RXL-4SG | NOVEMBER 2018

A Four Step Guide to Ridgistorm-XL Pre-Fabricated Component Chambers

RIDGISTORMAccess • RIDGISTORMCheck • RIDGISTORMControl • RIDGISTORMSeparate

Polypipe

Four Step Guide

This 4 step guide will help you to design and plan for your ideal stormwater, foul or combined system, utilising our ready-to-install component chambers and manholes.

Our modern methods of manufacturing reduce installation time and costs on-site, while also minimising Health and Safety risks during handling, storage and installation. Providing a comprehensive service through our in-house fabrication facility, we are able to create fully engineered solutions to precisely match specific project requirements. Our pre-fabrication solutions are designed to integrate seamlessly within existing drainage or water management systems, including our Ridgidrain, Polysewer, Ridgisewer and Ridgistorm-XL systems, or can be adapted to connect to other materials.

Chamber Options:

RIDGISTORMAccess: Provides easy access into and maintenance of a pipeline.

RIDGISTORMCheck: Controls flows within a drainage system which are required to be limited or checked (e.g. prior to discharge from site).

RIDGISTORMControl: Facilitates the inclusion of control devices into a drainage or sewer system.

RIDGISTORMSeparate: Captures and separates out silt particles, debris, metals or hydrocarbons, from a drainage system, protecting downstream elements.

Performance

- Design life in excess of 100 years
- Manufactured from Ridgistorm-XL pipework which is manufactured to meet the material and performance requirements of BS EN 13476:2007 (Parts 1-3), Plastic Piping Systems for Non-Pressure Underground Drainage and Sewerage

bsi. ISO 9001 Quality Management
Q 06225

bsi. ISO 14001 Environmental Management
EMS 535794

wrc approved
PT/348/0614

Key features and benefits

- Tailor-made, fully-welded, watertight structured wall chambers to suit project-specific requirements
- Off-site construction, one-piece installation, delivered ready-to-install reducing installation time and costs
- Strong but light in weight, minimising Health and Safety risks in handling and installation
- Manufactured in a factory controlled environment for improved quality of finish
- Eliminates wastage associated with in-situ construction
- WRc approved

Follow these four steps to create your perfect pre-fabricated Ridgistorm-XL component chamber:

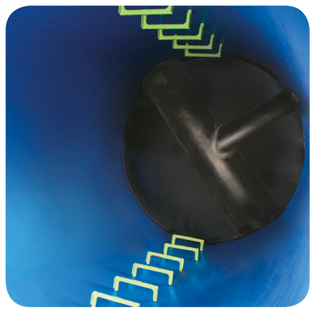
1. Select Chamber Type
2. Select Size
3. Select Connections
4. Select Ancillaries

1 Select Chamber Type (Part 1)

All of our chambers are pre-fabricated using thermoplastic structured wall pipes for exceptional durability and superior performance. What's more, they are designed to your exact project requirements and are delivered directly to site ready-to-install as one-piece modular solutions. We have a chamber for every project – find yours below:

1A. RIDGISTORMAccess

Provides easy access into and maintenance of a pipeline.



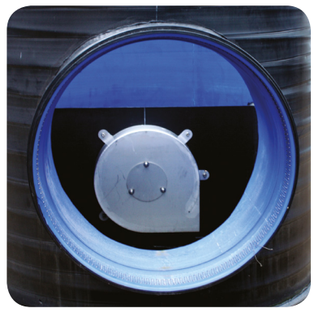
RIDGISTORMAccess Manholes

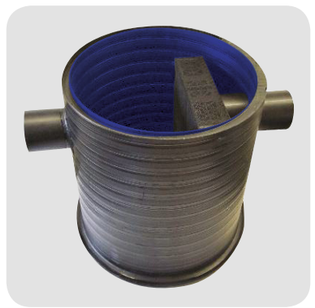
RIDGISTORMAccess Manholes are engineered for use in stormwater, foul and combined sewer applications to enable access to the pipework system for inspection and maintenance.

They reduce the need for direct access into the pipeline and minimise operational Health and Safety risks with the inclusion of optional Guardrail Assembly and Safety Chain Assembly. RIDGISTORMAccess Manholes are utilised where pipe runs change direction, combine, change invert level, diameter or pipe material.

1B. RIDGISTORMCheck

Controls flows within a drainage system which are required to be limited or checked (e.g. prior to discharge from site).





