BUILDINGENERGY BOSTON

WTF PSA Tape Testing: Round Two

Dave Gauthier, WTF CEO

Peter Yost, Chief Wingnut

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Wingnut Test Facility: Common Sense, Real World Testing of Building Materials

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WTF

Context - Caveats

- We are, after all…wingnuts
- Sample sizes of two are anecdotal, not statistically significant
- Our results are contextual and we ask that you not generalize them…
- To date, we have been driven by a sort-of PSA Holy Grail: one tape that does everything
- Our mission statement: cajole adult supervision…

It all started innocently enough…

Bird's-Eye View | Key Materials | Builder Tips

ADHESIVE/SEALANT
Low-VOC construction adhesive + more

BRICK VENEER
Brick is like a big hard sponge — let it dry, and everything is OK
+ more

RIGID INSULATION FOR WALLS
Types of rigid insulation + more

SHEATHING DRAINAGE MAT
Alternatives to sheathing drainage mat + more

SILL SEALERS
Thicker sill sealers are better + more

SILL SEALER
Sill sealer keeps sills or bottom plates away from concrete + more

CONTINUOUS BEAD OF SEALANT
Which caulks and sealants works best, and where? + more

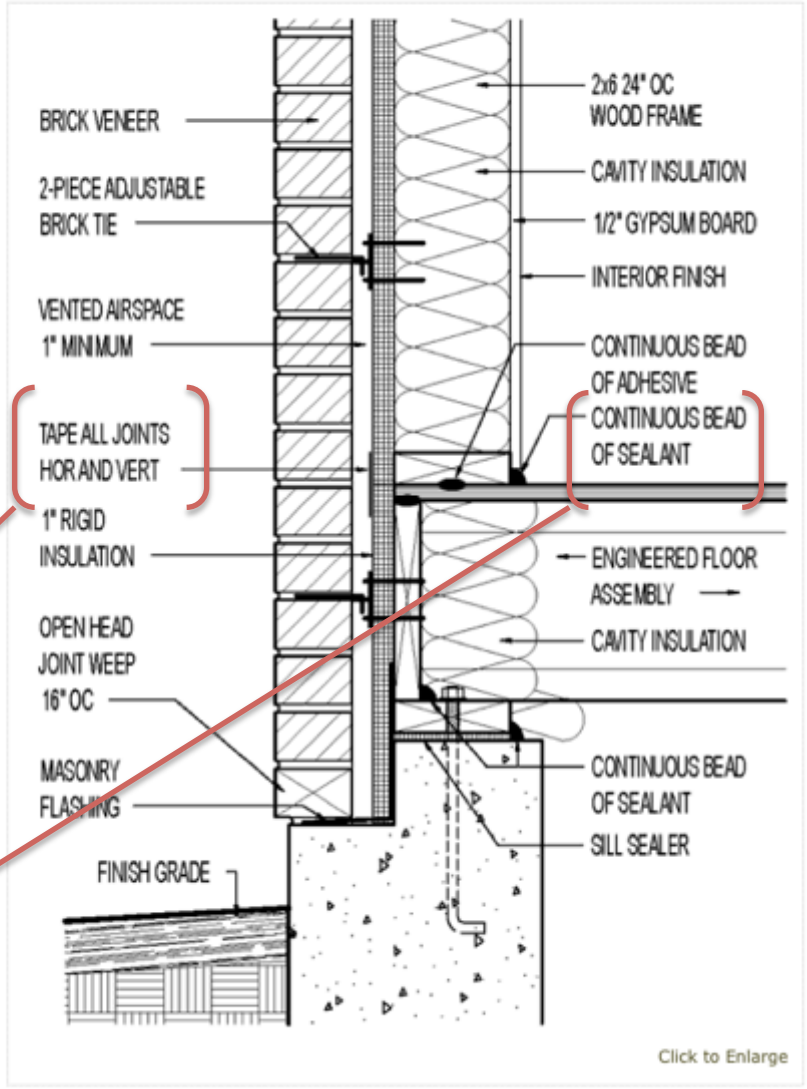
CAVITY INSULATION
Which insulation is greenest? + more

1/2" GYPSUM BOARD
Greener choices exist + more

INTERIOR FINISH
Let interior finishes let the walls dry + more

2-PIECE ADJUSTABLE MASONRY TIE
Two-piece ties hold better; stainless steel lasts longer + more

DRAWING DETAIL — Download: PDF | DWG



Click to Enlarge

"TAPE ALL JOINTS HOR AND VERT"

"CONTINUOUS BEAD OF SEALANT"

