HOUSE DOCTOR ORIENTATION

JULY 1, 2020

Agenda

Welcome by Fatima Razzaq, Bureau Director

Navigating the House Doctor Program

- The Contract -- Simone Early, AESU Director
- Planning Phase -- Simone Early, AESU Director
- Design Phase & Bid Phase – Simone Early, AESU Director
- Project Management – Stefanie Brynan, PMU Director
- Construction Phase – Sean Keating, Construction Advisor

Documents: Project Guides & Requirements

Sustainability – Greg Abbe, Sustainability Developer

Resiliency – New Ecology Team

Q & A – Use the Q&A button in lieu of the chat so that we can collect your questions for the end

Today’s Panelists from DHCD

Project Management Unit Director, DHCD

Construction Advisor, DHCD

Sustainability Program Developer, DHCD

Today’s Panelists from New Ecology

Deborah Hall,
Director of New Markets, New Ecology

Frank Stone,
Project Manager, New Ecology

Tom Chase,
Senior Project Manager, New Ecology

Welcome, House Doctors! – Fatima Razzaq

DHCD Overview

- DHCD's Division of Public Housing is split into two main Bureaus: Housing Management and Housing Development and Construction
- The Bureau of Housing Development and Construction is made up of the following units, which work with the House Doctors to implement capital improvement projects at the LHAs:
  - Project Management
  - Architects and Engineers
  - Construction Advisors

Regional Capital Assistance Teams (RCATs)

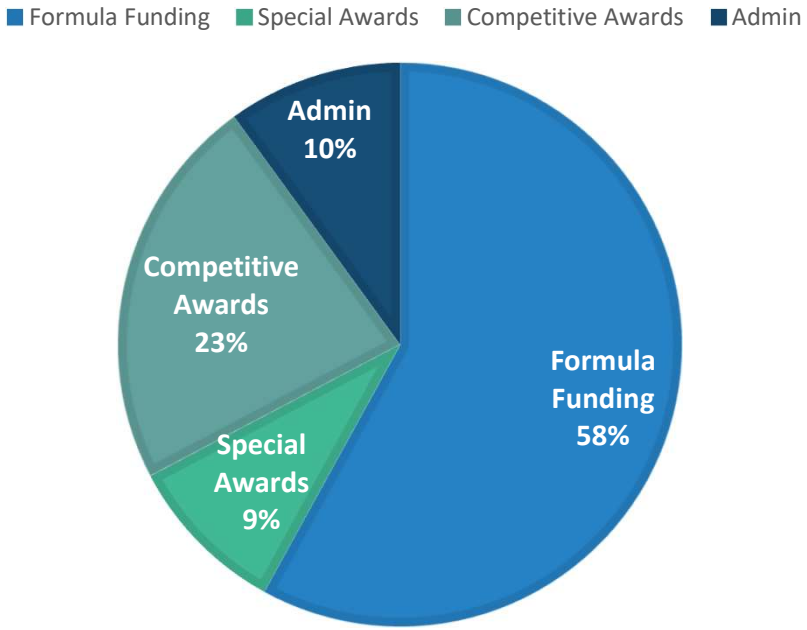
- LHAs with under 500 state-aided public housing units may be a part of the RCAT program
- RCATs deploy an additional team to assist LHAs with implementing their capital projects under $100,000
- There are 3 RCAT teams that each cover their own geographic area

Project Pipeline and Funding

PIPELINE

- We have a large pipeline of about 1,800 active projects statewide at any given time.
- About half of those will require us to work with a House Doctor for design
  - These projects represent estimated construction values between $50,000-multi-millions

FUNDING: ~$100M Annually



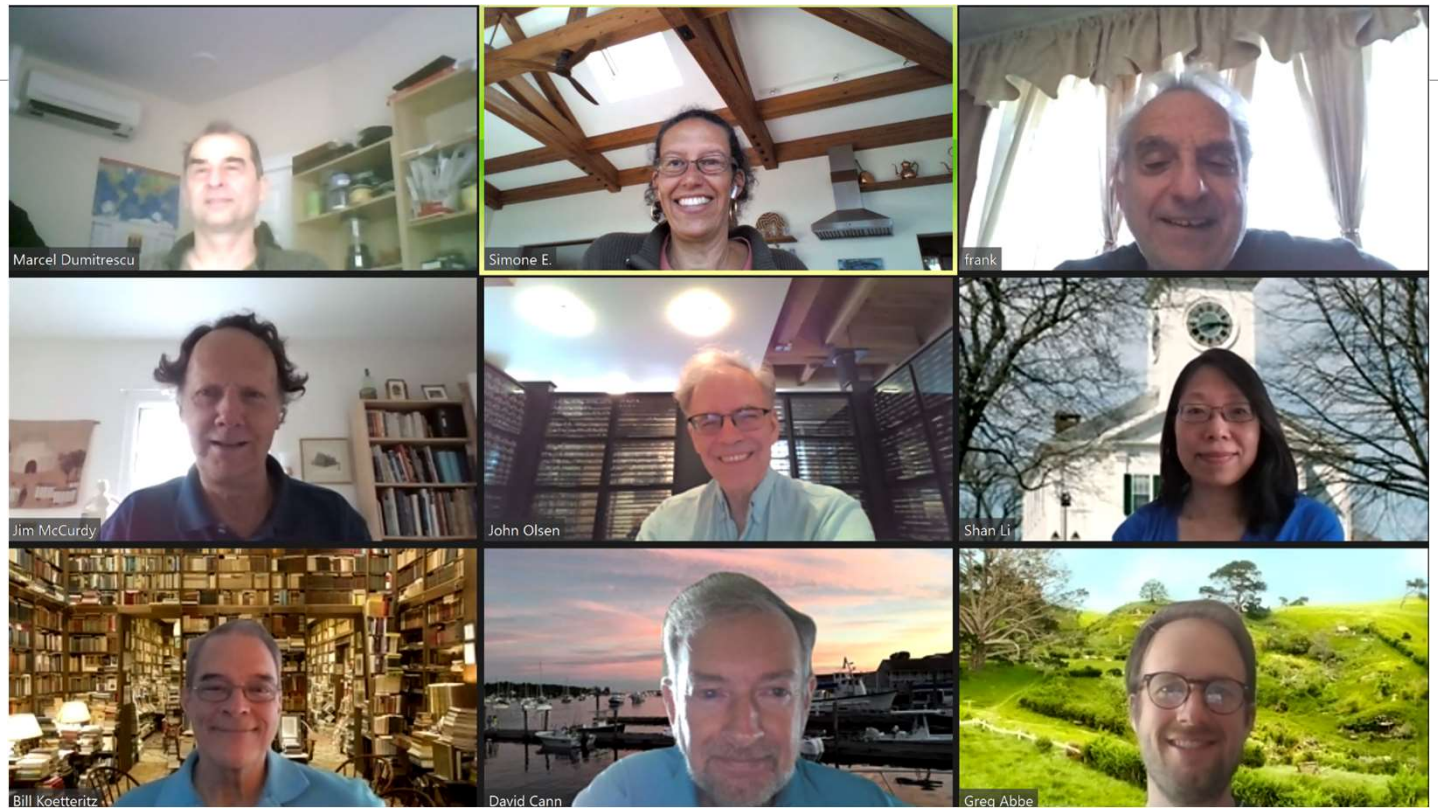
NAVIGATING THE HOUSE DOCTOR PROGRAM

Where will I be Working

667 Elderly & Special Needs
200 Family
705 Family
689 Special Needs

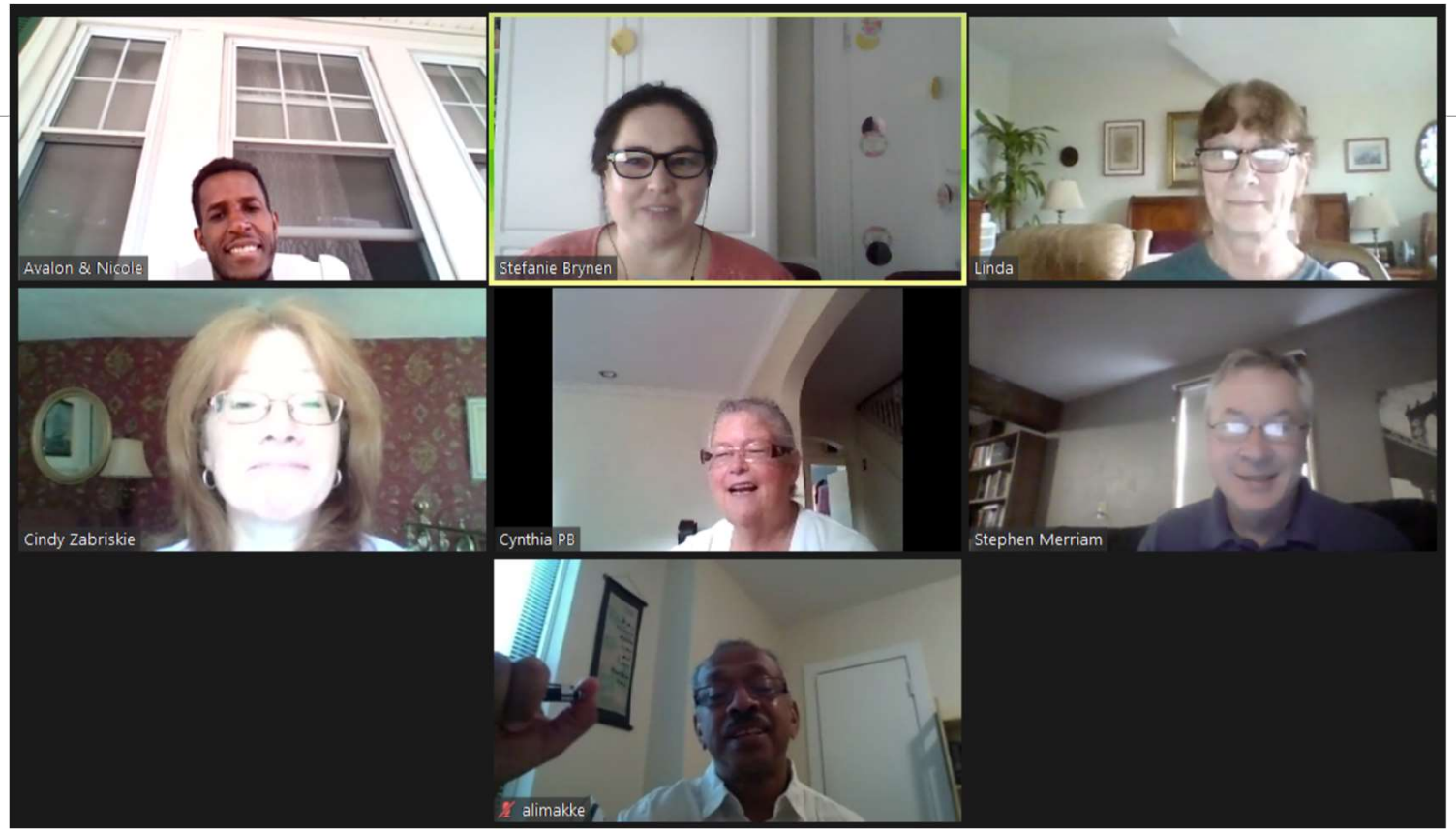
A calming picture of a development that does not need work

