

The Rainscreen Blame Game And a Real World Solution





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Learning Objectives

- Explore the history of rainscreens and the origins of the concept.
- Differentiate between the two types of rainscreens; drain back ventilated (DBVR) and pressure equalized. (PERS)
- Classify the different components of rainscreens and their effectiveness in real world situations.
- Determine the best way to warrant a project including the rainscreen principal.
- View and assess several case studies regarding successful and unsuccessful rainscreen installations.



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The EDA Envelope

Encompasses multiple self-performed services including exterior waterproofing, air & vapor barriers, and installation of all types of roofing and wall panel systems.

EDA then backs the entire job with a single source warranty guaranteeing quality control and accountability under **one company**.





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What is a Rainscreen?



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The Rainscreen Principal

Conventional wall design is called a “single barrier system” or “front seal” system:

- The outer shell of the system provides 100% defense against air/water infiltration.

Rainscreen Systems are comprised of an “Outer leaf” and an “Inner leaf”:

- The Outer Leaf **provides sheds and controls** the majority of water (but not all), provides UV protection and aesthetics.
- The Inner leaf provides final moisture barrier, air and vapor barrier, sub-framing support and insulation.

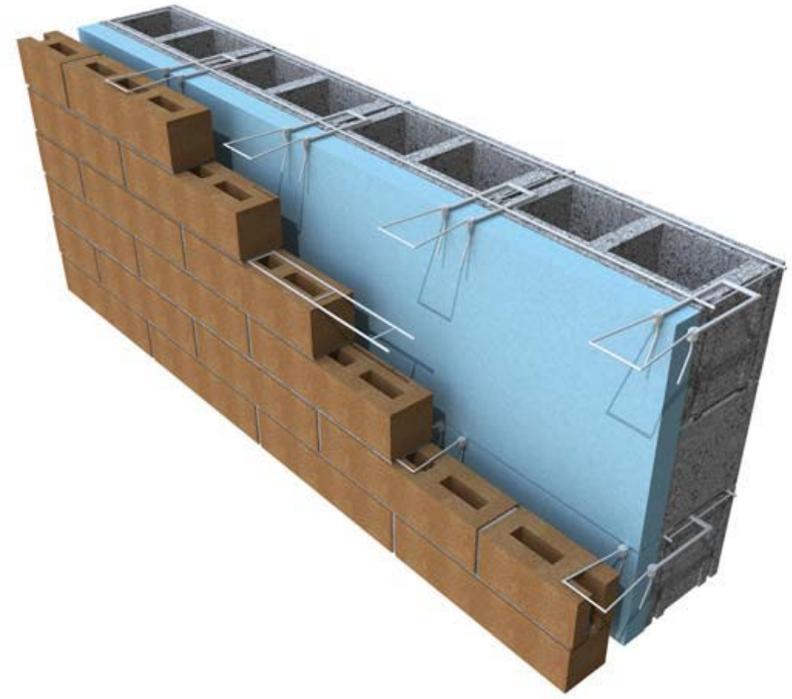


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- Masonry Cavity Walls developed using damproofing over concrete or block with a brick face.
- An Air Cavity allows for the moisture to weep down and through wall flashings allow for drainage.





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- The last 25 years have had a dramatic rise in scientific and product development. Improvements in air barriers and insulation have lead the way allowing for an explosion of cladding options; which are now available that traditionally were not.



Virtua Moorestown Fitness Center, Moorestown, NJ



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Types of Rainscreens



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- The MCA (Metal Construction Association) in conjunction with AAMA (American Architectural Manufacturers Association) developed standard testing methods for Rainscreens.
 - ▶ 2007 – AAMA 508-07 test developed for Pressure Equalized Systems
 - ▶ 2009 – AAMA 509-09 text developed for Drain Back Ventilated Rainscreens



Note: The two design methods are distinct and elements from one design SHOULD NOT be intermingled with elements from another.



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“Drain Back Ventilated” Rainscreen System or “DBVR”

- DBVR Approach allows water to pass through the outer leaf
- DBVR Approach must have a method for draining water
- DBVR Approach requires ventilation cavity to allow water and moisture to drain
- Standard Test Method is AAMA 509-09



Rutgers Institute for Food, Nutrition & Health, Rutgers University, NJ
Cook Campus - New Brunswick, NJ
- 7" of Mineral Wool -



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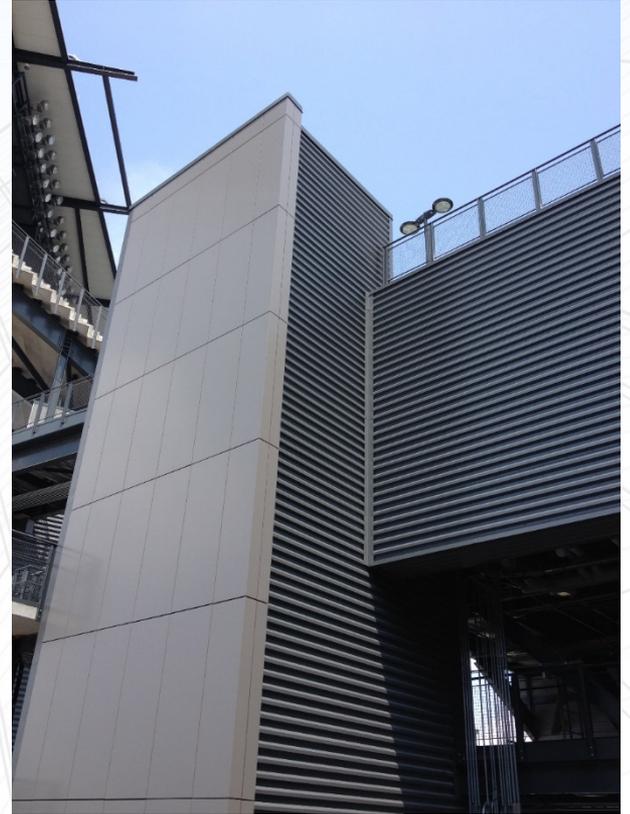
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“Pressure Equalized” Rainscreen or “PERS”

“Pressure Equalized” Rainscreen or “PERS”

- PERS systems allow air and water vapor to pass through the outer leaf but not water
- PERS systems require “compartmentalized” design and ventilation to allow for pressure within the system to equalize to outside pressure within a specified time
- PERS systems require a compartmentalized ventilating cavity for pressure equalization and a weep system for trapped moisture
- PERS systems require a non permeable air and vapor barrier
- Standard test method is AAMA 508-07



