MASS SAVE DEEP ENERGY RETROFIT BUILDER GUIDE

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LEARNING OBJECTIVES

- Steps and resources available for Mass Save Deep Energy Retrofit application process
- Some typical incentive levels in practical application
- Review real world application of details in the BSC / Mass Save "Builder's Guide“
- Discover lessons learned from 10 DER's over the past 4 years.


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Weatherization vs. Deep Energy Retrofit

- **Weatherization:** Try to get closer to code, make some improvements where possible.

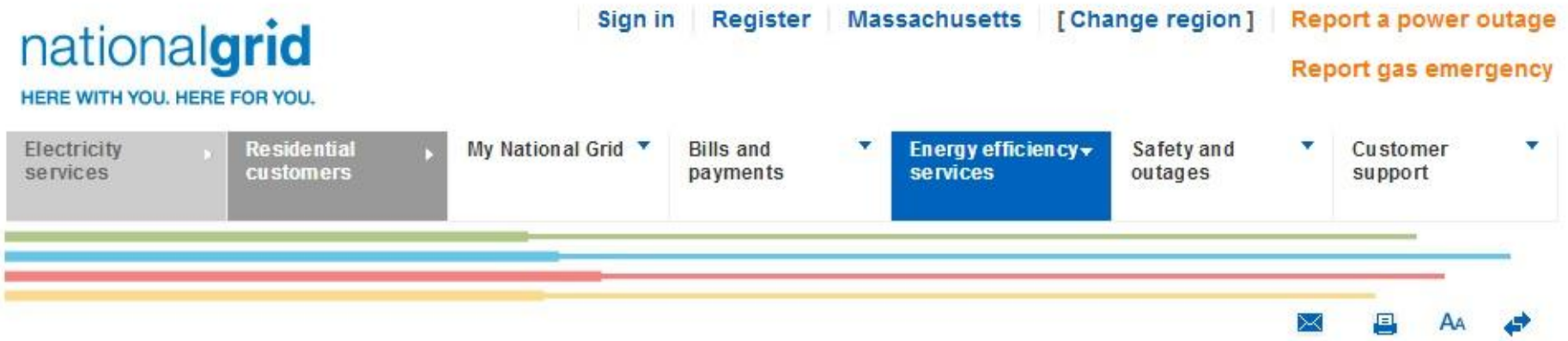
- **DER: Surpass code**. Assemblies and systems typically double IECC.

Weatherization vs. Deep Energy Retrofit

- Mass Save weatherization funding: $2 billion over 3 years: targeting savings: 15% (actuals not measured)

- DER pilot: $6.4 million over 3 years: targeted savings: 50% - 90% (actuals not measured by utility, but sometimes checked by contractor)

Simplified Process:



Services and rebates

Deep energy retrofit

National Grid's Deep Energy Retrofit Measures for 2013 are now available for homes in National Grid's electric and/or gas territories in Massachusetts and Rhode Island. National Grid Deep Energy Retrofit (DER) measures upgrade roofs, exterior walls, and basements in existing homes to perform significantly better than current code-compliant new homes.

The 2013 DER measures are "Roof-Only", "Wall-Only", and "Basement-Only" in order to align with re-roofing, re-siding, and basement fit-out home maintenance upgrades. Projects may pursue multiple DER measures at the same time.

The **base incentive** for Deep Energy Retrofit (DER) measures are:

- **Roof/Attic DER Measure - $3.00 per square foot of treated area**
- **Exterior Wall DER Measure - $3.50 per square foot of treated area**
- **Basement DER Measure - $2.00 per square foot of treated area**

Simplified Process:

The **performance incentive** for all DER Measures is **$1.75 per cubic feet per minute (CFM50) reduced** based on pre-construction and post-construction blowerdoor tests performed by National Grid.

All allowable DER roof, wall, and basement designs are included in the new "Deep Energy Retrofit Builder's Guide" created by Building Science Corporation (download below).

To participate, please email **DeepEnergyRetrofit@nationalgrid.com**

To learn more about deep energy retrofits, please click on the links below:

DER Measure description & guidelines

Homeowner Step-by-Step DER Process

DER Homeowner Application

DER Builder's Guide - low resolution

DER Builder's Guide - high resolution

DER open houses

DER case studies

Additional DER resources and examples

Participating DER contractors and design consultants

Contractor or design consultant application

View National Grid's **service territory map** for Massachusetts or **Massachusetts town listing**.

