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Flood-risk assessment techniques can help UK's development plans

As the demand for new homes and businesses in the UK increases, Dr Justin Butler, Managing Director of flood-mapping consultants Ambiental Technical Solutions, looks at the growing issue of developing on the floodplain, and how new techniques in flood risk assessment can help insurers to better understand and underwrite new developments.

The UK government is planning to build thousands of new homes, especially in the South East of the country, to help address the growing demand for housing.

Some of these developments are likely to be in 'greenbelt' areas or on reclaimed 'brownfield' sites. Some development however, is likely to occur in areas identified to be at risk of flooding.

Many of these developments include regeneration projects consisting of thousands of homes as well as commercial or industrial facilities; all likely to require insurance in some form or another. For example, the regeneration of the Thames Gateway includes the building of 120,000 new homes, redevelopment of the Lea Valley for the Olympic Village and numerous proposed commercial and industrial development projects.

Considering new development in and around the floodplain, insurers should not only focus on the level of flood risk to the site itself. A new development reduces natural vegetation which tends to 'soak up' water, thereby potentially increasing levels of flood risk, not only to that site, but also to other properties in the surrounding area.

In order to address the growing issue of flooding in the UK, a number of new initiatives have been set up by the UK government in the past few years. The most important in relation to new development on the floodplain, is 'Planning Policy Guidance Note 25 – Development and Flood Risk'. This explains how

flood risk should be considered at ‘all stages of the planning and development process, and sets out ways to reduce the risk of flooding to people and property.

PPG 25 has resulted in development of new techniques to address flooding as well as new types of flood risk information – some which could be useful to insurers in underwriting and pricing. This includes information from Strategic Flood Risk Assessments (SFRA) and Flood Risk Assessments (FRA).

An SFRA is designed to identify and analyse all the potential sources of flooding for an area – both now and in the future – in order to inform the regional planning process. For example, the ‘Thames Estuary 2100 Project’ involves assessing the level of flood risk for the entire Thames region up until the year 2100, including the impacts of climate change.

A large component of the SFRA process uses the output from computational flood modelling. The models are used to identify the extent and severity of flooding from a number of different sources. In some cases, however, the SFRA modelling does not incorporate how new development(s) and changes to flood defences effect patterns of flood risk in the area.

New developments in flood modelling technology can however address these issues. For example, Ambiental are currently developing a detailed, building level flood risk map for London based on a 3-dimensional representation of the city. Flowroute^{TM} models the impact of new developments on patterns of flood risk.

For example, based on architectural or engineering designs, new buildings (or flood defences) can be incorporated into the 3d environment and their effect on flood patterns assessed. Output from the model includes depth, duration and extent of water at the individual building level.

This type of information can greatly assist developers and planners to better understand how new developments can alter patterns of flood risk – both now and in the future. This information can also greatly benefit insurers and reinsurers to improve existing underwriting performance, particularly for high-value, high-risk commercial developments.

Individual Development

However, an SFRA does not provide a detailed assessment of flood risk to a particular site or individual development To address this need, and to meet the requirements set out under ‘PPG 25’, a detailed, site specific ‘Flood Risk Assessment’ (FRA) is required. The FRA examines not only whether the development is in a vulnerable location within the floodplain, but also how the development will impact on flood risk for the surrounding area.

From an underwriting perspective, particularly for high-value commercial property, insurers need to identify whether any new development(s) in the floodplain about to appear on their books have an accompanying FRA.

The presence of the FRA is likely to give some indication as to an acceptable level of flood risk to the site. However, this does not mean to say that there is no risk of flooding and that flood damage is unlikely to occur in the future. One of the primary functions of an FRA is to assess the level of flood risk, especially its affect on health and life. For example, a safe evacuation route to an upper floor within a development may be accepted by the Environment Agency as a suitable mitigation strategy against the impact of flooding. However, the potential for damage to the buildings and contents on the ground floor from a flood still remains.

Undertaking a FRA, as well as interpreting and analysing this type of information), requires expert understanding and detailed knowledge of hydrology and hydraulics. The results from any type of third-party assessment can be used by an insurer or reinsurer to more accurately underwrite the new development. Similar to traditional fire-risk assessments, insurers will increasingly come into contact with information relating to flood risk for a new or existing development and require the necessary knowledge and expertise to make full use of the information.

As the pressures of building new homes and locating businesses increases in the UK, some development is likely to occur in and around the floodplain.

Changes in government legislation to assess new developments in the floodplain have created a wealth of information which could be used by insurers and reinsurers to help inform their underwriting and pricing.

However, advances in three-dimensional flood risk modelling and flood R risk assessment techniques will provide the greatest return in terms of improving the accuracy and pricing of new developments in the floodplain. .

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