



## Advantage ICF System™ Field Guide

# Important: Before You Start

### Does Your Building Inspector Know You Are Building with the Advantage ICF System?

You are required to check with your local building inspector for local engineering and building code requirements. Local codes and regulations supercede provincial, state or national building codes. Some jurisdictions require soils reports from an engineer before work can start.

#### Note:

This Field Guide serves as an on-site checklist of essential steps for quality installation of the Advantage ICF System. We recommend you use this Field Guide in combination with both the Advantage ICF System Installation and Technical Manuals available from [www.advantageicf.com](http://www.advantageicf.com).

### TOOLS AND EQUIPMENT

Hammer  
Chalk line  
48" level  
Rebar bender / cutter  
Cordless drill and driver bits  
Lineman's pliers  
Handsaw  
Keyhole or drywall saw  
Concrete vibrator – 1" to 1 ¼"  
Scaffolding / bracing system  
Ladder(s)  
Sledgehammer  
Circular saw (preferably 8 ¼")  
Metal cut off wheels for circular saw  
Rebar wire-tie twister  
Felt-tipped permanent marker  
Tin snips  
String lines

### MATERIALS

Advantage ICF System blocks  
Rebar wire or rebar wire twist-ties (16 gauge x 5-6")  
1" / #8 deck screws  
1¾" / #8 deck screws  
3" / #10 deck screws  
Advantage ICF System sheathing tape or Tuck Tape  
Low expansion foam and dispenser  
24" zip straps (optional)  
Scaffold planking (see scaffolding / bracing in glossary)  
Rough opening (RO) material (see rough openings in glossary)  
Anchor (J) bolts  
Advantage ICF System multi-straps

### FOOTINGS

It is well worth making the effort to ensure your footings are square and level. We recommend you make your footings a minimum of 508mm (20") wide. A 508mm (20") wide footing makes it more practical to lay out blocks in case errors in alignment have occurred. A footing placed and finished within a tolerance of +/- ¼" is the ideal starting point.

### STEP FOOTINGS

A step footing of 16 ½" works with the Advantage ICF System as that is the height of the forms. This step height can be accomplished by stacking three, 2x6"s on edge.

## DOWELS

Steel reinforcing dowels should extend a minimum of 40 times bar diameter in height from the top of the footing to match the size, spacing and position of the vertical reinforcement required in the foundation wall.

### STEP 1

Mark the outside corner points of the building on the footing from the surveyor's offset pins.

Once the lines are chalked, nail a 24" piece of 2x4" kicker each way at outside corners. Kickers keep your corner forms positioned properly while you run your first course of block.

At this time, you can layout on the footing the location and rough size openings of any window and door locations.

Bring the rebar, scaffold/bracing material and the block inside the footings.

Cut the rebar to length, remembering to overlap 40 times the bar diameter, and place it besides the footing at the wall for which it is cut.

Place 2'x2' pre-bent corner bars (1 per horizontal row) at the corners.

Stack bundles of block inside the basement area, leaving enough room between the footings and the stacks to work.

Stack the corner blocks in pairs (one left-hand and one right-hand) near the corners where they will be used.

### INSPECT ALL BLOCKS FOR DAMAGE.

### STEP 2

#### FIRST COURSE

Starting at any corner, place a left or right-hand corner block tight to the 2x4" corner kickers. Work away from the corner in either direction towards the next corner using standard blocks.

If the outside length of the wall you are working on is an exact multiple of 1.2m (4'), then you will be able to use standard blocks all the way to the next corner.

When you reach the next corner, place another corner block as before. If you used a right-hand corner block at the first corner, use a left-hand corner block at the new corner and vice versa. Attach the corner block to the adjacent full block using a multi-strap.

#### FILLER BLOCKS

If the cutting of a filler block is necessary, keep the filler at least one full block from the corner. This will help keep the corner rigid. The Advantage ICF

System blocks are indented at 1" intervals to simplify measuring and marking. If filler lengths are more than half way between plastic ties, it is recommended that the first full block be cut back 2-3" and that amount be added to the filler to get the cut past the next tie or web.

### STEEL REINFORCEMENT

Once the first course is complete, place rebar horizontally in the appropriate rebar clips in the web, following your engineering specifications (or the design tables in the Advantage ICF System Technical Manual). The horizontal rebar is staggered in order to allow the vertical rebar to be placed between the horizontal bars from the top of the wall.

