

QUAD-LOCK[®]

Insulating Concrete Forms

**Build Smart • Build Energy Efficient
Build Your Future with Quad-Lock
Insulating Concrete Forms**



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Why Insulating Concrete Forms?

Benefits of ICF Construction

- **Energy Efficient**
 - Save 70% or more on utility costs over conventional building methods
- **Healthy**
 - No air infiltration, high STC ratings (50+)
 - No mold, mildew or rot; no food source for insects
 - No harmful substances
- **Solid and Secure**
 - Reinforced concrete withstands hurricane/tornado force winds & flying debris
- **Safe**
 - UL/ULC fire rated for up to 4 hours
- **Design Friendly**
 - No special order components, accommodate any design elements
- **Recyclable**
 - Minimum jobsite waste; easy recycling

Why Insulating Concrete Forms?

A major consulting company, McKinsey, studied the costs of reducing greenhouse gas emissions:

- ▶ Biodiesel, Carbon capture and storage, and many other measures have high costs to reduce energy consumption & emissions
- ▶ Better Building Insulation, Lighting Systems, Air-Conditioning, and Water heating are among the most cost-effective measures
- ▶ Improved Building Insulation has the highest **income** (not cost) for reduction in energy use & emission

Facts:

- ▶ The U.S. residential and commercial sectors consume almost 45% of all energy used (rest is industrial and transportation)
- ▶ Heating, cooling, and ventilation use about 56% of the energy in a typical U.S. home and about 51% for commercial buildings, making it the single largest operating expense
- ▶ The operation costs of a typical building over its lifetime easily exceed its construction cost – often by a multiple

We can make the biggest impact on energy use, emissions, health & productivity with Sustainable Buildings: better for the people and better for the environment



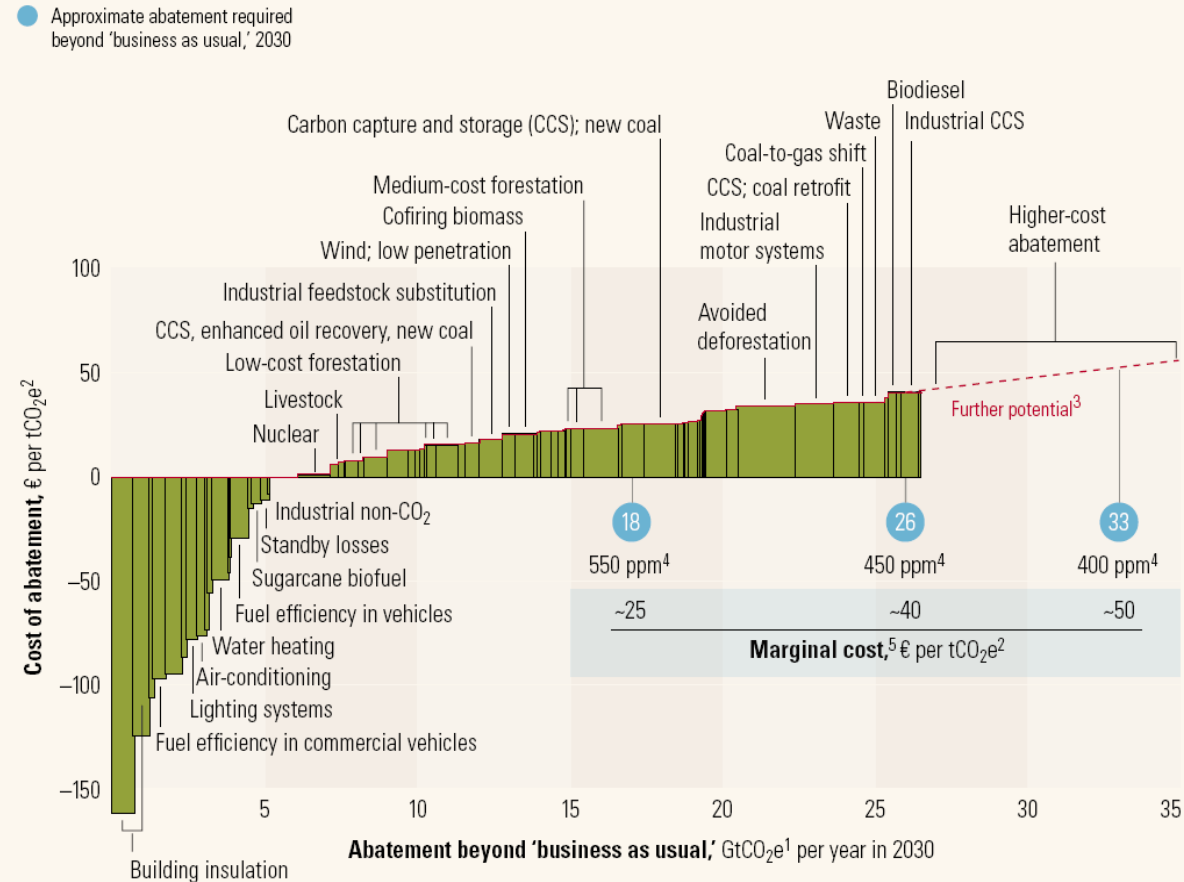
Sources: US Dept. of Energy, McKinsey Quarterly

EXHIBIT I

Source: McKinsey Quarterly - "A cost curve for greenhouse gas reduction" February 2007

What might it cost?

Global cost curve for greenhouse gas abatement measures beyond 'business as usual'; greenhouse gases measured in GtCO₂e¹



¹GtCO₂e = gigaton of carbon dioxide equivalent; "business as usual" based on emissions growth driven mainly by increasing demand for energy and transport around the world and by tropical deforestation.

²tCO₂e = ton of carbon dioxide equivalent.

³Measures costing more than €40 a ton were not the focus of this study.

⁴Atmospheric concentration of all greenhouse gases recalculated into CO₂ equivalents; ppm = parts per million.

⁵Marginal cost of avoiding emissions of 1 ton of CO₂ equivalents in each abatement demand scenario.

Why Insulating Concrete Forms?

ICFs Function As:

- Solid stay-in-place concrete form
- Attachment point for rebar every 12" [305mm] vertically and horizontally
- Interior and exterior insulation
R-Values: R-22 up to R-84
- Exterior and interior finish attachment
- Chase for utilities



Why Insulating Concrete Forms?

Quad-Lock is a Solid Wall

- UL/ULC 4 Hour Fire Rating
- STC Ratings of 50+
- No Mold, Mildew or Rot
- Superior Consolidation Panelized System: can work around any rebar pattern
- Solid, Safe and Secure



Why Insulating Concrete Forms?

Built-In Safety from Natural or Man-Made Disasters

- Hurricanes
- Tornados
- Storm Surge
- Earthquakes
- Fire



Why Insulating Concrete Forms?

Built-in Fire Resistance

- UL/ULC Fire Test: 6" [152mm] wall was burned at 2000°F [1100°C], under full load (1,326 kN or 298 kips or 300,000 lbf pound-force) for 3 hours
- 8" [203mm] wall rated for 4 hours
- Passed the UL/ULC hose stream test
- ICF foam's ability to spread flame are low and emissions are "no more toxic" than wood



Concrete does not burn!

Why Insulating Concrete Forms?

