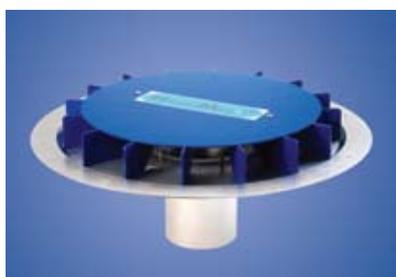


Siphonic Rainwater Drainage

Terrain HydroMax™ Siphonic Drainage



Designed to rapidly remove the high volumes of water deposited in extreme rainfall events from the roof areas of today's increasingly larger buildings, the Terrain HydroMax™ siphonic drainage system offers a complete and proven solution.



With ten times the flow capacity of a conventional gravity system and significantly faster water removal rates, Terrain HydroMax™ 'sucks' excess water from a roof to cope with downpours that would overwhelm a gravity system and is ideal for complex roof shapes.

Offering valuable total project cost savings of typically 20-45% over a conventional system, Terrain HydroMax™ can be factory prefabricated and gives important structural and space savings, with a reduced build programme.

Terrain HydroMax™ has a comprehensive range of roof drains for every flat and pitched roof membrane, from asphalt to bitumen to lead.

Ideal for commercial, industrial, sports, leisure, education and healthcare buildings, the roof drains are extremely compact and the range includes an inlet for the top deck of multi-storey car parks.

10 times the flow capacity of a conventional gravity system

Faster water removal rates

20-45% cost savings over a conventional gravity system

Reduces underground drainage

Ideal for complex roof shapes

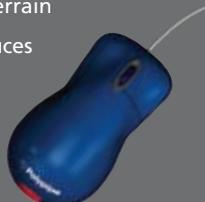
Structural and space saving

Accurate design software

Outstandingly accurate design software

Terrain HydroTechnic™ design software eliminates human errors and enables the designer working to BS 8490:2007 to achieve exceptionally accurate calculations which underpin the success of any engineered hydraulic siphonic drainage system. Independently tested by the world's

leading Hydraulic Research Centre at Wallingford, compliance with the performance requirements of BSEN 12056-3:2000, Terrain HydroTechnic™ produces calculations, factory ready drawings and bills of quantities.

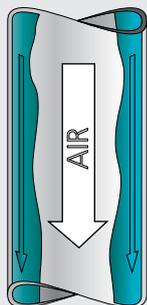


Terrain HydroMax™

How it works

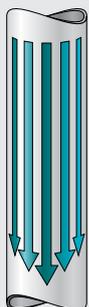
The Terrain HydroMax™ system 'sucks' water from the roof, using a powerful hydraulic force created by water accelerating down the full height of the building to deliver far greater capacity and flow rates than a gravity system. In a gravity drainage system, pipework carries both air and water. The flow in gravity pipes is extremely inefficient because of the large core of air which enables the water to flow resulting in the need for larger pipes and more of them as well as extensive underground systems.

In the Terrain HydroMax™ system as rain falls, the roof drain prevents the ingress of air, rapidly purging it until the system is fully primed and running full bore. Water is transported in smaller diameter pipes to fewer, more convenient locations. The system responds quickly to rainfall changes, is self-cleaning, drains rapidly when rainfall ceases, and is designed to prevent blockage by leaves, twigs and other debris.



Gravity flow

A gravity drainage system limits capacity to one-third water that adheres to the inner pipe wall with a large two-thirds air core.



