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CONNECTICUT
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AEC Applications – Division of Facilities & Transit

CT DOT *StormCAD* V8i with *MicroStation* V8i Start-up Workflow

AEC APPLICATIONS

CTDOT StormCAD V8i with MicroStation V8i Start-Up Workflow

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Thanks !

Thanks go to all that contributed to the creation of this document, especially to Nick Langer for his drainage expertise and to Charles Grillo for his review of this workflow. It is greatly appreciated.

Gabriele Hallock

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What Bentley StormCAD version do I have?

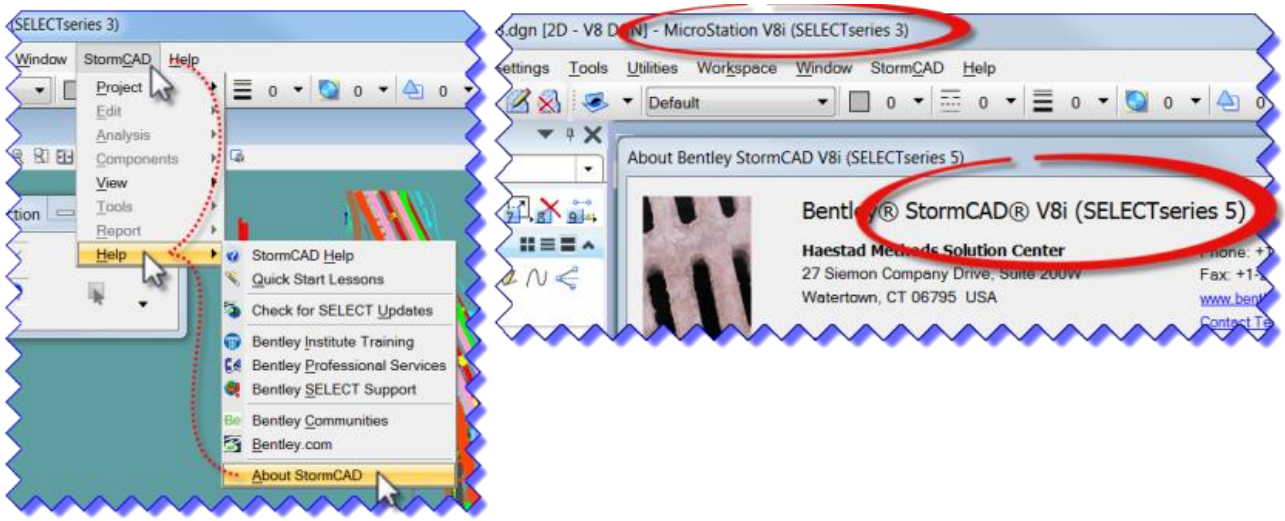
<u>StormCAD not open:</u>

Using Window Explorer go to where StormCAD is installed. Look **for StormCAD8** and search there for the **Readme.pdf** file. Open Readme.pdf.

← Version of StormCAD installed.

<u>StormCAD open:</u>

From the MicroStation menu bar **Click** the following: → StormCAD → Help → About StormCAD



Instructions that follow are for StormCAD SS5 with MicroStation SS3

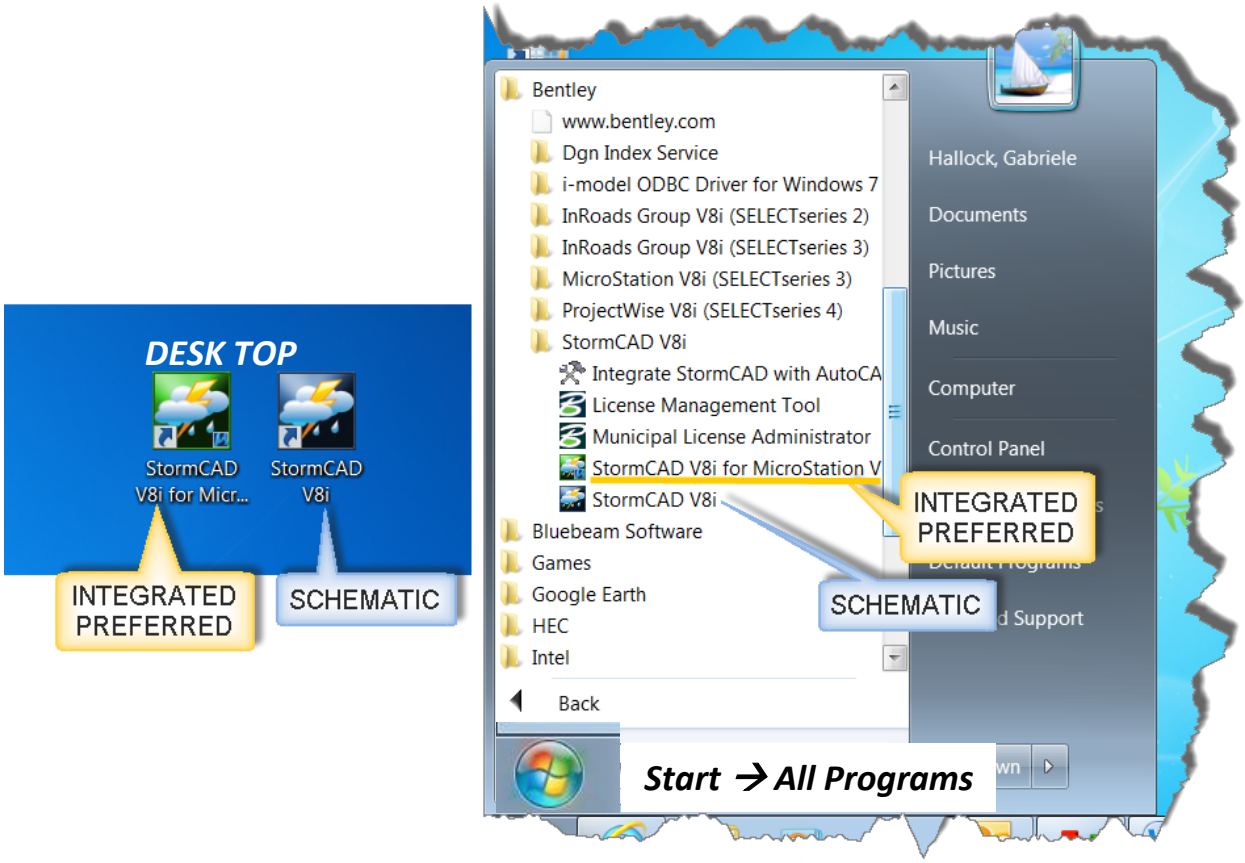
Section 1 Getting Started

Easy Storm Sewer Design and Modeling

StormCAD provides comprehensive modeling for the design and analysis of storm sewer systems. StormCAD is **FEMA-approved** and provides calculations for catchment runoff, gutters, inlets, junctions, pipe networks, and outfalls, and its intuitive interface makes the design and analysis of storm sewer systems easier.
StormCAD software is ***approved by the Departments Hydraulics and Drainage Unit*** to use for roadway storm sewer design.

It is the designer's responsibility to adhere to the CTDOT Drainage Manual and CTDOT Hydraulic & Drainage Directions.

On your desktop or under the Start → All Programs → Bentley → StormCAD V8i are two StormCAD V8i programs. **StormCAD V8i for MicroStation V8i** (preferred use) or **StormCAD V8i**, both are standalone programs, no need to go through Accounting.



Note: Before starting StormCAD, the designer should lay out the drainage systems in the drainage MicroStation file (HW_MST_1234_1234_Drainage_MDL.dgn) to reference into the

StormCAD MicroStation files. The designer should also calculate the Time of Concentration (T_C) and drainage areas. Each System will have its own MicroStation StormCAD file. StormCAD numbers each item but allows for the designer to add notes; it is helpful to have a sketch / schematic of the individual system with the necessary information such as: areas, elevations, lengths and slopes.

IMPORTANT GUIDELINES FOR USING STORMCAD V8I FOR MICROSTATION

DO NOT open other MicroStation files in the Project X-Drive container while in StormCAD V8i.

DO NOT open the newly created StormCAD V8i file through Accounting.

DO NOT open MicroStation through Accounting and then add StormCAD V8i as a MDL.

DO NOT use the project design file(s) as your drainage design file while in StormCAD V8i.

DO follow the *CTDOT MicroStation V8i Guide for Highway Designers*.

DO enter MicroStation through Accounting as normal and reference the StormCAD V8i MicroStation file in to your project design file(s).

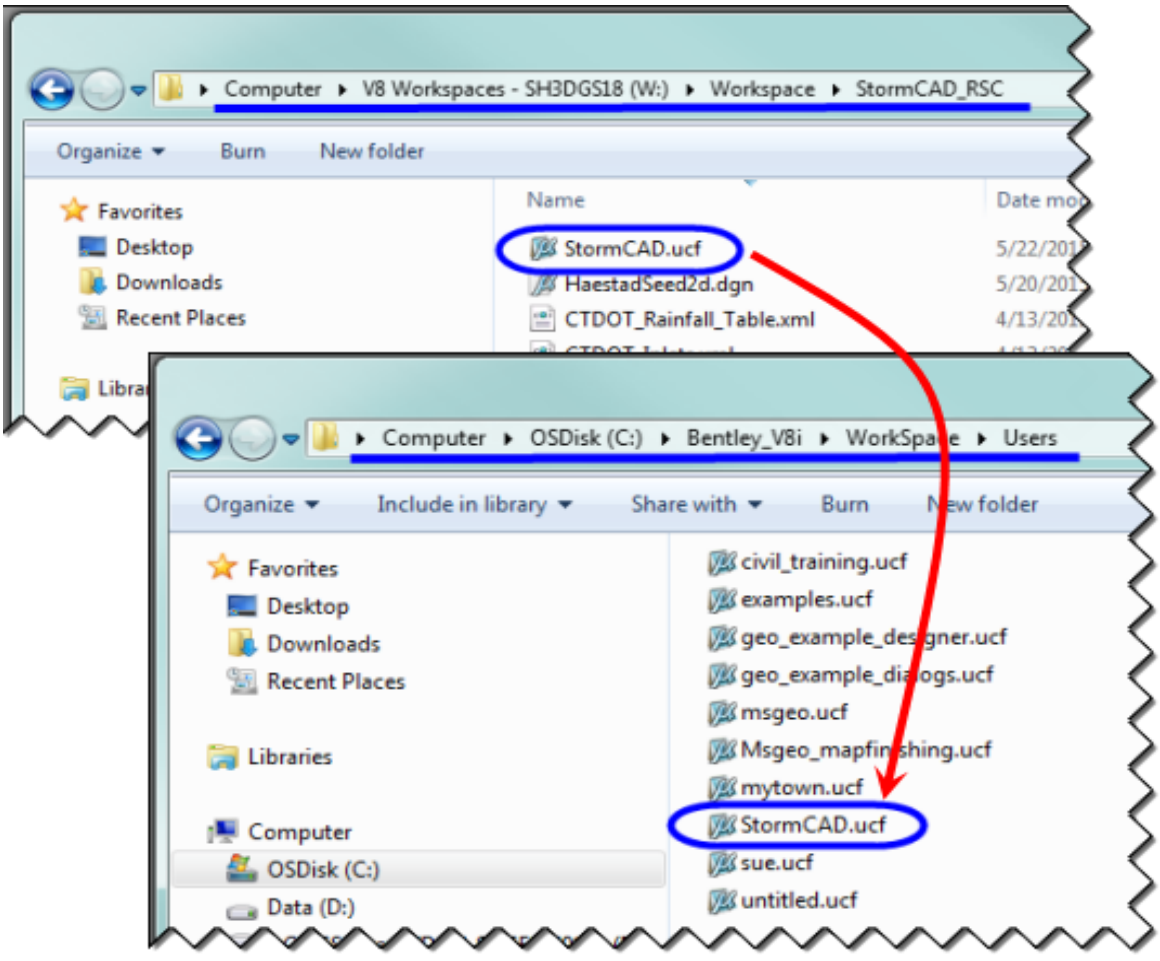
1.1 Starting StormCAD V8i Integrated with MicroStation

1.1.1 Use the Correct MicroStation User Configuration File

You will open StormCAD V8i for MicroStation as a standalone (not opening through Accounting) either from your desktop or from Start. Before you start up StormCAD it is necessary that you **copy the latest** CTDOT user configuration file for StormCAD to your computer.

A. Using Windows Explorer **copy** the file:
W:/Workspace/StormCAD_RSC/stormcad.ucf

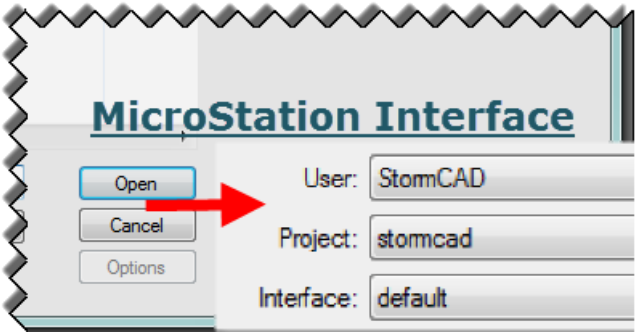
B. **Paste** to **C:/Bentley_V8i/Workspace/Users**



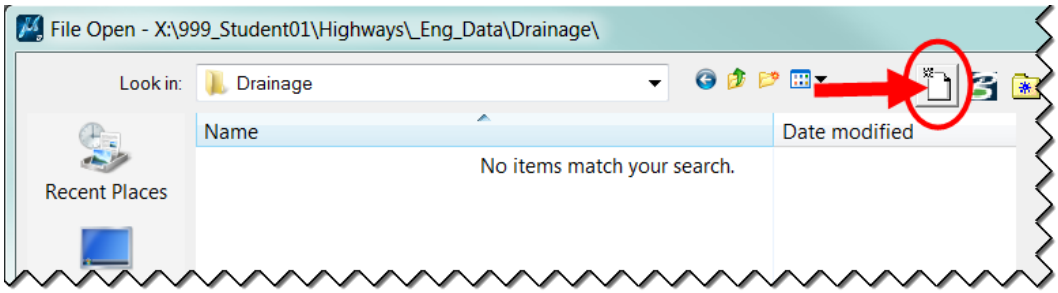
1.1.2 Start StormCAD & Create MicroStation File

A. To open StormCAD **double click** the ***StormCAD V8i for MicroStation V8i*** icon located on your desktop (or click on **START > All Programs > Bentley > StormCAD > StormCAD V8i for MicroStation V8i**)

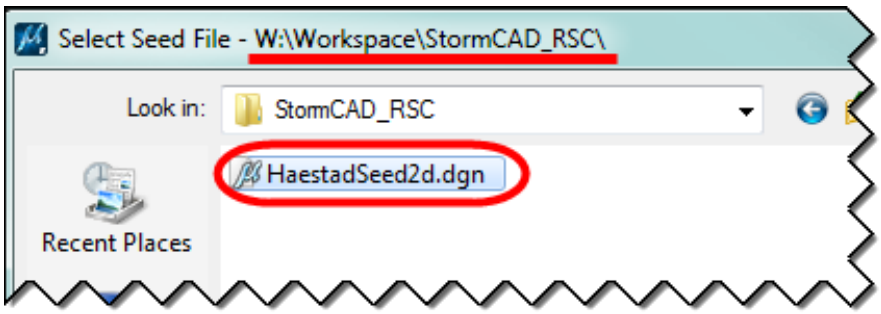
B. Change the MicroStation Interface to StormCAD as shown below:



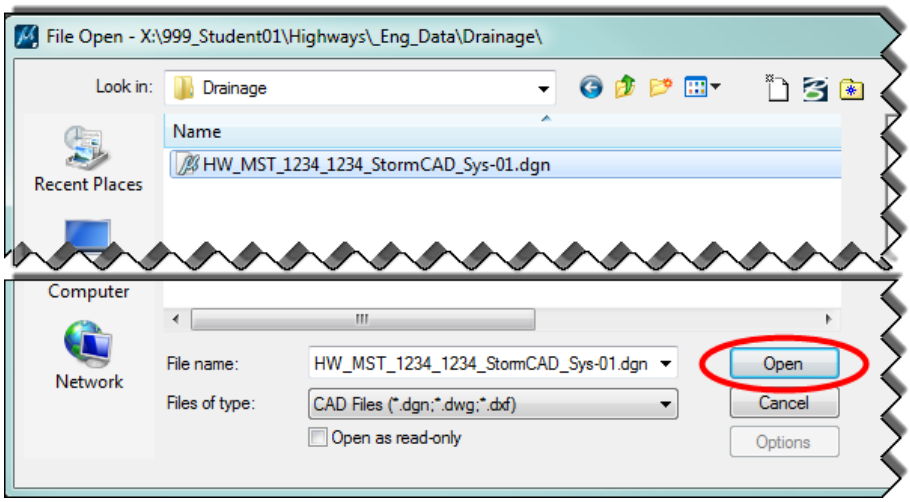
C. In the MicroStation File Manager box, select your X-drive project folder > Highways > _Eng_Data_/Drainage/ and select (click) the **New File** icon as shown:



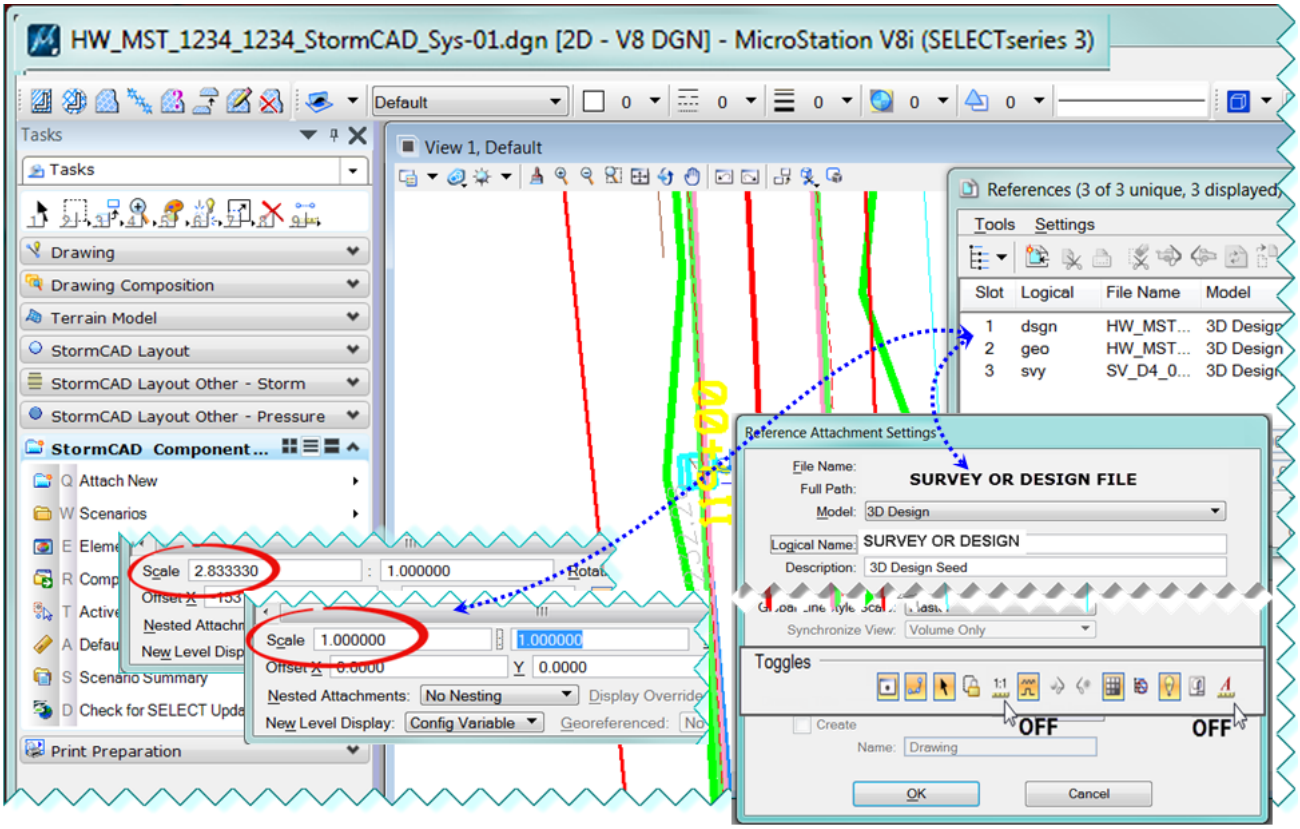
D. In the New file box, to select the seed file click on **Browse** and go to: **W:\Workspace\StormCAD_RSC\HaestadSeed2d.dgn** and click **Open**. It is <u>important</u> to use this seed file. Our CTDOT seed files have custom properties attached to it that will not work with StormCAD.



