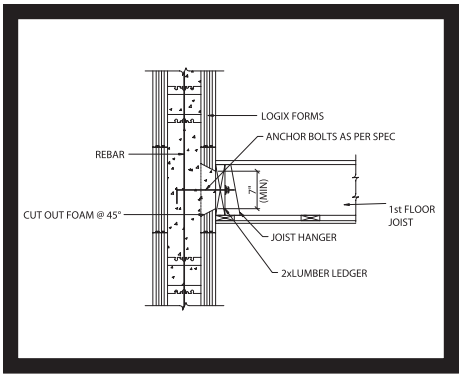
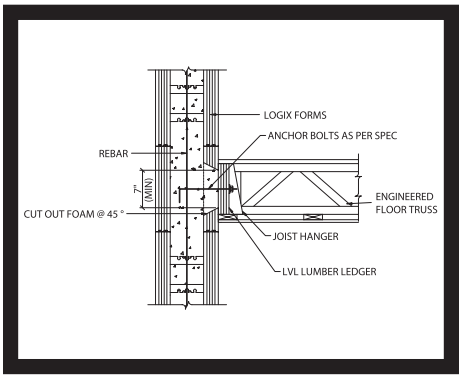
2.12 – FLOOR CONNECTIONS
2.12.1 - LEDGER WITH ANCHOR BOLTS & JOIST HANGERS





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

STEP 1: Place Logix blocks to a height allowing 2 inch (51 mm) minimum coverage over embedments.

STEP 2: Snap chalk lines directly on forms to mark the top and bottom of the proposed rim joist.

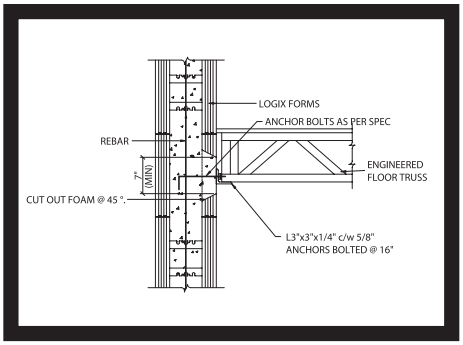
STEP 3: Cut openings between chalk lines to accommodate anchor bolts. The quantity and spacing of anchor bolts will be determined by code or engineering. Make certain that cuts are flared to facilitate proper concrete placement.

STEP 4: Pre-cut ledger to length. Pre-drill and install anchor bolts, washers and nuts as per hole layout and local code.

STEP 5: Attach ledger with screws into webs to hold in place while concrete is placed. Once concrete is cured, tighten anchor bolts.

STEP 6: Attach joist hangers to ledger according to hanger manufacturers' specs.

2.12.2 – STEEL ANGLE IRON LEDGER



For full size CAD drawing see Section 5, CAD Drawings

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 2.12.2**, 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 the foam out as you would with the wooden ledger then screw on 2x4 to cover the bottom of the cutout. The 2x4 temporarily supports the angle assembly so it must be installed level.

STEP 2: Sit the angle assembly on top of the 2x4 and tight up against the forms.

2.12.2 – STEEL ANGLE IRON LEDGER

CONTINUED

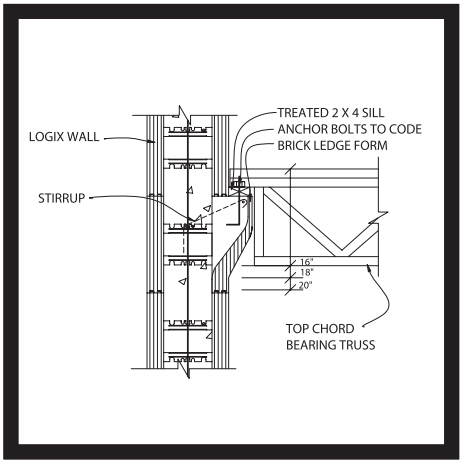
STEP 3: Screw strapping along the top edge of the angle to keep the assembly against the form during pour.

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

STEP 5: After some curing place floor systems on the angle and establish layout. Once layout is complete fasten the floor joist to angle with a tech screw or by ram-set. You may decide to attach a nailing surface to the bottom leg of the angle iron to nail joists to.

