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## **II – LEED Narrative and Somerville Sustainability Questionnaire**





**Alta XMBLY**  
**290 Revolution Drive**  
*Somerville, MA*

**Wood Partners**

**Green Building Report**  
**LEED v4 Midrise**

*July 2, 2018*



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## **LEED FOR HOMES MULTIFAMILY MIDRISE VERSION 4**

The Project Team will incorporate sustainable principles into its design, construction, and operation of the Alta XMBLY Project. The Project will meet its sustainability goals by achieving certifiability through the United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Building Design and Construction (BD+C) for Multifamily Midrise Version 4 (LEED MR) rating system. Implementation of LEED certifiability ensures the Project design includes the following sustainability principles:

- An integrated team, members of which will be in constant communication throughout the design and construction process;
- Environmentally friendly site design and consideration of landscaping that benefits both residents and the surrounding habitats;
- Efficient water use that minimizes waste and maximizes applicable technology;
- Energy efficiency through installation of high-efficiency equipment and a right-sized system design;
- Healthy materials and finishes throughout all interior spaces, reducing health effects on residents; and
- Effective ventilation and exhaust systems design to ensure continued health and air quality throughout the life of each building.

The narrative below details the strategies by which the Project will meet various prerequisite and credit requirements under LEED MR.

### **HOME SIZE ADJUSTMENT**

Using the Home Size Adjustment Calculator, the average home size point adjustment is +9.5 points.

### **INTEGRATIVE PROCESS**

The design team includes an architect, mechanical engineer, and sustainable design consultant. The team members have met monthly throughout the LEED planning, preliminary design, and design development stages of the planning process.

### **LOCATION AND TRANSPORTATION**

The Location and Transportation (LT) category addresses reduction of urban sprawl and rewards development on and near previously existing infrastructure, public transportation, and developed land.

## LLp Floodplain Avoidance

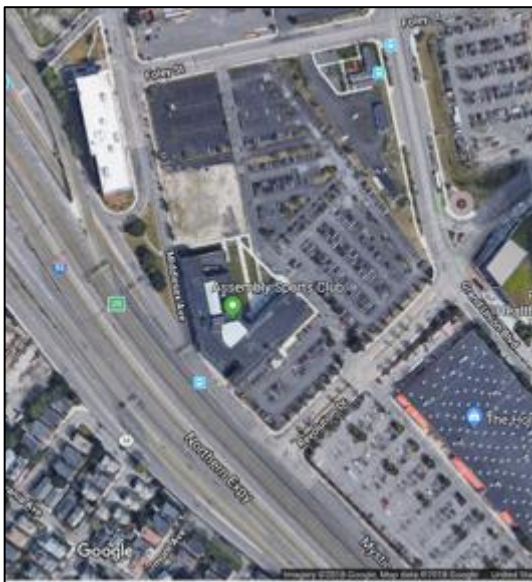
The site has been previously developed and is exempt from this prerequisite.

## LTc Site Selection (7 points)

**Previously Developed Land** (4 pts). The Project is located on a lot that is at least 75% previously developed

**Infill Land** (2 pts). The Project is located on a lot with a perimeter of >75% previously developed land; this qualifies as infill land.

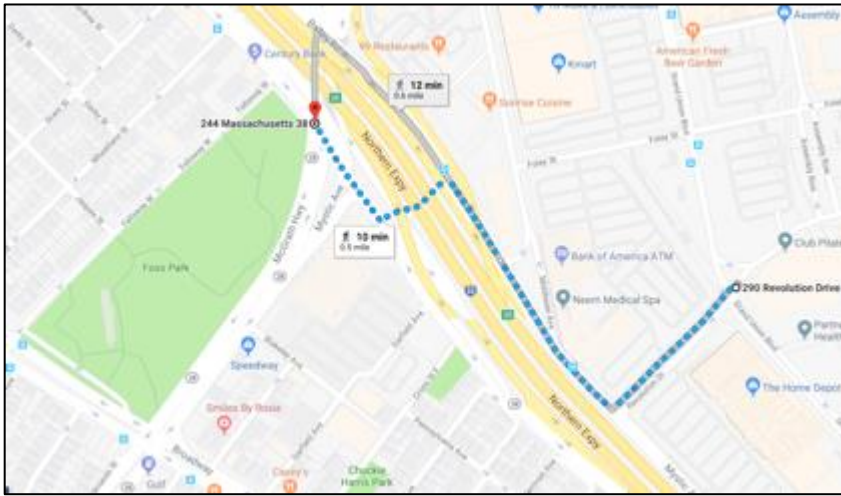
Existing Conditions demonstrating compliance with Previous Develop and Infill requirements can be seen on the Aerial Maps, below.



*LTc Site Selection. Aerial Map of Existing Conditions at Alta XMBLY.*

**Access to Open Space** (1 pt). Alta XMBLY residents have nearby (within ½-mile walking distance) access to open space at least ¾ acre in size, at Foss Park, which is 15 acres in size – see walking distance maps below.





*LTc Site Selection – 1/2-mile walking distance to Open Space at Foss Park.*

### **LTc Compact Development (3 points)**

The Project is designed with the following site density:

- 329 units within 1.65 acres for a density of 199 units per acre

### **LLc Community Resources (2 points)**

The Project is located within 1/2-mile walking distance of the following Community Resources. Both buildings meet the credit threshold of 12 accessible resources, for two (2) points:

#### ***Services and Walking Distances to Alta XMBLY:***

##### *Services*

1. Restaurant: Sunrise Cuisine – 0.1 mile
2. Restaurant: American Fresh Beer Garden – 0.3 mile
3. Gym/ health club: Club Pilates – 0.3 mile
4. Gym/ health club: TITLE Boxing Club – 0.3 mile
5. Hair Salon: SoMa Salon and Spa – 0.3 mile

##### *Food Retail*

6. Supermarket: Trader Joes – 0.4 mile
7. Supermarket: Stop & Shop – 0.3 mile

##### *Community-Serving Retail*

8. Clothing Store: TJ Maxx – 0.3 mile
9. Clothing Store: Nike Factory Store – 0.3 mile
10. Hardware Store: Home Depot – 0.2 mile

##### *Civic and Community Facilities*

11. AMC Assembly Row 12 – 0.3 mile
12. Sylvester Baxter Riverfront Park – 0.4 mile



*L7c Community Resources. Map).*

## **LLc Access to Transit (2 points)**

The Project is located 0.4-mile walking distance of the Assembly Square MBTA subway station. This station provides residents with 268 weekday trips and 214 weekend trips. The site is also 0.2 miles from the Grand Union Blvd @ Foley Street bus station which serves the 90 and 92 busses, which has 38 weekday and 26 weekend and 82 weekday and 54 weekend trips, respectively, qualifying for two (2) points via credit thresholds.

## **SUSTAINABLE SITES**

The Sustainable Sites (SS) category addresses environmental issues related to landscape and site design, ensuring a seamless co-existence between the built environment and the natural environment.

## **SSp Construction Activity Pollution Prevention**

The Project will provide a Stormwater Pollution Prevention Plan (SWPPP) to minimize runoff and wind erosion from the site throughout Construction. All members of the demolition and construction teams will adhere to the SWPPP. Daily, weekly, and monthly inspections will ensure that installed methodology is kept in good condition. Additionally, the plan will address the following requirements, as applicable:

1. Protection of stockpiles and disturbed soil during on-site storage for reuse,
2. Control of path and velocity of runoff from site,
3. Protection of on-site storm sewer inlets and water bodies,
4. Diversion of runoff from site hillsides,
5. Protection of erosion from site slopes 15%, or greater, and
6. Prevention of air pollution from dust and particulate matter.

## **SSp No Invasive Plants**

The project team has committed to specifying no species listed on the National Association of Exotic Pest Plant Council's list of invasive plants for the state of Massachusetts.

