



November 24, 2020

Swaathi Joseph, Zoning Associate Planner
Cambridge Community Development Department
344 Broadway, Cambridge, MA. 02139

Re: MIT West Campus Graduate Student Dormitory, Article 22 Green Building Report

Dear Ms. Joseph,

For compliance with Article 22.000, Green Building Requirements, The MIT West Campus Graduate Student Dormitory will pursue LEED Gold Certification under the LEED v4 BD+C Multifamily Midrise Program. The USGBC rolled-out LEED v4 in 2016 as a more comprehensive, rigorous standard. Projects scoring under LEED v4 are typically a full tier lower than those that were certified under the previous version, LEED for Homes 2008.

To obtain certification and operate sustainably, the project is implementing the following building systems and strategies: Only ENERGY STAR® certified appliances and all electric cooking; LED lighting with occupancy and sensor controls; the potential for heat pump water heating to supply all domestic hot water, low U-value and SHGC windows, and a high performing envelope that includes tight air-sealing with no thermal bridging, which reduces loads and allows the HVAC systems to be sized correctly. Equipment that is right-sized lasts longer, provides proper dehumidification, and maintains thermal comfort. The current HVAC design is through water source heat pumps; however, the team is evaluating a fossil fuel free system through variable refrigerant flow systems. In compliance with the 2019 Massachusetts Energy and Stretch codes, the building is proposed to perform 15% better than ASHRAE 90.1-2013 based on annual site energy usage. Additionally, the proposed building is projected to perform 30.8% better than ASHRAE 90.1 -2010 for LEED v4 compliance based on annual energy cost.

All of these strategies are detailed in the Green Building Report which includes the Sustainability Narrative, LEEDv4 Multifamily Workbook, Energy Modeling Summary, Resiliency Report, Net-Zero Narrative, and Affidavit of Compliance.

Please let me know if you have any questions or if I can be of further assistance.

Sincerely,

A handwritten signature in black ink that reads 'Karla Butterfield'.

Karla Butterfield, LEED AP, Homes
Sustainability Director
kbutterfield@swinter.com

CC: Tim Peters, KieranTimberlake
Robert Leber, Cosentini Associates

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Rating System Narrative

1.1 Introduction

In compliance with Article 22, the following chapter outlines the LEED certification goals for the Project and describes the strategies employed to meet the targeted LEED requirements and credits based on this stage of design development. The current LEED Scorecard is presented as Figure 4.1.

Attachment 3 includes an affidavit by the project LEED Accredited Professional.

While the proposed buildings comprise a graduate student dormitory building, the Project will register under the LEED v4 BD+C Multifamily Midrise program. It is tracking Gold level certification (74.5 preliminary + 12 possible points). The following is a summary of points per category:

Integrative Process (IP)	2 points	
Location and Transportation (LT)	15 points	
Sustainable Sites (SS)	5.5 points	1.5 possible points
Water Efficiency (WE)	6 points	2 possible points
Energy and Atmosphere (EA)	23 points	2 possible points
Materials and Resources (MR)	4.5 points	1.5 possible points
Indoor Environmental Quality (IEQ)	11.5 points	3 possible points
Innovation (IN)	4 points	1 possible point
Regional Priority (RP)	3 points	1 possible point
Total Points	74.5	12

1.2 Conformance with Article 22.23



1.2.1 Integrative Process

The Project is targeting 2 points total in the Integrative Process (IP) category and 1 point for exemplary performance.

IP Credit Integrative Process

Option 1. Integrative Project Team (1 point)

This credit will be earned with the experienced project team's capabilities and involvement throughout the design and construction process as well as at regularly held project team meetings. In addition to the Owner, the project team includes the Architect, Mechanical Engineer, Civil Engineer, Landscape Architect, Energy Modeler, Sustainability Consultant, Structural Engineer, Acoustical Consultant and Lighting Designer will work together from design through construction with the goal of achieving a durable, energy efficient, sustainable and healthy project.

Option 2. Design Charrette (1 point)

Building upon the Integrative Project Team Credit above, initial charrettes were held on August 25 and September 4th, 2020 including American Campus Communities (ACC), the architectural firm of Kieran Timberlake, Cosentini Engineering, as well as the landscape architects, civil & structural engineers, and sustainability consultants.

Option 3. Trades Training (1 point)

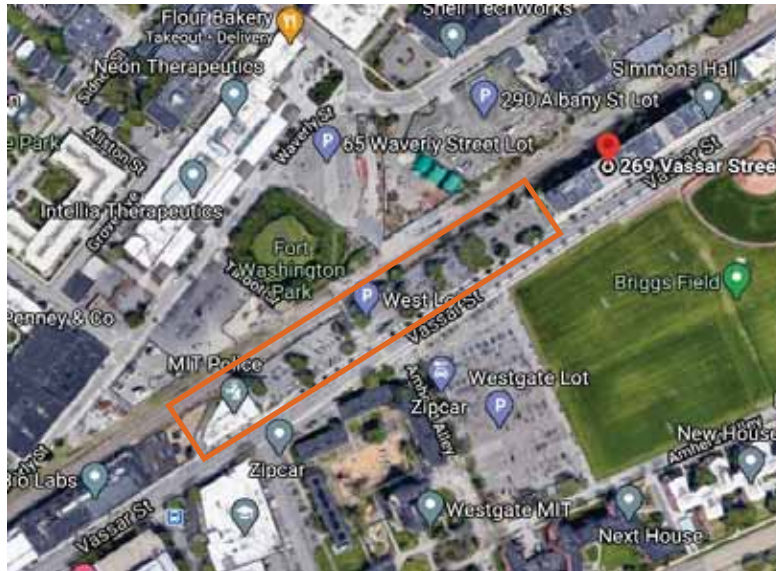
In addition to the Design Charrette during the design phase, eight hours of training on the green aspects of the project will be conducted in the beginning of construction for the trades. The training will focus on how the trades can contribute to achieving each LEED for Homes prerequisite and attempted credit.

1.2.2 Location and Transportation

The Project is currently targeting 15 points in the Location and Transportation (LT) category and 1 point for exemplary performance.

LT Prerequisite Floodplain Avoidance (Required)

The MIT West Campus Graduate Student Dormitory is located on a previously developed urban site in Cambridge, MA outside of the flood hazard area and therefore complies with this credit. FEMA Flood Map Panel 25017C0576E lists this address in minimal flood area.



LT Credit Site Selection

Option 1. Sensitive Land Protection Path 1. Previously Developed (4 points)

The Project Site is located on a parcel currently occupied by the MIT Police Building and West Lot which will be disassembled. As a 100% previously developed urban site in Cambridge, MA the project complies with this credit.



Option 2. Infill Development (2 points)

The project is sited in an urban location and is considered an infill site with development on all sides of its boundaries, complying with the requirements for this credit.

Option 3. Open Space (1 point)

The project is located within .3 miles from Fort Washington (.70 acres) and .3 miles of Tudor Street Dog Park (.5 acres) and therefore complies with this credit.

Option 4. Street Network (1 point)

The project is located within 1 square mile of 300 intersections and therefore complies with this credit.



Option 5. Bicycle Network and Storage (1 point)

The project will have bicycle storage within 200 yards of a bicycle network connecting Vassar Street, Massachusetts Avenue and the Dr. Paul Dudley White Bike Path. This network connects to more than forty LEED qualifying community resources including a school, employment center, and bus and the red line transit stops. For this credit, long term bicycle storage is required for 30% of the occupants and short-term bicycle storage is required for 2.5% of occupants (690 beds with up to 876 residents), a minimum of 263 long-term building and 22 short term spaces are required to meet this credit.

However, the project will provide 340 interior, long-term spaces and 35 short-term spaces.



LT Credit Compact Development (3 points plus 1 point regional priority)

The project includes 350 units (153 studios, 46 one-bedroom, 62 two-bedrooms, 89 four-bedroom) on 1.77 buildable acres. It exceeds the LEED midrise credit for 80 dwelling units per acre (providing 177.6 DU/acre) and therefore is considered very high density.

SS Prerequisite No Invasive Plants (Required)

The project team is specifying plantings for the project that are identified by the local extension services as either native or non-invasive. While the LHMR program requires avoidance of invasive plantings and awards projects installing drought tolerant species, the project team has set a more rigorous goal.

SS Credit Heat Island Reduction

Option 2. Nonabsorptive materials (1 points)

The project has been designed for reduced heat island effects on the site by installing Energy Star qualified high solar reflective roofing. Hardscapes will be evaluated for shading where possible such that approximately 75% of the project is targeted to be either shaded or non-absorptive material to achieve this credit.

SS Credit Rainwater Management (1 point and 1 possible points)

Case 2. NPDES Projects

The project is anticipating a design that will manage a 95th percentile rainfall event for the site, or 1.60 inches and assessing viability to manage 98th percentile rainfall event. Roof and hardscape storm water run-off will be managed through multiple subsurface infiltration systems designed to collect the 95th percentile storm event. As part of the overall stormwater management plan, the use of roof space is being evaluated for a 6" deep Green Roof System. For a minimal portion of the site, bioretention rain gardens will provide infiltration to the maximum extent practical. These strategies shall be detailed in the Stormwater Pollution Protection Plan provided by Nitsch Engineering.

SS Credit Nontoxic Pest Control (2.5 points and .5 possible points)

The project will integrate design strategies to mitigate pest control such as excluding wood siding and structure and sealing external cracks and joints with caulking and installing pest-proof screens. Discharge points for gutters, equipment condensate lines and other moisture sources will terminate at least 24" from the foundation system. The building operator and developer, ACC, implements a thorough Integrated Pest Management Plan (IPM) on all projects which includes an educational and awareness component for residents and building managers.

Other credit options within Nontoxic Pest Control, like the steel mesh termite control, physical termite barrier, and cellulosic structural material treating, are not being pursued because the building will be constructed of steel and concrete.



1.2.2 Water Efficiency

The Project is currently targeting 6 points plus 2 possible points total in the Water Efficiency (WE) category.

WE Prerequisite Water Metering Case 2. Multifamily (Required)

The project will install a water meter for the entire building, meeting the requirement of this prerequisite.

Performance Path

WE-T Total Water Use (6 points & 2 possible points)

The project team will complete the WaterSense Water Budget Tool to demonstrate the reduction of indoor and outdoor water use by 30% - 40% as compared to standard practices. Low flow fixtures shall include shower heads with less than 1.5 gallons per minute (gpm), lavatory faucets at or below 1.0 gpm and toilets with 1.28 gpf. The project will include minimal turf (no more than 20% of the total landscaped area) and

vegetation shall include drought-tolerant and natively adapted plantings. Irrigation will be installed with high efficiency features such as: rain sensors, zone controls, high-efficiency nozzles, pressure regulating devices, and drip irrigation in beds.

Maximizing the water use reduction credits is possible for this project but currently half of the points are assumed and 2 more marked as possible points while the landscape design is being finalized.



1.2.3 Energy and Atmosphere

The Project is currently targeting 23 points plus 2 possible points under the LEED v4 Multifamily Midrise, Energy and Atmosphere (EA) category. The Rating System offers two pathways for compliance with the prerequisite and credits: through demonstrated performance (ASHRAE 90.1 modeling) or compliance through prescriptive measures. This project will comply with EA prerequisites and credits by demonstrating performance with a whole building, ASHRAE 90.1 energy model.

EA Prerequisite Minimum Energy Performance (Required)

The project is exceeding requirements of ASHRAE 90.1-2010 Sections 5.4, 6.4, 7.4, 8.4, 9.4 & 10.4.

EA Commissioning

Option 1. Commissioning with Energy Star Protocols (Required)

This project will comply with the Energy Star Multifamily New Construction Program testing and verification protocols.

EA Prerequisite Energy Metering Case 2. Multifamily (Required)

The project will install a whole-building gas meter and electric meter complying with this requirement.

EA Prerequisite Education of Homeowner, Tenant, or Building Manager (Required)

The key to a successful project is during operations, and the building manager is the center of operations. ACC is very active with the ownership, maintenance and longevity of their properties. The project team will assemble an operations and training manual for the building manager and will coordinate an orientation with appropriate system vendors. In collaboration with the project design team, ACC will also develop a tenant operations and training manual to be provided to residents during orientation.

EA Credit Annual Energy Use (20 points)

A primary project goal is to design and build an exemplary structure with extremely low energy consumption and low life cycle costs. The building is designed to meet multiple energy codes and standards, including those set by the City of Cambridge and ASHRAE Standard 90.1. Energy efficiency strategies will include:

- 1.2.3.1 High performance envelope
- 1.2.3.2 Reduced Lighting Power Density in common areas, corridors, and dorms
- 1.2.3.3 Advanced Lighting Controls
- 1.2.3.4 Energy Recovery Ventilation
- 1.2.3.5 Reduced fan power, high performance heating & cooling & distribution
- 1.2.3.6 Low-flow plumbing fixtures
- 1.2.3.7 Energy Star certified appliances where applicable
- 1.2.3.8 Attention to compartmentalization air sealing

All mechanical, electrical, and plumbing (MEP) equipment shall be of the highest quality to minimize maintenance while providing long useful life and high operating efficiencies. Dorm units will meet ASHRAE 6.2 local and whole-unit exhaust levels with central Energy Recovery Ventilators. The HVAC systems will be “right-sized” to match the heating and cooling loads, with no oversizing, and distribution systems are compact without compromising occupant comfort. The HVAC system will be required to meet occupant thermal comfort as outlined by ASHRAE 55 Thermal Environmental Conditions for Human Occupancy. To ensure efficient operations and comfort, comprehensive commissioning of the HVAC systems, domestic water heaters, lighting control and electrical systems will be conducted. Passive strategies, such as solar shading, daylighting, and optimized massing and orientation will reduce the impact of cooling and heating loads. Thermal insulation levels will ultimately be selected based on energy model outputs and whole-building performance metrics. Thermal bridging will be minimized resulting in optimized overall building enclosure energy efficiency. The effects of building structure, cladding systems, and attachment methods will be carefully examined to ensure thermal bridging is minimized.

Multiple water heater equipment systems are being evaluated to meet the building resident’s hot water needs. Regardless of the hot water source, the appliances will be centrally located, and residences designed to minimize pipe lengths.

