

**Making properties and estates resilient to
flood risk and water availability in a
changing climate**



National Housing Maintenance Forum
workshop presentation

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Presentation structure

- Learning objectives
- Climate Ready and climate risks
- Measures to manage water availability and flood risk
- Case studies and discussion





Learning objectives

By the end of the workshop you will:

- Be aware of Climate Ready principles
- Understand relevant climate risks
- Know how to identify locations with greatest risk
- Be able to identify opportunities to deal with risks through maintenance
- Know where to get further information and support to realise these opportunities



By the end of the workshop you will:

- Be aware of the principles of EA's Climate Ready (CR) programme;
- Understand risks to housing sector presented by climate change;
- Know where to find out how to identify those locations/areas most at risk from climate change impacts on flood risk and water availability;
- Be able to identify broad opportunities to adapt housing estates to flooding and water availability risks through maintenance programmes;
- Know where to go to get further information and support to realise these opportunities for adaptation.

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- Climate Ready is the Environment Agency's support service to help businesses, public sector and other organisations adapt to the changing climate, launched April 2012.
- It's about considering how current and future climate change will affect development during its lifetime and ensure development is resilient.
- Split into 7 themes each with a lead.
- Themes are based roughly on how the UK Climate Change Risk Assessment 2012 reports risks.



Aim of BE theme –

We provide advice and support to business and the public sector helping them to manage the risks in the built environment so they adapt to climate change.

Built Environment – (defined in UK Climate Change Risk Assessment 2012)

The UK's built environment includes: 27 million homes, commercial and industrial properties, hospitals, schools, other buildings and the wider urban environment.

Very broad scope for influence with a wide range of customers and processes.



Risks for the built environment (from UK Climate Change Risk Assessment 2012)

Climate change - more frequent extreme weather events and rising sea levels. This is likely to result in:

- Increased intensity of rainfall events - increased frequency of flooding (coastal, river and surface water flooding)
- Long periods of low rainfall – limited water availability and more water restrictions
- More frequent periods of high summer temperatures – heat stress affecting health and wellbeing (not covered in detail in this presentation but basic info sources supplied)

Through Climate Ready we want to encourage new and existing development to consider and plan for these risks in the context of the lifetime, sensitivity and location of the development.

 **What are the implications for housing associations?**

- Supporting people most vulnerable to climate risks
- Need to meet rising housing standards
- Tight budgets – prioritise investment and optimise outputs



Often the most vulnerable groups in society live in social housing. These groups will need more support to cope with impacts such as:


Supporting vulnerable groups through these risks:

- Economic – increasing costs for water, insurance, replacing flood damaged contents.
- Social – hotter weather and heat stress.
- Environmental – maintaining the environment around them when there is high temps, limited water or excessive water.

Meeting housing standards - Decent homes will have started the process to manage climate risks (water efficiency), but other potentially other future drivers – e.g. Green Deal, or in locations where conditions are more extreme causing problems that need solutions above and beyond current standards.

Huge range of demands in asset management with squeezed budgets. Need to get the most from maintenance and prioritise investment.

How can HA's begin to identify and deal with these risks through maintenance?

 **How do you identify current and future flood risk?**


Flood risk info - EA and Lead Local Flood Authorities

Main river and coastal flood risk:

- EA flood map – on website under flood, click ‘Am I at risk of flooding?’

Main and ordinary river, coastal and surface water flood risk:

- Local Authorities – Strategic Flood Risk Assessments



You will often know if you have a problem with flooding as you will have had experience of it...but there are some resources that can help you identify risks and just because you haven't experienced floods in recent years doesn't mean you are not at risk.

EA flood risk role – lead on coastal and river flooding from ‘main rivers/watercourses’ (main rivers – are rivers with the highest risks to people and typically run through urban areas)

Lead Local Flood Authorities (LLFAs) were designated by the Floods and Water Act 2010 and are County Councils and Unitary Authorities. They lead on groundwater and surface water flooding and flooding from ‘ordinary rivers/watercourses’ (ordinary rivers/watercourses are lower risk and typically rural).

