



Are your drains breaking the law?

A UKDN Waterflow
Whitepaper



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Championing the Optimum Performance Code

Did you know that your drainage and sewerage system could be putting you at risk of prosecution and the environment at risk of pollution?

As far as the construction and architecture industries are concerned, everything from the pipework connections to the effectiveness of overall wastewater management is subject to

scrutiny under building regulations and energy efficiency criteria set by the EU.

The potential consequences of defective drains that are left unaddressed can be disastrous, not to mention expensive, so it is business-critical to be aware of the condition of your drainage system here in the UK.

This whitepaper highlights the core concerns that all architects and construction workers must be aware of if they are to adhere to the law in their day-to-day activities on the job.

The EU appliance and housing energy efficiency code



A brief history

In December 2012, the EU's Energy Efficiency Directive (EED, 2012/27/EU) came into effect to make it legally binding for countries within the EU to improve their approach to energy usage at every stage of the supply chain. It contained an array of required improvements to the ways in which our modern societies operate, including the renovation of buildings, the manufacturing of whitegoods and the manner in which the energy efficiency of such products was communicated to consumers via a common framework – this is the graded energy efficiency code we see all over our household appliances today.



The ultimate aim was for member states of the EU to achieve an energy efficiency rating (EPC) of 20% by 2020, which was upgraded to 30% by 2030 only two years after the EED came to pass.

UK policies to meet these targets understandably come under regular and intense scrutiny; it was reported in July 2018 that the government's Fuel Poverty Strategy for increasing the EPC of fuel-poor homes to grade C by 2030 was going to take at least another 60 years under current arrangements. The EED, along with 2008's Climate Change Act, has changed the way we work and live in every sector, from power to buildings, industry to agriculture and bioenergy to transport.

The country's overall commitment to climate change continues with research and development plans for the likes of flood defences and Sustainable Urban Drainage Systems (SuDS) in our communities,

which will collectively reduce our effect on the environment and, in turn, the environment's effect on us when it comes to coping with changes in the weather.

How was the EED received?

When the EED was published, documents showed that a number of terms were not as legally binding as some had hoped and the UK was accused of watering down the deal by pandering to fossil fuel lobbyists and not giving due diligence to investments in renewable energy.

It contained passages that campaigners argued were open to interpretation and more favourable for energy companies and manufacturers because of the self-regulatory nature of some of the agreements. The final directive was, therefore, considered to have been dampened by making many of its regulations voluntary instead of mandatory.

Does the EED apply to drainage systems?

The EED sets out certain requirements for EU member states to commit to improving the energy efficiency of their respective national building stock, which concerns everything from how buildings are insulated to how their water consumption is managed.

Building inspections will often take into account an assessment of the drainage system of any given property for efficiency purposes, but this may not always involve a check over the connections to wastewater drains and sewers to determine whether or not they are correct. If a misconnection goes undetected and wastewater is inadvertently filtered into the surface water sewer instead of the foul sewer, for instance, it can affect the overall energy efficiency of the property and ultimately make it illegal under EU regulations.



In England and Wales, the Minimum Energy Efficiency Standards (MEES) for commercial and residential properties were introduced in April 2018 to stipulate that non-domestic properties could not legally be under tenancy if the rating on their EPC was lower than E. The next five years will see this extended to all domestic properties, too, which makes it critically important for all types of construction companies, property developers and, indeed, councils to understand the legal requirements for energy efficiency in every property on their books – and this must include a thorough understanding of how an imperfect drainage system can negatively impact on said efficiency.

The difficulty here is that the current mechanism for grading the state of drainage, particularly domestic drainage, via CCTV survey footage is outdated and not as plain and simple as it should be in visual terms. The EU's EED, by comparison, provides clear visual indicators for the energy efficiencies of household products like fridges, freezers, televisions and washing machines, but defective drains can be just as, if not more, detrimental to the efficiency of a property if left unaddressed.

Moreover, the consequences of a defective drain extend far beyond the single property to which it is connected; misdirected wastewater from toilets, baths and washing machines can cause serious pollution issues in the surrounding areas if it gets into surface water sewers and spreads to important environmental habitats.

That's why understanding and maintaining our drains today will help us all achieve an efficient and environmentally sound infrastructure tomorrow. To do this, we need a simpler way for non-industry professionals to spot and diagnose drainage issues before it is too late.

