# Plastic Piping Systems ...less to do more

Polypipe v2

## Sustainability

## Sustainable Development

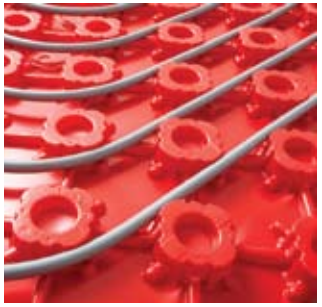
# ‘Development that meets the needs of the present without compromising the ability of future generations to meet their own needs’.

The Brundtland Commission report of 1987 ‘Our Common Future’ (commissioned by the United Nations General Assembly).

**Pages 3-5**
Polypipe Sustainable Solutions

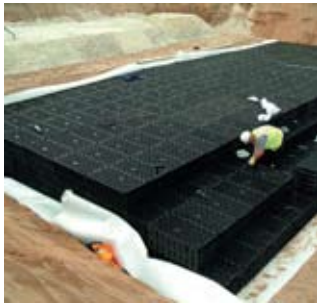
**Pages 6-7**
Sustainable Materials

**Pages 8-9**
Sustainable Processes



**Pages 10-13**
Sustainable Indoor Environments

**Pages 14-17**
Water Management



**Pages 18-19**
Case Studies

“In 2004, more than a quarter of the UK’s carbon dioxide emissions - a major cause of climate change - came from the energy we use to heat, light and run our homes. So it’s vital to ensure that homes are built in a way that minimises the use of energy and reduces these harmful emissions. The construction and use of our homes has a range of other environmental impacts created for example through water use… which can be significantly reduced through the integration of higher sustainability performance standards within the design of a home”.

Source: Department for Communities and Local Government. December 2006.

**Sustainability isn’t just a pipe dream... at Polypipe we’re making it happen!**

# Polypipe Sustainable Solutions

Today there is a growing recognition of the need to install more environmentally sustainable product systems in all areas of building and construction, including the development of new homes and the refurbishment of the UK's existing housing stock. Similarly with commercial and infrastructure construction schemes, whether the motivation comes from higher energy costs, greater regulation or greater corporate responsibility, clients and their specifiers are demanding greater levels of sustainability within their projects.

Polypipe has developed an unrivalled range of system solutions to meet these evolving needs, whether the need is to create low carbon, energy efficient **Sustainable Indoor Environments** or to deal with the pressing issues surrounding the preservation and **Management of Water** as a precious commodity, or simply minimising the impacts from our **Built Environment**.

| | Sustainable Indoor Environments | | | Water Management | | Built Environment |
|---|---|---|---|---|---|---|
| **Polypipe Sustainable Solutions** | Enabling Low or Zero Carbon Technology (LZCT) | Energy Conservation and Retention | Healthy Living Environments | Water Quality | Rainwater Management / Recycling | Minimising Impacts |
| Underfloor Central Heating Linked to LZCT (e.g. ground source heat pumps) | ✔ | ✔ | ✔ | | | ✔ |
| Overlay Central Heating Linked to LZCT (e.g. ground source heat pumps) | ✔ | ✔ | ✔ | | | ✔ |
| Geothermal Piping Systems for ground source Heat Pumps | ✔ | ✔ | | | | ✔ |
| Ducting for Exhaust Air Systems | ✔ | ✔ | ✔ | | | ✔ |
| dB12 Acoustic Soil and Waste System | | | ✔ | | | ✔ |
| Ducted and Mechanical Ventilation Systems | | | ✔ | | | ✔ |
| Cavity Closers for Windows, Doors and Abutments | | ✔ | ✔ | | | |
| Insulated Loft Hatches | | ✔ | ✔ | | | |
| Floor Muffle Sound Reducing Strip | | | ✔ | | | |
| Eco-Vat Rainwater Harvesting System | | | | | ✔ | ✔ |
| Terrain HydroMax Siphonic Rainwater Management System | | | | | ✔ | ✔ |
| Modular Attenuation and Soakaway | | | | | ✔ | ✔ |
| Large Diameter Piping Attenuation Systems | | | | | ✔ | ✔ |
| Flow Control and Water Filter Treatment | | | | ✔ | ✔ | ✔ |
| Sewer Systems | | | | ✔ | | ✔ |
| Polyguard Potable Water Barrier Pipe | | | | ✔ | | ✔ |
| Gravity Drainage Systems | | | | | | ✔ |
| Hot & Cold Water and Heating Systems Supply Pipe | | | ✔ | ✔ | | ✔ |

# Polypipe's "Code Breaking" Sustainable Residential Solutions

Polypipe design and manufacture products that meet and exceed the requirements in the Code for Sustainable Homes, the UK's national standard for the design and construction of sustainable new homes.

**1. Polyplumb Underfloor Heating Systems** enable the use of low and zero carbon technologies such as ground source and air source heat pumps to help achieve code levels 4, 5 and 6 and earn extra credits available in Ene7.

**2. Overlay Central Heating System** allows on-site micro energy renewable technologies (Low or Zero Carbon) such as air and ground source heat pumps to be used in existing buildings.