E. Type in the file name using file naming conventions in Appendix C of the CTDOT_DDE_Guide, example: **HW_MST_1234_1234_StormCAD_Sys-01.dgn**, select the file and click **Open**. StormCAD files reside in the \Highways_Eng_Data\Drainage folder.



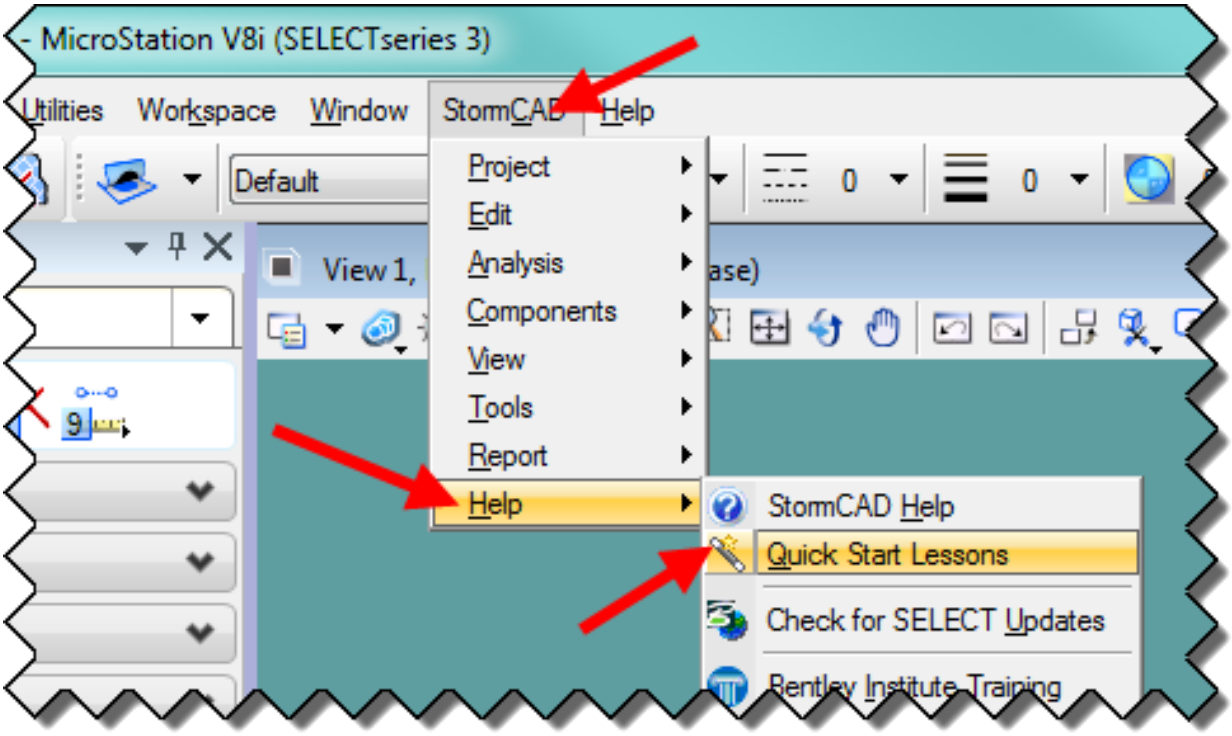
F. After the MicroStation file is opened, **reference** in files as needed. Make sure scales are correct (use measure tool) and turn off Levels as needed. **Save Settings**.



Section 2 Create new StormCAD Project

After creating the MicroStation file using the Haestad seed file, the StormCAD project files, defaults and properties need to be established.

If this is the first time you are using StormCAD, we suggest you open the help menu, within the MicroStation Menu bar click on **StormCAD → Help → Quick Start Lessons**.



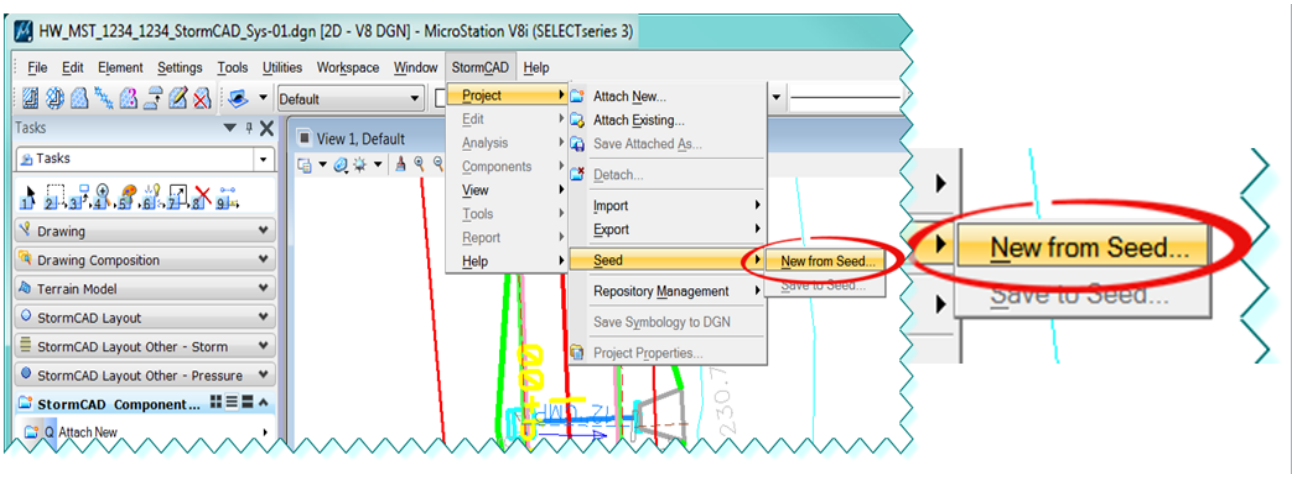
Use this workflow along with the Quick Start lessons to work your project / system scenarios or to learn using StormCAD.

Also, there is help available on the *Bentley Learn Server*. Please contact Samantha Scharpf of AEC Applications (Samantha.Scharpf@ct.gov) for a learning path of StormCAD V8i.

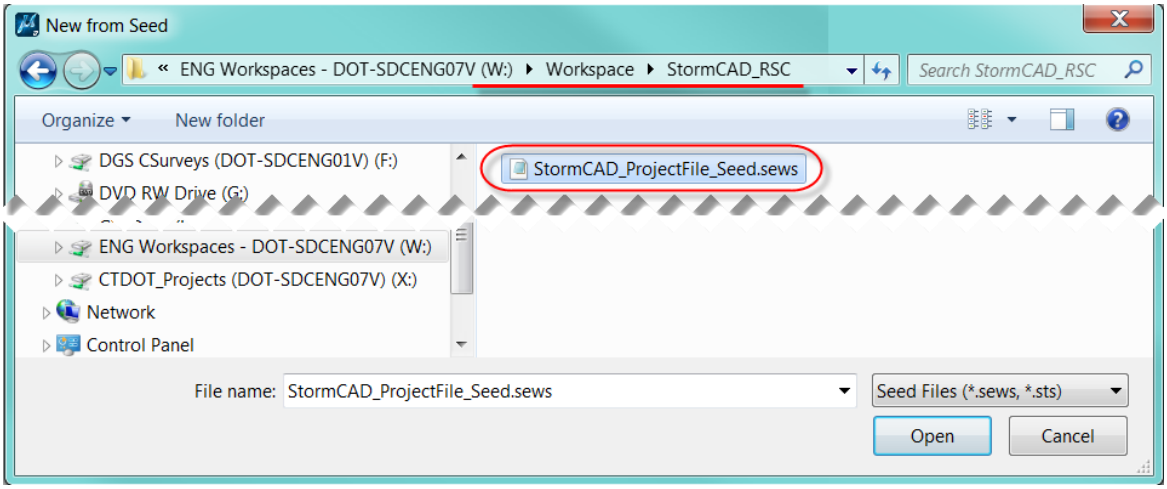
The user should be aware that the CTDOT workspace is not available within StormCAD V8i with MicroStation. This is a standalone application.

2.1 Create Project Files

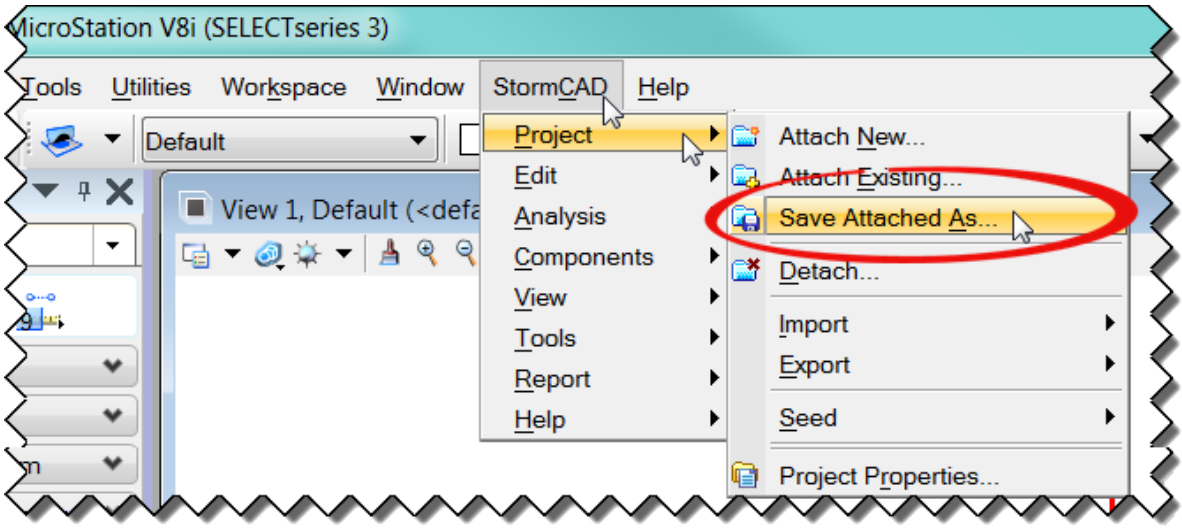
A. Within MicroStation menu bar, click on **StormCAD → Project → Seed → New from Seed**.



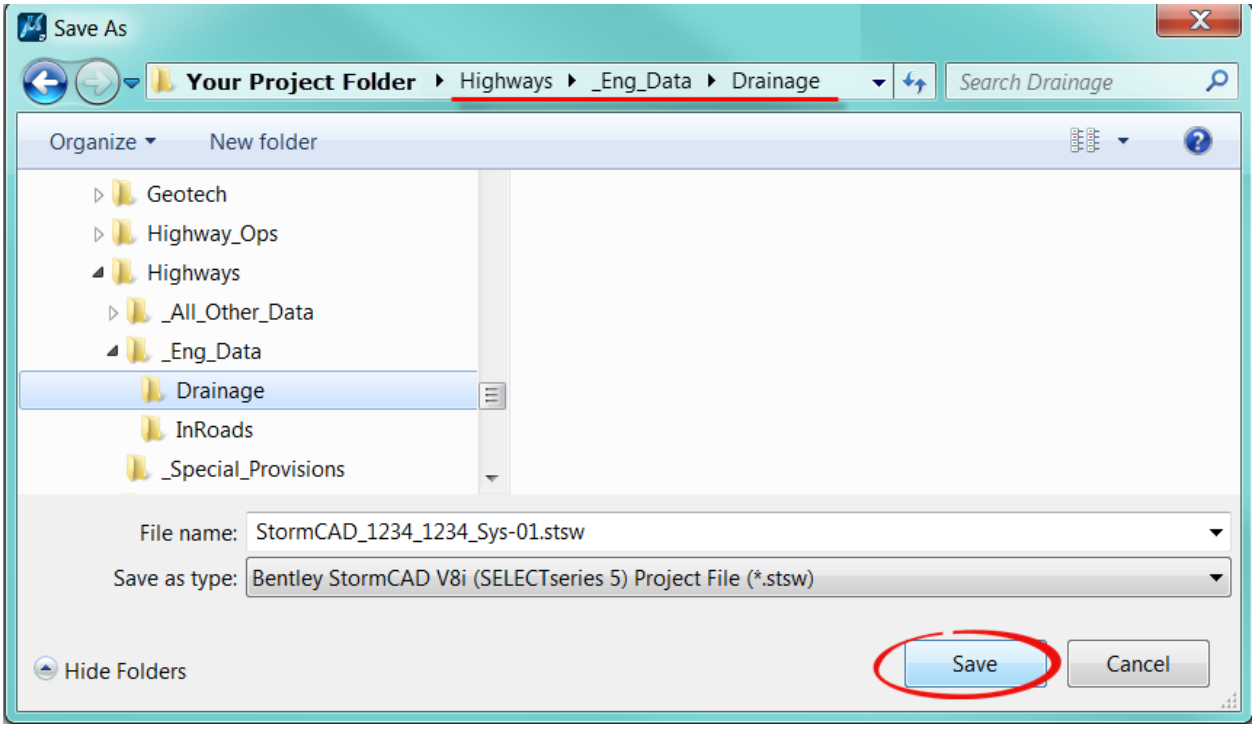
B. The **New from Seed** dialog box opens, browse to the StormCAD Resource directory and select the StormCAD seed-file: **W:\Workspace\StormCAD_RSC\StormCAD_CTDOT_ProjectFile_Seed.sews**. This will start your StormCAD project with the defaults and settings required. The designer has to ensure the defaults and settings comply with the Drainage Manual for <u>their project</u>. StormCAD will create the files needed, you will see some screens pop-in and –out. Wait until StormCAD completed the start up.



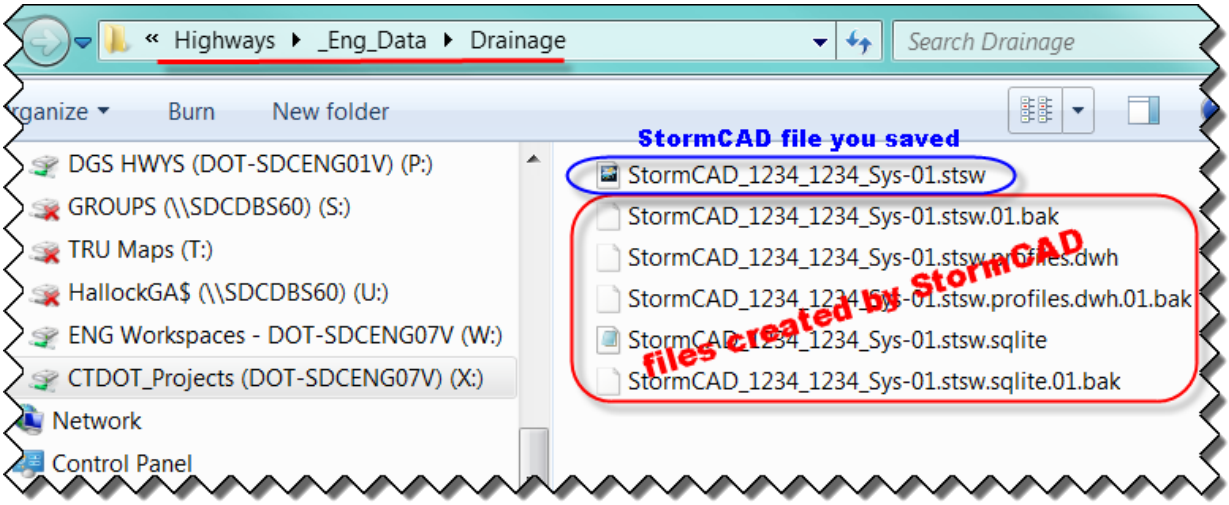
C. StormCAD created the files and stores those in a temporary folder. The designer has to save all files to the project folder. Within MicroStation menu bar, click on **StormCAD → Project → Save Attached As . . .**



D. The "**Save As...**" dialog box opens, type in a logical file name for your system, make sure you specify the folder where the files are to be saved/stored (see below). And click **"Save".**

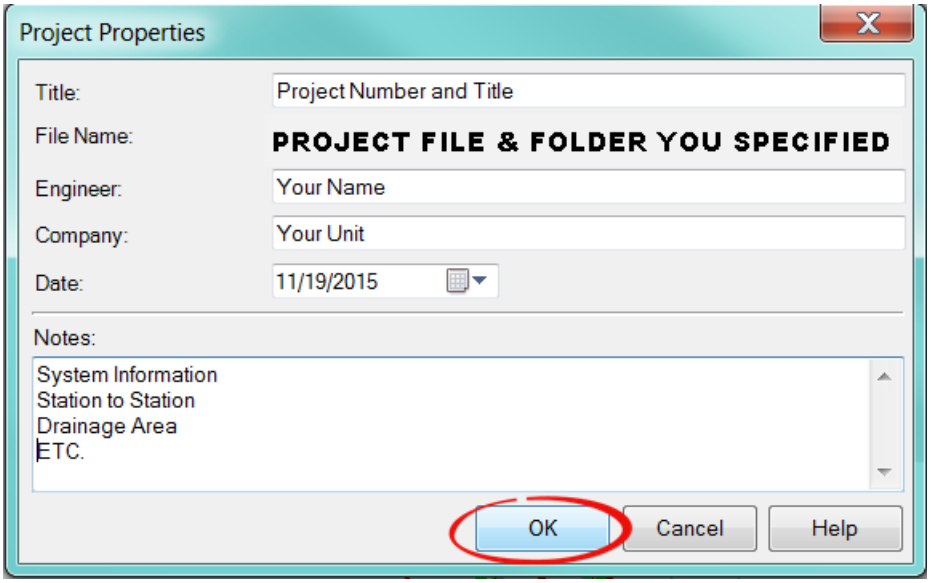


E. In Windows Explorer you can see the files created by StormCAD in the file folder you specified. Close Windows Explorer.

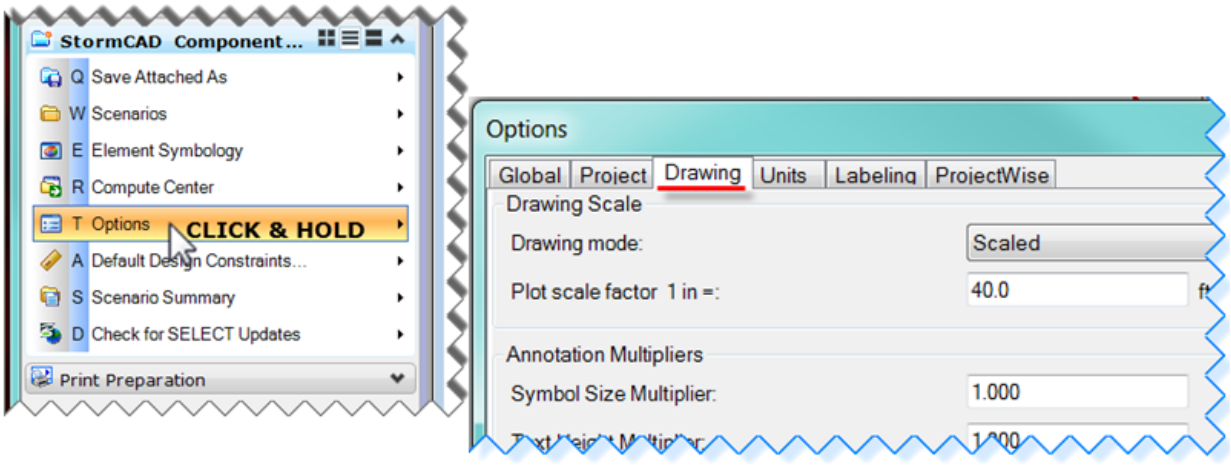


2.2 Set Project Properties & Options

A. From the MicroStation menu bar select **StormCAD → Project → Project Properties**. The Project Properties dialog box lets you enter project-specific information to help identify the project. Project properties are stored with the project files. Click **OK**.

