A.4 Community Engagement Materials

A.4.1 SBPCR Community Engagement Presentation (March 2019)

SOUTH BATTERY PARK CITY RESILIENCY

COMMUNITY ENGAGEMENT MEETING

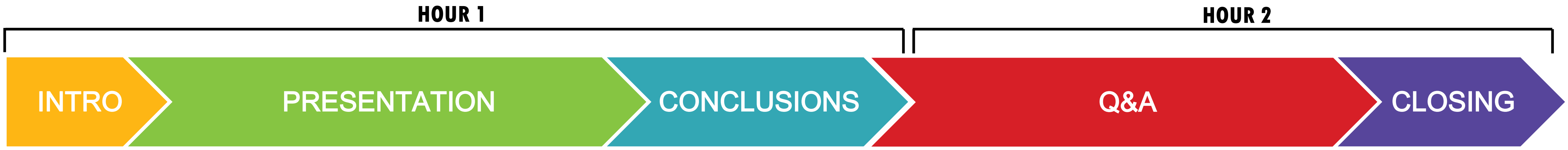
March 12, 2019

NEW YORK STATE OF OPPORTUNITY. Battery Park City Authority

AECOM

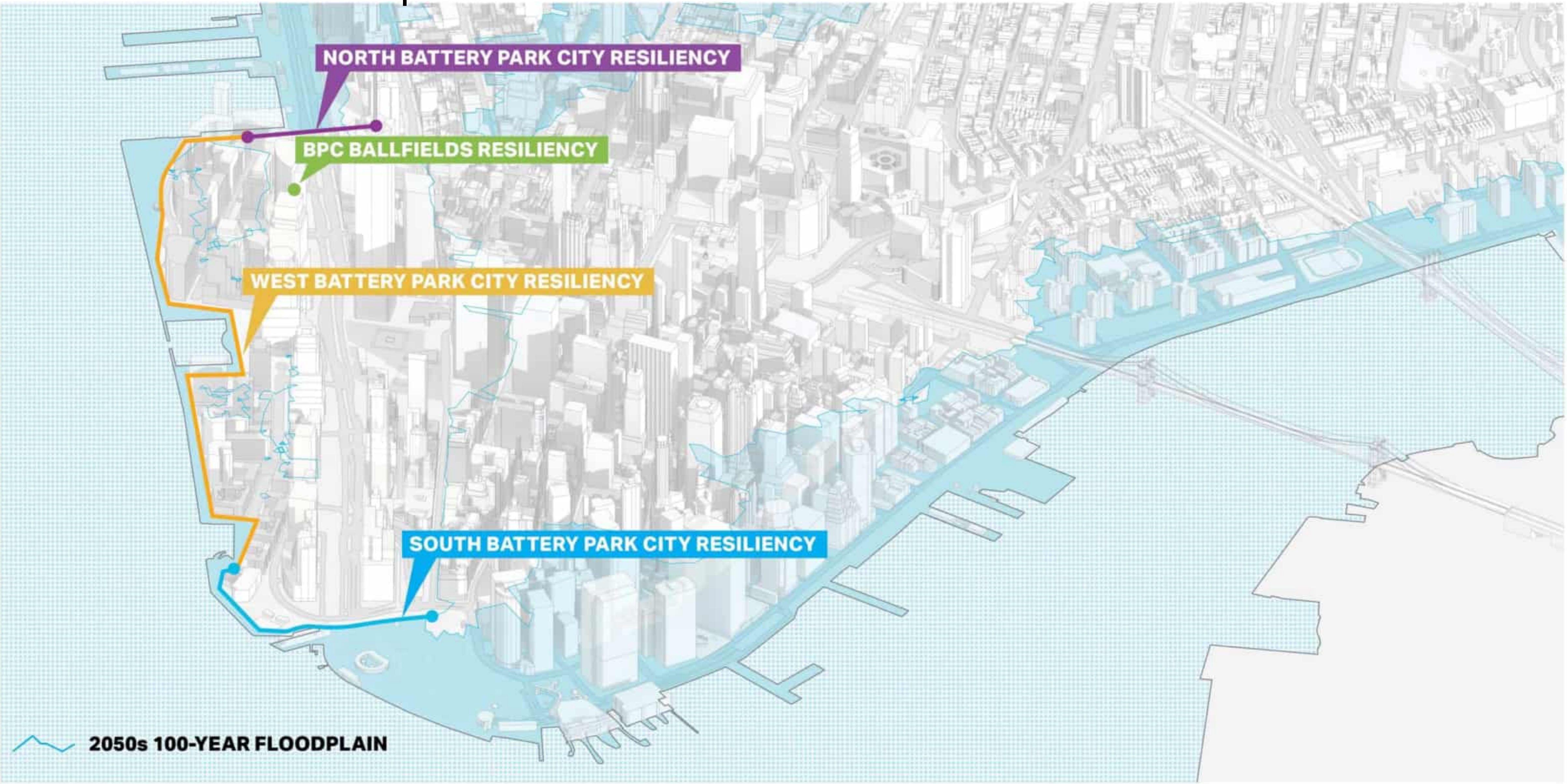
AGENDA

1. Project Update
2. Balance of Decisions
3. Inventory + Analysis
4. Engineering + Feasibility
5. Alignment Location Alternatives
6. Implications to Project Area + Potential Flood Risk Measures
7. Next Steps
8. Q&A

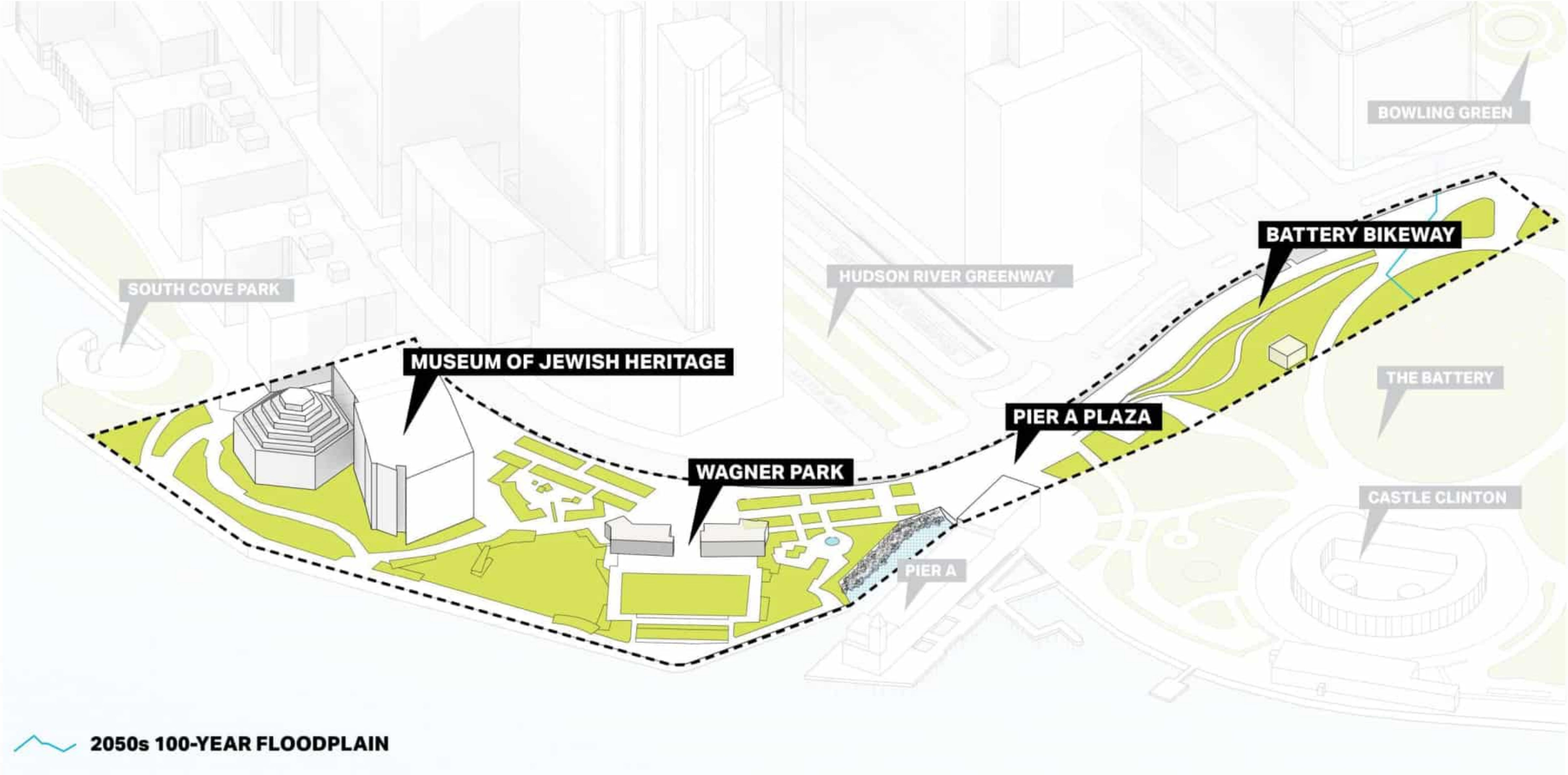


PROJECT UPDATE

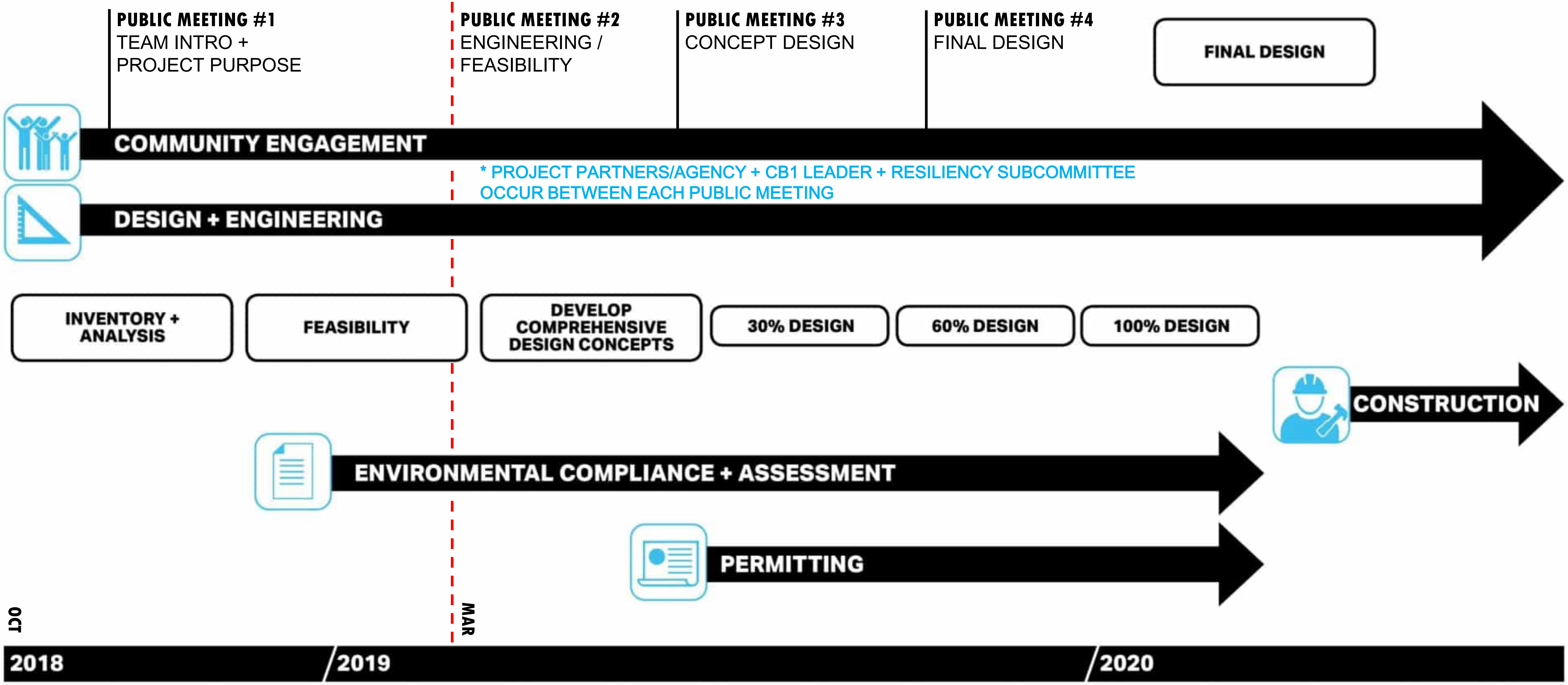
RESILIENCY MEASURES | BATTERY PARK CITY



PROJECT AREA

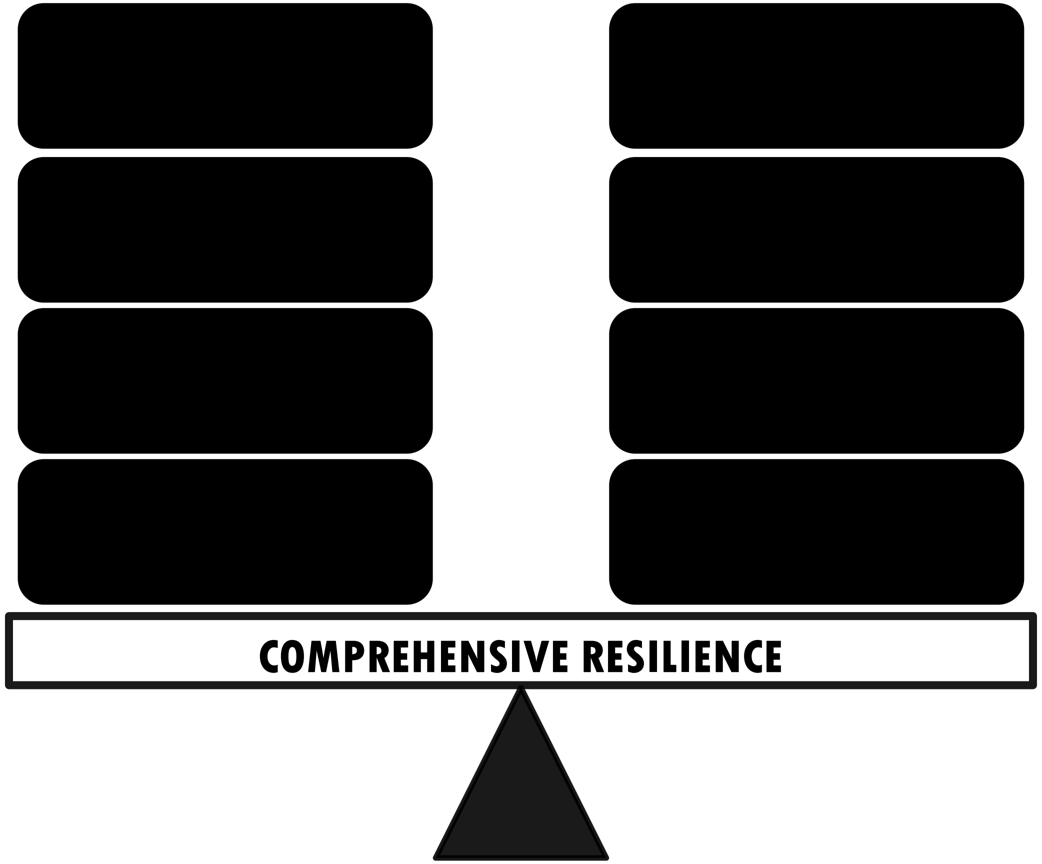


PROJECT SCHEDULE



BALANCE OF DECISIONS

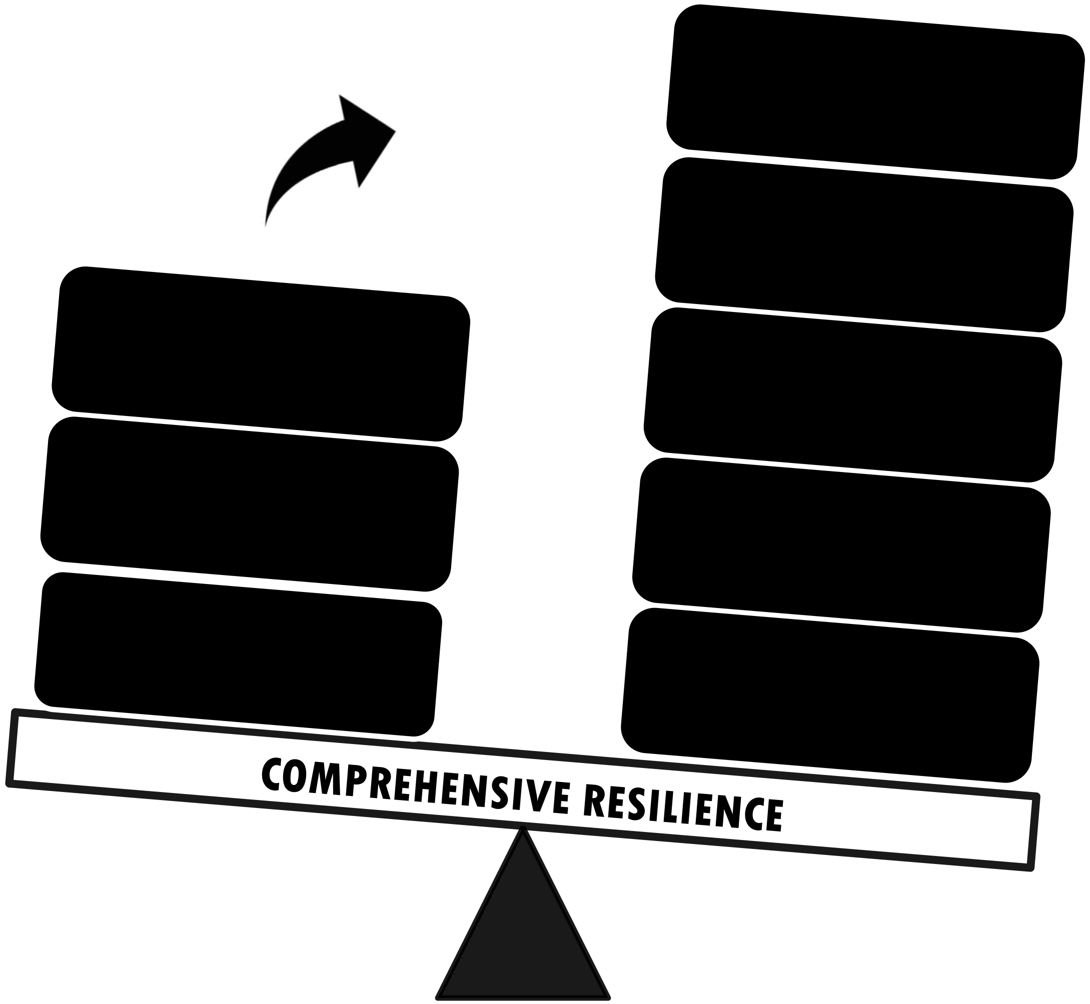
INTEGRATED PROJECT DECISIONS | EQUILIBRIUM



PROJECT CONSIDERATIONS

- AESTHETICS
- COST $$$
- DESIGN FLOOD ELEVATION
- DESIGN LEGACY
- FLOOD RISK MEASURES
- INTEGRATION OF DESIGN & LANDSCAPE
- LAWN/PARK SPACE
- LIFE CYCLE OF OPERATIONS & MAINTENANCE
- MAXIMIZE PROTECTED AREA
- BUILDING & NO BUILDING OPTIONS
- PROGRAMMING OF SITE & USES

INTEGRATED PROJECT DECISIONS | UNBALANCED



PROJECT CONSIDERATIONS

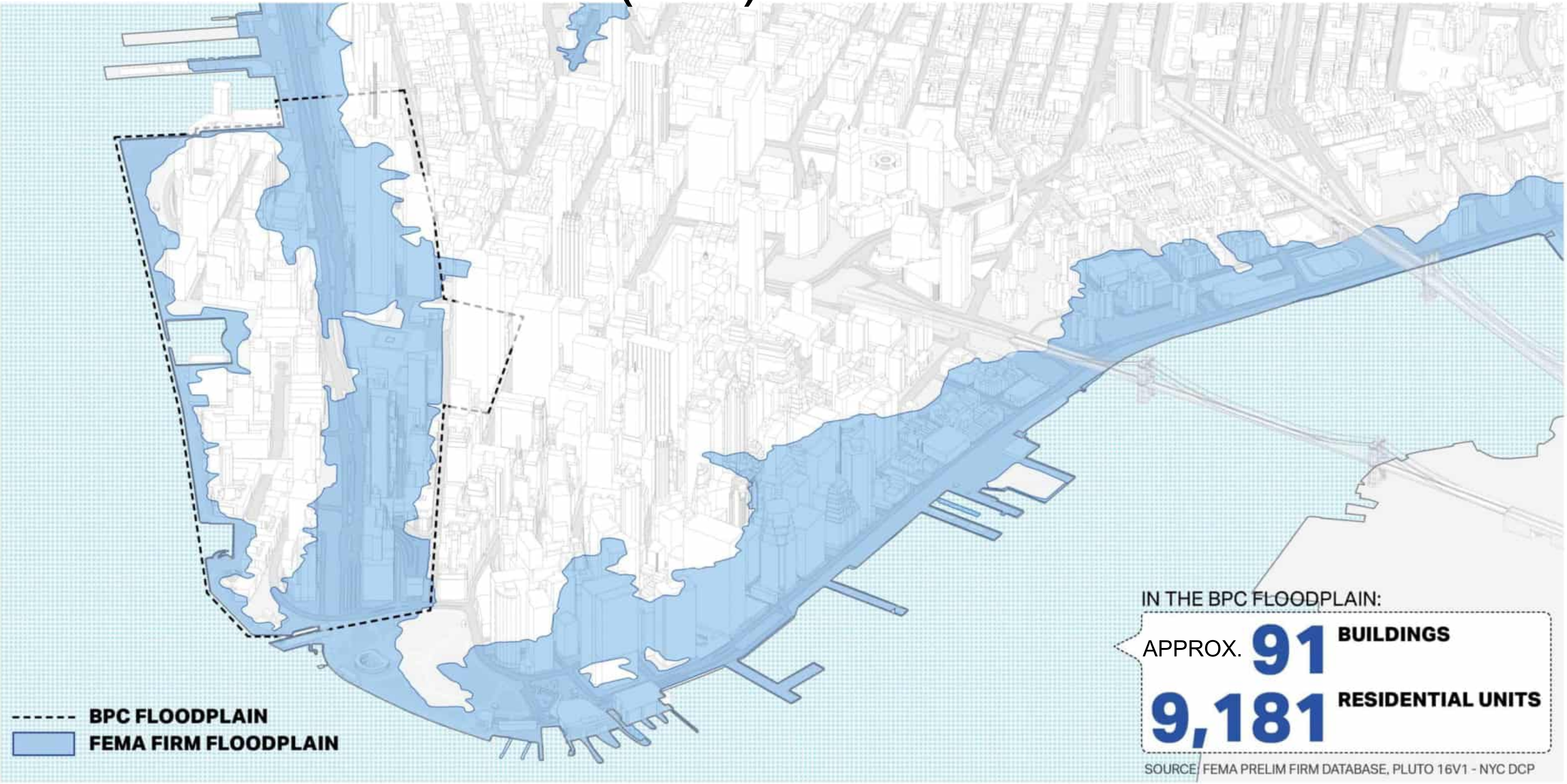
- **AESTHETICS**
- **COST $$$**
- **DESIGN FLOOD ELEVATION**
- **DESIGN LEGACY**
- **FLOOD RISK MEASURES**
- **INTEGRATION OF DESIGN & LANDSCAPE**
- **LAWN/PARK SPACE**
- **LIFE CYCLE OF OPERATIONS & MAINTENANCE**
- **MAXIMIZE PROTECTED AREA**
- **BUILDING & NO BUILDING OPTIONS**
- **PROGRAMMING OF SITE & USES**

INVENTORY + ANALYSIS

PROJECT BASIS OF ANALYSIS

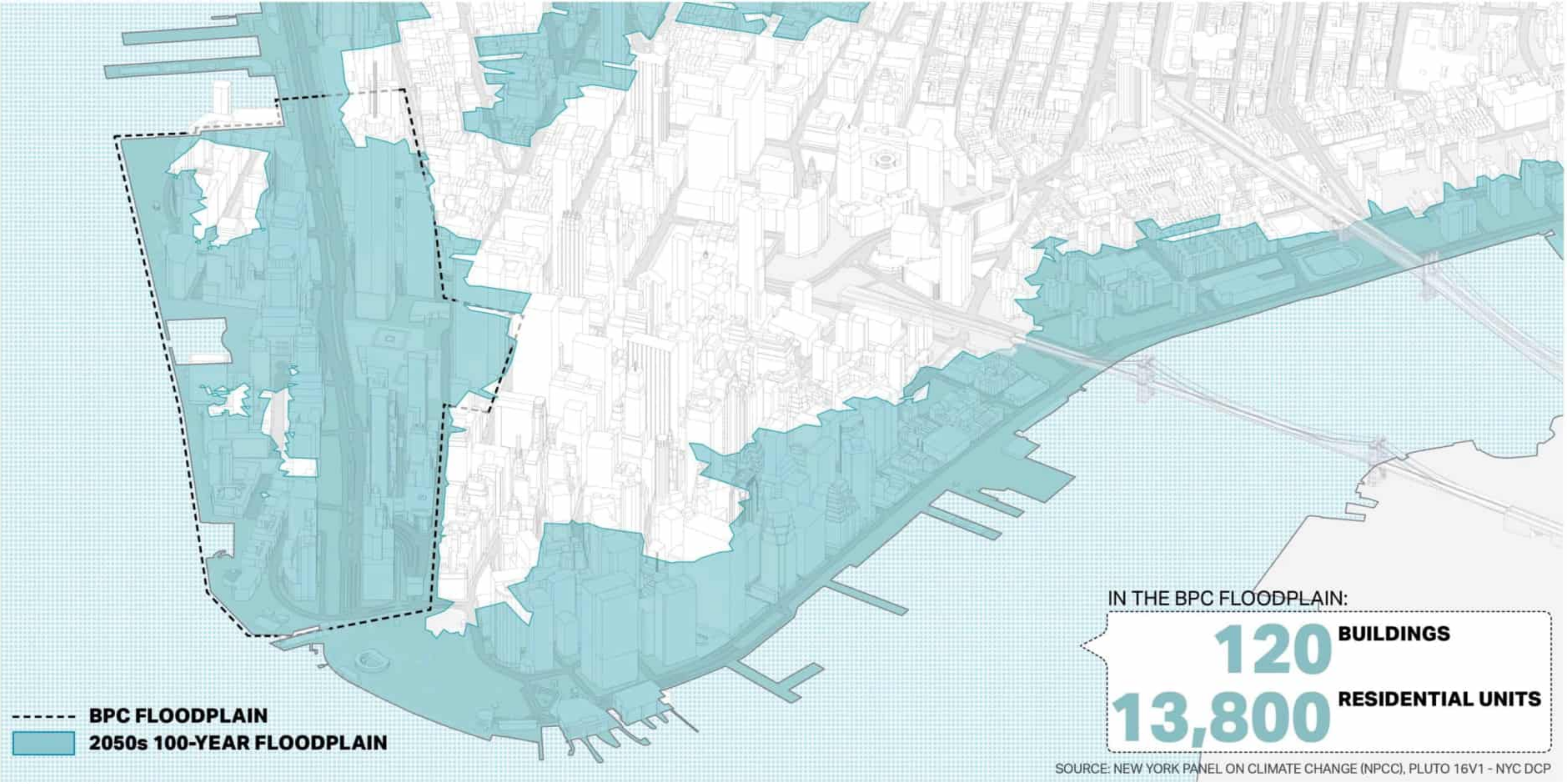
- Community Input
- Existing Drawings
- Subsurface Conditions
- Coastal Model of Site
- Project Partner & Agency Coordination
- Perkins Eastman: Wagner Park Site Assessment
- KSE Assessment: Battery Park City Authority Architectural/Engineering Building Inspection
- BPCA & BMCC Park User Study

FEMA FLOOD INSURANCE RISK MAP (FIRM)



*DATA FROM 2016

2050s 100-YEAR STORM



*DATA FROM 2016

PRECEDENT STORMS | RAINFALL

The Battery
Credit: Michael Appleton, The New York Times

The Battery
Credit: Mario Tama/Getty Images North America

North Cove Marina
Credit: Chip Somodevilla/Getty Images North America

HURRICANE IRENE
(2011)

HURRICANE HARVEY
(2017)

Houston, TX
Credit: US Army photo by 1st Lt. Zachary West

Houston, TX
Credit: Shuttershock/Reuters/Business Insider

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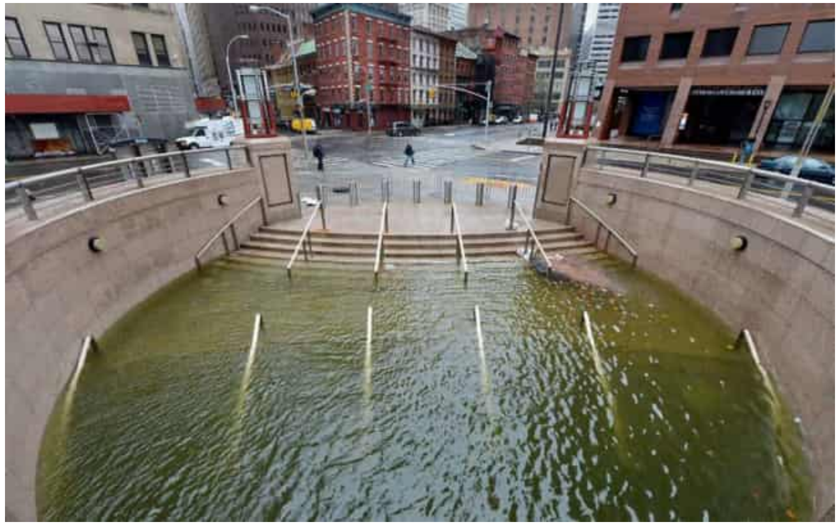
PRECEDENT STORMS | COASTAL SURGE

Battery Park City
Credit: Slate

The Battery
Credit: AP Photo/Craig Ruttle



One New York Plaza
Credit: Slate

HURRICANE SANDY
(2012)

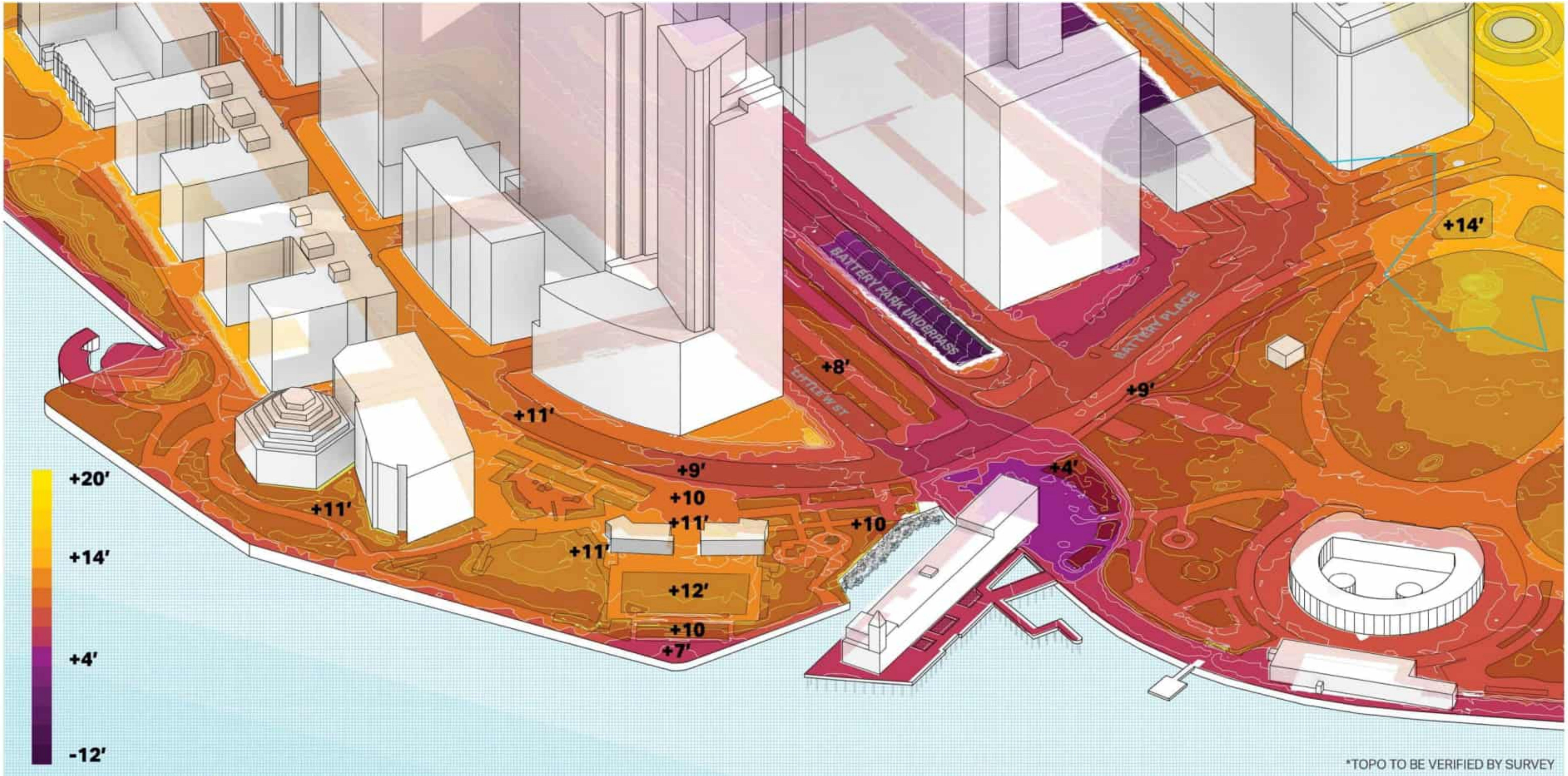
South Ferry Station
Credit: MTA

Battery Park Underpass
Credit: Downtown Express file photo by Jay Fine

PRECEDENT STORMS | STORM FREQUENCY DATA

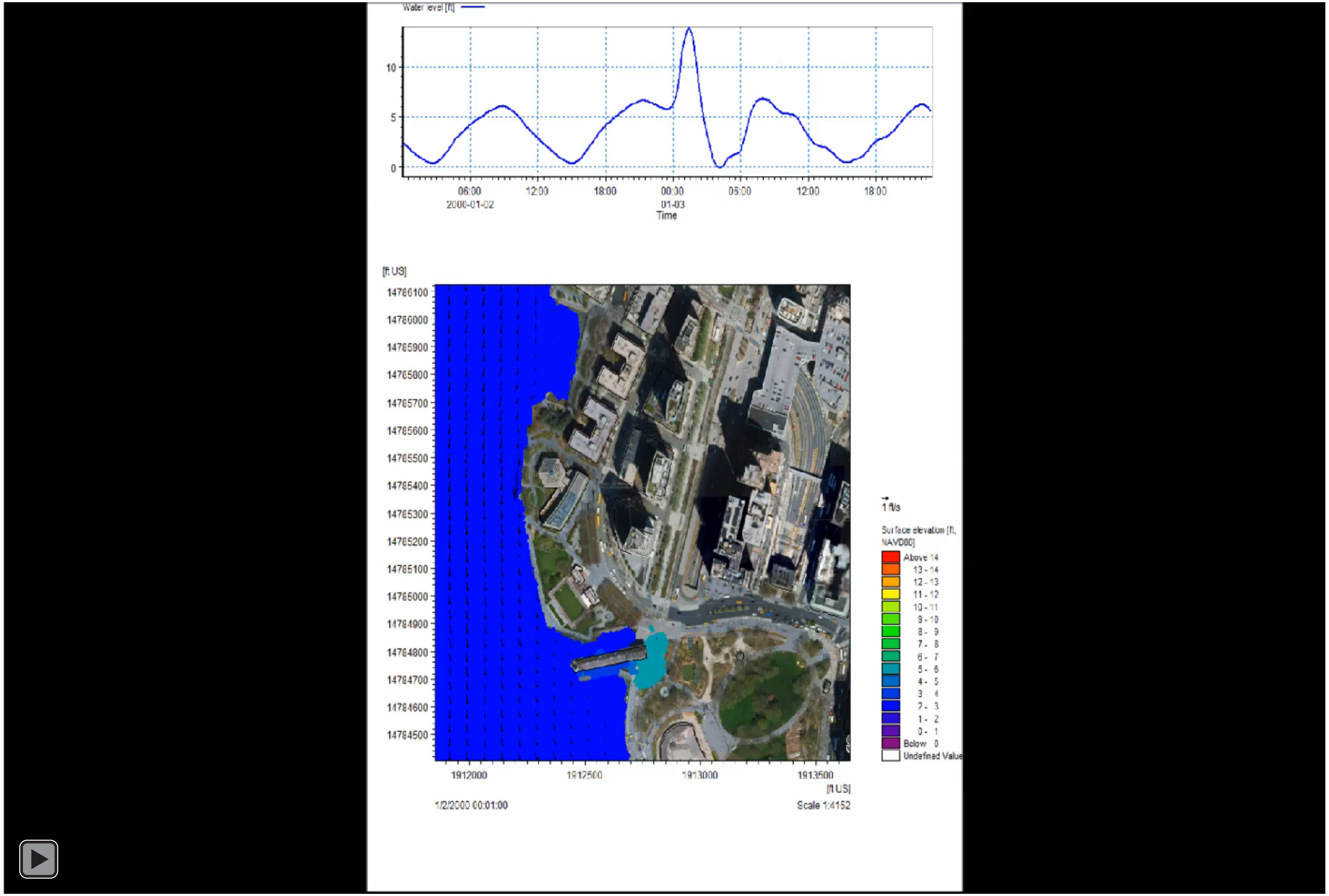
FROM 2010-2017 THERE HAVE BEEN (26) 500-YEAR EVENT STORMS

EXISTING TOPOGRAPHY



EXISTING CONDITIONS COASTAL MODELING

- 2050 100-Year Storm Event w/ Sea Level Rise (30”)
- Flood inundation shown over current physical conditions
- Depicts 1-2 tide cycles with storm surge added to the 2nd
- Precipitation storm event not included, but will be included



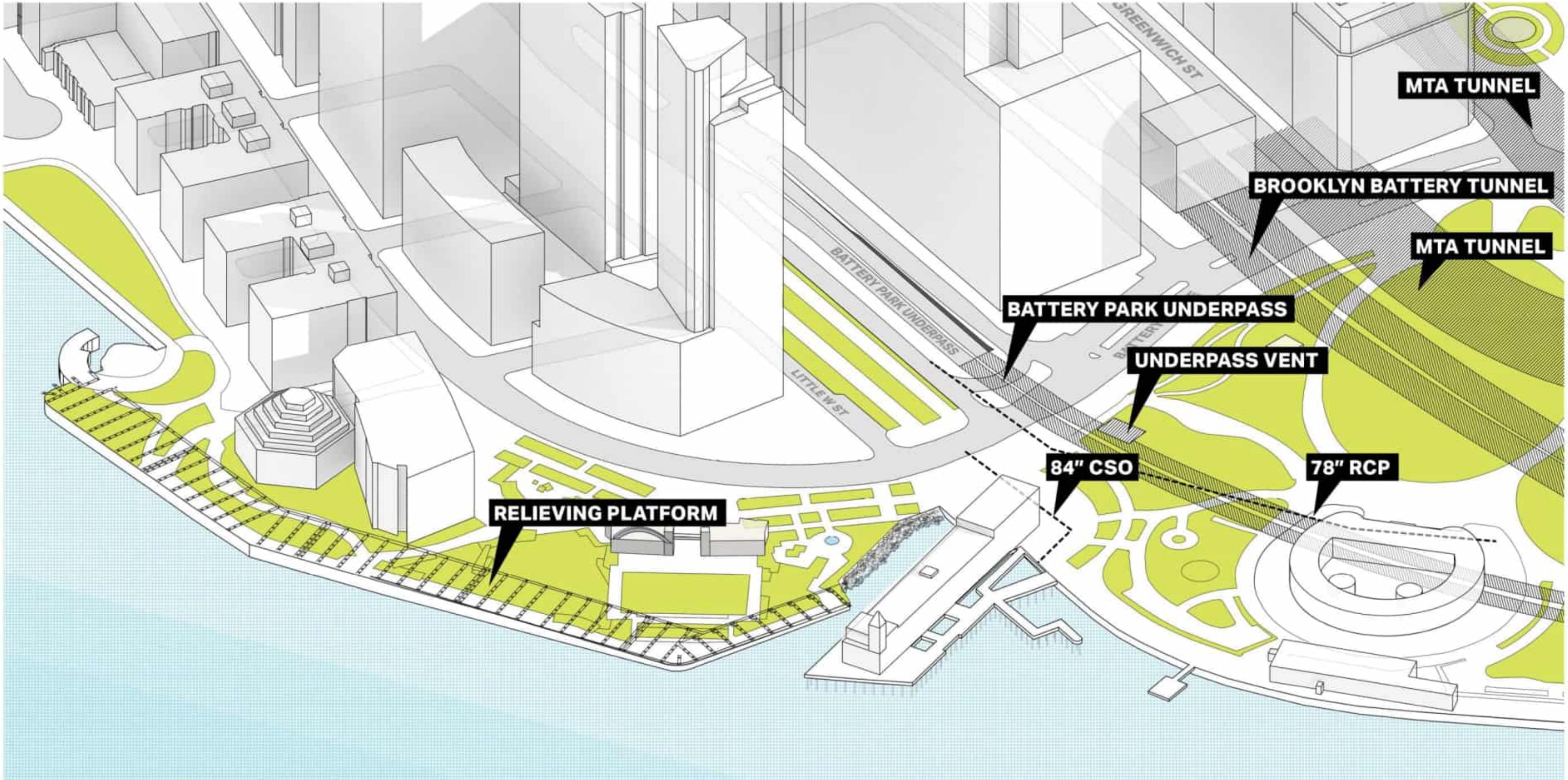
If video does not play please click here: https://youtu.be/NfO1myBa0IE

* Coastal Modeling animations in this presentation are preliminary. Models need to be refined with aspects such as surveyed information for the project area. This animation showcases only a range of approximate coastal surge elevations on the existing conditions.