The People You will Work With



AESU

The People You will Work With



PMU

The People You will Work With

Photo not Available

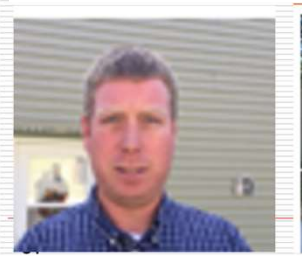
CMU

The People You will Work With

RCAT Northeast

RCAT Northwest

RCAT PMs



RCAT South

The People You will Work With

DAVE and RICK

Review of House Doctor Contract – RFS DHCD HD2020 (found online)

- **6.1 Basic Service:**
  - 6.1.1: The Basic Services will consist of the work in the phases described in the Work Order – includes all of the engineers required for a project.
  - 6.1.2: The Designer is responsible for identifying which building components are renewed or altered as a result of the construction.
  - 6.1.3: The Designer is responsible for scheduling and conducting meetings described in the Work Order and the preparation and distribution of meeting notes.
  - 6.1.4: The Designer shall meet the schedule and submission dates established in the Work Orders.
  - 6.1.5:The Designer is responsible for the production and delivery to DHCD of up to five hardcopy sets
  - 6.1.6: The Designer is responsible for archiving the bid documents, including addendum, and for the drafting and archiving of Record Documents.
  - 6.1.7: In order to preserve the environment for present and future generations and to encourage environmental justice for the residents of Local Housing Authorities, the Designer is responsible for identifying and recommending the use of energy and water conservation measures, resiliency to climate hazard measures, non-toxic/mindful material selection, indoor air quality improvement measures, and pollutant reduction measures as they relate to the scope of work.

- **6.2: The Department establishes the Construction Budget for each assignment.**

- **6.3: Extra Services** according to fee structure

- **6.4: Quality and Standards:** DHCD may review the Designer's work but the reviews will not relieve the Designer from compliance with the Quality Standards, i.e. meeting codes, etc.

Work Order and Fee Submittal – Planning Phase & Tab

1. DHCD AE writes a scope, budget, and creates a schedule to go to the House Doctor

2. HD Receives Fee Request from Cap Hub; Review the Work Order

3. Submit a Fee for Review by the House Doctor Administrator (Simone)

3a. Reject a request to do the project

3b. Receive a Fee Approval from the House Doctor Administrator

4. Contact the LHA to begin Work

Work Order and Fee Submittal – Planning Phase & Tab

1. The DHCD AE writes a scope, budget, and creates a schedule to go to the House Doctor.
The factors we consider for selection are:

Geography	Current workload	Cumulative workload	Phased Projects	LHA Preference	DHCD staff selection

2. HD Receives Fee Request from Cap Hub; Review the Work Order

3. Submit a Fee for Review by the House Doctor Administrator (Simone)

3a. Reject a request to do the project

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4. Contact the LHA to begin Work

Work Order and Fee Submittal – Planning Phase & Tab – write WO

Edit revise and propose new Submittal Due times, Numbers of Meetings, and/or Payment amounts.

Milestone	Submittal Due	# Meetings	Payment
Schematic Design	**3** weeks from the signed planning document	1	$3,140.25
Construction Docs 100%	**3** weeks from last written approval	4	$3,165.00
Bidding	**12** weeks	1	$993.50
Construction	**12** weeks	0	$3,744.00
Close-Out & Warranty	**9** months from Substantial Completion	1	$993.50
Designer / Total Designer Fees			$12,036.25
Estimated Construction Cost ↑%			$77,000.00

Work Order and Fee Submittal – Planning Phase & Tab

1. DHCD AE writes a scope, budget, and creates a schedule to go to the House Doctor

2. HD Receives Fee Request from Cap Hub; Review the Work Order

- Look the same but are updated regularly based on program changes
- If you have questions about the scope, contact the AE who wrote it (name is at the top of the Work Order)
- Standard turn around is 2 weeks, unless emergency or you request more time
- Review the schedule
- Include comments in Cap Hub

3. Submit a Fee for Review by the House Doctor Administrator (Simone)

3a. Reject a request to do the project

3b. Receive a Fee Approval from the House Doctor Administrator

4. Contact the LHA to begin Work

Work Order and Fee Submittal – receive fee

6/24/2020 **AESU Proposal**

Milestone	Submittal Due	# Meetings	Payment
Schematic Design	**3** weeks from the signed planning document	1	$4,800.00
Construction Docs 100%	**3** weeks from last written approval	4	$5,400.00
Bidding	**12** weeks	1	$1,400.00
Construction	**12** weeks	0	$8,800.00
Close-Out & Warranty	**9** months from Substantial Completion	1	$1,200.00
Designer / Total Designer Fees			$21,600.00
Estimated Construction Cost			$ 77,000.00

#

Due Date

7/6/2020

(11 days)

Is fee within 15% of AE Estimate?

NO 79 **%**

AE Estimated Fees: **$12,036.25**

DC Estimated Fees: **$21,600.00**

Work Order and Fee Submittal – Planning Phase & Tab

1. DHCD AE writes a scope, budget, and creates a schedule to go to the House Doctor

2. HD Receives Fee Request from Cap Hub; Review the Work Order

3. Submit a Fee for Review by the House Doctor Administrator (Simone)

- Discuss the fee with the AE if too high
- There is a max design fee of $100k before it goes to the DSC for review
- Hourly rates apply for extra services
- Not competing with other HDs but we can reject the fee
- If we cannot come to an agreement, no hard feelings, see you next time

3a. Reject a request to do the project

If you are too busy, or the scope is outside of your comfort level, please reject in a timely manner

3b. Receive a fee Approval from the House Doctor Administrator

Begin work. The clock starts from that point on milestones

4. Contact the LHA to begin Work

- This is the House Doctor's Responsibility
- Contact info in Cap Hub
- Every contact by email should include the Project # so we know what you are talking about

Design and Review – Design Phase & Tab

Contact the LHA to begin work

Walk-thru

Gather Documents

Review the Related Guidelines

Develop Concept/ Schematic design

Find existing drawings at our archive with Biddocs or I the back room of the LHA

Submit the Design into Cap Hub ALWAYS

Paper copy as needed

If the correct phase is not showing, ask PM to have it fixed

Include a transmittal for both digitally and hard copy so we know that all the parts are included

If you will be late, let the team know so the schedule can be revised

Assigned DHCD AEs will review the documents and provide a review memo

Recommending Approval, Incomplete, or Rejection

Reasons you won't be approved:

The project is over budget and there has not been a suggestion to get to budget

The design is not defined and quantifiable

Missing parts of the submittal, i.e. the estimate

The design does not meet the design guidelines

You are using the incorrect front end

PM will initiate a Phase Approval once the review of the phase are complete

Notice out of Cap Hub

Approval to Bid and you will receive instructions from cap hub on how to proceed

All our bidding is electronic apart from BHA

Bid Docs & Project Dog

Procurement Specialist – Dave McClave will guide your way

Project Management Team

Project Management Team – Stefanie Brynen

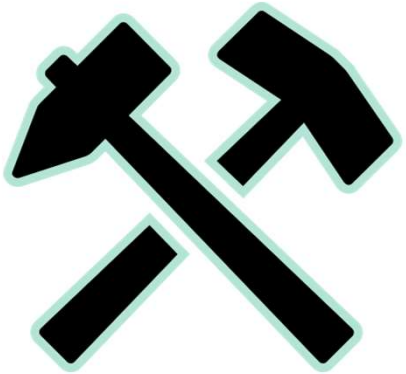
- DHCD Project Managers are here to help move the project forward, making sure all parties are on the same page
- Most frequently that means managing the project **schedule** and **budget**
- Helpful hints:
  - Please communicate any changes to the Work Order (changes in scope, schedule or budget) as early in the process as possible
  - All changes to the budget need to be approved by the Housing Authority, DHCD Architect or Engineer, and the Project Manager

DHCD and RCAT Project Managers

- There are two kinds of Project Managers - RCAT and DHCD
- RCAT PMs handle jobs between $10K- $100K
  - Jobs between $50K- $100K are called RCAT-Large
  - DHCD PMs handle jobs over $100K
- For more information about the RCAT program, go to: https://www.mass.gov/service-details/regional-capital-assistance-team-rcat-program

Changes to Schedule, Budget, or Scope

- Keep us informed of any changes as soon as they happen.
- Budget changes and schedule changes impact our forecast, so accuracy is critical for our processes.
- Changes in scope that require fee amendments can be submitted in CapHub. When submitting an amendment, include a description and the change and a breakdown of any additional fee.
- We’re here to help! Give us a call if you have any questions.



Construction Tips

Construction Tips for New Design Consultants – Sean Keating

Always refer to the DHCD Guidelines & Standards.

Be diligent about initial investigative work required in the scope of services.

If there are questions about code compliance, check with the local inspector before materials are ordered and work begins.

The director is the "owner", and the comfort, safety and consideration of the tenants must come first.

Post meeting minutes in a timely manner so the team has time to review them prior to the next meeting.