Terrain HydroMax™

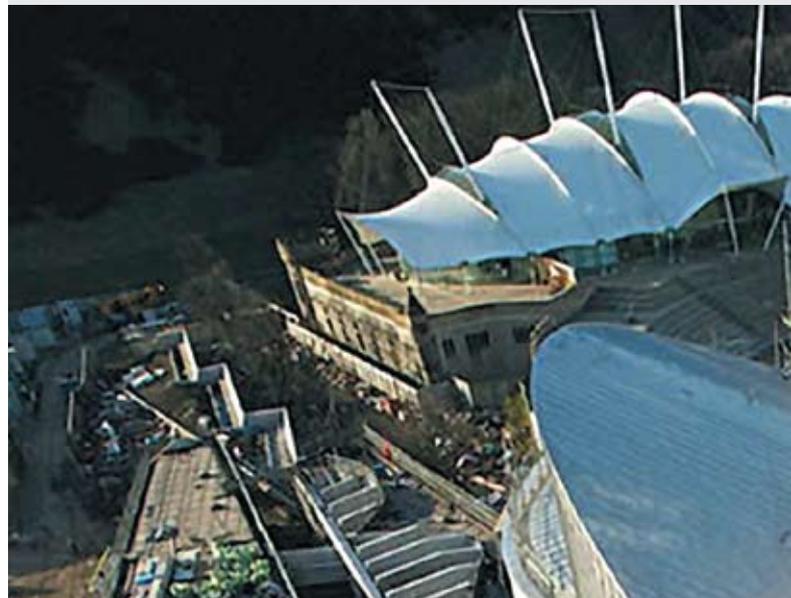
In the Terrain HydroMax™ system air is purged from the pipe so that it runs 100% full of water, normally achieving 10 to 15 times higher flow rates.

Saving time and money

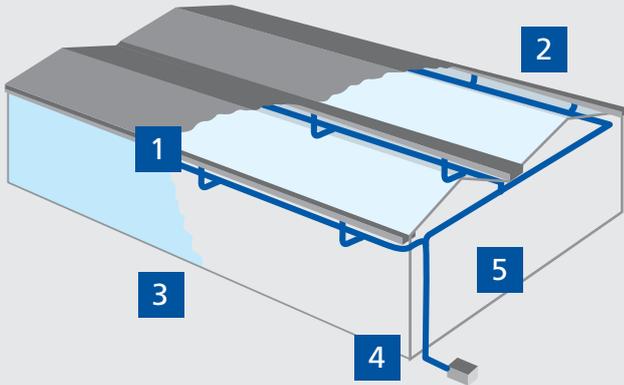
The Terrain HydroMax™ system shortens the construction build programme and significantly reduces below ground drainage, pipe diameters, trenching and backfilling work, whilst the small bore pipework places less load on the structure. Overall, the system requires fewer roof penetrations and internal downpipes. Less space is taken up by pipework, and with fewer collector pipes to convey water to the perimeter of the building or other preferred locations, such as a rainwater harvesting tank, much valuable and usable space is released.

The high level carrier pipes are installed horizontally without gradient, and pipes can be zoned beneath the roof along with air, electricity, water and other services. There is no need for drainage below the floor slab and no restrictions on downpipe location.

The system is ideal for use with HDPE pipes. Controlled, prefabricated manufacturing of the HDPE piping system reduces site work, with less on-site welding and cutting required. This method minimises changes of layout during installation.



The 4 steps of water flow through a siphonic system

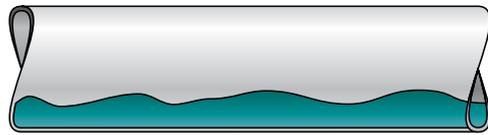


- 1 Small diameter collector pipes installed level without slope
- 2 High performance Terrain HydroMax™ roof drain
- 3 Significant reduction in underground drainage, trenching, soil removal, treatment or backfill
- 4 Design team or clients' chosen downpipe locations
- 5 No drainage under building floor slab



