BeFloodReady
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Property Flood Resilience

Understanding Property Flood Resilience (PFR)

Supported by

Department for Environment Food & Rural Affairs

Environment Agency

Cornwall Community Flood Forum

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Devon County Council

Devon Communities Together

TORBAY COUNCIL

PLYMOUTH CITY COUNCIL

South West Water

GROUNDWORK
CHANGING PLACES CHANGING LIVES

COMMUNITIES PREPARED

JBA consulting

This booklet is intended as a guide only. Whilst the information it contains is believed to be correct, we can take no responsibility for actions taken based on the information contained in this booklet.

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Original content has been developed by JBA Consulting in collaboration with Cornwall Community Flood Forum, Devon Community Resilience Forum and Communities Prepared.

The South West Property Flood Resilience Pathfinder has been led by Cornwall Council

Useful resources
are highlighted in **blue**
throughout this booklet.
Links to these resources can be
found on Page 40.

Please visit **www.BeFloodReady.uk**
for additional information
and guidance.

Introduction

The purpose of this guide is to provide an introduction to Property Flood Resilience (PFR) and how it can be used to manage flood risk to homes and businesses.

Property Flood Resilience, or PFR, is the term used to describe measures that help to reduce flood risk to people and property. Using PFR enables households and businesses to reduce the damage caused by floods, making the process of recovery and reoccupation easier.

For more information, advice and resources, check out **www.befloodready.uk** or follow us on Twitter **@befloodready**

Understanding your Flood Risk

Flooding can occur from a range of sources:

Fluvial Flooding

From rivers and streams

Coastal Flooding

Due to tides and storm events

Surface Water

After a heavy rainfall event

Groundwater

When the ground is saturated and water table high

Sewers

Blockages or additional water in the network

Canals & Reservoirs

In the unlikely event of a reservoir or canal failure

Understanding your flood risk is the first step in the process of increasing preparedness. This will help you make informed and suitable decisions about flood risk management.

Find out if you are at flood risk by visiting
www.gov.uk/check-flood-risk

Climate Change

Climate change is likely to lead to increasingly uncertain weather patterns. Unusual and extreme weather events are likely to become more commonplace in the future with the rarest events becoming more extreme than those in the past.

It is impossible to be precise about how much or how quickly the situation may change, but both longer wet periods and more intense rainfall should be expected. As a result, flood risk in many locations may increase in the future.

Notes

What is Property Flood Resistance?

PFR { **P**roperty **F**lood **R**esilience

PFR is the term used to describe measures that help to reduce flood risk to properties, enabling households and businesses to minimise the damage caused by flooding, speeding up recovery and reoccupation.

PFR includes both:

Protection Measures

Resistance measures that aim to reduce the amount of flood water entering a property, reducing the damage caused internally.

+

Adaptation Measures

Resilience measures aiming to reduce the amount of damage caused by flood water if it does enter the building. These measures allow the clean-up and repair process to occur quickly, making the recovery process more efficient.

Flood Protection Hierarchy

The flood protection hierarchy shows how PFR bridges the gap between large scale flood defence schemes and sandbags.

Defence Schemes

Large scale, engineered structures such as walls and embankments. These can protect a large number of properties but can be costly and disruptive.

Barrier Schemes

Temporary barriers can be deployed along watercourses when needed by the Environment Agency during flood events.

Property Flood Resilience

Measures that are fitted, or adaptations that are made to individual properties to reduce the risk of internal flooding.

Sandbags

Widely used in communities at flood risk. However, these are an ineffective form of protection. Sandbags do not create a watertight seal across doors and present a range of other issues that make them unsuitable.

Do Nothing

No management of flooding.