Test methods adhesives

Adhesives ASTM Standard test methods	Method
Resistance of Adhesive Bonds to Chemical Reagents	D896-97
Tensile Properties of Adhesive Bonds	D897-95a
Applied Weight Per Unit Area of Dried Adhesive Solids	D898-96
Peel or Stripping Strength of Adhesive Bonds	D903-98
Exposure of Adhesive Specimens to Artificial Light	D904-99
Strength Properties of Adhesive Bonds in Shear by Compression Loading	D905-98
Strength Properties of Adhesives in Plywood Type Construction in Shear by Tension Loading	D906-98
Standard Terminology of Adhesives	D907-99
Impact Strength of Adhesive Bonds	D950-98
Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal)	D1002-99
Cleavage Strength of Metal-to-Metal Adhesive Bonds	D1062-96e1
Standard Test Methods for Viscosity of Adhesives	D1084-97
Determining Strength Development of Adhesive Bonds	D1144-99
Effect of Moisture and Temperature on Adhesive Bonds	D1151-90
Resistance of Adhesives to Cyclic Laboratory Aging Conditions	D1183-96e1
Flexural Strength of Adhesive Bonded Laminated Assemblies	D1184-98
Storage Life of Adhesives by Consistency and Bond Strength	D1337-96
Working Life of Liquid or Paste Adhesives by Consistency and Bond Strength	D1338-99
Standard Specification for Adhesive for Acoustical Materials	D1779-98
Conducting Creep Tests of Metal-to-Metal Adhesives	D1780-99
Climbing Drum Peel for Adhesives	D1781-98
Atmospheric Exposure of Adhesive-Bonded Joints and Structures	D1828-96
Peel Resistance of Adhesives (T-Peel Test)	D1876-95
Preparation of Surfaces of Plastics Prior to Adhesive Bonding	D2093-97
Preparation of Bar and Rod Specimens for Adhesion Tests	D2094-91
Tensile Strength of Adhesives by Means of Bar and Rod Specimens	D2095-96e1
Creep Properties of Adhesives in Shear by Compression Loading (Metal-to-Metal)	D2293-96
Creep Properties of Adhesives in Shear by Tension Loading (Metal-to-Metal)	D2294-96
Strength Properties of Adhesives in Shear by Tension Loading at Elevated Temperatures (Metal-to-Metal)	D2295-96
Standard Guide for Preparation of Metal Surfaces for Adhesive Bonding	D2651-90
Durability Assessment of Adhesive Joints Stressed in Peel	D2918-99
Determining Durability of Adhesive Joints Stressed in Shear by Tension Loading	D2919-95

Lab Test Conditions

- Stainless steel substrate
- Clean substrate
- Warm (70 F)
- Dry (including 50% RH)

Clean trimmed fingernails

Surgical scissors instead of utility knife?

