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2.1 – INTRODUCTION

For builders who want a competitive edge, Logix offers solid products and friendly local service. Our products are designed to perform better in the field, providing trouble-free, profitable installations time after time.

Our technical team is ready to respond to your queries with practical advice on quick and efficient installation. With contractor training provided through our numerous regional technical support offices, help is always close at hand.

We are the most experienced ICF manufacturers in North America, manufacturing top quality products at our nine plants located throughout the United States and Canada.

For more information, or to contact a Logix representative, visit our website at www.Logixicf.com and click "Contact Us". You can also register online to receive Logix updates.

This manual will be updated regularly. Current updates will be available at www.Logixicf.com.

2.2 – USEFUL TOOLS & MATERIALS

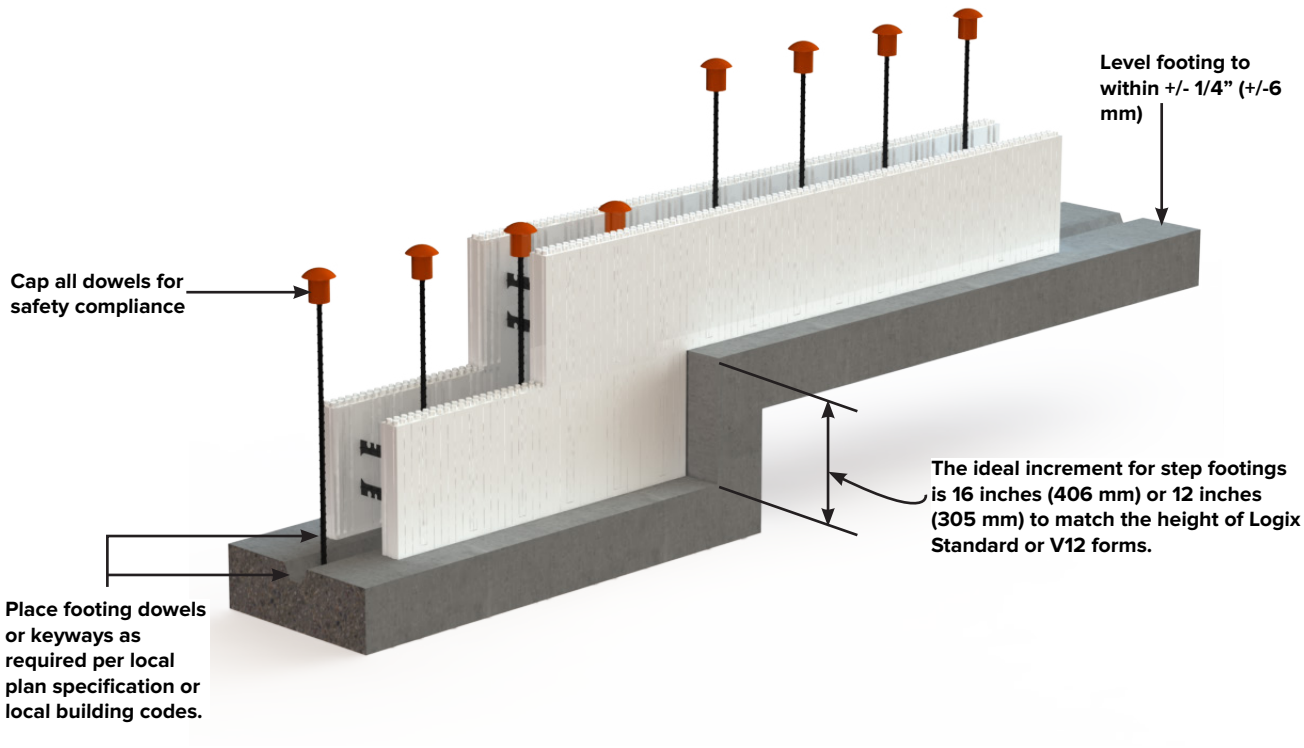
- Pruning saw
- Cordless drill
- Screws
- Hot knife
- Electric chainsaw
- Fiberglass-reinforced tape
- Step ladder
- Rebar bender/cutter
- Internal vibrator
- Contractor-grade foam gun
- Low expansion foam adhesive
- Approved scaffold planks
- Transit or laser
- 48” (1220mm) level
- Bolt cutters
- String line
- Chalk line
- Wall alignment system (safety compliant)
- 36 inch (914 mm) plastic zip ties, or Logix Vertical & Horizontal Hooks
- Concrete embedments
- Window and door buck material
- Sleeves for wall penetrations

NOTE: For more information on Logix Vertical & Horizontal Hooks see Technical Bulletin No.20

2.3 – ACCURATE FOOTINGS & SLABS

The first step to a successful Logix installation is an accurate footing or slab. This means a footing or slab that is:

- Code compliant
- Designed in accordance with construction drawings and specifications
- Designed taking into account soil conditions, seismic area, number of stories, building loads, and water tables.

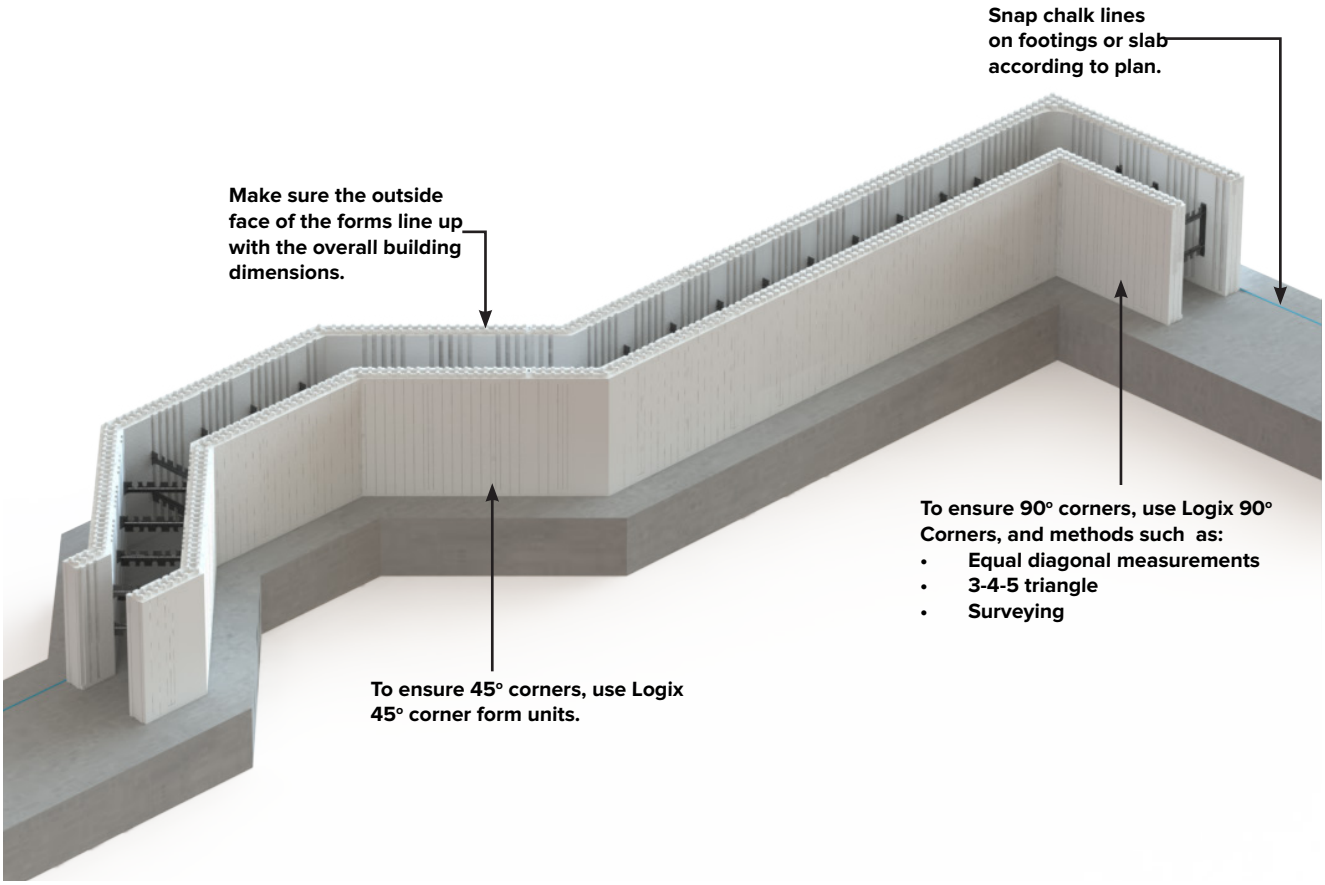


2.4 – WALL LAYOUT

Accurate wall layout is critical to ensure a complete and profitable Logix project.

Verify that wall layout is in accordance with plans and specifications.

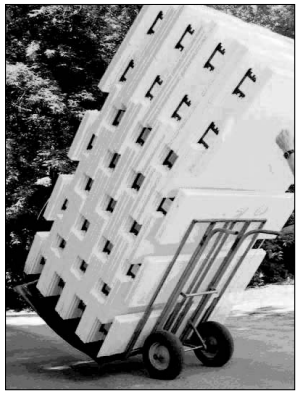
In addition to straight Standard forms, Logix provides 45^0 and 90^0 corner form blocks. However, Logix can be easily cut on-site to fit any corner angle or radius. See "2.7.8 – RADIUS WALLS" on page 26.



2.5 – PRODUCT HANDLING & PLACEMENT

There are several methods to efficiently handle Logix forms. Unlike most ICF systems, the consistent 2-3/4 inch (70 mm) panel thickness on Logix forms means that handling damage is minimized.





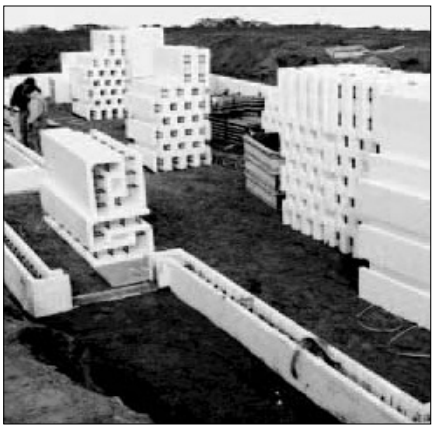

- Logix Standard Forms arrive stacked on disposable skids.
- The forms are strapped together for easy handling.
- Unloading can be accomplished manually or using alternate lifting equipment.
- Standard forms can be moved by two people using two 2x4s
- Corner forms come in bundles of four or twelve, and can easily be carried by one or two people.
- Specialized dollies are another convenient way to move Logix bundles.
- When transporting forms on an open trailer, position the forms so the wind travels through the webs to minimize drag.
- When tying forms down on an open trailer, ensure the forms are well secured and avoid form damage from strapping materials.
- If job site conditions require form protection, Logix bundle bags can be ordered.
- Logix forms are produced to the tightest tolerance in the industry, with a length tolerance of +/-1/8 inch (+/-3 mm), and a height tolerance of +/-1/16 inch (+/-2 mm).

When forms are unloaded, it is necessary to measure forms to determine uniform length and height. It is suggested to measure 2 forms per skid. In the unlikely event that forms are out of spec, please contact the local Logix representative immediately.

2.6 – JOBSITE EFFICIENCY

An efficient jobsite means a faster and safer installation, and ultimately a higher quality finished project.

- Keep all materials and tools outside of the footing area until the chalk lines have been snapped and the wall layout is complete. Generally, construction is accomplished from within the perimeter of the structure.
- When wall layout is complete, place forms at least 7 feet (2.134 m) inside the perimeter of the footings or slab to accommodate the wall alignment system.





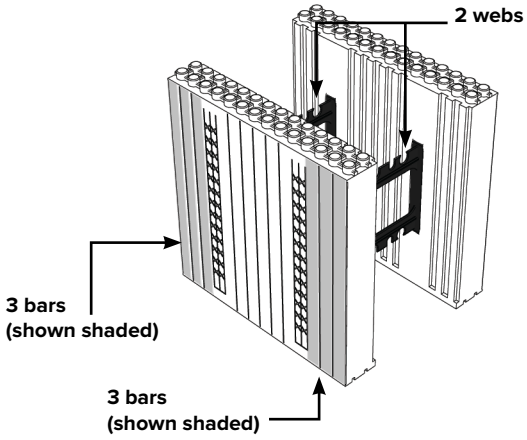
- Space skids of standard forms around the inside of the entire perimeter.

NOTE: When placing courses of forms, always take forms from the closest skid. This will eliminate the effects of normal manufacturing variations between skids.

- Periodic checking of dimensions ensures accurate wall construction.
- Additional materials that should be located within the perimeter:
- Window and door bucks
- Rebar (straight or pre-bent)
- Alignment system
- Approved scaffold planks
- Tools

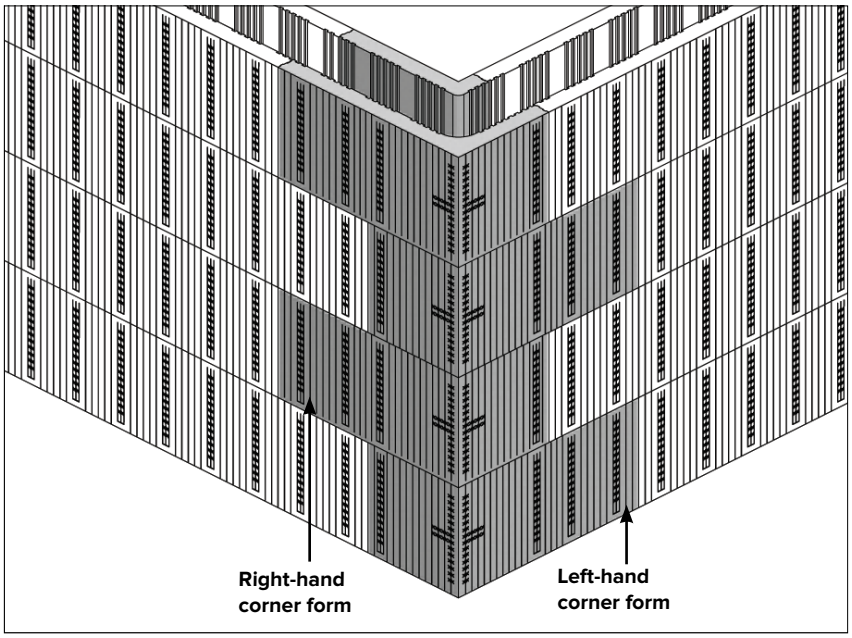
2.7 – LOGIX WALL CONSTRUCTION

When a form is cut, it can be identified using bars and webs. For example, a cut form with three bars, two webs, and three bars will be referred to as a "3-2-3".



By establishing a logical form pattern that takes into account the building dimensions, maximum efficiency will be achieved. It is important that the building dimensions have a tolerance of +/-1/2" inch (13 mm) or a stacked vertical joint will result. Such joints are acceptable if dimensions necessitate but will require additional form support on both sides of the form.

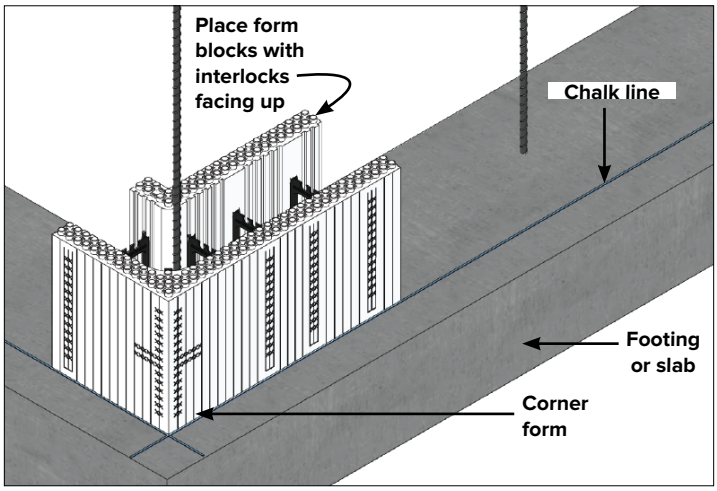
When building dimensions are based on 4 feet (1.219 m) increments, it is suggested to alternate between left- and right-hand corners within each course.



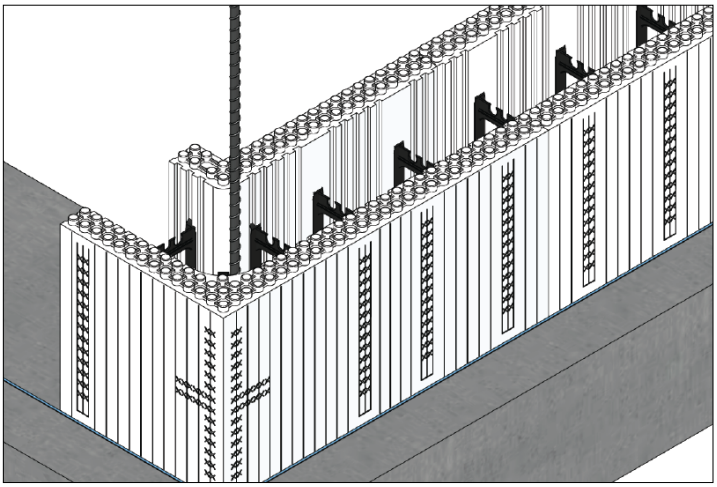
Alternating corner forms

2.7 – Logix WALL CONSTRUCTION cont'd

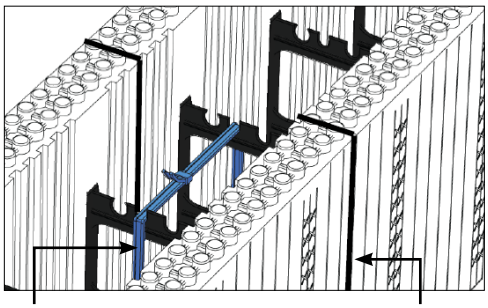
2.7.1 – THE FIRST COURSE

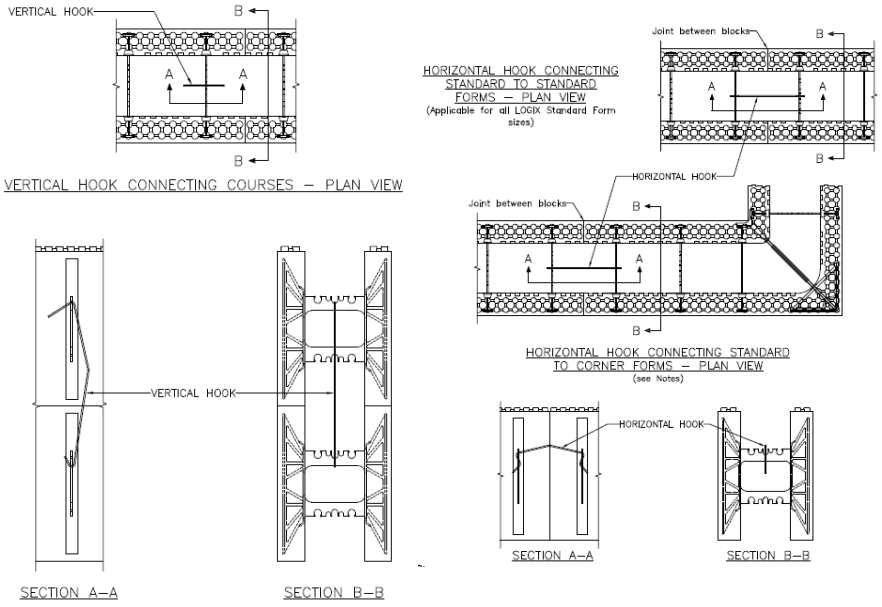


STEP 1: Start first course at a corner and align with chalk line.

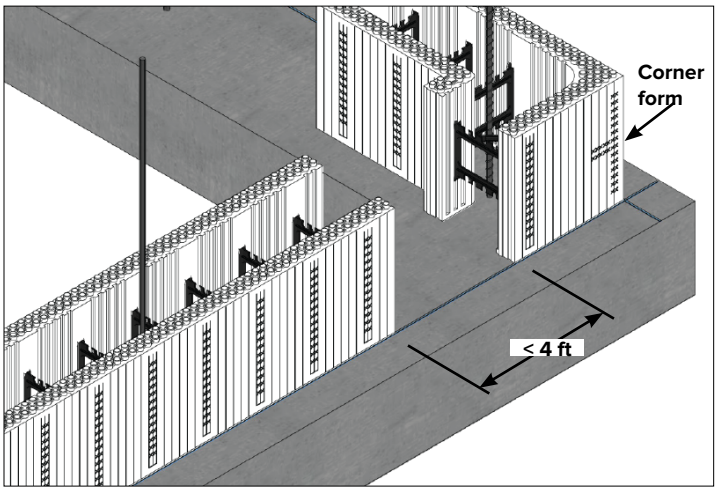


STEP 2: Continue placing forms along the chalk line.

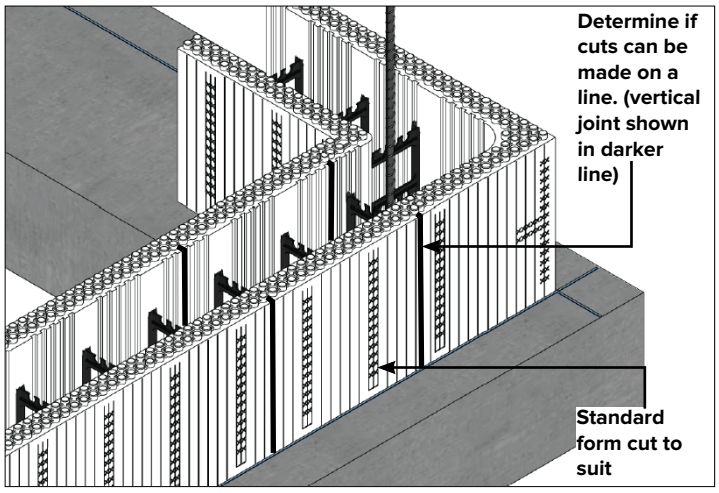




STEP 3: Secure forms end-to-end to maintain building dimensions using zip ties or Logix Hooks.

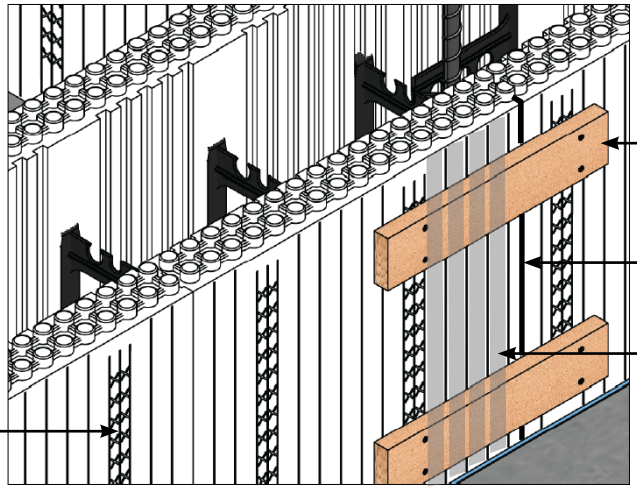


STEP 4: When forms are 4 ft or less from the second corner, place the second corner form.



STEP 5: Cut a Standard form to fit the space left between the corner and the previous Standard form.

At this point, determine if adjustments are needed to the building dimensions so the cut can be made on a line. If adjustments are needed, alter chalk lines accordingly.



If more than 3 bars are extending beyond any web, additional form support is required on both faces of the form.

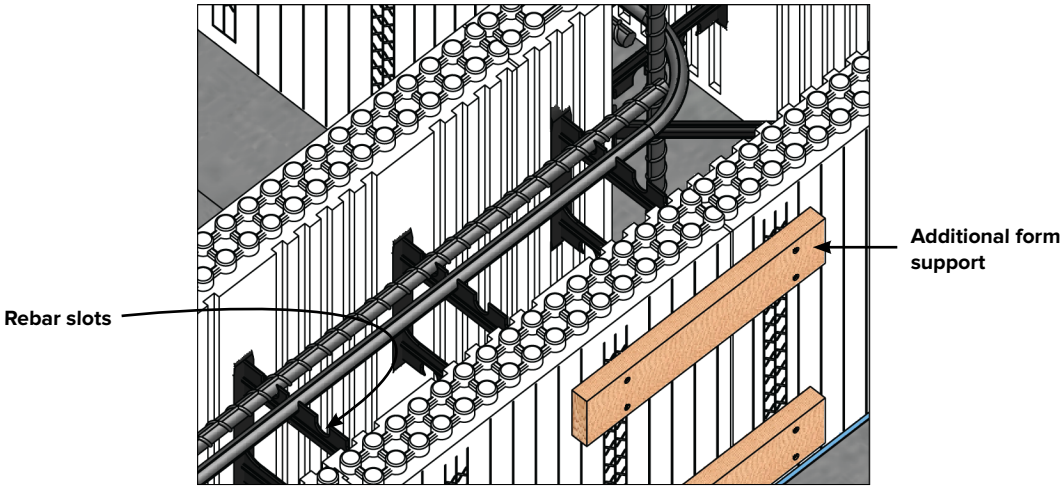
STEP 6: Continue around the wall in this manner until the first course is complete and dimensions are verified.

Leave the first course of forms in place across door openings and low windows until forms have been placed and building dimensions have been verified to maintain the interlock pattern above openings.

STEP 7: Place necessary rebar in first course as specified and according to local code.

NOTE: Web ties are designed with 'rebar slots' to provide secure placement of horizontal rebar, and allows for non-contact lap splices. See "2.8.2 – HORIZONTAL & VERTICAL REINFORCEMENT" on page 29.

STEP 8: Prior to starting the second course, install additional form support if required.



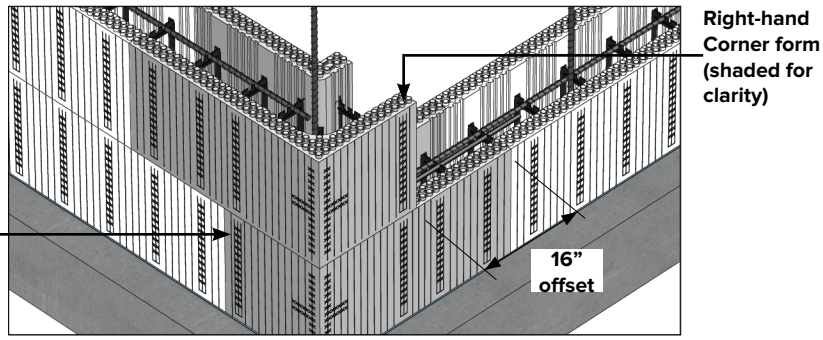
Place reinforcement and necessary additional form support prior to installing the second course.

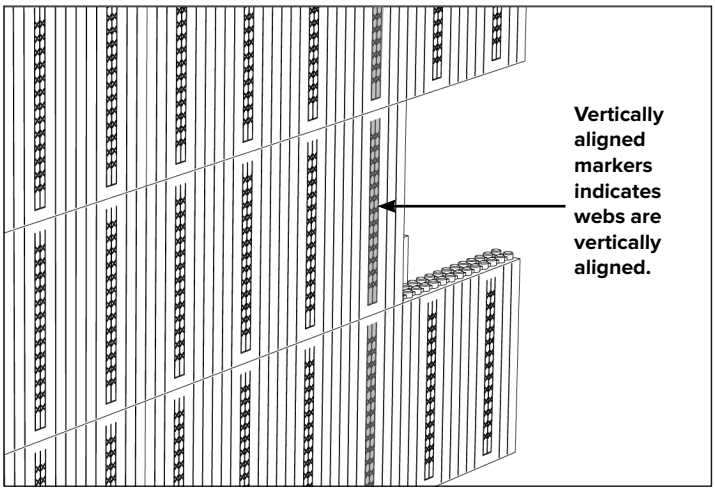
2.7.2 – THE SECOND COURSE

STEP 1: Starting at the original corner, place appropriate corner form. When possible, alternate between left- and right-hand corners between courses. This will create a 16" offset.

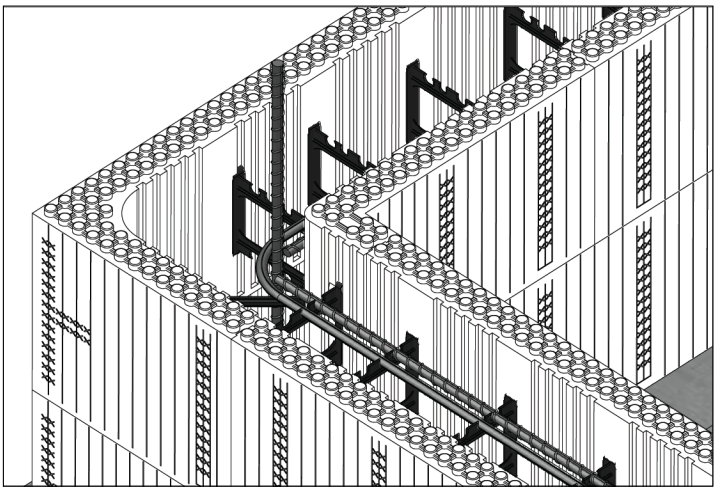
NOTE: It is necessary to firmly seat every form to the form below to minimize interlock settling. The interlock system is designed to secure forms betweens courses, which helps minimize form settling and movement during installation and concrete placement.

STEP 2: Continue placing forms around the wall, working in the same direction as the first course. Make sure to secure forms end-to-end, and between courses, with zip ties, Logix Hooks or foam adhesive.



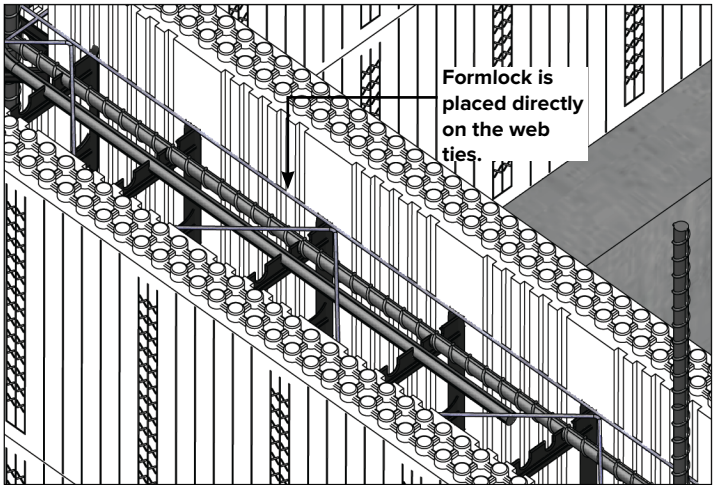


STEP 3: All webs should line up vertically, except where building dimensions are other than 8 inch (203 mm) increments. In this case, special cuts may be required to allow vertical alignment of webs. Webs are aligned when markers on the face of the form are vertically aligned.

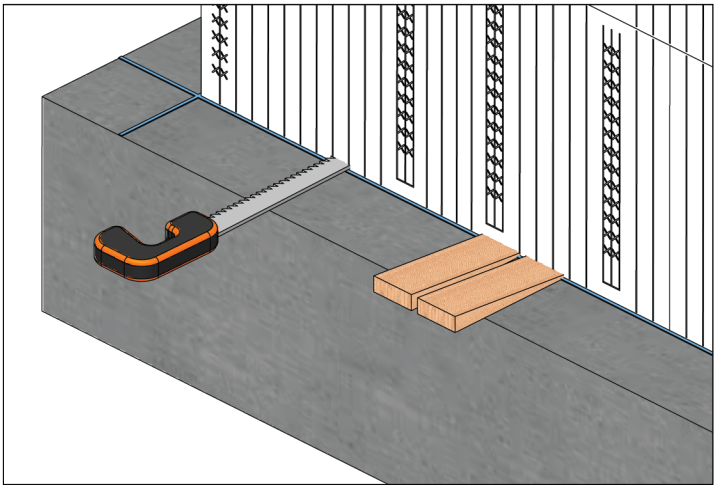


STEP 4: Place necessary rebar after completion of second course.

NOTE: Web ties are designed with 'rebar slots' to provide secure placement of horizontal rebar, and allows for non-contact lap splices.

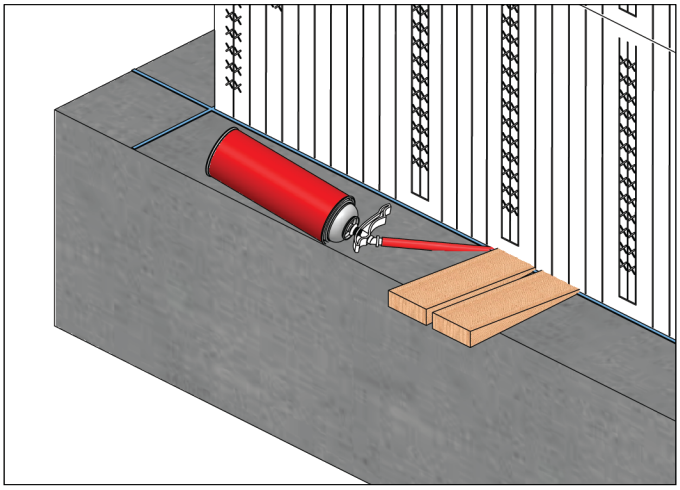


STEP 5: Form Lock can also be placed in the second course, if desired. Overlap Form Lock lengths by roughly 8 inch (203 mm). Align the points of the zigzag pattern in the Form Lock directly above the webs.



STEP 6: Confirm that the wall is straight and level. If adjustment is required, shim or trim the bottom of the wall until level is achieved.

STEP 7: Use foam adhesive to fasten the straightened and leveled wall to the footing or slab. Insert the nozzle 1 inch (25 mm) at the base of every other web along the chalk line, and shimmed and trimmed locations, and inject foam between the block and the footing.



When vertical joints are less than 8 inches (203 mm) apart, additional form support is required.

It is important to note that at this point the wall pattern has been established. Course number 1 will be the pattern for all odd numbered courses (3, 5, 7, etc.). Course number 2 will be the pattern for all even numbered courses.

Wall alignment system to be installed at some point between the second and fourth courses, at no more than 7 feet (2.134 m) intervals. See "2.11 – WALL BRACING & ALIGNMENT SYSTEM" on page 44.

2.7.3 – ADDITIONAL COURSES

Installation of additional courses is the generally the same as the second course, described in the previous section.

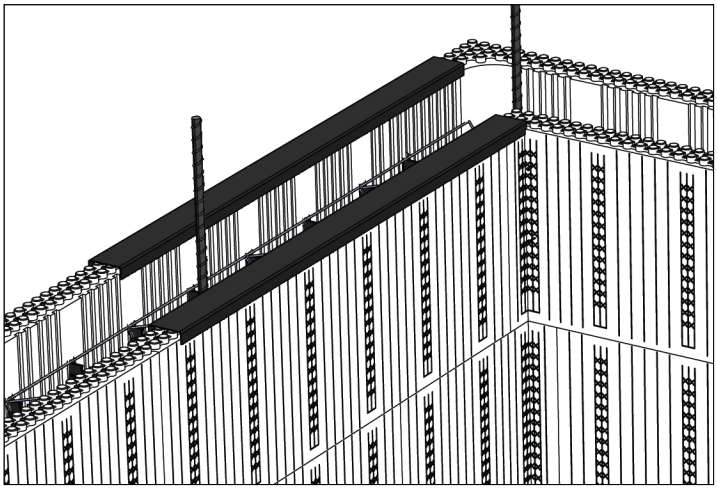
STEP 1: Fasten every corner end-to-end to adjoining forms using zip ties, Logix Hooks, or adhesive foam.

Install Form Lock, if desired, every fourth of fifth course after the second course.

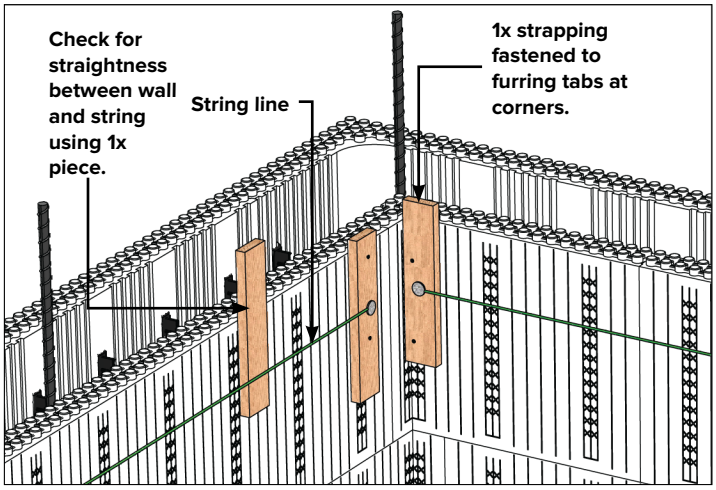
STEP 2: After completion of each course, place necessary rebar as specified and according to local code.

STEP 3: Secure forms end-to-end in the top course to maintain building dimensions.

STEP 4: Secure the top course to the forms below on both sides to prevent tipping during concrete placement.



STEP 5: If additional stories are planned, the interlock needs to be protected prior to concrete placement.



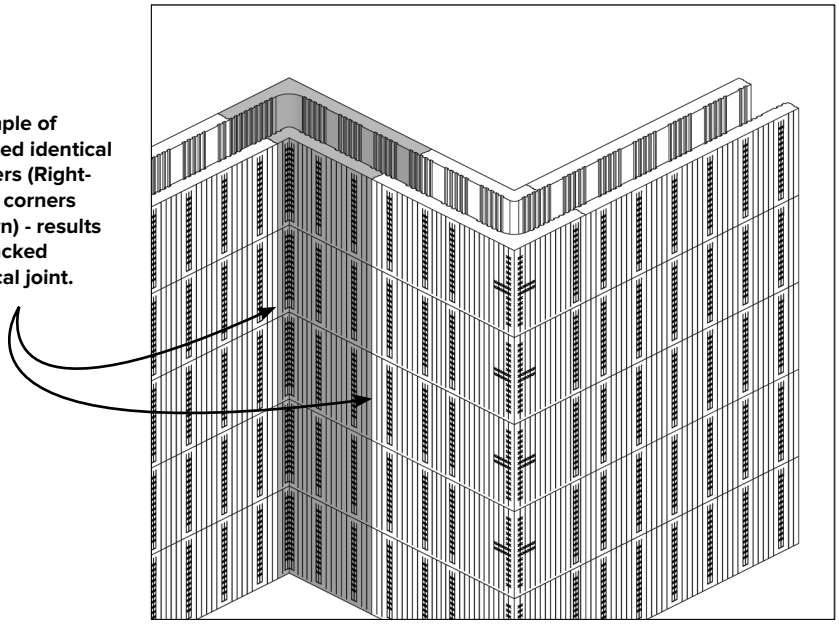
STEP 6: Check building dimensions. Check corners for plumb.

Ensure straight walls by placing a string at the top course set off from the wall using 3/4 inch pieces of wood placed in the corners. Check for straightness by running another 3/4 inch piece of wood between the string and wall.

When vertical joints are less than 8 inches (203 mm) apart additional form support is required.

If you need to stack identical corners in subsequent courses, you will need to provide additional form support where the stacked joints are created.

Example of stacked identical corners (Right-hand corners shown) - results in stacked vertical joint.



Vertical stacked joints requires additional form support.

Hold all reinforcement back 2 inches (51 mm) from door and window buck material to ensure proper concrete coverage.

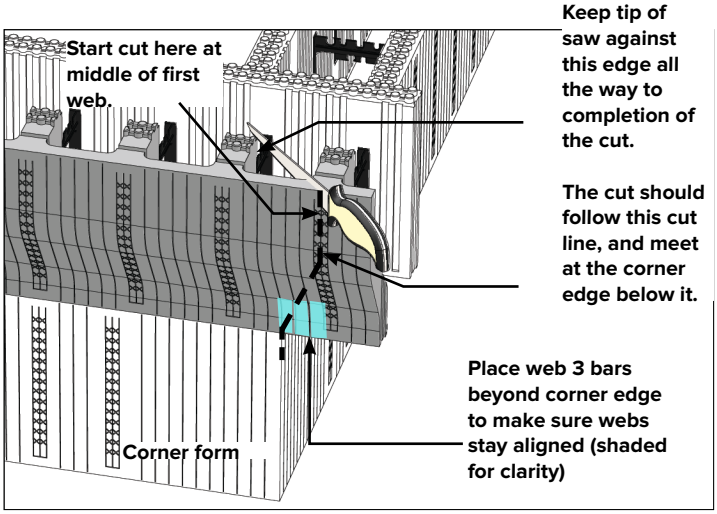
2.7.4 – CORNER BRICK LEDGE

Brick Ledge forms come only in straight units, so mitered cuts on site must be made to create corners with these blocks. Two methods can be used:

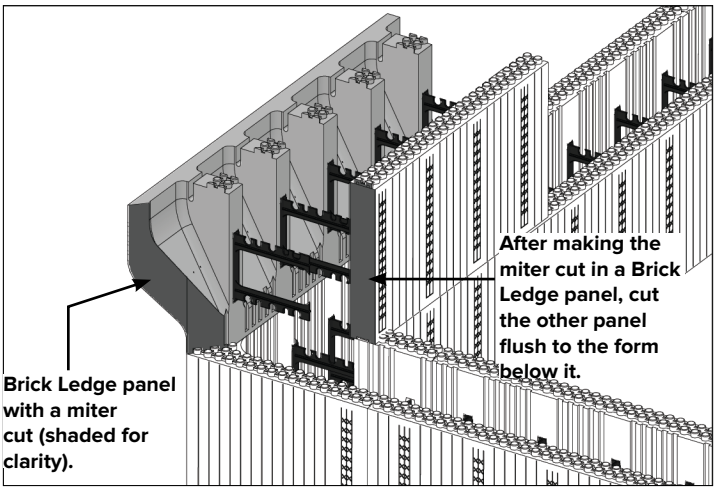
1. Freehand miter cutting.
2. Using a template.

NOTE: On a 6.25 inch (159 mm) Logix Brick Ledge always start a miter cut in the middle of the first web beyond the corner form.