RIDGISTORMCheck Vortex Flow Control Chambers

The RIDGISTORMCheck Vortex Flow Control Chamber allows for precise control of site discharge rates and provides an industry recognised flow attenuation solution.

They are site specific and engineered to suit a range of stormwater attenuation systems providing a hydraulically efficient means of flow regulation that does not use moving parts or require power to operate.

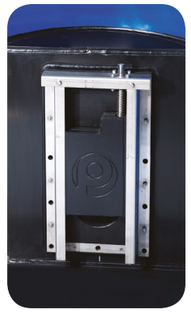
RIDGISTORMCheck Orifice Plate Flow Control Chambers

The RIDGISTORMCheck Orifice Plate Flow Control Chamber incorporates an integral orifice plate flow control with an optional, fully-removable Permavoid filter unit wrapped in a 2mm polyethylene mesh to provide filtration and ease of maintenance.

They allow for precise control of discharge rates and provide an industry recognised flow attenuation system, in a simple and cost-effective design.

1C. RIDGISTORMControl

Facilitates the inclusion of control devices into a drainage or sewer system.



RIDGISTORMControl Penstock and Valve Chambers

Our pre-fabricated RIDGISTORMControl Chambers incorporate a range of devices to limit or isolate flows within surface water, sewer and combined sewer systems. Typical valves include: Gate Valves (used to permit or prevent the flow of water and can isolate drainage sections), Flap Valves (non-return valves to prevent backflow upstream) and Penstocks (consist of a gate which can isolate or control water flow).

1D. RIDGISTORMSeparate

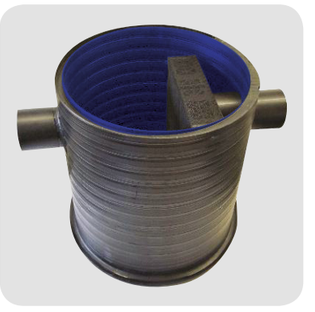
Captures and separates out silt particles, debris, metals or hydrocarbons, from a drainage system, protecting downstream elements.

RIDGISTORMSeparate Silt Traps

RIDGISTORMSeparate Silt Traps are located upstream of retention, attenuation and infiltration systems, capturing and retaining silt and separating out other particles by encouraging settlement in the units sump, preventing ingress into sustainable drainage systems (SuDS).

RIDGISTORMSeparate Mini & Basic Catchpits

RIDGISTORMSeparate Catchpits are ideal for stormwater systems and land drainage applications and are the simplest and most cost-effective way of separating out silt and debris, providing an easily maintainable drainage system and helping to protect the downstream drainage system and local environment.



RIDGISTORMSeparate Advanced Catchpits

RIDGISTORMSeparate Advanced Catchpits incorporate both a sump and removable filter unit on the chamber outlet to capture silt and debris. The filter unit is easily removed for maintenance purposes.

1 Select Chamber Type (Part 2)

1D. Continued RIDGISTORMSeparate-X4 stormwater treatment system

RIDGISTORMSeparate-X4 offers advanced 4-stage filtration of surface water run-off, providing high levels of solid and dissolved phase contaminant removal, including hydrocarbons and heavy metals. The RIDGISTORMSeparate-X4 stormwater treatment system utilises a number of processes to provide consistent levels of protection for the downstream elements of the drainage system and local environment. These processes occur in consecutive sections of the device, which may be generically defined as:

Dynamic separator

1. An angled inlet, within the base section, induces a radial flow which promotes sedimentation of particular pollutants.

Filter elements

2. As water flows up through the saturated filter elements, particulate matter is removed at 100% efficiency to 50 microns and, at lesser efficiencies, down to 1 micron.

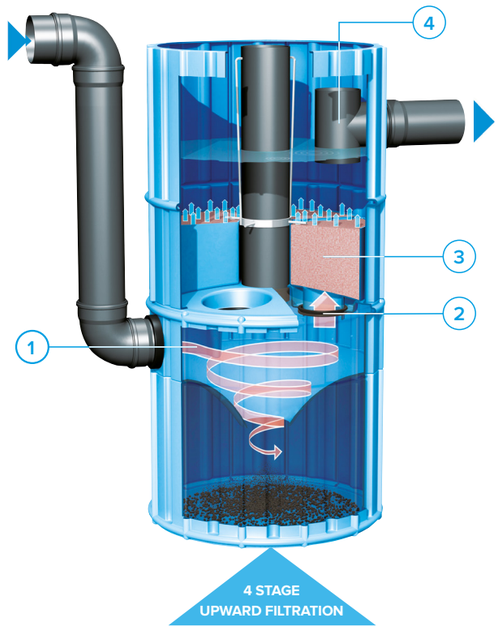
3. Dissolved chemical pollutants are removed through adsorption, absorption and precipitation mechanisms.

