

Four Retaining Wall Choices

A homeowner once approached me as I stood, hammer in hand, working on a stone retaining wall, and asked, “Is that it? You just knock the rocks into place?” I wish it were that simple. Stacking natural stone or concrete pavers or spiking together timbers may look easy, but I’ve replaced or rebuilt enough walls to know how often it is done incorrectly. The trick is to pick the material that best suits your landscape, your budget, and your ability (if you plan to tackle the project yourself).

I usually build fieldstone or timber walls because they are the most popular materials in my area, but modular-block and poured-concrete (or concrete-block) walls also are excellent options. Each type of wall requires a different set of tools and building skills. For instance, timber landscape ties are a good, inexpensive material for someone comfortable building with wood. A poured-concrete wall is likely the strongest choice, but the installation is probably best left to professionals.

Choosing the most appropriate material is the first decision you need to make when starting a retaining-wall project. Before you begin building a wall, you also need to consider the elevations of the new finished grades, the appropriate base and backfill, and the question of whether an engineer should design the wall.

When do you need an engineer?

You’ll have to check with your local building department to find out if you need a permit and

Hold back the earth with blocks, concrete, timbers, or stone. Here’s how different systems stack up.

BY ERIC NELSON

Caps, or coping blocks, are glued onto the final course.

Gravel backfill

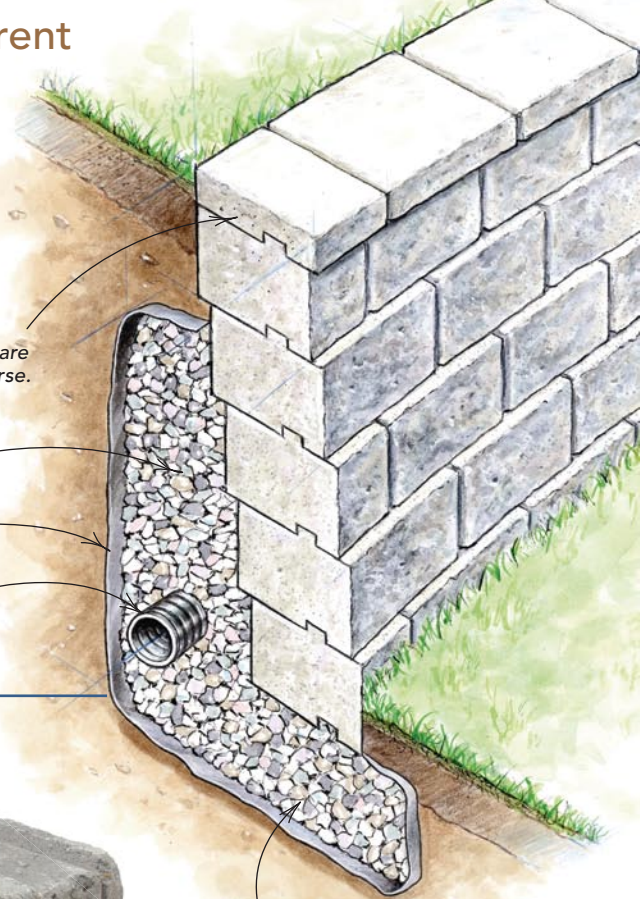
Filter fabric

Perforated drainpipe

Gravel base

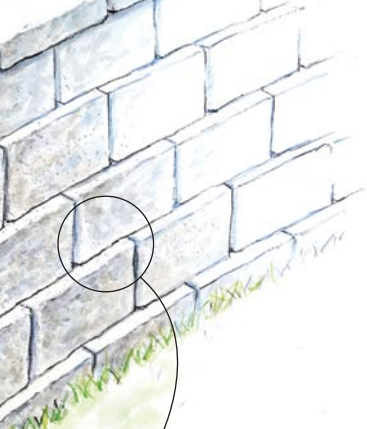
With pins or ridges, modular blocks lock together for strength

Unilock Roman Pisa
A ridge on the top of one course fits into a groove on the bottom of the next (www.unilock.com; 800-864-5625).





MODULAR BLOCK



VERSATILE IN DESIGN AND INTERLOCKING FOR STRENGTH

If you want the look of a natural-stone wall but lack the skill to build one, a modular-block wall might be the answer. These wall systems come in a variety of styles, patterns, and colors. There are tumbled blocks of uniform size that simulate the look of quarried granite; blocks of varying sizes that form patterns to look like natural stone; and split-faced blocks that look like what they are: concrete. In fact, these blocks are made from really strong concrete; most have a compressive strength of 5000 psi.

