

(USA) Introduction Chapter 3 - Review Results

File/s needed:

Click to download the [Introduction Project \(USA\) Model files](#).

Summary Results

Whenever a stormwater system is analyzed the SWC Summary result table is shown. This will list a range of important information regarding how well the individual system elements performed, if they flooded and what volume capacity remains at critical inundation conditions.

Continue working on your model or open `ID_US_Introduction_Project_Ch3.iddx` and run the model.

When viewing the SWC Summary result, select **All Storms** and **Critical Storm** options to view results for all rainfall for the Arch Chamber SWC and the orange highlighted storm representing the critical (i.e. highest water level) event.

Stormwater Controls Summary

All Items All Storms Select Item Arch Chamber Critical Storm Set Visible Columns

Summary Results for Arch Chamber

Storm Event	Max Level (ft)	Max Depth (ft)	Max Inflow (ft ³ /s)	Max Resident Volume (ft ³)	Max Flooded Volume (ft ³)	Total Lost Volume (ft ³)	Max Outflow (ft ³ /s)	Total Discharge Volume (ft ³)	Status
+0 %: ARI: WQe: Type IA: 1.0 in	166.8	1.0	0.320	1671.7	0.0	4501.8	0.000	0.0	OK
+0 %: ARI: 2 years: Type IA: 2.4 in	167.7	1.9	0.914	3811.4	0.0	6326.9	0.299	6563.9	OK
+0 %: ARI: 5 years: Type IA: 3.1 in	168.1	2.3	1.206	4558.2	0.0	6408.6	0.662	10731.0	OK
+0 %: ARI: 10 years: Type IA: 3.8 in	168.4	2.6	1.495	5210.4	0.0	6459.7	0.846	14946.3	OK
+0 %: ARI: 25 years: Type IA: 4.2 in	168.6	2.8	1.662	5485.2	0.0	6482.8	0.923	17364.4	OK
+0 %: ARI: 50 years: Type IA: 4.6 in	168.7	2.9	1.827	5724.9	0.0	6502.6	0.999	19794.0	OK
+0 %: ARI: 100 years: Type IA: 5.1 in	169.1	3.3	1.978	5973.9	0.0	6525.2	1.121	22829.5	OK

Help

The **Status** is **OK** so we can investigate the levels further. Looking at the combination of the Profile, Arch Chamber SWC dimensions and the Summary Results, it can be seen that the chambers themselves are exceeded by the runoff volume, though due to the incorporation of the Embedded storage the facility is able to detain enough additional runoff volume to keep from over topping. Select the upper right **X** buttons to close any dialogs that are open.

Stormwater Controls Summary

Summary Results for Arch Chamber

Storm Event	Max Level (ft)	Max Depth (ft)	Max Inflow (ft³/s)	Max Resident Volume (ft³)	Max Flooded Volume (ft³)	Total Lost Volume (ft³)	Max Outflow (ft³/s)	Total Discharge Volume (ft³)	Status
+0 %: ARI: WQe: Type IA: 1.0 in	165.8	1.0	0.320	1671.7	0.0	4501.8	0.000	0.0	OK
+0 %: ARI: 2 years: Type IA: 2.4 in	167.7	1.9	0.914	3811.4	0.0	6326.9	0.299	6563.9	OK
+0 %: ARI: 5 years: Type IA: 3.1 in	168.1	2.3	1.206	4558.2	0.0	6408.6	0.662	10731.0	OK
+0 %: ARI: 10 years: Type IA: 3.8 in	168.4	2.6	1.495	5210.4	0.0	6459.7	0.846	14946.3	OK
+0 %: ARI: 25 years: Type IA: 4.2 in	168.6	2.8	1.662	5485.2	0.0	6482.8	0.923	17364.4	OK
+0 %: ARI: 50 years: Type IA: 4.6 in	168.7	2.9	1.827	5724.9	0.0	6502.5	0.999	19794.0	OK
+0 %: ARI: 100 years: Type IA: 5.1 in	169.1	3.3	1.976	5973.9	0.0	6525.2	1.121	22829.9	OK

Profile - Flow Path

Arch Chamber

Name: Arch Chamber

Dimensions

Sizing Calculator

Exceedence Level (ft): 170.1

Depth (ft): 3.7

Base Level (ft): 165.9

Number of Chambers: 66

Number of Rows: 6

Distance Between Rows (in): 0.0

Chamber Length (ft): 8.5

Wall Thickness (in): 2.0

Diameter / Base Width (in): 52.0

Height (in): 30.5

Parabolic Arch Chamber
66 Chambers, 6 Rows, Total Volume = 6369.499ft³

Open the **Connection Summary** results under the **Results** ribbon and select **Critical Storm** to see how the pipe network performed.

