Introducing Waterfront Edge Design Guidelines

WEDG

Shape Your Waterfront

How to promote access, resiliency, and ecology at the water's edge

A program of the Metropolitan Waterfront Alliance

Metropolitan Waterfront Alliance

INTRODUCTION

PROMOTING ACCESS, RESILIENCY, AND ECOLOGY AT THE WATER'S EDGE

The Metropolitan Waterfront Alliance (MWA) created the Waterfront Edge Design Guidelines (WEDG) program to answer a simple question: How do we create the best possible waterfront? WEDG seeks to answer that question by promoting good design that results in resilient, accessible waterfronts that allow us to live with the water, instead of fighting it.

The waterfront is a place of challenge and opportunity. On the United States East Coast, we saw the challenge recently, when Superstorm Sandy swept through with devastating consequences. Whether you endured destructive flooding, were stuck in gas lines for hours, or lived without power for weeks, we all learned that our waterfront is a utility on which we depend. Harsher waterfront conditions due to climate change are inevitable, and we have to be ready.

Our harbors serve us all: in their traditional and still vital roles as working ports and more recently with cleaner waterways, expanded waterfront access, and beautiful new waterfront parks adding to our quality of life. The indispensable benefits and functions our waterfronts provide our coastal cities, coupled with the reality of climate change, means that we simply cannot develop our shorelines as we have in the past. Waterfront stakeholders—maritime businesses, park administrators, developers, homeowners, government regulators, and scores of others who control and manage our waterways—must understand that projects at the edge need to balance and support access, resiliency, and ecology. It is this ethos that informs WEDG—that we can and must strive for better waterfront design.

BACKGROUND

Since our inception, MWA has advocated for better waterfront edge design through our Design the Edge program and has been a key voice for resiliency and improved management of New York City and northern New Jersey's waterfronts and waterways. In 2010, in conjunction with the decennial update of the New York City Comprehensive Waterfront Plan, MWA's Aquatecture and Green Harbor Task Force recommended the creation of waterfront edge design guidelines. Released in 2011, **Vision 2020: New York City Comprehensive Waterfront Plan** calls for design guidelines as strategies to improve public access and support recreation, enliven the waterfront, support economic development, improve water quality, restore and protect shorefront habitats, improve governmental regulation, and increase resilience to climate change. In 2012, working with key members of New York City's waterfront task forces, MWA initiated the formal process leading to WEDG.

GUIDING PRINCIPLES

WEDG is a result of a unique collaboration between government agencies, not-for-profit organizations, technical experts, and other waterfront stakeholders. As a tool to guide and enhance projects on a voluntary basis, WEDG features design concepts and best practices for all waterfronts that are beneficial, feasible, understandable, cost-effective, and can meet regulations.

WEDG's guiding principles are a set of core values for best design practices for the waterfront edge. A well-designed edge is one where waterfront access, resilience, and ecological benefits are all incorporated into an integrated design. While each site and project has its own characteristics and goals guiding its outcome, these principles established a framework for the creation of WEDG by MWA in conjunction with the interdisciplinary task force and end-users:

Enhance Ecology: Waterfront edge designs should protect existing aquatic habitats and use designs, materials, and shoreline arrangements to improve the ecological function of the coastal zone and strive to be consistent with regional ecological goals such as those in the Hudson-Raritan Estuary Comprehensive Restoration Plan.

Encourage Maritime Use: Edge design should create a waterfront that is usable by the maritime community, commercial and recreational, where appropriate and feasible, thereby maximizing the maritime use and integrity of the harbor and waterfront. Edge design should enhance water-dependent uses, maritime business, maritime activity, and recreational boating activity.

Use a Science-Based, Evaluative Process for Restoration: Project decision makers should use all available science regarding ecological features of waterfront edge design. Projects with innovative ecological features should be monitored based on evidence in the literature and pre-project baseline ecological conditions to determine their effectiveness. Monitoring data should be used to improve designs over time.

Commit to Equity and Community Input: Waterfront edge designs should seek to serve the diverse needs of all types of surrounding communities and land uses and be developed with local community and user input. Waterfront edge designs in underserved communities and communities with lack of waterfront access should be designed with special attention to their needs through robust outreach and feedback-gathering processes. The economic and environmental benefits of maritime industry should be recognized and rewarded as well. Community input can be gathered during processes that determine—especially in public projects—community needs for ecology, recreation, access to the water and boats, commerce, retail, education, open space, and viewsheds, balanced with the needs of the working waterfront. Such processes seek the input of potential users of a space or infrastructure to determine how use affects final design.

Promote Resiliency: Waterfront edge designs must accommodate, mitigate, or be adaptable to the effects of sea level rise and increased coastal flooding. Increases in precipitation may lead to increased stormwater runoff, and green infrastructure and planted edge design can play an important role in improving water quality.

Enhance Public Access, Especially for Boats: Waterfront edge design should incorporate good public access designs—which accommodate the highest number of uses including the widest range of boat

types—that closely reflect user input. Recreation and opportunities to support human interaction with the water should be encouraged where appropriate, and designs should not preclude adding features that improve public access in the future.

Encourage Cost-Effective Solutions: The costs of a project should be assessed given risks including those from climate change, initial capital costs, ongoing maintenance requirements, and other factors. Project designs should be assessed for the economic burden it places on owners and stakeholders. Analyses of a project's vulnerability to and consequences of changing coastal conditions due to sea level rise and coastal flooding should be considered in determining the cost-effectiveness of designs.

SCOPE AND COMPONENTS

WEDG is for projects of all types, with scorecards tailored specifically for residential/commercial, parks, and industrial/maritime uses. Projects earn credits in seven categories:

CATEGORY 1: SITE SELECTION & PLANNING
Plan and develop responsibly through better project siting and resiliency strategies that account for climate change, sea level rise, and coastal flooding.

CATEGORY 2: PUBLIC ACCESS & INTERACTION
Enhance physical, visual, and psychological access to the waterfront area.

CATEGORY 3: EDGE RESILIENCY
Design a resilient and ecologically beneficial waterfront edge.

CATEGORY 4: ECOLOGY & HABITAT
Protect existing habitat and enhance the waterfront edge and site ecosystem.

CATEGORY 5: MATERIALS & RESOURCES
Use materials and resources that are resilient, environmentally friendly, and provide societal benefits; includes responsible construction practices.

CATEGORY 6: OPERATIONS & MAINTENANCE
Address life-cycles of projects including sustained maintenance strategies, preparations for future climate events, and partnerships to advance scientific understanding of waterfronts.

CATEGORY 7: INNOVATION
Identify innovative designs and strategies that are not currently included in WEDG or substantially exceed specific credit requirements.

WEDG is for the edge: While WEDG may provide guidance or serve as a resource for projects that do not have a waterfront edge, it is intended for properties directly touching a body of water. WEDG does not provide guidance on building design (such as the United States Green Building Council's LEED® program does), except for measures to improve building resiliency.

WEDG was developed and piloted on projects on the waterways of New York City and northern New Jersey, and many of the resources listed within the credits are specific to that region. However, MWA's long-term vision for WEDG is broader in scope, and WEDG is intended to be applicable to, potentially, all waterfront properties.

Not all credits apply to all projects. WEDG provides a diverse and extensive toolkit and menu of design options for a wide variety projects, but a project should not aim to achieve points under all credits. In some cases, credits may even be contradictory. For example, depending on local conditions, site context, and government policies, a project that provides both ferry and kayak access to a small site may create unintentional conflict and safety hazards between ferry vessels and much smaller kayaks. Determining which credits are appropriate for each project must be done in conjunction with local regulators and must consider a project's context within the region's larger waterfront goals, plans, and policies.

A VOLUNTARY PROGRAM

Like many other rating and certification programs (for example, those for green buildings), WEDG is voluntary. WEDG is a tool to encourage waterfront innovation and best practices and allow developers, property and business owners, and design professionals to differentiate themselves in the marketplace. WEDG can help diverse waterfront stakeholders achieve the best possible waterfront in the following ways:

Communities

- Activate your waterfront with amenities your community needs
- Be equipped to advocate for improved public access, resiliency, and ecological benefits
- Become more effective waterfront stewards

Owners and Professionals

- Have a menu of best practices at your fingertips
- Save money on waterfront projects by decreasing vulnerability and risk
- More precisely forecast the duration of project planning/construction
- Better predict regulatory expectations; streamline the permit review process
- Improve community relations during project development
- Use best practices generated by leaders in the design community

Government Agencies

- Better support promotion of public benefits such as waterfront amenities and resilient strategies in the face of climate change
- Encourage applicants to use WEDG as a tool to provide a more consistent, less confusing project review
- Promote water-dependent uses

WEDG is a boon for government agencies that welcome well-prepared permit applications. While WEDG certification certainly will indicate a design that incorporates many governmental policies, **WEDG certification is NOT itself a permit.**

Project Certification and Waterfront Building Council

Credits associated with the WEDG rating system are assigned a range of possible points. Projects achieving the minimum necessary points are awarded the WEDG-Certified level of achievement (higher achievement levels may be established in the future). WEDG Scorecards, listing credits and their achievable points, are located at the end of each project type. The minimum necessary points for each project type are as follows:

- Residential/Commercial: 130 (401 possible points)
- Parks: 130 (357 possible points)
- Industrial/Maritime: 100 (317 possible points)

As waterfront design advances and WEDG evolves, the minimum necessary points may change.

In 2015, MWA is showcasing a variety of waterfront projects, including case studies for each of the project types in the Appendix, to demonstrate how and where WEDG can be used. Following this process, MWA will define and formalize the certification process. Future plans include a dedicated WEDG web portal through which applications for WEDG certification may be submitted, reviewed, and certified. MWA is also creating a WEDG Homes for smaller residential projects.

To assist in certifying WEDG pilot projects, MWA has established the Waterfront Building Council as a preliminary body of professional organizations that currently includes the American Institute of Architects (New York Chapter), American Society of Landscape Architects (New York Chapter), American Planning Association (New York Metro Chapter), Urban Land Institute (New York), and the American Society of Civil Engineers Coast, Oceans, Ports, and Rivers Institute (New York Metropolitan Section Chapter).

WEDG is a living tool continually moving forward to incentivize and raise standards for the best waterfront edge designs. MWA invites you to send feedback and suggestions to wedginfo@waterfrontalliance.org.

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PART 1
Residential/Commercial Project Type

Credit Category

TOTAL POSSIBLE POINTS 401 PTS
CERTIFICATION 130+ PTS

CATEGORY 1: Site Selection & Planning (SS & P)

Plan and develop responsibly through better project siting and resiliency strategies that account for climate change, sea level rise, and coastal flooding.

43 POSSIBLE PTS

YES ? NO

SS & P-CREDIT 1 (PRIORITY)
Create a Multi-Disciplinary Project Team and Design Process
4 PTS

Use a multi-disciplinary team of professionals experienced in sustainable, resilient, and ecologically friendly waterfront development best practices to collaborate on the design, construction, and maintenance of the site. Employ an integrated design process that includes a pre-design site visit, a WEDG workshop, using the **WEDG Guiding Principles for Waterfront Edge Design** to guide the discussion and provide a forum for all disciplines to assess and contribute to the best waterfront edge design from the early stages of the project. Seek collaboration with government and regulatory agencies to obtain the best outcome for the larger community and region. Provide documentation of the pre-design site visit, meetings, and professions represented such as an architect, marine biologist, ecologist, coastal engineer, land surveyor, landscape architect, etc., to demonstrate compliance with this credit.

YES ? NO

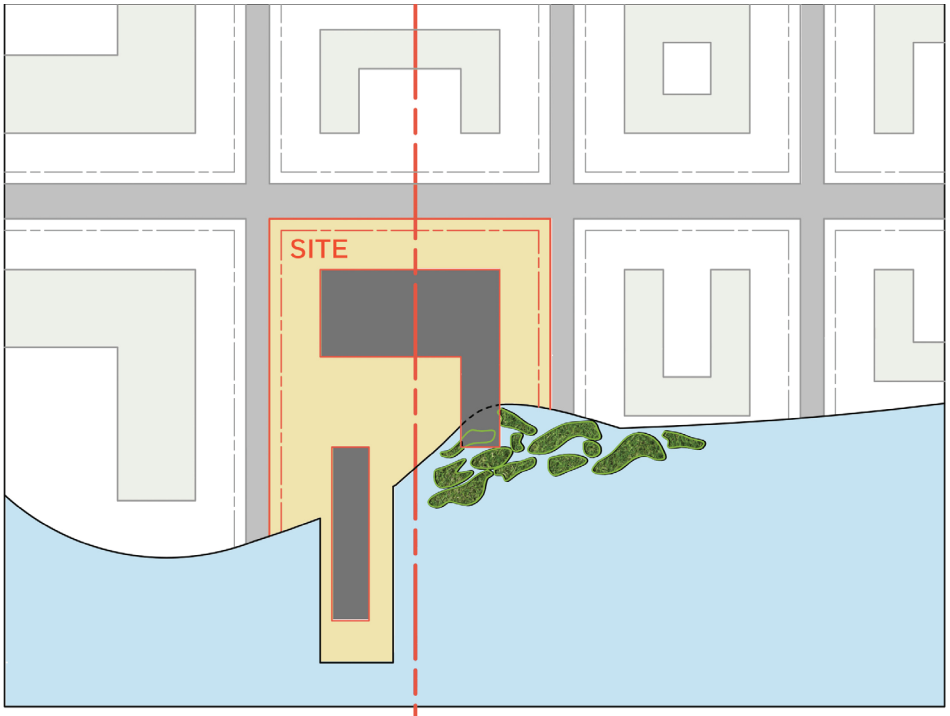
SS & P-CREDIT 2 (PRIORITY)
Conduct Assessment of Site's Vulnerability to Climate Change and Sea Level Rise
4 PTS

As a waterfront project is inherently exposed to the effects of climate change and an increasingly changing environment, the multi-disciplinary team should assess in detail how rising sea levels, higher and more frequent storm surges, and other coastal flooding affects the site and the proposed project. Use the best available data on current and future flood risk. For projects in New York City (NYC), the New York City Panel on Climate Change (NPCC) has developed the **Climate Risk Information 2013: Observations, Climate Change Projections, and Maps** that contain climate projections for sea level rise and future flooding. Include the identification of the height and spatial extent of future high tide, mean higher high water (MHHW), and 100- and 500-year flood zones with low, medium and high estimate sea level rise projections over the lifespan of the project. For projects in New Jersey, determine the site's Coastal Vulnerability Index, as developed by New Jersey's **Coastal Community Vulnerability Assessment and Mapping Protocol.** Refer to governing municipal codes for required construction elevations and freeboard adjustments. The outcome of these analyses should directly inform what are the best applicable edge treatments, overall strategy for shoreline stabilization, and strategies for adaptation and mitigation of flood risk. Provide site plans with a narrative, reviewed by the project team, describing vulnerabilities of the site and nearby properties (to the extent that they would be affected by actions taken on the project site) to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 3 (PRIORITY)
Avoid "Bluefield" Development
4 PTS

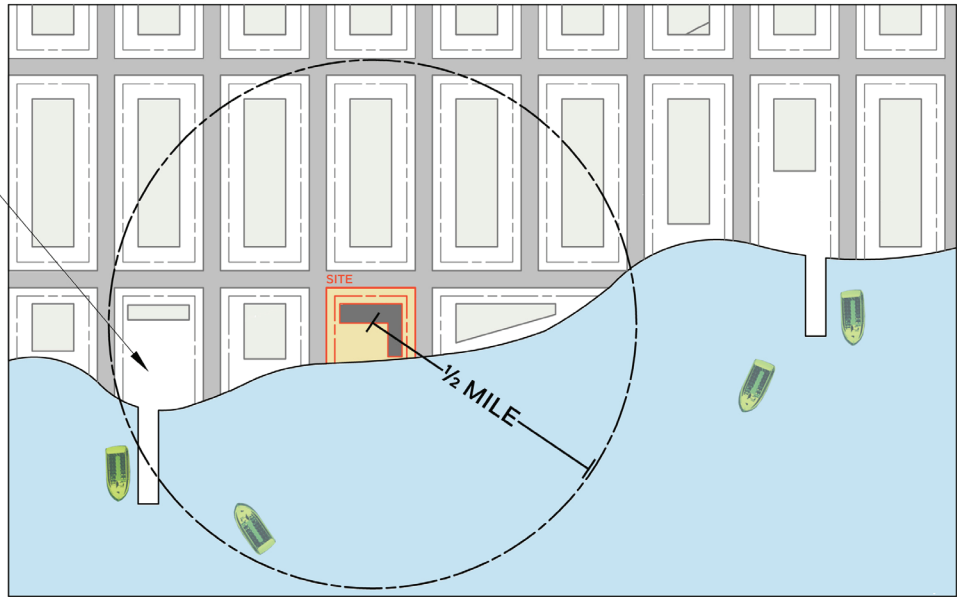
Do not construct housing or temporary lodging over water bodies or wetlands due to environmental considerations. Siting permanent or temporary housing/lodging (for example, apartments and hotels) over water bodies or wetlands that are vulnerable to flooding and storm damage is particularly problematic due to environmental considerations and significant public resources often required for emergency evacuation and reconstruction. Provide a description of the proposed land use and a site plan showing building footprint is not over water and/or in a wetland as mapped by the **United States Fish and Wildlife Service (US FWS) National Wetland Inventory, NYC Oasis, New York State Department of Environmental Conservation (NYS DEC) Environmental Resource Mapper, New Jersey Department of Environmental Protection (NJ DEP) New Jersey iMap,** or a site survey and natural resource investigation to demonstrate compliance with this credit.



YES ? NO

SS & P-CREDIT 4.1
Project Siting: Site Near Existing Waterborne Transportation
1 PT

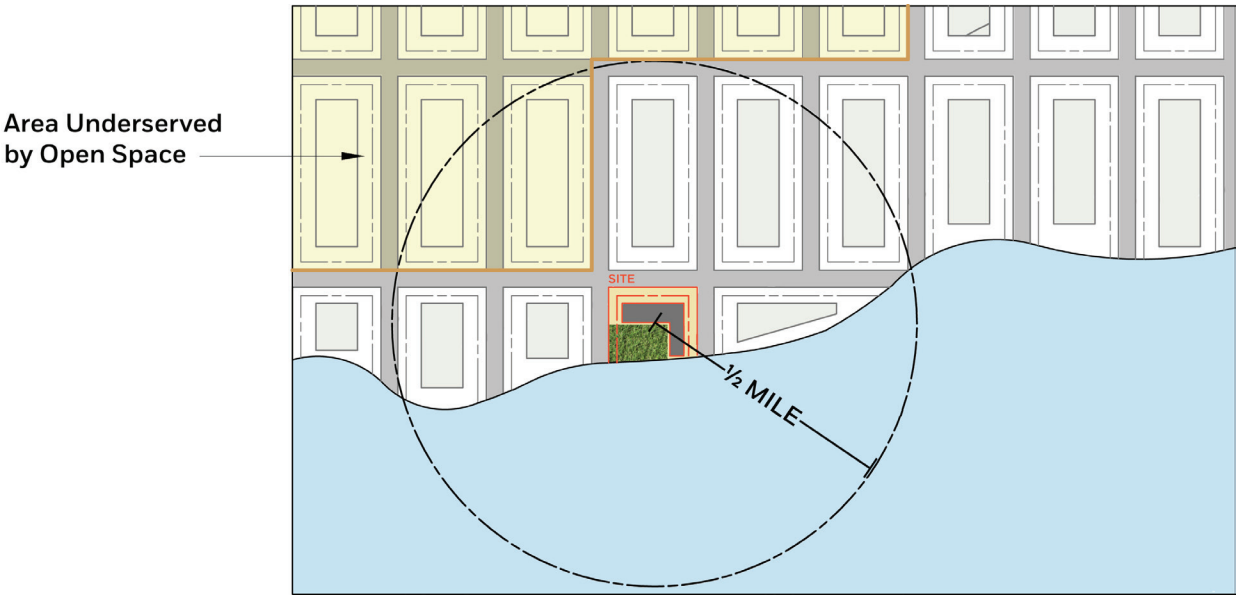
Site the project within ½ mile of **existing** or planned ferry service to provide better access for residents and workers to and from the waterfront. If the ferry service is in the planning stages, provide documentation regarding the status of the planned service. Provide area map, illustrating the proximity of the project site to the existing or planned ferry landing to demonstrate compliance with this credit.



YES ? NO

SS & P-CREDIT 4.2
Project Siting: Site Near Area Underserved by Open Space
1 PT

Site the project within ½ mile of an area with less than 2.5 acres of open space per 1000 people (underserved area), as determined by NYC's **City Environmental Quality Review (CEQR) Technical Manual.** For NYC this is within the boundary of a **CEQR designated Underserved Area**. Maps can be found here for **Bronx**, **Brooklyn**, **Manhattan**, **Queens**, and **Staten Island**. Provide area map to demonstrate compliance with this credit. (Note: Credit is only available if adding substantially additional open space is sufficient to improve the open space ratio, with the addition of the project's residents and workers.)



YES ? NO

SS & P-CREDIT 4.3
Project Siting: Site in Area Participating in FEMA's Community Rating System
1 PT

Site the project in community participating in Federal Emergency Management Agency (FEMA)/National Flood Insurance Program's (NFIP) **Community Rating System**, a voluntary program for recognizing and encouraging community floodplain management activities exceeding NFIP's minimum standards. For participating communities, flood insurance premium rates are discounted. Provide documentation to demonstrate compliance with this credit.

YES ? NO

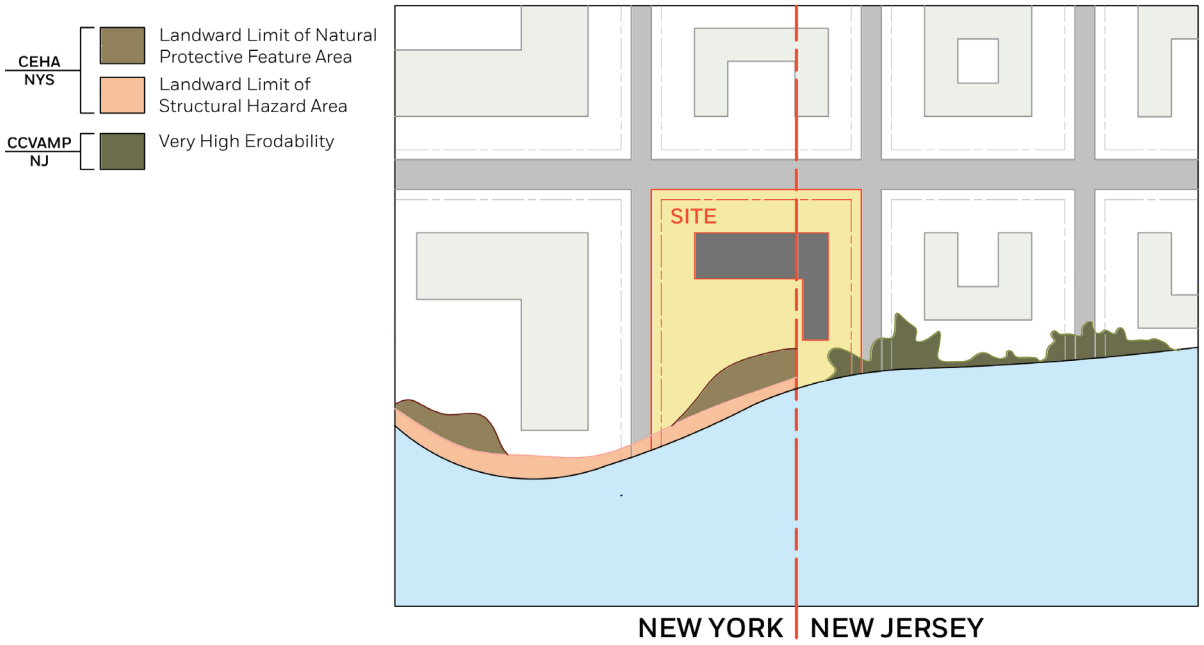
SS & P-CREDIT 4.4
Project Siting: Clean a Brownfield
5 PTS

Waterfront sites are often contaminated due to past industrial uses. Clean a site entered into the **NYC Voluntary Cleanup Program**, **NYS Brownfield Cleanup Program**, **US Environmental Protection Agency's (EPA) Brownfields Program**, or brownfield **defined by the state of New Jersey**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 5.1
Building Siting: Avoid Development in High Potential Erosion Area
2 PTS

Do not construct 50% or more of the total square footage of all building footprints seaward of **Coastal Erosion Hazard Area** line (**NYC Maps**) or areas that are designated as "Very High Erodability," as defined and mapped by the **New Jersey's Coastal Community Vulnerability Assessment and Mapping Protocol** (page 22). Provide site plan to demonstrate compliance with this credit.



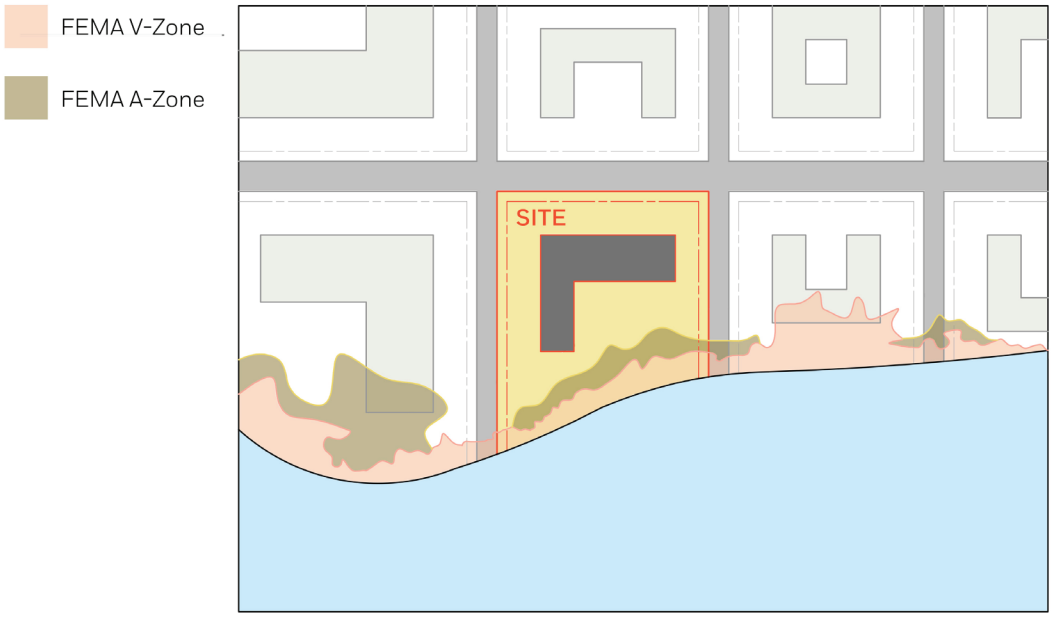
SS & P-CREDIT 5.2
Building Siting: Avoid the 100-Year Floodplain
POSSIBLE 6 PTS

FEMA Special Flood Hazard Areas (100-year floodplain) are more susceptible to storm events and coastal flooding. Locate 50% or more of the total square footage of all building footprints outside of the FEMA Special Flood Hazard Area (100-year floodplain) without the need for elevating grade or structures, based on the best available flood hazard data (currently **Preliminary FIRMS**). Siting outside the natural floodplain is the most responsible and cost effective solution to avoid any adverse effects. Siting without the need for elevating structures places the building's footprint out of a hazardous area. Elevating sections of the site outside of the flood zone is effective but can displace potential floodwaters elsewhere, creating issues for the surrounding community. Provide site plan to demonstrate compliance with this credit.

a) Locate building(s) outside the V-Zone **2 PTS**

b) Locate building(s) outside both the V-Zone and A-Zone **6 PTS**

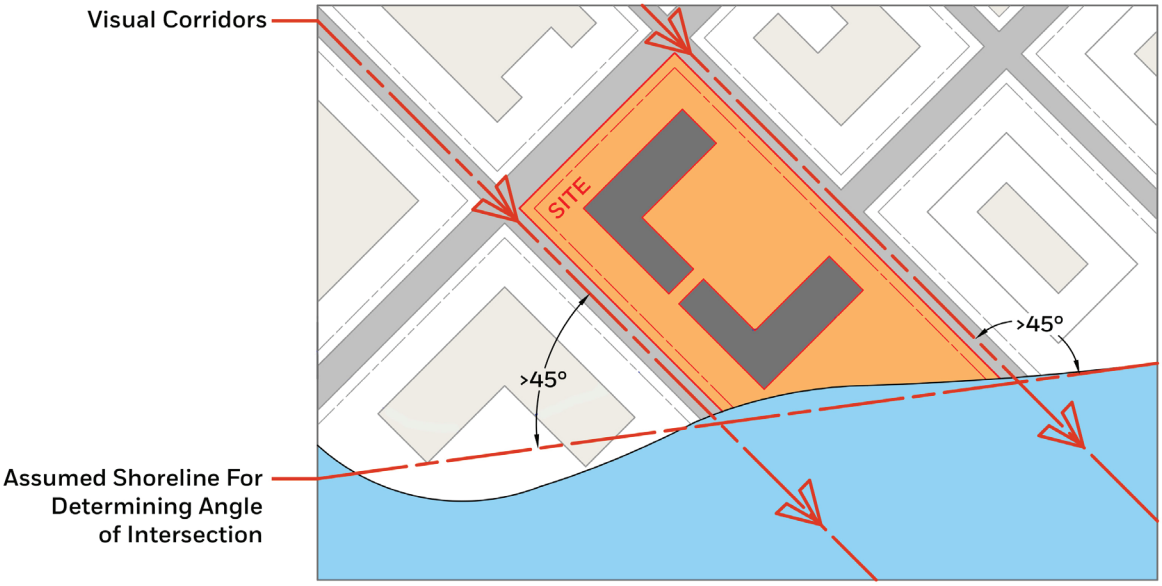
YES ? NO



YES ? NO

SS & P-CREDIT 5.3
Building Siting: Maximize Upland Views
2 PTS

Site buildings at an appropriate angle to the shoreline to maximize light, air, and visual access to water from the publicly accessible areas upland of the building. The longer side of the building footprint or its prolongation should not transect the "Assumed Shoreline for Determining Angle of Intersection" at an angle less than 45 degrees. Refer to the **NYC Department of City Planning's (DCP) Zoning Resolution 62-511 Location of Visual Corridors** and provide site plan to demonstrate compliance with this credit.



YES ? NO

SS & P-CREDIT 6
Raise Elevation: Increase Freeboard of Buildings
4 PTS

For projects that cannot avoid siting the building's footprint within the flood zone, minimize flood risk and damage and elevate the first occupiable floor to a higher elevation than the building code requirement. This determination should be based on a flood risk and vulnerability assessment from *SS & P-Credit 2*. Uses such as building access, parking, or minor storage are allowed below the first occupiable floor. Provide an elevation plan to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 7.1
Building-Scale Protection: Provide Wet Floodproofing
2 PTS

Wet floodproofing elevates the lowest occupiable floor and all mechanical systems at least to the FEMA Base Flood Elevation (BFE), minimizing damage from flooding while allowing floodwaters to enter the structure's lower levels. Refer to NYC DCP's **Designing for Flood Risk**. Integrate design elements from **FEMA TB 7-93 Wet Floodproofing Requirements**, **FEMA TB 6-93 Below-Grade Parking Requirements**, **FEMA TB 5-08 Free-of-Obstruction Requirements**, **FEMA TB-99 Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings**. Provide construction plans to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 7.2
Building-Scale Protection: Provide Dry Floodproofing
2 PTS

Dry floodproofing seals a building's exterior and openings to prevent flooding. Common dry floodproofing techniques include strengthening the foundations, floor slabs, and walls to resist hydrostatic loads and buoyant forces, installing backflow prevention devices, applying a waterproof coating to exterior walls, and sealing all wall penetrations, including windows, doors, and locations where utilities enter the building. Refer to NYC DCP's **Designing for Flood Risk**. Provide a narrative describing dry floodproofing designed in accordance with **American Society of Civil Engineers (ASCE) 24** and/or **FEMA TB 01-08 Openings in Foundation Walls and Walls of Enclosures**, **FEMA TB 02-08 Flood Damage Resistant Materials Requirements** and a copy of the **FEMA NFIP Residential Basement Floodproofing Certificate (FEMA 086-0-24)** to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 8
Site Perimeter Protection: Provide Deployable Flood Barriers
1 PT

Provide deployable floodwalls with an accompanying maintenance and operations plan. These require human intervention and often the installation of wall slats in preparation for flooding. Refer to the **NYC Department of Building's (DOB) Recent Local Laws: Post Hurricane Sandy Legislation**. Provide construction details and deployment plans to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 9
Incorporate Streetscape Enhancements to Mitigate Elevation Changes
2 PTS

Buildings with high design elevations have the potential to create negative visual impact on the public realm, disrupt a neighborhood character, and reduce the ease and availability of access. Consider streetscape enhancement strategies when designing or modifying such buildings to minimize negative impacts to streetscape and user experience. Refer to various resources such as NYC DCP's **Designing for Flood Risk** and **Retrofitting Buildings for Flood Risk** which illustrate design principles for urban floodplain design, along with code and regulatory compliant strategies.

- Consider neighborhood and block character when designing a building's setback from the street (i.e., commercial buildings are encouraged to be closer to the street line, while residential buildings may benefit from a setback from the street).
- The design of building access elements should become a transition area from building to sidewalk/public way through use of materials, shifts in scale, and pathway direction.
- For larger buildings, consider creating a spacious building lobby at grade, with interior access to floors above DFE, rather than external stairs and ramps which create a visual and special disconnect.
- For buildings near or close to the property line, façade articulation at the base of the building, combined with plantings and screenings, can help break up the monotony of a façade.
- For buildings further from the street line, other elements, such as plantings, stairs, porches, and changes in grade elevation, can contribute to a more dynamic streetscape.
- Maximize visual connectivity by dry floodproofing commercial/retail establishments fronting on streets. Dry floodproofing can keep fenestration, entrances and retail floor space down to the pedestrian level. (Note: Not applicable in purely residential buildings).
- Enliven streetscape by creating temporary seating areas for outdoor cafes, restaurants or other similar uses at spaces that are wet floodproofed.

Incorporate at least two design features from above into construction. Provide a construction plan highlighting these design features and a narrative of mitigation measures used to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 10
Participate in FEMA's National Flood Insurance Program
2 PTS

Participate in the FEMA **NFIP** by purchasing flood insurance to cover damages from coastal flooding and storms. Provide documentation of participation in the NFIP to demonstrate compliance with this credit.

CATEGORY 2: Public Access & Interaction (PA & I)

Enhance physical, visual, and psychological access to the water.

96 POSSIBLE PTS

YES ? NO

PA & I-CREDIT 1 (PRIORITY)
Maintain and Provide Safe Public Access
4 PTS

Create new public access or maintain and improve existing public access at the water's edge. Refrain from creating walls or other barriers to access. A project must preserve existing or provide additional public access to meet this credit. Access may be at the water's edge (for example, a beach or get-down) or immediately adjacent to the water (for example, an esplanade or waterfront public walkway, or a greenway). Provide a site plan and a narrative describing existing public access and how the project will preserve or enhance it to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 2 (PRIORITY)
Engage Local Community and Users
4 PTS

Water is a public resource for all. Seek out and encourage substantive and meaningful community input specifically relating to the waterfront aspects of the project:

- Identify key stakeholders, both individuals and groups, who will be affected by the future design/use, to provide feedback on future programming and overall design of public access amenities and interaction with the water's edge. For projects that require a discretionary action, meetings are in addition to those that may be legally required and are more focused on the uses at the waterfront rather than on all facets of a project.
- Organize a minimum of two local community meetings during program design, at the beginning (10% design) and end (75% design) of the design process, in order to foster community interaction and sustained engagement. Make final results public to community stakeholders.

Provide documentation of community outreach including meeting agendas, attendance lists, and a narrative of stakeholder influence on the design of the project to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 3 (PRIORITY)
Conduct Water-Dependent Use Assessment of Site
4 PTS

In order to determine the need for and feasibility of water-dependent facilities, assess currents, water depth, vulnerability to wakes, waves and storm conditions, vessel traffic, ecological issues, and regulatory requirements. The outcome of this analysis should directly inform what facilities and design strategies are appropriate for construction along the waterfront. Analysis of existing and potential water-dependent uses should seek (or attempt) to increase water-dependent uses. Provide documentation of the water-dependent use assessment to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 4.1
Pier: Build or Renovate
2 PTS

Build a pier or renovate an existing pier on site that is open and accessible to the public. Provide a site plan to demonstrate compliance with this credit. (Note: Platforms and wharves are considered related infrastructure and are applicable to this credit, see glossary.)

