



2023 Sustainable Architecture Award Jury

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Before Building Laboratory*

2023 Sustainable Architecture Award Winners Renovations, Adaptive Re-Use, or Retro-Fit



BEFORE and AFTER

Created a new main prominent entry with increased daylighting and security. Views from the interior look out to the solar flower connecting students with the school's energy efficient mission.



EXCELLENCE

+

**Commendation for
Implementation of
All-Electric
Commercial
Kitchen
Commendation for
Interactive
Learning Features**

**Buckley
Elementary School
| TSKP Studio LLC**

**Photo: Robert Benson
Photography, LLC**

Buckley Elementary School, originally built in the 1940s, became Connecticut's first Net Zero Energy public school with a projected Energy Use Intensity (EUI) of 18.1. Rather than demolishing and rebuilding, the renovation approach preserved 75% of the embodied carbon and eliminated operational carbon by using no fossil fuels.

Net Zero strategies extended beyond solar panels. Passive design was prioritized, followed by efficient active systems like geothermal and photovoltaics. The original 55,000 SF was gutted to the frame, with a 9,000 SF addition added for modern learning needs, including a STEM center with Art and Project labs.

- Energy efficiency upgrades included:
- Enhanced wall insulation (rigid, mineral wool, spray)
- High-performance windows and daylight-optimized polycarbonate panels
- 60 geothermal wells under the playfield
- 400 kW rooftop solar panels
- Smart Flower solar tracker at the entrance (4,000–6,000 kWh/year)
- All-electric kitchen
- Efficient mechanical systems and air purification via bipolar ionization

Final testing confirmed airtight construction with 155 CFM/SF @ 75 pascals. From December 2022 to present, the school used 133,833 kWh and generated 134,566 kWh, achieving true net zero.

Jury Comments: *“The way that they completely changed the feel of the space, taking an old school and making it into a modern well-lit airy location and integrating all these learning features and so the students understand what a sustainable building is.” “This was significant structure re-use in being net positive and equally impressive was the ability to create an all-electric kitchen.” “The sustainable strategies were very clear from the design ideas that aligned with their sustainable strategy were really clear and well-executed from the big picture of the project down to the details.” “Impressed with the integration of passive strategies and the embodied carbon savings.”*

EXCELLENCE



King's Block | Patriquin Architects

Photo: Ian Christmann Photography

This 1816 brick building, located near the Quinnipiac River, underwent a Passive House retrofit completed in May 2022, significantly cutting carbon emissions and increasing resiliency. Gas systems were removed, and mechanicals relocated from the basement to avoid flood risks.

To preserve its historic character, the exterior was minimally altered—only small vents and a rooftop solar array were added. Inside, a new high-performance envelope was built within the existing brick shell, including R-39 walls, R-50 roof, and R-40 basement ceiling. A detailed insulation strategy and air sealing yielded a blower door result of just 0.048 CFM/sf, surpassing PHIUS standards.

Key features:

- PHIUS 2018+ certified

- Modeled EUI: 15.4 kBtu/sf/yr, reduced to 4.3 with 11.4 kW solar
- Triple-pane tilt-and-turn windows inside original frames (U-0.16)
- Each floor has its own all-in-one electric heat pump/ERV/dehumidifier

This retrofit balances historic preservation with cutting-edge energy performance.

Jury Comments: “Great integration of the existing timbers.”

“The reuse strategy is really clever and well-executed.”

“Appreciated all the commentary on resilience and the awareness of flood resistance and resilience in flood conditions. And the fact they used cellulose insulation.”

MERIT



6 Maple Street – Preservation, Adaptive Reuse & Deep Energy Retrofit | Wyeth Architects

Photo: Robert Benson

Photography, LLC

This 1749 Colonial in Chester, CT, underwent a Passive House–inspired deep-energy retrofit that blends historic preservation with high-performance upgrades. The structure retains its original charm and village character while boasting a modern, energy-efficient interior.

Key upgrades:

- Continuous exterior insulation and high-performance windows
- Reversible chimney and fireplace sealing per preservation standards
- Exceptional airtightness for a retrofit (2.7 ACH50)
- HERS rating of 49 (twice as efficient as baseline)

The all-electric building features:

- Air-to-air heat pumps for heating/cooling
- Enthalpy recovery ventilation with MERV 13 filtration
- No fossil fuels
- Hot water recirculation loop for efficiency and comfort

Durability and moisture control were top priorities. French drains manage hillside runoff, keeping the lower level dry. Cement board siding and poly-ash trim resist moisture, rot, and pests. Copper gutters add durability with a modern touch.

This project proves that even an 18th-century building can be resilient, healthy, and energy efficient.

Jury Comments: *“A laudable job in renovating this building.” “Appreciated aspects of the design in the effort of modernizing the home and the historic features.” “The intentions are great, and the design choices expressed the ethos of the project – the façade, roof arch.”*