

BIG BLOCK 1600

Polycrete®



Installation Manual

Version: 1.0
Revision: 1.10
Date: 2011-11-27

About this manual

This manual is intended to assist the contractor, or installer of the Polycrete® Big Block in the proper techniques of construction. This manual assumes that generally accepted construction practices (i.e. level, plum and square) have been employed when building with the Polycrete® Big Block. Structures built with the Polycrete® Big Block should be designed, engineered, and constructed in accordance with all applicable building codes and regulations.

Disclaimer

In keeping with Polycrete® policy of continuing research and development, we reserve the right to change or modify the contents of this manual at any time. It is the responsibility of the end user to obtain the most recent information available. Since Polycrete® has no control over installation or workmanship, no responsibility for results is expressed or implied.

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1 SYSTEM OVERVIEW

1.1 Introduction and performances

1.1.1 Polycrete® Big Block system

Insulated Concrete Form (ICF) systems for concrete building solution have been developed during the last two decades.

- The new Polycrete® Big Block ICF system brings a revolutionary solution with its sturdiness, performances and its fast setup installation.
- The Polycrete® Big Block ICF system is manufactured with expanded polystyrene (EPS) embedding a steel wire mesh reinforcement. The wire mesh molded in the expanded polystyrene panels brings an extreme sturdiness and perfect wall stability.
- Polycrete® Big Block ICF is assembled with metal ties during the manufacturing process and is foldable. It's almost unbreakable and the costs of transportation are significantly reduced.
- The Polycrete® Big Block ICF is the largest on the market. It covers 16 sq ft (1,48m²) of wall. This large surface and its very simple design bring a very fast and economic method to set up the product on the building site.
- The Polycrete® Big Block ICF product is the only system on the market that resist to a lateral pressure of 1600 lbs/sq ft (75KPa) during the pouring of concrete.
- Polycrete® Big Block ICF is available in two EPS thickness (2 ½" and 1 ¾") and is perfectly adapted for all kinds of concrete building such as a residential, commercial or industrial projects.

It brings incomparable performances for ICF installation and the pouring of concrete, but also a significant energy saving, a secure, quiet and comfortable home, adding value for the owners.



Picture 1

1.1.2 Thermal Insulation

All materials used in a Polycrete® ICF wall bring thermal insulation performances above all required standards.

Since the structural building envelope is made of reinforced concrete, covered on both sides by expanded polystyrene, this explains the high-energy efficiency of the Big Block. There is neither gap for air leakage nor thermal bridges in the wall. ICF homes and buildings are very economical to heat in winter as well as to cool in summer.

1.1.3 Sound Protection

Acoustic insulation is a major factor for the comfort of a building owner. However, this is a very complex matter with a lot of various parameters. Most of the noises come from two sources:

- Aerial sound coming from interior or exterior (cars, radio, voices, electrical appliances etc.)
- Impact noises mainly due to impact on the floors.

Polycrete® ICF walls are perfectly airtight and bring excellent protection to aerial sound. Don't forget: No air leak = No sound! Polycrete® ICF wall reaches a sound attenuation rate of more than 55dB (A), which is better than most of the building codes requirements.

A concrete floor or slab propagates very well all impact noises. Special care must be conducted during the design to break the concrete continuity and then stop impact noise propagation. Construction sealant, carpet floor or floating slabs are several solutions to avoid impact noise.

It's strongly recommended to consult a specialist in this expertise area for the building design.

1.1.4 Fire Resistance

Nowaday, it's worldwide recognized that concrete is an excellent material against fire propagation. Concrete fire resistance is:

- 3 hours for a 15cm (6") concrete wall thickness
- 4 hours for a 20cm (8") concrete wall thickness

It's also clearly demonstrated that flame spread and smoke developed by expanded polystyrene are significantly less than ones developed by the same quantity of wood material. The fact that Polycrete® Big Block does not use any plastic web or ties, improves the fire resistance of Polycrete® wall. A good choice of finishing material will complete the fire resistance.

1.1.5 Increased Durability and extreme climatic resistance

Concrete reinforced walls (like Polycrete® ICF) are one of the most reliable and long life building solutions due to their structural strength. ICF Polycrete® product provides a perfect concrete maturation that reduces potential cracks in the concrete wall. Furthermore, the concrete is protected on both sides by panels of expanded polystyrene, which is an inert material with stable properties and is non-biodegradable. EPS panel can't be degraded by extreme climatic conditions such as rain, sun or frost and thawing cycles.

Everybody knows that nothing can resist to extreme nature cataclysm, nevertheless, it's worldwide recognized that concrete building with monolithic structures, are the best building solution to resist to hurricanes or seismic phenomena.

1.1.6 Environment and Ecology

While providing a high quality way of life, concrete Polycrete® ICF homes also participate to preserve the environment and our energetic resources. The superior thermal efficiency of ICF concrete walls allow to reduce by more than 50% the cost of the energy bill, throughout the year.

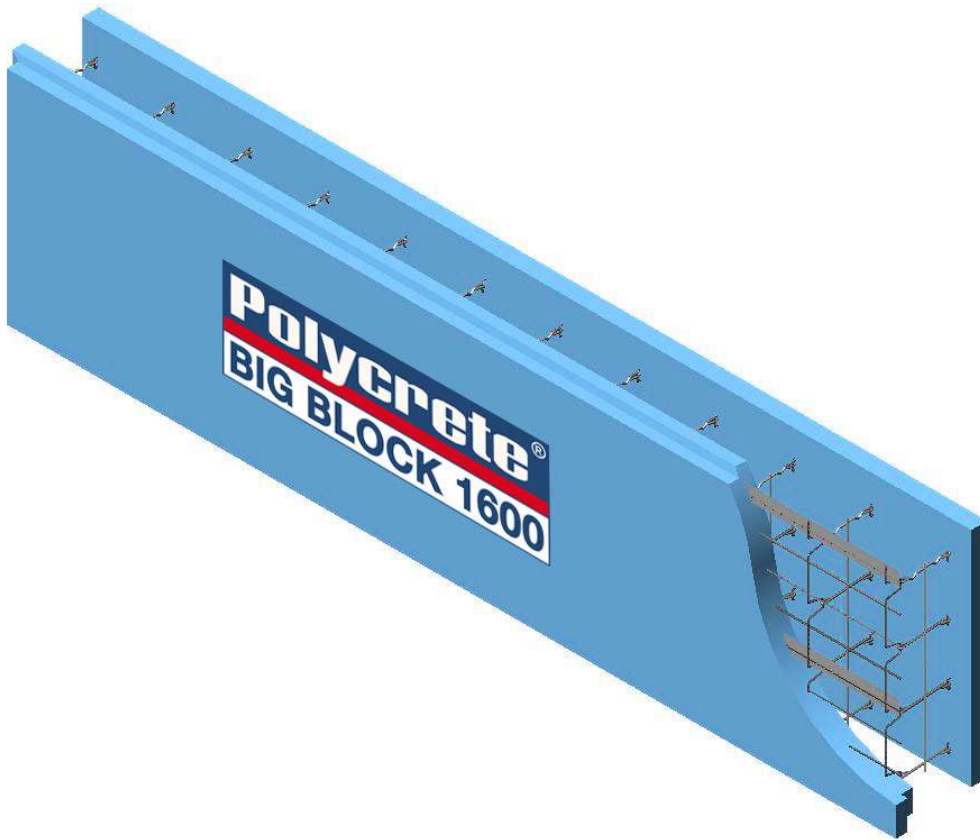
The expanded polystyrene used for the Polycrete® ICF products contains 98% of air and 2% of material. It's a modern product, clean and chemistry neutral, without any form of CFC. It's a non-biodegradable material (which is a required ICF property) but it's 100% recyclable and does not generate any kind of pollution.

Polycrete® ICF product properties and performances allow using these products for LEED projects in North America.

1.2 Product Specification

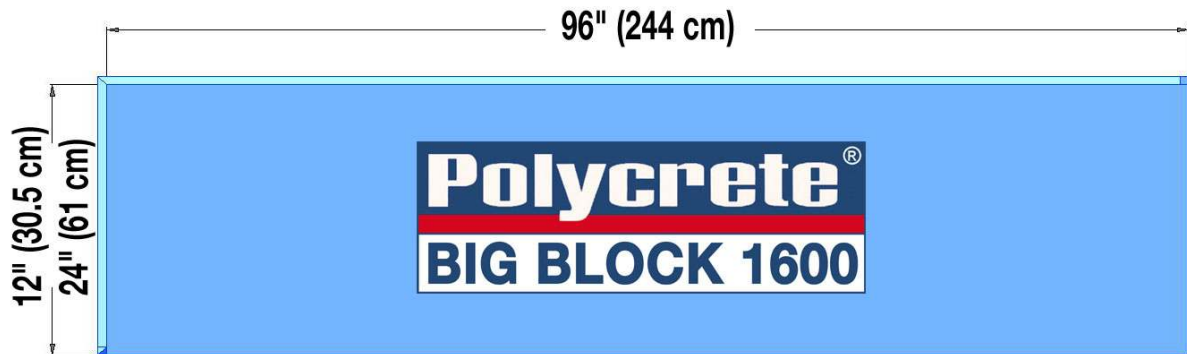
Each Polycrete® Big Block ICF is formed with the following parts:

- 2 panels of expanded Polystyrene (EPS type II)
- 1 steel wire mesh molded inside each EPS panel.
- 2 metal fastening strips welded to the wire mesh and molded inside EPS panels.
- 12 foldable steel assembly ties for the 2 EPS panels assembly. Each assembly ties is composed of 4 clips.



Drawing 1.2.a

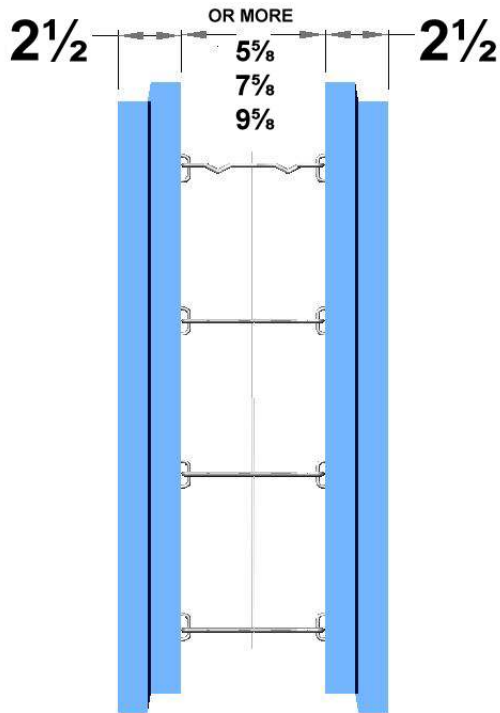
Each expanded Polystyrene panel measures either 12" (30.5 cm) or 24" high (61cm) and 96" in length (244cm).



Drawing 1.2.b

Standard EPS panel thickness is 2 ½" (64mm). A 3 ¼" EPS thickness is also available on request.

Assembly ties are available in 3 standard dimensions to provide concrete walls with 5 ⅝" (14,3cm), 7 ⅝" (19,4cm) or 9 ⅝" (24,5cm) thickness.



Drawing 1.2.c

Table '1.2.d' resumes standard dimensions of Polycrete® Big Block ICF.

Big Block 1600			
Block Height	12" (30.5 cm) or 24" (61 cm)		
Block Length	96" (244cm)		
Wall Surface	16 sq f (1,48 m2)		
Concrete Thickness	5 5/8" (14,3 cm)	7 5/8" (19,4 cm)	9 5/8" (24,5 cm)
Concrete Volume	7,5 cu f (0,21 m3)	10,2 cu f (0,29 m3)	12,8 cu f (0,36 m3)
EPS Thickness	2" 1/2 (64 mm)		
ICF Thickness	10 5/8" (27,0 cm)	12 5/8" (32,1 cm)	14 5/8" (37,1 cm)

Table 1.2.d – Standard dimensions of Polycrete® Big Block ICF.

Notes:

1. Concrete wall thickness 5 5/8" (for 6"), 7 5/8" (for 8") and 9 5/8" (for 10") are adjusted to fit with North American standard dimensions of building materials.
2. Assembly tie length can be adjusted during the manufacturing cycle, on special order, to allow different concrete wall thickness.
3. Expanded polystyrene thickness can be adjusted during the manufacturing cycle, on special order, to 1 3/4" (45mm) following thermal insulation performance required.

1.3 Material and Tooling

1.3.1 Recommended tools for Polycrete® Big Block installation

- Measuring tape
- Chalk line
- Spirit level or laser level
- Alignment rope
- Rebar bender and cutter
- Bolt cutter (used to cut metal assembly ties)
- Circular saw with 7" or 10" diameter diamond blade.
- Reciprocating saw
- Hot knife
- Drill etc...

1.3.2 Material

- 90° and 135° metal corner guides supplied by Polycrete® (sold or rented)
- Scaffolding supplied by Polycrete® (sold or rented)
- Metallic starting bases (sold by Polycrete®).
- Anchor bolts and nuts, screws, nails.
- Wood floor screws No 8 to be used to Polycrete® Big Block fastening strips.
- Steel rebars
- Floor and roof anchors
- Waterproofing membrane or equivalent
- Wood lumber for openings.

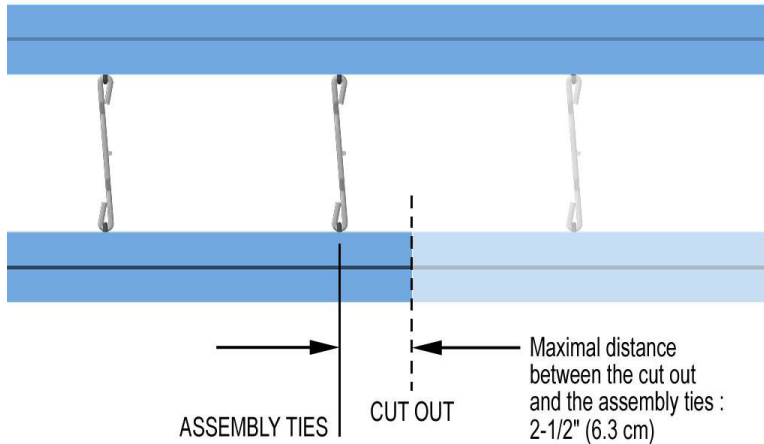
This material list contains typical material for Polycrete® ICF wall installation. Additional tools or material could be required following project design.

1.4 Cutting procedure for Polycrete® Big Block products

The Polycrete® Big Block extreme sturdiness is obtained by inserting and molding a steel wire mesh inside each expanded polystyrene panel. Cutting a Polycrete® Big Block panel must be done with powerful tools capable of cutting the steel wire mesh and the metal fastening strips as well as the EPS.

1.4.1 Cut out rules

When you need to cut Big Blocks, it is important to have less than 2-1/2" (6.3 cm) between the last remaining assembly ties and the cut. In fact, you should always avoid having a large area of a Big Block panel exposed to the lateral pressure of the concrete when pouring without having the support of assembly ties. Not doing so, could lead to undesired problems while pouring concrete.



Drawing 1.4.1 – Maximal distance between the cut out and the assembly ties

Also, whenever you need to cut out Big Block for openings, make sure to place the false buck in the ICF wall and fix it with screws and fender washers through the ICF. Fix the false buck with the ICF fastening strips whenever possible. See the 2.9 section for more details.



Polycrete® recommends to use wood floor screws no 8, available in various lengths of 1 1/2", 3" and 4" (38mm, 76mm and 100mm).

1.4.2 Right angle cut out

Right angle cut out (0 degree) can be easily performed with an 7" or 10" circular saw equipped with a 7" or 10" diamond blade.

To obtain a clean cut, it's recommended to use a saw guide and to proceed regularly, without shock not damage the blade.



Drawing 1.4.b - Diamond saw blade

1.4.3 22.5° cut out

The procedure is the same as for the right angle but the saw blade must be tilted by 22.5 degrees. This kind of cut is necessary for 135 degrees wall corner. Even with a 10" saw blade, it is possible that the blade does not cut out the whole EPS thickness. In this case, it will be necessary to complete the EPS cut out with a hot knife or a hand saw.

1.4.4 Opening cut out

Opening cut out will be performed with the circular saw and finalized (near the corners) with a reciprocating saw. We recommend using a '22 teeth per inch' blade for the reciprocating saw.

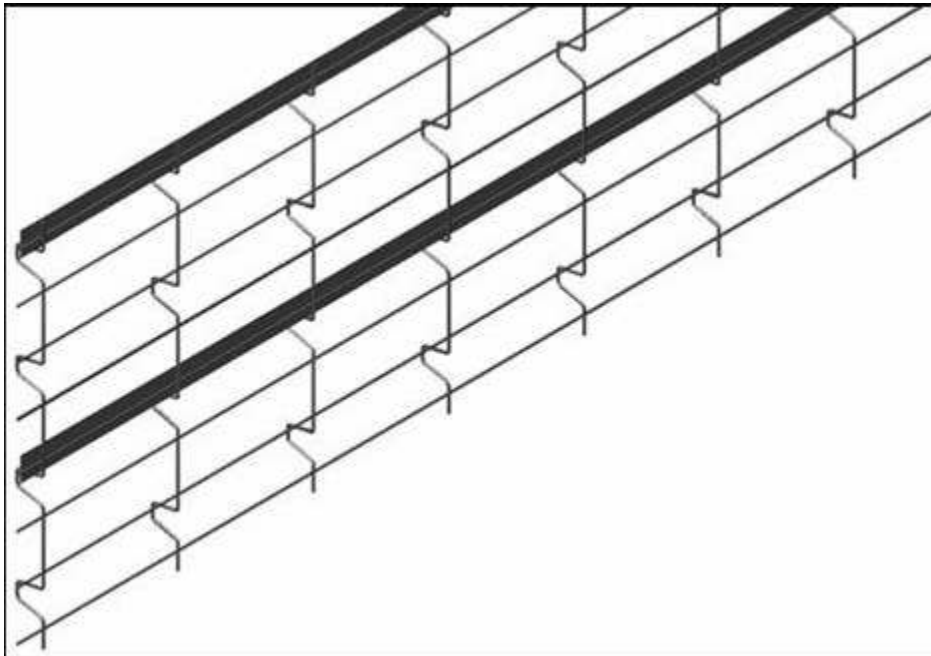


For your security ALWAYS wear protection gloves and glasses to perform Polycrete® Big Block ICF cut out. Steel particles can be projected during cutting.

