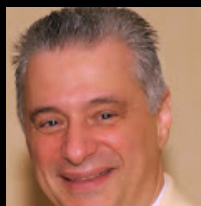


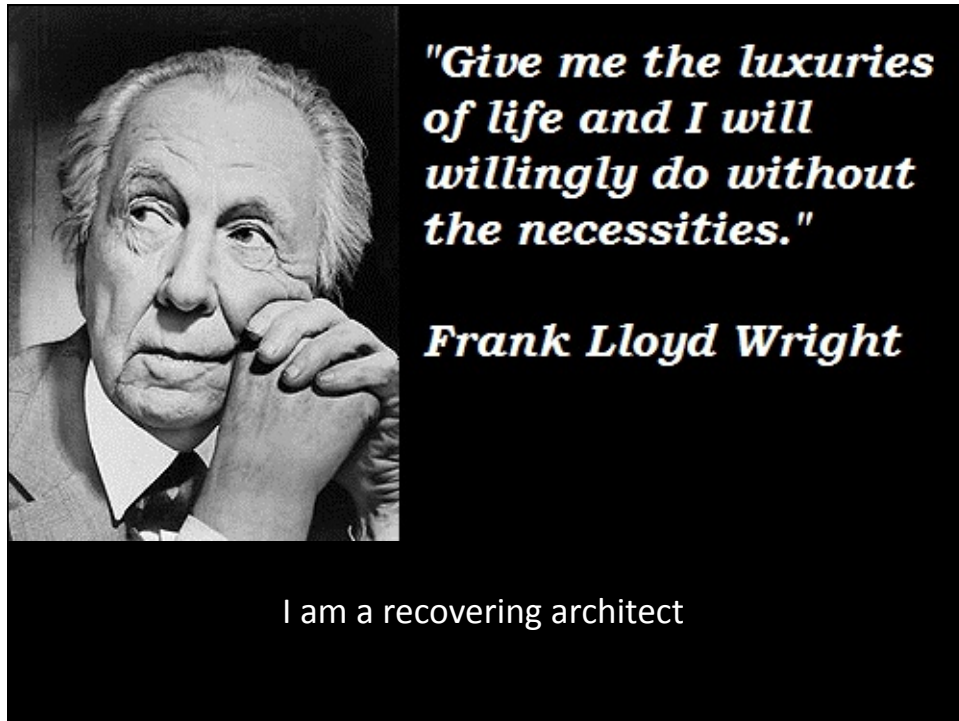


Tough Act to Follow



DISCLAIMER

I do not represent any insulation manufacturers







The Contractor's Serenity Prayer

God, grant me the serenity to accept the details
I cannot change,

The courage to change the details I can,
And the wisdom to know the difference

(and a big fat warranty budget just in case)









INSTRUCTIONS (ASTM B160Z-14 AND B220Z-14)

1. REMOVE SAMPLES FROM THE COLD STORAGE DEVICE.
2. PLACE THEM IN ORDER ON THE TABLE.
3. NOTE THAT THEY ARE LABELED A-G ON THE SAM.
4. OPEN THE SAMPLES
5. TASTE IN ALPHABETICAL ORDER.
6. RECORD YOUR SCORES ON THE WHITE BOARD.
7. TALLY SCORES TO FIND THE TOP TWO SAMPLES.
8. REFER TO THE KEY FOR THE MANUFACTURER AND PRODUCT.
9. REPORT TESTING RESULTS IMMEDIATELY TO QUALITY CONTROL (MARTY).

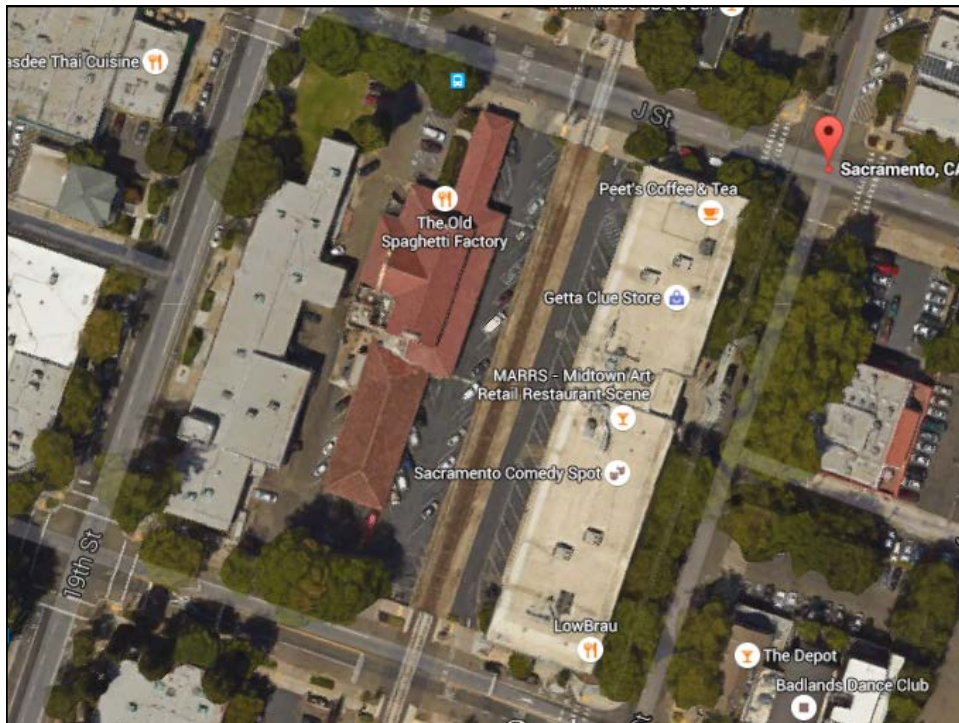
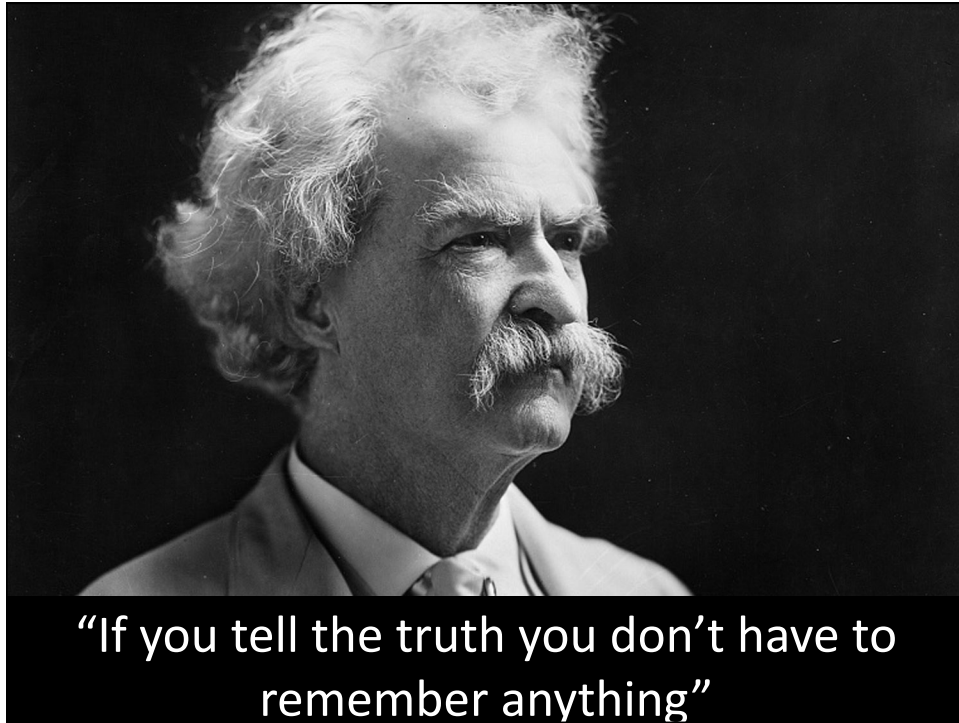
SUPPLEMENTAL INSTRUCTIONS

1. NO FUCKING WHINING. MANY BEERS ARE HOPPY, SOME ARE NOT. DEAL WITH IT.
2. DO NOT CHEAT AND LOOK AT THE KEY.
3. ALTHOUGH THE WRAP INDICATES COMPLIANCE WITH ASTM E2112, THE SAMPLES HAVE NOT BEEN TESTED TO THIS STANDARD. YOUR ARE CONDUCTING THE TESTING ACCORDING TO ASTM B160Z-14 AND ASTM B220Z-14 (ABOVE).
4. IF YOU DONT FINISH ALL THE BEERS, YOU ARE PUSSIES. SPLIT THE LEFTOVER BEERS AND TAKE THEM HOME. DONT BE PROUD OF BEING A LIGHTWEIGHT.
5. DUMP THE ICE OUT OF THE COOLER IN THE DRAIN IN THE FIRST FLOOR GARAGE AND LEAVE THE COOLER IN THE ANNEX- THE KEY IS ON ARIELLE'S DESK.
6. GET IN TRAINING MODE. THIS MEANS DRINKING A LITTLE DAILY TO TEMPER THE GUT AND TO STRETCH OUT THE WAIST BAND. WE DONT WANT TO LOOK LIKE PUSSIES AT SUMMER CAMP. THERE IS SOME RISK THAT ONE MEMBER OF OUR TEAM MAY ALREADY HAVE THIS COVERED- BEING A LIGHTWEIGHT, I MEAN. DONT LET IT BE YOU.

	W. H. H. H. H.	V. W.	Vortex	T.O.	CLUB	CINTEA	PROSCAMP	OL	LOST MESSIDAY	SA	W. H. H. H. H.	W. H. H. H. H.	Super	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14
MH	6	7	6	7	5	3	1	6	7	3	1	7	1	5
SL	3	2	2	4	3	2	1	6	7	1	5	5	2	5
MS	7	8	6	6	5	2	3	5	6	1	2	5	2	2
CL	7	7	6	6	4	3	2	5.5	5	1	2	5	2	4
TOTAL	22	24	20	23	17	10	7	22.5	25	6	10	22	7	16

Vortex
 *REALLY

























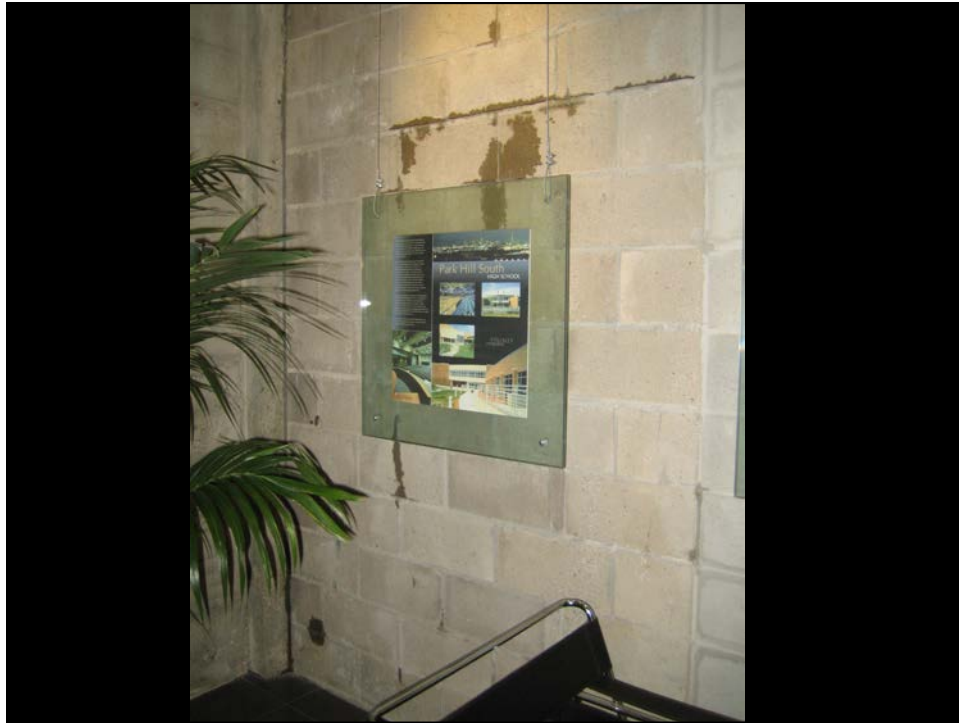
Friday		Saturday	
4		5	
Actual:	54° 47°	Actual:	51° 42°
	1.73 in		0.60 in
Average:	52° 38°	Average:	52° 38°
	0.11 in		0.11 in

January 4, 2008

BTW
"It doesn't rain
in Sacramento"









Notes from Pre-Installation Meeting - MARRS Thorolastic Installation Friday, May 9, 2015

1. Parties present

Steve Guent, RMW Architects
 Andy Eckstrom, The Heller Group
 Barbara Boone, The Heller Group
 Shawn Eckridge, Capitol Painting
 Patrick Hoopes, Warehouse Paint
 Ryan Wade, WCC
 Marty Houston, WCC

2. Schedule

- 1. Work will begin on Tuesday, May 13th and is expected to take approximately six weeks.
- 2. It was suggested that the area around Lounge 20 (SE corner of building) be completed first to allow for tenant to move in on schedule (complete by May 28).
- 3. Different sections of the building will be done at different times to allow for continued operation of tenant spaces. Andy Eckstrom (THG) will be responsible for notifying tenants of the work schedule based on input from Capitol Painting.
- 4. A representative from the manufacturer (Thorolastic), is required to be present at the end of the first area to be prepped for installation of the elastomeric to ensure that the preparation has been done in accordance with manufacturer requirements (and ultimately to ensure that warranty requirements will be met). The same representative will be required to visit upon installation of the elastomeric coating to ensure proper installation. Thoro representative will be responsible for indicating other milestones for review of the installation. It was agreed that testing of the elastomeric installation at the SE corner would be required and will take place on the 23rd of May.

3. Contract Requirements

- 1. Section 1.5 of the RMW specification requires submittals on the crack filler, block filler, sealants and concrete primer materials. Capitol to work with Thoro to provide full submittals on all materials.
- 2. Section 1.6.A indicates installer qualifications. Capitol indicated that they meet the qualifications and no objections were made to Capitol completing the work.
- 3. Section 1.6.B indicates single source limitations for the products for the elastomeric scope of work. Emphasis was placed on obtaining all materials made by Thoro.

4. Specified Product Review

- 1. We discussed which texture would be desired by the client and architect. It was agreed that the smooth texture, in accordance with the original installation, would be installed.
- 2. Loose paint will need to be removed mechanically around the window jambs and heads and feathered back per manufacturer instructions. The main body of the building will be power washed prior to elastomeric installation.
- 3. Block filler is to be used on CMU surfaces prior to installation of elastomeric.
- 4. Joints between CMU and concrete areas will be ground to allow for a sealant joint and backer rod.
- 5. Large cracks (>1/4") will be ground to allow for installation of backer rod and sealant joint, then patched over with knife grade Thorolastic Knife Grade, feathered to match existing surfaces. The sealant joint will be ground back 4" either side of the crack prior to installation of the sealant joint. Bare concrete areas will need to be primed prior to installation of elastomeric.
- 6. Medium cracks (>1/16" but <1/4") will be treated similarly, but will not require the sealant joint.
- 7. Small cracks (<1/16") will require filling cracks with Brouh Grade Thorolastic, grinding the adjacent surfaces and priming as needed per above prior to installation of elastomeric.
- 8. Thorolastic Knife Grade requires 24 hour cure time prior to covering with elastomeric coatings.

- 9. Installation of sealants, fillers or elastomeric is not to proceed if rain is expected in the following 24 hours.
- 10. Sealant joints will require 7 days of cure time prior to covering with elastomeric. A test joint for adhesion will be installed on the west face of the building. Capitol will coordinate a pull test from the Sonostic representative and will forward test report to all parties.
- 11. Wet film thickness required for the Thorolastic product will be verified by use of wet film gauge tests at each area where elastomeric is installed. Film gauges are to be dated and should include notation on where the sample was taken. The wet film gauges will be kept as part of the project record.

5. Submittals

- 1. Knife Grade, Concrete primer, and Sonostic NP1 have not been submitted. Capitol will submit products required by manufacturer for complete installation.
- 2. Submittals will include the correct block filler and concrete primer.
- 3. Color samples were delivered to the architect for review.

6. Clarifications / Changes

- 1. See substrate review

7. Quality Control

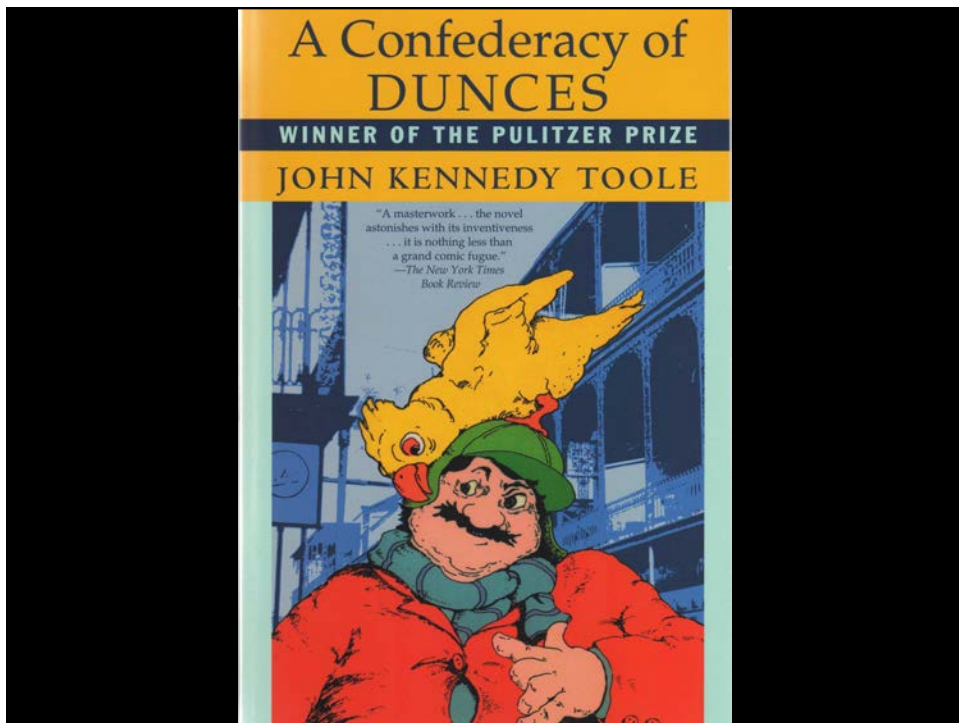
- 1. Capitol to provide on-going millage verification per above.
- 2. Thoro representative to sign off on crack prep prior to installation of elastomeric. Thoro representative will also need to review installation of elastomeric. Thoro to provide direction on frequency of site visits, given that application will be completed in stages. Capitol to confirm with Thoro representative their QC schedule. Pat Hoopes suggested that he may be able to review work on behalf of Thoro due to frequency of visits.
- 3. RMW to comment on site review dates - Capitol to provide all parties notice of pending completion of stages of the work.
- 4. It was agreed that we should determine the cost of a water test for the area at Lounge 20. MH to contact McGraw Hill to determine cost and availability. Representatives of the Heller Group, Capitol, WCC and RMW are requested to attend test.
- 5. Sealant needs to be tested for adhesion to substrates. Capitol to coordinate sealant pull test with manufacturer.
 - 1. joint prep requirements (per sealant manufacturer no primer is required)

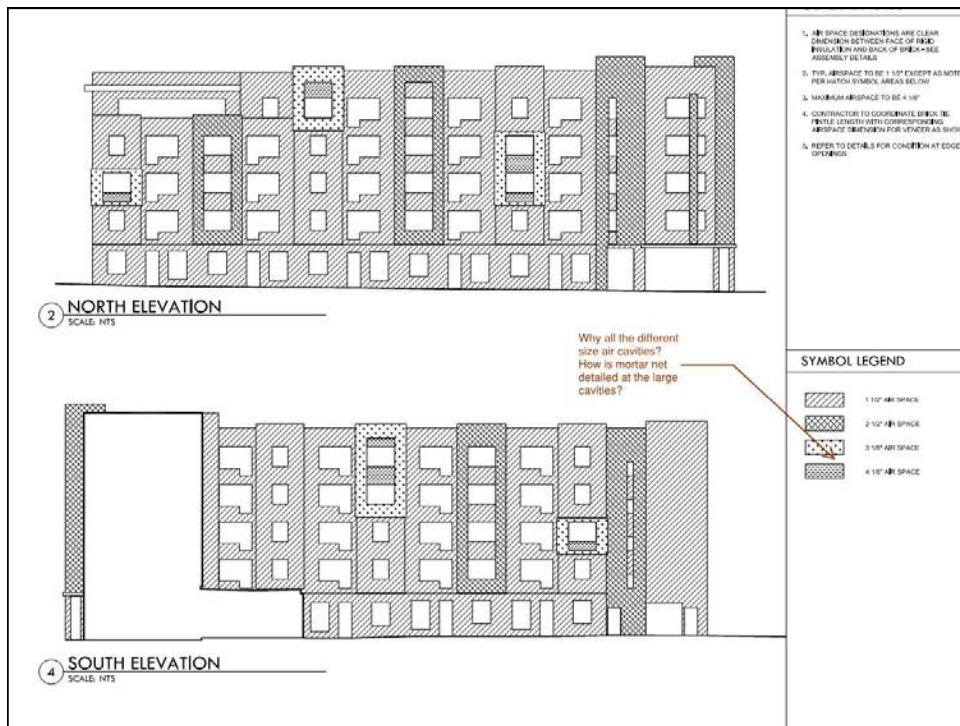
8. Substrate Review

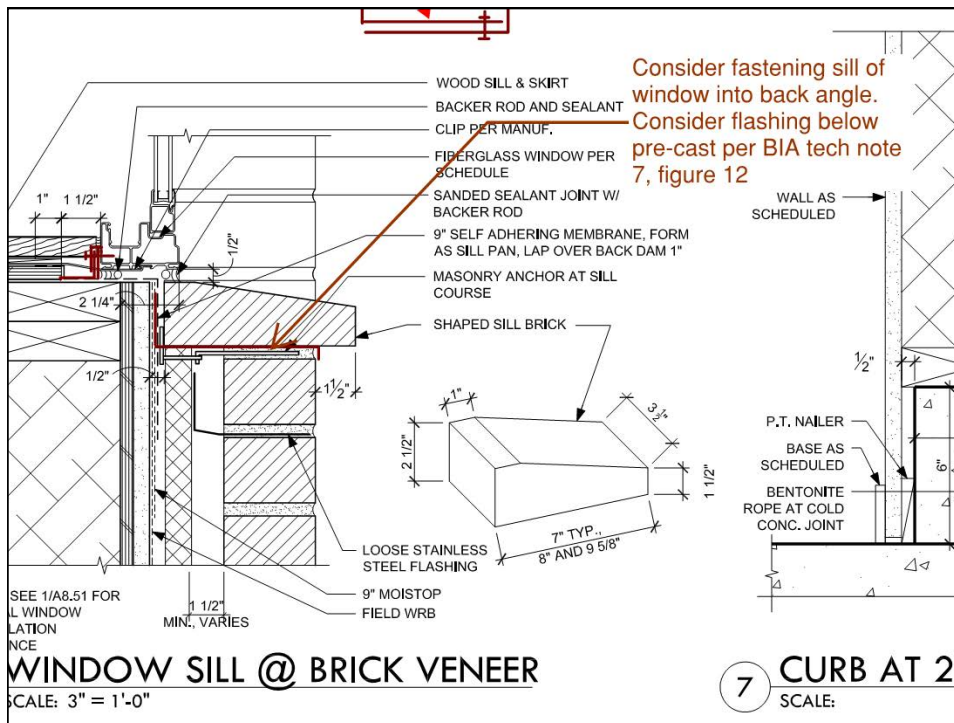
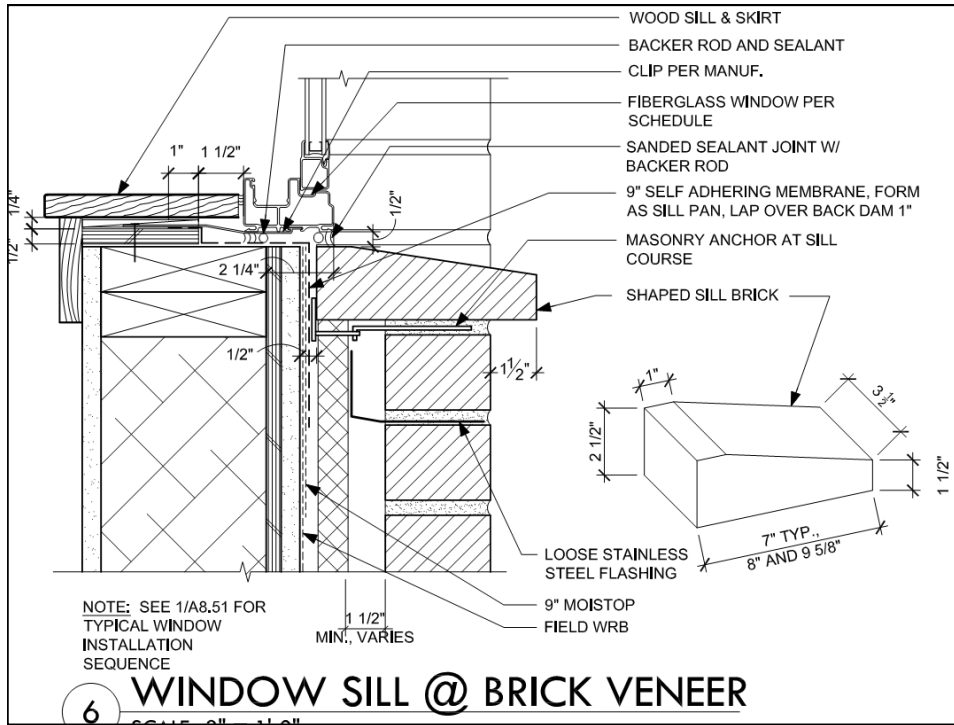
- 1. Existing sealant joints at storefront installation will need to be masked to provide a consistent clean line of elastomeric application.
- 2. Existing sandblasted CMU on the second floor at either side of the main entry will need to be addressed - clear sealer per first floor areas? (RW to RFI to RMW)
- 3. WCC to coordinate removal of light boxes prior to application of elastomeric. Since the meeting, there has been discussion of leaving light boxes in place and either sealing 3 sides with sealant or providing head flashing and sealant at the sides. RMW and RW to confirm.
- 4. Thorolastic representative will need to provide direction on how to treat the horizontal ledge below the parapet wall. RW to RFI to RMW for direction.

9. Other

- 1. Capitol to coordinate with Thoro representative inspections to meet warranty requirements.
- 2. Thorolastic elastomeric and all other products must be installed under weather condition indicated in product installation requirements.
- 3. Application of elastomeric cannot continue during high wind events to protect adjacent surfaces, buildings and automobiles. Capitol will protect adjacent surfaces from overspray and debris from crack preparation and will be required to clean the areas they prep at the end of each day and when moving to other areas of the building.
- 4. Thorolastic representative will need to provide direction on how to store and clean their materials at their yard.
- 5. There is no parking available for workers. All subcontractors will be required to provide their own parking.







