Nudura Online Basic Installation Training – Module Three

Nudura

TREMCO
Construction Products Group

Objectives:
To deliver an overview of Nudura ICF products, benefits of building with ICF's, and a best practice guide for ICF installation.

Agenda:
Module follows the Nudura Installation Manual and Product Guide.

Disclaimer:

The information presented in this course gives the participant the necessary guidance and basic knowledge of proper installation techniques for using the various products composing the Nudura Integrated Building Technology and associated accessories (the “Nudura Products”).

This course DOES NOT train an individual how to be a contractor. Nudura Inc. and Nudura Systems, Inc. do not have any control over the installation or workmanship used in the assembly or installation of the Nudura Products, whether by recognized Nudura trained installers or by unauthorized installers

Safety First

Personal Protective Equipment (PPE):

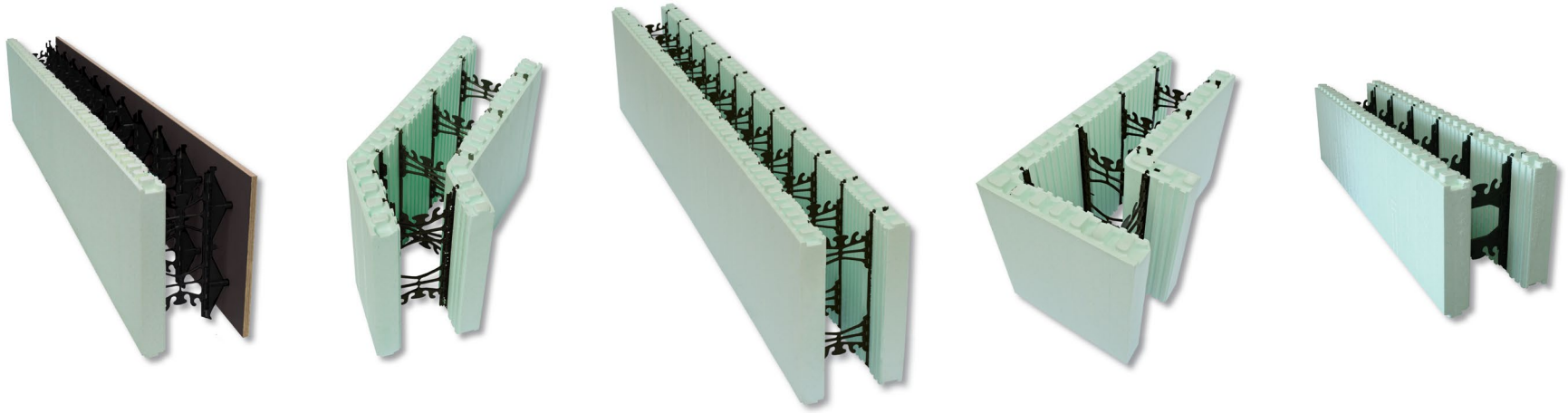
- Hard hats
- Safety boots
- Safety glasses
- Protective gloves

Where erecting scaffolding or alignment system, all local safety codes and regulations must be met.

Keeping a clean and efficient job site results in less chance of injury.

Take proper precautions to protect workers from protruding rebar.

Tools

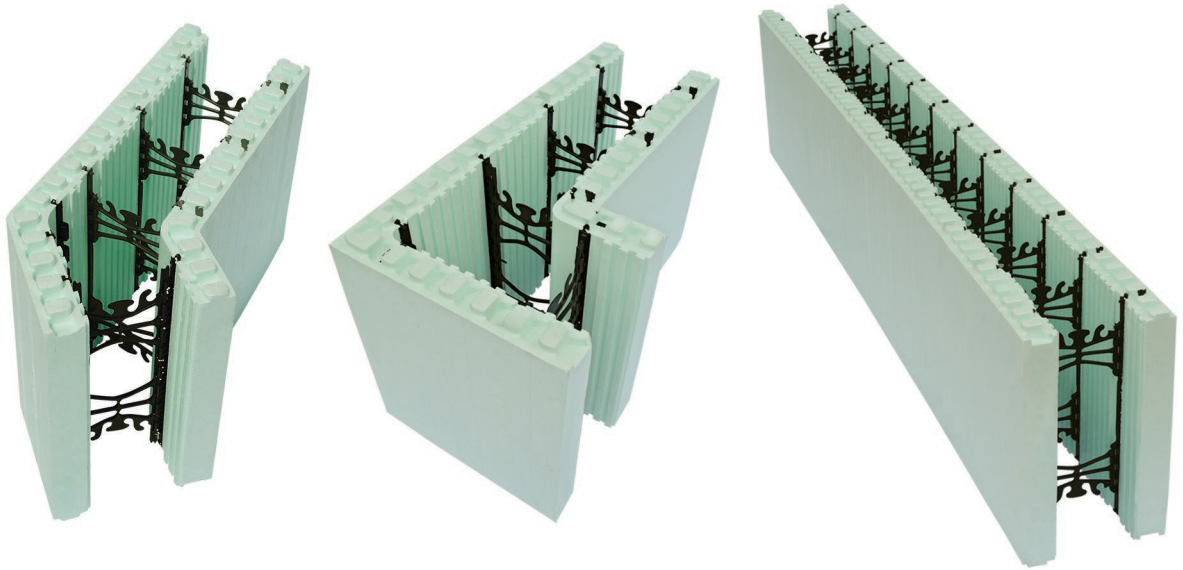


Tools

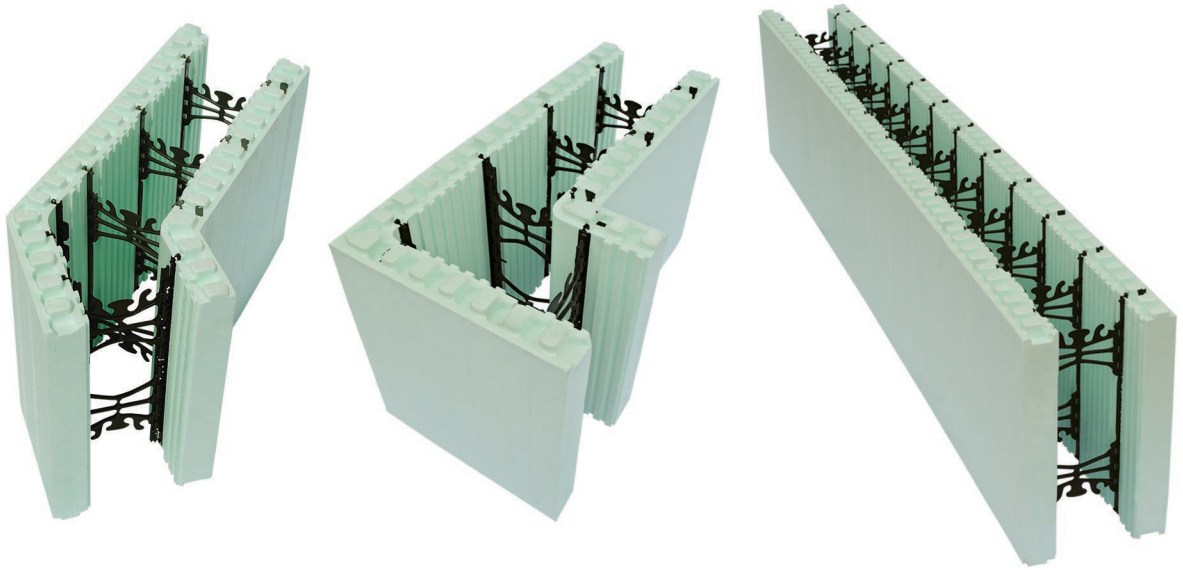
Specific tools for ICF construction include:

- Rebar Bender and Cutter
- Bolt Cutters
- NUDURA Folding Saw
- NUDURA Foam Guns and Low Expansion Spray Foam
- Rubber Mallet
- NUDURA Fiber Tape
- NUDURA Protection Tape
- Hot Knife
- Concrete Vibrator
- NUDURA Bit Kit

Nudura Tools Video



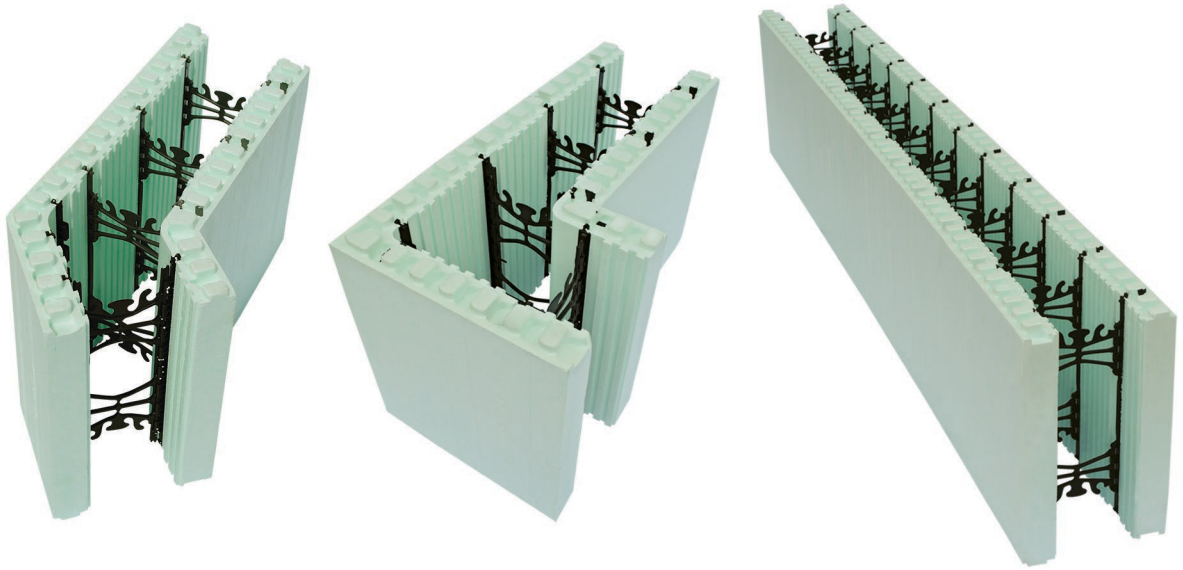
Site Preparation & Delivery



Site Preparation

- Keep a clean work site
- Place backfill away from access route
- Ensure adequate room for delivery vehicles
- Protect product on site from damage and inclement weather
- Level area for pump truck
- Provide proper access for concrete truck
- Ensure all worksite hazards are marked

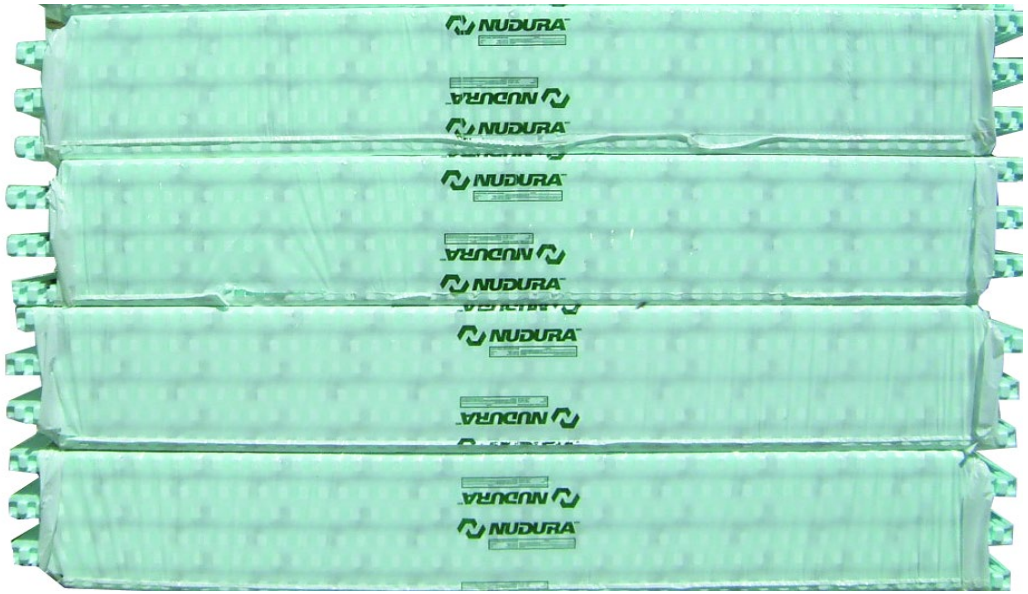
Nudura Products



Product Packaging

Majority of Nudura products are plastic shrink wrapped or in boxes.

Product should be additionally protected from snow and excessive UV rays.

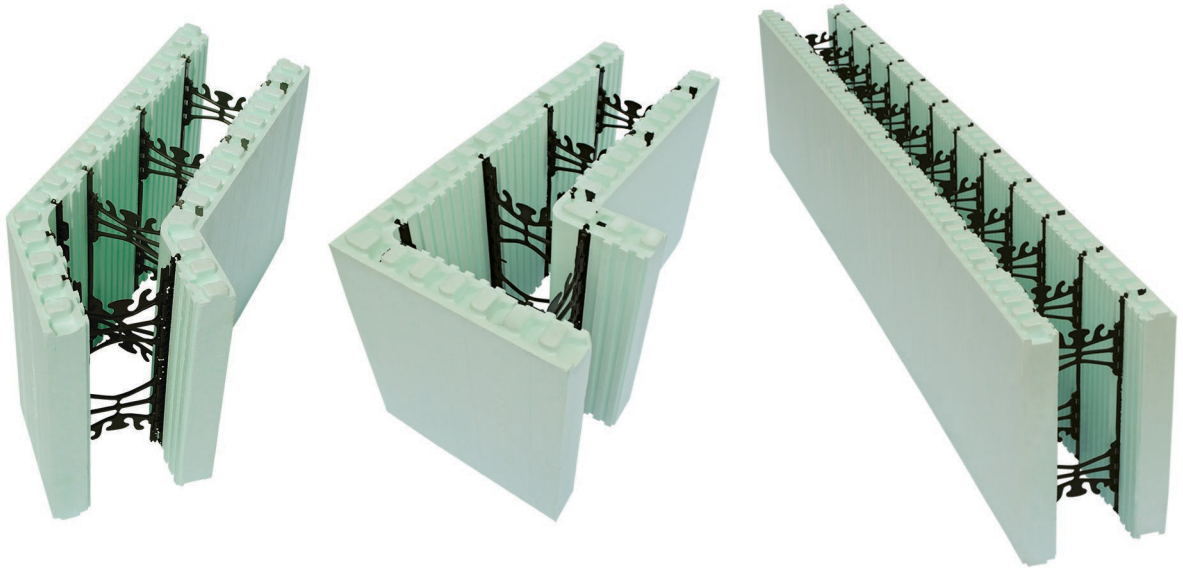


Product Packaging

Standard Form Bundles should be stored laying on side

Corner Form Bundles should be stored standing flat on interlock

Installation Procedures



Footings

Designed to transfer and distribute loads.
Vertical dowels provide support at the base of the wall.
Dowels are to be placed at the center of the wall location.