## **SSc Nontoxic Pest Control (2 point)**

The Project will include the following nontoxic pest-deterrent design methodology:

1. For below-grade walls, use solid concrete foundation walls, masonry walls with a course of solid block bond beam, or concrete-filled block.
2. 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 (e.g., dryer vents).
3. 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
4. Design landscape features to provide a minimum 18-inch (450 millimeters) space between the exterior wall and any plantings.

At construction completion, the Project will also develop an integrated pest management policy for distribution to residents. This document will include information on the following:

1. Pesticide use,
2. Housekeeping, and
3. Prompt reporting of any observed pest problems within the building(s).

## **WATER EFFICIENCY**

The Water Efficiency (WE) category addresses environmental degradation related to overuse of potable water within residential buildings and irrigation systems.

### **WEp Water Metering** *LEED H and H Midrise*

The Project will include at least one whole-house water meter.

### **WEc Indoor Water Use (9 pts)**

The Project will specify 1.0 gpm lavatory faucets, 1.5 gpm kitchen faucets, 1.5 gpm showerheads, 1.28 gpf toilets, and ENERGY STAR certified dishwashers and clothes washers to achieve a 45% reduction in water use.

## **ENERGY AND ATMOSPHERE**

The Energy and Atmosphere (EA) category addresses ongoing energy usage and continued building performance.

### **EAp Minimum Energy Performance**

The Project will meet all applicable requirements of the Massachusetts Stretch Energy Code. Energy modeling has not yet been completed but will be available prior to final permitting.

### **EAp Energy Metering**

The Project will install individual electric and gas meters for each residential unit as well as a central meter for the building.

### **EAp Education of Homeowner, Tenant, or Building Manager**

At construction completion, NEI will work with Wood Partners to develop an Operations Training Manual that describes the sustainable aspects of installed systems and assemblies. All operations staff will participate in a 1-hour training walk through to view and inspect installed equipment.

Additionally, NEI will work with Wood Partners to develop a Resident Green Guide to be distributed to applicable staff and/or residents at building occupancy. Distribution will be accompanied by copies of the LEED checklist as well as a 1-hour walk-through of the building and units to highlight installed LEED-related items.

### **EAc Annual Energy Use (5 pts)**

The Project will meet all applicable requirements of the Massachusetts Stretch Energy Code. While Energy Modeling has not been completed at this time, we conservatively estimate a *minimum* 10% reduction in energy cost below the ASHRAE baseline.

## **MATERIALS AND RESOURCES**

The Materials and Resources (MR) category addresses all installed materials, including framing and interior finishes, as well as diversion of waste from landfills.

### **MRp Certified Tropical Wood**

The Project will utilize non-tropical wood products, or if necessary, Forestry Stewardship Council (FSC)-certificated products for necessary woods from tropical countries. The builder will provide a letter stating this preference to all relevant sub-contractors.

## **MRp Durability Management**

Each building will meet the requirements of the ENERGY STAR for Certified Homes, version 3, Water Management System Builder Checklist. Additionally, the following interior water management measures will be installed:

1. Nonpaper-faced backer boards (or mold-resistant board) will be installed in all areas directly above the bathtub spa, or shower, as well as at any exposed wall or wall area behind fiberglass enclosures of tubs or showers – see specification excerpt below for more information.
2. Water-resistant flooring is specified in all kitchen, bathrooms, laundry, and spa areas and at all exterior doors.
3. Tankless gas-fired water heaters will be used for hot water heating
4. Install drain or drain pan under all clothes washers installed in, or over, living space, and
  - a. Drain pans will be installed under all clothes washers.
5. Exhaust all conventional clothes dryers directly to the outdoors
  - a. All dryers will be exhausted directly to the outdoors through rigid ductwork.

## **MRc Construction Waste Management (2 point)**

The Project will implement a Construction Waste Management Plan which requires waste haulers to prioritize recycling of construction waste and diversion from landfills and incinerators to the greatest extent possible. The waste hauler shall provide documentation of all waste removed from the site at least monthly to show a diversion rate of 40% below the baseline or greater.

## **INDOOR ENVIRONMENTAL QUALITY**

The Indoor Environmental Quality (IEQ) category addresses the exhaust and ventilation of all interior spaces within the building, ensuring a consistent healthy environment for building residents.

### **IEQp Ventilation**

The Project will design and install a whole-unit ventilation system for each individual dwelling unit, complying with the mechanical ventilation requirements of ASHRAE 62.2-2010. Non-unit spaces will meet the minimum requirements of ASHRAE 62.1-2010.

This includes provision of direct exhaust air to each residential unit, and confirmation that all inlets are located at least 10-feet away from all known sources of contamination, including exhaust outlets.

### **IEQp Combustion Venting**

The Project has designed the residential units without unvented combustion appliances, fireplaces, and with Carbon Monoxide (CO) monitors on each floor of all units.

### **IEQp Garage Pollutant Protection**

The garage will be separated from the conditioned spaces with a monolithic concrete slab with all penetrations fully sealed. Stairwells and elevator lobbies shall have self-closing weather-stripped doors and shall be fully air sealed from the garage. Carbon monoxide detectors shall be installed in rooms adjacent to the garage.

### **IEQp Radon-Resistant Construction**

The living spaces are separated from the ground with the garage, which will have active ventilation.

### **IEQp Air Filtering**

All Project mechanical ventilation ductwork and equipment will include minimum MERV 8 filtration media to ensure that harmful particulates are filtered out of the air stream, prior to entry into the interior spaces.

### **IEQp Environmental Tobacco Smoke**

Alta XMBLY will prohibit smoking within all areas of the building. This policy will be communicated to residents through rental agreements. Exterior designated smoking areas will be identified with signage and located at least 25-feet from all building entries, air intakes, and operable windows.

### **IEQp Compartmentalization**

The Project will compartmentalize each residential unit to minimize leakage. Each unit will be tested for leakage and will demonstrate compliance with the maximum allowable leakage of 0.23 CFM50 via blower door testing at construction completion.

### **IEQc Enhanced Ventilation (3 points)**

The Project will include a continuously operating exhaust fan in each unit of the building. Additionally, fresh air will be supplied to both the units and the common spaces of the building, providing balanced ventilation throughout.

### **IEQc Balancing of Heating and Cooling Distribution Systems (3 points)**

1. The average unit size is less than 1,200 square feet and automatically meets the requirements of the credit.
2. Each unit will be tested to confirm that supply air-flow rates are within 20% of ACCA calculated values.
3. Each bedroom will be tested to demonstrate a pressure difference of less than 3 Pa with respect to the main body of the building when the air handler is running and doors are closed.

### **IEQc Enhanced Combustion Venting (1 point)**

The Project will only install natural gas equipment listed by an approved safety testing facility. Any fireplaces installed will be in the amenity space and will have permanently fixed glass front and an electronic pilot with direct venting.

### **IEQc Enhanced Garage Pollutant Protection (1 point)**

The garage exhaust will meet the requirements of ASHRAE 62.1-2010. The exhaust fan will run continuously with increased exhaust if CO levels are elevated.

### **IEQc Environmental Tobacco Smoke**

Alta XMBLY will prohibit smoking within all areas of the building. This policy will be communicated to residents through rental agreements. Exterior designated smoking areas will be identified with signage and located at least 25-feet from all building entries, air intakes, and operable windows.

## **INNOVATION**

The Innovation and Design Process (ID) category encourages project planning and design to improve the coordination and integration of the various elements in a green home.

### **IDp Preliminary Rating**

The preliminary Project design indicated LEED Certifiability for the building. An updated checklist is attached in Appendix A, for review.

### **IDc LEED AP Homes (1pt)**

Eli Herman, of NEI, holds a LEED AP Homes credential and is an integrated member of the Project Team; his credentialing certificate can be seen in Appendix C, attached.

## **REGIONAL PRIORITY**

The Regional Priority (RP) category encourages projects to pursue existing checklist credits that have identified by the United States Green Building Council (USGBC) as “high-priority” for the project location and region.