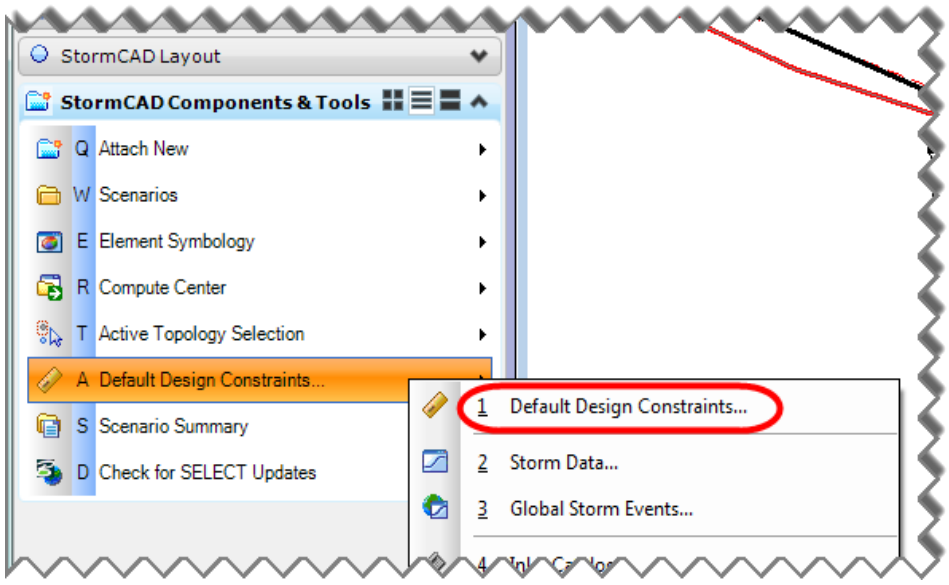


B. Select **Options** from the **StormCAD Components & Tools** task menu. Click on the **Drawing Tab** and select for Drawing mode: **Scaled or Schematic.**

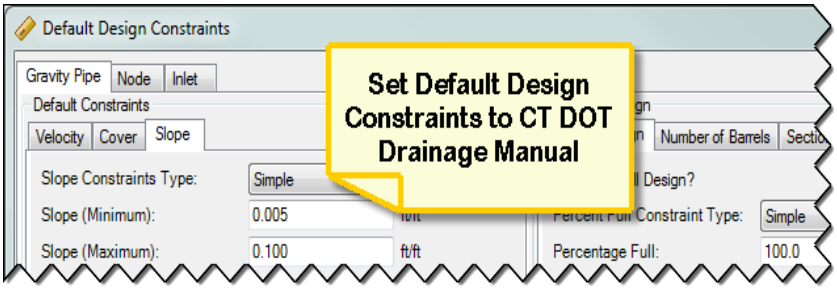


2.3 Set Project Defaults & Import Libraries

A. Next the Default Design Constraints are set for the project. From the StormCAD Components & Tools task **click** and **hold** Default Design Constraints, **select Default Design Constraints**.



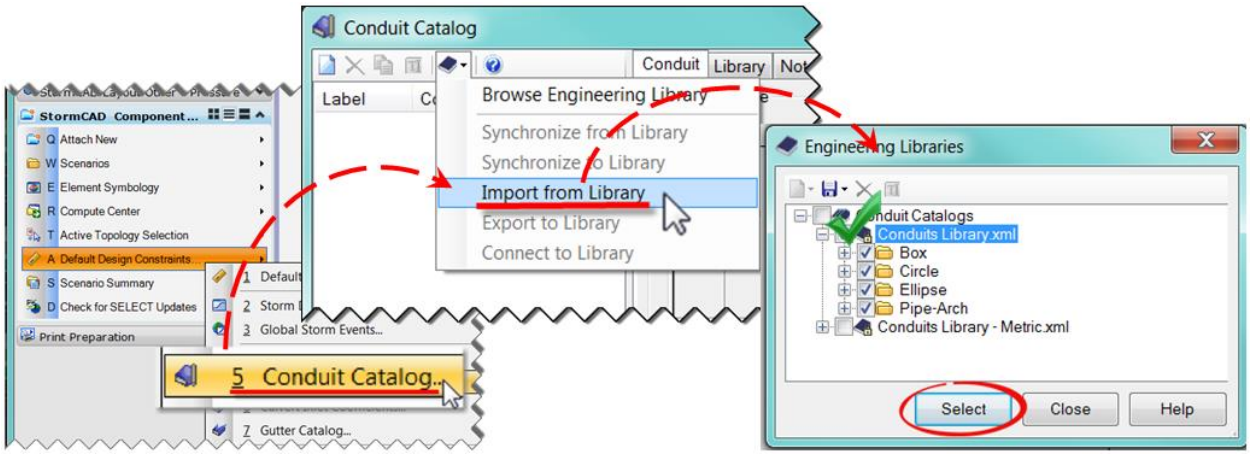
B. Set/Check the default design constraints according to the *CTDOT Drainage Manual*. **Close.**

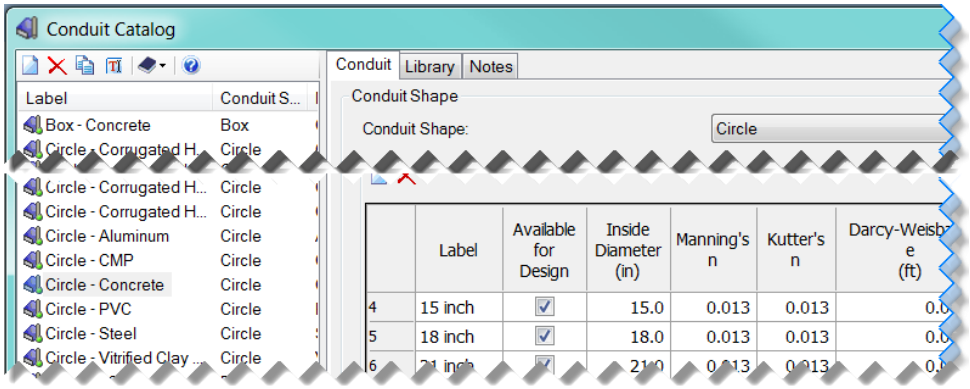


C. Import the Conduit Catalog, from the **StormCAD Components & Tools** tasks left-click and hold-down the left mouse button and **select Conduit Catalog…** .

D. **Click** on the book icon and select **Import from Library**. In the Engineering Libraries box **check on** the **Conduit Library.xml.** (C:\ProgramData\Bentley\StormCAD\8\Libraries\Conduits Library.xml => default)

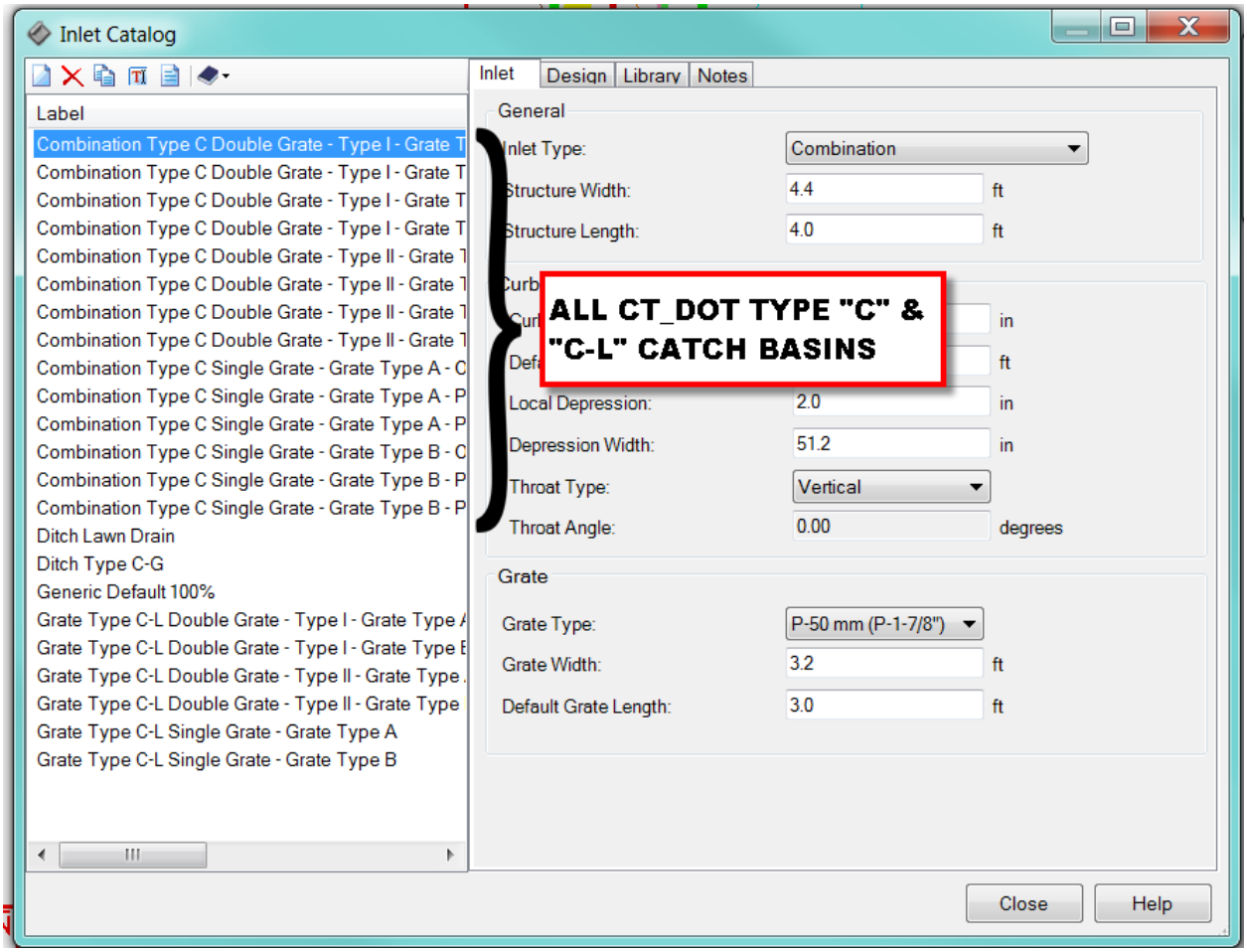
E. Click on **Select.** StormCAD will import all conduits. One can also expand the folder and **select all** 'Circular – Concrete' pipes or just **select a few** as needed for the project**. Close.**





F. The CTDOT_Inlets.xml Catalog is already loaded. To see all available inlets go to the StormCAD Components & Tools tasks left-click and hold-down the left mouse button **click** on **Inlet Catalog…** .

G. The Inlet Catalog box opens. All CTDOT catch basins are loaded.



H. The CT_DOT_Inlet.xml can be found at:
W:\Workspace\StormCAD_RSC\CTDOT_Inlet.xml

I. **Close** the Inlet Catalog.

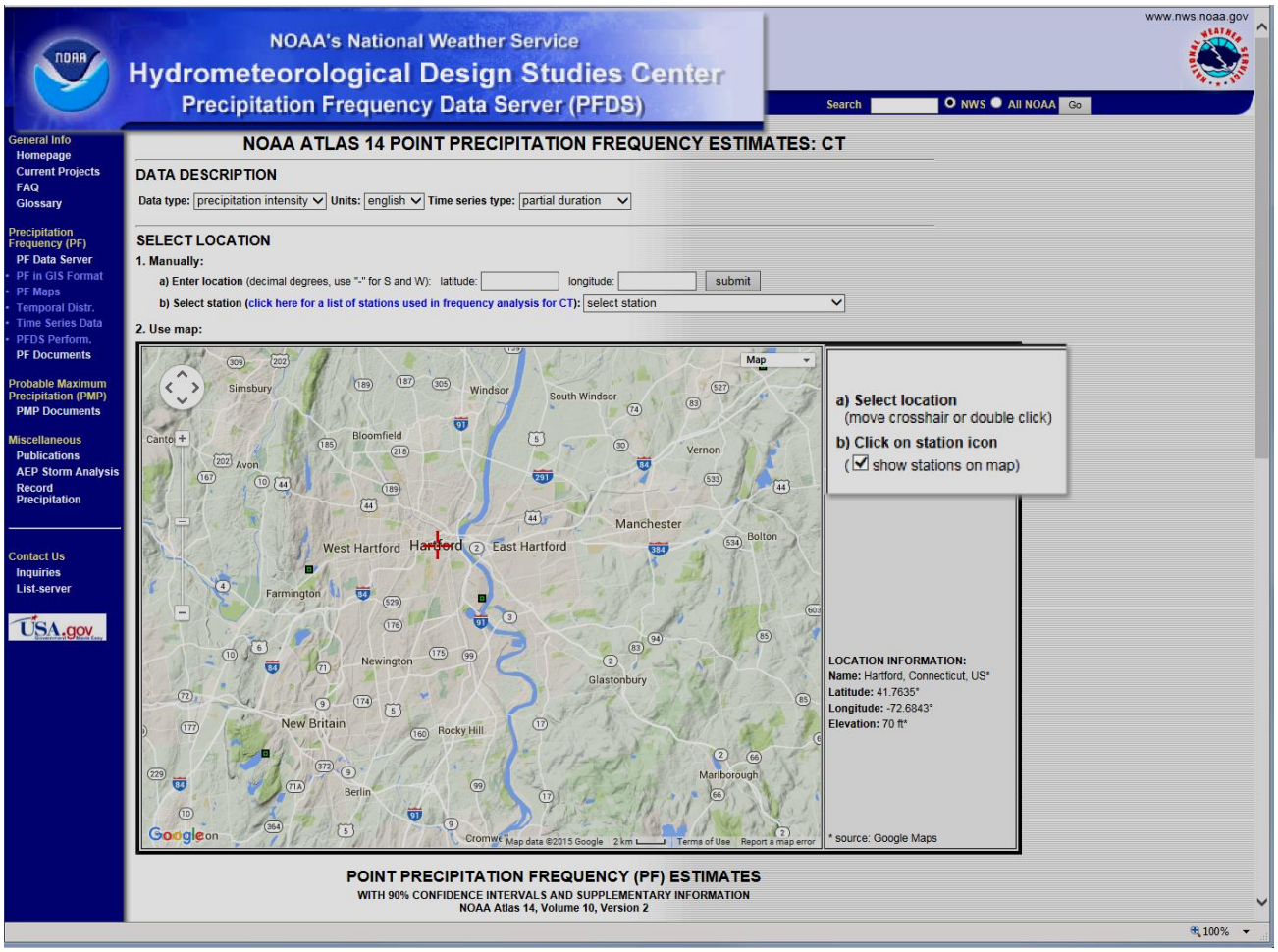
J. Save the project again. Click on **StormCAD** in the MicroStation menu, click on Project → **Save Attached As...**, in the "**Save As"** dialog box select the file name for your system and click **"Save".** The message "file name" already exists. Do you want to replace it. Click "**Yes**".

2.4 Defining Storm Events

The last piece of information needed is the rainfall data.

The Department's Hydraulics and Drainage Unit advises the designer to use the ***NOAA Atlas 14 data,*** which can be accessed through the NOAA Precipitation Frequency Data Server – PFDS in conjunction with the CTDOT Drainage Manual.

NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CT



Follow the directions on the NOAA Atlas 14 screen and directions given by CTDOT Hydraulics & Drainage unit on how to develop the Point Precipitation Frequency (PF) Estimates.
The precipitation frequency estimates can be downloaded in CSV-format and opened with Excel.
See an example of the PF estimate on the next page.

The Location Information for the example is: Hartford, CT, US; Latitude: 41.7635°; Longitude: -72.6843°; Elevation: 70 ft.

PF tabular | PF graphical | Supplementary information

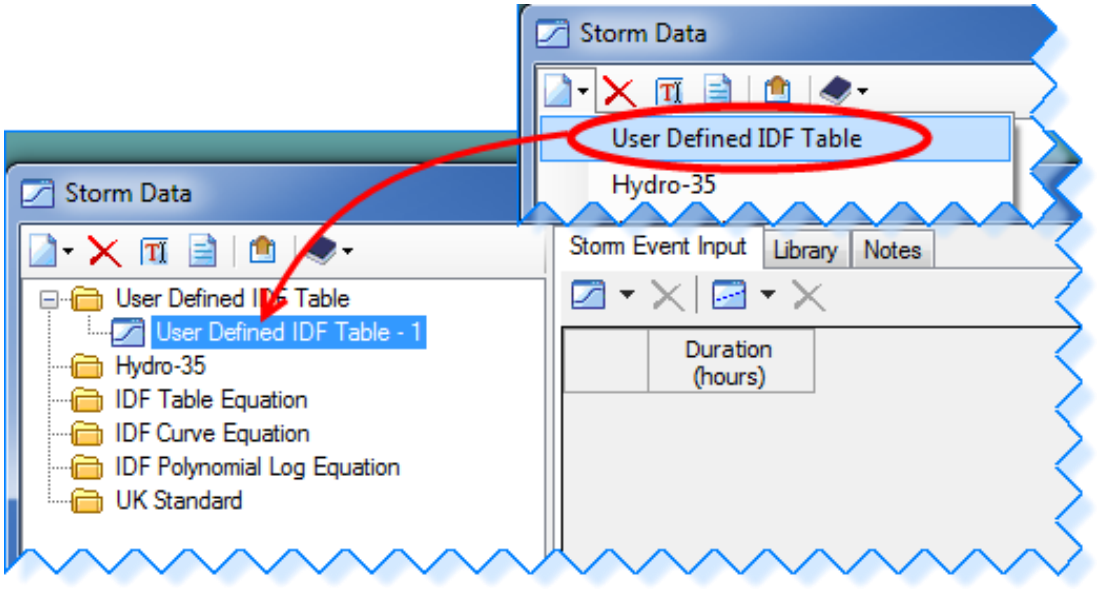
PDS-based precipitation frequency estimates with 90% confidence intervals (in inches

