

# NET ZERO DEAL PROFILE: 140 KENDRICK STREET, BUILDING A

Needham, Massachusetts

OFFICE

Net Zero Deal Profiles showcase net zero buildings worldwide, highlighting the financial structures and flows that made these projects viable.

## LOCATION:

140 Kendrick Street, Building A  
140 Kendrick Street, Needham, Massachusetts 02494  
<https://www.bxp.com/properties/140-kendrick-street>

## PROJECT TEAM:

**DEVELOPER:** BXP  
**CLIENT:** Wellington Management  
**ARCHITECT:** Stantec

## INTERVIEWEE:

Neetu Siddarth, sustainability director, energy and utilities, BXP

## PROPERTY TYPE:

Office

## NUMBER OF UNITS:

3 office buildings, amenities center

## SITE SIZE:

15.91 acres

## BUILDING AREA:

440,000 square feet  
• 106,000 square feet (Building A)

## LOCATION TYPE:

Suburban

## DATE STARTED:

October 2021

## DATE COMPLETED:

July 2023



140 Kendrick Street. (Courtesy of BXP)

# Overview

**140 Kendrick Street is a 440,000-square-foot premier workplace campus in Needham, Massachusetts, developed, owned, and managed by BXP. The campus includes three office buildings (A, B, and C), and the Exchange, an amenities center featuring conference facilities, a high-quality seating and collaboration area, a cafe, coffee bar, and a fitness center.**

**This profile focuses on Building A, a 106,000-square-foot office building leased by Wellington Management in 2021. Upon signing the long-term lease, BXP, in partnership with Wellington Management, began a comprehensive retrofit focused on improving operational efficiency and enhancing occupant comfort.**

**This retrofit is the first large-scale, net zero\*, carbon-neutral office repositioning of this scale in Massachusetts. The project scope included full electrification, building envelope enhancements, advanced energy recovery systems, modernization of mechanical systems, and the addition of on-site renewable energy generation. Building A now serves as a model for high-performance workplace design, achieving Leadership in Energy and Environmental Design (LEED) v4 Gold certification. The success of the project reflects a collaborative effort between BXP and Wellington Management to align sustainability goals with operational decisions, ensuring long-term performance while creating a human-centric workplace.**

## The Site and Neighborhood

140 Kendrick Street is a multibuilding complex with three buildings in Needham, Massachusetts, about 12 miles west of Boston. As it stands today, 140 Kendrick Street has about 440,000 square feet of space. The complex boasts a fitness center, conference center, café and coffee bar, and various transit-oriented spaces such as a garage with 1,300 parking spaces. Owned and developed by BXP in 2000, 140 Kendrick Street lies at the intersection of Cutler Pond and Route 128. Along with providing convenient access to the highway for car commuters, 140 Kendrick Street is also accessible via numerous bus stops and is 1.5 miles away from the Needham Heights train station.

Building A is a 106,000-square-foot office building on the campus, leased by Wellington Management and repositioned by BXP in 2021 to be the first net zero, carbon-neutral office retrofit of this scale in the state.

The location of Needham played a strategic role in the decision to pursue this ambitious retrofit. Needham has a long history rooted in real estate, housing development, and early manufacturing, including textile and underwear factories. The construction of Route 128 in the 1950s helped establish the nation's first industrial park, setting the stage for the town's evolution into a hub for innovation.

Today, Needham is home to the [N2 Innovation District](#), the center for innovation, technology, and entrepreneurship in the Boston suburbs. The N2 District is the manifestation of place-making, economic development, and sustainable growth—making it a fitting backdrop for the 140 Kendrick Street retrofit. The project reflects both the forward-looking vision of the N2 District and the ambitious sustainability goals of BXP and Wellington Management that define the journey to net zero.

\* Net zero for this project is aligned with the LEED Zero Carbon standard. LEED Zero Carbon recognizes net zero carbon emissions from energy consumption and transportation through carbon emissions avoided or offset over a period of 12 months.

# Sustainability Goals

The retrofit of Building A was guided by the ambitious environmental commitment of BXP and Wellington Management to create a state-of-the-art, efficient, net zero building targeting a 40 percent reduction in site energy use intensity.

