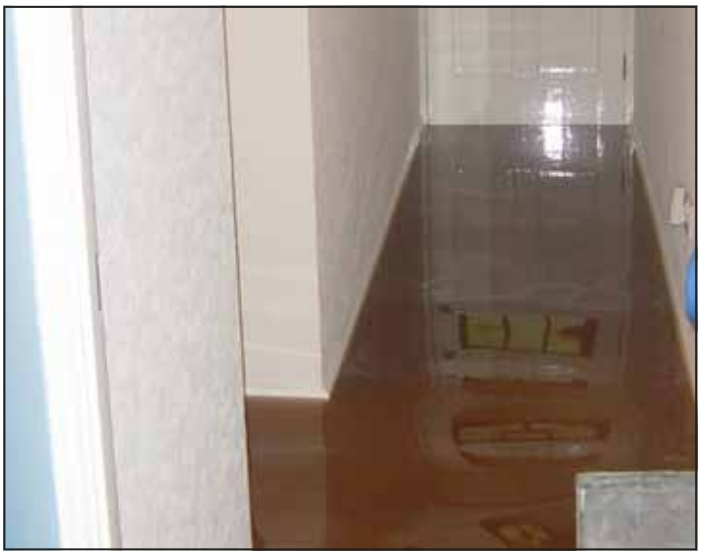
Case Studies - Resilient Repair

National Flood Forum

Worcester

Andy Churchill from Worcester talks about raising the floors in his house...

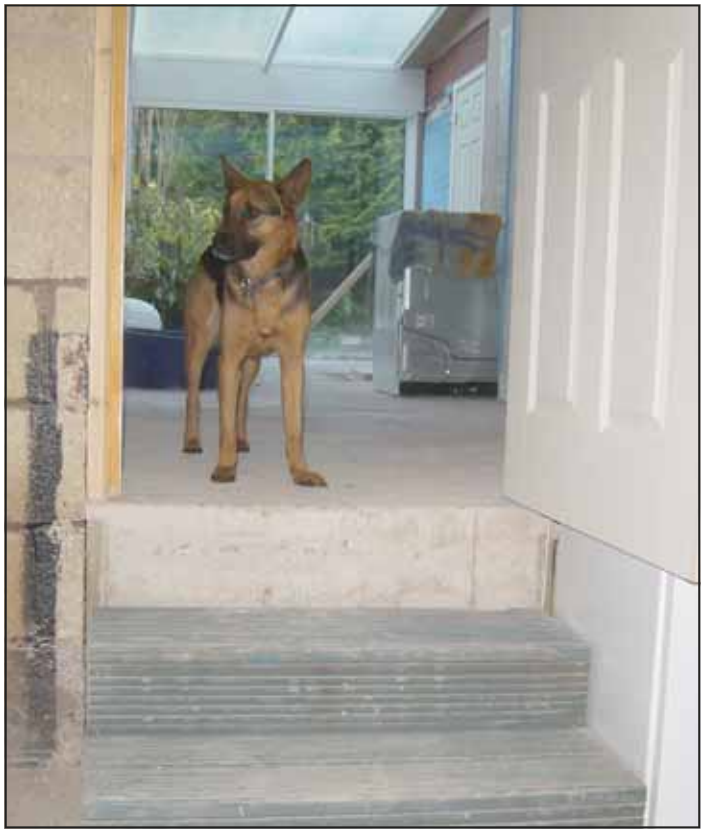
After the winter 2000 floods I took certain steps to try and hold back the ingress of flood water, some more successful than others! Two damp proof membranes were laid over the soil sub floor and a concrete slab formed on top, all surfaces running to a central sump pump. The pump would then hopefully pump out and



keep the level away from the floor-boards, after levels had receded it would then be used to pump out the under floor to speed up the drying out process. The water used to enter rapidly through the soil under floor so by slowing this we hoped to balance pumping out with water entering. Flood barriers for the doors were constructed from marine ply and butyl rubber- these were not used in the recent floods due to insufficient warning - aluminium covers were cut to cover air-bricks and these worked fine. During the floods more entry points were found and work was done to block these.

After two floods in seven years we had to do something to protect the value of our house and hold on to future flood insurance, our insurers had been excellent in 2000 and we hoped they would this time. As it turned out we had the renewal premium in November and the policy had gone up by about £20 and the excess remained at £75--a most welcome renewal figure!