Lincoln Financial Field, Philadelphia, PA

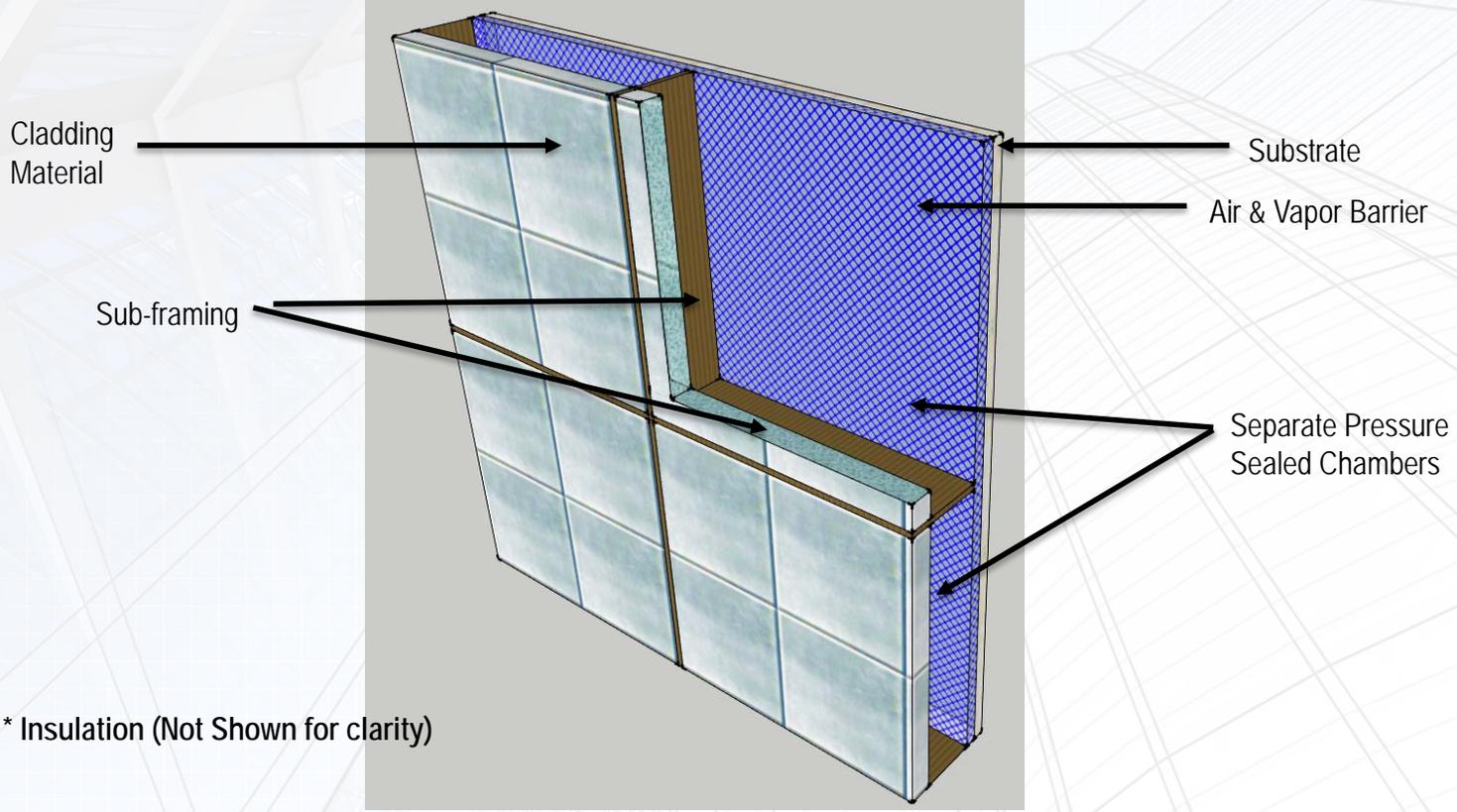


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Pressure Equalized Rainscreen (PERS)



* Insulation (Not Shown for clarity)



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Components Of A Rainscreen



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Air & Vapor Barriers

GRACE
Construction Products

Henry[®]

CARLISLE

VAPRO  **SHIELD**[®]





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Air & Vapor Barriers

- Air and Vapor Barriers can be vapor permeable or non-permeable.
- Options include Peel & Stick membranes or Liquid applied membrane
 - *Liquid tough in **cold weather** and to spray in city environment*
- As IBC 2012 gets implemented the Air & Vapor Barriers will need to be part of a tested NFPA 285 assembly.



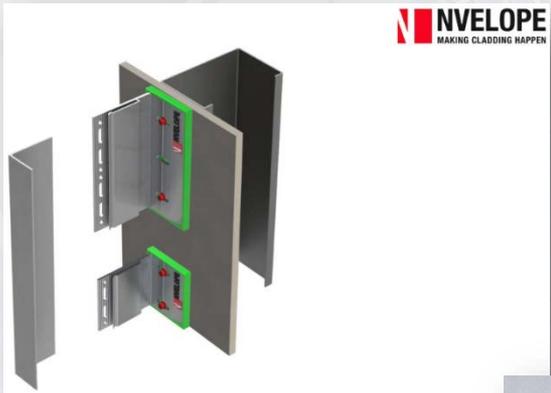


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Subframing Systems



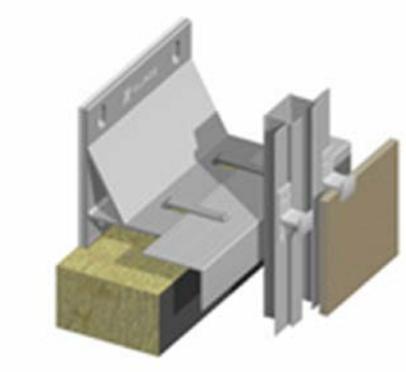
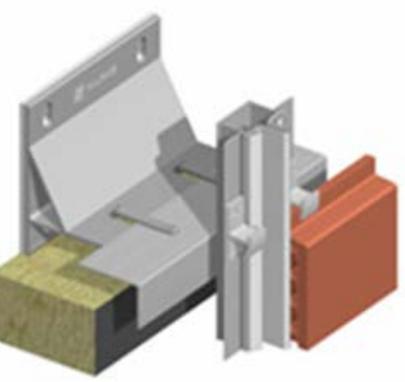
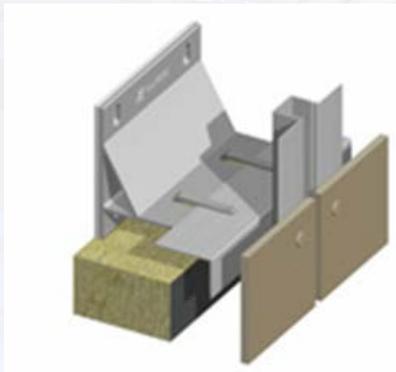


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Subframing Systems





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Subframing Systems

- Necessary to support cladding system
- Can be simple Zee Girts or hats to studs. Other systems need multiple layers or adjustability in the system.
- Can be designed to reduce Thermal Bridging
- Materials range from G-90 Galvanized, Galvalume, Stainless Steel or Aluminum. Corrosion resistance should be a consideration when designing the system.





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Types of Insulation For Rainscreen Applications



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Extruded Polystyrene

- Good R-Value (R-Value about 5 per inch)
- Does not meet NFPA 285 fire testing so it cannot be used in construction above 40'



Temple Pearson Hall, Temple University, PA



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Mineral Wool

- Inexpensive
- Exempt from NFPA 285 fire testing as it is not a “foam plastic”
- Low R-Value (R-Value about 4 per inch)



Virtua Moorestown Fitness Center, Moorestown, NJ



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Closed Cell Polyiso Insulation

- Most Expensive
- Some blends will meet NFPA 285 in certain assemblies
(Dow Thermax, Hunter XCI Class A)
- Good R-Value (R-Value 6.5 per inch)



Cooper Cancer Institute – Cooper University Hospital, Camden, NJ



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Cladding Material Options



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Exterior Façade Manufacturers

TREMCO

SWIRNOW BUILDING SYSTEMS

NeaCera® Terra-cotta Solutions by AVENERE CLADDING LLC

TRESPA®

FUNDERMAX®

for people who create

CORIAN® DESIGN

CENTRIA

TAKTL®

KANALCO LTD.

VMZINC

Prodema®
Made to last wooden Products



SHILDAN Group
Design your passion. Build with ours.