1.5 Fastening Strip

Two metal fastening strips are welded to the wire mesh and molded inside each EPS Big Block panel (drawing 1.5.a).

Each fastening strip is a galvanized metal strip of 1 ½" (38mm) wide, and 22 gage thickness (0,83mm). The spacing between the 2 fastening strips is 12 inches (30.5 cm) (center to center).



Drawing 1.5.a: Fastening strip positioning in the metal wire mesh.

These fastening strips are intended to fix the interior and exterior wall finishing. They also serve to fix the corner guides, the scaffolding and optional form molds during the installation of the Polycrete® Big Block wall. These fastening strips are made of metal strip, so it is necessary to use high quality screw.

1.6 Product Delivery

Polycrete® Big Block ICF is packed 16 Blocks per bundle. Each bundle measures approximately 105" x 49" x 47" (L x l x h) and weights around 520 lbs (236 kg). Polycrete® Big Block bundles must be shipped on 'flat Bed' trailer. A 48 feet trailer allows to ship 22 Polycrete® ICF bundles. A Polycrete® Big Block ICF bundle covers 256 square feet (24 m²) of wall surface. So, a 22 bundles trailer gives 5632 square feet (533 m²) of wall surface.

Bundles must be handled with care not to damage EPS panels. A forklift is mandatory to download the bundles on the job site. It is recommended not to remove the protection film over the bundles until the installation of the Polycrete® Big Block ICF.



Picture 2



Picture 3

1.7 Codes and Security rules

All technical information (computations, drawings, pictures) contained in this manual and relative to building techniques is provided as an example, to the best of our knowledge. In any case, this information must not supersede computed results and construction drawings provided by design architect or building engineer, following each state, province or country codes and regulations.

It is the designers and installers' responsibility to ensure the Polycrete® Big Block ICF product installation is performed in full conformity of all state, province or country codes and regulations.

Installation and security rules must also be applied in respect of all state, province or country codes and regulations.

For better security on the job site, several basic rules must be applied:

- Always ensure a clean and correct access to the job site.
- Always build up walls by the interior job site.
- Place all necessary material and tooling next to the wall in respect to the wall layout and by keeping a 10 feet distance (3m) for bracing and scaffolding setup.



Security is 'everybody's concern'...

2

INSTALLATION

2.1 Building Foundations

Building footing and foundation walls must be conformed to local building codes and regulations. These critical building structures must have been sized and computed by a certified engineer or builder after verification of the load bearing capacity of the soil. The footing or the slab will have to be perfectly leveled with an overall tolerance of $\pm 1/4"$ (± 6 mm).

When possible, footing will have to be on the same level on the overall building perimeter. When a step is required, it will have to be either 12" (30.5 cm) or 24" (61 cm) height (or a multiple of 12") which is the Polycrete® Big Block manufactured smallest height. This will avoid having to cut the Polycrete® ICF in his length. The footing will have to bear a lock or dowels to ensure a perfect connection of the footing and the foundation walls.



Picture 4



Picture 5



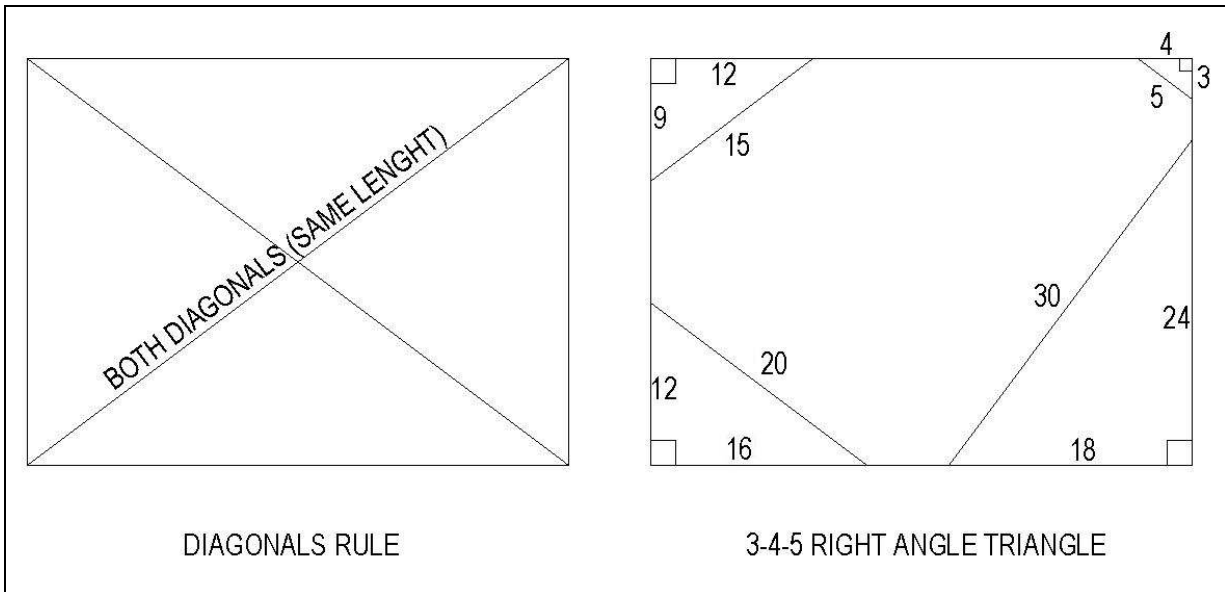
Picture 6

2.2 Wall Layout and starting bases

2.2.1 Wall Layout marking

For a perfect positioning of the first course of the Polycrete[®] Big Block ICF, a chalk line will be marked on the footing, corresponding to the exterior face of Polycrete[®] ICF blocks.

To ensure a perfect square building, diagonals rule or 3-4-5 right angle triangle principle will be applied (refer to drawings 2.2.a)



Drawing 2.2.a

2.2.2 Starting bases installation

To ensure a perfect stability of the first Polycrete[®] ICF course, dedicated starting bases must be used as shown in picture 2.2.b. Starting bases are supplied by Polycrete[®] and are available for each wall thickness. These starting bases will be fixed to the footing with concrete nails placed every 24" (61cm).



Picture 2.2.b

Starting bases must be installed perfectly flat on the footing to allow a perfect installation of the first course of Polycrete® ICF. In case of bad footing flatness, it will be necessary to adjust the footing with appropriate tools.

The installation of the starting bases must be made as follows:

- Mark the exterior perimeter using a “Chalk line”.
- Install the starting bases according to the desired wall thickness.
- Fix the starting bases with concrete nails to obtain a perfect stability.

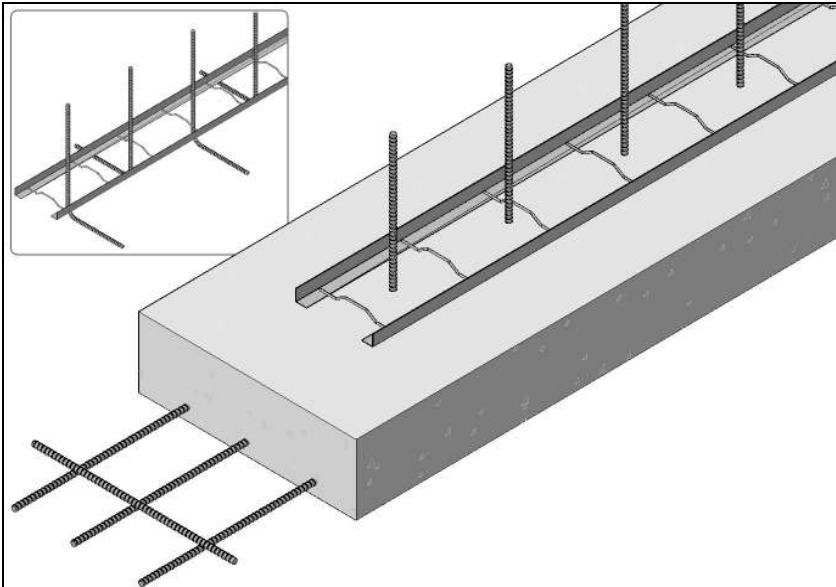


Figure 5.1.a Starting base

2.3 First course ICF placement



Before starting first course placement, it is requested to clean the footing and the starting bases and to ensure there is no remaining residue that could compromise the correct installation of Polycrete® Big Block ICF.

For the further courses, this policy will have to be strictly observed, to avoid that any residue fall inside the ICF wall and affect the concrete wall integrity.

To install the first course, it is recommended to take the necessary time to optimize the ICF blocks placement to reduce the cut out and the waste as much as possible.

It is recommended to start the first ICF positioning in a corner. The right angle corner placement and cutting are described in chapter 3.1 of this manual.



Picture 2.3.a



Picture 2.3.b

Perform the first course positioning all around the building perimeter. When possible, it is recommended not to perform cutting in the 24" (61cm) close to the corners.

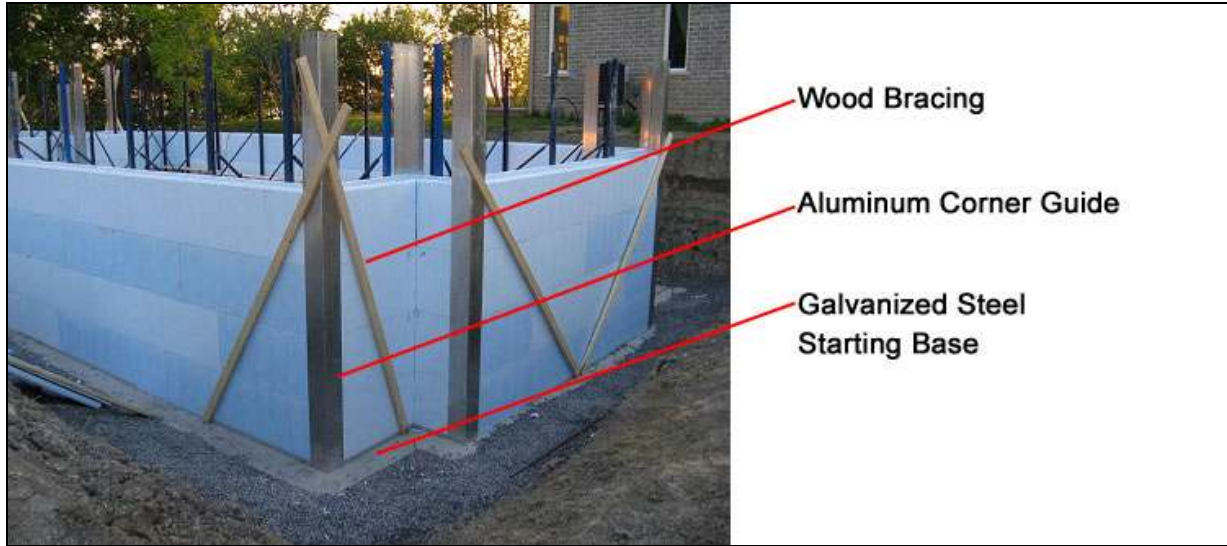
When all the blocks are cut and placed, it is strongly recommended to level perfectly the first ICF course, to ensure a perfect wall geometry and verticality for the further courses. The method consists of using a laser level, to determine the higher footing spot as the reference, and to level all the ICF blocks referenced to the higher spot. Do not forget to check the transversal horizontality between each internal and external panel.

When the first course is achieved, it is necessary to install exterior corner guides as explained in section 2.4.

2.4 Exterior corner guides

Once the first course of Polycrete® Big Block ICF is completed, it is necessary to put in place the corner guides to ensure a perfect stability and verticality of the walls.

Corner guides will be fixed in the starting base on the footing. After checking the perfect verticality of the corner guide, wood bracing (1"x 4" or 2"x4") will be fixed in the upper side of the corner guide and in the starting base (picture 2.4.a). Then, each Polycrete® Big Block will be fixed to the wood bracing and the fastening strips using appropriate wood screw length.



Picture 2.4.a

Corner guides are supplied (sold or rented) by Polycrete®'s authorized distributors. They are available in length of 12' (3,65m) for corner angles of 90 degrees and 135 degrees.

Between two corners, by checking distance at the bottom and at the top of the wall, you will ensure to have perfect wall geometry. This will complete the wall verticality check.

2.5 Reinforcing Steel placement

Polycrete® ICF walls for residential, commercial or industrial buildings are reinforced concrete walls. Steel reinforcement structure shall be defined by a certified engineer and be in conformance to local building codes and regulations.

Reinforcement structure is made of horizontal and vertical rebars. It must be installed in conformity with the drawings and specifications supplied by structure engineer.



HORIZONTAL REBARS MUST BE INSTALLED AFTER COMPLETION OF EACH POLYCRETE® ICF COURSE.

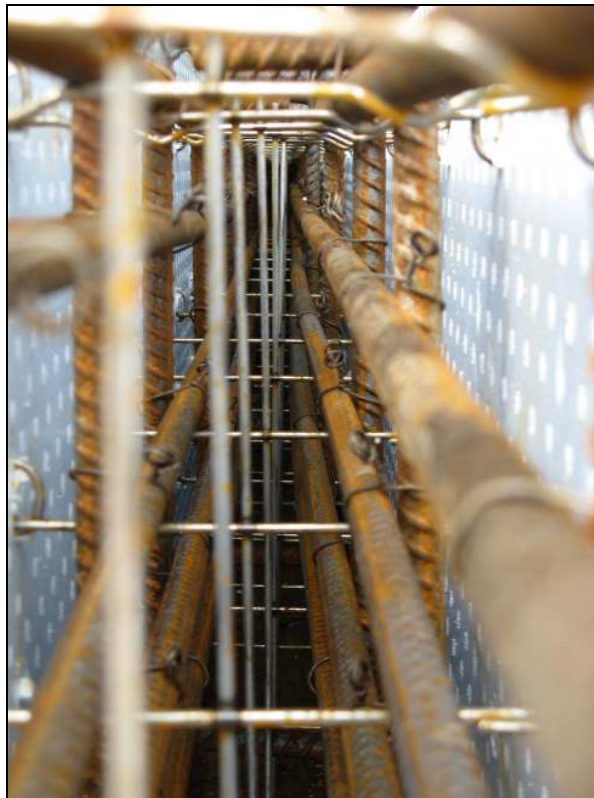
These rebars will be placed into the notches of the assembly ties and will be attached together to avoid any displacement during the pouring of concrete.

Vertical rebars will be installed before the pouring of concrete, when all the Polycrete® ICF blocks are installed. The vertical rebars could be cut 2" (5cm) below the top of the pouring of concrete. This will help the pouring of concrete operation. For successive storey or floor anchors or any other application requiring vertical rebars, it is recommended to install short rebars (respecting an overlap of 40 to 50 times the rebars diameter) or anchor bolts, right after the pouring of concrete is done.



Do not forget to place short rebars when finishing pouring!

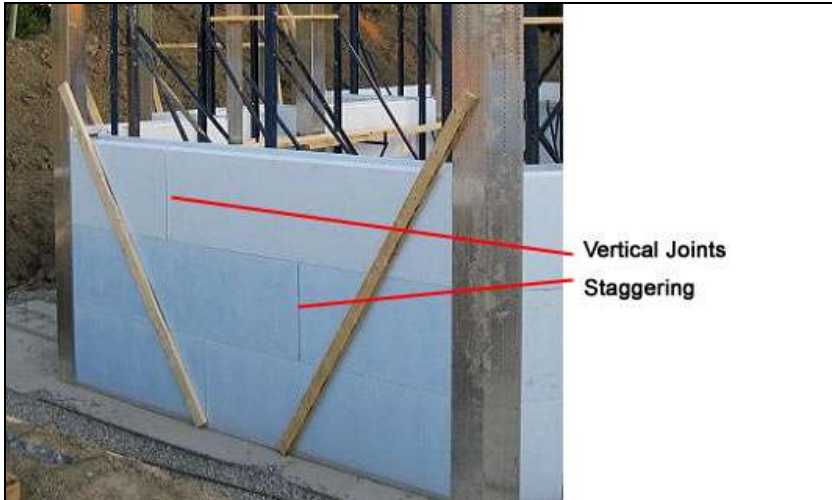
It is recommended to provide Polycrete® Big Block specification to structure engineer to help him take into account the Polycrete® Big Block ties spacing for the rebar placement.



Picture 2.5.a - Reinforcement structure for multi storey institutional project

2.6 Successive courses placement

Once the horizontal rebars are installed, the successive Polycrete® ICF course can be installed. It is necessary to cross the vertical joints to have a perfect stability of the ICF wall. Every time it is possible, a minimum of 12" (30.5 cm) staggering of vertical joints must be maintained (picture 2.6.a).



Picture 2.6.a

As for the first course, it is recommended to take the necessary time to optimize the second course placement. This will reduce cut and waste while respecting the vertical joints staggering.



Always check wall verticality and course horizontality before fixing ICF blocks to corner guides and bracing.

At the end of each course, do not forget to place horizontal rebars as described in section 2.5.

