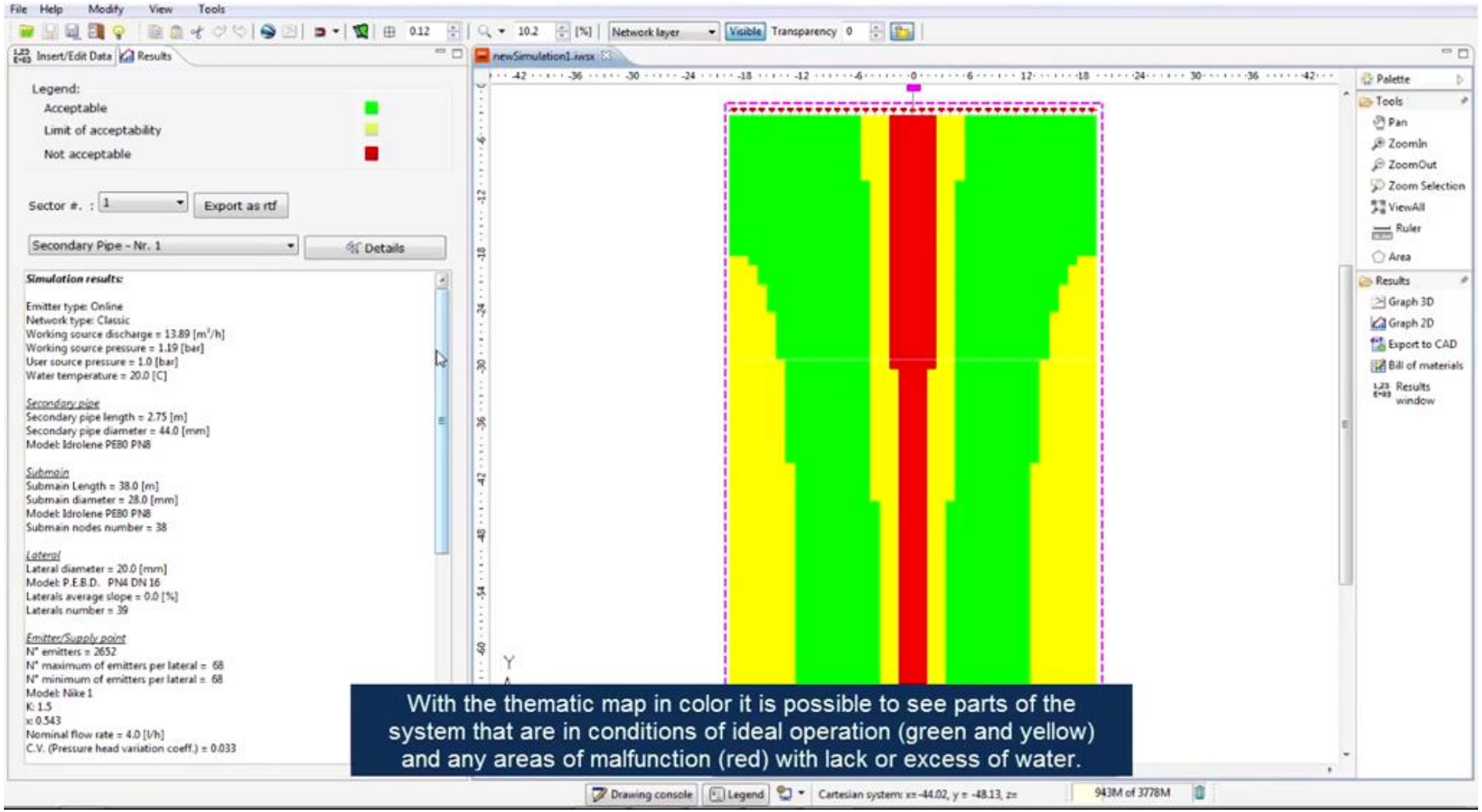
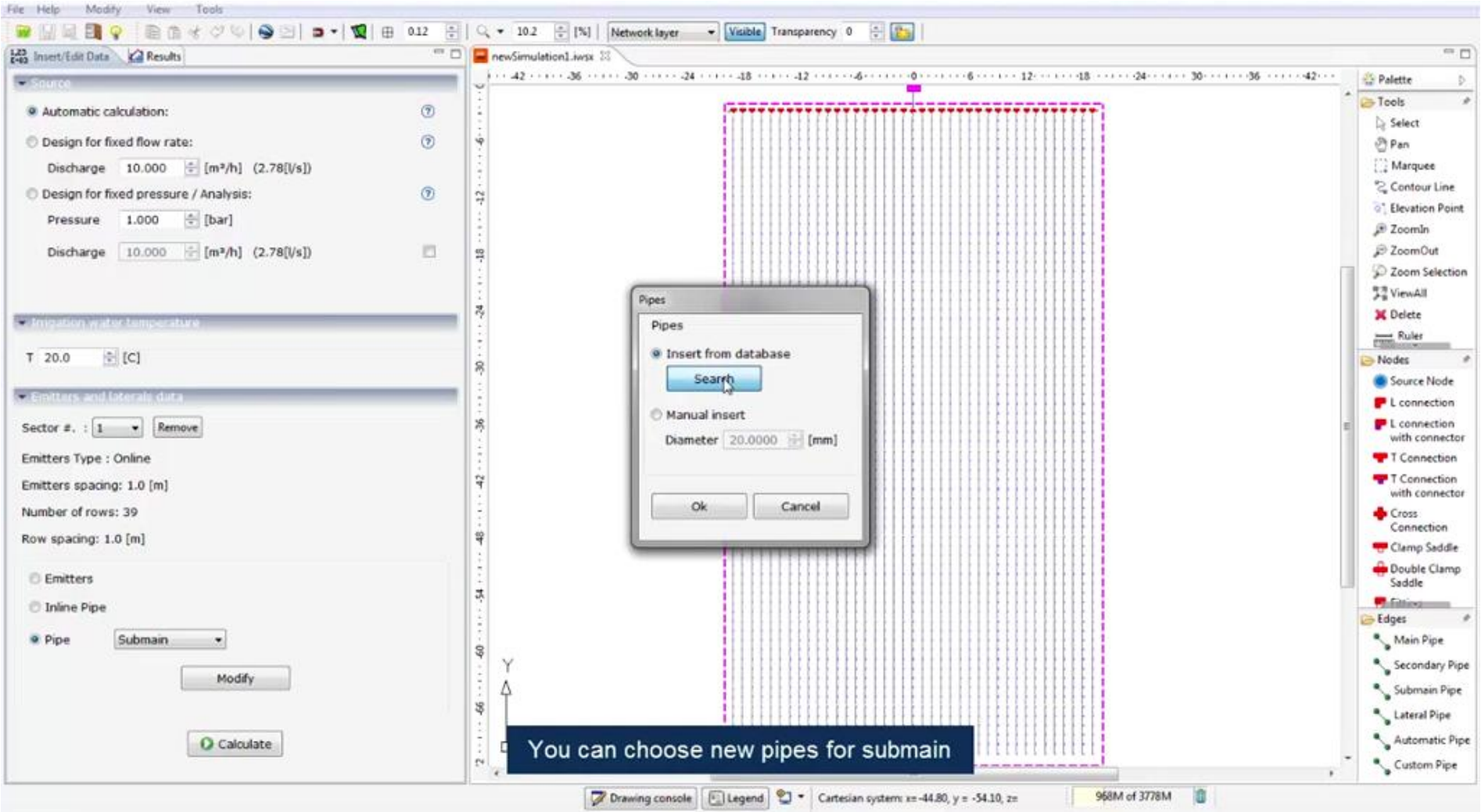


By clicking on "Calculate" the distribution of the flow rate and pressure, emitter by emitter, will be determined getting the hydraulic response of the complete network.



With the thematic map in color it is possible to see parts of the system that are in conditions of ideal operation (green and yellow) and any areas of malfunction (red) with lack or excess of water.


File Help Modify View Tools
Insert/Edit Data
Results
Source
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s])
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l/s])
Irrigation water temperature
T 20.0 [C]
Emitters and laterals data
Sector #. : 1
Remove
Emitters Type : Online
