LOWER MANHATTAN COASTAL RESILIENCY PROJECT – BATTERY

CB1 Environmental Committee Meeting

Sept 21, 2021

NYC/EDC NYC Parks Stantec

Stantec team

Greg Sprich

PE, ENV SP

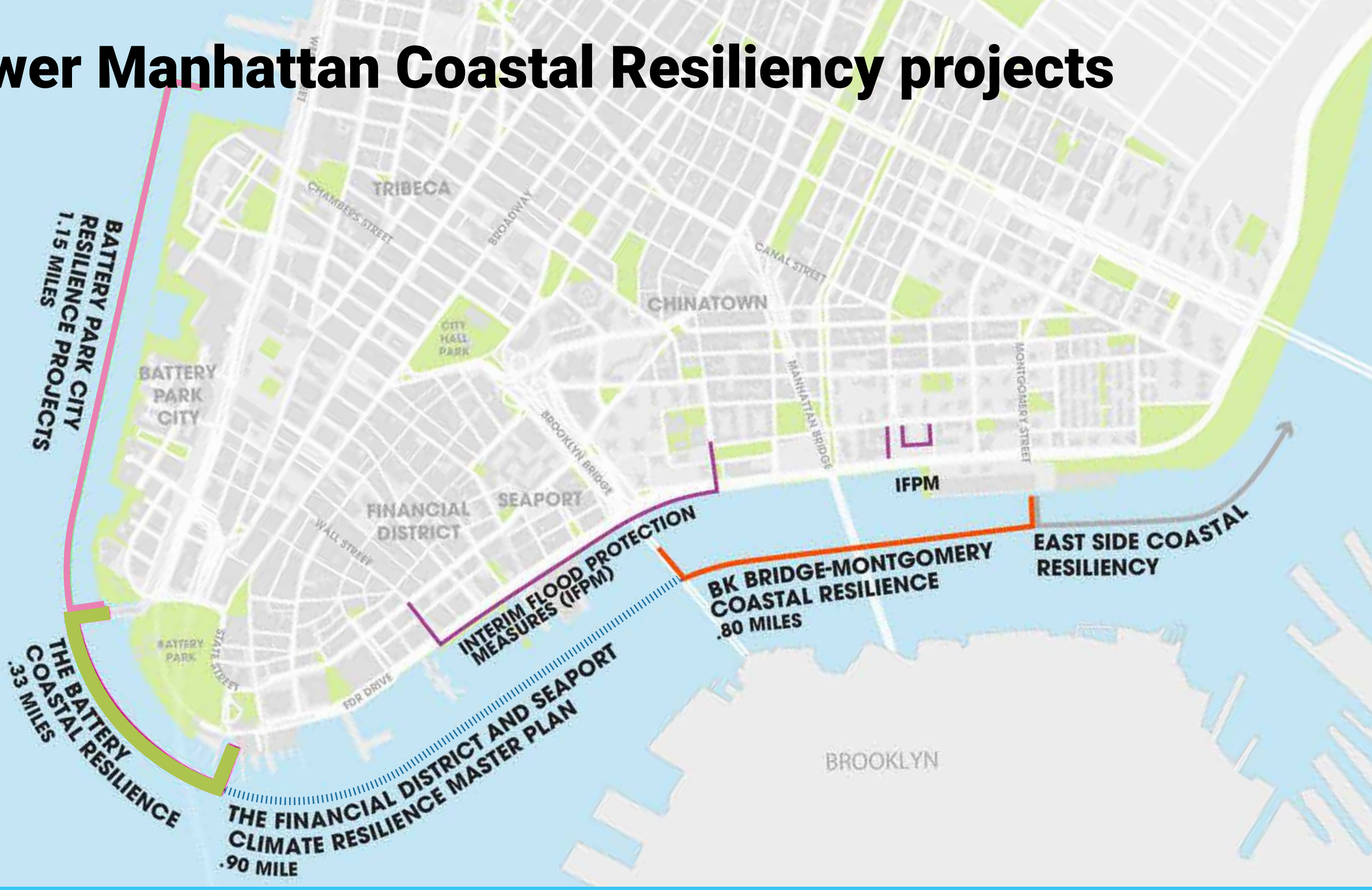
PROJECT MANAGER / CIVIL ENGINEER

Amy Seek

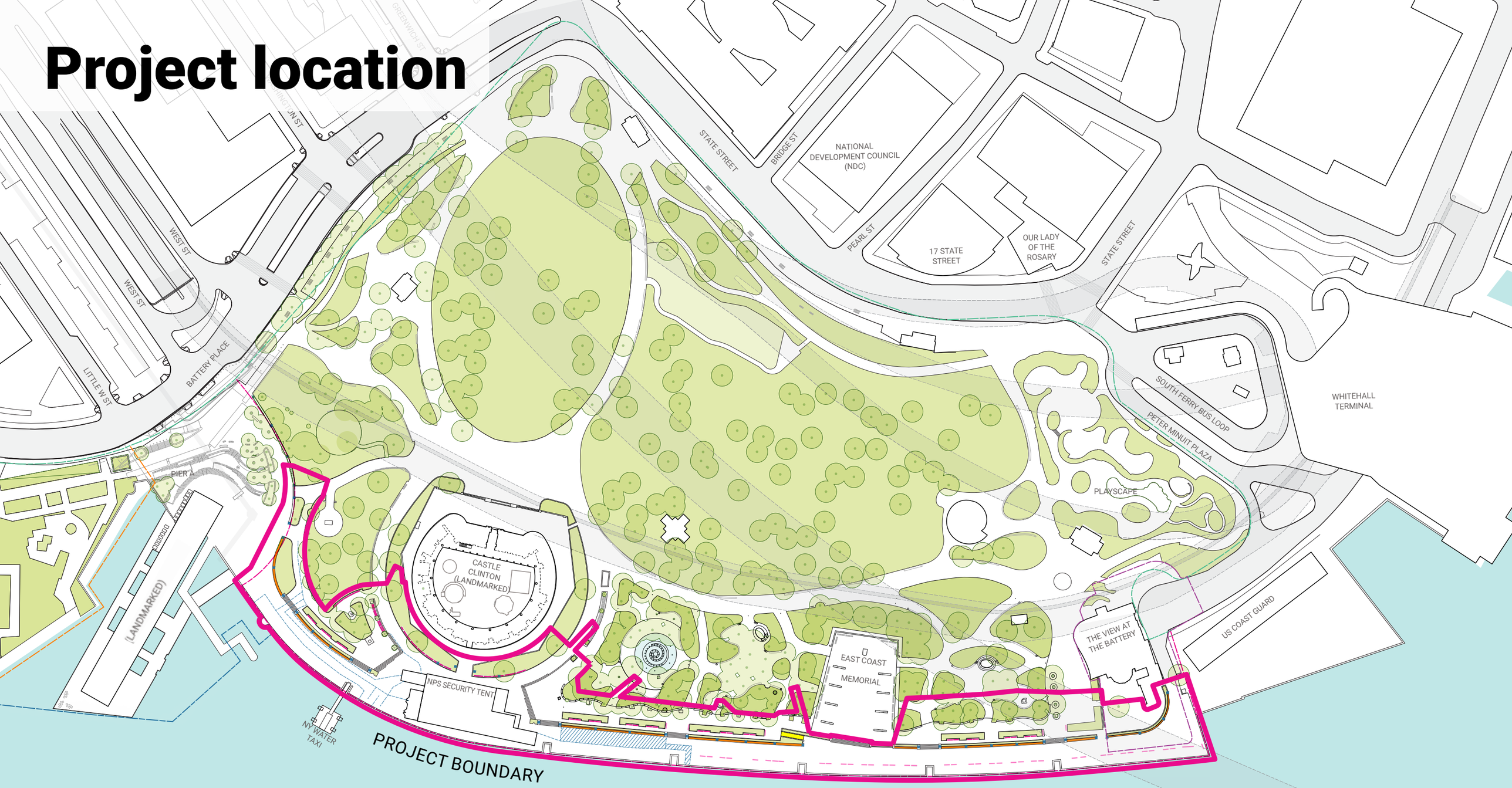
RLA, WEDG

LANDSCAPE ARCHITECTURE LEAD

Lower Manhattan Coastal Resiliency projects



Project location

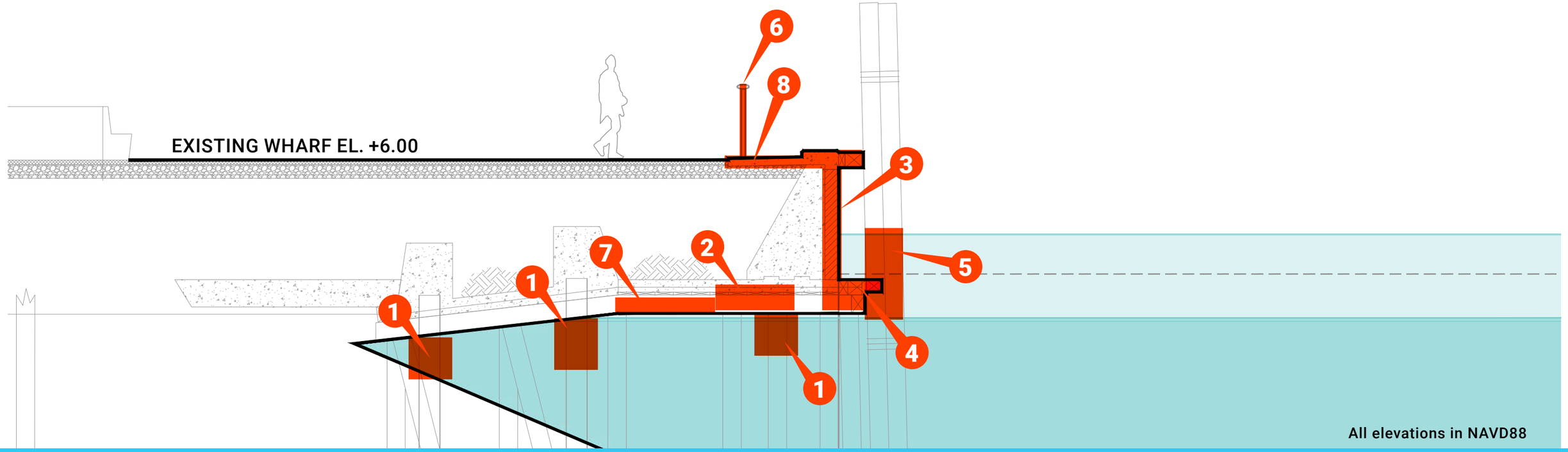


Wharf Condition

The wharf is in poor condition

WHARF CONDITION

1. SECTIONS OF TIMBER PILES MISSING DUE TO ROT
2. STRUCTURAL CRACK IN CONCRETE CAP
3. EXPOSED CONCRETE GRAVITY WALL FACE DUE TO COLLAPSING GRANITE BLOCK FASCIA
4. DAMAGE TO TIMBER LINE CAP
5. MARINE DEGRADATION AND TIMBER ROT
6. DAMAGED SEA RAIL
7. DAMAGED DECK
8. SINKHOLES

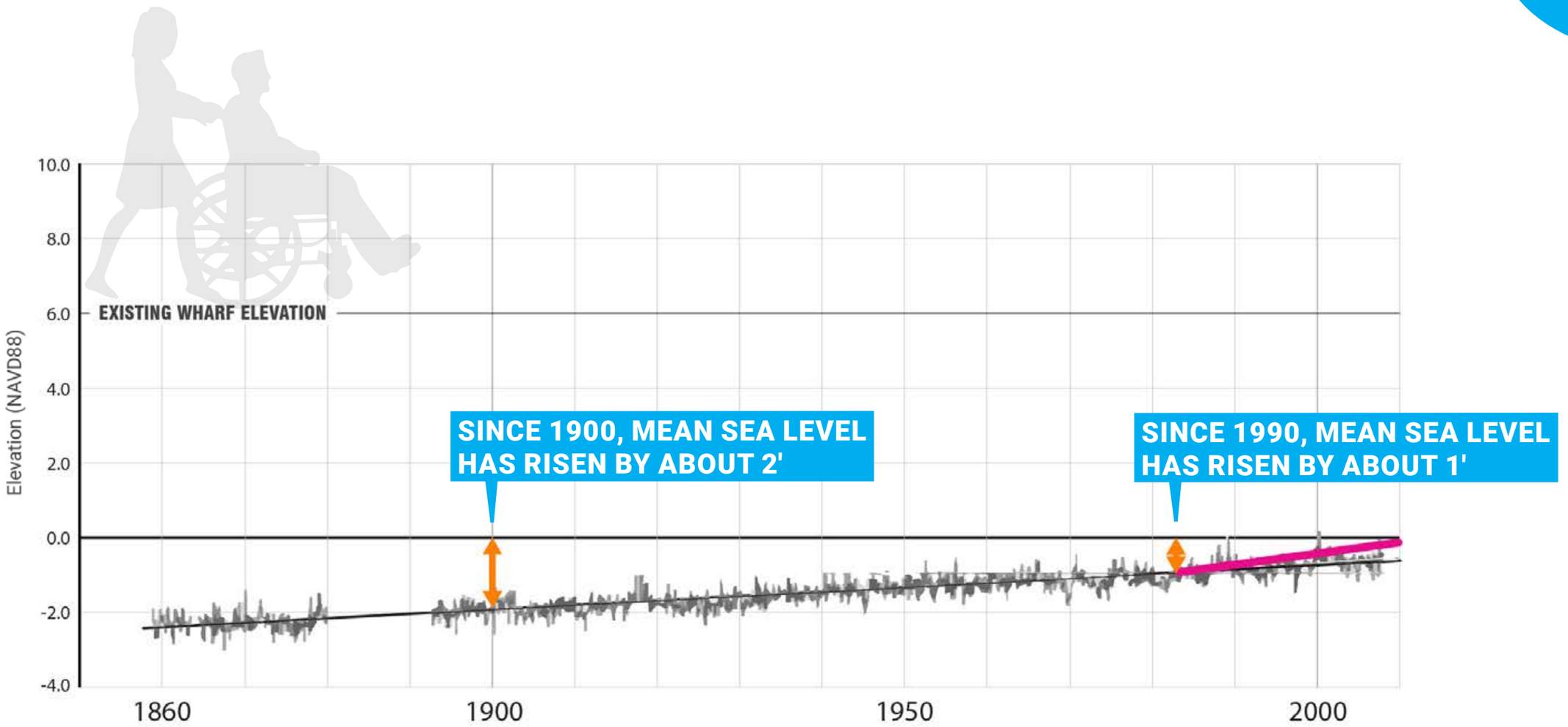


All elevations in NAVD88

Climate Context

Relative sea level rise at the Battery

CLIMATE CONTEXT

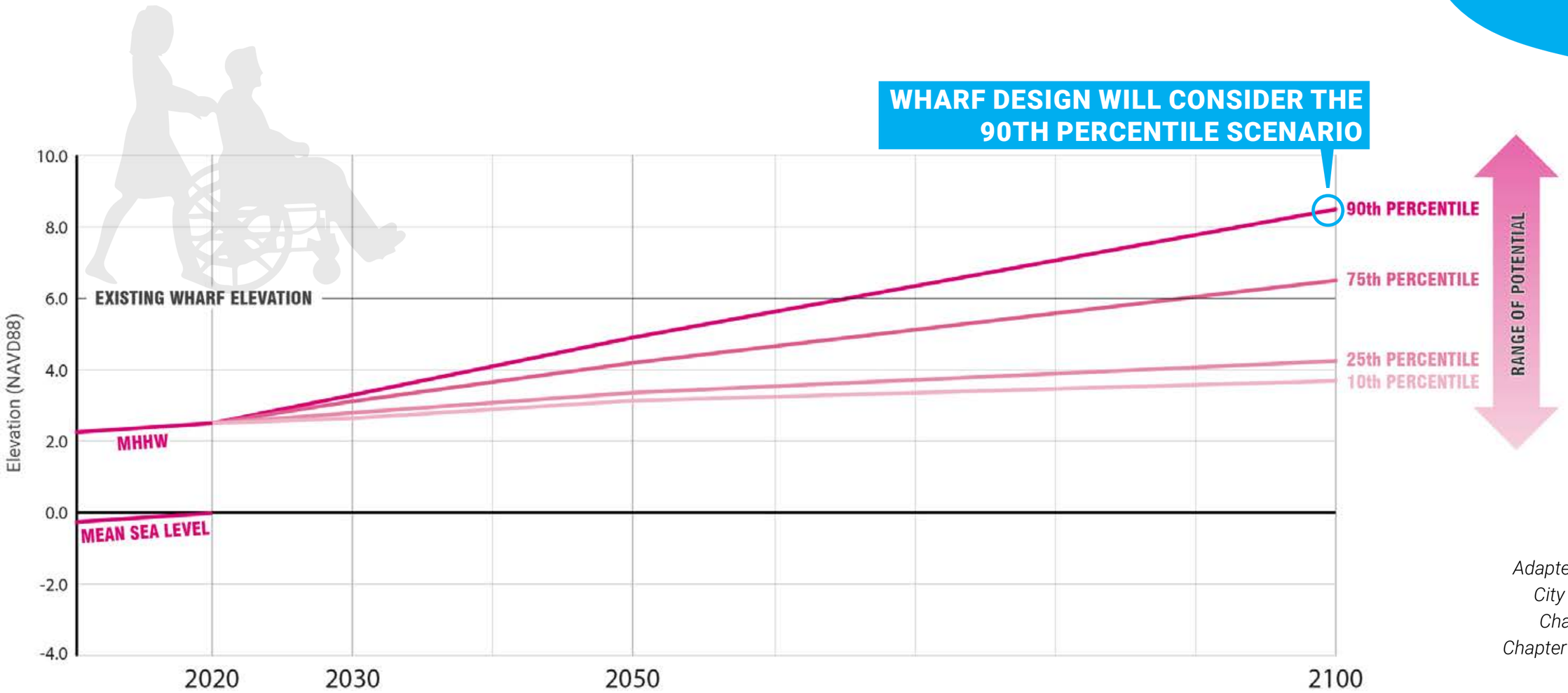


Adapted from New York City Panel on Climate Change 2019 Report Chapter 3: Sea Level Rise

We are seeing a new, more extreme, trendline starting in the 1990s.

