



defra

SID 5 Research Project Final Report

● **Note**

In line with the Freedom of Information Act 2000, Defra aims to place the results of its completed research projects in the public domain wherever possible. The SID 5 (Research Project Final Report) is designed to capture the information on the results and outputs of Defra-funded research in a format that is easily publishable through the Defra website. A SID 5 must be completed for all projects.

- This form is in Word format and the boxes may be expanded or reduced, as appropriate.

● **ACCESS TO INFORMATION**

The information collected on this form will be stored electronically and may be sent to any part of Defra, or to individual researchers or organisations outside Defra for the purposes of reviewing the project. Defra may also disclose the information to any outside organisation acting as an agent authorised by Defra to process final research reports on its behalf. Defra intends to publish this form on its website, unless there are strong reasons not to, which fully comply with exemptions under the Environmental Information Regulations or the Freedom of Information Act 2000.

Defra may be required to release information, including personal data and commercial information, on request under the Environmental Information Regulations or the Freedom of Information Act 2000. However, Defra will not permit any unwarranted breach of confidentiality or act in contravention of its obligations under the Data Protection Act 1998. Defra or its appointed agents may use the name, address or other details on your form to contact you in connection with occasional customer research aimed at improving the processes through which Defra works with its contractors.

Project identification

1. Defra Project code
2. Project title
3. Contractor organisation(s)
4. Total Defra project costs (agreed fixed price)
5. Project: start date
end date

6. It is Defra's intention to publish this form.
Please confirm your agreement to do so..... YES NO

(a) When preparing SID 5s contractors should bear in mind that Defra intends that they be made public. They should be written in a clear and concise manner and represent a full account of the research project which someone not closely associated with the project can follow.

Defra recognises that in a small minority of cases there may be information, such as intellectual property or commercially confidential data, used in or generated by the research project, which should not be disclosed. In these cases, such information should be detailed in a separate annex (not to be published) so that the SID 5 can be placed in the public domain. Where it is impossible to complete the Final Report without including references to any sensitive or confidential data, the information should be included and section (b) completed. NB: only in exceptional circumstances will Defra expect contractors to give a "No" answer.

In all cases, reasons for withholding information must be fully in line with exemptions under the Environmental Information Regulations or the Freedom of Information Act 2000.

(b) If you have answered NO, please explain why the Final report should not be released into public domain

Executive Summary

7. The executive summary must not exceed 2 sides in total of A4 and should be understandable to the intelligent non-scientist. It should cover the main objectives, methods and findings of the research, together with any other significant events and options for new work.

In 2006, it was estimated that approximately 393,000 homes and 77,000 commercial properties in England were located in areas at significant risk of flooding; that is, in areas with a greater than 1.3% annual chance of flooding (Environment Agency, 2006). Climate change is likely to increase the pressures on these properties and increases the need to consider a wider portfolio of flood management approaches, This includes the greater use, by individual households and businesses, of flood resistance (i.e. measures to prevent entry of water into a building fabric) and flood resilience measures (i.e. measures to limit the impact of flood water within a building).