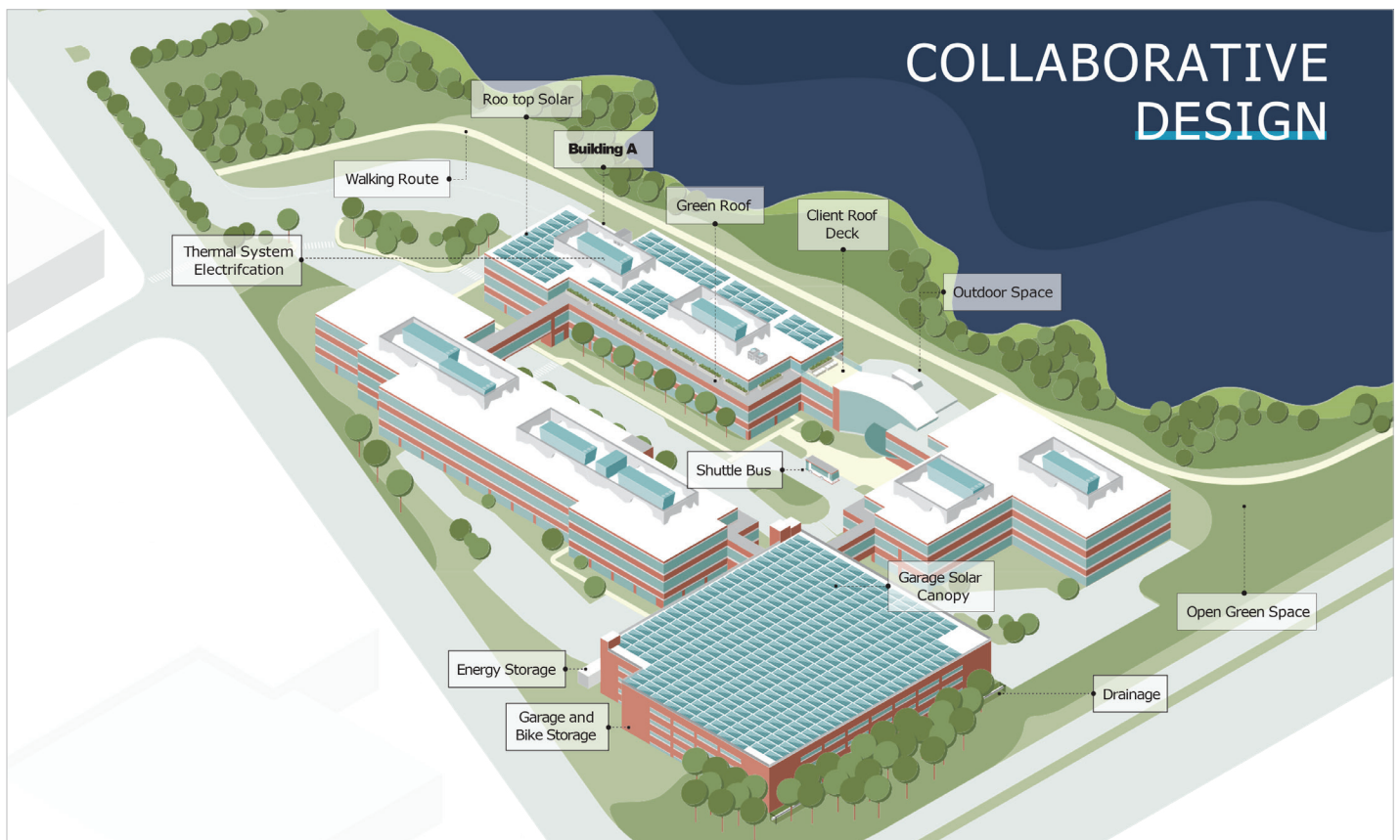
The collaboration was a continuation of a longstanding partnership. Wellington Management and BXP previously collaborated on building Boston's "First Green Skyscraper," Atlantic Wharf, in 2011. The skyscraper is LEED Platinum (BD+C Core and Shell v2 and LEED v4.1 O&M Recertification) and remains the headquarters for Wellington Management in Boston.

The net zero retrofit design was aligned with the project's sustainability goals and was successfully executed by targeting operational and embodied carbon reductions through strategies including electrification, building envelope improvements, advanced energy recovery system, mechanical system modernization, and the addition of on-site renewable energy generation. BXP assembled an expert team to work on the retrofit, supported by Wellington Management's commitment to incorporating sustainability considerations into operational decisions.

## Building Design

The design process of Building A was a collaborative effort between BXP and Wellington Management, with both teams engaged from the outset. The retrofit follows the original design philosophy of the building—"Long Life, Loose Fit"—that suggests a building is not

"complete" the day construction ends; rather, that day is when its life starts. Buildings designed under this philosophy use adaptable and flexible "loose fit" design strategies, allowing new elements to be added later in the building's life. For Building A, this approach ensured



The collaborative design philosophy of 140 Kendrick Street, Building A. (Courtesy of BXP)

that the building design met various programming needs and allowed for future sustainability improvements, including the 2021 retrofit.