**3. Polypipe Geothermal Piping** for use in conjunction with ground source heat pumps.

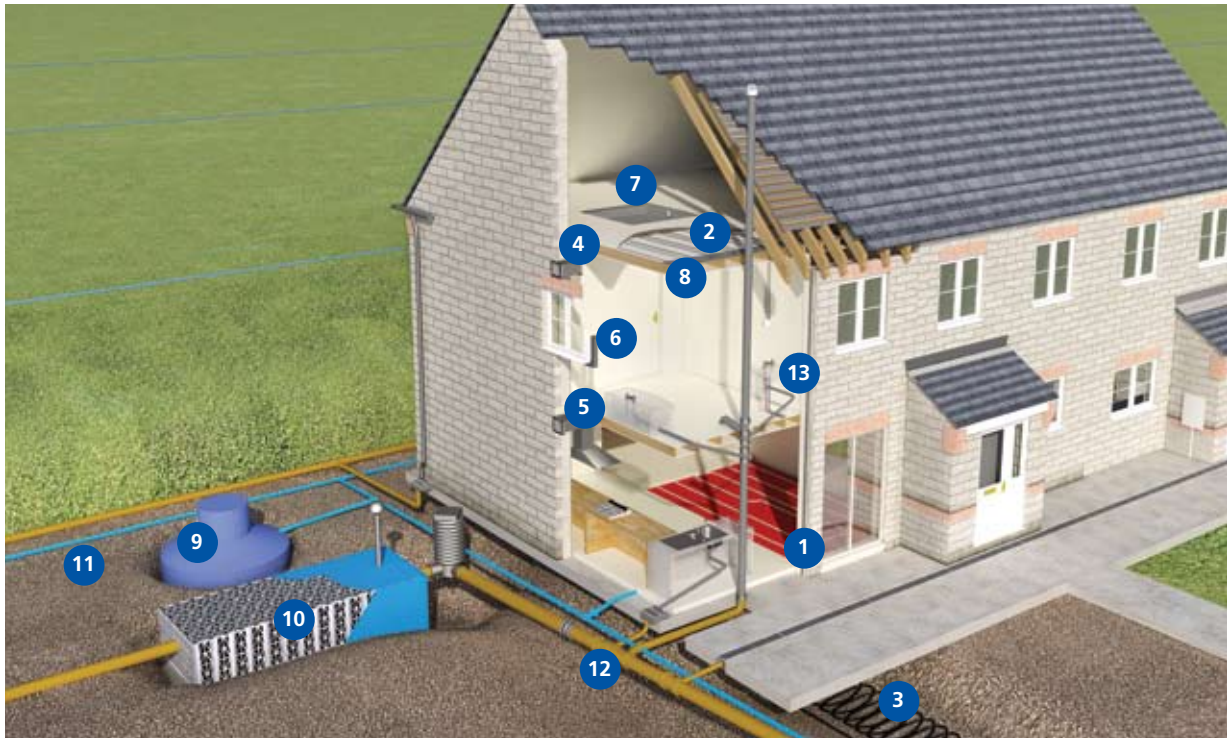
**4. Domus Modular Ducting Systems** for use in conjunction with exhaust air systems.

**5. Domus Ventilation Systems** provide maximised air flow in buildings to meet the requirements of Building Regulations including safety and fire standards.

**6. TDI Cavity Closers** effectively address thermal bridging in the building fabric improving insulation performance by 25% over current Part L1A Building Regulation requirements in line with Code Level 3*** for Energy.

**7. Polypipe Insulated Loft Hatches** reduce heat loss in ceilings.

**8. TDI Floor Muffle** strip reduces the impact of sound transfer in floors meeting the 41dB requirement in Building Regulations.




**9. Eco-Vat Rainwater Harvesting System** can reduce average per capita water consumption in households by at least 50% aiding achievement of Code Levels 4, 5 and 6 for both internal and external potable water use reference Wat 1 and Wat 2.

**10. Polystorm and Polystorm LITE modular cells** for attenuation and infiltration applications to meet mandatory Code entry requirements and comply with Surface Water Run-Off category Sur 1.

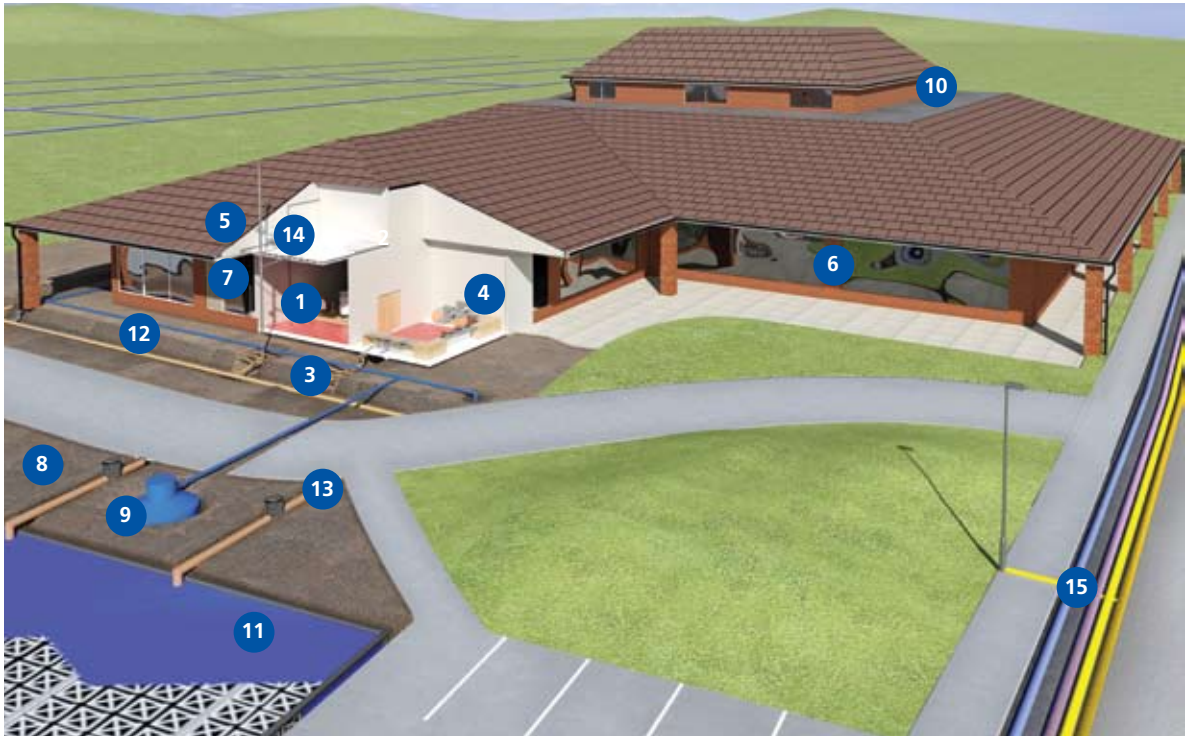
**11. Polyguard Potable Water Barrier Pipe System** prevents permeation of contaminants in "Brownfield" development sites.