Emitters spacing: 1.0 [m]
Number of rows: 39
Row spacing: 1.0 [m]
Emitters
Inline Pipe
Pipe
Submain
Modify
Calculate
newSimulation1.iwsx
Pipes
Insert from database
Search
Manual insert
Diameter 20.0000 [mm]
Ok
Cancel
You can choose new pipes for submain
Palette
Tools
Select
Pan
Marquee
Contour Line
Elevation Point
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Delete
Ruler
Nodes
Source Node
L connection
L connection with connector
T Connection
T Connection with connector
Cross Connection
Clamp Saddle
Double Clamp Saddle
Edges
Main Pipe
Secondary Pipe
Submain Pipe
Lateral Pipe
Automatic Pipe
Custom Pipe
Drawing console
Legend
Cartesian system: x=-44.80, y = -54.10, z=
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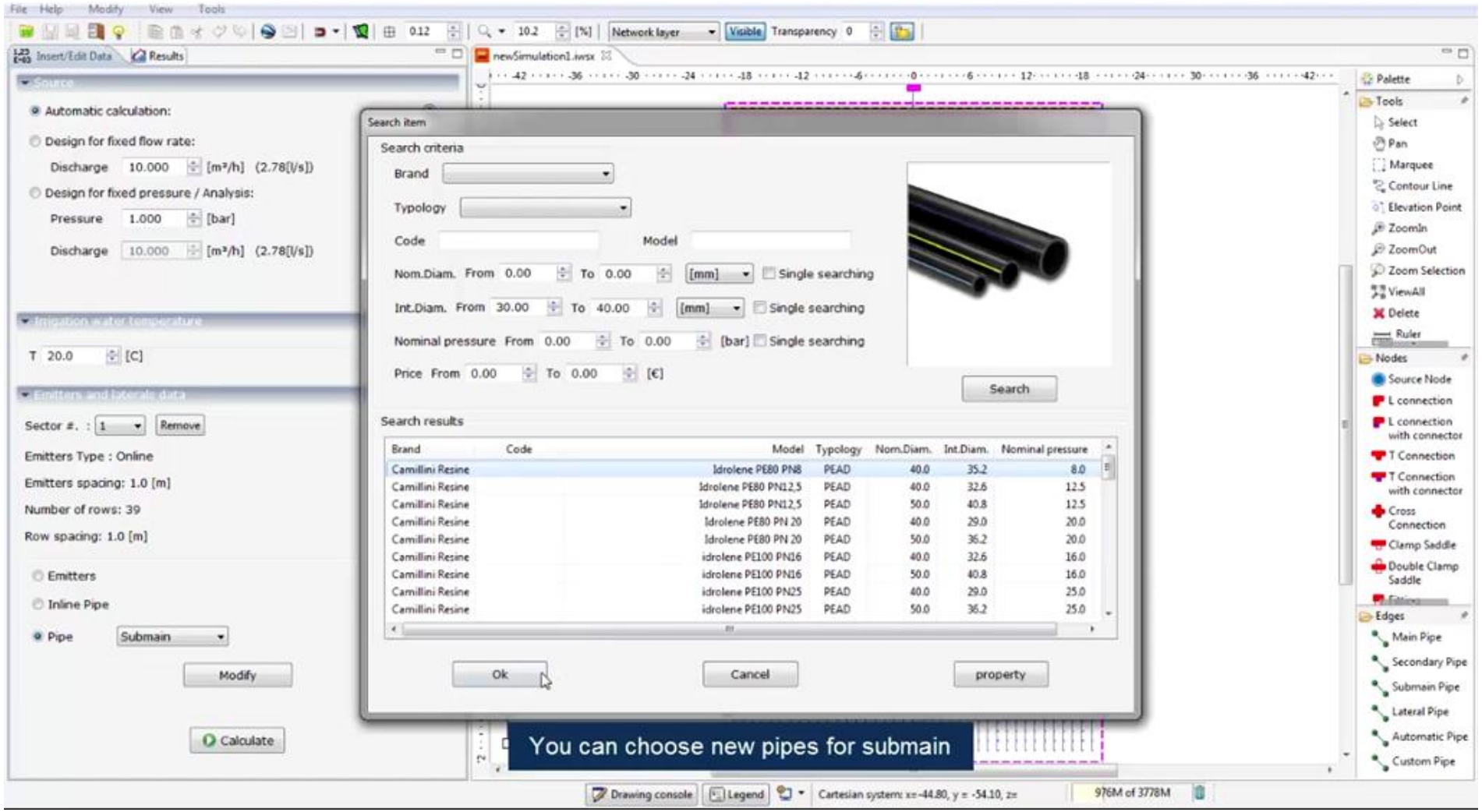
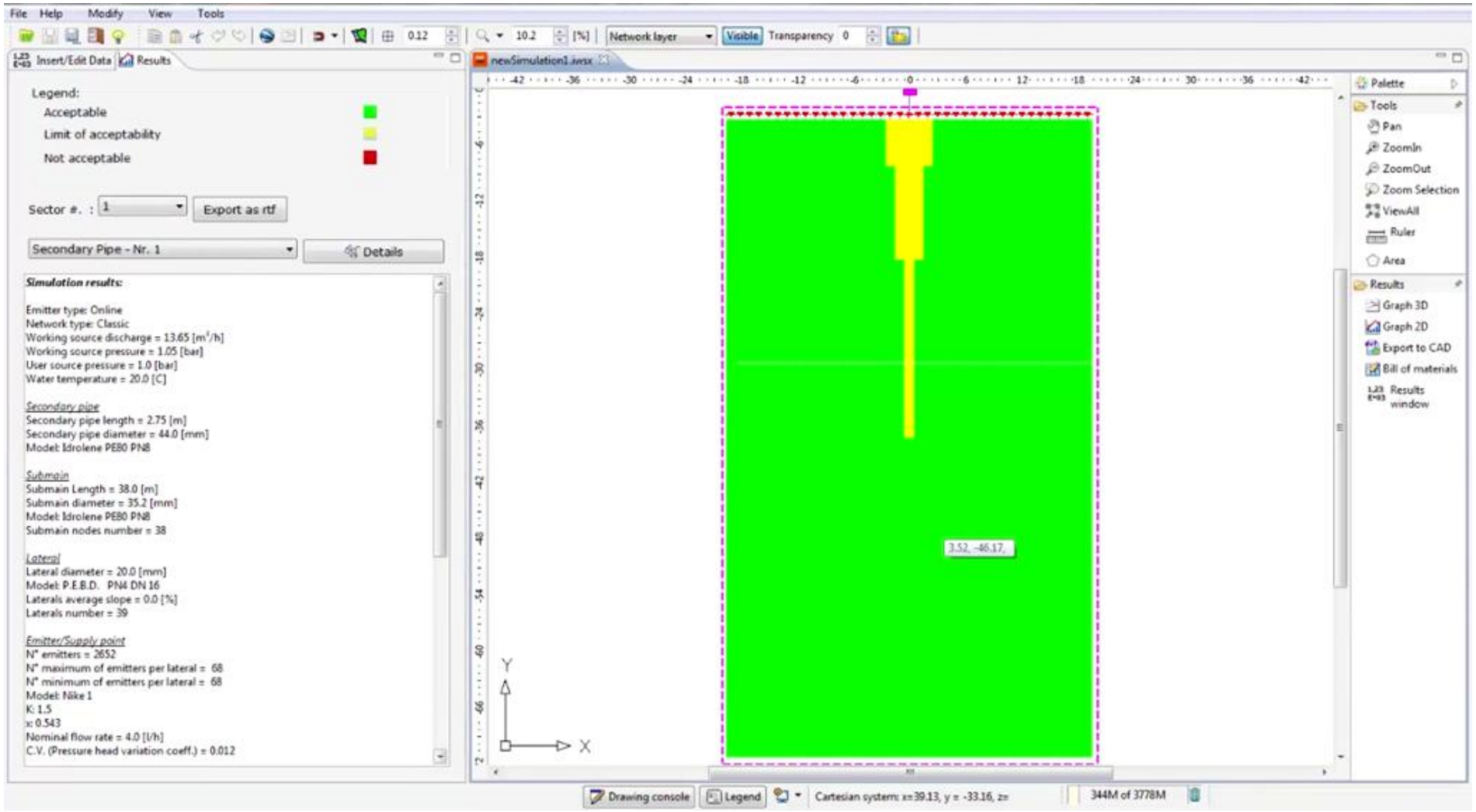
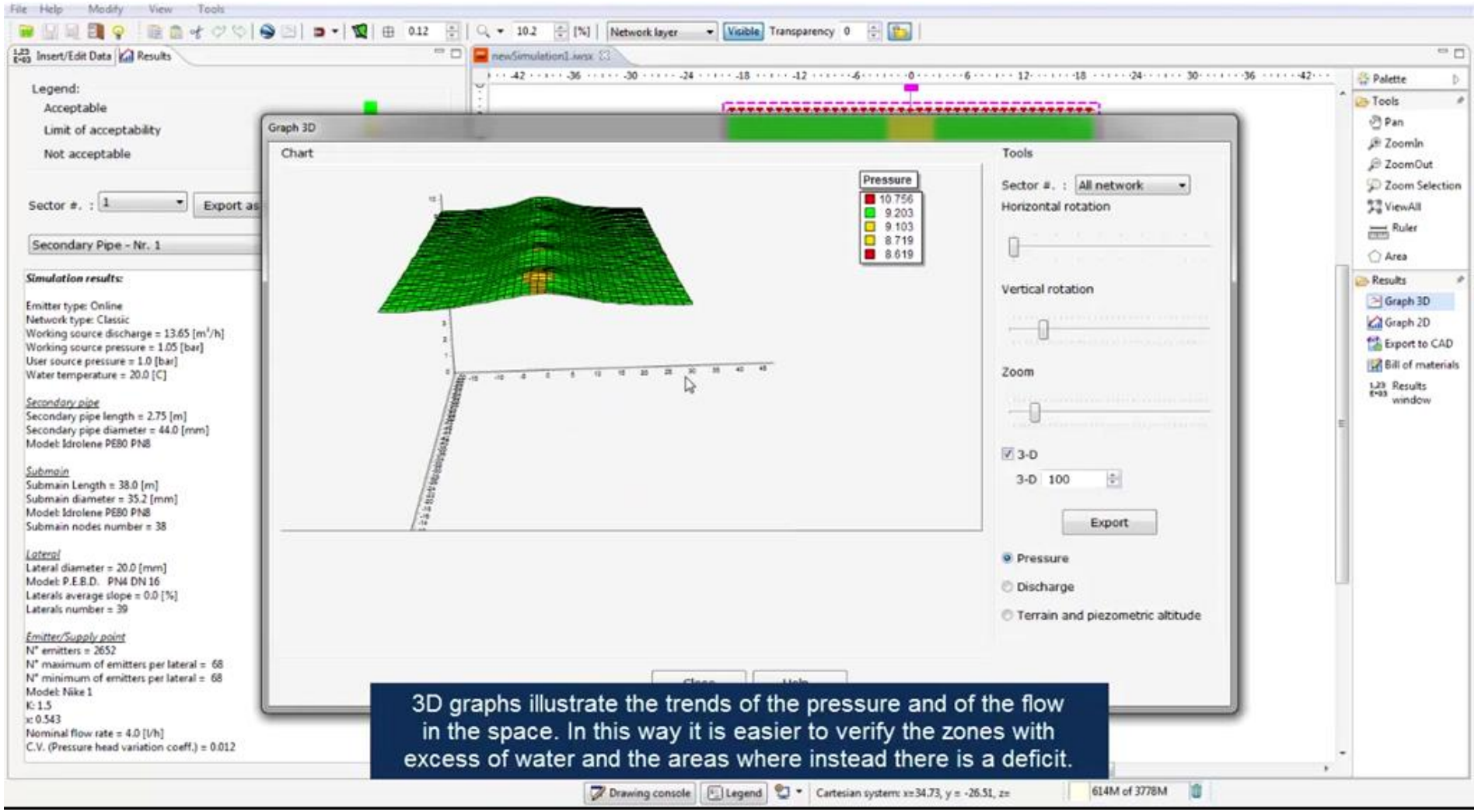
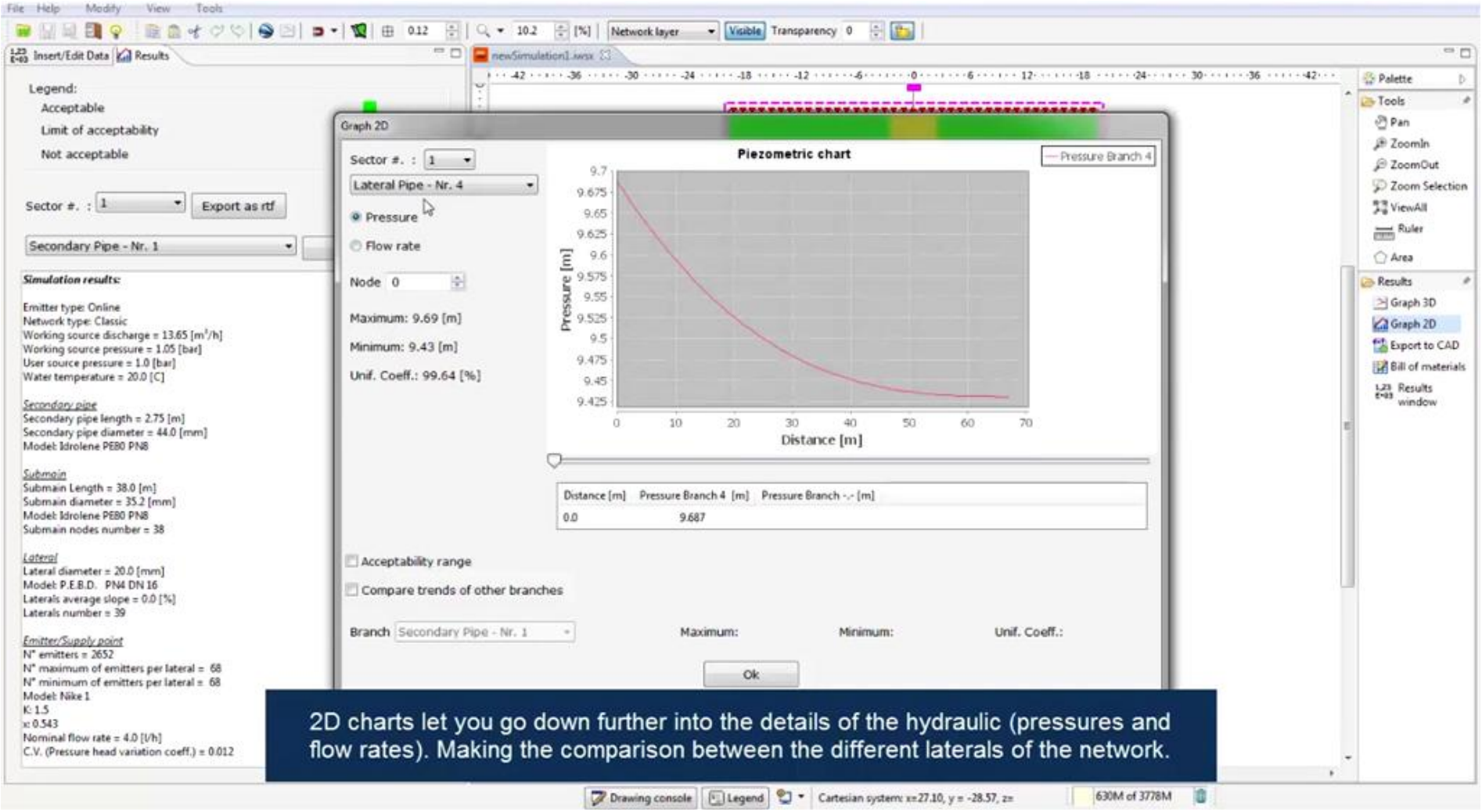
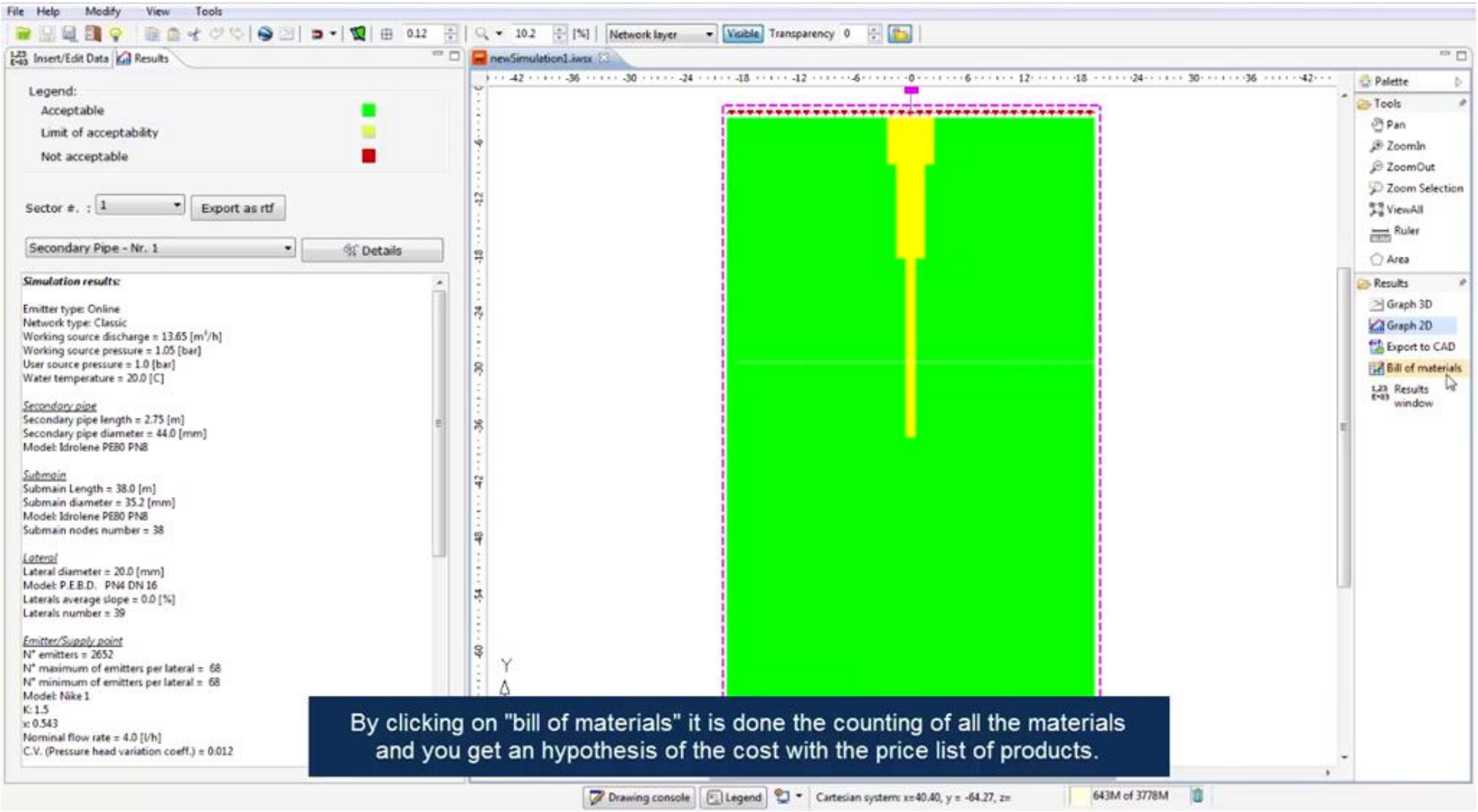

Search item
Search criteria
Brand
Typology
Code
Model
Nom.Diam. From 0.00 To 0.00 [mm] Single searching
Int.Diam. From 30.00 To 40.00 [mm] Single searching
Nominal pressure From 0.00 To 0.00 [bar] Single searching
Price From 0.00 To 0.00 [€]
Search
Search results
Brand Code Model Typology Nom.Diam. Int.Diam. Nominal pressure
Camillini Resine Idrolene PE80 PN8 PEAD 40.0 35.2 8.0
Camillini Resine Idrolene PE80 PN12,5 PEAD 40.0 32.6 12.5
Camillini Resine Idrolene PE80 PN12,5 PEAD 50.0 40.8 12.5