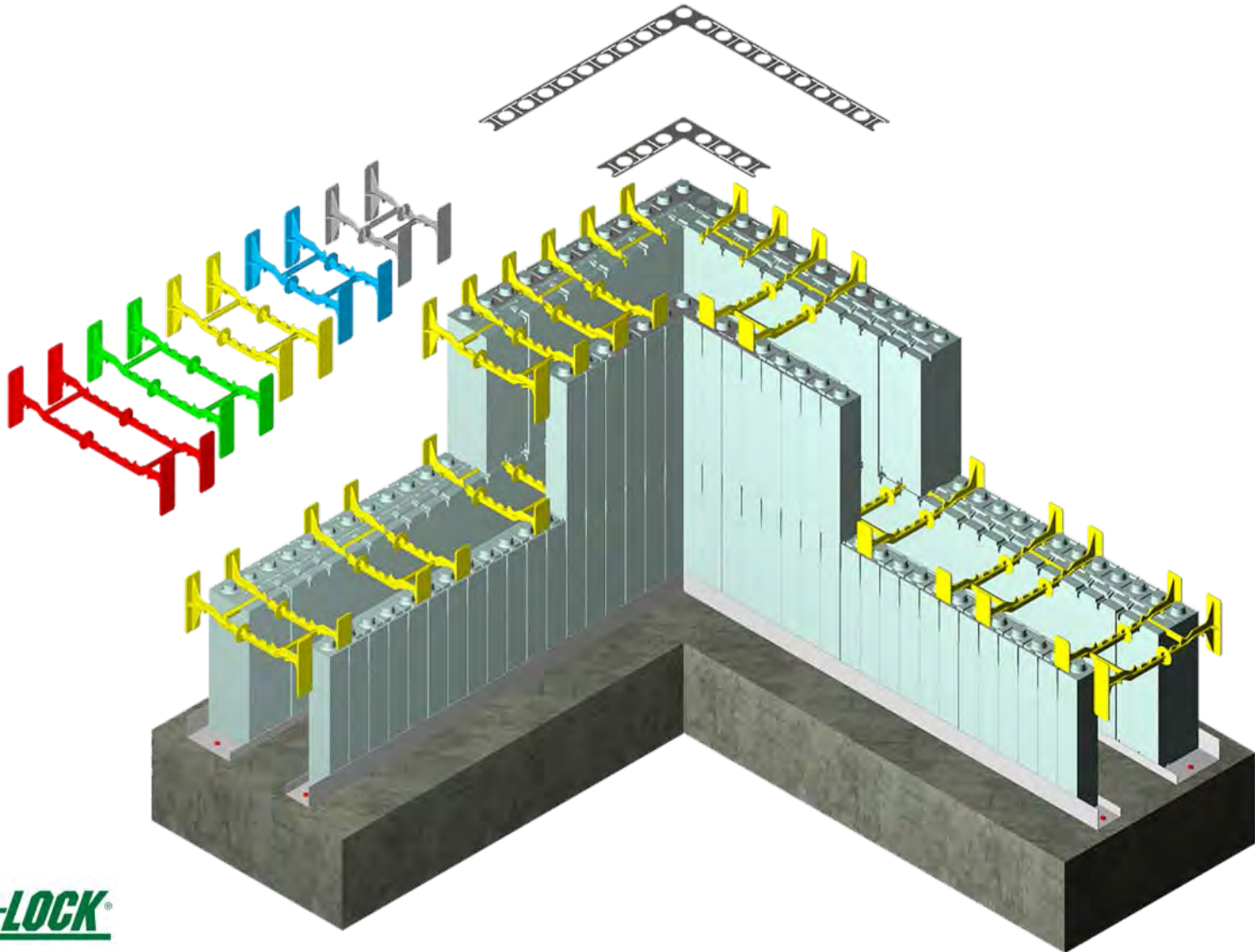
Proven: Solid and Secure

- FEMA320 guidelines and criteria, you can expect *“near-absolute” protection from winds and debris during a storm with winds as high as 250mph*
- Cannon tests by Quad-Lock & Texas Tech. University at 100+ mph
Results:
 - Damage limited to impact area
 - Minor damage to the Quad-Lock ICF
 - No damage to the concrete
 - No damage to the interior wall



Why Quad-Lock ICF?

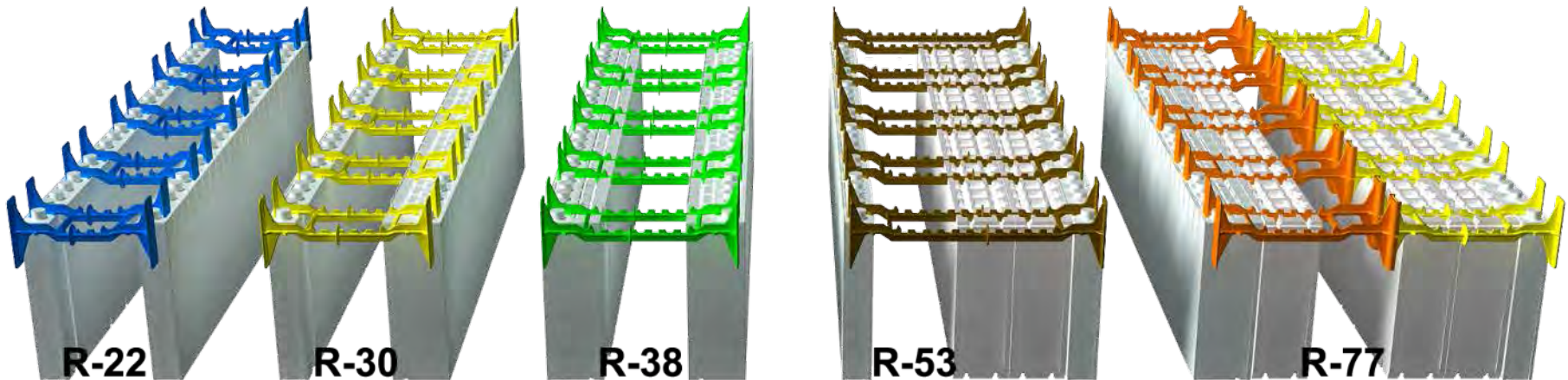
Four Main Components for **ANY** Structure



Why Quad-Lock ICF?

Quad-Lock Panels

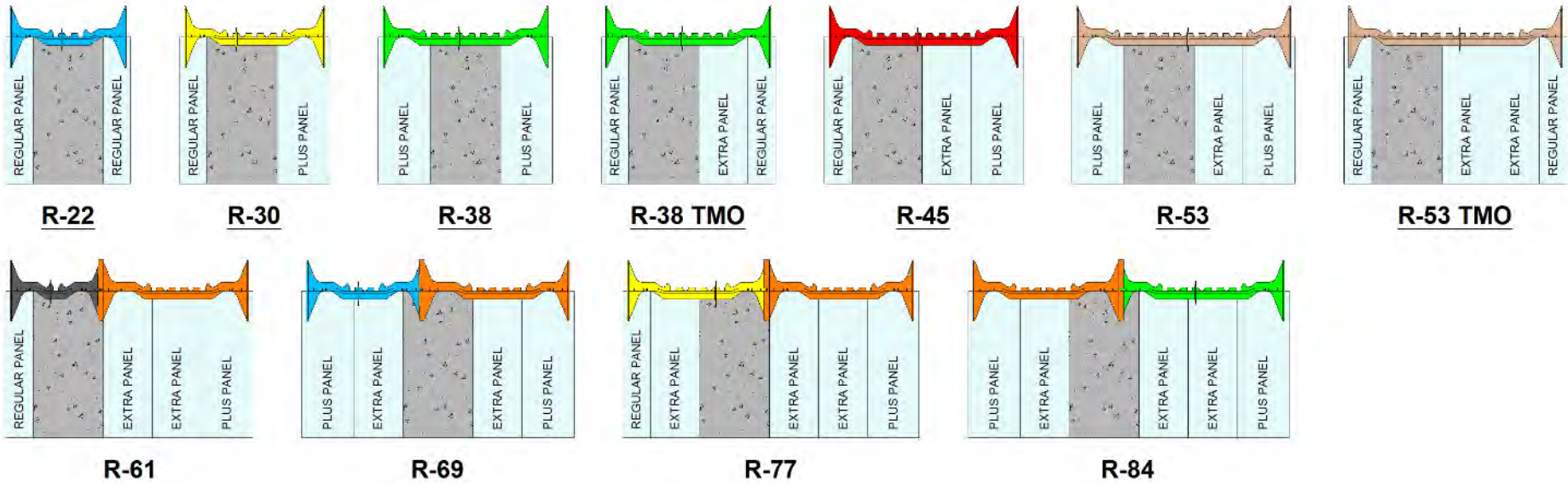
- Regular Panel: 12" X 48" [305mm X 1219mm], 2¼" [57mm] thick
- Plus Panel: 12" X 48" [305mm X 1219mm], 4¼" [108mm] thick
- FS – Fastening Strip: 1½" [38mm] wide fastening strip every 12" [305mm]
- Extra Panel: 12" X 48" [305mm X 1219mm], 4" [102mm] thick
- Scored every 2" [51mm] for easy measuring



Up to R-84

Why Quad-Lock ICF?