PFR at Home

Protection
Keep It Out

Adaptation
Recover Faster

- Flood Gates
- Flood Barriers
- Portable Pumps
- Vent Protection
- Self-Closing Airbricks
- Sump Pumps
- Resilient Room Design
- Resilient Floors
- Resilient Walls

Tanking

Silicon Sealing

Non Return Valves

Re-Pointing

Flood Doors

Waterproof Spray

Raising Electrics

Boiler Relocation

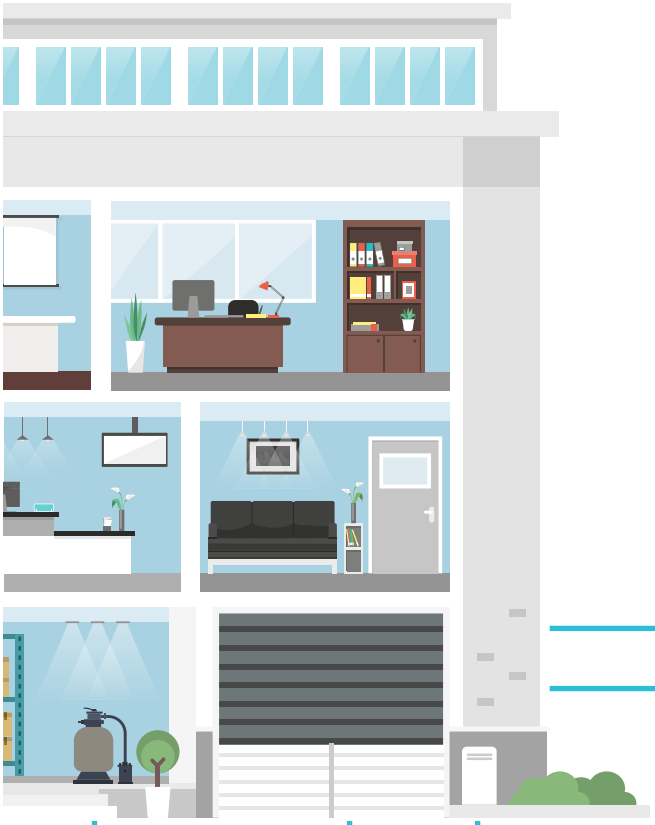
Storage of Important & Valuable Items

PFR at Work

Protection
Keep It Out

Adaptation
Recover Faster

- Waterproof Spray
- Silicon Sealing
- Non-Return Valves
- Sump Pumps
- Flood Barriers
- Flood Doors
- Resilient Room Design
- Resilient Floors
- Resilient Walls



Re-Pointing

Self-Closing Airbricks

Portable Pumps

Flood Barriers

Vent Protection

Raising Electrics

Boiler Relocation

Storage of Important & Valuable Items

Protection

Protection Measures: These resistance measures can be fitted to the outside of a property, forming a physical barrier between the flood water and the building. These measures aim to reduce the amount of water entering the building, thereby reducing the damage caused internally.

Flood Barriers 1

Flood Barriers can be installed across doorways, gateways or other openings to create a barrier to flood water. Barriers are demountable, so they can be easily fitted when there is a flood risk, then removed and stored away when not needed.

Flood Doors 2

Flood Doors automatically create a water resistant seal when closed, a benefit over barriers which have to be fitted into place when required. Flood windows are also available.

Flood Gates 3

Standard gates can be replaced with Flood Gates. Like a flood door, once shut and locked, a water resistant seal is formed. Gates can be used in garden walls to keep water away from a property.

Self-Closing Airbricks 4

Many buildings have airbricks located at ground level around the perimeter for ventilation. These can be replaced with Automatic Airbricks that allow for air to circulate but do not allow water to enter.

2

3

3

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1

2

Air Vent Protection

5

Water can enter the property through vents connected to appliances (e.g. tumble dryer, log burner, boiler etc). Vents can be blocked if redundant or raised above the flood level. 'Snorkel' measures can also be installed to raise the level of the vent. For measures associated with combustible fuel sources (e.g. boilers), a Gas Safe engineer must be consulted.

Sump Pump

6

Where a property has a basement or a suspended floor, flood water can enter these voids and cause damage.

A Sump Pump can be installed to control the water level, pumping water out at a faster rate than it is entering, so the water level does not rise significantly.