Designing with uncertainty

CLIMATE CONTEXT



Adapted from New York City Panel on Climate Change 2019 Report Chapter 3: Sea Level Rise

2021 MHHW

CLIMATE CONTEXT

PRESENT DAY MHHW IS 3.5' BELOW THE WHARF

2050 MHHW if wharf remains at current elevation

CLIMATE CONTEXT

MHHW IS 1’ BELOW THE WHARF

DAILY INUNDATION OF BOAT SLIPS

2080 MHHW if wharf remains at current elevation

CLIMATE CONTEXT

MHHW INUNDATION REACHES 1' ABOVE THE WHARF

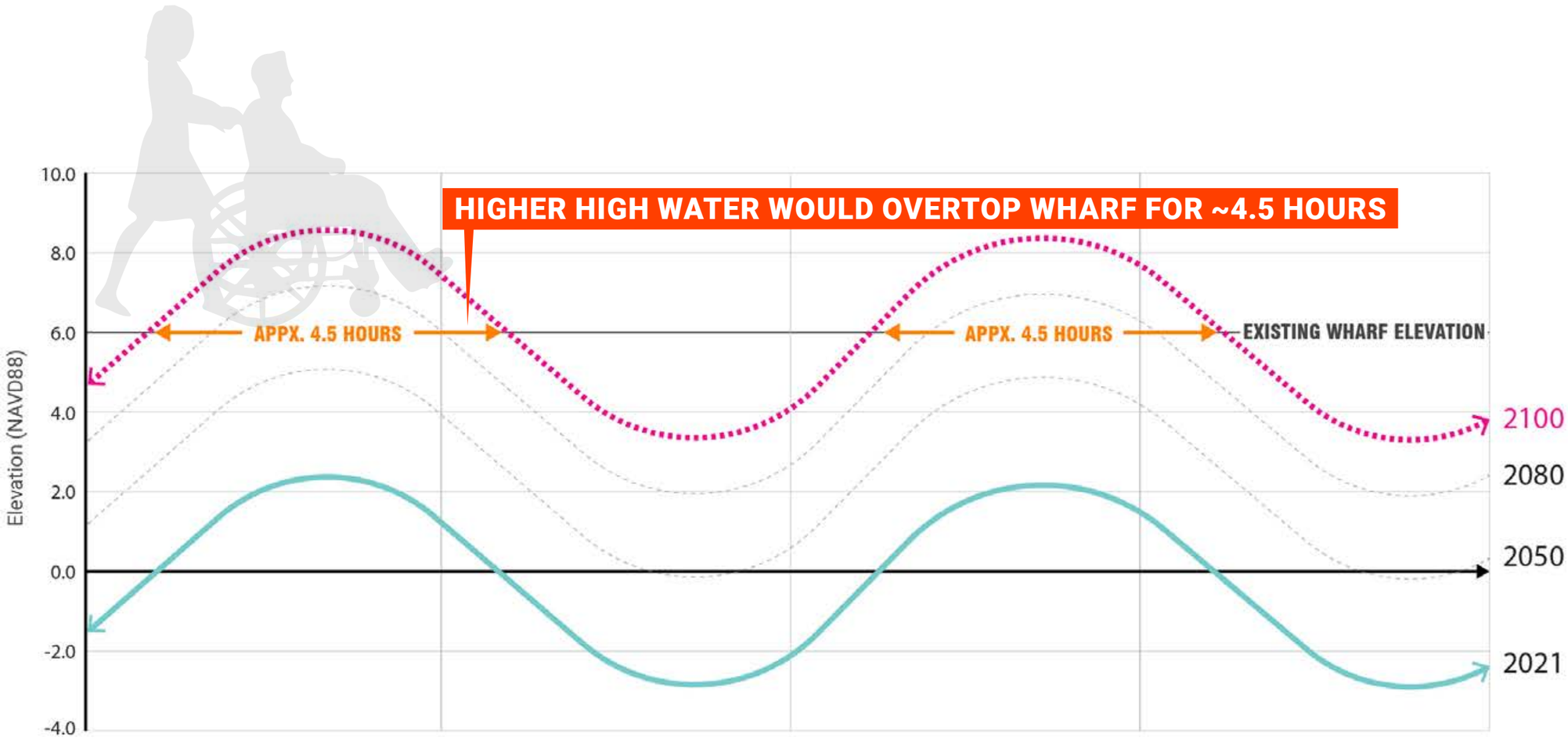
2100 MHHW if wharf remains at current elevation

CLIMATE CONTEXT

MHHW INUNDATION REACHES 2.5' ABOVE THE WHARF

2100 daily water levels

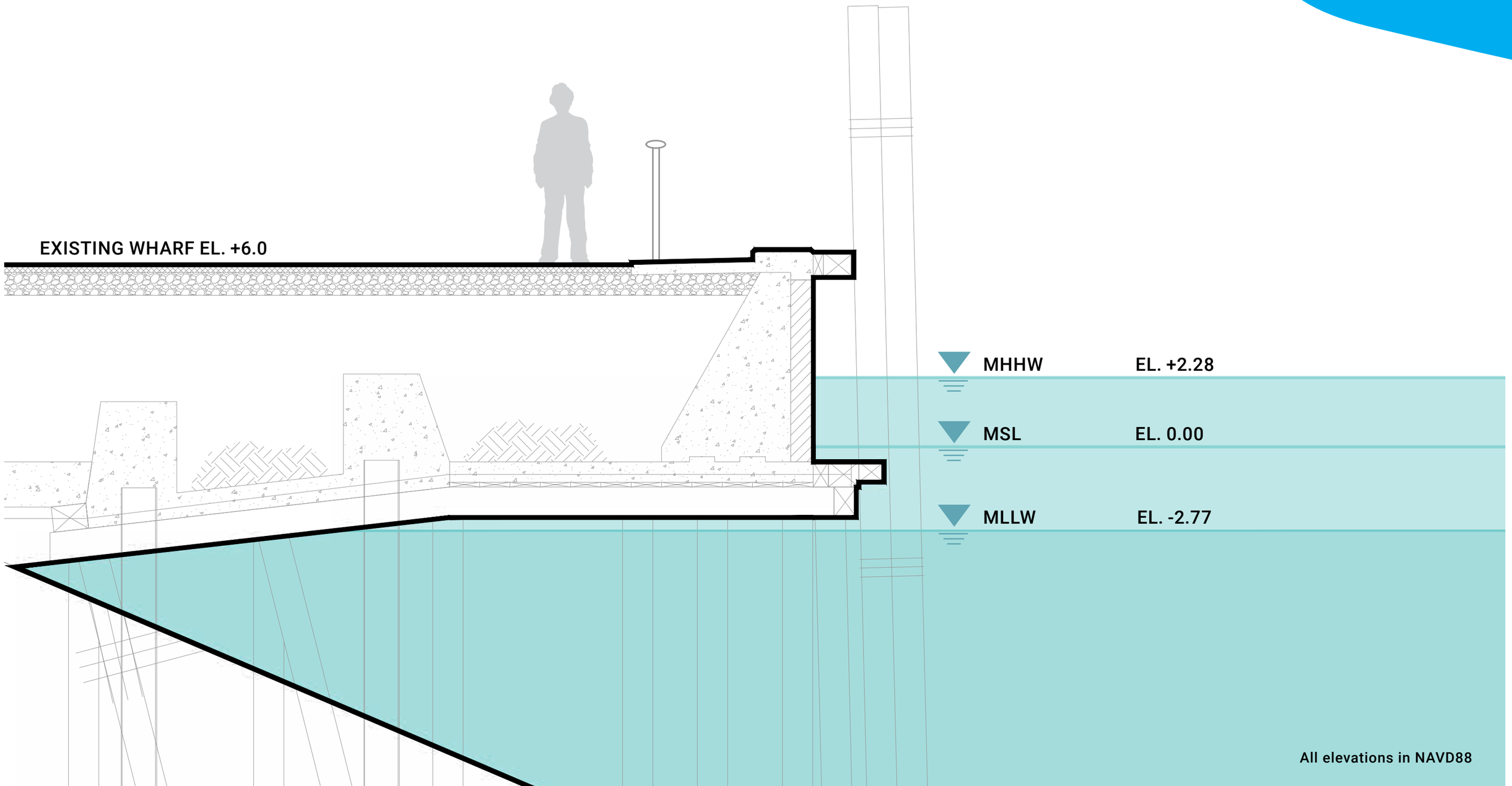
CLIMATE CONTEXT



Design Criteria

Wharf elevation

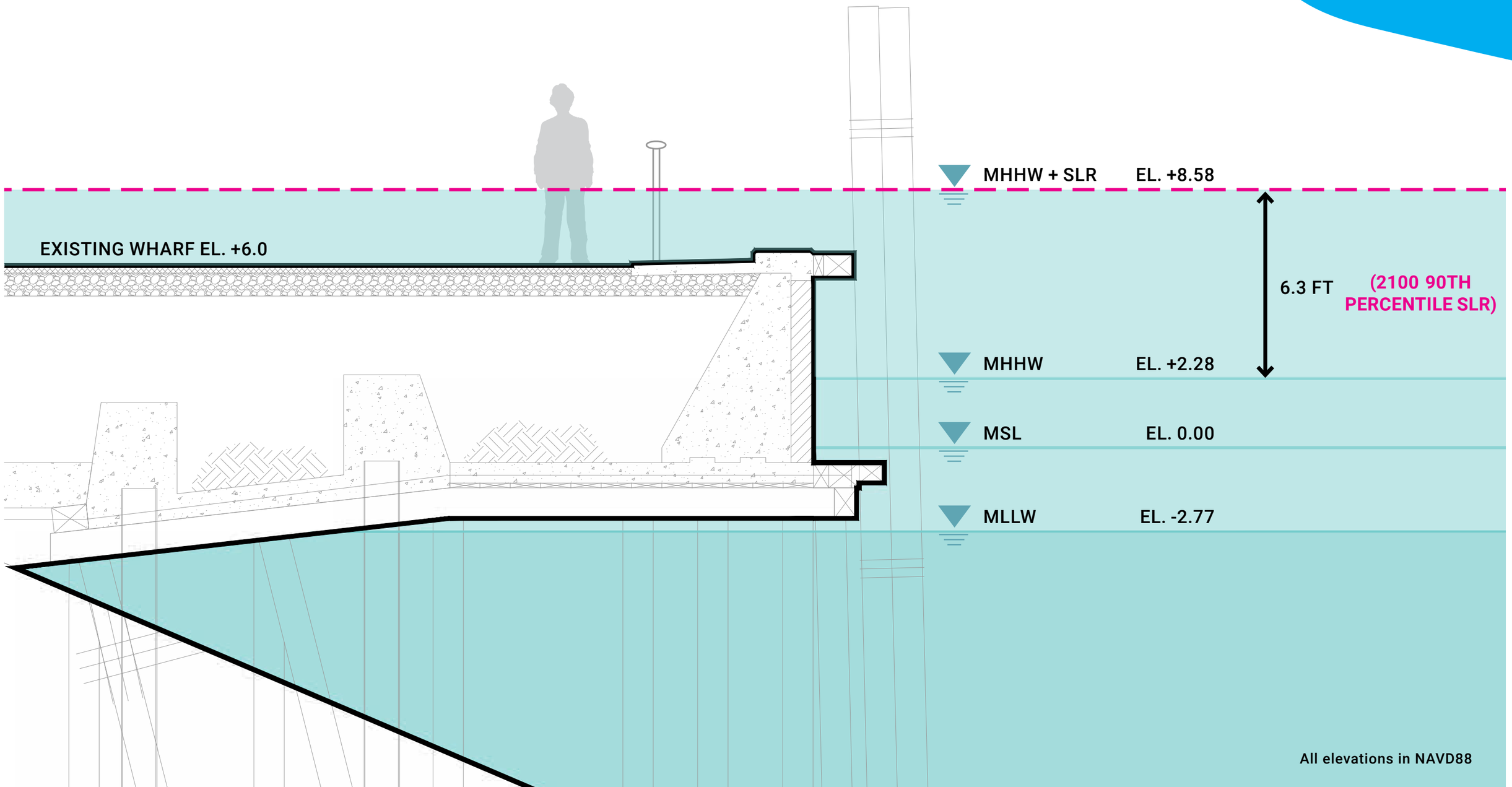
DESIGN CRITERIA



All elevations in NAVD88

Wharf elevation

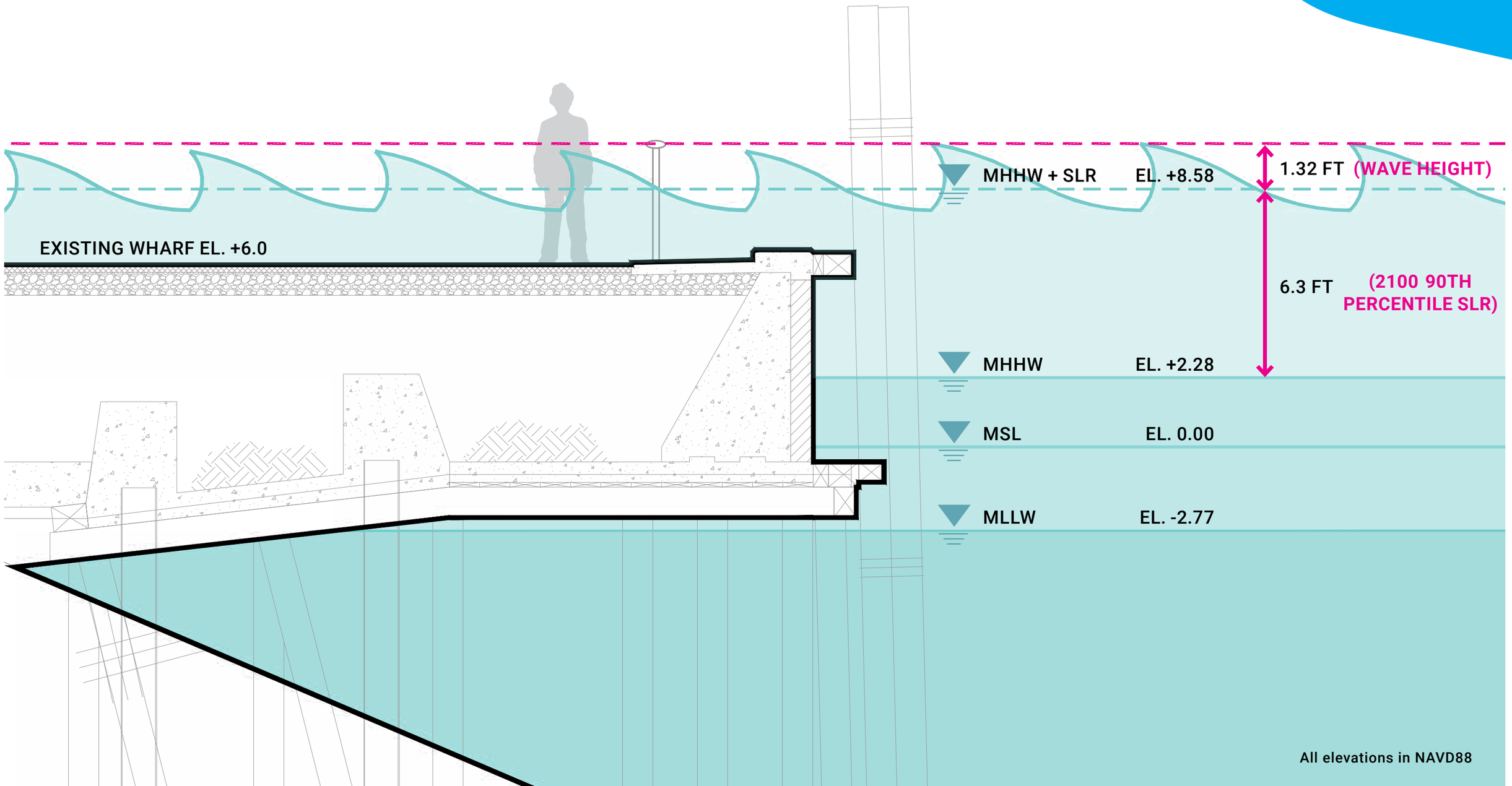
DESIGN CRITERIA



All elevations in NAVD88

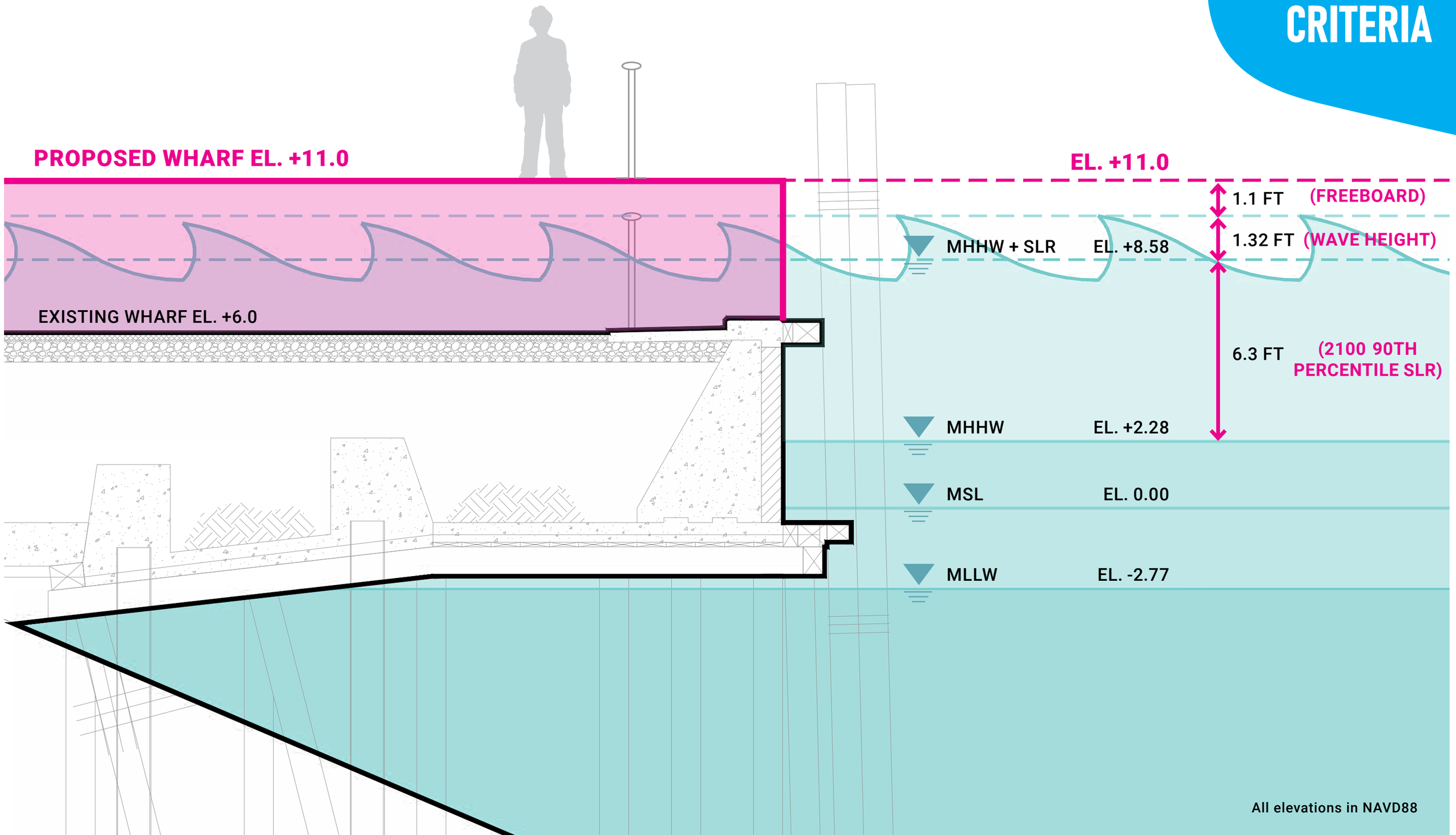
Wharf elevation

DESIGN CRITERIA



Wharf elevation

DESIGN CRITERIA



All elevations in NAVD88

LMCR project coordination

DESIGN CRITERIA

EL. +18.5

SOUTH BATTERY PARK CITY RESILIENCY PROJECT
100-YEAR STORM SURGE +
2050 SEA LEVEL RISE (30")

COORDINATION POINT

FINANCIAL DISTRICT AND SEAPORT CLIMATE RESILIENCE MASTER PLAN
CRITERIA AND DESIGN TBD

EAST END TIE-IN OPT 1
DESIGN ELEVATION AT +11 TO PROTECT FROM 2100 SEA LEVEL RISE (75")

EL. +11.0

EAST END TIE-IN OPT 2
DESIGN ELEVATION AT +11 TO PROTECT FROM 2100 SEA LEVEL RISE (75")

EL. +11.0

LOWER MANHATTAN COASTAL RESILIENCY PROJECT – BATTERY
DESIGN ELEVATION AT +11 TO PROTECT FROM 2100 SEA LEVEL RISE (75")

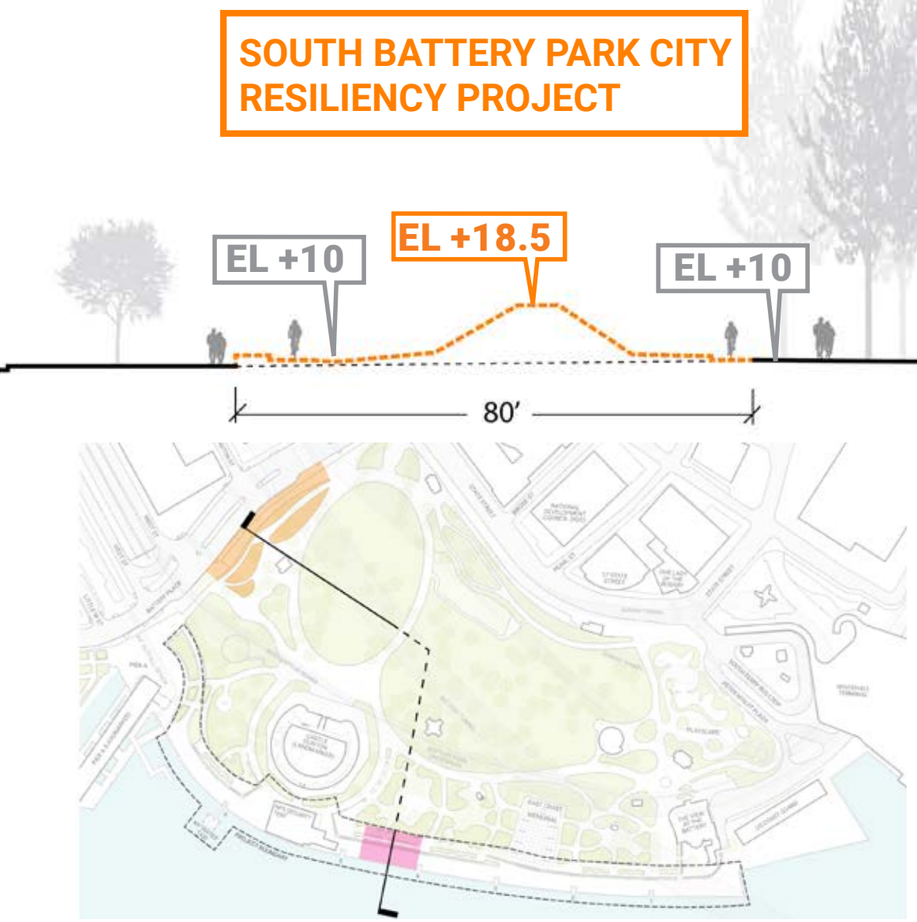
EL. +11.0

NATIONAL DEVELOPMENT COUNCIL (NDC)
17 STATE STREET
OUR LADY OF THE ROSARY
STATE STREET
BRIDGE ST
PEARL ST
WASHINGTON ST
WEST ST
LITTLE W ST
BATTERY PLACE
PIER
PIER A (LANDMARKED)
NPS SECURITY TENT
EAST COAST MEMORIAL
PLAYSCAPE
THE VIEW AT THE BATTERY
BATTERY PARK
0' 50' 100' 200'
N

