

# Detention



**Our range of innovative Detention systems and products have been intuitively designed to understand the immediate need to hold stormwater and then discharge it accordingly. Ensuring flow rates are controlled, even distribution is maintained when and where it is needed most.**

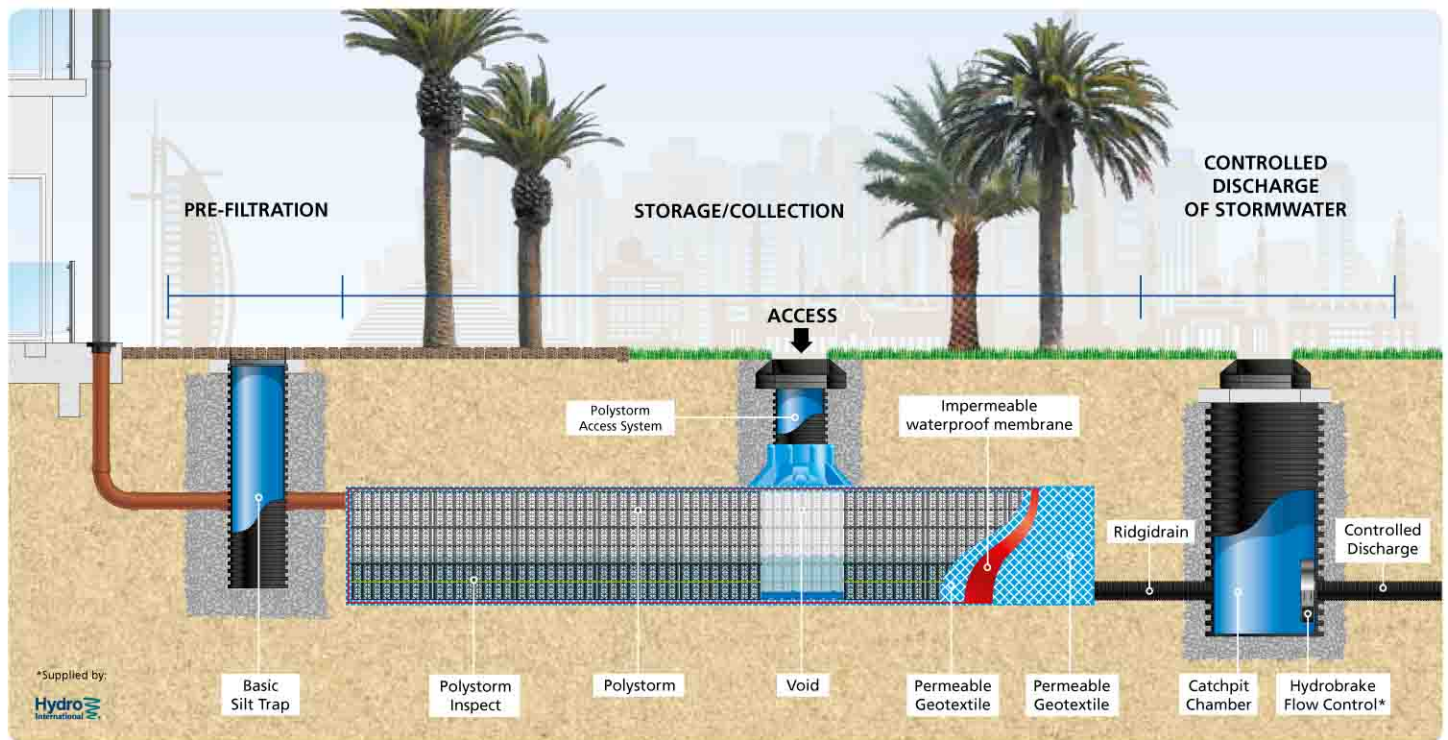
A tried and tested system that can provide storage at a variety depths and a wide range of traffic loadings, from pedestrian areas to large HGV parks.



# Detention



Polypipe's unrivalled expertise in Detention solutions comes from years of experience, the development of Polystorm and its use for modular water management systems.



## Overview

Rapid urbanisation has led to a huge increase in residential and commercial developments in the Middle East. This has created large, impervious surfaces which, in turn, contribute to a greater surface runoff during storm events. This puts the existing stormwater infrastructure under pressure.

This is where Water Sensitive Urban Design (WSUD) solutions such as Detention systems come in. And this is where Polypipe leads the way. We are experts in integrated water strategies that address the many challenges facing projects throughout the region in order to minimise environmental degradation.