- 2050 100-Year Storm Event w/ Sea Level Rise (30")
- Flood inundation shown over current physical conditions
- Depicts 1-2 tide cycles with storm surge added to the 2nd
- Precipitation storm event not included, but will be included

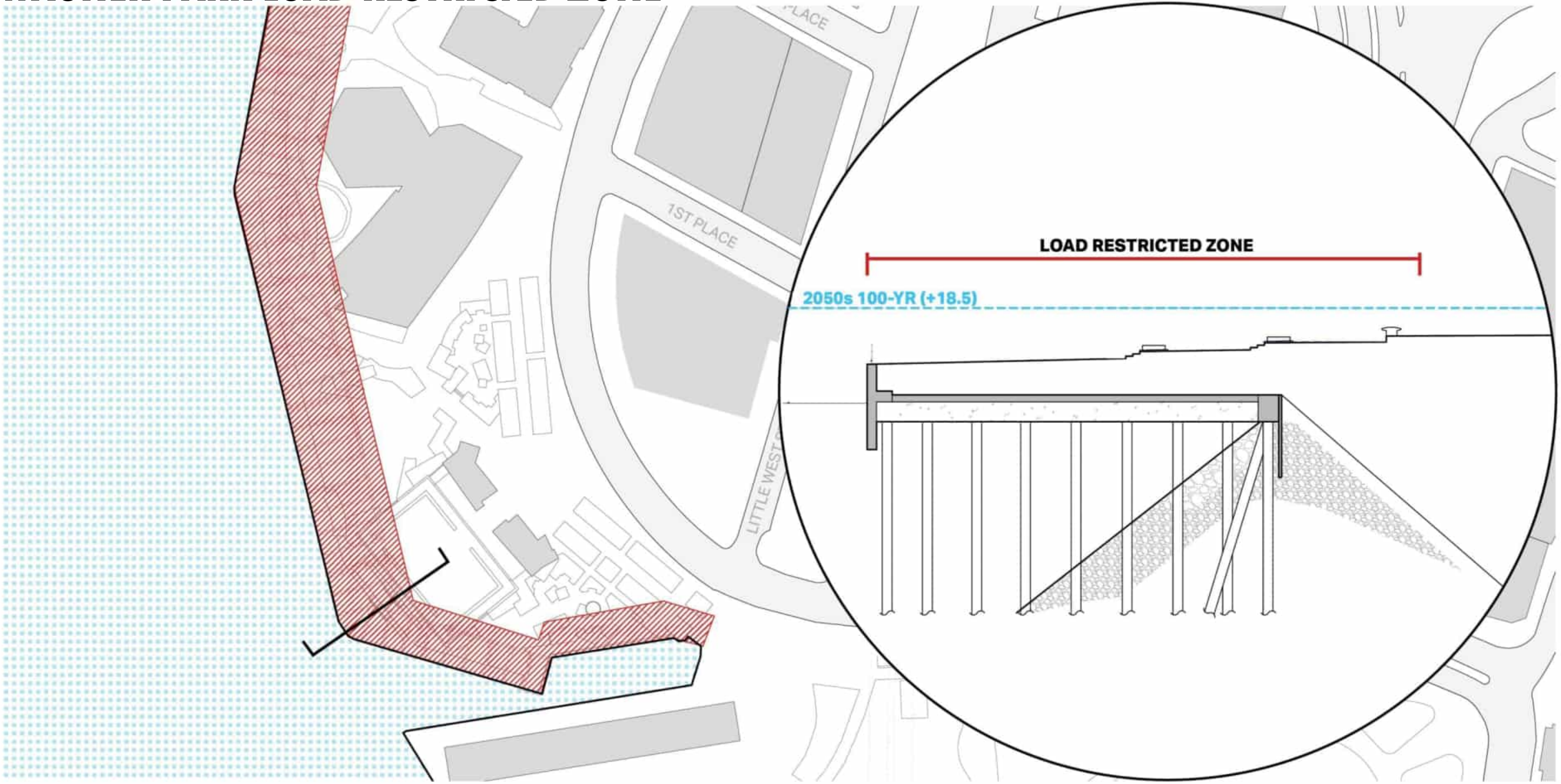
ENGINEERING + FEASIBILITY

SUBSURFACE



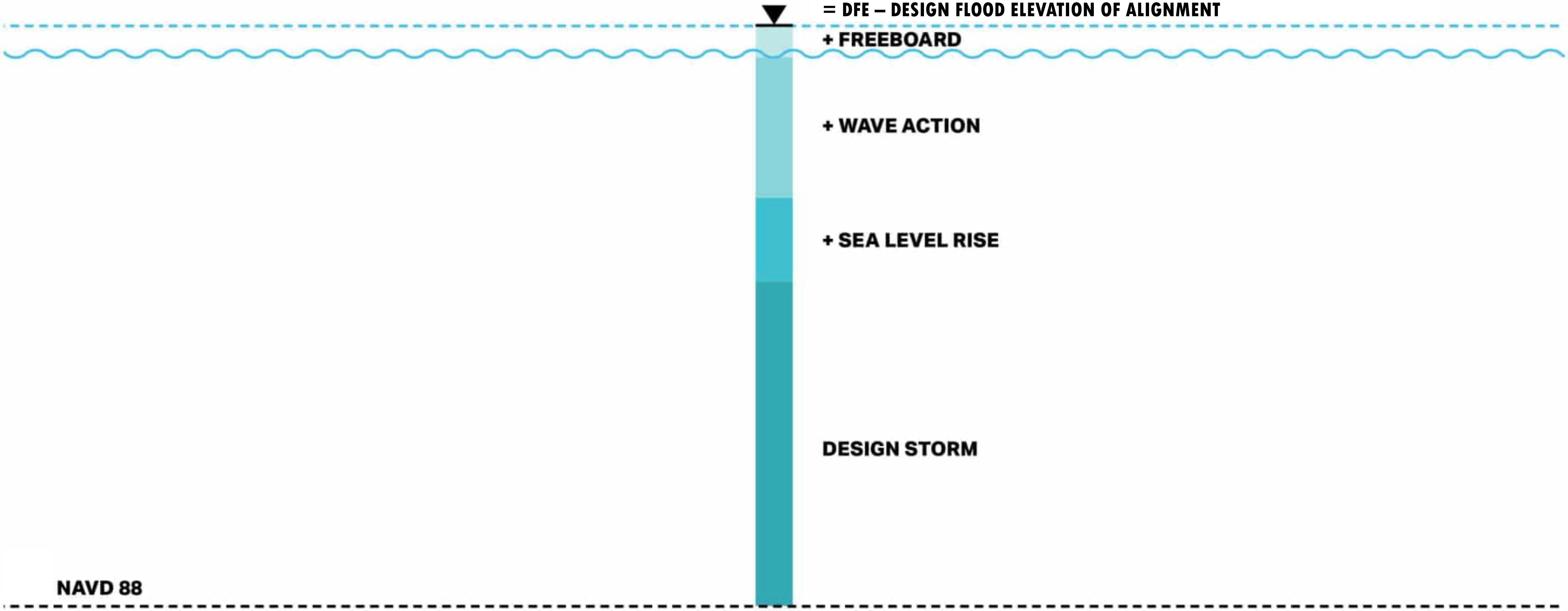
GREENWICH ST
MTA TUNNEL
BROOKLYN BATTERY TUNNEL
MTA TUNNEL
BATTERY PARK UNDERPASS
BATTERY PARK UNDERPASS
UNDERPASS VENT
LITTLE W ST
84" CSO
78" RCP
RELIEVING PLATFORM

WAGNER PARK LOAD RESTRICTED ZONE

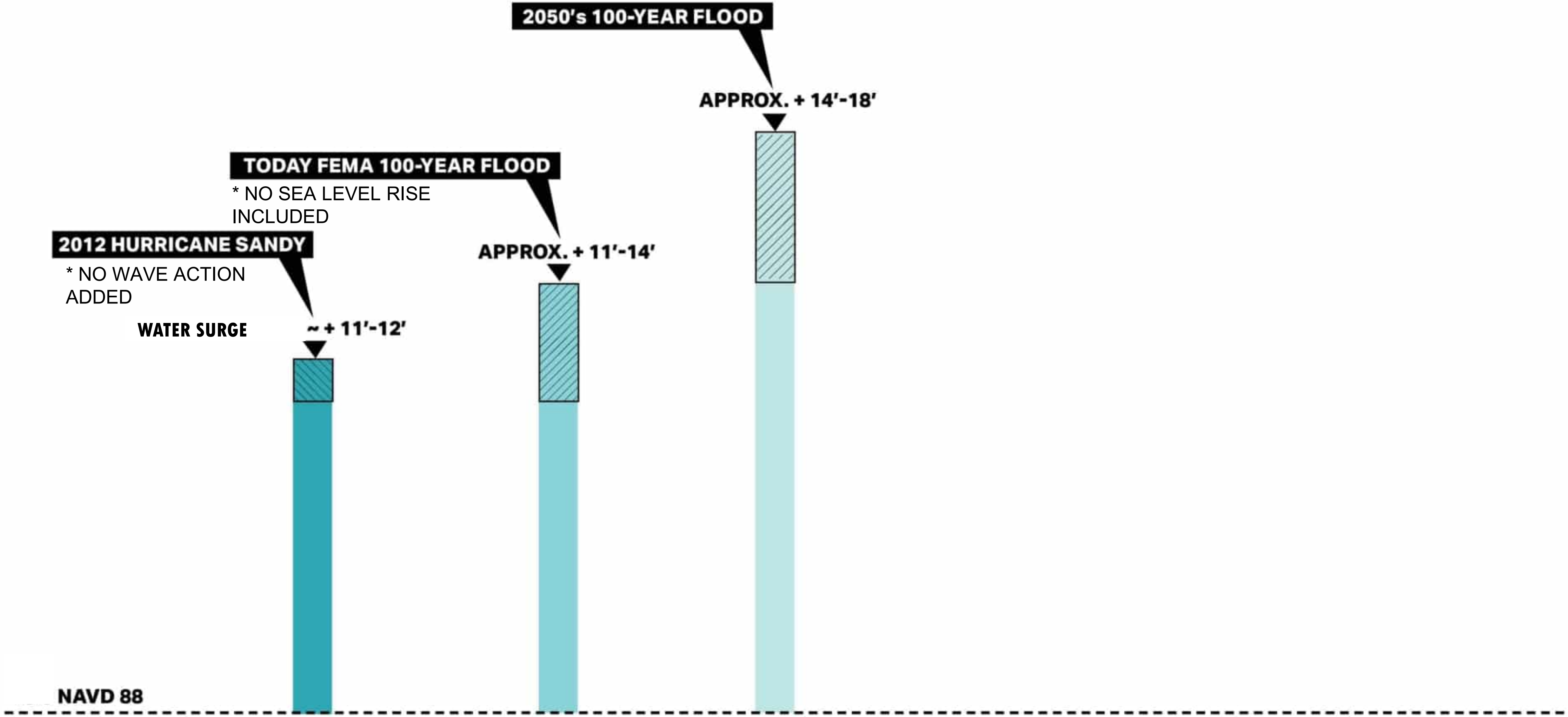


DESIGN FLOOD ELEVATION (DFE)

DESIGN STORM : 2050s 100 YEAR FLOOD

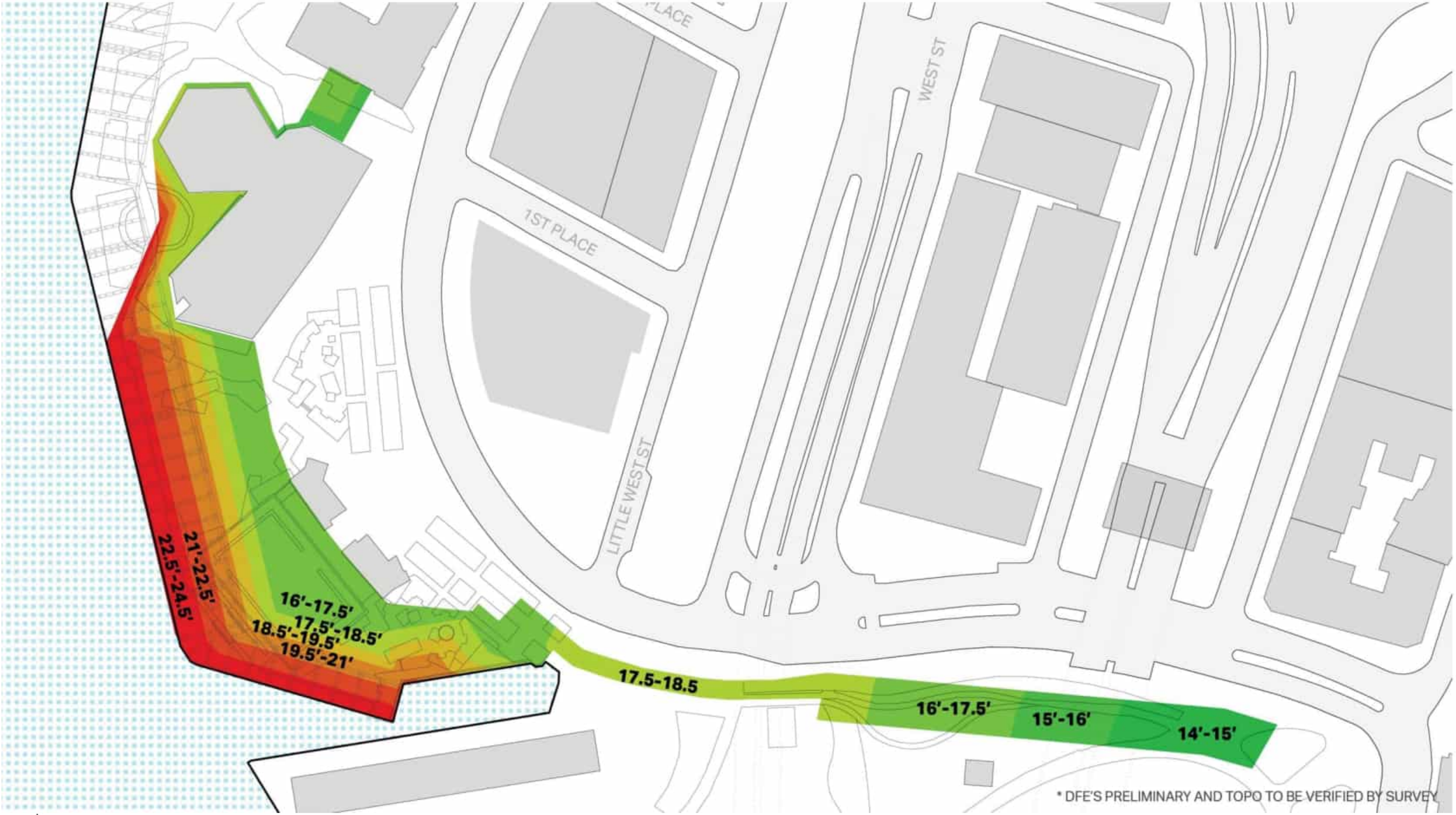


DESIGN FLOOD ELEVATION (DFE) COMPARISON

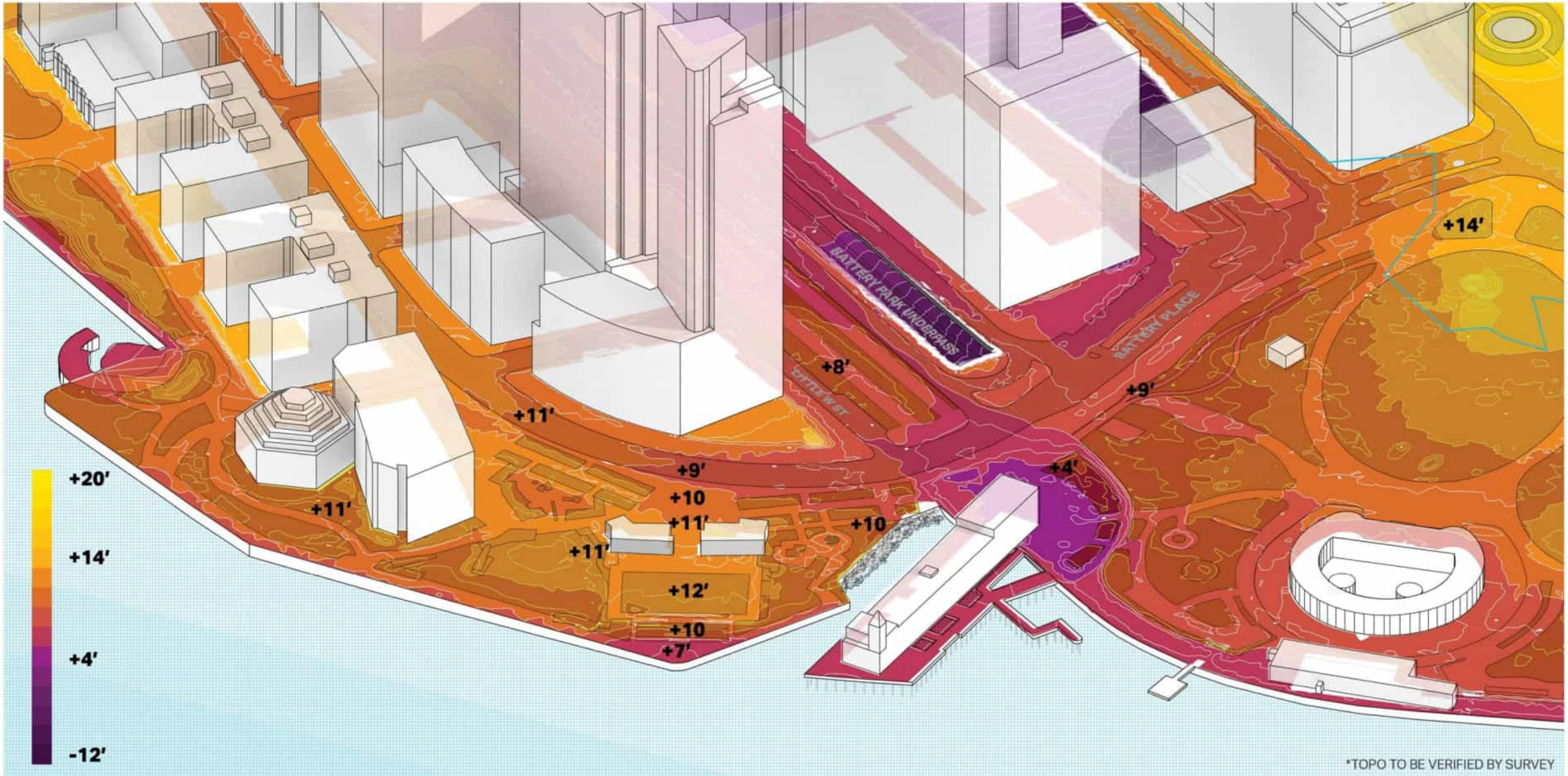


*** 2050 DFE TO BE VERIFIED WITH TOPO**

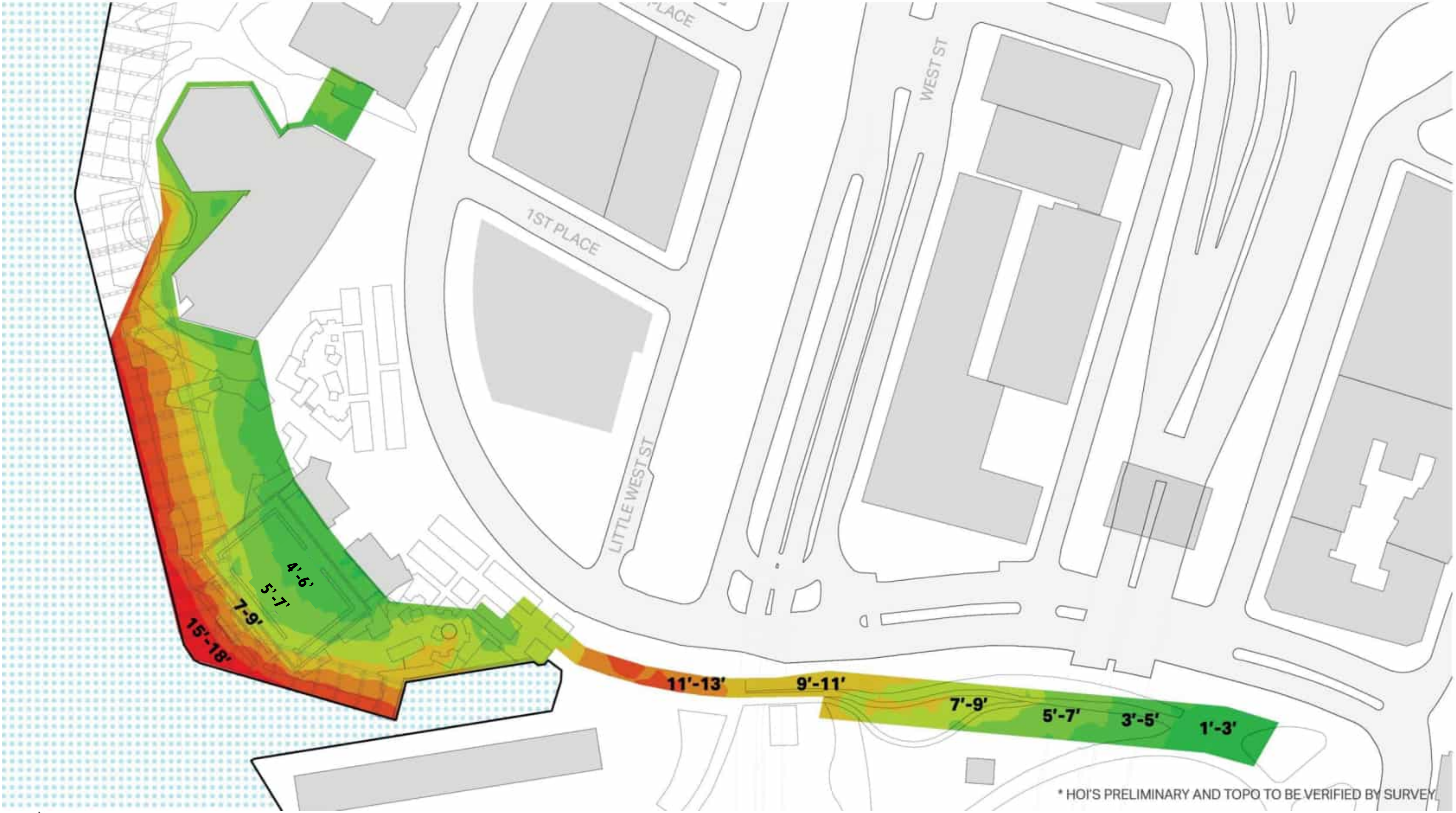
DESIGN FLOOD ELEVATION



EXISTING TOPOGRAPHY

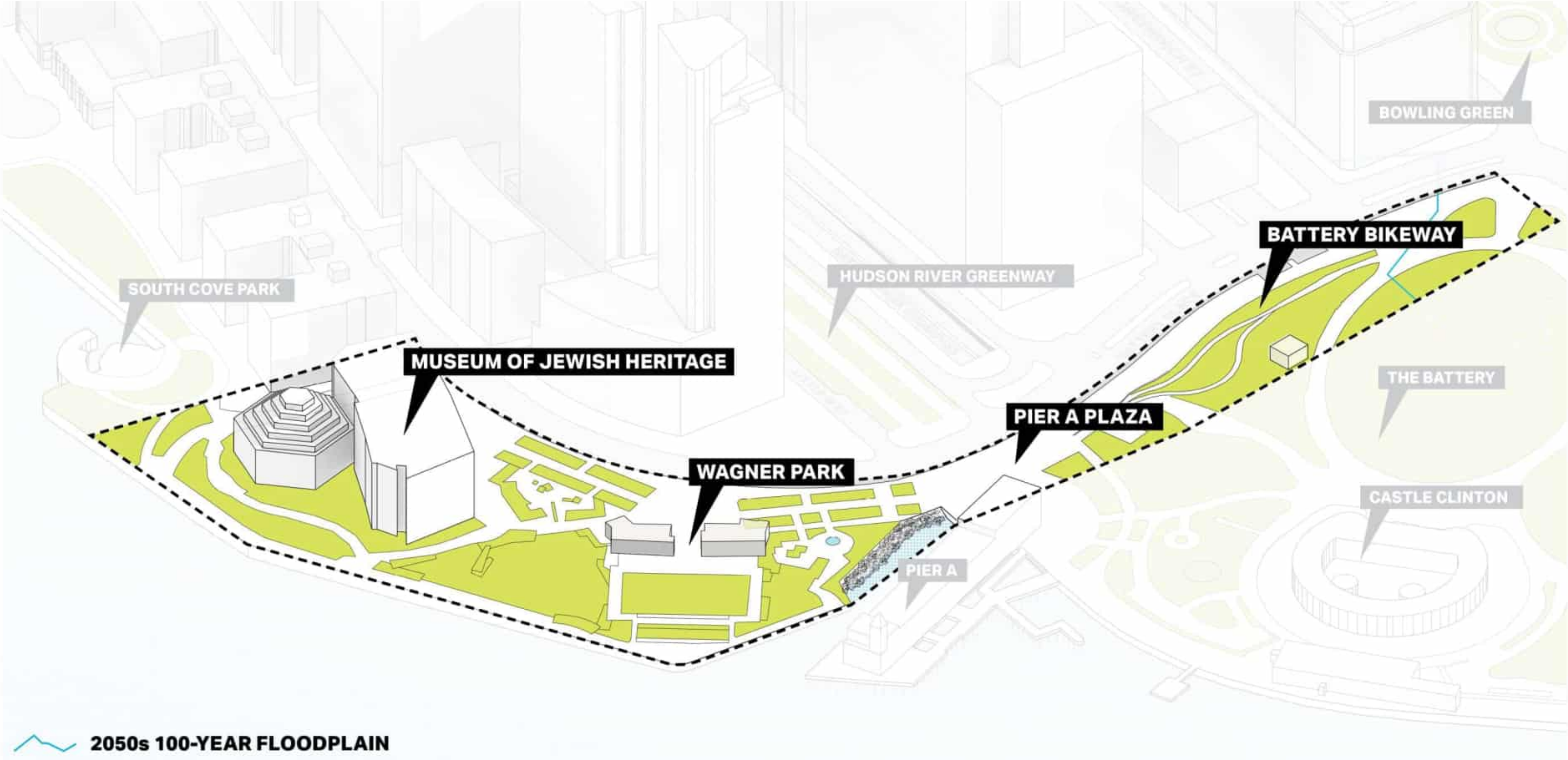


HEIGHT OF INTERVENTION

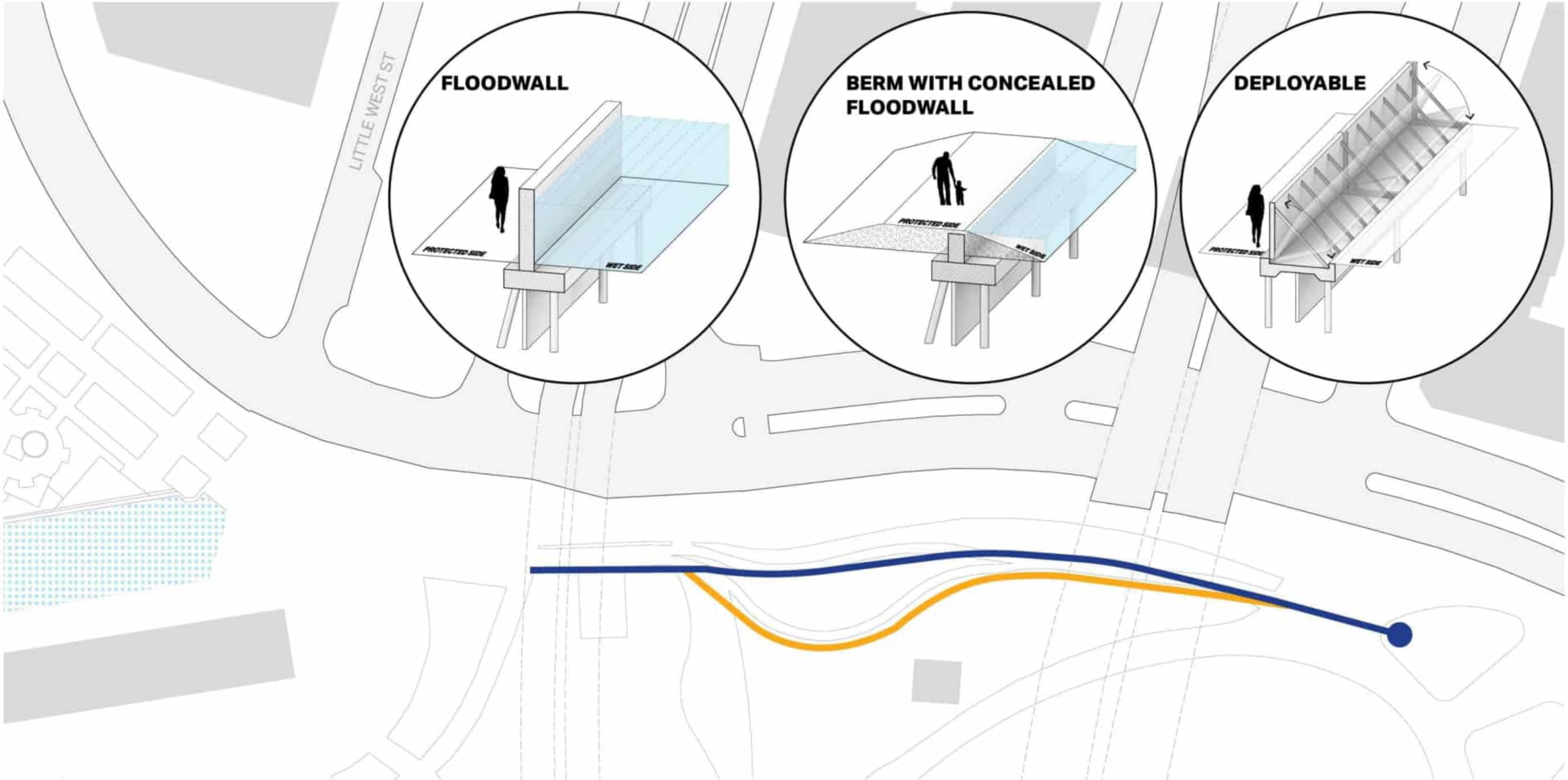


ALIGNMENT LOCATION ALTERNATIVES

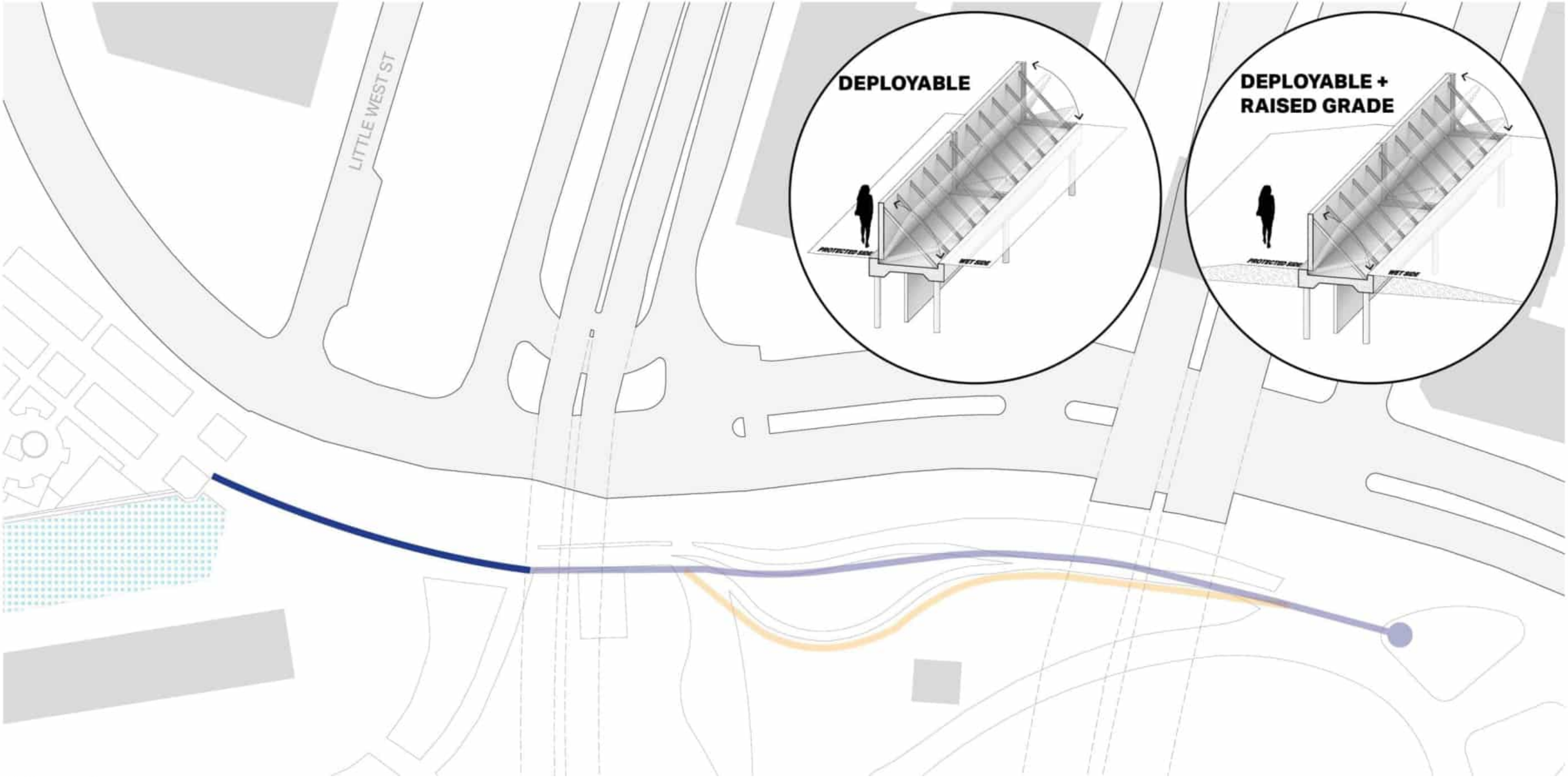
PROJECT AREA



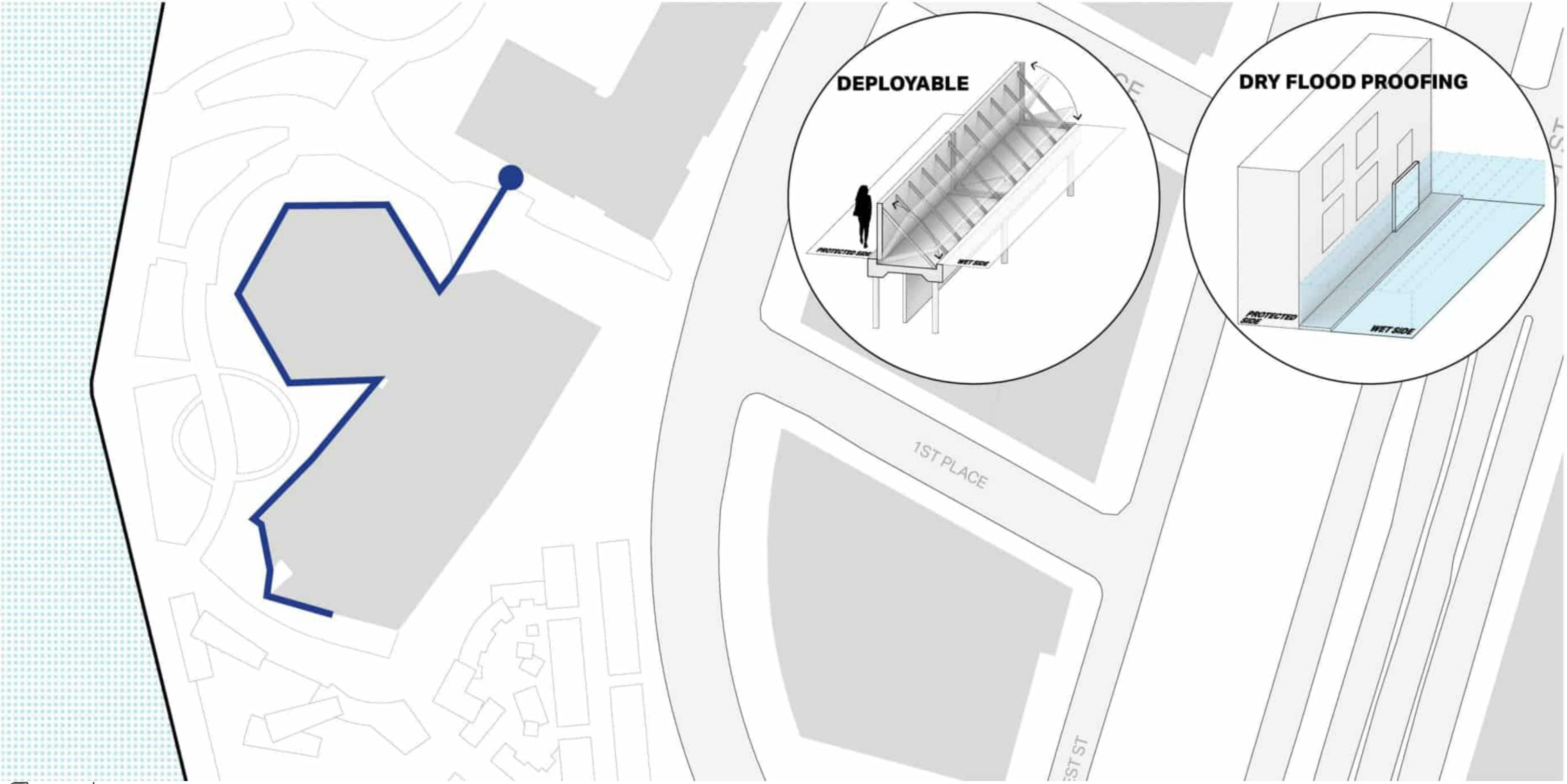
THE BATTERY SEGMENT



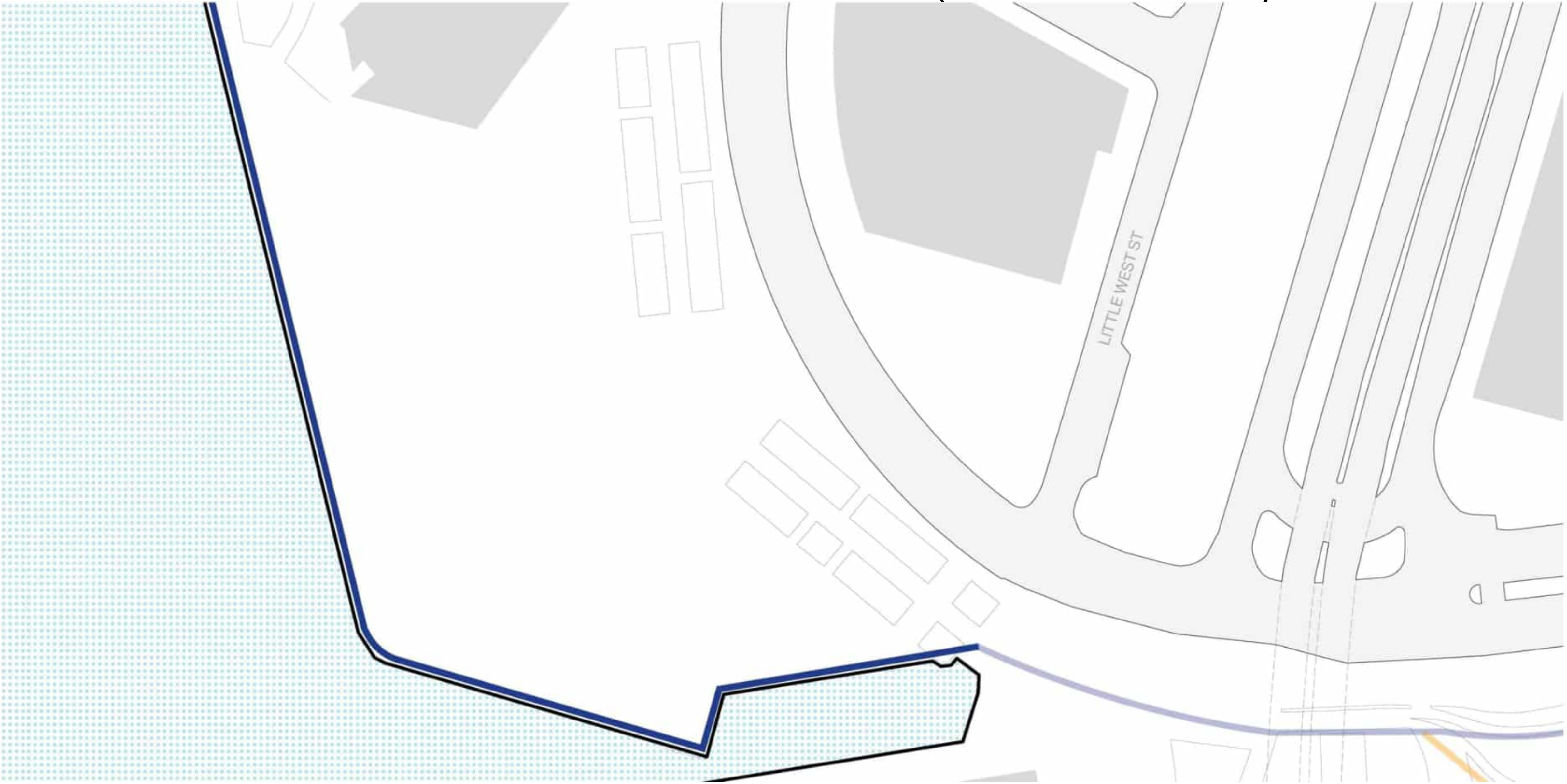
PIER A PLAZA SEGMENT



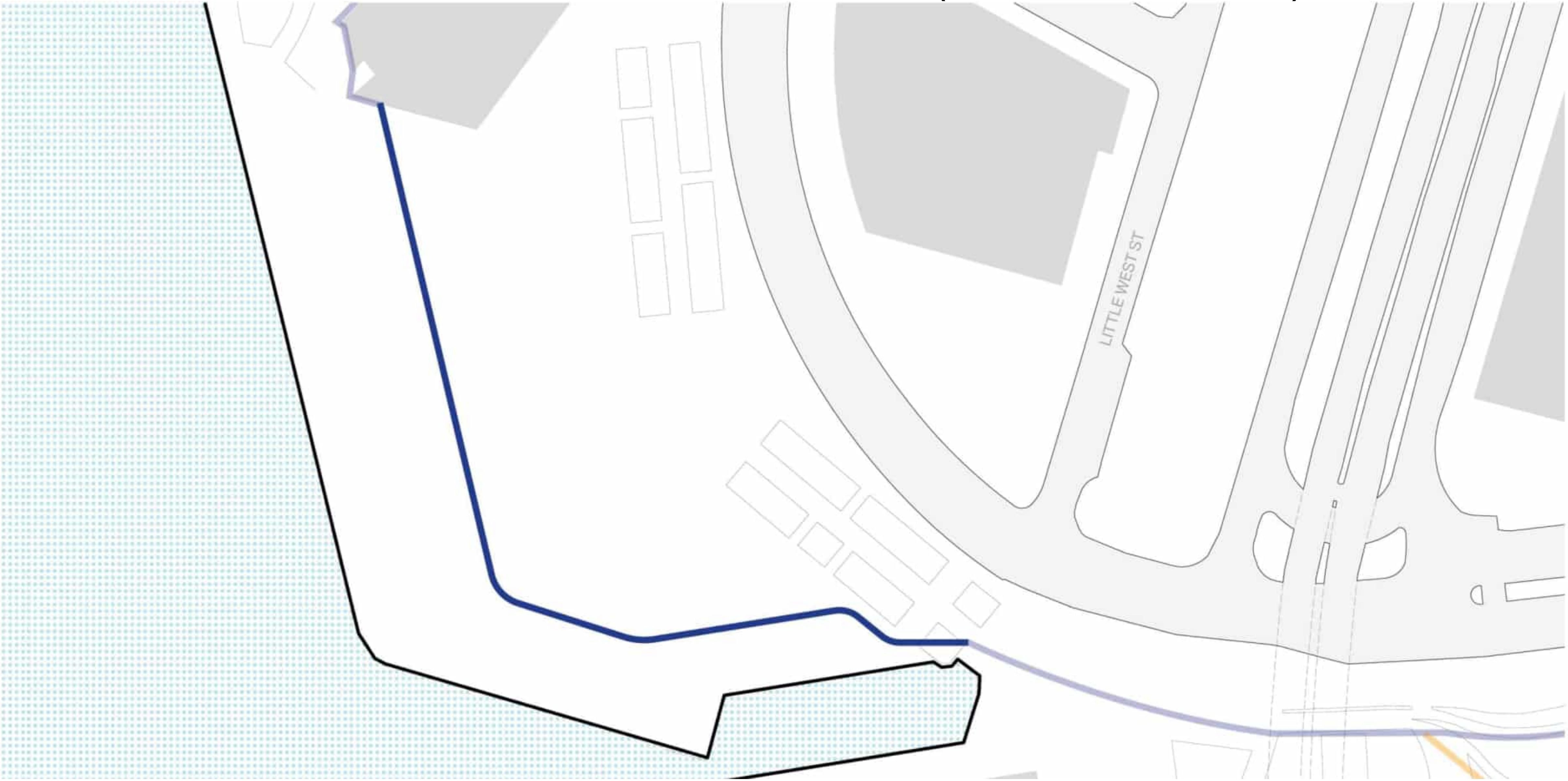
MUSEUM OF JEWISH HERITAGE SEGMENT



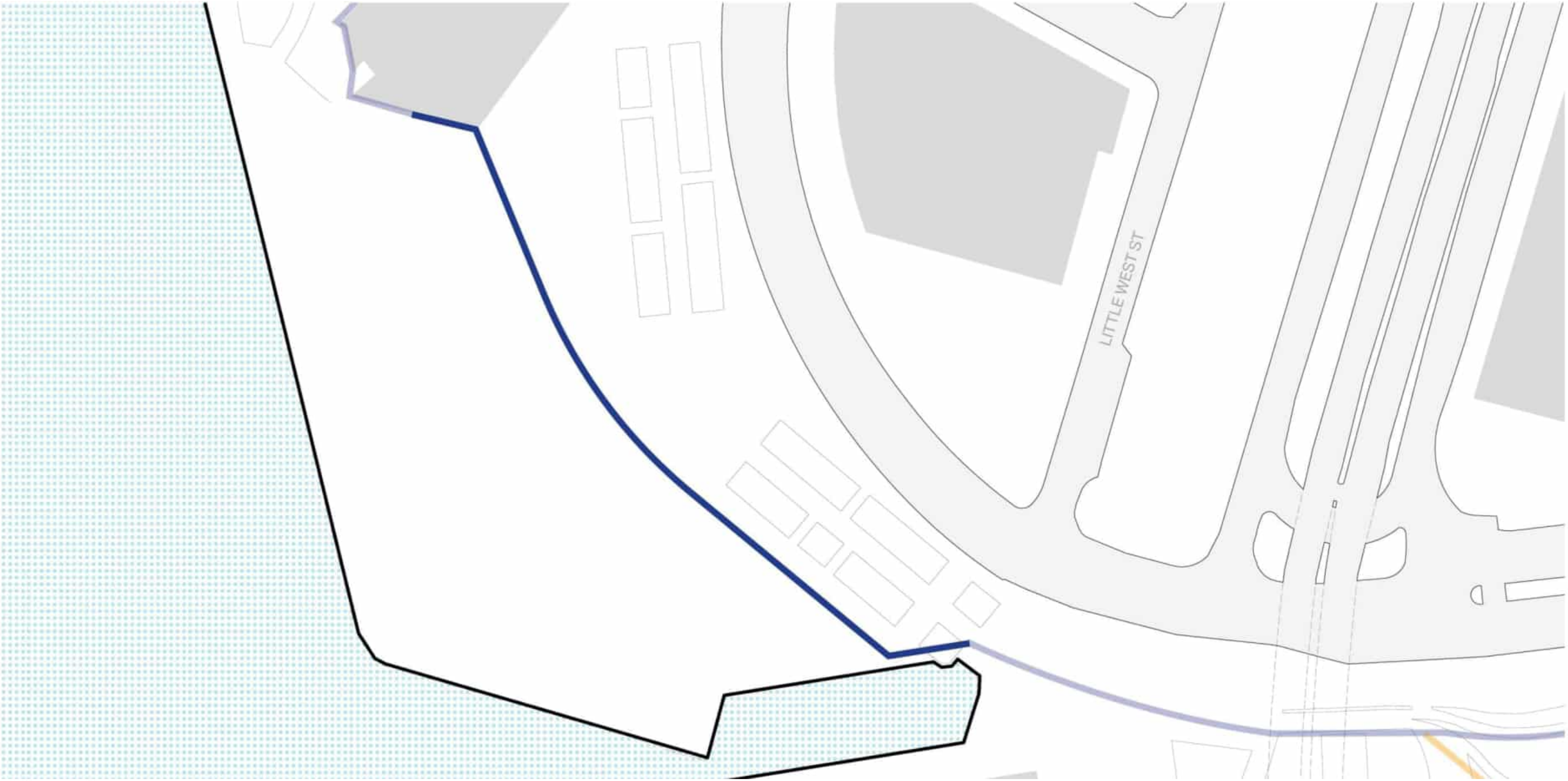
WAGNER PARK SEGMENT: ALIGNMENT ALTERNATIVE 1 (WATERFRONT EDGE)



WAGNER PARK SEGMENT: ALIGNMENT ALTERNATIVE 2 (RELIEVING PLATFORM)



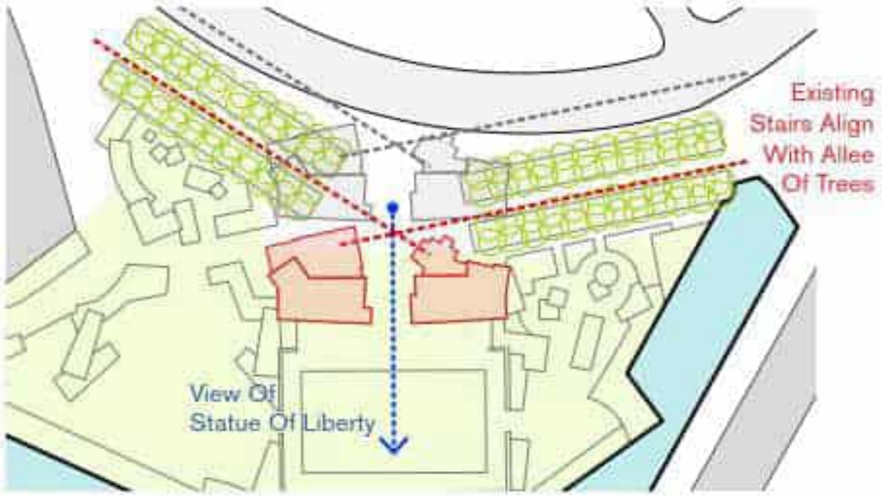
WAGNER PARK SEGMENT: ALIGNMENT ALTERNATIVE 3 (FURTHEST INTO SITE)



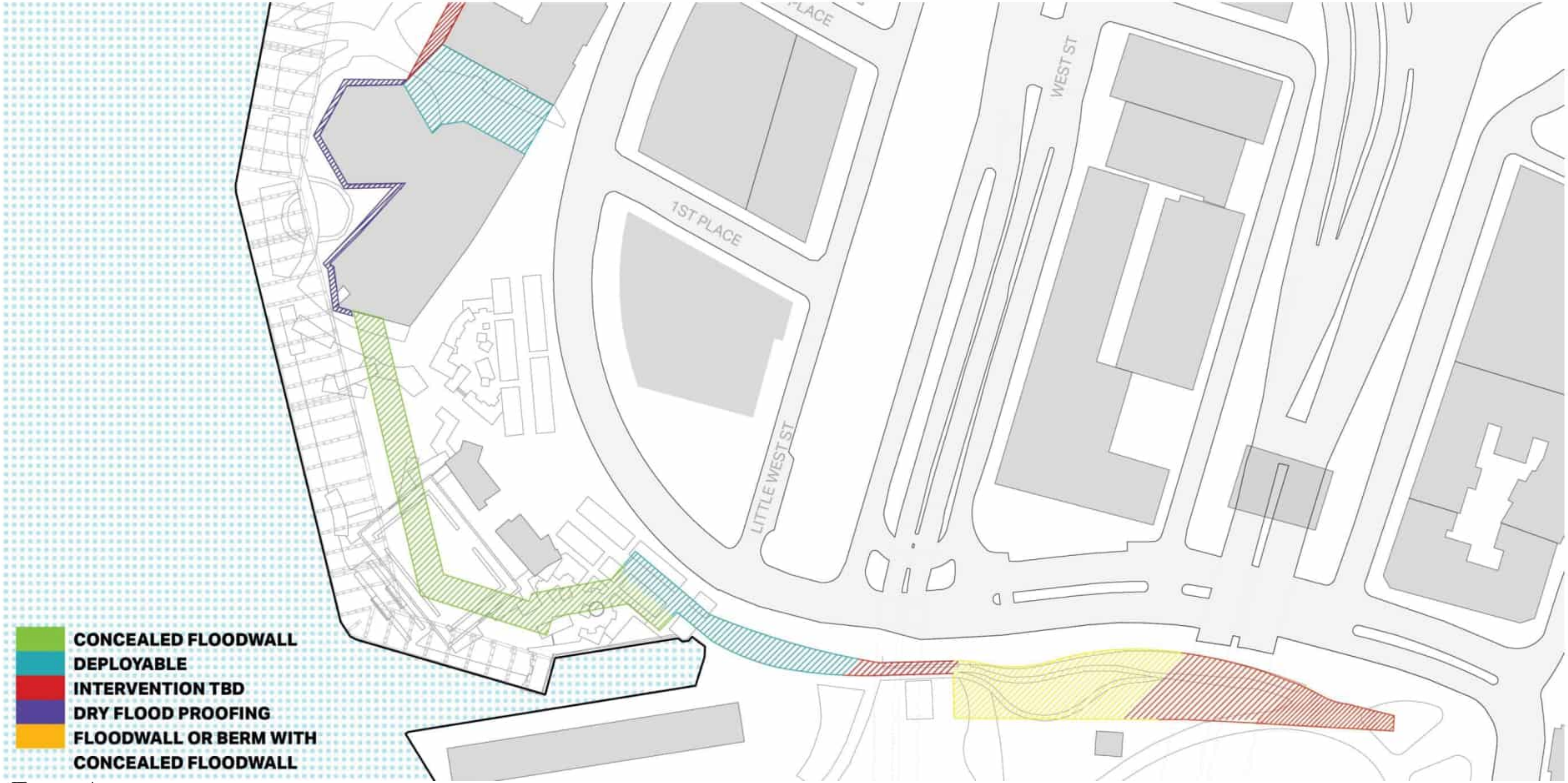
IMPLICATIONS TO PROJECT AREA
+
POTENTIAL FLOOD RISK MEASURES

BUILDING CONSIDERATIONS

		INITIAL COST	ONGOING MAINTENANCE COST	MAXIMIZE PROTECTED LAWN	BUILDING RELATIONSHIP TO LANDSCAPE	FRAMED VIEW TO STATUE OF LIBERTY
1.	REPAIR EXISTING BUILDING IN EXISTING LOCATION	$$	$$$	NO	BELOW DFE	BLOCKED BY FLOOD ALIGNMENT
2.	REMEDIATE EXISTING BUILDING IN EXISTING LOCATION	$$$	$$	NO	BELOW DFE	BLOCKED BY FLOOD ALIGNMENT
3.	BUILD NEW BUILDING					
A	REPLICATE EXISTING DESIGN AT HIGHER ELEVATION	$$$	$$	NO	STAIRS NO LONGER CONNECT TO STREET LEVEL	YES
B	REPLICATE EXISTING DESIGN CLOSER TO STREET	$$$	$$	YES	STAIRS NO LONGER ALIGN WITH ALLEE OF TREES	BLOCKED BY FLOOD ALIGNMENT
C	BUILD NEW DESIGN CLOSER TO STREET	$$$	$	YES	FULLY INTEGRATED	POSSIBLE
4.	NO BUILDING	$	–	YES	–	OPEN VIEW