Bare soft hands

Job site conditions

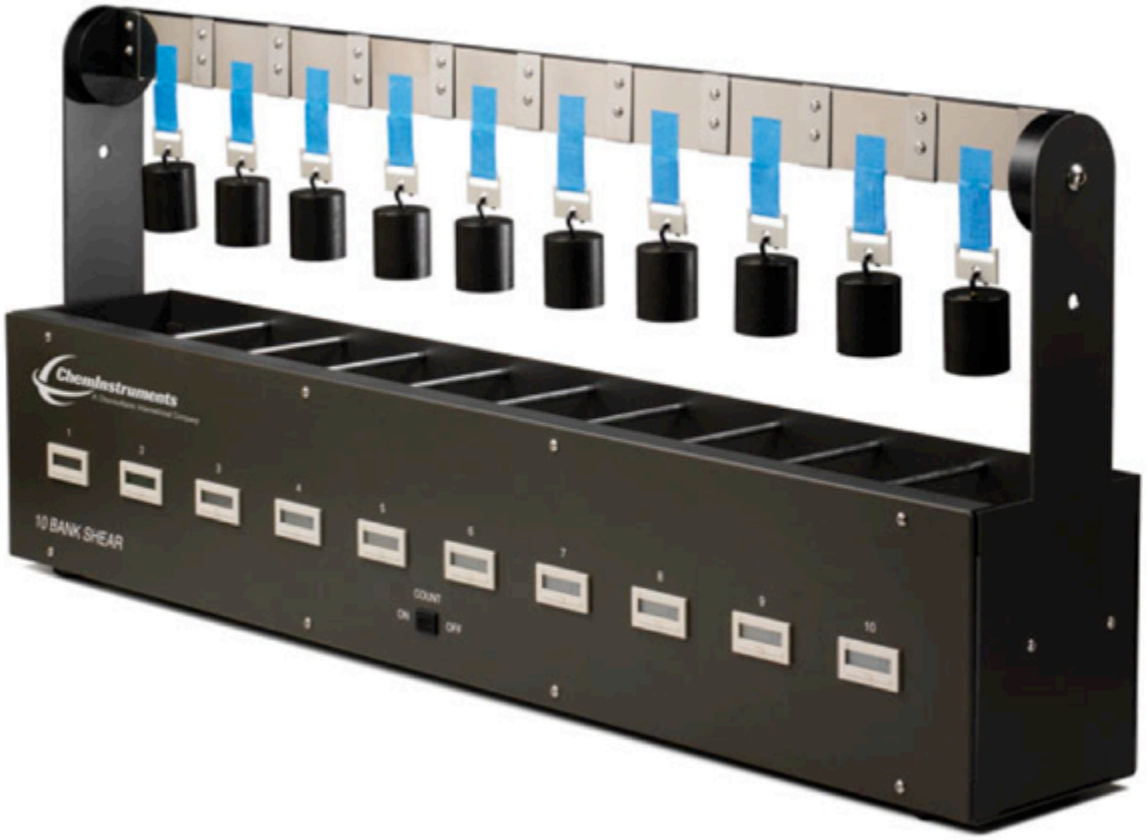
- Cold
- Dirty
- Wet

Demo – PSA “Lab” testing

Modes of failure

- Adhesive
- Backer
- Substrate

Round Two
ASTM D3654 – Method A



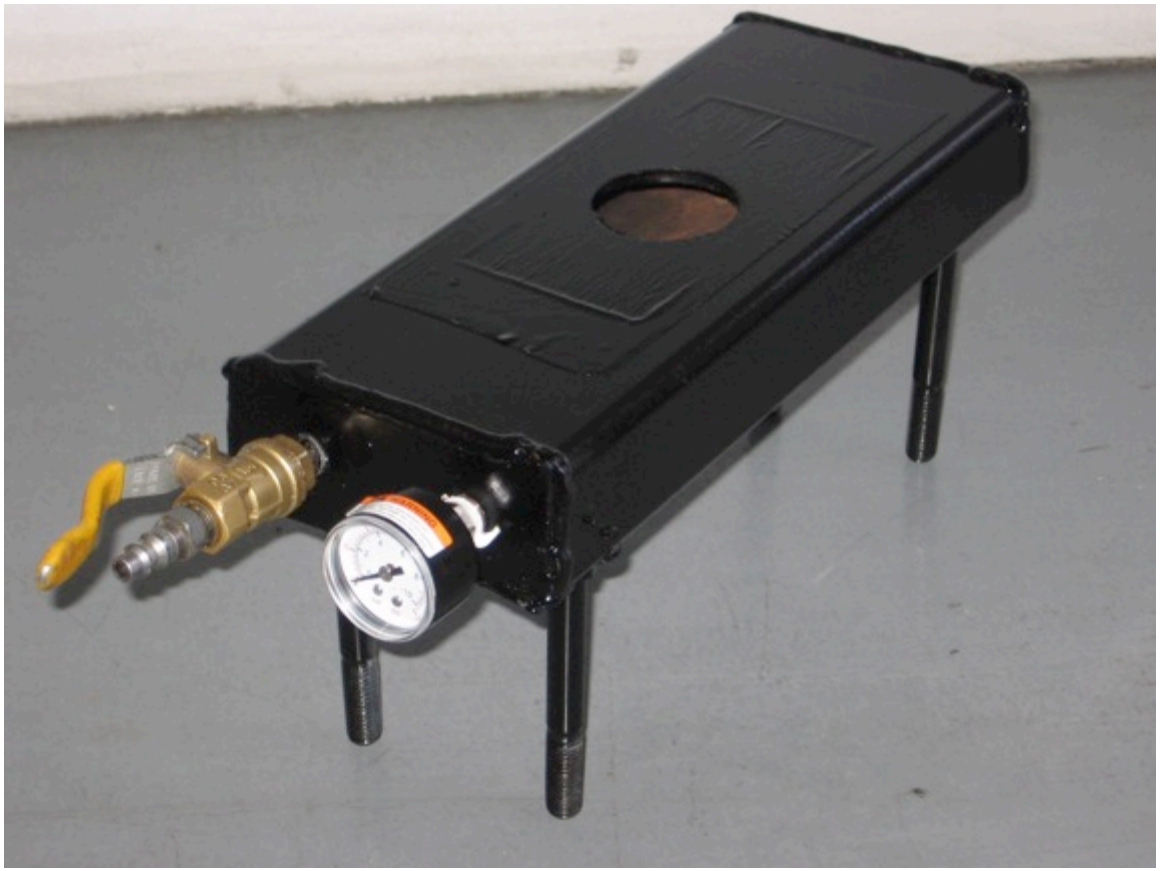
The role of primer…

…mandatory on masonry.

