

Aggregate Concrete Blocks A Guide to Movement Control

Introduction

After construction, buildings, especially the more modern slender constructions, are subject to small dimensional changes. The main movement in concrete masonry as it dries to equilibrium moisture content and the concrete carbonates is shrinkage. This data sheet gives guidance on how to accommodate such movements based on the rule of thumb below.

Typical movement joint spacing for unreinforced concrete masonry panels:

- Internal: 8 to 12m.
- External: 6 to 9m.

Factors influencing spacing of joints are: mortar type/strength, (note: the weaker the mix, the increased ability to accommodate movement); the effects of end restraint (this will require closer spacing of movement joints); the panel height/length ratio; use of bedjoint reinforcement and moisture content of blocks when laid.

Where possible, masonry should be designed as a series of panels, separated by movement control joints.

Panels

Ideally panels should be square, but generally length should not exceed 3 x height of the panel, except where bedjoint reinforcement is introduced. Care therefore has to be taken when introducing wide window openings as the blockwork immediately above and below may exceed the 3 to 1 length/height ratio. Where possible storey height openings should be designed, forming the masonry into discrete panels without interfering with the overall design aspect (see Figure 1).

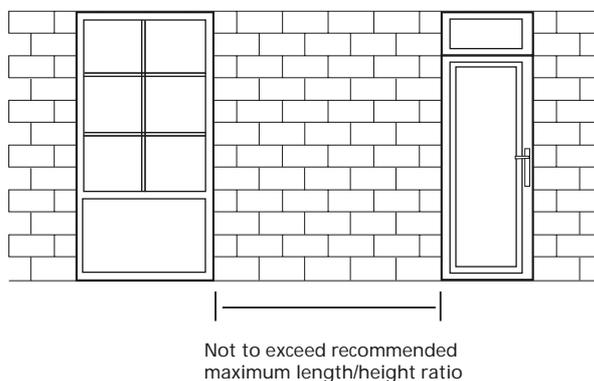


Fig. 1 *Masonry Movement Joints*

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Position of Movement Joints

Consideration for the location of movement joints should be given at:

- Change in wall height or thickness (see Figure 2 & Figure 3).
- Change of loading (see Figure 4).
- Abutments of walls and columns and junctions of dissimilar materials (see Figure 5).
- Movement joints in concrete floor slabs (see Figure 6).
- Between 1m and 3m from a corner (see Figure 7).
- Chases, recesses or openings (see Figure 8).