At UKDN Waterflow (LG) Ltd, we are championing the Optimum Performance Code to make it as straightforward as it should be for construction and architectural professionals and domestic property owners to maintain efficient drains. By adopting a new industry standard that makes it easy to spot blocked drains, drain misconnections or even small cracks in pipework, potentially illegal drainage systems could eventually become a thing of the past.

Introducing the Optimum Performance Code



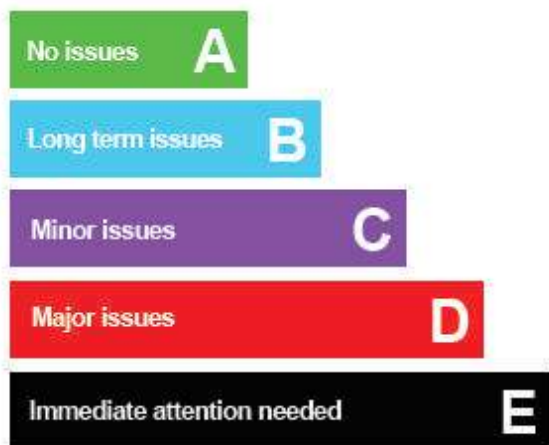
The current codes utilised in CCTV survey reports takes shape in a graded system to illustrate the condition of any given drain on a scale of 0 to 5, with 0 being the best and 5 being the worst. Whether it is provided via the Water Research Council (WRC) or smart sewage inspection software from WinCan or Innovyze, a rating of 0-1 represents a well-laid drain with perfect connections, well-placed joints and appropriate gradients. Conversely, a rating of 4-5 indicates a poorly-laid drain that has developed leaks or blockages as a result of cracks, misconnections, incorrect gradients or root ingress.

It is a suitable coding system for the general job at hand, but it is not presented in an easily understandable manner and is often considered too technical for domestic users and homeowners. We think it should and can be simpler.

The Optimum Performance Code aims to position the drain grading system alongside the widely recognised EU Energy Efficiency Directive for common household appliances.

This way, we can bring complete clarity to drain inspections at all levels, whether it concerns household foul sewers, surface water sewers or industrial-size sewers. The Optimum Performance Code is split into five distinct grades for judging the condition of a drain and sewer.

They are defined as follows:



A: No issues.

The optimum level of drain efficiency. No issues were identified and the drain is well-laid with no misconnections, displaced or open joints, incorrect gradients or root ingress, which means it can achieve an efficient flow with no blockages or leaks.

i **What to look out for:** The drains and pipes are in good condition and there are no visible cracks or build up of grease. The wastewater is draining properly and the flow is at optimum efficiency. There is nothing visible in the drainpipes that could cause obstructions or blockages.

B: Long term issues.

The drain is operating efficiently, but small issues that are affecting free-flowing wastewater are present, such as minor grease levels or minor gradient deficiencies. A repair schedule needs to be planned to improve overall drain efficiency.

i **What to look out for:** The drains and pipes are in good working order, but visible wear and tear means that minor blockages or obstructions may be occurring, which could be disrupting the efficiency of the water flow. The pipes may need to be cleaned and mended to achieve optimum efficiency.

C: Minor issues.

The drain is in need of repair due to noticeable deterioration of the pipes, such as blockages, erosion, cracks and leaks.

i **What to look out for:** The drains and pipes are showing significant signs of depreciation and blockages, leaks or water ingress have been identified. The wastewater is draining slowly and the system is emanating unpleasant odours.

D: Major issues.

The drain is in danger of becoming structurally

Introducing the Optimum Performance Code



unsound or causing a flood and must be allocated a repair schedule as soon as possible. The threat of permanent damage, serious blockages, pollution or flooding is very high and requires immediate attention.

i *What to look out for:* The water is stagnant and there are small leaks, cracks or collapses in the drains and pipes. The pipework is at an incorrect gradient and may be causing blockages and leaks, which has the potential to affect the surrounding substrate.

E: Immediate attention needed.

The drain needs urgent maintenance and repair due to collapse, fractured/broken pipework, structural damage, pollution, blockages or flooding. The drain simply cannot continue to function in its current state.

i *What to look out for:* There are misconnected pipes with significant cracks and leaks or subsidence. Some pipework is missing, there is a

backlog of wastewater and the drain is overflowing to the point at which it is causing large blockages or obstructions.

Simplifying sewage for non-industry professionals

This new coding system is designed to be entirely accessible to anyone in the construction, surveying and architectural sectors so that swift and appropriate action can be taken as and when it is necessary for any type of drainage system, whether it concerns a pipe as small as 75mm in diameter or a trunk sewer that is over 1000mm wide.

