

**BUILDER'S ESTIMATES.\***

STONE-WORK is estimated by the perch; 24¾ cubic feet making one perch. An 18-inch wall, 1 foot high, and 16½ feet long, contains one perch.

BRICK-WORK.—Bricks are usually estimated at 25 to the cubic foot. They usually lay 5 courses to each foot in height.

For an 8-inch wall, allow 17 bricks for each square foot of surface. For a 12-inch wall, allow 25 bricks for each square foot of surface. For a 16-inch wall, allow 34 bricks for each square foot of surface.

**CHIMNEYS.**

Size of Chimney.	No. of Flues.	Size of Flues.	No. of Bricks per foot in Height
16 x 16 inches	1	8 x 8 inches	30
16 x 24 "	1	8 x 16 "	40
16 x 28 "	2	8 x 8 "	50
16 x 40 "	3	8 x 8 "	70
16 x 52 "	4	8 x 8 "	90
20 x 20 "	1	12 x 12 "	40
20 x 24 "	1	12 x 16 "	45

The above does not include waste, which must be allowed.

MORTAR FOR BRICK-WORK.—One cask of good lime to a load (about 20 bushels) of sand is sufficient for 1,000 or 1,100 bricks.

CEMENT FOR CELLAR BOTTOMS should be mixed in the proportion of 1 of cement to 3 of gravel, and should be laid 3 inches thick. One cask of cement will cover five or 6 square yards.

PLASTERERS' MORTAR.—One cask of lime to a load (20 bushels) of sand, and 2 bushels of hair, will cover about 50 square yards of surface; and ½ cask of lime will skim the same. In estimating the surface to be covered, plasterers deduct only half the area of openings, such as doors and windows, from the square yards in the walls.

**TIMBERS.**

TIMBERS FOR A LIGHT FRAME.—Sills, 4 x 6 or 6 x 6 inches. Flooring-timbers, 2 x 6 inches, put from 16 to 22 inches apart. Posts, 3 x 5 inches. Ledger-boards, 1 x 6 inches, well fitted and nailed. Studding, 2 x 3 inches, put 16 inches to centres. Plates, 3 x 4 inches. Rafters, 2 x 5 inches, put 2 feet apart. Partition studding, 2 x 3 and strapping 1 x 3 inches, put 16 inches to centres.

TIMBERS FOR A MEDIUM FRAME.—Sills, 6 x 7, 7 x 8, or 8 x 8 inches. Flooring-timbers, 2 x 8, 9, or 10 inches, put 16 or 18 inches apart, and bridged. Posts, 4 x 6 or 4 x 8 inches. Studding, 2 x 4 inches, put 16 inches to centres. Window and door studs, 3 x 4, or 4 x 4 inches. Ledger-boards, 1 x 7 or 8 inches, well fitted and nailed, or girts, 4 or 5 x 7 or 8 inches. Plates, 3 x 4 inches. Rafters, 2 x 6 inches, put 2 feet

\*From "Modern Carpentry and Building," by Allen Sylvester

apart. Main partition studs 2 x 4 inches; other partitions, 2 x 3 inches, put 12 or 16 inches to centres.

TIMBERS FOR A GOOD HEAVY FRAME FOR DWELLING-HOUSE.—Sills, 8 x 8 or 8 x 10 inches. Flooring-timbers, first story, 2 x 12 inches; second story, 2 x 10 inches; third story, 2 x 8 inches, put 16 or 18 inches apart, and well bridged. Side girts, 5 x 8 inches. End girts, 6 x 8 inches. Outside studding, 2 x 5 inches, put 12 or 16 inches to centres. Window and door studs, 3 x 5 inches. Rafters, 2 x 8 inches, put 20 or 24 inches apart. Main partitions, 2 x 5 inches; other partitions, 2 x 4 inches, put 12 or 16 inches to centres.

To square the sills of a house, make a mark on the upper outside edge of the side sill 8 feet from the corner of the house, and 6 feet from the corner of the house on the end sill; when the sills are square, a 10-foot pole will just reach across from point to point.

FRAMING AND BOARDING.—To estimate the number of square feet of boards required to board a building, and lay the under floors, double the length, and also the width of the building; add these amounts, which gives the length around the building; multiply this by the length of the outside studding, which gives the square feet in the walls of the house. If the house has a pitch roof, multiply the width of the house by the rise of the roof: the result will be the square feet in 2 gables. Then, to find the square feet in the roof: to the length of the house, add the amount of projection at both ends (generally about 18 inches at each end, which makes 3 feet to be added), which amount multiply by twice the total length of the rafters, which gives the square feet in the roof. Then for the floors, multiply the length of the building by the width, and multiply this by the number of floors, which gives the square feet in all of the floors. Add together these different amounts, and add ⅛ for waste, which will give the number of square feet required. In estimating the labor in framing and boarding, some builders reckon eight or ten dollars per thousand feet.

**WIRE AND CUT NAILS.**

SOME experiments were recently made to determine the comparative holding power of wire and cut nails. The tests were made on pieces of white pine, joined with simple lap joints fastened by the nails. These were subject to transverse stresses, in some cases parallel to the axes of the nails, in others at right angles. When the load was applied perpendicular to the nails, the wood was often split and the cut nails were often broken, while the wire nail joints were broken by bending and drawing the nails. When the load was applied in the direction in which the nails were driven, the joints were broken by nails being drawn almost without being bent. Under this same manner of loading, the wire nails were started by smaller loads than the cut nails, yet when the cut nails were started they yielded rapidly, while the wire nails held nearly as well as at first. In all the cases tried the cut nails were found superior in strength and rigidity, while in one-half the cases wire nails gave the joints greater resistance than cut nails.

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