### STEP 3

#### ADDITIONAL COURSES

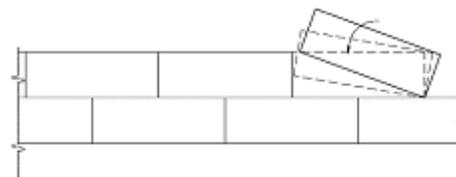
Start the second course of block at the same corner you started the first course. Place an opposite-hand corner block on the one below. For example, if you used a right-hand corner on the first course, use a left-hand corner on the second course. Glue the two corner blocks together with a light bead of low-expansion foam

#### STANDARD BLOCKS

Continue the course with full standard blocks. Remember to fasten the blocks to the corner blocks with multi-straps, the long side of the multi-strap to the long side of the corner. You should notice that the blocks have a 16" offset from course to course.

#### SETTING BLOCKS

When you set the blocks, always work from the open end towards the block previously placed. The purpose of this technique is to keep the joints tight. See figure below.

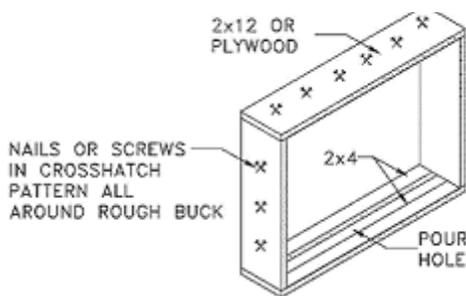


#### REBAR

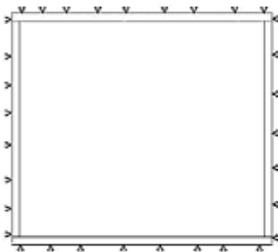
Once the second course of block is in place, install the horizontal rebar two rebar clips over from rebar in the course below. Rebar is typically on the tension side of the wall, see Advantage ICF System Technical Manual for details.

#### STEP 4 OPENINGS

Continue to lay courses until you reach the location of a wall opening, typically a window or a door. Bucks are built either with 2x12" lumber or 1" plywood ripped to a width of 11 1/4" to match the width of the Advantage ICF System blocks. 2x4" lumber is used to create the bottom of the buck, leaving a 4" hole for placing and vibrating the concrete as shown below:



The rough bucks are placed on the block, plumb and level and braced to keep them in place. Diagonal bracing and interior bracing should be used to keep unsupported buck lengths less than 36". Cross-hatch nails to the concrete side of the buck to keep it anchored in the concrete as shown in the figure below:



#### BLOCK PATTERN

Continue to follow the course pattern previously established up to and around the sides of the RO bucks. Following the course pattern will allow the interlock system to match up when you span over the top of the RO bucks.

Note that cut-off pieces of block with at least one factory edge and one tie can be used elsewhere in the wall.

If the cut edge of a block is within 4" of the last tie, run sheathing tape at 3 locations horizontally (top, middle and bottom) from the last tie through the rough buck and along the face of the block. This has two functions; keeping the Advantage ICF System block and rough buck in alignment and keeping the unsupported edge of the block from spreading during concrete placing and vibrating. When the cut edge is greater than 4" away from a tie, use strips of plywood screwed to the rough buck and covering or backing up the foam both on the inside and outside of the wall.

#### SCAFFOLDING AND BRACING

Once you have completed the third course of blocks it is time to install the scaffold and bracing system. If you are tall enough, you may be able to install the scaffolding after you have set the fourth course of blocks.

Attach the vertical part of the braces to the walls at 5'-4" to 6'-0" intervals starting 8" to 24" from each corner. Screw the braces into the ties using 3" screws. Use at least one screw per course. You will need to hold down the top course of block to ensure it does not lift off the block below when you are screwing the screws into the ties.

Attach scaffold brackets and/or handrail brackets to the vertical braces. These brackets are usually placed roughly 30" to 36" from the finished pour height of the wall or whatever height constitutes a comfortable working height to place and finish the concrete

#### TURNBUCKLES

Install the turnbuckle part of the bracing system. Attach the diagonal brace, complete with turnbuckles, to the vertical braces with a 1/2" bolt or a short piece of 10M rebar (or 2 - 3" screws if you are using dimensional lumber). Before securing the bottom part of the unit to the ground, make sure the turnbuckle is adjusted to a central point. Using a 4' level as a guide, lean the top of the wall in 1/2" to 3/4", and secure the base of the turnbuckle to the ground.

#### TOP COURSE

This final course should be secured to the previous course using either low-expansion foam or tape on the inside and outside of the joints.