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

2.12.3 – BRICK LEDGE FOR TOP & BOTTOM CHORD BEARING SYSTEMS



For full size CAD drawing see Section 5, CAD Drawings

The Logix Brick Ledge form can create a load bearing surface to support floor systems, including:

- Top chord bearing trusses
- Bottom chord bearing trusses or joists
- Cast in place concrete floors
- Pre-cast concrete floors

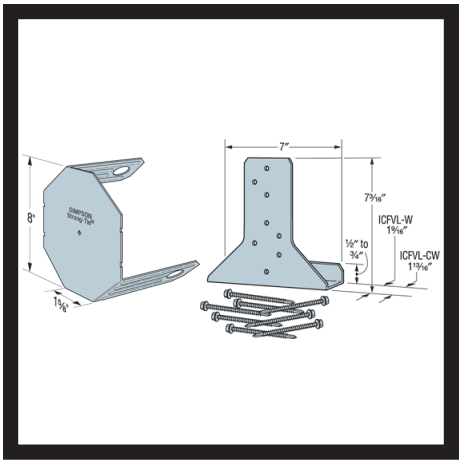
STEP 1: The Brick Ledge and the course above it must be foamed or otherwise secured down along the entire course to eliminate tilting or separating.

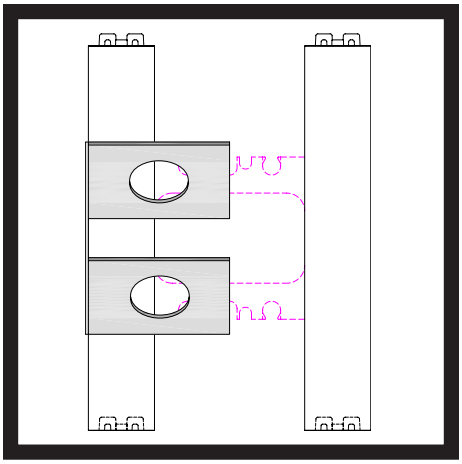
STEP 2: If the Logix block in the course above the Brick Ledge is of a smaller width than the Brick Ledge, additional form support will be required.

STEP 3: Install rebar in the Brick Ledge as specified. Butt joints are preferred for rebar in outer edge of Brick Ledge. Install 20 inches (508 mm) long stirrups in each Brick Ledge cavity, including the very corner.

STEP 4: As concrete is placed, install embedments as required.

2.12.4 – LEDGER WITH SIMPSON BRACKET & JOIST HANGERS





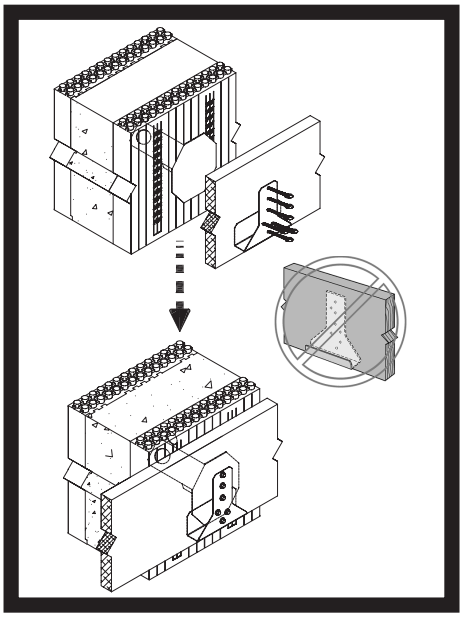
The ICFVL & ICFVL-W ledger connector system from Simpson Strong-Tie is designed for mounting steel or wood ledgers on ICF walls. The perforations in the embedded leg anchor it within the block. The exposed flange provides a structural surface for mounting either a wood or a steel ledger. The ICFVL bracket is the portion inserted into the block and embedded into the concrete. The ICFVL-W bracket is used with 1-1/2 inch (38 mm) ledger material. The ICFVL-CW bracket is used with 1-3/4 inch (44 mm) engineered wood ledgers. These brackets are installed on the ledger and attached to embedded ICFVL.

