HOMEOWNER REPAIR GUIDE

MASONRY FASTENERS

Many homeowners have questions about how to attach something to, or hang something from, a basement foundation wall. Much depends upon the type of foundation wall. The earliest homes in communities like Cleveland Heights had foundations of **fieldstone and mortar**. Prior to the turn of the 20th century, large and heavy **sandstone blocks** were used for foundation walls. There were many houses with **brick** foundations, too. Hollow **clay (tile) block** – lighter and much easier to work with than sandstone, and less expensive than brick – became the most common foundation wall during the WWI era. During the Depression, cement and ground-up coal cinders were mixed to create **cement (cinder) blocks**. From the mid-1940s to the present, these cement blocks have been the most common construction material for foundation walls, although in the past few decades, **poured concrete** foundations have also become popular in new construction.

WHERE TO DRILL

Regardless of the foundation material, securing something to a masonry wall can be a bit of a challenge. Drilling into fire-hardened brick and then driving in a screw or an expansive anchor can cause the brick to crack. Clay blocks, on the other hand, are hollow, so they will be damaged by anything that is driven into the walls of the block. It's usually easier to drill and attach something into the mortar joints between the blocks than to drill into the block itself.

CLAY BLOCK WALLS: DRILL INTO THE HORIZONTAL MORTAR JOINTS

Clay block walls are found in many basements in older homes in northeastern Ohio. In addition to the blocks themselves being hollow, the vertical mortar joints are only 3/4” thick. So, when attaching something to this type of wall, it’s best to **drill into the horizontal mortar joints**. Screws will be less likely to pull out if you choose screws long enough to pass through the item to be mounted and extend an extra 1-1/2” into the wall. Drill the hole at least 1/4” deeper than the screw length, so that any loose concrete particles will be forced into the back of the hole as you run the screw in.

LIGHTWEIGHT ITEMS

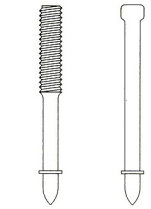
The type of fastener to use will also depend on what you are trying to secure to the wall. To fasten lightweight items to masonry, a variety of nails, screws and anchors are available.



Masonry nails

MASONRY NAILS

Fluted (ribbed) hardened **masonry nails** are driven in by hand with a hammer. They can be difficult to get started and can bend as you drive them in. It helps to pre-drill a pilot hole (slightly smaller than the nail) with a masonry drill bit.



Powder-driven studs

POWDER-DRIVEN STUDS

Another option is a powder-drive gun that shoots a **cement nail** (such as a powder-driven stud) into masonry walls. However, if you're not very experienced with the tool, you can easily overdrive the nail through the item you want to attach to the wall. Another problem is that the nails used with the gun are smooth, and can pull out.



Tapcon™ screw

CONCRETE SCREWS

The most commonly used fastener is a **concrete screw**, a hardened blue-colored fastener probably better known by the trade name **Tapcon™ screw**. To install it, drill a pilot hole into the mortar with a masonry drill bit that is smaller than the screw size. (For example, if you are using a ¼" screw, use a 3/16" masonry bit.) Then, drive the screw into the pilot hole with a screw gun or drill, using either a nut driver bit or a Phillips screwdriver bit. The threads of the concrete screw will bite into the sides of the pilot hole. You can also drive this type of screw into a lead or plastic anchor that has been hammered into a pre-drilled hole. Concrete screws are the best choice when you're installing a piece of plywood to a foundation wall (to hang electrical boxes or clamp conduit).

MEDIUM-WEIGHT ITEMS



Lag screw and shield

LAG BOLTS AND SHIELDS

For medium-weight items, **use lag bolts and shields** that expand in the wall. They grab into the hole better than regular anchors (which tend to be smooth), but require that you drill a hole (at least 1/2" diameter) that will hold the shield snugly. Make sure the bolt is long enough to go through the item being mounted to the wall and extend slightly beyond the end of the shield to expand it fully. The shield should be about 2" to 2-1/2" long.

HEAVYWEIGHT ITEMS

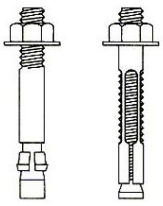


Foundation bolt

FOUNDATION BOLTS

For heavyweight applications (such as a wall-mounted weight-lift machine, or a joist for a porch floor on the exterior surface), you may need to punch a hole in the block. Insert an L-shaped **foundation bolt** (anchor bolt) in the hole and fill the block cavity with anchoring cement. Let the cement cure for a couple of days before applying any pressure on the bolt.

OTHER PROJECTS



Wedge and sleeve anchors

WEDGE AND SLEEVE ANCHORS

You may find other projects where **wedge/sleeve** fastening "systems" will be helpful (for example, securing a garage wall stud to the concrete footer, or fastening a stud wall to a concrete floor.) If you're not certain which method will work best for your project, your local hardware store may be able to advise you.

PREVENTING MOISTURE PROBLEMS

In addition to choosing the right fastener, you should also take care to prevent problems caused by basement moisture. Wall areas below “grade” (that is, below the soil line outside), are much cooler; in summer, water vapor in humid air will condense against the cool walls, leaving the surface damp. Moisture seeping through from the outside can also cause wall areas below grade to be wet. So, if steel or iron items are mounted below grade, they’ll eventually rust and crumble away. There are some ways to minimize this problem:

- Consider mounting metal items, such as electrical workboxes, onto wood blocks that you have painted on all sides and positioned above grade.
- Paint the contact area of the metal with a rust-preventing coating (i.e., **Rustoleum®**).
- Mount laundry tub faucets and the hose spigots for the washing machine onto painted wood blocks, as well, if they are below grade; while brass fixtures and copper piping don’t rust, the clamps are often just copper-plated steel, and they will eventually rust if mounted directly to the wall.
- Outlets and switches should be mounted at least 48” up from the basement floor (as required by the electrical code).

Home Repair Resource center

Home Repair Resource Center empowers homeowners to maintain their homes for sustainable and diverse communities.

WWW.HRRC-CH.ORG **+1.216.381.6100** **2520 Noble Road, Cleveland Heights, OH 44121**

© 2026, Home Repair Resource Center