The following credits have been identified for the building

1. Access to Transit (1pt)
2. Balancing of Heating and Cooling Distribution Systems (1 pt)
3. Nontoxic Pest Control (1 pt)



## **APPENDIX A: LEED CHECKLIST**



**ALTA XMBLY Scorecard**

Location: 290 Revolution Drive, Somerville, MA 2145, USA

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



Integrative Process		Preliminary	Y	1 of 2	M	0	Verified	0
IPc	Integrative Process			1 of 2		0		



Location and Transportation		Preliminary	Y	14 of 15	M	0	Verified	0
LTP	Floodplain Avoidance			Required				Not Verified
<i>Performance Path</i>								
LTc	LEED for Neighborhood Development			0 of 15		0		
<i>Prescriptive Path</i>								
LTc	Site Selection			7 of 8		0		
LTc	Compact Development			3 of 3		0		
LTc	Community Resources			2 of 2		0		
LTc	Access to Transit			2 of 2		0		



Sustainable Sites		Preliminary	Y	4 of 7	M	0	Verified	0
SSp	Construction Activity Pollution Prevention			Required				Not Verified
SSp	No Invasive Plants			Required				Not Verified
SSc	Heat Island Reduction			2 of 2		0		
SSc	Rainwater Management			0 of 3		0		
SSc	Nontoxic Pest Control			2 of 2		0		



Water Efficiency		Preliminary	Y	8 of 12	M	0	Verified	0
WEp	Water Metering			Required				Not Verified
<i>Performance Path</i>								
WEc	Total Water Use			0 of 12		0		
<i>Prescriptive Path</i>								
WEc	Indoor Water Use			4 of 6		0		
WEc	Outdoor Water Use			4 of 4		0		



Energy and Atmosphere		Preliminary	Y	13.5 of 37	M	3.5	Verified	0
EAp	Minimum Energy Performance			Required				Not Verified
EAp	Energy Metering			Required				Not Verified
EAp	Education of the Homeowner, Tenant or Building Manager			Required				Not Verified
EAc	Annual Energy Use			13.5 of 30		1.5		
EAc	Efficient Hot Water Distribution System			0 of 5		2		
EAc	Advanced Utility Tracking			0 of 2		0		



Materials and Resources		Preliminary	Y	2 of 9	M	3	Verified	0
MRp	Certified Tropical Wood			Required				Not Verified
MRp	Durability Management			Required				Not Verified
MRC	Durability Management Verification			0 of 1		0		
MRC	Environmentally Preferable Products			0 of 5		3		
MRC	Construction Waste Management			2 of 3		0		



Indoor Environmental Quality		Preliminary	Y	9 of 18	M	3.5	Verified	0
EQp	Ventilation			Required				Not Verified
EQp	Combustion Venting			Required				Not Verified
EQp	Garage Pollutant Protection			Required				Not Verified
EQp	Radon-Resistant Construction			Required				Not Verified
EQp	Air Filtering			Required				Not Verified
EQp	Environmental Tobacco Smoke			Required				Not Verified

<b>EQp</b>	Compartmentalization	Required		Not Verified
<b>EQc</b>	Enhanced Ventilation	3 of 3	0	
<b>EQc</b>	Contaminant Control	0 of 2	0.5	
<b>EQc</b>	Balancing of Heating and Cooling Distribution Systems	3 of 3	0	
<b>EQc</b>	Enhanced Compartmentalization	0 of 3	0	
<b>EQc</b>	Combustion Venting	1 of 2	0	
<b>EQc</b>	Enhanced Garage Pollutant Protection	1 of 1	0	
<b>EQc</b>	Low-Emitting Products	0 of 3	3	
<b>EQc</b>	No Environmental Tobacco Smoke	1 of 1	0	



<b>Innovation</b>		<b>Preliminary</b>	Y	3 of 6	M	0	<b>Verified</b>	0
<b>INp</b>	Preliminary Rating	Required					Not Verified	
<b>INc</b>	Innovation	2 of 5		0				
<b>INc</b>	LEED Accredited Professional	1 of 1		0				



<b>Regional Priority</b>		<b>Preliminary</b>	Y	3 of 4	M	0	<b>Verified</b>	0
<b>RPc</b>	Regional Priority	3 of 4		0				

<b>Point Floors</b>								
The project earned at least 8 points total in Location and Transportation and Energy and Atmosphere								No
The project earned at least 3 points in Water Efficiency								No
The project earned at least 3 points in Indoor Environmental Quality								No
<b>Total</b>		<b>Preliminary</b>	Y	57.5 of 110	M	10	<b>Verified</b>	0

**Certification Thresholds**    Certified: 40-49, Silver: 50-59, Gold: 60-79, Platinum: 80-110

## **APPENDIX B: LEED ACCREDITED PROFESSIONAL CERTIFICATE**





10566540-AP-HOMES

CREDENTIAL ID

23 FEB 2018

ISSUED

22 FEB 2020

VALID THROUGH

GREEN BUSINESS CERTIFICATION INC. CERTIFIES THAT

**Eli Herman**

HAS ATTAINED THE DESIGNATION OF

**LEED AP<sup>®</sup> Homes**

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, reading "Mahesh Ramanujan".

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





## **APPENDIX C: MULTIFAMILY HOMESIZE ADJUSTMENT CALCULATOR**



## Multifamily Home Size Adjuster

This approach can be used to determine an overall home size adjuster for multifamily buildings.

Input the number of units and the average square footage for units with the corresponding bedroom number. For example, if the building has three 2-bedroom units that are 1300 sq ft, 1400 sq ft, and 1500 sq ft, insert "3" in cell G9 and "1400" in cell H9. Please leave zeroes or blanks where appropriate.

This approach can also be used to determine an overall home size adjuster for a complex with multiple residential buildings. If a project includes multiple residential buildings, add all the buildings together like it's a single-mega structure. For example, if building A has four 2-bedroom units and building B has six 2-bedroom units, insert "10" in cell G9. Average the square footage for all units in the complex with the corresponding bedroom quantity.

Building ID	0 Bedrooms		1 Bedroom		2 Bedrooms		3 Bedrooms		4 Bedrooms		5 Bedrooms		6 Bedrooms	
	Number of Units	Average Floor Area (sq ft)	Number of Units	Average Floor Area (sq ft)	Number of Units	Average Floor Area (sq ft)	Number of Units	Average Floor Area (sq ft)	Number of Units	Average Floor Area (sq ft)	Number of Units	Average Floor Area (sq ft)	Number of Units	Average Floor Area (sq ft)
Home size adjustment	48	499.55	198	855.28	71	993.80	12	1,126.00						
Point adjustment	50%		34%		38%		49%		0%		0%		0%	
Total number of units	12.5		8.6		9.5		12.2		0.0		0.0		0.0	
Average home size point adjustment														9.5



This document outlines development review application requirements in relation to the long-term environmental sustainability and climate resilience of buildings within Somerville. Development proposals that require Site Plan Approval by the Somerville Zoning Ordinance must include a completed Sustainable & Resilient Buildings Questionnaire with the required Development Review Application. A Development Review Application is considered incomplete unless a completed questionnaire is submitted with the application.

The purpose of this questionnaire is to ensure that the impacts of future climate conditions are carefully evaluated and to encourage reasonable efforts to reduce or eliminate greenhouse gas emissions and mitigate the impacts related to climate change in the design, construction, and occupancy of buildings. Completion of this questionnaire raises awareness of site specific vulnerability, ensures that future climate conditions are considered throughout the stages of development.

Please review the following documents before completing the questionnaire:

- [Somerville Climate Change Vulnerability Assessment](#)
- [Carbon Neutrality Pathway Assessment](#)

## **RESOURCES:**

For information on net-zero and resilient building and site design, please review the following resources:

- [Architecture 2030 Palette \(Net-zero design tools\)](#)
- [Building Resilience in Boston](#)
- [Enhancing Resilience in Boston](#)
- [A Better City's Resiliency Toolkit](#)
- [Ready to Respond: Strategies for Multifamily Building Resilience](#)

For additional information visit [www.somervillema.gov/sustainaville](http://www.somervillema.gov/sustainaville)

## **PROCEDURE:**

A completed Sustainable & Resilient Buildings Questionnaire must be submitted with a Development Review Application for all development proposals that require Site Plan Approval. New construction or alterations to existing structures of 25,000 square feet or more must also submit an updated questionnaire prior to the issuance of the first Building Permit and prior to the issuance of the first Certificate of Occupancy to identify any design changes made subsequent to Site Plan Approval or additional information determined as the development process unfolds.

