8

WALL TYPES AND PROPERTIES

Masonry can be used structurally or as veneer. Masonry walls may be single- or multi-wythe, solid or hollow, grouted or ungrouted, and reinforced or unreinforced, depending on the structural requirements of the design.

Masonry is non-combustible and, in its various forms, can be used as both structural and protective elements in fire-resistive construction. Masonry is durable against wear and abrasion, and most types weather well without protective coatings. The mass and density of masonry also provide efficient thermal and acoustical resistance. Although masonry is one of the most durable of building materials, masonry construction is durable only if the component materials are of equally high quality and the detailing adequately provides for movement and weather resistance. Almost any masonry material or combination of materials can be used to satisfy functional requirements, including fire, sound, and thermal separation criteria. Specific material types, however, are generally selected on the basis of aesthetic criteria such as color, texture, and scale.

Masonry walls can be constructed with a single wythe (or single-unit thickness) or with multiple wythes. Multiple wythes may be contiguous, interlocked by overlapping units, or separated by an air space or cavity. When single wythes of masonry are attached to non-masonry backing walls, they are called *veneers* (*see Fig. 8-1*). For *single-wythe* curtain wall and loadbearing applications, vertical reinforcing can be placed in the hollow cores and horizontal steel in bond beam units. Where walls are also required to accommodate electrical conduit or plumbing piping, *multi-wythe* walls are more appropriate. The backing and facing wythe may be of the same or of dissimilar materials. A multi-wythe *composite wall* is one in which both the backing and facing wythe share applied axial loads.

Multi-wythe walls are more resistant to moisture penetration than single-wythe walls. Exterior exposures can be designed as *cavity walls* with an open separation of at least 2 in. between the facing and backing wythes.

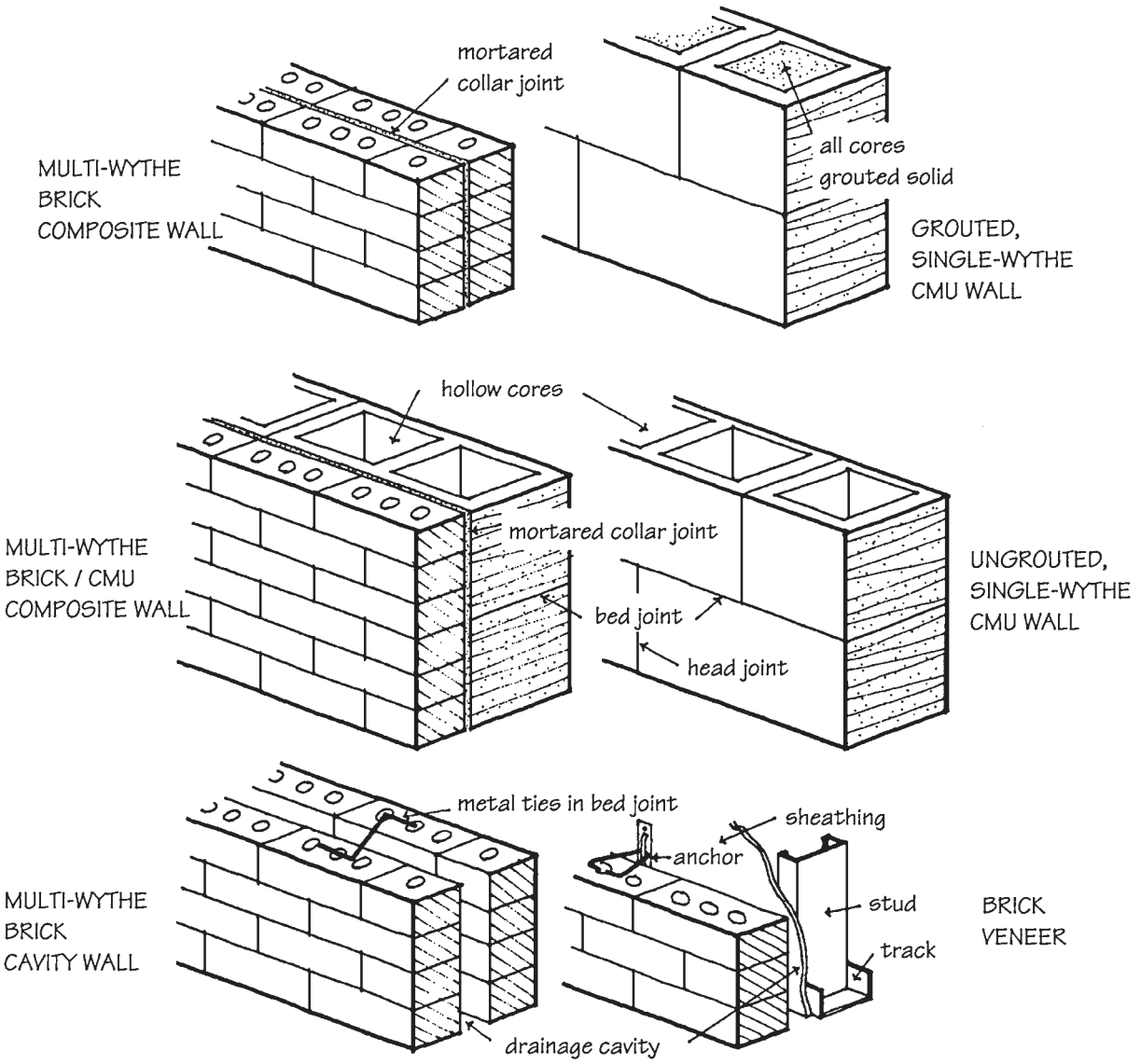

Figure 8-1 Examples of masonry wall types.

The open cavity, when it is properly fitted with flashing and weep holes, functions as a drainage system for moisture which penetrates within the wall section. Single-wythe walls are more susceptible to moisture penetration and must also be designed with a system of flashing and weep holes to divert collected moisture to the outside.

Masonry which supports the live and dead loads of floor and roof systems is said to be *loadbearing*. Masonry which supports only its own weight and resists only lateral wind, soil, or seismic loads is said to be *non-loadbearing*. Loadbearing masonry is a viable and economical structural system for many building types of either low-, medium-, or high-rise design. It is strong in compression, but requires the incorporation of reinforcing steel to resist tensile and flexural stresses. Repetitive, compartmentalized plans for hotels, multi-family