



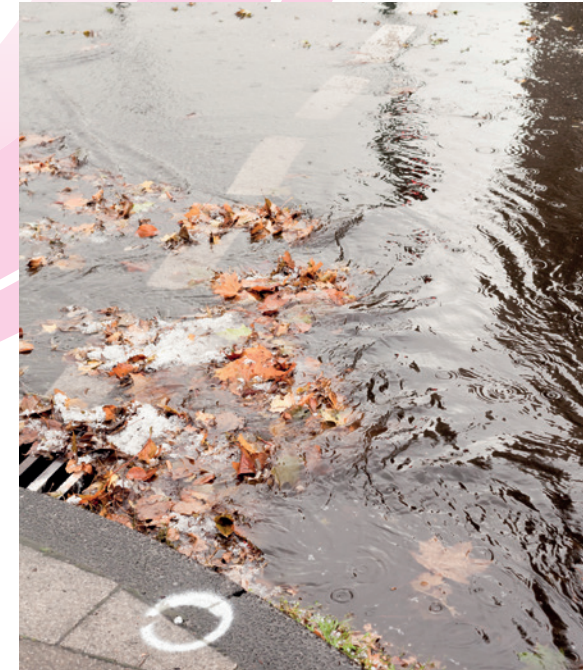
Best Practice: Surface Water and flooding

Surface water, also known as rainwater, stormwater, or run-off, is channelled through roof gutters, downspouts and road gullies into surface water drainage. Some of it seeps straight into the ground. Surface water drains often run to the nearest watercourse. Foul drains, on the other hand, carry sewage or contaminated waste to be processed at a wastewater treatment works.

Surface water drainage consists of above-ground gutters and rainwater pipes ('roof drainage') and under-ground pipework ('surface water drains and sewers'). The public sewer network is owned by the water and sewerage company (WaSC).

Surface water flooding occurs when there is a surplus of surface water via rain or melted snow and ice. On soft surfaces such as grass and soil, water may be absorbed into the land, but increasing urbanisation has reduced soft land, so there is less surface to absorb the rainfall. In extreme weather incidents, the land gets saturated and, when heavy rainfall follows heavy rainfall, the water table stays high and the water simply has nowhere to go. The result is flooding.

Time and again we see flash floods devastating communities: residents being rescued from rising waters, possessions ruined, cars washed away, roads collapsing, homes and businesses made inhabitable — and, on occasion, lives lost. **It's a grim reminder that we are at the mercy of the elements.**



What is the Government doing about flooding?

The Government's flood strategy consists of Flood Risk Management Plans (FRMPs): 2015 to 2021. These explain the risk of flooding from rivers, the sea, surface water, groundwater and reservoirs and also set out how risk management authorities will work with communities to manage flood risk over that six-year period. The Flood and Water Management Act provides for better, more comprehensive management of flood risk for people, homes and businesses, helps safeguard community groups from unaffordable rises in surface water drainage charges, and protects water supplies to the consumer. Surface Water Management Plan (SWMP) guidance provides a simplified overarching framework which allows different organisations to work together and develop a shared understanding of the most suitable solutions to surface water flooding problems (www.gov.uk/government/publications/surface-water-management-plan-technical-guidance).

For the authorities, meeting demand going forward will be a challenge. The 2010 report "Investing for the Future: Flood and Coastal Risk Management in England", was updated in 2014 to look at:

- the investment choices over the next 50 years;
- the link between long-term investment and existing plans
- current spending plans (about £750 million, including all public and third party sources)
- the risk of flooding from surface water alongside the risk of flooding from rivers and the sea.

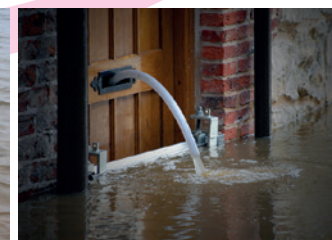
For more details, visit: www.gov.uk/government/publications/flood-and-coastal-risk-management-in-england-long-term-investment



Who is responsible for managing flood risk?

No single body is responsible for managing flood risk in the UK, not least because of devolved administrations in Scotland, Northern Ireland and Wales. The Department for Environment, Food and Rural Affairs (DEFRA) is the policy lead for flood and coastal erosion risk management in England, but the Cabinet Office (emergency response planning), the Department for Communities

and Local Government (land-use and planning policy) and the Treasury will also be involved in policy making. These national policies are then delivered by risk assessment management authorities (RMAs) including the Environment Agency, councils, flood authorities, water and sewerage companies, internal drainage boards and highways authorities).