Photos:

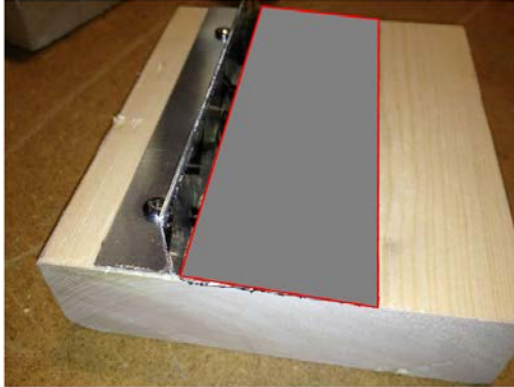


Photo #1
Metal "L" angle sill dam requires secure attachment to opening sill

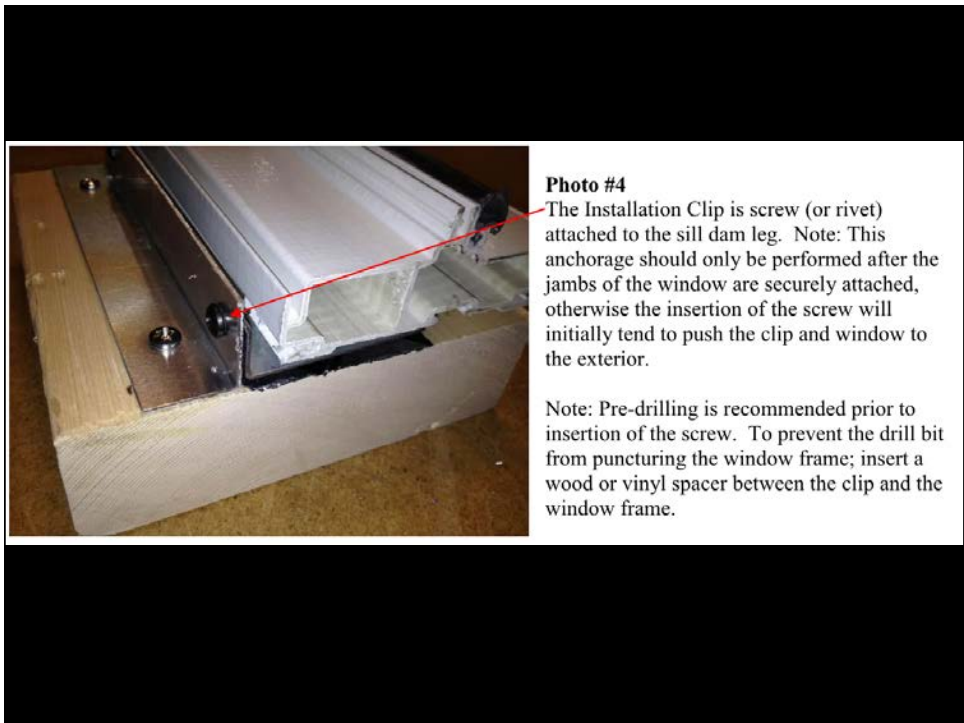
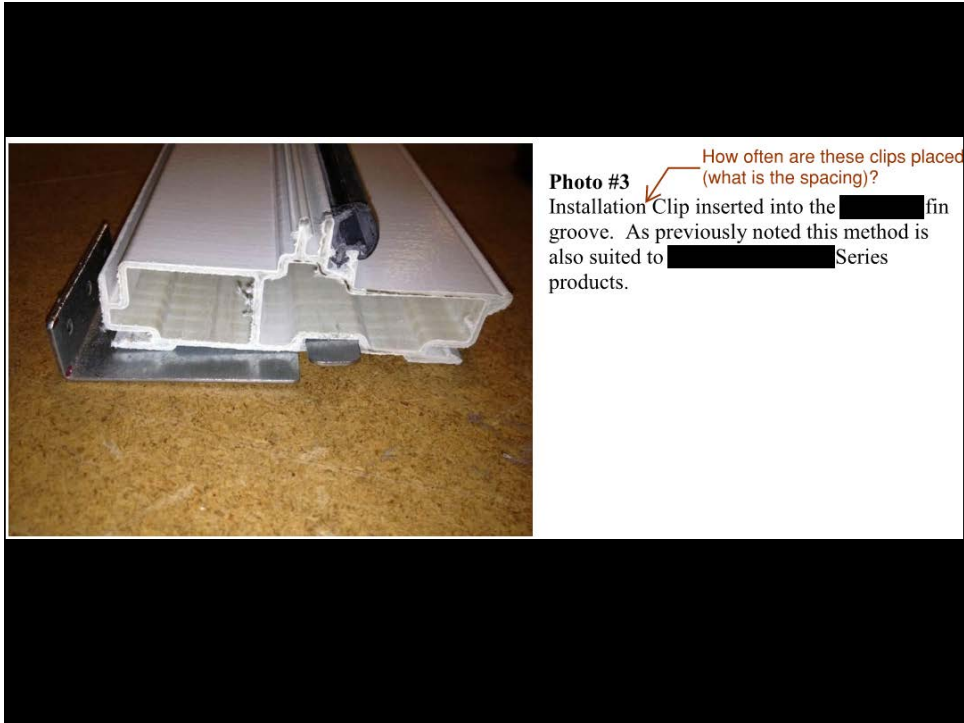
Flashing tape applied onto sill dam leg and on opening sill

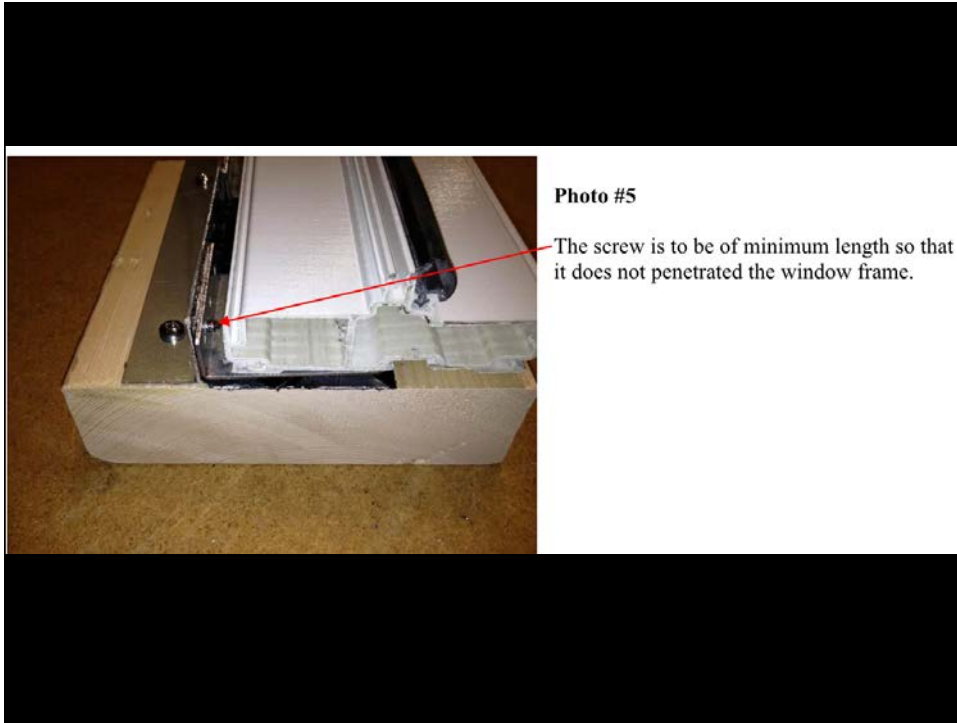
Are we required to use foil faced material?

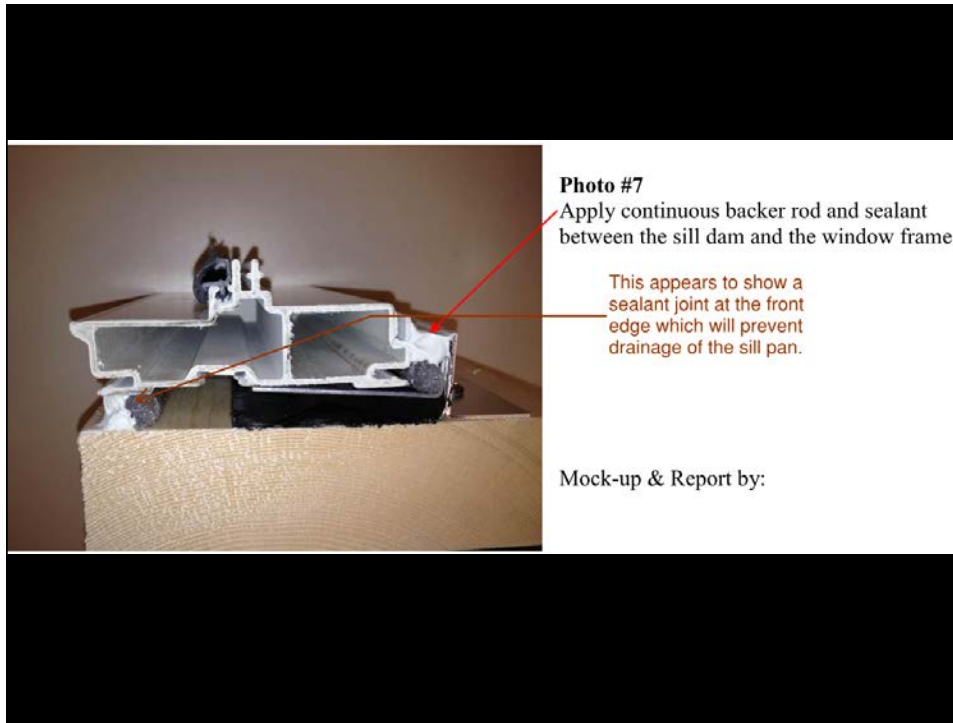


Photo #2
Standard Installation Clip is cut to length and then bent 90°. The clip length will need to be determined per job as it is based on the width of the joint between the sill dam and the window plus the leg height of the sill dam.

Is this bent in the factory or in the field?







QEDLAB QEDLAB Inc. - AAMA-Accredited Laboratory & Field Testing Agency
Project ID: 3137-01 Ref: Elot MLX Date: March 8, 2015

Master Test: 1		Formal Test Pressure:	Cycle #	Start Time	End Time	# Ingress	# Leaks	Pass / Fail
Test Date:	3/12/13	4.5 psf	1	12:32	12:37	4	4	FAIL
Week Day:	Tuesday	Equivalent Pp:	215 Pa	ABORTED				
Specimen ID:	1	Equivalent "qC":	0.16 "/sC					
Level:	1 st floor	Velocity Pressure:	42 mph	FINAL TEST RESULT: FAIL				
Unit #:	Mock Up	(+/-) Pressure:	- Negative					
Elevation:	East	Procedure (B):	Cyclic Static					
Location:	Mock Up							
Documented Instances of Formed Leaks:		4						
Leak #	Cycle #	Time	Description of Leak Behavior and Origin of Failure Mechanism if Known:					
1	1	1:15	Technicians observed water intrusion at the center mullion at the sill of the product.					
2	1	1:32	Technicians observed water intrusion at the bottom left corner of the product.					
3	1	2:30	Technicians observed water intrusion at the bottom right corner of the product.					
4	1	3:29	Technicians observed water intrusion at the top right corner of the product.					

Comments/Observations: Master Test 1 is the initial assessment of Specimen 1, a [redacted] casement "C" window measuring 56" x 48". Prior to testing, a twenty-minute purge was run to remove debris and/or moisture from the test area. Master Test 1 tested Specimen 1 at 4.5 Psf. Technicians observed water intrusion at four locations during the first cycle. Testing was aborted and Master Test 1 resulted in a fail.

2

It was at this point that our window installation crew (also our framer) refused to execute the project



“Those tests don’t count”

Physics is different when the manufacturer is present

Cladding wasn’t installed

QEDLAB QEDLAB Inc. – AAMA-Accredited Laboratory & Field Testing Agency
Project ID: 3137-02 Ref: Elot MKX Date: March 22, 2013

Master Test: 3		Formal Test Pressure:	Cycle #	Start Time	End Time	# Ingress	# Leaks	Pass / Fail
Test Date:	1/24/13	Pressure in psf:	1	4:37	4:42	0	0	
Week Day:	Tuesday	Equivalent Pa:	2	4:43	4:48	0	0	
Specimen ID:	3	Equivalent "WC":	3	4:49	4:54	0	0	FAIL
Level:	1 st Floor	Velocity Pressure:	4	4:55	5:00	1	1	
Unit #:	Room 2	[+/-] Pressure:	-					
Elevation:	North	Procedure (B):	Cyclic	Static				FINAL TEST RESULT: FAIL
Location:	n/a							

Documented Instances of Formal Leakage: None

Leak #	Cycle #	Time	Description of Leak Behavior and Origin or Failure Mechanism if Known:
1	4	5:21	Technicians observed water intrusion at the sill, to the left of the center mullion.



Comments/Observations: Master Test 3 is the initial assessment of Specimen 3. A [redacted] casement "C" window measuring 56" x 48". Prior to testing, a purge was run to remove debris and/or moisture from the test area. Master Test 3 tested Specimen 3 at 4.5 Psf. Technicians observed water intrusion at the sill, to the left of the center mullion. Due to water intrusion, Specimen 3 received a Fail.

Luckily, our design team rushed to the rescue

In-House Testing:	
Location	<p>██████████</p> <p>Note that tests will be conducted in a test chamber constructed by ██████████ personnel, with window perimeters sealed to window opening using a combination of self-adhering flashing membrane and <u>duct tape</u>.</p>
Conducted By	██████████ employees with knowledge of AAMA testing standards and expertise in conducting manufacturer testing of window units
Third Party Observation	Full time on-site observation by staff member from either ██████████ Construction This should read AAMA 502
Testing Standards	Testing procedures to comply with AAMA 503 / ASTM E 1105.
Test Pressures	<p>5.0 lbs/cu. In. for single framed windows</p> <p>4.5 lbs/cu. In. for mulled framed windows</p> Correct units are PSF
Acceptance Standard	<p>Per AAMA 503 and Specification Section 085313, Paragraph 1.7.B.1.b., with additional agreement that no water is to pass to the visible side of any portion of the test specimen and/or test assembly. No conjecture will be made as to whether the path may be through the window unit, the perimeter seal, or the framed wall test panel.</p> Per above, AAMA 502
Quantity	Minimum of 75 units



Luckily, our design team rushed to the rescue

In-House Testing:	
Location	<p>██████████</p> <p>Note that tests will be conducted in a test chamber constructed by ██████████ personnel, with window perimeters sealed to window opening using a combination of self-adhering flashing membrane and <u>duct tape</u>.</p>
Conducted By	██████████ employees with knowledge of AAMA testing standards and expertise in conducting manufacturer testing of window units
Third Party Observation	Full time on-site observation by staff member from either ██████████ Construction This should read AAMA 502
Testing Standards	Testing procedures to comply with AAMA 503 / ASTM E 1105.
Test Pressures	5.0 lbs/cu. In. for single framed windows 4.5 lbs/cu. In. for mullied framed windows Correct units are PSF
Acceptance Standard	Per AAMA 503 and Specification Section 085313, Paragraph 1.7.B.1.b., with additional agreement that no water is to pass to the visible side of any portion of the test specimen and/or test assembly. No conjecture will be made as to whether the path may be through the window unit, the perimeter seal, or the framed wall test panel. Per above, AAMA 502
Quantity	Minimum of 75 units

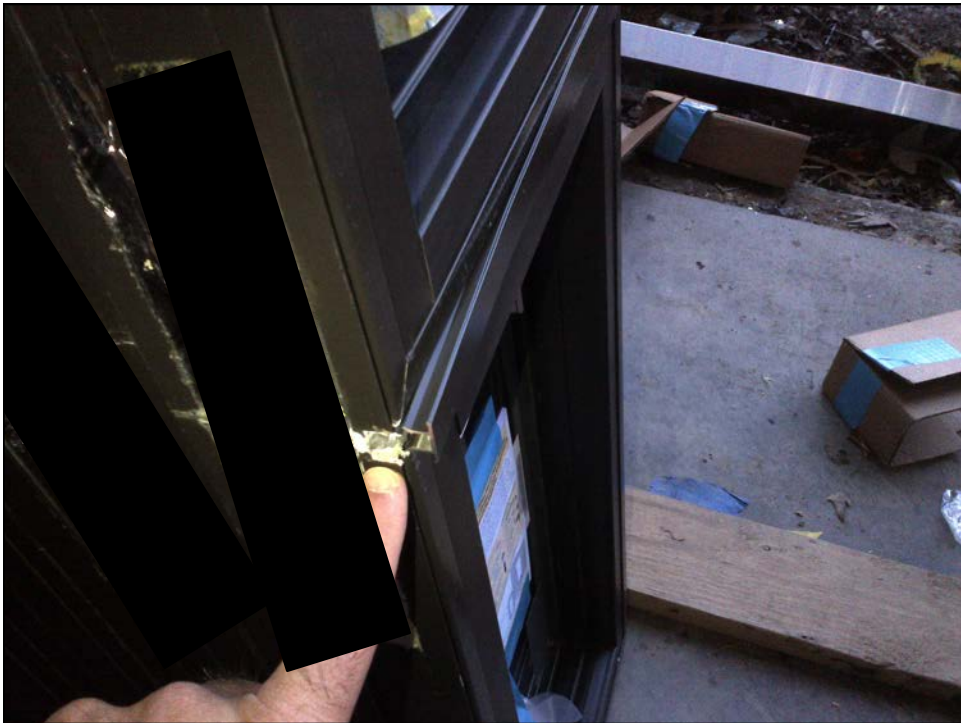


Marty,

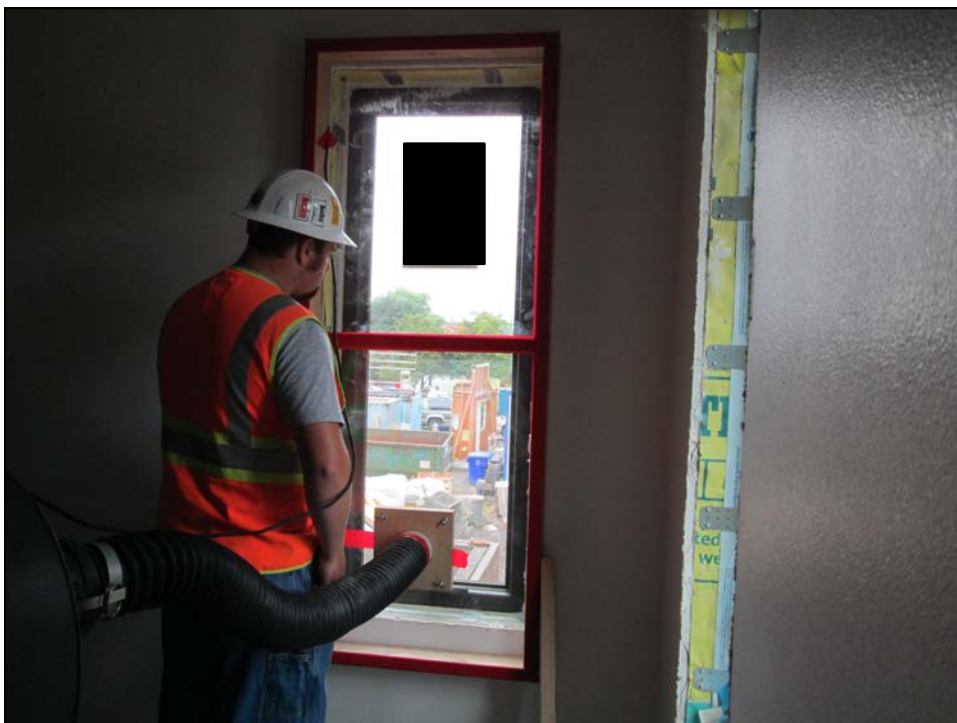
After review of our phone conversations, your proposal, and review with the [REDACTED] Team, as a goodwill gesture we have a proposed resolution that we believe should work for all involved:

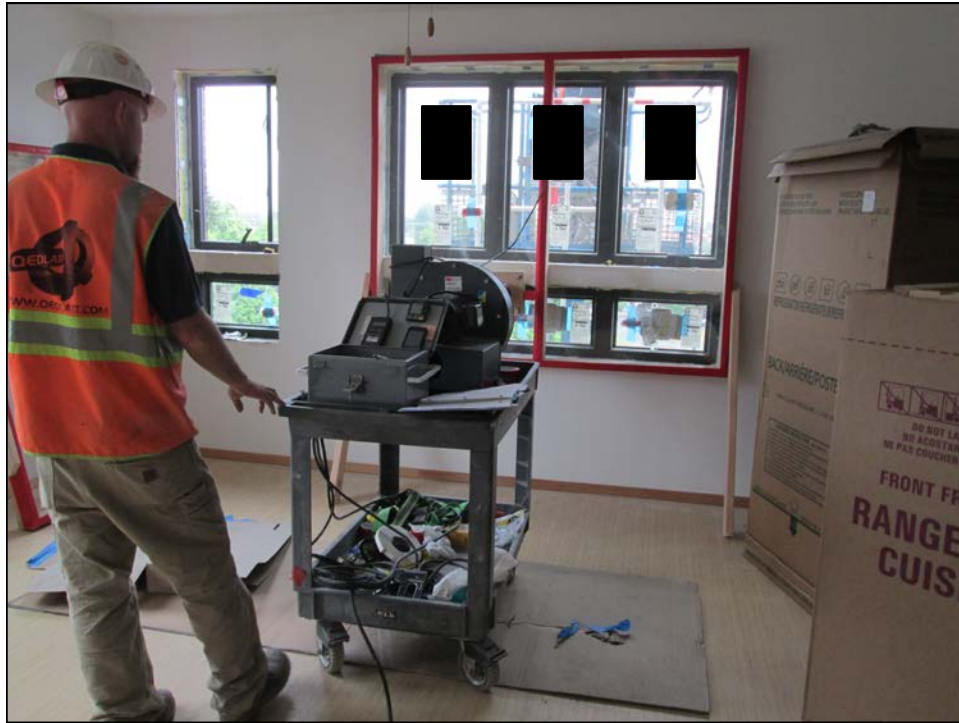
- [REDACTED] will remediate 100% of the units. Remediation for this specific job includes filling portions of the frame with foam, application of sealant at mitered corners, and removal of tape seal at sill and head 3/8" from edges of frame.
- [REDACTED] will test as many units as needed to provide a confidence factor that the above-mentioned remediation is performing to the project specifications. We will test a minimum of at least 50 units. [REDACTED] feels confident that with the remediation the windows will perform to the project specifications.
- Walsh Construction Company, [REDACTED] Architects and/or [REDACTED] can visit the [REDACTED] Facility near Portland Oregon, where the testing of the remediated windows is being performed, to observe the testing being performed. All agree that there will be no compensation by [REDACTED] to a third-party for third-party witnessing of the test.



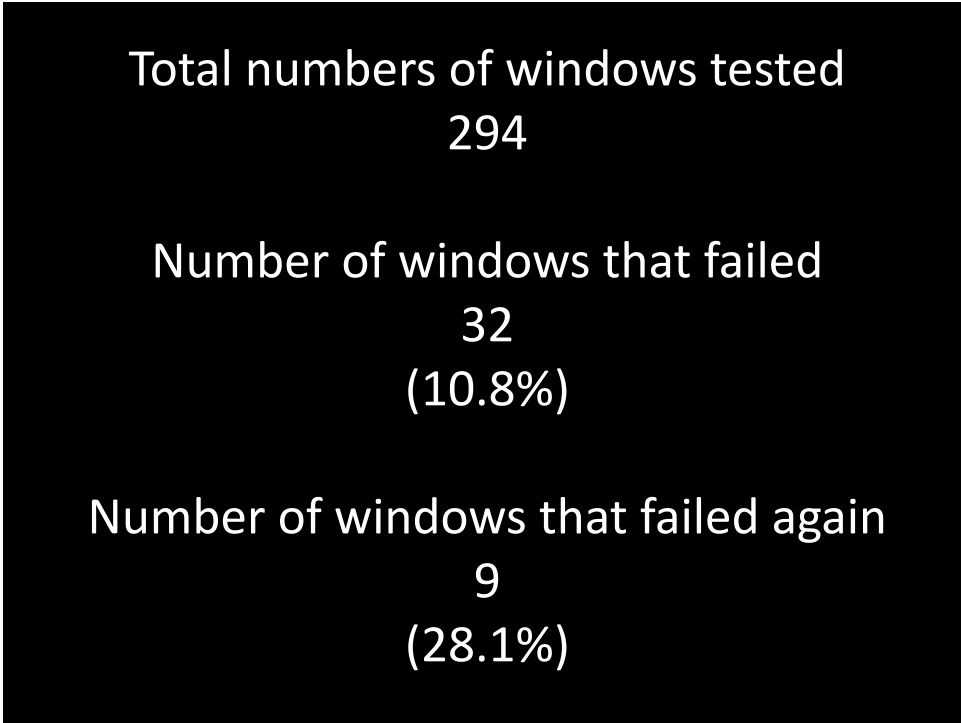


30% of 'remediated' windows were
rejected












LABORATORY CERTIFICATE 

June 26, 2013

LABORATORY NUMBER: 5004.8967
 CUSTOMER AUTHORIZATION: Letter dated June 17, 2013, MLK Eliot Project
 SUBMITTED: June 18, 2013
 REPORT TO: Walsh Construction Company
 Attn: Martin Houston
 2905 SW Firs Avenue
 Portland, OR 97201

SUBJECT:
 Two samples of sealant were submitted for comparative analysis.


SAMPLES SUBMITTED:
 1. [Redacted] Sealant, White, 10.1 Fl. Oz. Tube,
 2. [Redacted] Sealant, White, 20 Fl. Oz. Sausage,

ANALYSIS:
 The samples were examined for cure time and hardness followed by analysis after 0 and 40 hours of cure time using Fourier transform infrared spectroscopy (FTIR), solvent deposition from Acetone:Toluene, 1:1 by volume, and pyrolysis methodologies. Cure time was conducted at 20°C and 50% relative humidity. Hardness testing was conducted using ASTM C661-06(2011) "Standard Test Method for Indentation Hardness of Elastomeric Type Sealants by Means of a Durometer" as a guide.

RESULTS OF ANALYSIS:
 Cure Time:

Sample	Cure Time, hours	Durometer Hardness, Shore A, 168 hours
Tube, Lot No. 9522X-091-133	24	44
Sausage, Lot No. 95054-058-13	no cure @ 168	not applicable

36102 Eden Landing Place, Suite 3, Hayward, California 94545-3811 Phone: 510-887-8811 Fax: 510-887-8427 www.anamet.com
 This report shall not be reproduced, copied or sold, without the written approval of Anamet, Inc. ©2006 Anamet, Inc. All rights reserved.

LABORATORY CERTIFICATE 

Lab. No. 5004.8967 Walsh Construction Company
 June 26, 2013

FTIR:
 Solvent Deposition:
 The FTIR spectra obtained on the of the acetone:toluene soluble portions of the tube and sausage sealant samples after 0 hours cure time were similar and were indicative of phthalate plasticizer and polypropylene glycol.
 The FTIR spectra are presented in Figure 1.