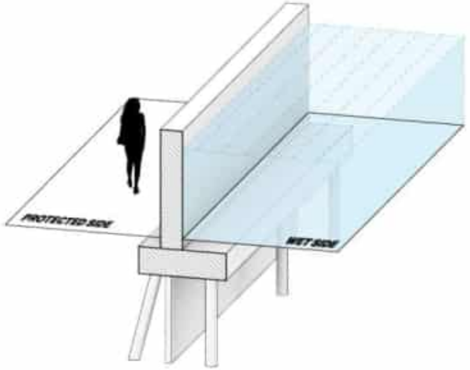


POTENTIAL ALIGNMENT FLOOD RISK MEASURES

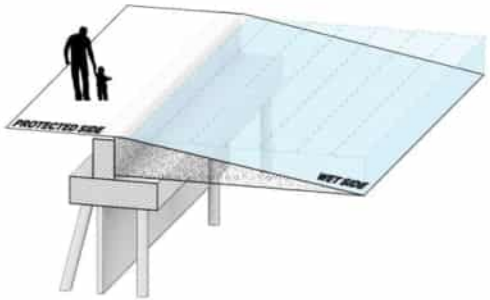


POTENTIAL ALIGNMENT FLOOD RISK MEASURES

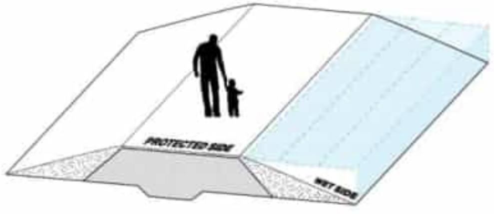
STATIC



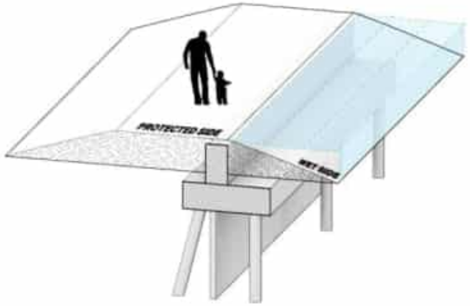
FLOOD WALL



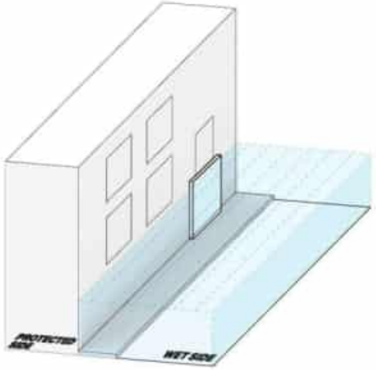
CONCEALED FLOODWALL



STRUCTURAL BERM

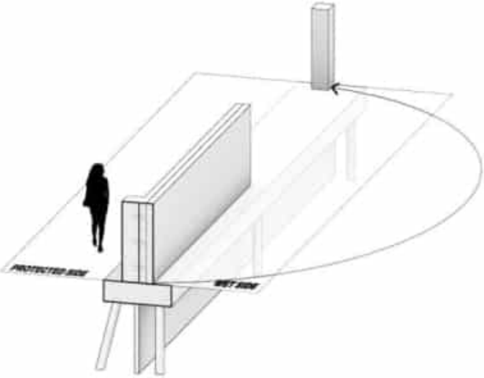


BERM WITH CONCEALED FLOODWALL

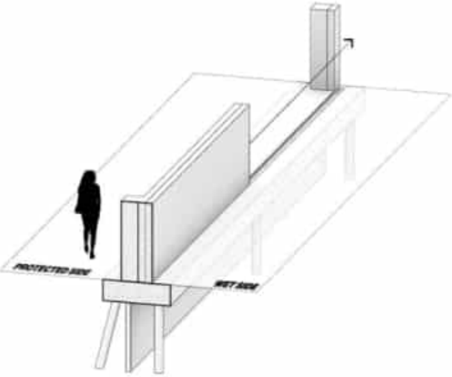


DRY-FLOOD PROOFING

DEPLOYABLES

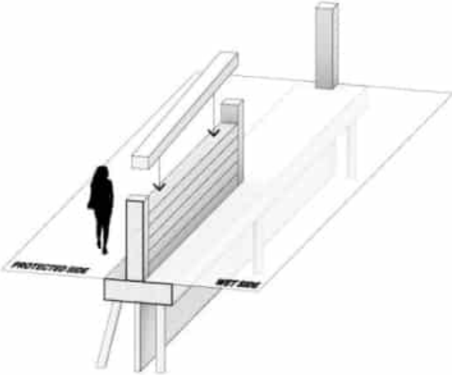


SWING GATE

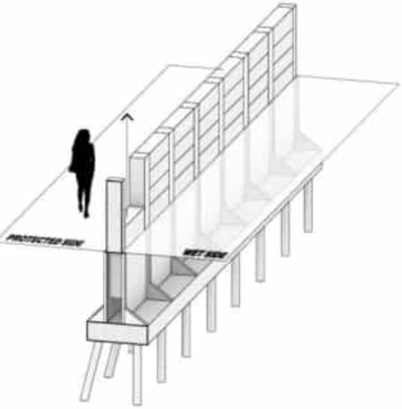


SLIDING GATE

FLIP UP GATE

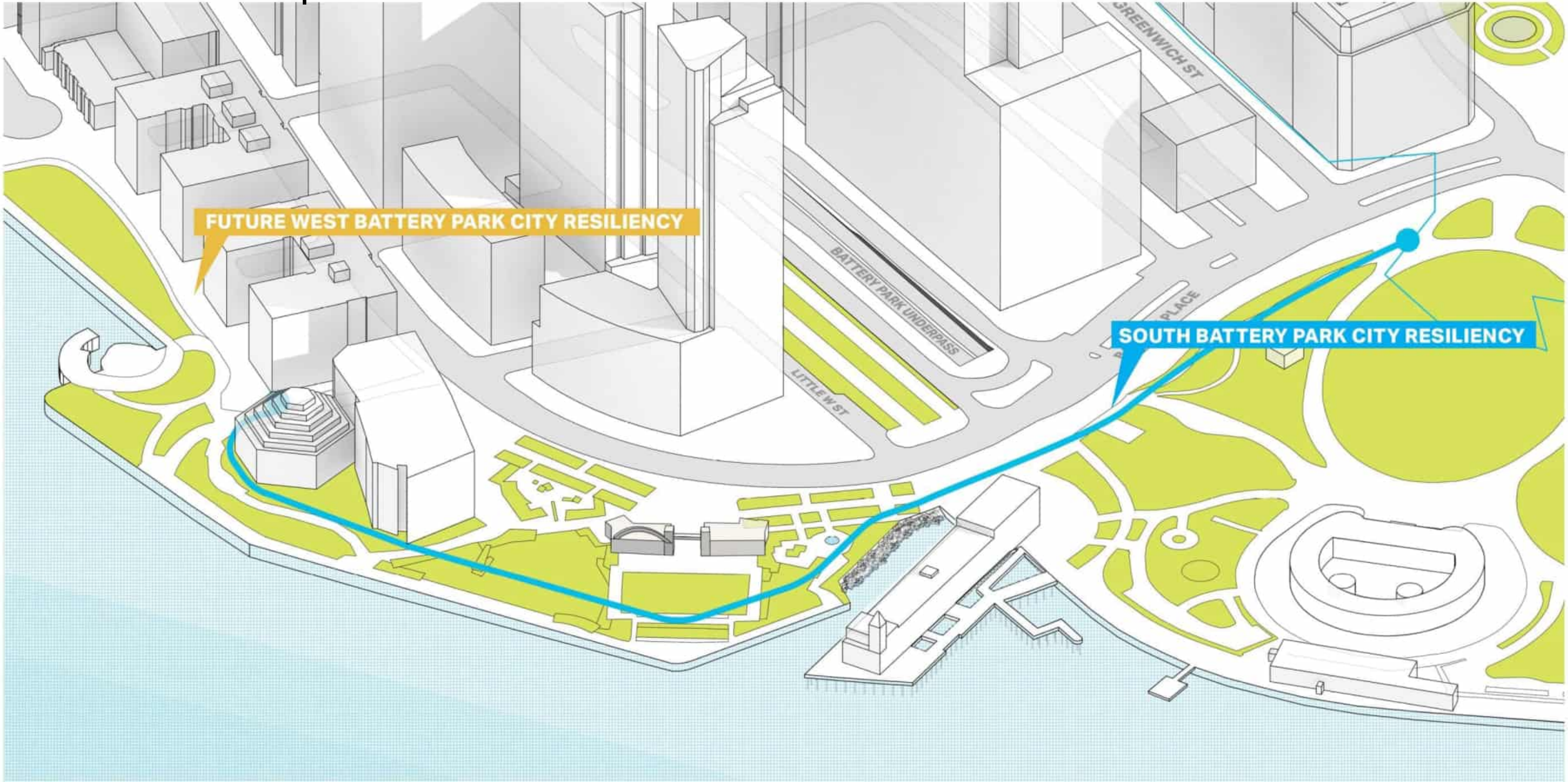


STOP LOGS



VERTICAL SLIDING GATE

2050s 100-YEAR | POTENTIAL ALIGNMENT



NEXT STEPS

NEXT STEPS

- Surveyors in the Field
- Geotechnical Borings & Drilling in the Field
- Environmental Assessment & Initial Consultation
- Development of Design with Public Feedback – joint CB1 Battery Park City-Environmental Protection Committee Meeting, April 2019 (date TBD)
- Next Public Meeting #3 Community Engagement May-June 2019

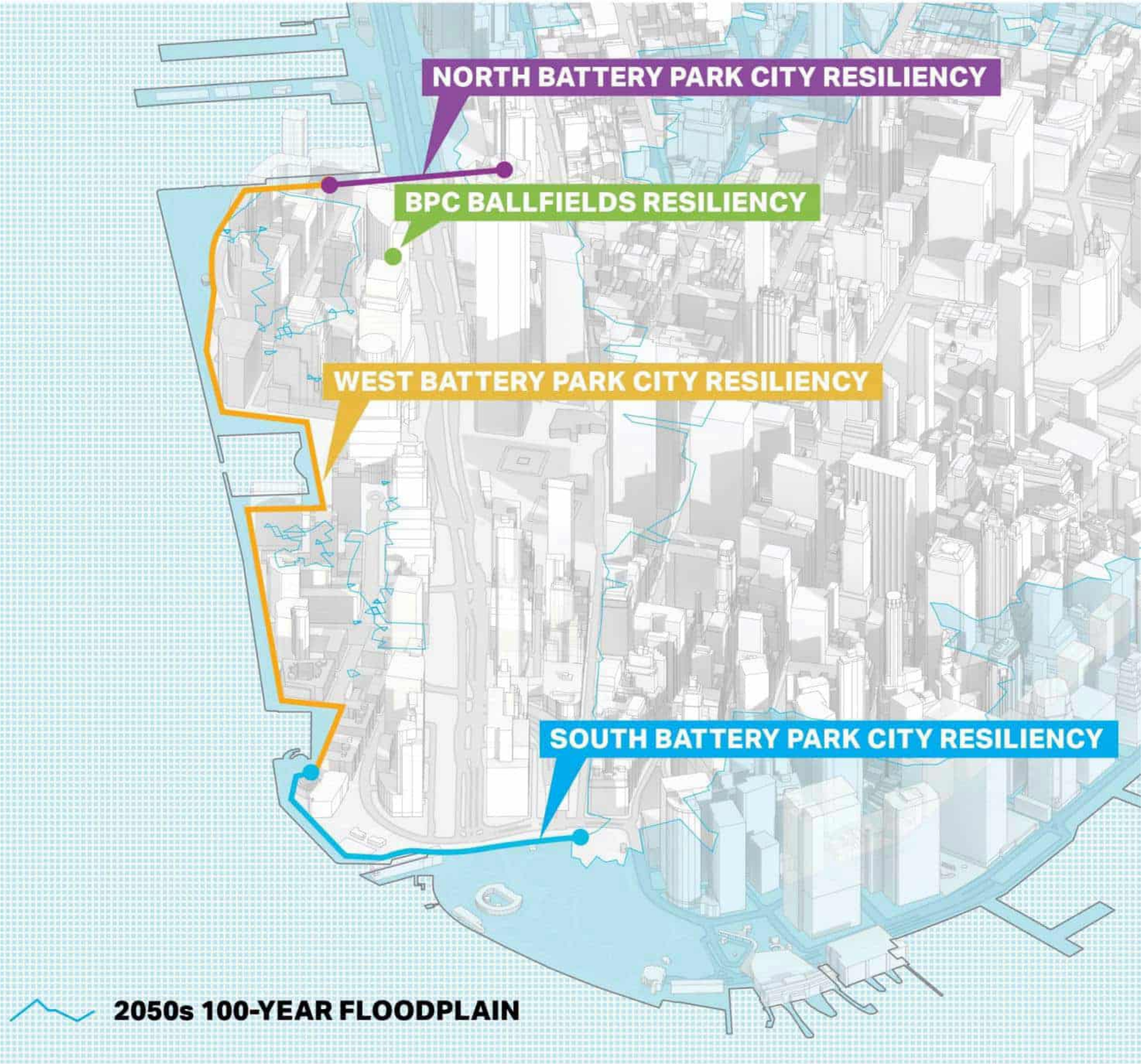
Q&A

A.4.2 SBPCR Public Meeting Presentation (January 2020)

SOUTH BATTERY PARK CITY RESILIENCY PROJECT

Public Meeting 4

January 15th, 2020



NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority | AECOM

AGENDA

How We Got Here: Evolution of the Design: 6:05 – 6:15pm

Overall Project Design Update:

The Battery and Pier A Plaza Presentation | 6:15 – 6:30pm

Part 1 Q&A I The Battery and Pier A Plaza I 6:30 – 6:45pm

Wagner Park, Museum of Jewish Heritage and 1st Place | 6:45 – 7:35pm

Part 2 Q&A I Wagner, MJH and 1st Place I 7:35 – 8:00pm

YOUR TEAM | PRESENTERS

PRESENTER

HEATHER MORGAN, RLA
AECOM
PROJECT MANAGER

PRESENTER

HOGAN EDELBERG, PLA
AECOM
LANDSCAPE ARCHITECTURE + URBAN DESIGN

PRESENTER

MATT JONES
MAGNUSSON KLEMENCIC ASSOCIATES
CIVIL ENGINEERING

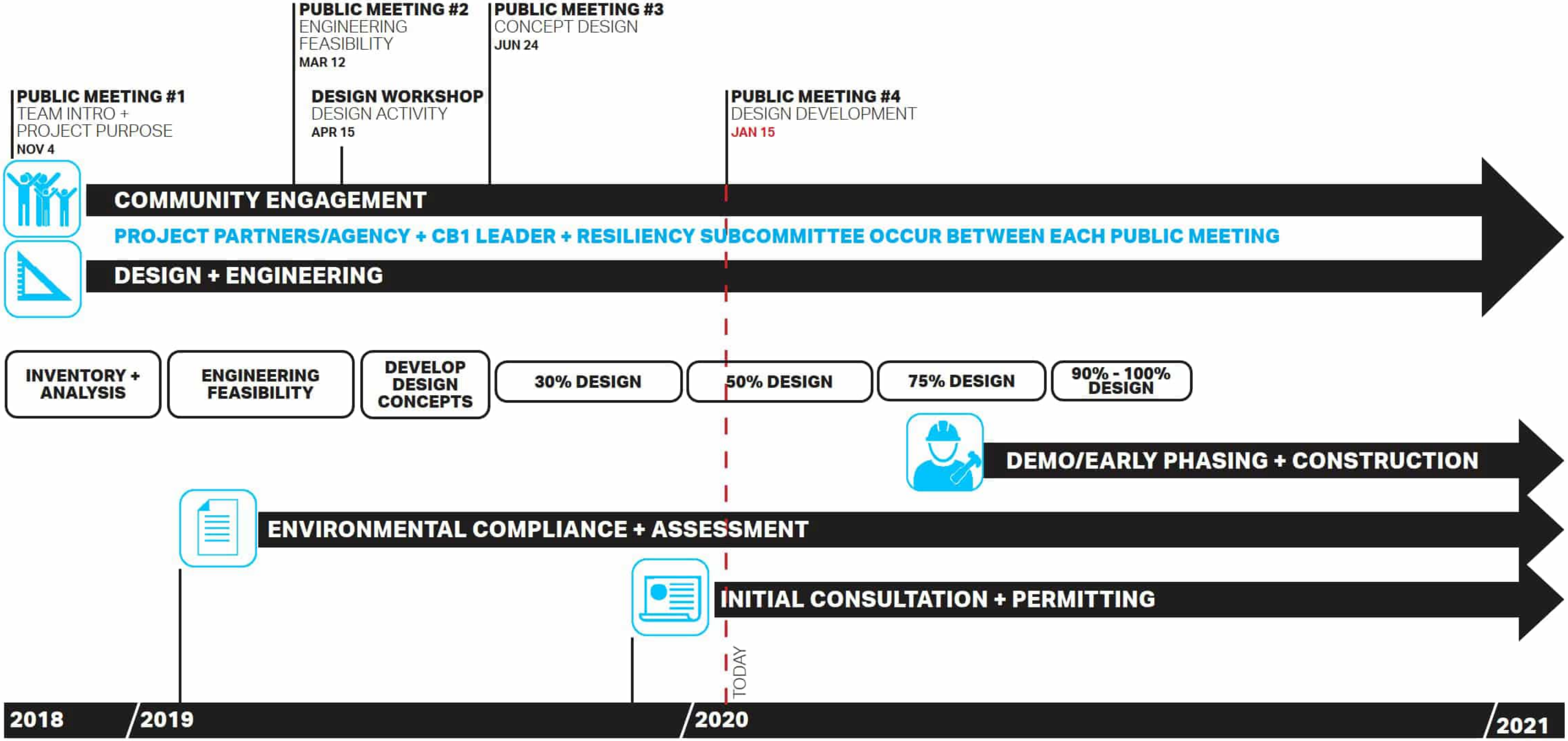
PRESENTER

GABRIEL SMITH
THOMAS PHIFER & PARTNERS
ARCHITECTURE

PRESENTER

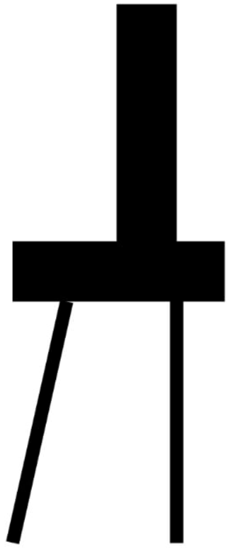
LOUIS DIAZ
AECOM
STRUCTURAL ENGINEERING

PROJECT MILESTONES




RESILIENCY MEASURES | BATTERY PARK CITY
3 PUBLIC MEETINGS
1 PUBLIC ACTIVITY WORKSHOP
1 ONLINE ACTIVITY
1 CB1 MEETING

JUNE 24TH PRESENTATION | CONCEPTUAL DESIGN PROCESS



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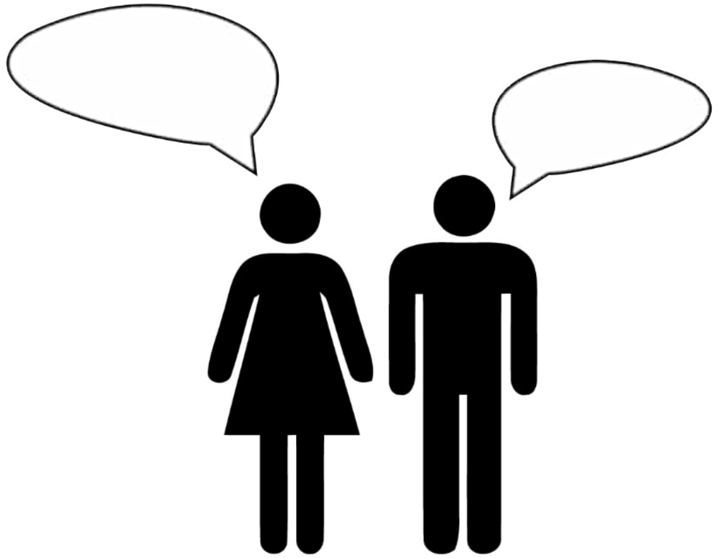

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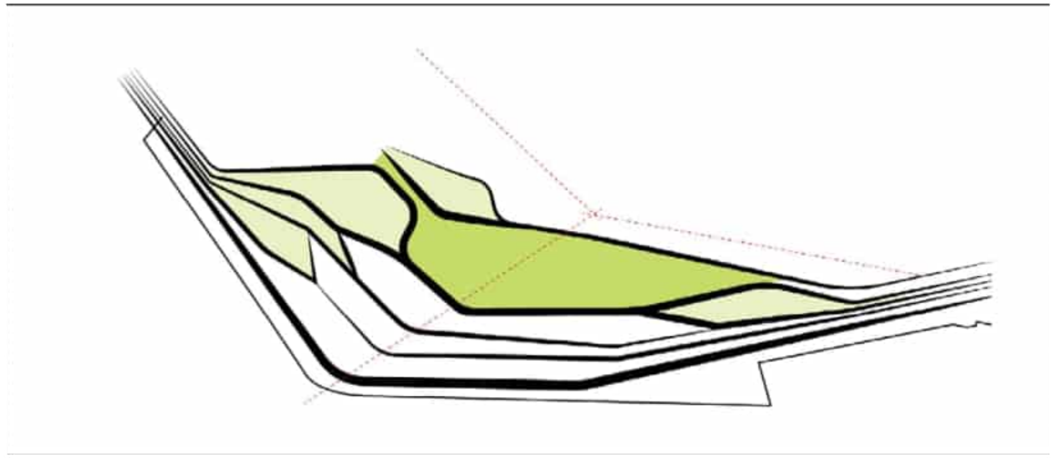


ENGINEERING + FEASIBILITY

PUBLIC + USER GROUP INPUT

CONCEPTUAL DESIGN STUDIES

Last time we showed you :

- Concepts for MJH alignment
- Two conceptual designs for Wagner Park
- Preliminary layout for Pier A Plaza & The Battery

WHAT YOU TOLD US

JUNE 24 (PUBLIC MEETING)

- VIEWS
- UNIVERSAL ACCESSIBILITY
- MAXIMIZE GREENSPACE
- PARK RESTROOMS
- OPEN LAWN
- GARDEN ROOMS / INTIMATE SPACES
- SUSTAINABILITY
- FLEXIBLE PROGRAMMING
- COMMUNITY EVENTS/ OUTDOOR CLASSROOMS

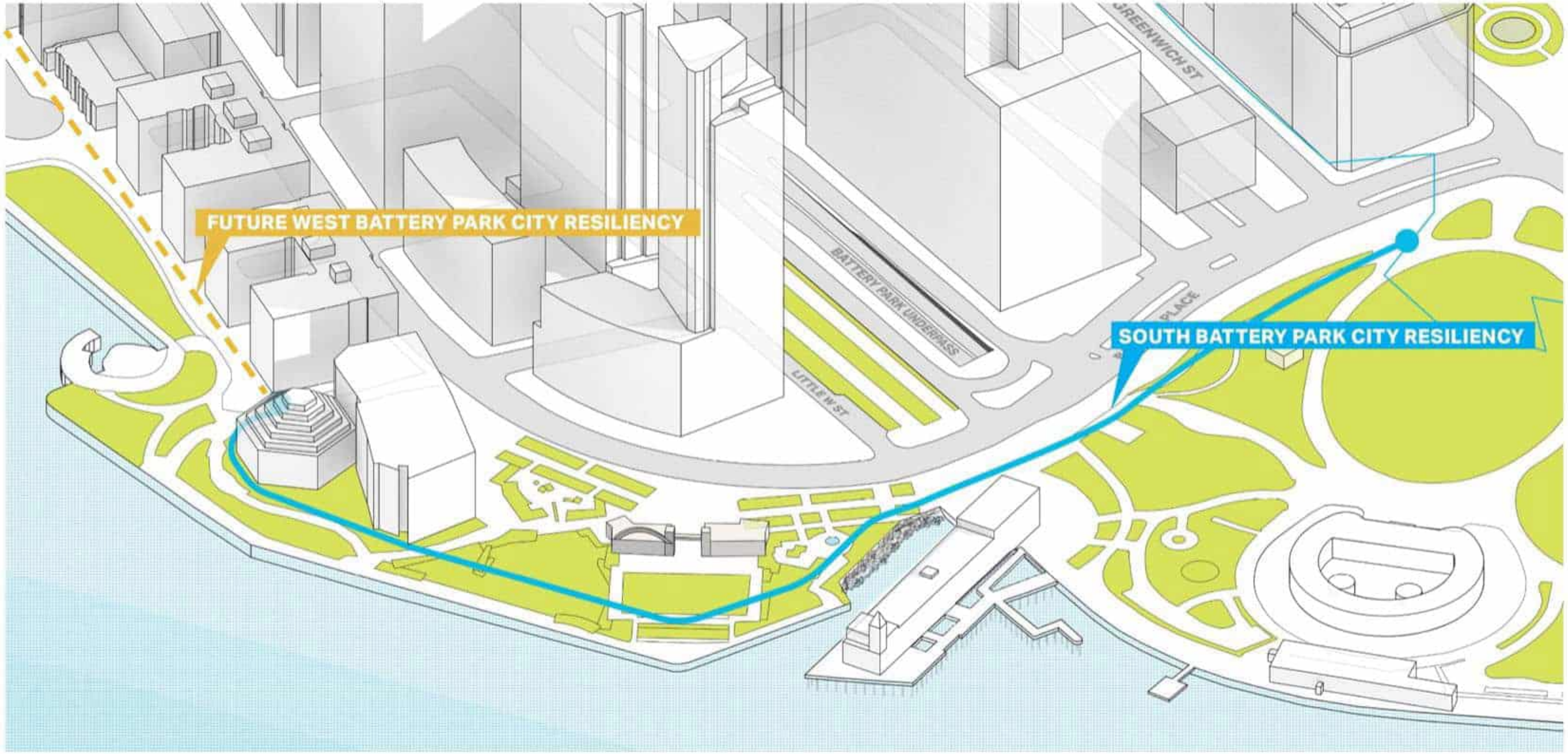
WHAT YOU TOLD US

OCT 3 (CB1 ENVIRONMENTAL)

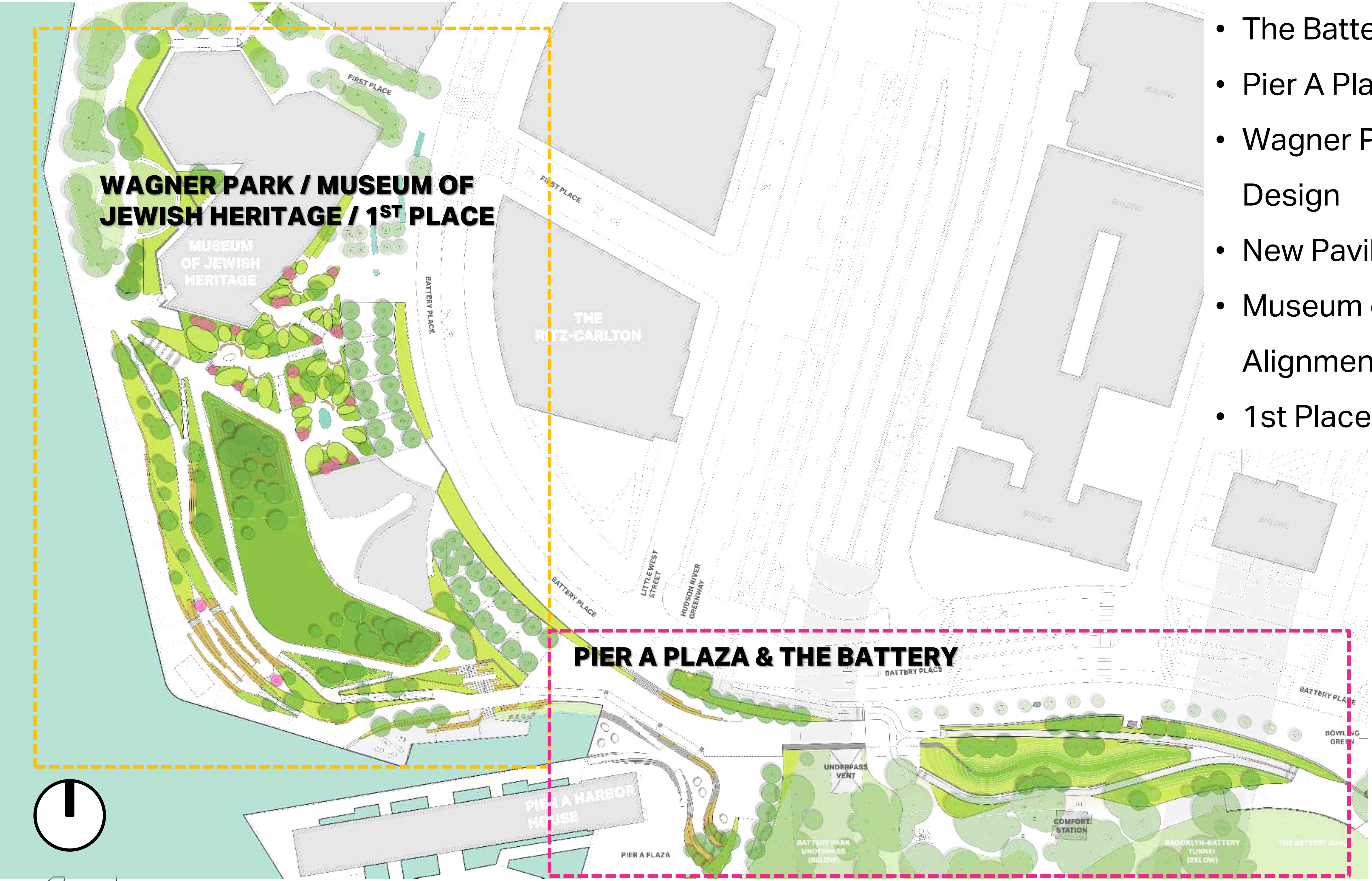
- ALTERNATE OPTIONS FOR PIER A PLAZA
- FURTHER DEVELOPMENT OF DEPLOYABLES
- FURTHER DEVELOPMENT OF POST/COLUMNS
- REFINEMENT OF BERM FLOOD WALL / PLANT PALETTE
- ENHANCED CIRCULATION CONSIDERATIONS
- MATERIALITY & AESTHETICS

TODAY | LOTS OF DESIGN TO COVER

- Integrated Coastal Model
- Interior Drainage Analysis
- The Battery Alignment Design
- Pier A Plaza Alignment Design
- Wagner Park Alignment & Park Design
- New Pavilion Design
- Museum of Jewish Heritage Alignment Design
- 1st Place Alignment Design

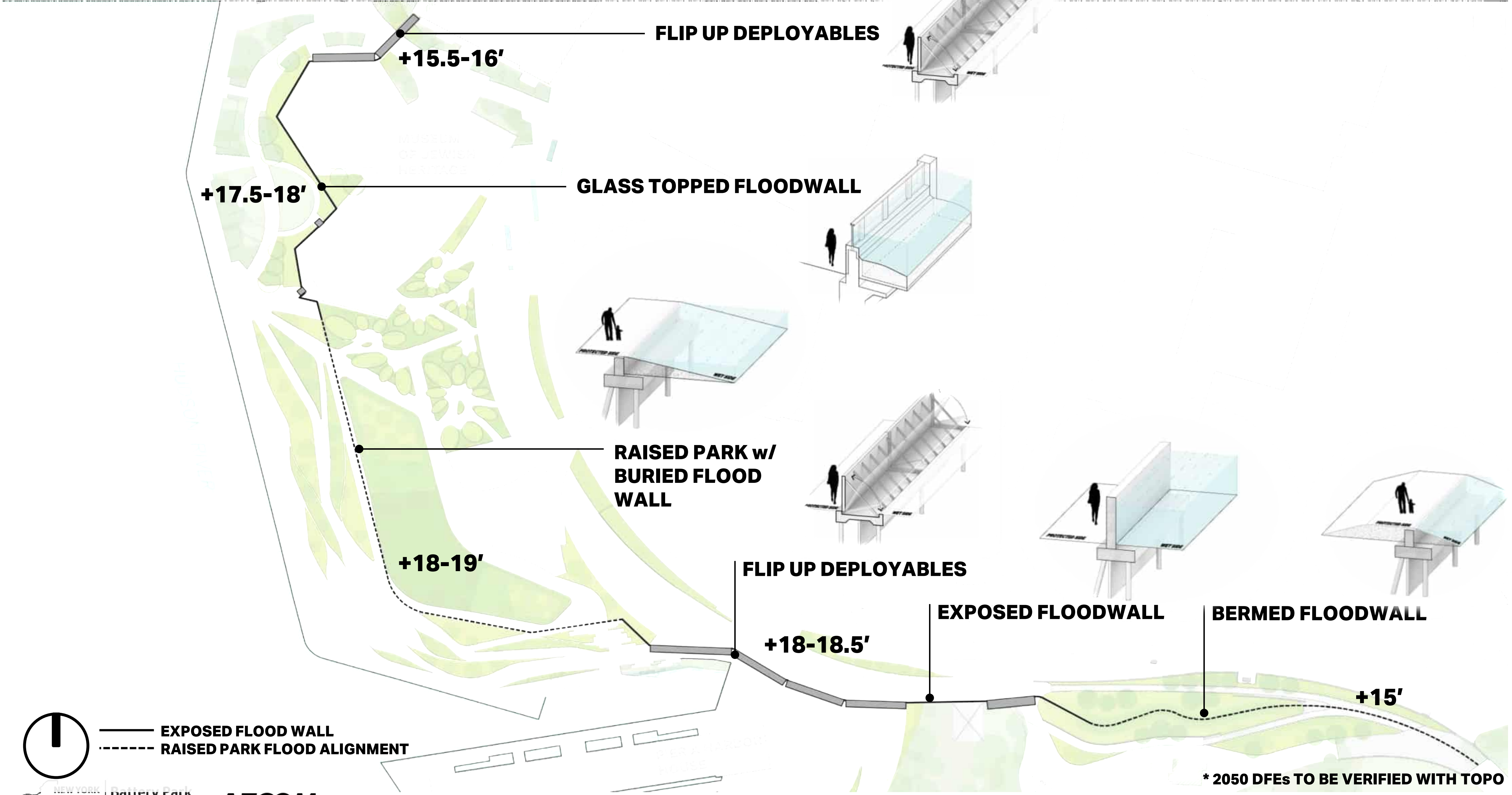


PROJECT DESIGN UPDATE I OVERALL SITE



- The Battery Alignment Design
- Pier A Plaza Alignment Design
- Wagner Park Alignment & Park Design
- New Pavilion Design
- Museum of Jewish Heritage Alignment Design
- 1st Place Alignment Design

THE SITE | FLOOD RISK MEASURES + DFE



* 2050 DFEs TO BE VERIFIED WITH TOPO

SUSTAINABILITY | OVERALL PROJECT PRIORITIES

PRINCIPAL TARGET AREAS:

- NET-ZERO ENERGY
- LOW CARBON DESIGN
- WATER HARVESTING + WATER REUSE
- HEAT ISLAND EFFECT REDUCTION
- LOW IMPACT MATERIALS
- INDOOR AIR QUALITY + GOOD THERMAL COMFORT
- ENHANCED ECOLOGICAL HABITATS

ALIGNED W/ BROADER BPC PROJECTS:

- Energy efficiency
- Sustainability Resolution (signed in May 2019)
- SMART Cities Initiative
- Existing Sustainable Parks Management practices

WAGNER PARK CERTIFICATIONS:

- **ILFI Zero Carbon**
  - Fully account for carbon emissions of the building energy use and materials.
  - Building will use energy efficiency measures to reduce its energy
  - Offset its remaining use with renewable energy
  - Building will undergo life cycle assessment
- **Waterfront Edge Design Guidelines (WEDG) Certification**
  - Administrated by Waterfront Alliance
  - Addresses a variety of goals important to a sustainable, resilient, and community-valued waterfront space.
  - Embraced by several major waterfront projects in the area.

INTERNATIONAL LIVING FUTURE INSTITUTE

ZERO CARBON CERTIFICATION

WEDG Waterfront Edge Design Guidelines

UPDATED COASTAL MODELING

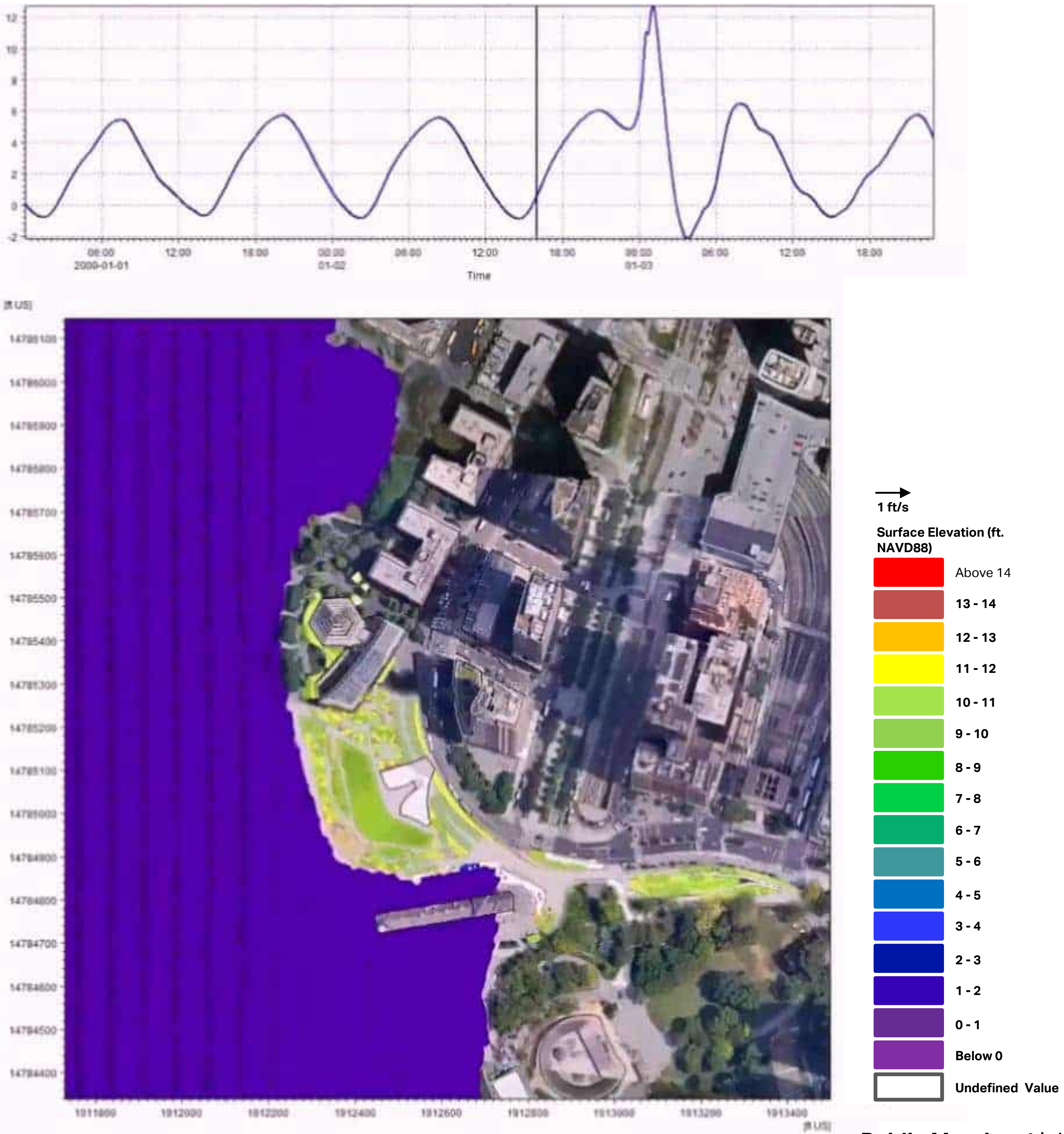
- 2050 100-Year Storm Event w/ Sea Level Rise (30")
- Flood inundation shown over proposed design conditions
- Depicts 1-2 tide cycles with storm surge added to the 2^{nd}
- Precipitation storm event not included, but will be included
- FEMA certification / accreditation for 100yr in today

UPDATED COASTAL MODEL

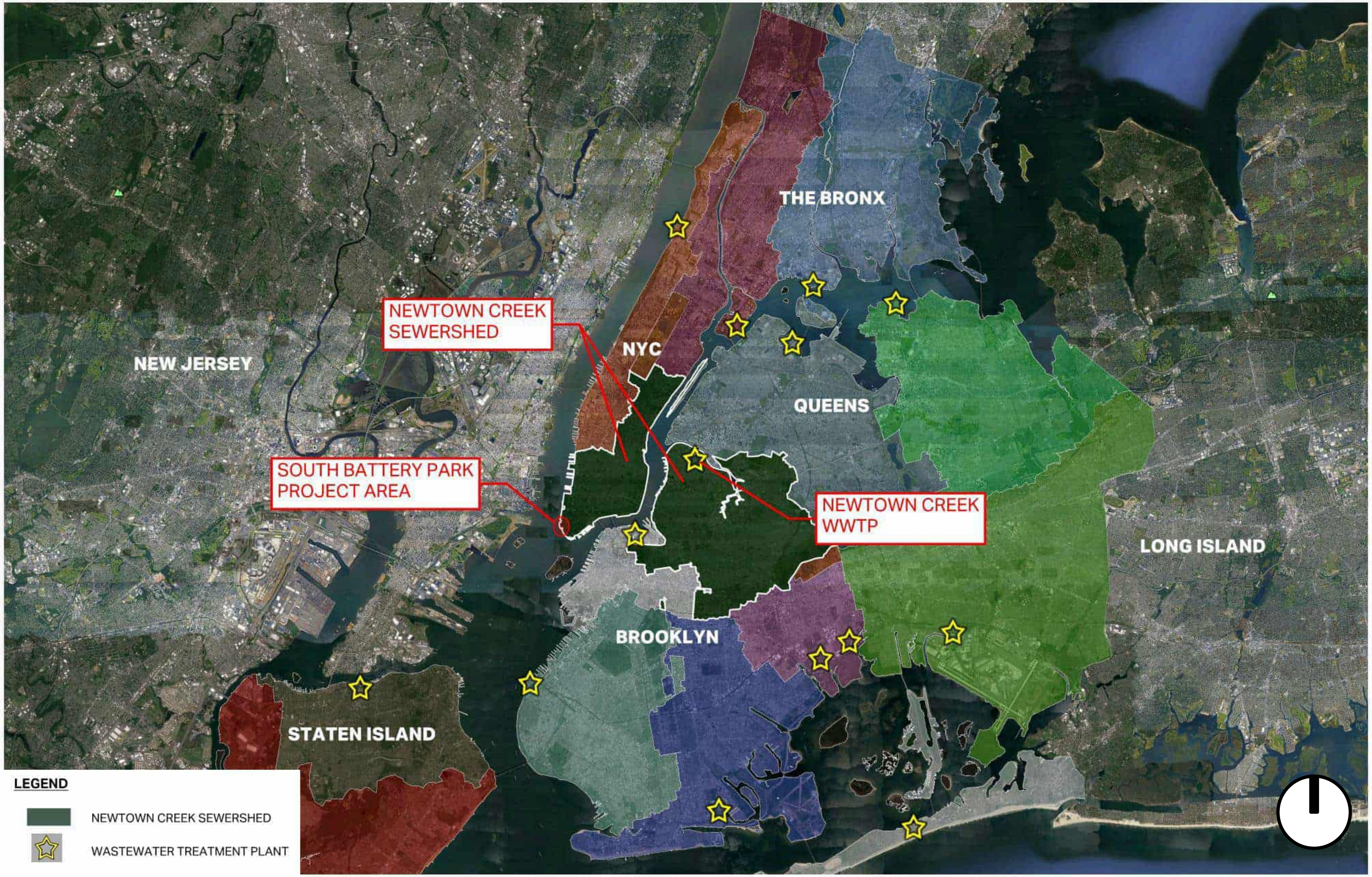
View the animation here:
https://www.youtube.com/watch?v=NC3GzdO_UA4

*Coastal Modeling animations in this presentation are preliminary. Models need to be refined with aspects such as the evolving design and furthered surveyed information.

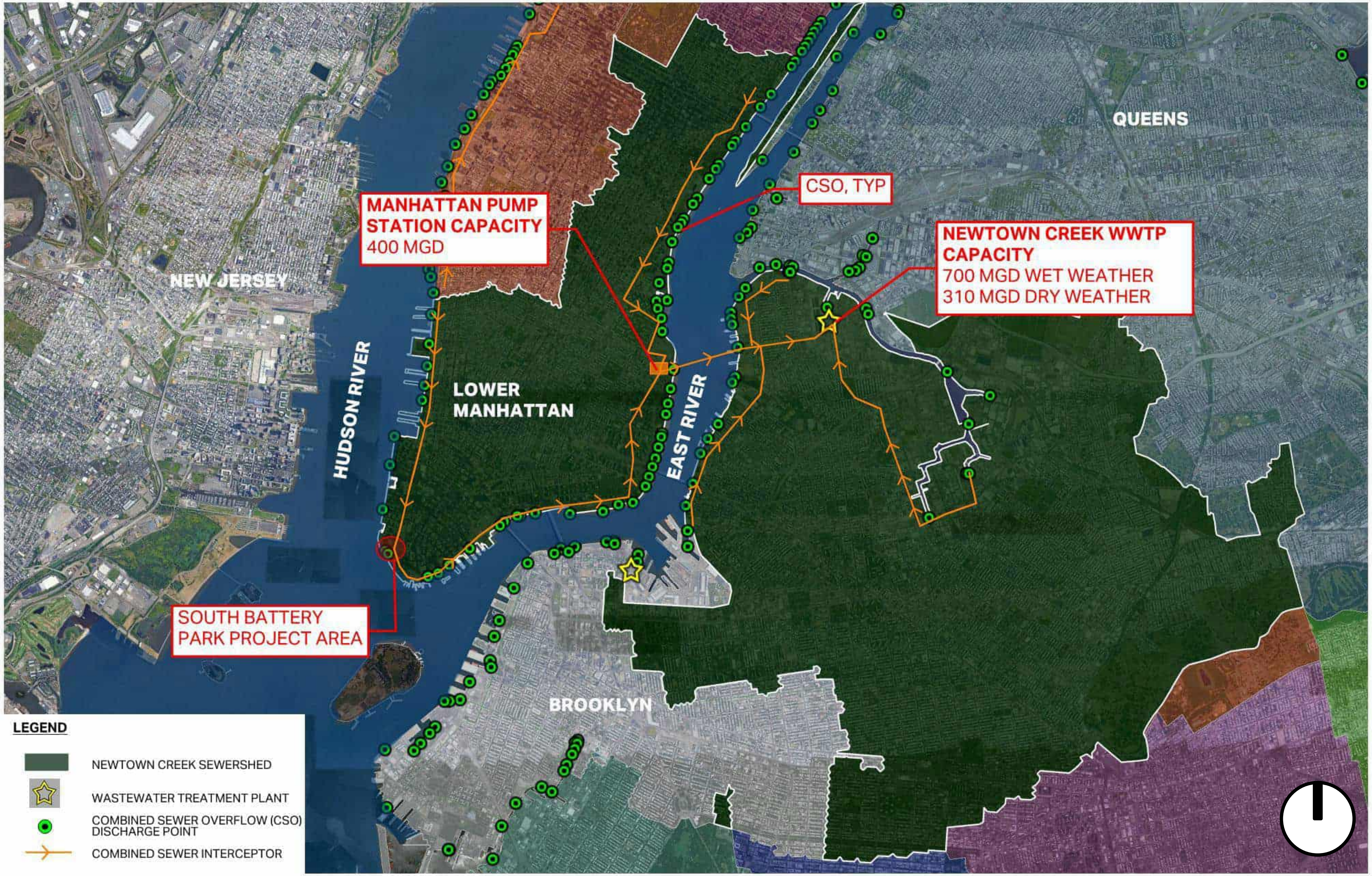
This animation showcases only a range of approximate coastal surge elevations on the most recent design.



