

AQUATECTURE

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baca

ARCHITECTURE
STRATEGIC PLANNING
ENVIRONMENTAL DESIGN

WORKING WITH WATER

RIBA 

**RIBA President's Award for Practice
Based Research 2009 & 2014**

defra 

**Innovation Fund
The Life Project**



**Architecture Review / MIPIM
Masterplanning award 2014**



**The Waterways Trust
Masterplanning Award 2013**

IULA^{'10}

**International Urban Design Award 2010
Bronze Medal**



**Green Dot Awards 2010 & 2014 (US)
Bronze Medal**



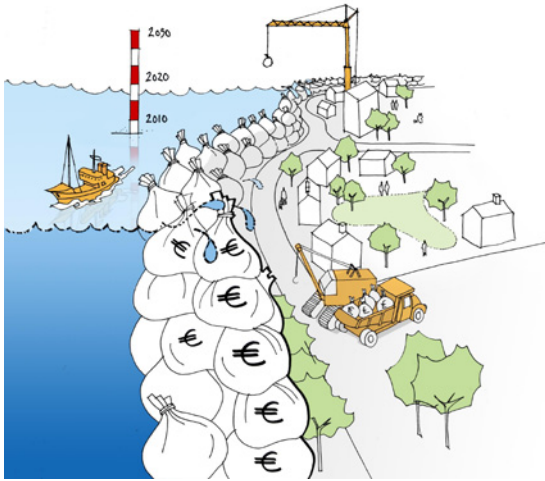
**HCA Sustainability Framework
Consultant**



**Cities and Flooding Handbook
The World Bank 2012**

UK's first Amphibious House

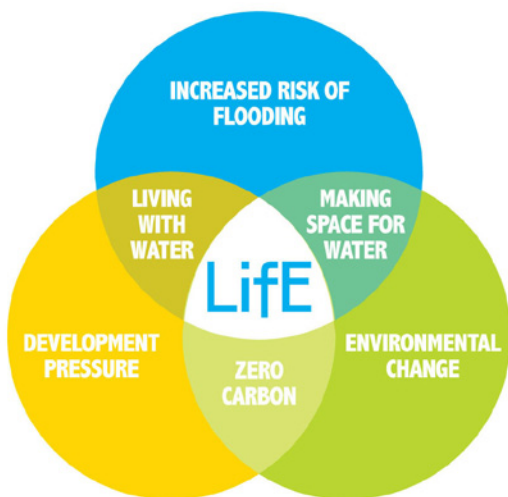




CONTINUAL IMPROVEMENT OF FLOOD DEFENCES COMES AT A COST AND STILL FACES RISK OF POTENTIAL FAILURE.



HOLISTIC DESIGN IDEAS ARE REQUIRED TO AVOID DEFERRING PROBLEMS TO OTHER AREAS.



DESIGN APPROACH TO THE Life PROJECT

Opening the floodgates

With few obvious sites available for new development and existing towns hemmed in by protected Green Belt land, pressure to build new homes on floodplains is greater than ever. However, floodplains are expanding. Rising sea levels and stormier weather, caused by climate change, are putting more land at risk of flooding. Compounding this problem, each new home built results in more greenhouse gases emitted, leading to further global warming.

In recent times flood protection has been concerned with keeping water out, defending property from water and living on dry land. Globally, there has been a change in attitude towards flood protection in response to the growing risk and uncertainty generated by climate change. The future of flood protection is in part a return to that of the past. Focus has shifted to more traditional flood-management techniques that allow land to be sacrificially flooded.

“These changes [in attitude] are required because traditional water-management methods are reaching their limits: technical measures alone are insufficient.” www.levenmetwater.nl

Barker and Coutts Architects (Baca) developed the Life project (Long-term Initiatives for Flood-risk Environments) to explore how to resolve the conflicting ambition for new development and making space for water. This initiative is based on 3 key principles.

An Integrated Solution

The solution is to combine ‘natural’ ecological flood-management and sustainable construction. Land and water assets become multi-functional, integrating selective and innovative development with land for recreation, renewable energy production, local food production, water storage and flood alleviation.