Factors that can affect footing size or thickened edge slab:

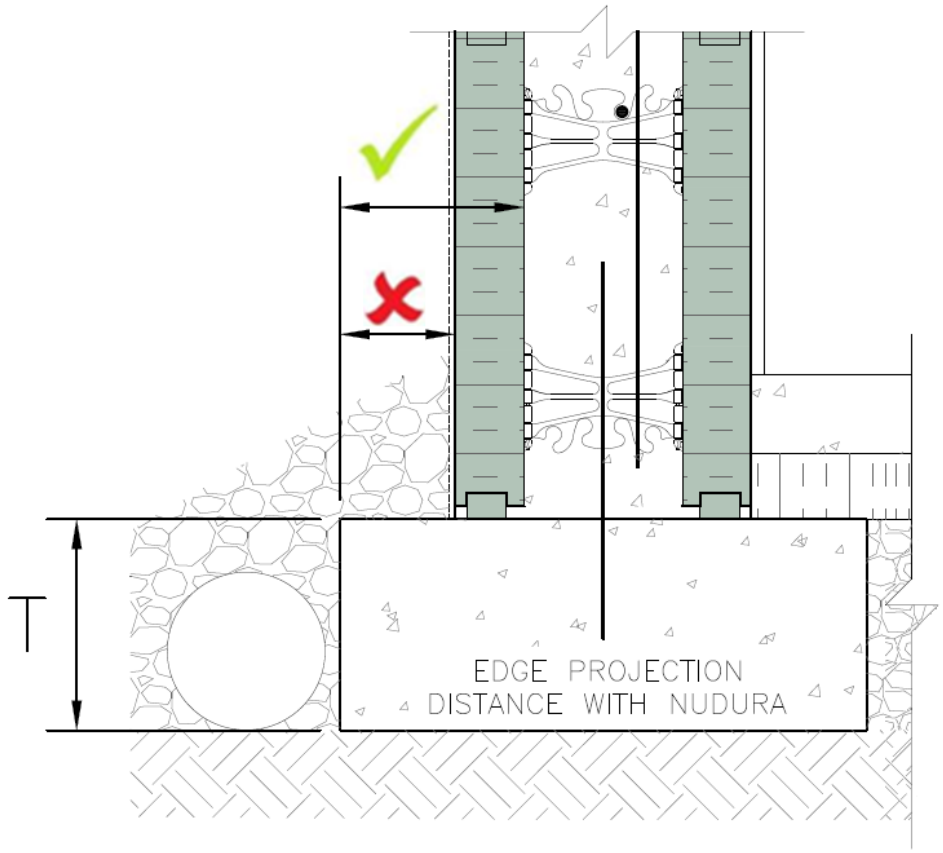
- Soil Type (Bearing Capacity)
- Loading Conditions
- Seismic Zones
- Water Table

Footings should be level within ± ¼”(6mm)

Consult local Building Codes for required footing sizes, required dowel spacing and bar diameter

Footings

- Edge projection distance must be taken from face of concrete wall
- Footing thickness (T) must always be equal to or greater than the edge projection distance
- Footing shall always be on Undisturbed Soil



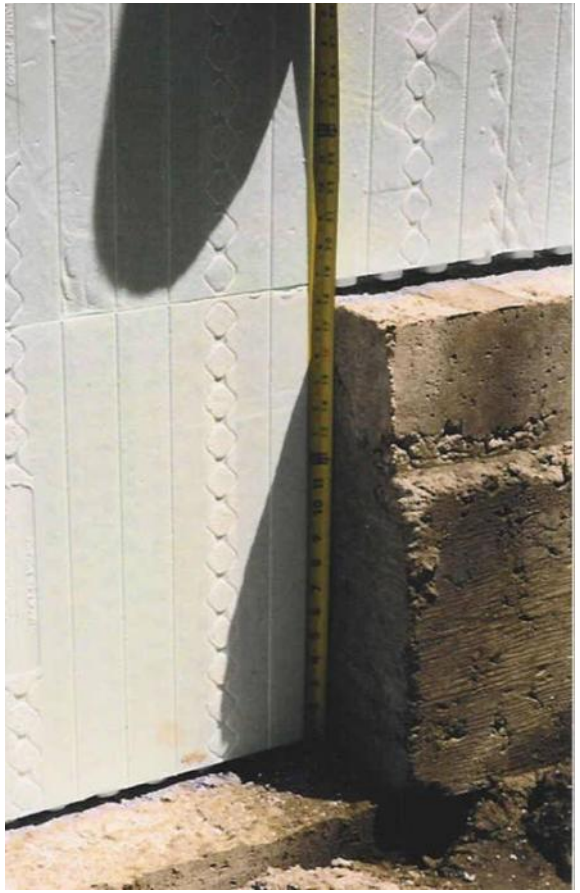
Footings

Ideal Step Footing Heights:

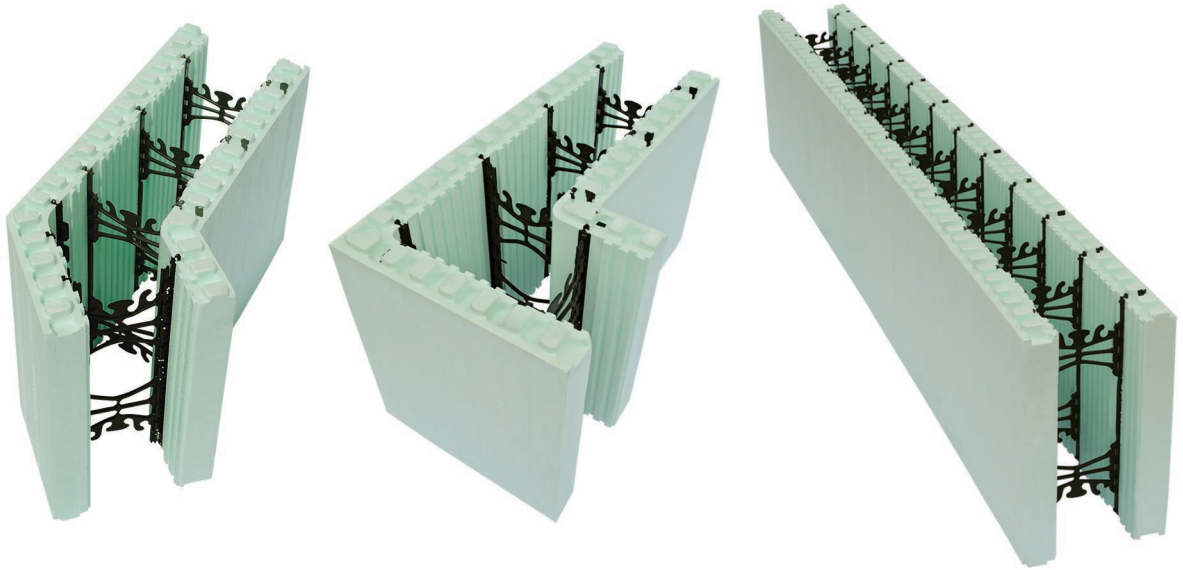
- Full height form- 18” (457mm)
- Half height form- 8 ½” (216mm)