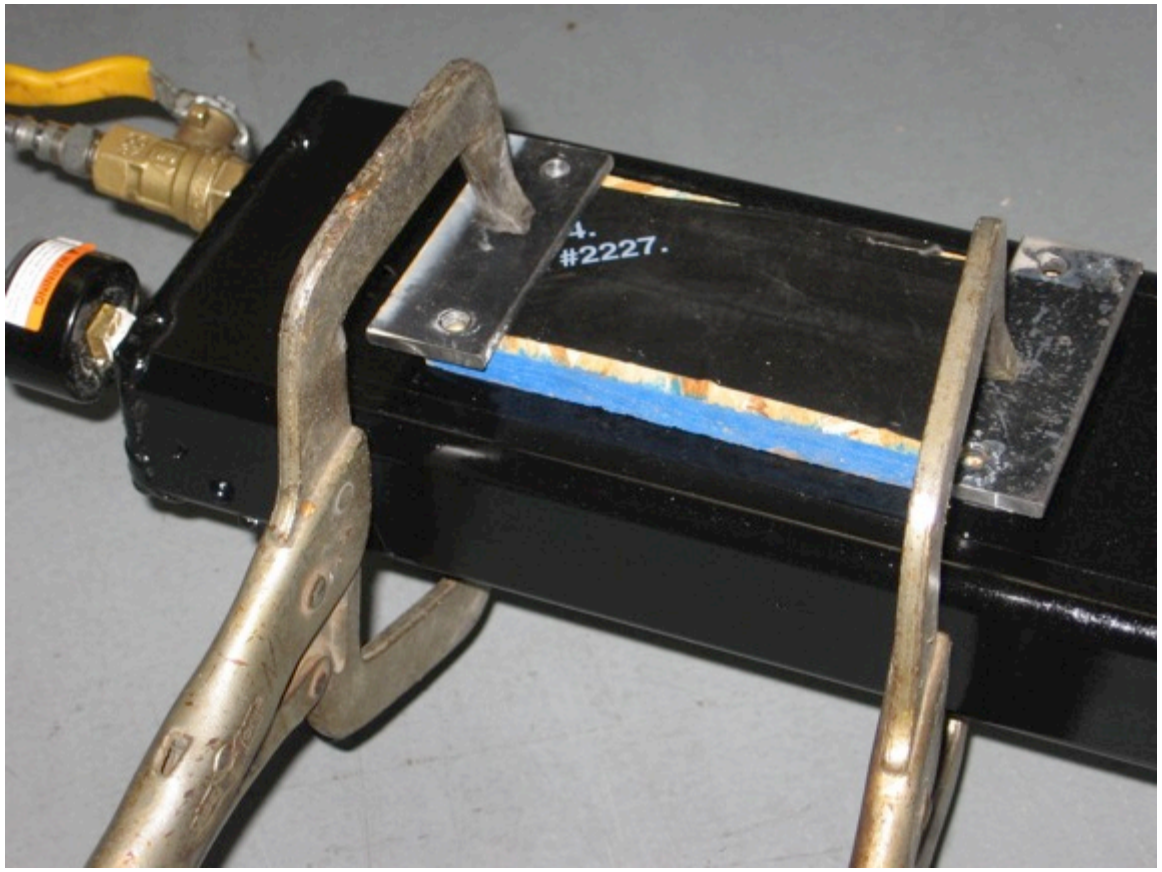
What forces do tapes really “see?”

What forces do tapes really “see?”