Longevity & Adaptability

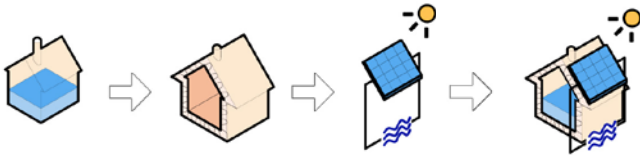
A versatile and adaptable flood-alleviation strategy is required, which through a multifarious response to risk and vulnerability, can cope with the increasing unpredictability and severity caused by climate change. Secondary and tertiary mechanisms to cope with flooding need to be integrated into design and planning so that protection is not just reliant on a singular fallible line of defence.

Continuity of Life

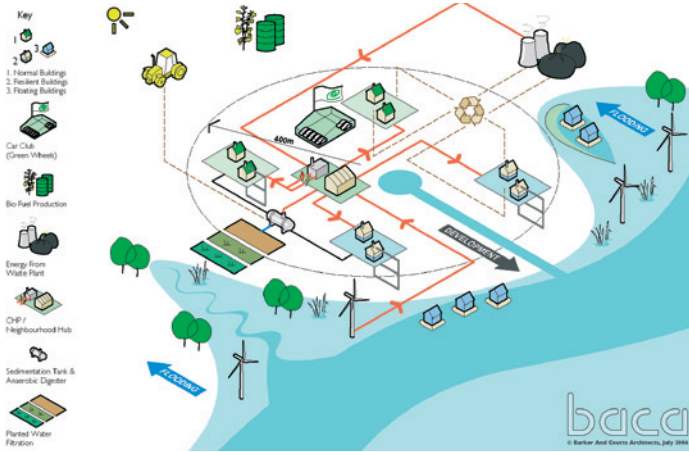
A further shift in concept is that increased flood occurrences should not disrupt life and business. Design should be based on providing ‘continuity of daily life’ - before, during and after a flood - to avoid the detrimental economic and social impacts that would otherwise result. A development that intrinsically provides flood resilience, through intelligent design and planning, should give insurers and financiers the confidence to offer affordable, long-term policies and investment.

This holistic approach could potentially release land for development that would not otherwise be available, allowing urban growth without creating urban sprawl, and improving links with existing communities.

The principles of BACA's approach are illustrated in the adjacent diagram.



INTEGRATED DESIGN. THE LIFE PROJECT EXPLORES WHAT CAN BE INTEGRATED, WHY AND WHAT IT MIGHT COST



The Life™ Project

Baca, with the Building Research Establishment (BRE) and an Expert Team (Cyril Sweett, Halcrow, Fulcrum Consulting & LDA Design), was awarded a grant by DEFRA as part of the 'Making Space for Water' programme 'Innovation Fund' to develop a set of generic planning and design principles for the integration of sustainable development with ecological flood-mitigation, and a concise illustrated handbook.

The team developed 3 conceptual masterplans on sites around the UK to determine and illustrate generic principles. A Life integrated planning toolkit was produced for Hackbridge, and awarded the EU Regio Star Award 2012.

CAN project

Further research was carried out into climate adaptation. The Climate Adaptive Neighbourhoods (CAN) research advanced an innovative masterplan for a prominent regeneration site in Norwich to create a holistic and adaptable design that could respond to a range of future climate issues.



Site 1: The River Wandle, Hackbridge

An upper catchment urban site. Multi-use amenity space, rain gardens and river naturalisation are explored to slow and store floodwater away from people's homes.

Site 2: The River Nene, Peterborough

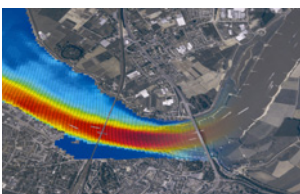
A middle catchment sub-urban site. Adaptable buildings, integrated flood conveyancing energy corridors, and fast recovery landscape are explored, to allow floodwater to flow through the site, without disruption to use.