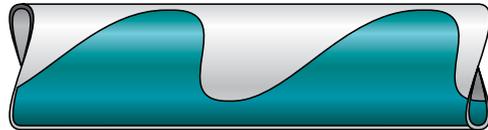
1. Gravity flow

Air carried above water



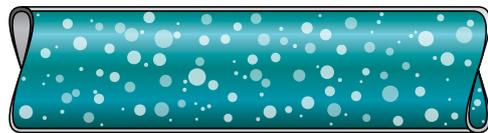
2. Plug flow

Air pockets driven down pipe with water 'plugs' to ensure self-cleaning



3. Bubble flow

Water fills pipe and carries bubbles in suspension



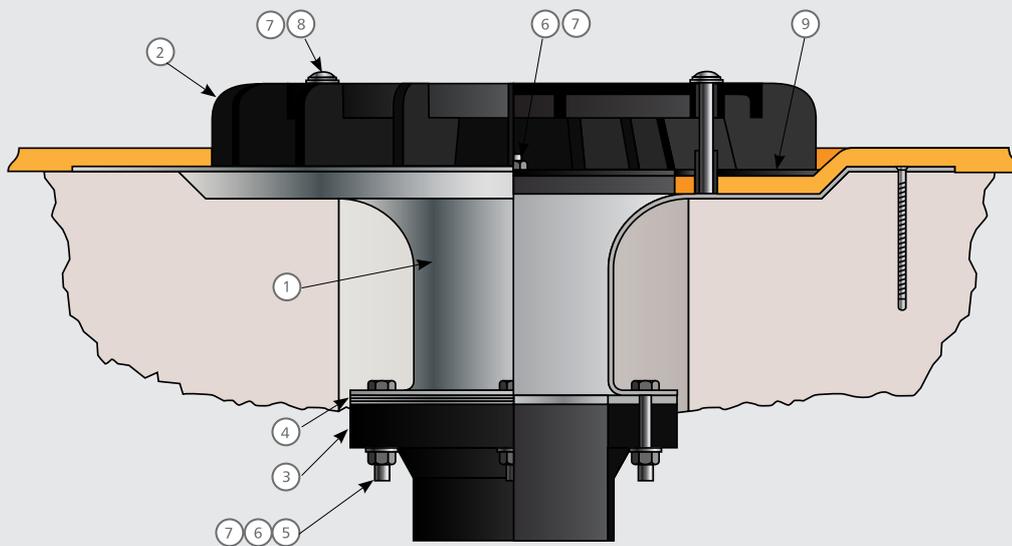
4. Full bore flow

Water fills pipe with all air purged and excluded, delivering far greater capacity and flow rates



The roof drain and piping system

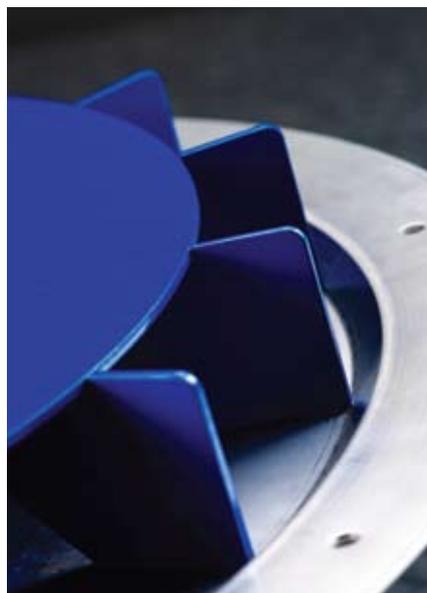
The Terrain HydroMax™ roof drain incorporates a one-piece inducer or air baffle plate, which becomes submerged in shallow water to exclude air. The height of the inducer above the body ensures the system primes rapidly with a minimum depth of water.



KEY

1. Terrain HydroMax™ roof drain body
2. Terrain HydroMax™ inducer
3. HDPE stub flange connector
4. Neoprene gasket
5. Hex headed set screw
6. Full nut
7. Washer
8. Button headed cap screw
9. Flashing ring