Portable Pumps

7

Where the property has a solid floor, if water does enter the property the level can rise causing damage. Portable Pumps can be used in combination with other measures, or as a back up in case flood water does still enter the property.

Non-Return Valves

8

Flood water can flow up through wastewater pipes causing flooding.

Non-return valves can be fitted to these pipes so wastewater can flow out, but flood water cannot enter.

Non-return valves can also be fitted to the foul sewer, preventing sewage backing up through the toilet. If a non-return valve cannot be fitted, a bung can be used to block the toilet.

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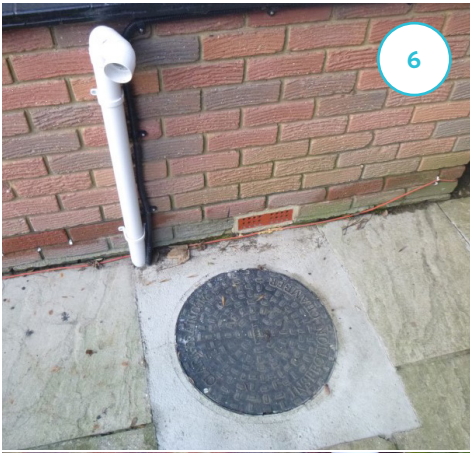
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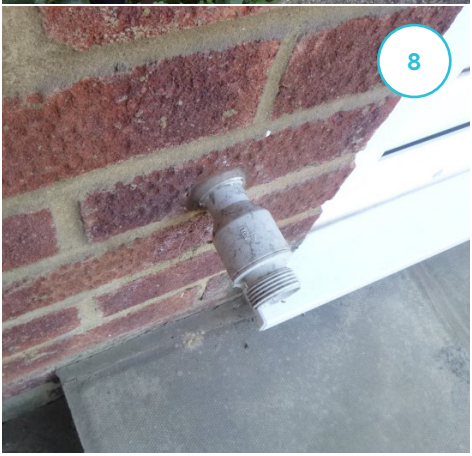
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Tanking

9

The ground floor of a property can be tanked internally to reduce the ingress of water through the walls and floor.

Silicon Sealing

10

Flood water can enter properties in the gaps around wires and pipes in walls. Silicon can be used to seal these gaps and increase resilience.

Re-Pointing

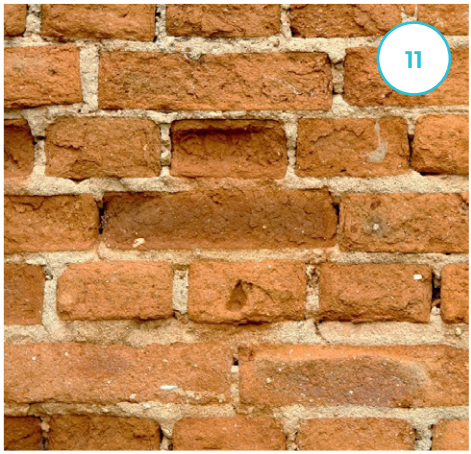
11

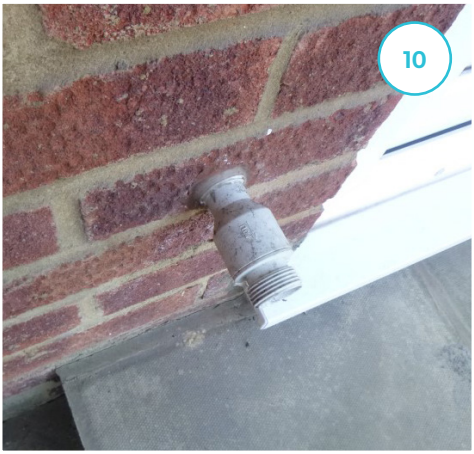
Gaps or cracks in walls can allow water to enter. Re-pointing helps to seal gaps, improving the overall condition of the wall and reducing water ingress.

