APPENDIX B: Sustainability

Preliminary LEED Checklist - Hotel

Preliminary LEED Checklist - Residential

Sustainable and Resilient Buildings Questionnaire – Hotel

Sustainable and Resilient Buildings Questionnaire – Residential

Preliminary LEED Checklist - Hotel

LEED v4 for BD+C: New Construction - Hotel

Project Checklist

Project Name: Assembly Edge

Date: B1809482.000

4/17/2018

Y	?	N			
	1		Credit	Integrative Process	1

11	5	0	Location and Transportation	16
		N	Credit	LEED for Neighborhood Development Location	16
	1		Credit	Sensitive Land Protection	1
	2		Credit	High Priority Site	2
5			Credit	Surrounding Density and Diverse Uses	5
3	2		Credit	Access to Quality Transit	5
1			Credit	Bicycle Facilities	1
1			Credit	Reduced Parking Footprint	1
1			Credit	Green Vehicles	1

7	3	0	Sustainable Sites	10
Y			Prereq	Construction Activity Pollution Prevention	Required
	1		Credit	Site Assessment	1
1	1		Credit	Site Development - Protect or Restore Habitat	2
1			Credit	Open Space	1
3			Credit	Rainwater Management	3
2			Credit	Heat Island Reduction	2
	1		Credit	Light Pollution Reduction	1

5	1	5	Water Efficiency	11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
2			Credit	Outdoor Water Use Reduction	2
2	1	3	Credit	Indoor Water Use Reduction	6
		2	Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

5	18	10	Energy and Atmosphere	33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
	6		Credit	Enhanced Commissioning	6
3	5	10	Credit	Optimize Energy Performance	18
	1		Credit	Advanced Energy Metering	1
	2		Credit	Demand Response	2
	3		Credit	Renewable Energy Production	3
	1		Credit	Enhanced Refrigerant Management	1
2			Credit	Green Power and Carbon Offsets	2

2	8	3	Materials and Resources	13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
	2	3	Credit	Building Life-Cycle Impact Reduction	5
	2		Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
	2		Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
	2		Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

6	11	0	Indoor Environmental Quality	16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
1	1		Credit	Enhanced Indoor Air Quality Strategies	2
1	2		Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
	2		Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
1	1		Credit	Interior Lighting	2
	3		Credit	Daylight	3
	2		Credit	Quality Views	1
1			Credit	Acoustic Performance	1

4	2	0	Innovation	6
3	2		Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

0	4	0	Regional Priority	4
	1		Credit	Renewable Energy Production (2 point threshold)	1
	1		Credit	Optimize Energy Performance (8 point threshold)	1
	1		Credit	High Priority Site (2 point threshold)	1
	1		Credit	Indoor Water Use Reduction (4 point threshold)	1

40	53	18	TOTALS	Possible Points:	110

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

Preliminary LEED Checklist -Residential

LEED v4 for BD+C: New Construction - Residential

Project Checklist

Project Name: Assembly Edge

Date: B1809482.000

4/17/2018

Y	?	N			
	1		Credit	Integrative Process	1

11	5	0	**Location and Transportation**		16
		N	Credit	LEED for Neighborhood Development Location	16
	1		Credit 1	Sensitive Land Protection	1
	2		Credit 2	High Priority Site	2
5			Credit 3	Surrounding Density and Diverse Uses	5
3	2		Credit 4	Access to Quality Transit	5
1			Credit 5	Bicycle Facilities	1
1			Credit 6	Reduced Parking Footprint	1
1			Credit 7	Green Vehicles	1

7	3	0	**Sustainable Sites**		10
Y			Prereq 1	Construction Activity Pollution Prevention	Required
	1		Credit 1	Site Assessment	1
1	1		Credit 2	Site Development - Protect or Restore Habitat	2
1			Credit 3	Open Space	1
3			Credit 4	Rainwater Management	3
2			Credit 5	Heat Island Reduction	2
	1		Credit 6	Light Pollution Reduction	1

5	1	5	**Water Efficiency**		11
Y			Prereq 1	Outdoor Water Use Reduction	Required
Y			Prereq 2	Indoor Water Use Reduction	Required
Y			Prereq 3	Building-Level Water Metering	Required
2			Credit 1	Outdoor Water Use Reduction	2
2	1	3	Credit 2	Indoor Water Use Reduction	6
		2	Credit 3	Cooling Tower Water Use	2
1			Credit 4	Water Metering	1

5	18	10	**Energy and Atmosphere**		33
Y			Prereq 1	Fundamental Commissioning and Verification	Required
Y			Prereq 2	Minimum Energy Performance	Required
Y			Prereq 3	Building-Level Energy Metering	Required
Y			Prereq 4	Fundamental Refrigerant Management	Required
	6		Credit 1	Enhanced Commissioning	6
3	5	10	Credit 2	Optimize Energy Performance	18
	1		Credit 3	Advanced Energy Metering	1
	2		Credit 4	Demand Response	2
	3		Credit 5	Renewable Energy Production	3
	1		Credit 6	Enhanced Refrigerant Management	1
2			Credit 7	Green Power and Carbon Offsets	2

2	8	3	**Materials and Resources**		13
Y			Prereq 1	Storage and Collection of Recyclables	Required
Y			Prereq 2	Construction and Demolition Waste Management Planning	Required
	2	3	Credit 1	Building Life-Cycle Impact Reduction	5
	2		Credit 2	Building Product Disclosure and Optimization - Environmental Product Declarations	2
	2		Credit 3	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
	2		Credit 4	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit 5	Construction and Demolition Waste Management	2

6	11	0	**Indoor Environmental Quality**		16
Y			Prereq 1	Minimum Indoor Air Quality Performance	Required
Y			Prereq 2	Environmental Tobacco Smoke Control	Required
1	1		Credit 1	Enhanced Indoor Air Quality Strategies	2
1	2		Credit 2	Low-Emitting Materials	3
1			Credit 3	Construction Indoor Air Quality Management Plan	1
	2		Credit 4	Indoor Air Quality Assessment	2
1			Credit 5	Thermal Comfort	1
1	1		Credit 6	Interior Lighting	2
	3		Credit 7	Daylight	3
	2		Credit 8	Quality Views	1
1			Credit 9	Acoustic Performance	1

4	2	0	**Innovation**		6
3	2		Credit 1-5	Innovation	5
1			Credit 6	LEED Accredited Professional	1

0	4	0	**Regional Priority**		4
	1		Credit 1	Renewable Energy Production (2 point threshold)	1
	1		Credit 2	Optimize Energy Performance (8 point threshold)	1
	1		Credit 3	High Priority Site (2 point threshold)	1
	1		Credit 4	Indoor Water Use Reduction (4 point threshold)	1

40	53	18	**TOTALS**	Possible Points:	110

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

Sustainable and Resilient Buildings Questionnaire – Hotel

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

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.

