

C.19 CONCRETE PLACEMENT

C.19.1 CONCRETE PLACEMENT METHODS.

There are a variety of methods available for the placement of concrete. While we recommend the use of a concrete boom pump (see below) for most applications, the nature and scope of your project and the practical availability of equipment will also determine the method you use. Whatever method is chosen, be sure that the job site is clean, clear, and ready to accommodate the equipment to be used and that access to the site has been made ready, including provisions for any overhead utility lines.

C.19.1.a CONCRETE BOOM PUMP.

A boom pump offers a variety of benefits in the placement of concrete in your PolySteel walls. The reach of the boom minimizes or eliminates the need to relocate the hose or pump on the site. The hose is relatively easy to maneuver around the perimeter of the project, and the automatic controls allow you to manage the flow rate of the concrete throughout the pour. Key considerations for using this method are:

- ✓ Schedule the concrete delivery 1/2 hour after the scheduled arrival of the pump to allow for set up time. Schedule your second concrete truck to be released on your call, once the pour is successfully under way, and all subsequent trucks to typically arrive at 1/2-hour intervals.
- ✓ The hose of the pump delivering the concrete into the forms should be no more than 2-1/2" to 3" in diameter. This will require the attachment of a reducer nozzle, or reducer hose, and should be requested in advance.
- ✓ The speed of the concrete dropping from the height of the boom must be reduced and controlled. This is achieved through the use of a "Ram's Horn" attachment, a double 90° elbow attachment, or thus use of a 10-foot section of reducer hose that narrows at the end, creating a funnel effect to slow the rate of flow. Some of these methods are illustrated below.
- ✓ Pumps are generally primed with a thinning agent that should not be placed in the walls. This initial slurry should be placed on the ground safely away from the work area and not in the wall.



BOOM PUMP
WITH REDUCER
HOSE



BOOM PUMP
WITH DOUBLE
90° ELBOW



ROLL
AROUND
SCAFFOLDING



BOOM PUMP
PLACEMENT

C.18 CONCRETE PLACEMENT (continued)

C.19.1 CONCRETE PLACEMENT METHODS.

C.19.1.b CONCRETE TRAILER PUMP.



This type of pump, also referred to as a line or grout pump, usually comes with a 2" or 3" hose that is manually moved around the job site. The hose is heavy and requires a larger crew than the boom pump. Key considerations for using this pump are:

- ✓ Schedule equipment the same as you would a boom pump.
- ✓ If you are using a roll-around scaffold, you can tie the hose to the rail to help carry the load of the hose and ease the burden of directing the flow of concrete.

C.19.1.c CONCRETE CONVEYOR.



These trucks or trailers lift the concrete into the wall on a conveyor belt. They may provide an affordable alternative for projects that have ample room for moving this equipment around the job site.

C.19.1.d DIRECTLY FROM CONCRETE TRUCK CHUTE.



If your job site allows free access to the walls to be filled directly from the chute of the concrete truck, we recommend the use of an "elephant trunk" at the end of the chute. This accessory provides good directional and flow control for managing the pour into the walls. This application generally applies to foundation walls.

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C.19.2 CONCRETE PLACEMENT PROCEDURES.

Concrete is a harsh material to work with and can actually burn exposed skin and eyes. Accordingly, you should always wear protective clothing, hard hat, eyewear, and gloves when working with this material. As you follow the procedures below during the placement of concrete, start slowly until you get the feel of this important process. Placing concrete too rapidly may cause the forms to bulge, rupture (see “Blow Out Repair”, Section 19.3), or move out of position, resulting in a crooked wall. If you have done your installation well, the day of your concrete pour should be the easiest, and most satisfying day on the project. It is, however, hard work and you should make sure that you have enough people, tools, and equipment on hand to get the job done.

1. We recommend that you place concrete at a rate of 4 vertical feet per hour, and one floor at a time (approximately 8-12 feet).
2. Beginning at a corner, fill the first two courses of PolySteel Forms, moving forward as the wall fills to allow the concrete to flow down at a 45° angle. Proceed in this manner around the entire perimeter of the building.
3. Clean the excess concrete from the top rebar as you go along so that subsequent passes do not have obstacles that can create voids below.
4. As you return to the original starting point, make a second pass in the same way. You should be able to reach the top of an 8-foot wall on the second pass. Minimizing the number of passes will minimize the possibility of voids in the wall.
5. Fill the forms below each window through the slot or ports in the bottom of the window buck after you have filled the wall on both sides of the opening.
6. Throughout the pour, it is important to ensure that the concrete is consolidated to eliminate voids, air pockets, and any separation from the rebar. This can be accomplished by:
 - ✓ “Rodding,” or churning the concrete in each vertical cell with a piece of rebar.
 - ✓ Placing a block of wood (2x4 or 2x6) against the side of the form and tapping it firmly with a hammer while moving along the wall.
 - ✓ Placing an orbital sander, without the paper, or a reciprocating saw, without the blade, against the attachment studs along the wall.
 - ✓ A small “pencil” vibrator may be used inside the forms, as long as caution is used. We recommend the Makita cordless vibrator for this purpose.

