for post-tensioning. In absence of data, the values given in appropriate codes should be used for the design.

The relaxation, shrinkage and creep losses are interdependent, and hence in prestressed concrete the 1000 hour test value is multiplied by a relaxation factor to take these together into account. However, no such data are available for brickwork; hence the total loss will be overestimated, if each is added separately.

11.7.5 Loss due to moisture expansion, shrinkage and creep

The effect of moisture expansion of fired clay bricks will be to increase the prestressing force in tendons, but this is disregarded in design. However, if the moisture movement causes shrinkage in masonry, there will be a loss of prestress. The code recommends a value of maximum strain of 500×10^{-6} for calcium silicate and concrete bricks. The loss of prestress can be calculated from the known value of strain.

Rather limited data are available for determination of loss of prestress due to creep in brickwork. The code recommends the creep strain is equal to 1.5 times the elastic strain for brickwork and 3 times for concrete blockwork and these values should be used for the design in the absence of specific data.

11.7.6 Thermal effect

In practice, materials of different coefficients of thermal expansion are used and this must be considered in the design. In closed buildings, the structural elements are subjected to low temperature fluctuations, but this is not the case for the external walls, especially prestressed widecavity cellular walls where the temperatures of the inner and outer walls will always be quite different. An unbounded tendon in a cavity will generally be at a different temperature from the inner or outer wall which may result in loss of prestress. Such effects are, however, difficult to estimate.

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Design calculations for a seven-storey dormitory building according to BS 5628

12.1 INTRODUCTION

As an illustration of structural design calculations based on BS 5628 we may consider a building having the layout shown in Figs. 12.1 and 12.2. It is assumed that the roof and floor slabs are of continuous *in situ* reinforced concrete construction. The structure has been kept simple to show the principle of limit state design. Only two walls above G.L.-an internal wall A, heavily loaded compared to the others, and a cavity wall B, have been considered. The inner leaf is assumed to support its own weight together with roof and floor loads, whilst the outer leaf will

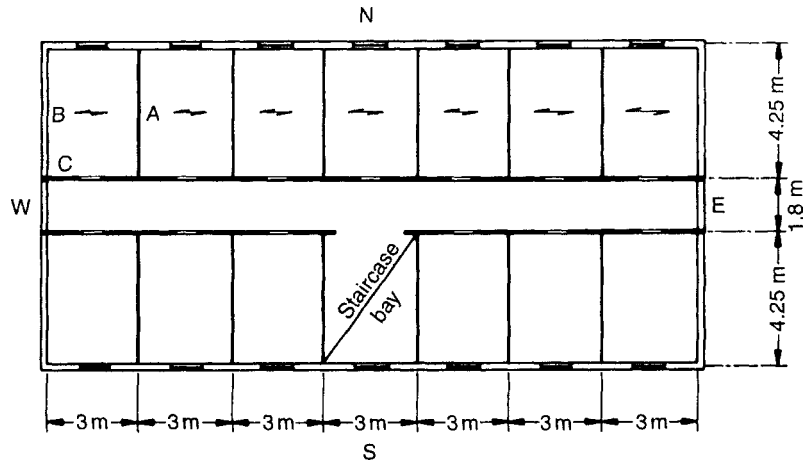

Fig. 12.1 Typical plan of a building.