Clear descriptions without the jargon make it easy to evaluate when professional action needs to be taken for proper drain maintenance, which means that illegal scenarios that present risks to tenants and neighbours, for instance, can be prevented.



Building, drain and sewage regulations in the UK

Regulations and legislation around drainage and sewage systems in the UK are tight and must be adhered to if breaking the law is to be avoided.

Anyone involved with construction and architectural activities will be aware of general procedures around obtaining planning permissions, but it can become significantly more complicated as far as drainage and sewerage are concerned.

It all comes down to the ownership of the sewers beneath the ground. Some properties own private sewers, but generally speaking, public sewers are owned by sewerage undertakers and water and sewerage service providers. Their permission must be gained before any development work is undertaken on or around the sewer they own – and this applies to anything from a new driveway to an extension of a roof.

The potential risks of flooding and blockages must be considered in line with the likes of gradients and gully positions, so it is often not as straightforward as getting basic planning permission.

Building, drain and sewage regulations in the UK



With regards to extending or altering an owned property, it is typically the owner who is responsible for the correct setup of the drainage system. It unfortunately doesn't matter if the issue was present under the previous owner because thorough drain inspections are not typically carried out unless specifically requested during changes of ownership; it is, therefore, the owner's remit to periodically check the condition of the property's drainage system to ensure it is compliant with the law and not at risk of causing flooding or pollution in the local area.

It is often a surprise to property owners looking into extensions that EU building regulations state that any pollution caused by a defective drainage system is the direct responsibility of the owner of the property to which it is attached.

The kinds of missed connections or poorly

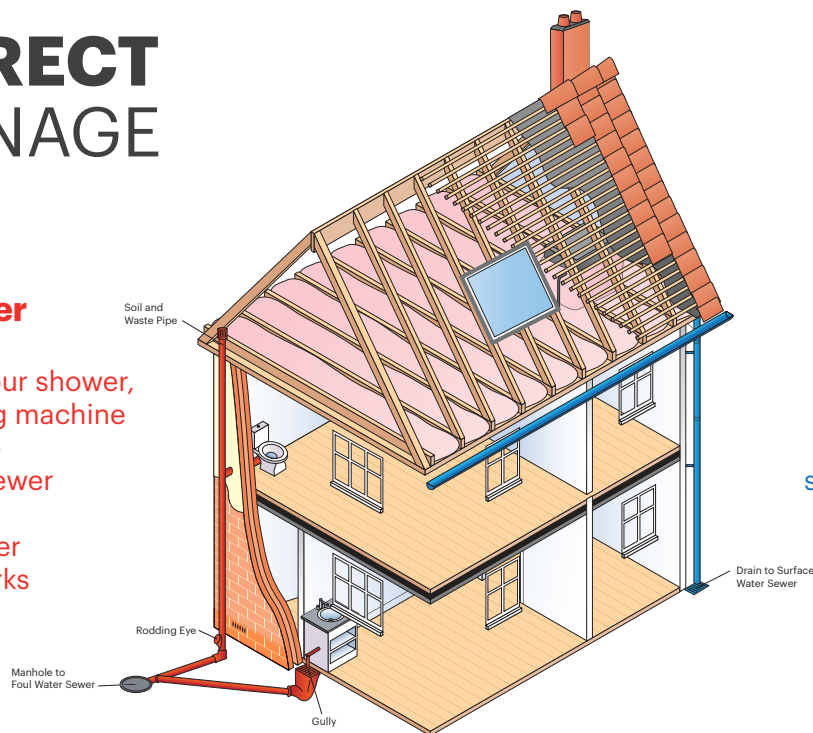
planned soakaways that tend to cause flooding and pollution are, indeed, illegal in the UK and can lead to prosecution by local authorities or the Environment Agency. The initial action taken by the authorities will be to work with the property owner to fix the issue as quickly and efficiently as possible, but potential legal action for significant damage to the environment, for instance, can incur fines of up to £50,000 or imprisonment for up to 12 months in some cases.

It is critical that builders consult Approved Document H before commencing any construction work to ensure they comply with the law. Moreover, it is of paramount importance that the owner of the sewerage or drainage system to which a connection is required is contacted as early as possible in the planning phase of any construction work. Failure to do so can result in illegal practices and hefty fines.

CORRECT DRAINAGE

Waste water

Water from your shower, toilet, washing machine and sink go to a foul water sewer to be treated at a wastewater treatment works



Part of the
Lanes Group plc

Surface water

Rain water, roof and ground runoffs will drain into a surface water sewer and end up in a river or stream

Foul Water Sewer

Surface Water Sewer

Building, drain and sewage regulations in the UK



What is an illegal drain?