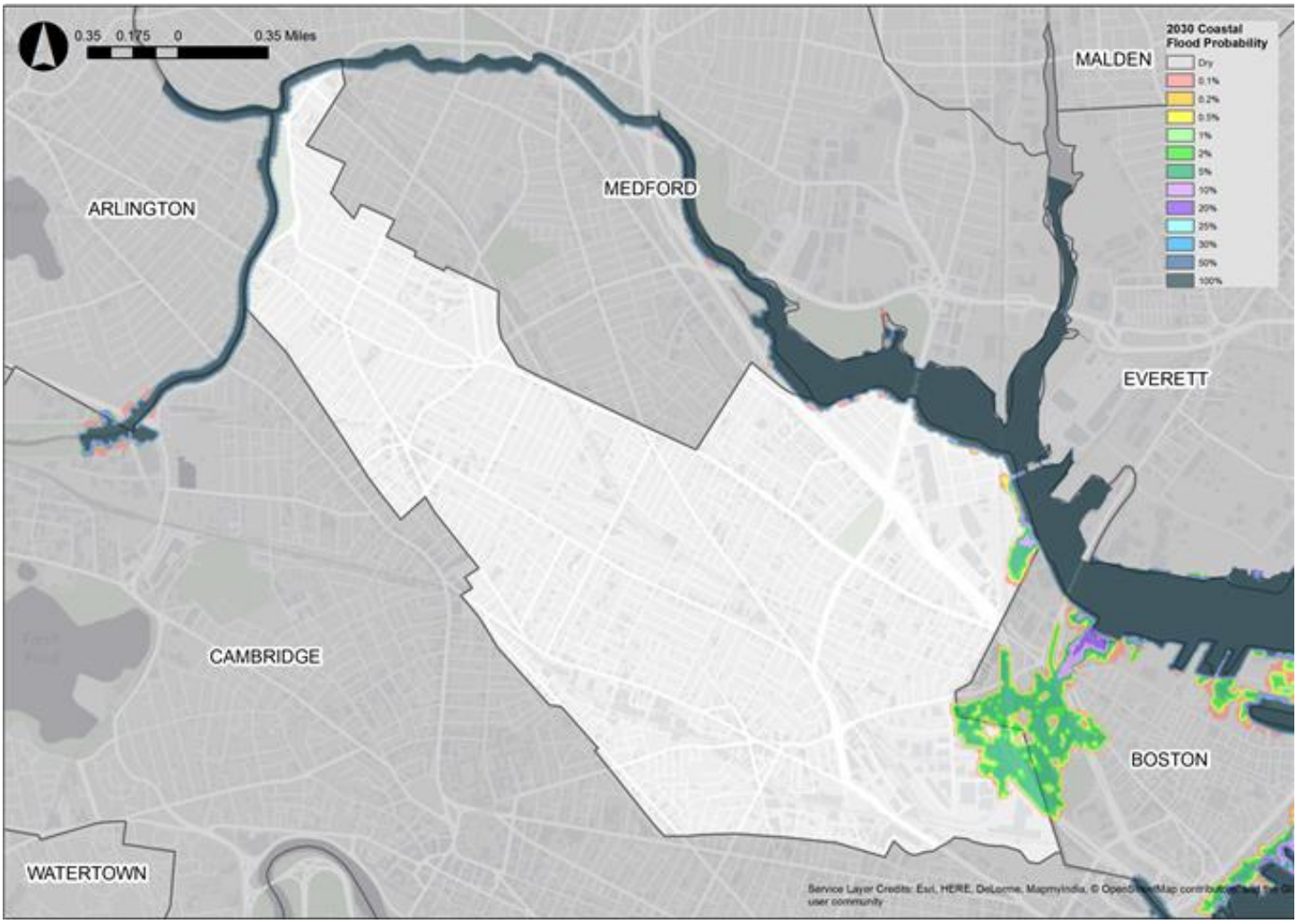
BACKGROUND: CLIMATE CHANGE VULNERABILITY

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.

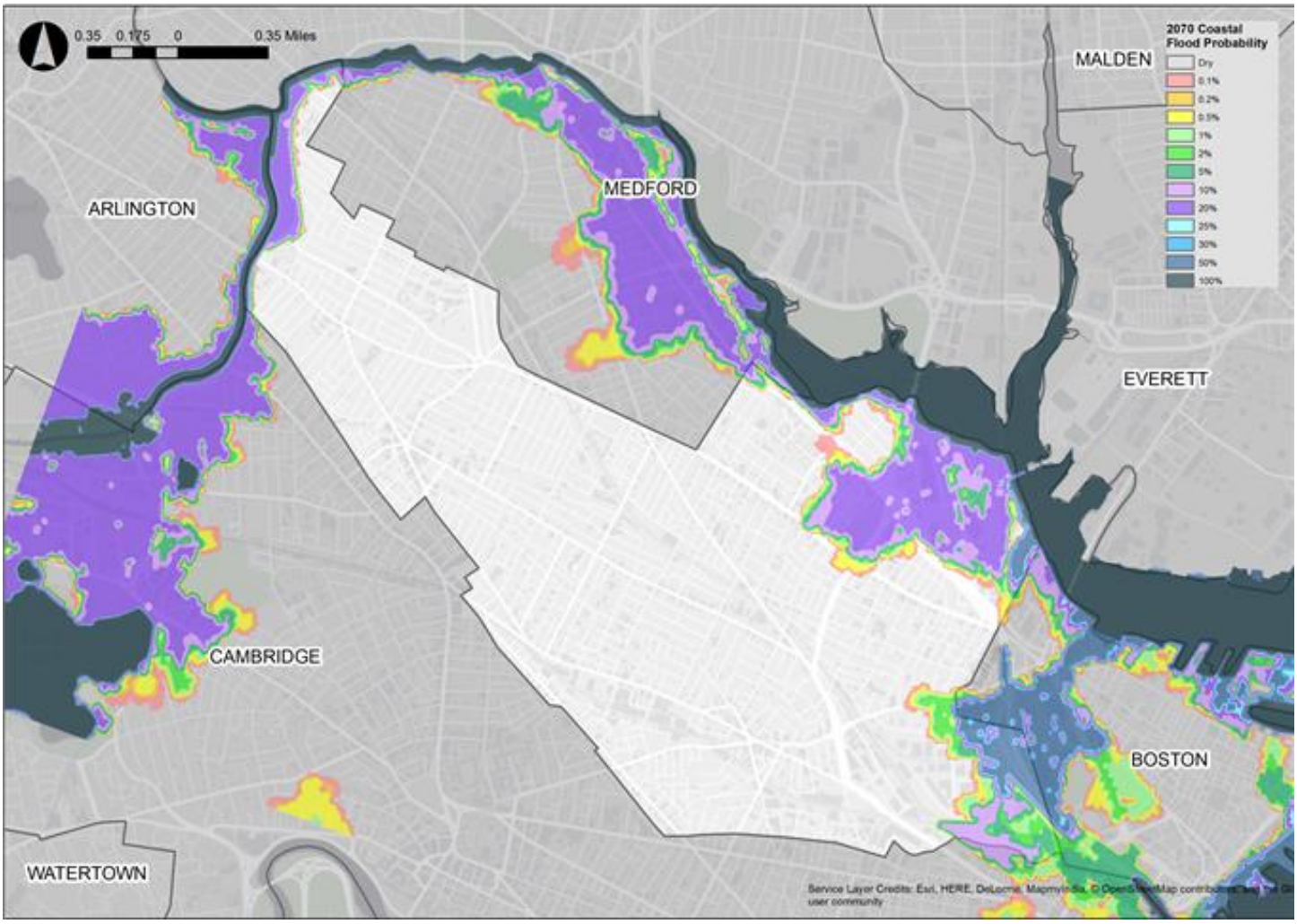
The following maps and figures provide an overview of projected climate exposure. Please review the Climate Change Vulnerability Assessment for more detailed analysis on Somerville's exposure, vulnerability, and risk to climate change.

