

# Household-level Flood Protection Surveys

## Report Template

### **Objectives of the report:**

- To provide the property owner and/or occupier with the best understanding of the nature of the flood risk at the building and the measures that can be taken to mitigate that risk. Includes:
  - *Assessment of the depth, frequency, duration, and type(s) of possible flooding including consideration of the likely contamination of floodwater;*
  - *Assessment of the elevation of building thresholds;*
  - *Assessment of the likely points of entry of floodwater into the building;*
  - *Evaluation of the measures needed to prevent the entry of water into the building;*
  - *Providing an assessment of the balance between flood protection and flood resilience appropriate for the building.*
- To provide the information needed for the property owner/occupier to hold informed discussions with insurers about the flood risk at the property.

### **General notes:**

1. The template is intended to provide pointers to the information needed to inform the flood risk at the property and the measures appropriate to prevent water entering the inhabited buildings<sup>1</sup>;
2. The template could be used to develop a report covering a number of properties in the same area at common flood risk. The surveyor should agree with each of the property owners those factors that can be covered by a common shared report and provide property-specific reports for the remaining aspects;
3. The surveyor is expected to use the template as a starting point and to provide additional information as needed to provide a well-balanced and professional report;
4. The report must address all of the pertinent factors in a manner that can easily be understood by the property owner and provide the evidence to support the statements and recommendations made;
5. The nature of the work is such that the reporting process could be broken into two components: a) the assessment of flood risk; b) the assessment of how the water will enter and affect the building and the specification of measures to be adopted. If the work is split in this way, then part b) of the report must contain clear references to part a).
6. This is not a template for those undertaking Flood Risk Assessments as required by PPS25.

---

<sup>1</sup> Whilst property owners will wish to understand the flood risk and possible mitigation measures for all buildings on a property, the main focus should be on the inhabited parts, rather than on buildings used normally for other purposes such as storage.

## Contents

1.	General property information.....	2
2.	Detailed property information .....	2
3.	Assessment of flood risk at the property .....	3
4.	Routes of water ingress.....	4
5.	Impact of water entry on the building.....	5
6.	Measures to reduce risk .....	5
7.	Post-construction inspection.....	7
8.	Amendment log.....	Appendix 1

## 1. General property information

### Provide information on:

- Location of property;
  - *Provide a location map at a zoom scale and with basemapping suitable to convey the information (for example an OS 1:25,000 colour raster basemap at a zoom not greater than 1:10,000). It should include sufficient information for the reader to understand the flood risk in the area and may highlight key infrastructure that impacts on flood risk and informal routes that water will take. If the property is in Flood Zones 2 or 3, this information should be shown on the map. Likewise, areas identified in Surface Water Management Plans as being at flood risk should also be shown.*
- Relationship of property to others:
  - *Is it within an identifiable community?*
  - *Is it detached/semi-detached/terraced/part of a block/etc.?*
- Local Authority administration area;
- Any flood-related community groups whose area covers the property.

## 2. Detailed property information

### Provide information on:

- Ground levels around the property to Ordnance Datum Newlyn;
  - *If a topographical survey is available this should be provided;*
  - *Survey accuracy should be stated and ideally should be better than set out in the survey note.*
- Threshold levels to Ordnance Datum Newlyn;
  - *Survey accuracy should be stated and ideally should be better than set out in the survey note.*

**Survey note:** Surveys should be carried out in accordance with the technical survey requirements within the Environment Agency's National Standard Contract & Specification for Surveying Services. All threshold survey levels should be correct to within 15mm within the local flood risk community, and within 45mm with respect to Ordnance Datum Newlyn. There should be no significant disparity between the accuracy of threshold surveys and that of ground level survey at any property.