In initial discussions with the Wellington Management team, BXP concluded that adopting a comprehensive retrofit strategy—encompassing the mechanical system, building envelope, lighting, and controls—was essential for establishing the project’s sustainability objectives. BXP presented Wellington Management with three resulting retrofit scenarios with differing levels of sustainability ambition. Given Wellington’s commitment to sustainability, the most ambitious option—the net zero retrofit—was chosen, in line with LEED v4 Gold and LEED Zero Carbon certification targets.

The net zero retrofit option included full electrification of the existing gas-fired systems, HVAC modernization to high efficiency variable refrigerant flow (VRF) heat

pumps, advanced energy recovery, and building envelope improvements. A crucial piece in the net zero retrofit strategy was maximizing on-site renewable energy generation to offset energy consumed at Building A on an annual basis. To increase renewable energy generation, the project used Building A’s roof space and the parking garage to install more than 1.4 megawatts of on-site solar photovoltaic and storage.

Additionally, occupant well-being was prioritized through biophilic design, incorporating features such as a green roof with over 15 drought-resistant plant species, access to 600 acres of nature reserve and public recreation area in Cutler Park, and plenty of natural lighting. This emphasis on green spaces directly connects the site with water, air, and soil while also creating a habitat for local flora and fauna.



140 Kendrick Campus. (Courtesy of BXP)

# Achieving Net Zero

140 Kendrick Street, Building A is the first net zero office building repositioning of this scale in Massachusetts. In 2024, Building A achieved LEED V4 BD&C: CS Gold certification and was the first office building to enroll in the MassSave Path 1 Net Zero and Low EUI Building's program. The building successfully achieved net zero emissions. Under typical conditions, Building A generates more renewable energy on-site than it consumes.

The on-site solar was sized to generate more energy than the building's annual consumption and includes 142 kilowatts of rooftop solar, 1.24 megawatts of garage canopy solar, and a 680 kilowatt hour (kWh) battery energy storage. This system is expected to consistently generate more energy than the building consumes annually, producing over 1.4 million kWh of clean energy each year, a 28,950,000 kWh of lifetime generation, offsetting 20,500 metric tons of carbon emissions. As a result of this on-site generation, less energy is lost in transmission through the grid, energy costs are reduced, and the building is energy positive.

The building envelope enhancements contributed to energy efficiency. The building's exterior envelope (roof and walls) was upgraded to enhance thermal insulation and airtightness. Spray foam insulation was applied to both the roof and walls, improving thermal performance while also providing acoustic benefits. The insulation and air-sealing measures helped minimize heat loss and air infiltration.

The retrofit incorporated whole-building electrification by electrifying the heating, ventilation, and cooling with a VRF heat pump system. The building had gas-fired rooftop units, which had reached the end of their useful life, so it made sense to replace them with a modernized HVAC system with advanced Superblock heat recovery, estimated to recover 90 percent of the building's heat. The new HVAC system relies on a high-efficiency (VRF heat pump) system, controlled by a new building

management system. The VRF heat pump system made the most sense because of its commercial-grade efficiency and ability to heat in very cold temperatures, which are common during a Massachusetts winter. VRF systems carry a higher upfront cost but provide long-term savings by reducing the HVAC system's energy consumption.

Additional features were incorporated in the tenant fit-out to enhance efficiency, including upgraded variable air volume boxes in the core, fan-powered terminals at the perimeter, efficient lighting and plug loads controls, Energy Star-rated workstation equipment, and a real-time energy monitoring system. Together, these upgrades complemented the broader retrofit efforts—such as the overhaul of existing heating and cooling systems, improvements to the building envelope, on-site solar, and eliminating on-site fossil fuel combustion—to effectively reduce the project's carbon footprint.

“A good question to ask your design team during retrofit planning is, what strategies should we prioritize to achieve a low EUI building? Can we quantify the impact of each strategy through an iterative energy and carbon analysis to maximize returns on the investment?”

