Exposure Screening Tool

Complete grey shaded cells to screen the project for climate change related hazards. Some are populated with drop down lists.

General	Criticality	*See "Appendix - Criticality"*	Non-critical
	Cost	*Major or Minor project*	
	Estimated useful life (years)	*See "Appendix - Useful Life"*	
	Projected construction completion date (calendar year)	*Review preliminary schedule to determine projected calendar year of construction completion*	
	Projected end of useful life (year)	*Sum of the above (autocalculated)*	0
	Climate projections	*See "Appendix - Design Adjustment"*	**Present to 2039**

Exposure Screening Tool

	Risk Screening Question	Directions	Answer	Total Score and Next Steps
Heat	Does the facility include new construction of, or substantial improvements to, the landscape, hardscape, roof, HVAC, building envelope, ventilation system, or façade?	All parts of NYC are exposed to extreme heat. New construction projects or substantial improvements that include changes to the landscape, hardscape, roof, HVAC, building envelope, ventilation system, or façade could affect the material performance of a project, thermal comfort of occupants, and/or increase ambient temperatures. If the project includes any of those components, answer 'yes.'		
			Heat Vulnerability Score	
	Is the facility in a neighborhood tabulation area with high heat vulnerability?	Identify the neighborhood tabulation area your facility is located in. Locate that neighborhood tabulation area on the Heat Vulnerability Index map located in Section II.A of the Guidelines and note the area's vulnerability. Select the corresponding answer. HVI map: http://a816-dohbesp.nyc.gov/IndicatorPublic/VisualizationData.aspx?id=2411,719b87,107,Summarize NTA map: https://data.cityofnewyork.us/City-Government/NTA-map/d3qk-pfyz		
			# of Heat Waves	
	How many annual heat waves are projected to occur at the end of the facility's useful life?	See Section II.A of the Guidelines and note the annual heat wave projection according to the useful life of the facility. Select the corresponding answer.		

Total Score	Exposure Rating
2-5	Low
6-8	Medium
9-10	High

If the project is less than $50M:
…and scores "Medium" or "High" consult Section II.A of the Guidelines.
…and scores "Medium" or "High" consult Section II.A of the Guidelines.
…and scores a "Low" using the Guidelines is not required.

If the project is $50M or more:
…and scores "Medium" or "High" complete a detailed Risk Assessment (See Section III) and then consult Section II.A in the Guidelines.
…and scores a "Low" using the Guidelines is not required.

SCORE	0
EXPOSURE RATING	

Precipitation	Does the facility require a new DEP site connection proposal, or a modification to the existing site connection plan?	The intensity and frequency of precipitation events are projected to increase across all parts of NYC, creating new challenges for stormwater management and impacts to the built environment. New construction projects provide opportunities to accommodate increased precipitation flow volumes, and typically require submitting a new site drainage connection proposal to DEP for review and approval. If a project is a substantial improvement, the scope of work of the substantial improvement would dictate if the previously approved DEP site connection plan will require modifications. If a new site connection proposal or modifications are required, answer 'yes.'	

Total Score	Exposure Rating
1	Low
2	Medium
3-4	High

If the project is less than $50M:
…and scores "Medium" or "High" consult Section II.B of the Guidelines.
…and scores a "Low" using the Guidelines is not required.

If the project is $50M or more:

			If the project is $50M or more:
Does the site have a history of flooding during precipitation events?	Consult institutional knowledge (for example, if this site experiences non-coastal flooding during heavy rain events) and 311 service requests for flooding at or near this site (see hyperlink below) and select "yes" if there is a history of flooding at the site. https://data.cityofnewyork.us/Social-Services/Street-Flooding/wymi-u6i8		…and scores "Medium" or "High" complete a detailed Risk Assessment (See Section III) and then consult Section II.B in the Guidelines. …and scores a "Low" using the Guidelines is not required.
Will there be a net increase in impervious area on the site as a result of the project?	Refer to preliminary site plans (if they are part of the project scope) or consult with Capital Project Initiation team. Choose 'yes' if a net increase in impervious area is anticipated.		

