LiteForm® ICF

LiteForm ICF forming components should only be assembled by workers who have been properly trained. It is the installer's responsibility to make sure that training is done before construction begins. Serious injury or death may result from safety hazards caused by improper assembly and installation of forming components! Before beginning check local engineering and building codes on cast-in-place concrete construction. This guide covers typical building situations and is not meant to replace specific codes for engineering or safety.

Tools and Materials Needed

Basic Carpentry Hand Tools

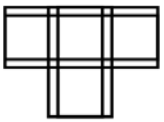
- Tape Measure
- Hammer
- Pliers
- 4' Level
- Course Tooth Hand Saw
- Utility Knife
- Chalk Line
- String Line
- Tin Snips
- Ladder
- Electric Drill
- Circular Saw

Building Materials

- 2"x4" Lumber for Braces
- 2" Lumber for Doors and Windows
- 1"x4" Wooden Grade Stakes
- 3" Course Thread Screws
- Plastic Insulation Washers
- 24" Zip Ties or Roll of 18 gauge Wire
- High Quality Low Expanding Foam Adhesive

Inventory May Include

LiteForm ICF Blocks
16" x 48" blocks with continuous furring ties every 6". Available in 4", 6", 8" 10" and 12" concrete thickness.



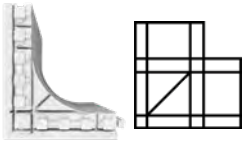
LiteForm ICF T-Tie
Available for 6" and 8" concrete thickness.

90° Corner Options

A

90° Corner Block
Left and Right 90° corner blocks are alternated between courses.

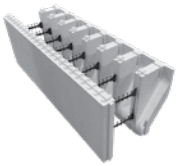
B



90° Compact Corner
Compact corners and corner ties are a space saving option to form 90° corners.

Optional Accessories

In-Wall Bracing
Steel In-Wall bracing is used to help keep your assembled wall straight from corner to corner.



Brickledge Block
LiteForm provides a brickledge block for 8" concrete thickness.

INSTALLATION VIDEO

LiteForm ICF

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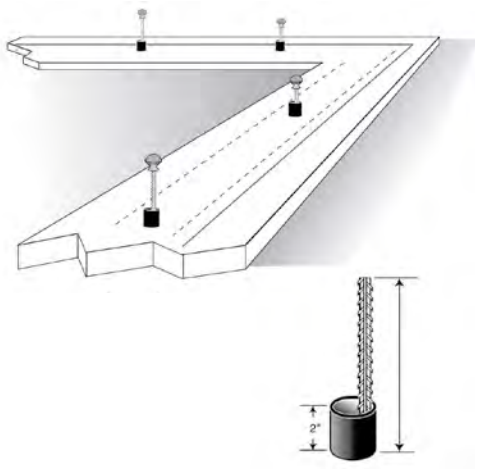
1 Footing or Pad Preparation

Footing or pad must be level, uniform and wide enough for the form to rest on. Footing must also be proper width and thickness for soil conditions. Check with local code officials for guidelines and specifications. First course (row) of forms will be glued to the footing/pad, along the chalk line.



2 Start at a Corner

Note : LiteForm ICF has 2 types of 90° corner designs. Instructions for both designs are as follows:

A. LiteForm ICF 90° Corner Block
B. LiteForm ICF 90° Compact Corner

A. LiteForm ICF 90° Corner Block

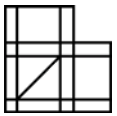
LiteForm ICF 90° Corner Block
Left and Right LiteForm ICF 90° Corner Blocks are alternated between courses to create staggered seams.

Using low expansion foam adhesive, run a bead of glue along the bottom side of the LiteForm ICF 90° Corner Block. Set the Corner Block in place on the footing following the chalk line. Glue will normally set within 20 minutes.

B. LiteForm ICF 90° Compact Corner

LiteForm ICF 90° Compact Corners and Corner Ties are a space saving option to form 90° corners.

