Residences on Lincoln Square

Worcester, Massachusetts

PROJECT SNAPSHOT

Development Type: New construction and historic adaptive reuse multifamily residential building

Completion Year: Anticipated Fall 2026

Developer: WinnDevelopment

Architect/Designer: Maugel DeStefano Architects (Harvard, MA)

Passive House Consultant: Building Evolution Corporation (BEC)

Verifier: Sustainable Comfort, Inc.

Contractor: F.W. Madigan Company, Inc.

Mechanical Systems Designer: Petersen Engineering

Code Pathway: Permitted under the Stretch Energy Code (225 CMR 23.00), with compliance demonstrated via Phius CORE 2021 (64-unit building).

The former Worcester Boys Club. Photo by Kiernan Dunlop. Source: The Worcester Guardian

PROJECT OVERVIEW

The redevelopment of the former Worcester Boys Club site, now known as the Residences on Lincoln Square, transforms a **long-vacant historic structure** into a **mixed-building senior housing development** in downtown Worcester. The original Boys Club building, constructed between 1928 and 1930, had been largely vacant since 2006 and sat in deteriorating condition after periods of limited reuse, including as a technical high school. With no active use by the City or Commonwealth, Worcester sought a development partner to reactivate the site and return it to productive community use.

The project consists of two buildings. The existing Boys Club structure is being rehabilitated and adapted into 16 residential units. The redevelopment must follow stringent historic tax credit design guidelines, preserving the historic facade of the building, while also maximizing investment in energy efficiency, water conservation, and healthy building practices. Complementing the renovation is a new five-story, **mid-rise multifamily building designed to Phius (passive house) standards**, delivering **64 new all-electric units**. The new construction residences are income-restricted at multiple affordability levels, including households earning approximately 30% and 60% of Area Median Income.

Together, the two buildings will provide 80 units of senior housing (age restricted to 55+), supporting housing stability and long-term energy performance. Construction is expected to conclude in fall 2026, with initial occupancy anticipated in spring 2026.

Design & Construction Approach

This multifamily project was developed using Low-Income Housing Tax Credits (LIHTC), which are administered through a state-level competitive allocation process. In Massachusetts, LIHTC-awarded developments must meet the Massachusetts Stretch Energy Code, regardless of whether the project is located in a Stretch Code community. In addition, the state's Qualified Allocation Plan awards competitive points for enhanced energy performance, including compliance with the Specialized Stretch Energy Code and Passive House certification, making higher-efficiency design strategies a key factor in project competitiveness and selection.

At the time the project permit was submitted (February 12, 2024), Worcester had not yet adopted the **Specialized Stretch Energy Code**, which became effective July 1, 2024. While the city was designated as a **Stretch Energy Code community** during permitting, the Stretch Energy Code does not require Passive House standards.

"*WinnDevelopment is pursuing Passive House certification wherever feasible, with more than twenty projects aiming for Passive House certification in Massachusetts in the next five years." Christina McPike, Vice President, WinnDevelopment*

Envelope

The Passive House project implements a layered insulation approach to achieve high thermal performance and support Passive House targets. Dense-packed **cellulose** is installed in the 2×6 wall cavities and paired with a continuous exterior insulation assembly, referred to by the project team as the **"armor wall" system**. The exterior insulation provides a continuous thermal layer that reduces thermal bridging through the wall assembly. Together, the cavity insulation and exterior "armor wall" contribute to a total wall assembly R-value of approximately **R-38.** The dense-packed cellulose is selected as a **low-embodied carbon material**, aligning with broader sustainability goals and reducing the overall environmental impact of the construction. The building also incorporates high-performance **triple-pane windows** by Yaro to support envelope efficiency.

Rendering of Residences on Lincoln Square, courtesy of WinnCompanies. Source: HIGH-PROFILE MONTHLY

Mechanical Systems

Centralized variable refrigerant flow (VRF) heat pumps provide heating and cooling, with each residential unit served by its own interior fan coil unit. **Central outdoor compressors are located on the rooftop and piped internally through branch boxes**, enabling an efficient system layout while allowing individual unit control and simultaneous heating and cooling in the building.

A **centralized Energy Recovery Ventilator (ERV) system delivers 100% mechanically supplied outdoor air**, supporting indoor air quality and occupant comfort while reducing ventilation-related energy losses through heat recovery.