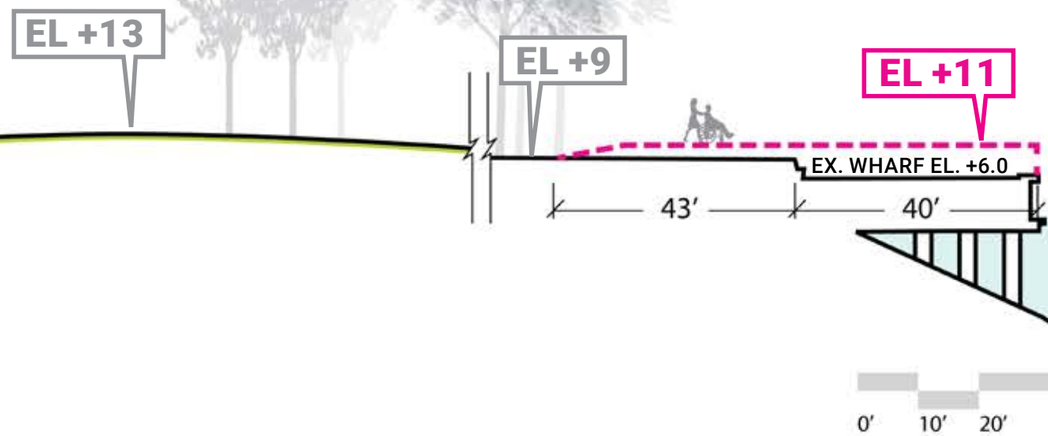
Coordinated adaptation projects

DESIGN CRITERIA

SOUTH BATTERY PARK CITY RESILIENCY PROJECT



LOWER MANHATTAN COASTAL RESILIENCY PROJECT – BATTERY



Understanding the Site

Existing access to wharf

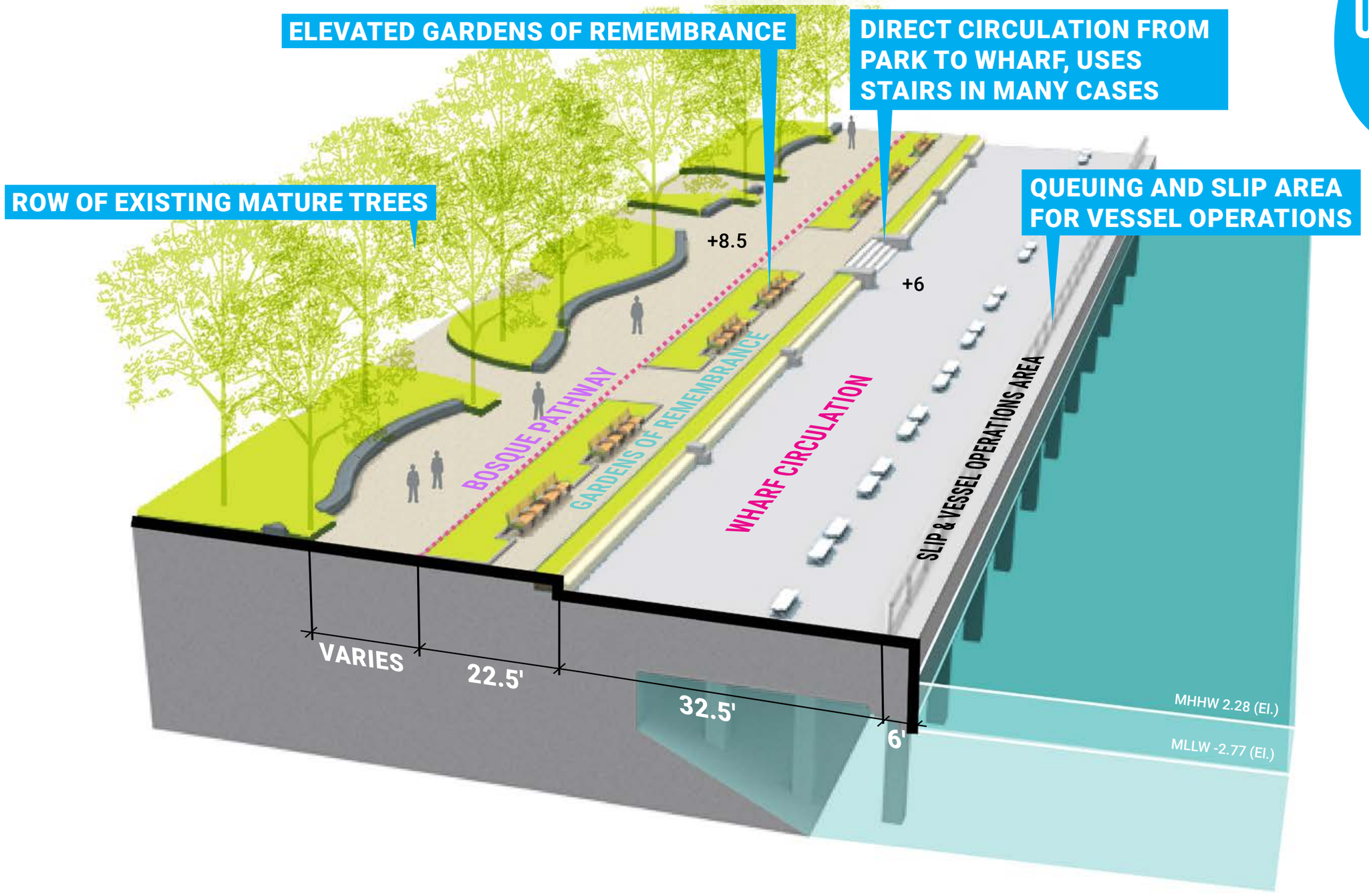
LEGEND

- PARK ENTRANCE
- PRIMARY PATH TO WHARF
- SECONDARY PATH TO WHARF
- STAIRS
- RAMPS / SLOPED PATHWAYS
- MOVABLE SECURITY FENCING
- INACCESSIBLE FOR REPAIRS

0' 50' 100' 200'

N

Current typical wharf segment



Seating

GARDENS OF REMEMBRANCE BACKED BENCH

GRANITE BACKED BENCH

BACKLESS BENCH

Incidental views

UNDERSTANDING
THE SITE

Framed views

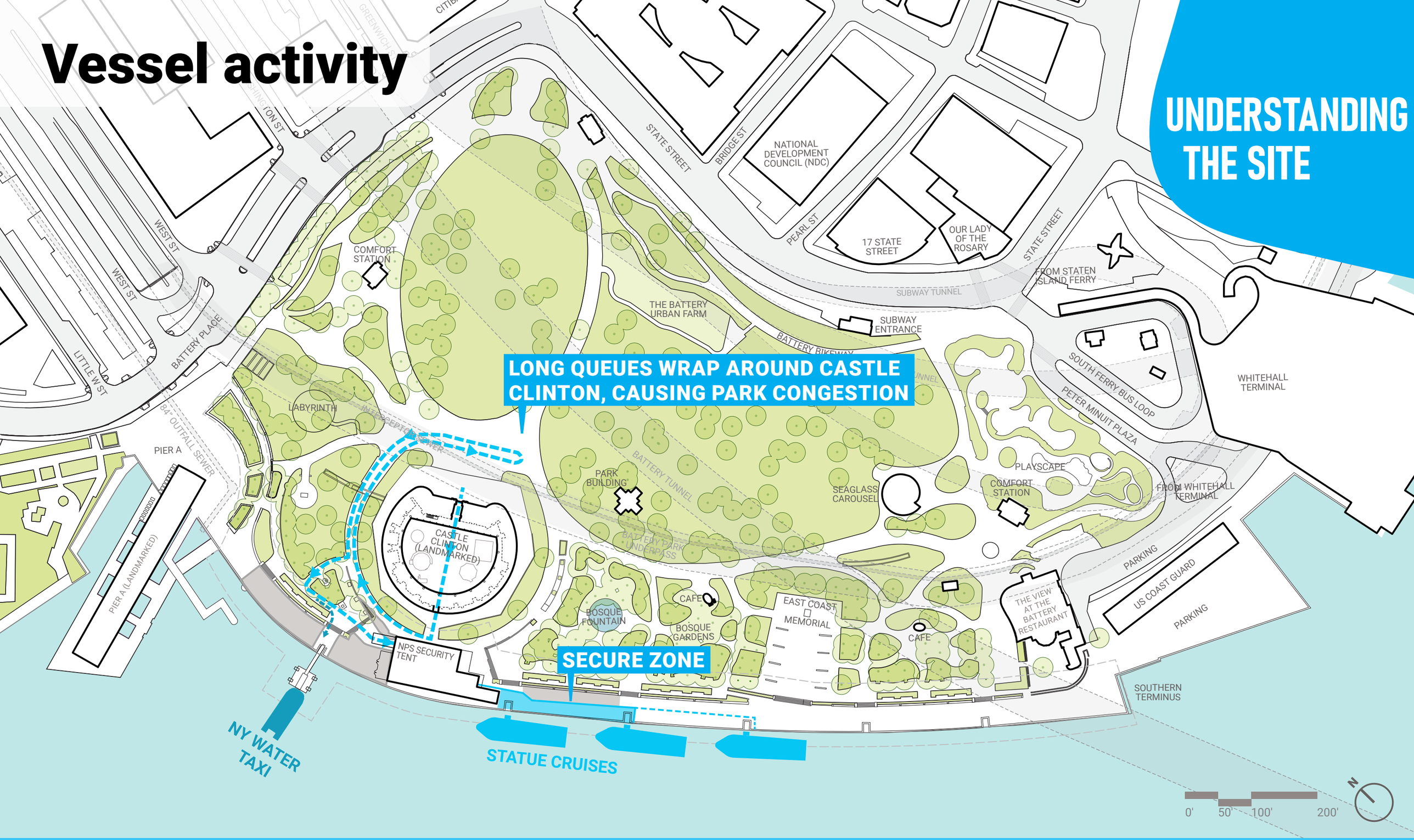
View of the water horizon

Current water view from bosque

Proposed reduced view of water, with preserved water horizon

Vessel activity

UNDERSTANDING THE SITE



Design goals

Prepare for Climate Change

1. Reconstruct and elevate the wharf approximately 5 feet to address its deteriorating condition while also taking into account future sea level rise.
2. Tie into adjacent resilience projects.
3. Improve drainage.

Support Site Uses

1. Accommodate Statue of Liberty, Ellis Island, and Water Taxi vessels during and after construction.
2. Prioritize universal design.
3. Maintain sufficient seating.

Preserve and Enhance Park Character

1. Maximize visibility of water/edge.
2. Minimize disturbance to physical structures, view corridors, and character of park.
3. Conserve existing artworks.
4. Minimize adverse impacts on historic structures and trees.
5. Reuse existing site materials.
6. Maximize sustainability of design/ construction.
7. Provide new planting and public amenities.
8. Protect the park's historic resources.

