

flood risk – rethinking our approach to what can be done

The more onerous flood risk rules introduced in 2016 need to be more intelligently applied if we are to deliver much-needed housing and reduce the levels of flood risk for the existing stock, says **Justin Meredith**

Floodline Developments/Broadway Malayan



Proposed flood-resilient 'can-float' homes

In February 2016 the Environment Agency (EA) announced significant amendments to the 'climate change allowances' when assessing flood risk to existing properties as well as proposed new developments.

Previously, when assessing flood risk the industry was required to model flooding based on a 1-in-100-years flood event, plus a climate change allowance of 20%. Now, under the new guidance, the industry is required to model for a 1-in-100-years flood event plus a challenging range of climate change allowances for peak river flow and peak rainfall intensity (up to 105%). The range is dependent upon where the property is, its expected life, and the classification of the development. For coastal areas there is an additional requirement for predicted sea level rise of

between 0.99 metres in the North and 1.21 metres in the South.¹ These changes apply even to development sites that have already been allocated, which may now be considered unviable for development. This will further restrict the supply of land for much-needed housing and could limit economic growth.

The implications for the existing housing stock and for policy

In essence, flood zones 2 and 3 have just got a lot bigger, and existing communities that were previously above the flood risk zone may now be considered to be at risk. In addition to the challenges for permitting new developments, these changes will have a significant effect on owners' ability to insure existing properties and on the levels of premiums

demanded. There is now an unacceptable risk to local communities in flood-prone areas, at a time when the condition of critical flood defences is in decline, and when councils are short of funds and making significant cuts to their budgets.

Clearly the country needs a planning framework that does not result in new development that is susceptible to flooding. Policy should discourage development that creates greater flooding issues in other areas by pushing the water (and the problem) to somewhere else. The National Planning Policy Framework (NPPF) clearly aligns with these requirements; but with the need for housing on the increase, with the impacts of earlier developments in the floodplain now being clearer, with budgets for flood infrastructure under pressure, and with the supply of usable land now expected to decrease due to climate change, it is clear that existing policies must either be changed or at least be more intelligently applied. If they are not, then we will miss an opportunity both to deliver much-needed housing and to reduce the levels of flood risk for the existing stock.

The House of Commons Environmental Audit Committee report of 2016, *Flooding: Cooperation across Government*,² stated there should be more long-term planning rather than a reactive approach to flooding. And the Environment, Food and Rural Affairs Committee has also previously expressed concern that there is not enough being done about prevention and that there is not enough engagement with private industry to address this issue:

*'The large number of properties at significant, and in some cases increasing, risk of flooding means that prioritising spend on flood defences is essential if the UK is to minimise potentially huge costs of future flood events. **Considerable economic gains may be made for local communities by unlocking for development land that would otherwise be unusable owing to flood risk.***

*'However, the Department has not obtained a firm commitment from the private sector that it will provide the level of investment necessary if funding targets are to be met.'*³ [Emphasis added]

By way of example, and in addition to the EA's own stated objectives, a strategic flood risk assessment carried out for West Berkshire Council has noted that:

*'The [Thames Catchment Flood Management Plan] encourages local authorities (and indeed developers) to **aim for a positive reduction in flood risk through future development and regeneration.** This process strives to ensure that decisions taken not only avoid the creation of a future legacy of new development at risk of flooding, but also **progressively reduce the risk of flooding to existing development.**'*⁴ [Emphasis added]

The assessment noted that this was a key objective of the then current Planning Policy Statement 25: *Development and Flood Risk*. It is now a key objective of the NPPF.

The NPPF hints at the potential for an innovative approach to development in areas exposed to flood risk, specifically in the 'Meeting the challenge of climate change, flooding and coastal change' section. Para. 100 states that:

'Local Plans should apply a sequential, risk-based approach to the location of development to avoid where possible flood risk to people and property and manage any residual risk, taking account of the impacts of climate change, by:

- *applying the Sequential Test;*
- *if necessary, applying the Exception Test;*
- **safeguarding land from development that is required for current and future flood management;**
- **using opportunities offered by new development to reduce the causes and impacts of flooding;** and
- *where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to facilitate the relocation of development, including housing, to more sustainable locations.'*⁵ [Emphasis added]

Sadly, the record of the application of policy is not encouraging, and the sequential test, which seeks to 'steer new development to areas with the lowest probability of flooding' (para. 101), is, in practice, applied with an inappropriate level of slavish adherence, and consequently schemes that are entirely flood resilient and appropriate in themselves, and which provide additional flood mitigation benefits to the wider area, are incorrectly rejected on 'policy' grounds.

