



SHELF ANGLES OR VENEER LINTELS?

There seems to be some confusion about where and when to use a shelf angle or a veneer lintel with brick veneer. The two perform different functions and cannot be substituted for each other.

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In brick veneer construction a shelf angle is used to support the veneer at the foundation or at inter-storey junctions. Shelf angles are not that common in New Zealand and do require specific engineering design (SED). They involve complex issues in relation to the differential separation necessary between the veneer and the timber frame when fixed to timber framing, for instance when supporting brick veneer between storeys. Sometimes they may span openings for windows and doors (if these fall inter-level) but this is not the main purpose of a shelf angle. A shelf angle may be used, for example, with a two-storey building, where the veneer of the upper storey needs to be supported above the roof line of a lower storey.

Shelf angles need specific engineering design for good reasons. Timber framing is inherently dimensionally unstable as a result of moisture changes and is capable of up to 10 mm shrinkage over a storey height. Brick or concrete masonry veneer is unlikely to move much at all. Any movement is easily accommodated by the ties, which are relatively flexible, but not by a shelf angle, which is a comparatively rigid connection between veneer and frame (see Figure 1). This differential movement between the two elements could lead to cracking in the veneer (usually along the lines of the mortar) if a shelf angle is used with a lintel. Also, the weight this adds to the timber lintel is not allowed for in NZS 3604: 1999. Proprietary veneer cladding systems may incorporate

shelf angles, but these will be SED systems and the fixings will have been designed to accommodate any movement.

To span openings in brick veneer, lintel angles and flats should be used. These are supported at each end by the veneer adjacent to the opening, not off the timber framing (see Figure 2).

The sizes for flats and angles are given in Table 11.4 of NZS 3604: 1999 (for brick veneer), or Table 12.2 of NZS 4229: 1999 (for concrete masonry veneer) for different lintel sizes. For both brick and concrete masonry veneer, lintels can span up to 4.8 m when supporting a veneer no higher than 700 mm. For supported veneers higher than this, the maximum span is 4 m. ◀

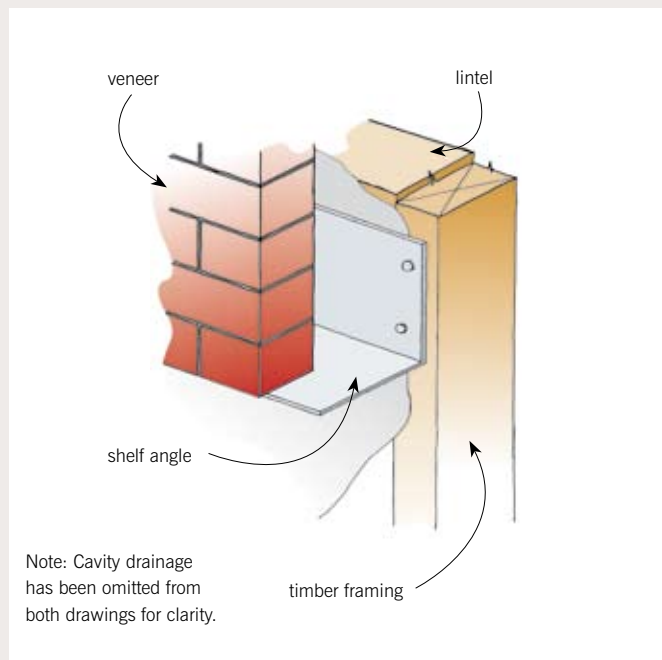


Figure 1: Shelf angle supports brick veneer at junctions.

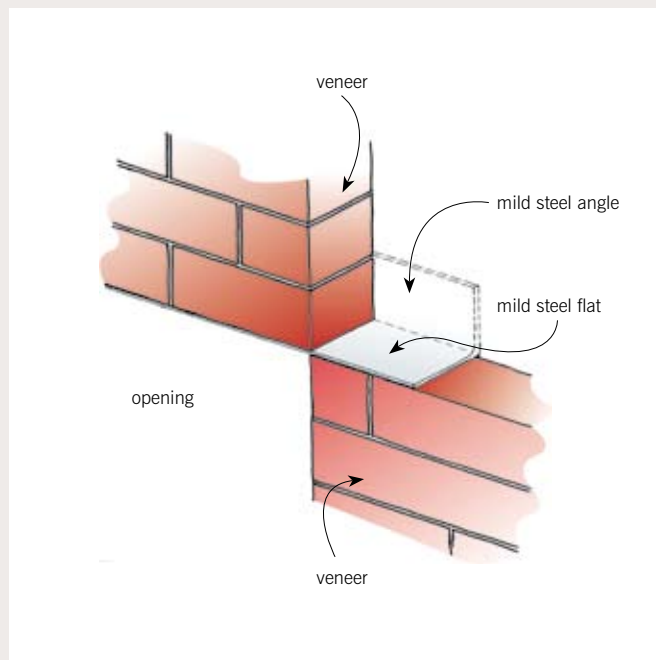


Figure 2: Veneer lintel (angle or flat) supports brick veneer at opening.