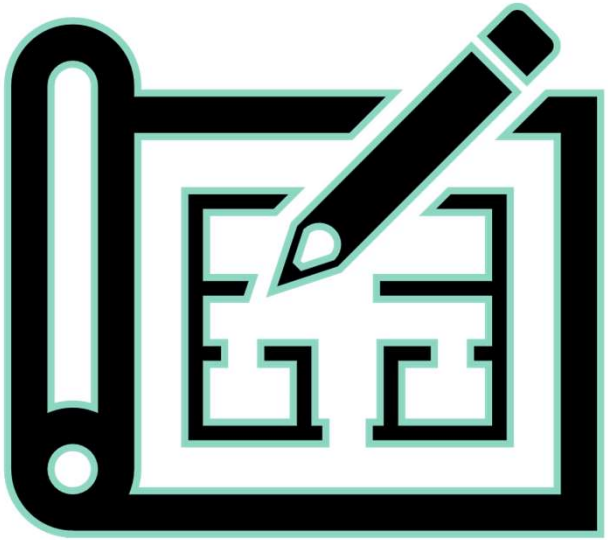
Submittals should be reviewed and returned as quickly as possible to keep the project moving.

Always include a cover letter with change orders.

This should be written so the director and his or her board can easily understand the need for the change.

Designers should defer to their responsibilities listed in the scope of services.

Site visits should still be made by the designers to review the work.



Documents:

PROJECT GUIDES & REQUIREMENTS did I say we are a bureaucracy

Public Housing Modernization Page

https://www.mass.gov/public-housing-modernization-documentation/need-to-know

Design Guidelines

Updating Now – Out by the end of Summer

- Roughly by CSI category
- Not Specs, do not refer to them in your spec sections
- Sustainability and Resiliency wrapped into the guidelines as well as individual compilations
- Aging in Place Checklist

Public Bidding Info

Front End Documents

- Also part of Smart Spec
- At varied procurement levels based on ECC

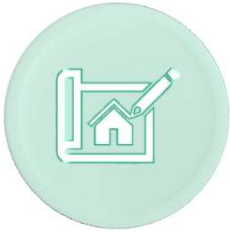
Construction Handbook

Sustainability and Resiliency

Other Guidelines - MAAB

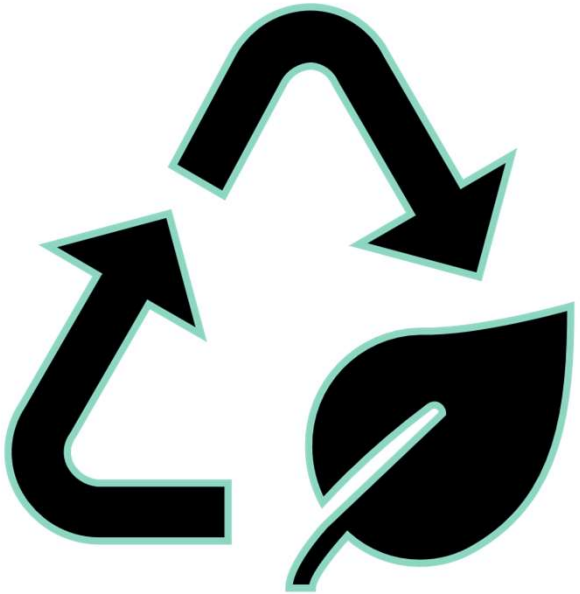
Developments are looked at as a whole, not an individual building

Fall under the category of REPLACEMENT VALUE at $73.32/sf, not the Full and Fair Cash Value of the building that means we are often faced with large scale MAAB renovation requirements while doing something totally unrelated



Sometimes able to defer to other developments within the LHA which exceed the unit count requirement

Compliance funding available to some housing authorities



SUSTAINABILITY AND RESILIENCY

General Overview – Greg Abbe

WHY CARE ABOUT SUSTAINABILITY?

- Gov. Baker committed MA to net-zero GHG emissions by 2050
- MA Legislature looks like to commit to the same goal
- A perilous point in time requiring action on issues of Climate Change
- Climate Change is especially bad for vulnerable populations, many of whom live in public housing

Program Offerings

PAST

- LHA's complete an application for SUST funding ($100k cap)
- Eligible projects include:
  - Low-flow toilets & showerheads
  - Weatherization (air-sealing/insulation)
  - Weatherstripping of doors
  - Oil/propane → Air Source Heat Pump (ASHP)
  - LED Lighting & Controls
  - Refrigerators
  - Bath fans & Range Hoods
  - Shade Trees

PRESENT

- LHA's may still complete SUST application ($150k cap)
- Targeted Initiatives- specific developments
  - Weatherization
  - Oil-furnace replacement
- Sustainability adders to other projects
  - Replacing a roof = check for insulation & bath fans
  - Kitchen or bath rehab = check for range hood/bath fans, check for low-flow fixtures
  - Replacing siding = check for insulation

Program Offerings (cont'd)

- May be more developments in the coming months!
- You can always check this website for updates:

https://www.mass.gov/service-details/public-housing-sustainability-resilience-and-healthy-building-environments

- Greg Abbe, Sustainability Program Developer

Gregory.abbe@mass.gov

CHARM

CLIMATE HAZARD ADAPTATION & RESILIENCE MASTERPLAN

JULY 1, 2020

NEW ECOLOGY
Community-Based Sustainable Development

dhcd Massachusetts

KLEINFELDER
Bright People. Right Solutions.

Agenda

- CHARM – Climate Hazard Adaptation and Resilience Masterplan
  - *Complements MA State Hazard Mitigation and Climate Adaptation Plan*
- Risk & Vulnerability Assessment of the Public Housing Portfolio
- On-Site Assessments & Resilience Strategies
- CHARM Resilience Toolkit
  - Design Guidelines & Standards

Resilience and the DHCD Capital Planning and Design Process

Resilience: the ability of a system to prepare for, withstand and recover quickly from a disaster

Risk & Vulnerability Across the Public Housing Portfolio

- 80,000 people in 1430 developments/ 45,300 apartments
- Prepared GIS map of developments, layered against mapped climate hazards over time
- Surveyed LHAs re: recent experience with extreme weather, insurance claims, emergency plans in place
- Developed risk & vulnerability score for every development
- Prioritized the most vulnerable developments

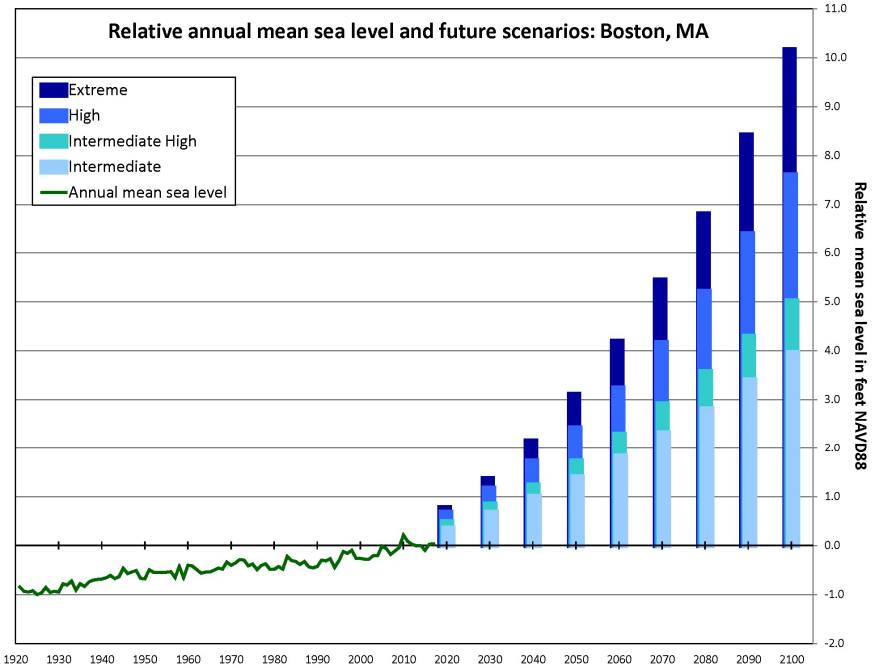
Exposure to Climate Change Hazards

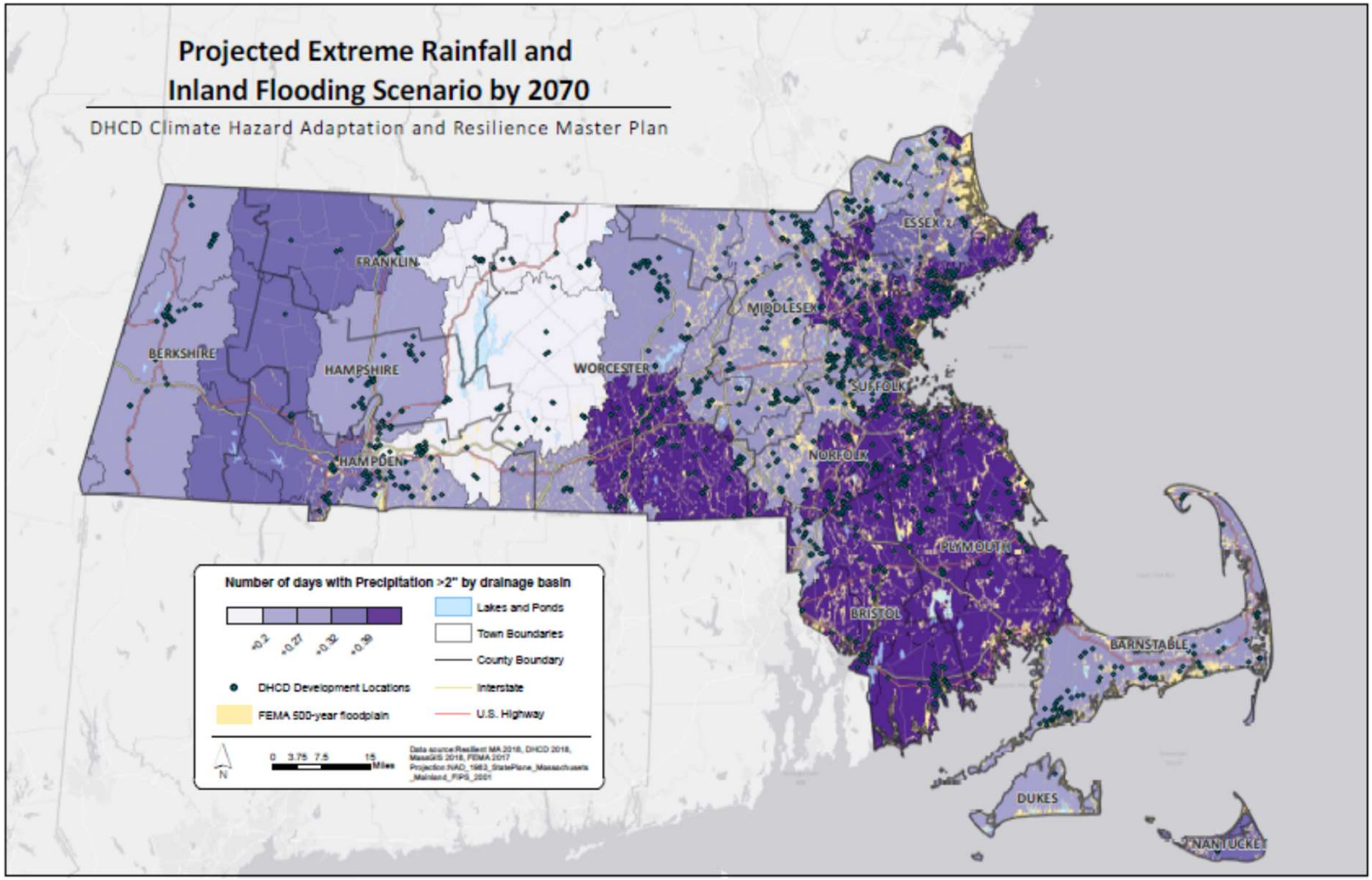
Expected Climate Changes through 2100:
Sea Level Rise

