



ACO StormBrixx®

## Vortex Flow Control User Guide

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### Introduction

The ACO Vortex Flow Control Program allows you to choose a method of flow control and verify that it is the best fit for your StormBrixx® system.

Calculations are developed from empirical testing to give the optimum combination of flow control dimensions to match your design parameters and reduce upstream detention requirements.

Flow controls can be configured with a flat back to mount on a square manhole chamber, or with a curved back to be installed directly on the wall of a circular manhole chamber.

### TOGGLE SWITCH **Imperial** | Metric **AASHTO** | CIRIA

- Units and Loading Standards can be changed via toggles located in the top-left of the page.
- Units include Imperial and Metric, while loading standards include AASHTO LRFD (US) and CIRIA C680 Structural and geotechnical design of modular geocellular drainage systems (Europe).

## Project Details

To save a project, you will be required to fill in all the relevant project details listed below. The outputted results of the Vortex Flow Control Program will be sent to the entered email address.

### Project Details

**Project Name**

**Project Location**

**State**

**Zip Code**

**Designer Name**

**Email Address**

## Navigation Tab 1 – Function & Performance

### Choose the Type of Outlet Flow Control Required

#### ■ ACO Q-Brake

ACO Q-Brake is a horizontal vortex flow control unit designed to regulate stormwater flows. The design of a vortex flow control is based on the fluid mechanics principle of the forced vortex, which permits flow regulation without any moving parts.

ACO Q-Brake utilizes the upstream head and discharge to generate a vortex within the body of the unit. The water is then released at a predetermined controlled rate preventing downstream flooding.

Unlike conventional products, ACO Q-Brake is less prone to blockage and permits higher flow at a lower head of water. This is because the vortex control allows an equivalent outlet size 4–6 times larger in cross-sectional area to be used.

Each ACO Q-Brake Vortex unit is custom built to suit the profile of the chamber. Radius fixing options remove the need for additional benching, simplifying installation and reducing cost.



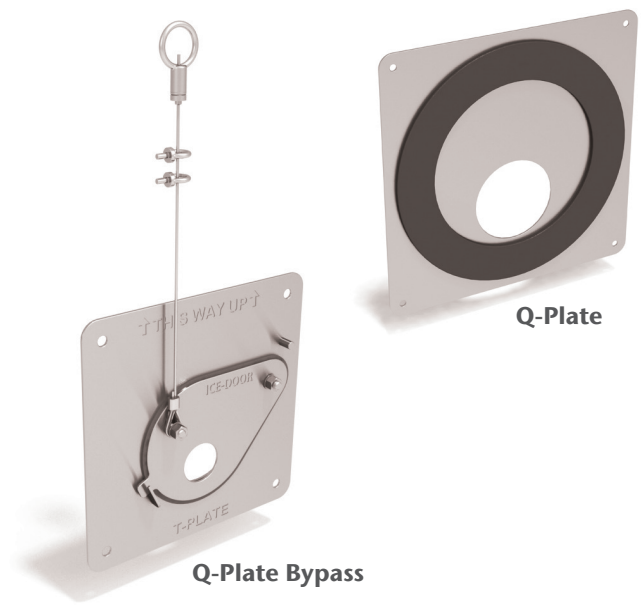
■ **ACO Q-Plate**

If a more conventional product is required, ACO Q-Plate orifice plates are perfect for all flow rates and can be used for a large variety of applications.

In flow control applications, orifice plates are used as restriction devices to regulate fluid flow or reduce the flowing pressure downstream of the orifice plate. The use of a fixed restriction orifice can be beneficial and economic by reducing the demands on other system components.

Due to the products custom construction, any manhole chamber size, pipe diameter, orifice opening can be accommodated.

An orifice plate is a plate inserted over the outlet pipe that has a hole for the flow to pass through. The hole is smaller in diameter than the outlet pipe, creating flow restriction and pressure drop. The plate is mounted in the pipe between flanges that hold it into place.



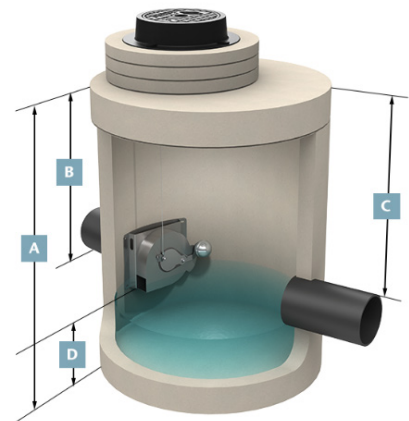
**Navigation Tab 2 – Manhole Details**

**Configuring the Manhole**

Each flow control unit is custom built to meet specific performance criteria and suit the profile of the manhole chamber. Radius fixing options remove the need for additional work that may be required thus simplifying installation and reducing cost.