Insulation R-Value Choices

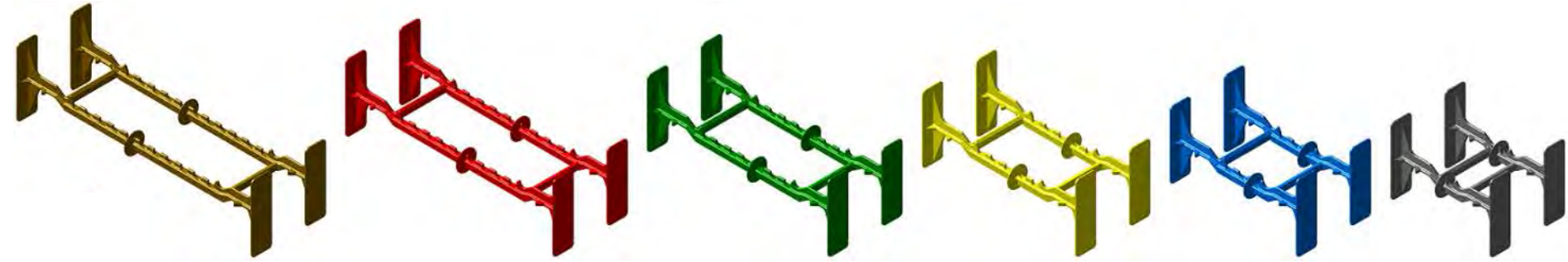


Samples are displaying 5.75" [146mm] concrete cavities. For larger or smaller concrete cavities than those listed, please consult our technical department.

TMO = Thermal Mass Optimized

Why Quad-Lock ICF?

Quad-Lock Ties – The Heart of the System



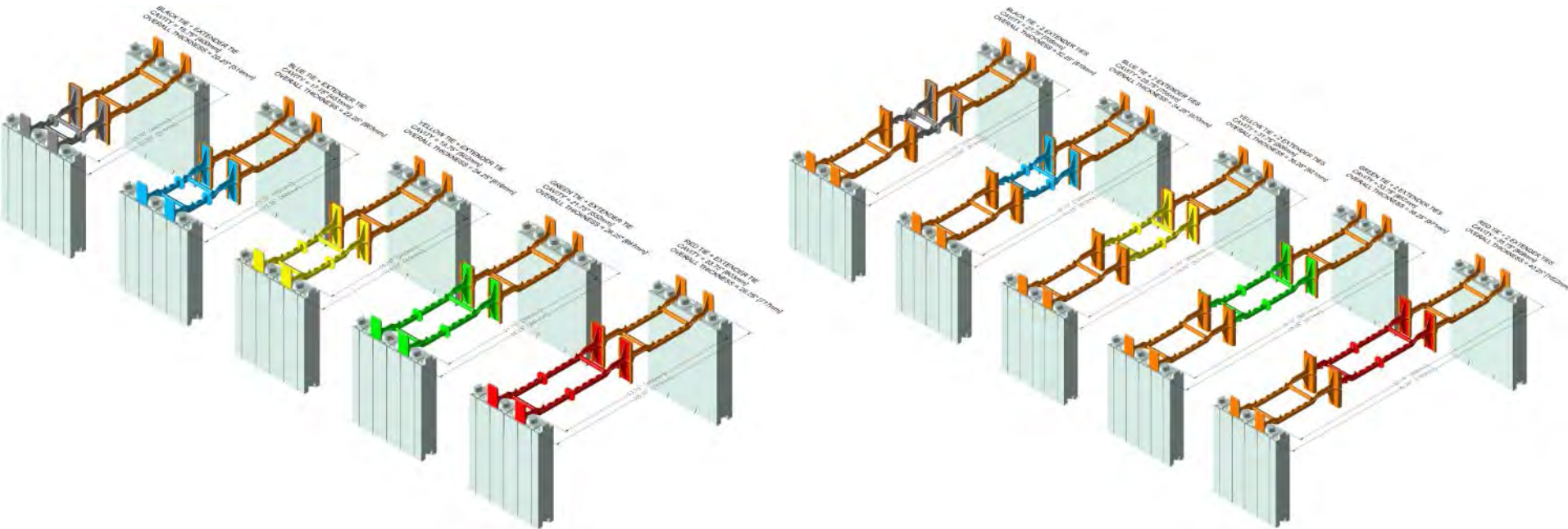
- Connects panels on 4 planes of resistance
- Attachment points every 12" [305mm]
- Molded rebar chairs
- 6 Lengths, color-coded



Why Quad-Lock ICF?

Extender Tie

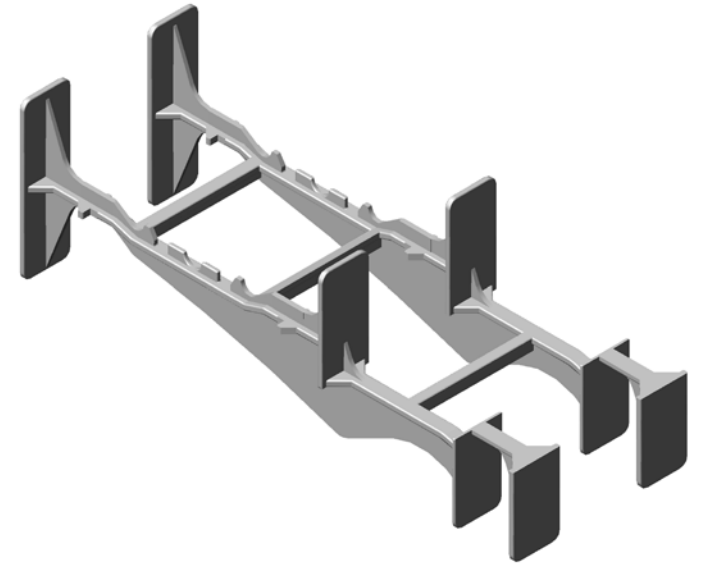
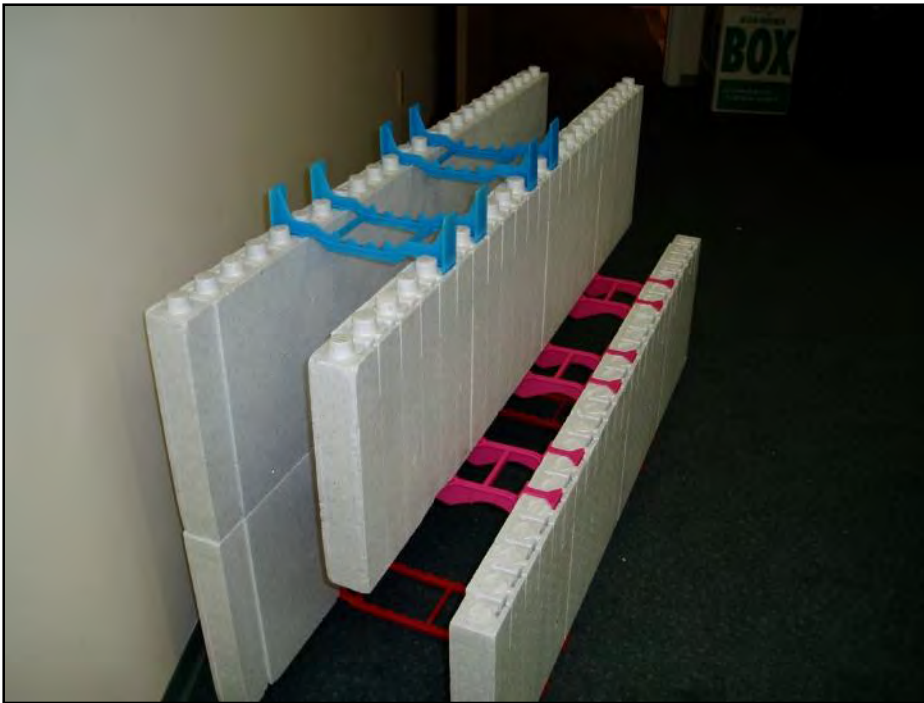
- Adds 12" [305mm] to any wall cavity



