

Building with Quad-Lock ICF

Basic Installation Guide

QUAD-LOCK[®]



Quad-Lock Building Systems Ltd.
(888) 711 – 5625
www.quadlock.com



Ordering



Mr. John Doe

7-Dec-2004

Re: Estimate for Quad-Lock components for your project (for R-Value of R22)

Basement

Dear Mr. John Doe:

We have calculated the following Quad Lock materials for your project

	Units per Bag or Box	Estimate to Full Packs or Boxes	excess units needed (for adj.)	Units rounded up to full boxes	\$cst/unit	\$cst	Discnt	\$cst/ft	Schaffer's Discount
QuadLock Panels (pairs)		184	770	770	0.00	0.00	0%	0.00	0.00
Q.L. Plus panels (pairs)		0	0	0	0.00	0.00	0%	0.00	0.00
Quad Lock 4" Ties	60	0	0	0	0.00	0.00	0%	0.00	0.00
Full Ties 2" Ties	60	0	0	0	0.00	0.00	0%	0.00	0.00
3" Ties	50	0	0	0	0.00	0.00	0%	0.00	0.00
10" Ties	40	78	3077	3040	0.00	0.00	0%	0.00	0.00
12" Ties	40	0	0	0	0.00	0.00	0%	0.00	0.00
J-Bolts		0	0	0	0.00	0.00	0%	0.00	0.00
Corner Brackets outside (C-45)				240	0.00	0.00	0%	0.00	0.00
Corner Brackets inside (C-35)				360	0.00	0.00	0%	0.00	0.00
Angle Brackets				90	0.00	0.00	0%	0.00	0.00
Top Wire Ties 4"	100	0	0	0	0.00	0.00	0%	0.00	0.00
6"	100	0	0	0	0.00	0.00	0%	0.00	0.00
8"	100	0	0	0	0.00	0.00	0%	0.00	0.00
10"	100	0	0	0	0.00	0.00	0%	0.00	0.00
12"	100	0	0	0	0.00	0.00	0%	0.00	0.00
J-Tracks			feet	507	0.00	0.00	0%	0.00	0.00
J-Track Plus			feet	0	0.00	0.00	0%	0.00	0.00
Rear and Slick water proofing			sqft	0	0.00	0.00	0%	0.00	0.00
Wind Locks	1000	1	704	1000	0.00	0.00	0%	0.00	0.00
Quad-Lock Components Total*						0.00			0.00
Total wall area		3042	sqft		Price/Lt.	Components per sqft		0.00	\$cst
Base Price for QL Components per sqft					R = 22	0.00		R = 80	0.00
Total Insul feet all walls		254	feet						
Amounts of Panels and Ties include extra materials for safety (2% for Ties and 2% for Panels)									
We estimate the following costs for materials from other sources:									
Rent for Bracing Materials 45 units @ \$cst/0 each						0.00			0.00
Lumber for Bracing (reusable)						0.00			0.00
Lumber for Window and Door Bucks						0.00			0.00
Reinforcing Steel (incl. 3% extra for overlaps, excl. lintel rebar etc.) 4570 feet @ \$cst/0Foot						0.00			0.00
Concrete 90.8 cubic yards @ \$cst/0 per cubic yard						0.00			0.00

From estimate, order the following:

- **Quad-Lock Materials:**
 - Panels and Ties
 - Metal Track, Corner Brackets, Angle Brackets, Wind Locks
- **Other Materials:**
 - Bracing system and extra lumber
 - 3" Screws, 1 5/8" Screws
 - Window and Door Buck material
 - String Line
 - Spray foam
 - Pre-bent, pre-cut rebar
 - Tie wire
 - Pins and shots for Powder Actuated Nailer (1 1/4" pins)
 - Floor framing and connectors
 - Waterproofing materials



