



ENERGY CODE CHANGES - CONTINUOUS INSULATION

Continuous Insulation Requirements - What does this Mean to Me?

Change is inevitable in the construction industry.

As we look ahead, this current year and into next, many states (if not already done so), will be considering adoption of the International Building Code (IBC) 2012 Energy Code Requirements. This will be a notable change in some buildings, particularly as it relates to building envelope design, construction, required efficiency of heating, ventilation and air conditioning systems.

Code revisions are implemented at the Federal level every few years, and then after State review, modified as necessary and adopted and incorporated locally at either the state or county level. In the State of Minnesota, codes are updated every three years and the IBC for 2012 builds upon and clarifies the 2009 codes. Minnesota skipped adopting the 2012 IBC due to a lack of resources to perform the extensive reviews. “As a result, there is some catching up to do for that particular state in terms of examining the impact of 2009’s changes and proposing amendments,” says Dave Haaland, architect and code specialist with UrbanWorks, Minneapolis. “IBC also works in concert with the International Conservation Code—they reference each other—which makes reviewing them even more complicated.”

Building Performance and Costs will be affected

Code updates serve two primary purposes: ***provide guidance to developers, designers and construction professionals in incorporating enhanced standards into new projects, and ensure state specific uniformity in performance and compliance.*** Because many changes also affect building performance and the associated costs, it is important to understand how the IBC – 2012 will influence the design, construction and costs of your project.

Changes adopted in states such as Iowa and Wisconsin (and scheduled later this year for states such as Minnesota), are a large part related to energy efficiency, tighter envelopes, window improvements and wall assemblies enhancements. Given commercial buildings rank among the largest consumers of energy, their construction and design will be the projects most significantly affected.

The challenge of these changes for architects, developers and builders will be to choose systems and materials that are most effective in meeting the new standards. Some States have an approach that creates numerous different interpretations, so working with a knowledgeable design professional and construction service partner that understands local adoption and enforcement is extremely important. Each specific change can carry cost and design implications, and deserves a careful review with your construction and design professional partners.

Gerhard Guth, staff code specialist for HGA Architects, Minneapolis, and chair of AIA Minnesota’s Building Codes Committee, acknowledges the incremental costs involved in incorporating these changes into the design and construction process, but says “the markets will respond, and new products and systems will alleviate some of those costs as time goes by.”

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Material suppliers identify how the code changes impact their own products, and frequently make modifications to correspond to a particular project's code requirements. This article will concentrate on areas of the code change that can impact the exterior building envelope design and the insulation or continuous insulation requirements outside the building sheathing surface.

#1 - Exterior Envelope.

One of the more significant cost impacts of the updated codes is related to changes in exterior envelope design that requires higher performing insulated envelope assemblies and air barriers. The degree of change is driven by which climate zone the project is located in. Code requirements can change how a design professional approaches items like building insulation, finishes and openings. Modifying a building's insulation, type and application/connection methods of exterior finishes impacts building costs more in some regions of the country vs. others. See the following **Detail A** that outlines the U.S. Climate Zones and the IBC code requirements associated with each. The southerly states below the Frost Belt will have little to no change to current envelope insulation design, but northern states and locations that extend into Canada will have more stringent envelope insulation requirements that will drive notable design and cost considerations.

GENERAL R-VALUE REQUIREMENTS FOR U.S. CLIMATE ZONES COMMERCIAL BUILDINGS WITH WOOD FRAMING

ASHRAE 90.1-2010 Code Requirements		IBC 2012 Code Requirements	
ZONE 1-	R-13.0 / NR	or	R-20
ZONE 2-	R-13.0 / NR	or	R-20
ZONE 3-	R-13.0 / NR	or	R-20
ZONE 4-	R-13.0 / NR	or	R-20
ZONE 5-	R-13.0 / R-3.8 c.i.	or	R-20
ZONE 6-	R-13.0 / R-7.5 c.i.	or	R-20 / R-3.8 c.i.
ZONE 7-	R-13.0 / R-7.5 c.i.	or	R-20 / R-3.8 c.i.
ZONE 8-	R-13.0 / R15.6 c.i.	or	R-20 / R-10 c.i.
c.i. = CONTINUOUS INSULATION, NR = NO (INSULATION) REQUIRED		c.i. = CONTINUOUS INSULATION, NR = NO (INSULATION) REQUIRED	

To view your state's specific compliance regulations visit:
<http://www.energycodes.gov/compliance>

