



Concrete Placement

Below-grade pours (such as foundations) can be done out of the chute of the concrete truck or conveyer, however using a pump is best.

Above-grade pours require lifting equipment. Most popular is the boom pump because of its easy maneuverability. Order a boom pump with a line reduction to a 3-inch hose and with **two ninety-degree angles** near the end (forming an “S”) or a loop attachment. Both of these slow down the flow of the concrete.



A line pump is smaller, and often less expensive. Order one with a 3-inch line or less. You will need 1-2 workers on the ground during the pour to help move the line.



Conveyor



Concrete Truck



Boom Pump



Amount

After the wall is built and ready to pour, re-estimate the amount of concrete. **Do not rely on the original estimate.** The layout may have changed.

A quick way to re-estimate the number of cubic yards of concrete needed is to count up the number of blocks in the walls, and divide:

For 4-inch walls	Divide by 15	(one yard fills 15 blocks)
For 6-inch walls	Divide by 10	(one yard fills 10 blocks)
For 8-inch walls	Divide by 7.5	(one yard fills 7.5 blocks)
For 10-inch walls	Divide by 6	(one yard fills 6 blocks)
For 12-inch walls	Divide by 5	(one yard fills 5 blocks)

Add (1) yard for screed off walls

Add (1) yard for the pump truck

Mix:

We recommend the following specifications for the concrete:

Compressive strength	3,000 psi at 28 days
Aggregate size	3/8" for the 4-inch block; 1/2" for the 6; 3/4" for the 8
Water/cement ratio	Less than 0.6
Slump	5.5 – 6.5

Consult the concrete supplier for the availability of an ICF mix design.

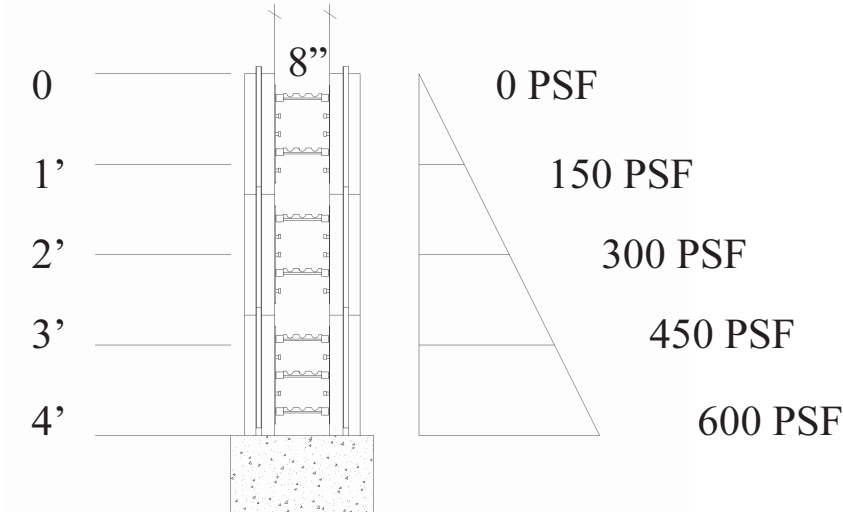
If the engineer or architect on the job specifies another mix design, follow their specifications.

DO NOT ADD EXTRA WATER TO THE CONCRETE, EITHER AT THE PLANT OR AT THE JOB SITE. THIS PRODUCES WEAK CONCRETE AND INCREASES THE PRESSURE ON THE FORMS.