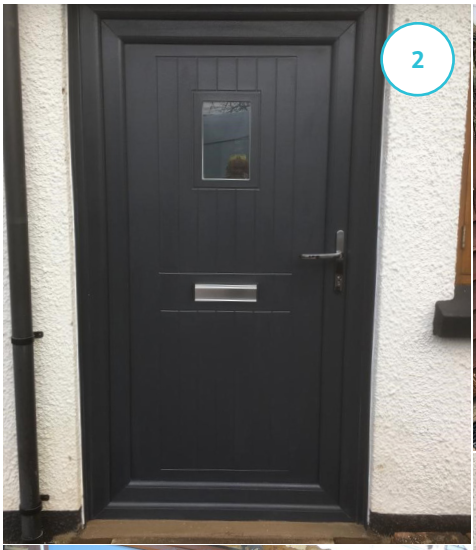
Waterproof Spray

12

If water stays in contact with a building for a long period of time, it can soak through the wall. A waterproof breathable spray can be applied to external walls to reduce this.



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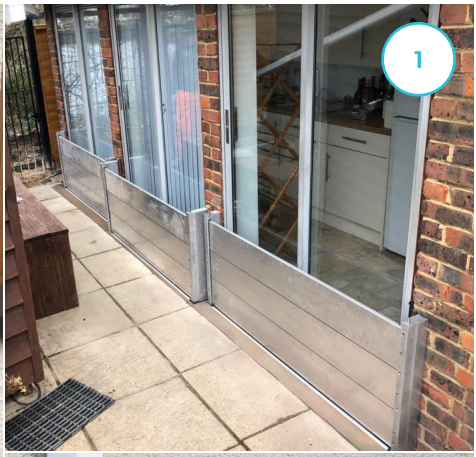
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Adaptation

Adaptation Measures: These resilience measures are used to adapt the internal property, limiting the damage caused if water does enter a building. These measures allow for efficient clean-up and repair after a flood, improving the recovery process.

Flood Resilient Walls

The use of water resilient materials and paints on walls can reduce the amount of internal damage. Plasterboard can also be installed horizontally so only the lowest sections are affected if flooding occurs.

Electrics

Electrics - The electrics for the ground floor can be separated from other floors so power can be turned off in isolation. Wiring and plug sockets can be raised up above floor level to improve resilience.

Water Resilient Flooring

Suspended timber floors, which are more susceptible to damage, can be replaced with solid concrete floors.

Tiled floors and skirting boards are also easier to clean compared to carpet and laminate which usually need replacing after a flood event.

Boilers

Boilers can be relocated to a place where flood risk is reduced. For example, boilers could be wall mounted above the flood level or re-installed on the first floor rather than the ground floor. This will reduce the risk of the boiler being damaged during a flood event.

Flood Resilient Design

Rooms in the home can be designed and constructed using flood resilient materials. Appliances can also be fitted in a way that minimises the risk of flood damage. The kitchen is a great example of where resilient design can be embraced:

- Cupboards constructed from stainless steel or other resilient materials.
- Use of wall mounted cupboards.
- Removable kickboards.
- Appliances such as ovens can be installed above the flood level.

These same principles can be carried through to other rooms in a property.

Personal or Valuable Items

The storage of valuable or personal items should be carefully considered. Can these items be stored on the first floor away from danger, or on shelves or bookcases above the flood level?

Check out the BRE Flood Resilient Repair Home at **www.gov.uk/check-flood-risk** for examples of flood resilient design.

PFR Stories

Caroline - Croyde, North Devon

Caroline's business has flooded on three occasions since 2008. In November 2011, the whole ground floor was flooded. The fire service was called out to pump flood water out of the property.

Caroline applied for grant funding available from Devon County Council to fund PFR at her property. Funding was approved and an independent survey was completed to recommend suitable measures. These measures were then installed.

The stone wall in front of the building was re-built by local craftsmen and a flood barrier was installed. A portable pump was also provided to manage any remaining flood risk from the nearby watercourse.