YES ? NO

PA & I-CREDIT 4.2
Pier: Design
6 PTS

Piers should be user-friendly; consider the following design features:

User Experience

- The pier should be designed to preserve views and not excessively obscure the waterfront
- Reduce pier's visual impact by using a stepped pier apron
- Place pier away from industrial/restricted areas
- Incorporate visual, odor, and noise barriers between pier and industrial/restricted areas
- Use railings to restrict access to rough water conditions, hazardous vessel amenities, or when piers are elevated high above water level.
- Use railings that minimize obstructions to scenic views or vessel access
- Provide shelter from winds, rainfall, and sunshine
- Place public walkways on the perimeter of pier structures

Adaptability

- Conduct a wave load analysis of horizontal wave forces, vertical wave uplift forces, and wave peaking damage
- Conduct a peak wave damage analysis in order to predict critical areas of a pier structure that will receive excessive wave action during storms
- Elevate piers to reduce effects of high wave action
- Reduce reflection and amplification of wave energy from vertical surfaces on piles
- Design angled piles to stay within the pier envelope in order to allow floating docks and vessels to anchor directly against piers

Minimize Impacts (Note: Refer to *E & H-Credit 1*)

- Space pilings so that they do not impede water flow
- Minimize hydrodynamic disturbance of structure
- Allow for light transmission through pier
- Avoid designs that obstruct or fragment habitats, wildlife corridors, or shoreline access below the structure
- Orient north-south to minimize over-water shadows
- Elevate piers or pier edge above the water line, to reduce effects of shading

Incorporate at least two design features from each focus area above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 5.1
Floating Dock: Build or Renovate
1 PT

Floating docks support on-water activities such as kayaking and canoeing. Build a floating dock or renovate an existing dock that is accessible to the public. During design consider the following:

- Site according to prevailing winds and currents
- Avoid or remediate flotsam accumulation areas
- Avoid or remediate hazardous bottom conditions
- Do not create navigational hazards

Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 5.2
Floating Dock: Design
2 PTS

Consider the following design features to create user-friendly floating docks:

Stabilization

- Provide a firm and stable platform to prevent listing
- Secure and stabilize to withstand:
  - Flow rates of 0.25 feet per second
  - Rough wave action equivalent to a 3-foot high wave with a period of 3.1 seconds during storms
- Use materials that can withstand exposure to water, salt, and UV light

Shape

- Design with a flat surface that does not warp or retain heat in direct sunlight
- Provide adequate surface traction without damaging water craft or causing foot discomfort
- Provide vertical sides (tapering or rounded sides are unsafe)
- Design with a minimum width of 5 feet
- Site close to shore to minimize distance to navigable water at mean low water

Access

- Provide at least two open sides for launching and landing
- Limit the use of handrails to only gangways and ramps
- Maintain at least 60 inches of clear opening for every 10 feet of linear dock
- Maintain freeboard of 4-8 inches for human-powered watercraft use
- Maintain freeboard of approximately 2 feet for motorized boats
- Establish suitable setbacks from adjacent docks to allow for maneuvering of boats
- Provide a landing area that permits safe boarding or exit from human-powered boats during maximum flood and ebb currents

Adaptability

- Design to be removable during flooding, high flow events, ice formation, high wave action, storm surges, etc.
- Design the deck connections to lift off its support during high water events
- Use transitional plates (or “toe plates”) for gangways steeper than 5%; consider the slope during low/high tides

Minimize Impacts

- Space pilings so that they do not impede water flow
- Space with adequate distance for boats to berth directly alongside the float
- Install piles that are tall enough to maintain float anchorage during high water events
- Avoid open-cell expanded polystyrene floats
- Prevent from resting on the bottom at low tide
- Allow light transmission through the structure

- Orient dock as close to north-south as possible
- Avoid covering docks with structures
- Design for easy maintenance and clean up
- Provide maritime fouling prevention (birds, algae, barnacles, etc.)
- Compensate for altered hydrodynamics and sediment transport

Incorporate at least two design features from each focus area above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 6.1
Beach and Get-down: Build or Renovate
1 PT

Public beaches and waterside get-downs allow direct contact with the water. Build or renovate a public beach or get-down.

- Site in areas of reduced stream velocity and wave action
- Avoid contaminated sites and sewer/stormwater outfalls
- Avoid flotsam accumulation areas

Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 6.2
Beach and Get-down: Design
2 PTS

Consider the following design features to create user-friendly beaches or get-downs:

- Slopes should be less than 1:2
- Reduce effects of erosion and/or sediment deposition
- Design for water access at all tidal ranges
- Prevent slippery conditions on built surfaces (install handrails, algae-resistant material, and textured surfaces)
- Provide safe access by incorporating padded surfaces, rounded edges, and corners and avoiding steep drops

Incorporate at least three design features above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 7.1
Human-Powered Boat Launch: Build or Renovate
1 PT

Build or renovate a public human-powered boat launch. Consider the following when siting:

- Site in areas that will not be easily damaged in rough weather or harsh seasonal conditions
- Site in an area that will not cause damage to wetland ecosystems or sensitive habitat during construction or in operation
- Site to minimize the distance between launch and storage/parking and shorten access routes to increase user experience
- Where applicable, modify existing structures to make more accessible for human-powered boaters instead of disturbing natural resources
- Site with preference towards shoreline launches that can support entry and egress of more users with a variety of skill levels. Select dock launch designs only when shoreline launches are not available or when the creation of a shoreline launch would create a more significant impact than a dock launch.

Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 7.2
Human-Powered Boat Launch: Design
2 PTS

Consider the following design features to create user-friendly human-powered boat launches:

Shoreline Launches (Note: Related to *PA & I-Credit 6.2*)

- Provide adequate launch and landing sites for the intended user/vessel
- Provide storage facilities
- Provide washing facilities, sanitizing products, or other hygiene amenities
- Provide soft landing areas for less experienced boaters
- Provide for secure and safe entry into the launch area and water
- Reduce use of hardscapes at launches and minimize construction
- Design slope at water's edge between 5-8%
- Provide adequate in-water transitional area for launch and landing
- Design for low- and high-tide use
- Provide refuge from strong currents or wave action
- Angle launch to predominant currents and site conditions
- Direct stormwater away from launch
- Accommodate water craft up to 20 feet long

OR

Dock Launches (Note: Related to *PA & I-Credit 5.2*)

- Provide adequate launch and landing sites for the intended user/vessel
- Provide storage facilities
- Reduce use of hardscapes at launches and minimize construction
- Provide washing facilities, sanitizing products, or other hygiene amenities
- Adjacent communal boat launches should have setbacks to allow for rapid maneuvering of boats
- Protect boaters from wind and wave action while getting in and out of the boats
- Design to the following minimum size, by launch type:
  - Communal: 24 feet long to allow multiple boats to load, launch, and disembark simultaneously and safely
  - Water trail: 8 feet wide to accommodate two boats side-by-side with room to stand and maneuver around them
  - Large craft: 20 feet long to accommodate large craft such as sea kayaks (19+ feet), outrigger canoes, and rowboats

Based on the type of launch being designed, incorporate at least two design features from above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 8.1
Community Boathouse: Build or Renovate
2 PTS

Build or renovate a boathouse (a launch and storage facility operated by community group or recreational organization, with minimal membership requirements, with programs to bring the public onto the water). Consider siting the structure on land (not over water) above MHHW. Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 8.2
Community Boathouse: Design
4 PTS

Consider providing the following to create a user-friendly community boathouse:

- Human-powered boat launch aids (floating launches, davit, craft dollies, etc.)
- Drainage and moisture control
- Waterside landmark as a navigation aid
- Leasable storage for personal craft
- Water craft retail and maintenance facilities
- Restrooms with showers
- Drinking water
- Boater education area
- Rescue and first aid facilities

Incorporate at least five of the above design features into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 9.1
Marina: Build or Renovate a "Clean Marina"
6 PTS

When creating or renovating a marina follow the National Park Service's (NPS) Clean Marina Initiative 2012, using the **Clean Marina Guidebook 2012**, **New York Sea Grant Marina Environmental Best Management Practices**, and the **New Jersey Clean Marina program**. These guidebooks include best practices for marina design and maintenance, stormwater management, vessel maintenance and repair, petroleum control, sewage handling, waste/chemical containment and disposal, and enforcement and compliance. Projects following this guide can attract more responsible customers, reduce costs, and protect the marine environment. Provide documentation to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 9.2
Marina: Designate Public Use and Access
2 PTS

Reserve 10% of slips/dock space for use by public programming (i.e., School Sailing Teams, Sea Scout Groups, Community Rowing Classes, etc.) for a discounted or waived fee. Provide documentation to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 9.3
Marina: Fund Public Programs
2 PTS

Provide at least 10% of annual revenue for use by public programming at marina facilities. Funding may be allocated towards equipment (and associated maintenance), programming fees/insurances, educator/instructor salaries, and other fiscal needs directly associated with sustaining a program. Provide documentation to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 10.1
Mooring Field: Create or Renovate
1 PT

Create or renovate a mooring field that designates at least 5% of slips for free or discounted use by community organizations providing public programming and following rules governing mooring fields under the jurisdiction of the **NYC Department of Parks and Recreation (DPR)** or **New Jersey's Coastal Management Rules** (Subchapter 3). Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 10.2
Mooring Field: Design
1 PT

The design of a mooring field can be enhanced by considering the following design features:

- Place moorings for boats of similar size together to increase density
- Reduce mooring distance from marina or launch ramp
- Provide moorings for a variety of boat sizes
- Optimize mooring arrangement to accommodate ship drafts
- Place mooring field in weather-protected areas
- Protect benthic environment using low-impact mooring systems

Incorporate at least three design features from above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 11.1
Ferries: Build or Renovate Docking Facility
2 PTS

Ferries are a fast, comfortable, efficient, and environmentally friendly form of transportation, can be a catalyst for waterfront redevelopment, and provide more transportation options. Build or renovate a ferry terminal landing and provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 11.2
Ferries: Docking Facility Design
4 PTS

Consider the following design features to build a user-friendly ferry docking facility:

- Optimize docking orientation and platform layout for maximum volume of marine traffic
- Provide proper wave attenuation to expedite docking
- Design gangways to accommodate quick loading and unloading
- Use non-slip surfaces and materials on all walkways
- Design the gangway connection to lift off its support during high water events
- Provide shelter from the elements
- Provide security and manage access
- Provide pedestrian and bicycle wayfinding to/from upland connections
- Provide bike access and parking
- Implement online tracking of ferries
- Employ vegetated buffers to reduce noise from ferry vessels without blocking scenic views
- Design, orient, and place docks, passenger loading amenities, and accompanying buildings to create sound barriers to ferry vessel noise
- Employ low emission vessels (US EPA Tier 3 or Tier 4) and those that produce less noise

Incorporate at least five design features from above into construction and operations. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 11.3
Ferries: Provide Operating Funds
4 PTS

Contribute ferry operating funds for a minimum of 12 months. Provide documentation to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 12
Provide Maritime and Docking Amenities
4 PTS

Build or preserve pier, floating dock, or bulkhead elements that can accommodate a variety of boats, such as tall ships and historic and educational vessels, to encourage public, maritime activities and recreation. Provide the following design features:

- Provide straight sides; avoid curves, indentations, and odd shapes
- Provide railings and openings to manage public access and ship boarding; railings should be set back from edge inboard of any cleats/bollards
- Provide frequently spaced fenders/bollards/cleats for a variety of vessel sizes
- Provide adequate pier bracing to resist racking by docked vessels
- Provide wake-reduction measures to protect berthed vessels
- Incorporate dockside safety amenities and procedures
- Provide dockside utilities (i.e., electric, sewage, water, and vehicle access)

Incorporate at least three design features from above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 13
Accommodate Public Fishing
2 PTS

Accommodate public fishing, including the responsible management of fish as a sustainable resource. Consider the following design features:

- Designate fishing areas
- Provide kiosks with fish permit and regulatory information (including advisory about consumption, where appropriate)
- Provide fishing supply and retail opportunities
- Provide washing, scaling, and cutting tables
- Provide rod holders and fishing line recycling receptacles
- Provide sitting areas and child-friendly railings

Provide construction plan highlighting at least three of the above features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 14.1
Public Walkways and Greenways: Ensure Edge Continuity
1 PT

Enhance connections between adjacent properties by aligning existing and new pathways along the shoreline to create a seamless and accessible edge. Connect pathways to adjacent shoreline properties and retain similar aesthetic or have appropriate transitions. Convey transitions between public and private space through grading and materials. Designs, including transitions between properties, must meet ADA standards. Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 14.2
Public Walkways and Greenways: Provide Widened Public Access Area
POSSIBLE 6 PTS

Increasing the width of a public access area on the water's edge accommodates more users and provides more facilities resulting in a larger public space. Provide site plan to demonstrate compliance with this credit.

a) Provide a 40 foot wide public access area **2 PTS**
b) Provide a 50 foot wide public access area **4 PTS**
c) Provide a 60 foot wide public access area **6 PTS**

YES ? NO

PA & I-CREDIT 14.3
Public Walkways and Greenways: Create Waterfront Greenway
2 PTS

Create greenways that are safe, comfortable, and inviting to both bicyclists and pedestrians. Successful greenways create a connected network linking popular destinations and minimize potentially unsafe or uncomfortable intersections and crossings. Where appropriate based on adjacent existing or planned greenways, construct greenway. Ensure greenway width is suitable, relative to the number of expected users, and that width and other features meet or exceed AASHTO or other guidelines. Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 15.1
Visual Corridors: Create Additional Corridors
POSSIBLE 4 PTS

Visual corridors are physical and psychological links to the waterfront. Incorporate additional visual corridors beyond what is required by existing municipal regulations. Connect additional corridors with fields of view on adjacent upland properties, streets, open spaces, and parks to improve visual connectivity to the waterfront. Provide site plan to demonstrate compliance with this credit.

a) Design one additional visual corridor **2 PTS**
b) Design two or more additional visual corridors **4 PTS**

YES ? NO

PA & I-CREDIT 15.2
Visual Corridors: Increase Width of Existing / Required Corridors
POSSIBLE 4 PTS

Increasing the width of visual corridors helps draw more activity to the waterfront and allows for more inviting public access. Increase width of required visual corridors by at least 20% beyond what is required by existing municipal regulations. Provide site plan to demonstrate compliance with this credit.

a) Exceed the width by at least 20% of minimum required **2 PTS**
b) Exceed the width by at least 40% of minimum required **4 PTS**

YES ? NO

PA & I-CREDIT 16
Incorporate Transit Access and Facilities
1 PT

Improve transit access to site by providing shuttle service or agreement with transit authorities to obtain public bus route extension to site. Provide evidence of agreement with a qualified transportation provider for service focused on, at a minimum, morning and evening peak hours and available to the surrounding community for at least 12 months, or provide evidence of bus route extension to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 17
Enhance Shoreline Street Ends
2 PTS

Encourage projects adjacent to shoreline street ends to purchase or enter into maintenance agreements with local municipalities. Submit a plan to improve and incorporate a street end into the waterfront edge, improving and encouraging public access and connectivity. Provide site plan and letter of support from relevant public agencies to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 18
Identify Local Programming Partners for Public Space
1 PT

Notify and engage the public and interested stakeholders at the beginning of the project and seek opportunities for strategic partnerships. Provide a signed memorandum of understanding with a partner organization to program the project's public space for at least 2 years to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 19
Ground Floor Frontages: Activate Waterfront Area
4 PTS

Active ground floors help enliven public waterfront areas; direct pedestrians towards the waterfront by incorporating the following design features:

- Orient entrances towards the waterfront
- Provide double building frontages that internally connect uplands to waterfront walkways
- Provide public amenities, such as restrooms, open use performance areas, etc.
- Reduce the visual impact of parking and service areas, restricting them to designated narrow out-of-sight service alleys or screening them through plantings, artwork, or other devices
- Include some recesses and articulation along long building frontages to create a more engaging building wall
- Avoid blank walls; large windows or door should constitute 50% or more of ground floor facades
- When constructing multiple buildings, site them to define waterfront outdoor space as a public focal point

Provide a construction plan highlighting any three of the above design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 20
Public Priority Phasing
2 PTS

Open the public access components (i.e., esplanade, open space, piers, boat launches, etc.) of the project before the full project is complete. Provide construction phasing plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 21.1
Incorporate Historical/Cultural Elements: Implement Interpretive Media
2 PTS

Improve the visitor experience by including historical/cultural elements within public areas by conducting research, providing interpretive media, and preserving historic resources. Describe the historical and cultural context of a landscape and reveal the significance of an outdoor space with archeological artifacts and artistic displays combined with informational panels, photographs, artwork, diagrams, maps, text, etc. Provide construction plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 21.2
Incorporate Historical/ Cultural Elements: Accommodate Historic Boats and Ships
2 PTS

Incorporating historic ships as a component of public access preserves maritime culture and offers visitors a window into history. Host a historical ship on site and provide education and events and off-season storage. Provide documentation of a contract with ship operator to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 22
Provide Ecological Educational Opportunities
2 PTS

Connect the public to wildlife and habitat by providing facilities and amenities that bring them close as possible without creating a disturbance. Increase public engagement and involvement by supporting participation in ongoing research of the local environment. Provide facilities or host organizations that offer opportunities to volunteer, intern, and participate in research, data collection, rescue, and rehabilitation. Consider the following design elements:

- Provide interactive educational facilities, such as a visitor center, kiosks, and information panels
- Incorporate wildlife viewing platforms, spotting scopes, or features
- Incorporate citizen science monitoring (i.e., water quality, aquatic life, etc.) or other interactive educational components

Provide construction plan or narrative to demonstrate compliance with this credit.

CATEGORY 3: Edge Resiliency (ER)

Design a resilient and ecologically beneficial waterfront edge.

102 POSSIBLE PTS

YES ? NO

ER-CREDIT 1 (PRIORITY)
Assess Waterfront Edge Conditions to Determine Appropriate Design
4 PTS

Analyze and inventory waterfront edge conditions and structures, including coastal geomorphology, reach, fetch, slope, tide range, storm surge, and wave energy, to determine design criteria for a range of feasible and appropriate stabilization strategies. Use NYC DCP's **Urban Waterfront Adaptive Strategies** guide and the US Army Corps of Engineers, (US ACE)/National Oceanic and Atmospheric Administration (NOAA)/FEMA and other stakeholders initiative, **Systems Approach to Geomorphic Engineering**, which seek to integrate natural features and structural treatments relative to resiliency, ecology, and public access. New York City Economic Development Corporation's **Waterfront Facilities Maintenance Management System: Inspection Guidelines Manual** (currently being updated) is a resource for a shoreline configuration analysis and provides guidance for relatively quick assessment. The New York State Department of Environmental Conservation (NYS DEC) and NOAA Hudson River Sustainable Shorelines Project has developed the **Engineered Approaches for Limiting Erosion along Sheltered Shorelines: A Review of Existing Methods**. It provides an overview of shoreline stabilization techniques, which are evaluated based on approach, construction cost, maintenance cost, and adaptability. Provide documentation of assessment and how it might influence final design to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 2 (PRIORITY)
Design Waterfront Edge for Climate Conditions Projected for the 2050s
4 PTS

Based on the *ER-Credit 1* assessment, engage the project team to determine the resiliency and projected ability of the waterfront edge to adapt to projected climate conditions in the 2050s, using the **NPCC's Climate Risk Information 2013: Observations, Climate Change Projections, and Maps** as a benchmark. Waterfront projects face specific vulnerabilities due to projected sea level rise and require responsible planning and precautionary measures. Vulnerabilities may include increased storm surge/tide, wind wave, shoreline erosions, and tidal inundation at daily high tides. Incorporate design elements that address vulnerabilities identified or allow it to be efficiently adapted in the future. According to the NPCC (2013), the following conditions are the middle range projections for conditions in the 2050s, which is the lifespan of a typical shoreline structure.

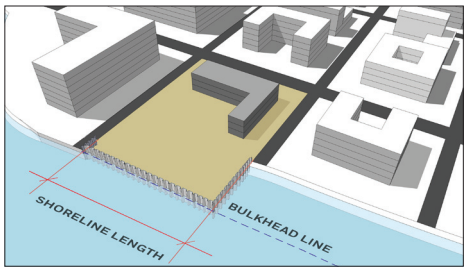
- 11 – 24 inches of sea level rise
- 5 days/year with rainfall at or above 2 inches
- 1.7 – 3.2% chance of 100 year flood event with increase in associated flood heights

Implement designs that minimize the consequences associated with these risks, or demonstrate how they could be adapted in the future with structural modifications. Consideration should also be given to minimize impacts on public access, ecology, and adjacent property. Provide a site plan and narrative to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 3.1
Shoreline Configuration: Remove Existing Fill/Restore Natural Shoreline
6 PTS

Create a more ecologically beneficial aquatic environment by removing man-made fill/structures from nearshore area, where appropriate. Do not increase flood risk or destabilize adjacent areas. Pull back the shoreline at least 10 feet landward of the existing location (MHHW) along the greater of 20% of the length of the shoreline or 50 feet. (Note: Changes to the shoreline configuration should be analyzed by the project team for hydrological impacts regarding storm surge/flooding, wave regime, and stream velocity/currents.) Provide a site plan and section view to demonstrate compliance with this credit.



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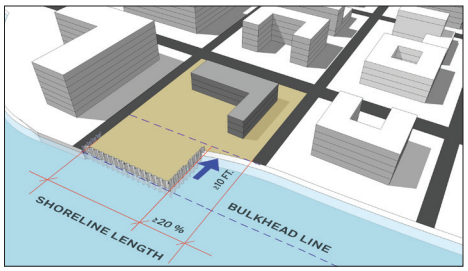

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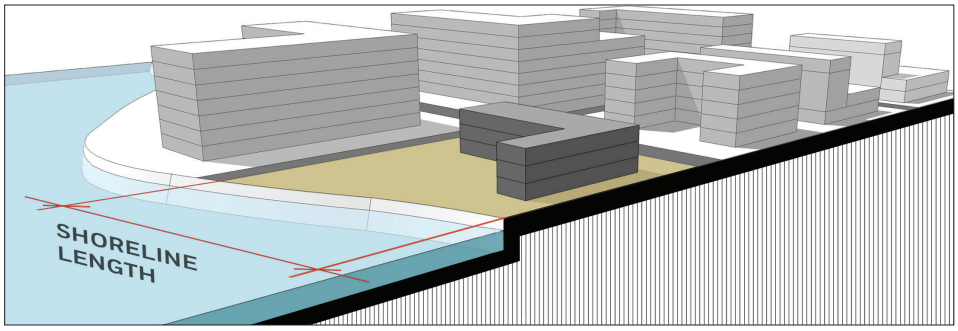
YES ? NO

ER-CREDIT 3.2
Shoreline Configuration: Reduce Slope
POSSIBLE 6 PTS

Gradually sloped shorelines – rather than a hardened or more vertical shoreline – can progressively dissipate wave energy, reducing reflection and amplification while also improving the aquatic habitat within the intertidal zone. Reconfigure at least 20% of the shoreline but not less than 50 feet to a maximum slope of 1:2. (Note: Changes to the shoreline configuration should be analyzed by the project team for hydrological impacts regarding, storm surge/flooding, wave regime, and stream velocity/currents.) Provide a grading plan to demonstrate compliance with this credit.

a) Reconfigure the shoreline length to a maximum slope of 1:2 **2 PTS**
b) Reconfigure the shoreline length to a maximum slope of 1:3 **4 PTS**
c) Reconfigure the shoreline length to a maximum slope of 1:4 **6 PTS**



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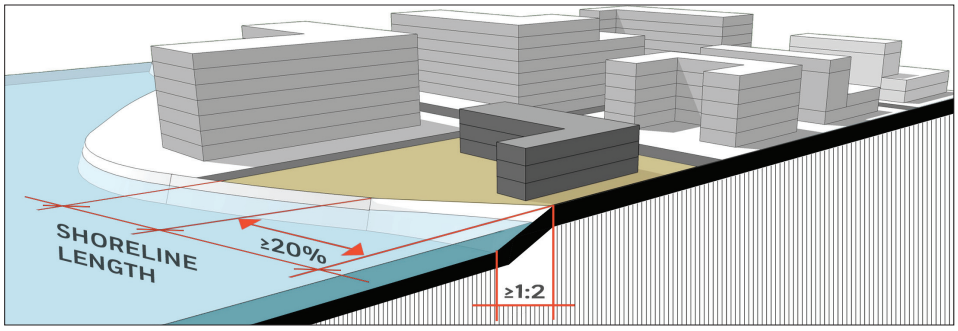

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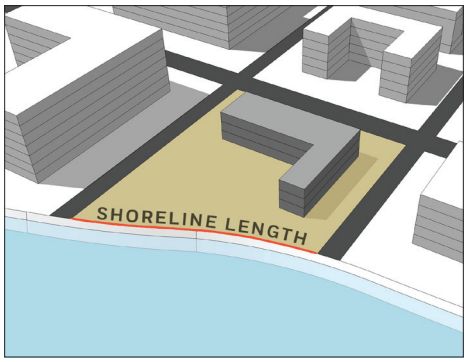
YES ? NO

ER-CREDIT 3.3
Shoreline Configuration: Create a Curvilinear Profile
2 PTS

Non-linear shorelines reduce stream velocity, create diverse micro-habitats, and improve hydrology of the greater riparian area. Create/modify shoreline to increase the total length of the shoreline by at least 25% or a minimum of 50 feet. (Note: Changes to the shoreline configuration should be analyzed by the project team for hydrological impacts regarding, storm surge/flooding, wave regime, and stream velocity/currents.) Provide a site plan to demonstrate compliance with this credit.



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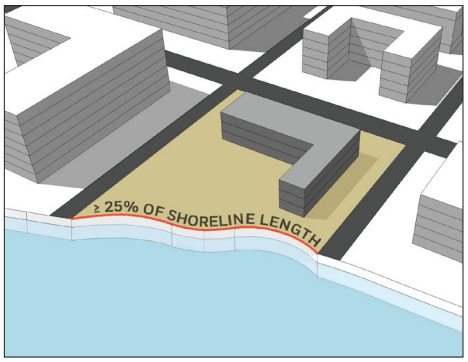


AFTER

YES ? NO

ER-CREDIT 3.4
Shoreline Configuration: Avoid Net Filling
4 PTS

Avoid filling in the water below mean high water; fill can adversely impact site ecology and the intertidal area. Fill and excavation should not result in positive net fill into the water column. (Note: Changes to the shoreline configuration should be analyzed by the project team for hydrological impacts regarding, storm surge/flooding, wave regime, and stream velocity/currents.) Provide a site plan and narrative to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 4.1
Stabilization Techniques: Rehabilitate/ Replace Manmade Edge
POSSIBLE 6 PTS

Based on the waterfront edge assessment *(ER-Credit 1 and 2)*, rehabilitate/replace an edge that is in disrepair to increase structural integrity and longevity for an expected service life of at least 50 years. Provide site plan and quantitative analysis to demonstrate compliance with this credit.

- **a)** Rehabilitate/replace edge for an expected service life of at least 50 years **2 PTS**
- **b)** Rehabilitate/replace edge for an expected service life of at least 75 years **4 PTS**
- **c)** Rehabilitate/replace edge for an expected service life of at least 100 years **6 PTS**

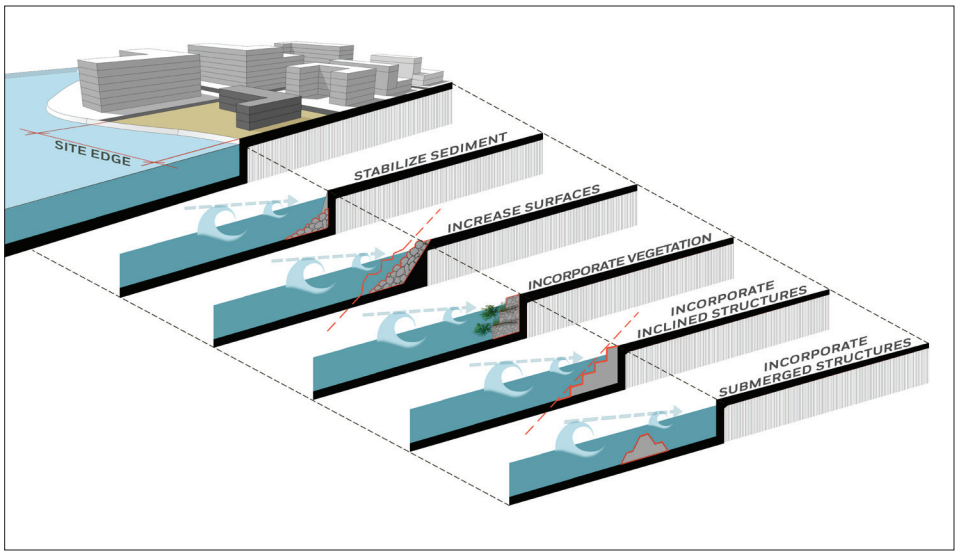
YES ? NO

ER-CREDIT 4.2
Stabilization Techniques: Incorporate Resilient Design Techniques
4 PTS

Stabilization techniques are often used to combat erosion, storms, and sea level rise. Incorporate at least two of the following design features into the design of an edge at least 25% of the shoreline length or no less than 50 feet. Provide construction details to demonstrate compliance with this credit.

- Stabilize sediment at the foot of stabilization techniques to prevent scour and erosion (i.e., rip rap at the base of a bulkhead, larger stone located at bottom of rip rap, or use of submerged aquatic vegetation (SAV) at the bottom of a revetment)
- Increase number of surfaces at various angles along the swash zone to dissipate wave energy (i.e., rip rap with various sizes of stone)
- Incorporate vegetation root systems or bio-grid products to stabilize loose sediments and anchor stabilizing structures (i.e., joint plantings in rip rap, vegetated gabions, etc.)

- Incorporate inclined structures leading up to vertical surfaces to dissipate wave energy (i.e., revetments, terraced gabions, fluted elements, etc.)
- Incorporate submerged structures to dissipate wave energy (i.e., toe berm)



YES ? NO

ER-CREDIT 4.3
Stabilization Techniques: Design for Ecological Diversity
4 PTS

Improving the ecological diversity of man-made waterfront edges and treatments fosters ecological productivity and natural resiliency. Incorporate at least two of the following design features into the design of an edge along at least 25% of the shoreline length or no less than 50 feet. Provide construction details to demonstrate compliance with this credit.

- Use rough, textured, porous surfaces to facilitate attachment of marine organisms (i.e., volcanic rock)
- Use materials that create interstitial spaces that vary in size and shape (i.e., rip rap of various shaped stone)
- Provide shade, habitat protection, wave attenuation, etc., via surface shapes and features (i.e., incorporating flat stone into rip rap to create shellfish refuges)
- Incorporate nature-based features (i.e., deep root plantings in vegetated gabions)
- Use appropriate stone size, depth, and cover layers to prevent root wedging of nature based features
- Select vegetation based on amount of available maintenance for control of over growth
- Use water retaining ecological features to increase bio-diversity and increase moist habitat (i.e., tide pools, crab caves in bulkheads, low tide exposed SAV blanket)

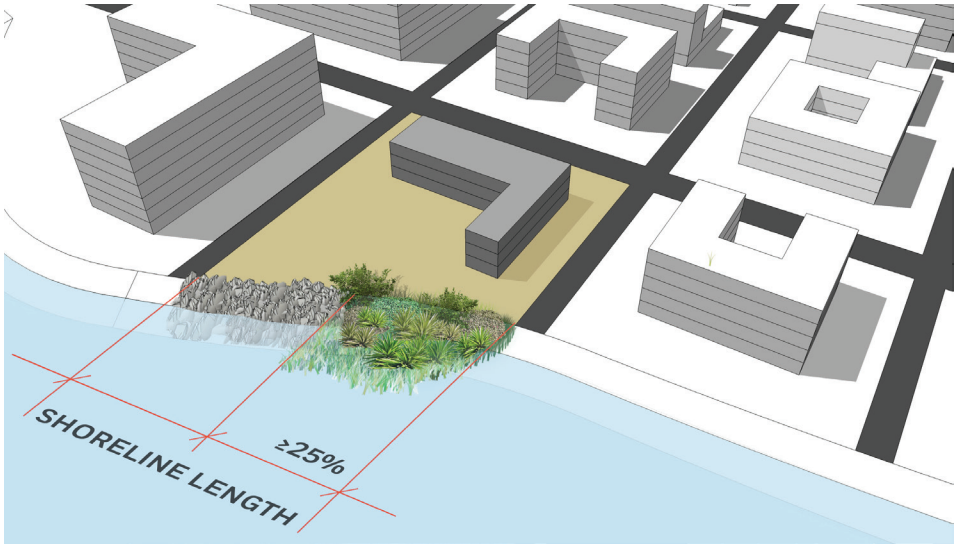
YES ? NO

ER-CREDIT 5.1
Natural Features: Restore/Replicate
POSSIBLE 6 PTS

Restore or replicate a natural feature along at least 25% of the shoreline or no less than 50 feet. Natural features provide many ecological functions and services as well as provide shoreline stabilization. Natural features can also self-repair waterfront edges with sediment catchment, deep root stabilization, and biogenic structures. Provide site plan and narrative to demonstrate compliance.

a) Restore/replicate a natural feature along at least 25% of the shoreline
2 PTS

b) Restore/replicate a natural feature along at least 50% of the shoreline
6 PTS



YES ? NO

ER-CREDIT 5.2
Natural Features: Incorporate Resilient Design Techniques
4 PTS

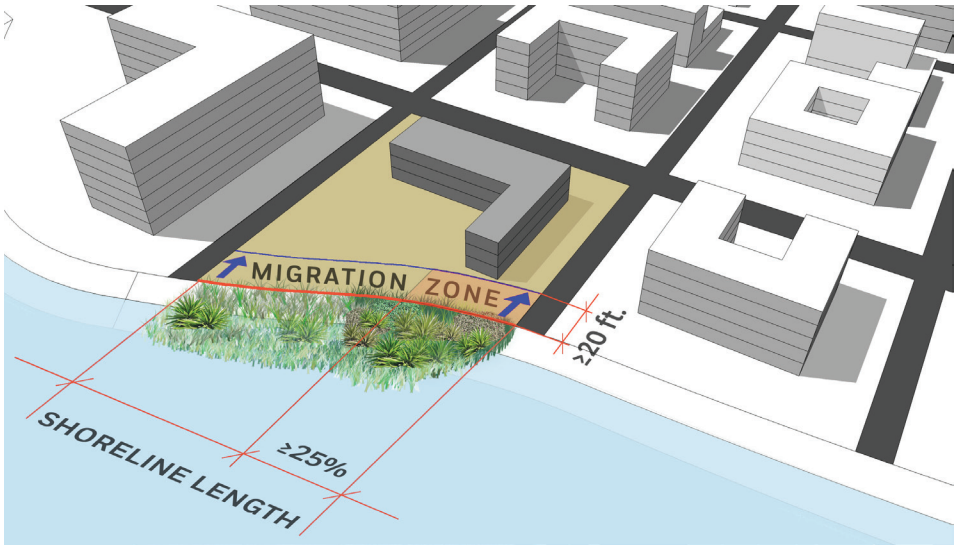
Natural features (existing, restored, or replicated) provide ecological benefits, but can be enhanced to increase their resilience during storm events and other disturbances. Incorporate at least three of the following design features into the design of an edge at least 25% of the shoreline length or no less than 50 feet. Provide site plan and narrative to demonstrate compliance.

- Limit proximity of human activities (i.e., exclude vessels from SAV areas)
- Prevent steep slope erosion at natural habitat edges (i.e., sills at seaward edge of marshes)
- Use bioengineered frame structures (i.e., oyster reefs, mussel beds, etc.)
- Use species that will stabilize and catch sediment (i.e., spartina grass, eel grass, etc.)
- Implement grazing management analysis and plans (i.e., geese fencing for marsh grasses, Asiatic shore crab prevention for oyster reefs)
- Provide two- to three-year vegetation establishment plan (i.e., monitoring, nutrient enrichment, repair)
- Design physical and ecological barriers to invasive species (i.e., salt water inundation against phragmites invasion)
- Incorporate filter feeders into ecosystem design to increase flush rates and reduce turbidity to promote submerged and emergent vegetation health
- Select species that create structural components and biogenic structures (i.e., oysters, mussels, salt marsh grasses, mangroves, etc.)
- Select species with high succession regeneration rates that “self-repair” natural structures after a disturbance (i.e., oysters, mussels, salt marsh grasses, etc.)

YES ? NO

ER-CREDIT 5.3
Natural Features: Preserve Upland Area for Wetland Migration
6 PTS

Wetlands and coastal dune systems are subject to landward migration due to rising sea levels. If the shoreline conditions of slope, elevation, and composition allow, wetlands will retreat and establish themselves upland as the seaward edge becomes submerged. During storm events, coastal dune systems get dispersed and captured by dune grass and build up over time as winds, waves, and other forces push them landward. Along at least 25% of the shoreline, designate at least 20 horizontal feet of upland open space area that has been deemed appropriate for wetland migration where wetlands exist or are created (40 feet for coastal dune systems). Open space may be publically accessible, but should not include construction of permanent structures. Provide site plan and narrative to demonstrate compliance.



YES ? NO

ER-CREDIT 6.1
Nearshore Structures: Restore/Create
4 PTS

Nearshore in-water structures can attenuate wave energy and reduce stream velocity. Excessive wave energy or stream velocity can cause sediment uplift, suspension, and scour. Refer to the **Engineering Design Guidance for Detached Breakwaters as Shoreline Stabilization Structures** by the US ACE. Reduce wave height, wave energy, and stream velocity by at least 15% from existing conditions. Provide site plan and section view to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 6.2
Nearshore Structures: Incorporate Nature-Based Features
4 PTS

Nearshore in-water structures can incorporate nature-based features, such as living breakwaters, fringe wetlands, reefs, water retaining features, and submerged aquatic vegetation, to enhance the environment. Incorporate nature-based features into the design of nearshore structures. Provide a site plan and narrative highlighting the integration of nature-based features into nearshore structures to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 6.3
Nearshore Structures: Minimize Hydrodynamic Impacts
4 PTS

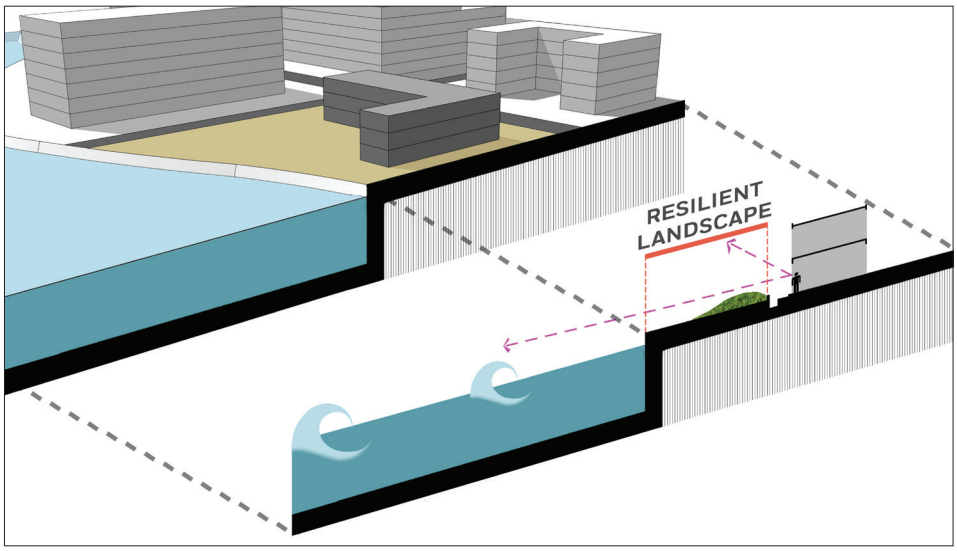
Structures on the waterfront edge will affect hydrodynamics, especially nearshore structures that are exposed, floating, or submerged in the water. Incorporate the following into nearshore structure design to reduce adverse affects on hydrodynamics. Provide a hydrodynamic assessment, site plans, and a narrative highlighting the measures taken to reduce adverse affects on hydrodynamics to demonstrate compliance with this credit.