SCORE	0
EXPOSURE RATING	

Sea Level Rise

Current Flood Risk Is the facility in the current 1% annual chance floodplain (100-year)?	Visit NYC Flood Hazard Mapper.* Click on the Map Legend and select the 'Preliminary Flood Insurance Rate Maps 2015'. Search for or navigate to the site to see if it is located within the current effective floodplain. If the site is shown to be all or partly in the current floodplain, answer 'yes.' http://www.nyc.gov/floodhazardmapper		If the project is less than $50M: …and scores "Medium" or "High" consult Section II.C of the Guidelines. …and scores a "Low" using the Guidelines is not required. If the project is $50M or more: …and scores "Medium" or "High" complete a detailed Risk Assessment (See Section III) and then consult Section II.C in the Guidelines. …and scores a "Low" using the Guidelines is not required.
Future Flood Risk Is the facility in the future 1% annual chance floodplain (100-year) at any point during its useful life?	Visit NYC Flood Hazard Mapper.* Click on the Map Legend and select the 'Future Floodplain' that corresponds to the project useful life. Search for or navigate to the property to see if it is located within the future floodplain. If the site is shown to be all or partly in the future floodplain, answer 'yes.' http://www.nyc.gov/floodhazardmapper		
Current Tidal Inundation Does this site have a history of flooding from high tide events?	Potential sources to answer this question include institutional knowledge (for example, if this site floods during regular high tides) or history of 311 service requests (see hyperlink below). If the site is shown to have a history of tidal flooding, answer 'yes.' https://data.cityofnewyork.us/Social-Services/Street-Flooding/wymi-u6i8		
Future Tidal Inundation Are there critical access roads to the site that will be inundated by future high tides?	Visit the NYC Flood Hazard Mapper.* Click on the Map Legend and select the "High Tide" scenario that corresponds to the project useful life. Identify if any primary access roads to the site are inundated from high tide plus sea level rise. If the site is shown to have roads at risk of tidal inundation, answer 'yes.' http://www.nyc.gov/floodhazardmapper		

Total Score	Exposure Rating
0	Not Exposed
1	Low
2	Medium
>3	High

**For more information on how to use the Flood Hazard Mapper, see Climate Resiliency Design Guidelines Section II.C.*

SCORE	0
EXPOSURE RATING	Not Exposed

Useful Life

Facilities and components and associated climate cha	
Climate Change Projections (time period covered)	**Examples of building**
2020s (through to 2039)	*Temporary or rapidly replaced components and finishings*
2050s (2040-2069)	*Facility improvements, and components on a regular replacement cycle*
2080s (2070-2099)	*Long-lived buildings and infrastructure*
2100+	*Assets that cannot be relocated*

ange projections
gs, infrastructure, landscape, and components grouped by typical useful life
• Interim and deployable flood protection measures • Asphalt pavement, pavers, and other ROW finishings • Green infrastructure • Street furniture • Temporary building structures • Storage facilities • Developing technology components (e.g., telecommunications equipment, batteries, solar photovoltatics, fuel cells)
• Electrical, HVAC, and mechanical components • Most building retrofits (substantial improvements) • Concrete paving • Infrastructural mechanical components (e.g., compressors, lifts, pumps) • Outdoor recreational facilities • At-site energy equipment (e.g., fuel tanks, conduit, emergency generators) • Stormwater detention systems
• Most buildings (e.g., public, office, residential) • Piers, wharfs, and bulkheads • Plazas • Retaining walls • Culverts • On-site energy generation/co-generation plants
• Major infrastructure (e.g., tunnels, bridges, wastewater treatment plants) • Monumental buildings • Road reconstruction • Subgrade sewer infrastructure (e.g., sewers, catch basins, outfalls)