Design Concept

Existing Plan

EXISTING QUEUE 2015

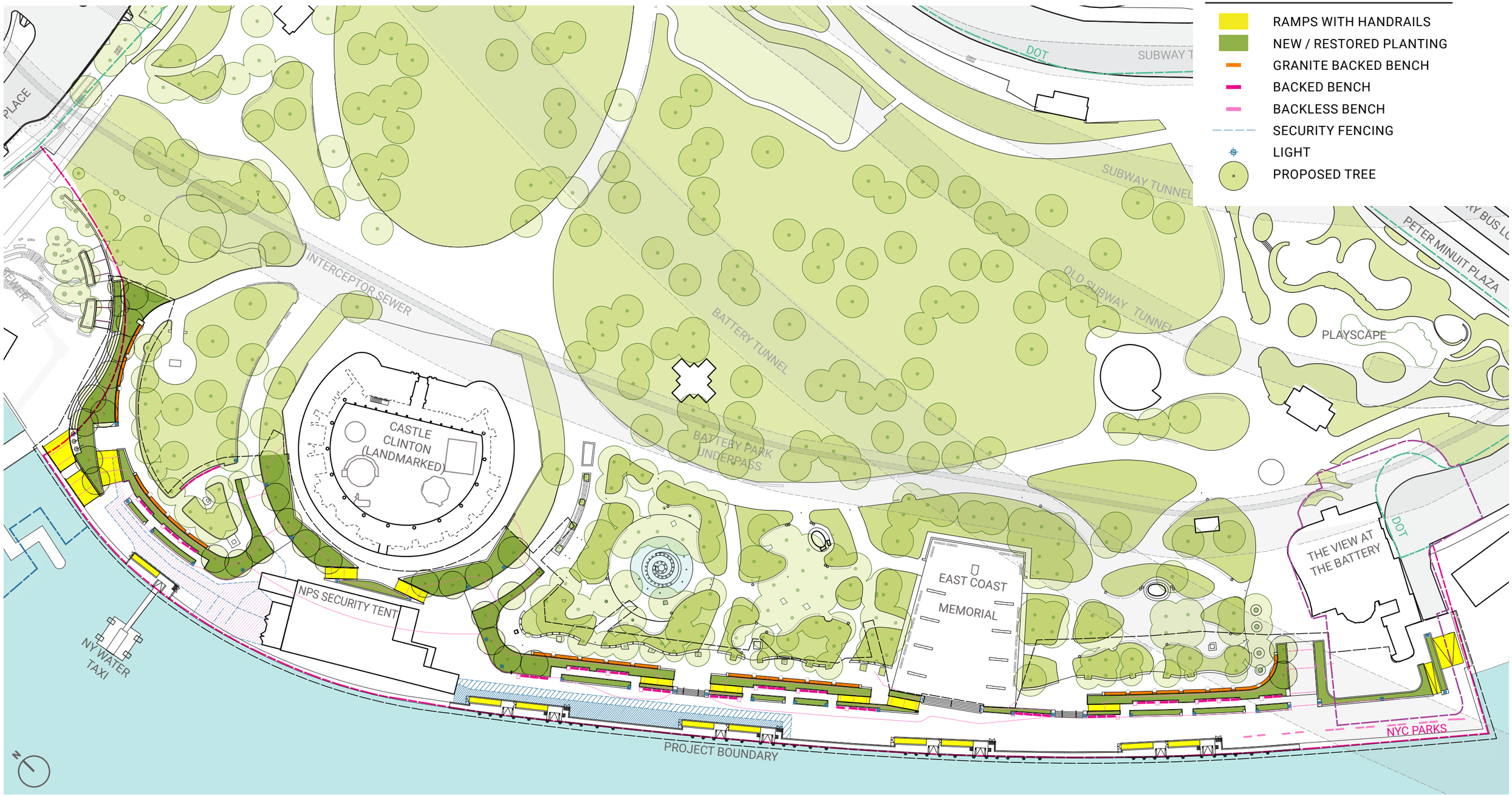
LEGEND

- RAMPS WITH HANDRAILS
- GRANITE BACKED BENCH
- BACKED BENCH
- BACKLESS BENCH
- SECURITY FENCING
- LIGHT

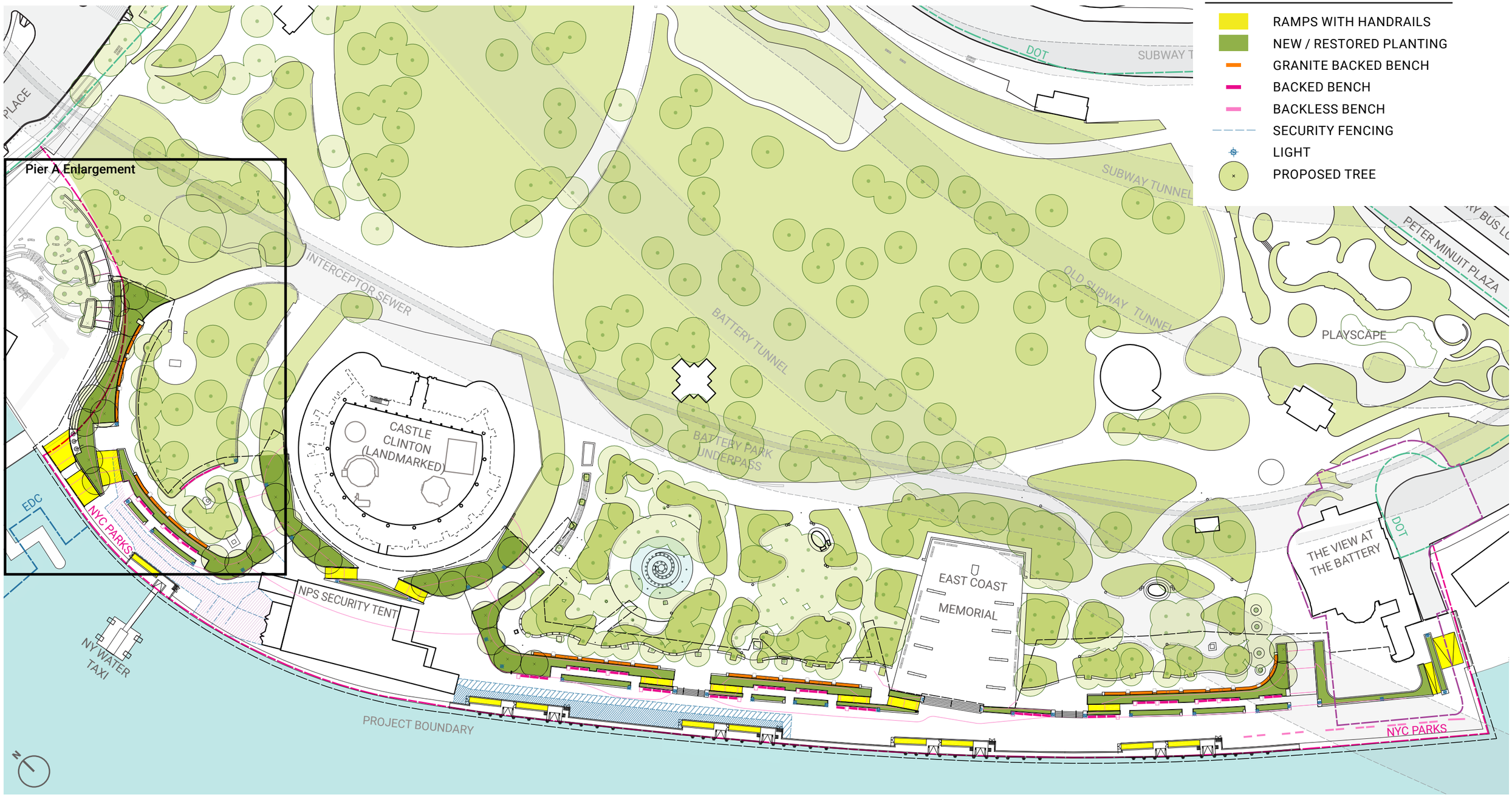
Proposed Plan

LEGEND

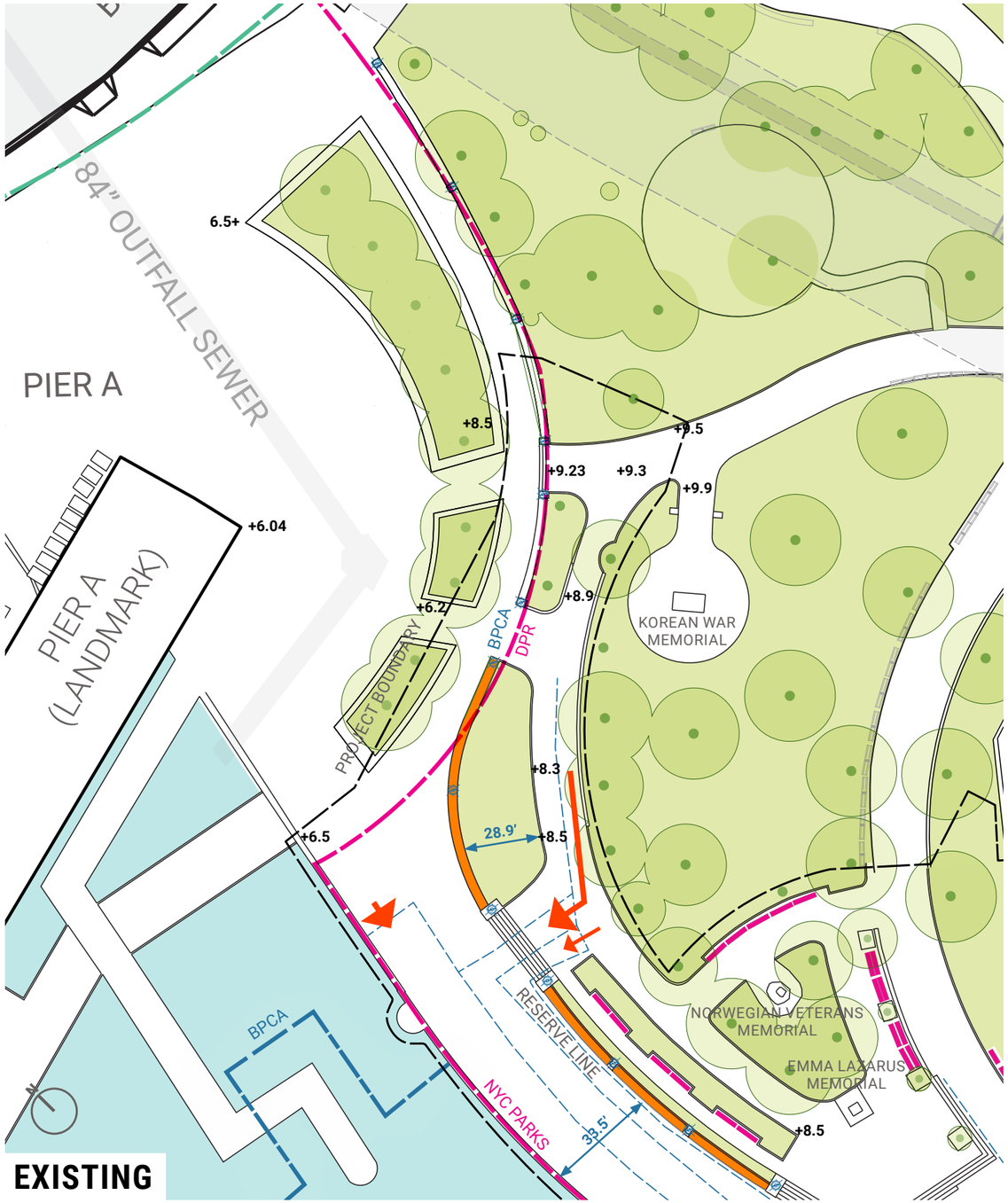
- RAMPS WITH HANDRAILS
- NEW / RESTORED PLANTING
- GRANITE BACKED BENCH
- BACKED BENCH
- BACKLESS BENCH
- SECURITY FENCING
- LIGHT
- PROPOSED TREE

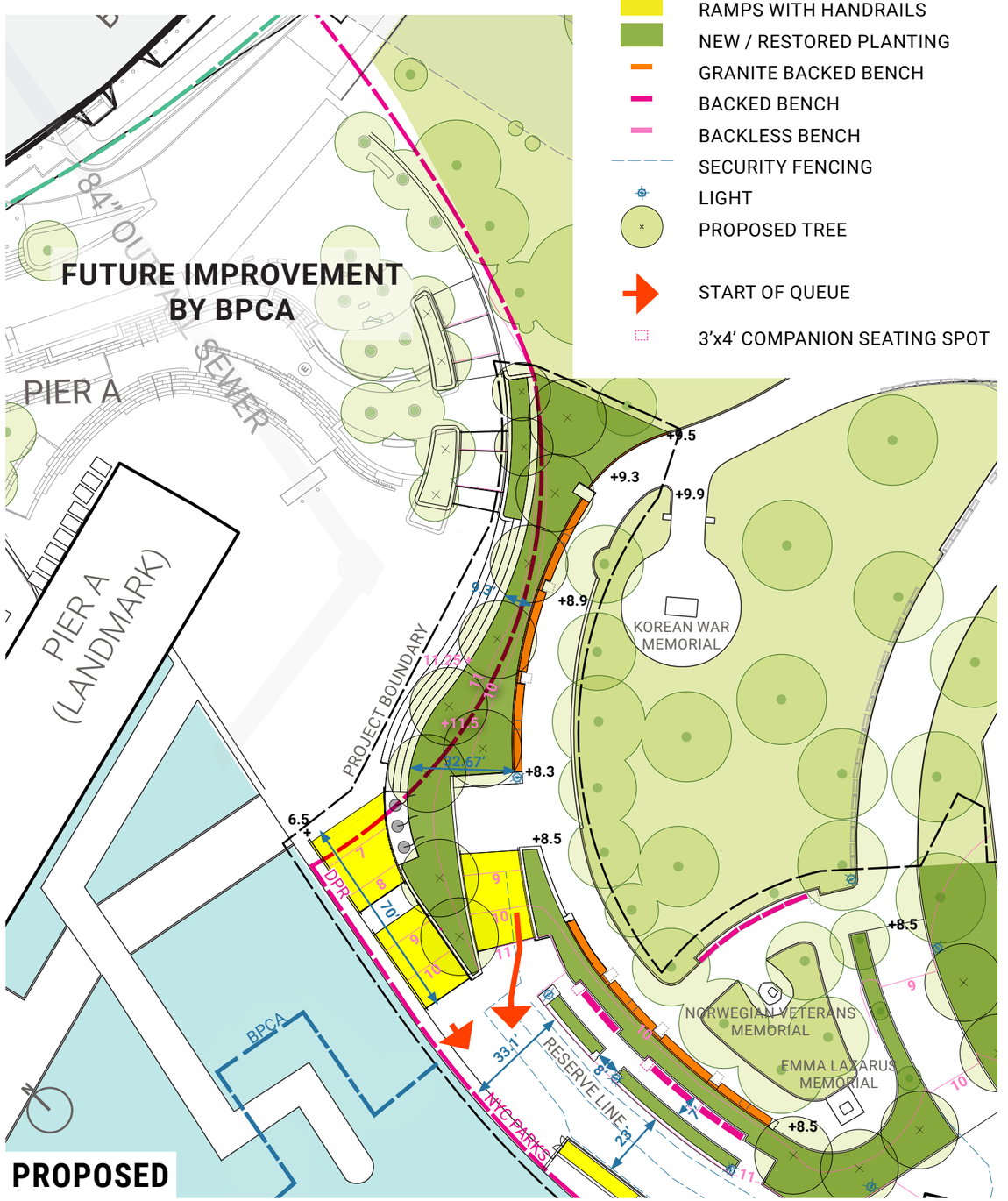


Proposed Plan



Pier A Enlargement

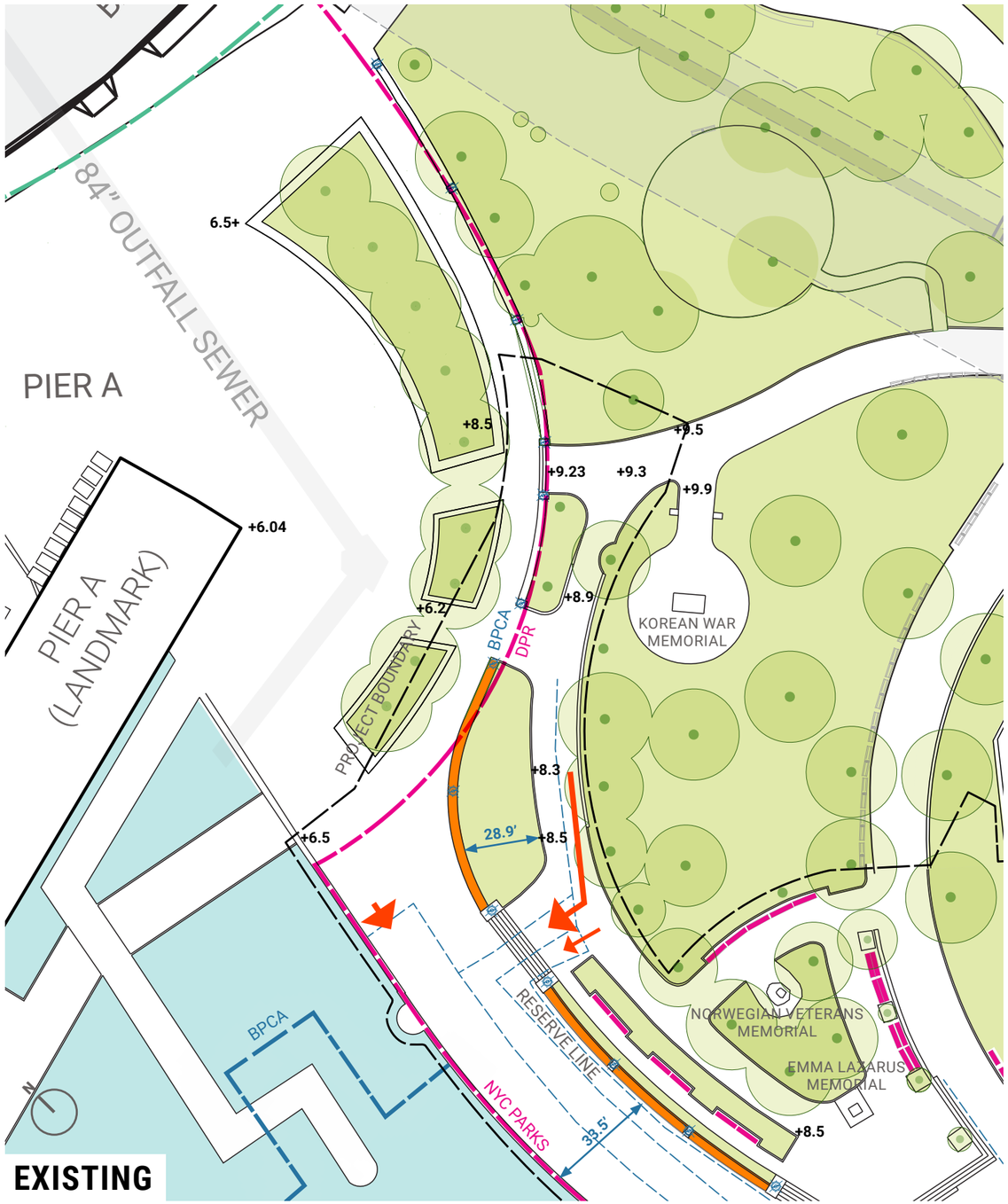




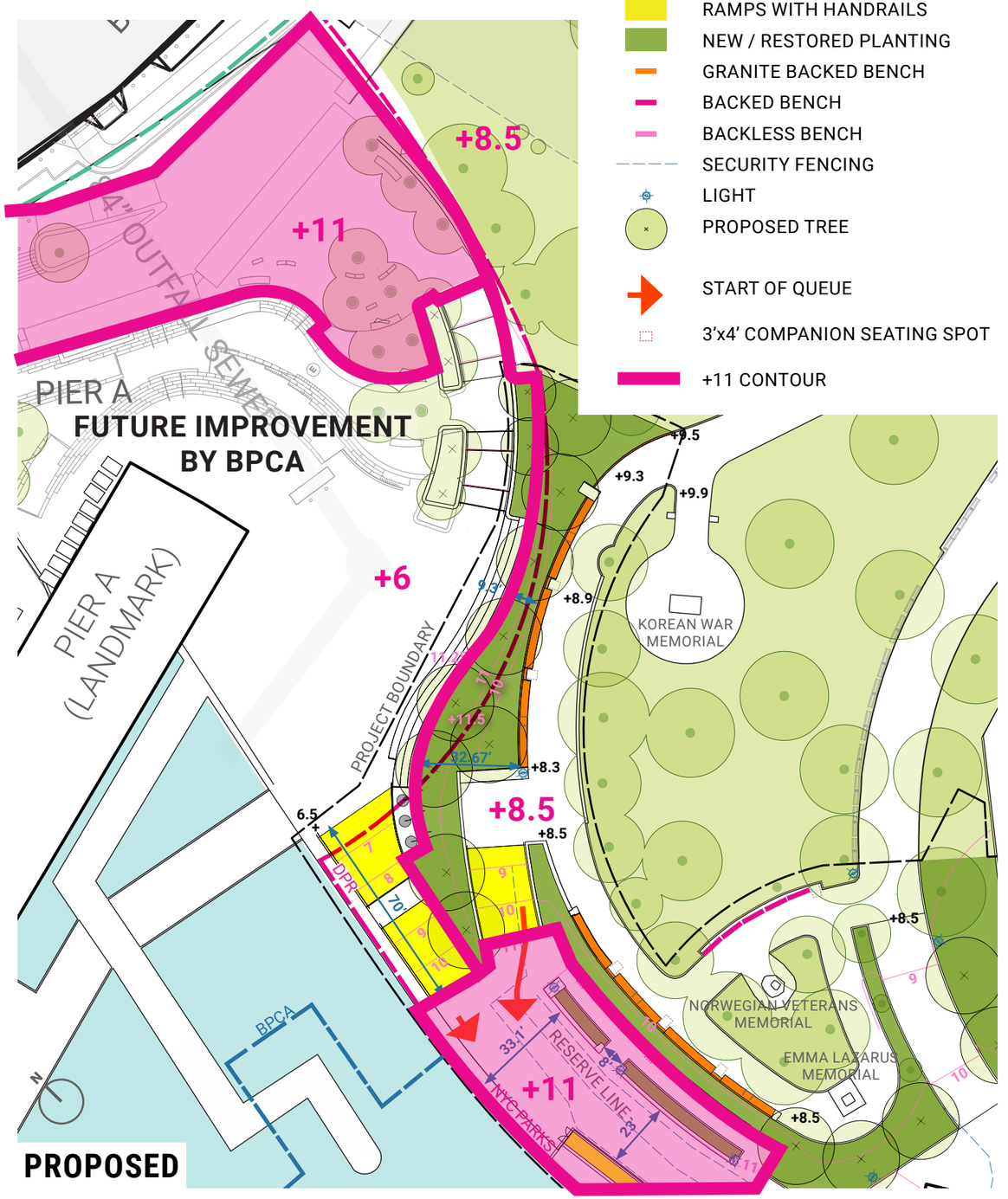
LEGEND

- RAMPS WITH HANDRAILS
- NEW / RESTORED PLANTING
- GRANITE BACKED BENCH
- BACKED BENCH
- BACKLESS BENCH
- SECURITY FENCING
- LIGHT
- PROPOSED TREE
- START OF QUEUE
- 3'x4' COMPANION SEATING SPOT

Pier A Enlargement



EXISTING



PROPOSED

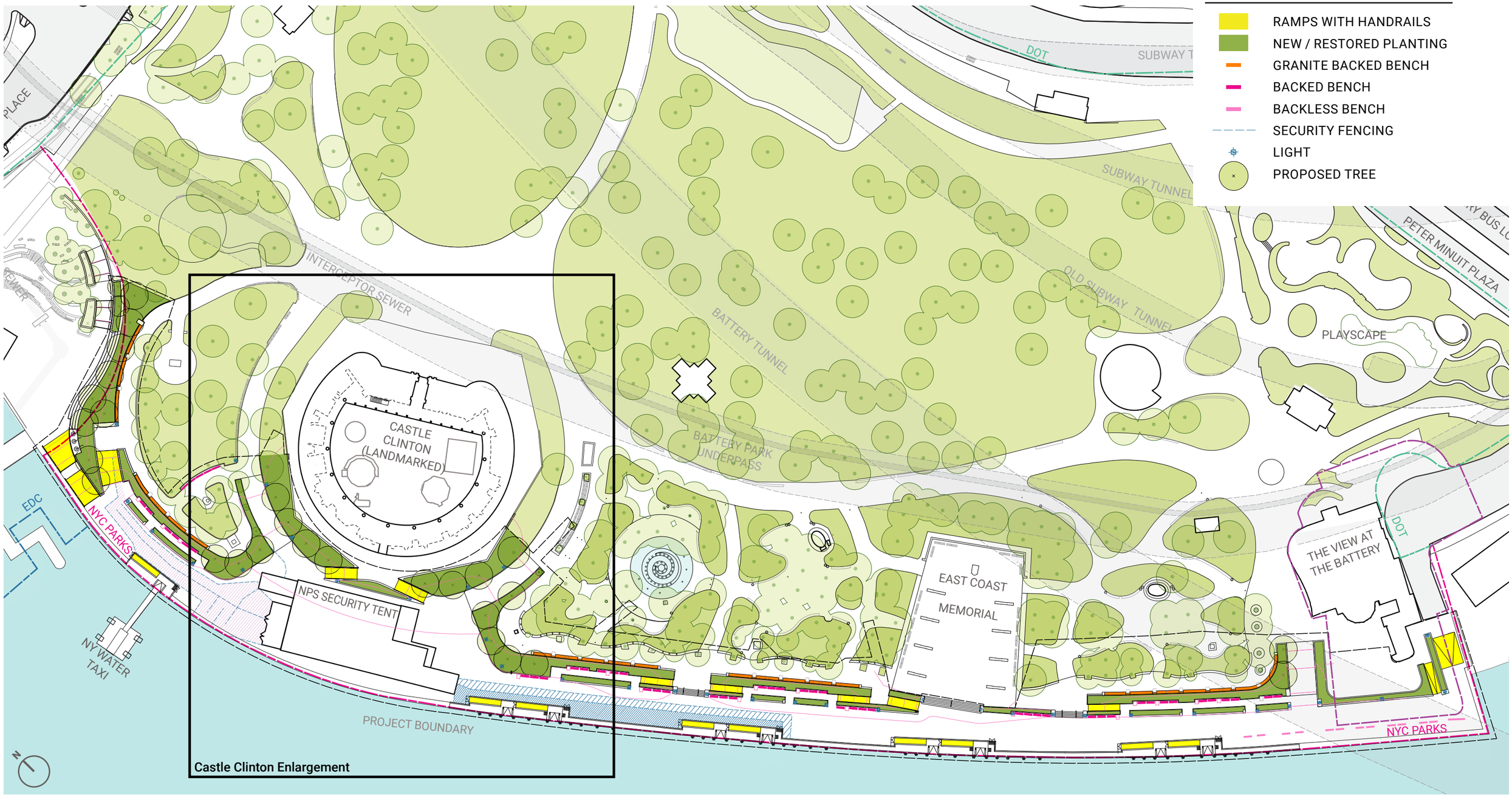
LEGEND

- RAMPS WITH HANDRAILS
- NEW / RESTORED PLANTING
- GRANITE BACKED BENCH
- BACKED BENCH
- BACKLESS BENCH
- SECURITY FENCING
- LIGHT
- PROPOSED TREE
- START OF QUEUE
- 3'x4' COMPANION SEATING SPOT
- +11 CONTOUR