The floods of summer 2007 had forced us into a corner. Raise the floor levels, rather than try to keep the waters out, was the way to go! While the insurers would "reinstate" the property to pre-flood conditions they could not fund flood prevention measures, we would have to pay to protect our house and house value. The first job was lifting all the floor joists by 10.75 inches, this was done by a builder employed and managed by myself. All the lifting was done while my wife and I lay on a beach in Turkey! We returned to raised joists and also a raised kitchen roof to allow us to raise the kitchen floor level, all door lintels and windows would have to be raised the same amount. We then called upon friends to assist in the raising of all concrete floors, all plumbing had to be adapted to fit in with the new levels,(£600+),then a damp proof membrane was laid on top. sheets of celotex insulation were then laid and another damp proof membrane followed by a concrete slab and screed, finally finishing with carpet on the wood and tiles on the concrete. Due to the porch door being at too low a level to raise steps were formed to reach the new interior floors, these will be tiled in case of flood

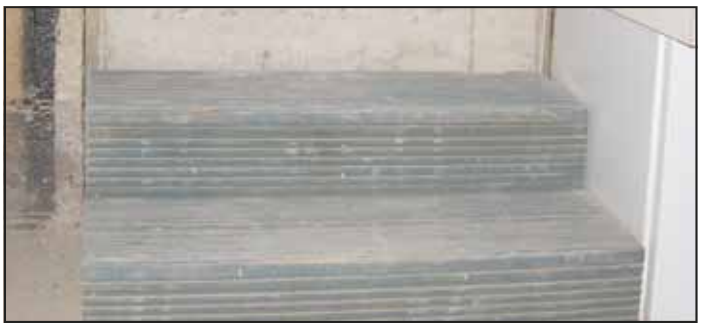


Worcester (continued)

water entry - a flood door is the next urgent purchase. The sump pump remains but will be placed at a higher level so as not to create a problem with pressure on the outside walls, it will still be used to pump out after levels recede.

By offering to "project manage" the reinstatement of our property ourselves we were able to do our flood prevention work along-side the insurance funded work. This has worked very well and as the water levels were six to seven inches in previous floods we have gone a fair way above those levels, we were only able to do this as we had eight foot six inch ceilings, had we had lower head height i dread to think what we would have done!

Severn Trent Water have visited and at their expense will fit non-return valves to the sewers and an increased pit to accommodate "solids" until levels recede. Work is due to start, and be completed, on



Thursday 22nd November.

We have now done what we can to floor levels, a flood gate will handle the lower end of the hall and porch, the garage will still flood but we can handle that. We have to hope that the next flood peaks at ,or close to, previous levels as being a semi-detached property creates problems if your neighbouring property has no flood protection measures implemented.

Andy Churchill

North Cave

Phil Garland describes the basic steps he has taken to make his home resilient...

So the question I asked myself "who or what will protect us in the future"

