WHAT IS AT RISK?

By 2070, the percentage of properties in the Alewife area that could experience flooding from the 100-year precipitation event doubles compared to sea level rise and storm surge.

BUILDINGS IN THE ALEWIFE AREA NEED TO BE PROTECTED AGAINST PROJECTED CLIMATE CHANGE IMPACTS AND/OR DESIGNED FOR A SPEEDY RETURN TO NORMAL OPERATION.

Open spaces in the Alewife area are more affected by sea level rise and storm surge flooding, whereas more properties are affected from piped infrastructure flooding due to precipitation.

WHAT ACTIONS ARE ALREADY BEING TAKEN?

- The City requires buildings of at least 25,000 square feet of gross floor area to meet the requirements of the most current LEED building rating system
- Massachusetts Stretch Energy Code
- Cooperation with the State and utilities for solar energy generation and storage
- Guidelines and recommendations established for homeowners for Heat, such as promoting and incentivizing weatherization, improved building envelopes and shading, rooftop reflectivity and low-e windows with improved U-values, encouraging HVAC system replacement and improved ventilation systems and strategies, improved space temperature control and setpoints, and backup solar energy and storage power systems
- Substantial renovations required to comply with new regulations
- The City requires sewage backflow preventers
- Flooding brochure to inform residents
- Alewife Overlay District Zoning to preserve and enhance the capacity to store floodwater, recharge groundwater and manage the collection and disposal of stormwater
- Guidelines and recommendations established for homeowners for flooding strategies to protect homes
- Green Roof Area exempt from max allowed building area (Zoning Ordinance Article 22, Subsection 22.30)

WHAT ARE OTHER CITIES DOING?

**HAFENCITY, HAMBURG - GERMANY**
Series of mixed-use buildings fully elevated from the street level for flood protection and improved neighborhood resilience.

**AMERICAN COPPER BUILDINGS - NEW YORK CITY, NEW YORK**
The mechanical systems are on the 2nd floor, and there are five natural gas emergency generators on the 48th floor.

**NEW YORK CITY COOL ROOF PROGRAM - NEW YORK CITY, NEW YORK**
New York City's CoolRoofs™ Program was launched in 2009. Through the program, building owners have applied approximately 6 million square feet of white, reflective coating on more than 600 building roofs.
The overall benefit of the strategies for **Adapted Buildings** is to develop a resilient neighborhood, protected from climate change impacts and designed to return to normal quickly.

Strategies for flood and heat resiliency have been developed separately for new and existing buildings as different approaches and means are needed for each.

**STRATEGY**

| B1 | FLOOD PROTECTION FOR NEW BUILDINGS | Establish regulations and design guidelines for new buildings and re-development to be resilient to future flood risks identified for the neighborhood. |
| B2 | HEAT PROTECTION FOR NEW BUILDINGS | Establish regulations and design guidelines for new buildings and re-development to be resilient to future heat risks identified for the neighborhood. |
| B3 | FLOOD PROTECTION FOR EXISTING BUILDINGS | Establish a program to support retrofitting of existing buildings and re-development to be resilient to future flood risks. |
| B4 | HEAT PROTECTION FOR EXISTING BUILDINGS | Establish a program to support retrofitting of existing buildings and re-development to be resilient to future heat risks. |
| B5 | BUILDING MANAGEMENT FOR FLOOD AND HEAT PROTECTION | Develop a program to enable building residents and occupants to effectively manage and operate resilient buildings. |
| B6 | SITE GREEN INFRASTRUCTURE | Implement green infrastructure (GI) at the parcel level to improve water management and reduce heat-island effect. |
| B7 | ADAPTED ZONING, POLICIES AND REGULATIONS | Revise zoning to factor in Climate Change risks, such as flooding and extreme heat and adjust building requirements to take into account new constraints such as revised flood elevation. |
WHAT CAN BE DONE TO PREPARE FOR CLIMATE CHANGE?

EXISTING BUILDINGS

- Retrofit/Protect to the 2070 10-year flood elevation from precipitation or sea level rise/storm surge, whichever is higher (B3)
- Recover/Manage to the 2070 100-year flood elevation from precipitation or sea level rise/storm surge, whichever is higher (B3)
- Elevate or protect vulnerable utilities such as fuel storage, furnaces, and electrical panels above 2070 10-year flood elevation (B3)
- Use flood resilient construction materials below the 2070 10-year flood elevation (B3)
- Maximize opportunities for natural ventilation and upgrading building mechanical systems for improved passive survivability (B4)

FLOOD PROTECTION

1) Use flood resistant materials
2) Build exterior floodwalls
3) Install backwater valves
4) Elevate/Relocate utilities

NEW BUILDINGS

- Build/Protect to the 2070 10-year flood elevation from precipitation or sea level rise/storm surge, whichever is higher (B1)
- Recover/Manage from the 2070 100-year flood elevation from precipitation or sea level rise/storm surge, whichever is higher (B1)
- Establish requirements for all vulnerable utilities to be located above the determined flood elevation based on building use type (B1)
- Design buildings with passive strategies including building orientation, high-performance insulation and windows, shading and natural ventilation, and white or green roofs (B2)
- Require all new buildings to design with a high-performance building envelope and limit air leakage (B2)
- Require buildings to have mixed-mode ventilation systems, which include passive cooling, and install ceiling fans where applicable. Encourage reflective rooftops (white roofs, e.g.) with a minimum solar reflectance index of 82 (B2)

HEAT RESILIENCY

- Install backup solar energy and storage power systems and separate circuits for critical building loads including AC in “selected cool zone” (B4)
- Retrofit rooftops with a minimum Solar Reflectance Index (SRI) of 82 (for rooftop slopes less than 10 degrees) and 39 (for rooftops over 10 degrees), non-roof surfaces with a minimum solar reflectance of 0.33 or install white or green roofs (structural capacity dependent) and green infrastructure in place of grey infrastructure (B4)
- Replace windows with low-e glass windows with a U-value maximum of U-0.03 (B4)
CLIMATE CHANGE PREPAREDNESS & RESILIENCE (CCPR) PLAN
ADAPTED BUILDINGS

MAPPING THE POTENTIAL LOCATIONS OF ADAPTED BUILDINGS STRATEGIES

- B1: Elevated utilities for new buildings
- B2: High performance building envelope for new buildings
- B3: Relocated electric panels for flood protection
- B4: White roofs for heat protection on existing buildings
- B5: Solar panels for resilient building management
- B6: Green roofs for heat protection on new buildings
- B7: Raised 1st floor for flood protection
- B8: White or green roof retrofits for heat protection
- B9: Bio-retention basin for green infrastructure

(Source: CCPR, 2017)
WHAT IS THE FLOODVIEWER TOOL?

To help the community understand flood risks to their property, the City has developed an online tool called the FLOODVIEWER. In just 4 EASY CLICKS, you can assess the climate change threats from flooding and how it affects your property. To learn more, visit: www.cambridgema.gov/Services/FloodMap

1. LAUNCH THE TOOL

2. SELECT FLOODING SCENARIO

3. SEARCH BY ADDRESS

FLOODVIEWER Questions or Comments?
Send us an email at: FloodViewer@CambridgeMA.gov