

## C.10 BRACING AND SCAFFOLDING

The best laid forms of mice and men will result in a successful project only if the walls are properly aligned and braced during the placement of concrete. Your goal is to construct plumb, level, and straight PolySteel walls, and the proper installation of an adequate wall alignment system with a stable and secure work platform is critical to your success.

### C.10.1 BRACING MATERIALS.

There are a variety of materials that can be used to construct an adequate bracing and wall alignment system for your PolySteel project. The following are listed in the order recommended.

1. **Panel Jack Wall® Alignment System.** Reechcraft, Inc. manufactures a steel and aluminum wall alignment system designed specifically for ICFs and is OSHA compliant for the construction of any PolySteel project you choose to build. The system consists of a vertical “strongback” channel, a steel “kicker” for diagonal support, with an integral turnbuckle for easy wall adjustment, a scaffolding platform bracket, and a guardrail railing support bracket when used as integrated scaffolding. The system also includes corner bracing, tall wall bracing, and a variety of hardware and accessories to meet a variety of needs and applications.

The system is easy to use, durable, and reliable, and is generally available for rent or sale through your PolySteel representative.

2. **Steel Studs and Turnbuckles.** Structural steel studs may be used as both strongbacks and diagonal supports in bracing your PolySteel wall. We recommend the use of a turnbuckle attached to the diagonal brace (see Recommended Tools and Supplies) to provide easy adjustment of the wall.
3. **Wood Bracing.** Quality, straight lumber is often used to construct wall bracing. The use of 2x6 lumber for the corner braces is combined with the use of 2x4 lumber for the vertical and diagonal braces for the rest of the wall. When used as a vertical brace, the 2x4 is placed perpendicular to the wall in the “strong back” position. Wood bracing can be reused inside the structure for the framing of interior walls.



PANEL JACK



STEEL STUDS &  
TURNBUCKLES



WOOD BRACING

## C.10 BRACING AND SCAFFOLDING (continued)

### C.10.2 INSTALLATION.

Whatever bracing system is used, the following steps should be taken to ensure that it is installed properly and provide the necessary alignment and support for a successful PolySteel project.

1. **Location.** Bracing is generally required on only one side of the PolySteel wall. The strength and stability of the steel attachment studs are sufficient to allow for any needed adjustment of the wall from just one side. Bracing to the outside of the wall is generally recommended so that the work area is kept clear of obstacles as much as possible, and to allow for the use of a roll-around scaffold as a platform from which to place concrete.

It may be necessary, or desired, to brace your walls to the inside of the structure (e.g., second story, deep basement, etc.). In this case, scaffolding should be included as part of the bracing and alignment system to provide a safe platform for concrete placement.

2. **Spacing.** Install vertical braces every 6-10 feet along the wall where no additional window or door bracing exists. If you are using a top rail or In-Wall Brace for alignment (see Section C.15) there is no need for additional bracing at doors and windows, and you may simply space your vertical bracing every 8 feet along the wall. Closer spacing may be required if braces are used as scaffolding in order to be OSHA compliant.
3. **Vertical Attachment.** Place the vertical brace up against the wall in alignment with the steel attachment studs. Use self tapping, or coarse-threaded screws, to secure the vertical brace to the attachment studs every 16". If wood bracing is being used, angle the screw (toenail) through the stud and into the PolySteel attachment stud.
4. **Support.** Just below the top of the vertical brace, attach a diagonal support brace ("kicker") at a 45° angle and extending to the ground or slab. Secure the kicker to the ground with a stake, or to a block of 2x4 lumber glued to the slab (this will eliminate damage to the slab and can be easily knocked away when the bracing is removed). For interior bracing on upper floors, you may secure the diagonal directly to the floor decking material. If you are using a turnbuckle, as recommended, it will have perforations for either a stake or screws to allow for these attachments.

All end bucks should be braced in at least three locations, the top, bottom, and middle of the wall, in addition to the vertical bracing installed for alignment.