It is clear that some amendments need to be made to policy – or that more guidance needs to be given on the appropriate application of existing policy – if we are to be able to encourage development which reduces flood risk for the wider community.

Solving the puzzle

At Floodline Developments we are seeking to cut through the confusion over how to apply or not apply these policies by taking two example sites through the appeals process. It is our hope that these projects may become helpful case studies for how to correctly apply policy in relation to land affected by flooding. By promoting appropriate example projects that we hope will achieve planning permission we are seeking to demonstrate that there is a way to deliver new houses, while *reducing the causes and impacts of flooding*. We can do all this at no cost to the public purse.

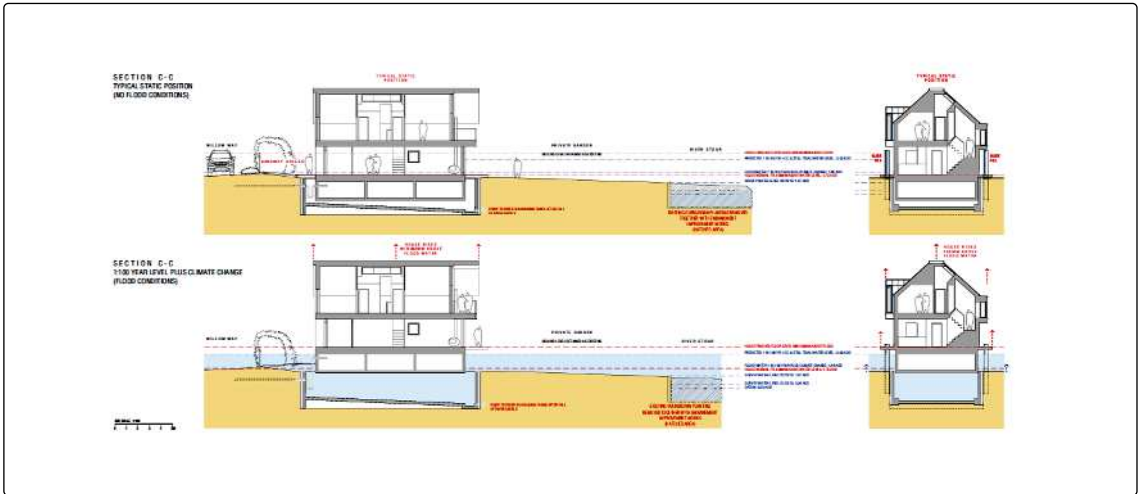


Fig 1 Proposed flood-resilient 'can-float' buildings in flood zones 3 and 2

Flood-resilient buildings

It is surprising that flood-resilient buildings are not more commonplace in the UK. The need to adapt to our changing climate is such that local authorities will need to have a more pragmatic approach to developing in flood-risk areas. There is no need for a change to current legislation. Long-established overseas, most notably in Holland, the principle of safe development within the floodplain is eminently achievable. Properly engineered buildings that are designed for a flood-risk environment and fit for purpose should be encouraged – especially where they allow flood risk to be reduced elsewhere.

Fig. 1 shows an example of a flood-resilient 'can-float' house being proposed at the side of a river in a coastal location. Due to the location of the proposed buildings, flood modelling was required to include fluvial flooding, tidal surge, storm surge and predicted sea level rise over the next 100 years. The house was demonstrated to be capable of withstanding a water level rise of 3.8 metres due to the combined impacts of these effects. The Environment Agency has no objections to the scheme, but the proposal will have to be tested at appeal, to confirm our belief that the project is entirely consistent with both the spirit and the letter of current policy.

Private sector funded flood cells

In addition to creating flood resilience at the individual house level, the opportunity exists (with intelligent design and appropriate engineering) to use new development to significantly reduce flood risk in the surrounding area.

Figs 2 and 3 show a modelled scenario illustrating the benefits that a privately funded alleviation scheme may bring. Forming part of a proposal for new flood-resilient houses, the flood model in Fig. 2 shows the current flooding issues, where local homes, the

business park and road infrastructure are flooded in a 1-in-20-year event, making the area inaccessible and causing damage to property and businesses. In reality, the area has witnessed flooding with a far greater frequency. Fig. 3 is the post-development model, showing a much more severe flood event (1 in 100 years plus the new climate change allowance). This now shows that the homes, business park and roads are free from flooding.