LEED v4 MFMR calculates energy cost savings as compared to ASHRAE 90.1 -2010; the project is holding a conservative 20% savings based upon ASHRAE 2010 in the current Lv4 workbook. However, the minimum building energy standard that serves as the baseline for this project will be ASHRAE 90.1 Energy Standard for Buildings, Except Low-Rise Residential Buildings, 2013 Edition. Project team goals and decisions are based upon this more rigorous energy modeling assessment. The project will also follow the International Energy Code 2018 with amendments based on Massachusetts Stretch Energy Code. The City of Cambridge has adopted the MA Energy Stretch Code (Appendix AA to 780 CMR: State Board of Building Regulations and Standards). The MA Energy Stretch Code requires new buildings over 100,000 SF to demonstrate an energy reduction of a minimum 15% in comparison to ASHRAE 90.1 2013. The project intends to exceed this minimum target by constructing a high performing, air- tight envelope with high efficacy lighting, appliances and equipment. The projected energy reduction for the MIT West Campus Graduate Student Dormitory is 30.8%. LEED v4 MFMR also credits projects with high occupancy per square foot.

EA-HW Efficient Hot Water Distribution System (2 points) Option 1. HW Efficient Hot Water Distribution

Path 1. Maximum Allowable Pipe Length (2 possible points)

Hot water pipe insulation is specified 1” to 1 ½” for all pipe-lines. The team is evaluating the feasibility of insulating all domestic hot water lines with a minimum R-4 pipe insulation including at elbows and tees.

Other credits within Energy and Atmosphere, Efficient Hot Water Distribution System, is not being pursued because the DHW system design will be calculated by limiting pipe lengths rather than volume.

Option 3. Pipe Insulation (2 points)

Hot water pipe insulation is specified 1” to 1 ½” for all pipe-lines. The team is evaluating the feasibility of insulating all domestic hot water lines with a minimum R-4 pipe insulation including at elbows and tees. This specification shall be detailed in Plumbing Systems.

EA Credit Advanced Utility Tracking Option 1. Electric and Water (1 point)

A permanent submeter will be installed to monitor the irrigation systems which will be identified in the Building Controls Specifications.

The third-party Utility Reporting credit is not being pursued for electric use given the frequent turnover in this dorm

style residence. It is anticipated that the domestic hot water system will be a compact design, however, equipment is still being evaluated which limits the team's ability to achieve all credits at this time.



1.2.4 Materials and Resources

The Project is targeting 4.5 points plus 1.5 possible points in the Materials and Resources (MR) category.

MR Prerequisite Certified Tropical Wood (Required)

The project specifications will outline a preference for non-tropical, reused or reclaimed, or Forest Stewardship Council (FSC) or USGBC-approved equivalent products and will require submittals for all wood products to indicate the country of origin of the wood. If a tropical wood is specified, appropriate documentation and chain of custody will be provided to the LEED Green Rater.

MR Prerequisite Durability Management (Required)

The project team will demonstrate all minimum durability planning strategies mandated by regulatory agencies and LEED will be designed and implemented effectively. Building durability goals will be met through enhanced building enclosure, component systems, and material selection. Resource efficiency will be met by specifying and installing materials of recycled content and local sourcing when available. Greenhouse Gas (GHG) impact and Life Cycle Cost Analysis (LCCA) are the basis for specifying systems. During the design decision-making process, the team is converting energy modeling predictions into GHG equivalencies, allowing for an educated evaluation of specific Energy Efficiency Measures (EEMs) and materials.

MR Credit Durability Management Verification (1 point)

The owner has retained a LEED Green Rater to assist the contractor in ensuring the delivery of a durable building and verify that the ENERGY STAR for Homes version 3 water management system builder checklist items are executed.

MR Credit Environmentally Preferable Products (1.5 point & 1 point possible)

The project specifications will require more than 50% of foundation aggregate will be extracted, harvested and manufactured within a 100-mile radius of the project site.

High recycled content, minimum 25% postconsumer and/or 50% postindustrial waste recycled content, will also be pursued for materials, including insulation, counters and flooring. The project team is utilizing resources such as The Cradle to Cradle Products Program and The Health Product Declaration Collaborative to assess materials and finishes.

Option 2. Environmentally Preferable Products (1 point)

The project is targeting 90% of insulation be EPP with the exception of HVAC and pipe insulation.

Other credits within Materials and Resources (Environmentally Preferable Products) are not being pursued because local material availability and construction cost estimations have determined which product materials are attainable.

MR Credit Construction Waste Management (1 point & 0.5 possible)

The project will contract a waste management company responsible for diverting construction material from landfill and documenting the amount of material recycled. Points are conservatively

estimated and will be based on percentages calculated from provided documentation. *While the project team is targeting at least 75% diversion rate, Lv4 only allows half the points to be claimed when calculating by a percentage of construction debris removed from the site vs. a performance calculation based on a baseline. A baseline calculation is not feasible for this building demographic.*



1.2.5 Indoor Environmental Quality

The Project is currently targeting 11.5 points plus 3 possible points in the Indoor Environmental Quality (IEQ) category.

EQ Prerequisite Ventilation (Required) Local Exhaust

Each unit must be provided with adequate exhaust for local points of contaminants, such as bathrooms and kitchens, as required by ASRHAE 62.2- 2010. All local exhaust systems will be ducted directly to the outside via the Energy Recovery Ventilators.

Whole Unit Mechanical Ventilation (Required)

Each unit will be provided with sufficient outdoor air as required by ASHRAE 62.2-2010. The project will provide enough outdoor air as required to each unit with a balanced, energy recovery ventilation system.

Non- Unit Spaces

The project is designed to meet the minimum requirements of ASHRAE Standard 62.1 – 2010 Sections 4 through 7 for all non-unit spaces. Filters will have a MERV 6 or higher rating for these systems and will be part of a scheduled maintenance agenda.

EQ Prerequisite Combustion Venting (Required)

Non-combustion for domestic hot water equipment is being assessed. However, exhaust will be provided for any installed combustion equipment. In addition, carbon monoxide sensors will be provided to each unit and sleeping areas. No fireplaces will be installed in this project, complying with the requirements of this credit.

EQ Prerequisite Garage Pollutant Protection (Required)

The project meets this mandate as no on-site garage is included in the design.

EQ Prerequisite Radon-Resistant Construction (Required)

Cambridge, MA is in a high-risk area for Radon according to the US EPA. The project team will incorporate radon mitigation measures into design and construction which include these five components: 1) a gas-permeable layer; 2) heavy-gauge plastic sheeting; 3) sealing and caulking of all penetrations through the concrete slab; 4) vent pipe that exhausts gases to the outside through side wall or roof; and 5) exhaust fan at the roof top which is located away from all intake air. Specifications and drawings shall be provided.

EQ Prerequisite Air Filtering - Good Filters (Required)

Both a VRF and Water Source Heat Pump system is being assessed. Regardless of the source, dorm units and common spaces will have MERV 8 filters (30% eff) located at the return side of the equipment. Energy recovery units will all have two sets of air filters on the outside air intake: MERV 8 pre-filters (30% eff) and MERV 13 post-filters (85%eff).

EQ Prerequisite Environmental Tobacco Smoke (Required)

As part of MIT's non-smoking campus policy, smoking will be prohibited in all areas of the building.

EQ Prerequisite Compartmentalization (Required)

Each residential unit will be compartmentalized to minimize leakage between units. Uncontrolled pathways for indoor air pollutants between units will be reduced by sealing penetrations in walls, ceilings, and floors and by sealing vertical chases adjacent to the units. Air Sealing details shall be added to plans and specifications.

Acceptable sealing of residential units will be demonstrated by blower door testing. The procedure described by RESNET will be used to demonstrate compliance with an allowable maximum leakage of 0.23 cfm₅₀ per square foot (0.07 cmm₅₀ per square meter) of enclosure (i.e., all surfaces enclosing the units, including exterior and party walls, floors, and ceiling). The owner has retained a RESNET accredited provider and rater to perform these air infiltration tests.

EQ Credit Enhanced Ventilation (2 points and 1 possible)

A balanced whole-unit ventilation system meeting ASHRAE 62.2 shall be tested, adjusted and balanced with 100-110% of ASHRAE design flows. The team is considering exhaust fan boost controls with timer settings to achieve the Enhanced Local Exhaust credit.

EQ Credit Contaminant Control for multifamily projects Option 1. (.5 point)

Permanent walk-off mats shall be installed at all main entrances.

The other credit options within Contaminant Control (Shoe Removal) are not being pursued because shoe removal & storage aren't appropriate for each dorm apartment.

Option 3. Preoccupancy Flush (.5 point)

Prior to occupancy the building will undergo a 48-hour flush out with windows open (in accordance with weather and safety) and fans running continuously.

Filters will be replaced after this process which is intended to expedite off gassing of building materials and finishes for enhanced indoor air quality. This procedure is detailed in Appendix Part C. (0.5 point)

Indoor air quality testing isn't being pursued due to a tight occupancy schedule.

EQ Credit Balancing of Heating & Cooling Distribution (2 points)

Supply air flow shall be tested and balanced to within 80% - 120% of the Manual D calculations. And bedrooms will demonstrate natural pressure differential with the installation of transfer grills.

The other credit options within Balancing of Heating & Cooling Distribution Systems (Multiple Zones) are not being pursued because the graduate student residences are single zoned, as calculated in Manual J & D.

EQ Credit Enhanced Compartmentalization (3 possible points)

In order to prevent high building leakage, a selected number of units shall have a blower door leakage test performed where the results demonstrate less than 0.15 CFM₅₀/sf of leakage.

Enhanced compartmentalization would require each dorm apartment meet roughly half the code threshold for air infiltration. While the project is targeting a whole building air infiltration threshold roughly three times tighter than code, it's acknowledged that compartmentalization air sealing to meet 0.23 cfm₅₀/ SFE is a difficult target and therefore listed as possible points.

EQ Credit Combustion Venting (2 points)

No fireplaces will be installed in this project, complying with the requirements of this credit.

EQ Credit Enhanced Garage Pollutant Protection Option 2. No Garage or Detached Garage (1 point)

The project achieves this credit as no on-site garage is planned for the residents.

EQ Credit Low-Emitting Products (2.5 points)

Interior finish materials such as paintings and coatings, adhesives and sealants, and flooring will be verified for low VOC content that will meet requirements of CA Section 01350.

EQ Credit No Environmental Tobacco Smoke (1 point)

Smoking will be prohibited in all areas of the building. The prohibition is communicated to residents through the building agreement and training session.



1.2.6 Innovation

The Project is currently targeting 4 points plus 1 possible point total in the Innovation (IN) category.

IN Prerequisite Preliminary Rating (Required)

Multifamily construction can be a rushed process without thought of impact of the development to the community, the residents, or the larger environment. LEED for Homes requires project teams to take the essential first step to sustainability planning with a Preliminary Rating during the design phase. The first rating was conducted at a sustainability kick off meeting on August 13, 2020 with subsequent updates to present date.

IN Credit LEED Pilot Credit (1 point)

The project team is assessing several LEED Pilot Credits including, Social Equity within the Community, Design for Accessibility, Assessment and Planning for Resilience or Design for Enhanced Resilience, and Learning Controls for Thermal Comfort.

IN Credit Exemplary Performance (2 points plus 1 possible point)

Due to the project location and aggressive energy saving strategies, exemplary performance credits will be realized for access to transit, community resources and increased energy savings.

IN Credit LEED Accredited professional (1 point)

Karla Butterfield of Steven Winter Associates, Inc. has been a principal participant of the project team during all phases of design and will continue to provide support throughout construction and commissioning. Ms. Butterfield's LEED Accredited Professional (AP) Homes certificate to has been filed to earn the project 1 point.



1.2.7 Regional Priority

The Project is currently targeting 3 points plus 1 possible point total in the Regional Priority (RP) category.

RP Credit (3 points, 1 possible points)

Due to the project location, regional priority credit will be achieved with compact development and access to community resources as well as energy use reduction.



LEED BD+C: Homes and Multifamily v4 Workbook

Step 1.

Ensure this project is registered in LEED Online.

Step 2.

Enable macros

Note: This workbook is for use with Excel for Mac 2011 and Excel 2007 or later.

Step 3.

Unit of measure

Step 4.

Project rating system

Project type

Market Classification

Total homes in submittal

Construction type

Subdivision/Development Name

Project team leader name

Project team leader organization name

Builder (if different than team leader org)

Project team leader Email address

Provider Organization name

Green rater

Green rater

Energy Rater

Provider QAD

Mid-construction visit date(s)

Date final visit completed
ex: 3/31/2016

Step 5.

The following information must be consistent with project details in LEED Online:

Individual Project Information

Project ID #	
Project name	MIT West Campus Graduate Student Dormitory
Project address	269-301 Vassar Street
City	Cambridge
State	MA
Country	USA
Zip Code	02139
Building type	Multifamily midrise
Number of stories	10
Number of bedrooms	679
Conditioned floor area (sq ft)	326091
Gross floor area (sq ft)	326091

Additional Resources

- Resources & Tools section of the Homes Guide to Certification (<http://www.usgbc.org/cert-guide/homes#tools>)
- Credit Library (<http://www.usgbc.org/credits>)

MIT West Campus Graduate Student Dormitory Scorecard

Location: 269-301 Vassar Street, Cambridge, MA 02139, USA

Note: The information on this tab is READ-ONLY. To edit this information, see the Credit Category tabs.