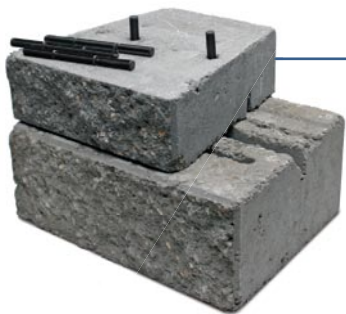
Modular-block retaining-wall systems are available from a number of manufacturers. Prices vary between manufacturers and styles. Each company—sometimes each style—has its own building system. Most sys-

tems are comprised of a few different components, including the basic wall blocks, corner blocks, and cap pieces. The good news is that none of the systems is too complicated, and the walls go up quickly.

The trick is to get the first course level. Then it is mostly a matter of stacking blocks and backfilling. Many systems even incorporate a setback into the design so that as you build up, the wall automatically pitches back into the retained earth behind. It is hard to avoid cutting blocks, but the only specialty tools you'll need are a masonry or diamond blade for your circular saw and a mason's chisel.

These interlocking systems are versatile enough for most designs. Curved walls can be built, and matching steps and walks can be incorporated. Some manufacturers will send a representative to help you figure out just what you need for your project.

Stagger the seams.



Versa-Lok Mosaic

A top-down pinning system lets you push a pin through a hole in one course and into a groove in the course below (www.versa-lok.com; 800-770-4525).

Keystone Country Manor

Pins are placed into the top of one course, and the next course is positioned on the protruding pins (www.keystone-walls.com; 800-747-8971).



Random patterns look natural. Allan Block's Ashlar Blend is a combination of three different blocks that can be mixed and matched (www.allanblock.com).

engineer's approval to build a retaining wall. The International Residential Code regulates the construction of walls more than 4 ft. tall. Likewise, most manufacturers of modular-block wall systems recommend that any wall over 4 ft. be designed, or at least approved, by a professional engineer. I agree that there is little danger in a homeowner or contractor tackling a project less than 4 ft. tall. I also agree that it is a good idea to speak with an expert before attempting to build a retaining wall over 5 ft., even if your local code doesn't require that you do. In many cases, two small walls look better than one tall wall anyway.

Consider terracing

Even the most attractive retaining wall can lose its charm if the wall is too massive for its surroundings. If there is enough area to divide the change in grade into multiple stepped walls, a series of small walls might be more visually appealing. Terraced walls also may avoid the need for permits, engineers, and complicated construction details. The area between terraced retaining walls does not have to be level and can be used for lawn or gardens.

Building two or more small walls also may be easier on your back because you don't have to lift the stone, block, or timbers too high, or set up staging. If you decide to build a terraced retaining wall, start with the lowest wall: You'll create flat areas to stand on while working on the upper walls, and you can incorporate steps, which have to be built from the bottom up.

Base and backfill

One truth about all retaining walls is that they are only as good as the base they are built on. The right depth and type of base depends on the material and the landscape. The base and back-



CONCRETE

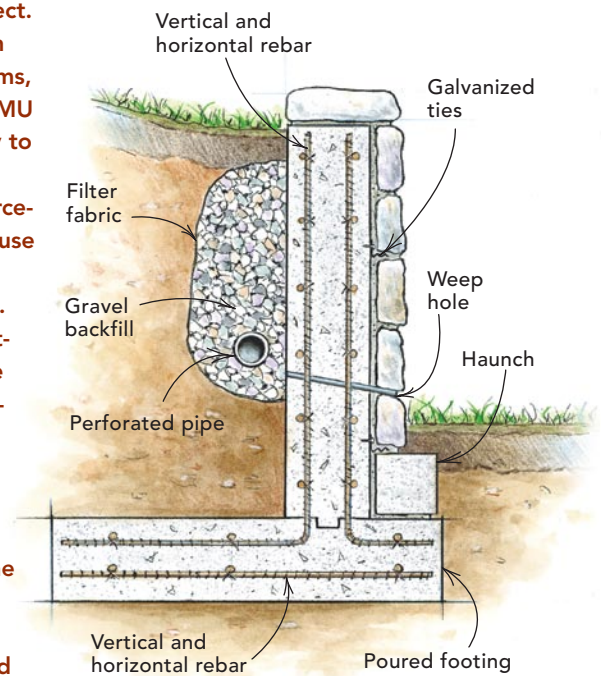
A STRONG MATERIAL WITH MANY LOOKS

Poured-concrete and concrete-block, or concrete-masonry-unit (CMU), walls are the most complicated, most expensive, and least attractive retaining walls. If they're engineered well, though, they're probably the strongest. And veneers can take the curse off how they look.

