WaterShed Aveton Gifford

Downpipe disconnection

What is a downpipe disconnection?

A downpipe disconnection simply intersects an existing downpipe which currently discharges into the combined sewer and diverts it away from the building to allow the surface water to naturally infiltrate into the ground.

When might I use a downpipe disconnection?

Downpipe disconnections are a very simple and cheap way of diverting rain water out of sewers to a nearby permeable area which should be downhill of the downpipe and away from other properties.

Rain water butts and downpipe planters or raised rain gardens can add value to a downpipe disconnection by storing and reusing water within your garden. This would have the additional benefit of reducing your water-use because you would need to water the garden less often. Overflows from these would then typically be connected to an infiltration feature such as a rain garden, filter drain or soakaway.

What do I need to consider when disconnecting my downpipe?

- Your downpipe should be disconnected to a permeable area at least 3m away from any building.
- The infiltration area should be sloping away from properties and roads
- The slope of the drain should not be greater than 1m vertical for every 50m horizontal (2%) to ensure the run-off has opportunity to infiltrate
- Rocks, flagstones or boulders can be used within the design of the downpipe disconnection to help slow the water and prevent erosion within the conveyance and infiltration area
- The existing discharge point should be capped to prevent rain water entering the combined sewer.

What will I need to do to maintain my downpipe disconnection?

Maintenance of a downpipe disconnection is similar to your existing gutters and downpipes, i.e. remove leaf litter and weeds.

Sources of further information

Information on designing, constructing and maintaining downpipe disconnections can be found at:

raingardens.info – Rain Garden Guide

riversides.org — Downspout Disconnection

toronto.ca — Stormwater Management Mandatory Downpipe Disconnection

portlandoregon.gov — How to Disconnect a Downspout

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Downpipe disconnection planter

What is a downpipe planter?

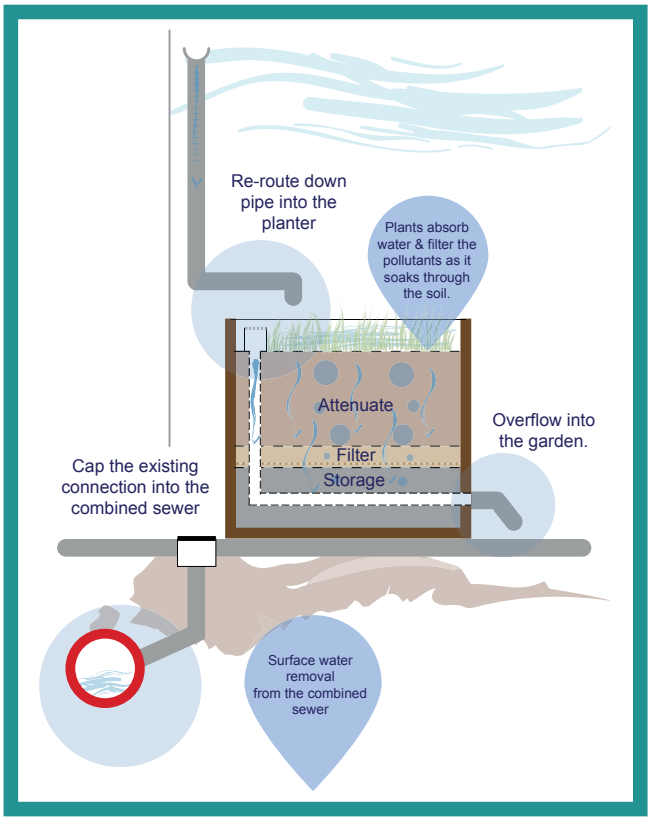
A downpipe planter is a raised flowerbed which collects roof water at the bottom of a downpipe. Typically they incorporate a layer of stone or other material in the lower portion to provide attenuation and free draining soil in the upper portion to grow plants. A high level overflow allows excess water to be drained off into other drainage systems, preferably to a rain garden or surface water sewer or stream.

When might I use a downpipe planter?

Downpipe planters are ideal for collecting run-off from roofs by disconnecting the downpipe from the existing sewer outlet and redirecting flows into the raised planter. The planter is made up of a layer of soil, gravel for drainage, and plants that can tolerate times with high rainfall and times without rain. The rain passes through the layer of soil and plant roots which filter the rainwater and trap any pollutants, allowing excess water to drain down to the base. If the soil is not suitable for infiltration, a slotted drain beneath the soil can take the filtered rain water and an overflow pipe on the surface prevents flooding.

