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# Zone 4



**FOR ALL**  
*Rocky Mountain*  
**GARDENERS**

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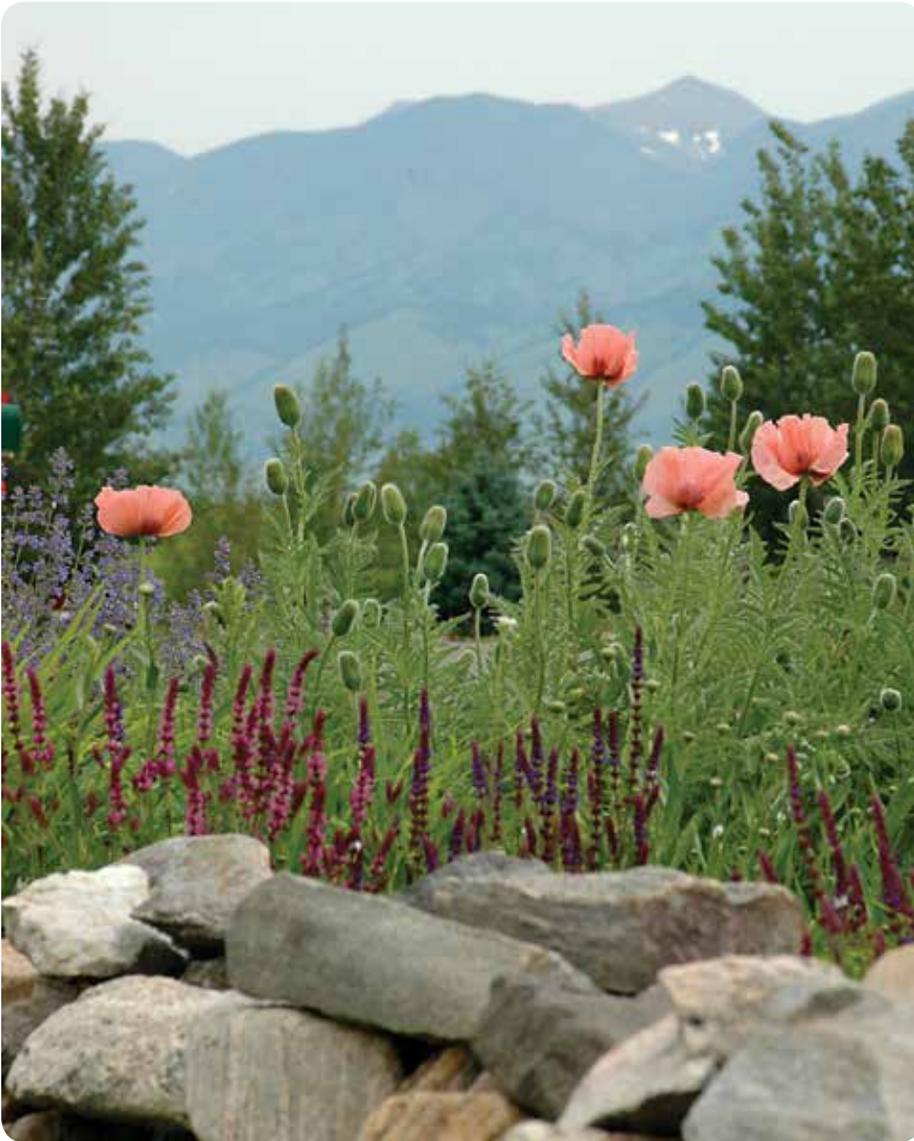


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# Build a Rocky Mountain Stone Wall

*Give your garden context with locally sourced stones*

Karin Kirk | Text and Photographs



*Locally sourced stone for building retaining walls or raised beds creates an elegantly rough, native look to any garden.*

There is something powerful about forging a garden in the Rocky Mountain region. No matter how cozy and sheltered our gardens may be, there's no escaping the fact that somewhere along the horizon a mountain range stands sentinel over the entire landscape. Our mountain environment dictates the slope of the land, the flow of water and weather, the contents of the soil, and the context of the inhabitants. Thus, a successful Rocky Mountain garden holds some sort of relationship to the mountains around it and allows the connection between the larger setting and the intimate details to be discernable.

When ascending into the mountains, a gardener sees plenty of opportunities to draw connections between the mountain landscape and the home garden. Alpine wildflowers look completely relaxed perched on exposed, rocky ledges, while trees grow into expressive, contorted forms when constrained by rocks and challenging climatic conditions. These themes may be borrowed for our home landscape and offer a way of grounding our gardens within the larger setting. The many ways that rocks and plants can express themselves make them natural partners in our landscape.

Before we go further I must make a confession. I am a geologist by profession and a gardener by passion. So the combination of rocks and plants might be irrationally appealing to me. That said, this pairing can work in many gardens in our region, and is fun and rewarding to pursue. Do-it-yourself (DIY) stonework can tie your yard to the greater landscape, provide accommodating nooks for rock garden plants and serve as a natural accent in your garden.