“Bellowing” - WTF Pressure Pig



“Bellowing” - WTF Pressure Pig



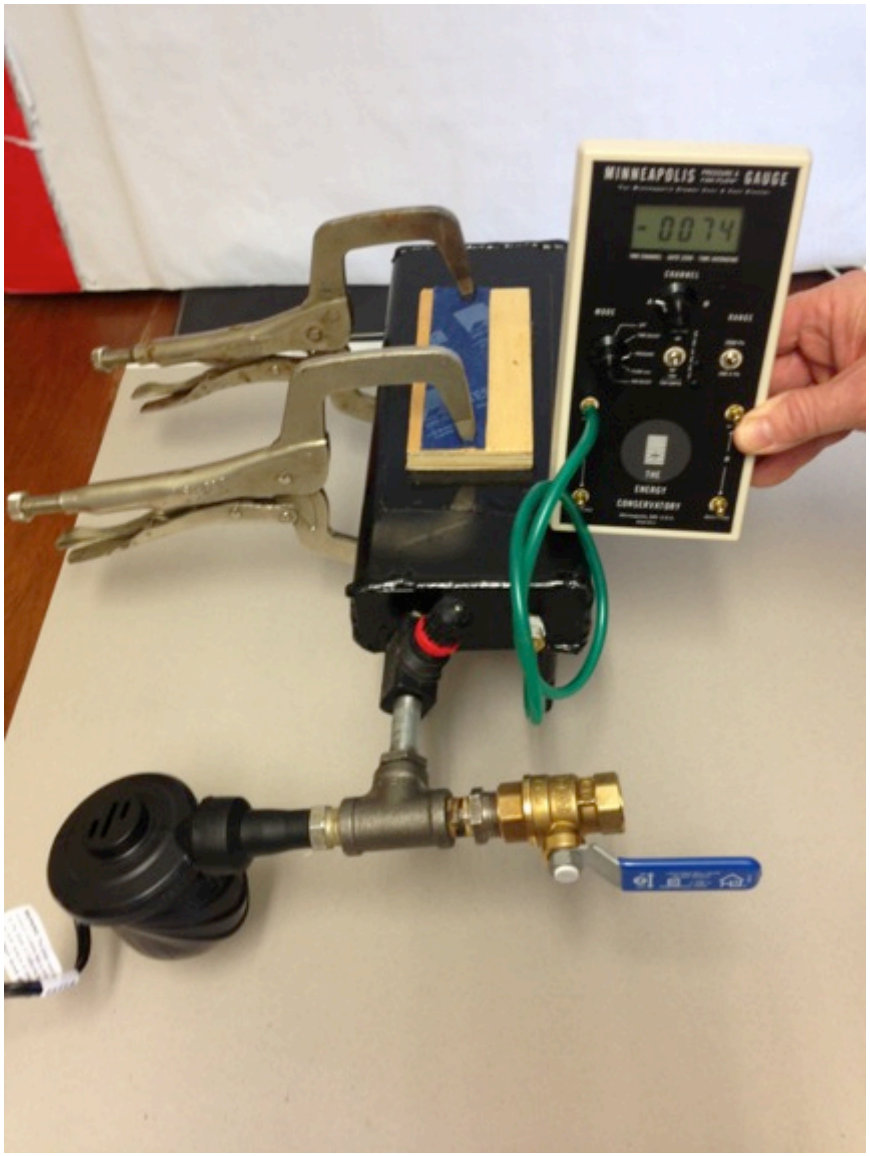
Earth air pressure extremes

- Difference between “normal” and extreme (hurricane and tornado) is about 3 psi
- Tape failure on WTF “pressure pig” was about 3 psi
- WTF Conclusion? Tapes will fail in hurricanes and tornados
- PSI vs Pascals?
- Real world?

Pressure relationships

- Pressure = Force divided by area
- 1 Newton = 1 Pascal per square meter
- 1 psi = 6895 Pa
- 70 mph wind = (about) 450 Pa

“Bellowing” - WTF Pressure Pig



“Bellowing” & the WTF “Pressure Pig”

Show pressure pig demo video…

A New Wingnut PSA tape test

Wingnut Math and Physics

- Since 1 Pascal = 1 Newton per square meter, then
- 75 Newtons/sq m = 16.8 lbs.
- Tape sample is 2.25 inches by 6 inches = 13.5 sq in.
- 13.5 sq in = .009 sq m
- 16.8 lbs * .009 sq m = 0.15 lbs
- 1 lb on 13.5 sq in is about 6 times greater than 75 Pa…

New testing protocol circulated to key manufacturers for their review…

- Huber ZIP Wall
- Siga
- Pro Clima
- ZIP tape manufacturer

Show protocol pdf…


Coca
Sprite
Schweppes


F3
E3
D3
SIGA-WIG
www.siga.ch

WingNut Test Facility

Tape Test 3

As of	11/24/15								
		Primed Vana	Vana	Zip	Wigluv	Pella	IPG	Typar/Typar	Zip/Zip
Flange		A	B	C	D	E	F	G	H
Vinyl	1	11/25/15	11/23/15		11/24/15	11/22/15	11/22/15	11/23/15	
Metal	2	11/23/15	11/24/15		11/25/15	11/22/15	11/23/15	11/23/15	
Metal	3		11/23/15		11/23/15	11/22/15	11/22/15	X	X
Vinyl	4	11/24/15	11/22/15		11/24/15	11/23/15	11/23/15	X	X

