

First Defense[®]

Enhanced Vortex Separator

Ideal source control for small sites and surface runoff

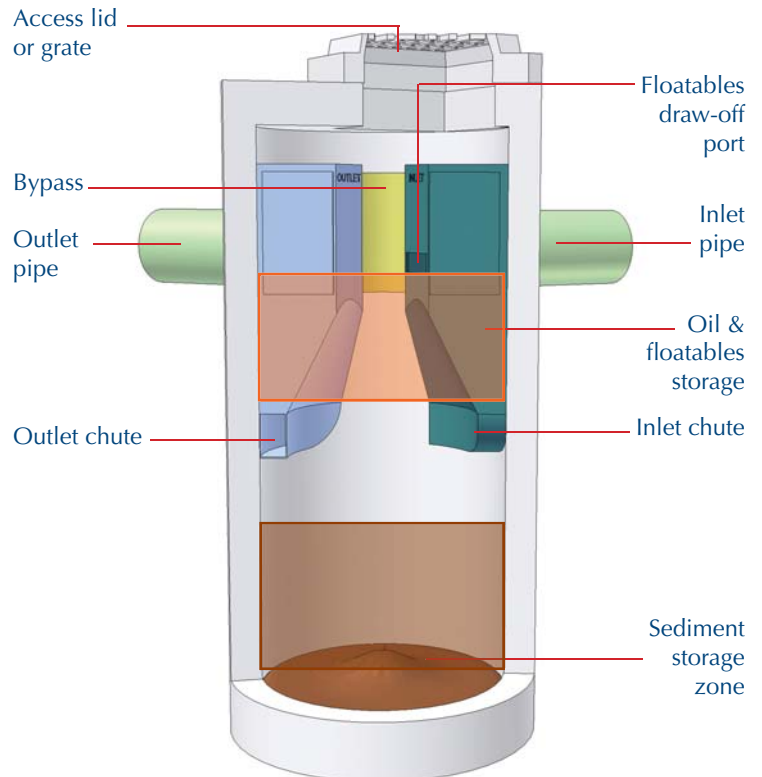
APPLICATIONS

- Small to medium size catchments
- New developments and retrofits
- Source control for streets, parking lots and maintenance yards
- Pretreatment for filters, infiltration and storage

ADVANTAGES

- Optional grated inlet
- Integral high-flow bypass eliminates need for upstream diversion structure
- Outlet chute orientation prevents short-circuiting to enhance removal
- Conventional pipe connectors are easy to fit up
- Can accommodate dual inlet pipes
- Arrives on site assembled and ready for installation

The **First Defense** is an enhanced vortex separator that provides stormwater treatment in a surface inlet device. The integral bypass and large pipe sizes convey a wide range of flows without risk of washout and surface flooding.

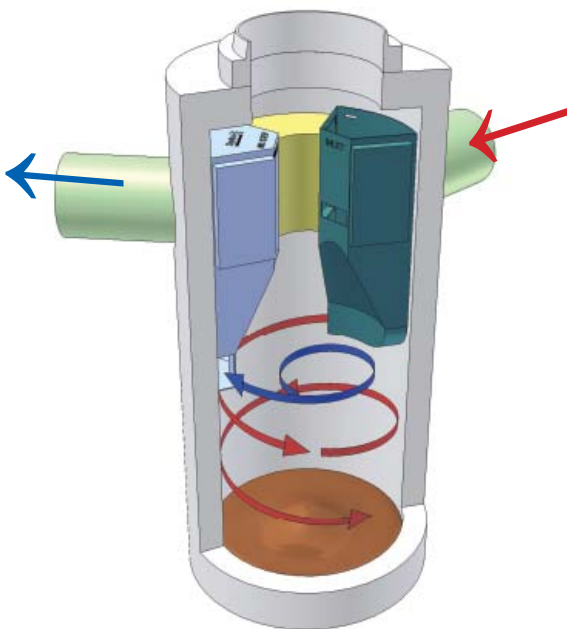


HOW IT WORKS

Contaminated stormwater runoff enters the inlet chute from a surface grate and/or inlet pipe (red arrow). The inlet chute introduces flow into the chamber tangentially to create a low energy vortex flow regime that directs sediment into the sump (brown zone) while oils, floating trash and debris rise to the surface (orange zone).