2.7 Wall Bracing

When the second course of Polycrete® Big Block ICF is completed, it is necessary to stabilize the ICF wall to ensure perfect wall verticality and to avoid any wall distortion during the successive ICF courses placement and during the pouring of concrete.

Bracing is obtained by the installation of Polycrete® scaffolding which also acts as vertical wall alignment. Scaffolding has to be installed as shown in picture 2.7.a.



Picture 2.7.a

- Wall bracing has to be done when second ICF course is completed.
- Maximum recommended spacing between scaffolds is 60" (1,50m).
- Scaffolds must be installed within 24" (61cm) of each wall corner.
- Scaffolds height is 12' (3,65m) and is supplied by Polycrete® (sold or rented).
- Scaffolds must be installed following procedures described in section 2.8 of this manual.

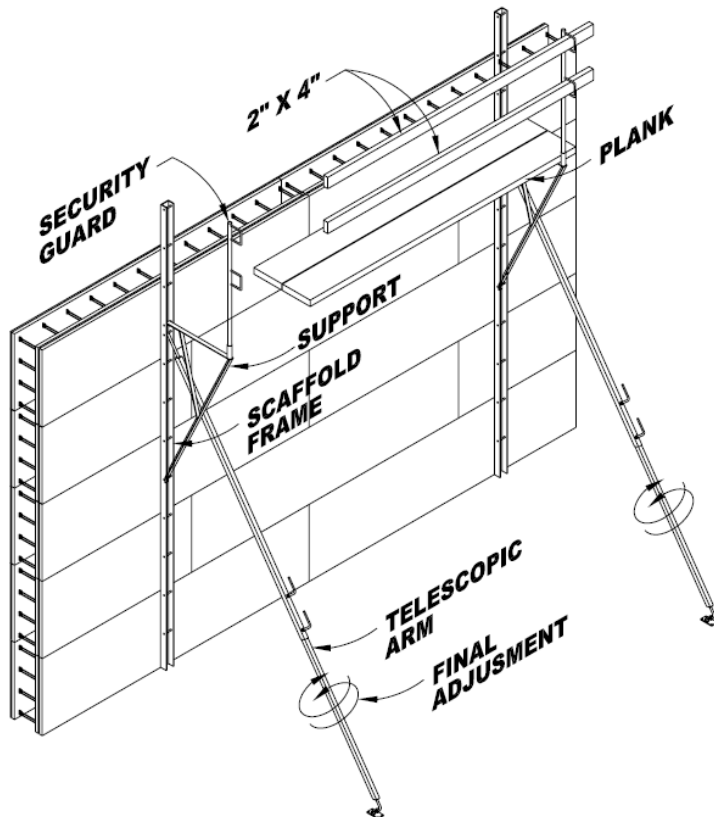
2.8 Polycrete® Scaffolding Setup

The scaffolding supplied by Polycrete® has 3 functions:

- Wall bracing and stabilization before and during the pouring of concrete.
- Vertical wall alignment before and during the pouring of concrete.
- Scaffolding for upper ICF courses and the pouring of concrete.

Perfect scaffolding setup is mandatory to obtain a high quality wall and ensure workers security.

A scaffolding assembly is made of 3 parts as shown in drawing 2.8.a.



Drawing 2.8.a



Unless there are very special circumstances, scaffolding should ALWAYS be installed INSIDE the building.

The scaffolding assembly steps are:

1. Attach the 'U' profile (channel) to each Polycrete® Big Block fastening strips with 2" screws (1)
2. Anchor the adjustable tubular bar to the ground plate (2)
3. Install scaffolding support with bodyguard to the 'U' profile (3).

IMPORTANT:

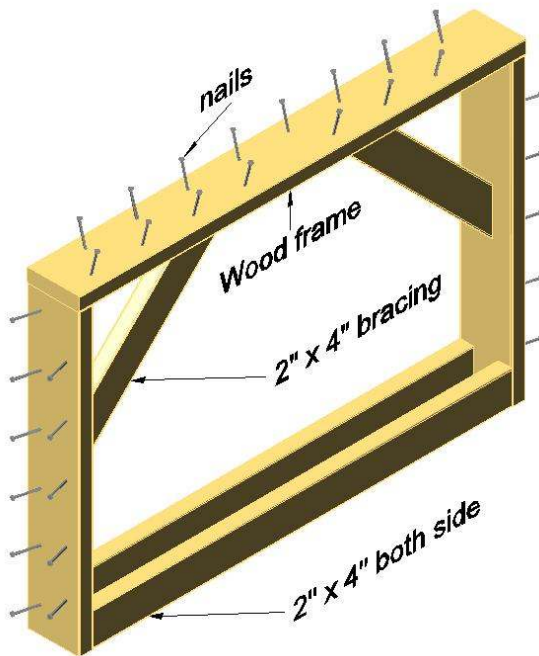
Whenever the scaffolding system is used to allow workers to circulate on the scaffolding planks, make sure to respect the following conditions :

1. The scaffolding frames (U profile) are always installed directly on the ground.
2. The distance between the ground and the planks does not exceed 9' (2.7 m).
3. Always install 2 scaffolding planks made to be used as such. Prohibit the use of other planks like 2" x 10" or less.
4. The planks must overlap the scaffolding supports at least 12 inches (30.5 cm) and each overlap is to be secured with 2 screws (#8 X 3").
5. Always install security guards (2" X 4") in the scaffolding supports when the working planks are at a height of 3 meters. Each 2" X 4" security guard must overlap and the overlap is to be secured with a screw (# 8 x 3").
6. The distance between the scaffolding frame must not exceed 5' (1.5 m).
7. Fix the scaffolding «U» frame with #8 X 2" screws in the Big Block's fastening strips, every 12" (30.5 cm).
8. A maximum of three (3) workers on a scaffolding plank. Only trained and authorized workers should have access to work with and on the scaffolding system.
9. If the wall is more than 12', the Polycrete scaffolding system should only be used for bracing, stabilization and alignment of the wall. Use a conventional scaffolding system for the workers to work on. For walls having a height of more than 12' (3.65 m), the above wall should be done in sections not exceeding 8' (2.43 m).
10. Adequately install and fix a ladder to access the scaffolding working platform made of planks. For bigger installations, plan at least two (2) access ladders.
11. The ground anchor plates (fixing the telescopic arm) must be fixed with 4 #10X2" screws (wood floor or wood stakes) or with 2 concrete screws (concrete floor).
12. Follow standard and security rules in effect.

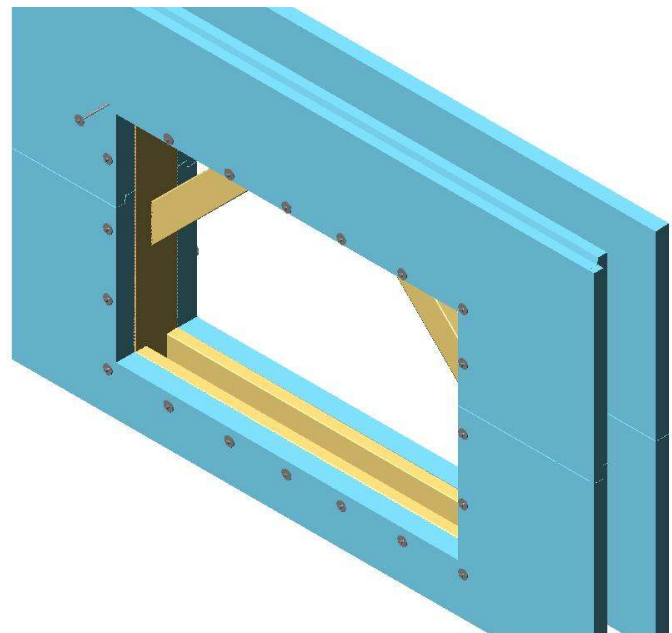
2.9 Window and door openings

Window and door openings must be carefully prepared to allow easy installation. The method consists of making a wood buck that either will stay in place after the pouring of concrete or will be removed following engineer instructions.

The method described here gives general guidelines for 'stay in place' option which is the most commonly used, but each 'false buck' will have to be carefully adapted following final assembly with interior and exterior wall finishing. This 'false buck' will serve as a formwork for the pouring of concrete and as support for the final buck.



Drawing 2.9.a



Drawing 2.9.b

- A gap of $\frac{3}{4}$ " (20mm) must be left all around the 'false buck' and the final door or window frame.
- False buck must have a wooden base in vertical position to allow an easy concrete flow during the pouring of concrete.
- Nails toward the concrete sides will serve as anchorage into the concrete (drawing 2.9.a).
- Place the buck in the ICF wall and fix it with 4" screws and fender washers through the ICF as shown on drawing 2.9.b. Fix the false buck with the ICF fastening strips whenever possible.
- Cut the ICF panels flush with the internal side of the buck.

Note: Before the pouring of concrete, ensure the buck will be able to support the load of fresh concrete above the buck, without any buck deformation or displacement.

In case of 'removable' buck option, the buck will not be inserted inside EPS panels, but will be placed flush with the EPS opening edges, and will only serve as formwork.



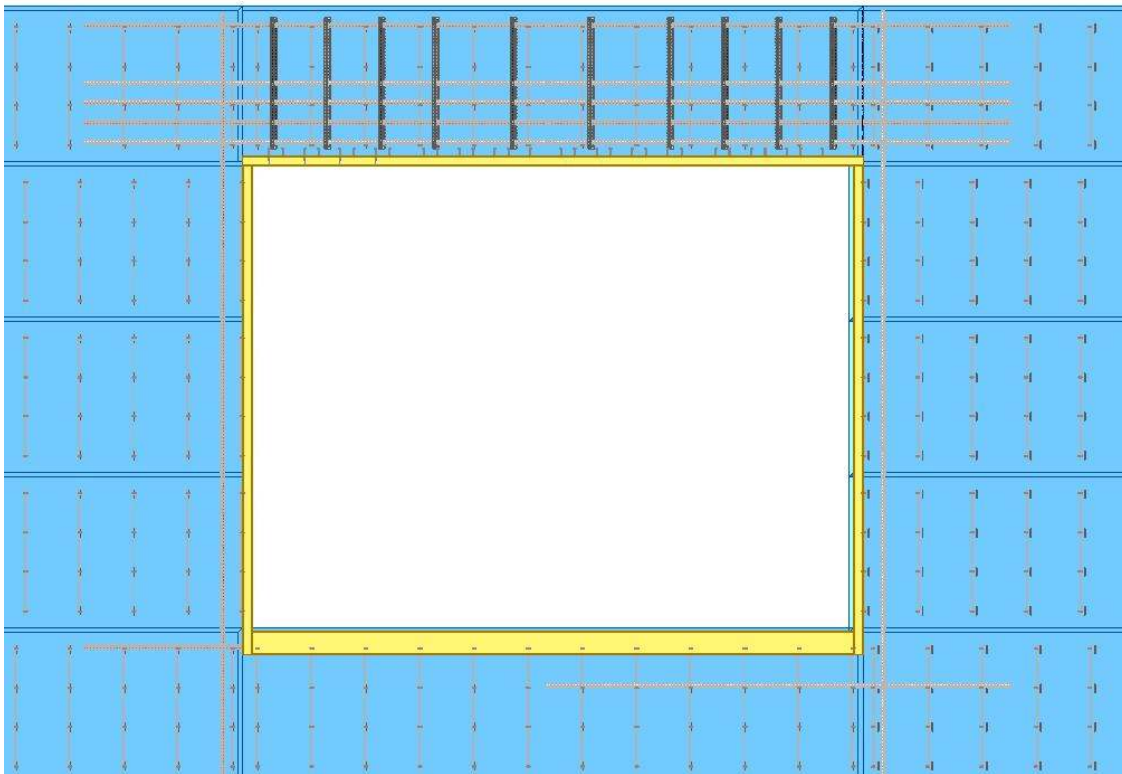
AFTER THE POURING OF CONCRETE, IT IS NECESSARY TO INSULATE (WITH POLYURETHANE FOAM FOR EXAMPLE) AND WATERPROOF (WITH SELF ADHESIVE WATERPROOF MEMBRANE FOR EXAMPLE) ALL OPENINGS.

2.10 Opening Lintel Requirements

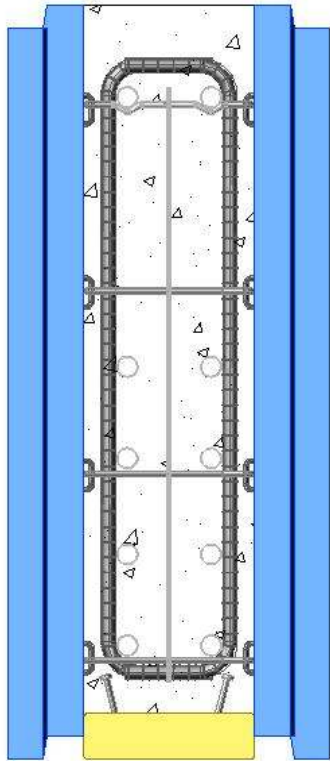
2.10.1 Lintel reinforcement requirements

Lintel reinforcement requirements must be designed and specified by structure engineer, especially when the lintel length is greater than 10' (3,0m). Tables based on uniform bearing load applied on the lintel are available upon request to determine the reinforcing steel requirements and stirrups height, number and positioning.

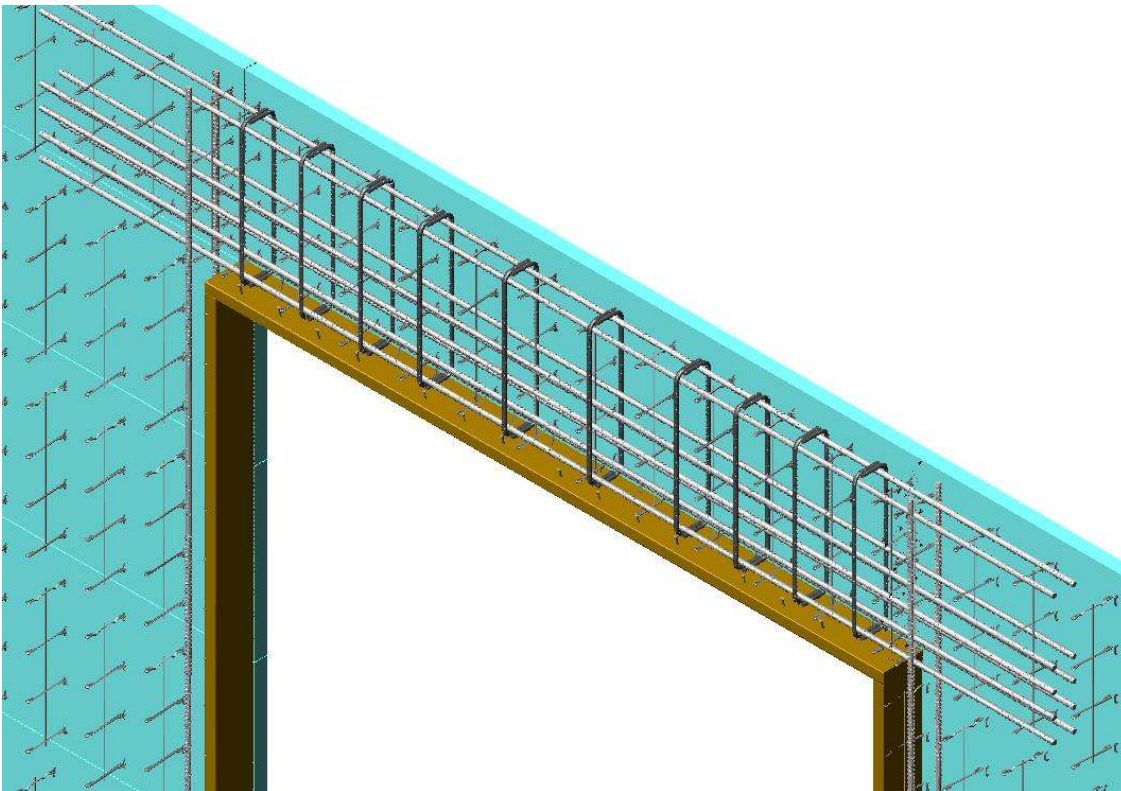
The drawing 2.10.a. gives a typical example of lintel steel reinforcement for a uniform bearing load.



