

WATERPROOF - FLOOD RISK AND DUE DILIGENCE FOR COMMERCIAL PROPERTY INVESTMENT IN THE UK

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FOREWORD

Marsh is delighted to sponsor a report on such an important issue as flood risk in commercial property investment, and I commend the authors for producing such a comprehensive and interesting report.

The focus on flood risk as an exposure is certainly on the rise. Our clients are increasingly asking us to help them understand the extent of the risk for their businesses and to provide advice on the options for reducing the threat. One need only refer to the statistics on the 2007 floods, contained within this report, as a stark reminder of the business impact flooding can inflict: 8,000 affected businesses and 35,000 insurance claims, averaging between £75,000 and £112,000, is enough to focus any business's mind. Yet, in the commercial property investment sector, the cost of the insurance claim is only one of a series of associated pressures. To a property investor or manager, the building or the physical asset is the business, and income yield from the property cannot always be switched to an alternative source following a major interruption. Coupled with a loss in potential rental, and ultimately returns, can come damage to reputation caused by an apparent oversight in corporate governance or a potential breach of tightening regulation.

Institutional investors are turning to flood risk due diligence as a means of reducing some of the unknowns and creating greater investment certainty, in exactly the way they do with issues of tax, regulation and law. What this report correctly points out is that it is increasingly the trend for these exercises in flood risk due diligence to continue well beyond the initial pre-investment strategy, and into the life cycle of the investment itself. So it should. An ongoing understanding of how the profile of risk is changing will help to determine the appropriate level of focus in control and ultimately, perhaps, when the asset should cease being an investment at all.

Good data is at the heart of understanding the issue, and it is pleasing to see the extent and quality of information on flood risk improving all the time, including major efforts by the insurance industry to better understand the profile of the risk exposure. Even without all of the 'data answers', there are plenty of steps commercial property investors can take to provide assurance to their stakeholders. We encourage our clients in this sector to see flood as one of a series of risks with the potential to impact their earnings potential, and to have:

- a clear process in place to understand the extent of the risk and to factor that into their commercial decisions around investment, development and divestment decision making;
- a strategy for implementing resilience through flood resistance measures, where the risk is seen as significant;
- a plan for responding to a flood that will limit the impact on earnings and reputation.

I hope you find the paper interesting and useful, and that your business's own efforts to manage this growing risk issue are pragmatic, informed and, above all, successful.

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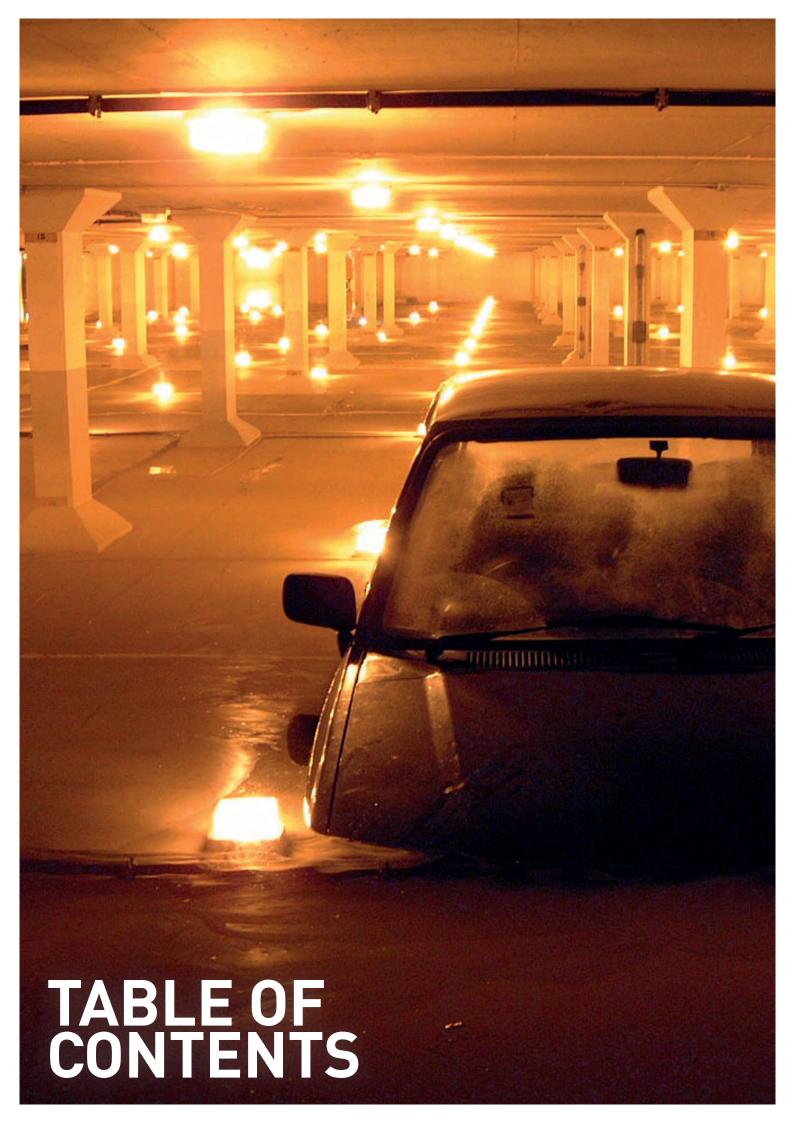


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In 2007, the worst floods in England since 1947 coincided with the start of the worst financial crisis since the 1930s. Both had a big impact on people, property and businesses; and both highlighted a need for better risk management.

This report looks at the way in which flood risk is investigated and managed by major institutions when they invest in commercial property – investments that underpin the pensions, insurance policies and savings plans of 'ordinary' people, many of whose lives were disrupted by the floods and the economic downturn.

Managing these property investments in the light of a predicted increase in flood risk is therefore an important responsibility and also increasingly complex. This College of Estate Management research, sponsored by Marsh, examines the demands of undertaking flood risk 'due diligence' for commercial property investment and finds:

- In 2010, funds held around £98bn or 4.8% of their investment in direct property, an asset that is most exposed to climate change risks, including flooding, and over which investors have greatest control in implementing adaptation measures.
- London has been identified as one of the most at risk cities globally, in view of the high level of economic activity coupled with high asset worth and hazard exposure. Nearly 20% by value of UK commercial property is central London offices. While the traditional 'square mile' of the City of London is outside the natural flood plain, the more recent centre of Docklands is wholly within it.
- Institutions are taking climate change risk increasingly seriously and the UK Stewardship Code 2010 obliges fund managers to intervene to protect or enhance shareholder value in the face of environmental risks.
- The advent of shorter commercial leases in recent years places greater onus on the investor, rather than the occupier or leaseholder, to take the lead in managing and mitigating risks associated with flooding.
- More public and private sector organisations are adopting the BREEAM Excellent rating of sustainability as the basis for selecting property to occupy, which allocates up to four credits towards measures that deal with flood risk and surface water run-off.
- Due diligence for flood risk is mainly centred on environmental and technical assessments, driven by stricter regulation, increased awareness and greater sensitivity to their impact on investment value and corporate reputation.

- Effective environmental due diligence draws on the skills of various disciplines, and a co-ordinated team approach to environmental auditing best ensures the assessment will be useful to all parties to a transaction.
- Due diligence is evolving from a process geared to informing the property purchase decision into the provision of ongoing environmental auditing to inform post-acquisition adaptation and risk management.
- A property in a flood risk area will not automatically be dismissed as an investment if investigations show occupied parts of buildings and access are unlikely to flood and/or adaptation can maintain business continuity during a flood event, also having regard to impacts on the wider business supply chain.
- In future, building-level adaptation to mitigate flood risk will be critically important. Adaptation needs to be seen as an ongoing process in response to changing risk levels, improvements in flood risk data and developments in flood resistance and resilience techniques.
- Insurers of commercial property are becoming more proactive in encouraging corporate clients to engage in flood risk assessment, mitigation, adaptation and management in order that insurance can continue to be offered at reasonable cost.
- While investors show greater awareness of flooding as a risk, it is still regarded as a risk with relatively low probability of occurring, but which must nevertheless be investigated. Two situations in which flood risk has come much higher up the agenda are development sites and property valuation.
- There tends to be an assumption that the main risk stems from proximity to rivers or the sea, which can be a false conclusion in view of a predicted increase in severe rainfall events causing problems in mainly urban areas through overwhelming the ability of drainage systems to cope.
- It would appear that it is still uncommon for investors to re-examine flood risk status during the holding period of property investments. The incentive to regularly reassess risk levels appears weak if properties have never been known to flood, when the available information is not expected to signal a measurable change in risk and is also relatively expensive to obtain.

- Improving the level of certainty that can be attached to flood risk estimates at the property level represents one of the greatest challenges for environmental consultancy. Estimating flood risk arising from increased rainfall and surface water flooding is particularly difficult.
- Implementation of the Flood and Water Management Act 2010
 is expected to bring improvements in flood risk information and
 management. Property owners also need to be aware of potential
 additional responsibilities under the Act for installing sustainable
 urban drainage schemes on new developments, maintaining existing
 drainage and for any features on their land designated as flood
 protection assets.

AREAS FOR FURTHER RESEARCH

This study recommends the following areas for further research:

- investigation of the amount and value of commercial investment property in flood risk areas, and the degree and nature of the flood risk to which it is exposed;
- the extent to which building owners are monitoring risk levels and implementing mitigation and adaptation measures for flood risk;
- the way in which valuers understand flood risk information and translate it into valuation advice to clients.



1.1 AIM AND SCOPE OF THE REPORT

This report examines the process of due diligence in relation to flood risk when commercial property is transacted and during the period it is held for investment purposes in the UK. It is designed to inform the property investment community and its professional advisers, and to increase the understanding of other stakeholders, including industry associations and policymakers.

Why commercial property investment?

Commercial property is a highly significant part of the UK economy and represents a major investment asset for the pensions and insurance industries (Investment Management Association (IMA) 2010). In 2010, funds held around 4.8% or £98bn of their investments in direct property. The security of these investments is very important to the large number of shareholders and stakeholders who rely on them for pensions, insurance and investment plans.

Why due diligence?

Due diligence is the systematic process by which prospective purchasers, in this case institutional investors, investigate the physical, financial, environmental and legal characteristics of a property. The purpose is to identify risks associated with the property, reduce uncertainties related to the value of the property, and inform the purchase decision and any subsequent actions geared to mitigating or managing the identified risks. Inadequate attention to risk management was a significant factor in the economic crash of 2007.

Why flood risk?

Floods are becoming more frequent and severe and businesses are more likely to suffer damage from flooding than fire (Estates Review 2009). The Flood and Water Management Act 2010 (FWMA) introduces significant changes in the way that flood risk is managed in the UK, and defines more clearly the roles and responsibilities of public authorities. However, the provision of flood defences remains a permissive or discretionary power. Failure to provide flood defences does not therefore give rise to a right to compensation on the part of property owners and occupiers, who must take the primary responsibility for protecting their land and property against flooding (Kenney *et al.* 2006). Understanding and interpreting flood risk can be complex. The amount of information and guidance has increased substantially in recent years and this report highlights the extent of, and limitations and anticipated developments in, the sources available.

Purpose of this report

This report therefore fulfils several functions:

- examining the process of due diligence, its importance as a method of investigating and assessing risk and its relationship to the governance of major financial institutions;
- providing an insight into the increasing importance of investigating flood risk within the context of wider environmental and technical due diligence when investing in commercial property;
- exploring the role of the parties involved, including institutional investors and pension funds, insurance companies, lenders, environmental consultants, solicitors and valuers.

1.2 RESEARCH APPROACH

This report is based on research involving:

- an examination of literature to bring together current thinking on real estate due diligence, flood risk, insurance and investment strategies;
- interviews (face-to-face and by telephone) with 20 senior professionals and managers representing major investment funds, lenders, environmental consultants, solicitors, valuers and the insurance industry;
- case studies to illustrate strategies for investigating, understanding and mitigating flood risk in relation to commercial property investment.

1.3 THE ISSUES FROM PREVIOUS RESEARCH

In December 2006, The College of Estate Management (CEM) published its very timely report, *Flood Risk and Property* (Kenny *et al.* 2006), which attracted significant attention during the major UK flood events of June 2007. The research found that most studies relating to flood risk had concentrated on residential property impacts and decisions about future development. Media coverage of the floods in 2007 also, understandably, tended to focus on the devastating effects on people, their homes, jobs and businesses.

Very little was written about the effect of flooding on commercial property and the risk to property investments, although there were some high profile cases. For example, in July 2007 Vodafone's state-of-the-art headquarters in Newbury, Berkshire, flooded and had to undergo extensive refurbishment and remodelling of the flood defences (Heap 2007). On 25 June flood water filled the ground floor of the Meadow Hall Shopping Centre in Sheffield. The centre was closed for a week and, in September, 58 of the 95 shops that had suffered damage remained closed. The flooding occurred just as centre owners British Land were planning to sell a 75% stake in their £1.7bn investment asset (Stockdale 2007). In February 2009 a 50% stake was sold based on a reduced £1.4bn valuation (Likus 2009) largely brought about by the economic downturn.

So while commercial property investment may appear remote from the lives of many people, it is important because of the way that the rental income from business leases on offices, shops, industrial and leisure facilities underpins pensions, insurance policies and savings plans.

Surveys for the 2006 CEM research found that most property investors undertook flood risk assessments in conjunction with property acquisitions, but none of those interviewed conducted periodic reviews of the flood status of property held in their portfolios, even though they monitored other aspects of building performance. When asked to compare flood risk against the other environmental perils of contamination, storm damage and subsidence, investors in particular placed greater emphasis on contamination, which is the most highly regulated of the perils with associated legal liabilities, regulatory obligations and duties.

These findings suggested that property investors could go unaware of changes in the flood risk status of their property, either because of climate change generally or owing to development up- or downstream changing the dynamics of a flood plain or river. This could have knock-on consequences in terms of failing to make adequate allowances for remedial works, facing unexpected increases in insurance premiums and overvaluing assets for investment or accounting purposes.

The previous research also indicated a lack of consistent information available to valuers about flood risk and showed that many did not know how to value in these circumstances, indicating a need for more guidance. An increase in flood risk driven by climate change could have a significant downward impact on values in affected areas, particularly if flood risk insurance also became restricted or unavailable.

Since then, the 2009 floods in Cumbria served as a reminder that exceptionally prolonged and heavy rainfall can have sudden, dramatic and damaging consequences that need to be better understood and prepared for in future (Met Office 2009).

A view from a major investor about this project

The whole issue of climate change impacts on the physical property market is certainly increasing in the consciousness of the commercial property sector. This said, it is probably still an underplayed field of enquiry. I think flood risk has always been something of a specialist and slightly distinct topic but it is such a crucially important area that the market needs to be on top of it. When the issue of flooding enters into the investment process, my experience is that it tends to be treated as a largely technical issue. I suppose the dialogues I was having around the time of the first CEM report in this area related mainly to the extent to which colleagues were aware of the risks, how they insured against them and the way insurance cover acts as a kind of mental 'offset' for the risks. However, investors need to be thinking about what happens should insurance cover for specific assets ever be withdrawn. So, this second research review by CEM seems a very valuable and interesting piece of work.

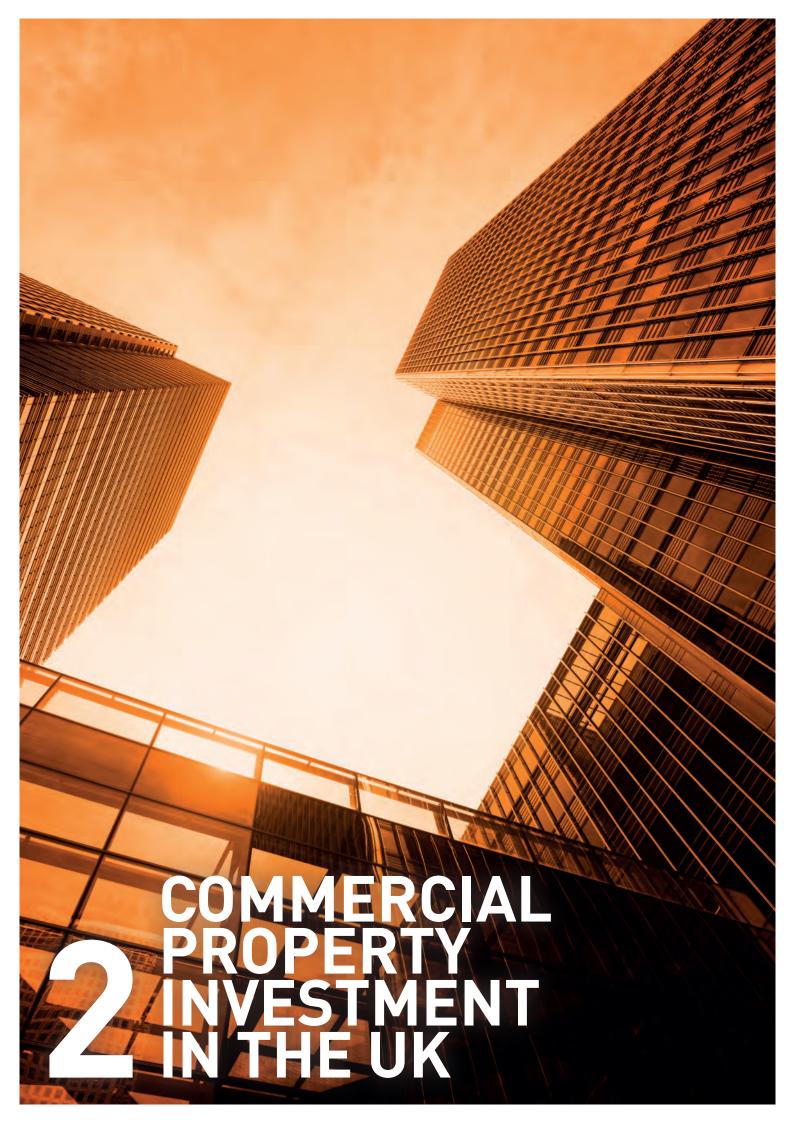
Dr Paul McNamara OBE, Director: Head of Research, PRUPIM, 2010

1.4 ABOUT THIS REPORT

This report is organised in the following sections:

- **2 Commercial property investment in the UK** examines the condition of the UK property investment market in 2009/10 and introduces the obligation on funds to manage investments responsibly under the Pensions Acts and the UK Stewardship Code for Institutional Investors (Financial Reporting Council (FRC) 2010a).
- **3 Due diligence, property and flood risk** provides a definition of due diligence, explores the changing market for environmental assessments and reviews sources of guidance.

- **4 Flood risk, insurance and adaptation** looks at how flood risk is assessed in the UK, the impact of floods on property, the changing insurance market and the importance of adaptation measures for property.
- **5 The Flood and Water Management Act 2010** discusses the implications of this recent legislation for landowners.
- **6 Due diligence in practice for flood risk** uses interviews undertaken for the research to create case studies that illustrate the role played by parties to the due diligence process that is investors, environmental consultants, lenders, valuers and solicitors.
- **7 Flood risk and commercial property** draws on the research interviews to examine how flood risk impacts on investment decisions.
- **8 Conclusions and recommendations** consolidates the research findings, draws conclusions about the role of flood risk due diligence for commercial property investment and makes recommendations for the future.



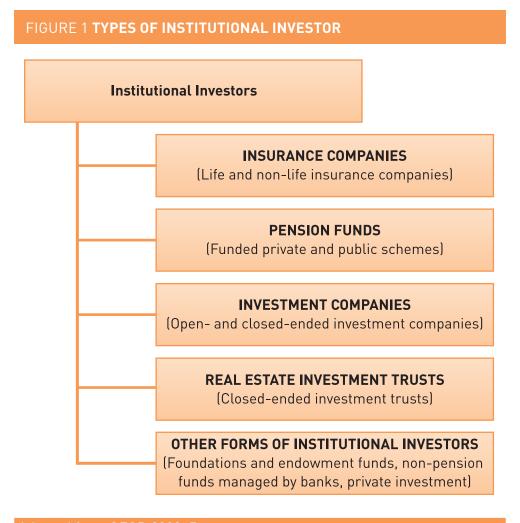
This report is primarily concerned with the way in which major institutional investors undertake due diligence for flood risk when transacting commercial property and during the period it is held for investment. The report focuses on direct property investment, although other forms of investment in shares, equities and securities can have an indirect property component.

This section sets the scene, briefly describing the nature and condition of the institutional investment market in 2009 and 2010 when the study was undertaken. Investors' response to climate change risk is introduced, and the obligation on funds to manage risks responsibly is placed within the context of governance requirements laid down by the Pension Acts and the UK Stewardship Code. The section therefore covers:

- types of institutional investor
- the scale of the market
- the nature of commercial property investment
- investment performance
- institutional investors' response to climate change risk
- duties for managing pension funds
- the UK Stewardship Code for Institutional Investors, which was introduced in 2010.

2.1 TYPES OF INSTITUTIONAL INVESTOR

Institutional investors can be defined as 'specialised financial institutions that manage savings collectively on behalf of small investors towards a specific objective in terms of acceptable risk, return maximisation, and maturity of claims' (Davis 2003: 8). A useful classification of institutional investors is provided by the Organisation for Economic Co-operation and Development (OECD) in Figure 1, showing insurance companies, pension funds and investment funds as the main players. A further category introduced to the UK market in 2007 is real estate investment trusts (REITs).