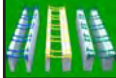
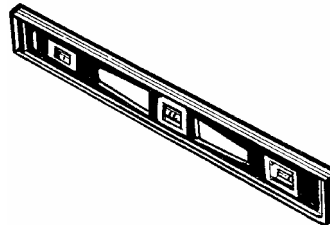
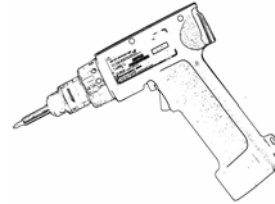
Watch the Quad-Lock video

Slide 2



Recommended Tools

- Extendable Razor Knives
- Sliding Chop Saw 10"
- Laser Level
- Sledge Hammer
- Tape Measures: 25', 100'
- Pruning Shears
- Hand Saws
- Cordless Screw Guns
- Rebar Cutter/Bender
- 6 ft. Level
- Circular Saw
- Metal Shears
- Powder Actuated Nail Gun (PAT) w/ 1 1/4" pins



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Load Truck or Trailer

- Assemble all necessary tools and equipment.
- Be sure to have adequate supplies of nails and screws
- Is power available at the site? (extension cords? generator?)



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Prepare Site

- Clear excess debris
- Check footings for level with laser
- Note problems on footing with felt pen
- Do **not** install vertical steel yet
- Cut all horizontal bar and set beside footing

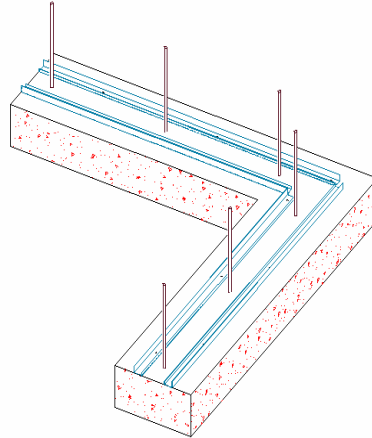


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Building Layout

- Lay out walls using chalk lines; Allow for panel thickness (2¼")
- Check building for square
 - Pull diagonal dimensions with 100' tape on largest rectangles available
- Block out door buck positions



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Place Door Bucks

- Locate and mark door openings
- Pre-build door bucks
- Set into position on footing
- Plumb, square, and brace into position
- Nail spacer at bottom of buck to maintain door dimension during pour



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Delivery

- Offload materials to minimize handling
- Place track and re-bar beside footing
- Place panels and ties inside footing
- Place corner brackets and 90° rebar at all corners

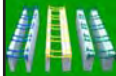


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Set Metal Track

- Place outside track on chalk line
- Secure at ends and every 24" with concrete fasteners (1¼" PAT)
- Cut spacers = to concrete wall size
- Place inside track on chalk line and fasten to footing
- Continue to place track with spacers



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Footings Out of Level?

- Set a level string line 14" to 16" high over outside panel row
- Set panels to string line and shim (or cut) panel bottoms as needed
- Place securely in track

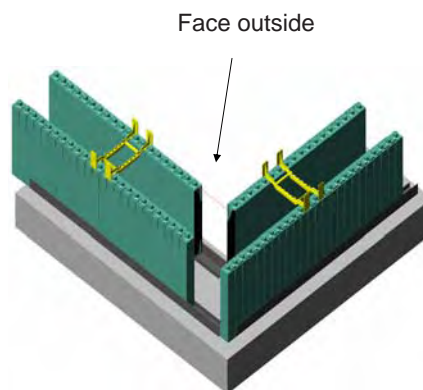


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Install Outside Corner Panels

- Start with full 48" panels on the outside
- Standing inside the corner, lap left outside panel over right panel
- Maintain same lap throughout
- Place metal corner bracket over interlock knobs



