Environment Agency's (Wessex Region) Property Flood Resilience Measures for Listed Building Consent & Pre-Application Advice

Guide for Listed Building Officers & Conservation Officers

CONTENTS

1. DEMOUNTABLE BARRIERS 1

2. PERMANENT FIXINGS & HARDWOOD PACKERS 2

3. FLOODGATES 3

4. AIRBRICK PROTECTION 4

AUTOMATIC AIRBRICKS WITH HERITAGE AIRBRICK COVER DETAIL: 5

5. MORTAR REPAIRS 7

6. SEALING OF SERVICES AND DRAINAGE POINTS 8

7. NON-RETURN VALVES (NRVS) 9

8. PUDDLE PUMPS 10

9. PIPE REDUCERS 10

1. Demountable Barriers

Aluminium Demountable Flood Barriers are products designed to impede the flow of water and prevent water ingress into the building. They usually require permanent fixings to the property to facilitate fitment. The barriers themselves are erected when flooding is anticipated and removed once the threat of flooding has passed. They are often used on listed buildings where Upvc Flood Doors are not an option. To create a flat seal, and allow installation of flood barriers, a new base (an aluminium strip or a C channel) will be installed. This provides permanent housing into which flood barriers can be inserted at times of heightened flood risk.

A rubber seal runs the entire length of the inside of the aluminium rail. The barrier system consists of 2x 300mm aluminium panels. The lowest barrier has rubber seals at the top and bottom edges of the panel (Image 1b). The top seal is shaped to provide a “tongue and groove” type fitting to the underside of the central / upper barrier. Likewise, the central barrier only has a rubber seal at the top. Each barrier will therefore have a horizontal “tongue and groove” rubber seal to provide a watertight barrier.

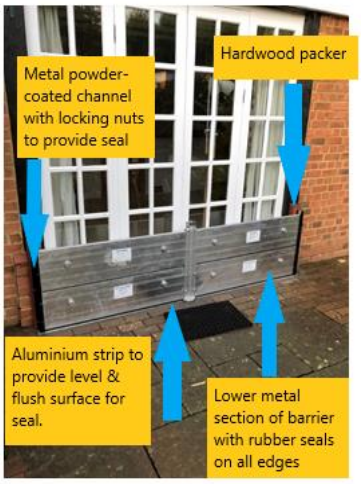

Image 1a)



Image 1b)



Figure 1c)



Image 1d) Demountable Flood Barrier with corner post

2. Permanent fixings & Hardwood Packers

A hardwood packer is attached directly to the property's doorframe or adjacent stone / brickwork (a waterproof sealant is used in the fixing of these hardwood packers) and provides a secure flush surface for metal channels to then be fixed to. These channels are powder-coated to blend in with the building (in this example (Image 2a) they have been powder-coated black). These channels act as a guide for sliding each of the demountable flood barrier's sections / panels into position. (In the example in Image 1a on page 1 above) there are four sections / panels. This example also includes a demountable central post (as this example is for a large doorway opening). The channels create a watertight seal by way of a system of locking nuts compressing the rubber seals within the channels that are on to the barrier's metal sections / panels. The metal powder-coated channels, and the demountable barrier's lower metal sections / panels - have a rubber seal on their bottom edge / 'face' - sit on a packer that is fixed to the outer leaf of the property using suitable frame fixings and then sealed using CT1 sealant.(please see product information link: https://www.ct1.com/wp-content/uploads/bsk-pdf-manager/2020/09/CT1_Product_Info_sheet_TRIBRID_10_09_2020.pdf) to ensure that there is a flush and level surface to provide a watertight seal.



Image 2a) Hardwood packer & aluminium strip



Image 2b) Waterproof sealant and render

The hardwood packers are a means to either mount channels on for the Demountable Barriers (as described above) and thus, a means to create a watertight seal; or, on their own the hardwood packers create a flush sealable surface for floodgates to compress against (see Floodgates in section 3 on page 3 below). Both the wooden packer and the channels are sealed with a waterproof sealant as can be seen in the photo above. The aluminium base strip is set into waterproof render.