- Nature of the underlying ground;
  - *Soil type and likely permeability;*

- *Susceptibility to seasonal variation.*
- Construction of the building;
  - *Depth of foundations and likely quality of underground construction with respect to impeding the entry of floodwater into the building;*
  - *Quality of above-ground construction with respect to preventing floodwater entering the building;*
  - *Ability of above-ground construction to resist water pressure at different levels if water is prevented from entering the building (strength of above-ground construction)*
  - *Presence of basements.*
- Constraints that will affect solutions, including:
  - *Heritage status, such as listing of the building;*
  - *Being in a conservation area;*
  - *Covenants affecting the use of the building and restrictions on development.*
- Safety factors such as air bricks provided for gas safety that would allow the entry of water into a building; basements that can flood easily.

**The format of the information should include visual form such as plans and cross-sections as appropriate.**

### **3. Assessment of flood risk at the property**

**Provide information on:**

- The sources of flood risk, identifying each type of risk, their relative importance and likelihood of occurring concurrently. Sources of flooding include:
  - *Rivers;*
  - *The sea;*
  - *Surface water runoff and ponding;*
  - *Groundwater;*
  - *Surrounding drainage system, including sewers.*
- The history of flooding at the property;
- The likely contamination of floodwater, e.g. muddy river water; water contaminated with sewage;
- Assessment of the frequency and duration of a range of depths of flooding;
- The level of confidence in the assessment of flood risk;
- Future changes to risk such as from climate change<sup>2</sup> and identified developments;
- Flow routes and likely hazard (velocity of flow at different depths);
- Assessment of the availability and utility of flood warnings that may impact on the choice of measures;
- The evidence used to make the assessment, e.g. Environment Agency risk maps and modelling; flooding records from newspapers and official sources; etc.;

---

<sup>2</sup> Reference should be made to Appendix B of PPS 25 or the latest information from the UK Climate Impacts Programme (UKCIP) such as the UK Climate Projections – UKCP09.

- Safety and convenience considerations such as ‘evacuation will be needed if flooding exceeds a depth of xxxm which is expected to occur with a frequency of yyyy’; ‘Water Street is cut off during flooding with a frequency of zzzz’;
- Local factors that affect flood risk, including:
  - *The condition of local flood defences and control structures;*
  - *The condition of watercourses such as siltation and weed growth;*
  - *The condition of local drainage, such as road gullies and culverts;*
  - *Potential blockages of flow routes such as new walls and fences across ‘blue corridors’ and drainage lines.*

**Note:** It is intended that the report is based on existing information and available modelling interpreted and reported in a professional manner. The surveyor is not expected to build new hydrological/hydraulic models.

## 4. Routes of water ingress

**Provide information on the points of entry of water into the building:**

- Through the ground:
  - *Through permeable foundations into under-floor spaces;*
  - *Through the ground, e.g. permeable gravels, into under-floor spaces;*
  - *Through floors constructed on the ground. The surveyor will need to consider the ease with which the water arrived at the underside of the floor and the route taken.*
- Through walls above ground and below damp-proof course level, including:
  - *Airbricks;*
  - *Service entry points;*
  - *Porous brickwork;*
  - *Cracks in walls;*
  - *Poor quality pointing in brickwork.*
- Through walls above damp-proof course level and below flood level, including:
  - *Doors;*
  - *Windows;*
  - *Airbricks;*
  - *Service entry points;*
  - *Porous brickwork;*
  - *Cracks in walls;*
  - *Poor quality pointing in brickwork.*
- Through services such as downstairs toilets and drains for washing machines, dishwashers, etc.

**The points of entry should be identified on plans and diagrams of the building as needed to:**

- Ensure that the property owner clearly understands the scope of work needed;
- Provide the basis for the specification of the work for tendering.

**Note:** The above lists are not exhaustive and illustrate only the most obvious points of ingress.

## 5. Impact of water entry on the building

**The survey should clearly describe the consequences of the entry of water into the building and the likely work needed to recover post-flood. Indications of the timescales for recovery should also be provided.** This section is intended to help the property owner understand the merits of the flood risk mitigation work proposed. In the event of a flood, insurance risk assessors are expected to provide definitive information on recovery from the particular flood.