Critical Facilities

Facilities defined as critical
The criticality definitions below are for use in the application of the Guidelines only. All items identified as critical in NYC Building Code Appendix G are critical in these Guidelines; however, this list includes additional facilities that are not listed in Appendix G. If a facility is not listed here, it is considered non-critical for the purposes of these Guidelines.
• Hospitals and health care facilities;
• Fire, rescue, ambulance, and police stations, as well as emergency vehicle garages;
• Jails, correctional facilities and detention facilities;
• Facilities used in emergency response, including emergency shelters, emergency preparedness, communication, operation centers, communication towers, electrical substations, back-up generators, fuel or water storage tanks, power generating stations and other public utility facilities;
• Critical aviation facilities such as control towers, air traffic control centers and hangars for aircraft used in emergency response;
• Major food distribution centers (with an annual expected volume of greater than 170,000,000 pounds);
• Buildings and other structures that manufacture, process, handle, store, dispose, or use toxic or explosive substances where the quantity of the material exceeds a threshold quantity established by the authority having jurisdiction and is sufficient to pose a threat to the public if released;
• Infrastructure in transportation, telecommunications, or power networks including bridges, tunnels (vehicular and rail), traffic signals, (and other right of way elements including street lights and utilities), power transmission facilities, substations, circuit breaker houses, city gate stations, arterial roadways, telecommunications central offices, switching facilities, etc.;
• Ventilation buildings and fan plants;
• Operations centers;
• Pumping stations (sanitary and stormwater);
• Train and transit maintenance yards and shops;
• Wastewater treatment plants;
• Water supply infrastructure;
• Combined-sewer overflow (CSO) retention tanks;
• Fueling stations;
• Waste transfer stations; and
• Facilities where residents have limited mobility or ability, including care facilities and nursing homes.

Design Adjustment Criteria

Provided for reference. Full datasets can be found in the Climate Resiliency Design Guidelines Appendices.

HEAT

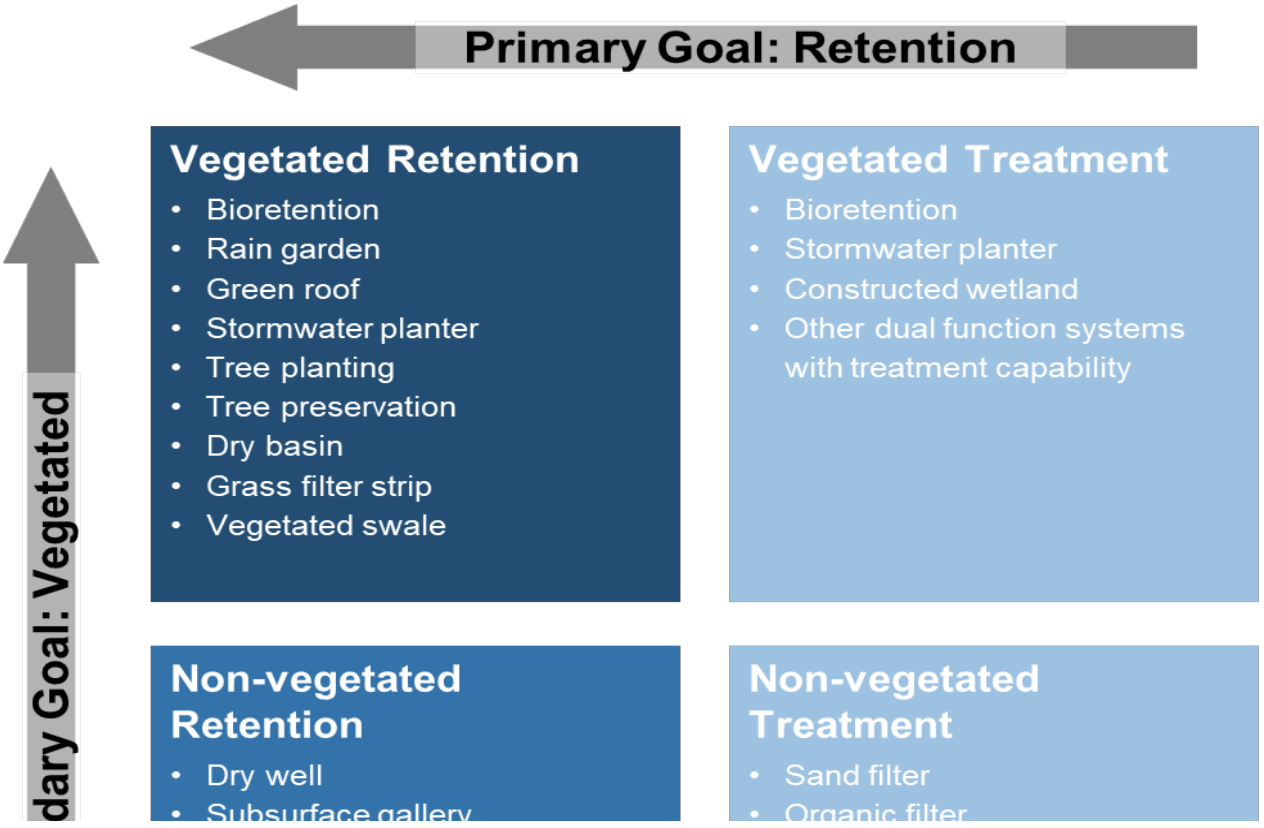
Current and projected extreme heat events and design criteria.