Why Quad-Lock ICF?

Brick Ledge Tie

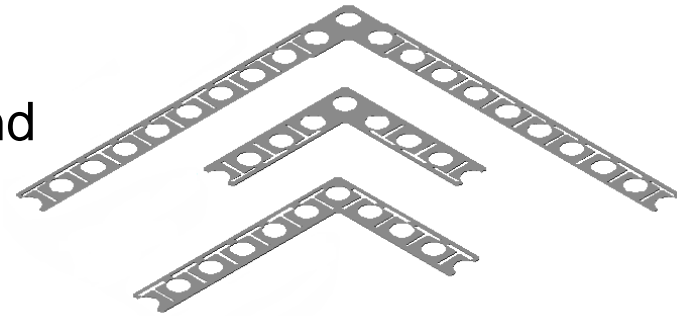
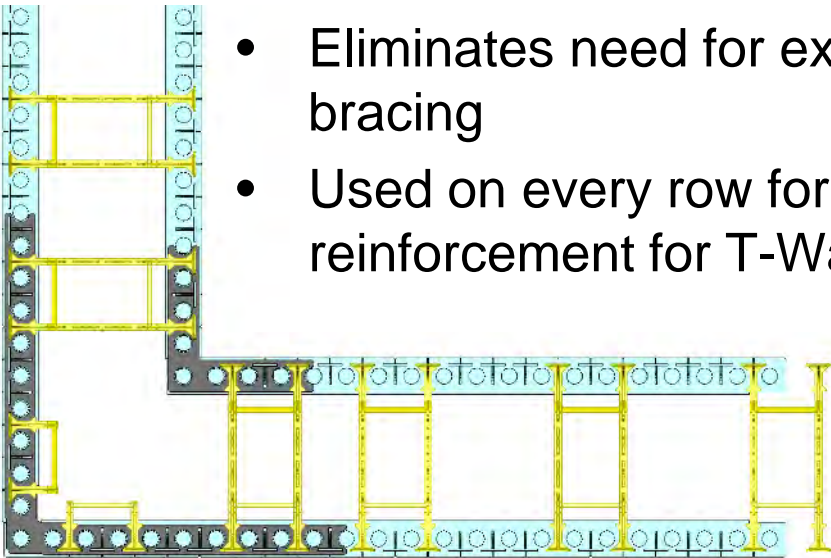
- Wall width transition 12" [305mm] to 6" [152mm]
- Used for exterior brick ledges
- Used for interior floor joists support.



Why Quad-Lock ICF?

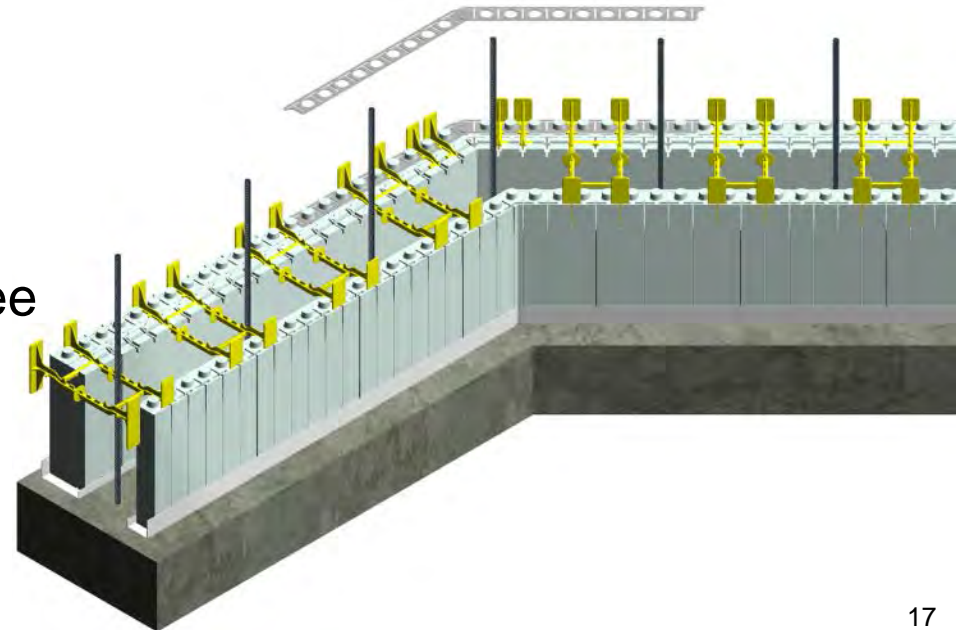
Inside/Outside Corner Brackets

- Eliminates need for external corner bracing
- Used on every row for 90° corners and reinforcement for T-Walls