STEP 1: Place Logix blocks to a height allowing 2 inch (52 mm) minimum coverage over embedments.

STEP 2: Snap chalk lines directly on forms to mark the top or bottom of the proposed rim joist. For ledgers less than 10-3/8 inch (264 mm) deep, brackets should be installed to the top chalk line. For ledgers more than 10-3/8 inch (264 mm) deep, brackets should be installed to the bottom chalk line. For steel floor joists and ledgers, brackets should be centered on the proposed ledger.

STEP 3: Create vertical cuts to accommodate ICFVL bracket. Make sure these cuts are made directly opposite the thinned channels inside the form so that when inserted, the bracket will be exposed to the maximum amount of concrete. The quantity and spacing of brackets will be determined according to the table on **page 2-57**.

2.12.4 – LEDGER WITH SIMPSON BRACKET & JOIST HANGERS CONTINUED



For full size CAD drawing see Section 5, CAD Drawings

STEP 4: Place concrete and consolidate, ensuring brackets are fully embedded.

STEP 5: For wood or composite ledger, after proper concrete curing, the ICFVL-W or ICFVL-CW and appropriate ledger material can be installed using fasteners provided by Simpson Strong-Tie.

It is recommended to temporarily install ledger to chalk line, fastened to webs within 1 inch (25 mm) of the top edge of the ledger. This will make it easier to complete the installation. Slip ICFVL-W or ICFVL-CW underneath wood ledger and attach the screws as required.

For steel ledger, position ledger against ICFVL, level, and attach using appropriate fasteners as required by floor manufacturer.

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

Simpson Strong-Tie Ledger Connector Loads & Spacings

Ledger Type	Model No.	4" LOGIX ICF Allowable Vertical Resistance[2]	6", 8" & 10" LOGIX ICF Allowable Vertical Resistance[2]	4" LOGIX ICF Factored Vertical Resistance	6", 8" & 10" LOGIX ICF Factored Vertical Resistance	Spacing to Replace Anchor Bolts[3,4,6]							
						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 Allowable Vertical Resistance[2]	6", 8" & 10" LOGIX ICF Allowable Vertical Resistance[2]	4" LOGIX ICF Factored Vertical Resistance	6", 8" & 10" LOGIX ICF Factored Vertical Resistance	Spacing to Replace Anchor Bolts[3,4,6]							
						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.

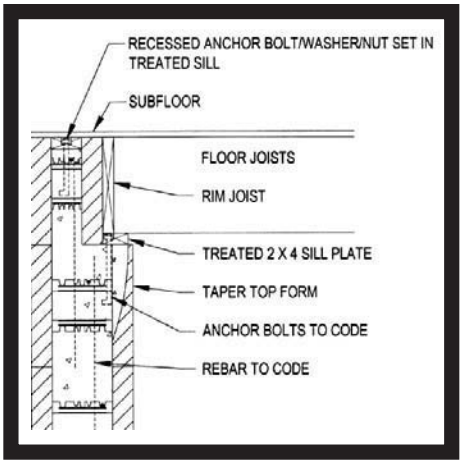
2.12.5 – TRANSITION LEDGE

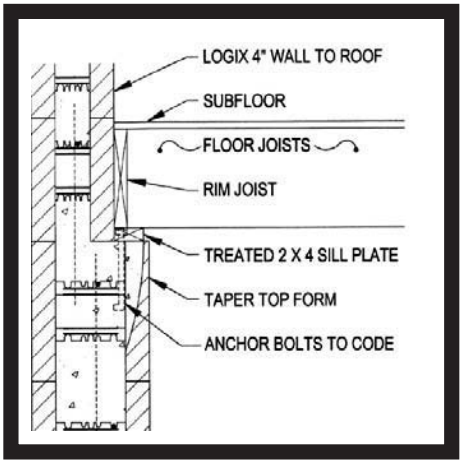
A transition ledge is commonly used when the Logix walls will be continuing up to the roofline.

The ledge created when transitioning from a wider to a narrower wall can provide a suitable bearing surface for many types of floor systems.

For additional bearing support Logix Taper Top forms can be used as the top course when transitioning from a 6.25 inch (159 mm) to 4 inch (102 mm) Logix wall.