Primary Parameters
- Sea Level Rise and Storm Surge (coastal)
- Precipitation and Flooding (inland)
- Extreme Temperatures

Secondary Parameters
- Wind, Drought, Fire

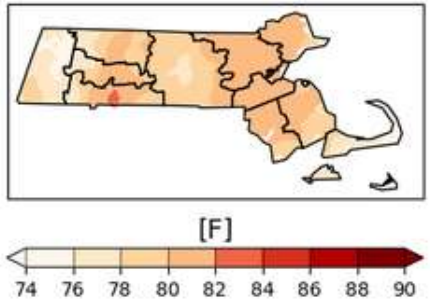
Time Horizons
- 2030, 2050 and 2070



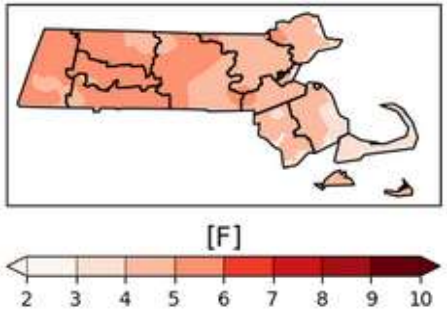

Projected Extreme Rainfall and
Inland Flooding Scenario by 2070
DHCD Climate Hazard Adaptation and Resilience Master Plan
FRANKLIN
BERKSHIRE
HAMPSHIRE
HAMPDEN
WORCESTER
MIDDLESEX
ESSEX
SUFFOLK
NORFOLK
PLYMOUTH
BRISTOL
BARNSTABLE
DUKES
NANTUCKET
Number of days with Precipitation >2" by drainage basin
Lakes and Ponds
Town Boundaries
County Boundary
Interstate
U.S. Highway
DHCD Development Locations
FEMA 500-year floodplain
0 3.75 7.5 15 Miles
N

Expected Climate Changes:

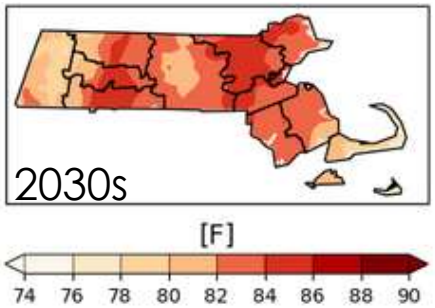
Extreme Heat – Average Maximum Summer Temperature

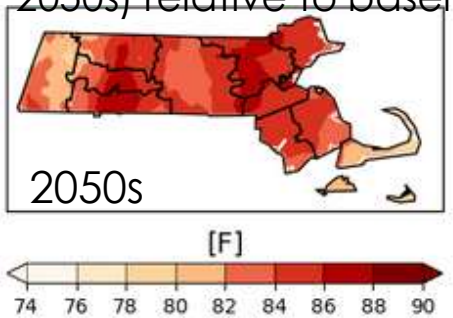


Baseline (1971-2000)



Projections (centered on 2050s) relative to baseline





Summer Days Over 90˚F - Statewide baseline (1971-2000): 4 days

- 4-12 more days by 2030s
- 6-22 more days by 2050s

Risk and Vulnerability Assessment Results

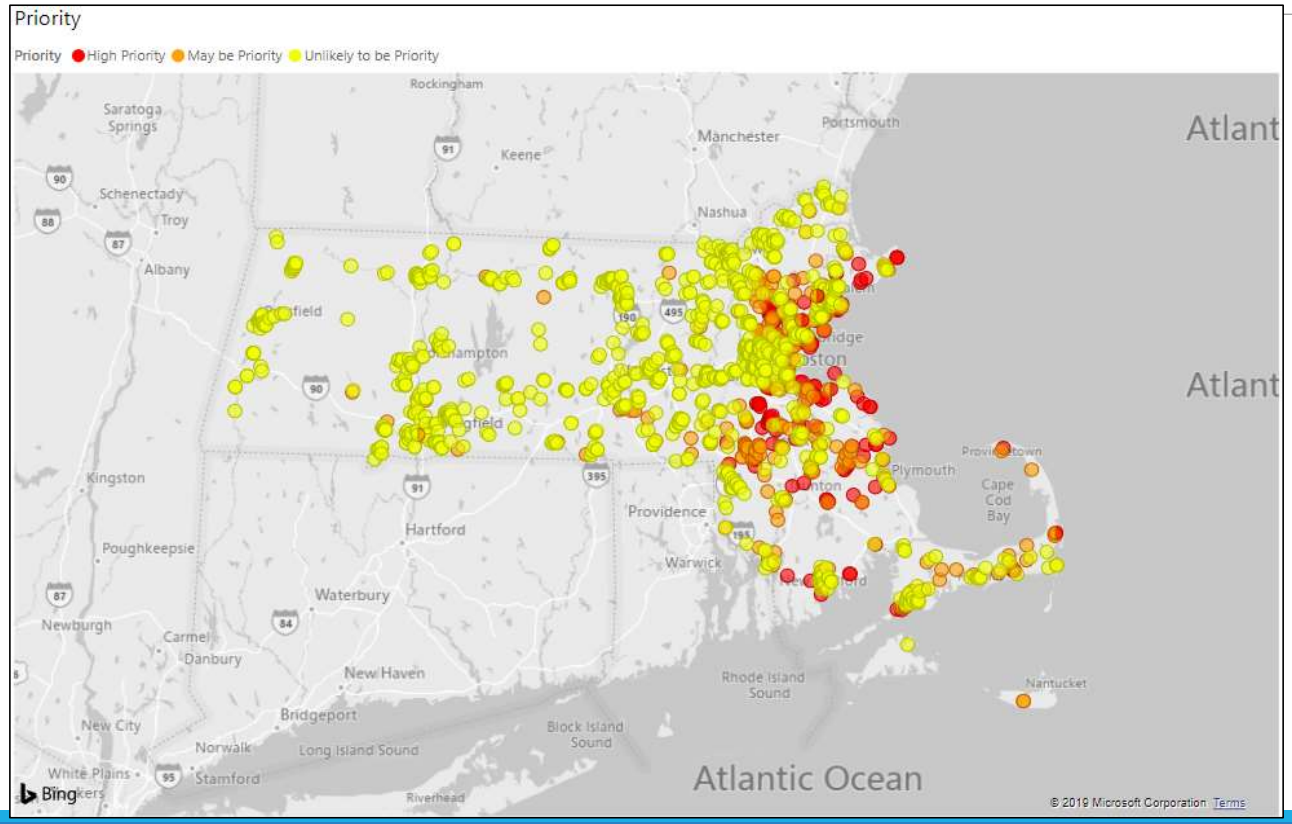
Excel Spreadsheet tool with data inputs from hazard exposure, facility condition information, LHA survey data, focusing on:

Exposure - Susceptibility to current or projected climate hazards

Criticality - Property size and resident density, past evacuation experience, possibility to shelter in place during emergency, access to community emergency resources, potentially hazardous neighboring land uses

Adaptive Capacity - the development's overall ability to sustain residents during an extreme conditions, with emergency generator, sump pumps, air conditioning, as well as emergency plan

RVA Results: 179 High Priority Developments



Highest scores located in Eastern MA at sites subject to:

- Sea Level Rise/ Storm Surge
- Riverine Flooding

Extreme heat impacts will affect portfolio statewide

Example High Priority Developments

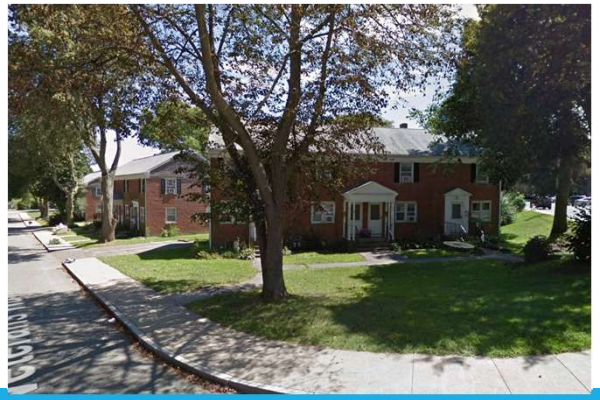
Chapter 667- Elderly

Lee Fort Terrace, Salem

Liston Towers, Revere

David J. Crowley Court, Quincy

Chapter 200 - Family



Riverdale Park, Gloucester

Menotomy Manor, Arlington

Veterans Housing, Winthrop

Rapid RVA Tool

- Background on the tools
- How to use the Rapid RVA
- Benefits from using the Rapid RVA

Rapid RVA Tool

Rapid Risk and Vulnerability Assessment | CHARM

Massachusetts Department of Housing and Community Development

INSTRUCTIONS

This tool is intended to educate and guide LHA users in planning more resilient developments. Please use the following questions to gather information about a given development by walking the site and in conversation with site managers and staff. For "NO" answers, see applicable resilience strategies to consider in the column to the right. Refer to the Resilience Strategies page to identify and explore potential strategies. Related hazards are identified as follows: "EP" = emergency preparedness, "P/SLRSS" = precipitation/sea level rise and storm surge, "H" = extreme heat, "W" = wind. Each "YES" answer receives a score of 3, each "NO" answer receives a score of 0. Total scores for all questions to derive development Resilience Score.