File Plan Import Rainfall/Pollutants Preliminary Sizing Build Analysis Results Export Help

Tables Show Profile Area Summary Manhole Schedule Take Off Data Audit Report Inflows Junctions Stormwater Controls Connections Phase Management

Data Profiles Reports Summaries

Connections Summary

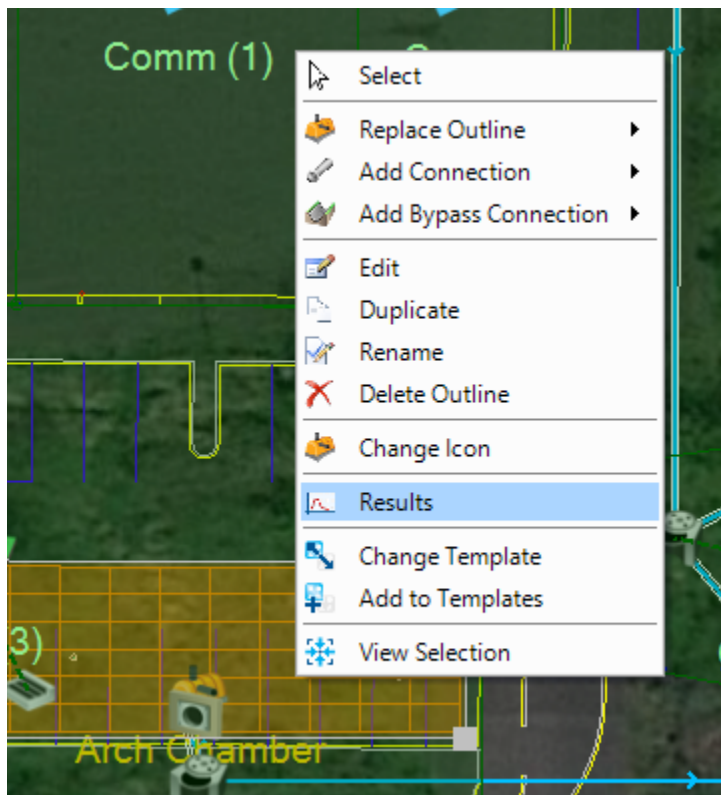
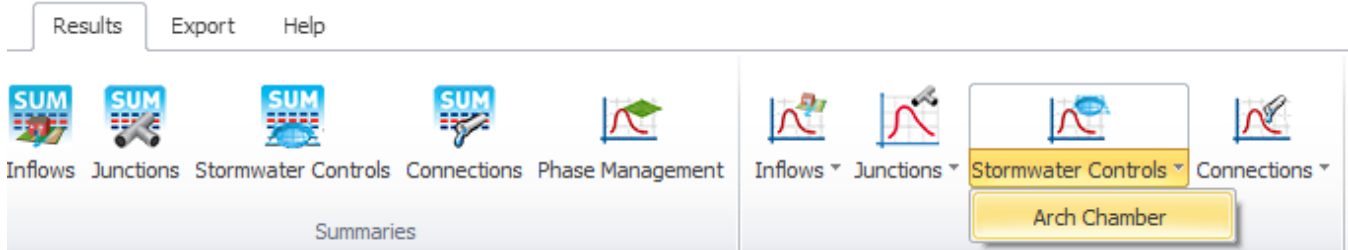
SCS: Critical Storm Per Item