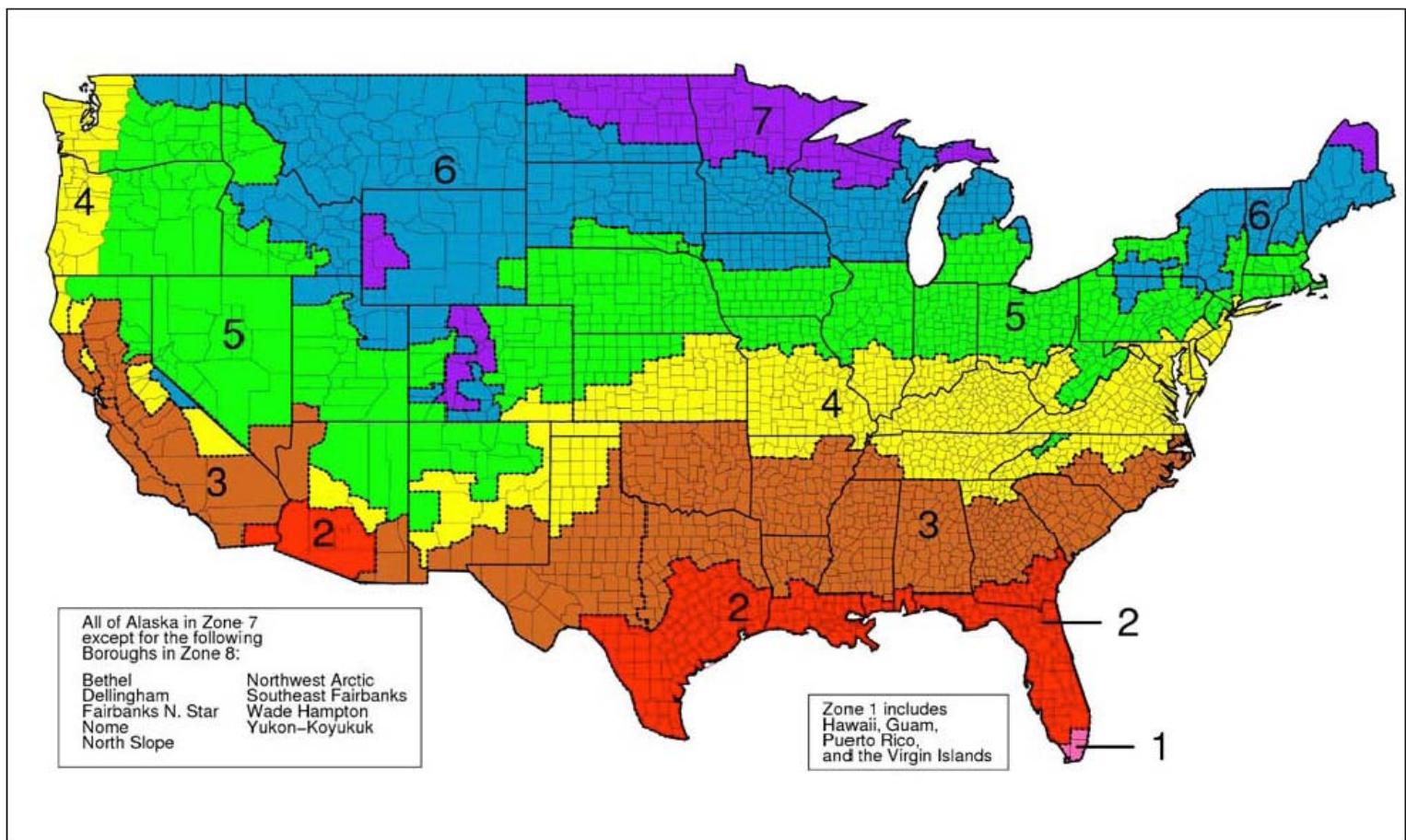
Detail A - Requirements

THE R-VALUES AND CLIMATE ZONE DIAGRAM IS FOR REFERENCE ONLY AND MAY NOT COMPLY WITH YOUR CURRENT BUILDING CODE., ALL REQUIREMENTS SHOULD BE CONFIRMED WITH YOUR STATE AND LOCAL BUILDING CODES PRIOR TO INSULATION SPECIFICATION.