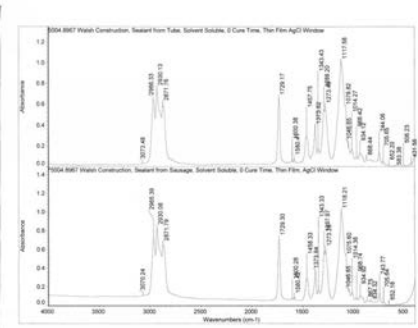
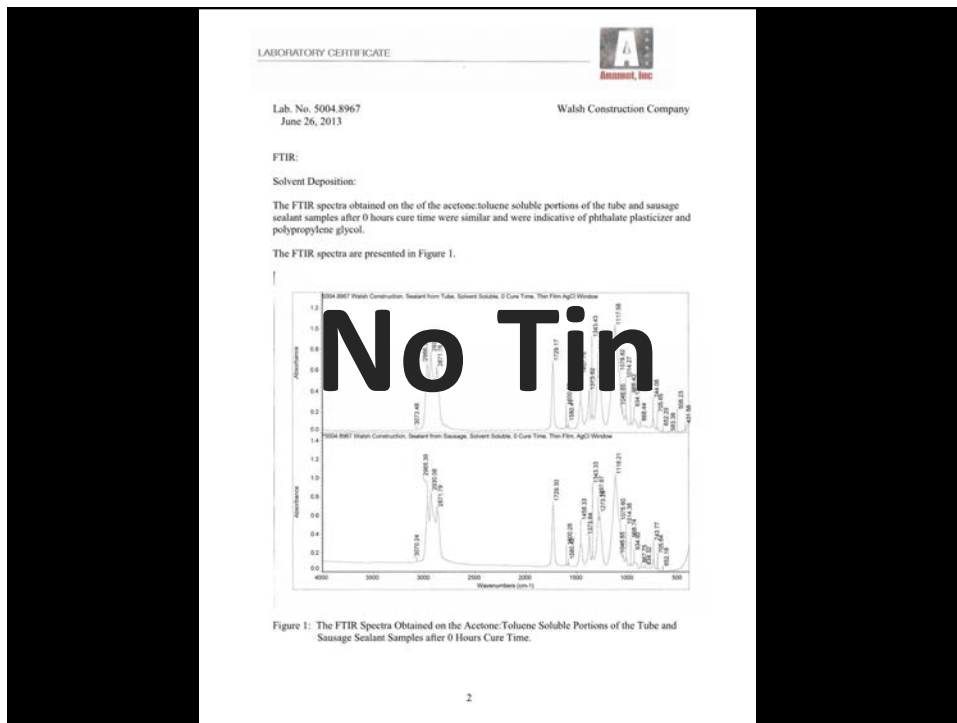
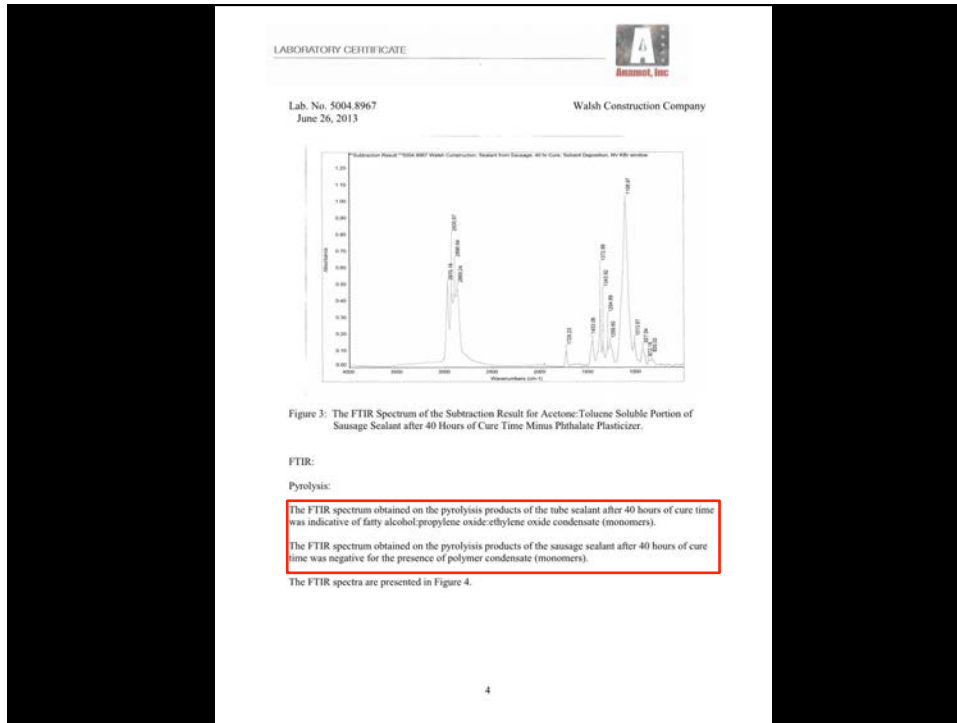
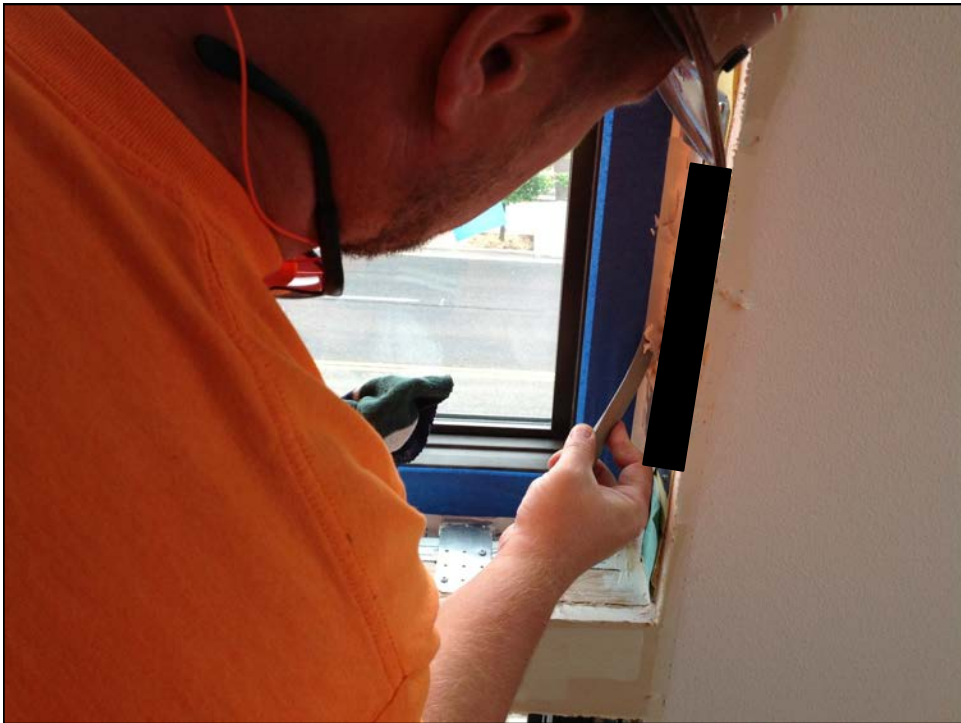


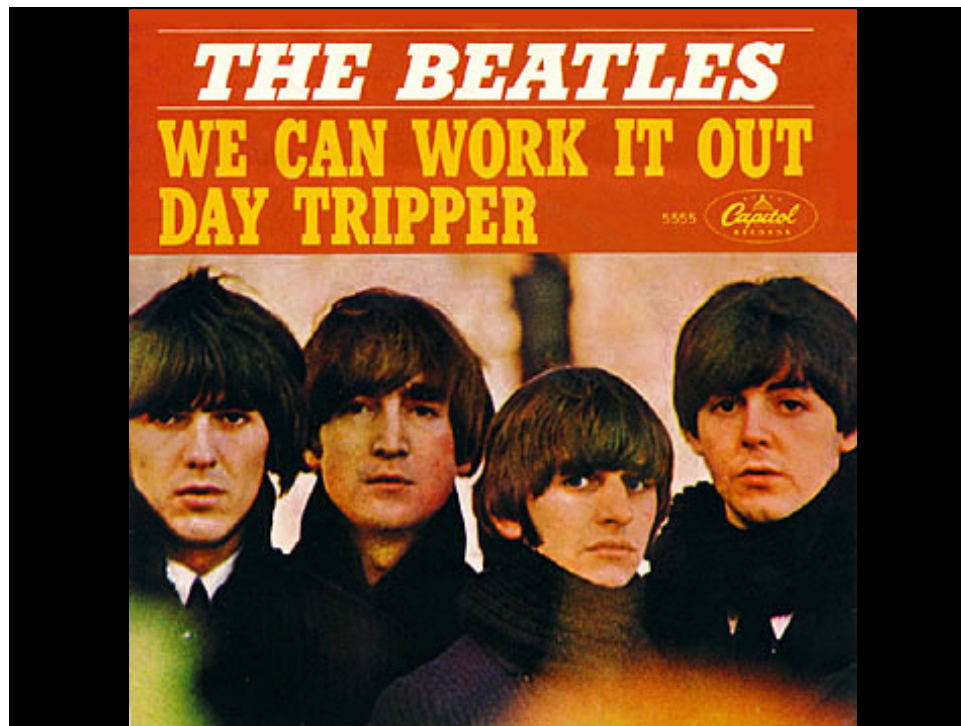
Figure 1: The FTIR Spectra Obtained on the Acetone: Toluene Soluble Portions of the Tube and Sausage Sealant Samples after 0 Hours Cure Time.

2





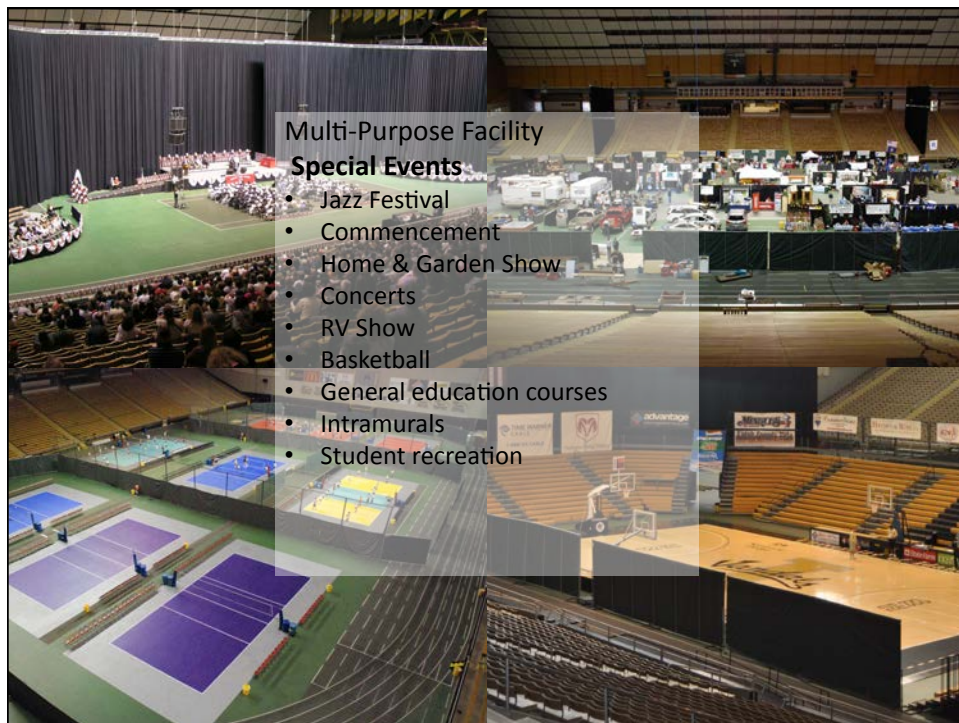


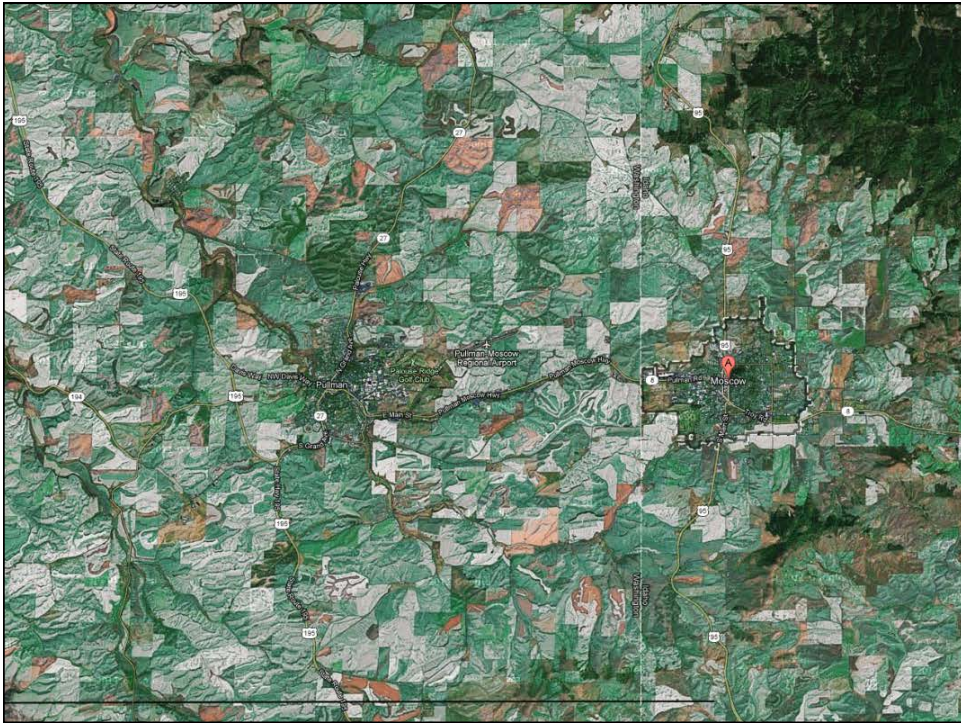


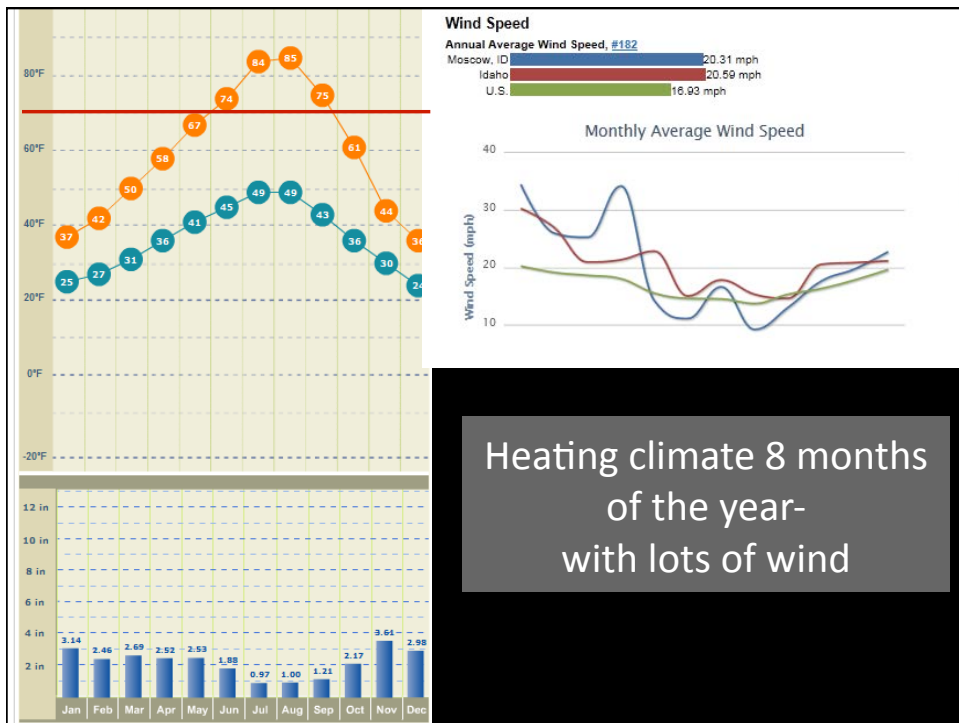
University of Idaho Kibbie Dome

- Life Safety Upgrade to an Essential Facility
 - Fire safety
 - Egress
 - Smoke Evacuation
- Opsis Architects

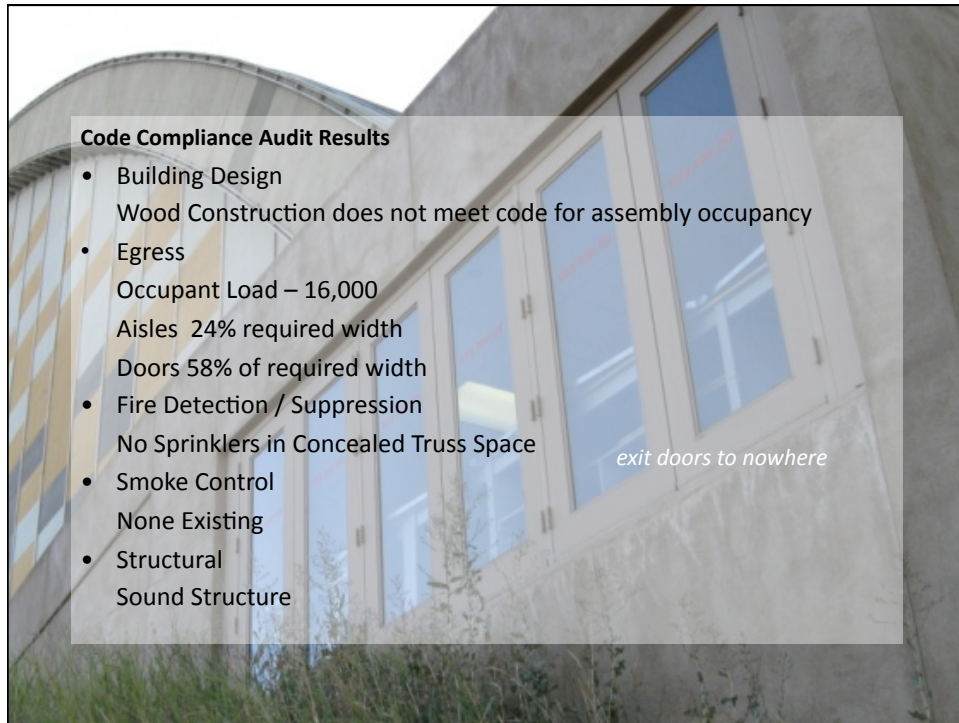
A nighttime photograph of the University of Idaho Kibbie Dome. The dome is illuminated from within, showing its translucent structure. A tall construction crane with lights is positioned to the right of the dome. The scene is dark, with some streetlights and trees visible in the foreground.





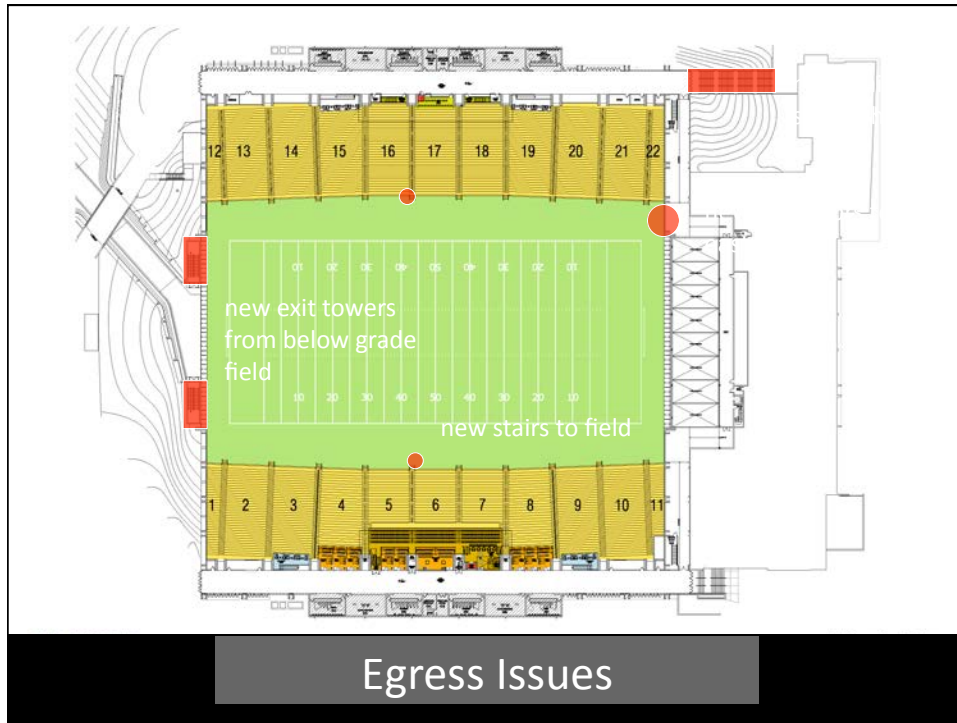


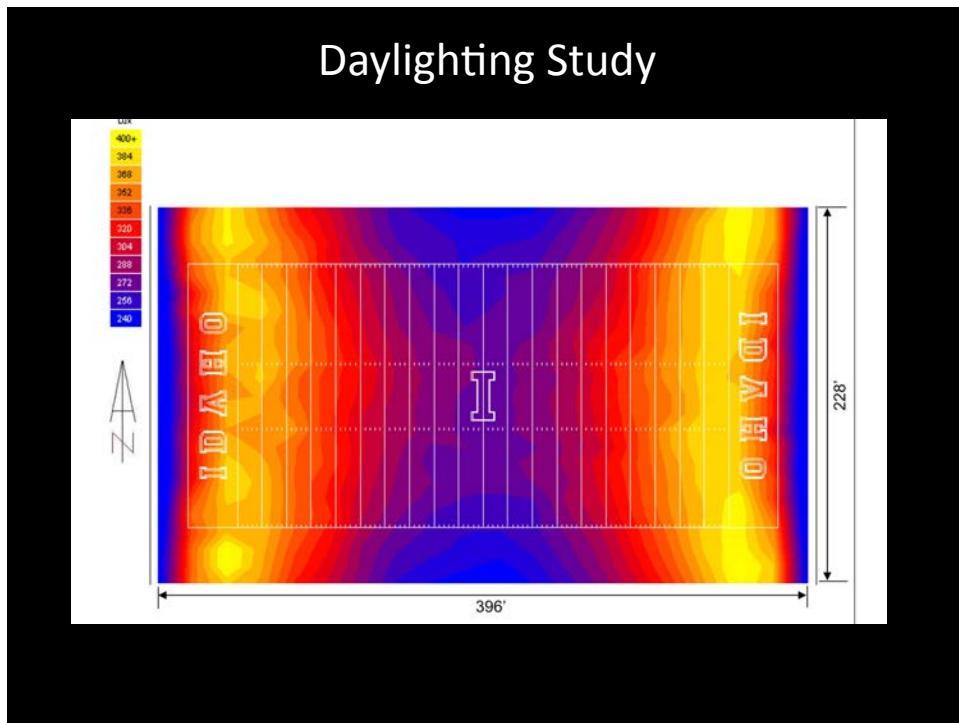
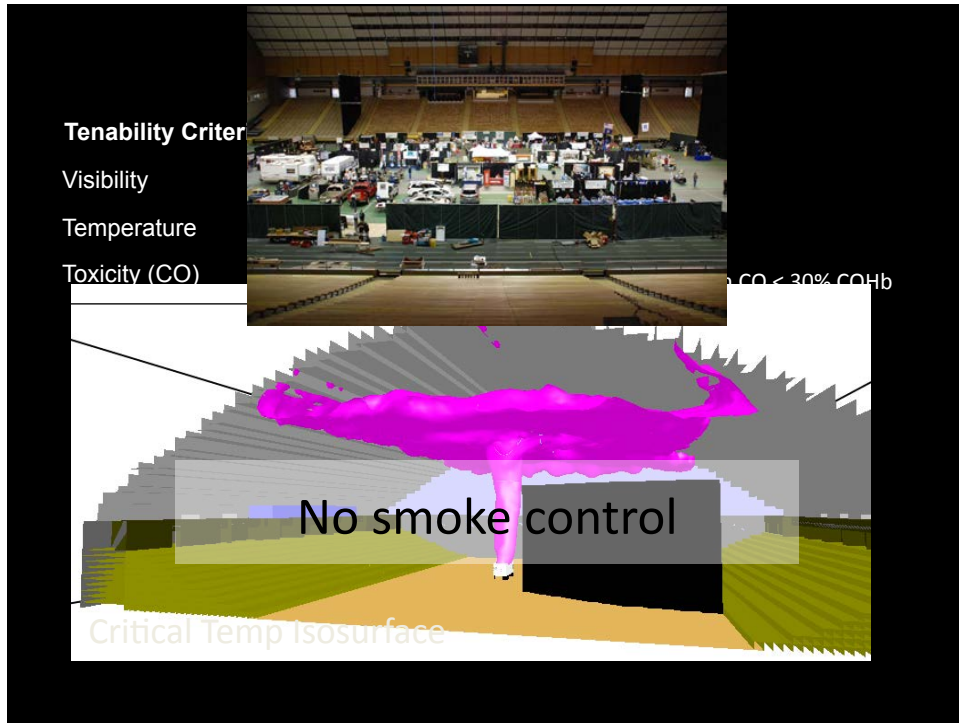
Heating climate 8 months of the year - with lots of wind

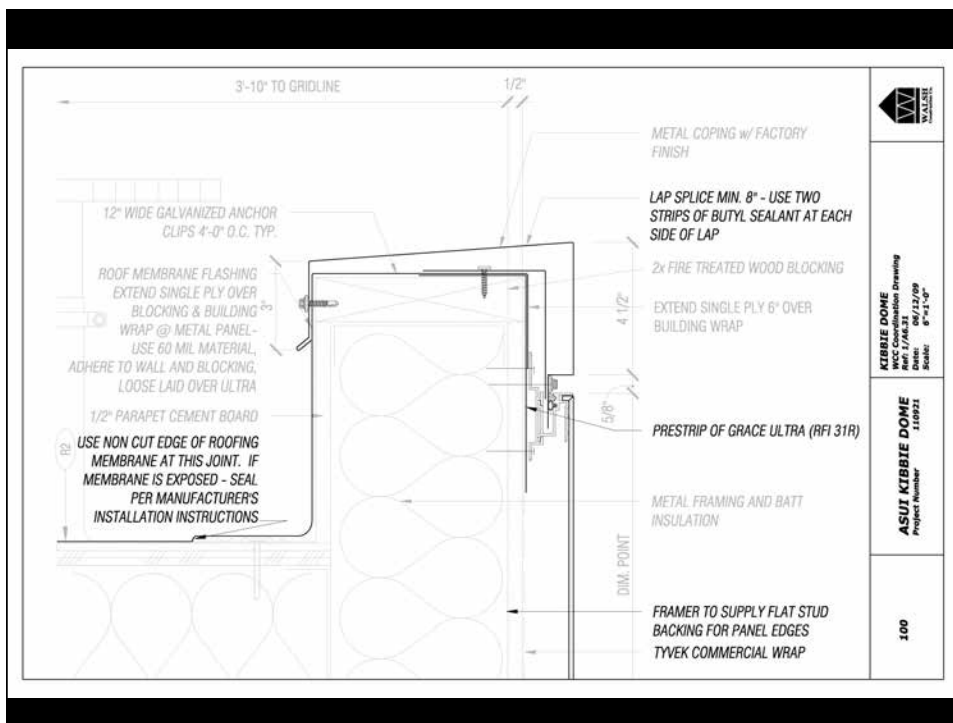


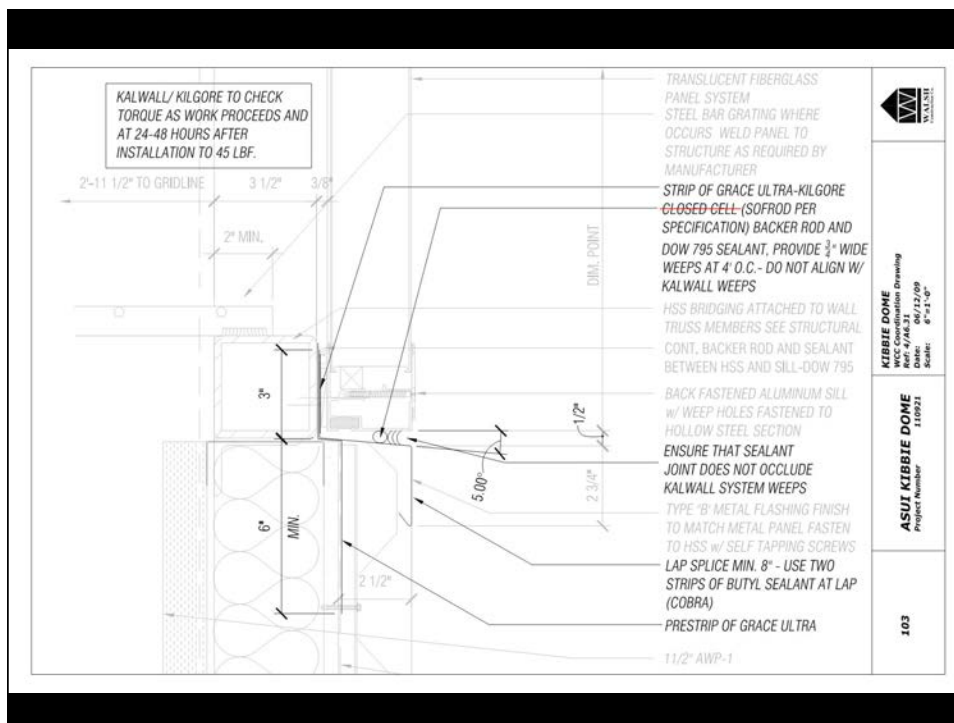
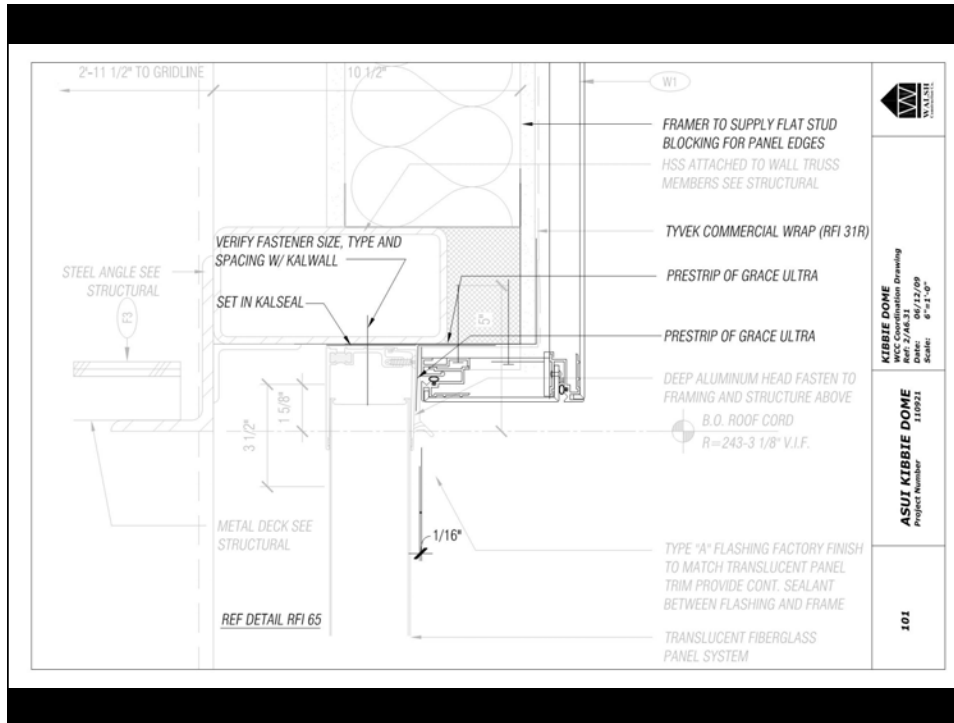