Adapted from OECD 2003: 5

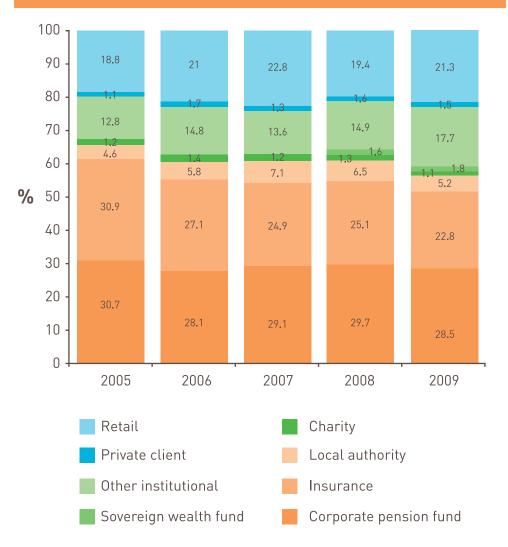
2.2 THE SCALE OF THE MARKET

The IMA UK survey 2009–10 shows £3.4 trillion of assets under management at the end of 2009 (IMA 2010). The breakdown of investment by investor type is shown in Figure 2. Institutional investors represented approximately 77% of the UK investment market in 2009, while retail and private customers accounted for the remaining 23%. The main institutional investors in the UK are corporate pension funds and insurance companies managing approximately £2 trillion.

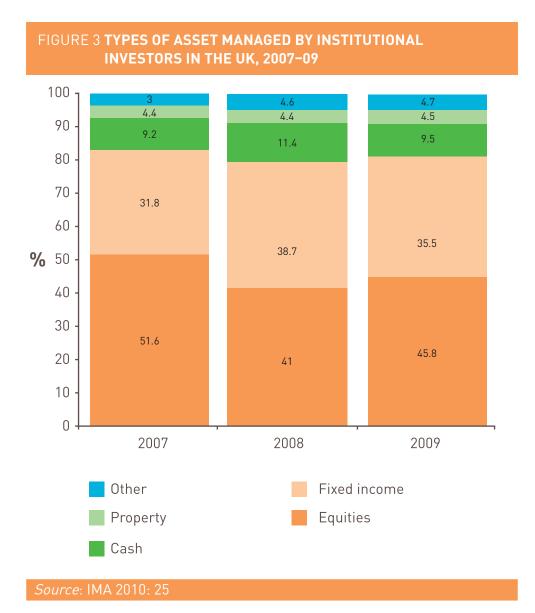
Types of asset under management are shown in Figure 3, and include equities, fixed income, cash and property. The average value of property investment in the period 2007–09 was approximately 4.4% of asset portfolios across investor types. Institutional investors held approximately 4.8% (or £98bn) of asset value in property, compared with 3.9% for retail investors (see Figure 4).

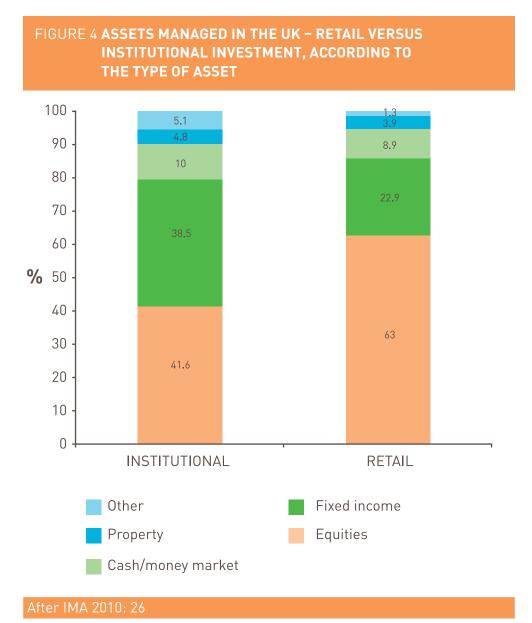
Property therefore represents a relatively small proportion of total investment assets, but the absolute value of property held is significant. It plays an important role in diversifying risk within a portfolio of investments in geographic as well as economic terms. Given the poorer performance of property as an asset class in recent years, it has been more important to investment portfolios in terms of risk reduction and diversification rather than performance enhancement (IMA 2010).





Source: IMA 2010: 22





2.3 THE NATURE OF COMMERCIAL PROPERTY INVESTMENT

Since the 1990s, institutional investment has been distinguished between 'core' and 'non-core' (Roulac 2003). Core real estate incorporates commercial property (office, retail, industrial) and residential property. Non-core investment is represented by any other types of property, for example agriculture, leisure and health. The main sectors of the core commercial property market are:

- offices (standard and business parks);
- retail (shopping centres, retail warehouses, standard shops, supermarkets and department stores);
- industrial (standard industrial estates and distribution warehousing, or logistics facilities)

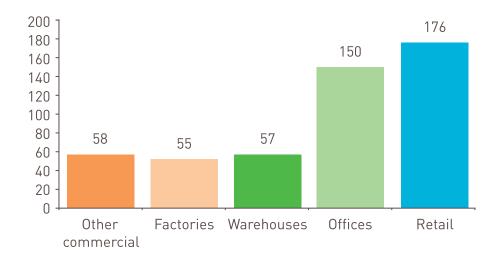
(Investment Property Forum (IPF) 2007)

There are additional smaller sub-sectors such as hotels, restaurants, pubs, car showrooms and petrol stations, student accommodation and health care (IPF 2007).

Data compiled for the British Council for Shopping Centres (*Property Data Report* 2010) shows that the value of the UK commercial property sector fell below £500bn in 2009, as capital values declined by about 3.5%, and estimates the total value at £496bn. Values for each of the sub-sectors within commercial property are illustrated in Figure 5.

Within the commercial sector, retail property represents the largest segment in the UK at just under 36%, with a broadly equal spread of inand out-of-town property (*Property Data Report* 2010). Geographically, commercial property investment is heavily concentrated in London and the south-east of England (IPF 2007). Investment Property Database (IPD) data for 2009 shows the value of central London offices at nearly 20% of overall commercial property, although this share has been declining.

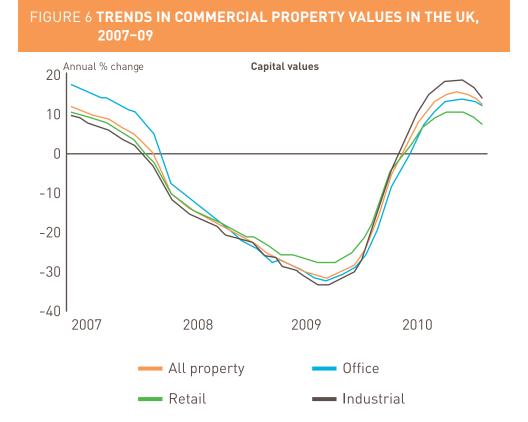




Source: Property Data Report 2010: 5

2.4 INVESTMENT PERFORMANCE

Trends in commercial property values compiled by RICS in December 2010 illustrated in Figure 6 show market changes since 2007, with falling values to mid 2009 and a recovery to mid 2010, when capital values improved by around 16% (RICS 2010a). In capital terms, the retail sector is the best performing sector over this period. However, at the start of 2011 there are signs of market distress linked to toxic loan repayments due in the USA, starting in the UK at the end of 2010 (Mellersh and Harding 2010; Barrett 2009).

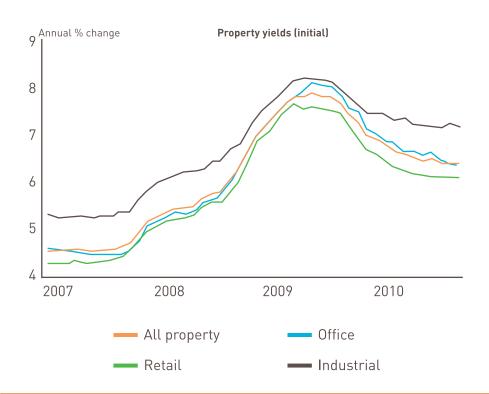


Source: RICS 2010a: 10

A considerable part of commercial property return comes as income, as against capital growth, and is expressed as a yield which reflects rental income as a return on capital value (IPF 2007). IPF analysis shows that compared to other types of investment assets, over the longer term commercial property had outperformed gilts, equities and cash deposits between the late 1990s and 2007 (IPF 2007).

UK commercial property yields for the period 2007–10 are illustrated in Figure 7 and show that during this period of economic turmoil the all property yield varied between a low of 4.5% in mid 2007 to just under 8% in 2009, dropping to 6.4% by December 2010 (RICS 2010a). The highest returns have been on industrial property, followed by offices and retail. Research by Central Financial Planning (CFP 2010) into UK property funds showed a weight of money moving into direct property investment in 2010, given the very low yield on cash.

FIGURE 7 COMMERCIAL PROPERTY YIELDS IN THE UK, 2007-10



Source: RICS 2010a: 10

While commercial property attracts higher returns than some other forms of investment asset, it also entails higher risks (Benjamin *et al.* 2001). Maintaining property in occupation with a good tenant and strong rental return is crucial to underpinning yields. CFP reports, 'We prefer diversified funds that do not take too much risk i.e. with long leases, low levels of voids and good quality tenants' (CFP 2010: 6). Commercial lease lengths have fallen steadily over the last 20 years, falling to their lowest ever level in 2010 with an average length of five years across all commercial property types and tenant (British Property Foundation (BPF) 2010a). Lease lengths tend to be longer for major occupiers and in the institutional investment sector, with average unexpired lease lengths in property fund portfolios of between 7.9 and 14.7 years (CFP 2010). Long leases are still important for funding commercial property development and regeneration projects (BPF 2010a).

An in-depth study of the causes of investment portfolio risk by the IPF (2011) sets out to measure risk in terms of differences between portfolio return and the market average, with the aim of better understanding the causes of portfolio risk and how these causes vary through the property market cycle.

The IPF study is based on an analysis of over 250 portfolios and 43 sources of risk. It focuses on 'evergreen' risk factors 'that are usually present over the years as well as those factors that are significant only in certain market conditions: the risk of flooding may only be present in the monsoon season but the risk of fire is ever present' (IPF 2011: 9). The study recognises that 'any portfolio could be expected to experience random one-off events that would significantly impact returns in the year in question' (p. 13) which could include natural events such as flooding. However, this report on flood risk by CEM points to flooding becoming a more ever-present risk, with flood resistance and resilience being increasingly required of property, as is fire resistance now.

2.5 INSTITUTIONAL INVESTORS' RESPONSE TO CLIMATE CHANGE RISK

A discussion paper for the Universities Superannuation Scheme (USS) (Mansley and Dlugolecki 2001) identified climate change as a particular risk management challenge for institutional investors because of the long-term nature of their investments. This paper asserts that 'if there are many or significant impacts, it will therefore also be likely to undermine the ability of pension funds and other institutional investors to fulfil their aims, so it is in their interests to see that the risks associated with climate change are minimised' (p. 5).

Institutional investors are also seen as uniquely placed to take action on climate change risk because of their size and the 'universal' nature of their investments. The paper suggests 10 points for action, which include issues around directly held property, governance and engagement and investment decision making. In relation to directly held property, while this generally represents a small proportion of investment portfolios, it is 'the area where institutional investors face most immediate exposure to climate change risk, and potentially where they have most direct control' (Mansley and Dlugolecki 2001: 6). Actions should therefore include reviewing the portfolio's direct property investments for climate change risk and identifying measures to mitigate risk exposure.

In relation to investor policies on governance and engagement, the paper recommends more active engagement with the companies in which they invest on their exposure to and management of climate change risks. In the case of direct property investments, this would include engagement with tenants and occupiers.

Subsequent guidance aimed at institutional investors:

- In 2004, CERES commissioned the *Investor Guide to Climate Risk* (Cogan 2004), which offers guidance to plan sponsors (including their investment consultants), fund managers (buy and sell side) and corporations (boards of directors, CEOs and top executives), recommending steps they should take in relation to assessment, disclosure and solutions for climate risk.
- In 2005 the Carbon Trust, with the Institutional Investors Group on Climate Change (IIGCC), commissioned Mercer Investment Consulting (2005) to produce a trustees' step-by-step guide to understanding and addressing climate change, which is concerned with the fiduciary duty of trustees in relation to how they consider climate change risk in investment decisions. Institutions' trustees have an important role in determining fund policy on climate change risk, which must be communicated to fund managers and their professional advisers, who are responsible for managing these risks. The IIGCC has since produced further guidance on climate change for the investor market (2008) and on climate impact reporting for investment tustees (2010).

The institutional investment market is therefore taking climate change risk increasingly seriously, a situation which is reflected through governance processes and legislative requirements for fund management, discussed next.

2.6 DUTIES FOR MANAGING PENSION FUNDS

Pension funds have long-term liabilities and, in order to be able to meet these requirements, trustees must monitor asset performance, manage existing investments and be able to invest new influxes of money.

The most important pieces of legislation concerning the duties of trustees are the Pensions Act 1995, outlining how schemes should be run, and the Pensions Act 2004, which is particularly concerned with reducing risks to beneficiaries. These Acts are mutually dependent and incorporate guidelines and the duties and powers of trustees (Pensions Regulator 2010).

Trustees must act in accordance with the trust's rules, in the best interests of beneficiaries, and be impartial, prudent, responsible and honest. Prudence is mostly associated with decisions related to investment schemes. Guidelines cover the type of investments trustees can make, diversification of investments and also risks and returns associated with them. The investment strategy must be accompanied by a statement of investment principles which emphasises ways of measuring and managing risks. The statement must also specify the environmental, social and ethical issues that are taken into account when making investment decisions (Pensions Regulator 2010).

The law allows trustees to delegate investment decisions to fund managers, who must be authorised under the Financial Services and Markets Act 2000. Nevertheless, trustees are still responsible for the investment strategy which fund managers have to pursue. Trustees are not liable for fund managers' mistakes, providing:

- proper due diligence was conducted within the competence of fund managers;
- fund managers respected the investment strategy (Pensions Regulator 2010).

Both trustees and fund managers are therefore responsible for ensuring that required steps are taken not only to minimise risks to investments, but to create long-term value.

2.7 THE UK STEWARDSHIP CODE FOR INSTITUTIONAL INVESTORS

The UK Stewardship Code (FRC 2010a) is intended to be implemented in conjunction with the UK Corporate Governance Code (FRC 2010b) and was introduced in July 2010. The Code primarily applies to firms which manage assets on behalf of institutional investors, but it is expected other institutional investors will adhere to the principles of the Code (FRC 2010c).

The Code operates on the basis of 'comply or explain'. In terms of reporting, this means that institutions must disclose on their official website how they comply with the Code's principles or explain why, if they have not done so. Disclosing compliance with the Code must be made not only publicly, but also to clients whose assets are managed.

Principle 2 of the Code explains ways in which institutional investors should monitor the companies in which they invest. Any gaps and non-alignment with the Corporate Governance Code should be carefully analysed. This has the aim of identifying any problems early on, to enable action to protect shareholder value (FRC 2010c). Principle 4 explains when and why interventions should be made to protect or enhance shareholder value; particular circumstances covered include concerns about:

- fund strategy and achievements
- fund governance
- environmental and social risks (FRC 2010c: 7).

The Code therefore aims to promote disclosure and increase the transparency of institutional investors' actions or, in the words of Baroness Hogg, FRC's Chairman, to act as a 'a catalyst for better engagement between shareholders and companies and create a stronger link between governance and the investment process' (Hawser 2010).

2.8 SUMMARY

Institutional investors hold a relatively small proportion of their assets (4.8%) in direct property, but its absolute value at circa £98bn is significant. Geographically, commercial property investment is concentrated in London and the south-east of England.

Over the longer term, direct property income returns have outperformed equities, gilts and cash deposits. However, while direct property brings higher returns than some other forms of investment, it also entails higher risks, and it therefore tends to be valued more for its contribution to risk diversification than performance enhancement in institutional investment portfolios.

Direct property is identified as an asset where investors face most direct exposure to climate change risk, owing not only to the potential physical impacts on property, but also to the size and long-term nature of these investments. At the same time, property investors are in a position to exert most direct control over the response to climate change risk, through implementing adaptation measures to mitigate and manage risk.

The advent of shorter commercial leases in recent years places greater onus on the investor, rather than the occupier or leaseholder, to take the lead in managing and mitigating risk. Shorter leases introduce greater flexibility for occupiers to decide to move if, for example, the property is adversely affected by flooding. This can lead to voids and loss of rent for the investor, whereas maintaining property in occupation and rent producing is crucial to underpinning investment value.

The Pensions Acts place obligations on funds and their trustees to act prudently and adopt good governance, and it is clear that institutional investors are taking climate change risks increasingly seriously. The UK Stewardship Code, introduced in 2010, reinforces the obligation on firms that manage institutional funds to make interventions to protect or enhance shareholder value in the face of environmental risks. Risks should therefore be assessed at the point a property is acquired, and monitored at intervals throughout the period it is held for investment.

Due diligence is the process by which fund managers assess risks. It is central to making sound property investment decisions and developing risk management strategies for climate change impacts, including flood risk. The due diligence process is therefore discussed in the next section.

'Due diligence ... is central to making sound property investment decisions and developing risk management strategies ...'



Due diligence tends to come more to the fore in an economic downturn, as it has done since 2007, with greater emphasis being placed on examining potential risks when transacting property. In the property market, flood risk is treated as part of wider environmental due diligence and this section therefore examines:

- the **definition and purpose** of due diligence in property transactions;
- the **changing market** for environmental assessments, which is broadening from due diligence at the point of the property transaction into regular audits of environmental performance;
- sources of guidance relevant to undertaking due diligence for commercial property investment, including high-level risk assessment for property portfolios, technical due diligence for individual sites and valuation guidance on incorporating environmental considerations into property valuations.

3.1 DEFINITION AND PURPOSE

Technical due diligence can be defined as:

'... the process of systematic review, analysis and discovery in which a prospective purchaser, occupier or financier of property gathers information about the physical characteristics of the property in order to enable them to make an informed assessment of the risks associated with the transaction.'

(RICS 2010a: 3)

The benefits of the due diligence process is identified by PricewaterhouseCoopers (PwC) (2010) as:

- reducing uncertainties related to the value of the property;
- identifying the risks associated with the property;
- providing a basis for dealing with obstacles to the property transaction at the strategic level.

Undertaking due diligence is important for the purchaser because the *caveat emptor* rule makes the buyer responsible for determining that he is satisfied with the title to and condition of the property. The property will usually be at the buyer's risk from exchange of contracts, and even if it is substantially damaged before completion the buyer may still be obliged to proceed with the purchase (Clyde and Co. 2009), unless the vendor acted negligently. It is therefore up to the buyer to obtain physical, structural and environmental surveys and valuation reports on the property, and to arrange appropriate insurance.

The main components of due diligence are illustrated in Figure 8. Investigations relating to flood risk fall largely under environmental and technical due diligence, although aspects can also overlap with market due diligence, in relation to the effect on property occupation and value, and legal due diligence.

FIGURE 8 THE COMPONENTS OF DUE DILIGENCE Market Technical Legal Tax Environmental Due Due Due Due Due Diligence Diligence Diligence Diligence Diligence Financial Due Diligence Investment Decision

3.2 THE CHANGING MARKET

Source: PwC 2010

The effect of market conditions on the due diligence process for real estate investment in the US was examined by Roulac (2000), by comparing the emphasis that investors placed on decision elements between a strong market in 1987 and a weak market in 1993. The survey of 51 institutional investors responsible for approximately \$51bn of real estate found that more resources were devoted to due diligence in difficult market conditions than in times of optimistic expectations. Further, in 1987 investors placed more emphasis on quantitative rather than qualitative measures, whereas the situation reversed in 1993, with investors seeking explanation and insight from qualitative enquiries rather than relying on quantitative assessments.

This finding is reflected by a UK investment surveyor interviewed for the current study who said:

'I suppose the nature of the market is that there are a number of transactions going through at the moment that are far lower

than they were in 2006/2007. And the nature of due diligence is that in a strong market the level of due diligence tends to be a lot lower, people are rushed to do deals before somebody else jumps in and does it under your nose. So there tended to be a lot less due diligence back in 2005/6 and 7. Whereas now it is almost an overreaction in that everything is being checked and certainly the flooding side of things is being checked a lot more than would have been done. And any property that does have any warts or issues or problems, the transactions are tending to stall because the market is a lot more sensitive to anything that comes up negative.'

3.2.1 A boom in environmental due diligence

UK environmental advisers are experiencing a boom in due diligence work for mergers, acquisitions, property transactions and other transfers (Bell 2010). This boom is being driven by:

- stricter regulation and mounting pressure from government, regulators and through the media for companies to offer greater transparency and accountability;
- increased awareness of environmental risks and growing recognition that environmental issues have the potential to impact not only on the initial value of the transaction, but also on the future success of the deal;
- greater sensitivity to the relationship between environmental liabilities and reputational risk, accompanied by a trend towards taking corporate social responsibility more seriously.