These heavy walls always should be designed by a professional who will test the soil conditions and draw plans for the project. Because they demand extensive excavation for the footing and material to build the forms, the pour is also best left to professionals. CMU walls require a footing engineered similarly to poured-concrete walls, and their strength depends on the right mortar mix and reinforcement. If you need retaining walls near a house under construction, consider having them poured at the same time as the foundation.

Laying up veneer can be tackled by a first-timer. Although the process is slow and the materials expensive, the wall's structural integrity won't be threatened by mistakes.

There are a variety of veneer materials to choose from. Natural stone is popular, but thin stone veneer is more expensive than most wall stone. Cultured, or artificial, stone is less expensive and has the advantage of uniform thickness. Of course, in the right landscape, brick veneer and stucco are good choices, too.



Concrete walls take on the look of the surface treatment





TIMBER

LESS DURABLE, BUT EASY TO BUILD

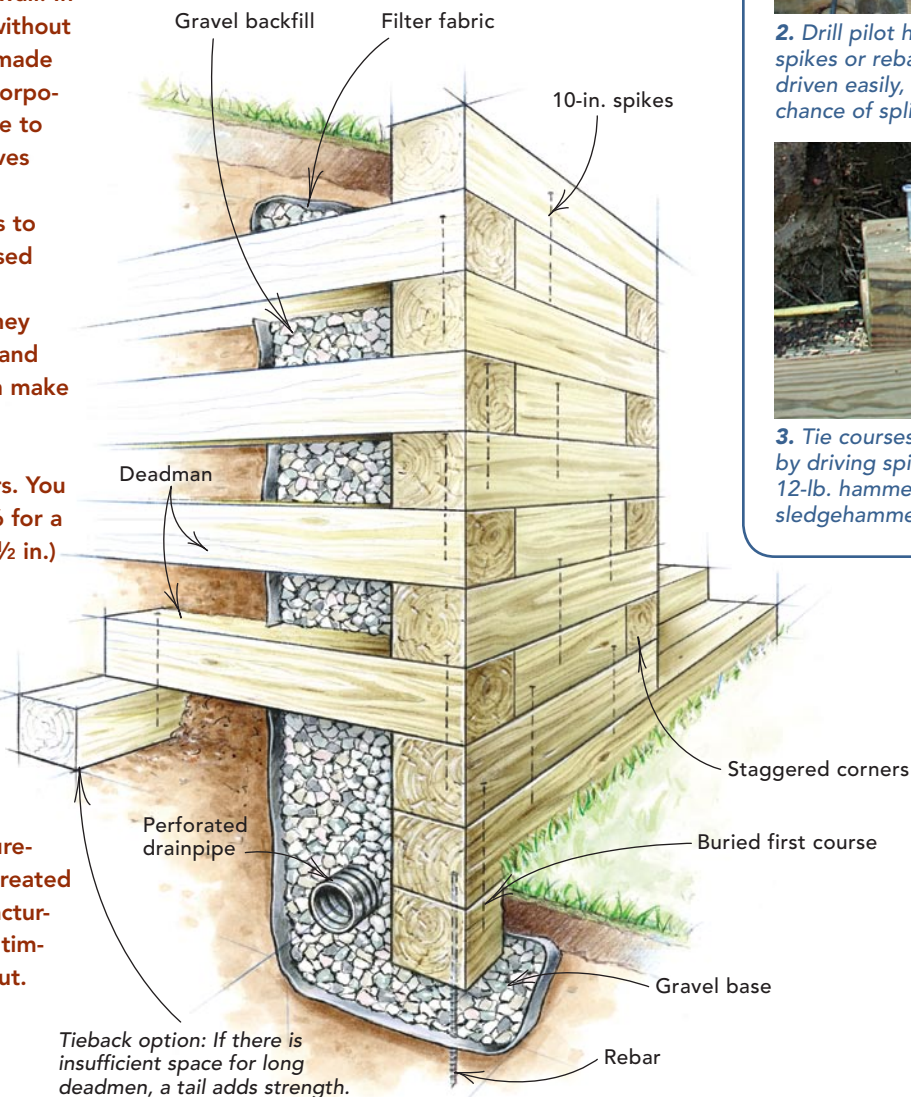
For most folks, timber retaining walls are the easiest type to build. And in most cases, they are the least expensive option (8-ft. pressure-treated 6x6s start at \$16). If you are comfortable with basic carpentry, you shouldn't have a problem building a timber retaining wall. In a dry area, a timber wall can be built without a base or tricky backfill. Steps can be made by joining two 6x6 timbers and are incorporated easily into these walls. It is simple to make 90° and 45° corners, though curves are tricky.