— [Neetu Siddarth](#), sustainability director for energy and utilities at BXP

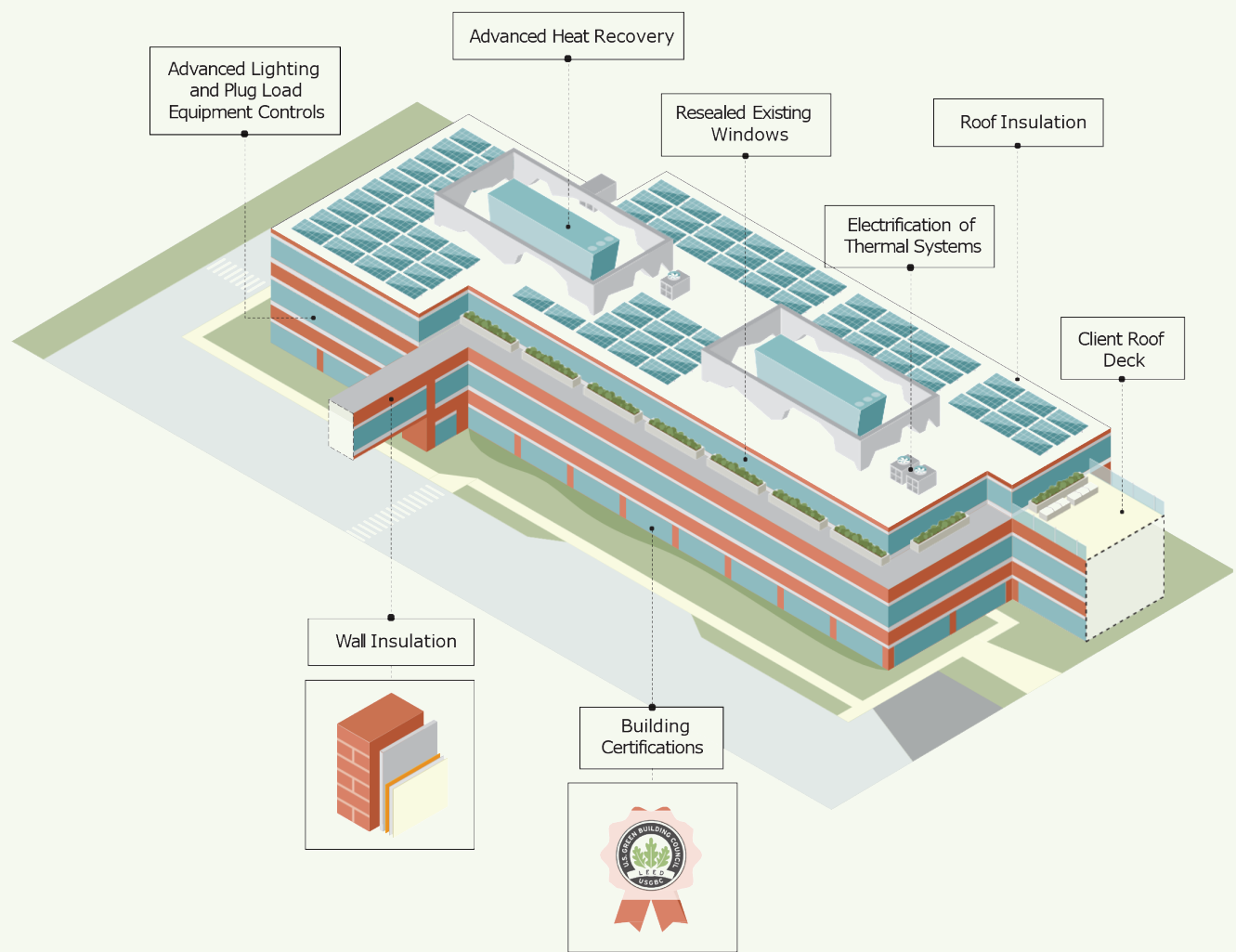
The following are the results of the retrofit:

- 40 percent reduction in energy use intensity (EUI)
- 90 percent of building heat recovered
- 38 percent reduction in indoor water use
- 23.4 kgCO<sub>2</sub>e/sq ft of embodied carbon savings
- 1.4 MW of on-site solar and storage
- 1.4 million kWh annual production of renewable energy

To further support the building's sustainability goals, the project considered water-use reduction. New low-flow water closets, urinals, and faucets were

installed, resulting in a 38 percent reduction in indoor water use. In addition, a stormwater infiltration system was designed and implemented as part of the garage's solar canopy project to capture and infiltrate runoff from the solar panels into the

ground for groundwater recharge. This system ensures that the garage solar installation has no adverse impact on the existing sewage infrastructure and contributes to regional efforts to prevent combined sewer overflows.