5. **Adjustment.** Use a 4-foot level to check the wall for plumb and adjust with the turnbuckle, or the re-positioning of the stake or wall connection. Once all forms are in place, set a string line along the wall, attached at the corners you have plumbed, to provide a reference point for any further adjustments.



## C.10 BRACING AND SCAFFOLDING (continued)

### C.10.3 BRACING TIGHT CORNERS.

In addition to the corner and intermediate bracing you have installed to align the walls, it is important to pay attention to areas where less than two feet of space exists between a corner and a door opening, or another corner (return). This creates what we call a jog or a “tight corner” where additional concrete pressure may develop in the forms during concrete placement.

In these instances, it is advisable to provide additional support to the corner area to avoid unnecessary bulging or separation in the formwork. This additional support can be provided by:

1. Securing the corner with strapping or plumbers tape attached around the corner and back to the nearest form or window buck.
2. Securing the corner with pieces of 1x4 lumber attached to the nearest form or window buck.
3. Securing the corner internally to the nearest connecting form or buck with wire or heavy-gauge zip ties (75 lb. test, or greater).
4. Attaching plywood to the outside surface of the corner where the concrete pressure is expected to be abnormally high.

Whichever method you choose to support the forms under these conditions, it is always advisable to place concrete in these areas with care and caution in order to prevent undue pressure from building in the formwork. If you allow for the concrete to flow into the corner, for example, rather than drop it straight down into the corner cavity, you will minimize the risk of over-pressurizing the area.

## C.10 BRACING AND SCAFFOLDING (continued)

### C.10.4 SCAFFOLDING.

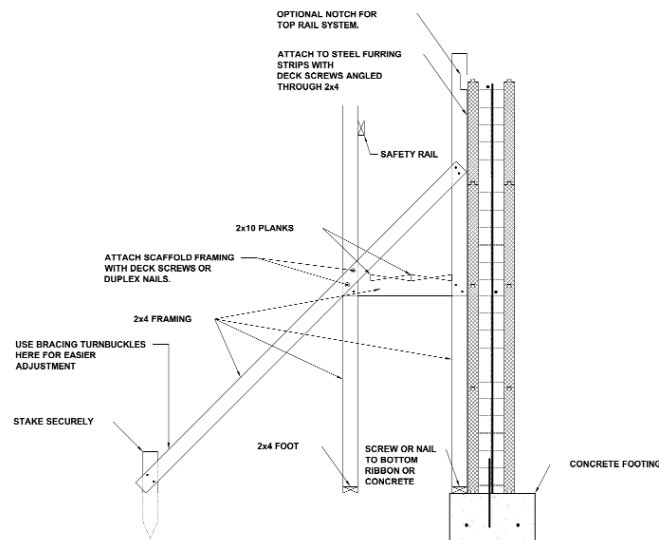
Scaffolding provides the work platform for the placement of concrete and the additional work necessary at the top of the PolySteel wall. There are two primary types of scaffolding to consider when planning your project, each has its own advantages to take into account. **In all cases, an OSHA compliant work platform is required whenever you are standing more than 6' from the ground.**

1. **Integrated Scaffolding.** The use of scaffolding as an integral part of the bracing system provides a convenient and efficient platform for the placement of concrete and work at the top of the wall. It also, however, places an additional load on the alignment system, and should be constructed and/or installed securely to ensure that it does not interfere with the alignment of the wall. The Panel Jack System recommended above, is designed for this purpose and will provide you with the safety, security, and performance you need for a successful project.

For larger projects, you may use the ReechCraft Tall Wall System, or traditional pole scaffolding secured to the PolySteel wall. Consult your PolySteel representative for system types and availability for this application.

If you are planning to construct scaffolding as part of a wood or steel-stud bracing system, consult the illustration below. ***Caution: While this application may provide an economical one-time solution, scaffolding constructed in this way creates an obstruction to the free flow of work across the walk board.***

FIGURE 3.12 WOOD BRACING AND SCAFFOLDING



2. **Independent Scaffolding.** For large or small projects, roll-around, or motorized automated lift scaffolding provides a flexible, cost-effective, and safe alternative to a fixed system. If you are working from an interior slab, this system works extremely well.