Integrative Process		Preliminary	Y	2 of 2	M	0	Verified	0
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IPc	Integrative Process			2 of 2		0		
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Location and Transportation		Preliminary	Y	15 of 15	M	0	Verified	0
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LTp	Floodplain Avoidance			Required				Not Verified
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Performance Path

LTc	LEED for Neighborhood Development			0 of 15		0		
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Prescriptive Path

LTc	Site Selection			8 of 8		0		
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LTc	Compact Development			3 of 3		0		
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LTc	Community Resources			2 of 2		0		
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LTc	Access to Transit			2 of 2		0		
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Sustainable Sites		Preliminary	Y	5.5 of 7	M	1.5	Verified	0
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SSp	Construction Activity Pollution Prevention			Required				Not Verified
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SSp	No Invasive Plants			Required				Not Verified
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SSc	Heat Island Reduction			2 of 2		0		
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SSc	Rainwater Management			1 of 3		1		
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SSc	Nontoxic Pest Control			2.5 of 2		0.5		
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Water Efficiency		Preliminary	Y	6 of 12	M	2	Verified	6
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WEp	Water Metering			Required				Not Verified
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Performance Path

WEc	Total Water Use			0 of 12		0		
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Prescriptive Path

WEc	Indoor Water Use			4 of 6		1		4
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WEc	Outdoor Water Use			2 of 4		1		2
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Energy and Atmosphere		Preliminary	Y	23 of 37	M	2	Verified	20
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EAp	Minimum Energy Performance			Required				Not Verified
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EAp	Energy Metering			Required				Not Verified
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EAp	Education of the Homeowner, Tenant or Building Manager			Required				Not Verified
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EAc	Annual Energy Use			20 of 30		0		20
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EAc	Efficient Hot Water Distribution System			2 of 5		2		
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EAc	Advanced Utility Tracking			1 of 2		0		
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Materials and Resources		Preliminary	Y	4.5 of 9	M	1.5	Verified	0
MRp	Certified Tropical Wood	Required					Not Verified	
MRp	Durability Management	Required					Not Verified	
MRc	Durability Management Verification			1 of 1		0		
MRc	Environmentally Preferable Products			2.5 of 5		1		
MRc	Construction Waste Management			1 of 3		0.5		



Indoor Environmental Quality		Preliminary	Y	11.5 of 18	M	3	Verified	4
EQp	Ventilation	Required					Verified	
EQp	Combustion Venting	Required					Verified	
EQp	Garage Pollutant Protection	Required					Not Verified	
EQp	Radon-Resistant Construction	Required					Verified	
EQp	Air Filtering	Required					Verified	
EQp	Environmental Tobacco Smoke	Required					Not Verified	
EQp	Compartmentalization	Required					Verified	
EQc	Enhanced Ventilation			2 of 3		0		2
EQc	Contaminant Control			1 of 2		0		1
EQc	Balancing of Heating and Cooling Distribution Systems			2 of 3		0		1
EQc	Enhanced Compartmentalization			0 of 3		3		
EQc	Combustion Venting			2 of 2		0		
EQc	Enhanced Garage Pollutant Protection			1 of 1		0		
EQc	Low-Emitting Products			2.5 of 3		0		
EQc	No Environmental Tobacco Smoke			1 of 1		0		



Innovation		Preliminary	Y	4 of 6	M	1	Verified	0
INp	Preliminary Rating	Required					Not Verified	
INc	Innovation			3 of 5		1		
INc	LEED Accredited Professional			1 of 1		0		



Regional Priority		Preliminary	Y	3 of 4	M	1	Verified	0
RPc	Regional Priority			3 of 4		1		

Point Floors

The project earned at least 8 points total in Location and Transportation and Energy and Atmosphere	<input type="text" value="Yes"/>
The project earned at least 3 points in Water Efficiency	<input type="text" value="Yes"/>
The project earned at least 3 points in Indoor Environmental Quality	<input type="text" value="Yes"/>

Total	Preliminary	Y	74.5 of 110	M	12	Verified	30
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Certification Thresholds Certified: 40-49, Silver: 50-59, Gold: 60-79, Platinum: 80-110

Integrative Process

Preliminary Y 2 Maybe 0 Verified 0

IP Credit Integrative Process

Up to 2 points

Exemplary Performance: Achieve all three options

Preliminary Y M Verified

Option 1. Integrative Project Team (1 point)

Y M V

True

Team members, in addition to the builder and verification team, include capabilities in at least three of the following skill sets: architecture or residential building design; mechanical or energy engineering; building science or performance testing; green building or sustainable design; and civil engineering, landscape architecture, habitat restoration, or land-use planning.

True

All team members referenced above were involved in at least three of the following phases of the design and construction process: conceptual or schematic design; LEED planning; preliminary design; energy and envelope systems analysis or design; design development; final design, working drawings or specifications; and construction.

True

Meetings were conducted with the project team at least monthly to review project status, introduce new team members to project goals, discuss problems, formulate solutions, review responsibilities, and identify next steps.

AND/OR

Option 2. Design Charrette (1 point)

Y M V

True

A full-day workshop (or two half-day workshops) was conducted with the project team, as defined in Option 1, no later than the design development phase.

08/31/20

Duration

AND/OR

Option 3. Trades Training (1 point)

Y 1

M

V

True

At least eight hours of training on the green aspects of the project and how the trades can contribute to achieving each LEED for Homes prerequisite and attempted credit was conducted before construction but after trades have been hired for the project.

Date(s)

Duration

Trainer

Location and Transportation

Notes

Preliminary Y 15 Maybe 0 Verified 0

LT Prerequisite Floodplain Avoidance

LT Prerequisite Floodplain Avoidance

Required

Required

Verified

Select one of the following:

True The project is not built on land within a flood hazard area.

True The project is built on land within a flood hazard area and in accordance with flood provisions.

True The project is built on land within a flood hazard area and is a previously developed building and hardscape.

MAP FILED

Performance Path

Performance Path

LT Credit LEED for Neighborhood Development

LT Credit LEED for Neighborhood D

15 points

Preliminary

Y

0

M

0

Verified

0

Name of LEED for Neighborhood Development project

LEED ND project ID number

Rating system and version

LEED ND certification date

Prescriptive Path

Prescriptive Path

LT Credit Site Selection

LT Credit Site Selection

Up to 8 points

Preliminary

Y

8

M

0

Verified

0

Exemplary Performance: Earn all 9 points

Option 1. Sensitive Land Protection (3-4 points)

Y

4

M

0

V

0

Option 1. Sensitive Land Protection (3

Path 1. Previously Developed (4 points)

Y

4

M

V

0

Path 1. Previously Developed (4 points)

1.75	Total buildable land area (acre or sq ft)
1.75	Previously developed buildable land area (acre or sq ft)
100.00%	Percentage of lot previously developed (%)

MAP FILED

OR

Path 2. Avoidance of Sensitive Land (3 points)

All new buildings, hardscapes, roads, or parking areas of the project are located on land that meets the following criteria:

- (Select one) Does not consist of prime farmland, unique farmland, or farmland of statewide or local importance.
- (Select one) Was not public parkland prior to acquisition.
- (Select one) Is not in a flood hazard area shown on a legally adopted flood hazard map or otherwise legally designated by the local jurisdiction or state.
- (Select one) Is not on land specifically identified as habitat for species listed in the U.S. Endangered Species Act; the state's endangered species act; NatureServe GH, G1, or G2 lists; or those listed under local equivalent standards (for projects outside the U.S.) that are not covered by NatureServe data.

- (Select one) Is not on land within 50 ft (15 m) of wetlands or within the setback distance from wetlands prescribed by local, state or national regulations, whichever is more stringent.
- (Select one) Is not on land within 100 ft (30 m) of water bodies, including seas, lakes, rivers, streams and tributaries.

AND/OR
Option 2. Infill Development (2 points)

100.00% Percent of land within a 1/2 mile (800 meters) from the project boundary that is previously developed

Alternatively, for projects within city limits of towns with populations less than 20,000

Percent of land adjacent to the project boundary that is previously developed

AND/OR
Option 3. Open Space (1 point)

Select one of the following:

- Yes Built within 1/2 mile (800 meters) of open space that is at least 3/4 acres (0.3 hectares)
- Create publically available open space on the project site

AND/OR
Option 4. Street Network (1 point)

300.00 Qualifying intersection density (intersections per square mile)

AND/OR
Option 5. Bicycle Network and Storage (1 point)

- Bicycle Network
- Select one of the following. The project has a functional entry and/or bicycle storage within 200 yd (180 m) of a bicycle network that connects to:
- Yes At least 10 uses
 - Yes A school or employment center
 - Yes A bus rapid transit stops, rail stations, and/or ferry terminals

Path 2. Avoidance of Sensitive Land (3 p

-
-
-
-

-
-

Option 2. Infill Development (2 points)

MAP FILED

Alternatively, for projects within city limits

Option 3. Open Space (1 point)

Tudor Street Dog Park .5 acres .3 miles

Option 4. Street Network (1 point)

FILED

Option 5. Bicycle Network and Storage

Bicycle Network

Bicycle Storage for Multifamily Buildings
Number of building occupants

Number of residential units

Number of short-term spaces provided

Number of long-term spaces provided

Bicycle Storage for Single Family Homes
The project is a single family home with garage.

Bicycle Storage for Multifamily Buildings
NEED STORAGE COUNT

Bicycle Storage for Single Family Homes

LT Credit Compact Development

0

Up to 3 points
Exemplary Performance for Single and Multifamily Lowrise Only: .35 DU/acre (86.5 DU/hectare)

Preliminary Y

M

Verified

Total project boundary area (acre)

Buildable land area (acre)
Number of dwelling units
DU/acre of buildable land

LT Credit Community Resources

0

Up to 2 points
Exemplary Performance: 16 uses for 1/2 point, 20 uses for 1 point.

Preliminary Y

M

Verified

26 Number of community resources within a 1/2 mile (800 meters) walking distance

LT Credit Access to Transit

0

Up to 2 points
Exemplary Performance: For multiple transit types, 720 weekday trips and 432 weekend trips. For commuter rail or ferry, 120 weekday trips.

Preliminary Y

M

Verified

For projects with multiple transit types

Number of weekday trips
Number weekend day trips

For projects with multiple transit types

For projects with commuter rail or ferry service only

Number of weekday trips

For projects with commuter rail or ferry service only

Sustainable Sites

Notes

Preliminary Y 5.5 Maybe 1.5 Verified 0

SS Prerequisite Construction Activity Pollution Prevention

SS Prerequisite Construction Activity

Required

Required

Verified

Confirm all of the following measures were implemented on the project, as applicable:

True Stockpiled and protected disturbed topsoil from erosion.

Provide SWPPP Reports

True Controlled the path and velocity of runoff with silt fencing or comparable measures.

True Protected on-site storm sewer inlets, streams, and lakes with straw bales, silt fencing, silt sacks, rock filters, or comparable measures.

True Provided swales to divert surface water from hillsides.

True Used tiers, erosion blankets, compost blankets, filter socks, berms, or comparable measures to stabilize soils in any area with a slope of 15% (6.6:1) or more that was disturbed during construction.

True Prevented air pollution from dust and particulate matter.

For construction sites larger than 1 acre

For construction sites larger than 1 acre

Select one of the following:

True The project team created an Erosion and Sedimentation Control (ESC) plan that conforms to the requirements of the 2012 U.S. Environmental Protection Agency Construction General Permit (CGP).

True The project team created an Implemented an Erosion and Sedimentation Control (ESC) plan that conforms to local standards and codes, which are as or more stringent than the 2012 EPA Construction General Permit (CGP).

SS Prerequisite No Invasive Plants

SS Prerequisite No Invasive Plants

Required

Required

Verified

True No invasive plant species have been introduced into the landscape.

SS Credit Heat Island Reduction

Up to 2 points

Preliminary Y

2

M

Verified

SS Credit Heat Island Reduction

Option 1. Shading and Option 2. Nonabsorptive Materials (1-2 points)

Hardscapes

0	Total hardscape area (driveways, walkways, patios, etc.) (sq ft)
	Area of shaded hardscapes (sq ft)
	Area of unshaded paving materials with an initial SR value of at least 0.33 (sq ft)
	Area of unshaded vegetation in open pavers (sq ft)
	Remaining hardscape area (not earning credit) (sq ft)

Roof

0	Total roof area (sq ft)
	Area of ENERGY STAR qualified roof (sq ft)
	Area of vegetated roof (sq ft)
	Remaining roof area (not earning credit) (sq ft)

0.0%

Percentage of area with shading or nonabsorptive material (%)

SS Credit Rainwater Management

Up to 3 points

Exemplary Performance: For Case 1, manage 100% of all stormwater on-site.

Preliminary Y

1

M

1

Verified

0

SS Credit Rainwater Management

Case 1. Low Impact Development (1-3 points)

Site Characteristics

0	Total lot area (sq ft)
---	------------------------

Y

M

V

Roof

0	Total roof area (sq ft)
	Vegetated roof area (sq ft)
	Roof area directed to a qualifying infiltration feature (sq ft)
	Remaining roof area (not earning credit) (sq ft)

Non-roof Site Area

0	Total landscape softscape area (sq ft)
	Total hardscape area (driveways, walkways, patios, etc.) (sq ft)
	Permeable paving (sq ft)
	Qualifying open pavers (sq ft)
	Hardscapes directed to qualifying infiltration features (sq ft)
	Remaining hardscape area (not earning credit) (sq ft)

Qualifying area, as a percentage of total lot area

0.0% Qualifying area, as percentage of total lot area (%)

Reduction of total impermeable area

0	Total impermeable area of the project (sq ft)
#N/A	Reference home size (sq ft)
0.0%	Impermeable area as a percentage of reference home size

OR

Case 2. NPDES Projects (2-3 points)

95th Percentile rainfall event

Y M V

Case 2. NPDES Projects (2-3 points)

PROVIDE CALCS

SS Credit Nontoxic Pest Control

SS Credit Nontoxic Pest Control

Up to 2 points

Preliminary Y

2.5

M

0.5

Verified

0

Exemplary Performance: Projects that achieve 2 points can earn another ½ point for each additional strategy, up to a total of 1 point.

Select all of the following that have been included in the project:

Install a steel mesh barrier termite control system. (1 point)

Install a physical termite barrier system (e.g., basaltic rock) approved by code. (1 point)

For below-grade walls, use solid concrete foundation walls, masonry walls with a course of solid block bond beam, or concrete-filled block. (0.5 point)

Install post-tension slabs. (0.5 point)

Treat all cellululosic structural material (e.g., wood framing) with a registered pesticide containing borates, following the manufacturer's directions for preconstruction treatment. (0.5 point)

Use noncellulosic material for all structural elements. (0.5 point)

Install ports or openings for all plumbing elements that penetrate the slab, to allow access for inspection and treatment of pest infestations. (0.5 point)

Install a registered termite bait system and provide for ongoing maintenance as required by the manufacturer. (0.5 point)

Design a minimum 6-inch (150 millimeters) inspection space between the surface of the planned landscape grade and nonmasonry siding. (0.5 point)

Seal all external cracks, joints, penetrations, edges, and entry points with appropriate caulking. Install rodent- and corrosion-proof screens (e.g., copper or stainless steel mesh) on all openings greater than ¼ inch (6 millimeters), except where code prohibits their installation. (0.5 point)

Design discharge points for rain gutters, air-conditioning condensation lines, steam vent lines, or any other moisture source such that discharge is at least 24 inches (600 millimeters) from the foundation. (0.5 point)

Design landscape features to provide a minimum 18-inch (450 millimeters) space between the exterior wall and any plantings. (0.5 point)

For multifamily projects

Develop an integrated pest management policy. The policy must include guidance for residents on pesticide use, housekeeping and prompt reporting of pest problems and incorporate policy in the Homeowner Education Manual. (Required)

NEED STORMWATER PLAN

For multifamily projects

NEED IPM

Water Efficiency

Notes

Preliminary Y 6 Maybe 1 Verified 0

WE Prerequisite Water Metering

WE Prerequisite Water Metering

Required

Required

Verified

N

Case 1. Single Family

V

Case 1. Single Family

Select one of the following:
 (Select one) A whole-house water meter is installed.
 (Select one) The house uses only well water and is not connected to a municipal water system.