2.12.5.1 – TRANSITION LEDGE WITH TAPER TOP FORMS





Logix 6.25 inch (159 mm) Taper Top forms can be used as the top course when transitioning to a 4 inch (102 mm) wall. Alternately, 6.25 inch (159 mm) Standard forms and corner forms can be hand cut to create Taper Top forms.

Logix 8 inch (203 mm) Taper Top forms can be used as the top course when transitioning to 4 inch (102 mm) or a 6.25 inch (159 mm) wall.

When hand cutting Taper Top forms, be careful not to drop foam scraps into the wall cavity.

STEP 1: Set Taper Top form as the top course of the lower wall.

STEP 2: Using short lengths of #4 (10M) rebar, provide a bearing support for the unsupported edge of the upper (narrower) form.

STEP 3: Install upper form, using foam adhesive to prevent lifting or tipping at connection.

STEP 4: 1x4 lumber can be attached vertically to the outside of the forms to assist in wall alignment.

STEP 5: Right after concrete placement, trowel off the ledge while checking for level. Insert embedments as required.

2.12.5.2 – TRANSITION LEDGE WITH CORNER BLOCKS

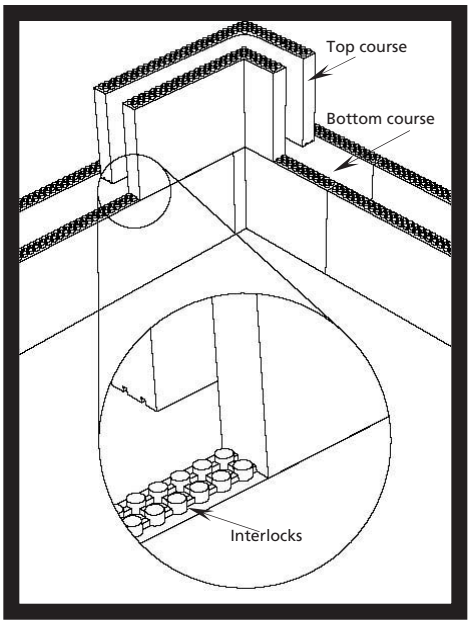


Figure 1a. Proper alignment of top course to bottom course. Interlock aligns with underside of top course.

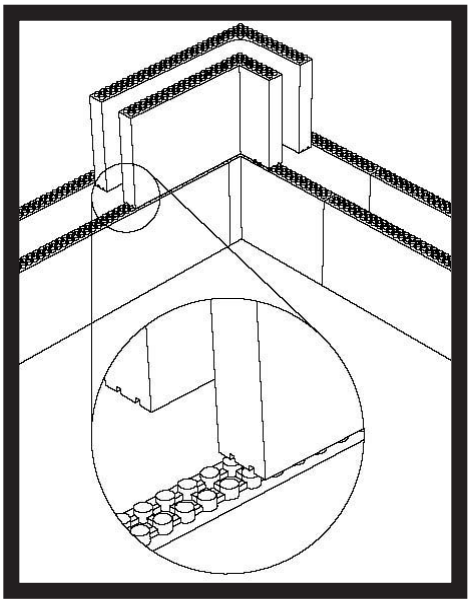


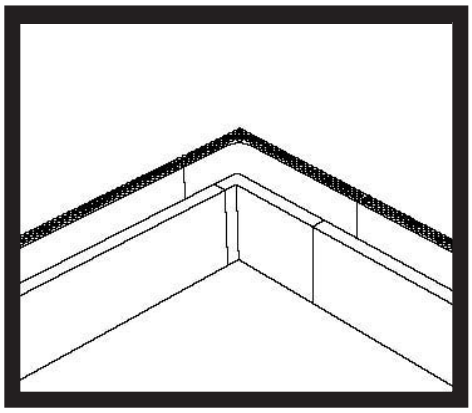
Figure 1b. Improper alignment of top course to bottom course. Interlock does not align with underside of top course.

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 (see **Figure 1a & 1b**).

