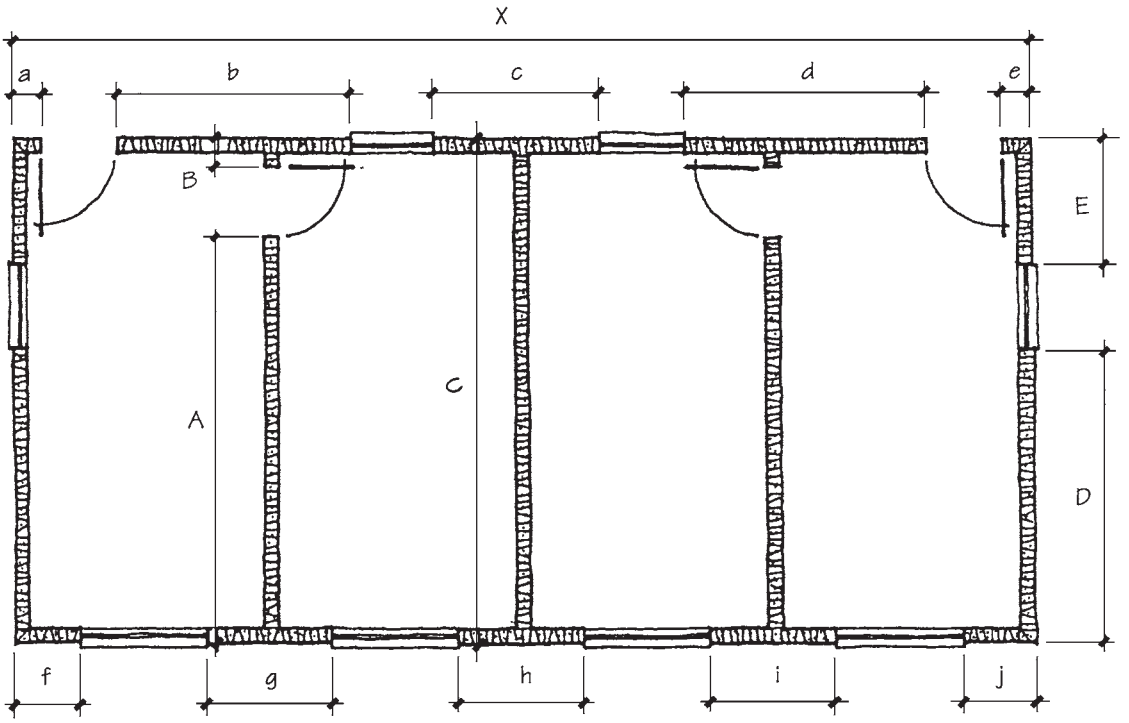

walls in long dimension of building: $a + b + c + d + e + f + g + h + i + j \geq 0.4X$

walls in short dimension of building: $A + B + C + A + B + D + E + D + E \geq 0.4X$

Figure 12-25 Shear wall requirements for empirically designed masonry. (*Based on requirements of the Masonry Standards Joint Committee,* Building Code Requirements for Masonry Structures, *ACI 530/ASCE 5/TMS 402, and* International Building Code 2003.)

adjustable ties. Ties in alternating courses must be staggered horizontally. Additional ties must be provided at all openings, spaced not more than 3 ft apart around the perimeter, and within 12 in. of the opening itself. Prefabricated wire joint reinforcement used to provide bond between multiple wythes must have cross wires of 9-gauge steel that are spaced a maximum of 16 in. on center. Spacings for joint reinforcement with three rigid wires are the same as for rigid ties, and for joint reinforcement with eye-and-pintle or loop-and-tab-type ties, the same as for adjustable ties.

12.2.5 Corbeling

Only solid masonry units may be used for corbeling. The maximum corbeled projection beyond the face of the wall is limited to one-half the wall thickness for solid walls, or one-half the wythe thickness for cavity walls. The maximum projection of any individual unit may not exceed half the unit height or one-third its thickness (*see Fig. 12-31*).

12.3 ANALYTICAL DESIGN

In the allowable stress method of design, computed stresses resulting from service loads may not exceed allowable stresses dictated by the code. The allowable stresses used are quite conservative, generally resulting in safety

Floor or Roof Construction	Maximum Ratio of Shear Wall Spacing to Shear Wall Length
Cast-in-place concrete	5:1
Precast concrete	4:1
Metal deck with concrete fill	3:1
Metal deck with no fill	2:1
Wood diaphragm	2:1

Figure 12-26 Shear wall spacing for empirically designed masonry. (*From Masonry Standards Joint Committee,* Building Code Requirements for Masonry Structures, *ACI 530/ASCE 5/TMS 402 and* International Building Code 2003.)

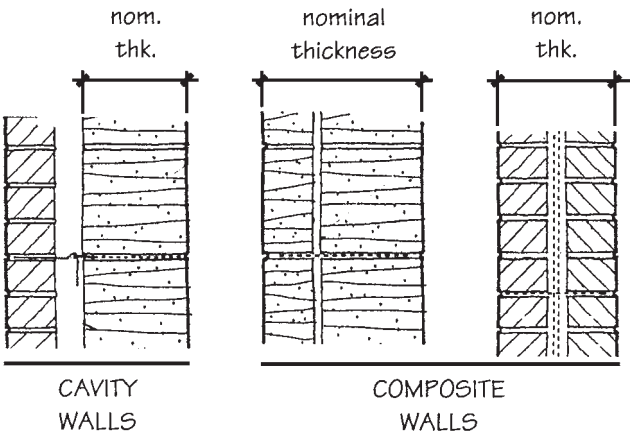

Figure 12-27 Shear wall thickness.

factors which range from 3 to 5. In order to use either the allowable stress or strength design methods, the masonry construction must be inspected in accordance with code requirements (see Chapter 17). Inspection is required to evaluate quality and acceptability of materials, equipment, and procedures. There is no option for uninspected work.

All allowable stress design requirements are based on units laid in running bond with a minimum overlap between units of one-fourth the unit length. Units laid in stack bond must be reinforced with bond beams or prefabricated joint reinforcement spaced 48 in. on center vertically, and the minimum area of steel must equal 0.00028 times the vertical cross-sectional area of the wall.

In determining stresses, the effects of all dead and live loads must be taken into account, and stresses must be based on actual rather than nominal dimensions. Consideration must be given to the effects of lateral load, eccentricity of vertical load, non-uniform foundation pressure, deflection, and