Half step allows both halves of form to be used

Consult Local Building Codes for Code compliant step heights



Nudura Footings Video



First Course Placement

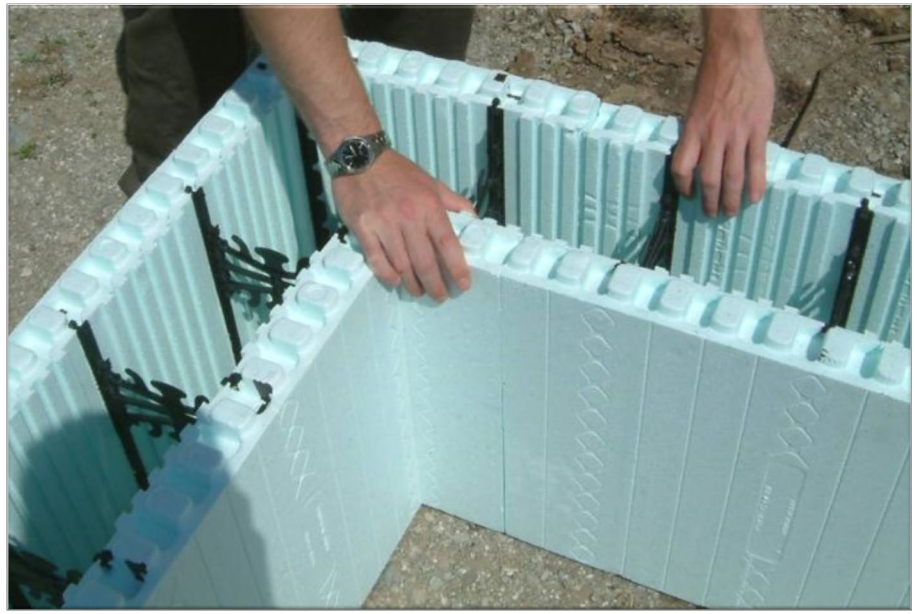
- All materials should be kept out of work area until layout is complete
- Once corners are established, place building line on footing or slab
- Mark door and window locations on footings
- Double check building dimensions and layout before work begins
- Mark location of any openings on the footing

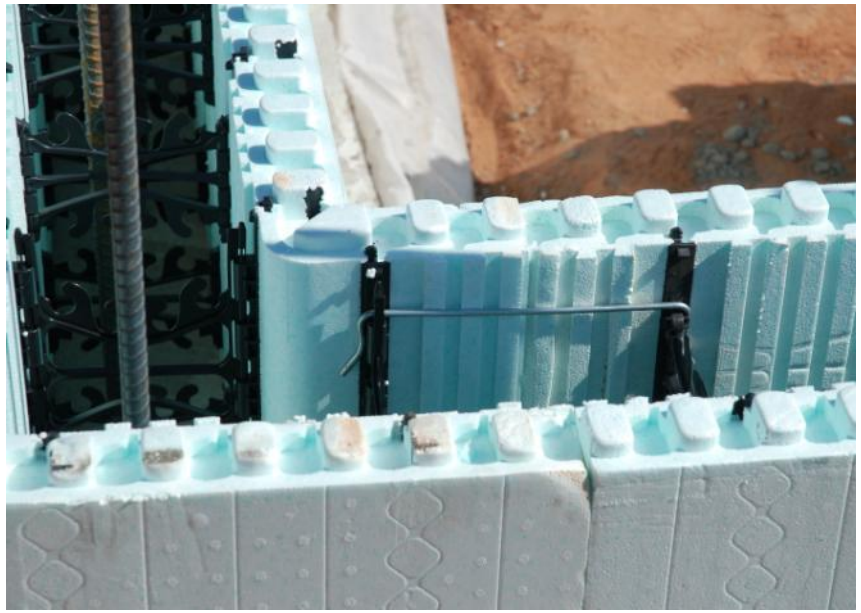
First Course Placement

- All Materials to be placed in middle of jobsite
- Maintain a 6’ (1.83m) clearance around perimeter
- Bend and place all reinforcement at corner locations
- Prepare safe and easy access in and out of jobsite
- Keep jobsite clean

First Course Placement

- Start the building layout at each corner on the longest wall
- Work towards center of wall ensuring forms are tight end to end
- Avoid cutting corner forms. If a corner must be cut, additional strapping must be installed





First Course Placement

Form units are to be cut along form cut lines

If required cut is off of cut line:

- Move corner slightly to allow cutting on line
- Install a vertical stack joint near center of wall

If a Vertical Stack Joint is necessary:

Butt the cut forms together end to end

Provide additional support to the joint on both sides of the wall

Form-Lock can be cut to span the joint to help maintain wall straightness

Additional bracing is required at the stack joint

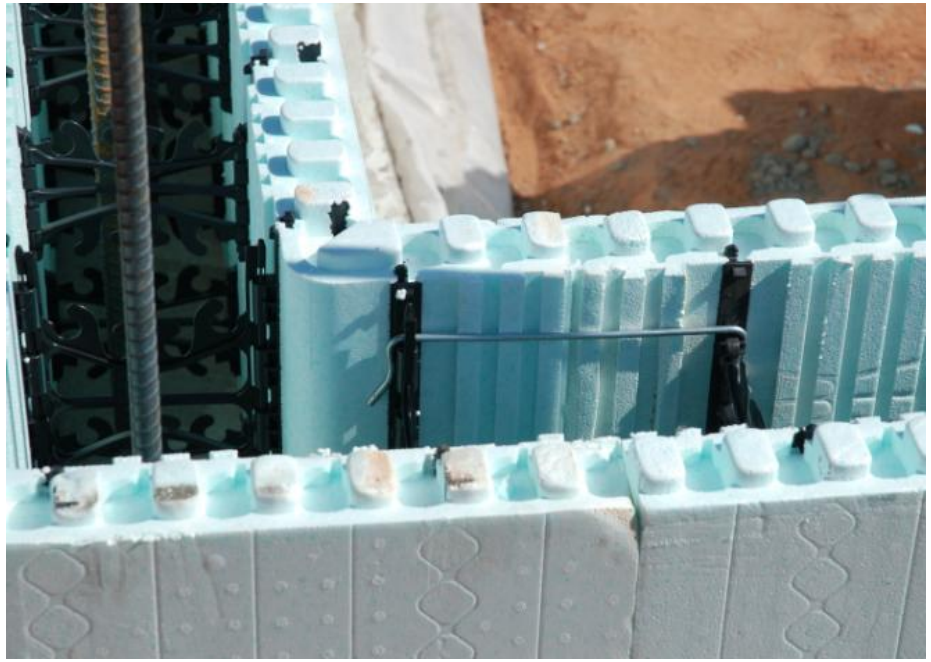
First Course Placement

Vertical Stack Joint

First Course Placement

On the First Course NUDURA recommends:

- 8 Vertical Joint Clips (VJC) per corner form
- 4 Vertical Joint Clips per standard form to standard form



VJC replaces having to tape or tie wire forms

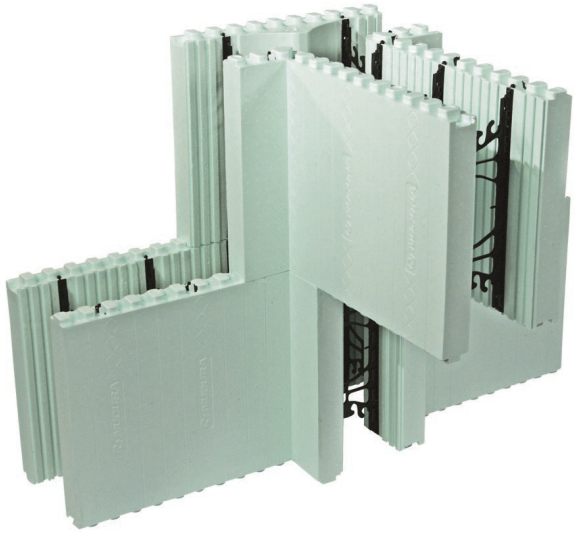
VJC will help to keep forms tight end to end

VJC will reduce labor during installation

Always check that the first course has the vertical joint clips installed before starting the next course

First Course Placement

T Connections can be made with either pre-formed T-Forms OR by using standard forms and site cutting the connection



- T Forms need to be considered in same manner as corner forms regarding placement and vertical joint clips

