Misconnections matter

Nobody wants to contaminate their local streams, rivers and beaches, yet around 300,000 householders each year unwittingly do so. Phill Mills explains what surveyors need to know

In most homes there are two drainage systems: one for used water from showers, washing machines, dishwashers, toilets, etc, and one for surface water, i.e. rainwater run-off from roofs, driveways and other hard surfaces. This separation is continued into the sewerage network with separate foul- and surface-water sewers, although these are sometimes combined in older systems.

Surface-water sewers carry rainwater from our properties and roads to the nearest local stream or river. There is no treatment. Foul sewers carry our used waste water to a sewage treatment works. The waste water is then treated to a high standard before it is returned to the water environment.

The situation is slightly different with combined sewers. In dry weather, all the flow goes to the sewage treatment works, but in times of heavy rainfall, some will discharge to local watercourses to prevent overloading of the sewer and flooding of properties. While this is not ideal, pollution is still minimised, as the sewage is diluted by the rainfall and the higher flow in the watercourses.

There are two forms of misconnections. The first is where kitchen appliances, baths, showers or toilets are connected to the surface-water drain instead of the foul drain. This means waste water from that property is flushed directly into the local stream or river, without any treatment. The second is where surface water, from a conservatory roof or extension, for example, is connected to the foul drain. The additional runoff to the foul sewer can lead to overloading and flooding of properties downstream with raw sewage during heavy rainfall.

The most common misconnection (more than 50% of the total) is washing machines and kitchen sinks emptying into the surface-water drain. Next come baths and hand basins, which account for a further 28%. (See pie chart, right). Many of the problems are caused by enthusiastic DIYers and 'cowboy' plumbers.

Unintended consequences

Misconnections can have a dramatic effect on streams and rivers. The natural flora and fauna can be badly affected and faecal matter, foam, scum, oil and sewage debris can linger on the surface or banks of watercourses.

Untreated sewage and 'disposable products' in the discharged water not only cause aesthetic and odour nuisance, but pose potential health risks to people and animals coming into contact with the water.

This is a problem for the water companies, which are responsible for many of the surface water discharges, and for the environmental regulators who have to enforce water-quality standards. It is also a problem for the general public, who can be affected by the contamination of a local amenity and the risk that poses to public health.

It is estimated that there are around 300,000 homes with misconnected pipework in the UK. The cumulative impact is huge – equivalent to the sewage discharge from a town the size of Swindon. In volume terms, this is around 16 Olympic swimming pools each and every day. No wonder the water companies and the Environment Agency (EA) take this issue very seriously.

Action by the water companies

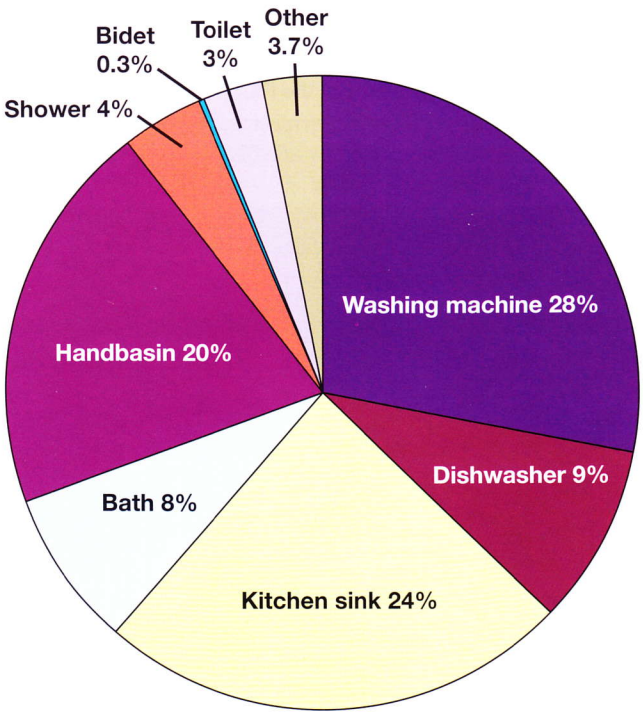
The water companies work with the EA to identify watercourses that are receiving polluted water from surface water outfalls as a result of suspected misconnections upstream. They then employ specialist contractors to trace the pollution back to the source, possibly from manhole to manhole. This process is time consuming, labour intensive and expensive, typically costing around five or six times the cost of correction per property. To put this in perspective, most misconnections cost between £20 and £200 to put right, although some do require excavation at a cost of several hundred pounds.

