



HOW-TO BOOKLET #3049

LAYING BRICKS



TOOL & MATERIAL CHECKLIST

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|----------------------------------------|---------------------------------------------|--------------------------------------------------|
| <input type="checkbox"/> Bricks | <input type="checkbox"/> Brick Mortar | <input type="checkbox"/> Baby Sledge Hammer |
| <input type="checkbox"/> Concrete | <input type="checkbox"/> Hammer | <input type="checkbox"/> Concrete Forming Boards |
| <input type="checkbox"/> Saw | <input type="checkbox"/> Level | <input type="checkbox"/> Batter Board Materials |
| <input type="checkbox"/> Nails | <input type="checkbox"/> Carpenter's Square | <input type="checkbox"/> Chalkline |
| <input type="checkbox"/> Jointing Tool | <input type="checkbox"/> Mason's Block | <input type="checkbox"/> Plumb Bob |
| <input type="checkbox"/> Brick Chisel | <input type="checkbox"/> Safety Glasses | |

Read This Entire How-To Booklet for Specific Tools and Materials Not Noted in The Basics Listed Above.

Bricklaying is an exacting job. It is heavy work, but, most of all, bricklaying takes lots and lots of patience because it is an exacting craft. As a do-it-yourselfer, laying bricks is within your skills. If you have never tackled a bricklaying project before, your first attempt ought to be a fairly simple job—such as a retaining wall or fence. This How-To Booklet addresses “vertical bricklaying” (walls and fences) rather than “horizontal bricklaying” (patios, walkways, driveways, etc.).

BRICKLAYING TERMINOLOGY

Every craft has its special terminology. Bricklaying is no exception. Many basics discussed in this Booklet will be easier to follow if you learn these terms:

STRETCHER. When a brick is laid so that a long, narrow side is the one that is exposed, that brick is said to be a stretcher. The long edge is horizontal.

HEADER. A header brick is laid so that a small end is exposed and the wide edge is horizontal.

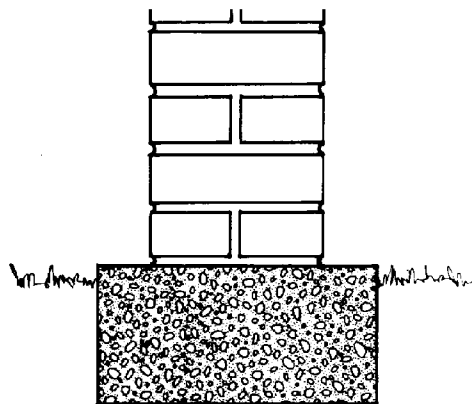
ROWLOCK STRETCHER. A stretcher laid so that the long, wide face is exposed.

ROWLOCK HEADER. A header laid so the narrow edge of the face is horizontal.

SOLDIER. A brick is called a soldier when it stands vertically with the narrow, long face exposed.

SAILOR. A sailor also stands on end. However, the long, broad face is exposed.

WYTHER. A wythe is the term for all the vertical courses together. A brick wall may be one, two, or three wythes thick for most purposes.



All masonry walls should be laid on a concrete footing or foundation—except in the most temperate climates. Foundation is wider than wall.

CLOSURE BRICK. In any course, bricks are laid from the outer edges in toward the center. The final brick, the one that fills the opening to complete the course, is called a closure brick. This brick almost always has to be cut to fit properly in its niche.