- Use modeling to assess changes in wave regime and sediment transport
- Plan for sediment deposition and erosion away from sensitive habitats and natural features
- Prevent sediment suspension in water column
- Avoid negative impacts to water circulation
- Avoid impacts to sediment budget within project region
- Avoid sedimentation of shipping channels
- Avoid negative impacts to erosion hazard areas

YES ? NO

ER-CREDIT 7
Create Resilient Landscape Features on Site
4 PTS

As part of a regional coastal protection strategy and if appropriate after analysis for *ER-Credit 1* and *2*, incorporate elements in the landscape to reduce the impacts of coastal flooding on vulnerable assets. Strategies should be sited upland from the water's edge and may include berms that connect with high elevation points, integrating flood walls into the landscape, or increasing edge elevation in extremely low lying areas. Consider impacts to public access and scenic views and flooding of adjacent sites, as these features near the waterfront edge can obstruct scenic views, prevent access to the waterfront, and trap/retain floodwaters during and after flood events. If a berm/levee is appropriate, it should be multipurpose and allow for public access, greenways, plantings, etc. These methods should be considered as an alternative to raising entire elevation of the site. Provide a site plan and narrative to demonstrate compliance with this credit.

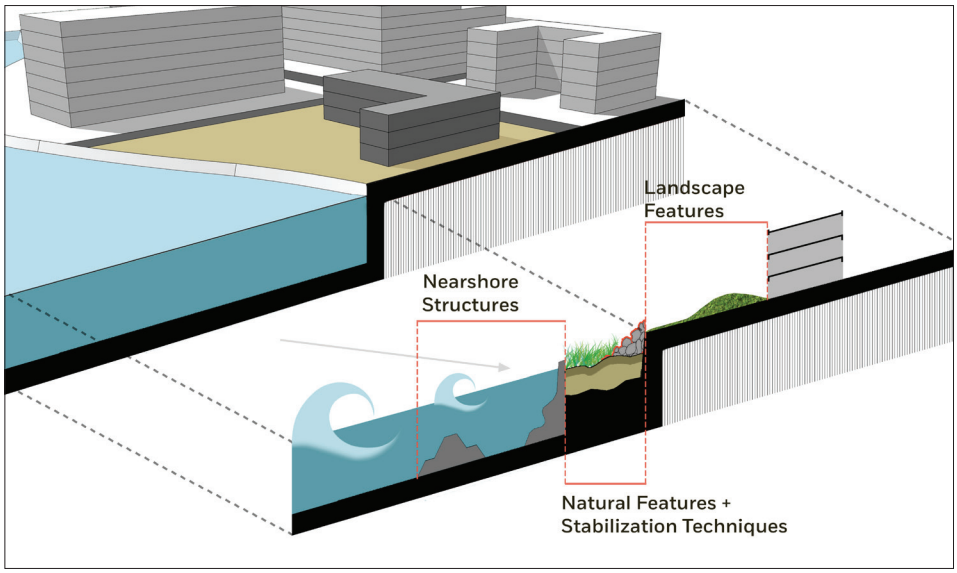


YES ? NO

ER-CREDIT 8
Integrate Multiple Edge Resiliency Strategies
POSSIBLE 6 PTS

Employ multiple edge resiliency strategies to create a multi-layered edge configuration that increases resilience to storms, flooding, sea level rise, and climate change. Within the same length of shoreline employ at least two of the following edge resiliency strategies: landscape features, stabilization techniques, natural features, or nearshore structures. Provide a site plan and narrative describing purpose and functionality of each layer as it contributes to the whole system to demonstrate compliance with this credit.

- **a)** Combine at least two different strategies within the same length of shoreline **2 PTS**
- **b)** Combine at least three different strategies within the same length of shoreline **4 PTS**
- **c)** Combine at least four different strategies within the same length of shoreline **6 PTS**



YES ? NO

ER-CREDIT 9.1
Sustainable Stormwater Management: Increase Retention and Infiltration Area
4 PTS

Stormwater will increase in velocity, quantity, and contaminants as it travels over impervious surfaces, harming the receiving body of water. Diverting stormwater into permeable areas with increased retention capacity can minimize these effects. Incorporate designs that increase stormwater infiltration by at least 40% over existing conditions where suitable to underlying soil and water table conditions. Provide site plan and documentation to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 9.2
Sustainable Stormwater Management: Reduce Runoff Discharge Flow Rate
4 PTS

Stormwater discharge along the waterfront can negatively affect the water quality of the receiving body of water. Incorporate designs that reduce runoff discharge by at least 15% from the existing conditions. Refer to the **TR-55 Urban Hydrology for Small Watersheds [Figure 2-1]** for details on how to attain the runoff curve number (inches of runoff discharge/ inches of rainfall). Consider the use of detention basins or other infrastructure to slow the discharge of stormwater. Provide site plan and documentation to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 9.3
Sustainable Stormwater Management: Improve Discharge Quality
4 PTS

Stormwater can acquire particulates, chemicals, litter, excessive nutrients, and other pollutants. Properties at the water's edge are the last opportunity for stormwater to be treated by natural or mechanical systems before entering receiving waters. Implement designs that would reduce 75% of Total Suspended Solids (TSS) from the existing conditions. Provide documentation to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 9.4
Sustainable Stormwater Management: Capture and Reuse
4 PTS

Stormwater capture and reuse has many benefits and possible uses. Captured stormwater can be purified and used for grey water purposes within building operations and for irrigation. Design water features to act as retention basins for stormwater capture and reuse. Implement designs that capture at least 5% of the stormwater. Provide documentation to demonstrate compliance with this credit.

YES ? NO

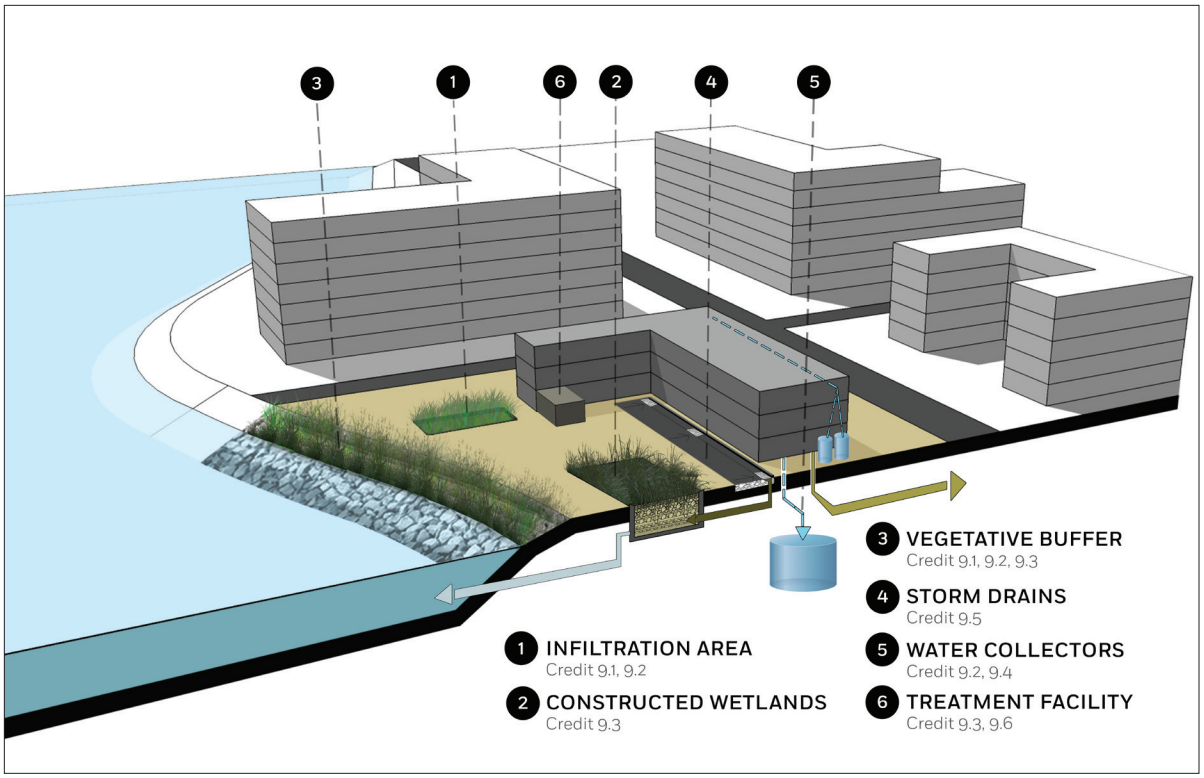
ER-CREDIT 9.5
Sustainable Stormwater Management: Separate Sanitary and Stormwater
4 PTS

In many urban settings, wastewater and stormwater runoff are combined into sewer systems and transported to municipal treatment facilities. During heavy rainfall these treatment facilities may experience a combined sewer overflow (CSO) discharge event when the volume of discharge exceeds the capacity of the facility. To relieve the municipal CSO system, separate stormwater runoff from the combined sewer system. Provide a site plan and narrative to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 9.6
Sustainable Stormwater Management: Treat Sewage and Grey Water on Site
4 PTS

Treat a significant portion of sewage on the site as this can relieve pressure on municipal sewer system. Various methods such as advanced hydroponic reactors, constructed filtration wetlands, algal turf scrubbers, and the use of living machines/ eco-machines are available to improve the quality of on-site sewage. These solutions should only be pursued if proper regulatory certifications allow such systems and should include contingency connections and procedures in the event of system failure. Provide site plans to demonstrate compliance with this credit.



CATEGORY 4: Ecology & Habitat (E & H)

Protect existing habitat and enhance the waterfront edge and site ecosystem.

68 POSSIBLE PTS

E & H-CREDIT 1 (PRIORITY)

Assess Natural Resources

POSSIBLE 6 PTS

YES ? NO

In order to understand the performance and quality of natural resources, conduct an in-depth assessment of existing conditions following a three-tiered approach. This assessment should categorize ecological communities as well as identify habitat areas and which species they serve.

Tier 1: Remote Assessment 2 PTS

Evaluate conditions of the project site and adjacent areas using geographic information systems, aerial imagery, etc.; also consider the local region. The remote assessment typically should include land cover type, land use, tidal ranges, vegetation densities, historical conditions, and other ecological information that relate landscape context to existing human infrastructure.

YES ? NO

Tier 2: Rapid Inventory Assessment 4 PTS

Conduct a field assessment of the project site with consideration given to the adjacent area. The rapid inventory assessment includes an inventory of all ecological communities categorized according any of the following classification systems:

- **Ecological Communities of New York State**
- **Preliminary Natural Community Classification for New Jersey**
- **Ecological Systems of the US**
- **Coastal and Marine Ecological Classification Standard**
- **Classification of Wetlands and Deepwater Habitats of the US**

The rapid inventory assessment must identify and determine the quality of these ecological communities regarding their basic community structure and composition, basic hydrology, species diversity, and richness, community robustness, suitable habitat, regional participation, patch dynamics, aesthetic quality, and ecological productivity. Use the following rapid assessments that apply to the project site:

- **Wildlife Habitat Benefits Estimation Toolkit**
- **Quantifying Terrestrial Habitat Loss and Fragmentation: A Protocol**
- **Habitat Equivalency Analysis: An Overview**
- **Ecological Integrity Assessment and Performance Measures for Wetland Mitigation**

YES ? NO

Tier 3: Intensive Functional Assessment 6 PTS

Conduct an in-depth, intensive functional assessment of critical ecosystems, restoration efforts, and green infrastructure. The intensive functional assessment must identify the performance and value of ecosystems functions and services provided by the natural resources on site. The assessment should also detail the advanced hydrology, flow of nutrients, and chemical and physical processes. Use the following assessments that apply to the project site:

- Benthic Index of Biotic Integrity for nearshore (subtidal) habitats
- Evaluation for Planned Wetlands (for coastal wetlands)
- **Oyster Habitat Restoration Assessment and Monitoring Handbook**
- **Ecological Integrity Assessment and Performance Measures for Wetland Mitigation**
- **Uniform Mitigation Assessment Methods**

- **Index of Biotic Integrity**
- **Biological Monitoring and Assessment: Using Multimetric Indexes Effectively**

Refer to **Ecological Integrity Assessment and Performance Measures for Wetland Mitigation, Table 5 Summary of Major categories and subcategories of ecological indicators, developed by US EPA**. This assessment can be submitted in a Final Environmental Impact Statement, Environmental Assessment Statement, or separate assessment publication.

Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 2 (PRIORITY)
Preserve or Enhance Existing Natural Resources
4 PTS

Based on the findings of *E & H-Credit 1*, engage the project team to determine how best to avoid impacts, and preserve or enhance the site's natural resources. Work with the regulatory agencies to gain approval for possible ecological preservation or enhancements that take into consideration establishment conditions (for instance, average salinity and inundation frequency for marsh grasses), biotic and abiotic factors (for instance, predatory migration route changes, climate change, sea level rise), and the probability of success. Provide documentation and post-implementation monitoring plan to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 3
Avoid Ecologically Sensitive Areas
2 PTS

Avoid building on ecologically sensitive areas. Provide documentation that the project is avoiding directly or indirectly adversely affecting the following areas to demonstrate compliance with this credit:

- **Critical Environmental Areas (NYS DEC)**
- **Significant Coastal Fish and Wildlife Habitats (NYS DEC)**
- **Recognized Ecological Complexes (NYC DCP)**
- **Special Natural Waterfront Areas (NYC DCP)**
- **Forever Wild Sites (NYC DPR)**
- **Critical Environmental and Historic Sites (NJ)**
- **Coastal Barriers Resource System (US FWS) (NY and NJ)**

YES ? NO

E & H-CREDIT 4
Contribute to the Comprehensive Restoration Plan of the Region
4 PTS

Projects should ideally contribute to a regional ecological restoration program related to public agency goals, recognizing the importance of maintaining contiguous natural areas to ensure connectivity and viability of the natural communities within them. For sites located in the New York metropolitan region, review the **Hudson River Estuary Comprehensive Restoration Plan** and determine if the project can enhance the **Target Ecosystem Characteristics** below:

- Coastal wetlands
- Shorelines and shallows
- Enclosed and confined waters
- Tributary connections
- Sediment quality
- Maritime forest
- Eelgrass bed
- Oyster beds
- Habitat for fish, crabs, and lobsters
- Waterbirds
- Acquisition

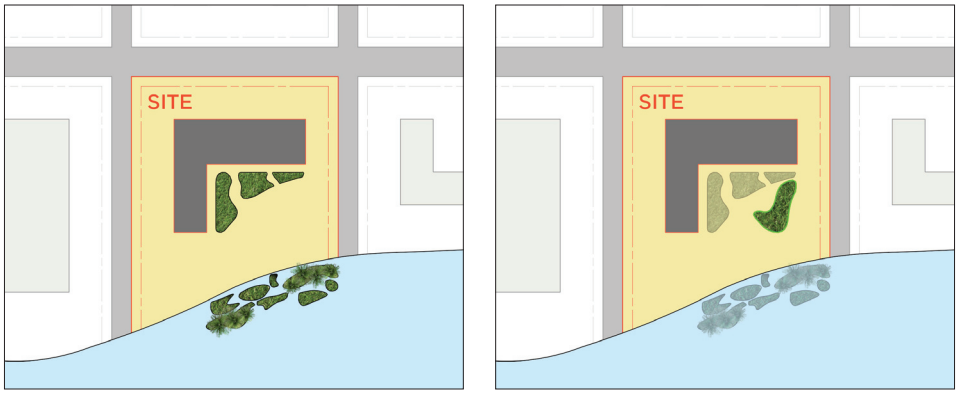
Provide documentation of contribution to a regional restoration program and concurrence of appropriate agency to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 5.1
Habitat Continuity: Add New Habitat
POSSIBLE 4 PTS

Based on identification of suitable habitat via *E & H-Credit 1*, increase the habitat area within the waterfront edge to provide a more ecologically productive environment. Increase total habitat area by at least 25% of the preexisting condition. Where existing conditions include no habitat, full points in this credit can be achieved if habitat is created and the total habitat area is greater than 25% of total project site. Increasing habitat is beneficial but it is the arrangement and connectivity between habitat patches that is the foundation for high-performance habitats that foster higher species diversity and abundance. Consider the addition of new habitat that reduces the distance between adjacent habitat patches to improve connectivity (Note: Related to *E & H-Credits 5.2-5.4.*) Provide site plans and description of ecological benefits including target species to demonstrate compliance with this credit.

a) Increase habitat areas by at least 25% **2 PT**
b) Increase habitat areas by at least 50% **4 PTS**

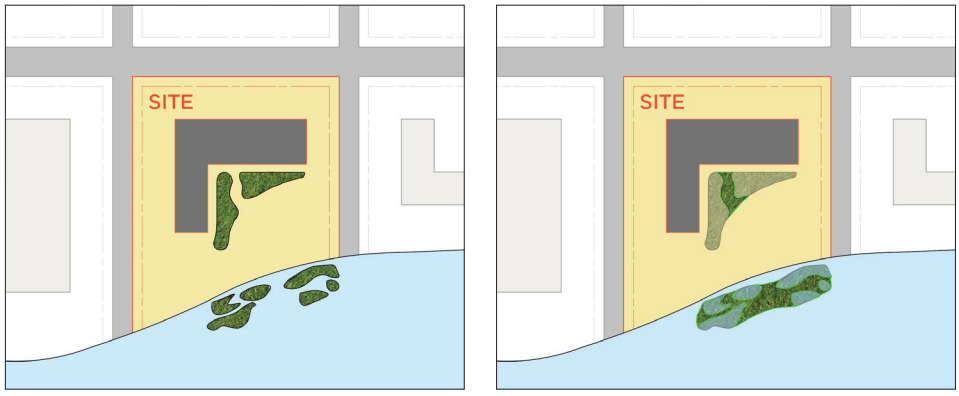


BEFORE AFTER

YES ? NO

E & H-CREDIT 5.2
Habitat Continuity: Consolidate Habitat Patches
4 PTS

Based on identification of suitable habitat via *E & H-Credit 1*, by adding new habitat or expanding existing habitat, consolidate and reduce the number of individual patches that divide up the total habitat area to where the average patch size is at least 5% of the total habitat area. Where existing conditions include no habitat, full points in this credit can be achieved if the average patch size is at least 5% of the total new habitat area. Larger, more contiguous patches typically provide a greater quality and variety of micro-habitats, leading to higher species diversity and abundance. When consolidating habitat patches consider arrangement and connectivity. (Note: Related to *E & H-Credit 5.3.*) Provide site plans and description of ecological benefits including target species to demonstrate compliance with this credit.

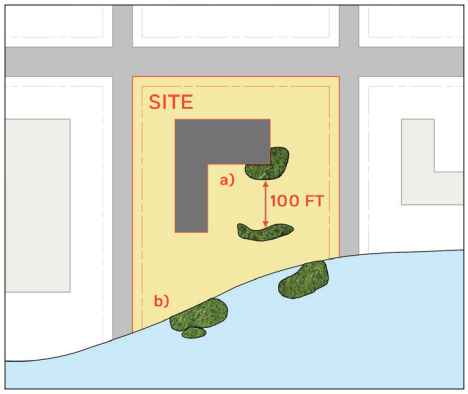


BEFORE AFTER

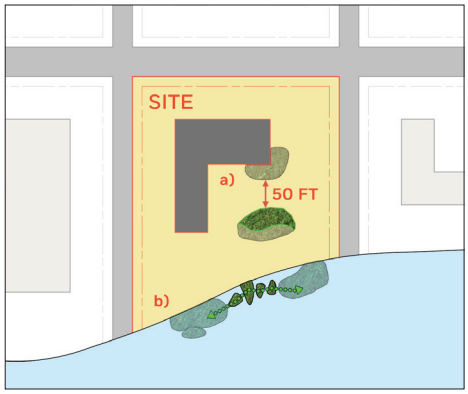
YES ? NO

E & H-CREDIT 5.3
Habitat Continuity: Increase Connectivity between Habitat Patches
4 PTS

Based on identification of suitable habitat via *E & H-Credit 1*, reduce the distance between patches or build structures to increase ecological connectivity within the site and to adjacent sites. Ecological corridors can increase viable habitat ranges, facilitate movement of critical species, enable re-colonization of previously disturbed areas, as well as increase general biodiversity and abundance. Projects can achieve this credit by either (a) reduce the average distance between adjacent habitat patches to less than 75 feet (Note: Where existing conditions includes no habitat, full points in this credit can be achieved if the average distance between new habitats is less than 75 feet.) or (b) create structural connections such as habitat bridges/tunnels/canals, habitat "stepping stones," green walls/bulkheads, or other habitat infrastructure. Provide site plan and description of ecological benefits including target species to demonstrate compliance with this credit.



BEFORE



AFTER

YES ? NO

E & H-CREDIT 5.4
Habitat Continuity: Increase Habitat Diversity
4 PTS

Incorporate multiple types of habitats, including terrestrial, intertidal, and sub-tidal zones, to increase ecological diversity. Based on the results of *E & H-Credit 1*, the project team should determine appropriate habitats to increase the site's ecological quality. Creating a mosaic of habitat types facilitates interspecies interactions and strengthens the ecological community. Refer to the **Ecological Communities of NYS** and prioritize ecological communities with high "Significant Natural Community Occurrence" ranking according to the New York Natural Heritage database reports. Also refer to the US FWS's **Technical Procedures for Conducting Status and Trend of the Nation's Wetlands** Table 1 and the examples below:

- Sand/pebble beach
- Barrier beach
- Eel/turtle grass beds
- Saltmarsh
- Highmarsh
- Wet meadows
- Bogs/fens
- Shrub swamps
- Bottomland hardwoods
- Forested swamps
- Rocky intertidal
- Mesic forest
- Breakwaters/biogenic reefs
- Grasslands
- Mudflats
- Freshwater wetlands
- Shrubland
- Heathland
- Fern meadow
- Deciduous forest
- Coniferous barrens
- Successional shrublands
- Successional hardwoods

Provide site plan and description of ecological benefits including target species to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 6.1
Habitat Complexity and Robustness: Use Native Plants
POSSIBLE 4 PTS

Based on identification of suitable habitat via *E & H-Credit 1*, incorporate the use of native plants throughout the project site. Native plans should comprise 75% or more of total planned biomass. Provide documentation to demonstrate compliance with this credit.

a) Native plants are 75% or more of total planned biomass. **2 PTS**
b) Native plants are 85% or more of total planned biomass. **4 PTS**

YES ? NO

E & H-CREDIT 6.2
Habitat Complexity and Robustness: Remove Invasive Species
4 PTS

Create a five-year removal and prevention plan of invasive species both flora and fauna that pose a danger to planned and existing ecological communities. Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 6.3
Habitat Complexity and Robustness: Create Resilient Ecosystems
4 PTS

Design landscapes, green infrastructure, and ecosystems to withstand harsh coastal conditions, floods, and storms. Ecosystems should be design to be flooded or washed over with minimal impact, assuming the expected repair or renovation costs, after a storm or flood, would not exceed 50% of the initial construction costs. Use plants that are salt-, flood-, and drought-tolerant, wind-resistant, and can withstand local temperature extremes and are appropriate for the site's sun/shade conditions. Incorporate ecological elements such as natural recovery, rapid succession, and biogenic stabilization into ecosystem design. Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 6.4
Habitat Complexity and Robustness: Support Endemic, Endangered, and Migratory Species
4 PTS

Complex and robust habitats have endemic, endangered, or migratory species that require a particular set of conditions in order to thrive. Refer to these links for a list of endangered and threatened species: **NYS DEC New York Natural Heritage Program** and **NJ DEP New Jersey's Endangered and Threatened Wildlife**. In some cases, creating barriers between critical or sensitive species and sources of human disturbance are necessary. (Note: Refer to *E & H-Credit 9.2.*) Preserve habitat and/or incorporate design features that attract these species through increased habitat complexity and diversity. Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 7
Perform Multiple Ecosystem Functions and Services
4 PTS

Based on the results of *E & H-Credit 1*, integrate at least two new ecosystem functions into site's design. Use the classification of ecosystem services developed by **The Millennium Ecosystem Assessment**:

- Gas regulation
- Climate regulation
- Disturbance regulation
- Water regulation
- Soil regulation
- Nutrient regulation
- Waste treatment and assimilation
- Pollination
- Biological control
- Barrier effects of vegetation
- Supporting habitats
- Soil formation
- Food provisioning
- Raw materials provisioning
- Water supply provisioning
- Genetic resources
- Provision of shade and shelter
- Pharmacological resources
- Landscape aesthetic opportunity
- Biogenic buildup

Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 8.1
Advanced Mitigation Actions: Avoid Environmental Impacts
8 PTS

Avoid designs that would result in open space, natural resources, hazardous materials, water and sewer infrastructure, or greenhouse gas emissions significant adverse impacts as determined through the environmental review process. Meet with regulatory agencies to find the appropriate design of facilities in order to comply with this credit. Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 8.2
Advanced Mitigation Actions: Exceed Mitigation Requirements
POSSIBLE 4 PTS

Any natural resource impacts actions that cannot be avoided or minimized must have compensatory mitigation equivalent or greater than the affected resources as approved by governing regulatory agencies in order to satisfy this credit. Work with regulatory agencies to prepare compensatory mitigation plans with guidance from the **Model Compensatory Mitigation Plan Checklist** developed by the US ACE and the US EPA. Exceed required mitigation actions that benefit the overall health of the metropolitan region by at least 15%. Provide documentation to demonstrate compliance with this credit.

a) Exceed mitigation requirements by 15% **2 PTS**
b) Exceed mitigation requirements by 30% **4 PTS**

YES ? NO

E & H-CREDIT 9.1
Disturbances and Pollution: Limit Light Pollution
2 PTS

Waterfront light pollution can encourage nuisance fauna such as jellyfish and impact navigation for aquatic fauna and vessels traveling at night; limit light on the waterfront. See **exterior lighting guidelines developed by the NYC Department of Design and Construction** and information provided by the **Illuminating Engineering Society of North America** and the **International Dark-Sky Association**. Provide documentation demonstrating that the project's ambient light and light projected seawards is less than those of the existing conditions to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 9.2
Disturbances and Pollution: Avoid Human Disturbances
2 PTS

Based on identification of suitable habitat via *E & H-Credit 1*, design barriers and take preventative measures to separate sensitive ecosystems from human activities. Human recreational activities can harm sensitive habitats and include but are not limited to excessive noise, litter, trampling of vegetation (by foot and paddle), compacting of soils, and the disturbing sediment due to prop wash and wakes from motorized boats. Creating barriers/buffers or preventing access to sensitive habitats can protect their ecological integrity. Provide site plan and narrative to demonstrate measures taken to reduce disturbance by human activity.

CATEGORY 5: Materials & Resources (M & R)

Use materials and resources that are resilient, environmentally friendly, and provide societal benefits; includes responsible construction practices.

40 POSSIBLE PTS

YES ? NO

M & R-CREDIT 1 (PRIORITY)
Provide a Life Cycle and Service Life Assessment of Materials
4 PTS

Analyze the materials used in the construction or enhancement of the waterfront edge by performing a life cycle and service life assessment of the materials and construction practices. **US EPA's Tool for the Reduction and Assessment of Chemical and other Environmental Impacts (TRACI)** methodologies are a resource for analyzing appropriateness of materials. Use the US EPA's TRACI via a resource such as the **Athena Sustainable Materials Institute's Life Cycle Assessment**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 2.1
Repurposed Fill: Redistribute on Site
1 PT

Use fill material from within the site during construction, in accordance with state and local regulations. This avoids the need to import construction materials from external sources, lowering the project's carbon footprint and reduce shipping costs. Provide documentation that at least 25% of the total fill used is from the site and has been authorized by state or local regulatory agencies or is exempt from such regulations to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 2.2
Repurposed Fill: Use Locally Dredged Material on Site
1 PT

Use material dredged from waterways within 25 miles that is in accordance with governing regulations: **NYS DEC Beneficial Use Determinations**, **NYSDEC Remedial Program Soil Cleanup Objectives**, **NJAC 7:26D Remediation Standards**, **NJAC Guidance Document for Beneficial Use Project**. Use of dredged material from onsite or nearby is a form of materials exchange that removes the intermediary when there is a need to dispose of dredged material and a need for fill material. Benefits include reduced material costs, reduced carbon footprint, and reduced transportation of invasive species from more distant sources and capping of possibly contaminated onsite soils. Obtain a permit from the **US ACE**, NJ DEP, and/or NYS DEC in order to dredge material from local waterways. Provide a narrative of suitability of dredged material for its proposed use and all associated permits to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 2.3
Repurposed Fill: Use Local Off-Site Sources
1 PT

Use suitable fill material from off-site sources within 30 miles if trucked or up to 50 miles if barged miles. This minimizes the need to import construction materials from more distant sources and increases the possibility of shipping through barging methods, lowering the project's carbon footprint and reducing overall shipping costs. Provide documentation that at least 50% of total fill used is from local sources to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 3.1
Repurposed Materials: Salvage Waterfront Structures on Site
1 PT

Repurpose waterfront structures from the site during waterfront edge construction (i.e., piers, rip rap, etc.). Benefits include reduced waste and cost for new materials. Provide documentation that at least 10% of avoided total material costs of the project are salvaged from the site (not including fill) to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 3.2
Repurposed Materials: Use Responsibly Sourced Lumber
2 PTS

Use composite lumber, reclaimed hardwoods, or certified lumber sources. As an alternative to pressure treated lumber, use recycled lumber alternatives, most of which are impervious to saltwater, sunlight, sand, marine organisms and insects and are resistant to mold, mildew, rot, warping and splintering. These materials are usually slip-resistant, durable, and long-lasting. Refer to the US EPA's list of **Alternatives to Pressure-Treated Wood**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 4.1
Regional Sourcing: Use Local, Native Plants
1 PT

Specific intra-species gene pools differ between regions due to varying climate and environmental conditions. Transplanting vegetation from one regional gene pool to another can weaken the local gene pool. Use native plant nurseries specializing in locally sourced plants. Provide documentation that 75% of total cost of plant material is sourced from within 50 miles to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 4.2
Regional Sourcing: Use Local Oyster Spat
1 PT

Use oysters raised by hatcheries within 100 miles, specializing in local gene pools when selecting seed, spat, or adults for use within the waterfront edge. These hatcheries must be growing spat from the Oyster Bay gene pool, which are bred with resistance to Roseovarius Oyster Disease. Refer to the **Cornell Cooperative Extension of Suffolk County's SPAT Program**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 5.1
Material Resilience: Use Durable Materials
1 PT

Use materials that are resistant to salt water, flooding, impacts, fracturing due to heat or cold, wind, and ultraviolet light. Use the **FEMA P-499 Home Builder's Guide to Coastal Construction**, **Technical Fact Sheet No. 1.7**, as a guide during material selection. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 5.2
Material Resilience: Protect/Waterproof Electrical/ Mechanical Equipment in Flood Zone
1 PT

Provide protection for utilities, such as waterproof vaults, as well as water- and salt-resistant materials for wires and lines that must be located in flood zone. Wiring should be encased in a non-corrosive metal or plastic conduit when allowed by code. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 6.1
Low Impact Materials: Use Permeable Materials
1 PT

Permeable cover materials used along the waterfront edge can help absorb stormwater and filter out pollutants. Provide documentation that at least 25% of cover is permeable and identified as such by appropriate state and local regulatory agencies as appropriate, to demonstrate compliance with this credit.

YES ? NO	**M & R-CREDIT 6.2** Low-Impact Materials: Use High-Albedo Surfaces **1 PT**	Use high-albedo paving surfaces, which are light in color and reflect sunlight away from the surface. This reduces cooling costs, helps the survival of plants, and improves air quality. Provide documentation that at least 50% of paving surface is high-albedo to demonstrate compliance with this credit.
YES ? NO	**M & R-CREDIT 6.3** Low-Impact Materials: Avoid Potentially Toxic, Preserved Lumber **2 PTS**	Avoid lumber preserved with potentially toxic substances in the water or at the waterfront edge. Do not use lumber preserved with chromated copper arsenate or fossil-fuel-derived creosote, which can leech into the marine environment. Provide documentation to demonstrate compliance with this credit.
YES ? NO	**M & R-CREDIT 7.1** Ecologically Beneficial Material: Use Supportive Composition **2 PTS**	Use materials that have a chemical composition, alkalinity, toxicity, pH, etc., that support and promote biological activity and attachment of marine organisms. Products such as concrete additives that decrease alkalinity and pH, foster the growth of marine organisms. Provide documentation to demonstrate compliance with this credit.
YES ? NO	**M & R-CREDIT 7.2** Ecologically Beneficial Material: Use Habitat Generating Products **2 PTS**	Use materials or products that provide habitat for marine organisms. Use products such as precast tidal pools, habitat/reef modules, oyster castles, form liners, molds and structural enhancements. Provide documentation to demonstrate compliance with this credit.
YES ? NO	**M & R-CREDIT 8.1** Renewable Energy: Use Independent Energy Systems for Auxiliary Structures **4 PTS**	Use independently powered, off-the-grid infrastructure for auxiliary structures that are located within the waterfront edge (this credit does not include buildings). Self-contained, renewable energy such as wind and solar can minimize the use of wiring and equipment susceptible to damage from flooding. Provide documentation to demonstrate compliance with this credit.
YES ? NO	**M & R-CREDIT 8.2** Renewable Energy: Use Water-Based Renewable Energy **4 PTS**	Use water-based renewable energy systems—such as tidal or wave energy—as supplementary energy sources or as independent energy systems for auxiliary structures. Provide documentation to demonstrate compliance with this credit.
YES ? NO	**M & R-CREDIT 9** Install Redundant Emergency Systems **4 PTS**	Install redundant back-up systems especially that include dry pumps, cooling systems, emergency power and lighting, and/ or other systems used during emergency situations. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 10.1
Responsible Construction: Minimize Construction Impacts
2 PTS

Based on an assessment of possible ecosystem construction impacts, integrate at least two of the following preventative strategies into construction practices prior to the project start:

- Reduce in-water construction to occupy less time within approved work timeframes for fish/wildlife protection as proscribed by regulatory bodies
- Protect water bodies from contaminants and particular matter with redundant barriers such as doubling up on turbidity curtains and silt barriers
- Keep construction equipment off wetlands and marshes and minimize size of construction area
- Minimize impacts to aquatic plants and bottom sediment topography when installing piles
- Use prefabrication techniques to reduce construction time and minimize area affected by construction
- Work from the water to avoid damaging natural features and habitat, and anchor construction barges away from aquatic habitat especially when creating structures over wetlands
- Install piles using drop or small, low-pressure vibratory hammers rather than high-pressure-jet installation

Provide construction plans and narrative describing benefits beyond required actions to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 10.2
Responsible Construction: Barge Materials
2 PTS

Use barge transportation of materials, which can reduce carbon emissions, alleviate truck traffic, and lower construction costs. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 10.3
Responsible Construction: Cooperate in Materials Exchange Program
2 PTS

Participate in a materials exchange program to reduce disposal/purchase costs and to lower carbon emissions. Provide documentation to demonstrate compliance with this credit.

CATEGORY 6: Operations & Maintenance (O & M)

Address life-cycles of projects including sustained maintenance strategies, preparations for future climate events, and partnerships to advance scientific understanding of waterfronts.

32 POSSIBLE PTS

YES ? NO

O & M-CREDIT 1 (PRIORITY)
Provide Operations and Maintenance Plan for the Waterfront Edge
4 PTS

Provide for maintenance and operational continuity for the waterfront area by establishing ongoing system for maintaining performance standards. A Maintenance Manual should be prepared by the owner based on best practices and should include maintenance and inspection details for waterfront area and edge. Include building systems personnel in the design, selection, and commissioning of all equipment. Provide documentation to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 2
Provide Regular Condition Assessment of Marine Assets
4 PTS

Provide regular condition assessment of marine assets, which can result in reduced maintenance costs. Use the latest **ASCE Waterfront Facilities Inspection and Assessment Manual**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 3
Identify Conservation Easement Opportunities for Open Space
4 PTS

Create an easement, a legal agreement between a landowner and a land trust or government agency that restricts development in certain sensitive areas. These easements can cover the entire property or just the shoreline. More information can be found on the United State Department of Commerce NOAA's website **here**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 4
Identify Partner(s) to Study Site
4 PTS

Create partnership(s) with academic or scientific institute, not-for-profit, etc., to study and assess waterfront areas and issues that will advance the science and understanding of waterfront projects and their interface with the environment. Topics could include resilient shorelines, ecosystem services, nature-based features, floodplain management, shading and in-water effects of structures, habitat restoration and mapping, etc. Provide documentation of partnership agreement to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 5
Provide Waterfront Emergency Preparedness Plan
4 PTS

Create an Emergency Preparedness Plan with model emergency operating procedures and a building contact directory for residents and tenants. Clear operating procedures for emergencies will allow owners, managers, residents, and homeowners to prepare effectively. Reference the recommendations in Proposal 28 of the **Building Resiliency Task Force** (United States Green Building Council, June 2013) for more detailed information. Provide documentation to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 6
Provide Long-term Funding/ Endowment Plan
4 PTS

Create an endowment fund that will maintain waterfront edge infrastructure such as promenades, seawalls, piers, etc. These facilities face harsh conditions requiring special consideration for their upkeep. Provide documentation to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 7
Provide Maintenance Plan for Sustainable Stormwater Management
4 PTS

Stormwater systems on waterfront properties are exposed to extreme conditions and require a thorough maintenance plan to keep the system fully functioning. Stormwater systems must be kept clear of debris, and elements such as bioswales, rain gardens, and constructed wetlands require specialized maintenance. Create a maintenance plan for the stormwater system describing operation, maintenance, including frequency and responsible parties. Provide documentation to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 8
Develop a Monitoring Program
4 PTS

Monitor the quality and growth of ecosystem functions and services. For a minimum of 5 years, develop or participate in a regional biological monitoring program or develop a biological monitoring program following a framework such as **NPS's Developing Conceptual Models for Monitoring Programs**, **NYS DEC's Standard Operating Procedure: Biological Monitoring of Surface Waters**, **Oyster Habitat Restoration Assessment and Monitoring Handbook**, **A Practitioners Guide to the Design and Monitoring of Shellfish Restoration Projects**, **A Framework for Standardized Monitoring of Living Shorelines In the Delaware Estuary and Beyond**, or **Identification of Metrics to Monitor Salt Marsh Integrity on National Wildlife Refuges In Relation to Conservation and Management Objectives**. Provide a narrative summarizing the monitoring plan to demonstrate compliance with this credit.