## **BACKGROUND: CARBON NEUTRALITY**

Understanding the global imperative to reduce greenhouse gas emissions in order to prevent extreme changes to the climate, Mayor Joseph A. Curtatone set a goal for Somerville to become carbon neutral by the year 2050. In 2017, the Somerville Board of Aldermen passed a resolution re-affirming the city's carbon neutrality goal. Carbon neutrality is defined as the net-zero release of carbon dioxide and other greenhouse gases (GHG) within Somerville's municipal boundary.

To achieve carbon neutrality by 2050, Somerville will need to drastically reduce greenhouse gas emissions from electricity, buildings, transportation, and waste disposal. Development within the city will need to be high performing and progressively improve its energy performance to become carbon neutral. Buildings should be designed to maximize energy efficiency, produce or procure renewable energy, and phase out fossil fuel use.

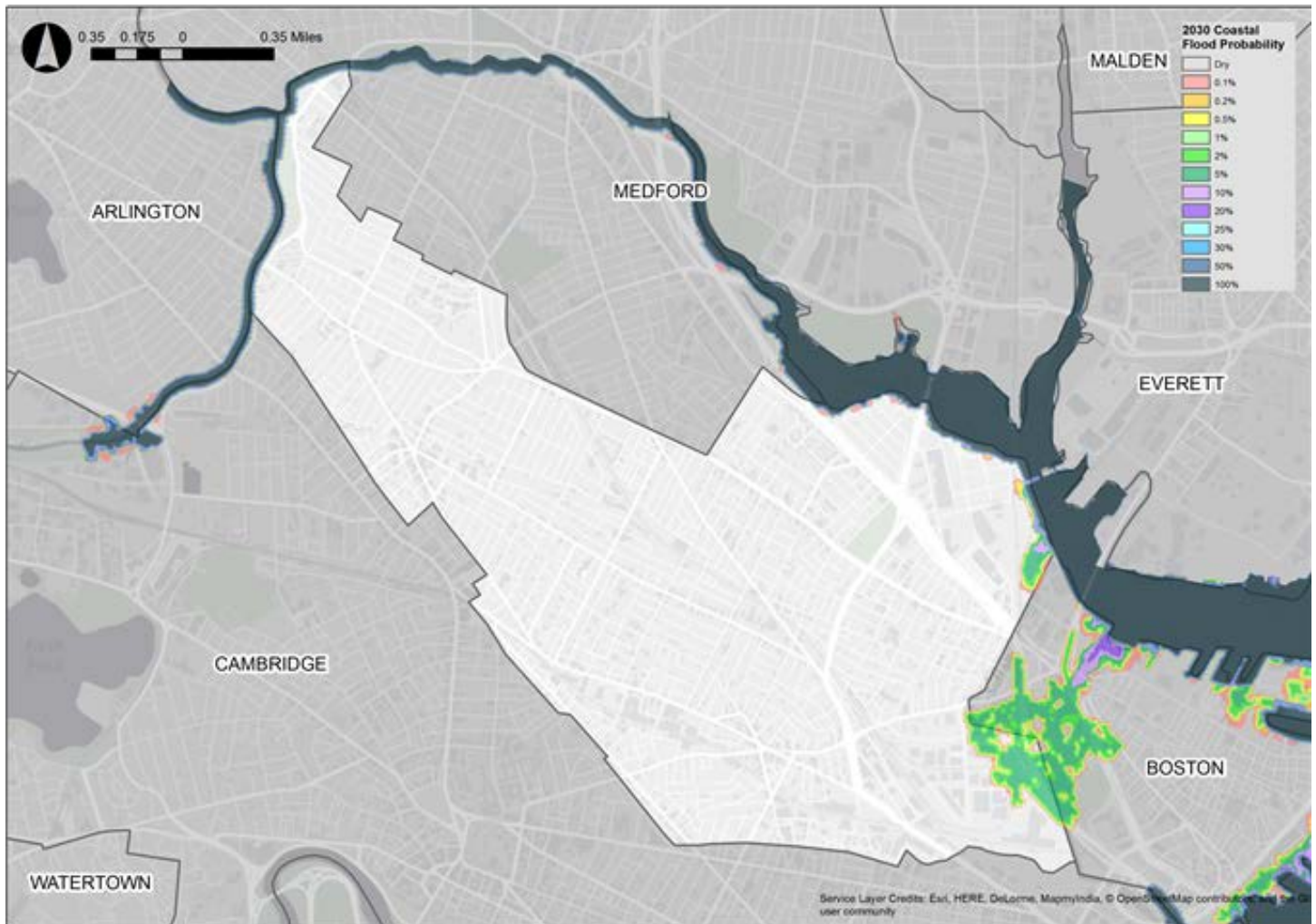
## **BACKGROUND: CLIMATE CHANGE VULNERABILITY**

Despite efforts to minimize greenhouse gas emissions, climate change is already impacting the City of Somerville and changes to the climate will continue to intensify unless global emissions are swiftly and significantly reduced. The City of Somerville's Climate Change Vulnerability Assessment analyses vulnerabilities associated with Somerville's key climate stressors: increased precipitation, sea level rise and storm surge, and higher temperatures. The analysis recommends that new development consider these climate impacts and take appropriate measures to address the projected climatic conditions described in the assessment.

Sea level rise and storm surge are already potential concerns for areas of East Somerville. By 2035-2040, the Amelia Earhart Dam could be regularly flanked by strong storms resulting in flooding for areas of Assembly Square, Ten Hills, and Winter Hill. Additionally, future 100-year (1% annual chance of occurrence) 24-hour storm events are projected to have a more than 30% increase in rainfall. This increased storm water will put additional stress on Somerville's water infrastructure and is likely to worsen precipitation-based flooding across many areas of the city. As the climate continues to change, average seasonal temperatures are expected to increase and the number of days above 90 degrees Fahrenheit (currently about 10 a year) could rise to 40 days by 2030, a third of the summer, and 90 days by 2070, nearly the entire summer.

The following maps and figures provide an overview of projected climate exposure. Please review the Climate Change Vulnerability Assessment for more detailed analysis on Somerville's exposure, vulnerability, and risk to climate change.