Type of Drainage	Implications
Road gullies and grills	Drainage gratings at the edges of the road which connect to highway drainage (maintained by highway authorities and Highway England) or, in urban areas, public sewers which are the responsibility of the water and sewerage company (WaSC).
Soakaways	Water flows from gullies into a soakaway, an underground chamber used more rural areas where sewers are not present. From there water gradually soaks into the surrounding ground.
Catchpits	A manhole with a sump. Since the bottom of it is lower than the pipes which go in and out, sediment settles, allowing the pipes to stay clear. Periodically the sump needs to be emptied.
Grips / Channels	Some rural roads have channels (grips) cut across verges to let water off the road. These are maintained along with road gullies by highway authorities.
Culverts	Pipes and stone culverts carry streams under roads and will be maintained by the highway authority or other organisations such as Network Rail or the Highways Agency.
Roadside ditches	These are often maintained by landowners on each side, not the highway authority.

Of course problems can occur even when drainage systems are clean and well-maintained, for example as a result of:

- Exceptional rainfall / extreme weather events
- A road being in a low-lying area
- Changes in 'run off' from adjoining land
- Rivers overflowing
- Debris carried into drains by floods.

The Highways Agency (HA) has been set a challenging public service agreement (PSA) target to improve journey time reliability (JTR). Congestion, accidents and flooding all contribute to JTR, but flooding is also a matter of safety and as such must be monitored and managed. To lessen the risks and reduce 'ponding' (as it's known in the trade), all roadside drainage, including aco channels, gullies and interceptors, should function adequately — preferably at optimum performance.

Local authorities are under pressure to be more proactive and keep surface water drains clean and flowing to minimise flooding. On roads the power of the water can also damage the asphalt surface, adding to problems like pot-holes — another major issue as budgets strain to keep pace with the repairs needed.

Lanes provides highway drainage cleansing services at all levels, including motorways and trunk routes for the Highways Agency through local framework agreements; and on other roads via highway authorities. Much of the work we do on the highways and byways is planned maintenance: clearing and cleaning grates and gullies of leaf mulch, silt and debris jetting and, of course, surveying where there's a need. Similarly, many public and private customers with large sites (shopping centres, supermarkets, petrol stations, schools, universities, factories) opt for planned maintenance programmes to keep their drains flowing to minimise flood risk.



1. Know your drainage system

Have a survey to map your drains, identify connections, water flows, system capacities and asset condition. This will show up any drainage issues, such as blockages, displaced joints, root ingress, seepage, collapse or ground contamination. Surveys are easily carried out using robotic CCTV cameras, which provide HD-quality footage of the inside of pipes. Pipes and chambers can also be laser scanned to create 3D point cloud images for assessing capacity and structural integrity. This is the best starting point for developing a drainage maintenance strategy.

Once you have a survey, act on the results. Clearing blockages, rectifying damage or collapse in your drains will keep your system in optimum condition. A professional drains specialist (like Lanes) will provide everything you need — CCTV surveys, drain cleaning, jetting and vacuumation, remedial services (from excavation and repair to no-dig technology) — and more. Lanes can also provide information that will help you plan repairs to meet budgets and capex funding targets.

2. Ensure your drains are fit for purpose

If you are extending your property, check that the existing drains will take the extra load and peak flow rates or install additional capacity. Remedial work to correct a problem after building is much more expensive than getting it right at the start. Installing enough access points (manholes) is essential so that blockages can be dealt with quickly.

Think ahead: sustainable urban drainage systems (SUDS) involve measures such as permeable paving instead of asphalt or concrete, increased areas of vegetation and attenuation tanks and ponds to slow down the rate at which rainfall enters the sewers. This reduces the risk of flooding by lightening the load on the network, especially in heavy wet weather conditions.

3. Have a maintenance plan

Preventative maintenance is essential to keep the system flowing and minimise the risk of flooding. Having drains surveyed regularly will reveal potential problem areas in advance, so there are no nasty surprises. It also means you can deal with urgent issues immediately, and plan less pressing work to suit you. For commercial and industrial sites, we recommend a CCTV survey every three to five years, depending on the area, water table and number of trees or other vegetation on site; with annual cleaning to de-silt the drains.

Where necessary, increase maintenance seasonally or according to operational demands. For example, autumnal leaf mulch is a major problem, washing into gullies and reducing drainage flow. In industrial and commercial settings in extra busy periods, interceptors may need to be maintained more regularly, and debris such as packaging in loading bays should be cleared so that it does not contribute to drain blockages.