## Detention

Polystorm Detention is the technique of holding stormwater on-site then discharging as required, in a controlled flowrate, into the existing stormwater infrastructure. Detention systems can be easily designed to accommodate the peak flows and incorporate a flow control device at the discharge point.

## Design Engineered

We understand the conflicting requirements projects can cause. For example, the need to balance tight installation schedules with long-term material performance.

This understanding is integral to the design process of our entire product range. It is why our solutions are increasingly being adopted as the products of choice by designers, engineers and installers.

### About Us

Polypipe designs, develops and manufactures the widest range of engineered plastic products and systems for water capture, management, supply and distribution, as well as above and below ground drainage. Perfect for the challenging needs of today's Middle Eastern construction industry.

With over 50 years experience, offices in UAE, Qatar and India, plus technical teams providing support from design to installation, we have a reputation for providing cutting-edge solutions designed for the future.





## Polystorm

Polystorm is a sustainable and cost-effective surface water management system. The Polystorm range has structurally robust individual cells manufactured from Virgin Polypropylene material. Having a high void ratio (95%), the system will provide a runoff detention solution when wrapped in a impermeable geomembrane.

The tried and tested Polystorm Detention system is designed to provide stormwater storage at a variety of depths and accommodate a wide range of loadings, from landscaped and pedestrian areas to low and high trafficked areas and HGV parks.

Acting also as a storage tank, the modular cells easily interlock and when used in conjunction with impermeable geomembrane layers, facilitate a sealed zone for water storage and subsequent controlled discharge to a network or other tank.

**NOTE:** Polystorm can also be used as an Attenuation or a Soakaway system.

### Polystorm

Designed for use in trafficked and loaded applications with a load bearing capacity of **40 tonnes**.



### Polystorm Xtra

Designed for use in deeper burial depths and heavily trafficked applications with a load bearing capacity of **80 tonnes**.



#### Product Benefits

- Can be easily used as a Soakaway, Attenuation or Detention system, for stormwater from:
  - Surface water runoff
  - Rainwater and washdown from multi-purpose roofs, plus hard and soft landscaped areas
  - Washdown areas
  - Condensate drainage
- 95% void ratio for greater water storage capacity
- Reduced excavation and disposal costs
- Light weight, yet robust for known structural performance
- Manufactured from Virgin Polypropylene
- Able to withstand loads of up to 80 tonnes
- 50 year design life
- Unique rounded corners for ease of handling and reduced membrane punctures
- Cost-effective, especially when used as a hybrid, value engineered system
- 100% recyclable at end of useful life
- 3rd party accreditation / BBA approved

#### Construction Benefits

- Modular units allow flexibility of shape. Ideal for shallow excavation systems, narrow strips or use in restricted areas
- Light weight tanks ideal for poor ground conditions
- Less aggregate requirement
- Minimal transport costs
- Each unit supplied with proprietary clips and shear connectors to prevent displacement

#### Water Management Benefits

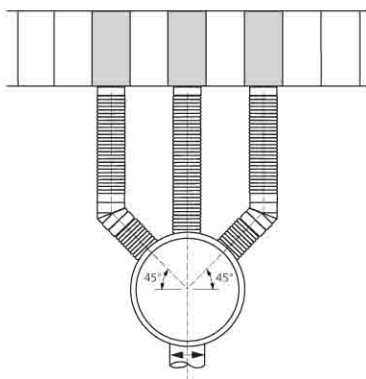
- Efficient and practical for surface water runoff
- Zero discharge
- Water re-use
- Sustainable solution
- No underground drainage pipes

## Polystorm Access and Inspect



### Pipe connections 160mm – 300mm

160mm EN 1401-1 pipes connect directly into the knock-out incorporated in the end of each cell. Cells are available with either 225mm or 300mm fabricated Ridgidrain pipe connection. For large diameter pipe connections from 450mm to 900mm manifold arrangements are required.



Typical Polystorm 450mm inlet manifold detail

Our Polystorm Access and Inspect solutions have been designed to be complementary to the Polystorm range. They provide access to attenuation or soakaway systems for remote CCTV inspection and maintenance activities such as flushing and jetting.