Energy efficiency in action at 140 Kendrick Street, Building A. (Courtesy of BXP)

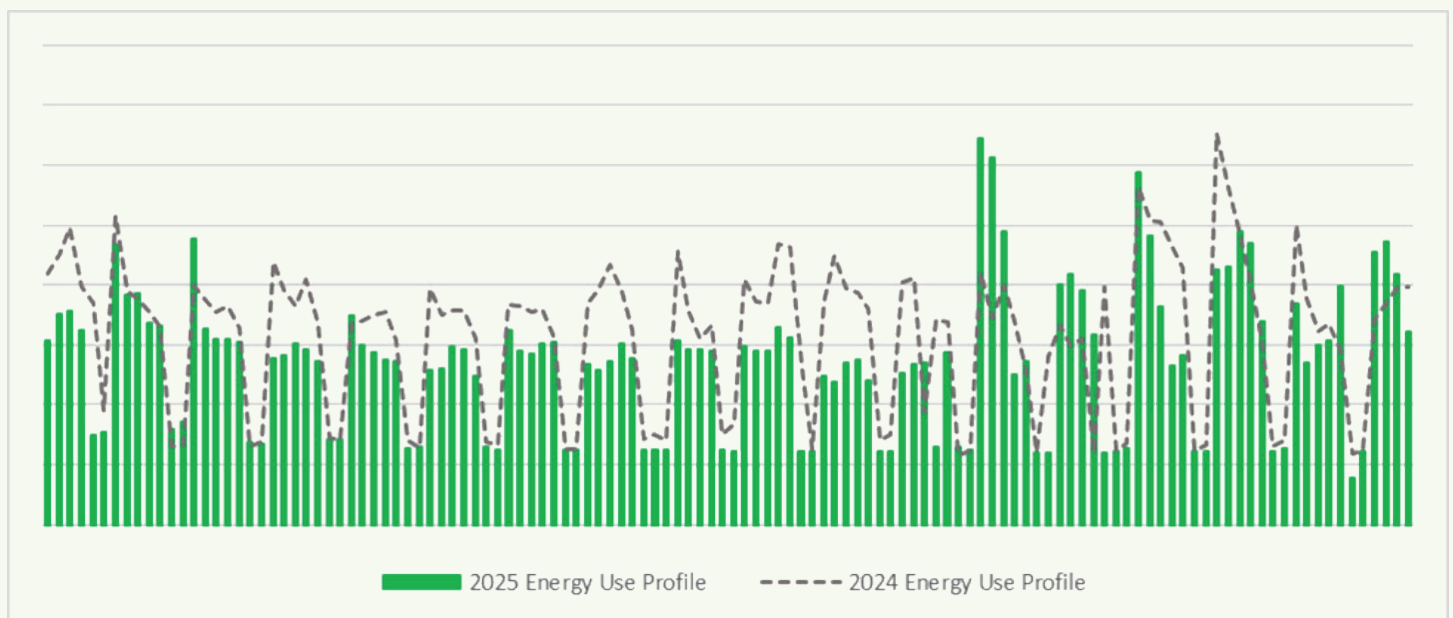
# Challenges

During the construction process, the existing building envelope presented challenges due to unforeseen conditions such as windows with missing seals and gaskets, system interface continuity issues, and no existing dedicated air barrier at opaque walls. Coordinating the spray foam application around the existing structural steel components required additional efforts to achieve the desired level of thermal performance. There were also a few schedule challenges in the project, such as long lead times for rooftop units, structural steel for garage solar canopy, and several weeks between crane placement and construction startup.

Roof work brought its own set of difficulties, including drainage slope analysis with increased levels of insulation, addition of roof anchor requirements for a ballasted rooftop solar system, and limitations on the rooftop solar size due to structural considerations. To mitigate the issues identified during the project, the design team conducted reviews and detailed studies early in the process.

On the financial side, a stormwater infiltration system had to be integrated as part of the garage solar canopy system due to permitting requirements, which incurred additional costs. Despite these extra costs and additional efforts to accommodate system upgrades, the project remained steadfast in its commitment to the retrofit by emphasizing early planning, quality control, and interdisciplinary coordination to achieve net zero.