CATEGORY 7: Innovation (IN)

20 POSSIBLE PTS

YES ? NO

IN-CREDIT 1
Inventive Design
10 PTS

Using approaches and techniques not addressed in this version of WEDG, propose a new credit that achieves significant, measurable performance in resiliency, ecology, or public access for innovative waterfront edge design. Provide the following to demonstrate compliance with this credit:

- Intent of the new proposed credit
- Details of the design approach
- Projected goals and achieved measurements

A project can submit a maximum of two proposed credits for 5 points each. (Note: The achievement of these points is at the discretion of the WEDG program.)

YES ? NO

IN-CREDIT 2
Exemplary Performance
10 PTS

Significantly surpass the requirements for 2 possible credits (possible 5 points each). Provide documentation to demonstrate compliance with this credit. (Note: The achievement of these points is at the discretion of the WEDG program.)

SCORECARD
Residential/Commercial Project Type

401 POSSIBLE POINTS

CATEGORY 1: Site Selection & Planning (SS & P)

Y	?	N			POSSIBLE POINTS: 43
○	○	○	**Credit 1**	(Priority) Use a Multi-Disciplinary Project Team and Design Process	4
○	○	○	**Credit 2**	(Priority) Conduct Assessment of Site's Vulnerability to Climate Change and Sea Level Rise	4
○	○	○	**Credit 3**	(Priority) Avoid "Bluefield" Development	4
○	○	○	**Credit 4.1**	Project Siting: Site Near Existing Waterborne Transportation	1
○	○	○	**Credit 4.2**	Project Siting: Site Near Area Underserved by Open Space	1
○	○	○	**Credit 4.3**	Project Siting: Site in Area Participating in FEMA's Community Rating System	1
○	○	○	**Credit 4.4**	Project Siting: Clean a Brownfield	5
○	○	○	**Credit 5.1**	Building Siting: Avoid Development in High Potential Erosion Area	2
○	○	○	**Credit 5.2**	Building Siting: Avoid the 100-Year Floodplain	6
○	○	○	**Credit 5.3**	Building Siting: Maximize Upland Views	2
○	○	○	**Credit 6**	Raise Elevation: Increase Freeboard of Buildings	4
○	○	○	**Credit 7.1**	Building-Scale Protection: Provide Wet Floodproofing	2
○	○	○	**Credit 7.2**	Building-Scale Protection: Provide Dry Floodproofing	2
○	○	○	**Credit 8**	Site Perimeter Protection: Provide Deployable Flood Barriers	1
○	○	○	**Credit 9**	Incorporate Streetscape Enhancements to Mitigate Elevation Changes	2
○	○	○	**Credit 10**	Participate in FEMA's National Flood Insurance Program	2

CATEGORY 2: Public Access & Interaction (PA & I)

Y	?	N			POSSIBLE POINTS: 96
○	○	○	**Credit 1**	(Priority) Maintain and Provide Safe Public Access	4
○	○	○	**Credit 2**	(Priority) Engage Local Community and Users	4
○	○	○	**Credit 3**	(Priority) Conduct Water-Dependant Use Assessment of Site	4
○	○	○	**Credit 4.1**	Pier: Build or Renovate	2
○	○	○	**Credit 4.2**	Pier: Design	6
○	○	○	**Credit 5.1**	Floating Dock: Build or Renovate	1
○	○	○	**Credit 5.2**	Floating Dock: Design	2
○	○	○	**Credit 6.1**	Beach and Get-down: Build or Renovate	1
○	○	○	**Credit 6.2**	Beach and Get-down: Design	2
○	○	○	**Credit 7.1**	Human-Powered Boat Launch: Build or Renovate	1
○	○	○	**Credit 7.2**	Human-Powered Boat Launch: Design	2
○	○	○	**Credit 8.1**	Community Boathouse: Build or Renovate	2
○	○	○	**Credit 8.2**	Community Boathouse: Design	4
○	○	○	**Credit 9.1**	Marina: Build or Renovate a "Clean Marina"	6
○	○	○	**Credit 9.2**	Marina: Designate Public Use and Access	2
○	○	○	**Credit 9.3**	Marina: Fund Public Programs	2
○	○	○	**Credit 10.1**	Mooring Field: Create or Renovate	1
○	○	○	**Credit 10.2**	Mooring Field: Design	1
○	○	○	**Credit 11.1**	Ferries: Build or Renovate Docking Facility	2
○	○	○	**Credit 11.2**	Ferries: Docking Facility Design	4
○	○	○	**Credit 11.3**	Ferries: Provide Operating Funds	4
○	○	○	**Credit 12**	Provide Maritime and Docking Amenities	4
○	○	○	**Credit 13**	Accommodate Public Fishing	2
○	○	○	**Credit 14.1**	Public Walkways and Greenways: Ensure Edge Continuity	1
○	○	○	**Credit 14.2**	Public Walkways and Greenways: Provide Widened Public Access Area	6
○	○	○	**Credit 14.3**	Public Walkways and Greenways: Create Waterfront Greenway	2
○	○	○	**Credit 15.1**	Visual Corridors: Create Additional Corridors	4
○	○	○	**Credit 15.2**	Visual Corridors: Increase Width of Existing/Required Corridors	4
○	○	○	**Credit 16**	Incorporate Transit Access and Facilities	1
○	○	○	**Credit 17**	Enhance Shoreline Street Ends	2
○	○	○	**Credit 18**	Identify Local Programming Partners for Public Space	1
○	○	○	**Credit 19**	Ground Floor Frontages: Activate Waterfront Area	4
○	○	○	**Credit 20**	Public Priority Phasing	2
○	○	○	**Credit 21.1**	Incorporate Historical/Cultural Elements: Implement Interpretive Media	2
○	○	○	**Credit 21.2**	Incorporate Historical/Cultural Elements: Accommodate Historic Boats and Ships	2
○	○	○	**Credit 22**	Provide Ecological Educational Opportunities	2

CATEGORY 3: Edge Resiliency (ER)

Y	?	N			POSSIBLE POINTS: 102
○	○	○	**Credit 1**	(Priority) Assess Waterfront Edge Conditions to Determine Appropriate Design	4
○	○	○	**Credit 2**	(Priority) Design Waterfront Edge for Climate Conditions Projected for the 2050s	4
○	○	○	**Credit 3.1**	Shoreline Configuration: Remove Existing Fill/Restore Natural Shoreline	6
○	○	○	**Credit 3.2**	Shoreline Configuration: Reduce Slope	6
○	○	○	**Credit 3.3**	Shoreline Configuration: Create a Curvilinear Profile	2
○	○	○	**Credit 3.4**	Shoreline Configuration: Avoid Net Filling	4
○	○	○	**Credit 4.1**	Stabilization Techniques: Rehabilitate/Replace Manmade Edge	6
○	○	○	**Credit 4.2**	Stabilization Techniques: Incorporate Resilient Design Techniques	4
○	○	○	**Credit 4.3**	Stabilization Techniques: Design for Ecological Diversity	4
○	○	○	**Credit 5.1**	Natural Features: Restore/Replicate	6
○	○	○	**Credit 5.2**	Natural Features: Incorporate Resilient Design Techniques	4
○	○	○	**Credit 5.3**	Natural Features: Preserve Upland Area for Wetland Migration	6
○	○	○	**Credit 6.1**	Nearshore Structures: Restore/Create	4
○	○	○	**Credit 6.2**	Nearshore Structures: Incorporate Nature-Based Features	4
○	○	○	**Credit 6.3**	Nearshore Structures: Minimize Hydrodynamic Impacts	4
○	○	○	**Credit 7**	Create Resilient Landscape Features on Site	4
○	○	○	**Credit 8**	Integrate Multiple Edge Resiliency Strategies	6
○	○	○	**Credit 9.1**	Sustainable Stormwater Management: Increase Retention and Infiltration Area	4
○	○	○	**Credit 9.2**	Sustainable Stormwater Management: Reduce Runoff Discharge Flow Rate	4
○	○	○	**Credit 9.3**	Sustainable Stormwater Management: Improve Discharge Quality	4
○	○	○	**Credit 9.4**	Sustainable Stormwater Management: Capture and Reuse	4
○	○	○	**Credit 9.5**	Sustainable Stormwater Management: Separate Sanitary and Stormwater	4
○	○	○	**Credit 9.6**	Sustainable Stormwater Management: Treat Sewage and Grey Water on Site	4

SCORECARD
Residential/Commercial Project Type
401 POSSIBLE POINTS

CATEGORY 4: Ecology & Habitat (E & H)

Y	?	N			POSSIBLE POINTS: 68
			Credit 1	(Priority) Assess Natural Resources	6
			Credit 2	(Priority) Preserve or Enhance Existing Natural Resources	4
			Credit 3	Avoid Ecologically Sensitive Areas	2
			Credit 4	Contribute to the Comprehensive Restoration Plan of the Region	4
			Credit 5.1	Habitat Continuity: Add New Habitat	4
			Credit 5.2	Habitat Continuity: Consolidate Habitat Patches	4
			Credit 5.3	Habitat Continuity: Increase Connectivity between Habitat Patches	4
			Credit 5.4	Habitat Continuity: Increase Habitat Diversity	4
			Credit 6.1	Habitat Complexity and Robustness: Use Native Plants	4
			Credit 6.2	Habitat Complexity and Robustness: Remove Invasive Species	4
			Credit 6.3	Habitat Complexity and Robustness: Create Resilient Ecosystems	4
			Credit 6.4	Habitat Complexity and Robustness: Support Endemic, Endangered, and Migratory Species	4
			Credit 7	Perform Multiple Ecosystem Functions and Services	4
			Credit 8.1	Advanced Mitigation Actions: Avoid Environmental Impacts	8
			Credit 8.2	Advanced Mitigation Actions: Exceed Mitigation Requirements	4
			Credit 9.1	Disturbances and Pollution: Limit Light Pollution	2
			Credit 9.2	Disturbances and Pollution: Avoid Human Disturbances	2

CATEGORY 5: Materials & Resources (M & R)

Y	?	N			POSSIBLE POINTS: 40
			Credit 1	(Priority) Provide a Life Cycle and Service Life Assessment of Materials	4
			Credit 2.1	Repurposed Fill: Redistribute on Site	1
			Credit 2.2	Repurposed Fill: Use Locally Dredged Material on Site	1
			Credit 2.3	Repurposed Fill: Use Local Off-Site Sources	1
			Credit 3.1	Repurposed Materials: Salvage Waterfront Structures on Site	1
			Credit 3.2	Repurposed Materials: Use Responsibly Sourced Lumber	2
			Credit 4.1	Regional Sourcing: Use Local, Native Plants	1
			Credit 4.2	Regional Sourcing: Use Local Oyster Spat	1
			Credit 5.1	Material Resilience: Use Durable Materials	1
			Credit 5.2	Material Resilience: Protect/Waterproof Electrical/Mechanical Equipment in Flood Zone	1
			Credit 6.1	Low Impact Materials: Use Permeable Materials	1
			Credit 6.2	Low Impact Materials: Use High-Albedo Surfaces	1
			Credit 6.3	Low Impact Materials: Avoid Potentially Toxic, Preserved Lumber	2
			Credit 7.1	Ecologically Beneficial Material: Use Supportive Composition	2
			Credit 7.2	Ecologically Beneficial Material: Use Habitat Generating Products	2
			Credit 8.1	Renewable Energy: Use Independent Energy Systems for Auxiliary Structures	4
			Credit 8.2	Renewable Energy: Use Water-Based Renewable Energy	4
			Credit 9	Install Redundant Emergency Systems	4
			Credit 10.1	Responsible Construction: Minimize Construction Impacts	2
			Credit 10.2	Responsible Construction: Barge Materials	2
			Credit 10.3	Responsible Construction: Cooperate in Materials Exchange Program	2

CATEGORY 6: Operations & Maintenance (O & M)

Y	?	N			POSSIBLE POINTS: 32
			Credit 1	(Priority) Provide Operations and Maintenance Plan for the Waterfront Edge	4
			Credit 2	Provide Regular Condition Assessment of Marine Assests	4
			Credit 3	Identify Conservation Easement Opportunities for Open Space	4
			Credit 4	Identify Partner(s) to Study Site	4
			Credit 5	Provide Waterfront Emergency Preparedness Plan	4
			Credit 6	Provide Long-term Funding/Endowment Plan	4
			Credit 7	Provide Maintenance Plan for Sustainable Stormwater Management	4
			Credit 8	Develop a Monitoring Program	4

CATEGORY 7: Innovation (IN)

Y	?	N			POSSIBLE POINTS: 20
			Credit 1	Inventive Design	10
			Credit 2	Exemplary Performance	10

CATEGORY	POSSIBLE POINTS	SCORE
1 Site Selection & Planning	43	
2 Public Access & Interaction	96	
3 Edge Resiliency	102	
4 Ecology & Habitat	68	
5 Materials & Resources	40	
6 Operations & Maintenance	32	
7 Innovation	20	
	TOTAL POINTS: 401	

WEDG CLASSIFICATION	
Certification	**130+ points**

PART 2
Parks Project Type

TOTAL POSSIBLE POINTS 357 PTS
CERTIFICATION 130+ PTS

CATEGORY 1: Site Selection & Planning (SS & P)

Plan and develop responsibly through better project siting and resiliency strategies that account for climate change, sea level rise, and coastal flooding.

32 POSSIBLE PTS

YES ? NO

SS & P-CREDIT 1 (PRIORITY)
Use a Multi-Disciplinary Project Team and Design Process
4 PTS

Use a multi-disciplinary team of professionals experienced in sustainable, resilient, and ecologically beneficial waterfront development best practices to collaborate on the design, construction, and maintenance of the site. Employ an integrated design process that includes a pre-design site visit, a WEDG workshop, using the **WEDG Guiding Principles for Waterfront Edge Design** to guide the discussion and provide a forum for all disciplines to assess and contribute to the best waterfront edge design from the early stages of the project. Seek collaboration with government and regulatory agencies to obtain the best outcome for the adjacent community and region. Provide documentation of the pre-design site visit, meetings, and professions represented such as an architect, marine biologist, ecologist, coastal engineer, land surveyor, landscape architect, etc., to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 2 (PRIORITY)
Conduct Assessment of Site's Vulnerability to Climate Change and Sea Level Rise
4 PTS

As a waterfront project is inherently exposed to the effects of climate change and an unpredictable environment, the multi-disciplinary team should assess in detail how rising sea levels, higher and more frequent storm surges, and other coastal flooding affects the site and the proposed project. Use the best available data on current and future flood risk. For projects in New York City (NYC), the New York City Panel on Climate Change (NPCC) has developed the **Climate Risk Information 2013: Observations, Climate Change Projections, and Maps** that contain projections for sea level rise and future flooding. Include the identification of the height and spatial extent of future high tide, mean higher high water (MHHW), and 100- and 500-year flood zones with low, middle, and high estimate sea level rise projections over the lifespan of the project. For projects in New Jersey, determine the site's Coastal Vulnerability Index, as developed by New Jersey's **Coastal Community Vulnerability Assessment and Mapping Protocol**. Refer to governing municipal codes for required construction elevations and freeboard adjustments. The outcome of these analyses should directly inform what are the best applicable edge treatments, overall strategy for shoreline stabilization, and strategies for adaptation and mitigation of flood risk. Provide site plans with a narrative, reviewed by the project team, describing vulnerabilities of the site and nearby properties (to the extent that they would be affected by actions taken on the project site) to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 3.1
Project Siting: Site Near Existing Waterborne Transportation
1 PT

Site the project within ½ mile of **existing** or planned ferry service to provide better access for visitors from the waterfront. If the ferry service is in the planning stages, provide documentation regarding the status of the planned service. Provide area map, illustrating the proximity of the project site to the existing or planned ferry landing to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 3.2
Project Siting: Site Near Area Underserved by Open Space
2 PTS

Site the project within ½ mile of an area with less than 2.5 acres of open space per 1000 people (underserved area), as determined by NYC's **City Environmental Quality Review (CEQR) Technical Manual**. For NYC this is within the boundary of a **CEQR designated Underserved Area**. Maps can be found here for **Bronx**, **Brooklyn**, **Manhattan**, **Queens**, and **Staten Island**. Provide area map to demonstrate compliance with this credit. (Note: Credit is only available if adding substantial additional open space is sufficient to improve the open space ratio.)

YES ? NO

SS & P-CREDIT 3.3
Project Siting: Clean a Brownfield
5 PTS

Waterfront sites are often contaminated due to past industrial uses. Clean a site entered into the **NYC Voluntary Cleanup Program**, **New York State (NYS) Brownfield Cleanup Program**, or **US Environmental Protection Agency's (EPA) Brownfields Program**, or brownfield defined by the **state of New Jersey**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 4.1
Building Siting: Avoid Building in High Potential Erosion Area
2 PTS

Do not construct 50% or more of the total square footage of all building footprints seaward of **Coastal Erosion Hazard Area** line (**NYC Maps**) or areas that are designated as with a "Very High Erodability," as defined and mapped by the **New Jersey's Coastal Community Vulnerability Assessment and Mapping Protocol** (page 22). Provide site plan to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 4.2
Building Siting: Avoid the 100-Year Floodplain
POSSIBLE 6 PTS

Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas (100-year floodplain) are more susceptible to storm events and coastal flooding. Locate 50% or more of the total square footage of all building footprints outside of the FEMA Special Flood Hazard Area (100-year floodplain) without the need for elevating grade or structures, based on the best available flood hazard data (currently **Preliminary FIRMS**). Siting outside the natural floodplain is the most responsible and cost effective solution to avoid any adverse effects. Siting without the need for elevating structures places the building's footprint out of a hazardous area. Elevating sections of the site outside of the flood zone is effective but can displace potential floodwater elsewhere, creating issues for the surrounding community. Provide site plan to demonstrate compliance with this credit.

a) Locate building(s) outside the V-Zone **2 PTS**
b) Locate building(s) outside both the V-Zone and A-Zone **6 PTS**

YES ? NO

SS & P-CREDIT 5
Raise Elevation: Increase Freeboard of Buildings
4 PTS

For projects that cannot avoid siting the building's footprint within the flood zone, minimize flood risk and damage and elevate the first occupiable floor to a higher elevation than the building code requirement. This determination should be based on a flood risk and vulnerability assessment from *SS & P-Credit 2*. Provide an elevation plan to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 6.1
Building-Scale Protection: Provide Wet Floodproofing
2 PTS

Wet floodproofing elevates the lowest occupiable floor and all mechanical systems at least to the FEMA Base Flood Elevation (BFE), minimizing damage from flooding while allowing floodwaters to enter the structure's lower levels. Refer to NYC Department of City Planning's (DCP) **Designing for Flood Risk**. Integrate design elements from **FEMA TB 7-93 Wet Floodpoofing Requirements**, **FEMA TB 6-93 Below-Grade Parking Requirements**, **FEMA TB 5-08 Free-of-Obstruction Requirements**, **FEMA TB-9 Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings**. Provide construction plans to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 6.2
Building-Scale Protection: Provide Dry Floodproofing
2 PTS

Dry floodproofing seals a building's exterior and openings to prevent flooding. Common dry floodproofing techniques include strengthening the foundations, floor slabs, and walls to resist hydrostatic loads and buoyant forces, installing backflow prevention devices, applying a waterproof coating to exterior walls, and sealing all wall penetrations, including windows, doors, and locations where utilities enter the building. Refer to NYC DCP **Designing for Flood Risk**. Provide a narrative describing dry floodproofing designed in accordance with **American Society of Civil Engineers (ASCE) 24** and/or **FEMA P-936 Floodproofing Non-Residential Buildings 2013**, **FEMA TB 3-93 Non-Residential Floodproofing Requirements and Certification**, **FEMA TB 01-08 Openings in Foundation Walls and Walls of Enclosures** and a copy of the **FEMA NFIP Floodproofing Certificate for Non-Residential Structures (FEMA Form 086-0-34)** to demonstrate compliance with this credit.

CATEGORY 2: Public Access & Interaction (PA & I)

Enhance physical, visual, and psychological access to the water.

78 POSSIBLE PTS

YES ? NO

PA & I-CREDIT 1 (PRIORITY)
Maintain and Provide Safe Public Access
4 PTS

Create new public access or maintain and improve existing public access at the water's edge. Refrain from creating walls or other barriers to access. A project must preserve existing or provide additional public access to meet this prerequisite. Access may be at the water's edge (for example, a beach or get-down) or immediately adjacent to the water (for example, an esplanade or waterfront public walkway, or a greenway). Provide a site plan and a narrative describing existing public access and how the project will preserve or enhance it to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 2 (PRIORITY)
Engage Local Community and Users
4 PTS

Water is a public resource for all. Seek out and encourage substantive and meaningful community input specifically relating to the waterfront aspects of the project:

- Identify key stakeholders, both individuals and groups, who will be affected by the future design/use, to provide feedback on future programming and overall design of public access amenities and interaction with the water's edge. For projects that require a discretionary action, meetings are in addition to those that may be legally required and are more focused on the uses at the waterfront rather than on all facets of a project.
- Organize a minimum of two local community meetings during program design, at the beginning (10% design) and end (75% design) of the design process, in order to foster community interaction and sustained engagement. Make final results public to community stakeholders.

Provide documentation of community outreach including meeting agendas, attendance lists, and a narrative of stakeholder influence on the design of the project to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 3 (PRIORITY)
Conduct Water-Dependent Use Assessment of Site
4 PTS

In order to determine the need for and feasibility of water-dependent facilities, assess currents, water depth, vulnerability to wakes, waves and storm conditions, vessel traffic, ecological issues, and regulatory requirements. The outcome of this analysis should directly inform what facilities and design strategies are appropriate for construction along the waterfront. Analysis of existing and potential water-dependent uses should seek (or attempt) to increase water-dependant uses. Provide documentation of the water-dependent use assessment to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 4.1
Pier: Build or Renovate
2 PTS

Build a pier or renovate an existing pier on site that is open and accessible to the public. Provide a site plan to demonstrate compliance with this credit. (Note: Platforms and wharves are considered related infrastructure and are applicable to this credit, see glossary.)

YES ? NO

PA & I-CREDIT 4.2
Pier: Design
6 PTS

Piers should be user-friendly; consider the following design features:

User Experience

- The pier should be designed to preserve views and not excessively obscure the waterfront
- Reduce pier's visual impact by using a stepped pier apron
- Place pier away from industrial/restricted areas
- Incorporate visual, odor, and noise barriers between pier and industrial/restricted areas
- Use railings to restrict access to rough water conditions, hazardous vessel amenities, or when piers are elevated high above water level
- Use railings that minimize obstructions to scenic views or vessel access
- Provide shelter from high winds, rainfall, and sunshine
- Place public walkways on the perimeter of pier structures

Adaptability

- Conduct a wave load analysis of horizontal wave forces, vertical wave uplift forces, and wave peaking damage
- Conduct a peak wave damage analysis in order to predict critical areas of a pier structure that will receive excessive wave action during storms
- Elevate piers to reduce effects of high wave action
- Reduce reflection and amplification of wave energy from vertical surfaces on piles
- Design angled piles to stay within the pier envelope in order to allow floating docks and vessels to anchor directly against piers

Minimize Impacts (Note: Refer to *E & H-Credit 1*)

- Space pilings so that they do not impede water flow
- Minimize hydrodynamic disturbance of structure
- Allow for light transmission through pier
- Avoid designs that obstruct or fragment habitats, wildlife corridors, or shoreline access below the structure
- Orient north-south to minimize over water shadows
- Elevate piers or pier edge above the water line, to reduce effects of shading

Incorporate at least two design features from each focus area above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 5.1
Floating Dock: Build or Renovate
1 PT

Floating docks support on-water activities such as kayaking and canoeing. Build a floating dock or renovate an existing dock that is accessible to the public. During design consider the following:

- Site according to prevailing winds and currents
- Avoid or remediate flotsam accumulation areas
- Avoid or remediate hazardous bottom conditions
- Do not create navigational hazards

Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 5.2
Floating Dock: Design
2 PTS

Consider the following design features to create user-friendly floating docks:

Stabilization

- Provide a firm and stable platform to prevent listing
- Secure and stabilize to withstand:
  - Flow rates of 0.25 feet per second
  - Rough wave action equivalent to a 3-foot high wave with a period of 3.1 seconds during storms
- Use floatation materials that can withstand exposure to water, salt, and UV light

Shape

- Design with a flat surface that does not warp or retain heat in direct sunlight
- Provide adequate surface traction without damaging water craft or causing foot discomfort
- Provide vertical sides (tapering or rounded sides are unsafe)
- Design with a minimum width of 5 feet
- Site close to shore to minimize distance to navigable water at mean low water

Access

- Provide at least two open sides for launching and landing
- Limit the use of handrails to only gangways and ramps
- Maintain at least 60 inches of clear opening for every 10 feet of linear dock
- Maintain freeboard of 4-8 inches for human-powered watercraft use
- Maintain freeboard of approximately 2 feet for motorized boats
- Establish suitable setbacks from adjacent docks to allow for maneuvering of boats
- Provide a landing area that permits safe boarding or exit from human-powered boats during maximum flood and ebb currents

Adaptability

- Design to be removable during flooding, high flow events, ice formation, high wave action, storm surges, etc.
- Design the deck connections to lift off its support during high water events
- Use transitional plates (or “toe plates”) for gangways steeper than 5%; consider the slope during low/high tides

Minimize Impacts

- Space pilings so that they do not impede barrier to water flow
- Space with adequate distance for boats to berth directly alongside the float
- Install piles that are tall enough to maintain float anchorage during high water events
- Avoid open-cell expanded polystyrene floats
- Prevent from resting on the bottom at low tide
- Allow light transmission through the structure
- Orient dock as close to north-south as possible
- Avoid covering docks with structures
- Design for easy maintenance and clean up
- Provide maritime fouling prevention (birds, algae, barnacles, etc.)
- Compensate for altered hydrodynamics and sediment transport

Incorporate at least two design features from each focus area above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 6.1
Beach and Get-down: Build or Renovate
1 PT

Public beaches and waterside get-downs allow direct contact with the water. Build or renovate a public beach or get-down.

- Site in areas of reduced stream velocity and wave action
- Avoid contaminated sites and sewer/stormwater outfalls
- Avoid flotsam accumulation areas

Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 6.2
Beach and Get-down: Design
2 PTS

Consider the following design features to create user-friendly beaches or get-downs:

- Slopes should be less than 1:2
- Reduce effects of erosion and/or sediment deposition
- Design for water access at all tidal ranges
- Prevent slippery conditions on built surfaces (install handrails, algae-resistant material, and textured surfaces)
- Provide safe access by incorporating padded surfaces, rounded edges and corners, and avoiding steep drops

Incorporate at least three design features above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 7.1
Human-Powered Boat Launch: Build or Renovate
1 PT

Build or renovate a public human-powered boat launch. Consider the following when siting:

- Site in areas that will not be easily damaged in rough weather or harsh seasonal conditions
- Site in an area that will not cause damage to wetland ecosystems or sensitive habitat during construction or in operation
- Site to minimize the distance between launch and storage/parking and shorten access routes to increase user experience
- Where applicable, modify existing structures to make more accessible for human-powered boaters instead of disturbing natural resources
- Site with preference towards shoreline launches that can support entry and egress of more users with a variety of skill levels. Select dock launch designs only when shoreline launches are not available or when the creation of a shoreline launch would create a more significant impact than a dock launch.

Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 7.2
Human-Powered Boat Launch: Design
2 PTS

Consider the following design features to create user-friendly human-powered boat launches:

Shoreline Launches (Note: Related to *PA & I-Credit 6.2*)

- Provide adequate launch and landing sites for the intended user/vessel
- Provide washing facilities, sanitizing products, or other hygiene amenities
- Provide soft landing areas for less experienced boaters
- Provide secure and safe entry into the launch area and water
- Reduce use of hardscapes at launches and minimize construction
- Design slope at water's edge between 5-8%

- Provide adequate in-water transitional area for launch and landing
- Design for low- and high-tide use
- Provide refuge from strong currents or wave action
- Angle launch to predominant currents and site conditions
- Direct stormwater away from launch
- Accommodate water craft up to 20 feet long

OR

Dock Launches (Note: Related to *PA & I-Credit 5.2*)

- Provide adequate launch and landing sites for the intended user/vessel
- Provide storage facilities
- Reduce the use of hardscapes at launch and minimize construction
- Provide washing facilities, sanitizing products, or other hygiene amenities
- Adjacent communal boat launches should have setbacks to allow for rapid maneuvering of boats
- Protect boaters from wind and wave action while getting in and out of the boats
- Design to the following minimum size, by launch type:
  - Communal: 24 feet long to allow multiple boats to load, launch, and disembark simultaneously and safely
  - Water trail: 8 feet wide to accommodate two boats side-by-side with room to stand and maneuver around them
  - Large craft: 20 feet long to accommodate large craft such as sea kayaks (19+ feet), outrigger canoes, and rowboats

Based on the type of launch being designed, incorporate at least two design features from above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 8.1
Community Boathouse: Build or Renovate
2 PTS

Build or renovate a boathouse (a launch and storage facility operated by community group or recreational organization, with minimal membership requirements, with programs to bring the public onto the water). Consider siting a structure on land (not over water) above MHHW. Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 8.2
Community Boathouse: Design
4 PTS

Consider providing the following to create a user-friendly community boathouse:

- Human-powered boat launch aids (floating launches, davit, craft dollies, etc.)
- Drainage and moisture control
- Waterside landmark as a navigation aid
- Leasable storage for personal craft
- Water craft retail and maintenance facilities
- Restrooms with showers
- Drinking water
- Boater education area
- Rescue and first aid facilities

Incorporate at least five of the above design features into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I- CREDIT 9.1
Marina: Build or Renovate a "Clean Marina"
6 PTS

When creating or renovating a marina follow the National Park Service's (NPS) Clean Marina Initiative 2012, using the **Clean Marina Guidebook 2012**, **New York Sea Grant Marina Environmental Best Management Practices**, and the **New Jersey Clean Marina program**. These guidebooks include best practices for marina design and maintenance, stormwater management, vessel maintenance and repair, petroleum control, sewage handling, waste/chemical containment and disposal, and enforcement and compliance. Projects following this guide can attract more responsible customers, reduce costs, and protect the marine environment. Provide documentation to demonstrate compliance with this credit.

YES ? NO

PA & I- CREDIT 9.2
Marina: Designate Public Use and Access
2 PTS

Reserve 10% of slips/dock space for use by public programming (i.e., School Sailing Teams, Sea Scout Groups, Community Rowing Classes, etc.) for a discounted or waived fee. Provide documentation to demonstrate compliance with this credit.

YES ? NO

PA & I- CREDIT 9.3
Marina: Fund Public Programs
2 PTS

Provide at least 10% of annual revenue for use by public programming at marina facilities. Funding may be allocated towards equipment (and associated maintenance), programming fees/insurances, educator/instructor salaries, and other fiscal needs directly associated with sustaining a program. Provide documentation to demonstrate compliance with this credit.

YES ? NO

PA & I- CREDIT 10.1
Mooring Field: Create or Renovate
1 PT

Create or renovate a mooring field that designates at least 5% of slips for free or discounted use by community organizations providing public programming and following rules governing mooring fields under the jurisdiction of the **NYC Department of Parks and Recreation** or **New Jersey's Coastal Management Rules** (Subchapter 3). Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I- CREDIT 10.2
Mooring Field: Design
1 PT

The design of a mooring field can be enhanced by considering the following design features:

- Place moorings for boats of similar size together to increase density
- Reduce mooring distance from marina or launch ramp
- Provide moorings for a variety of boat sizes
- Optimize mooring arrangement to accommodate ship drafts
- Place mooring field in weather-protected areas
- Protect benthic environment using low-impact mooring systems

Incorporate at least three design features from above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I- CREDIT 11.1
Ferries: Build or Renovate Docking Facility
2 PTS

Ferries are a fast, comfortable, efficient, and environmentally friendly form of transportation, can be a catalyst for waterfront redevelopment, and provide more transportation options. Build or renovate a ferry terminal landing and provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 11.2
Ferries: Docking Facility Design
4 PTS

Consider the following design features to build a user-friendly ferry docking facility:

- Optimize docking orientation and platform layout for maximum volume of marine traffic
- Provide proper wave attenuation to expedite docking
- Design gangways to accommodate quick loading and unloading
- Use non-slip surfaces and materials on all walkways
- Design the gangway connection to lift off its support during high water events
- Provide shelter from the elements
- Provide security and manage access
- Provide pedestrian and bicycle wayfinding to/from upland connections
- Provide bike access and parking
- Implement online tracking of ferries
- Employ vegetated barriers to reduce noise from ferry vessels without blocking scenic views
- Design, orient, and place docks, passenger loading amenities, and accompanying buildings to create sound barriers to ferry vessel noise
- Employ low emission vessels (US EPA Tier 3 or Tier 4) and those that produce less noise

Incorporate at least five design features from above into construction and operations. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 12
Provide Maritime and Docking Amenities
4 PTS

Build or preserve pier, floating dock, or bulkhead elements that can accommodate a variety of boats, such as tall ships and historic and educational vessels, to encourage public, maritime activities and recreation. Provide the following design features:

- Provide straight sides; avoid curves, indentations, and odd shapes
- Provide railings and openings to manage public access and ship boarding; railings should be set back from edge inboard of any cleats/bollards
- Provide frequently spaced fenders/bollards/cleats for a variety of vessel sizes
- Provide adequate pier bracing to resist racking by docked vessels
- Provide dockside utilities (i.e., electric, sewage, water, and vehicle access)
- Provide wake-reduction measures to protect berthed vessels
- Incorporate dockside safety amenities and procedures

Incorporate at least three design features from above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 13
Accommodate Public Fishing
2 PTS

Accommodate fishing, including the responsible management of fish as a sustainable resource. Consider the following design features:

- Designate fishing areas
- Provide kiosks with fish permit and regulatory information (including advisory about consumption, where appropriate)
- Provide fishing supply and retail opportunities
- Provide washing, scaling, and cutting tables
- Provide rod holders and fishing line recycling receptacles
- Provide sitting areas and child-friendly railings

Provide construction plan highlighting at least four of the above features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 14.1
Scenic Views and Naturalized Areas: Increase Naturalized Areas
2 PTS

Design the site to increase naturalized areas, focused on high performance landscapes, by clustering structures and amenities, reducing access to undisturbed areas, and creating buffer zones between public access and undisturbed areas. Increase naturalized areas to at least 40% of the total site. Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 14.2
Scenic Views and Naturalized Areas: Decrease Visual Obstructions
2 PTS

Reduce obstructions to scenic views and undisturbed areas by incorporating at least three of the following design features:

- Minimize quantity and size of buildings on site
- Maintain visual corridors
- Site buildings away from scenic views
- Conceal appearance of buildings with landscaping
- Minimize use of walkways
- Select materials that blend in to scenery
- Conceal the appearance of fencing and signage along undisturbed areas

Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 15
Elevated Paths and Boardwalks
2 PTS

Consider the following within elevated path and boardwalk design:

Shape and Access

- Boardwalks over wetlands should be elevated above MHHW
- Install railings on sections of boardwalk elevated above 18 inches
- Avoid long stretches of straight boardwalk and meandering path when appropriate
- Elevate sections of boardwalk and platforms to provide views over high or dense vegetation

Adaptability

- Boardwalk must be designed to withstand uplift from flooding and lateral forces from wave action or ice flow.
- Limit structures over water and areas of frequent inundation.
- Design vulnerable sections of deck to be removable in the event of a storm or flood conditions
- Construct using materials resistant to rot, corrosion, or fracturing
- Avoid construction over unconsolidated soils or areas of high erodability
- Construct sections of boardwalk/path to float while tethered to piles during flooding events
- Piles should be protected from floating debris collision

Minimize Impacts

- Plan path to avoid removing large trees or fragmenting habitat
- Elevate boardwalks/paths to reduce impacts from shading
- Increase light transmission through deck
- Restrict access to sensitive habitat and ecosystems with placement of railings on certain sections of boardwalk
- Use modular construction to decrease construction time

- Limit disturbance to habitats, vegetation, and soils by using a build-out approach that fully constructs one section of path before moving on to the next
- Allow for alternative paths to redirect around sections of path closed for nesting or migrating birds or other wildlife.

Incorporate at least two design features from each focus area above into construction. Provide a construction plan and narrative highlighting these design features to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 16.1
Public Walkways and Greenways: Ensure Edge Continuity
1 PT

Enhance connections between adjacent properties by aligning existing and new pathways along the shoreline to create a seamless and accessible edge. Connect pathways to adjacent shoreline properties and retain similar aesthetic or have appropriate transitions. Convey transitions between public and private space through grading and materials. Designs, including transitions between properties, must meet ADA standards. Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 16.2
Public Walkways and Greenways: Create Waterfront Greenway
2 PTS

Create greenways that are safe, comfortable, and inviting to both bicyclists and pedestrians. Successful greenways create a connected network linking popular destinations and minimize potentially unsafe or uncomfortable intersections and crossings. Where appropriate based on adjacent existing or planned greenways, construct greenway. Ensure greenway width is suitable, relative to the number of expected users, and that width and other features meet or exceed AASHTO or other guidelines. Provide site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 17
Incorporate Transit Access and Facilities
1 PT

Improve transit access to site by providing shuttle service or agreement with transit authorities to obtain public bus route extension to site. Provide evidence of agreement with a qualified transportation provider for service focused on, at a minimum, morning and evening peak hours and available to the surrounding community for at least 12 months, or provide evidence of bus route extension to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 18
Enhance Shoreline Street Ends
2 PTS

Encourage projects adjacent to shoreline street ends to purchase or enter into maintenance agreements with local municipalities. Submit a plan to improve and incorporate a street end into the waterfront edge, improving and encouraging public access and connectivity. Provide site plan and letter of support from relevant public agencies to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 19
Identify Local Programming Partners
1 PT

Notify and engage the public and interested stakeholders at the beginning of the project and seek opportunities for strategic partnerships. Provide a signed memorandum of understanding with a partner organization to provide programming for least 1 year to demonstrate compliance with this credit.