PREPARATION: THE FOOTINGS

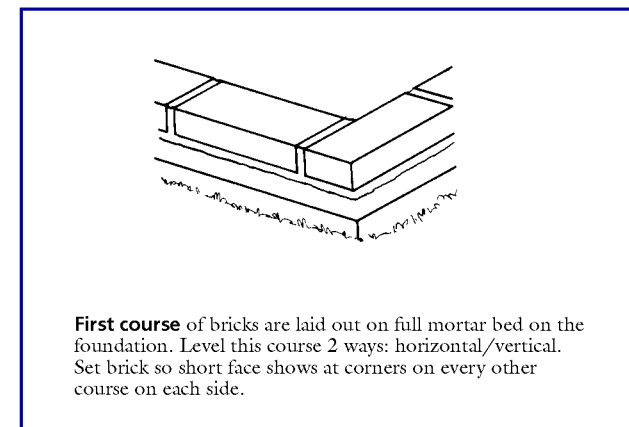
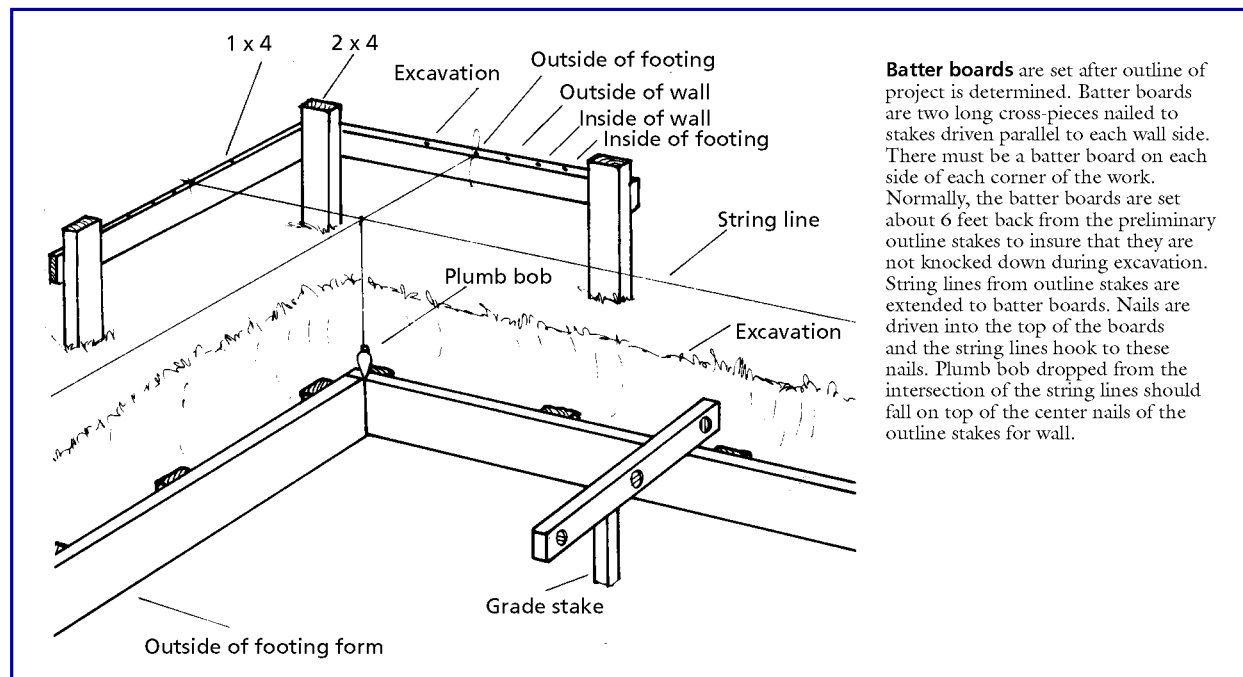
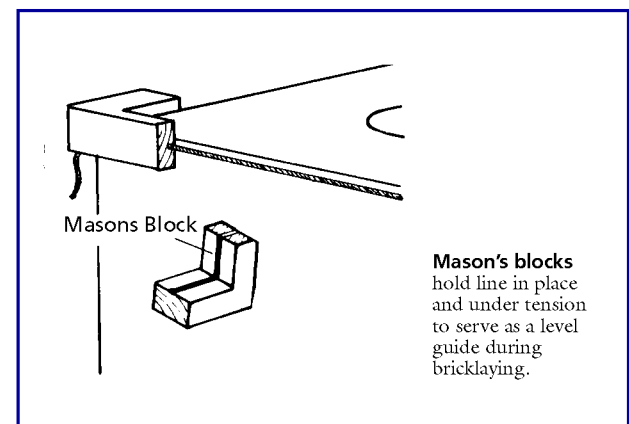
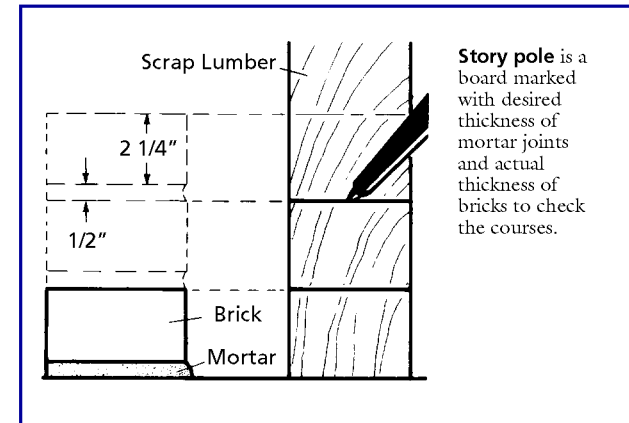
Brick structures must be supported by concrete footings. Otherwise, the heaving ground due to moisture and frost will crack the structure. Footings should extend to below the frost line. If the wall is load-bearing, the footing must be as deep as the wall is wide. The width of the footing should be twice the width of the wall. This means that a brick wall that is 12 inches thick requires a footing that is 12 inches deep and 24 inches wide. Walls that are not load-bearing don't have to be as thick or wide. A 2-wythe-thick wall would be 8 inches thick and require a footing 12 to 16 inches wide and 18 inches deep (this is an example).