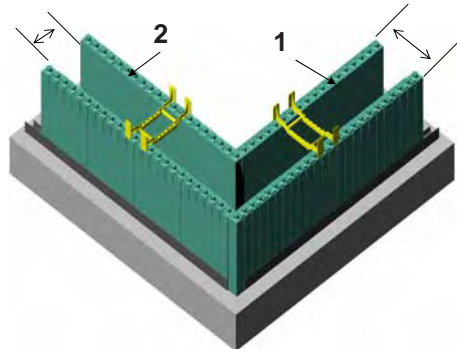
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Install Inner Corner Panels

For R-22 walls:

- Cut panel 1 by outside wall dimension
- Cut panel 2 by inside cavity dimension
- Cut the ends closest to the corner
- Lap right over left
- Keep panel ends away from corner aligned
- Place metal corner bracket over interlock knobs



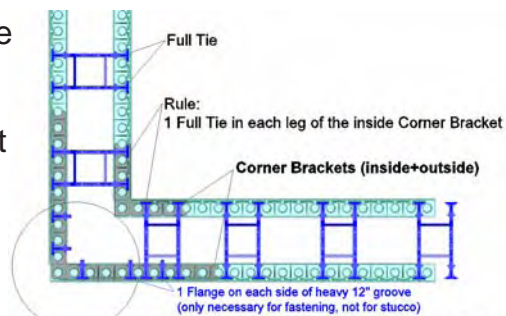
Note: Inner panel dimensions will change when using Quad-Lock Plus panels (4 1/4") on the outside

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Place Corner Ties

- Insert full ties as close to corner as possible with both flanges in Inside Corner Bracket
- Cut flanges from full tie
- Insert cut flanges in outside panels (2-3 each side) starting with first slot at corner
- Cut flanges in the corner are important!



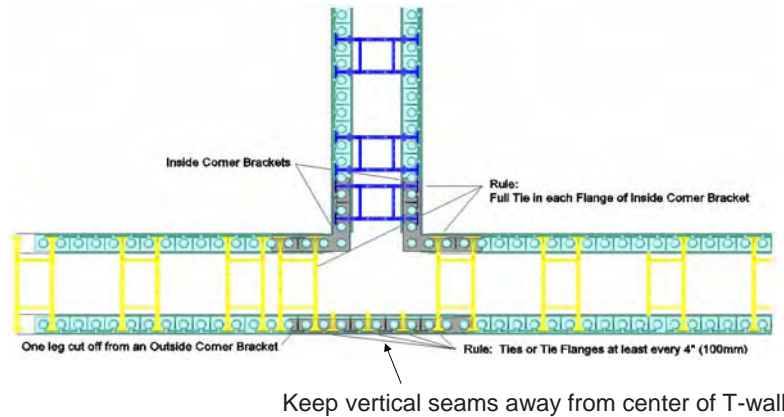
Important: CUT FLANGES are critical structural parts!
Install **AT LEAST 4 FLANGES** IN EACH LEG OF CORNER BRACKET
Note: Cut Flanges from Full Ties **DO NOT FORGET.**

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Build All Corners/T-Walls

- First build 1st course panels for all of the following:
 - 90° corners – T-walls – Angled corners – Radius

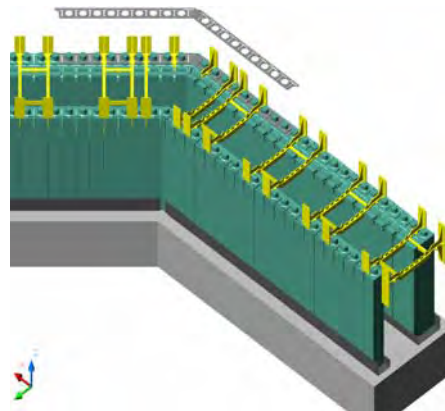


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Non-90° Angles

- Determine degrees of angle
- Cut each corner panel at $\frac{1}{2}$ the total degrees
- For the outside panel, make angle cut so it passes through center of 1st interlock knob
- Angle Brackets are for outside panels only