Camillini Resine Idrolene PE80 PN 20 PEAD 40.0 29.0 20.0
Camillini Resine Idrolene PE80 PN 20 PEAD 50.0 36.2 20.0
Camillini Resine idrolene PE100 PN16 PEAD 40.0 32.6 16.0
Camillini Resine idrolene PE100 PN16 PEAD 50.0 40.8 16.0
Camillini Resine idrolene PE100 PN25 PEAD 40.0 29.0 25.0
Camillini Resine idrolene PE100 PN25 PEAD 50.0 36.2 25.0
Ok
Cancel
property
Automatic calculation:
Design for fixed flow rate:
Discharge 10.000 [m³/h] (2.78[l/s])
Design for fixed pressure / Analysis:
Pressure 1.000 [bar]
Discharge 10.000 [m³/h] (2.78[l/s])
T 20.0 [C]
Sector #. : 1 Remove
Emitters Type : Online
Emitters spacing: 1.0 [m]
Number of rows: 39
Row spacing: 1.0 [m]
Emitters
Inline Pipe
Pipe Submain
Modify
Calculate
You can choose new pipes for submain


File Help Modify View Tools
Insert/Edit Data
Results
Legend:
Acceptable
Limit of acceptability
Not acceptable
Sector #. : 1
Export as rtf
Secondary Pipe - Nr. 1
Details
Simulation results:
Emitter type: Online
Network type: Classic
Working source discharge = 13.65 [m³/h]
Working source pressure = 1.05 [bar]
User source pressure = 1.0 [bar]
Water temperature = 20.0 [C]
Secondary pipe
Secondary pipe length = 2.75 [m]
Secondary pipe diameter = 44.0 [mm]
Model: Idrolene PE80 PN8
Submain
Submain Length = 38.0 [m]
Submain diameter = 35.2 [mm]
Model: Idrolene PE80 PN8
Submain nodes number = 38
Lateral
Lateral diameter = 20.0 [mm]
Model: P.E.B.D. PN4 DN 16
Laterals average slope = 0.0 [%]
Laterals number = 39
Emitter/Supply point
N° emitters = 2652