3.2.2 A two-tier split in environmental due diligence

The growth in environmental due diligence services has also evolved into a two-tier split. Traditional property-focused investigations (such as contaminated land liabilities) have become increasingly commoditised. The rise in electronically generated environmental reports from companies such as Landmark Information Group and GroundSure is fundamentally changing the environmental due diligence market and providing relatively cheap, fast and accurate data on historic land use, flood risk and environmental impacts as a first line of investigation.

At the same time, demand for second-stage and more far-reaching investigations from the top environmental firms is growing. A more sophisticated approach to environmental due diligence is also drawing management consultancies into the arena, to offer clients interpretation of environmental information in commercial and financial terms, bridging the gap between environmental, technical and financial due diligence. This is being accompanied by a greater focus on softer issues, including ethical, social and reputational concerns.

3.2.3 A new market in property sustainability due diligence

The wider environmental consultancy industry is expanding its range of services to serve a new market in property sustainability due diligence covering energy use, emissions, recycling building structures and Green buildings regulations. The new BREEAM code for sustainable construction incorporates criteria for flood risk and surface water run-off and allocates up to four credits that contribute to the overall sustainability rating. Achievement of the BREEAM Excellent rating is increasingly being sought by major occupiers, for example government departments, health authorities and public companies such as M&S and John Lewis (BREEAM 2011).

3.2.4 Changes in consultancy relationships

According to Bell (2010) the higher profile of environmental risk has also changed the relationship between environmental consultants, clients and law firms. Whereas in the past it would have been commonplace for the lawyer to commission the environmental reports, it is now more usual for the client to appoint the law firm and environmental consultants directly. In this way the environmental consultant is more often involved at an earlier stage of the transaction and can work with the client and the lawyer to agree the scope of the environmental due diligence, ensuring the appropriate information is provided and suitable warranties put in place.

3.2.5 A changing role for environmental due diligence

The role of environmental due diligence is also changing. It is no longer being seen as just a process geared to identifying risks and levering a reduced price or limiting liability, but as an opportunity to improve future performance, for example through informing planned changes and improvements to property assets post transaction that help mitigate environmental risks.

In the US mergers and acquisitions market, more firms now commission 'update audits' to provide a health check on assets they have acquired to ensure that they will continue to perform well into the future. Auditing for sustainability and environmental management is also being offered as a mainstream service by property consultancies in the UK (for example DTZ, JLL and CBRE), stimulated by new regulations, including requirements for businesses to display Energy Performance Certificates since January 2009 and to participate in the Carbon Reduction Commitment Energy Efficiency Scheme since April 2010.

3.3 SOURCES OF GUIDANCE

There is a wealth of information about due diligence aimed at the American market. This most probably reflects the greatly increased regulation in US financial markets during the last 20 years, following major corporate collapses (Enron, Worldcom) coupled with the greater incidence of extreme weather events and severe tornadoes.

A US guide to environmental risks in real estate transactions by Nanney (1993) emphasises that effective environmental due diligence draws on the skills of various disciplines. A co-ordinated team approach to environmental auditing is therefore recommended as the best way to make sure that the assessment will be useful to all parties involved in a transaction. The role of the environmental consultant is viewed as particularly important in identifying risks common to certain localities and implementing appropriate investigations.

Most sources of guidance regarding due diligence produced in the UK are offered by reputed accounting and real estate companies, for example PwC (2010), KPMG (2010) and Jones Lang LaSalle (JLL) (2010), all of which have strong US links.

The PwC guidance provides a very clear overview of the main components and benefits of due diligence (see Figure 8).

The KPMG guidance is particularly concerned with due diligence in emerging markets, characterised as sellers' markets, with increased liquidity generating greater competition for deals. Environmental risks tend to be higher than in developed markets and 'acquirers are under ever increasing pressure to undertake due diligence concisely, effectively and with limited exposure to management' (KPMG 2010: 1).

The JLL guidance, 'From sandbags to solar panels', concentrates on addressing environmental aspects of real estate resilience to climate change. The report particularly covers issues of energy efficiency and zero carbon, and makes recommendations mainly about mitigation, but also adaptation measures appropriate to each stage of the property life cycle, asserting that: 'Investors should carry out a comprehensive risk assessment of all properties to identify those most at risk of flooding, subsidence, drought or weathering damage'. Conversely, occupiers are recommended to 'carry out a light touch risk assessment to ensure that occupation of the building accords with business continuity management' (JLL 2010: 3).

Three sources of guidance particularly relevant for property investment and flood risk are now covered in more detail:

- The Acclimatise report, providing a high-level review of climate change risks and opportunities for commercial property;
- RICS guidance on the due diligence process;
- RICS valuation standards and guidance.

3.3.1 The Acclimatise report



This report (Acclimatise 2009), commissioned by Henderson Global Investors, Insight Investment, Railpen Investments and the USS, examines the investment implications of adapting to climate change. It is aimed at organisations with UK property assets, including institutional investors, and it:

- provides a high-level review of the risks and opportunities associated with 'inevitable climate change' (p. 1);
- identifies the specific investment drivers at risk;
- gives guidance on the questions investors and analysts should ask to encourage disclosure of information.

The report is concerned with the direct impacts of an increase in extreme weather events and the effects of incremental change disrupting the use and occupation of commercial property. It identifies not only the risks associated with flooding, but also those arising from pressure on water resources, from droughts, subsidence and heatwaves.

It emphasises that climate change impacts need to be considered collectively rather than individually, and recognises that there would be little benefit in a generic risk assessment for the property sector because each fund has a unique asset profile. Any assessment of climate change impacts must therefore reflect the asset base characteristics and the risk attitudes of the investor and its tenants. Investors will also need to work closely with their insurers to assess the changing risk profile of their portfolio.

One of the most useful aspects of this report is the checklist of questions for investment and property managers to ask themselves in relation to addressing the effects of climate change on the whole property portfolio and investment strategy, in relation to:

- **Governance issues**, including steps to assess the vulnerability of assets, develop adaptation strategies, understand business impacts, engage with tenants and develop management systems.
- **Stable income streams**, covering resilience of supply chains, revenue streams, operational cost implications and risk management to secure favourable insurance.
- Increasing capital value, looking at issues of asset value, depreciation, liquidity, continuity and crisis management plans, changes in regulation, and decisions about refurbishment and new development in relation to buying and selling decisions.
- Reputation, legal and regulatory issues, including monitoring and responding to changes in regulation, sharing knowledge and managing business relationships with the wider investment community.
- **Good covenants**, looking at occupier needs and functionality, including lease conditions that enable adaptation.

3.3.2 RICS guidance on the due diligence process

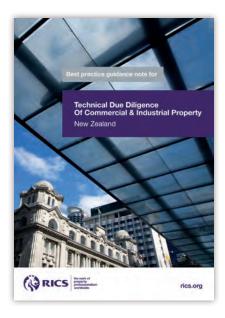
Three sources of guidance from RICS are reviewed here:

- Building surveys and technical due diligence of commercial property' (RICS 2010b), which covers England and Wales;
- 'Best practice guidance note for technical due diligence of commercial and industrial property, New Zealand' (RICS 2010c);
- the RICS isurv information service.

'Building surveys and technical due diligence of commercial property'

This latest RICS guidance for building surveys includes the term 'technical due diligence' (TDD) in the title for the first time, recognising the 'more commercial nature of TDD required by investment clients' (Mann 2010: 2). The guide covers the process of taking instructions, preparing for the survey, the property inspection and preparing the report. Vendor surveys are also covered for the first time, in view of their increased use to collate due diligence documentation before property is marketed to avoid the need for surveys by each purchaser's team. The issues associated with assigning the benefit of such surveys to third parties are discussed.





'Technical due diligence of commercial and industrial property, New Zealand'

This best practice guidance launched by RICS New Zealand in May 2010 also offers practical advice to RICS members on the principles which should be adopted when providing technical due diligence for commercial and industrial property. It is expected to provide a point of reference for property professionals worldwide, and particularly for international investors looking at the New Zealand investment market. It points out that many large property owners are institutional investors and that: 'The managers of these investment vehicles have a fiduciary responsibility to the ultimate owners in making acquisitions, to ensure that all reasonable risks and liabilities are understood' (RICS 2010c: 3).

It is structured differently from that produced for England and Wales, which concentrates more on explaining the types of building survey applicable and the appropriate basis of agreeing client instructions. The New Zealand guide focuses on the benefits of undertaking technical due diligence and its role in risk management, and makes recommendations about the process to be followed in relation to four key aspects of dealing with property: acquisition, occupation, disposal and development.

The items to be included when taking client instructions are covered in some detail. It is stressed that 'a "one size fits all" approach cannot be taken' (RICS 2010c: 6) and, where the exercise is conditional to sale and purchase agreements, the client's time frame is usually short, typically 5–10 working days, but this can vary according to the size and nature of the property.

It is standard practice to engage third-party specialist consultants from time to time to assist with the technical due diligence process and preparation of the report. Generally, such consultants are engaged either by the 'main' or 'lead' consultant, or directly by the client. The RICS New Zealand guidance sets out the main points to consider in structuring the terms of engagement in each case and notes that consultants may be required to work together or share information. While technical due diligence is normally undertaken in advance of the legal due diligence, the tasks of the technical and legal advisers can overlap, and there can therefore be advantages to them working together to avoid duplication.

The role of risk ratings discussed in the New Zealand guidance is seen as an integral part of due diligence, designed to aid the client in identifying and managing risks and to determine recommendations about 'which risks to avoid, transfer, mitigate or accept' (RICS 2010c: 28). Flooding is specifically mentioned in relation to:

- describing the property for the purpose of the report and specifically identifying 'evidence of flooding or ground stability' (p. 13), including whether the property is in a flood plain;
- assessment of future development opportunities in relation to checking for known hazards.

The RICS isurv information service

The RICS online information service for surveyors, isurv (www.isurvlive. co.uk) contains various guidance on technical due diligence including, for example, a list of the professional consultants who may become involved in a due diligence exercise (see Table 1); a checklist of points to take into consideration (covering occupational issues, repairs and defects, environmental issues and legal issues); and a planning and development due diligence checklist.

TABLE 1 BUILDING DUE DILIGENCE TEAM MEMBERS

The team will vary according to the nature, size and value of the transaction or building. The following may be involved:

- building surveyor
- services engineer
- environmental engineer
- agent
- managing agent
- solicitor
- planner
- space planner

- structural engineer
- cladding specialist
- project manager
- IT consultant
- cost consultant
- geomatics surveyor
- quantity surveyor (for fire insurance valuation)
- tax specialist capital allowances

Source: isury 2011

3.3.3 RICS valuation standards and guidance

RICS Valuation Standards – Global and UK (7th edn, 2011), known also as the 'Red Book', establishes the code of practice for the valuation of real estate in the UK.



The Red Book provides that: 'Depending on the scope and purpose of the valuation the valuer will agree, in the terms of engagement, the extent to which contamination and environmental matters are to be investigated or commented upon' (Appendix 2.1(I), p. 275).

In adapting to changing circumstances and requirements, RICS produces ancillary guidance which must be followed in conjunction with standards contained in the Red Book. Chartered surveyors are expected to have informed themselves about the contents of information papers, which the courts would be likely to take into account in the event of allegations of professional negligence.

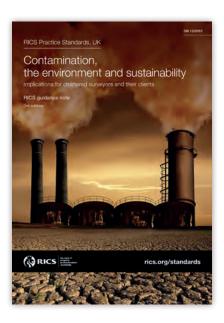
The RICS Valuation Information Paper 13 (VIP13), 'Sustainability and commercial property valuation' (RICS 2009), became effective from 15 September 2009. According to the Red Book, it is currently under review (RICS 2011: 306).

VIP13 primarily relates to commercial property that is either owner-occupied or held within an investment portfolio. It discusses key issues relevant to assessing whether properties are resilient to environmental risk (including flood risk), with the aim of 'establishing standardised approaches to reflecting sustainability within the valuation process and practice' (RICS 2009: 2).

VIP13 recognises that while the science of climate change is still disputed, the likely impacts have become sufficiently widely accepted to be recognised as a real risk and a key concern for property performance, including an increase in extreme weather events and the effects of sea level rise leading to the risk of flooding. Given that the severity of these effects is likely to be greater in some areas than others, then over time more secure locations might be expected to become more desirable. The paper acknowledges that 'not all aspects of sustainability translate easily or demonstrably into market value' and 'currently little is known about their impacts on value' (RICS 2009: 5).

An important aspect of the valuation process is for the valuers to be 'satisfied that they are in possession of sufficient information, either through their own due diligence and verification or through having been provided with information upon which they may rely, to enable them to make informed judgements and properly advise the client' (RICS 2009: 8). In advising a property investor, the paper recommends that consideration should be given to whether sustainability issues might impact on future performance and sets out a series of questions for valuers to consider in assessing current and future occupational demand for the property since, ultimately, 'The valuer has responsibility to the client to ensure a valuation reflects the material factors that may affect value' (p. 20). These questions deal with approaches to analysing sustainability issues at the building level in relation to the usual valuation considerations, for example analysing comparable rental evidence, yields, impact on rental growth, depreciation, risk, residual value and the sale or letting period.

Investigating flood risk is covered in some detail in RICS Practice Standards UK Guidance Note 13 (RICS 2010d). Section 5.4 on flooding:



- summarises the impact of the main UK flood events of recent years;
- explains the sources of flood mapping, the accuracy of mapping and level of detail offered:
- provides a checklist of information that surveyors should be looking for when considering flood risk in an area;
- briefly discusses the ways in which flood water can enter buildings, and touches on ways in which building resilience may be improved.

3.4 SUMMARY

Due diligence as applied to direct property investment is a process of systematic review, analysis and discovery designed to identify risks, reduce uncertainties and deal with obstacles to a transaction. Due diligence for flood risk is mainly centred on environmental and technical assessments, but also involves market and legal due diligence in relation to identifying impacts on value and defining the apportionment of liabilities.

Effective environmental due diligence draws on the skills of various disciplines and a co-ordinated team approach to environmental auditing best ensures the assessment will be useful to all parties to a transaction.

In a strong market the level of due diligence tends to be lower, as there is greater pressure to complete deals quickly to avoid losing out to competition. In a weak market, active investors devote more resources to due diligence and place greater emphasis on qualitative rather than quantitative measures to provide explanation and insight. Further, where a problem such as flood risk is identified, the transaction is more likely to stall as investors become more selective and risk averse.

In the downturn since 2007, UK environmental consultants have experienced a boom in due diligence work, also driven by stricter regulation, increased awareness of environmental risks and greater sensitivity to their impact on transaction value and reputational risk.

A split in the due diligence market has emerged, and first-stage investigations have become increasingly commoditised, with the rise in electronically generated reports providing fast, cheap and accurate information on historic land use and flood risk. Demand for second-stage, more far-reaching investigations from environmental consultants has also increased, accompanied by greater input from management consultants involved in interpreting the financial impacts of environmental assessments.

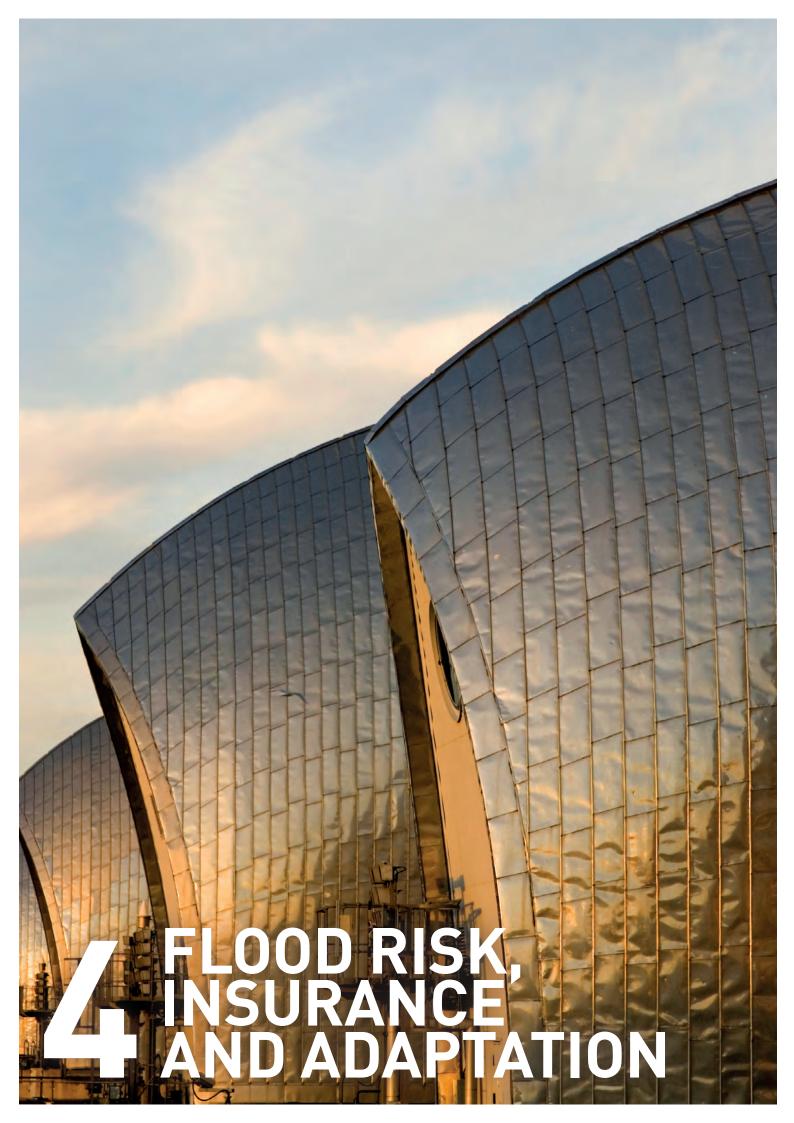
In view of the higher profile of environmental risks, it has become more common for client investors to appoint environmental consultants directly, rather than through a solicitor or other consultant, and at an earlier stage in the transaction. The environmental consultant then works with the client and solicitor to agree the scope of investigations, and to ensure the appropriate information is provided and that warranties are put in place.

The role of due diligence is also evolving from a process implemented purely in conjunction with a transaction into the provision of ongoing environmental auditing of property performance, driven by energy performance and carbon reduction legislation, to inform post-acquisition adaptation and risk management.

There are relatively few sources of guidance relevant to undertaking property investment due diligence aimed specifically at the UK market. This report reviews sources covering both the strategic and property level. The strategic level management of investment portfolios is addressed in the Acclimatise report, which is concerned with ensuring good governance of investments, stable income streams, increasing capital value, maintaining reputation, regulatory compliance and occupier covenant strength, including lease conditions that enable adaptation. RICS guidance aimed at the property level covers:

- the technical aspects of building investigation;
- the responsibility of valuers to reflect environmental risks, including flood risk, in the investment valuation;
- approaches to investigating flood risk and its impact on property.

The way in which flood risk is assessed and its impact on UK property is explored in Section 4.

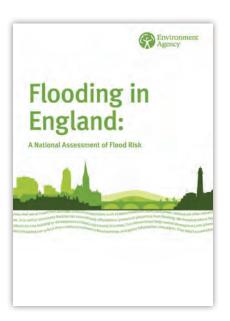


Increasing awareness in the UK property sector of the impact of flooding is being driven by not only experience of flood events in recent years, but also by predicted increases in extreme weather during this century. Understanding the scale and effect of flood risk is an important factor in considering the prospect of managing and offsetting the risk through flood defences, insurance and adaptation measures. This section therefore examines:

- how flood risk is assessed nationally;
- evidence for the impact of flooding on UK property, in particular commercial property assets;
- the role of insurance in mitigating and managing risk;
- adaptation measures to address flood risk;
- sources of guidance on adaptation and emergency planning for flood risk.

4.1 HOW FLOOD RISK IS ASSESSED NATIONALLY

The UK Environment Agency (EA)'s first national assessment of flood risk for England (EA 2009a) explains how the agency tackles flooding, mainly from rivers and the sea. It contains:



- a summary of the causes of flooding (see Table 2);
- an explanation of the steps taken to manage flood risk;
- an overview of the strategy and policy framework;
- a guide to the organisations involved in protecting people and property from flooding.

The EA takes a risk-based approach to managing floods, which involves reducing the likelihood of flooding and reducing impacts when flooding occurs. Factors addressed in managing flood risk are illustrated in Figure 9.