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Build to Common Point

- Set full panels from each corner or angle, working toward middle
- Cut last panel to fit, leaving 1/4" gap, if not on the 2" layout
- Gap will continue to top of wall
- Place all 1st course panels and ties



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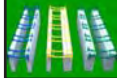


Second Course

- Near corners, place full panels centered over 1st row joints (creates 2 foot offset)
- Infill panels at corner, following same lap pattern as 1st course
- Place corner brackets, ties, and flanges as in 1st course



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Reinforcing Bar

- If allowed, place 1½” plastic pipe shorts over stub steel to secure vertical bar later
- Place horizontal rebar in tie slots w/ proper overlaps
- Do not tie bar to ties



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Plumbing and Electrical?

- Are you setting electrical runs in conduit?
- Are there plumbing stacks or penetrations that need to be set? (cut extras?)
- Consider all preparations for utilities at this point



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Stack Walls

- Continue stacking walls to 4' level
- Repeating pattern of 1st and 2nd courses
- Check corners for plumb regularly
- Try to position common butt joints at doors or windows
- Ensure that ties are placed every 12"; use deeper lines in panels for layout



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Minimize Waste

- Collect scrap, and cut to 12" or 24"
- Combine pieces to make 48" panels throughout the job
- Be sure to straddle joints with a full tie

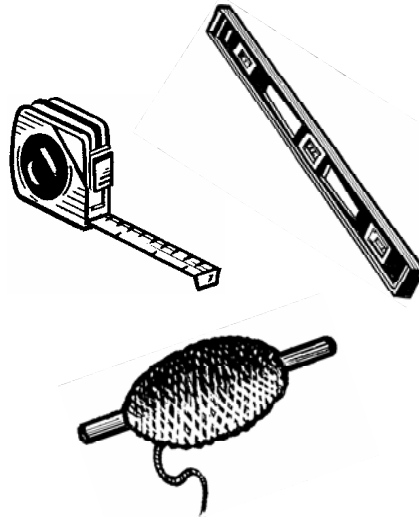


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Plumb, Straight, Square, and Level

- At the 4 foot level:
Stop Production
- Check walls for:
 - Plumb
 - Alignment
 - Square
 - Level
 - Accurate Dimensions

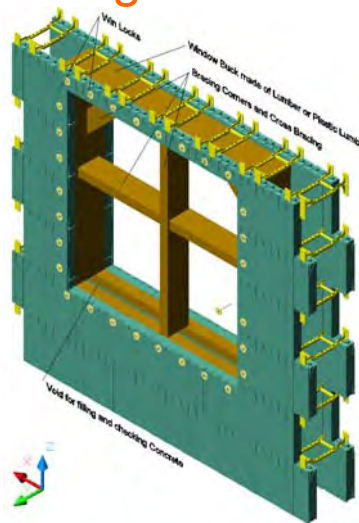
Make adjustments
as necessary



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Window Openings

- Determine elevations for window openings
- Pre-build all window bucks, and set into position
- Check for level and square
- Secure bottoms with Wind Locks and 3" screws
- Leave space in sill to pour and vibrate



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Secure Bracing

- Attach bracing members to Quad-Lock ties with #10 screws
- Place diagonal braces and secure to ground or slab
- Adjust walls into plumb with turnbuckles
- Set scaffold boards and railings



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Continue Stacking Walls

- Build walls around door and window bucks
- Add extra steel around openings as specified by engineer
- Add penetrations for utilities as needed
- Place horizontal rebar per specifications