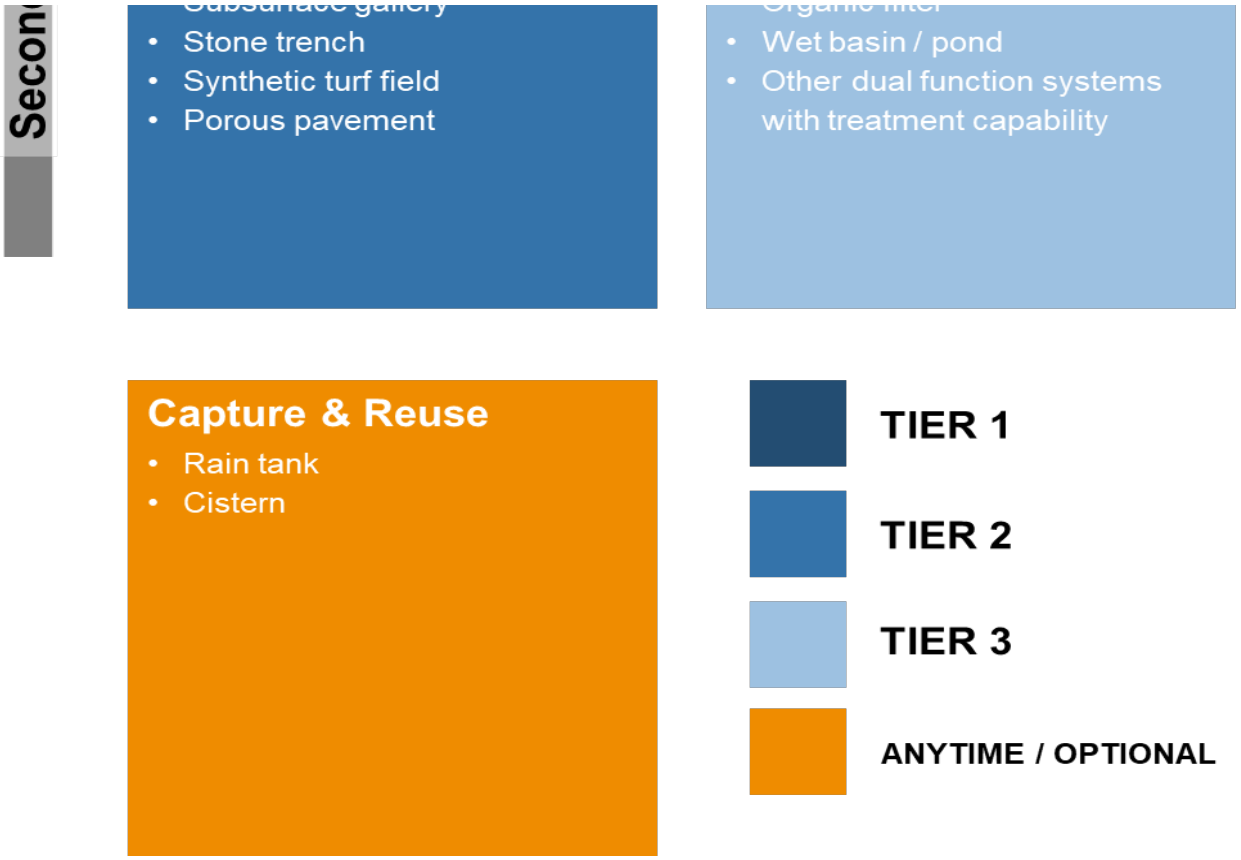
	Extreme heat events			*Design crite*
End of useful life	**# of heat waves per year**	**# days at or above 90°F**	**Annual average temperature**	**1% Dry Bulb temperature**
Historic Trend (1971-2000)	**2**	**18**	**54°F**	**91°F**
2020s (through to 2039)	**4**	**33**	**57.2°F**	**--**
2050s (2040-2069)	**7**	**57**	**60.6°F**	**98°F**
2080s (2070-2099)	**9**	**87**	**64.3°F**	**--**