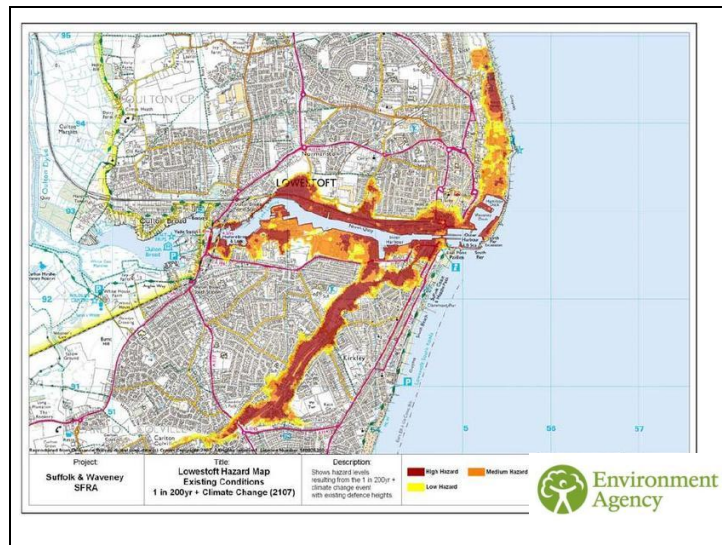
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EA flood map notes:

- It shows the likelihood and consequences of flooding that could happen now.
- Considers climate changes that have already happened.
- BUT - does not show how the risks will increase in the future due to climate change – we are developing this.
- As a guide - the potential extent of an extreme flood shown on the Flood Map might in future become more 'normal' as a result of climate change.


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SFRA flood map extract – just an example, they will all look a bit different! But more detailed than EA flood map.


SFRAs:

- Carried out by one or more local planning authorities to assess the risk to an area from flooding from all sources
- Takes account of the impacts of climate change
- Assesses the impact that changes or development in the area will have on flood risk
- It may also identify, particularly at more local levels, how to manage those changes to ensure that flood risk is not increased.

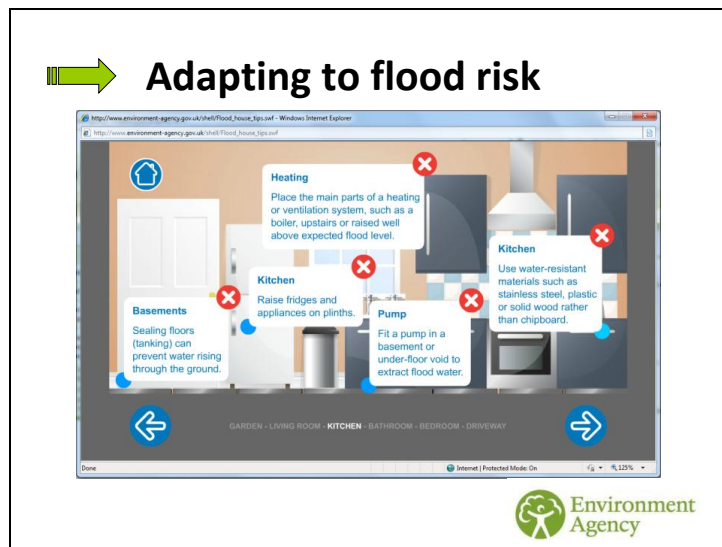


Other sources of flood risk information

- Areas Susceptible to Surface Water Flooding map and Flood Map for Surface Water (EA)
<http://www.environment-agency.gov.uk/research/planning/129324.aspx>
- Lead Local Flood Authorities (LLFAs) are responsible for producing the following:
 - Preliminary Flood Risk Assessment (PFRA) (out now)
 - Flood Risk/Flood Hazard Maps (due 2013)
 - Flood Risk Management Plan (due 2015)



Flood risk data is evolving with changing roles across the EA and Lead Local Flood Authorities , with time we hope there will be a comprehensive flood map covering all sources, but this will take time.



Opportunities to manage risks can be found on our 'Interactive flood house' on EA website provides options.

Some of these could be address through maintenance.

- Flood resilient materials (alternatives to chipboard and plaster board, tile flooring/hard wearing flooring);
- Flood protection measures (non return valves on drainage and pipes, flood gates, covered air bricks, raised electrics, raised appliances);
- Emergency planning – ensuring the house can function in a flood (water supplies for drinking and WCs, storage space on upper floors for supplies, hooks to hang soft furnishings above flood water);

Also, to manage surface water:

- SUDS (integrating SUDS into estates, including in buildings e.g. green roofs, or into communal areas/green spaces).

Further help: Clearly choice of measures depends on the local situation and level of flood risk. For further information and support for coastal and river flooding contact your local Environment Agency office for advice. For further information and support for surface water flooding contact your Lead Local Flood Authority.


Note on SUDS – SUDS Approval Bodies (SABS) will be responsible for approving SUDS schemes. EA a consultee but likely to focus on larger schemes and in high risk catchments 'rapid respond catchments'.

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 **Flood warning and response**

- Important in managing risks
- Community Flood Plans
- Information sources provided in further information section



• Flood warning and response also very important in managing risks – not covered in this presentation but sources of information are provided in the further info section.

• Community Flood Plans can be developed for communities at risk.

• Prepared by EA or Lead Local Flood Authority, depending on the source of risk (if main river, then EA, if surface water or ordinary water course then LLFA).



Flood risk – further information

- Environment Agency Interactive Flood House
<http://www.environment-agency.gov.uk/homeandleisure/floods/31644.aspx#>
- Designing for exceedance in urban drainage - good practice (CIRIA, 2006)
<http://www.ciria.org/service/bookshop/core/orders/product.aspx?productid=123>
- SUDS Manual (note – this is in the process of being updated)
<http://www.ciria.org/SERVICE/Home/core/orders/product.aspx?catid=2&prodid=155>
- Susdrain – advice on retrofitting SUDS
<http://www.susdrain.org/delivering-suds/retrofitting/why-retrofit/why-change.html>







Flood risk – further information

- Community Flood Plans – Environment Agency
<http://www.environment-agency.gov.uk/homeandleisure/floods/38329.aspx>
- Prepare your property for flooding – Environment Agency
<http://www.environment-agency.gov.uk/homeandleisure/floods/31644.aspx>
- Guidance on how to use sandbags for flood protection
<http://www.environment-agency.gov.uk/homeandleisure/floods/106769.aspx>
- JBA Consulting – produce guidance on property level protection and flood emergency planning - <http://www.jbaconsulting.co.uk/>



➡ **How do you identify where water availability is a problem**

- Water efficiency is important everywhere!
- More problematic in some areas
- Classification of water stress and metering



- Our water resources role – joint role with water companies.
- Water efficiency is important across the country, however, some areas may **have** limited water availability and an increasing population and will therefore require a greater degree of water efficiency measures.
- EA classification of water stressed areas (2012):
 - Will identify water companies that abstract from ‘seriously water stressed’ waterbodies
 - These water companies will need to consider compulsory metering as an option to effectively manage water resources within the statutory WRMP process.
 - Water Resource Management Plans (due 2014) produced by water companies will indicate if they are going to implement metering in their area.
 - BUT – even if not in current management plan, could be introduced in the future - remember water availability is likely to be more of a challenge in the medium to long term.

Notes:

Water stress maps are produced by the EA as evidence to advise the SoS on areas of water stress so we can exercise and power under Water Industry Act 1999.



Opportunities to manage risks through maintenance (i.e. measures that could reasonably be part of maintenance):

- Low water flow fittings (taps, showers, toilets, baths etc.)
- Low water flow appliances (washing machines, dishwashers etc. – if provided)
- Water recycling appliances (water butts for garden use, rainwater harvesting for internal use, grey water recycling) NOTE – rain water harvesting for domestic use and grey water recycling are only viable on a larger scale – i.e. on a block of flats, not individual properties.
- Water efficient landscaping (soil materials and plants that need less water)

Education around water usage also critical, but not necessarily part of maintenance programmes. See further information section for information.