LiteForm ICF 90° Compact Corner



LiteForm ICF 90° Compact Corner Tie

LITEFORM ICF 90° COMPACT CORNER VIDEO

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B. LiteForm ICF 90° Compact Corner Continued

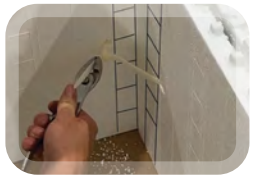
Start with 2 full blocks. Cut one of the full blocks in half (2 - 24" Sections).

Drill or punch a hole on the opposite side of the 1st plastic tie on **both** sides of the 48" adjoining block.

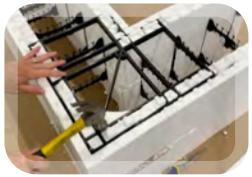
Drill or punch a hole on the opposite side of the 1st plastic tie on both sides of the 24" cut block.

Slide both the full and half blocks onto the compact corner.

Using the provided zip ties, run ties through the pre-drilled holes in the corner and into to the hole you made in the adjoining block. Pull the zip tie tight against the ties.



Add the 3rd zip tie to the inside of the corner and pull it tight. **IMPORTANT - Remove zip ties after concrete is set.**



Place a LiteForm ICF 90° Corner Tie onto the pre-molded slots. You may need to clean the slots with a drywall saw. Tap the corner with a hammer so it is flush to the

3 Glue First Course of Forms

Once the first course of forms are set, place foam glue every 18-24 inches so that it expands enough to protrude from both sides of the form. Glue both sides of the form wall.

4 Center of Wall : Common Seam

Reinforce the common seam at the center of each wall using the same **foam adhesive**. For common seams that are within 36" from the corner, use additional materials to reinforce the common seam. Tie spacing over 6" must be supported externally on both sides of the wall.

Optional Reinforcing Methods →

1x4 Wood Cleats

1/2" Plywood

5 2nd Course

A. LiteForm ICF 90° ICF Corner Block - Using the alternating LiteForm ICF 90° Corner Block (Left or Right), place the Corner Block onto the first course. The alternating LiteForm ICF 90° Left and Right Corner Blocks produce alternating seams through the wall assembly.

B. LiteForm ICF 90° Compact Corner

Repeat the same steps from the 1st course using the other 1/2 block on the alternate side of the LiteForm ICF 90° Compact Corner. This will create an alternating seam for your wall.

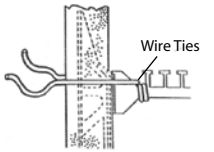
Place a LiteForm ICF 90° Corner Tie into the pre-molded slots the same as you did for the first course.

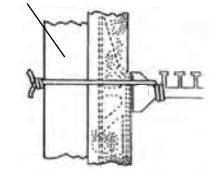
Set your corner assembly onto the first course corner.

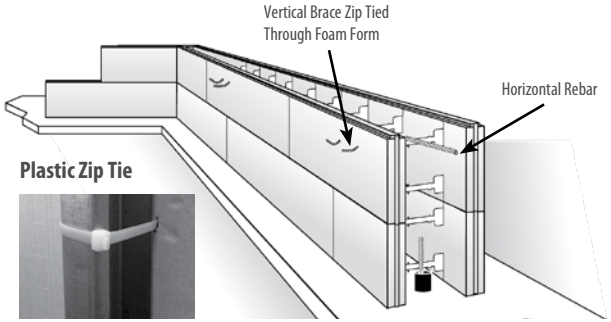
Trim the tongue off of the next full block and slide it against the cut block.

6 Vertical Bracing

Begin installing wire ties with the second course of forms. A 24-inch zip-tie or 16 gauge wire is pressed through the form wall and wrapped around a spacer tie, leaving the ends extending out. As assembly continues, wire ties should be placed approximately every 32 inches up the wall, with rows placed approximately 6-feet apart along the entire wall. If a brace is also being used to support a work platform, braces should be placed in the corners. Always follow OSHA guidelines when constructing and working from platforms.



