

The Thames Amphibious House

by Richard Coutts / © 2018-06-15 16:32:54 / International / © 41958 / EN

New Construction

Static position

During a flood event

Primary energy need :

80.26 kWhpe/m².year

(Calculation method : Other)

ENERGY CONSUMPTION

Economical building *Building*

< 50	A
51 à 90	B
91 à 150	C
151 à 230	D
231 à 330	E
331 à 450	F
> 450	G

Energy-intensive building

Building Type : Isolated or semi-detached house
Construction Year : 2015
Delivery year : 2015
Address 1 - street : SL7 1QE MARLOW, United Kingdom
Climate zone : [Cfb] Marine Mild Winter, warm summer, no dry season.

Net Floor Area : 205 m²
Construction/refurbishment cost : 750 000 €
Cost/m2 : 3658.54 €/m²

Certifications :



General information

An amphibious house is a building that rests on the ground on fixed foundations but whenever a flood occurs, rises up in its dock and floats there buoyed by the floodwater.

The amphibious house is located adjacent to the River Thames in Marlow is a UK first. Based on the practices pioneering non-defensive approach to make space for water within the built environment - the house marks a valuable and critical contribution to both architectural design and flood resilience discourse.

The Amphibious House is a highly innovative approach to tackle extreme flooding. The 250 tonne house, which sits on the ground within a purpose made dock, is able to rise up to 2.7m when a flood occurs, buoyed by the flood water; whilst remaining connected to all utilities through flexible servicing. Built on the banks of the River Thames in Buckinghamshire, the house is the first to secure Planning, Building Regulations and to be constructed in the United Kingdom.

The house uses technology from marine and bridge construction as well as conventional building to create an elegant solution to flooding that is also attractive and complimentary to the setting. The flotation attributes, including the guide-posts, slide-gear and flexible services are expressed in the architecture as is the industrial weatherscreen skin. The triple height glazed facade allows views of the river from all floors. The northern elevation provides a simple complement to neighbouring houses.

The unique 225sqm house, which is located just 10m from the river's edge and within a Planning Conservation Area the house, also provides an intelligent and contextual response to its setting. The design was tailored to overcome the challenges of having no vehicular access to the site, limited space to work and needing all plant and materials to be brought across the river via a lightweight chain ferry. This pioneering prototype house passed a full float test before client occupation.

The Amphibious house demonstrates that architecture, engineering and flood strategies can be holistically combined to create beautiful buildings that allow occupants to enjoy living near water safely.

See more details about this project

<https://www.dezeen.com/2016/01/20/baca-architects-bouyant-amphibious-house-river-thames-buckinghamshire-floating-architecture/>

Stakeholders

Contractor

Name : (Greenfords)

Contact : Simon Rogers

<http://greenford.ltd.uk/>

Construction Manager

Name : Creative Interiors

Stakeholders

Function : Others

Techniker (Structural)

Matthew Wells

<https://www.techniker.co.uk/>

Design of can-float base and civil engineering

Contracting method

General Contractor

Type of market

Table 'c21_algeria.rex_market_type' doesn't exist

[Close liaison with Environment Agency](#)

[Close liaison with Planning Department](#)

[Close liaison with Building Control](#)

If you had to do it again?

We are now on to our next generation of amphibious and floating homes. This building type now has proof of concept in the UK , which means securing planning for the next generation should be easier. We have learned a great deal regarding its construction and have

Building users opinion

Our site is at flood risk. We considered raising the house on stilts but we were restricted by planning rules as to how high we could build. Also we didn't want too many steps in old age. The amphibious house will provide us with more accommodation on a small footprint that can rise during a flood event to keep us and its contents safe and dry. The build was challenging as everything had to come across the river but we now have panoramic views across the river safe in the knowledge that the house can adapt as necessary to rising river levels.

Energy

Energy consumption

Primary energy need : 80,26 kWhpe/m².year

Primary energy need for standard building : 100,00 kWhpe/m².year

Calculation method : Other

Systems

Heating system :

- Individual electric boiler

Hot water system :

- Other hot water system

Cooling system :

- Reversible heat pump
- No cooling system

Ventilation system :

- compensated Air Handling Unit

Renewable systems :

- Solar Thermal

Renewable energy production : 20,00 %

Smart Building

BMS :

House uses a Hive Hub 360 - providing heating, cooling & security control plus energy and water consumption monitoring.

Environment

Urban environment

The site for the replacement dwelling is on an isolated island on the River Thames. This meant that all construction components had to be designed to be transported across the river and assembled with limited mechanical means.

Land plot area : 350,00 m²

Built-up area : 35,00 %

Products

Product

Amphibious Dolphin

Techniker engineering / Baca Architects

Techniker engineering / Baca Architects

<http://www.baca.uk.com>

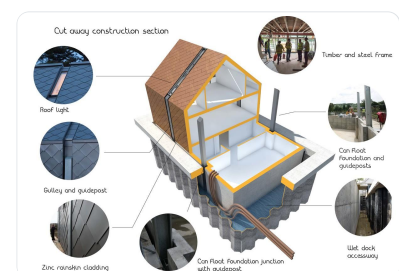
Product category : Gros œuvre / Structure, maçonnerie, façade

The dwelling is set between four galvanized steel columns termed 'dolphins'. A bespoke running mechanism is fixed between the house and guide posts to facilitate smooth vertical movement as the house rises and falls.

The dolphins hold the house true and level against the river current during a flood.

Services connect the house with land. Insulated and flexible pipes run along the side of the house, within the wet dock, to pump wastewater into a treatment tank set in the ground.

Similar to servicing a boat/yacht the sliding gear requires testing with an annual float test lifting the building a minimum of 300mm from its static position



Costs

Construction and exploitation costs

Total cost of the building : 750 000 €

Energy bill

Forecasted energy bill/year : 800,00 €

Real energy cost/m² : 3.9

Real energy cost/Dwelling : 800

Carbon

GHG emissions

GHG in use : 21,64 KgCO₂/m²/year

Contest

Reasons for participating in the competition(s)

The UK's first amphibious house - A flood resilient home adaptable to rising river levels

Building candidate in the category



Smart Building



Users' Choice