2030 Coastal Flood Probability



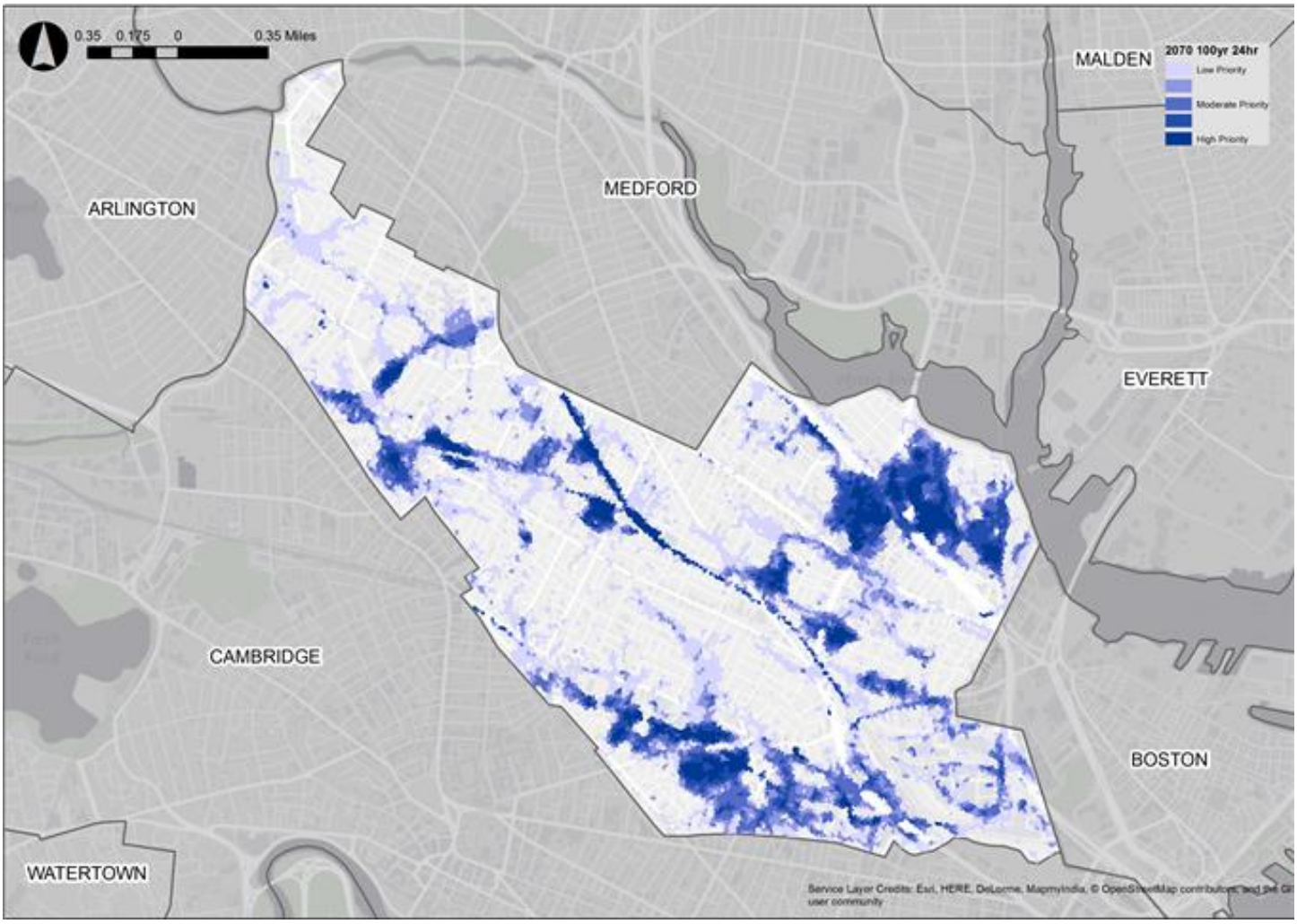
This map shows the annual chance of flooding from coastal storm events and sea level rise in 2030. A 100% chance of flooding means that area is very likely to flood that year, while a 50% chance means that there is an equal chance that it may or may not flood in a given year. A 1% chance of flooding 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)