TABLE 2 THE CAUSES OF FLOODING

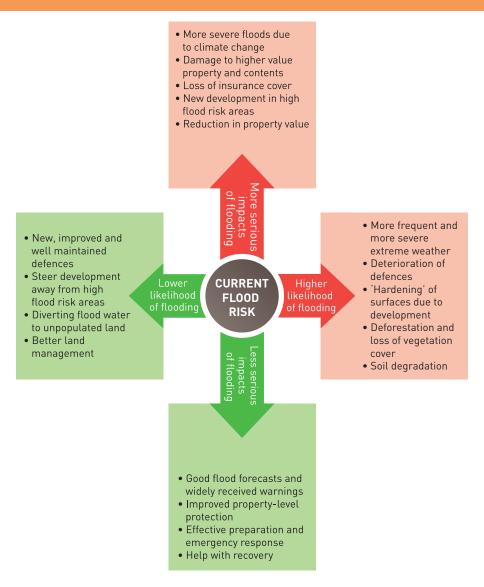
| Flooding type | Cause |
|------------------------|---|
| River flooding | Occurs when a watercourse cannot cope with the water draining into it from the surrounding land, for example when heavy rain falls on an already waterlogged catchment. |
| Coastal flooding | Results from a combination of high tides and stormy conditions. Low atmospheric pressure coupled with a high tide can cause a tide surge and lead to serious flooding. |
| Surface water flooding | Occurs when heavy rainfall overwhelms the drainage capacity of an area. It is difficult to predict and pinpoint, much more so than river flooding. |
| Sewer flooding | Occurs when sewers are overwhelmed by heavy rainfall or when they become blocked. The likelihood depends on the capacity of the local system. Can result in land and property being contaminated by raw sewage and pollution of rivers. |
| Groundwater flooding | Occurs when water levels in the ground rise above surface levels. Most likely to occur in areas underlain by porous rocks or aquifers. |

Source: EA 2009a: 7

The EA uses two main approaches to mapping flooding from rivers and the sea:

- The Flood Map, which is available from the EA website, shows where floods may occur and how severe they might be in areas of natural flood plains if no defence structures were in place. It is aimed at assisting local authorities to make planning decisions and at helping property owners recognise risks and prepare for floods.
- The National Flood Assessment presents risk and vulnerability in greater detail, including consideration of the impact of flood defence structures and other measures that reduce risk. It is designed to contribute to flood risk management policy and investment priorities, and to help insurers set risk-based premiums and excesses.

FIGURE 9 MANAGING FLOOD RISK - ADDRESSING LIKELIHOOD AND IMPACTS



Source: EA 2009a: 8

The EA has also produced initial maps of areas susceptible to surface water flooding, but the accuracy of these maps is still being developed and 'they are not yet suitable for a house by house assessment of risk' (EA 2009a: 13). Interviews with environmental consultants for this report highlight concern about an anticipated increase in surface water flooding due to severe weather events, as 'nationally surface water flooding is much more frequent than major fluvial and tidal flooding' (see Section 5.4).

The national assessment identifies land at risk of flooding using three categories as shown in Table 3. The risk categories assigned to locations are estimations of the chance of weather severe enough to cause a flood and the likelihood that it would overwhelm defence structures. The category of a location may change over time, owing to more accurate modelling, better information or because the risk is changing. The risk may change because of changes in the catchment or in the protection assets (flood defences) provided.

TABLE 3 FLOOD RISK CATEGORIES

| Risk category for a location | The chance of flooding in any year at that location | |
|------------------------------|---|--|
| Low | Less than 0.5 per cent | One in 200 chance in any given year |
| Moderate | 0.5-1.3 per cent | One in 200 to one in 75 chance in any given year |
| Significant | More than 1.3 per cent | One in 75 chance in any given year |

Source: EA 2009a: 24

4.2 FLOOD RISK IMPACTS ON UK PROPERTY

Sources of evidence for the impact of flood risk on UK property are of two main types:

- information from recent flood events about what has happened, the damage caused, losses and costs of recovery;
- assessments for the future based on a predicted increase in severe weather events and potential impacts under a range of scenarios.

4.2.1 Recent flood events

The EA has calculated that the devastating floods during the summer of 2007 cost a total of £3.2bn, including more than £2bn to homeowners and businesses (EA 2010). A breakdown of information collected by the EA from the Association of British Insurers (ABI) about the impact of the floods on businesses is shown in Table 4. The EA report attributes the high number of claims to multiple claims on one policy or claims against more than one policy. In addition to the recorded losses, businesses were disrupted by damage to critical infrastructure and services, including water and electricity supplies and roads.

TABLE 4 IMPACT OF THE 2007 FLOODS ON BUSINESSES

| Number of businesses affected | 8,000 |
|--|------------------|
| Number of flood-related insurance claims by businesses | 35,000 |
| Average claim per business | £75,000-£112,000 |
| Estimated damage to commercial property | £0.58bn |
| Claims for disruption to business and lost income | £160m |
| Total economic costs associated with business impacts | £740m |

Source: EA 2010

4.2.2 Future predictions

Flood risk assessments by the European Environment Agency (EEA) predict that, for the UK, extreme river flows and 1-in-100-year flood events will become more common (EEA 2008a), and show an increasing and high risk of coastal flooding, with 50,000 people a year potentially affected by the 2080s (EEA 2008b).

The UK Environment Agency's 2008 National Flood Risk Assessment shows that around 5.2m properties in England (or one in six) are at risk of flooding, and the estimated annual damage is more than £1bn. Climate change and development pressures are expected to increase flood risk in England, particularly in the latter half of this century (EA 2009a).

ABI research published in 2009 examined the financial implications of climate change based on modelling the effects of increases in global temperatures predicted to rise by anything from 2°C to 6°C this century (ABI 2009a). The study found that in Great Britain, temperature increases would impact most directly on rainfall, increasing the risk of extreme flood events. The resulting financial implications are summarised in Table 5, which shows significant increases in insured losses, insurance pricing and capital requirements.

TABLE 5 SUMMARY OF INCREASED TEMPERATURE IMPACT ON INSURED LOSS, INSURANCE PRICING AND CAPITAL REQUIREMENTS FOR RAIN-INDUCED INLAND FLOODING IN GREAT BRITAIN

| Temperature change | 2°C | 4°C | 6°C |
|--|---------|---------|---------|
| Increase in average annual insured loss (AAL) | 8% | 14% | 25% |
| | £47m | £80m | £138m |
| Increase in insured loss from 1-in-100 year events | 18% | 30% | 56% |
| | £769m | £1,240m | £2,353m |
| Increase in insured loss from 1-in-200 year events | 14% | 32% | 73% |
| | £832m | £1,920m | £4,346m |
| Theoretical impact on insurance pricing* (based on AAL) | 16% | 27% | 47% |
| Additional minimum capital required for 1-in-200 year flood* | £1,065m | £2,457m | £5,565m |

^{*}Annual GDP growth of 2.5% is assumed

Source: ABI 2009a: 5

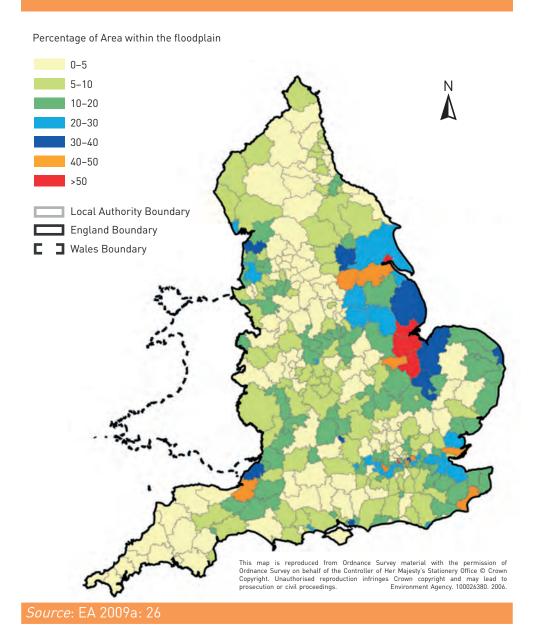


The report, 'Climate change – The risks for property in the UK', commissioned by Hermes Real Estate and Upstream from UCL Environmental Research, examines 'the physical impact of anticipated climate change on UK property during the 21st century' (Austin et al. 2008: 6), focusing on adaptation rather than mitigation. Analysis of scientific data shows that the most severe effects, including increased flood risk, will be in southern parts of the UK. A city-by-city analysis suggests that Southampton is likely to be particularly adversely affected. London, Bristol, Cardiff and Cambridge are also predicted to suffer negative impacts.

In particular, winter rainfall is expected increase, by as much as 25% in the Thames Gateway and 26% in Southampton, increasing the risk of flash flooding in urban areas. The report recommends that the property sector needs to 'set in place means for being regularly updated on the impacts of future climate change' (p. 8) and in particular keep abreast of developments in flood risk data through interaction with the EA.

The map in Figure 10 shows the proportion of local authority land in England at risk of flooding, which highlights high risk areas in the Thames estuary and the east coast of England (EA 2009a). The national risk assessment also identifies numbers of people and property at risk from flooding. London has the highest number of people at risk at around one million, but property is largely located in areas with low chance of flooding, mainly owing to the flood defence structures in the Thames estuary, including the Thames Barrier. However, it is anticipated that with sea level rise the Thames Barrier may need to be replaced at some point in the future.

FIGURE 10 LOCAL AUTHORITY BOUNDARIES, PERCENTAGE OF LAND WITHIN THE FLOOD PLAIN



In 2009 the UK EA conducted a public consultation on its flood risk management plan for London and the Thames estuary, being the first major flood risk project to put climate change adaptation at its core (EA 2009b). The plan is based on research conducted with the UK Met Office around the primary risk from tidal flooding, with an estimated worst case scenario of a +2.7m sea level rise this century.

Assets at risk in the tidal Thames flood plain, which includes a corridor through central London, are summarised in Table 6. Property potentially affected has an estimated value of £200bn and includes over 500,000 homes, 40,000 business premises, and key government and public buildings. The consultation particularly identifies the risk to London's internationally important financial and business services sector. While the traditional 'square mile' of the City of London is outside the natural flood plain, the more recent centre of Docklands is wholly within it.

TABLE 6 ASSETS AND PEOPLE AT RISK IN THE TIDAL THAMES FLOOD PLAIN

| 350 sq | km | land | area | |
|---------|-----|-------|-------|---|
| 55 sa k | m d | esiai | nated | h |

55 sq km designated habitat sites

1.25 million residents (plus commuters, tourists and other visitors)

Over 500,000 homes

40,000 commercial and industrial properties

£200 billion current property value

Key government buildings

400 schools

16 hospitals

8 power stations

More than 1,000 electricity substations

4 World Heritage sites

Art galleries and historic buildings

167 km of railway

35 tube stations

51 rail stations (25 mainline, 25 DLR, 1 international)

Over 300 km of roads

Source: EA 2009b: 12

The plan consultation discusses the challenges faced in implementing flood risk management, including the need to replace ageing flood defences, the dramatic increase in building values and their susceptibility to flood damage, and the general low public awareness of flood risk. The need for all stakeholders to be aware of their own responsibilities in taking precautionary actions is emphasised, rather than placing reliance wholly on flood defences to manage the risk.

In commenting on the EA plan for the Thames estuary, the ABI (2009c) notes that the increasing severity of urban flooding arising from severe rainstorms is predicted to affect 500,000 to 700,000 additional people. London has been identified as one of the most at-risk megacities globally, in view of the high level of economic activity combined with high asset worth and exposure to natural hazards. The ABI stresses that:

- insurers need a clear commitment from government that the expected future levels of flood protection will not be less than today's;
- to be effective, the plan needs to be broadened from its focus on tidal flooding to embrace all sources of flooding, including surface water.

4.3 FUNDING FLOOD DEFENCES

Based on research showing investment in flood resilience to be very cost effective, the ABI asserts that the funding of flood defences needs to change from a short-term, three-year cycle to sustained and planned investment over a much longer period, informed by a full and public assessment of the risks and costs (ABI 2009c).

To keep pace with increasing flood risk, the EA has calculated that spending on flood defences in England and Wales would need to double over 25 years from £570m per annum in 2009 to £1,040m per annum in 2035, just to maintain the current level of protection. This does not include dealing with the increasing risk from surface water flooding, estimated to require another £150m per year. Making progress on significantly reducing flood risk would mean even higher investment. The ABI (2010) believes this is justified, despite tough economic conditions, and asserts that every £1 spent on flood defences saves £8 in the wider economy through reducing the long-term consequences of flood damage.

However, the government comprehensive spending review in October 2010 cut funding to the Department for Environment, Food and Rural Affairs (DEFRA), leading to a reduction in the allocation to flood defences from

£2.15bn over three years (2008–11) to £2bn over four years (2011–15). Between November 2010 and February 2011, DEFRA implemented a consultation aimed at reforming the funding allocation process for flood defences from 2012, to reduce the burden on the tax system and lever funding from other sources (DEFRA 2010a). The ABI and British Insurance Brokers' Association (BIBA) expressed disappointment at the cuts, and the Institute of Civil Engineers (ICE) said that the reduced public spending would demand a more innovative approach to managing flood risk (Meeson 2010; ICE 2010).

4.4 FLOOD RISK AND INSURANCE

Increasing flood risk is proving a challenge to the insurance sector. Member companies of the ABI represent over 90% of the UK insurance market and control assets equivalent to a quarter the UK's capital. This section examines the steps they are taking to ensure the continued availability of insurance, and the difference in approach for homes and small businesses as against large corporate organisations. It covers:

- the insurance market for flood risk
- a new way forward for insurance
- the relationship between insurance and property
- insurance and commercial property.

4.4.1 The insurance market for flood risk

The UK is unusual in that flood insurance is considered normal and expected as a means to offset and mitigate flood hazard (Kenny *et al.* 2006). In many other countries there is less emphasis on insurance and/or governments take a greater role in flood cover or compensation (Clark *et al.* 2002).

Continuing insurance depends on managing risks and the most difficult aspect for the insurance sector is where a severe weather event damages many properties at the same time, resulting in major losses in one year, as seen in the major UK flood events of 2007. This unwelcome volatility in insurers' annual results can only be spread over time through the international reinsurance market. Costs and availability are never guaranteed because they depend on factors unrelated to the risk of flooding in the UK and use capital subject to high returns because of the high risks involved.

The effect on capital requirements also has implications for the global economy (ABI 2009a). This is because insurers must hold enough capital to cover expected losses and, when this increases, the amount of capital available for investment is reduced. Given that insurance companies hold around 15% of stocks on the London Stock Exchange, the implication for capital flows is significant.

In order that affordable insurance could continue being available to as many people as possible, the ABI entered into an agreement with government in 2000 on a Statement of Principles on the Provision of Flood Insurance. This agreement is a temporary measure designed to protect homeowners and small and medium-sized enterprises (SMEs) by guaranteeing them continued insurance cover even though they occupy property that would otherwise become uninsurable, making it difficult to mortgage and virtually unsellable. In return, the government is committed to ensuring flood risk is appropriately managed over the long term to enable the competitive market to deliver affordable flood insurance once the Statement of Principles ends. Managing flood risk involves vital investment in flood defences and other measures to reduce risk, including ensuring that the planning system does not permit unwise development on flood plains.

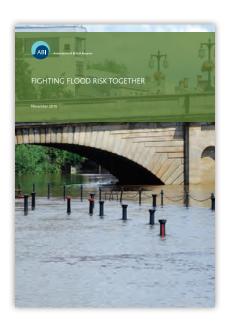
The Statement of Principles has proved problematic because it distorts the insurance market and will not therefore be renewed after 2013 (ABI 2010). New entrants to the insurance market do not have to adhere to the agreement and can avoid offering insurance in high flood risk areas. Consumers then suffer through a reduction in market competition and existing insurers are at a commercial disadvantage. This situation also restricts the opportunity for a specialist 'high flood risk' market to develop and reduces incentives for property owners and communities to invest in flood risk management.

The ABI is therefore calling for a new way forward in fighting flood risk in the UK to take effect once the Statement of Principles comes to an end.

4.4.2 A new way forward for insurance

The ABI sets out the basis for its belief that a new way forward for dealing with increasing flood risk in the UK needs to be established for the period after mid 2013, when the current Statement of Principles expires, in its report, 'Fighting flood risk together' (ABI 2010).

Here, the ABI emphasises that the 'responsibility for fighting flood risk must be shared between consumers, insurers, Government and other stakeholders' (p. 4). At a ministerial summit on flooding held in September 2010, three key areas for shared work were identified:



- Risk sharing between consumers, central and local government and insurers. It is not yet clear what this might involve, but the ABI has commissioned research to examine the options.
- Better data about flood hazard and flood risk that is up to date and accurate, to assist in the planning of flood defences, the pricing of insurance and informed choices by consumers and developers about investments.
- Consumer experience of resilience measures because, while resistance and resilience measures are key to flood risk management, consumer take-up in the aftermath of a flood is low. Further research is therefore needed to inform policy development.

The ABI concludes that while the UK is one of the few countries where flood insurance remains integral to property insurance, to enable this to continue requires:

- effective use of flood defence spending;
- world class risk data available to insurers and the public;
- a practical and sustainable solution to replace the Statement of Principles by 2013.

4.4.3 The relationship between insurance and property

The highly complex relationship between the UK insurance industry and the flood-insurance-related professions is discussed in the report, 'Insurance and UK floods: A strategic re-assessment,' jointly funded by HM Treasury and a consortium of insurers, brokers and Lloyd's managing agencies. It suggests that the property owner sits between two sets of forces or constraints (Clark *et al.* 2002: 13), illustrated in Figure 11 and described as:

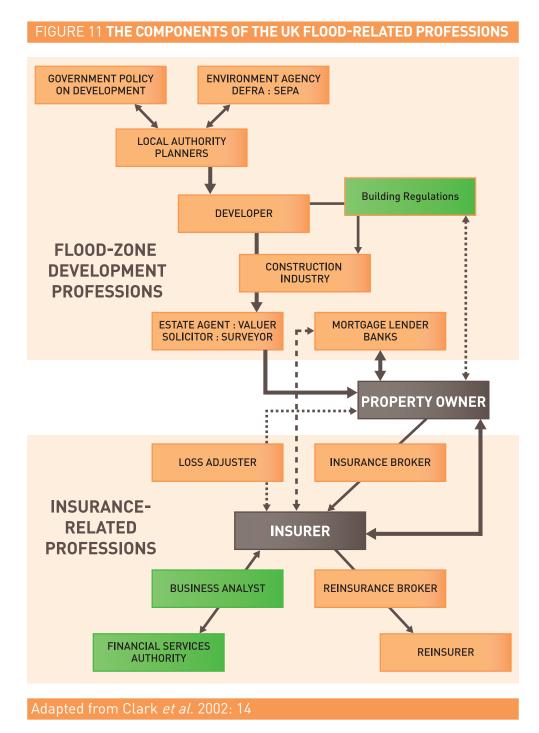
- the 'flood-zone development professions', which have a role in both promoting and regulating development and occupation;
- the 'insurance-related professions', involved in underwriting the majority of the risks at a price, which can facilitate or constrain development and occupation.

The property transfer professions, that is estate agents, valuers, solicitors and surveyors, are identified as ideally placed to provide frank information on which to base a risk-aware decision (see Figure 11). However, the report mainly focuses on the residential insurance market and takes a somewhat sceptical view that flood risk information would be provided in practice, stating:

'Not only is a proactive full and frank statement of risk superficially against the commercial interests of those who take fees from the property-transfer process, but it is doubtful whether full and frank information would be welcomed by purchasers.'

(Clark et al. 2002: 16).

As the research undertaken for this study into flood risk due diligence shows, in the institutional commercial property investment market significant efforts are being made by property investors and professionals to improve the reliability and communication of information between parties to enable risk-aware decisions. This is important not only to underpin the security of investments, but in order to comply with professional guidance and increasingly strict regulation.



4.4.4 Insurance and commercial property

Among the property investment funds and professional advisers interviewed for this project, none had seen a change or reduction in insurance availability because of flood risk to commercial investment property that they dealt with.

Large corporate organisations usually arrange their property insurance through a broker or their own in-house specialists, and policies are customised to the needs of the organisation. They will often employ surveyors to work with the business to:

- identify and manage risks for properties in their existing portfolio through the type of insurance cover arranged;
- provide advice about implementing flood resistance and resilience works to buildings identified as potentially at risk of flooding;
- advise on the flood risk at proposed new locations when making investment and development decisions.

Location is important not only in terms of whether the property itself is at risk of flooding, but whether flooding could affect the business supply chain through impeding access to suppliers, employees and customers. Insurers Marsh make the point that with the advent of just-in-time inventory control, any disruption to the supply chain could cause significant impacts on the continuity of the business, and 'if particular property assets or suppliers are considered to be highly vulnerable to flooding or severe weather, then perhaps relocating to a safer place or finding a new supplier may be considered to be the better risk management approach, and the cheapest option in the longer term' (Marsh 2011a: 2).

Flood risk insurance is usually integrated into other areas of cover and is also related to business interruption cover. Premiums are driven by the market, the reinsurance provisions, the spread of risk in the case of block policies covering many properties, and the appetite of individual insurance companies to underwrite policies. Rising levels of flood risk in the UK are likely to place greater focus on risk assessment and risk management; therefore dialogue between large commercial clients and their insurers is likely to become more important.

Lloyds brokers JLT suggest that while the real estate insurance market is expected to remain competitive in 2011, the exceptions are likely to be unoccupied or void buildings, and particularly those with potential or actual flood issues (JLT 2011a). However, they believe that clients who actively manage risk in partnership with a broker 'will differentiate themselves in

the mind of the insurer as well as help protect their assets' (JLT 2011b: 2). Some businesses 'should be able to reduce the cost of their insurance by improving the flood resistance of the properties and the resilience of their buildings' (JLT 2011b: 2) such that their brokers can negotiate rates that truly take account of improvements that owners have made.