What do I need to consider when planning my downpipe planter?

- The planter needs to be constructed to cope with the forces of soil and water pushing against the outside walls
- You will need a layer of soil for planting in with a gravel layer below. This needs a perforated pipe and outflow to stop waterlogging. It is best to separate the two layers with a hessian sheet across the top of the gravel to stop soil particles clogging up your drain below
- You will need a high and low level overflow to the ground to stop water logging in the planter. This could be a soakaway, rain garden, stream or sewer. (Discharging from the downpipe planter into a sewer may not qualify you for funding or a reduction in water bills)
- An impermeable membrane (a material which does not allow water through) should be used to line the planter if the planter itself is not watertight.



- The larger the planter the more of your roof water it will intercept. An annual summer storm in the South West will typically have 11mm of rainfall. You can multiply that by your roof area to see what proportion of the flow your planter will retain.

What will I need to do to maintain my downpipe planter?

Maintenance of a downpipe planter will typically involve making sure it doesn't become waterlogged. This may occur because of roots or silt blocking the overflows. Ensure the plants are maintained as per their individual needs.

Sources of further information

Information on designing, constructing and maintaining downpipe planters can be found at:

riversides.org — Rain Garden Guide
oregonstate.edu — Stormwater planters
water.epa.gov — What is green infrastructure? Planter boxes

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Filter drain

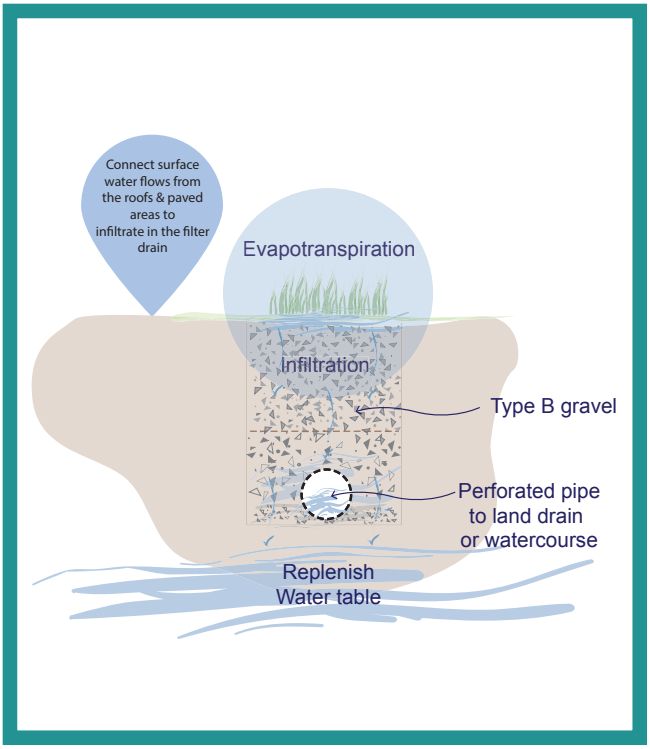
What is a filter drain?

A filter drain (also known as a French drain) is a gravel-filled trench which collects and conveys surface water as well as allowing water to drain into the surrounding ground. They also reduce pollution by slowing down flows and filtering the rainwater run-off prior to entering watercourses, increasing biodiversity whilst having a low-maintenance garden

When might I use a filter drain?

Filter drains are ideal for collecting run-off from drives and roads as well as point sources such as roof downpipes.

As they are typically shallow they can be relatively cheap and straightforward to install. The filter drain can be installed to convey surface water as well as provide infiltration by being connected to a separate feature such as a rain garden.



What do I need to consider when laying my filter drain?

- Filter drains should be laid 3m away from your property foundations; you should consider a short length of conventional pipework or a channel such as a rill to collect and convey the water from the downpipe
- A geotextile (a material which allows water through) should be used to line the trench just below the surface to prevent sediment in the gravel fill. This can block the drain, so slowing infiltration into the ground below.
- A perforated pipe of at least 75mm diameter should be incorporated into the base of the drain to act as an overflow. If this discharges to a stream or sewer a headwall must be incorporated into the design.
- Make sure you seek permission from the watercourse / riparian owner to discharge to the drain, stream or watercourse.
- The slope of the drain should not be less than 1m vertical for every 400m horizontal and ideally to maximise the slowing effect, no greater than 1m every 50m (2%)
- The drain shouldn't be laid close to or underneath trees or shrubs.
- Care should be taken to ensure that run-off, overflows and excess flows to the drain are not contaminated and only convey surface water. You must not connect to any drains discharging foul water or grey water (including sinks, washing machines etc.)