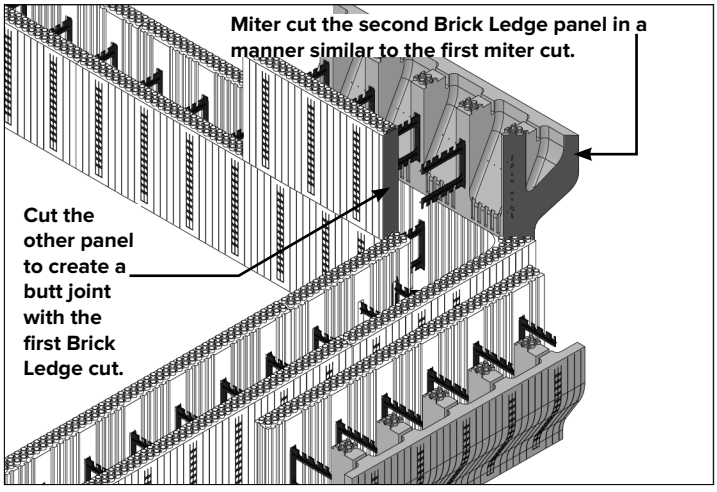
Extending a Brick Ledge block two webs beyond the corner block and making the cut will create a remaining piece that can be used for an inside corner elsewhere in the layout.



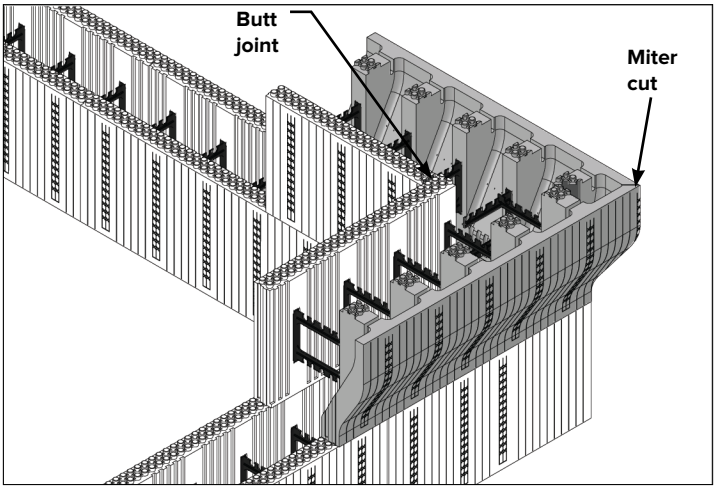
STEP 1: With the first Brick Ledge block, make a miter cut on the Brick Ledge panel.



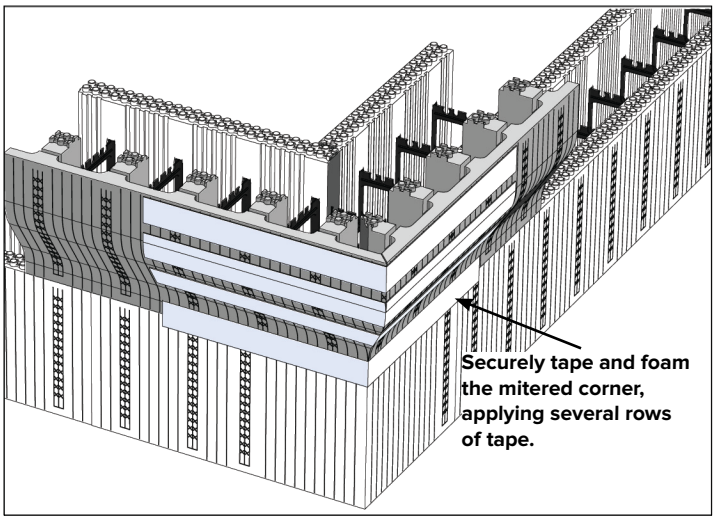
STEP 2: With the first Brick Ledge block, make a butt-joint cut flush to the form below.



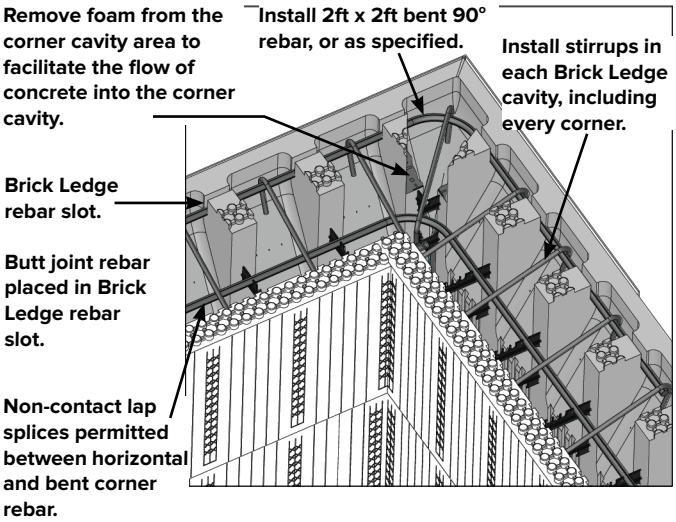
STEP 3: With the second Brick Ledge block, make similar miter and butt-joint cuts.



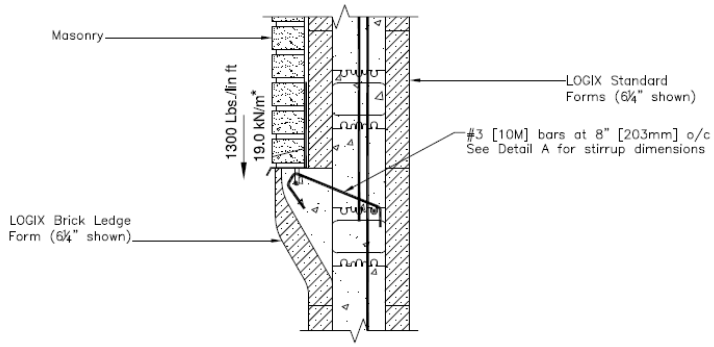
STEP 4: Place both cut Brick Ledge blocks to create the Brick Ledge 90° corner.



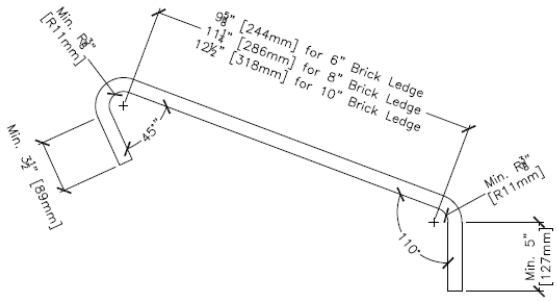
STEP 5: Secure the corner Brick Ledge with tape and foam.



STEP 6: Place rebar, as required,and remove foam from cavity where necessary.



BRICK LEDGE STANDARD REINFORCEMENT



DETAIL A

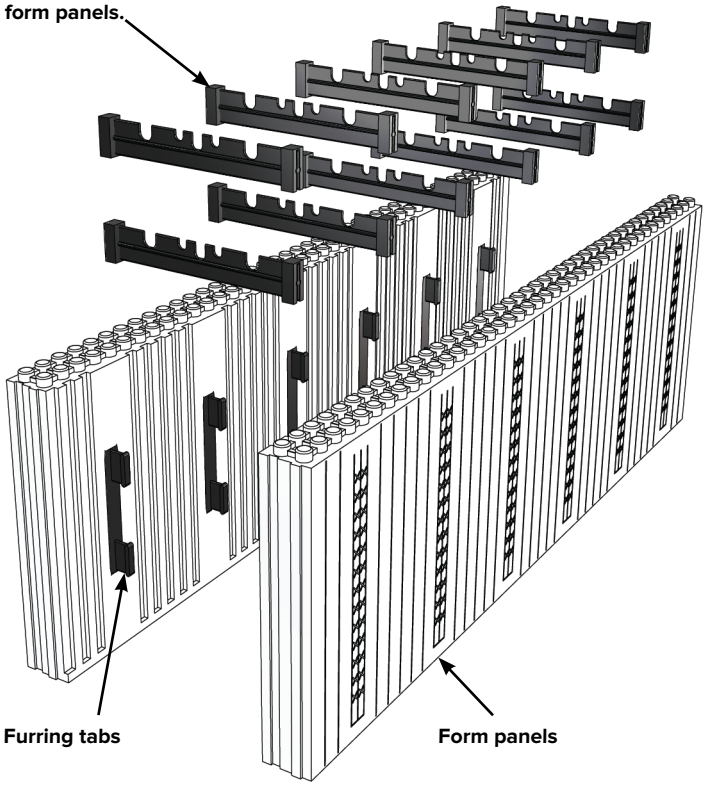
NOTES:
See Section 6 – Engineering in the LOGIX Product Manual for reinforcement details.

*1kN = 224.8lb

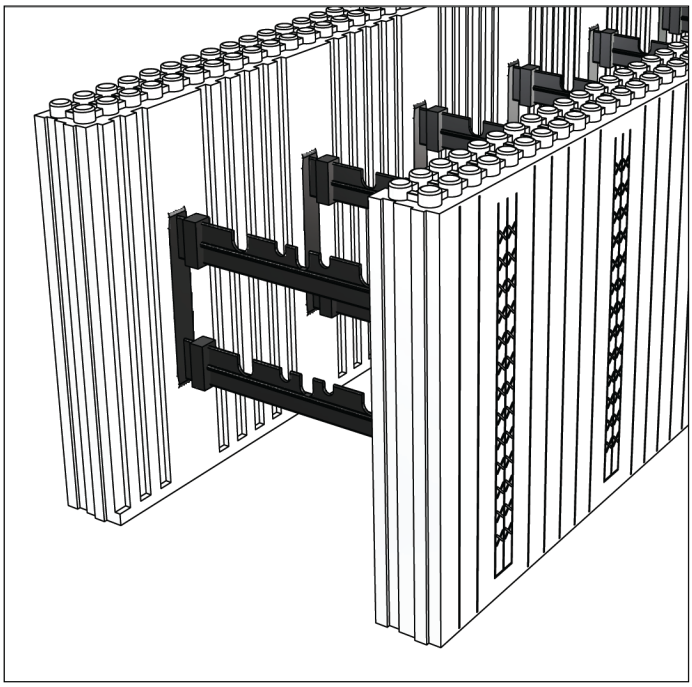
2.7.5 – KNOCK-DOWN FORMS

Logix Knock-down forms (Logix KD) are designed to offer the same benefits as the Logix solid forms (Logix PRO). However, Logix KD forms also

- reduce shipping costs and inventory requirements
- accommodates tilt-up wall panel construction
- allows hassle-free assembly of forms around complex rebar patterns (i.e. stirrup or rebar cage pattern in walls)
- allows custom block configurations (i.e. Taper Top-Brick Ledge, etc...)



Logix KD Standard Form - disassembled view.



Logix KD Standard Form - assembled view.

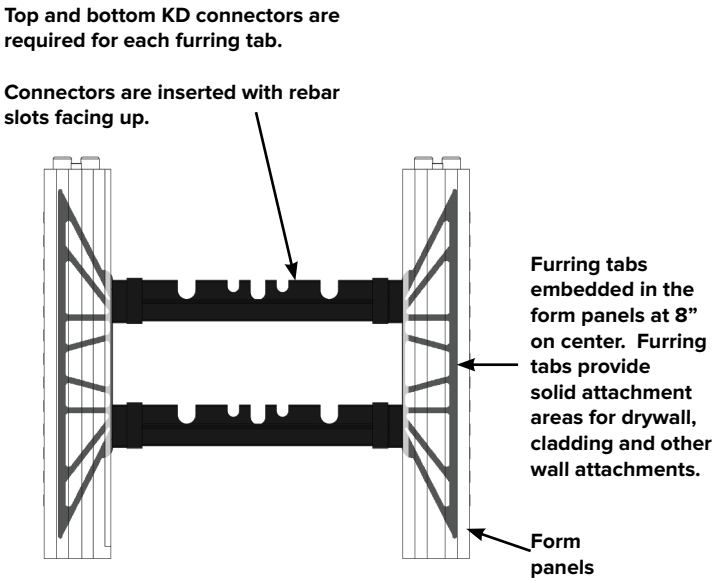
2.7.5.1 – PRODUCT HANDLING

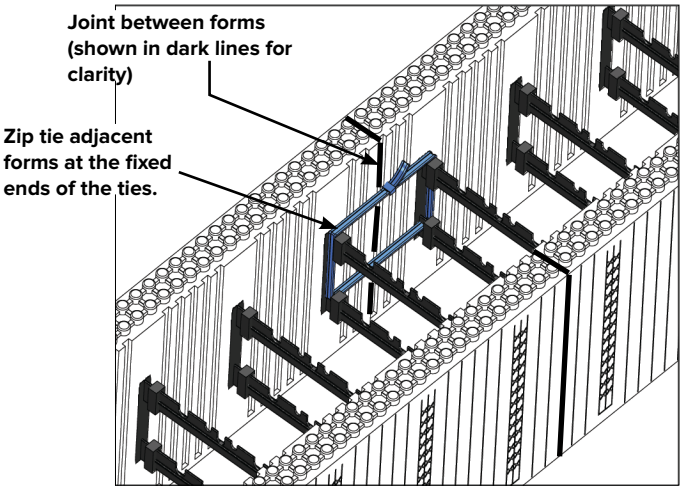
There are several methods to efficiently handle Logix KD forms. The high foam density and consistent 2-3/4 inch (70 mm) panel thickness on Logix KD means that handling damage is minimized.

The forms arrive on-site unassembled. KD Connectors and panels arrive on-site packaged in boxes and bundled in stacks, respectively.

2.7.5.2 – ASSEMBLING AND INSTALLATION

As the forms are assembled on-site they are stacked in place to form the walls. Stacking the blocks, including required tools and methods, are the same when using Logix Pro forms.



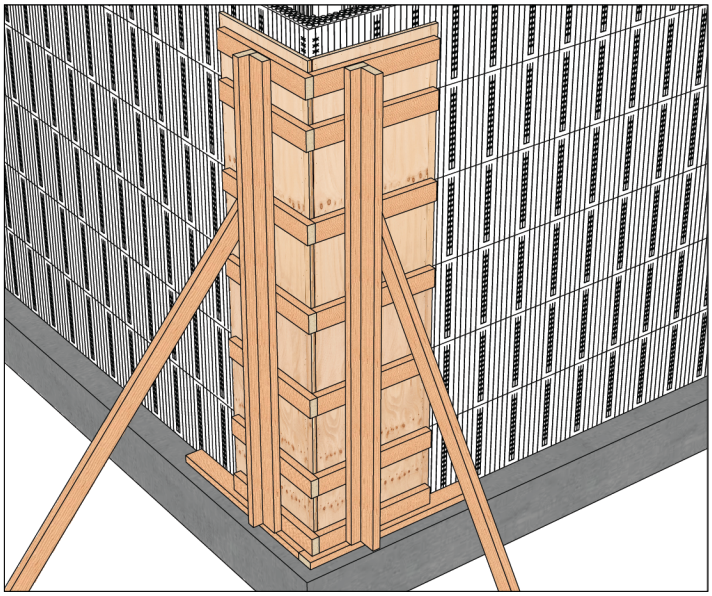


2.7.5.3 – CORNER FORM SUPPORT

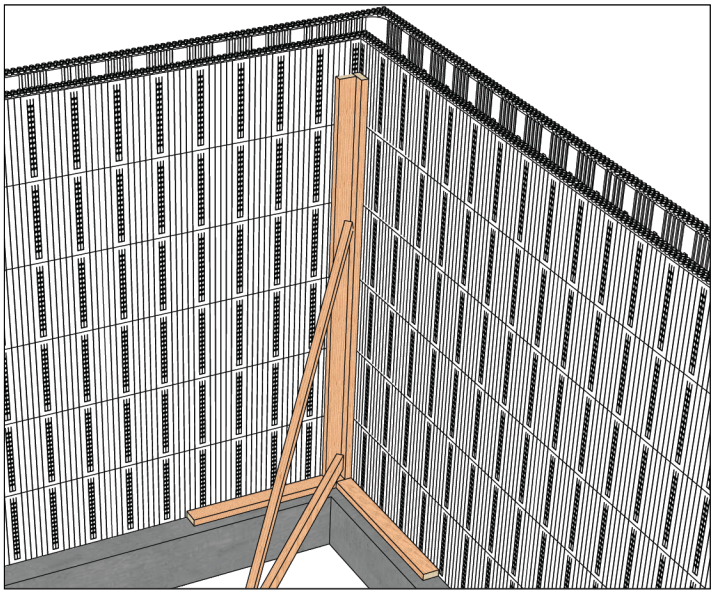
For any type of ICF knock-down system it is good practice to provide additional form support at the corners.

To ensure a safe and proper concrete pour the following corner form support is recommended:

- Using 2.5 inch (64 mm) wood screws to fasten 2x6 vertically to the embedded furring tabs on both sides of the corner.
- For outside corners wrap steel strapping around the corners. For the bottom third of the concrete pour height evenly space two strappings for each course. Then one strap per course for the remaining pour height. Using 1.5 inch (38 mm) wood screws the bands should attach to at least two furring tabs that extend beyond the 2x6 on both sides of the corner.
- For inside corners apply typical bracing as required.



Example of outside corner form support for KD forms.



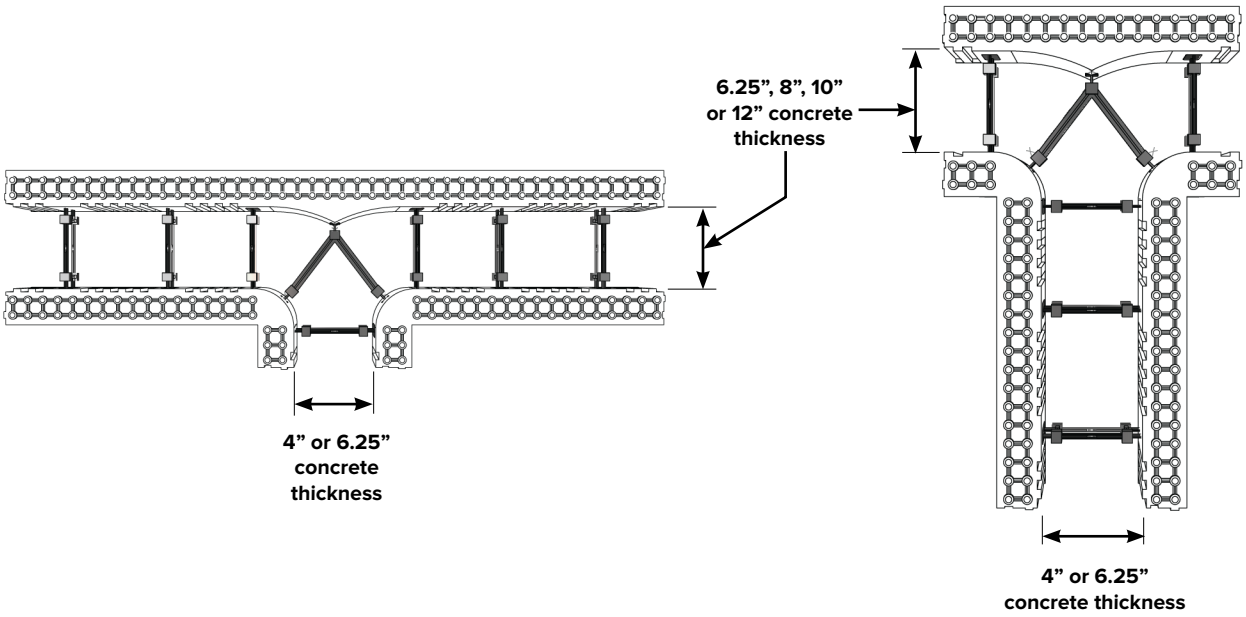
Example of inside corner form support for KD forms.

2.7.6 – TEE WALLS

Wall T-junctions can be constructed using Logix T-walls, or by field-cutting Logix Standard forms.

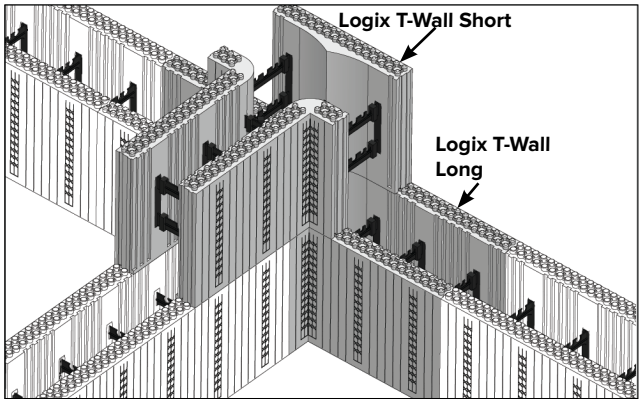
Logix T-walls arrive to the job site assembled or disassembled. When assembled Logix T-walls provide sizes that are commonly used in construction. Each T-wall size comes in two different shapes, a long and short section, so that a running bond pattern is created when the T-wall forms are stacked.

Installation of Logix T-walls is straightforward. As with all Logix forms, the T-walls are stacked in the usual running bond pattern, and follows the same basic installation instructions detailed in "2.7 – LOGIX WALL CONSTRUCTION" on page 10.



Logix T-wall Sizes	Description
4 to 6	4" connected to 6.25" Logix
4 to 8	4" connected to 8" Logix
4 to 10	4" connected to 10" Logix*
4 to 12	4" connected to 12" Logix*
6 to 6	6.25" connected to 6.25" Logix
6 to 8	6.25" connected to 8" Logix
6 to 10	6.25" connected to 10" Logix*
6 to 12	6.25" connected to 12" Logix*

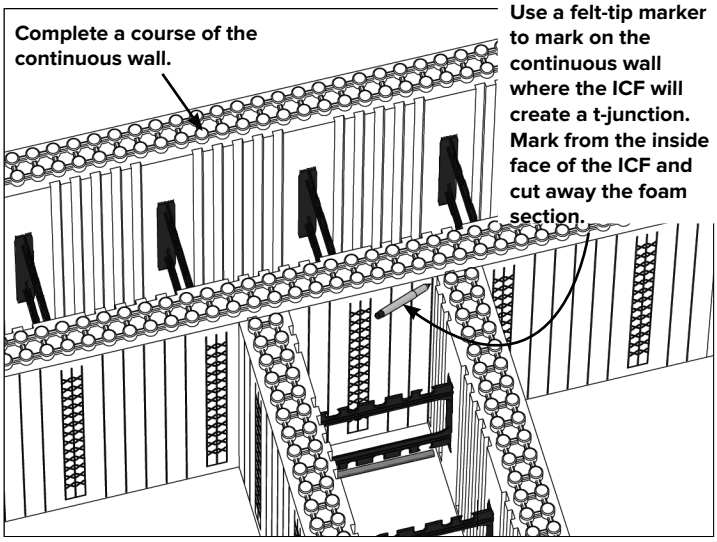
*** Assembled without diagonal ties.**

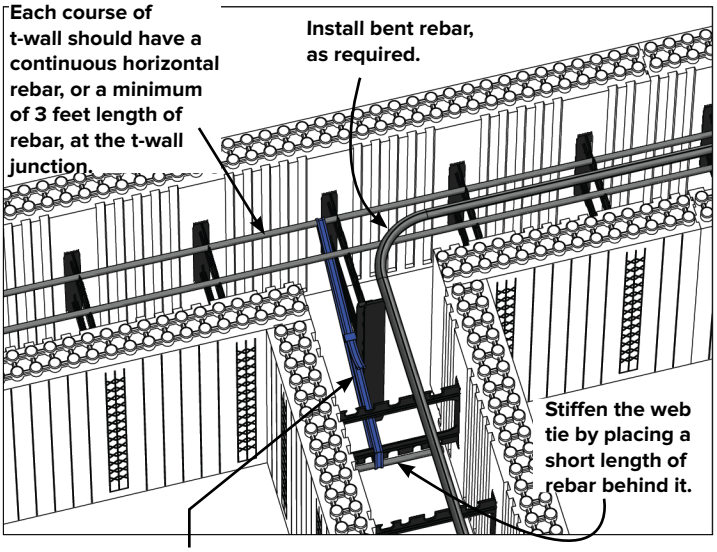


Logix T-Walls stacked

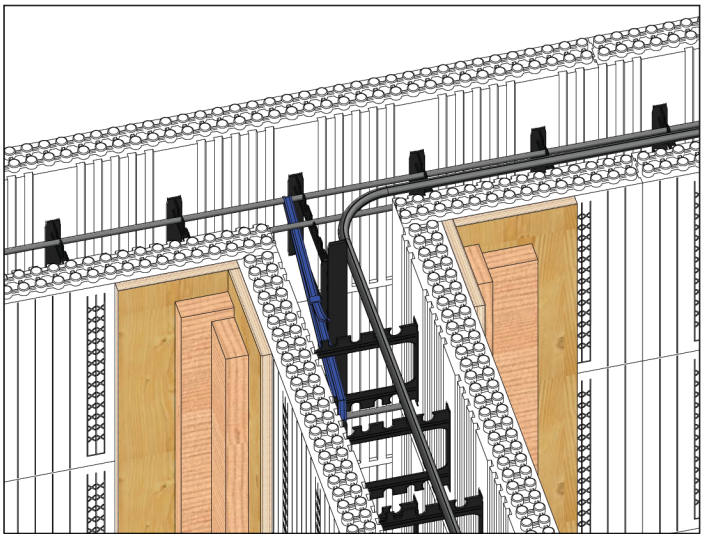
2.7.6.1 – FIELD-CUT T-WALLS

When necessary, t-walls can be made field cutting Standard forms, or straight blocks.





For each course use a ziptie or tie wire to support the ICF at the t-junction. Wrap the ziptie or tie wire around the horizontal rebar and to the web tie closest to the t-junction.

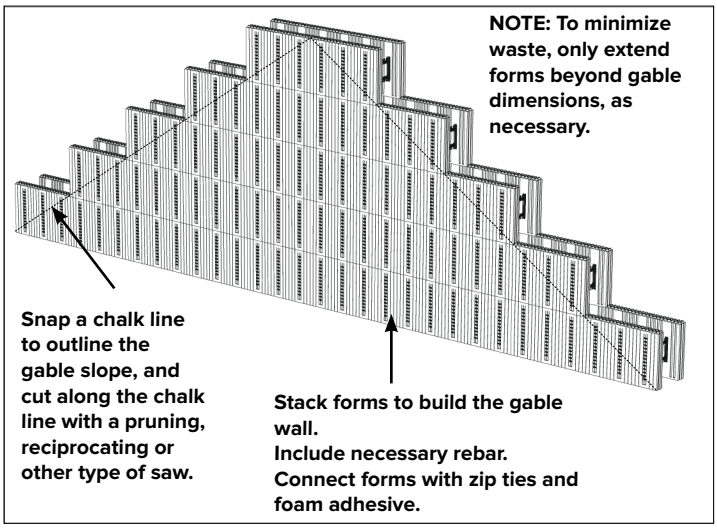


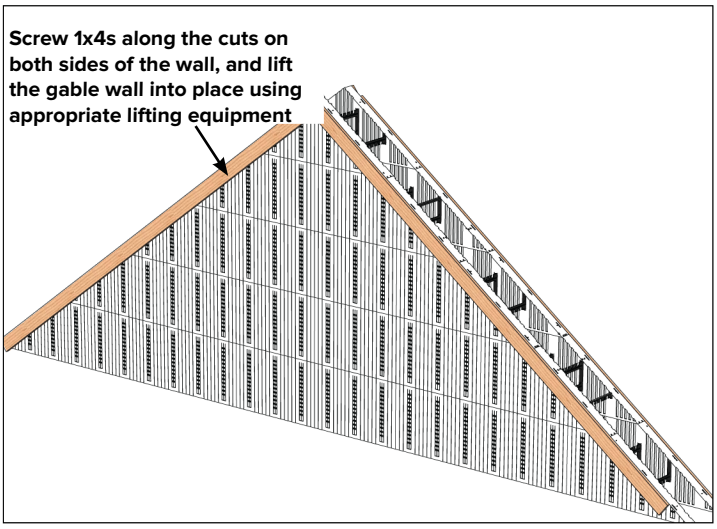
When the entire wall has been checked for plumb and square, apply foam adhesive to the butt joints, and install additional form support, as required.

Another option for building a t-wall is to construct the entire continuous wall first. This method requires pre-planning to ensure there is adequate reinforcement at every course to allow the t-wall to be attached securely. All other steps above need to be applied.

2.7.7 – GABLE WALLS

The preferred method to construct a gable end is on the floor to be installed as a one-piece unit.

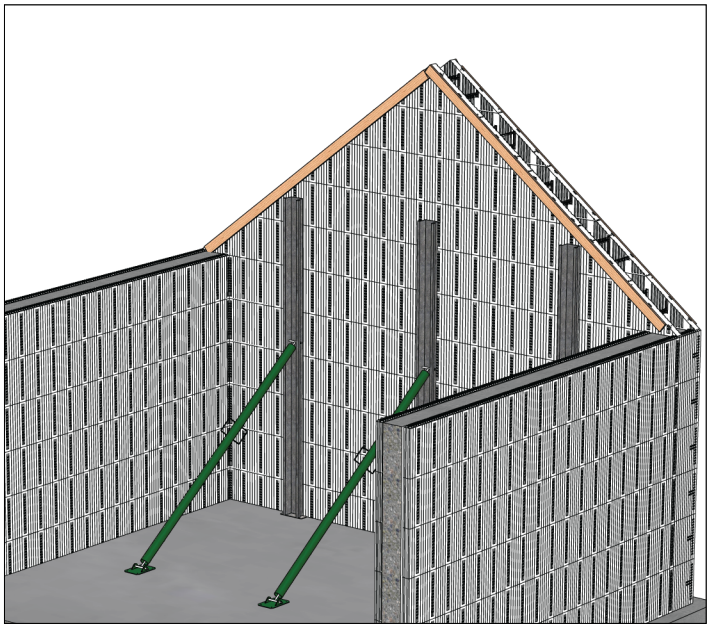




Make sure all necessary roof attachment hardware is available prior to concrete placement, as it must be installed during or immediately after the pour.

NOTE: Pieces of plywood can be screwed into the 1x4s during placement to help contain the concrete.

Another option for constructing a gable wall is to assemble the gable in place. Set the pitch for the gable by marking the first course appropriately. Subsequent courses should follow this pattern.



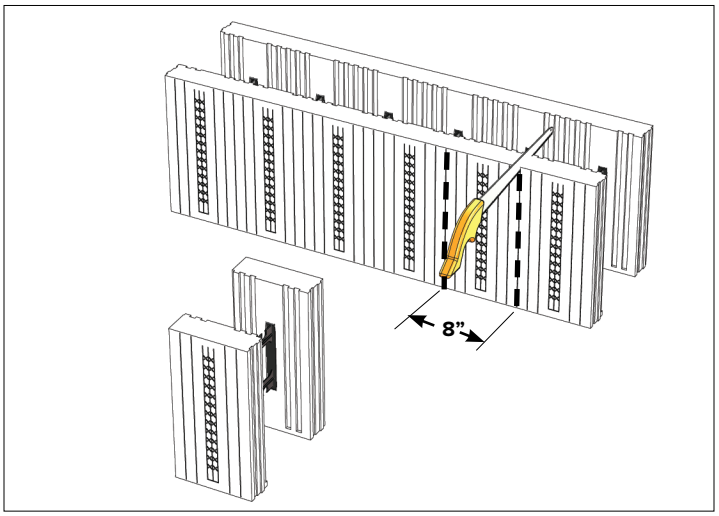
Prior to lifting the gable wall into place, ensure that appropriate wall alignments and scaffolding system is in place for safe installation.

2.7.8 – RADIUS WALLS

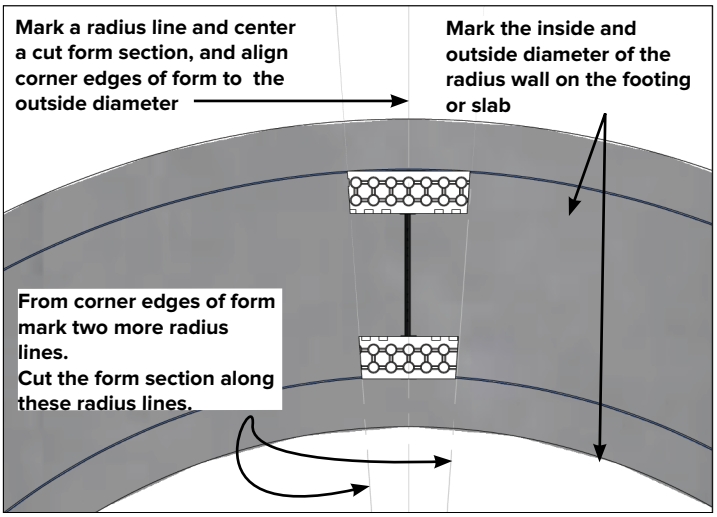
There are a number of different methods for creating radius walls with Logix. Below, is a guide that will create radius walls based on 8 inch segments of Logix.

NOTE: This process will result in vertically stacked joints, and additional form support will be required prior to concrete placement.

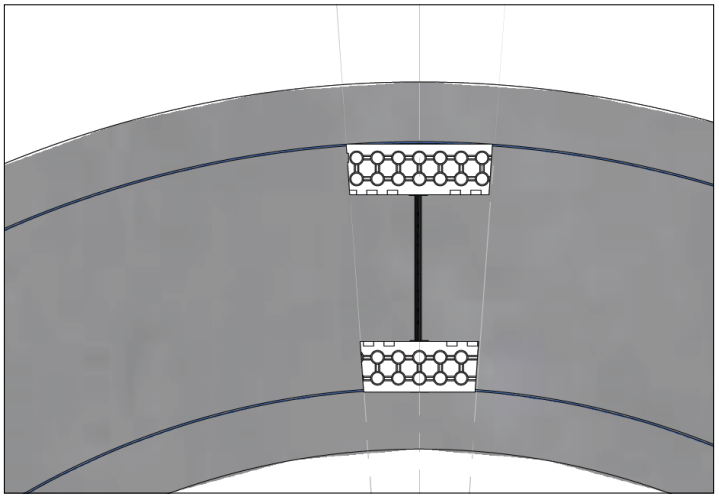
See "2.21 – RADIUS WALLS" on page 83, for radius wall tables.



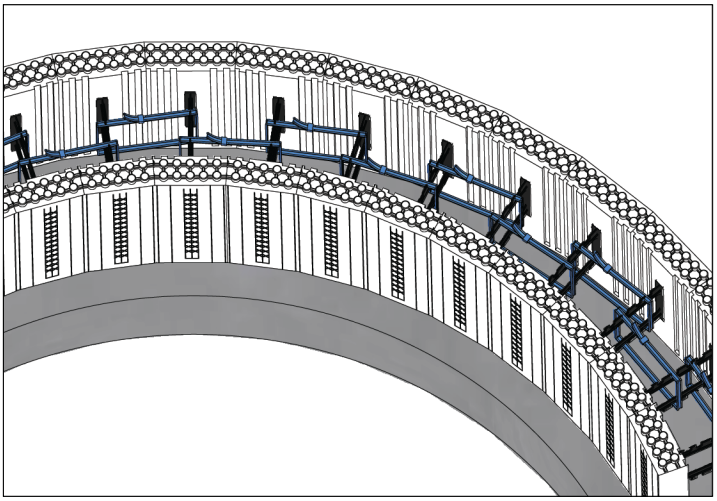
STEP 1: Cut forms into 8" sections with web centered in each section.



STEP 2: Mark radius lines for an 8"cut section.



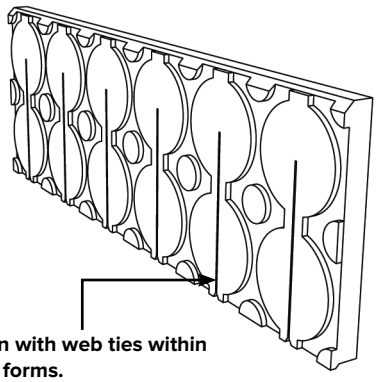
STEP 3: Cut the 8" section at the edges along the radius lines. Mark and cut all form sections using this template.



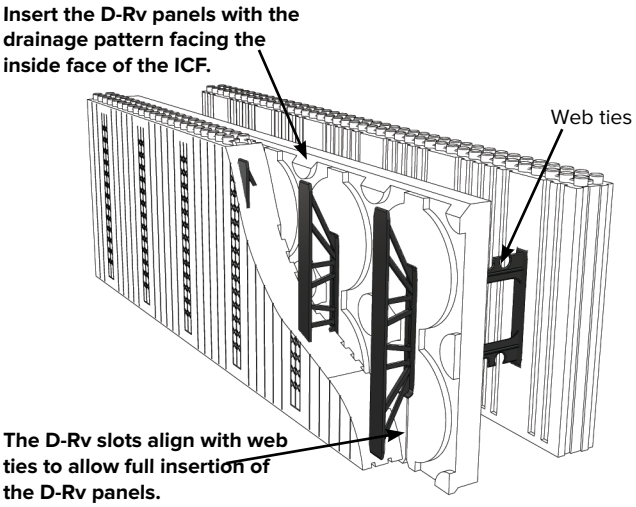
STEP 4: Connect and secure sections with zip-ties, tapes and foam to create the first course. Repeat the steps for each additional course, and connect each with zip ties or Logix hooks.

2.7.9 – LOGIX D-RV

Logix D-Rv™ are 2 inch thick foam panels made with a drainage layer. It provides a quick and easy alternative to providing drainage with the added benefit of increasing the R-value of a Logix wall assembly.



D-Rv panel with drainage pattern.



D-Rv panels snap and lock into place against the inside face of Logix forms without the need for fasteners or adhesives.

(The drainage layer may be required, either by code or design, when a direct applied finish, such as stucco, is used on an exterior ICF wall).

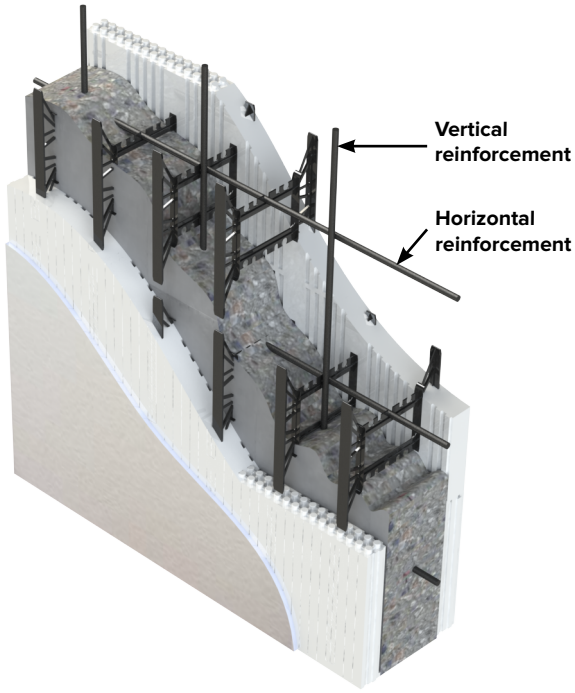
Logix D-Rv can be installed into the Logix form blocks either before or while the form blocks are stacked to build the wall. This speeds up the construction process and eliminates the need to apply the drain layer to the exterior face after a Logix wall has been built.

Offsetting the vertical joints of the D-Rv™ panels with the vertical joints of the Logix forms will create a stronger, more rigid wall structure.

For more information contact your local Logix representative or see Technical Bulletin No. 36, Logix D-Rv™ in the Logix Technical Library.

2.8 – REINFORCEMENT

Reinforcing steel (rebar) strengthens concrete walls to help minimize cracking and buckling under load due to backfill, wind, and other loads. Rebar also helps control cracking due to temperature swings and shrinkage.



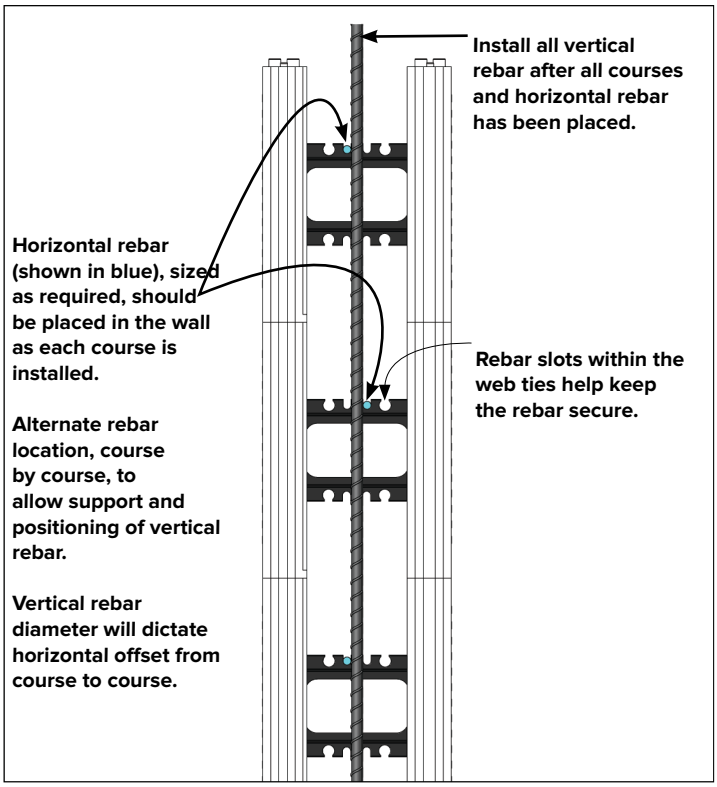
2.8.1 – BASIC REINFORCEMENT

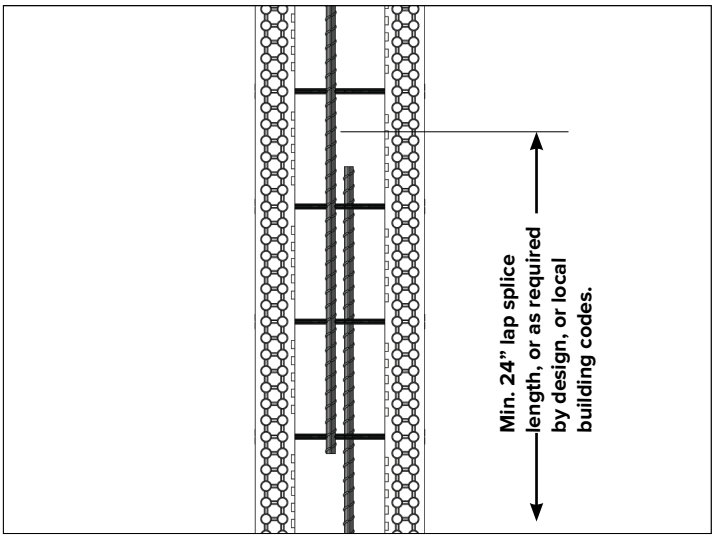
- Reinforcing steel must meet the requirements of ASTM A615, ASTM A996, or ASTM A706 for low-alloy steel. Minimum of Grade 40 (300MPa).
- Reinforcing steel in a Logix wall must have minimum 3/4 inch (19 mm) concrete cover.
- Hold the reinforcement back from door and window openings by 2” (51 mm), or as required by design, or local building codes.
- Refer to Section 6, Engineering for the Logix prescriptive engineering tables.
- It is the responsibility of the installer to verify table rebar specifications with local building codes and engineering specs.