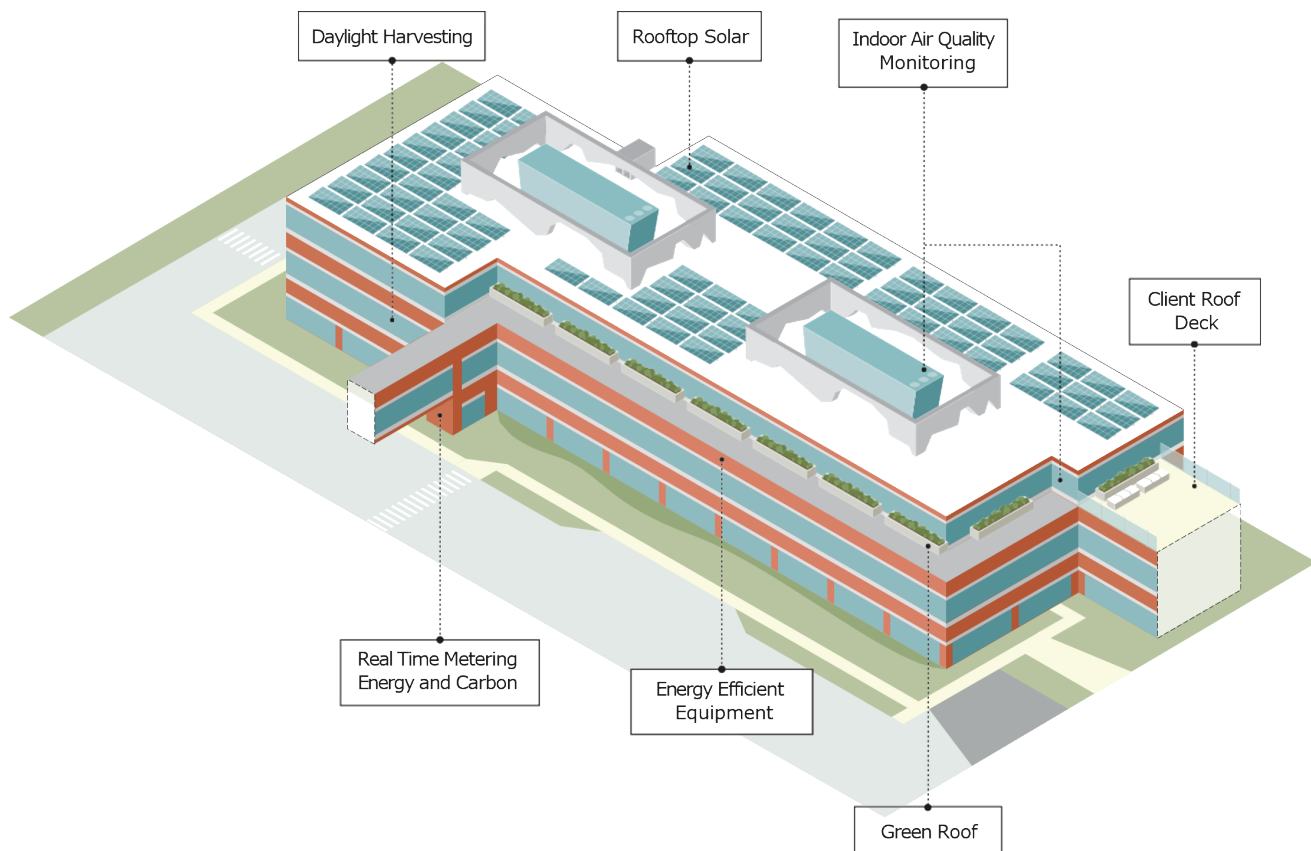
After the building became operational, dedicated, monitoring-based commissioning and measurement and verification (M&V) efforts ensured that the building operates as designed. A real-time energy and carbon monitoring net zero dashboard was developed to support tracking the project's performance in real time. The critical role of the facilities operations team in managing and measuring net zero operations was vital to the success of the project. Their ability to tweak building system programming and observe the impact in real time through the net zero dashboard were vital to the project's success. The M&V effort resulted in a 30 percent energy use reduction post implementation.



# Reducing Embodied Carbon

Building life cycle impact reduction was central to the retrofit approach. In addition to reducing operational carbon, Building A avoided embodied carbon emissions associated with the new ground-up construction—from source material production and construction to end of life. To address end-of-life emissions, Building A minimized waste sent to landfill. For instance, after evaluating energy performance and embodied carbon, the existing windows were resealed rather than replaced. This approach retained high-performing components, enhanced energy efficiency, and improved thermal comfort—while avoiding the use of new materials and reinforcing circular economy principles.

Lower-carbon materials were specified. For example, for the roof deck, Forest Stewardship Council–certified sustainably harvested wood pavers were chosen as an alternative to concrete pedestal pavers. Similarly, the environmental impact of spray foam insulation was also considered, and a third-party certified product with ultra-low global warming potential was specified. In total, repositioning the existing building structure resulted in an estimated savings of 23.4 kilograms of carbon emissions ( $\text{kgCO}_2\text{e}$ ) per square foot of embodied carbon, supporting BXP’s overarching goal to reduce embodied carbon in new development projects by 14 percent by 2024, relative to a 2018 baseline. Along with reusing structural and envelope elements, the project team also achieved a 50 percent construction waste diversion rate.