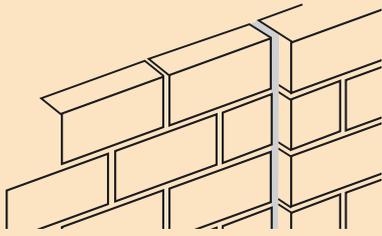


Fig. 2

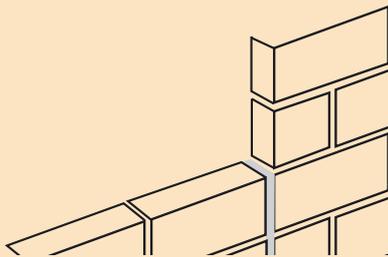


Fig. 3

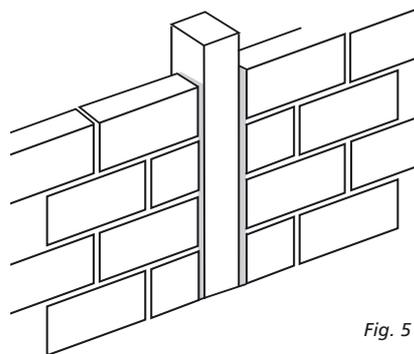


Fig. 5

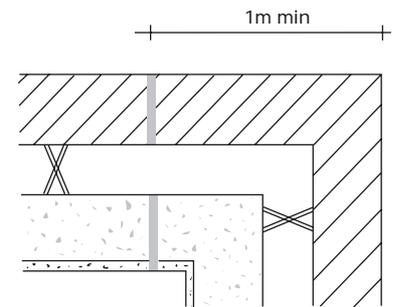


Fig. 7

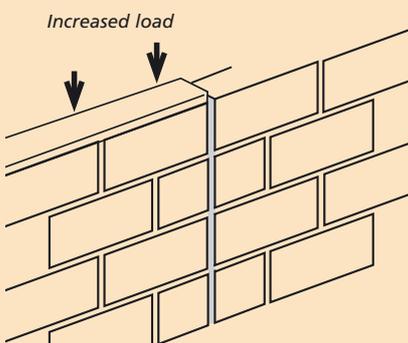


Fig. 4

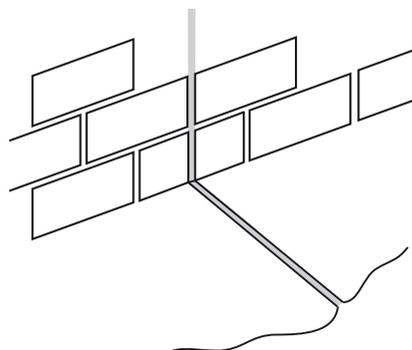


Fig. 6

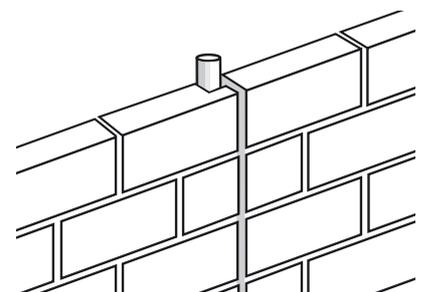


Fig. 8

Bedjoint Reinforcement

The inclusion of ladder type bedjoint reinforcement is recommended in two courses, one above and one below openings, to dissipate the extra stresses created around openings (see Figure 10 & Figure 11).

Bedjoint reinforcement can also be used to reduce the incidence of movement joints as well as improving the lateral stability of masonry walls (see Table 1).

Note: Bedjoint reinforcement should never bridge a movement control joint.

Due to the variations in physical properties between different concrete blocks, the manufacturer should be consulted for more specific guidance.

TYPICAL SPACING OF MOVEMENT JOINTS	
Unreinforced blockwork	9m
Reinforced at 675mm vertical centres	12m
Reinforced at 450mm vertical centres	14m
Reinforced at 225mm vertical centres	16m