For additional questions, please email a program representative at DeepEnergyRetrofit@nationalgrid.com

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https://www1.nationalgridus.com/DeepEnergyRetrofit-MA-RES

PREREQUISITES:

- All participating homes must have mechanical ventilation that meets current new construction building code.
- All participating homes must have direct-vented sealed-combustion heating and hot water equipment.
- A project must submit a radon test results of less than 4 picocuries per liter (pCi/L) prior to pursuing a DER roof or DER wall measure

MULTI-UNIT AND INCOME ELIGIBILITY:

- A “dwelling unit” for purposes of incentives must have separate legal egress, bath and kitchen and electric meters. The building must be legally zoned for multiple units.
- Apartments must have at least 500 SF of floor space to be eligible. • Income eligible properties will be considered for 2013, however the project must declare status and can not also accept low income funding such as coordinated through LEAN, the Low Income Energy Affordability Network.

EXCLUSIONS:

- Don’t demolish…! Wait until baseline test.
- Additions not eligible

DER defined:

“Deep Energy Retrofit (DER) refers to the retrofit of the building enclosure and other building systems in a way that results in a **high performance building**.

A successful DER will result in very low post-retrofit energy use and also provide benefits to building **durability, comfort, and indoor air quality** (IAQ).”

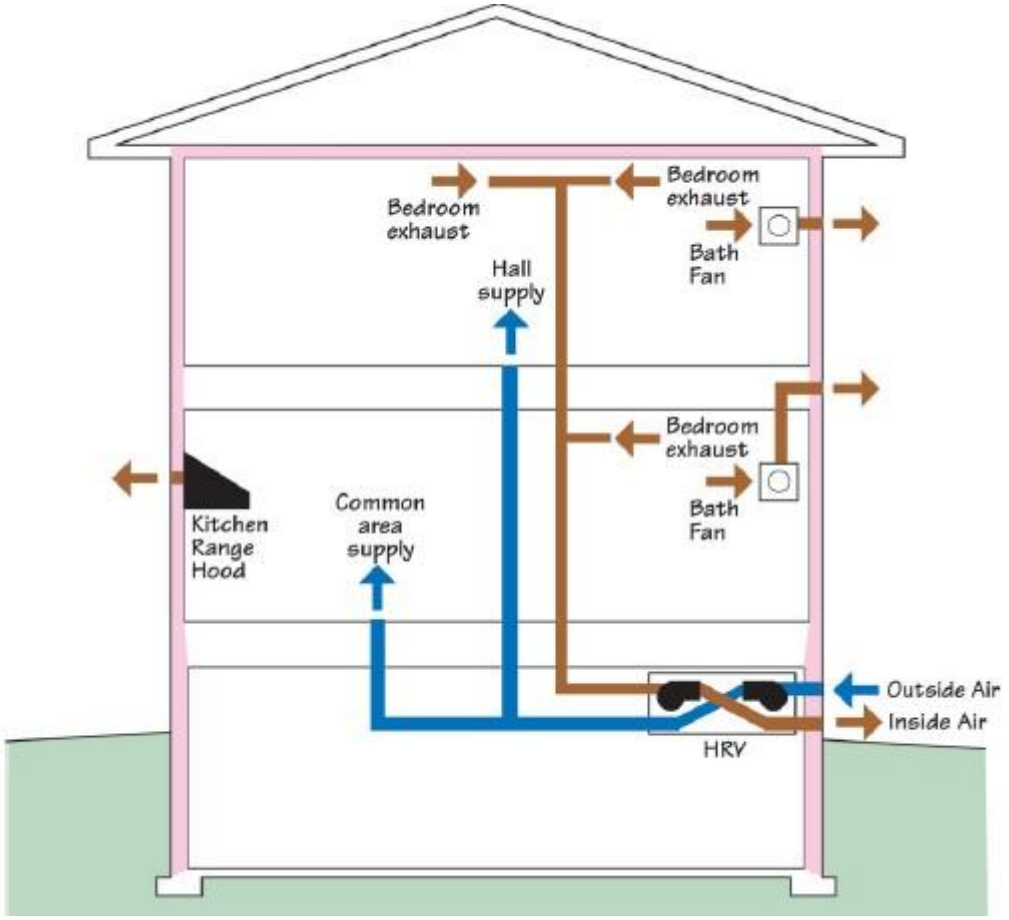
DER minimums:

“1.5 - 5 - 10 - 20 - 40 - 60”

- 1.5 Air Changes / Hour max: (Code is now 7 ACH)
- R-5 Windows minimum
- R-10 Basement slab
- R-20 Foundation Walls
- R-40 Framed walls above foundation
- R-60 Roof / attic

Mechanical systems:

- Sealed combustion appliances (for comprehensive retrofits)
- Highest efficiency equipment offered by the manufacturer
- Heat Pumps
- Combustion Safety Requirements (partial retrofits)
- Ventilation: Balanced (HRV or ERV) systems for comprehensive retrofits



WHY DER...?

WHY DER...?

* Can’t we just build better new houses...?