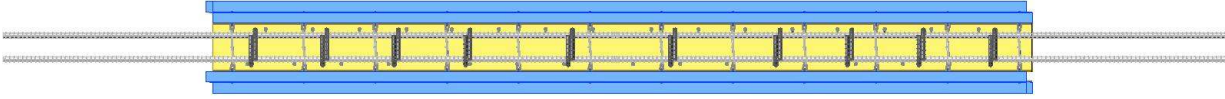
Drawing 2.10.a – Lintel-Elevation



Drawing 2.10.a – Lintel Cross Section



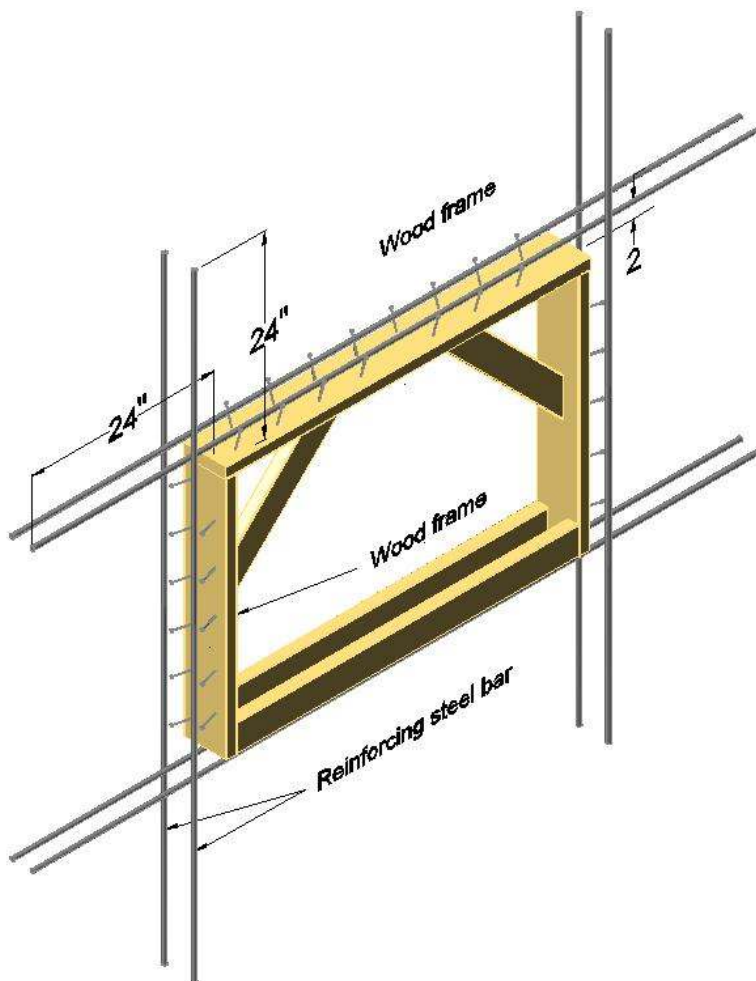
Drawing 2.10.a – Lintel ISO View



Drawing 2.10.a – Lintel Top View

2.10.2 Reinforcement around opening

Every opening in a concrete wall represents a weakness area in the concrete structure that may induce additional constraints and micro cracks. Each opening must be reinforced all around the opening with steel reinforcement bars as shown in drawing 2.10.b.



Drawing 2.10.b

- The buck must be surrounded with two 15M steel rebars placed in the concrete at 1" (25mm) distance from the buck.
- These rebars must exceed buck by 24" (61 cm) on each side.
- For large size openings, it is necessary to consult a specialized structure engineer.

2.11 Service Openings

Several service openings must be required such as:

- Water, gas, fuel lines
- Sanitary services,
- Chimney,
- Plumbing & Electrical,
- Exhaust (oven, dryer, air exchanger).

This kind of opening is a simple procedure before the pouring of concrete, but it has to be carefully placed to avoid further 'laborious' work after the pouring of concrete.



General contractors MUST consult ALL specialized contractors to size and place all required services openings at appropriate locations. This will avoid further services problems such as impossible services crossing or through wood or metal beam.

To set up these service openings, EPS panels must be cut with a keyhole saw or a hot knife. When the opening is done, use an appropriate pipe or sleeve to place it in the hole.

Installers can choose to place a larger pipe than required in order to further place the final pipe inside this one. Another method consists in placing directly the final size pipe, but in this case it is necessary that the pipe exceeds both sides of the wall to further place the pipe connections.

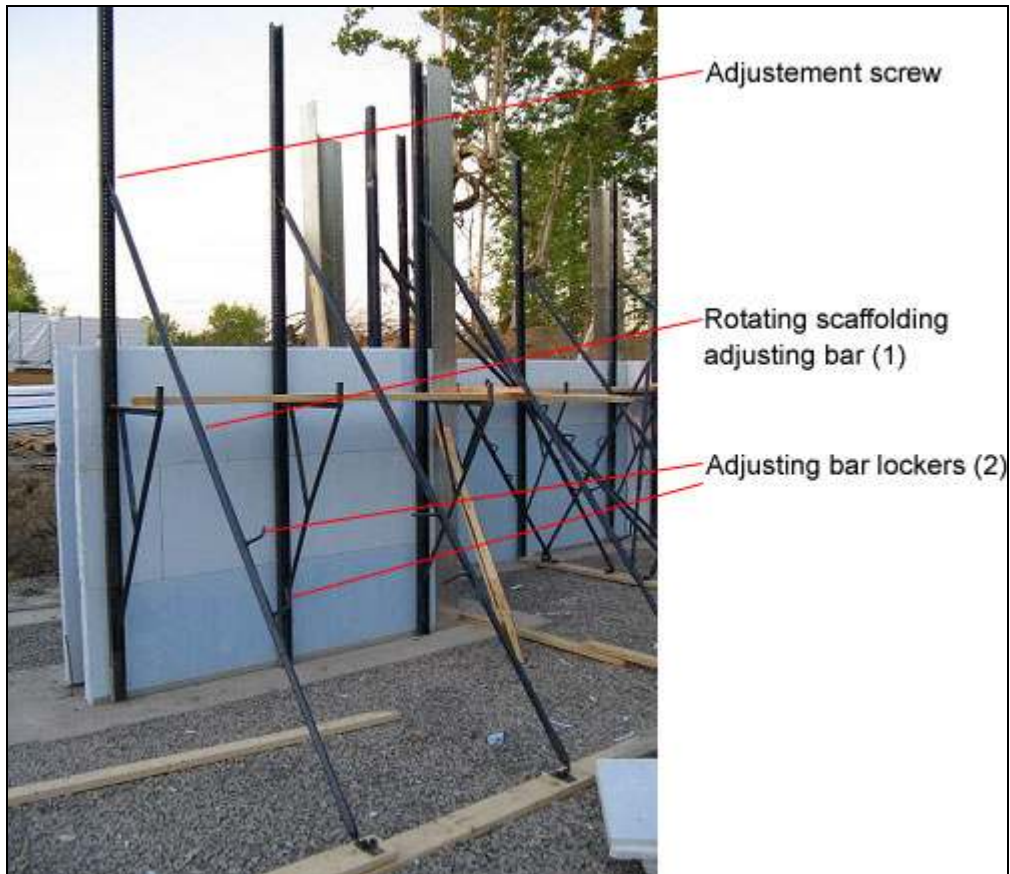
All pipes or sleeves placed in the wall will then act as 'formwork' during the pouring of concrete. They must be resistant enough to support concrete pressure. It is recommended to take special attention to large size entry pipe and to internally reinforce them is necessary.

Each time it is possible, avoid cutting embedded steel wire mesh or metal ties to avoid any weakness in the ICF structure. After the pouring of concrete, it will be necessary to insulate and waterproof all service openings with polyurethane foam and a waterproof product like a self adhesive waterproof membrane or plastic cement without any solvent.

2.12 Wall alignment adjustment

When each Polycrete® ICF course is completed, it is recommended to verify and adjust if necessary the right corner angles, verticality and walls alignment.

During and after the pouring of concrete, the same verifications and adjustments will have to be carefully done as the lateral pressure induced by the fresh concrete could induce some wall misalignments. Wall verticality has to be checked with a spirit level or a plumb line. Wall alignment can be performed with the following procedure:



Picture 2.12.a

1. On the exterior side of the wall, tighten a rope between each wall corner with a precise spacing between the rope and the wall.
2. During and after the pouring of concrete, align the wall by checking the spacing between the rope and the wall, in front of each scaffold.
3. Adjust each scaffold by screwing (rotating) the adjusting bar (1) in the appropriate rotation. It could be necessary to also modify the length of the scaffold adjusting bar by moving the bar lockers (2).

2.13 Joint bracket

The 4" (10.16 cm) joint brackets are mainly used to attached two Polycrete Big Blocks in the first joint starting from the corner of a wall. 2 brackets are needed per joint. The goal of this bracket is to avoid Polycrete Big Block from moving sideways near a corner. If you don't have joint brackets, you can simply use steel wire (16GA) to attach the Polycrete Big Blocks together near the corner.



Image 2.13.a – Joint bracket



Image 2.1.3.b – Joint bracket installation

It is preferable to install joint brackets on each side (interior and exterior) of the ICF in order to have an effective lock of brackets. Also, install the brackets on the first clip of the Big Block's assembly ties (as shown).

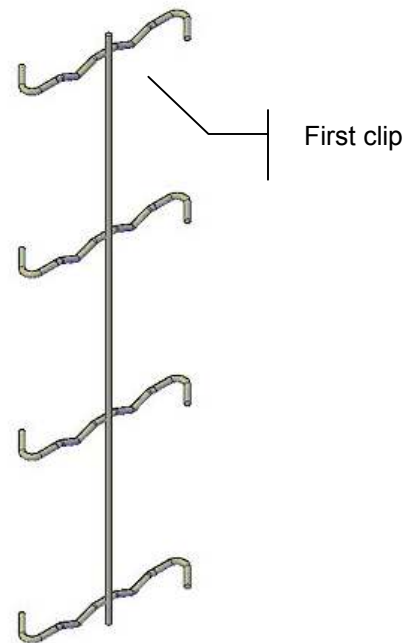


Image 2.1.3.c – Assembly ties

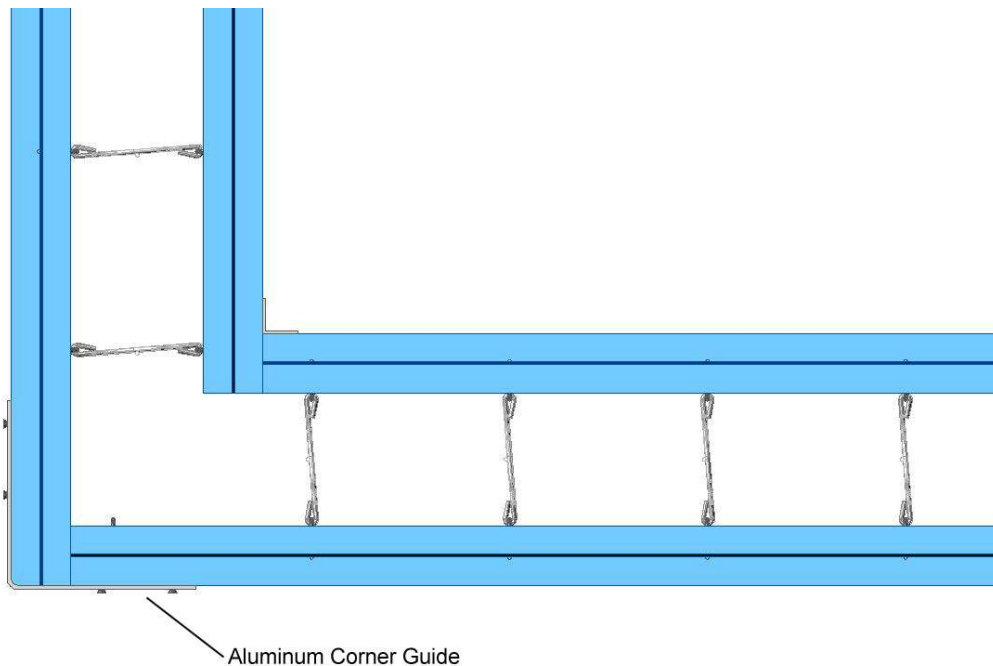
3 SPECIFIC WALL INSTALLATION

In this section, installer will find all necessary information and procedures to perform specific Polycrete® Big Block installation and cutting such as, right corner, 135° corner, intersection T wall or radius wall.

The cutting procedure of Polycrete® Big Block ICF is explained in section 1.4 of this manual.

3.1 90° Corner

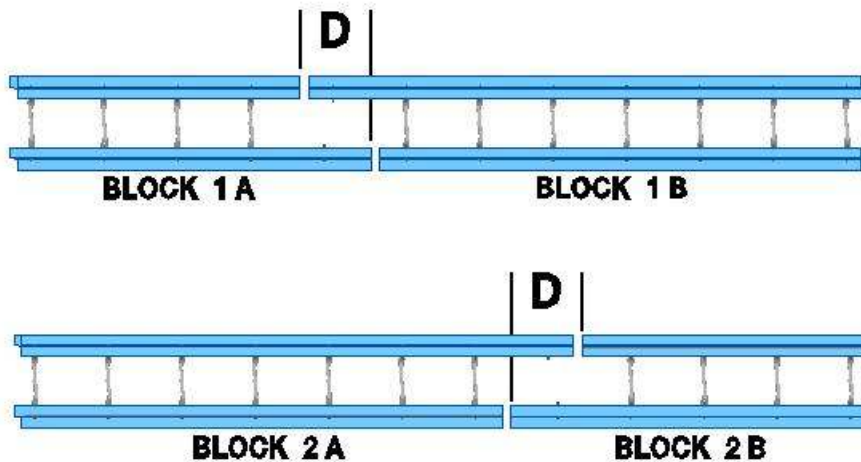
To realize a right angle corner, the recommended (and easier) solution is to perform a right angle cut such as describe here after in drawing 3.1.a. It's also possible to execute right angle corner with combined 45° cut outs, but this procedure is much more complex and does not bring any significant advantage.



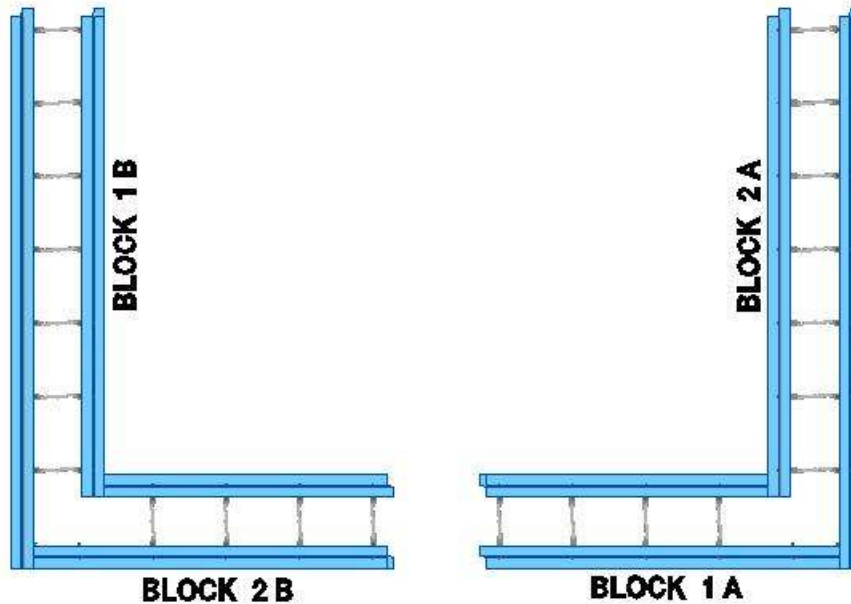
Drawing 3.1.a

To optimize ICF Big Block placement and significantly reduce ICF waste, the following procedure is recommended:

1. Take an original ICF block and cut them in 2 parts 1/3 - 2/3 as shown in drawing 3.1.b (block 1A and 1B).
2. The cutting distance 'D' is given in table 3.1.d versus the concrete wall thickness.
3. Take another original ICF block and execute the same cut out but with 2/3 – 1/3 as shown in drawing 3.1.b (block 2A and 2B).
4. Then place 'block1 – part A' and 'block 2 – part A' in a right angle corner of the building as shown in drawing 3.1.a.
5. Place the 2 remaining blocks (block1 – part B' and 'block2 – part B' in an opposite right angle corner of the building.
6. Verify the corner alignment and then screw the corner guide to the fastening strip of each ICF block.
7. For the next ICF course, execute exactly the same cutting procedure but invert the block placement in order to obtain the vertical joints staggering.



Drawing 3.1.b



Drawing 3.1.c

Table 3.1.d: Cutting Distance D versus wall thickness

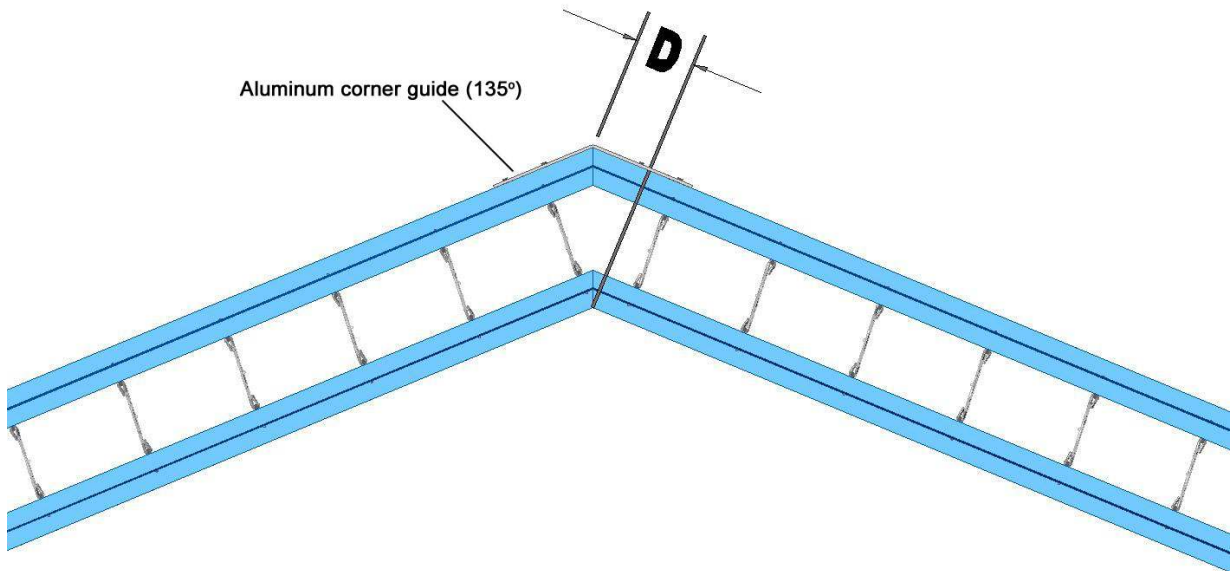
	Big Block 1600		
EPS thickness	2 1/2" (64 mm)		
Concrete wall thickness	5 5/8" (14,3 cm)	7 5/8" (19,4 cm)	9 5/8" (24,5 cm)
Cutting distance 'D'	8 1/8" (20,6 cm)	10 1/8" (25,7 cm)	12 1/8" (30,8 cm)

IMPORTANT NOTE:

- The 1/3 – 2/3 cutting ratio is given as a generic rule.
- It must be adapted to each corner versus the length of the wall in order to minimize or to avoid unnecessary cutout in the other ICF blocks of the wall.
- The purpose of this ratio is to avoid cutting the ICF block in the middle in order to always have vertical joints staggering between successive ICF courses.

