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CASKADE HYDRA
High Velocity Rainwater Management System

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Designing out risk

Rainwater management is one of the critical issues in a building's design. Even the smallest buildings need effective rainwater management but the bigger the building, the more critical it becomes and buildings in Britain are getting bigger by the year.

Such buildings demand designs and construction techniques which allow a quick and simple integrated build programme so that clients can commence trading at the earliest possible opportunity. They also bring the requirement for cutting edge engineering practices to maximise free spans, and minimise elements within the building which interfere with its principal function.

Elements which are likely to require excessive maintenance or repair, or which involve unnecessarily intrusive components, or which represent potential failure points, need to be addressed through clear and innovative thinking, to ensure unhindered business flow and maximum space optimisation.

Anything which interferes with these fundamental issues must be avoided at all cost.

The unique Cascade™ Hydra high capacity hydraulic rainwater management system embraces these design issues, virtually eliminating the need for internal rainwater discharge pipework. High speed hydraulic water channels are integrated into the body of the gutter itself, transferring the rainwater discharge element from the high-risk, warm interior of the building, to the low-risk, cold exterior.

In recent years, the boundaries of architecture have been stretched to the limit, with building lengths greater than 200 metres becoming commonplace. This development will only intensify the potential risks associated with vulnerable and intrusive high-level internal pipework – risks which do not exist with Cascade™ Hydra.

Innovation by design

Cascade™ Hydra's strength lies both in its technical innovation and in the simplicity of its construction. Integrated, sealed hydraulic chambers (primary and secondary) allow the system to rapidly drain rainwater to external metal outlet pipes with no use of internal pipework.

The primary chamber is designed to



accommodate the initial rainwater capacity of the roof, and a secondary chamber with inlet orifices set higher than the primary allows for safe discharge in storm conditions.

Subjected to Scrutiny

The system has been subjected to a rigorous testing programme designed to simulate extreme worst-case conditions.

At the University of Sheffield Department of Civil Engineering, the fundamental principles of Cascade™ Hydra formed the basis of a meticulous study conducted by some of the foremost academics in the field of water management.

The subsequent study concluded that the Cascade™ Hydra high velocity rainwater management system comfortably accommodated severe and storm force rainfall intensities.

In negative pressure tests, calibrated and certified by UKAS approved technicians, a negative pressure equivalent to 0.75 bar was applied to Cascade™ Hydra, proving the sheer strength of the systems construction.



Precision control for Optimum Efficiency

The inflow of water into the Cascade™ Hydra system is controlled by a series of purpose-designed inlet orifices along the length of the gutter, incorporating anti-vortex plates with fins designed to optimise the efficiency of the directional flow of the water through the inlet orifice. Sizing of each inlet orifice is specifically calibrated for total inflow control, unlike the use of rainwater outlets which have a predetermined discharge diameter.

As rainwater falls, it flows into the gutter and when it reaches the primary chamber

inlet orifice it flows into the chamber. The flow from the surface of the gutter via the inlet orifice into the main collection flow in a Cascade™ Hydra system is instant. Cascade™ Hydra needs no feeder pipes, tail pipes, main collection flow pipes, or inboard underground systems. This unique system effectively eliminates internal pipework discharge systems.



Programme speed

Because it is an integral part of the main structural gutter system, Cascade™ Hydra is installed completely outside of the roofline of the building. With the Cascade™ Hydra system, as soon as the gutter installation is complete, the entire rainwater system is complete; there is no need to manage complex internal pipework and bracketry arrangements, saving the time, cost, inconvenience and potential programme delays this work can involve.

