Passive House Case Study

Historic Pine Street Passive House
Philadelphia, PA

Multifamily Retrofit
PHI Database ID#: 7427

Certification Goal:

Status: Pending
In construction phase

Size: 5,200 FT2 TFA with Four Units

Description: This project is a Passive House retrofit of a historic 4 unit residential rowhouse apartment.

DOE Climate Zone: 4a

Team:

Owner:
Laura Blau & Paul Thompson

Architect/Designer:
BluPath Design
www.blupath.us
Laura Blau AIA, Paul Thompson AIA, Kevin Davey, Intern

PH Consultant:
BluPath Design
www.blupath.us
Laura Blau, CPHD

Builder:
Laura Blau, CPHB
GreenSteps, LLC

Other:
Kent Leslie, Architect
Amy Rivera, PE Structural Engineer

1722 Pine was built in 1845 as a single-family residence. The 1700 block of Pine Street is one of the few streets with a continuous cornice line for its 20 adjoining homes, indicating that a single developer built the entire block. In 1922, the 77-year-old home received its first major renovation, converting it into three apartments above a professional ground-floor office. In 2016, 96 years later, Laura and Paul began the second major renovation. The single-pane 1920s deteriorated windows were cold and drafty, with diminished function. The apartments were tired, knob and tube wiring needed replacing, and only one unit was air-conditioned. The time was right for a major renovation.

The renovation goals were to maintain the historic character while meeting Passive House Step-by-Step principles and setting a precedent for renovating landmark masonry structures. The owners began an intensive renovation, underpinning the basement and converting the first-floor therapist offices to a bi-level owner’s apartment and professional office, reconfiguring the upper units with additional bathrooms, larger modern kitchens, and upgraded finishes. They removed the gas service and converted it to an all-electric building with new mechanical, electrical, and plumbing systems.
The project achieves low utilization energy and lower embodied energy by avoiding foam and using recycled rigid insulation for roof and under-slab locations. Elsewhere, cellulose above-grade and mineral wool below-grade insulation was installed.

The owners’ Unit A is designed to meet EnerPHit’s performance. The upper apartments apply the EnerPHit Step-by-Step approach to phased improvements. EnerPHit recognizes the complexities and practical constraints of retrofits compared to new construction, allowing a slightly relaxed airtightness standard, and acknowledges numerous limitations, such as orientation, limited access, existing materials, past renovations, local codes, and preservation restrictions.