INTERIOR DRAINAGE| EXISTING SYSTEM OVERVIEW



INTERIOR DRAINAGE| EXISTING SYSTEM OVERVIEW



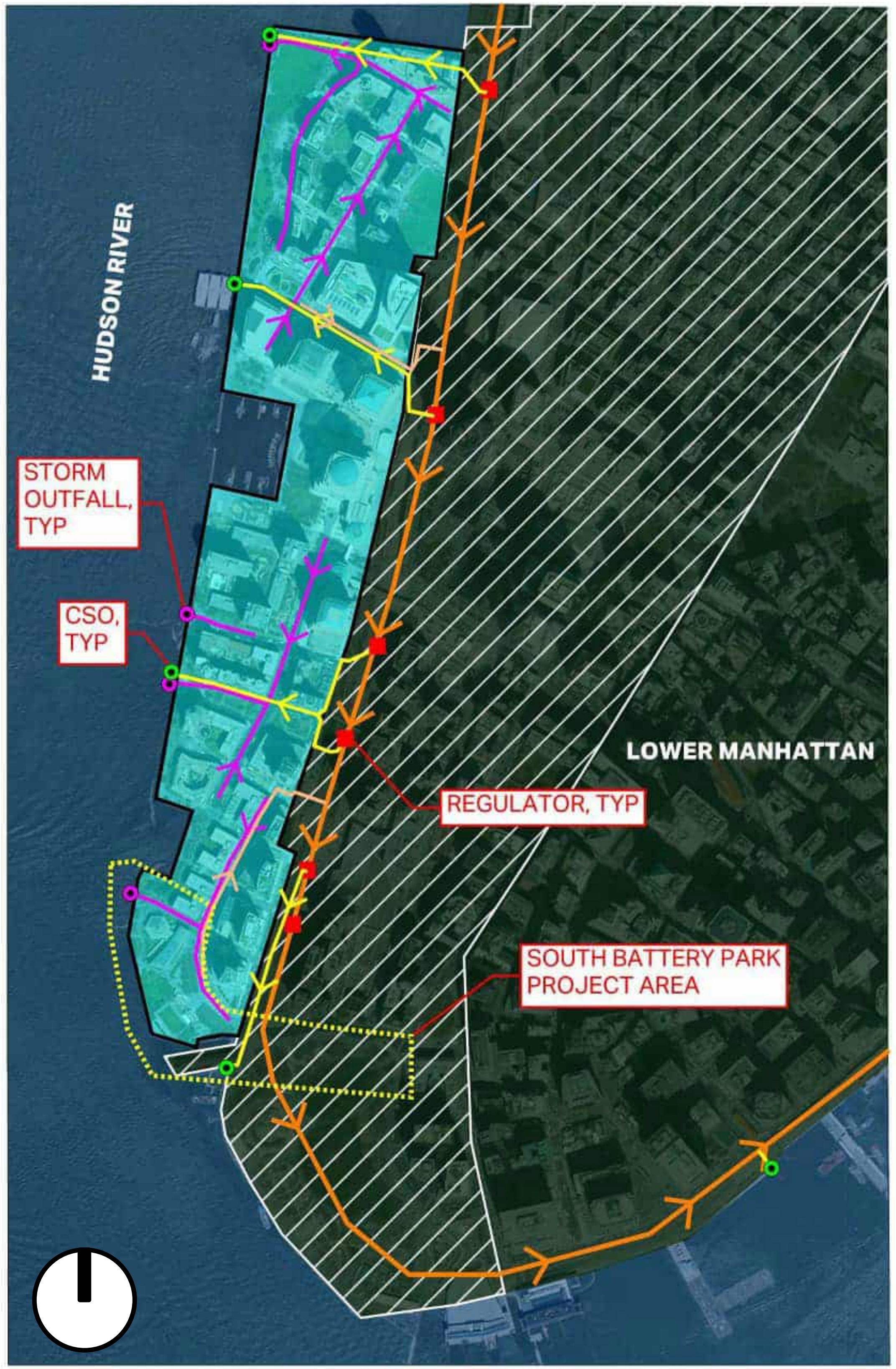
INTERIOR DRAINAGE| EXISTING SYSTEM OVERVIEW

INTERIOR DRAINAGE| EXISTING SYSTEM OVERVIEW

INTERIOR DRAINAGE|
EXISTING SYSTEM OVERVIEW

LEGEND

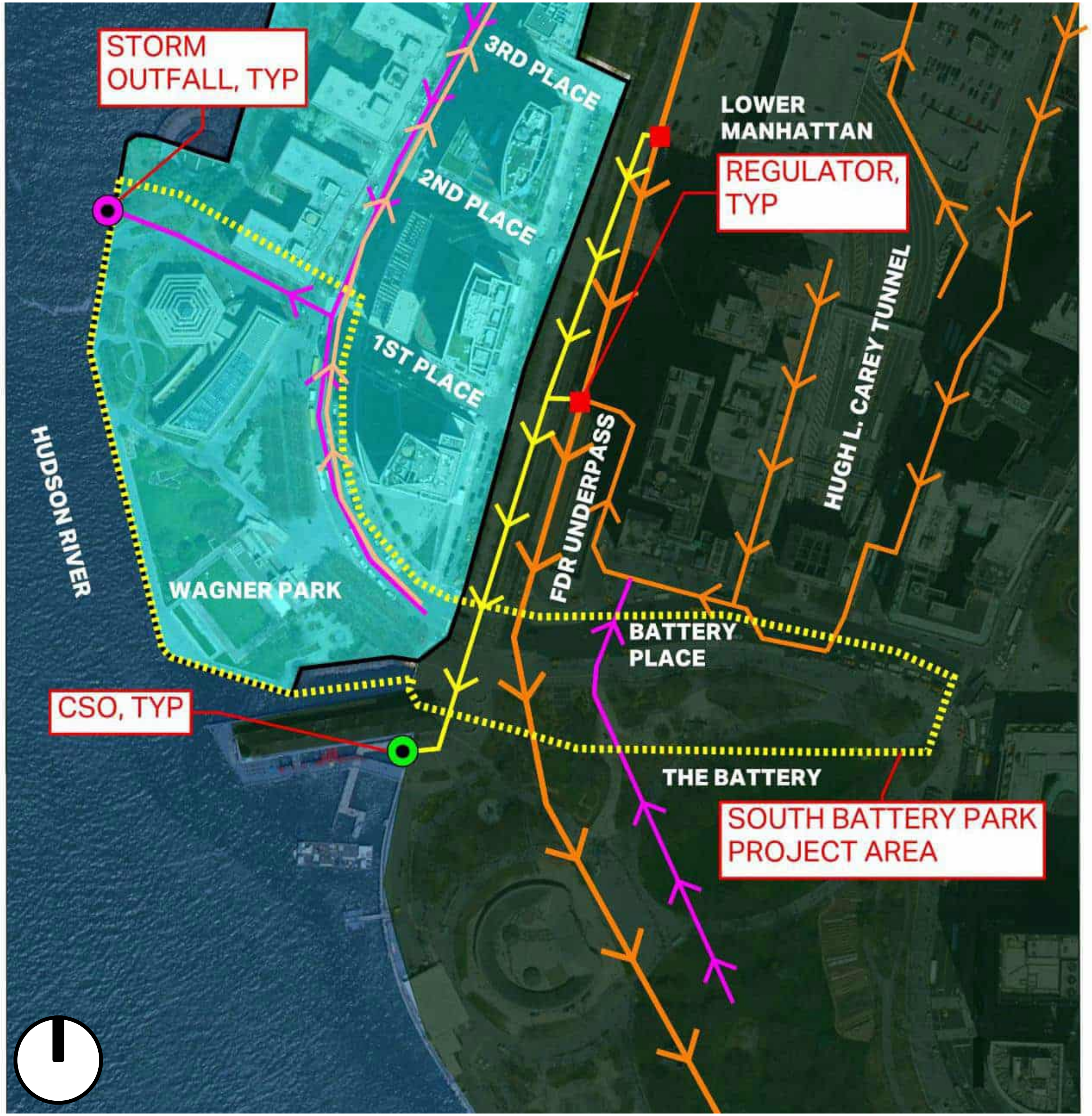
- SEPARATED STORMWATER DRAINAGE AREA
- NEWTOWN CREEK SEWERSHED
- COMBINED SEWER OVERFLOW (CSO) DISCHARGE POINT
- SEPARATED STORMWATER DISCHARGE POINT
- COMBINED SEWER INTERCEPTOR
- NEWTOWN CREEK SUB-SEWERSHED
- COMBINED SEWER OVERFLOW (CSO) OUTFALL PIPE
- SEPARATED STORMWATER SEWER
- SEPARATED SANITARY SEWER
- SOUTH BATTERY PARK COASTAL RESILIENCY PROJECT AREA
- EXISTING COMBINED SEWER REGULATOR



INTERIOR DRAINAGE|
EXISTING SYSTEM OVERVIEW

LEGEND

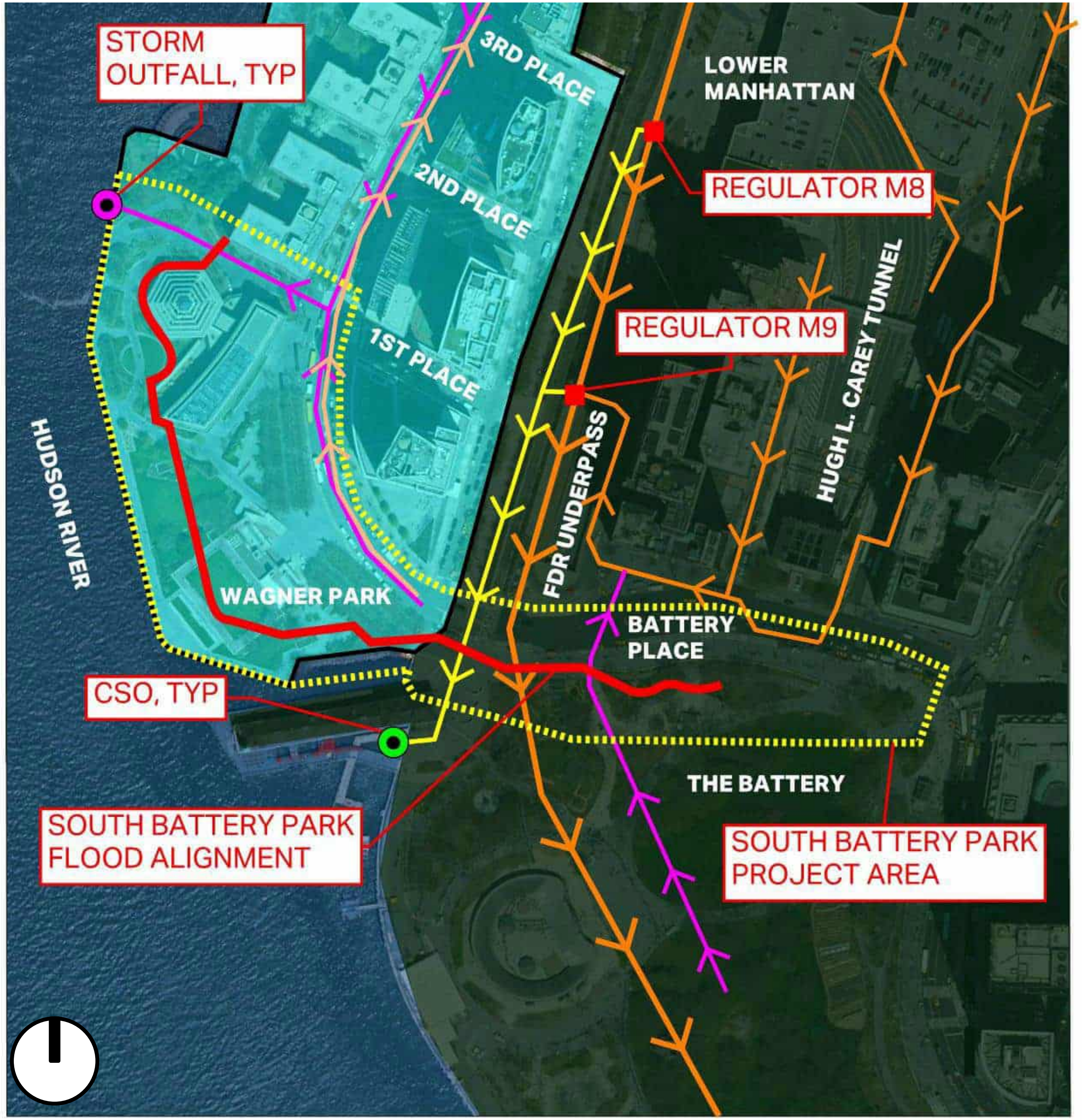
- SEPARATED STORMWATER DRAINAGE AREA
- NEWTOWN CREEK SEWERSHED
- COMBINED SEWER OVERFLOW (CSO) DISCHARGE POINT
- SEPARATED STORMWATER DISCHARGE POINT
- COMBINED SEWER INTERCEPTOR
- COMBINED SEWER OVERFLOW (CSO) OUTFALL PIPE
- SEPARATED STORMWATER SEWER
- SEPARATED SANITARY SEWER
- SOUTH BATTERY PARK COASTAL RESILIENCY PROJECT AREA
- EXISTING COMBINED SEWER REGULATOR



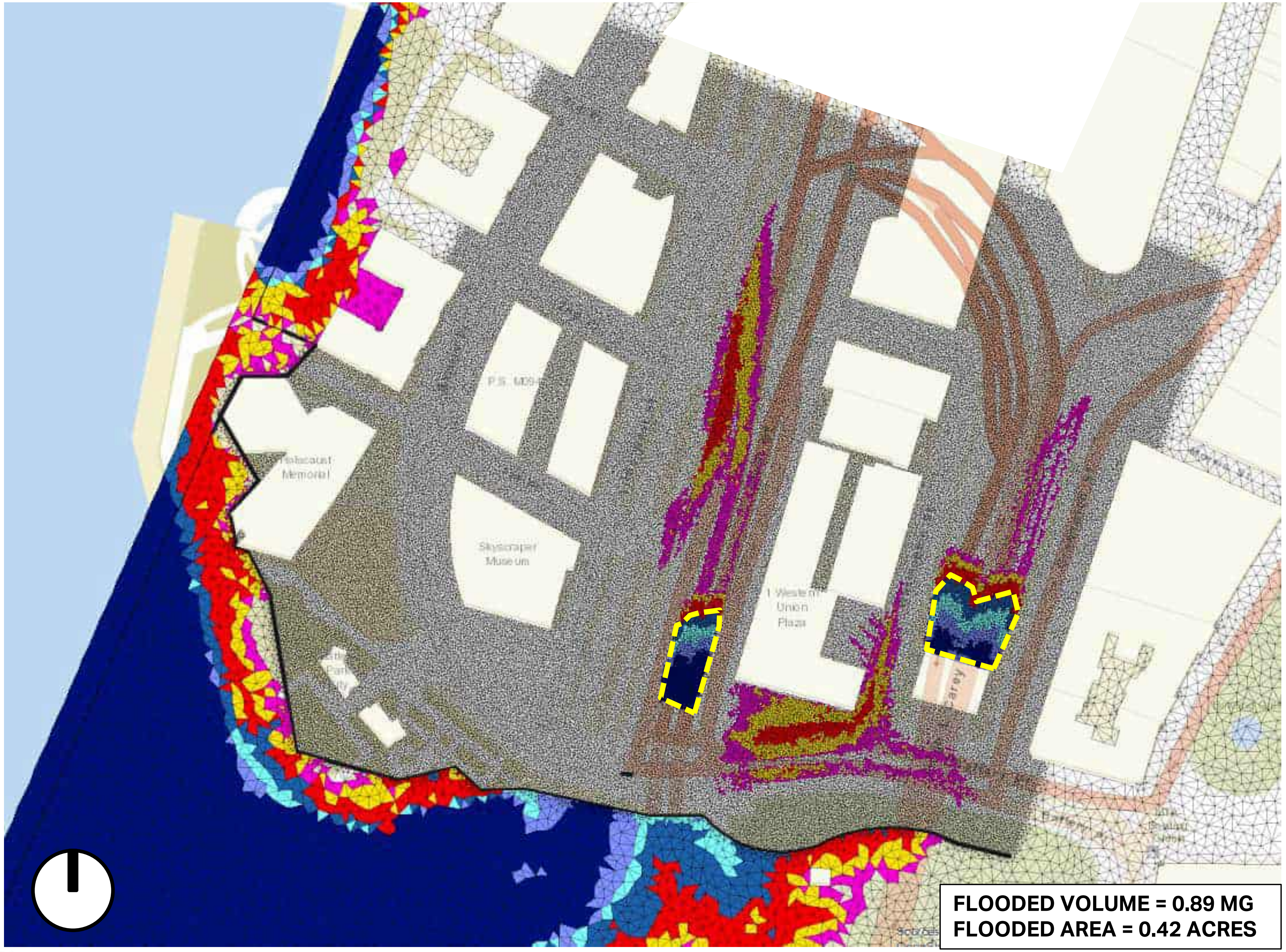
INTERIOR DRAINAGE|
EXISTING SYSTEM OVERVIEW

LEGEND

- SEPARATED STORMWATER DRAINAGE AREA
- NEWTOWN CREEK SEWERSHED
- COMBINED SEWER OVERFLOW (CSO) DISCHARGE POINT
- SEPARATED STORMWATER DISCHARGE POINT
- COMBINED SEWER INTERCEPTOR
- COMBINED SEWER OVERFLOW (CSO) OUTFALL PIPE
- SEPARATED STORMWATER SEWER
- SEPARATED SANITARY SEWER
- SOUTH BATTERY PARK COASTAL RESILIENCY PROJECT AREA
- EXISTING COMBINED SEWER REGULATOR
- PROPOSED FLOOD ALIGNMENT



INTERIOR DRAINAGE| FEMA ACCREDITATION SIMULATION



FLOODED DEPTH (FT.)	CORRESPONDING COLOR
0	
0.1	Magenta
0.5	Yellow
1	Red
2	Blue
3	Cyan
4	Light blue
5+	Navy

SIMULATION NOTES
+ PRELIMINARY RESULTS
+ ASSUMING INTERCEPTOR ISOLATION GATES NORTH OF REG-08 AND SOUTH OF REG-09
+ CSS FLOODING ONLY
+ NO WAVE OVERTOPPING

DESIGN CRITERIA
+ 100-YR SURGE
+ PRESENT DAY SEA LEVEL
+ 5YR NOAA RAIN

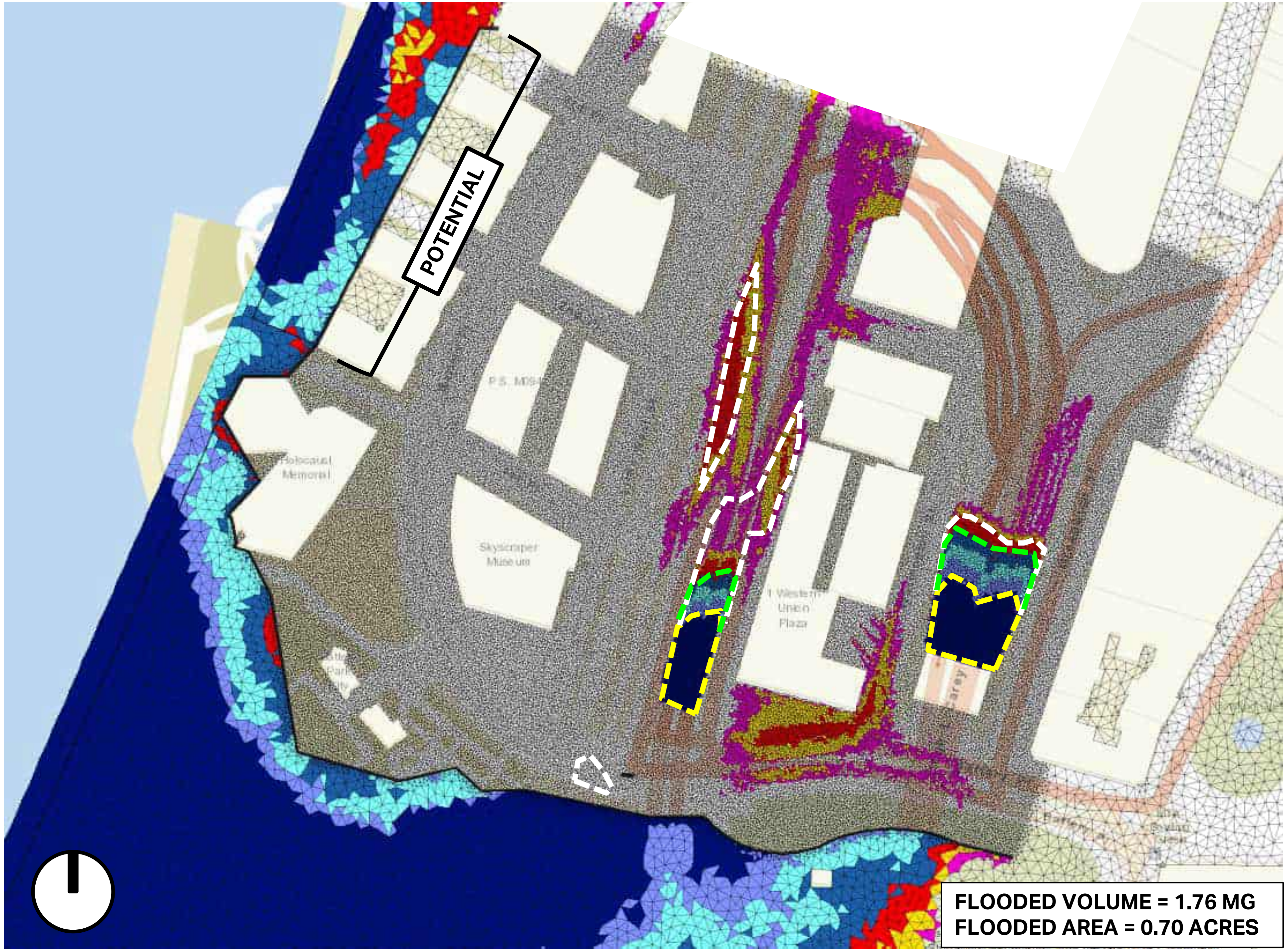
INTERIOR DRAINAGE| 2050 SIMULATION (SOUTH BATTERY ALIGNMENT)

FLOODED DEPTH (FT.)	CORRESPONDING COLOR
0	
0.1	
0.5	
1	
2	
3	
4	
5+	

SIMULATION NOTES
+ PRELIMINARY RESULTS
+ ASSUMING INTERCEPTOR ISOLATION GATES NORTH OF REG-08 AND SOUTH OF REG-09
+ CSS FLOODING AND COASTAL FLOODING
+ NO WAVE OVERTOPPING

DESIGN CRITERIA
+ 100-YR SURGE
+ 2050 SEA LEVEL
+ 5YR NOAA RAIN

INTERIOR DRAINAGE| 2050 SIMULATION (FUTURE WEST ALIGNMENT ADDITIONS)



FLOODED DEPTH (FT.)	CORRESPONDING COLOR
0	
0.1	
0.5	
1	
2	
3	
4	
5+	

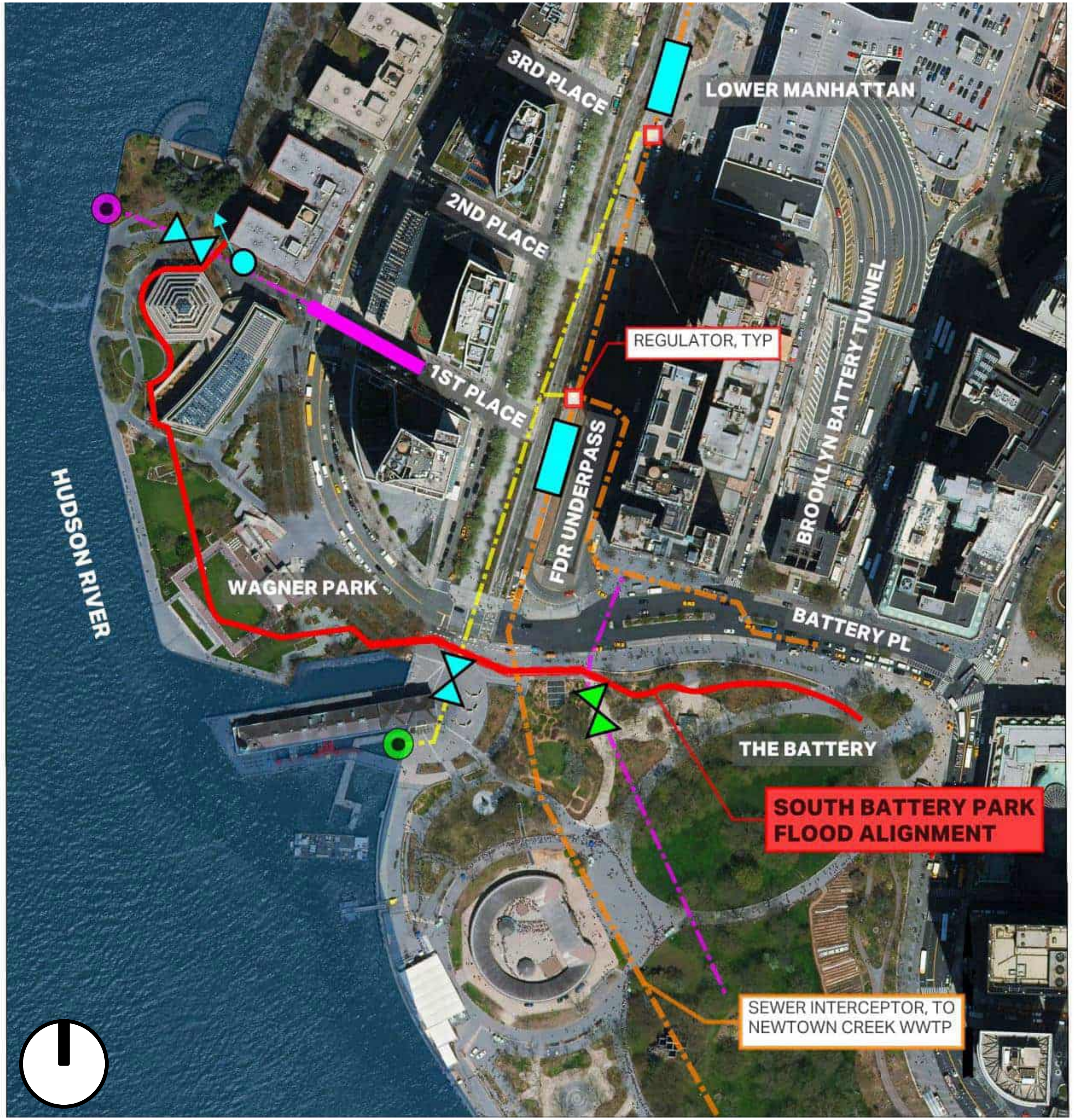
SIMULATION NOTES
+ PRELIMINARY RESULTS
+ ASSUMING INTERCEPTOR ISOLATION GATES NORTH OF REG-08 AND SOUTH OF REG-09
+ CSS FLOODING ONLY
+ NO WAVE OVERTOPPING

DESIGN CRITERIA
+ 100-YR SURGE
+ 2050 SEA LEVEL
+ 5YR NOAA RAIN

INTERIOR DRAINAGE|
POTENTIAL MITIGATION STRATEGIES

LEGEND

- EXISTING COMBINED SEWER OVERFLOW (CSO) DISCHARGE POINT
- EXISTING SEPARATED STORMWATER DISCHARGE POINT
- EXISTING COMBINED SEWER INTERCEPTOR
- EXISTING COMBINED SEWER OVERFLOW (CSO) OUTFALL PIPE
- EXISTING SEPARATED STORMWATER SEWER
- EXISTING COMBINED SEWER REGULATOR
- PROPOSED RESIST STRUCTURE ALIGNMENT
- POTENTIAL INTERCEPTOR GATE WITH CONTROL HOUSE
- POTENTIAL BACKFLOW PREVENTION VALVE
- POTENTIAL PIPE UPSIZING
- POTENTIAL PUMP STATION
- POTENTIAL ISOLATION VALVE



THE BATTERY

PIER A

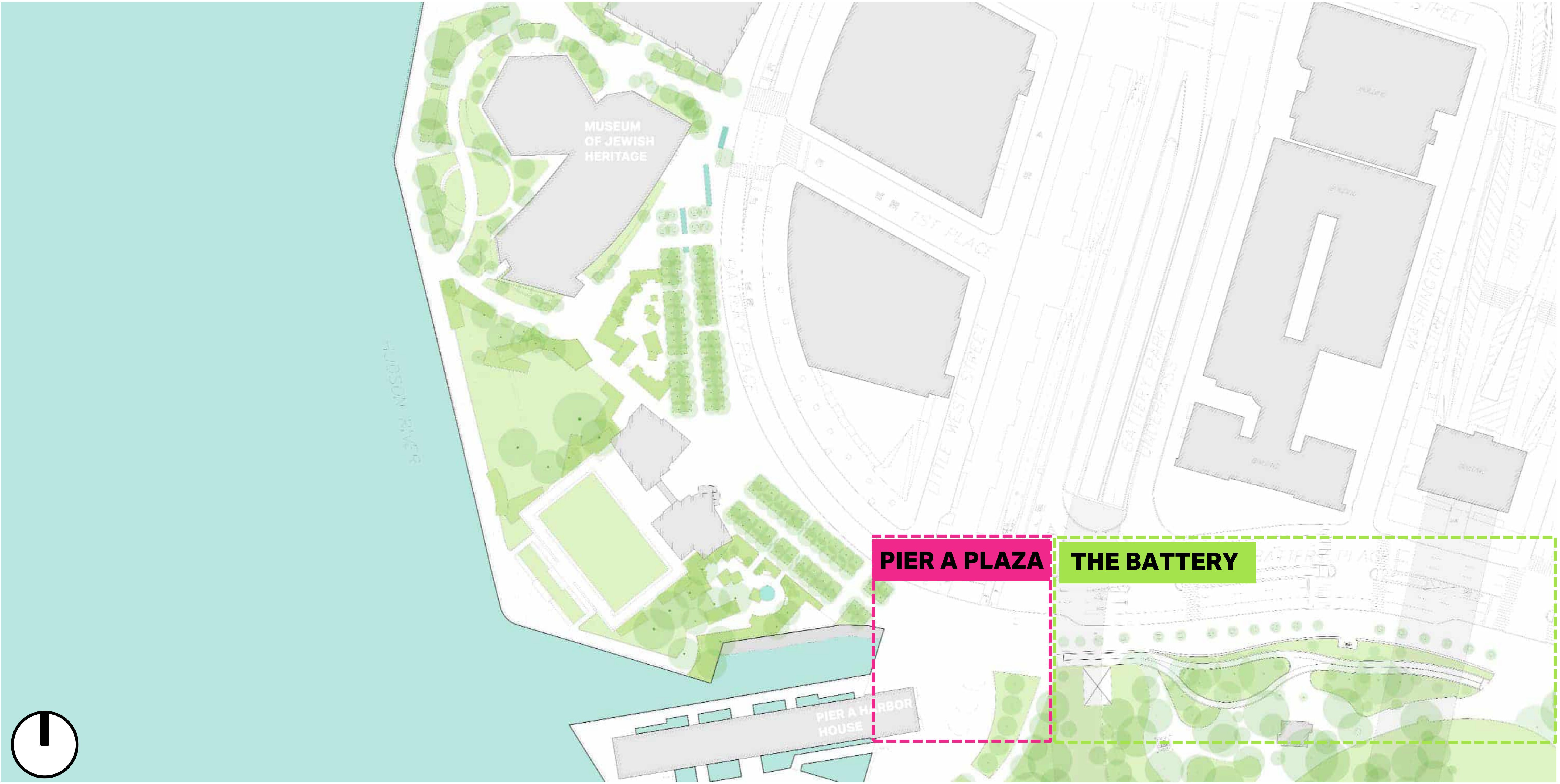
WAGNER PARK

MUSEUM OF JEWISH HERITAGE

THE BATTERY

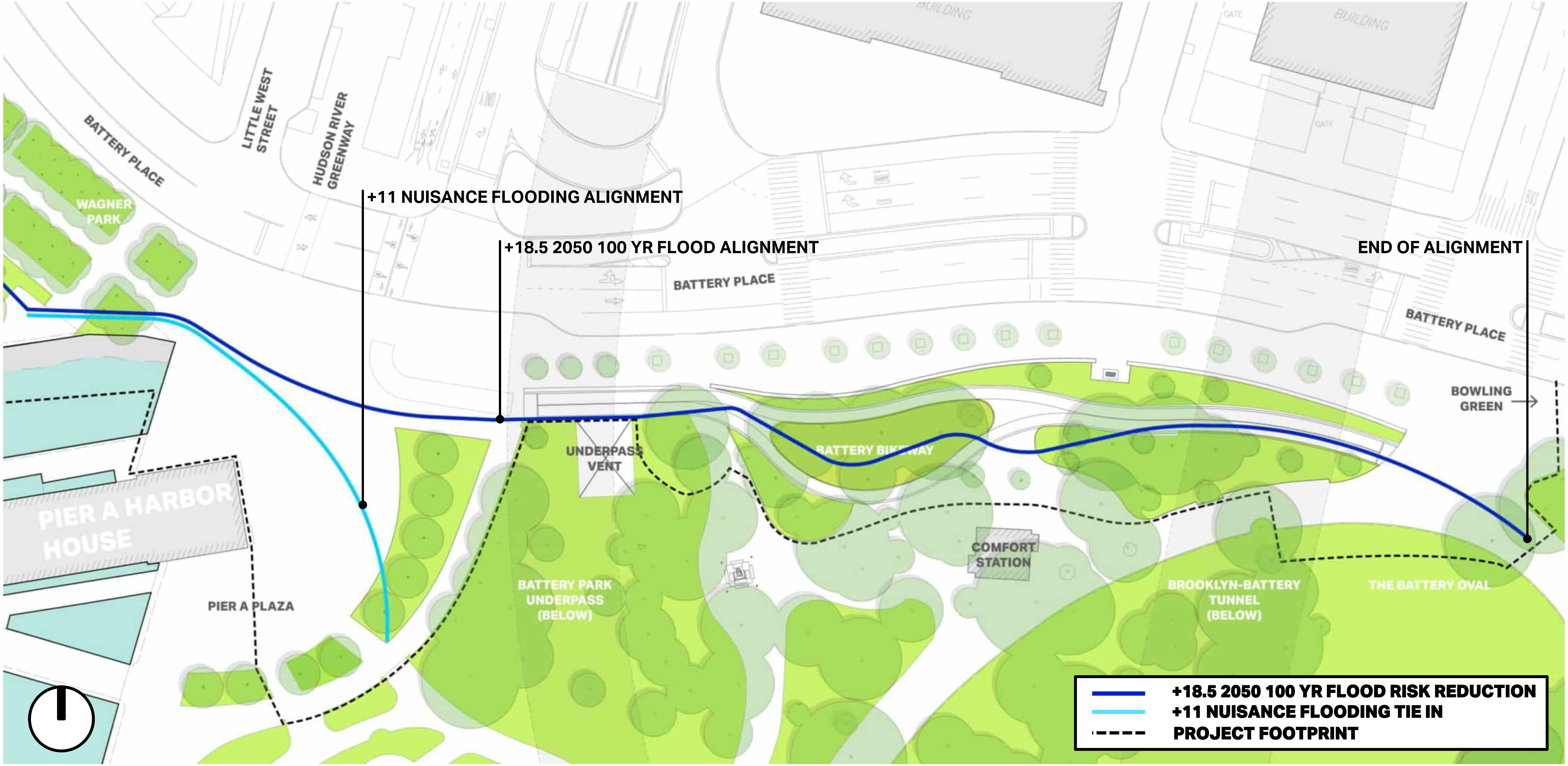
PIER A PLAZA

THE SITE

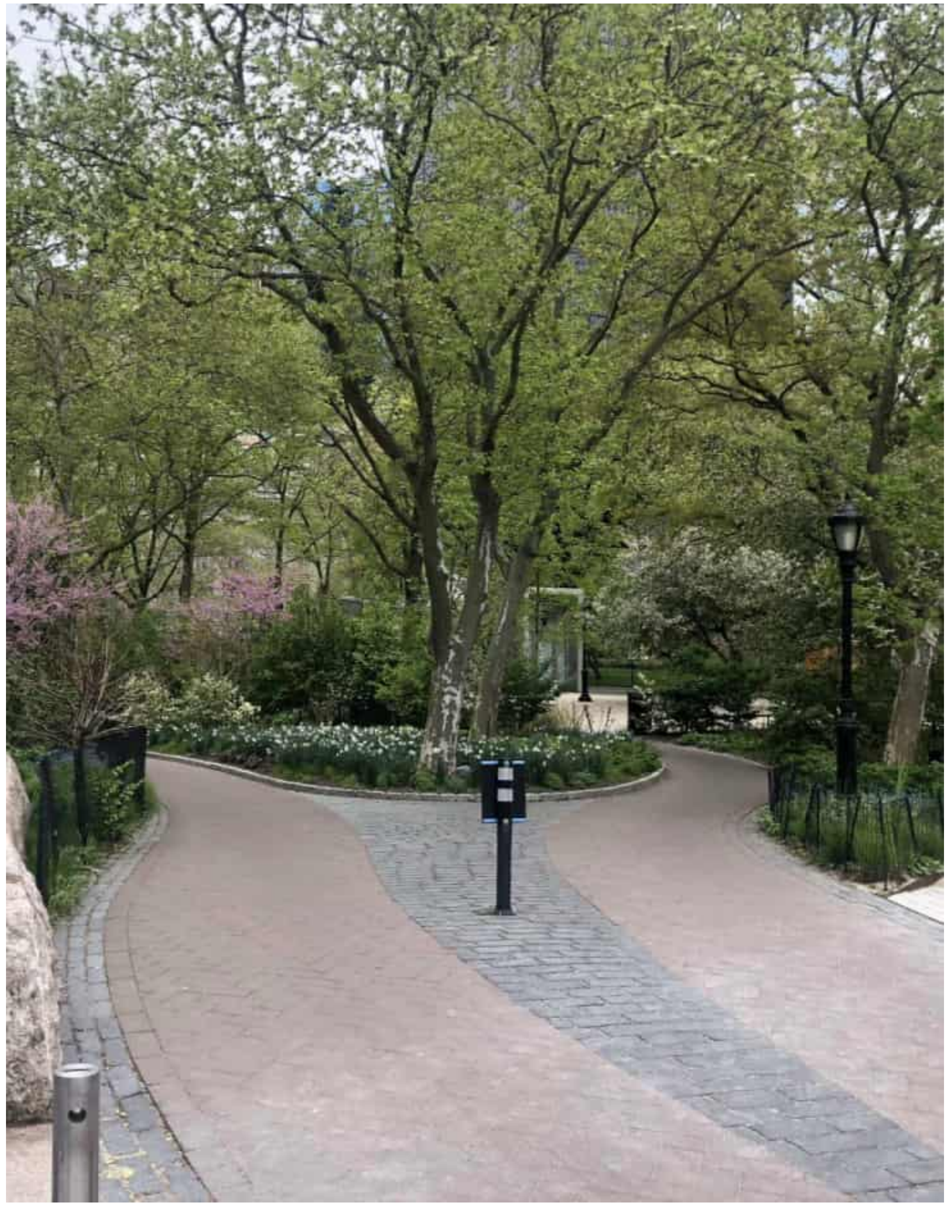

MUSEUM
OF JEWISH
HERITAGE
HUDSON RIVER
1ST PLACE
BATTERY PLACE
LITTLE WEST STREET
BATTERY PARK UNDERPASS
WASHINGTON STREET
PIER A HARBOR HOUSE
PIER A PLAZA
THE BATTERY