Duration	Average recurrence interval (years)							
	1	2	5	10	25	50	100	200
5-min	4.01 (3.16-5.08)	4.86 (3.83-6.17)	6.26 (4.91-7.97)	7.42 (5.78-9.50)	9.01 (6.79-12.1)	10.2 (7.55-14.1)	11.5 (8.20-16.4)	13.0 (8.78-19.1)
10-min	2.84 (2.24-3.59)	3.44 (2.71-4.37)	4.43 (3.48-5.65)	5.26 (4.10-6.73)	6.38 (4.81-8.58)	7.25 (5.35-9.98)	8.13 (5.81-11.6)	9.22 (6.22-13.5)
15-min	2.23 (1.76-2.82)	2.70 (2.13-3.43)	3.48 (2.73-4.43)	4.12 (3.21-5.28)	5.01 (3.77-6.73)	5.69 (4.20-7.82)	6.38 (4.56-9.12)	7.23 (4.88-10.6)
30-min	1.49 (1.18-1.89)	1.82 (1.43-2.30)	2.34 (1.84-2.98)	2.78 (2.17-3.56)	3.38 (2.55-4.55)	3.85 (2.84-5.29)	4.31 (3.08-6.17)	4.89 (3.30-7.17)
60-min	0.938 (0.739-1.19)	1.14 (0.898-1.45)	1.47 (1.16-1.88)	1.75 (1.36-2.24)	2.13 (1.61-2.86)	2.42 (1.79-3.33)	2.72 (1.94-3.89)	3.08 (2.08-4.52)
2-hr	0.609 (0.483-0.766)	0.738 (0.584-0.930)	0.948 (0.748-1.20)	1.12 (0.881-1.43)	1.36 (1.03-1.83)	1.55 (1.15-2.12)	1.73 (1.25-2.48)	1.99 (1.35-2.90)
3-hr	0.468 (0.372-0.586)	0.566 (0.450-0.711)	0.727 (0.576-0.916)	0.861 (0.678-1.09)	1.05 (0.796-1.40)	1.19 (0.886-1.63)	1.33 (0.965-1.90)	1.53 (1.04-2.23)
6-hr	0.293 (0.235-0.365)	0.356 (0.285-0.444)	0.459 (0.366-0.575)	0.545 (0.432-0.686)	0.662 (0.508-0.880)	0.753 (0.566-1.03)	0.844 (0.617-1.21)	0.978 (0.667-1.42)
12-hr	0.177 (0.143-0.219)	0.217 (0.175-0.269)	0.282 (0.227-0.351)	0.337 (0.269-0.421)	0.412 (0.318-0.544)	0.469 (0.355-0.637)	0.527 (0.388-0.750)	0.615 (0.420-0.884)
24-hr	0.103 (0.084-0.127)	0.129 (0.104-0.159)	0.171 (0.138-0.211)	0.205 (0.165-0.255)	0.253 (0.197-0.333)	0.290 (0.221-0.393)	0.327 (0.243-0.465)	0.386 (0.265-0.552)
2-day	0.058 (0.048-0.071)	0.074 (0.060-0.091)	0.100 (0.081-0.123)	0.121 (0.098-0.150)	0.151 (0.118-0.198)	0.173 (0.134-0.235)	0.196 (0.148-0.281)	0.237 (0.163-0.337)
3-day	0.042 (0.035-0.051)	0.054 (0.044-0.066)	0.073 (0.059-0.089)	0.089 (0.072-0.109)	0.110 (0.087-0.145)	0.127 (0.098-0.172)	0.143 (0.109-0.205)	0.174 (0.120-0.247)
4-day	0.034 (0.028-0.041)	0.043 (0.035-0.052)	0.058 (0.048-0.071)	0.071 (0.058-0.087)	0.088 (0.070-0.115)	0.101 (0.079-0.137)	0.115 (0.087-0.163)	0.139 (0.096-0.197)
7-day	0.023 (0.019-0.028)	0.029 (0.024-0.035)	0.038 (0.032-0.046)	0.046 (0.038-0.056)	0.057 (0.045-0.074)	0.066 (0.051-0.088)	0.074 (0.056-0.105)	0.089 (0.062-0.125)
10-day	0.019 (0.015-0.022)	0.023 (0.019-0.027)	0.030 (0.025-0.036)	0.036 (0.029-0.043)	0.044 (0.035-0.057)	0.050 (0.039-0.066)	0.056 (0.043-0.079)	0.067 (0.046-0.094)
20-day	0.013 (0.011-0.016)	0.016 (0.013-0.019)	0.019 (0.016-0.023)	0.022 (0.018-0.027)	0.027 (0.021-0.034)	0.030 (0.023-0.039)	0.033 (0.025-0.045)	0.038 (0.027-0.053)

The data you see in the PF tabular format will be used for StormCAD to create a new User Defined IDF table specific to your project location.

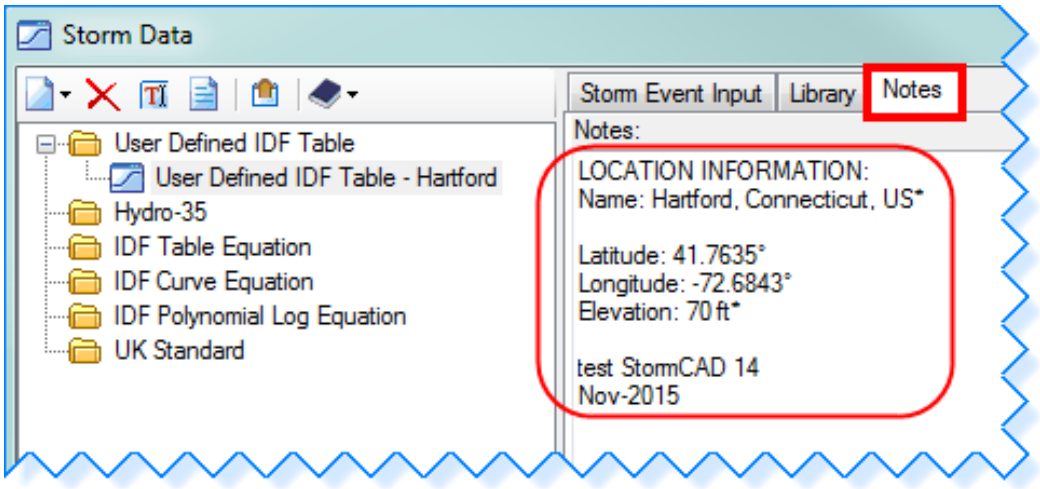
A. In StormCAD within the StormCAD Components & Tools task, click on **Storm Data…**

B. In the Storm Data box click the **New** icon and select **User Defined IDF Table**. A blank IDF table is created (User Defined IDF Table -1).

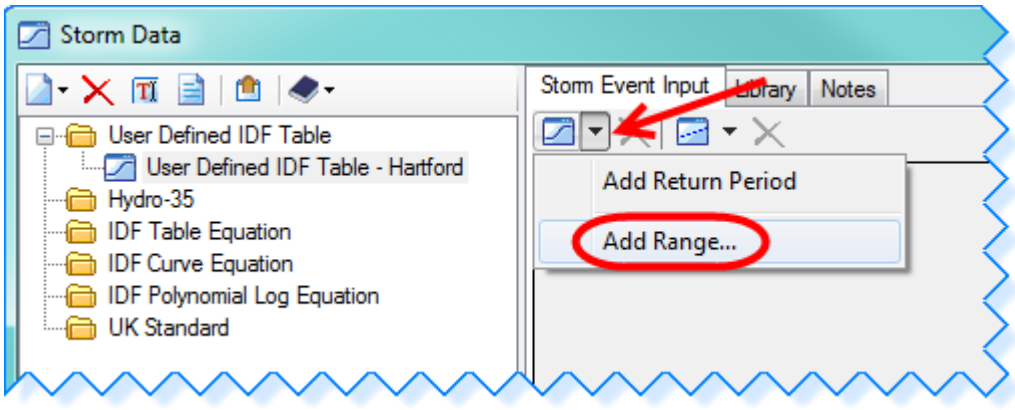


C. Right-click on User Defined IDF Table – 1 and click **Rename**. Rename your table, example **Hartford**. Or Project No.

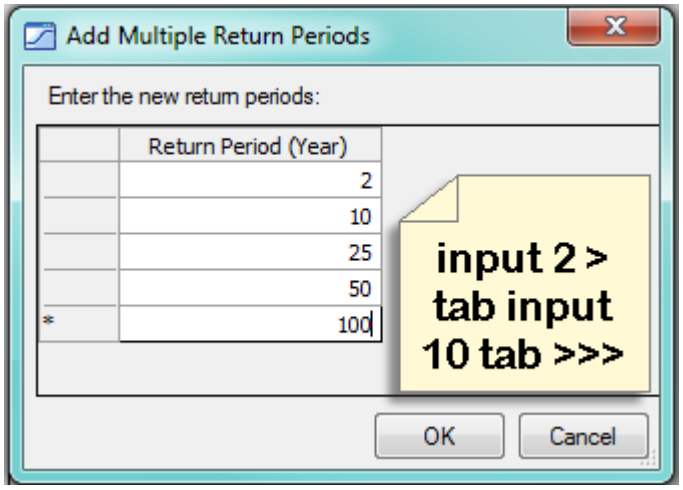
D. Click on the **Notes Tab**. Add notes pertaining to the project: location, latitude, longitude and elevation from the NOAA Atlas 14 data. (This will help you and others to duplicate the data if needed).



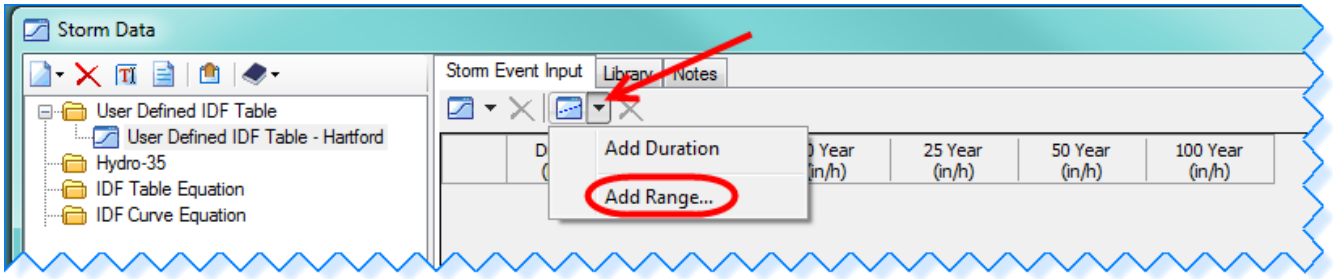
E. Select the **Storm Event Input Tab** and click on the down arrow for **Add/Remove Return Periods**. Select **Add Range…**



F. The **Add Multiple Return Periods** box opens. Enter the **return period** (year) needed for your project. (2, 10, 25, 50 and 100 years). Click **OK** when all period years are entered.

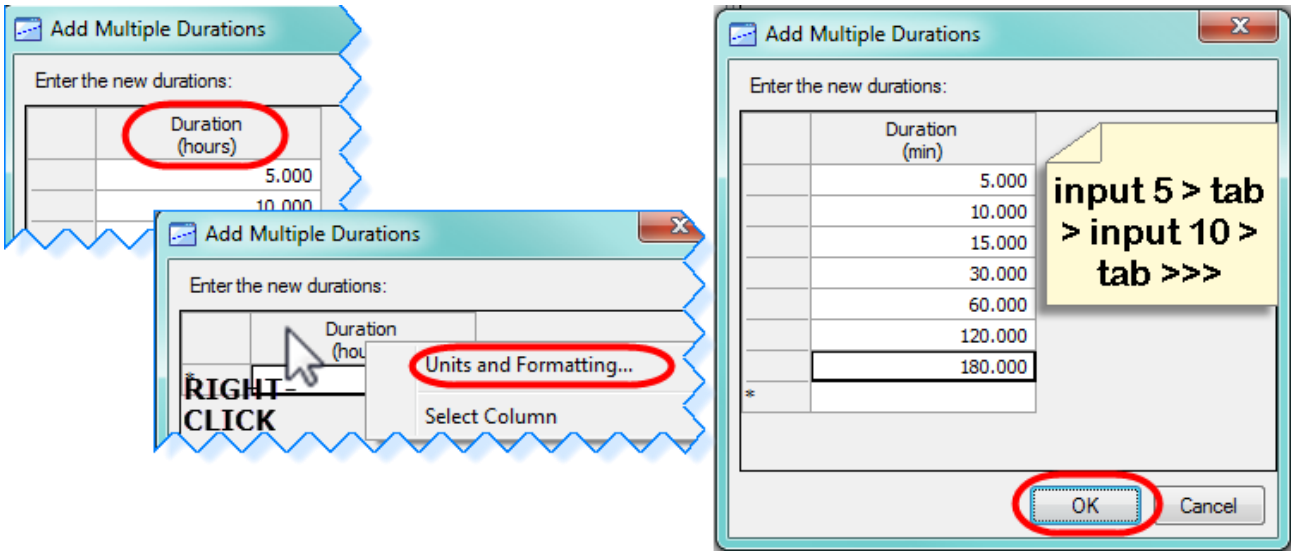


G. Click on the down arrow for **Add/Remove Durations**. Select **Add Range…**

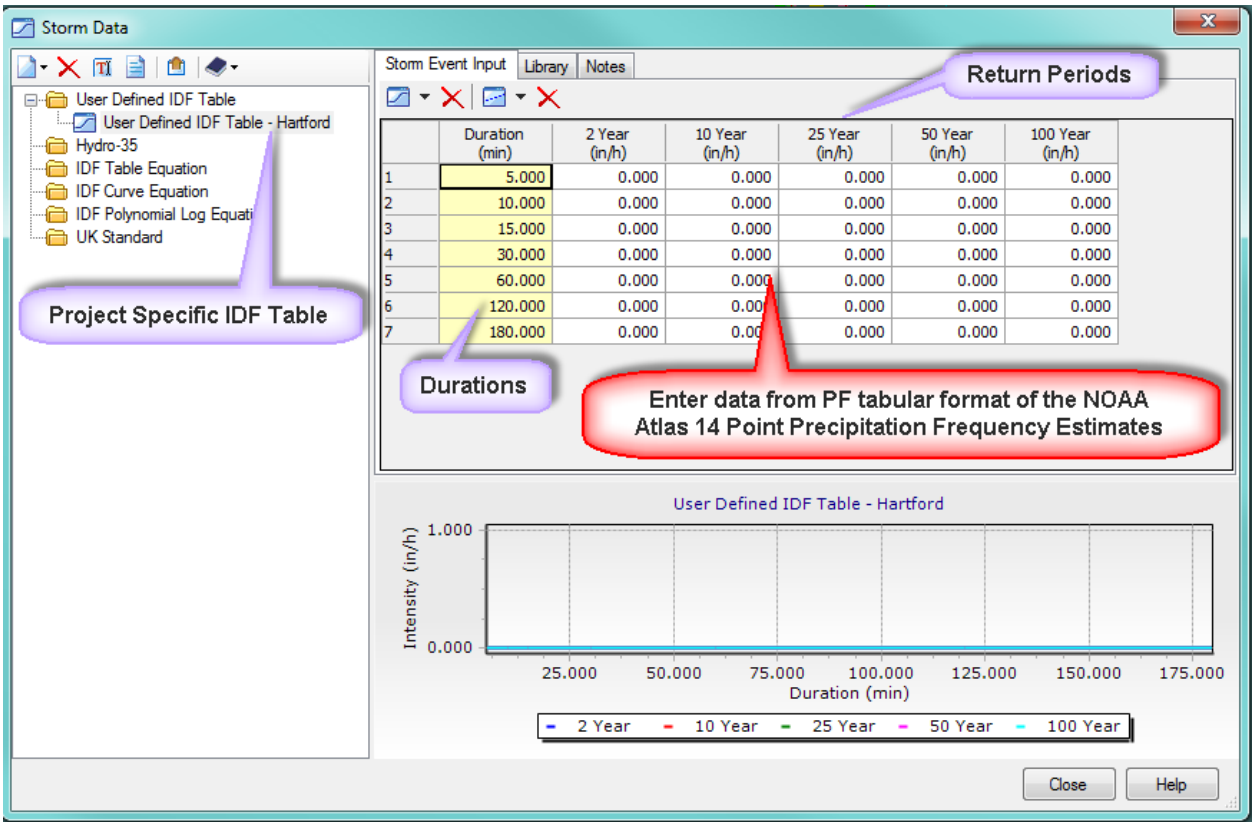


H. The **Add Multiple Durations** box opens. Right-Click on Duration (hours), click on **Units and Formatting…** , change Unit: from **hours to min**, click **OK.**

I. Enter the **Duration** (min) needed for your project. (5, 10, 15, 30, 60, 120, 180). Click **OK** when all durations needed are entered.

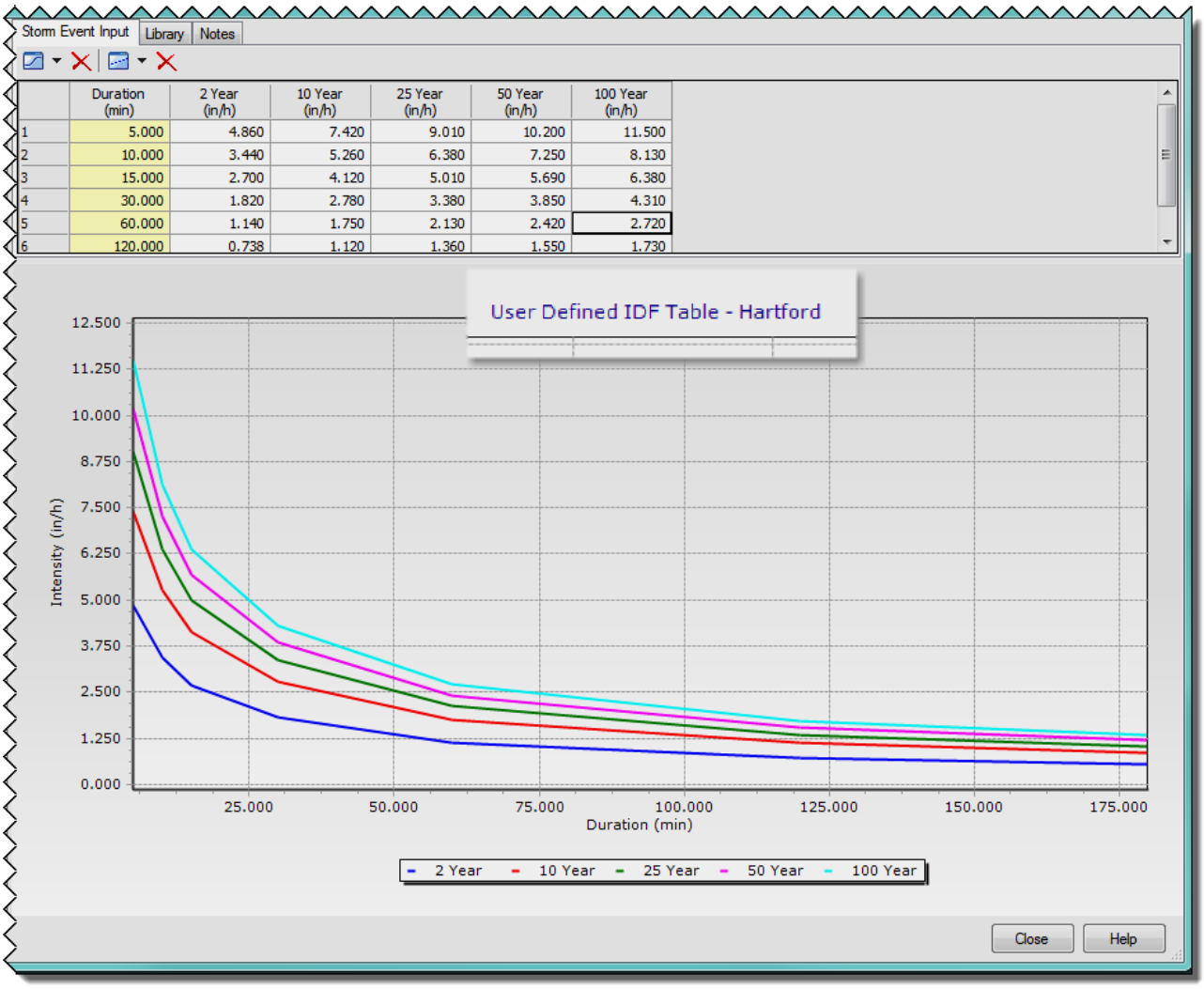


J. Your storm data dialog box should look as shown below:



K. Enter into each column (year – in/hr) the data from NOAA Atlas 14 Point Precipitation Frequency Estimates for your project.