A simple trench may be dug for the footing. Or, you may want to dig a trench and form the sides of it with boards for the footing. This is recommended since the top of the concrete surface must be leveled. With board forms, you can use a 2x4 strike on the edges of the forms to level the concrete between them.

Also, you can mix the concrete for the footing, or you can prepare the trench/forms and have a ready-mix truck place the concrete for you. A good foundation mix, if you do it yourself, is 1 bag of cement to 3-4 bags of aggregate (sand/gravel).

MIXING THE MORTAR

Except for walks or patios made of bricks set in sand, bricks are held in place with mortar. The mortar mix used in most instances is 1 part cement, 1/4 part hydrated lime, and 3 parts sand by volume. However, some codes may specify a different proportion, especially in cold weather climates.



You can buy ready-to-mix mortar in a “mortar mix” or a “sand mix.” This product is sold in home center and building material stores in 40 and 80 lb. bags. All you do is add water and stir.

If you are mixing mortar from scratch, assemble the material and with a shovel and hoe, blend the materials thoroughly. Then add a little water at a time until you get the mortar to the proper consistency. Mortar mix should be somewhat drier than

a concrete mix. A test is to pull the mortar up in a series of ridges with a shovel or hoe. If the mortar stays in sharp distinct ridges and does not slump, it has the right amount of water. If the ridges are crumbly, add water. If the mix slumps down, there is too much water. Add more materials to the mixture. Remember: it is always easier to add more water to a dry mix than to add dry materials to a soupy mix. Therefore, when you mix, easy does it with the water.

Allow the mortar to set for a few minutes before using it. If, as you work, the mortar starts to dry out, add a very small amount of water and thoroughly remix the mortar to bring it back. However, once it starts to set, it must be junked.

THE DRY RUN WITH BRICKS

Lay out the project without mortar so you can determine the best brick arrangement. First, use a nail to mark the concrete footing to indicate the ends of the wall or the corners of the job. You also can use batter boards to determine location (see illustration of batter boards; they are recommended).

Between the corner marks, lay as many full bricks as possible, end-to-end or in the pattern you want. Use thin wooden strips as spacers to allow for the size of mortar joints. Note the size of the closure brick. If possible, move the wall ends or corners out so that the closure brick will be a full unit and there won't be any cutting necessary.

After dry-laying the bricks to determine positioning, snap a chalkline between the two starting points. You may prefer to place a straightedge along this line and to score the footing slightly with a nail or the edge of a trowel. Water can dissolve the chalkline mark.

Prepare the bricks. Bricks absorb moisture quickly. Unless the units are wetted before they are laid, the bricks will suck the moisture out of the mortar. You need to wet the brick with water before starting to lay them. Do not soak the bricks.