[fibre C]
NORTH AMERICA

Kalzip®

StoneLite™

ALPOLIC®
MATERIALS

Stonepanels®

NBK | ARCHITECTURAL TERRACOTTA

ALCOA

ALUCOBOND®

RHEINZINK®

KEMPER SYSTEM



Composite Panels

BUI
INNO
CONF



Salvation Army, Philadelphia, PA



Bridge on Race, Philadelphia, PA

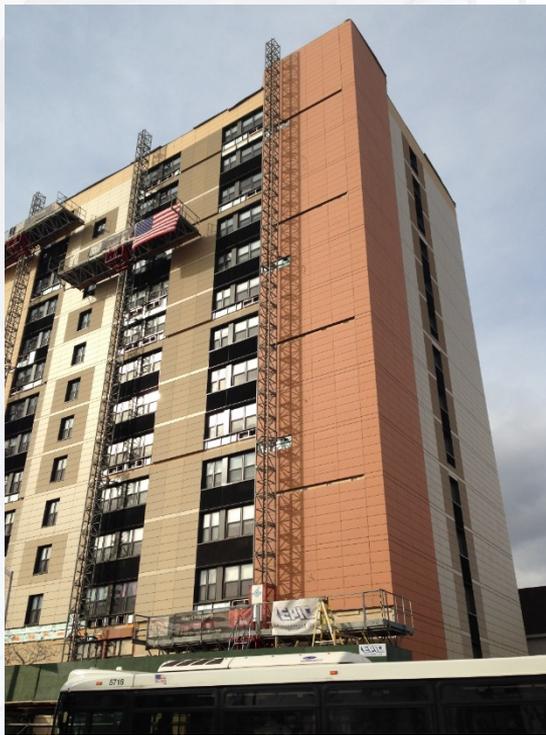


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Terra Cotta



Harborview Apartments, Jersey City, NJ



Rutgers School of Pharmacy, Piscataway, NJ



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Phenolic Panels



Camden Prep, Camden, NJ



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Metal Plate Panels



2110 Walnut Street - Philadelphia, PA

Fiber Concrete



Adelphi University – Nexus Building, Garden City, NY



MSK Middletown Hospital – Middletown, NJ



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Ceramic Tile



UPCOMING – University of Pennsylvania – Wharton
Academic Research Building

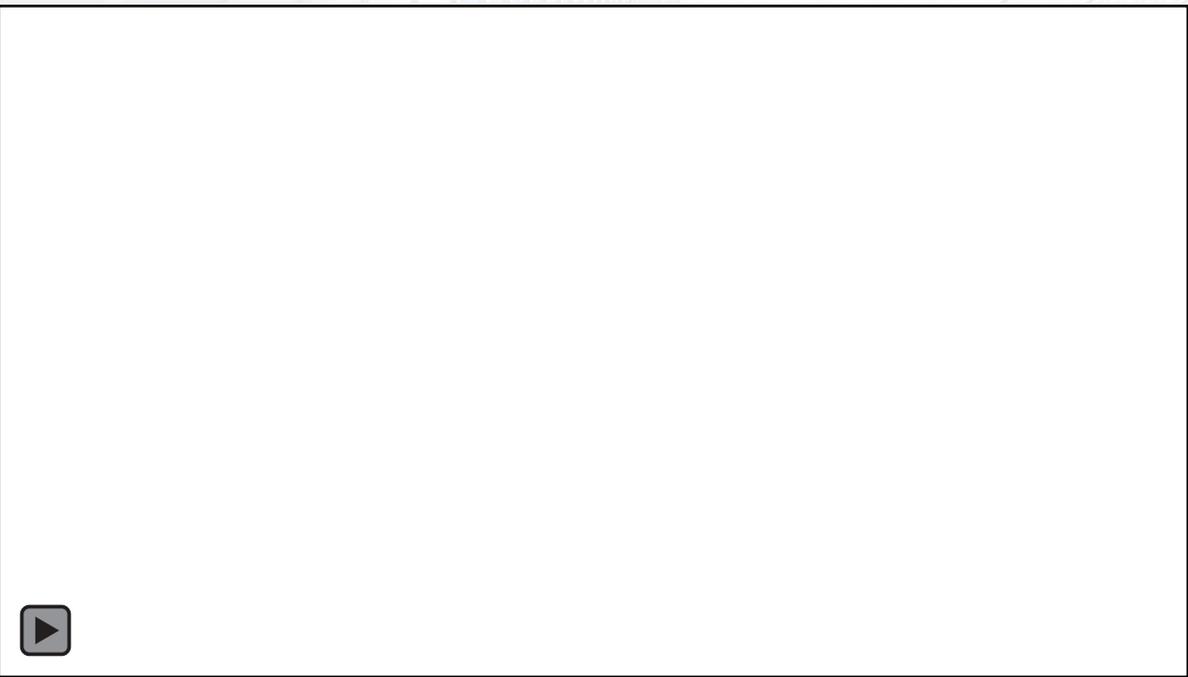


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Stone



Jefferson University Health Center
Cherry Hill, NJ



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ASHRAE Standards

- New Building Insulation Standards Coming up in IBC 2012 and 2015
 - New standards require “Continuous Insulation” and are designed to eliminate “Thermal Bridging”. (Insulation within the stud cavity loses 50% R-value rating per new ASHRAE Standards)
- “Outboard” Insulation is also key in alleviating problems associated with water condensation by moving the dew point further out in the wall assembly



“Thermal Bridging”



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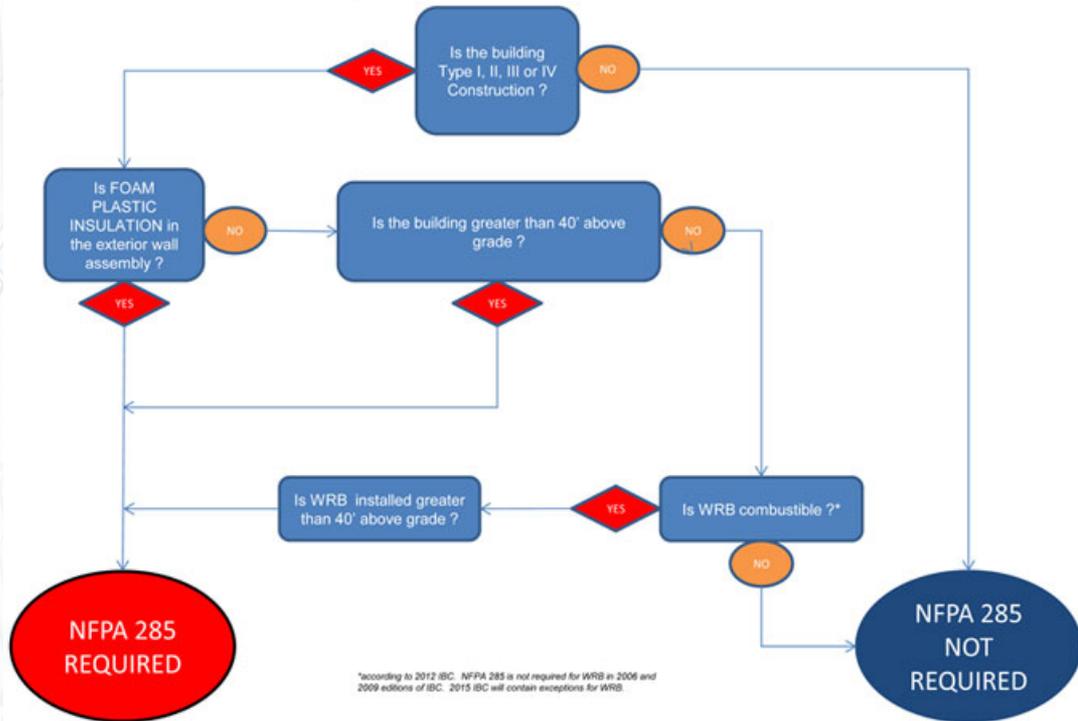
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NFPA 285

- Multistory Burn Test, which tests fire propagation through the exterior wall assembly.
- Test is system specific not product specific.
- Changes in IBC 2012 include Air Barrier being tested.
- Criteria to determine if NFPA 285 applies.

NFPA REQUIREMENTS ACCORDING TO 2012 IBC





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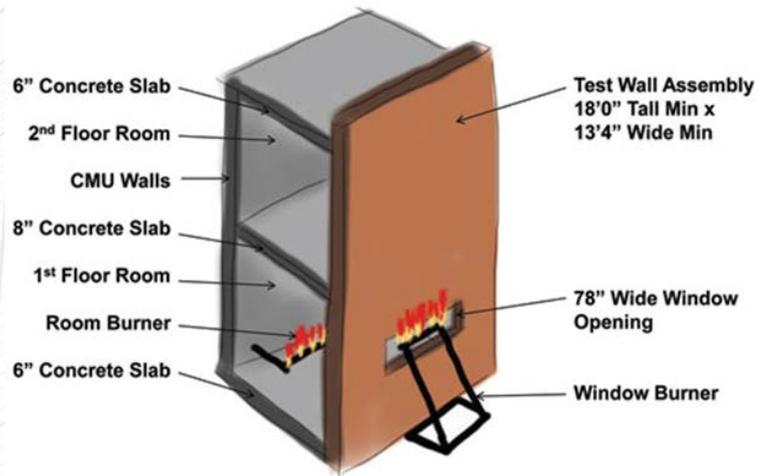
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NFPA 285



NFPA 285 Fire Test - Components





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Moisture Control/The Blame Game

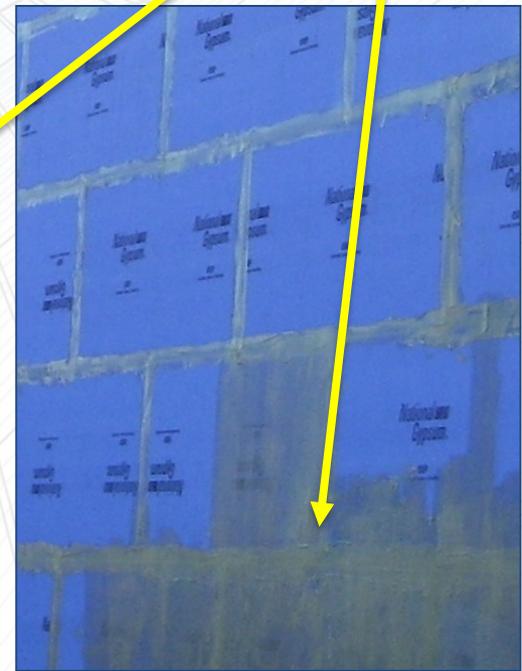
- The Air and Vapor Barrier (AVB) is the primary protection against air and moisture infiltration into the building.
- The AVB is an integral and important part of the Rainscreen system.
- The company installing the Rainscreen needs to be integrally involved in the design and installation of the AVB if they are to insure the overall performance of the system.
- Here's why?