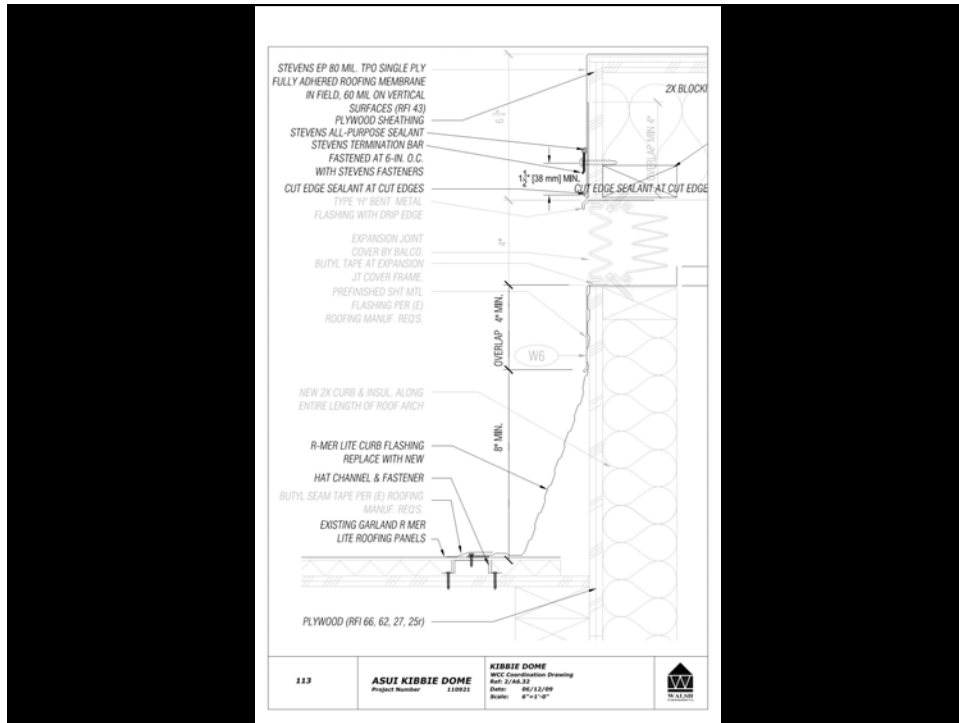


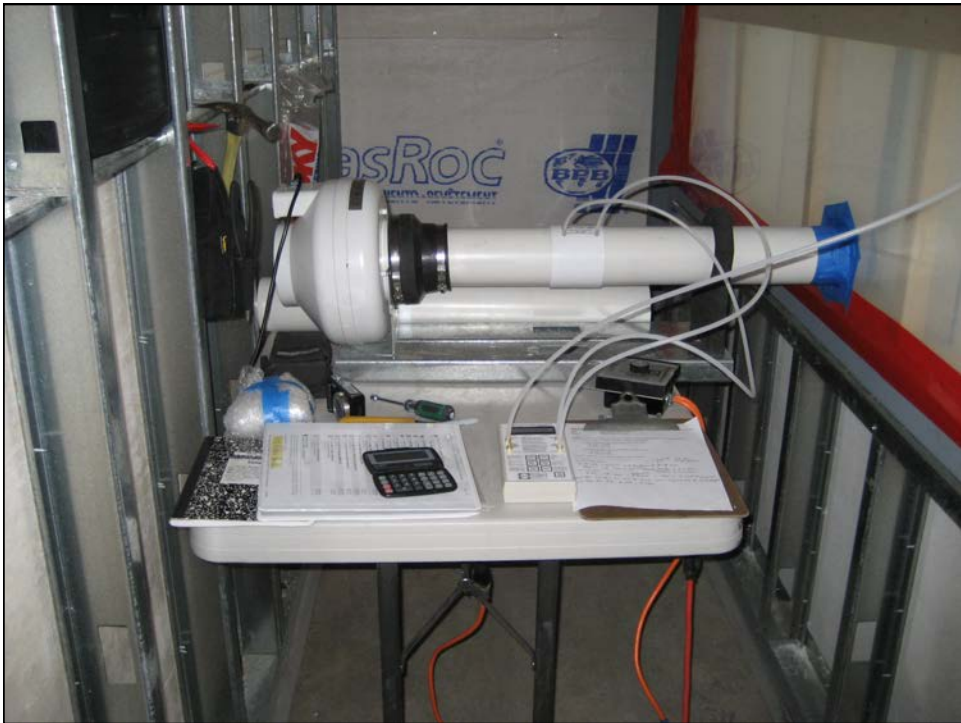
















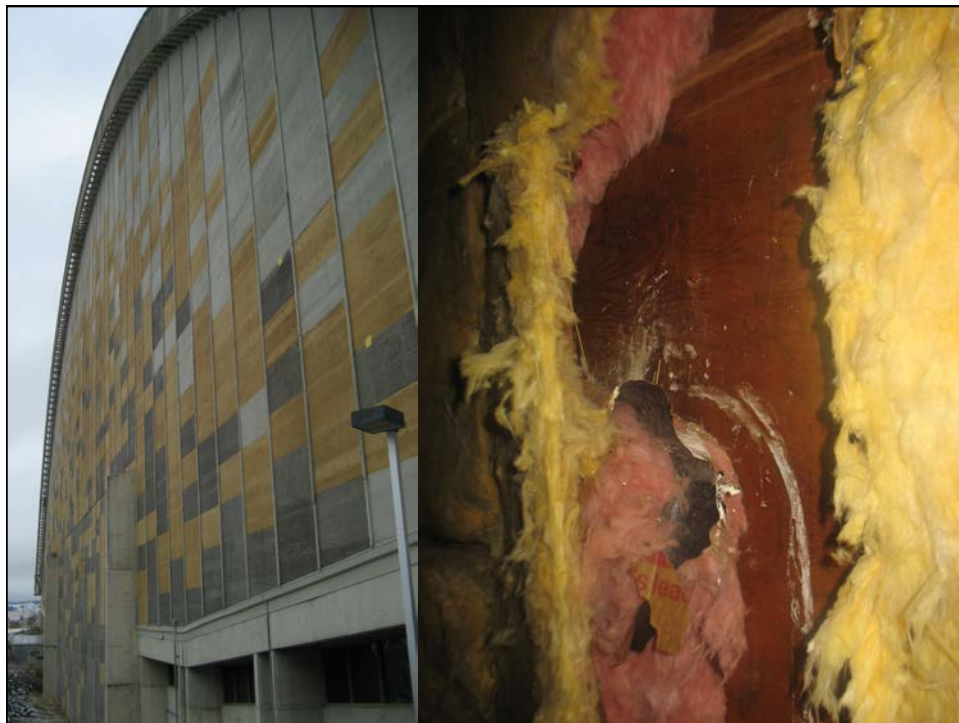


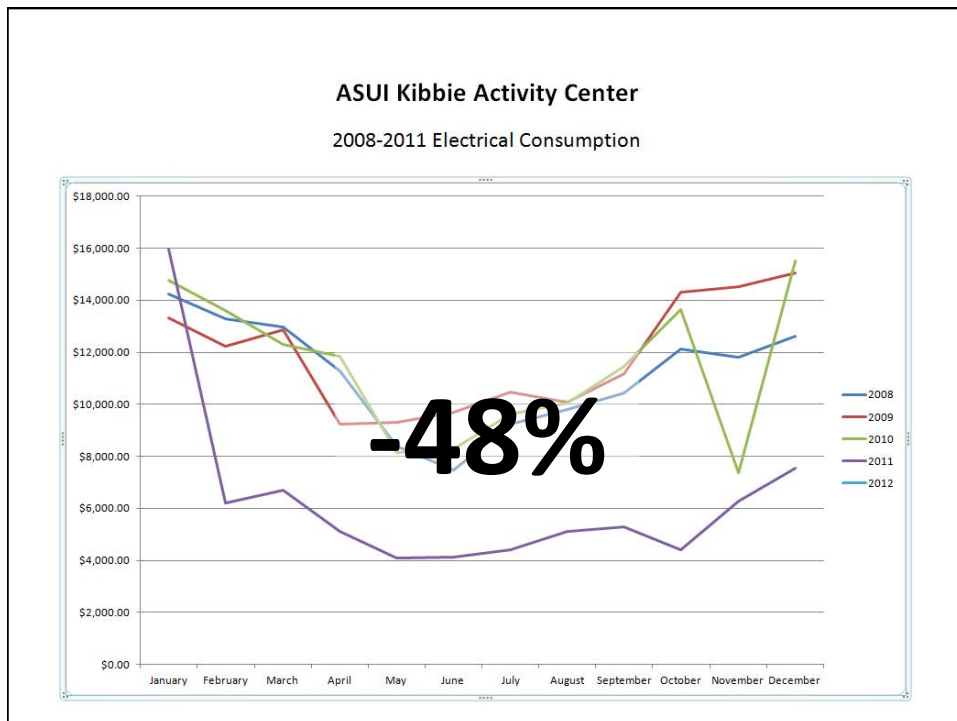
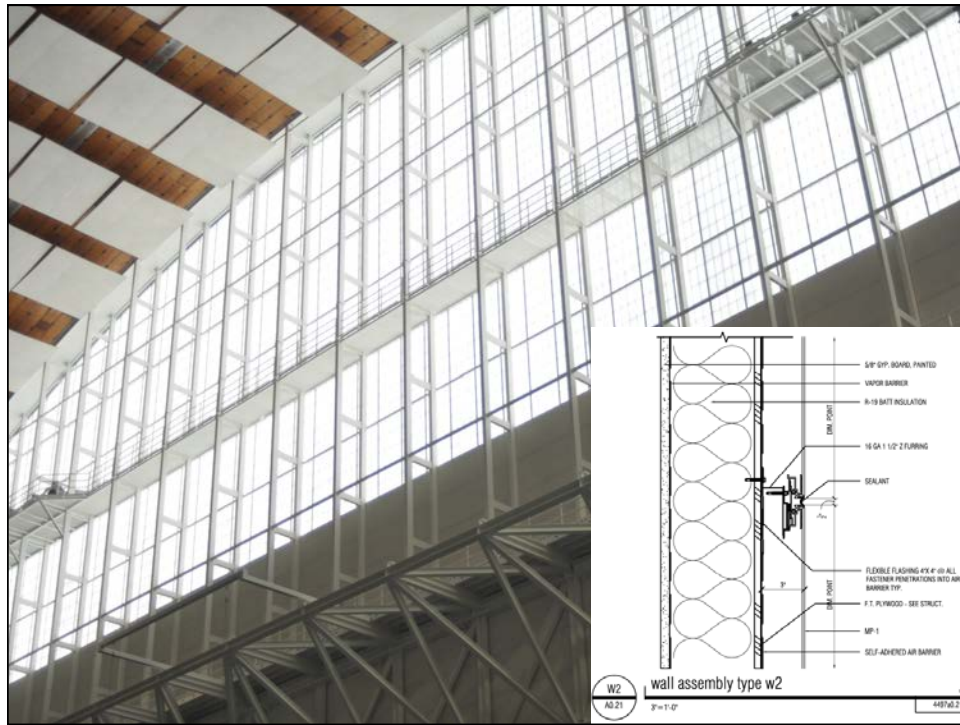


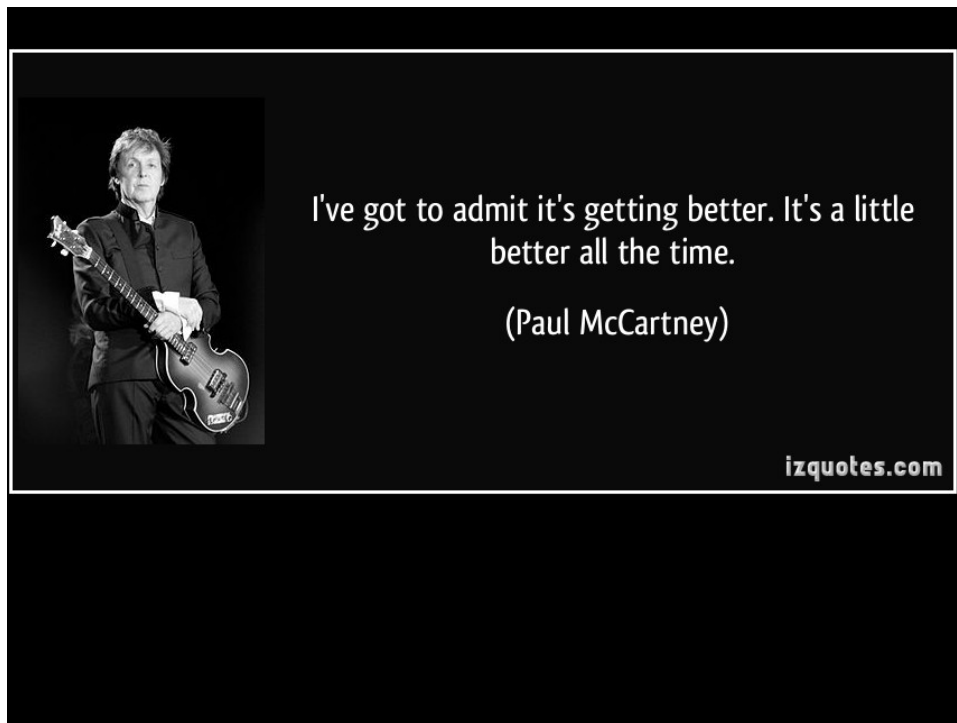
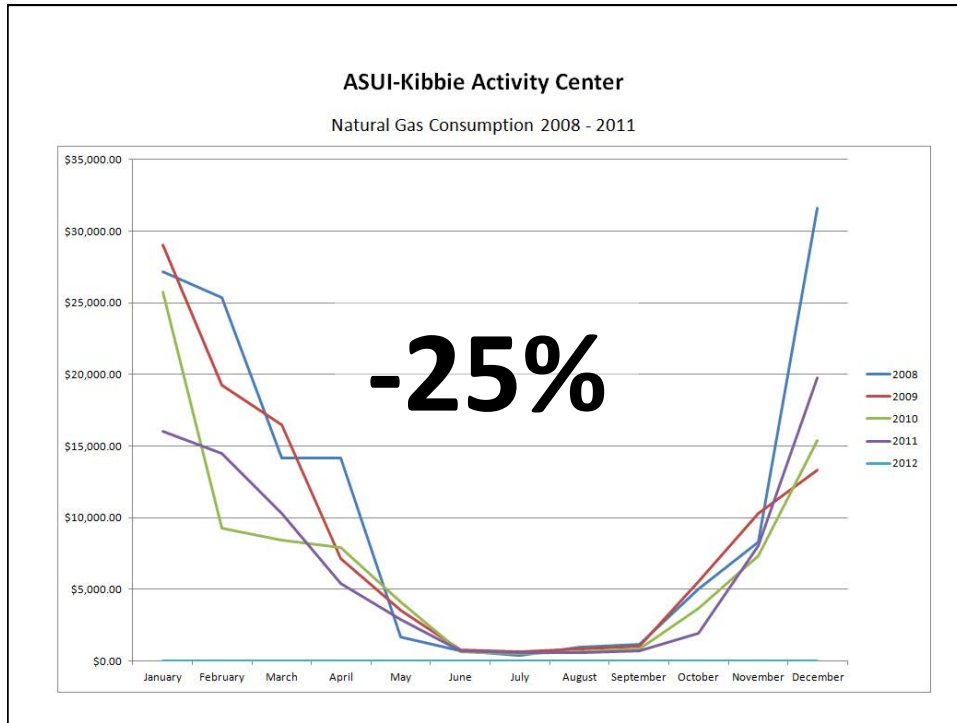


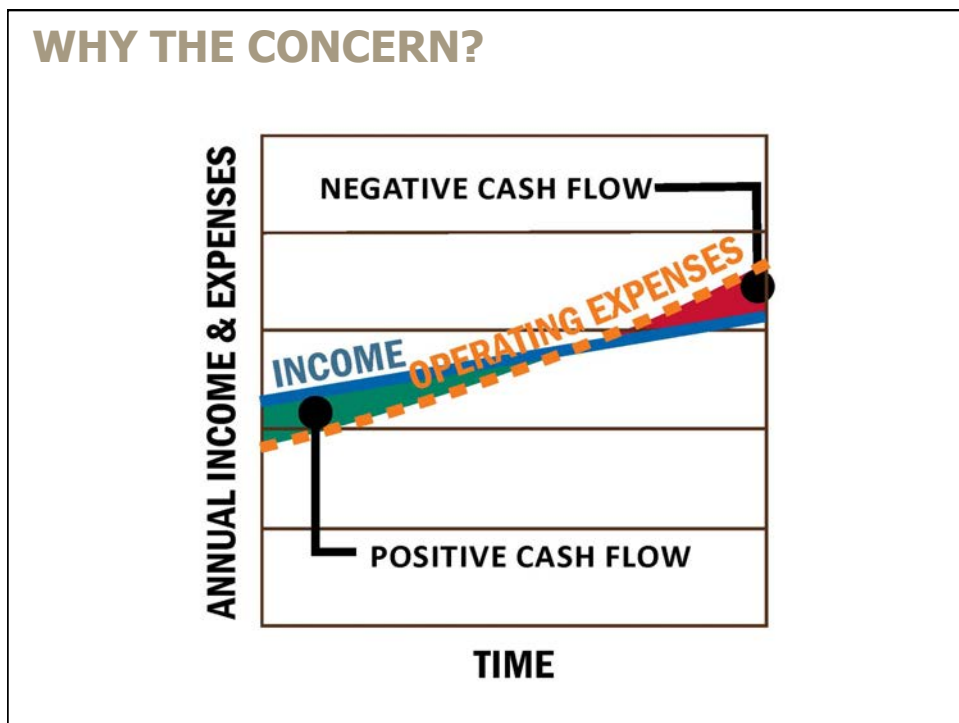
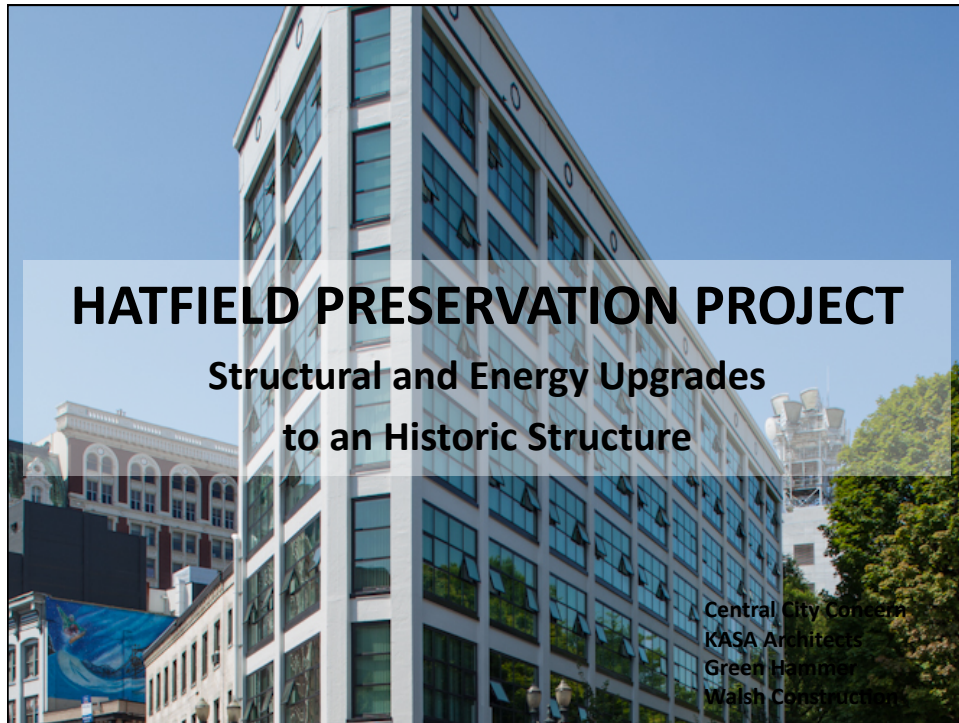












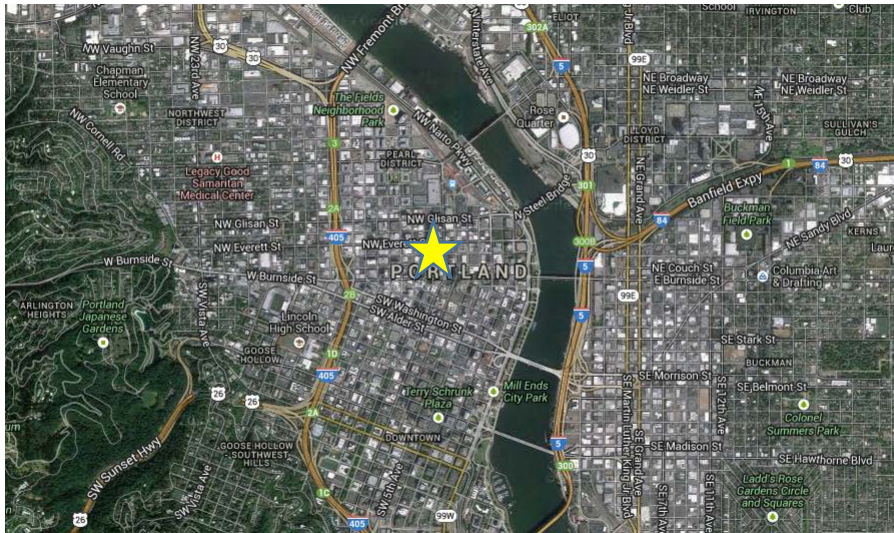
MARK O. HATFIELD BUILDING

Deep Energy Retrofit



MARK O. HATFIELD BUILDING

Location



MARK O. HATFIELD BUILDING

History

**Widening of
Burnside in 1930**

**Façade Repair
in 2010**



Built in 1910

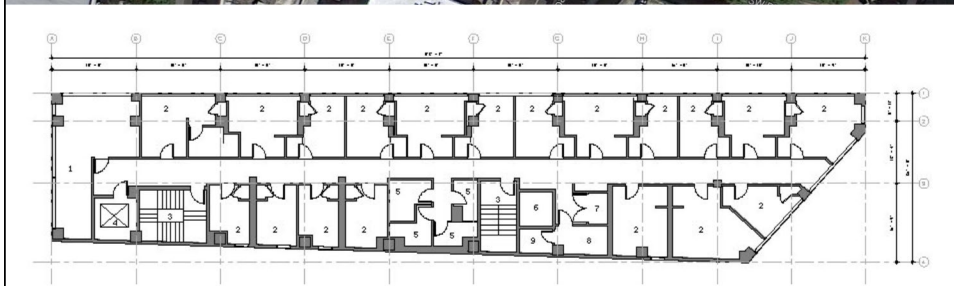
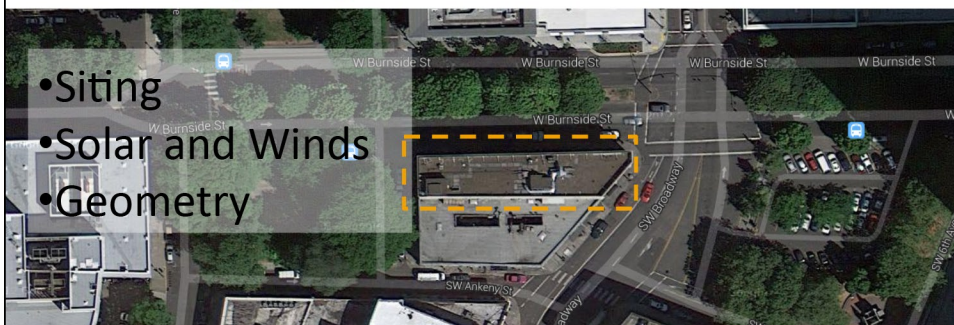
**Hatfield
converted to CCC
housing in 1994**

**Phase 01 of
Passive House
rehab**



MARK O. HATFIELD BUILDING

Basic Building Design



MARK O. HATFIELD BUILDING

Basic Building Design

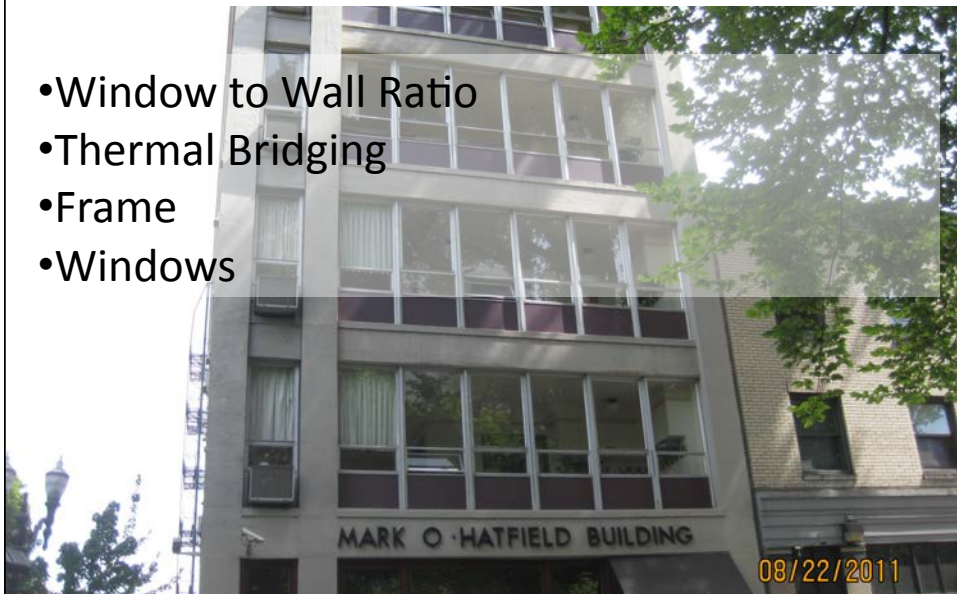
- Structural Frame
- Windows
- Heating System