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U.S. CLIMATE ZONES for C.I. REQUIREMENTS



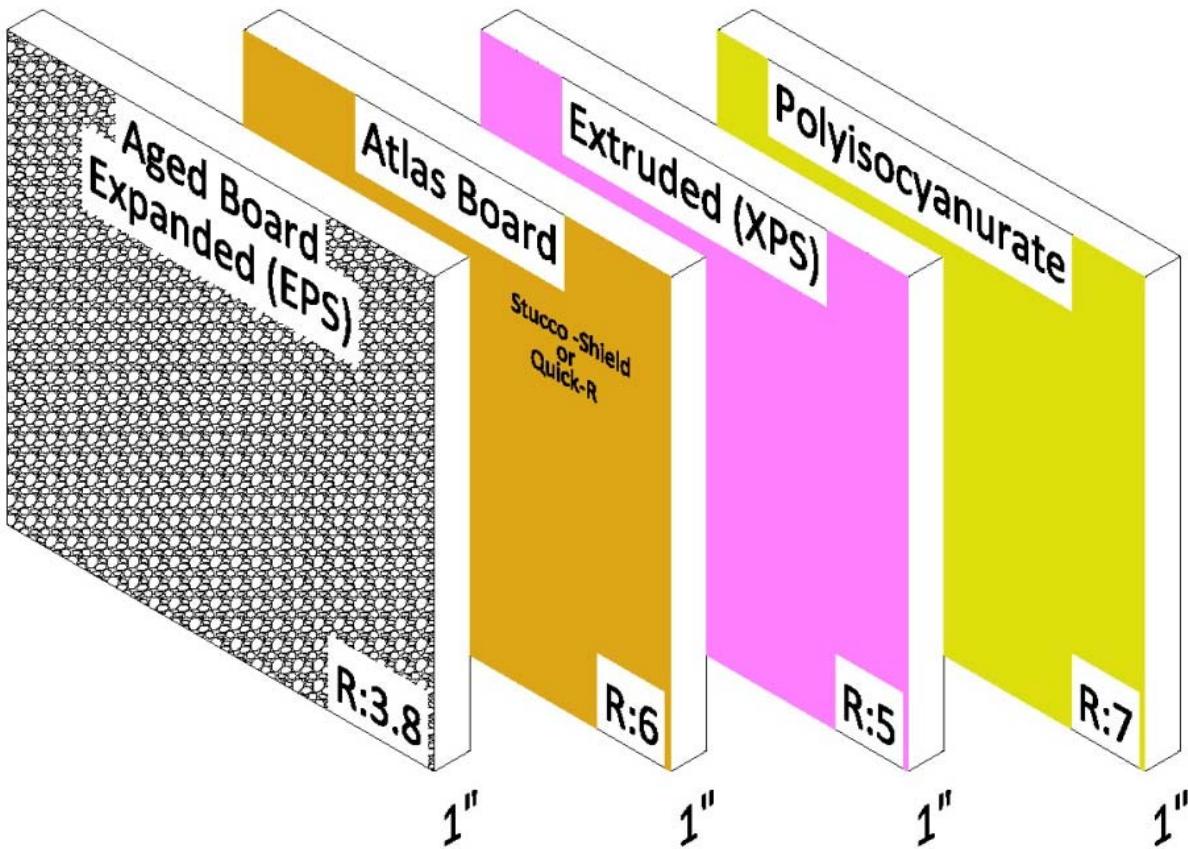
GENERAL R-VALUE REQUIREMENTS FOR U.S. CLIMATE ZONES
COMMERCIAL BUILDINGS WITH WOOD FRAMING

Detail A - Climate Zones

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#2 - Insulation & Cavity Ventilation.

With an enhanced R-value requirement and the potential need to incorporate some level of outside continuous insulation (depending on climate zone location) updated exterior fenestration and finish designs will need to be revised. Sandwiched insulation thicknesses from 5/8" to 1 ½" may be required. **Detail "B"** shown below provides some insulation types to consider and the R-Value per inch of thickness.