- Additional bracing is recommended on T Forms

First Course Placement

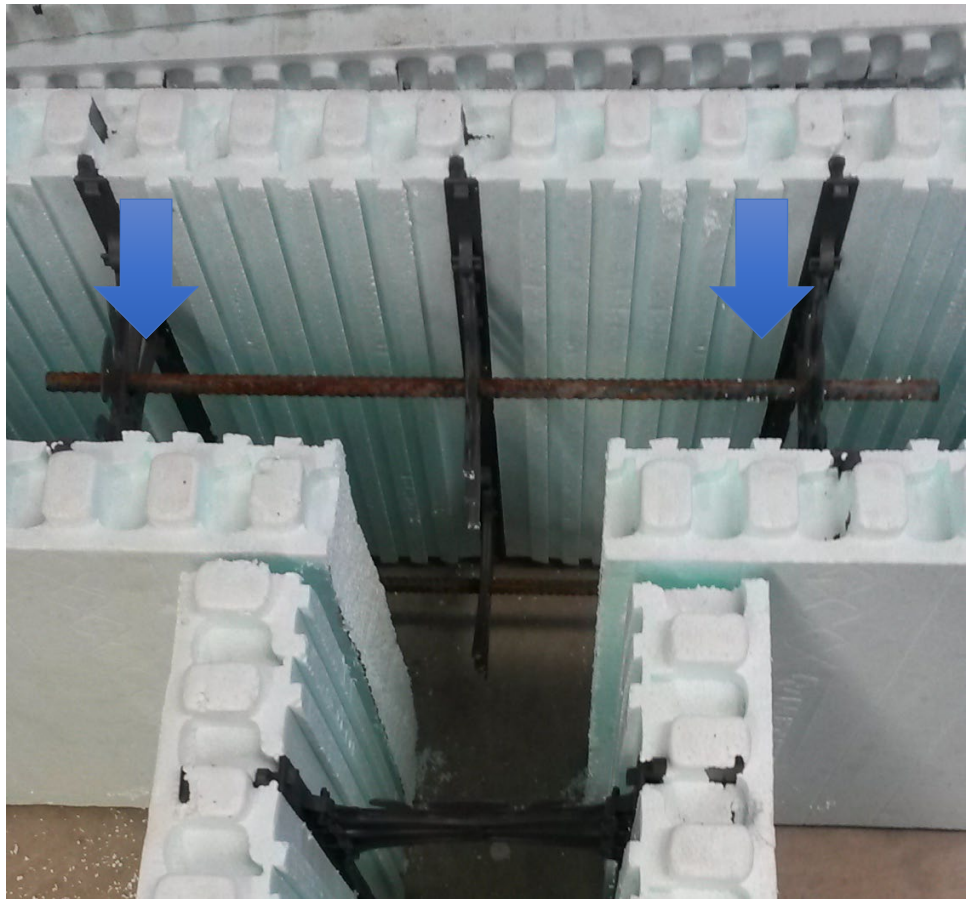
When site cutting a T connection, using the Nudura T-Form strap increases efficiency and strength of the area

- Mark location of T-Connection on main wall
- Use Nudura folding saw to remove foam at connection.
- Cut web as shown in image

Note: When cutting forms ensure that no debris falls into the wall cavity. If some does, remove it prior to pouring the wall.

First Course Placement

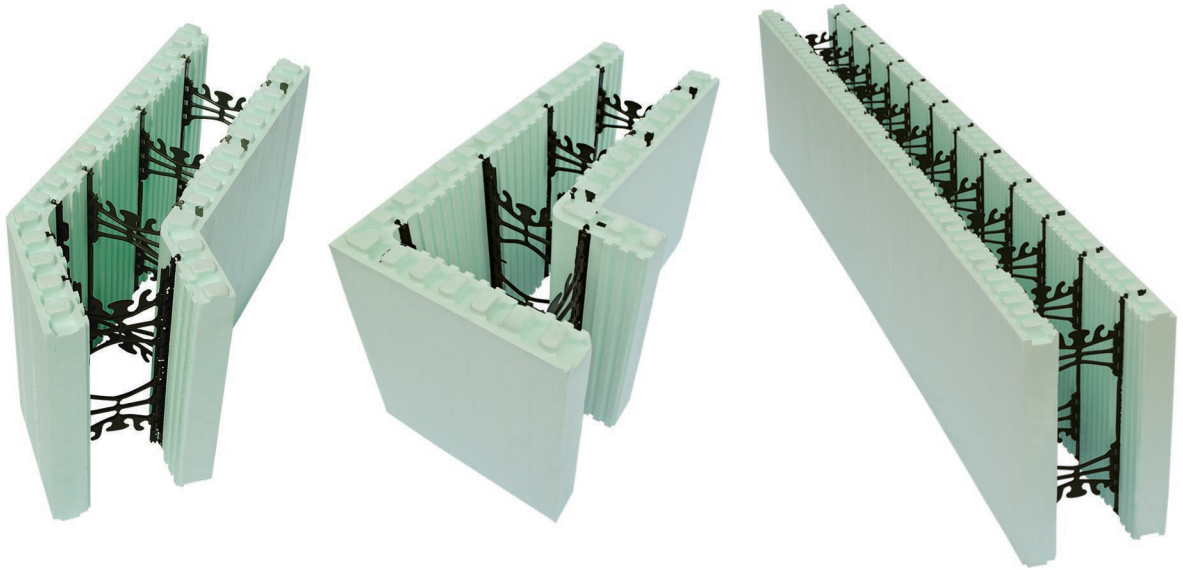
- Insert min 20” (508mm) long length of rebar in web for support
- Rebar must extend across cut web to full web on each side of T Connection



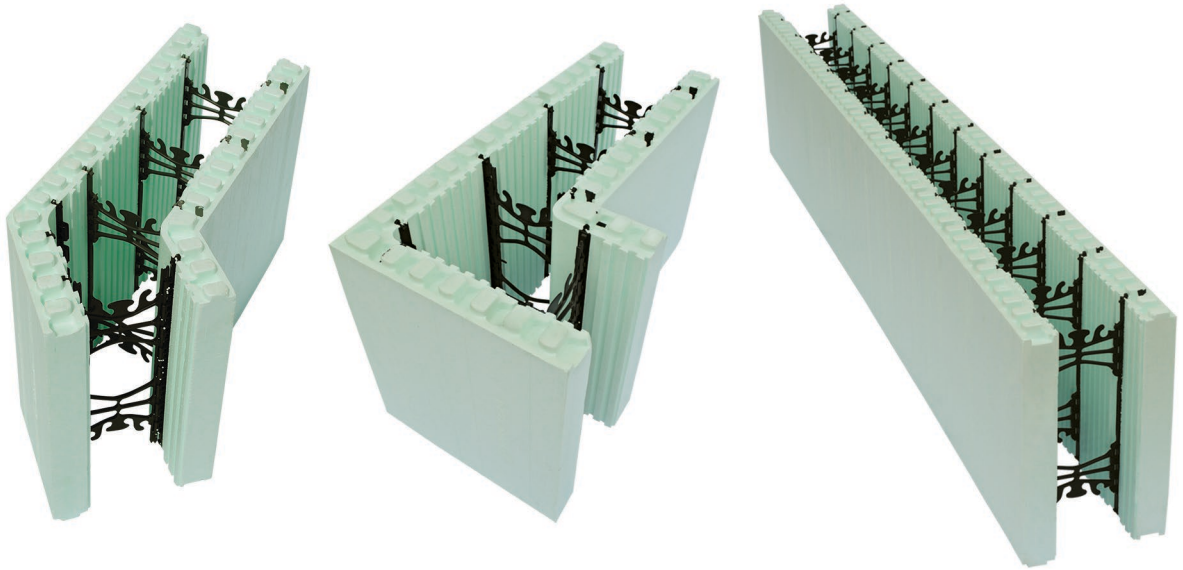
First Course Placement

- Hook NUDURA T-Form Support Strap over rebar pieces and fasten to fastening strips with 2” (51mm) screws
- Straps should be installed 4 per course
- Gaps can be filled with NUDURA low expansion foam
- Caution should be taken when pouring any T connections as there is increased concrete pressure in this spot