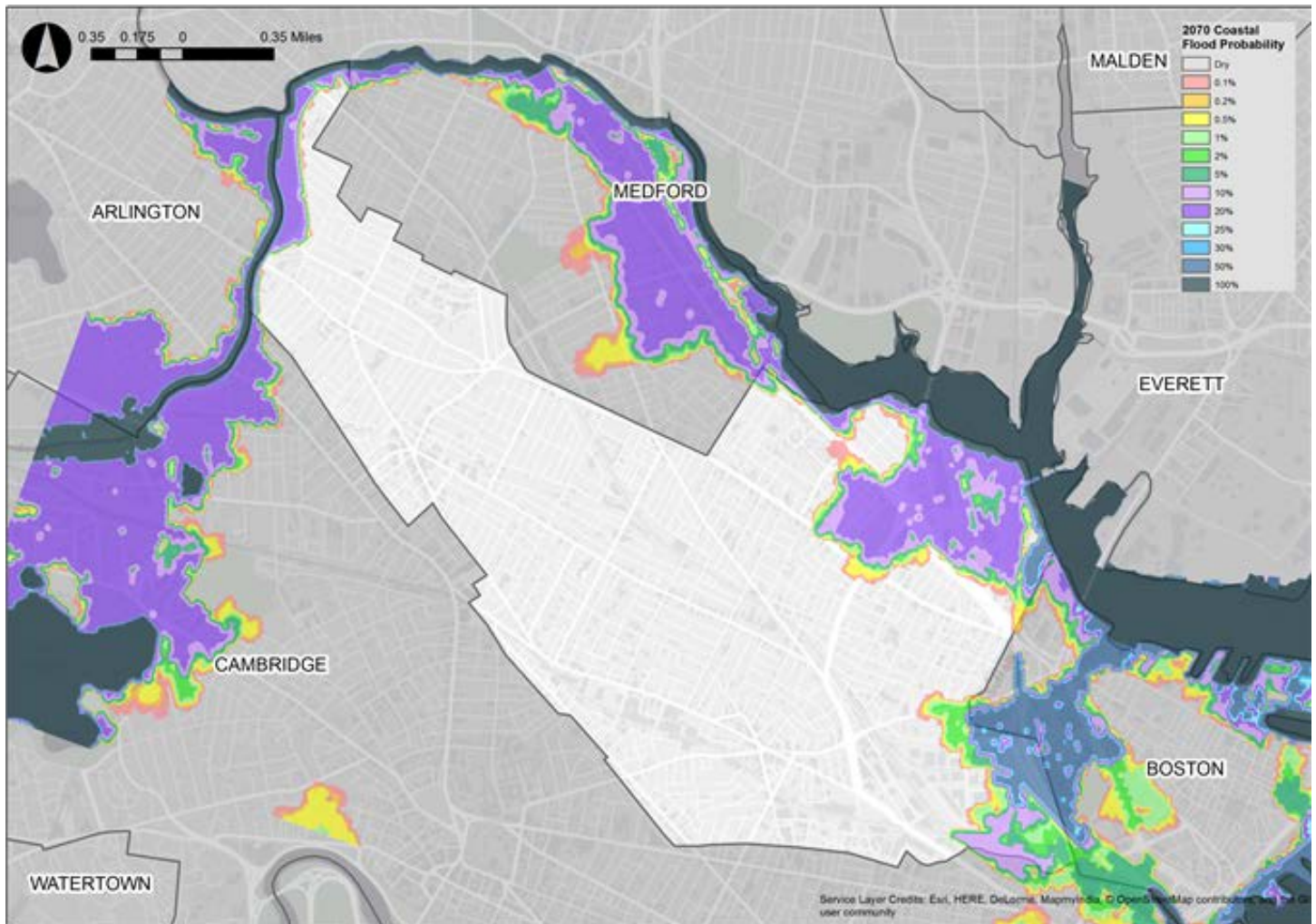
## 2030 Coastal Flood Probability



This map shows the annual chance of flooding from coastal storm events and sea level rise in 2030. A 100% chance of flooding means that area is very likely to flood that year, while a 50% chance means that there is an equal chance that it may or may not flood in a given year. A 1% chance of flooding corresponds with a '100-year event'. A 0.1% chance corresponds with a '1000-year event'. (Somerville Climate Change Vulnerability Assessment, 2017)



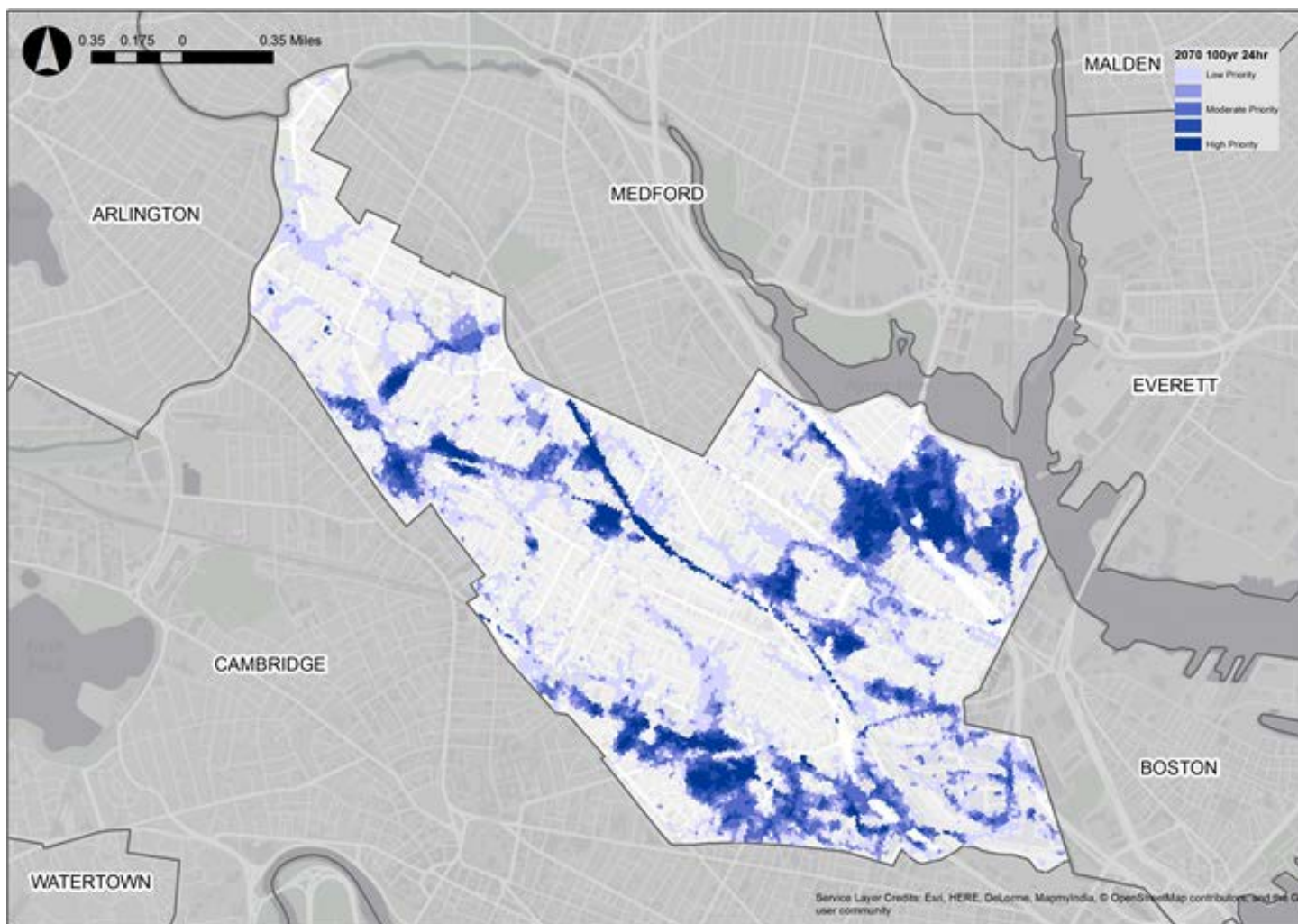
## 2070 Coastal Flood Probability



This map shows the annual chance of flooding from coastal storm events and sea level rise in 2070. A 100% chance of flooding means that area is very likely to flood that year, while a 50% chance means that there is an equal chance that it may or may not flood in a given year. A 1% chance of flooding corresponds with a 100-year event. A 0.1% chance corresponds with a 1000-year event. (Somerville Climate Change Vulnerability Assessment, 2017)