OR

Case 2. Multifamily

V

Case 2. Multifamily

True

A water meter or submeter is installed for each unit.
 A water meter or submeter is installed for the whole building.

Performance Path

Performance Path

WE Credit Total Water Use

WE Credit Total Water Use

Up to 12 points

Preliminary Y

M

Verified

0

Exemplary Performance: 70% reduction of indoor and outdoor water consumption

0.00%

Total reduction of indoor and outdoor water consumption as calculated in the [Water Reduction Calculator](#). (%)

For single family projects

For single family projects

(Select one)

The water pressure does not exceed 60 psi (415 kPa). There are no detectable water leaks. Any installed water softeners are demand initiated.

--

Prescriptive Path

WE Credit Indoor Water Use

Up to 6 points

Preliminary

Y

4

M

0

Verified

0

Case 1. Single Family

Y

M

V

(Select one)

The water pressure does not exceed 60 psi (415 kPa). There are no detectable water leaks.

Meet any of the following:

Lavatory Faucet (1-2 points)

All installed lavatory faucets and/or faucet aerators are WaterSense labeled.
Average rated flow volume across all lavatory faucets (gpm)

Showerheads (1-2 points)

All installed showerhead fixtures and fittings are WaterSense labeled.
Average rated flow volume per shower compartment (gpm)

Toilets (1 point)

All installed toilet fixtures and fittings are WaterSense labeled.
Average rated flush volume across all toilets (gpf)

Clothes Washers (1 point)

All clothes washers are ENERGY STAR qualified or performance equivalent

OR

Case 2. Multifamily and Midrise

Y

4

M

V

Note: No additional credit is awarded if the fixtures and fittings in non-unit spaces are more efficient than those of in-unit spaces.

Meet any of the following for in-unit spaces and non-unit spaces:

Lavatory Faucet (1-2 points)

All installed lavatory faucets and/or faucet aerators are WaterSense labeled.
Average rated flow volume across all lavatory faucets (gpm)

Showerheads (1-2 points)

All installed showerhead fixtures and fittings are WaterSense labeled.
Average rated flow volume per shower compartment (gpm)

Toilets (1 point)

All installed toilet fixtures and fittings are WaterSense labeled.
Average rated flush volume across all toilets (gpf)

Clothes Washers (1 point)

All clothes washers are ENERGY STAR qualified or performance equivalent

Prescriptive Path

WE Credit Indoor Water Use

Case 1. Single Family

Lavatory Faucet (1-2 points)

Showerheads (1-2 points)

Toilets (1 point)

Clothes Washers (1 point)

Case 2. Multifamily and Midrise

Lavatory Faucet (1-2 points)

NEED SPECS

Showerheads (1-2 points)

Toilets (1 point)

Clothes Washers (1 point)

WE Credit Outdoor Water Use

Up to 4 points

Preliminary Y

M

Verified

30.00
100.00

Turf grass area as a percentage of total landscape softscape area (%)
Native or adapted plant area as a percentage of total landscape softscape area (%)

WE Credit Outdoor Water Use

NEED LANDSCAPE PLAN / CALCS

Energy and Atmosphere

Preliminary Y 23 Maybe 2 Verified 20

Notes

Verified (Initials) Date Verified

Verification Details

EA Prerequisite Minimum Energy Performance

Required Required Verified N

EA Prerequisite Minimum Energy Performance

Responsible Party

Whole-Building Energy Simulation

- Target Finder (Optional). Enter energy performance rating target (kBtu/sq ft per year)
- True The project meets the mandatory requirements of ASHRAE 90.1-2010, Sections 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4
- 20 Total energy cost savings (%)

Commissioning

Option 1. Commissioning using ENERGY STAR Protocols.

True The project meets the ENERGY STAR Qualified Multifamily High Rise Buildings Testing and Verification Protocols.

OR

Option 2. Commissioning using Prescriptive Path

V

Option 2. Commissioning using Prescriptive Path

Who is CX Agent? NEED PLAN

1. Reduced Heating and Cooling Distribution System Losses for In-Unit HVAC
 - Duct leakage rate does not exceed 4.0 cm25 per 100 sq ft (1.2 cmm at 25 Pa per 100 sq m) of conditioned floor area.
 - Duct leakage rate in units smaller than 1,200 sq ft (110 sq m) does not exceed 8.0 cm25 per 100 sq ft (1.7 cmm at 25 Pa per 100 sq m) of conditioned floor area.
 - Total duct leakage rate in-units systems does not exceed 8.0 cm25 per 100 sq ft (2.4 cmm at 25 Pa per 100 sq m) of conditioned floor area.
 - The air-handler unit and ductwork are visibly within the unit's envelope.

2. Fundamental Commissioning of Central HVAC Systems

The project meets the performance testing and ongoing maintenance requirements of LEED V4 New Construction EA Prerequisite Fundamental Commissioning and Verification for central commercial heating, cooling, water heating and ventilation systems.

3. Construction Document Specifications

The following details were included in the bid documents: Elements to be sealed, air barrier sheet and compartmentalization sheet.

4. LEED for Homes Multifamily Midrise Thermal Enclosure Inspection Checklist

The LEED for Homes Multifamily Midrise Thermal Enclosure Inspection Checklist has been completed.

The project is a certified Passive House project.

EA Prerequisite Energy Metering

Required Required Verified N

EA Prerequisite Energy Metering

Responsible Party

Case 1. Single Family

- A whole-house electric meter is installed.
- A whole-house gas meter is installed.

Case 1. Single Family

OR

Case 2. Multifamily

True Electric submeters are installed in each residential unit.

Case 2. Multifamily

Whole building | A whole-building gas meter or submeter for each residential unit is installed.

EA Prerequisite Education of Homeowner, Tenant, or Building Manager

Required

Required

Verified

True | An operations and maintenance manual, binder, or CD has been/will be provided to all individuals or organizations responsible for the maintenance of the home.

True | A minimum one-hour walkthrough of the home with the occupants has been conducted.

EA Prerequisite Education of Homeowner, Tenant, or Building Manager

Responsible Party

PROVIDE MANUALS

Total Points

EA Credit Annual Energy Use

Up to 30 points

Exemplary Performance: 65% or better reduction from ASHRAE 90.1-2010.

20.0%	Percent reduction from ASHRAE 90.1-2010
15	Points earned
5.0	Average home size point adjustment (from the Multifamily HSA tab)
20.0	Final points earned

Preliminary Y M V

EA Credit Efficient Hot Water Distribution System

Up to 5 points

Option 1. Efficient Hot Water Distribution (2 points)

Preliminary Y M Verified
 Y M V

Note: Projects using heat traces that serve a single unit or house are awarded only half credit.

For projects using circulating systems

- Circulating pump does not operate continuously, is on a timer, or is on a water temperature sensor.
- Circulating pump is demand activated by a momentary contact switch, motion sensor, flow switch, door switch or voice command.
- After the pump starts, the controls allow the pump to operate until the water temperature in the return pipe rises not more than 1°F (0.5 °C) above the initial temperature of the water in the pipe. Controls limit the water temperature to a maximum of 105°F (40 °C). Controls limit pump operation to not more than 5 minutes per activation in the event that both means of shutting off the pump have failed.
- Circulating hot water systems have with an automatic or readily accessible manual switch to turn off the hot water circulating pump when not in use.

EA Credit Annual Energy Use

Responsible Party

Coefficient 90.1, SWA holding HSA 14.5 points

EA Credit Efficient Hot Water Distribution System

Responsible Party

Option 1. Efficient Hot Water Distribution (2 points)

For projects using circulating systems

-
-
-

For projects using heat-traced piping systems

Piping is insulated.

Path 1. Maximum Allowable Pipe Length (2 points)

Y M

V

Pipe or tube length installed (ft)

Nominal pipe size (in)

Maximum pipe or tube length allowed for water heaters, boilers with no circulation loop or heat traced pipe or in multifamily buildings a central circulation loop or heat traced pipe (ft)

Maximum pipe or tube length allowed for circulation loop or heat traced pipe serving a single unit or house (ft)

OR
Path 2. Maximum Allowable Pipe Volume (2 points)

Y

V

Volume of hot or tempered water from source to termination (oz)

OR

Option 2. Performance Test (3 points)

Y M

V

Note: Projects using heat traces that serve a single unit or house are awarded only half credit.

For projects using circulating systems

Circulating pump does not operate continuously, is on a timer, or is on a water temperature sensor.

Circulating pump is demand activated by a momentary contact switch, motion sensor, flow switch, door switch or voice command.

After the pump starts, the controls allow the pump to operate until the water temperature in the return pipe rises not more than 10°F (6 °C) above the initial temperature of the water in the pipe. Controls limit the water temperature to a maximum of 105°F (40 °C). Controls limit pump operation to not more than 5 minutes per activation in the event that both means of shutting off the pump have failed.

Circulating hot water systems have with an automatic or readily accessible manual switch to turn off the hot water circulating pump when not in use.

For projects using heat-traced piping systems

Piping is insulated.

Note: Projects using heat traces that serve a single unit or house are awarded only half credit.

Case 1. Hot water source is a water heater or boiler with no circulation loop or heat traced pipe; or in multifamily buildings a central circulation loop or heat traced pipe.

Y

V

Meets WaterSense Labeled New Homes requirements

Tested volume of water stored in piping (gal)

OR
Case 2. Hot water source is a circulation loop or heat traced pipe serving a single unit or house

Y

V

Tested volume of water stored in piping (gal)

For projects using heat-traced piping systems

Piping is insulated.

AND/OR
Option 3. Pipe Insulation (2 points)

Y

V

R-4 Insulation R-value

For projects using heat-traced piping systems

Path 1. Maximum Allowable Pipe Length (2 points)

anticipated

Path 2. Maximum Allowable Pipe Volume (2 points)

Option 2. Performance Test (3 points)

For projects using circulating systems

For projects using heat-traced piping systems

Case 1. Hot water source is a water heater or boiler with no circulation loop or heat traced pipe; or in multifamily buildings a c

Case 2. Hot water source is a circulation loop or heat traced pipe serving a single unit or house

For projects using heat-traced piping systems

Option 3. Pipe Insulation (2 points)

EA Credit Advanced Utility Tracking

Up to 2 points
Exemplary Performance: Meter separate energy usage information for at least four end uses.

Preliminary Y M Verified

Responsible Party

Case 1: Single Family

Y M V

Case 1: Single Family

Option 1: Electric and Water (1 point)

Y M V

Option 1: Electric and Water (1 point)

Select one of the following:

A permanent energy-monitoring system that records at intervals of one hour or less has been installed.

The house has an automatic in-ground irrigation system and landscaped irrigated area larger than 1,000 sq ft (93 sq m) and has installed a submeter to monitor all irrigation system components.

AND/OR

Option 2: Third-Party Utility Reporting (1 point)

Y M V

Option 2: Third-Party Utility Reporting (1 point)

The homeowner has shared all applicable utility data with USGBC via a USGBC-approved third-party.

Case 2: Multifamily

Y M V

Case 2: Multifamily

Option 1: Electric and Water (1 point)

Y M V

Option 1: Electric and Water (1 point)

Select one of the following:

A permanent energy-monitoring system that records at intervals of one hour or less has been installed in each unit.

The project has an automatic in-ground irrigation system and landscaped irrigated area larger than 1,000 sq ft (93 sq m) and has installed a submeter to monitor all irrigation system components.

AND/OR

Option 2: Third-Party Utility Reporting (1 point)

Y M V

Option 2: Third-Party Utility Reporting (1 point)

Path 1: Whole-Building Master Meter

Y M V

Path 1: Whole-Building Master Meter

The building owner has shared all applicable utility data with USGBC via a USGBC-approved third-party.

OR

Path 2: Individual Unit Meters

Y M V

Path 2: Individual Unit Meters

At least 50% of unit owners or occupants have shared all applicable utility data with USGBC via a USGBC-approved third-party.

Path 2: Individual Unit Meters

NEED SUBMITTAL

ENERGY STAR-qualified ceiling fans are installed (0.5 point)

ENERGY STAR-qualified dishwasher(s) are installed (0.5 point)

EA Credit Renewable Energy

Up to 4 points

Exemplary Performance: Produce at least 2,500 kWh annually.

Preliminary Y

0

M

0

Verified

0

Annual electricity produced by the renewable electricity generation system (kWh)

RECs are retained by owner.

Total points from all other EA credits

EA Credit Renewable Energy

Responsible Party

Materials and Resources

Preliminary Y 4.5 Maybe 1.5 Verified 0

MR Prerequisite Certified Tropical Wood

Required

Required

Verified

True

All wood in the building is nontropical, reused or reclaimed, or certified by the Forest Stewardship Council, or USGBC-approved equivalent.

MR Prerequisite Durability Management

Required

Required

Verified

True

ENERGY STAR for Homes, version 3, water management system checklist is collected from builder.

Confirm all of the following have been implemented on the project:

True

Nonpaper-faced backer board, or a product or coating over wallboard that meets standard ASTM D 3273 standard, was installed on the area above bathtub, spa or shower, and in areas behind fiberglass enclosures where wallboard is installed.

True

Water-resistant flooring was installed in the kitchen, bathroom(s), laundry room, spa area(s). No carpet was installed in these areas.

True

Water-resistant flooring was installed in entryways within 3 feet of exterior door(s).

True

A drain and drain pan, drain pan and automatic water shut-off or flow restrictors, or floor drain with floor sloped to drain was installed for all tank water heaters in or over living space.