THE BATTERY + PIER A | EXISTING CONDITIONS

THE BATTERY + PIER A PLAZA| FLOOD ALIGNMENTS



THE BATTERY | EXISTING CONDITIONS

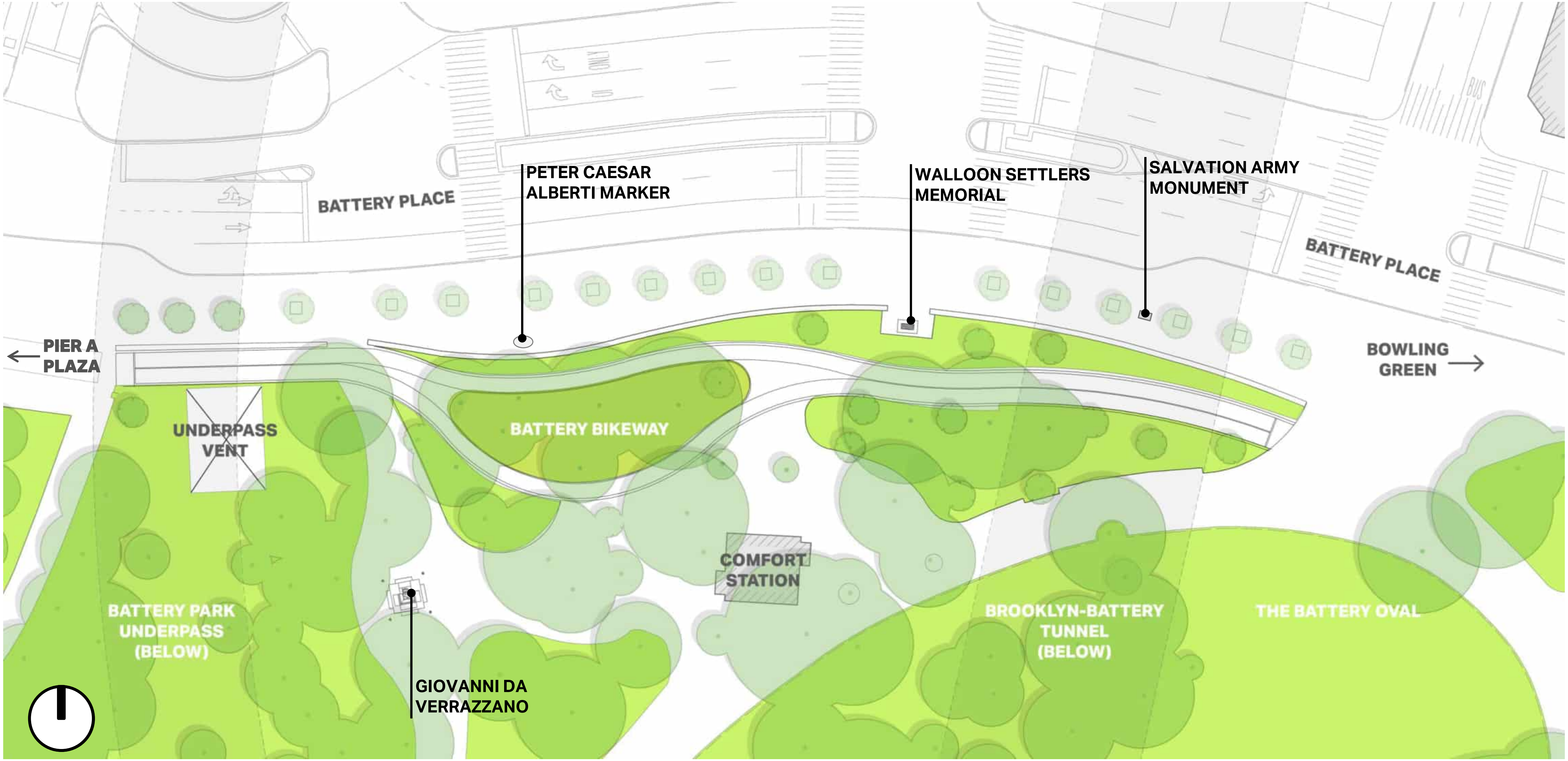


BIKEWAY

LUSH PLANTING

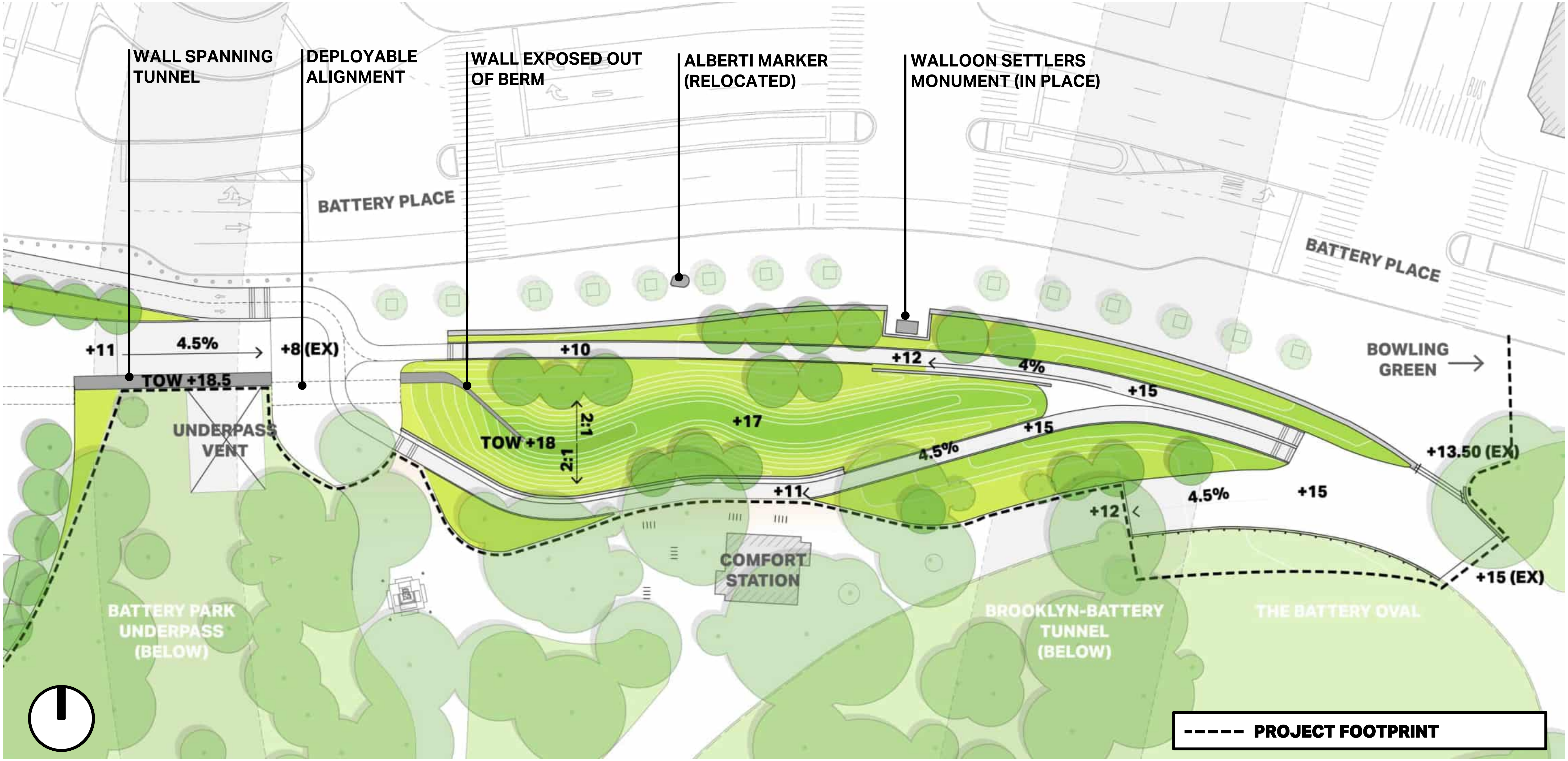
BIKE PARKING AROUND COMFORT STATION

THE BATTERY | EXISTING CONDITIONS



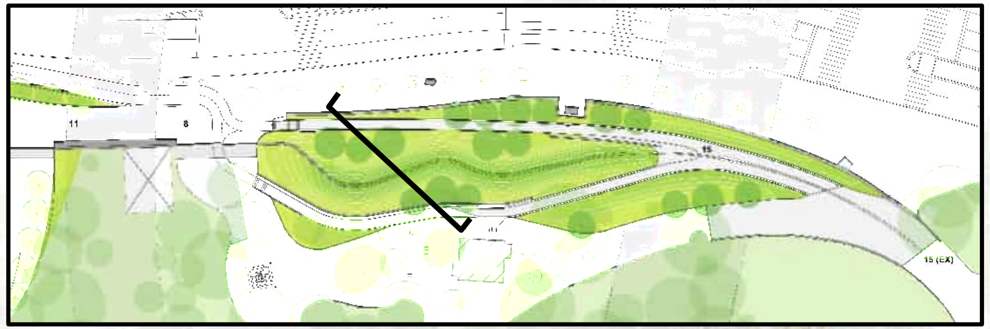
THE BATTERY | PROPOSED DESIGN

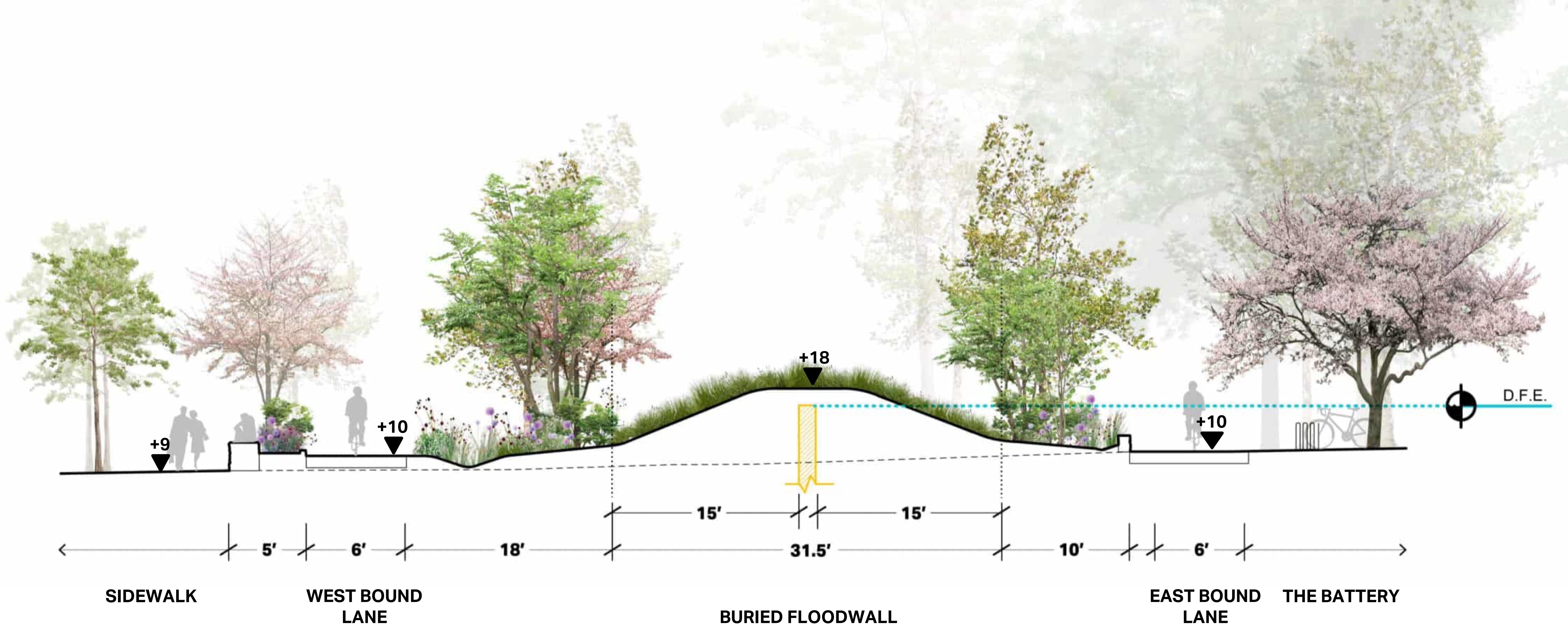
THE BATTERY | PROPOSED DESIGN



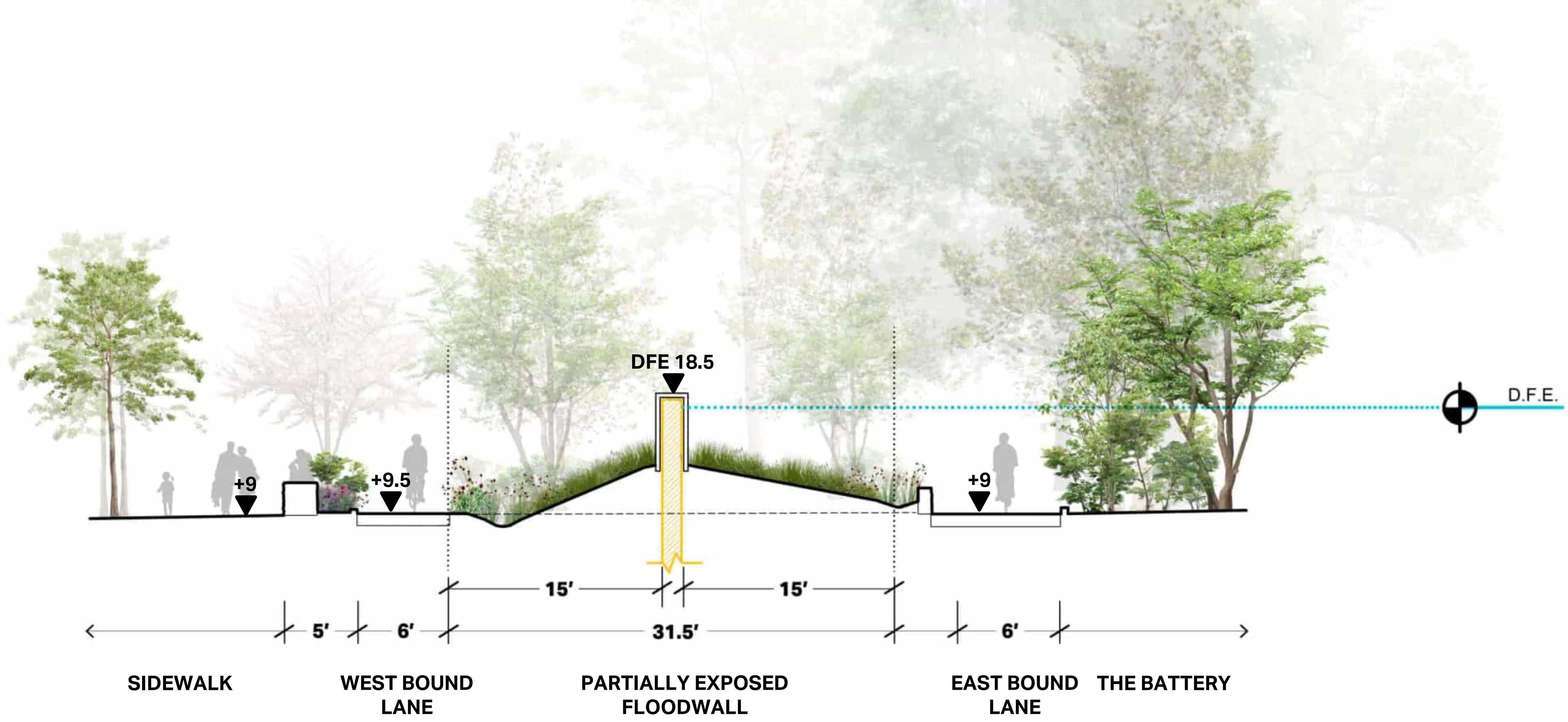
THE BATTERY | CIRCULATION

THE BATTERY | PROPOSED DESIGN





THE BATTERY | PROPOSED DESIGN



THE BATTERY | PLANTING

WITHIN 15' OFFSET 2:1 SLOPES

- **SALT TOLERANT**
- **BLENDS IN WITH SURROUNDING PLANT PALETTE**
- **SHALLOW ROOTS**
- **SEASONAL INTEREST**

HUDSONIA TOMENTOSA
FLASE HEATHER

IBERIS SEMPERVIRENS
EVERGREEN CANDYTUFT

ASCELPIAS SYRIACA
COMMON MILKWEED

ARMERIA MARITIMA
SEA THRIFT

ARTOSTAPHYLOS UVA-URSI
BEARBERRY

CAREX VULPINOIDEA
FOX SEDGE

CHASMANTHIUM LATIFOLIUM
NORTHERN SEA OATS

CERASTIUM TOMENTOSUM
SNOW IN SUMMER

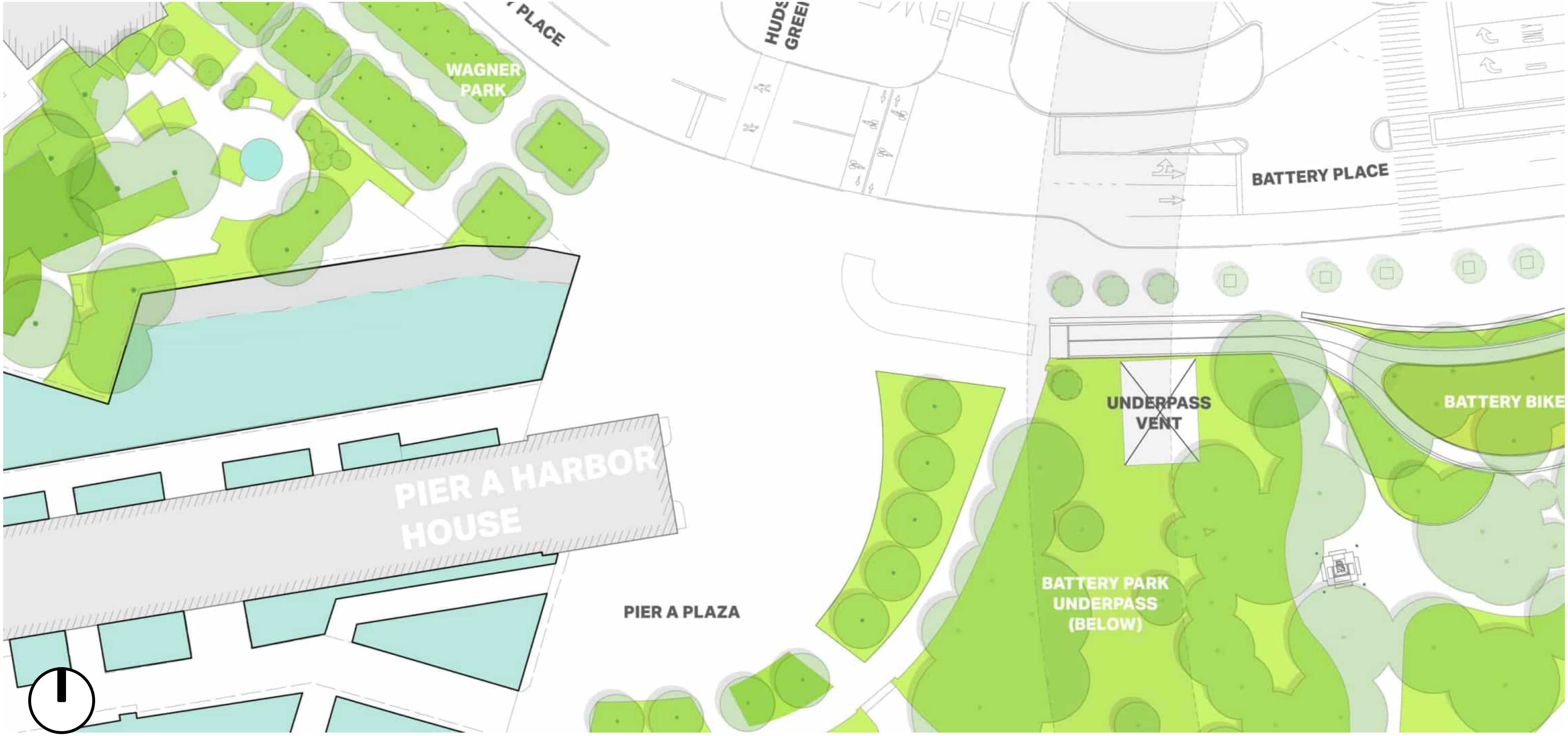
PIER A PLAZA | EXISTING CONDITIONS

HARBOR HOUSE

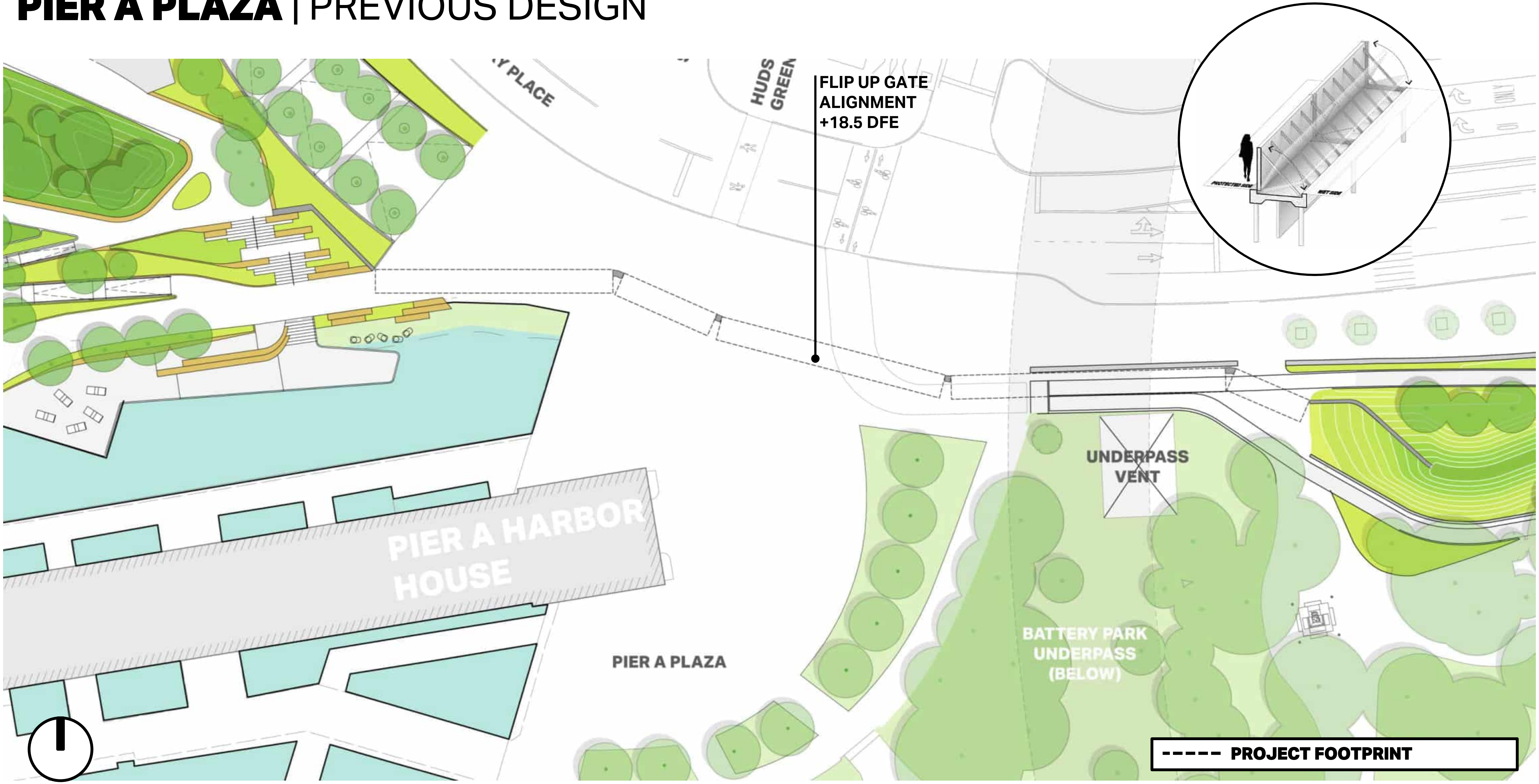
VIEW CORRIDORS

BIKEWAY

PIER A PLAZA | EXISTING CONDITIONS

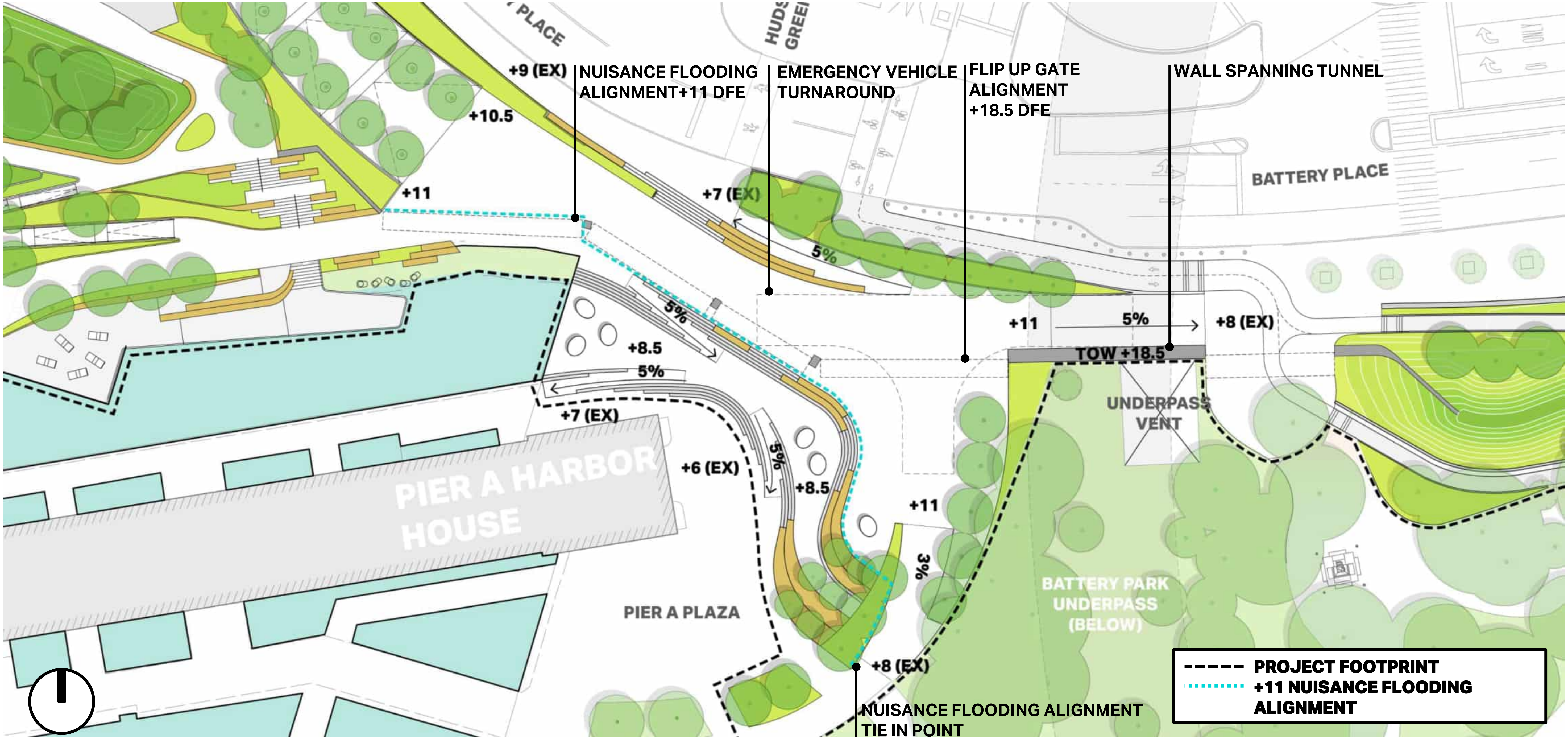


PIER A PLAZA | PREVIOUS DESIGN

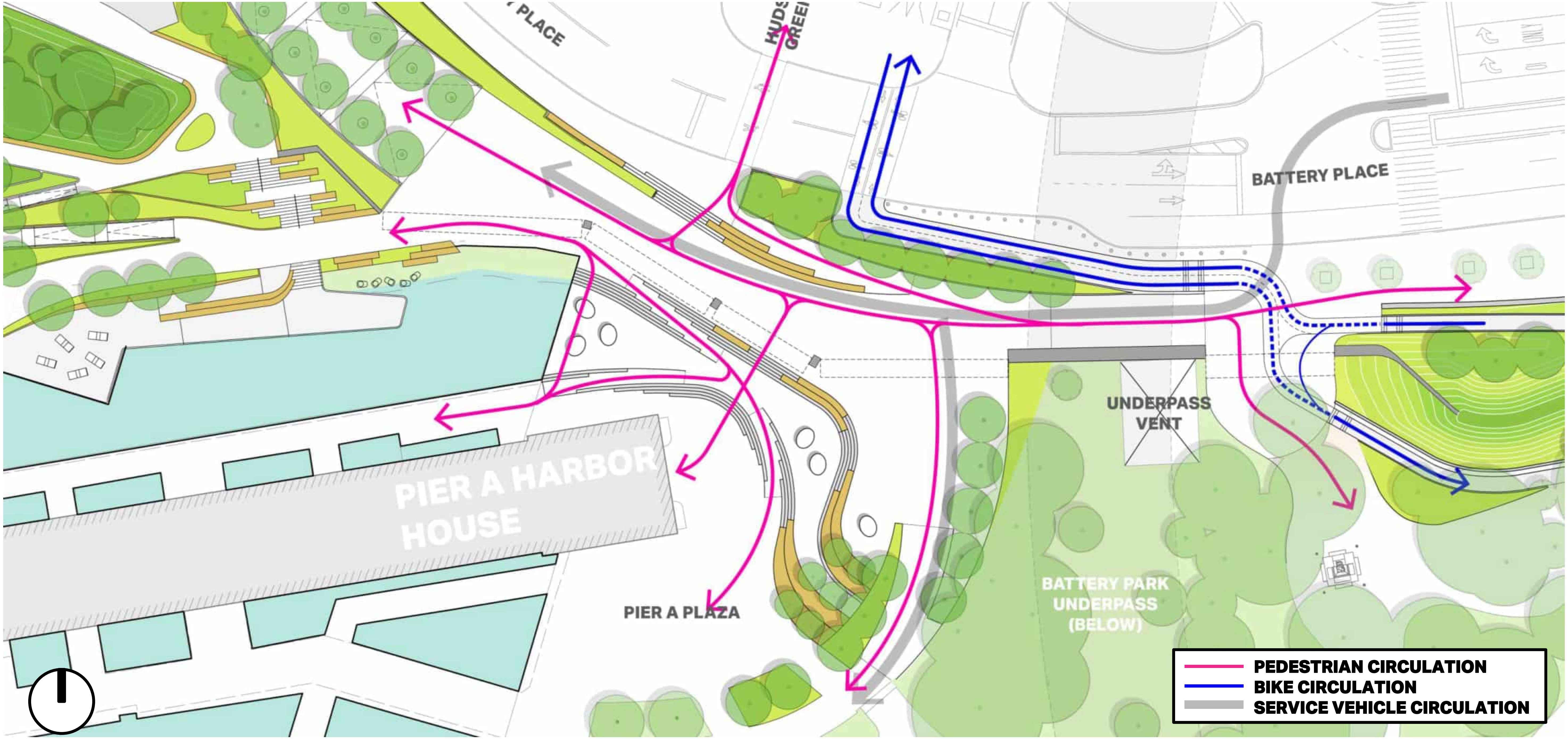


PIER A PLAZA | PROPOSED DESIGN

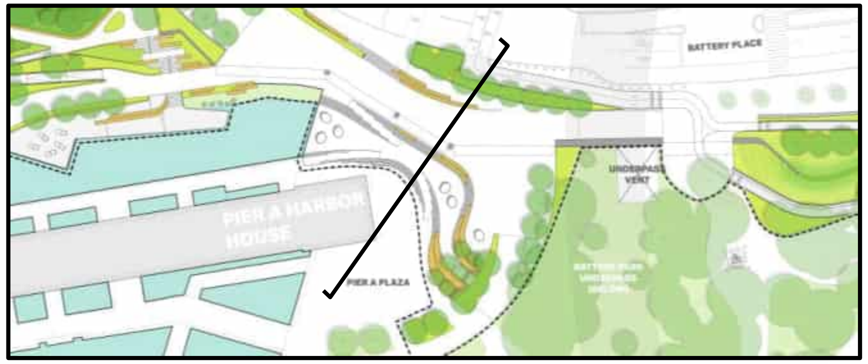
PIER A PLAZA | PROPOSED DESIGN

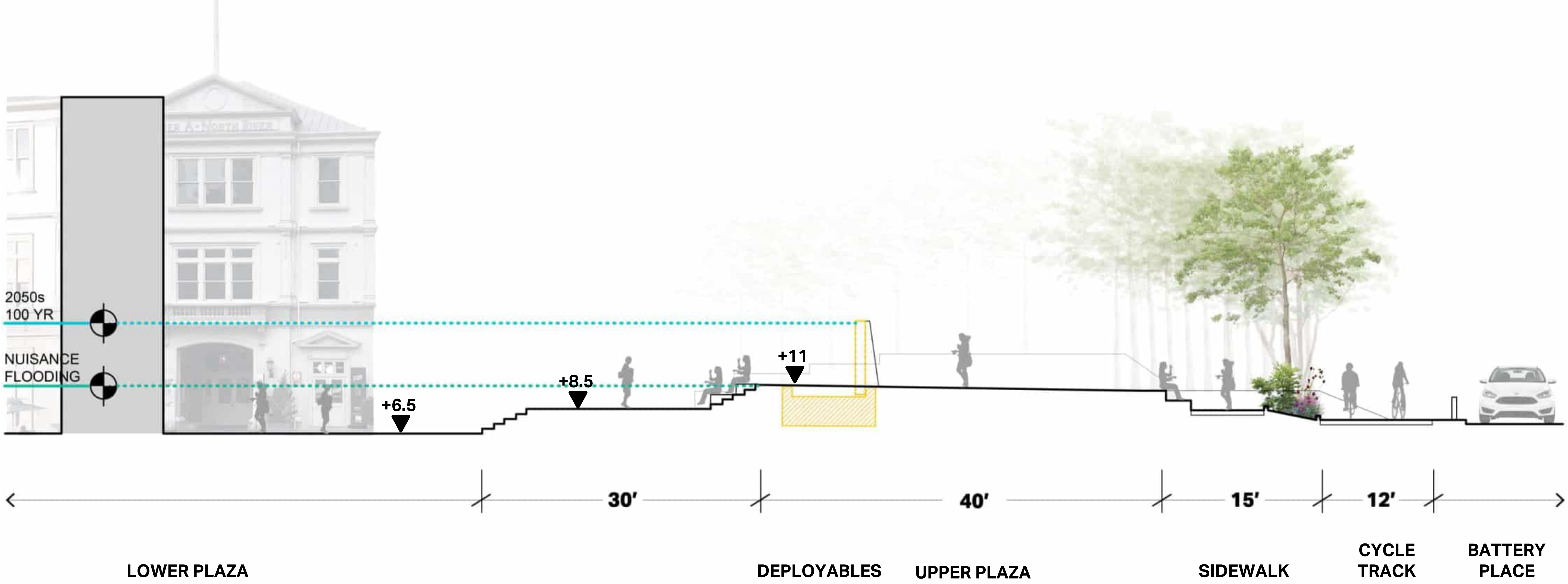


PIER A PLAZA | CIRCULATION



PIER A PLAZA | PROPOSED DESIGN

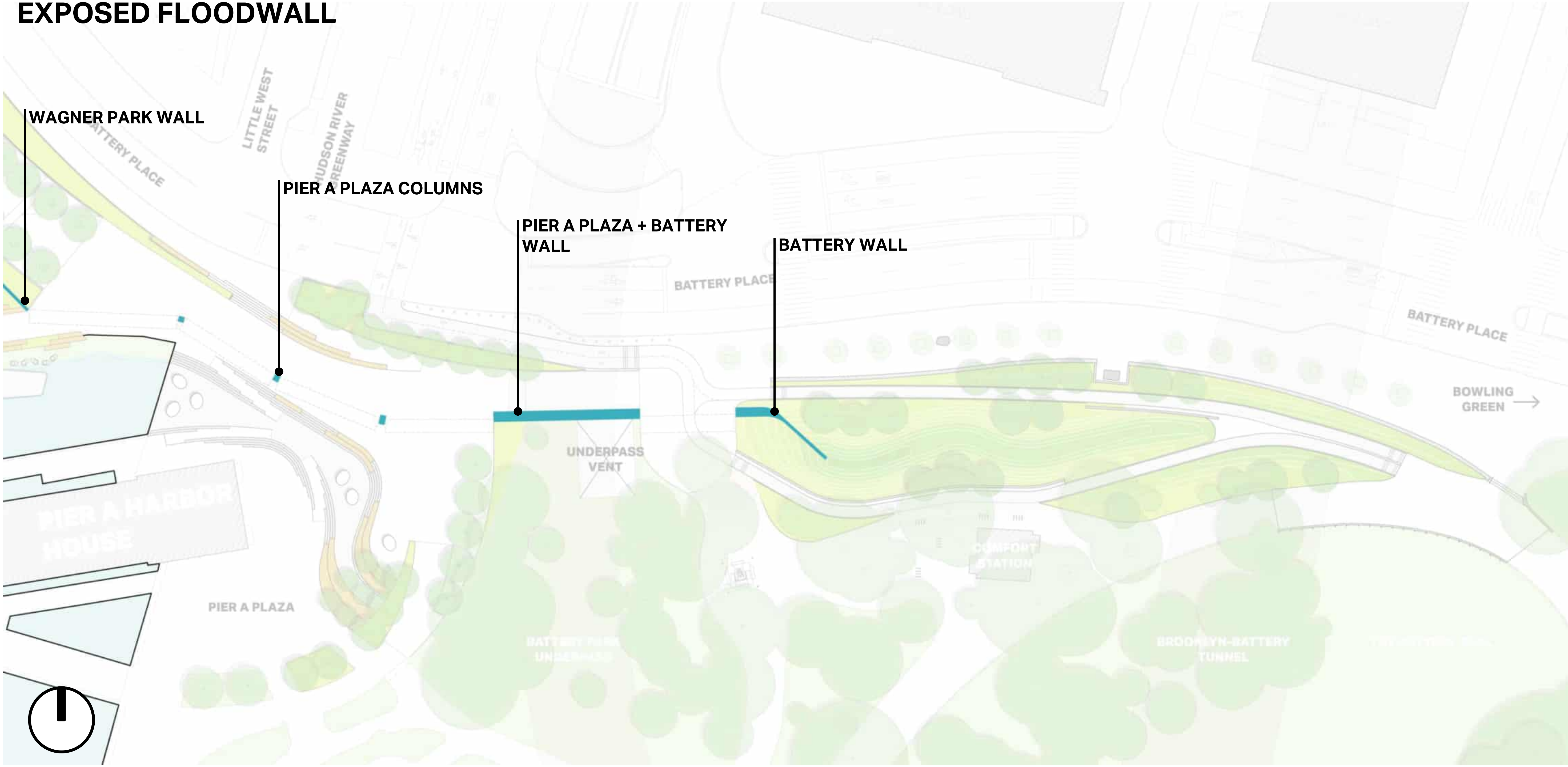





BATTERY PLACE
UNDERPASS VENT
PIER A HARBOR HOUSE

THE BATTERY + PIER A PLAZA | MATERIALS PALETTE

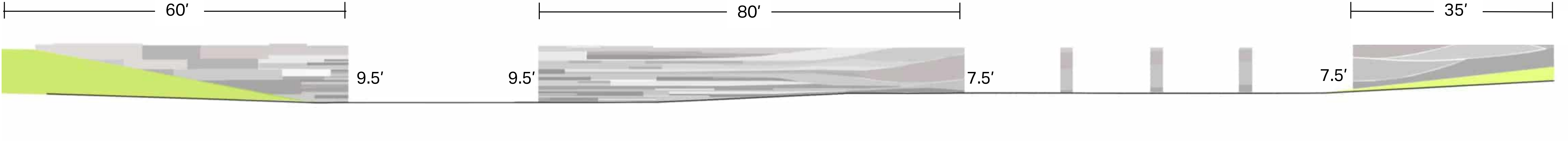
EXPOSED FLOODWALL



THE BATTERY + PIER A PLAZA | MATERIALS PALETTE

EXPOSED FLOODWALL

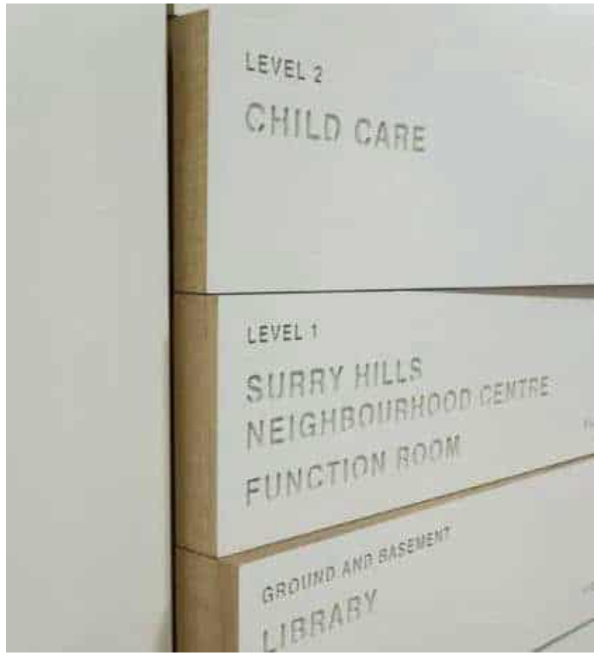
SPLIT FACE STONE **BLEND OF SIZE, SHAPE, AND TEXTURE OF MATERIALS** **POLISHED STONE**



THE BATTERY **PIER A PLAZA** **WAGNER PARK**

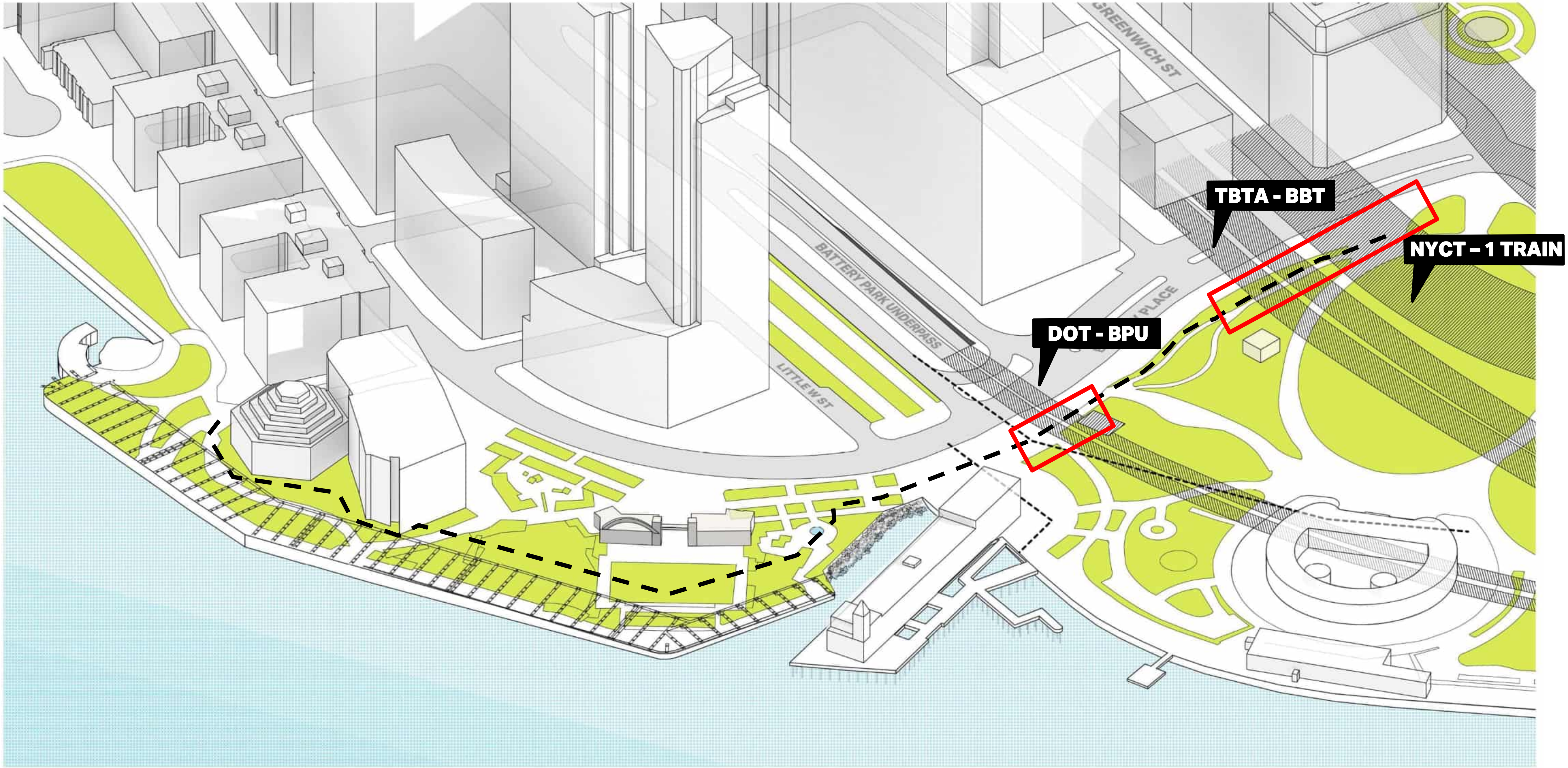
THE BATTERY + PIER A PLAZA | SIGNAGE + LIGHTING

SIGNAGE



LIGHTING

THE BATTERY & PIER A PLAZA | STRUCTURAL ENGINEERING



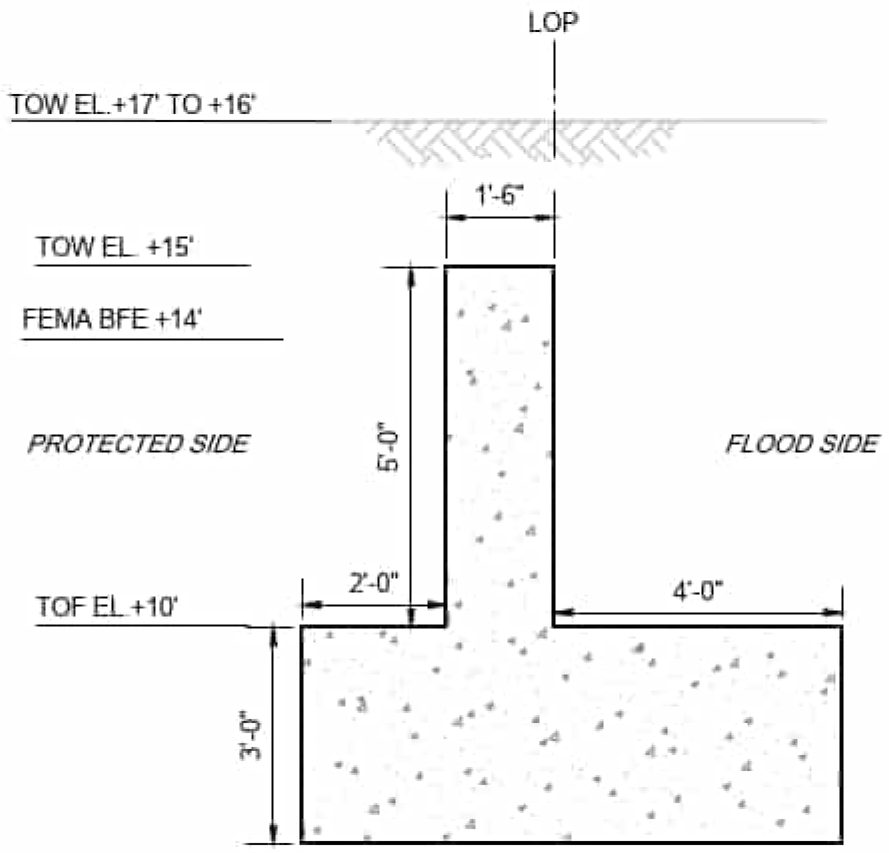
THE BATTERY | STRUCTURAL ENGINEERING

Challenge: Spanning the Brooklyn-Battery Tunnel and the 1 Subway Tunnel

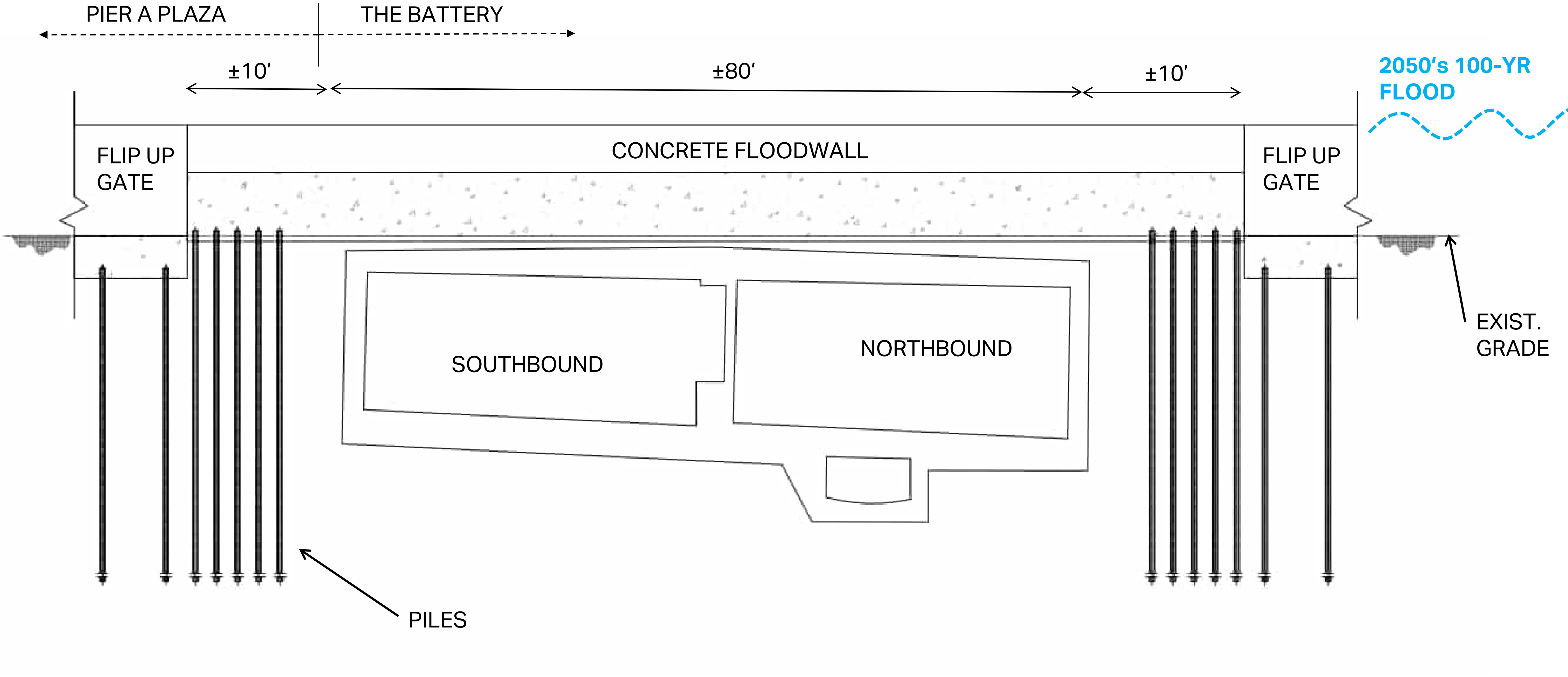
Solution: The lower HOI allows the use of a shallow footing and piles are not required

Challenge: Congestion of utilities through Battery Park and along Battery Place

Solution: Utilize a shallow foundation where possible and jet grouting as a seepage barrier around utilities

