

# Flood Resilient Homes

## What homeowners can do to reduce flood damage



**This factsheet outlines the steps that homeowners living in flood risk areas can take to minimise the damage caused if flooding occurs.**

This factsheet builds on research conducted by the Building Research Establishment (BRE) for the Association of British Insurers (ABI) examining the most cost-effective approaches for incorporating flood resilience measures into your home, either after a flood event or during the normal course of renovation.

The full technical report *Assessment of the cost and effect on future claims of installing flood damage resistant measures* is available on the ABI website<sup>1</sup>.

The National Flood Forum (NFF) assisted in developing this leaflet from the original research, and the ABI is grateful for their involvement in this project.

The National Flood Forum is a non-profit making organisation dedicated to reducing the suffering of people from flooding and linking together communities at risk from flooding.

### IS YOUR HOME AT RISK OF FLOODING?

For many people, flooding is a fact of life. There are approximately 2 million homes at risk from coastal or inland flooding (10 % of homes in the UK), and around 200,000 homes at very high risk of flooding, namely with a greater than 1-in-75 chance per year of flooding.

In the long term, this situation could worsen. Climate change could increase the number of properties at risk of flooding, while continued pressure for new homes could mean even more developments being situated in floodplains.

While the Government has a significant programme of flood management in place to address the needs of the UK's at-risk areas, there will be areas where the risk of flooding remains substantial.

**Individual property owners can do much to increase the resistance and resilience of their properties to flood damage, perhaps in partnership with their mortgage provider, insurer, or local authority. There are many practical steps that homeowners can take to reduce the cost of flood repairs and speed up recovery times.**

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<sup>1</sup> [http://www.abi.org.uk/Display/File/78/Flood\\_Resistance\\_report.pdf](http://www.abi.org.uk/Display/File/78/Flood_Resistance_report.pdf)

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### FLOOD PROTECTION PRODUCTS - KEEP THE WATER AT BAY

Technology has moved beyond sandbags. There is now a range of simple and relatively cost-effective methods of keeping floodwater out of your property during a short-lived flood. Recently, the British Standards Institute (BSI) has developed a "Kitemark" Certification Scheme for such products<sup>2</sup>.

The Environment Agency has a number of useful publications setting out recommended flood-protection products for your home. These are available for download from the Agency's website<sup>3</sup> or by calling Floodline on 0845 988 1188. In addition, CIRIA hosts a very comprehensive website<sup>4</sup> containing up-to-date and relevant information on flooding and resilience.

During prolonged deep flooding, it may not be possible to keep the water out of your house. Flood boards installed around doors can offer significant protection against flash-flooding for a few hours. They will not offer protection against more prolonged periods of flooding, when water could enter through the floor and brickwork.

Flood protection products will give you time to move your possessions off the ground floor and out of reach of the floodwater. A pump-and-sump system may be effective in removing water from the house as fast as it enters, keeping the level of water within the building down to a minimum.

Even when water does get into the house in these situations, it is often "cleaner", because much of the mud and silt stays outside the property, substantially reducing clean up costs after a flood. This could be a particular benefit if you are in an area subject to sewer flooding.

Nevertheless, for floods deeper than 1 m, it is recommended that you actually let the water into your house, as the build up of water pressure outside your property could cause the walls to cave in, leading to serious structural damage.

<sup>2</sup> <http://www.bsi-global.com/Kitemark/Schemes/schemes/pas1188.xalter>

<sup>3</sup> <http://www.environment-agency.gov.uk/subjects/flood/351186/351222/483622>

<sup>4</sup> <http://www.ciria.org/flooding>

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## FLOOD RESILIENT MEASURES - LIMITING WATER DAMAGE

If your property is vulnerable to repeated flooding, it is important to limit damage to speed up drying/re-occupation by making the inside of your home resilient to floodwater. This could involve ensuring that the walls, floors, and fixtures will not be damaged by water, and also re-organising your house so that valuable and costly items (including service meters and the boiler) are above the level of the flood. Making your home flood resilient is more affordable during the normal course of renovation for your property, or during repairs after a previous flood.