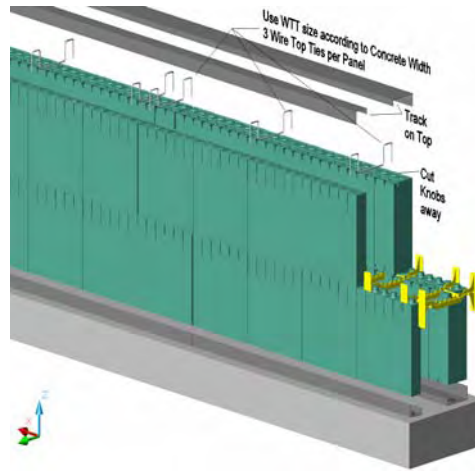


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Top of Wall

- Remove interlock knobs from top panels
- Place Wire Top Ties
 - One WTT at each panel end
 - One WTT in center of each panel
- Place metal track over panels and WTT's
- Cut and lap track at corners. Secure with self tapping screw
- **No Corner Brackets on top row**



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Secure Common Seams

- Check corners for plumb and secure
- Cut 1 x 4s at 24"
- Screw 1 x 4s to wall across common seams; 2 screws each side
- Spray foam gaps in foam panels



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Re-Check PSS & L

- Install string line around top course of panels, space $\frac{3}{4}$ " from foam. Stretch tight, and measure gap with 1 x 4
- Check alignment of wall, and adjust with panel jacks
- Check all wall dimensions and plumb at corners

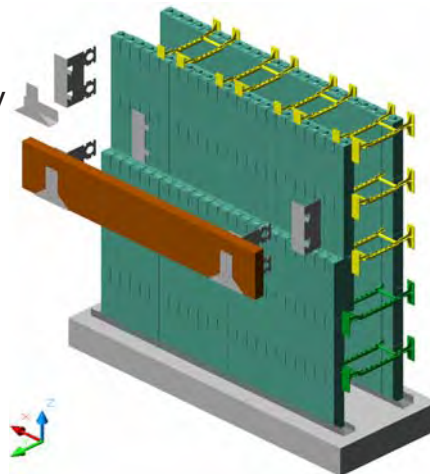


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Set Ledger Brackets, Bolts, & Beam Pockets

- If using ICFLC ledger brackets, shoot elevation and install brackets into wall cavity
- Set any additional fasteners to be cast into concrete
- Install beam pockets
- Use Plus Panels for wall width transition



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Place Vertical Steel

- Pre-cut all vertical steel and place around perimeter of wall
- Slide steel down the wall and into 1 ½" plastic pipe pre-set over stub steel
- Secure with tie wire to top horizontal bar



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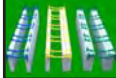


Order Concrete and Pump

- Calculate concrete usage (See Product Manual)
- Schedule concrete delivery
- Specify ICF type mix at max. 6" slump – any special engineering specs?
- Order pump with 3" hose



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Assign Tasks for Pour

- Assign crew to:
 - Handle pump and place concrete
 - Run vibration equipment
 - Spot bottom of wall for pour height and possible problems
 - Check for quality control



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Equipment for Pour

- J-bolts and other hardware
- 1 ¼” Pencil Vibrator
- Trowels
- Water for cleaning
- Hard hats, safety glasses, & rubber gloves
- Water for crew
- Plywood & lumber or metal bracing to repair problem areas



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Place Concrete

- Place 2' to 3' maximum on first lift
- Maximum 6" slump
- Successive lifts 3' to 4'
- Vibrate with max 1 ¼" pencil vibrator between lifts
- **DO NOT OVER-VIBRATE!**
- Vibrate steel to clear build-up of concrete
- Pay close attention to consolidation around doors and windows
- Re-align walls with turnbuckles



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Finish Top of Wall

- To make minor adjustments to elevation, raise the track and pin to foam panels
- Screed away excess concrete
- Trowel concrete smooth
- Set anchor bolts at specified centers
- Re-check alignment



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After Pour

- Clean concrete from walls with hose or pressure washer
- Clean concrete from all panel jacks and walking boards
- Crewmembers should thoroughly wash hands and exposed skin areas



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Remove Bracing

- On the following day, remove panel jacks, braces, and window & door bracing
- Fill gaps and holes with spray foam where foam panels may have been damaged
- Rasp foam to level any areas where bowing may have occurred due to excessive vibration



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