Roof/Attic DER Measure - **$3.00 per square foot of treated area**

Exterior Wall DER Measure - **$3.50 per square foot of treated area**

Basement DER Measure - **$2.00 per square foot of treated area**

The **performance incentive** for all DER Measures is **$1.75 per cubic feet per minute (CFM50) reduced**.

When is DER appropriate?

Participating Utilities

berkshire gas
Energy You Can Count On.
People You Can Trust.

Columbia Gas of Massachusetts
A NiSource Company

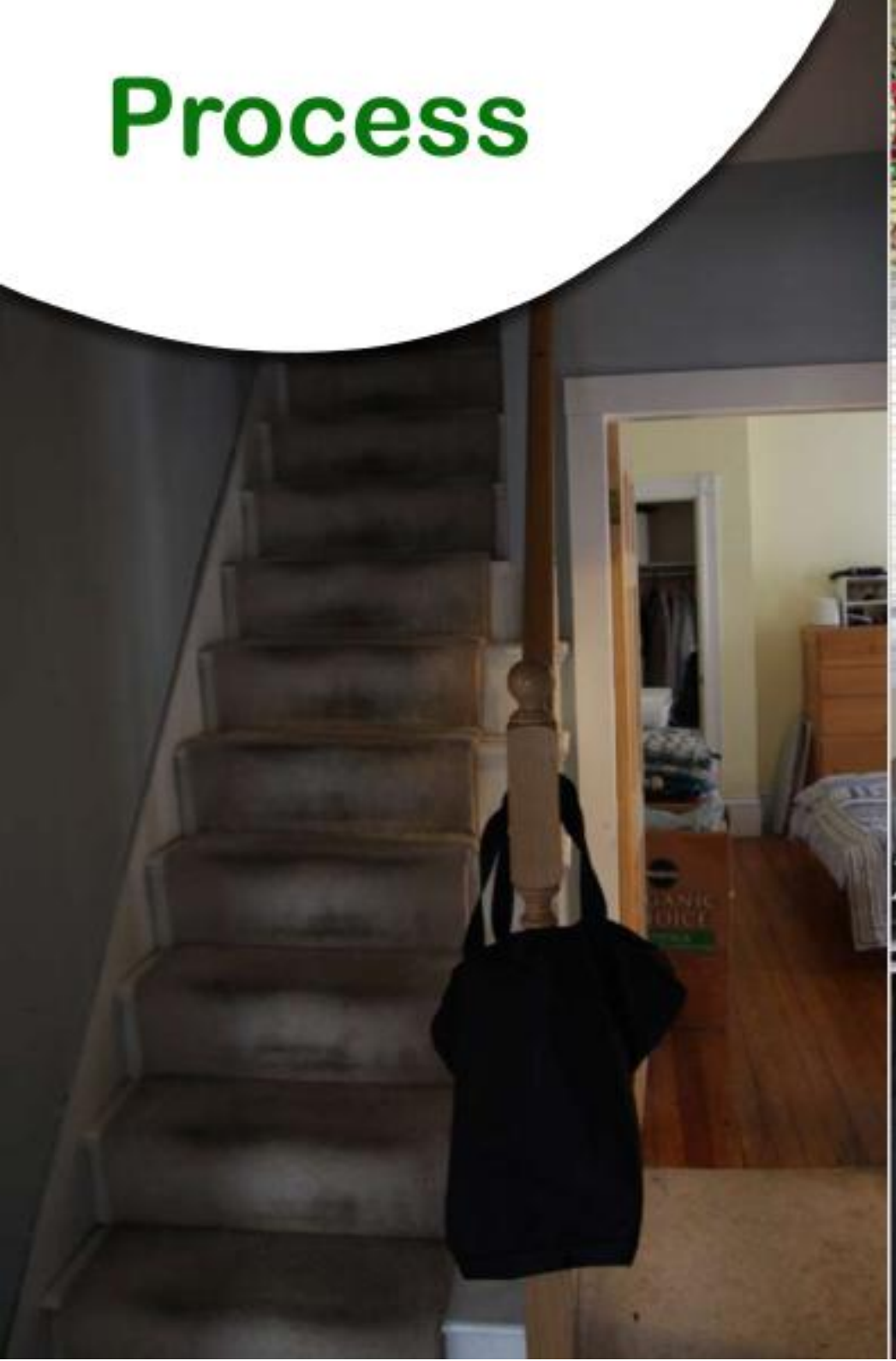
nationalgrid
HERE WITH YOU. HERE FOR YOU.