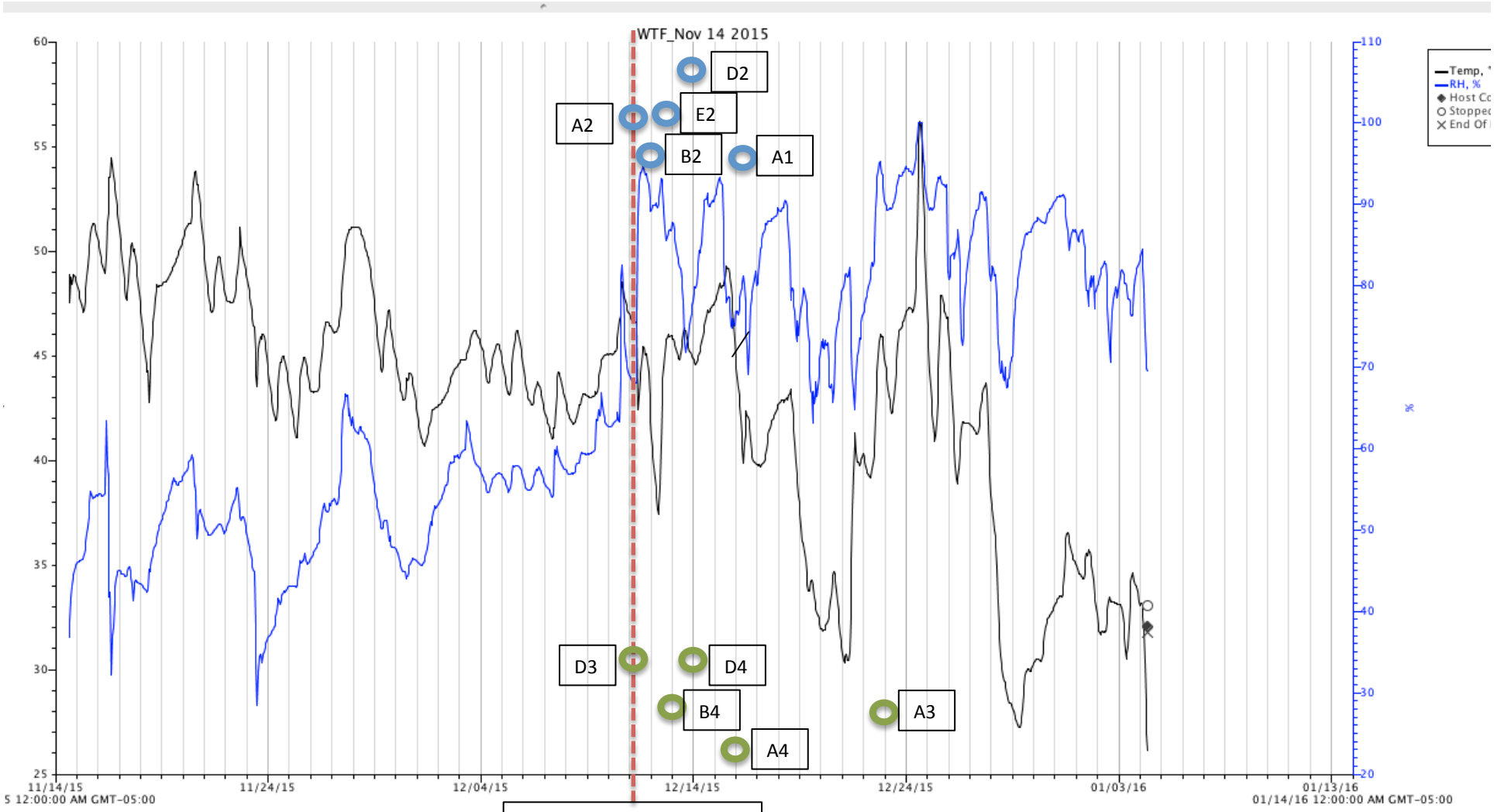

D1
E1
F1


B2
C1

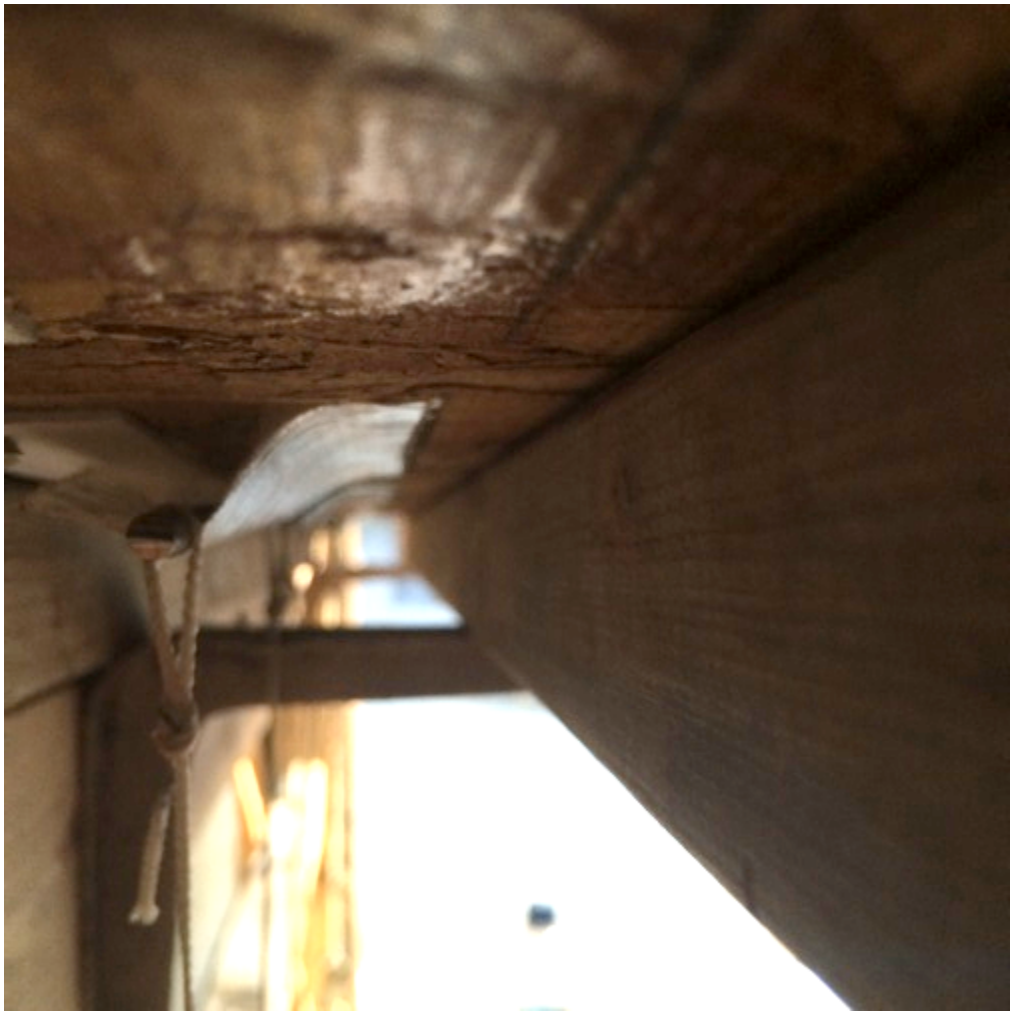

onset
43.22 °F
MEMORY
81.6 %RH
LOGGING
HOBO® temp/RH logger

WingNut Test Facility								
Tape Test 4								
As of	1/22/16							
		Primed Vana	Wigluv	Zip	Primed Vana	Wigluv	Zip	Test Condition
Flange		A	B	C	D	E	F	
Vinyl	1	12/17/15			1/22/16			WETTED
Metal	2	12/11/15	12/12/15		12/14/15	12/13/15		WETTED
Vinyl	3	12/23/15			12/11/15			DRY