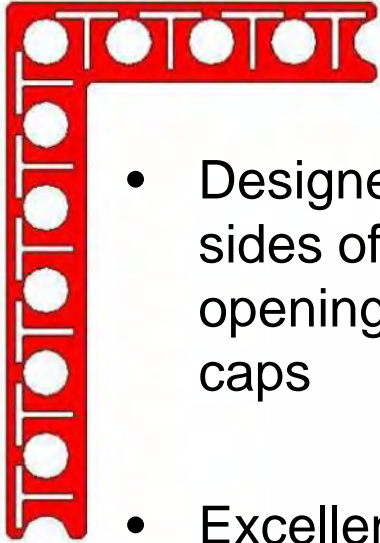
Angle Brackets

- Hinged to allow angles of any degree
- Used on external panels only

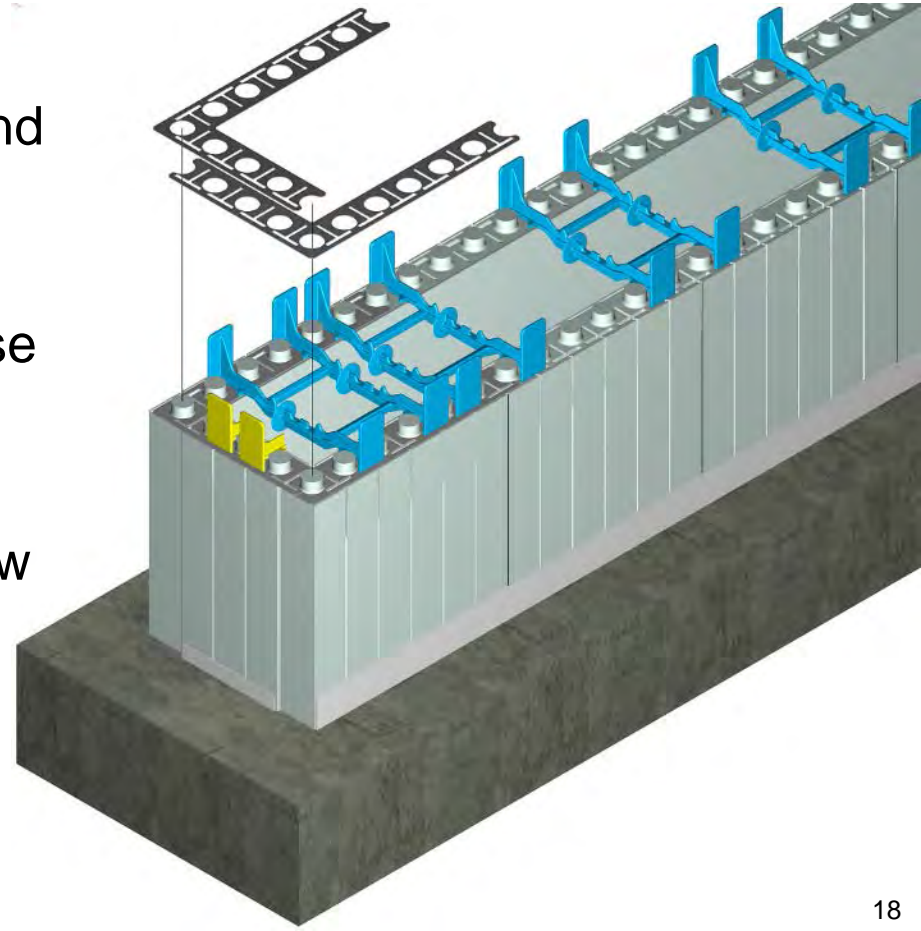


Why Quad-Lock ICF?

Window/End-Cap Brackets



- Designed to form insulated sides of window and door openings and insulated wall end caps
- Excellent for scrap pieces – use as end caps
- Use with Wire Top Ties to allow maximum openings



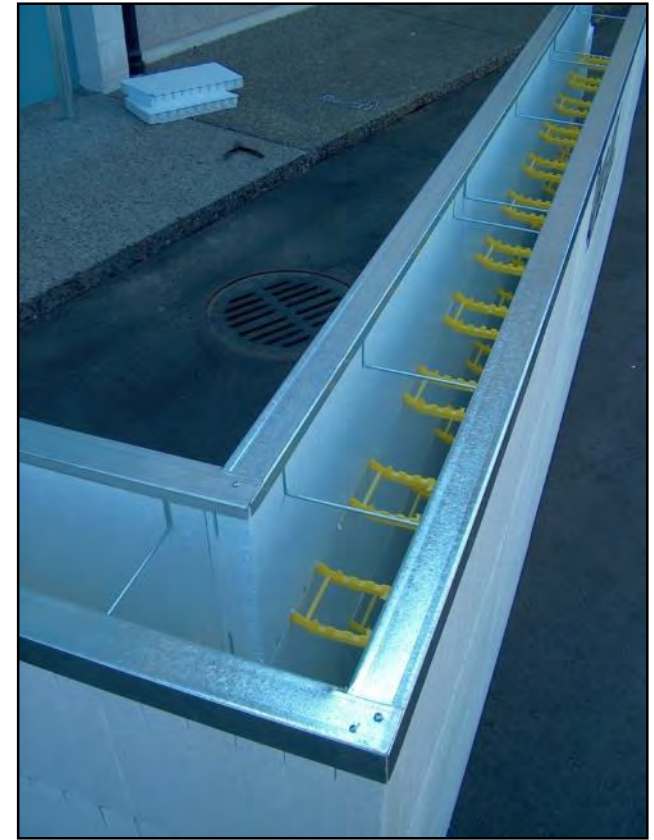
Why Quad-Lock ICF?

Metal Track

- Used to start & finish wall
- Regular & Plus widths
- Secures footings every 2½ft [762mm]



Metal Track (footing)

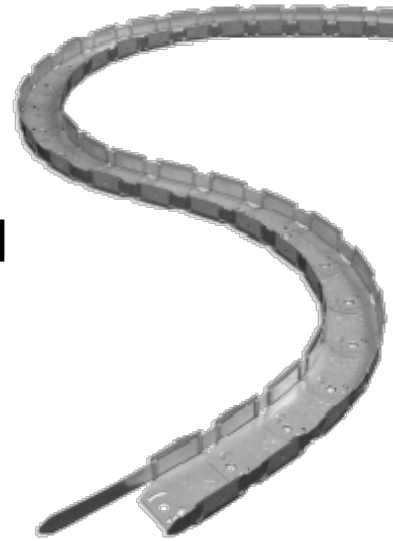


Metal Track (top)

Why Quad-Lock ICF?

Flex-Track

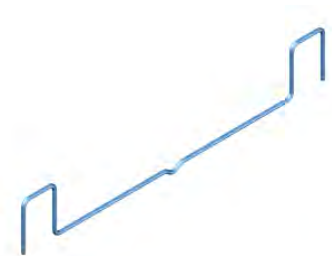
- Used to create high quality, radius walls, simply and easily
 - As tight as 4 feet [1219mm]
- Regular & Plus widths



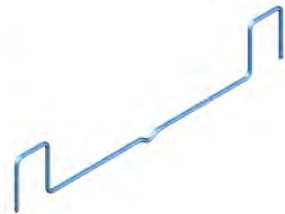
Why Quad-Lock ICF?

Wire Top Ties

- Used to finish top of wall with Metal Track
- Keeps top of panels plumb and secure



WTT 14" [350mm]



WTT 12" [300mm]



WTT 10" [250mm]



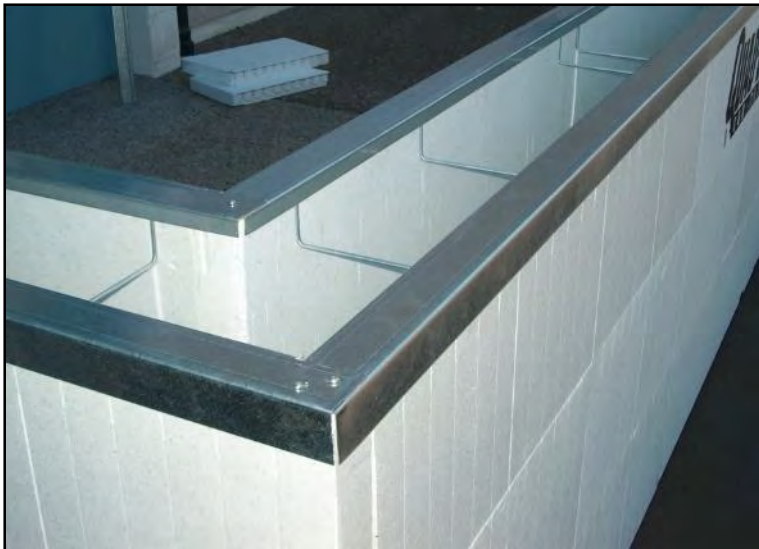
WTT 8" [200mm]



WTT 6" [150mm]



WTT 4" [100mm]