### Polystorm Inspect

- A high strength thermoplastic cell which evenly distributes its load throughout the Polystorm structure
- Provides a tunnel along the length of a fully installed structure
- Tunnel end is open by default but can be closed by means of a clip-on moulded end plate



### Polystorm Access

- Provides a 1m x 0.5m shaft within a Polystorm geocellular structure to enable surface access for remote camera inspection and maintenance
- Consists of a 500mm diameter shaft extending from the surface level to the top of a Polystorm structure
- Base unit at chamber base which interlocks with surrounding layer

Full details and drawings, plus specification details for various loading conditions and applications, are available on request.



Note: For inlets larger than 600mm please contact +971 (0) 4 880 6680.





## Manholes & Water Control Chambers



### Hydro International Downstream Defender

- Special internal components maximise pollutant capture and minimize footprint, headloss and washout
- Captures and retains a wide range of TSS particles
- High peak treatment flow rates
- Treats the entire storm with no washout or untreated bypass flows
- Low maintenance requirements – no dredging required, and no screens or media to block
- Variable inlet/outlet angles for ease of site layout

### Flow Control Chamber

Polypipe's Hydro Brake chamber allows precise control of water discharge rates and, combined with our storage systems, provides an industry-recognised flow detention system.

- Pre-fabricated plastic chamber
- Range of diameters with integral vortex flow control
- Non-bypass, Manual or auto bypass designs
- Vortex recognised as the most hydraulically efficient means of flow control

### Silt Traps

Used to isolate grit, silt and other impurities in surface water before they can enter a Polystorm tank system. They save time and money by reducing damage to components and membranes.

- Prevents ingress of debris and extends life of structure
- Self-cleaning, low maintenance
- Constructed off-site saving on-site time and expense

A range of chambers for Treatment, Pre-filtration and Flow Control fabricated to provide access to any part of a drainage system. Available in a range of depths and Pre-fabricated offsite to reduce installation time on-site.

### Manholes & Catchpits

#### Manholes

- Manholes offer easy inspection and maintenance in durable, one-piece unit
- Optionally fabricated with offset step that reduces need for direct access into pipe during maintenance, improving health and safety in areas with risk from sewer gas and other dangerous compounds

#### Catchpits

- Designed to separate silt and other particles
- Help improve the quality of water before reintroduction into the environment
- Take into account water flow rates and differing ground conditions



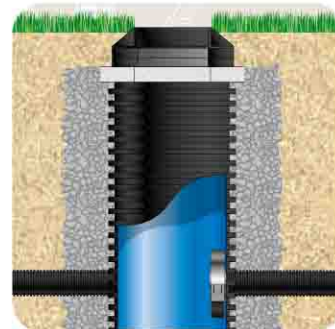
Advanced Silt Trap Chamber



Catchpit Chamber



Hydro International Downstream Defender Chamber



Hydro International Hydrobrake Flow Control Chamber

Up to depths of 1.2 metre the dual filter advanced silt trap is always recommended. For depths over 1.2 metres up to 4 metres, the basic silt trap can be used. Both advanced and basic are available with 160mm ring seal pipe connections.



## Ridgidrain and Ridgigully

### Ridgidrain

The Ridgidrain advanced drainage system is the complete technical and commercial answer to all non-pressure, surface and sub-surface water drainage applications.

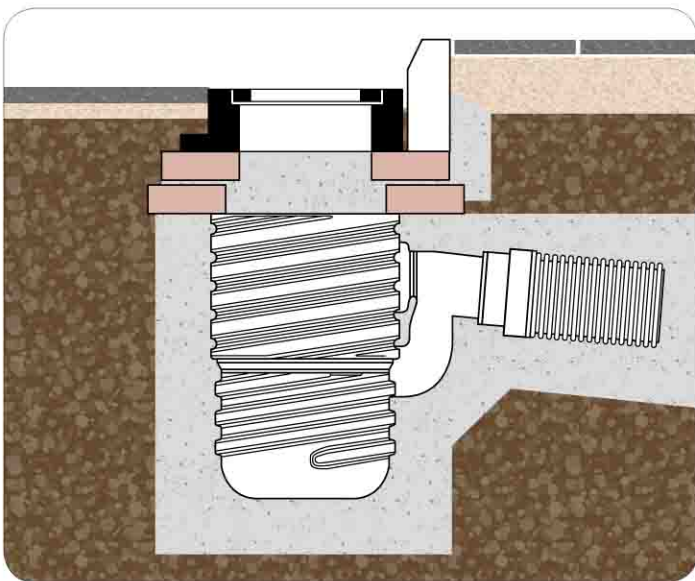


#### Key benefits include

- Up to 94% lighter than concrete resulting in fewer health and safety risks
- A full range of pipes from 150mm diameter to 600mm
- Available plain ended or with factory fitted integral socket
- Ridgidrain requires fewer joints which means faster installation
- Robust, impact and abrasion resistant construction
- The structured wall design leads to high ring stiffness
- Low friction inner wall enables superior hydraulic performance
- Designed to withstand ground movement and differential settlement
- Blue coloured inner wall for ease of CCTV surveying