True

A braided washer hose, drain and drain pan, drain pan and automatic water shut-off or flow restrictors, or floor drain with floor sloped to drain was installed for clothes washer in or over living space.

True

Conventional clothes dryers exhaust directly to outdoors.

MIR Credit Durability Management Verification

1 point

Preliminary Y M Verified

True Each measure in the ENERGY STAR for Homes, version 3, water management system builder checklist was verified by the verification team.

MIR Credit Environmentally Preferable Products

Up to 5 points

Preliminary Y M Verified

Exemplary Performance: For Option 2, achieve a minimum of 4 points to earn another 2 points for purchasing products that meet the requirements.

Option 1. Local Production

Preliminary Y M Verified

Select which the following were extracted, processed, and manufactured within 100 miles (160 km) of the project site:

<input type="text" value="50.00"/>	Percentage of locally produced framing (%) (0.5 point)
<input type="text"/>	Percentage of locally produced aggregate for concrete and foundation (%) (0.5 point)
<input type="text"/>	Percentage of locally produced drywall and interior sheathing (%) (0.5 point)

AND/OR

Option 2. Environmentally Preferable Products

Preliminary Y M Verified

Select the criteria met by at least 90% of the component:

No Floor Covering (2 points)	<input type="text"/>
Floor Covering (1 point)	<input type="text"/>
Insulation (1 point)	At least 25% postconsumer or 50% preconsumer recycled content
Sheathing (1 point)	At least 25% postconsumer or 50% preconsumer recycled content
Framing (1 point)	<input type="text"/>
Drywall (1 point)	For non-synthetic, 10% post-consumer recycled content
Concrete (1 point)	<input type="text"/>
Roofing (1 point)	<input type="text"/>
Sliding (1 point)	<input type="text"/>

Select criteria met for at least 3 of the following additional components by at least 90% of the component (1 point):

Doors	
Cabinets	
Counters	
Interior Trim	
Decking/Patio	
Windows	

MR Credit Construction Waste Management

Up to 3 points

Preliminary Y

M

Verified

Exemplary Performance: For renovation projects, track and divert at least 50% of demolition waste.

LEED Reference Home Baseline Waste (lbs)

Total Construction Waste (including recycled waste) (lbs)

Recycled Waste (lbs)

Project Construction Waste (lbs)

Percent reduction below baseline (%)

	0.00

Indoor Environmental Quality

Preliminary Y 11.5 May/Je 3 Verified 0

Notes

Verified (Initials)

Date Verified

Verification Details

EQ Prerequisite Ventilation

Required

Required

Verified N

EQ Prerequisite Ventilation

Responsible Party

COSENTINI

Case 1, Single Family

V

Case 1, Single Family

The project has earned the EPA Indoor airPLUS label

OR

Local Exhaust

Confirm all of the following have been implemented on the project:

Local exhaust systems meeting the requirements of ASHRAE Standard 62.2-2010, Sections 5 and 7 or local equivalent, whichever is more stringent, were installed in all bathrooms (including half-baths) and the kitchen.

Local exhaust systems exhaust air directly to the outdoors.

All bathroom exhaust fans are ENERGY STAR-labeled or an HRV or ERV is used.

For exhaust hood systems capable of exhausting in excess of 400 cubic feet per minute (188 liters per second), makeup air is provided at a rate approximately equal to the exhaust air rate.

Makeup air systems have a means of closure and can be automatically controlled to start and operate simultaneously with the exhaust system.

Whole House Mechanical Ventilation

The building meets ASHRAE Standard 62.2-2010 Sections 4 and 7 or local equivalent, whichever is more stringent.

OR

Case 2, Multifamily

V

Case 2, Multifamily

Local Exhaust

Confirm all of the following have been implemented on the project:

Local exhaust systems meeting the requirements of ASHRAE Standard 62.2-2010, Sections 5 and 7 or local equivalent, whichever is more stringent, were installed in all bathrooms (including half-baths) and the kitchen.

Local exhaust systems exhaust air directly to the outdoors.

All bathroom exhaust fans are ENERGY STAR-labeled or an HRV or ERV is used.

For exhaust hood systems capable of exhausting in excess of 400 cubic feet per minute (188 liters per second), makeup air is provided at a rate approximately equal to the exhaust air rate. Makeup air systems have a means of closure and can be automatically controlled to start and operate simultaneously with the exhaust system.

Whole Unit Mechanical Ventilation

The project meets ASHRAE Standard 62.2-2010 Sections 4 and 7 or local equivalent, whichever is more stringent.

Non-Unit Spaces

The project meets the minimum requirements of ASHRAE Standard 62.1-2010 Sections 4, -7 or local equivalent, whichever is more stringent.

The project is located in a non-attainment area for PM_{2.5}. The project has installed MERV 11 or higher filters.

The project is located in a non-attainment area for ozone.

Whole Unit Mechanical Ventilation

PROVIDE CALCS & ERV SPECS

EQ Prerequisite Combustion Venting

Required

Required

Verified

N

The project has earned the EPA Indoor airPLUS label
 OR
 No unvented combustion appliances were installed (ovens and ranges excluded).
 A carbon monoxide (CO) monitor is installed on each floor, hard-wired with a battery backup.

For projects with fireplaces or woodstoves installed

Provide doors that close or a solid glass enclosure.
 Closed combustion, power-vented or passes BPI or RESNET combustion safety protocols

For projects where space and water heating equipment involving combustion are installed

Select one of the following:

True Equipment is installed with closed combustion (i.e. sealed supply air and exhaust ducting)
 True Equipment is installed with power-vented exhaust
 True Equipment is located in a detached utility building or open-air facility

EQ Prerequisite Garage Pollutant Protection

Required

Required

Verified

N

The project has earned the EPA Indoor airPLUS label
 OR
 All air-handling equipment and ductwork is placed outside the fire-rated envelope of the garage.
 Shared surfaces between the garage and conditioned spaces are tightly sealed.

Conditioned Spaces Above Garage

All penetrations and all connecting floor and ceiling joist bays are sealed.

Conditioned Spaces Next to Garage

All doors are weather-stripped.
 Carbon monoxide detectors are installed in rooms that share a door with the garage
 All penetrations and all cracks at the base of the walls are sealed.

EQ Prerequisite Combustion Venting

Responsible Party

For projects with fireplaces or woodstoves installed

For projects where space and water heating equipment involving combustion are installed

EQ Prerequisite Garage Pollutant Protection

Responsible Party

Conditioned Spaces Above Garage

Conditioned Spaces Next to Garage

EQ Prerequisite Radon-Resistant Construction

Required Verified N

Exemplary Performance: For projects in radon zones 2 and 3, install a qualifying passive radon ventilation system.

EPA Indoor airPLUS label V

The project has earned the EPA Indoor airPLUS label

OR

Case 1, New Construction V

1 EPA radon zone

For projects in EPA radon zone 1

True There is a capillary break per the Indoor airPL US specifications.

True An electrical outlet has been provided near vent piping in the attic to facilitate future fan installation.

True A gas-tight vertical vent pipe extending up through the conditioned spaces and terminating above the roof opening has been installed.

OR

The house is elevated by at least 2 feet (600 millimeters) with open air space between building and ground or there is a garage under the building.

OR

Case 2, Renovation of Existing Building V

EPA radon zone

For renovation projects in EPA radon zone 1 with no slab work being performed

Radon test results (pCi/L)

If results are greater than 4 pCi/L, an active ventilation system has been installed.

EQ Prerequisite Air Filtration

Required Verified

The project has earned the EPA Indoor airPLUS label

OR

8.00 MERV rating of filters on recirculating space conditioning systems

6.00 MERV rating of filters on mechanically supplied outdoor air systems with 10 ft (3 m) or more of ductwork

EQ Prerequisite Radon-Resistant Construction

Responsible Party

EPA Indoor airPLUS label

Case 1, New Construction

For projects in EPA radon zone 1

Case 2, Renovation of Existing Building

EQ Prerequisite Air Filtration

Responsible Party

EQ Prerequisite Environmental Tobacco Smoke

Required

Required

Verified

For multifamily projects

- True Smoking is prohibited in all common areas of the building.
- True Smoking is prohibited outside the project building(s) (except in designated smoking areas located at least 25 ft (7.5 m) from all entries, outdoor air intakes, and operable windows).
- True Signage communicating the smoking policy has been installed.

EQ Prerequisite Compartmentalization

Required

Required

Verified

For multifamily and attached single-family projects

- True Each residential unit has sealed penetrations through walls, ceilings, and floors and vertical chases adjacent to units.
- True All doors in the residential units leading to common hallways have weather-stripping.
- True All exterior doors and operable windows have weather-stripping.
- Blower door test results (cfm50)
- Envelope enclosure area (sq ft)
- Leakage per area of enclosure (cfm50/sq ft)

EQ Credit Enhanced Ventilation

Up to 3 points

Preliminary

Y

2

M

0

Verified

0

Option 1. Enhanced Local Exhaust (1 point)

Bathroom exhaust fan control type in every bathroom with a shower, bathtub, or spa

AND/OR

Option 2. Enhanced Whole-House Ventilation (2 points)

A balanced whole-house ventilation system was designed and installed that meets ASHRAE 62.2-2010 sections 4 and 7 in each home or unit.

True The system does not exceed ASHRAE 62.2-2010 requirements by more than 10%.

EQ Prerequisite Environmental Tobacco Smoke

Responsible Party

For multifamily projects

EQ Prerequisite Compartmentalization

Responsible Party

For multifamily and attached single-family projects

EQ Credit Enhanced Ventilation

Responsible Party

Option 1. Enhanced Local Exhaust (1 point)

Option 2. Enhanced Whole-House Ventilation (2 points)

EQ Credit Contaminant Control

Up to 2 points
Exemplary Performance: Achieve a minimum of 2 1/2 points to earn another 1/2 point.

Preliminary Y M Verified

Responsible Party

Option 1. Walk-off Mats (0.5 point)

Y M V

Option 1. Walk-off Mats (0.5 point)

For all primary entryways, a permanent walk-off mat that is at least 4 feet (1.2 meters) long and allows access for cleaning has been installed.

For multifamily projects

For exterior entryways in common areas, permanent systems that are at least 10 feet (3 meters) long have been installed.

Option 2. Shoe Removal and Storage (0.5 point)

Y M V

Option 2. Shoe Removal and Storage (0.5 point)

A shoe removal and storage space is near the primary entryway.

No conventional carpet is installed in shoe removal and storage area.

Option 3. Preoccupancy Flush (0.5 point)

Y M V

Option 3. Preoccupancy Flush (0.5 point)

The project has earned the EPA Indoor airPLUS label

OR

At installation, all permanent ducts and vents were sealed to minimize contamination from construction.

After construction ends and before occupancy

Any dust and debris was removed from ducts.

The home was flushed out for 48 hours, with all windows open, a fan run continuously or all HVAC fans and exhaust fans.

Option 4. Air Testing (1 point)

Y M V

Option 4. Air Testing (1 point)

The building was tested for indoor air contaminants and maximum concentrations were not exceeded.

EQ Credit Balancing of Heating and Cooling Distribution Systems

Up to 3 points

Case 1, Forced-Air Systems

Preliminary Y 2 M 0 Verified 0

Y 2 M 0 V 0

Option 1, Multiple Zones (1 point)

Y M V

A system with at least two space-conditioning zones with independent thermostatic controls has been installed.

OR

The project is a single family home less than 800 sq ft (74 sq m) or a multifamily building whose average unit size is less than 1,200 sq ft (110 sq m).

AND/OR

Option 2, Supply Air-Flow Testing (1 point)

Y 1 M V

The supply air-flow rates are within +/- 20% (or +/- 25 cfm or 1 lps) of calculated values from ACCA Manual J.

AND/OR

Option 3, Pressure Balancing (1 point)

Y 1 M V

The pressure differential between bedroom and rest of the house is less than 3 Pa.

OR

Case 2, Radiative Systems

Y 0 M 0 V 0

Option 1, Multiple Zones (1 point)

Y M V

A system with at least two zones with independent thermostatic controls has been installed
Each zone has a separate loop and pump controlled automatically by a thermostat control.

OR

The project is a single family home less than 800 sq ft (74 sq m) or a multifamily building whose average unit size is less than 1,200 sq ft (110 sq m).

AND/OR

Option 2, Room-by-Room Controls (2 points)

Y M V

Room-by-room thermostatic controls are installed.

EQ Credit Enhanced Compartmentalization

Up to 3 points

Preliminary Y M 3 Verified 0

0.00 Leakage per area of enclosure (cm50/sq ft)

EQ Credit Combustion Venting

Up to 2 points

Preliminary Y 2 M 0 Verified 0

Option 1, No Fireplace or Woodstove (2 points)

Y 2 M V

No fireplaces or woodstoves have been installed.

OR

Option 2, Enhanced Combustion Venting Measures (1 point)

Y M V

EQ Credit Balancing of Heating and Cooling Distribution Systems

Responsible Party

Case 1, Forced-Air Systems

Option 1, Multiple Zones (1 point)

Option 2, Supply Air-Flow Testing (1 point)

Provide TABS

Option 3, Pressure Balancing (1 point)

Transfer grills in BR

Case 2, Radiative Systems

Option 1, Multiple Zones (1 point)

Option 2, Room-by-Room Controls (2 points)

EQ Credit Enhanced Compartmentalization

Responsible Party

anticipated

EQ Credit Combustion Venting

Responsible Party

Option 1, No Fireplace or Woodstove (2 points)

Option 2, Enhanced Combustion Venting Measures (1 point)

The project has earned the EPA Indoor airPLUS label

OR

- EPA qualified wood- or pellet-burning fireplaces with either power or direct venting have been installed.
- A natural gas, propane, or alcohol stove approved by a safety testing facility and has power or direct venting has been installed.
- A natural gas, propane, or alcohol stove has a permanently fixed glass front or gasketed door and an electronic pilot.

EQ Credit Enhanced Garage Pollutant Protection

1 point Preliminary Y 1 M 0 Verified 0

Option 1. Exhaust Fan on Controls in Garage (1 point)

Y M Verified V

All of the requirements in ASHRAE 62.1-2010 for garage ventilation have been met.

The garage has sufficient exhaust to create negative pressure with respect to adjacent spaces with the doors to the garage closed.