Caroline is now better prepared for any future flooding in Croyde.

> *Its reassurance more than anything. The comfort of knowing that I can sleep at night and come downstairs in the morning and my feet will still be dry.*

Jayne - Feniton, East Devon

Jayne's bungalow in Feniton is at flood risk. After a flood, Jayne had to move out of her home to allow repair work to be completed by her insurance company.

Jayne now has a range of PFR products to protect her property from future flood events. These products include airbrick covers to stop water from going under the floors and causing damage. She also has flood barriers for her front and back door.

These resilience measures have been put through their paces during a recent flood in Feniton, protecting this home from flooding again.

> *We had the barrier up at the back door because usually our back garden floods first. Water came right up to the back door and the barriers stopped the water from coming in.*

Hear Caroline and Jayne talk about their experiences with PFR and watch other BeFloodReady Stories at **www.befloodready.uk**

Andrew - Kentisbeare, Mid Devon

Andrew's home is upstream of a bridge over the nearby River Ken. When flooding occurs, this bridge causes water to build up, flooding the property and the main road through Kentisbeare.

Andrew privately funded measures on his property after flooding in 2012. PFR measures installed at the property included flood doors, barriers, gates and non-return valves. Using a grant scheme, Andy was able to fund a garage barrier, air vent cover and portable pump, to further protect his property.

> *It was the speed of the event that overcame us. We were both going out to work, we had moved one car away from the house. By the time I had walked back from the centre of the village I couldn't actually get into the garage because water had already started inundating it. We lost a motorhome and a car.*

> *From our point of view, we now have much greater peace of mind because we've got a large flood barrier across the front of the garage. When we go away, we put the flood barriers up and we are absolutely confident we are not going to lose anymore vehicles.*

Andy - Landkey, North Devon

Andy's property was flooded by the nearby Landkey Brook in January 2018. During this event, flood water surrounded the property and entered the building through the front door.

Using a grant scheme, Andy had three flood gates installed in the existing stone wall that surrounds his property. Gaps in the stone wall were also filled and a non-return valve was also fitted in the manhole to prevent sewage from backing up into the property.

> *For me its peace of mind. To know that I can go away for a weekend and not worry unduly about it raining and the property flooding again.*

To watch other BeFloodReady Stories and to find out more about how you can get PFR, please head to:
www.befloodready.uk

Funding PFR

There are a range of ways that Property Flood Resilience can be funded:

Privately Funded PFR

Homeowners and businesses can privately fund PFR measures. Although this can be expensive, it is a worthwhile investment, protecting the property from flooding and reducing the associated stress and disruption that is often caused.

PFR Schemes

PFR measures can be provided to groups of properties as part of a PFR scheme. This type of flood risk management scheme is increasingly being delivered by the Environment Agency and Local Authorities across the UK.

PFR Flood Recovery Grants

Often, there are Government Flood Recovery Grants made available in locations where major flood events have occurred. These grants provide an opportunity to install PFR and build back better, so that properties can be more resistant and resilient to future flooding.

For more information and guidance, go to:
www.befloodready.uk

Funding Notes

Use this space to makes notes on any funding schemes available in your area:

The PFR Process

The PFR process will vary slightly depending on how the measures are being funded. The general steps within the PFR process are summarised below.

Understanding Your Flood Risk

1

Understanding the source of your flood risk is crucial. This will help you to interpret expected flood durations, depths and lead times. To find out more about understanding your flood risk, go to befloodready.uk

It is also important to identify how flood water could enter your property and what could be damaged during a flood.

Initial Planning

2

It is helpful to have an initial look at what PFR products might be suitable for your property and type of flood risk.

Researching funding options are also important as grant funding may be available through your Local Authority or the Environment Agency.

Property Survey

3

Getting an independent survey of your property is key to understanding the most suitable PFR options for you.

Experienced surveyors will assess flood risk, flood history and building construction to make recommendations on the most appropriate PFR measures.

