BRICK VENEER OVER HABITABLE SPACES

Some external moisture is likely to penetrate masonry veneer, but this isn't a problem when sufficient ventilation can drain and dry any water that enters. In this example, poor construction details restricted ventilation and caused problems.

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The exterior brickwork of masonry veneer cladding provides the first line of defence against moisture ingress. The second line of defence is the drying and drainage provided by a 40–70 mm (50 mm recommended minimum) wide cavity between the masonry veneer and the timber framing. This stops moisture that penetrates the veneer from travelling into the framing.

Weepholes and top vents allow air behind the wall, providing ventilation that can dry any moisture that passes through the external face. Weepholes should be at least 75 mm high and formed in every third perpend or vertical joint in the lowest course of bricks. The masonry wall must be set 50 mm lower than the timber framing to keep any moisture away from the framing.

Base of wall must be built right

The vulnerable part of this wall construction is the base of the masonry veneer. If there is no step-down or if mortar droppings or other debris are left at the bottom of the cavity, they may facilitate moisture passage across the gap to the framing.

Two features essential to the success of a masonry veneer over timber frame construction are:

- a 50 mm minimum step-down so the base of the veneer is lower than the bottom of the timber
- the cavity must be kept clear.

These requirements apply equally to construction at an upper floor level as at the ground floor level and were not adhered to in the following case study.

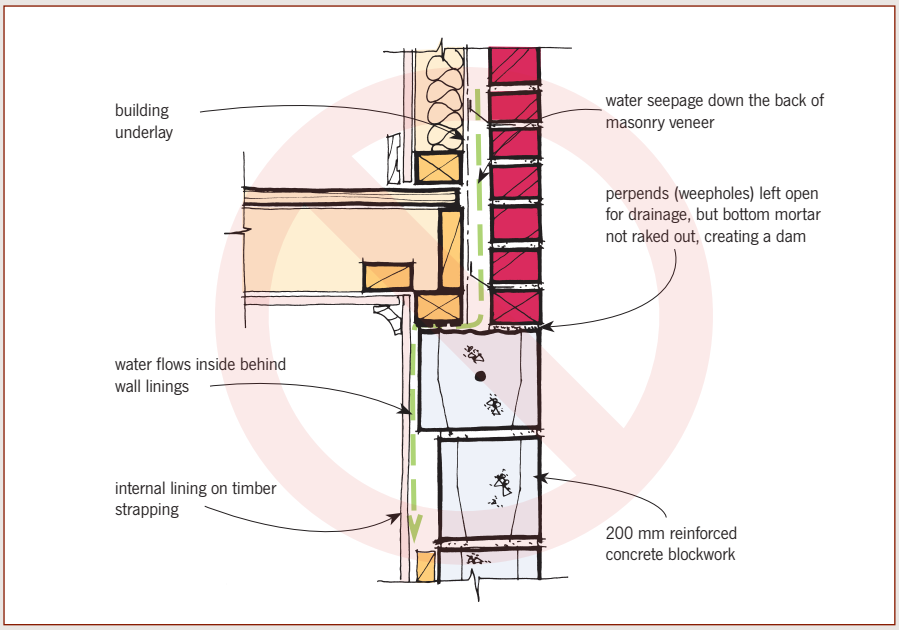

Figure 1: The problem – faulty installation of masonry veneer.

Case study finds missing step-down

The lower-level habitable space of a 2-storey house repeatedly experienced water ingress. It had an upper-level brick veneer over timber frame construction wall, built on a 200 mm reinforced concrete masonry lower-level wall. Initial investigation failed to find the cause of the water ingress but identified that:

- the brick veneer had weepholes at every third perpend in the bottom course
- there was no evidence of cracking in the concrete masonry
- externally mounted spoutings and downpipes were not blocked and showed no evidence of water spillage into the cavity.

FINDING THE PROBLEM

During pressure hosing, starting at the bottom of the wall and working up, leakage was induced when the masonry veneer (upper level) was hosed. The removal of a section of the lowest course of the brick veneer finally revealed the problem (see Figure 1).

The brick veneer and timber framing had been built directly on top of the concrete-filled masonry wall. Weepholes had been incorporated in the bottom course of bricks, but no 50 mm step-down had been created to keep the timber framing clear of the cavity drainage area. To make things worse, mortar droppings had been left in the cavity, resulting in a →

build-up of mortar that blocked the weepholes. Instead of draining out through the weepholes, the water that penetrated the masonry veneer was directed back towards the framing and then down the inside face of the masonry block wall.

THE SOLUTION

Because this was a repair, it was not possible to build a step-down at the base of the wall.