Clearly choice of measures depends on the local situation and level of risk around water availability. The water supplier can provide bespoke support to HAs on making such choices.



Water availability – further information

- Conserving water in buildings <http://publications.environment-agency.gov.uk/pdf/GEHO1107BNJR-E-E.pdf>
- Radian Homes 'Retrofit South East' water efficiency retrofitting in social housing <http://www.radian.co.uk/201004072131/retrofit.html>
- Water efficiency in the South East of England <http://publications.environment-agency.gov.uk/pdf/GEHO0407BMNC-E-E.pdf>
- Plugin Midlands <http://pluginmidlands.wordpress.com/>
- Green Deal <http://www.energysavingtrust.org.uk/Publications2/Energy-efficiency/Green-Deal-guidance-for-the-water-sector>
- SHIFT <http://www.sustainablehomes.co.uk/shift/membership/>





Heat stress – further information

- A Cool Place to Live (London Wildlife Trust)
<http://www.wildlondon.org.uk/Pages/Category.aspx?Title=a-cool-place-to-live&IDCategory=19568cbc-2c48-40a0-aec5-f1f34fb32e4e>
- Beat the Heat http://www.ukcip.org.uk/wordpress/wp-content/PDFs/Beating_heat.pdf
- BIOPICCC: Built Infrastructure for Older People in Conditions of Climate Change <http://www.arcc-cn.org.uk/project-summaries/biopiccc/>








Heat stress – further information

- 'SNACC' Suburban neighbourhood adaptation for a changing climate: identifying effective, practical and acceptable means of suburban re-design
<http://www.arcc-cn.org.uk/project-summaries/snacc/>
- 'CREW' Community Resilience to Extreme Weather
<http://www.arcc-cn.org.uk/project-summaries/completed-projects/crew/>
- CREW and SNACC summary - <http://www.arcc-cn.org.uk/network-outputs/syntheses-of-project-findings/>




 **Overview**

- Identifying current and future climate risks
- Adaptation options and priorities
- Further information and support



- Preparing for climate change – current and future risks around flooding and water resources.
- Adaptation is likely to be needed everywhere, but in some locations need to adapt will be more urgent.
- Preparation for the ‘future’ depends on lifetime of the development and likely climate challenges in that location during its lifetime.
- Maintenance programmes provide opportunities for changes that can promote adaptation. Where risks are greatest, immediate efforts can be focused.
- Support is available from the Environment Agency and other organisations such as water companies to help identify risks and how to respond to the risks.




JBA
consulting

**Flood Risk Case Study –
Property Level Flood Protection**

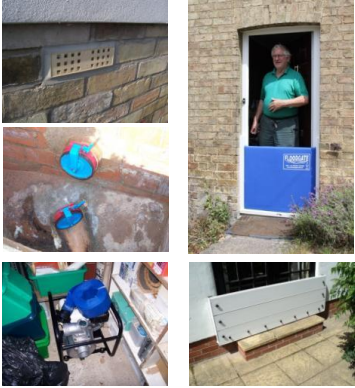
Phil Emonson BSc MSc FRGS MCIWEM C.WEM
Chartered Senior Analyst

Consultants
of the Year 2010
Winner

What Is Property Level Protection?



- Resistance – prevent water entering property
- Resilience – act to reduce the amount of damage caused if it does
- Manually deployed and automatic
- BSI Kitemark
- Cost-effective means of flood mitigation



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Property-level protection (PLP) consists of manufactured products or ‘measures’ that can be fitted in and around a property. There are two forms these can take; resistance measures (aimed at preventing flood water from getting in, such as those shown here, self-closing air bricks, non-return valves, dewatering pumps and door barriers), and resilience measures) which act to reduce the amount of damage caused if it does (such as waterproof plaster, tiled floor coverings, raising of electrics etc).


Before any of these measures are installed, an effective survey of a property will identify all sources of flooding and ensure correct recommendations are made.