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C.19.2 CONCRETE PLACEMENT PROCEDURES (continued)

Careful attention should be paid to making sure that good consolidation is achieved in all areas around windows and doors, and any other void-prone areas that have a lot of reinforcement or are otherwise confined.

Caution: *It is possible to vibrate the wall too much, causing a bulge or rupture, in the forms. Accordingly, due care and good judgment should be used with all of the methods.*

6. If you intend to continue building on the wall beyond the level you have installed, you should leave the top of the concrete rough and irregular to help ensure a good bond with the next level of concrete.

- ✓ Be sure to extend the vertical rebar beyond the top of the wall a distance sufficient to provide the proper overlap with the bar for the wall above. As an alternative, you may insert the overlapping bar into the wet concrete (with the proper amount of overlap) as you reach the top of your pour.

- ✓ Be sure to clean the tongues at the top of the wall section before stacking the next course of forms.



EXTEND REBAR FOR OVERLAP

7. To finish the PolySteel wall, pour concrete to the top and screed off level to the top rail, or the top of the forms. Install anchor bolts or hurricane straps at the spacing indicated, in the center of the wall.



SCREED TOP OF WALL



INSTALL ANCHOR BOLTS

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C.19.2 CONCRETE PLACEMENT PROCEDURES (continued)

8. Check the walls for plumb and straight. Adjust the bracing turnbuckles, as needed, to move the wall into alignment with the string lines. This must be done while the concrete is still “green”.
9. Clean any excess concrete from the walls and around the perimeter of the job site. Do it now, while the concrete is still green, and your job site will look professional for the remainder of the project.

CONGRATULATIONS ON A SUCCESSFUL POUR!

Bracing can generally be removed after 24 hours and floor decking can be installed at that time. For basement walls, the concrete must cure for at least 7 days, and the intermediate floor and slab must be in place prior to backfilling (See Section C.24 Basement Walls).



C.19 CONCRETE PLACEMENT (continued)

C.19.3 BLOWOUT REPAIR.

A “Blowout” is a common concrete term that is used to describe a rupture in the forms that can sometimes occur during the placement of concrete that causes a small amount of concrete to spill out. While the term “Blowout” generally implies a major concrete event, this is not the case with PolySteel Forms. It is not only a rare occurrence, but a relatively minor one, with little more than a bucket or two of concrete likely to be released from the breach, and the repair is procedure simple and quick to execute. The most important thing to know is how to be prepared for this occurrence, so that you can easily remedy the situation and continue on with your concrete placement without incident or delay.

1. Prepare a Blowout repair kit to have on the job, which includes:

- ✓ Patching lumber – 2’x2’ pieces of plywood or OSB board, 2’ sections of 2x4 or 2x6 lumber, i.e., enough to cover two or three potential ruptures on both sides of the wall.
 - ✓ Screws – 12” - 14” screws to extend through the wall and attach patches on both sides, or self tapping screws to attach directly to the attachment studs on either side of a breach. You may also use a 1/2” or longer threaded rod, long enough to reach through the wall, with nuts and washers for each end to secure to patching lumber on both sides.
 - ✓ Rasp – a tool for smoothing and leveling any uneven foam after the repair is complete.
2. If a blowout occurs, stop pouring concrete in the area and move to another section of the wall. You may continue to pour while someone else repairs the breach.
3. Clear away the concrete from the opening and locate the broken piece of foam that came out. Clean it off and fit it in the hole as flush to the wall surface as possible.
4. Apply a patch across the hole and secure it to the attachment studs on either side of the opening. You may also use the longer screws to attach the patch, through the wall, to a piece of lumber on the other side.
5. Continue placing concrete until the job is finished.
6. Remove the patch when the concrete has set and rasp the foam smooth and level with the surrounding wall surface.