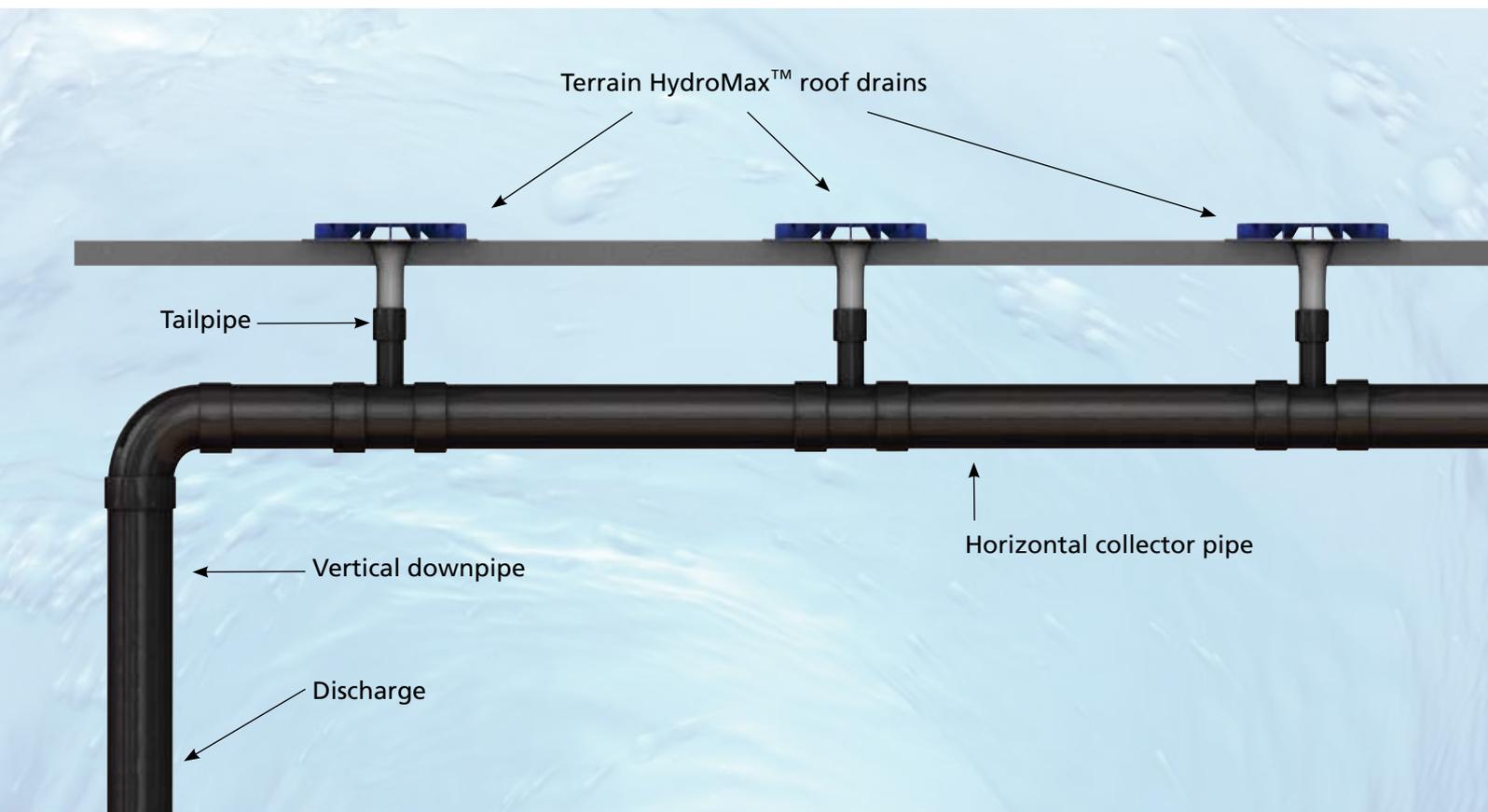
The inducer fins extend beyond the cover plate to restrict the formation of vortices by swirling water, which could entrain air. The fins also prevent blockage by debris and although the entire system is low maintenance, good housekeeping practice is recommended.



The roof drain is of a compact design and the system has over thirty different models available to cope with a range of roof types. The tailpipe below the roof drain is of relatively small diameter and in use, a series of tailpipes is connected to a horizontal collector or leader pipe below the roof.

Flow capacity

A 75mm roof drain can remove up to 25 litres of rainwater per second, whilst the 125mm drain can remove up to 100 litres of rainwater per second with certain piping configurations.



The piping system

The collector pipe is normally installed horizontally without slope at high level and runs to a convenient point where it drops to ground level with a transition break connection into the below-ground gravity drainage system or manhole chamber.



Terrain HDPE high density polyethylene pipes are manufactured in the UK to BS EN 1519-1:2000