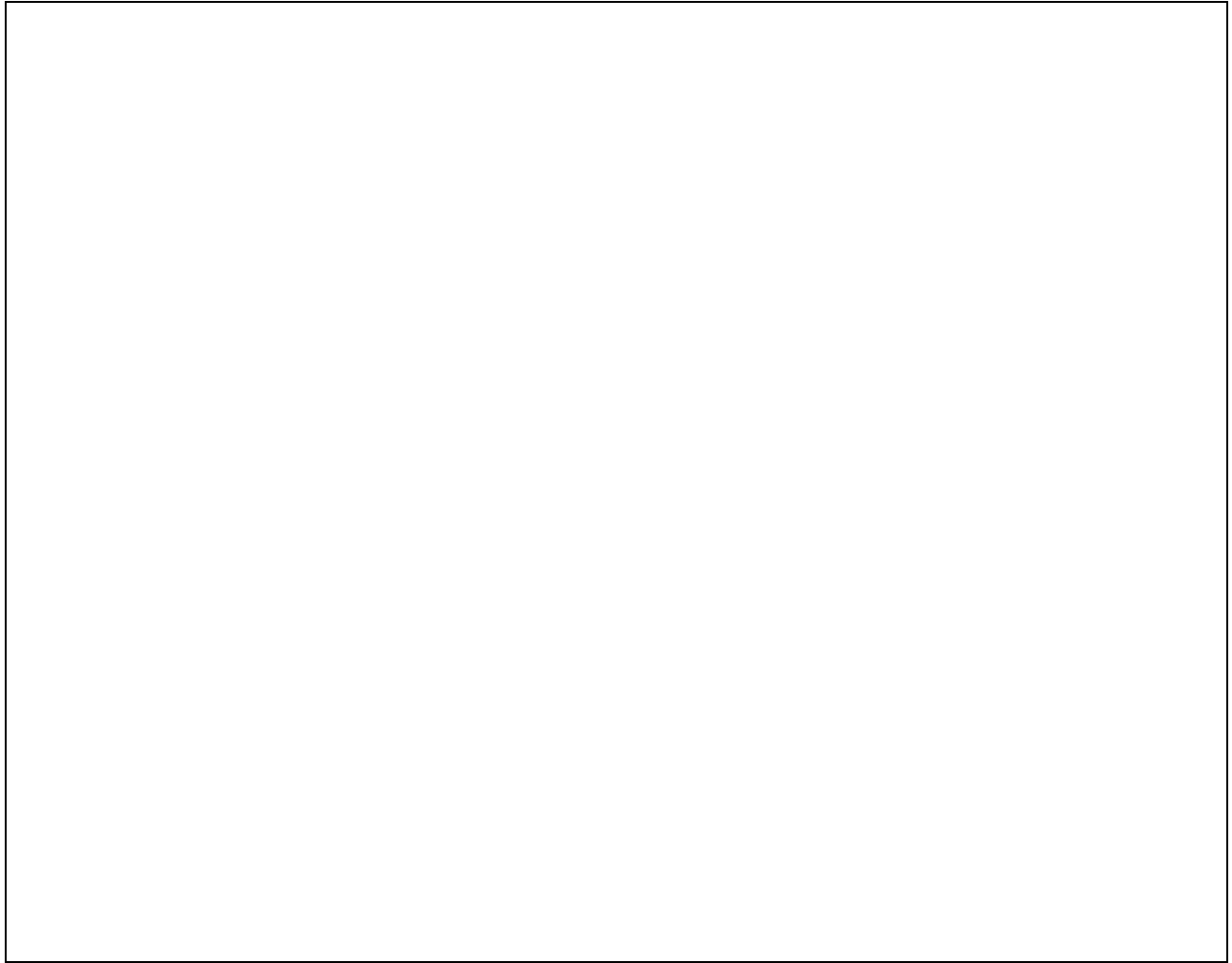
To investigate the economic benefits of using resistance and resilience measures in, Entec UK and Greenstreet Berman were commissioned in June 2007 to undertake a research project entitled "FD2607 – Developing the evidence base for flood resistance and resilience". This project was intended to provide analytical information for the wider Making Space for Water projects, RF1 and RF2 (encouraging and incentivising uptake of resistance products and resilience measures by households and businesses). It should be noted that the primary focus of the research is the application of flood resistance and resilience to existing properties rather than new development.

A key element of the project was the examination of the effectiveness of property based resilience and resistance measures in reducing flood risk over the long term. This involved developing a new economic model to quantify the costs and benefits of resilience and resistance at a property level. The model was developed for both residential and selected commercial properties and facilitated the quantification of property-scale benefits and costs for different packages of flood resistance and resilience measures.

The study has also investigated a wider range of issues (including current awareness of flood resistance/resilience; impact of insurance; access to information etc) which have influenced the existing use of resistance and resilience methods and how these factors could influence the adoption of these measures in the future. These issues were investigated through a stakeholder survey (including insurance, loss adjusters; National Flood Forum; CIRIA and RICS representatives) and a telephone based survey of 1131 residential and commercial properties within significant flood risk areas of England.