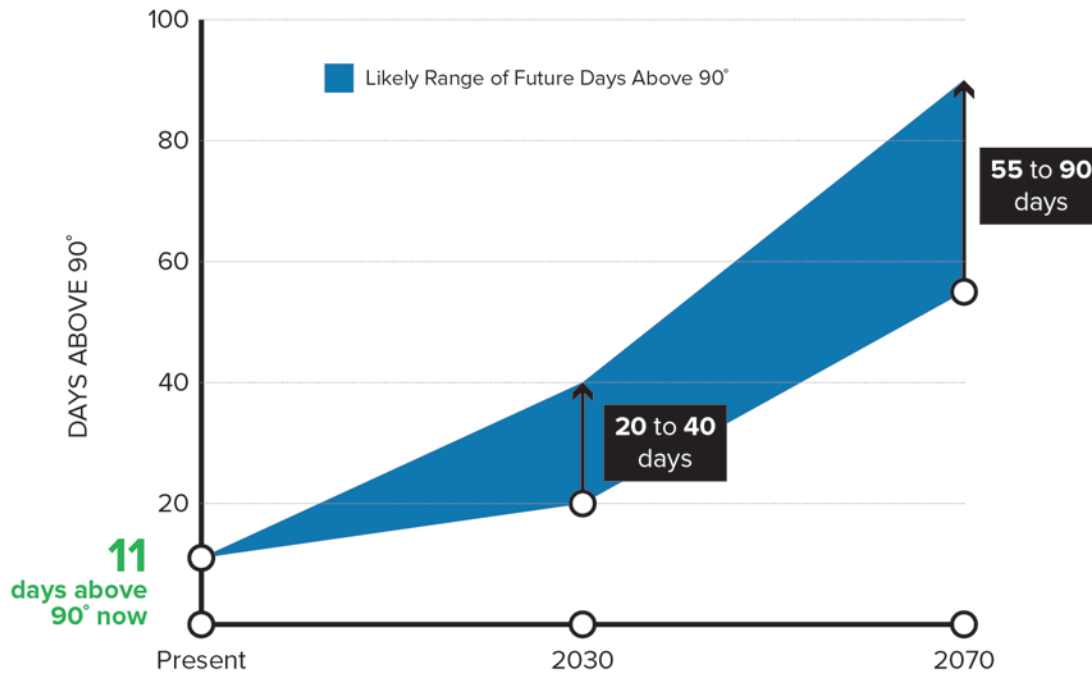
## Precipitation Projections



2070 100-year, 24-hour Design Storm Priority Areas of Flood Concern  
(Somerville Climate Change Vulnerability Assessment, 2017)

Storm Type	Present-day Rainfall	2030 Rainfall	2070 Rainfall
10-year (10%), 24-hour	4.9 in	5.6 in	6.4 in
100-year (01%), 24-hour	8.9 in	10.2 in	11.7 in

## Temperature Projections



(Somerville Climate Change Vulnerability Assessment 2017)

Temperature	1971-2000 (average)	2030		2070	
		(low)	(high)	(low)	(high)
Annual	50.0° F	53.3° F	53.5° F	55.8° F	58.7° F
Summer	70.6° F	74.5° F	74.8° F	77.4° F	80.6° F
Winter	29.8° F	32.2° F	33.0° F	34.6° F	38.0° F

## **SUSTAINABLE & RESILIENT BUILDINGS QUESTIONNAIRE**

### Proposal Information

Proposal Name	ALTA Xmbly (to be revised at a later date)
Address	290 Revolution Drive Somerville, MA 02129
Owner/Developer	WP East Acquisitions, L.L.C.
Business Address	3715 Northside Parkway NW, STE 4-600 Atlanta GA 30327
Designated Contact	Jim Lambert
Telephone Number	(781)-541-5822
Email Address	Jim.Lambert@woodpartners.com

### Design Team

Design Architect	The Architectural Team
Architect of Record	Michael D. Binette
Engineer	Wozny Barbar & Associates
Landscape Architect	Copley Wolff
Sustainability/LEED	New Ecology
Permitting	Nutter McLennen & Fish, LLP
Construction Management	WP East Builders, LLC

### State Review

Is MEPA Approval Required?	Yes/No; Why? Yes
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### Building & Site Details

Building Type	Type IA / IIIA Construction
Gross Floor Area	425,758+/- GSF. (includes all occupied spaces, mechanical and garage areas)
Principal Uses	Assembly, Business, Mercantile, Residential, and Storage (Garage)
Ground Floor Uses	Assembly, Mercantile, Residential, and Storage
Site Elevation	Average Ground Level 13'-0"
Ground Story Elevation	13'-0"
Building Height	# of Stories (feet) 84'-11"
Below Grade Levels	# of Stories (feet) The building is slab on grade, no below grade levels
Ground Water Elevation	Ground water is located between -4'-0" and -5'-0" +/- below grade.
Parking Spaces	199 parking spaces provided (includes ADA, van and EV spaces)
EV Ready Spaces	10 EV spaces at occupancy, 20 additional spaces will be pre-wired for future installation
EV Charging Spaces	Number (by level) 5 @ Level One, 5 @ Level Two at occupancy
Climate Vulnerability Exposure (check all that apply)	<input checked="" type="checkbox"/> Sea Level Rise & Storm Surge <input checked="" type="checkbox"/> Precipitation Induced Flooding <input checked="" type="checkbox"/> Heat <input type="checkbox"/> Other(s):

Green Building

LEED Version

LEED for Homes Multifamily Mid-rise v4

LEED Certifiable

☒ Yes ☐ No

LEED Rating

Silver/Gold/Platinum Silver certifiable

LEED Point Score

57.5

Building Systems

Expected Life of Building

Fifty Years

Critical Site Infrastructure

Water, Drainage, Sewer, Gas, Electrical, Telephone-Communications

Expected Life of Key Systems

Twenty Years

Type of Heating System(s)

High efficiency, dual-purpose, gas-fired heaters producing hot water for domestic usage and building heating; fan-coils with hot water coils and DX split systems.

Type of Cooling System(s)

Condensing units located on roof; environment-friendly refrigerant, R410a.

**Building Energy Use & Continuity**

Reducing greenhouse gas emissions is critical to avoiding the worst impacts of climate change. To achieve Somerville's 2050 carbon neutrality goal, new construction must be designed to maximize energy efficiency, produce or procure renewable energy, and phase out fossil fuel use. At the same time, new development should make efforts to improve resiliency to disruptions in utility services, which could become more frequent with more powerful storm events and heat waves.

1. Explain how building energy loads & performance were determined:

Energy loads & performance were determined using Energy Star Target Finder.

Annual Electric Load	5348 (kWh)
Annual Heating Load	8,870* (MMbtu/hr)
Annual Cooling Load	266,000* (Tons/hr)

Peak Electric Load	2,125 (kW)
Peak Heating Load	6.4* (MMbtu)
Peak Cooling Load	539* (tons)

Energy Use Intensity	107.4 (kBtu/SF)
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2. Describe any strategies that will be implemented to support continued building operations during potential utility outages.

An emergency natural gas fired generator will be provided to support continued building operations during potential utility outages. The generator will have three output breakers and automatic transfer switches to support the fire pump, standby and life safety loads including emergency lighting and fire alarm system.

Back-Up/Emergency Power Systems

Electric Output	400 KW
System Type	Generator

Number of Power Units	1 unit
Fuel Source	Natural Gas

Emergency and Critical System Loads (in the event of service disruption)

Electric 

5,000	(kWh)
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Heating 

0	(MMbtu/hr)
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Cooling 

0	(Tons/hr)
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2. How is the building designed to reduce energy usage? Please describe the key design features of the building including any active (equipment, controls, features, etc.) or passive (orientation, massing, systems, etc.) energy efficiency measures.

The building is designed to reduce energy by providing tankless hot water heaters, high efficiency (>93%+) fan coil heating units equipped with high efficiency EC motors, low flow plumbing fixtures, LED lighting and energy star appliances in all apartment units and common areas. Each apartment contains a seven day programmable thermostat. The building is designed to be LEED Silver certifiable and will exceed the MA Stretch code requirements. A solar ready, high albedo roof is provided to absorb minimal heat.

Energy Use below  
Mass Code

10	%
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Energy Use below  
ASHRAE 90.1  
(current edition)

10	%
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3. Will the building use air or ground source heat pumps or solar thermal systems? Please describe any such system. If no, please explain the building's heating and cooling systems and whether high efficiency electric or renewable powered systems were considered.

The building will not use air or ground source heat pumps or solar thermal systems. The buildings heating and cooling system will be vertical fan-coil units for the individual apartments. However, the building system components will be of high efficiency (water heaters efficiency >93%+, high efficiency EC motors; R410a refrigerant.