Note: Due to HVAC system typical useful life of around 25 years, only design criteria projections for the 2050s are shown. Projections for tl not shown because it is anticipated that enough of a safety margin is employed already in current systems to withstand the temperature ris through the 2020s. The NPCC is developing projections of 1% Wet Bulb temperatures, which are expected to increase. This design criteria added in a later version of the Guidelines.

PRECIPITATION

DEP Stormwater Management Practice Hierarchy for Separate Sewer Areas





SEA LEVEL RISE

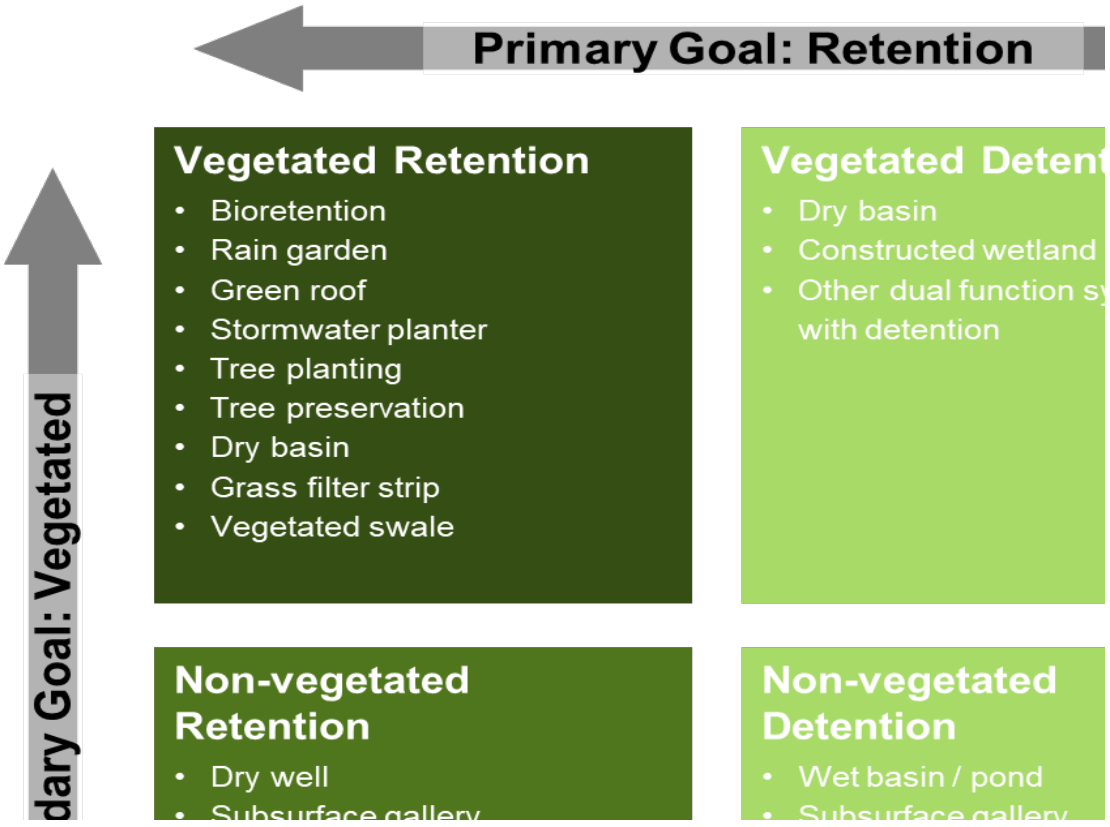
Sea level rise-adjusted (SLRA) design flood elevation (DFE)