Timbers range from used railroad ties to planed lumber. If you can find them, used railroad ties are fairly inexpensive, but they're often treated with creosote. They also may be inconsistent in dimension and not very straight. This combination can make for tricky building.

The most commonly used material is pressure-treated 6x6 landscape timbers. You can use a rough-sawn, dimensional 6x6 for a rustic look, or a planed 6x6 (actually 5½ in.) for a more-finished look. For shorter walls, a 4x6 timber also can be used.

The length of the ties also varies. A 12-ft. or 16-ft. tie can cover a lot of ground but is difficult to handle alone. An 8-ft. tie is more manageable for one person.

The obvious drawback to timber walls is that they eventually rot. Pressure-treated timbers will last longer than untreated timbers, but be aware that the manufacturer's warranty on new pressure-treated timbers may not be honored if the tie is cut.



The basic steps of timber-wall construction



1. Cut timbers with a chainsaw, or with a circular saw and a handsaw.



2. Drill pilot holes so that spikes or rebar can be driven easily, with less chance of splitting.



3. Tie courses together by driving spikes with a 12-lb. hammer or 20-lb. sledgehammer.

fill in the drawings shown here represent best practices. In other words, this is how I would build each of these walls in wet or uncertain conditions. In dry areas, I build timber walls right on the ground. And although I always build stone and modular-block walls on at least an 18-in. gravel base, I put a drain in the base only in wet areas. Any time a perforated pipe is used in the base, the gravel must be separated from the earth with filter fabric.

Backfill is equally important. Dry-laid stone walls usually are backfilled with large stones, and the voids are filled with rubble. If the wall is separated from the earth with filter fabric, drainage behind the wall often is unnecessary. Modular-block walls should be backfilled with gravel and a perforated drain-pipe and separated from the earth with filter fabric. This method also can be used for a timber wall in a wet area, a wet-stacked stone wall, or a poured-concrete wall. Weep holes are another option for poured-concrete walls and wet stone walls.

For some projects, excavating for the base and backfill is the most laborious part of the job. If this is the case, it might be worthwhile to hire an excavator or to rent a backhoe for a day.

The last thing I do before I begin a wall is to determine the height of the top of the wall and the finished grade at the bottom of the wall. This way, I can make sure the top of the base is set a few inches below the finish grade (lawn or garden) to keep it hidden when the project is complete. Don't trust your eye when determining elevations. Use a site level to avoid mistakes.

Eric Nelson owns Garden Paths, a landscape contracting and design business in Bethlehem, Conn. Photos by Brian Pontolilo, except where noted.



STONE

DURABLE, BUT CONSTRUCTION IS TRICKY

Stone walls may be the best choice for a natural-looking landscape. Natural stone offers limitless design possibilities, including curves, and stone walls can be built to follow a sloping grade. Steps can be incorporated into stone walls, though stone treads often are too heavy to handle without a machine. The price, type, and availability of stone vary from one area to the next, but natural stone is almost always one of the more expensive retaining-wall materials.

Along with pricey material costs, stone walls bring high labor costs. It takes practice to learn to build with the irregularities of natural stone, and even for an experienced mason, building a stone wall takes longer than building the same wall with another material. Still, stone walls can be a rewarding project for patient first-timers. In most areas, you can have pallets of stone delivered. And a few inexpensive tools, such as a mason's hammer, will make the work go more smoothly.

Stone walls can be stacked dry using stone and rubble for backfill. Dry walls are built on a base of compacted gravel. It's important for hidden backfill stones to be stacked just as securely as visible "face" stones. All voids inside the wall should be filled with rubble.