In this example, the flood mitigation scheme, as well as offering new protection to the existing community, is also capable of holding an additional 1 million cubic meters of flood water, offering additional relief to the downstream communities and surrounding area. These dramatic changes are a result of culverts being placed under the road (to drain upstream flood water into the lake), the height of the weir at the bottom of the lake being raised to increase the holding volume; and sustainable drainage systems being used intelligently within the proposed development.

Conclusion

It is not overstating the case to say that it is vital for the country that these projects succeed and that the lessons from them are learned and re-applied to other projects. Only by reducing the barriers to intelligent, appropriate development can we address the growing risks to communities and businesses from flooding. Furthermore, local authorities should actively encourage developers to include well considered flood mitigation schemes within their proposals, as an important element of the scheme's contribution to local amenities. There are some exciting opportunities to collaborate with the Environment Agency to model the economic benefits of projects that include in-built flood mitigation, to provide an independent assessment of the value of such schemes to the wider community.

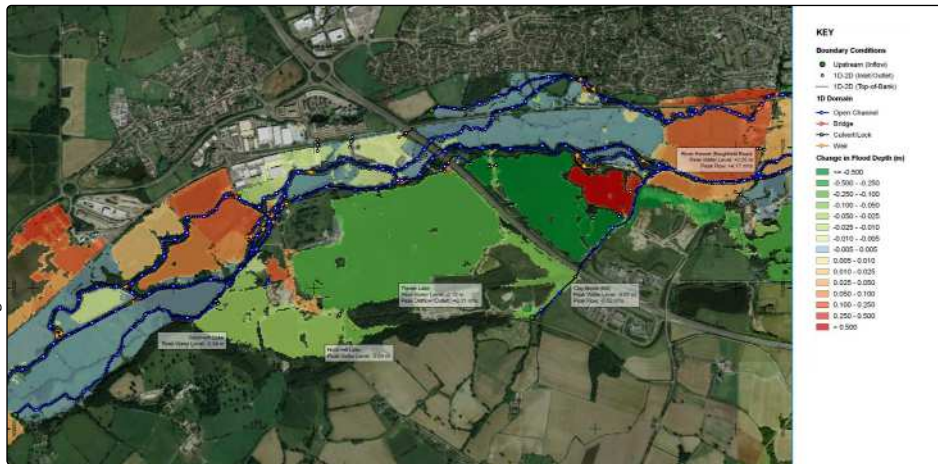


Fig. 2 Baseline flood model - present day, showing flood to local houses, businesses and infrastructure



Fig. 3 Updated model - post-development, showing flood alleviation to the local community, business and infrastructure

Local authorities need to actively consider engaging with the private sector to find solutions. Authorities are missing the opportunity to utilise sites (including brownfield sites) that may offer considerable returns to the council as well as their communities, either due to incorrect designation of the site (resulting in it not being allocated for development) or because they have not realised the potential of this new development approach to address these real issues in a forward-thinking and proactive way.

Flooding is 'Britain's earthquake', and while we cannot stop rain from falling we can control how it is managed once it is on the ground. Councils have the ability to consider such schemes and proposals as they are all covered within the existing legislative framework. If they can take a more proactive approach and engage with private industry, there is a massive opportunity to begin to enable the implementation of flood defences which otherwise would not be funded by the council themselves, nor by the Environment Agency. All this can be funded through the profits from development, without any added burden on already-overstretched public finances. This is the right time for a new approach.

● **Justin Meredith** is Managing Director at Floodline Consulting. The views expressed are personal.

Notes

- 1 See 'Flood risk assessments: climate change allowances'. Webpage. Environment Agency, Feb. 2016, updated Feb. 2017. www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances
- 2 *Flooding: Cooperation across Government*. HC 183. Second Report of Session 2016-17. Environmental Audit Committee. House of Commons, May 2016. <https://publications.parliament.uk/pa/cm201617/cmselect/cmenvaud/183/183.pdf>
- 3 *Defra Performance in 2014-15*. HC 443. First Report of Session 2015-16. Environment, Food and Rural Affairs Committee. House of Commons, Dec. 2015. <https://publications.parliament.uk/pa/cm201516/cmselect/cmenvfru/443/443.pdf>
- 4 *West Berkshire Strategic Flood Risk Assessment (SFRA) Level. 1*. Jacobs, for West Berkshire Council, May 2008. <http://info.westberks.gov.uk/CHttpHandler.ashx?id=36419&p=0>
- 5 *National Planning Policy Framework*. Department for Communities and Local Government, Mar. 2012. www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf