

Improving Flood Resilience in Housing



Relevant Case Studies

DARD Rivers Agency - Flood Maps

Red Cross - Flooding and Mental Health

This information sheet is part of the Climate Northern Ireland built environment hub.

The United Kingdom Climate Impact Projections (UKCP09) suggest Northern Ireland will experience increased winter rainfall, with precipitation falling in shorter more intense extreme events as drivers for increased flooding events arising from climate change¹. Residential properties at significant risk from flooding have been identified as a priority risk from the Climate Change Risk Assessment for Northern Ireland².

An estimated 60,000 properties in Northern Ireland at risk of flooding from rivers and the sea, although approximately 50% of these

are protected by flood defences. The city of Belfast has a population of approximately 333,871³ with 10,000 properties currently at risk of coastal and river flooding⁴. Even if the number of properties at risk does not increase significantly in the future, the frequency of flooding of properties already at risk is likely to increase based on current projections. The effects of flooding are wide ranging. In residential areas these include: loss of homes and possessions, reduction in property value and difficulty getting mortgages and affordable property insurance⁵.



Overview

There is a logical hierarchy for strategies dealing with flood risk⁶:

Avoidance - The simplest approach is to avoid the risk by not building in flood-prone areas such as flood plains.

Resistance - Incorporating permanent or temporary barriers such as door dams and non-return drainage valves may 'dry proof' a building for short-duration floods and flood depths of up to 1m.

Resilience - Buildings can be made more resilient by designing them to minimise damage and simplify reinstatement once the flood has subsided, a technique referred to as 'wet proofing'.

Policy and legislation

The relevant policies and legislation for flooding in relation to housing are as follows:

1. European Union Floods Directive

(2007/60/EC) confirms that development can exacerbate the consequences of flooding and identifies the important role of the planning system in managing development to reduce the risks and impacts of flooding. This Directive is transposed to local legislation through the **Water Environment (Floods Directive) Regulations (Northern Ireland) 2009**.

2. Flood Risk Management Plans (DARD, 2015) highlight the flood hazards and risks in the 20 most Significant Flood Risk Areas in Northern Ireland with regards to flooding from rivers, the sea, surface water and reservoirs.

3. Strategic Planning Policy Statement for Northern Ireland (2015) aims to prevent future development that may be at risk from flooding. It provides information on the regional strategic objectives for the management of flood risk and the regional strategic policy which must be taken into account in the preparation of Local Development Plans and in the determination of planning applications.

4. Planning Policy Statement 15 (PPS 15) – Planning and Flood Risk sets policy to minimise flood risk to people, property and the environment. It asserts that flood avoidance through the careful selection of housing and economic zonings is a measure by which development plans can play a role in furthering a more sustainable approach to flood management.

5. The Regional Development Strategy

2035 (RDS) recognises the need to avoid, where possible, the selection of flood prone land for employment and housing growth. It urges the planning system to adopt a precautionary approach to development in areas of flood risk and the use of the latest flood risk information that is available in order to properly manage development.

6. Water & Sewerage Services

(Amendment) Act 2016 only permits stormwater discharges to combined sewers in exceptional circumstances, and then the use of storm attenuation to prevent pollution and out of sewer flooding. NI Water can adopt hard components of SuDS and can also require the consideration of SuDS as part of the application to connect.

C. CIBSE TM55 Design for Future Climate

Provides case studies for improving resilience and adapting buildings.

D. BRE Centre for Resilience

Identifies the critical issues that need to be addressed to develop a resilient built environment. BRE offer flood resilient design and construction techniques.

E. BRE - A Future Flood Resilient Built

Environment - this white paper by Dr Stephen Garvin aims to encourage successful approaches that address existing and future developments in the built environment.

F. Home Quality Mark - BRE developed a new voluntary sustainability standard for new homes, based on flood resilience, well-being and carbon footprint.

G. London Climate Change Partnership

produced reports on '*Your home in a changing climate*' which looks at the steps that can be taken to retrofit homes. This was adapted for tower blocks and social housing with '*Your social housing in a changing climate*'.

H. Climate UK offers a range of presentations that provide information on how developments and buildings can be adapted to be resilient to the impacts of climate change and extreme weather.

Tools and guidance

The following list provides a range of tools and guidance for practitioners who want more information on adapting houses to flooding. *Links available on back page.*

A. Innovate UK - Design for Future

Climate Contains a comprehensive library of resources including project reports, guidance and frameworks for undertaking adaptation assessment, presentation material, cost analysis and policy documents supporting adaptation and resilience.

¹ UKCP09 (2009) <http://ukclimateprojections.metoffice.gov.uk/>

² Defra (2012) http://www.climatenorthernireland.org.uk/cmsfiles/resources/files/climate_change_risk_assessment_NI_2012_FULL-REPORT.pdf

³ Based on 2011 census taking account of the 2015 council reform.

⁴ British Red Cross (2010) <http://www.climatenorthernireland.org.uk/cmsfiles/resources/files/Cut-off-by-the-floods-report-2012.pdf>

⁵ DOE (2006) http://www.planningni.gov.uk/index/policy/planning_statements_and_supplementary_planning_guidance/pps15-flood-risk.pdf

⁶ Bill Gething and Katie Puckett (2013) Design for Climate Change



climatenorthernireland.org.uk

Links to tools and guidance:

- A. <https://connect.innovateuk.org/web/design-for-future-climate>
- B. <http://www.ribabookshops.com/item/design-for-climate-change/77532/>
- C. https://connect.innovateuk.org/documents/3239554/6021575/CIBSE%20TM55%20Design%20for%20Future%20Climate_%20Case%20Studies.pdf
- D. <https://www.bre.co.uk/resilience>
- E. <https://www.bre.co.uk/filelibrary/pdf/FutureFloodResilientBuiltEnvironment.pdf>
- F. <http://www.homequalitymark.com/>
- G. <http://climatelondon.org.uk/wp-content/uploads/2012/10/Your-home-in-a-changing-climate.pdf>
<http://climatelondon.org.uk/wp-content/uploads/2013/02/Your-social-housing-in-a-changing-climate.pdf>
- H. <http://climateuk.net/event/building-resilient-environment>



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