A UN Environment Programme (UNEP) briefing paper, 'Adaptation and vulnerability to climate change', addresses the threats and opportunities for insurers in relation to the adaptation of property, and these are summarised in Table 7. To achieve truly integrated adaptation it will be important for insurers to become more proactive and 'become partners in the process of infrastructure planning', rather than simply being turned to for insurance once a development is complete or to renegotiate premiums or excesses in the light of losses due to damage (UNEP 2006: 23).

TABLE 7 CLIMATE IMPACT RISKS AND OPPORTUNITIES FOR THE INSURANCE SECTOR IN RELATION TO PROPERTY

| INSURANCE | THREAT (climate impacts, inappropriate adaptation) | OPPORTUNITY (adaptation or climate impacts) |
|-----------|--|---|
| PROPERTY | Inaccurate risk pricing Misinformed response from public sector (e.g. rigid product control) More costly repairwork Some markets become uninsurable Lack of capital/reinsurance Unprecedented disasters threaten solvency/liquidity | More demand for risk transfer Risk differentials can be segmented Administration of disaster recovery Climate-resilient infrastructure |

Source: UNEP 2006: 17

Approach to flood insurance by a major investor

Every site is individually valued and added into and taken out of the block policy as necessary, but we have certain sweep-up cover clauses that make sure that we're not under-insured anywhere.

Because it's such a big policy, insurers have been trying to sell us flood protection and flood investigation schemes for the whole of our portfolio and sites. So they're quite into it in terms of a service. We've not really been interested or taken them up because of our good claims history, so it's not worth the expenditure for us at the moment.

We have discussed the theory with our insurers and we asked them what is going to change in the way of their insurance policies – are they going to exclude certain postcodes and are they going to withdraw anything? They're still waiting to see whether flood risk is going to be managed by exclusions from policies or by a special pool of money put in by all the insurance companies who cover flood. Until that's decided none of them want to do themselves out of the market by saying they won't insure flood areas. Excesses on domestic properties appear to have gone up for flood risk but not for commercial property, certainly not on our policy it hasn't. We still only get penalised really for subsidence claims.

In our insurance management we have a quarterly report which flags up if there are any claims for flood, so that's our first way of knowing if there are any flood issues on the site. Since I've been having that provided to me for about the last four or five years we've not had a single flood other than where someone's burst a pipe or something like that.

4.5 ADAPTATION MEASURES

The UNEP briefing paper considers adaptation to climate change from the viewpoint of the finance sector and states the belief that 'adaptation is a vital complement to mitigation' (UNEP 2006: 3). The issues for fund management are illustrated in Table 8. While many predicted effects are negative, positive opportunities connected with adaptation are identified. For example, it is suggested that in investment 'adding socially responsible factors, including climate change, into stock assessment and portfolio management gives a more reliable performance' (UNEP 2006: 16).

TABLE 8 CLIMATE IMPACT RISKS AND OPPORTUNITIES FOR FUND MANAGEMENT

| FUND MANAGEMENT | THREAT | OPPORTUNITY |
|-----------------------|--|---|
| General | Unpredictable impacts on global markets Uninsured damage to assets Macroeconomic downturn hits business volume | Upsurge in socially responsible investment More saving for 'rainy day' |
| Corporate securities | Climate impacts affect market value of securities | Outperformance by climate leadersMajor adaptation projects |
| Property | Unplanned refit costs | Outperformance by climate-resilient stock |
| Government securities | Ability to repay impaired by pressure on public purse from disasters | Increased need for publicly funded adaptation |
| Other | Compounded climate risk across diversified funds | Mezzanine finance for adaptation projects |

Source: UNEP 2006: 18

At the strategic level in the UK, adaptation issues for flood risk come within the remit of the Adaptation Sub-Committee (ASC) of the Committee on Climate Change, which in 2010 produced the first national assessment of progress on preparing for climate change, 'How well is the UK prepared for climate change?' (Committee on Climate Change 2010). The ASC is charged with providing independent advice to the UK government under the Climate Change Act 1980. The report identifies five adaptation priorities for the UK:

- land use planning
- providing national infrastructure
- designing and renovating buildings
- managing natural resources
- · emergency planning.

The report finds that while the UK has started to build capacity for adaptation, this is 'not yet being systematically translated into tangible action on the ground to reduce the UK's vulnerability to climate change' (Committee on Climate Change 2010: 2). It quotes a survey of 350 FTSE-listed companies (Acclimatise 2009) which found that, in general, adaptation was an unexplored corporate issue, even though 87% of companies believed they were exposed to climate change risk. Key barriers to action that will not be overcome by capacity building alone include:

- inadequate or insufficiently accurate climate risk information preventing organisations making a business case for adaptation, for example on surface water flooding risks;
- market and policy barriers preventing sensible 'low-regrets actions', such as implementing sustainable urban drainage and property-level flood protection.

Among the further actions required, the ASC identifies:

- establishing a process for defining adaptation outcomes, for example the level of flood risk regarded as acceptable;
- ensuring decision-makers have the practical tools and information to quantify key climate risks and manage uncertainties.

The ASC assessment also suggests that early adaptation efforts should focus on decisions that have long-lasting consequences, including decisions about long-lived assets such as buildings and infrastructure. The main challenge is 'making decisions in the face of considerable uncertainty' (Committee on Climate Change 2010: 4).

The ABI, in commenting on plans for the Thames estuary, stresses that the task of adaptation to flood risk needs more visibility and recognition at all political levels and must be seen as a process requiring constant change and adjustments, with no end point to be reached (ABI 2009c). Adaptation needs to be applied not only to new developments through the planning system, but also to retrofitting the existing building infrastructure and stock to withstand more extreme weather events.

4.6 GUIDANCE ON ADAPTATION AND EMERGENCY PLANNING

The implementation of adaptation measures and improvement in emergency planning for floods relies on property owners and occupiers being better informed. Most of the publicly available guidance is aimed at homeowners and small businesses, whereas large businesses will generally turn to professional advisers and specialist contractors for solutions to flood protection for the properties they occupy. Nevertheless, for large businesses the flood resilience of their wider supply chain, including employees, is also likely to impact on their ability to remain trading.



This section therefore briefly covers:

- guidance from the Department for Communities and Local Government (DCLG) for developers on improving the flood performance of new buildings (primarily housing);
- consumer guidance published by the ABI, RICS and the EA;
- business continuity guidance from insurers Marsh.

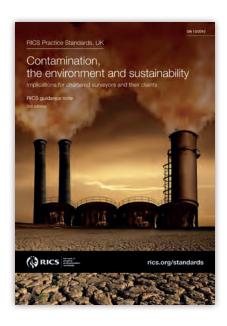
The report, 'Improving the flood performance of new buildings', produced by the DCLG (Bowker *et al.* 2007), is aimed primarily at housing developers and designers, and provides guidance on how to improve the resilience of properties in low or residual flood risk areas by using suitable materials and construction details. The approaches are suitable for areas defined as Flood Zone 1 (low risk) or where flood risk management or mitigation has been put in place. The guidance includes a useful glossary of terms relating to flooding and construction approaches to improving building performance (see Table 9) and a decision framework to aid consideration of whether to adopt a **water entry** or **water exclusion** strategy when designing new buildings.

TABLE 9 GLOSSARY OF TERMS RELATING TO FLOODING AND CONSTRUCTION APPROACHES

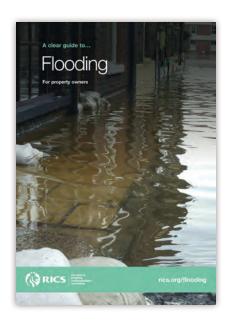
| Term | Construction objective |
|------------------|---|
| Flood avoidance | Constructing a building and its surrounds (at site level) in such a way as to avoid it being flooded, for example by raising it above flood level or re-siting the scheme outside a flood risk area. |
| Flood resistance | To prevent flood water entering a building and damaging its fabric. |
| Flood resilience | Although flood water may enter the building, its impact is reduced, for example by choosing materials and construction details that mean no permanent damage is caused, structural integrity is maintained and drying and cleaning are facilitated. |
| Flood repairable | Although flood water may enter the building, elements that are damaged can be easily repaired or replaced. This is also a form of flood resilience. |

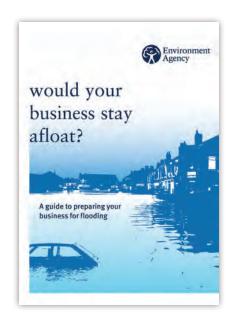
Adapted from Bowker et al. 2007: 9

In 2009 the ABI published its 'Climate adaptation: Guidance on insurance for new developments' (ABI 2009b), where it called for the creation of 'climate-aware developments' with built-in resilience to mitigate climate change impacts. An increased risk of flooding is identified as presenting the greatest challenge for the UK, not only from rivers and the sea, but from surface water, sewer overflows and groundwater. Prospective purchasers are also advised that before buying a property in a new development they should check the flood risk and obtain information on measures to reduce it.



RICS Guidance Note 13 (RICS 2010d) recognises that surveyors may be called upon to advise on the preparation of flood plans and measures to make property more resistant to flooding. In section 5.4 the document briefly discusses ways in which flood water can access buildings and the measures that could be taken to improve the resistance of property by 'dry-proofing' or 'wet-proofing'.





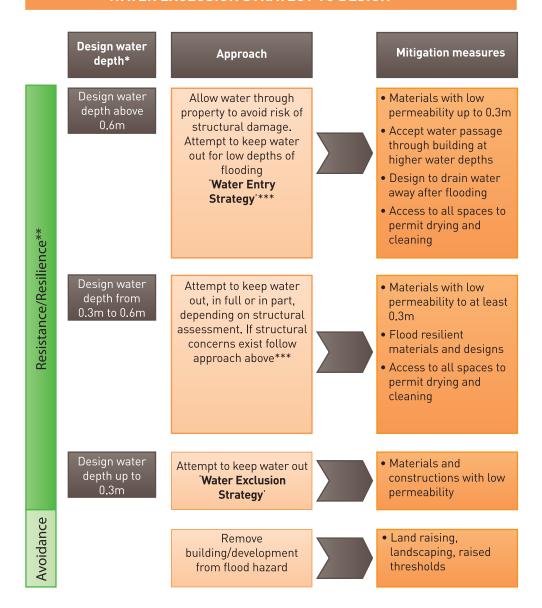
The RICS consumer property guide to flooding for property owners (RICS 2010e) is particularly aimed at homeowners and small businesses, but it is also likely to be useful to any property occupier who is starting from a position of no knowledge about flood issues and who needs to be better informed. The guide addresses fundamental questions about flooding in a straightforward and practical way, for example, 'How will a flood affect the value and insurability of my property?', 'What can I do to deal with flood risk to my property?' and 'Why does it take so long to reinstate a property after a flood?'. Links to other relevant sources of information are also incorporated, including weblinks and contact numbers for the EA flood information services, the National Flood Forum and the ABI.

Environment Agency guidance, 'Would your business stay afloat?' (EA 2011), encourages business occupiers to plan for how they would deal with a flood. It points out that preparing a flood plan can also help towards compliance with, for example, the Occupiers Liability Act 1984 and environmental regulations. The guidance covers how to check if the business is in a flood risk area, signing up for flood warnings and practical steps for protecting the business that can help reduce losses, damage to property and business interruption. It advocates making a written plan covering human resources, maintenance/facilities and finance and purchasing. Sample forms are included as the basis for recording information about key locations, staff contacts and protective actions.

Insurers Marsh issued an advice note in February 2011 outlining a general business continuity and health and safety checklist to assist businesses in getting back to normal as quickly as possible following a flood (Marsh 2011b). The advice covers:

- immediate actions to clear buildings of flood water;
- recovery actions, including contacting insurers, maintaining critical activities, informing staff, suppliers and customers;
- health and safety actions, associated with cleaning up premises, reducing risks and safely reinstating utility services.

FIGURE 12 **DECISION FRAMEWORK FOR ADOPTING A WATER ENTRY OR**WATER EXCLUSION STRATEGY TO DESIGN



Notes:

- * Design water depth should be based on assessment of all flood types that can impact on the building
- ** Resistance/resilience measures can be used in conjunction with avoidance measures to minimise overall flood risk
- *** In all cases the 'water exclusion strategy' can be followed for flood water depths up to 0.3m

Source Bowker et al. 2007 9

4.7 **SUMMARY**

In terms of flood risk threat to institutional investment property, London has been identified as one of the most at-risk cities globally, in view of the high level of economic activity coupled with high asset worth and hazard exposure.

In the future, building-level adaptation to mitigate flood risk will be critically important. The evidence suggests that adaptation to climate change risks is currently an underexplored corporate issue and that early efforts would be best focused on decisions that have lasting consequences, such as with long-lived building assets.

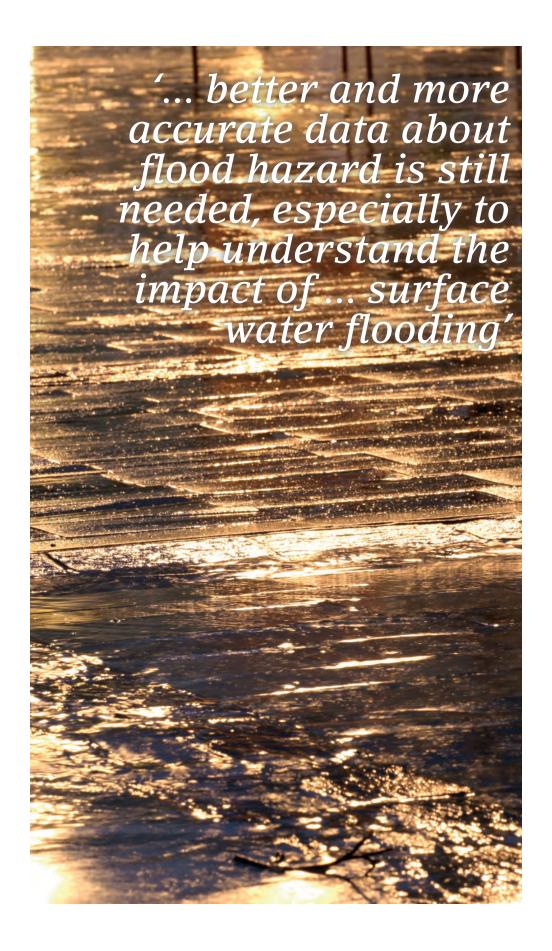
Adaptation also needs to be seen as an ongoing process in response to changing risk levels, improvements in flood risk data and developments in flood resistance and resilience techniques.

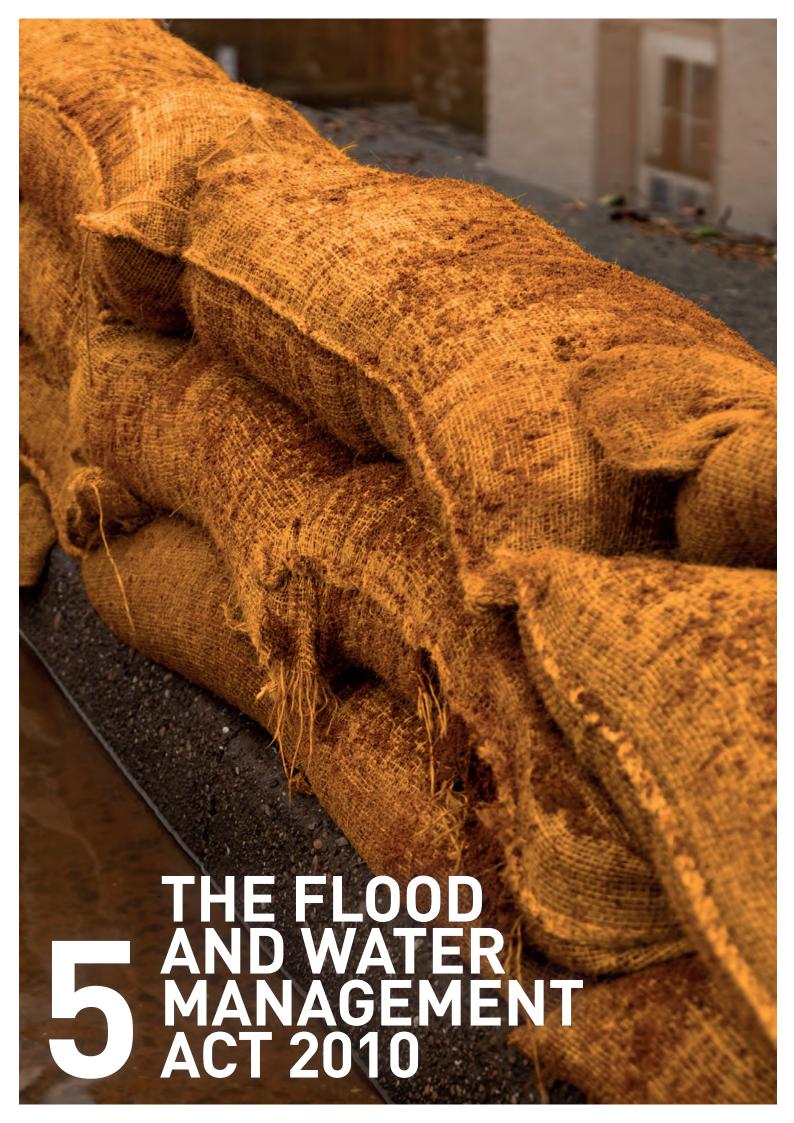
Publication of the first national assessment of flood risk for England by the EA in 2009 is a step forward in aiding property owners to recognise risks, make investment decisions and prepare for floods. However, better and more accurate data about flood hazard is still needed, especially to help understand the impact of an anticipated increase in the severity of urban flooding arising from severe rainstorms generating surface water flooding.

Reliance cannot be wholly placed on publicly funded flood defences or on insurance. These are connected in that the continuance of flood risk insurance will depend on the effective use of flood defence spending together with improvements in the accuracy of flood risk data.

While the EA has calculated a need to double flood defence spending by 2035 just to maintain current protection levels, and the ABI believes the cost can be justified in terms of savings to the wider economy through reduced flood damage, 27% cash cuts were made in the October 2010 spending review, and alternative ways of funding defences are being explored.

The restrictions on insurance availability and high premiums threatening homeowners and small businesses in flood risk areas have not so far been experienced by large corporate organisations, which arrange bespoke policies through brokers or in-house experts. However, rising levels of flood risk is likely to place greater focus on risk assessment and risk management in the future, with insurers becoming more proactive in engaging their commercial clients in dialogue about mitigation and adaptation measures.





The devastating floods in England in 2007 led the then UK government to commission an independent review by Sir Michael Pitt, whose report called for greater clarity and transparency in responsibility for flood defences.

The resulting Flood and Water Management Act 2010 (FWMA) was deemed sufficiently important to reach the statute books before the 2010 general election and it received Royal Assent on 8 April 2010. While the Act commencement date was in April 2011, risk management authorities were expected to make a start on the organisational framework and strategic development in advance of this date.

A copy of the FWMA and Explanatory Notes prepared by DEFRA (2010b) can be found on the DEFRA website.

This section reviews the main implications of the FWMA for landowners, particularly in relation to the powers of public authorities to designate flood protection features and require sustainable urban drainage systems (SUDS). The viewpoints of interviewees are also incorporated.

5.1 AIMS OF THE FWMA

The FWMA has the principal aim of providing better protection from flooding and better management of water supplies in the event of drought. It includes specific provisions on:

- roles and responsibilities for flood and coastal erosion risk management
- flood protection assets owned by third parties
- SUDS
- flood resilience within properties.

5.2 ROLES AND RESPONSIBILITIES

The FWMA defines risk as flood risk and coastal erosion risk having consequences for human health; social and economic welfare of individuals and communities; infrastructure; and the environment, including cultural heritage (WSP 2010). It places duties on the EA, local authorities, developers and other bodies to manage flood risks.

The EA and local authorities are required to produce strategic flood risk assessments and surface water management plans, and must also issue guidance on these plans covering surface run-off, groundwater and ordinary watercourses. The EU Floods Directive, transposed into UK law by The Flood Risk Regulations 2009 introduced on 9 December 2010, required the EA to publish preliminary assessment maps and reports prepared in conjunction with lead authorities by December 2011, to comply with the FWMA (s.15(2)).

In its briefing note (LGA 2010), the Local Government Association welcomes the new legislation, which creates clearer roles and responsibilities and instils a more risk-based approach to flood risk and water management. The briefing note provides a useful summary of the key measures, including the powers and duties assigned to local authorities. However, it also expresses concerns about funding and capacity, including skills shortages, and considers that close monitoring and flexibility in government funding will be essential to allow for additional expenditure if it becomes clear that emerging costs outweigh budgets. The importance of a clear funding mechanism for SUDS is particularly stressed.

An environmental consultant's viewpoint of the local authority role

I think the biggest problem with the Flood and Water Management Act is that whilst it's quite well intentioned in its desire to get local authorities more involved in local flood management and surface water management, it's the resources available ... they are maybe getting one person within their organisation who is now pretty clued up and that's just not enough.