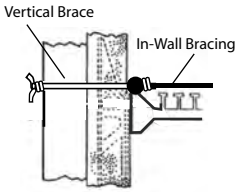




Plastic Zip Tie

7 A. LiteForm In-Wall Bracing (Optional)

Horizontal In-Wall bracing sections should be installed horizontally every 32 - 48 inches around the entire wall and at the top of the wall. Wire-tie or zip-tie the In-Wall to a spacer tie and vertical stud approximately every 32 inches.



IMPORTANT!
Wherever a vertical brace will be located, make sure to use a wire or zip-tie wrapped around the In-Wall bracing. This will ensure a straight wall from corner to corner.

B. Using Masonry Reinforcement for Wall Alignment

Wire masonry reinforcement can also be used for wall alignment and is available at most building supply centers. The same basic technique for installation is used. Scan the QR code for specific instructions on using masonry reinforcement for wall alignment.

LiteForm ICF
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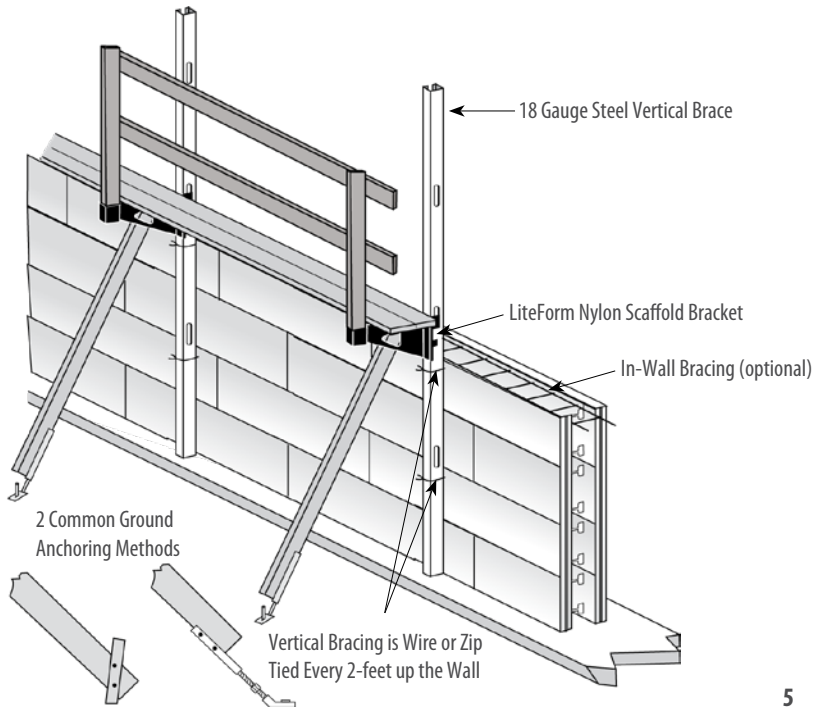
8 Vertical Bracing Support

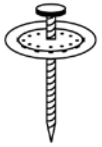
When assembled wall reaches 4-courses high, exterior vertical braces must be attached along one side of the form. They are placed approximately *6-feet apart and are anchored to the form with the wire ties which were installed earlier. Braces can be good-quality dimensional lumber (2X4) or 18-gauge steel. Additional braces should be used next to window or door jambs. A diagonal "kicker" brace is anchored to each vertical brace. If optional steel In-Wall Bracing is not used, vertical braces should be placed approximately every 4-feet apart, to ensure proper alignment. *Maximum spacing of 6 feet is allowed by OSHA guidelines, if brace is also being used to support a work platform.



