4. Geometry of the Wall

Whether the cause of movement is in the building shell or due to ground movement, the geometry of the wall significantly affects the way in which the brickwork reacts to movement and the degree of damage that may be caused.

Both plan and elevation shape and dimensions may inadvertently result in the build up of dangerous stress levels in various positions when movement takes place. In effect, the design creates planes of weakness where cracking could occur. Typical areas of potential danger are cited, together with suggested approaches for their avoidance or cure.

(i) ABRUPT CHANGES OF WALL THICKNESS

(a) The thinner section of wall should not be overstressed. If it is, it should be thickened. Fig. 10.

(b) If two loading conditions are present, one on each thickness of wall, it is advisable for the two sections to be separated by a type A joint.

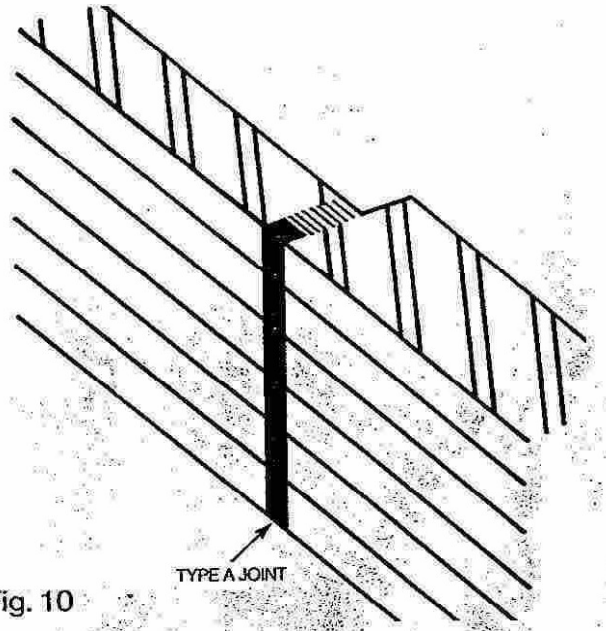


Fig. 10

(c) If there is no differential load problem, the addition of bed joint reinforcement may minimise the risk of cracking.

(ii) ABRUPT CHANGES IN HEIGHT OF WALL

(a) As two load conditions are present, the different heights of wall should be divided by a type A joint. Fig. 11.

(b) The foundation design should be adequate for both load conditions, so that the wall will settle evenly.

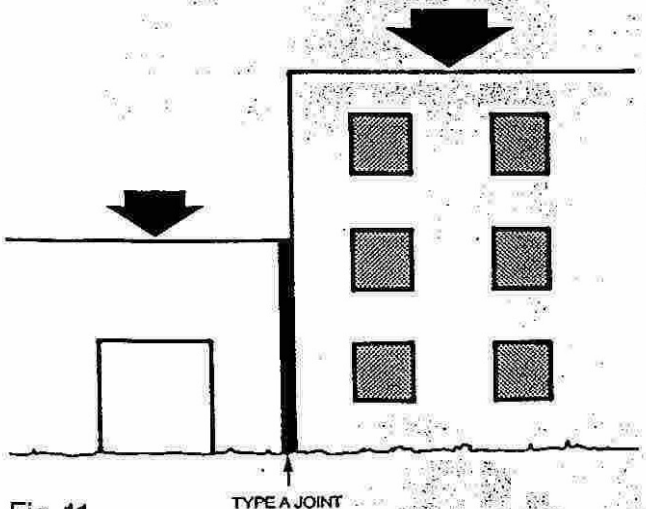
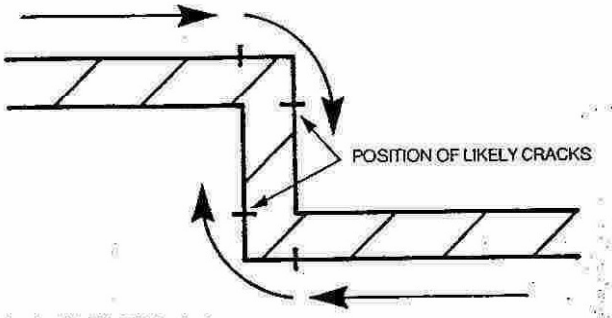


Fig. 11

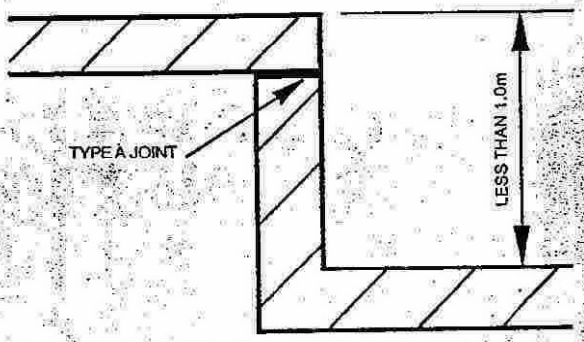
(iii) CHANGES IN DIRECTION INVOLVING SLENDER RETURN WALLS

(a) Return walls should be designed to have adequate stability to withstand the adjacent walls' movement.

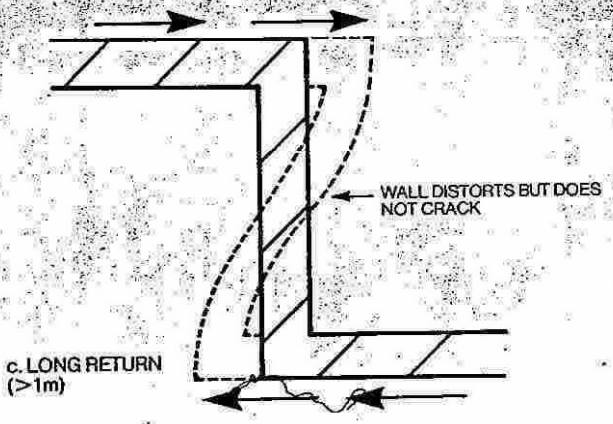
(b) Short return walls should be avoided as far as possible. Any return wall will be affected by the expansion forces in the brickwork in both adjoining walls. Where short returns are unavoidable, incorporate type A joint as shown in 'b'. Fig. 12. This is aggravated by the wall sliding on the d.p.c. Correct choice of the d.p.c. material is therefore important and advice should be sought from the manufacturer, or Ibstock Technical Services Department.



a. SHORT RETURN (<1m)



b. SHORT RETURN WITH MOVEMENT JOINT



c. LONG RETURN (>1m)

Fig. 12

(iv) POINTS OF WEAKNESS AROUND OPENINGS

(a) In walls of 12m or over the wall length should be broken up by movement joints, or the brickwork should be treated as panels between the windows. Fig. 13.

(b) When large openings in low walls (or multiple openings above each other in high walls) occur a type A joint should be positioned on the plane of weakness, or bed joint reinforcement should be used. Fig. 14.