

Movement Joints

Clay bricks manufactured to EN BS 771-1 the harmonized European Standard, expand after firing significantly for a number of years. Many other materials shrink over the same period. Timber cladding and timber structures shrink significantly. Reinforced concrete frames creep and contract. Concrete blocks contract throughout their initial life as do concrete bricks which are excluded from the advice contained within this note.

Brickwork therefore requires both vertical and horizontal provision for Movement Joints (MJ). These are designed as compressible gaps which will close up as the brickwork expands. Other movement joint provision which works in a satisfactory way may be window reveals etc. Movement joints are generally viewed as undesirable and well thought out provision of joints can either dispense, disguise, or at worse develop as part of the rhythm of the building.

The UK has a wide range of temperatures and particular recommendations contained within PD 6697, have been found to be satisfactory in UK climatic conditions. The advice contained in this note amplifies the advice in PD 6697. All the advice contained in these notes are accepted knowledge and the current industry advice.

This Technical Note does not pretend to advise on the wider project and offers no advice on foundations or structural design of any description, but is solely concerned with the irreversible expansion of clay products. Additional expansion provision for structural movement, sagging and accommodation for load will be in addition to the advice contained within PD 6697.

Clay bricks require movement joints to allow for irreversible expansion during the first few years of installation. After 5 years,

most of the irreversible movement has occurred and stability has been achieved. Although expansion may continue for up to 20 years this is generally minor, and relatively unimportant. It is worthwhile mentioning that reclaimed bricks of great age also require expansion provision. The reason for this is that under load in a façade the brick has achieved stability. When the load is reduced, expansion may reoccur. This may be uncommon but the possibility exists.

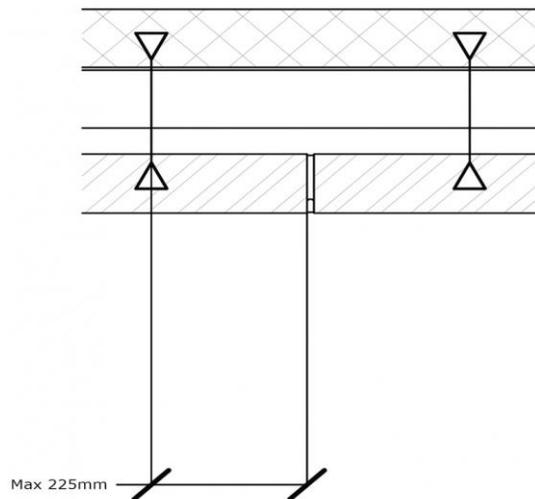
Bed Joint Reinforcement (BJR) is a panacea for many areas of brickwork. This includes Movement Joints which can be extended to up to 17M with BJR in every 3rd bed joint of a standard brick or 225mm. BJR imparts tensile characteristics to a masonry wall which otherwise would be a largely compressive structure.

Lime Mortar manufacturers have claimed on occasion that the use of lime mortar means that the façade can move and brickwork expand without the use of MJs. We suggest that if this is considered the design is underwritten by the lime mortar manufacturer. There is no authoritative independent evidence of the need for MJs not being required. Examples of projects constructed with Lime Mortar with no MJs such as Glyndebourne Opera House by Hopkins Architects required very sophisticated structural advice. This is beyond the scope of general advice such as contained in in this technical note.

We strongly advise that all proposals are reviewed and confirmed by Bespoke Brick. We cannot accept any liability for projects which have not been reviewed, as we are unaware of the project requirements and particular circumstances. While this note seeks to advise designers, it does not provide any detailed design provisions which will always need to be reviewed by a competent designer.

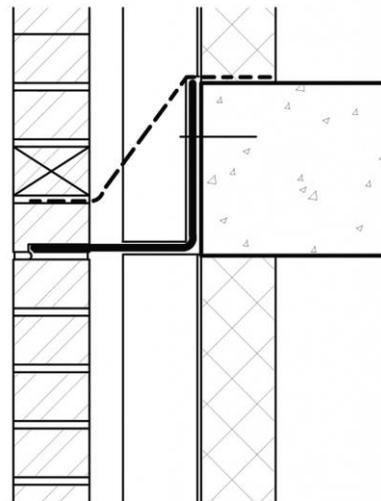
Vertical MJ for Horizontal Expansion

- Typical Vertical Movement joint to cater for horizontal expansion. Often a closed cell polyethylene strip. The tear off strip removed when pointing and finished with silicone sealant matching the mortar finish.
- Width of joint 1.3mm per linear run of brickwork.
- Ties must be within 225mm of the joint at 300mm vertically.
- Ties to be embedded to 50mm min. into bed joint.



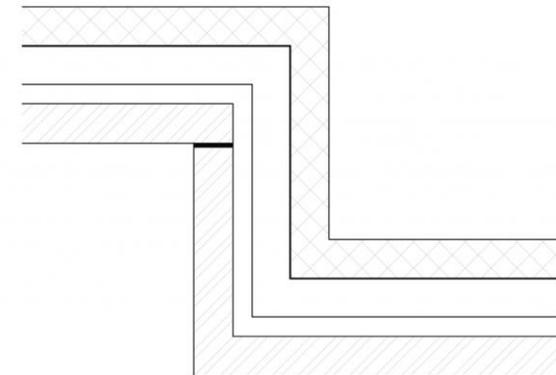
Horizontal MJ for vertical Expansion

- Typical horizontal expansion joint with pistol brick shielding shelf angle. Minimum support 2/3 brick width.
- DPC normally laid to joint above shelf angle min 2 weep holes to every opening or every 900mm.
- Ensure no mortar droppings to DPC blocking weep holes.
- Max. distance between horizontal joints 9M. If this is exceeded discussion is required with Bespoke Brick.