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

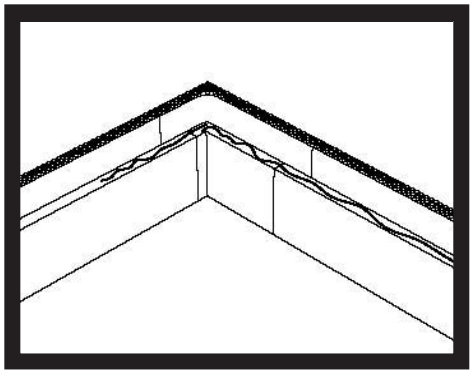
2.12.5.2 – TRANSITION LEDGE WITH CORNER BLOCKS CONTINUED



Step 1

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).

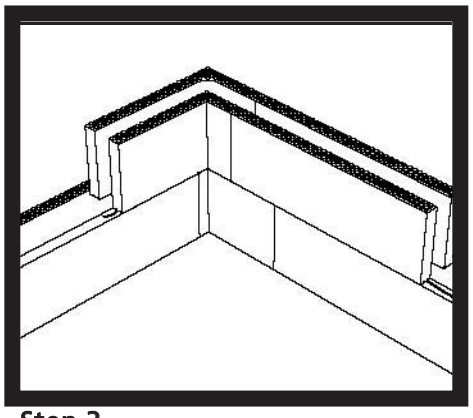
As an alternative, Taper Top blocks for the bottom course can be used. The Taper Tops provide more flexibility since they can be adjusted to ensure the interlocks align wit the top course.



Step 2

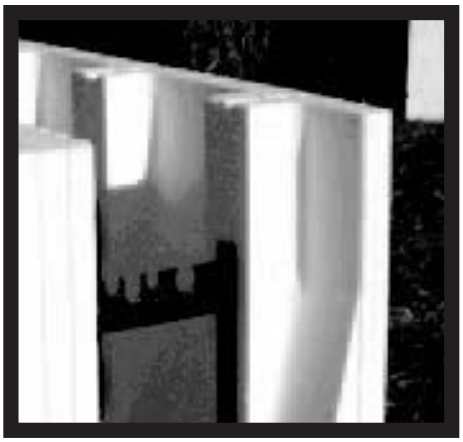
STEP 2: Apply foam adhesive prior to installing the top course.

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



Step 3

2.12.6 – TAPER TOP WITH SILL PLATE

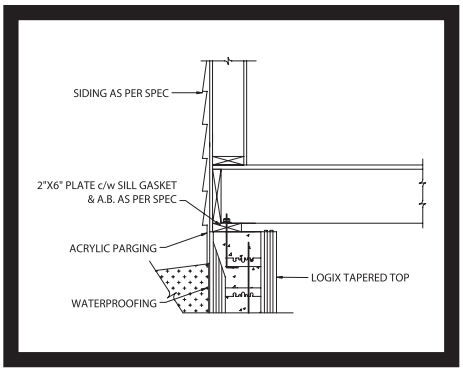


The Taper Top form creates a greater bearing surface at the top of Logix walls.

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.

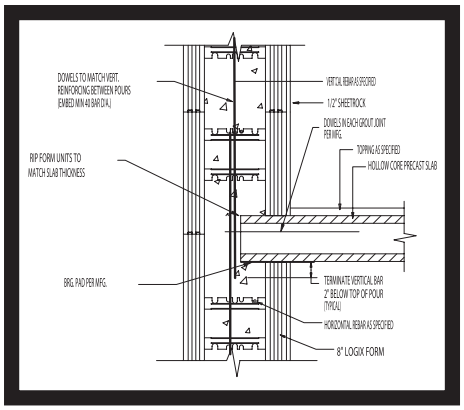


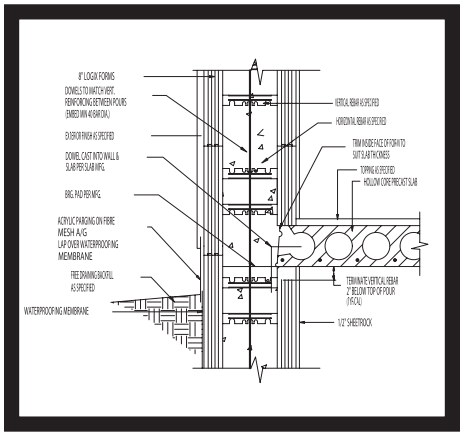
For full size CAD drawing see Section 5, CAD Drawings