The maintenance of the UK's drainage and sewerage network is critical if flooding and pollution are to be avoided. This means keeping on top of the potential issues that could contravene EU law.

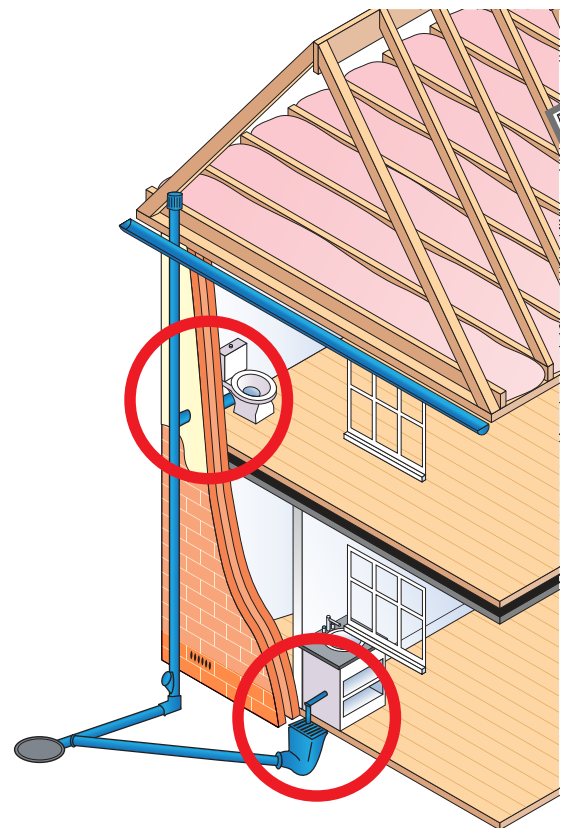
Examples of illegal setups include misconnections, cracks in pipes and blockages that put the surrounding areas of a property at risk. For instance, the pipes that are supposed to lead from a toilet system to a foul water sewer might be incorrectly attached to a surface water sewer, which means that dirty water, i.e. pollution, will end up in our rivers and streams. This is why it is crucially important for everyone's sake that

great care is taken during the construction of any building concerned with drainage and sewage.

It is not, of course, only construction workers and property owners who need to be aware of such regulations. In 2016, many of the major water and sewerage companies (WASCs) in the UK were slapped with millions of pounds' worth of fines for various illegal discharge offences. Moreover, recent Environment Agency data referenced in WWT's PR19 Challenge Report showed that the number of category 1 incidents (those that have a serious, extensive or persistent impact on the environment, people or property) caused by English WASCs had risen to a three-year high of 11 in 2017, so the threat of illegal connections is still firmly on the industry's radar.

DRAIN MISCONNECTION

A drain misconnection is when a household appliance or plumbing is connected to the wrong drain/pipe and therefore, foul water is discharged into the surface water sewer.



Building, drain and sewage regulations in the UK



A case study of an illegal drain

Boundary Brook in Oxford's Lye Valley Nature Reserve was subjected to the wastewater from a potential total of over 800 misconnected homes and businesses in 2018. Thames Water's engineers spent months trying to identify the root cause of the problem that could have had lasting environmental consequences for the wildlife habitat.

A resolution was finally reached in October when workers pinpointed the offending pipes that were incorrectly connected to the foul water sewer. The disastrous effect that the

multiple misconnections could have had on the environment does not bear thinking about, but the critical importance of the excavation work required to establish the correct connections to the combined or foul drain must be stressed.

As aforementioned, the responsibility of establishing the necessary connections in the first place comes down to the individual property owners and not the operators of the drains or sewers beneath them, so stringent checks by way of CCTV surveys and drain repairs have to be routinely carried out if environmental disasters, fines and prosecutions are to be avoided.

Applying the Optimum Performance Code

Let's take a look at the Optimum Performance Code in practice.

