# DRAINAGE **ADDING EN-SUITES AND BATHROOMS**

Drainage works can be a 'mystical art' to the uninitiated, and cost-wise they are expensive, as rarely do any works come in under £500. So this begs the question, "Do we realise what we are asking our builders and tradesmen to do?" So often investors say, "I'm going to put an en-suite in here ..." or "a bathroom in there ...", but do they understand the process and why the works cost what they do?



Figure 1. Dirty water is carried by a network of drains and sewers to treatment and recycling plants before the now clean water is returned to rivers and the sea. (www.water.org.uk)



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#### Mark is a Chartered Engineer who moved into property full time following a serious rugby injury in 1996.

Landlords and investors since 1991, he and his wife Claire have well over 20 years of experience in buy-to-lets (BTLs), Houses in Multiple Occupation (HMOs), developments, and conversions into flats and houses. They typically work on properties in very poor condition.

#### **SEWERAGE AND WHO'S RESPONSIBLE FOR WHAT?**

There are three different types of sewer:

- 1. The 'foul system' containing waste from toilets, baths, wash basins, kitchen sinks, dishwashers, showers, etc.
- 2. The 'surface water' sewers, which carry rainwater away to rivers and soakaways.
  - 3. The mainly pre-1920's 'combined sewers', which transport a mix of all wastewater and are common in older, more developed areas. It is these older sewers carrying raw sewerage that can easily flood with a sudden influx of surface water during storms.

TO SIMPLIFY: you are responsible for the maintenance, repair and costs of everything between your plughole or toilet and the boundary of your property. Beyond your boundary, one of twelve local water companies takes over. These companies hold the drainagerecords for your area showing the route, elevations and construction materials of the buried pipes, sewers, tunnels, culverts, and evenunderground water courses (see photo 1). However, the older and more established an area is, the records are often incomplete and you may well encounter surprises if you go looking.

#### CASE STUDY #1

Commercial to residential conversion of 1840 Victorian building. Merseyside

The existing building had a kitchen sink, ladies and gents' toilets all feeding into an old single 4" vertical soil stack at the rear (see photo 3). Although it was assumed that the stack fed into a drain at the rear, the only known sewer was in the road to the front of the building (see photo 1).



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Drainage search at time of purchase showing a combined sewer beneath the road at the front of the building and a large surface drain beneath the eastern boundary of No.26 & No.32. No further information was shown

The survey determined that a combined sewer services the rear of the property via the rear alleyway. Also the surface water drain is in fact an underground watercourse within a Victorian brick culvert.



An original 6" clay pipe 'U Bend' or 'Trap'

buried beneath the rear vard.

with a surface vent in the combined sewer



The other tenants - as seen on CCTV, inside the 6"clay pipe! Note the pipe joint and approx 10% blockage remaining of the pipe base after jetting.





Contractors broke open the soil stack and cleared the drains at the rear by 'jetting', then undertook a location mapping survey and a CCTV video condition survey of the existing drains. It was discovered that the 4" cast iron stack fed into a 4" clav drain with multiple offshoots to buried surface grids and in turn fed into a 6" lateral clay pipe the length of the rear yard (with a 'U bend', see photo 4). All this then dropped dramatically into a large 9" deep combined sewer beneath the rear alleyway. None of this information was shown on the local drainage search information (see photos 1 and 2).

With this mapping information, a schedule of ground and drainage works was prepared for the replacement of the soil stack and the addition of a new plastic soil stack all with various connections and linking into two new manholes in the rear yard, which in turn link via plastic clay pipe coupler to the old drains. This work was inspected and certified by the BCO (British Council for Offices).

Drainage Survey:	£250
External ground & drainage works:	£1,250
Total:	£1.500

Note: For the images below, the red line is a combined sewer and the blue line is a surface water culvert.





Shows the cast iron soil stack extending upward not so much as a 'vent stack' but to pick up the rainwater downpipe from the roof autter.





A new soil pipe showing 40mm connections into pipe boss from the kitchen sink and an en-suite shower room Note: pipe connections must be at least 200mm apart.

### **UNDERSTANDING YOUR PROPERTY'S DRAINS**

Houses built in similar rows or developments of similar construction usually have a similar predictable drainage pattern with household drains running into sewers laid under the centre of the road or down rear alleyways. Where this becomes more complex is when construction is a one-off, an infill, or a small development, a larger repeatedly extended commercial building, or even a property utilising much older drains on its existing site. It's also worth bearing in mind that water flow works with gravity and is made more complex in hilly areas.