Did you know...

1 in 6 UK properties are at risk of flooding



Keep up with the latest information about adverse weather conditions:

The Environment Agency (EA) offers a flood warning service (www.environment-agency.gov.uk/homeandleisure/floods/38289.aspx). You can follow the EA on Twitter (@EnvAgency) too, where there are also regional options, including regular updates. Sign up for a free service including warnings direct to your mobile, email, fax or pager — particularly useful if you live near or in a flood risk area.

The Meteorological Office (www.metoffice.gov.uk/) gives five-day weather forecasts as well as information and tips on keeping one step ahead of the weather. It also routinely issues weather warnings and an app lets you check out the forecast on the move.

DEFRA, of course, carries data about flooding (www.defra.gov.uk/environment/flooding/). And if you are thinking of travelling, check out

The Highways Agency weather watch specifically aimed at helping people plan their journey www.highways.gov.uk/traffic-information/traffic-information-services/weather-watch/

Finally, you'll also find flood alert news on our own twitter feed (@LanesForDrains) with regular retweets of pertinent information direct from the above agencies.

Turn to Lanes

Meantime, if the worst does happen, Lanes is here to help in the battle against the rising tide of floodwater — and the bale out. Thanks to a 'pink fleet' of advanced jetting and vacuumation tankers covering the whole of the UK (not to mention the capability to move plant and equipment to wherever resources are needed), we are often called out as an additional emergency service.

For more information or advice about surface water flooding, visit www.lanesfordrains.co.uk or call 0800 526 488.

Project challenge

Facilities management company Environment & Power Technology (EPT) had to respond urgently to the flooding, in late December, of an underground car park at the Greater Manchester offices of HM Customs and Excise. The water cut the electricity supply resulting in the building being closed at one of the busiest times of the year for tax officials. EPT called in Lanes Group to pump out the water.

Rapid response

Because of the rapid response by EPT and Lanes Group, it was possible to pump the water directly into a nearby mains sewer. On the same day, two jet vac tankers started removing water. Due to the scale of the task, and the need to complete it as quickly as possible, two more jet vac tankers were deployed the following day.

Advanced technology

The process was accelerated by assigning two recycler jet vactankers to the task. These advanced machines can vacuum and pump water at the same time, so can work continuously, increasing the amount of water removed. All four machines worked in unison around the clock, completing water removal within four days. With the basement carpark clear of flood water, the building's facilities management team could start the process of drying the affected area, so power could be restored and the HMRC offices could reopen.

The project

The basement car park in Quay Street, Salford, was flooded with nearly 6,000 cubic metres of water, enough to fill two-and-a-half Olympic swimming pools, when the River Irwell burst its banks during record rainfall. Within an hour of getting the call, on Sunday 27 December, Lanes Group personnel were on site assessing the situation.



The Journey of Clean Water



Rainfall

All water which flows out of our taps begins life as rainwater, either flowing into streams and rivers to form 'surface water' or traveling through cracks and fissures in the ground to form 'groundwater'.

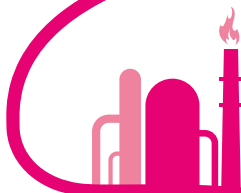
Storage

Some water gets pumped directly to the treatment plant, but in many cases it is stored in reservoirs. Not only do these ensure a constant supply of water, but it's also a natural filtration method as the heavy pieces of dirt and sediment naturally fall to the ground.



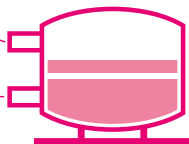
Screening

After being pumped to the treatment plant, the first step is screening to remove any large branches or leaves before the water moves on to the next stage. Not doing this can cause blockages in the finer stages of filtration.



Filtration

This stage takes out the smaller particles in the water which can prove harmful to humans. This is done firstly by flocculation - adding a solution to the water to make particles larger and easier to remove. It is then passed through both a rapid gravity filter and slow sand filter, which are designed to trap particles.



Chlorination

Before the water is pumped out for domestic use, a small amount of chlorine - less than one milligramme per litre - is added to remove any bacteria which could still be present. The water is tested at every point to ensure there are no problems before it is deemed suitable for consumption.



Arrives at the kitchen tap

Finally, the water is pumped back into the mains water supply for the general public to enjoy.



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**Call us today and we
will be delighted to help**