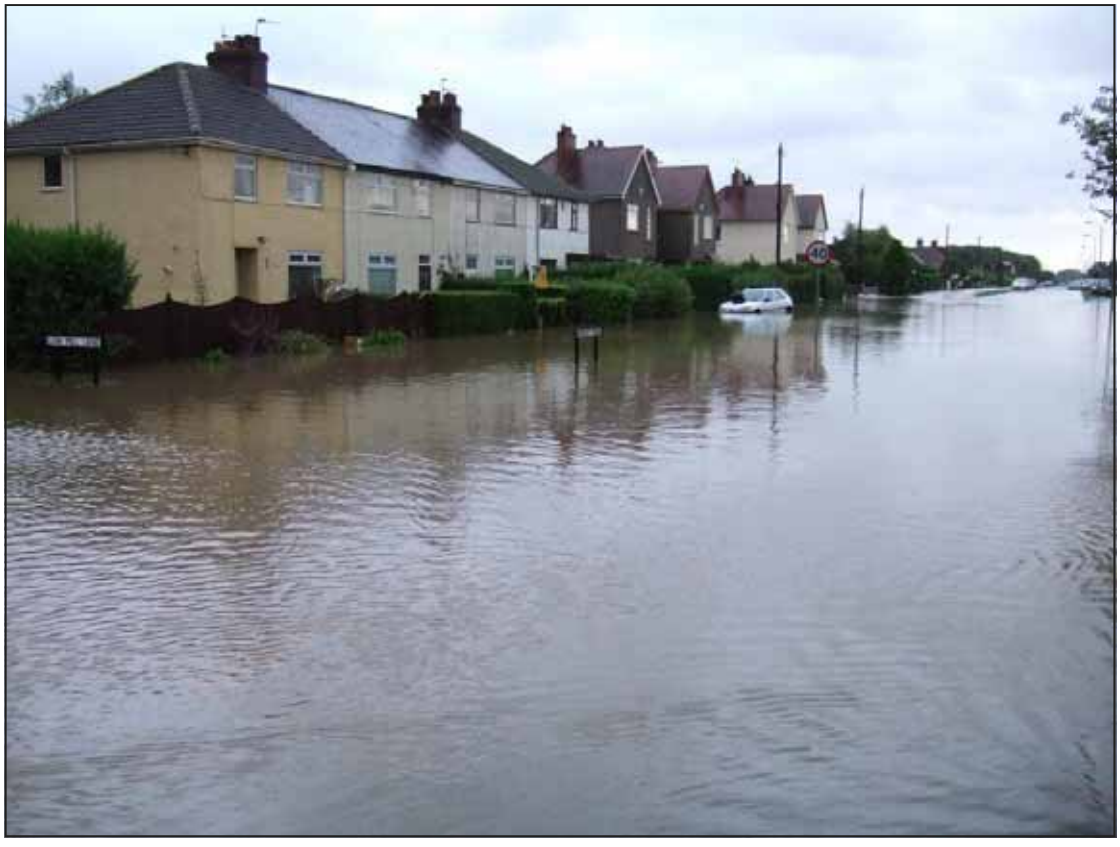
On the 25th June 2007 my family and I where victims of the floods in East Yorkshire.

The village we live in became very proactive immediately after the floods to try and get to the source of the flooding and get some answers to questions we where all asking.

We set up a committee, commissioned a drainage engineer and commenced a flood defence scheme design and proposal.

With the design work starting on our scheme, I could rest easy in the thought that our village would be safe in the future from flooding as our MTP application (an application for 100% direct government funding for flood defence schemes) would be submitted and be successful based upon the previous years submissions, that are point scored for success.

Life seemed to be getting back onto track, the drying



Flooding in North Cave - Summer 2007

North Cave (continued)

certificate on my house was issued to the insurance company and the contractors where ready to start, with a promise that we would be back in for Christmas. Great.

Then like a shot from the blue the Environment Agency changed the point scoring criteria and our flood defence scheme was thrown out, as it wasn't highly scored enough to be successful.

What would we do now, who or what would protect my property? My thoughts immediately turned to my own flood defences. Without any structured village flood defence scheme will I get insurance in the future? Will the insurance be too expensive or will it have such an excess for flooding that it becomes unviable.

I commenced my investigation into flood resilient repairs and construction, from a construction background myself I knew this would be invaluable experience for me, as in the future, flooding will be now be part of design criteria on all new developments in our area.

So timber floors to concrete, sockets relocated at higher level, solid wood kitchen units, install a new wall mounted boiler, install a new wall mounted gas fire as well as many others.

So with my flood resilient repair scheme in hand I approached my loss adjustor to ask for these to be included in my reconstruction. I was confident that my insurers would be most grateful to receive these recommendations as in the future, should we flood again it would prevent excessive costs for reconstruction and would allow less time out of the house.

The answer came back that my insurers that they where not prepared to pay for this cost, it would be my responsibility. Their reason? - I could change insurers in the future and they would not see the benefit for this work. They will only pay like for like reinstatement costs.

How could I afford this when my house is apparently worthless and the only way I can the value back is by these construction methods and the village flood defence scheme. Right back to square one again.

This made me start to think just slightly out of the box, certain things could be done, that relatively speaking would not be that expensive when reinstating the house after a flood:

- Install the boiler or service meters on a wall or on a plinth off the floor
- Change timber floors to concrete. If the cost precludes this then look to fit air brick covers.
- Fit all timber skirting boards, door frames and architraves and paint them to a finish on all sides, front and back.
- Look to tile all concrete floors with a non-porous floor tiles with solid adhesive backing and non-porous grout.
- Don't paint over your hinges to your doors, leave them exposed so that they are easy to unscrew and remove quickly.
- Look to use a lime based plaster or sand and cement render and skim when re-plastering the walls
- Consider using waterproof paints for all surfaces that you feel to be in the flood line.
- Fit non return valves on all drainage pipes.
- Remove any floor mounted kitchen appliances and either site on plinths or have integrated products.

