Deep Energy Retrofit Open House

Saturday, October 13, 2012 • 10:00 AM — 3:00 PM

85 Laurel Street • Melrose, MA

National Grid will be sponsoring an Open House with Synergy Construction, DEAP Energy Group, European Architectural Supply (EAS), and New England Clean Energy that showcases the Deep Energy Retrofit of a 1945 two story Garrison Colonial style home in Melrose, MA.

The owners, David Fink and Barbara Simko, initially planned to remodel the 1945 era kitchen and build an addition to add space. Working with architect Steve Baczek and energy efficiency specialist Mike Duclos, the design evolved via the DER program to one that adds no square footage. Instead, the project focuses on energy efficiency, super-insulation improvements per DER guidelines, and recovery of space currently occupied by obsolete mechanical systems. The house also has the potential to reach Net Zero Energy (NZE) by adding a roof PV array and high solar gain windows.

The super-insulated all-electric home, made possible through financial and technical support from National Grid and Building Science Corporation, includes full envelope insulation and air sealing, new windows and doors, and new heating equipment. The chimney and existing oil fired steam heating system are being removed and replaced by mini-split air source heat pumps. The existing gas hot water heater will be replaced by an electric GE heat pump water heater. A drain water heat recovery heat exchanger will be installed in the basement to recover heat energy normally lost down the drain.

The project is aiming for completion by December 2012

Here are some of the highlights of this Melrose DER NZE project:

- **Roof**: R-60 (6" rigid polyisocyanurate foam over sheathing + blown-in cellulose between rafters)
- **Walls**: R-40 (4" rigid polyisocyanurate foam over sheathing + blown-in cellulose in cavities)
- **Basement walls**: R-20 (with 2" XPS foam and 1.5" rigid polyisocyanurate foam)
- **Basement floor**: R-10 with 2" XPS over existing concrete slab
- **Windows**: R-8 Schuco SI82 U-PVC tilt & turn casements
- **Doors**: R-5 Therma-Tru
- **Heating and Cooling**: Mitsubishi MUZ-FE09NA heat pumps (COP=4.5, HSPF=10, SEER=26)
- **Ventilation**: Balanced ventilation with Zehnder CA350 87% efficiency Heat Recovery Ventilator (HRV)
- **Hot Water**: GE GEH50DEEDSCA 50 gallon heat pump water heater with 2.4 energy factor rating (EFR)
- **Drain Water Heat Recovery**: GFX G4-60 for drain water heat energy recovery
- **PV**: 7.35kW SunPower E19/245 3 x 10 array with Enphase M210 microinverters for shading performance

Directions to the Open House:

1. House is on Larrabee & Laurel Street corner in Melrose.
2. By car, take I-93S exit 35, turn left under I-93, take next right, follow straight thru light past Stone Zoo
3. Turn left at Melrose sign, continue downhill thru light, turn left at next light onto Main St., take right at next light to Grove St., continue straight thru light to Larrabee St. on left, take left and continue 1 block to Laurel St..

The DER is a 2.3 mile walk from Orange Line Oak Grove subway stop.
Polyiso rigid foam will be installed on exterior walls with blown in cellulose to achieve R-40.

1st floor/basement wall/insulation detail from Steve Baczek DER drawing set.

Polyiso rigid foam will be installed on exterior walls with blown in cellulose to achieve R-40.

Street view with R-8 Schuco U-PVC windows and Tyvek installed.

Backyard view from south, original double hung window on right upper corner, other windows are new triple pane, 9 foot wide slider to be installed above hatch to be removed, PV array to be installed on roof after removing chimney, kitchen with induction stove to be relocated to left room on cement slab over unheated garage after insulation completed.

R-7.6, 0.5 SHGC triple pane Schuco S182 slider arrives from EAS to be installed on the 1st floor south wall of the dining room.

New ice & water shield to be installed on DER roof.

GE electric heat pump water heater installed, EFR = 2.4

Installation of sistered roof rafters done to strengthen roof for PV array.