Site 3: The River Arun, Littlehampton

A lower catchment rural site. Integrated tidal lagoons, incremental regional flood-management and aquatic buildings are explored to create development opportunities, new habitat, flood protection and energy generation.

The Eiland Veur Lent, Nijmegen

Construction began in 2013 on a major flood-relief channel in Nijmegen, Netherlands as part of the national 'Room for the River' programme. The project also includes a major dyke relocation and 3 new bridges. The resulting island will be a 'Retreat' combining water recreation, river ecology, flood-resilient development and sustainable infrastructure to create a self-sufficient 'eco-leisure' destination.

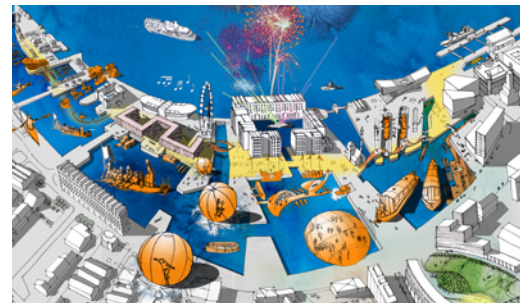


FLOOD MAP



+8m FLOOD LEVEL





WORK IN PROGRESS >

UK'S FIRST AMPHIBIOUS HOUSE COMPLETED
 FLOOD-RESILIENT PROTOTYPE PROPERTY, BRE INNOVATION PARK
 INTEGRATED FLOOD DEFENCE HANDBOOK, SHOREHAM
 FLOATING PROPERTIES IN LIVERPOOL AND LONDON
 CLIMATE ADAPTIVE NEIGHBOURHOODS
 MODULAR ADAPTABLE CONSTRUCTION
 FUTURE CITY DESIGN WITH WATER, SHANGHAI

Clockwise from top left

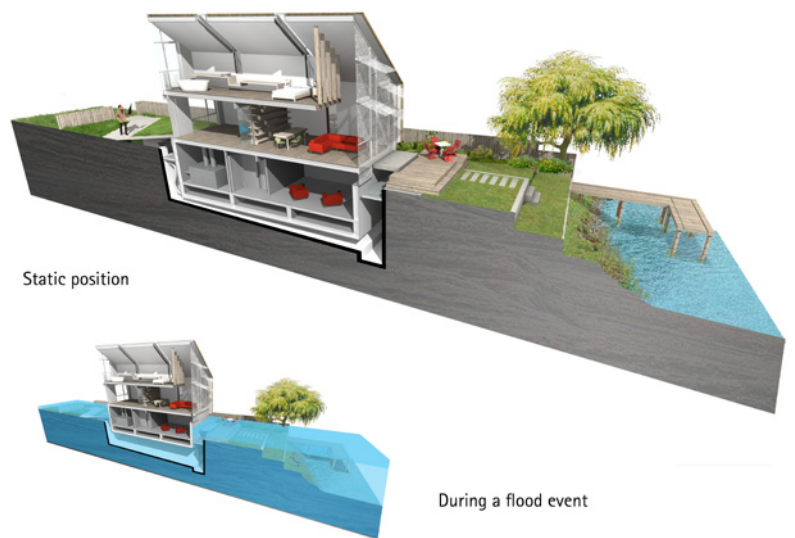
The Floating Village > 75 floating homes and businesses planned for the Royal Docks, London.

Liverpool South Docks > A comprehensive waterspace strategy for this World Heritage site.

Aquobox > Flood-Resilient Property for Defra, BRE innovation park, Watford.

The UK's first amphibious house (can float) has been completed on the River Thames.

Eiland Veur Lent, Nijmegen, NL > Plans for an 'eco resort' are combined with a major Room for the River project and architectural innovation.



Baca is an award-winning, research-led design practice specialising in integrated environmental and high-quality design.

The practice has a diverse array of projects that includes one-off houses, social housing, masterplanning, memorials and commercial projects.

Baca is internationally recognised for innovation in flood-resilient and adaptable architecture and spatial planning.

Baca are the project leaders of the LiFE project, exploring innovative ways to tackle flooding and climate change through the built environment.

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