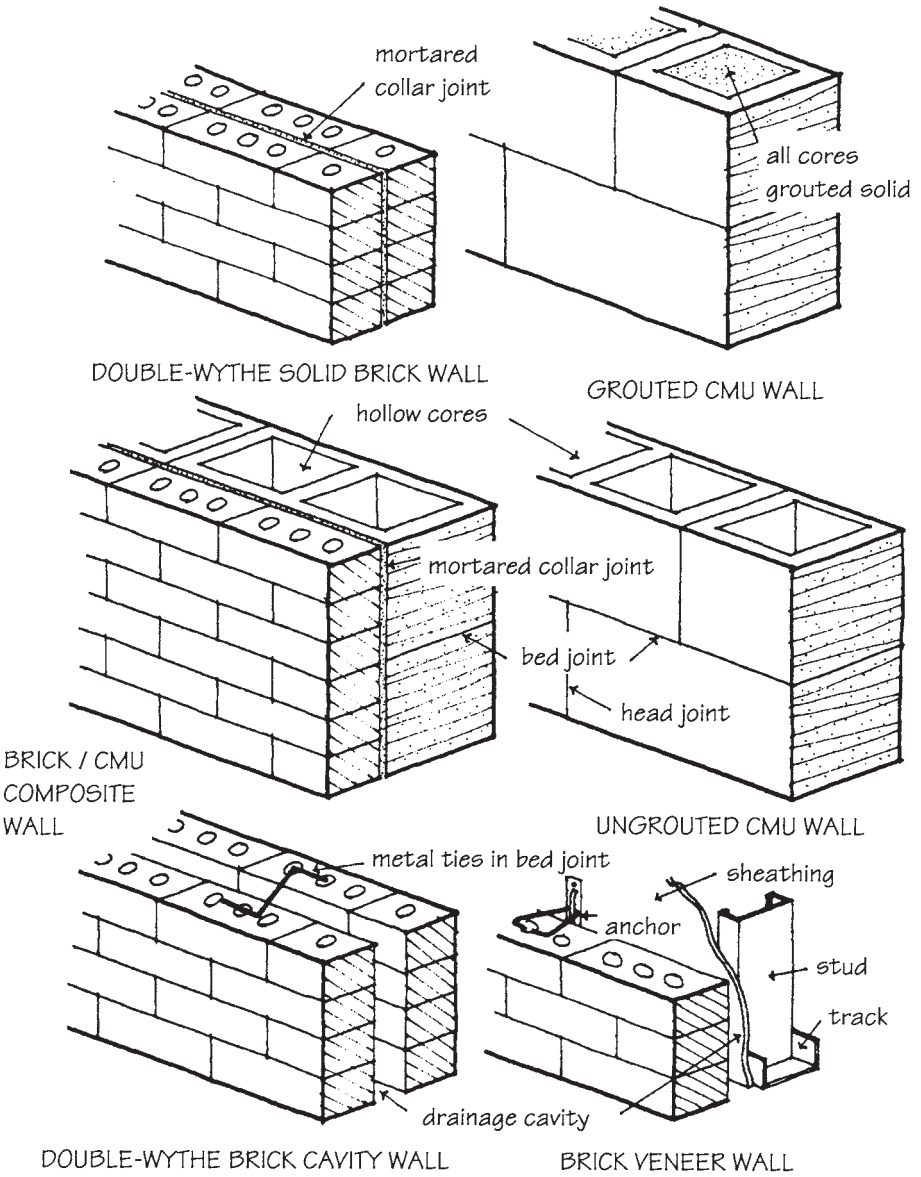

Figure 1-4 Examples of masonry wall types.

commonly expressed by both design professionals and contractors are related to weather resistance. Moisture penetration and durability, in fact, seem to be more significant day-to-day issues for most than structural performance. Building codes, which have traditionally provided minimum performance requirements only for structural and life safety issues, are now beginning to address water penetration, weather resistance, and durability issues for masonry as well as other building systems.

Contemporary masonry walls are more water permeable than traditional masonry walls because of their relative thinness, and more brittle because of the portland cement that is now used in masonry mortar. As is the case with any material or system used to form the building envelope, the movement of moisture into and through the envelope has a significant effect on the performance of masonry walls. Contemporary masonry systems are designed, not with the intent of providing a barrier to water penetration, but as drainage walls in which penetrated moisture is collected on flashing membranes and

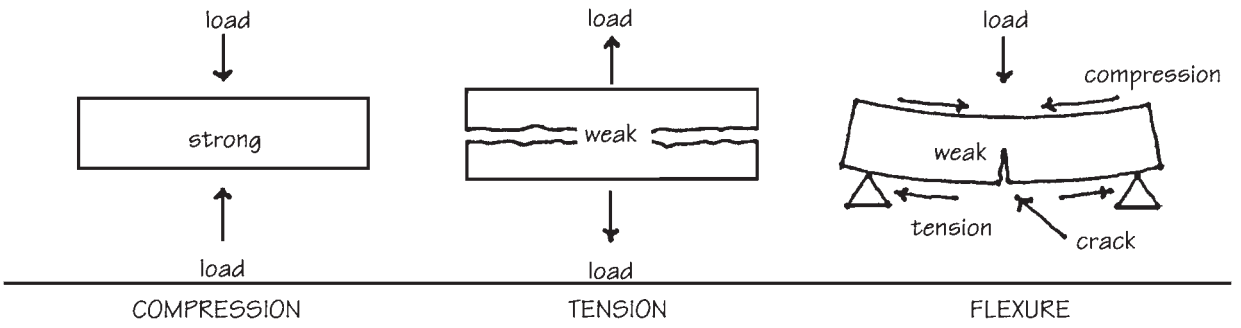

Figure 1-5 Compressive, tensile, and flexural strength of masonry.

expelled through a series of weep holes. Higher-performance wall systems for extreme weather exposures can be designed as pressure-equalized rain screens, but at a higher cost than drainage walls. Design, workmanship, and materials are all important to the performance of masonry drainage and rain screen walls:

- Mortar joints must be full
- Mortar must be compatible with and well bonded to the units
- Drainage cavity must be kept free of mortar droppings
- Appropriate flashing material must be selected for the expected service life of the building
- Flashing details must provide protection for all conditions
- Flashing must be properly installed
- Weep holes must be properly sized and spaced
- Weep holes must provide rapid drainage of penetrated moisture

With adequate provision for moisture drainage, masonry wall systems can provide long-term performance with little required maintenance. The chapters which follow discuss materials, design, and workmanship with an eye toward achieving durability and weather resistance as well as adequate structural performance in masonry systems.