9 Window & Door Casing and Bracing

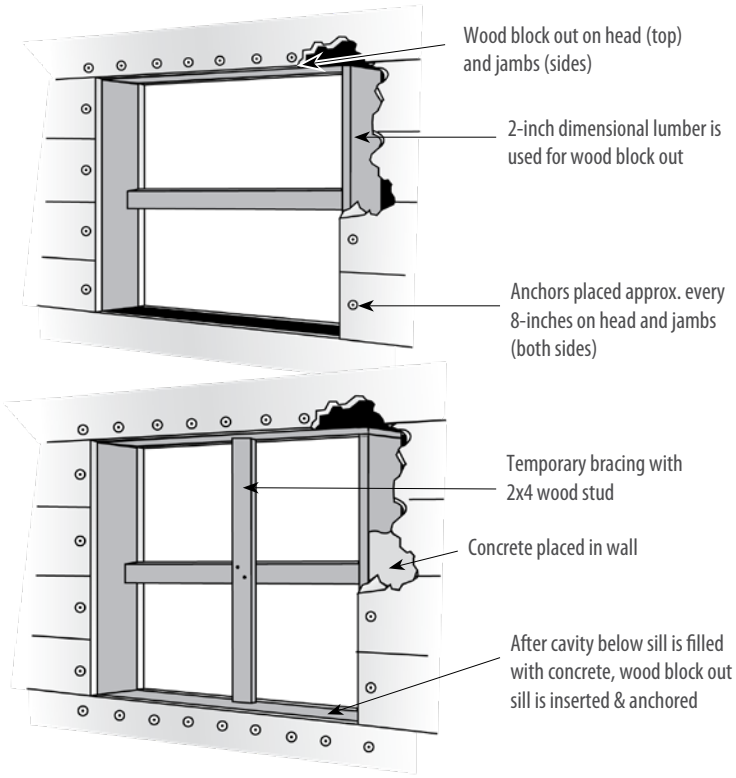
Openings can be built during form wall assembly or they can be cut in with a hand saw, after the form is assembled.

Prior to placement of concrete, wood block outs are securely anchored at head and jambs. A temporary 2x4 wood brace is added to openings over 2-feet tall. Wood sill block out is not placed at this time to allow for visual inspection of proper concrete placement under sill.



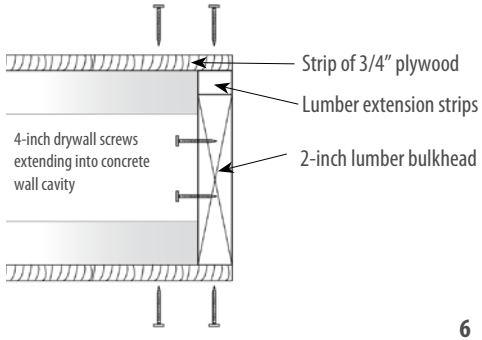
3-inch Drywall Screw with Plastic Reinforcing Washer

Seat Screw so that Washer is Countersunk Into Insulation



Alternate Technique for Window and Door Casing

The 2-inch dimensional lumber (for block outs) can be installed flush with trimmed edges of insulation. The 2-inch lumber is anchored in place with strips of 3/4-inch plywood or 1x4 lumber anchored to bulkhead and plastic spacer ties with drywall screws. Strips of 2-inch lumber are used to extend the width of block out lumber (concrete wall width + 5-inches)