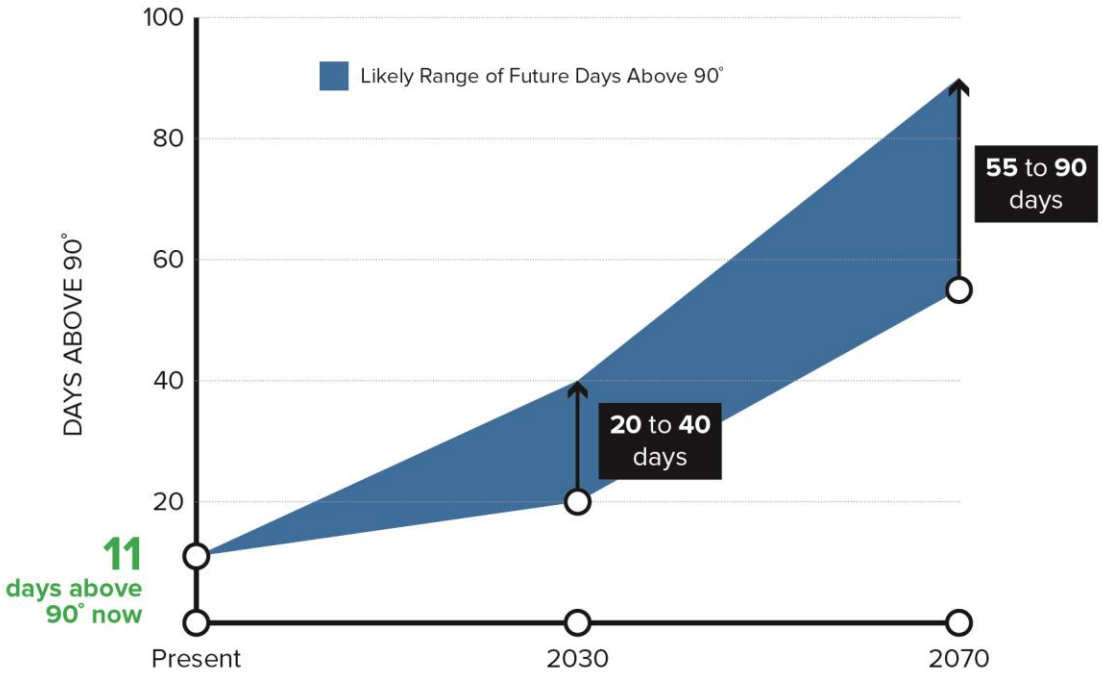
Precipitation Projections



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 (low)	2030 (high)	2070 (low)	2070 (high)
Annual	50.0º F	53.3º F	53.5º F	55.8º F	58.7º F
Summer	70.6º F	74.5º F	74.8º F	77.4º F	80.6º F
Winter	29.8º F	32.2º F	33.0º F	34.6º F	38.0º F

SUSTAINABLE & RESILIENT BUILDINGS QUESTIONNAIRE

Proposal Information	
Proposal Name	Assembly Edge (Hotel building)
Address	845 McGrath Highway & 74 Middlesex Avenue
Owner/Developer	Kems Corp
Business Address	200 Broadway, Suite 103 Lynnfield, MA 01940
Designated Contact	Joe Hennessey
Telephone Number	781-842-2996
Email Address	Jhennessey@kemscorp.com

Design Team	
Design Architect	Khalsa Design Inc.
Architect of Record	Khalsa Design Inc.
Engineer	Allied Consulting Engineering
Landscape Architect	Verdant Landscape Architecture
Sustainability/LEED	WSP Built Ecology
Permitting	VHB, McDermott, Quilty & Miller LLP
Construction Management	TBD

State Review	
Is MEPA Approval Required?	Yes/**No;** Why? No, the project does exceed one MEPA threshold, however there is state financial assistance, land transfer by a state agency, or corresponding state agency action or permit.

Building & Site Details	
Building Type	Hotel
Gross Floor Area	108,605 SF
Principal Uses	180 Hotel Rooms, Hotel lobby, and Amenities
Ground Floor Uses	Hotel lobby and amenities
Site Elevation	13.5 to 15.2 feet (Somerville City Base) 7.3 to 9.0 feet (NAVD88)
Ground Story Elevation	14 feet (City of Somerville Base)
Building Height	13 Stories (147 feet)
Below Grade Levels	1 - parking
Ground Water Elevation	Between 7' and 10' below grade
Parking Spaces	197 above grade spaces, 93 below grade, 290 total spaces
EV Ready Spaces	10
EV Charging Spaces	10

Climate Vulnerability Exposure (check all that apply)	X Sea Level Rise & Storm Surge X Precipitation Induced Flooding ☐ Heat ☐ Other(s):

Green Building	
LEED Version	LEED Version 4 BD+C
LEED Certifiable	Yes
LEED Rating	Certified
LEED Point Score	40

Building Systems	
Expected Life of Building	50 years
Critical Site Infrastructure	Water, Sewer, Stormwater, Gas, Electrical, Communications
Expected Life of Key Systems	Heat pumps 20 years; Cooling Tower - 15 years: Boiler and pumps - 25 years
Type of Heating System(s)	Water source heat pumps with gas fired boiler source
Type of Cooling System(s)	Water source heat pumps with roof mounted cooling tower

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:

All calculations for heating, cooling, and ventilation were established with the understanding of program and use from the project team and within the guidelines established by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers).

Annual Electric Load	1,050,000 (kWh)	Peak Electric Load	400 (kW)
Annual Heating Load	7,500 (MMbtu/hr)	Peak Heating Load	3 (MMbtu/hr)
Annual Cooling Load	375,000 (Tons/hr)	Peak Cooling Load	300 (tons)

Energy Use Intensity	110 (kBtu/SF)

2. Describe any strategies that will be implemented to support continued building operations during potential utility outages.

Hotel room occupancy will be established and set centrally from the front desk. Unoccupied rooms will have thermostats set for 60 degrees Fahrenheit ("F") heating and 80 degrees F cooling. Occupied rooms will be set to 68 degree F heating and 75 degree F cooling adjustable by the occupant. Premium efficiency water source heat pumps will be used.

Back-Up/Emergency Power Systems

Electric Output	500 kw	Number of Power Units	1
System Type	Emergency generator	Fuel Source	Diesel

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

Electric	400 (kW)	Heating	3 (MMbtu/hr)
		Cooling	300 (Tons)

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.

Hotel room occupancy will be established and set centrally from the front desk. Unoccupied rooms will have thermostats set for 60 degrees F heating and 80 degrees F cooling. Occupied rooms will be set to 68 degree F heating and 75 degree F cooling adjustable by the occupant. Premium efficiency water source heat pumps

Energy Use below Mass Code	30 %	Energy Use below ASHRAE 90.1 (current edition)	30 %

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.

Premium efficiency water source heat pumps will be used.
Because we are using high efficiency water-sourced heat pumps, there is no need for air source or ground source heat pumps. We are not specifying solar thermal systems for this building.

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

No current plans.

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 not be able to viably support on-site generation. The project site is very limited in size and the building needs to accommodate public realm, open space for tenants and residents, as well as the equipment to serve the building - which will be predominantly located on the roof. The design team will also continue to investigate the feasibility of incorporating alternative systems such as Combined Heat and Power.

6. Describe any on-site energy storage systems.

The team will be reviewing options for on-site energy storage, however the capacity to assist with the building's function will require real estate that is not currently feasible within the design.