Mechanical Systems (cont.)

An **all-electric, centralized heat pump water heating system** using a Mitsubishi QAHV system produces domestic hot water. The system uses CO_2 as the refrigerant, which has a significantly **lower global warming potential** than conventional refrigerants, supporting both operational efficiency and climate goals.

Appliances and Lighting

All major appliances installed in the project are **ENERGY STAR®** certified, supporting energy-efficient operation and helping to reduce occupant utility costs. This includes **ENERGY STAR®** certified refrigerators, dishwashers, washers, and dryers. Cooking is fully electric but uses electric resistance appliances rather than induction. Lighting throughout the building is **100 percent LED**.

Performance Results

Assembly/System	Material	Metric	Value	Notes
Walls (exterior / armor wall)	High-performance, rigid poured polyurethane foam.	R-value	R-15	5 in 1 product. Sheathing with insulation, air a nd water barrier
Walls (cavity)	Dense-packed cellulose	R-value	R-21	
Roof / Ceiling	Polyiso	R-value	R-50	Flat roof, 9” ci
Slab / Floor	Batt and insulated ceiling tile @ Podium	R-value	R-40	R-26 batt + 4” Rockfon
Windows	Triple pane	U-factor / SHGC	0.13 / 0.32	YARO
Heating	VRF with vertical fan coil units	COP	>3.5	Mitsubishi Electric
Cooling	VRF with vertical fan coil units	IEER	21.4	Mitsubishi Electric

Cost Insights

The property was acquired by WinnCompanies from the City of Worcester in 2019 for $300,000. The redevelopment of the former Worcester Boys Club and the construction of the Residences on Lincoln Square site represents an approximately $51 million investment, with total development costs expected to reach up to $70 million upon completion.

The project is supported by a layered financing structure that includes **federal and state LIHTC equity**, **historic tax credits**, and a mix of **public and private funding** sources. In addition to baseline requirements, the QAP awards competitive points for enhanced energy performance, including compliance with the Specialized Stretch Energy Code and Passive House certification, making higher-efficiency design strategies a key factor in project competitiveness.

Cost Insights (cont.)

Key contributors include the Massachusetts Executive Office for Housing and Livable Communities, the Massachusetts Housing Partnership, $900,000 award from MassDevelopment's Underutilized Property Program, the City of Worcester through HOME and $1.75 million from Affordable Housing Trust funds, the U.S. National Park Service and Massachusetts Historic Commission, as well as private financing from Rockland Trust, MassHousing, and BlueHub Capital. Rockland Trust is providing construction financing, while the Massachusetts Housing Partnership is supporting permanent financing, with additional gap funding from state and local sources.[1]

Outcomes & Lessons Learned

Passive House projects require a higher level of **upfront planning and coordination** than conventional multifamily construction. Each building presents unique conditions, and addressing those differences requires a tailored testing plan and early alignment across the project team. Extensive testing protocols and building readiness documentation are necessary to confirm that assemblies, systems, and sequencing are aligned before verification.

Achieving **airtightness targets** can be challenging, particularly at transitions such as the ground floor, where site conditions introduce complexity beyond design intent. As Chris Straile noted, *"all Passive House projects face challenges related to passing airtightness testing… Lincoln Square faces a unique challenge given the nature of the historic adaptive reuse building, which is physically attached to the passive house building, creating a challenging connection detail disrupting primary air and thermal barriers that must be dealt with in the field."*

Addressing these conditions requires **close collaboration** with contractors and subcontractors to map air barrier continuity during design and construction in order to identify practical solutions on site.

Special thanks to Britt Clark, Senior Architectural Green Building Consultant at Sustainable Comfort, Inc., and WinnCompanies' internal Energy & Sustainability team, including Chris Straile, for their insights and contributions to this case study.

To view additional Massachusetts case studies, visit the link below:
https://neep.org/code-collaboratives/massachusetts-case-studies

1. Affordable Housing Finance, WinnCompanies Launches Redevelopment of Worcester Boys Club, 2024; ConnectCRE, WNC Launch Conversion of Historic Boys Club Building in Worcester, 2024; WinnCompanies, WinnDevelopment Begins Construction on $51 Million Redevelopment of Historic Property for Senior Housing, 2024).