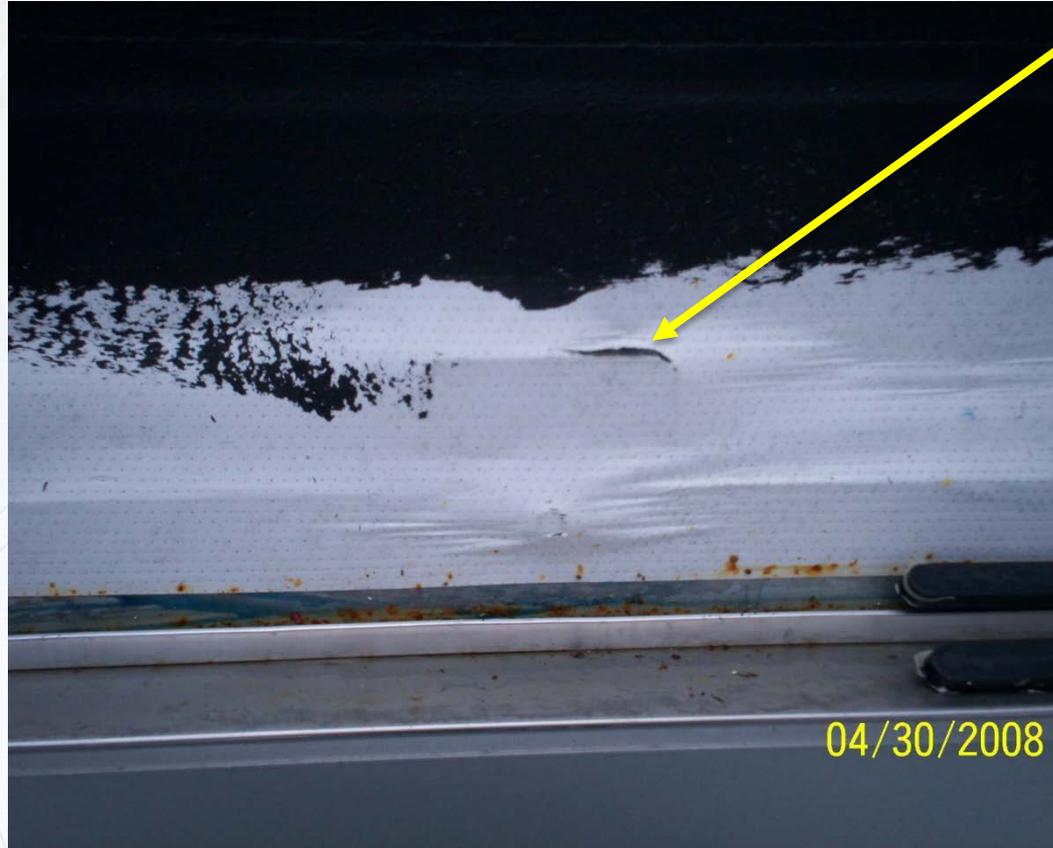
Air and Vapor Barrier installed too thin.



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Cuts in Air and Vapor Barrier.



04/30/2008

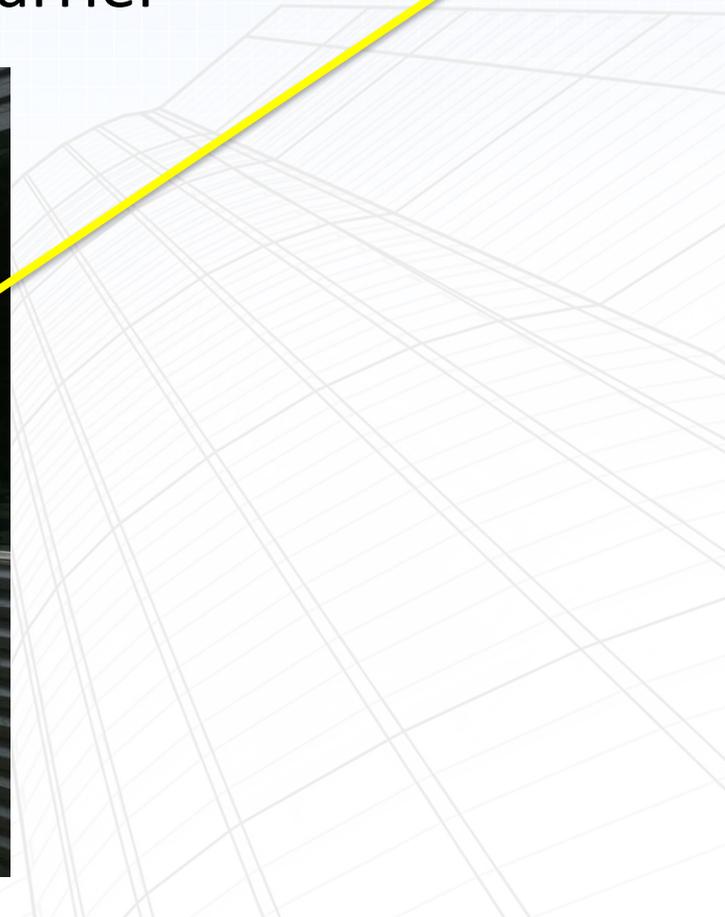


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Incorrectly installed Weather Barrier



Tyvek & Butyl sealant do not marry



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Improper Termination



Blueskin NOT adhered properly



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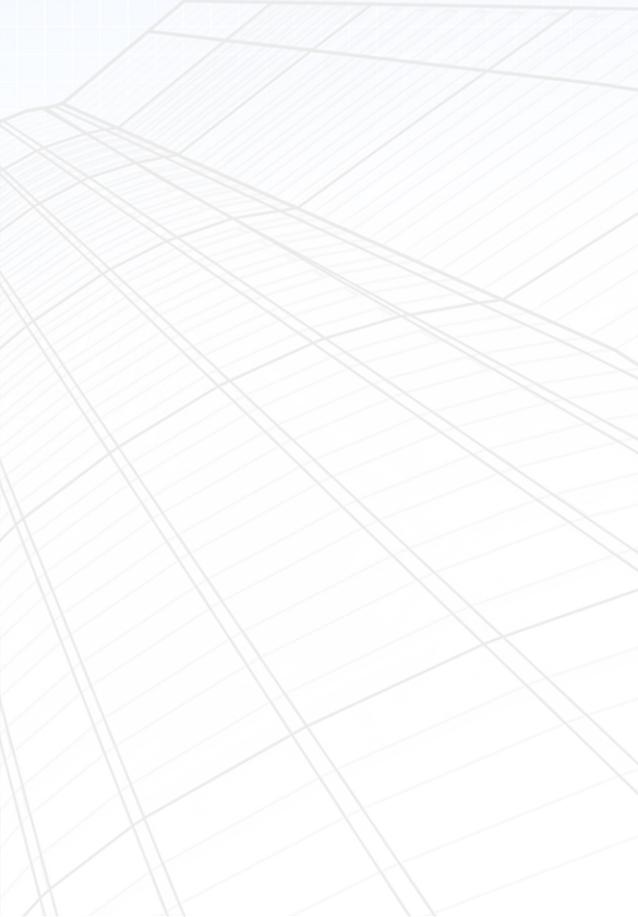
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Multiple AVB's – Warranties Void