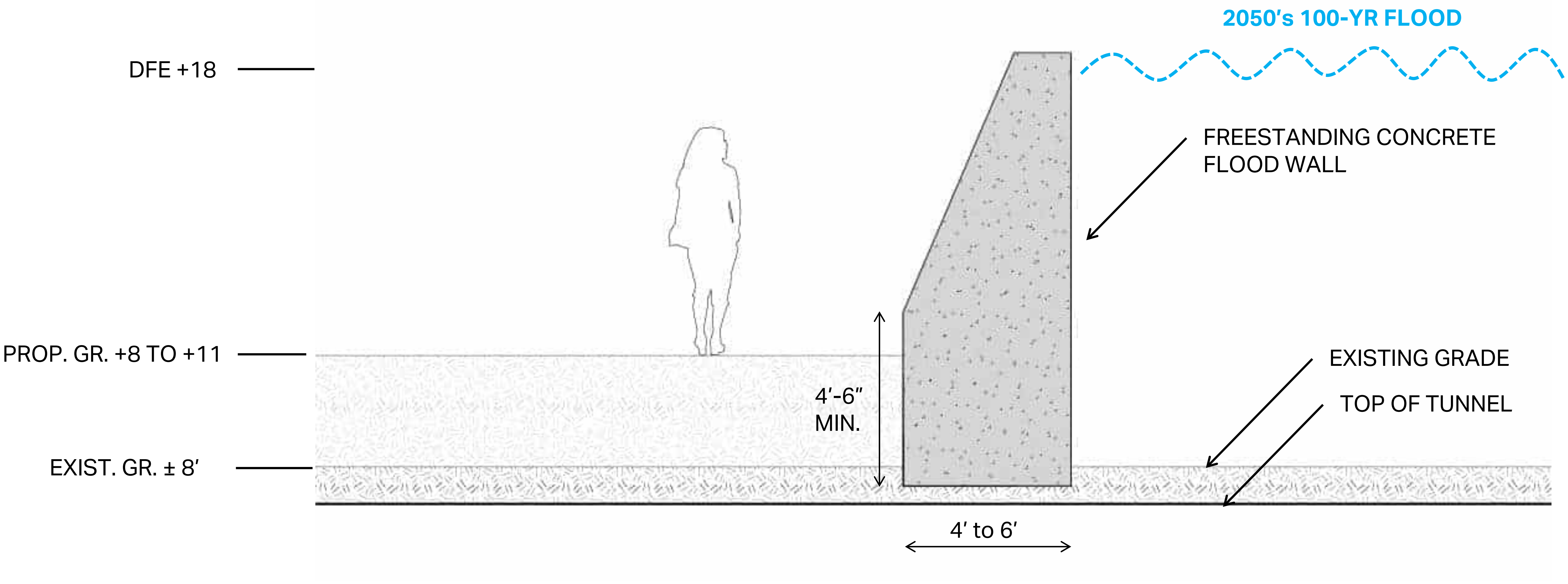


PIER A PLAZA| STRUCTURAL ENGINEERING



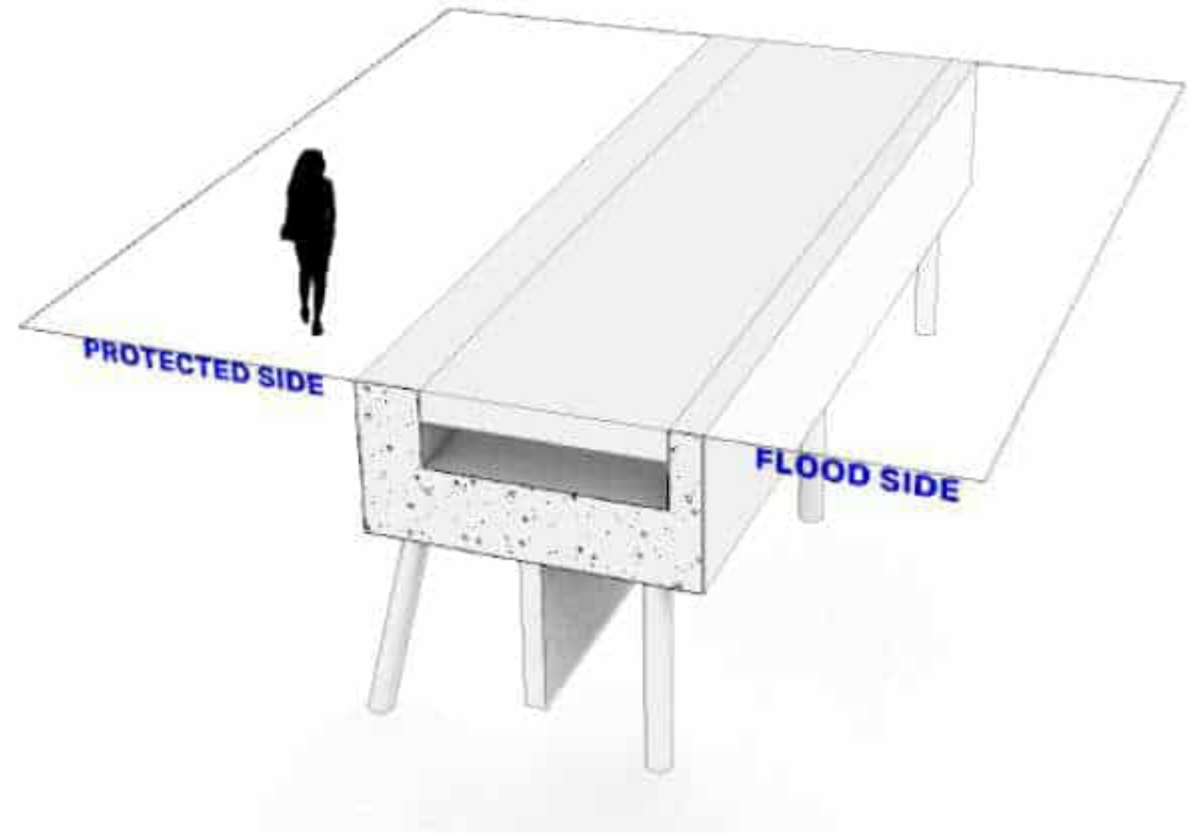
Section Looking North

PIER A PLAZA| STRUCTURAL ENGINEERING

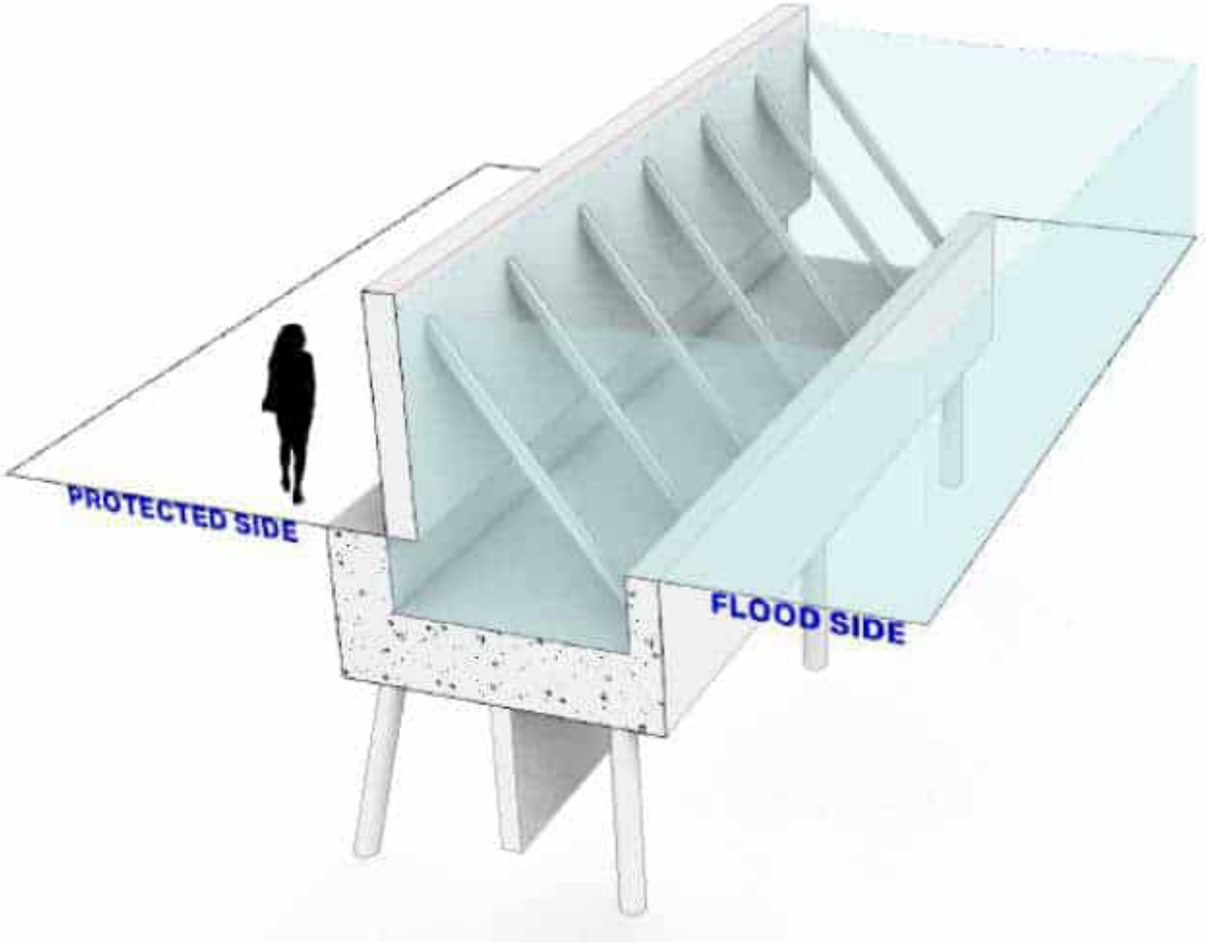


FDR UNDERPASS

PIER A PLAZA| STRUCTURAL ENGINEERING



FLIP UP GATE – STOWED POSITION



FLIP UP GATE – DEPLOYED POSITION

The Battery and Pier A Plaza

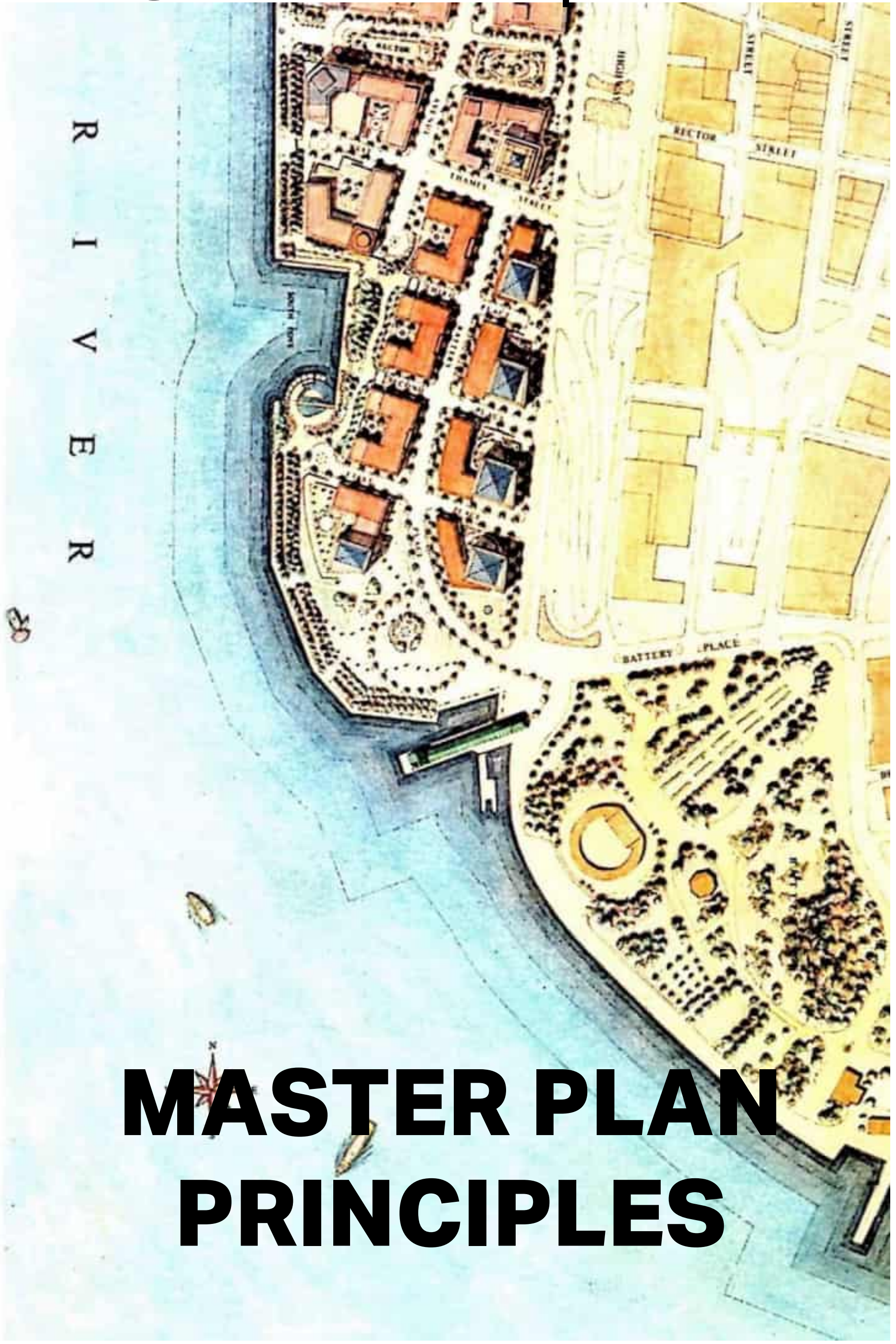
Q&A

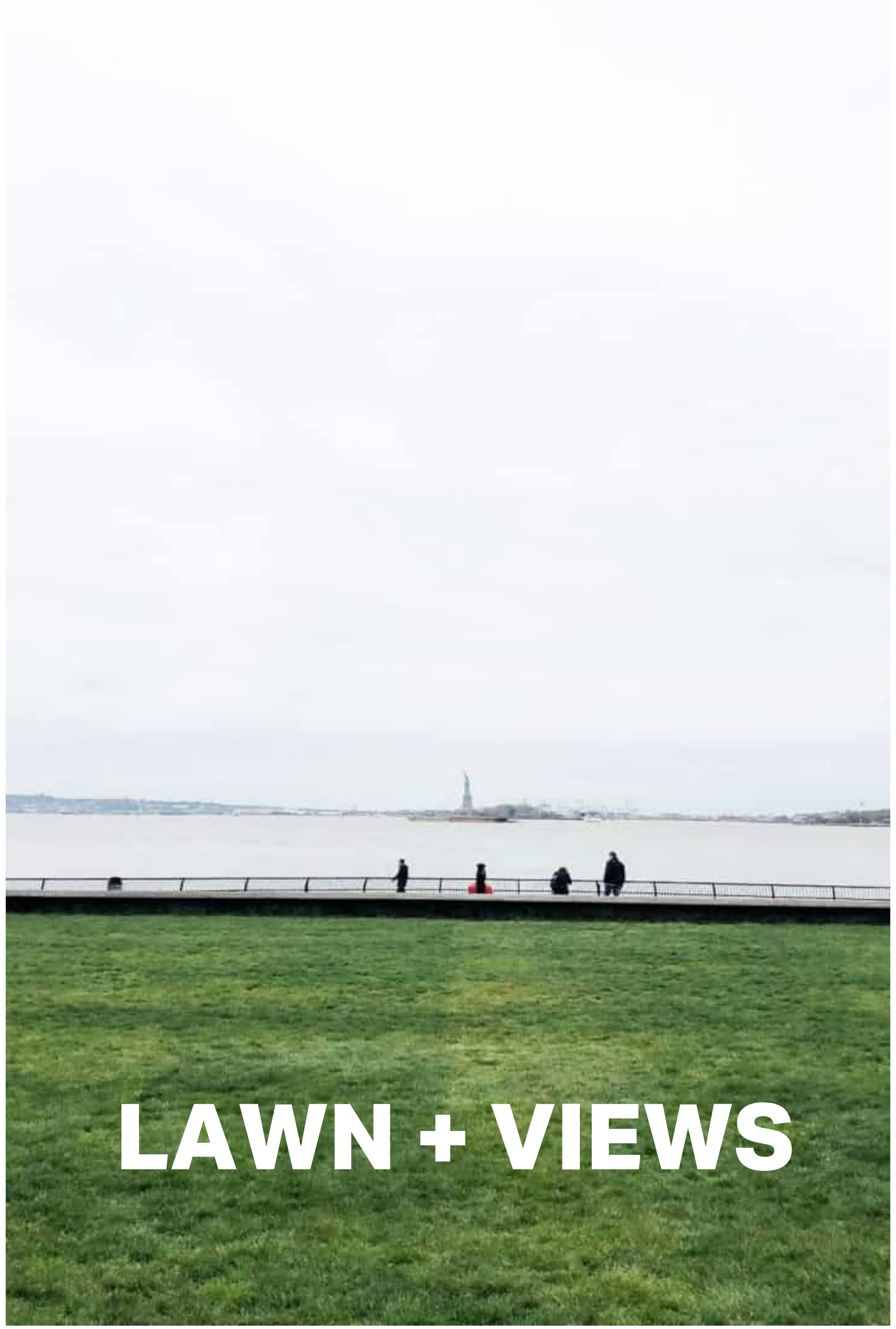
WAGNER PARK

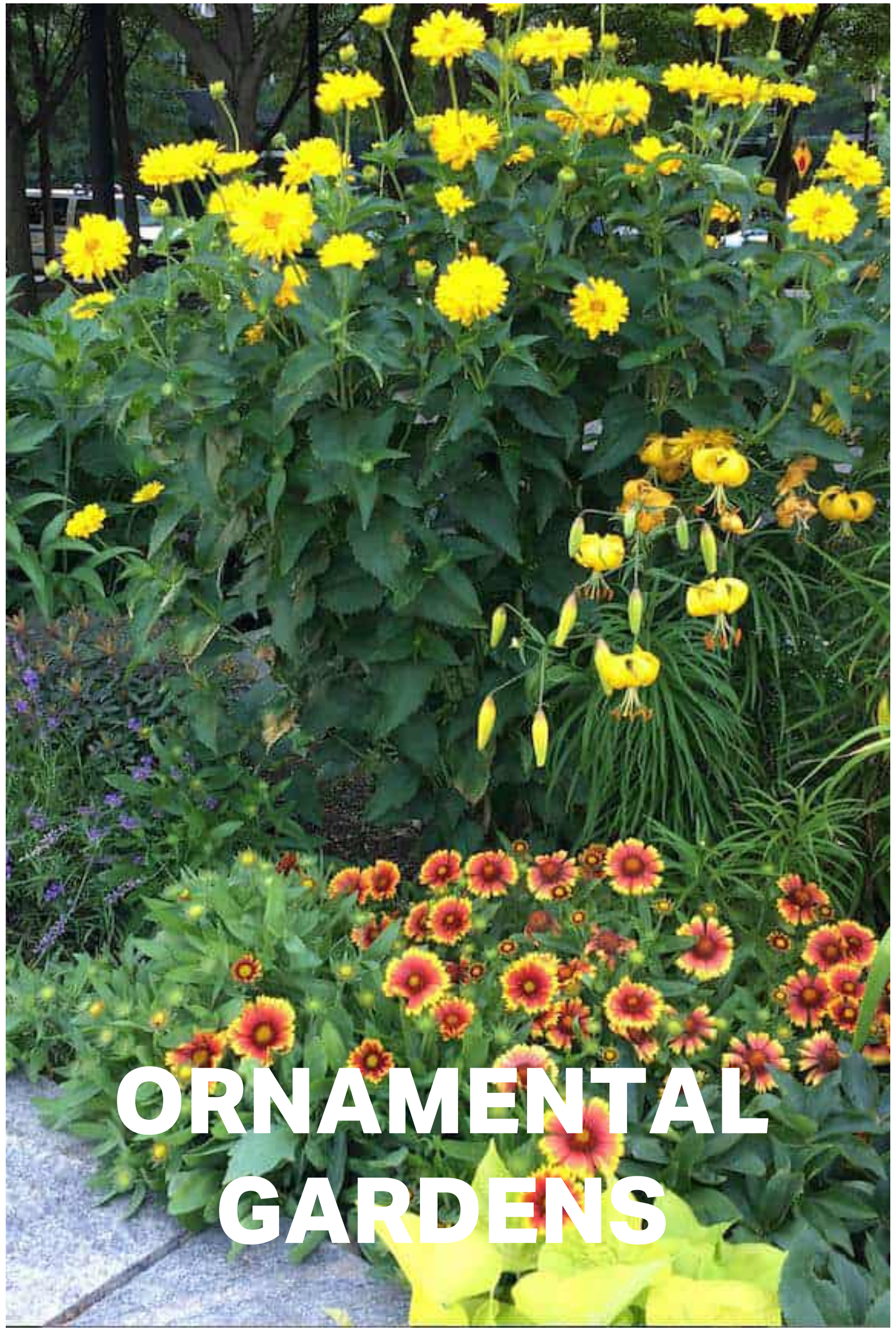
THE SITE

WAGNER PARK
MUSEUM OF JEWISH HERITAGE
HUDSON RIVER
1ST PLACE
BATTERY PLACE
LITTLE WEST STREET
BATTERY PARK UNDERPASS
WASHINGTON STREET
PIER A HARBOR HOUSE

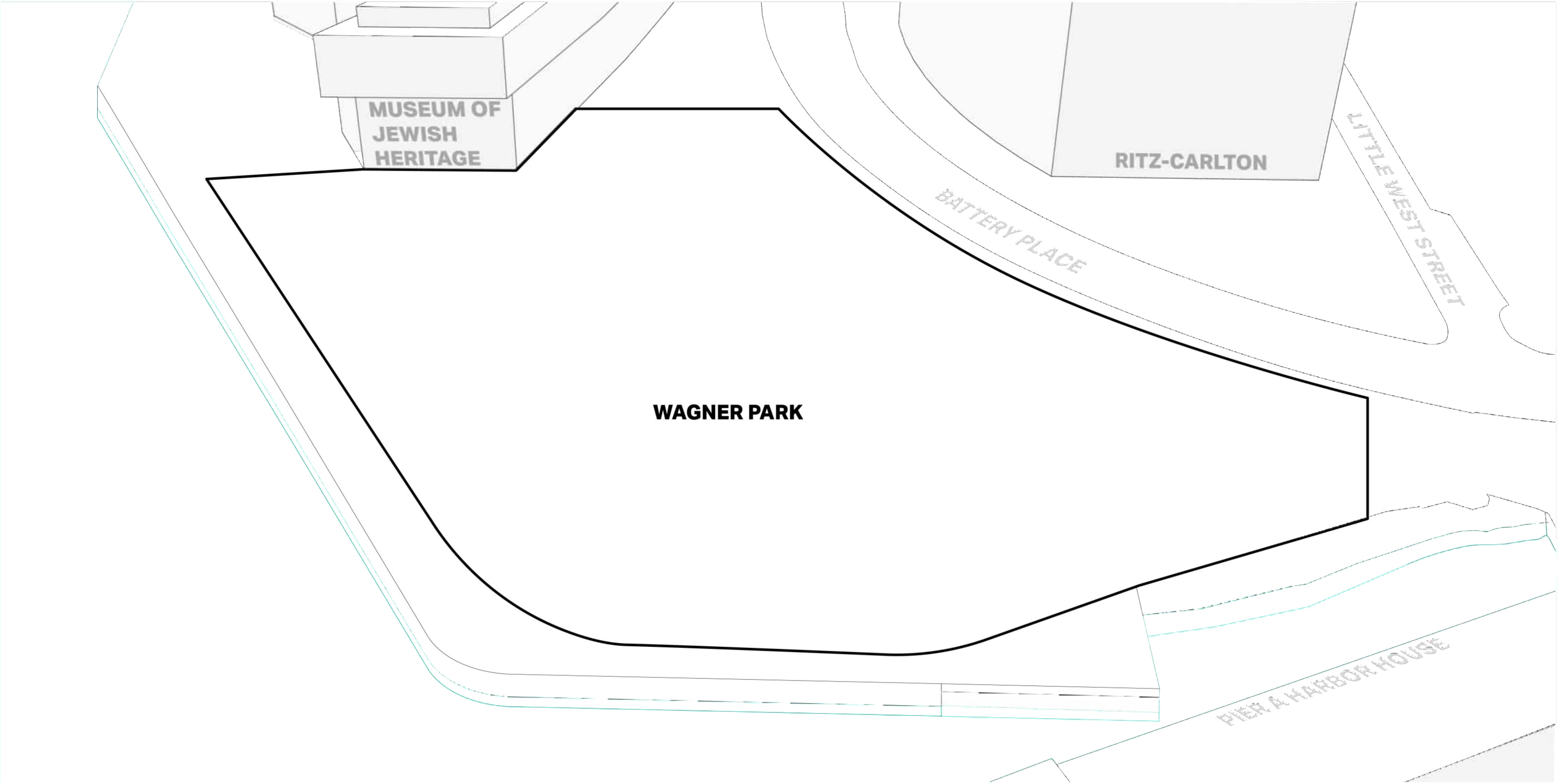
WAGNER PARK | DESIGN INSPIRATION



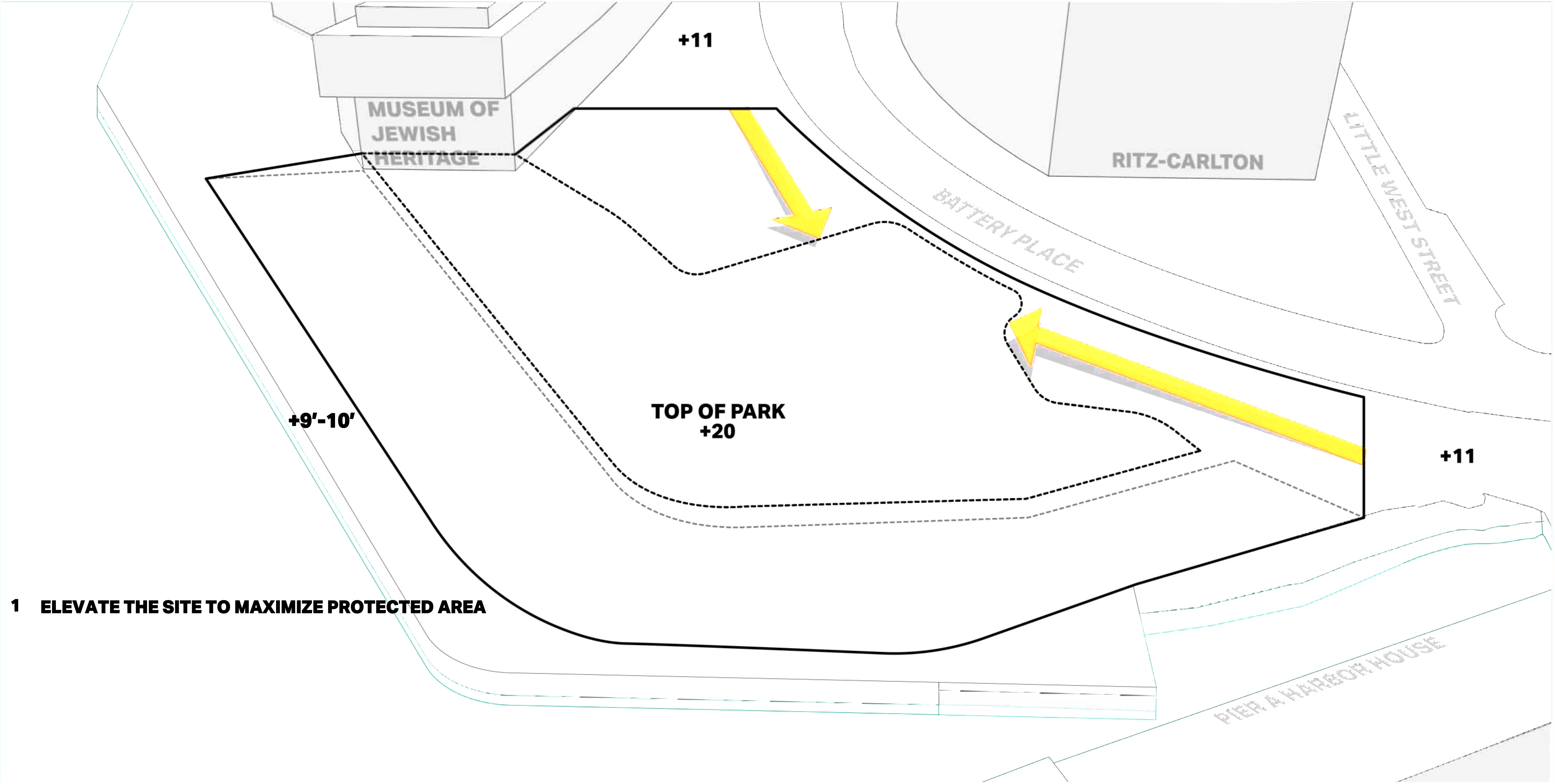




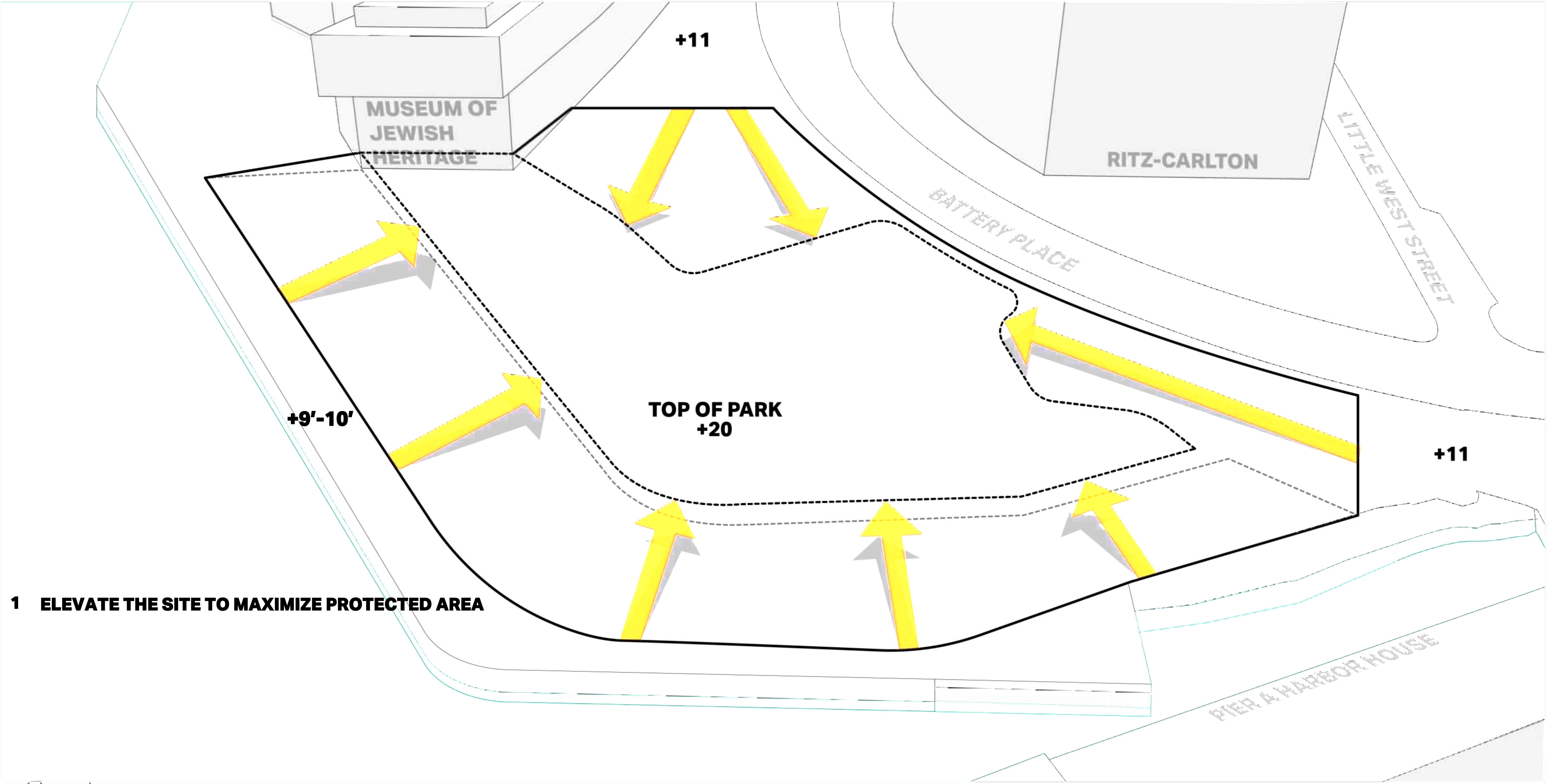
WAGNER PARK | DESIGN PRINCIPLES



WAGNER PARK | DESIGN PRINCIPLES

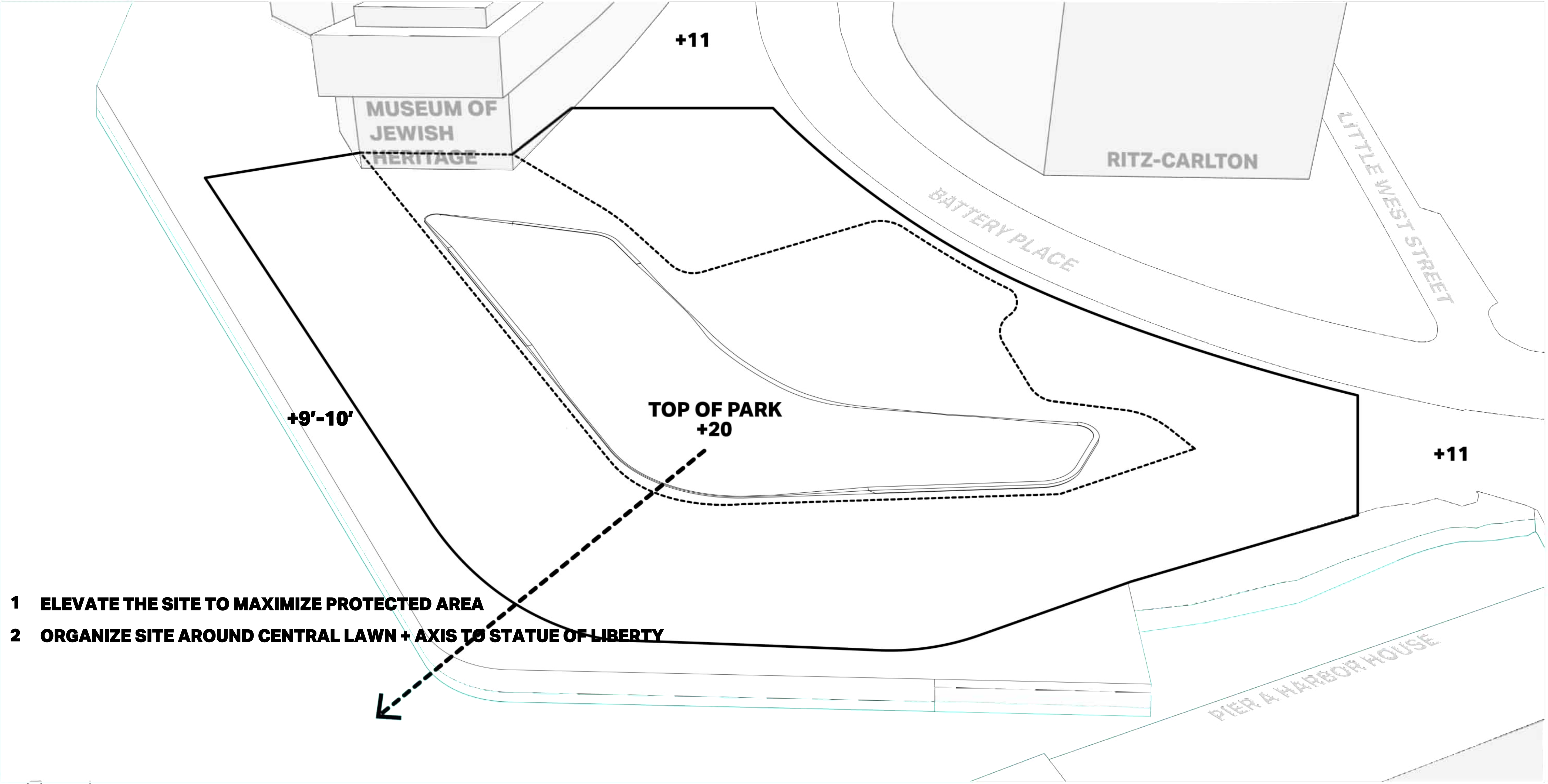


WAGNER PARK | DESIGN PRINCIPLES



1 **ELEVATE THE SITE TO MAXIMIZE PROTECTED AREA**

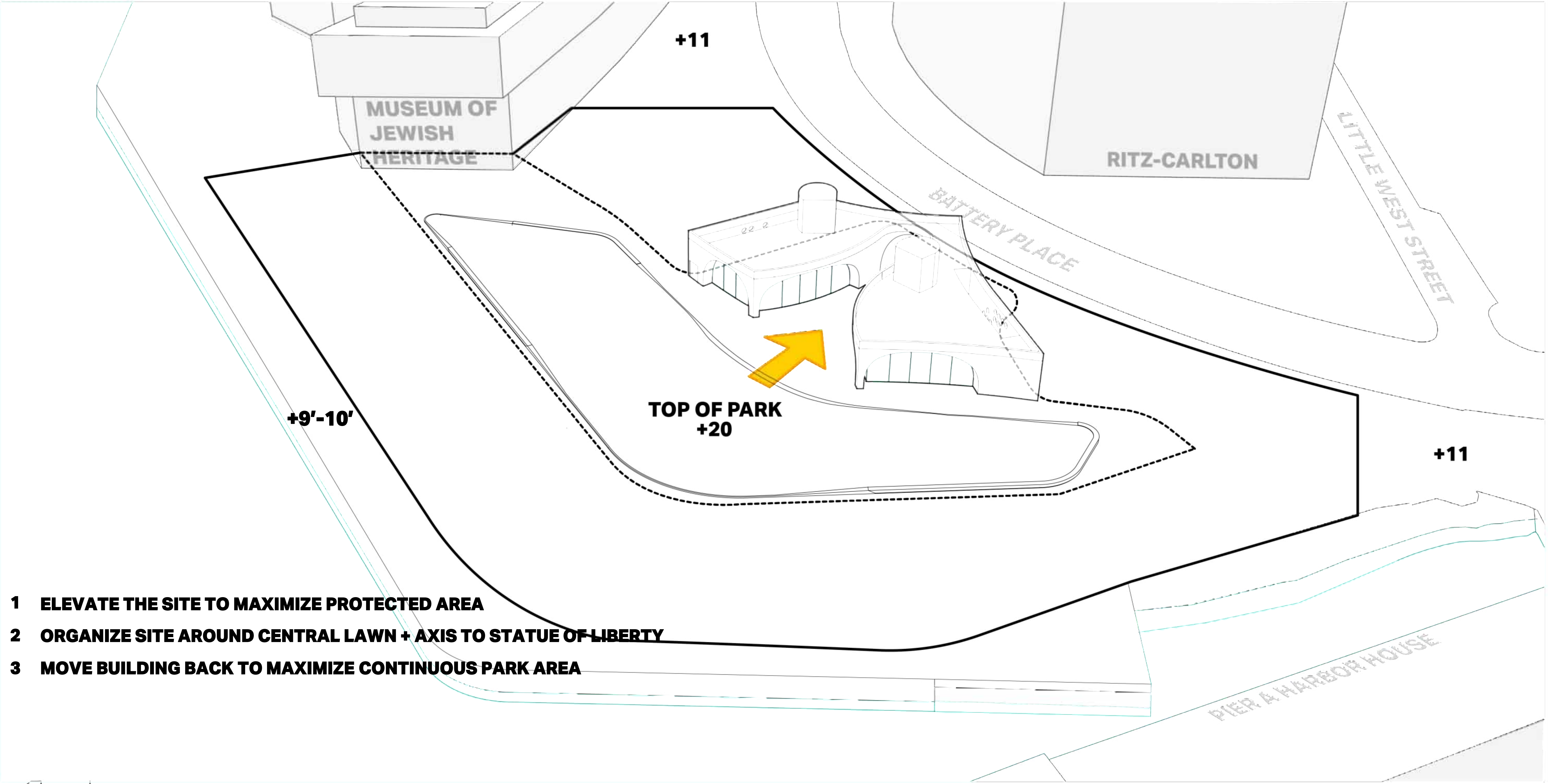
WAGNER PARK | DESIGN PRINCIPLES



1 ELEVATE THE SITE TO MAXIMIZE PROTECTED AREA

2 ORGANIZE SITE AROUND CENTRAL LAWN + AXIS TO STATUE OF LIBERTY

WAGNER PARK | DESIGN PRINCIPLES

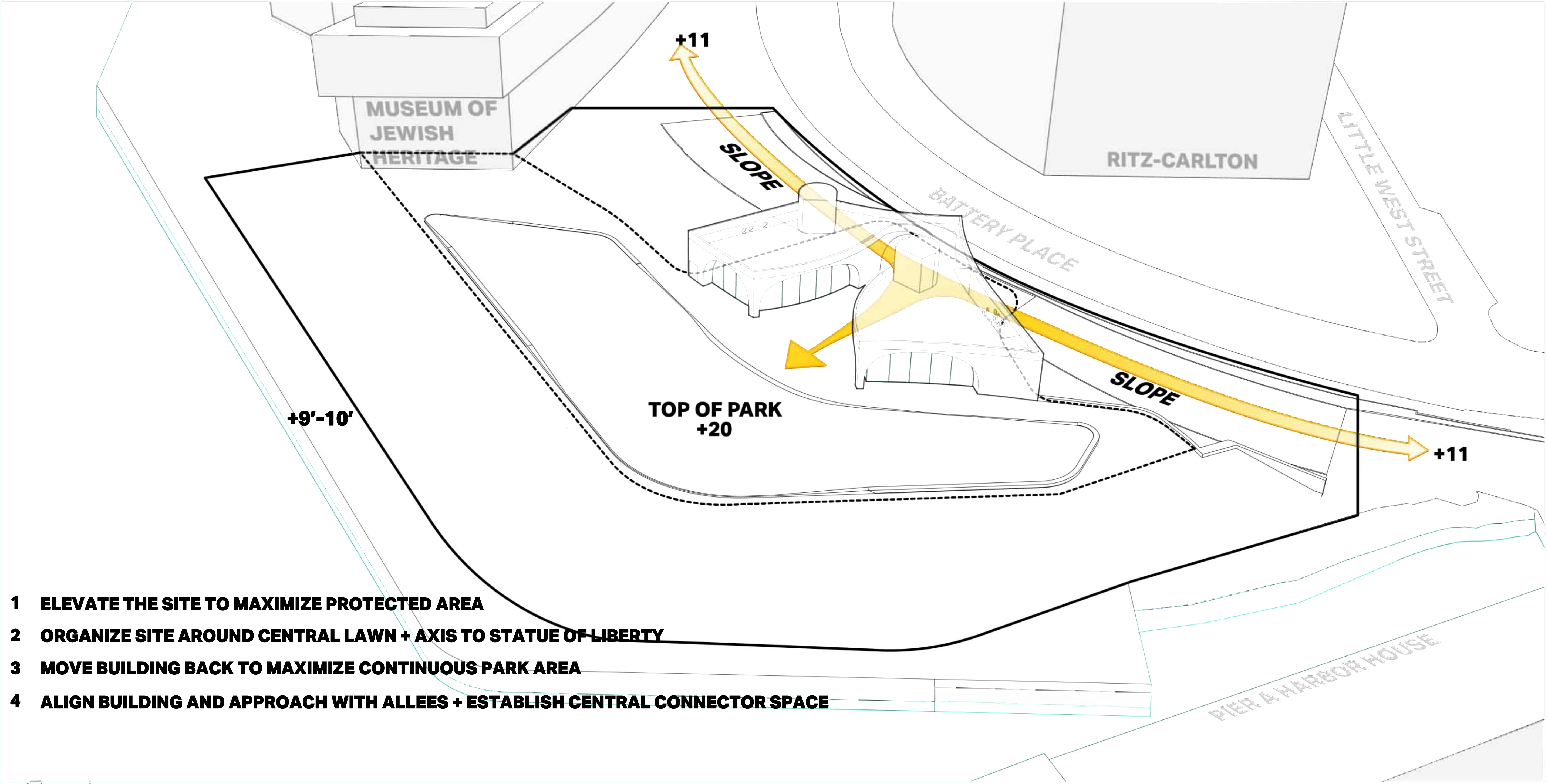


1 **ELEVATE THE SITE TO MAXIMIZE PROTECTED AREA**

2 **ORGANIZE SITE AROUND CENTRAL LAWN + AXIS TO STATUE OF LIBERTY**

3 **MOVE BUILDING BACK TO MAXIMIZE CONTINUOUS PARK AREA**

WAGNER PARK | DESIGN PRINCIPLES



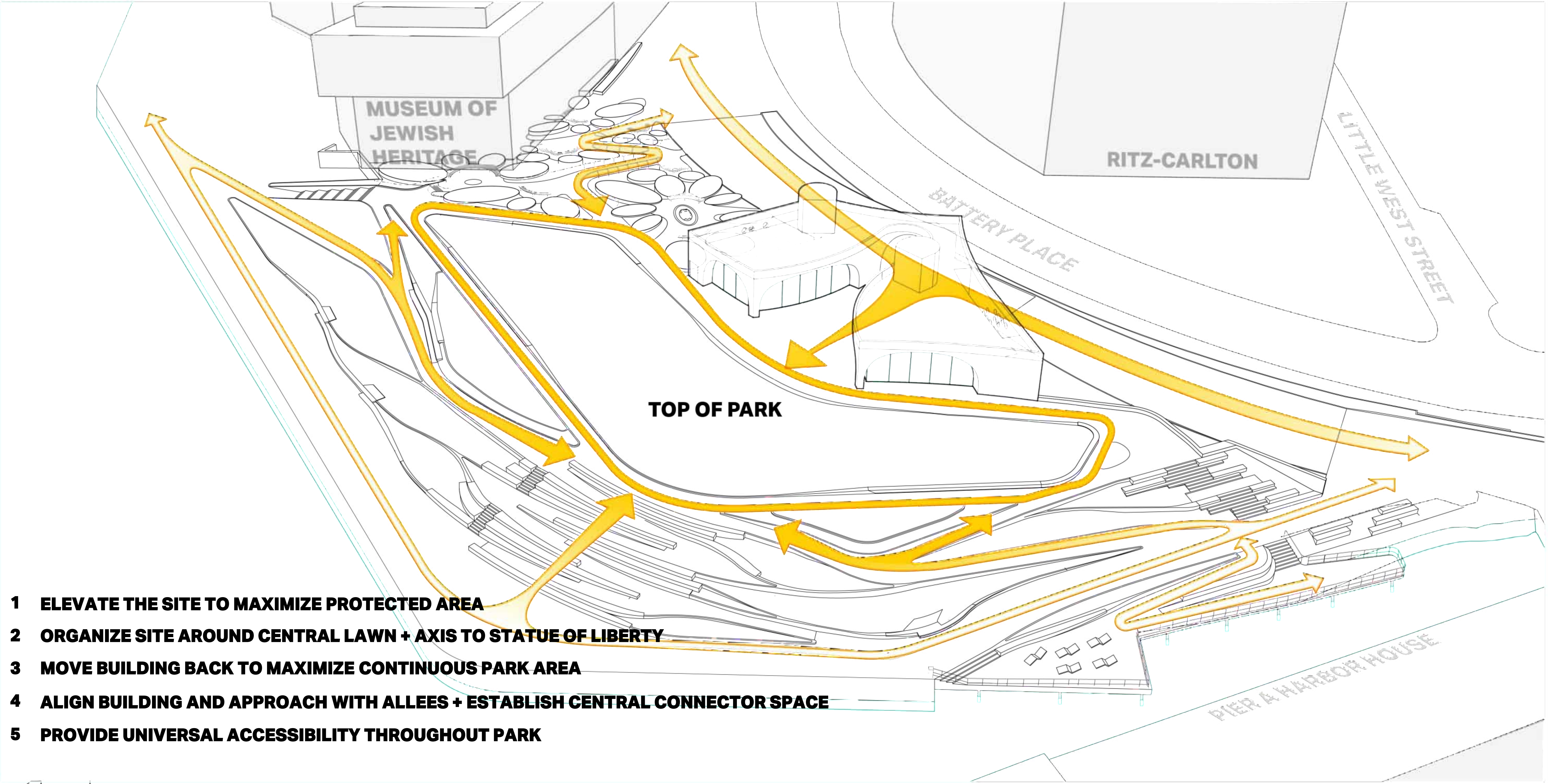
1 **ELEVATE THE SITE TO MAXIMIZE PROTECTED AREA**

2 **ORGANIZE SITE AROUND CENTRAL LAWN + AXIS TO STATUE OF LIBERTY**

3 **MOVE BUILDING BACK TO MAXIMIZE CONTINUOUS PARK AREA**

4 **ALIGN BUILDING AND APPROACH WITH ALLEES + ESTABLISH CENTRAL CONNECTOR SPACE**

WAGNER PARK | DESIGN PRINCIPLES



1 **ELEVATE THE SITE TO MAXIMIZE PROTECTED AREA**

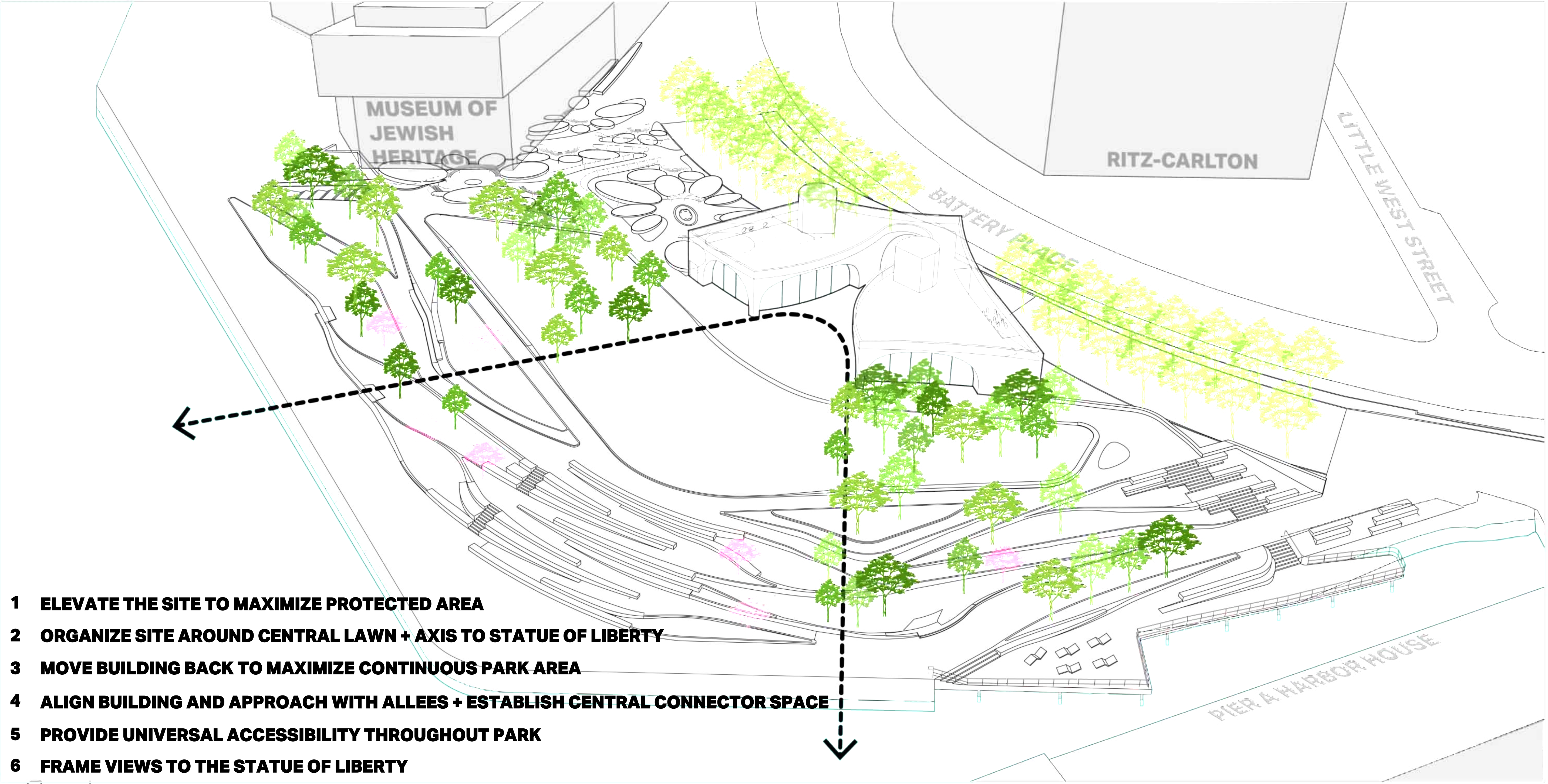
2 **ORGANIZE SITE AROUND CENTRAL LAWN + AXIS TO STATUE OF LIBERTY**

3 **MOVE BUILDING BACK TO MAXIMIZE CONTINUOUS PARK AREA**

4 **ALIGN BUILDING AND APPROACH WITH ALLEES + ESTABLISH CENTRAL CONNECTOR SPACE**

5 **PROVIDE UNIVERSAL ACCESSIBILITY THROUGHOUT PARK**

WAGNER PARK | DESIGN PRINCIPLES



1 ELEVATE THE SITE TO MAXIMIZE PROTECTED AREA

2 ORGANIZE SITE AROUND CENTRAL LAWN + AXIS TO STATUE OF LIBERTY

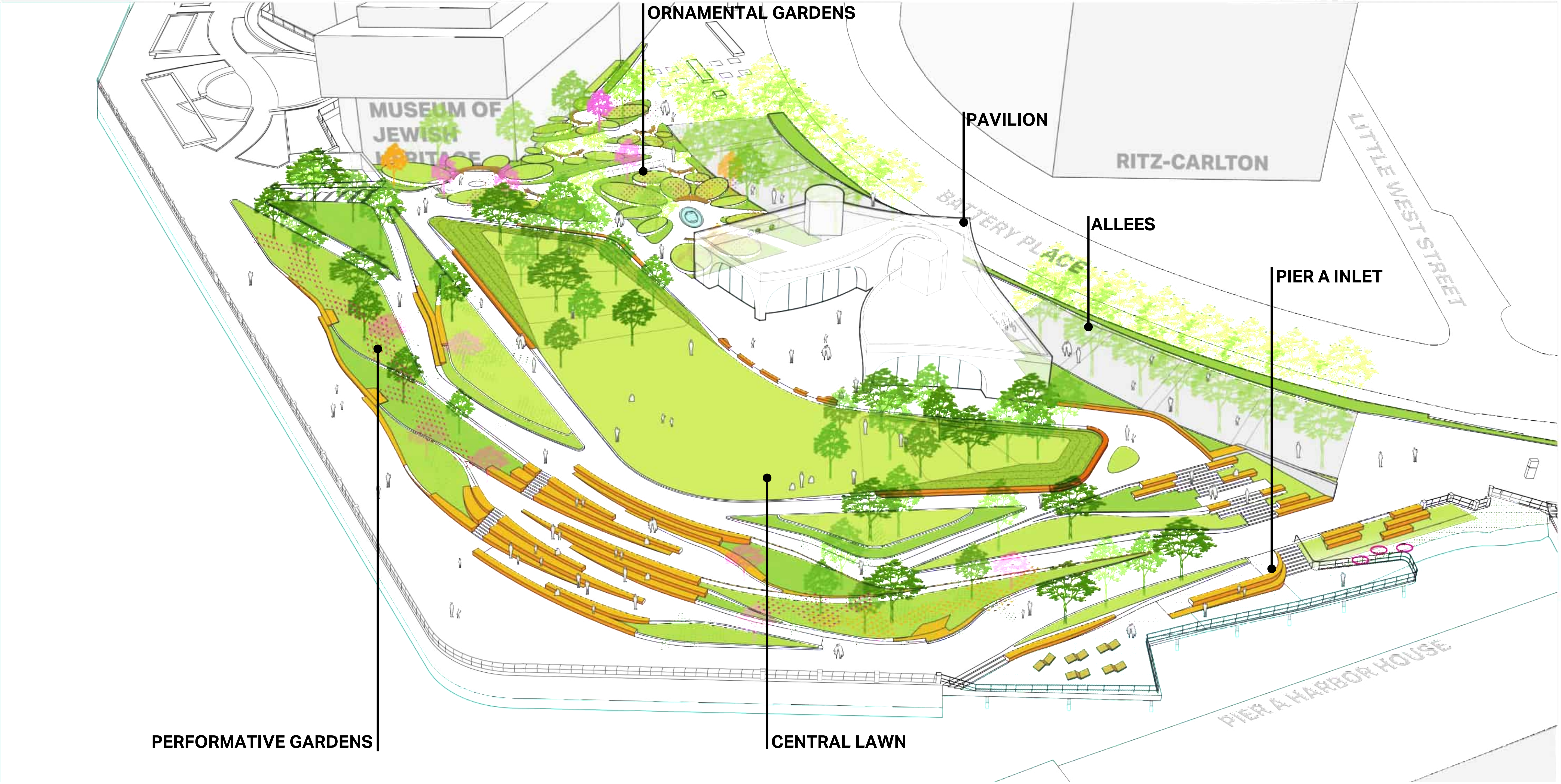
3 MOVE BUILDING BACK TO MAXIMIZE CONTINUOUS PARK AREA

4 ALIGN BUILDING AND APPROACH WITH ALLEES + ESTABLISH CENTRAL CONNECTOR SPACE

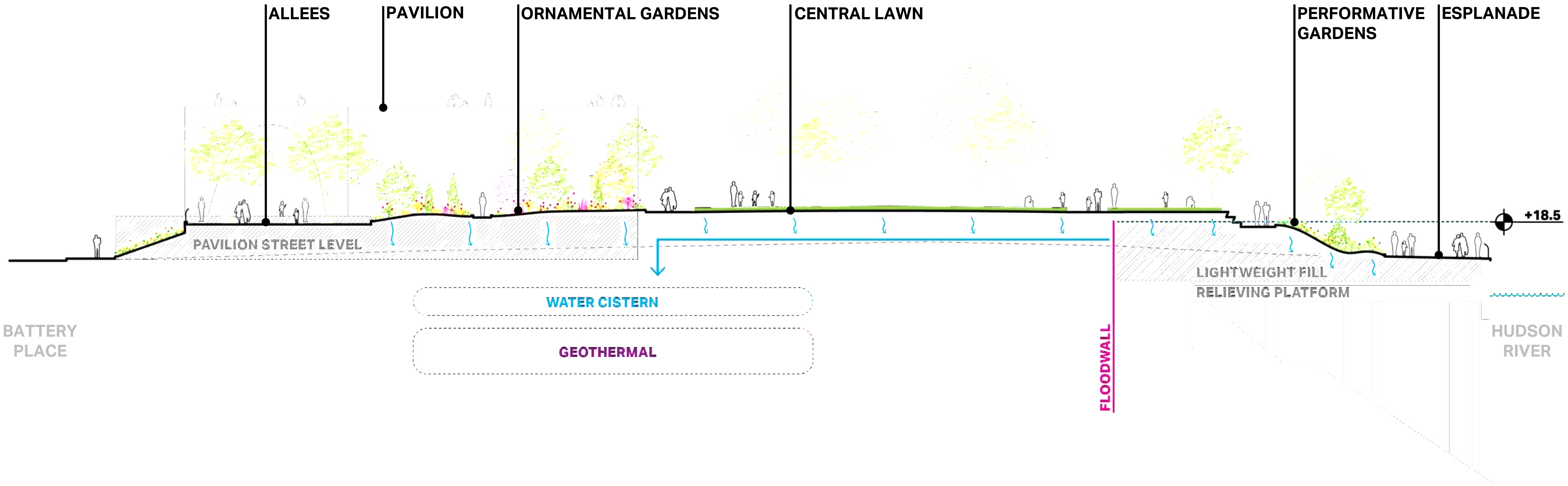
5 PROVIDE UNIVERSAL ACCESSIBILITY THROUGHOUT PARK