Detail B - Popular Insulation Types

Insulation Types:

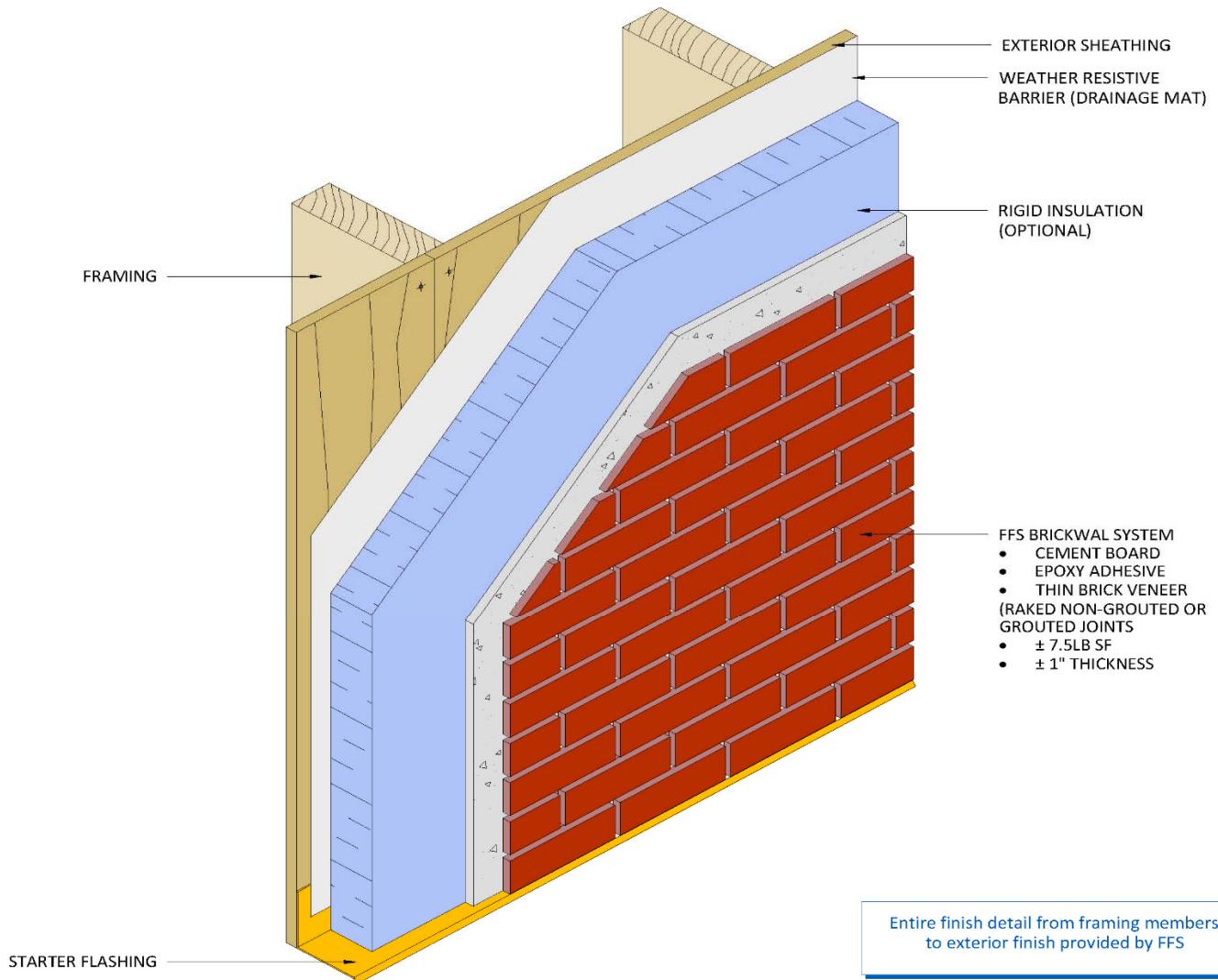
Depending on the exterior wall framing thickness, the R-Value of the cavity wall insulation, and the climate zone the project is located in, some type of continuous insulation could be required around the exterior perimeter of your project. If a 2x4 wall is used that provides a wall cavity R-Value of 13, an R-Value of either 3.8 or 7.5 could be required. If a 2x6 wall is utilized that would provide an R-Value of 20, either an R-Value of 3.8 or nothing could be required. If continuous outsolation is required, the thickness of the insulation depends on the type of insulation selected. An EPS board has the least R-Value per inch and Polyisocyanurate has the greatest R-Value per inch.

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The following **Detail "C"** gives an example of continuous insulation placed into an exterior wall assembly that incorporates FFS BrickWal as the finish veneer. **See Detail C.**

This drawing represents a generic detail for illustration purposes only.
Actual details utilized may vary due to specific project requirements.



