



171-173 Columbia St. Is a green and affordable triple-decker rehabilitated from a fire in 2020. (Courtesy of HRI)



The project includes fully electric appliances and other strategies in the Green Certification Plus program. (Photo by Matt Cronin, courtesy of ZED)

2020 Green Communities Criteria

171-173 Columbia Street, Cambridge, MA

Enterprise Green Communities is the only national green building program designed specifically for and with the affordable housing sector. Green building practices lead to efficient, comfortable, and resilient affordable homes, and promote equitable development by giving residents a voice in the design and development of their communities.

REHAB FOCUSED ON FUTURE PROOFING

- After a fire caused significant damage to the property, [Homeowner's Rehab, Inc. \(HRI\)](#) temporarily rehoused residents to make repairs. Rather than returning the building to its original state, HRI partnered with architect [ZeroEnergy Design \(ZED\)](#) and obtain funding through the [Mass Clean Energy Center \(CEC\)'s Triple Decker Challenge](#) to transition the property to an all-electric, near net-zero energy residence.
- Energy efficiency was a core focus, as was resident comfort and health through prioritizing building durability and indoor air quality. HRI also targeted resilience strategies, taking into account Cambridge's high hazard risk for extreme heat, air pollution, and flooding.

DESIGN FOR AN EQUITABLE TRANSITION TO A CLEAN ENERGY ECONOMY

- Reducing energy demand is a core component of increasing energy efficiency in a building. The Columbia Street project reduced heat island effect by installing a cool roof. Robust insulation and air tightness are also important strategies to reduce energy demand. Cellulose insulation made from recycled newsprint was used, which provides good soundproofing, is a low-VOC product, generally does not require an extra moisture barrier, and helps reduce the project's embodied carbon footprint.
- To address efficiency and electrify the building, ZeroEnergy Design selected ducted air-source heat pumps for each unit, which extract heat from the air outside and distribute it inside. During warmer months, this process is reversed to provide cooling. These were paired with Energy Recovery Ventilators (ERVs) to help control heat and moisture.



“There was this really unfortunate event. Luckily no one was injured, but it became an opportunity to extend the lifespan of the building, to address the energy efficiency, to electrify the building, and decouple it from fossil fuels.”

Stephanie Horowitz,
Co-founder of ZeroEnergy Design

(from Bluedot Living, “[How a Cambridge Triple-Decker Became a Model for Affordable, Sustainable Living](#)”)

Open floor plan reflecting resident input. (Photo by Matt Cronin, courtesy of ZED)

ADDRESSING RESIDENT NEEDS THROUGH INTEGRATIVE DESIGN

- Resident needs, resilience, and health outcomes were considered during the integrative design process with the help of the [Project Priority Survey](#) (Criterion 1.1). Developers worked closely with the property managers who conducted interviews with the displaced residents to evaluate proposed designs.
- Using the [CDC’s Environmental Justice Index](#), high asthma rates, respiratory hazards (diesel particulate matter) and proximity to toxic sites were identified, which informed pursuing strategies focused on air quality and resident health.
- Design choices based on these outcomes included low-VOC finishes, open floor plans, and new layouts that reflected resident preferences, and an additional laundry space in the communal basement area.

ACHIEVING ENTERPRISE GREEN COMMUNITIES PLUS CERTIFICATION

- 171-173 Columbia Street achieved [Green Communities Plus Certification](#), which includes certifying to the [DOE’s Efficient New Homes Program](#) (ENH), greatly reducing the building’s overall carbon footprint and achieving Net Zero Energy ready status. The ENH program also includes earning [ENERGY STAR for Homes](#) and [EPA Indoor AirPlus](#) certifications.
- The rehabilitated building reduced energy demand, resulting in lower utility costs. The project is positioned to be net-zero energy. Employing energy efficiency strategies and transitioning to fully electric (5.5b), and solar PV-readiness (5.3a) also provides resident health benefits and resilience against climate risks.

- **Green Communities Points:** 70 (40 min required)
- **Project Type:** Substantial Rehabilitation
- **Construction Cost:** \$2,041,000
- **Year Completed:** 2022
- **Size:** 4,699 SF
- **AMI:** 3 units 51-80% AMI
- **Property Developer:** Brian Reilly, [Homeowner’s Rehab, Inc.](#)
- **Architects:** [ZeroEnergy Design](#)
- **Green Building Consultants:** [New Ecology, Inc.](#)
- **Financing:** [Massachusetts Clean Energy Center](#) (MassCEC) [s Triple Decker Challenge](#) award

OPTIONAL GREEN COMMUNITIES CRITERIA ACHIEVED

2.7 Preservation of and Access to Open Space	2.12 Access to Fresh, Local Foods
5.2b Moving to Zero Energy: Near Zero Certification	5.3a Moving to Zero Energy: PV/Solar Hot Water Ready
5.5b Moving to Zero Carbon: All Electric	6.10 Construction Waste Management
6.5 Environmentally Responsible Material Selection (3/4 product categories):	— Concrete, Steel, Insulation — Roofing — Wood, Non-Composite
7.6 Smoke-Free Policy	7.9 Construction Pollution Management

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