

ADVICE SHEET #4



BATHROOM ELECTRICS

What to expect and why

Of all the places in a house or flat, it is the bathroom that has the most stringent regulations covering its wiring. These regulations are afforded their own chapter in the [IEE Wiring Regulations \(BS7671\)](#), the document that defines good wiring design and practice, because this one room is potentially the most hazardous.

The old saying that, 'electricity and water don't mix', has endured for a reason. This sheet will go some way to explain why and how a good electrician will help prevent the two from having a potentially fatal effect should they ever meet each other!

Why is a bathroom such a dangerous place?

Electricity always wants to travel to earth- the earth beneath your feet. If you've ever had a tingle from a wire, you're probably still alive because you were wearing shoes, or standing on a carpet, or fully clothed- all things that hindered the progress of the shock through your body as it tried to flow to earth. An electric shock in a bathroom might well occur when you're bare foot and dripping wet and, with these factors actually encouraging the flow of current, you are far less likely to survive. Which is why the following preventative measures are so important.

1. Creating a safety zone

One of the first checks that an electrician will perform when asked to carry out work in a bath or shower room is to determine whether or not the [Main Bonding Conductors](#) are present. These cables are essential if the pipes that eventually supply the bathroom i.e. water and central heating, are of copper metal. Services run in plastic, or a mixture of the two, require a different approach, but we'll stay with all metal as an illustration....

These cables link together the service pipes and, combined with the protection afforded by the [RCD](#) device in the [consumer unit](#), ensure that the risk of a severe electric shock is significantly reduced. Here is an example:

Without equipotential bonding

If a metal radiator becomes 'live' because of a fault somewhere and you brush against it as you turn on the tap, the electricity will run through your body, injuring you on the way.

With equipotential bonding

If the radiator and the tap pipe work are linked anyway, the electricity will tend to 'ignore' you in favour of the length of chunky earth cable. You will feel a tingle, but not the full force of the fault current. And the **RCD** will detect the current leakage and **trip** the relevant **fuse**.

Equipotential bonding creates the 'safety zone' of the title.

2. Choosing the right equipment...

Bathrooms are divided into **zones** by the Regulations, with each needing a certain level of protection for the equipment used in it.

It is obvious that a plug socket is not allowed in a shower cubicle, or at the end of the bath, and this reasoning is carried through to all the other electrical items found in the room. Shaver sockets, light switches, fans, electric towel rails- they are all limited to certain zones in the bathroom and have to be of a particular construction to resist the water that may touch them. Another example:

The lights that are situated above a shower cubicle or bath have to be splash proof. If you are holding the shower head in a soapy hand and it slips round to spray the unprotected light above your head you will probably receive a shock. You are creating a path along which the electricity in the light fitting will flow- and it will end up in your body.

3. ...And installing it properly

You choose to have an extractor fan installed. A timed version; that carries on running after you've turned off the lights and left the room. Now you want the electrician to fit it, but the price seems high just to run some cable and make a few connections. The reason for the cost, apart from drilling a 100mm hole through your bathroom wall and making good the brickwork, is as follows:

An extractor fan carries on working when the lights are turned off because electricity is continually allowed to flow to it. This means that the fan is always 'live'- even when it's not running. Which is why there must be a **fan isolator switch** fitted outside your bathroom. This switch allows the fan to be totally isolated from the electricity supply and to fit it into the existing bathroom circuit means effectively re-wiring the bathroom lights with special cable, aside from fitting the switch itself and making good the decoration. And then the lighting/fan circuit will have to be joined to the existing **equipotential bonding** that is hopefully in the bathroom already.

So you can see that fitting an extractor fan is rarely a short, cheap job.

What it takes to issue an electrical certificate for bathroom work

Any electrical work carried out in a bathroom is **notifiable**. This means that the local council have to be told of the work, that it conforms to current Building Regulations and that it has been carried out to BS7671 standards. Filling out the certificate means ticking a number of boxes to answer various questions. Four of them are as follows:

1. 'Presence of main equipotential bonding conductors'
2. 'Confirmation of the adequacy of equipotential bonding.'
3. 'Presence and correct location of appropriate devices for isolation and switching.'
4. 'Selection of equipment and protective measures appropriate to external influences.'

Without the four ticks the certificate cannot be issued.

To summarise

No certificate can be issued for work carried out in a bathroom until all the boxes have been ticked. If you want a fan, or some new lights, or a shaver socket etc. fitted properly and safely and your bathroom does not already have the **equipotential bonding** or possibly the **fan isolator switch** mentioned above then prepare yourself for the bad news- I'm going to have to do some extra work before I start on the fan....

This Advice Sheet has been produced to explain the reasons why electrical work should be left to the professionals or to at least indicate why a simple job can sometimes turn into a more complex one!

Should you have any questions, please call me on 07812 000 658 to discuss them.

Arthur Hunt