Self-closing doors have been installed. Deck-to-deck partitions or a hard lid ceiling have been installed.

The exhaust fan either runs continuously or is on a carbon monoxide sensor that turns on the fan when ambient CO levels reach 35 ppm.

OR

Option 2. Detached Garage or No Garage or Carport (1 point)

Y 1 M Verified V

True No garage has been constructed.

A detached garage has been constructed.

EQ Credit Low-Emitting Products

Up to 3 points Preliminary Y 2.5 M 0 Verified 0

Select all that apply. At least 90% of a component must meet the requirement.

True Site-applied interior paints and coatings have been tested and meet the requirements of CA Section 01350. (0.5 point)

Flooring has been tested and meets the requirements of CA Section 01350. (0.5 point)

Insulation has been tested and meets the requirements of CA Section 01350. (0.5 point)

True Site-applied adhesives and sealants have been tested and meet the requirements of CA Section 01350. (0.5 point)

True Composite wood products have been tested and meet the California Air Resources Board requirements for ultra-low-emitting formaldehyde (ULEF) resins or no-added formaldehyde based resins. (1 point)

EQ Credit No Environmental Tobacco Smoke

1 point Preliminary Y 1 M 0 Verified 0

True Smoking is prohibited throughout the building, including within living units.

True The prohibition is communicated to tenants through building rental or lease agreements or in condo or co-op association covenants. Restrictions and provisions for enforcement are also included.

EQ Credit Enhanced Garage Pollutant Protection

Responsible Party

Option 1. Exhaust Fan on Controls in Garage (1 point)

Option 2. Detached Garage or No Garage or Carport (1 point)

Detached garage or on-top?

EQ Credit Low-Emitting Products

Responsible Party

NEED SUBMITTALS

NEED SUBMITTALS

NEED SUBMITTALS

NEED SUBMITTALS

EQ Credit No Environmental Tobacco Smoke

Responsible Party

Innovation

Preliminary Y 4 Maybe 1 Verified 0

IN Prerequisite Preliminary Rating

Required Required Verified

Preliminary rating and meeting are complete.

IN Credit Innovation

To achieve all five innovation points, a project team must achieve at least one pilot credit, at least one innovation credit and no more than two exemplary performance credits.

Up to 5 points Preliminary Y M Verified

Option 1. Innovation (1 point) Y M V

Describe the intent of the proposed innovation credit.

AND/OR

Option 2. Pilot (1 point) Y M V

Pilot credit name

AND/OR

Option 3. Additional Strategies (0.5-3 points) Y M V

Exemplary Performance: 1-2 points

Strategy
 Credit name

Strategy
 Credit name

Strategy
 Credit name

Strategy
 Credit name

Strategy
 Credit name

Strategy
 Credit name

IN Credit LEED Accredited Professional

1 point Preliminary Y M Verified

Name of credential holder

Regional Priority

Preliminary Y 3 Maybe 1 Verified 0

RP Credit Regional Priority

Up to 4 points

Preliminary Y 3 M 1 Verified 0

Regional priority credits may be found on www.usqbc.org/rpc.

Regional Priority Credit Name	Required Threshold
LT	
EA	
SS	

Net Zero Narrative

In accordance with Paragraph (c), Section 22.25.1 of the Zoning Ordinance:

The project team is evaluating building envelope performance, including roof, foundation, walls and window assemblies, and window-to-wall ratio to reduce operational carbon.

During schematic design and design development phases, the project team has implemented Passive House Planning Package (PHPP) and ASHRAE simple box modeling to influence design decisions based upon first cost and operational cost. Site Energy Use Intensity (EUI), Source EUI and total greenhouse gas emissions reduction goals are integral to the envelope and equipment decision making process.

Utilizing an existing building site for the new grad dorm means limitations for orientation and massing.

However, the project team is dedicated to a study of high-performance envelope and mechanical systems and the potential for on-site and off-site renewable energy systems to reduce the building's operational carbon.

While net zero fossil fuel construction is the ultimate objective, the project team is also aware of the importance of reducing the embodied carbon in construction materials and remains dedicated to that analysis.

Project Name: MIT West Campus Graduate Student Dormitory

Project Address: 269 -301 Vassar Street

Submitted By: Melissa Stopa, MIT

Date of Submission: October 30, 2020

Development Characteristics

<i>Lot Area (sq. ft.):</i>	77,101
<i>Existing Land Use(s) and Gross Floor Area (sq. ft.) by Use:</i>	Police Station (14,000 gsf) and surface parking lot
<i>Proposed Land Use(s) and Gross Floor Area (sq. ft.), by Use:</i>	Dormitory (326,091 gfa)
<i>Proposed Building Height(s) (ft. and stories):</i>	105' / 10 Stories
<i>Proposed Dwelling Units:</i>	350
<i>Proposed Parking Spaces:</i>	0
<i>Proposed Bicycle Parking Spaces (Long-Term and Short-Term):</i>	344 long-term & 35 short-term

Green Building Rating System

LEED – Leadership in Energy & Environmental Design (U.S. Green Building Council)			
<i>Rating System & Version:</i>	LEED v4 BD+C Multifamily Midrise	Seeking Certification?	YES
<i>Rating Level:</i>	Gold	# of points	74.5 preliminary & 12 possible

Proposed Project Design

Building Envelope

Envelope Component	Thermal Value	Description
Roofs:	R-38 hr-ft ² ·°F/Btu	6 ½" (on average) tapered polyisocyanurate
Above-Grade Walls:	R-18 hr-ft ² ·°F/Btu	5" of exterior mineral wool insulation and thermally broken brick ties. Thermally broken shelf angles or standoff shelf angles. At the thin brick locations, 5" of exterior mineral wool insulation and precast concrete panels
Cantilevered Floors / Soffit:	R-30 hr-ft ² ·°F/Btu	10" of mineral wool insulation
Ground Slab:	R10	2" XPS continuous exterior perimeter insulation extending 48" below grade.
Punched Window U-value:	≤ 0.39 Btu/hr-ft ² ·°F	Double Pane
Punched Window SHGC ("g-factor"):	0.40	Argon filled. While the project budget cannot support triple-glazed windows at this time, the team will conduct further analysis of available window products to improve the u-value.
Curtain Wall Vision U-value:	≤ 0.42 Btu/hr-ft ² ·°F	Double Pane
Curtain Wall Spandrel U-value:	0.17 Btu/hr-ft ² ·°F	
Curtain wall vision SHGC ("g-factor"):	0.40	Argon filled
Exterior Opaque Doors:	R-2.5 hr-ft ² ·°F/Btu	
Window to Wall Ratio:	26%	

Envelope Performance

	Proposed		Baseline	
	Area (sf)	U-Value	Area (sf)	U-Value
Window	36,530	0.38	36,530	0.42
Wall	103,970	0.055	103,970	0.055
Roof	48,500	0.026	48,500	0.032

Envelope Commissioning Process

LEED v4 Multifamily Midrise mandates quality installation and third-party verification of thermal insulation by qualified energy raters. Thermal bridging will be minimized resulting in optimized overall building enclosure energy efficiency. Glazing will consist of high performance thermally broken windows, frames and curtainwall. The building will undergo building enclosure commissioning in addition to the energy rater insulation inspections. Building Envelope Commissioning (BECx) will be performed per the LEED BD+C v4 reference guide. BECx consists of the validation that the design and performance of materials, components, assemblies and systems achieve the objectives and requirements of the owner. The process comprises modeling, observing, testing, documenting, and verifying materials, components, assemblies, and systems to validate that both their use and installation meet the owner’s requirements. It uses performance-oriented practices and procedures to verify that the project is achieving the owner’s project requirements. As required by LEED, the BECx process will be performed in general accordance with NIBS Guideline 3-2012.

The commissioning scope of work includes the following:

Criteria for Commissioning	Design	Construction	Pre-Occupancy
Develop air-barrier set:	✓		
Develop Trades Training & Mock-Up unit testing:	✓		
Develop a list of Quality Assurance (QA) responsible parties:	✓		
Incorporate Inspection Schedule and QA Responsibilities into Construction Schedule:		✓	
Inspections of Site, Foundation, Structure, Air Sealing, Insulation, and Mechanicals during construction for LEED requirements:		✓	
Conduct Intermediate (Mock-Up area) Performance Testing:		✓	
Conduct final air infiltration, ventilation, duct & pressure differential testing:			✓
Verify finishes, appliances, mechanicals, lighting:			✓
Submit final Energy Model & Ventilation Calculations and LEED certification Documentation:			✓

Building Mechanical Systems

The current design for heating and cooling is through a Water Source Heat Pump (WSHP) System. However, the team is evaluating a fossil fuel free heating and cooling through Variable Refrigerant Flow (VRF) systems using a Passive House specific methodology. The required space conditioning thresholds and energy demands for each scenario analyzed are displayed in the following tables. As shown below:

Criteria for Design WSHP	Current Design	Fossil Fuel Free Target
Space Heating Demand (kBTU/ft ² -yr):	11.61	≤ 4.75
Space Cooling Demand (kBTU/ft ² -yr):	3.86	≤ 5.39
Source Primary Energy (kBTU/ft ² -yr):	56.4	≤ 46.8
Criteria for Design VRF	Current Design	Fossil Fuel Free Target
Space Heating Demand (kBTU/ft ² -yr):	11.61	≤ 4.75
Space Cooling Demand (kBTU/ft ² -yr):	3.56	≤ 5.39
Source Primary Energy (kBTU/ft ² -yr):	52.3	≤ 46.8

**All noted primary energy and space heating & cooling demands and thresholds are calculated in reference to the project's "treated floor area", not the project's gross square footage.*

Systems Description

Space Heating:	High efficiency WSHP –with NG condensing boilers, or VRF systems
Space Cooling:	High efficiency WSHP with open cell cooling towers and heat exchangers or VRF systems
Heat Rejection:	In WSHP concept – open circuit cooling towers, in VRF option – air cooled condensers
Pumps & Auxiliary:	Condenser water pumps and heat exchangers in WSHP scheme
Ventilation:	Central Energy Recovery Ventilation with MERV 13 minimum filtration
Domestic Hot Water:	w/ VRF Heating & Cooling, Heat Pump Water Heaters (being evaluated) or central NG high EF boilers
Interior Lighting:	LED with automated controls
Exterior Lighting:	LED with automated controls
Appliances:	Central laundry, high-efficiency washers/dryers, dorm apartments w/ ES appliances & electric cooking

Airtight Building Envelope

To ensure a high performing envelope, the whole building should target maximum infiltration rate of 1.5 ACH50 which is significantly tighter than the code threshold and requires diligent taping and sealing of all joints, penetrations, and transitions.

Thermal Bridge Free Design and Construction

Thermal bridge-free construction shall be addressed in the design phase and detailed in the project drawings; the design and construction drawing set shall be reviewed for thermal bridges and improved with iterative thermal modeling.

Appliances

All appliances shall be ENERGY STAR® certified and all project specifications for exact appliance model numbers must be provided to SWA. Any deviation from the appliance specifications must be approved by the architect. All cooking ranges and ovens in the apartments shall be electric.

Lighting & Controls

Common area lighting shall be LED, wherever possible. All lighting fixtures should target 80 lumens per watt or greater. The common area lighting should not exceed 99,860 kWh/year with the use of controls.

The following installed lighting power densities (LPD) in W/ft2 should be pursued as a maximum, prior to the integration of area lighting controls. All non-apartment common spaces shall have either bi-level lighting, occupancy or vacancy sensors.

Room Type:	W/ft ²	Hours/Day
Corridors	0.5	24
Stairs	0.40	24
Back of House	0.50	4
All other Common Spaces	0.70	10

DHW System

Central domestic hot water (DHW) can be provided with natural gas condensing boiler(s). The condensing boiler should have an energy efficiency of 95% or greater. Central DHW re-circulation lines should be insulated to code minimum levels of insulation, and pipe lengths should be kept to a minimum via optimized layouts of plumbing fixtures and recirculation loops.

Building Mechanical Systems Commissioning

Based on LEED BD+C v4 requirements, Fundamental Commissioning and Enhanced Commissioning (including Building Envelope Commissioning) will be performed for the project. Commissioning is a process that can span from the inception of a new construction project and continues through the post-occupancy phase. Commissioning is the process of verifying through demonstration, visual inspections, testing, and documentation that the Building Envelope and all the building’s Mechanical, Electrical, Plumbing and Fire Alarm systems are performing interactively according to the design intent, are operating efficiently and meet the owner’s expectations. The commissioning process typically includes design and specification reviews; pre-functional testing (with Factory Acceptance Testing depending on component); mock-up and prototype testing; and final assembly operational testing. To satisfy the associated LEED credits, Whole Building Energy Modeling and plan and specification reviews will be completed during the Design Development Phase. Review of Construction Documents for compliance with LEED criteria will occur at 50% and 90% CDs.

LEED v4 Fundamental Cx	LEED v4 Enhanced Cx
Develop Owner's Project Requirements	Conduct Commissioning Design Review
Incorporate Cx Requirements into Construction Documents	Review Contractor Submittals
Develop a Commissioning Plan	Conduct Building Envelope Commissioning
Conduct Functional Performance Testing	Develop a Systems Manual
Develop a Summary Commissioning Report	Verify that Training Requirements have been met
Compile the Operations and Maintenance Plan	Visit site 8-10 months into the Warranty Period

Anticipated Energy Loads and Greenhouse Gas Emissions

Using EQuest software, the baseline for this project is the ASHRAE 90.1 Energy Standard for Buildings, Except Low-Rise Residential Buildings, 2013 Edition. The building will also comply with the International Energy Code 2018 with amendments based on Massachusetts Stretch Energy Code. The City of Cambridge has adopted the MA Energy Stretch Code (Appendix AA to 780 CMR: State Board of Building Regulations and Standards) requiring new buildings over 100,000 SF to demonstrate a site or source energy reduction of a minimum 10% in comparison to ASHRAE 90.1 2013. Preliminary modeling of the MIT West Campus Graduate Dorm is predicting 30.8% site energy reduction in comparison to ASHRAE 90.1 2013.

