

Facing a Block Wall With Stone

A good rock supply, tight joints and hidden mortar are the secret to the solid, structural look

by Tim Snyder



Building with fieldstone and building with concrete block represent two extremes in masonry construction. Concrete blocks aren't especially interesting to look at, but they go up fast, and it's easy to build a sturdy wall with them. Stone construction demands patience, skill, and above all, lots of rocks. Even with these ingredients, the different shapes and sizes of the material make it tough to keep a wall of stone plumb and strong. Given these considerations, it's easy to appreciate a construction technique that combines the beauty of stone with the strength and practicality of concrete block.

Larry Neufeld laid up his first stone face to cover a block chimney in a house that he and his brother were building. He had never worked with stone before, but as a general contractor he knew enough about masonry to take on the project. By the time work began on the solar addition shown here, he had developed a technique and style that take the best from both building materials. The finished wall—20 tons of mass facing the windows and skylights on the south side of the addition—shows little mortar at all, and unless you examine the joints carefully, they seem to be dry-fit.

A flexible system—Neufeld's method uses found stone, and thanks to the New England countryside, he can usually gather what he needs from the fields and stone walls on the owner's property. Working against a 6-in. thick block wall, he lays up a face 8 in. thick, using odd-sized stones from 2 in. to 7½ in. thick. The void behind the stone is filled with mortar, which sets up around the masonry ties set in the block's joints.

Neufeld's system can work just as well with a poured wall or a bearing wood-frame wall, as long as the footing is beefed up to hold the extra load, and there is a mechanical connection between wall and face.

It's good to begin the job with plenty of

Hiding the block. With a depth of 8 in., the stone face that covers this block wall doesn't require rocks of uniform thickness. Careful fitting is still important, though. At left, Neufeld works against temporary grounds that frame an opening in the wall. These boards were later replaced by the oak casing shown on the facing page. The finished wall faces a bank of windows in a solar addition, and looks like a solid stone wall.



stones. As you look for rocks, pick out natural corners, base-course stones with especially flat, broad faces and pieces with unusual colors or mineral formations. Toss these in separate piles before you start building, and each time you sort through your rock, take stock of the sizes and shapes you've got. Cataloging like this can make the job go a lot more quickly. But even with a good collection of stone, you can expect to be missing a few key pieces. In the middle of a job, Neufeld often finds himself driving more slowly past stone walls after work, seeking out an elusive corner or curved face.

Before laying up the face, be sure that any wall or ceiling surfaces that will be adjacent to the stones are finished. This means drywalling, paneling, plastering and painting earlier than you normally would, but it's far easier to do this work before the face goes up.

Laying up the wall—For bonding stone to block, Neufeld uses a mix of three parts sand to one part portland cement. Working his mix in a wheelbarrow, he adds just enough water to make a very stiff mortar. Then at the front of the barrow he adds a bit more water and trowels up a small section of wet mix. The stiff mix is used between the stones so that no mortar will flow out of the joints onto the exposed rock face. The wet mix fills voids closer

to the wall, and bonds the back sides of the stones solidly to the block.

Neufeld uses a tape to check the thickness of the face as he lays it up. A level isn't much help because of the irregularities in the stone, so he uses it only for rough checking. Working against a plumb block wall is pretty good insurance that the stone face will be plumb, but with many rough facets to account for, Neufeld does plenty of adjusting by eye. Fortunately on this job, a temporary post had to be nailed up to support the second-floor overhang where the circular stair would go. By plumbing the post both ways, Neufeld was able to use it to align the face of the wall as he laid it up. He also measured against the post to check the arc of the curved wall section.

The secret to achieving the dry-stack look is to test-fit all stones carefully before laying them in place, and then to keep the mortar away from the face edge of the joint. Test-fitting the stones is the first step in building the face, and it's like working on a big jigsaw puzzle. Working horizontally across the wall, you have to find stones that fit well together. A good fit means not only that the joints are tight, but also that they are staggered vertically, just as they would be in a solid, structural wall (see Neufeld's finished wall, above).

In many instances, you have to do some coaxing to get a joint right. And it's always a

good idea to flatten the top edges of your stones slightly before casting them in the wall. This ensures a stable surface for the next course of stones to rest on.