Recommended pipes

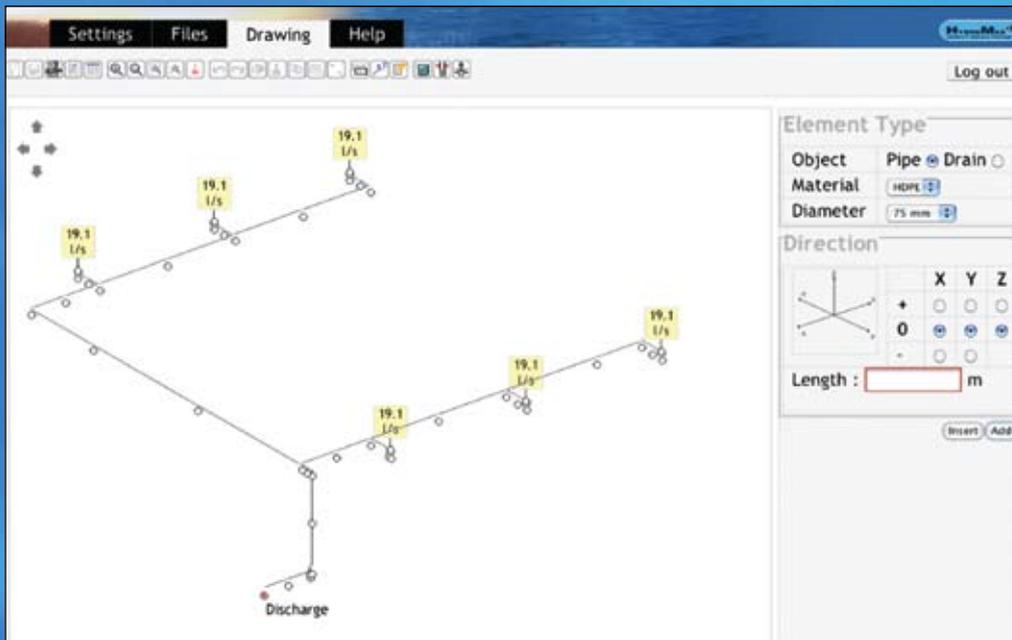
Terrain HDPE high density polyethylene pipes are manufactured in the UK to BS EN 1519-1:2000 and BBA certification. Fully welded to withstand high negative pressures, they offer excellent performance and durability with high weather and corrosion resistance.

With a wide range of diameters and fittings for maximum design flexibility, they are lightweight with electro-weld joints for rapid and simple installation. In addition, stainless steel and cast iron pipes can be used for aesthetics or as dictated by the site.

Correct installation

Essential to the success and performance of a siphonic system, correct installation is ensured by the system design software and prefabrication of specified pipework. In addition, installation is facilitated by the prefabricated Terrain Rail System, which supports pipes, enabling them to be hung from roof voids, and restrains pipe expansion. All rails, fixings, connections and brackets are included for rapid and speedy installation.

HydroTechnic™ Design software & technical support



| | Current |
|---------------------------|-------------|
| Out of Balance | 0.911 m |
| Minimum Pressure | -6.671 m |
| Maximum Pressure | 1.152 m |
| Minimum Velocity | 1.839 m/s |
| Minimum Vertical Velocity | 2.734 m/s |
| Maximum Velocity | 7.485 m/s |
| Discharge Velocity | 2.734 m/s |
| Fill time | 52 seconds |
| Pass/Fail? | PASS |
| Tail Pressures | |
| 1 | -0.531 m |
| 2 | -0.586 m |
| 3 | -0.912 m |
| 4 | -0.008 m |
| 5 | -0.001 m |
| 6 | -0.018 m |

This highly accurate and technically advanced software rapidly calculates rainfall and flow parameters for all kinds of pipework and buildings and provides pressure calculation results for compliance with BS 8490:2007.

Technical support

Polypipe Terrain offers a complete technical advisory service for information, assistance and help with specification, scheduling and estimating – a full design and installation partnership that includes sourcing of approved designers and installers.

This is supported by CAD drawings of products and applications, design and manufacture of prefabricated pipework and rail systems, installation drawings and on-site advice and problem solving. A full range of training services is available.





Design assistance

The Polypipe Terrain technical support service can provide design assistance for any project on receipt of the following details:

- Design rainfall rate or geographical location
- AutoCAD drawings of roof and floor plans, **both** sections and elevations
- Gutter profiles
- Performance specification

Registered installer network

A nationwide network of registered installers operates throughout the UK and is comprehensively supported by Polypipe Terrain's technical department.

Please contact us for details of your nearest installer.

Centre of Excellence

The Polypipe Terrain Centre of Excellence in Aylesford, Kent provides exhibition, demonstration and training facilities for consultants, clients, contractors, installers and distributors.

