# **Building Concrete Stairs**

Unless planning on constructing a one-story building which happens to be on the same level as the ground, staircases are vital in enabling the building occupants to move from one flooring level to the other. Concrete staircases are especially popular as it lasts longer relative to wooden staircases and is cheaper than installing staircases constructed from metallic materials.  When designed correctly, a concrete staircase is not only functional but can also add aesthetic value to the overall design of the building.

## Step One: Getting the Formwork Right

To prevent ending up with a concrete staircase consisting of uneven steps, need to first calculate the dimensions for each step based on the difference in floor height, the length of your stairway and the number of risers we would like to have.

After measured the differences between both floors, need to then divide the value of the height found by the number of risers you would like to have on staircase. Generally, outdoor staircases have the standard 12” tread and 7.5” riser heights for ergonomic and economic reasons.

Next, need to decide on the width of our stairs. The common rule of thumb is to budget for a girth of at least 6” wider than the girth of the door, although it is generally agreed upon that the wider staircase is, the more comfortable it is to walk upon. If plan on creating a landing as well, do note that the final landing construction must jut out from the house by at least 36”, with a minimum width equivalent to the door width.

## Step Two: Ground Prepping

Now that have a rough idea on what staircase will look like, then prep the foundation of the staircase to prevent uneven steps. The general idea of ground prepping is to simply ensure that the ground we will build our staircase upon is very compact to prevent any sinking in during cement pouring. Just like how it would be a bad idea to build an entire house on an uneven, loose surface, it is just as dangerous to build a heavy concrete staircase on poor foundation. The best way to go around compacting our soil is to simply rent a mechanical compactor which will then be activated over the soil.  Once that’s done, then pile on an extra layer of dirt or hay bale as well to save on concrete materials and weight.

## Step Three: Building the Form Panels

then get started on building wood form panels, which are basically two panels made out of wood that help maintain the shape of the steps while the concrete is being poured in. Although there are those whoe believe in stacking up lumber for this process, we recommend utilizing ½” and 2×4’s Oriented Strand Board for the form panelling instead.

Before you cut the wood panelling out, be sure to make the panels longer and higher than the actual staircase dimensions. Next, affix a perimeter board across the face of the panel using two nails on each side of the board.

## Step Four: Assembling the Form Panels

It is very important that the finalized form panel is very sturdy, as it is essentially holding up the shape of the cement staircase as it sets into shape. The first thing you would need to do is ensure that the base of the panelling is fully flat on the ground to prevent ending up with a lopsided staircase. The next thing you need to do is check for any gaps between the foundation or porch. If there are visible gaps, all we need to do is fill up the holes with wood pieces.

By the end of Step Four, you should have a well angled wooden panelling which is perpendicular to the rest of the flat flooring.

## Step Five: Reinforcing Steps

Most amateurs often over look the importance of reinforcing their concrete staircase with steel, as staircases are often viewed as simple, lightweight projects relative to the rest of the house. Having said that, we highly recommend that we take the time to drill in bars of steel into your concrete foundation to better support and extend the lifespan of our stairs.

To do this, first start off by drilling ½” holes into the concrete foundation, followed by the hammering of ½” rebars. Each hole should be about 4” inches deep and 8” apart along the wall the staircase will be up against. Each hole should also have a minimum of 4” depth from the edges of the stairs and landing.

## Step Six: Installing Steps

then install the stair risers based on our formwork design (see Step One). Each riser should be cut out and nailed into the form panels with nails. We recommend that each riser board is made from a 2×8 board which is approximately 7 ¼” in height. If we would like to achieve an exact height, we may want to get a 2×10 board instead, then have to manually cut it to the optimal height.

## Step Seven: Bracing

Like teeth braces, bracing our panelling basically means enforcing the structure to ensure that the concrete will not flow out and lose its shape before it has time to fully set. The general rule to bracing concrete is that we can never have too much of it, as concrete is essentially very heavy and difficult to reset once it’s lost its shape.

To create a brace, all you need to do is apply as many 2×4 boards as you can in an angle along the sides of the wooden panels. To hold these boards into place, install a steel stake directly onto the ground while also nailing the other end of the board directly into the form panel.

## Step Eight: Pouring the Concrete

Seven steps later, we can finally witness the satisfying spectacle of cement being poured into your form panels. Just like how we would grease our baking pan before pouring in the dough mix, we should also grease the inner surface area of our panel with form oil or diesel fuel to make it easier to release the panels once the cement has set.

You would also want to check the state of your cement mix before pouring it into your panel. Ideally, your cement mix should be highly viscous as a runny mix will cause the steps to slump downwards. You would also want to keep about two bucketfuls of cement mix aside for later touch ups as well.

## Step Nine: Adding the Finishing Touches

The best method of getting the perfect, tight finish for each step is to repeat the troweling process several times for each step. The first thing we would need to do is screed to surface of the steps with a magnesium trowel. Next, an edger will be used to clean the edges. After half an hour has passed, we can then apply the edger once more to scrape off excess cream onto the edge. This should then be followed by a second round of the magnesium trowel which is used to smoothen the surface of the step and remove any bumps.

## Step Ten: Curing Staircase

Once the concrete has reasonably hardened, began by removing the stair riser boards only. we can then apply the cement saved up (in Step Eight) unto the pock marks created along the surface of the steps, followed by an application of the magnesium trowel and edger to remove additional imperfections. Finally, dip a concrete broom into water and lightly pull said broom across the concrete the achieve desired finish.

Once a further 24 hours has passed, then remove the form board panels and then lightly spray the surface of the concrete steps with water. want to get as much water as we can onto the surface of the cement steps for better curing, so do try to floor the staircase until there are visible puddles. Next, cover the entire stairs with plastic to prevent evaporation and allow the curing process to run for at least a whole week.