Metal	4	12/16/15	12/13/15		12/14/15	12/13/15		DRY

High Performance Acrylic Tapes



Latest drop (3-6): B4 Siga on PVC flange



What have we learned

- This test has passed muster with major manufacturers
- Butyl tapes we tested don't like low temps or "tougher" substrates
- Off the shelf "high performance" tapes did not make the cut
- Only one tape has held regardless of substrate and wetting (so far…)

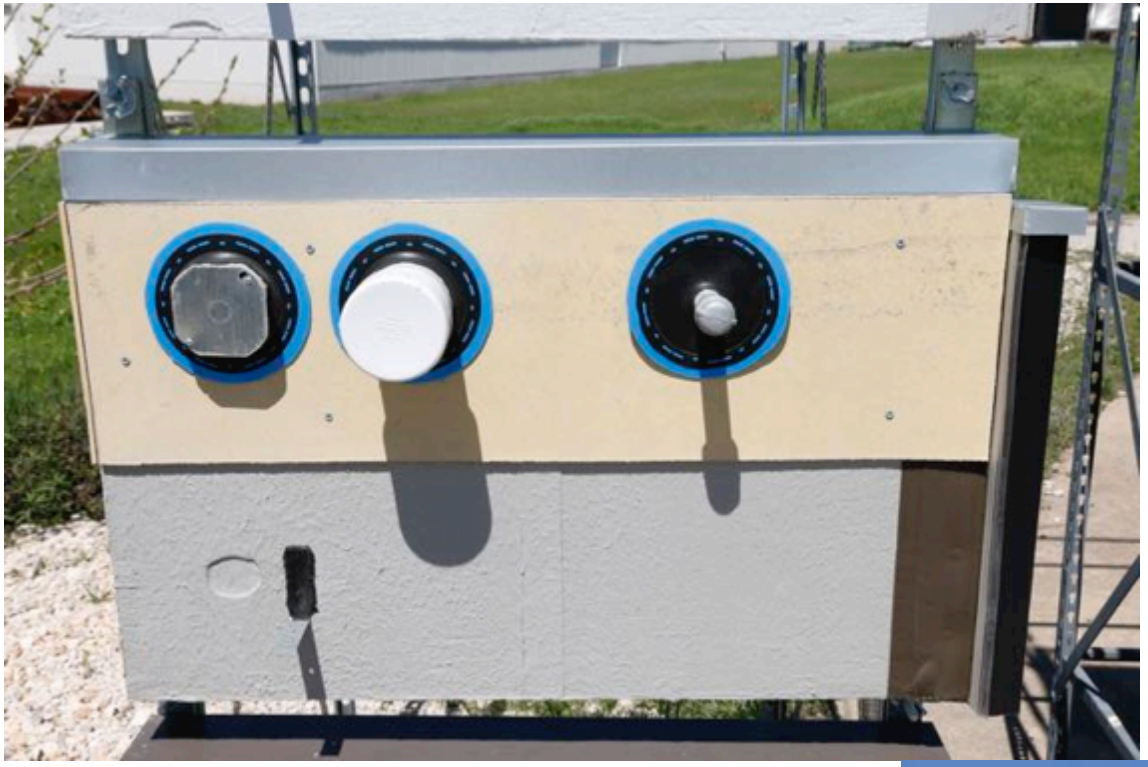
WTF has been “admired”

