

Article 80 Review Guidelines – Appendix 7 (addition of a new section)

Climate Change Resiliency and Preparedness Checklist

In 2011, Mayor Menino adopted the final recommendations of the Climate Action Leadership Committee. In conformance with this directive, all development projects subject to Boston Zoning Article 80 Small and Large Project Review, including all Institutional Master Plan modifications and updates, are to complete the following checklist and provide any necessary responses regarding project resiliency, preparedness, and strategies to reduce project impacts due to Climate Change.

For more information about the City of Boston's climate policies and practices, and the 2011 update of the climate action plan, *A Climate of Progress*, please see the City's climate action web pages at <http://www.cityofboston.gov/climate>

For comments on the Climate Change Resiliency and Preparedness Checklist or best building practices, please contact: John.Dalzell.BRA@cityofboston.gov

In advance we thank you for your time and assistance in advancing best practices in Boston.

Climate Change Analysis and Information Sources:

1. Northeast Climate Impacts Assessment (www.climatechoices.org/ne/)
2. USGCRP 2009 (<http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts/>)
3. Army Corps of Engineers guidance on sea level rise (<http://planning.usace.army.mil/toolbox/library/ECs/EC11652212Nov2011.pdf>)
4. Proceeding of the National Academy of Science, “Global sea level rise linked to global temperature”, Vermeer and Rahmstorf, 2009 (<http://www.pnas.org/content/early/2009/12/04/0907765106.full.pdf>)
5. “Hotspot of accelerated sea-level rise on the Atlantic coast of North America”, Asbury H. Sallenger Jr*, Kara S. Doran and Peter A. Howd, 2012 ([http://www.bostonredevelopmentauthority.org/planning/Hotspot of Accelerated Sea-level Rise 2012.pdf](http://www.bostonredevelopmentauthority.org/planning/Hotspot%20of%20Accelerated%20Sea-level%20Rise%202012.pdf))
6. “Building Resilience in Boston”: Best Practices for Climate Change Adaptation and Resilience for Existing Buildings, Linnean Solutions, The Built Environment Coalition, The Resilient Design Institute, 2103 (http://www.greenribboncommission.org/downloads/Building_Resilience_in_Boston_SML.pdf)

PLEASE COMPLETE THE QUESTIONNAIRE ONLINE

Project Information

Project Name:	
Project Address Primary:	
Project Address Additional:	
Project Contact (name / Title / Company / email / phone):	

Team Description

Owner / Developer:	
Architect:	
Engineer (building systems):	
Sustainability / LEED:	
Permitting:	
Construction Management:	
Climate Change Expert:	

Project Permitting and Phase

At what phase is the project – at time of this questionnaire?

PNF / Expanded PNF Submitted	Draft / Final Project Impact Report Submitted	BRA Board Approved
BRA Design Approved	Under Construction	Construction just completed:

Building Classification and Description

What are the principal Building Uses - select all appropriate uses?

Residential – One to Three Unit	Residential - Multi-unit, Four +	Institutional	Education
Commercial	Office	Retail	Assembly
Laboratory / Medical	Manufacturing / Industrial	Mercantile	Storage, Utility and Other
First Floor Uses (List)			

What is the Construction Type – select most appropriate type?

Wood Frame	Masonry	Steel Frame	Concrete
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Describe the building?

Site Area:	<input type="text"/> SF	Building Area:	<input type="text"/> SF
Building Height:	<input type="text"/> Ft.	Number of Stories:	<input type="text"/> Flrs.
First Floor Elevation:	<input type="text"/> Elev.	Are there below grade spaces:	<input type="text"/> Yes / No

Green Building

Which LEED Rating System(s) and version has or will your project use (by area for multiple rating systems)?

Select by Primary Use:	New Construction	Core & Shell	Healthcare	Schools
	Retail	Homes Midrise	Homes	Other
Select LEED Outcome:	Certified	Silver	Gold	Platinum

Will the project be USGBC Registered and / or USGBC Certified – Primary Use?

Registered:	Yes / No	Certified:	Yes / No
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Extreme Weather and Heat Events

Climate change will result in more extreme weather events including higher year round average temperatures, higher peak temperatures, and more periods of extended peak temperatures. The section explores how a project responds to higher temperatures and heat waves.

Analysis

What is the full expected life of the project?

Select most appropriate:	10 Years	25 Years	50 Years	75 Years
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What time span of future Climate Conditions was considered?

Select most appropriate:	10 Years	25 Years	50 Years	75 Years
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Analysis Conditions - What range of temperatures will be used for project planning – Low/High?

/ Deg.

What Extreme Heat Event characteristics will be used for project planning – Peak High, Duration, and Frequency?

Deg.	Days	Events / yr.
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What Drought characteristics will be used for project planning – Duration and Frequency?

Days	Events / yr.
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What Extreme Rain Event characteristics will be used for project planning – Seasonal Rain Fall, Peak Rain Fall, and Frequency of Events per year?

Inches / yr.	Inches	Events / yr.
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What Extreme Wind Storm Event characteristics will be used for project planning – Peak Wind Speed, Duration of Storm Event, and Frequency of Events per year?

Peak Wind	Hours	Events / yr.
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Mitigation Strategies

What will be the overall energy performance, based on use, of the project and how will performance be determined?

Energy use below code:	%			
Select compliance path:	Energy model	Prescriptive path	EnergyStar	Other, please

			describe
What specific measures will the project employ to reduce building energy consumption?			
Select all appropriate:	High performance building envelop	High performance lighting & controls	Building day lighting
	High performance HVAC equipment	Energy recovery ventilation	No active cooling
			EnergyStar equip. / appliances
			No active heating
Describe any added measures:			

What are the insulation (R) values for building envelop elements?