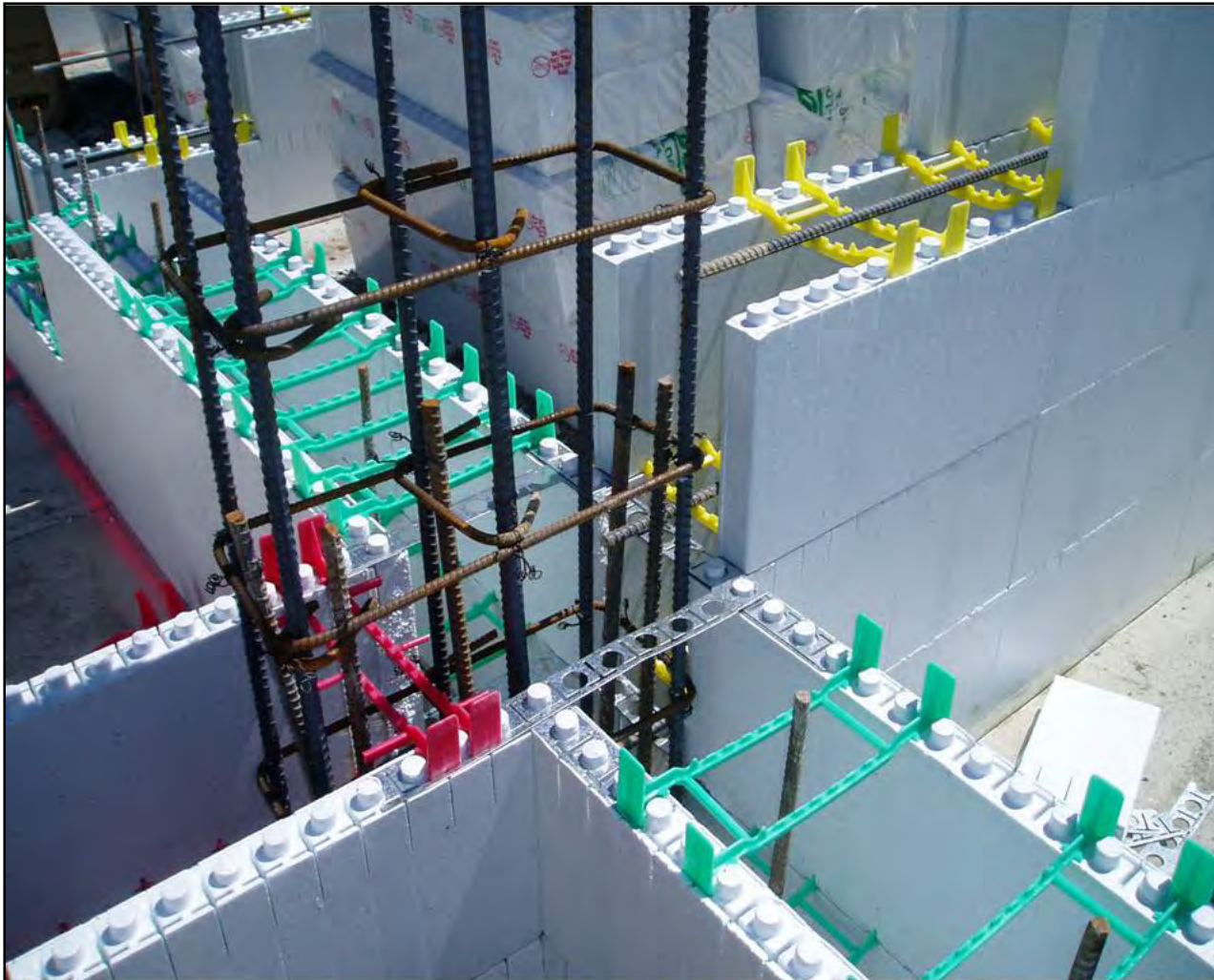
Why Quad-Lock ICF?

Product Transportation is Easy



Cool Things You Can Do With Quad-Lock

Combine Variable Wall Widths



Cool Things You Can Do With Quad-Lock

Radius Walls

- Made on-site – no special order pieces
- 4 feet [1219mm] or larger



Cool Things You Can Do With Quad-Lock

Radius Arched Walls



Cool Things You Can Do With Quad-Lock

Obstacles? No Problem...



Cool Things You Can Do With Quad-Lock

Pools

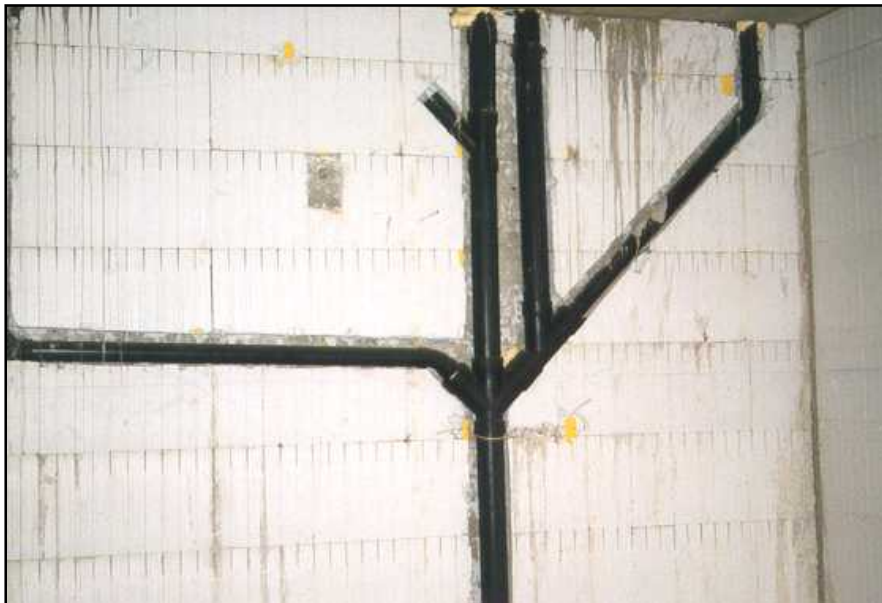
- Huge reduction in operating costs
- No special liners required



How Do You Do That?

Chases for Electrical/Plumbing

- No need to cut through plastic strips
- Fill with spray foam to keep insulation value



How Do You Do That?

Exterior Finishing



How Do You Do That?

Footings



How Do You Do That?

Wood Window Bucks



How Do You Do That?

Vinyl Window Bucks



How Do You Do That?

Peel and Stick Damp-Proofing



How Do You Do That?