L. The User Defined IDF Table should look similar as shown below:



M. After all your input is completed click **Close**.

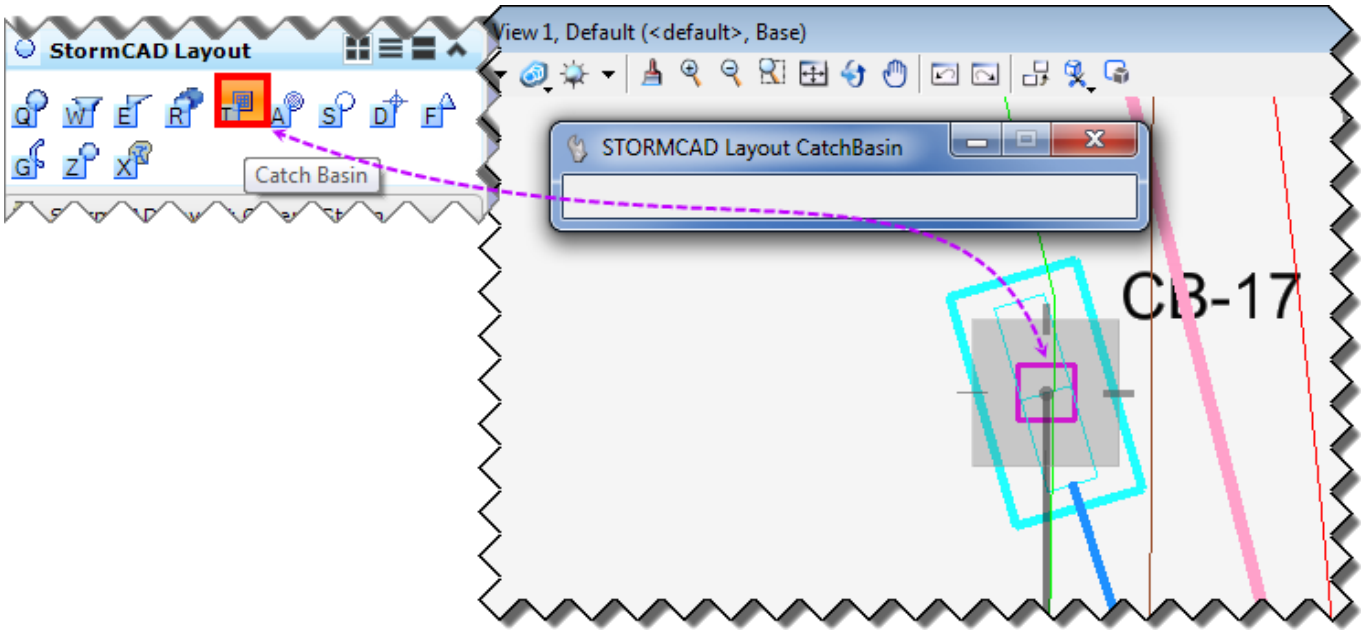
N. Again save the project. Click on **StormCAD** in the MicroStation menu, click on Project → **Save Attached As...**, in the "**Save As"** dialog box select the file name for your system and click **"Save".** The message "file name" already exists. Do you want to replace it. Click "**Yes**".

Section 3 Design of Storm Sewer System

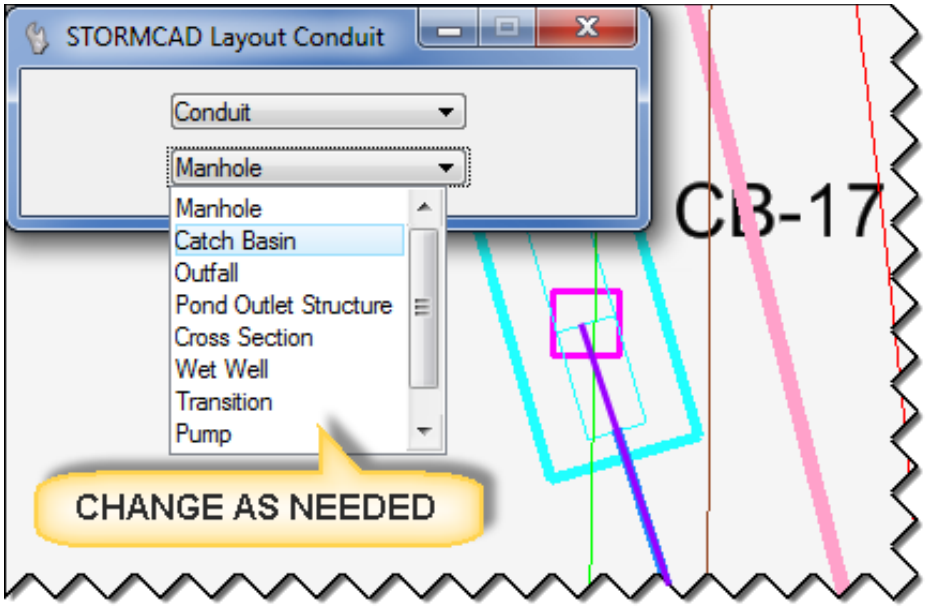
3.1 Layout of Storm Sewer System

A. Using the StormCAD Layout tools place your drainage structures and conduits as needed. You can follow the Quick Start Lessons – Part 2.

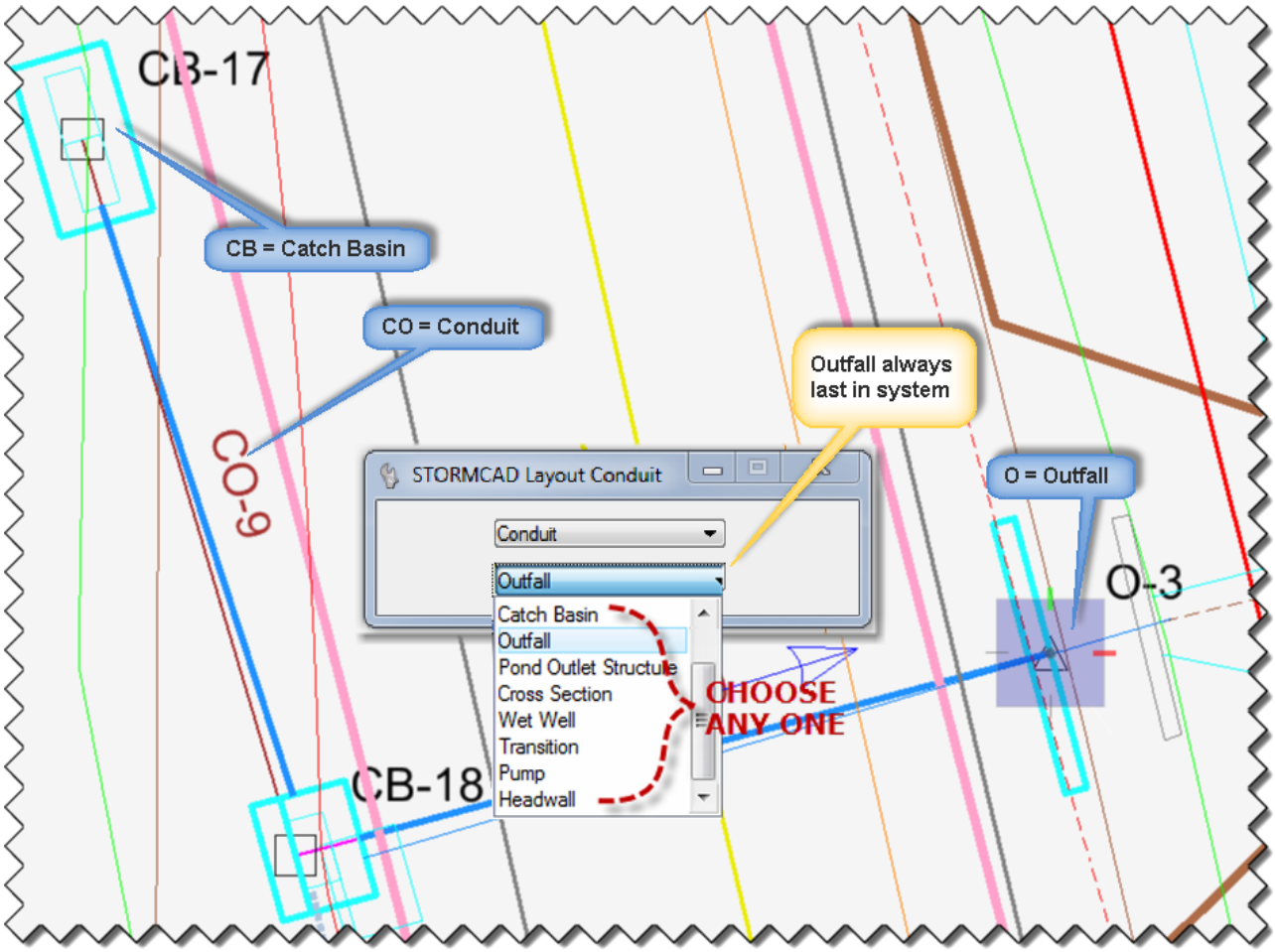
B. As Example: Select **Catch Basin,** as your inlet and place at desired location



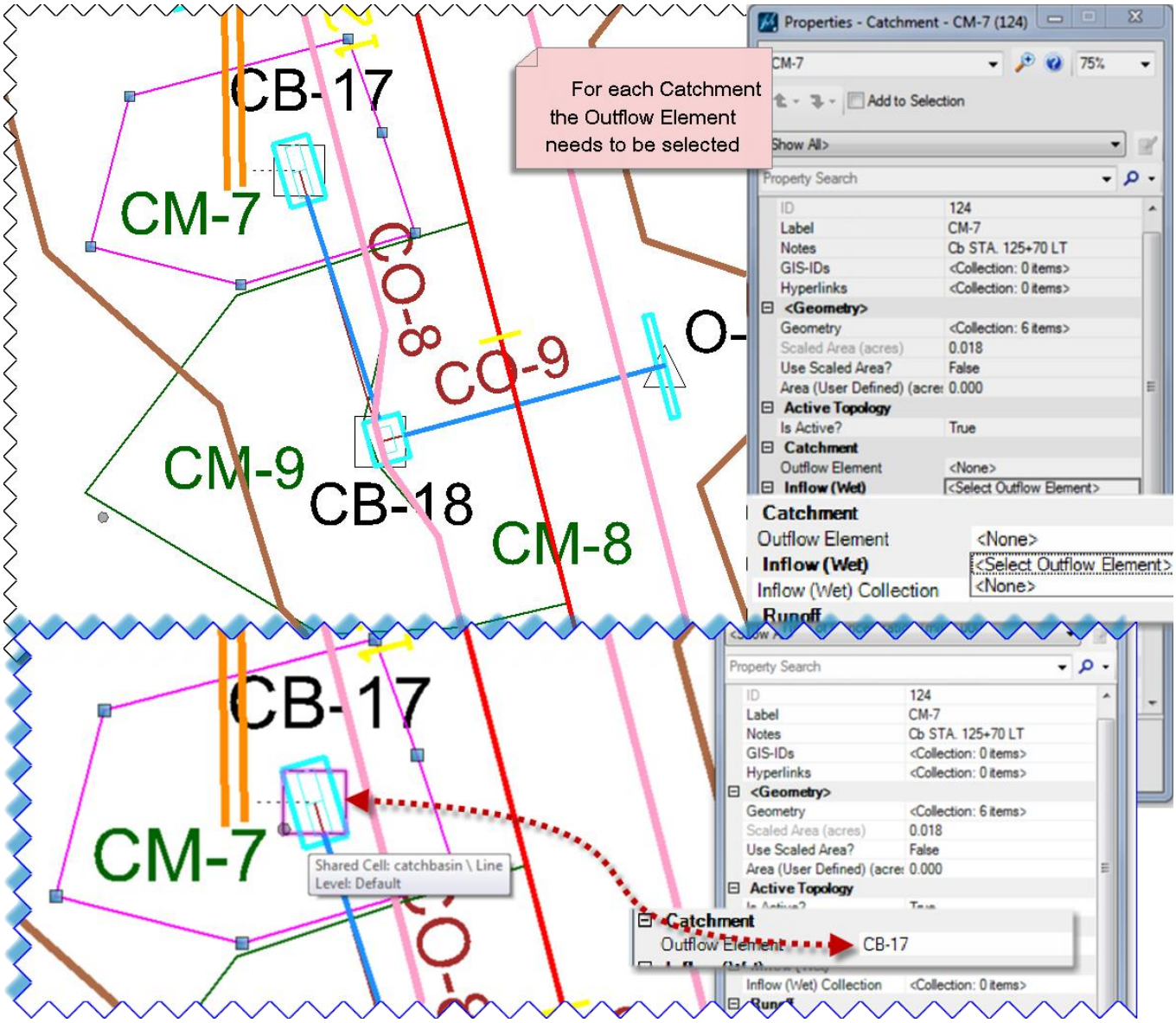
C. Next pick either conduit or channel. Start at the catch basin just placed, within the Layout Conduit box select your next inlet or outlet (example: catch basin).



D. Continue to place the conduit/channel until all of your system is placed ending with Outfall. You can change the structure using the pull-down menu from the Layout Conduit box. StormCAD will number everything.

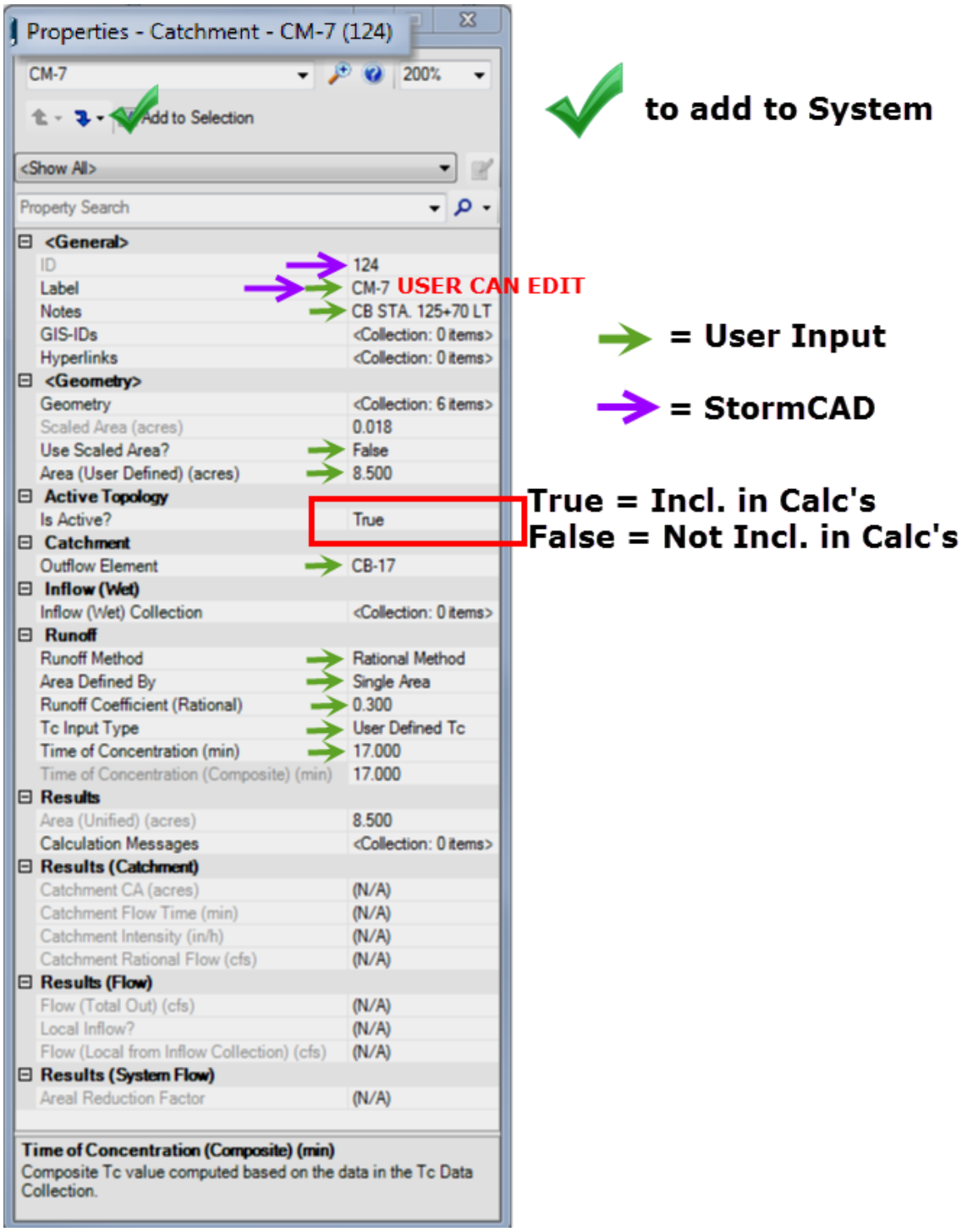


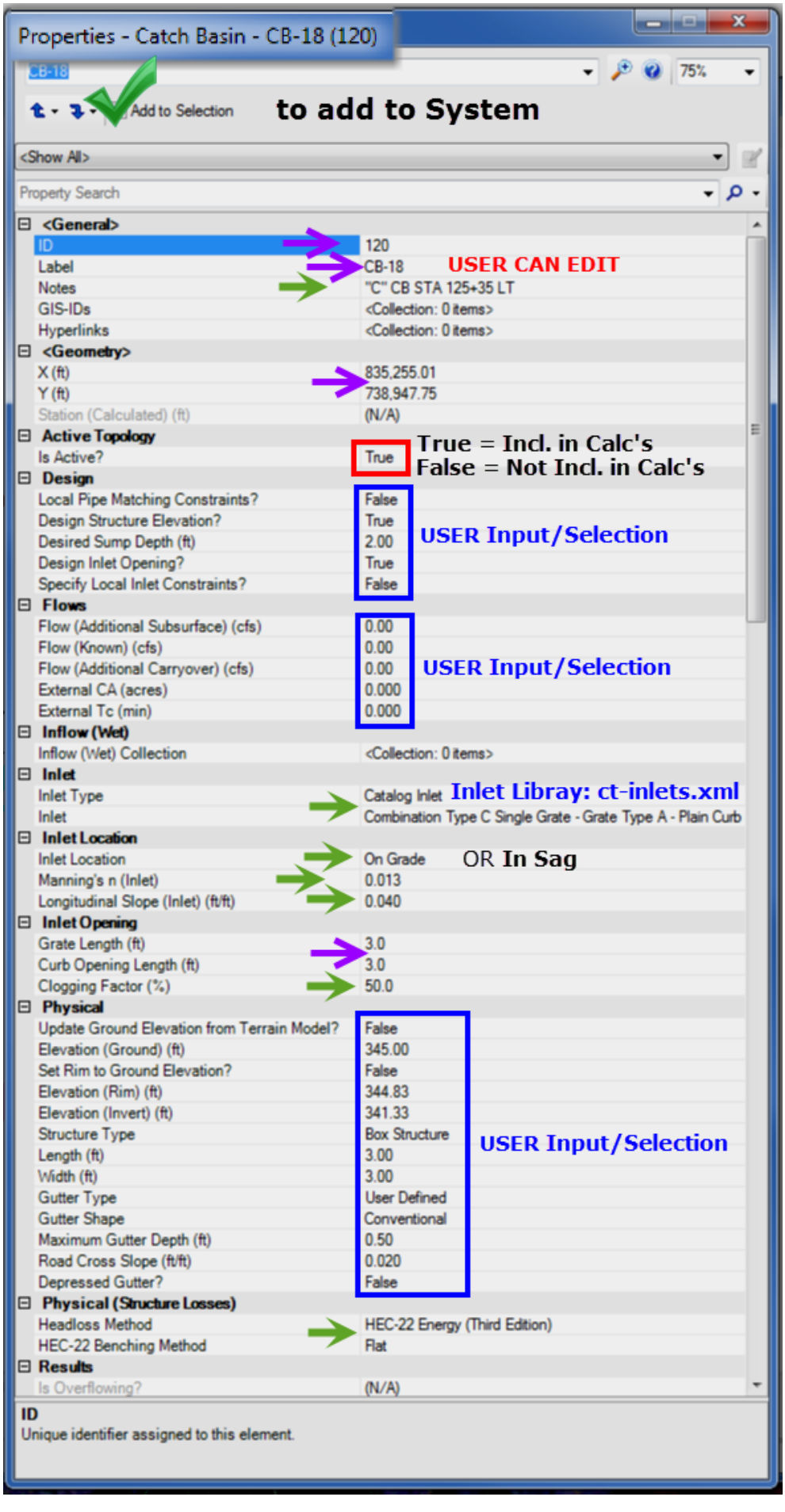
E. Now place the catchment areas for each inlet (catch basin). You can just draw shapes and insert the size or you can draw the actual area shape and have StormCAD calculate the area.