5.3 DESIGNATED FLOOD MANAGEMENT FEATURES

The duty on 'lead local flood authorities' (unitary or county councils) to implement local flood risk management strategies includes keeping a register of features likely to have a significant effect on flood risk, accompanied by information about their ownership and state of repair. Law firm TaylorWessing (2010) suggests that these additional provisions may well have unexpected and unanticipated impacts on present and future land use, development and construction.

Designated flood management features can be structures, natural or

man-made, which affect flood or coastal erosion risk, and could include, for example, walls, channels, culverts, sluices, raised ground and embankments. Designation means that they cannot be removed, altered or replaced without the consent of the responsible authority, usually the EA or lead local authority. Appeals can be made against designation or a refusal to alter, remove or replace a structure, but this nevertheless represents a potential additional complication for present and future land use, development and construction proposals. Although current provisions do not allow responsible authorities to compel maintenance of designated features, TaylorWessing (2010) suggests that the registration of ownership and state of repair may lead to an indirect duty to at least maintain the feature in the same condition as at the point of registration.

An environmental consultant's view of designated assets

The idea is that local authorities and the Environment Agency should know more about assets which would affect flooding and that a database of all their critical assets must be created. The Flood Water Management Act increased the power of the local authority and Environment Agency in terms of obtaining this information because now there is a duty for all the players involved, including private companies and developers, to provide information about assets which could affect drainage regimes and which are within their land.

It has to do more with the provision of comprehensive information, because quite a lot of this information is available but is not in a single place and not comprehensive.

5.4 SUSTAINABLE DRAINAGE AND FLOOD RESILIENCE

The FWMA also requires specified authorities to carry out their functions in ways that contribute to achieving sustainable development. In particular authorities have new powers to require, enforce and adopt SUDS. Further, the power under the Building Act 1984, enabling local authorities to require a landowner to carryout works to unsatisfactory drains, is extended to SUDS, although it is not yet clear whether this power could be used to compel the maintenance or even improvement of existing drainage systems (TaylorWessing 2010).

A briefing paper by WSP (2010) provides a civil engineer's view of the FWMA and a detailed technical summary of the main aspects affecting development, particularly in relation to SUDS and the mechanism for the adoption of these drainage systems. It also notes the amendments made to the Building Act 1984, which will lead to changes to the Building Regulations to require flood resilient construction methods.

An environmental consultant's view of SUDS

The key thing in terms of the Flood Water Management Act I would say is the increased power given to local authority in terms of surface water management and increased focus on surface water.

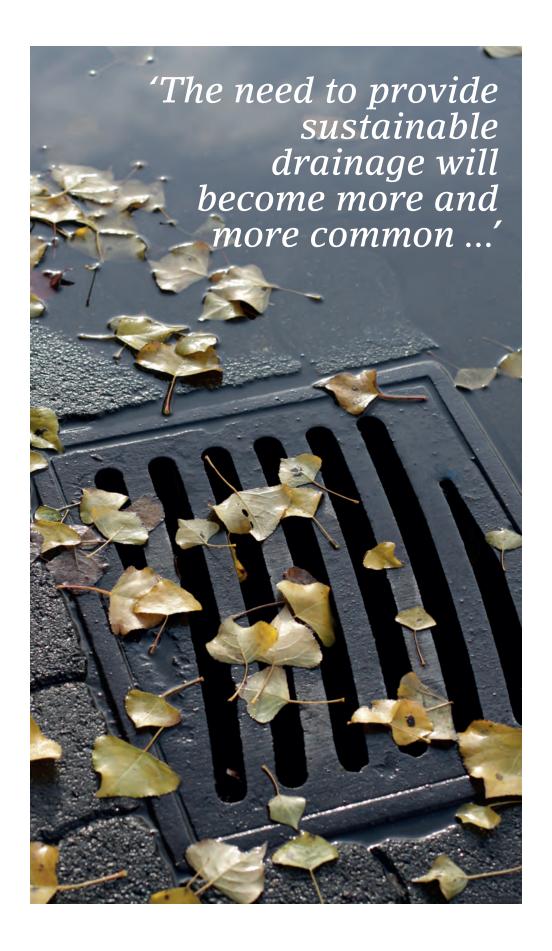
Up to a few years ago surface water wasn't really so important in terms of risk management. The focus, especially in terms of the Environment Agency input, was on tidal and fluvial flood risk and surface water was not really considered a big issue. Now it is understood better it is an issue. Nationally, surface water flooding is much more frequent than major fluvial and tidal flooding and potentially economic damage is significant.

This is why the Flood Water Management Act focuses on the sustainable management of surface water, giving more power to local authorities and indicating a framework to ensure that in the future surface water is managed in a more sustainable way. In the past it was quite typical to simply use traditional engineering systems, drainage pipes and storage tanks, basic and traditional engineering means to manage run-off. Now local authorities will be expected to adopt trench systems, provided that they comply with the National Standards in terms of sustainable drainage. The need to provide sustainable drainage will become more and more common, including for example Green roofs, permeable pavements and ponds, in order to get the system adopted and in order to get planning approval if you are lodging a planning application.

A solicitor's view of the FWMA

I think one of things the Act will change for the lawyers is the enquiries that need to be made not only of a vendor of an investment property but also enquiries that you make of local authorities, the Charges Register and that kind of thing. So there will be a whole new series of searches and questions that can be raised about:

- What are the Local Authorities doing about drainage systems?
- Is there going to be any work to improve drainage systems?
- Are there going to be any drainage systems which are going to be sustainable urban drainage systems?
- Is there anything on a list of proposals for a system to be built and registered as such, because that could affect some redevelopment proposal for the property in the future?



5.5 IMPLICATIONS FOR PROPERTY OWNERS AND DEVELOPERS

The British Property Federation (BPF) briefing on the FWMA (BPF 2010b) summarises the key requirements of the Act for property owners and developers. Its membership comprises many of the biggest organisations in the property industry, including major institutions, fund managers, investment banks and professional organisations. As regards the requirement on lead authorities to identify flood protection structures, the BPF believes that 'the vast majority of these structures will not touch BPF members' (2010b: 3). The BPF also points out that because the FWMA was pushed through Parliament quickly before the election in May 2010, there is a lot of working detail yet to come, some of which will be taken forward through secondary legislation and other regulations.

Overall, while the FWMA has significant planning and design implications for developers, it should also mean that they are able to obtain more accurate information on sites potentially at risk of flooding (WSP 2010).

A solicitor's view of the FWMA's effect on developers

I think there will be a two-phase implementation. Broadly speaking those areas that are known to be having flooding problems will take an active role in the strategic issues raised, but there will also be a certain amount of reaction when incidents occur in unexpected areas and flooding issues will rise up the agenda. So a combination of strategy for obvious areas and then reaction when incidents occur. The flood defence authorities will get a better understanding of what they can do and what they should be doing and so I think it will be a gradual implementation but it will assume an increasing level of importance.

The only other thing I'd say is that local authorities are being stretched at the moment. It will have a knock-on effect on development almost certainly, because local authorities are not the best in the world at committing to new developments. So this may be yet another stick to beat developers with to improve the current infrastructure in and around the surrounding area. I suspect that is actually going to be yet another reason why developments are going to stall or they're just never going to get off the ground in the first place. It's an unknown quantity that developers just will not be able to cost out on Day One.

5.6 SUMMARY

The identified benefits of the FWMA are that it:

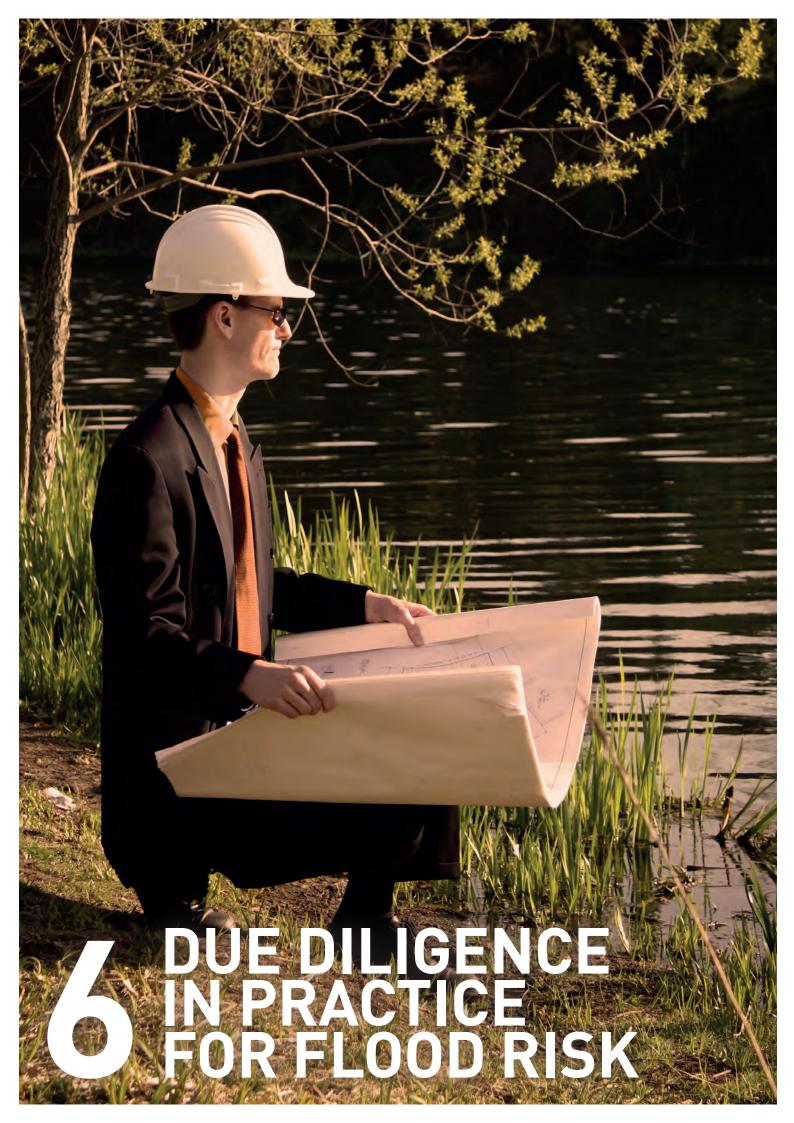
- creates clearer roles and responsibilities for managing flood risk, particularly as between the EA and local authorities;
- increases the focus on surface water as a significant source of flood risk;
- gives greater powers to local authorities, especially in surface water management;
- instils a more risk-based approach to flooding and water management;
- provides for the creation of a comprehensive register of flood protection assets;
- is likely to bring about improvements in the accuracy of information available to developers about sites potentially at risk of flooding.

However, there are a number of uncertainties associated with the introduction of the Act, in that:

- much of the working detail has yet to be defined and will be taken forward through secondary legislation and regulations;
- local authorities have greater powers, but there are concerns about funding, resources and skills shortages that could hamper implementation;
- the extent to which local authority powers to require works to unsatisfactory drainage systems extend to existing private systems is unclear;
- the designation of flood protection assets could present an additional complication for present and future land use, development, construction proposals and maintenance liabilities;
- the FWMA still represents an unknown quantity for landowners and developers who cannot yet fully cost the property impacts of the Act's requirements.

Reducing the uncertainties for property owners and developers will therefore depend on:

- the level of funding and resources made available to enable local authorities and the EA to pursue implementation of the FWMA;
- the speed of clarification provided by secondary regulations and through experience of working with the new requirements.



Interviews conducted for this project explored the due diligence process as it relates to flood risk. They have been used to present the various approaches taken by investors, environmental consultants, lenders, valuers and solicitors contained in Boxes 1–6. These interviews illustrate the role of each of the parties and the way that they interact during the investigations and through the sharing of information.

The relationships between the parties are summarised in Figure 13.

FIGURE 13 ENVIRONMENTAL CONSULTANT PROCESS FOR FLOOD RISK DUE DILIGENCE

INSTRUCTION FROM CLIENT INVESTMENT FUND **Phase 1** Site inspection and/or desktop study Desktop study Environmental information gathered from online electronic reports (Landmark, Argyll), including: Environment Agency flood risk data historical maps regulatory data – permits and authorisations on site position related to flood plain Site visit usually required by the client, especially if the site is in a flood zone (EA data) Flood risk low or Flood risk level of manageable concern Phase 2 Investor goes to investigation insurer Consult Environment Agency (up to 20 days) Topographic surveys

6.1 APPROACHES TO THE PROCESS

The due diligence process illustrated in Boxes 1–6 usually takes about 10 working days, between agreeing heads of terms for an investment transaction to clearing survey and proceeds as follows:

- Starting with the property investor (Box 1), in large funds due
 diligence for an investment acquisition is normally co-ordinated by one
 person and commences once the asset manager has agreed heads of
 terms for the transaction. The manager responsible for co-ordinating
 the due diligence will then commission an environmental report,
 including the flood risk status of the property, and specialist building
 surveys, for example including cladding and mechanical services.
- The environmental consultant (Box 2) makes first-stage investigations involving a desktop study and usually a site visit. If this indicates a level of flood risk of concern to the investor, second-stage investigations are undertaken which involve more in-depth enquiries of the EA. (Also see Figure 14).
- Where a lender (Box 3) is involved, the bank will normally make
 its own enquiries and investigations into flood risk and use its own
 lawyers and valuers, but may also receive a copy of the environmental
 report commissioned by the borrower.
- Valuers (Box 4) can act either for the investment fund or a bank as lender, and will make their own environmental enquiries, including flood risk. When valuers are commissioned by the investor to provide an independent valuation as a final check to support the investment transaction, they will usually be provided with all the survey information gathered by the investor so that they are working from the same information base.
- The **solicitors** (**Boxes 5 and 6**) undertaking legal due diligence for an investor client will also conduct environmental searches and enquiries covering flood risk, in parallel with the 'operational due diligence' being undertaken by the environmental consultants and surveyors through on-site investigations. The solicitors then review the information gathered through the legal searches and surveys to identify the impact of any constraints or risks on the transaction and provide advice on how they may be addressed through contracts.

BOX 1: THE INVESTOR PROCESS

Due diligence surveys are usually commissioned on the day heads of terms are agreed for the transaction, or the next day. They include a building fabric survey, if necessary specialist cladding and structural advice, and always an environmental audit, which includes contaminated land and a flood risk profile. A separate sustainability report covers a whole range of issues and also includes flooding. The trend is 5–10 days to clear surveys, but often the information that's required can't be provided fast enough. For a new build project, a flood risk assessment forms part of the planning studies.

If the first stage of the investigation shows that there is any sort of flood risk, we then ask our specialists to carry out a more detailed flood analysis and in-depth report involving more liaison with the Environment Agency, and usually a topographical survey to see whether the situation is manageable or not.

The asset managers consider the value of the property in relation to any risks identified. They always have to get an independent valuation, not the agents who are acting for us or the vendor, but another third party valuation to check or support the transaction. All the survey information goes to the independent valuers, so they're working from the same basis and knowledge. This valuation is one of the last stages of the due diligence, literally a few days before exchange of contracts.

BOX 2: THE ENVIRONMENTAL CONSULTANT PROCESS

A fund will contact us saying they are looking to acquire a particular property. They send us the sales brochure and ask for a Phase 1 report. Some of the funds will instruct us direct and others will instruct us via a building surveyor or even a solicitor.

For the Phase 1 inspection we would normally do a site inspection. Some clients may decide they don't want us to do the site inspection and we will just do a desktop study. The majority of the time it's to save a bit of money, but when you think how much money they're paying for the building and the overall due diligence, then is it worth saving £500? It depends if they can acquire the property without funding, but certainly some of the banks will say 'we want a site inspection as well'.

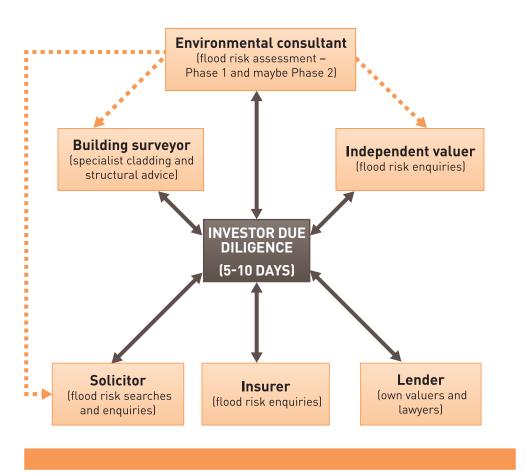
The initial steps would involve obtaining environmental information from one of the database providers, such as Landmark. That data includes historical maps and regulatory data in terms of any permits or authorisations that are held on the site or in the surrounding area. It will also show whether the site is within a flood plain. At the same time we also check the Environment Agency website in relation to flood risk. Generally a site visit will then be made, unless the client does not require it.

Our report will identify whether the site is in a flood risk zone and what the Environment Agency website states, for example whether it's in Flood Risk Zone 1 or a 1-in-100 years' or 1-in-1,000 years' risk.

The client will then decide whether to ask us to make further enquiries with the Environment Agency or whether there is enough for them to go to their insurers and get comfortable that cover is going to remain in place.

The problem is that with commercial transactions there is pressure to act quickly, but getting information from the Environment Agency can take time and they quite often will say, 'we have 20 working days to respond to your enquiry'. The timescale from instruction to final report is traditionally 10 working days, but we let the client know of any major issues before then, so it gives them the opportunity to request more time or seek further information from the vendor.

FIGURE 14 INVESTOR DUE DILIGENCE FOR FLOOD RISK - DYNAMICS



BOX 3: THE LENDER PROCESS

The lender can be approached at all stages of the transaction. You'll get customers that have identified something that they think they might like to purchase and want to discuss the appetite to lend on it, so that's really early on in the process. Occasionally you get people, probably less so in this market, where they've already agreed a purchase price or maybe have already exchanged contracts because they were able to buy for cash and are then looking for funding.

We ask the valuers appointed by the bank as part of the valuation due diligence to check out whether there's potential for flooding or if there's been flooding in the past. It's just one of the things we'd expect them to pick up.

If the borrower believes that there could be an issue with flooding, they might have undertaken some of their own investigations which they will pass to us as an early part in the process, especially if there is an instance which has made the national press in terms of flooding within the last couple of years. We might then be given copies of consultants' reports and if there is an issue or something wasn't clear, we speak to the consultants having got the borrower's permission first, but this situation is not common.

In terms of timing, vendors put purchasers under pressure to complete quickly but it's usually set by the market. When market conditions are tighter purchasers often win a bid on a property because they say they can move quickly, but in weaker market conditions like we are experiencing now, we will take our time. So the normal valuation due diligence would typically take a couple of weeks to turn around, and then if there are any issues arising from that the enquiries carry on.

BOX 4: THE VALUER PROCESS

We do a considerable number of investment valuations, both for investors as part of due diligence exercises, upon purchase or as part of an internal review, but also for financing purposes for the banks. It's not often that we advise on smaller assets, say under several million pounds.

We will have a shopping list of information that we ask for. Ordinarily information comes in from the client. Most investors that we advise tend to be knowledgeable clients and therefore they have already commissioned these types of reports and we are able to rely on those: a building survey, ground conditions report and environmental surveys. We will also run some fairly high-level checks on the flood risk using the national flood risk information online. Often the bank will ask us whether or not we feel that any additional form of environmental reporting is required.

With certain transactions there are reasons why they have to be done quickly in a secretive and quiet sort of fashion, so you are not always in possession of all the information. You can ask for more, but the client might turn round and say 'well sorry, either timetable doesn't permit or we are not prepared to do that'. It is the job of an investment manager to make that judgement call and as valuers we make a judgement as to how the market as a whole would assess the value of that property on the basis of the amount of information to hand.

Depending on the responses, we will then need to articulate that through the valuation report as to how it impacts on the property and how the market as a whole would react to that risk. What we are not saying as valuers is 'well we wouldn't invest', we need to assess whether the market would invest or not. It is all about trying to mirror how the market would price an asset. This is really where the RICS Valuation Information Paper No. 13 comes in, because it says that you should be able to articulate those risks at least in a qualitative form. It may not actually affect the value, but it could well impact on the risk profile and that should be conveyed in written form.



BOX 5: THE SOLICTIOR PROCESS

London firm acting for major institutional investors

Normally you would get heads of terms and straight off one of the first things is submitting searches. We commonly use a search provider such as SearchFlow and then put in a whole myriad of searches including the Environment Agency search, which is now a general environment search, as well as all the common utilities searches and the more plain real estate searches, such as the local authorities. We then crack on. Generally people don't hold back with the deal waiting for the search results to come in. You get on with the rest of the deal, so looking at the actual property due diligence that has been submitted by the other side, and in the course of the transaction you'd be reviewing searches as and when they turn up.

When you're acting for a bank you tend to become involved at a later stage, and you are then effectively given a package of papers which would include the searches and replies to enquiries outlined above, and you go through those and review them. The process is pretty fundamentally the same, you just tend to become involved at a later stage so there is more of a impetus timing-wise to go through it quickly.

There are two aspects to due diligence. Effectively there is operational environmental due diligence where you get a consultant in to actually see what is on the ground and what the risk might be, and then legal due diligence which arises from the results of searches and documentation, and they are two separate disciplines to a certain extent.