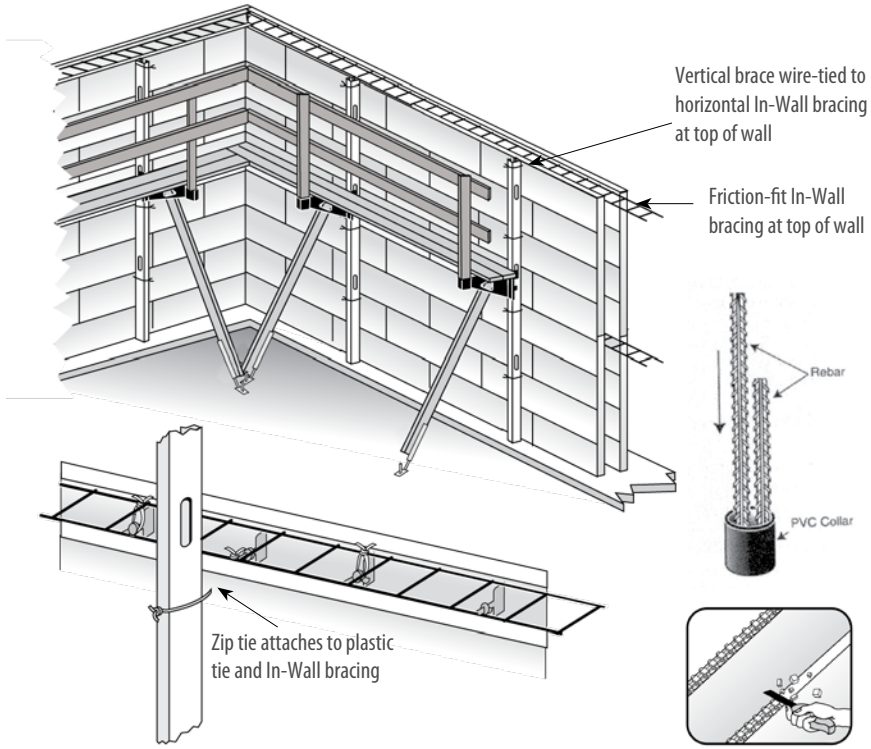


10 Top Assembly of Form Wall

When assembled wall reaches full height, vertical rebar is lowered in-between the foam planks and inserted into the PVC collar up against the other rebar protruding from footing or pad.

Steel In-Wall bracing is 'friction fit' around the entire wall. The vertical 2x4 braces are anchored to the form with lengths of wire through the form wall and around the steel In-Wall Bracing.

If a wood frame structure will be constructed above the concrete wall, castellations should be removed with a sharp blade or saw, to ensure a smooth fit.



11 Final Check List of Your Project

- **Are corners plumb from top to bottom?**
- **Are vertical braces wire tied every 2-feet?**
- **Diagonal braces adjusted and anchored?**
- **Is top In-Wall bracing installed and wire-tied?**
- **Has final alignment been checked?**
- **Is someone assigned to check for blow-outs?**
- **Is all rebar installed?**
- **Does each vertical brace have a diagonal brace?**
- **Are window and door bulkheads reinforced?**
- **Have utility holes been cut and blocked?**
- **Is a blow-out repair kit handy?**
- **Is scaffold planking safely anchored?**

Calculate Concrete

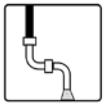
Length in Feet x Height in Feet x Thickness in Inches x .0031 = Cubic Yards of Concrete - Minus window and door openings.

Concrete Specifications

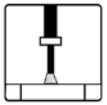
1/2 to 3/4 inch smooth aggregate
2,500 to 4,000 psi mix
4 to 6 inch slump

Placing the Concrete with a Concrete Pump

Concrete is often placed in the insulating form walls with a concrete pump. To minimize the risk of form failure, the discharge pressure from the pump hose should be reduced by using one of the techniques detailed below. Most pump operators are familiar with theses techniques and can provide the necessary accessory if they are notified, in advance.



90-Degree Elbows - A 90º elbow accessory is attached to the pump's delivery hose to reduce discharge volume and pressure.



Hose Reducer - A 3-inch reducer is attached to the pump's delivery hose. The 3-inch discharge hose reduces the concrete's discharge pressure.

Hose Harness -A hose harness can be fitted with a rope or strap to bend it so that concrete is not discharged straight down into the form. The hose is diverted and allows the concrete to fall naturally.

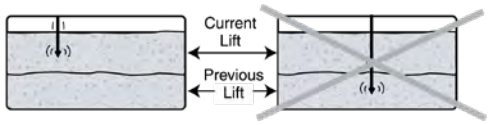
Flexible Hose -A 4-inch or 5-inch flexible discharge hose can be used to mitigate waste and control the flow of concrete.