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





For full size CAD drawing see Section 5, CAD Drawings

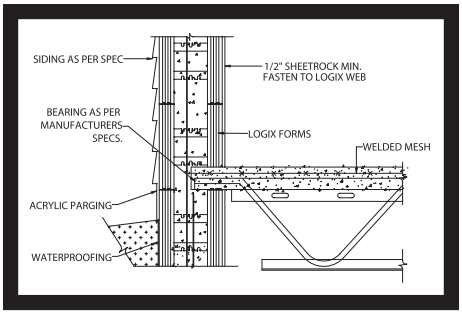
Pre-cast floor systems are poured at the factory and shipped to site then craned in place. They are usually tensioned with steel cables cast in the concrete to provide maximum strength. Pre-cast floor are fast and can have very long clear spans.

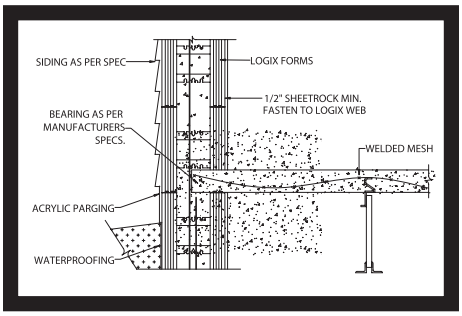
Typically the Logix wall is constructed to the desired height and the pre-cast planks sit directly on the cured concrete. The planks, typically 4 feet (1.220 m) wide, are craned in place and the groves between planks are grouted together. A 2 inch (52 mm) topping is poured over the deck to provide a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

2.12.7.2 – HAMBRO FLOOR SYSTEM





For full size CAD drawing see Section 5, CAD Drawings

The Hambro floor system is a proprietary composite floor system that combines open web steel joists and a 2.5”-5” (64mm - 127mm) floor slab. The joists are spaced 4’-1” (1.225m) O.C. and held apart with locking bars. Then temporary plywood forms are placed between the joists and the concrete deck is poured. After sufficient cure the plywood forms are removed. Hambro is a fast and efficient concrete floor system and can span upwards of 25 feet (7.620 m).

The open joist design makes for easy mechanical and utility installation.

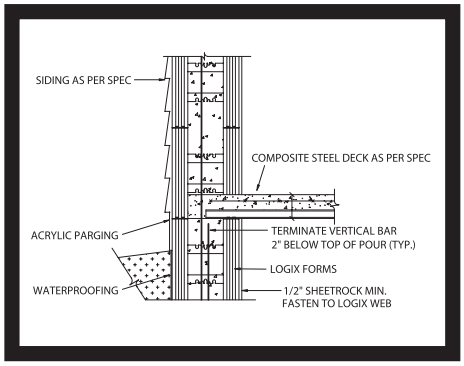
See Hambro for more details: www.hambrosystems.com

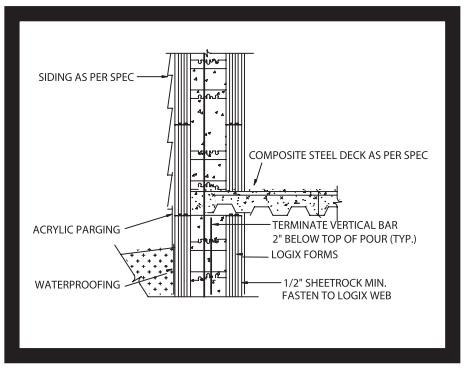
2.12.7.3 – STEEL COMPOSITE FLOOR SYSTEM

Composite floors are a combination of steel and concrete that is bonded together to create a very strong floor. The steel composite decking is a corrugated steel pan that has deformations that bond securely with the concrete. The steel deck is the formwork for the pour and then acts as reinforcement in the concrete. These systems are quick to install and are comparatively thin, resulting in more headroom in the finished.

It may be necessary to temporarily support the pan until the concrete has sufficiently cured.

For more info and design consult your floor manufacturer and your local design engineer.





For full size CAD drawing see Section 5, CAD Drawings