With these changes now incorporated on my house I am now hoping that when I receive my insurance renewal I can confidently inform my insurers of these and hopefully ensure that my excess is minimal and cover is continued.

As the for the village flood defence scheme well a lot of hard work is ahead of us but I'm sure that we will be successful.

Phil Garland

North Cave

Flood Resilience - Well Worth It !

Twice Bitten

We live near Oxford and were flooded in 2000, 2003 and 2007.

We made insurance claims in tens of thousands of pounds in 2000 and 2003. In 2007 the damage was so little we did not claim. After the 2000 flood we put things back as before, thinking we would not flood again for 50 years. Three years and one flood later, we knew differently. When we flood, water comes up through the floor, so just blocking up outside doors would not solve the problem. So we decided to restore our house in a way that would minimise the damage caused by any future flood - so-called flood resilience.

Being flooded will never be fun, but being more or less flood resilient makes it less stressful and one's much more quickly back to normal.

Stone Floors

We are lucky that the water is pretty clean. We noticed that in our neighbours' farmhouse the stone-flagged floor only needed mopping to return to normal. While our insurers assessed our claim on the basis of replacing like with like, they did not mind how we spent the money. So we decided to have stone (travertine) floors, rather than replacing wooden floors. Fortunately we had a concrete slab already.

Sump and Pump

At the same time we had a sump (just a pit below floor level, in our case with a plastic drum lining it) dug in one corner of the kitchen, and in which sits a submersible electric pump. Water coming into the house runs across the floor and down through the grating (fig. 1) into the sump below. It's then pumped back out into the garden (fig. 2).

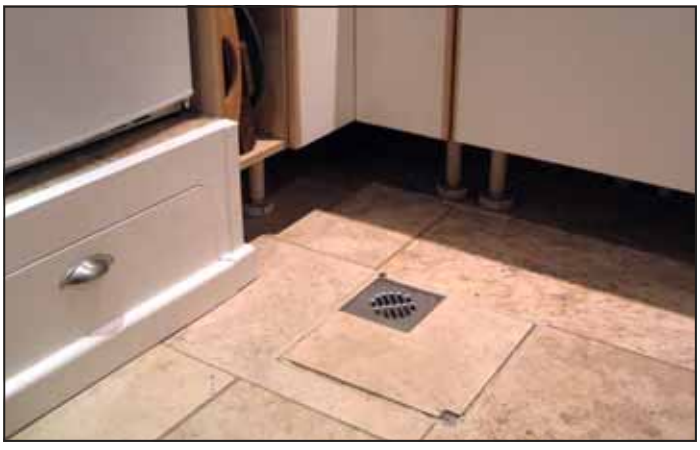


Figure 1

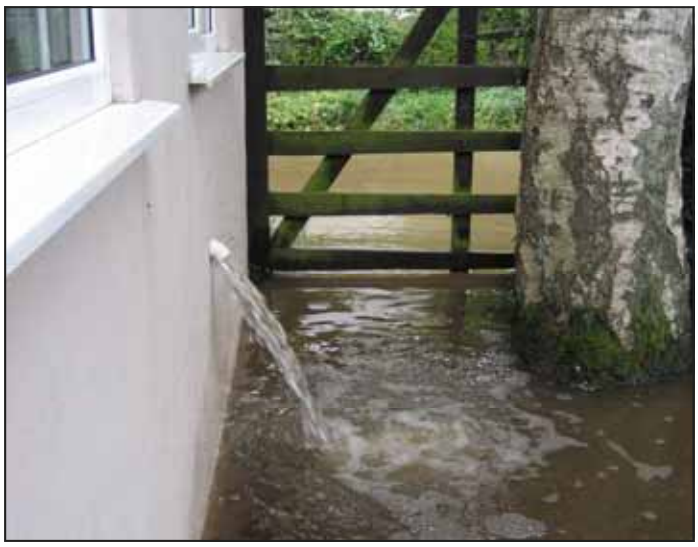


Figure 2

We are on the edge of the flood plain so we get plenty of warning and (so far!) the flooding outside has not been more than about 30 cm deep. If flood water gets about a metre or more deep outside you should not pump water out as the weight of water outside, not balanced by water inside, can cause a wall to collapse. Not a nice thought.