Nudura T-Strap Video



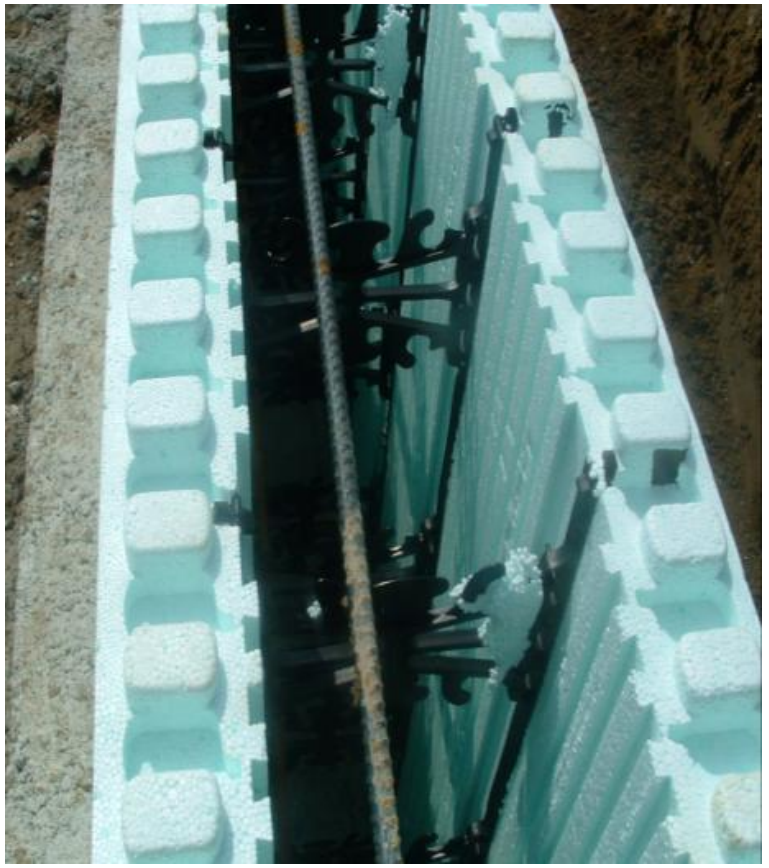
Nudura Getting Started Video



First Course Placement

Reinforcement in NUDURA Walls

- Controls cracking caused by concrete shrinkage around openings
- Increases strength against lateral loads (backfill, wind, seismic)
- Typical rebar is 10M (#4) or 15M (#5)
- Minimizes deflection



First Course Placement

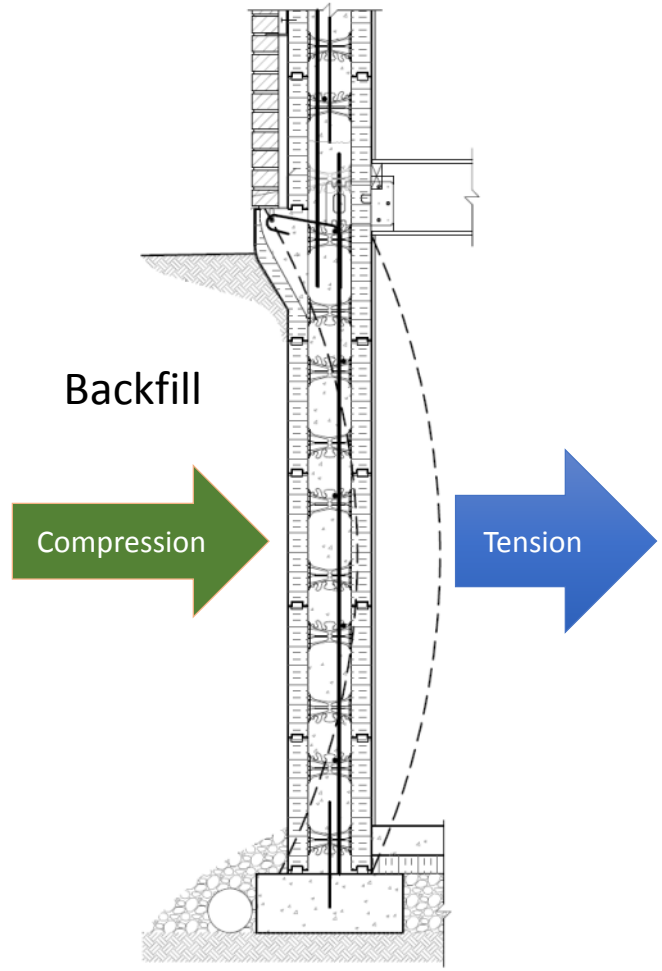
- Reinforcement is installed as per plans and specifications
- Wall Reinforcement tables available in Appendix D of Installation Manual

<u>Below Grade Reinforcement</u>

Typically placed towards tension side (Inside) of the wall

<u>Above Grade Reinforcement</u>

Typically placed in center of wall



First Course Placement

Reinforcement Lap Splice

Applies to Horizontal and Vertical Reinforcement

Lap length can be calculated by:

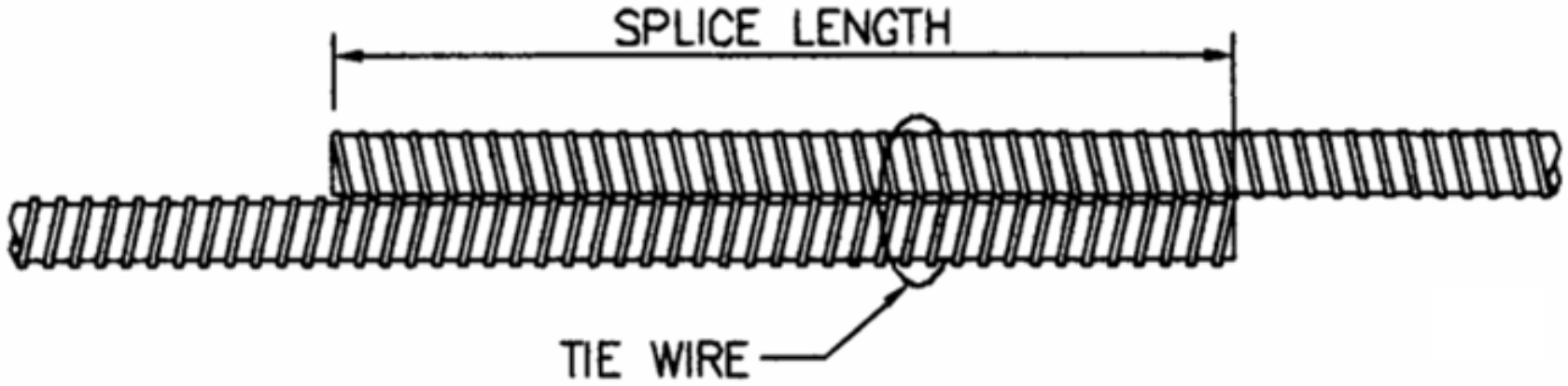
- 40 x reinforcement diameter for 40,000 psi steel (Grade 40)
- 60 x reinforcement diameter for 60,000 psi steel (Grade 60)

