

## 1. Introduction

LRWA Members are frequently asked to respond to requests from designers seeking to hide waterproofing upstand details behind a viewable external wall on roofs, podium decks, balconies or terraces.

To achieve this hidden detail the designer suggests that the waterproofing system is installed and dressed up the outside face of the hidden inner leaf of the external wall, within the cavity. The outer exposed leaf is then designed to be built directly off the waterproofing, creating a cavity/void between the two leaves of the external wall.

The main reasons for this are:

1. to hide the waterproofing upstand and/or flashing from view.
2. to enable waterproofing to be completed ahead of the external face of the wall.
3. enabling other trades works to proceed ahead of, or between, the roofing contractor carrying out the waterproofing.

Whilst these reasons can be understandable in each individual case, there are a number of considerations that the principal designer must consider. This Guidance Note has been produced to raise awareness of some key considerations the principal designer needs to assess when designing and building walls directly off the waterproofing system.

## 2. Key considerations when building onto waterproofing systems

- Any waterproofing installed behind the outer leaf of the external wall cannot be accessed for inspection, maintenance and repair. If the waterproofing is not certified to last the life of the building this may cause future repair or replacement complications such as needing to remove sections of the external leaf to gain access to the cavity and installed waterproofing.
- The waterproofing system used might not be certified for this application i.e. as a damp-proof membrane (dpm) or damp-proof course (dpc).
- Building the external leaf of a wall directly off the waterproofing could endanger the waterproofing integrity during its construction, and impose localised loadings that could cause cold flow, deformation or creep, limiting and potentially compromising the performance of the waterproofing. If designing with the external leaf of the wall directly off the waterproofing the manufacturer's advice should be sought prior to specification and construction to ensure waterproofing integrity is not compromised and minimise the chance of mechanical damage.
- A manufacturer's warranty and/or BBA certification may require periodic inspection, or the option to inspect the waterproofing, which this method of construction would prohibit, making the warranty/certification void. The waterproofing manufacturer's advice should be sought before commencing installation.
- Waterproofing is not a structural item. The facade engineer should be consulted to ensure the stability of the external wall is not adversely affected by using this method of construction.
- Correct installation of the cavity tray remains a requirement in a masonry wall, as does adequate cavity drainage with weep holes at 1m centres. The cavity tray should drain above the finishes on the external face of the outer leaf.
- Can alternative methods of hiding the waterproofing flashing be used, such as hiding the waterproofing behind a proprietary metal counterflashing? There are several aesthetic systems available as alternatives to a standard lead or similar cover flashing, e.g., a profiled, powder-coated trim, possibly matching the brickwork or cladding.

### 3. Supplementary Advice from Other Organisations

Other organisations have made assessments and provided information based on their experiences.

#### **National House Building Council (NHBC)**

The NHBC has concerns in this area;

“Design of the interface between the flat roof/podium deck and superstructure is technically demanding and a common source of failure leading to claims against NHBC’s warranty. NHBC also asks for the cavity in front of framed elements to be drained, which would add complexity to this detail.”

“Generally, where a flat roof or terrace abuts a wall the waterproofing layer should extend up the wall to form a minimum 150mm upstand measured from the balcony/terrace drainage layer of the roof/terrace. The waterproofing material forming an upstand should link directly under a cavity tray to ensure the cavity fully drains. Weep holes should be provided in masonry walls at 1m maximum spacings to assist drainage.

Where there is a door threshold or a window sill less than 150mm above the balcony/terrace drainage layer and there is a requirement for level access, or the fenestration design involves windows at or close to internal floor level and the paving/decking level, then the following upstand and accessible threshold design requirements...should apply.

Designs which continue the waterproofing layer horizontally through/under the outer leaf of a cavity wall and form an upstand against the inner leaf within the cavity are not acceptable because:

- materials used for the waterproofing layer are generally unsuitable to perform as a DPC supporting masonry loads
- the cavity must fully drain to avoid water retention and associated problems through prolonged saturation of the wall material, frost action and water turning stagnant
- water draining from the waterproofing layer must not be directed into a cavity wall
- future inspection, repair and maintenance of hidden upstands cannot be carried out without significant disruption to the construction”

***NHBC Standards (2021) Chapter 7.1 Flat Roofs, Terraces and Balconies section 17 ‘Accessible Thresholds and Upstands’***

“In balcony walls (especially long balconies) the structural stability should be checked, as cavity trays and DPCs in the wall can create a slip plane that can seriously limit the ability of the wall to resist horizontal forces. In such cases, it may be necessary to incorporate a ring beam or other support to ensure stability.”