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

The hotel rooms will be dynamically controlled based on occupancy in the rooms.

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 and National Grid have indicated that the electrical and gas infrastructure is likely sufficient to handle the anticipated load.

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

The design has not yet evaluated a demand response program, but the design team has implemented a low-energy, dynamic system that will reduce demand (relative) on the overall energy grid infrastructure.

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 Proponent is committed to constructing a building that will not preclude the advancement toward net zero, as technology becomes available. The Project is currently being designed and constructed towards this goal by reducing energy demand through incorporation of efficient building systems and design elements, such as installing an Energy Management System (EMS) and designing a well-insulated building envelope. The Project is also working toward the goal of net zero by considering on-site renewable & alternative energy sources in the future. The Project's roof will be at a minimum "solar ready."

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.

This development will use a high albedo roof, which at a minimum will be designed to be "solar ready"

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 project's site plan has been designed to incorporate low impact development (LID) best management practices (bmp), capable of absorbing stormwater during future storm and flooding events. Additionally, the building includes 10 electric vehicle charging stations. The building will incorporate emergency power generation for all life safety systems.

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?

The project's site plan has been designed to incorporate LID BMPs, capable of absorbing stormwater during future storm and flooding events. Additionally, the project lays the groundwork for an enhanced network of open space that connects the Mystic River, Assembly Row, and Assembly Square with the residential neighborhoods of East Somerville west of the Kensington Underpass.

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.

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.

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 cooling tower could be up sized during period replacement (15 years) to provide additional capacity as required.

Temperature Design Conditions

Low Temperature	0 Degrees	High Temperature	90 Degrees
Annual Cooling Days	150 Days	Annual Heating Days	200 Days
		Days Above 90º	15 Days

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 incorporate the following strategies:
- High albedo roof materials
- High albedo pavement materials within the Courtyard and Kensington Ave Pedestrian Way
- Increased tree and vegetation cover in the Courtyard and the Urban Park

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

The project will incorporate thermal massive materials as required by the energy code. The project will also provide increased tree cover in the Courtyard and Urban Park, which will reduce the heat island effect and increase the comfort for occupants of the open space during extreme heat events.

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?

Green infrastructure and LID BMPs are being used on site to reduce runoff and infiltrate more stormwater on site. The project will use porous pavement, bioretention basins and tree filters in the Courtyard and the Urban Park to reduce runoff (by approximately 25%), 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 minimal risk of flooding (approximately 20%)

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

Flooding Design Considerations

Site Elevation - Low	13.6 (ft)	Site Elevation - High	15 (ft)
Site Elevation - Avg.	Average Ground Level	Ground Level Elevation	(ft)

Is any portion of the site in a FEMA SFHA? (1% chance floodplain)	No	What FEMA zone(s)	
Base Flood Elevation		Design Flood Elevation	
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?

Ground floor uses include: Hotel lobby, hotel amenity space, loading and site mechanical space
Below Ground: 1 level of parking

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 is planning to locate critical building systems above grade, and backflow preventers will be placed in all major utility connections. Additionally, at the appropriate time in the future, the project would consider implementing temporary flood barriers, as necessary.

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

Yes

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)

Yes, at the appropriate time in the future, the project would consider implementing temporary flood barriers as necessary.

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

The design team is evaluating the options in light of the robust Somerville Climate and Vulnerabilities reports and studies

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?

No hazardous materials will be stored on site

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.

No, out of flood zone

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

Yes, 14 feet.

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

The electrical room and vaults will be sealed to prevent any water infiltration during a flood event.

Sustainable and Resilient Buildings Questionnaire – Residential

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

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.

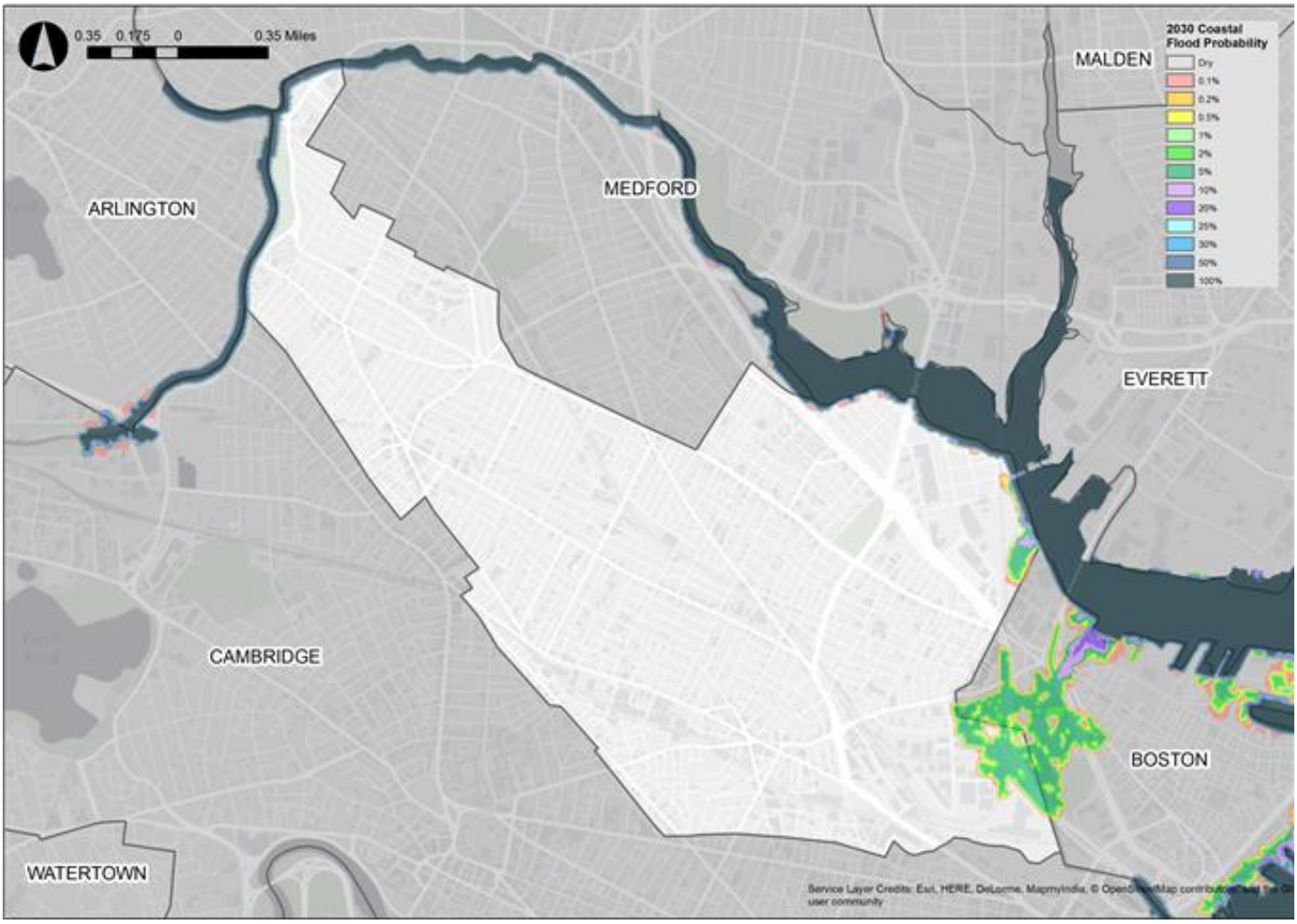
BACKGROUND: CLIMATE CHANGE VULNERABILITY

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.