2.8.2 – HORIZONTAL & VERTICAL REINFORCEMENT

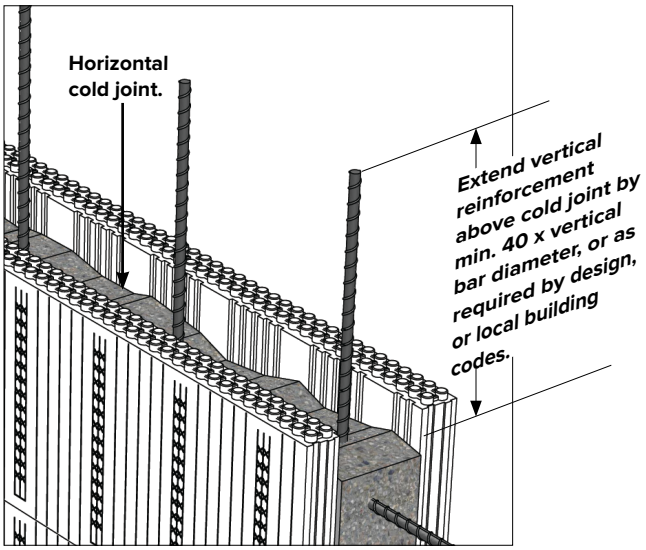
It is the responsibility of the installer to verify table rebar specifications to comply with local building codes and engineering specs.

Refer to Section 6 for Logix prescriptive engineering tables, and Section 5.2.1 for typical reinforcement details.





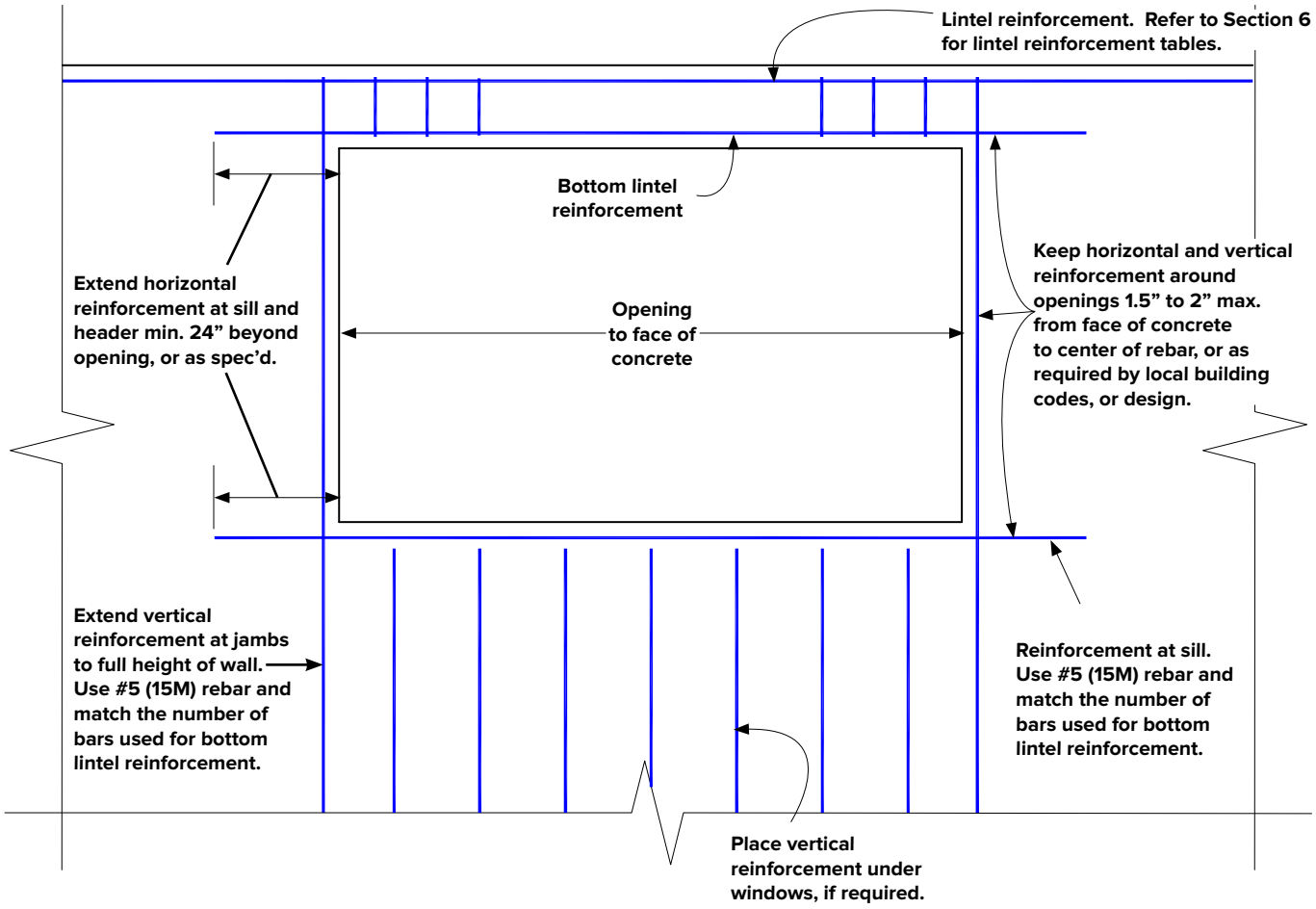
Rebar slots in the web ties allow for non-contact lap splices of horizontal rebar, the preferred method when creating lap splices.



2.8.3 – TYPICAL REINFORCEMENT AT OPENINGS

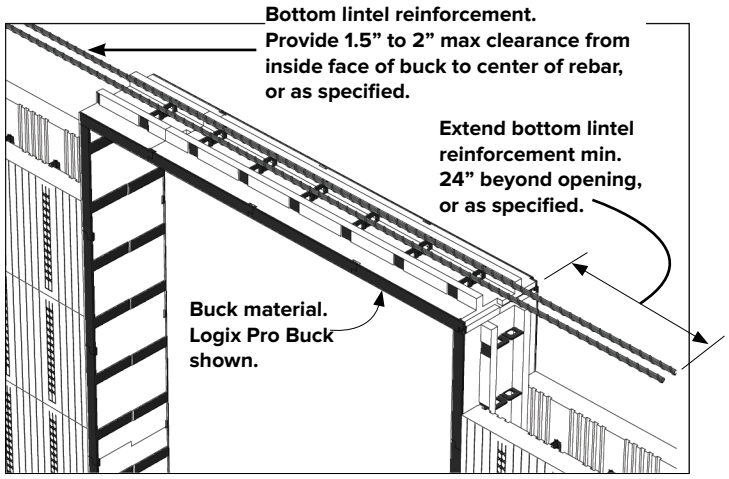
It is the responsibility of the installer to verify table rebar specifications to comply with local building codes and engineering specs.

Refer to Section 6 for lintel reinforcement tables, and lintel details.



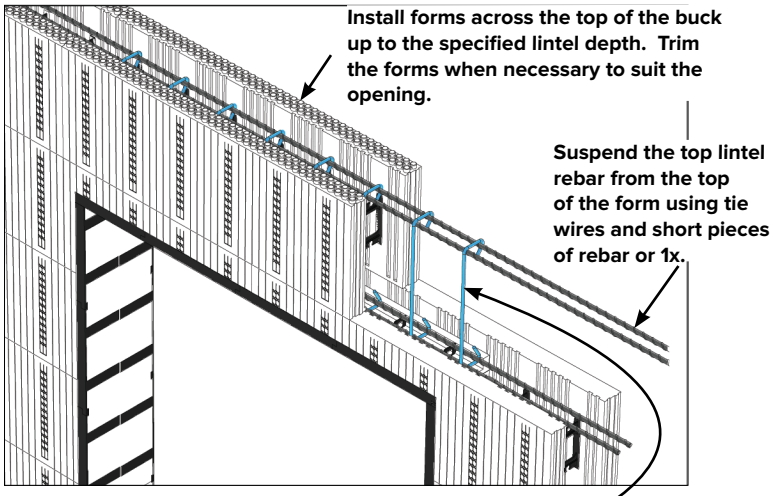
2.8.4 – LINTELS

Appropriate lintel rebar should be placed in the proper sequence directly above doors and windows to carry loads over these openings.



Before placing forms across the top of door or window openings, rest the bottom lintel bar(s) on buck material.

NOTE: Form Lock can be installed across the entire length of the lintel span. In some cases it may be required to install top lintel rebar before installing Form Lock, in order to achieve necessary concrete cover.



Use the stirrups to hang the bottom lintel rebar from the top steel. Depending on lintel depth and stirrup shape, it may be easier to rest the stirrups in place with the bottom lintel rebar before placing forms above the top buck.

Refer to Section 6 for lintel reinforcement tables, and lintel details.

2.9 – WINDOW & DOOR BUCKS

Bucks provide attachment surfaces for windows and doors while holding back concrete from these openings during concrete placement. Mark the center and edges of openings as you place courses and cut blocks as needed.

Refer to the rough opening (R/O) dimensions for windows and doors. Provide for openings in the wall taking into consideration the thickness of the chosen buck material. See window and door manufacturer info for R/O dimensions.

Cross bracing is required for all window and door bucks approximately 18 inches (457 mm) on center to help withstand the pressures of concrete placement.

Window and door openings within 4 feet (1.220 m) of corners require additional horizontal strapping from corner to across the opening.

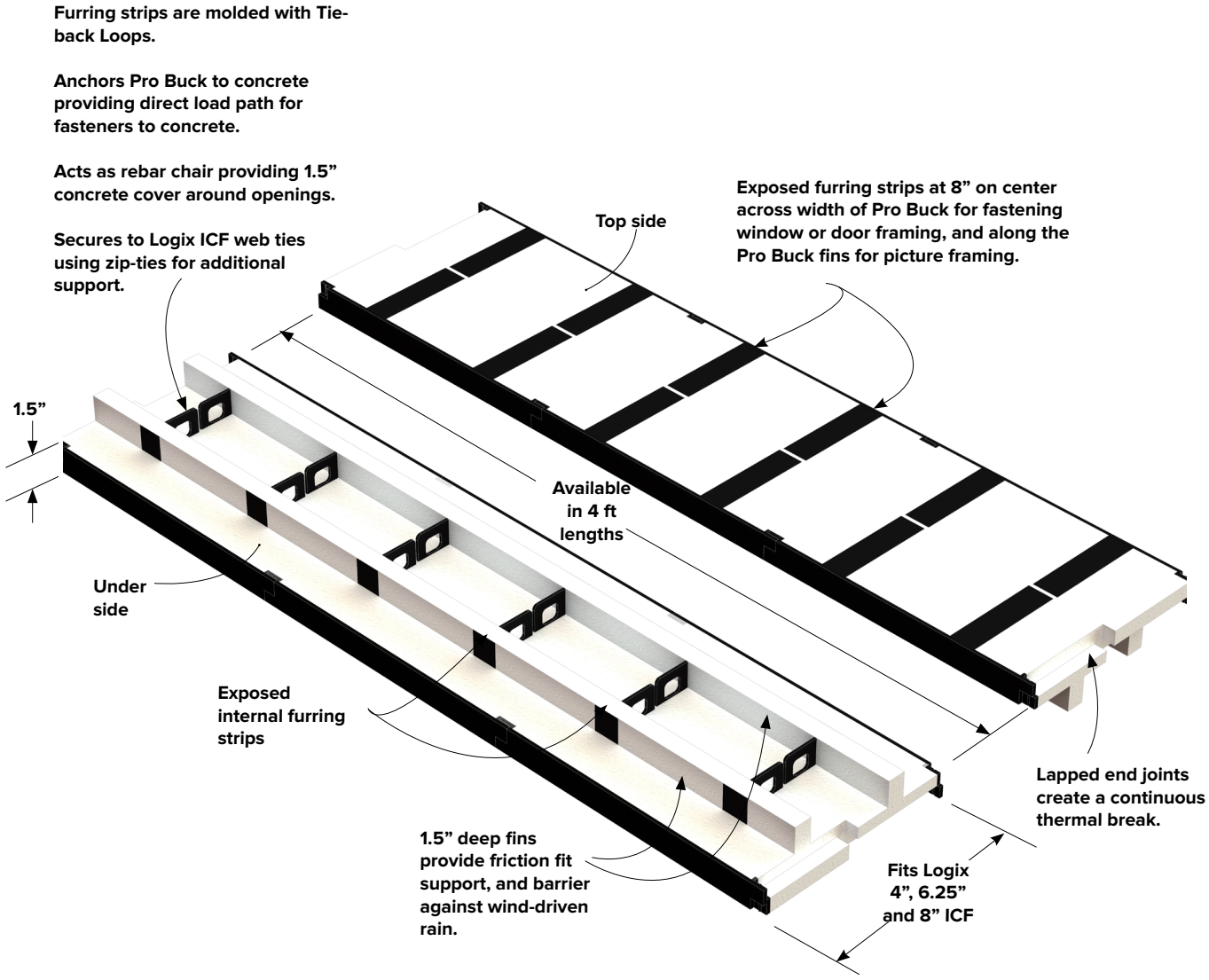
Prior to placing window or door buck, confirm that bottom lintel rebar has been installed.

Bucks can be made from EPS foam, lumber or vinyl. Logix Pro Buck, made of dense EPS foam, is recommended for use with Logix ICF.

2.9.1 – LOGIX PRO BUCK

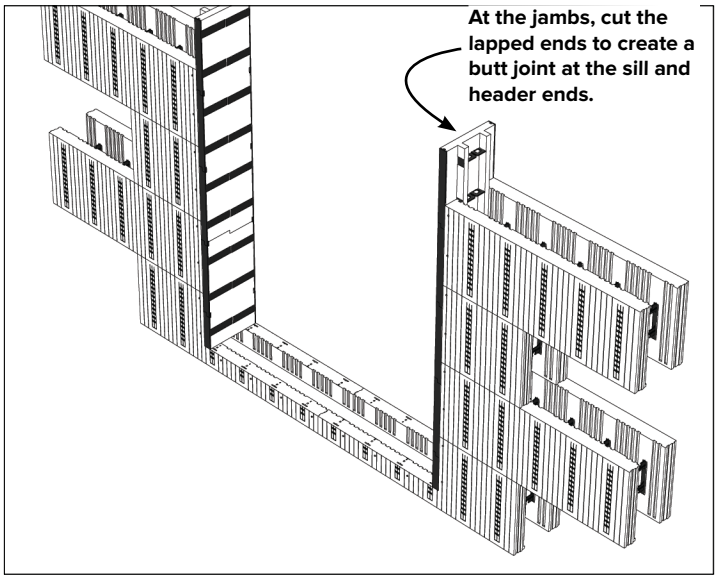
Recommended for use with Logix ICF is the Logix Pro Buck system. Designed for Logix, Pro Buck creates a complete thermal break in window and door openings. And unlike wood and vinyl bucks, Pro Buck is light weight, faster and easier to install, while creating little job site waste. For more information refer to the Logix Pro Buck Installation Guide.

For efficiency, a table long enough to accommodate connecting and cutting Pro Buck sections together is recommended. This can be done by simply using a pair of sawhorses and a section of plywood, or 2x lumber, such as 2x10 or 2x12 pieces.

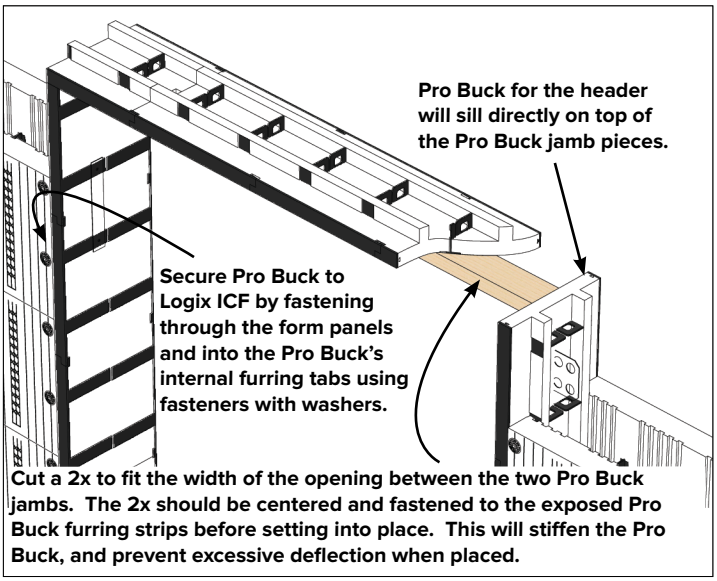


2.9 – WINDOW AND DOOR BUCKS cont'd

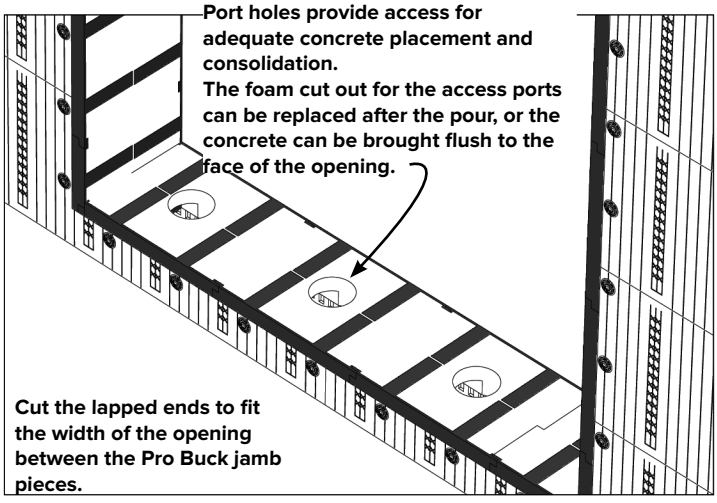
When the walls are built to the height of the opening installation of the Pro Buck can begin. The rough opening is measured between the Pro Bucks. Therefore, to account for the 1.5" thickness of Pro Buck, the opening in the Logix ICF wall should be cut 3" wider and 3" taller than the rough opening.



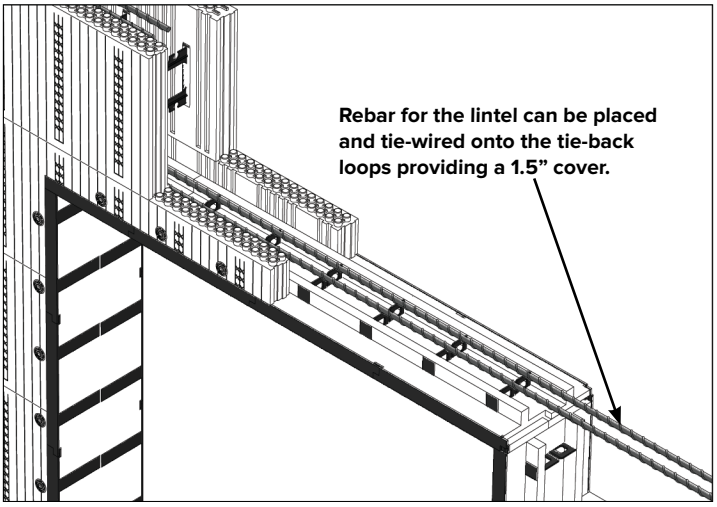
STEP 1: Assemble Pro Buck for the jambs, and cut the lapped ends to fit the height of the opening minus 1.5", which is the thickness of the Pro Buck at the header.



STEP 2: Install Pro Buck at the header. Cut the lapped ends to fit the entire width of the opening. The ends of Pro Buck will sit directly on the Pro Buck jamb pieces.



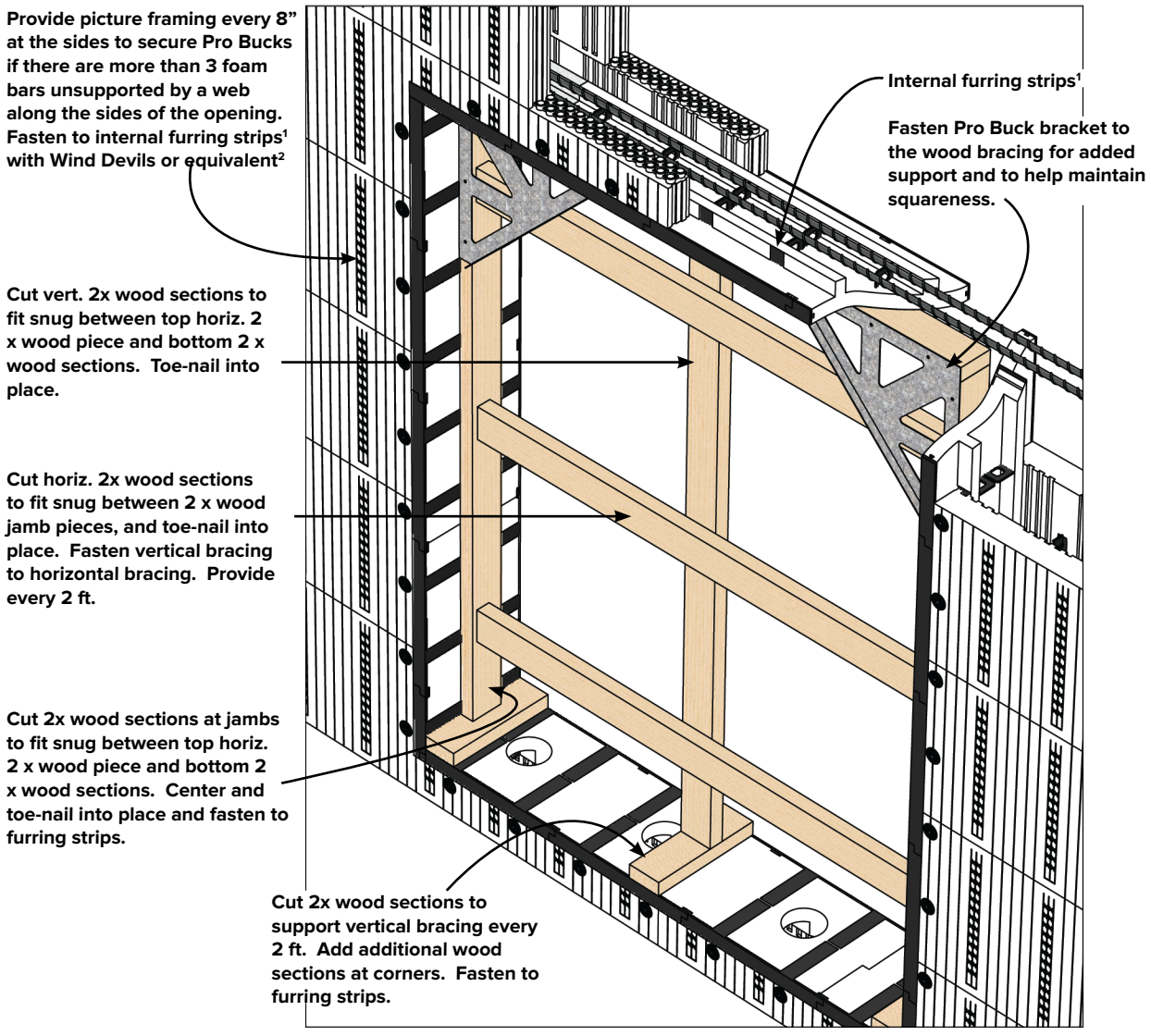
STEP 3: Install Pro Buck at the sill. To avoid debris in the wall cavity, cut min. 4" port holes at 16" on center before placing in the opening.



STEP 4: Continue installing forms above the opening. Use zip ties around the tie-back loop to secure the Logix forms to the Pro Buck at the header.

Once the Pro Buck pieces are placed in the opening add 2x wood bracing, and Pro Buck Brackets, to secure the Pro Bucks during concrete placement. Wood screws are recommended when fastening wood bracing to Logix Pro Buck.

NOTE: Using a membrane flashing is recommended to cover the joints between Pro Bucks and the Logix blocks.



1. Internal furring strips are easy to locate as they are in the same spot as the exposed furring strips that run across the face of Pro Buck.
2. Wind Devil fasteners are available from www.wind-lock.com. Finishes such as stucco, or acrylic textured finishes can be applied directly over Wind Devil fasteners.

2.9 – WINDOW AND DOOR BUCKS cont'd

Non-corrosive wood screws are recommended for the attachment of window or door frames. Inset or flanged windows and doors are fastened to the furring strips molded into the Logix Pro Buck. The furring strips are anchored into the concrete providing proper load transfer from the window/door to the concrete substrate.

To determine the fastener type and spacing for load rated windows and doors, withdrawal and lateral load resistance of specific fasteners are provided below.

Direct Fastening to Furring Strips

	Allowable Withdrawal[1]	Allowable Lateral[1]
#6 wood screw, min 1" long	30 lb	72 lb
#8 wood screw, min 1.25" long	38 lb	188 lb
#10 wood screw, min 1" long	34 lb	90 lb

1. Withdrawal factor of safety = 5, allowable lateral load based on the lesser of factor of safety of 3.2 or 75% of proportional limit. Based on independent fastener testing conducted by QAI Laboratories, in accordance with ASTM D1761, and ASTM E2634.

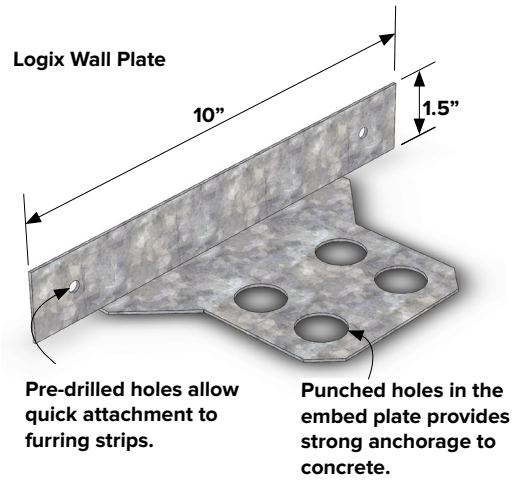
Where heavier load conditions are expected, mullion anchorage or where fixtures may not align with furring strips for proper fastening, such as door hinges, the Logix Wall Plate Inserts are recommended. The Wall Plates provide additional fastening edges between Pro Buck furring strips, and provide stronger fastener resistance. Withdrawal and lateral load resistance of specific fasteners are provided below.

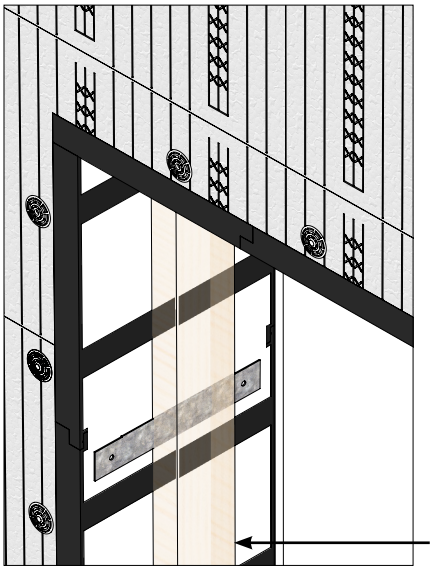
Direct Fastening of Logix Wall Plate

	Allowable Withdrawal[1]	Allowable Lateral[1]
#8-18x1" long self-tapping screw	102 lb	142 lb
#10-16x1.5" long self-tapping screw	106 lb	171 lb

1. Withdrawal factor of safety = 5, lateral resistance factor = 0.5 & 0.53 for #8 and #10 screws, respectively. Based on independent fastener testing conducted by QAI Laboratories, in accordance with ASTM D1761, and ASTM E2634.

To insert Logix Wall Plate cut a narrow slit on the face of Pro Buck.

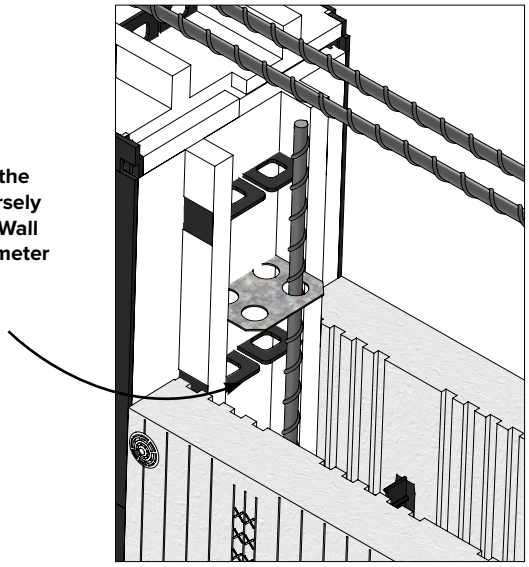




Wall Plate at front face of Pro Buck

Bracing support for opening can support the Wall Plate during concrete placement.

The Wall Plate securely anchors into the concrete core. When placed transversely to the opening holes punched in the Wall Plate allow for the placement of perimeter reinforcement.



Wall Plate at back side of Pro Buck

Pro Buck can also be installed length wise along the opening and temporarily fastened to the furring strips at pre-drilled holes, if required.

2.9.2 – TREATED PLYWOOD BUCK

Following are several methods for building bucks. Regardless of the method chosen, pre-planning is required to optimize chosen finish materials.

STEP 1: Rip 3/4 inch (19 mm) treated plywood to full form width.

STEP 2: Rip treated 2x4 diagonally on table saw at 180° angle.

STEP 3: Assemble buck with appropriate fasteners with 2x4s creating a dovetail detail.

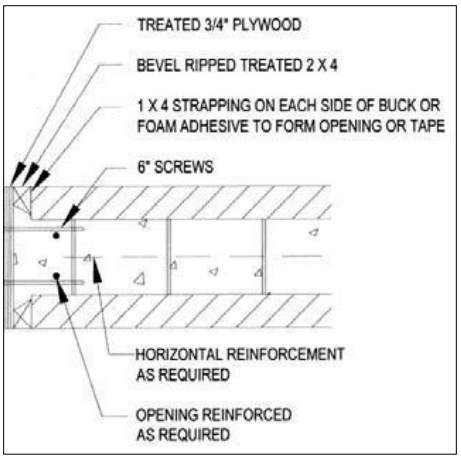
STEP 4: Assemble buck sides and top with access holes cut in bottom piece for placement of concrete. Two 2x4s can also be used for the bottom to allow concrete placements.

STEP 5: Place pre-assembled buck in opening and fasten in place with foam adhesive. The buck can also be installed in opening as separate pieces.

STEP 6: Install temporary cross bracing to withstand concrete pressure. Attaching screws through the buck and into closest webs can provide additional buck support.

NOTE: Pressure treated wood for window bucks are normally required only if the bottom of the window buck frame is located at or below ground level. Check with local building codes to determine if your area requires pressure treated window bucks.





2.9.3 – SOLID WOOD BUCK

STEP 1: Choose appropriate wood product based on the dimension of the forms:

- 4" (102mm) form: 9.5" (241mm)
- 6.25" (159mm) form: 11.75" (298mm)
- 8" (203mm) form: 13.5" (343mm)
- 10" (254mm) form: 15.5" (394mm)

STEP 2: Cut top piece of buck to fit the width of the opening.

STEP 3: Cut sides of buck, remembering that the top piece rests on the side pieces.

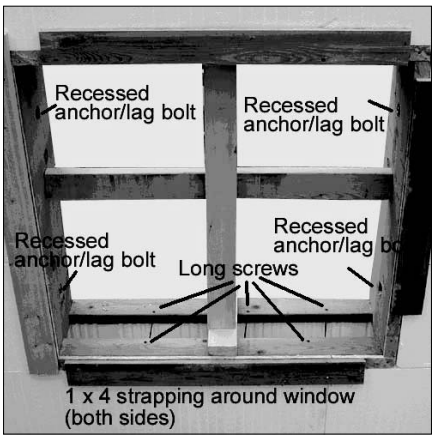
STEP 4: Cut two 2x4s for the bottom to allow concrete placement.

STEP 5: Assemble buck and place in opening.

STEP 6: Once the buck is in place, it must be centered and secured. This can be done by attaching 1x4s to the edges of the buck, extending the edge of the 1x4 over the foam to hold the buck firmly in place. Alternately, the buck can be secured with foam adhesive and tape.

STEP 7: Solid wood bucks will require additional concrete anchors to create a permanent attachment to the concrete.





2.9.4 – RADIUS OPENINGS

Radius windows and doors can be assembled at the site with shortened pieces of Logix Pro Buck or lumber buck material.

STEP 1: Create the template for the radius opening with OSB or plywood that matches door or window rough opening.

STEP 2: Using template, draw outline of radius on wall, allowing for buck material thickness. Cut accordingly.

STEP 3: Cut buck material into approximately 4 inch (102 mm) widths to create radius buck.

STEP 4: Cut side and bottom buck pieces. Leave openings in the bottom piece for concrete placement and consolidation.

STEP 5: Assemble buck pieces in the opening in the following order:

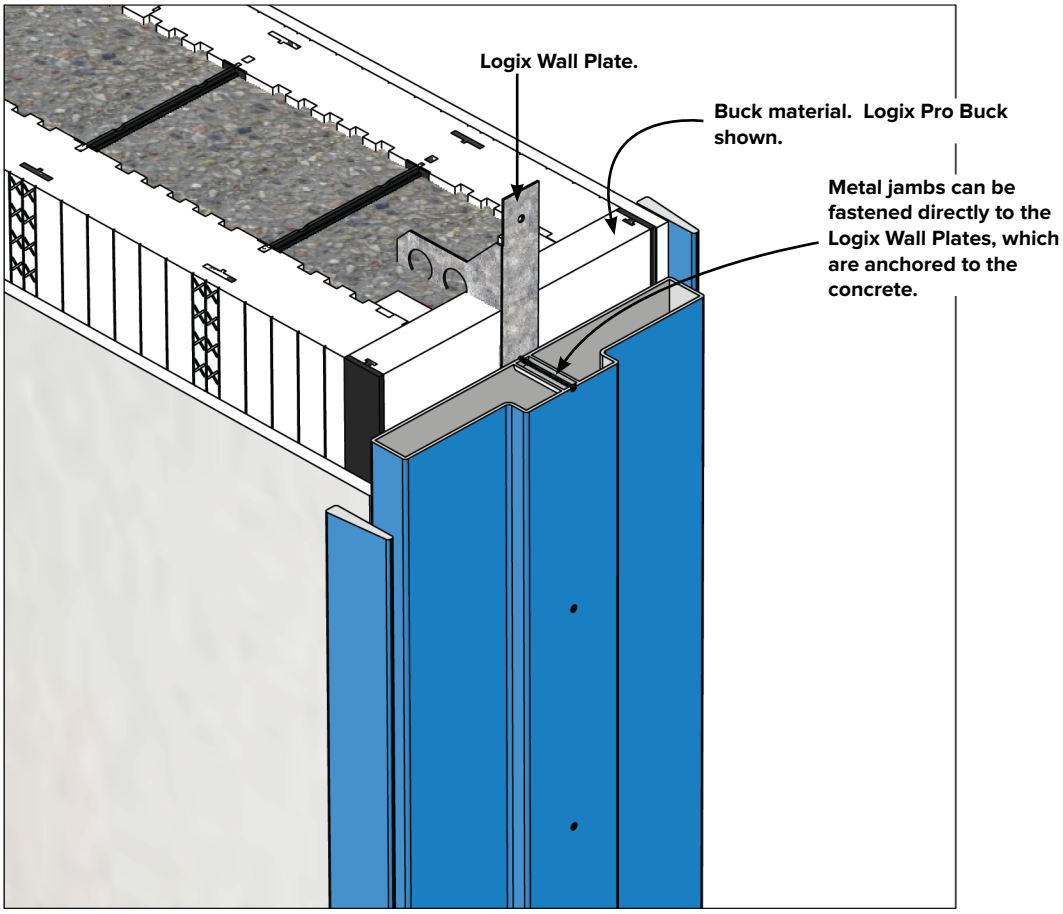
- bottom
- sides
- radius top

STEP 6: Once the buck is in place, it must be centered and secured. This can be done by attaching 1x4s to the edges of the buck, extending the edge of the 1x4 over the foam to hold the buck firmly in place. Alternately, the buck can be secured with foam adhesive and tape. Insert the radius template in opening to provide additional support.

STEP 7: Solid wood bucks will require additional concrete anchors to create a permanent attachment to the concrete.

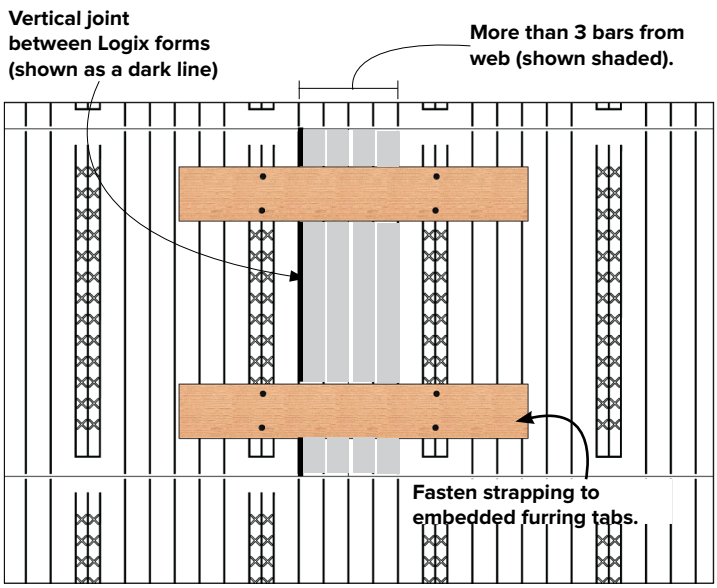
2.9.5 – METAL JAMBS

Metal jambs are typically used in commercial applications. Many metal jamb companies will pre-bend jambs to fit Logix forms. Contact your local Logix representative for more details.

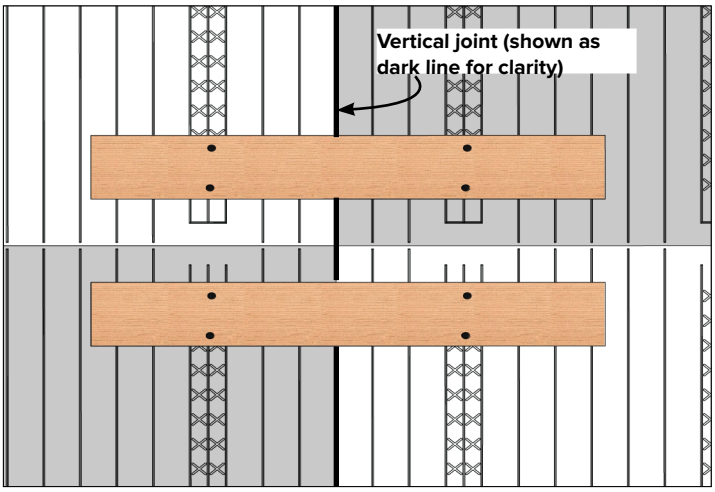


2.10 – ADDITIONAL FORM SUPPORT

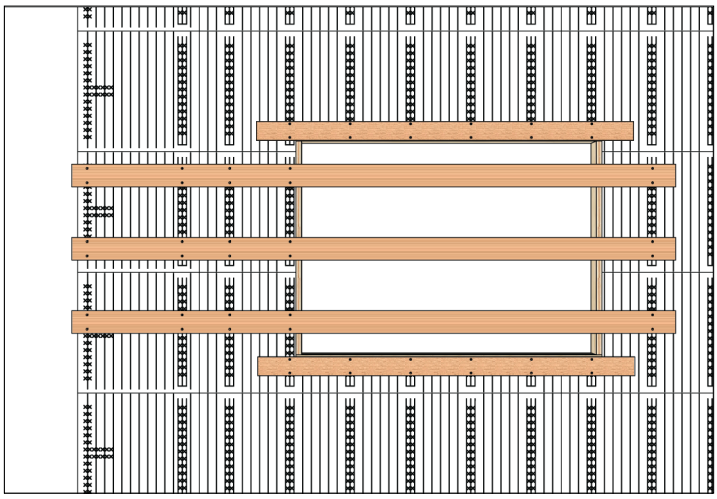
The time spent prior to concrete placement pays huge dividends in job efficiency, accuracy, and profitability.



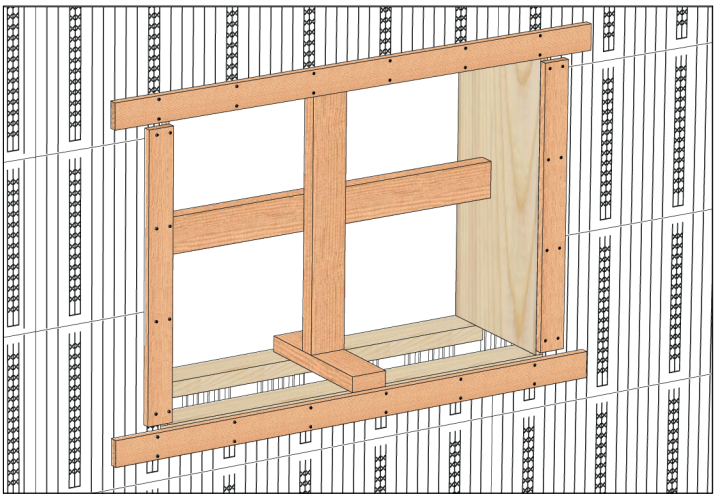
Provide wood strapping on both sides of Logix when there are more than 3 bars beyond a web.