3.2 135° Corner (cutting at 22.5°)

To realize a 135 degree corner as shown in drawing 3.2.a, the procedure is similar as for the right angle corner, except that the saw blade must be tilted by 22,5 degrees. The cutting distance 'D' is given in table 3.2.d versus the concrete wall thickness.



Drawing 3.2.a

Table 3.2.d: Cutting Distance D versus wall thickness

	Big Block 1600		
EPS thickness	2 1/2" (64 mm)		
Concrete wall thickness	5 5/8" (14,3 cm)	7 5/8" (19,4 cm)	9 5/8" (24,5 cm)
Cutting distance 'D'	4 1/8" (10,4 cm)	4 7/8" (12,3 cm)	5 5/8" (14,3 cm)

Notes:

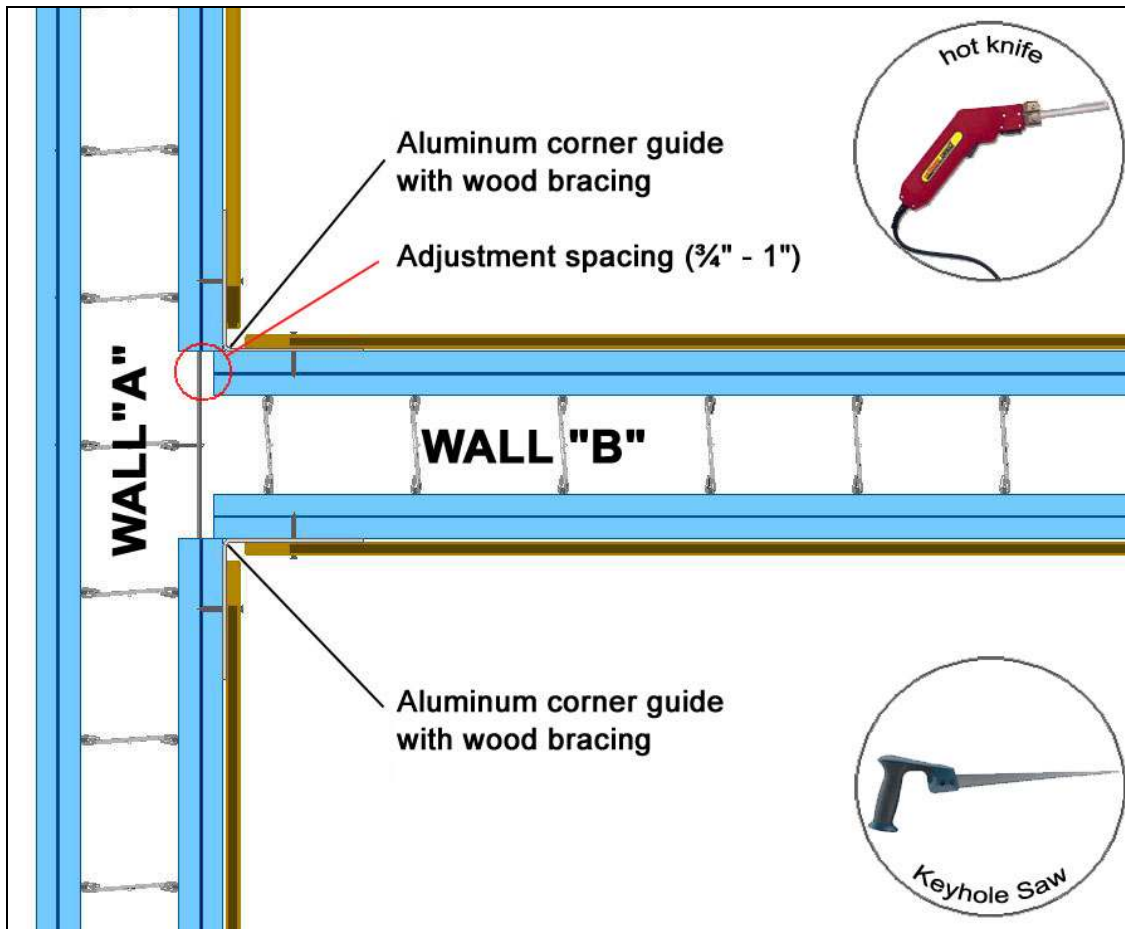
- The cutting distance 'D' must be measured on each external side of the EPS panels.
- When the ICF blocks are installed, verify the corner alignment and then fix the corner guide to the fastening strips of each ICF block.

IMPORTANT NOTE:

- The 1/3 – 2/3 cutting ratio is given as a generic rule.
- It must be adapted to each corner versus the length of the wall in order to minimize or to avoid unnecessary cutout in the other ICF blocks of the wall.
- The purpose of this ratio is to avoid cutting the ICF block in the middle in order to always have vertical joints staggering between successive ICF courses.

3.3 T - Wall (Intersection wall)

When you need to build a T-Wall, the procedures explained so far, are always valid. The difference of a T-Wall is only that two walls are intersecting together, as shown in the drawing 3.3. Considering that the starting bases are well installed, the installation procedure of a T-Wall is the following:



Drawing 3.3

1. Put in place an ICF block for the Wall A.
2. Determine the exact location of the Wall B on the Wall A ICF block. Trace by using a level
3. With a hot knife or a handsaw, cut and remove the expanded polystyrene of ICF block 'B' **WITHOUT CUTTING THE INTERNAL WIRE MESH.**
4. When the Wall B is put in place, keep a $\frac{3}{4}$ " to 1" distance between the Wall B and the internal wire mesh of the Wall A opening (see drawing 3.3). That spacing might be needed when the walls are to be aligned before and after the pouring of concrete.
5. In some cases it is preferable to build the Wall B once the Wall A is done. If such is the case, make sure to have the Wall A perfectly aligned prior to building the Wall B.

6. Place a corner guide in each right angle as shown in drawing 3.3 and fix it in the fastening strips of each ICF block. Make sure that you always have a right angle between both walls.

For the subsequent Wall A rows of ICF blocks, cut and remove the expanded polystyrene for the opening **prior** to its installation. That way, you will prevent remains from falling into the wall.

When installing each Wall B rows, it is important that horizontal rebars are continuing into Wall A. To do so, fold each rebar in such a way that approximately 1' of it is inserted into the Wall A. Make sure to alternate the rebar end in Wall A from row to row.

Notes:

- Polycrete® ICF block allows changing the concrete wall thickness without any problem between walls 'A' and 'B'.
- The configuration is commonly used to set up internal split walls.

3.4 Radius wall

Nevertheless, the metallic wire mesh embedded inside Polycrete® Big Block panels, it is possible to realize curved walls having a radius as low as 10 feet (3,0m).

It is necessary to initially create a wood assembly jig, having exactly the desired curve in order to realize ICF blocks having the same curve.

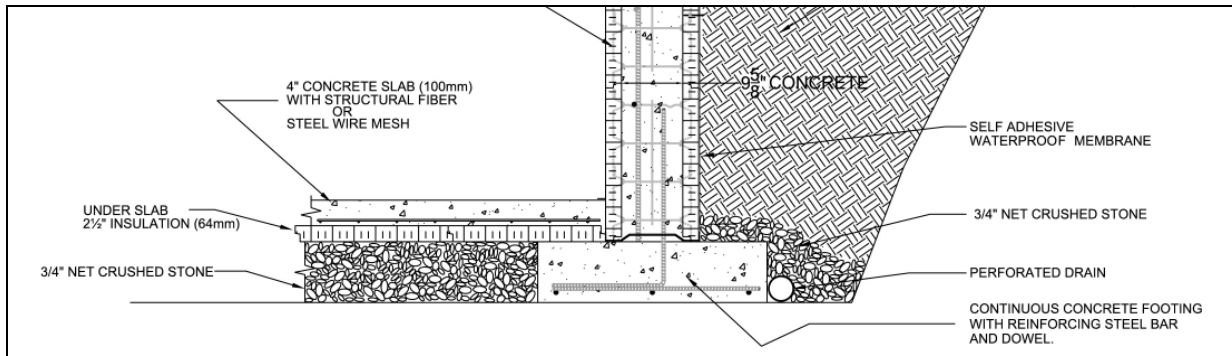
Radius wall sections are prepared upon special order at Polycrete® factory, following architect drawings and engineer specifications.



Do not hesitate to contact our 'Polycrete® Technical Team' for any questions or for assistance in Polycrete® ICF wall installation.

3.5 Foundation Wall to ground Slab junction

Interior building ground slab must be in accordance with local building code and regulations. Typical design rules are described below:



Drawing 3.5.a

- Interior building ground must be filled up with 3/4" net crushed stones and leveled with the footing.
- A polyethylene membrane must cover the entire building ground.
- 2 1/2" (64mm) insulating layer, made of Polycrete® expanded polystyrene insulating panels must cover the whole interior building ground.
- Reinforcing steel wire mesh conform to structure engineer specification must be lay-down on the insulating layer.
- A concrete slab is poured with appropriate thickness conform to engineer specification.

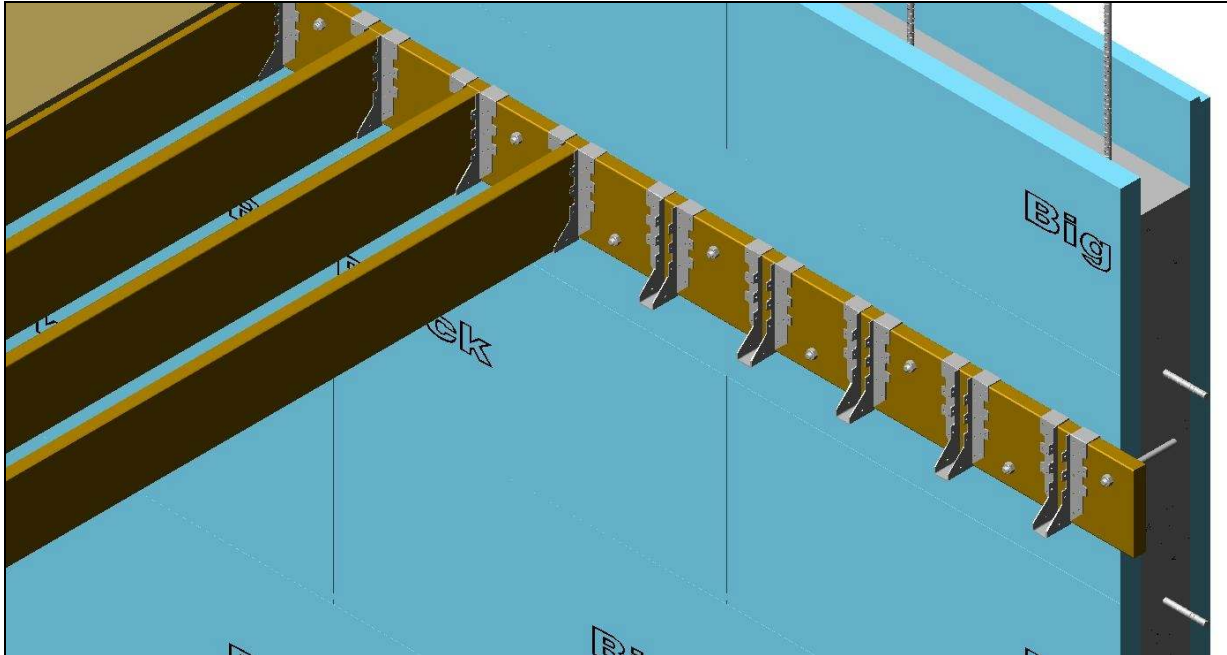
3.6 Floor connections

Floor connections with Polycrete® ICF walls are similar to floor connection to any standard concrete wall. Floor connections must be in accordance with structure engineer specifications.

Floor anchors (slide in anchor, joist hanger or anchor bolt, or any other anchorage type) must be installed before or during the pouring of concrete. Several typical floor connections are shown in the following sections.

3.6.1 Connection to traditional wooden floor structure

For all types of wooden floor, it is necessary to install an anchor beam (generally 2"x 10") on the wall, all around the floor, as shown in drawing 3.6.1.



Drawing 3.6.1.a

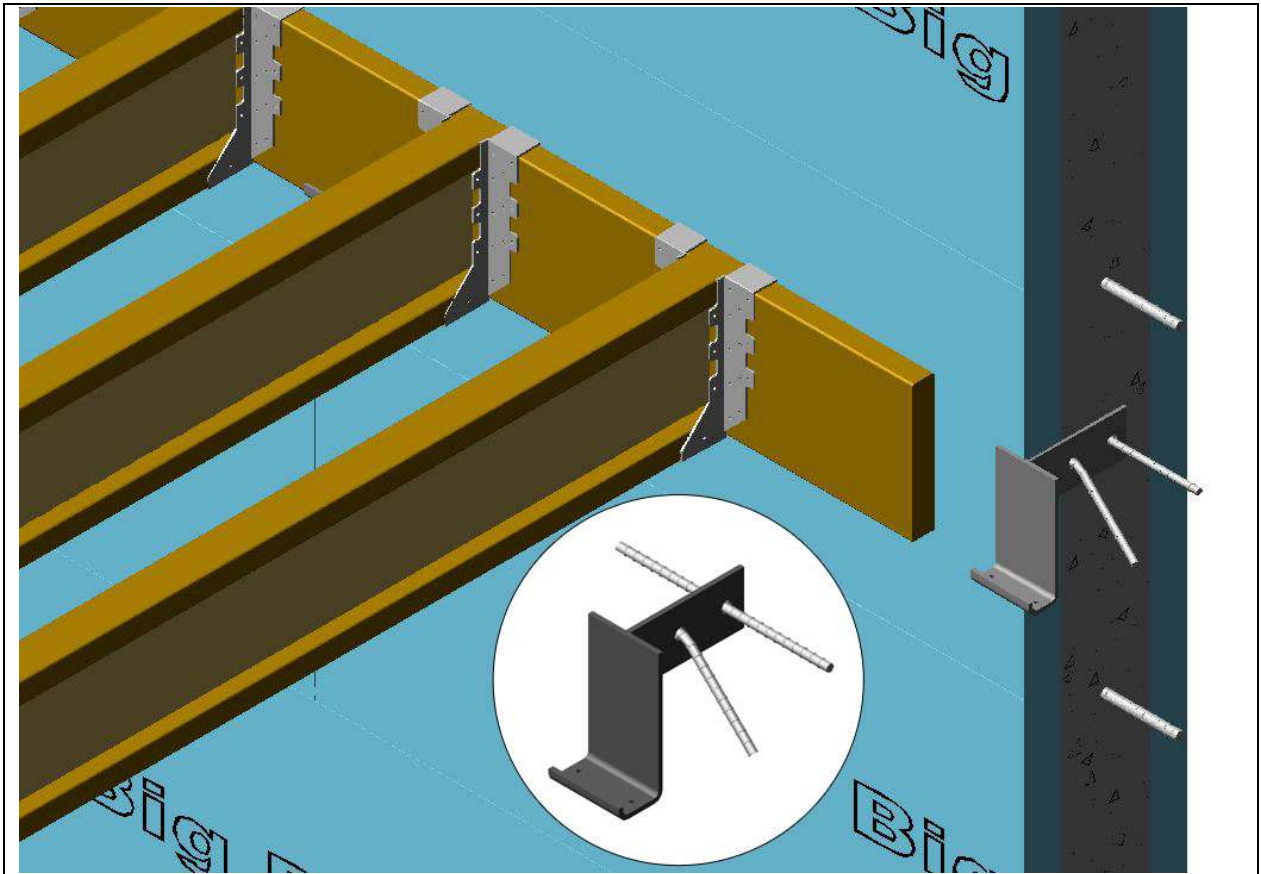
Procedure:

- 24 hours after the pouring of concrete, remove bracing and scaffolding.
- Establish the floor level, and position anchor beams all around the walls using screws inside the ICF block fastening strips.
- Drill holes, in staggered rows, throughout the anchor beam, EPS panel and inside the concrete wall, respecting specified spacing and further joist hanger positioning.
- Insert appropriate concrete anchor bolts in the holes, and tighten the anchoring bolts.
- Install joist hanger stirrups on the anchor beams.

The following table is given as a general rule to determine the maximal spacing between each anchor bolt based on the floor span. Please refer to the engineer specifications to get appropriate spacing and recommendations.

Floor span	Maximum distance between staggered 5/8" diameter anchor bolts (8" min. length)
Up to 12' span	Each 24" max.
12' to 16' span	Each 20" max.
16' to 20' span	Each 16" max.
20' to 24'	Each 12" max.

Instead of using anchor bolts as specified in the above procedure, you can use specialized ICF ledger connectors or hangers that need to be installed prior to the pouring of concrete. The following drawing is showing the Polycrete® ICF ledger hanger.