Once a misconnected property is identified, the situation is explained to the homeowner, whose responsibility it is to carry out the repair, since the misconnection is on their property. When homeowners refuse or fail to carry out the work within a reasonable time, the company refers the matter to the Environmental Health Department of the local authority for enforcement action.

To improve general awareness and understanding of the pollution problems caused by misconnections, six partners have set up the 'ConnectRight' campaign: Water UK (representing all the water and sewerage companies), the EA, the Consumer Council for Water, the Chartered Institute for Environmental Health, the Chartered Institute of Plumbing and Heating Engineers and Defra.

This joint campaign, launched in February this year, aims to reduce water pollution by:

- raising awareness and understanding of misconnections and the environmental problems they cause
- helping householders to check their existing connections and showing them how to correct them if they are misconnected
- rising awareness and educating DIYers, plumbers and builders to connect new appliances, showers, toilets, etc, correctly
- encouraging householders to contact their water company if they need help to resolve a misconnection problem.



Household misconnections by type. Washing machines and kitchen sinks account for half of all misconnections

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Most misconnections are carried out by plumbers and 42% of householders are unaware that there should be two separate systems

Customer views

The EA contracted Ipsos MORI last year to carry out research into consumer awareness of misconnections. Not surprisingly, many people did not understand the intricacies of the drainage systems on their properties, with 42% believing there was just one drain for all waste and surface water. However, 24% did say they had separate systems for foul and surface water. Around 40% of those surveyed had installed one appliance that involved a connection to the drainage system on the outside of the house. Most of these installations had been carried out by plumbers and the vast majority of respondents (85%) thought their appliances had been plumbed correctly. Most would check an installation only if there was a drainage problem.

How can surveyors help?

Surveyors are ideally placed to spot misconnections such as the one in the picture – a typical example of a waste-water pipe emptying into the surface-water system. Obviously, no-one expects surveyors to become the 'misconnection police' and 'shop' people to the water companies, local authorities or the EA. However, it would be helpful and benefit the local environment if surveyors advised owners of misconnections they saw and recorded them in their survey reports for the information of future owners. Indeed, anyone requiring a condition report of any kind would surely expect the surveyor report on identifiable misconnections.

The water companies can provide advice to property owners free of charge. Their contact details are on customers' bills, in the telephone directory and on the Water UK website *www.water.org.uk*

Property owners can also get free advice from the ConnectRight website – *www.connectright.org.uk* or from *www.washerhelp.co.uk*

Case study 1

Milk Street, Bromley

The Milk Street catchment consists of around 1,800 properties, residential and commercial. There is a 600mm-diameter surface-water outfall that discharges into a stream running in the Milk Street Ditch, which cuts through an area of local authority allotments and then flows into the River Ravensbourne. The watercourse had become so polluted that it was covered with a white amalgamation of fats, oils and grease and sewage fungus and could not support aquatic life. There were numerous public complaints.

The water and sewerage company Thames Water, in conjunction with the EA, carried out a pollution-tracing survey. The study found a property misconnection rate of around 3%, which included three toilets, 11 baths, 17 basins, 14 dishwashers, 29 washing machines and 26 kitchen sinks discharging into the surface-water drainage system. All misconnections were rectified by their owners. Two years later, further pollution was identified and an additional five misconnected properties detected.

Case study 2

Pyrles Lane, Loughton

The Pyrles Brook runs through a council housing estate in Loughton. Two large-diameter surface-water outfall pipes discharge into the brook. The condition of the brook had become so poor that it was sometimes described as 'an open sewer' and represented both an environmental risk and a health risk to children playing near the banks of the brook.

The Pyrles Lane catchment consists of around 1,500 mainly residential properties. In this case, Thames Water took a different approach and inspected every property in the catchment. This identified an overall rate of 3.5% misconnections: five toilets, 49 washing machines, 14 dishwashers, 27 kitchen sinks, 23 basins, eight utility sinks, nine showers, seven baths, four water softeners, one bidet and a swimming pool were discharging into the surface-water drainage system.

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