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AVB Coordination



*AVB Punctured by another trade, EDA
Envelope CAUGHT IT*

AVB Coordination



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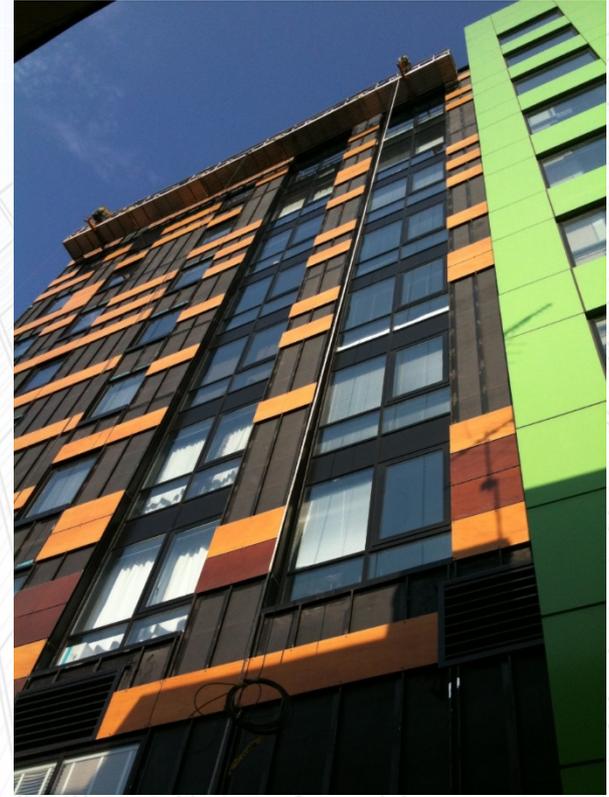


AVB Coordination OFF – Taped over safety rails



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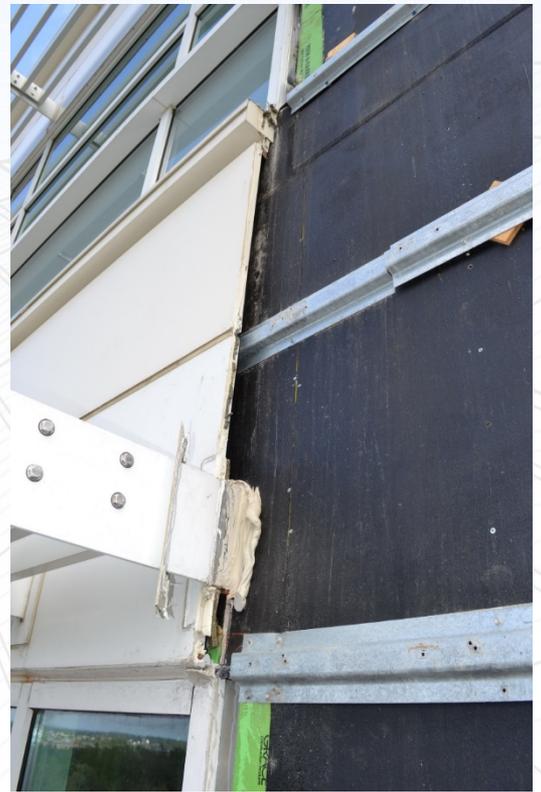
Unsuccessful Rainscreens



Chestnut Street, Philadelphia, PA



Unsuccessful Rainscreens



York Hospital, York, PA



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Unsuccessful Rainscreens



Arch Street, Philadelphia, PA

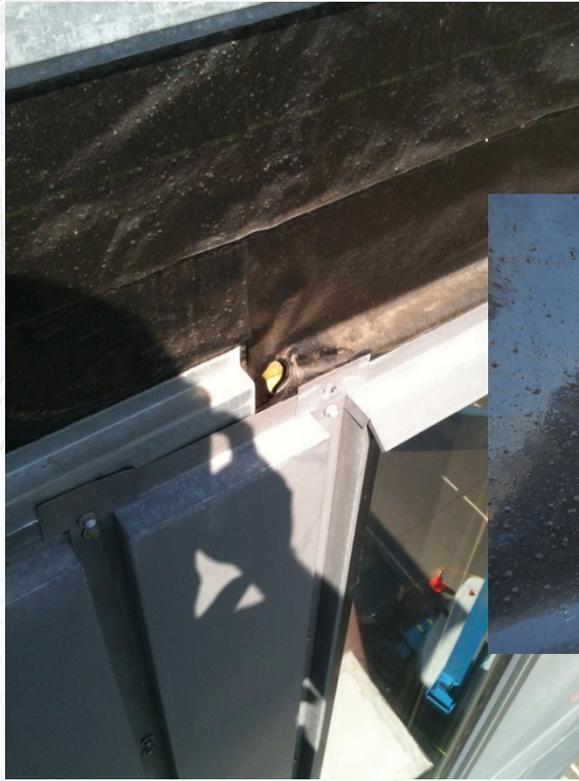


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Unsuccessful Rainscreens



Arch Street, Philadelphia, PA
-Reverse Lapping-



Unsuccessful Rainscreens



Before



During

Arch Street, Philadelphia, PA
Added 2" of air space



After



What Can You Do? – Quality Control Among Trades

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EDA Rain Screen Inspection Form

Project Name and Number:

Location of area being signed off:

**** A Representative from EDA Contractors and EDA Construction must initial each box**
**** NO FRAMING OR PANELS ARE TO BE INSTALLED UNTIL THERE ARE 1 SIGNATURES IN EVERY "APPROVED" BOX. ANY ACTION ITEMS WILL BE RE-INSPECTED FOR APPROVAL**
**** Pictures of each location will be filed with this form for future reference**

	APPROVED		NOT APPROVED	ACTION ITEM
	Contractors	Construction		
Thickness of air barrier sufficient	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Bhueskin flashing smooth with no fish mouths	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Mesh tape at joints is completely covered	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
No holes or voids in the membrane observed	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Membrane fully cured and ready for framing	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Manufacturer's Representative observed this location	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Flashing at doors and windows installed per details	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Products Used:



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Misrepresented Warranties





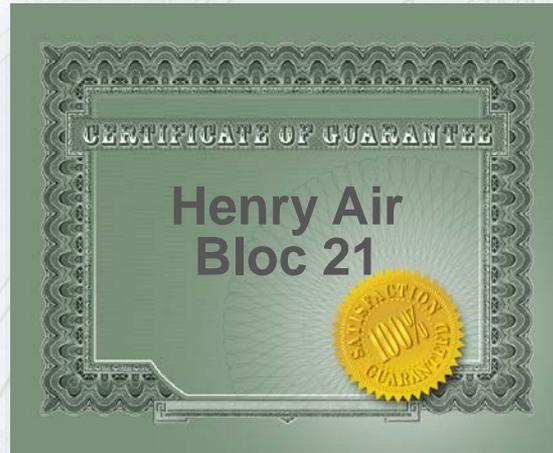
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Misrepresented Warranties

- What This Warranty Does Not Cover.
- The Contractor who installs the Product is not a representative, agent or employee of HENRY. HENRY therefore does not warrant or guarantee the workmanship of the Contractor.





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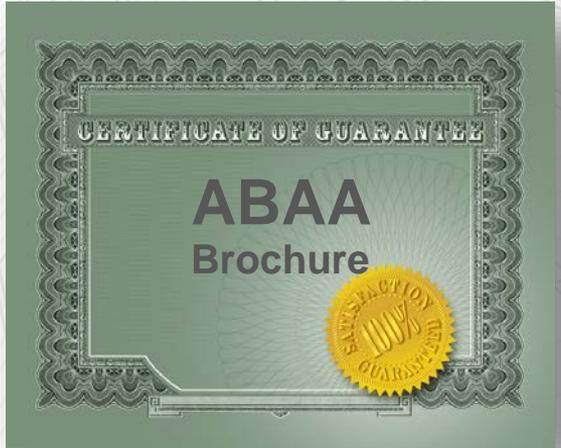
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Misrepresented Warranties

- All of this is attained at a minimal cost of \$0.085 per square foot of the air barrier material being installed, which is included in the ABAA accredited contractors bid.

★ This program does not constitute a warranty.



Good Warranties



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Firestone Red Shield Warranty

Firestone Red Shield™ Warranty. Nobody covers you better.