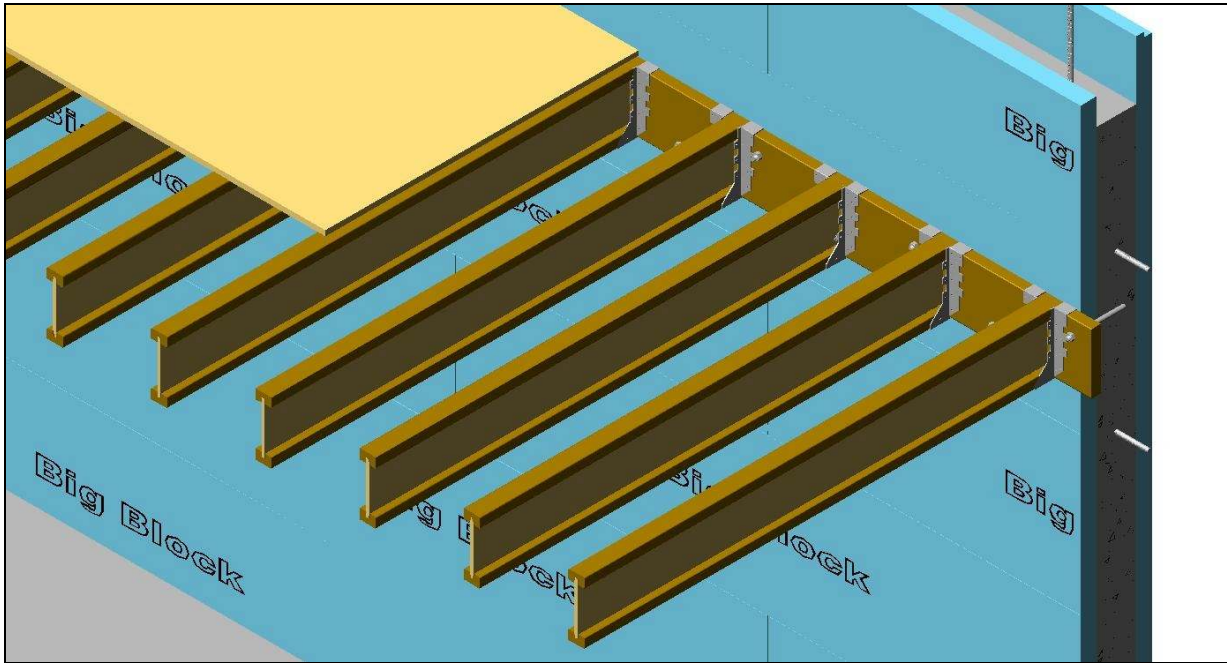


Drawing 3.6.1.b – Polycrete® ICF ledger hanger

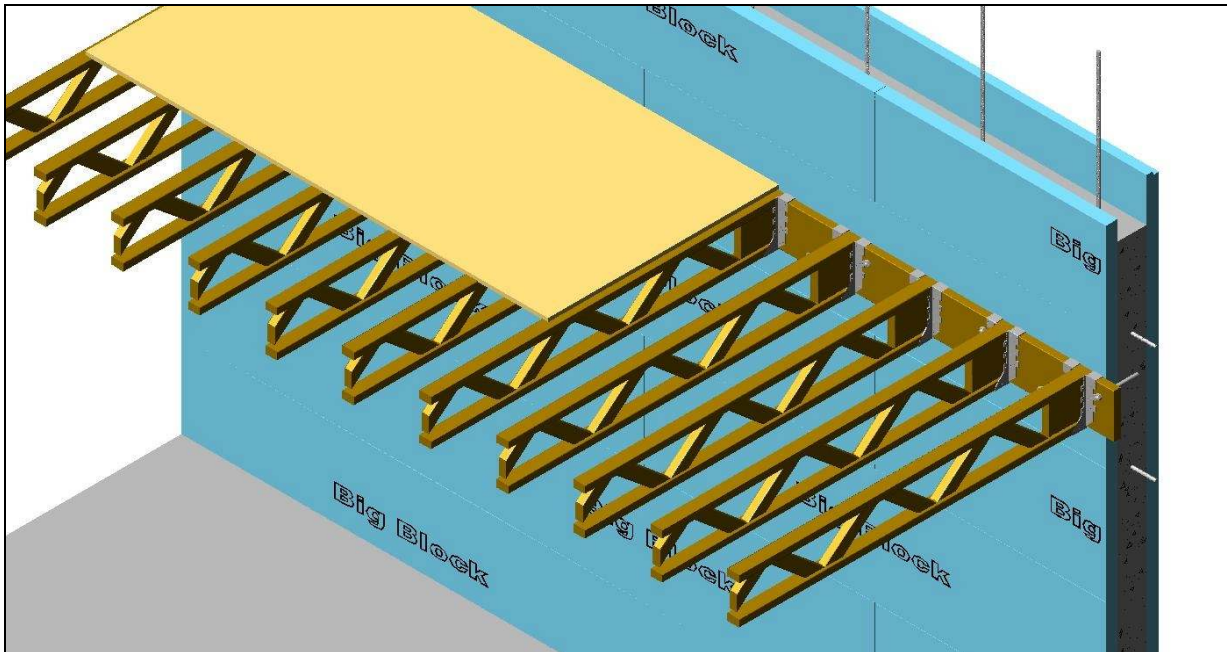
The following table is given as a general rule to determine the maximal spacing between each Polycrete® ledger hanger based on the floor span. Please refer to the engineer specifications to get appropriate spacing and recommendations.

Floor span	Distance between each ledger hanger (c/c)
Up to 12' (3.6 m) span	Each 60" max.
12' to 16' (3.6 – 4.8 m) span	Each 42" max.
16' to 20' (4.8 – 6 m) span maximal	Each 36" max.

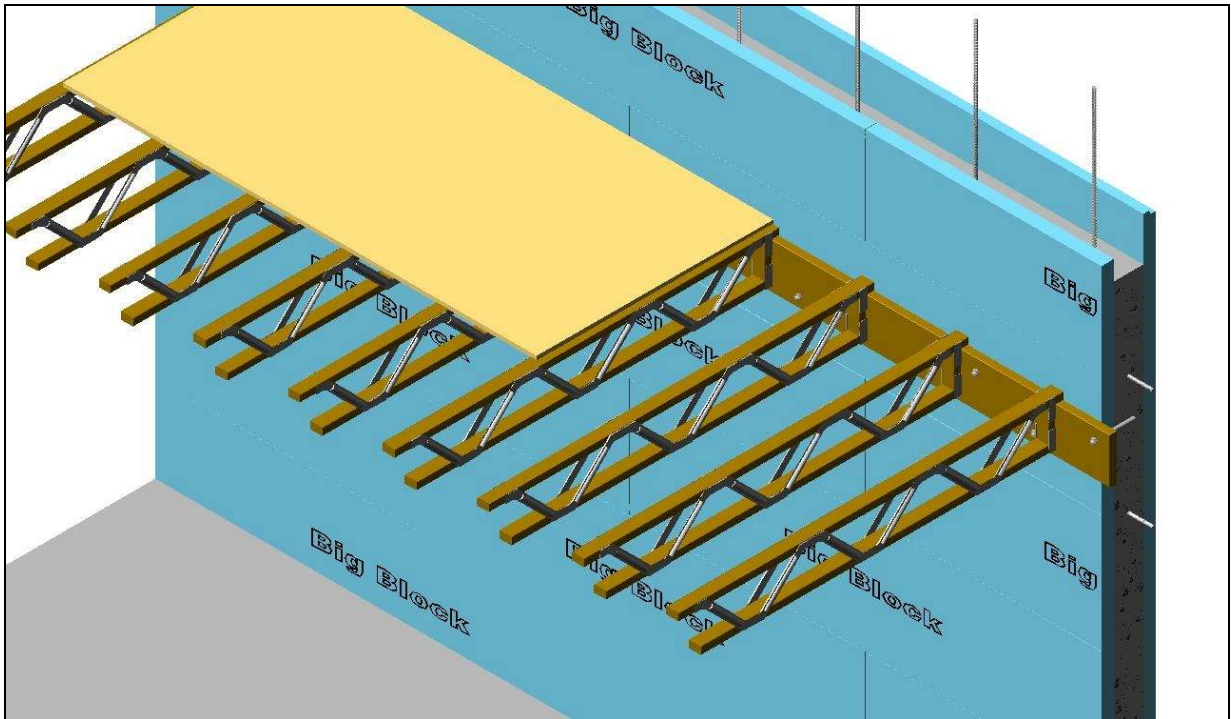
3.6.2 Other types of floor structures



Drawing 3.6.2.a - Floor of wooden joists type 'I'