Critical* Facilities				
End of Useful Life	**Base Flood Elevation (BFE)[56] in NAVD 88**	**+ Freeboard[57]**	**+ Sea Level Rise Adjustment[58]**	**= Design Flood Elevation (DFE) in NAVD 88**
2020s (through to 2039)	FEMA 1% (PFIRM)	24”	6”	= FEMA 1% + 30”
2050s (2040-2069)	FEMA 1% (PFIRM)	24”	16”	= FEMA 1% + 40”
2080s (2070-2099)	FEMA 1% (PFIRM)	24”	28”	= FEMA 1% + 52”
2100+	FEMA 1% (PFIRM)	24”	36”	= FEMA 1% + 60”
Non-critical Facilities				
2020s (through to 2039)	FEMA 1% (PFIRM)	12”	6”	= FEMA 1% + 18”
2050s (2040-2069)	FEMA 1% (PFIRM)	12”	16”	= FEMA 1% + 28”
2080s	FEMA 1% (PFIRM)	12”	28”	= FEMA 1% + 40”

(2070-2099)				
2100+	FEMA 1% (PFIRM)	12”	36”	= FEMA 1% + 48”
Additional analysis should be conducted to incorporate wave action and wave run-up in DFE calculations especially in areas that are located within the FEMA’s 1% annual chance Limit of Moderate Wave Action (LiMWA) zone. Wave run-up is the maximum vertical extent of wave uprush above surge.				

ria
Cooling Degree Days *(base = 65°F)*
1,149
--
2,149
--
he 2020s are e expected will be

DEP Stormwater Management Practice Hierarchy for Combined Sewer Areas



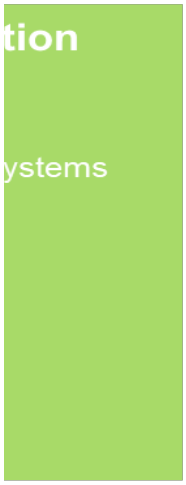
Second

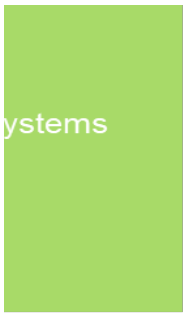
- Subsurface gallery
- Stone trench
- Synthetic turf field
- Porous pavement

- Subsurface gallery
- Blue roof
- Detention tank
- Other dual function sy
  with detention