For any non-standard building that requires drainage works, it would be worth undertaking a drainage location plan and survey. These surveys usually take a couple of hours, costing £250-£500 to obtain a map showing the location of all surface drains and foul sewers on your property. But of most interest is the CCTV video, were you can see individual pipe joints, cracks, blockages, areas of leakage, root ingress, collapse and even the local inhabitants (see photo 5). Based on this information a program of drainage works can then be clearly established.



### **TIPS FOR DRAINAGE** REGULATIONS **COMPLIANCE AND USE**

- External works need to be ca 450mm below ground (to avoid freezing)
- Keep to the minimum gradient requirement of 1 in 40 to 1 in 80 for foul water drainage: 100mm in 4m-8m, or 25mm-50mm per metre
- Fit smooth bends and gradual changes in direction (to maintain the flow)
- · Fit more 'rodding eye' points (so you can clear out blockages)
- Fit non-return vermin control and flood protection valves

### THE 'U BEND OR 'TRAP' MIRACLE

Drainage water can smell really bad and depending on its contents give off noxious gases. However, a length of pipe in a 'U' shape with drainage water filling the 'U' creates a seal for unpleasant smells (see photo 4). This water is changed over every time the pipe is used and so doesn't smell. These 'U bends' are underneath a toilet, sink and in the external pipe work that you can't see.

### THE BUILDING REGULATIONS **PARTG& PARTH**

- · Part G of the building regulations deals with water supply and sanitation.
- Part H of the building regulations deals with drainage and foul water disposal.

The building regulations are the required 'minimum standards' for design, construction and alterations for building works in Britain. Any drainage works internal, external, buried or otherwise will need to meet these standards.

Make sure your building regulations application to the council is done correctly (see the council website, but usually costs under £300, and you can phone and ask them for advice on this) or appoint an independent building inspector and let them help you.

#### GREYWATER **OR SULLAGE**

This is relatively clean water from kitchen sinks, washing machines, baths, showers, etc. This water can be re-used by 'harvesting' or channelling off into a storage tank before it enters the sewers and it can be pumped out to flush toilets and for use in the garden!

#### **CASE STUDY #2**

#### **Refurbishment and** addition of x6 en-suites to a HMO, Lancashire:

- This property was an existing HMO with shared facilities (x1 bathroom + cloakroom). Although the drainage system and and single soil stack were at the rear. the drains were too shallow (need to be in excess of 450mm) and had to be replaced and deepened to achieve approx 1:60 inclination (ie 100mm in 6m).
- This work was inspected and certified by an independent building inspector.
- · Ground and external £850 drainage works:
- New internal drainage works:
- £1,400 New en-suites x6: £3.000 each

Note: For the images to the right, the red line is a combined sewer and the blue line is a surface water culvert



## **I WANT TO FIT EN-SUITES...**

In theory you can install a drainage run pretty much anywhere for an extra bathroom or en-suite. But this may mean ripping up your existing drainage just to deepen or increase the pipe inclination, or building false ceilings or boxing in to hide pipe work. It takes careful planning and a competent builder/plumber that can work out the details on paper and communicate them to the building inspector

#### Is it worth fitting en-suites?

- Break the cost down for that property in that specific area versus the return. In general, fitting an en-suite will cost £3,000-£5,000 each (bearing in mind the average price to fit a new bathroom is £4,500).
- In some areas of Britain, good quality +10m<sup>2</sup> rooms in houses with shared facilities will typically rent for approximately £10/week less than a room with an en-suite (what's the difference in your area?).
- So, even an average construction cost of £3,000 per en-suite divided by £10 a week premium will mean more than five years to get your money back, or roughly a 17% ROI per year at 100% occupancy.
- · However, the fact that a HMO has en-suites could increase occupancy rates and reduce voids.
- It's also worth noting that the addition of en-suites will not necessarily mean that a HMO will get a rental multiplier on a commercial mortgage, and they are unlikely to impact much on the bricks and mortar value of a rental property.
- The addition of an extra bathroom or en-suite can add £10,000 to an improved family home so this is often worthwhile in properties to sell on (ie flips).

#### **CONTACT DETAILS**

#### HOW MUCH DOI **NEED TO KNOW?**

Every site and project is different and this article just touches on a much larger subject. We haven't discussed cess pits or macerators, let alone 'ball cocks' and 'spigots'. No one can know everything, so the real skill here is getting the right input from your plumber, builder, building inspector or JV partner. It's really about good communication and having someone in your team that you can go to when you need additional guidance.

Mark is happy to chat or coach anyone who may need some assistance and can be contacted at: mark@cheshlancs.co.uk or www.cheshlancs.co.uk