The tables in the annex set out some of the cost-effective measures you can take to protect the inside of your home from the impacts of flooding. For five different property types, the tables set out how much more it costs to renovate with a flood-resilient measure (column 2) compared to standard repair (column 1), and how much you will save if you adopt this measure next time your property floods (columns 3 and 4).

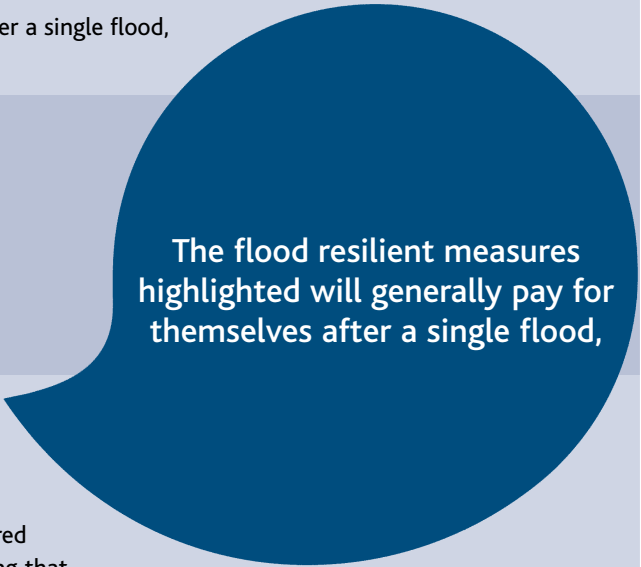
The costs outlined in the tables are only indicative. They provide a guide to the measures that will generally pay for themselves after a single flood, i.e. where the extra cost of installing flood resilience is more than offset by the damage costs saved after the next flood.

### Key flood resilient measures highlighted in the tables include:

- Replace timber floors with concrete and cover with tiles.
- Replace chipboard/MDF kitchen and bathroom units with plastic equivalents.
- Replace gypsum plaster with more water-resistant material, such as lime plaster or cement render.
- Move service meters, boiler, and electrical points well above likely flood level.
- Put one-way valves into drainage pipes to prevent sewage backing up into the house.

Undertaking these measures will mean that services can be maintained and your house can be quickly cleaned, dried, and re-occupied with minimum disruption. Overall, it would be best to put in place a suite of measures to protect your property from flooding - both keeping the water out initially, and then reducing damage when/if the water enters your home.

Before undertaking major renovations, it is worth getting advice from a specialist flood surveyor (contact Royal Institute of Chartered Surveyors for advice<sup>5</sup>), who can recommend an appropriate set of measures for your property, taking account of the type of flooding that occurs locally, the construction of your property, and other factors, such as local geology.



The flood resilient measures highlighted will generally pay for themselves after a single flood,



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## PAYING FOR THE MEASURES

You may wish to install these measures pro-actively, during renovations or improvements to your property, or reactively, during repair following flood damage. The cost of many measures will usually be more than repaid by the flood costs they save.

In the long term, adopting flood resilient measures could make it easier for an insurer to continue to provide cover to a homeowner living in a high flood-risk area. Before undertaking any work, we recommend that you discuss with your current insurer the impact on your insurability, including your premium and any excesses.

Insurance helps you minimise the financial cost of damage from flooding, but it cannot remove the trauma and misery of the experience. Although insurance plays a positive role, it is designed to deal with occasional damage. Where the likelihood of flooding is high, it is much better for you to reduce the effects of flooding wherever possible.

ABI members are willing to work with customers in reinstating their homes to flood-resilient standards following damage, provided this does not cost more than the repairs covered in the insurance contract. If the cost of flood proofing is substantially greater than standard repairs, then insurers will provide funds equivalent to the standard repair.

There are now some good options to fund any balance. For example, the Council for Mortgage Lenders have confirmed that lenders would normally be willing to consider extending loans to cover the additional costs of flood-resilient repairs, provided the homeowner has sufficient equity and can afford to meet any additional repayments.