### Ridgigully

Compared to heavy concrete gullies, Ridgigully is light weight, easy to handle and simple to install. Manufactured in durable HDPE, in three sizes, it's highly suitable for both trapped and untrapped systems. It has a 160mm spigot outlet as standard, which is easily adapted to fit Ridgidrain and other pipe systems, using the multi adaptor (ARG multi).



#### Key benefits include

- Unique patented screw thread corrugations
- Light weight construction with superior strength
- Effective keying into the concrete surround
- Nested gullies lock together for easy handling, transportation and safer on-site storage
- Range of accessories include gully risers, eliminating the need for brickwork to finished level





## The Permavoid Geocellular System



### Key benefits include

- Forms interlocking structural raft of exceptionally high compressive and tensile strength – 140 T/m<sup>2</sup>.
- Designed for attenuation or soakaways at shallower depths
- Provides effective source control and flood mitigation
- Suitable for use beneath porous and non-porous surfaces
- Reduction in excavation depth and cost
- No need for trench supports or plant
- Provides treatment to remove silt and hydrocarbon deposits
- Increased deck area eliminates the need for pipework under deck
- Eliminates the need to construct the deck slab to falls
- Can provide passive 'on-demand' irrigation via capillary hydraulic column system
- Capacity to attenuate extreme storm events - typically up to 100 year + 30% climate change allowance
- Eliminates the need for outlets, through the deck, reducing leak potential
- Provides harvesting facility for reuse such as toilet flushing or soft landscape irrigation.

### High Water Tables

High water tables and perched water at shallow depth require specific design and construction measures to avoid issues such as floatation of attenuation structures. Permavoid can easily provide the attenuation or infiltration solution by avoiding groundwater issues.

### Excavation over hard rock

Excavation over hard rock is usually expensive and slow. However, Permavoid is ideal for use on sites that are underlain by hard rock at shallow depths. The system can be incorporated into the construction, avoiding any additional excavation for drainage.

Permavoid is a shallow, geocellular water attenuation system made from high strength modular cells. It's suitable for sub-base replacement in pedestrian pavements plus light and heavy trafficked areas, as well as channel and gully components incorporating silt/oil gravity separation features.

Permavoid is ideal for landscaping, passive irrigation and sporting facilities, and podium decks as an attenuation system beneath roads, hard & soft landscapes, to convey water horizontally.

During peak times the system controls the flow & discharge rate back into the network – and with a void ratio almost 70% higher than aggregate, it's more cost-effective and easier to transport than an equivalent volume.



### Podium Decks

As podium decks increase in size and use, so does the total runoff from them hence source control becomes vital. Permavoid solutions can be used as a sub-base replacement and thus offer the required storm water storage capacity because of their high void ratio. Thus, there is no need for drainage outlets to be taken through the deck, water can be taken to the edge of the slab where rainwater down pipe connections are easy to make.

### Passive Irrigation

Permavoid can provide on demand passive irrigation via capillary hydraulic column system. This system achieves the most efficient way to use water available for irrigation.



## Technical Support

When it comes to 'best practice' for designing and specifying a Detention System for your project, our drainage experts will utilise the latest hydraulic modelling and structural performance tools to engineer the perfect solution for Middle East conditions.

Our technical Services team has fully-qualified design engineers who will provide detailed information from hydraulic sizing, structural calculations, CAD drawings and standard details, right through to installation and maintenance guidance.



## Sustainability



Our reputation is built on innovation and unrivalled manufacturing excellence.

All Polypipe products are manufactured and supplied to market with sustainability as a key objective. Our products are manufactured in plastic and are 100% recyclable at the end of their useful life.

Our energy consumption has been lowered to make our new machinery more energy efficient. We are committed to low and zero carbon construction technology and the management of water as a precious resource.

Our products are lighter therefore easier and safer to load and offload.





## Polypipe Middle East Offices

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