4. Describe any existing or planned connections to distributed energy or district energy systems.

The Project will connect to existing electrical ductbanks provided in the adjacent roadways. The project will have (2) 2,500 amp, 120/208V, 3 phase service for the residential use and (1) 3,000 amp, 120/208V, 3 phase services for the house (garage/common areas), restaurant and retail spaces within the building.

5. Is on-site renewable energy generation feasible? Please describe your analysis and findings. If yes, will any renewable energy be produced onsite? If so, please describe (system type and capacity).

The project will provide conduits and structural upgrades to provide a 'solar ready' roof for the future installation of solar PV panels. The mechanical condensing units will be located in the center of the roof above the corridor allowing space for the future solar panels to be located around the perimeter of the roof

6. Describe any on-site energy storage systems.

As described in item 5 above, the project will provide conduits and structural upgrades to provide a 'solar ready' roof for the future installation of solar PV panels. The estimated future PV module quantity is 500 panels at 78" x 39" located between the mechanical units and 10 feet from the roof edge per OSHA guidelines. Estimated future DC power will be 147.5kW based on 500 panels with an average output of 295 watts.

7. Describe any other measures intended to reduce energy use and greenhouse gas emissions.

To reduce energy consumption project will be equipped with high efficiency LED lighting in all residential units and common areas. Low flow/flush WaterSense plumbing fixtures are specified as: 1.28 GMP for toilets, 1.5 GPM for lavatory faucets, kitchen faucets and shower heads for a reduction in water usage of 30% compared to the baseline. Operable windows are provided in the residential units along with tankless, high efficiency (>93%+) hot water heaters, fan-coils with energy efficient motors (ECM), and seven day programmable thermostats.

8. Does the electric utility's infrastructure have enough capacity to support the addition of your



building's energy load? Please confirm that you have consulted with the local utility.

Eversource is the electrical energy provider for the project. We met with Eversource on 7/25/18 to review the proposed loads and requirements for this project and they confirmed the infrastructure has enough capacity to support the project. Please find attached the 'Will Serve' letter from Eversource.

9. Describe measures that will be implemented to reduce building energy demands on utilities and infrastructure, such as a demand response program.

>93% efficient hot water heater utilized for domestic hot water and hydronic heating coil in air handling unit within residential units, well as 90% efficient LED lighting and 7-day programmable thermostats will help reduce the energy demands on utilities.

The City of Somerville recognizes that as technology advances, incorporating design elements to mitigate carbon emissions and increase resilience may become more feasible. Applicants are encouraged to devise strategies that permit building systems to adapt and evolve over time to further reduce GHG emissions and to avoid path dependency that perpetuates reliance on fossil fuels. With this in mind, please answer the following questions:

10. Will the building be a net zero carbon building? A net zero carbon building is a highly energy efficient building that either produces or procures enough carbon-free renewable energy to meet building operations or offsets any remaining carbon emissions. If the building will not be a net zero carbon building, describe how the building's systems will be adapted over time to achieve net zero energy emissions. Changes could include, but are not limited to, additional renewable energy generation, energy storage, additional energy efficiency measures, or other measures that would further reduce greenhouse gas emissions.

The building will not be a net zero carbon building. As described in item 5 above, the project will provide conduits for a 'solar ready' roof for the future installation of solar PV panels. However, the project will be equipped with high efficiency LED lighting, low flow plumbing fixtures, operable windows, high efficiency (>93%) hot water heaters, fan-coils with ECM, and seven day programmable thermostats.

11. Will the building's roof include any sustainability features? These may include, but are not limited to, high albedo roof materials, solar panels, or vegetation. If no features are included in the design, please describe why and if any features could be added in the future.

The building upper roof will include two sustainable features: a high albedo roof to reflect sunlight and absorb less heat than a standard roof, and the roof will have pre-wired conduits to be 'solar ready' for the future installation of solar PV. The amenity courtyard provides over 3,000 sf of ornamental shrub, groundcover, and perennial plantings selected based on their ability to thrive in elevated growing conditions. The courtyard will be anchored by a central alley of multi-stem birch planted in 6' x 6' x 4' raised planters. These trees are spaced at approximate 15' on center to allow the creation of a continuous canopy over the central dining/gathering hardscape area. All lighting within the Amenity Courtyard will be low-energy LED fixtures. Vegetable beds for residents will be incorporated into the courtyard landscaping.

12. Has the building been planned and designed to accommodate any additional future resiliency enhancements? Please describe if designs could accommodate future additions of any of the following:

- Solar PV (roof or site is solar ready)
- Solar Thermal
- Connection to district energy system
- Potable water storage
- Wastewater storage
- Back up energy systems & fuel
- Electric Vehicle Charging

- Green roof

The building will incorporate ten (10) electric vehicle charging stations (5% of total spaces) at occupancy with conduit provided to support twenty (20) future stations (15% of total spaces). The upper roof will be Solar PV ready and EverSource has confirmed the ability to connect to the existing utilities in the adjacent roadway. An emergency natural gas fired generator will be provided to support continued building operations, the fire pump, standby and life safety loads including emergency lighting and fire alarm system during potential utility outages.

### Climate Change Risk and Vulnerability

13. How did you use climate change projections from Somerville's Climate Change Vulnerability Assessment (CCVA) to inform the building and site design of your project?  
Alta XMBLY considered Somerville's key climate stressors: increased precipitation, seas level rise, storm surge and higher temperatures in the design of the building and Site. The project is located landward of the Amelia Earhart Dam and analyzed the regional impacts from these stressors as a basis of design for the building and Site design.

14. Based on the information in the Climate Exposure section of the CCVA, what are the projected climate change impacts that your site might vulnerable to? Please list and describe all relevant impacts from the CCVA.

The projected climate change impacts that this site might be vulnerable to include:

- Coastal flooding influenced by the tidal portion of the Mystic River below the Amelia Earhart Dam
- Riverine flooding influenced by the portion of the Mystic River above the Amelia Earhart Dam
- Local street drainage and ponding influenced by rainfall events.
- The effects of sea level rise on each of the three prior flood hazards listed above

The next two sections ask specific questions about how the project is designed to manage climate-related risks from heat, coastal and inland flooding.

### Managing Heat Risks

As temperatures increase, Somerville will become more susceptible to the urban heat island effect which causes hotter temperatures due to paved surfaces and waste heat generated by energy use when compared to less developed areas. Open space, trees coverage, and impervious surfaces can help reduce heat exposure and the intensity of the urban heat island effect.

Increasing average temperatures can have wide-ranging impacts on human life, the built environment, and natural ecosystems. Rising temperatures and more intense heat waves present significant public health concerns and can contribute toward kidney, lung, and heart problems. Vulnerable populations are particularly susceptible to heat-induced illness and mortality. Buildings also demand greater electricity for cooling. Even small changes in average temperatures can significantly impact the natural environment.

15. Describe how the building and its energy systems will be adapted to efficiently manage future higher average temperatures, higher extreme temperatures, additional annual heat waves, and longer lasting heat waves.

The HVAC systems being provided will have a 10% safety-factor to provide a system to meet future temperature fluctuations that are above average.

### Temperature Design Conditions

Low Temperature	75	Degrees	High Temperature	72	Degrees
Annual Cooling Days	150	#	Annual Heating Days	215	#

There is no risk posed in the near term as evidenced in the 2030 flood map. The 2070 Coastal Flood high flood risk model shows that the Project Site has minimal risk of flooding (approximately 20 percent). Regardless of the minimal risk flood, the project is planning to locate critical building systems above grade. Additionally, at the appropriate time in the future, the project would consider implementing temporary flood barriers as necessary.

