

6 in 1 Design Advantages

In the design of any project, the selection of building materials is one of the first and major steps that are key to the overall project success, for many aspects. On the surface it sounds simple, conventional methods and traditional materials become an easy decision, but all buildings in today's market are being designed as a whole entity, working as a system to create a healthy and resilient environment. To really understand it, there is some research and education involved, especially for wall construction, to ensure products and assemblies are compatible and meet building and energy codes, plus function to building science standards.

What this means, is that conventional wall assemblies have become a collection of components, each to address specific elements like water, vapor, air, thermal resistant, structural capacity and resiliency. As a designer and contractor, the onus is more prevalent on each, to make the walls and the building envelope products and assemblies meet the specification for the end user. On the surface it may sound simple but now the codes are requesting third party testing and inspections, blower door testing and certifications to ensure the building envelope meets specific standards.

6 in 1 DESIGN SOLUTION

Research and education will lead the designers, contractors and owners to simpler solutions to meet or exceed today's building standards. The solution is Fox Blocks insulated concrete forms which provides SIX major building components into ONE product.

What this means as a 6 in 1 Design Solution is that Fox Blocks provides the structure, continuous insulation, air and vapor barriers, furring attachment surfaces and speed of construction with a reversible interlock. Plus, all the elements combined provide much more to the overall building envelopes performance and resiliency over time.

1. Structural Cast-In-Place Reinforced Concrete (ICF)

- A wall that is stronger than
 - Wood frame wall
 - Steel stud wall
 - CMU wall
- Flexible design for below and above grade walls
- Bearing walls, shear walls and resists lateral loads
- Secure rebar positions
- Design ability for large openings
- Wind resistant
- Seismic design



1. Structure
2. Continuous Insulation
3. Air Barrier, WRB
4. Vapor Retardant
5. Attachment Surface
6. Reversible Interlock

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- Fewer connection points - connections are typically the start of structural failure.
- Non-cavity wall
- Bullets don't pass through
- Air does not pass through
- Flying wind debris missiles do not penetrate the wall
- Not conducive to mold and rot
- Lightweight formwork that stays-in-place
- Easy and fast to install
- No capital investment for formwork
 - Do not need to take down after concrete placement and load up and deliver
 - Easier on personal physical health
 - More flexibility with design and construction
 - No concrete forming trucks on-site or roads
 - No form oil on site or ground

2. Continuous Insulation (double layer)

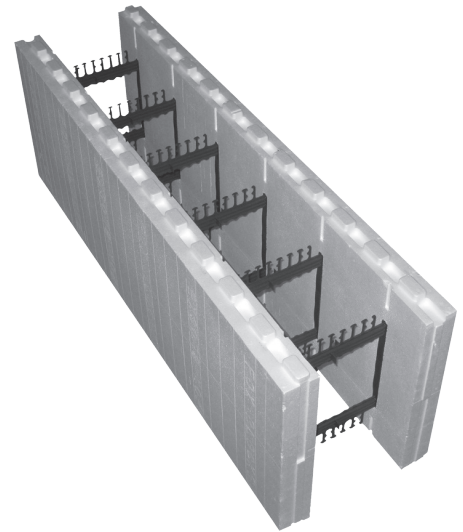
- 2 $\frac{5}{8}$ " thick expanded polystyrene (EPS) insulation on exterior and interior face of concrete wall
- R-23 continuous
- No thermal bridging or breaks
- Moderates temperatures on inside with insulation on both sides of concrete wall
- Not conducive to mold and rot
- Wood and metal stud walls place insulation place insulation in the wall cavity for the R-Value. The overall whole wall R-Value is decreased when factoring the R-Value of the studs. For example – a stud wall may have R19 insulation but the actual whole wall R-Value will be less than R16 due to the thermal bridging at each stud. Whereas a Fox Blocks wall is consistent with a continuous effective R-Value of R23 as a whole wall.
- Fox Blocks walls are more energy efficient and perform better than the initial R-Value due to the combination of R-Value, air tightness, no thermal bridging and the thermal mass

3. Air Barrier

- Monolithic concrete wall is the air barrier
- No additional membrane or air barrier needed
- Cleaner air with less indoor air contaminant
- Concrete walls do not require a weather resistive barrier

4. Vapor Retarder

- Fox Blocks wall assemblies act as the vapor retarder
- No additional membrane or retarder/barrier needed
- Fox Blocks does not promote mold, mildew or rot



Fox Blocks Standard Form

*Available in concrete core sizes -
4", 6", 8", 10" and 12"*

Refer to Fox Blocks Technical Bulletin -
Fox Blocks Product Line-Up

Refer to Fox Blocks Technical Bulletin on
CI, Thermal Resistance and Zero Energy
Ready Homes

Refer to Fox Blocks Technical Bulletin –
Air Barrier and Airtightness

Refer to Fox Blocks Technical Bulletin
on Vapor Barriers

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5. Furring Attachment or Studs

- Exterior and Interior face of Fox Blocks
- 1½" wide, continuously vertical, 8" o.c.
- More attachment locations than wood or metal stud walls
- No need for additional furring as required on CMU or traditional concrete walls
- No thermal bridging at fastening points
- Withdrawal and lateral load third party testing for fasteners

These 6 in 1 design advantages make building the exterior walls much simpler, with fewer components, less coordination of materials and sub-trades, not to mention speed of installation by using one product.