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (ft)	Max US Water Level (ft)	Max Flow Depth (ft)	Discharge Volume (ft³)	Max Velocity (ft/s)	Flow / Capacity	Max Flow (ft³/s)	Status
Standard Pipe (2)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH	Standard MH (1)	172.2	171.8	0.3	5265.7	2.4	0.14	0.368	OK
Standard Pipe (3)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (1)	Standard MH (2)	172.1	171.7	0.6	6871.8	2.5	0.09	0.478	OK
Standard Pipe (4)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (3)	Standard MH (2)	169.5	168.6	0.7	3401.4	1.7	0.17	0.237	OK
Standard Pipe (5)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (4)	Standard MH (2)	169.5	168.5	0.3	0.0	0.1	0.02	0.005	Surcharged
Standard Pipe (6)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (5)	Standard MH (6)	169.3	167.2	0.3	22829.2	3.6	0.05	1.121	OK
Standard Pipe (7)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (7)	Standard MH (8)	172.0	171.7	0.2	1719.1	2.0	0.14	0.118	OK
Standard Pipe (9)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (8)	Standard MH (9)	171.3	170.9	0.2	7301.5	3.4	0.1	0.502	OK
Standard Pipe (10)	+0 %: ARI: WQe: Type IA: 1.0 in	Pipe	Standard MH (1)	Standard MH (9)	172.4	171.4	0.1	0.0	0.0	0	0.000	OK
Standard Pipe (13)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Arch Chamber	Standard MH (5)	168.8	166.8	0.3	22829.3	3.4	0.06	1.121	OK
Standard Pipe (14)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (2)	Arch Chamber	169.0	168.2	1.1	11358.9	2.4	0.13	0.767	OK
Standard Pipe (15)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (1)	Standard MH (1)	170.5	169.6	0.2	5186.0	3.1	0.21	0.364	OK
Standard Pipe (8)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (1)	Standard MH (1)	172.1	171.8	0.2	2655.8	2.3	0.06	0.183	OK
Standard Pipe (16)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (1)	Standard MH (8)	171.8	171.6	0.2	2655.7	1.9	0.05	0.183	OK
Standard Pipe (11)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (9)	Standard MH (1)	171.2	170.3	0.3	7301.4	2.9	0.16	0.502	OK
Standard Pipe (17)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (1)	Standard MH (1)	170.8	169.9	0.3	7301.5	2.8	0.16	0.501	OK
Standard Pipe (12)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (1)	Standard MH (1)	170.2	169.3	0.5	12488.4	2.9	0.08	0.864	OK
Standard Pipe (18)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (1)	Arch Chamber	169.2	168.4	1.1	12475.7	2.4	0.15	0.862	OK
Standard Pipe	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (1)	Standard MH (1)	172.2	172.0	0.1	1606.1	2.5	0.15	0.111	OK
Standard Pipe (19)	+0 %: ARI: 100 years: Type IA: 5.1 in	Pipe	Standard MH (1)	Standard MH (1)	172.0	171.8	0.2	1606.1	1.3	0.1	0.111	OK

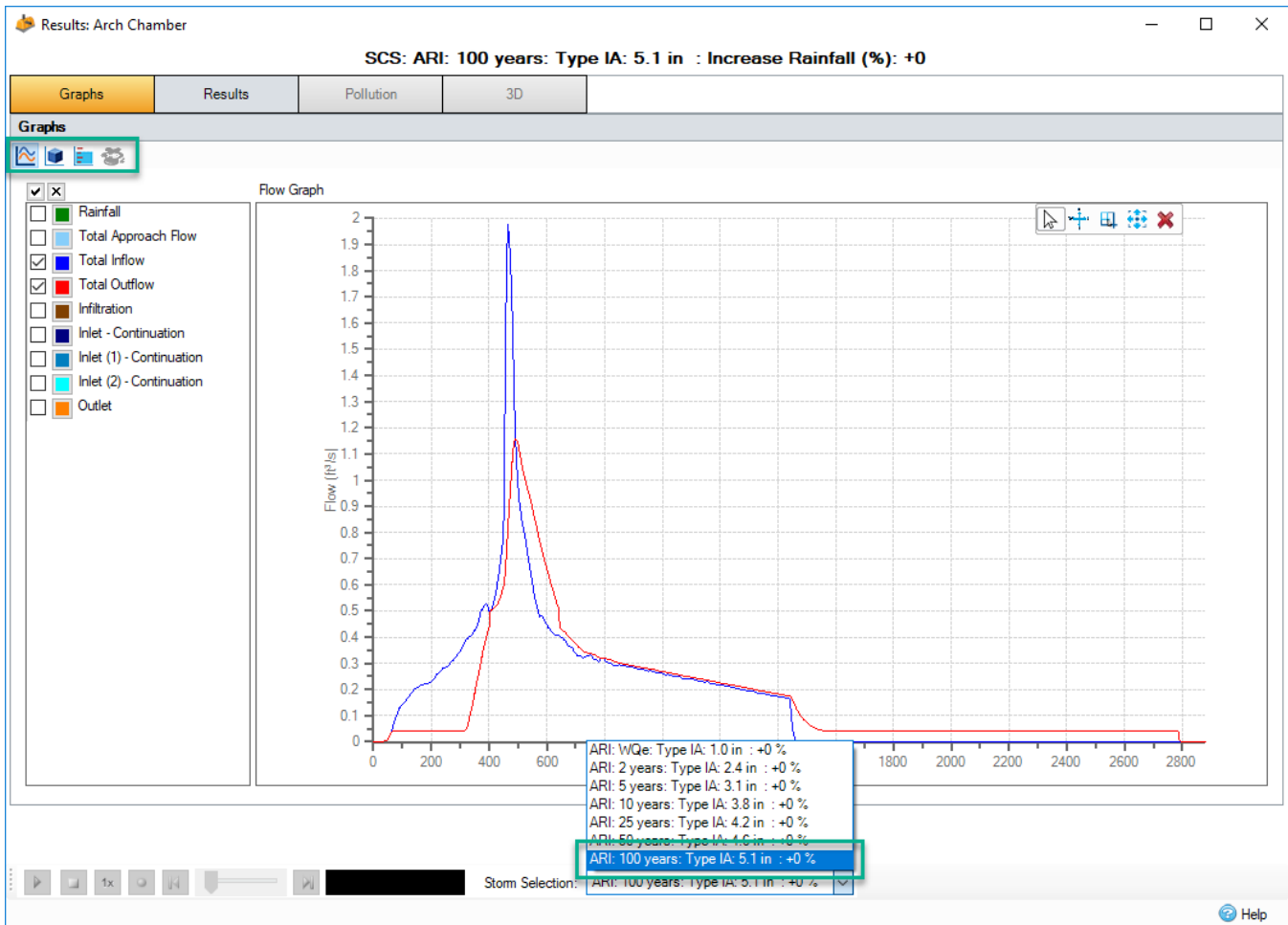
The **100 year ARI** storm is the highest intensity rainfall event so it is no surprise that the same storm is the critical event for most of the pipe network. However, note that a connection will be highlighted in Red if the Flow/Capacity relationship is greater than 1.0 - this would indicate a potentially undersized pipe. Flow/Capacity is the max flow calculated during the analysis divided by the 'pipe full flow Manning's equation'. When this value is over 1, or even over 0.8, it often an indication that this connection would benefit from being upsized. As the (likely conservative) Rational based Pipe Sizing was performed no segment of the network has a Flow/Capacity greater than 1.0. **Close this dialog to continue reviewing other results.**