YES ? NO

PA & I- CREDIT 20.1
Incorporate Historical/ Cultural Elements: Implement Interpretive Media
2 PTS

Improve the visitor experience by including historical/cultural elements within public areas by conducting research, providing interpretive media, and preserving historic resources. Describe the historical and cultural context of a landscape and reveal the significance of an outdoor space with archeological artifacts and artistic displays combined with informational panels, photographs, artwork, diagrams, maps, and text, etc. Provide construction plan to demonstrate compliance with this credit.

YES ? NO

PA & I- CREDIT 20.2
Incorporate Historical/ Cultural Elements: Accommodate Historic Ships
2 PTS

Incorporating historic ships as a component of public access preserves maritime culture and offers visitors a window into history. Host a historical ship on site and provide education and events and off-season storage. Provide documentation of contract with ship operator to demonstrate compliance with this credit.

YES ? NO

PA & I- CREDIT 21.1
Ecological Education Opportunities: Create Passive Educational Features
1 PT

Connect the public to surrounding wildlife and habitat by providing informational signs and interactive displays. Incorporate wildlife viewing platforms, spotting scopes, or other interactive features into site design. Provide documentation to demonstrate compliance with this credit.

YES ? NO

PA & I- CREDIT 21.2
Ecological Education Opportunities: Establish a Facility for Programming
1 PT

Build a visitor center that provides facilities for educational programming and engagement with the local environment, including at least two of the following:

- Interactive educational facilities, such as kiosks and information panels
- Educational exhibition space, lecture facilities or classrooms for use by school groups, camp programming, and community events
- Research labs, field stations, and amenities for outdoor activities

Integrate at least two of the above design features into final construction. Provide documentation to demonstrate compliance with this credit.

CATEGORY 3: Edge Resiliency (ER)

Design a resilient and ecologically beneficial waterfront edge.

102 POSSIBLE PTS

YES ? NO

ER-CREDIT 1 (PRIORITY)
Assess Waterfront Edge Conditions to Determine Appropriate Design
4 PTS

Analyze and inventory waterfront edge conditions and structures, including coastal geomorphology, reach, fetch, slope, tide range, storm surge, and wave energy, to determine design criteria for a range of feasible and appropriate stabilization strategies. Use NYC DCP's **Urban Waterfront Adaptive Strategies** guide and the US Army Corps of Engineers (US ACE)/National Oceanic and Atmospheric Administration (NOAA)/FEMA and other stakeholders initiative, **Systems Approach to Geomorphic Engineering**, which seek to integrate natural features and structural treatments relative to resiliency, ecology, and public access. New York City Economic Development Corporation's **Waterfront Facilities Maintenance Management System: Inspection Guidelines Manual** (currently being updated) is a resource for a shoreline configuration analysis and provides guidance for relatively quick assessment. The New York State Department of Environmental Conservation (NYS DEC) and NOAA Hudson River Sustainable Shorelines Project has developed the **Engineered Approaches for Limiting Erosion along Sheltered Shorelines: A Review of Existing Methods**. It provides an overview of shoreline stabilization techniques, which are evaluated based on approach, construction cost, maintenance cost, and adaptability. Provide documentation of assessment and how it might influence final design to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 2 (PRIORITY)
Design Waterfront Edge for Climate Conditions Projected for the 2050s
4 PTS

Based on the *ER-Credit 1* assessment, engage the project team to determine the resiliency and projected ability of the waterfront edge to adapt to projected climate conditions in the 2050s, using the **NPCC's Climate Risk Information 2013: Observations, Climate Change Projections, and Maps** as a benchmark. Waterfront projects face specific vulnerabilities due to projected sea level rise and require responsible planning and precautionary measures. Vulnerabilities may include increased storm surge/tide, wind wave, shoreline erosions, and tidal inundation at daily high tides. Incorporate design elements that address vulnerabilities identified or allow it to be efficiently adapted in the future. According to the NPCC (2013), the following conditions are the middle range projections for conditions in the 2050s, which is the lifespan of a typical shoreline structure.

- 11 – 24 inches of sea level rise
- 5 days/year with rainfall at or above 2 inches
- 1.7 – 3.2% chance of 100 year flood event with increase in associated flood heights

Implement designs that minimize the consequences associated with these risks, or demonstrate how they could be adapted in the future with structural modifications. Consideration should also be given to minimize impacts on public access, ecology, and adjacent property. Provide a site plan and narrative to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 3.1
Shoreline Configuration: Remove Existing Fill/Restore Natural Shoreline
6 PTS

Create a more ecologically beneficial aquatic environment by removing man-made fill/structures from nearshore area, where appropriate. Do not increase flood risk or destabilize adjacent areas. Pull back the shoreline at least 10 feet landward of the existing location (MHHW) along the greater of 20% of the length of the shoreline or 50 feet. (Note: Changes to the shoreline configuration should be analyzed by the project team for hydrological impacts regarding storm surge/flooding, wave regime, and stream velocity/currents.) Provide a site plan and section view to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 3.2
Shoreline Configuration: Reduce Slope
POSSIBLE 6 PTS

Gradually sloped shorelines – rather than a hardened or more vertical shoreline – can progressively dissipate wave energy, reducing reflection and amplification while also improving the aquatic habitat within the intertidal zone. Reconfigure at least 20% of the shoreline but not less than 50 feet to a maximum slope of 1:2. (Note: Changes to the shoreline configuration should be analyzed by the project team for hydrological impacts regarding, storm surge/flooding, wave regime, and stream velocity/currents.) Provide a grading plan to demonstrate compliance with this credit.

- **a)** Reconfigure the shoreline length to a maximum slope of 1:2 **2 PTS**
- **b)** Reconfigure the shoreline length to a maximum slope of 1:3 **4 PTS**
- **c)** Reconfigure the shoreline length to a maximum slope of 1:4 **6 PTS**

YES ? NO

ER-CREDIT 3.3
Shoreline Configuration: Create a Curvilinear Profile
2 PTS

Non-linear shorelines reduce stream velocity, create diverse micro-habitats, and improve hydrology of the greater riparian area. Create/modify shoreline to increase the total length of the shoreline by at least 25% or a minimum of 50 feet. (Note: Changes to the shoreline configuration should be analyzed by the project team for hydrological impacts regarding, storm surge/flooding, wave regime, and stream velocity/currents.) Provide a site plan to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 3.4
Shoreline Configuration: Avoid Net Filling
4 PTS

Avoid filling in the water below mean high water; fill can adversely impact site ecology and the intertidal area. Fill and excavation should not result in positive net fill into the water column. (Note: Changes to the shoreline configuration should be analyzed by the project team for hydrological impacts regarding, storm surge/flooding, wave regime, and stream velocity/currents.) Provide a site plan and narrative to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 4.1
Stabilization Techniques: Rehabilitate/ Replace Manmade Edge
POSSIBLE 6 PTS

Based on the waterfront edge assessment (*ER-Credit 1* and *2*), rehabilitate/replace an edge that is in disrepair to increase structural integrity and longevity for an expected service life of at least 50 years. Provide site plan and quantitative analysis to demonstrate compliance with this credit.

- **a)** Rehabilitate/replace edge for an expected service life of at least 50 years **2 PTS**
- **b)** Rehabilitate/replace edge for an expected service life of at least 75 years **4 PTS**
- **c)** Rehabilitate/replace edge for an expected service life of at least 100 years **6 PTS**

YES ? NO

ER-CREDIT 4.2
Stabilization Techniques: Incorporate Resilient Design Techniques
4 PTS

Stabilization techniques are often used to combat erosion, storms, and sea level rise. Incorporate at least two of the following design features into the design of an edge at least 25% of the shoreline length or no less than 50 feet. Provide construction details to demonstrate compliance with this credit.

- Stabilize sediment at the foot of stabilization techniques to prevent scour and erosion (i.e., rip rap at the base of a bulkhead, larger stone located at bottom of rip rap, or use of submerged aquatic vegetation (SAV) at the bottom of a revetment)
- Increase number of surfaces at various angles along the swash zone to dissipate wave energy (i.e., rip rap with various sizes of stone)
- Incorporate vegetation root systems or bio-grid products to stabilize loose sediments and anchor stabilizing structures (i.e., joint plantings in rip rap, vegetated gabions, etc.)
- Incorporate inclined structures leading up to vertical surfaces to dissipate wave energy (i.e., revetments, terraced gabions, fluted elements, etc.)
- Incorporate submerged structures to dissipate wave energy (i.e., toe berm)

YES ? NO

ER-CREDIT 4.3
Stabilization Techniques: Design for Ecological Diversity
4 PTS

Improving the ecological diversity of man-made waterfront edges and treatments fosters ecological productivity and natural resiliency. Incorporate at least two of the following design features into the design of an edge along at least 25% of the shoreline length or no less than 50 feet. Provide construction details to demonstrate compliance with this credit.

- Use rough, textured, porous surfaces to facilitate attachment of marine organisms (i.e., volcanic rock)
- Use materials that create interstitial spaces that vary in size and shape (i.e., rip rap of various shaped stone)
- Provide shade, habitat protection, wave attenuation, etc., via surface shapes and features (i.e., incorporating flat stone into rip rap to create shellfish refuges)
- Incorporate nature-based features (i.e., deep root plantings in vegetated gabions)
- Use appropriate stone size, depth, and cover layers to prevent root wedging of nature based features
- Select vegetation based on amount of available maintenance for control of over growth
- Use water retaining ecological features to increase bio-diversity and increase moist habitat (i.e., tide pools, crab caves in bulkheads, low tide exposed SAV blanket)

YES ? NO

ER-CREDIT 5.1
Natural Features: Restore/Replicate
POSSIBLE 6 PTS

Restore or replicate a natural feature along at least 25% of the shoreline or no less than 50 feet. Natural features provide many ecological functions and services as well as provide shoreline stabilization. Natural features can also self-repair waterfront edges with sediment catchment, deep root stabilization, and biogenic structures. Provide site plan and narrative to demonstrate compliance.

a) Restore/replicate a natural feature along at least 25% of the shoreline
2 PTS

b) Restore/replicate a natural feature along at least 50% of the shoreline
6 PTS

YES ? NO

ER-CREDIT 5.2
Natural Features: Incorporate Resilient Design Techniques
4 PTS

Natural features (existing, restored, or replicated) provide ecological benefits, but can be enhanced to increase their resilience during storm events and other disturbances. Incorporate at least three of the following design features into the design of an edge at least 25% of the shoreline length or no less than 50 feet. Provide site plan and narrative to demonstrate compliance.

- Limit proximity of human activities (i.e., exclude vessels from SAV areas)
- Prevent steep slope erosion at natural habitat edges (i.e., sills at seaward edge of marshes)
- Use bioengineered frame structures (i.e., oyster reefs, mussel beds, etc.)
- Use species that will stabilize and catch sediment (i.e., spartina grass, eel grass, etc.)
- Implement grazing management analysis and plans (i.e., geese fencing for marsh grasses, Asiatic shore crab prevention for oyster reefs)
- Provide two- to three-year vegetation establishment plan (i.e., monitoring, nutrient enrichment, repair)
- Design physical and ecological barriers to invasive species (i.e., salt water inundation against phragmites invasion)
- Incorporate filter feeders into ecosystem design to increase flush rates and reduce turbidity to promote submerged and emergent vegetation health
- Select species that create structural components and biogenic structures (i.e., oysters, mussels, salt marsh grasses, mangroves, etc.)
- Select species with high succession regeneration rates that "self-repair" natural structures after a disturbance (i.e., oysters, mussels, salt marsh grasses, etc.)

YES ? NO

ER-CREDIT 5.3
Natural Features: Preserve Upland Area for Wetland Migration
6 PTS

Wetlands and coastal dune systems are subject to landward migration due to rising sea levels. If the shoreline conditions of slope, elevation, and composition allow, wetlands will retreat and establish themselves upland as the seaward edge becomes submerged. During storm events, coastal dune systems get dispersed and captured by dune grass and build up over time as winds, waves, and other forces push them landward. Along at least 25% of the shoreline, designate at least 20 horizontal feet of upland open space area that has been deemed appropriate for wetland migration where wetlands exist or are created (40 feet for coastal dune systems). Open space may be publically accessible, but should not include construction of permanent structures. Provide site plan and narrative to demonstrate compliance.

YES ? NO

ER-CREDIT 6.1
Nearshore Structures: Restore/Create
4 PTS

Nearshore in-water structures can attenuate wave energy and reduce stream velocity. Excessive wave energy or stream velocity can cause sediment uplift, suspension, and scour. Refer to the **Engineering Design Guidance for Detached Breakwaters as Shoreline Stabilization Structures** by the US ACE. Reduce wave height, wave energy, and stream velocity by at least 15% from existing conditions. Provide site plan and section view to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 6.2
Nearshore Structures: Incorporate Nature-Based Features
4 PTS

Nearshore in-water structures can incorporate nature-based features, such as living breakwaters, fringe wetlands, reefs, water retaining features, and submerged aquatic vegetation, to enhance the environment. Incorporate nature-based features into the design of nearshore structures. Provide a site plan and narrative highlighting the integration of nature-based features into nearshore structures to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 6.3
Nearshore Structures: Minimize Hydrodynamic Impacts
4 PTS

Structures on the waterfront edge will affect hydrodynamics, especially nearshore structures that are exposed, floating, or submerged in the water. Incorporate the following into nearshore structure design to reduce adverse affects on hydrodynamics. Provide a hydrodynamic assessment, site plans, and a narrative highlighting the measures taken to reduce adverse affects on hydrodynamics to demonstrate compliance with this credit.

- Use modeling to assess changes in wave regime and sediment transport
- Plan for sediment deposition and erosion away from sensitive habitats and natural features
- Prevent sediment suspension in water column
- Avoid negative impacts to water circulation
- Avoid impacts to sediment budget within project region
- Avoid sedimentation of shipping channels
- Avoid negative impacts to erosion hazard areas

YES ? NO

ER-CREDIT 7
Create Resilient Landscape Features on Site
4 PTS

As part of a regional coastal protection strategy and if appropriate after analysis for *ER-Credit 1* and *2*, incorporate elements in the landscape to reduce the impacts of coastal flooding on vulnerable assets. Strategies should be sited upland from the water's edge and may include berms that connect with high elevation points, integrating flood walls into the landscape, or increasing edge elevation in extremely low lying areas. Consider impacts to public access and scenic views and flooding of adjacent sites, as these features near the waterfront edge can obstruct scenic views, prevent access to the waterfront, and trap/retain floodwaters during and after flood events. If a berm/levee is appropriate, it should be multipurpose and allow for public access, greenways, plantings, etc. These methods should be considered as an alternative to raising entire elevation of the site. Provide a site plan and narrative to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 8
Integrate Multiple Edge Resiliency Strategies
POSSIBLE 6 PTS

Employ multiple edge resiliency strategies to create a multi-layered edge configuration that increases resilience to storms, flooding, sea level rise, and climate change. Within the same length of shoreline employ at least two of the following edge resiliency strategies: landscape features, stabilization techniques, natural features, or nearshore structures. Provide a site plan and narrative describing purpose and functionality of each layer as it contributes to the whole system to demonstrate compliance with this credit.

a) Combine at least two different strategies within the same length of shoreline **2 PTS**
b) Combine at least three different strategies within the same length of shoreline **4 PTS**
c) Combine at least four different strategies within the same length of shoreline **6 PTS**

YES ? NO

ER-CREDIT 9.1
Sustainable Stormwater Management: Increase Retention and Infiltration Area
4 PTS

Stormwater will increase in velocity, quantity, and contaminants as it travels over impervious surfaces, harming the receiving body of water. Diverting stormwater into permeable areas with increased retention capacity can minimize these effects. Incorporate designs that increase stormwater infiltration by at least 60% over existing conditions where suitable to underlying soil and water table conditions. Provide site plan and documentation to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 9.2
Sustainable Stormwater Management: Reduce Runoff Discharge Flow Rate
4 PTS

Stormwater discharge along the waterfront can negatively affect the water quality of the receiving body of water. Incorporate designs that reduce runoff discharge by at least 20% from the existing conditions. Refer to the **TR-55 Urban Hydrology for Small Watersheds** [Figure 2-1] for details on how to attain the runoff curve number (inches of runoff discharge/ inches of rainfall). Consider the use of detention basins or other infrastructure to slow the discharge of stormwater. Provide site plan and documentation to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 9.3
Sustainable Stormwater Management: Improve Discharge Quality
4 PTS

Stormwater can acquire particulates, chemicals, litter, excessive nutrients, and other pollutants. Properties at the water's edge are the last opportunity for stormwater to be treated by natural or mechanical systems before entering receiving waters. Implement designs that would reduce 90% of Total Suspended Solids (TSS) from the existing conditions. Provide documentation to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 9.4
Sustainable Stormwater Management: Capture and Reuse
4 PTS

Stormwater capture and reuse has many benefits and possible uses. Captured stormwater can be purified and used for grey water purposes within building operations and for irrigation. Design water features to act as retention basins for stormwater capture and reuse. Implement designs that capture at least 10% of the stormwater. Provide documentation to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 9.5
Sustainable Stormwater Management: Separate Sanitary and Stormwater
4 PTS

In many urban settings, wastewater and stormwater runoff are combined into sewer systems and transported to municipal treatment facilities. During heavy rainfall these treatment facilities may experience a combined sewer overflow (CSO) discharge event when the volume of discharge exceeds the capacity of the facility. To relieve the municipal CSO system, separate stormwater runoff from the combined sewer system. Provide a site plan and narrative to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 9.6
Sustainable Stormwater Management: Treat Sewage and Grey Water on Site
4 PTS

Treat a significant portion of sewage on the site as this can relieve pressure on municipal sewer system. Various methods such as advanced hydroponic reactors, constructed filtration wetlands, algal turf scrubbers, and the use of living machines/ eco-machines are available to improve the quality of on-site sewage. These solutions should only be pursued if proper regulatory certifications allow such systems and should include contingency connections and procedures in the event of system failure. Provide site plans to demonstrate compliance with this credit.

CATEGORY 4: Ecology & Habitat (E & H)

Protect existing habitat and enhance the waterfront edge and site ecosystem.

66 POSSIBLE PTS

E & H-CREDIT 1 (PRIORITY)

Assess Natural Resources

POSSIBLE 6 PTS

YES ? NO

In order to understand the performance and quality of natural resources, conduct an in-depth assessment of existing conditions following a three-tiered approach. This assessment should categorize ecological communities as well as identify habitat areas and which species they serve.

Tier 1: Remote Assessment 2 PTS

Evaluate conditions of the project site and adjacent areas using geographic information systems, aerial imagery, etc.; also consider the local region. The remote assessment typically should include land cover type, land use, tidal ranges, vegetation densities, historical conditions, and other ecological information that relate landscape context to existing human infrastructure.

YES ? NO

Tier 2: Rapid Inventory Assessment 4 PTS

Conduct a field assessment of the project site with consideration given to the adjacent area. The rapid inventory assessment includes an inventory of all ecological communities categorized according any of the following classification systems:

- **Ecological Communities of New York State**
- **Preliminary Natural Community Classification for New Jersey**
- **Ecological Systems of the US**
- **Coastal and Marine Ecological Classification Standard**
- **Classification of Wetlands and Deepwater Habitats of the US**

The rapid inventory assessment must identify and determine the quality of these ecological communities regarding their basic community structure and composition, basic hydrology, species diversity, and richness, community robustness, suitable habitat, regional participation, patch dynamics, aesthetic quality, and ecological productivity. Use the following rapid assessments that apply to the project site:

- **Wildlife Habitat Benefits Estimation Toolkit**
- **Quantifying Terrestrial Habitat Loss and Fragmentation: A Protocol**
- **Habitat Equivalency Analysis: An Overview**
- **Ecological Integrity Assessment and Performance Measures for Wetland Mitigation**

YES ? NO

Tier 3: Intensive Functional Assessment 6 PTS

Conduct an in-depth, intensive functional assessment of critical ecosystems, restoration efforts, and green infrastructure. The intensive functional assessment must identify the performance and value of ecosystems functions and services provided by the natural resources on site. The assessment should also detail the advanced hydrology, flow of nutrients, and chemical and physical processes. Use the following assessments that apply to the project site:

- Benthic Index of Biotic Integrity for nearshore (subtidal) habitats
- Evaluation for Planned Wetlands (for coastal wetlands)
- **Oyster Habitat Restoration Assessment and Monitoring Handbook**
- **Ecological Integrity Assessment and Performance Measures for Wetland Mitigation**
- **Uniform Mitigation Assessment Methods**
- **Index of Biotic Integrity**
- **Biological Monitoring and Assessment: Using Multimetric Indexes Effectively**

Refer to **Ecological Integrity Assessment and Performance Measures for Wetland Mitigation**, Table 5 Summary of Major categories and subcategories of ecological indicators, developed by US EPA. This assessment can be submitted in a Final Environmental Impact Statement, Environmental Assessment Statement, or separated assessment publication.

Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 2 (PRIORITY)
Preserve or Enhance Existing Natural Resources
4 PTS

Based on the findings of *E & H-Credit 1*, engage the project team to determine how best to avoid impacts, and preserve or enhance the site's natural resources. Work with the regulatory agencies to gain approval for possible ecological preservation or enhancements that take into consideration establishment conditions (for instance, average salinity and inundation frequency for marsh grasses), biotic and abiotic factors (for instance, predatory migration route changes, climate change, sea level rise), and the probability of success. Provide documentation and post-implementation monitoring plan to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 3
Contribute to the Comprehensive Restoration Plan of the Region
4 PTS

Projects should ideally contribute to a regional ecological restoration program related to public agency goals, recognizing the importance of maintaining contiguous natural areas to ensure connectivity and viability of the natural communities within them. For sites located in the New York metropolitan region, review the **Hudson River Estuary Comprehensive Restoration Plan** and determine if the project can enhance the **Target Ecosystem Characteristics** below:

- Coastal wetlands
- Shorelines and shallows
- Enclosed and confined waters
- Tributary connections
- Sediment quality
- Maritime forest
- Eelgrass bed
- Oyster beds
- Habitat for fish, crabs, and lobsters
- Waterbirds
- Acquisition

Provide documentation of contribution to a regional restoration program and concurrence of appropriate agency to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 4.1
Habitat Continuity: Add New Habitat
POSSIBLE 4 PTS

Based on identification of suitable habitat via *E & H-Credit 1*, increase the habitat area within the waterfront edge to provide a more ecologically productive environment. Increase total habitat area by at least 50% of the preexisting condition. Where existing conditions include no habitat, full points in this credit can be achieved if habitat is created and the total habitat area is greater than 50% of total project site. Increasing habitat is beneficial but it is the arrangement and connectivity between habitat patches that is the foundation for high-performance habitats that foster higher species diversity and abundance. Consider the addition of new habitat that reduces the distance between adjacent habitat patches to improve connectivity (Note: Related to *E & H Credits-4.2-4.4.*) Provide site plans and description of ecological benefits including target species to demonstrate compliance with this credit.

a) Increase habitat areas by at least 50% **2 PTS**
b) Increase habitat areas by at least 75% **4 PTS**

YES ? NO

E & H-CREDIT 4.2
Habitat Continuity: Consolidate Habitat Patches
4 PTS

Based on identification of suitable habitat via *E & H-Credit 1*, by adding new habitat or expanding existing habitat, consolidate and reduce the number of individual patches that divide up the total habitat area to where the average patch size is at least 10% of the total habitat area. Where existing conditions include no habitat, full points in this credit can be achieved if the average patch size is at least 10% of the total new habitat area. Larger, more contiguous patches typically provide a greater quality and variety of micro-habitats, leading to higher species diversity and abundance. When consolidating habitat patches consider arrangement and connectivity. (Note: Related to *E & H-Credit 4.3.*) Provide site plans and description of ecological benefits including target species to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 4.3
Habitat Continuity: Increase Connectivity between Habitat Patches
4 PTS

Based on identification of suitable habitat via *E & H-Credit 1*, reduce the distance between patches or build structures to increase ecological connectivity within the site and to adjacent sites. Ecological corridors can increase viable habitat ranges, facilitate movement of critical species, enable re-colonization of previously disturbed areas, as well as increase general biodiversity and abundance. Projects can achieve this credit by either (a) reducing the average distance between adjacent habitat patches to less than 50 feet (Note: Where existing conditions includes no habitat, full points in this credit can be achieved if the average distance between new habitats is less than 50 feet.) or (b) creating structural connections such as habitat bridges/tunnels/canals, habitat "stepping stones," green walls/bulkheads, or other habitat infrastructure. Provide site plan and description of ecological benefits including target species to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 4.4
Habitat Continuity: Increase Habitat Diversity
4 PTS

Incorporate multiple types of habitats, including terrestrial, intertidal, and sub-tidal zones, to increase ecological diversity. Based on the results of *E & H-Credit 1*, the project team should determine appropriate habitats to increase the site's ecological quality. Creating a mosaic of habitat types facilitates interspecies interactions and strengthens the ecological community. Refer to the **Ecological Communities of NYS** and prioritize ecological communities with high "Significant Natural Community Occurrence" ranking according to the New York Natural Heritage database reports. Also refer to the United States Fish and Wildlife Service's **Technical Procedures for Conducting Status and Trend of the Nation's Wetlands** Table 1 and the examples below:

- Sand/pebble beach
- Barrier beach
- Eel/turtle grass beds
- Saltmarsh
- Highmarsh
- Wet meadows
- Bogs/fens
- Shrub swamps
- Bottomland hardwoods
- Forested swamps
- Rocky intertidal
- Mesic forest
- Breakwaters/biogenic reefs
- Grasslands
- Mudflats
- Freshwater wetlands
- Shrubland
- Heathland
- Fern meadow
- Deciduous forest
- Coniferous barrens
- Successional shrublands
- Successional hardwoods

Provide site plan and description of ecological benefits including target species to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 5.1
Habitat Complexity and Robustness: Use Native Plants
POSSIBLE 4 PTS

Based on identification of suitable habitat via *E & H-Credit 1*, incorporate the use of native plants throughout the project site. Native plans should comprise 85% or more of total planned biomass. Provide documentation to demonstrate compliance with this credit.

a) Native plants are 85% or more of total planned biomass. **2 PTS**
b) Native plants are 95% or more of total planned biomass. **4 PTS**

YES ? NO

E & H-CREDIT 5.2
Habitat Complexity and Robustness: Remove Invasive Species
4 PTS

Create a five-year removal and prevention plan of invasive species both flora and fauna that pose a danger to planned and existing ecological communities. Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 5.3
Habitat Complexity and Robustness: Create Resilient Ecosystems
4 PTS

Design landscapes, green infrastructure, and ecosystems to withstand harsh coastal conditions, floods, and storms. Ecosystems should be design to be flooded or washed over with minimal impact, assuming the expected repair or renovation costs, after a storm or flood, would not exceed 25% of the initial construction costs. Use plants that are salt-, flood-, and drought-tolerant, wind-resistant, and can withstand local temperature extremes and are appropriate for the site's sun/shade conditions. Incorporate ecological elements such as natural recovery, rapid succession, and biogenic stabilization into ecosystem design. Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 5.4
Habitat Complexity and Robustness: Support Endemic, Endangered, and Migratory Species
4 PTS

Complex and robust habitats have endemic, endangered, or migratory species that require a particular set of conditions in order to thrive. Refer to these links for a list of endangered and threatened species: **NYS DEC New York Natural Heritage Program** and **NJ DEP New Jersey's Endangered and Threatened Wildlife**. In some cases, creating barriers between critical or sensitive species and sources of human disturbance are necessary. (Note: Refer to *E & H Credit 8.2.*) Preserve habitat and/or incorporate design features that attract these species through increased habitat complexity and diversity. Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 6
Provide Multiple Ecosystem Functions and Services
4 PTS

Based on the results of *E & H-Credit 1*, integrate at least two new ecosystem functions into site's design. Use the classification of ecosystem services developed by **The Millennium Ecosystem Assessment**:

- Gas regulation
- Climate regulation
- Disturbance regulation
- Water regulation
- Soil regulation
- Nutrient regulation
- Waste treatment and assimilation
- Pollination
- Biological control
- Barrier effects of vegetation
- Supporting habitats
- Soil formation
- Food provisioning
- Raw materials provisioning
- Water supply provisioning
- Genetic resources
- Provision of shade and shelter
- Pharmacological resources
- Landscape aesthetic opportunity
- Biogenic buildup

Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 7.1
Advanced Mitigation Actions: Avoid Environmental Impacts
8 PTS

Avoid designs that would result in open space, natural resources, hazardous materials, water and sewer infrastructure, or greenhouse gas emissions significant adverse impacts as determined through the environmental review process. Meet with regulatory agencies to find the appropriate design of facilities in order to comply with this credit. Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 7.2
Advanced Mitigation Actions: Exceed Mitigation Requirements
POSSIBLE 4 PTS

Any natural resource impacts that cannot be avoided or minimized must have compensatory mitigation equivalent or greater than the affected resources as approved by governing regulatory agencies in order to satisfy this credit. Work with regulatory agencies to prepare compensatory mitigation plans with guidance from the **Model Compensatory Mitigation Plan Checklist** developed by the US ACE and the US EPA. Exceed required mitigation actions that benefit the overall health of the metropolitan region by at least 15%. Provide documentation to demonstrate compliance with this credit.

a) Exceed mitigation requirements by 15% **2 PTS**
b) Exceed mitigation requirements by 30% **4 PTS**

YES ? NO

E & H-CREDIT 8.1
Disturbances and Pollution: Limit Light Pollution
2 PTS

Waterfront light pollution can encourage nuisance fauna such as jellyfish and impact navigation for aquatic fauna and vessels traveling at night; limit light on the waterfront. See **exterior lighting guidelines developed by the NYC Department of Design and Construction** and information provided by the **Illuminating Engineering Society of North America** and the **International Dark-Sky Association**. Provide documentation demonstrating that the project's ambient light and light projected seawards is less than those of the existing conditions to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 8.2
Disturbances and Pollution: Avoid Human Disturbances
2 PTS

Based on identification of suitable habitat via *E & H-Credit 1*, design barriers and take preventative measures to separate sensitive ecosystems from human activities. Human recreational activities can harm sensitive habitats and include but are not limited to excessive noise, litter, trampling of vegetation (by foot and paddle), compacting of soils, and the disturbing sediment due to prop wash and wakes from motorized boats. Creating barriers/buffers or preventing access to sensitive habitats can protect their ecological integrity. Provide site plan and narrative to demonstrate measures taken to reduce disturbance by human activity.

CATEGORY 5: Materials & Resources (M & R)

Use materials and resources that are resilient, environmentally friendly, and provide societal benefits; includes responsible construction practices.

39 POSSIBLE PTS

YES ? NO

M & R-CREDIT 1 (PRIORITY)
Provide a Life Cycle and Service Life Assessment of Materials
4 PTS

Analyze the materials used in the construction or enhancement of the waterfront edge by performing a life cycle and service life assessment of the materials and construction practices. **US EPA's Tool for the Reduction and Assessment of Chemical and other Environmental Impacts (TRACI)** methodologies are a resource for analyzing appropriateness of materials. Use the US EPA's TRACI via a resource such as the **Athena Sustainable Materials Institute's Life Cycle Assessment**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 2.1
Repurposed Fill: Redistribute on Site
1 PT

Use fill material from within the site during construction, in accordance with state and local regulations. This avoids the need to import construction materials from external sources, lowering the project's carbon footprint and reducing shipping costs. Provide documentation that at least 25% of the total fill used is from the site and has been authorized by state or local regulatory agencies or is exempt from such regulations to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 2.2
Repurposed Fill: Use Locally Dredged Material on Site
1 PT

Use material dredged from waterways within 25 miles that is in accordance with governing regulations: **NYS DEC Beneficial Use Determinations**, **NYS DEC Remedial Program Soil Cleanup Objectives**, **NJAC 7:26D Remediation Standards**, **NJAC Guidance Document for Beneficial Use Project**. (Note: Only material dredged for maintenance of navigable waterways is acceptable, material dredged from undisturbed or ecologically sensitive areas is not acceptable.) Use of dredged material from onsite or nearby is a form of materials exchange that removes the intermediary when there is a need to dispose of dredged material and a need for fill material. Benefits include reduced material costs, reduced carbon footprint, and reduced transportation of invasive species from more distant sources and capping of possibly contaminated onsite soils. Obtain a permit from the **US ACE**, NJ DEP, and/or NYS DEC in order to dredge material from local waterways. Provide a narrative of suitability of dredged material for its proposed use and all associated permits to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 2.3
Repurposed Fill: Use Local Off-Site Source
1 PT

Use suitable fill material from off-site sources within 30 miles if trucked or up to 50 miles if barged. This minimizes the need to import construction materials from more distant sources and increases the possibility of shipping through barging methods, lowering the project's carbon footprint and reducing overall shipping costs. Provide documentation that at least 50% of total fill used is from local sources to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 3.1
Repurposed Materials: Salvage Waterfront Structures on Site
1 PT

Repurpose waterfront structures from the site during waterfront edge construction (i.e., piers, rip rap, etc.). Benefits include reduced waste and cost for new materials. Provide documentation that at least 10% of avoided total material costs of the project are salvaged from the site (not including fill) to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 3.2
Repurposed Materials: Use Responsibly Sourced Lumber
2 PTS

Use composite lumber, reclaimed hardwoods, or certified lumber sources. As an alternative to pressure treated lumber, use recycled lumber alternatives, most of which are impervious to saltwater, sunlight, sand, marine organisms and insects and are resistant to mold, mildew, rot, warping and splintering. These materials are usually slip-resistant, durable, and long-lasting. Refer to the US EPA's list of **Alternatives to Pressure-Treated Wood**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 4.1
Regional Sourcing: Use Local, Native Plants
1 PT

Specific intra-species gene pools differ between regions due to varying climate and environmental conditions. Transplanting vegetation from one regional gene pool to another can weaken the local gene pool. Use native plant nurseries specializing in locally sourced plants. Provide documentation that 75% of total cost of plant material is sourced from within 50 miles to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 4.2
Regional Sourcing: Use Local Oyster Spat
1 PT

Use oysters raised by hatcheries within 100 miles, specializing in local gene pools when selecting seed, spat, or adults for use within the waterfront edge. These hatcheries must be growing spat from the Oyster Bay gene pool, which are bred with resistance to Roseovarius Oyster Disease. Refer to the **Cornell Cooperative Extension of Suffolk County's SPAT Program**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 5
Protect/ Waterproof Electrical/ Mechanical Equipment in Flood Zone
1 PT

Provide protection for utilities, such as waterproof vaults, as well as water- and salt-resistant materials for wires and lines that must be located in flood zone. Wiring should be encased in a non-corrosive metal or plastic conduit when allowed by code. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 6.1
Low Impact Materials: Use Permeable Materials
1 PT

Permeable cover materials used along the waterfront edge can help absorb stormwater and filter out pollutants. Provide documentation that at least 50% of cover is permeable and identified as such by appropriate state and local regulatory agencies as appropriate, to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 6.2
Low-Impact Materials: Use High-Albedo Surfaces
1 PT

Use high-albedo paving surfaces, which are light in color and reflect sunlight away from the surface. This reduces cooling costs, helps the survival of plants, and improves air quality. Provide documentation that at least 50% of paving surface is high-albedo to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 6.3
Low-Impact Materials: Avoid Potentially Toxic, Preserved Lumber
2 PTS

Avoid lumber preserved with potentially toxic substances in the water or at the waterfront edge. Do not use lumber preserved with chromated copper arsenate or fossil-fuel-derived creosote, which can leech into the marine environment. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 7.1
Ecologically Beneficial Material: Use Supportive Composition
2 PTS

Use materials that have a chemical composition, alkalinity, toxicity, pH, etc., that support and promote biological activity and attachment of marine organisms. Products such as concrete additives to decrease alkalinity and pH, foster the growth of marine organisms. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 7.2
Ecologically Beneficial Material: Use Habitat Generating Products
2 PTS

Use materials or products that provide habitat for marine organisms. Use products such as precast tidal pools, habitat/reef modules, oyster castles, form liners, molds and structural enhancements. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 8.1
Renewable Energy: Minimize Conventional Energy Use
4 PTS

Renewable energy such as wind and solar can minimize the use of wiring and equipment susceptible to flooding, in addition to being carbon-free. Provide documentation that energy is at least 15% renewable to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 8.2
Renewable Energy: Use Water-Based Renewable Energy
4 PTS

Use water-based renewable energy systems—such as tidal or wave energy—as supplementary energy sources or as independent energy systems for auxiliary structures. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 9
Install Redundant Emergency Systems
4 PTS

Install redundant back-up systems, especially those that include dry pumps, cooling systems, emergency power and lighting, and/ or other systems used during emergency situations. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R- CREDIT 10.1
Responsible Construction: Minimize Construction Impacts
2 PTS

Based on an assessment of possible ecosystem construction impacts, integrate at least two of the following preventative strategies into construction practices prior to the project start:

- Reduce in-water construction to occupy less time within approved work timeframes for fish/wildlife protection as proscribed by regulatory bodies
- Protect water bodies from contaminants and particular matter with redundant barriers such as doubling up on turbidity curtains and silt barriers
- Keep construction equipment off wetlands and marshes and minimize size of construction area
- Minimize impacts to aquatic plants and bottom sediment topography when installing piles
- Use prefabrication techniques to reduce construction time and minimize area affected by construction
- Work from the water to avoid damaging natural features and habitat, and anchoring construction barges away from aquatic habitat especially when creating structures over wetlands.
- Install piles using drop or small, low-pressure vibratory hammers rather than high-pressure-jet installation.

Provide construction plans and narrative describing benefits beyond required actions to demonstrate compliance with this credit.

YES ? NO

PA & I- CREDIT 10.2
Responsible Construction: Barge Materials
2 PTS

Use barge transportation of materials, which can reduce carbon emissions, alleviate truck traffic, and lower construction costs. Provide documentation to demonstrate compliance with this credit.