MARK O. HATFIELD BUILDING

Envelope

- Window to Wall Ratio
- Thermal Bridging
- Frame
- Windows



MARK O. HATFIELD BUILDING
Mechanical

- Inefficient Boiler



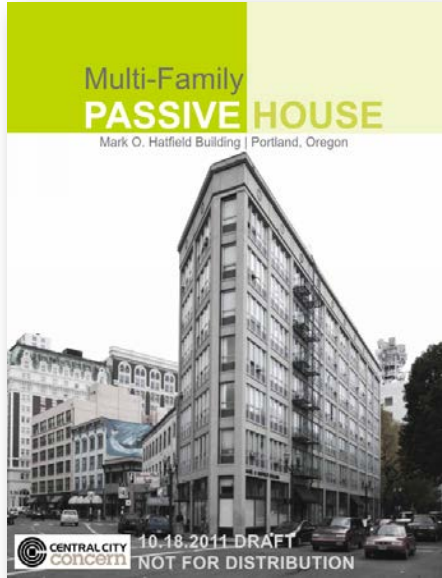
MARK O. HATFIELD BUILDING
Mechanical

- Inefficient Radiators



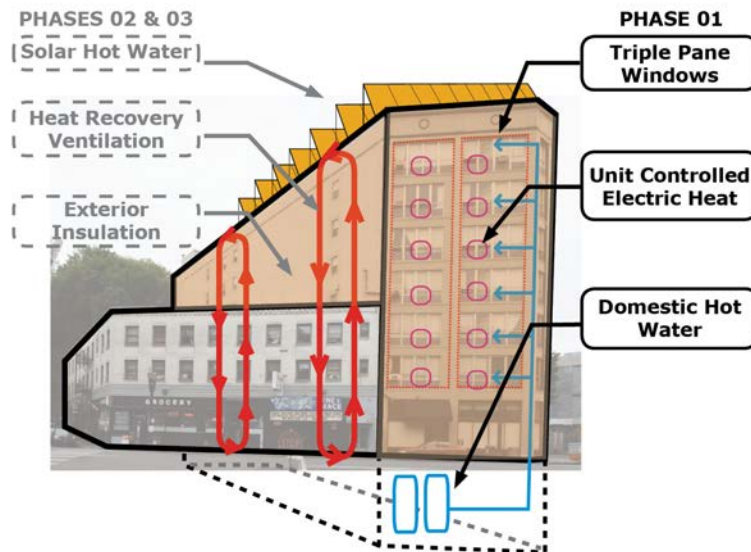
PASSIVE HOUSE FEASIBILITY

A Phased Approach to Deep Energy Retrofits



BIG PICTURE PLANNING

The Ideal Package

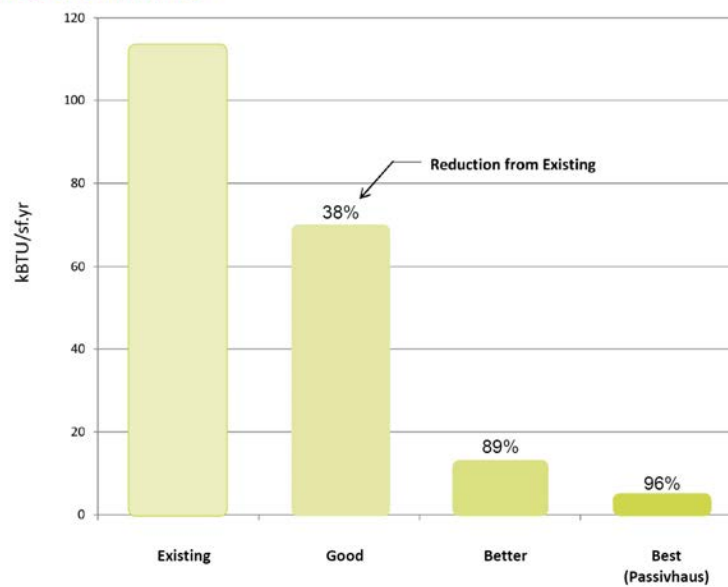


ASSEMBLY OPTIONS

	Existing Building	Good Rehab	Better Rehab	Best Rehab Passive House
Basement Slab Insulation	none	none	none	none
First Floor Insulation	none	none	none	none
Wall Insulation	none	none	2" EPS Exterior Insulation	6" EPS Exterior Insulation
Roof Insulation	Existing 4" Polyiso Board	Existing 4" Polyiso Board w/limited repair	Existing 4" Polyiso Board w/limited repair	Existing 4" Polyiso Board w/limited repair
Window Frame	Aluminum (not thermally broken)	Fiberglass (Cascadia 300 tilt/turn)	Fiberglass (Cascadia 300 tilt/turn)	Fiberglass/Vinyl (Rehau Geneo Euroline 4700)
Frame U-Value	unknown	0.289	0.289	0.14
Window Glazing	Single Pane	2-pane/Cardinal LoE 366 Argon	3-pane/Cardinal LoE 366/180 Argon	3-pane Rehau Geneo PHZ
U Value IGU	1.02	0.20	0.12	0.11
Airtightness (ACH at 50 pa)	10	5.00	0.60	0.60
Airtightness (cfm/sf, 75a)			0.16	0.16

ENVELOPE PERFORMANCE STUDY

Annual Heating EUI (Source: Green Hammer)



COMPLETED PROJECT SCOPE

Phase 01

- **Single pane windows replaced with Cascadia triple pane windows**
- **Windows and flashing designed to anticipate EIFS at a later date**
- **Mechanical ventilation designed to anticipate HRV at a later date**
- **Heating disconnected from oversized boiler and switched to unit electric heaters with connection to window watchers**
- **Installed new high efficiency DHW Heaters**
- **Concrete repair and air sealing**













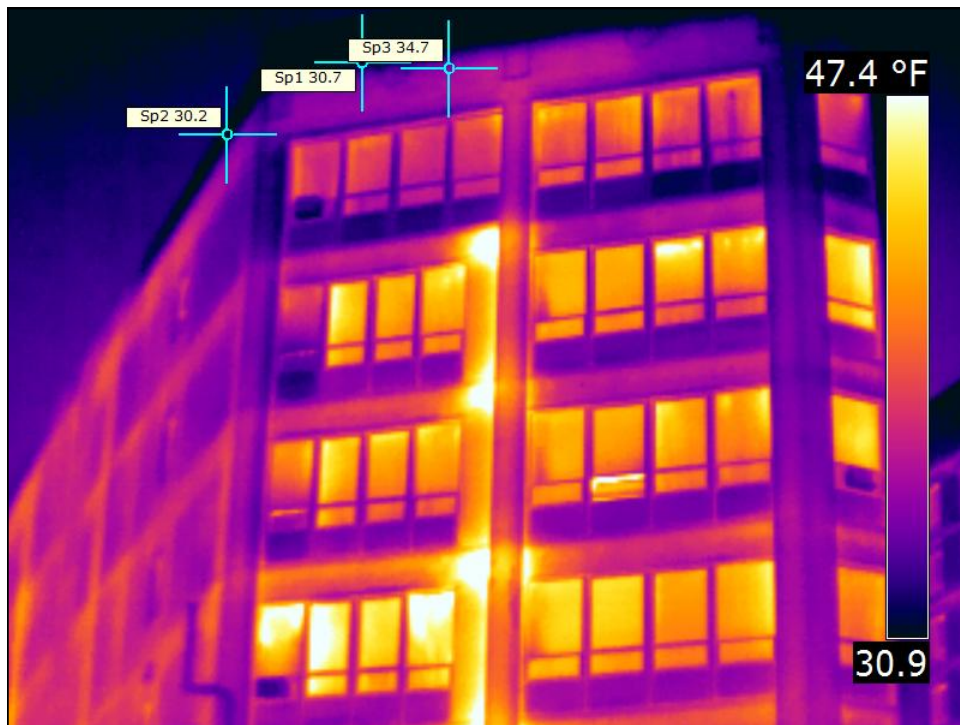




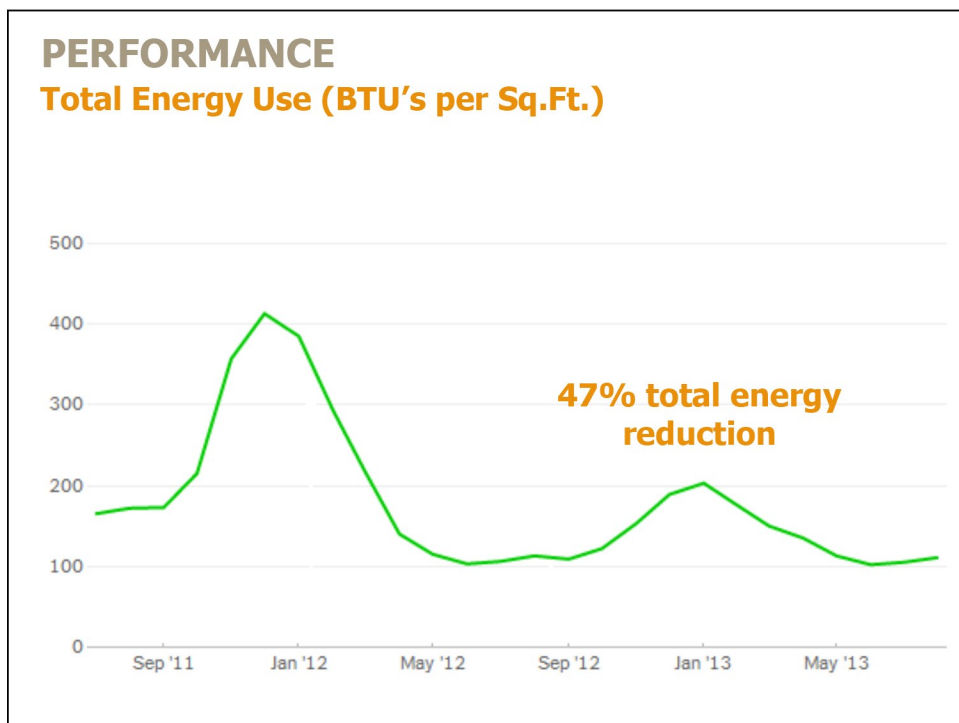
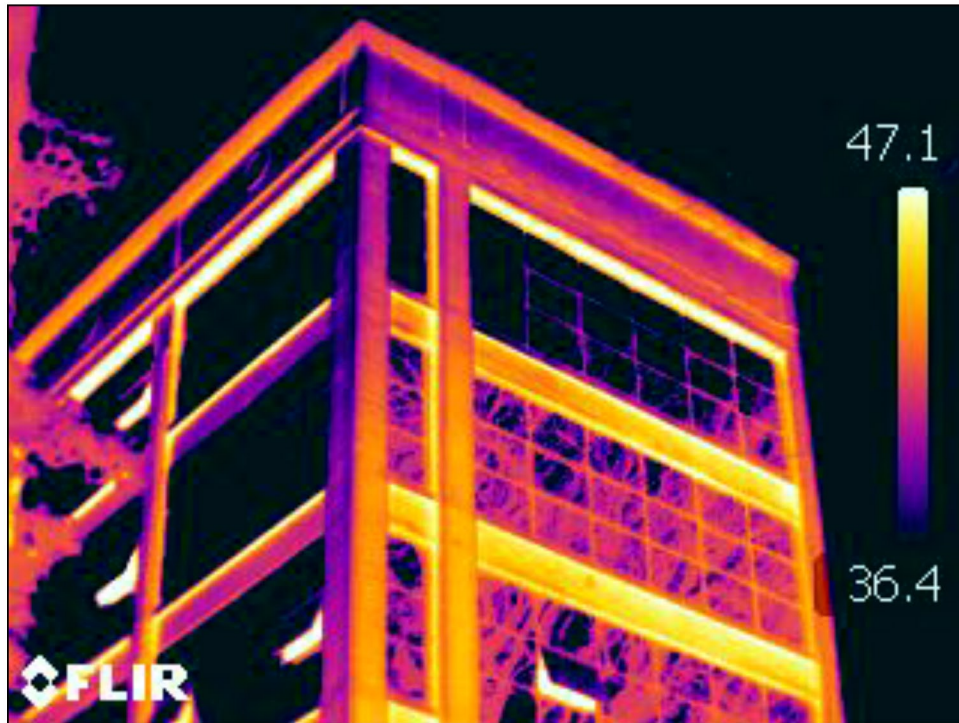


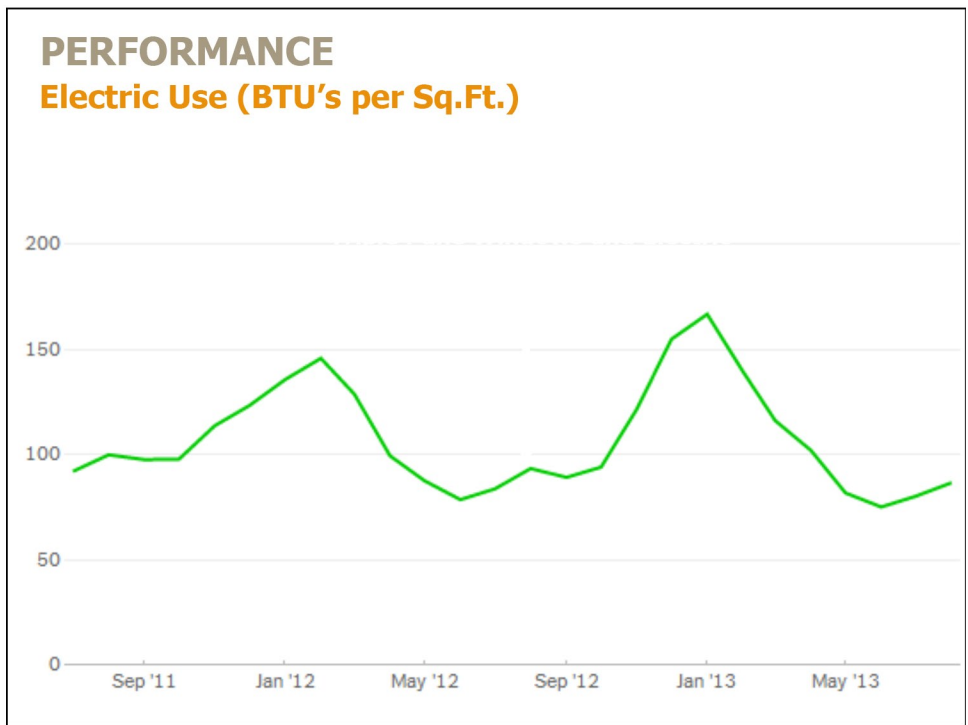
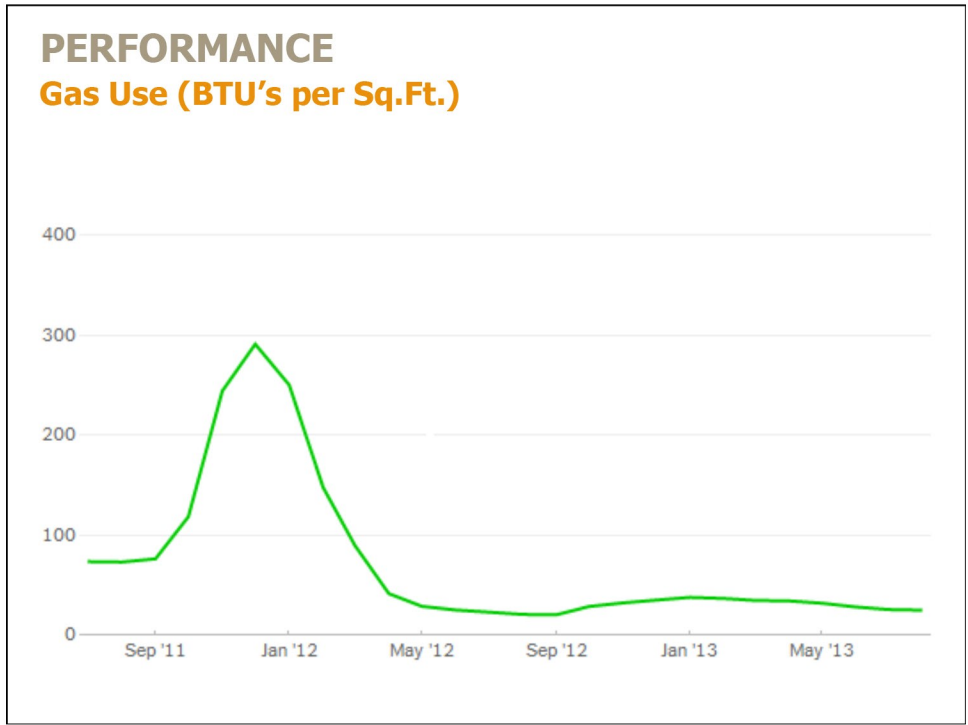








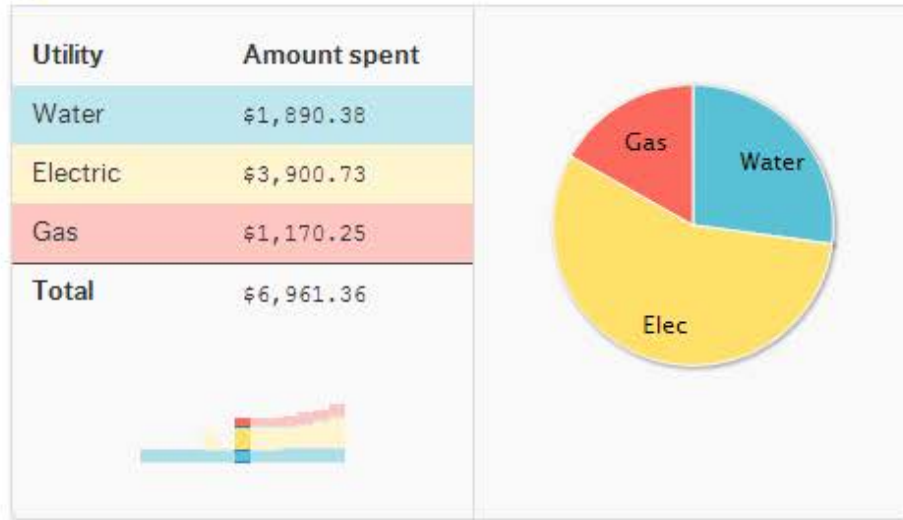




PERFORMANCE

July 2011

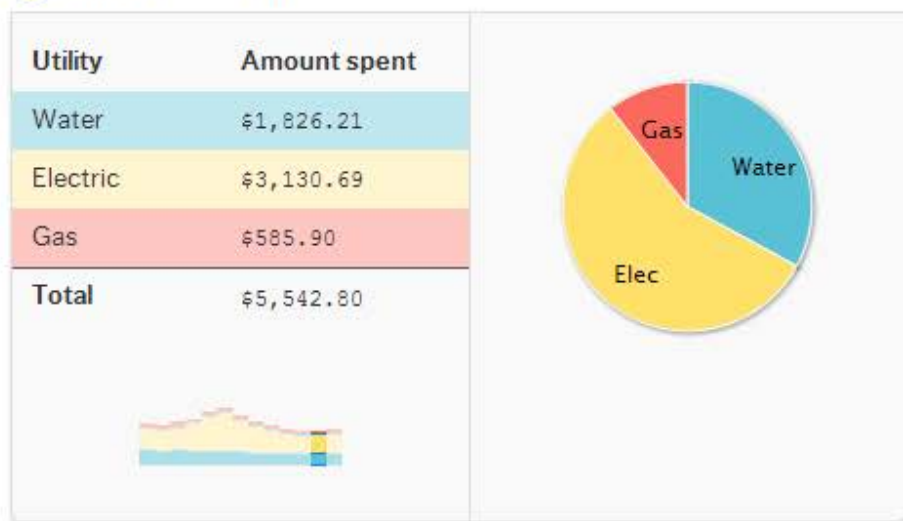
💰 Cost Breakdown

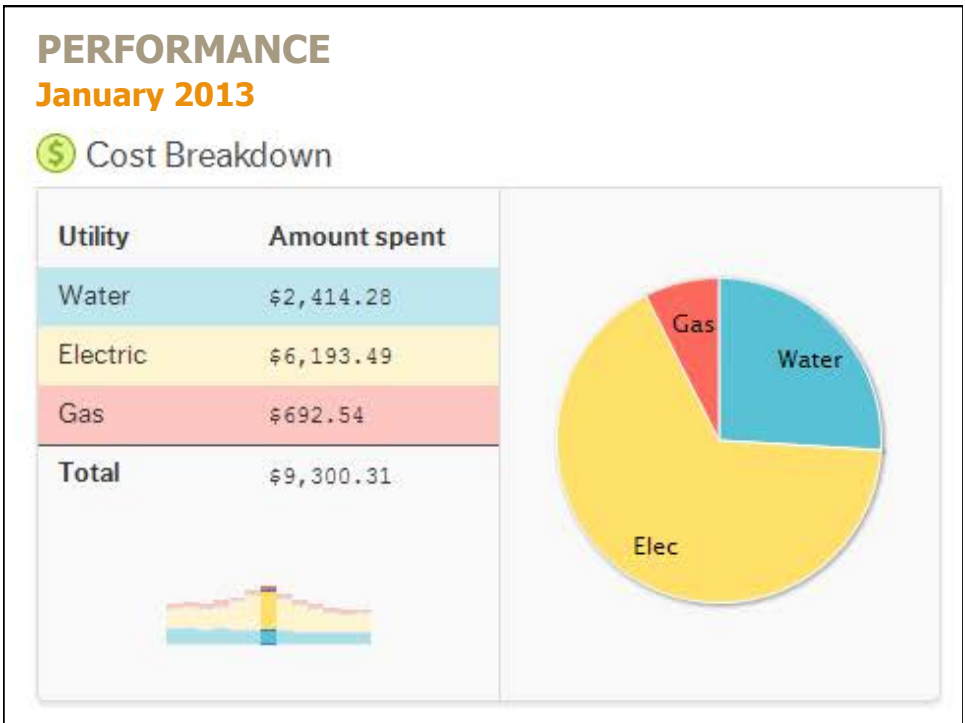
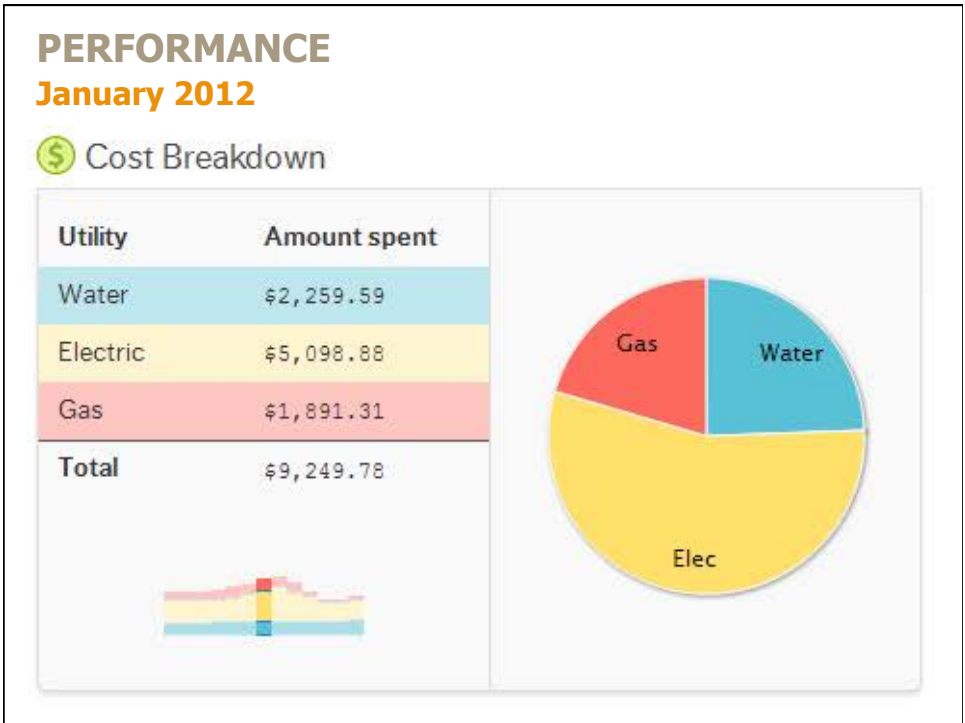


PERFORMANCE

July 2013

💰 Cost Breakdown





PERFORMANCE

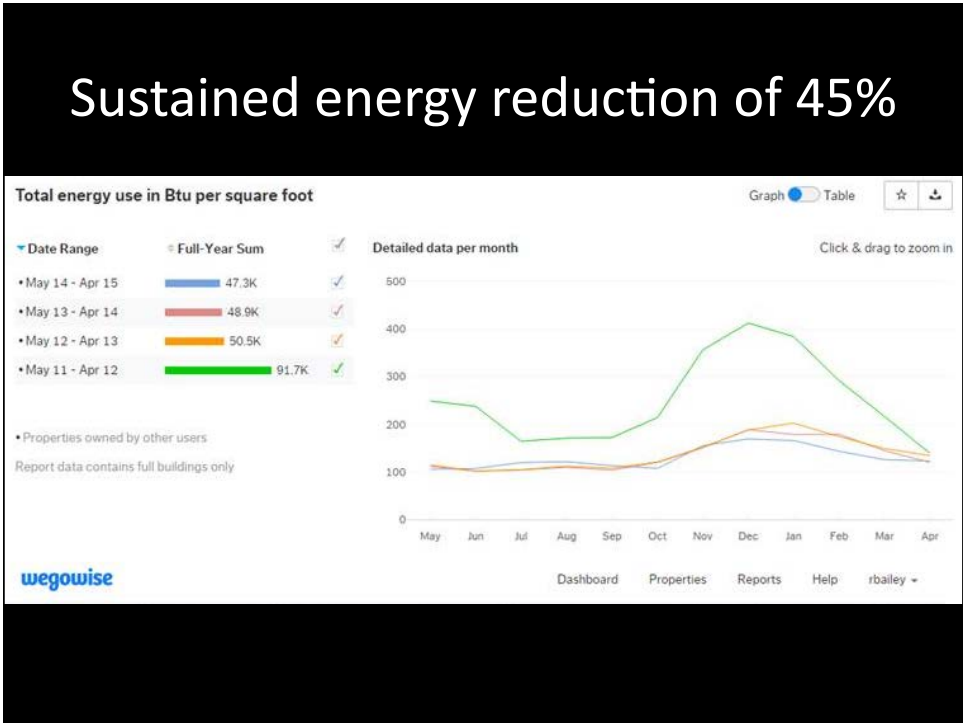
Dollars Per Occupant Per Year

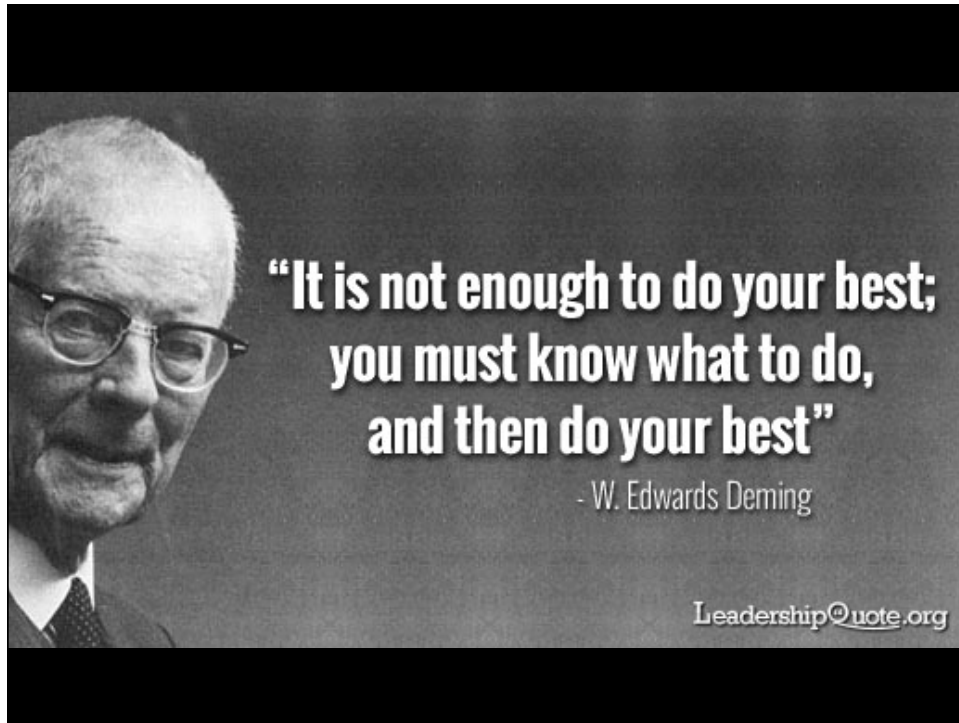
Before Rehab: \$770
After Rehab: \$530
Savings: \$240

Dollars Per Year (Whole Building)

Before Rehab: \$81,620
After Rehab: \$56,224
Savings: \$25,396

Percent Savings in Dollars Per Year: 31%





REACH Community Development

- Mission
Provide quality, affordable housing for individuals, families and communities to thrive
- Board of Directors
REACH is overseen by a volunteer board
- Overview
 - Established in 1982
 - Private, nonprofit
 - 1,852 units in metro area
 - 115 staff



Orchards at Orenco
PHASE II



The complex block contains text on the left and an aerial photograph on the right. The photo shows a modern urban development with a prominent red brick building and a glass-roofed plaza. The REACH logo is in the bottom left, and the project name 'Orchards at Orenco PHASE II' is in the bottom right.