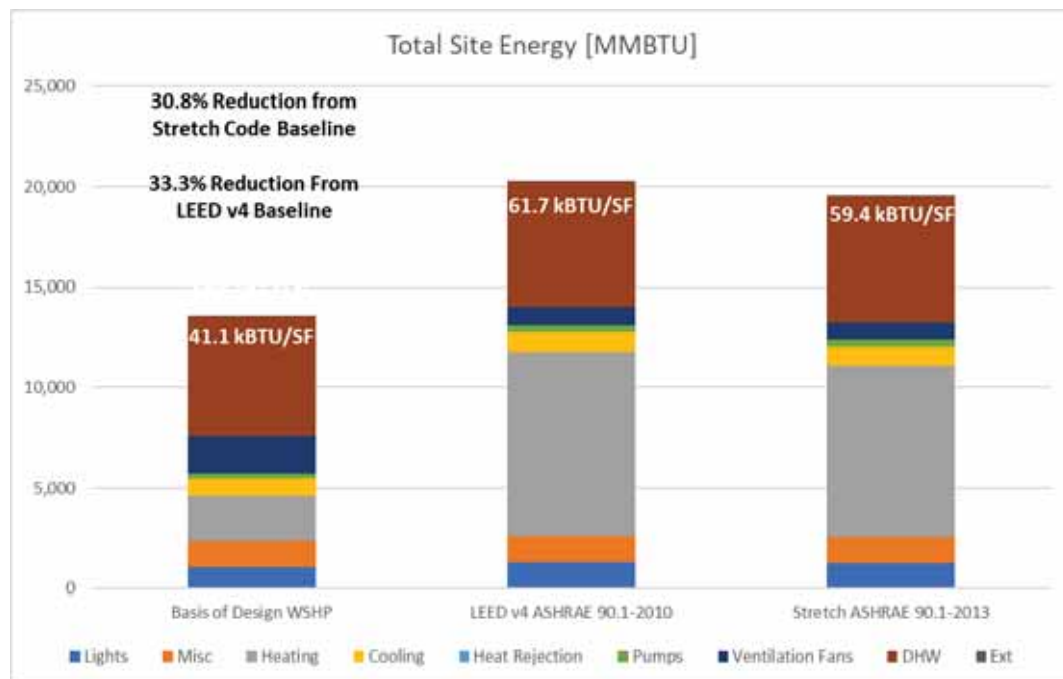
Annual Projected Energy Consumption and GHG Emissions

	Baseline Building per ASHRAE 90.1-2013		Proposed Building		Net Zero Scenario Transition	
	<i>kWh or Therms</i>	<i>% of Total</i>	<i>kWh or Therms</i>	<i>% of Total</i>	<i>kWh or Therms</i>	<i>% of Total</i>
Space Heating	84,587 therms	41%	94,595 kWh, 19,022 therms	16.5%	372,000 kWh	14%
Space Cooling	277,097 kWh	5%	255,016 kWh	6.5%	255,016 kWh	10%
Heat Rejection	2,042 kWh	<1%	1,799 kWh	<1%	1,799 kWh	<1%
Pumps & Aux.	103,713 kWh	2%	78,686 kWh	2%	78,686 kWh	3%
Ventilation	256,086 kWh	4.5%	538,979 kWh	14%	538,979 kWh	20%
Domestic Hot Water	62,717 therms	32%	59,271 therms	41%	659,000 kWh	25%
Exterior Lighting	4,500 kWh	<1%	4,500 kWh	<1%	4,500 kWh	<1%
Interior Lighting	371,506 kWh	6.5%	371,506 kWh	8%	371,506 kWh	14%
Misc. Equipment	383,510 kWh	7%	383,510 kWh	10%	383,510 kWh	14%
	<i>\$US, kBTU, kBTU/SF</i>		<i>\$US, kBTU, kBTU/SF</i>	<i>\$ Reduction from Baseline</i>	<i>\$US, kBTU, kBTU/SF</i>	<i>\$ Reduction from Baseline</i>
Total Energy Cost	\$407,617		\$387,838	7.4%	\$466,374	+14.4%
Total Energy Use	19,526 MMBTU		13,511 MMBTU	30.8%	9,093 MMBTU	53.4%
Site EUI	59.4 kbtu/SF		41.1 kbtu/SF	30.8%	27.7 kbtu/SF	53.4%
Source EUI	92.7 kbtu/SF		78.7 kbtu/SF	15.1%	91.4 kbtu/SF	1.4%
	<i>kWh or Therms</i>	<i>% Total Energy</i>	<i>kWh or Therms</i>	<i>% Total Energy</i>	<i>kWh or Therms</i>	<i>% Total Energy</i>
On-site Renewable Energy Generation	-		-		208,703 kWh per Case 2	7.8%
Off-site Renewable Energy Generation	-		-		-	
	<i>Metric Tons, CO₂, [SF]</i>		<i>Tons, CO₂, [SF]</i>	<i>% Reduction from Baseline</i>	<i>Tons, CO₂, [SF]</i>	<i>% Reduction from Baseline</i>
GHG Emissions	1,215 metric tons		1,015 metric tons	16.5%	763 metric tons	37.2%
GHS Emissions/SF	0.0037 metric tons/SF		0.0031 metric tons/SF	16.5%	0.0023 metric tons/SF	37.2%

Energy Use Intensity

Site Energy Use Intensity (EUI), Source EUI and total greenhouse gas emissions reduction goals are integral to the envelope and equipment decision making process. Using the ASHRAE 90.1 modeling for this preliminary analysis, the building has a projected site EUI of 41 kBtu/sf.yr as designed with water sourced heat pumps. This as-designed reference meets Mass Stretch Code and LEED v4 Gold levels of efficiency. To move the building toward zero operational carbon, triple pane windows were modeled and resulted in a projected site EUI of 34 kBtu/sf.yr. The project team has made best-guess assumptions for the following loads however these will ultimately be dependent upon occupant behavior and final structural design considerations:

- Domestic hot water consumption
- Dwelling unit miscellaneous plug loads



Integrative Design Process

The project team includes sustainability consultants who have been integral to the process from the schematic design phase. The initial LEED-focused design charrette took place on August 13, 2020 and the project team has had several break-out meetings to analyze specific strategies on a weekly basis, at minimum. Milestone meetings requiring additional, outside consultants have included: analysis of common versus in-unit laundry; green-roof vs. solar roof spaces; thermal comfort and durability implications from fossil fuel free heating and cooling; implementing new, untested strategies for fossil fuel free domestic hot water.

As part of the integrative design process, the project team has assessed tools to better ensure the health and well-being of the building's residents. In addition to pursuing Energy Star Multifamily New Construction (ESMFNC) Certification, which addresses building-science best practices affecting indoor air quality, the project team is assessing Indoor airPLUS Certification. The EPA's Indoor airPLUS (IAP) program is currently available to low-rise residential buildings. However, version 2 will allow residential buildings of all heights to receive an IAP label when it rolls in 2021. IAP builds upon the ESMFNC program with requirements in the following categories:

- Moisture Control
- Radon Mitigation
- Pest Barriers

- Heating, Cooling and Ventilation Systems
- Low-Emission Materials
- Occupant Education

The International WELL Building Institute's™ WELL Building Standard is focused on improving occupant comfort and driving better choices. Several WELL practices align with the MIT West Campus Graduate Dorm design goals, such as:

- Smoke Free Environment
- Ventilation Effectiveness
- Construction Pollution Management
- Enhanced Air Quality
- Pollution Infiltration Management
- Fundamental Water Quality
- Drinking Water Promotion
- Moisture Management
- Light Exposure
- Glare Control
- Occupant Control of Lighting Environments
- Site Planning and Selection
- Physical Activity Opportunities
- Enhanced Thermal Performance
- Sound Masking

While WELL Core and Multifamily Residential Certification is available for this building demographic, the air quality testing requirements are extremely challenging for dormitory residences. Nourishment and Movement categories are also a challenge given buildable lot restrictions and in-unit kitchens.

The Fitwel Multifamily Residential Scorecard also uses a verification approach to address health as an integrated system. Fitwel principles which align with the MIT West Campus Graduate Dorm design goals include:

- Walkability
- Bicycle Access
- Proximity to Transit
- Tobacco Smoke-Free
- Active Pedestrian Areas
- Indoor Air Quality
- Integrated Pest Management
- Acoustic Comfort
- Operable Windows
- Views from Common Spaces
- Thermal Control
- Stakeholder Collaboration Process
- Water Bottle Refilling
- Water Quality
- Emergency Preparedness Plan

The project team will continue to evaluate the practicality of implementing Fitwel Certification given project restraints including lack of common food and snack areas, lot restrictions and building layout.

Renewable Energy

A Solar PV Feasibility Study was completed to determine the racking system selections and estimated productions of a potential rooftop solar array. The current design consists of multiple roof levels and large mechanical systems. As such, solar array options are limited due to available roof space and shading. Two arrays were created in AutoCAD using preliminary files, assessing potential solar PV system sizes while accounting for shading and access pathways required for fire department and equipment maintenance. The basis of design of the PV arrays is SunPower's 360W module. The two arrays most viable at the project site are a trellis canopy and combination ballasted and tilt-up kit system.

Raised PV systems like a trellis or canopy, offer the potential to offset greater levels of electrical consumption. However, trellis options require penetrations into the roof – which could result in significant incurred costs to the project for structural and drainage evaluations. Installing a trellis canopy system would incur significant installation costs and is not deemed feasible at this point.

Case 1: Solar PV system on a trellis canopy. This more significant mounting system would allow the modules to be installed higher, spanning above the main rooftop energy recovery units, generators, plumbing penetrations, and circumvent loss of production due to shading from the bulkheads and upper roofs. This system would be significantly heavier and costlier than a low-profile rack but allows for a much larger system size and deep offsets of annual electrical consumption. One of the main obstacles to installing a system like this is often the zoning height limit, since the entire array should be mounted with a minimum clearance of 9' underneath to allow for fire access pathways. It is SWA's understanding that encroachment above the maximum allowable height is allowed for a solar PV system in this jurisdiction. Cooling towers and ERU's also require clearance directly above to allow exhaust to vent upwards. This array is a viable for the MIT Grad Housing project as it is raised to allow for access to equipment beneath.

Trellis systems are estimated as follows:

Building A: 253.08 kW w/ annual production of 322,589 kWh

Building B: 192.24 kW w/ annual production of 245,039 kWh

Case 2: Combination Ballasted PV array and tilt-up kit at 10 degrees. This combination system maximizes production with ballasted arrays on the lower roofs paired with a low-profile tilt-up racking product, such as the Iron Ridge Tilt Mount or the ProSolar SolarWedge, on the upper roof and bulkhead.

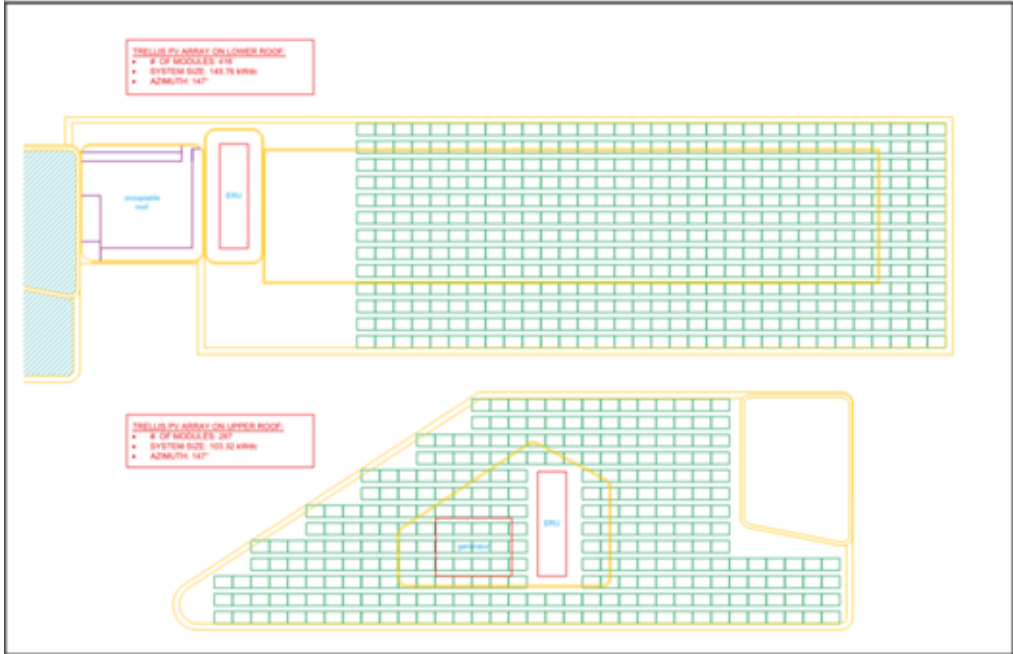
Ballasted systems are fairly light (approximately 3-6 psf), can be installed without penetrations into the roof, and are inexpensive in comparison to larger racks. However, their low profile makes them more susceptible to shading. Just like the ballasted option, tilt-up systems are simple to install and inexpensive in comparison to larger racks. Tilt-up systems are typically lighter than regular ballasted systems and are more well suited to higher elevations. However, the primary method for resisting wind uplift is direct connections to the roof structure as opposed to ballast.