(I should just say that there are ways to try to proof houses against water coming in at all - such as tanking or cavity drainage systems. We did not go down this road, which tends to cost more, but may be worth investigating.)

Flood Boards

We could not get ready-made flood boards to fit our door frames so we had a carpenter fix grooved hardwood supports either side of the door and at flood time we slide in a marine ply board, with a rubber seal on the lower edge and two brass bolts into the supports to hold it in place - though mastic is still necessary. We had to use chewing gum at one stage but mastic is definitely better - be prepared with a fresh pack! Fig. 3 shows a board in place. A good DIYer (not me) could do all this.

Electrics Up

We have fridge (fig. 1), freezer and washing machine up on platforms with storage space below. They are actually easier to use at this height!

Electrical points are well up off the floor. Kitchen units are anyway on plastic legs (quite common I think). The plinths unclip (again, common I think) and can be removed if a flood looks likely. Fig. 2 shows the units with the plinths removed. There is no need for special waterproof units as the water never gets deep if the pump is doing its job.

Oxford (continued)

We still put furniture up on wooden blocks or bricks or stand legs in plastic margarine containers or similar, but these should be sufficient because the water level should never rise far indoors.

When skirting boards were replaced we had them gloss painted on the back and underside edge before putting them in place. They survived the last flood undamaged.

Choice of plaster, and covering up air bricks during floods, are among other things to consider (see 'Finding out more' below). Another point to bear in mind is that in terraced or semi-detached houses water may get in through party walls, above or below floor level.

How Did it Work?

When the next flood duly came, in July 2007, the sump pump came into operation on cue. It coped well to start with, easily keeping pace with the water coming in; as time went by though it cut out at more and more frequent intervals. We now know that it was overheating and the thermal cut-out operating. The

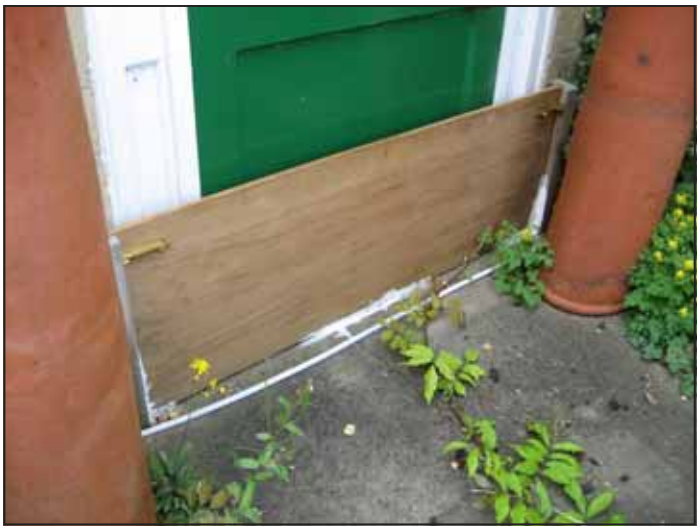


Figure 3

pump we had was not powerful enough for the job and we have had to get a bigger one. But even not working perfectly it did a pretty good job.

How Big a Pump?

I don't think you can calculate how big a pump you need because you can't readily work out how fast water comes in (at least I can't) - so as far as I can see all you can do is go for the biggest you can afford: talk to someone knowledgeable in your area. I'm not going into detail because circumstances differ so much. We know of people who have two pumps in a single sump and even two sumps in different parts of the house. Generator or battery back-up is something you might want to consider if power supply is at risk. There are firms who are able to advise about all this, an internet search or Yellow Pages will give some names.

If we were to start again we'd have a bigger sump too, which would take longer to fill so the pump would come on less often. I mean a bigger area, not deeper. Our present one is about 15 inches square - a better size might be say 24 inches square. But even with the overheating the pump did well enough to save the day.

Cost and Insurance

Cost is an issue for almost everybody. As far as I know insurance companies will not pay extra to help with these measures (though you could always ask!). However, many things don't cost much more (if at all) to do in a flood-resilient way. If they are done in the aftermath of a flood, insurance payments can be put towards them.