What will I need to do to maintain my filter drain?

Maintenance of a filter drain will typically involve making sure the drain is not blocked by roots or silt. Depending on the amount of silt entering the drain the geotextile and gravel fill may require renewing or cleaning.

Sources of further information

Information on designing, constructing and maintaining filter drains can be found at:

planningportal.gov.uk – Building Regulations Part H
sudswales.com – Filter drains

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Rain garden

What is a rain garden?

A rain garden can be a shallow depression in free-draining soil planted with water tolerant plants. As surface water passes through the soil, silt settles out and the surface water is allowed to infiltrate into the ground.

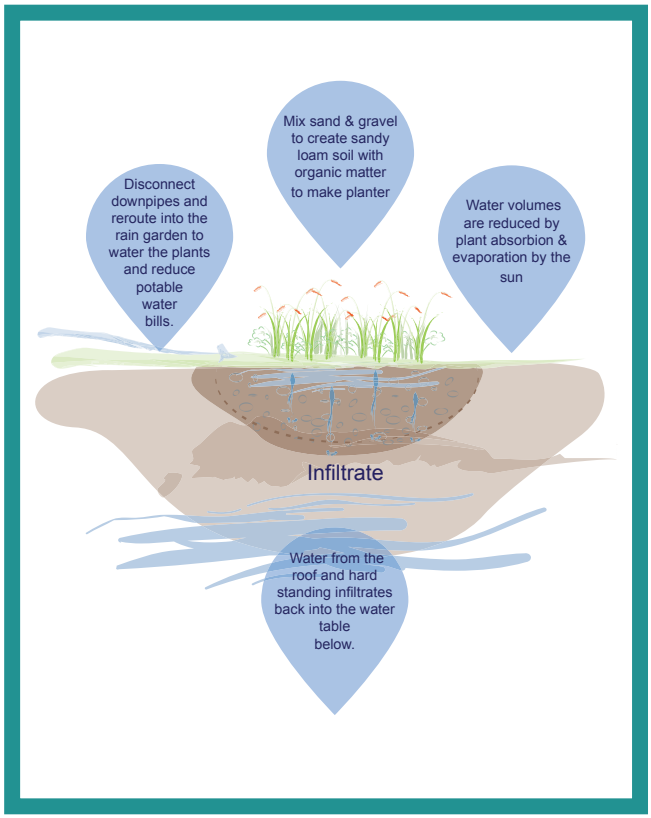
Rain gardens typically have an overflow to allow excess rainfall to be safely routed away from homes or other sensitive areas.

When might I use a rain garden?

Rain gardens are ideal where the gardens are downhill of a property and its driveway in areas where the ground is relatively free draining.

What do I need to consider for my rain garden?

- You need to consider where water will go should the rain garden overflow; you will need to allow for an overflow directed towards a soakaway, stream or surface water sewer. Discharging from the rain garden into a combined sewer may not qualify you for funding or a reduction in water bills.
- There are simple tests (see UK Rain Garden Guide) which can be used to check whether your garden is free-draining and to see if the permeability needs improvement.
- The larger the rain garden the less often it will overflow and the less waterlogged it will become. An annual summer storm in the South West will typically have 11mm of rainfall. You can multiply your roof area by 11mm to see what volume in litres your rain garden would need to retain all the flow.
- A rain garden should be situated at least 5m from any building foundations. Also you should consider whether the ground might be adversely affected by increases in the flow of water into the ground (for example soluble material such as chalk). Further information on this is described in the Susdrain and Ciria factsheet 'Using SuDS close to buildings'. The link is provided below.



- Rain gardens are best suited on gentle slopes. On steeper slopes it can be difficult to create a level perimeter to retain water.
- You should avoid locating rain gardens too close to trees as it may cause problems with shading and tree roots.

What will I need to do to maintain my rain garden?

Maintenance of a rain garden differs very little from general garden maintenance. Ensure that the flow path is free flowing and maintain the plant bed as you wish.

Sources of further information

Information on designing, constructing and maintaining rain gardens can be found at:

raingardens.info – Rain Garden Guide
susdrain.org – Rain Gardens page
rspb.org.uk – Sustainable drainage systems; Maximising the potential for people and wildlife

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Water butts

What is a water butt?