Here are some examples of how the grades would be applied in genuine drain inspections:

Pipework in Good Condition: Grade A



Old and Worn Pipework with Clear Erosion: Grade C



Backlog of Wastewater: Grade C

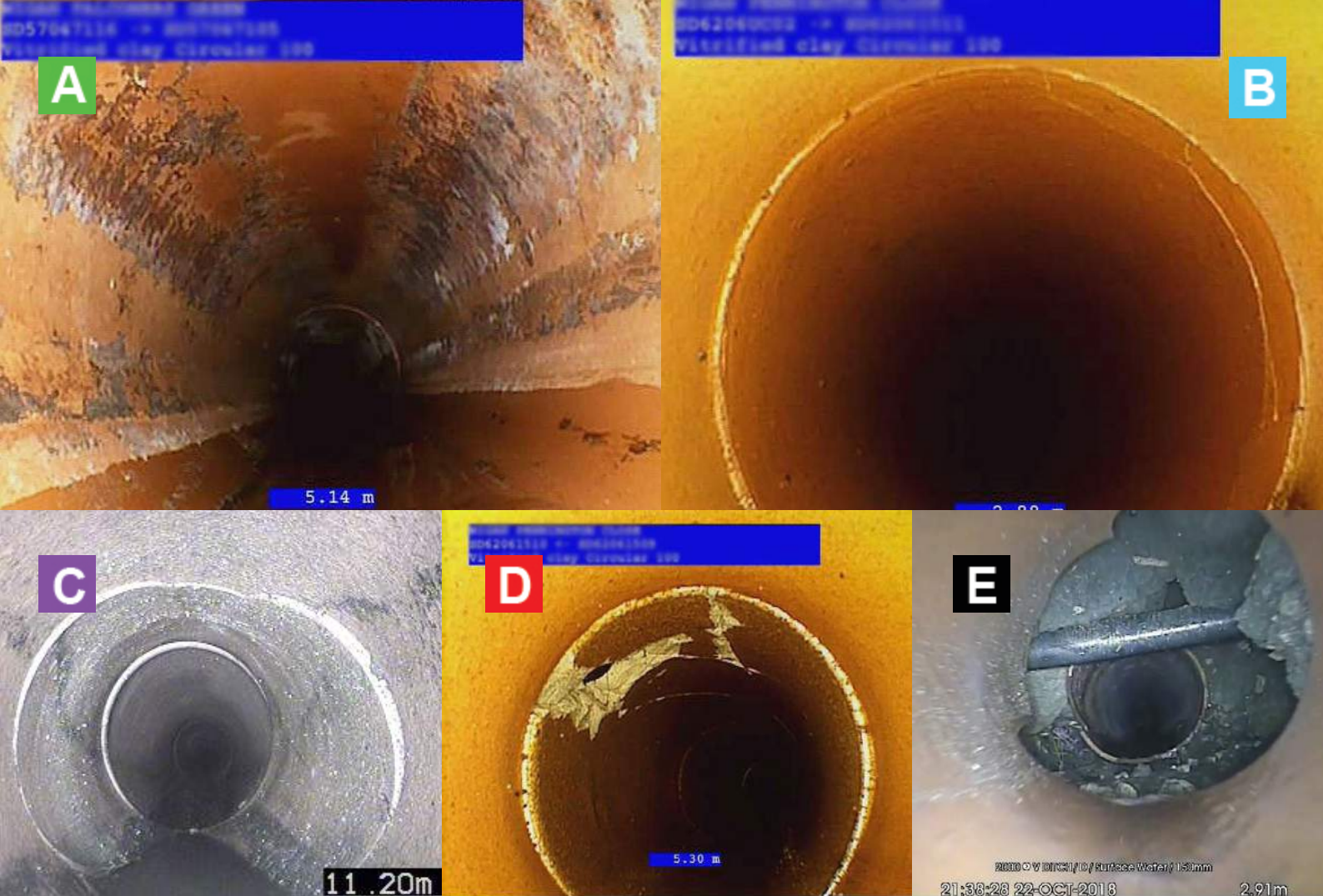


Slow Draining Wastewater: Grade B



Damaged Pipe: Grade E

The new code aims to make it easy to identify the most common issues found in drainage systems in the UK and indicates when action needs to be taken, including when professional help needs to be enlisted for a CCTV survey and accompanying report. Construction and architectural companies can stand by it to get on top of the causes before they see the effects, which means they could avoid prosecutions and environmental disasters.



Are your drains breaking the law?

If you are concerned that your potentially damaged or blocked drains could be breaking the law, contact UKDN Waterflow (LG) Ltd today to seek professional assistance.

With our state-of-the-art camera, software technology and engineers who are trained to Water Industry standards, we can diagnose drainage problems for any type of property or infrastructure.

Don't let your drains break the law. Get a class-leading CCTV drain survey, comprehensive report and drain repair scheduled today.

This whitepaper was written and produced by Richard Leigh, Business Development Director at UKDN Waterflow (LG) Ltd.