Oil retention

4. Water is discharged via an oil trap assembly that is designed to retain free phase oils; in particular in the event of a spill.

As standard, the device is supplied pre-installed within a fabricated chamber, ready to install on site. However, Polypipe is able to offer the RIDGISTORMSeparate-X4 as a stand-alone unit if required.

The device incorporates an overflow which by-passes the filter cartridge elements during peak storm conditions.

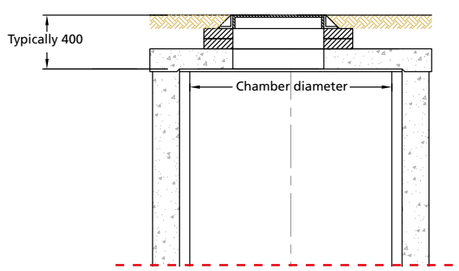


2 Select Size

Component chambers come in diameters from 320-3000mm and can be manufactured to the exact depth required to suit project requirements. Considerations should be given to the cover and frame detail.

Chamber Diameter mm	
320	1200
450	1500
500	1800
600	2100
750	2400
900	2700
1050	3000

For further guidance on the appropriate diameter for your application, please contact our Technical Team on +44 (0)1509 615100.



Typically, a standard cover and frame build-up is 400mm with a concrete cover slab, two courses of brickwork and a cover and frame.

3 Select Connections

Depending on the location and application of the component chamber, different piping systems will be required to connect as inlets and outlets. Whether a system is for foul or surface water, adoptable under 'Sewers for Adoption' or required to comply with the 'Specification for Highway Works', suitable pipe connections are available:

BS EN 1401-1

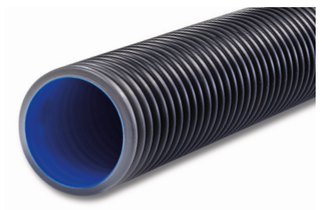
A PVCu plastic pipe system for non-pressure underground drainage and sewerage, available in sizes 110mm and 160mm.

Polysewer

An adoptable PVCu structured wall sewer piping system, available in sizes 150-300mm.

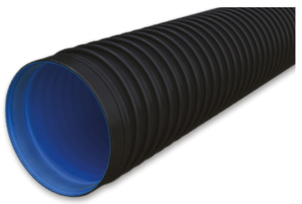
Ridgisewer

An adoptable polypropylene structured wall sewer piping system, available in sizes 400-900mm.



Ridgidrain

Used for non-pressurised surface and sub-surface drainage applications, this HDPE twinwall piping system is available in sizes 100-900mm.



Ridgistorm-XL

An adoptable engineered HDPE thermoplastic large diameter piping system, used for a variety of applications, available in sizes 750-3000mm.

Other options are available to connect to other piping materials. Please contact our Technical Team on +44 (0)1509 615100 for further information.

4 Select Ancillaries

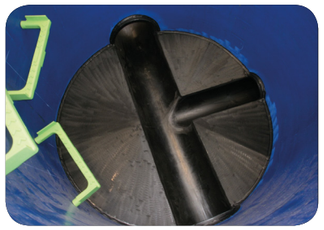
A wide range of ancillary items for safety, access and lifting are available, improving Health and Safety on-site during installation and the lifetime use of the chambers.

Ridgistorm-XL Lifting Points

The range of Ridgistorm-XL Lifting Points have been designed specifically to aid in the safe handling of Ridgistorm-XL chambers when loading, off-loading and installing the products on-site. The lifting points consist of three plastic lugs, which are pre-welded into a Ridgistorm-XL chamber and can lift up to 2500kg in weight.

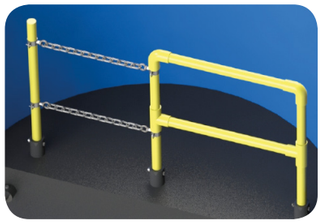
Steps and Ladders

Access to Ridgistorm-XL chambers and manholes can be aided by incorporating either step rungs or ladders. Step rungs are manufactured to BS EN 13101 and ladders to BS EN 14376.