6 FRAME VIEWS TO THE STATUE OF LIBERTY

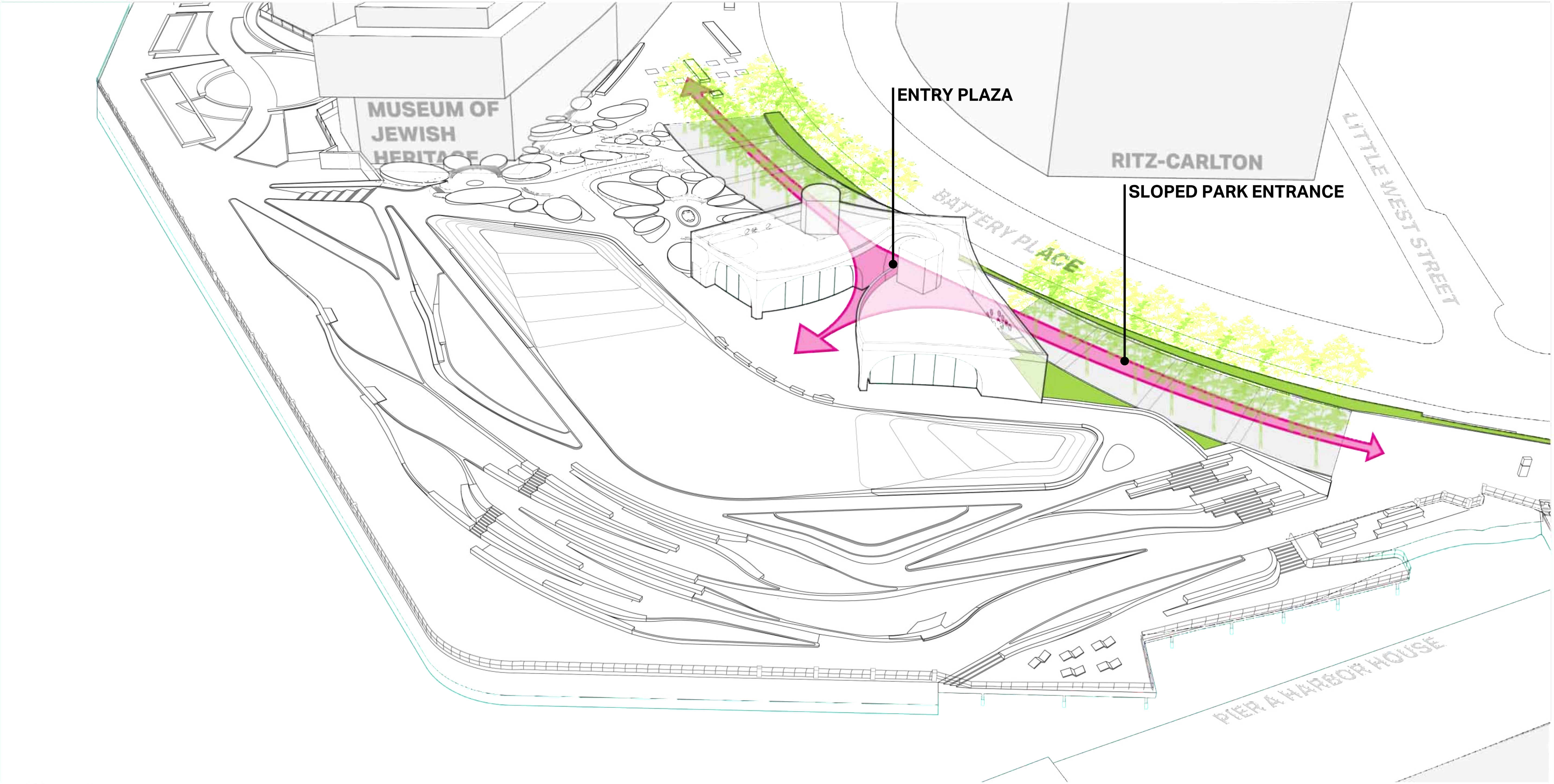
WAGNER PARK | PROPOSED DESIGN



WAGNER PARK


ALLEES
PAVILION
ORNAMENTAL GARDENS
CENTRAL LAWN
PERFORMATIVE GARDENS
ESPLANADE
+18.5
PAVILION STREET LEVEL
WATER CISTERN
GEOTHERMAL
FLOODWALL
LIGHTWEIGHT FILL
RELIEVING PLATFORM
BATTERY PLACE
HUDSON RIVER

WAGNER PARK | ALLEES



PAVILION DESIGN PRINCIPLES

LANDSCAPE RESPONSIVE DESIGN

THE BATTERY| PAVILION

VIEW FROM BATTERY PLACE

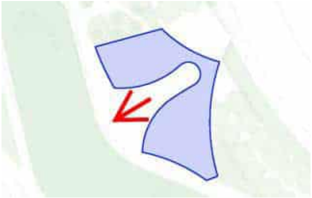
ENHANCE PROCESSION - STREET TO PARK

APPROACHING THE PAVILION FROM NORTH ALLEE

ALIGN APPROACH WITH TREE ALLEES

LOOKING NORTH WEST FROM ENTRY COURT

ESTABLISH ENTRY COURT



LOOKING OUT TOWARDS THE PARK

FRAME VIEW TO STATUE OF LIBERTY

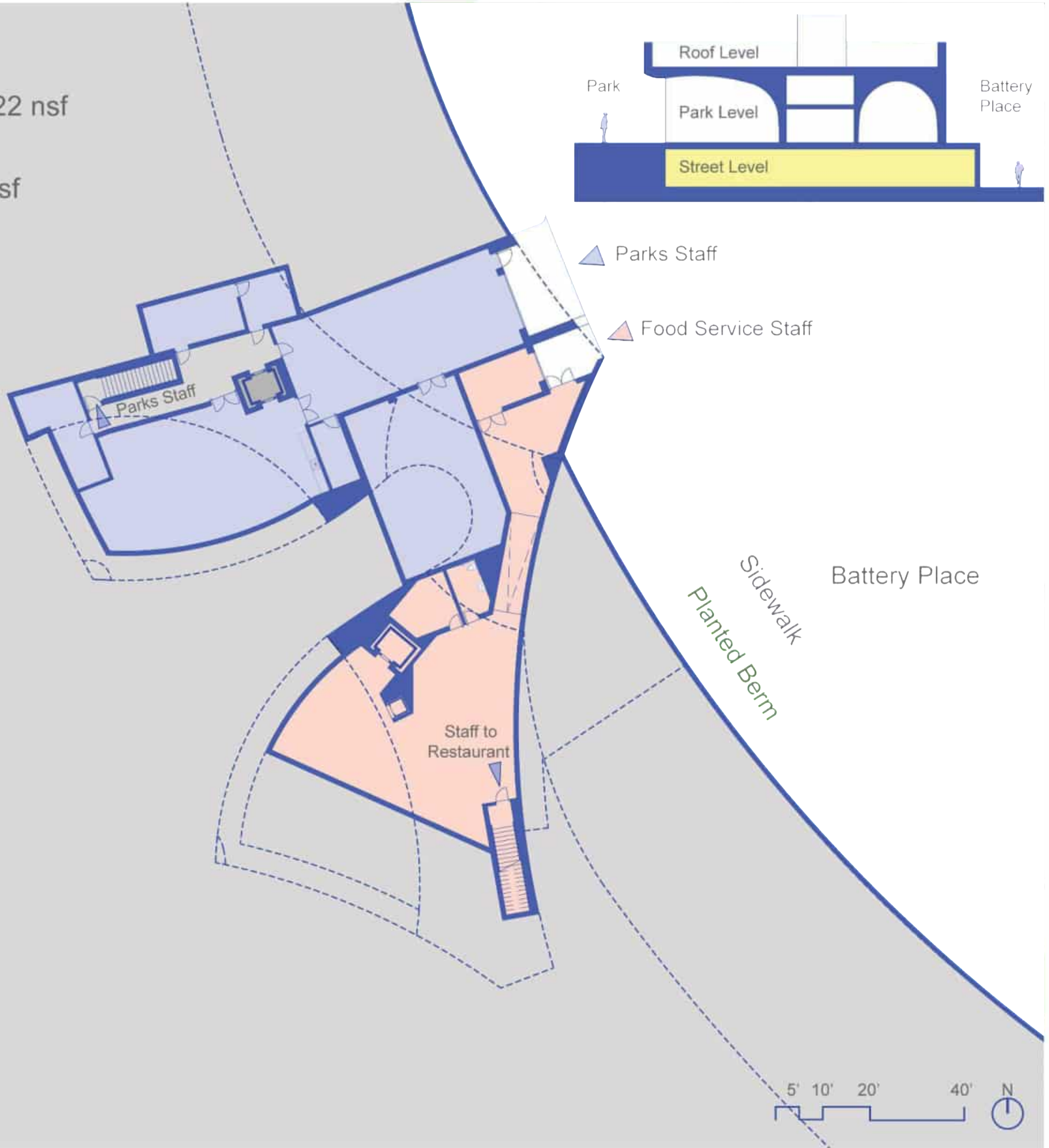
SITE PLAN


North Allee
Planted Berm
Entry Court
Battery Place
Sidewalk
Planted Berm
Park
South Allee
Ellis Island
Statue of Liberty
10' 20' 40' 80'
N

STREET LEVEL

Parks Support, Storage, Garage = 4,122 nsf

Food Service Kitchen, Trash = 2,308 nsf

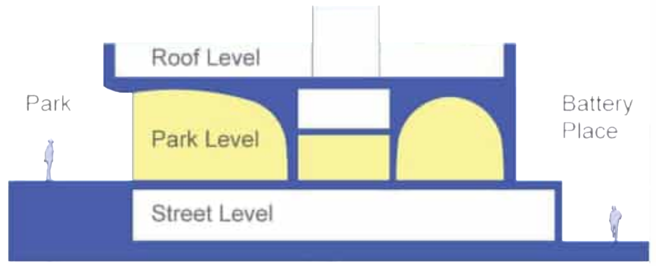


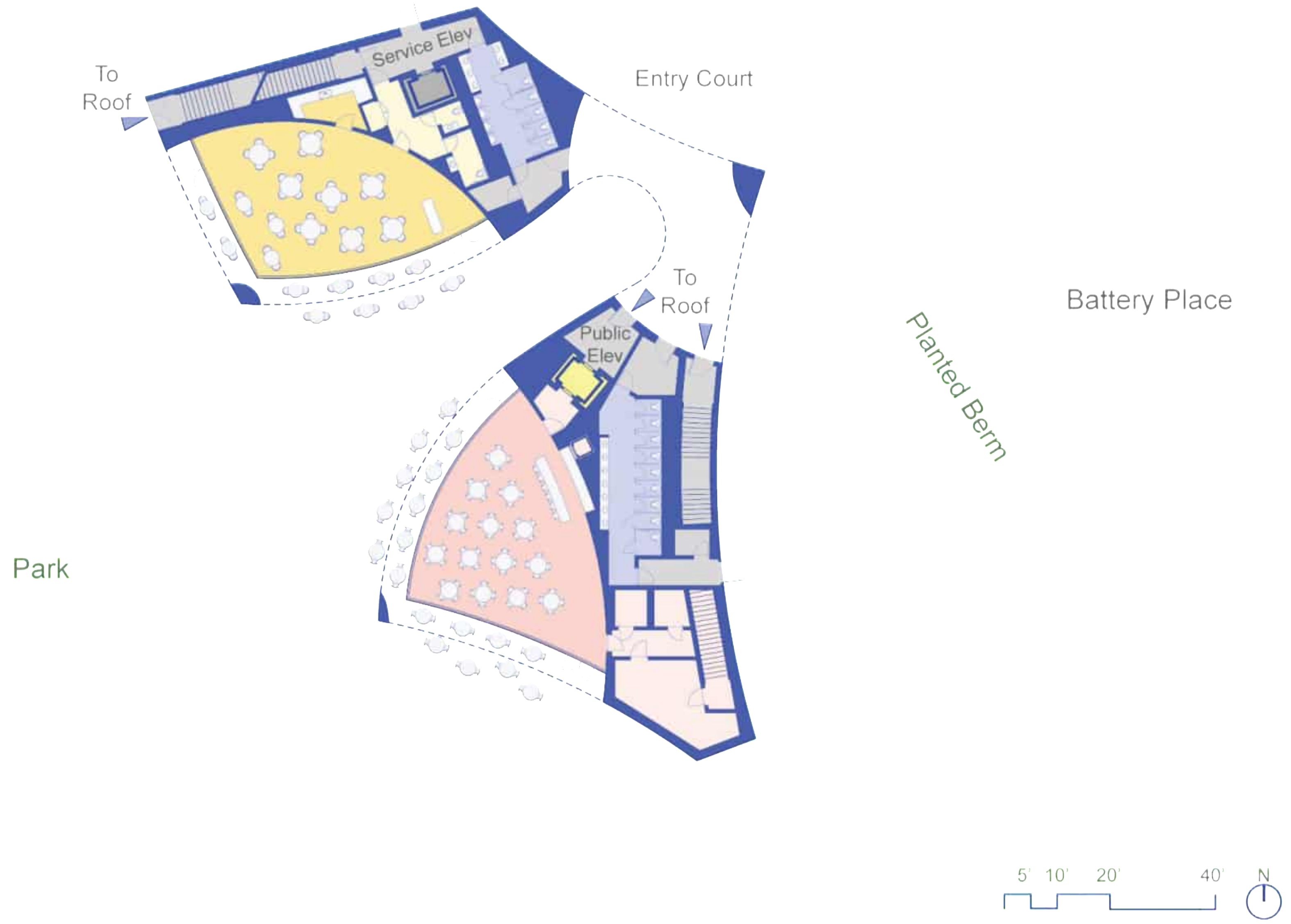
PARK LEVEL

New Community Room = 1,228 nsf and Environmental Classroom

Food Service Restaurant = 1,225 nsf

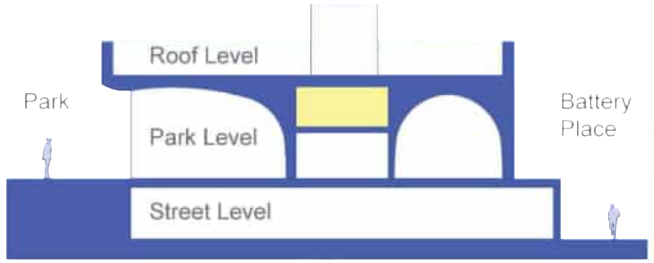
Public Toilets = 661 nsf

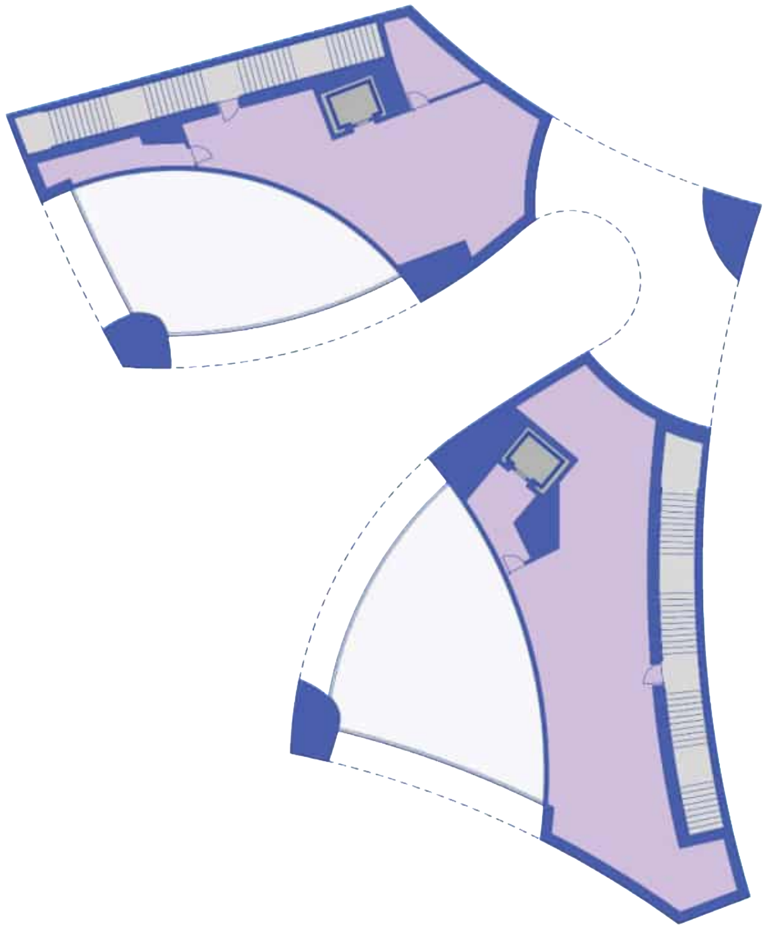




MECHANICAL LEVEL

Mechanical Rooms = 2,583 nsf

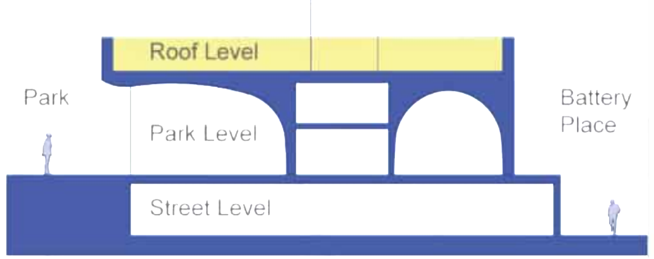


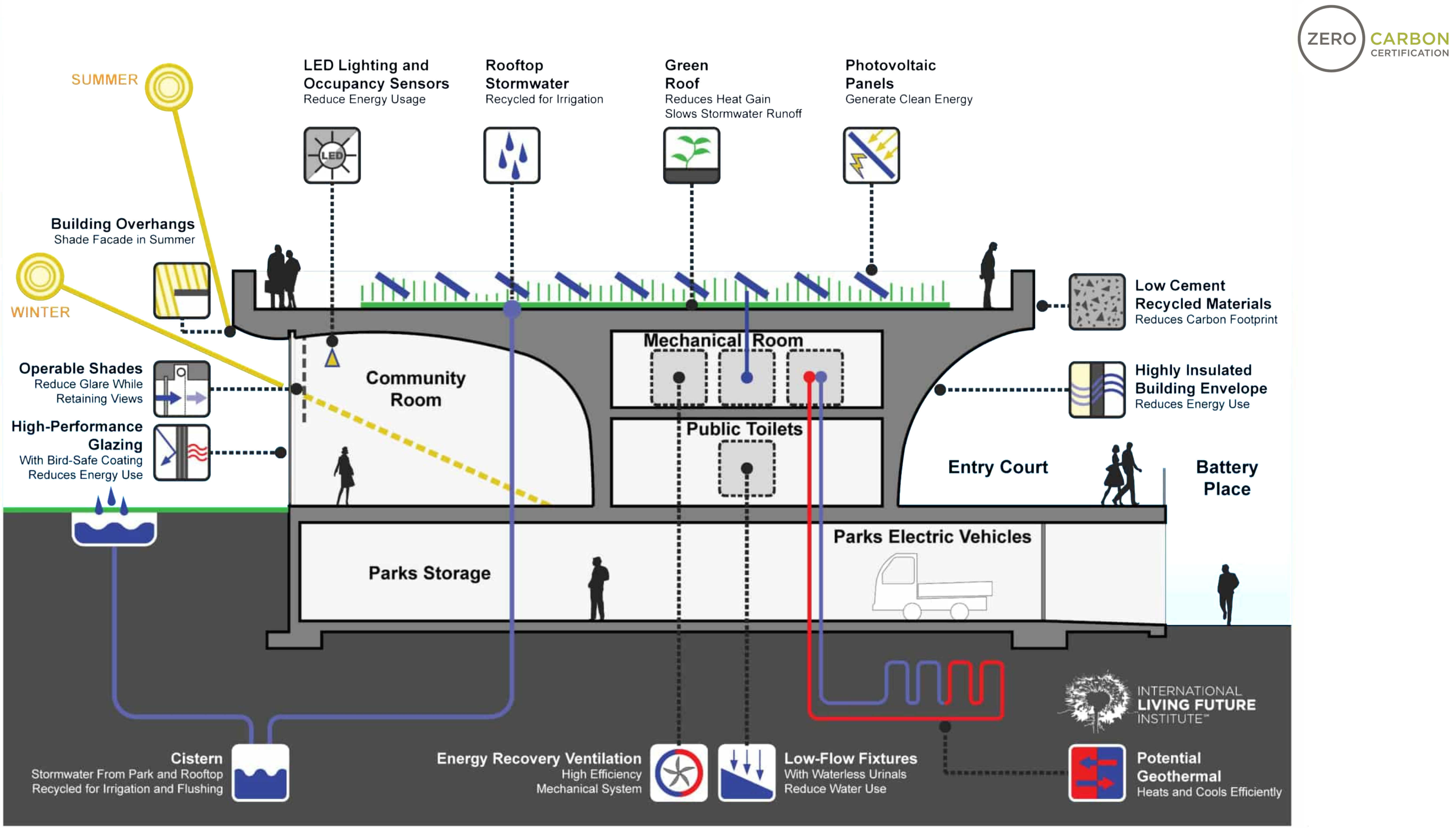


ROOF LEVEL

Green Roof With Photovoltaic Panels = 2,485 nsf

Public Roof Terrace = 2,960 nsf



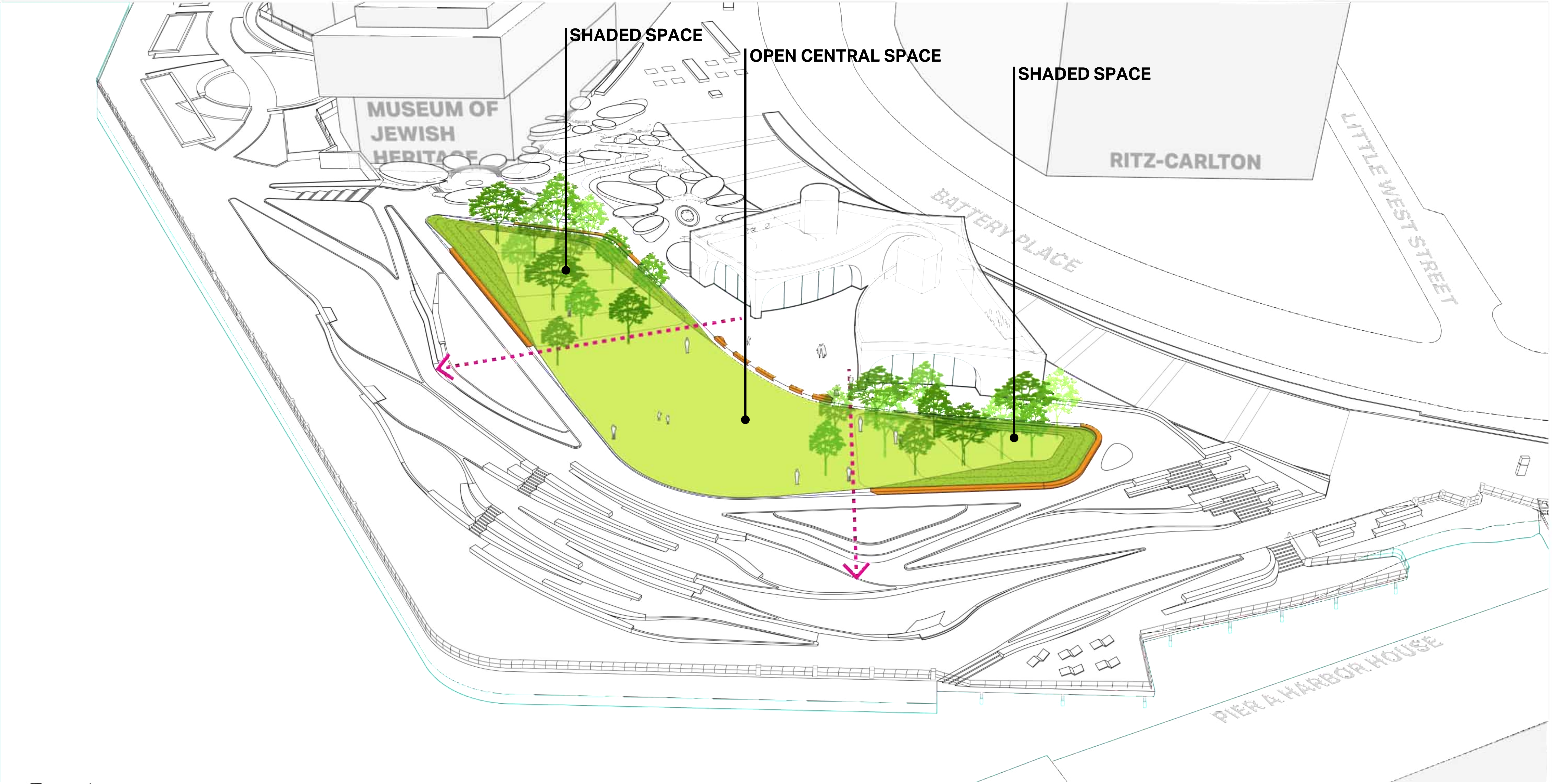


ZERO CARBON CERTIFICATION
SUMMER
WINTER
LED Lighting and Occupancy Sensors
Reduce Energy Usage
Rooftop Stormwater
Recycled for Irrigation
Green Roof
Reduces Heat Gain
Slows Stormwater Runoff
Photovoltaic Panels
Generate Clean Energy
Building Overhangs
Shade Facade in Summer
Low Cement Recycled Materials
Reduces Carbon Footprint
Operable Shades
Reduce Glare While Retaining Views
High-Performance Glazing
With Bird-Safe Coating
Reduces Energy Use
Highly Insulated Building Envelope
Reduces Energy Use
Community Room
Mechanical Room
Public Toilets
Entry Court
Battery Place
Parks Storage
Parks Electric Vehicles
INTERNATIONAL LIVING FUTURE INSTITUTE
Cistern
Stormwater From Park and Rooftop
Recycled for Irrigation and Flushing
Energy Recovery Ventilation
High Efficiency
Mechanical System
Low-Flow Fixtures
With Waterless Urinals
Reduce Water Use
Potential Geothermal
Heats and Cools Efficiently