Product Supply

4

Sourcing quality PFR products and finding reputable contractors can be challenging but there are resources available to help. The National Flood Forum's Blue Pages is a directory of products and services for flood risk management.

Identifying BSI Kitemarked products is important to ensure products are tried and tested.

Product Installation

5

At the stage where PFR products are being installed, ensure that the contractor takes the time to demonstrate measures. Identify any issues with the installation early so that they can be resolved quickly and within any warranty periods.

It is recommended that the measures are independently audited to check that they are fitted properly and that nothing is left unprotected.

Storage and Maintenance

6

Correct storage and maintenance is essential to keep PFR products in working order. Ask the installer to advise on this and check the product manufacturers recommendations.

You should test your products regularly to check for any issues that may impact performance during a flood. Running mini exercises will ensure you can install measures quickly and correctly. This type of training will help you feel more confident during a future flood event.

Important Considerations

Suitability

PFR measures need to be suitable for both the building and the user. If you are away for long periods of time, automatic rather than manual measures may be more suitable. If mobility is a challenge, think about the weight and manoeuvrability of the products chosen.

Quality

It is essential that any measures chosen have been thoroughly tested. Homeowners and businesses should identify BSI Kitemarked products as these have been independently tested.

The PFR Code of Practice, released in 2020, provides detailed guidance on the effective use of PFR.

Storage

PFR measures should be stored appropriately in a dry indoor environment to ensure they are not damaged because this may impact their performance in a flood event. Additional elements, such as screws, should also be carefully stored for easy access.

Maintenance

PFR measures need to be looked after to ensure that they remain fully functional and ready for a flood event. Always follow product manufacturer recommendations to maintain products.

Equipment Testing

It is sensible to test your measures regularly to ensure that you know how they work and that you can assemble them quickly and correctly in an emergency situation. This will also highlight if measures need additional maintenance or if any tools or fittings are missing and need replacement.

Insurance

Residents and business owners at flood risk can find it difficult to access affordable insurance. The Association of British Insurers provides the following tips:

- Shop around - price comparison websites aren't always best.
- Commission a property level flood risk survey. Some insurers will take this information into account.
- Install PFR measures to reduce your flood risk. Some insurers will take this into account.
- Contact the National Flood Forum for help and advice.

Residential

FloodRe is a scheme that makes flood cover available and affordable for some residential properties. FloodRe is not a home insurer itself – instead it works behind the scenes with existing insurance companies, helping them to offer more affordable flood insurance to those in areas at risk of flooding.

Business

Unfortunately there are no schemes like FloodRe available for businesses to help obtain affordable insurance against flooding. However, there are ways that businesses can access affordable flood insurance.

The Association of British Insurers (ABI) has produced a guide, detailing how your insurance company could respond if your property floods:
Responding to Flood - What You Need To Know

Planning, Training & Exercising

Flood Plans

If you live or own a business in a flood risk area, preparing a flood plan is key to minimise the impact of flooding if it occurs.

By planning in advance, not only will you be better prepared to respond in an emergency, you will be better equipped to recover from it in the long term.

The Environment Agency has a Personal Flood Plan Template that is free to download. Business in the Community (BITC) and HM Government have guidance to assist businesses in developing a flood plan.

In addition to having a personal and business flood plan ready in case of an emergency, developing a community flood plan can have a huge impact on increasing the flood resilience of the community. The Environment Agency provides flood plan guidance for communities and groups.

Flood Kits

During a flood, or in the event that you have to leave your home for an unknown length of time, there are a number of key items that you will need quick access to. Having a list of essential and overnight items ready will help you react quickly and grab everything you might need.

Useful resources and websites can be found at the end of this booklet on **page 40.**

Flood Groups

One of the most effective ways to increase flood resilience is to work together in a community group. By joining an existing flood group or setting up a new one in a community at flood risk, you could make a real difference in increasing flood resilience in your community.

The BeFloodReady Community Hub provides a space for flood groups to share experiences, collaborate and learn from each other.