Another option is to stack the face stones dry, then backfill with stone and mortar. This type of construction requires a deeper (24 in.) compacted-gravel base. Finally, you can mortar the joints between stones. These walls should be built on a poured-concrete footing with rebar placed horizontally in the footing and vertically to extend through the wall as it is built up. All "wet" walls need a drain in the backfill or weep holes to relieve pressure from water that seeps behind the wall.





Stone walls can be deceiving. From a distance, this stone retaining wall appears dry-stacked. A closer look reveals that the stones actually are mortared. Mortared backfill is a good idea for taller walls or walls that will be walked on or sat on.



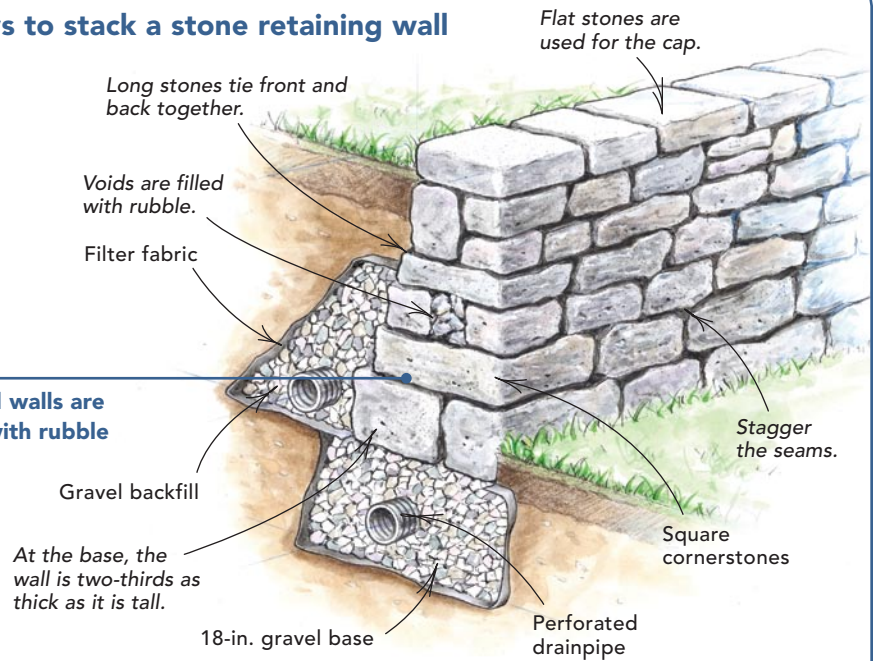
The many faces of natural stone. The availability and type of stone vary from one area to the next. Fieldstone is easy to find in the Northeast (top photo). Quarried Niagra boulders (center) and limestone (below) are common in the Midwest.



Three ways to stack a stone retaining wall

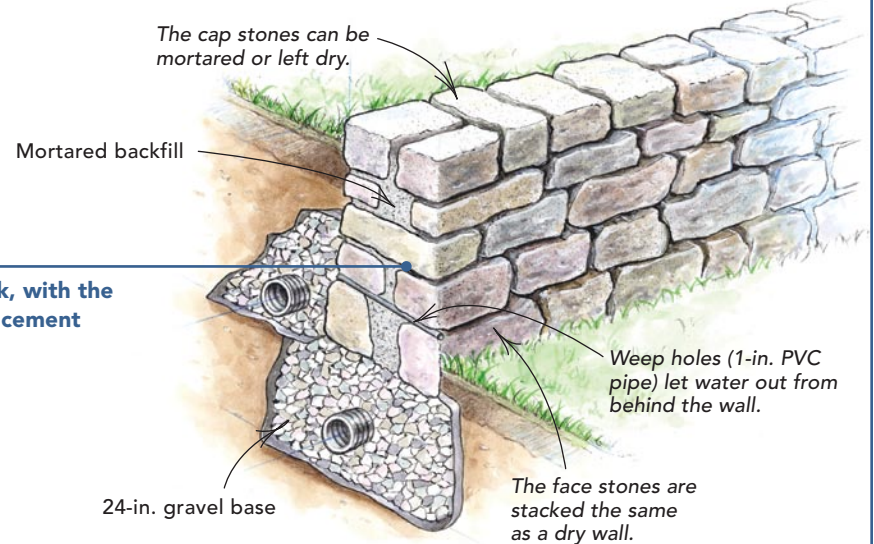
1

Dry-stacked walls are backfilled with rubble



2

The dry look, with the strength of cement



3

A poured-concrete footing prevents wet walls from cracking