REACH Community Development

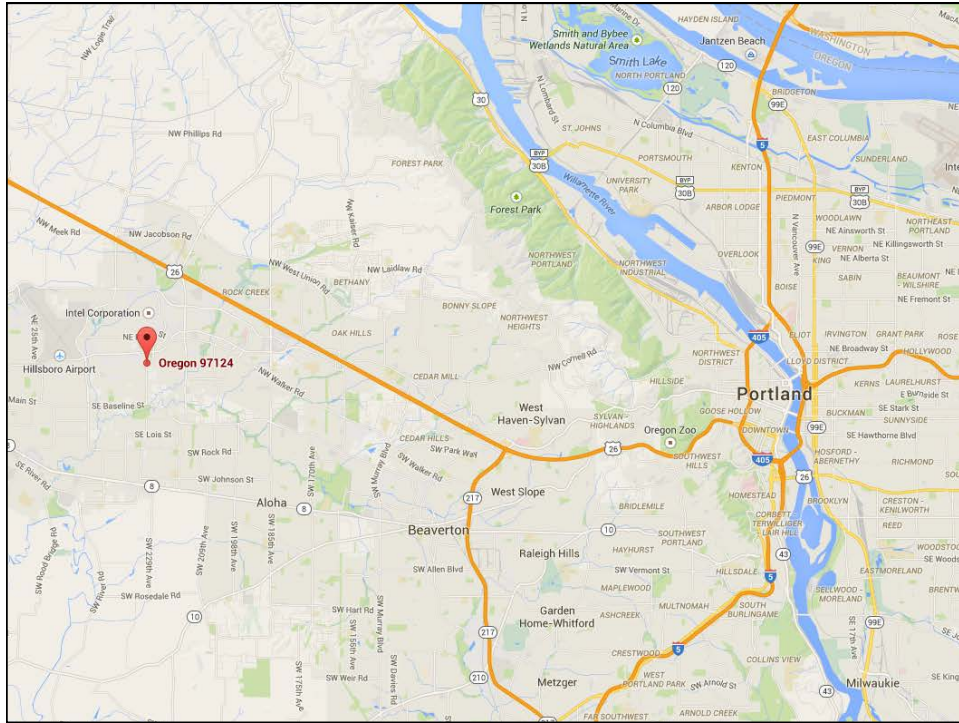
The vision and commitment came from REACH Community Development. REACH has a goal of providing not just affordable housing, but also “affordable living” opportunities—which means reducing the total cost to residents of rent, utilities, transportation and food. After seeing Passive House projects in Europe, REACH’s former executive director got excited about bringing the idea to the U.S., and REACH included it as a goal in its current five-year strategic plan.

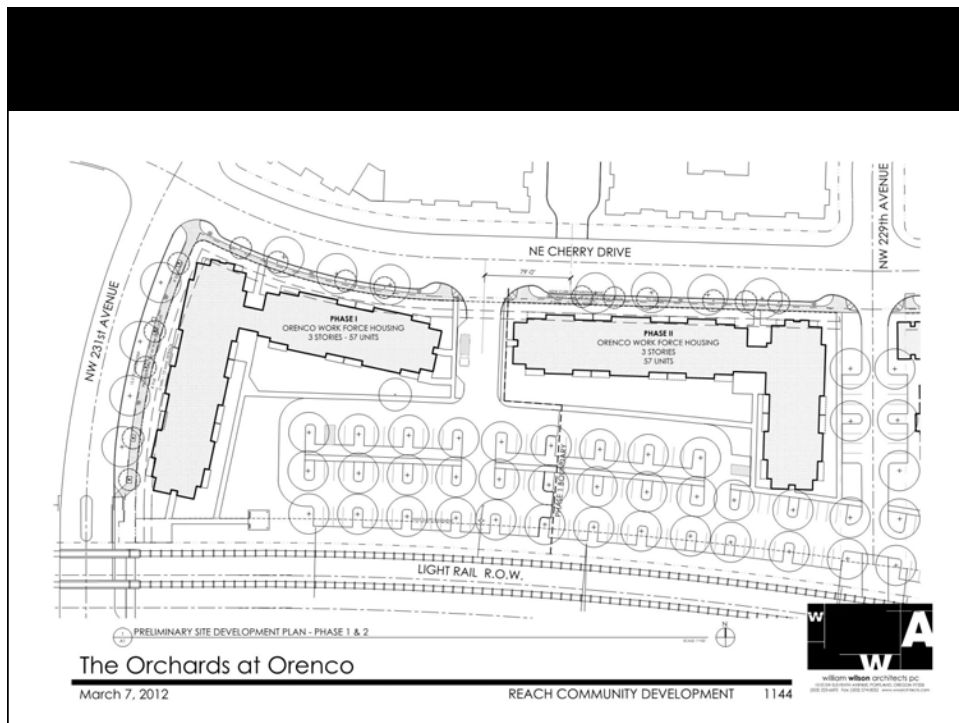


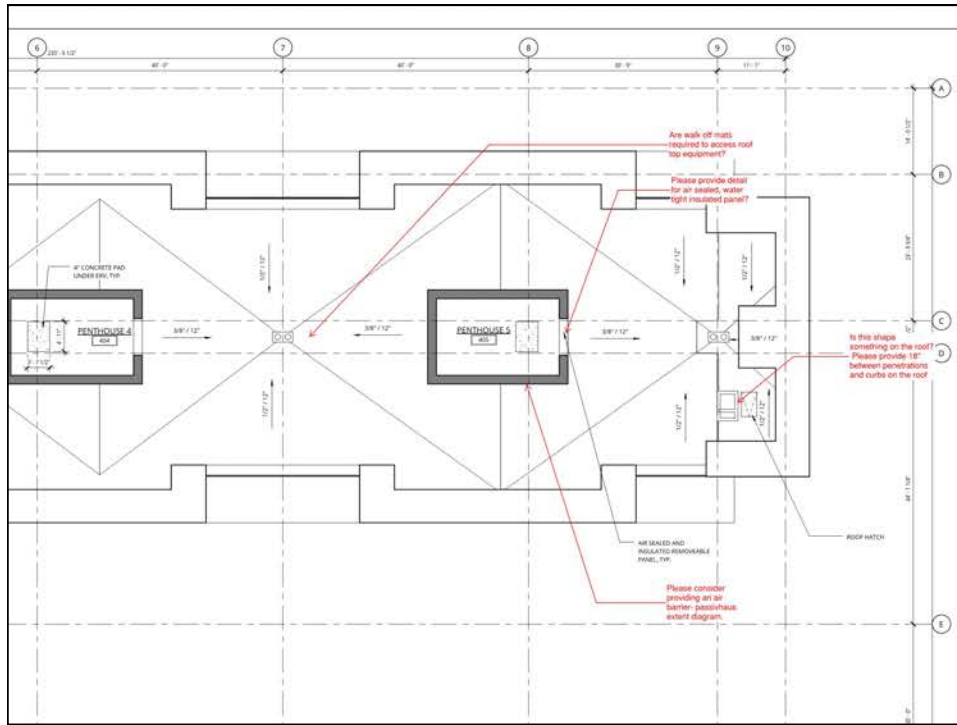
Orchards at Orenco
PHASE II

Orchards at Orenco Passive House Construction









WOOD STUDS

	<ul style="list-style-type: none"> BRICK VENEER AIR SPACE MINERAL FIBER INSULATION WRB PLYWOOD SHEATHING WOOD STUDS BLOWN IN INSULATION VAPOR BARRIER GYPNUM WALLBOARD GYPNUM WALLBOARD
	<p>What is the vapor control layer material? Where in the specification is it called out?</p> <p>If this wall is not rated, why are two layers of GWB required?</p>
<h3>60A2</h3>	<p>FIRE RATING / SOURCE: 0 HOUR</p> <p>STC RATING / SOURCE:</p>
	<ul style="list-style-type: none"> FIBER CEMENT SIDING AIR SPACE MINERAL FIBER INSULATION WRB

10 NON PH - WINDOW HEAD

MBD 1' 0" x 1' 0"

FRAMING: TYPICAL

NOTE WINDOW PROFILE SHOWN

Why does insulation terminate here?

SJM FLASHING: Why does this SJM need to extend over the face of the window? (compatibility)

WEATHER MAT

S.S. FLASHING

Please indicate position and termination of vapor control layer consistently from drawings to drawing

WEATHER MAT EXTEND AT JAF D.C.

S.S. FLASHING WITH WEATHER MAT

Please consider eliminating cleat and allow sealant to be permanent attachment of flashing: consider clipping into frame face

2x6 FINISHED METAL TRIM WITH S.S. CLIP FOR GALVANIC SEPARATION

BACKER ROD AND SEALANT WITH WEEPS UP FROM BACK CORNER

ORCHARDS AT ORENCO - PHASE I
 NW 231ST AVENUE & CHERRY DRIVE HILLSBORO, OREGON

REACH COMMUNITY DEVELOPMENT

REVISION	DATE	REASON FOR ISSUE

DOOR DETAILS

DD SET

DATE	REVISION
09/27/13	
PROJECT NUMBER	SHEET NUMBER
134025	A4.03
SCALE	
6" = 1'-0"	

22 DTL SECT AT BRICK - DOOR SIM.

MBD 1' 0" x 1' 0"

RIGID INSULATION

FOIL TAPE AT VAPOR BARRIER TERMINUS: TYPICAL

CONTINUOUS SEALANT AT RIGID WINDOW

SEE STRUCT. FOR FRAMING

RIGID INSULATION

FOIL TAPE AT VAPOR BARRIER TERMINUS: TYPICAL

PT VERTICAL FURRING STRIP

EXTERIOR INSULATION

Note that the profile shown does not match specified window. Cascade typically allows attachment through sill as shown - not sure if Euroline doors may be able to use their inset nail fin instead. Also need to see if the front of the window is properly supported

SJM FLASHING

HEMMED EDGE WITH CLEAT AND CONTINUOUS SEALANT CONTINUE TO OUTSIDE FACE OF WINDOW TRIM: TYPICAL

FIBER CEMENT SIDING - SEE ELEVATIONS FOR EXPOSURE

PT VERTICAL FURRING STRIPS

EXTERIOR INSULATION

WRB

EXT SHEATHING

NOTE WINDOW PROFILE SHOWN

19 DTL-SILL AT LAP SIDING

MBD 1' 0" x 1' 0"

THE ORCHARDS AT ORENCO STATION PHASE 1
 DD SET
 SEPT 2013

07 54 13
 THERMOPLASTIC MEMBRANE ROOFING (TPO)
 PAGE 6 of 11

- C. Firestone Building Products Co: Product: UltraPly TPO; www.firestonebpco.com.
- D. Johns Manville Corporation; ST6PA series single ply: www.jm.com.

2.02 PERFORMANCE REQUIREMENTS

- A. Installed roofing membrane and base flashings to remain watertight, resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. UL Class A for Roofing System.
- C. Wind resistance to meet:
 - 1. Factory Mutual (FM) Class 1-90. Membrane
 - 2. Wind Design Criteria: 80 mph, Exposure B.

This suggests a fully adhered system. This is an excellent application method, but is very sensitive to weather and may not be possible at the time of installation

2.03 MATERIALS

- A. Membrane: Scrim-reinforced, thermoplastic polyolefin (TPO)-based sheet per ASTM D 6878 and bearing UL label on packaging.
 - 1. Sheet Width: 120 inches minimum.
 - 2. Thickness: 0.060 inch, nominal, when measured in accordance with ASTM D 751.
 - a. Minimum weather surface thickness: 15 mils.
 - 3. Color: White.
 - 4. Breaking Strength: 366 lbf, when tested in accordance with ASTM D 751, Grab Method.
 - 5. Elongation, ultimate, of unreinforced membrane (ASTM D 412, Die C): 500 percent.
 - 6. Tear strength (ASTM D 751, Procedure B), 8 x 8 inch sample: 86 lbf
 - 7. Brittleness test (ASTM D 2137, at minus 45 deg C): Pass.

PART 2 PRODUCTS

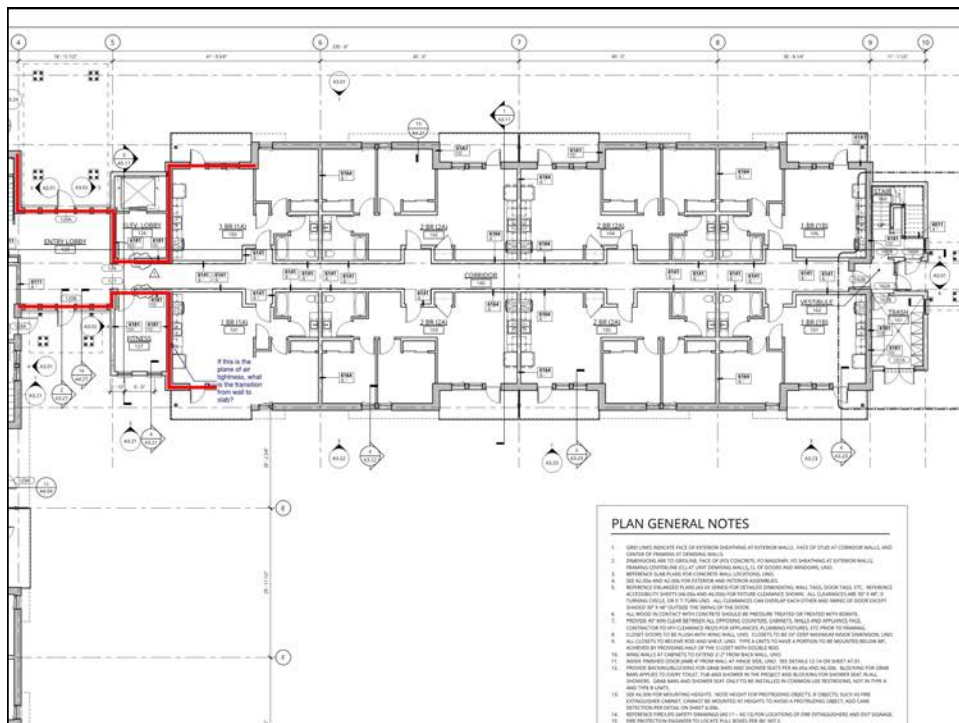
2.01 MATERIALS

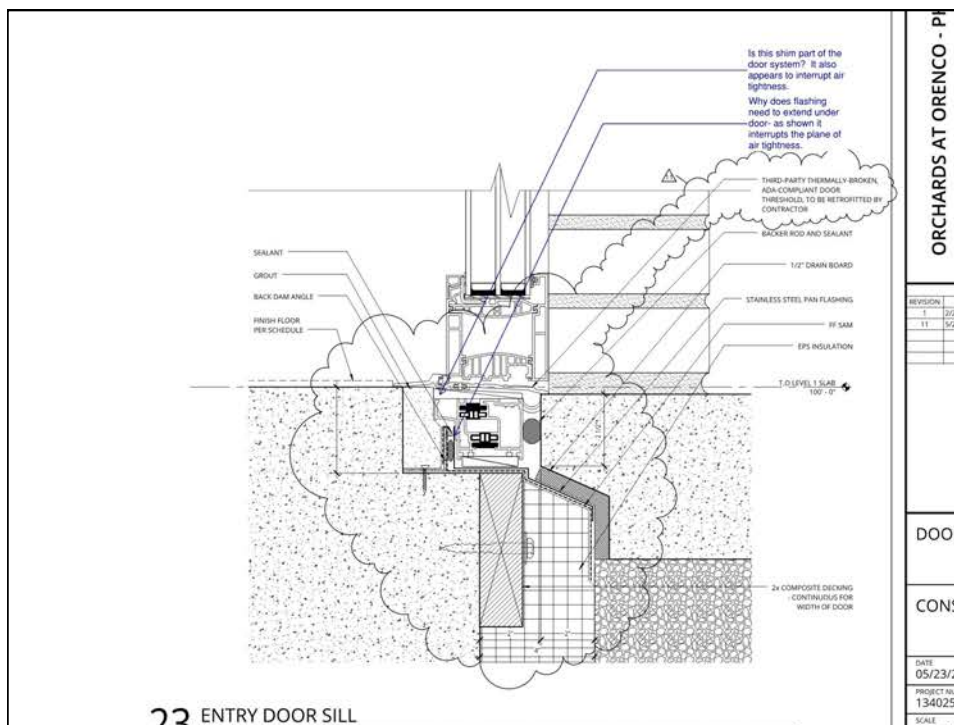
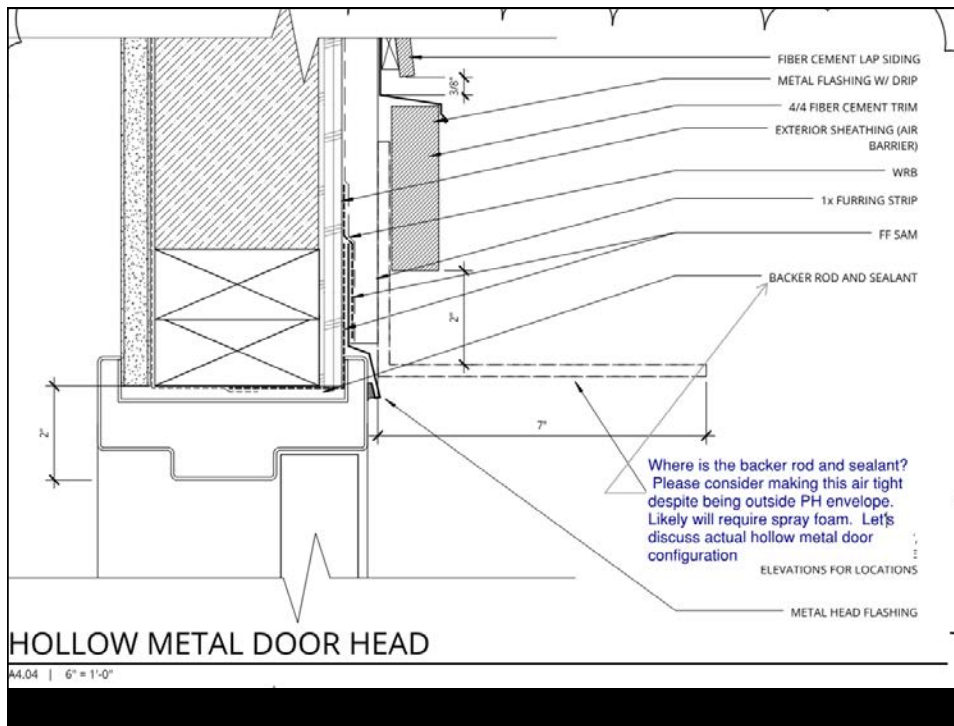
- A. As noted above in Related Requirements. Materials specified make up the air barrier system of the building to be inspected and tested.

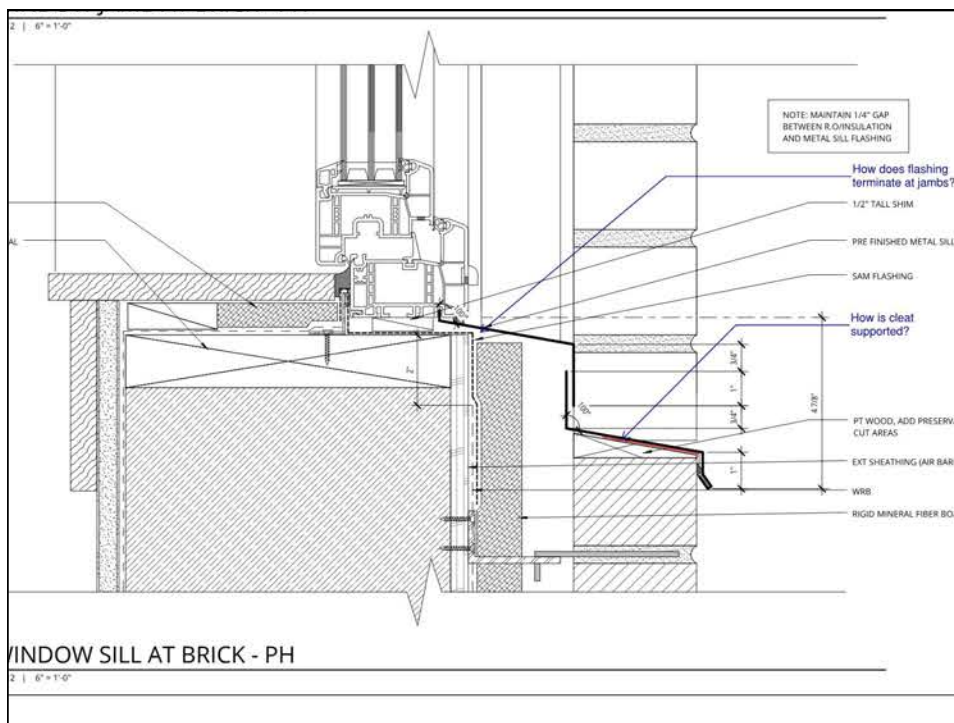
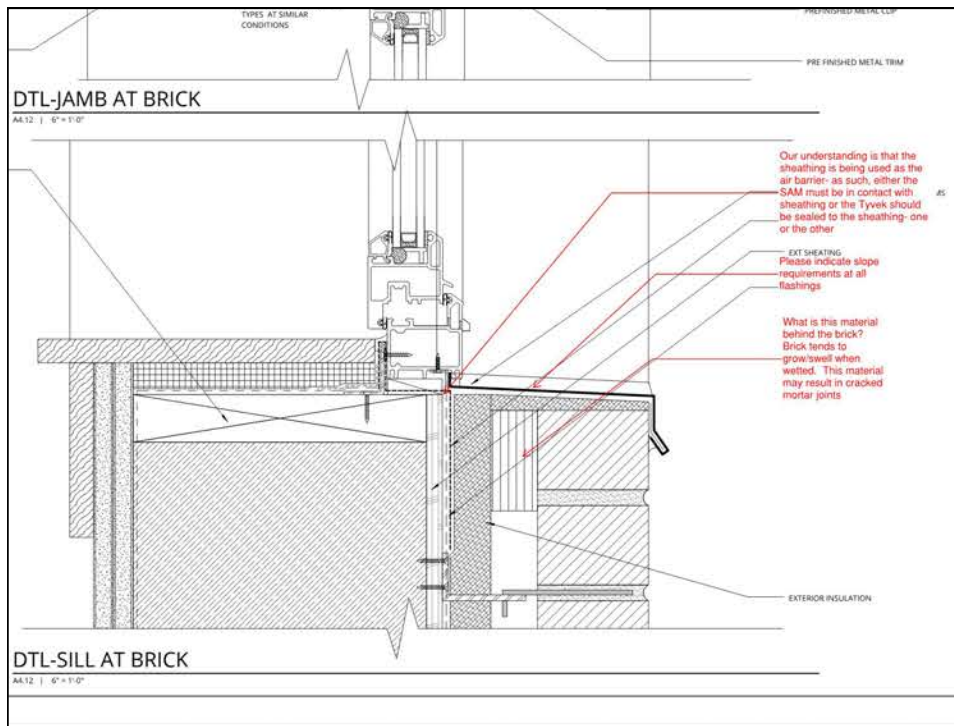
2.02 PERFORMANCE REQUIREMENTS

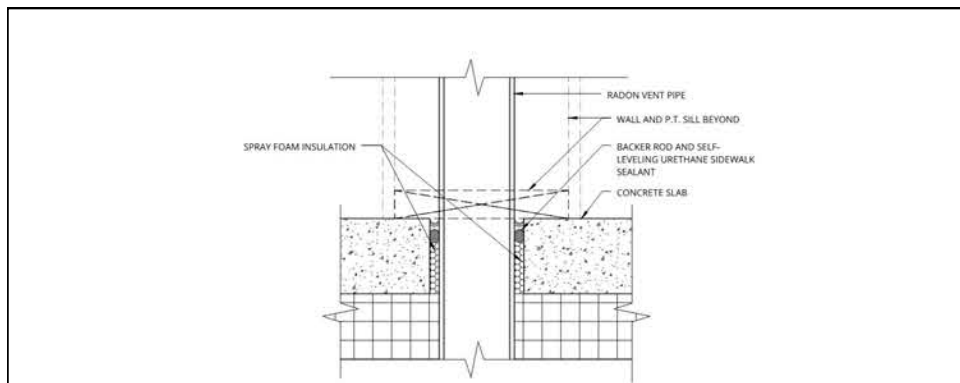
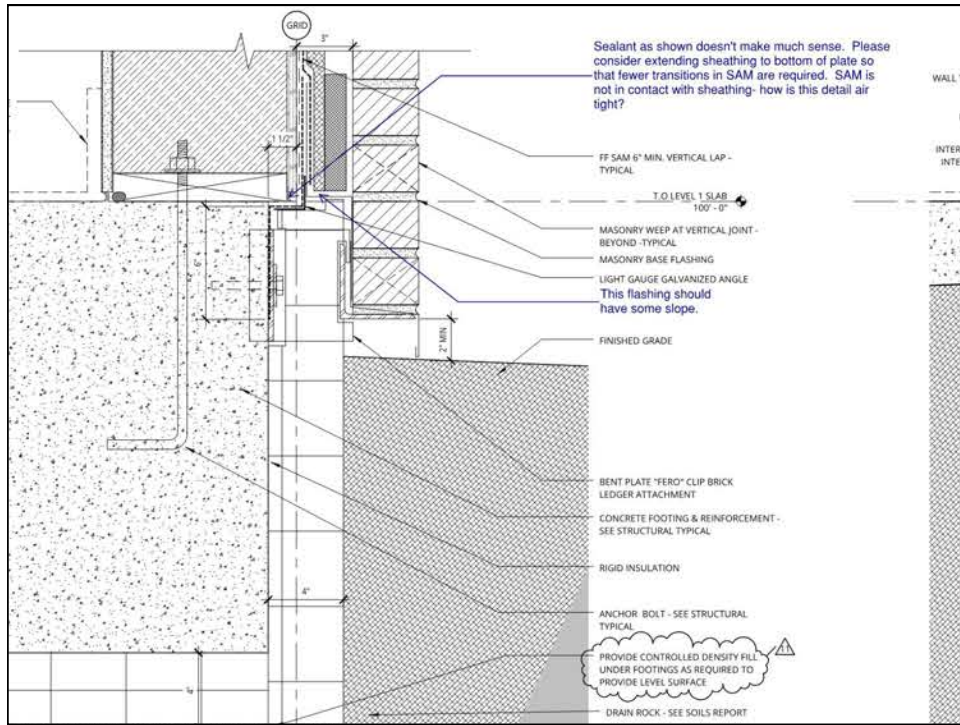
- A. Materials:
 - 1. Air barrier system materials in the opaque envelope shall have an air permeance not to exceed 0.004 cfm/ft2 under pressure differential of 0.3 in. water (1.57psf) (0.0002 L/sm2 @ 75 Pa) when tested in accordance with ASTM E2178.
- B. Assemblies of Materials and Components:
 - 1. Air permeance not to exceed 0.04 cfm/ft2 under a pressure differential of 0.3 in. water (1.57psf) (0.002L/s.m2 @ 75 Pa) when tested in accordance with ASTM E1677 or E783.
- C. Air tightness Goal of Entire Building:
 - 1. Air leakage of the entire building shall not exceed 0.40 cfm/sf under a pressure differential of 0.3 in. water (1.57psf)(0.02L/sm2 @ 75 Pa) when tested according to