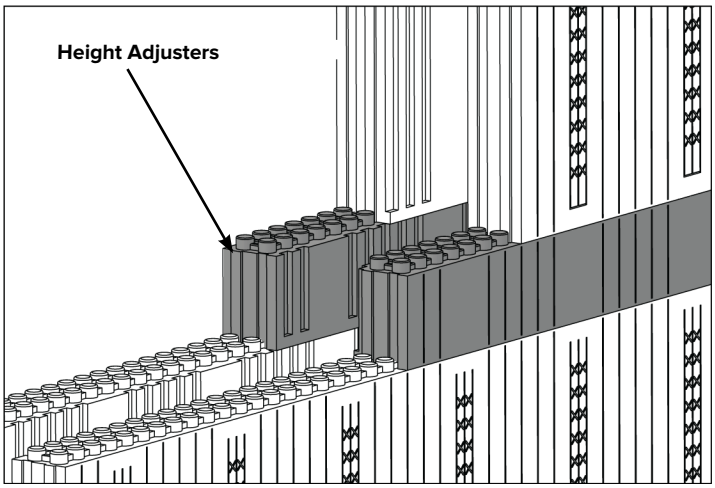
Provide wood strapping on both sides of Logix when vertical joints are directly on top of each other, or offset between joints is less than 8” between courses.



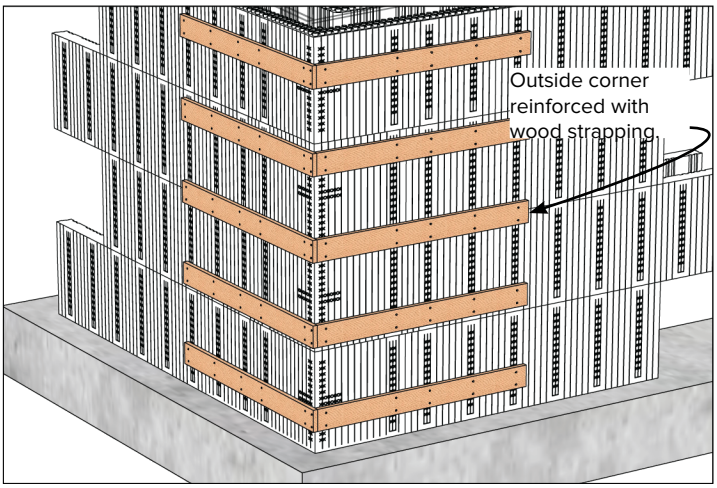
Provide wood strapping on both sides of Logix at window and door openings less than 4 feet from a corner. Run strapping across opening. Fasten to embedded furring tabs, and bracing around openings.



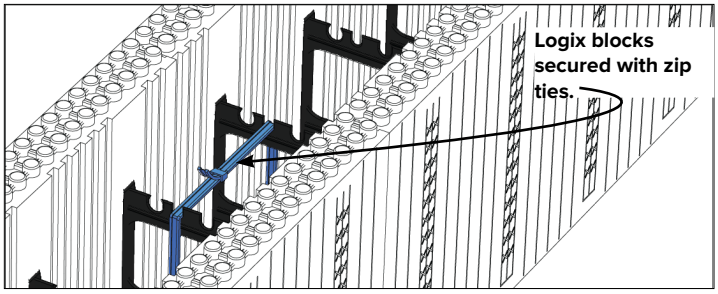
Wood strapping is required around window and door openings to maintain straightness. In addition, cross bracing with 2x4 supports is required inside window and door bucks to hold bucks in place and prevent sagging. Use foam adhesive on bucks to provide additional buck support.



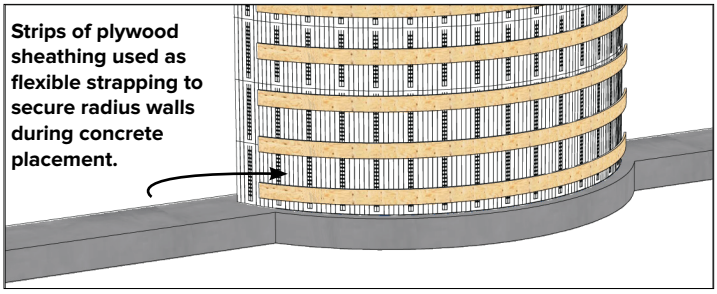
Foam adhesive should be used to secure all Height Adjusters.



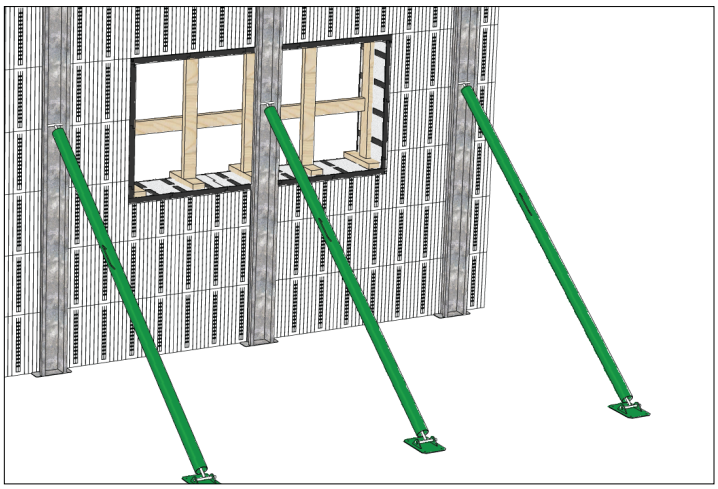
All outside corners can be reinforced with tape, or wood strapping, and zip ties.



The top course and lintels should be secured with adhesive foam, zip ties, or Logix Horizontal and Vertical Hooks.



Radius walls should be secured with foam adhesive and flexible strapping material.

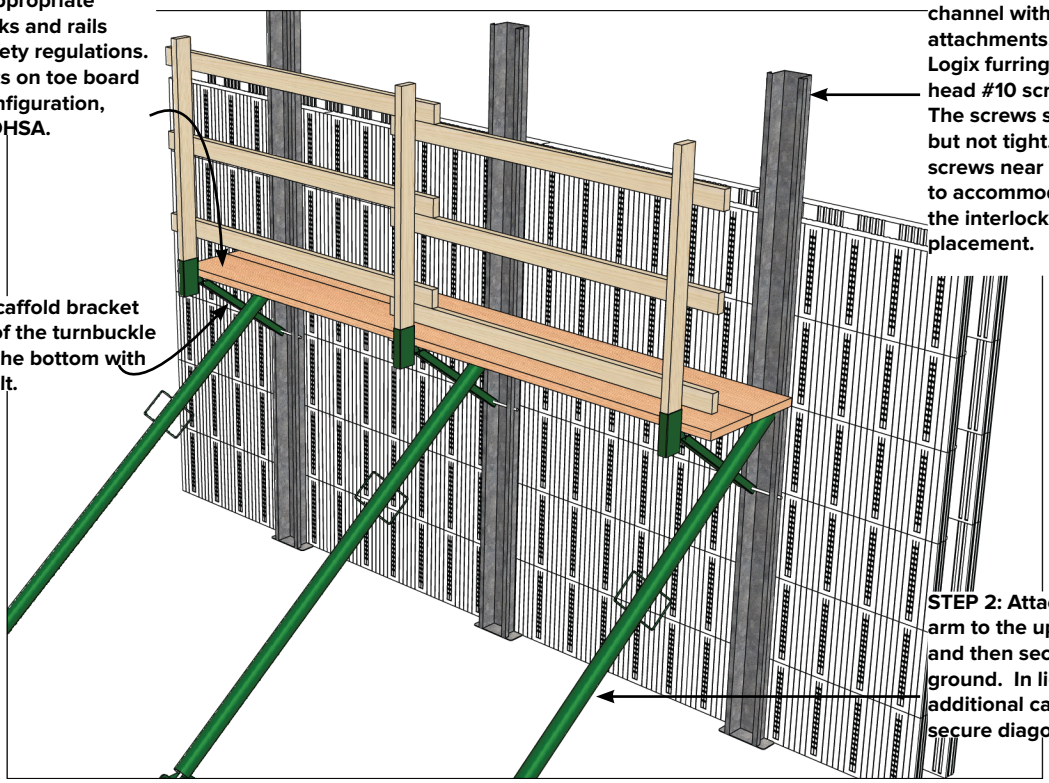


The middle of large openings should be vertically braced to prevent tipping.

NOTE: All forms should be firmly seated to prevent settling.

2.11 – WALL BRACING & ALIGNMENT SYSTEM

A bracing system provides support for the wall and acts an alignment system to keep the walls straight and plumb during concrete placement. Typically, the wall alignment system is installed on the inner side of the Logix wall, and installed after placing 2 to 4 courses of Logix forms (depending on wind and other conditions).



Recommended minimum spacing and bracing locations:

- no more than 2 feet (0.610 m) from each corner or wall end, and every 7 feet (2.134 m) or less thereafter, in accordance with OSHA/OHSA requirements.
- on either side of every door and window opening.
- along door and window openings that span more than 6 feet (1.829 m)

NOTES: Prior to concrete placement, make certain walls are aligned perfectly plumb, or leaning slightly inward. The wall must not lean out at all.

A string line must be used to achieve straight walls. See Section “2.7.3 – ADDITIONAL COURSES” on page 16.

Before, during and after concrete placement, the diagonal turnbuckle arm is used to adjust wall straightness to stringline.

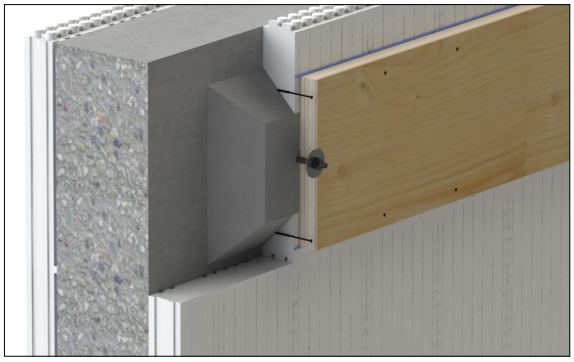
Proprietary bracing systems are available through ICF dealers or bracing suppliers.

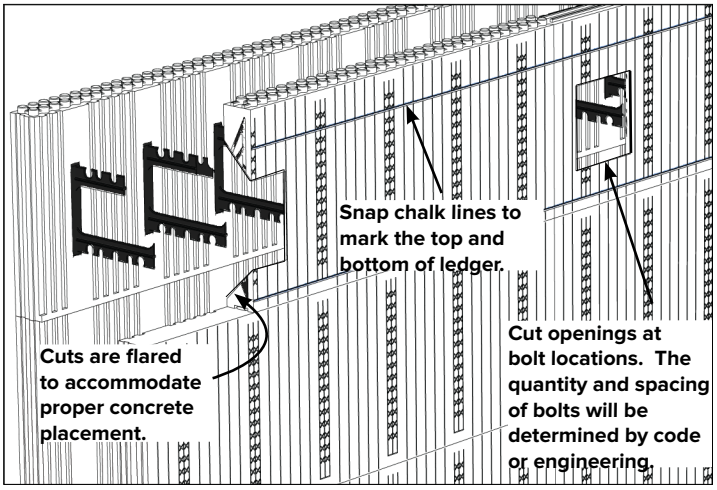
For tall wall bracing and alignment see Section 3.2, Tall Wall Bracing Systems.

2.12 – FLOOR CONNECTIONS

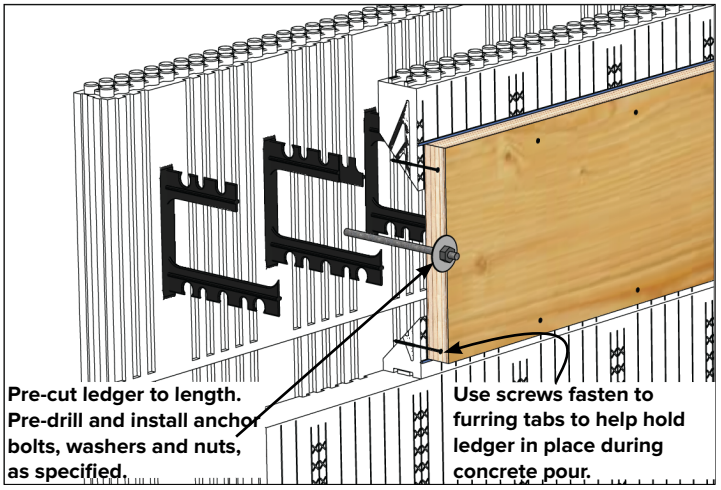
Any type of floor system can be easily integrated with Logix. For any questions or assistance, please contact your local Logix representative.

2.12.1 - LEDGER WITH ANCHOR BOLTS & JOIST HANGERS

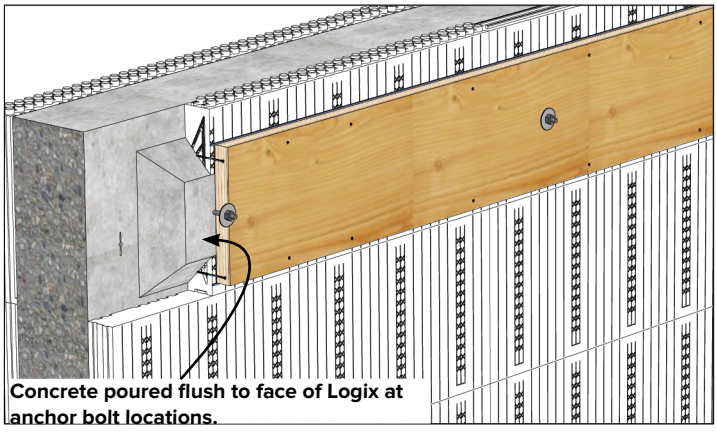




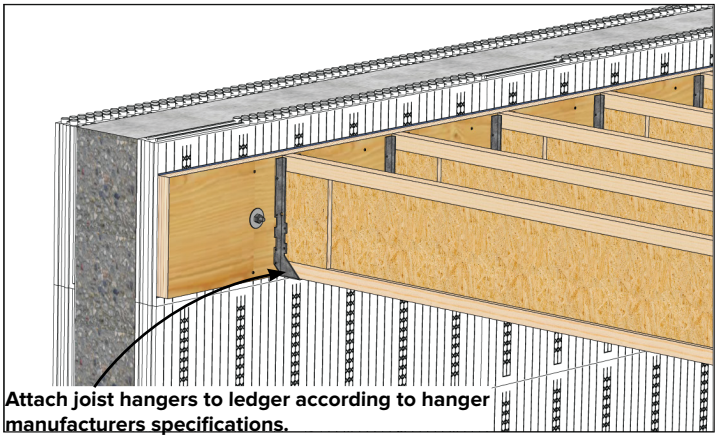
STEP 1: Snap chalk lines and cut openings for bolt locations.



STEP 2: Install ledger with anchor bolts.



STEP 3: Place concrete.



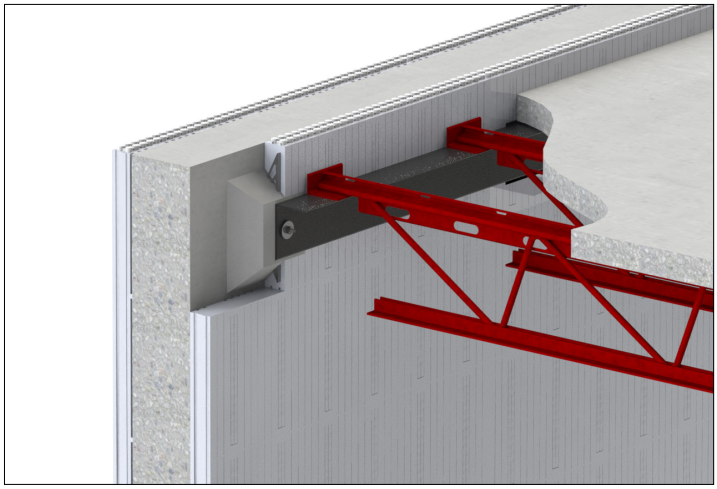
STEP 4: Install joist hangers.

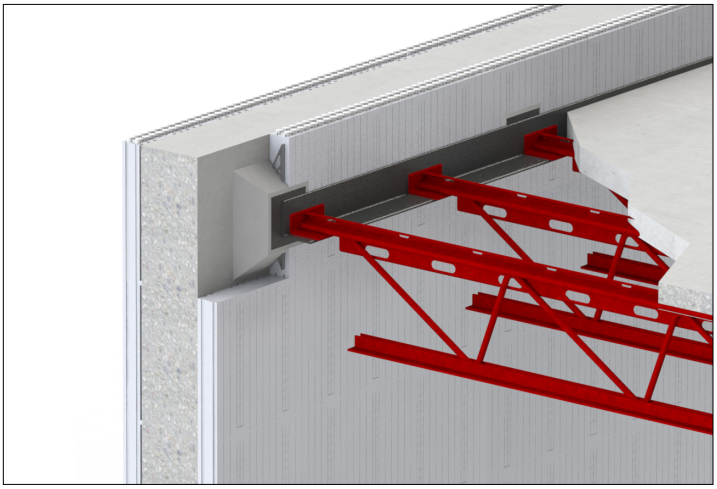
2.12.2 – STEEL ANGLE IRON LEDGER

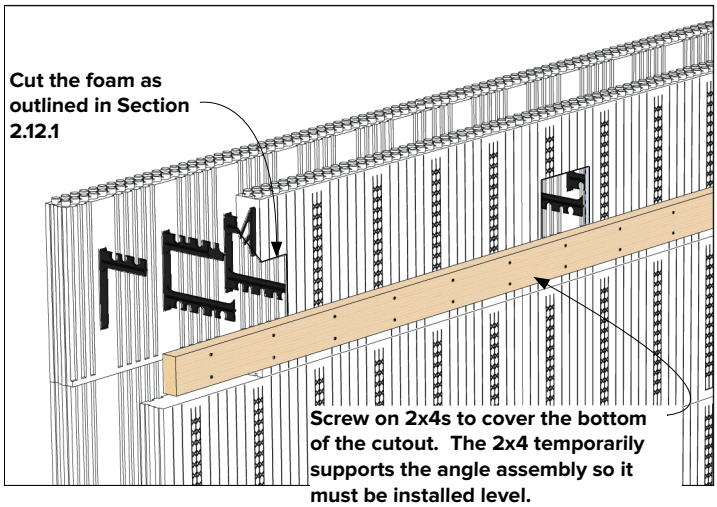
When floor spans become very long or concrete topping is applied to the floor, a wood ledger may not be adequate to support floor loads. In this case a steel angle iron can be used in place of a wood ledger. The angle iron can support much more weight and also eliminates the need for joist hangers, as the floor system sits right on the angle.

To install an angle iron ledger follow the steps in Section "2.12.1 - LEDGER WITH ANCHOR BOLTS & JOIST HANGERS" on page 45, but use pieces of plywood to temporarily hold the bolts in place. After the pour drill and bolt on the angle iron. Local steel fabricators may be able to pre-drill your angle iron.

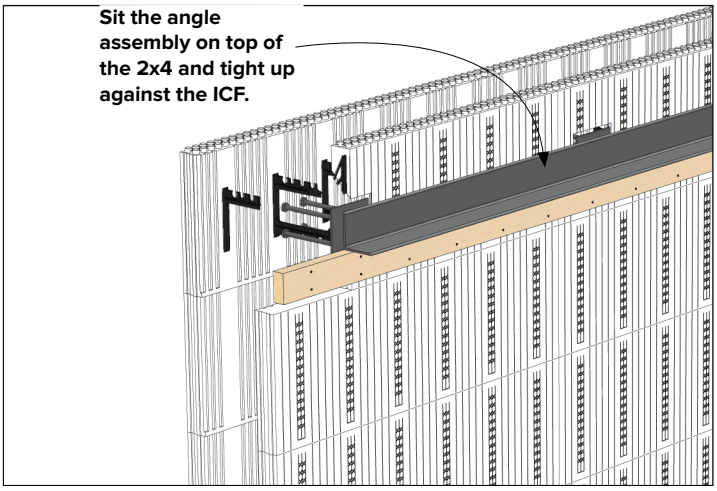
Another alternative is to pre-fabricate an angle iron with anchor bolts or nelson studs welded directly to the angle. The entire assembly is then cast in place. This application is described below.



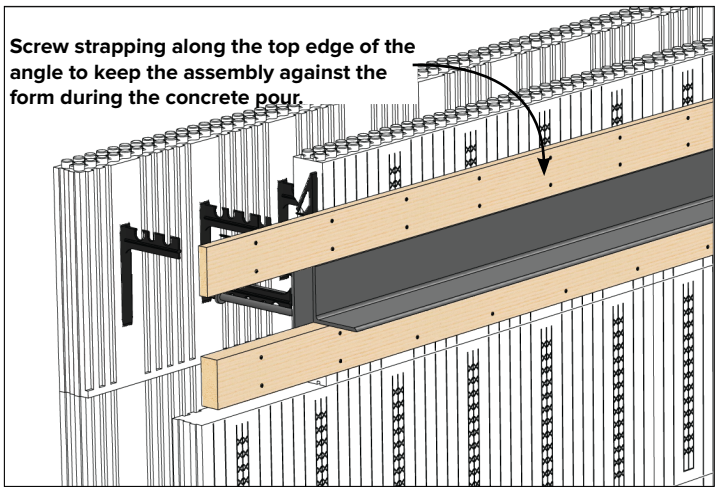




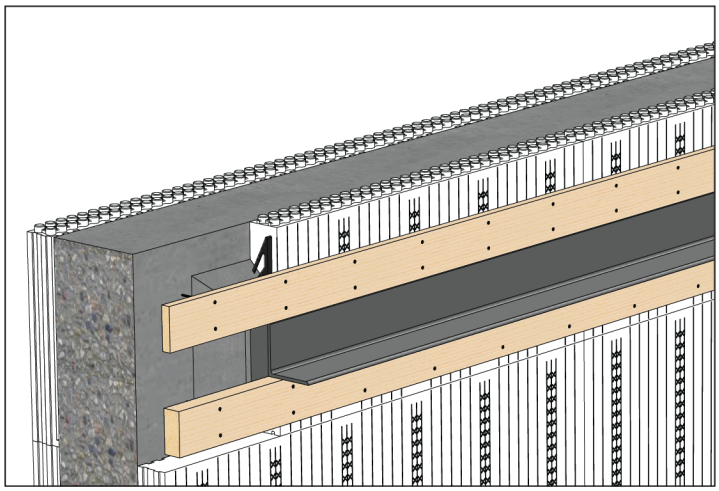
STEP 1: Cut foam to accommodate anchors, and install 2x4 to support angle assembly.



STEP 2: Install 2x4 to support angle assembly.

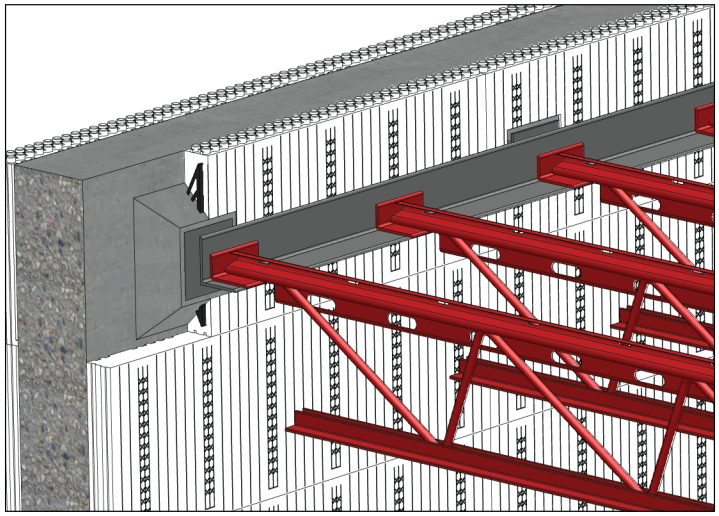


STEP 3: Install strapping to support angle assembly.



STEP 4: Pour concrete and cast the assembly in place.

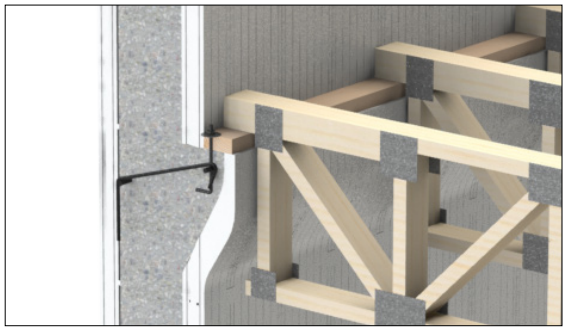
NOTE: It is code in some areas for the angle assembly to be primed.



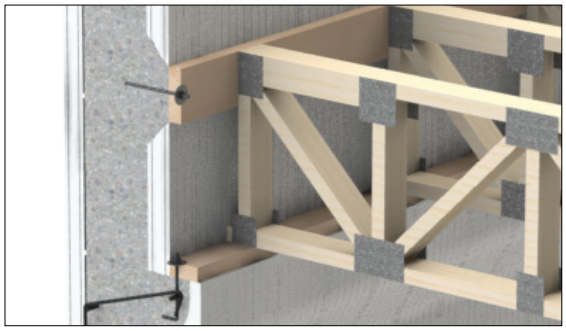
STEP 5: After some curing place floor systems on the angle and establish layout. Once layout is complete fasten the floor joist to the angle iron, as specified. You may decide to attach a nailing surface to the bottom leg of the angle iron to nail joists to.

2.12.3 – BRICK LEDGE FOR TOP & BOTTOM CHORD BEARING SYSTEMS

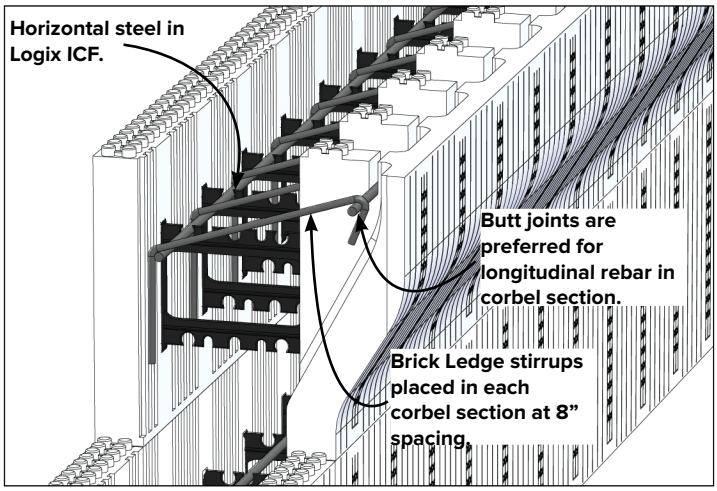
The Logix Brick Ledge form can create a load bearing surface to support floor systems, including top and bottom chord bearing trusses or joists.



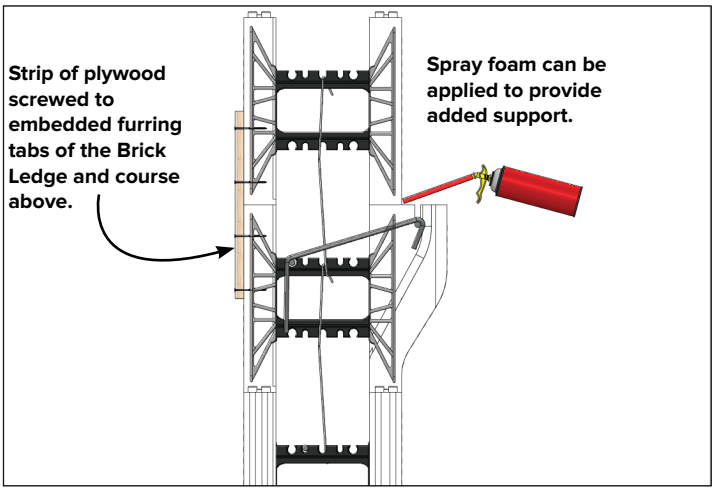
Top chord bearing on Logix Brick Ledge.



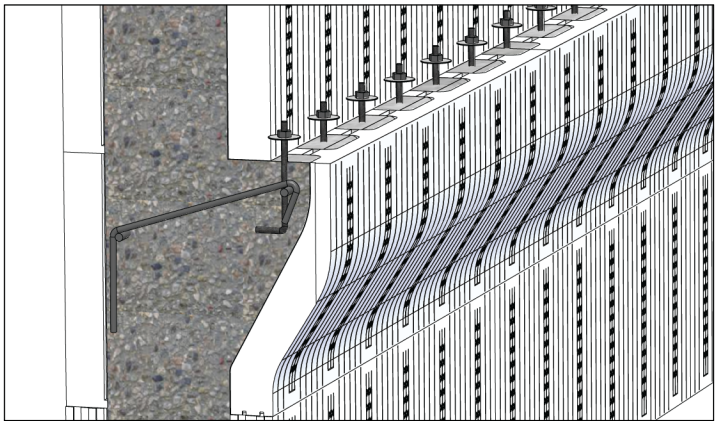
Top chord bearing on Logix Brick Ledge.



STEP 1: Install a course of Logix Brick Ledge, and place required reinforcement.



STEP 2: When installing a course above the Logix Brick Ledge add additional form support to prevent tilting or separating.



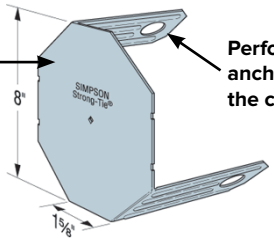
STEP 3: As concrete is placed, install embedments, as required.

NOTE: If the Logix block in the course above the Brick Ledge is of a smaller width than the Brick Ledge, additional form support will be required.

2.12.4 – LEDGER WITH SIMPSON BRACKET & JOIST HANGERS

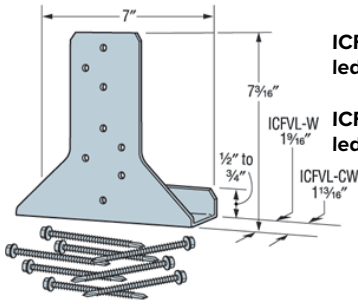
The ICFVL & ICFVL-W ledger connector system from Simpson Strong-Tie is designed for mounting steel or wood ledgers on ICF walls.

Exposed flange provides mounting surface for wood or steel ledgers.



Perforated legs anchor bracket to the concrete.

ICFVL bracket is inserted through the Logix form panels prior to concrete placement.



ICFVL-W is used with 1 1/2" wood ledgers.

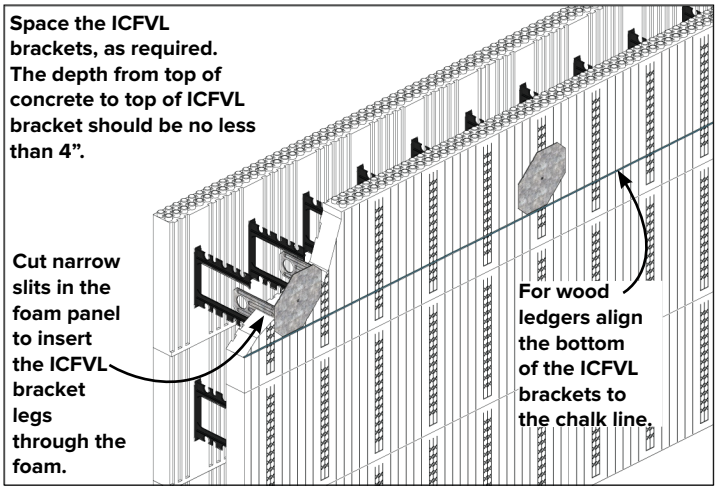
ICFVL-CW is used with 1 3/4" LVL ledgers.

ICFVL-W and ICFVL-CW brackets are installed on the ledger and screwed to the embedded ICFVL.

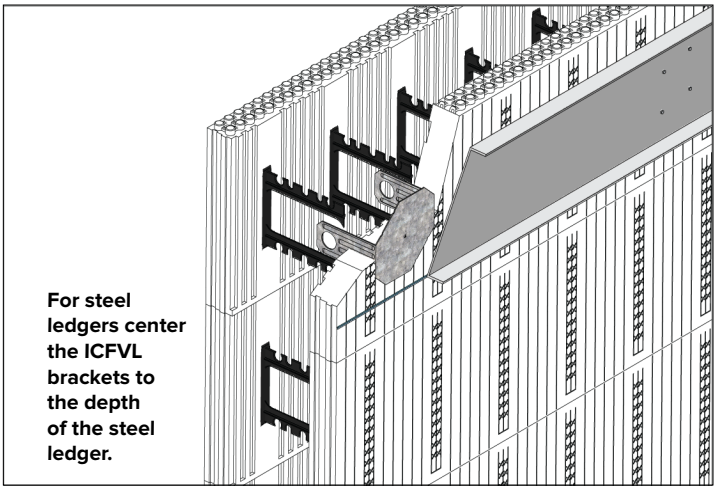
Space the ICFVL brackets, as required. The depth from top of concrete to top of ICFVL bracket should be no less than 4".

Cut narrow slits in the foam panel to insert the ICFVL bracket legs through the foam.

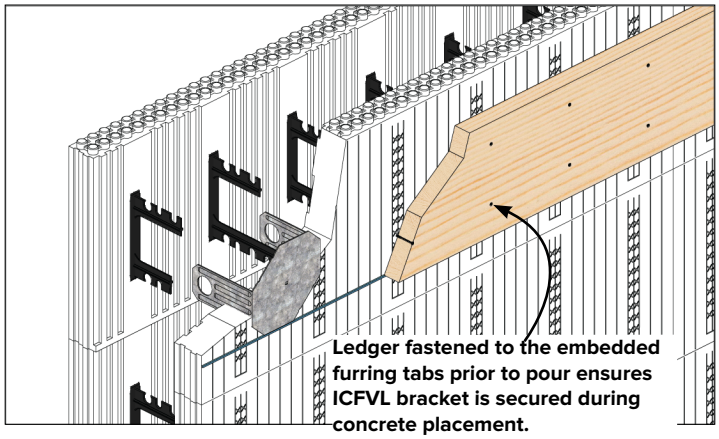
For wood ledgers align the bottom of the ICFVL brackets to the chalk line.



For steel ledgers center the ICFVL brackets to the depth of the steel ledger.



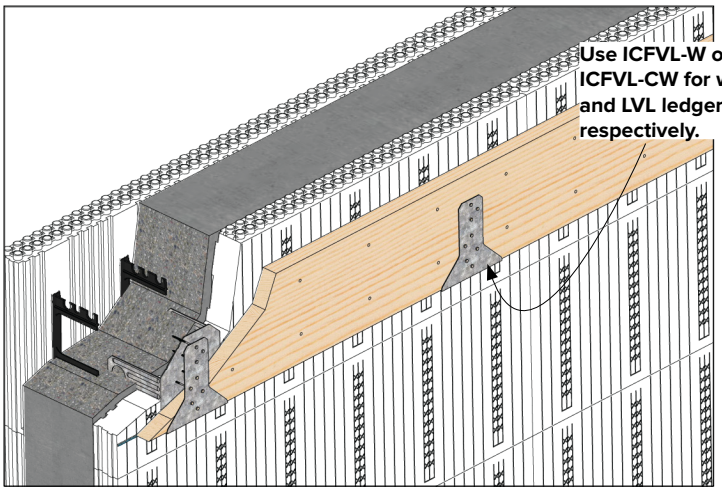
STEP 1: Snap a chalk line to mark the bottom of the ledger and insert ICFVL brackets, as specified.

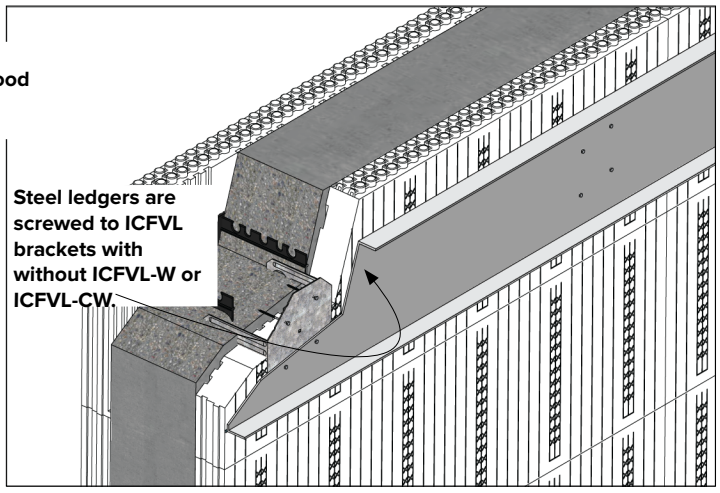


Ledger fastened to the embedded furring tabs prior to pour ensures ICFVL bracket is secured during concrete placement.

STEP 2: Secure the ICFVL brackets before placing concrete. Fastening strapping across the brackets or installing the ledgers prior to concrete placement will help ensure full concrete embedment of the ICFVL brackets.

2.12 – FLOOR CONNECTIONS Cont'd





STEP 3: Place and consolidate concrete. Once set, slip the ICFVL-W or ICFVL-CW underneath the wood ledger and drive eight ICF-D3.25 screws through the ledger and into the ICFVL bracket. ICF-D3.25 screws are supplied by Simpson Strong-Tie.

For steel ledgers use four #14 x 3/4" screws to attach the ledger to the ICFVL brackets. These screws are not supplied by Simpson Strong-Tie.



NOTE: Industry studies show that hardened fasteners can experience performance problems in wet environments. Accordingly, use this product in dry environments only. In addition, due to its corrosive nature, treated lumber should not be used with this product.

Use extra caution when installing the hangers on both sides of a wall. Consult your local Simpson Strongtie rep or contact Simpson Strongtie at (800) 999-5099 prior to installation.

Complete technical data is available at www.strongtie.com

STEP 4: Connect the floor joists to the ledgers, as required.

Simpson Strong-Tie Ledger Connector Loads & Spacings

Ledger Type	Model No.	4" LOGIX ICF	6", 8" & 10" LOGIX ICF	4" LOGIX ICF	6", 8" & 10" LOGIX ICF	Spacing to Replace Anchor Bolts[3,4,6]							
		Allowable Vertical Resistance[2]	Allowable Vertical Resistance[2]	Factored Vertical Resistance	Factored Vertical Resistance	1/2" Dia. Bolts at				5/8" Dia. Bolts at			
		lbs (kN)	lbs (kN)	lbs (kN)	lbs (kN)	12" (305mm)	24" (610mm)	36" (914mm)	48" (1220mm)	12" (305mm)	24" (610mm)	36" (914mm)	48" (1220mm)
2xD.Fir-L/SPF	ICFVL w/ ICFVL-W	1375 (6.12)	1894 (8.42)	1890 (8.41)	2630 (11.70)	4' (1220mm)	4' (1220mm)	4' (1220mm)	4' (1220mm)	3'-9" (1143mm)	4' (1220mm)	4' (1220mm)	4' (1220mm)
1 3/4" LVL	ICFVL w/ ICFVL-CW	1375 (6.12)	1894 (8.42)	1890 (8.41)	2630 (11.70)	4' (1220mm)	4' (1220mm)	4' (1220mm)	4' (1220mm)	3'-6" (1067mm)	4' (1220mm)	4' (1220mm)	4' (1220mm)
(0.054") 16ga	ICFVL	1770 (7.87)	1894 (8.42)	2435 (10.83)	2630 (11.70)	1'-3" (381mm)	2'-3" (686mm)	-- --	-- --	1' (305mm)	'2 (610mm)	-- --	-- --
(0.068") 14ga	ICFVL	1770 (7.87)	1894 (8.42)	2435 (10.83)	2630 (11.70)	1' (305mm)	2' (610mm)	-- --	-- --	9" (229mm)	1'-6" (457mm)	-- --	-- --

Ledger Type	Model No.	4" LOGIX ICF	6", 8" & 10" LOGIX ICF	4" LOGIX ICF	6", 8" & 10" LOGIX ICF	Spacing to Replace Anchor Bolts[3,4,6]							
		Allowable Vertical Resistance[2]	Allowable Vertical Resistance[2]	Factored Vertical Resistance	Factored Vertical Resistance	2-5/8" Dia. Bolts at				3/4" Dia. Bolts at			
		lbs (kN)	lbs (kN)	lbs (kN)	lbs (kN)	12" (305mm)	24" (610mm)	36" (914mm)	48" (1220mm)	12" (305mm)	24" (610mm)	36" (914mm)	48" (1220mm)
2xD.Fir-L/SPF	ICFVL w/ ICFVL-W	1375 (6.12)	1894 (8.42)	1890 (8.41)	2630 (11.70)	1'-9" (533mm)	3'-9"' (1143mm)	4' (1220mm)	4' (1220mm)	3'-6" (1067mm)	4' (1220mm)	4' (1220mm)	4' (1220mm)
1 3/4" LVL	ICFVL w/ ICFVL-CW	1375 (6.12)	1894 (8.42)	1890 (8.41)	2630 (11.70)	1'-9" (533mm)	3'-6" (1067mm)	4' (1220mm)	4' (1220mm)	2'-9" (838mm)	4' (1220mm)	4' (1220mm)	4' (1220mm)
(0.054") 16ga	ICFVL	1770 (7.87)	1894 (8.42)	2435 (10.83)	2630 (11.70)	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --
(0.068") 14ga	ICFVL	1770 (7.87)	1894 (8.42)	2435 (10.83)	2630 (11.70)	-- --	-- --	-- --	-- --	-- --	-- --	-- --	-- --

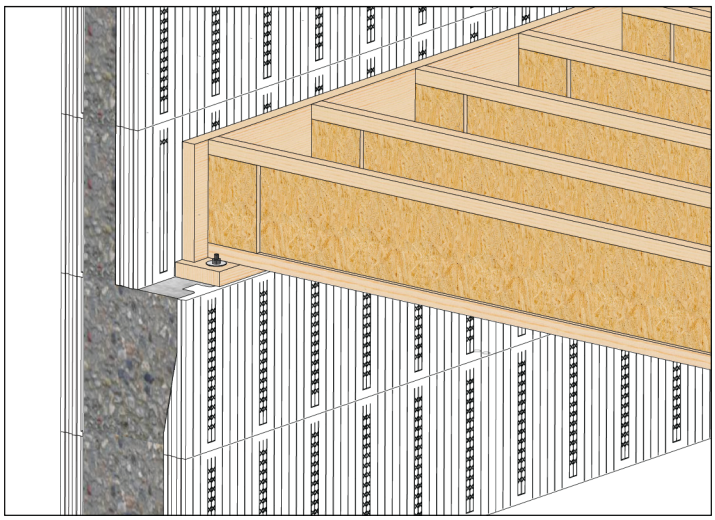
Allowable lateral load = 1905lbs (8.47kN) (Applicable to all form sizes).