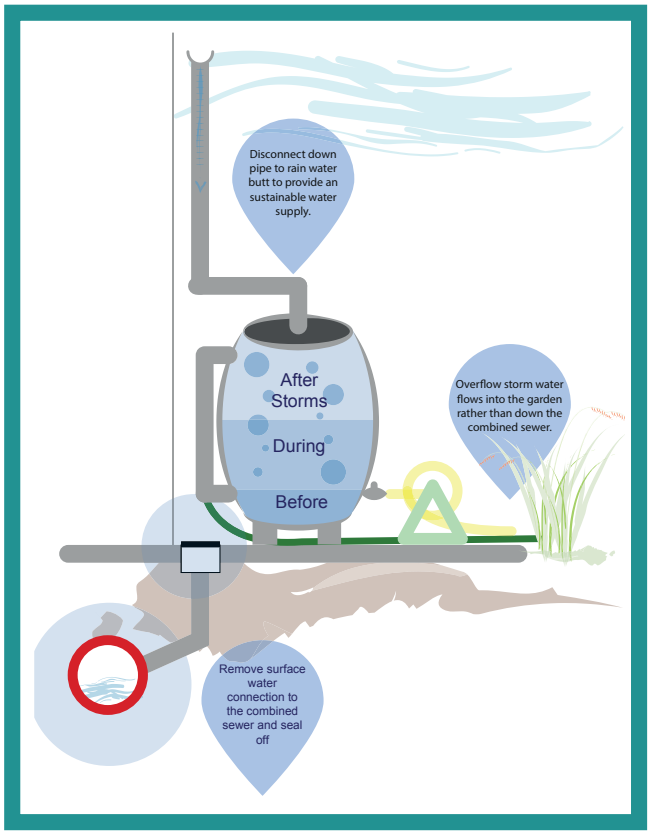
Water butts collect rain water from downpipes and store it for re-use. They come in a wide variety of sizes, shapes, finishes and colours to suit a wide range of applications.

When might I use a water butt?

Water butts are ideal for collecting run-off from roofs by disconnecting the downpipe from the existing sewer outlet and intercepting the flows. An overflow which prevents the water butt from flooding should be redirected away from the combined sewer to ensure flows are fully disconnected. For example , you could connect a perforated hose to the outflow to allow the water butt to empty after a rain fall event, and make capacity for the next storm. (see illustration).

What do I need to consider when planning my water butt?

- The water butt needs to be placed in an area which can take the weight of the water
- You will need an overflow from the water butt which directs water away from the combined sewer
- Where it is not possible to route the overflow away from the combined sewer, you should ensure the water butt has a constant outflow such as an irrigation system so that the water butt does not remain full for long periods
- The larger the available volume within the water butt the more of your roof water it will intercept. An annual summer storm in the South West will typically have 11mm of rainfall. You can multiply that by your roof area to see what proportion of the flow your water butt will retain.
- You may wish to raise the water butt slightly for ease of filling watering cans.



What will I need to do to maintain my downpipe planter?

Maintenance of a water butt will typically involve removing leaf litter to prevent taps or irrigation systems becoming blocked.

Sources of further information

Information on designing, constructing and maintaining water butts can be found at:

rhs.org	– Water: collecting, storing and re-using
bbc.co.uk	– BBC Gardening Guide to Saving Water
waterwise.org	– How to install a water butt
uksuds.com	– Small scale suds for individual buildings

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The WaterShed project

What is the problem?

Our sewer network is in most places a combined system where rainwater from roads, roofs, driveways and in some cases fields enters the sewer network. As more green spaces are paved over, ever more surface water is entering the sewer network and overloading it with stormwater when it rains hard. This has the effect of triggering overflows or causing spills of diluted untreated sewage, polluting the environment.

Traditional ways of containing stormwater - building bigger sewers and concrete tanks - are simply not keeping pace with the rate of increase in surface water. Every new driveway, patio, hardstanding or extension is adding to the impermeable areas in our towns and cities, while climate change is producing ever more intense downpours.

What is the WaterShed Project?

South West Water understands the distress and blight that sewer flooding brings and is committed to preventing it.

Our WaterShed projects across the region are taking a new approach to tackling flooding from sewers.

Across the world there are examples of better ways of managing storm water in towns and cities: engineered but natural features that store water close to where it falls and re-use this water to make homes for wildlife and enhance our green spaces.

There are also better ways all the agencies that deal with flooding can work together - by sharing aspirations and priorities and pooling resources. This is all part of the WaterShed approach.

Why?

Storm tanks simply hold water at the bottom of the catchment - and when they are full they overflow. Pumping so much water around the sewerage network is energy-intensive and costly. We need to reduce both the cost of pumping and the amount of carbon we use as part of our commitment to reducing greenhouse gases.