The key findings of the research are:

- Measures designed to keep water out of the individual properties (resistance measures) are economically worthwhile for properties with an annual chance of flooding of 2% or above (50 year return period). The largest percentage savings are for residential properties with an annual risk of flooding of 4% or greater (25 year return period). For households that flood more than once in every ten years, the benefits outweigh the up-front investment by a factor of between five and ten, while for the average office-based business they outweigh the up-front investment by between six and eleven times.
- Temporary resistance measures (i.e. temporary flood guards and airbrick covers) reduce the costs of damage by about 50% if they are properly deployed prior to a flood. Additional investment in permanent resistance (i.e. permanent floodproof doors, windows and airbrick covers) increases the proportion of prevented damage to between 65% and 84%, but these measures are not as cost-beneficial as temporary resistance measures due to the higher investment costs.
- In contrast, a full package of resilience measures (i.e. the use of flood-resilient plaster, resilient kitchens and resilient flooring) will only be economically worthwhile when installed in a building that has a greater than 4% annual risk of flooding or that has a greater than 2% annual risk and is in need of repair or refurbishment. In the latter case, the extra cost of resilience is relatively low. Building in resilience without the driver of refurbishment or repair was not found to be desirable.
- However, householders' and businesses' perceptions of the benefits and costs of these measures are influenced by a range of other factors not included in the economic analysis (above). These include the payment of VAT for the purchase of products, a tendency to discount future benefits more heavily and the responsiveness of insurance terms to the particular risk circumstances of individual properties. Sensitivity analysis suggested that, of these factors, insurance is the most influential. Where insurance terms accurately reflect the flood risk, measures are equally as cost-beneficial from the individual's point of view as they are from the societal point of view (i.e. beneficial for properties subjected to an annual risk of flooding of 4% or greater), but where they do not, resistance and resilience measures only become cost-beneficial to the individual householder or business at a 10% annual risk of flooding.
- A telephone based survey of 1,131 individuals showed that many householders and small businesses in areas of significant flood risk recognise the benefits of property-level measures, including the potential long-term financial savings, greater feelings of safety and reductions in the disruption caused by floods.
- However, the survey also showed that many people are deterred from taking action because they feel they are expensive or not their responsibility. Householders and small businesses also identified a wide range of other factors that deter people from protecting their properties, including not knowing the right property-level measures to use, concerns about impacts on the appearance of the property, not wishing to be reminded of the risk, and concern that such measures might adversely affect property values or make them hard to sell.
- The resistance/resilience measure of which households and businesses were most aware was the sandbag (Businesses – 33% flooded, 54% non-flooded; Households – 36% flooded, 60% non-flooded). This is in spite of the fact that most flood management experts consider sandbags to be a largely ineffective resistance technique. In addition, less than one in four surveyed were able to recall any resistance measures other than sandbags and only one in ten could think of an example of a resilience measure.
- Flooded households in the survey were much more likely than un-flooded households to have taken resistance and resilience measures, mirroring previous research (Harries, 2007) that highlighted the importance of flooding in promoting subsequent action. 27% of flooded households said that they had taken some measures to reduce the impact of flooding, while only 6% of non-flooded households had taken some steps.



Project Report to Defra

8. As a guide this report should be no longer than 20 sides of A4. This report is to provide Defra with details of the outputs of the research project for internal purposes; to meet the terms of the contract; and to allow Defra to publish details of the outputs to meet Environmental Information Regulation or Freedom of Information obligations. This short report to Defra does not preclude contractors from also seeking to publish a full, formal scientific report/paper in an appropriate scientific or other journal/publication. Indeed, Defra actively encourages such publications as part of the contract terms. The report to Defra should include:
- the scientific objectives as set out in the contract;
 - the extent to which the objectives set out in the contract have been met;
 - details of methods used and the results obtained, including statistical analysis (if appropriate);
 - a discussion of the results and their reliability;
 - the main implications of the findings;
 - possible future work; and
 - any action resulting from the research (e.g. IP, Knowledge Transfer).

References to published material

9. This section should be used to record links (hypertext links where possible) or references to other published material generated by, or relating to this project.

Thurston, N; Finlinson, B; Breakspear R; Williams, N; Shaw, J; Goudie, J and Harries, T (2008) Developing the evidence base for flood resilience, Flood & Coastal Management 2008 Conference, 1st-3rd July 2008, University of Manchester

Thurston, N; Finlinson, B; Breakspear R; Williams, N; Shaw, J; Goudie, J and Harries, T (2008) Assessing the benefits, costs and barriers of using flood resistance and resilience to protect existing homes and businesses within England, FloodRisk 2008 Conference, 30th September-2nd October 2008, University of Oxford