**12. Polypipe's Gravity Drainage Systems** provide a sustainable and safe means of drainage in all residential applications, reducing leakage and ensuring end of life recyclability.

**13. Polypipe's Hot & Cold Water Systems** utilise Polybutene pipes that are lightweight in transport and energy efficient in their manufacture and performance.

# Polypipe's Sustainable Commercial and Infrastructure Solutions

Polypipe manufacture a range of commercial and infrastructure solutions that meet and exceed the building regulations surrounding sustainability.




**1. Polyplumb Underfloor Heating Systems** allow on-site micro energy renewable technologies (Low or Zero Carbon) such as air and ground source heat pumps to be used.

**2. Overlay Central Heating System** allows on-site micro energy renewable technologies (Low or Zero Carbon) such as air and ground source heat pumps to be used in existing buildings.

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**5. Domus Ventilation Systems** provide maximised air flow in buildings.

**6. TDI Cavity Closers** effectively address thermal bridging in the building fabric improving insulation performance by 25% over current Part L1A Building Regulation.

**7. Terrain Acoustic dB12** provides a complete acoustic drainage system specifically designed to eliminate the effect of noise.

**8. Ridgistorm-XL** large diameter pipe solution ideal for large scale attenuation projects.

**9. Eco-Vat Rainwater Harvesting System** can reduce average per capita water consumption for both internal and external potable water use.

**10. Terrain HydroMaxTM Siphonic Roof Drainage and Rainwater Harvesting System** for efficient rainwater management and recycling on large scale commercial developments.

**11. Polystorm and Polystorm LITE Modular Cells** for attenuation and infiltration applications.

**12. Polyguard Potable Water Barrier Pipe System** prevents permeation of contaminants in "Brownfield" developement sites.

**13. Gravity Drainage and Sewer Systems** provide a sustainable and safe means of drainage in all commercial and infrastructure applications, reducing leakage and ensuring end of life recyclability.

**14. Hot & Cold Water and Heating Systems Supply Pipe** utilise pipes that are lightweight in transport and energy efficient in their performance.

**15. Cable Management and Duct Systems** incorporate recycled materials where regulations allow.

## Plastics… Less to do More

Plastics are among the most researched materials in the world and rapid technological and manufacturing developments made in recent years have allowed for continuous innovation. For example wall thicknesses for water pipes have decreased by one third in the last 20 years, while product performance has improved.

Plastics use less than 4% of the world's total oil output and are integral to sustainable development.

## Thinner, Lighter and More Robust

Thinner, lighter and more robust than most traditional materials, plastics help reduce energy use - and therefore greenhouse gas emissions - because they are lightweight in production, transport and use. A plastic pipe used in infrastructure applications is typically only 6% of the weight of its concrete equivalent. This lightweight construction also reduces the need to use heavy mechanical equipment during the installation process - again reducing carbon emissions.

'With the support of WaterAid, more than 5.5 million people have gained access to safe, clean water thanks to the use of plastic pipes'

APME (Association of Plastics Manufacturers in Europe), 'Plastics: At Work for a Sustainable Future'

## Carbon Efficient

Using plastics also reduces the need for quarrying activities. And, because of their lightweight nature, the carbon footprint from transporting them is smaller.

'From the view of the total life cycle, plastics can… be considered as one of the most energy efficient materials.'

('The Contribution of Plastic Products to Resource Efficiency', Final Report, Gesellschaft fuer Umfassende Analysen/Corporation for Comprehensive Analyses, Vienna, January 2005).)

## Flexibility... Less Leakage

Plastic pipes offer a big advantage in relation to buried installations because the flexibility of the pipe system is more able to cope with ground movement. Recent investigations have confirmed that the flexibility of plastic pipes, in combination with the longer pipe runs, fewer joints and higher integrity joints, results in better performance in practice ensuring, for example, that breakage and consequent leaking of joints is very unlikely, which is obviously better for the environment.

## No Corrosion and Chemically Resistant

Unlike many traditional pipe materials, plastic pipes are not subject to corrosion, and offer excellent resistance to a wide range of chemicals. Correctly installed, plastic pipes require little or no maintenance in normal use, they do not rust, pit or scale. Their smooth non-porous bore guards against stubborn blockages on the inner pipe wall. The total piping system is designed to meet specified long-term performance requirements, ensuring complete integrity and leak-free operation.

