

Pump Day Procedures

1. Pump day should be devoted entirely to concrete placement. All forms should be in place, braced and ready to pour.

Pre pour checklist: (also found on page 4-20 of your manual)

- Walls meet the design, drawings and layout
- Walls are aligned and braced every 6' - level, plumb, square and straight
- Wall heights meet the plans
- Window and door openings located correctly
- Window and door bucks braced inside horizontally and vertically every 2'-0" and square
- Window and door bucks braced for plumb within the wall
- Window and door buck anchors are in place
- Intermediate floor connections are in place and supported
- Sleeve Penetrations for dryer vents, electrical and plumbing service in place
- Penetrations for outside fixtures and outlets
- Beam pockets located and marked
- Brick ledge (if applicable) is reinforced and supported
- Concrete ordered to meet recommended mix (5.5" - 6.5" slump, 1/2: maximum aggregate, proper concrete compressive strength)
- Ensure correct concrete volume is ordered.
- Concrete pump (boom type preferred) reduced to 3" with an "S" bend
- Avoid placing concrete directly into the corners
- Corners securely braced
- Horizontal and vertical rebar is properly installed to meet the structural design
- Special cut forms are properly reinforced and braced
- Bulkheads and intersecting walls adequately braced
- Ladders and scaffolding in place
- Adequate labor is available
- Site is organized and clean
- Concrete pump truck and ready mix trucks have easy access to the job site
- If applicable get building inspector's and engineer's approval
- Be sure there are no construction debris and/or tools and materials in the cavity of the forms.

2. **Did you?**

- a. Make sure that the correct amount of concrete has been ordered, trucks spaced correctly, and the proper mix design and slump specified.
- b. Order second truck to be shipped when called. Space all subsequent trucks at 45-minute intervals; holding the final truck on will call for any adjusted amount.
- c. When ordering, tell them your order will be pumped, it is for an ICF wall and that you **will** send back any trucks that arrive with more than a 6.5" slump. Add water if necessary at the site to correct the proper slump.
- d. Order correct mix. Work with your ready mix supplier prior to the pour to make sure they understand the concrete specifications and parameters that ICF's require.

3. **Methods for placing the concrete:**

- a. **Line Pumps**, also called trailer pumps are very effective for placing concrete. They are somewhat more labor intensive because the hose has to be manually moved and lifted into position. We recommend using a 2-inch diameter hose. Commonly, 2 1/2 inch hoses are available, but are substantially heavier and more difficult to handle. The hose can be tied to the upper standard of a rolling scaffold to make placement easier. Line pumps are becoming more and more available. The hourly rates for line pumps are much lower than that of a boom pump, but quite often the total cost is the same, because they take longer to set up, pump, take down and require more manpower on pump day.
- b. **Boom Pumps** are the most intimidating of all the options, but can get the job done faster if everyone is properly prepared. Boom pumps are measure by their reach. Ideal reach depends on the job. On most residential Reward jobs, 28, 32 and 36 meters will do. If you have to use a reach larger than what is needed, try to adjust the placement of the truck on the job site to level out the boom and reduce the height of the fall of the concrete. Most importantly, make sure the hose is reduced to at least 3 inches. Some will reduce to 2 inches, but that is

rare. It is strongly recommend having an elbow, rams horn or other attachment at the end of the hose to break the fall and collect the concrete coming through the boom. Preferably, a steady rate is what you want, not pulsing or stopping and starting. Get to know your operator. He can make or break you. If you're fully prepared, you can unload 8 yards in as little as 12 minutes, but 20 minutes is more typical. If you're **not** ready, or if the concrete is not right, it can take an hour or more!

Be aware of any overhead power lines when working with boom equipment. With certain temperature and humidity levels electricity can jump from overhead lines to the boom with disastrous consequences. If you have any concern, consult your pump company and your local utility can shield the lines during the pour.

4. **How to manage the pour:**

Managing the pour takes time and a lot of repeated communication. Make sure the pump operator and each ready mix driver understands that *no water is to be added without your approval*. Many times their recommendations do not have your best interest in mind. A wetter mix will make their job easier but can cause you plenty of headaches and a less than satisfactory job. **If the concrete arrives too wet, you have to make the decision to send the truck back or wait until it begins to tighten up.** If you decide to pump, know that you cannot do lifts very high and may have to take more laps around the walls. If you need to increase the slump, one gallon of water will increase one cubic yard of concrete by one inch.

Finally, understand that ready mix suppliers think they are in the trucking business. Many believe ICF's tie up their trucks for long periods of time. They seem to remember only the bad jobs. **You must be ready to pour.** You can unload trucks quickly with Reward Wall Forms. Other ICF systems are not as strong as Reward. Unfortunately, an unsuccessful pour on another ICF becomes a negative reflection for all ICF's. Being ready on the day of the pour requires having enough manpower on hand. Here are some guidelines for manpower:

a. **If you are using a boom pump:**

- 1 - pump operator
- 1 - hose man
- 2 - wall watchers (one inside, one outside)
- 1 - utility person for emergencies, contingencies, straightening wall etc.

b. **If you are using a line pump:**

- 1 - pump operator
- 1 - hose man
- 2 - or more hose handlers, rolling scaffolding crew, watching the wall etc
- 1 - utility person
- 1 - outside wall watcher

Pump day can be exhausting, don't be skimpy on manpower.