YES ? NO

PA & I- CREDIT 10.3
Responsible Construction: Cooperate in Materials Exchange Program
2 PTS

Participate in a materials exchange program to reduce disposal/purchase costs and to lower carbon emissions. Provide documentation to demonstrate compliance with this credit.

CATEGORY 6: Operations & Maintenance (O & M)

Address life-cycles of projects including sustained maintenance strategies, preparations for future climate events, and partnerships to advance scientific understanding of waterfronts.

20 POSSIBLE PTS

YES ? NO

O & M-CREDIT 1 (PRIORITY)
Provide Maintenance and Operations Plan for the Waterfront Edge
4 PTS

Provide for maintenance and operational continuity for the waterfront area by establishing ongoing system for maintaining performance standards. A Maintenance Manual should be prepared by the owner based on best practices and should include maintenance and inspection details for waterfront area and edge. Include site personnel in the design, selection, and commissioning of all equipment. Provide documentation to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 2
Provide Regular Condition Assessment of Marine Assets
4 PTS

Provide regular condition assessment of marine assets, which can result in reduced maintenance costs. Use the latest **ASCE Waterfront Facilities Inspection and Assessment Manual.** Provide documentation to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 3
Identify Partner(s) to Study Site
4 PTS

Create partnership(s) with academic or scientific institute, not-for-profit, etc., to study and assess waterfront areas and issues that will advance the science and understanding of waterfront projects and their interface with the environment. Topics could include resilient shorelines, ecosystem services, nature-based features, floodplain management, shading and in-water effects of structures, habitat restoration and mapping, etc. Provide documentation of partnership agreement to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 4
Provide Maintenance Plan for Sustainable Stormwater Management
4 PTS

Stormwater systems on waterfront properties are exposed to extreme conditions and require a thorough maintenance plan to keep the system fully functioning. Stormwater systems must be kept clear of debris, and elements such as bioswales, rain gardens, and constructed wetlands require specialized maintenance. Create a maintenance plan for the stormwater system describing operation, maintenance, including frequency and responsible parties. Provide documentation to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 5
Develop a Monitoring Program
4 PT

Monitor the quality and growth of ecosystem functions and services. For a minimum of 5 years, develop or participate in a regional biological monitoring program or develop a biological monitoring program following a framework such as **NPS's Developing Conceptual Models for Monitoring Programs**, **NYS DEC's Standard Operating Procedure: Biological Monitoring of Surface Waters**, **Oyster Habitat Restoration Assessment and Monitoring Handbook**, **A Practitioners Guide to the Design and Monitoring of Shellfish Restoration Projects**, **A Framework for Standardized Monitoring of Living Shorelines In the Delaware Estuary and Beyond**, or **Identification of Metrics to Monitor Salt Marsh Integrity on National Wildlife Refuges In Relation to Conservation and Management Objectives**. Provide a narrative summarizing the monitoring plan to demonstrate compliance with this credit.

CATEGORY 7: Innovation (IN)

20 POSSIBLE PTS

YES ? NO

IN-CREDIT 1
Inventive Design
10 PTS

Using approaches and techniques not addressed in this version of WEDG, propose a new credit that achieves significant, measurable performance in resiliency, ecology, or public access for innovative waterfront edge design. Provide the following to demonstrate compliance with this credit:

- Intent of the new proposed credit
- Details of the design approach
- Projected goals and achieved measurements

A project can submit a maximum of two proposed credits for 5 points each. (Note: The achievement of these points is at the discretion of the WEDG program.)

YES ? NO

IN-CREDIT 2
Exemplary Performance
10 PTS

Significantly surpass the requirements for 2 possible credits (possible 5 points each). Provide documentation to demonstrate compliance with this credit. (Note: The achievement of these points is at the discretion of the WEDG program.)

SCORECARD
Parks Project Type

357 POSSIBLE POINTS

CATEGORY 1: Site Selection & Planning (SS & P)

Y	?	N		POSSIBLE POINTS: 32
○	○	○	**Credit 1** (Priority) Use a Multi-Disciplinary Project Team and Design Process	4
○	○	○	**Credit 2** (Priority) Conduct Assessment of Site's Vulnerability to Climate Change and Sea Level Rise	4
○	○	○	**Credit 3.1** Project Siting: Site Near Existing Waterborne Transportation	1
○	○	○	**Credit 3.2** Project Siting: Site Near Area Underserved by Open Space	2
○	○	○	**Credit 3.3** Project Siting: Clean a Brownfield	5
○	○	○	**Credit 4.1** Building Siting: Avoid Development in High Potential Erosion Area	2
○	○	○	**Credit 4.2** Building Siting: Avoid the 100-Year Floodplain	6
○	○	○	**Credit 5** Raise Elevation: Increase Freeboard of Buildings	4
○	○	○	**Credit 6.1** Building-Scale Protection: Provide Wet Floodproofing	2
○	○	○	**Credit 6.2** Building-Scale Protection: Provide Dry Floodproofing	2

CATEGORY 2: Public Access & Interaction (PA & I)

Y	?	N		POSSIBLE POINTS: 78
○	○	○	**Credit 1** (Priority) Maintain and Provide Safe Public Access	4
○	○	○	**Credit 2** (Priority) Engage Local Community and Users	4
○	○	○	**Credit 3** (Priority) Conduct Water-Dependant Use Assessment of Site	4
○	○	○	**Credit 4.1** Pier: Build or Renovate	2
○	○	○	**Credit 4.2** Pier: Design	6
○	○	○	**Credit 5.1** Floating Dock: Build or Renovate	1
○	○	○	**Credit 5.2** Floating Dock: Design	2
○	○	○	**Credit 6.1** Beach and Get-down: Build or Renovate	1
○	○	○	**Credit 6.2** Beach and Get-down: Design	2
○	○	○	**Credit 7.1** Human-Powered Boat Launch: Build or Renovate	1
○	○	○	**Credit 7.2** Human-Powered Boat Launch: Design	2
○	○	○	**Credit 8.1** Community Boathouse: Build or Renovate	2
○	○	○	**Credit 8.2** Community Boathouse: Design	4
○	○	○	**Credit 9.1** Marina: Build or Renovate a "Clean Marina"	6
○	○	○	**Credit 9.2** Marina: Designate Public Use and Access	2
○	○	○	**Credit 9.3** Marina: Fund Public Programs	2
○	○	○	**Credit 10.1** Mooring Field: Create or Renovate	1
○	○	○	**Credit 10.2** Mooring Field: Design	1
○	○	○	**Credit 11.1** Ferries: Build or Renovate Docking Facility	2
○	○	○	**Credit 11.2** Ferries: Docking Facility Design	4
○	○	○	**Credit 12** Provide Maritime and Docking Amenities	4
○	○	○	**Credit 13** Accommodate Public Fishing	2
○	○	○	**Credit 14.1** Scenic Views and Undisturbed Areas: Increase Naturalized Areas	2
○	○	○	**Credit 14.2** Scenic Views and Undisturbed Areas: Decrease Visual Obstructions	2
○	○	○	**Credit 15** Elevated Paths and Boardwalks	2
○	○	○	**Credit 16.1** Public Walkways and Greenways: Ensure Edge Continuity	1
○	○	○	**Credit 16.2** Public Walkways and Greenways: Create Waterfront Greenway	2
○	○	○	**Credit 17** Incorporate Transit Access and Facilities	1
○	○	○	**Credit 18** Enhance Shoreline Street Ends	2
○	○	○	**Credit 19** Identify Local Programming Partners	1
○	○	○	**Credit 20.1** Incorporate Historical/Cultural Elements: Implement Interpretive Media	2
○	○	○	**Credit 20.2** Incorporate Historical/Cultural Elements: Accommodate Historic Ships	2
○	○	○	**Credit 21.1** Ecological Educational Opportunities: Create Passive Educational Features	1
○	○	○	**Credit 21.2** Ecological Educational Opportunities: Establish a Facility for Programming	1

CATEGORY 3: Edge Resiliency (ER)

Y	?	N		POSSIBLE POINTS: 102
○	○	○	**Credit 1** (Priority) Assess Waterfront Edge Conditions to Determine Appropriate Design	4
○	○	○	**Credit 2** (Priority) Design Waterfront Edge for Climate Conditions Projected for the 2050s	4
○	○	○	**Credit 3.1** Shoreline Configuration: Remove Existing Fill/Restore Natural Shoreline	6
○	○	○	**Credit 3.2** Shoreline Configuration: Reduce Slope	6
○	○	○	**Credit 3.3** Shoreline Configuration: Create a Curvilinear Profile	2
○	○	○	**Credit 3.4** Shoreline Configuration: Avoid Net Filling	4
○	○	○	**Credit 4.1** Stabilization Techniques: Rehabilitate/Replace Manmade Edge	6
○	○	○	**Credit 4.2** Stabilization Techniques: Incorporate Resilient Design Techniques	4
○	○	○	**Credit 4.3** Stabilization Techniques: Design for Ecological Diversity	4
○	○	○	**Credit 5.1** Natural Features: Restore/Replicate	6
○	○	○	**Credit 5.2** Natural Features: Incorporate Resilient Design Techniques	4
○	○	○	**Credit 5.3** Natural Features: Preserve Upland Area for Wetland Migration	6
○	○	○	**Credit 6.1** Nearshore Structures: Restore/Create	4
○	○	○	**Credit 6.2** Nearshore Structures: Incorporate Nature-Based Features	4
○	○	○	**Credit 6.3** Nearshore Structures: Minimize Hydrodynamic Impacts	4
○	○	○	**Credit 7** Create Resilient Landscape Features on Site	4
○	○	○	**Credit 8** Integrate Multiple Edge Resiliency Strategies	6
○	○	○	**Credit 9.1** Sustainable Stormwater Management: Increase Retention and Infiltration Area	4
○	○	○	**Credit 9.2** Sustainable Stormwater Management: Reduce Runoff Discharge Flow Rate	4
○	○	○	**Credit 9.3** Sustainable Stormwater Management: Improve Discharge Quality	4
○	○	○	**Credit 9.4** Sustainable Stormwater Management: Capture and Reuse	4
○	○	○	**Credit 9.5** Sustainable Stormwater Management: Separate Sanitary and Stormwater	4
○	○	○	**Credit 9.6** Sustainable Stormwater Management: Treat Sewage and Grey Water on Site	4

SCORECARD
Parks Project Type

357 POSSIBLE POINTS

CATEGORY 4: Ecology & Habitat (E & H)

Y	?	N			POSSIBLE POINTS: 66
○	○	○	**Credit 1**	(Priority) Assess Natural Resources	**6**
○	○	○	**Credit 2**	(Priority) Preserve or Enhance Existing Natural Resources	**4**
○	○	○	**Credit 3**	Contribute to the Comprehensive Restoration Plan of the Region	**4**
○	○	○	**Credit 4.1**	Habitat Continuity: Add New Habitat	**4**
○	○	○	**Credit 4.2**	Habitat Continuity: Consolidate Habitat Patches	**4**
○	○	○	**Credit 4.3**	Habitat Continuity: Increase Connectivity between Habitat Patches	**4**
○	○	○	**Credit 4.4**	Habitat Continuity: Increase Habitat Diversity	**4**
○	○	○	**Credit 5.1**	Habitat Complexity and Robustness: Use Native Plants	**4**
○	○	○	**Credit 5.2**	Habitat Complexity and Robustness: Remove Invasive Species	**4**
○	○	○	**Credit 5.3**	Habitat Complexity and Robustness: Create Resilient Ecosystems	**4**
○	○	○	**Credit 5.4**	Habitat Complexity and Robustness: Support Endemic, Endangered, and Migratory Species	**4**
○	○	○	**Credit 6**	Perform Multiple Ecosystem Functions and Services	**4**
○	○	○	**Credit 7.1**	Advanced Mitigation Actions: Avoid Environmental Impacts	**8**
○	○	○	**Credit 7.2**	Advanced Mitigation Actions: Exceed Mitigation Requirements	**4**
○	○	○	**Credit 8.1**	Disturbances and Pollution: Limit Light Pollution	**2**
○	○	○	**Credit 8.2**	Disturbances and Pollution: Avoid Human Disturbances	**2**

CATEGORY 5: Materials & Resources (M & R)

Y	?	N			POSSIBLE POINTS: 39
○	○	○	**Credit 1**	(Priority) Provide a Life Cycle and Service Life Assessment of Materials	**4**
○	○	○	**Credit 2.1**	Repurposed Fill: Redistribute on Site	**1**
○	○	○	**Credit 2.2**	Repurposed Fill: Use Locally Dredged Material on Site	**1**
○	○	○	**Credit 2.3**	Repurposed Fill: Use Local Off-Site Sources	**1**
○	○	○	**Credit 3.1**	Repurposed Materials: Salvage Waterfront Structures on Site	**1**
○	○	○	**Credit 3.2**	Repurposed Materials: Use Responsibly Sourced Lumber	**2**
○	○	○	**Credit 4.1**	Regional Sourcing: Use Local, Native Plants	**1**
○	○	○	**Credit 4.2**	Regional Sourcing: Use Local Oyster Spat	**1**
○	○	○	**Credit 5**	Material Resilience: Protect/Waterproof Electrical/Mechanical Equipment in Flood Zone	**1**
○	○	○	**Credit 6.1**	Low Impact Materials: Use Permeable Materials	**1**
○	○	○	**Credit 6.2**	Low-Impact Materials: Use High-Albedo Surfaces	**1**
○	○	○	**Credit 6.3**	Low Impact Materials: Avoid Potentially Toxic, Preserved Lumber	**2**
○	○	○	**Credit 7.1**	Ecologically Beneficial Material: Use Supportive Composition	**2**
○	○	○	**Credit 7.2**	Ecologically Beneficial Material: Use Habitat Generating Products	**2**
○	○	○	**Credit 8.1**	Renewable Energy: Minimize Conventional Energy Use	**4**
○	○	○	**Credit 8.2**	Renewable Energy: Use Water-Based Renewable Energy	**4**
○	○	○	**Credit 9**	Install Redundant Emergency Systems	**4**
○	○	○	**Credit 10.1**	Responsible Construction: Minimize Construction Impacts	**2**
○	○	○	**Credit 10.2**	Responsible Construction: Barge Materials	**2**
○	○	○	**Credit 10.3**	Responsible Construction: Cooperate in Materials Exchange Program	**2**

CATEGORY 6: Operations & Maintenance (O & M)

Y	?	N			POSSIBLE POINTS: 20
○	○	○	**Credit 1**	(Priority) Provide Operations and Maintenance Plan for the Waterfront Edge	**4**
○	○	○	**Credit 2**	Provide Regular Condition Assessment of Marine Assests	**4**
○	○	○	**Credit 3**	Identify Partner(s) to Study Site	**4**
○	○	○	**Credit 4**	Provide Maintenance Plan for Sustainable Stormwater Management	**4**
○	○	○	**Credit 5**	Develop a Conceptual Monitoring Program	**4**

CATEGORY 7: Innovation (IN)

Y	?	N			POSSIBLE POINTS: 20
○	○	○	**Credit 1**	Inventive Design	**10**
○	○	○	**Credit 2**	Exemplary Performance	**10**

CATEGORY	POSSIBLE POINTS	SCORE
1 Site Selection & Planning	**32**	
2 Public Access & Interaction	**78**	
3 Edge Resiliency	**102**	
4 Ecology & Habitat	**66**	
5 Materials & Resources	**39**	
6 Operations & Maintenance	**20**	
7 Innovation	**20**	
	TOTAL POINTS: 357	

WEDG CLASSIFICATION	
Certification	**130+ points**

PART 3
Industrial/Maritime Project Type

Credit Category

TOTAL POSSIBLE POINTS 317 PTS
CERTIFICATION 100+ PTS

CATEGORY 1: Site Selection & Planning (SS & P)

Plan and develop responsibly through better project siting and resiliency strategies that account for climate change, sea level rise, and coastal flooding.

54 POSSIBLE PTS

YES ? NO

SS & P-CREDIT 1 (PRIORITY)
Create a Multi-Disciplinary Project Team and Design Process
4 PTS

Use a multi-disciplinary team of professionals experienced in sustainable, resilient, and ecologically beneficial waterfront development best practices to collaborate on the design, construction, and maintenance of the site. Employ an integrated design process that includes a pre-design site visit, a WEDG workshop, using the **WEDG Guiding Principles for Waterfront Edge Design** to guide the discussion and provide a forum for all disciplines to assess and contribute to the best waterfront edge design from the early stages of the project. Seek collaboration with government and regulatory agencies to obtain the best outcome for the adjacent community and region. Provide documentation of the pre-design site visit, meetings, and professions represented such as an architect, ecologist, coastal engineer, land surveyor, landscape architect, etc., to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 2 (PRIORITY)
Conduct Assessment of Site's Vulnerability to Climate Change and Sea Level Rise
4 PTS

As a waterfront project is inherently exposed to the effects of climate change and an unpredictable environment, the multi-disciplinary team should assess in detail how rising sea levels, higher and more frequent storm surges, and other coastal flooding affects the site and the proposed project. Use the best available data on current and future flood risk. For projects in New York City (NYC), the New York City Panel on Climate Change's (NPCC) **Climate Risk Information 2013: Observations, Climate Change Projections, and Maps** that contain projections for sea level rise and future flooding. Include the identification of the height and spatial extent of future high tide, mean higher high water (MHHW), and 100- and 500-year flood zones with low, middle, and high estimate sea level rise projections over the lifespan of the project. Determine the site's Coastal Vulnerability Index, as developed by New Jersey's **Coastal Community Vulnerability Assessment and Mapping Protocol**. The outcome of these analyses should directly inform what are the best applicable edge treatments, overall strategy for shoreline stabilization, and strategies for adaptation and mitigation of flood risk. Provide site plans with a narrative, reviewed by the project team, describing vulnerabilities of the site and nearby properties (to the extent that they would be affected by actions taken on the project site) to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 3.1
Project Siting: Site Near Existing Waterborne Transportation
1 PT

Site the project within ½ mile of **existing** or planned ferry service to provide better access for workers to and from the waterfront. If the ferry service is in the planning stages, provide documentation regarding the status of the planned service. Provide an area map, illustrating the proximity of the project site to the existing or planned ferry landing to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 3.2
Project Siting: Site in Appropriate Area
2 PTS

Site the project within the boundaries of a **Significant Maritime Industrial Area** for NYC or within an existing, appropriate industrial area for New Jersey. Provide an area map to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 3.3
Project Siting: Clean a Brownfield
5 PTS

Waterfront sites are often contaminated due to past industrial uses. Clean a site entered into the **NYC Voluntary Cleanup Program**, **New York State (NYS) Brownfield Cleanup Program**, or **United States Environmental Protection Agency's (US EPA) Brownfields Program**, or brownfield defined by the **state of New Jersey**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 4.1
Non-Operations Building Siting: Avoid Development in High Potential Erosion Area
2 PTS

Do not construct 50% or more of the total square footage of all non-operations building footprints seaward of **Coastal Erosion Hazard Area** line (**New York City Maps**) as or areas that are designated as with a "Very High Erodability," as defined and mapped by the **New Jersey's Coastal Community Vulnerability Assessment and Mapping Protocol** (page 22). Provide a site plan to demonstrate compliance with this credit.

SS & P-CREDIT 4.2
Non-Operations Building Siting: Avoid the 100-year Floodplain
POSSIBLE 6 PTS

Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas (100-year floodplain) are more susceptible to storm events and coastal flooding. Locate 50% or more of the total square footage of all non-operations building footprints outside of the FEMA Special Flood Hazard Area without the need for elevating grade or structures, based on the best available flood hazard data (currently **Preliminary FIRMS**). Siting outside the natural floodplain is the most responsible and cost effective solution to avoid any adverse effects. Siting without the need for elevating structures places the building's footprint out of a hazardous area. Elevating sections of the site can be effective but can displace potential floodwater elsewhere, creating issues for the surrounding community. Provide site plan to demonstrate compliance with this credit.

a) Locate non-operations building(s) outside the V-Zone **2 PTS**
b) Locate non-operations building(s) outside both V-Zone and A-Zone **6 PTS**

YES ? NO

YES ? NO

SS & P-CREDIT 5
Non-Operations Building Elevation: Increase Freeboard
4 PTS

For projects that cannot avoid siting the non-operations building's footprint within the flood zone, minimize flood risk and damage and elevate the first occupiable floor freeboard to a higher elevation than the building code requirement. This determination should be based on a flood risk and vulnerability assessment from *SS & P-Credit 2*. Provide an elevation plan highlighting the increases in freeboard to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 6.1
Non-Operations Building-Scale Protection: Provide Wet Floodproofing
2 PTS

Wet floodproofing elevates the lowest occupiable floor and all mechanical systems at least to the FEMA Bare Flood Elevation (BFE), minimizing damage from flooding while allowing floodwaters to enter the structure's lower levels. Integrate design elements from **FEMA TB 7-93 Wet Floodproofing Requirements**, **FEMA TB 6-93 Below-Grade Parking Requirements**, **FEMA TB 5-08 Free-of-Obstruction Requirements**, **FEMA TB-9 Design and Construction Guidance for Breakaway Walls Below Elevated Coastal Buildings**. Provide a construction plan to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 6.2
Non-Operations Building-Scale Protection: Provide Dry Floodproofing
2 PTS

Dry floodproofing seals a non-operations building's exterior and openings to prevent flooding. Common dry floodproofing techniques include strengthening the foundations, floor slabs, and walls to resist hydrostatic loads and buoyant forces, installing backflow prevention devices, applying a waterproof coating to exterior walls, and sealing all wall penetrations, including windows, doors, and locations where utilities enter the building. Provide a narrative describing dry floodproofing designed in accordance with **American Society of Civil Engineers (ASCE) 24** and/or **FEMA P-936 Floodproofing Non-Residential Buildings 2013**, **FEMA TB 3-93 Non-Residential Floodproofing Requirements and Certification**, **FEMA TB 01-08 Openings in Foundation Walls and Walls of Enclosures** and a copy of the **FEMA NFIP Floodproofing Certificate for Non-Residential Structures (FEMA Form 086-0-34)** to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 7
Materials and Equipment Siting: Avoid the 100-Year Floodplain
4 PTS

Locate or lift the majority of the most critical material and equipment storage areas outside of the FEMA Special Flood Hazard Area (100-year floodplain), based on the best available flood hazard data (currently for NYC, the **Preliminary FIRMS**), which are more susceptible to storm events and coastal flooding. Provide site plan to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 8.1
Materials and Equipment Protection: Provide Wet Floodproofing
2 PTS

Wet floodproofing elevates the lowest occupied storage spaces and places mechanical equipment above the FEMA BFE, minimizing damage from flooding while allowing floodwaters to enter the structure's lower levels. Wet floodproof storage areas containing materials that are susceptible to damage from floodwaters, especially those containing hazardous materials. Elevating within storage areas or buildings may be the simplest strategy when relocation of materials or equipment outside of the floodplain is not possible. Provide site and elevation plans to demonstrate compliance with this credit

YES ? NO

SS & P-CREDIT 8.2
Materials and Equipment Protection: Provide Dry Floodproofing
2 PTS

Install containment walls or enclosures for dry floodproofing around storage areas for susceptible materials or equipment. Placement of containment walls or enclosure should be prioritized for hazardous materials or equipment susceptible to damage from floodwaters. Protect stray materials from entering waterways during storms. Provide site plan to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 9
Electrical Substation: Avoid the 100-Year Floodplain
4 PTS

Locate or lift critical electrical substations outside of the FEMA Special Flood Hazard Area (100-year floodplain), based on the best available flood hazard data (currently for NYC, the **Preliminary FIRMS**), which are more susceptible to storm events and coastal flooding. Provide site plan to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 10
Site Perimeter Protection: Provide Deployable Flood Barriers
2 PTS

Provide deployable floodwalls with an accompanying maintenance and operations plan. These require human intervention and often the installation of wall slats in preparation for flooding. Refer to the **NYC Department of Building's (DOB) Recent Local Laws: Post Hurricane Sandy Legislation**. Provide construction details and deployment plans to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 11
Use Marine Transportation in Operations
6 PTS

Water-dependant uses along the waterfront preserve and promote the use of the waterways for transporting materials and goods, providing jobs to the region, and can reduce truck traffic. Comprise 25% or more of inbound/outbound traffic through use of marine transportation. Provide documentation that operations use vessels to demonstrate compliance with this credit.

YES ? NO

SS & P-CREDIT 12
Enter Open Industrial Uses Sales Tax Exemption Program
2 PTS

The Open Industrial Uses Sales Tax Exemption Program (OIUSTEP) exempts the purchase of building materials to renovate and improve unenclosed industrial materials storage facilities from sales tax. This program encourages cost-effective pollution prevention controls to safely store hazardous materials in the city's flood zones. Provide documentation to demonstrate compliance with this credit.

CATEGORY 2: Public Access & Interaction (PA & I)

Provide public access in different forms within and/or at the site as appropriate; includes design strategies that limit negative effects on nearby communities.

38 POSSIBLE PTS

YES ? NO

PA & I-CREDIT 1 (PRIORITY)
Assess Potential for Safe Public Access
4 PTS

Assess possibilities for creating public access to the site on an open or scheduled basis for the public to safely access the site, and provide educational tours, interactive exhibits/displays, overlooks, etc. Provide a narrative to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 2 (PRIORITY)
Engage Local Community and Users
4 PTS

Water is a public resource for all. Seek out and encourage substantive and meaningful community input and how the facility might fit into past and/or current community plans. Provide documentation of community outreach including meeting agendas, attendance lists, and a narrative of stakeholder influence on the design of the project to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 3
Provide Working Waterfront Employment
2 PTS

Create and/or preserve 25 or more full-time positions associated with a water-dependent use or activity. Preference should be given to local neighborhood residents. Provide documentation to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 4
Support Working Waterfront Vocational Training
2 PTS

Water-dependent employment is a specialized field requiring hands-on training and experienced guidance. Provide or financially support vocational training in careers related to the working waterfront. Preference should be given to local neighborhood residents. Provide documentation to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 5
Provide Safe Public Access within Facilities
2 PTS

Provide public access to the site on an open or scheduled basis for the public to safely access the site, which could include educational tours, interactive exhibits/displays, overlooks/platforms, etc. Integrate design elements that provide a safe environment, and consider the use of protective fencing, lighting, catwalks, and overlooks/platforms throughout the facility to create a safe pathway. Provide a narrative and site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 6
Designate Public Areas
2 PTS

Provide inviting public spaces within the site that can safely provide unique access, vantage points, overlooks/platforms, etc. Provide a site plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 7
Incorporate Historical/ Cultural Elements: Implement Interpretive Media
2 PTS

Improve the visitor experience by including historical/cultural elements within public areas by conducting research, providing interpretive media, and preserving historic resources. Describe the historical and cultural context of a landscape and reveal the significance of an outdoor space with archeological artifacts and artistic displays combined with informational panels, photographs, artwork, diagrams, maps, text, etc. Provide a construction plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 8
Identify Local Programming Partners
2 PTS

Notify and engage the public and interested stakeholders at the beginning of the project and seek opportunities for strategic partnerships that strengthen the local community with the project. Provide a signed memorandum of understanding with a partner organization to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 9.1
Enhanced Perimeter Design: Increase Perimeter Aesthetics
2 PTS

Increase perimeter aesthetics of a site by using vegetated buffers, art installations, attractive/informative fence wrap, etc. Preference should be given to local educational facilities and groups for possible partnerships. Provide a construction plan to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 9.2
Enhanced Perimeter Design: Increase Perimeter Transparency
2 PTS

Provide transparency along the site perimeter to better engage the public with the activity of the waterfront site. Transparent perimeters and visual sightlines to the water provide the surrounding community with a glimpse of the activities within an industrial working waterfront site and can foster interest or visitors to possible scheduled public access, interactive exhibits/displays, and educational opportunities. Provide construction plans to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 10.1
Responsible Siting and Design: Suppress Dust and Odor
4 PTS

Industrial activities on waterfront sites are often susceptible to dust, airborne debris, and odor due to wind on the waterfront. Suppress dust and odor by relocating their sources away from sensitive sites (i.e., residences, public areas, etc.), enclosing and properly ventilating these sources, and/or providing vegetated buffers. Provide a site plan and narrative to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 10.2
Responsible Siting and Design: Minimize Noise
4 PTS

Use of machinery and heavy equipment may produce noise levels that can negatively affect nearby sensitive sites. Dampen obtrusive noises by relocating their sources away from sensitive sites (i.e., residences, public areas, etc.), enclosing these sources, and/or providing sound buffers to reduce noise. Provide a construction plan or narrative to demonstrate compliance with this credit.

YES ? NO

PA & I-CREDIT 10.3
Responsible Siting and Design: Minimize Litter and Discharges
4 PTS

Industrial activities may produce litter or liquid discharges that can lower water quality. Protect the integrity of the waterways by relocating sources of litter and discharges away from the water, enclosing these sources, and/or providing adequate buffers and capture mechanisms to prevent them from entering waterways. Provide a site plan to demonstrate compliance with the credit.

YES ? NO

PA & I-CREDIT 11
Incorporate Transit Access and Facilities
2 PTS

Improve transit access to site by providing shuttle service or agreement with transit authorities to obtain public bus route extension to site. Provide evidence of agreement with a qualified transportation provider for service focused on, at a minimum, morning and evening peak hours and available to the surrounding community for at least 12 months, or provide evidence of bus route extension to demonstrate compliance with this credit.

CATEGORY 3: Edge Resiliency (ER)

Design a resilient and ecologically beneficial waterfront edge.

96 POSSIBLE PTS

YES ? NO

ER-CREDIT 1 (PRIORITY)
Assess Waterfront Edge Conditions to Determine Appropriate Design
4 PTS

Analyze and inventory waterfront edge conditions and structures, including coastal geomorphology, reach, fetch, slope, tide range, storm surge, and wave energy, to determine the range of feasible and appropriate stabilization strategies. Use NYC Department of City Planning's (DCP) **Urban Waterfront Adaptive Strategies** guide and the US Army Corps of Engineers (US ACE)/National Oceanic and Atmospheric Administration (NOAA)/FEMA and other stakeholders initiative, **Systems Approach to Geomorphic Engineering**, which seek to integrate natural features and structural treatments relative to resiliency, ecology, and public access. New York City Economic Development Corporation's **Waterfront Facilities Maintenance Management System: Inspection Guidelines Manual** (currently being updated) is a resource for a shoreline configuration analysis and provides guidance for relatively quick assessment. The New York State Department of Environmental Conservation (NYS DEC) and NOAA Hudson River Sustainable Shorelines Project has developed the **Engineered Approaches for Limiting Erosion along Sheltered Shorelines: A Review of Existing Methods**. It provides an overview of shoreline stabilization techniques, which are evaluated based on approach, construction cost, maintenance cost, and adaptability. Provide documentation of assessment and how it might influence final design to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 2 (PRIORITY)
Design Waterfront Edge for Climate Conditions Projected for the 2050s
4 PTS

Based on the *ER-Credit 1* assessment, engage the project team to determine the resiliency and projected ability of the waterfront edge to adapt to projected climate conditions in the 2050s, using the **NPCC's Climate Risk Information 2013: Observations, Climate Change Projections, and Maps** as a benchmark. Waterfront projects face specific vulnerabilities due to projected sea level rise and require responsible planning and precautionary measures. Vulnerabilities may include increased storm surge/tide, wind wave, shoreline erosions, and tidal inundation at daily high tides. Incorporate design elements that address vulnerabilities identified or allow it to be efficiently adapted in the future. According to the NPCC (2013), the following conditions are the middle range projections for conditions in the 2050s, which is the lifespan of a typical shoreline structure.

- 11 – 24 inches of sea level rise
- 5 days/year with rainfall at or above 2 inches
- 1.7 – 3.2% chance of 100 year flood event with increase in associated flood heights

Implement designs that minimize the consequences associated with these risks, or demonstrate how they could be adapted in the future with structural modifications. Consideration should also be given to minimize impacts on public access, ecology, and adjacent property. Provide a site plan and narrative to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 3.1
Shoreline Configuration: Remove Existing Fill/ Restore Natural Shoreline
6 PTS

Create a more ecologically beneficial aquatic environment by removing man-made fill/structures from nearshore area, where appropriate. Do not increase flood risk or destabilize adjacent areas. Pull back the shoreline at least 10 feet landward of the existing location along the greater of 20% of the length of the shoreline or 50 feet. (Note: Changes to the shoreline configuration should be analyzed by the project team for hydrological impacts regarding storm surge/flooding, wave regime, and stream velocity/currents.) Provide a site plan to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 3.2
Shoreline Configuration: Reduce Slope
4 PTS

Gradually sloped shorelines – rather than a hardened or more vertical shoreline – can progressively dissipate wave energy, reducing reflection and amplification while also improving the aquatic habitat within the intertidal zone. Reconfigure at least 20% of the shoreline but no less than 50 feet to a maximum slope of 1:1.5. (Note: Changes to the shoreline configuration should be analyzed by the project team for hydrological impacts regarding storm surge/flooding, wave regime, and stream velocity/currents.) Provide a grading plan to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 3.3
Shoreline Configuration: Avoid Net Filling
4 PTS

Avoid filling in the water below mean high water; fill can adversely impact site ecology and the intertidal area. Fill and excavation should not result in positive net fill into the water column. (Note: Changes to the shoreline configuration should be analyzed by the project team for hydrological impacts regarding storm surge/flooding, wave regime, or stream velocity/currents.) Provide a site plan and narrative to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 4.1
The Working Edge: Design for Resiliency
4 PTS

Consider the following design features to create resilient and efficient working edges. Providing a site plan to demonstrate compliance; use two of the following five options:

- Design height must be appropriate for easy loading/unloading facilities in all tidal ranges without overtopping during storm events
- Reduce scour behind bulkheads/seawalls (i.e., capping)
- Armor edges vulnerable to scour with toe structures (often caused by dredging of channels, erosion and navigational traffic)
- Select materials resistant to marine borer activity/corrosion
- Armor edges against abrasion along the sand line (especially for steel sheeting bulkheads and piles)

YES ? NO

ER-CREDIT 4.2
The Working Edge: Mitigate for Functional Elevations
4 PTS

Industrial/maritime properties usually have working edges with low elevations in order to ease the loading/unloading process that leave the sight vulnerable to flood events and wave action. Providing a site plan to demonstrate compliance; use one of the following options:

- Use a floating structure
- Use a lower elevation wharf/pier structure
- Integrate a stepped edge or tiered platform using a low edge for maritime functionality and a high edge designed to stabilize shoreline and protect higher uplands and facilities.

YES ? NO

ER-CREDIT 4.3
The Working Edge: Protect with Proper Fendering
4 PTS

The working docks require adequate fendering to protect them. Consider fendering options and guidance in the **Trelleborg Marine Systems Guide to Fender Design**, based on the **World Association for Waterborne Transport Infrastructure Guidelines for the Design of Fender Systems 2002**. Provide a construction plan to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 4.4
The Working Edge: Incorporate Nature-based Features
4 PTS

Working edges need not be void of ecological activity. Incorporate nature-based features into the design of the working edge. Consider strategies that add vegetation to bulkheads, provide habitats for marine life, and could improve the ecological quality of the working edge. Provide construction plans to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 4.5
The Working Edge: Minimize Effect on Environment
4 PTS

The working edge need not negatively impact the environment. Address two of the following issues when designing the working edge:

- Site working edge in area where dredging is not needed
- Implement designs that reduce over-water shading
- Improve flushing rates and reduce stagnant water
- Reduce impacts from propwash
- Do not use tires on mooring facilities even as fenders
- Provide a 25-foot buffer between areas of vessel traffic and submerged aquatic vegetation or unarmored wetlands
- Floating or suspended watercraft lifts should be more than 9 feet seaward of the MHHW
- Avoid use of light skirting on over-water structures or along edges

Provide construction plans to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 4.6
The Working Edge: Condense Edge
4 PTS

Make efficient use of space on the shoreline by condensing the working edge to less than 75% of the total shoreline length. This can increase the shoreline available for stabilization treatments, natural features, and nearshore structures. Provide site plan to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 5
Non-working Edge Stabilization Techniques: Rehabilitate/ Replace Manmade Edge
4 PTS

Based on the waterfront edge assessment (*ER-Credit 1* and *2*), rehabilitate or replace an edge that is in disrepair to increase structural integrity and longevity for an expected service life of at least 30 years. Consider implementing the following designs elements into construction:

Resilient Features

- Stabilize sediment at the foot of armoring treatments to prevent scour and erosion (i.e., rip rap at the base of a bulkhead, larger stone located at bottom of rip rap, or use of submerged aquatic vegetation (SAV) at the bottom of a revetment)
- Increase number of surfaces at various angles along the swash zone to dissipate wave energy (i.e., rip rap)
- Incorporate vegetation root systems or bio-grid products to stabilize loose sediments and anchor stabilizing structures (i.e., joint plantings in rip rap, vegetated gabions, etc.)
- Incorporate inclined structures leading up to vertical surfaces to dissipate wave energy (i.e., revetments, terraced gabions, fluted elements, etc.)
- Incorporate submerged structures to dissipate wave energy (i.e., toe berm)

Ecological Diversity

- Use rough, textured, porous surfaces to facilitate attachment of marine organisms (i.e., volcanic rock)
- Use materials that create interstitial spaces that vary in size and shape (i.e., rip rap of various shaped stone)
- Provide shade, habitat protection, wave attenuation, etc., via surface shapes and features (i.e., incorporating flat stone into rip rap to create shellfish refuges)
- Incorporate nature-based features (i.e., deep root plantings in vegetated gabions)
- Use appropriate stone size, depth, and cover layers to prevent root wedging of nature based features
- Select vegetation based on amount of available maintenance for control of over growth
- Use water retaining ecological features to increase bio-diversity and increase moist habitat (i.e., tide pools, crab caves in bulkheads, low tide exposed SAV blanket)

Incorporate at least two design features from each focus area above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 6
Non-working Edge Natural Features: Restore/Replicate
4 PTS

Restore or replicate a natural feature along at least 25% of the shoreline or no less than 50 feet. Natural features provide many ecological functions and services as well as provide shoreline stabilization. Natural features can also self-repair waterfront edges with sediment catchment, deep root stabilization, and biogenic structures. Consider the following design features that promote resiliency in natural features:

- Limit proximity of human activities (i.e., exclude vessels from SAV areas)
- Prevent steep slope erosion at natural habitat edges (i.e., sills at seaward edge of marshes)
- Use bioengineered frame structures (i.e., oyster reefs, mussel beds, etc.)

