

# Crown ICF installation guide 2023:

## Step 1 Footings:

Get your footings poured to the depth and width that are specified by your engineer and or architect.

Typical residential footings are 8 to 12 inches thick and 18 to 24 inches wide.

Rebar in footings:

There are 3 acceptable ways rebar is placed in your footings:

- 1) “L” shaped rebar placed in the footing before the footing is poured.  
This rebar should be set so that there is at least 32 inches of rebar extending out the top of the concrete after the footing is poured.
- 2) Rebar to be wet set after the footing is poured. These can be set with “L” shaped rebar or straight rebar. Rebar should extend at least 32 inches above top of footing.
- 3) After the footing is poured:
  - a) All building wall locations are measured out and lines snapped as to the exact location your wall will be sitting.
  - b) The first row of blocks are dry set in place
  - c) All rebar locations are drilled in exact specified locations per plans with a minimum depth of 6 1/2 inches. Do not drill through the bottom of the footing.
  - d) Rebar is hammered into said holes. Epoxy is optional but not necessary.
- 4) Recommended spacing of rebar for residential application:
  - Below grade: #5 bar 16 inches on center vertically and horizontally
  
  - Above grade: #5 bar 16 inches on center vertically and horizontally IF an additional story is to be placed.
  
  - Above grade: #4 bar 32 inches on center vertically and horizontally IF an additional story is not to be placed.

\*These are only recommendations for typical residential structures where jurisdictions do not require engineering. These recommendations do not trump any specified engineers requirements for any particular build.

## **Step 2 Post footings, first row block and preparations:**

Optional: Concrete is porous and can therefore wick water up its walls. In very wet climates or areas where your footing could be in or under water regularly, you can put roofing ice and water shield over your entire footing before you snap out any lines or drill any holes. We recommend "Grace" ice and water shield, but any brand will do. This will greatly reduce any wicking of water up the wall and will have no effect on the strength of your product.

1) Once all of your lines are snapped out for wall locations, you will tap-con in "L" shaped metal angle flashing along the inside and outside of your snapped lines. We recommend, but do not require using the CROWN ICF starters offered by CROWN ICF. You will have the tallest side of the angle flashing pointing upwards and the shorter side pointing towards the inside of the wall. This should be a light gauge sheet metal/gutter apron/ roof flashing type material. You should be able to screw a regular tip screw through the material with out needing any drilling.

These flashing pieces usually comes in 10 to 12 foot long pieces and are normally any where from 3 inches by 3 inches to 1 1/2 inches by 3 inches. You want the shorter side of the flashing being tap-coned into the concrete and the longer side going up the outside edge of the first course of Crown ICF blocks.

2) Dry set (no glue) your first row of Crown ICF blocks. Find your highest point on the footing with a laser level off the top of first course you have laid in place. That is your bench mark. You will now be able to go around the rest of your walls lifting the blocks to the exact right height inside and out and holding the block in at that proper elevation by simply putting a screw through the piece of angle metal and into the web that is imbedded inside the block. This will guarantee a perfect starting elevation around your entire house no matter how far off the footings were (up to the height of your angle metal). This will help make the rest of your project go smooth.

3) Your rebar is now in place with one of the three methods we have explained and your first row of Crown ICF blocks are in place perfectly level. You will now put a piece of 2 inch PVC that is cut at a length of 2 to 3 inches over the top of each piece of imbedded rebar so that it is around the rebar and setting on top of the concrete footing. This will ensure that when we drop the full wall length rebar down the wall from above that it is lined up nicely with the bars coming out of the footing. You will tie the full length rebar off on the top horizontal rebar leaving the full length wall vertical rebar coupled next to the bottom rebar with the PVC coupler you installed and tied off on the top horizontal rebar. This will keep the bar in the center of the wall when pouring concrete. No other tying off of vertical rebar is necessary.

### **Step 3 Corner braces**

You will set up a corner brace on every inside and outside corner of your structure. This will help keep your building from growing inwards or outwards as you stack your blocks. The foot of the brace will be tap-coned into the footing at the corner of the structure which will be flush with your already set corner block. Each corner brace should have two turn buckles that come off of it at a 90 degree angle from each other. They can either be staked into the ground on the outside of the building or they can point inwards along each side of the wall and tap-coned into the footing right next to the wall. These turn buckles will then be turned to make the brace plumb in all directions. Tap-coning the braces into the footings is preferred and should be done when possible.

### **Step 4 Set your first row of corner blocks**

The male side of the shiplap is the top of the block. The female side of the shiplap is the bottom of the block.

Dry set (no glue) all of your corner blocks with all of the long sides of the corners going in the same direction around the building. It is not preferred, but ok to alternate them if needed for any reason.

### **Step 5 Set your first row of straight blocks**

Dry set (no glue) the straight blocks working your way around the building in one direction, clockwise or counter clockwise (going around the building clockwise will make it easier when you get to using your glue guns and the application of the glue/foam). As you approach the next corner, you will more than likely not be ending on an exact full block.

Each corner will have an uncut corner block and at least one full uncut straight block coming off of it in each direction so long as the the length of the wall will allow for it.

You will cut one or two of the straight blocks as needed between the uncut corners to fit in the space that needs to be filled. Make sure you have at least two webs remaining in either block to fit into the remaining space on that wall. We will call this cut location the common seam. That same cut seam will follow all the way up the wall for every row till the top of the building. **MARK THIS LOCATION THAT YOU CUT THE BLOCKS WITH A BLACK "X" USING A SHARPIE MARKER ON THE INSIDE AND OUTSIDE OF THE WALL.** This location must have a piece of 1/2 inch plywood or OSB place over it and screwed off into a web to the right and left of the cut seam with four 2 inch screws on the inside AND outside of the wall where it was cut.