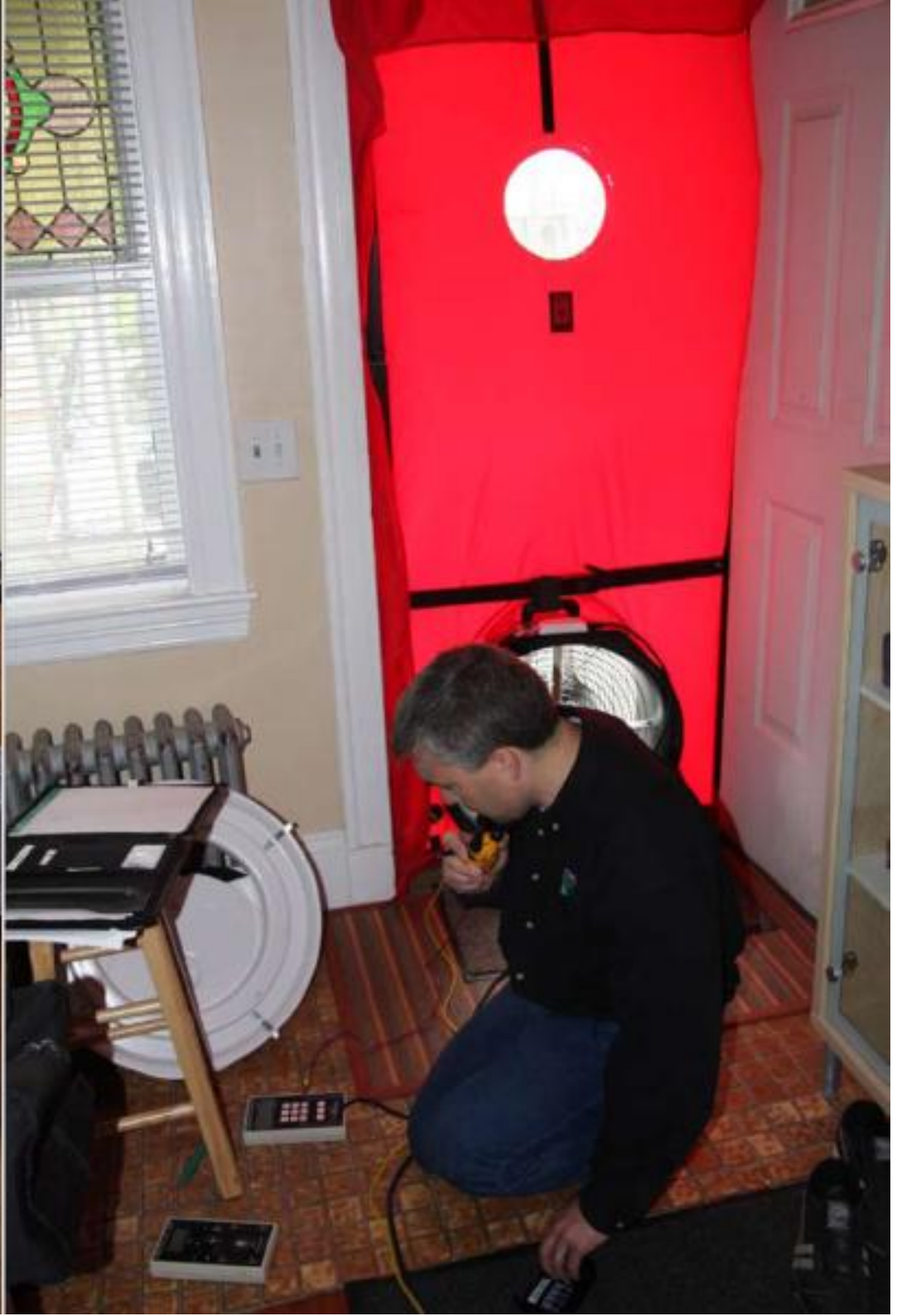
New England Gas Company

Unitil

Western Massachusetts Electric
The Northeast Utilities System

Process





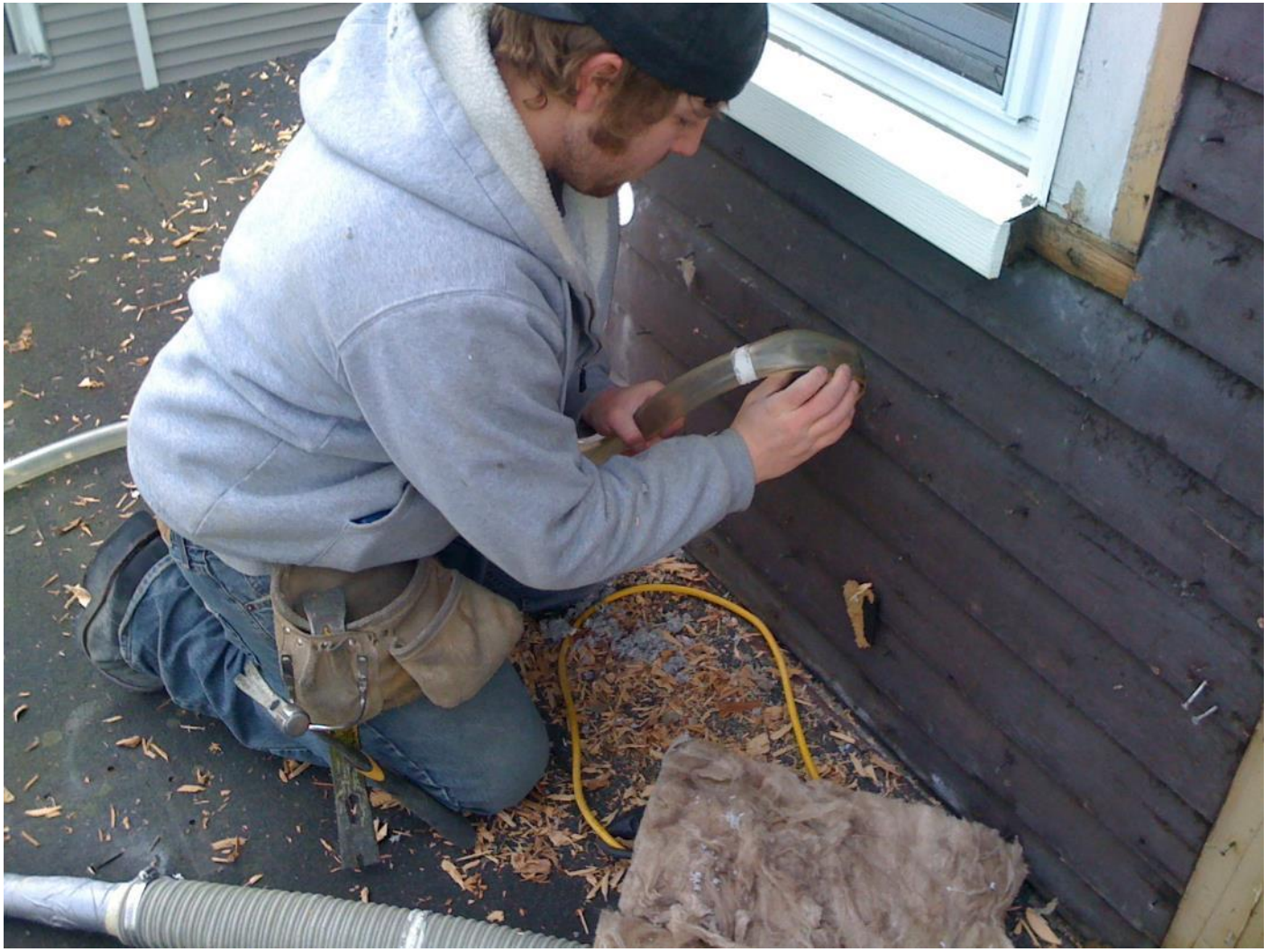
Application Process

- Check the utility’s territory map
- Baseline testing
- Review program with clients
- Need a DER approved provider
- Application is much simpler now
- Review of application by participating utility
- Homeowner to participate in workshop

Execution:

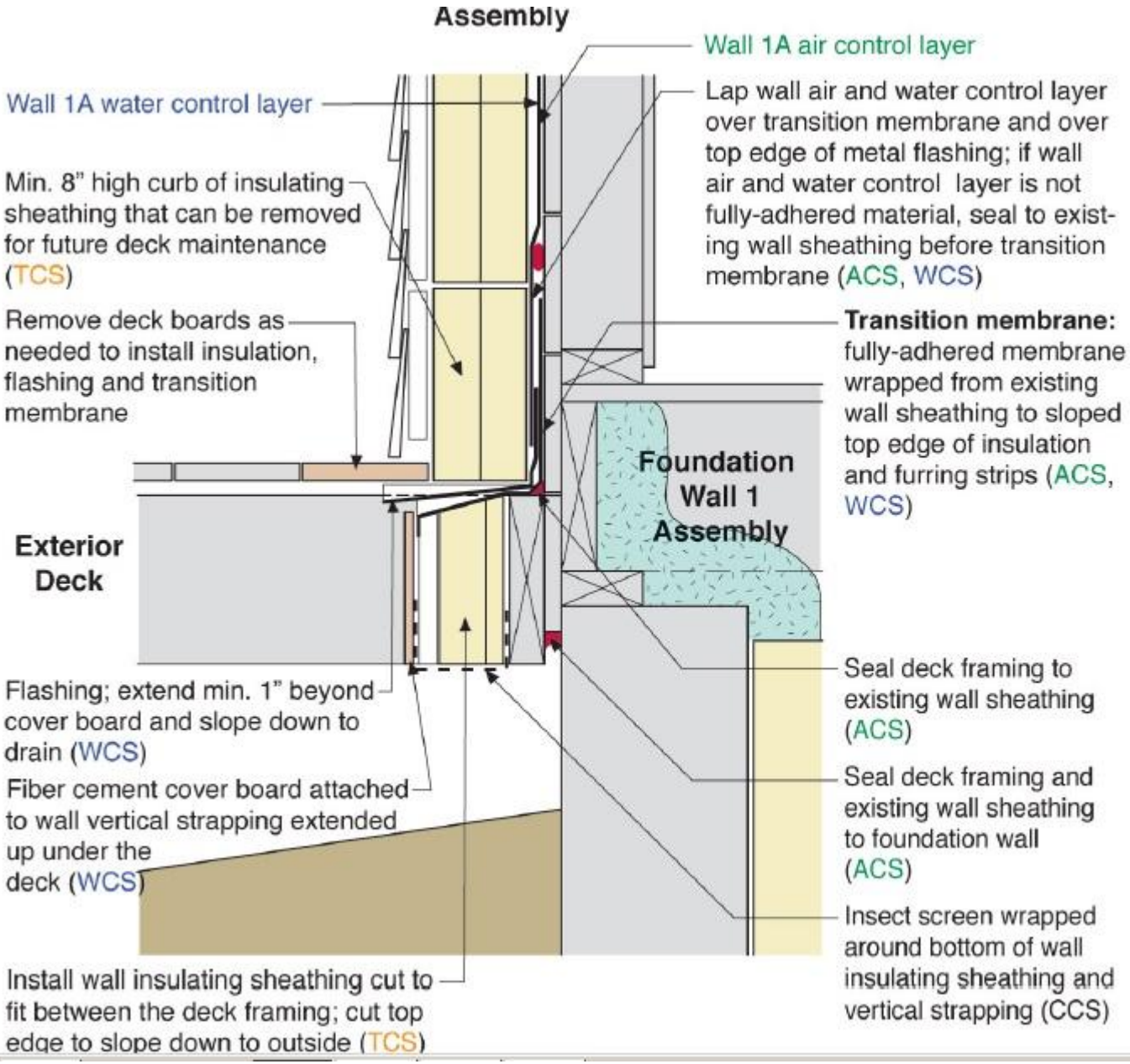
- CSG inspection(s)
- Incentive payment at completion

Densepack existing wall cavities