The Firestone Red Shield Warranty. It's the one the competition has never managed to equal, because no other roofing manufacturer can match the resources of Firestone Building Products.

For example, Firestone has warranted roofing systems for over 25 years. That's a record few other companies can match. And with Firestone Red Shield coverage, you can choose warranties on all roof types, with no dollar limit for material and labor.*

Need more proof? Firestone warranties offer coverage from five years all the way up to 30 years. And you can even transfer Red Shield warranty coverage from owner to owner. Finally, with the Firestone Red Shield Warranty, you're backed by the resources of a billion-dollar global company with a

heritage that goes back over a century.

With Firestone behind your next roofing system, all of the characteristics that are important to your needs—including installation expertise and product support—come together. The result is a single package of capabilities designed to meet your demand for top quality. All backed by comprehensive Firestone Red Shield warranties that help assure outstanding roofing performance for decades to come.

Compare Firestone Red Shield Warranty coverage to any competitor. You'll soon see why nobody covers you better.



There's a Firestone roofing system for every need. And a Red Shield Warranty for every commercial roof.



Red Shield Platinum™ Warranty 30 Years Strong

- Multiple coverage types available:
 - * Puncture: covers incidental punctures
 - * Puncture/hail: covers punctures with 2" of hail
 - * Puncture/hail/wind: covers punctures, hail and 100 mph wind
- Available with Fully Adhered (FA) RubberGuard™ EPDM Roofing Systems (Min. thickness: 90 mil)
- Available with Mechanically Attached (MA) or FA UltraPly™ TPO Roofing Systems (Min. thickness: 80 mil)
- TPO MA system utilizes Wide Weld technology



Red Shield Medallion™ Warranty 25 Years Strong

- Available with FA or MA RubberGuard EPDM RMA Roofing Systems
- Available with FA or MA UltraPly TPO Roofing Systems
- Available with SBS and APP Modified Bitumen Roofing Systems (Min. thickness: 2-ply granular surface w/ AcrylTop™ Coating)
- Available with UNA-CLAD™ Metal Roofing Systems (UC-4)



Red Shield Warranty 5 to 20 Years Strong

- Available with FA, MA or Ballast RubberGuard EPDM Roofing Systems
- Available with FA, MA or Ballast UltraPly TPO Roofing Systems
- Available with SBS and APP Modified Bitumen Roofing Systems. Two-ply APP/SBS systems qualify for a \$500 flat fee warranty, regardless of square footage.
- Available with UNA-CLAD Metal Roofing Systems (UC-3, UC-4, UC-6, UC-14)

*Subject to terms and conditions of Red Shield limited warranty.

FIRESTONE RED SHIELD WARRANTY THE ONE THAT STANDS ALONE.



Compare for yourself. Does their warranty do all this?

Firestone's Red Shield Warranty stands alone against the competition. Trust Firestone to offer a warranty program for every building, every need, every budget.

- ✓ Material and labor covered with comprehensive, no-dollar limit liability
- ✓ "Edge to edge" system coverage, including membrane, insulation and metal — all from a single source manufacturer
- ✓ A single source for warranties on all roof types, from EPDM to TPO, from Modified Bitumen to Metal
- ✓ Licensed and trained installers, plus field technical team to inspect roofs for optimum installation and quality control
- ✓ Warranties from five years up to 30 years in length
- ✓ A wide variety of warranties to match every customer's needs
- ✓ Warranty coverage that has been put to the test, earning the trust of contractors, building owners, architects and specifiers for over a generation
- ✓ Warranty coverage that is transferable from owner to owner
- ✓ One number to call for warranty claims — 24/7/365
- ✓ Backed by Bridgestone Corporation, a global company with billions in assets
- ✓ The comfort and confidence that come from dealing with a company that is dedicated, reliable and easy to work with





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Better Warranty

Repair or cause to be repaired leaks in the EDA Building Envelope System (as defined below) installed by EDA Contractors that directly result from defective material or defective work-manship supplied or performed by EDA Contractors.



600 Center Avenue
Bensalem, PA 19020
(215) 638-3500 - Office
(215) 638-3550 - Fax
www.edacontractor.com

Exterior Building Envelope Limited Warranty

Warranty No. _____
Building Owner Name: _____
Building Address: _____
Date of Substantial Completion: _____

EDA Contractor, Inc. (EDA Contractor) warrants (herein the "Limited Warranty" or the "Warranty") to the Owner named above, subject to the Terms, Conditions and Limitations set forth below, that during the Warranty Period (defined below) EDA Contractor will:

1. **Repair or cause to be repaired leaks** in the EDA Building Envelope System (as defined below) installed by EDA Contractor that directly result from defective material or defective workmanship supplied or performed by EDA Contractor. Should the EDA Building System develop any such leaks during the Warranty Period, EDA Contractor's sole obligation shall be to furnish necessary material and labor to repair the affected area and return it to a watertight condition. EDA Contractor shall have the right to specify and determine the method of repair.
2. For purposes of this Limited Warranty, in addition to the other defined terms in this document, the following terms shall have the following meaning: "EDA Building Envelope System" or the "System" means the exterior building envelope system that EDA Contractor fabricates and installs on the building referenced above, including all parts and components of the System, which shall be fabricated and installed in accordance with details approved by the Owner and/or its architect/engineer; "leak" or "leaks" means the penetration of water from the exterior of the building through the System and into the building.