RESILIENCE SCORE
Scores are out of 100 points, with 100 being most resilient
49

Property Name	Prattville Apartments, Chelsea, MA
Assessment Completed By	Tom Chase
Date	5/28/20

ASSESSMENT QUESTIONS

PROPERTY MANAGEMENT	YES / NO	HAZARD(s)	COMMENTS	APPLICABLE RESILIENCE STRATEGIES	SCORE
Does the development have an emergency management plan covering staff, residents, and business operations continuity?	NO	EP	Some evacuation planning in place	22	0
Is the emeregency management plan referenced by the municipal emergency plan? Check with municipal officials to confirm.	NO	EP		22	0
Are staff familiar with the emergency preparedness plan and aware of their role in it, if identified?	NO	EP		22	0
Is there a nearby public facility where residents can go during power outages, storms or extreme heat or cold?	NO	EP		26	0
Are residents able to evacuate without mobility assistance?	YES	EP		22, 26, 27	3

Rapid RVA Tool

Rapid Risk and Vulnerability Assessment | CHARM

Massachusetts Department of Housing and Community Development

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Rapid RVA Tool

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Rapid Risk and Vulnerability Assessment | CHARM

Massachusetts Department of Housing and Community Development

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Is there a nearby public facility where residents can go during power outages, storms or extreme heat or cold?	NO	EP		26	0
Are residents able to evacuate without mobility assistance?	YES	EP		22, 26, 27	3

BUILDING EXTERIOR	YES / NO	HAZARD(s)	COMMENTS	APPLICABLE RESILIENCE STRATEGIES	SCORE
Is the development located o[illegible] a FEMA flood zone AE, AO, AH, D, or V? See: https://m[illegible] gov/portal/search	NO	P/SLRSS		22, 26	0
Have residents and st[illegible]ed severe weather-related challenges getti[illegible]m the development? Examples include flooding [illegible]ed trees.	YES	P/SLRSS		22, 26, 27	3
Is the developm[illegible] of vents or other penetrations in the outside walls (above or below grade) that could let water into the building(s)?	NO	P/SLRSS		1, 2, 7, 8	0

1 - Rapid RVA | 2 - Resilience Strategies | +

Resilience Strategies on Tab 2

Resilience Strategies | CHARM

Massachusetts Department of Housing and Community Development

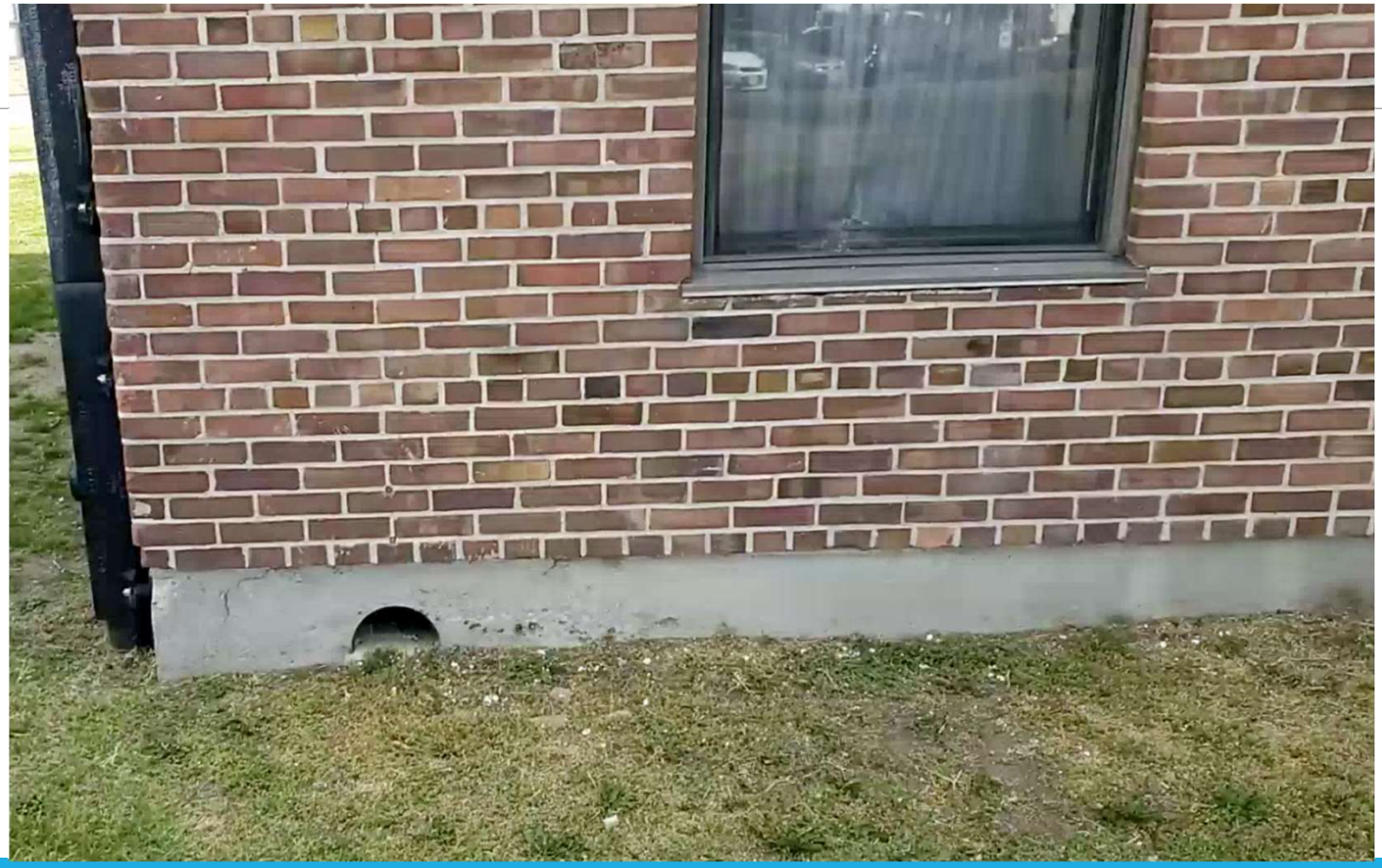
INSTRUCTIONS

Use the strategy ID number below to match applicable strategies as identified during the Rapid Risk and Vulnerability Assessment.

STRATEGY ID	STRATEGY NAME	HAZARD(s)	STRATEGY DETAILS	APPLICABLE DESIGN GUIDELINE SECTION
1	**Wet Floodproofing**	P/SLRSS	FEMA defines wet floodproofing as "Permanent or temporary measures applied to a structure or its contents that prevent or provide resistance to damage from flooding while allowing floodwater to enter the structure or area. Generally, this includes properly anchoring the structure, using flood resistant materials below the Base Flood Elevation (BFE), protection of mechanical and utility equipment, and use of openings or breakaway walls."	**06 10 00 ROUGH CARPENTRY** **06 20 00 FINISH CARPENTRY** **08 10 00 DOORS AND FRAMES** **09 20 00 GYPSUM** **09 30 00 TILE** **09 64 00 WOOD FLOORING** **09 65 00 RESILIENT FLOORING** **09 68 00 CARPET** **09 90 00 PAINTING** **14 20 00 ELEVATORS** **22 00 00 PLUMBING** **23 00 00 HVAC** **26 00 00 ELECTRICAL** **33 00 00 SITE UTILITIES**
2	**Dry Floodproofing (Building)**	P/SLRSS	Dry floodproofing of a building is installing measures applied to a structure to prevent damage from flooding by preventing floodwater from entering the structure. There are two types of dry floodproofing: active and permanent. Active measures require removable elements to be put into place before an anticipated flood. Permanent measures are fixtures and systems integrated into the structure itself, which do not need to be manually deployed in the event of an emergency. Dry floodproofing is prone to a high risk of failing in lightweight wood-framed buildings, however, and is not recommended for wood-framed building exteriors or openings per FEMA guidance.	**07 10 00 WATERPROOFING AND DAMPPROOFING** **07 90 00 SEALANTS** **08 10 00 DOORS AND FRAMES** **32 30 00 SITE IMPROVEMENTS** **33 00 00 SITE UTILITIES**

Using the Rapid RVA

Building Exterior: Penetrations in outside wall

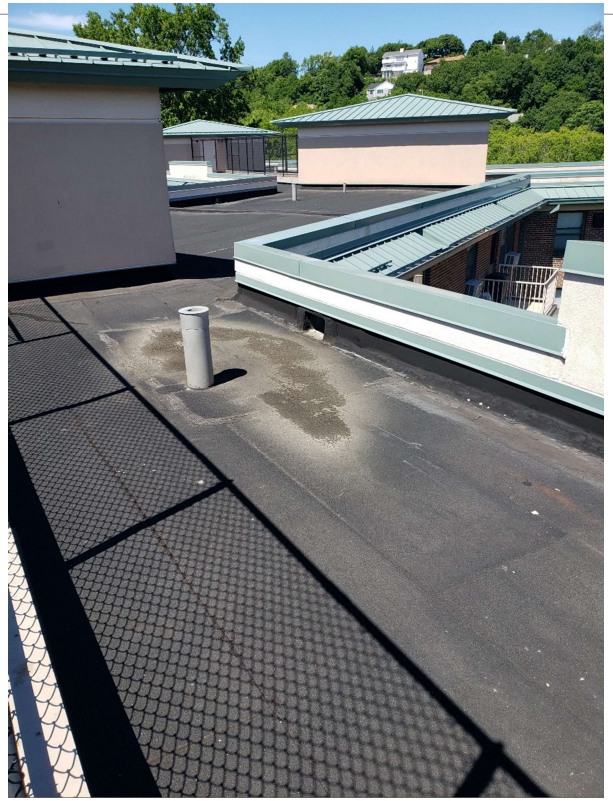


Rapid RVA Tool

BUILDING EXTERIOR	YES / NO	HAZARD(s)	COMMENTS	APPLICABLE RESILIENCE STRATEGIES	SCORE
Is the development located outside a FEMA flood zone AE, AO, AH, D, or V? See: https://msc.fema.gov/portal/search	NO	P/SLRSS		22, 26	0
Have residents and staff avoided severe weather-related challenges getting to and from the development? Examples include flooding or downed trees.	YES	P/SLRSS		22, 26, 27	3
Is the development free of vents or other penetrations in the outside walls (above or below grade) that could let water into the building(s)?	NO	P/SLRSS		1, 2, 7, 8	0
Are stormwater and sanitary sewer systems separated at this location?	YES	P/SLRSS		6	3