- Use species that will stabilize and catch sediment (i.e., spartina grass, eel grass, etc.)
- Implement grazing management analysis and plans (i.e., geese fencing for marsh grasses, Asiatic shore crab prevention for oyster reefs)
- Provide two- to three-year vegetation establishment plan (i.e., monitoring, nutrient enrichment, repair)
- Design physical and ecological barriers to invasive species (i.e., salt water inundation against phragmites invasion)
- Incorporate filter feeders into ecosystem design to increase flush rates and reduce turbidity to promote submerged and emergent vegetation health
- Select species that create structural components and biogenic structures (i.e., oysters, mussels, salt marsh grasses, mangroves, etc.)
- Select species with high succession regeneration rates that "self-repair" natural structures after a disturbance (i.e., oysters, mussels, salt marsh grasses, etc.)
- Designate at least 20 horizontal feet of upland open space area that has been deemed appropriate for wetland migration, in response to sea level rise, where wetlands exist and/or are created (40 feet for coastal dune systems).

Incorporate at least two design features from above into construction. Provide a construction plan highlighting these design features to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 7
Non-working Edge Nearshore Structures: Restore/Create
4 PTS

Nearshore in-water structures can attenuate wave energy and reduce stream velocity and thus minimize sediment uplift, suspension, and scour. Nearshore in-water structures can incorporate nature-based features, such as living breakwaters, fringe wetlands, reefs, water retaining features and submerged aquatic vegetation, to enhance the environment. Refer to the **Engineering Design Guidance for Detached Breakwaters as Shoreline Stabilization Structures** by the US ACE. Reduce wave height, wave energy and stream velocity by at least 15% from existing conditions. Consider the following for nearshore structure design to reduce adverse affects on hydrodynamics:

- Use modeling to assess changes in wave regime and sediment transport
- Plan for sediment deposition and erosion away from sensitive habitats and natural features
- Prevent sediment suspension in water column
- Avoid negative impacts to water circulation
- Avoid impacts to sediment budget within project region
- Avoid sedimentation of shipping channels
- Avoid negative impacts to erosion hazard areas

Incorporate at least two design measures from above into construction. Provide a construction plan highlighting these design measures to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 8
Create Resilient Landscape Features on Site
4 PTS

As part of a regional coastal protection strategy and if appropriate after analysis for *ER-Credit 1* and *2*, incorporate elements in the landscape to reduce the impacts of coastal flooding on vulnerable assets. Strategies should be sited upland from the water's edge and may include berms that connect with high elevation points, integrating flood walls into the landscape, or increasing edge elevation in extremely low lying areas. Consider impacts to public access and scenic views and flooding of adjacent sites, as these features near the waterfront edge can obstruct scenic views, prevent access to the waterfront, and trap/retain floodwaters during and after flood events. If a berm/levee is appropriate, it should be multipurpose and allow for public access, greenways, plantings, etc. These methods should be considered as an alternative to raising entire elevation of the site. Provide a site plan and narrative to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 9
Integrate Multiple Edge Resiliency Strategies
POSSIBLE 6 PTS

Employ multiple edge resiliency strategies to create a multi-layered edge configuration that increase resilience to storms, flooding, sea level rise, and climate change. Within the same length of shoreline employ at least two of the following edge resiliency strategies: landscape features, stabilization techniques, natural features, or nearshore structures. Provide a site plan and narrative describing purpose and functionality of each layer as it contributes to the whole system to demonstrate compliance with this credit.

- **a)** Combine at least two different components within the same length of shoreline **2 PTS**
- **b)** Combine at least three different components within the same length of shoreline **4 PTS**
- **c)** Combine at least four different components within the same length of shoreline **6 PTS**

YES ? NO

ER-CREDIT 10.1
Sustainable Stormwater Management: Reduce Exposed Storage Areas
4 PTS

Industrial storage areas for aggregate, hazardous, or stockpiled materials that are exposed to rainfall may contribute pollutants or loose sediments to stormwater runoff. Enclosing these storage areas or providing coverings that can reduce exposure to rainfall can greatly improve stormwater quality. Implement designs that would reduce the total amount of storage areas exposed to rainfall to 50% or less of the total storage areas on site. Provide site plan to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 10.2
Sustainable Stormwater Management: Strategic Infiltration and Paving
4 PTS

Design stormwater facilities to sequester potential pollutants prior to discharge. Equipment wash areas, hazardous materials, and aggregate piles should be considered to meet this requirement. Provide site plan to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 10.3
Sustainable Stormwater Management: Increase Retention and Infiltration Area
4 PTS

Stormwater will increase in velocity, quantity, and contaminants as it travels over impervious surfaces, harming the receiving body of water. Diverting stormwater into permeable areas with increased retention capacity can minimize these effects. Incorporate designs that increase stormwater infiltration by at least 20% over existing conditions where suitable to underlying soil and water table conditions. Provide site plan and documentation to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 10.4
Sustainable Stormwater Management: Reduce Runoff Discharge Flow Rate
4 PTS

Stormwater discharge along the waterfront can negatively affect the water quality of the receiving body of water. Incorporate designs that reduce runoff discharge by at least 10% from the existing conditions. Refer to the **TR-55 Urban Hydrology for Small Watersheds [Figure 2-1]** for details on how to attain the runoff curve number (inches of runoff discharge/ inches of rainfall). Consider the use of detention basins or other infrastructure to slow the discharge of stormwater. Provide site plan and documentation to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 10.5
Sustainable Stormwater Management: Improve Discharge Quality
4 PTS

Stormwater can acquire particulates, chemicals, litter, excessive nutrients, and other pollutants. Properties at the water's edge are the last opportunity for stormwater to be treated by natural or mechanical systems before entering receiving waters. Implement designs that would reduce 50% of Total Suspended Solids (TSS) from the existing conditions. Provide documentation to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 10.6
Sustainable Stormwater Management: Capture and Reuse
4 PTS

Stormwater capture and reuse has many benefits and possible uses. Captured stormwater can be purified and used for grey water purposes within building operations and for irrigation. Design water features to act as retention basins for stormwater capture and reuse. Implement designs that capture any amount of the stormwater. Provide documentation to demonstrate compliance with this credit.

YES ? NO

ER-CREDIT 10.7
Sustainable Stormwater Management: Separate Sanitary and Stormwater
4 PTS

In many urban settings, wastewater and stormwater runoff are combined into sewer systems and transported to municipal treatment facilities. During heavy rainfall these treatment facilities may experience a combined sewer overflow (CSO) discharge event when the volume of discharge exceeds the capacity of the facility. To relieve the municipal CSO system, separate stormwater runoff from the combined sewer system. Provide a site plan and narrative to demonstrate compliance with this credit.

CATEGORY 4: Ecology & Habitat (E & H)

Protect existing habitat and enhance the waterfront edge and site ecosystem.

36 POSSIBLE PTS

E & H-CREDIT 1 (PRIORITY)
Assess Natural Resources
POSSIBLE 4 PTS

YES ? NO

In order to understand the performance and quality of natural resources, conduct an in-depth assessment of existing conditions following a two-tiered approach. This assessment should categorize ecological communities as well as identify habitat areas and which species they serve.

Tier 1: Remote Assessment 2 PTS

Evaluate conditions of the project site and adjacent areas using geographic information systems, aerial imagery, etc.; also consider the local region. The remote assessment typically should include land cover type, land use, tidal ranges, vegetation densities, historical conditions, and other ecological information that relate landscape context to existing human infrastructure.

YES ? NO

Tier 2: Rapid Inventory Assessment 4 PTS

Conduct a field assessment of the project site with consideration given to the adjacent area. The rapid inventory assessment includes an inventory of all ecological communities categorized according any of the following classification systems:

- **Ecological Communities of NYS**
- **Preliminary Natural Community Classification for New Jersey**
- **Ecological Systems of the United States**
- **Coastal and Marine Ecological Classification Standard**
- **Classification of Wetlands and Deepwater Habitats of the US**

The rapid inventory assessment must identify and determine the quality of these ecological communities regarding their basic community structure and composition, basic hydrology, species diversity, and richness, community robustness, suitable habitat, regional participation, patch dynamics, aesthetic quality, and ecological productivity. Use the following rapid assessments that apply to the project site:

- **Wildlife Habitat Benefits Estimation Toolkit**
- **Quantifying Terrestrial Habitat Loss and Fragmentation: A Protocol**
- **Habitat Equivalency Analysis: An Overview**
- **Ecological Integrity Assessment and Performance Measures for Wetland Mitigation**

Provide documentation to demonstrate compliance with this credit.

E & H-CREDIT 2 (PRIORITY)
Preserve or Enhance Existing Natural Resources
4 PTS

YES ? NO

Based on the findings of *E & H-Credit 1*, engage the project team to determine how best to avoid impacts, and preserve or enhance the site's natural resources. Work with governmental regulatory agencies to gain approval for possible ecological preservation or enhancements that take into consideration establishment conditions (for instance, average salinity and inundation frequency for marsh grasses), biotic and abiotic factors (for instance, predatory migration route changes, climate change, sea level rise), and the probability of success. Provide documentation and post implementation monitoring plan to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 3
Avoid Ecologically Sensitive Areas
2 PTS

Avoid building on ecologically sensitive areas. Provide documentation that the project is avoiding the following areas to demonstrate compliance with this credit:

- **Critical Environmental Areas** (NYS DEC)
- **Significant Coastal Fish and Wildlife Habitats** (NYS DEC)
- **Recognized Ecological Complexes** (NYC DCP)
- **Special Natural Waterfront Areas** (NYC DCP)
- **Forever Wild Sites** (NYC Department of Parks and Recreation (DPR))
- **Critical Environmental and Historic Sites** (NJ)
- **Coastal Barriers Resource System** (US Fish and Wildlife Service (USFWS)) (NY and NJ)

YES ? NO

E & H-CREDIT 4.1
Ecological Landscaping: Add New Substantial Habitat
POSSIBLE 4 PTS

Based on identification of suitable habitat from *E & H-Credit 1*, increase the habitat area within the waterfront edge to provide a more ecologically productive environment. Increase total habitat area by at least 10% of the preexisting condition. Where existing conditions include no habitat, full points in this credit can be achieved if habitat is created and the total habitat area is greater than 10% of total project site. Increasing habitat is beneficial but it is the arrangement and connectivity between habitat patches that is the foundation for high-performance habitats that foster higher species diversity and abundance. Consider the addition of new habitat that reduces the distance between adjacent habitat patches to improve connectivity (Note: Related to *E & H-Credit 4.2*). Provide site plans and description of ecological benefits including target species to demonstrate compliance with this credit.

a) Increase habitat areas by at least 10% **2 PTS**
b) Increase habitat areas by at least 20% **4 PTS**

YES ? NO

E & H-CREDIT 4.2
Ecological Landscaping: Reduce Fragmentation and Consolidate Habitat Patches
4 PTS

Based on identification of suitable habitat via *E & H-Credit 1*, by adding new habitat or expanding existing habitat, consolidate and reduce the number of individual patches that divide up the total habitat area to where the average patch size is at least 5% of the total habitat area. Where existing conditions include no habitat, full points in this credit can be achieved if the average patch size at least 5% of the total habitat area. Larger, more contiguous patches typically provide a greater quality and variety of micro-habitats, leading to higher species diversity and abundance. When consolidating habitat patches consider arrangement and connectivity. Provide site plans and description of ecological benefits including target species to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 5
Create Resilient Ecosystems
4 PTS

Design landscapes, green infrastructure, and ecosystems to withstand harsh coastal conditions, floods, and storms. Ecosystems should be design to be flooded or washed over with minimal impact, assuming the expected repair or renovation costs, after a storm or flood, would not exceed 75% of the initial construction costs. Use plants that are salt-, flood-, and drought-tolerant, wind-resistant, and can withstand local temperature extremes and are appropriate for the site's sun/shade conditions. Incorporate ecological elements such as natural recovery, rapid succession, and biogenic stabilization into ecosystem design. Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 6.1
Advanced Mitigation Actions: Avoid Environmental Impacts
8 PTS

Avoid designs that would result in open space, natural resources, hazardous materials, water and sewer infrastructure, or greenhouse gas emissions significant adverse impacts as determined through the environmental review process. Meet with regulatory agencies to find the appropriate design of facilities in order to comply with this credit. Provide documentation to demonstrate compliance with this credit.

YES ? NO

E & H-CREDIT 6.2
Advanced Mitigation Actions: Exceed Mitigation Requirements
POSSIBLE 4 PTS

Any natural resource impacts actions that cannot be avoided or minimized must have compensatory mitigation equivalent or greater than the affected resources as approved by governing regulatory agencies in order to satisfy this credit. Work with regulatory agencies to prepare compensatory mitigation plans with guidance from the **Model Compensatory Mitigation Plan Checklist** developed by the US ACE and the United States Environmental Protection Agency. Exceed required mitigation actions that benefit the overall health of the metropolitan region by at least 15%. Provide documentation to demonstrate compliance with this credit.

a) Exceed mitigation requirements by 15% **2 PTS**
b) Exceed mitigation requirements by 30% **4 PTS**

YES ? NO

E & H-CREDIT 7
Limit Light Pollution
2 PTS

Waterfront light pollution can encourage nuisance fauna such as jellyfish and impact navigation for aquatic fauna and vessels traveling at night; limit light on the waterfront. See **exterior lighting guidelines developed by the NYC Department of Design and Construction** and information provided by the **Illuminating Engineering Society of North America** and the **International Dark-Sky Association**. Provide documentation demonstrating that the project's ambient light and light projected seawards is less than those of the existing conditions to demonstrate compliance with this credit.

CATEGORY 5: Materials & Resources (M & R)

Use materials and resources that are resilient, environmentally friendly, and provide societal benefits; includes responsible construction practices.

49 POSSIBLE PTS

YES ? NO

M & R-CREDIT 1 (PRIORITY)
Provide a Life Cycle and Service Life Assessment of Materials
4 PTS

Analyze the materials used in the construction or enhancement of the waterfront edge by performing a life cycle and service life assessment of the materials and construction practices. **US EPA's Tool for the Reduction and Assessment of Chemical and other Environmental Impacts (TRACI)** methodologies are a resource for analyzing appropriateness of materials. Use the US EPA's TRACI via a resource such as the **Athena Sustainable Materials Institute's Life Cycle Assessment**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 2.1
Repurposed Fill: Redistribute on Site
1 PT

Use fill material from within the site during construction in accordance with state and local regulations. This avoids the need to import construction materials from external sources, lowering the project's carbon footprint and reduce shipping costs. Provide documentation that at least 25% of the total fill used is from the site and has been authorized by state or local regulatory agencies or is exempt from such regulations to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 2.2
Repurposed Fill: Use Locally Dredged Material on Site
1 PT

Use material dredged from waterways within 25 miles that is in accordance with governing regulations: **NYS DEC Beneficial Use Determinations**, **NYS DEC Remedial Program Soil Cleanup Objectives**, **NJAC 7:26D Remediation Standards**, **NJAC Guidance Document for Beneficial Use Project**. Use of dredged material from onsite or nearby is a form of materials exchange that removes the intermediary when there is a need to dispose of dredged material and a need for fill material. Benefits include reduced material costs, reduced carbon footprint, and reduced transportation of invasive species from more distant sources and capping of possibly contaminated onsite soils. Obtain a permit from the **US ACE**, NJ Department of Environmental Protection (DEP), and/or NYS DEC in order to dredge material from local waterways. Provide a narrative of suitability of dredged material for its proposed use and all associated permits to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 2.3
Repurposed Fill: Use Local Off-Site Sources
1 PT

Use suitable fill material from off-site sources within 30 miles if trucked or up to 50 miles if barged. This minimizes the need to import construction materials from more distant sources, and increases the possibility of shipping through barging methods, lowering the project's carbon footprint and reducing overall shipping costs. Provide documentation that at least 50% of total fill used is from local sources to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 3.1
Repurposed Materials: Salvage Waterfront Structures on Site
1 PT

Repurpose waterfront structures from the site during waterfront edge construction (i.e., piers, rip rap, etc.). Benefits include reduced waste and cost for new materials. Provide documentation that at least 10% of avoided total material costs of the project are salvaged from the site (not including fill) to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 3.2
Repurposed Materials: Use Responsibly Sourced Lumber
2 PTS

Use composite lumber, reclaimed hardwoods, or certified lumber sources. As an alternative to pressure treated lumber, use recycled lumber alternatives, most of which are impervious to saltwater, sunlight, sand, marine organisms and insects, resistant to mold, mildew, rot, warping and splintering. These materials are usually slip-resistant, durable, and long-lasting. Refer to the US EPA's list of **Alternatives to Pressure-Treated Wood**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 4
Use Local, Native Plants
1 PT

Specific intra-species gene pools differ between regions due to varying climate and environmental conditions. Transplanting vegetation from one regional gene pool to another can weaken the local gene pool. Use native plant nurseries specializing in locally sourced plants. Provide documentation that 75% of total cost of plant material is sourced from within 150 miles to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 5.1
Material Resilience: Use Durable Materials
1 PT

Use materials that are resistant to salt water, flooding, impacts, fracturing due to heat or cold, wind, and ultraviolet light. Use the **FEMA P-936 Floodproofing Non-Residential Buildings 2013** as a guide during material selection. Provide materials list and narrative to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 5.2
Material Resilience: Protect/Waterproof Electrical/ Mechanical Equipment in Flood Zone
1 PT

Provide protection for utilities, such as waterproof vaults, as well as water- and salt-resistant materials for wires and lines that must be located in flood zone. Wiring should be encased in a non-corrosive metal or plastic conduit when allowed by code. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 5.3
Material Resilience: Provide Cathodic Protection to Waterfront Structures
1 PT

Use cathodic protection to minimize corrosion of waterfront infrastructure. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 6.1
Low Impact Materials: Use Permeable Materials
2 PTS

Permeable cover materials used along the waterfront edge can help absorb stormwater and filter out pollutants. Provide documentation that at least 5% of cover is permeable and identified as such by appropriate state and local regulatory agencies as appropriate, to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 6.2
Low-Impact Materials: Use High-Albedo Surfaces
1 PT

Use high-albedo surfaces, which are light in color and reflect sunlight away from the surface. This reduces cooling costs, helps the survival of plants, and improves air quality. Provide documentation that at least 50% of pavement is high-albedo to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 6.3
Low-Impact Materials: Avoid Potentially Toxic, Preserved Lumber
2 PTS

Avoid lumber preserved with potentially toxic substances in the water or at the waterfront edge. Do not use lumber preserved with chromated copper arsenate or fossil-fuel-derived creosote, which can leech into the marine environment. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 7.1
Ecologically Beneficial Material: Use Supportive Composition
2 PTS

Use materials that have a chemical composition, alkalinity, toxicity, pH, etc. that support and promote biological activity and attachment of marine organisms. Products such as concrete additives to decrease alkalinity and pH foster the growth of marine organisms. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 7.2
Ecologically Beneficial Material: Use Habitat Generating Products
2 PTS

Use materials or products that provide habitat for marine organisms. Use products such as precast tidal pools, habitat/reef modules, oyster castles, form liners, molds and structural enhancements. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 8.1
Renewable Energy: Minimize Conventional Energy Use
4 PTS

Renewable energy such as wind and solar can minimize the need for wiring and equipment susceptible to flooding, in addition to being carbon-free. Provide documentation that site's energy use is at least 15% renewable to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 8.2
Renewable Energy: Use Water-Based Methods
4 PTS

Use water-based renewable energy systems—such as tidal or wave energy. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 9.1
Maritime Amenities: Enhance Docking Facilities
2 PTS

Enhance docking facilities by providing amenities for vessels and crew. Consider providing waste/bilge pump stations, vessel utilities, crew resting/lounge areas, off-site transportation, etc. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 9.2
Maritime Amenities: Use Electric Cold Ironing
4 PTS

Cold ironing provides a cleaner environment by providing shore-side electrical power as opposed to a ship at berth using its own, potentially polluting engines. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 9.3
Maritime Amenities: Provide Safe Harbor During Storm Events
2 PTS

During storm events and rough weather, facilities that can provide safe harbor are in high demand. Design facilities to provide shelter for docking with reduced wave action and shielding from wind for all vessels associated with daily operations. Facilities should also have bolstered mooring and fendering options to keep vessels attached with little damage. Consider providing safe harbor for other vessels in the area that may not have the proper amenities at their facilities. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 10
Install Redundant Emergency Systems
4 PTS

Install redundant back-up systems especially that include dry pumps, cooling systems, emergency power and lighting, and/or other systems used during emergency situations. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 11.1
Responsible Construction: Minimize Construction Impacts
2 PTS

Based on an assessment of possible ecosystem construction impacts, integrate at least two of the following preventative strategies into construction practices prior to the project start:

- Reduce in-water construction within approved work timeframes for fish/wildlife protection as proscribed by regulatory bodies
- Protect water bodies from contaminants and particular matter with barriers such as turbidity curtains and silt barriers
- Keep construction equipment off wetlands and marshes and minimize size of construction area
- Minimize impacts to aquatic plants and bottom sediment topography when installing piles.
- Use prefabricated construction materials to minimize construction time and affected area
- Work from the water to avoid damaging natural features and habitat, and anchor construction barges away from aquatic habitat, especially when creating structures over wetlands
- Install piles using drop or small, low-pressure vibratory hammers rather than high-pressure-jet installation.

Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 11.2
Responsible Construction: Barge Materials
2 PTS

Use barge transportation of materials which can reduce carbon emissions, alleviate truck traffic, and lower construction costs. Provide documentation to demonstrate compliance with this credit.

YES ? NO

M & R-CREDIT 11.3
Responsible Construction: Cooperate in Materials Exchange Program
2 PTS

Participate in a materials exchange program to reduce disposal/purchase costs and to lower carbon emissions. Provide documentation to demonstrate compliance with this credit.

CATEGORY 6: Operations & Maintenance (O & M)

Address life-cycles of designs including sustained maintenance strategies, preparations for future climate events, and potential partnerships to advance scientific understanding of waterfronts.

24 POSSIBLE PTS

YES ? NO

O & M-CREDIT 1 (PRIORITY)
Provide Operations and Maintenance Plan for the Waterfront Area
4 PTS

Provide for maintenance and operational continuity for the waterfront area by establishing an ongoing system for maintaining performance standards related to access, resiliency, and ecology. A Maintenance Manual should be prepared by the owner based on best practices and should include maintenance and inspection details for waterfront area and edge. Include building systems personnel in the design, selection, and commissioning of all equipment. Provide documentation to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 2
Provide Regular Condition Assessment of Marine Assets
4 PTS

Provide regular condition assessment of marine assets and structures, which can result in reduced maintenance costs. Use the latest **ASCE Waterfront Facilities Inspection and Assessment Manual**. Provide documentation to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 3
Identify Partner(s) to Study Site
4 PTS

Create a partnership with academic or scientific institute, not-for-profit, etc., to study and assess waterfront areas and issues that will advance the science and understanding of waterfront projects and their interface with the environment. Topics could include resilient shorelines, ecosystem services, nature-based features, floodplain management, shading and in-water effects of structures, habitat restoration and mapping, etc. Provide documentation of partnership agreement to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 4
Provide Waterfront Emergency Preparedness Plan
4 PTS

Create a waterfront Emergency Preparedness Plan, which contains instructions for emergency procedures based on storm, flooding, high-winds and other possible events. Clear operating procedures for emergencies will allow staff to prepare effectively. Provide documentation demonstrating compliance with this credit.

YES ? NO

O & M-CREDIT 5
Install Smart Switches
4 PTS

Install “smart switches” to isolate the effects of flooding. Provide documentation to demonstrate compliance with this credit.

YES ? NO

O & M-CREDIT 6
Provide Maintenance Plan for Sustainable Stormwater Management
4 PTS

Stormwater systems on waterfront properties are exposed to extreme conditions and require a thorough maintenance plan to keep the system fully functioning. Stormwater systems must be kept clear of debris, and elements such as bioswales, rain gardens, and constructed wetlands require specialized maintenance. Create a maintenance plan for the stormwater system describing operation, maintenance, including frequency and responsible parties. Provide documentation to demonstrate compliance with this credit.

CATEGORY 7: Innovation (IN)

20 POSSIBLE PTS

YES ? NO

IN-CREDIT 1
Inventive Design
10 PTS

Using approaches and techniques not addressed in this version of WEDG, propose a new credit that achieves significant, measurable performance in resiliency, ecology, or public access for innovative waterfront edge design. Provide the following to demonstrate compliance with this credit:

- Intent of the new proposed credit
- Details of the design approach
- Projected goals and achieved measurements

A project can submit a maximum of two proposed credits for 5 points each. (Note: The achievement of these points is at the discretion of the WEDG program.)

YES ? NO

IN-CREDIT 2
Exemplary Performance
10 PTS

Significantly surpass the requirements for 2 possible credits (possible 5 points each). Provide documentation to demonstrate compliance with this credit. (Note: The achievement of these points is at the discretion of the WEDG program.)

SCORECARD
Industrial/Maritime Project Type

317 POSSIBLE POINTS

CATEGORY 1: Site Selection & Planning (SS & P)

Y	?	N		POSSIBLE POINTS: 54	
○	○	○	**Credit 1**	(Priority) Use a Multi-Disciplinary Project Team and Design Process	**4**
○	○	○	**Credit 2**	(Priority) Conduct Assessment of Site's Vulnerability to Climate Change and Sea Level Rise	**4**
○	○	○	**Credit 3.1**	Project Siting: Site Near Existing Waterborne Transportation	**1**
○	○	○	**Credit 3.2**	Project Siting: Site in Appropriate Area	**2**
○	○	○	**Credit 3.3**	Project Siting: Clean a Brownfield	**5**
○	○	○	**Credit 4.1**	Non-Operations Building Siting: Avoid Development in High Potential Erosion Area	**2**
○	○	○	**Credit 4.2**	Non-Operations Building Siting: Avoid the 100-Year Floodplain	**6**
○	○	○	**Credit 5**	Non-Operations Building Elevation: Increase Freeboard	**4**
○	○	○	**Credit 6.1**	Non-Operations Building-Scale Protection: Provide Wet Floodproofing	**2**
○	○	○	**Credit 6.2**	Non-Operations Building-Scale Protection: Provide Dry Floodproofing	**2**
○	○	○	**Credit 7**	Materials and Equipment Siting: Avoid the 100-Year Floodplain	**4**
○	○	○	**Credit 8.1**	Materials and Equipment Protection: Provide Wet Floodproofing	**2**
○	○	○	**Credit 8.2**	Materials and Equipment Protection: Provide Dry Floodproofing	**2**
○	○	○	**Credit 9**	Electrical Substation: Avoid the 100-Year Floodplain	**4**
○	○	○	**Credit 10**	Site Perimeter Protection: Provide Deployable Flood Barriers	**2**
○	○	○	**Credit 11**	Use Marine Transportation in Operations	**6**
○	○	○	**Credit 12**	Enter Open Industrial Uses Sales Tax Exemption Program	**2**

CATEGORY 2: Public Access & Interaction (PA & I)

Y	?	N		POSSIBLE POINTS: 38	
○	○	○	**Credit 1**	(Priority) Assess Potential for Safe Public Access	**4**
○	○	○	**Credit 2**	(Priority) Engage Local Community and Users	**4**
○	○	○	**Credit 3**	Provide Working Waterfront Employment	**2**
○	○	○	**Credit 4**	Support Working Waterfront Vocational Training	**2**
○	○	○	**Credit 5**	Provide Safe Public Access within Facilities	**2**
○	○	○	**Credit 6**	Designate Public Areas	**2**
○	○	○	**Credit 7**	Incorporate Historical/Cultural Elements: Implement Interpretive Media	**2**
○	○	○	**Credit 8**	Identify Local Programming Partners	**2**
○	○	○	**Credit 9.1**	Enhanced Perimeter Design: Increase Perimeter Aesthetics	**2**
○	○	○	**Credit 9.2**	Enhanced Perimeter Design: Increase Perimeter Transparency	**2**
○	○	○	**Credit 10.1**	Responsible Siting and Design: Suppress Dust and Odor	**4**
○	○	○	**Credit 10.2**	Responsible Siting and Design: Minimize Noise	**4**
○	○	○	**Credit 10.3**	Responsible Siting and Design: Minimize Litter and Discharges	**4**
○	○	○	**Credit 11**	Incorporate Transit Access and Facilities	**2**

CATEGORY 3: Edge Resiliency (ER)

Y	?	N		POSSIBLE POINTS: 96	
○	○	○	**Credit 1**	(Priority) Assess Waterfront Edge Conditions to Determine Appropriate Design	**4**
○	○	○	**Credit 2**	(Priority) Design Waterfront Edge for Climate Conditions Projected for the 2050s	**4**
○	○	○	**Credit 3.1**	Shoreline Configuration: Remove Existing Fill/ Restore Natural Shoreline	**6**
○	○	○	**Credit 3.2**	Shoreline Configuration: Reduce Slope	**4**
○	○	○	**Credit 3.3**	Shoreline Configuration: Avoid Net Filling	**4**
○	○	○	**Credit 4.1**	The Working Edge: Design for Resiliency	**4**
○	○	○	**Credit 4.2**	The Working Edge: Mitigate for Functional Elevations	**4**
○	○	○	**Credit 4.3**	The Working Edge: Protect with Proper Fendering	**4**
○	○	○	**Credit 4.4**	The Working Edge: Incorporate Nature-based Features	**4**
○	○	○	**Credit 4.5**	The Working Edge: Minimize Effect on Environment	**4**
○	○	○	**Credit 4.6**	The Working Edge: Condense Edge	**4**
○	○	○	**Credit 5**	Non-working Edge Stabilization Techniques: Rehabilitate/Replace Manmade Edge	**4**
○	○	○	**Credit 6**	Non-working Edge Natural Features: Restore/Replicate	**4**
○	○	○	**Credit 7**	Non-working Edge Nearshore Structures: Restore/Create	**4**
○	○	○	**Credit 8**	Create Resilient Landscape Features on Site	**4**
○	○	○	**Credit 9**	Integrate Multiple Edge Resiliency Strategies	**6**
○	○	○	**Credit 10.1**	Sustainable Stormwater Management: Reduce Exposed Storage Areas	**4**
○	○	○	**Credit 10.2**	Sustainable Stormwater Management: Strategic Infiltration & Paving	**4**
○	○	○	**Credit 10.3**	Sustainable Stormwater Management: Increase Retention and Infiltration Area	**4**
○	○	○	**Credit 10.4**	Sustainable Stormwater Management: Reduce Runoff Discharge Flow Rate	**4**
○	○	○	**Credit 10.5**	Sustainable Stormwater Management: Improve Discharge Quality	**4**
○	○	○	**Credit 10.6**	Sustainable Stormwater Management: Capture and Reuse	**4**
○	○	○	**Credit 10.7**	Sustainable Stormwater Management: Separate Sanitary and Stormwater	**4**

CATEGORY 4: Ecology & Habitat (E & H)

Y	?	N		POSSIBLE POINTS: 36	
○	○	○	**Credit 1**	(Priority) Assess Natural Resources	**4**
○	○	○	**Credit 2**	(Priority) Preserve or Enhance Existing Natural Resources	**4**
○	○	○	**Credit 3**	Avoid Ecologically Sensitive Areas	**2**
○	○	○	**Credit 4.1**	Ecological Landscaping: Add New Substantial Habitat	**4**
○	○	○	**Credit 4.2**	Ecological Landscaping: Reduce Fragmentation and Consolidate Habitat Patches	**4**
○	○	○	**Credit 5**	Create Resilient Ecosystems	**4**
○	○	○	**Credit 6.1**	Advanced Mitigation Actions: Avoid Environmental Impacts	**8**
○	○	○	**Credit 6.2**	Advanced Mitigation Actions: Exceed Mitigation Requirements	**4**
○	○	○	**Credit 7**	Limit Light Pollution	**2**

SCORECARD
Industrial/Maritime Project Type
317 POSSIBLE POINTS

CATEGORY 5: Materials & Resources (M & R)

Y	?	N			POSSIBLE POINTS: 49
○	○	○	**Credit 1**	(Priority) Provide a Life Cycle and Service Life Assessment of Materials	**4**
○	○	○	**Credit 2.1**	Repurposed Fill: Redistribute on Site	**1**
○	○	○	**Credit 2.2**	Repurposed Fill: Use Locally Dredged Material on Site	**1**
○	○	○	**Credit 2.3**	Repurposed Fill: Use Local Off-Site Sources	**1**
○	○	○	**Credit 3.1**	Repurposed Materials: Salvage Waterfront Structures on Site	**1**
○	○	○	**Credit 3.2**	Repurposed Materials: Use Responsibly Sourced Lumber	**2**
○	○	○	**Credit 4**	Regional Sourcing: Use Local, Native Plants	**1**
○	○	○	**Credit 5.1**	Material Resilience: Use Durable Materials	**1**
○	○	○	**Credit 5.2**	Material Resilience: Protect/Waterproof Electrical/Mechanical Equipment in Flood Zone	**1**
○	○	○	**Credit 5.3**	Material Resilience: Provide Cathodic Protection to Waterfront Structures	**1**
○	○	○	**Credit 6.1**	Low Impact Materials: Use Permeable Materials	**2**
○	○	○	**Credit 6.2**	Low Impact Materials: Use High-Albedo Surfaces	**1**
○	○	○	**Credit 6.3**	Low Impact Materials: Avoid Potentially Toxic, Preserved Lumber	**2**
○	○	○	**Credit 7.1**	Ecologically Beneficial Material: Use Supportive Composition	**2**
○	○	○	**Credit 7.2**	Ecologically Beneficial Material: Use Habitat Generating Products	**2**
○	○	○	**Credit 8.1**	Renewable Energy: Minimize Conventional Energy Use	**4**
○	○	○	**Credit 8.2**	Renewable Energy: Use Water-Based Renewable Energy	**4**
○	○	○	**Credit 9.1**	Maritime Amenities: Enhance Docking Facilities	**2**
○	○	○	**Credit 9.2**	Maritime Amenities: Use Electric Cold Ironing	**4**
○	○	○	**Credit 9.3**	Maritime Amenities: Provide Safe Harbor During Storm Events	**2**
○	○	○	**Credit 10**	Install Redundant Emergency Systems	**4**
○	○	○	**Credit 11.1**	Responsible Construction: Minimize Construction Impacts	**2**
○	○	○	**Credit 11.2**	Responsible Construction: Barge Materials	**2**
○	○	○	**Credit 11.3**	Responsible Construction: Cooperate in Materials Exchange Program	**2**

CATEGORY 6: Operations & Maintenance (O & M)

Y	?	N			POSSIBLE POINTS: 24
○	○	○	**Credit 1**	(Priority) Provide Operations and Maintenance Plan for the Waterfront Edge	**4**
○	○	○	**Credit 2**	Provide Annual Condition Assessment of Marine Assests	**4**
○	○	○	**Credit 3**	Identify Partner(s) to Study Site	**4**
○	○	○	**Credit 4**	Provide Waterfront Emergency Preparedness Plan	**4**
○	○	○	**Credit 5**	Install Smart Switches	**4**
○	○	○	**Credit 6**	Provide Maintenance Plan for Sustainable Stormwater Management	**4**

CATEGORY 7: Innovation (IN)

Y	?	N			POSSIBLE POINTS: 20
○	○	○	**Credit 1**	Inventive Design	**10**
○	○	○	**Credit 2**	Exemplary Performance	**10**

CATEGORY	POSSIBLE POINTS	SCORE
1 Site Selection & Planning	**54**	
2 Public Access & Interaction	**38**	
3 Edge Resiliency	**96**	
4 Ecology & Habitat	**36**	
5 Materials & Resources	**49**	
6 Operations & Maintenance	**24**	
7 Innovation	**20**	
	TOTAL POINTS: 317	

WEDG CLASSIFICATION	
Certification	**100+ points**

Alkalinity — A substance having a pH of 7 or greater, this pH level would constitute a substance as an alkali or base.

Armoring — The act of incorporating or implementing structural design elements to stabilize sediments while protecting against the forces of erosion.

Assumed Shoreline for Determining Angle of Intersection — The average line of a portion of shoreline that a visual corridor will intersect with. The line is used to determine the angle of intersection when designing the orientation of a visual corridor. (DCP ZR Fig. 62-511.2)

Barrier Beach — A sand bar essentially parallel to the shore, the crest of which is above normal high water level. Also called an offshore barrier and barrier island.

Base Flood Elevation (BFE) — The computed elevation in feet to which floodwater is anticipated to rise during the 1% annual chance storm shown on the Flood Insurance Rate Maps issued by the Federal Emergency Management Agency. A building's flood insurance premium is determined by the relationship between the BFE and the level of the lowest floor of a structure.

Beach — The zone of unconsolidated material that extends landward from the low water line to the place where there is marked change in material or physiographic form, or to the line of permanent vegetation (usually the effective limit of storm waves). The seaward limit of a beach – unless otherwise specified – is the mean low water line.

Benthic Environment (or Zone) — The benthic zone is the ecological region at the lowest level of a body of water such as an ocean or a lake, including the sediment surface and some sub-surface layers.

Berm — An elevated landscape feature or ridge of compacted soil located in such a manner as to channel water to a desired location.

Berth — A space allotted to a vessel at anchor, at a pier/wharf, or in a slip.

Biogenic reef — Biogenic reefs are made up of living plants and animals rather than rock or chalk. The living organisms that comprise these reefs can be very different – from mussels to honeycomb worms and delicate pink maerl reefs. Packed together these animals provide incredibly rich habitats for other species.

Biomass — The amount of living matter usually given in a dry weight per unit area of habitat. Typical measurements include kg/m2, lbs/yd2,tons/acre, or kt/ha.

Bluefield Development — Construction over water bodies or wetlands.

Bog — A wet, spongy, poorly drained area which is usually rich in very specialized plants, contains a high percentage of organic remnants and residues, and frequently is associated with a spring, seepage area, or other subsurface water source.