Detailed Individual Results

Either right-click the **Arch Chamber SWC** and select **Show Results** or select **Stormwater Controls** under the **Results** ribbon to view detailed results for the Chamber structure.

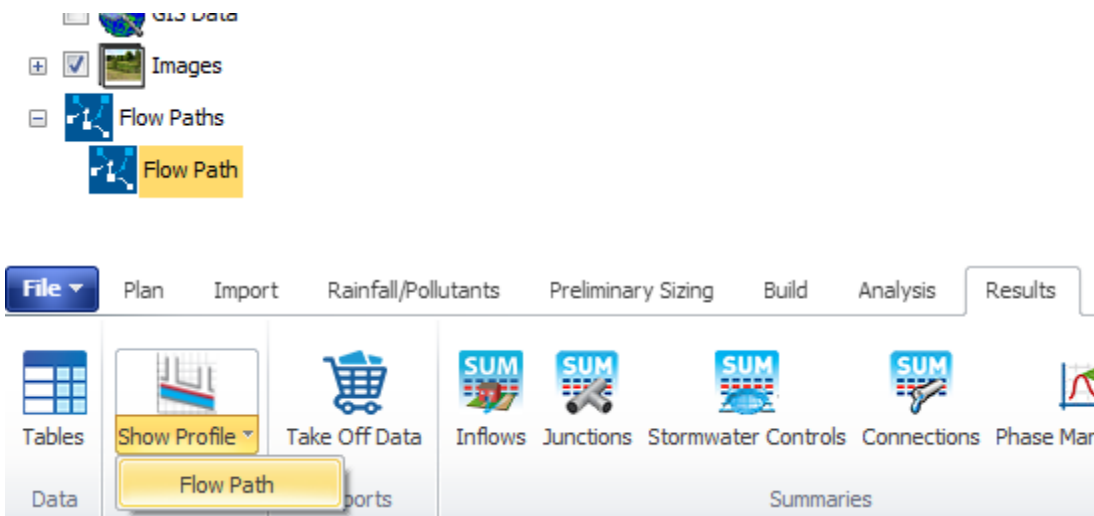


Switch the Storm Selection to the **100 year ARI** event and uncheck the Graph types and options so just the **Flow Graph** is selected, with **Total Inflow** and **Total Outflow** checked. Using either the zoom controls or the mouse wheel, zoom into the graph to review the peak flow portion of the graph. This graphical view clearly shows the flow mitigation that results from the use of the Chamber structure.



Profile Long Section

View a Profile of the Flow Path either by using the **Tree View** or the **View Ribbon, Profiles** option.



Using the animation display controls, play through the hydraulic analysis – zoom into the Profile using the zoom controls or the mouse wheel to review different section of the network. Close the Profile when done reviewing the Flow Path performance. To turn off the **Summary Table** below the profile select the **Summary Table** icon toggle on the top of the **Profile** dialog (see arrow in image below).