STRATEGY ID	STRATEGY NAME	HAZARD(s)	STRATEGY DETAILS	APPLICABLE DESIGN GUIDELINE SECTION
1	Wet Floodproofing	P/SLRSS	FEMA defines wet floodproofing as "Permanent or temporary measures applied to a structure or its contents that prevent or provide resistance to damage from flooding while allowing floodwater to enter the structure or area. Generally, this includes properly anchoring the structure, using flood resistant materials below the Base Flood Elevation (BFE), protection of mechanical and utility equipment, and use of openings or breakaway walls."	06 10 00 ROUGH CARPENTRY 06 20 00 FINISH CARPENTRY 08 10 00 DOORS AND FRAMES 09 20 00 GYPSUM 09 30 00 TILE 09 64 00 WOOD FLOORING 09 65 00 RESILIENT FLOORING 09 68 00 CARPET 09 90 00 PAINTING 14 20 00 ELEVATORS 22 00 00 PLUMBING 23 00 00 HVAC 26 00 00 ELECTRICAL 33 00 00 SITE UTILITIES
2	Dry Floodproofing (Building)	P/SLRSS	Dry floodproofing of a building is installing measures applied to a structure to prevent damage from flooding by preventing floodwater from entering the structure. There are two types of dry floodproofing: active and permanent. Active measures require removable elements to be put into place before an anticipated flood. Permanent measures are fixtures and systems integrated into the structure itself, which do not need to be manually deployed in the event of an emergency. Dry floodproofing is prone to a high risk of failing in lightweight wood-framed buildings, however, and is not recommended for wood-framed building exteriors or openings per FEMA guidance.	07 10 00 WATERPROOFING AND DAMPPROOFING 07 90 00 SEALANTS 08 10 00 DOORS AND FRAMES 32 30 00 SITE IMPROVEMENTS 33 00 00 SITE UTILITIES
7	Sump Pumps	P/SLRSS	Sump pumps are submersible pumps set in sump pits and designed to remove water from the lowest point in a building as water	26 00 00 ELECTRICAL
8	Component Protection Floodproofing	P/SLRSS	Component protection dry floodproofing is installing measures applied to a piece of equipment or location within a building to prevent damage from flooding by preventing floodwater from reaching the equipment or entering the confined location. Using	22 00 00 PLUMBING 23 00 00 HVAC

Building Exterior, Roof: Light in color or ENERGY STAR certified?



Rapid RVA Tool

BUILDING EXTERIOR	YES / NO	HAZARD(s)	COMMENTS	APPLICABLE RESILIENCE STRATEGIES	SCORE
Is membrane roof material white or a light color, or are asphalt shingles ENERGY STAR certified?	NO	H		14	0

INSTRUCTIONS

Use the strategy ID number below to match applicable strategies as identified during the Rapid Risk and Vulnerability Assessment.

STRATEGY ID	STRATEGY NAME	HAZARD(s)	STRATEGY DETAILS	APPLICABLE DESIGN GUIDELINE SECTION
14	Cool Roof	H	A cool roof is a reflective, light colored roof that reduces the amount of solar energy a building absorbs by reflecting the solar energy back into the atmosphere. Cool roofs can be a painted-on or membrane product and reduce the building's cooling load	07 30 00 ASPHALT ROOF SHINGLES 07 50 00 MEMBRANE ROOFING

Building Exterior: Exterior wall insulation

Rapid RVA Tool

RESILIENCE SCORE
Scores are out of 100 points, with 100 being most resilient
52

ASSESSMENT QUESTIONS

BUILDING EXTERIOR	YES / NO	HAZARD(s)	COMMENTS	APPLICABLE RESILIENCE STRATEGIES	SCORE
Do exterior walls have insulation?	YES	H		17	3

DHCD Resilience Toolkit

1. Introduction
   - Glossary

2. Building and Site Guidelines
   - Building and Site Guidelines Overview
   - Resilience Index to DHCD Design Guidelines
   - DHCD Design Guidelines Updates

3. Rapid RVA and consolidated Resilience Design Guidelines

4. Emergency Preparedness Guidelines

Glossary

CHARM Glossary of Terms

Base Flood Elevation (BFE)

This is defined by FEMA as the top of water elevation projected for the base flood. BFEs listed on FEMA Flood Insurance Rate Maps are based on the 1% Annual Chance Flood.

Design Flood Elevation (DFE)

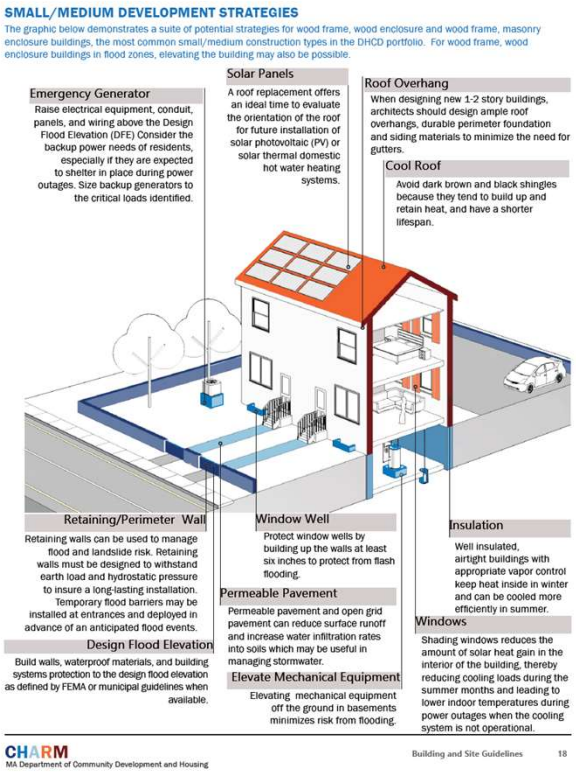
The Design Flood Elevation is the elevation of the highest flood (generally the BFE plus freeboard) that a retrofitting method is designed to protect against. Also referred to as Flood Protection Elevation.

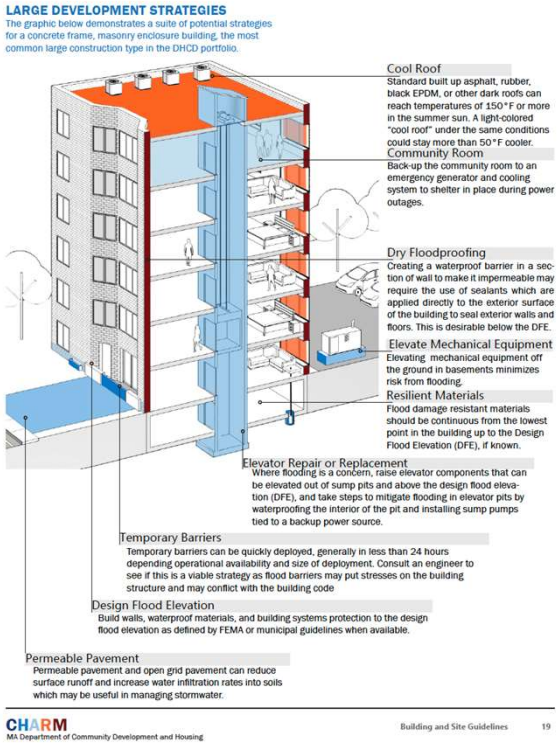
Freeboard

Freeboard is defined as the distance between the SLR-BFE and the SLR-DFE. It is defined by FEMA as a factor of safety, or a buffer between predicted flood levels and a building's lowest occupiable floor.

Building and Site Guidelines

Building and Site Guidelines Overview

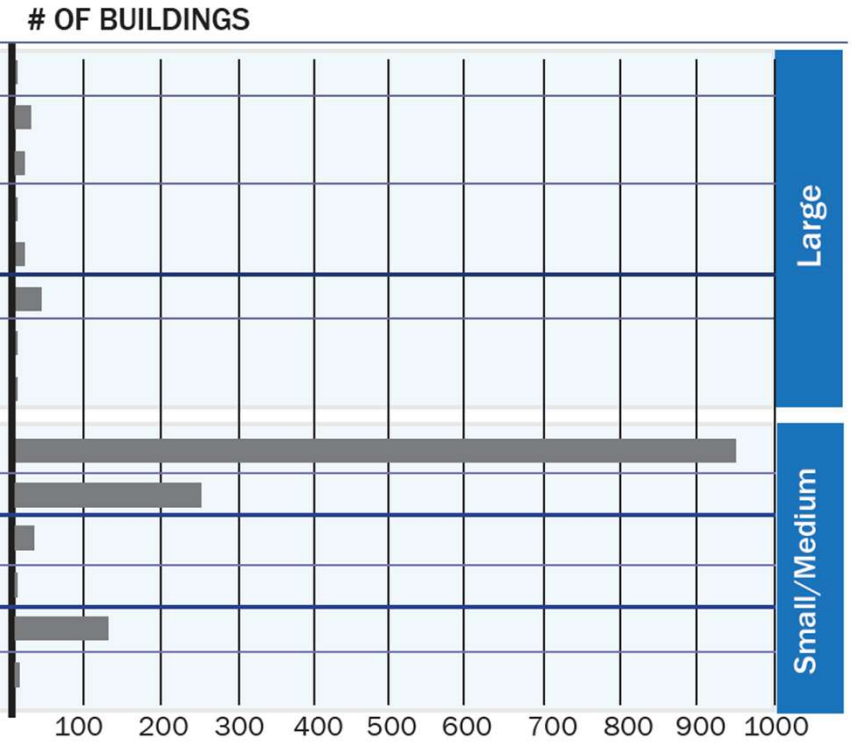




LHA Buildings by Construction Type

LHA BUILDINGS BY CONSTRUCTION TYPE

STRUCTURE	ENCLOSURE	SIZE
Steel Frame	Metal Panel Enclosure	(4-7 Floors)
	Masonry Enclosure	(4-7 Floors)
		(8-20 Floors)
	Concrete Panel Enclosure	(4-7 Floors)
		(8-20 Floors)
Concrete Frame	Masonry Enclosure	(4-7 Floors)
	Concrete Panel Enclosure	(8-20 Floors)
		(4-7 Floors)
Wood Frame	Wood Siding Enclosure	(1-4 Floors)
	Masonry Enclosure	(1-3 Floors)
Steel Frame	Masonry Enclosure	(1-3 Floors)
	Concrete Panel Enclosure	(1-3 Floors)
Concrete Frame	Masonry Enclosure	(1-3 Floors)
	Concrete Panel Enclosure	(1-3 Floors)



LHA Buildings by Construction Type

SMALL/MEDIUM BUILDINGS

The most common construction type for small/medium buildings is wood frame, wood or masonry enclosure. Small building developments are likely to have multiple small buildings with individual mechanical and electrical equipment.