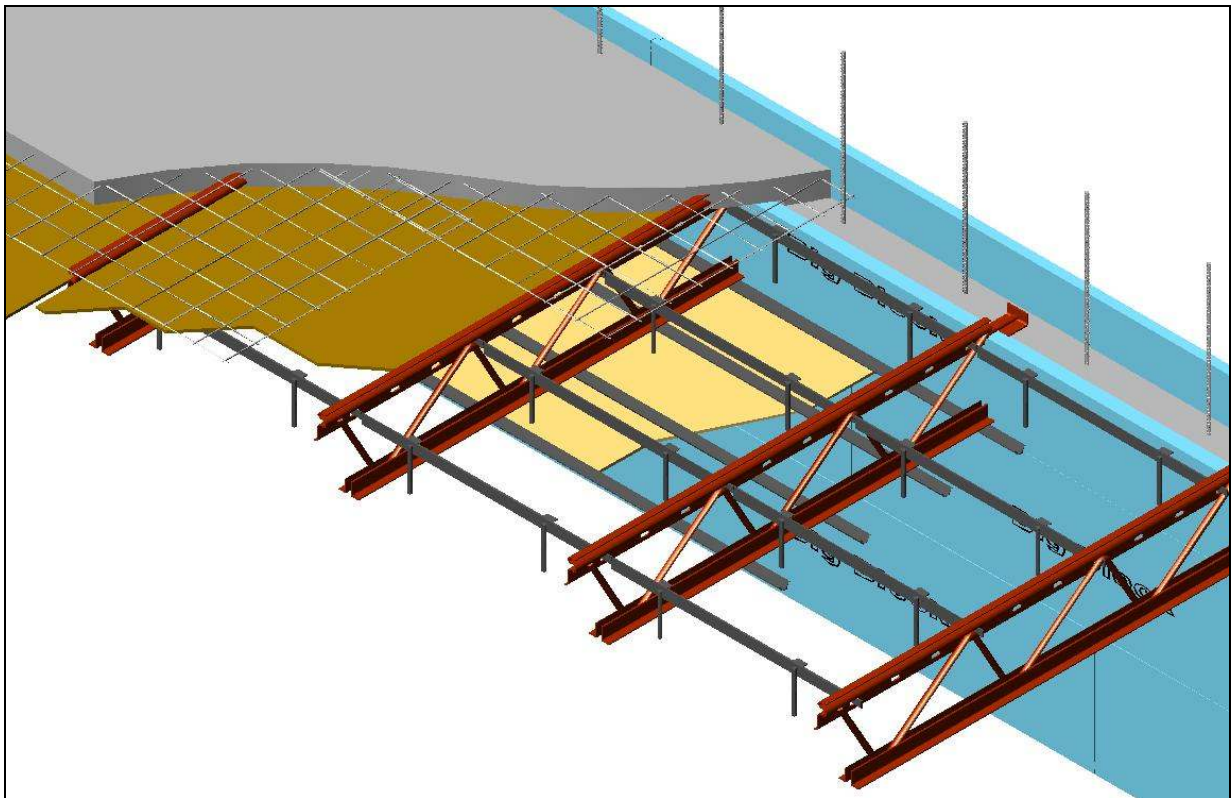


Drawing 3.6.2.b - Floor of wooden 'traditional' joists



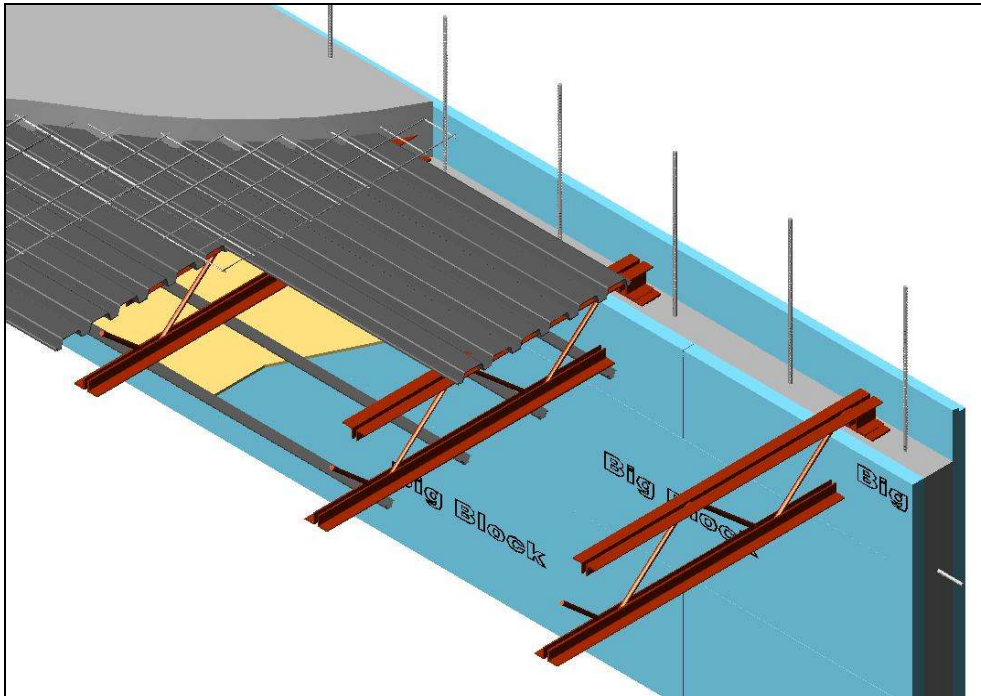
Drawing 3.6.2.c - Floor of wooden beams

3.6.3 Concrete floor with “Hambro® System”



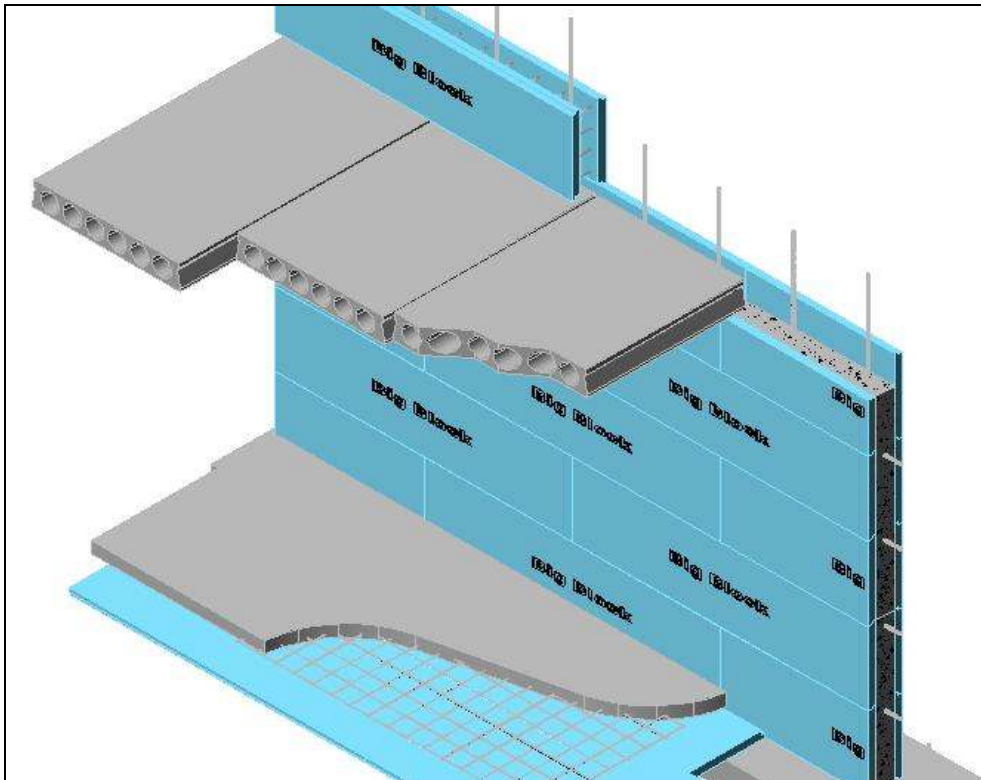
Drawing 3.6.3

3.6.4 Concrete floor with steel joist & steel deck

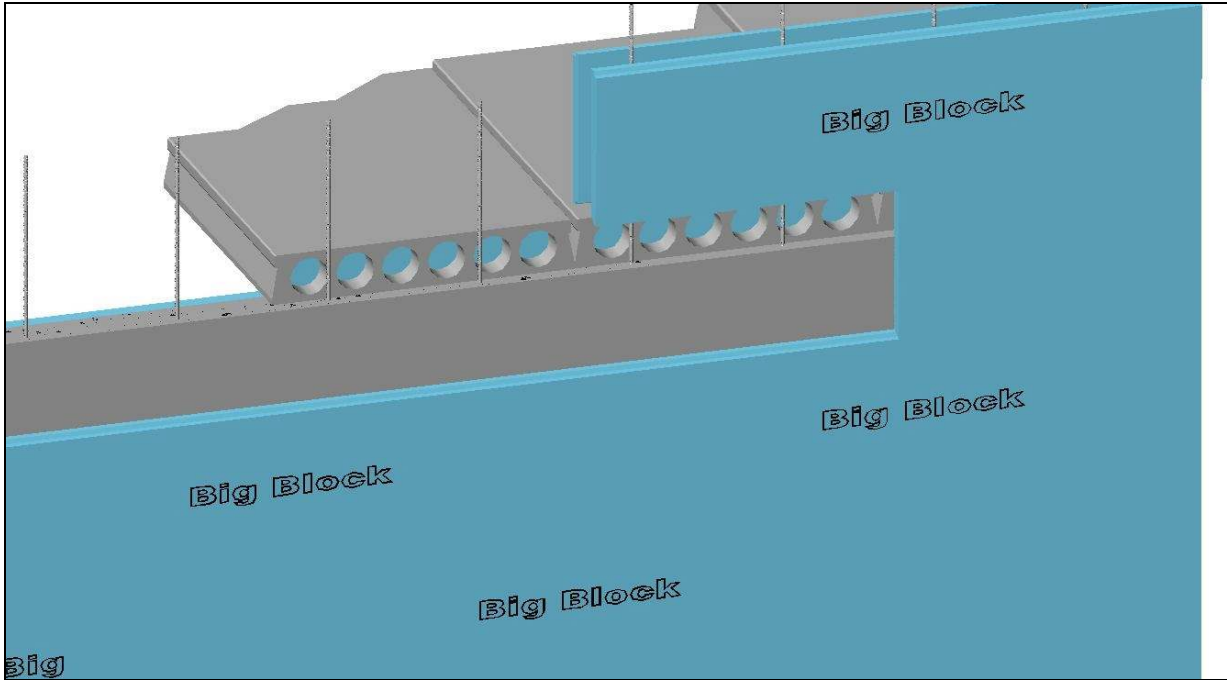


Drawing 3.6.4

3.6.5 Floor with 'prefab' hollowed concrete slab.

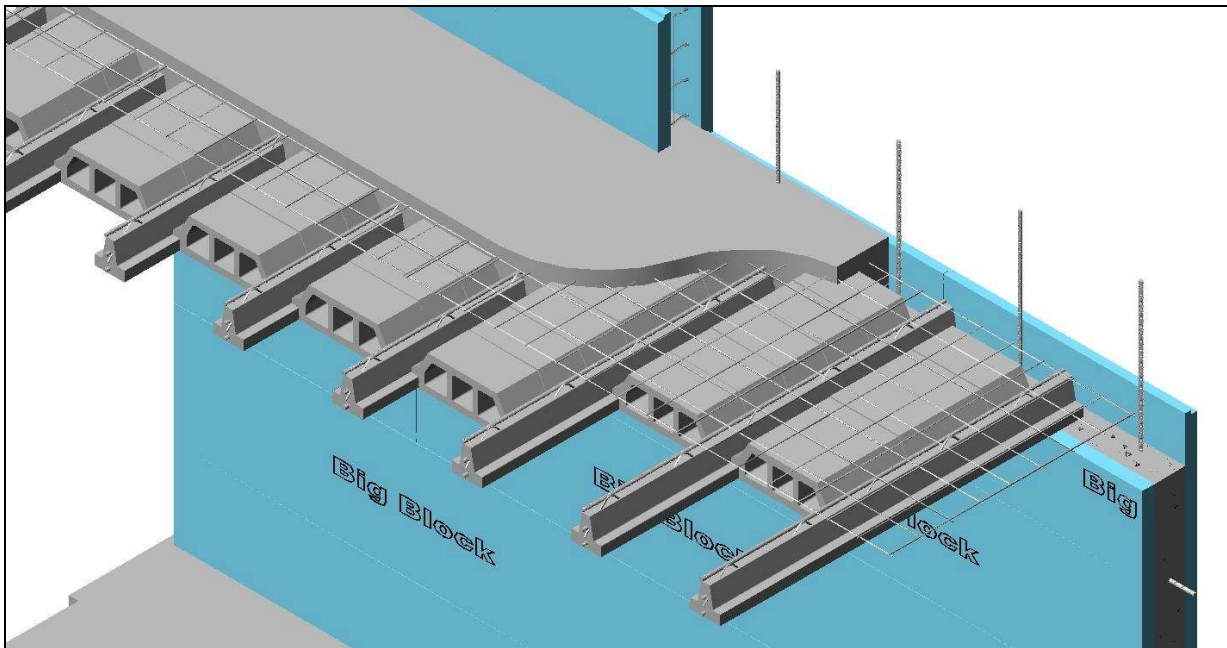


Drawing 3.6.5.a



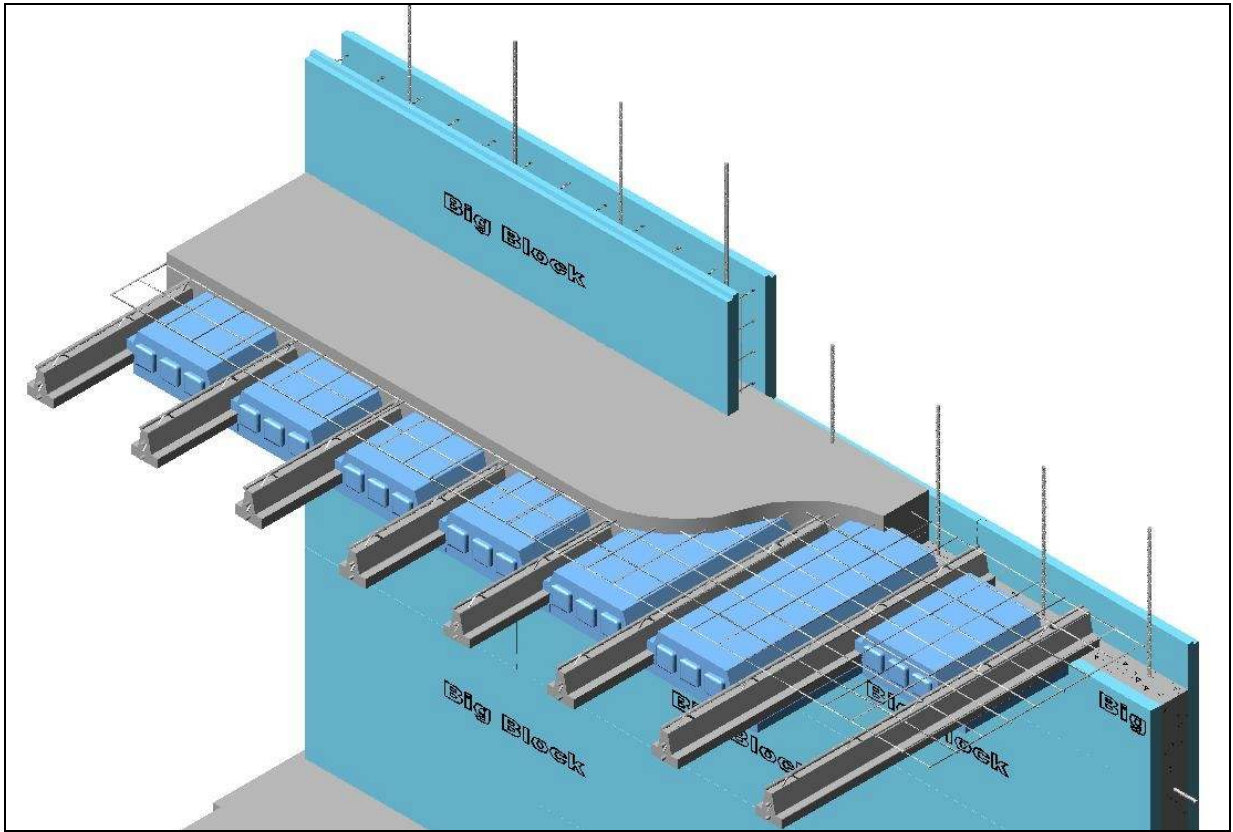
Drawing 3.6.5.b

3.6.6 Concrete *Hourdi* Floor Structure



Drawing 3.6.6

3.6.7 Polystyrene Hourdi Floor Structure

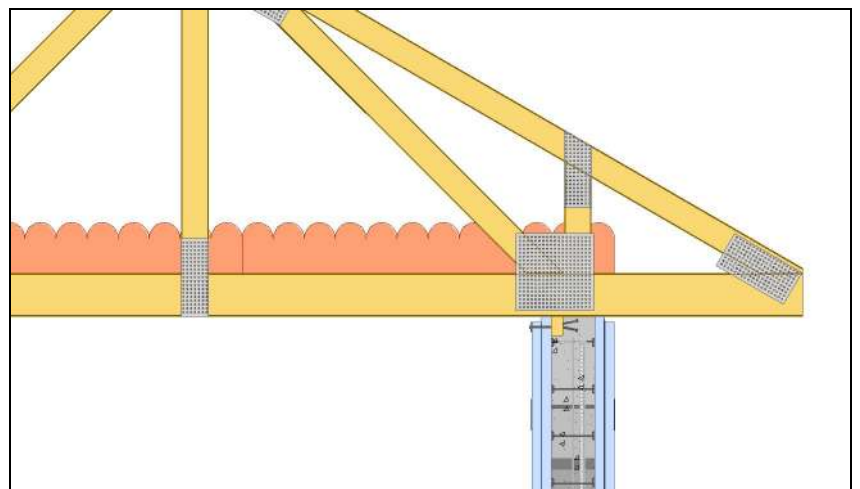


Drawing 3.6.7

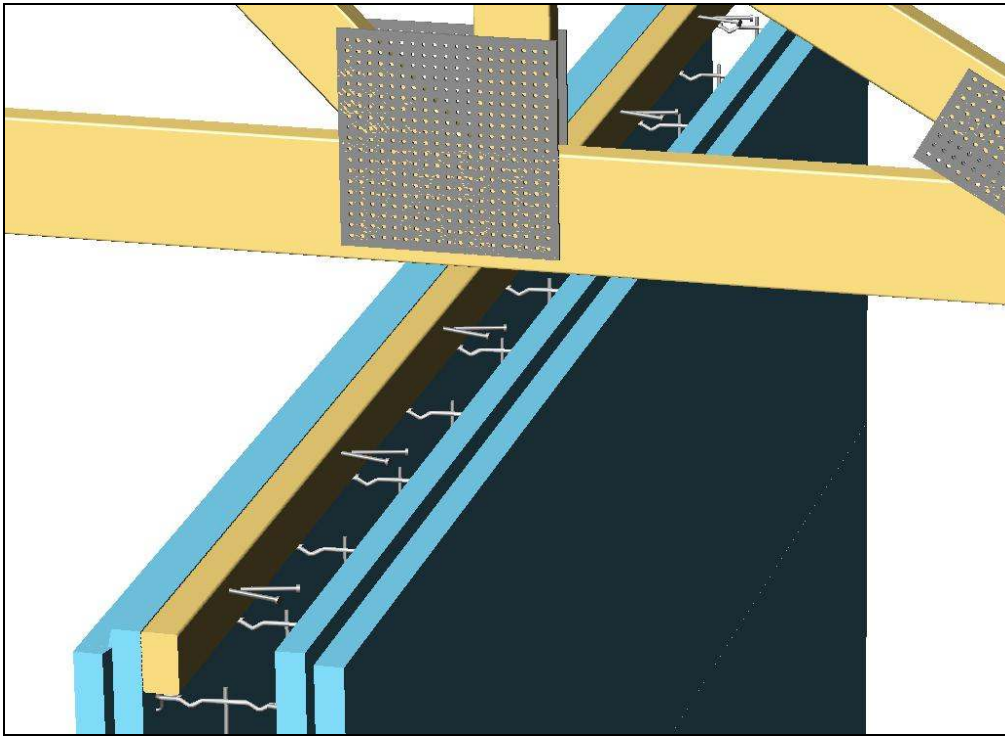
3.7 Roof connection

Roof connection with a Polycrete® Big Block ICF wall is similar to roof connection to traditional wood frame building. A wood plate (2"x 3") placed 'vertically' is anchored on the top of the concrete wall as shown on drawing 3.7.a. This 2"x3" wood plate is fastened against the interior EPS panel with #8 3" screws through the fastening strip, when possible. Else, use fender washers with #8 4" screws.

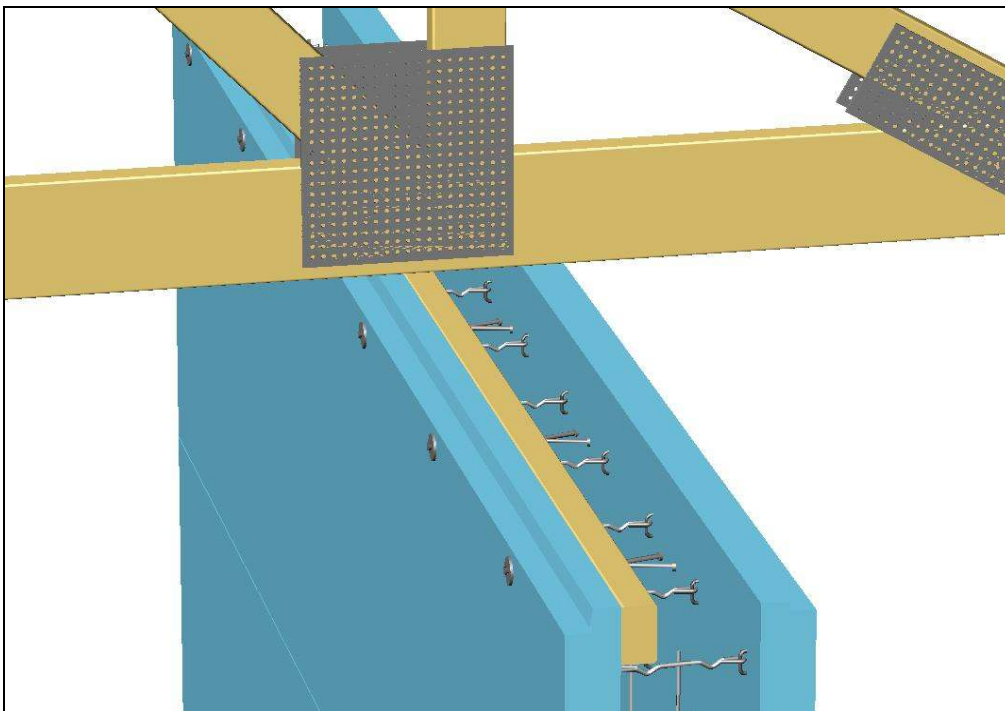
The roof frame is then attached to the 2"x3" wood plate.



Drawing 3.7.a



Drawing 3.7.b



Drawing 3.7.c



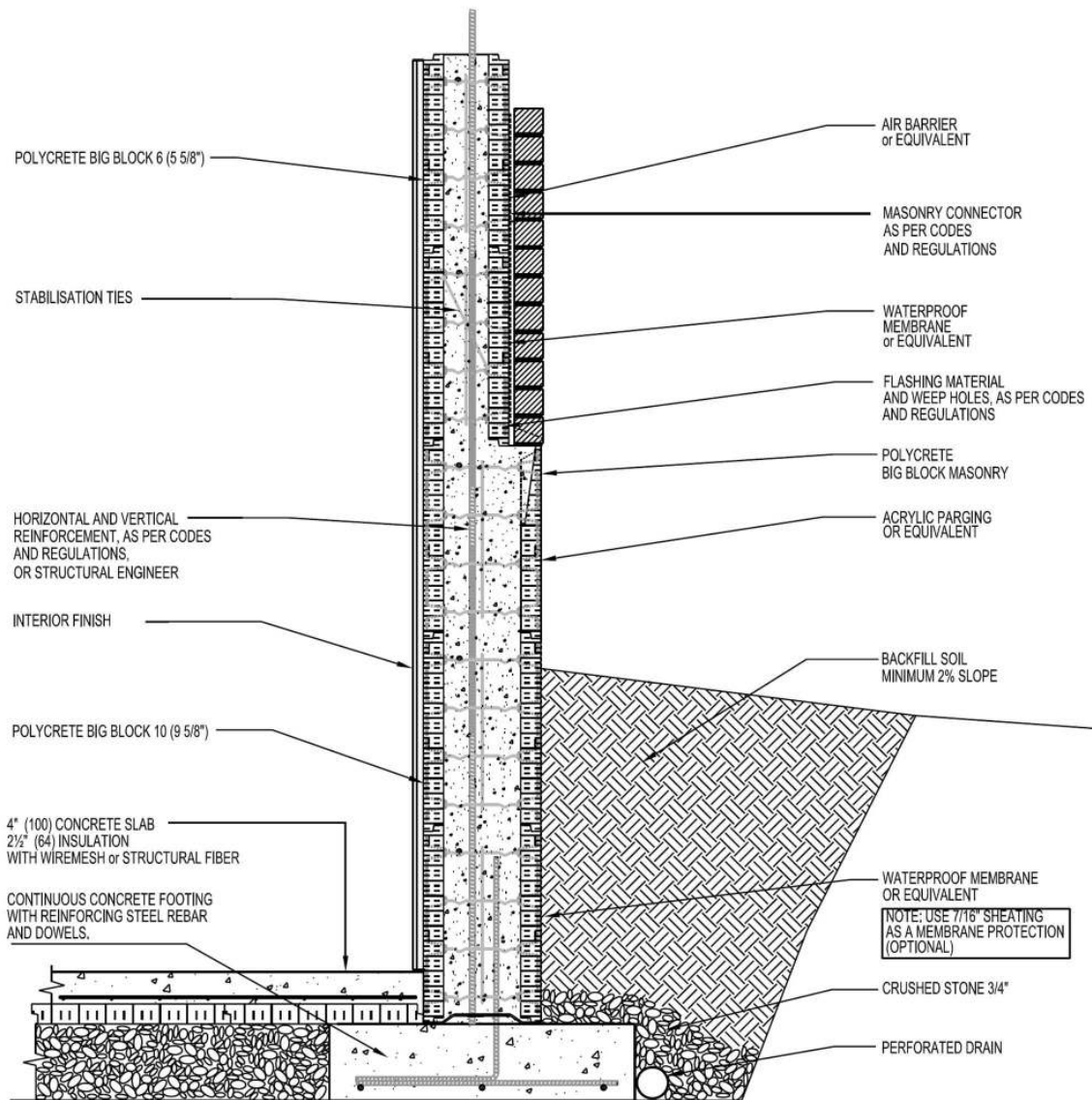
Note: For building regions subject to hurricanes or severe wind conditions, specific 'hurricane-proof' roof anchors can be installed.