Detail C - Insulation Wall Finish Example

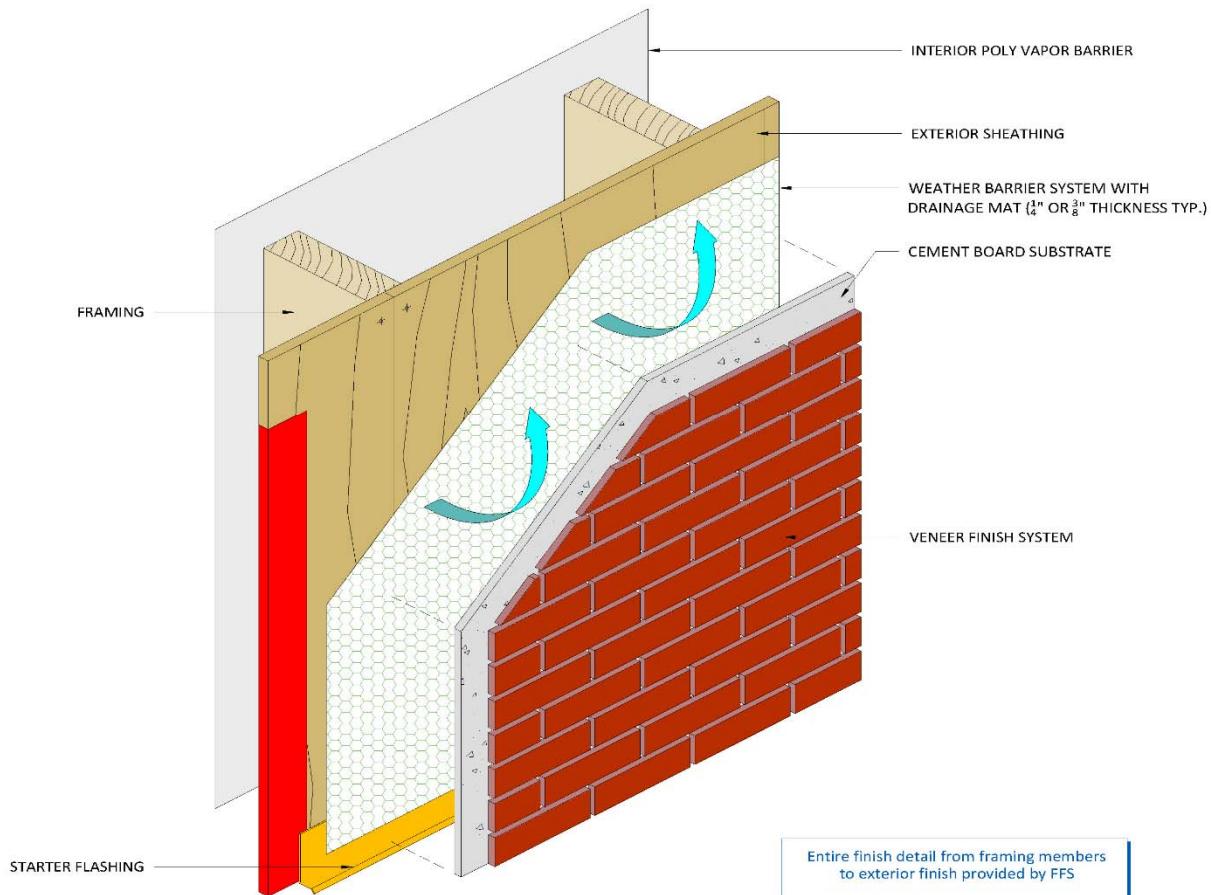
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Another design enhancement gaining popularity is exterior cavity wall ventilation/drainage. This is sometimes referred to in the industry as a “Rain Screen” system. Residential and commercial projects are giving this approach additional consideration. When design professionals have concern or need for an interior vapor barrier, a ventilated cavity can provide additional protection. Pressure equalization and trapped water vapor concerns are minimized with a rain screen design.

A number of products are currently available that work in conjunction with exterior wall finishes to address this enhancement. **See Detail D.**

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Detail D - Rain Screen Approach

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Panelized Construction.

A factory panelized project, constructed in a controlled environment, will help mitigate the higher field labor costs associated with the code compliance while providing a more predictable level of end product quality. This panelized approach, when combined with FFS factory applied veneer finishes meets or exceeds the design requirements of a project.

(Further information provided in upcoming issues of *Fullerton Finish Systems News*)

Fullerton is Here to Keep You Informed

At the Fullerton Companies, we always strive to be a valuable resource to keep you informed on the changing dynamics of our industry. With the continuous insulation code change, we at Fullerton have already changed our existing details and available products to meet or even exceed these new standards.