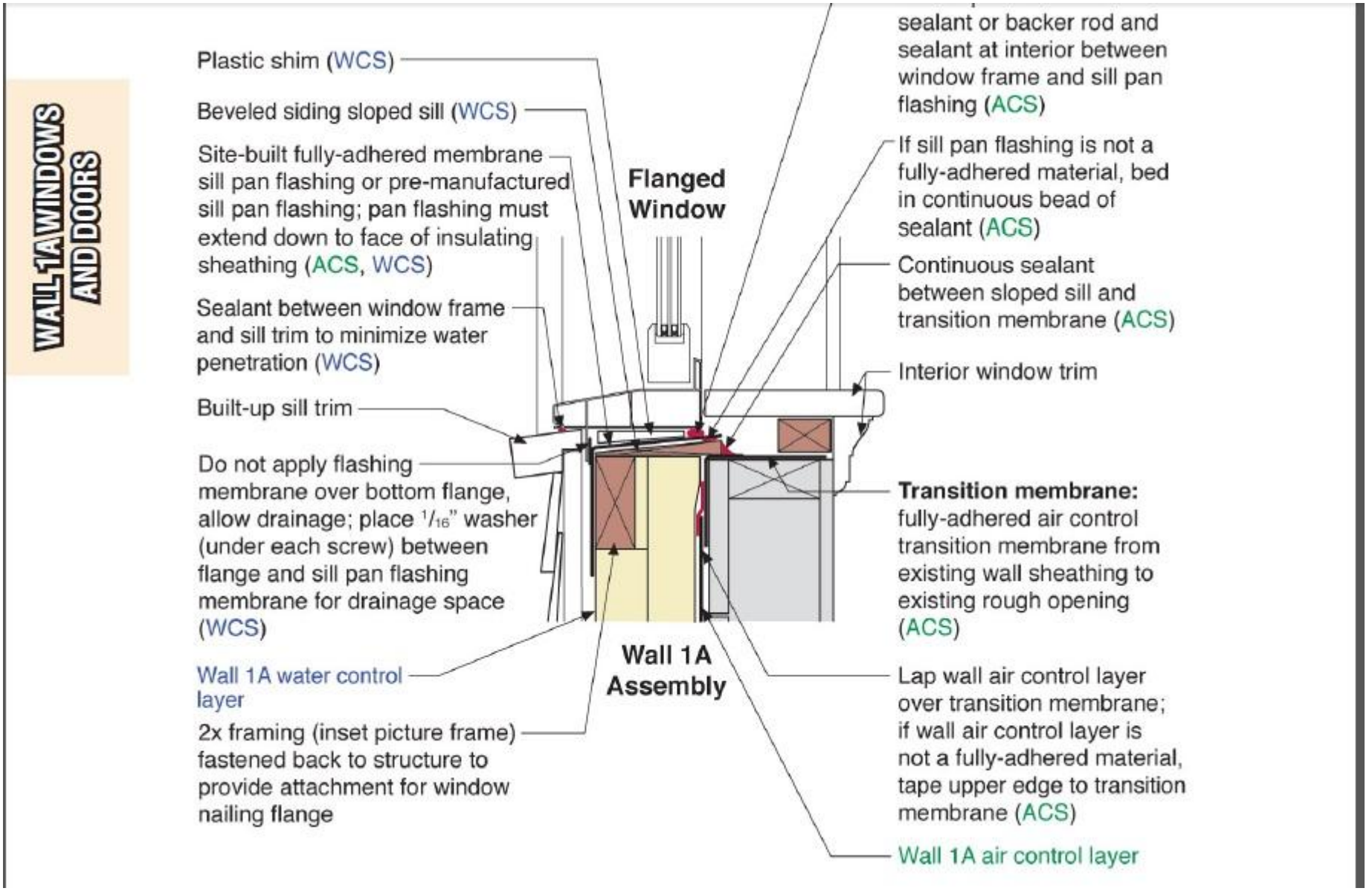
Apply air barrier then rigid foam “out-sulation”. Foil facing as drainage plane, siding back vented.

