

Hydro Vortex Drop™ Shaft

Safer and more economical than simple vortex drop shafts.

The Hydro Vortex Drop™ Shaft is a compact, single shaft system used in water conveyance tunnels to dissipate the energy of dropping water from height in order to protect infrastructure from noise, vibration and damage.

Applications

- Drop heights of up to 30 m.
- Flood control.
- CSO systems.
- Stormwater systems.

Advantages

- No requirement to keep an air core within the drop pipes, therefore pipe sizes are significantly reduced.
- No need for auxiliary air and/or maintenance shafts.
- Safe, controlled and efficient.
- Self-activating with no moving parts.
- A multiple pipe arrangement can be used to accommodate higher flow rates.

Design

The Hydro Vortex Drop™ Shaft is designed to operate safely in both the air entrained 'vortex' and 'pipe full' modes and ensures a smooth transition between the different modes of operation. At low flows the drop pipes operate in the vortex mode, whilst at design flows they operate in pipe full mode.

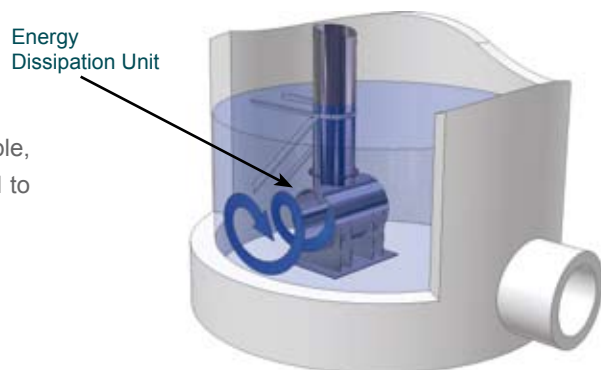
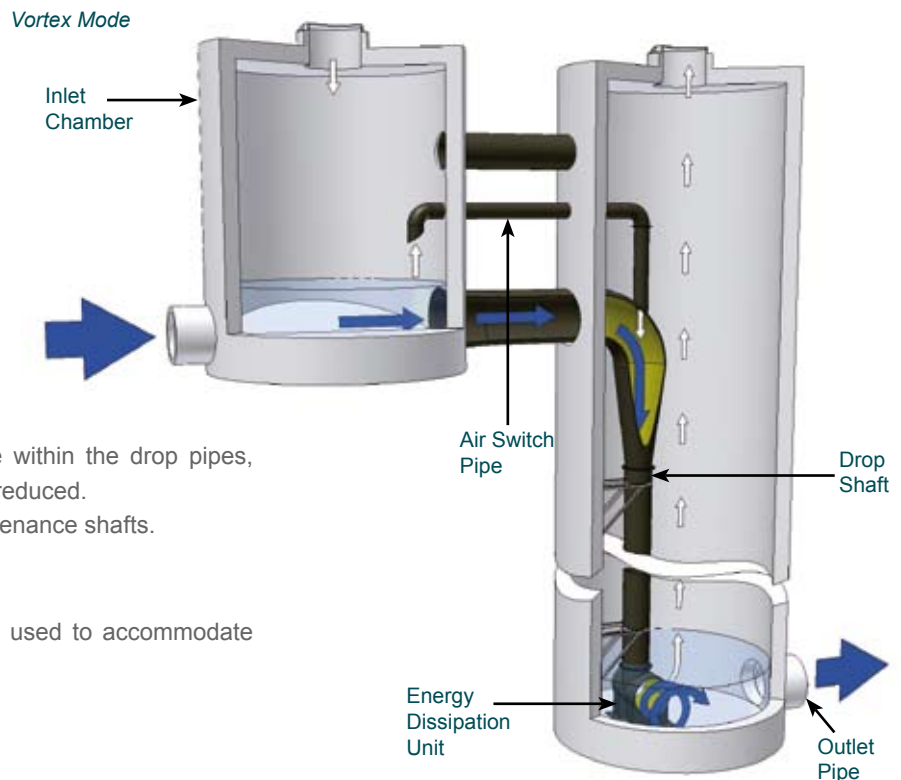
Energy Dissipation

The Hydro Vortex Energy Dissipation Unit (EDU) is a simple, self-activating energy dissipation device. It is small compared to conventional energy dissipation structures.

Sizing

The Hydro Vortex Drop™ Shaft operates under pipe full conditions at design flows.