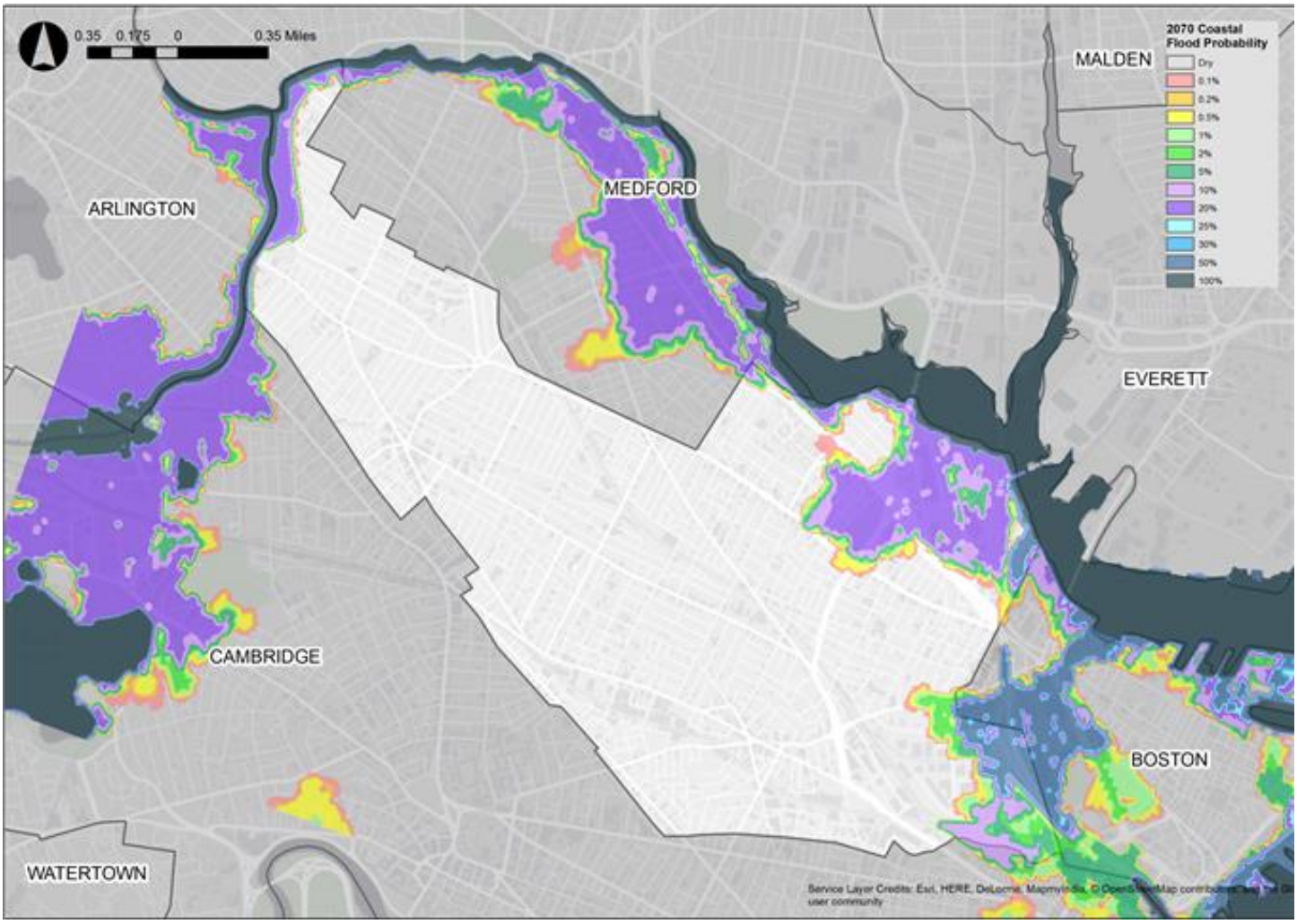
The following maps and figures provide an overview of projected climate exposure. Please review the Climate Change Vulnerability Assessment for more detailed analysis on Somerville's exposure, vulnerability, and risk to climate change.