## Plastics - A Recyclable Material

Plastics are used to make long-lasting products. And, in addition to their longevity, plastics are perfectly fit for recycling after use. For example, PVC compounds are 100% recyclable - physically and chemically. And, because PVC is a thermoplastic material, it can be re-processed to be used in plastic products whether from site off-cuts or end of life recycled material.

Polypipe is a group sponsor of Vinyl 2010, the formal industry body set up by the plastics sector to research, promote and support the adoption of best environmental practice and sustainable development. One initiative is Recovinyl, a commitment by the entire European PVC sector to demonstrate that PVC has a sustainable future, bringing both economic and environmental benefits.

## Polypipe's Commitment to Sustainability

At Polypipe, managing the potential environmental impact of our activities is an integral part of our business and we are very proud of our environmental track record.

We are committed to reducing material usage and waste and to recycling as much as possible. Finding sustainable product solutions is another of our ongoing commitments. These commitments apply from materials use through to processes, recycling, waste policy and transport.

## Investment

A large proportion of Polypipe's 3-year £60 million capital investment programme has been in new plant and machinery. A key consideration was our wish to reduce energy and raw material consumption and increase output. On a single manufacturing site we replaced 17 injection moulding machines with new machines saving between 18 and 20% on energy costs.




Our Philosophy:
Reduce, Reuse, Recycle

## Using Recycled Materials

Polypipe uses thousands of tonnes of reprocessed materials every year, either from our own in-house recycling operations or as bought-in materials. Our usage policy ensures that we maximise the amount of recycled materials used without compromising product performance, quality and durability.

### We achieve this by ensuring that:

- We recycle our own in-house waste, as well as processing recycled polymer where product standards allow - including site off cuts and post-consumer waste
- Where we are unable to recycle material, manufacturing waste is returned to the process elsewhere.

Using recycled materials, re-using waste and offering fully recyclable products is putting Polypipe at the head of the field in our sector.

- Our floor heating systems are based on standard pipe sizes ensuring zero waste from otherwise unusable short lengths
- Overlay floor heating panels are manufactured using recycled materials
- Our Civils cable management systems are manufactured from recycled materials
- Where performance parameters allow, products are manufactured entirely from recycled material.

By focusing on small processes that we can establish in-house to help reduce waste, we are contributing to the bigger picture.

## Water Usage

Through substantial investment in our water supply systems within our manufacturing units including the use of advanced filtration systems, we are able to re-use water utilised in our manufacturing processes reducing our overall water consumption.

## Transport

Plastic products are substantially lighter than alternative construction materials, which means that Polypipe uses less fuel to transport them than traditional material manufacturers.

In addition, low-rolling resistance tyres fitted to our vehicles mean potential fuel savings of 5%, while rev limiters reducing speed from 56mph to 54mph saves a further 5%. Our use of bio diesel fuels further helps reduce our carbon footprint.

In addition, the consolidation of a number of our manufacturing and operating sites has allowed us to reduce the amount of intersite miles our logistics fleet travel.

## Energy Reduction

Our commitment to energy efficiency helps reduce our carbon emissions as well as improve our business performance. In our main manufacturing sites over the last 4 years we have reduced our energy usage by 10% per tonne of output.

At Polypipe we use sustainable and environmentally aware manufacturing processes wherever possible to reduce our energy consumption, including:

- Insulated heater jackets on extruders and injection moulders to minimise heat loss and energy input
- Low-energy lighting in our offices and manufacturing facilities
- Sub-metering on all production lines to monitor energy consumption
- Insulated barrels on extrusion lines
- Variable speed drives used on machinery to ensure most efficient energy usage

## Environmental Management Systems

It's one thing to comply with existing regulations, but to exceed them in preparation for future legislation is typical of Polypipe's innovation and forward thinking.

Polypipe is proud to have achieved ISO 14001 accreditation at a number of our main sites which means that our environmental management system has been independently assessed by the British Accreditation Bureau and met all the necessary standards.


## Sustainable Indoor Environments

Not only is the public becoming increasingly environmentally conscious, but there is increasing legislation around carbon emissions including the introduction in 2006 of the UK Government's Code for Sustainable Homes.

There is therefore a growing demand for homes that offer reduced environmental impact, lower running costs and features that enhance health and well being.

## Energy Efficient Under Floor Central Heating Systems

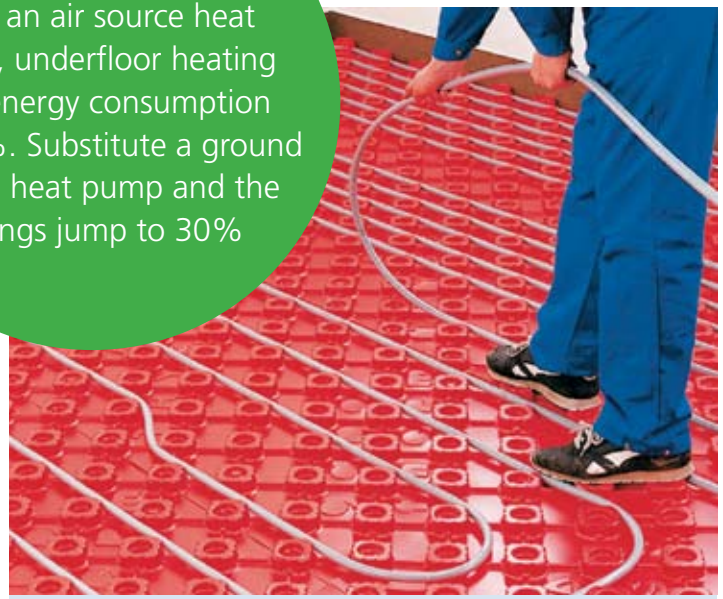
The use of under floor heating typically allows room temperatures to be reduced by 1°-2°C when compared with radiators, while still providing the same level of comfort. Each 1°C reduction in room temperature reduces fuel consumption by 6%. This means it is cheaper to run and gives the house a reduced carbon footprint.