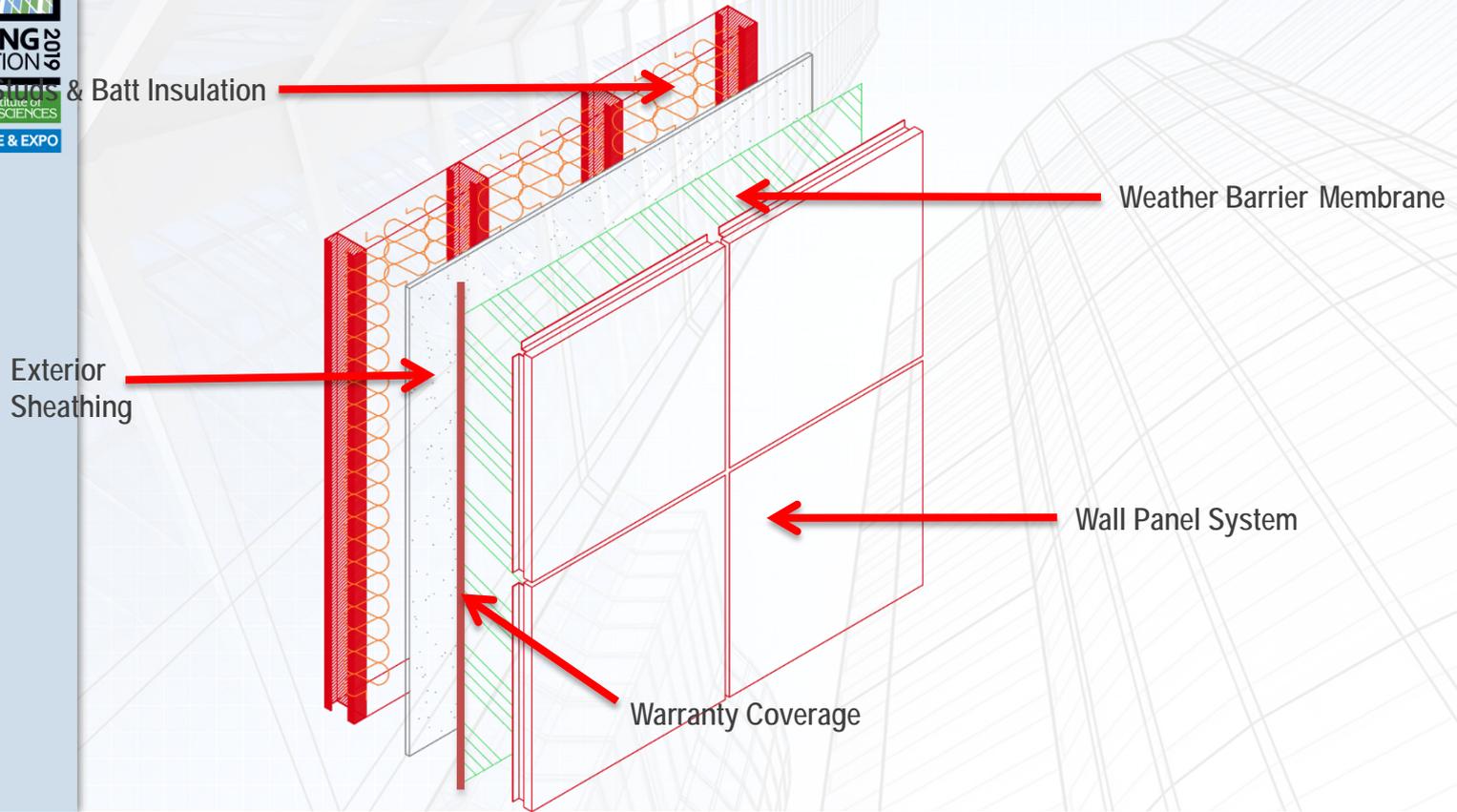
Terms, Conditions and Limitations

1. **Warranty Period** The period of this Limited Warranty shall be from _____ to _____. Any repaired portion of the System as well as the remaining original System will be warranted only for the original Warranty Period.
2. **Notice** In the event of any leak or other conditions in the EDA Building System covered by this Limited Warranty, Owner shall give notice in writing to EDA Contractor within ten (10) days from the date Owner discovers or should have discovered the condition giving rise to the claim. Any claim under this Limited Warranty shall be deemed waived if Owner fails to give written notice strictly in accordance with this paragraph.
3. **Investigation** Upon receipt of any notice under this Limited Warranty, EDA Contractor shall be given free and unimpeded access to the building to conduct an investigation of the claim. Owner shall be responsible to perform and pay for moving any equipment, furniture or non-structural interior construction from the area to be investigated and/or repaired under this Limited Warranty. If, upon investigation, EDA Contractor determines that a leak in the EDA Building System is caused by a defect in materials or workmanship in the installation of the EDA Building System, unless otherwise excluded by the Terms, Conditions and Limitations in this Limited Warranty, EDA Contractor will repair or cause to be repaired the affected areas in accordance with and subject to the terms of this Limited Warranty.
4. **Design/Design Engineering** EDA Contractor will fabricate and install the System in accordance with details approved in writing by the Owner and/or its architect/engineer. EDA Contractor's performance of its work and installation of the EDA Building Envelope System shall not constitute acceptance of any work, materials or systems installed or provided by others if such work, materials or systems are not in accordance with approved details and Contract Documents. EDA Contractor shall have no responsibility for coordinating the design, installation or performance of the EDA Building Envelope System with other parts, components and systems in the building. Any leak in the EDA Building Envelope System that results from or is caused by the Owner's and/or its architect/engineer's failure to properly coordinate and/or mis-coordination of the design, installation and performance of the EDA Building Envelope System with other parts, components and systems in the building are EXCLUDED from this Limited Warranty, and EDA Contractor shall have no liability or responsibility for the effect of any such lack of coordination or mis-Coordination on the EDA Building Envelope System or its performance, and this Limited Warranty shall be null and void to the full extent that any such leak results from or is caused by, in whole or in part, any such lack of coordination or mis-Coordination. In addition, any leaks in the EDA Building Envelope System that result from or are caused by errors, miscalculations or other failures in the design of the System or in the design of other parts, components or systems in the building (herein "Design Errors") are EXCLUDED from this Limited Warranty, and EDA Contractor shall have no liability or responsibility for the effect of any such Design Errors on the EDA Building Envelope System or its performance, and this Limited Warranty shall be null and void to the full extent that any such leak in the EDA Building Envelope System results from or is caused by, in whole or in part, any Design Errors.
5. **Additional Exclusions** In addition to the other limitations and exclusions set forth in this Limited Warranty, this Limited Warranty does not apply and shall be null and void if any of the following occur:



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Insulation Inside Wall Cavity





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Rainscreen Specification

Special Building Enclosure Warranty.

The installer of the exterior rainscreen panels shall provide a (10) year warranty covering all leaks that directly result from **defective material or defective workmanship** supplied or performed by installer for both the Air & Vapor Barrier and the rainscreen panels.

Should the exterior walls develop any such leaks during the Warranty Period, the installer's sole obligation shall be to furnish necessary material and labor to repair the affected area and return it to a watertight condition.

All removal of overburden and access to area is to be included in warranty. Warranty must be provided by a single source entity which includes the Waterproofing Membrane and Air & Vapor Barrier and Exterior Rainscreen Panels.



EDA CONTRACTORS

successful together.



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Successful Rainscreens



“Bridge on Race” - 205 Race Street, Philadelphia, PA



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Successful Rainscreens



Atlantic Care Hospital,
Egg Harbor, NJ



B
IN
G

Waterproofing/Roofing/Vegetative Roofing



3201 Race Street, Philadelphia, PA



EDA Duck Giveaway Contests

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1. Monthly EDA Duck Selfies #EDADuckSelfie

- Monthly winners chosen for most interesting duck selfie pictures taken (or pictures of ducks at work!)
- One entry per month, same person can win multiple months (must be different picture)
- Email Duck Selfies to crobbins@edacontractor.com or send on Twitter or Instagram to [@EDACContractors](https://twitter.com/EDACContractors) (#EDADuckSelfie)
- (Winners announced monthly on company website & on Twitter)



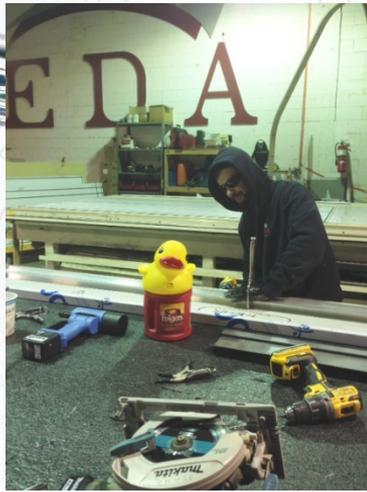


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1. Monthly EDA Duck Selfies #EDADuckSelfie





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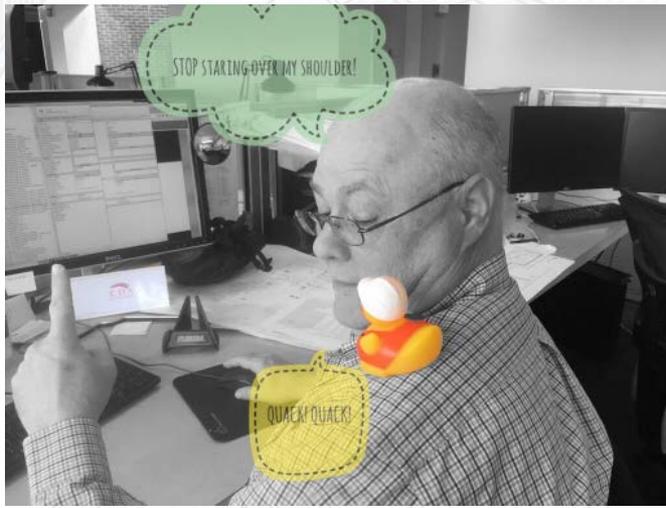
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1. #EDADuckSelfie Monthly Winners



January 2017 Winner

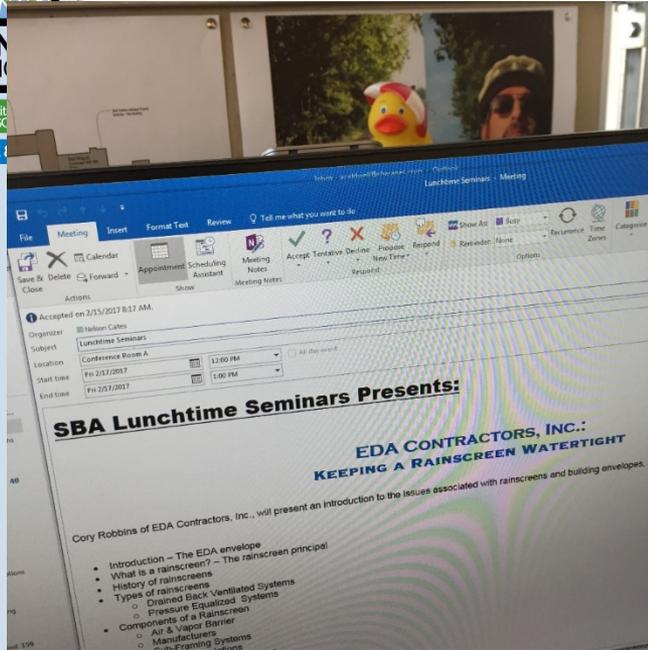
Bill Mahon – NORR (Philadelphia)