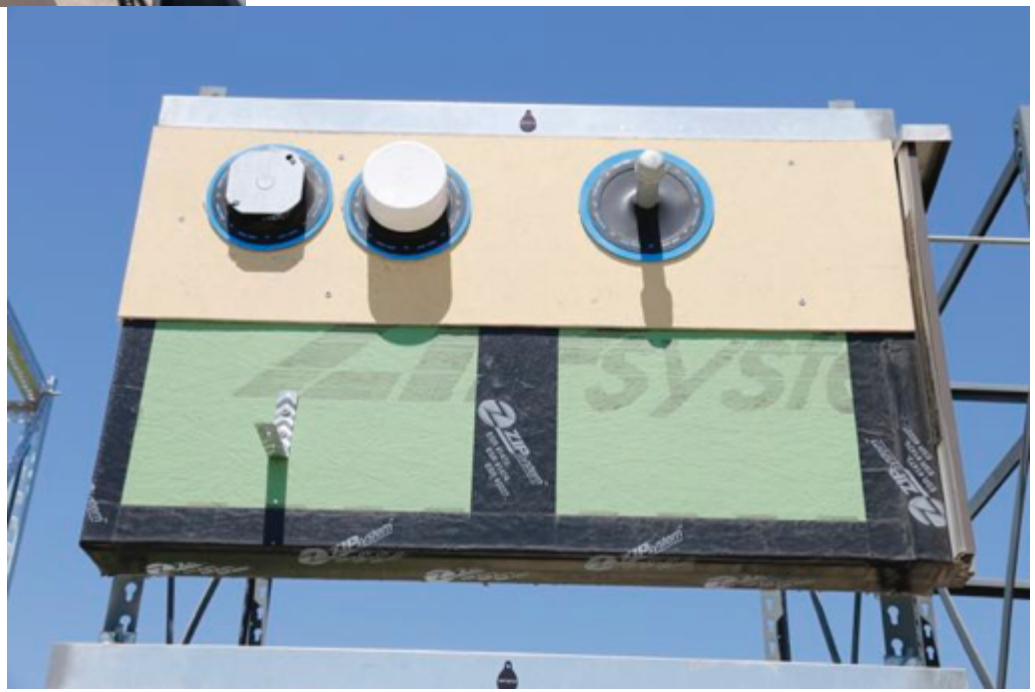
Prof. David NiCastro University of Texas – Austin
Construction Durability Lab
(JJ Pickle Center)

http://mattrisinger.com/fluid-applied-wrb-testing/

From Matt Reisinger's blog…

http://mattrisinger.com/fluid-applied-wrb-testing/





http://mattrisinger.com/fluid-applied-wrb-testing/

So, what's next for WTF?

- Run current tests through at least a full summer plus this past winter
- Look at negative side basement waterproofing
- Simple test for PI dependent R-value?
- Siloxane testing?

So what is next? WTF 2.0?

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Sticky Business

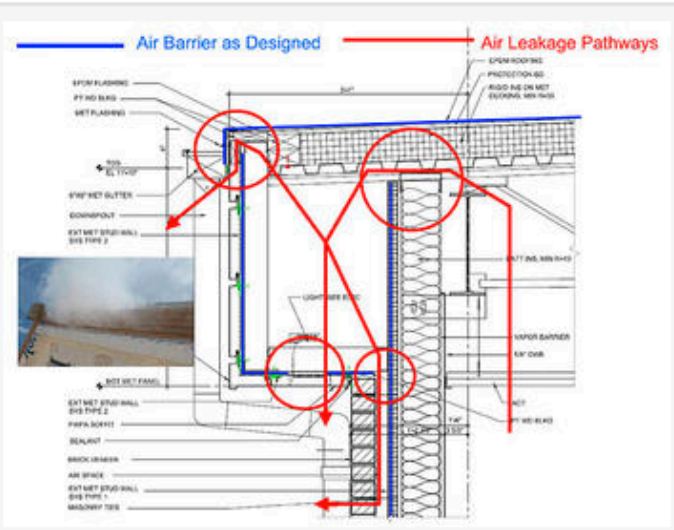
3 New Ways to Learn Building Enclosure Commissioning

Posted November 11, 2013 2:03 PM by Peter Yost
Related Categories: BuildingGreen's Top Stories, Sticky Business

With the need for BECx rising, the industry is working to train designers and other specialists to do the job.

Recent BuildingGreen resources give a pretty good picture of just what building enclosure commissioning (BECx) is and how its use is on the rise in high-performance buildings. But a logical follow-up question I get asked a lot is: how can I get the necessary education to become proficient in BECx—or actually get credentialed or certified as a BECx agent or expert?

There are several questions wrapped up here, and I want to take them one at a time to keep this complex topic at least somewhat straight.



This elementary school assembly could have been air-sealed at the top of the wall, simplifying the assembly and providing air-barrier continuity. BECx would have found a mistake like this early; as its prominence grows, the industry is struggling to meet demand for this expertise. When a fogger was used to identify where the

Recent Comments

Insulated Vinyl Siding: Worth the Extra Cost?
Lawrence Lile says, "

A fellow was trying to convince me that this EPS ionsulation behind the vinyl would add R-10 to a building. I had considered using his...

" More...

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