3. Floodgates

Floodgates work through a compression mechanism and are fitted to the building only when there is risk of ingress from flood waters. Packers (like the examples shown in Images 2a & 2c in section 2 on page 2 above) will be installed to the door frame or adjacent stone or brickwork to secure the floodgate thus providing a flush sealable surface. These packers will be wooden and not take away from the historic character of the building.



Image 3a) Floodgate installed in position.



Image 3b) Rear view of Floodgate shows a 'car-jack' type ratchet mechanism that extends the Floodgates width dimensions until it compresses and seals against either the external doorframe or if needed hardwood packers are fitted to the doorframe or adjacent stone or brickwork to form a flush sealable surface as used in the Demountable Flood Barriers above.

4. Airbrick Protection

Flood water can enter a property through airbricks therefore when putting flood resilience measures in place existing airbricks will be replaced with airbricks that are designed to automatically shut off during flood conditions. These chosen or fitted with heritage covers to ensure they are in keeping with the historical character of the property. Images 4a and 4b below show examples of automatic airbricks without heritage covers; whilst Images 4c and 4d show examples of automatic airbricks with heritage covers and how they can be as aesthetically adaptable to suit the property.



Image 4a) White airbrick without heritage cover



Image 4b) Red airbrick without heritage cover

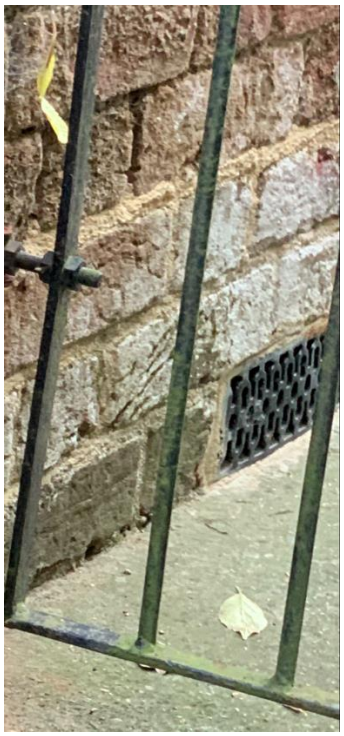

Image 4c) With heritage cover



Image 4d) With heritage cover

Automatic Airbricks with Heritage Airbrick Cover detail:

Essentially this involves a black automatic airbrick which is a Kitemarked flood resistance product. It will provide both ventilation in accordance with BS493:1995 and flood resistance in accordance with BS851188-1:2019. The cover is cast iron, finished in black and is fitted in front of the automatic airbrick. The cover is designed so that it has minimal interference with the ventilation passages yet maximises the coverage of the automatic airbrick beneath. As the cover is fitted in front of the automatic airbrick it cannot disturb its operation in the event of a flood.

As shown in Figures 6c and 6d this system has minimal aesthetic impact on the property. We have had one instance where a resident contacted us to say we hadn't done the works on their airbricks when indeed we had but they simply hadn't noticed.

The main benefit of Automatic airbricks incorporating Heritage Airbrick Covers is that they are a passive measure – no operation or interaction is required for them to provide flood resistance. All other alternatives will require someone to manually fit covers in place. This isn't always possible due to:

- little or no warning of a flood occurring
- time required to fit multiple covers
- availability of someone to deploy the covers – unoccupied property, holidays, working hours, middle of the night, etc, etc
- ability of Residents to physically deploy the covers – due to ill health, elderly or infirm residents etc, etc

Permanently sealing the airbrick opening, for example with a matching brick isn't an appropriate solution in the vast majority of applications as the ventilation is there for a reason and must be maintained. Furthermore, we have also come across properties where the covers have been permanently deployed due to the above considerations of getting the covers fitted in time. Again, this is not ideal as aesthetically the covers have a large impact and more importantly when the covers are fitted the intended ventilation is totally restricted.