Days Above 90° 11 current day #

16. What design features will be implemented on site to minimize the site's contribution to the urban heat island effect? Please describe any and all design elements. Strategies could include, but are not be limited to, the following:

- High albedo pavement or roof materials
- Passive cooling or increased ventilation capacity
- Green roofs or walls
- Heat resistant trees and plants
- Additional landscaped areas

The project will include street trees selected from the City of Somerville Draft Urban Forestry Management Plan and approved by Vanessa Boukili, City Arborist, prior to installation. Trees will be selected based on their ability to withstand periods of drought and winter snow removal activities. They will be planted in 4"-6" raised planters with protective tree rails and structural soils in a manner which is consistent with established street tree plantings at Assembly Row. Spacing is also consistent with Assembly Row – typically 30' on center to allow the establishment of a consistent shade canopy when mature. Peripheral raised landscape beds are also provided at the streetscape. These beds will be planted with salt-tolerant shrubs and perennials consistent with the established planting design at Assembly Row. All concrete sidewalks shall be high albedo consistent with current LEED standards. A high albedo roof surface on the building will be provided.

17. What additional design and operations strategies will be implemented to protect building occupants during extreme heat events?

To protect building occupants during extreme heat events , all units will be provided with air conditioning from individual fan coil units. Each residential unit will also have operable windows. All common areas will be conditioned using rooftop and individual cooling systems.

## Managing Flood Risks

Several areas of Somerville are already prone to flooding from intense precipitation. As part of a wet region, Somerville is projected to experience more than a 30% increase in rainfall during a 100-year 24-hour event. With climate change, precipitation events will become more intense—meaning that a greater volume of rain will fall in a shorter period of time. This can lead to flooding in areas where the drainage system does not have sufficient capacity. It will be further exacerbated by the presence of impervious surfaces, such as roads and parking lots, where the water cannot be absorbed into the ground, but rather is funneled into storm drains, nearby water bodies or other low-lying areas.

In addition to flooding from precipitation, sea level rise and storm surge are already potential concerns for areas of East Somerville and by 2035-2040 the Amelia Earhart Dam could be regularly flanked by storms. More information can be found in the complete Vulnerability Assessment.

18. How has the site and building been designed to manage storm water from rain event?

Much of the site today is covered by impervious parking or near-impervious surfaces with minimal landscape islands or green features. The Project as part of the larger Master Plan project will implement an environmentally sensitive site design that creates additional open space areas and significantly reduces the amount of on-site paved surface parking areas. This will serve to re-establish components of a natural water cycle allowing evapotranspiration, and groundwater recharge. Green infrastructure and LID BMPs are being used on site to reduce runoff and increase the time of concentration for the stormwater runoff on the project site. LID BMP's that can be utilized on site include: permeable paver's, rain gardens, tree box filters and proprietary separators to reduce runoff and improve runoff water quality.

19. Is the site susceptible to flooding from sea level rise and storm surge or rain events now or during its expected lifetime? Please refer to the Somerville Climate Change Vulnerability Assessment and restate your potential flood risks based on the CCVA.

There is no risk posed in the near term as evidenced in the 2030 flood map. The 2070 Coastal Flood high flood risk model shows that the Project Site has a risk of flooding at approximately 20%. The existing site will be filled by 2-3 feet to achieve a building first floor elevation of 13 feet.(NGVD29). This design elevation was established based on a flood analysis of the local area to which identified the most significant risk was the inundation local stormwater infrastructure by future precipitation and sea level rise overtopping the outfall. The design mitigated this risk by setting the elevation at 13 feet at which point the stormwater from the localized street flooding will find relief overland through the roadway to the Mystic River as the highest elevations within the roadway is 12.6 feet.



If you answered YES to the previous question, please complete the next section. Otherwise, you have completed the questionnaire. Thank you.

\*All Elevation in NGVD29

#### Flooding Design Considerations

Site Elevation - Low	10.25 (ft)	Site Elevation - High	13.0 (ft)
Site Elevation - Avg.	Average Ground Level	Ground Level Elevation	13.0 (ft)
Is any portion of the site in a FEMA SFHA? (1% chance floodplain)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	What FEMA zone(s)	Zone X
Base Flood Elevation	10.3	Design Flood Elevation	13.8
2030 Flood Risk	0 (%)	2070 Flood Risk	20 (%)

20. What are the ground floor uses of the building? Are there any below ground stories of the building? If so, what uses are located below ground?

The ground floor uses of the building included assembly, mercantile, residential (five units), and storage/parking which are all located above grade. There are no below ground stories for this project.

21. Are there any flood-sensitive assets, utilities, mechanical equipment, or critical site infrastructure located in areas of the building that are at risk of flooding? What measures will protect building systems during a flood or severe storm? These might include, but may not be limited to, the following:

- Elevation of utilities and mechanical systems
- Water tight utility conduits
- Waste water back flow prevention
- Storm water back flow prevention
- Systems located above the ground floor
- Securing objects at risk of becoming dislodged

The project will provide backflow preventers in all major utility connections.

22. Will any flood-damage resistant materials be used in design and construction in flood risk areas?

The design will comply with the building code for flood resistant materials up to the DFE. The first (3) floors of the building is Type 1 construction - comprised of non combustible concrete structural systems, CMU, metal stud framing and masonry exterior cladding.

23. What flood control design elements will be used to mitigate a 2070 coastal flood event with a 10% chance to occur in any given year (a '10-year' event)? These might include, but may not be

limited to, the following:

- Elevation of the site
- Structural elevation of the building
- Non-structural elevation of the ground floor
- Wet flood-proofing (allowing water to flow through building envelope)
- Dry flood-proofing (preventing water from entering building)

Elevation of the site was raised from 11.00 feet +/- to 13.00 feet NGVD29 .

24. What is the recovery plan for a 2070 coastal flood event with a 1% chance to occur in any given year (a '100-year' event)? Summarize anticipated pre- and post-event policies, strategies, and actions necessary to facilitate post-flood recovery. These might include, but may not be limited to, the following:

- Flood mitigation design (see #23)
- Recovery management team
- Annual training & exercises
- Hazard evaluation & mitigation
- Damage assessment
- Demolition & debris removal
- Repair permitting
- Business resumption

Elevation of the site was raised from 11.00 feet +/- to 13.00 feet NGVD29 and will provide dry flood proofing to DFE of 13.8 feet at critical infrastructure and occupiable spaces.

25. Will hazardous or toxic material be stored on site? Where will it be stored? How will you protect hazardous or toxic material from flooding?

Hazardous or toxic materials will not be stored on site. Parking to be provided at ground level. Parking area will not be subject to flooding until later in the century, at that time, vehicles can be moved to the upper parking level in advance of a predicted flooding event.

26. Will the building employ any temporary measures to prevent flooding on site? These could include barricades, flood gates, and other measures. Please describe any temporary measures and include the elevation the measures are designed for.

Removable flood barriers such as flood planks will be considered to protect entry ways as necessary.

27. Will the site be accessible during a flood inundation? If yes, to what flood elevation?

Less than 1 foot of flooding would be expected on the site by 2070 based on the Boston Harbor Flood Risk Model, given the proposed Site elevation. This would not impede emergency access to the Site.

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28. Will any additional measures be employed to protect the building from storms and flooding?

The water surface level of the Mystic River above the Amelia Earhart is controlled by the Department of Conservation and Recreation (DCR). The DCR provides protection to the site from the majority of riverine flooding events.

July 27, 2018

WP East Acquisitions LLC  
Jim Lambert  
91 Harwell Ave  
Lexington, MA 02421

RE: 5 Middlesex Ave, Somerville, MA 02145

Dear WP East Acquisitions LLC:

Eversource is in receipt of your request for future electrical services at the proposed site.

Based on the information regarding the project received to date, Eversource has availability, capacity and intent to provide electric service to the project. Further engineering is required to confirm sizing, layouts and locations of these services. Eversource intends to continue to work with the customer to finalize coordination of the design and engineering, as well as the construction of the project.

Should you have any additional questions, please do not hesitate to contact me.

Sincerely,



Laquita Sanders  
Customer Service Engineer  
Phone # 781-441-3433  
Fax # 781-441-8721