Ballasted and Tilt-Up Kit systems are estimated as follows:

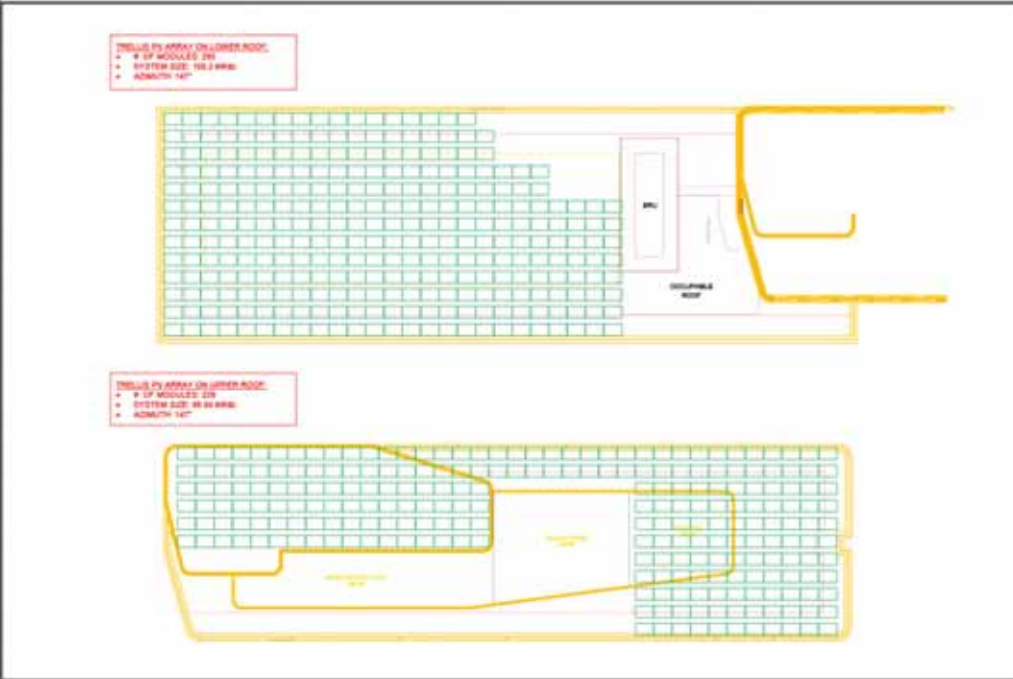
Building A: 107.28 kW w/ annual production of 129,570 kWh

Building B: 65.52 kW w/ annual production of 79,133 kWh

Trellis PV Array – Building A and Building B



Building A – Trellis PV Array on Lower and Upper Roofs

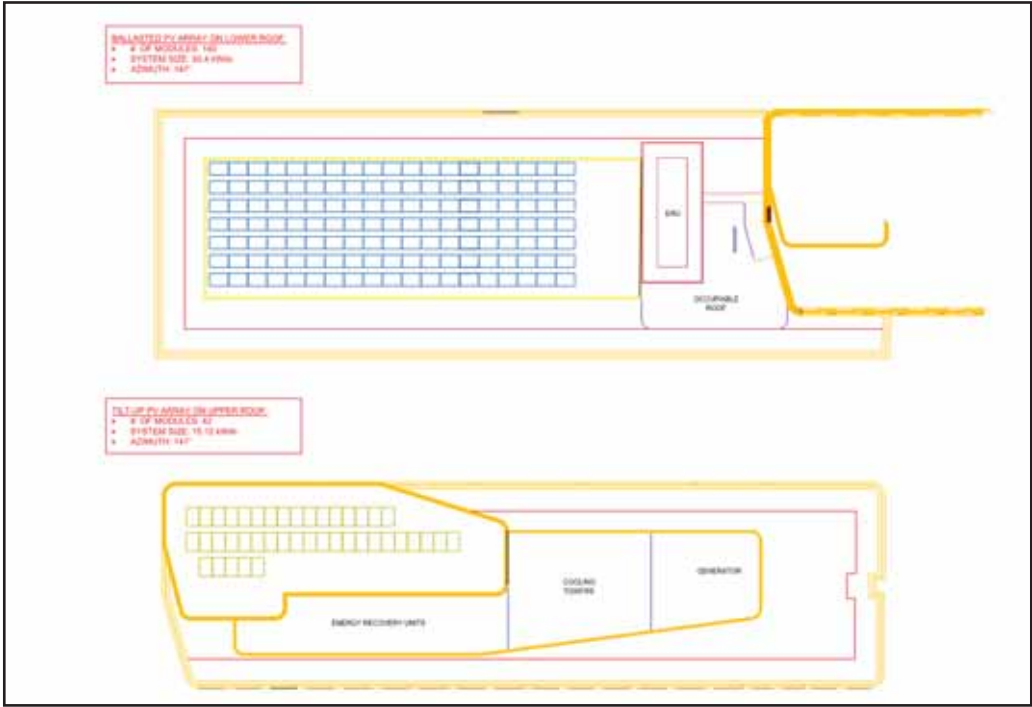


Building B – Trellis PV Array on Lower and Upper Roofs

Ballasted & Tilt-up PV Array – Building A and Building B



Building A – Ballasted and Tilt Up Kit Array on Lower and Upper Roofs



Building B – Ballasted and Tilt Up Kit Array on Lower and Upper Roofs

Net Zero Scenario Transition

While some building components and mechanical technologies may not currently be feasible, the following opportunities have been identified to advance the project toward future net zero green-house gas emissions:

	Net Zero Condition	Transition Process:
Building Envelope:	Triple Pane Windows	Replace window assemblies for all Insulated Glass Units (IGU's) with triple pane glazing in high-R frames (i.e. fiberglass). This transition will require a phased approach at vacancy and full replacement of the window units.
HVAC Systems:	WSHP to Electrified Hydronic Heat Pump System	Convert the WSHP system to an electrified hydronic system taking advantage of a hydronic loop for a WSHP lasting 50 -80 years. Provide structural support and space for storage tanks in or near the boiler room and roof space for heat pumps located to minimize piping. Allow chases from the boiler to the outdoor heat pump locations for easy installation of a riser pair with insulation. Provide adequate electric capacity for heat pumps and leave spare breakers in the boiler room for additional pumps and controls for the heat pump system.
Domestic Hot Water:	Heat Pump Water Heaters	Replace central NG fired DHW with a central Heat Pump Water Heater System. Provide structural support and roof space for rooftop HPWH units. Allow plumbing chases from the roof top to the mechanical room and provide adequate room and electric capacity for additional pumps.
Renewable Energy Systems:	Site PV	Install the ballasted system from the above solar study. During the design and as practical, the mechanical roof mounted equipment will be mounted on the building to accommodate future renewables and electrical conduits will be installed between the roof and central electrical switchgear rooms. Space will be identified during the design to show future location of inverters, storage, and related equipment.
Other Strategies:	Embodied Carbon	Kieran Timberlake conducts whole-building LCA on all projects using Tally®, a software developed by the firm to enable real-time embodied carbon and environmental impact data to inform design decisions. Through targeted LCA studies and review of product EPDs, this approach has reduced embodied carbon and other environmental impacts buildings and reduced or eliminated products containing chemicals from Living-Future's red-list. A whole-building LCA is underway for the MIT West Campus Graduate Student Dormitory and to date, embodied carbon analysis is being conducted on specific building assemblies to inform design.

Local Utility and Agency Support

The Mass Save® program has the goal of helping residents and businesses across Massachusetts save money and energy, leading the state to a clean and energy-efficient future. The program is composed of local electric and natural gas utilities and energy efficiency service providers who are taking strides in energy efficiency. These sponsors include Berkshire Gas, Blackstone Gas Company, Cape Light Compact, Columbia Gas, Eversource, Liberty Utilities, National Grid, and Unitil. Residential and mixed-use new construction projects or greater than-50% gut rehab projects—all four stories or more—are eligible to participate if located within a Sponsor's service territory. Incentives and rebates are available for both residential in-unit and common area energy efficiency measures. Incentives are awarded based on annual site energy saved. Incentives are determined by the amount of electric savings, natural gas fuel savings, and overall performance compared to the program-provided energy

model. This model compares efficiencies of windows, insulation, mechanical equipment, lighting, and appliances.

The project team recently reached out to Mass Save, during the schematic development phase, to receive information regarding technical support and potential incentives. The project team is waiting to be assigned a dedicated Mass Save Account Manager for guidance throughout the process. Account Managers provide ongoing technical support throughout construction including optional design charrettes in order to increase efficiency beyond the Baseline. The project team is prepared to provide detailed project information outlining all qualifying energy efficiency equipment and measures being installed as well as plans, specifications, and approved submittals to help facilitate this process.

As a member of the Carbon Leadership Forum (CLF) Boston, Karla Butterfield, the project's LEED Green Rater, has engaged other members of the CLF Boston in a dialogue about embodied carbon for this project. Born from the Embodied Carbon in Buildings Workshop (MIT, May 31, 2019) the CLF Boston is a valuable resource for assessing building materials including, but not limited to, concrete, steel, insulation, carpeting and furnishings.

The project team intends to leverage both private and public organizations to help ensure the thermal envelope, mechanical equipment, appliances and fixtures are assessed for water, energy and material efficiency.

Green Building Project Checklist

Green Building

Project Location: Cambridge, MA

Applicant

Name: MIT West Campus Graduate Student DormitoryAddress: 269-301 Vassar St., Cambridge MA 02139

Contact Information

Email Address: kbutterfield@swinter.comTelephone #: 203-857-0200 x3030

Project Information (select all that apply):

- New Construction – GFA: 326,091 sf
- Addition – GFA of Addition: _____
- Rehabilitation of Existing Building – GFA of Rehabilitated Area: _____
- Existing Use(s) of Rehabilitated Area: _____
- _____
- Proposed Use(s) of Rehabilitated Area: _____
- _____
- Requires Planning Board Special Permit approval
- Subject to Section 19.50 Building and Site Plan Requirements
- Site was previously subject to Green Building Requirements

Green Building Rating Program/System:

- Leadership in Energy and Environmental Design (LEED) – Version: 4
- Building Design + Construction (BD+C) – Subcategory: _____
- Residential BD+C – Subcategory: _____
- Interior Design + Construction (ID+C) – Subcategory: _____
- Other: Homes - Multifamily Midrise
- Passive House – Version: _____
- PHIUS+
- Passivhaus Institut (PHI)
- Other: _____
- Enterprise Green Communities – Version: _____



Project Phase

SPECIAL PERMIT

Before applying for a building permit, submit this documentation to CDD for review and approval.

Required Submissions

All rating programs:

- Rating system checklist
- Rating system narrative
- Net zero narrative (see example template for guidance)
- Affidavit signed by Green Building Professional with attached credentials – use City form provided (Special Permit)



Project Phase

BUILDING PERMIT

Before applying for a building permit, submit this documentation to CDD for review and approval.

Required Submissions

All rating programs:

- Rating system checklist – updated from any prior version
- Rating system narrative – updated from any prior version with additional supporting information from construction documents
- Net zero narrative – updated from any prior version (see example template for guidance)
- Energy Simulation Tool results demonstrating compliance with selected rating system. *[Note: For Passive House rating program, must use WUFI Passive, Passive House Planning Package (PHPP), or comparable software tool authorized by Passive House.]*
- Credentials of Green Commissioning Authority (or copy of contract between developer and Commissioning Authority if an independent consultant or subcontractor), including documentation of Green Commissioning process experience on at least two building projects with a scope of work similar to the proposed project extending from early design phase through at least ten (10) months of occupancy
- Affidavit signed by Green Building Professional with attached credentials – use City form provided (Building Permit)

Passive House rating program only:

- Letter of intent from Passive House rater/verifier hired for on-site verification, with credentials of rater/verifier
- Credentials of Certified Passive House Consultant who has provided design, planning, or consulting services (if different from the Green Building Professional for the project)
- Construction drawings and specifications



Project Phase

CERTIFICATE OF OCCUPANCY

Before applying for a certificate of occupancy, submit this documentation to CDD for review and approval.

Required Submissions

All rating programs:

- Rating system checklist – updated from any prior version
- Rating system narrative – updated from any prior version with additional supporting information from as-built conditions
- Net zero narrative – updated from any prior version (see example template for guidance)
- Energy Simulation Tool results demonstrating compliance with selected rating system, updated to as-built conditions. *[Note: For Passive House rating program, must use WUFI Passive, Passive House Planning Package (PHPP), or comparable software tool authorized by Passive House.]*
- Affidavit with schedule of commissioning requirements signed by Green Commissioning Authority, with attached credentials – use City form provided (Certificate of Occupancy)
- Affidavit signed by Green Building Professional with attached credentials – use City form provided (Certificate of Occupancy)

Passive House rating program only:

- Pressure Test Verification
- Ventilation Commissioning
- Quality Assurance Workbook
- Final testing and verification report from rater/verifier



Affidavit Form for Green Building Professional Special Permit

Green Building

Project Location: 269-301 Vassar Street, Cambridge, MA

Green Building Professional

Name: Paula M. Zimin

Architect

Engineer

Mass. License Number: LEED AP BD+C #41637 / NY Registered Architect License #041233

Company: Steven Winter Associates, Inc.

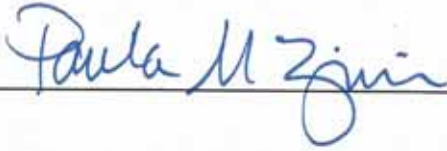
Address: 61 Washington Street, Norwalk, CT 06854

Contact Information

Email Address: pzimin@swinter.com

Telephone Number: 212-564-5800 x1170

I, Paula M. Zimin, as the Green Building Professional for this Green Building Project, have reviewed all relevant documents for this project and confirm to the best of my knowledge that those documents indicate that the project is being designed to achieve the requirements of Section 22.24 under Article 22.20 of the Cambridge Zoning Ordinance.



November 20, 2020

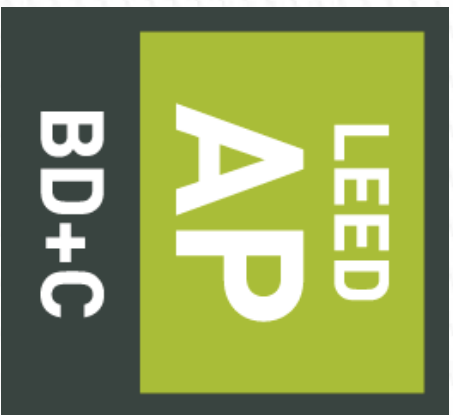
(Signature)

(Date)

Attach either:

- Credential from the applicable Green Building Rating Program indicating advanced knowledge and experience in environmentally sustainable development in general as well as the applicable Green Building Rating System for this Green Building Project.
- If the Green Building Rating Program does not offer such a credential, evidence of experience as a project architect or engineer, or as a consultant providing third-party review, on at least three (3) projects that have been certified using the applicable Green Building Rating Program.





41637-AP-BD+C

CREDENTIAL ID

09 NOV 2009

ISSUED

07 NOV 2021

VALID THROUGH

GREEN BUSINESS CERTIFICATION INC. CERTIFIES THAT

Paula Zimin

HAS ATTAINED THE DESIGNATION OF

**LEED AP[®] Building Design +
Construction**

by demonstrating the knowledge and understanding of green building practices and principles needed to support the use of the LEED green building program.

A handwritten signature in black ink that reads "Mahesh Ramanujan".

MAHESH RAMANUJAN
PRESIDENT & CEO, U.S. GREEN BUILDING COUNCIL
PRESIDENT & CEO, GREEN BUSINESS CERTIFICATION INC.