3.2 Input Design Data for Storm Sewer System

F. Using the "Select Tool" double-click on the first catchment area, the properties box will open. Enter all the data for your SYSTEM, continue with the other items in your system. See most common examples (Catchment, Catch Basin, Conduit and Outfall)below:




Properties - Catch Basin - CB-18 (120)
CB-18
75%
Add to Selection
to add to System
<Show All>
Property Search
<General>
ID
120
Label
CB-18
USER CAN EDIT
Notes
"C" CB STA 125+35 LT
GIS-IDs
<Collection: 0 items>
Hyperlinks
<Collection: 0 items>
<Geometry>
X (ft)
835,255.01
Y (ft)
738,947.75
Station (Calculated) (ft)
(N/A)
Active Topology
Is Active?
True
True = Incl. in Calc's
False = Not Incl. in Calc's
Design
Local Pipe Matching Constraints?
False
Design Structure Elevation?
True
Desired Sump Depth (ft)
2.00
Design Inlet Opening?
True
Specify Local Inlet Constraints?
False
USER Input/Selection
Flows
Flow (Additional Subsurface) (cfs)
0.00
Flow (Known) (cfs)
0.00
Flow (Additional Carryover) (cfs)
0.00
External CA (acres)
0.000
External Tc (min)
0.000
USER Input/Selection
Inflow (Wet)
Inflow (Wet) Collection
<Collection: 0 items>
Inlet
Inlet Type
Catalog Inlet
Inlet
Combination Type C Single Grate - Grate Type A - Plain Curb
Inlet Libray: ct-inlets.xml
Inlet Location
Inlet Location
On Grade
OR In Sag
Manning's n (Inlet)
0.013
Longitudinal Slope (Inlet) (ft/ft)
0.040
Inlet Opening
Grate Length (ft)
3.0
Curb Opening Length (ft)
3.0
Clogging Factor (%)
50.0
Physical
Update Ground Elevation from Terrain Model?
False
Elevation (Ground) (ft)
345.00
Set Rim to Ground Elevation?
False
Elevation (Rim) (ft)
344.83
Elevation (Invert) (ft)
341.33
Structure Type
Box Structure
Length (ft)
3.00
Width (ft)
3.00
Gutter Type
User Defined
Gutter Shape
Conventional
Maximum Gutter Depth (ft)
0.50
Road Cross Slope (ft/ft)
0.020
Depressed Gutter?
False
USER Input/Selection
Physical (Structure Losses)
Headloss Method
HEC-22 Energy (Third Edition)
HEC-22 Benching Method
Flat
Results
Is Overflowing?
(N/A)
ID
Unique identifier assigned to this element.

Note:

"Structure Losses" (Headloss Method) for catch basins (inlets), Figure 7-6, typical bench configurations from the HEC-22 – Third Edition.

Benching tends to direct flow through the access hole, resulting in a reduction in energy losses. Figure 7-6 illustrates some typical bench configurations.

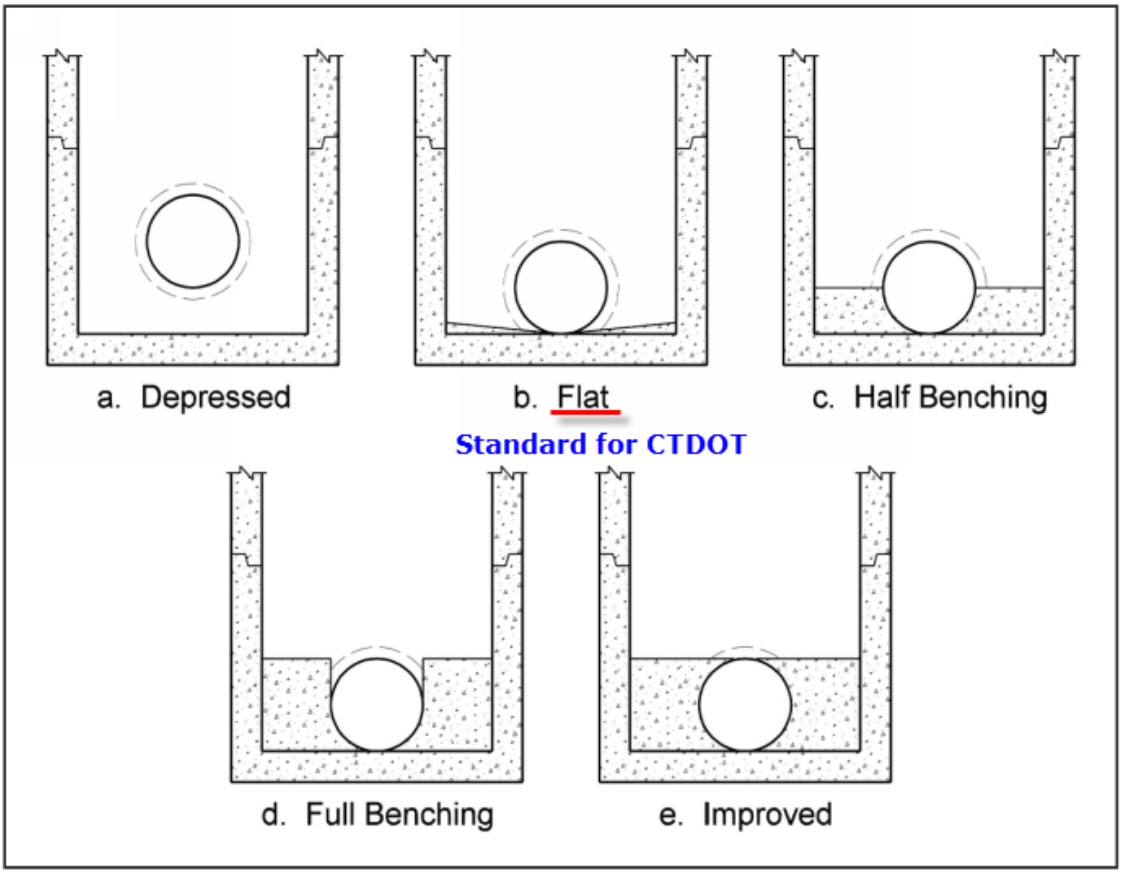
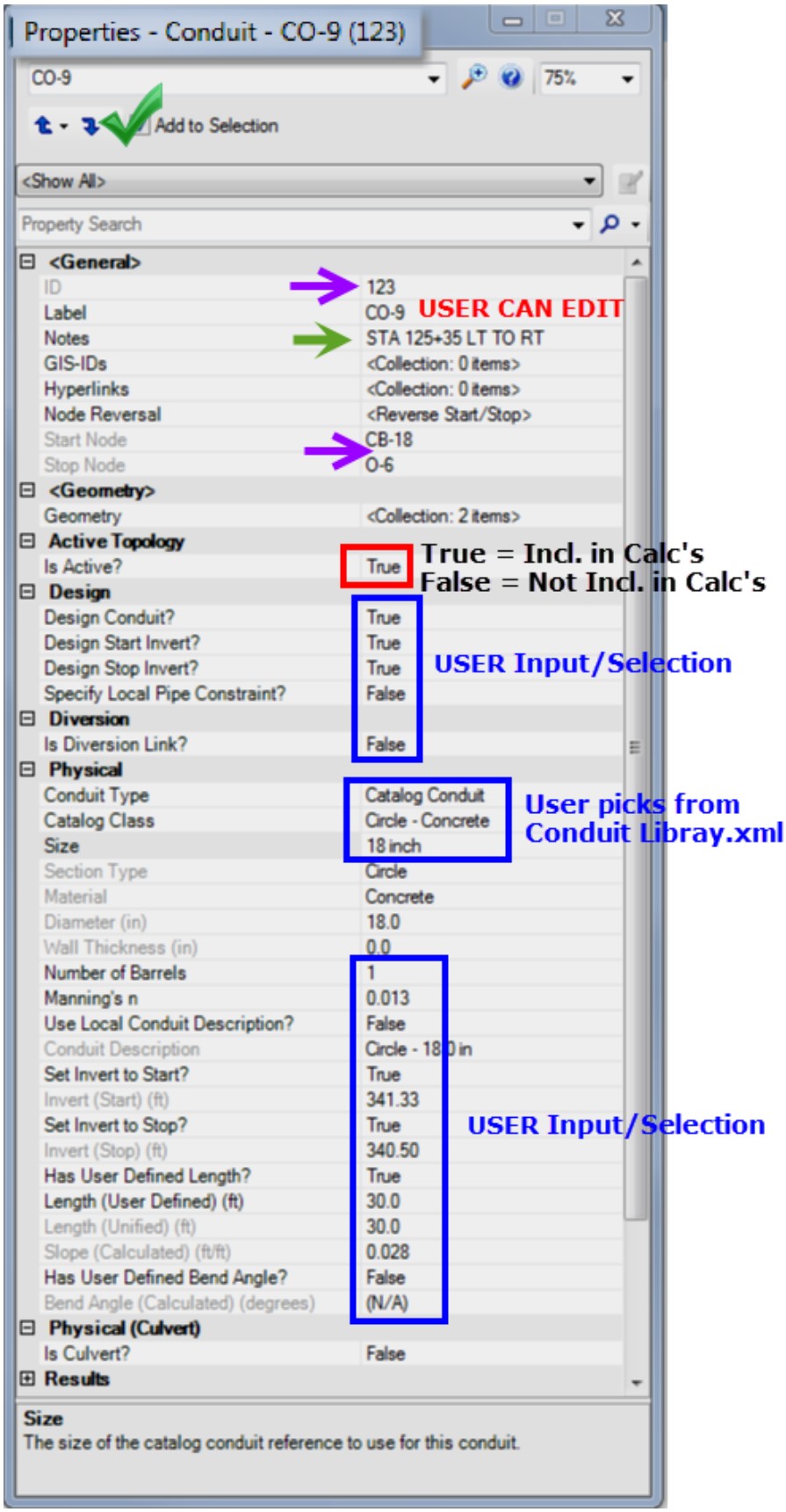
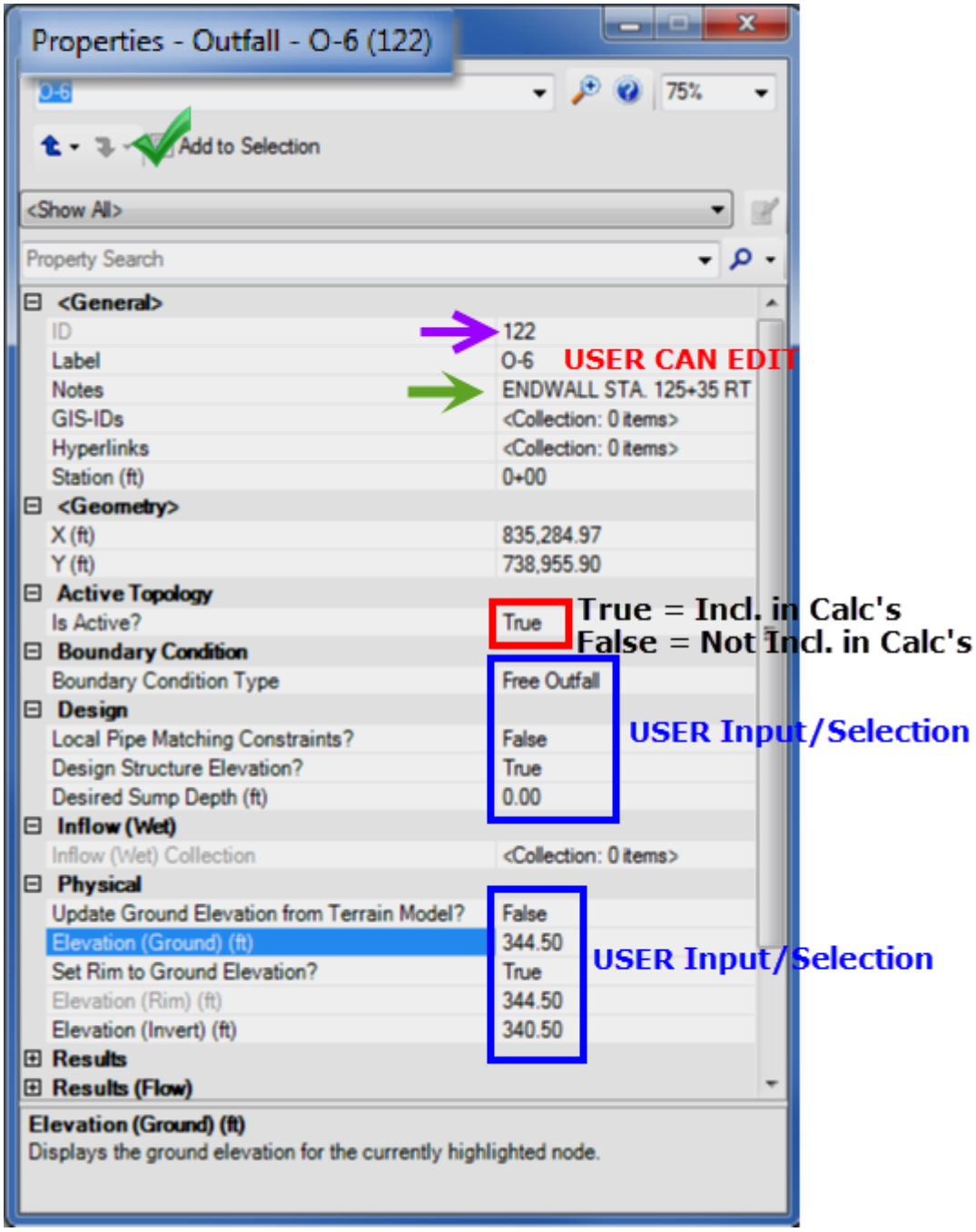


Figure 7-6. Access hole benching methods.


Properties - Conduit - CO-9 (123)
CO-9
75%
Add to Selection
<Show All>
Property Search
<General>
ID
123
Label
CO-9
USER CAN EDIT
Notes
STA 125+35 LT TO RT
GIS-IDs
<Collection: 0 items>
Hyperlinks
<Collection: 0 items>
Node Reversal
<Reverse Start/Stop>
Start Node
CB-18
Stop Node
O-6
<Geometry>
Geometry
<Collection: 2 items>
Active Topology
Is Active?
True
True = Incl. in Calc's
False = Not Incl. in Calc's
Design
Design Conduit?
True
Design Start Invert?
True
Design Stop Invert?
True
USER Input/Selection
Specify Local Pipe Constraint?
False
Diversion
Is Diversion Link?
False
Physical
Conduit Type
Catalog Conduit
Catalog Class
Circle - Concrete
Size
18 inch
User picks from
Conduit Libray.xml
Section Type
Circle
Material
Concrete
Diameter (in)
18.0
Wall Thickness (in)
0.0
Number of Barrels
1
Manning's n
0.013
Use Local Conduit Description?
False
Conduit Description
Circle - 18.0 in
Set Invert to Start?
True
Invert (Start) (ft)
341.33
Set Invert to Stop?
True
USER Input/Selection
Invert (Stop) (ft)
340.50
Has User Defined Length?
True
Length (User Defined) (ft)
30.0
Length (Unified) (ft)
30.0
Slope (Calculated) (ft/ft)
0.028
Has User Defined Bend Angle?
False
Bend Angle (Calculated) (degrees)
(N/A)
Physical (Culvert)
Is Culvert?
False
Results
Size
The size of the catalog conduit reference to use for this conduit.

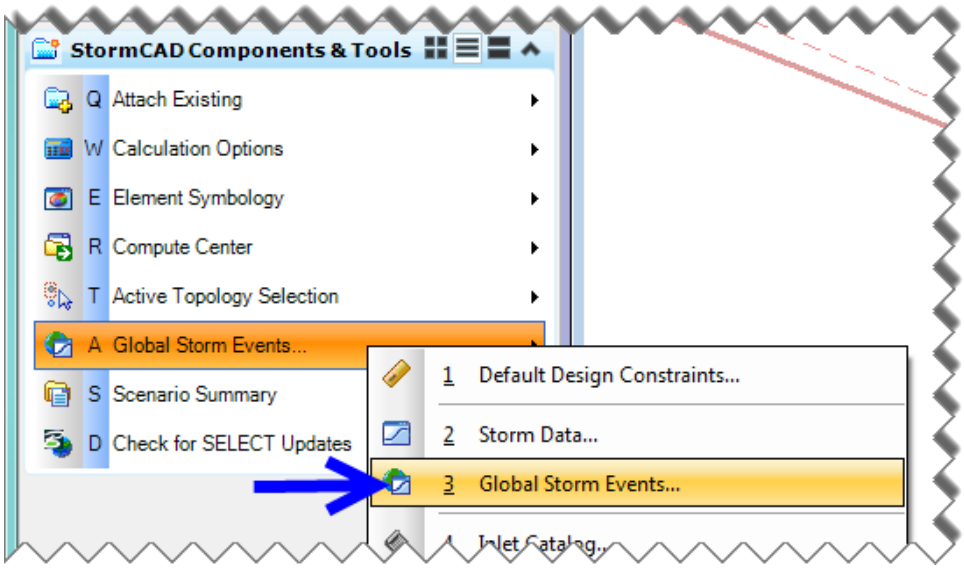

Properties - Outfall - O-6 (122)
O-6
75%
Add to Selection
<Show All>
Property Search
<General>
ID
122
Label
O-6
USER CAN EDIT
Notes
ENDWALL STA. 125+35 RT
GIS-IDs
<Collection: 0 items>
Hyperlinks
<Collection: 0 items>
Station (ft)
0+00
<Geometry>
X (ft)
835,284.97
Y (ft)
738,955.90
Active Topology
Is Active?
True
True = Incl. in Calc's
False = Not Incl. in Calc's
Boundary Condition
Boundary Condition Type
Free Outfall
Design
Local Pipe Matching Constraints?
False
Design Structure Elevation?
True
Desired Sump Depth (ft)
0.00
USER Input/Selection
Inflow (Wet)
Inflow (Wet) Collection
<Collection: 0 items>
Physical
Update Ground Elevation from Terrain Model?
False
Elevation (Ground) (ft)
344.50
Set Rim to Ground Elevation?
True
Elevation (Rim) (ft)
344.50
Elevation (Invert) (ft)
340.50
USER Input/Selection
Results
Results (Flow)
Elevation (Ground) (ft)
Displays the ground elevation for the currently highlighted node.

Section 4 Analyzing the System

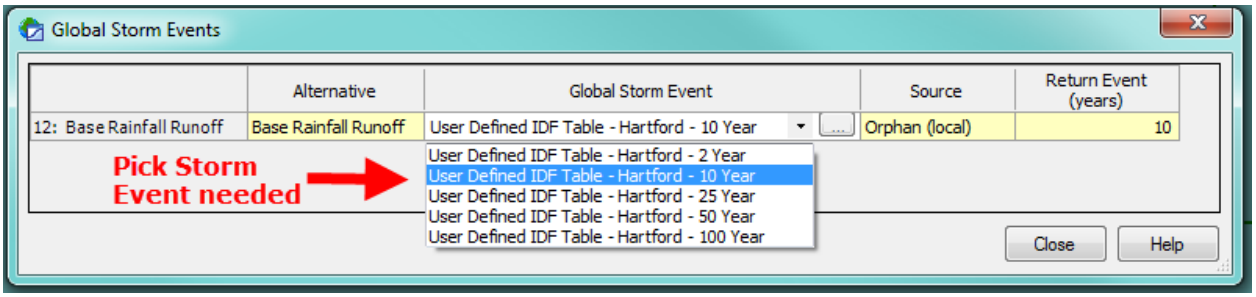
Before you can analyze the system you created you have to select Global Storm Event for your calculations.