Select either a circular or square manhole chamber and the program will use industry standard drainage software and hydraulic design calculations to ensure the flow control unit is correctly sized for your project requirements. Once the required manhole chamber has been selected, the following information is required:

- Proposed type and size of outlet from manhole (height & diameter)
- Proposed design/hydraulic head – invert of outlet pipe to top water level
- Proposed outlet pipe diameter
- Proposed design flow – maximum allowable discharge



**Tank Dimensions**

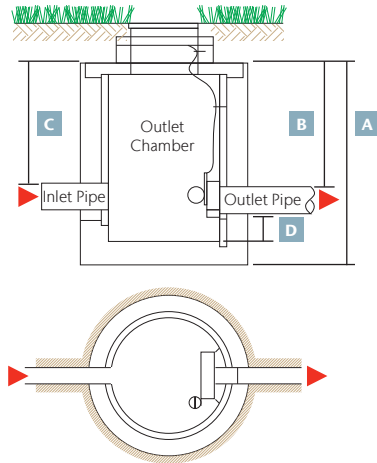
<b>A</b> Full Height	<input type="text"/>	ft	<input type="text"/>	in
<b>B</b> Height to Outlet	<input type="text"/>	ft	<input type="text"/>	in
<b>C</b> Height to Inlet	<input type="text"/>	ft	<input type="text"/>	in
<b>D</b> Sump Height	0 ft 0 in			

**Outlet Pipe Size and Type**

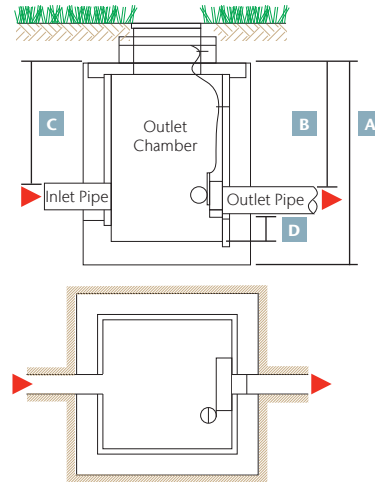
**E** Select Pipe Size  (SDR 35)



### Square Manhole with Q-Brake and Q-Plate



### Circular Manhole with Q-Brake and Q-Plate



## Navigation Tab 3 – Flow Control Configuration

### Configuring the Flow Control Device

From information entered on Manhole Details, the sump height will be automatically calculated. The software will then size and design the flow control unit to meet the design criteria and to suit the proposed surface water application. The design/hydraulic head and the proposed design flow (discharge rate) input is required again to complete the calculation.

As changes are made, program results are updated live on-screen via a Graphic Display Output.

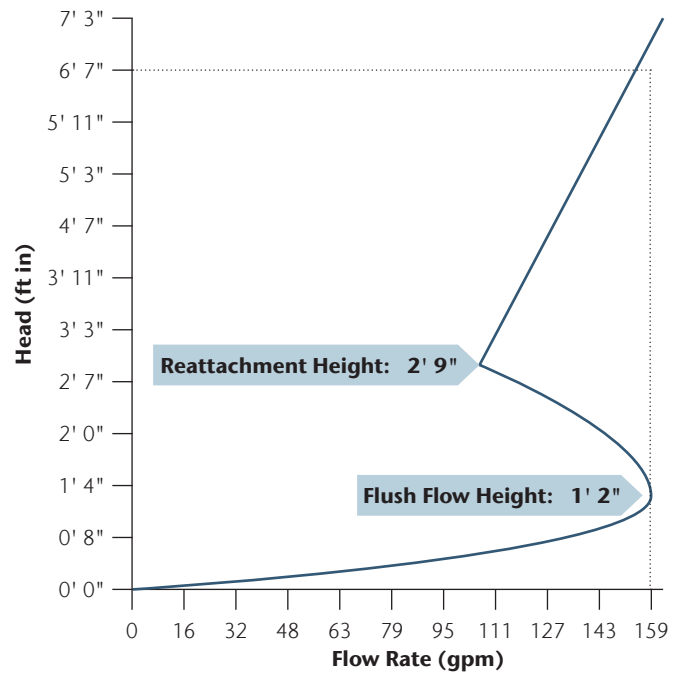
#### Manhole

Manhole Radius	0 ft 0 in
Manhole Outlet Pipe Type & Diameter	6" (SDR 35)
Head of Water	<input type="text"/> ft <input type="text"/> in
Flow Rate	<input type="text"/> gpm
Minimum Sump Height	0 ft 0 in

#### Flow Control Results

Body Diameter	0 ft 0 in
Body Depth	0 ft 0 in
Outlet Spigot Outside Diameter	0 ft 0 in

#### Graphic Display Output



## Finished Product

Once all information is entered into the Vortex Flow Control Program and submitted, ACO will supply the following:

- Head discharge table & graph
- ACO Q-Brake Vortex or Q Plate installation details
- Information for manhole sizing

Before the manufacturing of your flow control unit can begin, ALL of the above information must be confirmed once your order is placed.