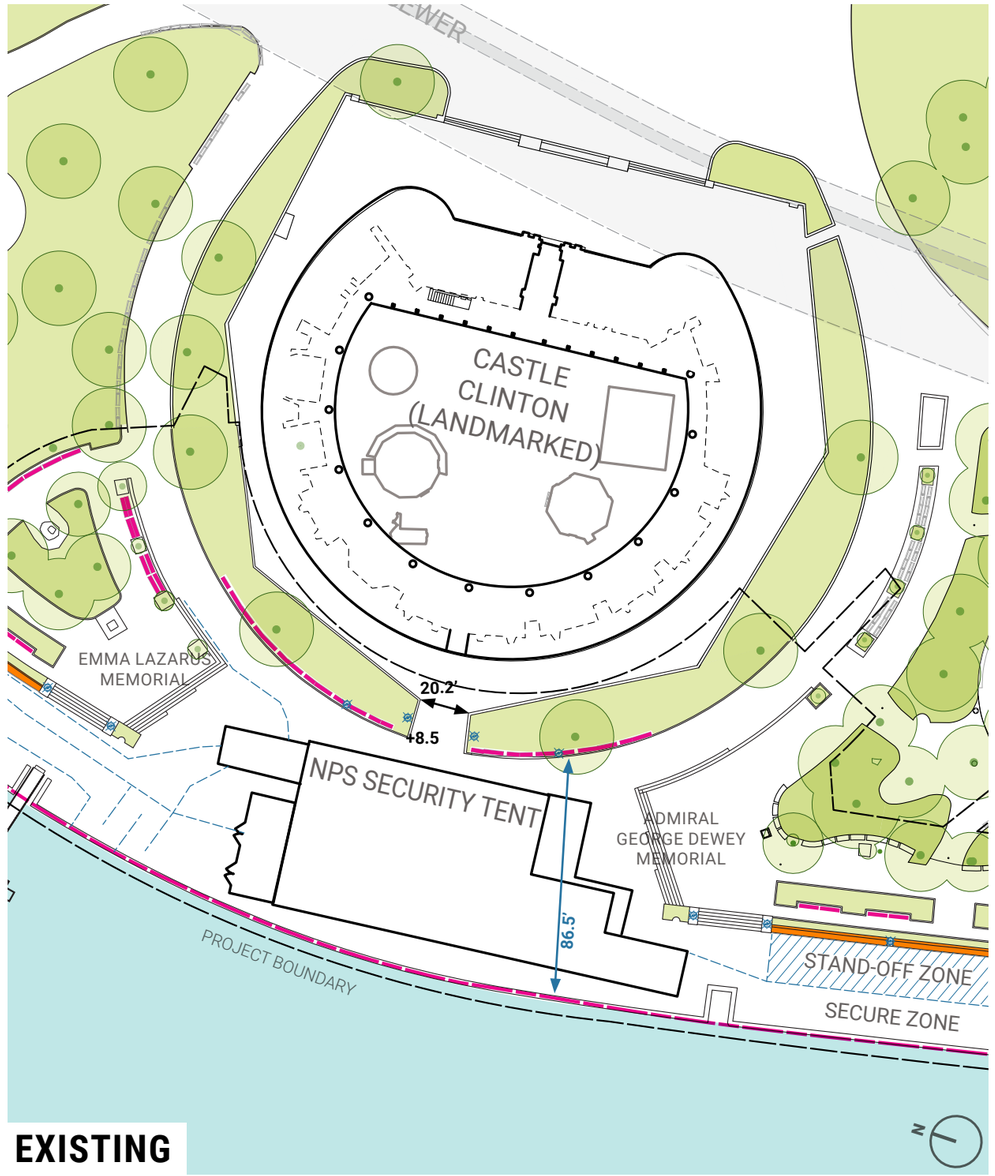
Proposed: Pier A Plaza

Proposed: Pier A Plaza

Proposed Plan



Castle Clinton Enlargement



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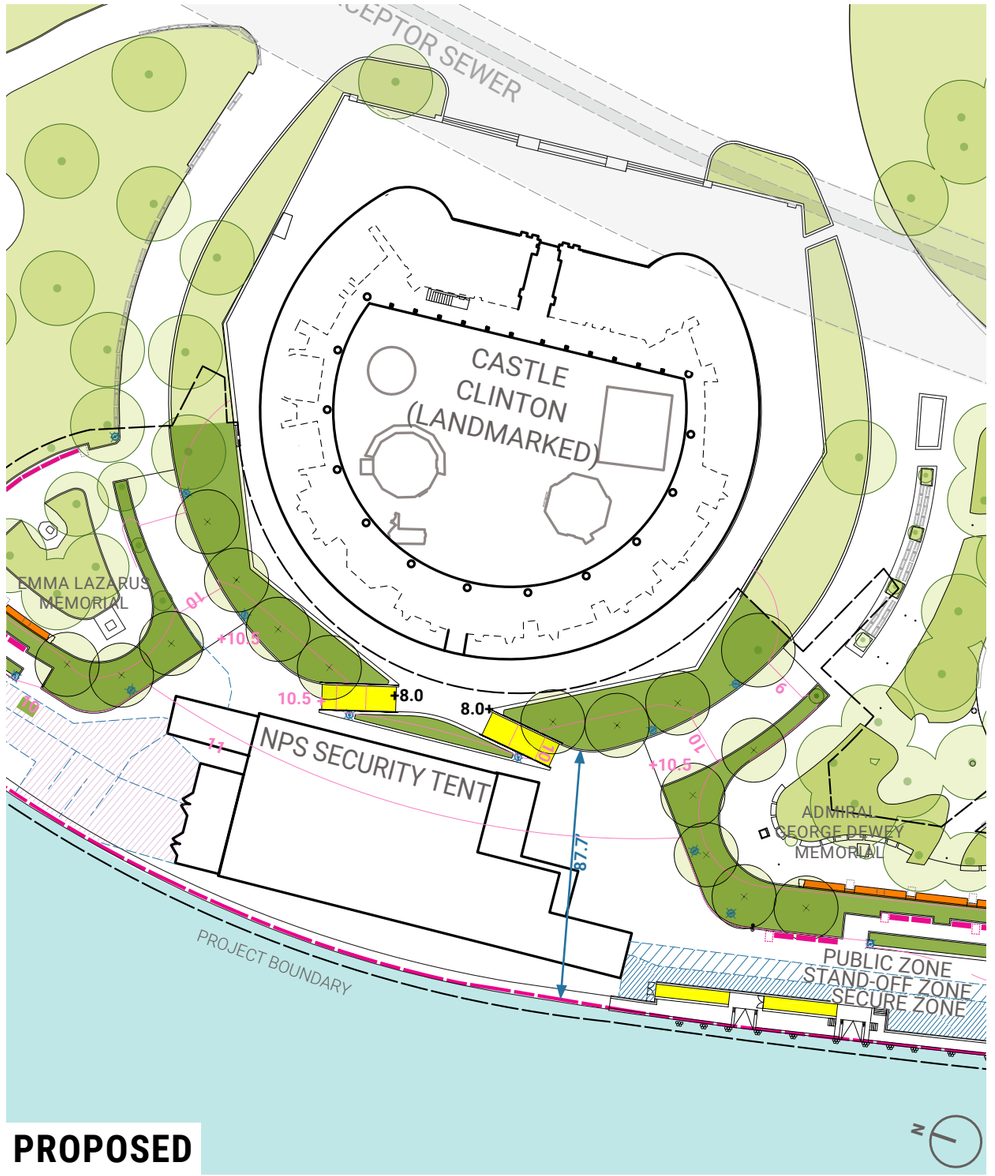


PROPOSED

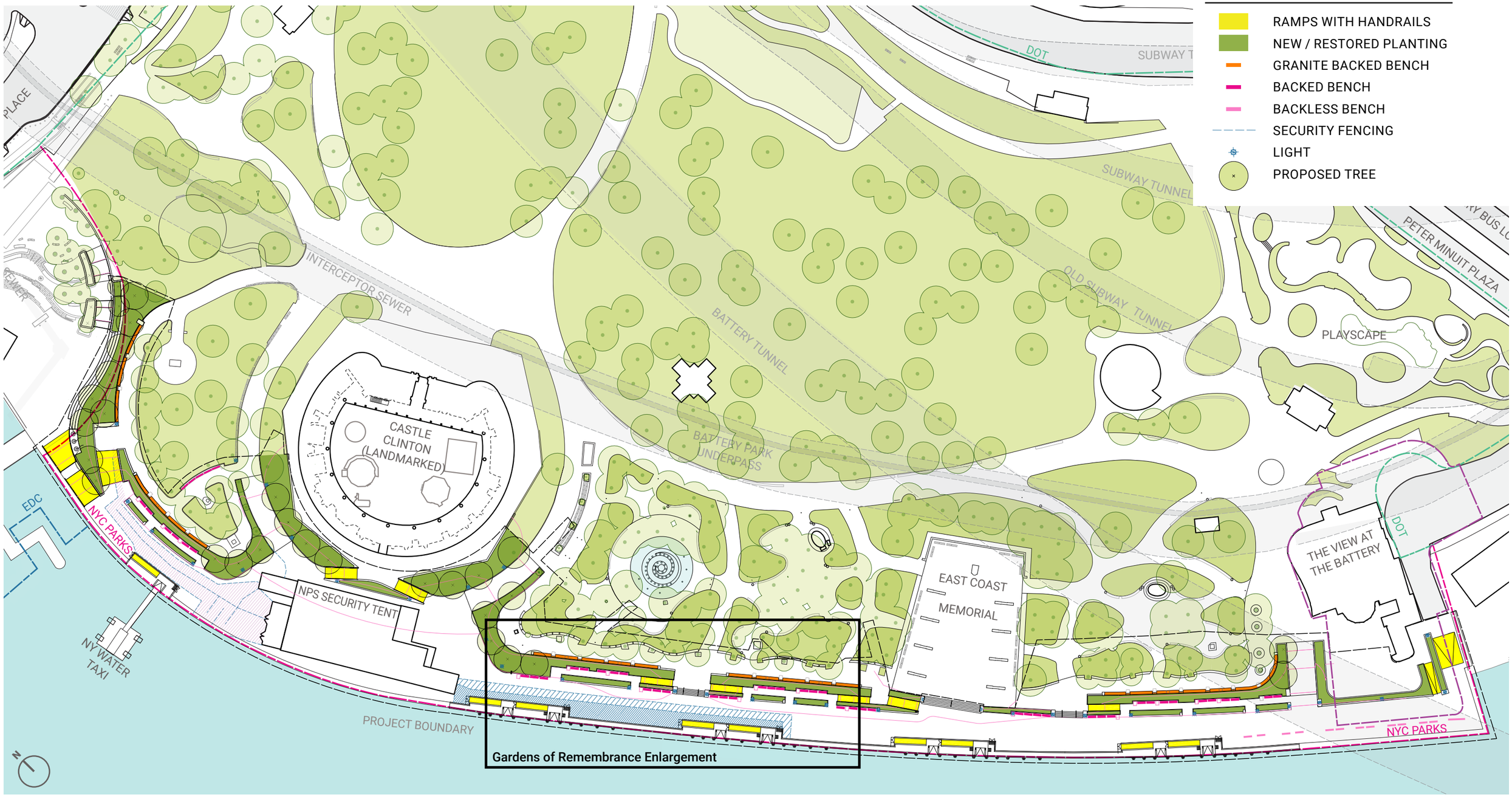
LEGEND

- GRANITE BACKED BENCH
- BACKED BENCH
- BACKLESS BENCH
- LIGHT
- RAMPS WITH HANDRAILS
- NEW / RESTORED PLANTING
- SECURITY FENCING
- PROPOSED TREE
- COMPANION SEATING SPOT

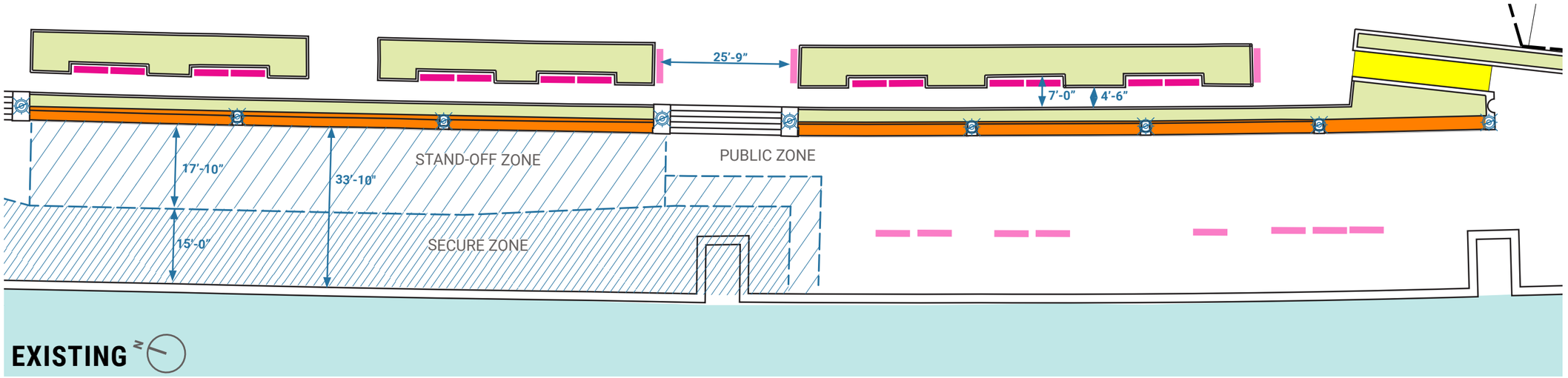
Proposed Plan

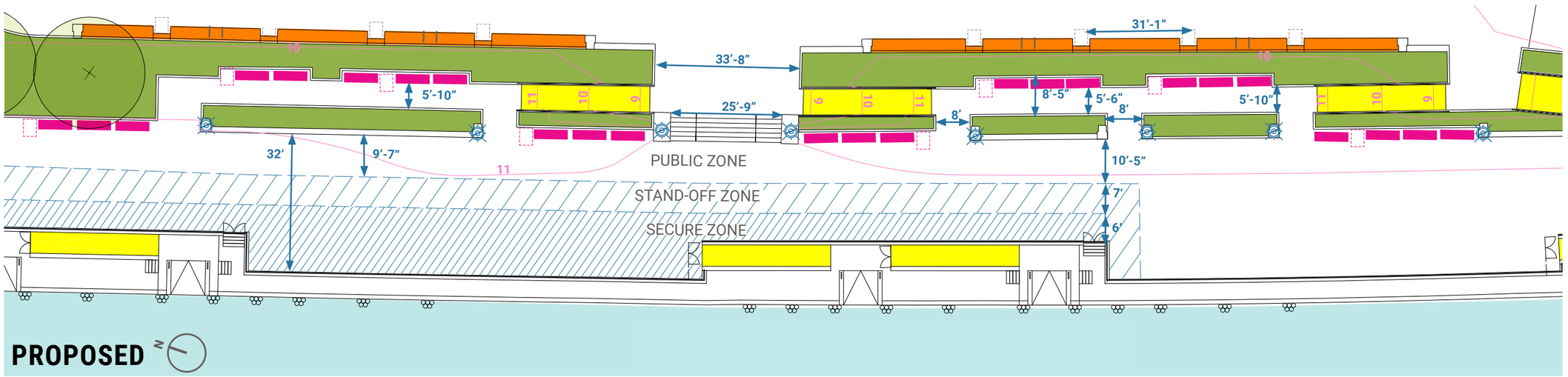
LEGEND

- RAMPS WITH HANDRAILS
- NEW / RESTORED PLANTING
- GRANITE BACKED BENCH
- BACKED BENCH
- BACKLESS BENCH
- SECURITY FENCING
- LIGHT
- PROPOSED TREE



Gardens of Remembrance Enlargement Plan

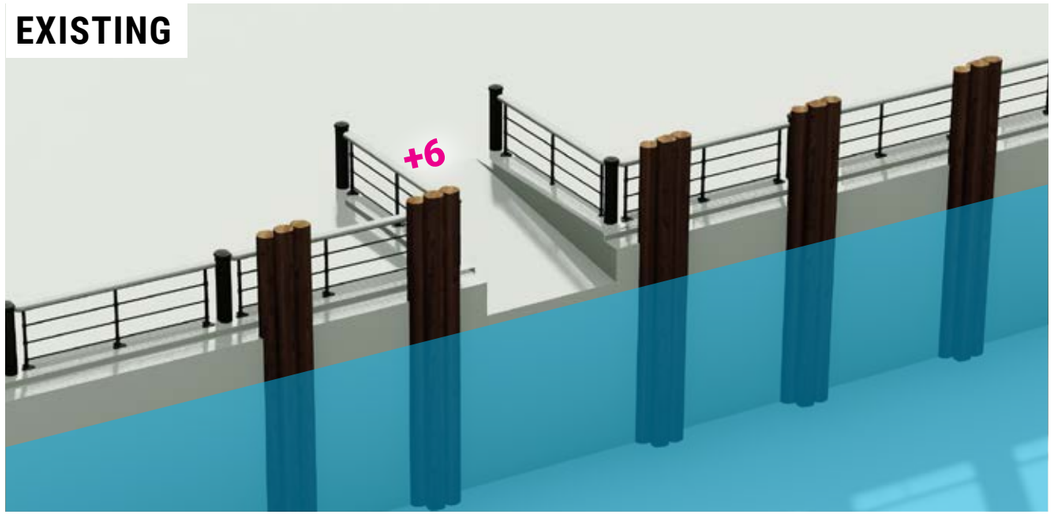




LEGEND

- GRANITE BACKED BENCH
- BACKED BENCH
- BACKLESS BENCH
- LIGHT
- RAMPS WITH HANDRAILS
- NEW / RESTORED PLANTING
- SECURITY FENCING
- PROPOSED TREE
- COMPANION SEATING SPOT