4.1 Global Storm Event

A. Select **Global Storm Events…** from the StormCAD Components & Tools.

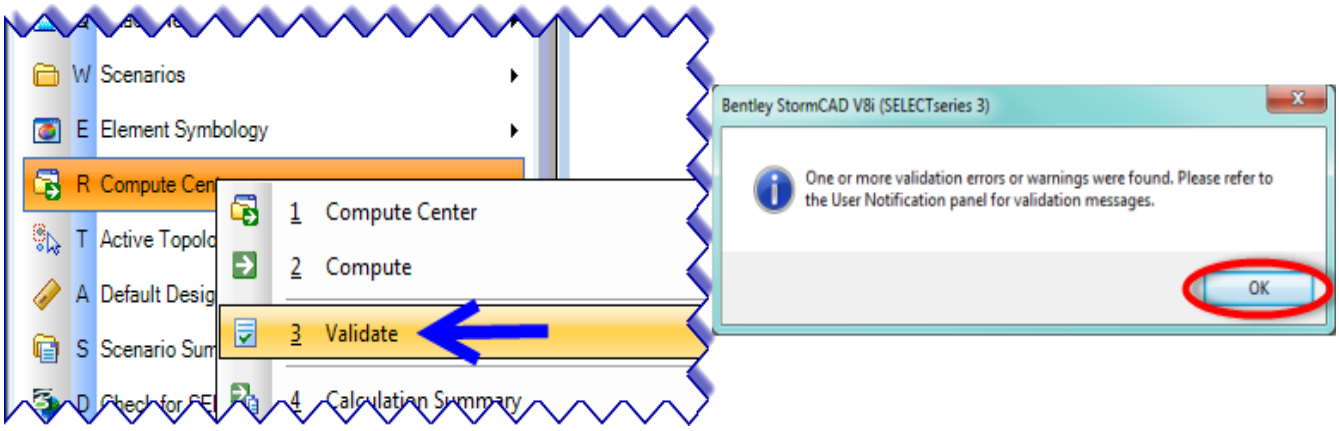


B. In the Global Storm Events box, click on ▼ (down arrow) and select the Global Storm Event needed for your calculation scenario. Click **Close**.



4.2 Validate and Calculate the Model/System

A. To analyze the system created, select **Compute Center → Validate**. You may get a message for errors or warning. Click **OK**.

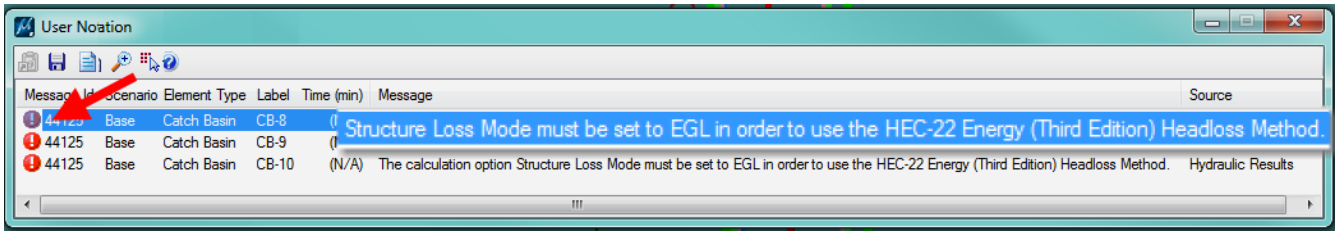


B. **User Notifications** may open displaying a list of warnings generated during the validation. There are two types:

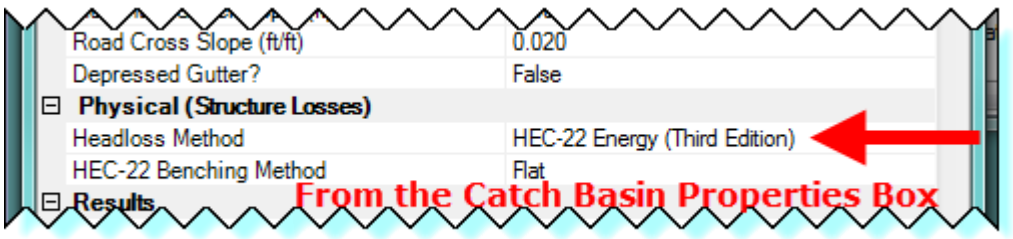
- Red => error must be corrected before model (system) can be computed,
- Yellow => does not prevent successful calculation of model (system).

As Example:

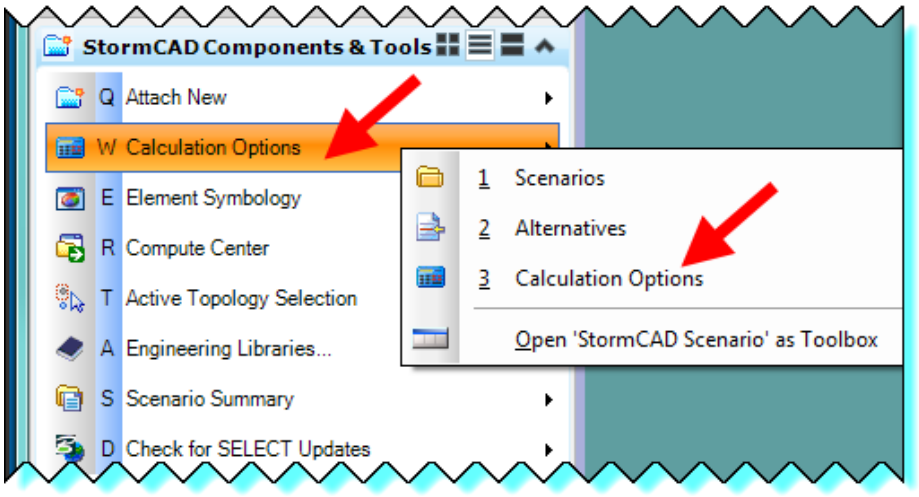
<u>User Notification</u>:



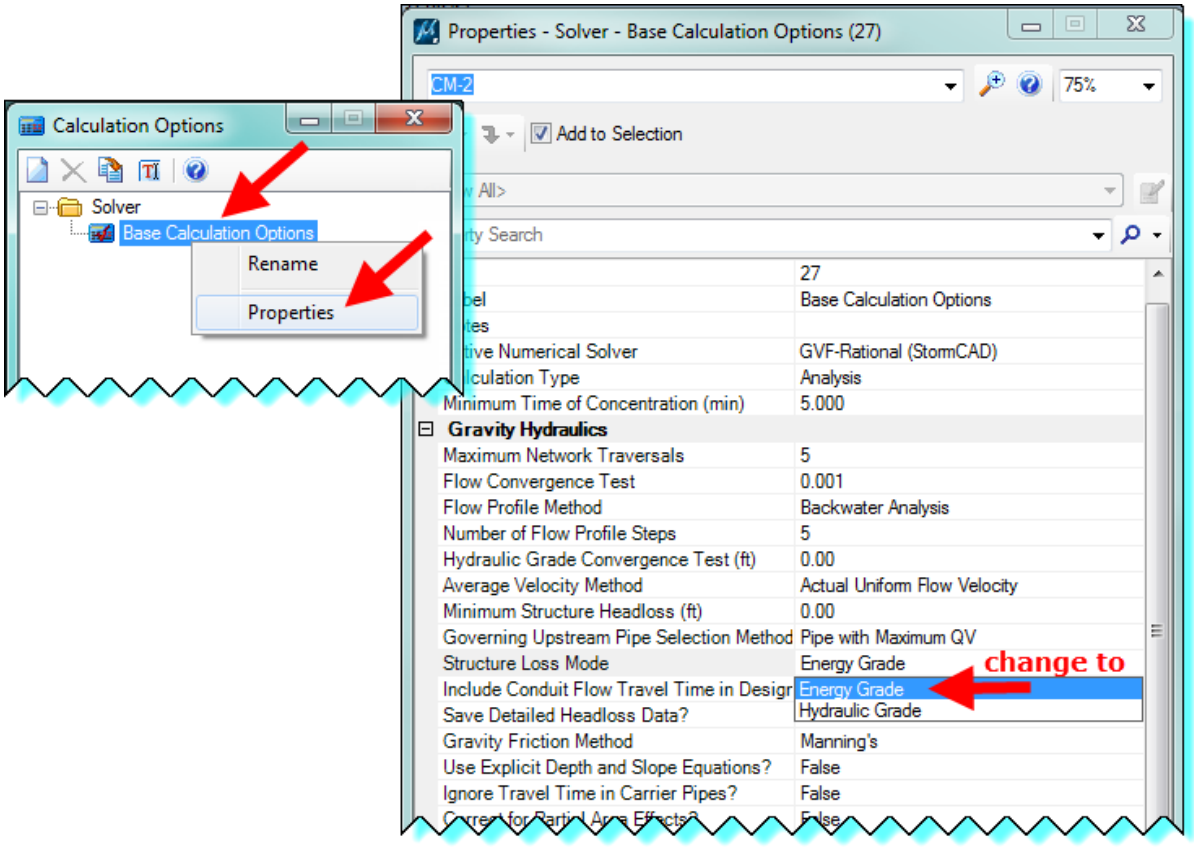
<u>Meaning:</u> Inlet calculations use the Headloss Method: HEC-22 Energy (3rd Edition) to use this, the Structure Loss mode must be set the **E**nergy **G**rade **L**ine in the calculation options.



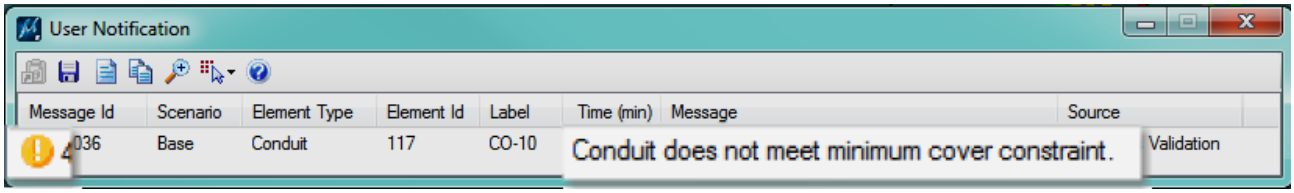
Fix / Change: **Click** on **Calculations Options** in the StormCAD Components & Tools task bar.



In the Calculation Options box **right-click** on **Base Calculation Options** and **click Properties**. In the Properties – Solver – Base Calculation Options box **change** the Structure Loss Mode from Hydraulic Grade to Energy Grade. **Close** the boxes and **Validate again**.

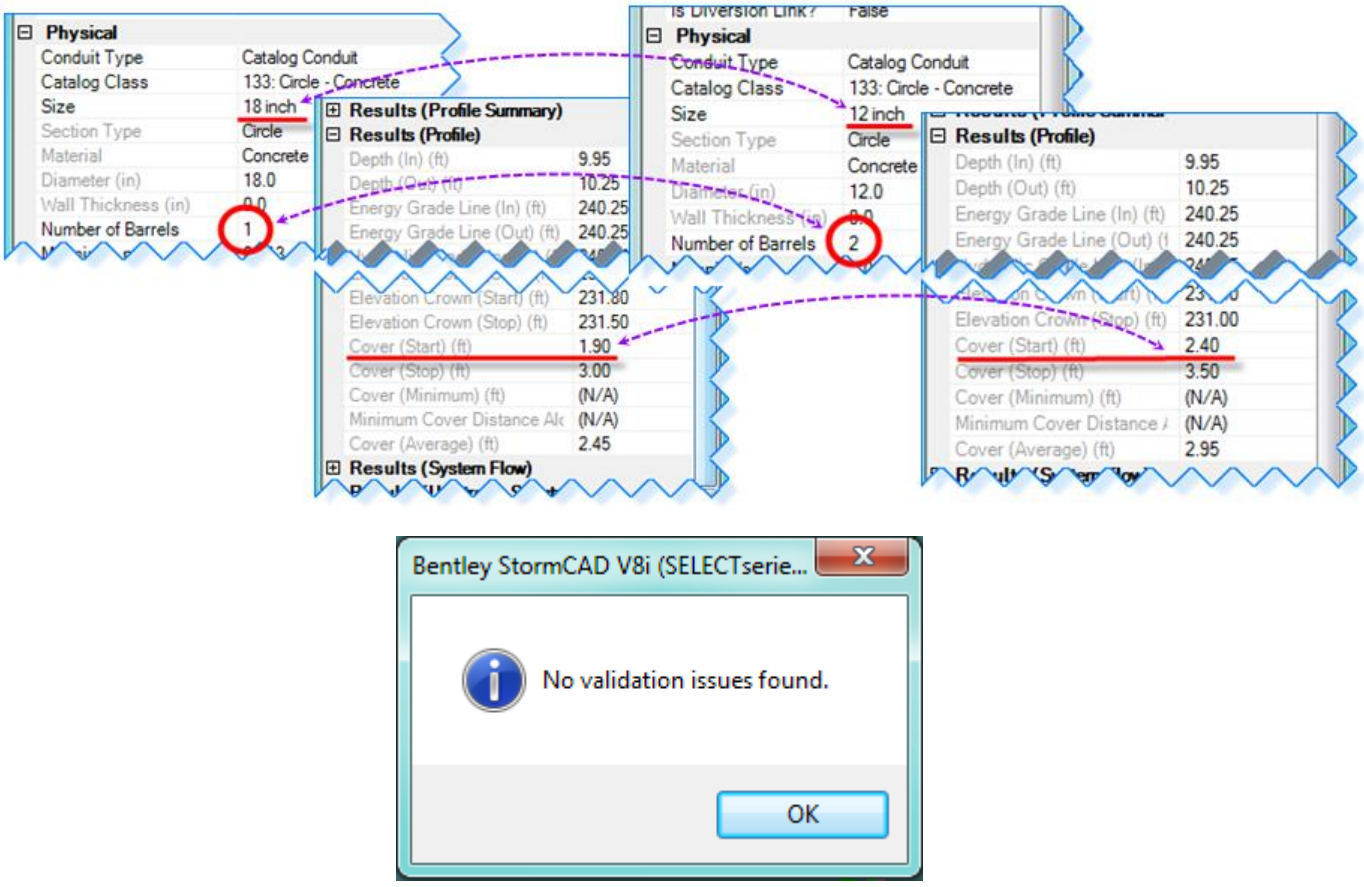


User Notification:

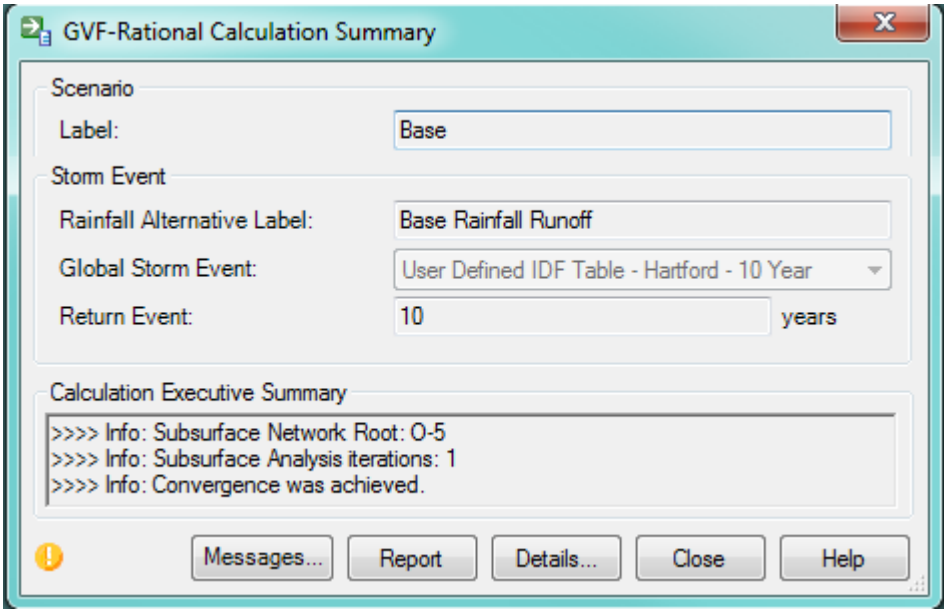


Meaning: The culvert (pipe) doesn't have enough cover as set in the Default Design Constraints.

Fix / Change: Pick a **smaller culvert size** and add **extra barrel** if needed, or lower the culvert elevations as needed, or leave as is and make culvert a Class V concrete culvert. **Close** the boxes and **Validate again**.



C. After you validated and all issues (RED) have been resolved as needed for your design system click the **Compute** button to calculate the model (system). After the calculation is complete, the **GVF-Rational Calculation Summary** is displayed. **Review** the Messages…, Details … and **Close**. Make any changes necessary, validate and compute again to update your design.



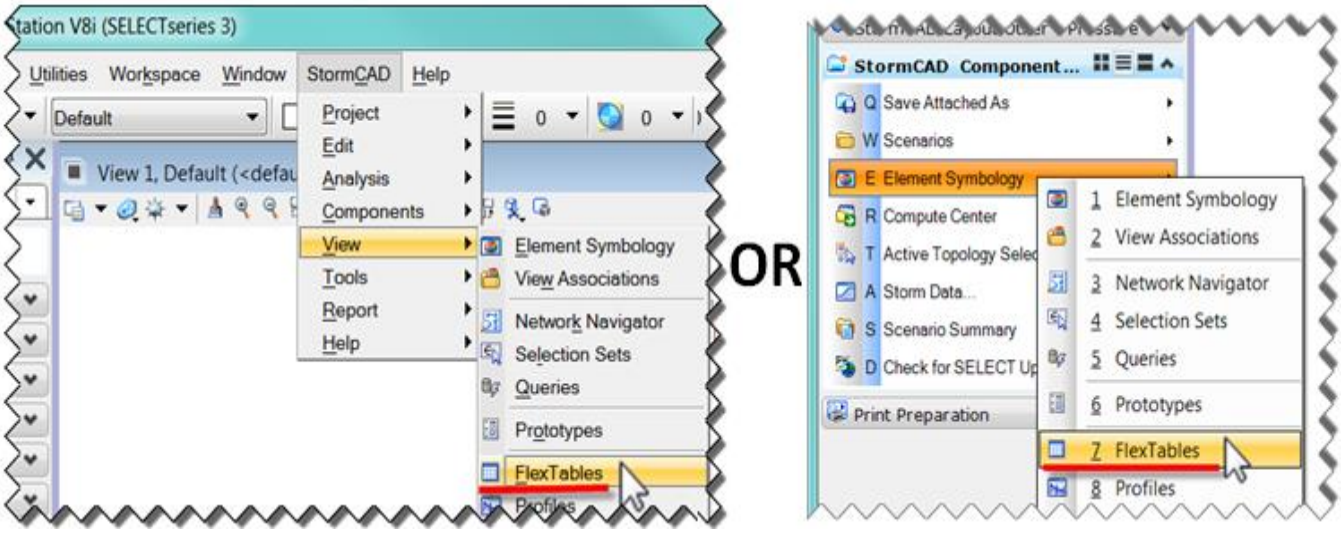
4.3 Presentation of Results

After all the calculations are completed the designer needs to be able to display and print the information, StormCAD uses reports, flex tables and profiles to display and print the drainage model calculations. We discuss **FlexTables** and **Profiles**, users are encouraged to explore the presentation options more on their own.