3.8 Masonry exterior finish with a concrete foundation

Polycrete® ICF wall offers a large choice of exterior finishing as described in section 5.4. One of the most popular types is the installation of a masonry veneer. To bear it, the wall must have a specific extension as explain in this section.

The foundation wall must be 4" (10cm) larger on the exterior side than the storey wall. In most of the cases, foundation wall has a 9-5/8" (245mm) concrete thickness as the storey thickness is 5-5/8" (143mm).

The drawing 3.8 gives a good overview of the method used to build a concrete masonry extension with the Polycrete Masonry Big Block.



Drawing 3.8 - Masonry veneer extension

1. Pour concrete into foundation walls following standard procedure. Make sure that the extension is completely filled with concrete by using an adequate vibrator.
2. Once the concrete is poured, level the extension concrete to the appropriate elevation.



It is highly recommended as well as a good practice to install an air barrier before the masonry installation.

Note : Make sure to follow all of the engineer's recommendations regarding the masonry concrete extension construction for building made of insulated concrete formworks. Be especially aware of the following topics :

- Steel rebars installation.
- The panels initial clearance cut.
- The installation of an air barrier prior to the masonry installation.
- A self-adhesive waterproof membrane for the foundation.
- A protection for the waterproof membrane depending on the backfilling material.

3.9 Masonry exterior finish with a steel angle

This method is an alternative to the one describe previously. Some steps are to be followed to use a steel angle.

- The foundation wall must exceed 4 in. (102 mm) to support the masonry.
- Place an angle on the foundation wall. Furthermore, the angle must be mechanically joined to the concrete with L-shaped anchoring bolts.
- Install a self-adhesive membrane between the angle and the wall to drain the water behind the facing of the masonry.
- Place the masonry veneer in accordance with normal procedure.
- It is highly recommended to install an air barrier on all the exterior Polycrete® wall.
- The supports between the masonry must be attached to the Big Block steel stripping with screws #10-1 ½ in., Zinc.
- Check with the manufacturer if there is another alternative.

3.10 Waterproof membrane protection

A self-adhesive waterproof membrane (or equivalent) needs to be installed on all Polycrete® wall surface below grade before backfilling. This is an important step to assure the perfect foundation wall sealing. It is also important to properly protect the membrane prior to backfilling. Failing to do so can damage the membrane during the backfilling operation, compromising the sealing capacity of it. Use of a 7/16" (11mm) sheathing is a good way to achieve membrane protection. This step must be done according to local codes and regulations.

4

CONCRETE PLACEMENT

4.1 Pre concrete placement check list

The following checklist addresses several important topics to be verified:



Carefully checking each of these topics is mandatory to ensure a perfect pouring of concrete. Not respecting some of these inspection criteria could induce serious problems during or after the pouring of concrete.

Inspection checklist for concrete ordering and pouring equipments:

- Validate the access road to the job site for the boom pump and concrete trucks.
- Validate workspace area for boom pump (trees, wire clearance, etc.)
- Order reducer, double 90 degrees and a flap gate with the boom pump.
- Compute the concrete volume requested for the pour (Overall wall surface x wall thickness).
- Order the correct concrete specification, conform to chapter 4.2.
- Order concrete vibrator conforms to chapter 4.4 if requested.

Job site inspection checklist, BEFORE the pouring of concrete:

- Verify correct access to the job site
- Clear the job site and protect equipment and building material against concrete spillage.
- Verify the positioning, alignment and verticality of ICF wall.
- Verify the perfect scaffolding stability.
- Verify the right positioning of all reinforcement bars as requested by a structure engineer.
- Verify the correct positioning and perfect anchorage and stability of opening bucks.
- Verify all sleeves penetration. They must be correctly placed and secured.
- Verify the correct positioning of floor and roof anchors, if required.
- Verify the availability of rebars, anchors bolt, and others, that need to be placed during the pouring of concrete (if requested).
- Verify the availability of all requested equipment for pouring:
 - Trowel, level, alignment rope etc.
 - Concrete vibrator
 - Additional scaffolds if necessary
 - Additional lumber and plywood for repair if necessary
- Verify that all requested people for pouring are present and trained.
- Obtain the building inspector or design engineer approval if required.

Inspection checklist at boom pump installation and concrete delivery

- Verify boom pump work area and reducer, double 90° and flap gate set up.
- Verify concrete delivery is conformed to ordered specification.
- Perform a slump test if necessary
- Obtain a conformity delivery bill for each concrete truck

4.2 Concrete specifications

Concrete mix must be in accordance with the specification defined by the structure engineer, and with national or local codes or regulations.

The recommended concrete mix characteristics are:

- Portland Cement type 10 (normal) (Equivalent to type 1 in USA)
- Aggregate: ½" (12mm) maximum size for 6" concrete wall
- ¾" (20mm) maximum size for 8" and 10" concrete wall
- Compressive strength at 28 days: 25 MPA (3600 psi)
- Slump (on site): 6" to 8" (150mm to 200mm)
- Mix with or without air entrainment
- Fresh mix density: ± 5200 lbs/m³ (±2400kg/m³)
- Water/cement ratio: Less than 0.6

It is possible to add some concrete additive such as a 'superplasticizer' to ease concrete placement or such as 'structural fiber' to reinforce concrete. However, all concrete specifications must be validated by the structure engineer.

4.3 Pouring of concrete

Concrete placement shall be done in conformance with structure engineer specification and with all building code and regulations.

Expanded Polystyrene properties of Polycrete® Big Block ICF, ensure an optimum concrete curing, and minimize concrete shrinkage. These insulating properties also allow the pouring of concrete by low or high temperature without impact on the final concrete wall quality.

However, concrete placement must respect several rules:

- The pouring of concrete must be done with a boom pump that gives a high flexibility to perfectly control the concrete flow and the perfect placement in the ICF wall.
- The concrete fall height in the ICF wall must not exceed 8' (2,5m)
- Each lift does not exceed 4' (1,2m)

To avoid bad concrete placement and lack of concrete in the wall, it is recommended to follow these 3 basic rules:

- Start the pour by filling under the buck openings.
- Continue the pour from opening to the center of the wall.
- Avoid completing the pour close to a corner or a buck.

During the pouring of concrete, the lateral pressure induced by the fresh concrete on the ICF structure is very important. It is mandatory to verify the perfect alignment and the good verticality of the walls and to immediately perform all necessary adjustments as described in chapter 2.12.

4.4 Concrete consolidation

The extreme sturdiness of Polycrete® Big Block ICF, allow installer to use concrete vibrator to perform concrete consolidation. Standard vibrator utilization methods have to be respected. Do not hesitate to contact Polycrete® Technical team for support and instructions.

Vibrating operation must always be started at the bottom of the wall and continued to the top of the wall following each concrete lift. Each lift must have been vibrated before to start the next lift.

Once the pouring of concrete is completed and the wall is consolidated, it is necessary to level and to clean the top of the wall to install floor or roof structure.

When a successive storey is to be done, it is recommended not to fulfill the last ICF course, and to stop 2" to 4" (5cm to 10cm) below the top of the wall. This will ease the installation of the next ICF course.



Do not forget to place all necessary reinforcing bars, anchors or bolt in the fresh consolidated concrete to ensure a perfect anchorage of next storey or floor or roof as needed.

Once consolidated, concrete must be dense and homogenous, without any void or honeycombing. Concrete must perfectly bond to reinforcing bars.

4.5 Post pouring wall alignment verification

During and after the pouring of concrete, the lateral pressure induced by the fresh concrete on the ICF structure is very important. It is mandatory to verify the perfect alignment and the good verticality of the walls and to immediately perform all necessary adjustments as described in chapter 2.12.

- ✓ A perfect wall angle and alignment allow easy installation of the floor, successive storey or roof.
- ✓ Bad wall quality can induce major problems for further operations with significant delays and additional costs.
- ✓ These costs, delays and problems can be easily avoided by following the checklists and the correct installation procedures described in this manual.

Once the concrete wall is consolidated and perfectly aligned, it is recommended to protect the top of the wall against rain or snow. 24 hours after the pouring, concrete is cured enough to remove bracing and scaffolding and to continue successive ICF course installation.

It is mandatory to install the storey floor before pouring the successive storey.

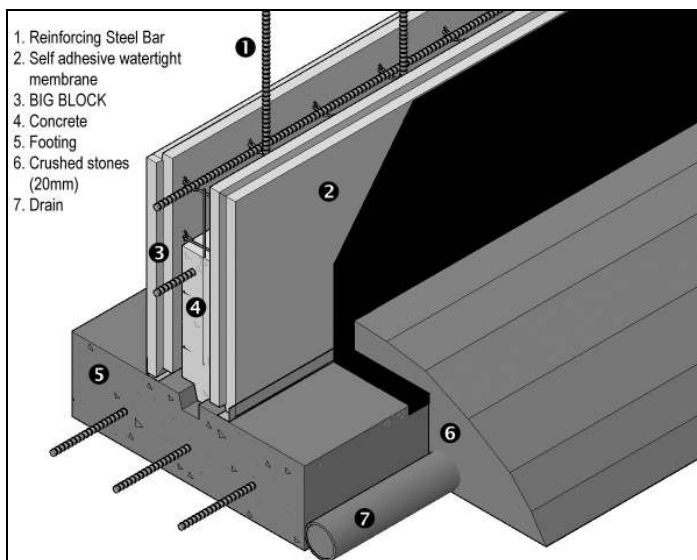
Inspection checklists are available in annex 6.1 for use on job sites.

5

DAMP PROOFING AND WALL FINISHING

5.1 Damp and water proofing

Building footing and foundation walls must be surrounded by a 'French drain' following local codes and regulations. Exterior sides below the grade foundation wall must be protected for damp proofing and waterproofing when exterior soil grade is higher than the interior floor level. Damp proofing and waterproofing are realized with a peel and stick application membrane. This membrane is vertically applied on the foundation wall but also on the footing up to the drain. A minimum overlap of 2" (5cm) is recommended between each membrane strip. A special care will have to be done at the foundation backfill to not scrap or damage the membrane.



Drawing: 5.1.a

Note: above grade walls do not require damp proofing or waterproofing membrane excepted when exterior masonry veneer is applied, as shown in drawing 3.8.1.

Polycrete® distributes appropriate waterproofing membrane.

5.2 Air and vapor barriers

All materials used in Polycrete® ICF walls bring thermal insulation performances above all requested codes and regulations.

Insulation provided by expanded polystyrene panels directly seal the concrete walls without air gaps nor thermal bridges. This structure does not allow any airflow between exterior and interior building environment. So, there is no possible vapor formation through concrete walls, neither airflow.

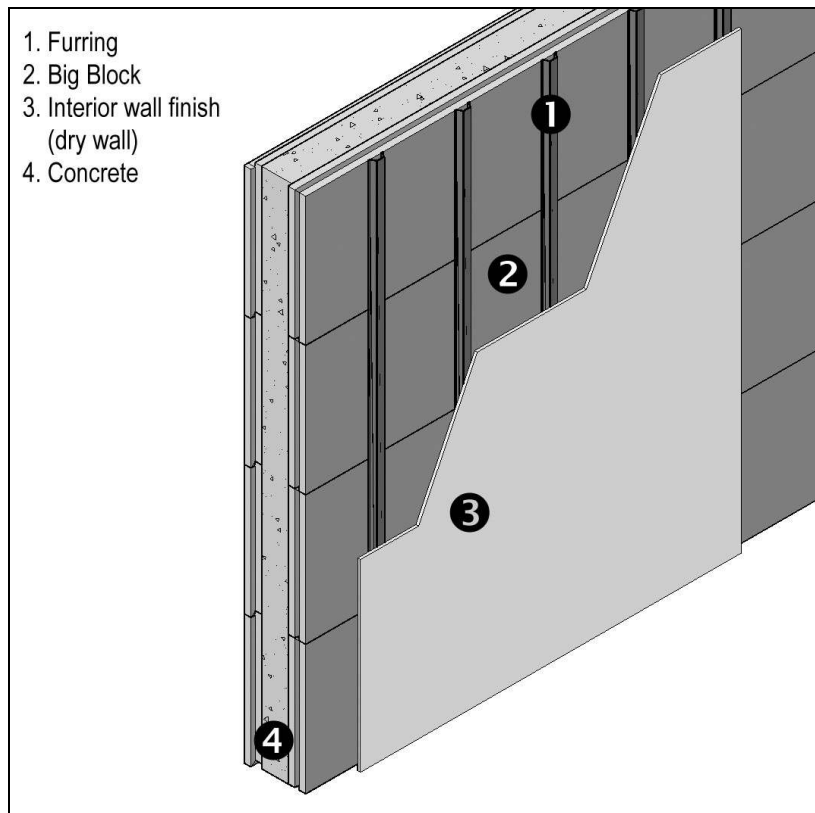
Polycrete® ICF walls do not require any air nor vapor barrier, except for masonry, or unless requested by local codes or structure engineer.

5.3 Interior finishing

Interior finishing has several impacts on the wall performances, such as the thermal insulation, sound insulation and fire resistance. An interior wall finishing must be in accordance with local codes and regulations.

Gypsum boards are one of the most common solutions. They can be fixed directly to the Polycrete® ICF fastening strips, or on vertical wood or metal furring previously installed to the ICF fastening strips. This second solution could provide an easy way for electronic and electrical service installations, but the fact to have an air gap (and wood furring) between EPS panel and gypsum board will degrade fire resistance performances.

Furring must be installed in conformance with local codes and with high quality screw specified in section 1.5 of this manual.



Drawing: 5.3.a

5.4 Exterior finishing

Exterior finish brings the final esthetic aspect to a building, but they also significantly contribute to the thermal insulation performances of the wall. Exterior finish also protects EPS panels from weather element and nature.

All kinds of exterior finish may be applied to Polycrete® ICF wall. It is important to follow all recommendations and installation procedures given by the manufacturer of each exterior finish.

Vertical exterior finish can be directly fixed to the fastening strips embedded inside the Polycrete® ICF panels.

Horizontal exterior finish can also be installed, but they require intermediate vertical furring.

Acrylic coating (stuccos) can be directly applied on the EPS panel surface. It is recommended to use an acrylic coating with embedded fiber mesh that will provide better strength and will prevent potential cracking due to shrinkage.

Masonry veneer (brick or stone) is also a very common exterior finish possibility. It requires a brick ledge as described in section 3.8 of this manual. Brick or stone ties can be attached to the fastening strips of the Polycrete® ICF panels.



Picture 7 - Acrylic coating



Picture 8 - Stone masonry veneer

5.5 Services setup

Before the pouring of concrete, it is recommended to verify that all sleeves for service penetration are present and well positioned. Refer to section 2.11 of this manual for details.

5.5.1 Electrical and electronic service requirements

Installation of electronic and electrical services must be done before and after interior finishes, in conformance with design requirements and local code and regulations.

Wiring is easy in making horizontal and vertical grooves in the EPS panels. Standard electrical boxes can be installed after having performed an opening in the EPS panel.

5.5.2 Plumbing requirements

Installation of plumbing services must be done before and after interior finishes, in conformance with design requirements and local code and regulations.

Even with the superior thermal insulation performances of a Polycrete® ICF wall, it is not recommended to install plumbing services in the external walls.

6 ANNEXES

6.1 Pre and post concrete placement check list



Carefully checking each of these topics is mandatory to ensure a perfect pouring of concrete. To not respect some of these inspection criteria could induce serious problems during or after the pouring of concrete.

Inspection checklist for concrete ordering and pouring equipments:

- Validate the access road to the job site for the boom pump and concrete trucks.
- Validate workspace area for boom pump (trees, wire clearance, etc.)
- Order reducer, double 90° and a flap gate with the boom pump.
- Compute the concrete volume requested for the pour (Overall wall surface x wall thickness).
- Order the correct concrete specification, conform to chapter 4.2.
- Order concrete vibrator conform to chapter 4.4 if requested.

Job site inspection checklist, BEFORE the pouring of concrete:

- Verify correct access to the job site
- Clear the job site and protect equipment and building material against concrete spillage.
- Verify the positioning, alignment and verticality of ICF wall.
- Verify the perfect scaffolding stability.
- Verify the right positioning of all reinforcement bars as requested by a structure engineer.
- Verify the correct positioning and perfect anchorage and stability of opening bucks.
- Verify all sleeves penetration. They must be correctly placed and secured.
- Verify the correct positioning of floor and roof anchors, if required.
- Verify the availability of rebars, anchors bolt, and others, that need to be placed during the pouring of concrete (if requested).
- Verify the availability of all requested equipment for pouring:
 - o Trowel, level, alignment rope etc.
 - o Concrete vibrator
 - o Additional scaffolds if necessary
 - o Additional lumber and plywood for repairs if necessary
- Verify that all requested people for pouring are present and trained.
- Obtain the building inspector or design engineer approval if required.

Inspection checklist at boom pump installation and concrete delivery

- Verify boom pump work area and reducer, double 90° and flap gate set up.
- Verify concrete delivery is conformed to ordered specification.
- Perform a slump test if necessary
- Obtain a conformity delivery bill for each concrete truck

POST pouring inspection checklist:

- Verify the positioning, alignment and verticality of ICF walls.

- Verify that all rebars, anchors or bolt are well positioned in concrete for successive storey, floor or roof when required.
- Verify that all bucks and service sleeves have not been displaced by the pouring of concrete.
- Verify the finishing and perfect level of the top of the concrete wall.
- Clean all tools, scaffolding, EPS surfaces and floor of concrete spillages.

FOR SUPPORT

If you have any questions or comments, please contact us:

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