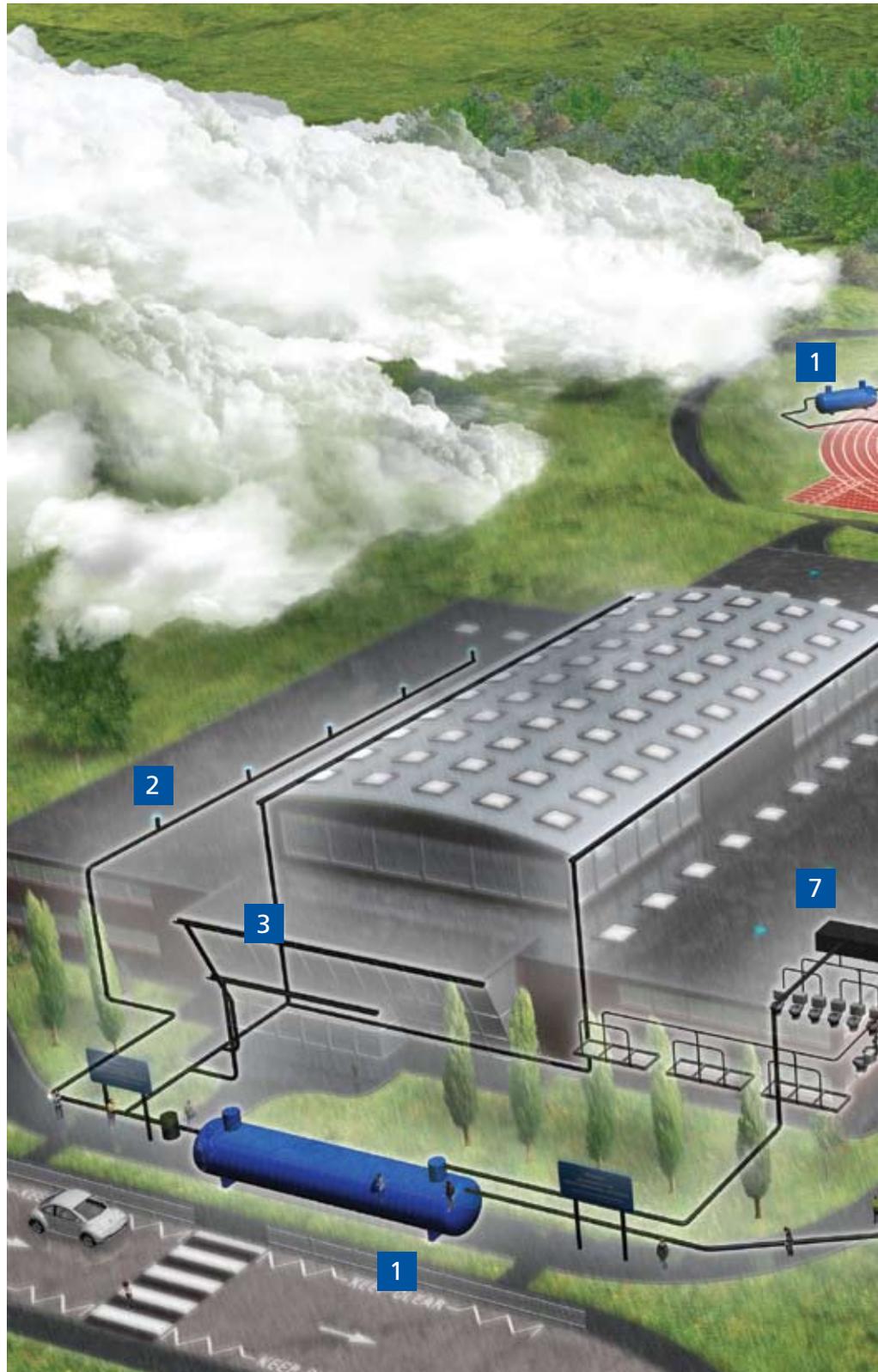


A Roof to River solution

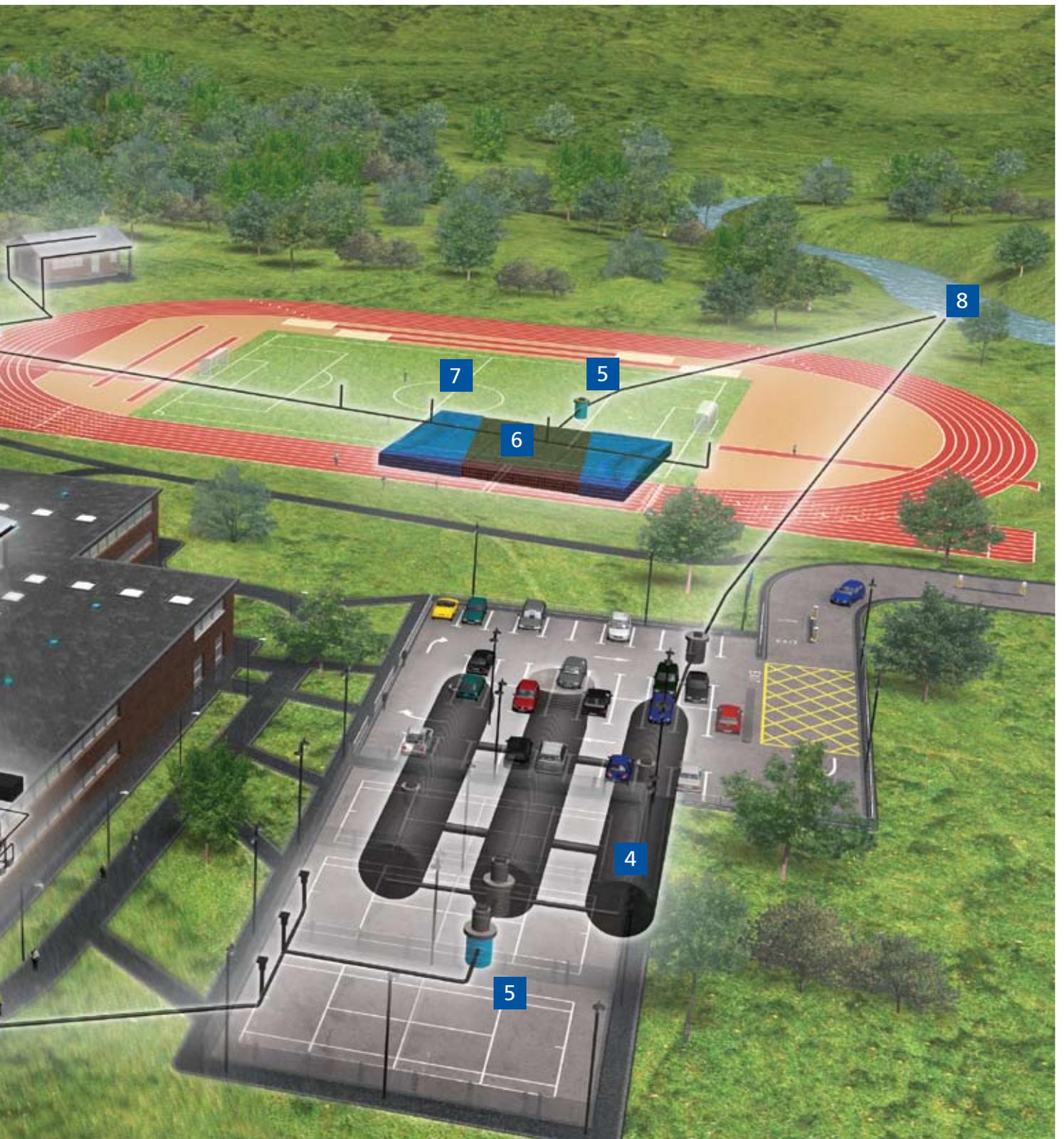
Polypipe Terrain provides a total solution 'from roof to river' enabling the specifier to choose a complete system from one manufacturer with one range of products, offering prefabricated systems using sustainable materials and processes.

It's a proven and integrated drainage solution for all requirements from roof collection to rainwater harvesting and storage, to recycling, soakaways and discharge, with a complementary range of pipework solutions.

- 1** Rainwater harvesting
- 2** Siphonic rainwater system
- 3** Gravity rainwater system
- 4** Pipe flood alleviation system
- 5** Water treatment filter
- 6** Modular flood attenuation system
- 7** Re-use of stored water
- 8** Outflow



Regulations and climate demand integrated, intelligently designed water management systems, to control rainwater as close to source as possible.



Siphonic Rainwater Drainage



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