If non-passive covers are not deployed correctly or in time for whatever reason the ingress of water in the event of a flood would easily overwhelm any pumping capacity to suppress flood levels. Property Flood Resilience measures work as a system. All other measures such as flood barriers or non-return valves would be compromised and rendered useless if the airbricks were not protected.

If a Listed Building were to flood the remedial works would almost certainly lead to a much greater impact on the property than the works required to provide Property Flood Resilience measures.

Other benefits include:

- Only 3 other systems are Kitemarked – all of these are types of covers
- All covers still have an aesthetic impact as they need frames (Kitemarked frame is plastic), fixings or wall modifications to get an appropriate seal

One further point for consideration. If automatic airbricks and Heritage Airbrick Covers are fitted it would be possible to remove the existing airbricks to be retained by the Homeowner such that if the building ever had to be returned to original condition they could be refitted.

5. Mortar repairs

Mortar repairs are carried out up to a height of 600mm where identified. Details of the mortar used for lime pointing and rendering is attached below images 5a & 5b.

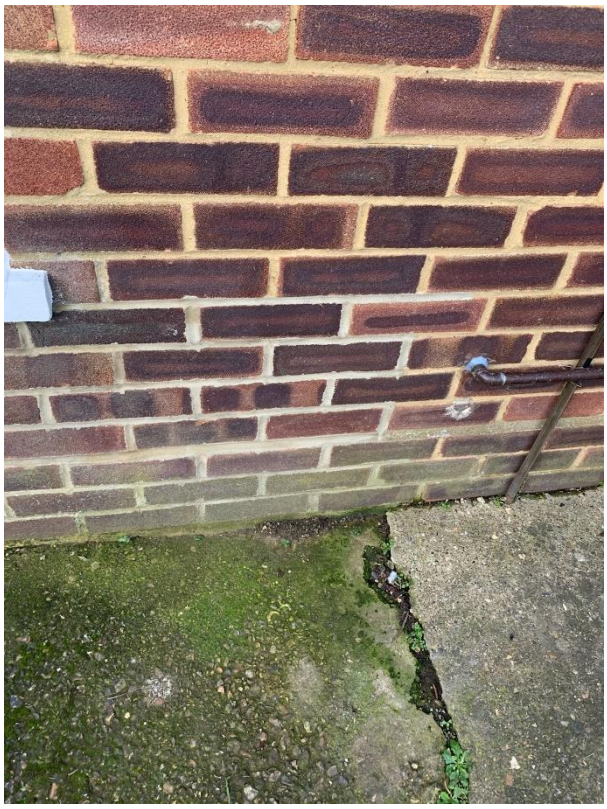

Image 5a) Waterproof Mortar and pointing repair.



Image 5b) Waterproof render repair. (Note the render painted black was the renders original colour.

Method statement – Lime Pointing (same material used for rendering)

Method statement lime pointing..pdf

COSH Lime pointing (same material used for rendering)

Coshh Lime pointing.pdf

6. Sealing of services and drainage points

Service and drainage points are sealed with waterproof sealant.

Sealant - CT1 TECHNICAL DATA TRIBRID ® Polymer

https://www.ct1.com/wp-content/uploads/bsk-pdf-manager/2020/09/CT1_Product_Info_sheet_TRIBRID_10_09_2020.pdf

7. Non-Return Valves (NRVs)

No-Return Valves (see Image 7a below) are fitted to drainage systems to prevent flood water flowing back up the drainage system and into the building. These Property Flood Resilience measures do not affect a listed building's aesthetics as they are fitted within the drainage system.



Image 7a) 110ml NRV installed into an underground Polydrain round inspection chamber

8. Puddle Pumps

Generally, the puddle pumps the EA provide property owners is the EGO 500 SELS Automatic Puddle Pump (see Image 8a below). These puddle pumps are deployed in situations where small amounts of water have managed to enter the building and are simply plugged in by the property owner with a discharge hose attached that allows the water to be discharged away from the property.



Image 8a) EGO 500 SELS Automatic Puddle Pump

9. Pipe Reducers

These Property Flood Resilience measures do not affect a listed building's aesthetics as they are fitted within the drainage system.