This goal seems low for passivhaus



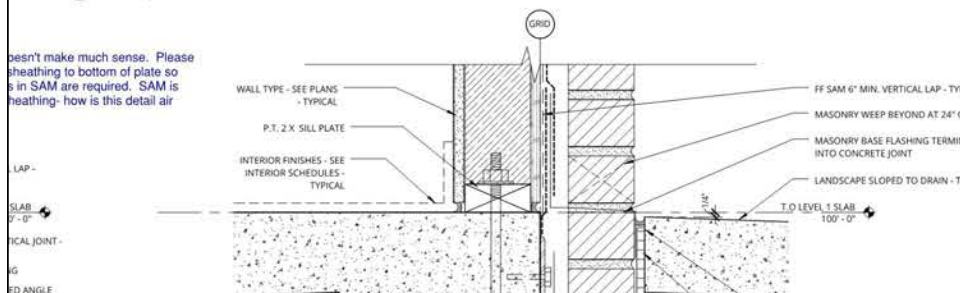




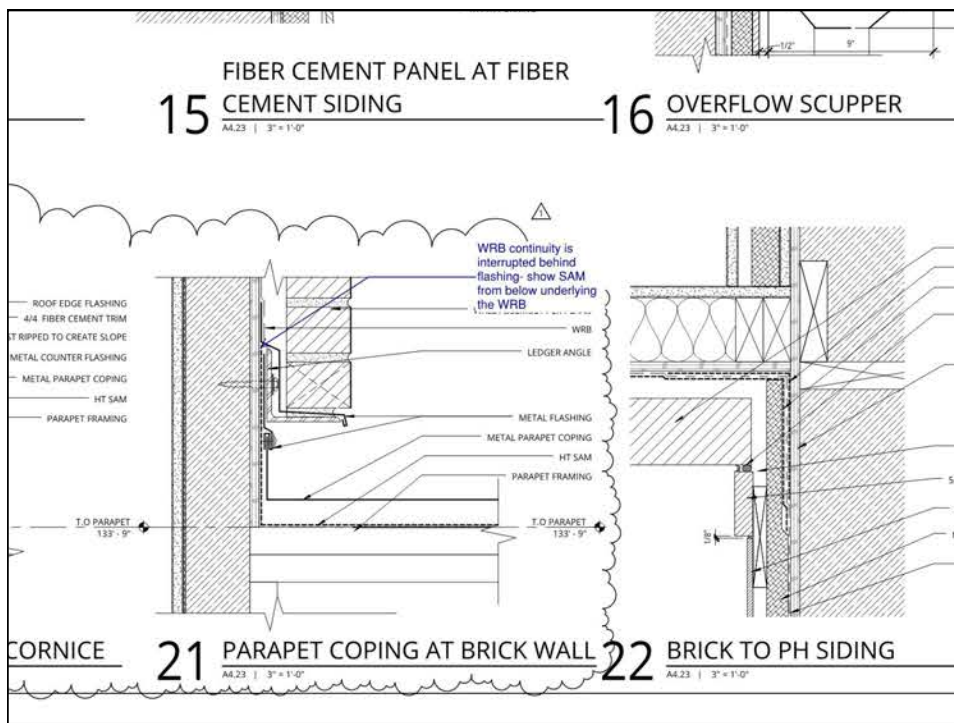
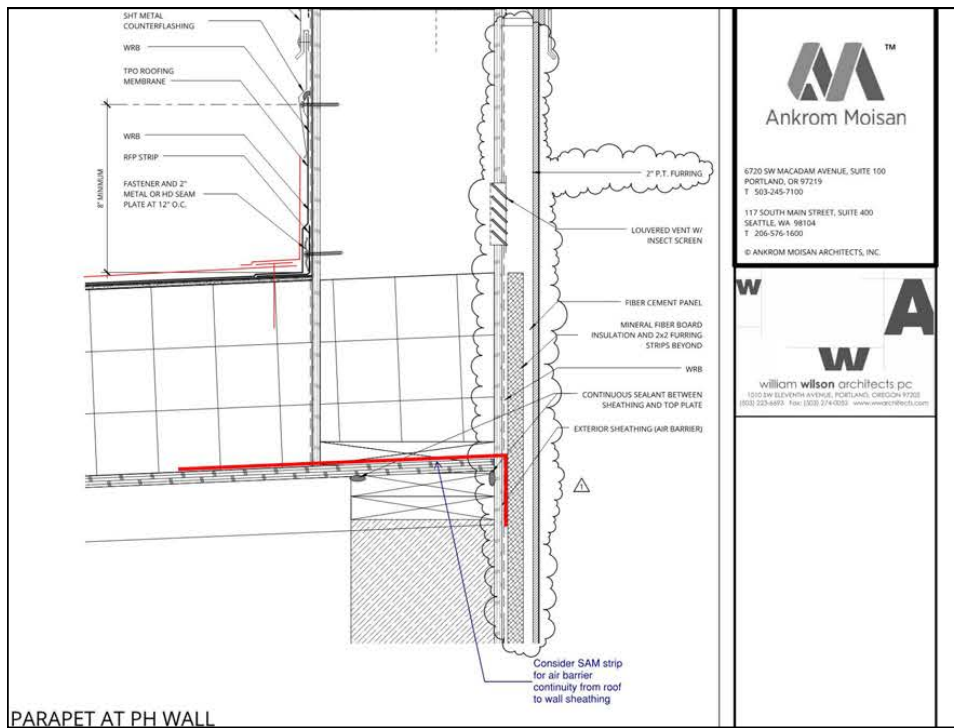


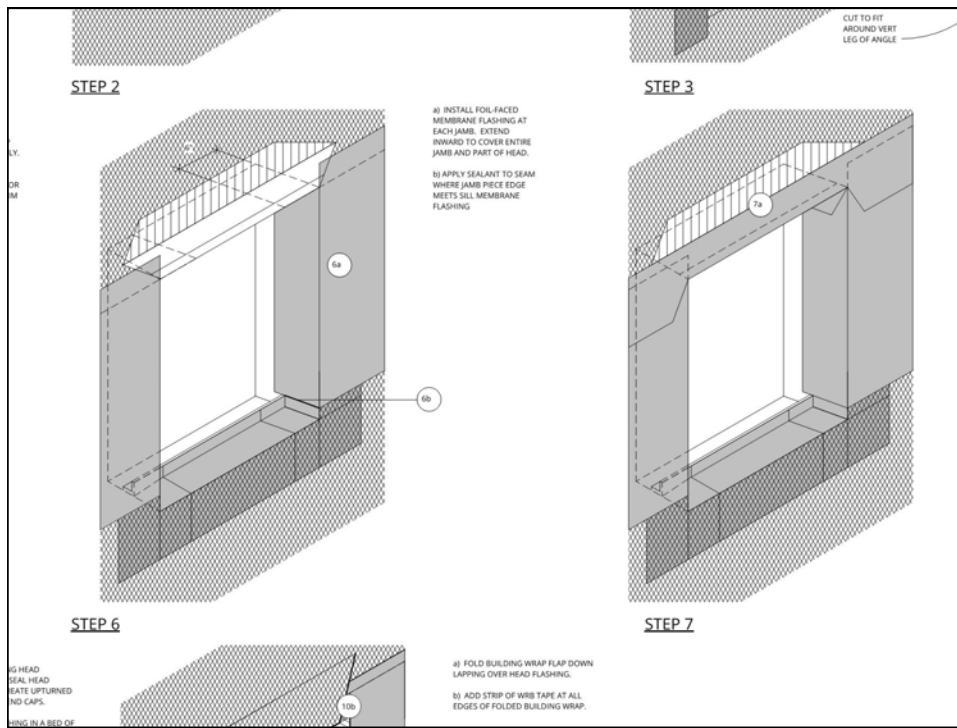
5 RADON VENT AT SLAB

A4.21 | 3" = 1'-0"



doesn't make much sense. Please consider extending sheathing to bottom of plate so that fewer transitions in SAM are required. SAM is not in contact with sheathing- how is this detail air tight?





Detailed Agenda for Orchards Orenco	
Building Envelope Coordination Meeting	
6520 NE Cherry Dr Hillsboro Tuesday, July 1st	
1. General	<ul style="list-style-type: none"> ☐ Introductions / sign-up sheet
2. Schedule	<ul style="list-style-type: none"> ☐ review overall construction schedule ☐ establish approximate start dates for all trades / review general sequencing of work ☐ establish dates for mockup construction & review
3. Submittal Procedures	<ul style="list-style-type: none"> ☐ review submittal process & requirements for each trade ☐ review previously-issued approvals ☐ identify potential lead time issues ☐ review mock-up requirements
4. RFI / Clarification Procedures	<ul style="list-style-type: none"> ☐ review RFI process & requirements ☐ establish process for resolving design issues / details not specifically addressed in drawings
5. Framing and Air Barrier 8:30AM-9:30AM	<p>Timberland, RDF, SIGA 014010</p> <ul style="list-style-type: none"> ☐ review specifications: <ul style="list-style-type: none"> • performance requirements • product requirements • installation requirements • submittal requirements • QA/QC requirements (including testing) • warranty requirements ☐ review drawings: <ul style="list-style-type: none"> • detail requirements A2.00d (6,9,12,15,18), A3.21 (1), A4.13 (7,13,15,19,21), A4.22, A4.26 (Exp 3) ☐ identify sequencing impacts on details ☐ review areas requiring coordination between trades ☐ identify design issues / details not specifically addressed in drawings
6. Roofing 9:00AM-10:00AM	<p>Sloyler, Firestone 075413</p> <ul style="list-style-type: none"> ☐ review specifications: <ul style="list-style-type: none"> • product requirements • installation requirements • submittal requirements • QA/QC requirements • warranty requirements
7. Sheet Metal Roofing 9:30AM-10:30AM	<p>Brown Sheet Metal 074113, 076200</p> <ul style="list-style-type: none"> ☐ review specifications: <ul style="list-style-type: none"> • product requirements • installation requirements • submittal requirements • QA/QC requirements • warranty requirements ☐ review drawings: <ul style="list-style-type: none"> • detail requirements A4.22, A4.23, A4.25 ☐ identify sequencing impacts on details ☐ review areas requiring coordination between trades ☐ identify design issues / details not specifically addressed in drawings
8. Interior Insulation 10:30AM-11:15AM	<p>JB Insulation 072126</p> <ul style="list-style-type: none"> ☐ review specifications: <ul style="list-style-type: none"> • performance requirements • product requirements • installation requirements • submittal requirements • QA/QC requirements (including testing) • warranty requirements ☐ review drawings: <ul style="list-style-type: none"> • detail requirements A4.13, A2.00d ☐ identify sequencing impacts on details ☐ review areas requiring coordination between trades ☐ identify design issues / details not specifically addressed in drawings
9. WRB, Exterior Insulation, Cladding 11:00AM-2:30PM	<p>Matson, Dupont, Hardie, Roxul</p> <p>For each roofing type:</p> <ul style="list-style-type: none"> ☐ review specifications: <ul style="list-style-type: none"> • product requirements • installation requirements • submittal requirements • QA/QC requirements



Framing and Air Barrier

Schedule/General

- Schedule: Completion June 2015. Currently working on below slab and foundation construction. Framing begins on August 9th (mobilization). Roof sheathing to be completed by November 1, 2014. RDF will be taping seams in the sheathing as the sheathing is installed. Main slab on grade pour begins mid July.
- Timberland indicated that there may be a lead time with 2x10 KD lumber and will look into need to order early.

Drawing Review

- 11A4.23- sealant as the air barrier transition to be changed to SAM pre-strip (PW 10240- 18" strip) prior to placing parapet framing. Parapet bottom plate to be set in sealant on SAM to minimize air leakage from nail holes.
- LTT 19 shown on 11S503 to be detailed with sealant around penetration and bottom plate of strap to complete air tightness.
- WCC to RFI StoneWood regarding minimizing fasteners through bottom plate of parapet framing.
- WCC to RFI if drywall clips can be used in lieu of blocking shown on 6A2.00d to allow for installation of insulation in stud cavity.
- 2/S501- sequence requires 24" strip of vapor barrier prior to installation of 2.25" x3/4" rip of plywood and pre-rock (CWS) prior to installation of joists.
- 18A2.00d- sealant to be installed at gaps in floor sheathing to complete air barrier (WCC).
- 15A2.00d- fire caulking is not required at sheathing gap at floor line- SIGA tape to be installed over backer rod at these locations.
- 11A4.22- Timberland to add blocking for strip vents 5.25" back from inside face of fascia (2 pieces, one either side of strip vent).
- 3A4.20- 2x4 wall framing to be installed after air barrier construction is complete at the 2x10 sheathed wall. Timberland/RDF

Roofing

Schedule/General

- Project is to be complete June 2015
- Vapor barrier installation is to begin November 6, 2014 in zone 1.
- Roof installation (zone 1) is to be complete December 18, 014.
- Roof installation (zone 2) starts November 13, 2014 and must be completed by January 15, 2015.
- Installed roof membrane must be protected from HVAC and sheet metal trades by a layer of 1/2" rigid insulation topped with 1/2" plywood at roof entries, all walkway areas and around mechanical equipment.
- Snyder to review substrate prior to installation of vapor barrier and after insulation installation to eliminate areas of ponding water.
- Minimum temperature to install TPO- 50F. Team is considering installing SBS modified asphalt roofing, which has a minimum temperature for installation of 40F. Owner to review costs and durability considerations.

Roofing Specification and Drawing/Installation Review

- System is a fully adhered Firestone Ultra Ply TPO.
- System consists of 4"x4" Dens Deck boards fully adhered followed by three layers of insulation with seams staggered installed with adhesive or hot asphalt below TPO membrane. Base layer of insulation will be 4"x8" sheets followed by 4"x4" sheets.
- Snyder is to supply a cost for leak detection- I.D.
- 075413.1.09 manufacturer's inspections to be scheduled by Snyder with WCC present.
- 075413.1.10 C warranty language must be verified by Snyder ("building materials or contents damage").

3. Bid proposal includes borate treated 1x4 furring. Need to confirm if Comfort Board IS or Rockboard 80 is to be used (WCC RFI).

4. Need to verify fastener attachment of furring with Stonehard Design. Need to verify if dimensional lumber or plywood for furring was assumed. Also need to verify that borate treatment is acceptable (WCC RFI).

5. Quickflash will be used for hose bibs and electrical penetrations.

6. A hose bib and electrical outlet shall be added to the mock up construction.

7. All penetrations need to be detailed with Siga Wigluv at the sheathing to complete air tightness (RDF).

8. Sonolastic 150 (Master Seal 150) to be used between window and trim and from siding to trim. Pre-construction adhesion testing to be conducted prior to mock up (Nick/Atlas/BASF).

9. Need to verify temporary fastening of semi rigid insulation prior to installation of furring members (WCC).

10. 085313.2.02- Performance criteria to be verified (in accordance with energy model) through shop drawing review process (AM, GH, WCC).

11. 085313.2.03 F- Back dam to be 18 gauge supplied by Euroline.

12. 085313.2.03 - Michael Born would like to see if 60% and 70% screens are available in addition to the 80% submitted. (Euroline)

13. 085313.3.03 B- QED has issued a testing proposal that is acceptable to AMHDC.

14. 1A4.12 Euroline noted their concerns about use of spray foam at rough openings, which may present window drainage problems. Concerns were duly noted- GH to confirm if deletion of spray foam is acceptable within PHILUS model.

15. 4A4.12- Details need to be revised to provide adequate drainage at flashing behind lintel and to provide uniform interface of windows, cladding and flashing (MS/WCC to provide suggested revised details for review).

16. 13A4.12- Vapor barrier is not taped to the window pre-wrap. Team to consider using Hardie Trim Tabs for construction of window trim- verify on mock up.

17. 16A4.12- Need to verify if air seal will be constructed using Dow 795 or CWS (WCC RFI). Both exterior joints to be installed by NWSR.

18. 19A4.12- Joint between flashing and trim to be re-configured to provide movement capacity (MS sketches).

19. 22A4.12- Flashing terminates at jamb with down turn leg to support sealant from brick to flashing joint to be installed by NWSR. We need to determine how clear at brick is fastened- confirm with Brown Sheet Metal (WCC/Brown).

20. 16A4.13- Sealant is currently shown installed to furring- this detail needs to be re-configured to allow installation of sealant to trim (WCC RFI).

21. 19A4.13- Vapor barrier needs to be installed as part of exterior wall framing- prior to interior studs.

22. 22A4.13- WCC RFI if sealant is to be installed from window to flashing as shown in other typical details.

23. 24A4.13- Sill detail should be similar to passive house window sill/brick detail.

24. 15A4.21- Sealant as shown to be deleted at bottom of sheathing. Please consider extending sheathing to bottom of plate so that fewer transitions in SAM are required. Sam to be installed 6" onto plywood and then down concrete to below FERRO clip. B+B to determine if thinner brick can be used at angle to allow for better drainage.

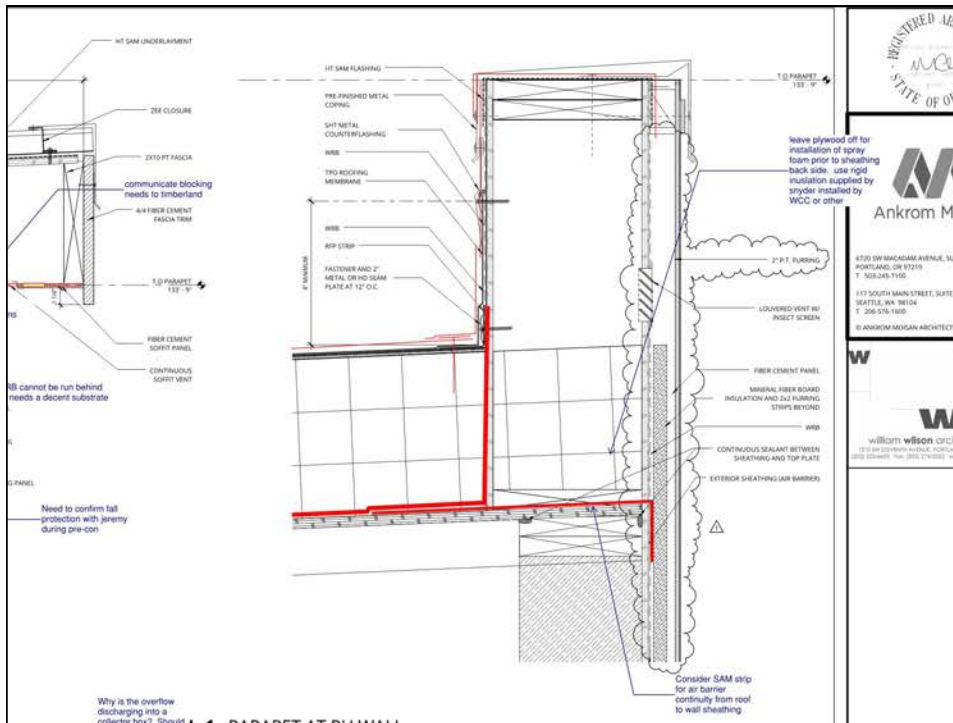
25. 17A4.21- Area of brick cavity below through wall flashing at level 1 slab to be skugged solid with mortar (WCC RFI).

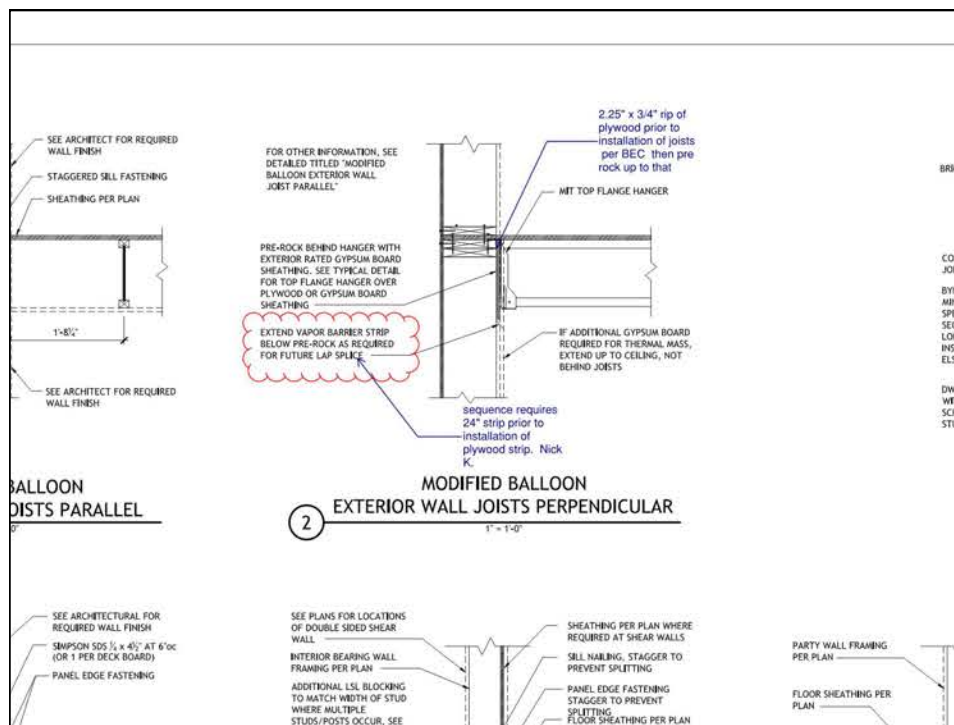
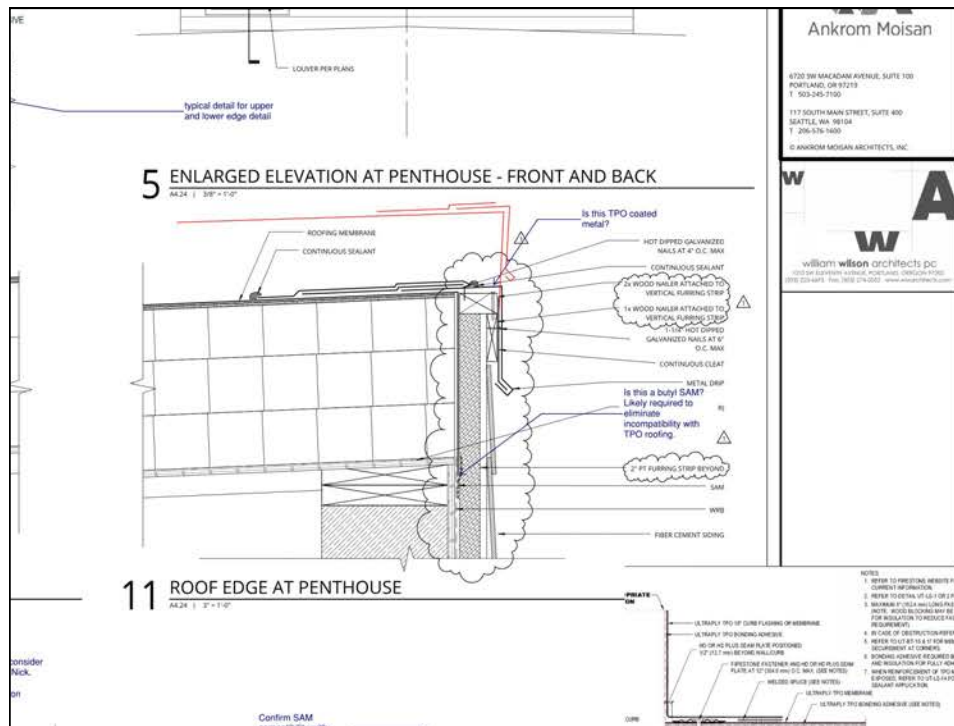
26. 19A4.21- Although non passive house, this area needs to be air tight- extend SAM onto face of sheathing 6" at bottom of wood sheathing. SAM to extend 6" above top of mortar net. Below grade flashing is to terminate with a straight hem, not a kick as shown.