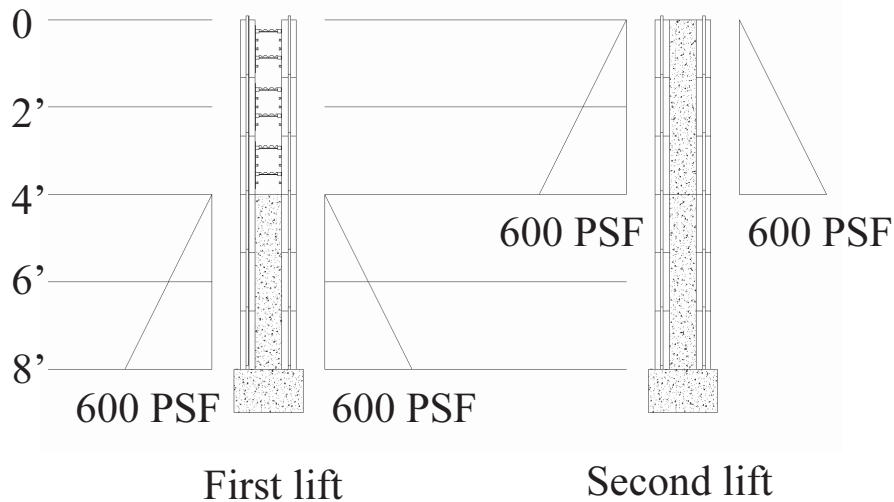


During the pour, concrete puts outward pressure on the forms. ECO-Block is designed to withstand it. However, the installer needs to avoid steps that would dangerously increase these pressures.

The outward pressure is highest at the bottom of a lift. That is the reason for extra connectors and bracing near the bottom.



As the concrete hardens, the pressure gradually reduces to near zero. By the time the crew begins the second lift, the concrete of the first lift has usually cured enough that there is little likelihood of difficulties in the bottom of the wall. As the second lift is poured, the highest pressure occurs at the bottom of the second lift.





Things that increase the outward pressure on the forms are:

- The force of the falling concrete
- Vibration
- Water added to the concrete

As concrete falls into the forms it exerts an outward pressure approximately 1.5 times greater than the pressure it exerts when it is resting in the forms. Many recommendations are geared towards minimizing this extra pressure, including using an S-bend on a boom pump, a 3-inch line on any pump, and breaking the fall of the concrete from the chute with a shovel. Not doing these things will increase the pressure on the forms and the risk of form failure. The maximum pressure develops at the bottom of the lift.

Vibrating the forms will also increase the pressure approximately 1.5 times. Using a smaller diameter vibrator can significantly reduce this pressure. The recommended diameter is $\frac{3}{4}$ ". Under no circumstances should a vibrator greater than 1" in diameter be used on the walls. When the walls are being vibrated maximum pressure will again occur at the bottom of the forms, so be sure to watch carefully. Other forms of vibration (tapping the wall along the webs, applying a hand sander or reciprocating saw externally along the webs) have a similar but lesser effect.

Adding extra water to the concrete can increase pressures more than 1.5 times depending on the amount added. It also weakens the final concrete, and may weaken it below what is required. Therefore **ADDING EXTRA WATER TO THE CONCRETE IS NOT RECOMMENDED.**

Note: Because the cavity on a 4" wall tends to fill much faster than a 6" or thicker wall, the concrete pressures tend to occur quicker. **PLACE CONCRETE VERY SLOWLY WHEN FILLING A 4" WALL!**



Plan to get experienced help the first couple of times you place the concrete.

Select a starting point near the center of a wall. Begin placing concrete in the wall, swinging the concrete hose in a back and forth motion, while moving around the wall perimeter.

Each pass around the wall perimeter is considered a “lift”. Concrete should be placed in 3’-4’ lifts until the wall cavity is filled.

The swinging motion of the hose allows the concrete pressure to be evenly dispersed over several feet.

When pouring a corner swing the hose to either side of the corner allowing the concrete pressure to be dispersed away from the corner, NOT directly in the corner.

Follow the same procedure on the remaining walls, working around the building in a consistent direction (clockwise or counterclockwise).

Follow the same procedure outlined above as many times as necessary until the wall is filled keeping in mind that if another story of ECO-Block will be built on top of this one, the concrete should be kept at least 4” below the top of the wall.

If the concrete is being placed out of a chute, have one worker hold a shovel at the bottom of the chute to direct the concrete and slow its fall.

Technical Tip: While the walls are being poured, protect the top of the block with tape (masking, duct, etc.). This will keep the tongue connection clean allowing for easy stacking of additional forms.