Insurance companies remain committed to providing financial protection against flooding to as many property owners as possible. They will continue to do all they can to help those most at risk of flooding to take steps to reduce the risks, so flood cover can be made available wherever possible.

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## Indicative Costs (£) for a Three-Bedroom Semi-Detached House

Measure	Cost of restoration without flood resilience	Extra cost of installing flood resilience	Costs saved each deep flood (to 1m)	Costs saved each shallow flood (to 5cm)
<b>FLOORS</b>				
1 Replace sand-cement screeds on solid concrete slabs	585	115	390	390
2 Replace chipboard flooring with treated timber floorboards	470	505	370	370
3 Replace floor including joists with treated timber to make it water resistant	3100	520	2735	2735
4 Replace timber floor with solid concrete	3100	6150	2350	2350
5 Raise floor above most likely flood level	20300	12000	15800	13500
<b>WALLS</b>				
6 Replace mineral insulation within walls with closed cell insulation	430	270	360	360
7 Replace gypsum plaster with water resistant material, such as lime plaster	3875	2925	3375	3375
8 Install chemical damp-proof course below joist level	3100	3445	2450	2450
9 Replace doors, windows, frames with water-resistant alternatives	5800	4670	5150	2450
<b>INTERIORS</b>				
10 Mount boilers on wall	850	150	700	700
11 Move washing machine to first floor	400	200	400	400
12 Replace ovens with raised, built-under type	450	200	350	350
13 Move electrics well above likely flood level	500	300	400	None
14 Move service meters well above likely flood level	1000	500	850	300
15 Replace chipboard kitchen/bathroom units with plastic units	1750	1650	1550	1550



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## Indicative Costs (£) for a Four-Bedroom Detached House

Measure	Cost of restoration without flood resilience	Extra cost of installing flood resilience	Costs saved each deep flood (to 1m)	Costs saved each shallow flood (to 5cm)
<b>FLOORS</b>				
1 Replace sand-cement screeds on solid concrete slabs	705	145	470	470
2 Replace chipboard flooring with treated timber floorboards	570	605	450	450
3 Replace floor including joists with treated timber to make it water resistant	3750	625	3310	3310
4 Replace timber floor with solid concrete	3750	7150	2850	2850
5 Raise floor above most likely flood level	23600	12800	18500	19180
<b>WALLS</b>				
6 Replace mineral insulation within walls with closed cell insulation	465	350	380	380
7 Replace gypsum plaster with water resistant material, such as lime plaster	4325	3350	3750	3750
8 Install chemical damp-proof course below joist level	3750	4150	2950	2950
9 Replace doors, windows, frames with water-resistant alternatives	7200	5630	6420	2820
<b>INTERIORS</b>				
10 Mount boilers on wall	850	150	700	700
11 Move washing machine to first floor	400	200	400	400
12 Replace ovens with raised, built-under type	500	200	400	400
13 Move electrics well above likely flood level	525	375	425	None
14 Move service meters well above likely flood level	1000	500	850	300
15 Replace chipboard kitchen/bathroom units with plastic units	3750	4150	2950	2950



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## Indicative Costs (£) for a Two-Bedroom Ground Floor Flat

Measure	Cost of restoration without flood resilience	Extra cost of installing flood resilience	Costs saved each deep flood (to 1m)	Costs saved each shallow flood (to 5cm)
<b>FLOORS</b>				
1 Replace sand-cement screeds on solid concrete slabs	510	105	340	340
2 Replace chipboard flooring with treated timber floorboards	410	440	325	325
3 Replace floor including joists with treated timber to make it water resistant	2750	460	2425	2425
4 Replace timber floor with solid concrete	2750	5650	2050	2050
5 Raise floor above most likely flood level	19550	11450	15350	13400
<b>WALLS</b>				
6 Replace mineral insulation within walls with closed cell insulation	410	255	345	345
7 Replace gypsum plaster with water resistant material, such as lime plaster	3700	2875	3200	3200
8 Install chemical damp-proof course below joist level	2750	3010	2175	2175
9 Replace doors, windows, frames with water-resistant alternatives	5840	5070	5260	3010
<b>INTERIORS</b>				
10 Mount boilers on wall	850	150	700	700
11 Move washing machine to first floor	N/A	N/A	N/A	N/A
12 Replace ovens with raised, built-under type	450	200	350	350
13 Move electrics well above likely flood level	450	250	350	None
14 Move service meters well above likely flood level	1000	500	850	300
15 Replace chipboard kitchen/bathroom units with plastic units	2750	3010	2175	2175