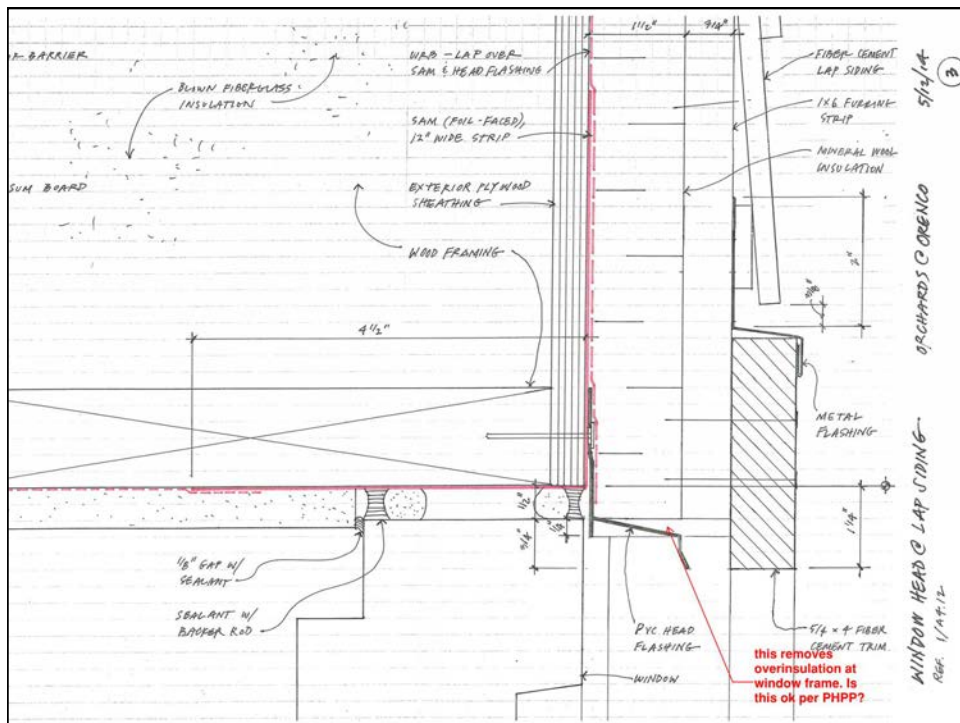
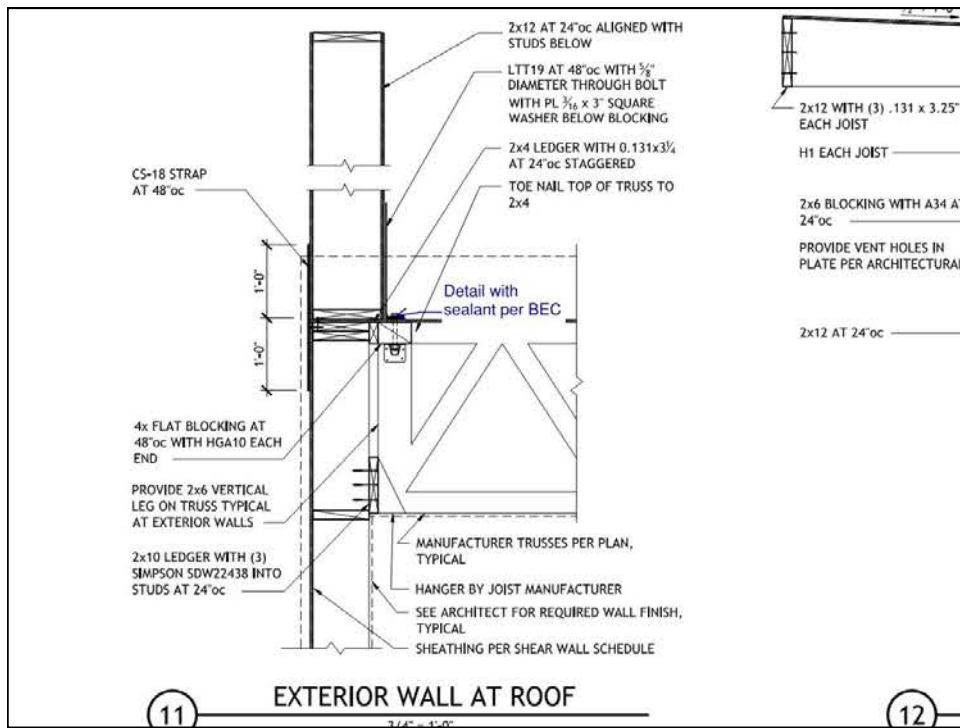
27. 7/A4.22- Sequence of installation of fiber cement trim needs to be reviewed- currently, the trim can neither be installed in sequence nor painted (WCC RFI).

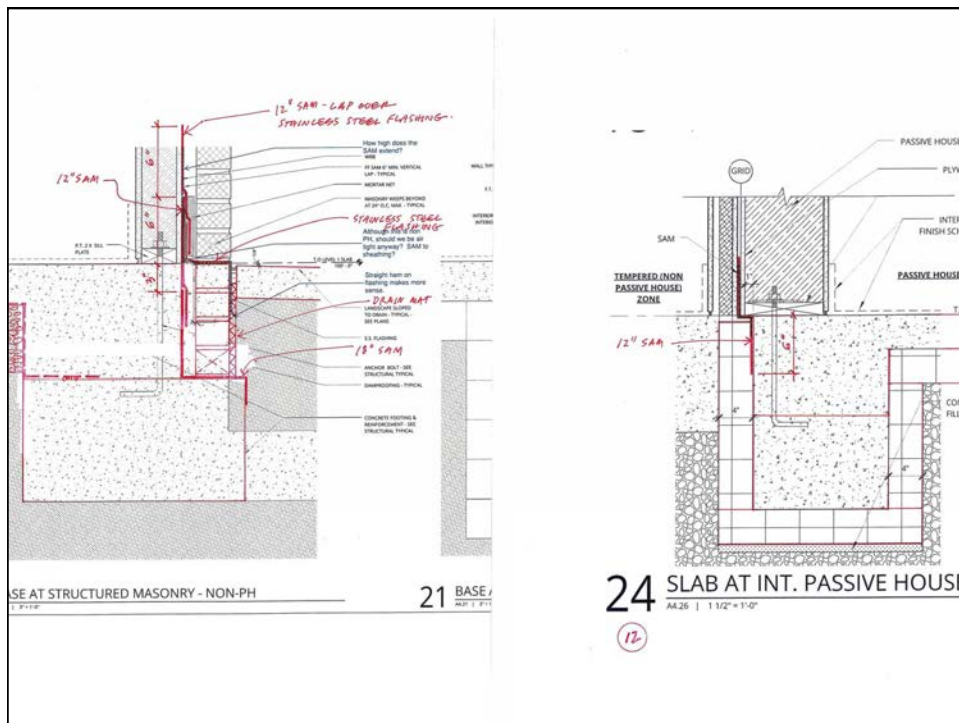
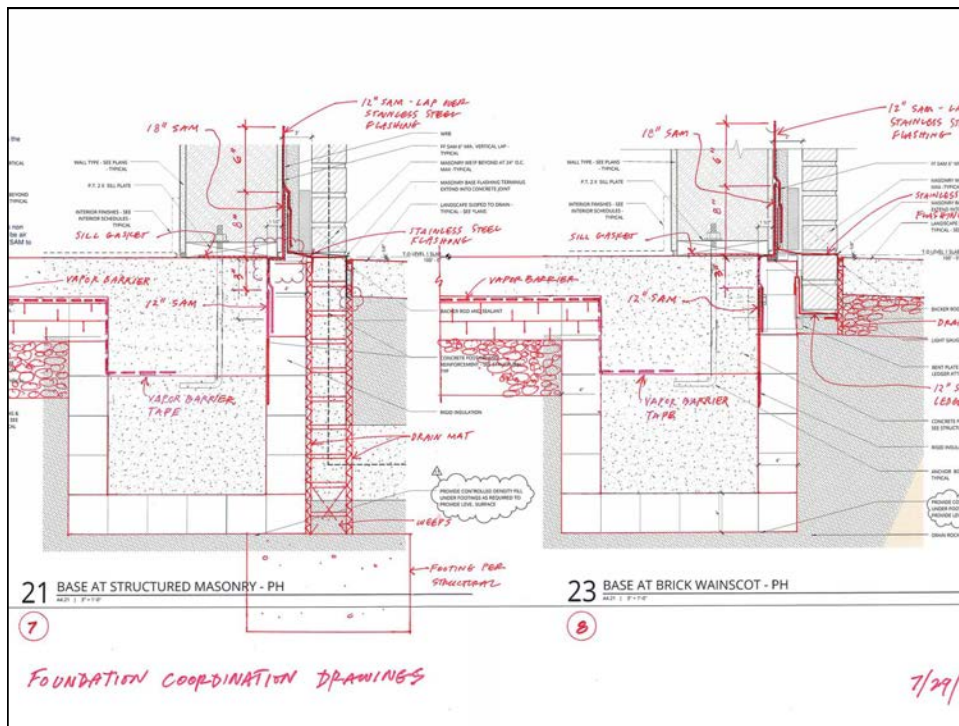
28. 9/A4.22- WCC RFI type of paint to be used on exposed PT Lumber

29. 13A4.22- It was suggested that flashing from cladding onto roof to be constructed as a through wall flashing (WCC RFI)





























Qualified Envelope Diagnostics, Inc.
AAMA ACCREDITED LAB & FIELD TESTING AGENCY
Address: 2206 S NW Brookside Avenue, Gresham, OR 97030
Phone: 503.663.8077 • Fax: 503.663.8649
Web: www.qed.com • www.qedlab.com



QEDLAB Inc. - AAMA Accredited Laboratory & Field Testing Agency
Project ID: 3294-01 Ref: Orchards at Orenco Date: August 29, 2014

3294-01 ORCHARDS AT ORENCO PHASE 1

REPORT DATE: August 29, 2014 REFERENCE TEST DATE (S): August 20, 2014

SUBMITTED TO:		DISTRIBUTED TO:		PROJECT LOCATION:	
JESSICA WOODRUFF BLACK ORCHARD LLC C/O BLACK COMMUNITY DEVELOPMENT		JESSICA WOODRUFF CWK@BLACKCOMMUNITYDEVELOPMENT.ORG		HILLSBORO, OREGON	


TEST AUDIENCE:		ENVIRONMENTAL CONDITIONS (Daily Average)	
Dino Santoro - E-ROKING	Rick Hunt - E-ROKING	Temperature: 66°	BAROMETRIC PRESSURE: 29.9 in Hg
Mario Houde - E-ROKING	Nick Ruckow - RGF	Wind Speed: 6 mph	
Traavis Moore - WCC	Jessup Brooks - WCC		
Craig Kelley - HSC	Amanda ASA - AMA		
Jessica Woodruff - REACH	Jay Nees - WCC		
Bill Wilson - QED LAB	Miss Poshak - QED LAB		
Dylan Lamar - WCC			

SUMMARY OF TEST RESULTS:

On August 20, 2014, technicians performed AAMA accredited window testing at the Orchards at Orenco project in Hillsboro, Oregon. Testing was performed in accordance with ASTM E 1355 (Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference) per AAMA 502-12 (Voluntary Specification for Field Testing of Newly Installed Fenestration Products) and the Project Specifications and per AAMA 503-08 (Voluntary Specification for Field Testing of Newly Installed Stormfronts, Curtain Walls and Glazing Systems) and the Project Specifications.

Test Date	Location	Master Test	Daily Test	Specimen ID	Product Type	Test Pressure	Final Result	Observations
8/20/14	Mock up	1	1	1	Door	6.00 psf	PASS	Ø Leaks
8/20/14	Mock up	2	2	1	Door	12.00 psf	PASS	Ø Leaks
8/20/14	Mock up	3	3	2	TIR/Turn	6.00 psf	PASS	Ø Leaks
8/20/14	Mock up	4	4	2	TIR/Turn	15.00 psf	PASS	Ø Leaks

* Testing was performed at 6.00 PSF interior vacuum pressure in accordance with the project specification. Test pressures that exceed 6.00 PSF were conducted for exploratory purposes only for a 5-minute period.



Comments/Observations: Master Test 1 is the initial assessment of Specimen 1, a Euroline brand door measuring 80" x 80 1/2". Prior to testing, a purge was run to remove debris and/or moisture from the test area. Master Test 1 tested Specimen 1 at 6.00 psf. Technicians did not observe any water intrusion during the test and Specimen 1 received a Pass.

Orchards at Orenco Phase 1 - Prelim Door Results - Message (HTML)

Message Bluebeam

Reply Forward Call Delete Move to Folder Create Rule Other Actions Block Sender Not Junk Junk E-mail Category Follow Up Mark as Unread Options Find Find Related Select Add to Evernote 5 Evernote

You forwarded this message on 11/21/2014 2:59 PM.

From: Ryan Shanahan [rshanahan@earthadvantage.org]
To: Craig Kelley; Jessica Woodruff; Mike Steffens; Marty Houston; Jay Nees; Jeremy Brooks; Michael Born; Dylan Lamar
Cc: Sara Walker
Subject: Orchards at Orenco Preliminary Blower Door Results

Message | Preliminary BD Test Results 11-21-14.xlsx (9 KB) | Prelim BD Manometer Photo.jpg (20 KB)

Hey guys,

I've attached a spreadsheet here with the results of today's preliminary testing. I can honestly tell you that these are the best results I've ever seen and that everyone involved has a lot to be proud of!

The ~50 pa result of .056 ACH is right up there with the tightest BD test in the world! http://www.worldrecordacademy.com/technology/tightest_residential_building_Dillingham_house_sets_world_record_213292.html

Congratulations all!

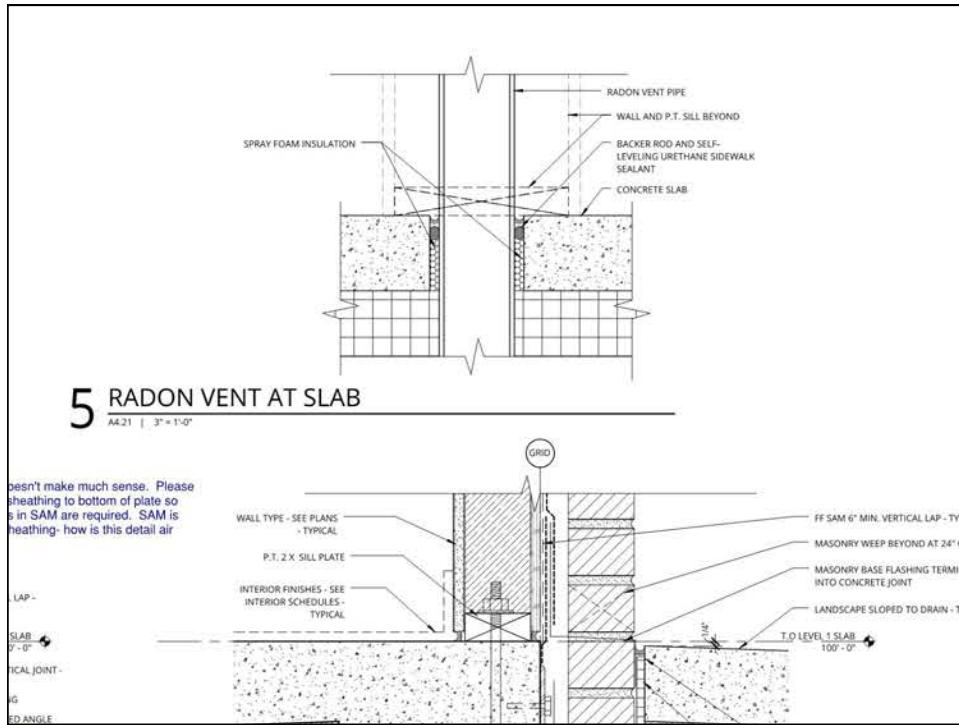
PS. Does anyone have a PR.FL@50 photo better than the one I attached?

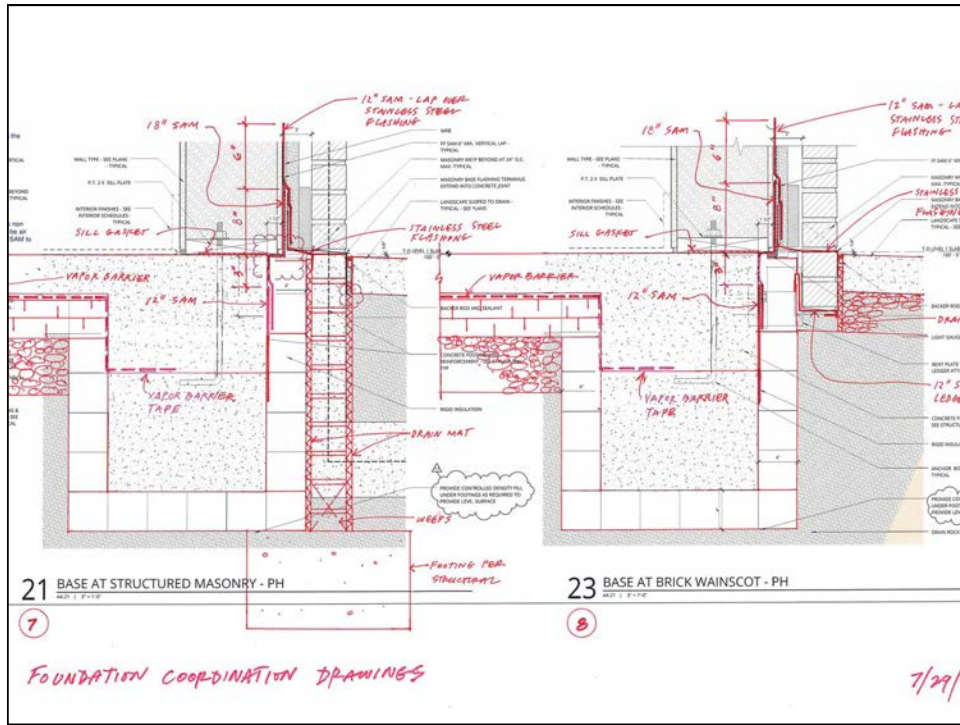
Ryan Shanahan CPHC, PHILUS+ Rater
Green Building Consultant
rshanahan@earthadvantage.org
C 971.344.7227

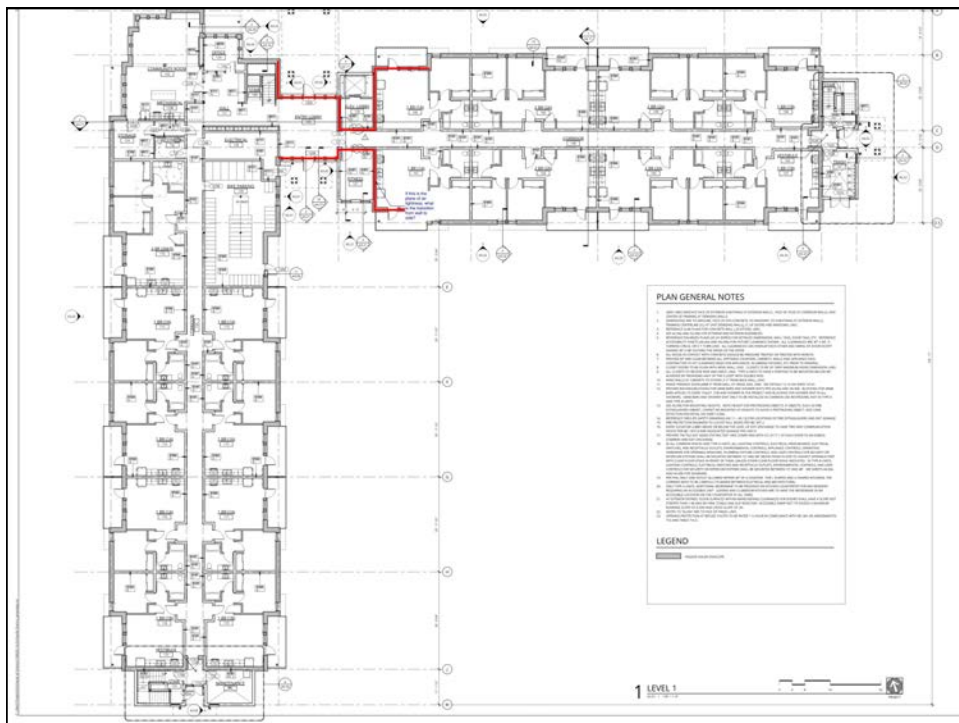
Earth Advantage // Better Buildings Now
earthadvantage.org / portland.or

Earth Advantage has certified 14,000 homes and counting!













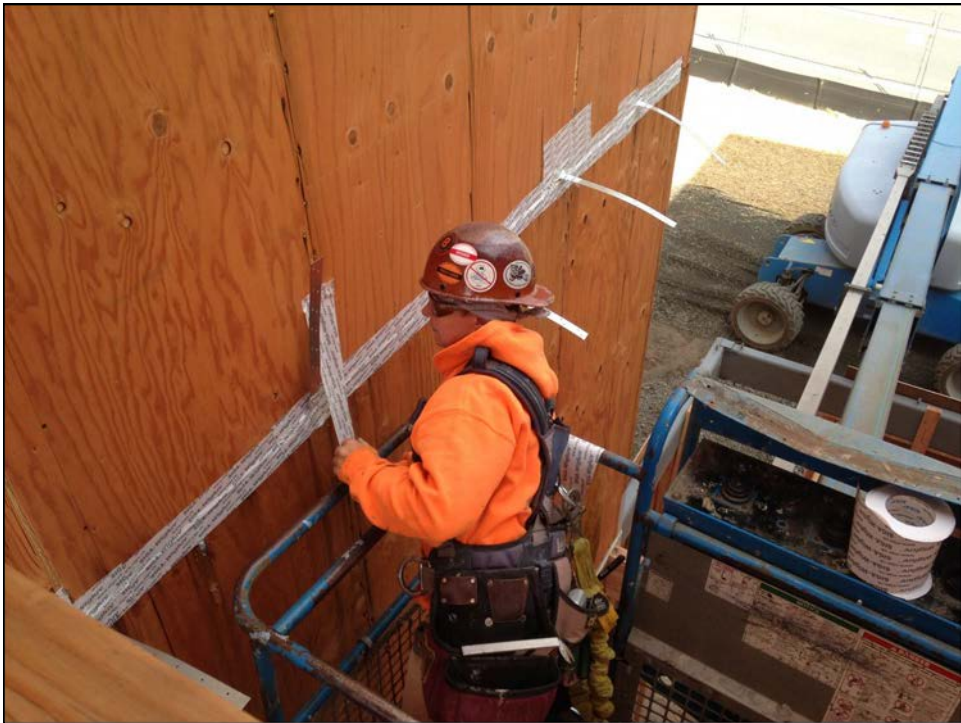










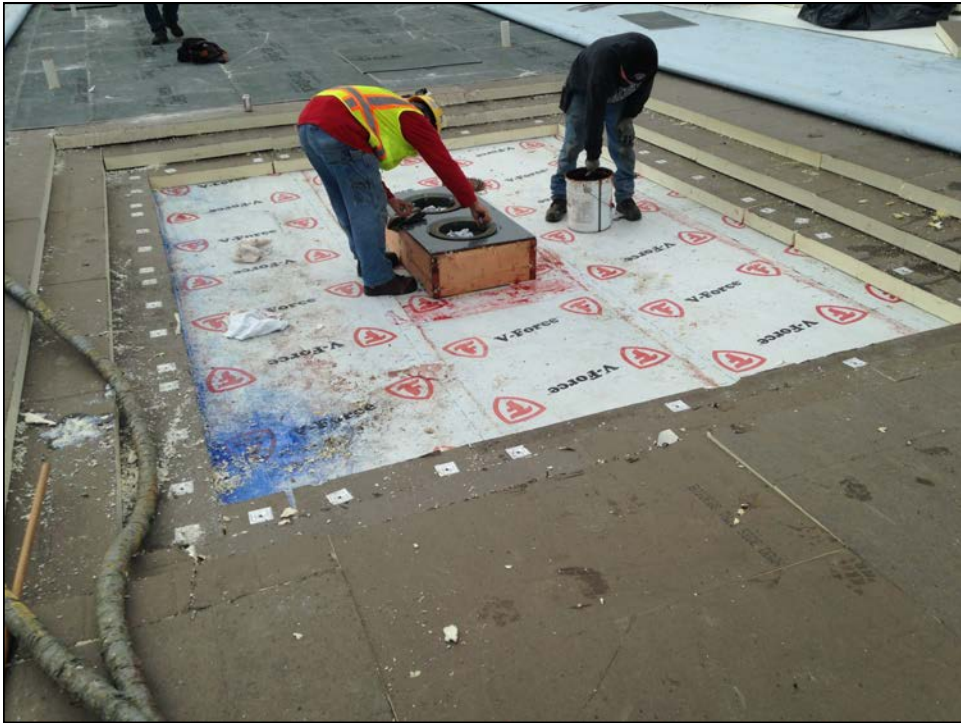








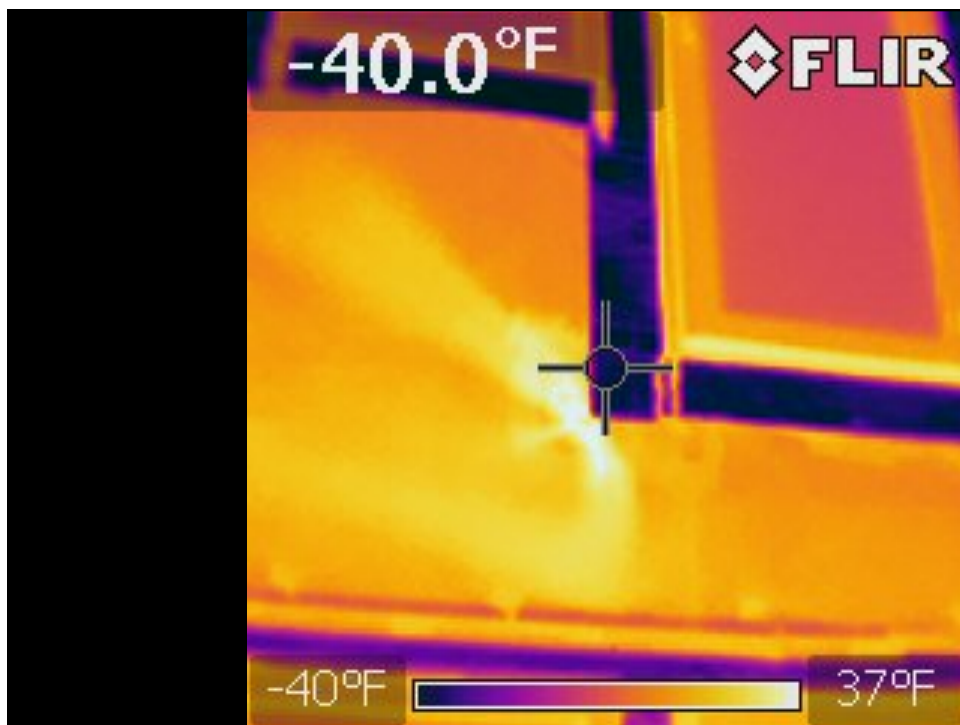
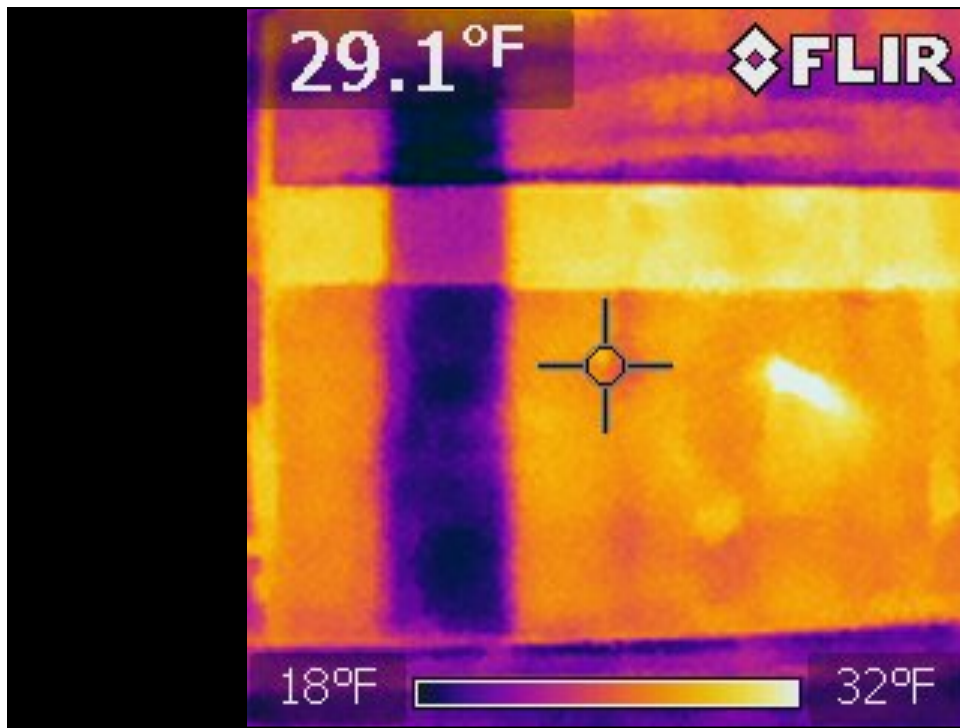






Mike and the Open Door





	CFM @ 50	Actual CFM	ACH50	
Negative Pressure				
25	356	224	0.056185243	
50	359	359	0.056658714	
75	362	451	0.057132185	
Positive Pressure				
25	602	374	0.095009877	
50	594	594	0.093747287	
75	582	767	0.091853403	
Average	476		0.075124089	(.006529 CFM / SQ FT Gross Envelope)
w/ 18x24" hole	5320		0.83962217	
w/ 11x11" hole	3820		0.602886596	