Training and Exercising

Training and exercising can be hugely beneficial on a **personal** and **community** level.

Personal:

- Run through your flood plan, make sure its up to date.
- Run through your flood kit, make sure its up to date.
- Practice fitting your PFR measures regularly so you know you can install everything quickly and correctly. This can highlight any issues that need addressing.

Community:

- Ensure your community flood plan is regularly reviewed and kept up to date.
- Ensure flood wardens have received appropriate training.
- Run community exercises regularly. The Environment Agency or local resilience organisations can help to facilitate this.

Find out more about the importance of planning, training and exercising at:
www.befloodready.uk

Community Spirit

Communities Prepared is a Lottery funded national community resilience programme run by Groundwork South in partnership with the Environment Agency, Cornwall Community Flood Forum and Cornwall College Business.

The programme trains and supports Flood Warden and Community Emergency Volunteer groups nationwide to prepare for, respond to, and recover from, a range of emergencies, including flood, snow, utilities failure, and public health. It builds on a successful pilot phase which ran from 2016-18 in South West England and supported 300 volunteers in 30 communities.

Find out more about Communities Prepared:
www.communitiesprepared.org.uk

COMMUNITIES PREPARED

Notes

Notes

Notes

Resources

Environment Agency: Long Term Flood Risk
flood-warning-information.service.gov.uk/long-term-flood-risk

Environment Agency: Practical advice on what to do to protect yourself and your property
assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/403213/LIT_5216.pdf

Environment Agency: Prepare for Flooding
flood-warning-information.service.gov.uk/long-term-flood-risk/managing-flood-risk

Environment Agency: Personal Flood Plan
assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/444659/LIT_4112.pdf

Environment Agency: Prepare you property for flooding
assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/451622/LIT_4284.pdf

Environment Agency: Flood plan guidance for communities and groups:
assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/292939/LIT_5286_b9ff43.pdf

Know Your Flood Risk: A Business Guide to Flood Resilience
www.knowyourfloodrisk.co.uk/sites/default/files/FloodGuide_ForBusinesses.pdf

Business in the Community: Would you be ready
www.bitc.org.uk/wp-content/uploads/2019/10/bitc-berg-toolkit-wouldyoubereadyguideenglandwalesnorthernireland-jul19.pdf

Business in the Community: Would Your Business Premises Be Ready For A Flood?
www.bitc.org.uk/fact-sheet/would-your-business-premises-be-ready-for-a-flood/

Environment Agency: A guide to preparing your business for flooding
assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/410606/LIT_5284.pdf

HM Government: Business Continuity Management Toolkit
assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/137994/Business_Continuity_Managment_Toolkit.pdf

Property Flood Resilience Case Studies
edition.pagesuite-professional.co.uk/html5/reader/production/default.aspx?pubname=&edid=659cb024-a5d5-4004-acbf-1d9236228817

Property Flood Resilience Case Studies – 2020 Update
edition.pagesuite.com/html5/reader/production/default.aspx?pubname=&pubid=b3dddc3f-8c89-4711-86f3-4f0f9ce9a713

National Flood Forum: Property Protection Advisor
nationalfloodforum.org.uk/about-flooding/reducing-your-risk/property-protection-advisor/

National Flood Forum: Blue Pages
bluepages.org.uk/

FloodRe Flood Re-Insurance Scheme
www.floodre.co.uk/

Association of British Insurers - Responding to Major Floods
www.abi.org.uk/globalassets/files/publications/public/flooding/abi-guide-to-responding-to-major-floods.pdf

Association of British Insurers: Accessing Flood Insurance
www.abi.org.uk/products-and-issues/topics-and-issues/flooding/accessing-flood-insurance/

Find more information and resources at:
www.befloodready.uk

The aim of
this guide is to provide
you with information on
Property Flood Resilience (PFR).

It is designed to help you make
informed decisions about
managing your
own flood risk.

BeFloodReady
befloodready.uk