But aren't rocks heavy? [For moving rocks, see "The Little Stone Boat," *Zone 4*, No. 18, p. 26.] Well, yes, but they are still perfectly manageable. And aren't they difficult to stack? Well, yes and no—and this is where the real fun lies. Stacking rocks must be among the most ancient of human skills. There is an inescapably primitive feeling one gets when working with such simple means of rocks plus gravity. Lay one rock on top of another. If it stands strong, then you move on to the next one. If the connection is wobbly or awkwardly unattractive, then you remove the rock and reconsider. This cycle is repeated over days, weekends, or entire summers until you have a permanent monument to your efforts. Once you begin, the process becomes somewhat addictive.

So, how does one get started as a DIY stonemason? Here are some tips to frame your project, find materials, do the construction, and tie it all together with plant combinations.



*Where to begin?! The author searches for the next stone to fit.*

## LOCATION AND SITING

A stone wall is a big, permanent feature. You really won't want to move it once it's built, so the location is key. Many home landscapes have natural breaks in flow or topography that can serve as comfortable homes for a stone structure. In order for the wall to take on a natural appearance, it is best if it's situated as some sort of divider, break or transition, rather than protruding in the middle of a uniform expanse.

### Consider these settings for a wall:

- A dividing line between lawn and garden areas,
- A boundary between cultivated and wild parts of the property,
- A low retaining wall to manage slope changes,
- An accent within a garden, to elevate or contain a special collection of plants.

### A couple of places where a natural stonewall is not ideal:

- A retaining wall over 2 feet tall. At this height, the wall needs structural integrity, and large rocks plus prior experience are both helpful.
- Raised beds in which you intend to dig frequently. The inside edges of the wall will be uneven and it's likely that you'll dislodge those rocks with vigorous digging or tilling. If you are mindful to work carefully around the edges, stone raised beds can work just fine.

## GETTING STARTED

Once you've determined the spot for your wall, the first step is to prepare the site. At a minimum, you'll want to clear out all vegetation, including roots.

Anything organic will decompose over time and potentially change the grade of the soil, which will disrupt the rocks above it. Ideally, you can dig down to subsoil or a stable surface. For a large wall or for an area with poor drainage, it's optimal to lay down a bed of crushed gravel.

This has the advantage of providing a stable base for your wall, assuring steady drainage and giving you a soft bed in which to set the foundation rocks.

Another factor to consider is the potential for weeds or lawn grass to invade your wall. Weed cloth can be laid under a wall but it has the potential to inhibit drainage. An alternate solution is to install a mowing strip, which is a flat section of rocks that extends out into the lawn by 6 or 8 inches, allowing the wheel of the lawnmower to ride right along it, thus eliminating the need for weekly weed whacking.

## SOURCING ROCKS

Perhaps you are always cursing the rocks that emerge from the soil every spring. Or are you one of those types who brings home a couple of favorite rocks from every excursion? In either case, you might have some rocks on hand with which to build a wall. For the rest of us, we'll need to purchase or collect the rocks. This is perhaps the trickiest aspect of DIY wall building. Stony pastures or farm fields offer an easy source of material if you own the land or know someone who does. The "Materials" section of Craigslist often has free rocks to offer. Broken concrete slabs can be given a new life when dry-stacked into a wall.

*Top—Use a hinged measuring stick to estimate the size and shape of the space that will receive the next stone.*

*Bottom—Transferring the measuring stick to the rock pile, the author selects a stone for the best fit.*

Collecting rocks is allowed in the national forests with proper permitting. Our national forests offer a virtually endless supply of rocks and your local ranger district can guide you to the material most suitable for your project. There is a modest fee for the permit, but it's well worth it for the access to the rocks and the maps and information the ranger district provides. This can be a fun way to obtain your rocks, and it ensures that the rocks in your wall will mimic those in your local environment. But then again, it's tons of work (literally!) and may not be the solution for everyone.

An easier, albeit more expensive, way to go is to purchase rock from a local stone dealer. Browsing the stone yard is a sure-fire way to engage your creative, rock-stacking instincts, and gives you many ideas. Before you fall in love with an exotic-looking rock shipped in from out of state, or worse yet, across an ocean, remember that the whole idea is to create a natural-looking feature. Ask about rocks that are native to your area. With any luck, those ought to be cheaper too.





*For a stable wall, it may be necessary to fill gaps with fragments of stone.*

## BUILDING THE WALL

Dry-laid walls are those built without mortar and these are by far the easiest type to build yourself. There is no messy cement to contend with and a dry stacked wall is infinitely tweakable and repairable. Plus, there is a certain honesty to a structure that is held together by nothing other than gravity.

The stacking process offers a cycle of perusing your available rocks, examining

the spaces you need to fill, and matching rocks to those voids. In your mind, you are considering geometry and structures and mentally rotating the shapes to find possible combinations that will fit. It's an amazing spatial puzzle and one of the most addictive aspects of working with stone. There is innate satisfaction in a sequence of well-placed stones, countered by a lingering unrest from unfilled voids or arrangements that you know aren't quite ready to stand the test of time.