1kN = 224.8lbs = 102Kg
1. Minimum steel ledger specification is Fy=33ksi (230MPa) and Fu=45ksi (310MPa) in accordance with CSA S136-94.
2. No load duration increase is allowed.
3. Spacing is based on vertical load only.
4. For steel ledger, spacing is based on a combination of ledger gauge & anchor bolt diameter. Spacing is closer for a 14 gauge ledger in order to achieve the equivalent bolt/ledger capacity.
5. Minimum concrete compressive strength, f'c, is 2500psi (17.25MPa).
6. The designer may specify different spacing based on the load requirements.
7. For more information contact Simpson Strongtie at www.simpsonstrongtie.com

Note: Industry studies show that hardened fasteners can experience performance problems in wet environments. Accordingly, use this product in dry environments only. In addition, due to its corrosive nature, treated lumber should not be used with Simpson Strongties.

2.12.5 – TRANSITION LEDGE

A transition ledge typically occurs at the floor level where a wider Logix wall transitions to a narrower Logix wall above the floor line, and usually up to the roof line.



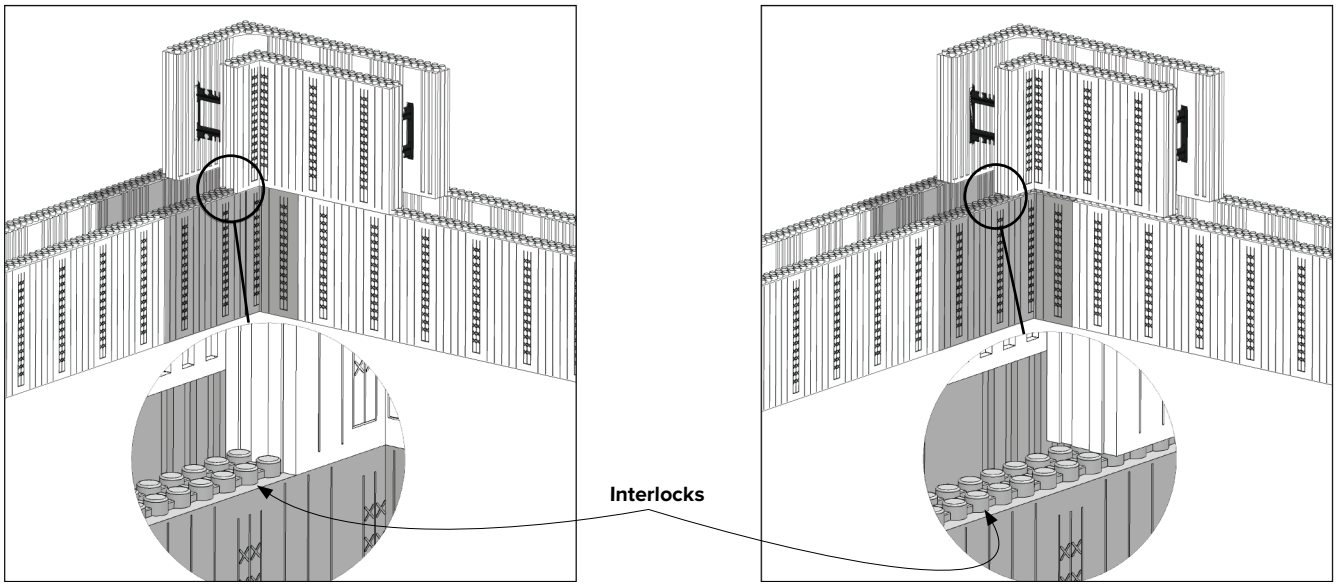
The ledge created when transitioning from a wider to a narrower wall can provide a suitable bearing length for many types of floor systems. The bearing length will vary depending on the thickness and type of Logix forms used. For a complete list of bearing lengths see Section 5.4.1, Bearing Lengths.

2.12.5.2 – TRANSITION LEDGE WITH CORNER BLOCKS

Transitioning from a wider block to a narrower block is commonly used in cases where a thinner wall becomes more economical (i.e., below grade wall to above grade wall), or to create a ledge that can support a floor or roof system, or finishes such as brick veneer.

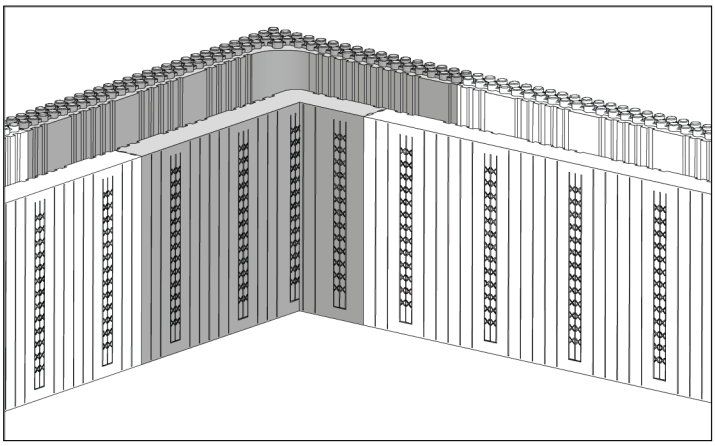
When transitioning at corner locations using corner blocks, you might find that the interlocking knobs on the top side of the wider bottom block (bottom course) do not interlock or align with the underside of the top narrower block (top course). As a result, the top course will not sit or snap into its proper position.

This typically occurs in transitions at corner locations, and is easily resolved by following a few simple steps outlined below.

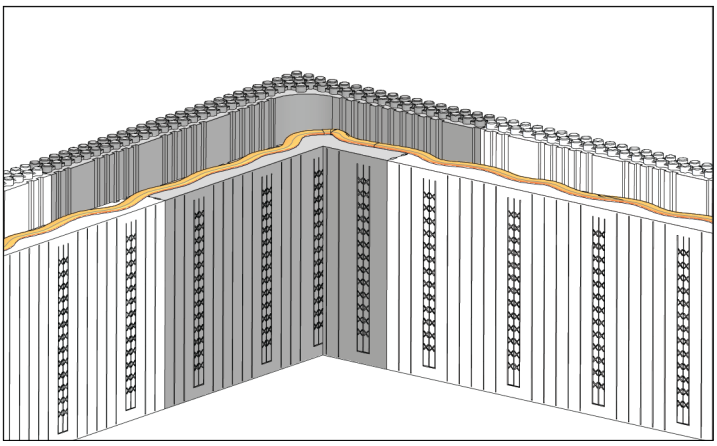


Proper alignment of top course to bottom course. Interlock aligns with underside of top course.

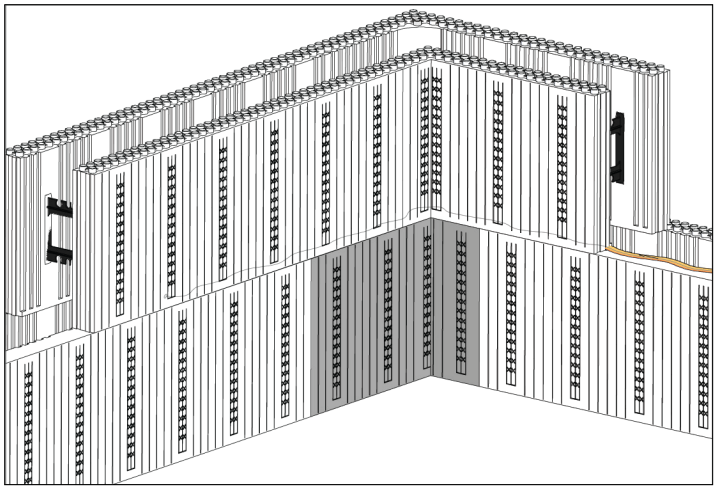
Improper alignment of top course to bottom course. Interlock does not align with underside of top course.



STEP 1: Cut the interlocks off the wider corner blocks (it may be necessary to cut the interlocks off the rest of the blocks on the bottom course to ensure the top course can be placed flush on top of the previous course).
As an alternative, Taper Top blocks for the bottom course can be used. The Taper Tops provide more flexibility since they can be adjusted to ensure the interlocks align with the top course.



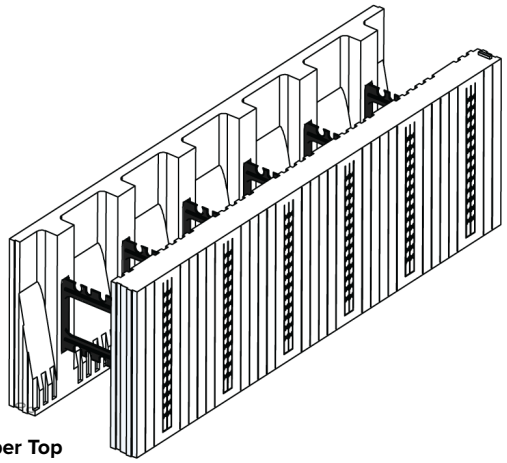
STEP 2: Apply foam adhesive prior to installing the top course.



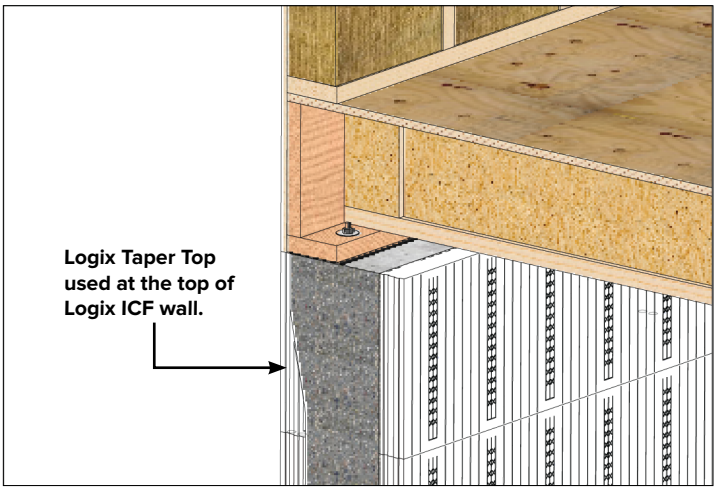
STEP 3: Install the top course beginning with the corner block and continuing around the building perimeter.

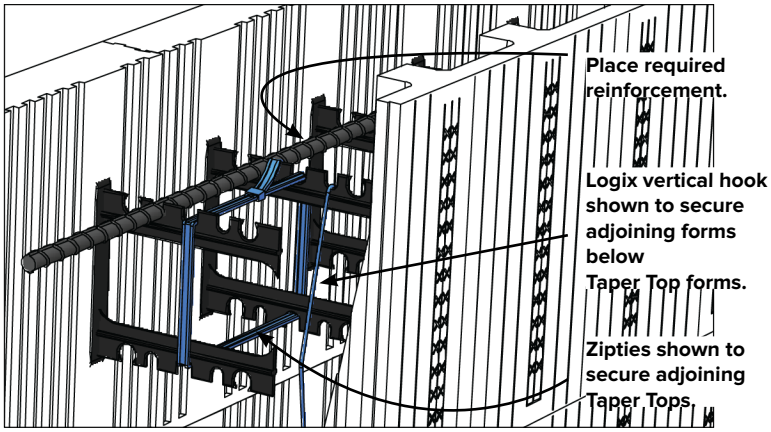
2.12.6 – TAPER TOP WITH SILL PLATE

The Taper Top form creates a greater bearing surface at the top of Logix walls.

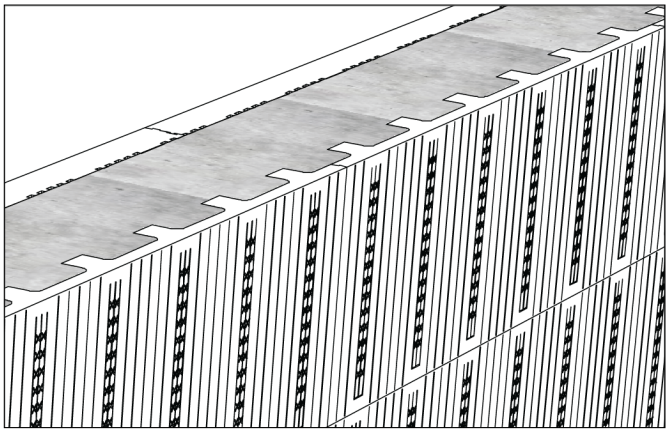


Logix Taper Top

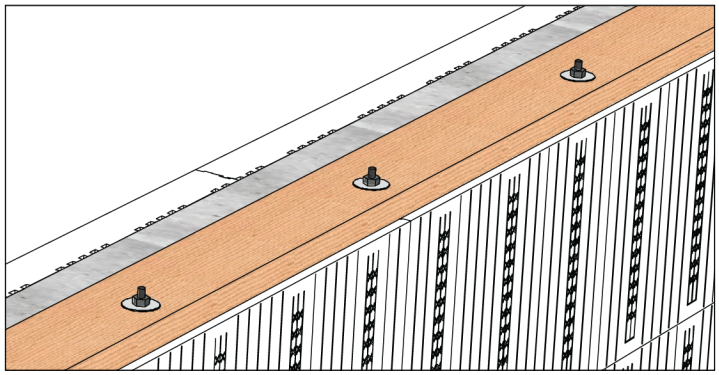




STEP 1: Taper Top forms need to be foamed down or otherwise secured to the course below.



STEP 2: Trowel concrete flush with top of forms, or inset as required. Be sure to check for level.



STEP 3: Insert embedments as required.

2.12.7 – CONCRETE FLOOR SYSTEMS

Building with Logix will allow you to explore many concrete floor system options. Our walls are stronger and can support added weight that wood or steel frame buildings may not. Concrete floor systems are very popular in multi-residential buildings where the transmission of sound and fire are a concern. They are also growing in popularity in single-family residential applications.

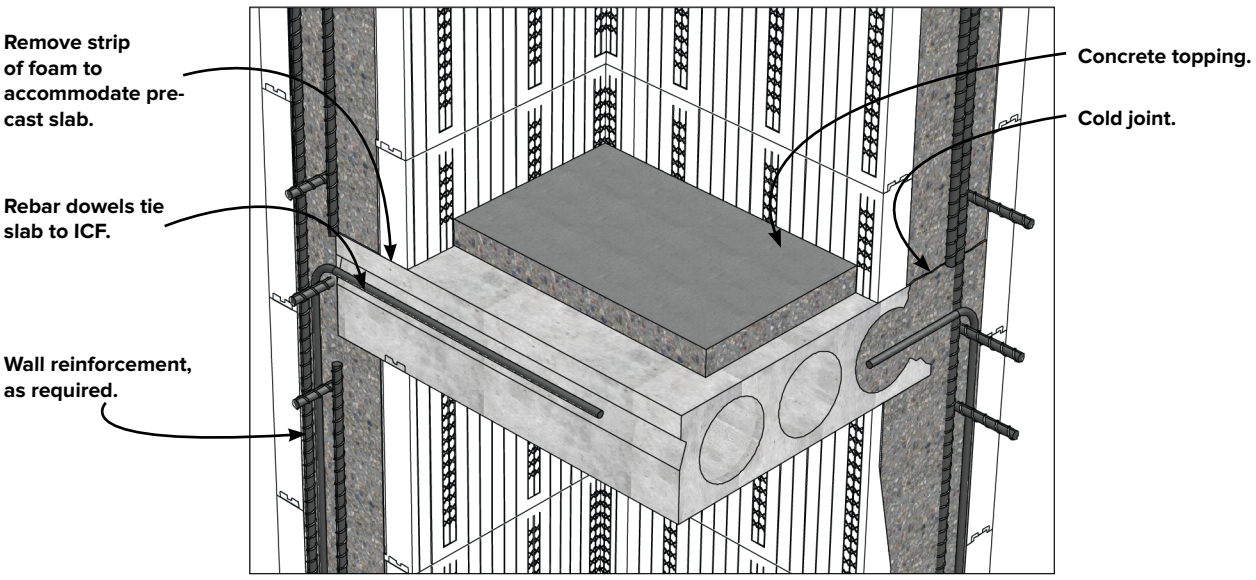
2.12.7.1 – PRECAST CONCRETE FLOORS

Pre-cast floor systems are poured at the factory and shipped to site then craned in place. They are usually tensioned with steel cables cast in the concrete to provide maximum strength. Pre-cast floor are fast and can have very long clear spans.

Typically the Logix wall is constructed to the desired height and the pre-cast planks sit directly on the cured concrete. The planks, typically 4 feet (1.220 m) wide, are craned in place and the groves between planks are grouted together. A 2 inch (52 mm) topping is poured over the deck to provide a smooth and level finish.

The reinforcing of the wall is tied in to the grouted grooves to secure the floor in place. The vertical reinforcing of the wall is extended past the planks to secure future levels of Logix.

See floor manufacturer for specific installation requirements and details.

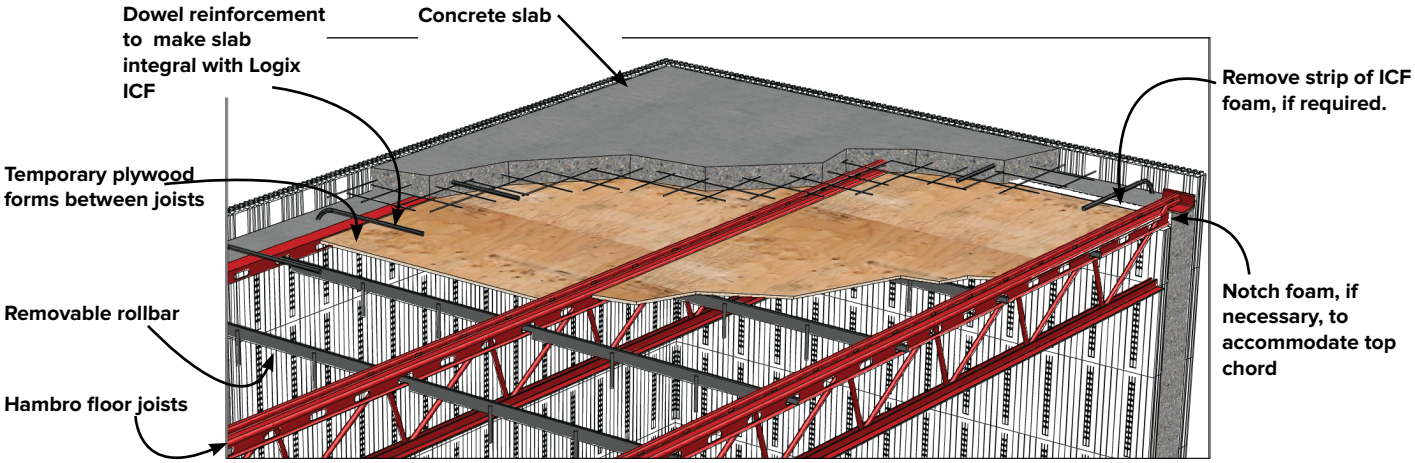


Logix ICF with precast slab (hollow core slab example).

2.12.7.2 – COMPOSITE FLOOR SYSTEMS

Composite floors are a combination of steel and concrete that is bonded together to create a very strong floor allowing for longer spans and wider joist spacings.

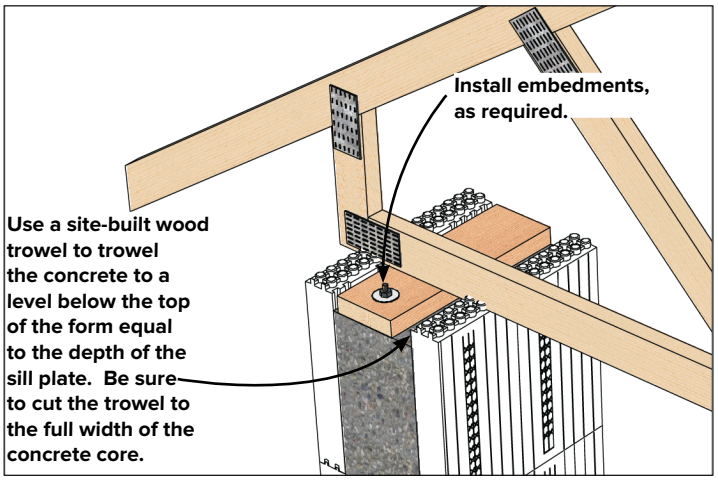
There are a number of brands designed for ICFs including Hambro, iSpanEcospan and Total Joist. Consult your floor manufacturer and your local design engineer for more information.



Composite floor system - Hambro

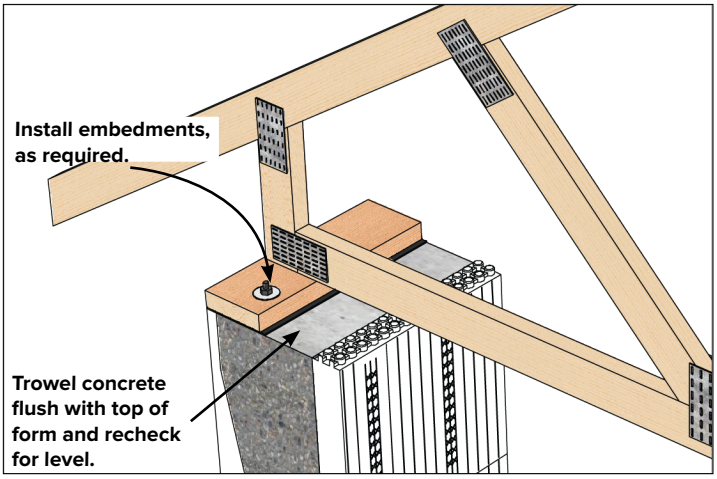
2.13 – ROOF CONNECTIONS

Roof connections can be attached to the Logix wall in a variety of ways. Several factors can affect which method to use such as area of the country and wind conditions. There are a number of tie-down options made by Simpson Strong-Tie, including brands designed for ICFs, such as Burmon tie-down systems.



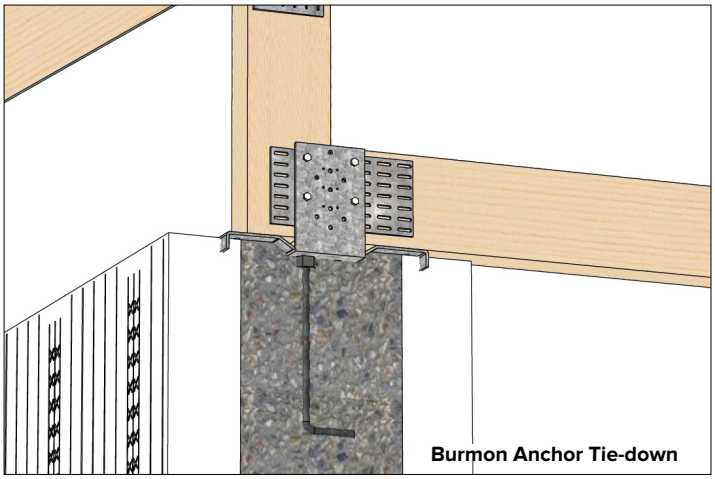
INSET SILL PLATE

This method of sill plate attachment is the most energy efficient. The Logix foam on each side provides an excellent thermal barrier.



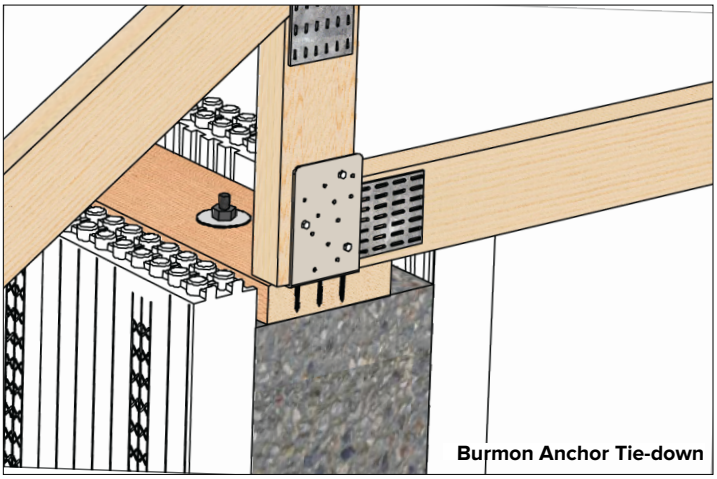
TOP MOUNTED SILL PLATE

This method is typically used when additional wall height is required.



TIE-DOWN TO CONCRETE

This method anchors the roof truss to the concrete.



TIE-DOWN TO SILL PLATE

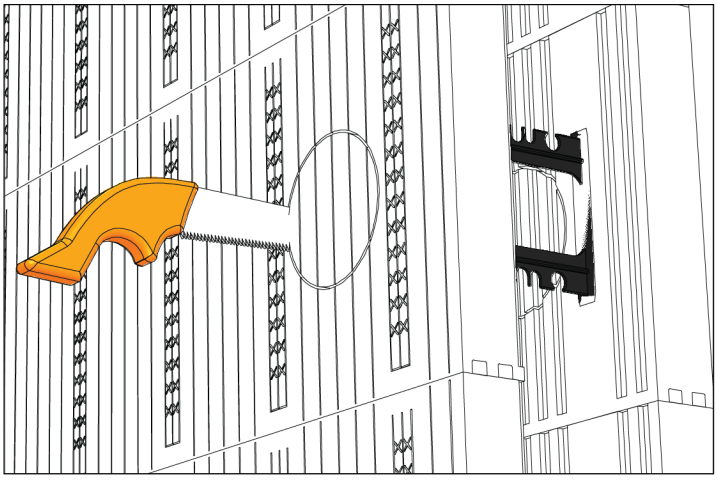
This method anchors the roof truss to the sill plate. (Burmon Anchor Tie-down)

2.14 – SERVICE PENETRATIONS

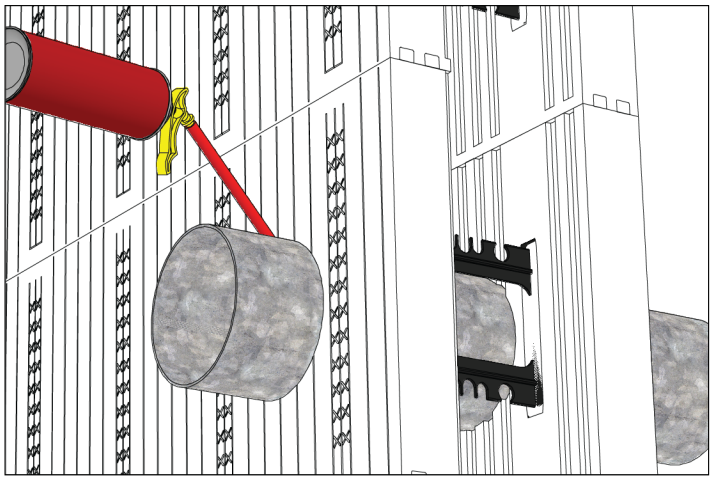
Identify and size all service and utility penetrations. Install all appropriate and properly sized sleeves where required, remembering that lightweight sleeves can be crushed during concrete placement.

List of possible service penetrations

- Dryer vent
- Water heater vent
- Water
- Sewer
- Electrical main service
- Gas line
- A/C line
- Furnace vent
- Air Exchange/HRV
- Central vacuum
- Ducting
- Bathroom vent
- Kitchen appliance venting
- Fireplace rough opening and vent
- Pet door



Cut appropriate sized holes for penetrations.



Install all required services through the ICF prior to concrete placement, and secure with spray foam.

2.15 – CONCRETE PLACEMENT

2.15.1 – PRE-PLACEMENT CHECKLIST

DATE:
FOREMAN:
JOB:

Prior to placing concrete in Logix insulated concrete forms, be certain to mark off each item on the checklist provided in this section.

_____ 1. String line in place around the top of entire perimeter?

_____ 2. Walls straight and plumb (not leaning out)?

_____ 3. Top course foamed or tied down with zip ties or Logix Hooks end to end to maintain dimensions?

_____ 4. Additional form support on all corners?

_____ 5. Have Tee-walls been foamed and supported?

_____ 6. Alignment - screw in every course?

_____ 7. Scaffold planking properly secured?

_____ 8. All handrails and toe boards installed?

_____ 9. All bucks cross braced?

_____ 10. All bucks secured to wall?

_____ 11. All buck concrete anchors installed?

_____ 12. All horizontal and vertical rebar in place?

_____ 13. All lintel reinforcing in place?

_____ 14. All penetrations installed?

_____ 15. All beam pockets in place?

_____ 16. All floor embedments installed?

_____ 17. Are anchor bolts and hold-downs on site?

_____ 18. Has cavity of wall been checked, and foreign material removed?

_____ 19. Plywood, screw gun, and saw on site?

_____ 20. Interlock protected by tape, or other covering?

_____ 21. Proper concrete mix and slump ordered?

_____ 22. Concrete vibrator on site?

_____ 23. Pump equipped with reducer or 2 1/2” trimmer hose available?

2.15.2 – MIX DESIGN

Minimum compressive concrete strength is typically 3,000 psi (20MPa) at 28 days. However, this will depend on the structure and loading conditions. For seismic areas mix design should be confirmed with local codes or by an engineer.

The following maximum aggregate sizes are recommended for use in Logix walls:

	Form Cavity Size, in. (mm)				
	4 (102)	6.25 (159)	8 (203)	10 (254)	12* (305)
Max. Aggregate Size, in. (mm)	3/8 (9.5)	3/8 (9.5) to 1/2 (13)	3/4 (19)	3/4 (19)	3/4 (19)

Always consult your local ready mix companies for appropriate concrete mix design.

2.15.3 – BEST PRACTICES

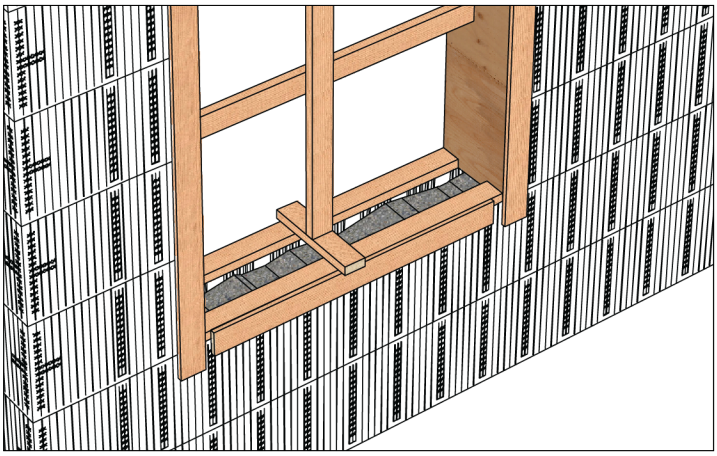
The most important stage of a successful Logix project is the concrete placement. Extra workers at this stage are important - be certain to have enough on hand during the pour to safely handle placement, consolidation, alignment, embedments, and cleanup.

An experience crew ensures the concrete is properly placed and consolidated. The following are recommended practices and considerations when placing concrete.

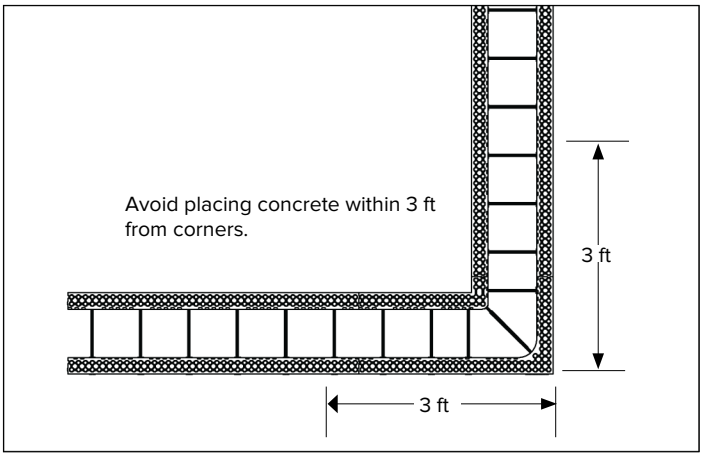
- Concrete slump should be 5 inch (127 mm) to 6 inches (152mm) for best results.
- Use an internal vibrator with a head size of 3/4 inch (19 mm) to 1 inch (25mm) and maximum 1 hp motor. Do not use a vibrator with a head larger than 1 inch (25 mm).
- Appropriate internal vibration assures the strongest walls possible and is especially important for below grade application where the greatest loads occur.
- The rule of thumb for internal vibration is fast in and slow out, always moving, with a withdrawal rate of approximately 3 inch (76 mm) per second.
  Other methods of placement include conveyor truck, crane and bucket, and directly off the ready mix truck.
- Lift height is determined by many factors, such as air temperature, concrete temperature, slump, etc. In general, lift heights should not exceed 4ft (1.220 m) per hour.
- When placing concrete below freezing or at temperatures above 100° F (38° C), it's important to protect all exposed concrete with insulation.
- When placing concrete in 4 inch (102 mm) forms, it is recommended that the pump truck be fitted with a 2.5 inch (76 mm) flexible hose end.

2.15.4 – PLACING CONCRETE

STEP 1: Complete the pre-placement checklist.



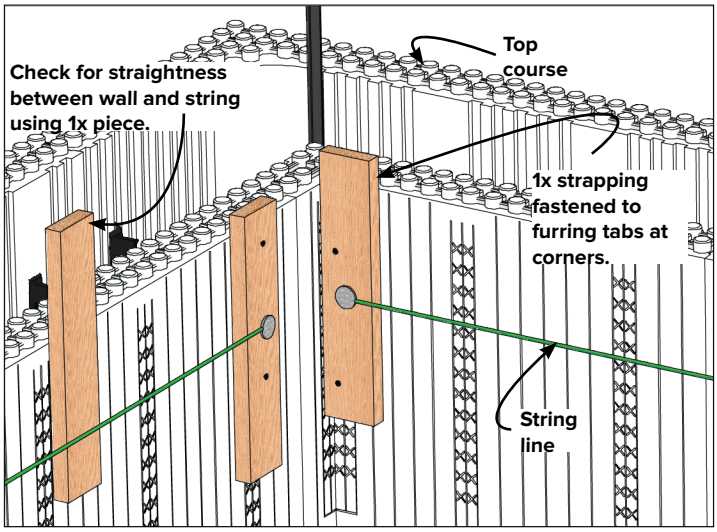
STEP 2: Begin concrete placement under openings, filling those areas and consolidating.



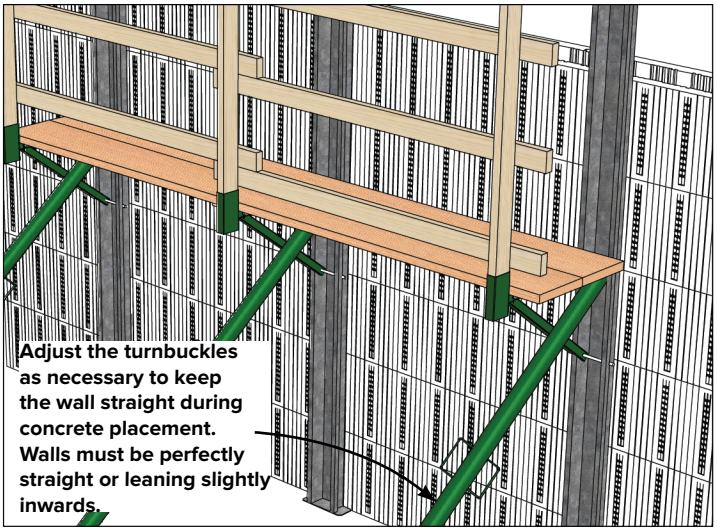
STEP 3: Beginning no closer than 3 feet (0.914 m) from a corner, start filling the wall from the top, allowing the concrete to flow gently toward the corner. Then fill in that corner from the opposite side using the same technique.

STEP 4: Continue placing concrete around entire wall in appropriately sized lifts, using the same technique at each corner to minimize fluid pressure.

STEP 5: As the concrete is being placed, consolidation is taking place to remove air and voids to ensure structural integrity.



STEP 6: Check and adjust wall alignment using string lines and turnbuckles.



STEP 7: Return to starting location and begin the next lift. Follow all the techniques established above.

2.15.5 – POST-PLACEMENT CHECKLIST

DATE:
FOREMAN:
JOB:

After placing concrete in Logix insulated concrete forms, be certain to mark off each item on the checklist provided in this section.

_____ 1. Has consolidation been completed?

_____ 2. Are walls straightened to string line?

_____ 3. In extreme temperatures, has exposed concrete been protected?

_____ 4. Have all anchors and embeds been installed?

_____ 5. Has spilled concrete been disposed of?

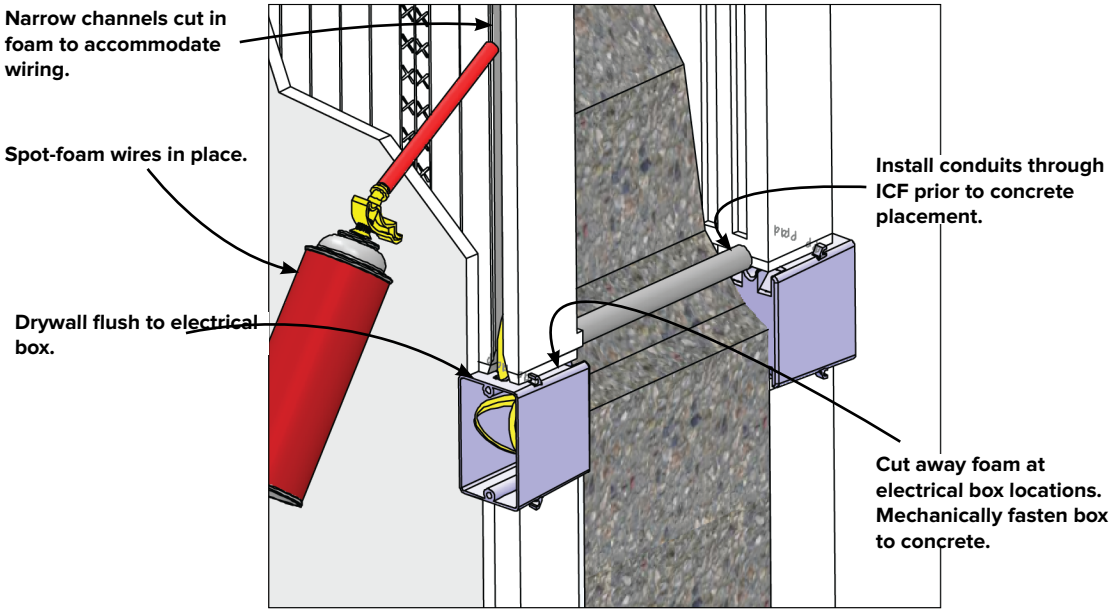
_____ 6. Has final check for straight and plumb been done?

2.16 – ELECTRICAL INSTALLATIONS

Electrical and plumbing installation are typically performed after concrete placement.

The exception to this rule is the placement of conduit that penetrates the wall, which must be performed before concrete placement.

Installing electrical wiring and boxes is accomplished by creating channels in the EPS foam. When installed in Logix walls directly against the concrete, electrical boxes will extend 1/2 inch (13 mm) beyond the foam to match the thickness of 1/2 inch (13 mm) sheetrock.



Various tools can be used to create the channels and spaces for wiring and boxes:

- Electrical chainsaw with an adjustable roller depth stop
- Hot knife
- Circular saw with a masonry blade

Make the wiring channels narrow so there will be a friction fit with the wiring. The wiring needs to remain embedded well into the foam to meet local electrical codes. Foam adhesive can be spot-applied into the channel to help hold the wiring in place.

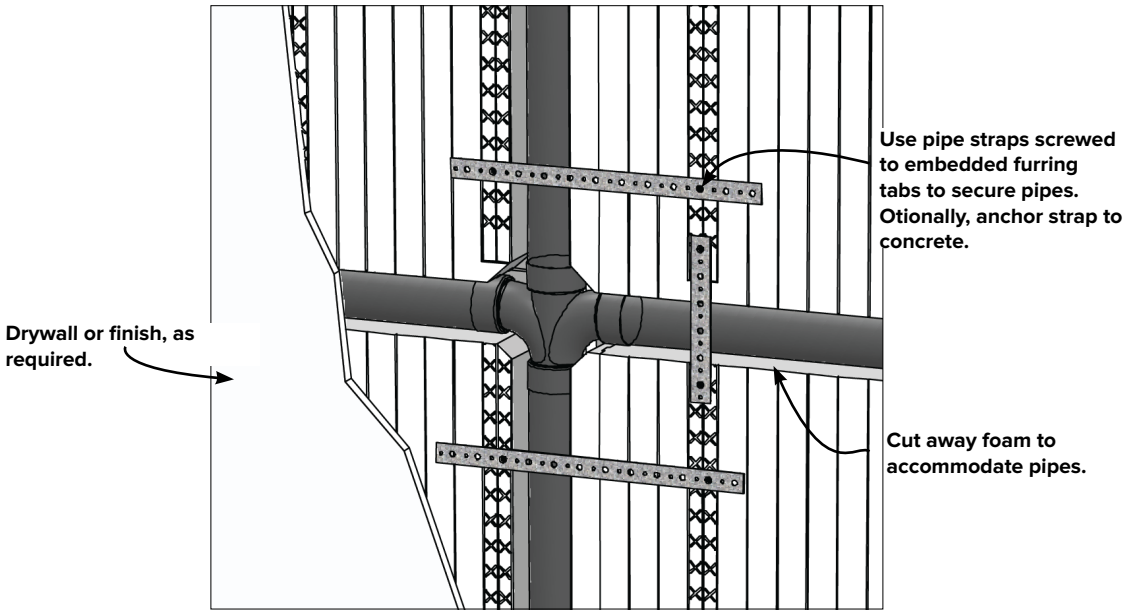
2.17 – PLUMBING INSTALLATIONS

In most cases, buildings are designed so plumbing pipes are not carried through the Logix walls, except for utility entry and exit points.