Proposed Slip Design



Gardens of Remembrance

View From Bosque Pathway

View From Wharf Entrance

EXISTING

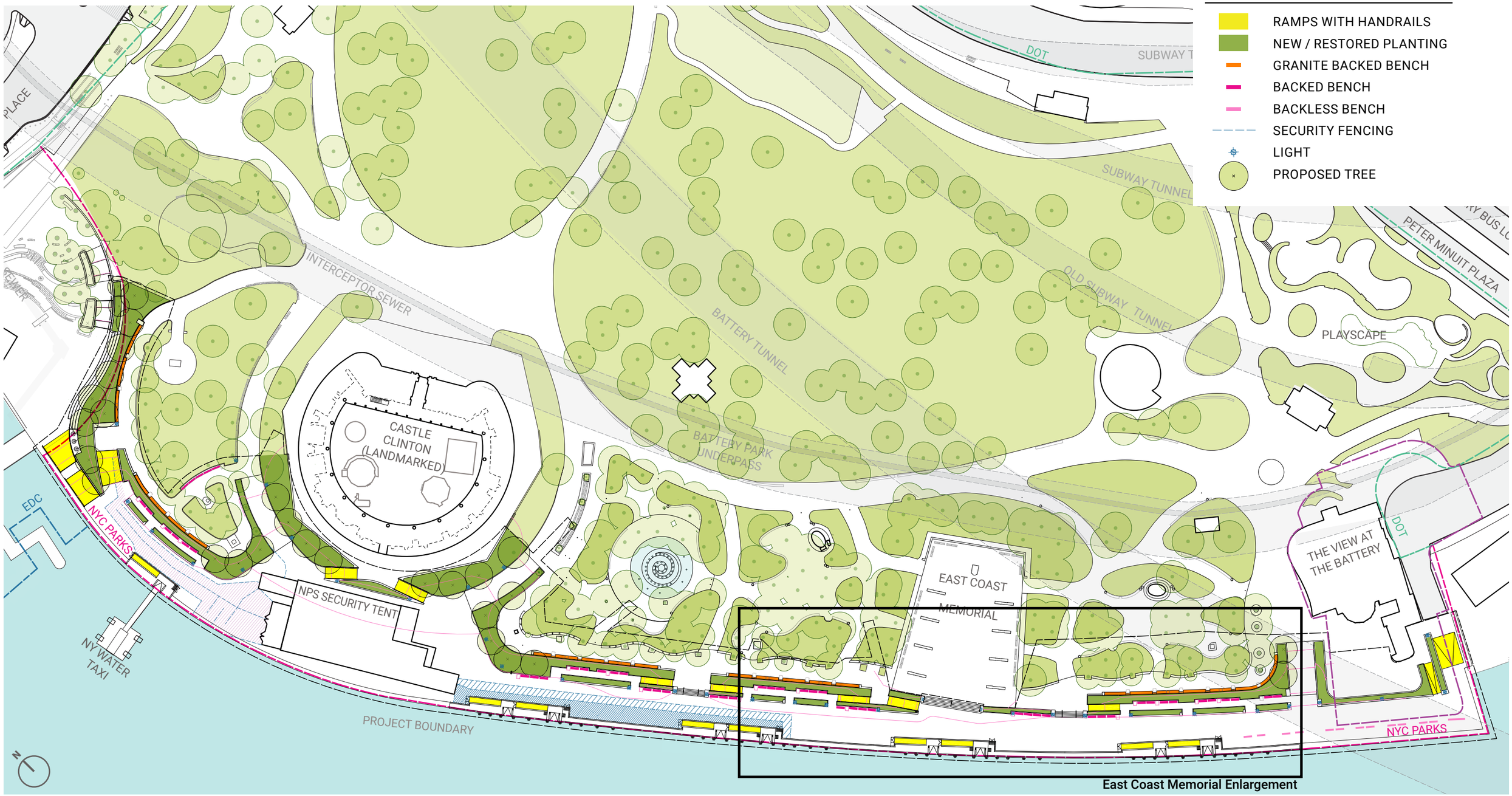
PROPOSED

View From Bosque Fountain

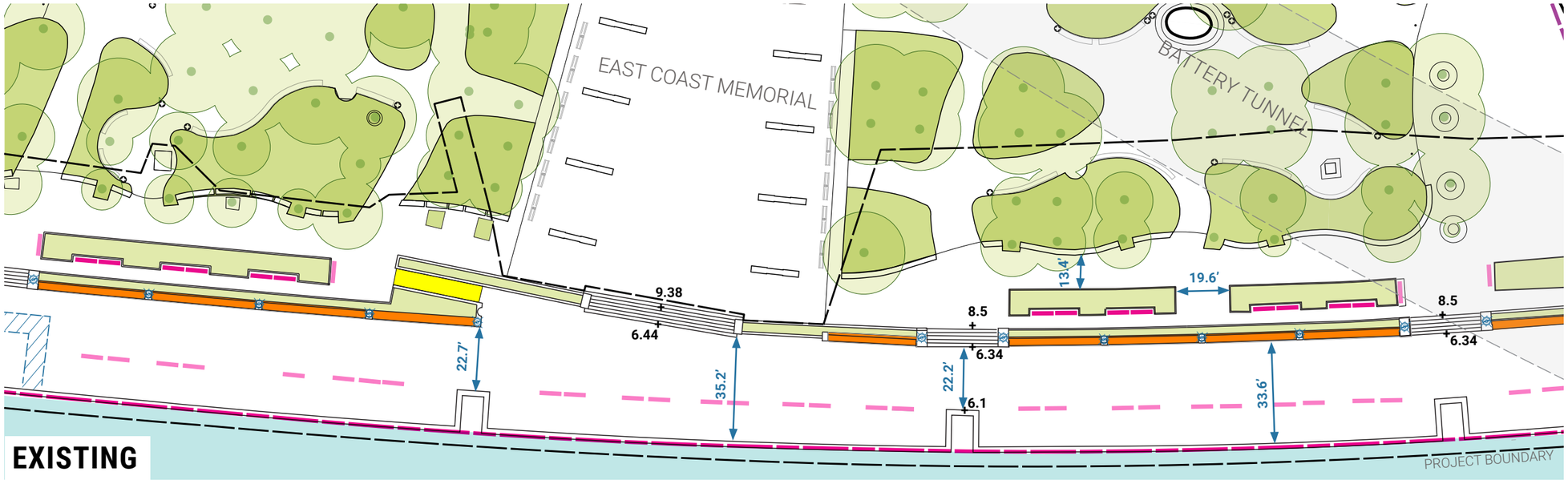
EXISTING

PROPOSED

Proposed Plan



East Coast Memorial



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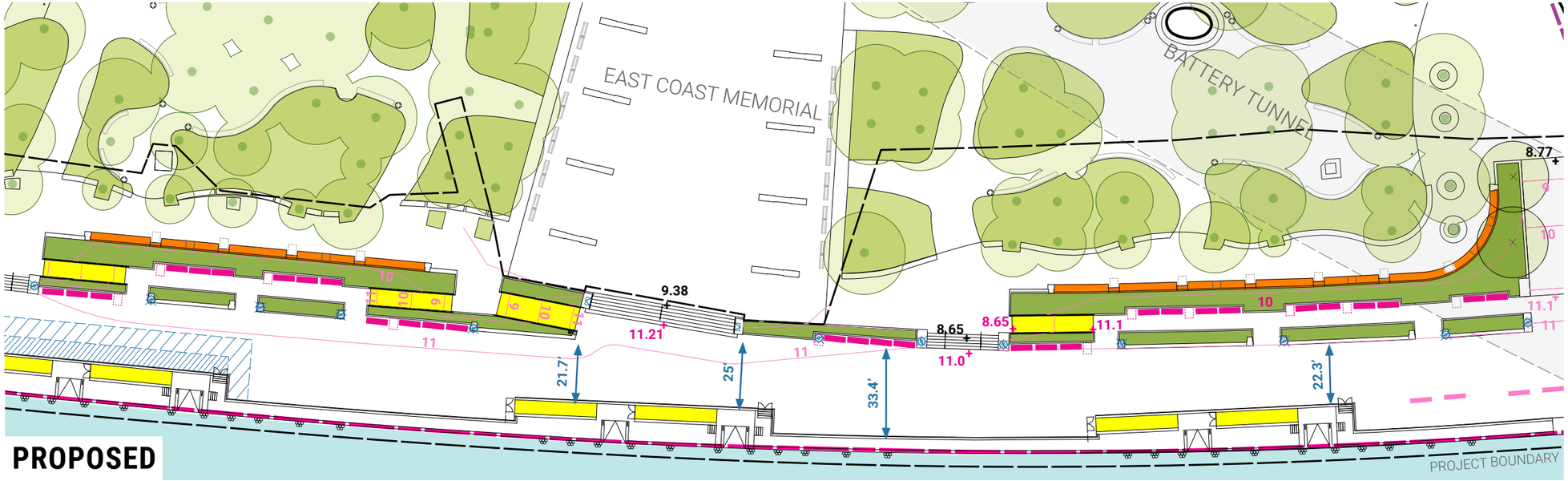
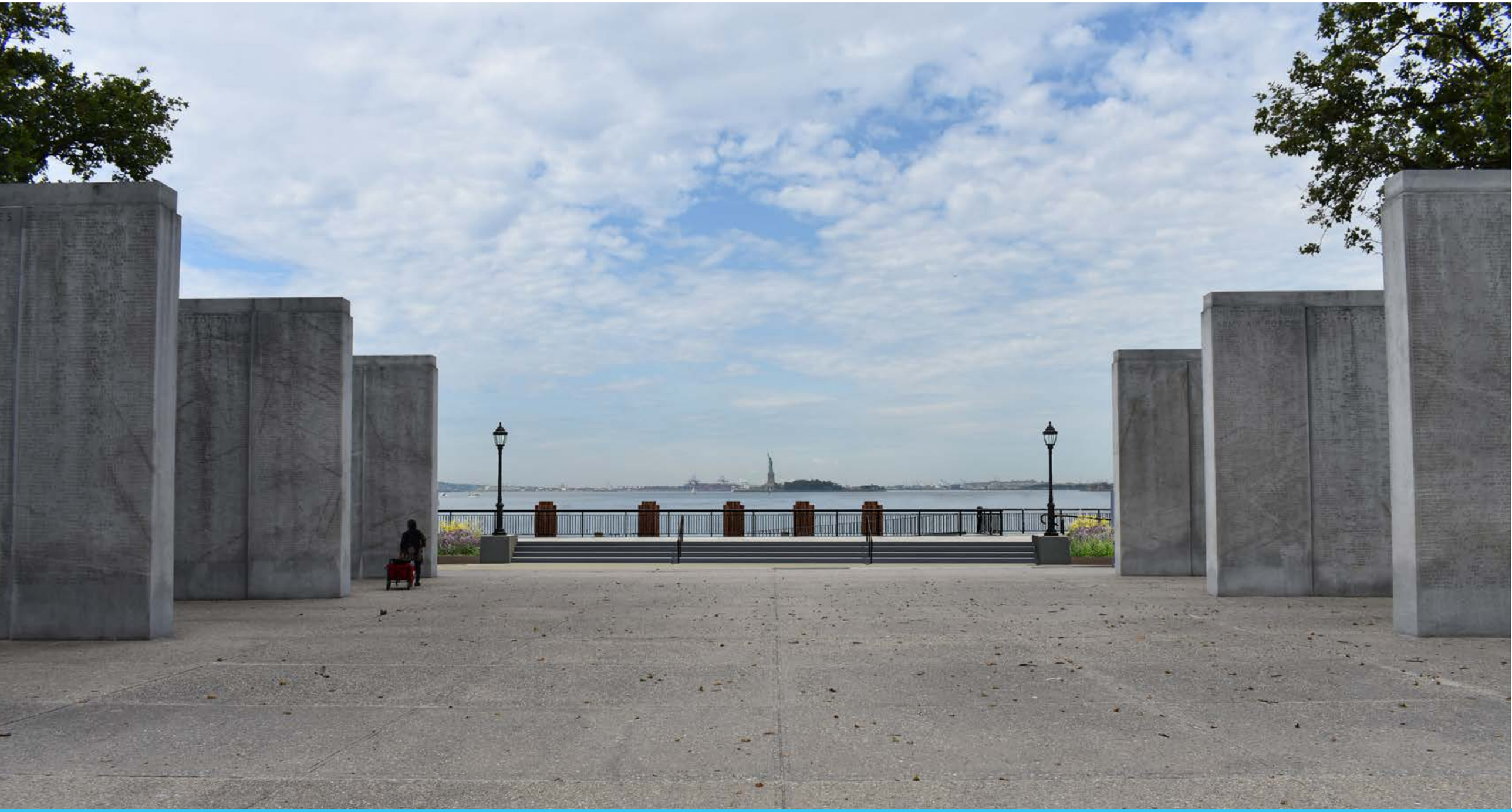


PROPOSED

LEGEND

- GRANITE BACKED BENCH
- BACKED BENCH
- BACKLESS BENCH
- LIGHT
- RAMPS WITH HANDRAILS
- NEW / RESTORED PLANTING
- SECURITY FENCING
- PROPOSED TREE
- START OF QUEUE
- COMPANION SEATING SPOT

Proposed View From East Coast Memorial



Planting Approach

1

KEEP GENERAL FEEL AND PLANTING CHARACTER

Original design

- Place species in small blocks
- Restore lost intermingling of species
- Restore balance of structural and filler plants
- Create evocative species composition
- Include appropriate number of shorter-lived horticultural species

2

UPDATE PLANT PALETTE

Phlox paniculata '*Jeana*'

- Use improved cultivars
- Use more heat adapted, urban and salt tolerant species

3

BALANCE FLOWERS THROUGHOUT THE YEAR

Hauser & Wirth by Piet Oudolf

- Build strong flower themes
- Preserve the garden's attractive summer and winter themes
- Create stronger appeal in spring and fall
- Underplant taller species for more lushness and spring interest

Drainage

Drainage Approach

Project Timeline

PDC PRELIMINARY SUBMISSION DATE

2021 | **2022**

FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY

STAKEHOLDER ENGAGEMENT

● PUBLIC MEETING

OUTREACH ROUND II
YOUR FEEDBACK!

OUTREACH ROUND III
YOUR FEEDBACK!

DESIGN PHASE 1 — **CONCEPT DESIGN (30%)**

DESIGN PHASE 2 — **SCHEM. DESIGN (50%)**

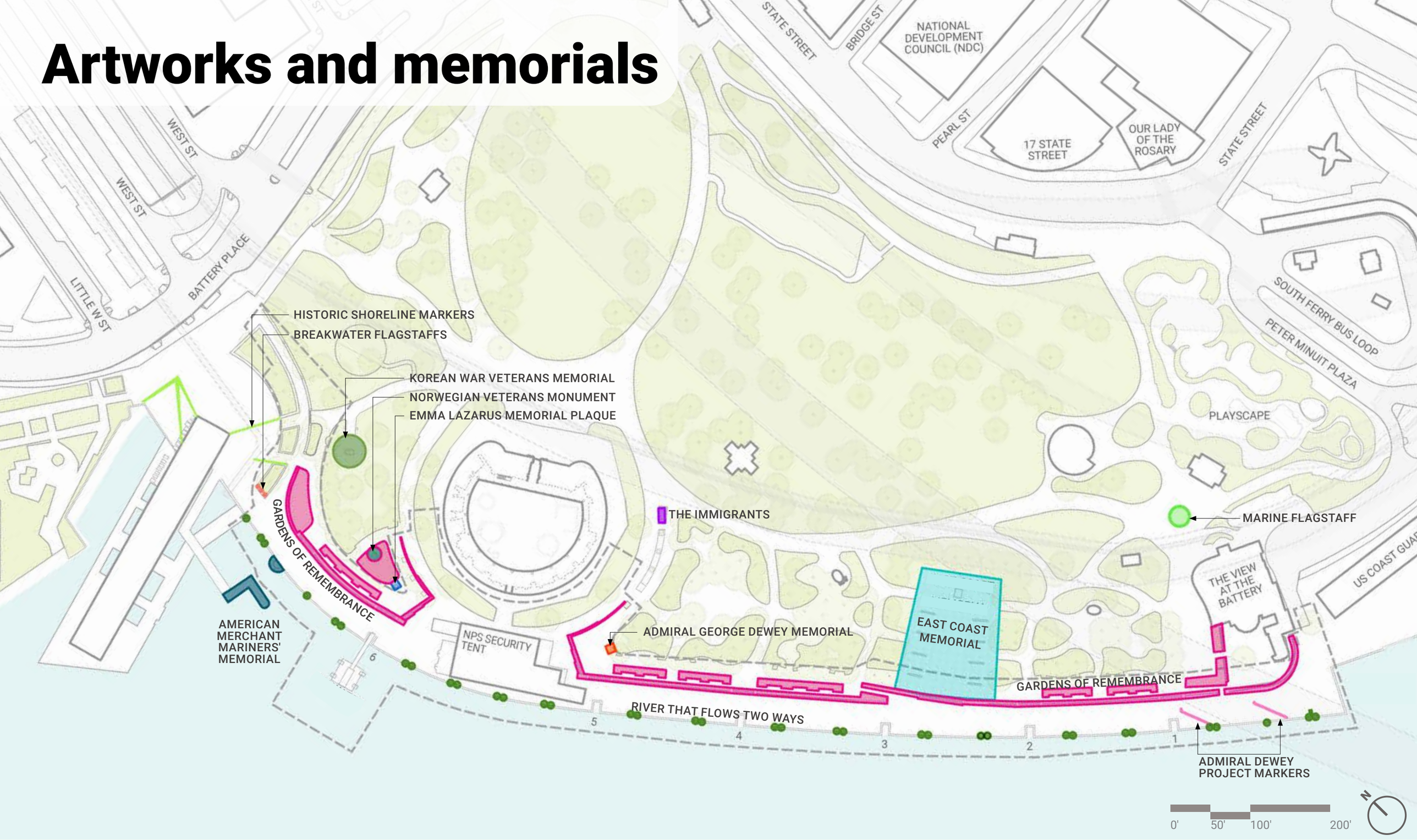
DESIGN PHASE 3 — **FINAL DESIGN (75-100%)**

CONSTRUCTION

Questions?

Appendix

Artworks and memorials



Artworks and memorials

AMERICAN MERCHANT MARINERS' MEMORIAL

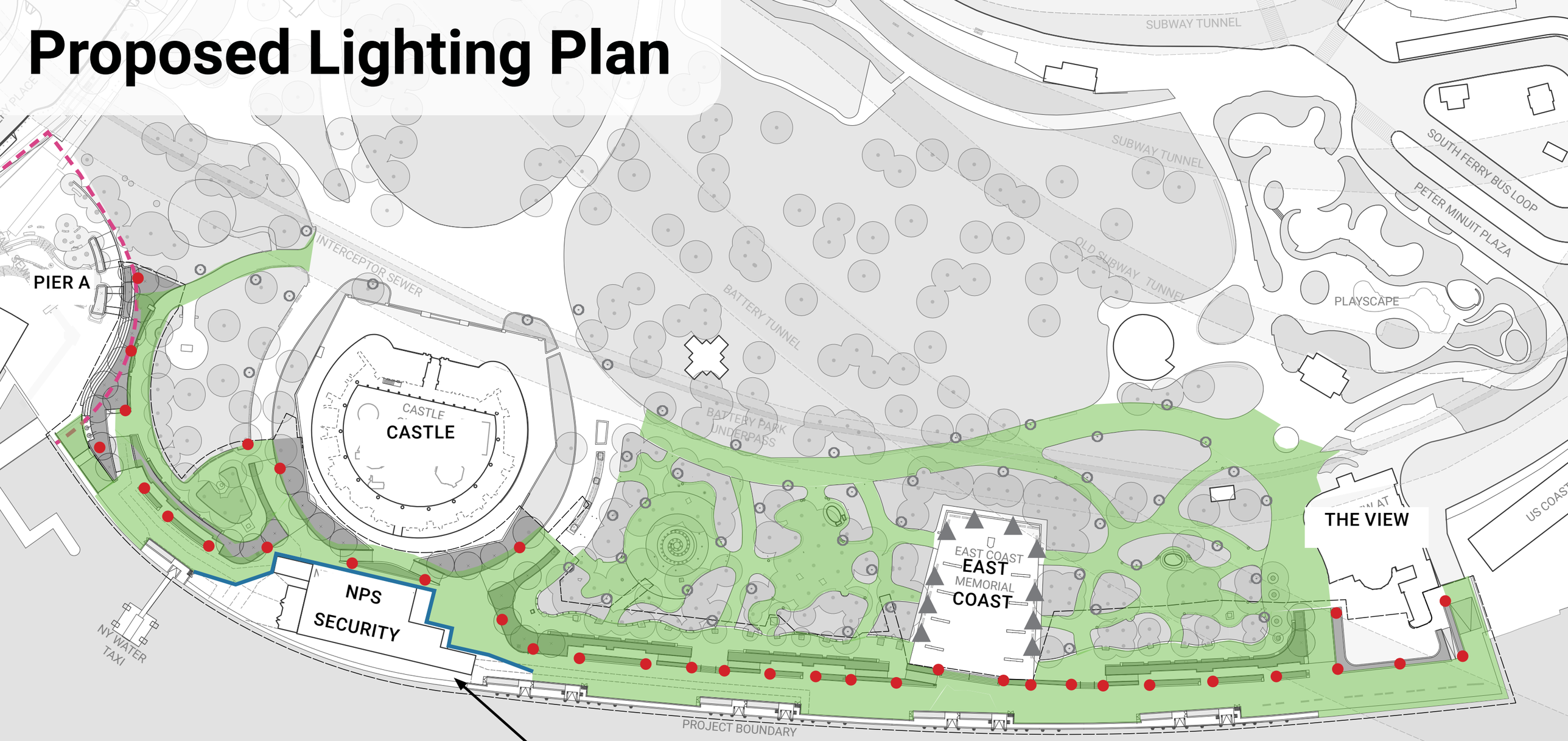
GARDENS OF REMEMBRANCE

EAST COAST MEMORIAL

RIVER THAT FLOWS TWO WAYS

Historic structures

Proposed Lighting Plan



LEGEND

- ACCEPTABLE LIGHT LEVELS
- PROTECTED SCREENING AREA
- PROJECT LIMIT LINE
- EXISTING RIVERSIDE LUMINAIRE ON B-POLE (NYCDOT MAINTAINED)
- EXISTING EAST COAST MEMORIAL LAMPPOST (NYCDOT MAINTAINED)
- PROPOSED RIVERSIDE LUMINAIRE ON B-POLE (NYCDOT MAINTAINED)
- RECESSED LIGHT FIXTURE (NYCDPR OWNED AND

0' 50' 100' 200'