You'll begin by taking some of the largest rocks in your pile and setting them as foundation stones. Pay particular attention to the rocks at the ends of the wall and any corners or other focal points. Use your best rocks there. Big, solid stones at either end will give the wall visual anchors, as well as structural ones. The foundation rocks can be irregularly shaped on the bottom since they are just set into the ground and do not have to mate up with another rock.

Once the foundation layer is done, move up to the next course. As you add the next layer of rocks, a key principle is to lay each rock over the seam between the rocks in the layer below. This strengthens the wall and creates a rhythmic look to your stonework. You'll also want the visible face of the wall to be uniform and aesthetically pleasing, so try to arrange the rocks with the nicest surface facing out. That said, don't prioritize looks over stability (sounds like relationship advice, doesn't it?). Over time, the best-looking wall is the one that is well built and structurally sound.

Sometimes you'll need to fill in behind a rock or prop it up to keep it from wobbling. I use chunks of concrete or odd-shaped rocks to fill in hidden spaces within a wall. To aid in leveling and stabilizing a wobbly rock, a thin or wedge-shaped fragment can be tapped into place.

The entire wall will take on a gentle tapered shape, with the widest part at the base and narrowing toward the top. The sloping face of the wall is called batter, and this function is to give the wall natural stability. A vertical face is inherently unstable, while a sloped one will stand the test of time.

As you continue stacking rocks, be mindful not to paint yourself into a corner. If you add a rock that requires an overly complex shape for the neighboring rocks

## HOW MUCH ROCK DO I NEED?

There are two ways to fit the quantity of rocks to the scale of your project:

### 1. Figure out how many rocks you can get your hands on, then plan your project accordingly.

This is the way to go if you've inherited a bunch of fieldstones from a neighbor, or the size of your pickup or your budget place firm limits on how much stone you can acquire.



### 2. Plan your wall, measure the dimensions, then estimate the tonnage needed.

Go this route if your wall has to be a specific size, and if you are fortunate to have a large truck and/or a healthy landscaping budget.

To estimate the volume of rock needed, determine the length, width, and height of your wall. **Multiply L x W x H to determine the volume of the wall.**

$$30 \text{ feet long} \times 1.5 \text{ feet tall} \times 2 \text{ feet wide} = 90 \text{ cubic feet}$$

If your stone yard sells stone by the cubic yard, divide by 27 to get cubic yards

$$90 \text{ ft}^3 / 27 = 3.3 \text{ yd}^3$$

If your stone yard sells stone by weight, convert volume to weight. This varies a bit by the type of rock, but an average sandstone is 160 lb/ft<sup>3</sup>. Your stone yard can help you with this conversion.

$$90 \text{ ft}^3 \times 160 \text{ lb/ft}^3 = 14,400 \text{ lbs}$$

Wait, that's over 7 tons, is that math right? Yes. It takes a surprising amount of rock to build a large wall. If your wall is a retaining wall rather than freestanding, you can use less rock since the wall needn't be nearly as wide.

But here is a key factor. Take whatever quantity you come up with and add 20%. You will always need extra rocks on hand to allow you to select just the right rock for the job, and to accommodate a thicker wall at the base. So don't try to skimp because in the end you'll need to get more rocks to finish the job. At \$100 or more per delivery charge, this can be a painful mistake (and one that I have made more than once!).

*This rock wall delineates the boundary between the lawn and garden.*

to fit, it will be difficult to work out a satisfactory solution. On the other side of that coin, don't fall to the temptation of using up all your best rocks first, lest you be left with nothing but woefully irregular shapes by wall's end.

### THE CAPSTONE LAYER

Aside from the foundation stones, reserve your largest and most appealing rocks for the top layer of the wall. The capstones serve to knit the wall together by covering several of the smaller rocks below. These rocks are the only ones that will be visible from the top, which invites the use of rocks with interesting minerals, fossils, textures or lichens. A capstone layer made from large, well-fitted rocks will lend a sense of strength and pleasing aesthetics to your project.

### THE LAST STEP: INTEGRATING WITH THE LANDSCAPE

Once the wall is complete, you can



engage in the hugely satisfying process of marrying plants to your stonework. Take your cues from nature about what plants look content growing next to rocks, or what combinations you've admired in your own mountains. If your rock wall is raised, it will have excellent drainage for alpine plants and drought-tolerant sedums and succulents. Creeping plants like pussytoes (*Antennaria* sp.), *Dianthus*, and thyme will happily migrate along the seams between

rocks. Self-seeders like *Cerastium* and California poppies (*Eschscholzia californica*) will emerge from between layers of stone, lending a timeless feel to your garden. Dwarf evergreens look completely at home amongst stonework, and also mimic the rugged alpine environment. In fact, you might find that placing plants next to stones makes just about any plant look better. Which of course, will only lead you to start making plans for your *next* wall! 📌



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