When dealing with insurers, think flood resilience and ASK. We were lucky with our insurers and loss adjuster, but not everyone is so lucky. But you need to ask too - if you don't ask you will probably end up with what the insurers decide, which may not be what's best for you.

Think twice when the insurer says they will "do everything and put it back just as it was"(!) You may be allowed to choose your own builder. Think flood resilience and keep asking for what you want.

Finding out More

This is just what we've done; these measures won't all be appropriate for everyone and of course, as always, you need to get proper advice for your own circumstances. There are many other aspects to flood resilience not dealt with here. Ask the National Flood Forum for further advice. Stopping the water ever getting in is the best thing, but if that isn't possible, flood resilience measures are very well worthwhile.

Thanks

My thanks to two fellow conspirators in the Oxford Flood Alliance - Richard Thurston for reading the draft of this article and making several helpful comments; and Nick Hills for discussions on flood resilience.

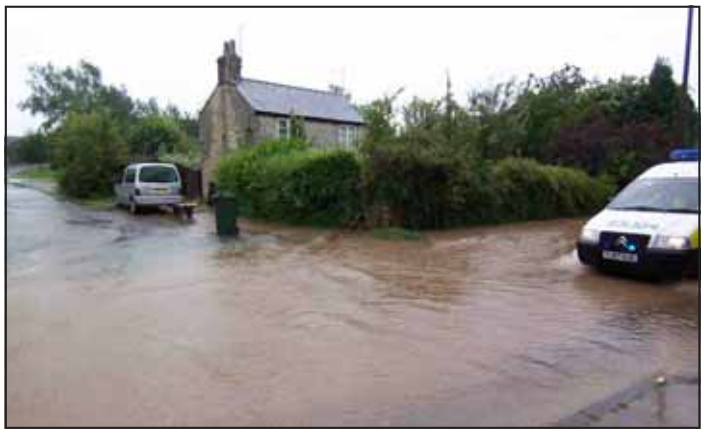
Peter Rawcliffe

Oxford.

Flood Resilient Homes - Tadcaster

As I write this, we are still living in rented accommodation 12 months on from the June 2007 floods which left 3ft of sewage contaminated water in our house. We are hoping the repairs to our home will be completed in the next few weeks.

But, having been flooded five times since 2000, we live in fear of another period of heavy rain which will cause just as much damage. **Pictures 1 & 2**



Picture 1

Having appeared in several radio, TV and newspaper articles and saying the same three things :-

"There is an urgent need for one coordinating body responsible for flood control in the UK"

"Until there's some sort of scheme to prevent flooding in our village we're at risk all the time."

"Even if you go out for the day or on holiday, the first thing you do is look at the weather forecast for your own village. We're always on the lookout."

Up to this point, my story is the same of thousands of others throughout the UK. Like most of these other victims there is nothing that can be done to prevent wide scale flooding due to inadequate drainage, lack of flood defenses or just simply living in the wrong place.

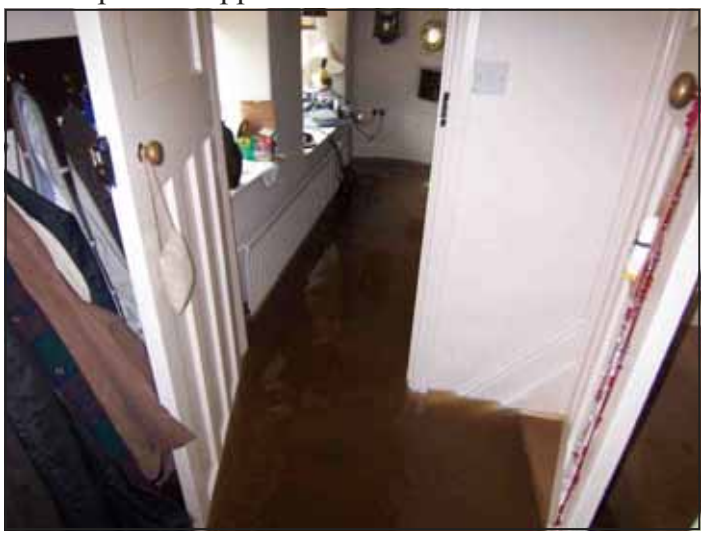
But I had had enough. I was not prepared to wait for another flood or wait until the council decided if or when it would improve the drainage in the village, **the next time we would be ready.** We would make sure our home would not flood again. So for the last 12 months we have been planning.