Operational due diligence is basically the consultants going out to site, on to the ground, finding out what the physical topography is like, what the issues might be and advising on any potential constraints that may be posed by flood risk or by other environmental issues.

The legal side of things then is looking at what the constraints might be, how they are factored into the deal, how the risks are carved out, allocated, covered or identified elsewhere depending upon what the impact might be on the heads of terms.

BOX 6: THE SOLICITOR PROCESS

Provincial firm acting for smaller investors

There are a number of clients that we will do investment acquisitions and disposals for from time to time. We don't have a huge client base, unlike some of the bigger London firms, and our clients are probably not quite as sophisticated, but the issues are still the same.

We would normally get instructed once the client has done the deal in commercial terms, once the heads of terms have been prepared and discussed and finalised. We would then often get the call to say, 'we now want to complete within the next three weeks'. That wouldn't be untypical. More enlightened clients might give us a bit more advanced warning. Some buy at auctions, so they sometimes ask us for due diligence in advance, but it's fairly limited what you can do, particularly if they ring you up and say, 'the auction is on Friday,' which isn't uncommon.

The more sophisticated clients will have people that they will routinely ask to do environmental searches and investigations in advance of agreeing a price and agreeing a deal. If it is apparent there could be a flood risk issue, they may have asked a firm of consultants to consider that as well, but I would say that is low down the environmental agenda. Ground contamination, for example, is routinely investigated but they wouldn't routinely look at flooding unless it was so obvious because the property is right next to a river.

We use SearchFlow to do most of our searches and due diligence reports. Then there are a number of companies that provide fairly easy access environmental and flood risk reports, like Landmark and Argyll, available online. It might cost a couple of hundred pounds maximum and we would make sure that the client is happy that we include that investigation as part of our normal level of due diligence.

If those reports suggest that there isn't any risk at all, then you just report to the client and move on. But if they suggest that there is a level of risk, you need to discuss that with the client and it could be a question of going to some experts to do a more detailed flood risk assessment. Obviously clients are worried about the potential risk, but they are also worried about cost at that stage because those next level risk assessment reports can be several thousands of pounds.

Information is shared with valuers and lenders. Often when we produce a due diligence report either we would be asked to present that to the lender or the lender may have their own solicitors acting for them, depending on the nature and value of the funding, and they would want to see all the results of all those reports.

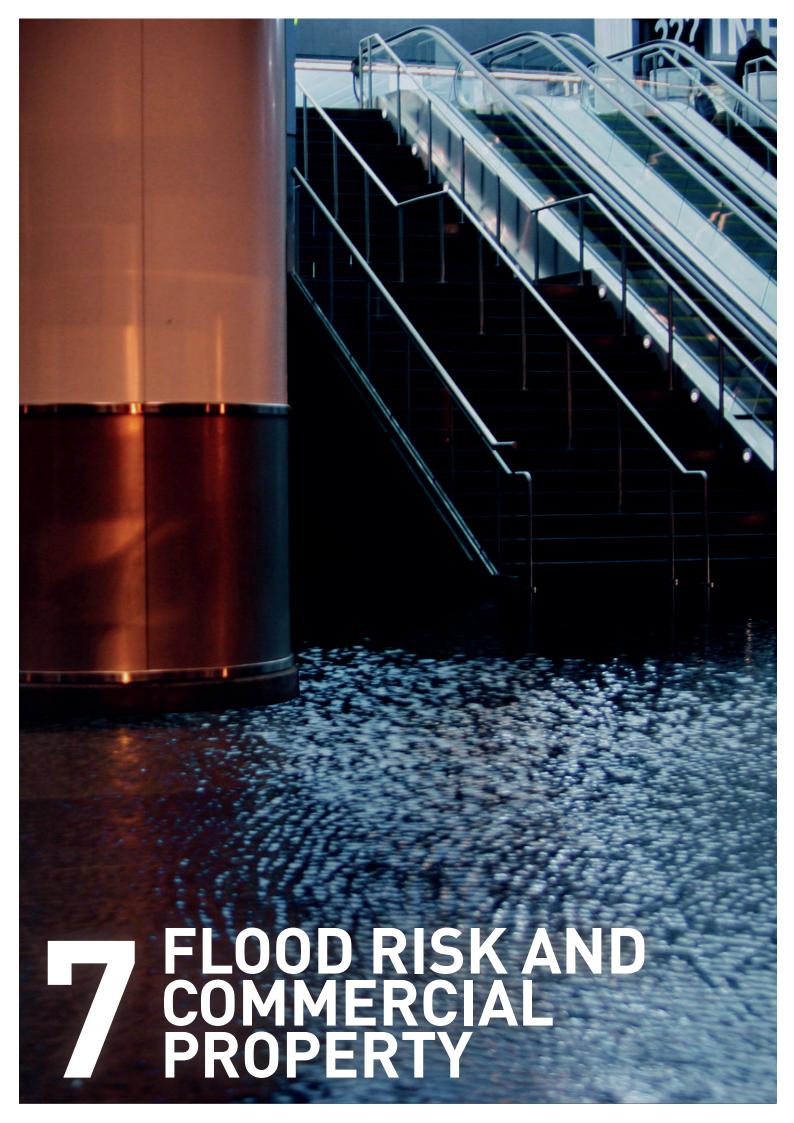
6.2 SUMMARY

The interviews illustrate the roles played by the investor and their main professional advisers when undertaking due diligence for flood risk, and the way in which information is shared between them.

In a competitive market for investment deals, due diligence is generally accompanied by a relatively high level of time pressure coupled with demand for confidentiality on the part of the investor. This can make it difficult to gather all the information ideally required by the deadline for completing the transaction, particularly if second-stage enquiries about flood risk are needed and the EA can take a statutory maximum of 20 days to respond. The investor may therefore have to make a judgement on whether to proceed with the deal or lose out to a competitor, particularly where the property meets the fund's investment criteria in all other respects, although the information about flood risk may be imperfect.

Preliminary reports on flood risk status are now relatively inexpensive and quick to obtain online from providers such as GroundSure, SeachFlow, Landmark and Argyll. It is therefore common for all the professional advisers working on a transaction to commission standard searches to progress their contribution to the due diligence process. However, if the initial report indicates a need for second-stage investigations, costs can escalate from a few hundred to several thousand pounds and this is more likely to deter smaller investors from pursuing a transaction.

Flood risk is just one component of environmental considerations when undertaking due diligence, and for smaller investors it is still relatively low down their agenda compared to, say, the risk of contaminated land, which is routinely investigated. The relative importance of flood risk investigations, the availability of information and the effect on investment decisions are considered further in Section 7.



This section draws particularly on the research interviews and examines the way in which flood risk is considered when major funds invest in commercial property from the viewpoint of investment managers, environmental consultants, valuers, lawyers and lenders. It considers the following questions:

- Has flood risk come higher up the agenda?
- How good is the flood risk information on which decisions are based?
- How does flood risk information influence investment decisions?

7.1 HAS FLOOD RISK COME HIGHER UP THE AGENDA?

The research interviews indicate that there is greater awareness of flood risk among investors, following high profile events in recent years. However, unless a property is obviously located close to a watercourse or on a flood plain, many investors and their advisers still generally regard it as a risk with low probability of occurring, but that must nevertheless be investigated as part of standard enquiries and due diligence. Flash floods triggered by extreme rainfall events are particularly poorly understood, and this currently represents a big challenge in terms of raising awareness.

In the economic downturn, purchasers and lenders have become more risk averse. Flooding is just one of the risks that they are looking at more closely, and one lawyer reported: 'We have seen a lot more focus on potential flood risk and indeed ... recently I've seen one or two deals turned down because there was what I would have thought of as a relatively minor risk in percentage terms.'

Two circumstances in which flood risk is particularly perceived to be higher up the agenda are development sites and valuation appraisal, but the interviews suggest that it is still not common for flood risk to be reassessed during the life of a property investment and on revaluation.

7.1.1 Development sites

With development sites, planning policy on flooding has strengthened considerably in the last decade and has introduced powerful requirements on developers to submit flood risk assessments in conjunction with planning applications in all the UK regions (see Table 9 on planning guidance). Requirements in the FWMA are also viewed as having greater implications for development proposals than for existing buildings, particularly in relation to SUDS.

However, while flood risk is becoming a major issue from a political and social perspective, an environmental consultant reported that 'for some reason developers and landowners don't really ... appreciate that this is a key issue both in terms of commercial risk and also in terms of the potential for development areas', and too often leave investigations to the last minute when 'the information requested or available is quite limited'. This is attributed both to a lack of understanding of the issues and to the unwillingness of developers and landowners to pay for good information. However, while the cost of making more detailed investigations may be a few thousand pounds, this is usually small in relation to the total scheme value.

TABLE 9 PLANNING POLICY GUIDANCE

| Jurisdiction | Planning policy guidance |
|---------------------|---|
| England | Planning Policy Statement (PPS) 25: <i>Development and Flood Risk</i> (Revised March 2010) |
| Wales | Technical Advice Note (TAN) 15: <i>Development and Flood Risk</i> (2004) |
| Scotland | Scottish Planning Policy: A Statement of the Scottish Government's Policy on Nationally Important Land Use Planning Matters (February 2010). (Supersedes Scottish Planning Policy (SPP) 7: Planning and Flooding) |
| Northern Ireland | PPS 15: Planning and Flood Risk (June 2006) |

7.1.2 Valuation appraisal

In the valuation arena, instructions from banks for loan security valuations now commonly incorporate specific requirements to conduct a flood risk check because, as a banker explained:

'What obviously drives an investment proposal from a funder's perspective is the security value ... If you had a proposition where flooding was highlighted as a problem, the first thing that the bank would look at is, is it a serious enough problem to impact on occupier demand? In which case that might affect the cash flow, and if it impacts on occupier demand it will probably have an impact on investment demand, so it affects the security value.'

Valuers therefore need to understand how to articulate flood risk in terms of pricing investment assets in order to assist investors and lenders in making judgements about the level of risk they are willing and able to accept. A valuer explained: 'Where we think there is a material issue, then that will be transposed through to the valuation commentary ... on how that risk may be considered by the market at large'; and: 'If you have concerns then you have to make sure your valuation report expresses those and proper assumptions are put in place.' The same valuer reported a perception that investors' attitude to flood risk has shown a change in recent years:

'We have recently valued a property ... where we know that there is a recorded flood risk. It was openly marketed and received very strong bidding. ... I think it was because clearly investors got comfortable with the fact that the risk was a manageable one ... the property obviously had other very strong credentials and ... those won the day in the market place ... Now that thought process, I am pretty sure, would not have happened in the same way five years ago. I suspect that ... the level of information they would have had available to them would have been less.'

In valuation terms, conveying an elevated form of risk would usually be done through adjusting the investment yield, but 'it's going to vary on the circumstances of the individual asset', and therefore identifying a flood risk component is seen as 'just an impossible question'. Equally, evidence of occupiers bidding less rent for property where there is flood risk might conceivably start to happen in future, but valuers interviewed for this project had not yet seen a change in the market.

However, analysis of fund assets by SIAM (Sustainable Investment and Asset Management LLP) reported in *IPD Eco News* (Woollam 2010) finds 'a palpable change in investor sentiment' and increasingly negative attitudes to property in flood risk areas such that 'the impact on value is likely to emerge very quickly'. The degree of risk is attributed not just to the probability of a flood event, but is linked to the number of properties affected, the occupiers and lease structures. Retail warehouses are particularly identified as being in locations at risk of flooding, but long lease lengths and the limited supply of 'safer' alternatives might be expected to reduce any negative impact on value.

7.1.3 Reassessment of flood risk

The previous CEM research (Kenny et al. 2006) found that investors tend not to specifically revisit the flood risk to property held in the portfolio post acquisition, and interviews for this project suggest that this is still largely the case. Although one of the valuers said it would be considered during the usual periodic revaluations of investment property, other interviewees indicated that a reassessment would only be made if a flood event had occurred and/or if the issue was flagged during an insurance review. One interviewee suggested that the tendency for investors not to revisit flood risk status is because:

"... once something like that has been investigated initially at purchase and with the initial due diligence then ... it's not a variable that you would expect to change. And actually if you have held a property for 10, 15 years or so and maybe you'd never had an investigation in the first place ... and in your experience there has never been a flood you wouldn't ask the guestion because you wouldn't want to know the answer."

7.2 HOW GOOD IS FLOOD RISK INFORMATION?

The readily available information on river and coastal flood risk is on the EA's website in the form of the national flood map. RICS guidance (2010e) provides a detailed explanation of the EA flood mapping, discusses the value and limitations of the information and illustrates how it is possible to zoom in on specific locations at postcode level using examples of maps from the database. Typically, the information for large cities is better than less urbanised areas according to an environmental consultant 'because there is more interest in assessing the level of risk in detail'. However, the mapping to date has not been particularly accurate, in that while it indicates a standard of protection in terms of the annual probability of a flood occurring, it does not give a predicted flood level or depth. This presents a particular difficulty in assessing the flood resilience of highway networks.

Flood depth has been the subject of much research and is a key factor influencing the scale of damage (Office of the Deputy Prime Minister (ODPM) 2003), largely due to the hydraulic pressure on buildings accompanied by abrasion and scouring. The potential for damage increases significantly once flood water rises above floor level and depths of over 1m may damage the structure unless the water pressure can be equalised across the building (ABI 2004).

Flood depth information does exist and is currently used by the EA in providing commercial advice. It should be incorporated into the next generation of flood maps, although these maps will still not make it possible to accurately identify the risk for individual properties.

Online toolkits are based on readily available information, such as the EA flood maps, and therefore provide a good starting point for obtaining an indication of the annual flood risk or probability in a locality, but without any critical assessment of the risk for a subject property. An example of this difficulty is in relation to surface water flood maps, which can be used to indicate a degree of risk for any site in the UK, but according to an environmental consultant those models actually 'make gross over simplifications and can only ever be seen as very indicative'. This is why for a 'proper' due diligence you need to start with that information and then investigate the detail through enquiries and discussion with the relevant authorities; but, as one lawyer observed:

"... it's difficult to quantify as a risk because of the fact that it impacts across a wide area in an unpredictable way."

Hence the view of an environmental consultant that:

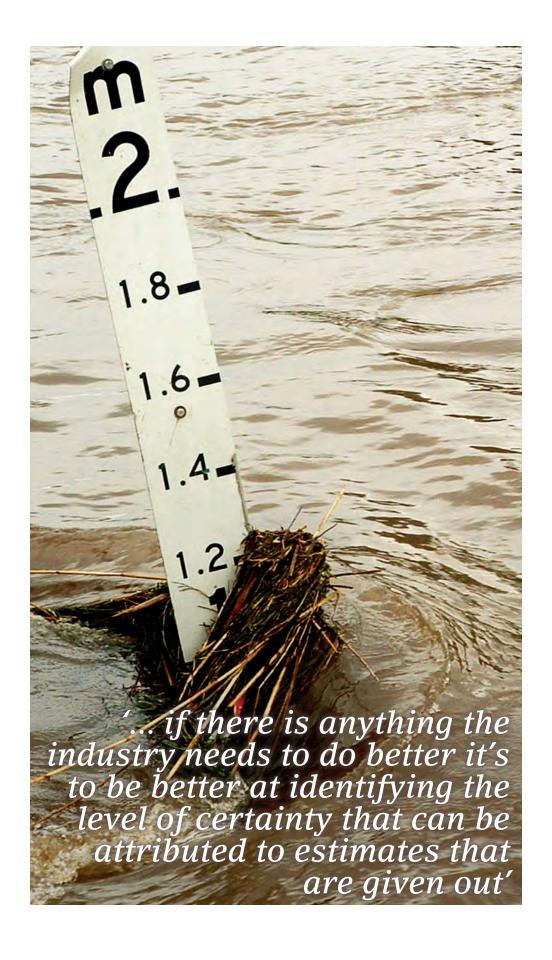
"... if there is anything the industry needs to do better it's to be better at identifying the level of certainty that can be attributed to estimates that are given out."

An environmental consultant's view of flood risk information

If you look into the Environment Agency website and check the flood maps you can assess whether you are in Flood Zone 1, 2 or 3 – low, medium or high risk.

But the reality is the quality of those maps is quite variable, so quite often the initial impression, based on those maps, is not necessarily the actual risk at the site, simply because there is not enough information. So if you want to assess in detail the risk in a certain area you really need to go through a formal consultation process, and especially with the Environment Agency in terms of tidal and fluvial flooding. In terms of surface water flooding it is extremely important to liaise with the council and with the water company to see whether there is any history of flooding at the site.

The Environment Agency hydraulic modelling throughout the country is a process which is ongoing. I would say that typically cities are better than the rest simply because they invest more money in assessing the risk. In the big cities and with big rivers there is of course more interest in assessing the level of risk in detail. Typically if you are focusing on the Thames you would have quite detailed information. If you are focusing on a minor watercourse in a small town, in the countryside, potentially you could have issues about some reliability of information, and quite often the Environment Agency tells you that they do not know enough and it is up to the developer or whoever owns the area to assess the risk by undertaking hydraulic modelling.



An environmental consultant's discussion of hydraulic models

The level of accuracy of flood maps is not brilliant. They're not designed to give accurate information at the property level. So you need to do further interpretation, which is usually done by consultants, and we will then contact the Environment Agency to find out if there is a hydraulic model available. We can purchase those models at a price and use them to give a proper feel for what the level of flood risk is for a number of different annual probabilities, plus how sensitive it is to increases of flow.

So we can develop a strategy for protecting a property that's robust and takes account of residual risk and uncertainty, because often there is an awful lot of uncertainty with hydrological estimates. Too often in this industry, people are saying, 'well the Environment Agency have given us a flood level – let's just design to that'. And that is a bit dangerous, because you can be sure that the Agency will say 'this is for you to do with as you see fit but there is no liability on our part'. Often it is not palatable for clients to be told, 'the Agency have given a flood level but if there is a lot of uncertainty associated with that, we recommend you look at it properly and it will cost you £10,000', and the client may choose to take the risk.

I think if there is anything the industry needs to do better it's to be better at identifying the level of certainty that can be attributed to estimates that are given out. If the originators of the analysis can be encouraged to give an indication of sensitivity, then that would be helpful.

7.3 HOW DOES FLOOD RISK INFORM THE INVESTMENT DECISION?

Case Studies 1–5 below are drawn from interviews with investors and illustrate three main responses to information that property is in a flood risk area:

- Is the risk such that the investment transaction should be aborted?
- Can the property be adapted to mitigate the risk?
- Can the risk be adequately managed?

Just because a first-stage investigation indicates that property is in a flood risk area does not mean that it will automatically be dismissed as a potential purchase by an investment fund, but indicates a need for further investigation about the level of risk before a decision is made. So what level of flood risk would constitute a deal breaker?

Case Studies 1 and 2 concerning supermarket investments show that the ability for a store to remain trading, even though it is in a flood risk area, is a very important consideration in deciding whether to proceed with a transaction. In Case Study 1 the potential disruption to trading is judged too high and the investment purchase is called off; whereas in Case Study 2 the store is not actually directly affected, it traded well during a period of flooding and therefore the investment sale went ahead. These cases demonstrate the vital importance of good information, not only about whether the building itself is likely to flood, but the extent to which access would be cut off because roads and car parking become flooded.

In **Case Study 3**, flooding has been identified as a potential problem for an office building. The investor therefore decides to take the opportunity to make building alterations during a refurbishment project that mitigate the risk by moving vulnerable plant and equipment from the basement to roof level. Again, the objective is to enable the occupier to continue in business at the location, despite some disruption if the lower basement level parking is flooded.

The rationale for deciding to go ahead with an investment purchase despite surveys revealing a flood risk issue was compared by interviewees with the approach taken to contamination risk. If the property and the tenant's covenant meet the investor's requirements in other respects, then providing works can be carried out to reduce the contamination risk to acceptable levels, the transaction can go ahead.

To some extent a similar principle can be applied to flood risk, as shown by Case Study 3. However, as one of the lawyers interviewed explained, in certain respects contamination risk can be more of a known quantity because, through invasive survey and taking samples, the extent and nature of the contamination can be determined, whereas:

'The problem with flood is that it is not really quantifiable. It might be known that the property is in an area which is liable to flooding, but you will not be able to know the cost [or] ... whether in the future that is uninsurable. With contamination you are going to be saying, "It will cost x amount to remediate the property and we can either take that from the price or we can just deal with it here and now or require the other side to remedy it."... Whereas the risk of flooding is a risk that's there but the extent of any damage caused by it is unquantifiable because it depends on the level of flood that occurred.'

Arriving at a workable solution to support the investment decision can therefore involve the investor in rationalising advice from a number of consultants (environmental, building survey, valuation and legal). The interviews suggest that there can be benefits to the client of the consultants working more collectively to improve understanding of how flood risks can be translated from the environmental assessment into valuation impacts and legal contracts, but one lawyer observed that this 'took a long time to happen with contaminated land issues ... it is something which isn't done very well in the industry ... putting people together and getting them to talk to each other'.

With **Case Study 4**, the investor is alerted to a potential flood risk problem because planning permission for additional development at a high street shop investment is turned down, although the site has not been known to flood. However, lowering the risk requires off-site defences, and on-site adaptation is not viewed as an option.