Capture & Reuse

- Rain tank
- Cistern


tion
ystems



OPTIONAL

Design Strategies List

This table presents a non-comprehensive list of design strategies to address climate change

Extreme Heat	Extreme Precipitation
Mechanical Cooling System	Select High Elevation Site
Minimize East-West Building Orientation	Select Higher Elevation within Existing Site
Passive Solar Cooling and Ventilation Systems	Green Roof
Cool Roof (SRI appropriate)	Protect Below Grade Areas from Flooding
Green Roof (extensive)	On-site Stormwater Management (gray)
Vegetated Structures (planters, walls)	Reduce Impervious Areas
Enhanced HVAC System, including space layout optimization, system scalability, and improved controls	Permeable Pavement
More Efficient Building Envelope	Increase Green Spaces and Planted Areas
Shade Structures	Tree Planting/Preservation
Structures Covered by Energy Generation Systems	Bioswale
Light Colored Pavements (appropriate SRI)	Rainwater Reuse Cisterns
Increase Planted Areas	Stormwater Planter
Permeable Surfaces and Open-grid Pavement	Grass Filter Strip
Bioswales	Constructed Wetland
Daylighting	Selection of Salt/Flood Tolerant Plantings
Window shading	Selection of Native Plantings
Operable windows	Preservation of Natural Vegetation
Waste Heat Recovery	Other:
Solar + Storage	Blue Roof (SCA Project specific)
Trees and Shrubs	
Preservation of Natural Vegetation	
Other:	

e hazards, as described throughout the Guidelines.

Sea Level Rise & Storm Surge
Select High Elevation Site
Select Higher Elevation within Existing Site
Raise Building Floor Elevation
Waterproof Building Envelope
Elevate Critical Building Functions
Elevate Critical Equipment
Perimeter Floodwall/ Levee (passive or active)
Dry/Wet Floodproofing
Utility Redundancy Design
Resilient Materials & Landscape Treatments
Design for Storm Surge Outflow
Install Backwater Flow Prevention
Design for Scour
Raise Road Elevation
Flexible Adaptation Pathway
Constructed Wetland
Preservation of Natural Wetland
Other:

PROJECT TIMELINE - EXAMPLE

Resiliency actions and associated reporting incorporated into an exam
Resilient design is most effective when incorporated as early as possibl
Projects that are Public Private Partnerships shall complete the scopin

Project Phase	Resiliency Action
Scoping/Planning	Incorporate resiliency considerations into project scope development/early planning.
	Screen the project for climate change related hazards using the Exposure Screening Tool
Preliminary Design	Integrate resilient design strategies
	Assess risk
	Analyze costs and benefits
Final Design	Finalize resilient design strategies

ple project timeline. Reporting requirements are submitted to
le. The exposure screening during scoping/planning should inf
g/planning section during financing/procurement.

Description
Collect information on type of project, useful life, criticality, operational goals, expected location, and estimated cost for use in exposure screening and risk assessment.
Assess exposure to changing climate conditions.
Use the Climate Resiliency Design Guidelines to design project to withstand climate change projections for heat, precipitation, and sea level rise.
For projects with total costs greater than $50 million, assess likelihood and consequence of climate change hazards to the project.
Conduct analysis of the benefit/cost implications of the project as necessary. Use the qualitative assessment for projects below $50 million and the in-depth assessment for larger projects.
Evaluate results to determine incorporation of resiliency strategies in final design.

› ResilientDesign@cityhall.nyc.gov.
form the project funding request and procurement.

Reporting
Resilient Design Submittal Checklist - Planning and Schematic Phase Submission (blue sections)
Resilient Design Submittal Checklist Appendix - Exposure Screening
Resilient Design Submittal Checklist - Preliminary Design Phase Submission (green sections)
Risk Assessment
BCA Analysis
Resilient Design Submittal Checklist - Final Design Phase Submission (purple sections)