

Patching massive concrete

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Marian from Baltimore Ontario has a big hole in her foundation wall where a steel 'I' beam was removed, as you can see in the photo she sent us. Her contractor filled it in with mortar and bricks. She would rather fill it with concrete. So we set up a block of concrete with a similar hole, and covered one side with Plexiglas so that the camera could see what happens when we fill a hole with concrete. In real life you will brace pieces of plywood on either side. You could even oil the plywood so that it comes off easily after the concrete has set. No Dust For a really good patch, you will want to brush off any dust and then prime the sides of the hole with a concrete primer that will help the wet concrete stick to the dry concrete. Proper water content The biggest error in working with regular concrete is that people will use too much water, which subjects the concrete to shrinkage and cracking. You should be able to fill a small bucket with concrete, turn it over and take the bucket off and the concrete will almost keep its form. There are actually formal test procedures like this which test a concrete mix for its 'slump', a measure of its water content. For a patch, we want very little slump. It is wet enough to keep everything stuck together but dry enough to keep its form. Vibration In the second photo above you can see how this thick concrete does not fill in the hole smoothly or even completely as it is shovelled into the form. If you just left it like that, you would have weak spots, even water channels right through the wall called honey combs. When the concrete wall was originally poured, the contractor went through a vibration procedure to shake the concrete up and cause it to fill in the holes. For a little patch like this, fill it 3 or 4 inches and then simply take a 1x3 and push it down into the concrete and push and stir it around. As you can see in the third photo, this causes the voids to fill in, the air to escape and the concrete to stick firmly to all the sides. Don't over-vibrate or you will separate the fine sands from the rocks and that weakens the concrete as well. Work it just enough that it tends to mechanically flow and look smoothed out. Finish off smooth Then fill in another 4 inches and work your way to the top. A thick well worked mixture makes for waterproof concrete without shrinkage cracks.

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