To fix the problem, the lowest two courses of the brick veneer were progressively removed from around the building and the veneer above temporarily supported with timber blocks (although sections will stand without support). The debris at the top of the concrete masonry wall was removed, and a thin layer of plaster was applied to the top of the wall to create a smooth finish with a slight fall to the outside face of the building (see Figure 2).

A 1 mm thick, butyl rubber flashing was laid over the plastered top of the concrete block wall and turned up against the timber frame at the back of the cavity, ensuring that the building underlay on the exterior face of the timber frame lapped over the top of the flashing, which was then stapled to the framing. The flashing was installed in continuous lengths with lapped and glued joints only at corners and where it was necessary to change direction only.

Remember...

A step-down is always required at the base of any masonry veneer wall, whether it starts at the ground or on the first floor (see Figure 3).

Care must also be taken to ensure that all mortar and debris is removed from the cavity so the drainage channel remains clear.

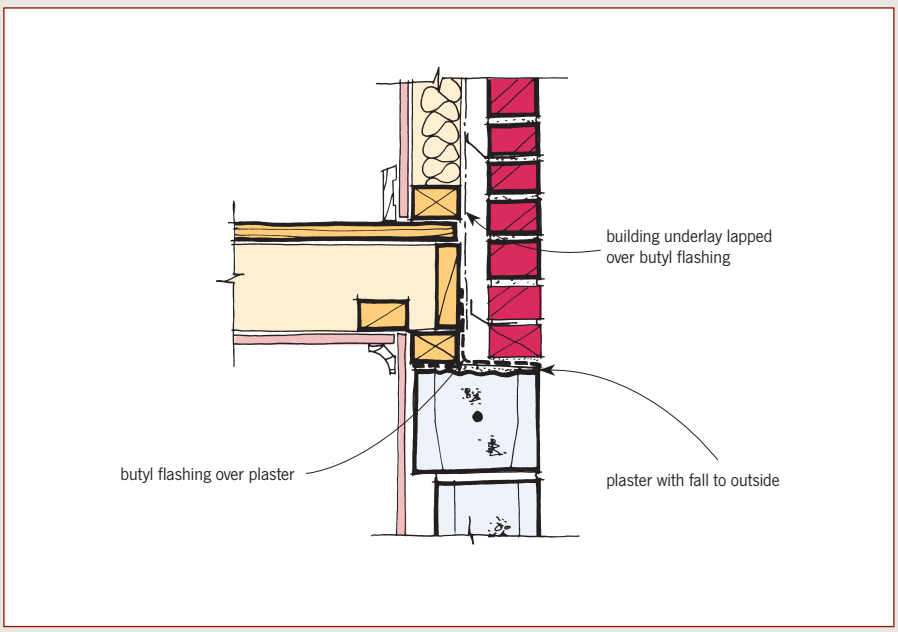

Figure 2: Solution for this case study.

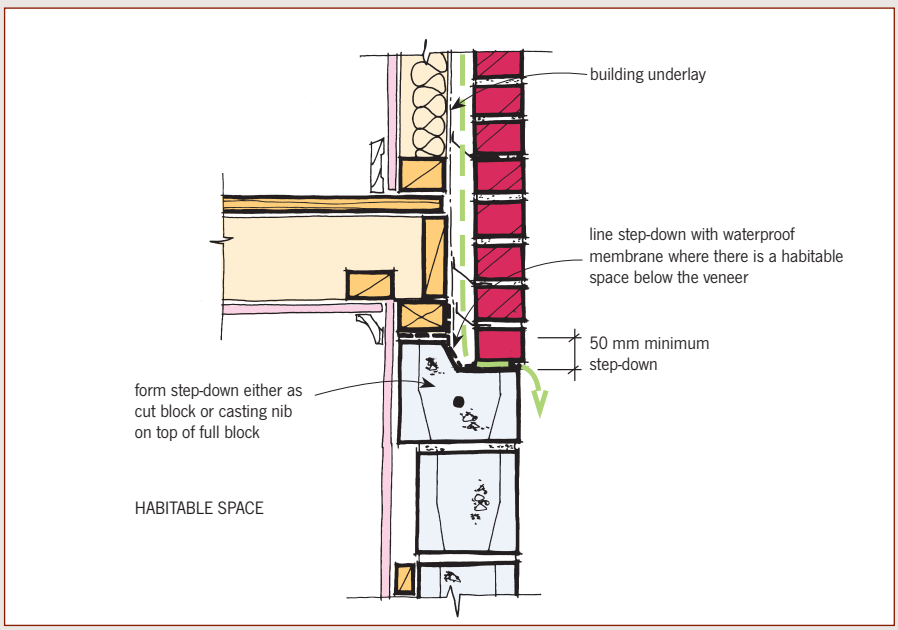

Figure 3: Correct construction details for masonry veneer on a blocked wall with a habitable space below.