N° maximum of emitters per lateral = 68
N° minimum of emitters per lateral = 68
Model: Nike 1
K: 1.5
x: 0.543
Nominal flow rate = 4.0 [l/h]
C.V. (Pressure head variation coeff.) = 0.012
newSimulation1.iwsx
Network layer
Visible
Transparency
3.52, -46.17,
Y
X
Palette
Tools
Pan
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Ruler
Area
Results
Graph 3D
Graph 2D
Export to CAD
Bill of materials
Results window
Drawing console
Legend
Cartesian system: x=39.13, y = -33.16, z=
344M of 3778M

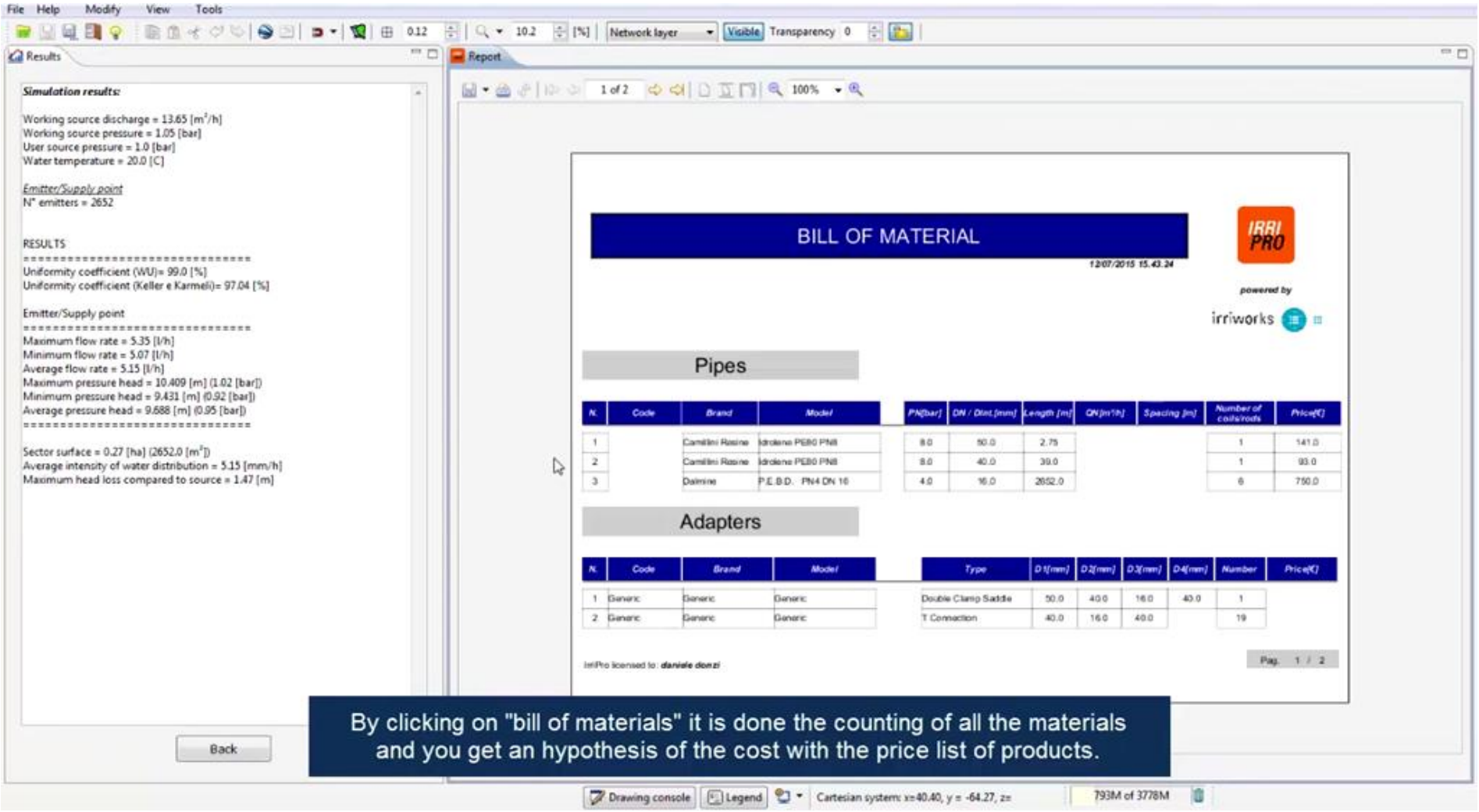


3D graphs illustrate the trends of the pressure and of the flow in the space. In this way it is easier to verify the zones with excess of water and the areas where instead there is a deficit.