Example: Lee Fort Terrace - Salem Housing Authority is characterized as Small/Medium by wood frame, masonry enclosure, single story.

LARGE BUILDINGS

The most common construction type for large buildings are steel or concrete masonry structure with masonry enclosure. Large building developments are likely to have elevators and centralized mechanical and electrical equipment.

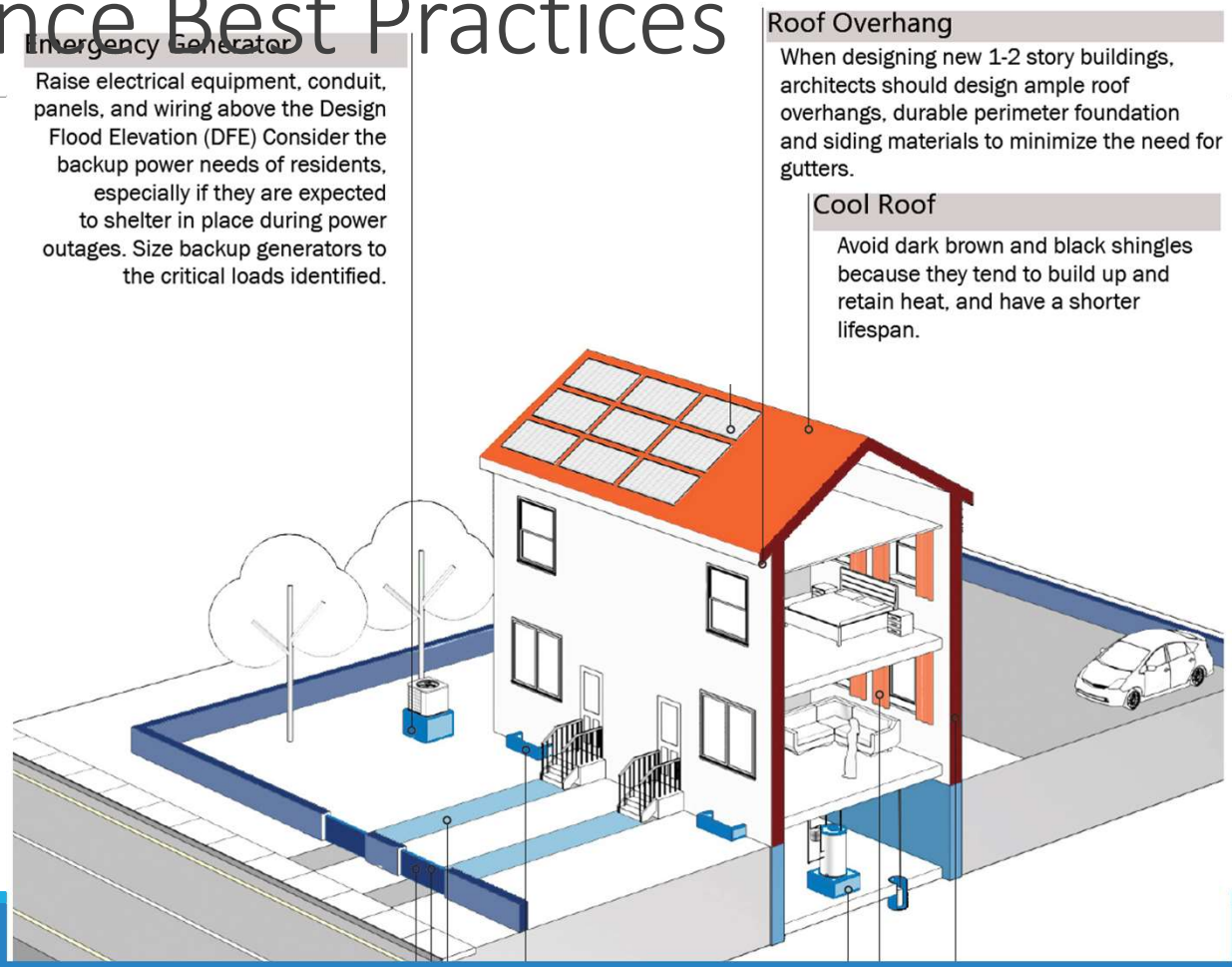
Example: McCarthy Building - Melrose Housing Authority is characterized as Large by masonry frame, masonry enclosure, seven stories.

Resilience Best Practices

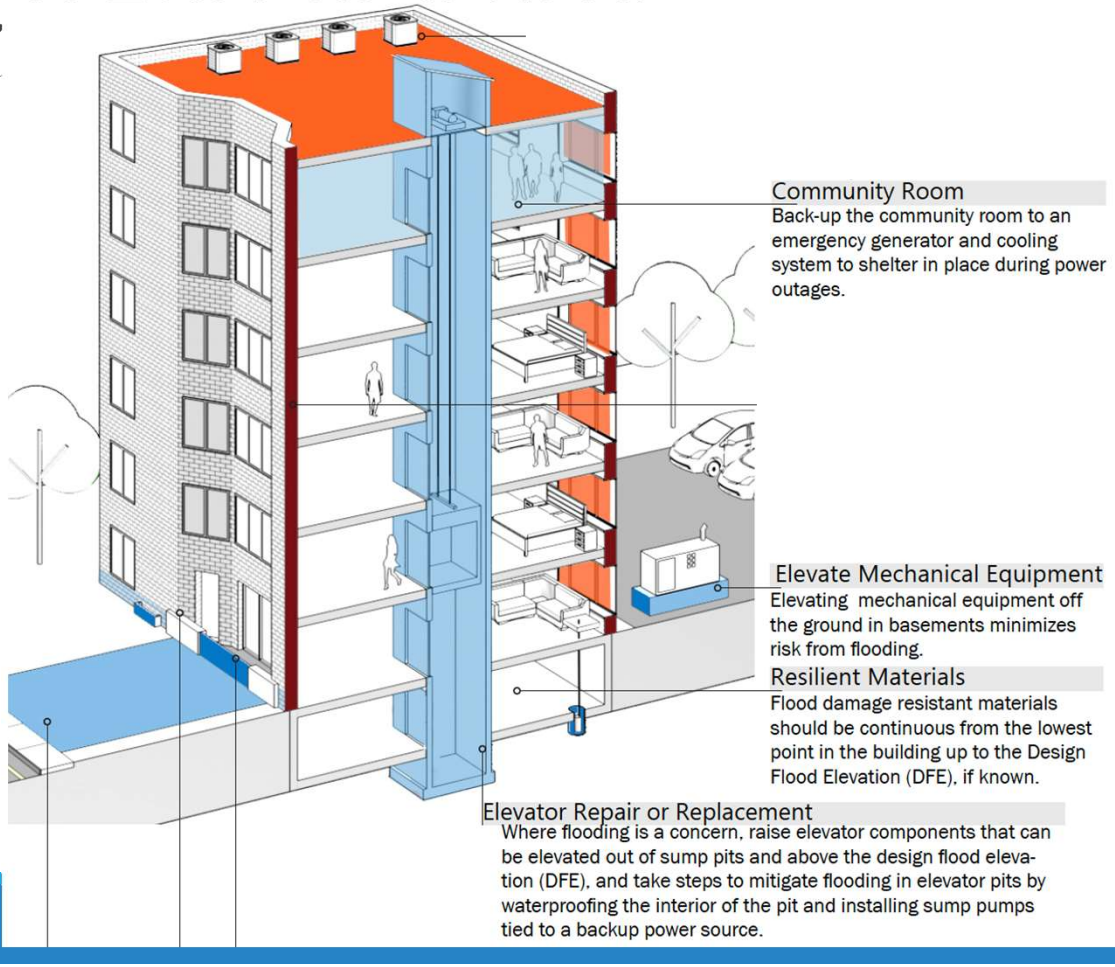
Building Strategies

Resilient Structure and Enclosure **The most effective wall assemblies are well insulated, air and water tight to keep flooding out and maintain comfortable indoor temperature.**	Climate Hazard			Guideline Section
	PRECIPICATION	STORM SURGE	EXTREME HEAT	
Repairing or improving the thermal performance of **masonry** at all properties should always be done with attention to managing moisture and permeability as well as thermal performance.			◆	04 20 00 Unit Masonry
Use **wood** building materials which are considered flood damage resistant, meaning they can withstand direct contact with water for at least 72 hours without being significantly damaged.	◆	◆		06 10 00 Rough Carpentry 06 20 00 Finish Carpentry
For some residential buildings, the Massachusetts Energy Code requires a **continuous air barrier** assembly for new construction buildings or additions at opaque exterior walls or soffits, including joints and junctions to abutting constructions to control air movement through the wall. The air barrier also serves as a liquid-water drainage plane when flashed to discharge water to the exterior.	◆	◆		07 10 00 Waterproofing and Dampproofing
The most **effective wall assemblies** have a primary **water barrier** (the exterior cladding: brick, clapboards, shingles, etc.) and a secondary, vapor-open, bulk water barrier (house wrap with all joints taped, peel-and-stick membrane, liquid-applied air and water barrier, or other product).			◆	07 20 00 Building Insulation & Moisture Protection
Making improvements to **roof drainage** will help buildings address water penetration and structural failures. Improving roof insulation at the eaves of sloped roofs will reduce the freeze-thaw cycling of ice and snow on the roof that leads to ice dams.	◆		◆	07 30 00 Asphalt Roof Shingles