However, in some cases it may be required to embed pipe in the EPS. For example, a kitchen vent tube may need to be installed vertically in the EPS foam. Pipes embedded in the foam cannot exceed 1-1/2 inch (38 mm) in diameter. Fittings embedded in the foam cannot exceed 2-1/2 inch (64 mm) diameter.

An external faucet will require the installation of a hose sleeve through the wall prior to concrete placement. This will permit replacement of the faucet or pipe should it ever be necessary.

If connecting to existing sewer lines, establish the location of the required opening and ensure clearances, since this is difficult to change.



Pipes embedded within the Logix foam panels.

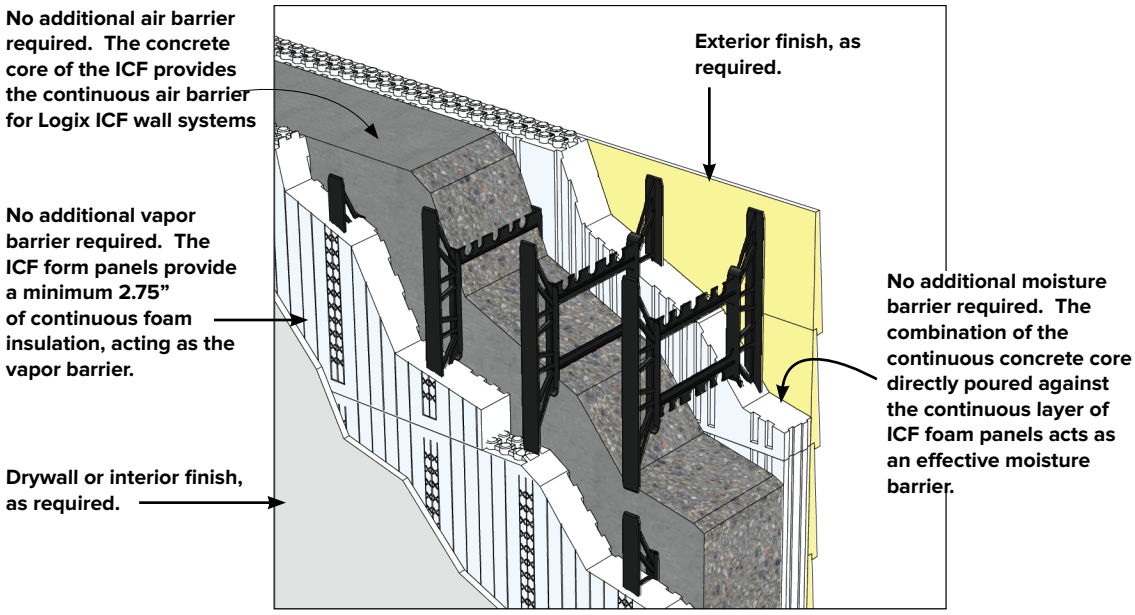
2.18 – INTERIOR & EXTERIOR FINISHES

2.18.1 – VAPOR & AIR BARRIERS

The Logix wall assembly has no need for an additional vapor barrier, the solid concrete core covered with the low permeance EPS foam insulation on the inside wall face keeps water vapor from penetrating the wall.

The fact that the inner face of EPS foam maintains a similar temperature as the inside air of the building and that a Logix wall has no cavity means that no condensation can occur in a Logix wall assembly.

The Logix wall assembly has no need for an air barrier (building wrap) layer as the solid concrete core and low permeance EPS foam insulation on the outside wall face keeps air and moisture from penetrating the wall.



Typical Logix wall assembly - no additional vapor barrier, house wrap and air barrier required.

2.18.2 – INTERIOR DRYWALL

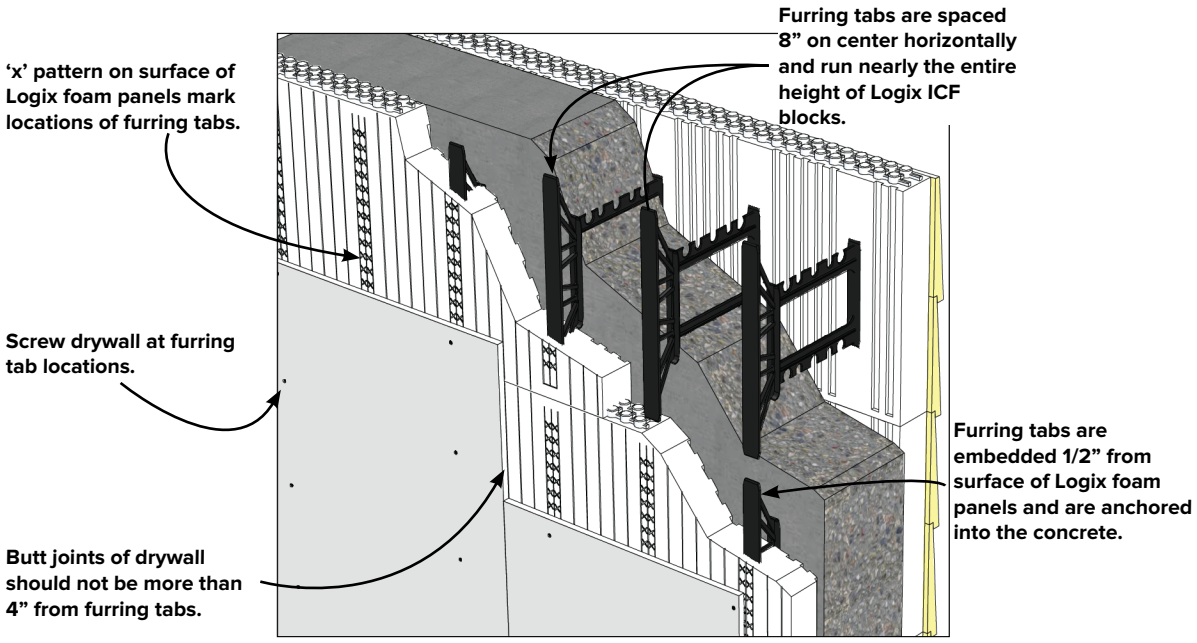
Drywall should be installed in the same manner on a Logix wall as on a stud wall, with the following time-saving exceptions:

- All furring tabs (studs) are on 8 inch (203 mm) centers from floor to ceiling for easy attachment of any type of interior wall finish.
- The butt joints of the sheetrock do not need to fall on webs (studs) as the foam provides solid backing wherever the joints fall. However, the edge of sheetrock panels should not exceed more than 4" from webs.
- A foam-compatible adhesive can be used to effectively fasten the sheetrock to the Logix wall along with screws. Always make sure to verify the local code for types and spacing for sheetrock fasteners. Typically, adhesive alone is not allowed as a fastener of sheetrock, but again check with local building codes.

Many local building codes require the application of 1/2 inch (13 mm) drywall or other suitable thermal barrier in any living space even though the EPS foam has a fire retardant component. Always verify local building code requirements.

Non-habitable spaces such as crawl spaces, attics, and other types of hidden areas typically do not require a thermal barrier (drywall).

Embedded furring tabs are fixed at each corner of the Logix 90° corner forms for solid sheetrock fastening at all corners.



Typical Logix wall assembly - Attaching drywall.

2.18.3 – EXTERIOR SIDING

Siding material of some kind must be installed over the EPS foam to protect it from the UV rays of the sun. Foam left exposed to the sun will slowly develop a dusty surface.

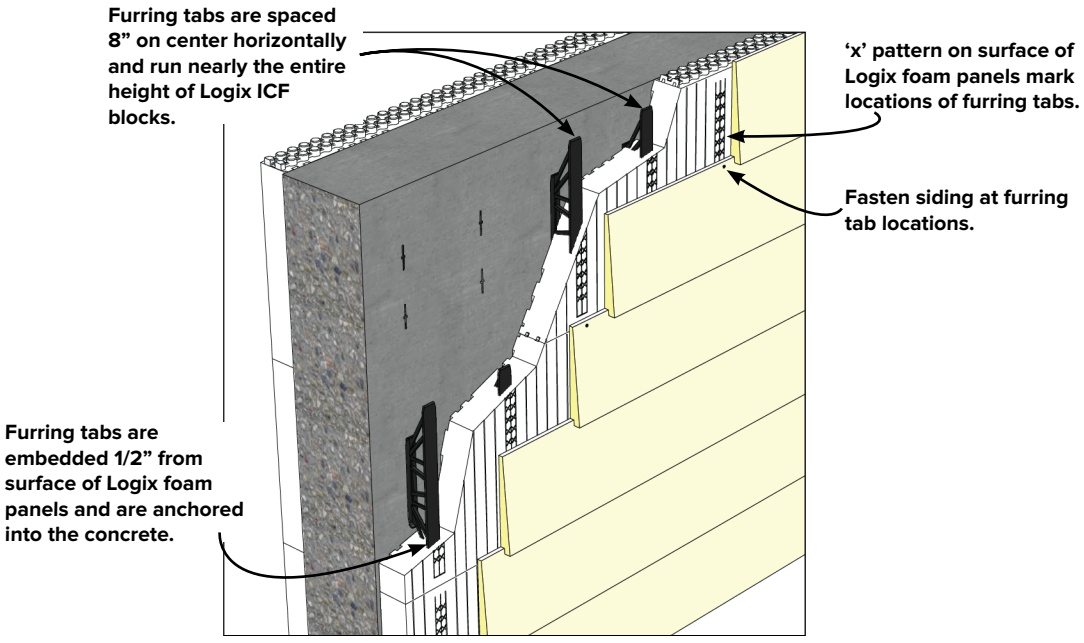
NOTE: When using Logix Platinum Series care should be taken to protect exposed foam surfaces from reflected sunlight and prolonged solar exposure until wall cladding or finish material is applied. Shade exposed foam areas, or remove sources of reflective surfaces, where heat build up onto exposed foam might occur. For more information refer to BASF Technical Leaflet N-4 Neopor, "Recommendations for packaging, transporting, storing and installing building insulation products made from Neopor EPS foam." (The BASF Technical Leaflet is attached to every bundle of Logix Platinum forms delivered to a job site).

Metal and vinyl siding can be installed directly over the top of the EPS.

Although air guns can be used, Logix recommends the use of screw guns when attaching exterior siding. Always follow manufacturer's recommendations and local codes to determine the size and spacing of fasteners for all siding products.

Any type of siding that is used on a typical wood-framed building can be used on a Logix building.

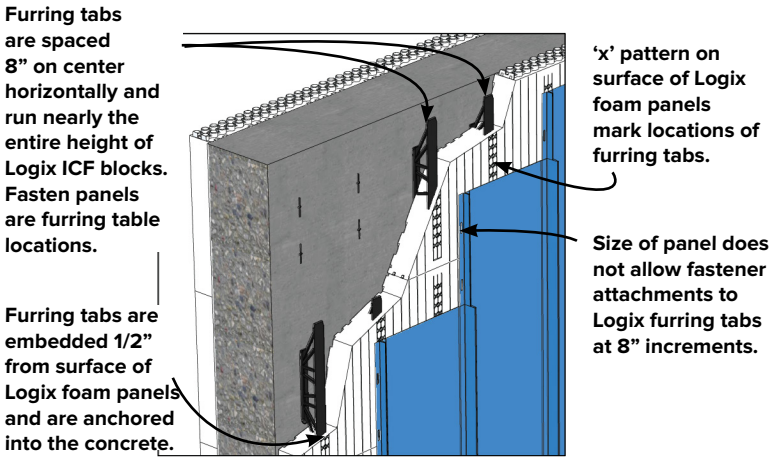
The siding channel stock around doors and windows can be fastened to whatever type of buck material was chosen, in a similar fashion as wood framed building.



Typical Logix wall assembly - Siding.

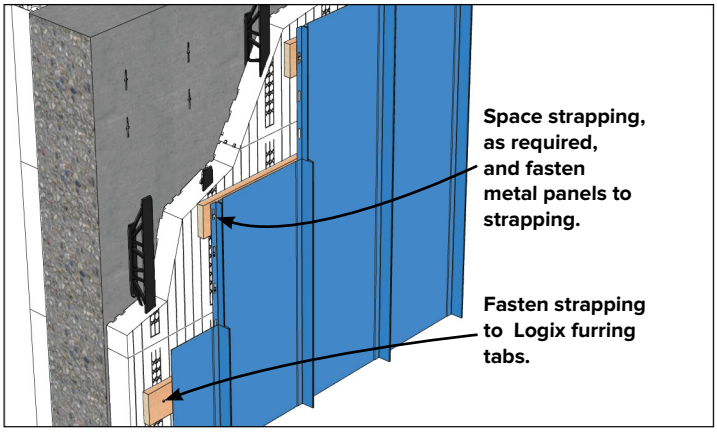
2.18.4 – STEEL PANEL SIDING

Steel panel siding can be applied vertically to a Logix wall when the style of the panel matches the Logix web spacing at 8 inch (203 mm) on center increments for fastening purposes.



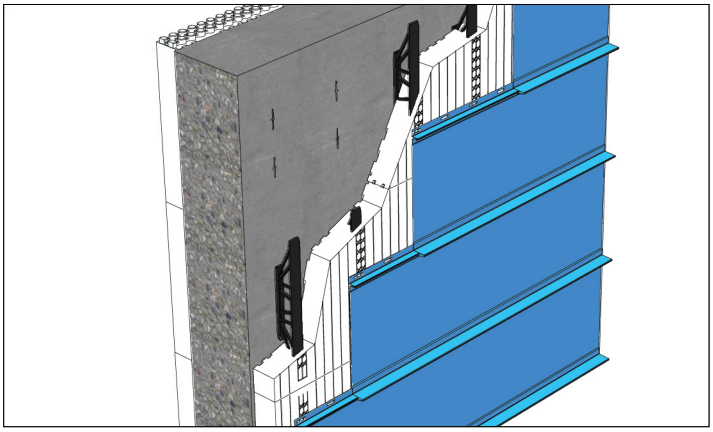
Typical Logix wall assembly - Metal Panel Siding.

When a panel siding is chosen that doesn't fit with 8 inch (203 mm) increment for fastening, two different methods are available:



Typical Logix wall assembly - Metal Panel Siding with strapping

METHOD 1: A 1/2 inch (13 mm) or 3/4 inch (19 mm) strip of wood can be attached horizontally to the webs in the wall to provide the manufacturer's specified fastener spacing.



Typical Logix wall assembly - Metal Panel Siding placed horizontally.

METHOD 2: The panels can be installed horizontally, by fastening directly into the webs.

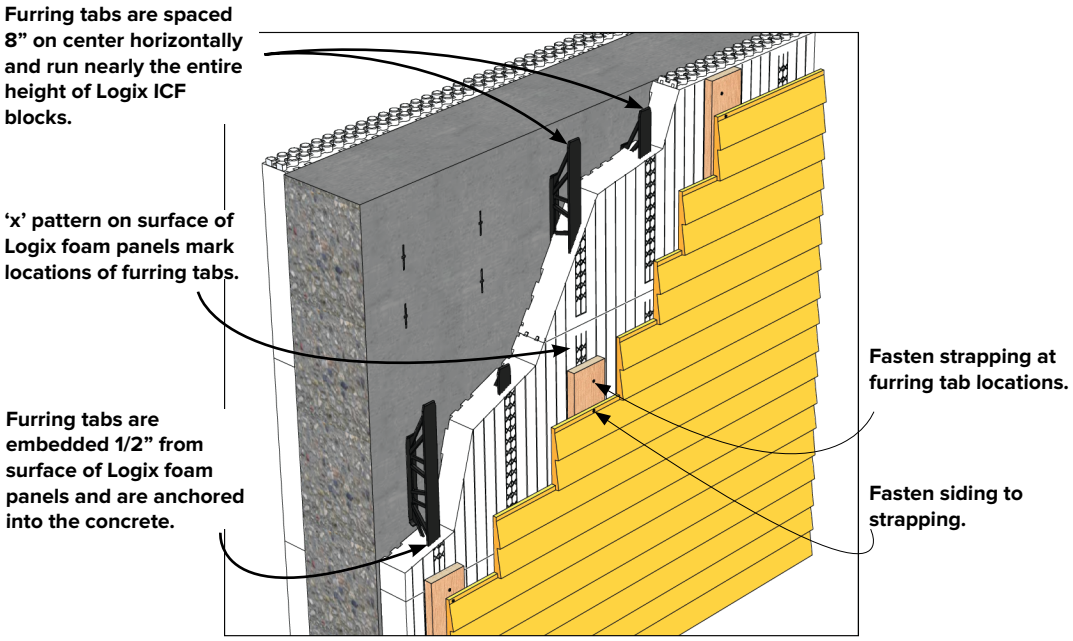
NOTE: Although air guns can be used, Logix recommends the use of screw guns when attaching exterior siding. Always follow manufacturer's recommendations and local codes to determine the size and spacing of fasteners for all siding products.

2.18.5 – WOOD SIDING

Any wood siding can be attached to the Logix wall in the same manner as to a traditional framed building. The spacing of the web studs on 8 inch (203 mm) centers allows for industry standard spacing of fasteners. Typically, screws are used for attaching wood siding or even half-log siding to the Logix wall.

Although air guns can be used, Logix recommends a screw gun with screws in clips (Quik Drive). This is usually the fastest method for applying wood siding. Always follow manufacturer's recommendations and local codes to determine the size and spacing of fasteners for all siding products.

A good practice for installing wood siding on a wall, is to apply the siding over vertical 1 inch x 2 inch (25 mm x 51 mm) wood nailing strips with a screen at the bottom. The screen keeps insects out while the space allows air to circulate behind the siding. The air circulation helps equalize the moisture content in the wood siding, which makes for much more dimensionally stable siding and longer lasting application.



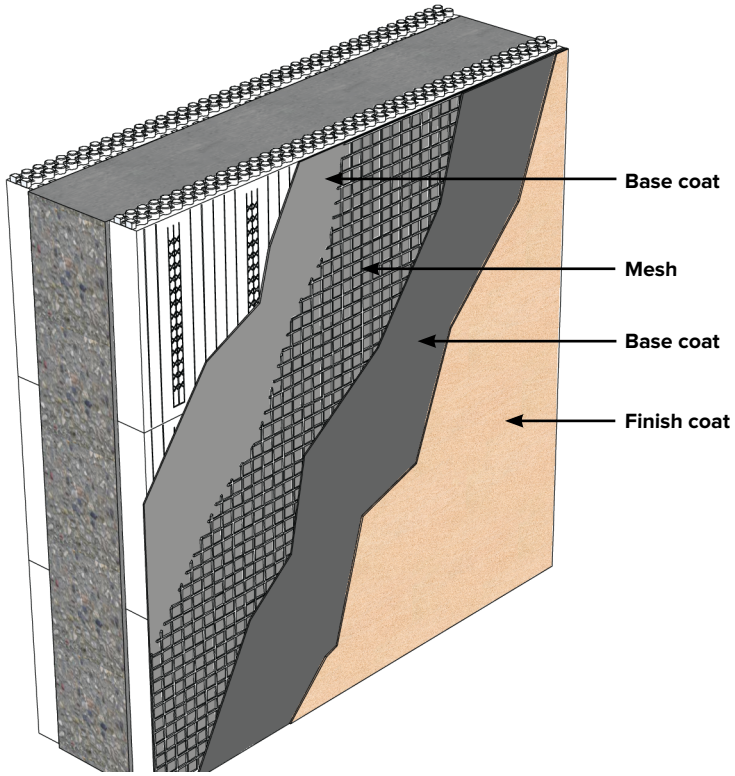
Typical Logix wall assembly - Wood Siding.

2.18.6 – EIFS

There are now acrylic-based stucco products available that are more flexible and easier to work with than traditional cement-based stucco. Collectively these products are known as EIFS (Exterior Insulation Finish Systems) and almost always require an EPS substrate.

Because Logix blocks are made with EPS, they are a natural fit for EIFS finishes. In addition, the webs in Logix blocks are embedded 1/2 inch (13 mm) deep in the EPS foam to comply with EIFS manufacturer requirements.

It is important to follow the EIFS manufacturer's application procedures.



Typical Logix wall assembly - EIFS example. Consult EIFS manufacturer for recommended application procedures..

2.18.8 – CEMENT COMPOSITE SIDING

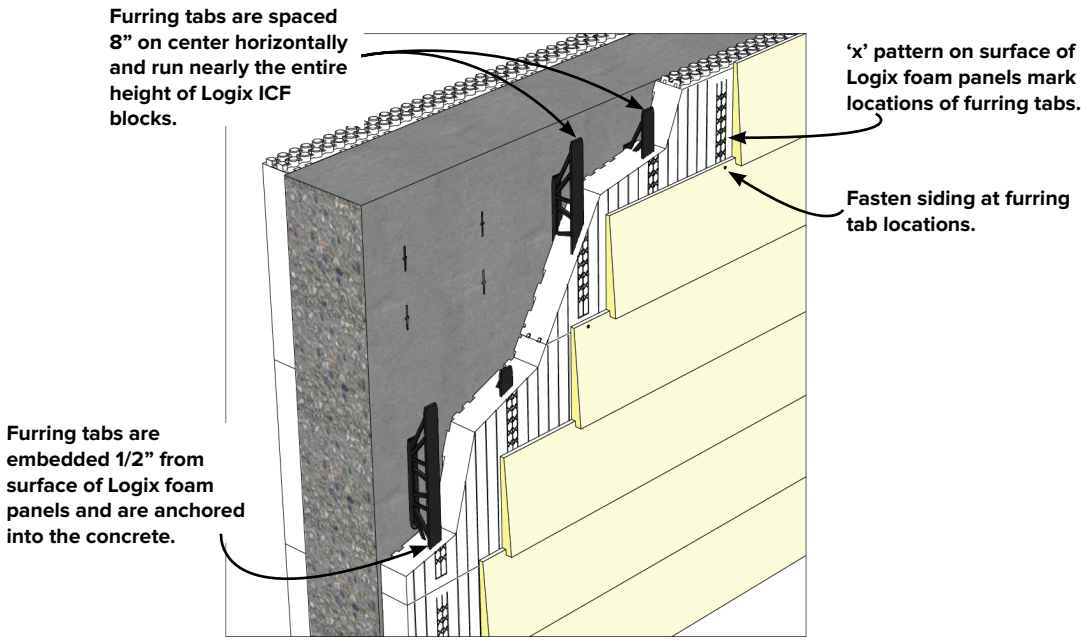
Recently the new cement fiber siding products have gained popularity. This type of siding can usually be fastened directly to the Logix webs.

Although air guns can be used, Logix recommends a screw gun to fasten flat-headed exterior screws at 16 inch (406 mm) centers. The screws pull the siding in tight and hold the siding securely in place.

Some manufacturers may require the siding to be strapped out to allow air space behind. Vertical or shake patterns will require strapping for fastening. See illustrations in Section 2.18.4 and 2.18.5 for strapping examples.

Always follow manufacturer's recommendations and local codes to determine the size and spacing of fasteners for all siding products.

Check with your siding manufacturer for specific requirements.



Typical Logix wall assembly - Cement fibre siding installed horizontally.

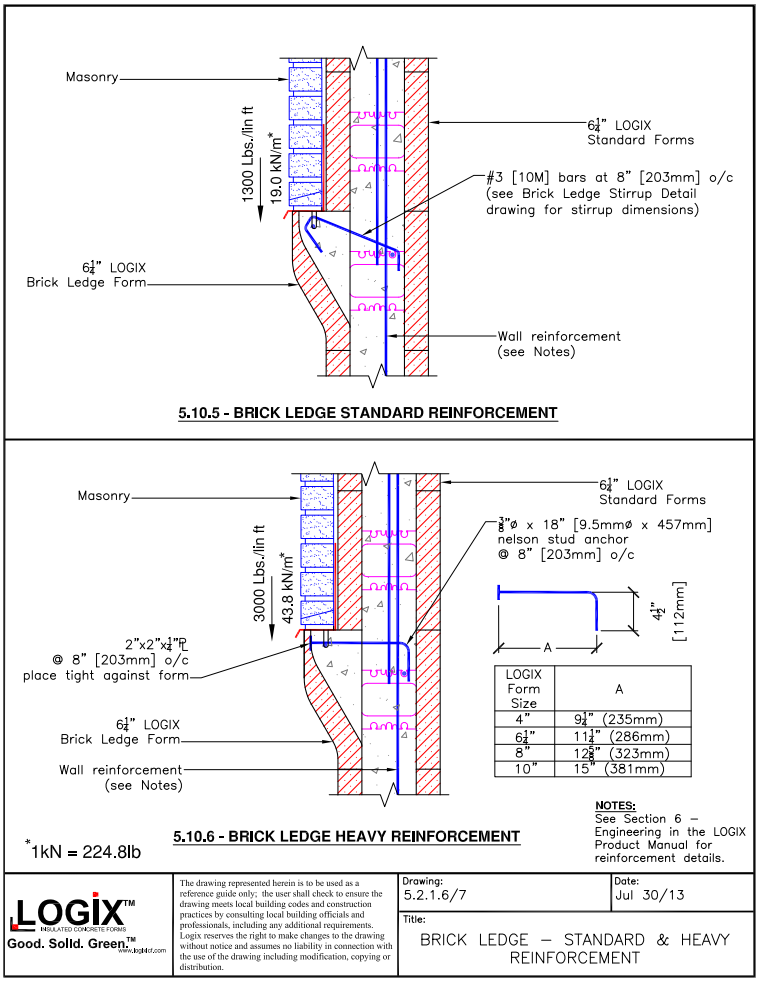
2.18.9 – BRICK VENEER

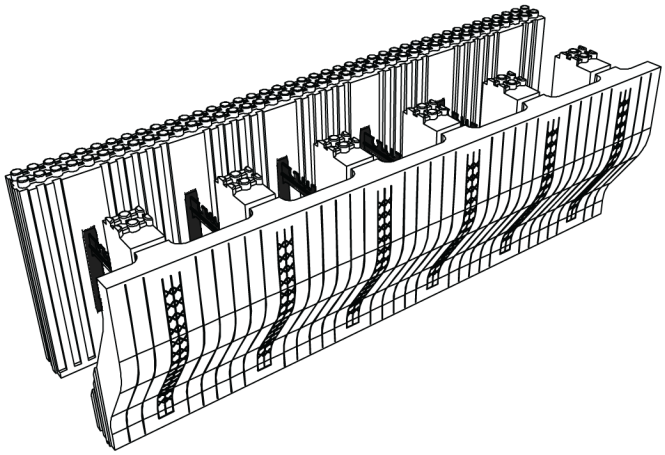
The Logix Brick Ledge form units are used to support a brick veneer as the exterior finish material. The Brick Ledge forms are simply placed at a level where the brick is desired to begin. The design of the form creates a reinforced concrete ledge.

With standard reinforcing, the Brick Ledge can bear up to 1300lb/ft (19kN/m) of wall.

With site-specific engineering, up to 3000lb/ft (44kN/m) of wall is attainable.

To install Brick Ledge form units, follow the instructions in section "2.7.4 – CORNER BRICK LEDGE" on page 18 of the guide. When reinforcing steel and concrete are in place within the wall, brick is laid on the ledge and tied back to the webs with brick ties as specified.



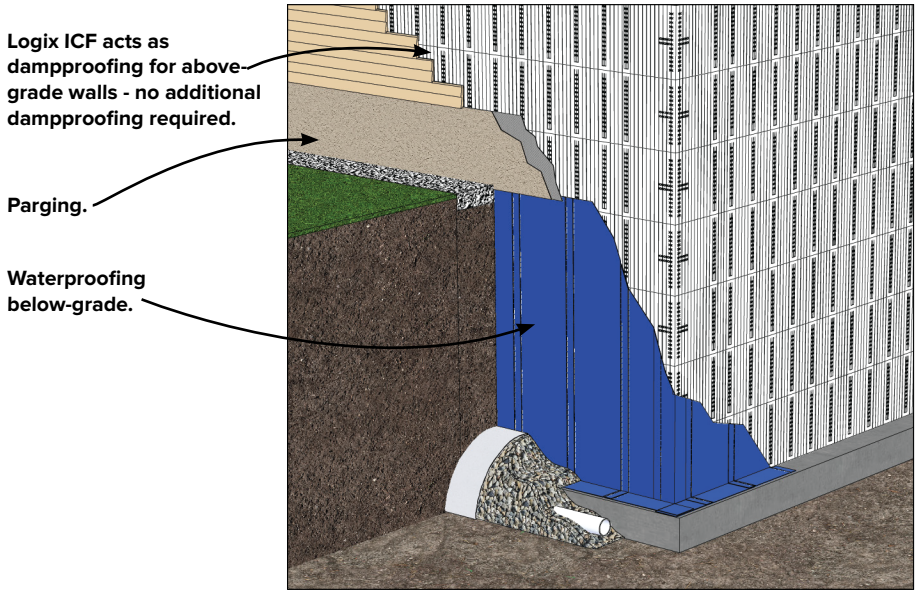


2.18.10 – BELOW GRADE WATERPROOFING, DAMPPROOFING & PARGING

There are many methods available to protect the "below grade" and the "just above grade" areas of the exterior of your building.

Dampproofing is used on concrete or masonry surfaces to repel water in above grade walls. The 2.75 inch (70 mm) foam panels of the Logix insulated concrete forms act as dampproofing, therefore, no additional dampproofing treatment is required.

NOTE: Although dampproofing above grade walls is not typically required, check with local building codes for dampproofing requirements.



2.18.10.1 – BELOW GRADE WATERPROOFING

Logix recommends a rubberized "peel and stick" waterproofing membrane. The membrane is applied vertically to the wall from grade level down to and overlapping the top of the footing. It is recommended to use protection board, such as 1/2 inch rigid foam boards, or drainage boards, to prevent damage to the waterproofing membrane during backfilling.

Proper free-draining backfill material is recommended for below-grade walls.

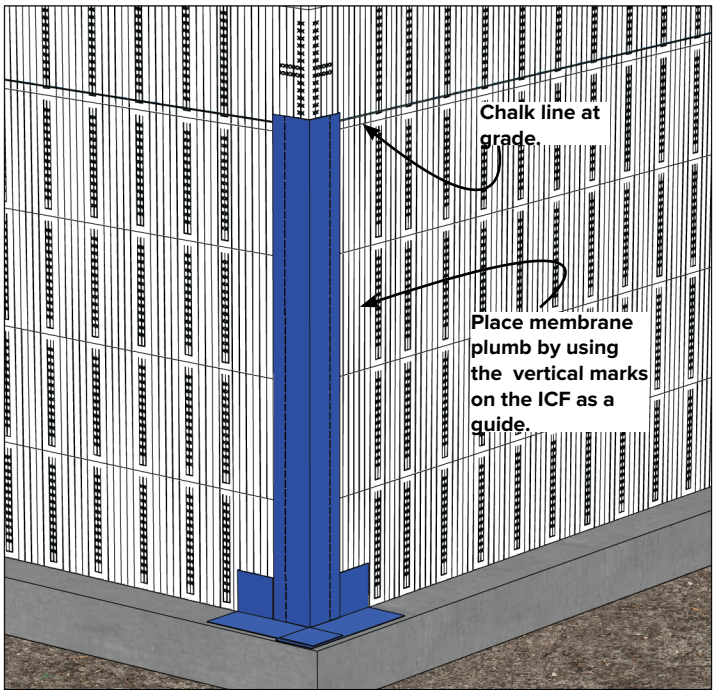
NOTE: Membrane should be installed within one week prior to backfill being placed. Sunlight and high temperatures may cause the membrane to begin to "sag" which may cause wrinkles in the material. This may result in tears or punctures during the placement of the backfill material. Should you choose to use one of the many other types of waterproofing available be sure to follow the manufacturer's recommended installation procedures.

2.18.10.1 – BELOW GRADE WATERPROOFING

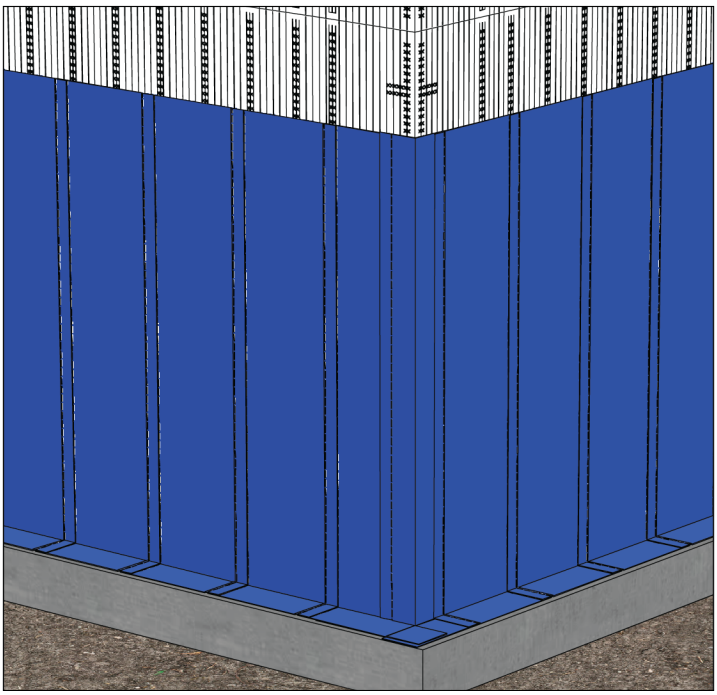
STEP 1: Prep the wall and footing area to be covered by removing all dirt and debris. If the ICF foam panels have been subjected to prolonged UV exposure a chalky layer of dust will develop on its surface. Be sure to remove the dust layer by sweeping the surface with a broom.

STEP 2: Snap chalk lines for the "grade" line.

STEP 3: Measure the height from grade line to footing. Add enough length to cover the top of the footing and cut pieces of membrane to length.



STEP 4: Apply the membrane at corners first. Hang the membrane vertically, and starting at the top pull back the first 8" to 10" of the release paper and press. Continue pulling back the release paper and pressing the membrane to the wall. Make sure to wrap the corners with the membrane.



STEP 5: Starting at a corner continue applying cut pieces of membrane around the wall, maintaining 2 inch overlap by using the printed marks on the membrane as a guide.

NOTE: Extreme temperatures, both cold and hot, may cause the installer to consider other types of waterproofing. Be sure to follow the manufacturer's installation process.

2.18.10.2 – ABOVE GRADE PARGING

The area that is above grade line and below the exterior siding material must be parged to protect the EPS from damage.

Parging is a coating material that is applied to give a finished appearance to the small area of wall that is above grade level but below where the siding materials will begin. Logix Prepcoat is the preferred option for this area.

STEP 1: Prep the wall area to be covered by removing any dirt or debris. The wall may need to be "scuffed" to reveal fresh EPS beads.

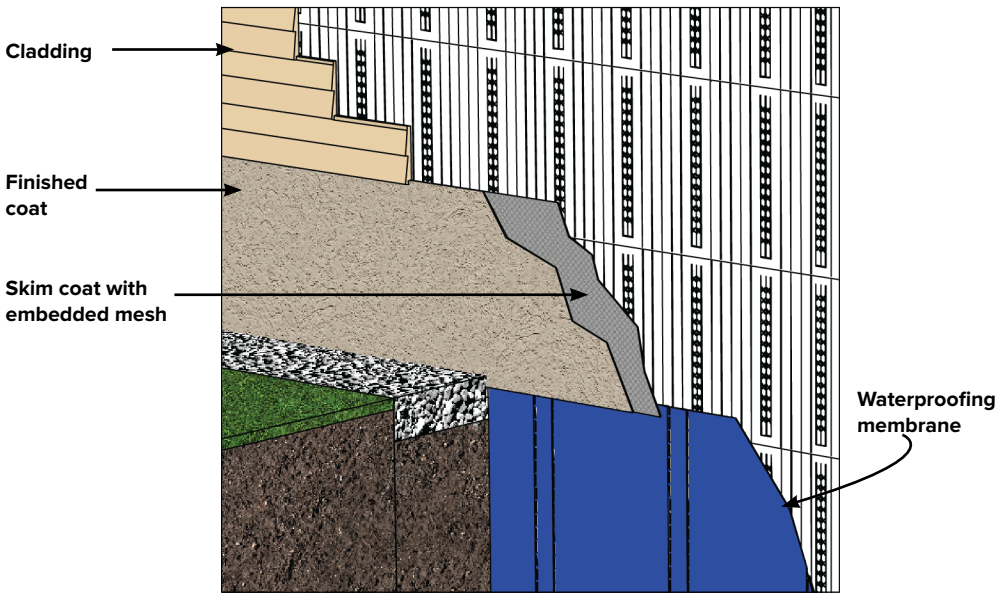
STEP 2: Mix Prepcoat dry material with water to a pasty consistency.

STEP 3: Using a trowel apply a thin, 1/16" - 1/8" (2mm - 3mm) "skim coat" of Prepcoat.

STEP 4: Pre-cut pieces of Logix fiber mesh 1" - 2" (25mm - 51mm) wider than the area to be parged. This will allow for an over-lap over the waterproofing membrane to create a "drip ledge".

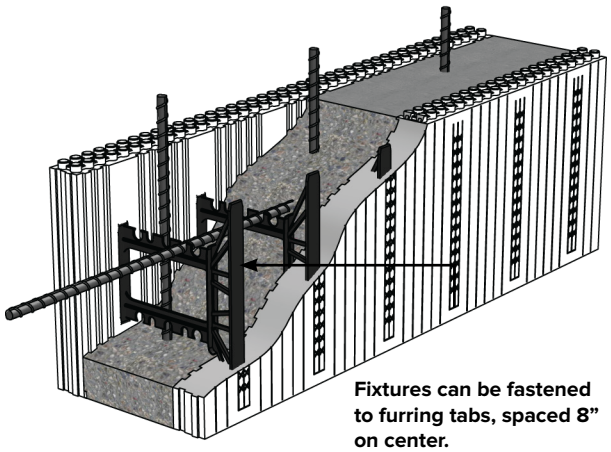
STEP 5: Embed the mesh in the skim coat firmly.

STEP 6: Once the area is dry to the touch apply a second coat of Prepcoat. This coat can be painted or stained if desired.



2.19 – ATTACHING FIXTURES

For attaching fixtures Logix provides furring tabs spaced every 8 inches, which provides more fastening points than stud walls.



Fixtures can be fastened to furring tabs, spaced 8" on center.

Different methods are used to attach fixtures depending on whether the fixture is light or heavy in weight.

2.19.1 - LIGHT WEIGHT FIXTURES

Fixtures that are light in weight, such as small picture frames or mirrors, can be attached to the wall without having to fasten into the furring tabs by using typical hanging pins, finishing nails or plugs.

Fixtures such as curtain rods, large picture frames or mirrors, bathroom accessories, etc., require a more secure attachment to the wall.

The Grappler, a product made specifically for ICFs, provides a stronger attachment for fixtures that are light in weight but require a more secure hold. The Grappler is also useful in areas where a stronger fastening point is required in an area where furring tabs may be absent. The Grappler is a 4" x 8" steel meshed plate that is pressed into the surface of the Logix form panels before drywall is placed. Once the drywall is installed the Grappler is sandwiched between the ICF and drywall creating a much stronger and secure attachment area.

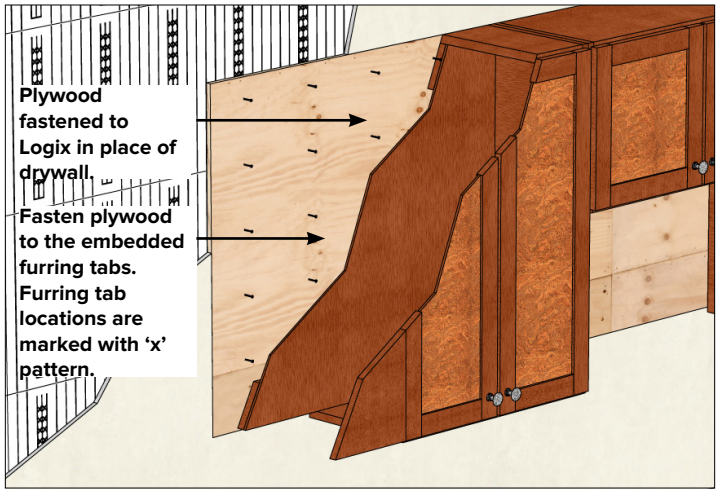


2.19.2 - HEAVY WEIGHT FIXTURES

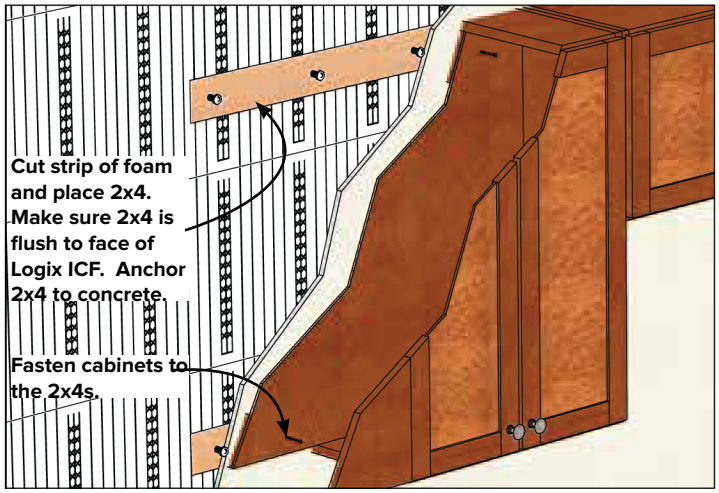
Additional backing is recommended to support heavier wall fixtures, such as kitchen cabinetry, wall mounted fixtures, grab bars, hand rails, etc.