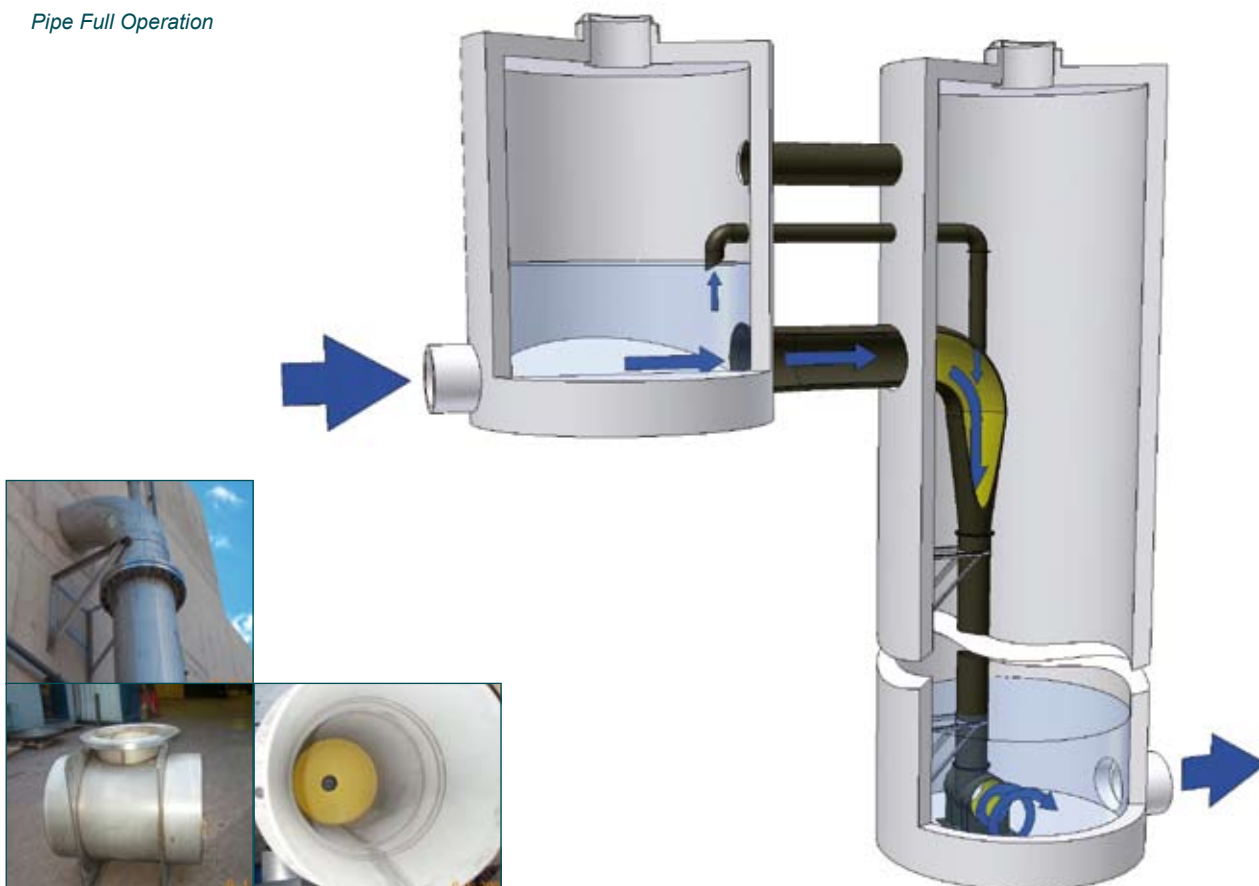
- There is no requirement to keep an air core within the drop pipes as in conventional designs therefore pipe sizes are significantly reduced.
- Typically flows of 0 - 2000 l/s can be transferred safely through drop heights of up to 30 m. The use of multiple pipes can accommodate higher flow rates.



Noise and Vibration

The Hydro Vortex Drop™ Shaft is designed to aid the reduction of noise and vibration within the system because at design flows the system operates in pipe full conditions. This is a quieter mode of operation than conventional vortex drop systems. The Hydro Vortex Drop™ Shaft provides a smooth transition from the vortex mode to the pipe full mode, avoiding glugging noises and destructive vibrations caused by the system taking in large volumes of air.

Pipe Full Operation



Maintenance Requirements

There are no moving parts and no replacement spares are required. The Hydro Vortex Drop™ Shaft is self-activating and is controlled by the hydraulics of the system.

The compact Hydro Vortex Drop™ Shaft is safer for operation and maintenance staff due to improved access and no requirement for auxiliary shafts.

Operator involvement should be no more than visual monitoring of the system to ensure that nothing unusual occurs. Although extremely unlikely, problems could feasibly occur if a pipe blockage is encountered or if the hydraulics of the system differ considerably from those considered for design, eg. if a much higher inflow rate occurs at the top inlet or if unpredicted surcharge is encountered at the bottom outlet. Any concerns should be reported to Hydro International who will respond accordingly.

turning water around ...®

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