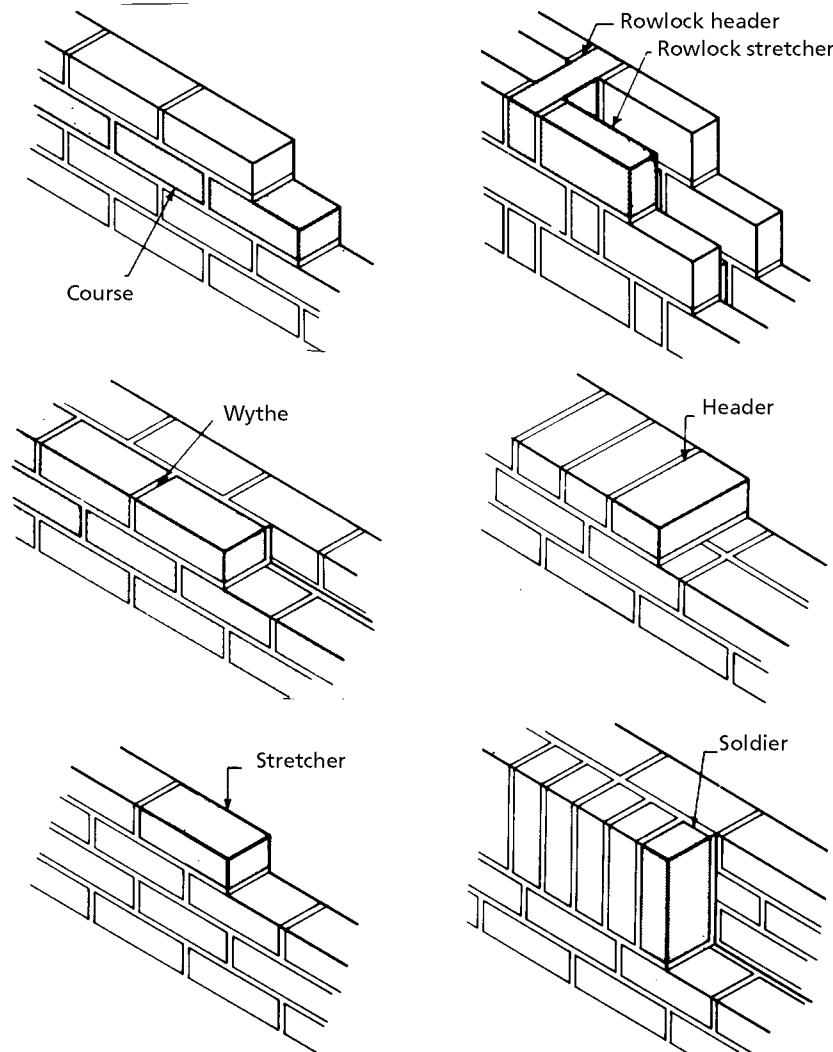
Use this simple test to determine whether the bricks are wet enough:

Select a brick face that will be mortared. In a 1-inch diameter circle on the face, place several drops of water. If the mixture disappears in less than 1 minute, sprinkle all the bricks while you mix the mortar. By the time the mortar is mixed, the bricks should be wet enough to be laid.

Basic terms in bricklaying indicate how a brick is laid in relationship to the wall. A 2-wythe wall is laid in pairs of courses and the wythes are tied together with headers. The outside faces of a 2-wythe wall are even with the ends of a brick laid lengthwise. Building or common brick is the most economical to buy. SW brick will withstand weathering; MW grade will withstand moderate weathering; NW bricks are for mild climates. Face brick is the best quality and costs accordingly. Paving brick is made to be used without mortar. Firebrick is used to line fireplaces, ovens, and furnaces. Running bond brick pattern, shown in the illustrations, is the most common. Others include stack bond, Flemish bond; English bond; diamond.

Bond patterns have varying degrees of structural soundness. If the wall you are building is load-bearing (will support weight), be sure to check the codes in your area as to what type brick, detailed above, you should use.

To fracture bricks, use a brick chisel and baby sledge hammer. Score the fracture point on all sides of the brick with the chisel. Then strike the chisel on the scored line with a firm blow with the sledge. Wear safety glasses and gloves while you work.



THROWING THE MORTAR

To “throw” the mortar, grip the trowel firmly, but do not squeeze it. Pick up some mortar from the hawk or wheelbarrow and throw it back on/in as follows:

- 1 Pick up the mortar, using a slicing motion with one side of the trowel.
- 2 Position the trowel where you want to place the mortar.
- 3 Turn the trowel sideways 90-degrees so the blade is straight up and down.
- 4 At the same time, give a slightly downward flip of the trowel.

When the mortar is thrown or flung in this manner, the mortar adheres well to the surface and settles down in any depression. The flipping motion pulls the trowel toward you so the mortar is flung down in a line rather than in a single lump. The correct motion will cover the tops of one to two bricks.