Neufeld uses a mason's hammer to knock off leading edges, and a cold chisel to fracture thick stones. Sometimes you can split a sedimentary rock along its bedding lines, but more often than not you'll end up with random fragments. This is one reason why Neufeld prefers to trim off as little as possible, using smaller pieces to fill gaps rather than trying for an ideal fit between two stones. He doesn't like to chip into the exposed face of a stone if it can be avoided, explaining that a split face has a harsh look that will never be lost inside a house.

Your test-fit stones should be able to rest on the previous course without falling off. They don't have to be exactly plumb at this stage, but you're looking for a gravity fit. Once you're satisfied that a group of stones fits well into the wall section, memorize their relative positions and remove them from the wall. Then prepare a bed of mortar by packing some stiff mix on top of the previous course. Work out from the block wall and leave the inch of joint area closest to the outside face bare of mortar. Lay down just enough mortar so that each stone will seat securely in its preassigned position. After pressing the



Hiding the mortar. The key to the dry-fit appearance is to keep mortar away from the face edge of each joint. Neufeld packs the mortar close to the block, left, then presses the stone in place and seats it in its mortar bed with several hammer blows, as shown above.

Balance and alignment. At right, stone chips inserted along joint lines to serve as temporary wedges prevent tall, thin stones from leaning out of plumb. They're removed after the mortar has set. The facing is thick enough to conceal a heating duct in the wall. Below, corner and curve construction depends on a good selection of shapes and sizes. A mixture of small and large stones also makes it easier to stagger the joint lines.



stones into their mortar bed, Neufeld sometimes uses a hammer to help seat them.

As you seat the stones, check to make sure they're plumb. Broad, narrow stones that don't extend the full depth of the face tend to lean out farther than they should. To make minute adjustments in orienting these stones, Neufeld inserts small rock fragments that serve as temporary wedges. They hold the stones in alignment until another course is laid up and the mortar sets; then Neufeld removes them.

It's best not to pack mortar behind a course until the mortar between the stones has set. Then trowel in the wetter mix to fill the space behind the stone, and you're ready to test-fit another course. This way the wetter mix can't ooze out of the joints and dribble down the face of the stone.

At the end of the day when you're using up

the last of your mortar, don't fill all the way up behind the last course of stones. It's better to leave a slight depression because this forms a keyway for the mix you trowel in the next day. Another important practice at the end of the day is cleaning the stone you've laid up. Go over the joints with a pointing chisel or a sharp piece of wood, and rake them back so that there's little or no mortar showing. Then use a broom to sweep down the face of the wall so that any drops of mortar are removed before they adhere.

Curves, corners and openings—To build the curved section of the face, Neufeld traced the clearance arc for the circular stair onto the concrete floor. Then he fit and laid up the stones as if he were working on a straight section. The only differences were that he had to use smaller stones to get smoothly around the arc, and that he could no longer sight off the temporary post to check for plumb. He used a level instead.

Successful corners are mostly a matter of having a good variety of cornerstones to choose from. Your first inclination may be to overlook small, right-angled rocks in favor of large, squarish stones. But what you actually want is a mixture of large and small; this creates overlapping joints and integrates the corner with the rest of the wall, as shown in the photo, bottom left.

You don't need an exact 90° angle to make a cornerstone. The secret is to aim for a right-angle average over several courses. Stones that come within 10° of 90° should work in a corner, as long as you get a good combination of large and small, acute and obtuse.

At door or window openings, both the stone face and the block wall are exposed. On this job, Neufeld hid this joint with trim. Before constructing the face, he erected temporary grounds from 2x stock along the trim lines. Once the face had been built into these plumb and square housings, they were removed and replaced by finish trim.

Fine points—Neufeld admits that it takes time to develop technique and style, a consistent choice of stones that will look nice in the finished wall. He likes to play one shape off against another, but stresses that the joint lines should give an impression of horizontality. Using a mixture of small and large stones is important to the overall composition, and also makes it easier to stagger the joints. But with this method of laying up stone, you've got the flexibility to try out your own ideas. Neufeld says that on his next job, he'd like to do a rock pattern in relief.

Building this 32-ft. wall took Neufeld about 400 hours. Since he was the general contractor for the entire solar addition, working on the wall kept him at the site through the arrival and departure of most of the subcontractors. Because the structural part of the wall—the concrete block—was finished at an early stage, there was no need to rush in laying up the stone. Having the time to find and fit the rock is an important advantage. □