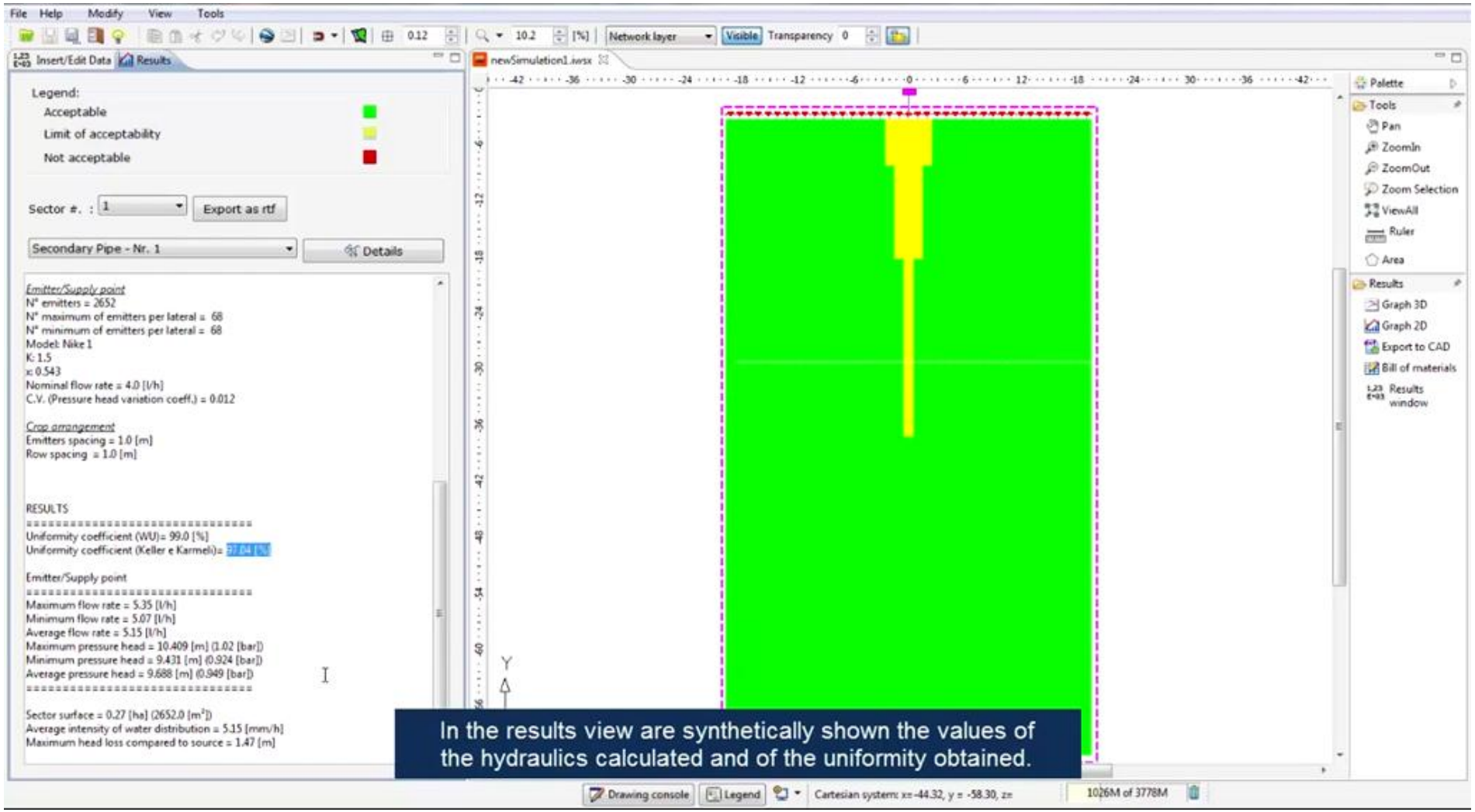

Graph 2D
Sector #. : 1
Lateral Pipe - Nr. 4
Pressure
Flow rate
Node 0
Maximum: 9.69 [m]
Minimum: 9.43 [m]
Unif. Coeff.: 99.64 [%]
Piezometric chart
Pressure Branch 4
Pressure [m]
Distance [m]
Distance [m] Pressure Branch 4 [m] Pressure Branch -.- [m]
0.0 9.687
Acceptability range
Compare trends of other branches
Branch Secondary Pipe - Nr. 1
Maximum:
Minimum:
Unif. Coeff.:
Ok
Legend:
Acceptable
Limit of acceptability
Not acceptable
Export as rtf
Secondary Pipe - Nr. 1
Simulation results:
Emitter type: Online
Network type: Classic
Working source discharge = 13.65 [m³/h]
Working source pressure = 1.05 [bar]
User source pressure = 1.0 [bar]
Water temperature = 20.0 [C]
Secondary pipe
Secondary pipe length = 2.75 [m]
Secondary pipe diameter = 44.0 [mm]
Model: Idrolene PE80 PN8
Submain
Submain Length = 38.0 [m]
Submain diameter = 35.2 [mm]
Model: Idrolene PE80 PN8
Submain nodes number = 38
Lateral
Lateral diameter = 20.0 [mm]
Model: P.E.B.D. PN4 DN 16
Laterals average slope = 0.0 [%]
Laterals number = 39
Emitter/Supply point
N° emitters = 2652
N° maximum of emitters per lateral = 68
N° minimum of emitters per lateral = 68
Model: Nike 1
K: 1.5
x: 0.543
Nominal flow rate = 4.0 [l/h]
C.V. (Pressure head variation coeff.) = 0.012
2D charts let you go down further into the details of the hydraulic (pressures and flow rates). Making the comparison between the different laterals of the network.