As underfloor central heating is the enabler to maximise the use of low or zero carbon technologies for heat generation such as air source heat pumps or geothermal systems, it is key to sustainable indoor environments.

At Polypipe we manufacture the most complete range of floor heating systems for every application. Solid floor systems provide "thermal mass" solutions and incorporate our unique floor panel, which enhances performance and requires less screed material than other systems.

The patented Overlay system provides a unique retro fit underfloor system, unlocking for the first time the massive potential for energy efficient under floor central heating in existing dwellings.

Used in association with an air source heat pump, underfloor heating cuts energy consumption by 20%. Substitute a ground source heat pump and the savings jump to 30%



## Eu-ray Research Report

Results from a recent study show that underfloor central heating is more energy-efficient than radiator heating using 5% less energy than radiators. However, if a building uses a heat pump, instead of a boiler, the energy saving capability of underfloor central heating becomes much greater. Used in association with an air source heat pump, underfloor heating cuts energy consumption by 20%. Substitute a ground source heat pump and the savings jump to 30%

(Energy performance calculations based on CEN standards developed for the Energy Performance of Buildings Directive (EPBD), European Association for Surface Heating and Cooling (Eu-ray), 2007)

## Ground Source Heat Pumps - Geothermal Piping Systems

Geothermal heating systems, (ground-source heat pumps), work on the simple principle that the ground below the "frost line" (normally around four feet in depth) is a constant temperature year round. Heat can be taken from the ground and transferred through a heat pump to the heating system in the dwelling.

Polypipe's range of Geothermal Piping Systems meet the increasing demand for ground source heat pumps.


## Exhaust Air Ducted Ventilation Systems

Using exhaust air in dwellings allows you to recover and reuse heat and control the quality of air in a house.

These systems can supply both domestic hot water and heating from the energy recovered from exhaust air controlled domestic ventilation.

Polypipe offers the widest range of ducted systems in the UK to meet the increasing demand for and efficient running of exhaust air systems.

Case Study

## BRE iHUB Visitor Centre

The Building Research Establishment has recently opened its iHUB Visitor Centre for its Innovation Park. Polypipe's underfloor central heating system has been chosen for the new build section and Polypipe's 'Overlay' retro-fit system for the refurbishment of the existing part of the building. Both of these systems are powered by an Air Source Heat Pump. Additionally, Polypipe's Eco-Vat Home rain water harvesting system has been chosen to collect rain water from the roof area and recycle and re-use for toilet flushing and irrigation. The Polyfit hot and cold water supply system has also been installed.

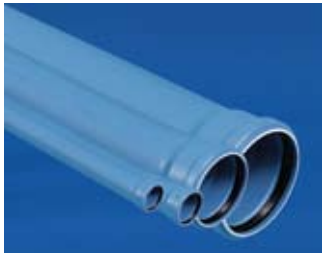
# Eliminating the Effect of Noise

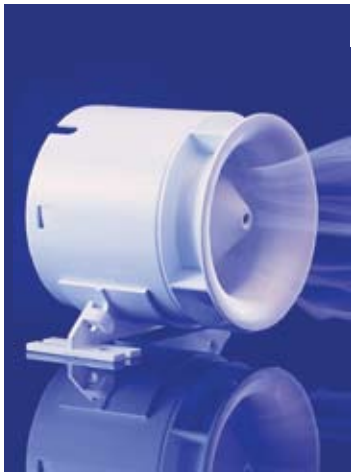
## Terrain Acoustic dB12

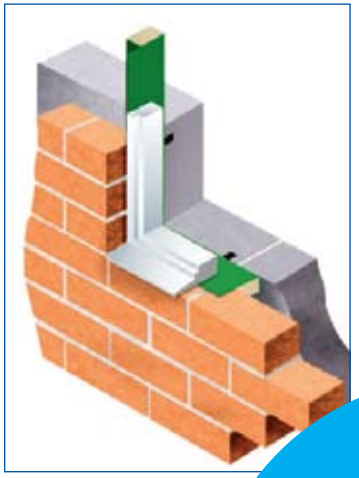
The sound of water travelling though a building can be very intrusive. In order to meet sound control within Building Regulations, additional materials and labour are usually required, increasing the cost and time on site.

The Terrain Acoustic dB12, a complete acoustic drainage system specifically designed to eliminate the effect of noise, is a simple, quick and cost effective solution, which substantially beats the sound performance criteria. It creates a high quality durable and reliable system, and is ideally suitable for:

- Mixed development
- Hospitals
- Hotels
- Schools
- Commercial Applications







Polypipe has always led the way in manufacturing quality products to meet and exceed ever changing regulations

## TDI Floor Muffle Sound Reducing Strip

The TDI floor muffle is a noise reducing solution for the domestic environment. The 20mm thick enclosed sound-reducing strip is simply stapled to the top of joists and sits between the timber floor joists and the floorboards. When tested at the BRE no further insulation was required to achieve 41dB as required by Building Regulations.