Bracing and Scaffold



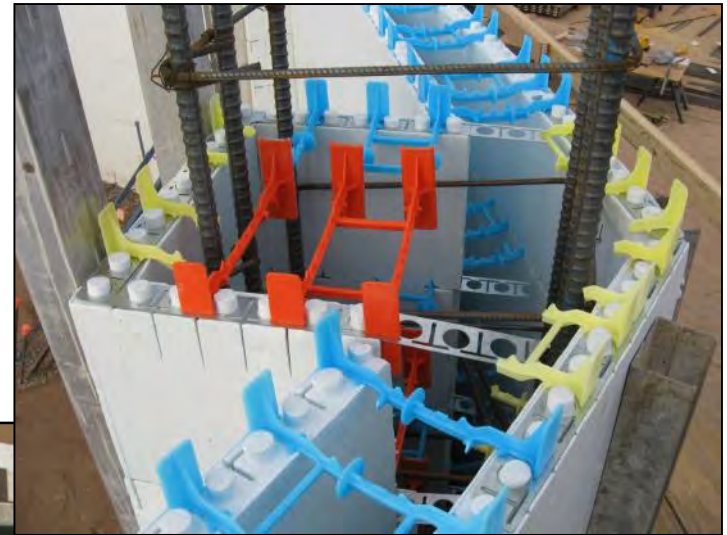
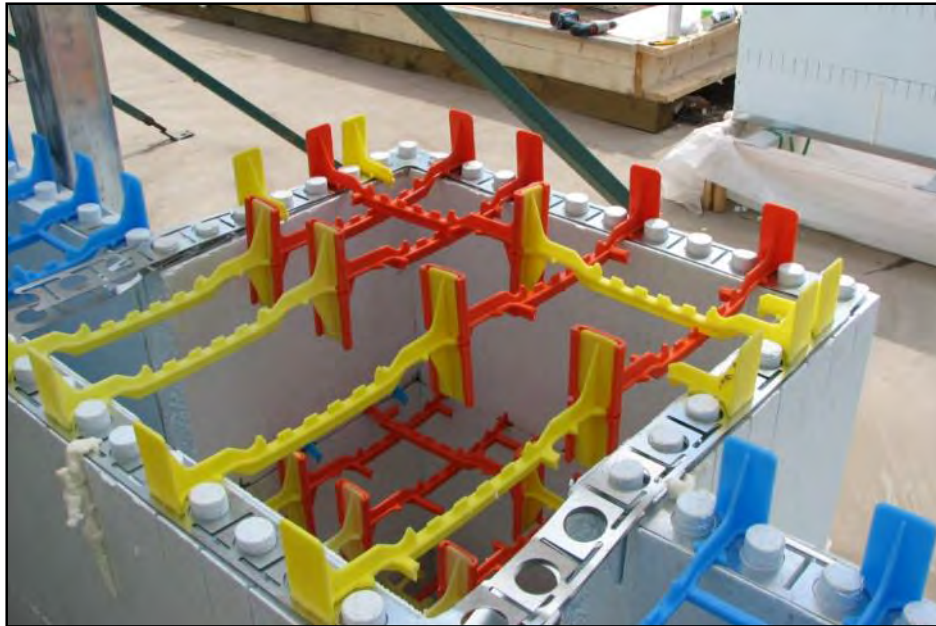
How Do You Do That?

Beam Pockets



How Do You Do That?

Pilasters & Columns



What Can I Build?



What Can I Build?



What Can I Build?



What Can I Build?



What Can I Build?



What Can I Build?



What Can I Build?



What Can I Build?



What Can I Build?



What Can I Build?



What Can I Build?

LEED Certified Homes



Without the energy-saving qualities of Quad-Lock walls, there's absolutely no way we could have submitted these homes for LEED Certification.

Most importantly, Xanterra's new Quad-Lock homes are a model for future sustainable construction products at Yellowstone and other National Parks around the country, where conservation of limited resources is a mantra we take very seriously.

Thanks for helping Xanterra stay "green".

– Jim Hanna
Director, Environmental Affairs
Xanterra Parks & Resorts for
Yellowstone National Park



What Can I Build?



Walk-Outs



What Can I Build?

Multiple Exterior Finishes



What Can I Build?



Brick



What Can I Build?

Log Homes



What Can I Build?

Condominium Developments



What Can I Build?

**Townhomes
Multi-Family**



What Can I Build?

Worship Facilities



What Can I Build?

Extended Care Facilities



What Can I Build?

Storage



What Can I Build?

Office Buildings



What Can I Build?



Mixed Use: Commercial & Residential



What Can I Build?

Warehouses



What Can I Build?

Assisted Living Facilities



It was the first time our contractor had used Quad-Lock and we were very impressed with the ease and speed of installation.

– Larry Koop
Lifestyles Assisted Living
Chilliwack, BC



What Can I Build?

Hotels



What Can I Build?

Educational Facilities



What Can I Build?

Earth Homes



What Can I Build?

Zero Energy Homes



What Can I Build?

Basements



What Can I Build?

Firewalls

- Four-hour fire-rated walls
- UL/ULC approved



"I use Quad-Lock Insulating Concrete Forms instead of wood for building my firewalls because the ease of assembly creates outstanding value. Quad-Lock's soundproofing qualities are unmatched and far superior to wood firewall construction."

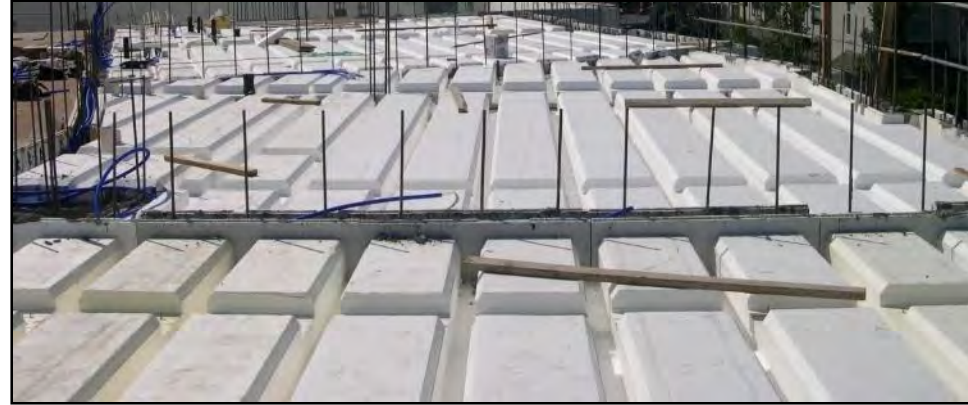
**– Mark Calvin
Builder/Developer
Grand Junction, CO**

Quad-Deck Floor & Roof System

A Complete Building System with Quad-Deck

- Pan floor form design, T-Beam
- High thermal insulation of R-16 to R-33 [U-0.35 to U-0.17]
- Accommodate large spans up to 31 ft. [9.5m]
- Molded-in metal joists & furring strips
- Ideal for radiant floor heating
- No secondary shoring required
- Perfect systems for shelters, safe-rooms, garages etc.

Quad-Deck Floor & Roof System



The energy efficiencies, sustainability and affordability were the key economic components driving the reasons for using these products.

Out of the 30 years that I have been developing, my association with Quad-Lock has been the most successful supplier/purchaser arrangement I have had. To the entire team of Quad-Lock staff members, I give my thanks and a highest recommendation to anyone desiring to use their products.