2030 Coastal Flood Probability



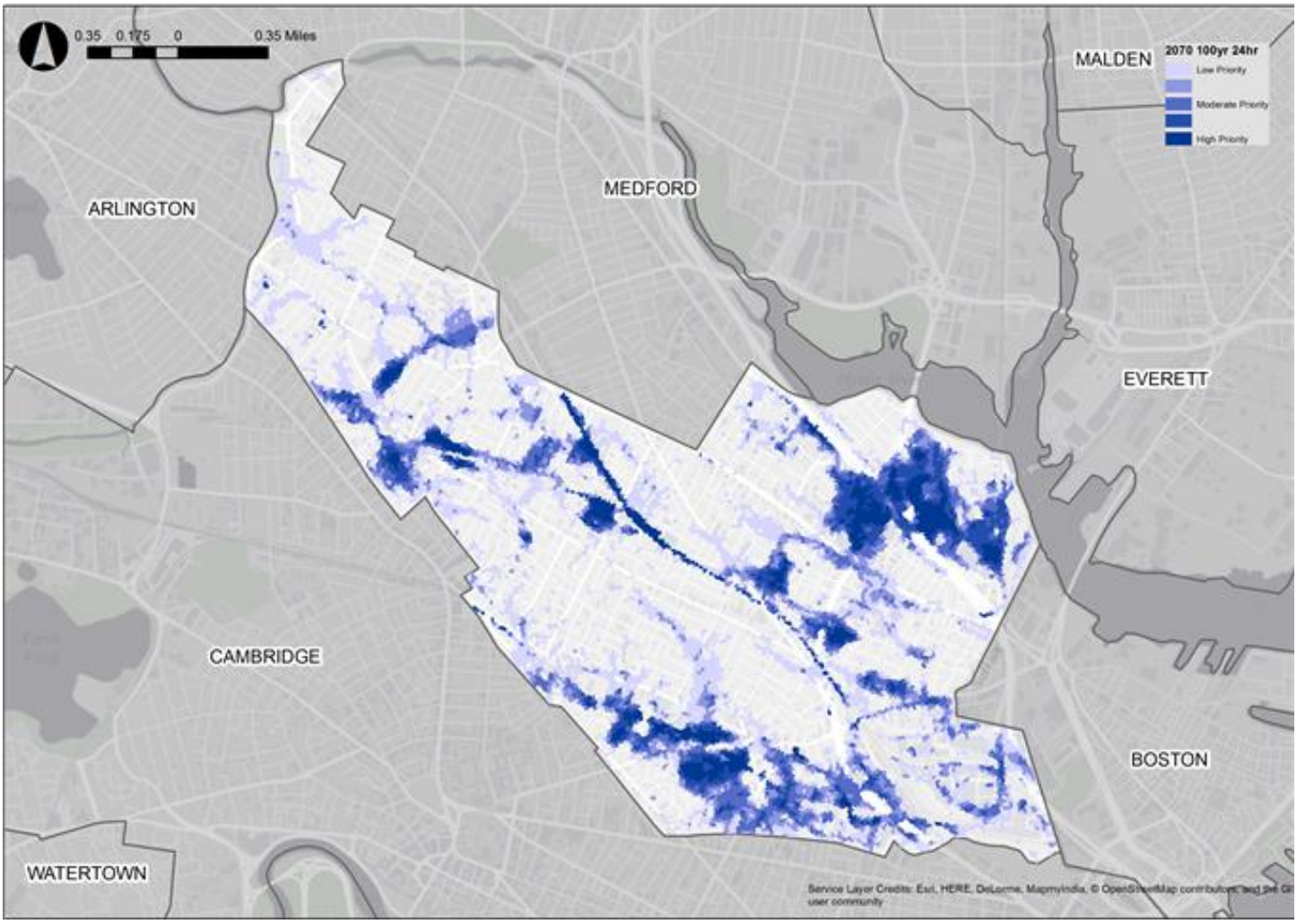
This map shows the annual chance of flooding from coastal storm events and sea level rise in 2030. A 100% chance of flooding means that area is very likely to flood that year, while a 50% chance means that there is an equal chance that it may or may not flood in a given year. A 1% chance of flooding 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)

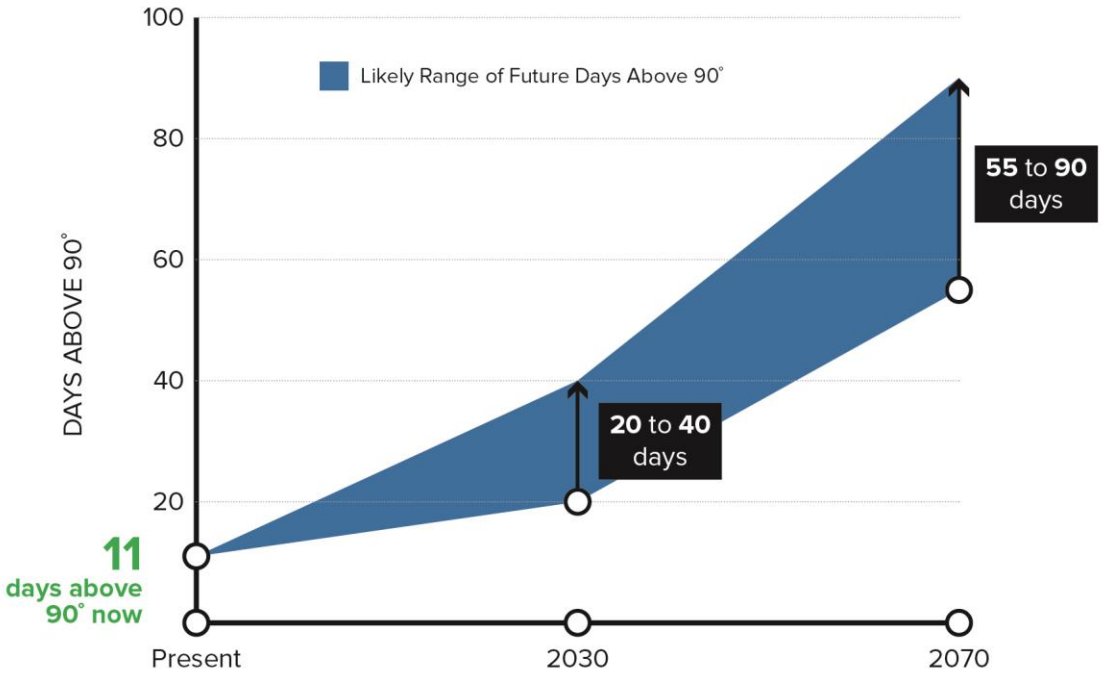
Precipitation Projections



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 (low)	2030 (high)	2070 (low)	2070 (high)
Annual	50.0º F	53.3º F	53.5º F	55.8º F	58.7º F
Summer	70.6º F	74.5º F	74.8º F	77.4º F	80.6º F
Winter	29.8º F	32.2º F	33.0º F	34.6º F	38.0º F

SUSTAINABLE & RESILIENT BUILDINGS QUESTIONNAIRE

Proposal Information	
Proposal Name	Assembly's Edge (Residential Building)
Address	845 McGrath Highway & 74 Middlesex Avenue
Owner/Developer	Kems Corp
Business Address	200 Broadway, Suite 103 Lynnfield, MA
Designated Contact	Joe Hennessey
Telephone Number	781-842-2996
Email Address	Jhennessey@kemscorp.com

Design Team	
Design Architect	Khalsa Design Inc.
Architect of Record	Khalsa Design Inc.
Engineer	Allied Consulting Engineering
Landscape Architect	Verdant Landscape Architecture
Sustainability/LEED	WSP Built Ecology
Permitting	VHB, McDermott, Quilty & Miller LLP
Construction Management	TBD

State Review	
Is MEPA Approval Required?	Yes/**No**; Why? No, the project does exceed one MEPA threshold, however there is state financial assistance, land transfer by a state agency, or corresponding state agency action or permit.