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## Indicative Costs (£) for a Two-Bedroom Terrace House

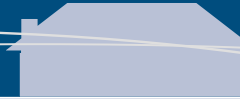
Measure	Cost of restoration without flood resilience	Extra cost of installing flood resilience	Costs saved each deep flood (to 1m)	Costs saved each shallow flood (to 5cm)
<b>FLOORS</b>				
1 Replace sand-cement screeds on solid concrete slabs	450	90	300	300
2 Replace chipboard flooring with treated timber floorboards	360	390	285	285
3 Replace floor including joists with treated timber to make it water resistant	2430	405	2145	2145
4 Replace timber floor with solid concrete	2430	5170	1780	1780
5 Raise floor above most likely flood level	17200	11000	13250	11700
<b>WALLS</b>				
6 Replace mineral insulation within walls with closed cell insulation	385	235	320	320
7 Replace gypsum plaster with water resistant material, such as lime plaster	3525	2725	3050	3050
8 Install chemical damp-proof course below joist level	2430	2655	1905	2175
9 Replace doors, windows, frames with water-resistant alternatives	4400	3710	3870	2080
<b>INTERIORS</b>				
10 Mount boilers on wall	850	150	700	700
11 Move washing machine to first floor	400	200	400	400
12 Replace ovens with raised, built-under type	450	200	350	350
13 Move electrics well above likely flood level	450	250	350	None
14 Move service meters well above likely flood level	1000	500	850	300
15 Replace chipboard kitchen/bathroom units with plastic units	2430	2655	1905	1905





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## Indicative Costs (£) for a Three-Bedroom Bungalow

Measure	Cost of restoration without flood resilience	Extra cost of installing flood resilience	Costs saved each deep flood (to 1m)	Costs saved each shallow flood (to 5cm)
<b>FLOORS</b>				
1 Replace sand-cement screeds on solid concrete slabs	840	170	560	560
2 Replace chipboard flooring with treated timber floorboards	675	725	535	535
3 Replace floor including joists with treated timber to make it water resistant	4340	730	3830	3830
4 Replace timber floor with solid concrete	4340	8160	3340	3340
5 Raise floor above most likely flood level	26350	18350	20800	17300
<b>WALLS</b>				
6 Replace mineral insulation within walls with closed cell insulation	510	385	420	420
7 Replace gypsum plaster with water resistant material, such as lime plaster	4600	3600	4000	4000
8 Install chemical damp-proof course below joist level	4340	4930	3415	3415
9 Replace doors, windows, frames with water-resistant alternatives	8375	6635	7525	3475
<b>INTERIORS</b>				
10 Mount boilers on wall	850	150	700	700
11 Move washing machine to first floor	N/A	N/A	N/A	N/A
12 Replace ovens with raised, built-under type	550	200	450	450
13 Move electrics well above likely flood level	600	500	500	None
14 Move service meters well above likely flood level	1000	500	850	300
15 Replace chipboard kitchen/bathroom units with plastic units	4340	4930	3415	3415



ABI

Association of British Insurers

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### Annex Providing More Description on Flood Resilient Measures

#### FLOORS

- 1 Replace sand-cement screeds on solid concrete slabs. Where screeds are damaged in floods, resistance to future damage may be improved by replacement with a denser proprietary concrete screed.
- 2 Replace chipboard flooring with treated timber floorboards. Chipboard has to be replaced if there is any chance of contamination. Other treated floorboards are more resilient to flood.
- 3 Replace floor including joists with treated timber to make it water resistant/repellent. The timber is less likely to absorb water, enabling the floor to dry out more quickly and be more resistant to rot or distortion.
- 4 Replace timber floor with solid concrete and provide tiled finish with falls to allow draining to sump and pump
- 5 Raise floor levels above the most likely flood level. In general, this is only applicable when floodwaters do not rise much above the existing floor level and where the ceiling height can accommodate it. Raising floors may require resetting doors and windows to higher cill levels, with additional costs.