**– Pat Lenihan
Developer
SCH Group**



Quad-Deck Floor & Roof System



Quad-Deck Floor & Roof System

Condominium Developments



Quad-Deck Floor & Roof System

Floors



Quad-Deck Floor & Roof System

Radiant Floor Heating



Quad-Deck Floor & Roof System

Quad-Deck Shoring



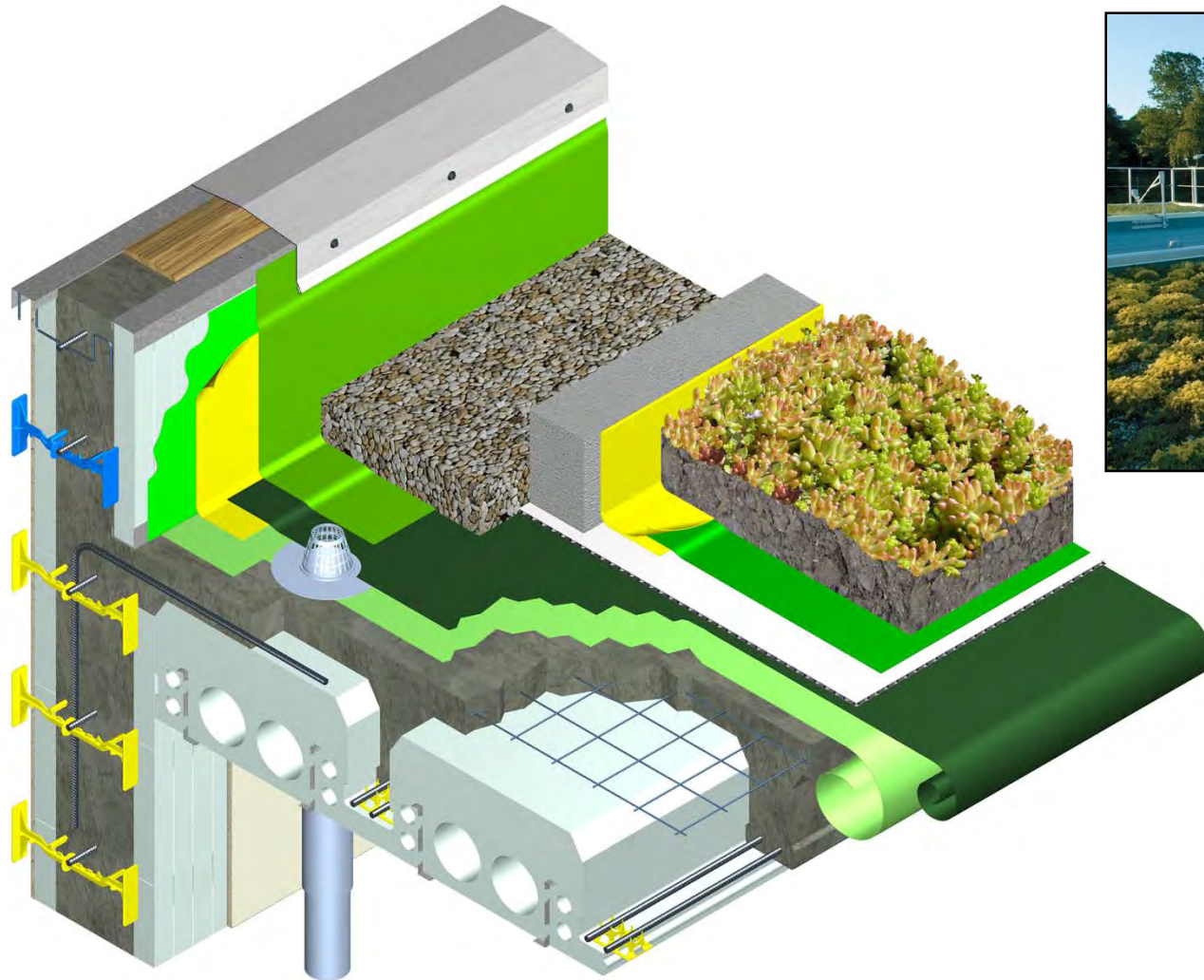
Quad-Deck Floor & Roof System

Complete Envelope Solution



Quad-Deck Floor & Roof System

Green Roofs



Quad-Deck Floor & Roof System

Safe Rooms



Quad-Deck Floor & Roof System



Quad-Deck Floor & Roof System

Tilt-Up



Testimonials

Homeowners

// *When we elected to use Quad-Lock it was primarily for the energy savings, but what we got was much more. Our home is our refuge, insulating us from noise and temperature. Our home is our castle. When we look out the windows, we know by the thick walls that we are secure. We liked your system because the concrete walls were a solid 6" thickness throughout.*

Our home is slightly over 3100 square feet with 2 hot water heaters, electric furnace, heat pump, well pump and Jacuzzi tub. Our electric bill, averaged over one year, is only \$125 per month.

There are many instances where the benefits of Quad-Lock are evident, but one of our favorites is last year's Christmas party. The conditions were clear and windy and 18° outside. With our guests inside, without the furnace coming on, the temperature actually rose from 70 - 72° over the duration of the party (5 hours)!

// – Steve and Trudy Wegner
Homeowners, Oregon

Testimonials

Homeowners



Having owned several homes of conventional frame construction over the past 40 years, we always dreamed of building a truly solid home some day, like we remembered from our native Germany.

Researching suitable, locally available components which would allow for a rather sophisticated architectural design (not a bunker!), we came across Quad-Lock – a unique system of interlocking foam blocks, acting as self supporting steel reinforced forms for concrete filling, and remaining in place as highly effective heat and sound barriers, both inside and outside. We used Quad-Lock for all exterior and bearing interior walls.

We very much enjoy living in our indeed solid, new home. 

**– Norbert and Christa Holm
Homeowners, British Columbia**

Testimonials

Builders

// *There's no other system on the market that offers the same level of design and flexibility that Quad-Lock does. Anything that we want to do with Quad-Lock, we can do with little or no trouble at all. With other manufacturers you've got lots of waste. With Quad-Lock, I've had jobs come back where they've returned a couple of panel pairs and a few ties, we estimated it that close. No waste.*

//

– Stewart Bodner
Bozeman Brick, Block and Tile
Bozeman, MT

Testimonials

Architects & Designers

// *Essentially, Quad-Lock ICF allowed me to sculpt my design. We created multiple radius walls and arches which would have been near impossible with conventional building methods.*

//
– Barry Oberpriller
Blue Home Design
Leverett, MA

// *Quad-Lock has expanded the design boundaries in my architectural practice. No other building system offers as many benefits in conjunction with its architectural flexibility as Quad-Lock does.*

//
– Mark Preston
Preston Architecture
Burien, WA

Quad-Lock the Company

Who is Quad-Lock

- Established in 1994
- Distributed through dealers in North America (USA, Canada and Mexico), and in the Caribbean, Europe, Africa and Asia
- Manufacturing facilities in Surrey (Canada), Atlanta (USA), and Austria (Europe)
- Quad-Lock is one of the few ICF companies to develop, manufacture and distribute a patented ICF system
- Sustaining member of ICFA/CICFI
- Quad-Lock is the only ICF manufacturer to be ISO 9001



Quad-Lock the Company

Quad-Lock is Environmentally Friendly

- ICFs are post-industrial, petroleum by-products
- ICFs are inert and non-toxic
- ICF construction waste is ~2% and can be re-used in the project
- Remaining concrete and EPS foam is recyclable
- Reduced use (and cost) of energy
- Life cycle assessment shows that additional energy used in manufacturing is recouped after approximately 5 years
- A concrete home saves as much as 50 trees

Quad-Lock the Company

Green Building Commitment

QUAD-LOCK® ICF & Concrete

Triple Bottom Line Contributions:

ENVIRONMENT

- Building Life Measured in Centuries
- Structural Integrity
- Construction Waste Can be Recycled
- No CFCs or HCFCs; No Off-Gassing
- Responsible Manufacturing Process

ISO 9001:2000 Certified Company

CONCRETE BUILDING SOLUTIONS — *IT'S TIME TO SWITCH*

QUAD-LOCK® ICF & Concrete

Triple Bottom Line Contributions:

SOCIAL

- Enhanced Safety and Security Against 'Catastrophic' Events
- Cleaner, Quieter, More Comfortable Interiors
- Superior Indoor Air Quality – Minimal Air Infiltration
- Sound Deadening – High STC Ratings
- Fire Ratings – up to 4 Hours

ISO 9001:2000 Certified Company

CONCRETE BUILDING SOLUTIONS — *IT'S TIME TO SWITCH*

QUAD-LOCK® ICF & Concrete

Triple Bottom Line Contributions:

ECONOMIC

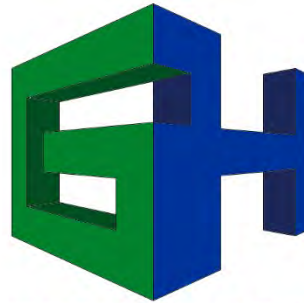
- Energy Efficient
 - Significant reduction in heating and cooling costs
- Smaller HVAC Sizing
 - Lower costs on equipment and installation
- Faster Construction Resulting in Less Financing Costs
- Lower Lifetime Costs for Building Operations and Maintenance
- Variable Wall Configurations
 - R-Values of R-22, R-32 or R-40
 - Better use of thermal mass

ISO 9001:2000 Certified Company

CONCRETE BUILDING SOLUTIONS — *IT'S TIME TO SWITCH*

Contact Us

Quad-Lock Building Systems' Dealer



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