Lap Splices can be contact or non-contact

First Course Placement

Contact Lap Splice

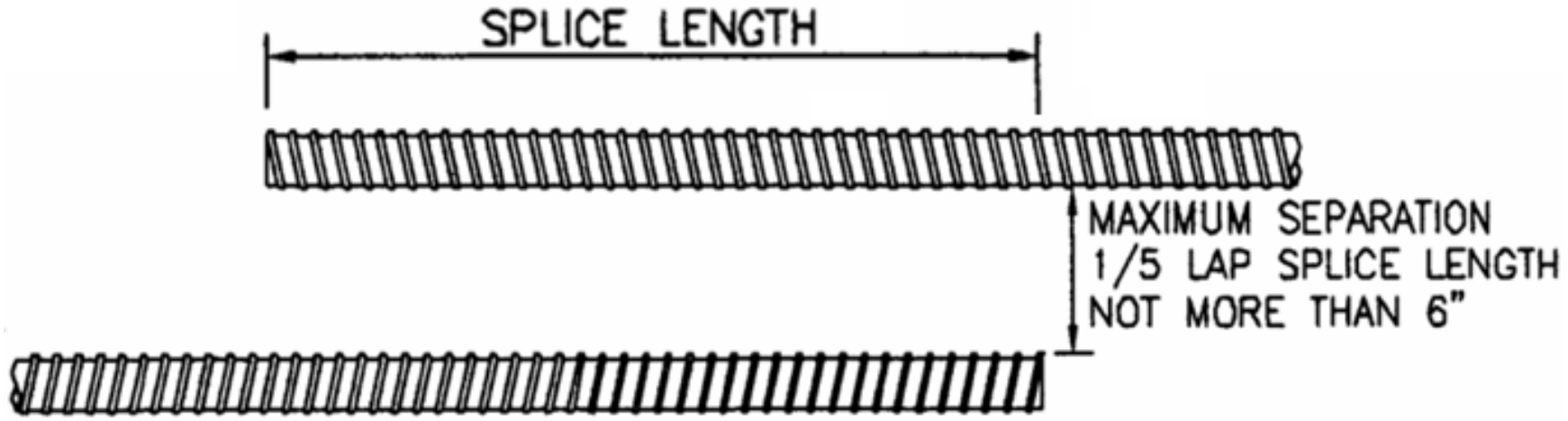
- Occurs when reinforcing steel is touching and must be tie wired.
- If a contact splice is required bars must be lapped to appropriate length and tied together.



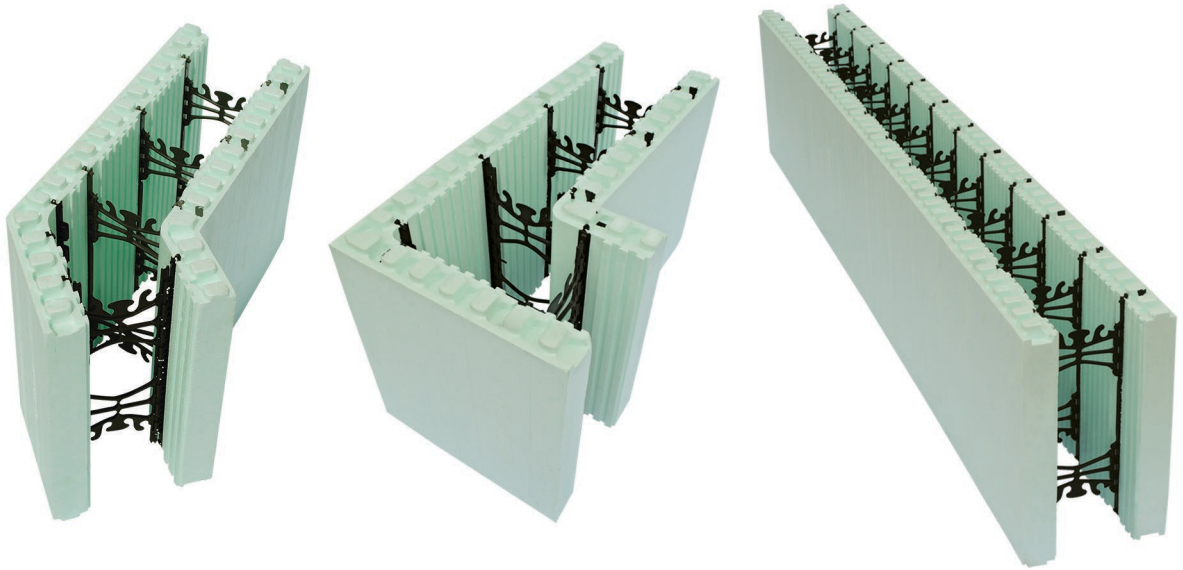
First Course Placement

Non-Contact Lap Splice

- Occurs when reinforcing steel is not touching
- Separation between bars can not be more than 1/5th lap length to 6” (150mm) maximum



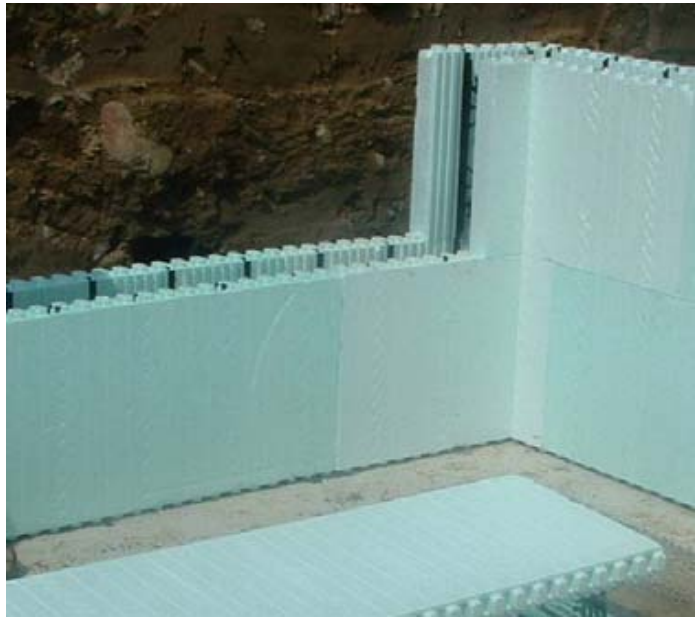
Reinforcement Video



Second Course Placement

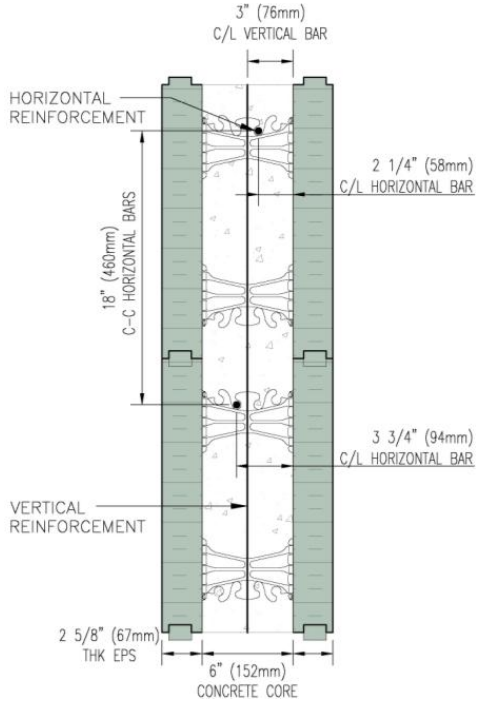
Start second course at same corner as first course

- 16” (406mm) off-set is established by reverse stacking of corner forms
- Four Vertical Joint Clips recommended to link corner form to standard forms



Second Course Placement

- Horizontal Reinforcement will need to be offset from previous course by one notch location
- Form-Lock is installed into second course to help maintain wall straightness
- Overlap each length of Form-Lock



