



**Figure 18-2** Estimated productivity rates based on weight of masonry units. (From *Kolkoski, Masonry Estimating.*)

**18.1.2 Value Engineering**

In estimating the total cost of a building system or product, future as well as present costs must be considered. Value engineering and life-cycle costing methods evaluate expenses throughout the life of a building. For example, the fire resistance of masonry structures means lower insurance rates and lower repair costs if interior spaces do sustain damage from fire (refer to Chapter 8). Masonry thermal characteristics reduce energy consumption for heating and air conditioning, and the durability and finish of the surfaces also minimize maintenance costs.

Maximizing the structural and functional capabilities of the masonry will also reduce initial costs. Strength design of reinforced masonry permits construction of tall, slender walls with significant reductions in lateral support requirements. Using double-wythe walls for loadbearing applications multiplies their functional role to that of structure, acoustic and fire separation, mechanical and electrical chase, exterior envelope, and interior finish.

But “value” engineering can *devalue* a building if initial costs of critical items are cut without regard to performance or maintenance issues. It makes little sense, for instance, to save a few dollars of initial cost by switching to a less expensive (i.e., less durable) flashing material. Stainless steel flashing may not be warranted on the corner convenience store that will undoubtedly be gone in a few years, but PVC flashing is just as inappropriate on a courthouse or school or other public building likely to be occupied for decades.

## 18.2 SPECIFICATION GUIDELINES

Specifications are an important part of quality assurance and quality control in masonry construction. To achieve quality workmanship and proper performance, the architect or engineer must carefully outline the products and standards of construction required. Reference standards should be used to govern the quality of specified products. ASTM standards cover all of the mortars, unit types, and varieties of stone (see Appendix B), and are widely accepted throughout the industry.

Lump-sum or unit-price allowances may be used for specifying masonry units, but the specifications should also include sufficient information (including unit size, grade, type, and texture) so that the contractor can accurately bid the labor required for installation. Most ASTM standards for masonry products cover two or more grades and types of units, so the project specifications must identify what is required. Omitting this information makes it impossible for bidders to accurately estimate cost.

The size of unit required should always be included in the specifications, preferably giving actual rather than nominal dimensions to avoid ambiguity. In some industries, “nominal” means approximate, but in modular masonry, it means the manufactured dimension plus the thickness of the mortar joint. A nominal 8-in. modular brick can be manufactured at 7½ in. for use with ½-in. joints, or 7⅝ in. for use with ⅜-in. joints. Dimensions should be listed with thickness first, followed by the face dimensions of height and then length.

Color and texture are not included in ASTM standards, so requirements must be established by the specifications. If an allowance method is used, the final selection may be made from samples submitted by the contractor or supplier. If trade names are used to identify a color range and finish, or if descriptions are not given in the project specifications, samples of acceptable materials should be available to the contractors for inspection prior to bidding.

The specification guidelines that follow may be used as a reminder list for the primary items requiring attention in the specifications. If more than one masonry system is used on a project, sections should be combined to include the mortar, units, and accessories for each system under a separate heading (e.g., Veneer Masonry System or Reinforced Unit Masonry System). This makes it clear to the contractor which anchors or ties go where, what mortar type, flashing, and so on.

### 18.2.1 Mortar and Grout

- Portland cement: ASTM C150 Type I, or Type III for cold weather, low alkali content, non-staining