Our commitment to leadership in the construction and building materials industry means we are well ahead of the industry in incorporating significant code improvements into our products and services before they are widely mandated.

Our pledge to you is remaining a proactive leader in changing or developing products for the industry and customers we serve. If you have any questions or want to discuss this directly, we welcome your call.

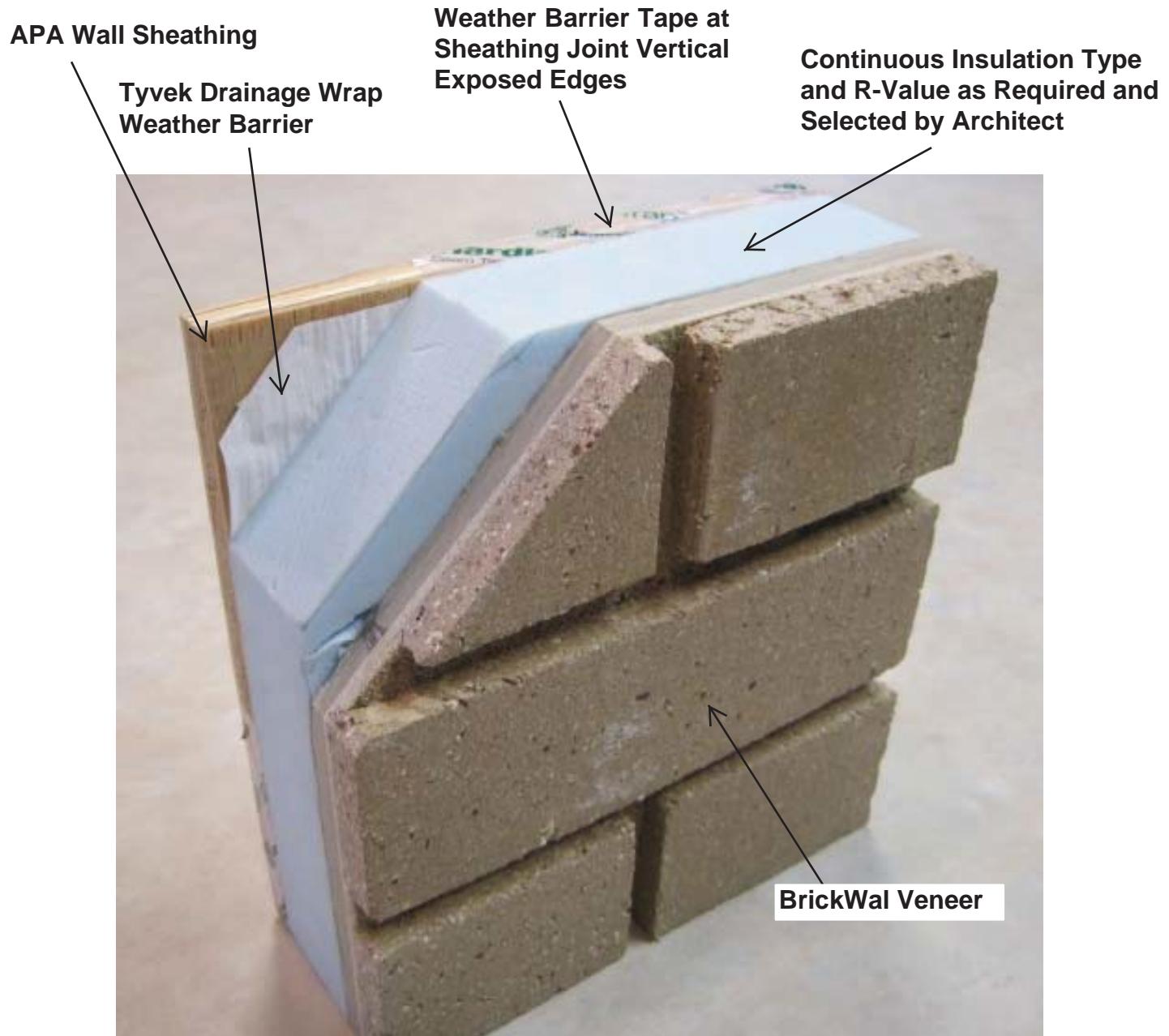
Best Regards,

A handwritten signature in blue ink that reads "Dave Walock".

