Hydro Vortex Drop™ Shaft

Safer and more economical than traditional drop shaft alternatives.

Product Profile

The Hydro Vortex Drop™ Shaft, is a self activating energy dissipation system with no moving parts, designed to safely drop water or sewage from virtually any height in order to protect the infrastructure from noise, vibration, and damage.

Advantages

• No auxillary air and/or maintenance shafts are needed
• Due to small pipe sizes and modular design the Hydro Vortex Drop™ Shaft provides a simple retrofit solution into existing chambers.
• Self-activating with no moving parts or complicated construction
• A multiple pipe arrangement can accomodate higher flow rates

Flexible Design

The Hydro Vortex Drop™ Shaft is ultimately configurable and can be designed to suit either the smallest flow or the longest drop. Its compact nature means that two or more shafts can be fitted into the same chamber further enhancing its versatility and ensuring best solution can be found for each installation.

Applications

• Control the drop of flows into deep tunnels
• Energy dissipation of dropping water
• Flood control
• Combined sewer systems
• Stormwater systems

Construction

The Hydro Vortex Drop™ Shaft is constructed from durable and corrosion resistant stainless steel. Furthermore the inlet bend, reducer and Energy Dissipation Unit can be treated with an Irathane coating to ensure an extremely long component life.

Installation

The Hydro Vortex Drop™ Shaft is easy to install as it does not require complicated concrete work or approach channels. All components are prefabricated and use bolted connections, minimizing the installation time and cost.

Easy Access

The fully enclosed nature of the Hydro Vortex Drop™ Shaft allows access to the base of the drop structure in the same chamber as the flow. This aids any maintenance commitment and simplifies visual inspection.

Prefabricated stainless steel construction.

Integrated access.

Adaptable design solution.
How it Works

At low flow water passes through the Hydro Vortex Drop™ Shaft inlet pipe and drops as a film, maintaining contact with the inside surface of the drop pipe. This results in the formation of a central air core through the drop pipe. Water then enters the top of the Energy Dissipation Unit and exits the system through the sides into the bottom of the drop chamber. A weir at the bottom of the chamber creates a stilling area to absorb the release of energy from the water exiting the Energy Dissipation Unit. This ensures a smooth operation with minimal turbulence. At increased flows, the water level in the inlet chamber submerges the inlet pipe of the Hydro Vortex Drop™ Shaft. At this stage, air is fed into the Hydro Vortex Drop™ Shaft via the Air Switch pipe, maintaining the stability of the air core and a smooth flow regime.

If the flow rate continues to increase the water in the upstream inlet chamber rises until it reaches the Air Switch, whereupon the system begins to enter the transition to Full Pipe Mode. At this stage any increase in flow has a much lower impact on the upstream water level due to the high flow capacity during Full Pipe Mode. The Air Switch pipe is designed to smoothly and efficiently regulate the transition phase, dosing the amount of air required to sustain the optimal flow conditions and eliminating any glugging or harmful vibrations until the Full Pipe Mode is reached completely and there is no more air flow through the system.

Key Components

**Air Switch** - Controls the amount of air entering into the falling flow from the Drop Pipe to eliminate ‘glugging’ and therefore the damaging effects of water hammer or hydraulic shock.

**Top Bend** - Safely transitions the flow into the vertical section of the pipe. A taper may be required depending on site circumstances.

**Drop Structure** - A full depth chamber housing the Drop Pipe, a control weir, maintenance access and the Outlet Structure.

**Energy Dissipation Unit** - Developed using the latest scientific techniques, this component is designed to disperse the energy created by the falling water in addition to effectively preventing erosion and controlling the onward flow.

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. Operator involvement should be no more than visual monitoring of the system.

Hydro’s expert service teams provide plant condition assessment and planned maintenance programmes for our wide range of water and wastewater treatment equipment through tailored Service Agreements to meet the needs of each site.

Hydro maintains a comprehensive and well-managed store of spares for all its equipment. Hydro’s customers can be assured of speedy delivery of plant, helping to reduce the time our customers need to spend sourcing replacement parts.

To enable wastewater and water treatment operators to avoid interruption to their processes during planned downtime, Hydro offers a full equipment hire service for a wide range of primary, secondary and tertiary treatment plant, which can be operated on a stand-alone basis or integrated with existing equipment.