Occupant well-being and green power building attributes. (Courtesy of BXP)

# Client Engagement and Well-being

With 27 percent of building operational emissions being attributed to occupiers, addressing emissions from tenants (who BXP refers to as clients) is an important wedge in stabilizing climate change over the coming years. Aligning a shared value of sustainability, BXP and Wellington Management collaborated closely throughout the entire life cycle of the net zero retrofit of Building A. Key to this strategy was a focus on occupant well-being. By incorporating elements such as biophilic design and smart building technology, the collaboration created health incentives for Wellington Management and its employees.

An essential component was the installation of an indoor air quality monitoring system. The system was installed in Building A to monitor outside air, supply air, and return air streams. It checks for temperature, humidity, CO<sub>2</sub> levels, and total volatile organic compounds, and alerts property management if ideal thresholds are not met, enabling timely intervention to restore optimal indoor conditions.

Beyond indoor air quality, the retrofit also prioritized exposure to nature and green spaces as part of a broader occupant well-being strategy. Nature has

many benefits to occupant mental and physical health, especially in the office environment. Such amenities can also increase employee satisfaction and productivity. To support this principle, The Exchange is available to all occupants and includes collaboration space, outdoor areas, a roof deck, two Sheffield bike stands for storage, outdoor seating, and access to nature and views. The site is also located next to Cutler Park, a 600-acre nature preserve and public recreation area with a 1.5-mile trail looping Kendrick Pond. Access to walking trails was added to facilitate both outdoor activity and a sense of community among clients, as well as provide a nature-positive environment that helps reduce the site's net carbon emissions.

The project added sustainable transit options to further reduce the building's environmental impact and support occupant convenience. On weekdays, a shuttle service operates hourly between the corner of Lincoln and Walnut Streets (Newton Highlands) and 140 Kendrick Street, giving clients access to shared transport. BXP and Wellington also plan to survey transportation and bike lane connectivity and offset commuting emissions in the future.



Outdoor seating area at Building A. (Courtesy of BXP)

# Financial Overview

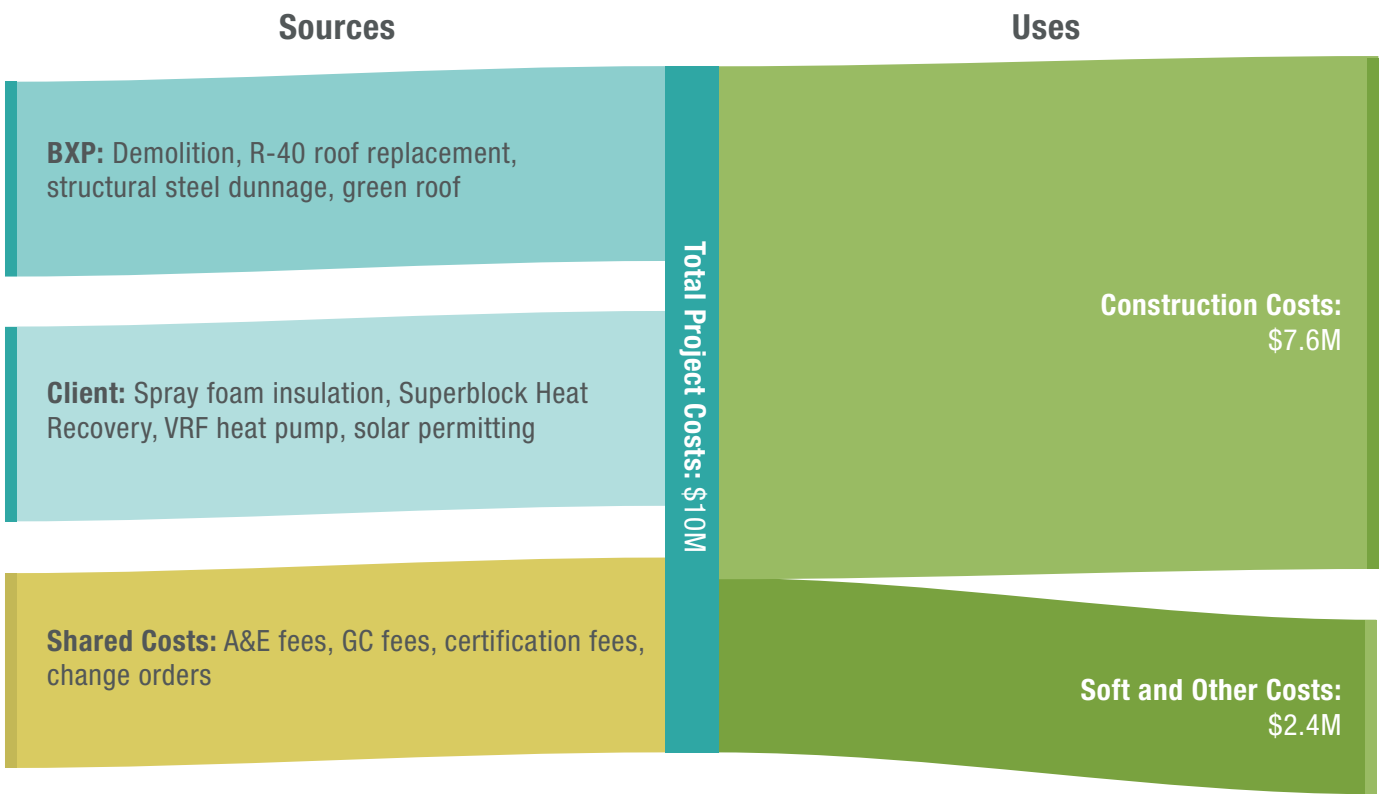
To realize the ambitious net zero energy goals for 140 Kendrick Street, Building A, the project team implemented a series of innovative financial strategies. These strategies included a net zero [green leasing framework](#), a split-organization funding model, and an on-site solar power purchase agreement (PPA). Each approach was carefully structured to balance investment responsibilities, maximize incentives, and ensure long-term performance outcomes.