Different attachment methods can be employed depending on the type of attachment.

2.19.2.1 – CABINETS



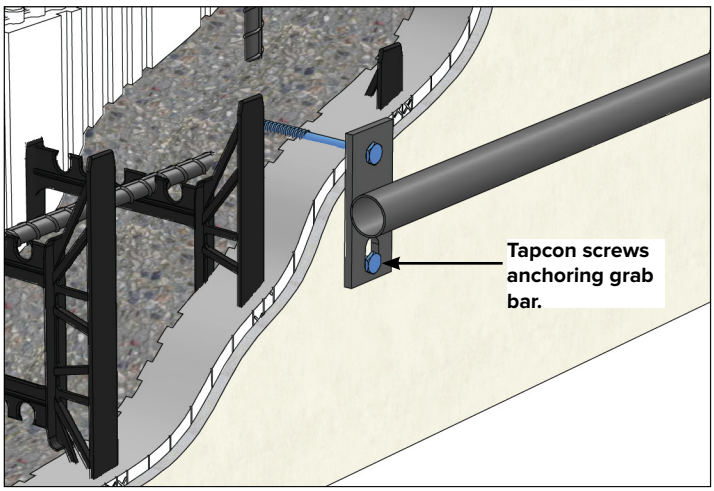
METHOD 1: Plywood board can be attached to the Logix wall behind the heavier cabinets in place of gypsum board, providing a thermal barrier comparable to gypsum and a strong attachment surface for heavier items and fixtures. Be certain to attach the plywood board to the Logix webs with a sufficient number of screws to hold heavy items in place for when loads are applied.



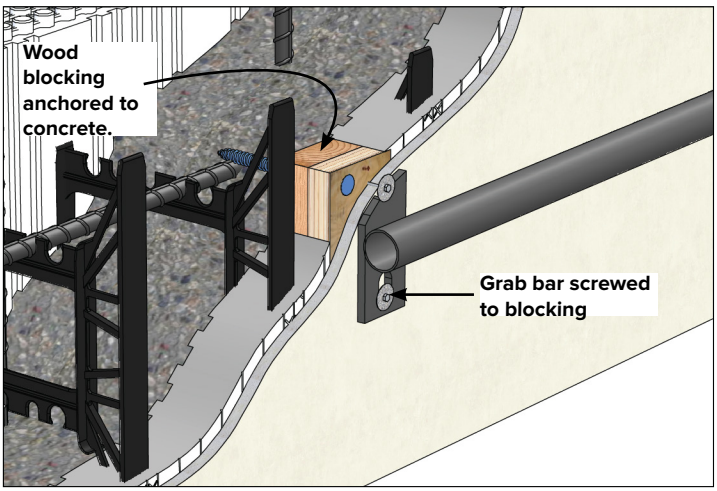
METHOD 2: Create horizontal channels behind the cabinets equal in width to a 2x4 and install 2x4 backing directly to the concrete surface using sufficiently long concrete screws and a rotohammer. Attach the cabinets to the 2x4s.

2.19.2.2 - GRAB BARS

METHOD 1: Before placing drywall, place the Grapplers (see Section "2.19.1 - LIGHT WEIGHT FIXTURES" on page 78) onto Logix at grab bar fastening points. Install the drywall and fasten the grab bar to the Grapplers.

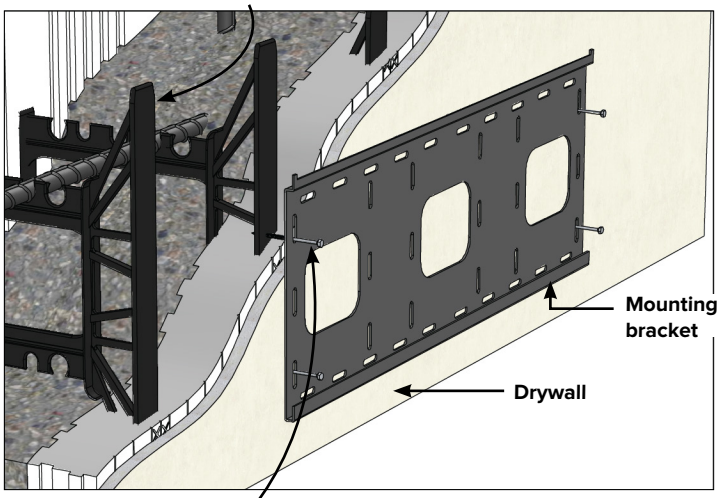


METHOD 2: Use Tapcon screws to anchor the grab bar directly to the concreted.

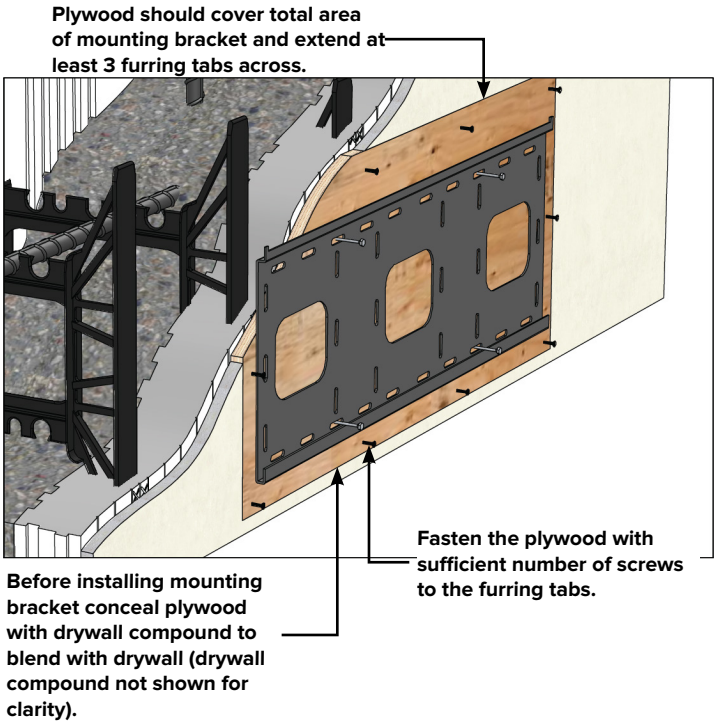


METHOD 3: For a stronger hold remove the foam and replace with wood blocking behind the grab bar mounting bracket. The wood blocking should be mechanically fastened to the concrete.

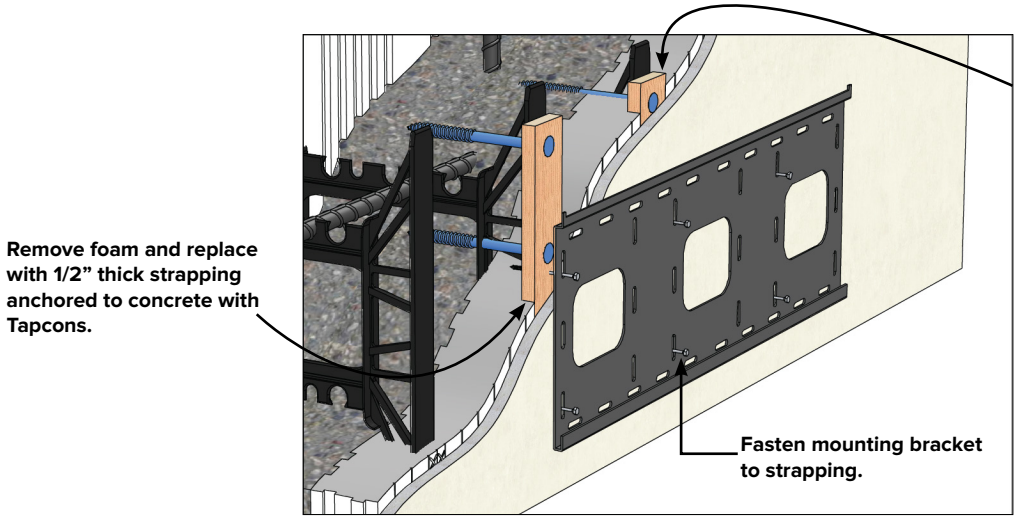
2.19.2.3 – TELEVISIONS



METHOD 1: Face mounted TVs up to 200lbs can be secured to the furring tabs with a minimum of 4 course thread screws. Care must be taken to ensure the screws are properly fastened to the furring tabs. Fastening to Grapplers in combination with furring tabs will also work.



METHOD 2: Replace the drywall behind the mounting bracket with plywood.



METHOD 3: TV mounts that swivel causes heavier loading conditions and should be anchored to the concrete with plywood and tapcons.

2.20 – HOLDING POWER OF SCREWS FASTENED TO LOGIX FURRING TABS

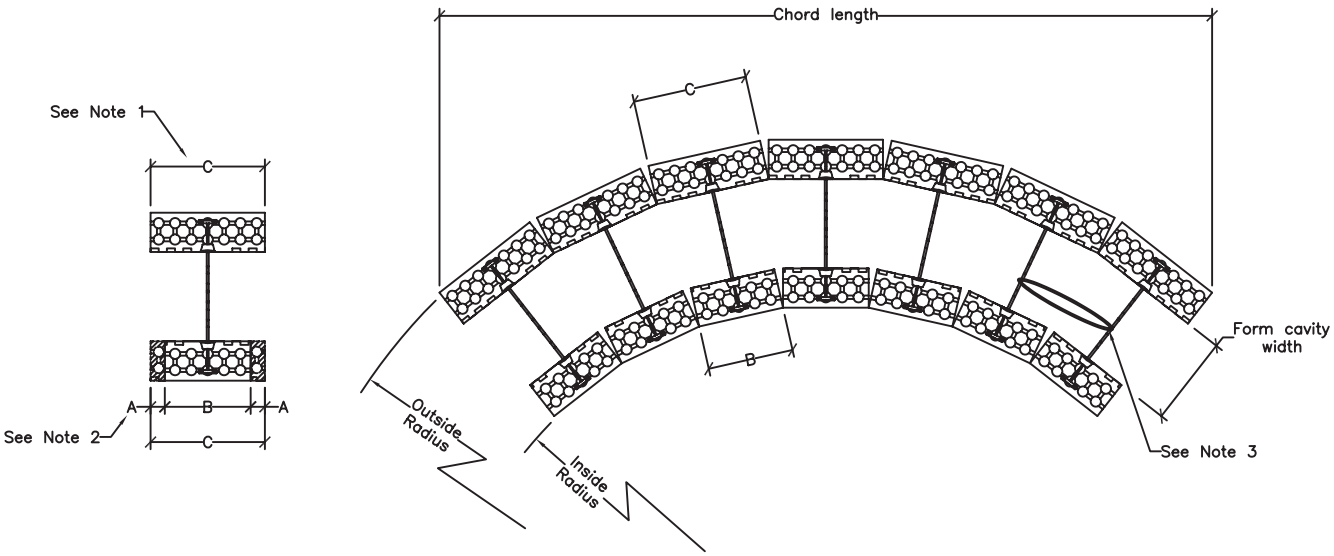
Web fastener withdrawal and shear testing using course and fine thread drywall screws. Tests were conducted on furring tabs embedded 1/2 inch (52 mm) from the surface of the 2.75 inch (70 mm) Logix EPS panels .

	Max. Average Withdrawal Resistance	Allowable Withdrawal Resistance[1]	Max. Average Shear Resistance	Allowable Shear Resistance[2]
Coarse Thread Drywall Screw	166lb (75.3kg)	33lb (15.0kg)	367lb (166.5kg)	49lb (22.2kg)
Fine Thread Drywall Screw	169lb (76.7kg)	34lb (15.4kg)	328lb (148.8kg)	49lb (22.2kg)

1kg = 9.81 Newtons

1. Allowable withdrawal resistance values are based on a factor of safety of 5.
2. Allowable shear resistance values are based on a factor of safety of 3.2 within defined deflection limits (for more detailed information contact info@ Logixicf.com)

NOTE: The numbers in this table represent resistance at failure. Good building practice mandates a minimum of a 5 to 1 safety factor in calculating fastener loading. For complete test results on additional fasteners, see **Section 8** in the Logix Design Manual or consult your local Logix representative.



Outside Radius, ft. (m)	Form Cavity Width							
	4" (102mm)		6.25" (159mm)		8" (203mm)		10" (254mm)	
	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)
3 (0.914)	8 (203)	13/16 (21)	8 (203)	1 3/32 (28)	8 (203)	1 19/64 (33)	8 (203)	1 35/64 (39)
3.5 (1.067)	8 (203)	11/16 (17)	8 (203)	59/64 (23)	8 (203)	1 3/32 (28)	8 (203)	1 19/64 (33)
4 (1.219)	8 (203)	19/32 (15)	8 (203)	51/64 (20)	8 (203)	61/64 (24)	8 (203)	1 1/8 (29)
4.5 (1.372)	8 (203)	17/32 (13)	8 (203)	45/64 (18)	8 (203)	27/32 (21)	8 (203)	1 (25)
5 (1.524)	8 (203)	15/32 (12)	8 (203)	5/8 (16)	8 (203)	3/4 (19)	8 (203)	57/64 (23)
5.5 (1.676)	8 (203)	27/64 (11)	8 (203)	9/16 (14)	8 (203)	43/64 (17)	8 (203)	51/64 (20)
6 (1.829)	8 (203)	25/64 (10)	8 (203)	33/64 (13)	8 (203)	5/8 (16)	8 (203)	47/64 (19)
6.5 (1.981)	8 (203)	23/64 (9)	8 (203)	15/32 (12)	8 (203)	9/16 (14)	8 (203)	43/64 (17)
7 (2.134)	8 (203)	21/64 (8)	8 (203)	7/16 (11)	8 (203)	17/32 (13)	8 (203)	5/8 (16)

NOTES:

1. Field cut Logix Standard forms (straight forms) into widths, C, according to Logix Radius Walls table. For inside radius field cut additional foam, A, accordingly.
2. Secure each radius section with zip ties, Logix Hooks, tape or foam.
3. The field cuts, C, are kept at 8” (203mm), 16” (406mm), 24” (610mm) or 48” (1220mm) lengths. The field cuts, A, are determined depending on required radius. The combined field cuts, A and C, results in an outside radius which is within 1% of the design radius for radii less than 60ft (18.3m), and 1% to 2% for radii between 60ft and 100ft (18.3m to 30.5m).

Outside Radius, ft. (m)	Form Cavity Width							
	4" (102mm)		6.25" (159mm)		8" (203mm)		10" (254mm)	
	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)
7.5 (2.286)	8 (203)	5/16 (8)	8 (203)	13/32 (10)	8 (203)	31/64 (12)	8 (203)	37/64 (15)
8 (2.438)	8 (203)	9/32 (7)	8 (203)	3/8 (10)	8 (203)	29/64 (12)	8 (203)	35/64 (14)
8.5 (2.591)	8 (203)	17/64 (7)	8 (203)	23/64 (9)	8 (203)	27/64 (11)	8 (203)	33/64 (13)
9 (2.743)	8 (203)	1/4 (6)	8 (203)	11/32 (9)	8 (203)	13/32 (10)	8 (203)	31/64 (12)
9.5 (2.896)	8 (203)	15/64 (6)	16 (406)	41/64 (16)	8 (203)	25/64 (10)	8 (203)	29/64 (12)
10 (3.048)	16 (406)	29/64 (12)	16 (406)	39/64 (15)	8 (203)	23/64 (9)	8 (203)	7/16 (11)
10.5 (3.200)	16 (406)	7/16 (11)	16 (406)	37/64 (15)	8 (203)	11/32 (9)	8 (203)	13/32 (10)
11 (3.353)	16 (406)	27/64 (11)	16 (406)	35/64 (14)	8 (203)	21/64 (8)	8 (203)	25/64 (10)
11.5 (3.505)	16 (406)	25/64 (10)	16 (406)	17/32 (13)	8 (203)	5/16 (8)	8 (203)	3/8 (10)
12 (3.658)	16 (406)	3/8 (10)	16 (406)	1/2 (13)	8 (203)	19/64 (8)	8 (203)	23/64 (9)
12.5 (3.810)	16 (406)	23/64 (9)	16 (406)	31/64 (12)	16 (406)	37/64 (15)	8 (203)	11/32 (9)
13 (3.962)	16 (406)	11/32 (9)	16 (406)	15/32 (12)	8 (203)	9/32 (7)	8 (203)	21/64 (8)
13.5 (4.115)	16 (406)	21/64 (8)	16 (406)	29/64 (12)	16 (406)	17/32 (13)	8 (203)	5/16 (8)
14 (4.267)	16 (406)	21/64 (8)	16 (406)	7/16 (11)	8 (203)	1/4 (6)	16 (406)	39/64 (15)
14.5 (4.420)	16 (406)	5/16 (8)	16 (406)	27/64 (11)	8 (203)	1/4 (6)	16 (406)	19/32 (15)
15 (4.572)	16 (406)	19/64 (8)	16 (406)	13/32 (10)	8 (203)	15/64 (6)	16 (406)	37/64 (15)
15.5 (4.724)	16 (406)	19/64 (8)	16 (406)	25/64 (10)	8 (203)	15/64 (6)	16 (406)	35/64 (14)
16 (4.877)	24 (610)	27/64 (11)	16 (406)	3/8 (10)	8 (203)	7/32 (6)	16 (406)	17/32 (13)
16.5 (5.029)	24 (610)	13/32 (10)	16 (406)	23/64 (9)	8 (203)	7/32 (6)	16 (406)	33/64 (13)
17 (5.182)	24 (610)	13/32 (10)	16 (406)	23/64 (9)	16 (406)	27/64 (11)	16 (406)	1/2 (13)
17.5 (5.334)	24 (610)	25/64 (10)	24 (610)	33/64 (13)	16 (406)	13/32 (10)	16 (406)	31/64 (12)
18 (5.486)	24 (610)	3/8 (10)	24 (610)	1/2 (13)	16 (406)	13/32 (10)	16 (406)	15/32 (12)
18.5 (5.639)	24 (610)	23/64 (9)	24 (610)	31/64 (12)	16 (406)	25/64 (10)	16 (406)	15/32 (12)
19 (5.791)	24 (610)	23/64 (9)	24 (610)	15/32 (12)	16 (406)	3/8 (10)	16 (406)	29/64 (12)

Outside Radius, ft. (m)	Form Cavity Width							
	4" (102mm)		6.25" (159mm)		8" (203mm)		10" (254mm)	
	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)
19.5 (5.944)	24 (610)	11/32 (9)	24 (610)	15/32 (12)	16 (406)	3/8 (10)	16 (406)	7/16 (11)
20 (6.096)	24 (610)	11/32 (9)	24 (610)	29/64 (12)	16 (406)	23/64 (9)	16 (406)	27/64 (11)
20.5 (6.248)	24 (610)	21/64 (8)	24 (610)	7/16 (11)	16 (406)	11/32 (9)	16 (406)	27/64 (11)
21 (6.401)	24 (610)	21/64 (8)	24 (610)	7/16 (11)	16 (406)	11/32 (9)	16 (406)	13/32 (10)
21.5 (6.553)	24 (610)	5/16 (8)	24 (610)	27/64 (11)	16 (406)	21/64 (8)	16 (406)	25/64 (10)
22 (6.706)	24 (610)	5/16 (8)	24 (610)	13/32 (10)	16 (406)	21/64 (8)	16 (406)	25/64 (10)
22.5 (6.858)	24 (610)	19/64 (8)	24 (610)	13/32 (10)	16 (406)	5/16 (8)	16 (406)	3/8 (10)
23 (7.010)	24 (610)	19/64 (8)	24 (610)	25/64 (10)	16 (406)	5/16 (8)	16 (406)	3/8 (10)
23.5 (7.163)	24 (610)	9/32 (7)	24 (610)	25/64 (10)	24 (610)	29/64 (12)	16 (406)	23/64 (9)
24 (7.315)	24 (610)	9/32 (7)	24 (610)	3/8 (10)	24 (610)	29/64 (12)	16 (406)	23/64 (9)
24.5 (7.468)	24 (610)	9/32 (7)	48 (1,219)	47/64 (19)	24 (610)	7/16 (11)	16 (406)	11/32 (9)
25 (7.620)	24 (610)	17/64 (7)	48 (1,219)	23/32 (18)	24 (610)	7/16 (11)	16 (406)	11/32 (9)
25.5 (7.772)	24 (610)	17/64 (7)	48 (1,219)	45/64 (18)	24 (610)	27/64 (11)	16 (406)	21/64 (8)
26 (7.925)	48 (1,219)	33/64 (13)	48 (1,219)	45/64 (18)	24 (610)	13/32 (10)	16 (406)	21/64 (8)
26.5 (8.077)	48 (1,219)	33/64 (13)	48 (1,219)	11/16 (17)	24 (610)	13/32 (10)	16 (406)	5/16 (8)
27 (8.230)	48 (1,219)	1/2 (13)	48 (1,219)	43/64 (17)	24 (610)	25/64 (10)	16 (406)	5/16 (8)
27.5 (8.382)	48 (1,219)	1/2 (13)	48 (1,219)	21/32 (17)	24 (610)	25/64 (10)	16 (406)	5/16 (8)
28 (8.534)	48 (1,219)	31/64 (12)	48 (1,219)	41/64 (16)	24 (610)	25/64 (10)	16 (406)	19/64 (8)
28.5 (8.687)	48 (1,219)	15/32 (12)	48 (1,219)	41/64 (16)	24 (610)	3/8 (10)	24 (610)	29/64 (12)
29 (8.839)	48 (1,219)	15/32 (12)	48 (1,219)	5/8 (16)	24 (610)	3/8 (10)	24 (610)	7/16 (11)
29.5 (8.992)	48 (1,219)	29/64 (12)	48 (1,219)	39/64 (15)	24 (610)	23/64 (9)	24 (610)	7/16 (11)
30 (9.144)	48 (1,219)	29/64 (12)	48 (1,219)	39/64 (15)	24 (610)	23/64 (9)	24 (610)	27/64 (11)
30.5 (9.296)	48 (1,219)	7/16 (11)	48 (1,219)	19/32 (15)	48 (1,219)	45/64 (18)	24 (610)	27/64 (11)
31 (9.449)	48 (1,219)	7/16 (11)	48 (1,219)	37/64 (15)	48 (1,219)	45/64 (18)	24 (610)	13/32 (10)

Outside Radius, ft. (m)	Form Cavity Width							
	4" (102mm)		6.25" (159mm)		8" (203mm)		10" (254mm)	
	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)
31.5 (9.601)	48 (1,219)	27/64 (11)	48 (1,219)	37/64 (15)	48 (1,219)	11/16 (17)	24 (610)	13/32 (10)
32 (9.754)	48 (1,219)	27/64 (11)	48 (1,219)	9/16 (14)	48 (1,219)	43/64 (17)	24 (610)	25/64 (10)
32.5 (9.906)	48 (1,219)	27/64 (11)	48 (1,219)	9/16 (14)	48 (1,219)	21/32 (17)	24 (610)	25/64 (10)
33 (10.058)	48 (1,219)	13/32 (10)	48 (1,219)	35/64 (14)	48 (1,219)	21/32 (17)	24 (610)	25/64 (10)
33.5 (10.211)	48 (1,219)	13/32 (10)	48 (1,219)	17/32 (13)	48 (1,219)	41/64 (16)	24 (610)	3/8 (10)
34 (10.363)	48 (1,219)	25/64 (10)	48 (1,219)	17/32 (13)	48 (1,219)	41/64 (16)	24 (610)	3/8 (10)
34.5 (10.516)	48 (1,219)	25/64 (10)	48 (1,219)	33/64 (13)	48 (1,219)	5/8 (16)	24 (610)	3/8 (10)
35 (10.668)	48 (1,219)	25/64 (10)	48 (1,219)	33/64 (13)	48 (1,219)	39/64 (15)	24 (610)	23/64 (9)
35.5 (10.820)	48 (1,219)	3/8 (10)	48 (1,219)	1/2 (13)	48 (1,219)	39/64 (15)	24 (610)	23/64 (9)
36 (10.973)	48 (1,219)	3/8 (10)	48 (1,219)	1/2 (13)	48 (1,219)	19/32 (15)	24 (610)	23/64 (9)
36.5 (11.125)	48 (1,219)	3/8 (10)	48 (1,219)	1/2 (13)	48 (1,219)	19/32 (15)	24 (610)	11/32 (9)
37 (11.278)	48 (1,219)	23/64 (9)	48 (1,219)	31/64 (12)	48 (1,219)	37/64 (15)	24 (610)	11/32 (9)
37.5 (11.430)	48 (1,219)	23/64 (9)	48 (1,219)	31/64 (12)	48 (1,219)	37/64 (15)	24 (610)	11/32 (9)
38 (11.582)	48 (1,219)	23/64 (9)	48 (1,219)	15/32 (12)	48 (1,219)	9/16 (14)	24 (610)	21/64 (8)
38.5 (11.735)	48 (1,219)	11/32 (9)	48 (1,219)	15/32 (12)	48 (1,219)	9/16 (14)	24 (610)	21/64 (8)
39 (11.887)	48 (1,219)	11/32 (9)	48 (1,219)	15/32 (12)	48 (1,219)	35/64 (14)	24 (610)	21/64 (8)
39.5 (12.040)	48 (1,219)	11/32 (9)	48 (1,219)	29/64 (12)	48 (1,219)	35/64 (14)	24 (610)	21/64 (8)
40 (12.192)	48 (1,219)	11/32 (9)	48 (1,219)	29/64 (12)	48 (1,219)	17/32 (13)	24 (610)	5/16 (8)
40.5 (12.344)	48 (1,219)	21/64 (8)	48 (1,219)	7/16 (11)	48 (1,219)	17/32 (13)	48 (1,219)	5/8 (16)
41 (12.497)	48 (1,219)	21/64 (8)	48 (1,219)	7/16 (11)	48 (1,219)	17/32 (13)	48 (1,219)	5/8 (16)
41.5 (12.649)	48 (1,219)	21/64 (8)	48 (1,219)	7/16 (11)	48 (1,219)	33/64 (13)	48 (1,219)	39/64 (15)
42 (12.802)	48 (1,219)	5/16 (8)	48 (1,219)	27/64 (11)	48 (1,219)	33/64 (13)	48 (1,219)	39/64 (15)
42.5 (12.954)	48 (1,219)	5/16 (8)	48 (1,219)	27/64 (11)	48 (1,219)	1/2 (13)	48 (1,219)	19/32 (15)
43 (13.106)	48 (1,219)	5/16 (8)	48 (1,219)	27/64 (11)	48 (1,219)	1/2 (13)	48 (1,219)	19/32 (15)

Outside Radius, ft. (m)	Form Cavity Width							
	4" (102mm)		6.25" (159mm)		8" (203mm)		10" (254mm)	
	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)
43.5 (13.259)	48 (1,219)	5/16 (8)	48 (1,219)	13/32 (10)	48 (1,219)	1/2 (13)	48 (1,219)	19/32 (15)
44 (13.411)	48 (1,219)	5/16 (8)	48 (1,219)	13/32 (10)	48 (1,219)	31/64 (12)	48 (1,219)	37/64 (15)
44.5 (13.564)	48 (1,219)	19/64 (8)	48 (1,219)	13/32 (10)	48 (1,219)	31/64 (12)	48 (1,219)	37/64 (15)
45 (13.716)	48 (1,219)	19/64 (8)	48 (1,219)	13/32 (10)	48 (1,219)	31/64 (12)	48 (1,219)	9/16 (14)
45.5 (13.868)	48 (1,219)	19/64 (8)	48 (1,219)	25/64 (10)	48 (1,219)	15/32 (12)	48 (1,219)	9/16 (14)
46 (14.021)	48 (1,219)	19/64 (8)	48 (1,219)	25/64 (10)	48 (1,219)	15/32 (12)	48 (1,219)	35/64 (14)
46.5 (14.173)	48 (1,219)	9/32 (7)	48 (1,219)	25/64 (10)	48 (1,219)	15/32 (12)	48 (1,219)	35/64 (14)
47 (14.326)	48 (1,219)	9/32 (7)	48 (1,219)	3/8 (10)	48 (1,219)	29/64 (12)	48 (1,219)	35/64 (14)
47.5 (14.478)	48 (1,219)	9/32 (7)	48 (1,219)	3/8 (10)	48 (1,219)	29/64 (12)	48 (1,219)	17/32 (13)
48 (14.630)	48 (1,219)	9/32 (7)	48 (1,219)	3/8 (10)	48 (1,219)	29/64 (12)	48 (1,219)	17/32 (13)
48.5 (14.783)	48 (1,219)	9/32 (7)	48 (1,219)	3/8 (10)	48 (1,219)	7/16 (11)	48 (1,219)	17/32 (13)
49 (14.935)	48 (1,219)	17/64 (7)	48 (1,219)	23/64 (9)	48 (1,219)	7/16 (11)	48 (1,219)	33/64 (13)
49.5 (15.088)	48 (1,219)	17/64 (7)	48 (1,219)	23/64 (9)	48 (1,219)	7/16 (11)	48 (1,219)	33/64 (13)
50 (15.240)	48 (1,219)	17/64 (7)	48 (1,219)	23/64 (9)	48 (1,219)	27/64 (11)	48 (1,219)	33/64 (13)
50.5 (15.392)	48 (1,219)	17/64 (7)	48 (1,219)	23/64 (9)	48 (1,219)	27/64 (11)	48 (1,219)	1/2 (13)
51 (15.545)	48 (1,219)	17/64 (7)	48 (1,219)	11/32 (9)	48 (1,219)	27/64 (11)	48 (1,219)	1/2 (13)
51.5 (15.697)	48 (1,219)	17/64 (7)	48 (1,219)	11/32 (9)	48 (1,219)	27/64 (11)	48 (1,219)	1/2 (13)
52 (15.850)	48 (1,219)	1/4 (6)	48 (1,219)	11/32 (9)	48 (1,219)	13/32 (10)	48 (1,219)	31/64 (12)
52.5 (16.002)	48 (1,219)	1/4 (6)	48 (1,219)	11/32 (9)	48 (1,219)	13/32 (10)	48 (1,219)	31/64 (12)
53 (16.154)	48 (1,219)	1/4 (6)	48 (1,219)	11/32 (9)	48 (1,219)	13/32 (10)	48 (1,219)	31/64 (12)
53.5 (16.307)	48 (1,219)	1/4 (6)	48 (1,219)	21/64 (8)	48 (1,219)	13/32 (10)	48 (1,219)	15/32 (12)
54 (16.459)	48 (1,219)	1/4 (6)	48 (1,219)	21/64 (8)	48 (1,219)	25/64 (10)	48 (1,219)	15/32 (12)
54.5 (16.612)	48 (1,219)	1/4 (6)	48 (1,219)	21/64 (8)	48 (1,219)	25/64 (10)	48 (1,219)	15/32 (12)
55 (16.764)	48 (1,219)	1/4 (6)	48 (1,219)	21/64 (8)	48 (1,219)	25/64 (10)	48 (1,219)	15/32 (12)

Outside Radius, ft. (m)	Form Cavity Width							
	4" (102mm)		6.25" (159mm)		8" (203mm)		10" (254mm)	
	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)
55.5 (16.916)	48 (1,219)	15/64 (6)	48 (1,219)	21/64 (8)	48 (1,219)	25/64 (10)	48 (1,219)	29/64 (12)
56 (17.069)	48 (1,219)	15/64 (6)	48 (1,219)	5/16 (8)	48 (1,219)	3/8 (10)	48 (1,219)	29/64 (12)
56.5 (17.221)	48 (1,219)	15/64 (6)	48 (1,219)	5/16 (8)	48 (1,219)	3/8 (10)	48 (1,219)	29/64 (12)
57 (17.374)	48 (1,219)	15/64 (6)	48 (1,219)	5/16 (8)	48 (1,219)	3/8 (10)	48 (1,219)	29/64 (12)
57.5 (17.526)	48 (1,219)	15/64 (6)	48 (1,219)	5/16 (8)	48 (1,219)	3/8 (10)	48 (1,219)	7/16 (11)
58 (17.678)	48 (1,219)	15/64 (6)	48 (1,219)	5/16 (8)	48 (1,219)	3/8 (10)	48 (1,219)	7/16 (11)
58.5 (17.831)	48 (1,219)	15/64 (6)	48 (1,219)	5/16 (8)	48 (1,219)	23/64 (9)	48 (1,219)	7/16 (11)
59 (17.983)	48 (1,219)	7/32 (6)	48 (1,219)	19/64 (8)	48 (1,219)	23/64 (9)	48 (1,219)	7/16 (11)
59.5 (18.136)	48 (1,219)	7/32 (6)	48 (1,219)	19/64 (8)	48 (1,219)	23/64 (9)	48 (1,219)	27/64 (11)
60 (18.288)	48 (1,219)	7/32 (6)	48 (1,219)	19/64 (8)	48 (1,219)	23/64 (9)	48 (1,219)	27/64 (11)
60.5 (18.440)	48 (1,219)	7/32 (6)	48 (1,219)	19/64 (8)	48 (1,219)	23/64 (9)	48 (1,219)	27/64 (11)
61 (18.593)	48 (1,219)	7/32 (6)	48 (1,219)	19/64 (8)	48 (1,219)	11/32 (9)	48 (1,219)	27/64 (11)
61.5 (18.745)	48 (1,219)	7/32 (6)	48 (1,219)	19/64 (8)	48 (1,219)	11/32 (9)	48 (1,219)	13/32 (10)
62 (18.898)	48 (1,219)	7/32 (6)	48 (1,219)	9/32 (7)	48 (1,219)	11/32 (9)	48 (1,219)	13/32 (10)
62.5 (19.050)	48 (1,219)	7/32 (6)	48 (1,219)	9/32 (7)	48 (1,219)	11/32 (9)	48 (1,219)	13/32 (10)
63 (19.202)	48 (1,219)	7/32 (6)	48 (1,219)	9/32 (7)	48 (1,219)	11/32 (9)	48 (1,219)	13/32 (10)
63.5 (19.355)	48 (1,219)	13/64 (5)	48 (1,219)	9/32 (7)	48 (1,219)	11/32 (9)	48 (1,219)	13/32 (10)
64 (19.507)	48 (1,219)	13/64 (5)	48 (1,219)	9/32 (7)	48 (1,219)	21/64 (8)	48 (1,219)	25/64 (10)
64.5 (19.660)	48 (1,219)	13/64 (5)	48 (1,219)	9/32 (7)	48 (1,219)	21/64 (8)	48 (1,219)	25/64 (10)
65 (19.812)	48 (1,219)	13/64 (5)	48 (1,219)	9/32 (7)	48 (1,219)	21/64 (8)	48 (1,219)	25/64 (10)
65.5 (19.964)	48 (1,219)	13/64 (5)	48 (1,219)	17/64 (7)	48 (1,219)	21/64 (8)	48 (1,219)	25/64 (10)
66 (20.117)	48 (1,219)	13/64 (5)	48 (1,219)	17/64 (7)	48 (1,219)	21/64 (8)	48 (1,219)	25/64 (10)
66.5 (20.269)	48 (1,219)	13/64 (5)	48 (1,219)	17/64 (7)	48 (1,219)	21/64 (8)	48 (1,219)	3/8 (10)
67 (20.422)	48 (1,219)	13/64 (5)	48 (1,219)	17/64 (7)	48 (1,219)	5/16 (8)	48 (1,219)	3/8 (10)

Outside Radius, ft. (m)	Form Cavity Width							
	4" (102mm)		6.25" (159mm)		8" (203mm)		10" (254mm)	
	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)
67.5 (20.574)	48 (1,219)	13/64 (5)	48 (1,219)	17/64 (7)	48 (1,219)	5/16 (8)	48 (1,219)	3/8 (10)
68 (20.726)	48 (1,219)	13/64 (5)	48 (1,219)	17/64 (7)	48 (1,219)	5/16 (8)	48 (1,219)	3/8 (10)
68.5 (20.879)	48 (1,219)	3/16 (5)	48 (1,219)	17/64 (7)	48 (1,219)	5/16 (8)	48 (1,219)	3/8 (10)
69 (21.031)	48 (1,219)	3/16 (5)	48 (1,219)	17/64 (7)	48 (1,219)	5/16 (8)	48 (1,219)	23/64 (9)
69.5 (21.184)	48 (1,219)	3/16 (5)	48 (1,219)	1/4 (6)	48 (1,219)	5/16 (8)	48 (1,219)	23/64 (9)
70 (21.336)	48 (1,219)	3/16 (5)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)	48 (1,219)	23/64 (9)
70.5 (21.488)	48 (1,219)	3/16 (5)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)	48 (1,219)	23/64 (9)
71 (21.641)	48 (1,219)	3/16 (5)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)	48 (1,219)	23/64 (9)
71.5 (21.793)	48 (1,219)	3/16 (5)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)	48 (1,219)	23/64 (9)
72 (21.946)	48 (1,219)	3/16 (5)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)	48 (1,219)	11/32 (9)
72.5 (22.098)	48 (1,219)	3/16 (5)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)	48 (1,219)	11/32 (9)
73 (22.250)	48 (1,219)	3/16 (5)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)	48 (1,219)	11/32 (9)
73.5 (22.403)	48 (1,219)	3/16 (5)	48 (1,219)	15/64 (6)	48 (1,219)	19/64 (8)	48 (1,219)	11/32 (9)
74 (22.555)	48 (1,219)	11/64 (4)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)	48 (1,219)	11/32 (9)
74.5 (22.708)	48 (1,219)	11/64 (4)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)	48 (1,219)	11/32 (9)
75 (22.860)	48 (1,219)	11/64 (4)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)	48 (1,219)	11/32 (9)
75.5 (23.012)	48 (1,219)	11/64 (4)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)	48 (1,219)	21/64 (8)
76 (23.165)	48 (1,219)	11/64 (4)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)	48 (1,219)	21/64 (8)
76.5 (23.317)	48 (1,219)	11/64 (4)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)	48 (1,219)	21/64 (8)
77 (23.470)	48 (1,219)	11/64 (4)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)	48 (1,219)	21/64 (8)
77.5 (23.622)	48 (1,219)	11/64 (4)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)	48 (1,219)	21/64 (8)
78 (23.774)	48 (1,219)	11/64 (4)	48 (1,219)	15/64 (6)	48 (1,219)	17/64 (7)	48 (1,219)	21/64 (8)
78.5 (23.927)	48 (1,219)	11/64 (4)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)	48 (1,219)	21/64 (8)
79 (24.079)	48 (1,219)	11/64 (4)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)	48 (1,219)	5/16 (8)

Outside Radius, ft. (m)	Form Cavity Width							
	4" (102mm)		6.25" (159mm)		8" (203mm)		10" (254mm)	
	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)
79.5 (24.232)	48 (1,219)	11/64 (4)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)	48 (1,219)	5/16 (8)
80 (24.384)	48 (1,219)	11/64 (4)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)	48 (1,219)	5/16 (8)
80.5 (24.536)	48 (1,219)	11/64 (4)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)	48 (1,219)	5/16 (8)
81 (24.689)	48 (1,219)	5/32 (4)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)	48 (1,219)	5/16 (8)
81.5 (24.841)	48 (1,219)	5/32 (4)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)	48 (1,219)	5/16 (8)
82 (24.994)	48 (1,219)	5/32 (4)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)	48 (1,219)	5/16 (8)
82.5 (25.146)	48 (1,219)	5/32 (4)	48 (1,219)	7/32 (6)	48 (1,219)	1/4 (6)	48 (1,219)	5/16 (8)
83 (25.298)	48 (1,219)	5/32 (4)	48 (1,219)	7/32 (6)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)
83.5 (25.451)	48 (1,219)	5/32 (4)	48 (1,219)	7/32 (6)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)
84 (25.603)	48 (1,219)	5/32 (4)	48 (1,219)	7/32 (6)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)
84.5 (25.756)	48 (1,219)	5/32 (4)	48 (1,219)	13/64 (5)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)
85 (25.908)	48 (1,219)	5/32 (4)	48 (1,219)	13/64 (5)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)
85.5 (26.060)	48 (1,219)	5/32 (4)	48 (1,219)	13/64 (5)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)
86 (26.213)	48 (1,219)	5/32 (4)	48 (1,219)	13/64 (5)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)
86.5 (26.365)	48 (1,219)	5/32 (4)	48 (1,219)	13/64 (5)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)
87 (26.518)	48 (1,219)	5/32 (4)	48 (1,219)	13/64 (5)	48 (1,219)	1/4 (6)	48 (1,219)	19/64 (8)
87.5 (26.670)	48 (1,219)	5/32 (4)	48 (1,219)	13/64 (5)	48 (1,219)	1/4 (6)	48 (1,219)	9/32 (7)
88 (26.822)	48 (1,219)	5/32 (4)	48 (1,219)	13/64 (5)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)
88.5 (26.975)	48 (1,219)	5/32 (4)	48 (1,219)	13/64 (5)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)
89 (27.127)	48 (1,219)	9/64 (4)	48 (1,219)	13/64 (5)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)
89.5 (27.280)	48 (1,219)	9/64 (4)	48 (1,219)	13/64 (5)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)
90 (27.432)	48 (1,219)	9/64 (4)	48 (1,219)	13/64 (5)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)
90.5 (27.584)	48 (1,219)	9/64 (4)	48 (1,219)	13/64 (5)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)
91 (27.737)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)

Outside Radius, ft. (m)	Form Cavity Width							
	4" (102mm)		6.25" (159mm)		8" (203mm)		10" (254mm)	
	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)	C, in. (mm)	A, in. (mm)
91.5 (27.889)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)
92 (28.042)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	15/64 (6)	48 (1,219)	9/32 (7)
92.5 (28.194)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	15/64 (6)	48 (1,219)	17/64 (7)
93 (28.346)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	15/64 (6)	48 (1,219)	17/64 (7)
93.5 (28.499)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	15/64 (6)	48 (1,219)	17/64 (7)
94 (28.651)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)
94.5 (28.804)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)
95 (28.956)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)
95.5 (29.108)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)
96 (29.261)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)
96.5 (29.413)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)
97 (29.566)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)
97.5 (29.718)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	7/32 (6)	48 (1,219)	17/64 (7)
98 (29.870)	48 (1,219)	9/64 (4)	48 (1,219)	3/16 (5)	48 (1,219)	7/32 (6)	48 (1,219)	1/4 (6)
98.5 (30.023)	48 (1,219)	9/64 (4)	48 (1,219)	11/64 (4)	48 (1,219)	7/32 (6)	48 (1,219)	1/4 (6)
99 (30.175)	48 (1,219)	1/8 (3)	48 (1,219)	11/64 (4)	48 (1,219)	7/32 (6)	48 (1,219)	1/4 (6)
99.5 (30.328)	48 (1,219)	1/8 (3)	48 (1,219)	11/64 (4)	48 (1,219)	7/32 (6)	48 (1,219)	1/4 (6)
100 (30.480)	48 (1,219)	1/8 (3)	48 (1,219)	11/64 (4)	48 (1,219)	7/32 (6)	48 (1,219)	1/4 (6)

2.22 – TALL WALLS

Logix walls can be constructed to any height provided proper engineering and construction methods are used.