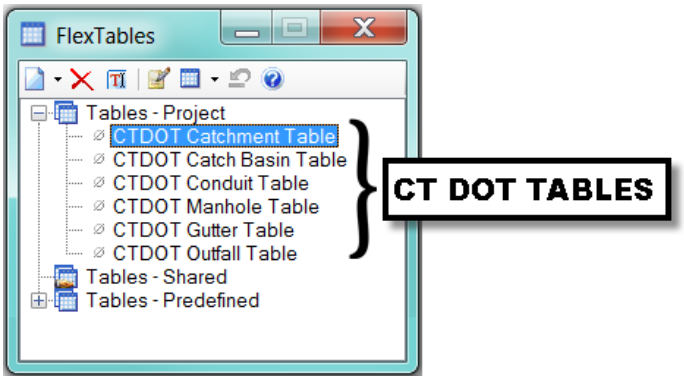
4.3.1 FlexTables

Different FlexTables are available for a drainage system as needed. The designer should use the drainage manual as a guide to determine the information needed to represent the designed system, example: CTDOT Drainage Manual - Tables 11-4 & 11-5 Inlet Spacing Computation Sheet and Tables 11-8 & 11-9 Storm Drain Computation Sheet.

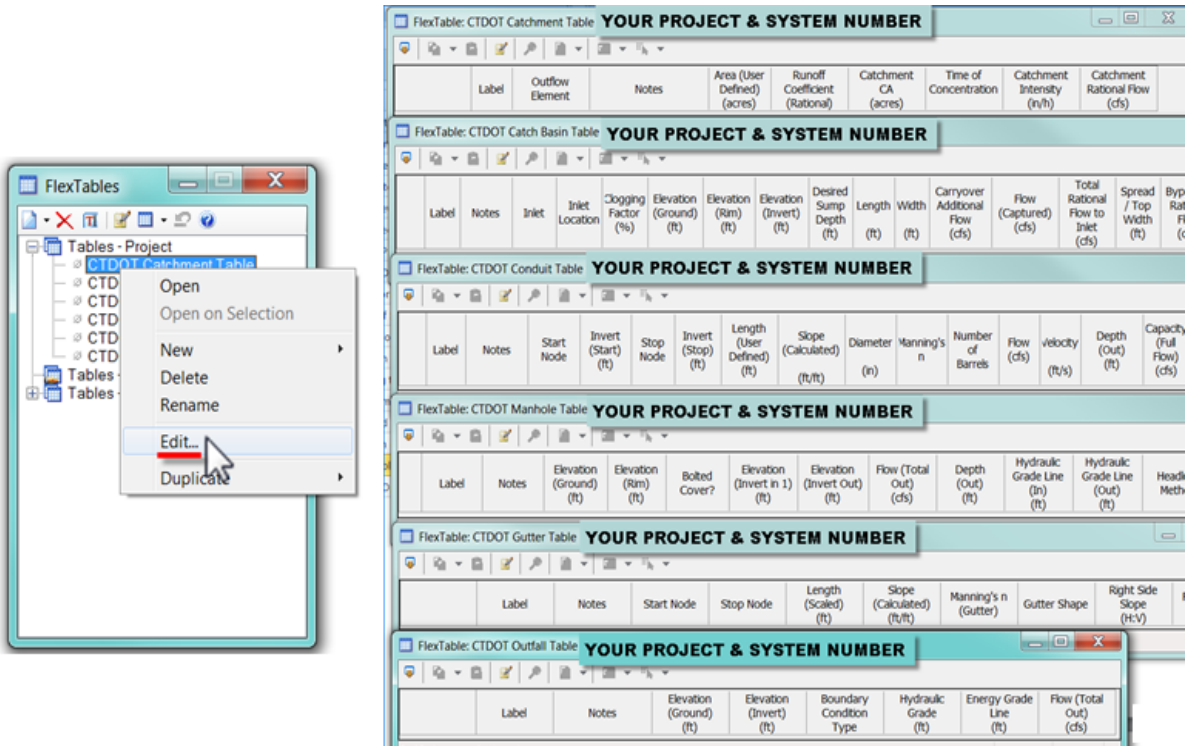
A. To view flex tables, from the menu bar select **StormCAD → View → FlexTables** or use the StormCAD Components and Tools task, left-click and hold on **Element Symbology → FlexTables**.



B. The FlexTables dialog box opens. Custom CTDOT Tables are available for catchment, catch basin, conduit, manhole, gutter and outfall. The designer can also create tables or modify tables. Multiple tables are stored and can be accessed by clicking on the checkbox for Tables – Predefined.



C. The designer should determine if all information needed is available. Individual flextables can be modified by **Right-Click → Edit** to add and/or remove selected columns.



D. To view flextables and print click on the Report icon , in the preview window adjust columns as needed and print to pdf.

4.3.2 Profiles

Two types of profiles are available to the designer to show the storm drainage system. The designer should use the drainage manual as a guide to determine the information needed to represent the designed system, example: CTDOT Drainage Manual – Chapter 11 – Figure 11-12 Use Of Energy Losses In Developing A Strom Drain System.

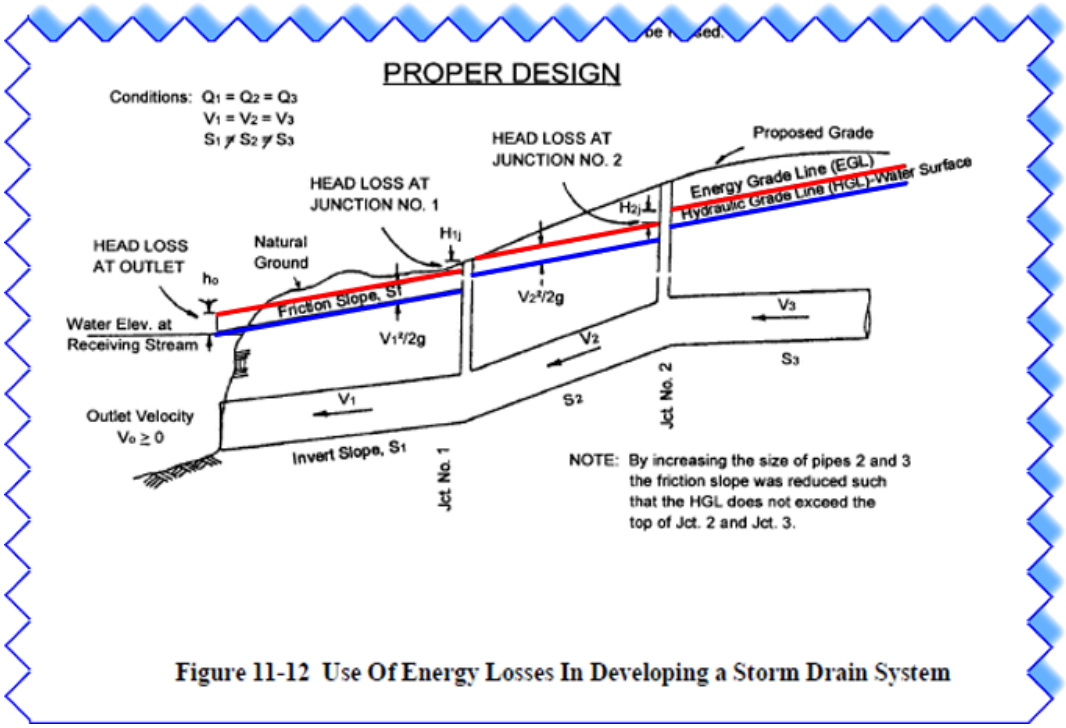
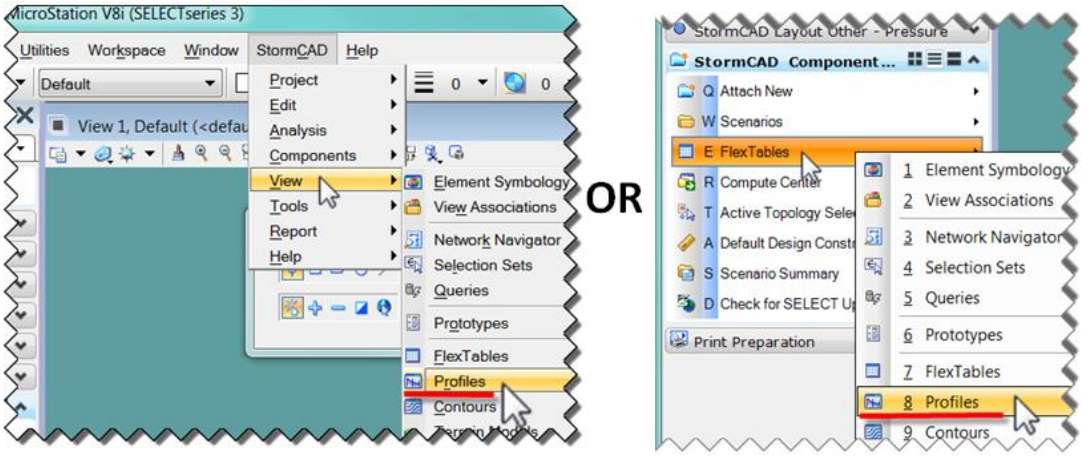
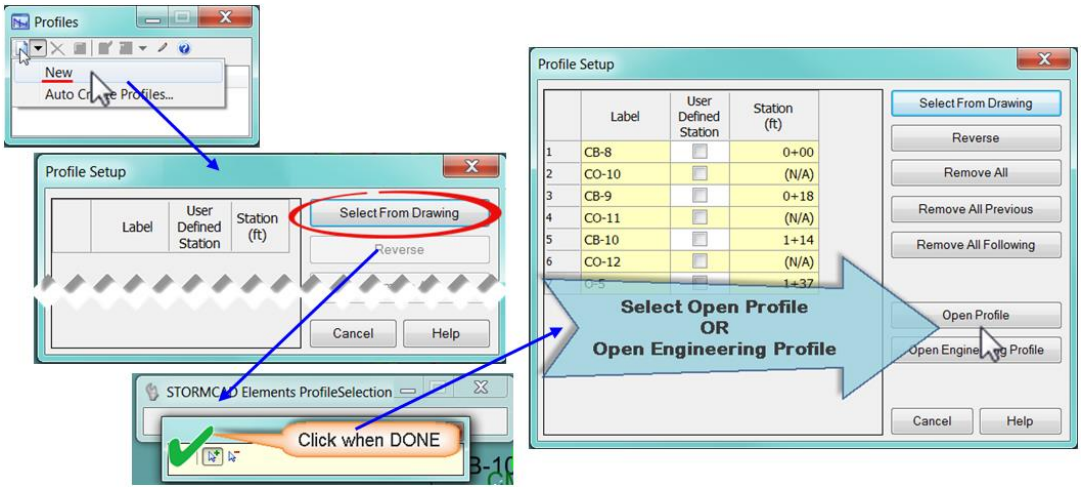


Figure 11-12 Use Of Energy Losses In Developing a Storm Drain System

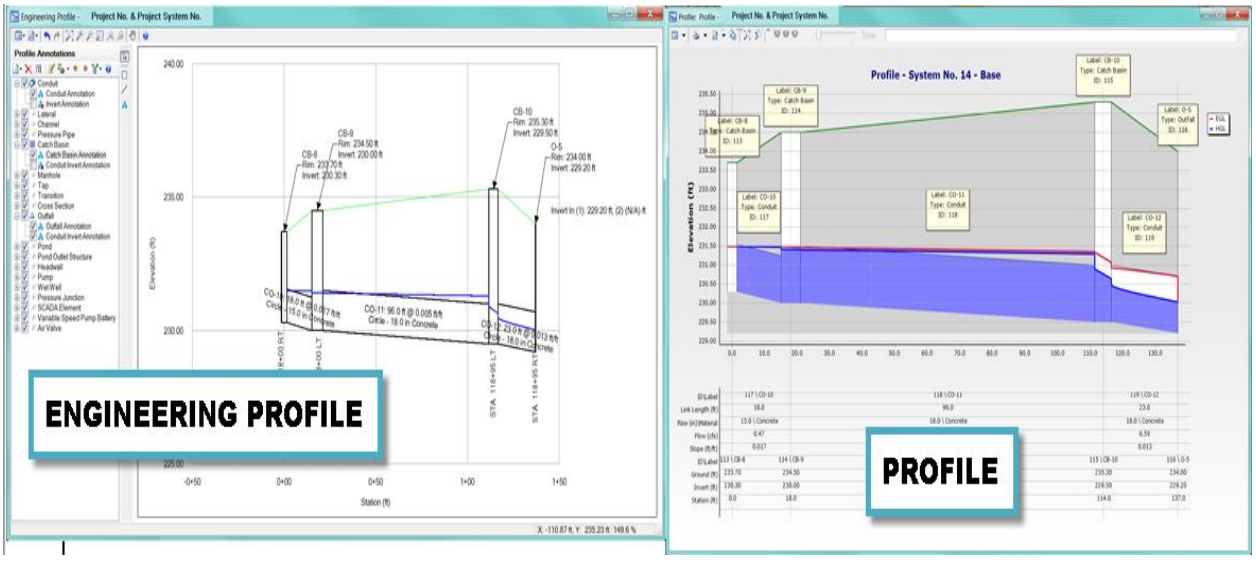
A. To view profiles, from the menu bar select **StormCAD → View → Profiles** or use the StormCAD Components and Tools task, left-click and hold on **Element Symbology → Profiles**.



B. The Profiles box opens, click on the “New” icon and click **New**. The Profile Setup box opens. Click on **Select From Drawing**. The STORMCAD Elements ProfileSelection pick box opens. Select the structure items in your system to show as profile.



C. Select the profile option you want: **Open Profile** or **<u>Open Engineering Profile</u>**. The profile box will open, both boxes have various options to label, annotate and print the profile display.

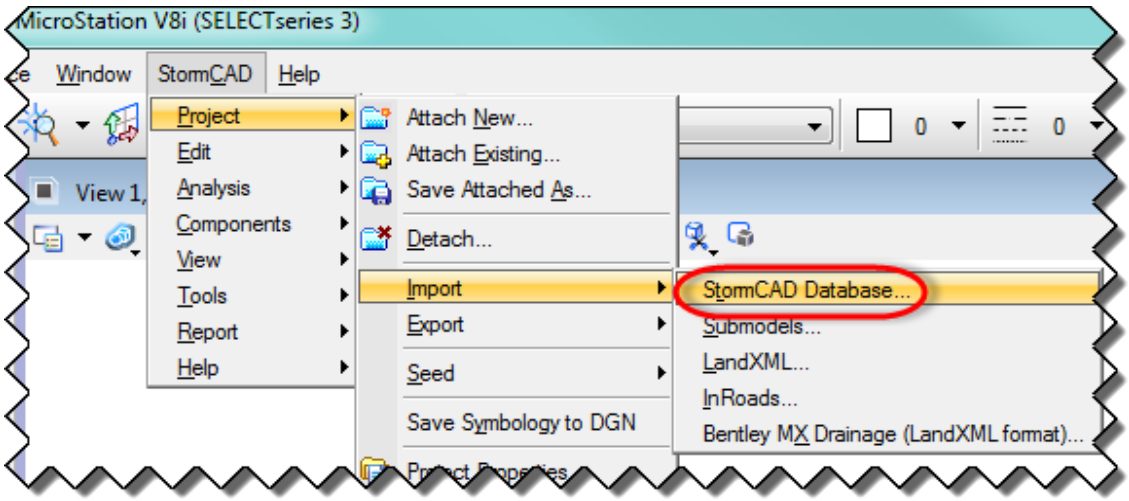


Section 5 Convert/Opening Existing StormCAD Project

Should you need to open an existing StormCAD project please follow these directions. File extensions for StormCAD V8i SS3 have changed from previous versions. New files have to be created.

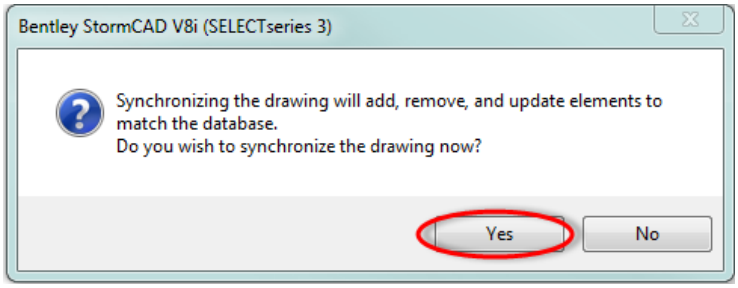
A. Create a **new *.dgn** file using the **HaestadSeed2d.dgn file,** see Section 1.1.2 .

B. Select from the menu bar **StormCAD → Project → Import → StormCAD Database**

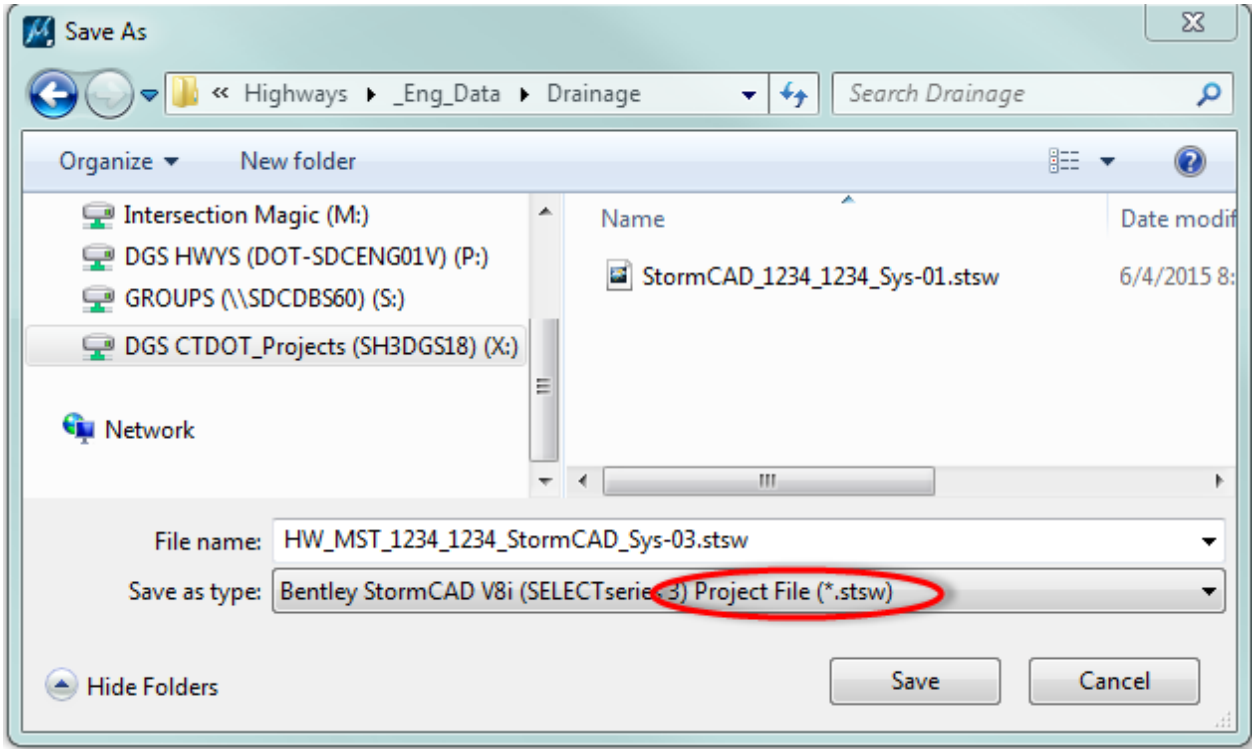


C. In the manager select the **existing Prj_Nbr_Sys_XX.stc.mdb** file. Click **Open**. Please be aware if the existing model/system is large it can take some time. Click **Yes**. Files with new extensions will be created by StormCAD V8i SS3.

D. The following question may come up: Do you wish to synchronize the drawing now? Click **Yes**.



E. The **Save As** box opens. **Save** the file into the project container. You will see the ***.stsw** file extension.



F. StormCAD recreates the schematic in the new DGN-file and creates all the files needed with new extensions. After completion of the import you can make changes as needed, such as updating the rainfall intensity with a new User Defined IDF-table, see Section 3.