Place Concrete in Lifts

Place concrete in lifts not to exceed a height of 4-feet, with no more than 8-feet of concrete placed vertically in one hour. This rate must be followed, regardless of how concrete is placed into the form. Placing concrete in lifts over 4-feet per lift can cause immediate form failure (blow-outs).

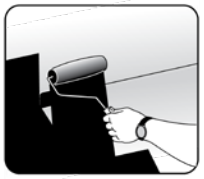
Vibrating Walls

Only experienced operators should be allowed to use an electric vibrator with a 3/4 - 1 inch head to consolidate concrete.



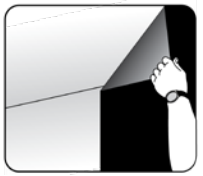
Winter Projects

If a winter project is delayed for several days, assembled forms should be covered to protect the accumulation of ice or snow at the bottom of the form. If this debris is not removed, they will cause voids in the wall when the concrete is placed.



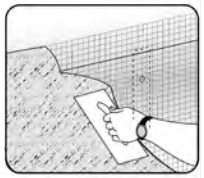
Damproofing

Select only latex or low-solvent liquid damproofing which is approved for application directly onto the polystyrene insulation. Apply a liberal coating directly onto the form, sealing the seams in the form wall.



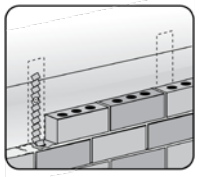
Waterproofing

Self-adhesive membranes (minimum 60 mil thickness) or approved liquid waterproofing materials can be applied directly to the form walls. Follow manufacturer's recommendations for application directly onto rigid polystyrene insulation.



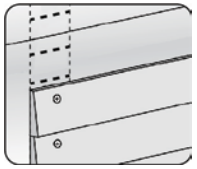
Stucco, EIFS, Synthetic Masonry

Insulation surface must first be roughened by sanding or scratching. For products having a base coat and mesh, the mesh is anchored directly to the concealed tie pads. Follow manufacturer's instructions for proper placement, temperature control, etc. Form walls which have been exposed to the environment for more than 90 days will normally have a light coat of fine "powder" which must be thoroughly brushed off before applying finish.



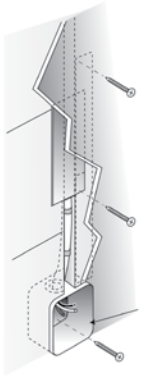
Brick

With a concrete brick ledge, brick veneer (fascia) can be added directly to the form walls. Brick anchors may be attached to the concealed plastic tie pads or may be inserted throughout the form walls, into the form cavity, prior to placement of concrete. Follow local building codes or accepted practices for the placement of brick anchors.



Drywall or Siding

Gypsum board (drywall) is attached directly to the form walls. This is done by anchoring the drywall to the form's concealed continuous vertical furring strips with a drywall screw. The furring strips are the tab-ends of Spacer Ties and are located every 6-inches on both sides of the forms.



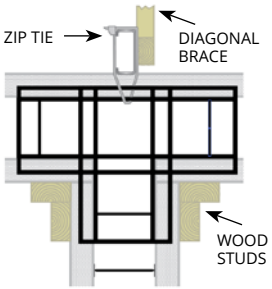
Electrical and Plumbing Lines

Follow local codes for the types of electrical and plumbing components which are acceptable for project.

Electrical and plumb lines are concealed in the insulation by cutting or carving a pathway approximately 1-1/2" to 2-1/2" inches deep with a saw, router or hot knife. For junctions or switch boxes, insulation is completely removed and items are anchored directly into the concrete. Electric lines can be protected by running the inside approved metal or plastic conduit. Damage to lines can also be avoided by covering the pathway with a 16 gauge metal strip, approximately 2-inches wide, anchored to the concealed tie pads with a drywall screw.
Electric lines can be held to the back of the pathway by using approved electrical anchors or expandable insulation placed approximately 2-feet apart.