Treated stormwater exits through a submerged outlet chute located opposite to the direction of the rotating flow (blue arrow). Enhanced vortex separation is provided by forcing the rotating flow within the vessel to follow the longest path possible rather than directly from inlet to outlet.

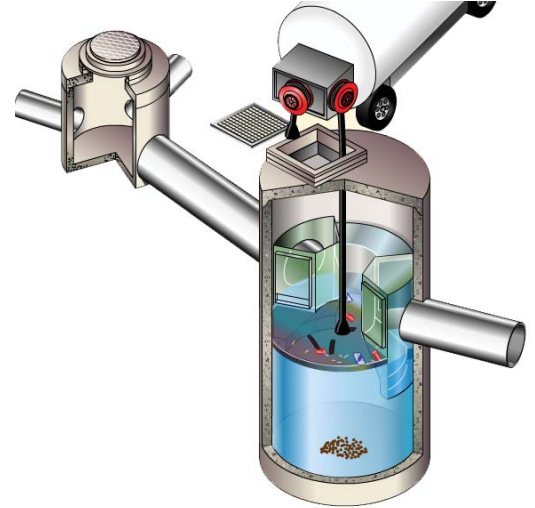
Higher flows bypass the treatment chamber to prevent turbulence and washout of captured pollutants. An integral bypass chute conveys infrequent peak flows directly to the outlet chute, eliminating the expense of external bypass control structures. Floatables are diverted away from the bypass chute into the treatment chamber through the floatables draw-off port.



Maintenance

The **First Defense** allows for easy and safe inspection, monitoring and cleanout procedures. An access port is located at the top of the manhole. A commercial sump-vac is used to remove captured sediment and floatables. The frequency of cleanouts, although site specific, is typically once a year.

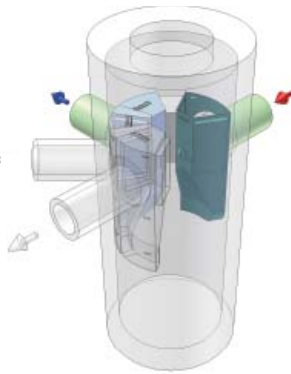
A comprehensive Operations & Maintenance Manual is available upon request.



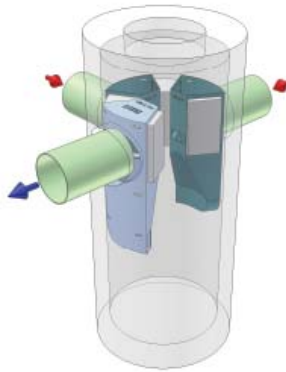
Inlet Design Options

For maximum flexibility the **First Defense** can be designed to accommodate a variety of inlet configurations.

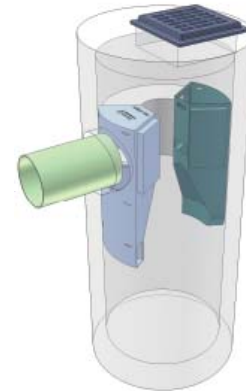
Flexible Inlet / Outlet Angle



Dual Inlets



Grated Inlet



First Defense Sizing and Design

Model Number and Unit Diameter (ft)	Typical Bypass Capacity (cfs)	Sediment Storage Capacity (cubic yds)	Oil Storage Capacity (gallons)	Maximum Inlet/Outlet Pipe Diameter (in)	Depth (rim to invert) (ft)	Depth (invert to sump) (ft)
4 - ft	6.0	1.0	180	18	3	6.5
6 - ft	18.0	3.1	420	24	4	8.5

Please contact us for site specific sizing.

For more information please call our office toll free at 800-848-2706 or inquire at www.hydro-international.biz.