It is quick to install, with no special tools required and complies with current Building Regulations and is BBA certified.

## “Build Tight, Vent Right…….”

### Ventilation

Polypipe manufactures high quality Domus branded domestic and commercial ventilation products that provide a ‘one stop shop’ solution to meet the requirements of the Building Regulations for domestic housing, and light industrial and commercial premises.

Features of the Domus range include channels and pipes manufactured with flame retardant plastics to meet the relevant international standards and usage of recycled, non corrosive plastics to ensure safe and sustainable ventilation solutions.

### Insulation

Polypipe manufacture a comprehensive range of products designed to provide complete and economical solutions to cold bridging and other insulation problems.

The new 0.25 range is specially designed to help meet the energy saving requirements for the achievement of code levels within the Code for Sustainable Homes and has been fully assessed by the BBA. Polypipe TDI Cavity Closers effectively address thermal bridging in the building fabric improving insulation performance by 25% over current Building Regulation requirements. In addition TDI’s Insulated Loft Hatch also reduces heat loss through ceiling apertures and complies with the extra 20% energy efficiency required by the conservation of fuel and power approval document L1A, April 2006.

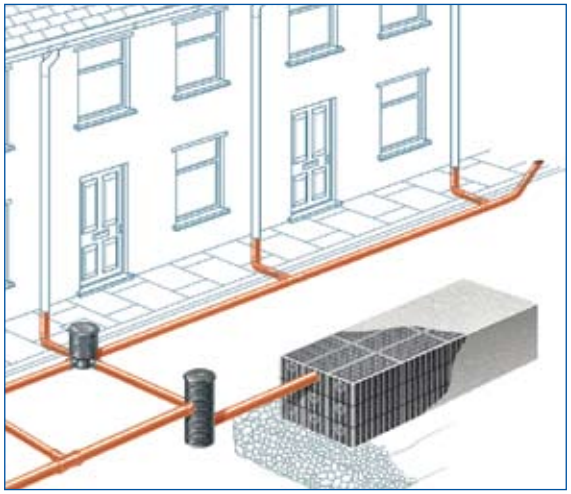
# Plastic Piping Systems ...less to do more

Polypipe sustainable indoor environmental solutions can help meet the Merton Rule by providing at least 10% of predicted energy requirements through incorporating renewable energy production equipment on larger developments.

Polypipe
Sustainability

## Water Management Solutions

Sustainable Drainage Systems (SUDS) include rainwater harvesting, soakaway and attenuation solutions designed to prevent surface water from entering the existing drainage system or watercourse unchecked. Implementing SUDS contributes significantly towards sustainable developments and planning authorities now expect planning applications to show how a more sustainable approach to drainage is to be incorporated into the development.



## Rainwater Harvesting

The Eco-Vat rainwater harvesting system, together with other water saving solutions such as low flush toilets, are examples of a range of solutions that Polypipe can offer to help alleviate water shortages.

Rainwater harvested from an Eco-Vat system can easily replace 50% of the domestic demand for non-potable water for applications such as toilet flushing. In Commercial, Industrial and Retail applications the cost of water, combined with increased demand and larger roof catchment areas, mean that short pay backs can be achieved.

Eco-Vat can now also be linked to the new **Polypipe HydroMax Siphonic Rainwater System** for optimised rainwater management in commercial applications.

## Soakaways

Soakaways allow water to infiltrate back into the ground, recharging ground water and reducing treatment of surface water run off. Traditional rubble fill or granular soakaways typically have a 30% void ratio. The latest technical solutions, such as the Polystorm modular units, have a 95% void ratio. This allows soakaways to be downsized, reducing site excavation and disposal costs, not to mention reducing the energy expended by construction activity.

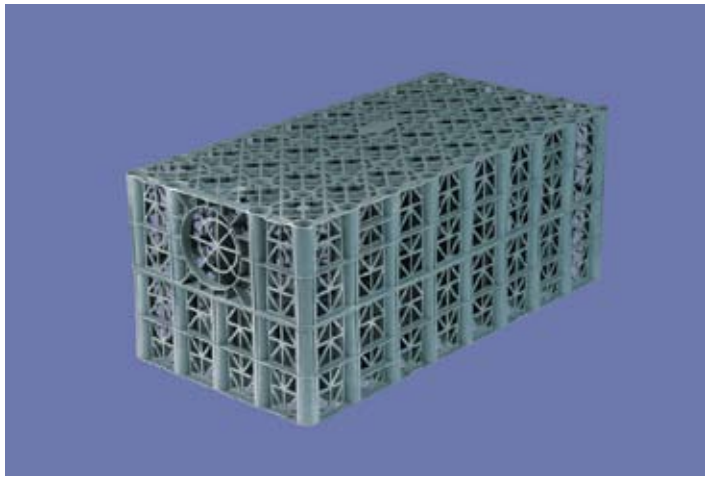
Rainwater harvested from an Eco-Vat system can easily replace 50% of the domestic demand for non-potable water