Aspects to consider include:

- Damage to furniture, furnishings and personal effects;
- Damage to fixtures and fittings and household equipment such as boilers and white goods;
- Damage to services including meters;
- Damage to the fabric of the property, including:
  - *Floor finishes;*
  - *Suspended floors;*
  - *Skirtings;*
  - *Doors and frames;*
  - *Windows and frames;*
  - *Plaster and wall finishes;*
  - *Electrical and electronic circuits and their components.*

As the timescales needed for drying out the building, taking into account the nature of its construction, climate, etc., are a key influence on flood recovery, estimates of this aspect should not be overlooked. Mention should also be made of the problems associated with over-rapid drying where this is relevant to the type of construction involved, particularly where there are hazards to health from factors such as mould growth.

## 6. Measures to reduce risk

**From the assessment of the flood risk and the likely means of water entry, develop a cost-effective and practical range of options to prevent the entry of floodwater into the building.**

**State clearly the minimum work that needs to be done to be effective and specify the performance (acceptable leakage rates) for the products used, taking note that insurance companies are expected to require flood mitigation products to meet the BS PAS 1188:2009 test specification (or international equivalent) for them to issue flood insurance for properties at high flood risk. It is expected that products already meeting PAS 1188:2003 would be considered acceptable also.**

Although the primary focus is on preventing the entry of water into a building, consideration needs to be given to residual risk – flooding that overwhelms the flood protection measures. **Advice should be provided on suitable resilience options and their merits in the context of the nature of the flood risk, together with an assessment of the risk avoided by the implementation of the measures, and an assessment of the residual risk.**

As well as the primary consideration of preventing the entry of water through identified routes (see 4 above), factors to take into account include:

- The preferences of property owners and the participating community;
- Aesthetic considerations, particularly where there are heritage/etc. concerns;
- Any unintended consequences from the adoption of measures, particularly where deployed incorrectly, including:
  - *Condensation and dampness if measures are left in place for long periods;*
  - *Structural deterioration.*
- The likelihood that attached neighbours will also adopt measures;
- How often people are away from home;
- Warning lead times needed for effective deployment of measures;
- Whether people are able to deploy measures, e.g. the elderly and infirm;
- Whether members of the community will assist with the deployment of measures;
- Storage of measures;
- Ongoing maintenance;
- If the solution requires pumping, for example, whether the power is likely to be affected during a flood event;
- Is planning permission / flood defence consent needed;
- Safety, for example:
  - *Personal safety, particularly where floods are likely to frequently overtop measures; where warnings may be unreliable; where basements are involved;*
  - *Structural safety during a flood – is the building strong enough to take the lateral loading;*
  - *Electrical safety during a flood – how modern are the electrical safety systems;*
  - *Where air bricks below floor are provided for gas safety purposes and therefore create a potential hazard when sealed during a flood;*
  - *Health and safety considerations if there is a need for evacuation, such as helping the elderly negotiate flood boards or escaping through windows; avoiding a flood wave when a flood-proof door is opened during a flood (they typically open inwards);*
  - *General trip/other hazard from frames for measures;*
  - *Possible injury during deployment.*

**Provide an estimate of cost for the work proposed including any storage provision, as well as costs for ongoing maintenance.**

**Note:** Providing flood boards and airbrick covers, for example, will not deliver an effective solution if other points of water entry are not addressed as well. The work proposed must address a complete effective solution.

## 7. Post-construction inspection

Check that all work proposed has been carried out as specified.

Check that all products used meet the specification (see 6 above)

## 8. Appendix 1 – Amendment Log

Date	Section	Amended paragraph/text/bullet starts with
21.10.09	6	State clearly the minimum work
21.10.09	6	Although the primary focus
21.10.09	3	<i>Surrounding drainage system, including sewers.</i>