5. **Tools:**

A properly equipped team will make the pour easier, more efficient and result in a cleaner professional finished product.

Slump Cone	Gloves	Trowels
5 gallon bucket	Brooms	Hardhats
Sunscreen	Eye protection	Drinking water
Plywood for slump test	Hand tools	Shovels
Long sleeved shirts & long pants (for skin protection from concrete and sun burns)		

6. **Placement of the concrete:**

a) Make sure your **scaffolding or wall boards** (or other method of getting around the top of the wall) **are correct and safe**. To begin with proper placement, the hose man must be standing at approximately waist height to the top of the wall. If the top of the wall is above the waist, handling the hose is very fatiguing and the hose man will not be able to see both sides of the wall.

b) The most important thing to remember when filling the walls is that **the man running the hose needs to know where the concrete is at all times**.

c) The key person in this process is the one who is tapping on the wall and telling the hose man exactly where the concrete is in each section - and then tells him when to move.

d) The first yard of concrete is the one that will give you the most problems. The pump truck has just been primed, or the ready-mix truck has come in wet, the concrete drops the furthest distance, the crew is jittery and the job may not be

completely ready to pour. As a precautionary measure, you can pump the first yard back into the ready-mix truck and blend it with the 6 or more yards remaining in the mixer, after the pump operator has already primed out. With the first yard you may want to fill below a window so you can see the mix and slump. Another technique is to begin at a corner with a window within 4 ft or so. Fill by moving towards the window and watch the concrete fill up to the bottom of the window, then move to the other side of the window starting approximately 4ft away and fill back towards the window to lock in the other side.

e) The person managing the pour should personally check the concrete in each new truck when it arrives to make sure that the slump is correct. The objective of the first lift is to get beyond the 32" level (above the seam of the second course of forms). When dropping the concrete the furthest, a drier concrete mix works well (e.g., a 4" slump). Most houses, up to a 12-foot wall height, will require three passes for a complete fill. How quickly you can make the next pass depends on the how long between laps. Generally, around 120 linear ft. of wall is a good breaking point. The switching out of trucks can give you the breaks you may need.

f) Between the passes around the wall, someone should trail the hose man to shake any concrete that may build up on the top of the forms or sit on top of the rebar. This will help prevent voids below potential choke points. This is very important.

g) The second pass or lift usually the one in which you can do the greatest lift. While filling the walls on the second pass, be careful not to fill to close to the top, stay at least 24 inches down from the top course and do not fill over doors and windows until the last pass. One exception to this rule is that on deep lintels over 32 inches, you may want to make a pass to begin to form the lintel and load the window. There is another method to filling lintels over doors and windows, but the concrete portion over and down both sides must be filled completely.

h) The last pass is to the top of the wall. You may want to increase the slump by adding water. The increase in slump will allow you to more effectively fill the top of the wall and will give you more open time trowel the top of the wall and set straps or anchor bolts. Extra care should be given to lintels over doors and windows. The extra rebar and stirrups can prevent good fill of the concrete. Make sure someone taps or vibrates the outside of the wall for proper consolidation.

i) Finally, see if your pump operator can dispense the concrete out the end of the hose in a smooth continuous sleeve or ribbon of mud. Try to avoid stopping and starting or the pumping of air through the hose.

7. **Blowouts:**

Blowouts in Reward Walls are not like blowouts in other concrete applications. They are quite simple to fix and **only take a few minutes to repair**. A blowout can occur for several reasons. The most common are; a cut form did not get patched or too much water. To repair, the pour can continue while the utility man cleans up the spillage and places the broken foam back into the wall the way it came out. Half-inch OSB slightly larger than the blowout is simply screwed to the furring strips. Most blowouts are generally only one foot square. For larger blowouts, using 5/8" all thread through the wall and clamping OSB on both sides is quite effective.

Occasionally the horizontal seams tear and bulge. Tears usually occur on the top of the first course and during the beginning of the first yard of the first truck. Close observation of the wall will minimize any drastic bulges. In the case of a bulge, quickly communicate to the hose man to move ahead and get away from the spot and just leave it alone. By the next pass it will be fine if the concrete was not extremely wet. After the pour simply rasp the wall flush. A cheap wire brush works well.

Blowouts don't have to be considered a catastrophe. They tell you how to improve and can be easily corrected without compromising the integrity of the structure.

8. **Final Inspection and cleanup:**

- a. Inspect the job to see if you have missed anything.
- b. Check to see if the walls have moved (The earlier in the pour you notice a bow, the easier it is to correct.)
- c. Confirm that you have good fill. Cross check the amount of yardage you estimated the walls would require with the load tickets, and know how much yardage you may have left over. Having a yard or two extra is less costly than having a one or two yard call back.
- d. Did you over fill at a door threshold location or forget a beam pocket? It will be easier to dig out the concrete today than it will be tomorrow.
- e. Clean up the spillage today, also make sure the teeth are clean if you have another story of Reward Walls to go.

If you have any questions, please call Rich at 413-218-5471