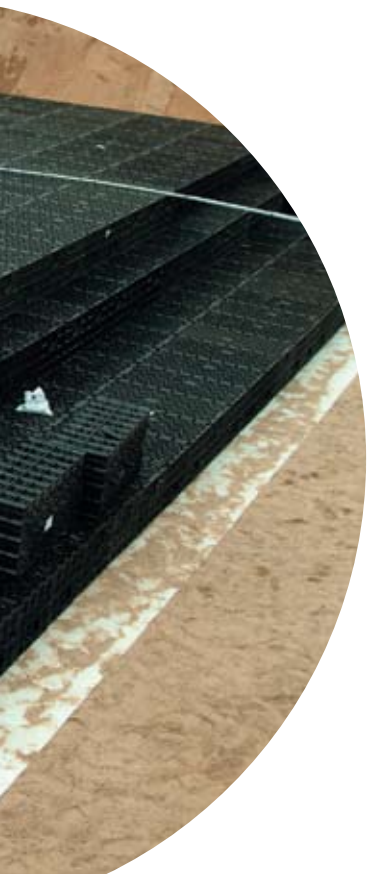
## Polystorm Modular Attenuation Systems

If ground conditions prohibit the use of a soakaway solution, the next step is to consider an attenuation structure which acts as a storage device for the stormwater, releasing it back into the drainage network or watercourse at a predetermined discharge rate through the use of a flow control device within set Environment Agency parameters.

Polystorm and Polystorm Lite are modular cell solutions which, when wrapped in an impermeable membrane, form a leak-tight tank structure for stormwater storage. Polystorm & Polystorm Lite both benefit from a high void ratio of 95% allowing maximum storage capacity from minimum space.

The Polystorm modular attenuation systems and Ridgistorm XL piped systems (see page 16) can both be combined with prefabricated silt traps and the bespoke Stormcheck flow control chamber to provide an effective attenuation solution.





## Sustainable Drainage Systems (SUDS)

SUDS best practice limits the flow of rainwater which runs off-site or is piped away, protects local watercourses from the contamination carried in surface run-off, encourages natural groundwater recharge (where appropriate), and reduces the likelihood of downstream flooding.

## Ridgistorm-XL Piped Attenuation Solutions

Polypipe can offer both modular cell and piped attenuation solutions. Ridgistorm-XL is the latest innovative solution to SUDS and stormwater management requirements. Ridgistorm-XL offers a large diameter pipe solution ideal for use in large scale attenuation projects.

The Ridgistorm-XL system is much lighter than rigid alternatives such as concrete pipes and comes in 6m lengths as standard, reducing the number of joints in a pipeline, therefore providing quick and easy installation.

Because it is light, Ridgistorm-XL can be stored and handled safely on site and further health and safety benefits are offered by the patented electro-fusion jointing process which minimises the time an operative needs to spend working in confined spaces.

Ridgistorm-XL offers the most advanced large diameter plastic pipe solution available in the UK for use in:

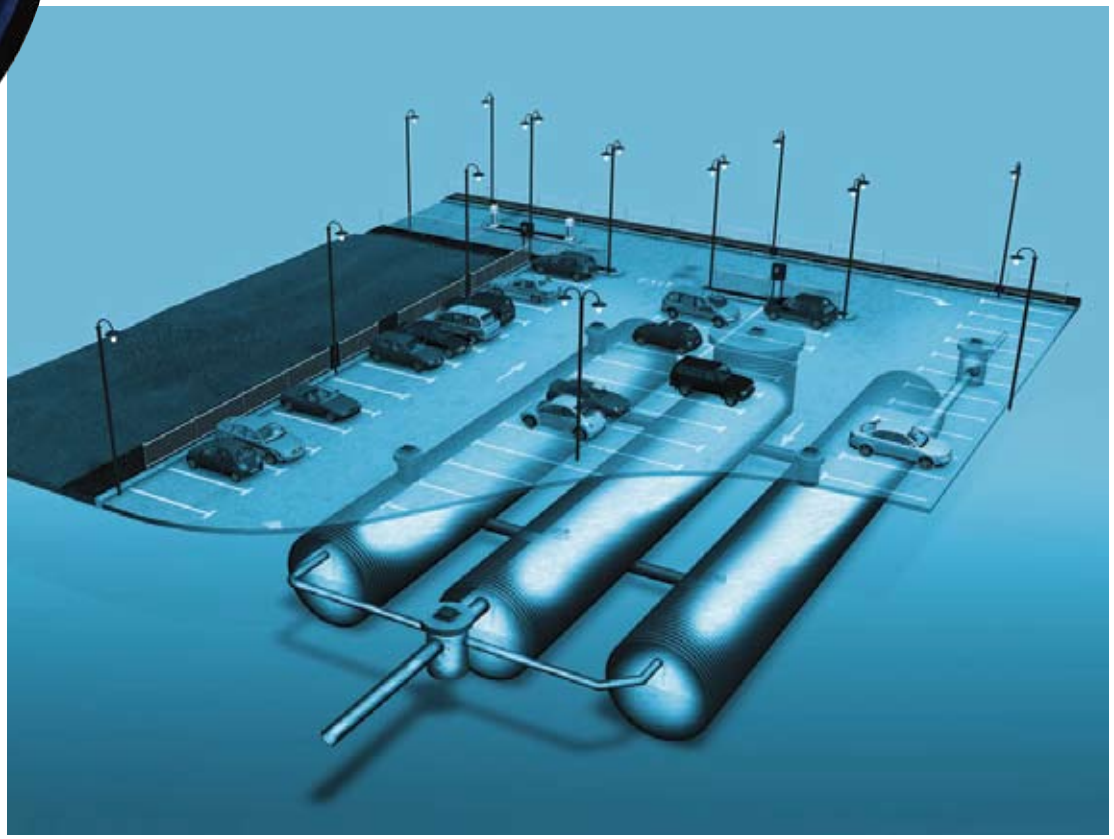
- Surface water drainage
- Large-scale attenuation structures
- Specialist pipeline applications
- Foul sewers
- Bespoke large diameter manholes and chambers



### Ridgistorm features include:

- Bespoke pipe profile providing individual stiffness class - engineered to suit any application.
- A robust, durable and adaptable solution in comparison to rigid materials such as concrete and steel.
- Due to its longer lengths and lighter weight, it can be 70% cheaper to transport than equivalent concrete pipes and can be handled and stored much more safely on-site.