Building & Site Details	
Building Type	Residence
Gross Floor Area	258,973 SF
Principal Uses	210 Residential units
Ground Floor Uses	Residential lobby, 9,427 SF retail space
Site Elevation	13.5 to 15.2-feet (Somerville City Base) 7.3 to 9.0-feet (NAVD88)
Ground Story Elevation	14± feet (City of Somerville Base)
Building Height	21 Stories (235 feet)
Below Grade Levels	1 - parking
Ground Water Elevation	Between 7'-10' below grade
Parking Spaces	197 above grade spaces, 93 below grade spaces, 290 total spaces
EV Ready Spaces	10
EV Charging Spaces	10

Climate Vulnerability Exposure (check all that apply)	X Sea Level Rise & Storm Surge X Precipitation Induced Flooding ☐ Heat ☐ Other(s):

Green Building	
LEED Version	LEED Version 4 BD+C
LEED Certifiable	Yes
LEED Rating	Certified
LEED Point Score	40

Building Systems	
Expected Life of Building	50 years
Critical Site Infrastructure	Water, Sewer, Stormwater, Gas, Electrical, Communications
Expected Life of Key Systems	Heat Pumps - 20 years: Cooling Tower - 15 years: Boiler and pumps - 25 years
Type of Heating System(s)	Water source heat pumps with gas fired boiler source
Type of Cooling System(s)	Water source heat pumps with roof mounted cooling tower

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:

All calculations for heating, cooling, and ventilation were established with the understanding of program and use from the project team and within the guidelines established by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers).

Annual Electric Load	2,100,000 (kWh)	Peak Electric Load	750 (kW)
Annual Heating Load	15,000 (MMbtu/hr)	Peak Heating Load	5 (MMbtu)
Annual Cooling Load	750,000 (Tons/hr)	Peak Cooling Load	500 (tons)

Energy Use Intensity	100 (kBtu/SF)

2. Describe any strategies that will be implemented to support continued building operations during potential utility outages.

There will be a backup emergency generator, fueled with diesel oil, which will be able to serve critical system loads for electrical, heating, and cooling.

Back-Up/Emergency Power Systems

Electric Output	800 KW	Number of Power Units	1
System Type	Emergency Generator	Fuel Source	Diesel

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

Electric	750 (kW)	Heating	6 (MMbtu/hr)
		Cooling	500 (Tons)

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.

Unoccupied rooms will have thermostats set for 60 degrees Fahrenheit ("F") heating and 80 degrees F cooling. Occupied rooms will be set to 68 degree F heating and 75 degree F cooling adjustable by the occupant. Premium efficiency water source heat pumps will be used.

Energy Use below Mass Code	30%	Energy Use below ASHRAE 90.1 (current edition)	30%

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.

Premium efficiency water source heat pumps will be used.
Because we are using high efficiency water-sourced heat pumps, there is no need for air source or ground source heat pumps. We are not specifying solar thermal systems for this building.

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

No current plans

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 not be able to viably support on-site generation. The project site is very limited in size and the building needs to accommodate public realm, open space for tenants and residents, as well as the equipment to serve the building - which will be predominantly located on the roof. The design team will also continue to investigate the feasibility of incorporating alternative systems such as Combined Heat and Power.

6. Describe any on-site energy storage systems.

The team will be reviewing options for on-site energy storage, however the capacity to assist with the building's function will require real estate that is not currently feasible within the design.

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

The residential units will be dynamically controlled based on occupancy in the rooms.

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 and National Grid have indicated that the electrical and gas infrastructure is likely to handle the load.

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

The design has not yet evaluated a demand response program, but the design team has implemented a low-energy, dynamic building mechanical system that will reduce demand (relative) on the overall energy grid infrastructure.

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 Proponent is committed to constructing a building that will not preclude the advancement toward net zero, as technology becomes available. The Project is currently being designed and constructed towards this goal by reducing energy demand through incorporation of efficient building systems and design elements, such as installing an Energy Management System (EMS) and designing a well-insulated building envelope. The Project is also working toward the goal of net zero by considering on-site renewable & alternative energy sources in the future. The Project's roof will be at a minimum "solar ready."

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.

This development will use a high albedo roof, which at a minimum will be designed to be "solar ready"

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 project's site plan has been designed to incorporate low impact development (LID) best management practices (bmp), capable of absorbing stormwater during future storm and flooding events. Additionally, the building includes 10 electric vehicle charging stations. The building will incorporate emergency power generation for all life safety systems.

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?

The project's site plan has been designed to incorporate LID BMPs, capable of absorbing stormwater during future storm and flooding events. Additionally, the project lays the groundwork for an enhanced network of open space that connects the Mystic River, Assembly Row, and Assembly Square with the residential neighborhoods of East Somerville west of the Kensington Underpass.

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.

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.

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 cooling tower could be up sized during periodic replacements (15 years) to provide additional capacity as required

Temperature Design Conditions

Low Temperature	0 Degrees	High Temperature	90 Degrees
Annual Cooling Days	150 Days	Annual Heating Days	200 Days
		Days Above 90º	15 Days

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 Incorporate the following strategies:
- High albedo roof materials
- High albedo pavement materials within the Courtyard and Kensington Ave Pedestrian Way
- Increased tree and vegetation cover in the Courtyard and the Urban Park

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

The project will incorporate thermal massive materials as required by the energy code. The project will also provide increased tree cover in the Courtyard and Urban park, which will reduce the heat island effect and increase the comfort for occupants of the open space during extreme heat events

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?

Green infrastructure and LID BMPs are being used on site to reduce runoff and infiltrate more stormwater on the site. The project will use porous pavement, bioretention basins and tree filters in the Courtyard and the Urban Park to reduce runoff (by approximately 25%), 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 minimal risk of flooding (approximately 20%)

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

Flooding Design Considerations

Site Elevation - Low	13.6 (ft)	Site Elevation - High	15 (ft)
Site Elevation - Avg.	Average Ground Level	Ground Level Elevation	(ft)

Is any portion of the site in a FEMA SFHA? (1% chance floodplain)	No	What FEMA zone(s)	
Base Flood Elevation		Design Flood Elevation	
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?

Ground floor uses include: Retail, residential lobby, loading and site mechanical space.
Below ground uses include: 1 level of below grade parking

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 is planning to locate critical building systems above grade, and backflow preventers will be placed in all major utility connections. Additionally, at the appropriate time in the future, the project would consider implementing temporary flood barriers, as necessary.

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

Yes

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)

Yes, at the appropriate time in the future, the project would consider implementing temporary flood barriers as necessary.

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

The design team is evaluating their options in light of the robust Somerville Climate and Vulnerabilities reports and studies

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?

No hazardous materials will be stored on site

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.

No, out of flood zone

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

Yes, 14 feet

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

The electrical room and vaults will be sealed to prevent any water infiltration during a flood event.