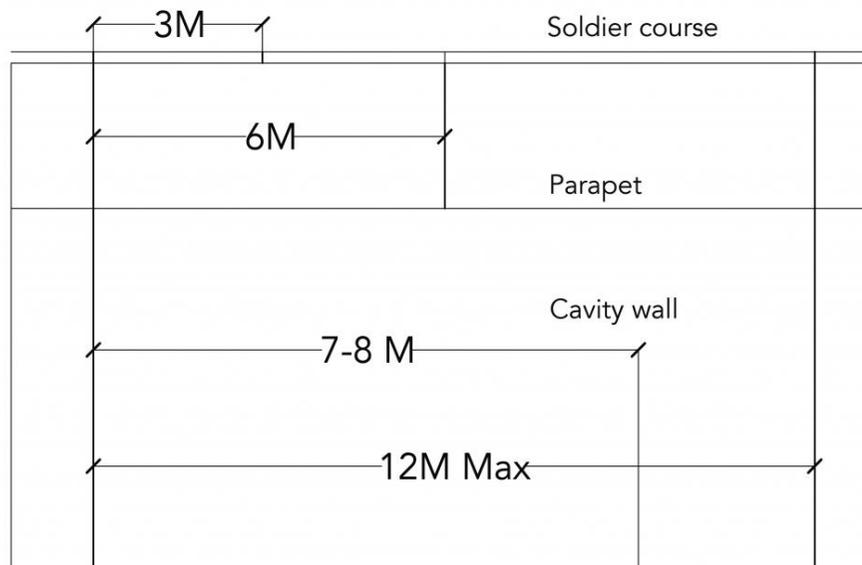
Short Returns

- Typical horizontal expansion joint with pistol brick shielding shelf angle. Minimum support 2/3 brick width.
- Short returns require a movement joint as indicated. If the short leg is longer than 1m a MJ is not essential.
- If no MJ is included in the corner compressible joints are required within 1.5m of the corner for both legs.
- The corner does partly disguise MJ provision.
- If the corner has a MJ this is effective in the 12m max provision between MJs.

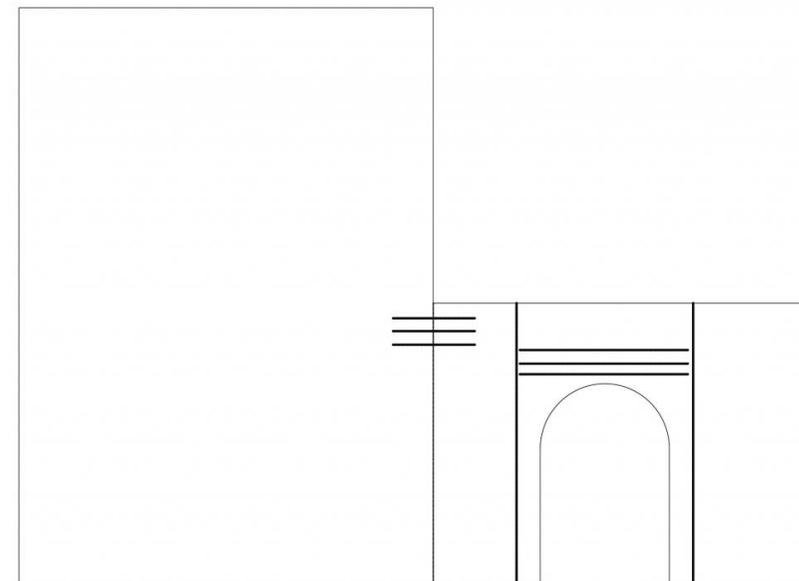


Movement Joint Distance Requirements

- Solder Course Parapet Cavity Wall
- Normal max. between MJ's without Bed Joint Reinforcement (BJR) is 12m. Allow 1.33 x 12m gives a MJ of 16mm wide.
- It is more normal to have an MJ at 7-8 M centres, to keep MJ's at 10mm width.
- For free standing walls, parapets and where M6 mortar is used for severe exposure, MJ's are placed at 6m centres.
- While soldier courses are not recommended, if against advice they are used then MJ's should be placed at 3m centres.
- DPCs act as slip planes where MJ's frequency are increased.
- If BJR is used every 3rd course, MJ's can be extended up to 17m.
- For walls of different heights, a separating MJ is required.
- BJR laid in 3 rows under the junction of the walls of different height if a MJ is not designed in this area.
- Large openings set up stresses in the facade; designers are advised to either place MJ's each side of the opening, or 3 rows of BJR above and extending well beyond the opening.



Brick Education notes provided by Simon Hay, Chartered Architect, Building Expertise Ltd.



Different wall heights
need MJ's or BJR

Large openings
need MJ's or BJR