Only cut the straight blocks. Do not cut the corner block unless absolutely necessary i.e. two corners that dive directly into each other.

You will repeat this process as you work your way around the building.

What ever direction you have chosen to go around your building, you will continue to go for the duration of the building which will result in the cut blocks always being right above one another in a similar location to the previous row.

## **Step 6 Laser in your first row level**

You will now find your highest point on your first row of blocks that you have dry set. Put a screw through your metal L bracket and into the web of your block at this point on both the inside and outside of the building. Work your way around the rest of the building lifting up your block where needed to what is perfectly level with your starting bench mark and put screws through your L bracket and into your web in the block to hold the block at elevation on the left, right, and middle of every block. Make sure you are doing this same process on the inside and outside of the block as

footings can be off level both in length and width. Every block will have at least 6 screws going through the L bracket and into the ICF web (three inside and 3 outside the building).

## **Step 7 Setting your next rows**

Crown ICF corners are directional. You will alternate corners from one direction to the next every other row. This does not change the fact that you will continue to go around the building in the same direction leaving all of your cuts on the same side of each wall or where ever you have chosen to make your common seam.

You will use a spray foam glue, adhesive or Liquid Nails (LN-2000 LIQUID NAILS FUZE\*IT ALL SURFACE INTERIOR/EXTERIOR ALL-PURPOSE ADHESIVE Gl). If using a spray foam glue/adhesive, we recommend OSI Quad Foam Window and Door Installation Foam, “Great Stuff Gaps and Cracks” (the red can), or “Great Stuff Big Gap Filler” (the black can) or

Do NOT use “Great Stuff Window and Door” (the blue can). The great stuff gun is nice to use and will save on foam expenses. Just be sure to have cleaner.

All blocks will be glued from here on out. When you apply the glue/foam/ Liquid Nails, apply it to all the inside corners of the female edges of every block with at least a 1/2 inch diameter bead. Firmly press the block into the male sides of each corresponding block.

When you get to locations or elevations that require installation around buck material or doors you will need to cut the ICF block as needed to fit around the opening. You will need to brace all of these locations by spanning 1/2 inch plywood or OSB from the buck to at least one web in the block all the way around the opening. This must be done on both the inside and outside of the building.

## **Step 8 Window and door bucks**

There are a wide variety of window and door bucks. Use what ever method the manufacturer is recommending when installing. Regardless of what type of buck system you are using, all bucks that require consolidation of concrete underneath them, must has accessible hatches

on the bottom of them. Cut these hatches in starting no more than 12 inches from either side of the buck. These hatches should be at least six inches wide and go to the center of the opening.

All bucks should have a support put on the inside in place vertically and horizontally every 2 feet in order to avoid sagging or bowing.

When building bucks out of wood, we recommend using sill seal around all of the edges of the buck. This will help avoid creating a thermal break after the concrete shrinks or the lumber dries out. All wood bucks should be made out of treated lumber unless you are placing some kind of protective barrier between the concrete and the wood. After the buck is build we recommend putting galvanized or triple coated ceramic screws through the buck with the screw threads going into where the concrete will be poured. This will ensure a long lasting connection between the lumber and the concrete.

## **Step 9 Embedded hangers**

When installing embedded hangers, follow all manufacturer specifications of that particular hanger.

## **Step 10 Top row**

When you install your top row, you will dry set the row. You will then laser level in the the exact top elevation. Mark the level and snap string lines to the exact hight. Make sure your line does not have any sag in it. You will then cut the inside and outside of the block at that level.

## **Pre pour check list:**

Check that all openings are in the proper locations.

Check that all inserts, mechanical sleeves, and structural embedments are in place.

Check that all windows and doors are level and plumb.

Check that all supports are in place.

Check the slump of the concrete.

Check that you have all tools in place.

## **Pouring:**

Can use anything from pea gravel to 3/4 inch stone.

5 1/2 to 7 1/2 inch slump.

When filling under windows only fill them from the right and left of the buck until the bottom of the window is filled. Never fill under the bottom of the window from within the window. The bottom of the window must become consolidated from concrete being poured from the top of the wall on the right and left of the window.

When pouring concrete into the wall, allow the concrete to pile up high enough (usually about 3 to 4 feet) to create an angle at about 45 degrees. This will allow the concrete to fall and flow smoothly without slamming flat down at the bottom of the wall creating undue stress on the ICF wall. This flow of concrete will reduce both the likelihood of blow outs and voids.

Don't over vibrate the wall. When vibrating around windows, it is best to vibrate where you have the plywood bracing on the inside and outside. Do not allow the vibrator to vibrate against the ICF wall.

## **Straightening walls:**

Once the wall has been topped off, get everyone off of the scaffolding except for one or two guys who remain eyeing the string lines. The guys on the ground will be adjust the braces in and out according to what those on the scaffolding are calling out while eyeing the string lines.

## **Breakdown:**

Braces and scaffolding can be taken down after 24 hours.

Climate, weather conditions, and flooring system vary dramatically.  
Therefore an engineer should set the time line before floor systems are put  
in place.

ANY QUESTIONS OUTSIDE OF THESE 10 EASY TO FOLLOW STEPS,  
PLEASE CONTACT CROWN ICF AT 262-909-7410