Benching and Channelling

Options are available for benching and channelling within chambers where required, and can be designed and pre-fabricated to the exact needs of the system for surface water, foul or combined sewer applications.

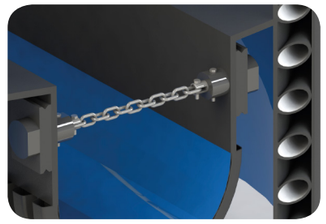


Guardrail Assembly

Ridgistorm-XL Guardrail Assemblies can be pre-installed into our manholes and chambers, with an outflow pipe greater than 600mm, to act as a safety barrier.

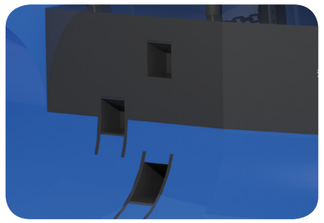
The Guardrail Assembly consists of three components:

- Guardrail attachment points
- Pre-assembled Guardrail
- Chain gates



Safety Chain Assembly

Ridgistorm-XL Safety Chain Assemblies are securely fixed into RIDGISTORMAccess Manhole outflow pipes greater than 600mm, acting as a lifeline if a worker was to accidentally fall into the outflow pipe whilst in the manhole. The Safety Chain Assembly is positioned as close to the end of the channel as possible, allowing the worker to hold onto the chain to prevent being carried further into the system.



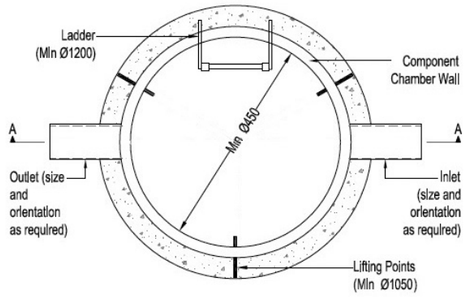
Ridgistorm-XL Toe Holds

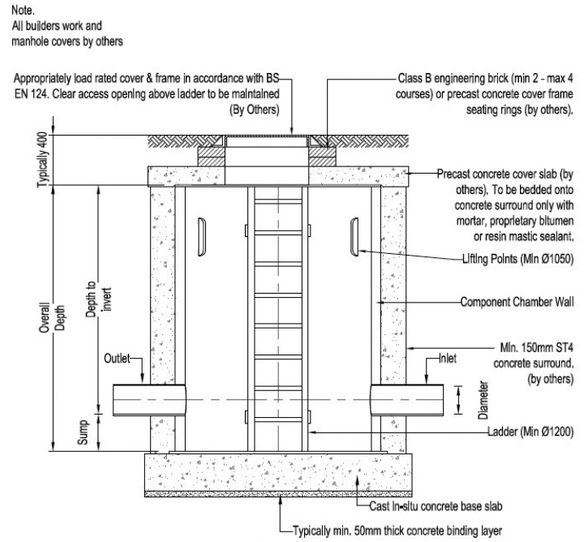
Ridgistorm-XL Toe Holds act to create a step within the channel wall, and are designed to provide safe and secure assistance for maintenance personnel when accessing or exiting a chamber channel.

This is just a selection of our vast range of products on offer. Contact our Technical Team and we can pre-fabricate a solution catered to your specific requirements.

Typical Component Chamber Installation

Below is an example of a typical installation detail for our component chambers and manholes, along with a step by step guide on how to install them:





Typical Installation

1. Excavate and support excavation
2. Pour 50mm thick concrete binding layer
3. Cast in-situ concrete base slab
4. Lower chamber onto base slab using lifting points
5. Connect pipework to the chamber
6. Erect formwork around the chamber
7. Pour concrete surround
8. Once cured position precast concrete cover slab on to concrete surround
9. Install Class B engineering brickwork to surface
10. Lay cover and frame (appropriate load rating)
11. Backfill around chamber

Typical Chamber Specification

Chamber diameter mm	750	900	1050	1200	1500	1800	2100	2400	2700	3000
Step Rungs/ Ladder	✗	✗	✗	✓	✓	✓	✓	✓	✓	✓
Lifting Points	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓
Connections	Connections available from 100mm - 3000mm									

1. Step rungs are usually only permitted to a depth of 3m, once this depth is exceeded ladders are typically required.
2. Ladders cannot be used in chamber diameters smaller than 1200mm diameter.
3. Lifting points are available in standard, extended and heavy duty forms, the correct lifting points will be chosen dependant on chamber weight and diameter.
4. Catchpits between 450mm-600mm diameters will be made from Ridgidrain and cannot contain steps/ladders or lifting points.