Bottomland Hardwoods — Deciduous forests of dominant tree species which occur on soils that are moisture-saturated or inundated during a portion of the growing season. These forests are in serious decline due primarily to agricultural land clearing and flood control.

Breakwaters — A man-made structure protecting a shore area, harbor, anchorage, or basin from waves.

Bulkhead — A structure or partition built to retain or prevent sliding of the land into the water.

Cathodic Protection — A method of protecting metal surfaces from corrosion by making all the active sites of corrosion into passive sites by supplying electrical current through it.

Cleats — A device consisting of two hornlike prongs projecting horizontally in opposite directions from a central base, used for securing lines from vessels to piers, wharves, docks or similar structures.

Coastal Erosion Hazard Area (CEHA) — There are two types of coastal erosion hazard areas:

- CEHA Natural Protective Feature Areas (NPFA): Areas that contain the following natural features: beaches, dunes, bluffs, and nearshore areas. NPFAs protect natural habitats, infrastructure, structures, and human life from wind and water erosion, along with storm-induced high water. Human activities (for example, development or modification of beaches, dunes, or bluffs) may decrease, or completely remove the erosion buffering function of natural protective features.
- CEHA Structural Hazard Areas: Lands located landward of natural protective feature areas and have shorelines receding at a long-term average annual recession rate of 1 foot or more per year. Development within structural hazard areas is limited by regulation to reduce the risk to people and property from coastal erosion and flood damage.

Coastal Geomorphology — Coastal geomorphology, by definition, is the study of the morphological development and evolution of the coast as it acts under the influence of winds, waves, currents, and sea-level changes.

Cold Ironing — Supplying docked vessels with shore-side power while at berth allowing docked vessels to power their engines down and reduce emissions.

Combined Sewer Overflow — A combined sewer overflow is the discharge from a combined sewer system that is caused by snowmelt or stormwater runoff.

Combined Sewer System — Combined sewer systems are sewer systems that are designed to collect stormwater runoff, domestic sewage, and industrial wastewater in the same pipe and bring it to the publicly owned treatment works facilities. During rain events, when storm water enters the sewers, the capacity of the sewer system may be exceeded and the excess water will be discharged directly to a waterbody (rivers, streams, estuaries, and coastal waters).

Community Boathouse — A launch and storage facility entrusted or contracted to a community group and/or recreational organization, with minimal membership requirements, if any, for the purposes of fostering public programming and bringing people onto the water.

Davits — A cantilever crane designed for carrying light water craft.

Deep Root Stabilization — The stabilization of soils through a mix of vegetation with deep taproots and wide spread tubers. The side spread network of tuber roots holds sediment together while the deep taproots anchor the whole system deep within the sediment.

Design Flood Elevation (DFE)
The minimum elevation to which a structure must be elevated or floodproofed. It is the sum of the Base Flood Elevation (BFE) and a specified amount of freeboard based on the building's structural category. The NYC Building Code defines the Design Flood Elevation (DFE) as the BFE plus the designated amount of freeboard.

Detention/ Retention Basin
Both types of basins are intended to reduce the negative effects of excessive stormwater caused by impervious structures and paving in the built environment. Detention basins (also known as detention ponds and dry ponds) are basins designed to detain stormwater for a period of time. These facilities do not typically have a large permanent pool of water. Retention basins (also known as stormwater ponds and wet retention ponds), however, have a permanent pool of water throughout the year (or season). The primary removal mechanism in a retention basin is settling.

Dry Floodproofing
See Floodproofing

Ebb
The outward flow of the tide as the water returns to the sea.

Ecological Corridors
Also known as a wildlife, biological, habitat, wildlife movement, or dispersal corridors; are linear features whose primary wildlife function is to connect at least two significant habitat areas

Ecosystem Services
Ecosystems services are the benefits people obtain from ecosystems. These include provisioning services such as food and water, regulating services such as flood and disease control, cultural services such as spiritual, recreational, and cultural benefits, and supporting services, such as nutrient cycling, that maintains the conditions for life on earth.

Edge Resiliency Strategies
Restoration and reinforcement measures used to promoting ecological productivity and stabilization of sediments while protect uplands from the forces of erosion, sea level rise, and climate change. Edge resiliency strategies can be divided amongst four main strategies: landscape features, stabilization techniques, natural features, and nearshore structures.

Eel/Turtle Grass Beds
See Submerged Aquatic Vegetation

Estuary
These areas and their surrounding wetlands are bodies of water usually found where rivers meet the sea. Estuaries are home to unique plant and animal communities that have adapted to brackish water – a mixture of fresh water draining from the land and salty seawater. Estuaries are delicate and extremely diverse ecosystems.

Federal Emergency Management Agency (FEMA)
An agency of the United States Department of Homeland Security, whose primary purpose is to coordinate the response to a disaster that has occurred in the United States.

FEMA A-Zone
Areas subject to inundation by the 1 percent annual chance flood event without wave action. Mandatory flood insurance purchase and floodplain management standards apply.

FEMA Community Rating System (CRS)
The Community Rating System (CRS) recognizes and encourages community floodplain management activities that exceed the minimum NFIP standards. Depending upon the level of participation, flood insurance premium rates for policyholders can be reduced up to 45%. Besides the benefit of reduced insurance rates, CRS floodplain management activities enhance public safety, reduce damages to property and public infrastructure, avoid economic disruption and losses, reduce human suffering, and protect the environment.

FEMA National Flood Insurance Program (NFIP)
NFIP sets national building design and construction standards for new construction and substantial improvements (including buildings that have been substantially damaged) more than or equal to 50 percent of the value of the building in Special Flood Hazard Areas. NFIP underwrites flood insurance coverage only in communities that adopt and enforce floodplain regulations that meet or exceed NFIP criteria.

FEMA Special Flood Hazard Area (SFHA)
The SFHA is the portion of the floodplain subject to a 1% or greater change of inundation by the base flood, designated Zone A, AE, V, VE on a FIRM. Mandatory flood insurance purchase requirements and floodplain management standards apply. It is also called the 100 year flood zone or the base flood.

FEMA V-Zone
Areas along coasts subject to inundation by a 1% annual chance flood event with additional hazards associated with storm-induced waves over 3 feet high.

Fender
A piece of timber, bundle of rope, system of buoys, or the like, hung over the side of a vessel to lessen the shock or prevent chafing, such as between the vessel and a dock or another vessel. Fenders include systems to lessen the shock of mooring on a dock, pier, wharf, or the like.

Fens
Fens are peat-forming wetlands that receive nutrients from sources other than precipitation.

Fetch
Distance along open water over which wind blows. For any given shore there may be several fetch distances depending on predominant wind direction.

Fill
Man-made deposits of natural soils and rock products; may include organic matter and waste materials.

Floating Dock
Structures located on, in, or over public water; normally not connected to or otherwise in contact with the shoreline.

Floating Launches
Structures that provide access while floating on the water. Typically composed of a deck, frame, and floats, they are anchored to the shore.

Flood Resistant Material
Any building product capable of withstanding direct and prolonged contact with floodwaters without sustaining significant damage (prolonged contact means at least 72 hours).

Floodplain (100-year floodplain)
The land area susceptible to being inundated by stream derived waters with a 1% chance of being equaled or exceeded in any given year.

Floodproofing

Any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

- Dry Floodproofing (NYC Department of City Planning): Dry floodproofing makes a structure watertight up to at least the level of the DFE through the implementation of a sealant, flood shields, aquarium glass, strengthening structural components to resist hydrostatic forces from floodwaters, and protecting utilities from flood damage. Unlike wet floodproofing, the first floor of a dry-floodproofed structure can be at an elevation below grade or below the base flood elevation. Through dry floodproofing, building access can be maintained at grade with no apparent differences from a non-floodproofed condition. Dry floodproofing can present safety hazards during a flood event by blocking egress, so it is not allowed in entirely residential buildings.
- Dry Floodproofing (FEMA): A floodproofing technique that results in the building resisting penetration of flood water up to the DFE, with walls substantially impermeable to the passage of water and structural components having the capacity to resist specified loads. Under the NFIP standards, only non-residential buildings can use dry floodproofing. The purpose of dry floodproofing a building is to make it watertight using flood-resistant materials to floods of a limited duration and depth. Dry flood proofing reduces the potential for flood damage by reducing the probability that the building interior will be inundated.
- Wet Floodproofing (NYC Department of City Planning): Wet floodproofing allows buildings in the A Zone to be designed to allow floodwaters to enter and leave the structure without the use of any mechanical equipment. Spaces that are below grade on all sides are prohibited, and the lowest occupiable floor is required to be elevated above the BFE. To prevent the collapse of building walls, a wet-floodproofed building allows for the equalization of hydrostatic forces on both sides of the wall during a flood event. This is achieved with openings at the ground floor that allow water to flow in and out at an appropriate rate. Openings should be provided on at least two sides of the enclosed space and the bottom of each opening should not be more than 1 foot above grade level. Non-engineered openings need to provide at least 1 square inch of net open area for each square foot of enclosed space. Engineered openings are required to be certified by a registered professional and designed according to specific provisions.
- Wet Floodproofing (FEMA): A floodproofing technique designed to permit parts of the structure below the DFE to intentionally flood, by equalizing hydrostatic pressures and by relying on the use of flood damage-resistant materials. With this technique, parts of the building below the DFE are only to be used for parking, storage, building access or crawl space. Wet floodproofing includes permanent or contingent measures applied to a structure or its contents that prevent or provide resistance to damage from flooding while allowing floodwaters to enter the structure or area. Generally, this includes properly anchoring the structure, using flood resistant materials below the BFE, protection of mechanical and utility equipment, and use of openings or breakaway walls.

Fluted Elements

Grooves, furrows, or any modifications of the like built into the structure of a seawall, bulkhead, or any armoring structure to redirect wave energy.

Forested Swamp

Forested swamps are found throughout the United States. They are often inundated with floodwater from nearby rivers and streams.

Fragmentation (Habitat) Habitat fragmentation involves alteration of habitat resulting in spatial separation of habitat units from a previous state of greater continuity.

Freeboard An additional amount of height above the BFE to provide a factor of safety to address the modeling and mapping uncertainties associated with Flood Insurance Rate Maps, as well as a degree of anticipated future sea level rise. Vessel freeboard is the height of a vessel or a dock above the surface of the water

Gabions Structures composed of masses of rocks, rubble or masonry held tightly together usually by wire mesh so as to form blocks or walls. Sometimes used on heavy erosion areas to retard wave action or as a foundation for breakwaters or jetties.

Gangway Provides access from land or pier to a boat or craft.

Get-down A structural feature that provides public access to the water's edge.

Grasslands Grasslands are found where there is not enough regular rainfall to support the growth of a forest, but not so little as to form a desert.

Grazing Management In terms of ecosystem establishment, grazing management attempts to regulate the amount of predation upon target species within an ecosystem. Grazing management plans should incorporate population monitoring, predator deterrence measures, and plans for reestablishment of target species. Grazing management plans is not exclusive to fauna but flora as well (i.e., grazing management of asiatic shore crabs on oyster reefs).

Gray Water Waste Water that has not been contaminated by fecal matter or urine and can be used for irrigation purposes or other uses, after filtration.

Greenway A strip of undeveloped land near an urban area, set aside for recreational use or environmental protection.

Habitable Space All rooms and spaces within a dwelling unit, including bedrooms, living rooms, studies, recreation rooms, kitchens, dining rooms, and other similar spaces.

Habitat The physical location in which a population of plants or animals lives.

Habitat Patches An area of distinct habitat type. In landscape ecology, patches are spatial units at the landscape scale. Patches are areas surrounded by matrix, and may be connected by corridors. The geomorphology of the land interacting with climate factors, along with the other factors such as the establishment of flora and fauna, soil development, natural disturbances, and human influences work to determine patch size, shape, location, and orientation.

High-Albedo Pavement Materials ability to reflect the visible, infrared, and ultraviolet wavelengths of sunlight. Increased surface reflectance of pavement materials may be the most straightforward heat island reduction strategy, reducing absorption and reradiation of solar heat.

Human Disturbance An unnatural disturbance created by human action or activity such a clear cutting or habitat fragmentation.

Human-Powered Boat Launch

A human-powered boat launch means a place or facility, including beaches, ramps, dock structures, derricks, railways, hoists, trailers, or other devices from which or by which human-powered vessels are put or placed into or removed from the water, but shall not include such facilities, devices or structures used exclusively as part of a residential or association dock by the owner or the owner's family.

Hydrodynamic Assessment

A hydrodynamic model is a tool able to describe or represent in some way the motion of water.

Hydrodynamics

Hydrodynamic forces are imposed on an object, such as a building, by water flowing against and around it. Among the forces are positive frontal pressure against the structure, drag effect along the sides, and negative pressure in the downstream side. Hydrodynamic forces are one of the main causes of flood damage. Typical areas where hydrodynamic forces are of particular concern are along rivers and streams with high velocity floodwaters and coastal and other areas subject to wave forces.

Impervious Cover

(a) Those surfaces in the urban landscape that cannot effectively infiltrate rainfall consisting of building rooftops, pavement, sidewalks, driveways. Steep slopes and compact soils are not typically included as impervious cover. (b) Impervious cover is defined as all impermeable surfaces and includes: paved and gravel road surfaces, paved and gravel parking lots, paved driveways, building structures, paved sidewalks, and miscellaneous impermeable structures such as patios, pools, and sheds. Porous or modular block pavement may be considered 50% impervious. The measured area of a site plan that does not have permanent vegetative or permeable cover shall be considered total impervious cover.

Intertidal Zone

The land area between mean low water and mean high water that is inundated periodically by tides.

Landscape Features

An edge resiliency strategy that uses raised and/or lowered landscape topography to retard the upland advance of floodwaters and/or storm surges during storm events. These components can include but are not limited to raised planters, elevated greenways walkways/bikepaths, berms, and drainage ditches, among others.

Life Cycle and Service Life Assessment

A technique to assess the environmental aspects and potential impacts associated with a product, process, or service by compiling an inventory of relevant energy and material inputs and environmental releases; evaluating the potential environmental impacts associated with identified inputs and releases; interpreting the results in any decision making process.

Light Pollution

Light pollution is an unwanted consequence of outdoor lighting that includes such affects as sky glow, light trespass, and glare.

Living Breakwater

A man-made structure protecting a shore area, harbor, anchorage, or basin from waves incorporating nature based features.

Lowest Occupiable Floor

See Occupiable Space

Marina

A docking facility is any marina, boat basin, marine terminal and any other areas on navigable waters containing a single structure or a collection of related structures such as docks, piers, bulkheads, breakwaters and pilings used for the reception, securing and protection of boats, ships, barges or other watercraft.

Maritime Fouling The accumulation of unwanted material on solid surfaces, leading to the detriment of function on a maritime structure, vessel, or facility.

Mangrove Swamps Mangrove swamps are coastal wetlands found in tropical and subtropical regions. They are characterized by their halophytic shrubs and other plants growing in brackish to saline tidal waters. These wetlands are often found in estuaries where fresh water meets salt water and are infamous for their impenetrable maze of woody vegetation.

Mean Higher High Waterline (MHHW) The average height of the higher high waters over a 19-year period. For shorter periods of observation, corrections are applied to eliminate known variations and reduce the result to the equivalent of a mean 19-year value.

Mean High Water (MHW) The average of all high water heights observed over the National Tidal Datum Epoch.

Mean Sea Level (MSL) The arithmetic mean of hourly heights observed over the National Tidal Datum Epoch.

Mitigation (Compensatory) Compensatory mitigation refers to the restoration, establishment, enhancement, or in certain circumstances, preservation of wetlands, streams, or other aquatic resources for the purpose of offsetting adverse impacts.

Mitigation Banking In a designated mitigation area, the restoration, enhancement, creation, and, in exceptional circumstances, preservation undertaken to compensate in advance for adverse impacts to the aquatic ecosystem.

Mooring Field Any group of devices that is fixed in navigable waters to which a vessel can be made fast including buoys, chains, ropes, piles, spars, and dolphins.

Natural Features Are created and evolve over time through the actions of physical, biological, geologic, and chemical processes operating in nature. Natural coastal features take a variety of forms, including reefs (e.g., coral and oyster), barrier islands, dunes, beaches, wetlands, and maritime forests.

Natural Features An edge resiliency strategy that uses vegetated ecosystems and other coastal features to provide erosion control and restore the conditions of a natural shoreline environment. Natural features are created over time through many physical, biological, geologic, and chemical processes operating in nature and can attempt to be recreated through man-made restoration efforts.

Natural Resources Land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, and other such resources.

Nature Based Feature

Natural features are techniques and components implemented into the edge design that are composed of medium to large scale ecosystems and habitats that stabilize sediments, resist erosion, attenuate wave energy, retain stormwater, combat sea level rise, as well as provide a functional and productive ecological community. Natural features utilize but are not limited to existing ecosystems that have been naturally developed over time however man made ecosystems and restoration efforts are considered natural features since the end goal of these techniques is the creation of a self-sustaining ecosystem. Nature based features are those that mimic characteristics of natural features but are created by human design, engineering, and construction to provide specific services such as coastal risk reduction.

Nearshore Structure

An edge resiliency strategy that uses submerged, emergent, or floating structures to attenuate wave action and dissipate wave energy before reaching the shoreline. These features include but are not limited to living breakwaters, toe berms, and floating breakwater islands.

Non-Operations Building (Industrial)

Buildings whose primary use does not house critical equipment, materials, or infrastructure required in daily operations or manufacturing. Non-operations buildings include administration buildings, visitor centers, support offices, etc.

Occupiable Space

A room or enclosed space, other than a habitable space, designed for human occupancy or use in which individuals may remain for a period of time for rest, amusement, treatment, education, dining, shopping, employment, labor, or other similar purposes. See Habitable Space.

Ornamental Vegetation

Plants grown for the display of aesthetic features including: flowers, leaves, scent, overall foliage texture, fruit, stem and bark, and aesthetic form. These plants though aesthetically pleasing may not be native to the region or be a participant in regional ecology.

Pier

A structure at the water's edge that is not a "platform", a pile-supported overwater structure, or a portion thereof, that projects from a shoreline, bulkhead, or platform and has a seaward dimension that exceeds 50% of its dimension along the land or platform to which it is connected. (DCP ZR 62-11) For use within WEDG, credits that refer to a pier structure may also apply to a wharf or platform structure.

Pile

A long, heavy timber or section of concrete or metal that is driven or jetted into the earth or seabed to serve as a support or protection.

Platform

A pile-supported or solid-core structure at the water's edge, or a portion thereof that: is permanently connected to the land and has a seaward dimension that does not exceed 50% of its dimension along the land to which it is connected.

Propeller Wash "Propwash"

Water thrown backward by the motion of oars, propellers, paddle wheels, etc.

Range

The limits within which any fluctuation takes place a range of values.

Reach

A segment of a shoreline where influences and impacts, such as wind direction, wave energy, littoral transport, etc. mutually interact.

Revetments Bank protection by armor, that is, by facing a bank or embankment with erosion-resistant material.

Rip rap Layer of large stones used to protect soil from erosion in areas of concentrated runoff. Can also be used on slopes that are unstable because of seepage problems.

Riparian area The upland area along a shoreline, next to the water, marsh, or beach.

Rocky Intertidal The rocky intertidal is a marine zone that sits at the juncture of crashing ocean waves and rocky shorelines. It can take the form of exposed rocky cliffs, boulder rubble, wave pounded rocky shelves, and sheltered rocky shores.

Salt Marsh A grassland containing salt-tolerant vegetation established on sediments bordering brackish or saline water bodies where water level fluctuates either tidally or non-tidally within an estuarine system.

- Salt Marsh (High Marsh): The part of a marsh that lies between the low marsh and the marsh's upland border, and typically experiences less inundation than the low marsh which is reflected in the differences in vegetation species.
- Salt Marsh (Low Marsh): The seaward edge of a salt marsh, usually a narrow band along a creek or ditch which is flooded at every high tide, and exposed at low tide. Low marshes are usually set in more saline conditions within an estuarine system than a high marsh.

Sand/Pebble Beach A beach that is comprised of stones, boulder, or bedrock.

Seawalls Solid, vertical structures used to protect backshore areas from heavy wave action, and in lower wave energy environments, to separate land from water. They can be constructed using a range of materials; the most common being poured concrete, steel sheet pile, concrete blocks, gabions, and timber cribs.

Scour Scour is the removal by hydrodynamic forces of granular bed material in the vicinity of coastal structures.

Sediment Catchment A function of an ecosystem's geomorphology that captures sediments as they travel through the system.

Shoreline Configuration The bird's eye spatial profile and cross-sectional view of the shoreline and its components located at the waterfront edge.

Shoreline Equivalent to the Mean High Highest Waterline.

Shrub Swamp Shrub swamps are similar to forested swamps except that shrubby vegetation dominates. Forested and shrub swamps are often found adjacent to one another. The soil is often water logged for much of the year, and covered at times by as much as a few feet of water because this type of swamp is found along slow moving streams in flood plains.

Slip A berth designated between some sort of pile set, pier, or dock structure allowing land access to a vessel.

Slope Ground that has a natural incline.

Stabilization Techniques An edge resiliency strategy that uses both hard and soft structures to armor and stabilize the shoreline from erosion forces especially during storm events with high wave action. These techniques can include hardened structures, such as seawalls, bulkheads, revetments, and gabions, as well as softer structures such as dormant post planting, brush mattresses, and vegetated geogrids.

Stepped Pier Apron A stepped pier apron is the outer edge of a pier or wharf designated for the perimeter pier public access walkway that has a lowered elevation than the center of the pier in order to minimize the appearance of the railing while providing seating opportunities and the security of a railing that is sometimes necessary at the edge.

Storm Surge Storm surge is a rise in coastal water level associated with a hurricane or other strong coastal storm above the level associated with normal astronomical tides. The storm surge height is the difference between the observed storm tide and the astronomic or normal tide. Surge is produced by a combination of low pressure and the force of winds associated with intense storm systems. When a storm approaches the land, the storm surge "piles up" and leads to coastal flooding. This is distinct from riverine flooding or inland flooding caused by precipitation overwhelming the base flow capacity of a watershed's rivers and streams.

Stormwater Surface water from rain or other precipitation.

Stream Velocity The speed at which water flows through a stream. The higher the velocity, the greater the erosive force of the stream.

Submerged Aquatic Vegetative plants The aquatic plants are known collectively as submerged (or submersed) aquatic vegetation. SAVs generally include rooted vascular plants that grow up to the water surface but not above it (although a few species have flowers or tufts that may stick a few centimeters above the surface). The definition of SAV usually excludes algae, floating plants, and plants that grow above the water surface.

Swash Zone The zone of wave action on the beach, which moves as water levels vary, extending from the limit of run-down to the limit of run-up. The zone is characterized by a turbulent layer of water that washes up on the beach after an incoming wave has broken.

Tide The periodic rise and fall of a body of water resulting from gravitational interactions between the sun, moon, and earth; the vertical component of the particulate motion of a tidal wave. Although the accompanying horizontal movement of the water is part of the same phenomenon, it is preferable to designate this motion as tidal current.

Toxicity The quality, relative degree, or specific degree of being toxic or poisonous.

Underserved Area Areas in NYC where the amount of open space per 1000 residents is less than 2.5 acres.

Water Column An imaginary vertical column of water used as a control volume for computational purposes; usually the size of a unit area and as deep as the depth of water at that location.

Water-Dependent Use Water-dependent uses are uses that can only be conducted on, in, over, or adjacent to the water; each involves, as an integral part of the use, direct access to and use of the water.

Wave Action Waves have characteristics and effects as they move inland from an ocean, bay, or other large body of water. Large, fast-moving waves can cause extreme erosion and scour, and their impact on buildings can cause severe damage.

Wave Attenuation Wave attenuation is the reduction in wave energy or wave height that occurs when a wave passes through shallow water areas such as vegetation and structures. The energy of waves, tides, and currents is attenuated via frictional drag introduced by bottom friction in shallow water areas.

Wave Energy Wave energy is the transport of energy by ocean surface waves.

Wave Height The vertical distance between the trough and the following crest.

Wet Floodproofing See Floodproofing

Wet Meadows Wet meadows are a type of marsh that commonly occurs in poorly drained areas such as shallow lake basins, low lying farmland, and the land between shallow marshes and upland areas.

Wetland Migration As the sea rises along gently sloping stretches of undeveloped coastline, the landward migration of wetlands, causing a gradual transition from non-wetland to new wetland.

Wetlands Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes:

a) at least periodically, the land supports predominantly hydrophytes;
b) the substrate is predominately undrained hydric soil; and
c) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year. The term system refers to a complex of wetlands and deep water habitats that share the influence of similar hydrologic, geomorphologic, chemical, or biological factors.

Wharf A solid-core structure, or a portion thereof, constructed for the docking of vessels, that projects from the land or from a platform and has a seaward dimension that exceeds 50% of its dimension along the land or platform to which it is connected.

Working Edge The Working Edge is designated for edges whose primary focus is accessibility of industrial water-dependent uses such as docking, berthing, mooring, loading, unloading, and other vessel-based activities. Working edges are a vital component of activating the working waterfront in urban cities and heavily employ the use of structural elements in order to accommodate vessels.

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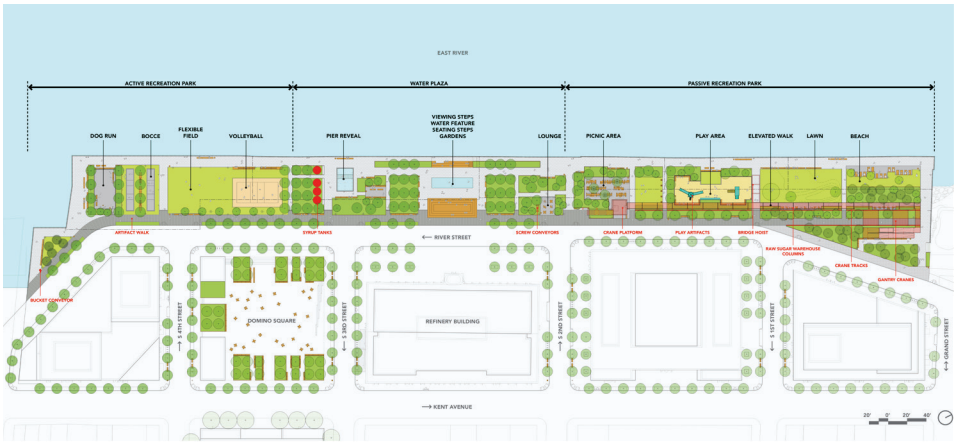
Appendix

Residential / Commercial Domino Sugar Site

Two Trees' Domino Sugar site reconnects South Williamsburg to its waterfront and incorporates elements of the historic Domino Sugar factory. The project addresses the unique conditions along the East River, focusing on enhanced public access to the waterfront and resilient strategies in response to climate change conditions. A new five-block-long waterfront edge will replace the dilapidated, existing bulkhead and will be raised to support a world-class waterfront park built with storm-resistant materials and high-performance landscapes featuring large areas of native and resilient vegetation. The design elements found below contributed to its designation.

shop architects

The Domino Sugar site is located on the South Williamsburg waterfront in Brooklyn.



field operations

- Building footprints are set back, outside of the floodplain, as a resilient strategy to reduce the risk of flooding.
- The relieving platform supporting the waterfront public access area will be renovated, with the timber structure replaced by a concrete structure that will be elevated above the floodplain. The multi-level waterfront park will include a pier reveal to bring light and air to the park's lower areas and expose and feature the historic, preserved wood piles.
- Overall access and east-west connections to the waterfront will be improved, with streets and view corridors extended to the elevated park, reconnecting upland areas to the water.
- The waterfront park, a combination of active and passive areas and informed through community outreach, includes recreational fields and courts and a dog run to the south; native plant gardens and gathering spaces in the center; and picnic areas, a large lawn, and a play space to the north.
- The waterfront park is 43% vegetated with large areas of native and resilient vegetation, and there are 169 new proposed street trees.
- A five-block-long Artifact Walk integrates large-scale historical objects with the waterfront park. The 80-foot gantry cranes that once loaded sugar and the 425-foot-long rails on which they rolled will be preserved and integrated into this interpretative walk.

1	Site Selection & Planning	**31** / 43
2	Public Access & Interaction	**64** / 96
3	Edge Resiliency	**30** / 102
4	Ecology & Habitat	**42** / 68
5	Materials & Resources	**10** / 40
6	Operations & Maintenance	**12** / 32
7	Innovation	**5** / 20

TOTAL **194** / 401
Certification is at +130 Points

Parks Brooklyn Bridge Park

Brooklyn Bridge Park exemplifies the principles of the WEDG program to balance and support access, resiliency, and ecology, and its high score reflects its designers and operators' attention to sustainability. This award-winning, regional park serves over 4 million visitors each summer with robust programming and events for all types of uses and interests. The design elements found below contributed to its designation.

michael van valkenburgh associates

Brooklyn Bridge Park is an 85-acre park stretching along the East River waterfront from Atlantic Avenue to north of the Manhattan Bridge in DUMBO.

michael van valkenburgh associates

- Rehabilitation of piles throughout the park increases its longevity and sustainability. Measures include pilot designs such as pile encapsulation that reduces CO_2 emissions and attracts marine life.
- A state-of-the art green marina with berthing for 120 boats of a variety of sizes will subsidize free and low-cost boating opportunities. Ten percent of the marina's dock space will be shared with community partners for kayaking, fishing, and sailing programs.
- Replacing vertical-walled bulkheads with more permeable, resilient materials such as rip rap and vegetation encourages marine growth, increasing the diversity and availability of habitat for birds and other wildlife.
- The park's extensive use of native plants creates multiple habitats supporting a diverse range of species. Stormwater collected from the park's landscape and adjacent buildings is circulated through a series of above-ground landscape elements that function as ecological treatment systems prior to entering underground storage. The stored water supplies much of the park's irrigation needs.
- Multiple beaches, get-downs, and launches bring people and their vessels to and into the water, a rarity in New York City.
- The park includes extensive repurposing of salvaged materials. Site structures were carefully deconstructed so that materials could be reused in the park's design. Materials repurposed from nearby NYC DOT and MTA projects can also be seen throughout the park.

1	Site Selection & Planning	**17** / 32
2	Public Access & Interaction	**64** / 78
3	Edge Resiliency	**68** / 102
4	Ecology & Habitat	**48** / 66
5	Materials & Resources	**26** / 39
6	Operations & Maintenance	**16** / 20
7	Innovation	**5** / 20

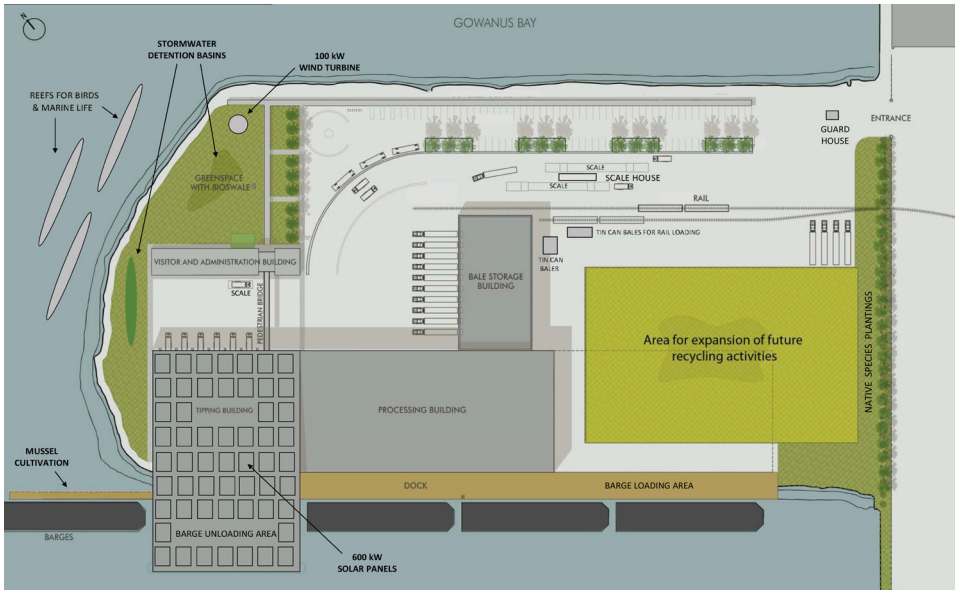
TOTAL **244** / 357
Certification is at +130 Points

Industrial / Maritime
Sunset Park Materials Recovery Facility

The Sunset Park Materials Recovery Facility (MRF) was awarded the first-ever "WEDG-certified" designation at MWA's annual Heroes of the Harbor Gala on October 6, 2014. The Sunset Park MRF is the anchor to NYC's curbside recycling program, handling a majority of the city's recyclables. After more than a decade of planning, design, permit acquisition, and construction, Sims Metal Management, an international recycling company, opened this state-of-the-art recycling plant on the Sunset Park waterfront in December 2013. The facility exemplifies the principles of the WEDG program by providing enduring resiliency, sustainable ecology, and engaging public access, all within an industrial/maritime use. The design elements found below contributed to its designation.

john majors, aerial & architectural photos of nj

The Sunset Park Materials Recovery Facility is located on the Sunset Park waterfront in Brooklyn.



- Portions of the wharf, recycling equipment, electrical substations, and buildings were raised at least 4 feet above 100-year floodplain to combat sea level rise and climate change.
- Viable habitat for coastal birds and aquatic biota was increased substantially through the integration of approximately 50,000 square feet of natural green space and three nearshore breakwater reefs built from material dredged from the Kill van Kull.
- The Recycling Education Center and educational amenities throughout the facility provide safe access and a first-hand user experience for the community and school groups.
- The sustainable stormwater system increased permeable infiltration through the use of native vegetation bioswales and green space to capture and detain stormwater, preventing contributions to NYC's combined sewer systems.
- More than 60% of the waterfront is a more resilient edge that integrates a large stone revetment with a deep-root vegetated buffer zone.
- Most material is transported to and from the facility by barge, which is twice as efficient as rail transport and ten times as efficient as trucking.

1	Site Selection & Planning	**32** / 54
2	Public Access & Interaction	**30** / 38
3	Edge Resiliency	**58** / 96
4	Ecology & Habitat	**22** / 36
5	Materials & Resources	**20** / 49
6	Operations & Maintenance	**8** / 24
7	Innovation	**5** / 20

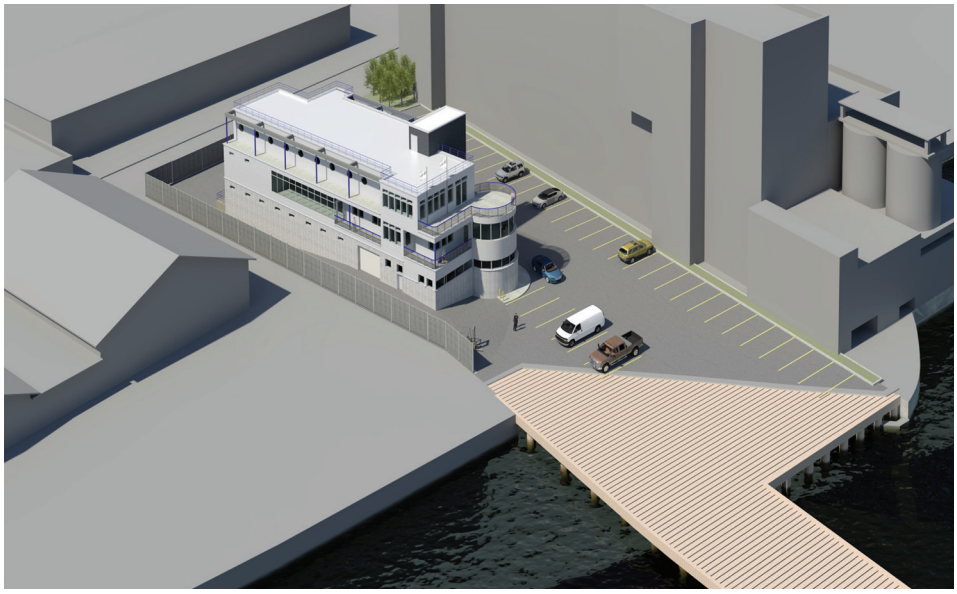
TOTAL **175** / 317
Certification is at +100 Points

Industrial / Maritime
Sandy Hook Pilots Association Headquarters

The Sandy Hook Pilots Association has a rich and storied tradition of piloting larger vessels in New York Harbor, Hudson River, Hell Gate, and Long Island Sound since the 17th century. A critical maritime institution, they pilot more than 10,000 ships annually—all foreign-flag and U.S.-regulated vessels—and have responded to numerous emergencies throughout the region over the years. Their former Staten Island headquarters was destroyed by Superstorm Sandy in 2012, and they decided to build back better and stronger, ensuring they passed on a more resilient facility to future generations. The new state-of-art facility, built from the ground up, overlays resiliency in all aspects of it design, while also being a good neighbor to the local community. The design elements found below contributed to its designation.

glen v. cutrona associates

The Sandy Hook Pilots Association's new headquarters will be completely rebuilt on its North Shore, Staten Island, property.



glen v. cutrona associates

- Amenities for the local community include a more transparent site perimeter to maximize views to the waterfront, a historical display regarding the role of the pilots in the maritime industry, and educational partnerships and programs with local high schools and SUNY Maritime College.
- Designers evaluated future vulnerabilities to assess how rising sea levels, higher and more frequent storm surges, and other coastal flooding would affect the facility, and raised the building outside of the floodplain as a resilient strategy.
- Storm-resilient materials, such as a zinc-titanium exterior, were used.
- In case of emergencies, redundancies were built in and include back-up generators, communications systems and servers, and raised electrical equipment and materials.
- The facility employs over 100 persons, preserving the vital working waterfront within the port of New York and New Jersey.
- The reconstructed edge includes a new bulkhead to provide stability and withstand future climate conditions, removes old debris and historic fill, and avoids building into the water. Later, the bulkhead will be cathodically protected to prevent corrosion.

1	Site Selection & Planning	**34** / 54
2	Public Access & Interaction	**18** / 38
3	Edge Resiliency	**32** / 96
4	Ecology & Habitat	**16** / 36
5	Materials & Resources	**24** / 49
6	Operations & Maintenance	**8** / 24
7	Innovation	**0** / 20

TOTAL **132** / 317
Certification is at +100 Points

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Design
Pentagram

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