PERFORMANCE DESIGN ADVANTAGES

In addition to the 6 in 1 Design Solutions there are also many performance benefits that a Fox Blocks insulated wall assembly provides over conventional construction. Design performance advantages include- strength, resiliency, energy efficiency, fire resistance, sound attenuation, sustainability and overall speed of construction for faster completion.

1. Strength and Resiliency

- Reinforced concrete building envelope
- ACI 318 concrete design
- Below and above grade construction
- Capable for multi-story building designs, and high rise- 20 stories+
- Resiliency for high winds, flying debris
- Security, blast and ballistic protection
- Shearwalls, load bearing walls and interior demising walls
- Recognized by FEMA for safe rooms and community shelters

2. Construction and Schedules

- Reduces sub-contractors as a 6 in 1 product
- Improves scheduling, minimizes reliance on other crews, sequencing
- One step installation provides the 6 in 1
- Faster weathertight building allowing sub-contractors, such as electrical, mechanical, and drywall to begin earlier, as the ICF is constructed on upper floors.
- Construction in cold weather when other types of construction may shut down
- Big, heavy, expensive tools not needed
- Completion and occupancy of projects on time or sooner
- One Fox Blocks is 5.33 square feet of wall area



Fox Blocks Interlock



Fox Studs vs Wood Stud

Refer to Fox Blocks Technical Bulletins –
Studs and Fasteners

Refer to Fox Blocks Technical Bulletin –
Man Hour Rates

6 in 1 Design Advantages



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3. Building Codes

- Adopted by the building code
- Meets fire resistant ratings for up to 4 hours
- Meets sound ratings
- Meets or exceeds energy code R-Value requirements
- Meets requirements as a weather resistive barrier
- Meets or exceeds requirements as an air barrier
- Meets requirements as a vapor retarder
- Provides continuous insulation
- Approved for use on any type of building (Type I, II, III, IV, and V)

4. Architect Design

- High Recycled content per block (approximately 50% by weight)
- CAD and Revit (BIM) detail libraries
- Sustainability
- LEED v4 contribution
- Flexible – radius, curves, angles, heights, lengths, finishes
- Proven record for high performance buildings – schools, hotels
- Reduces risk

5. HVAC and Operating Systems

- Reduced energy loads facilitates lowering the size of the heating and air handling systems
- Overall lower heating and cooling operating costs
- Provides better control of air quality
- Fewer air changes from airtightness
- Less maintenance on operating equipment

6. Financial

- Speed of construction for faster occupancy
- Possible reduction in construction insurance
- Safety aspect, fewer sub-contractors, easy product installation
- High performance buildings influence – appraisers, banks and insurance
- Life cycle operating cost savings

7. Health and Comfort

- Airtightness for better control of indoor air quality
- Continuous insulation over mass walls stabilizing thermal comfort
- High performance on sound mitigation
- Overall a comfortable and safe building envelope

Refer to Fox Blocks Code Compliance
Research Report – CCRR-1010



Refer to Fox Blocks CAD details
and BIM Library



Refer to Fox Blocks Technical Bulletin –
Cost Savings – Material and Labor

6 in 1 Design Advantages



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SUMMARY

Consideration for a designer, contractor, developer, owner, to have both the opportunity to use 1 product that provides 6 basic design functions, as well as, numerous other performance advantages is something that Fox Blocks can provide.

Building and Energy codes are changing to recognize the performance aspects of the building envelope versus the prescriptive. This makes all the performance advantages that Fox Blocks offers in one product a true benefit.

Designing and constructing a high-performance building with all these advantages can be a simple and rewarding process with a long-term benefits for the building and the occupants.

Fox Blocks has a proven track record for all building types, residential and commercial. Check out the Fox Blocks website Case Studies for some of these building types that have utilized the advantages of Fox Blocks:

- Residential above and below grade walls
- Townhouses with fire rated demising walls
- Zero Energy Ready and Net Zero homes
- Hotels – multi-story
- Condominiums
- Student Residence, up to 20 floors
- Schools – high performance and Net Zero
- Gymnasiums – tall walls
- Buildings of Worship
- Theaters
- Fire stations
- Community shelters and administration buildings
- Industrial plants and warehousing
- Commercial and retail buildings

www.foxblocks.com
www.youtube.com/foxblocksairlite



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