Case Studies

Manchester Airport, surface water drainage, Manchester

We supplied a unique surface water drainage system for Manchester Airports Group Plc, who required a new shuttle bus route and 9,000 extra car parking spaces at Manchester Airport.

The drainage system covered an area of over 65 acres, using surface water drainage pipes from 150mm Ridgidrain to 1200mm Ridgistorm-XL large diameter pipe and over 100 component chambers. The drainage system allows captured surface water to be carried through a number of drainage runs and pre-fabricated chambers before entering an existing water course.

The chambers were manufactured in Polypipe's in-house fabrications department and were supplied in diameters ranging from 900mm to 2700mm. The chambers included RIDGISTORMControl Orifice Plates, RIDGISTORMSeparate Catchpits, RIDGISTORMControl Penstocks and RIDGISTORMControl Flap Valves to prevent water returning into the system after being dispelled. Catchpits and chambers sized 1500mm and above included Ridgistorm-XL Lifting Points to allow for safe handling during lifting and installation.

Gulls Way, Capital Works, The Wirral

The Gulls Way Capital Works scheme in Heswall, Wirral, required combined sewer improvements for a residential development where the existing 450mm concrete sewer had insufficient capacity to cope with high volumes of rainfall, causing the surrounding road network to flood during storm events.

As well as providing Ridgistorm-XL pipes in 900mm diameters, we were able to pre-fabricate structural components to create a number of 1500mm RIDGISTORMAccess Multiple Pipe Manholes, allowing duel carrier pipes to run parallel to one another. The manhole access was positioned centrally to allow for a single point of access into both pipelines.

We delivered the chambers to site with integral benching and step runs incorporated, and the light in weight nature of their plastic systems – combined with Ridgistorm-XL's factory fitted Lifting Points – meant that the new combined sewer system was able to be installed, much quicker and safer than would have otherwise been possible, minimising the project's impact on road users and local residents.

Westbrook Primary School, earth tube air pre-conditioning system, Hounslow

We supplied more than 376 metres of our Ridgistorm-XL large diameter pipe in 900mm and 1050mm diameters. The system incorporated an antimicrobial lining along with pre-fabricated condensate chambers, to form a new earth tube Heat Exchange System as part of the school's redevelopment.

Ridgistorm-XL modular earth tube structured wall piping system was installed underground to precondition the temperature of incoming air before it enters the building, with air drawn into the earth tube system via air inlets. The earth tube system allows for 100% fresh air ventilation within the school, creating an improved internal environment, while reducing the energy required to heat or cool the building and greatly reducing the school's carbon footprint in line with the requirements of the London Plan.

The condensate chambers contain a pre-fabricated raised panel to allow any condensation which may be in the earth tube system to be collected. Any bacteria in the system is captured by the excess condensation water, which is then collected within the bases of the condensate chambers. This water can then be accessed and pumped out of the chambers during maintenance regimes.

Sloy Power Station, water capture, Scottish Highlands

Ridgistorm-XL large diameter pipe and RIDGISTORMSeparate Catchpits were airlifted up the mountainside of the Arrochar Alps to Loch Sloy.

The mountainside is home to the Loch Sloy Dam and Sloy Reservoir, whose combined catchment area of 31 square miles is collected to supply Scottish and Southern Energy's (SSE) Sloy Hydroelectric Power Station. Located on the banks of Loch Lomond, the power station converts energy generated by water travelling down the mountainside from Loch Sloy above in pipework, which is then turned into useful electricity, feeding homes across Scotland.

Polypipe's Ridgistorm-XL came to use during repair works to the existing pipework at Sloy Reservoir, which was originally installed in 1946. The system replaced part of the original pipework to collect excess water from the catchment area of the reservoir to feed the power station. Standing at 3.45m high, the RIDGISTORMSeparate Catchpits in 1500mm diameters were selected to provide effective separation of silt and debris from water entering the system – a vital consideration given the remoteness of the site.

A Four Step Guide to Ridgistorm-XL Pre-Fabricated Component Chambers

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