N

Existing Lighting Fixtures

RIVERSIDE LUMINAIRE ON B-POLE

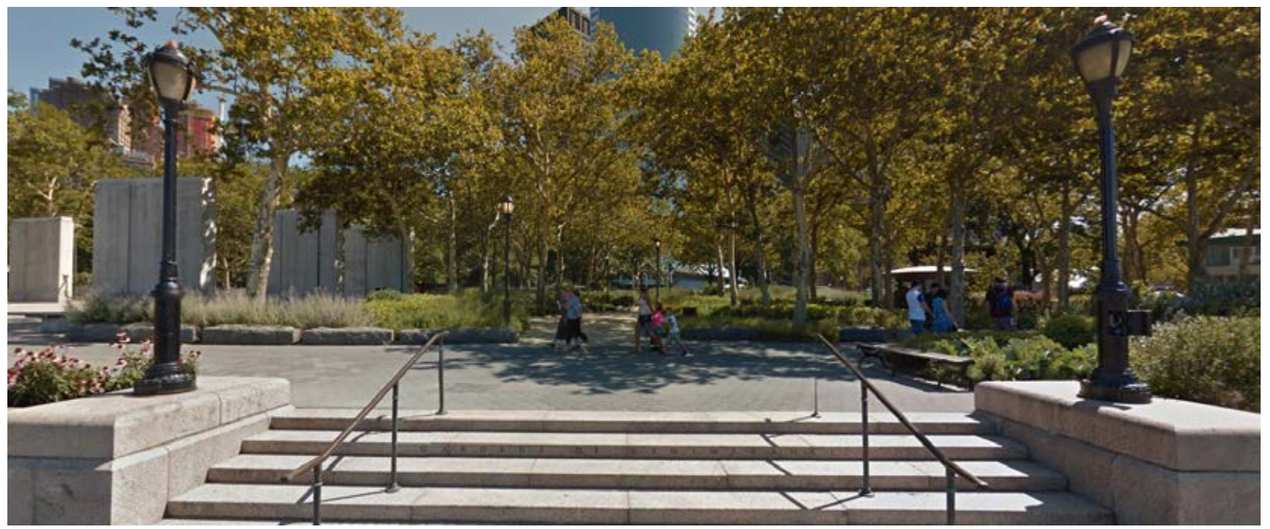
LOCATED ON GRANITE BLOCKS OR GROUND ALONG WHARF

2085 (WORLD'S FAIR) ON B-POLE

FOUR POLES LOCATED AT THE SOUTHERN ENTRANCE OF CASTLE CLINTON

RECESSED LIGHT FIXTURES WITHIN EAST COAST MEMORIAL'S CHEEK WALLS

LOCATED ON EITHER SIDE OF EAST COAST MEMORIAL STEPS



RIVERSIDE LUMINAIRE ON B-POLE WITH RECEPTACLE

LOCATED ON EITHER SIDE OF PARK STEPS

Envision Process

ENVISION

Quality Of Life
14 Credits

WELLBEING
QL1.1 Improve Community Quality of Life
QL1.2 Enhance Public Health & Safety
QL1.3 Improve Construction Safety
QL1.4 Minimize Noise & Vibration
QL1.5 Minimize Light Pollution
QL1.6 Minimize Construction Impacts

MOBILITY
QL2.1 Improve Community Mobility & Access
QL2.2 Encourage Sustainable Transportation
QL2.3 Improve Access & Wayfinding

COMMUNITY
QL3.1 Advance Equity & Social Justice
QL3.2 Preserve Historic & Cultural Resources
QL3.3 Enhance Views & Local Character
QL3.4 Enhance Public Space & Amenities

QL0.0 Innovate or Exceed Credit Requirements

Leadership
12 Credits

COLLABORATION
LD1.1 Provide Effective Leadership & Commitment
LD1.2 Foster Collaboration & Teamwork
LD1.3 Provide for Stakeholder Involvement
LD1.4 Pursue Byproduct Synergies

PLANNING
LD2.1 Establish a Sustainability Management Plan
LD2.2 Plan for Sustainable Communities
LD2.3 Plan for Long-Term Monitoring & Maintenance
LD2.4 Plan for End-of-Life

ECONOMY
LD3.1 Stimulate Economic Prosperity & Development
LD3.2 Develop Local Skills & Capabilities
LD3.3 Conduct a Life-Cycle Economic Evaluation

LD0.0 Innovate or Exceed Credit Requirements

Resource Allocation
14 Credits

MATERIALS
RA1.1 Support Sustainable Procurement Practices
RA1.2 Use Recycled Materials
RA1.3 Reduce Operational Waste
RA1.4 Reduce Construction Waste
RA1.5 Balance Earthwork On Site

ENERGY
RA2.1 Reduce Operational Energy Consumption
RA2.2 Reduce Construction Energy Consumption
RA2.3 Use Renewable Energy
RA2.4 Commission & Monitor Energy Systems

WATER
RA3.1 Preserve Water Resources
RA3.2 Reduce Operational Water Consumption
RA3.3 Reduce Construction Water Consumption
RA3.4 Monitor Water Systems

RA0.0 Innovate or Exceed Credit Requirements

Natural World
14 Credits

SITING
NW1.1 Preserve Sites of High Ecological Value
NW1.2 Provide Wetland & Surface Water Buffers
NW1.3 Preserve Prime Farmland
NW1.4 Preserve Undeveloped Land

CONSERVATION
NW2.1 Reclaim Brownfields
NW2.2 Manage Stormwater
NW2.3 Reduce Pesticide & Fertilizer Impacts
NW2.4 Protect Surface & Groundwater Quality

ECOLOGY
NW3.1 Enhance Functional Habitats
NW3.2 Enhance Wetland & Surface Water Functions
NW3.3 Maintain Floodplain Functions
NW3.4 Control Invasive Species
NW3.5 Protect Soil Health

NW0.0 Innovate or Exceed Credit Requirements

Climate and Resilience
10 Credits

EMISSIONS
CR1.1 Reduce Net Embodied Carbon
CR1.2 Reduce Greenhouse Gas Emissions
CR1.3 Reduce Air Pollutant Emissions

RESILIENCE
CR2.1 Avoid Unsuitable Development
CR2.2 Assess Climate Change Vulnerability
CR2.3 Evaluate Risk & Resilience
CR2.4 Establish Resilience Goals and Strategies
CR2.5 Maximize Resilience
CR2.6 Improve Infrastructure Integration

CR0.0 Innovate or Exceed Credit Requirements

Key Sustainability Opportunities

Natural World

14 Credits

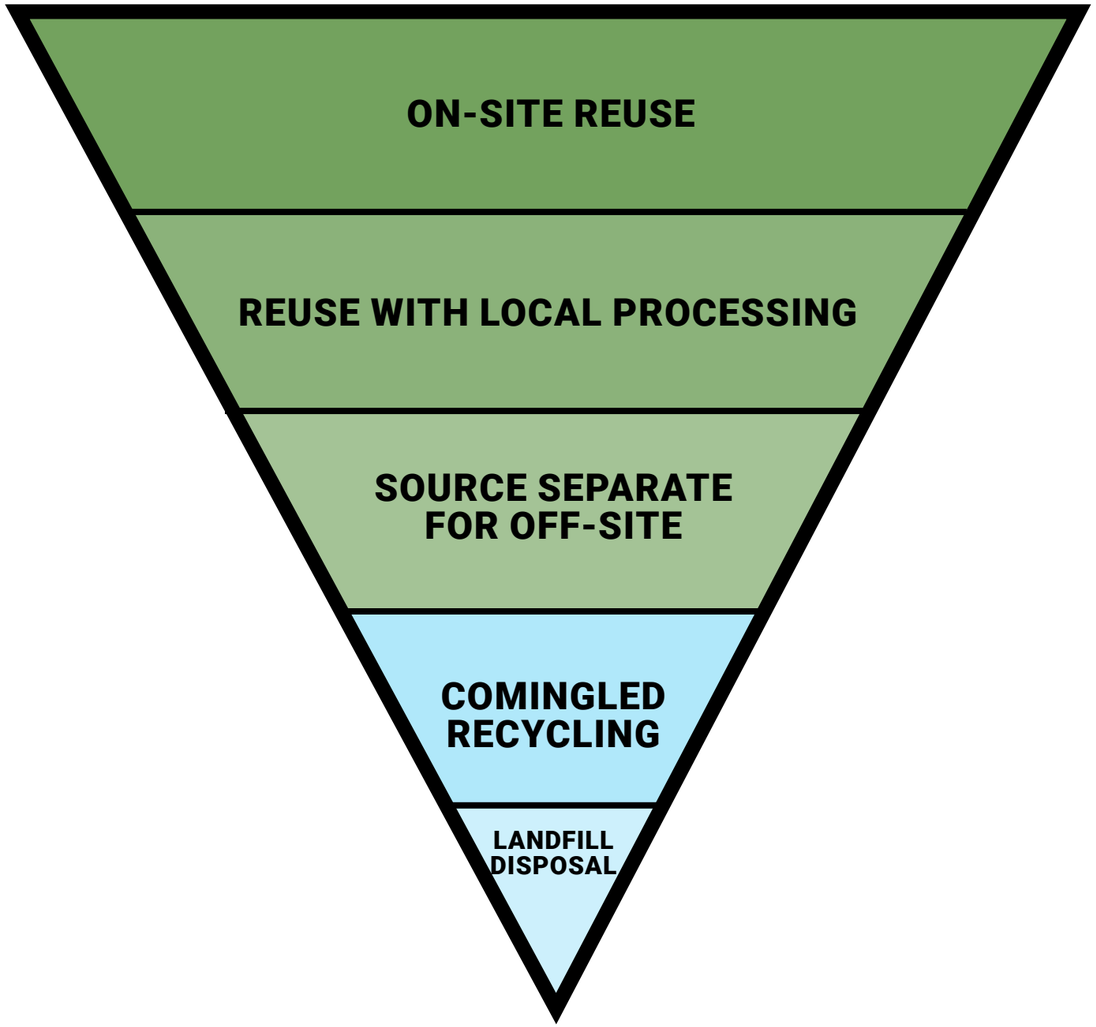
- **Embodied Carbon Reduction**

Climate and Resilience

10 Credits

- **Waste Reduction**

Waste Management Hierarchy



1. As much as possible, reuse materials that can be handled, processed, and stored on site while considering noise and air pollution impacts of reworking materials.

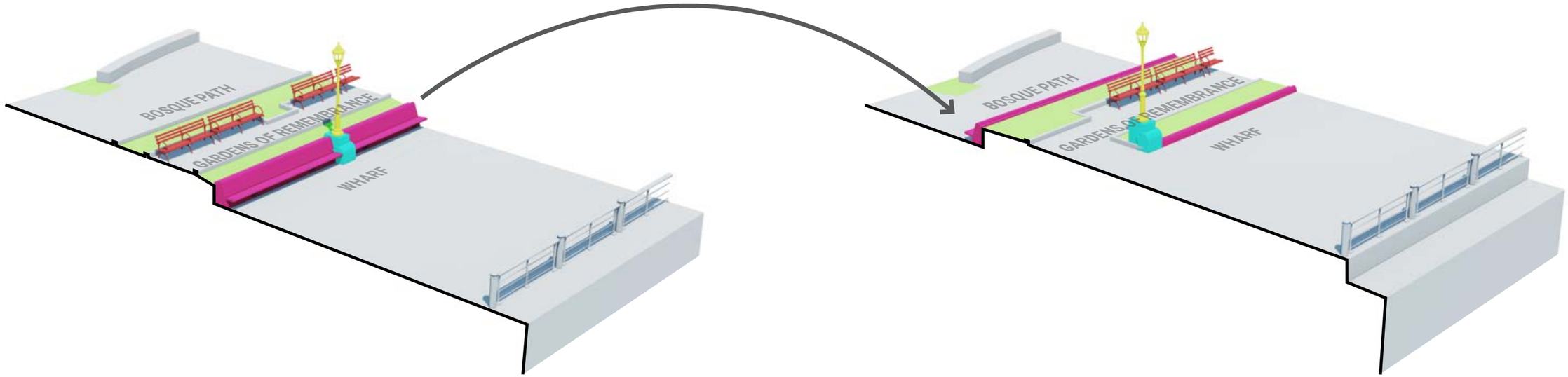
2. As much as possible, reuse materials that can be processed or reworked within 50 miles of the site.

3. For all other materials, as much as possible, source separate waste products and send to salvage yards within 50 miles of the site (including compost disposal).

4. For all other materials, as much as possible, comingle waste products and send to recycling facilities within 25 miles of the site.

5. For all other materials that cannot be salvaged or recycled, landfill disposal is a last resort.

Material Reuse



EXISTING FEATURES LOCATION

PROPOSED RELOCATION

EXISTING FEATURES

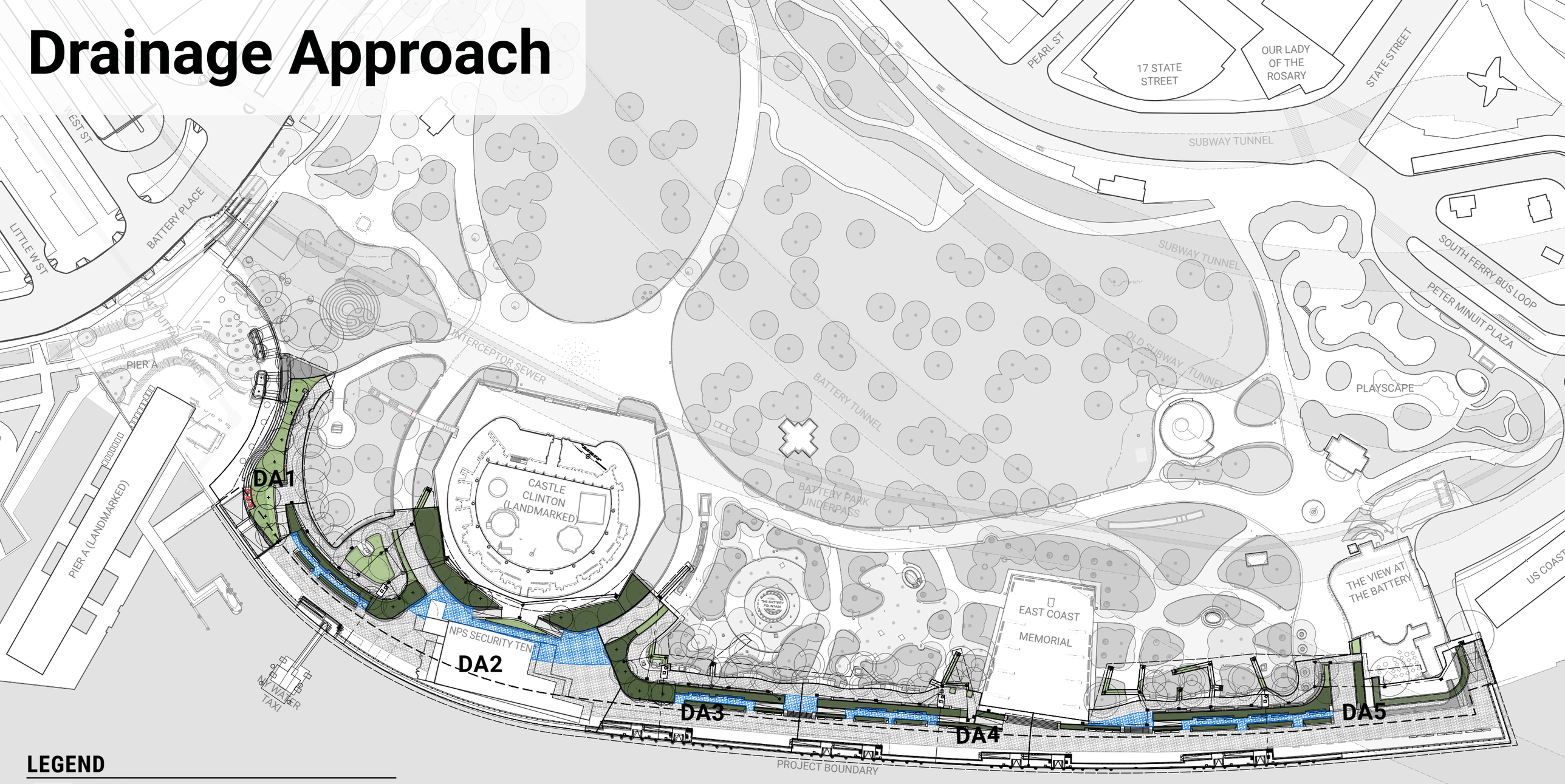
Granite Backed Bench

Pier Types A,C,D

Light Fixture

Pier A Planter Wall

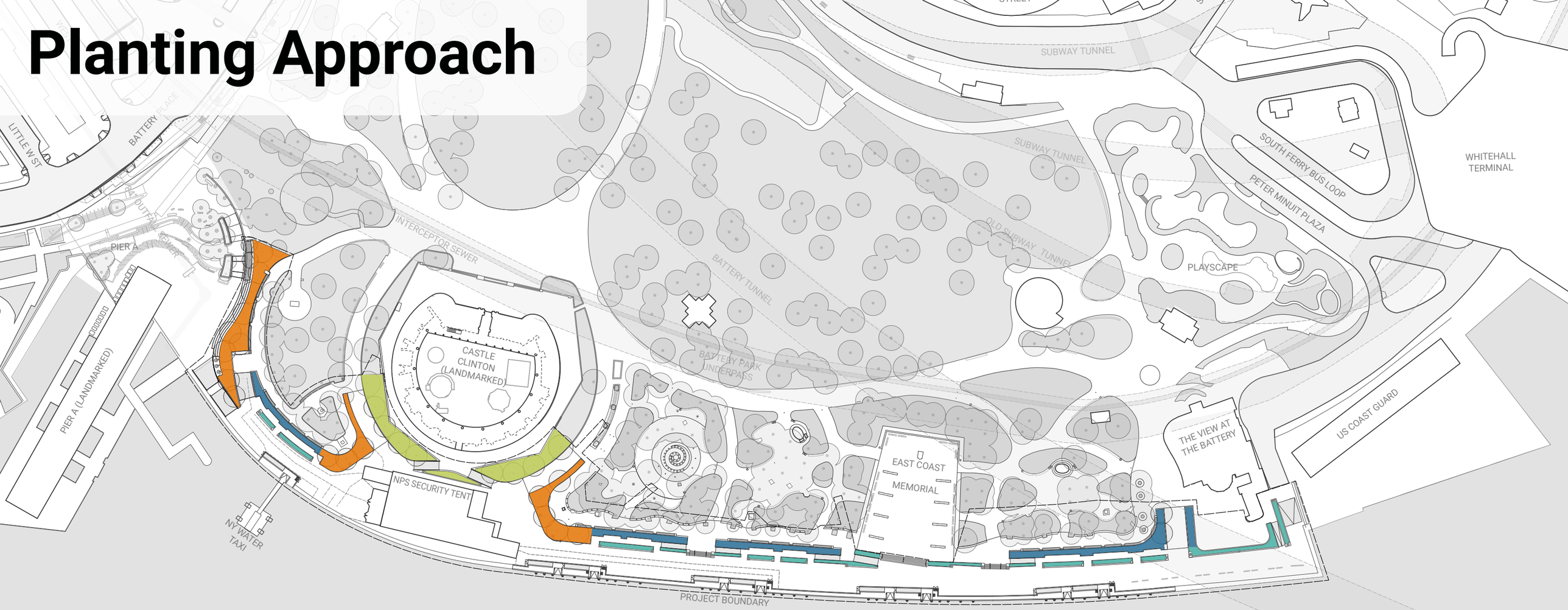
Drainage Approach



LEGEND

- POTENTIAL SMP
- PLANTED AREA NOT BEING CONSIDERED FOR SMP
- POTENTIAL AREA FOR POROUS PAVEMENT
- STANDARD PAVEMENT (NOT POROUS)
- EXISTING TREE CRZ
- DEVELOPMENT AREA BOUNDARY
- BACK OF PROPOSED WHARF STRUCTURE

Planting Approach



ZONE A

- Bright and colorful forb meadow inspired planting with loose, transparant emergents. Narrow beds in full sun. Open view to water. Average height under 3’

ZONE B

- Transition zone from Bosque to narrow bed typology on wharf. Average planting height 3’. Interplanted taller perennials as backdrop to benches. Deeper beds in full sun tilted towards Bosque.