Resilience Best Practices



Resilience Best Practices



DHCD Design Guidelines

DHCD Design Guidelines Revisions

Existing DHCD Design Guidelines by CSI Section

New Resilience Design Guidelines by CSI Section

Revised DHCD Design Guidelines by CSI Section

Resilience Index to Design Guidelines

CATEGORIES	Precipitation Flooding	SLR&SS Flooding	Extreme Heat	Emergency preparedness
01 74 19 -- Waste Management				
02 41 00 -- Demolition				
02 61 00 -- Contaminated Site Material Removal				
02 65 50 -- Underground Storage Tank Removal				
02 82 00 -- Asbestos Remediation				
02 83 00 -- Lead Paint Remediation				
03 30 00 -- Concrete				
04 20 00 -- Unit Masonry	X	X		
05 10 00 -- Structural Steel				
05 55 00 -- Miscellaneous and Ornamental Iron				
06 10 00 -- Rough Carpentry	X	X		
06 20 00 -- Finish Carpentry	X	X		
06 50 00 -- Structural Plastics & Composites				
06 64 00 -- Plastic Tub & Shower Panels				
06 65 00 -- Plastic & Composite Trim				
07 07 00 --Solar Photovolatic Systems				X
07 10 00 -- Waterproofing and Dampproofing	X	X		

DHCD Design Guidelines Example

DESIGN AND CONSTRUCTION GUIDELINES AND STANDARDS
DIVISION 32 • EXTERIOR IMPROVEMENTS

32 12 00 • ASPHALT PAVING

SECTION INCLUDES

Bituminous Concrete Paving of Roads and Walkways

RELATED GUIDELINE SECTIONS

02 41 00	Demolition
03 30 00	Concrete
22 00 00	Plumbing
26 00 00	Electrical
31 00 00	Earthwork
32 30 00	Site Improvements
32 80 00	Site Irrigation
32 90 00	Landscape
33 00 00	Site Utilities

Climate Resilience Design Considerations

Pavement presents an opportunity to address heat island effects and manage stormwater. Some pavement types can help mitigate both concerns. Light colored pavement (high albedo) and open grid pavement help reduce heat impacts. Open grid and permeable pavements help absorb stormwater. Some materials will require modified maintenance practices.

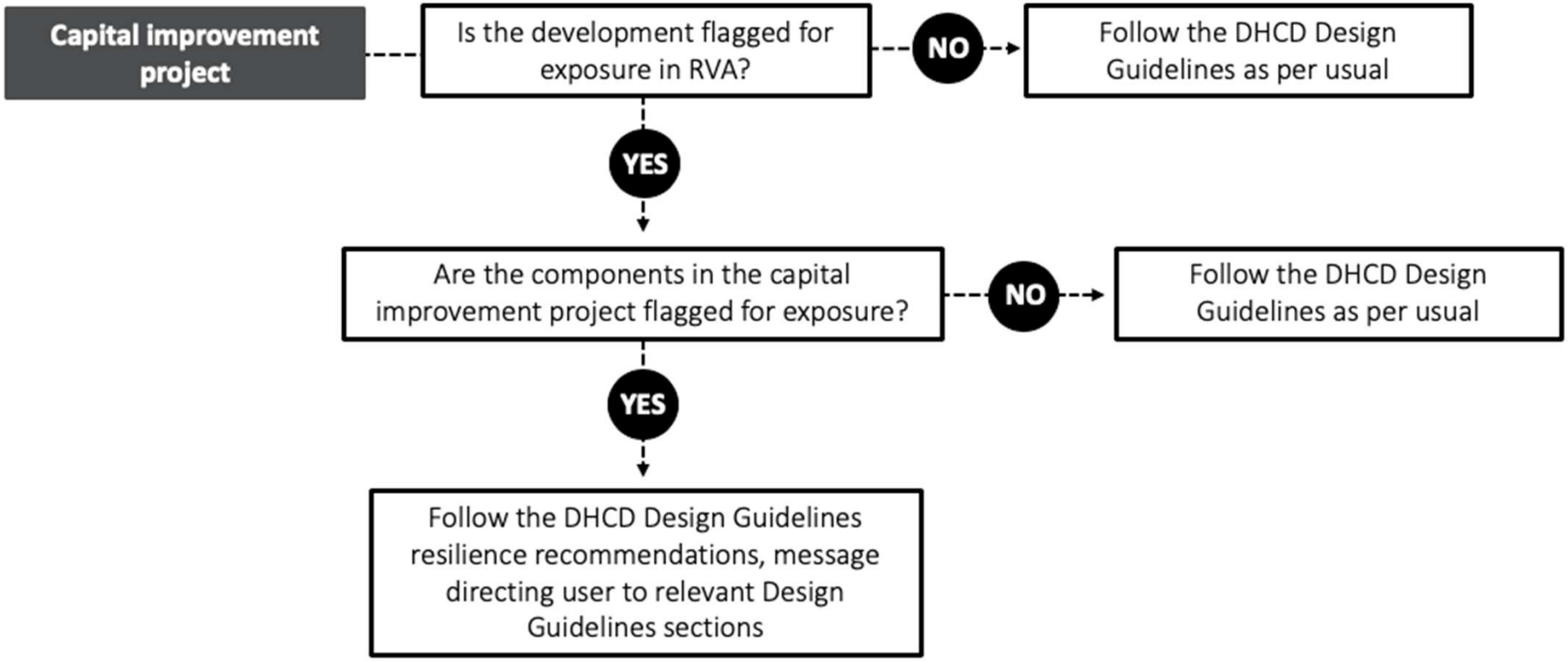
DHCD Design Guidelines Example

CLIMATE RESILIENCE RESOURCES

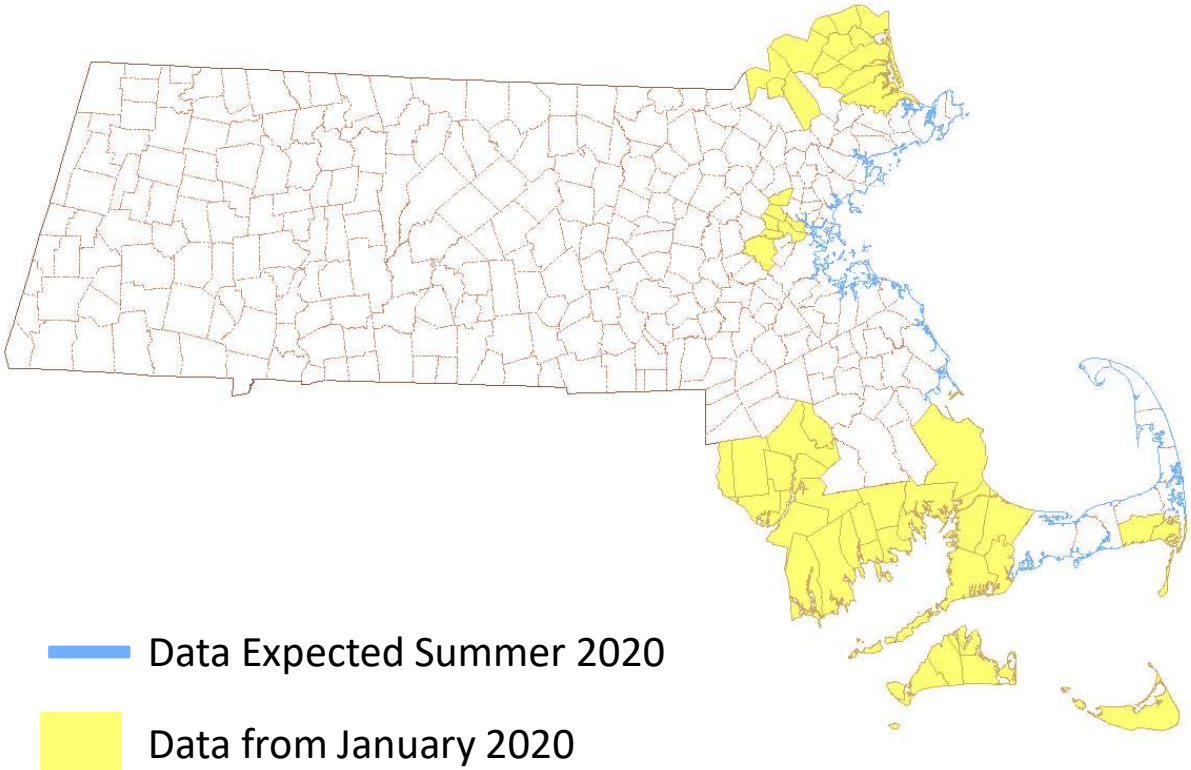
Project teams can learn more about strategies to manage flooding from resources such as these and others:

- Chapter 10 of Enterprise's "Strategies for Multifamily Building Resilience" provides a number of accessible strategies and example images of how to adapt hard surfaces to reduce heat and stormwater impacts: https://www.enterprisecommunity.org/download?fid=2154&nid=4325
- Toronto's "Wet Weather Flow Management Guidelines" provides a number of lessons learned on low impact development practices related to stormwater management in appendix F: https://www.toronto.ca/wp-content/uploads/2017/11/9191-wwfm-guidelines-2006-AODA.pdf
- The University of New Hampshire's Stormwater Center has extensive resources related to the incorporation of permeable pavements and bioswales. Their resources include cold weather performance data, maintenance documentation, and impact studies. Their work can be found here: https://www.unh.edu/unhsc/
- As part of their work, UNH's Stormwater Center has published *Design Specifications for Porous Asphalt Pavement and Infiltration Beds* which includes a discussion of appropriate

How to Use the Revised Guidelines



Massachusetts Coast Flood Risk Model Update



1,347 Developments
498 are in coastal towns

<u>From MC-FRM Data Released</u>

- 18 Developments are within the MC-FRM
  - 9 in greater Boston
  - 9 in the South Grid

thank you

comments and other communications to:

Tom Chase
chase@newecology.org
(617) 557-1700 x7061

Staying the Course & Other Random Info

- Reasons Consultants Don't Stay the Course:
  - Getting bored with the work
  - Not making enough money
  - Other work picks up – suspend your selection availability
  - Worn down by dealing with the bureaucracy
  - Not serving your client – the LHA & DHCD
  - Retirement
- You can still apply for RFS through the DSC but we prefer that you do not take on small projects with the RCATs, unless you are an engineer – these also show up as work being done in cap hub, but the fee is capped at $10k
- Lunch and Learns
- Ask us if you have questions!

CLOSING/ QUESTIONS