Advanced Forming Techniques

T-Intersections



6" and 8" Concrete Wall

Form a T-intersection using 2 full blocks. Cut form to the inside dimension and remove ties. Insert a LiteForm ICF T-Tie at the top of every course. Tie the vertical brace to the T-Tie wherever the other horizontal In-Wall is placed. Support the inside of the T-intersection with vertical studs fastened to a plastic tie. The back of the T-intersection can be supported with vertical and diagonal braces.

T-INTERSECTION VIDEO

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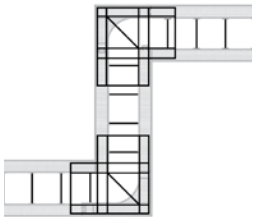
Offset Corners



6" and 8" Offsets with Compact Corners

Place compact corners onto full blocks. Determine the offset return by subtracting the concrete wall thickness from the offset length. Use zip ties and corner ties to secure the common seam at the corner.

OFFSET CORNER VIDEO

LiteForm ICF

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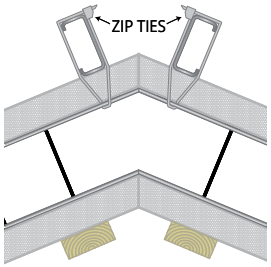
45 Degree Corners



4", 6" and 8" Concrete Wall

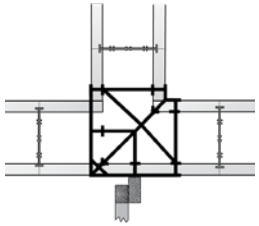
Miter cut 22.5˚from two blocks to form a 45˚ corner. Remove any cut ties. Insert the 45˚ In-Wall support. This should sit on top of the ties and be friction fit. Brace the back of the 45˚ wall on both sides with a steel stud or wood studs and diagonal brace. Once the vertical and diagonal bracing is secured and wire tired to the top of the wall, use foam adhesive all the way up the seam. Place 2 - 2x4 studs on each side of the 45˚ and screw fasten to a plastic tie.

Fiber Tape Option

Fiber tape can be used as additonal support for 45º corners.

Advanced Forming Techniques Continued

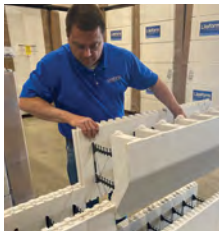
Wall Thickness Transitions



10" and 12" Concrete Wall

Exposed 90-degree Corner Ties are used in intersections for walls which are over 8-inches thick. The blocks are cut and positioned as usual. The T shape is assembled by alternating the position of the 90-degree Corner Tie as the wall is assembled. Additional bracing is also required. For T-Intersection in concrete walls which are over 12-inches thick, 12-inch Exposed 90-degree Corner Ties are cut apart and re-wired at the new width using 18 gauge wire.

Brickledge Assembly



8" Concrete Wall

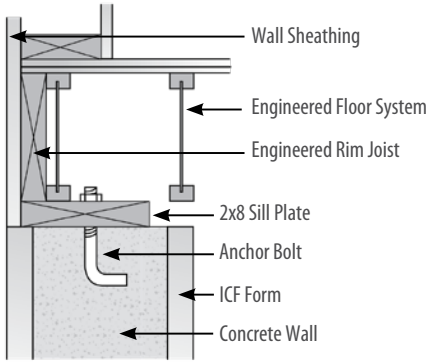
The Brickledge block can be paired with LiteForm ICF wall forms. Structural engineering is needed to determine the rebar requirements to support the weight of the brick veneer.

Many installers will place In-Wall bracing at the course of brickledge blocks. This will help in keeping wall alignment and enforcing the brickledge.

For more advanced forming techniques visit - youtube.com/liteform

Top Plate

Detail as drawn is a general guide only and does not replace manufacturer's guidelines for application of their products or the prevailing construction codes for a particular region or project design.



NOTES

NOTES

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The Best Way to Build

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US Patent Numbers 4765109, 4916879, 4889310, 5209039, 361710D, 4866891, 48858888, 4706429, 4730422, 5497592,. Canadian Patent Number 1314727. Patents Pending.
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