BUILDING A 1-WYTHE WALL

For accurate placement and alignment, bricks are laid in a stepped-back arrangement, first building up the ends and then working toward the middle. Mortar joints usually are offset from one course to the next.

The first course. Starting at one end, throw about a 1-inch-thick bed of mortar that is long enough to seat two or three bricks and is the width of one brick. Use the tip of the trowel to furrow the mortar out, spreading it evenly along the footing.

The thickness at the thickest parts should be about 3/4- to 1-inch. Lay a level on the top of the brick and tap the brick down until it is level in all directions. The final mortar joint between the brick and the footing should be about 1/2-inch thick. Then proceed to the opposite end of the course and repeat a second brick in the same manner.

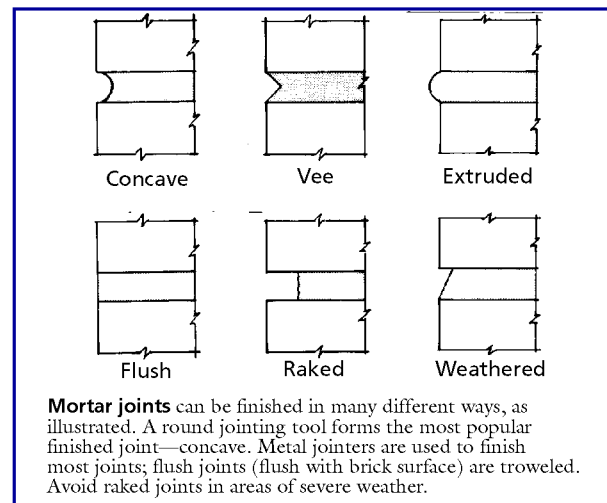
Run a mason’s line between the two bricks. Place a string level on the line and adjust the bricks until

they are level with each other. You may have to add or subtract mortar to reach level. Or, if almost level, you can make adjustments in the following brick courses.

Fill toward the middle. To add more bricks to the first course, butter the end of a brick. Hold the brick in one hand, and the trowel in the other. With a flip of the wrist, turn the trowel over, dump the mortar on the brick end and press the mortar firmly in place with the trowel.

Put the brick down on the mortar bed, about 1-1/2 to 2 inches away from the end brick. Gently push the second brick down into the mortar and against the end brick until the joints below and to the sides are about 1/2-inch thick. Align the top front edge of the brick with the string guide, but don’t let the brick touch the string. With the edge of the trowel, remove the excess mortar that has been squeezed out during placement and toss it back into the mortar box or hawk—or position it for the next brick. In this fashion, lay about 6 bricks from each end of the course toward the middle of the run.

The second course. To create staggered mortar joints in consecutive courses, the end bricks for the second course must be half bricks.



Mortar joints can be finished in many different ways, as illustrated. A round jointing tool forms the most popular finished joint—concave. Metal jointers are used to finish most joints; flush joints (flush with brick surface) are troweled. Avoid raked joints in areas of severe weather.

Lay the two end bricks, run the mason’s line between them and fill in on each side until you can add no more bricks without overhanging the bricks laid in the first course. Subsequent courses will begin alternately with full stretchers or half bricks.

Complete from three to five courses to build the leads before you begin to fill in the center sections. Use a story pole to maintain the right size mortar joints. Use a level to ensure straight and plumb sides and corners. Plumb is vertical level.

The top courses. Continue to build up the leads and to fill in until you reach the course below the final course. The top course may be the same as those below, or you can embed a flashing layer in the mortar, or finish off the top with prefabricated capping. Some lay a final coating of mortar across the top course. This thin layer should be smooth with rounded edges. It will help protect the mortar joints.

Leads with corners. Fill in the ends of one side of a multi-sided project just as you would for a free-standing lead. Then move to the adjacent side. Throw a mortar line along the footing next to the first stretcher placed. Butter the end of a brick and position the brick so that the end butts against the side of the stretcher. Put a brick at the opposite end of the course, run a mason’s line, and fill in 5 or 6 bricks on each side as above. Do the same for all the connecting sides.

The second course. Start the second course at a side of a lead that includes both a header and a stretcher. Place the stretcher so it overlaps the top and creates a flush corner edge.

At the other end of this course, place a header or stretcher as needed to ensure that the joints in the two courses are not aligned. If there is not an adjoining wall at this end, use a cut brick instead of a header. Then fill in bricks at each side to continue building the stepped-back leads.