***NHBC Standards (2021) Chapter 7.1 Flat Roofs, Terraces and Balconies section 18 ‘Parapets and guarding to terraces and balconies’***

#### **Brick Development Association**

The Brick Development Association (BDA) has also stated their concerns:

“Essentially you need to have continuous waterproofing for the podium but avoid loading any brickwork on to the hot-melt\*. Any compression of the waterproofing could result in the brickwork cracking.”

\*Note: this could also affect other forms of waterproofing. Please consult the manufacturer for further information

## Local Authority Building Control Warranty/Premier Guarantee

See below for selected extracts from the Local Authority Building Control (LABC) Warranty/Premier Guarantee technical update (April 2021) 'Podium Deck Guidance', whilst the title refers to podium decks it is relatable to roof terraces and balconies:

"Drainage falls should be constructed in a manner that they fall away from any structures built off the podium. Water standing on the deck, can exert pressures laterally on the external walls of structures built over the deck, therefore, the waterproofing line from the podium deck surface must be continuous to DPC level"

**(Deck Falls, p6)**

"The waterproofing layer must be linked to any cavity tray to avoid discontinuity which could result in moisture ingress."

**(Waterproofing, p7)**

"Where structures abut or are built off the podium deck, the waterproofing must be dressed up the vertical surface of the facade to a minimum of 150mm above the finished Podium Deck level.

Cavity trays above abutments (Podium Deck to Wall junctions) are often breached at the podium deck level, allowing water to seep into the building. Continuity is therefore essential between these two elements and waterproofing detailing is required to ensure any water passing the cavity tray is discharged to the podium deck adequately. Waterproofing layers must be linked with the DPC which should be at least 150mm above the finished surface level. Masonry should be durable against saturation in accordance with BS EN 771-1"

**(Abutment Joints, p9)**

"Where structures are built off the Podium Deck, a suitably designed 150mm upstand above the waterproofing layer must be provided. Surface water should be designed to fall away from any structures built off the podium.

Planters should be built off a 150mm monolithic kicker with the Podium Deck slab."

**(Architectural Features, p11)**

**Local Authority Building Control (LABC) Warranty/ Premier Guarantee technical update (April 2021)  
'Podium Deck Guidance'**

It is clear from the LABC Warranty/Premier Guarantee Technical Update document that they recommend incorporating a 150mm integral concrete kicker to the structural deck to create a suitable base for walls.

## 4. Additional Guidance

This type of use, as per this LRWA Guidance Note, is unlikely to be covered under any insurance or warranty. Should a Client or Contractor wish to proceed with such an installation, then the risk should lie firmly with them, and with the Designer.

1. In all cases, the specific manufacturer's guidance should be referred to and followed.
2. The correct, technically preferred / acceptable and reliably warrantable option is to build one or both leaves directly off the concrete deck or kicker (not off the waterproofing), and then to install the waterproofing system on the outer (exposed) leaf, with a standard upstand detail connected to the DPC. This should be a minimum 150mm above the finished surface (ref: BS 6229:2018, 'Flat Roofs with continuously supported membranes, Code of Practice').

### **BS 6229:2018 'Flat Roofs with continuously supported membranes, Code of Practice'**

The guidance of BS 6229:2018 is mentioned in all of the advice on this topic as they uphold the recommendation to have a vertical upstand waterproof flashing finishing a minimum 150mm above the finished roof level.

*LRWA was founded in 1979, and consists of the UK's leading manufacturers of liquid roof coatings and related material suppliers. It aims to raise awareness about the technical and financial benefits of specifying liquid applied roofing systems and to establish both product and installation standards to ensure optimum performance is achieved; to this end LRWA has been involved in the writing of European Technical Approvals as the official body, in conjunction with the BBA and EOTA.*

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