In **Case Study 5**, the flood risk to an existing shopping centre investment is addressed through business continuity planning, involving shopping centre management staff taking appropriate steps to deploy sandbags and other mitigation measures to exclude water if flooding is threatened. Clearly this is not ideal, and an environmental consultant observed that with large shopping centres a 'perimeter' approach to flood defences is probably the right choice where possible, rather than property level flood resilience or resistance.

CASE STUDY 1

Supermarket purchase aborted owing to flood risk

We were looking to make a supermarket purchase in the south of England and the flood risk was enough to concern us. So we got a specialist report carried out and it turned out that the building itself was never under water, but part of the car park would be under water. But because it was a supermarket we decided it was too risky to buy because of the risk that at quite a high frequency all the access roads to the site would be flooded. The area would be closed down, so you wouldn't be able to get shoppers to the site. There would therefore be a serious impact on the investment value because the retail tenant was likely to be dissatisfied with the site and its income-generating potential would be severely disrupted.

CASE STUDY 2

Supermarket investment sale proceeds despite local flooding

We owned a supermarket that was less than a mile from a well-known shopping centre that was flooded. Because of the supermarket's address everyone was saying 'it must be under water'. But in fact it thrived during the flooding because it did still have an access road to it, it wasn't under water and none of the car parking was lost. It was just one of those things, that if you look at a flood map the whole valley is coloured blue, but actually if you start analysing it in more detail the route to the supermarket was open and a land survey shows that it is above the levels that are affected; but we had to prove that to a purchaser. The retailer said it was one store that performed really well during the floods because it was one of the few places people could go for shopping.

That's why if due diligence shows a property as being in a flood plain or in a flood risk area we don't just say 'we won't buy it' – we investigate further because there are properties that still are very successful in their location that aren't affected, and you have to keep delving to get to that level of information.

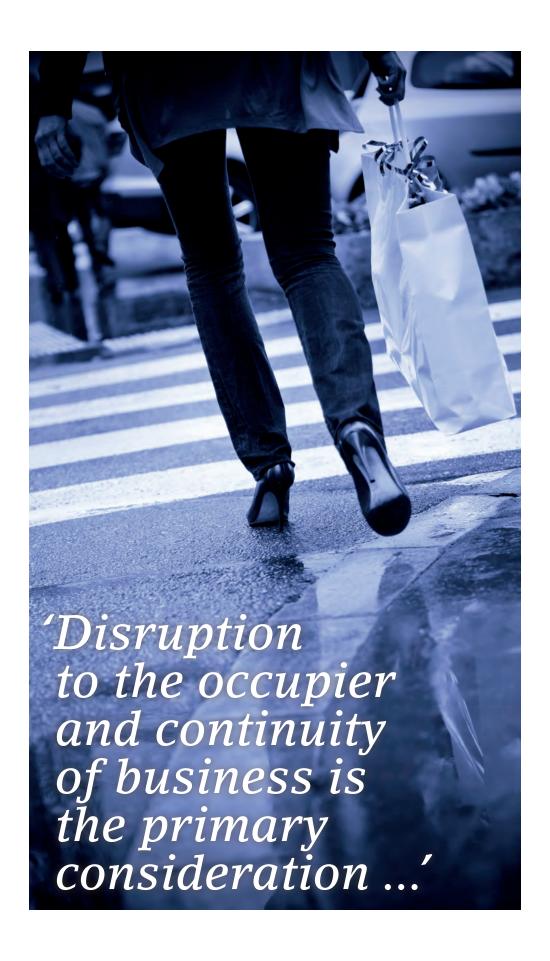
CASE STUDY 3

Flood mitigation works to office investment purchase

We've got an office block that we've purchased that needs some major refurbishment work. We think that doing the refurbishment work will improve its situation for flood, because all of the vulnerable plant and equipment currently in a basement and ground floor is going to be moved to roof level. All of the ground floor, the undercroft usage, will then revert to parking and be less at risk.

The site remains with something like just under half of its car park available at all times and the access roads to it available at all times. This means that we believe that the office use that is above the undercroft would be able to continue even when it was a severe flood situation, so an occupier, whilst inconvenienced, wouldn't have their business disrupted to the extent that they couldn't operate. So we consider that risk is manageable and it was sensible to proceed with the purchase.

Disruption to the occupier and continuity of business is the primary consideration and then the secondary consideration is damage to building fabric and the cost of managing that.



CASE STUDY 4

Effect of flood risk on high street shop investment

We have got a block of high street shops in outer London where we are looking to do some further development by putting residential units above the car park to the rear. The planners gave us a very negative feedback because the building is on the flood plain. We wouldn't have even considered that risk ourselves because the building has never flooded in 30 years and there is no indication that it is any more likely than it was 5 years ago or 10 years ago. But the planners are obviously aware of it so that made us think about the existing asset, even if we can't do the development. But it's probably not worth spending any money on precautions at the site because really what are needed are defences outside our land.

Tenants will ask and they will have a list of preliminary enquiries they go through before they take a unit, because they don't want to be liable for flooded buildings. But I have never heard of a tenant in my portfolio saying, 'I won't take the building because I think it might flood in the future'.

CASE STUDY 5

Shopping centre management – flood mitigation and business continuity plan

In a redevelopment we design to build out flood risk as far as practical. But I know of a shopping centre which we built several years ago that was subject to a risk management plan which involved locating sandbags and other flood mitigation measures at strategic points. This was because some of the malls dipped down and there is a culvert that runs underneath the centre as well, so there's an issue there with potential basement flooding as well as flooding of the malls. So we had a risk assessment undertaken and made sure that the centre management team and security providers are all aware of what needs to happen if torrential rain or flooding is threatened.

We have a business continuity plan for all the shopping centres. Normally it's more related to heightened security in the event of threats of terrorist acts or fire that concentrate the mind, but if flood is a risk it will also appear in that business continuity plan.

7.4 SUMMARY

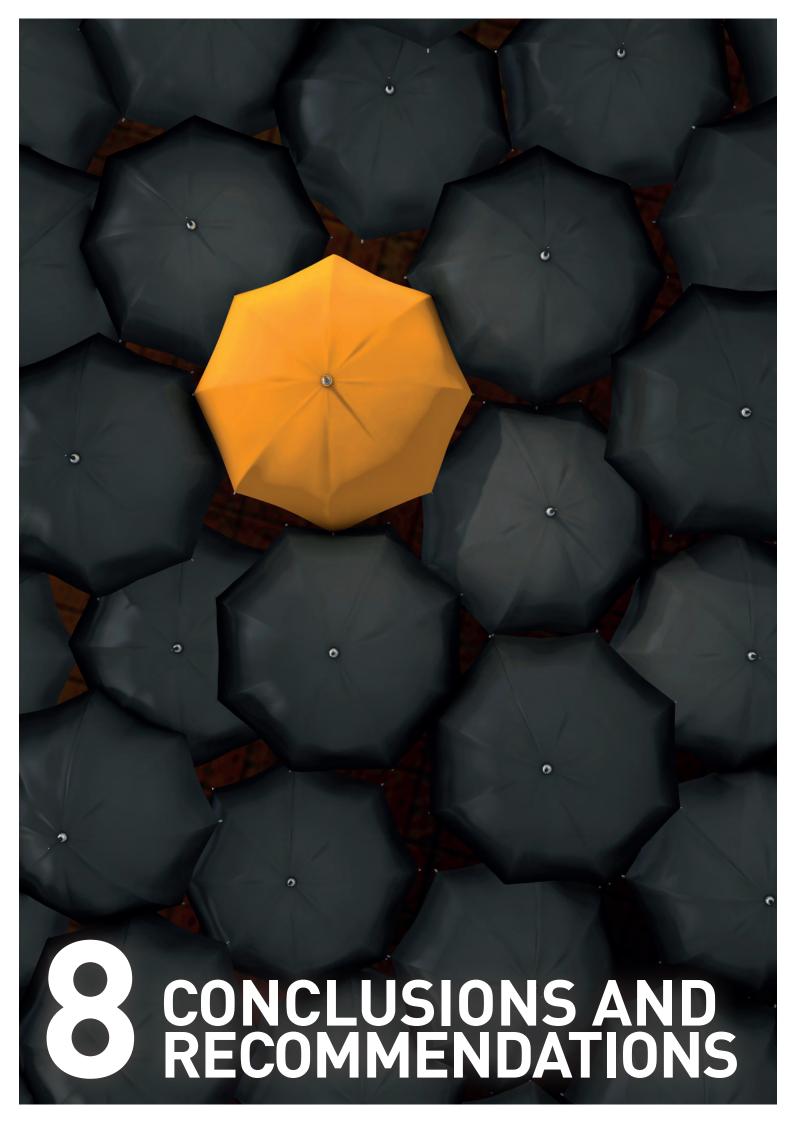
The research interviews indicate that while there is a greater awareness of flooding as a risk, following high profile events in recent years, it is still regarded as a risk with relatively low probability of occurring, but which must nevertheless be investigated.

However, there are two situations in which flood risk has come much higher up the investor's agenda. Firstly, in the case of development sites, UK planning policy has strengthened considerably in the last decade, with powerful requirements on developers to submit flood risk assessments in conjunction with planning applications; and secondly, in the valuation arena, because of the potential for flooding to disrupt property occupation and income streams, adversely impacting on security and investment value. The case studies demonstrate that minimising the risk to disruption of the occupier's business is a primary consideration for the investor in deciding to proceed with a property purchase. This makes it imperative for valuers to understand how to articulate flood risk when pricing investment assets, even though evidence for a measurable effect on investment yields or on property rents is not readily apparent in the market.

However, it would appear that it is still not common for investors to reexamine the flood risk status of a property during the holding period of the investment, unless a flood event occurs, because the flood risk level is regarded as unlikely to change. Equally, reinvestigation would only be worthwhile if flood risk data is regularly updated and its accuracy improved such that any changes would be revealed and assessments accorded greater certainty.

It is clear that the quality and accuracy of information about flooding plays a vital part in informing decisions about proceeding with investments, implementing adaptation works and devising management strategies. The greatest challenges lie:

- for environmental consultancies, in improving the level of certainty that can be attached to flood risk estimates at the property level;
- for investors, their valuers and lawyers, in understanding how to translate flood risk assessments into value impacts and legal contracts;
- for the professional disciplines, in working more collectively when decisions involve integrating complex information.



This research demonstrates the importance when investing funds in property of due diligence for flood risk to inform investment decisions and any measures needed to mitigate or manage this risk.

The problem with flooding as a risk is that it is becoming more likely and yet increasingly unpredictable. That makes it both essential and harder to address.

This report examines the property investment context against which due diligence for flood risk is set, sources of guidance and the role of the professionals involved in the due diligence process.

The findings and conclusions are now reviewed in relation to:

- property most at risk
- investors' response to flood risk
- flood risk data improvements
- due diligence and environmental audits
- informing investment decisions
- insurance and adaptation.

8.1 PROPERTY MOST AT RISK

Southern parts of the UK are expected to be most affected by increased flood risk, and cities particularly identified are London, Bristol, Cardiff, Cambridge and Southampton. In 2010, funds held about £98bn or 4% of their assets in direct property investment and geographically value is heavily concentrated in London and the south-east of England.

London is seen as one of the most at-risk cities globally, because of the high level of economic activity, high asset worth and exposure to flood hazard. Although the traditional 'square mile' of the City of London is very close to the river Thames it is outside the natural flood plain, whereas the more recent Docklands business district developed in the 1980s, including London's other major financial centre at Canary Wharf, is wholly within it.

In terms of property type, warehouses are particularly identified as being in locations more at risk of flooding. Although it is suggested that long lease lengths and a limited supply of 'safer' alternatives may reduce any negative impact on warehouse values, businesses are advised to consider the impact on supply chain disruption and plan accordingly.

8.2 INVESTORS' RESPONSE TO FLOOD RISK

Flooding, as with other environmental risks, is one over which investors can and need to control their response, particularly because of the size and long-term nature of direct property investments. The Pensions Acts and the UK Stewardship Code place duties on fund managers to implement good governance and protect fund value in the face of environmental risks; duties they are taking increasingly seriously.

The primary consideration for property is to maintain it in occupation and keep it producing rent, whereas the risk of flooding poses a threat to this objective. With the advent of shorter commercial leases, business occupiers have greater flexibility to move in response to any disruption, which places greater onus on investors, rather than occupiers, to take an active role in managing and mitigating flood risk. More public and private sector organisations are also adopting the BREEAM Excellent rating as the basis for selecting property to occupy, which allocates up to four credits relating to flood risk and surface water run-off that contribute to the overall sustainability rating.

The research indicates that while fund managers and their advisers are increasingly aware of flooding as a risk, it is largely regarded as a risk with relatively low probability which must, nevertheless, be investigated. There also tends to be an assumption that the main risk stems from proximity to rivers or the sea, which can be a false conclusion in view of a predicted increase in severe rainfall events causing problems in mainly urban areas through overwhelming the ability of drainage systems to cope.

Two areas in which flood risk has come higher up the agenda are both subject to regulation – development sites and valuation:

- Development is regulated by powerful statutory requirements, through planning policy and the FWMA, to combat and minimise flooding.
- Valuations must comply with professional standards set by RICS, requiring valuers to ensure they possess sufficient information to enable informed judgements when advising clients, who may be investors or lenders, about material factors affecting value.

However, it would appear that it is still not common for investors to reexamine the flood risk level during the holding period of the investment, unless a flood event occurs, because the flood risk level is viewed as unlikely to change. Part of the reason for this attitude may lie in the current limitations of flood risk information.

8.3 FLOOD RISK DATA IMPROVEMENTS

The most important aspect of devising a response to flood risk is access to sound and reliable information. Flood mapping for the UK indicates whether a locality is assessed as low, medium or high risk, but establishing the risk at an individual property level requires more detailed investigations by environmental consultants. The difficulty is that although flood risk is predicted to increase, more detailed estimates of how frequently and how deep floods might be are still fraught with uncertainty.

Prudent investors must make full flood risk investigations when acquiring property that is new to them and where first-stage enquiries identify a possible risk. However, the incentive to regularly reassess the risk levels within portfolios appears weak if properties have never been known to flood, and when the available information is not only unable to provide what investors regard as a meaningful indication of risk but is also relatively expensive to obtain.

Information about river and coastal flood risk tends to be better for large cities, because there is more incentive and interest in assessing the level of risk in more detail. However, surface water flooding is particularly difficult to predict and is expected to become more of an issue for urban areas owing to an increase in severe rainfall events and run-off from hard surfaces overwhelming drainage systems. While surface water flood maps exist for the UK, they are described as somewhat indicative only.

Improvements in the accuracy and availability of flood risk information are anticipated, particularly driven by the demands of the insurance industry and by requirements in the FWMA. Improving the level of certainty attached to flood risk estimates represents the greatest challenge for environmental consultancy.

Investment managers therefore need to keep abreast of changes in flood risk data and implement reviews when improved information becomes available that can usefully inform property level decisions, potentially as part of commissioning wider and regular environmental audits.

8.4 DUE DILIGENCE AND ENVIRONMENTAL AUDITS

The level of due diligence tends to be lower in a strong market, when the pressure to complete deals quickly limits the time available to gather and assess information. The downturn since 2007 has therefore seen a boom in real estate due diligence, as purchasers, their advisers and lenders have become more aware of environmental risks, more sensitive to their impact on transactions and more concerned about reputational risk. The challenge will be for quality improvements in flood risk due diligence to be carried forward into a more active property market.

Effective due diligence draws on a range of professional disciplines including environmental consultants, civil engineers, surveyors, valuers and solicitors, and a co-ordinated approach can best ensure the assessment will be useful to all the parties to a transaction. The research indicates that the level of professional co-ordination achieved to tackle contaminated land issues has yet to be replicated in relation to flood risk, which would also benefit from greater interdisciplinary working.

With the higher profile of environmental risks it has become more common for client investors to appoint environmental consultants directly, rather than through another consultant, and early in the transaction. This provides more opportunity for them to work with clients, solicitors and other consultants in devising the extent of investigations, ensuring appropriate information is provided that can inform financial assessments and legal contracts.

The due diligence market is also evolving from an activity geared to informing transactions into the provision of ongoing environmental auditing of property performance, driven by energy performance and carbon reduction legislation, to inform post-acquisition adaptation and risk management.

8.5 INFORMING INVESTMENT DECISIONS

The research indicates that the increased availability of information about flood risk is bringing about a change in thinking. While investors have been more risk averse during the downturn, just because a property is found to be in a flood risk area it will not automatically be dismissed as a potential purchase if, in other respects, it represents an attractive investment. However, more investigation will be undertaken before a decision is made.

The case studies presented here show that avoiding disruption to the occupier's business is the main consideration, and even where a flood risk is identified a transaction may still proceed if:

- occupied parts of buildings and access are unlikely to flood;
- physical building adaptations can maintain continuity of the occupier's business during a flood event.

Consideration needs to be given to whether flooding could affect the business supply chain because, with the advent of just-in-time inventory control, any disruption could cause significant impacts on business continuity.

8.6 INSURANCE AND ADAPTATION

Building-level adaptation to mitigate flood risk will be critically important in the future, and needs to be seen as an ongoing process in response to changing risk levels, improvements in flood risk data and developments in flood resistance and resilience techniques.

Reliance cannot be placed wholly on the insurance industry or publicly funded flood defences. While large corporate organisations have not so far experienced the restrictions on flood risk insurance felt by households and small businesses, in future their insurers are likely to be more proactive in promoting flood resilience, adaptation to buildings and emergency flood recovery plans by occupiers, as a means to continuing insurance at a reasonable cost.

Property owners need to be aware of additional responsibilities arising from the FWMA:

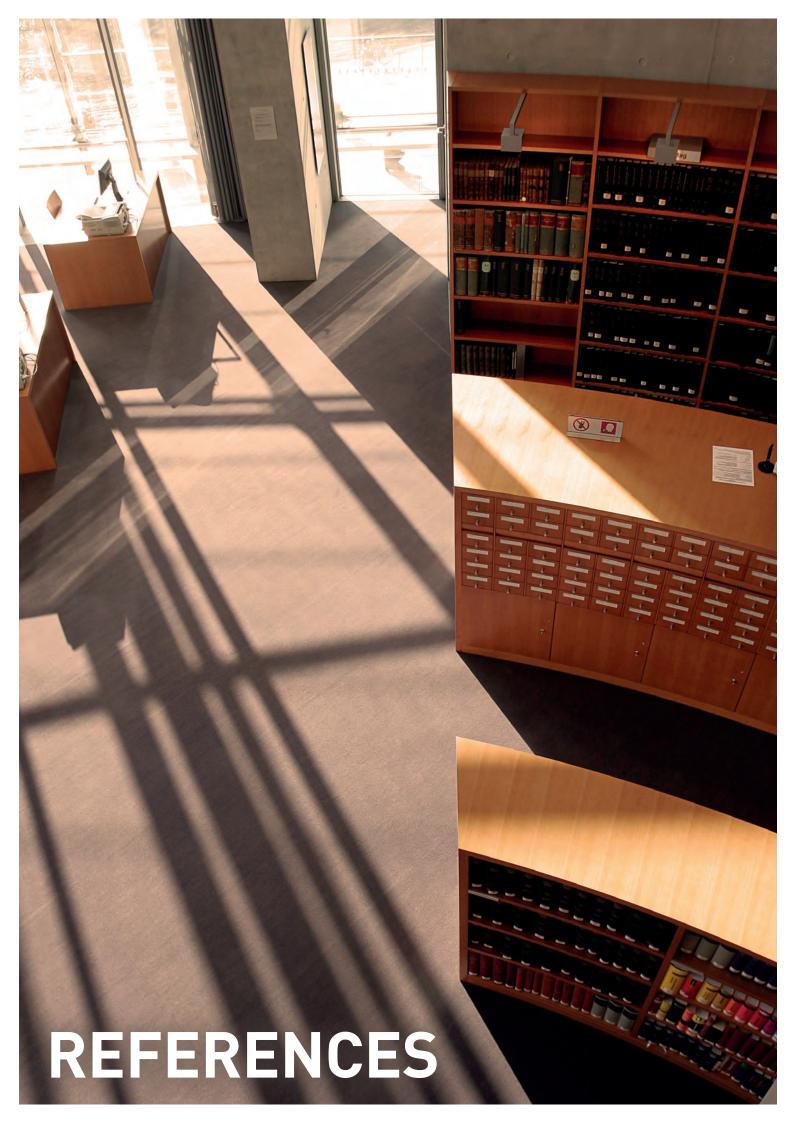
- for installing SUDS when new developments are undertaken;
- for any features on their land that become designated flood protection assets;
- if local authority powers to require maintenance or improvement works to unsatisfactory drainage are extended to existing private systems.

8.7 AREAS FOR FURTHER RESEARCH

This study suggests that the following areas would benefit from further research to inform the commercial property sector:

- Investigation of the amount and value of commercial investment property in flood risk areas, and the degree and nature of the flood risk to which it is exposed.
- The extent to which building owners are monitoring risk levels and implementing mitigation and adaptation measures for flood risk.
- The way in which valuers understand flood risk information and translate it into valuation advice to clients.





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