Dave Walock
President/CEO
Fullerton Companies

SAMPLE MOCK UP – Wall Finish Veneer

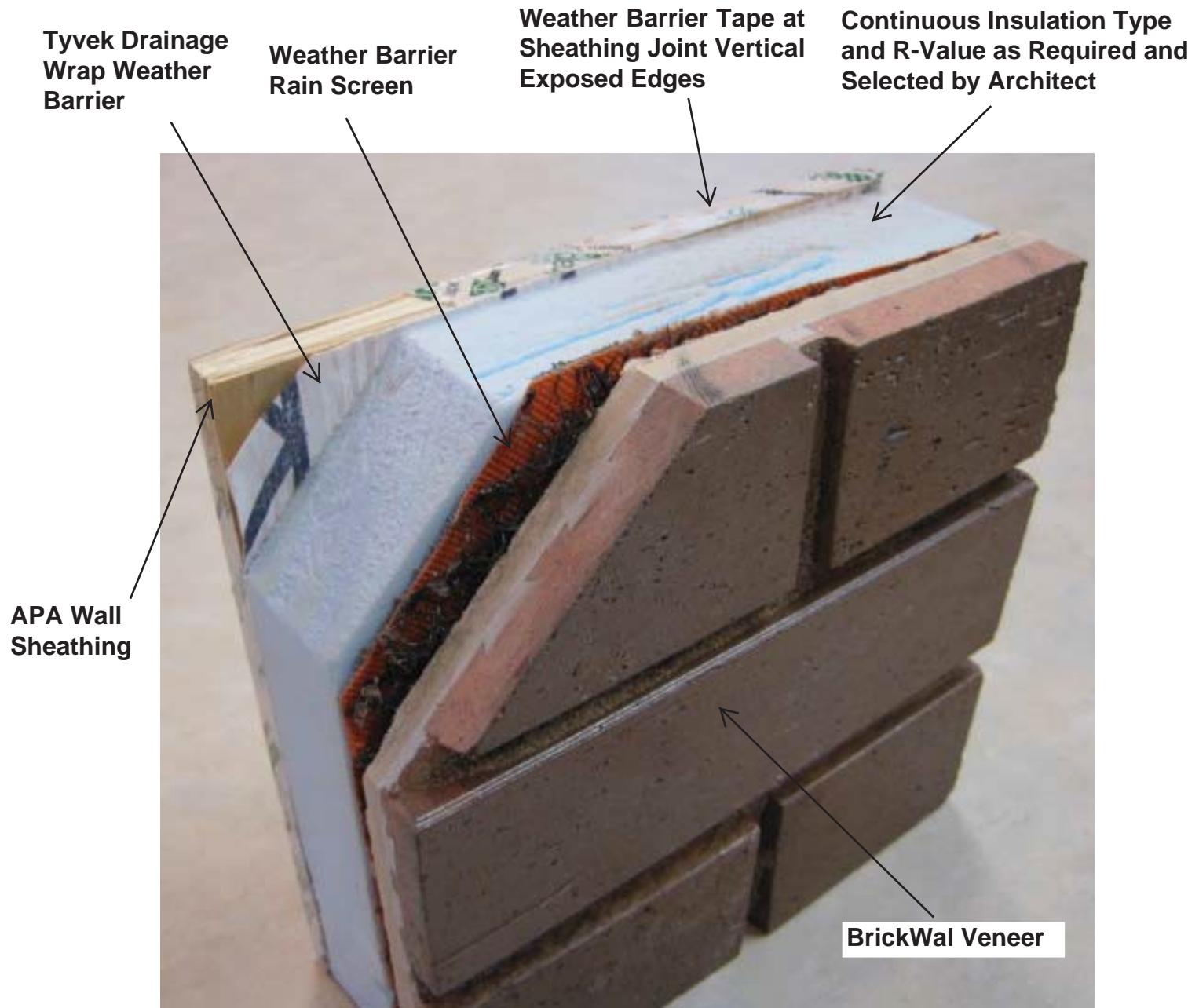
BrickWal Finish Veneer – With CI:



Standard Detail With Continuous Insulation Added

SAMPLE MOCK-UP - Wall Finish Veneer

BrickWal Finish Veneer – With CI & Rain Screen Added:



**Detail With Continuous Insulation & Rain Screen
Added**

SAMPLE MOCK-UP - Wall Finish Veneer



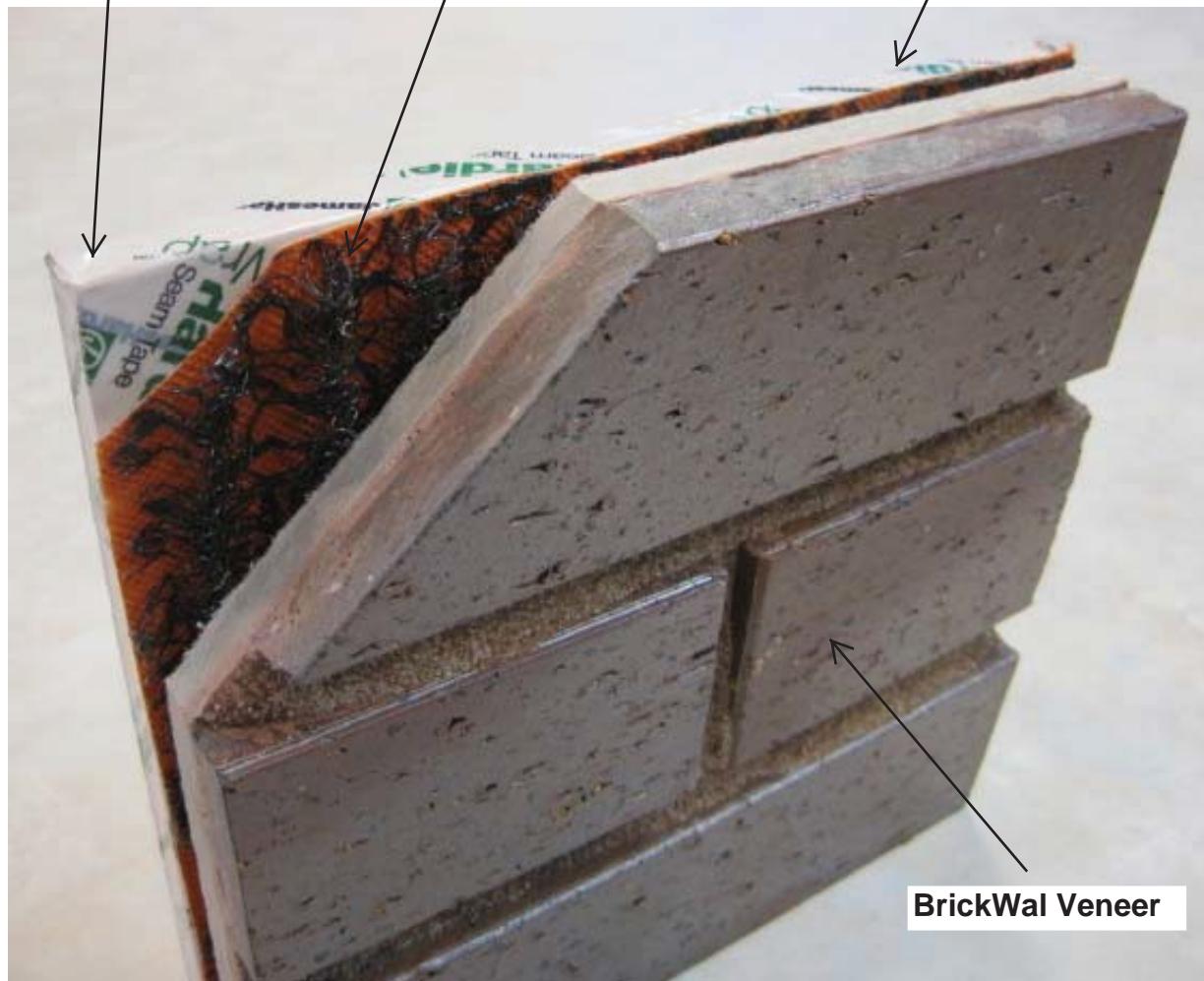
BrickWal Finish Veneer – With No CI & Rain Screen Type

Weather Barrier:

APA Wall Sheathing

Weather Barrier
Rain Screen

Weather Barrier Tape at
Sheathing Joint Vertical
Exposed Edges



Detail With No Continuous Insulation & Rain Screen Weather Barrier

SAMPLE MOCK-UP - Wall Finish Veneer**BrickWal Finish Veneer – No CI:**

APA Wall Sheathing

Tyvek Drainage Wrap
Weather BarrierWeather Barrier Tape at
Sheathing Joint Vertical
Exposed Edges

BrickWal Veneer

**Standard Detail With No Continuous Insulation**