I must at this point express a professional interest in this subject, since I am a flood consultant myself and some people find this ironic.

You might say – "a flood consultant being flooded" – but as I was prepared to put my trust in local councils and other bodies to undertake flood prevention works, but all to no avail. So I decided to use my professional skills and design a scheme that would prevent my own house from flooding.

Where to start? Well from the bottom up…… We live in an old stone cottage with ground floors of a solid composition – stone floors bedded onto mortar/earth. So we had the floors dug up and re-laid using a tanking system. These are systems usually used in underground car parks and basements and are designed to prevent the ingress of water. It resembles a very thick plaster or mortar. This was laid onto a concrete bed.

Next came the internal walls and we had cement based plaster applied that is water resistant and



Picture 2

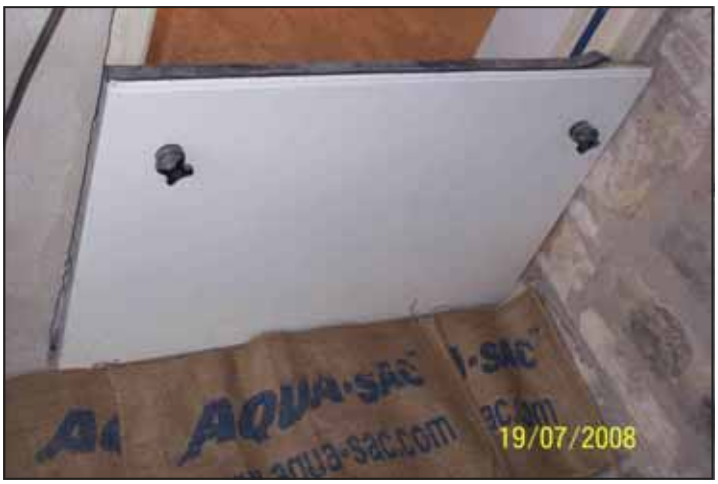
would not have to be removed if we flooded again. The list goes on….

"If we flooded again?" Well that is always a possibility, but having a history of flooding and finding it hard to obtain insurance I decided to make our home Flood Resilient. If we flooded again the costs would be minimal and with due preparation we could be back in a couple days after the flood water had gone.

We therefore made our house flood resilient by fitting or building:-

1) New concrete floors with membranes.
2) Ceramic tiles on all ground floors.
3) All major joinery in solid hardwood expect for a few bits of disposable architrave.

Flood Resilient Homes - Tadcaster (continued)



Picture 3

4) Flood doors fitted to front and rear outside door **Picture 3.**
5) Secondary flood door on inner door opening.
6) New sealed hardwood doors.
7) New retaining (waterproof) bund wall at front of house.
8) New retaining (waterproof) bund wall at rear of house.
9) Conservatory raised by one foot onto new waterproof dwarf wall.
10) Six industrial submersible pumps with float switches installed in front an back garden **Picture 4.**
11) New flood water discharge chamber (for the pumps) in front garden for gravity drainage to water course.
12) All walls tanked with Siko 20 - as used in underground basements and store rooms.
13) All through wall connections at three feet above floor level – water pipes - washing machine etc..
14) Downstairs toilet replaced with pumped Saniflo unit.
15) Exterior walls painted with silicone sealer.
16) New bund walls built in garden to stop water reaching front an back doors.
17) All service/cable connections at a higher level.
18) A stock of expandable emergency flood 'sand bags' stored just in case!

So! Is all this enough? Well only time and the Met Office will know but I am determined that no flood water will get in….

What is annoying though, is having spent a considerable amount of money on flood defenses, none of the insurance companies seem to be willing to offer a normal rate for house insurance or even offer a discount on premiums.

They offer discounts if you fit a burglar alarm, so why not flood doors???

One of the prime concerns in doing all this protection work was also the appearance of our in that we did not want our house to look like some sort of flood fortress. Everything fitted or built into the property is indiscernible from normal house fittings or is dismountable.

Picture 4

I have prepared a **free** fact sheet on all the equipment, finishes and fittings I have used, together with some useful documents on other aspects of flooding which is available on the National Flood Forum website. So, fingers crossed……

Laurence Waterhouse

Tadcaster