For a 4"-thick common brick, with nominal dimensions of 2-2/3" × 8", the true dimensions are approximately 2.292" by 7.625".

With the mortar joint, it will be 2-2/3" by 8", giving a face area of 21.333 square inches or 0.148 SF.

The number of bricks per SF = 1/(0.148) = 6.75 bricks per SF.

If the wall thickness is 8", twice as many bricks per SF, or 13.5 bricks per SF, are required.

Productivity Factors

The productivity of installing (laying) bricks is influenced by several factors, including:

- **The type, size, color, and weight of the unit,** and the kind of mortar and ties or other accessories used. For instance, masonry units that are dark tend to be hard and brittle, which leads to lowered productivity; lightweight units make handling easier and faster.
- **The skill and experience of the mason(s).**
- **The complexity of design:** Shape and thickness of the walls, number of openings, architectural design, bond, special joint requirements, and the number of brick types involved.
- **Height and location of the work:** If the mason is working on scaffolding 15' above ground, productivity will be lower than working at ground level.
- **Quality of work:** If the design allows for a small margin of tolerance, and the owner has a strict quality assurance procedure, productivity will decrease.
- **Other factors:** Weather conditions, job site congestion, management-labor relationship, etc., will all affect productivity. (See "Productivity and Job Duration" in Chapter 1.)

Quantity Takeoff

There are several methods for the quantity takeoff of masonry walls. Costs in *CostWorks* and *Building Construction Cost Data* are given both per SF of the wall area and per M bricks (thousand bricks). The area of the wall is determined by the following equation:

Area of wall = [OSP – 4 × Thk/12] × Ht – Openings > 10 SF

Where:

OSP = The outside perimeter of the building in feet.

Thk = The thickness of the wall in inches.

Ht = The height of the wall (building) in feet.

$OSP - \frac{Thk}{12}$ = Center-to-center perimeter of the exterior wall.

Copyright RSMeans - A division of Reed Construction Data

Deducting Openings

Frequently, openings less than 10 SF are not deducted. Some contractors do not deduct even larger openings, in exchange for not including the labor and materials needed to frame those openings. The cost of an opening, to a mason, includes the lintel and its installation and framing the opening. Overall, the cost of an average door or window opening is close to the cost of the additional block and its installation if that opening did not exist. (Many contractors will only deduct large openings that extend vertically all the way to the slab above, e.g., openings that don't need framing and there is no lintel involved.) Typically, deductions are made for openings over 10 SF, and the cost of lintels and other items related to the opening is added.

When masonry walls (brick or CMU) are long, control joints may be required. Any control joints must be added to the cost of the wall.

Example 1

Estimate the bare cost and total cost including overhead and profit for erecting a wall, 8' high, 120' long in Milwaukee, WI. The wall will have 6" concrete blocks (CMU) and 4" face brick.

Solution

Area of wall = 120' × 8' = 960 SF. Use the following Means line item:

Means Item No.	Description	Unit	Bare Costs				Total Incl. O&P
			Mat.	Labor	Equip.	Total	
04 27 10.20 0400	Cavity Wall, 4" face brick, 6" CMU	SF	5.10	9.10	–	14.20	19.45

City Cost Index for Milwaukee, WI, Division 4 is 102.7%, 118.9%, and 112.7% for materials, installation, and total, respectively.

Total Bare Cost =

960 SF × [($5.10 × 102.7%) + ($9.10 × 118.9%)] = $15,415 ≈ $15,400

Total Cost Incl. O&P = 960 SF × $19.45 × 112.7% = $21,043 ≈ $21,000

Example 2

Estimate the bare cost of providing and installing common brick masonry for an 8" thick outside wall of a rectangular building with outside dimensions of 40' by 32' and 11' high to be built in New York City, NY. Make proper deductions for the following openings:

Copyright RSMeans - A division of Reed Construction Data