Roof:	R =	Walls:	R =
Foundation:	R =	Basement / Slab:	R =
Windows:	R = / U =	Doors:	R = / U =

What specific measures will the project employ to reduce building energy demands on the utilities and infrastructure?

On-site clean energy / CHP system(s)	Building-wide power dimming	Thermal energy storage systems	Ground source heat pump
On-site Solar PV	On-site Solar Thermal	Wind power	Describe any additional measures
Describe any added measures:			

Will the project employ Distributed Energy / Smart Grid Infrastructure and /or Systems?

Select all appropriate:	Local Distributed Electricity connected	Building will be Smart Grid ready	Distributed steam / heat / chilled water connected	Building will be distributed thermal energy ready
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Will the building remain operable without utility power for an extended period?

Yes / No	If yes, for how long:	Days
If Yes, is service "Islandable?"		
If Yes, describe strategies:		

Describe any non-mechanical strategies that will support building functionality and use during an extended interruption(s) of utility services and infrastructure:

Select all appropriate:	Solar oriented – longer south walls	Prevailing winds oriented	External shading devices	Tuned glazing,
	Building cool zones	Operable windows	Natural ventilation	Building shading
	Potable water for drinking / food preparation	Potable water for sinks / sanitary systems	Waste water storage capacity	High Performance Building Envelop
Describe any added measures:				

What measures will the project employ to reduce urban heat-island effect?

Select all appropriate:	High reflective paving materials	Shade trees & shrubs	High reflective roof materials	Vegetated roofs
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Describe other strategies:

What measures will the project employ to accommodate rain events and more rain fall?

Select all appropriate:

On-site retention systems & detention ponds	Infiltration galleries & areas	Bioswales & vegetated water capture systems	Vegetated roofs
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Describe other strategies:

What measures will the project employ to accommodate extreme storm events and high winds?

Select all appropriate:

Hardened building structure & elements	Buried utilities & hardened infrastructure	Hazard removal & protective landscapes	Soft & permeable surfaces (water infiltration)
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Describe other strategies:

Sea-Level Rise and Storms

Rising Sea-Levels and more frequent Extreme Storms increase the probability of coastal and river flooding and enlarging the extent of the 100 Year Flood Plain. This section explores if a project is or might be subject to Sea-Level Rise and Storm impacts.

Location Description and Classification:

Do you believe the building to susceptible to flooding now or in the full expected life of the building?

Describe site conditions?

Site Elevation – Low/High Points:

Building Proximity to Water:

Is the site or building located in any of the following?

Coastal Zone:

Velocity Zone:

Flood Zone:

Area Prone to Flooding:

Are updates in the floodplain delineation due to climate change likely to change the classification of the site or building location?

What is the project or building proximity to nearest Coastal, Velocity or Flood Zone or Area Prone to Flooding?

If you answered YES to any of the above Location Description and Classification questions, please complete the following questions. Otherwise you have completed the questionnaire; thank you!

Sea-Level Rise and Storms

This section explores how a project responds to Sea-Level Rise and / or increase in storm frequency or severity.

Analysis

How were impacts from higher sea levels and more frequent and extreme storm events analyzed:

Sea Level Rise: Frequency of storms:

Building Flood Proofing

Describe any strategies to limit storm and flood damage and to maintain functionality during an extended periods of disruption.

Will the building remain occupiable without utility power during an extended period of inundation:

If Yes, for how long:

Has the ground floor level been elevated in response to Sea Level Rise:

First Floor Elevation: Height above 100 Year Floodplain:

Will lower building levels be constructed in a manner to prevent water penetration:

If yes, what is the Flood Proof Elev. (height above 100 Year Floodplain):

What measures will be taken to ensure the integrity of critical building systems during a flood or severe storm event:

Systems located above 1 st Floor.	Water tight utility conduits	Waste water back flow prevention	Storm water back flow prevention
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Were the differing effects of fresh water and salt water flooding considered:

Will the project site and building(s) be accessible during periods of inundation or limited circulation and / or access to transportation:

If yes, to what height above 100 Year Floodplain:

Will the project employ hard and / or soft landscape elements as velocity barriers to reduce wind or wave impacts?

If Yes, describe:

Describe any additional strategies to addressing sea level rise and or sever storm impacts:

Building Resilience and Adaptability

Describe any strategies that would support rapid recovery after a weather event and accommodate future building changes that respond to climate change:

Will the building be able to withstand severe storm impacts and endure temporary inundation?

Select appropriate:

<input type="text" value="Yes / No"/>	<input type="text" value="Hardened / Resilient Ground Floor Construction"/>	<input type="text" value="Temporary shutters and or barricades"/>	<input type="text" value="Resilient site design, materials and construction"/>
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Can the site and building be reasonably modified to increase Building Flood Proofing or rising sea levels?

Select appropriate:	Yes / No	Surrounding site elevation can be raised	Building ground floor can be raised	Construction been engineered
Describe additional strategies:				

Has the building been planned and designed to accommodate future resiliency enhancements?

Select appropriate:	Yes / No	Solar PV	Solar Thermal	Clean Energy / CHP System(s)
		Potable water storage	Wastewater storage	Back up energy systems & fuel

Describe any additional strategies:

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Thank you for completing the Boston Climate Change Resilience and Preparedness Checklist!

For questions or comments about this checklist or Climate Change Resiliency and Preparedness practices, please contact: John.Dalzell.BRA@cityofoboston.gov