#### WALLS

- 6 Replace mineral insulation within internal partition walls with closed cell insulation. Closed cell insulation is more likely to survive a flood without having to be replaced.
- 7 Replace gypsum plaster with more water resistant material, such as lime plaster or cement render. This reduces the extent to which water will penetrate and significantly increases the probability that a wall will survive a flood without damage
- 8 Install chemical damp-proof course below joist level. This helps minimise the amount of dampness that gets above the damp-proof course, potentially reducing the damage to the property and the amount of repair work that must be done above this level.
- 9 Replace doors, windows, skirting boards, doorframes and window frames with fibreglass, plastic or UPVC or other similar water-resistant alternatives. These do not absorb water or warp, and so are more readily functional after a flood.

#### INTERIORS

- 10 Mount boilers on wall above the level that floodwater is likely to reach.
- 11 Move washing machine to first floor. Move washing machines to first floor rooms. Washing machines are heavy and impractical to move before a flood and are expensive to replace after one.
- 12 Replace ovens with raised, built-under type. These are more likely to be above the flood line but are lighter to move for deeper flood.
- 13 Move electrics to at least one metre above floor (or well above likely flood level) with cables dropping from first-floor level distribution down to power outlets at high level on wall.
- 14 Move service meters to at least one metre above floor level (or well above likely flood level) and place them in plastic housings
- 15 Replace chipboard kitchen/bathroom units with plastic or similar units. Chipboard units generally have to be thrown out after a flood, but plastic units may be disinfected and used again.



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## Useful Contacts

Association of British Insurers (ABI)	Tel: 020 7600 3333	<a href="http://www.abi.org.uk">www.abi.org.uk</a>
British Damage Management Association (BDMA)	Tel: 07000 843 2362	<a href="http://www.bdma.org.uk">www.bdma.org.uk</a>
British Standards Institution (BSI)	Tel: 020 8996 9000	<a href="http://www.bsi-global.com">www.bsi-global.com</a>
Building Research Establishment (BRE)	Tel: 01923 664000 (England and Wales)	<a href="http://www.bre.co.uk">www.bre.co.uk</a>
Chartered Institute of Loss Adjusters (CILA)	Tel: 020 7337 9960	<a href="http://www.cila.co.uk">www.cila.co.uk</a>
CIRIA	Tel: 020 7549 3300	<a href="http://www.ciria.org">www.ciria.org</a>
Council of Mortgage Lenders (CML)	Tel: 020 7437 0075	<a href="http://www.cml.org.uk">www.cml.org.uk</a>
Environment Agency	Floodline: 0845 988 1188	<a href="http://www.environment-agency.gov.uk">www.environment-agency.gov.uk</a>
Flood Protection Association (FPA)	Tel: 01329 516303	<a href="http://www.floodprotectionassociation.org">www.floodprotectionassociation.org</a>
Institution of Structural Engineers	Tel: 020 7235 4535	<a href="http://www.istructe.org.uk">www.istructe.org.uk</a>
The National Flood Forum (NFF)	Tel: 01299 403055	<a href="http://www.floodforum.org.uk">www.floodforum.org.uk</a>
Royal Institution of Chartered Surveyors	Tel: 0870 333 1600	<a href="http://www.rics.org">www.rics.org</a>
Scottish Environment Protection Agency	Floodline: 0845 988 1188	<a href="http://www.sepa.org.uk">www.sepa.org.uk</a>