Some measures are deployed manually (by a homeowner or maintenance ‘Flood Response’ team), whereas others such as self-closing air bricks, non-return valves (and even UPVC flood doors) operate automatically. To provide reassurance to homeowners it is important that products provided have been awarded the BSI Kitemark wherever possible – tested for leakages etc

There is overwhelming evidence that PLP is a cost-effective solution to ensure properties remain resistance and resilience to flood risks.

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Case Study – Toll Bar, Doncaster



- Defra funded grant scheme for local authorities – Doncaster Met BC
- St. Leger Homes, 20 properties
- All 20 provided with PLP measures to make them resistant and resilient to flooding
- Some properties required sealing & improvements to minimise water ingress = makeover
- HA taken over responsibility for deployment, checking and testing of products:
 - Products stored in container onsite
 - HA have a flood response team, work jointly with the council to deploy measures when warning of a flood event.

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Scheme was part of a Defra funded grant scheme for local authorities (2010-2011), which was a pilot scheme for PLP. St Leger Homes had an interest in 20 of the properties, all of which had experienced significant flooding, most notably in 2007.

All 20 were provided with flood resistance and resilience measures – such as the door barriers, air brick covers etc

A number of the properties were in a poor state of repair, and needed significant sealing and repair to minimise the risk of water ingress through walls, cracks, joints etc... In some respects they had a makeover

HA have taken over responsibility of the deployment, storage, checking and testing of the products. They're stored in a container on site , and the HA have a flood response team who work with the council to deploy any measures upon receipt of a flood warning from the Environment Agency.

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Property Level Protection in Action



- It does work!



- Engaging with the residents is key; raises awareness about flood risk



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PLP is a growing , cost-effective solution in which to provide flood risk mitigation. These two examples are a scheme I was involved with, which flooded in July 2012 – and worked.

We have heard of examples of “scheme failure”, but actually this is human failure in the provision of the correct products for the property (for example, were pumps provided to address the risk of rising groundwater through the flooring - that’s why an independent survey is so important!), that the products were not stored properly, or deployed on time. But all products supplied should be KiteMark tested, so will work to a given depth of water. But if all parts of the jigsaw are in place, then the scheme will work.

But PLP delivery isn’t just about products... Effective and on-going engagement with residents is key to increasing education and raising awareness about flood risks. This can involve community events, testing the deployment of measures in an exercise situation, are the creation of Flood Action Groups.

EMERGENCY PLAN

Plugin West Midlands



Water resources case study

**Doug Clarke, Severn Trent Water,
Water Efficiency Manager**



Plugin West Midlands

- Water efficiency measures in West Midlands
- Partnership project
- Sustainability Housing Award



**Sustainable Housing
AWARDS 2012
WINNER**

Project supported housing association residents in west Midlands save water by installing free water saving products and providing advice on water usage.

Partnership project in West Midlands between Environment Agency, Severn Trent Water, South Staffs Water, Global Action Plan, Wolverhampton Homes, Orbit Heart of England, Optima Community Association, Black Country Housing Association and Accord Housing.

Sustainable Housing Awards winner 2012 for community engagement.




Plugin West Midlands

- Business as usual approach
- Training for maintenance teams
- Range of devices installed




Delivery through maintenance and links with resident education:

- Installations were done through planned and routine maintenance, Decent Homes work and on change of tenancy – making water saving part of ‘business as usual’.
- Maintenance teams were trained by the water companies to install and explain the products and use this to talk to residents about other ways to save water and energy. (photo)
- Included the following types of device:
 - Water-efficient showerhead
 - ShowerSave adapters
 - Save-a-flush bags
 - Tap inserts (twin)
 - Shower timers
 - Dual flush conversion kits
 - Water saving guides

 **Plugin West Midlands - outcomes**

- Water-saving equipment installed in 3,300 homes
- The water saving products save almost 40,000 litres of water a day
- Now the project is moving to East Midlands



Project outcomes

- Water-saving equipment installed in 3,300 homes
- The water saving products save almost 40,000 litres of water a day – equivalent to the water use of about 308 people.

Now moving into East Midlands...

 **Discussion**

- Any questions on presentation / case studies?
- Have you used any of these existing resources? If so, were they useful?
- What other support do you need?