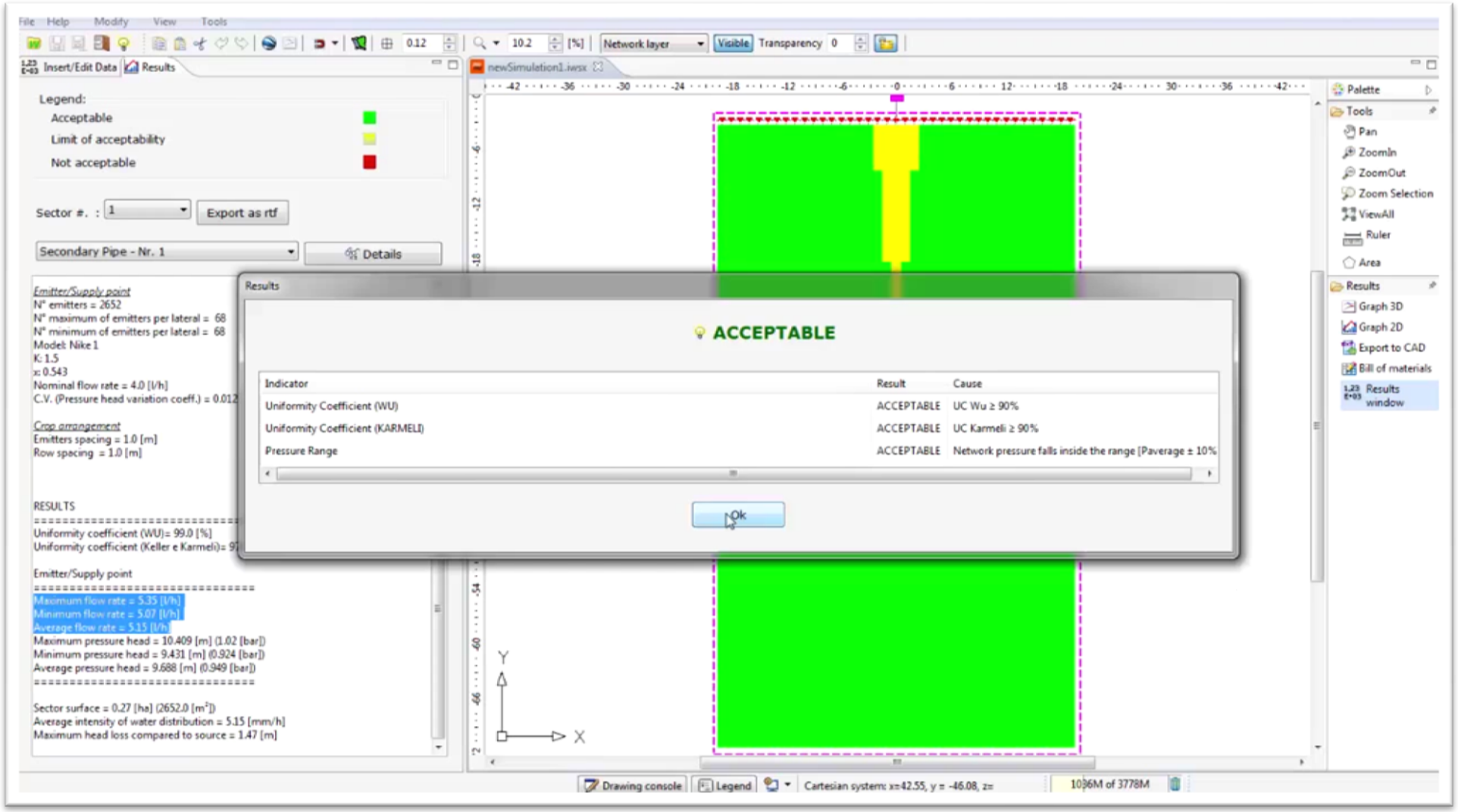
By clicking on "bill of materials" it is done the counting of all the materials and you get an hypothesis of the cost with the price list of products.



By clicking on "bill of materials" it is done the counting of all the materials and you get an hypothesis of the cost with the price list of products.



In the results view are synthetically shown the values of the hydraulics calculated and of the uniformity obtained.


File Help Modify View Tools
Insert/Edit Data
Results
Legend:
Acceptable
Limit of acceptability
Not acceptable
Sector #. : 1
Export as rtf
Secondary Pipe - Nr. 1
Details
Emitter/Supply point
N° emitters = 2652
N° maximum of emitters per lateral = 68
N° minimum of emitters per lateral = 68
Model: Nike 1
K: 1.5
x: 0.543
Nominal flow rate = 4.0 [l/h]
C.V. (Pressure head variation coeff.) = 0.012
Crop arrangement
Emitters spacing = 1.0 [m]
Row spacing = 1.0 [m]
RESULTS
Uniformity coefficient (WU)= 99.0 [%]
Uniformity coefficient (Keller e Karmeli)= 97
Emitter/Supply point
Maximum flow rate = 5.35 [l/h]
Minimum flow rate = 5.07 [l/h]
Average flow rate = 5.15 [l/h]
Maximum pressure head = 10.409 [m] (1.02 [bar])
Minimum pressure head = 9.431 [m] (0.924 [bar])
Average pressure head = 9.688 [m] (0.949 [bar])
Sector surface = 0.27 [ha] (2652.0 [m²])
Average intensity of water distribution = 5.15 [mm/h]
Maximum head loss compared to source = 1.47 [m]
newSimulation1.iwsx
Network layer
Visible
Transparency
Results
ACCEPTABLE
Indicator
Result
Cause
Uniformity Coefficient (WU)
ACCEPTABLE
UC Wu ≥ 90%
Uniformity Coefficient (KARMELI)
ACCEPTABLE
UC Karmeli ≥ 90%
Pressure Range
ACCEPTABLE
Network pressure falls inside the range [Paverage ± 10%
Ok
Palette
Tools
Pan
ZoomIn
ZoomOut
Zoom Selection
ViewAll
Ruler
Area
Results
Graph 3D
Graph 2D
Export to CAD
Bill of materials
Results window
Drawing console
Legend
Cartesian system: x=42.55, y = -46.08, z=
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