February 2017 Winner

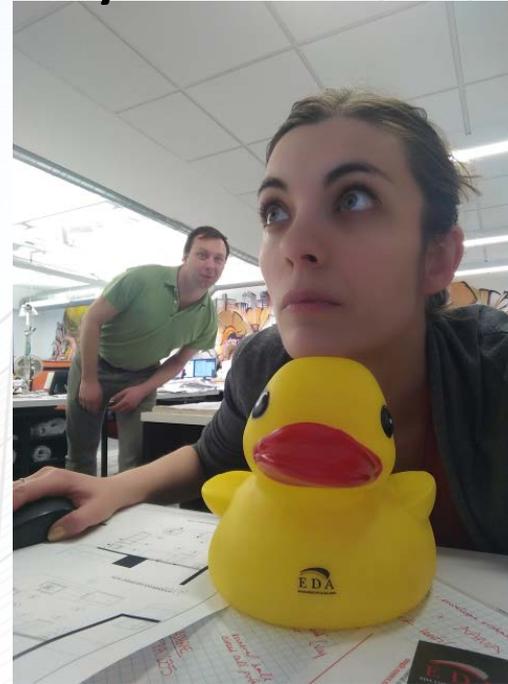
Gary Frankel – Shalom Baranes (DC)

1. #EDADuckSelfie Monthly Winners



March 2017 Winner

Andy Caldwell – Shalom Baranes (DC)



April 2017 Winner

Melissa Chapman-Smith – Coscia Moos
(PHL)

1. #EDADuckSelfie Monthly Winners



May 2017 Winner

Ellen Wright – Cope Linder (Phila)



June 2017 Winner

Enessilee McClain – Cannon Design
(Baltimore)

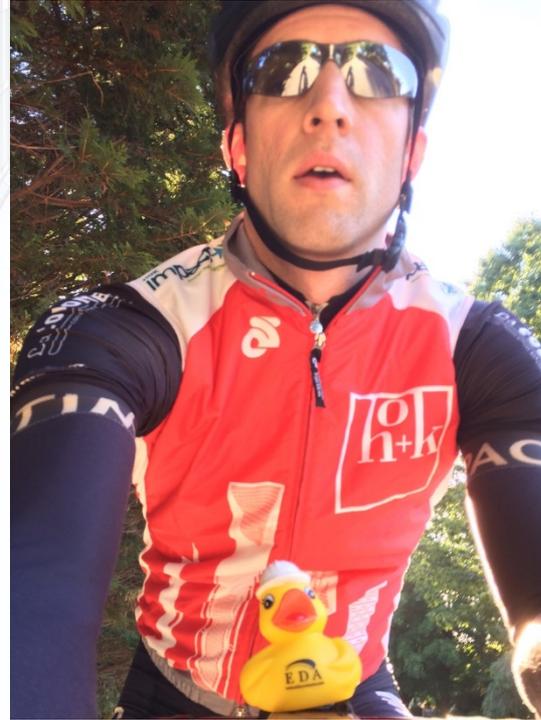




1. #EDADuckSelfie Monthly Winners



July 2017 Winner
Krista Best – Spillman Farmer
(Bethlehem, PA)



August 2017 Winner
Nate Cornman – HOK Architects (Phila)

1. #EDADuckSelfie Monthly Winners



September 2017 Winner
PZS Architects – Entire Office
(Philadelphia, PA)



October 2017 Winner
Sarah Hayes & Tim Markwardt –
Blackney Hayes (Phila)



1. #EDADuckSelfie Monthly Winners



November 2017 Winner
Coscia Moos – Entire office
(Philadelphia, PA)



December 2017 Winner
Bohlin Cywinski Jackson – Joe Bridy
(Philadelphia, PA)



1. #EDADuckSelfie Monthly Winners



January 2018 Winner
Christine Sawatzke - SOSH



EDA LEADING THE WAY THROUGHOUT THE YEAR

February 2018 Winner
Sandi Velleca – WH Pacific
(Anchorage, Alaska)

1. #EDADuckSelfie Monthly Winners



March 2018 Winner

Tim Markwardt – Blackney Hayes
(Philadelphia, PA)



April 2018 Winner

GBCA Full Office
(Philadelphia, PA)



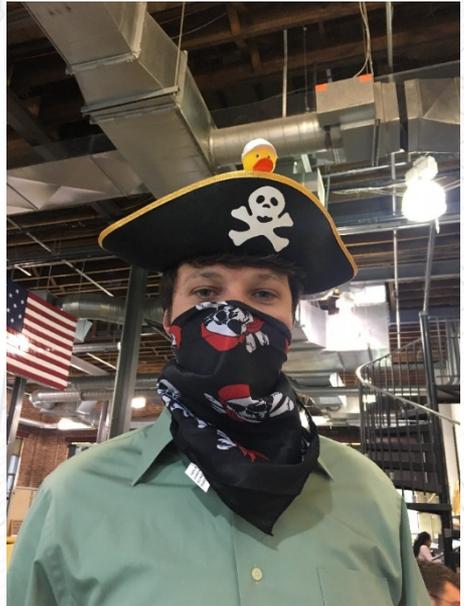


1. #EDADuckSelfie Monthly Winners



May 2018 Winner

Cherise Lakeside – LSW Architects
(Portland, WA)



June 2018 Winner

Eric Baumgartner – GWWO Inc
(Baltimore, MD)



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2. Quarterly EDA Duck Lottery

- Quarterly winners pulled in lottery format
 - April 1, 2017 (Apple iPad)
 - July 1, 2017 (Apple iPad)
 - October 1, 2017 (Apple iPad)
 - January 1, 2018 (Apple iPad)
 - April 1, 2018 (\$200 VISA Giftcard)
- AIA/HSW accredited presentation attendees are provided a duck with a unique number on the bottom
- Stay tuned to the website for the lottery pull for a GREAT prize
- **(Winners announced quarterly on company website) 24 hour window or forfeit winning prize!**





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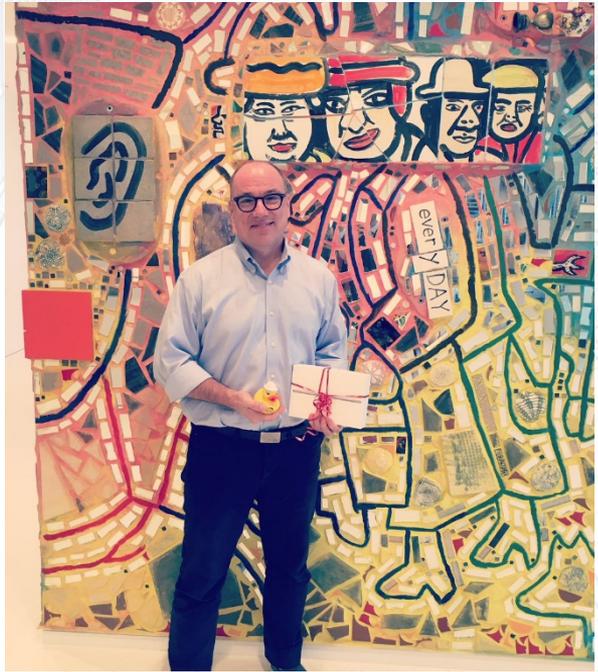
2. Quarterly LDA Duck Lottery

Winners



April 1st (1st Quarter) Winner

Yogesh Saoji – WRT Architects (Phila)



July 1st (2nd Quarter) Winner

Stephen Beacham - HOK Architects
(Phila)



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2. Quarterly LDA Duck Lottery

Winners



October 1st (3rd Quarter) Winner
Matthew Herbert – Design Collective
(Baltimore)



January 1st (4th Quarter) Winner
Elizabeth Kahley – Kieran Timberlake
(Philadelphia)



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2. Quarterly LBA Duck Lottery

Winners



April 1st (1st Quarter) Winner

Jim Keiffer – KCBA Architects (Hatfield, PA)



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Thank you