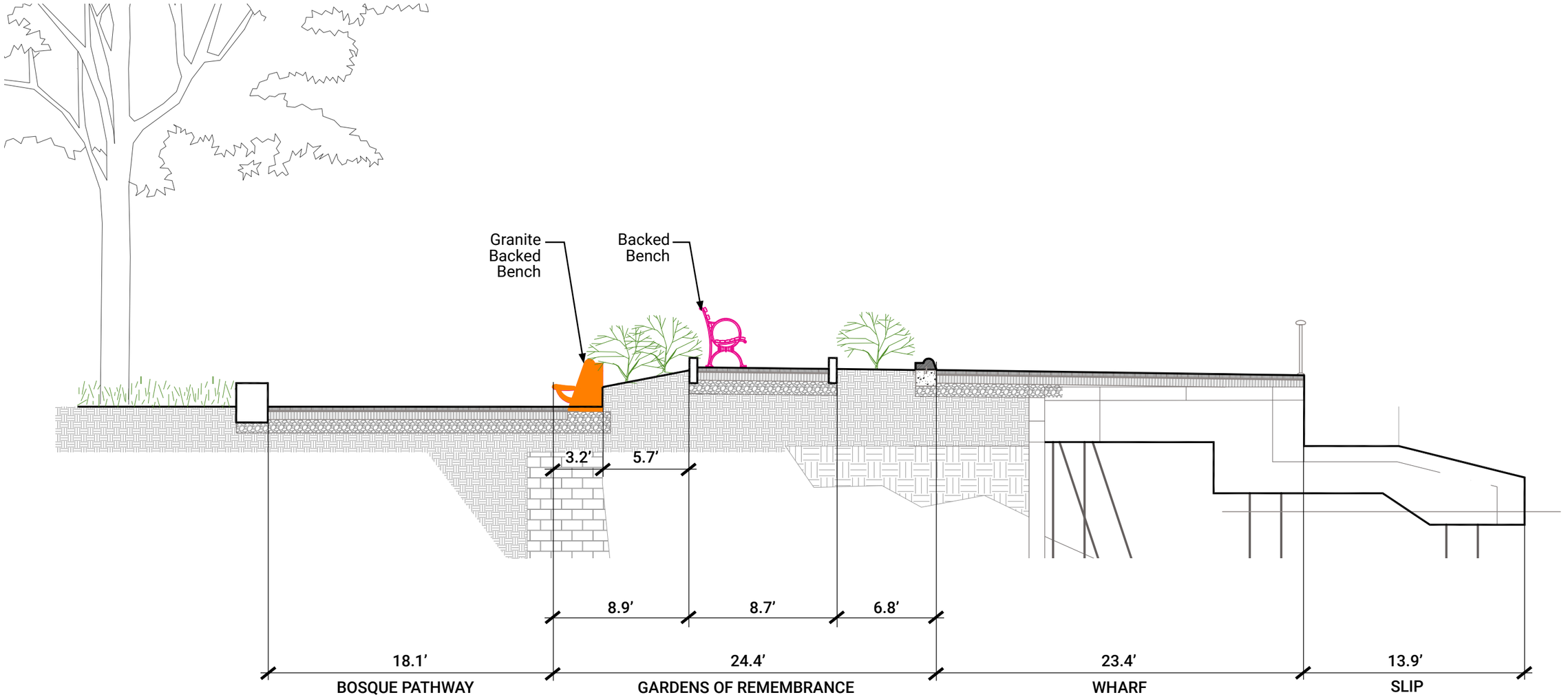
ZONE C

- Bosque-like, more landscape scale planting in deep beds tilted towards Bosque. Average vegetation height 3-4’. Sun to dappled shade.

ZONE D

- Bold grass massings under trees firmly ground Castle Clinton’s massive architecture. Deep beds in full sun to dappled shade.

Typical Gardens of Remembrance Section



Section A-A'

Universal Design

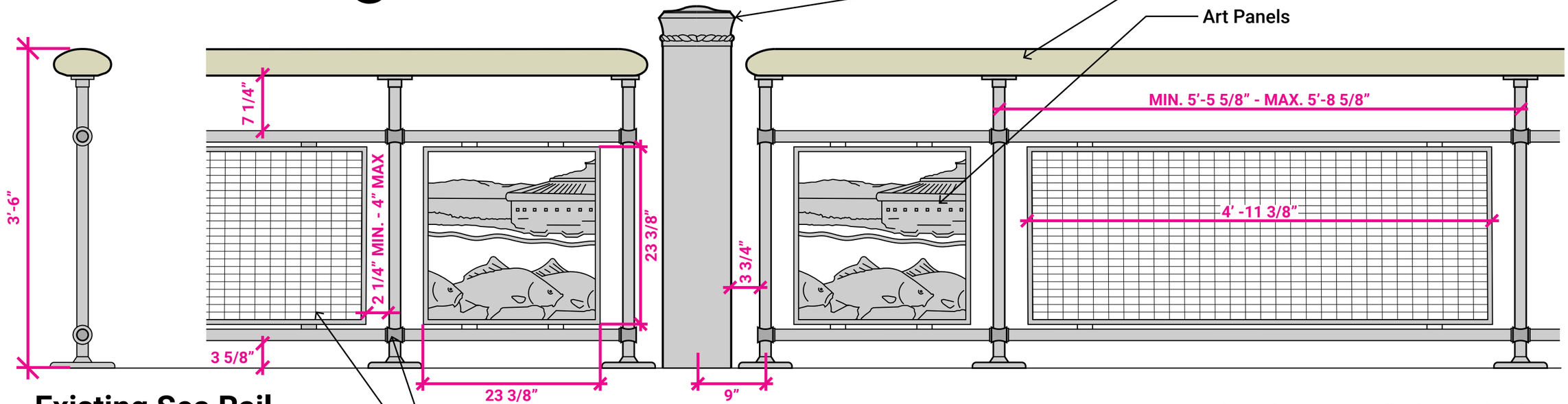
Existing

Proposed

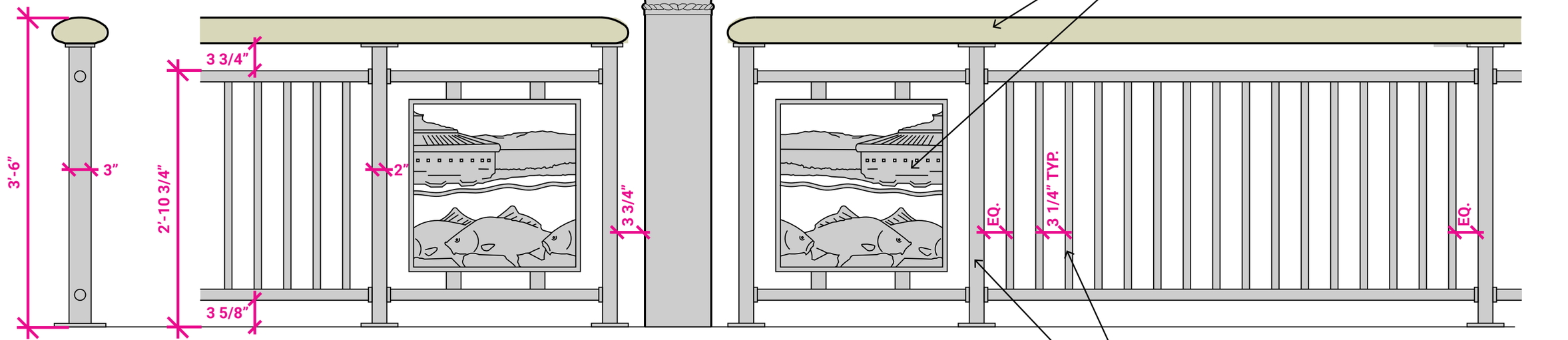
View From Pier A To Wharf

Proposed View From Ferry To East Coast Memorial

Sea Rail Design

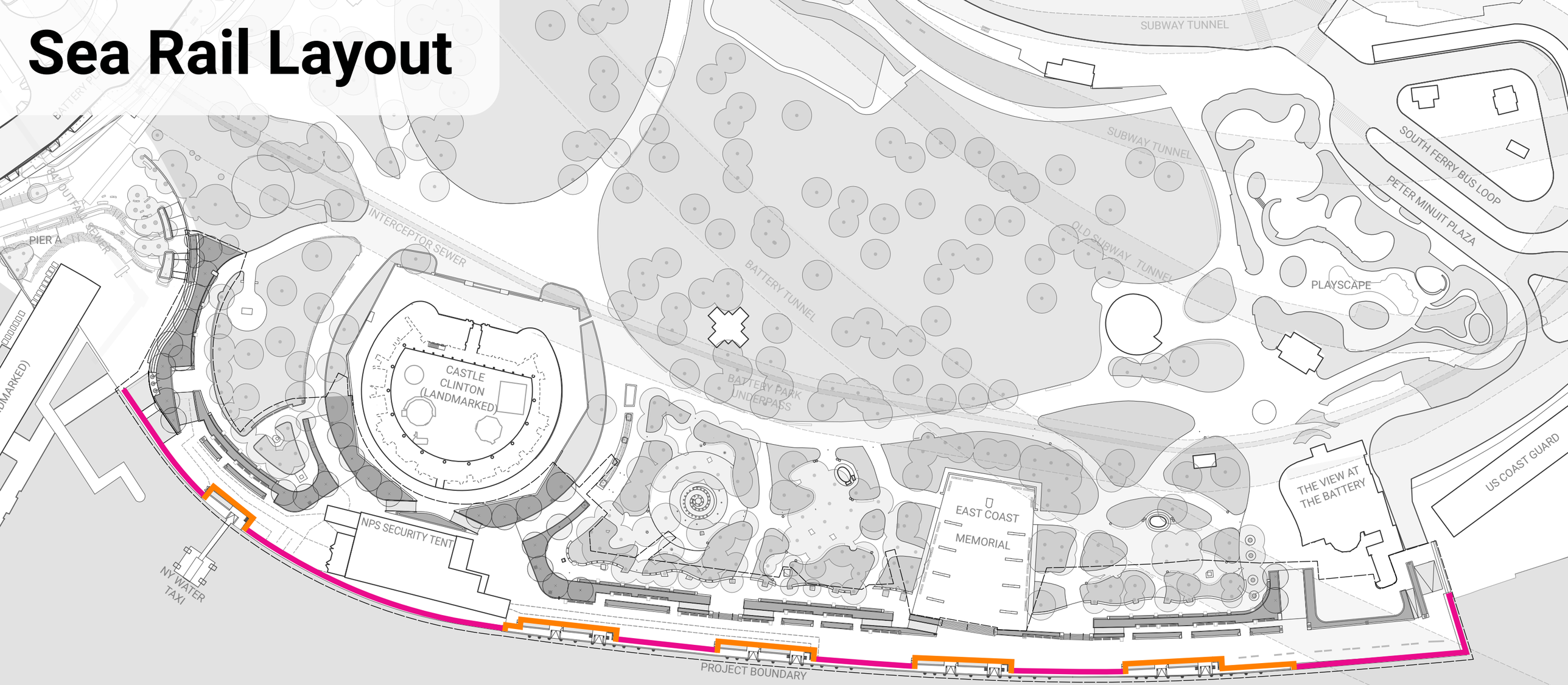


Existing Sea Rail



Proposed Sea Rail

Sea Rail Layout



LEGEND

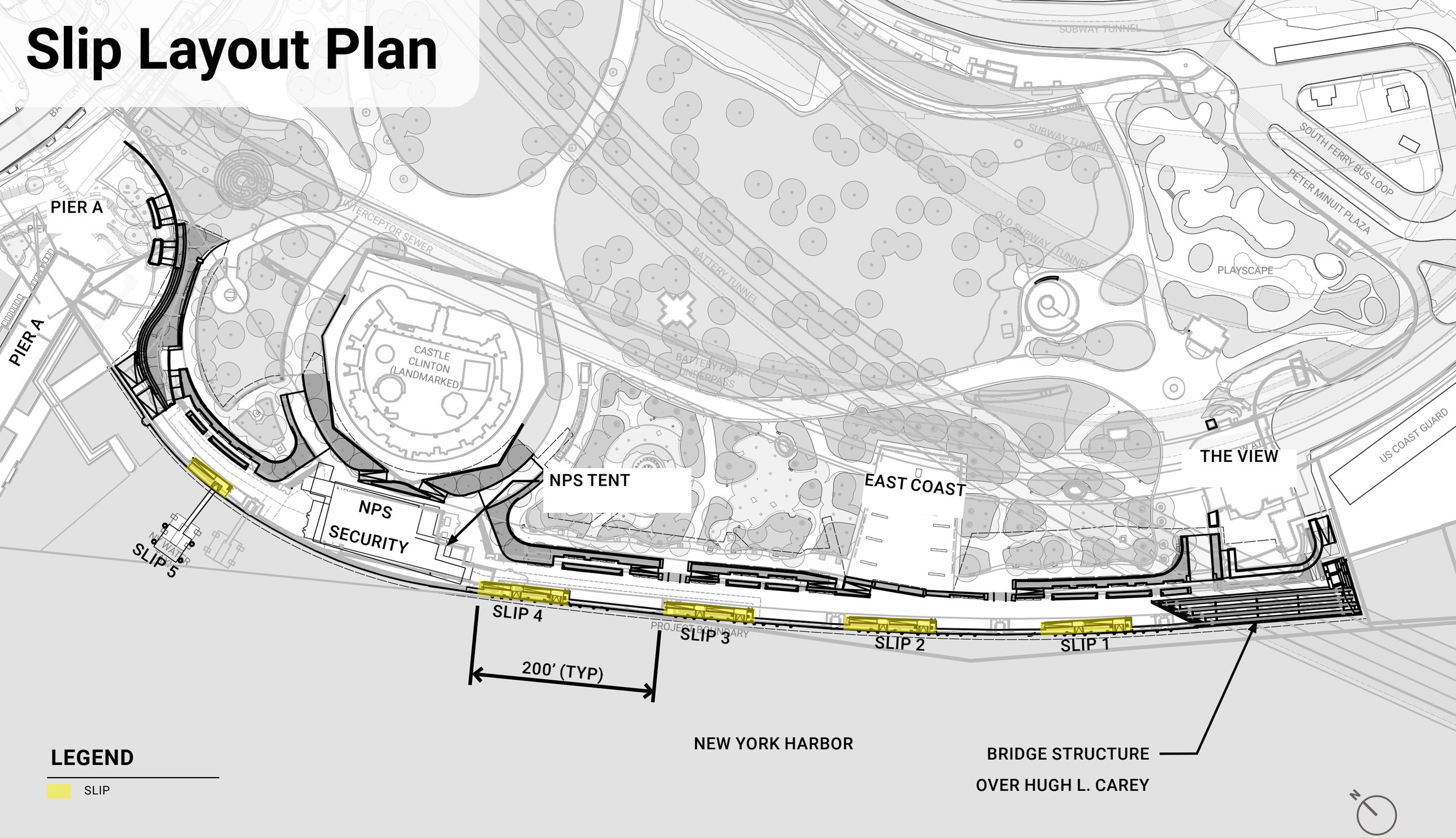
- WOOD TOP RAIL
- METAL TOP RAIL

MATERIAL QUANTITIES

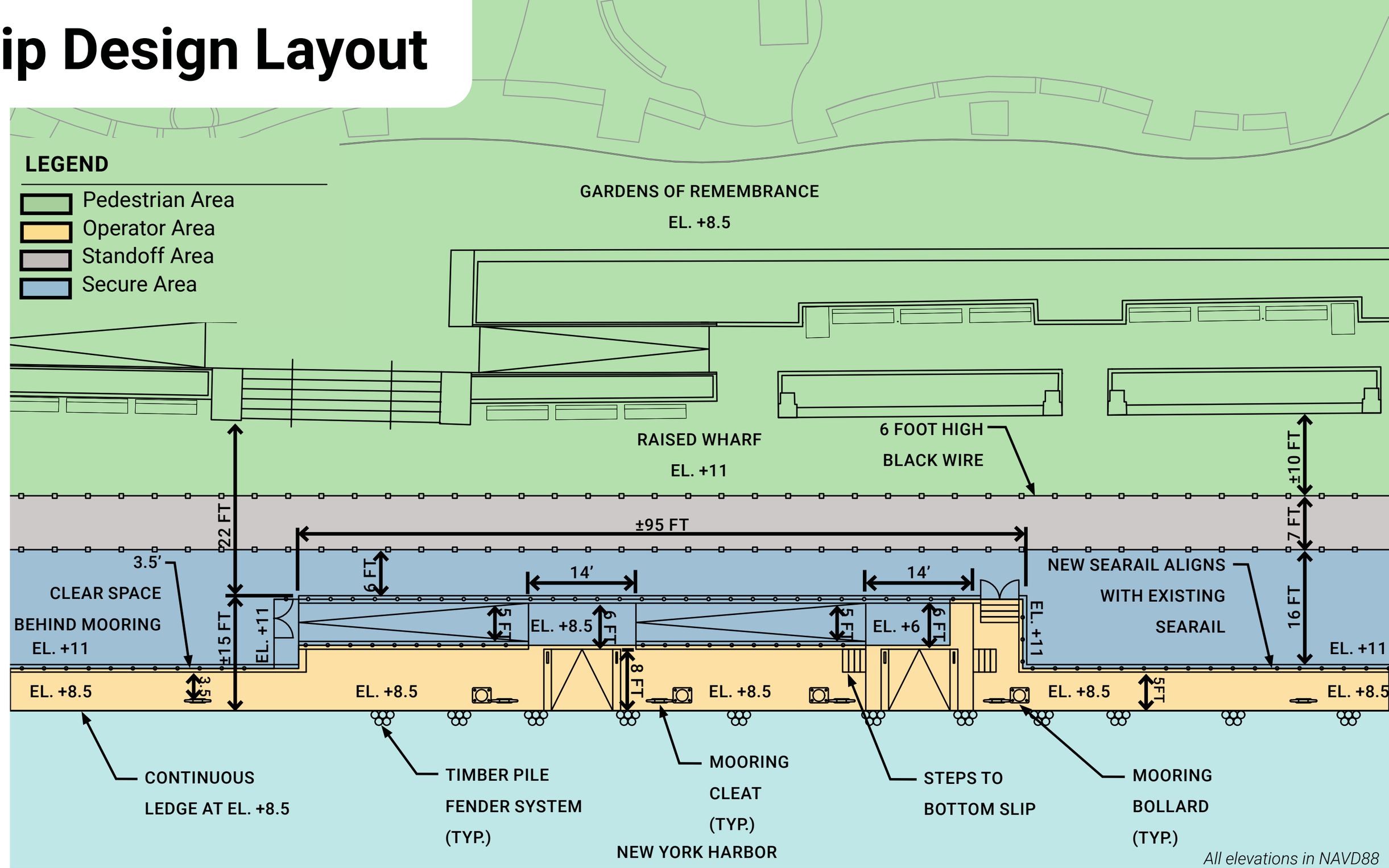
EXISTING WOOD TOP RAIL	1275 LF @85% REUSE	1500 LF
WATERFRONT WOOD TOP RAIL	1000 LF	1500 LF
SLIPS METAL TOP RAIL	600 LF	

CAST IRON BOLLARDS	19 PROPOSED (18 EXISTING)
ART PANELS	37 PROPOSED (36 EXISTING, 1 MISSING)

Slip Layout Plan



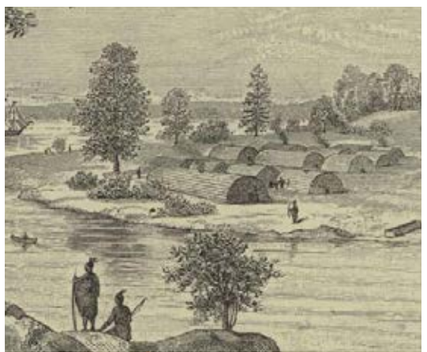
Slip Design Layout



All elevations in NAVD88

Timeline

The earliest known inhabitants in the area were the Lenape



1626
Fort Amsterdam constructed by the Dutch for the purposes of trade and defense

1811
Southwest Battery Fort (now known as Castle Clinton) erected 200ft offshore

1853-1872
Period of waterfront filling to create developable land. Roughly 20% of the larger metropolitan region is built on landfill and much of that fill is varied forms of waste from city development projects and garbage

1855-1890
Castle Clinton used as the federal immigration center; processed approximately eight million immigrants during this time

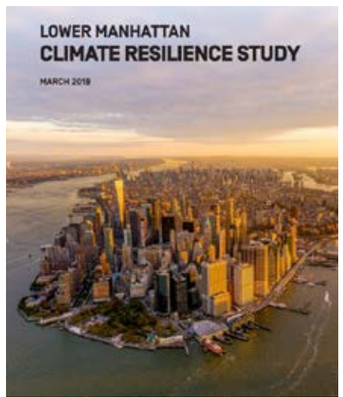
1890-1941
Castle Clinton acquired by New York City Department of Public Parks and operated as the New York Aquarium

1940-1952
Battery Park closed to build Brooklyn-Battery Tunnel and Battery Park Underpass

1974
1.2 million cubic yards of earth from the World Trade Center foundation excavation was used to create Battery Park City

2012
Hurricane Sandy

2019
LMCR Study



2021 Daily Water Levels