Second Course Placement

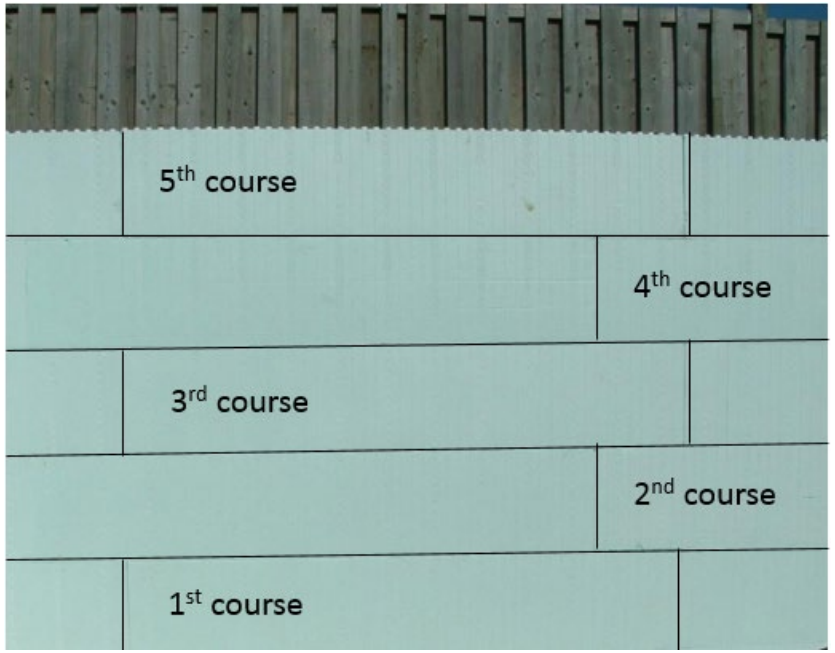
- Once second course is complete the forms need to be leveled
- Forms can be shimmed (preferred) or cut to achieve a level wall

Second Course Placement

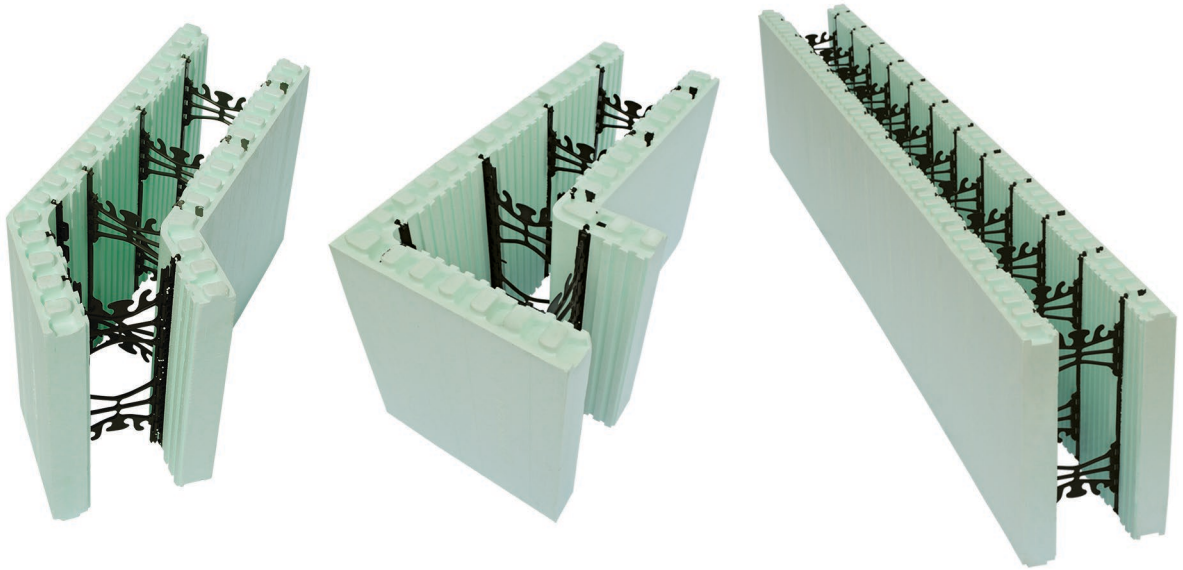
- First Course can now be secured to footing using NUDURA Low Expansion Spray Foam

Additional Course Placement

- The layout pattern of the first two courses of forms will be followed up the height of the wall
- This includes all cuts, reinforcement, lap splices, etc...
- Vertical Stack Joints will be maintained up the height of the wall
- Example: 1st, 3rd, and 5th course will follow same placement



Additional Course Placement Video



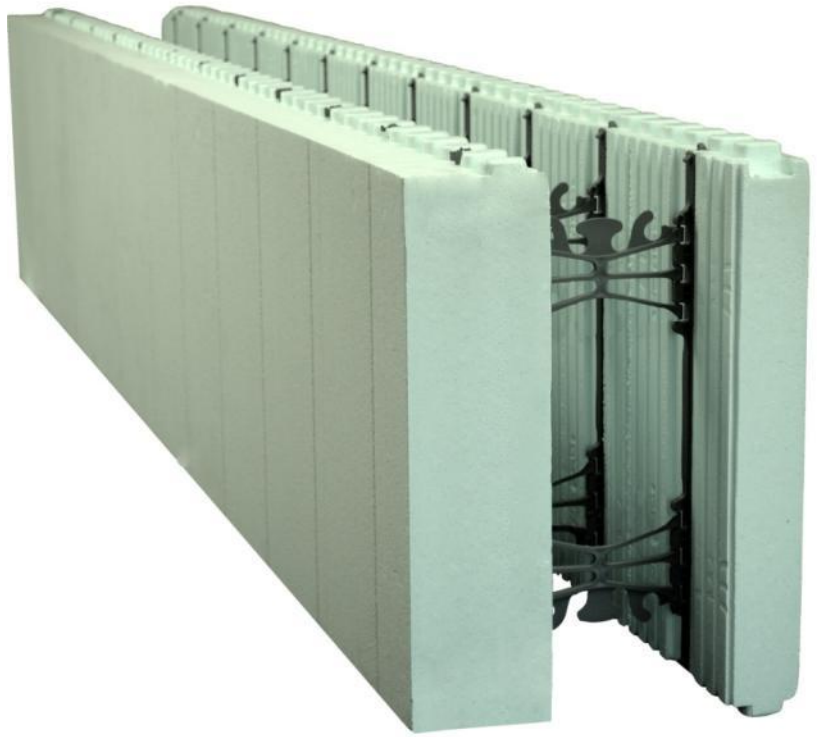
plus+ series

Plus Forms

Additional EPS Foam Laminated to Standard Form

Available Thicknesses:

- 1” (25mm)
- 2” (50mm)
- 4” (100mm)
- 6” (150mm)



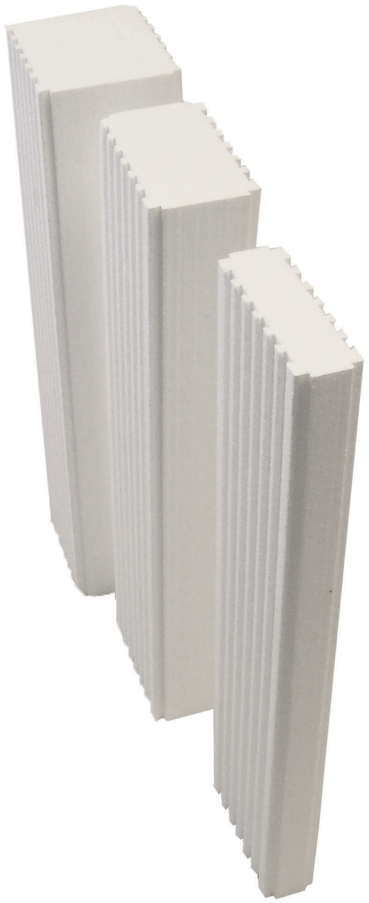
plus+ series

R Value Plus Forms

Additional EPS Foam Inserts

Available Thicknesses:

- 2” (50mm)
- 4” (100mm)
- 6” (150mm)



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