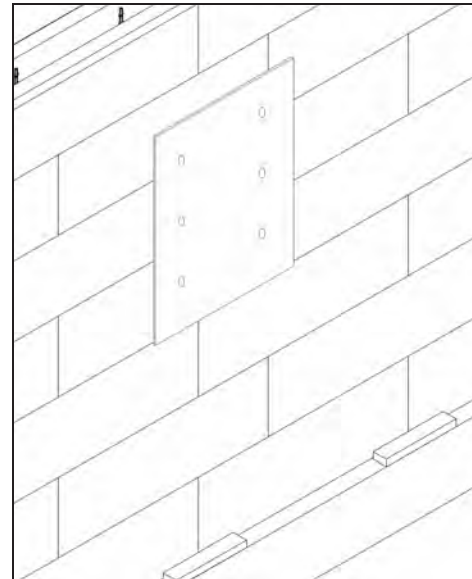
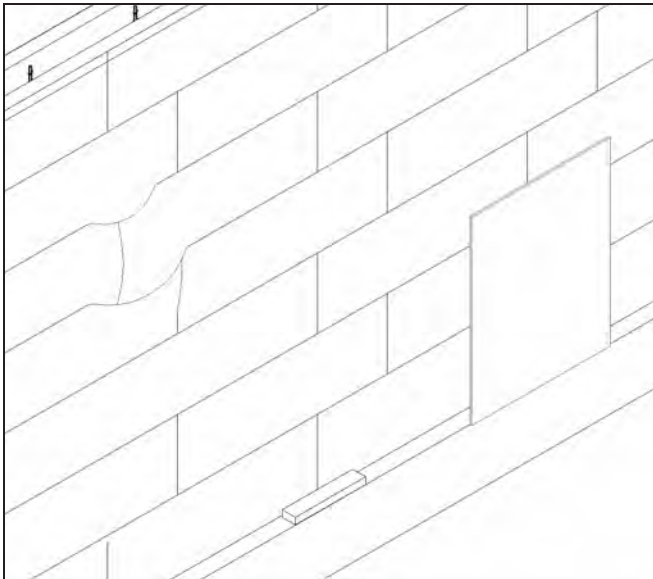
Have 1-2 workers on the ground continuously consolidating concrete and watching for bulges, should they occur.

Some consolidation methods are:

- Use an internal vibrator – $\frac{3}{4}$ " diameter or less. Remember to consolidate from the bottom of the wall towards the top, and be careful not to hit the sides of the form.
- “Rodding” – plunge a length of rebar up and down a few times into the concrete from above.
- Touch the vertical rebar with a reciprocating saw after the blade has been removed.

Consolidate every foot or so repeatedly down each wall, following the pour.

If the crew spots a bulge, reinforce it with a square of plywood or some 1x4s screwed flat over the bulge. Screw these wood reinforcements directly to the ECO-Block webs with #10 course thread drywall screws.



Technical Tip:

- **Put a 2x4 block against the wall over a web and tap it lightly with a hammer or vibrate it with a hand sander or the end of a reciprocating saw with no blade in it.**
- **Protect the top of the wall from damage with aluminum or plastic gutter pieces or tape.**



If any of the foam happens to blow out, stop the concrete placement on that wall. This rarely happens but it is possible if the rate of placement has been too fast, or the concrete is too wet. Move the placement to the next wall and continue to work as the crew repairs the hole. To repair the hole, remove the concrete down to the bottom of the hole. Replace the torn form fragment, cover it by screwing plywood or 1x4s to the webs at least 16", or (2) webs beyond the torn form. The placement can now resume on the repaired wall.

If you are building another story of ECO-Block on top of this one, leave the concrete rough on top and at least 4" below the top of the wall. If a roof or frame walls will go on top, trowel the concrete smooth and check the wall for level at close intervals. Insert anchor bolts or straps as necessary for the roof trusses or top plate.

Before, during and after placement, check the string line and adjust the braces as necessary to bring the wall to perfect plumb everywhere. Immediately after the pour, check all dimensions, including diagonals and adjust as necessary.

Any time after the concrete has set up (at least one day), the reinforcement from both sides of each buck can be removed.

Do not remove the bracing and scaffolding until the concrete has reached adequate strength, usually 3-5 days.