Table 1

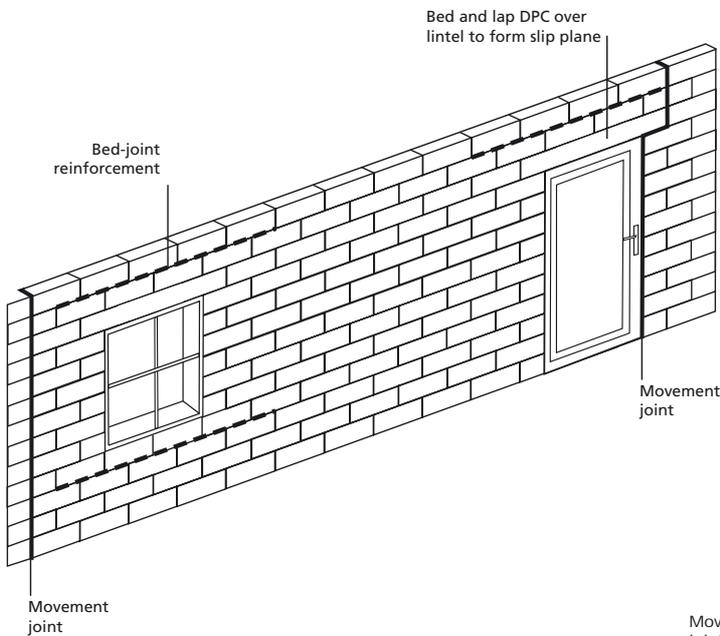


Fig. 10

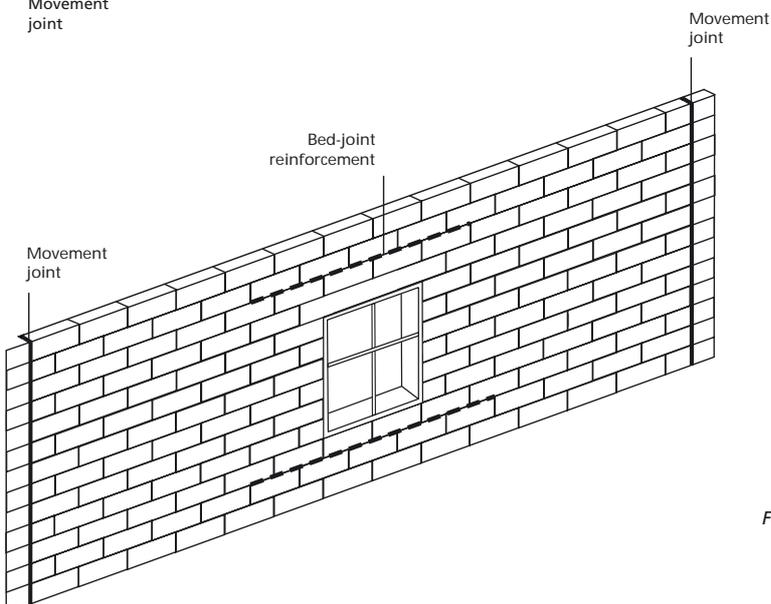


Fig. 11

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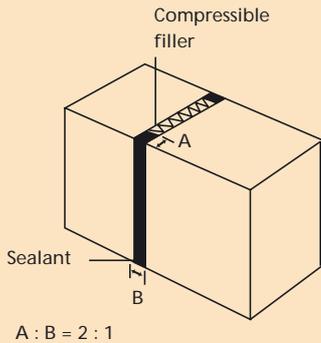


Fig. 12

Joints

Joints should normally be 10mm wide and filled with a compressible filler such as a 13mm polyethylene foam strip, with a bond breaker and finished with a suitable sealant, such as a 2 part polysulphide when used externally (see Figure 12). Where masonry has an applied finish such as render/plaster or tiling, the joint should be continuous through the finishes (see Figure 13). Where the movement control joint is bridged by flat ties to improve lateral stability, one end of the tie should be debonded by the use of a PVC sleeve. Consideration should be given to the effects of fire, sound and stability when introducing a movement control joint.

Deflection

It is important that any deflection from a floor or a roof is not transmitted to a non-loadbearing wall. If the anticipated deflection is not excessive, the joint may be packed with a compressible filler, such as mineral wool or a fire resistant foam (see Figure 14). This joint can be hidden from view by fixing a coving which should be fixed to the soffit only.

Shrinkage can also occur vertically. In tall panels, which are non-loadbearing, any lateral restraint employed should not prevent the wall from moving vertically.

General

Shrinkage of blockwork can be minimised by laying dry blocks and by protecting the work as it proceeds.

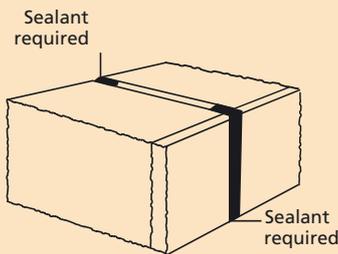


Fig. 13

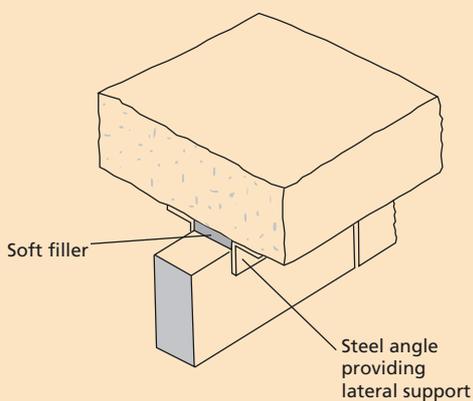


Fig. 14

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