A more sustainable solution

The Watershed programme aims to reduce sewer flooding using Sustainable Drainage Systems (SuDS) and partnership working.

SuDS aim to mimic natural drainage processes by managing rain water on the surface. They are increasingly being used as they can:

- Slow down the speed at which run-off enters our rivers and streams
- Improve the quality of surface water entering our rivers and streams
- Green our urban environment
- Create a variety of habitats and encourage biodiversity
- Educate our children on the water cycle and sustainable management of our water resource
- Improve the attractiveness of our green spaces and urban environment
- Enable rain water to be stored for reuse.

South West Water and their customers benefit from:

- Reduced risk of sewerage flooding to our homes, gardens and roads
- Reduced CSO spills and risk of pollution of bathing beaches and watercourses
- Keeping our costs and bills as low as possible by reducing unnecessary pumping and treatment of rain water

Why we need you

To remove surface water from the combined system we will need your help to divert run-off from roof, road and paved areas to surface water sewers, the ground, rivers or the sea. This will often involve working within people's gardens, as well as parks and other green spaces. With your input into the design and delivery of these schemes we can work together to achieve something that benefits everyone.

Sources of further information

Information about how SuDS could help your area can be found at:

rhs.org	– Water: collecting, storing and re-using
bbc.co.uk	– BBC Gardening Guide to Saving Water
waterwise.org	– How to install a water butt
uksuds.com	– Small scale suds for individual buildings

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Soakaway

What is a soakaway?

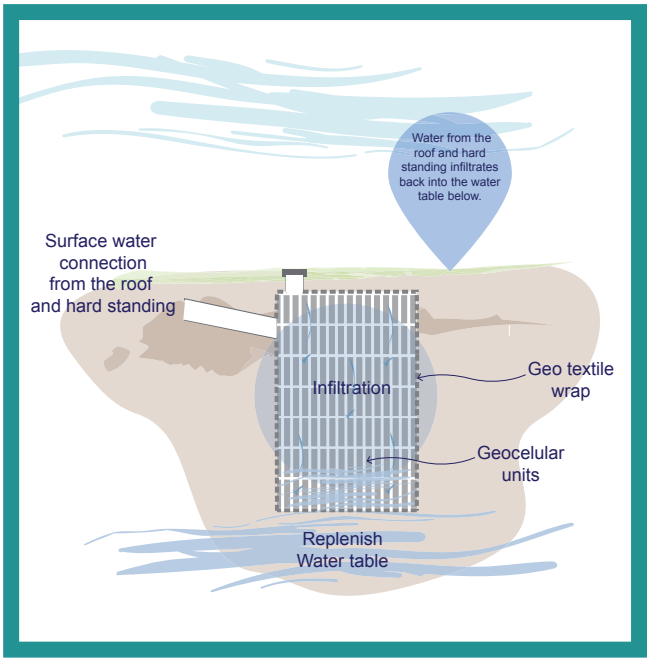
A soakaway is a below-ground structure which disperses run-off from roofs and roads into the ground. Soakaways are typically constructed using perforated concrete manhole rings, or by utilising geocellular systems (similar to milk crates) surrounded by a geotextile. The size of the soakaway is determined by the area to be drained and the permeability of the ground.

When might I use a soakaway

Soakaways are ideal for disposal of surface water in areas which have good permeability and where the water table is not too high. A pipe, filter drain, swale or other conveyance method will be required to collect surface water and route it to the soakaway.

What do I need to consider when planning my soakaway?

- The soakaway should be downhill of your property, more than 5m away from any building and 2.5m away from boundary walls.
- The ground water level should be no higher than 1m below the base of the soakaway.
- The permeability of the ground can be determined using a simple infiltration test (see sources for further information)
- You can calculate the size of soakaway required using the spreadsheet on the UkSuDS.com website
- Geocellular units are light weight and easy to install, but you will need to excavate an appropriate sized hole for the volume of run-off discharging to the soakaway.



What will I need to do to maintain my soakaway?

Maintenance of a soakaway will typically involve removing sediment and debris from the systems leading to it. Over time the soakaway itself may silt up and the geotextile clog, and infrequent cleansing or reconstruction of the soakaway itself may be required.

Sources of further information

Information on designing, constructing and maintaining downpipe disconnect can be found at:

planningportal.gov.uk – Building Regulations Part H
uksuds.com – Soakaway design spreadsheet
diyfixit.co.uk – Installing a soakaway for surface water drainage