Given the project’s ambitious net zero energy target, a green leasing strategy was employed to align owner and client goals. The lease included specific clauses requiring retrofits to enable the building to qualify for LEED Zero Carbon certification, underscoring the critical role of stakeholder partnership in achieving performance-driven outcomes. As part of this lease, BXP and Wellington mutually defined the base building. The total project budget was approximately \$10 million, with \$7.6 million in construction costs.

BXP funded core base building improvements—including necessary demolition, replacement of the R-40 roof and remote terminal units, structural steel dunnage, and the installation of a green roof. The client cost share included investment in items such as spray foam insulation, Superblock technology and VRF system premium, electrical infrastructure upgrades, and solar permitting, to be paid back over a 20-year period at an amortized rate. Shared costs included architecture and engineering fees, general contractor soft costs, LEED certification fees, and change orders incurred during the build-out.

On-site solar was delivered through a PPA between the solar developer and BXP. This structure enabled the project to meet the requirement of offsetting 100 percent of annual electricity consumption through competitively priced on-site renewable energy, without upfront capital investment. Participation in the MassSave program further bolstered the project’s financial viability, with the building becoming the first commercial office project to take part in the Net Zero and Low EUI Buildings incentive pathway.

140 Kendrick, Building A  
Sources & Uses



# Awards and Certifications

The net zero achievements of 140 Kendrick Street, Building A reaped many industry certifications and awards. In addition to being the first commercial office to participate in the Mass Save net zero incentives program, the building also achieved [LEED V4 BD&C:CS Gold certification](#), the inaugural [2024 Nareit Sustainability Impact Award](#), and the [Built Environment Plus Green Building Showcase's Award and People's Choice Award in 2023](#). The building is currently pursuing LEED Commercial Interiors and LEED Zero Carbon certifications.



Solar panels on Building A. (Courtesy of BXP)

# Lessons Learned

The 140 Kendrick Street, Building A retrofit demonstrates that early collaboration, clear sustainability targets, and flexible design frameworks are essential to achieving net zero goals in commercial retrofits. A key lesson reiterated the importance of engaging stakeholders, especially the clients and engineering team, early in the process to align net zero priorities, construction plans, and ensure long-term success and a smooth measurement and verification process. Together, BXP and Wellington Management pursued a holistic design approach that balanced sustainability outcomes with human-centered design—ensuring the building would be both environmentally responsible and optimized for comfort. Financially, clear cost-sharing agreements and green lease structures helped balance upfront investments with long-term benefits. The design also faced challenges implementing high-performing envelope strategies (insulation at walls, airtightness, etc.) while reusing existing enclosure, fenestration, and structural components. The team identified unique conditions during the demo and exploration process and was able to target actionable solutions. Moreover, the team built a net zero dashboard for the building that enhanced submetering scope and visibility into energy and carbon granular data through a real-time energy monitoring system. Ultimately, the retrofit highlighted that successful net zero outcomes are rooted in interdisciplinary collaboration and a willingness to innovate at every step.

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