Logix tall walls should be designed in accordance with ACI 318 or CAN/CSA A23.3.

Constructing tall walls follows the same basic steps described throughout Section 2. In addition, building taller walls is done in much the same way as concrete pours using traditional formwork. Generally, Logix blocks are stacked and braced, normally 10 to 12 feet high. The concrete is then placed. After the concrete sets Logix blocks are then stacked another 10 to 12 feet, and bracing is raised or extended higher to support the wall, as well as keeping the wall plumb. This process is continued until the specified wall height is reached.



To ensure a smooth build, the following items should be considered:

- Load tables in Section 6 can be used as a design aid for both the builder and designer. However, tall wall designs should be reviewed and approved by a local licensed professional engineer.
- In higher wind areas taller walls may require guy wires for additional support. Typically, this will be determined by the engineer of record.
- Proper consolidation of concrete can be achieved by adequate vibrating. However, depending on the drop height, and the steel congestion, external vibration, in addition to internal vibration, should be considered, particularly at corners, openings, and congested areas of rebar. (External vibrators made specifically for ICFs are available. See Section "2.23 – SUPPORTING PRODUCTS" on page 94.
- Since tall walls are typically poured using a pump truck, using a 2 1/2" trimmer hose can provide better control of the concrete pour.
- If required, roughen the surface of all cold joints to ensure a good bond between the surface of the old pour and the subsequent pour. In addition, ensure adequate rebar embedments are provided.
- For the final stage of the pour, a Logix Taper Top block can be used, if required, for the top course of the wall. This provides a larger opening for concrete to flow into the wall and also provides a larger bearing area for supporting elements.
- Several tall wall bracing and alignment systems are available. For more information see Section 3.2, Tall Wall Bracing Systems.

NOTE: Both ACI 318 and CAN/CSA A23.3 permit cold joints when concrete is poured in stages.

2.23 – SUPPORTING PRODUCTS

A list of supporting ICF products are shown below. Consult with the listed manufacturer prior to using with Logix Insulated Concrete Forms. Please note: the products listed below does not prohibit the use of Logix ICFs with other supporting products not listed.

FOOTINGS

Product Name	Manufacturer	Contact	Website
Form-A-Drain	CertainTeed Corp.	708-301-4449	certainteed.com

EXTERIOR FINISHES

Product Name	Manufacturer	Contact	Website
Durock	Alfacing International Ltd.	1-888-238-6345	durock.com
Senerflex	Degussa Wall Systems, Inc.	1-800-221-9255	senergy.cc
Sto EIFS System	Sto Corp.	1-800-221-2397	stocorp.com
GrailCoat	GrailCoat	1-877-472-4528	grailcoat.com
TAFS (Textured Acrylic Finishes	dryvit	1-800-263-3308	dryvit.com
SoftCoat PB System	Total Wall, Inc.	1-888-702-9915	totalwall.com
Akroflex	Omega Products Corp.	602-721-5027	omega-products.com
Impact System	parex	1-800-537-2739	parex.com
PermaCrete	Quality Systems	1-800-607-3762	permacrete.com
Crack Guard	Poly-Wall	1-800-846-3020	poly-wall.com
WeatherWall Systems	Eco Specialty Products Ltd.	1-888-481-5507	ecocoatings.ca

WATERPROOFING

Product Name	Manufacturer	Contact	Website
System III	Epro	1-800-882-1896	eproserv.com
Blueskin WP2000	Bakor, Inc	1-800-387-9598	bakor.com
Colphene 3000	Soprema, Inc	1-800 567-1492	soprema.com
Delta-MS Clear	Cosella-Dorken Products, Inc.	1-888-4DELTA4	cosella-dorken.com
Platon	Armtec Ltd.	1-800-265-7622	systemplaton.com
Tamko TW60	Tamko, Inc.	1-800-641-4691	tamko.com
Grace waterproofing products	Grace Construction Products	See website	graceconstruction.com
Aqua-Wrap/Green Sheild	Aqua Seal Inc.	1-888-282-3861	aquasealusa.com
Protecto Universal Primer Free Membrane	Protecto Wrap	1-800-759-9727	protecowrap.com

CONNECTION SYSTEMS

Product Name	Manufacturer	Contact	Website
ICF Ledger Connector System	Simpson Strong-Tie Co., Inc.	1-800-999-5099	simpsonstrongtie.com
ICF-Connect	ICF-Connect Ltd.	1-866-497-1576	icfconnect.com

ADHESIVE & SEALANTS

Product Name	Manufacturer	Contact	Website
Enerfoam Sealant/Enerbond Adhesive	Dow Chemical Company	1-800-800-FOAM	dow.com/buildingproducts
PL300	Loctite	1-800-624-7767	www.loctiteproducts.com

WALL BRACING & ALIGNMENT SYSTEMS

Product Name	Manufacturer	Contact	Website
Uniscaffold, LLC	Uniscaffold	1-208-791-5624	www.uniscaffold.com
Giraffe Bracing	Giraffe Bracing	1-888-778-2285	www.giraffebracing.com
Plumwall	Plumwall Ltd.	1-905-786-7586	www.plumwall.com
Mono-Brace	Tapco	814-336-6549	www.mono-brace.com
Amazing Brace	Lakeland Group	905-372-7413	www.lakeland-multitrade.com

EXTERNAL VIBRATORS

Product Name	Manufacturer	Contact	Website
Brecon	Brecon Inc.	815-463-8073	http://icfvibrator.com
Arkie Wall Banger	Available from Wind-lock	1-800-872-5625	-

SUPPLIERS OF SUPPORTING ICF PRODUCTS

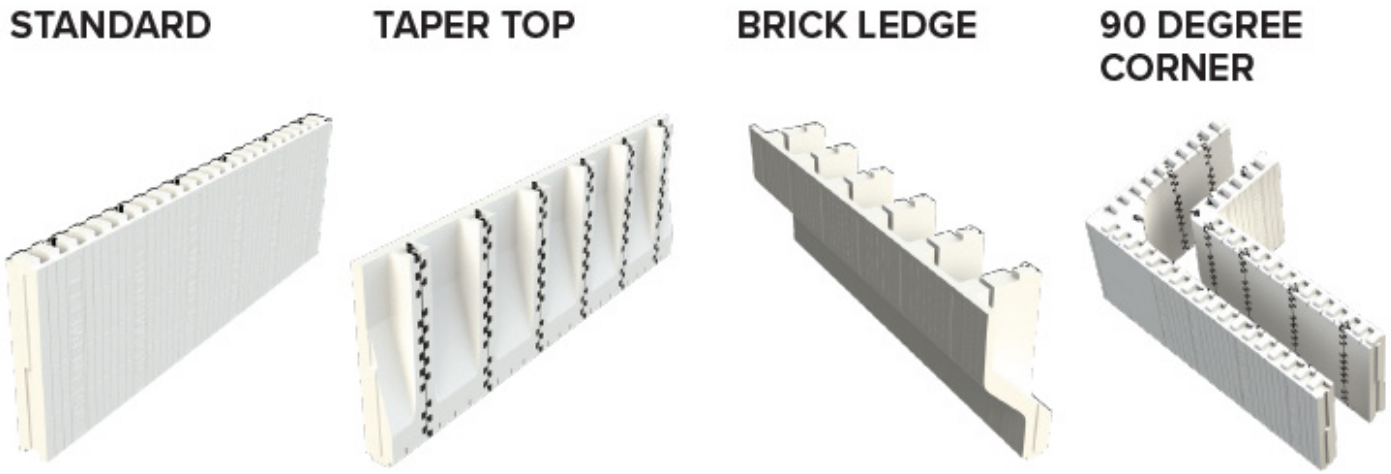
Company	Contact	Website
Wind-lock	1-800-872-5625	wind-lock.com
Grace Construction Products	See website	graceconstruction.com

3.0 – ELEMENT ICF INSTALLATION

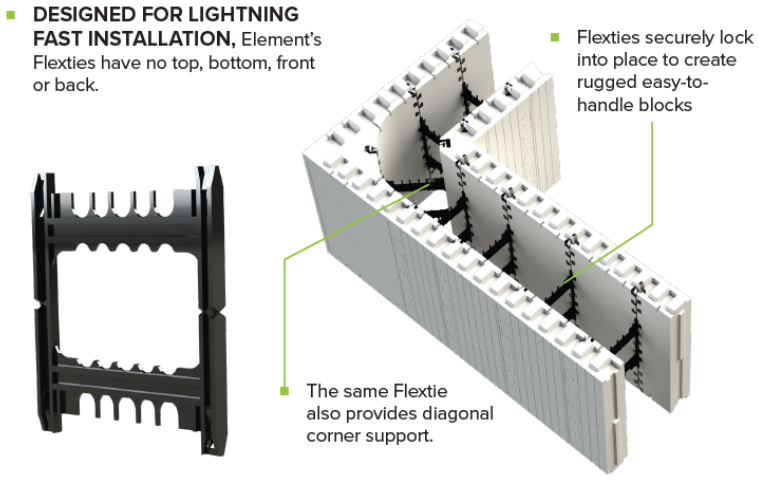
The installation process for Element ICF closely follows the guidelines outlined in Section 2 of this guide. However, there is a key distinction: unlike Logix ICF, Element ICF is a reversible system. Additionally, it incorporates additional web tie features, which are detailed in this section.

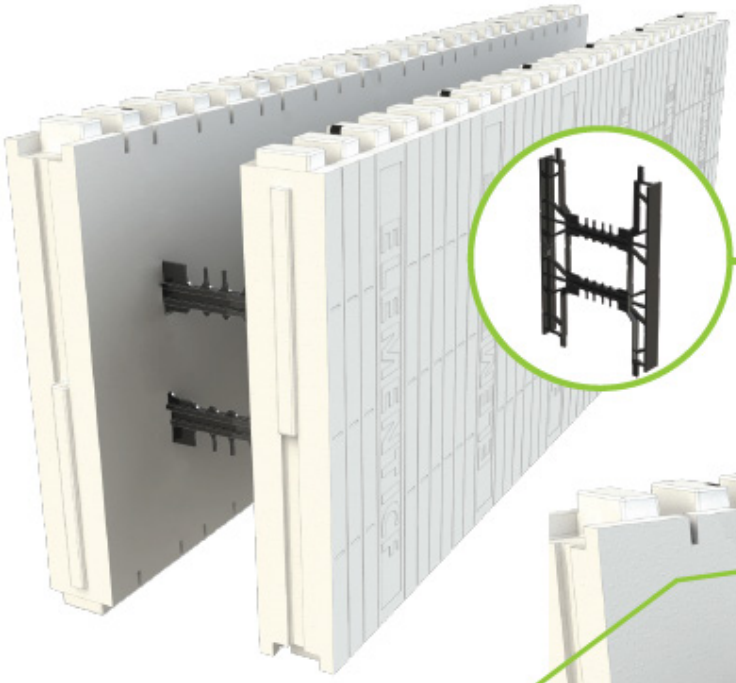
3.1 – ELEMENT ICF PRODUCTS

Element ICFs are available as site-assembled and preformed blocks. Blocks are available in the following forms and size shown below.

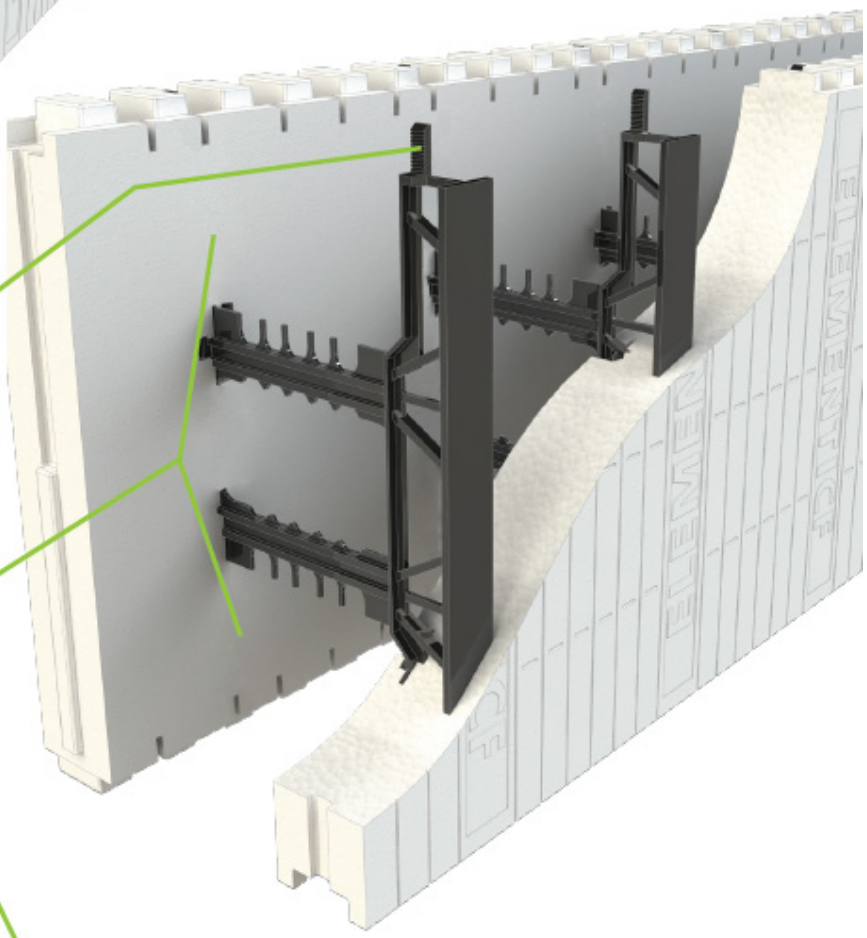


3.2 – FEATURES

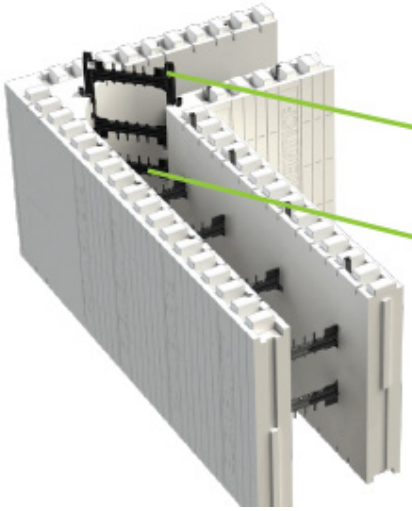




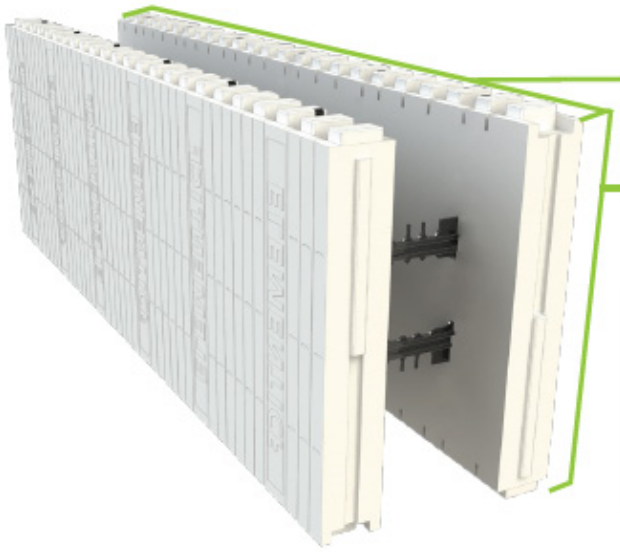
- **ELEMENT'S PREFORMED BLOCKS ARE FULLY INTERCHANGEABLE** with site-assembled blocks
- **THE WEB USED USED IN ELEMENT'S PREFORMED BLOCKS**



- **PREFORMED BLOCKS HAVE THE ZIP TABS** that securely clip the blocks top-to-bottom to minimize lifting and settling
- **PREFORMED BLOCKS DO NOT HAVE THE END-LOCKING CHANNELS**



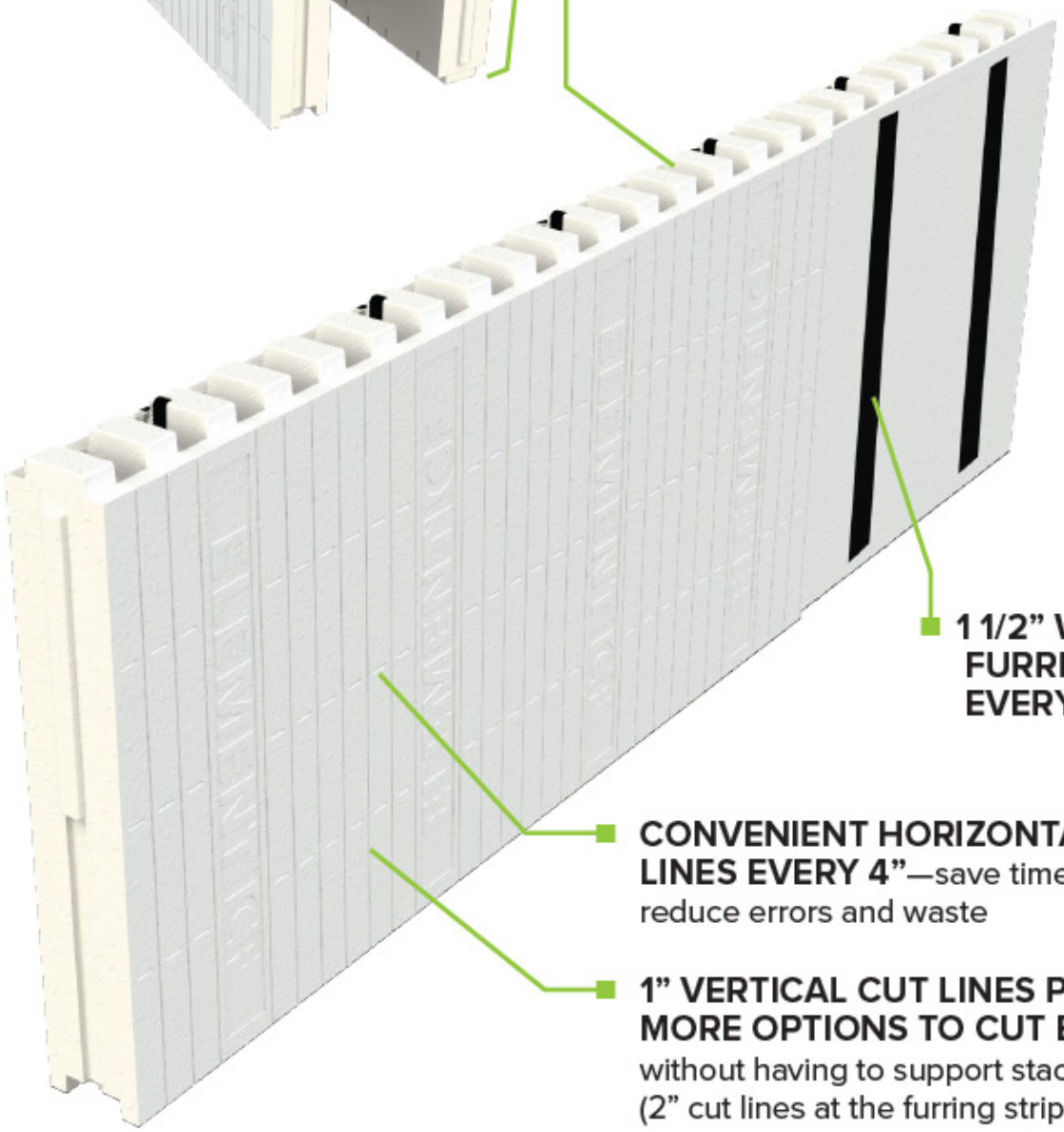
- **A BRIDGING FLEXTIE** will perma-lock two preformed 90 degree corner forms together.
- **REGULAR FLEXTIES** are used to provide additional diagonal corner support.



4' BLOCK LENGTH — the optimum length for fast & easy handling & Installation

16" BLOCK HEIGHT — conforms to accepted industry standards

THICK 2 3/4" FOAM PANELS — provide added strength and more R-value

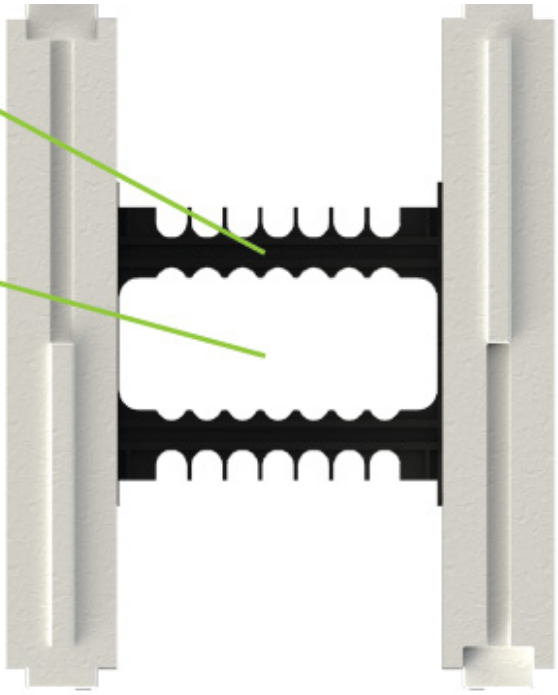


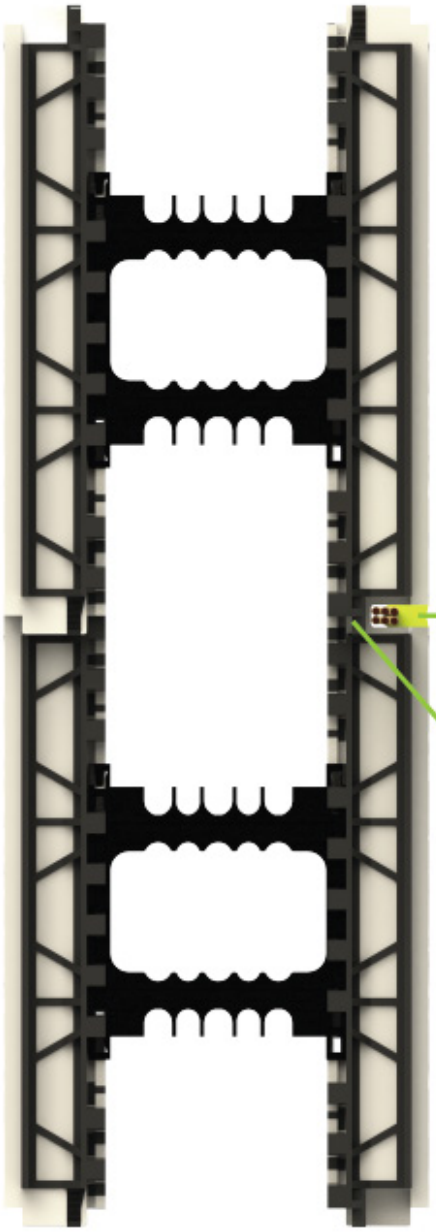
1 1/2" WIDE FURRING STRIPS EVERY 8" O/C

CONVENIENT HORIZONTAL CUT LINES EVERY 4"—save time and reduce errors and waste

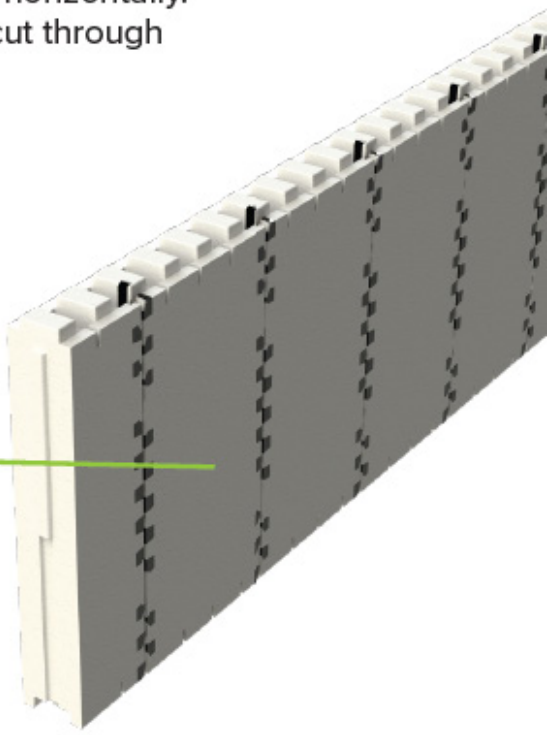
1" VERTICAL CUT LINES PROVIDE MORE OPTIONS TO CUT BLOCKS without having to support stacked seams. (2" cut lines at the furring strips)

- **RUGGED REBAR HOLDERS** allow a single crew member to install longer rebar lengths
- **OPEN WEB DESIGN** optimizes concrete flow and consolidation

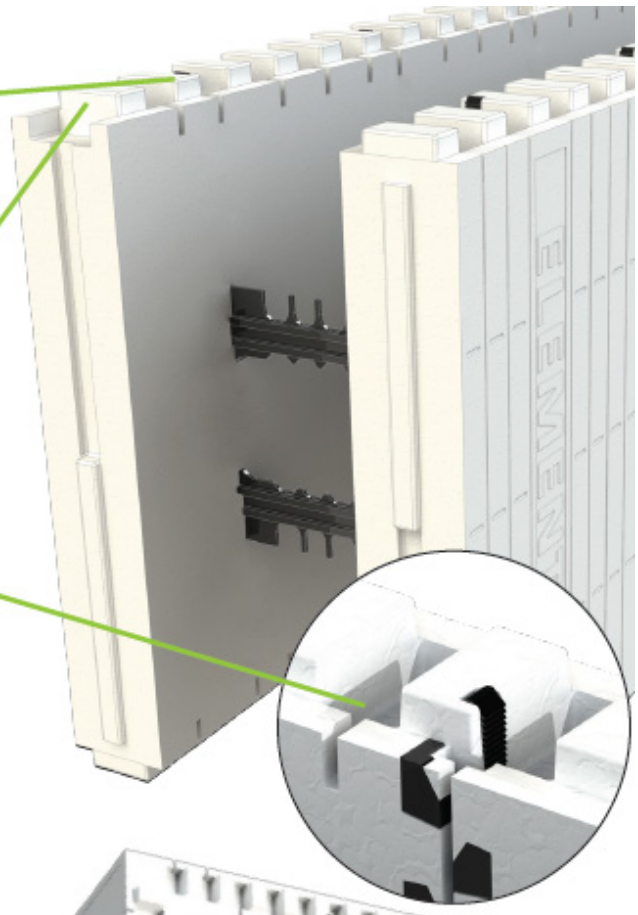


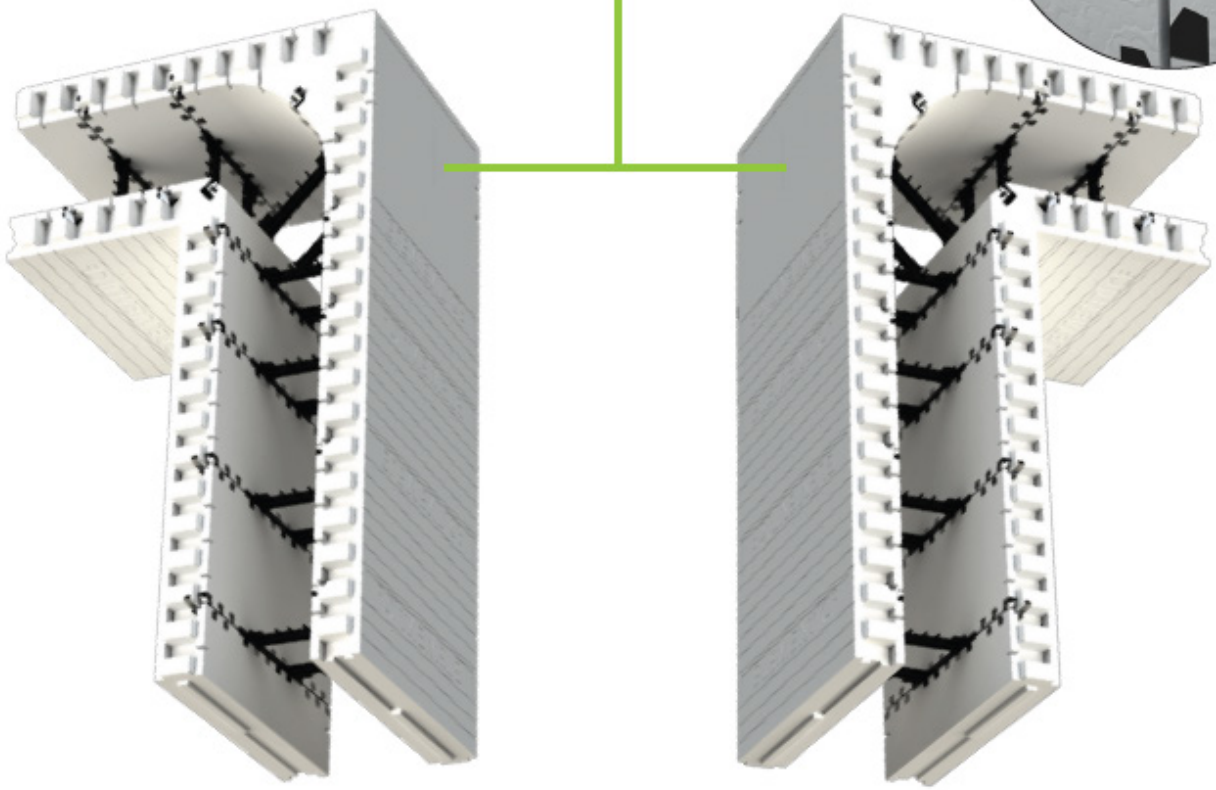


- **ALL-FOAM WIRE CHASES** provided every 16” o/c horizontally. No plastic or metal to cut through to install wiring.
- **CONTINUOUS WEBS—** No settling
- **NO GROOVES CUT INTO THE INTERIOR WALLS** —this preserves system R-value

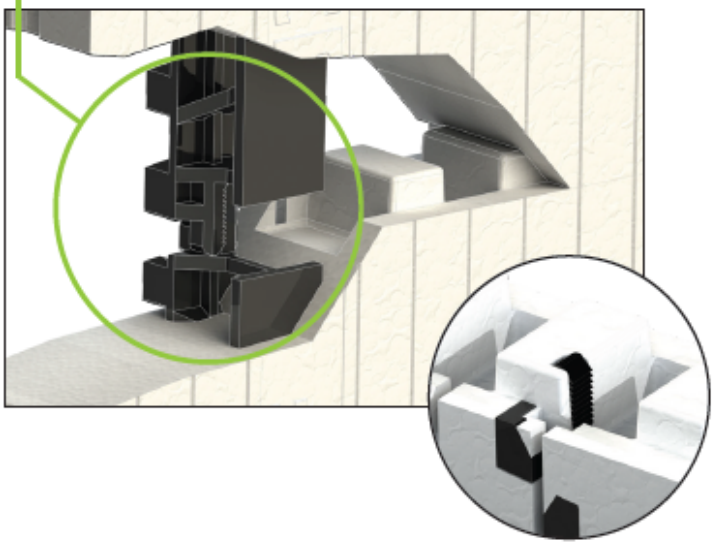


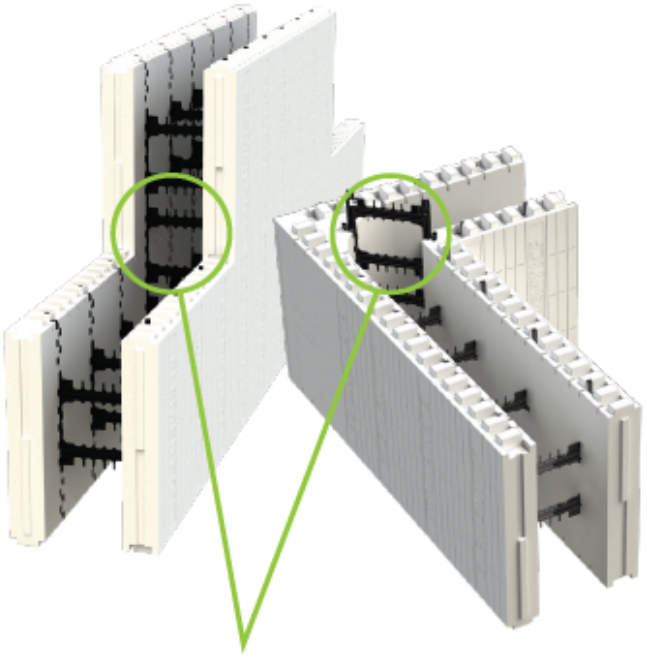
- **ROBUST & DURABLE INTERLOCK PROVIDES A SNUG EASY FRICTION FIT**
  — to minimize movement during concrete placement
- **4 WAY REVERSIBLE INTERLOCK MEANS OUR BLOCKS HAVE NO TOP OR BOTTOM, FRONT OR BACK**
  — product waste is reduced
- **SELF DRAINING TO MINIMIZE ICE BUILD-UP IN COLD CONDITIONS.**
- **NO LEFT AND RIGHT CORNERS**
  — this saves time on the job site





WEBS ALWAYS CLIP TOGETHER
— so no floating or settling occurs during the concrete pour. Plus - the need for wire clips or gluing is eliminated!





AND WHEN THE NEED FOR ABSOLUTE MAXIMUM STRENGTH IS ESSENTIAL — additional Flexties® **perma-lock** one course to the other!
No other ICF system can do this!

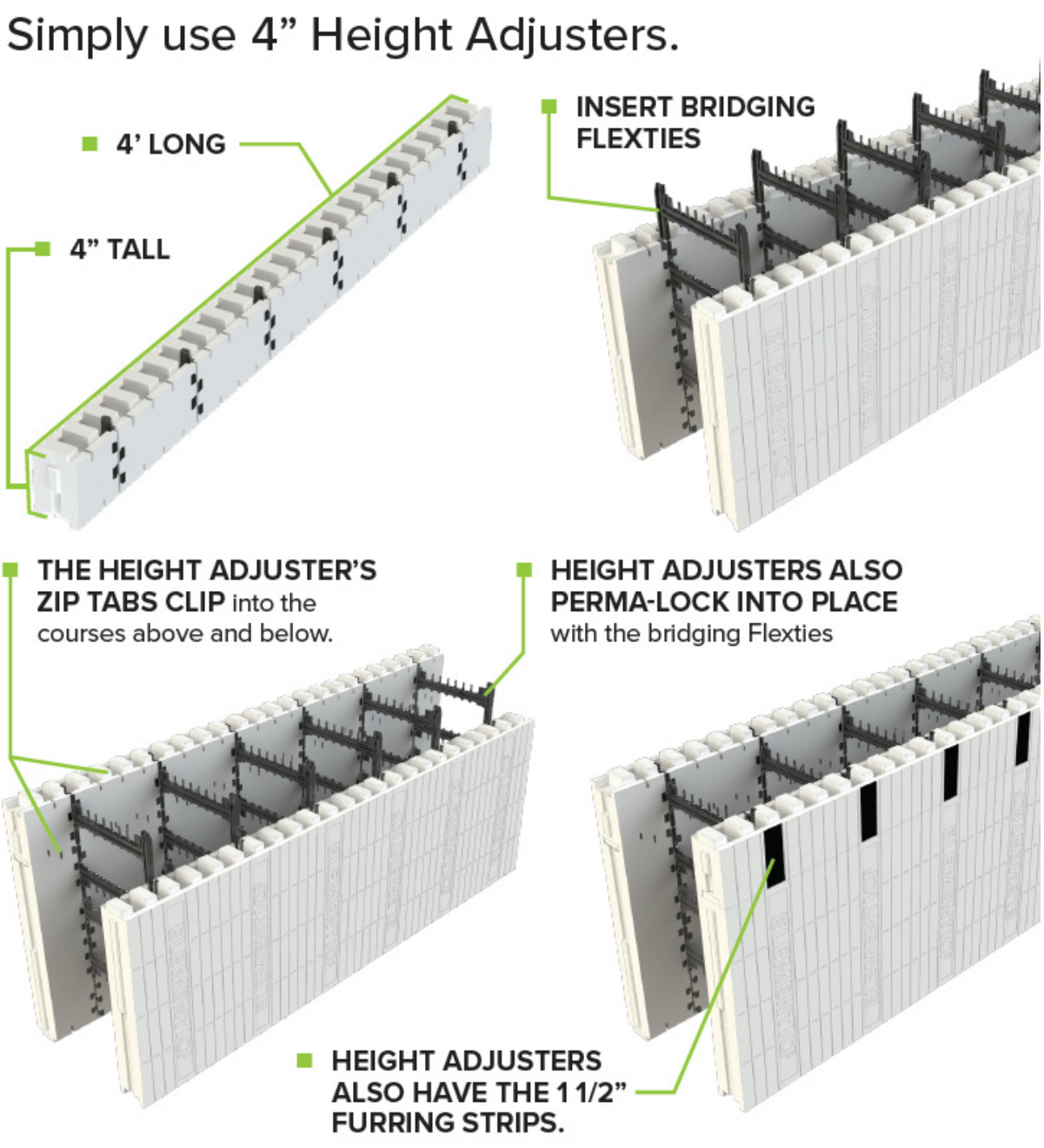
3.3 – ELEMENT ICF CORE SIZES





- SITE-ASSEMBLED BRICK LEDGE, TAPER TOP AND DOUBLE TAPER TOP BLOCKS ARE AVAILABLE IN ALL CORE WIDTHS.

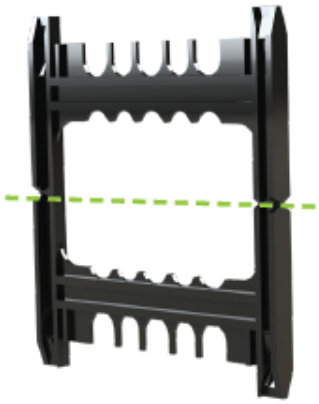
3.4 – ELEMENT ICF HEIGHT ADJUSTERS



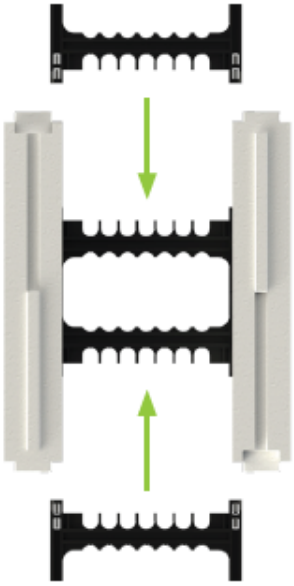
- **ALTERNATIVE INSTALLATION TIP** - Instead of installing the bridging Flexties, you can snap Flexties in half at the scored center point and cross-brace the opposing height adjusters with the 1/2 Flextie pieces.

TO CREATE TWO FULLY FUNCTIONAL 8” TALL BLOCKS SIMPLY:

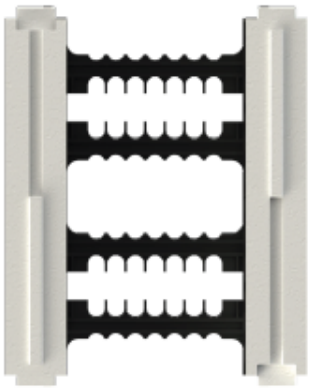
1 Snap Flexties in half at the scored center point.



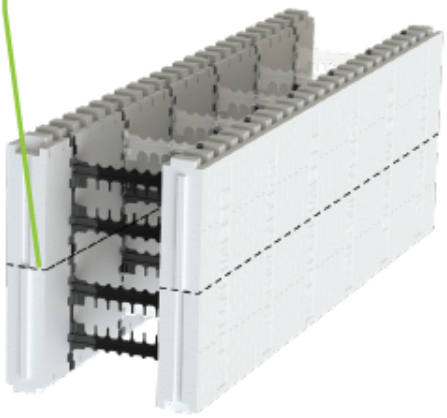
2 Slide an inverted 1/2 Flextie piece into each end locking position in the block



3 The 1/2 Flexties securely lock into place.

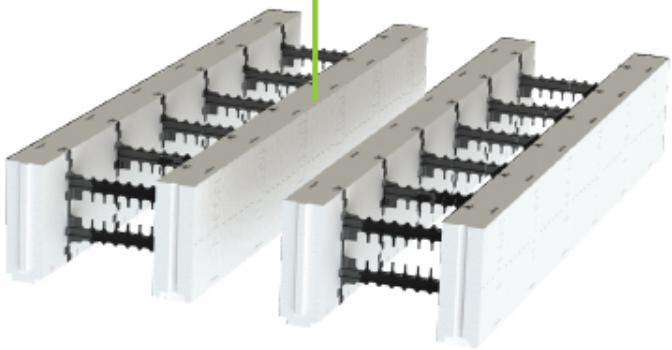


4 Cut the 16” tall block in half along the embossed center cut line



5 You now have two rugged and fully functional 8” tall blocks with zero waste created

No other ICF can do this!



- **Alternative Installation Tip** - You can also create an 8” tall block with 4 Height Adjusters and 6 Flexties.







3.5 – ELEMENT ICF XRV™ INSERT PANEL