Builder's Guide

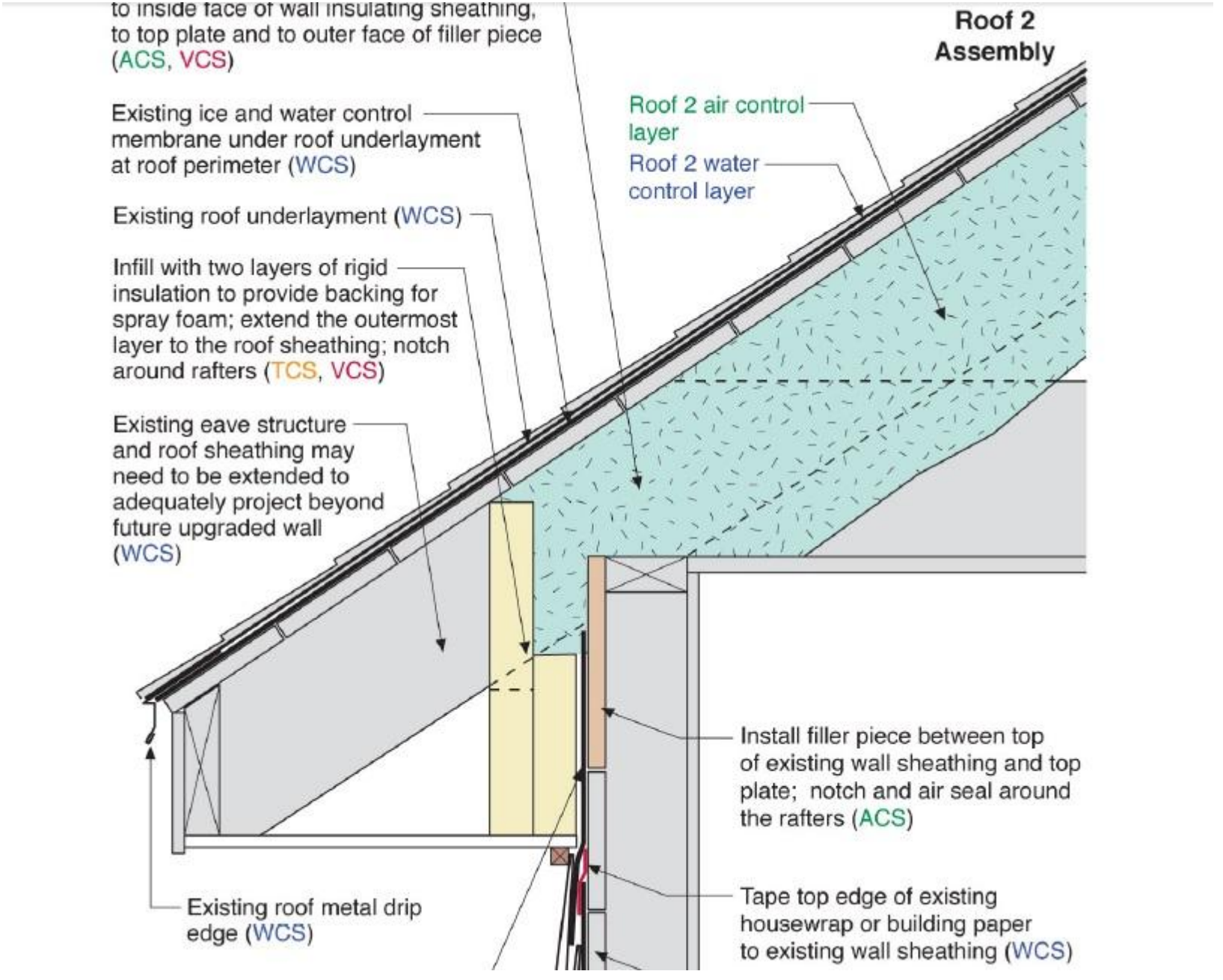


WALL 1B PORCH AND DECK CONNECTIONS

Builder's Guide



Builder's Guide



Deviations from Builder Guide

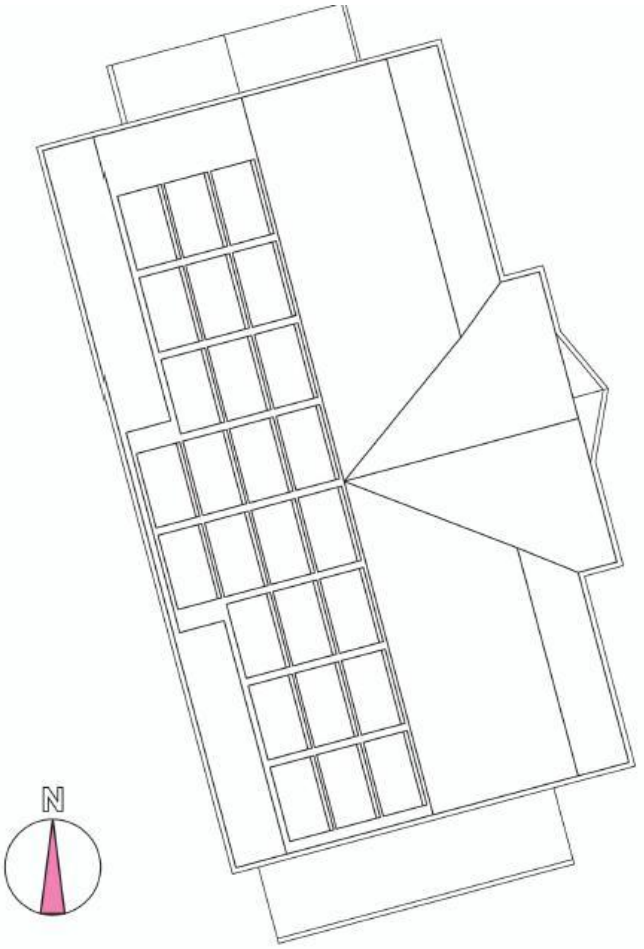
Up to 5 hours of review with BSC for free, then billed at hourly rates.

Opportunity: air seal first, then frame stairs.

No drafty corners

HRV: essential to high performance homes

7kW.
Closing the gap to zero…



ACI Thousand Homes Challenge:

How a 105 year old Victorian nearly hits net-zero

Month	CCF (gas)	Gas (in KWH)	Electric (kwh)	Total KWH per month	
November (gas meter read on 12/11/12: 8753 CCF)	-	-	-	-	(Baseline)
December	48	1449.85776	455	1904.85776	
January	50	1510.2685	50	1560.2685	
February	42	1268.62554	0	1268.62554	
March	21	634.31277	0	634.31277	
April	6	181.23222	0	181.23222	
May	5	151.02685	0	151.02685	
June	5	151.02685	0	151.02685	
July	3	90.61611	0	90.61611	
August	3	90.61611	0	90.61611	
September	5	151.02685	0	151.02685	
October (gas meter read on 11/11/12 at 8902 CCF)	14	422.87518	0	422.87518	
November		0		0	Anticipated electric draw for November: 0
Total 12 months KWH:				6606.48474	THC total MAX allowance for Heat, Cool,

24 Princeton Appliance types	Gas	Electric
Clothes Dryer	G	
Inductive Cooktop		E
Gas Cooktop	G	
DHW tank	G	
Radiant floor heat	G	
Cooling (not installed)	NA	NA

Old homes CAN be made to perform better than many new ones.

This concludes The American Institute of Architects
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Please visit www.bostongreenbuilding.com for more info on our Deep Energy Retrofit services.

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