### **RIBBON (LINE UP) RAIL**

Install a 2x4" or 2x6" ribbon or line-up rail around the outside at or near the top of the wall. Fasten the ribbon rail to the block to every third web with a 3" screw.

### **STRING LINE**

Run a string line along the length of each wall on the ribbon rail to check whether the wall is straight or not. Adjust the turnbuckles accordingly.

### **INTERLOCK PROTECTION**

If the building is continuing beyond the basement level using the Advantage ICF System, protect the interlock from damage by covering it with tape

### **BEAM POCKETS, SLEEVES AND INSERTS**

Any beam pockets, sleeves or inserts should be installed once the top course has been laid.

### **REBAR**

Install the specified vertical reinforcing steel by sliding it down between the offset lengths of horizontal rebar. This creates a 'weave' effect that enables the horizontal rebar to hold the vertical rebar in place.

### **CORNERS**

On walls that are six rows or courses high, it is recommended to tie the corner blocks back to the first full block using the multi-strap at the middle of the form at each course. On walls higher than 6 courses, it is necessary to use two multi-straps on the courses below the 6th row.

### **PRE-POUR CHECKLIST, PLACING AND FINISHING**

Check the listed items prior to pouring any concrete.

- The blocks on the first course are set on the chalk lines.
- All T corners and T back bracing is in place.
- All rail ribbon is in place together with string-lines attached, ready for wall alignment.
- Extra pieces of plywood and bracing material are at hand ready to deal with the unexpected.
- 1" to 1¼" vibrator.
- The concrete pump operator knows that they are coming to an ICF building site.
- The specified strength, aggregate size, slump, and quantity of concrete have been ordered.

- The tabs on the blocks of the top course are protected if another floor will be added using the Advantage ICF System.
- Sufficient help is on hand to place, align, finish and clean up after the pour. A five-person crew is recommended: one to handle the hose pump, two to vibrate, one inside the wall and one outside the wall.
- Auto-level or laser level is available the top of the wall will be leveled.
- You have anchor bolts on site if required.
- The beam pockets are in place.
- Rebar properly placed as per Technical Manual requirements or engineer's specifications.
- Note: A structural engineer or representative may have to inspect rebar placement prior to pour. Make sure proper notice is given for this inspection.

### **PLACING AND FINISHING THE CONCRETE**

We strongly advise that you accept help from Plasti-Fab staff (1-888-446-5377) or experienced ICF installers if this is your first ICF concrete pour.

### **POUR RATE**

The rate of pour should not exceed that recommended by the American Concrete Institute shown below:

Temperature Degrees C (F)	Pour Rate Feet per Hour (Metres per Hour)
4.4 (40)	2.20 (0.67)
10 (50)	2.75 (0.84)
16 (60)	3.03 (0.92)
21 (70)	3.85 (1.17)
27 (80)	4.40 (1.34)
32 (90)	4.95 (1.51)

### **METHOD**

The ideal concrete slump is between 100 mm (4") and 150mm (6"). A 4' to 5' wall can be filled and vibrated in one pass with only a little topping-up. An 8' (or 6-course) wall should be filled in two passes, first a 4' lift followed by vibration, then filled to grade and vibrated again. It is advisable to fill walls higher than 9' in lifts not exceeding 4'.

## **VIBRATION**

It is essential to vibrate the concrete to eliminate air bubbles that may become trapped in the forms. Not vibrating can severely compromise the strength of the walls.

When vibrating the concrete, start one web space away from a corner, then vibrate every 16", or two spaces, from thereon, avoiding as best as possible the vertical joints of the forms. Avoiding the vertical joints of the forms helps prevent bulging or flaring (especially the bottom row) at these locations.

Vibrate as close as possible to any RO bucks to ensure the reinforcements around the openings become well covered with concrete. The same is true for areas around any structural or mechanical sleeves or boxouts. The concrete at the bottom of RO bucks should be finished level with the bottom of the horizontal 2x4"s at this time.

**Make sure you vibrate into the previous lift a maximum depth of 1'. Place the vibrator quickly into the concrete and remove it slowly, at a rate of 1' per second. Remain 4' to 5' behind the concrete placer.**

## **CLEAN UP**

Any spilled concrete should be cleaned off the footings inside and outside of the wall.

## **FINAL CHECK**

After the concrete has been poured, leveled and the anchor bolts placed, check that all the corners, tees and free-standing ends are plumb, adjust the walls to the string lines, and once the final adjustments have been completed, get off the scaffold and walk around the excavation sighting the walls to confirm that they are straight.

Note: Be sure to remove the tape protecting the interlock system the day after the day.

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