Due to its longer lengths and lighter weight, it can be 70% cheaper to transport than equivalent concrete pipes

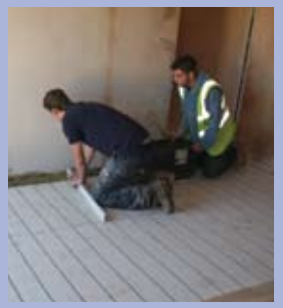


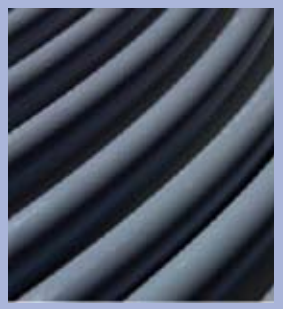
## Sewers

Together, Polysewer and Ridgisewer make the largest range of WIS 4-35-01 Kitemarked structured wall pipe systems in the UK. In fact Ridgisewer is the only Kitemarked structured wall alternative to concrete pipes. Both Polysewer and Ridgisewer have the traditional benefits of plastic pipe systems e.g. strength and durability, but weigh as little as 6% of rigid pipes providing for easier handling and thus quicker and safer installation.

## Polyguard

Throughout the UK there are many development sites that have previously been contaminated by industrial use, otherwise known as Brownfield sites. These sites have been exposed to organic, inorganic, corrosive and toxic elements which can contaminate mains water supply. Polyguard is designed to ensure the safe delivery of drinking water through such redeveloped Brownfield land.





## Overlay Fits with Edwardian Splendour

Built at the turn of the last century, the Royal Masonic School for Boys at Bushey is the true epitome of Edwardian architectural elegance and is part of a four-year refurbishment project to create 300 luxury apartments within the complex.

One of the many problems when converting an early 20th Century school, even one as grand as this, was to banish the comparatively spartan conditions imposed on boys at the time and replace them with high levels of comfort demanded for modern living. The introduction of the Overlay underfloor central heating system was crucial in order to leave walls uncluttered by radiators and to obtain even heat throughout each room. The great advantage of Overlay was that it provided a high load bearing system only 18mm thick laid on top of an existing floor.

## Polyplumb UFCH Benefits Barn Conversion

With a footprint of less than 200 sq.m. living space in this barn conversion was restricted and so, in order to maximise the floor area and leave walls uncluttered, underfloor heating was specified from the outset. The Polyplumb System was selected for its efficiency, speed of installation and sustainable credentials.

The hall and kitchen areas downstairs utilised the ultra-flexible polybutene pipe in a solid concrete floor, whilst the configuration used for the suspended floors upstairs utilised heat spreaders on battens before the pipe was again walked in from the coil.

## Hybrid Polystorm Solution for RAF Development

Incorporating both the Polystorm and Polystorm Lite sustainable drainage solutions, the project at RAF Northolt, Cambridgeshire was part of the £600 million MoD Single Living Accommodation Modernisation Scheme (SLAM) designed to deliver living accommodation for MoD personnel.

The original project specification was changed from a concrete box culvert due to issues with rising material costs and concerns over the performance of the product in times of high-flow water run-off. However, a solution was needed that was capable of storing the required water capacity whilst accommodating difficult site constraints. The modular construction of Polystorm and Polystorm Lite allowed Polystorm cells to be connected together to cope with the uneven burial depths on-site and a bespoke designed manifold system was also incorporated to improve hydraulic performance.

## Soakaway Solution for New School Extension

A hybrid soakaway solution using the Polystorm and Polystorm Lite modular cells was used at the development of a new school building in Doncaster to cope with varying burial depths on-site. The adaptability of the Polystorm and Polystorm Lite cells enabled the different products to be installed on top of one another to offer a sustainable water management solution for the landscaped area.

In order to accommodate difficult site constraints the Polystorm soakaway solution was designed as two separate tanks, balanced by Ridgidrain pipe, plus a catch pit to prevent the ingress of debris and silt into the modular system.

## 100,000 litre Rainwater Harvesting Solution for Bristol College

A bespoke 100,000 litre Eco-Vat rainwater harvesting system with tank and leaf filter were supplied for the new college building at Brislington Enterprise College in Bristol as part of the UK's Building Schools for the Future programme. Installed to cope with rainwater from the schools 5000 square metre roof area, the tank stores and filters rainwater before it is used for toilet flushing within the new development.

The Eco-Vat Rainwater Harvesting tanks reduce mains water consumption and is one of the few on the market to be BBA approved, providing significant cost savings on water bills. It is calculated that the Eco-Vat system installed at Brislington Enterprise College will save the Local Authority over £10,400 per annum.


## Polypipe Achieves Code Level Six

Polypipe Eco-Vat rainwater harvesting system has been installed at the first commercially built Code Level Six houses at Upton Northampton by Mansell Partnerships for English Partnerships. The system will help achieve the Code's reduction in potable water usage requirement of 80 litres per person per day.

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## Useful Website Links

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