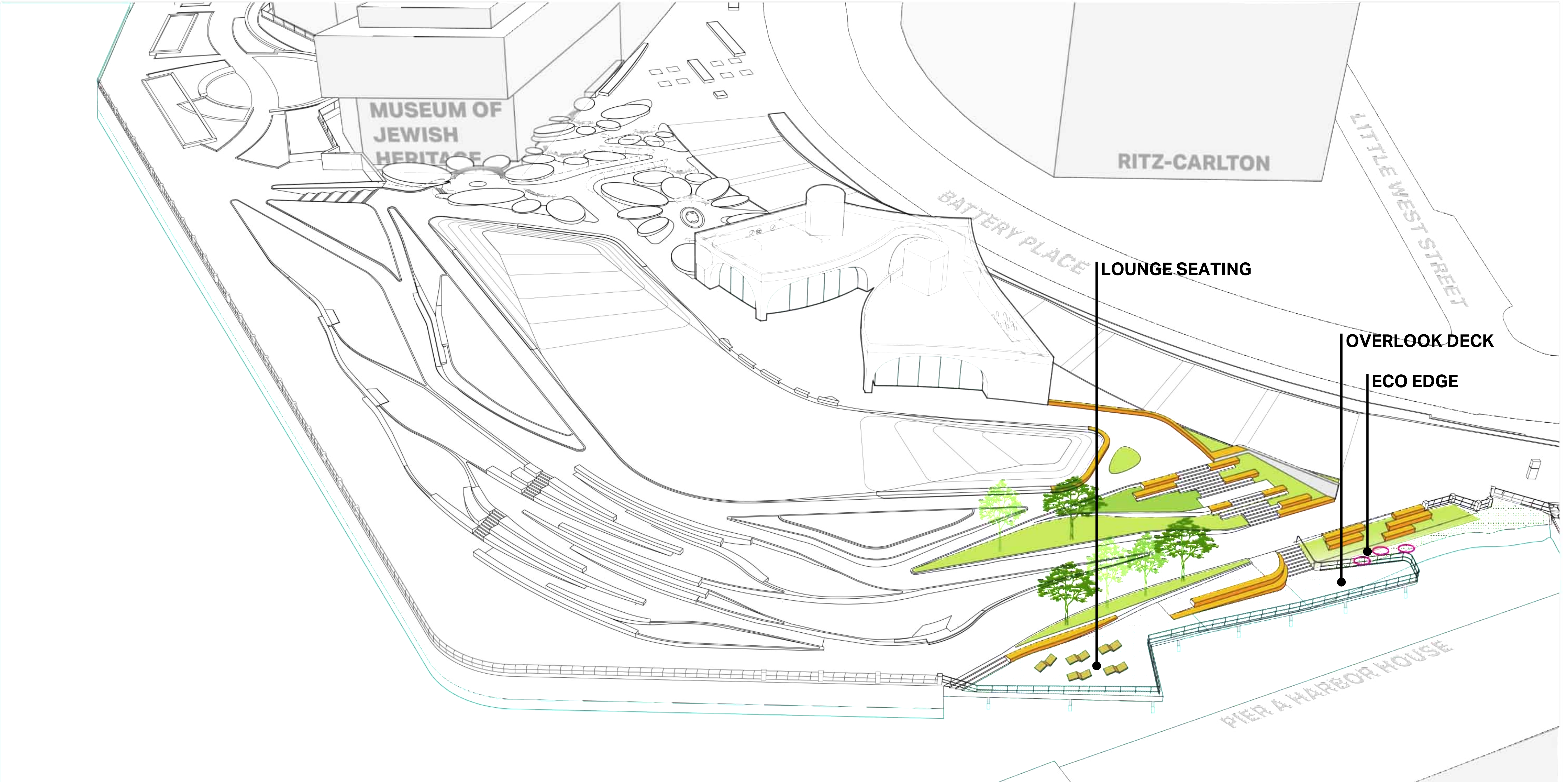
LOOKING OUT TOWARDS THE PARK

FRAME VIEW TO STATUE OF LIBERTY

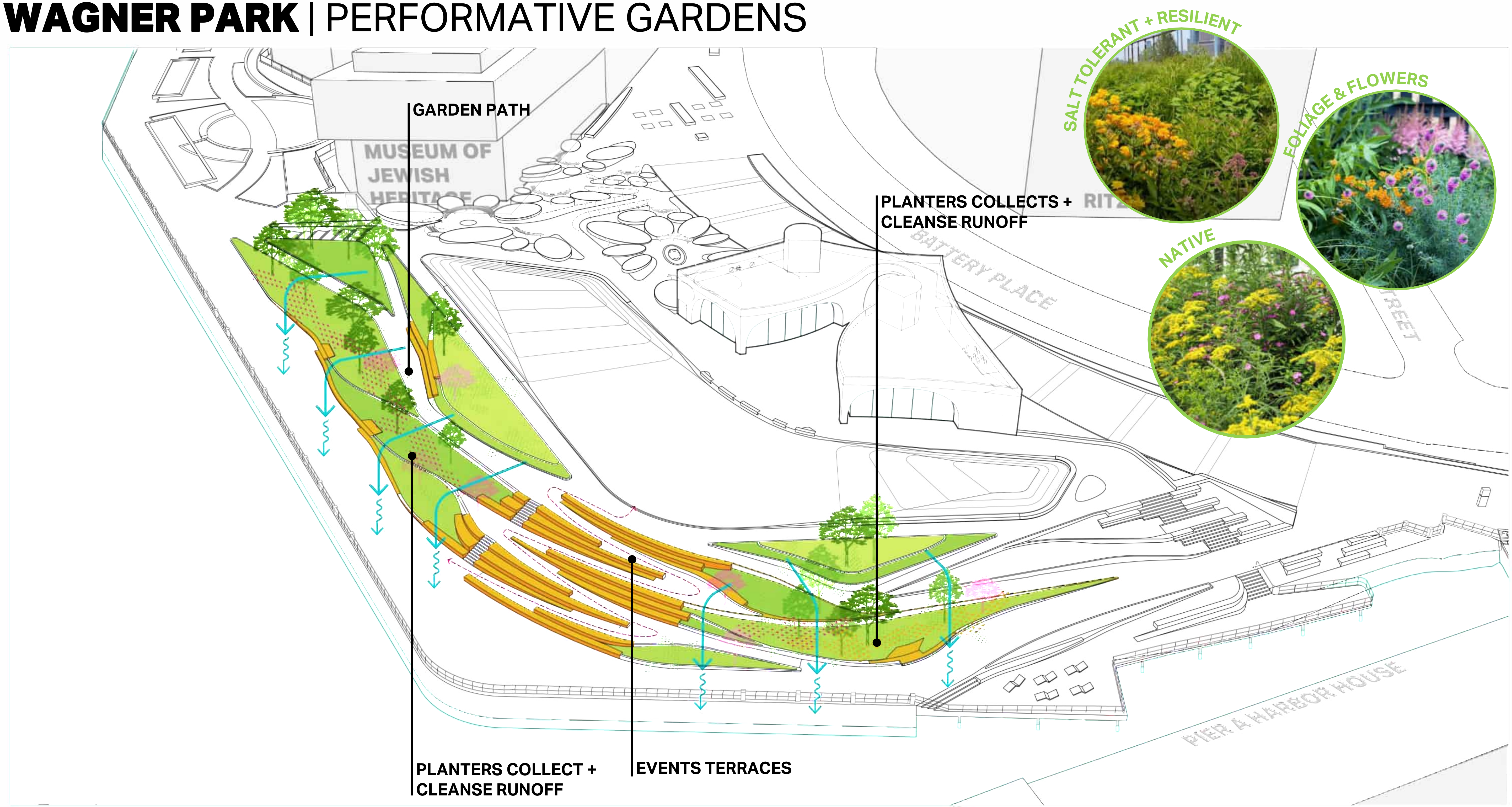
WAGNER PARK | CENTRAL LAWN

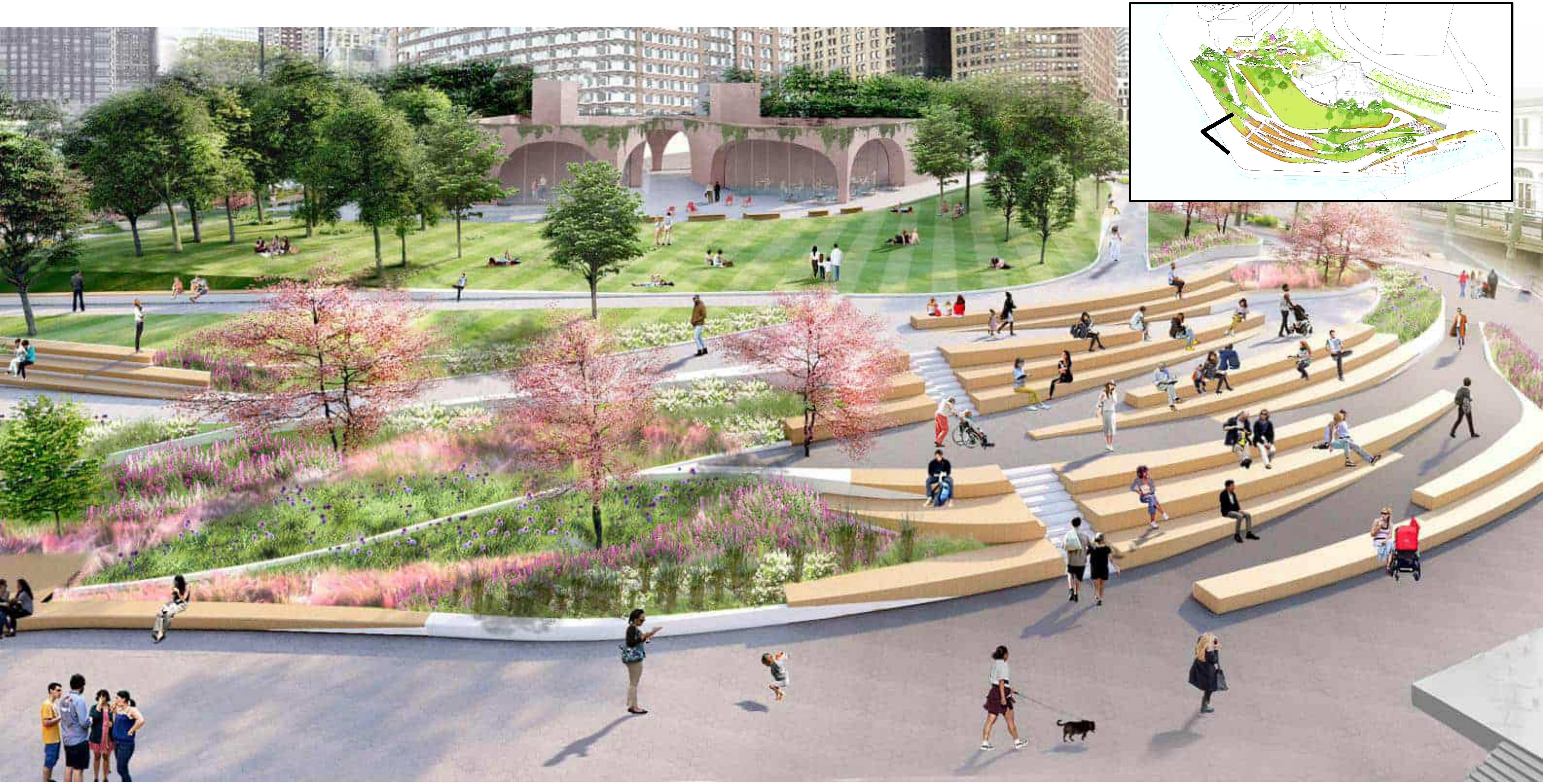


WAGNER PARK | PIER A INLET



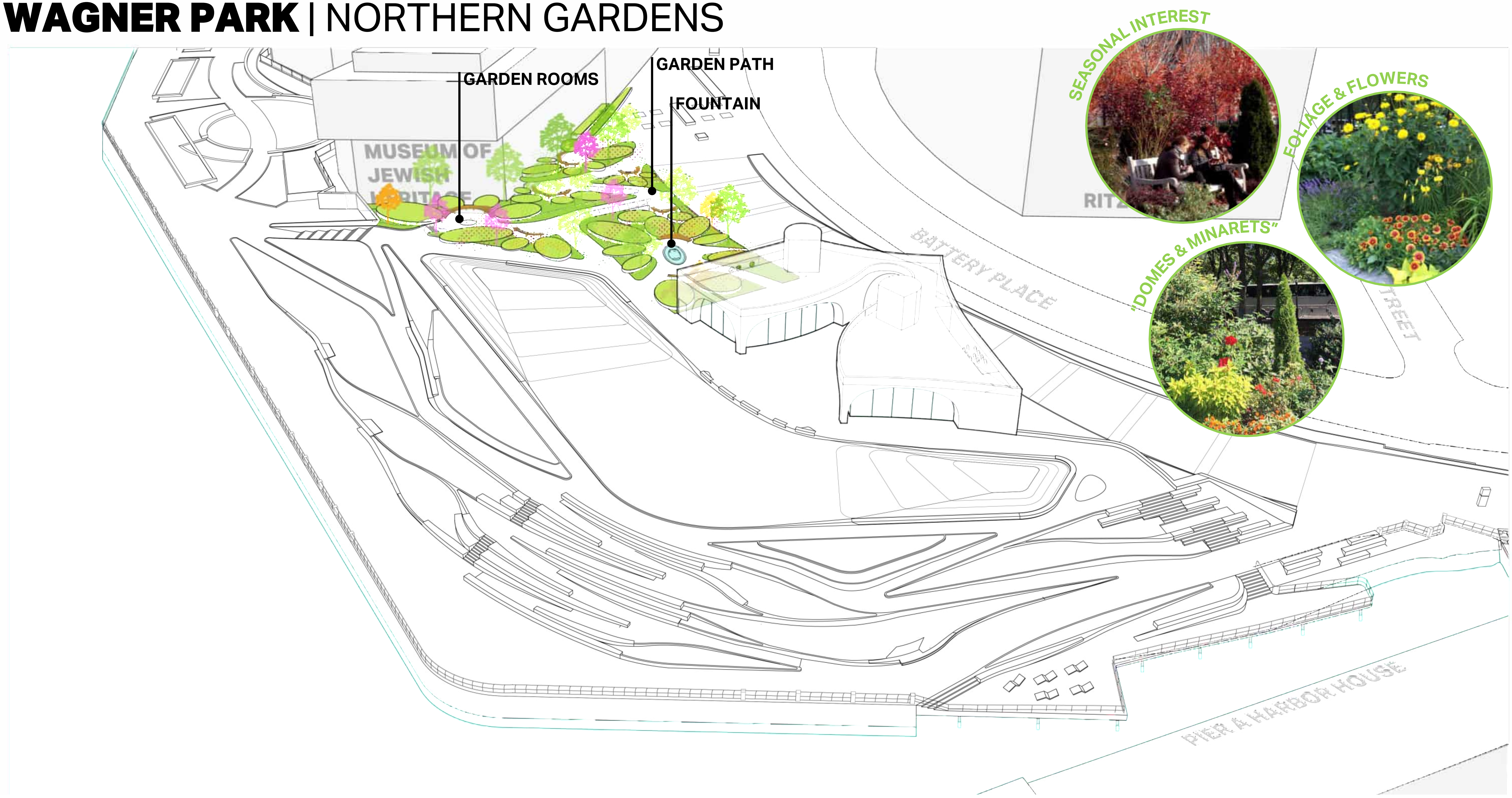
WAGNER PARK | PERFORMATIVE GARDENS






MUSEUM OF

WAGNER PARK | NORTHERN GARDENS



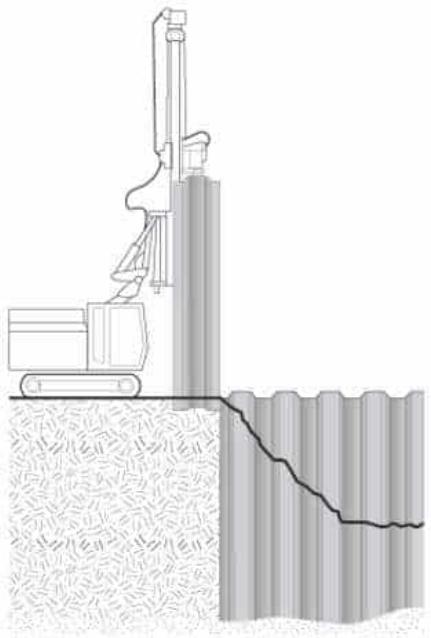

7

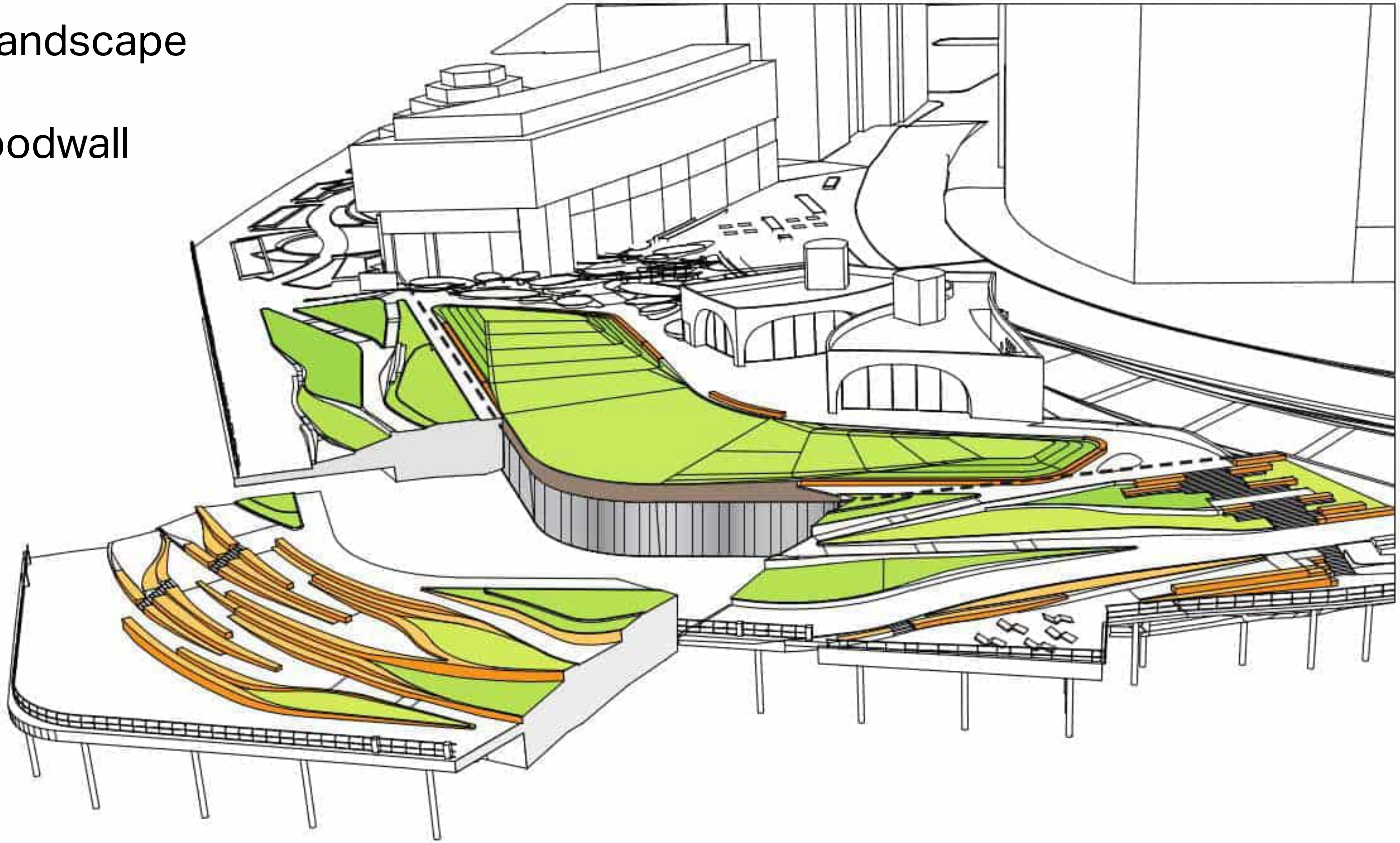
WAGNER PARK | STRUCTURAL ENGINEERING

Challenge: Provide Passive Protection integrated into Landscape

Solution: Utilize a Buried Floodwall under the landscape

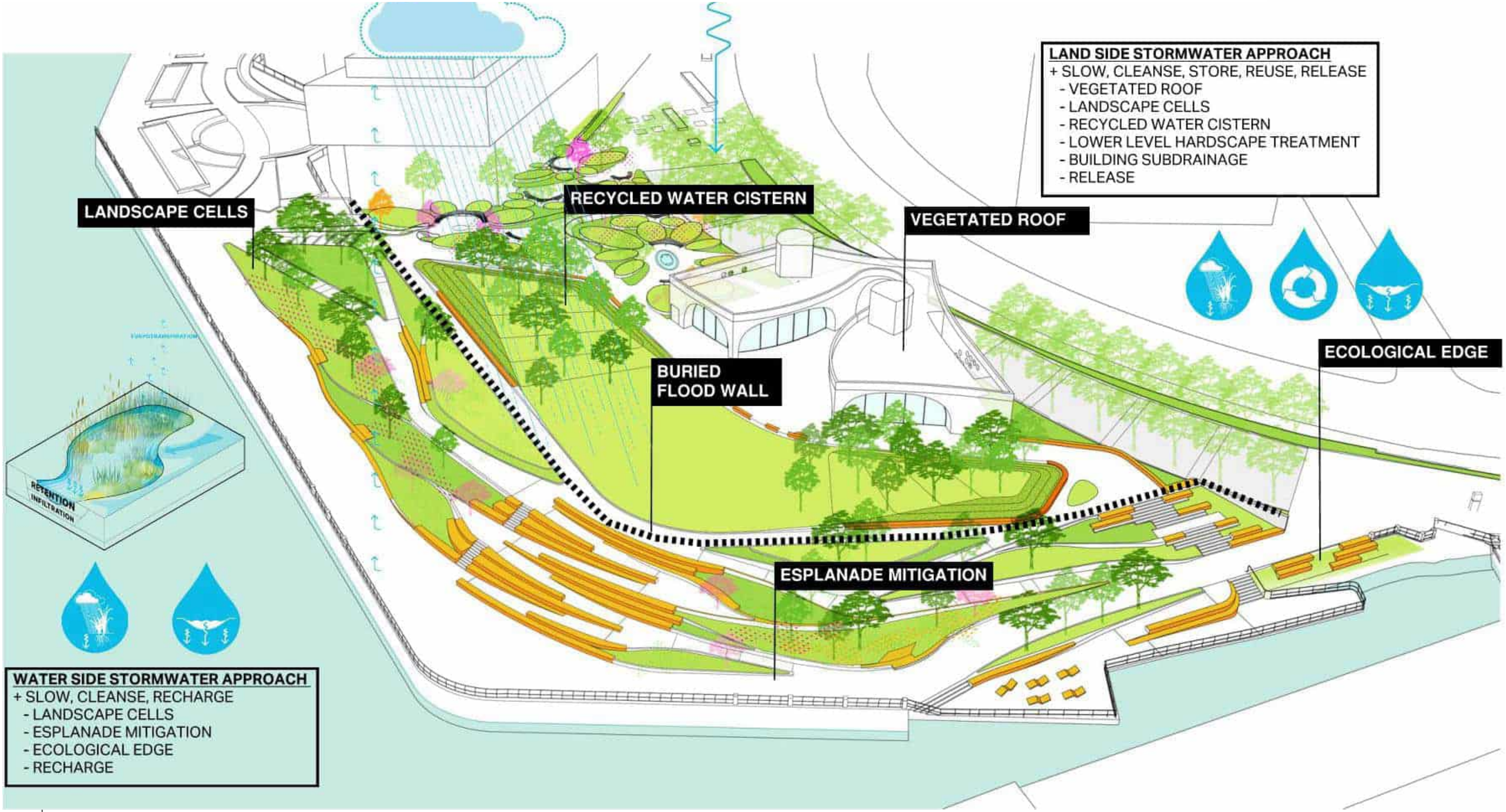
SHEET PILE



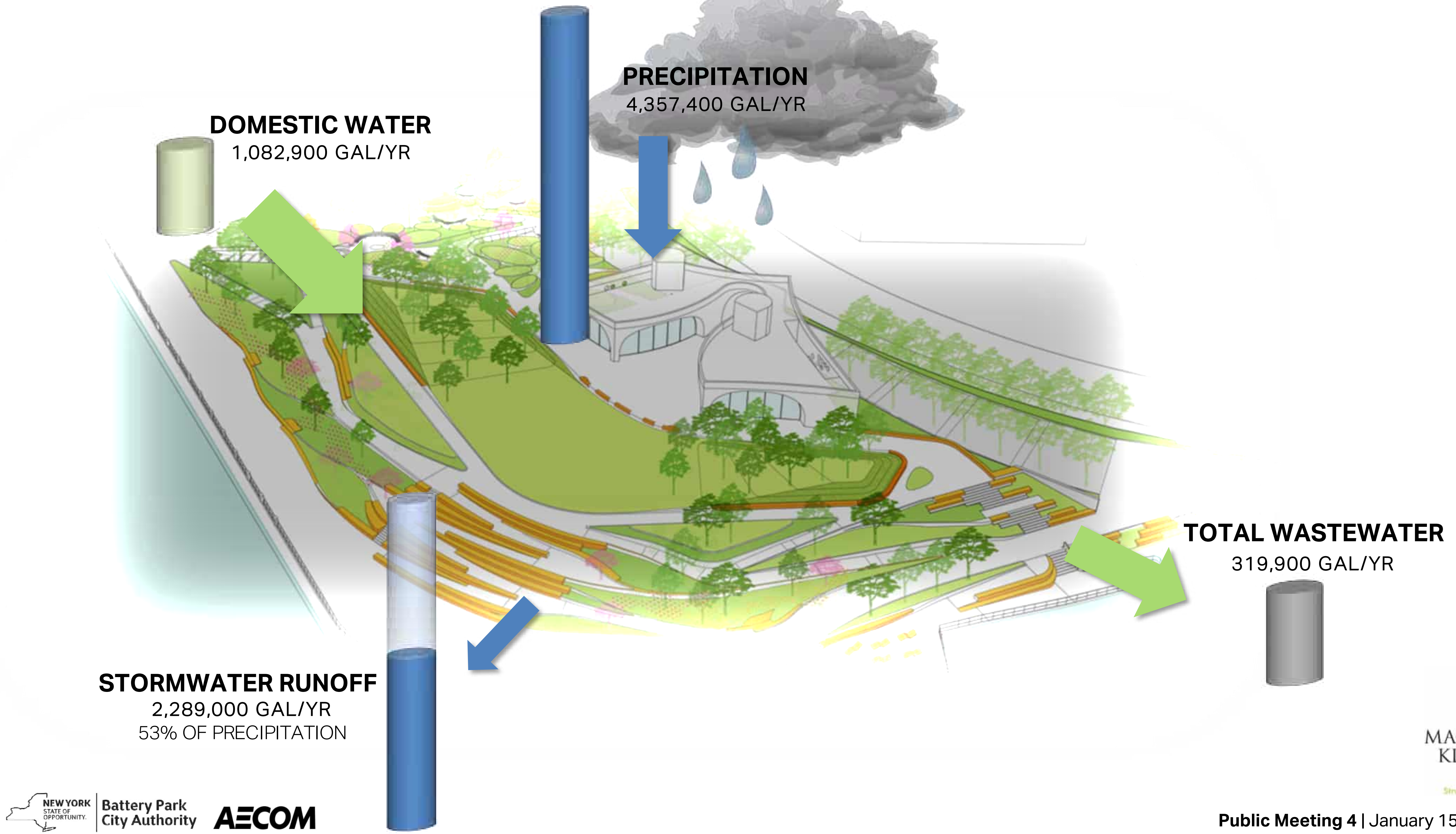


NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority | AECOM

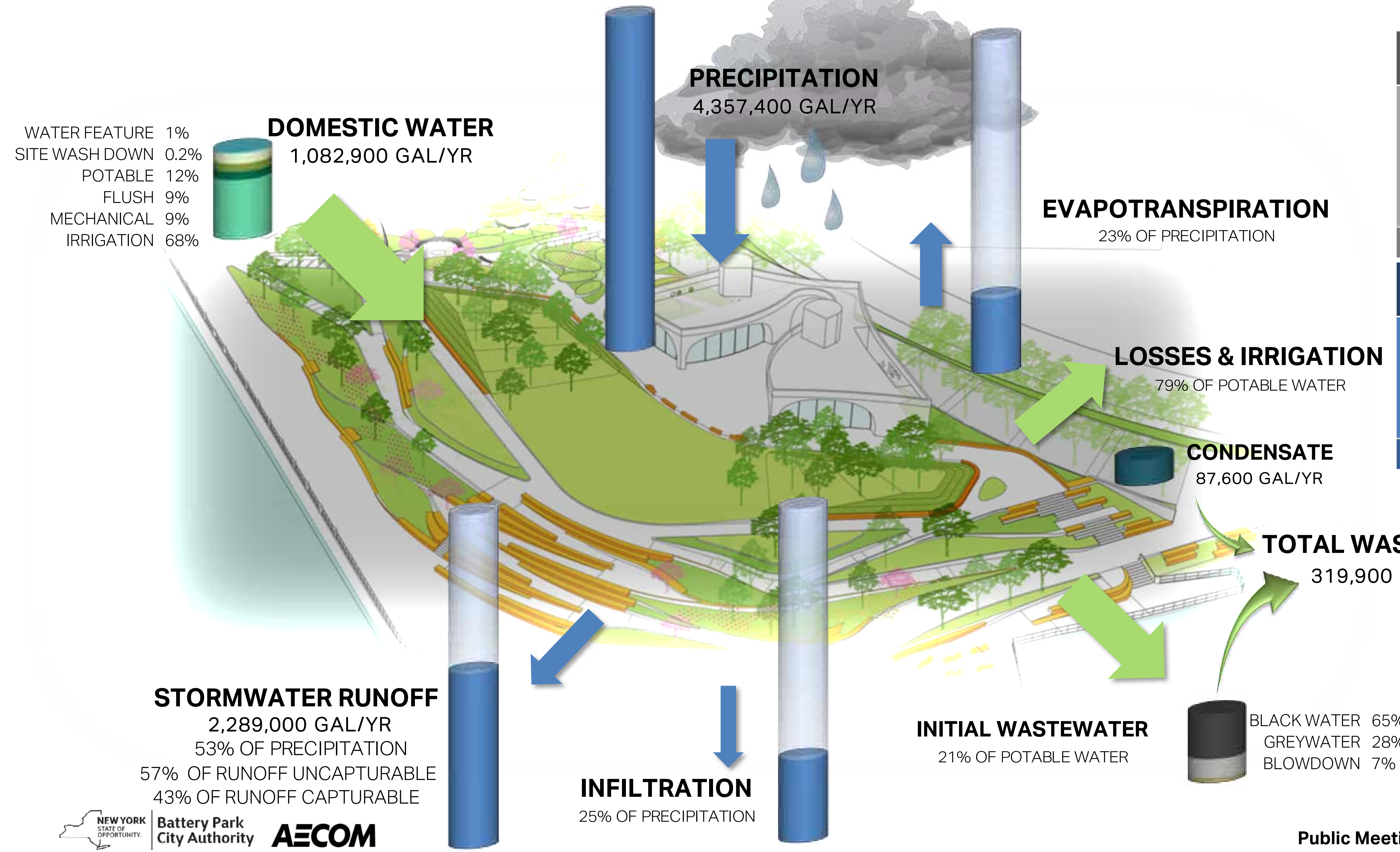
WAGNER PARK | STORMWATER MANAGEMENT APPROACH



WAGNER PARK | WATER BALANCE SUMMARY



WAGNER PARK | WATER BALANCE SPECIFICS

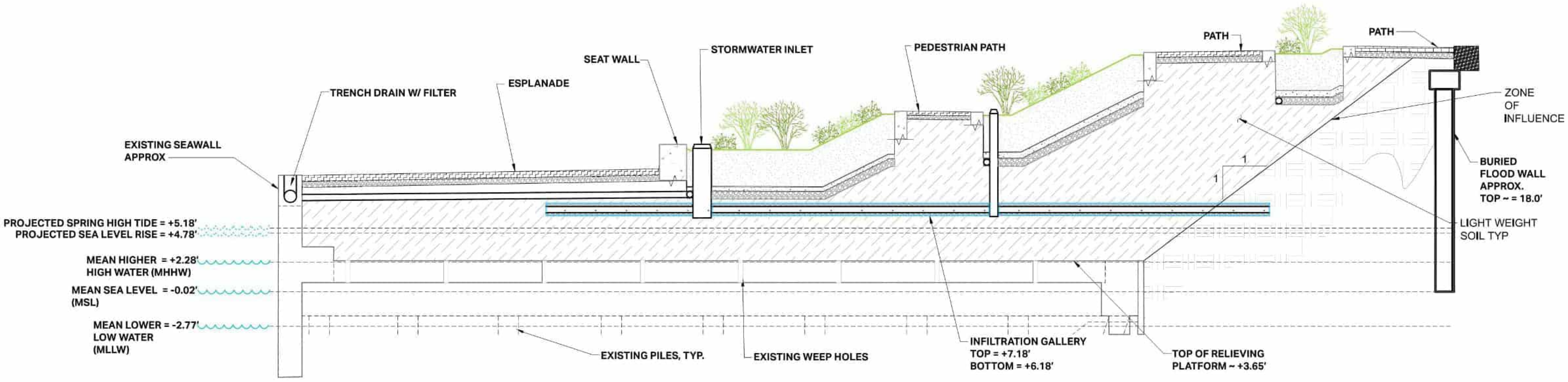


SUPPLIES	VOLUME (GAL/YR)
STORMWATER RUNOFF	987,800
CONDENSATE	87,600
GREYWATER	63,800
BLACK WATER	151,600
TOTAL	1,220,100

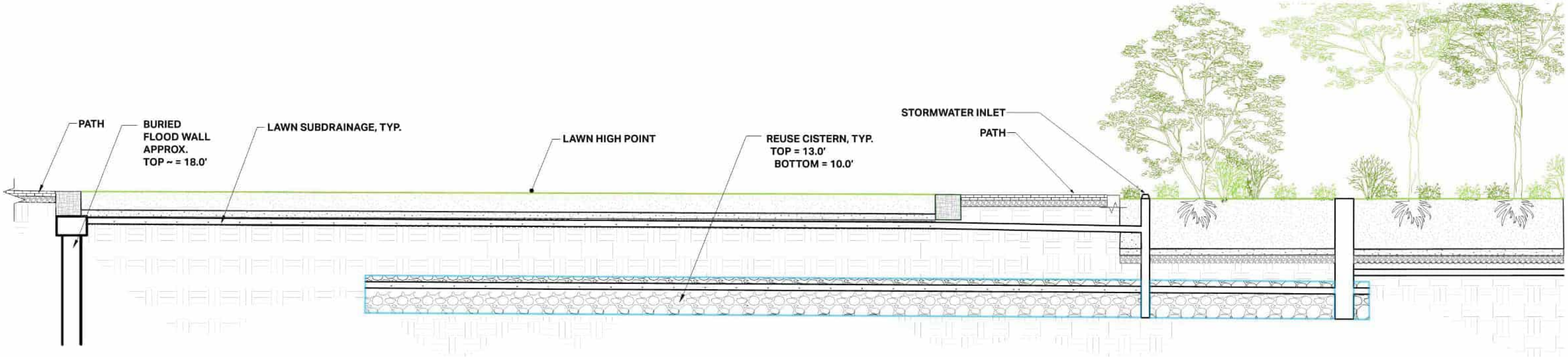
DEMANDS	VOLUME (GAL/YR)
SITE WASH DOWN	1,800
IRRIGATION	736,100
FLUSH	99,200
MECHANICAL	102,500
TOTAL	939,600

MAGNUSSON KLEMENCIC ASSOCIATES
Structural + Civil Engineers

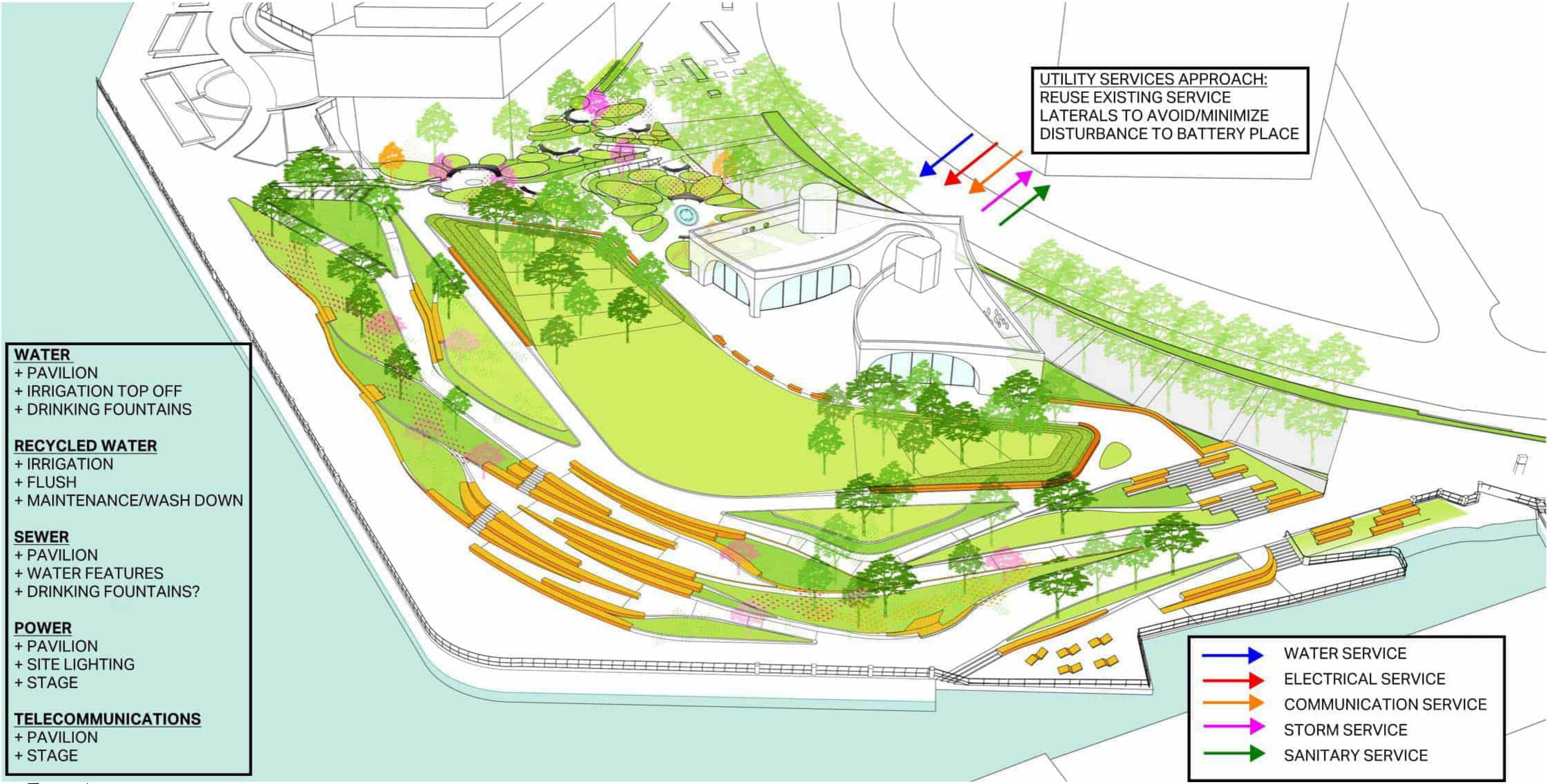
WAGNER PARK| WATER SIDE SECTION



WAGNER PARK| LAND SIDE SECTION

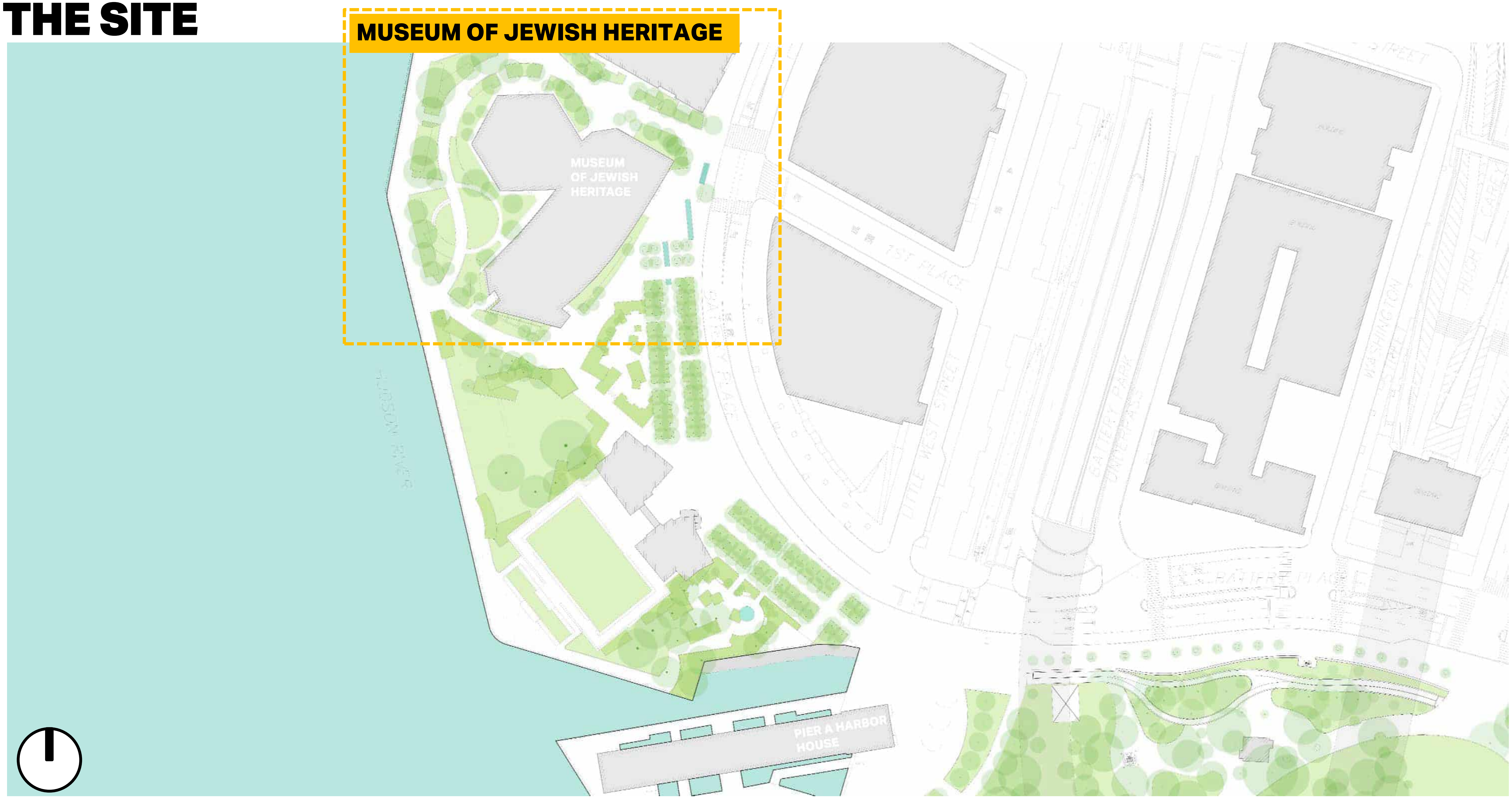


WAGNER PARK | UTILITY PROVISIONING



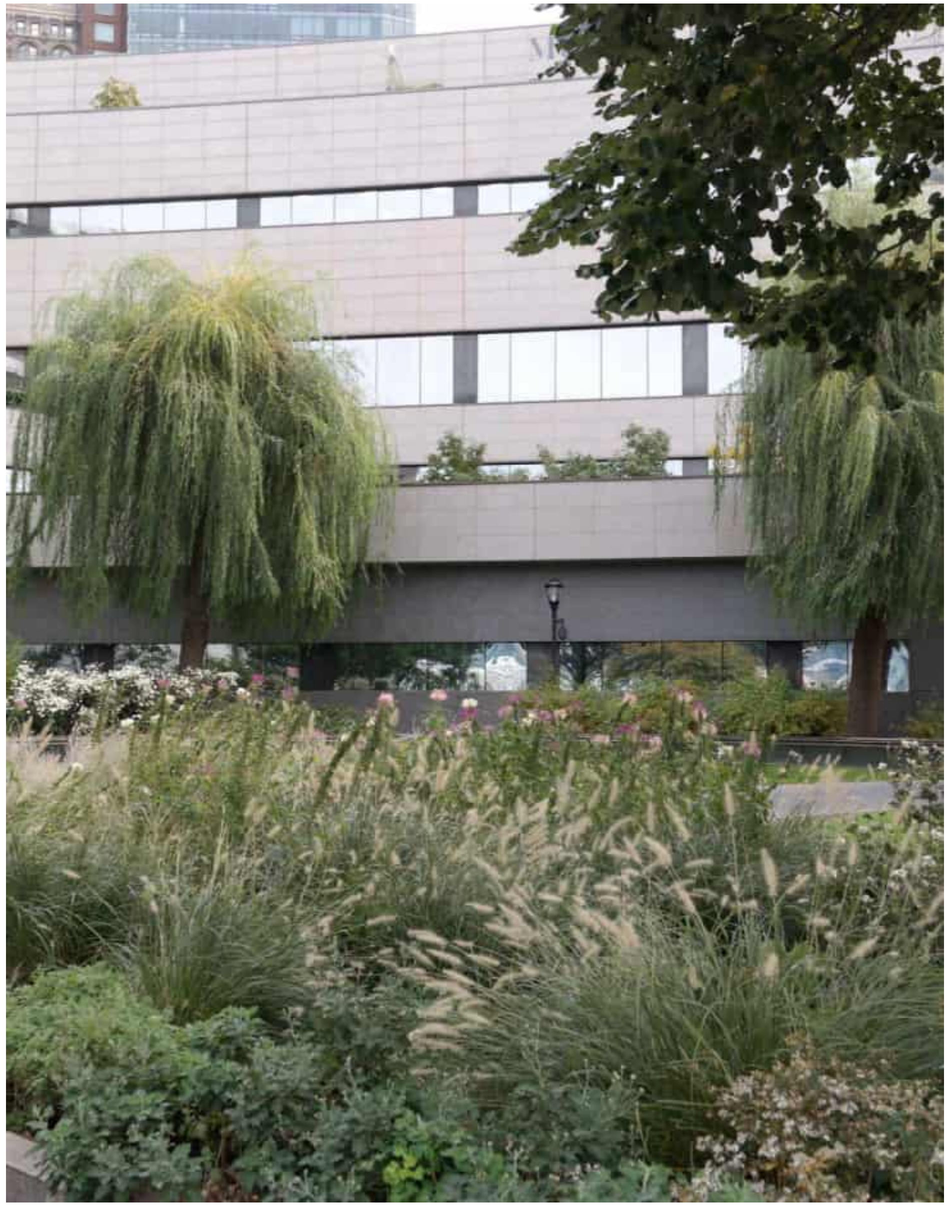
MUSEUM OF JEWISH HERITAGE

THE SITE

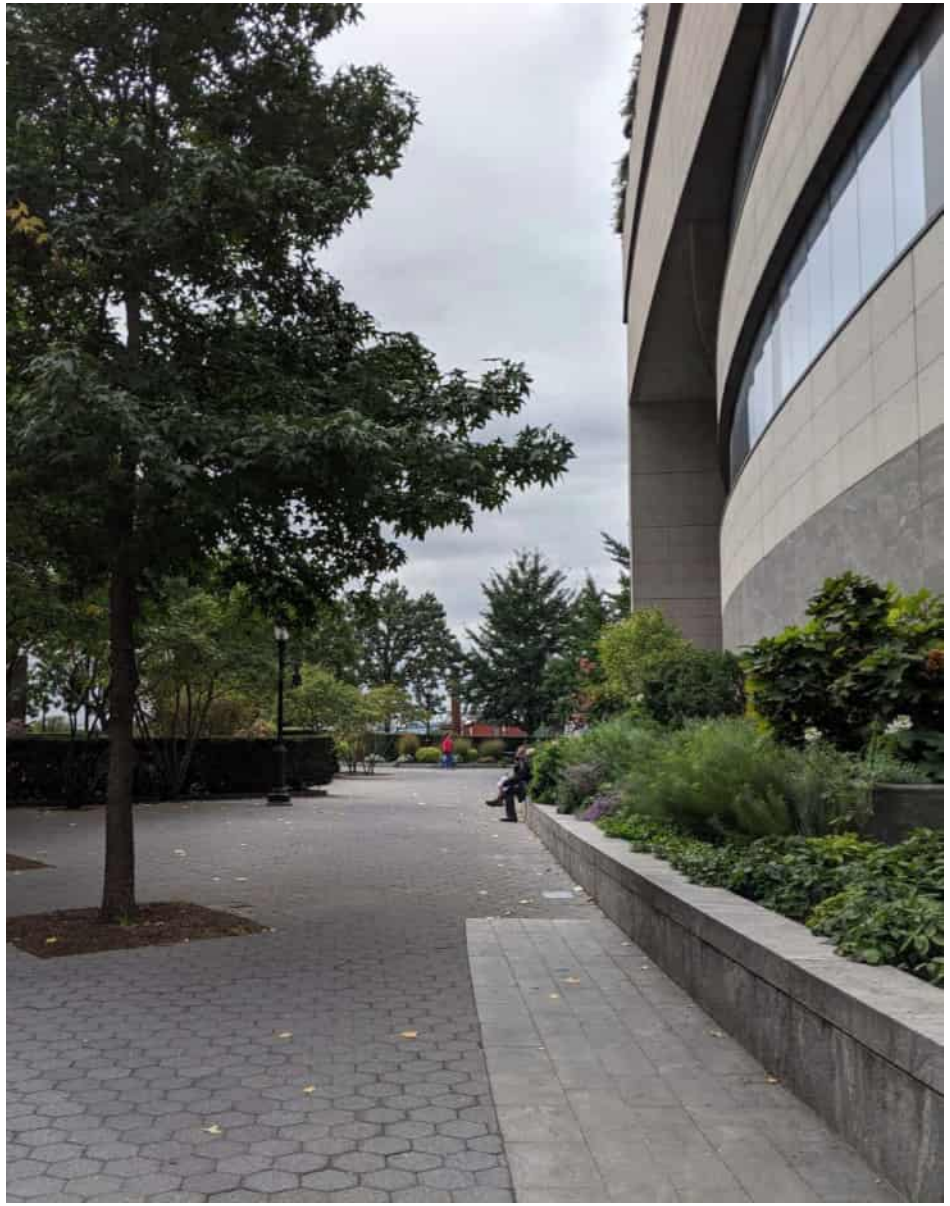

MUSEUM OF JEWISH HERITAGE
MUSEUM
OF JEWISH
HERITAGE
HUDSON RIVER
PIER A HARBOR
HOUSE
1ST PLACE
BATTERY PLACE
LITTLE WEST STREET
BATTERY PARK
UNDERPASS
WASHINGTON
BATTERY PLACE

MUSEUM OF JEWISH HERITAGE | EXISTING CONDITIONS

PATHWAYS



LUSH PLANTING



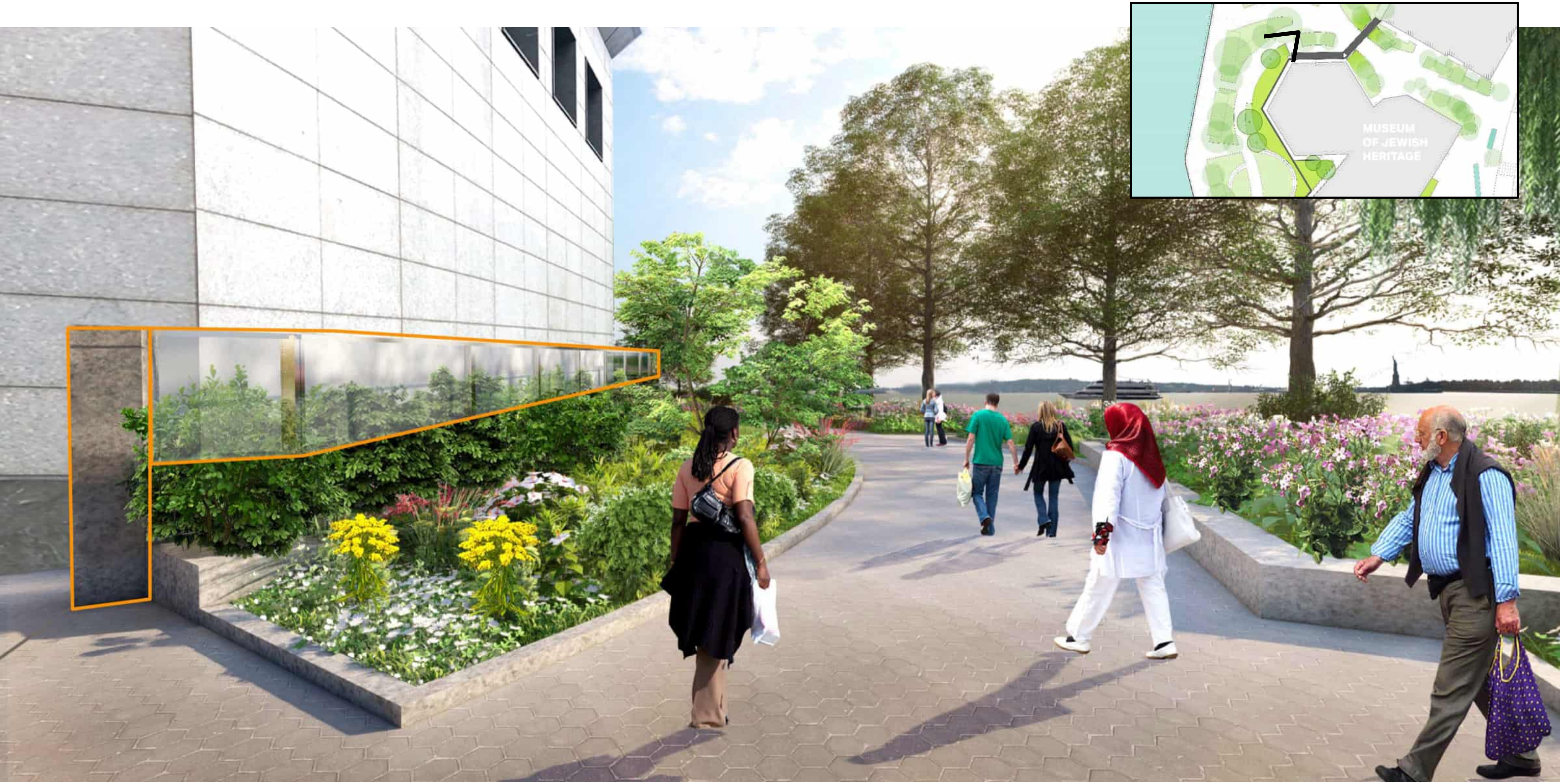
ENTRANCE PLAZA

MUSEUM OF JEWISH HERITAGE | EXISTING CONDITIONS

MUSEUM OF JEWISH HERITAGE | PROPOSED DESIGN

MUSEUM OF JEWISH HERITAGE | PROPOSED DESIGN


MUSEUM
OF JEWISH
HERITAGE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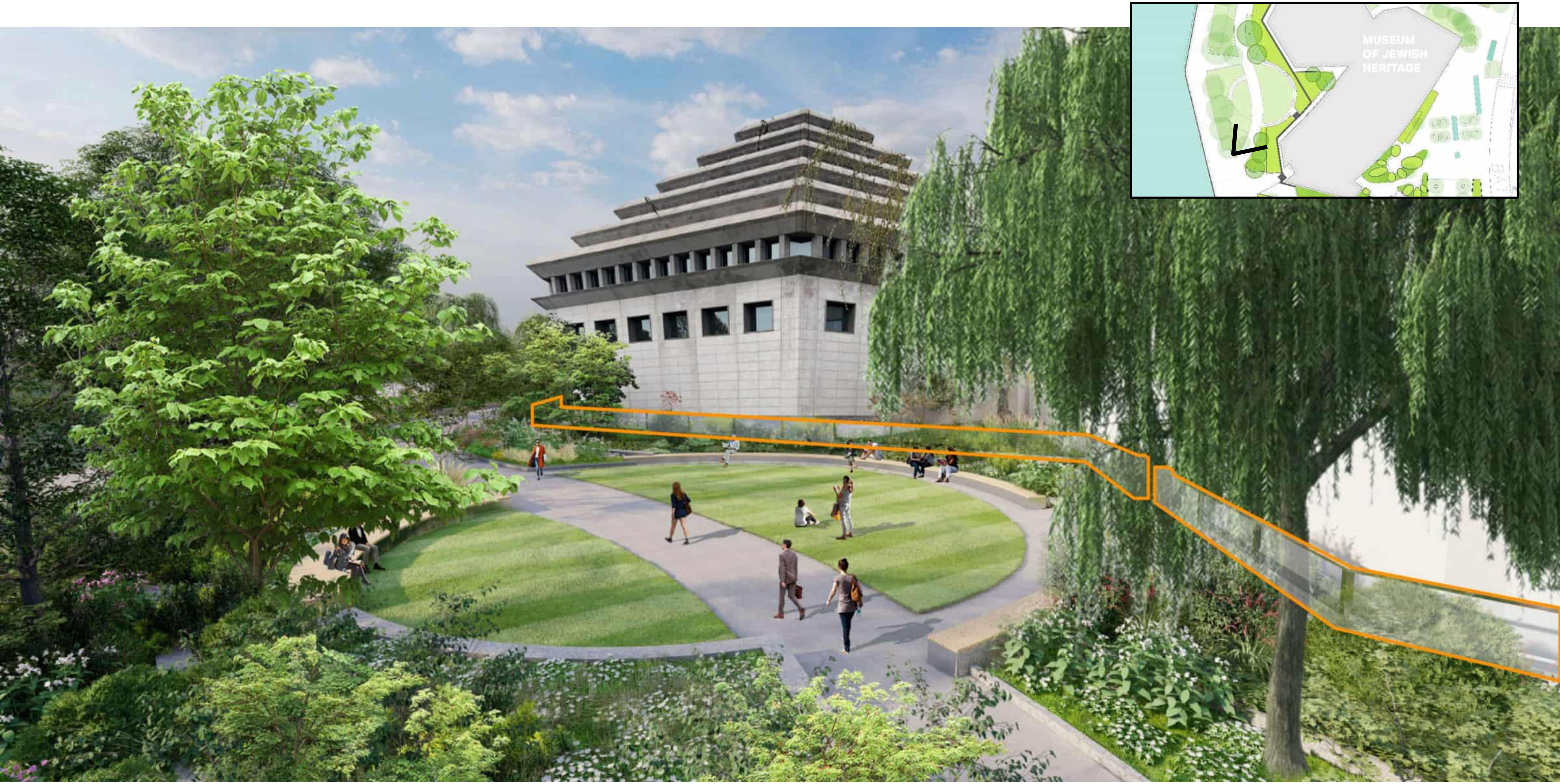
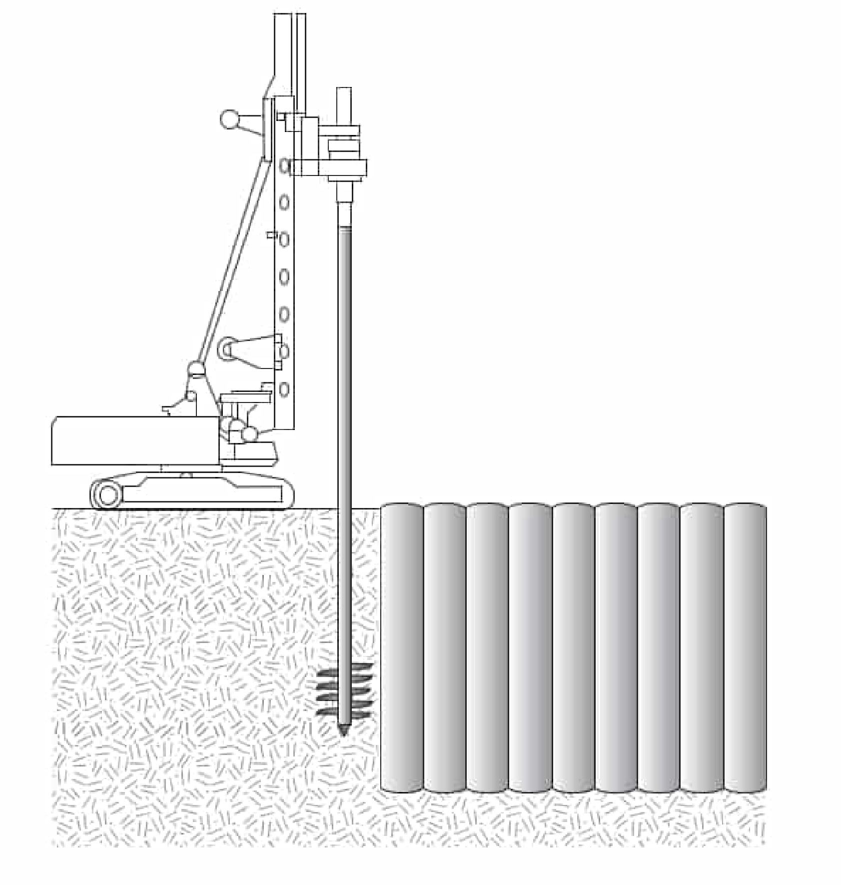

MUSEUM
OF JEWISH
HERITAGE

MUSEUM OF JEWISH HERITAGE | STRUCTURAL ENGINEERING

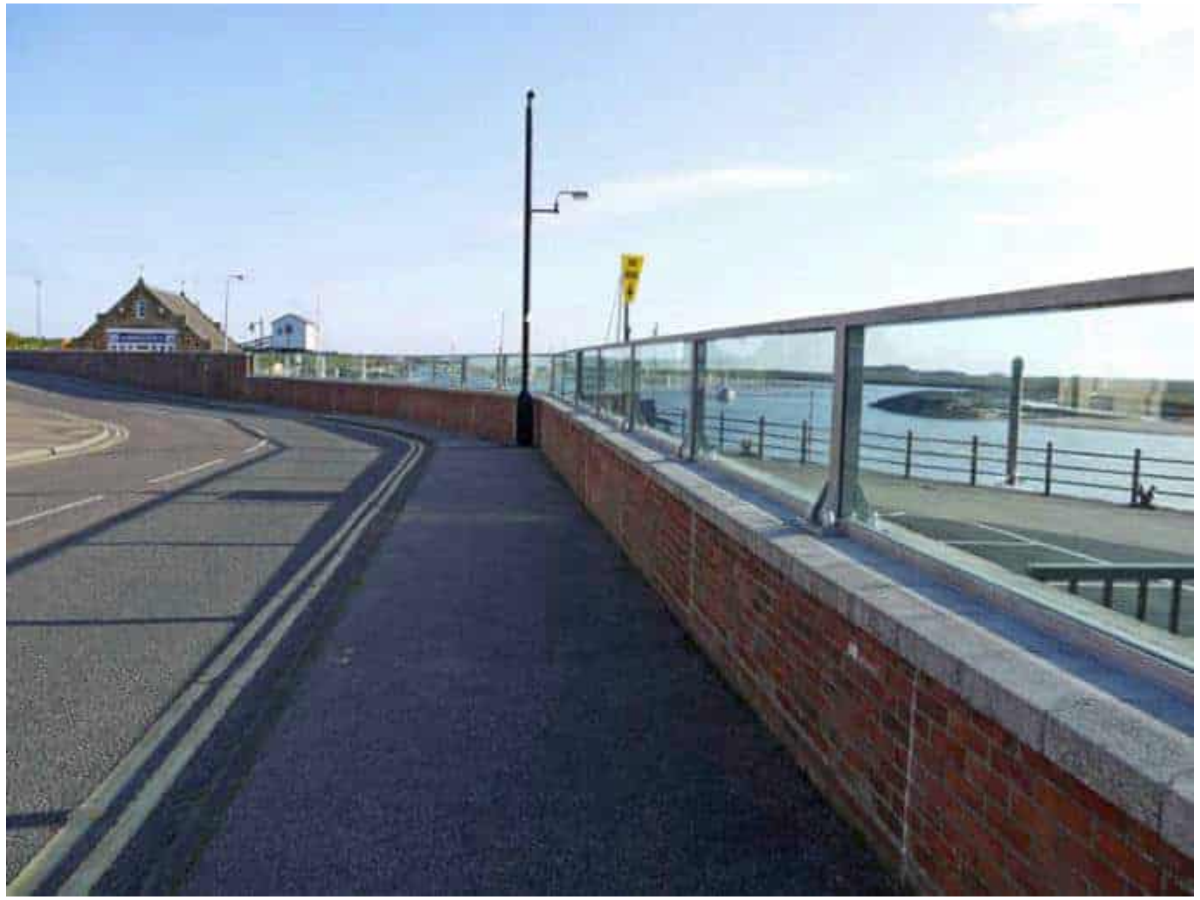
Challenge: Proximity to building and relieving platform

Solution: Utilize a foundation with a small footprint that can also serve as a seepage barrier

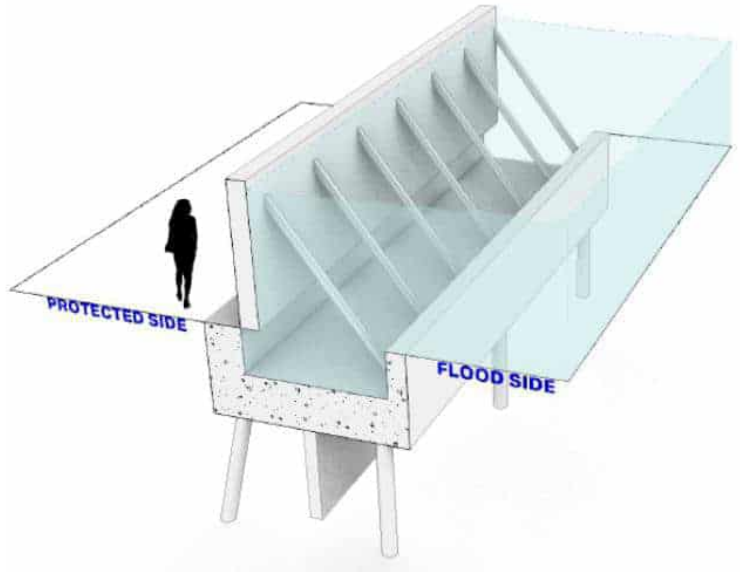


Challenge: Maintaining views to and from building

Solution: Utilizing Floodproof Glass where possible

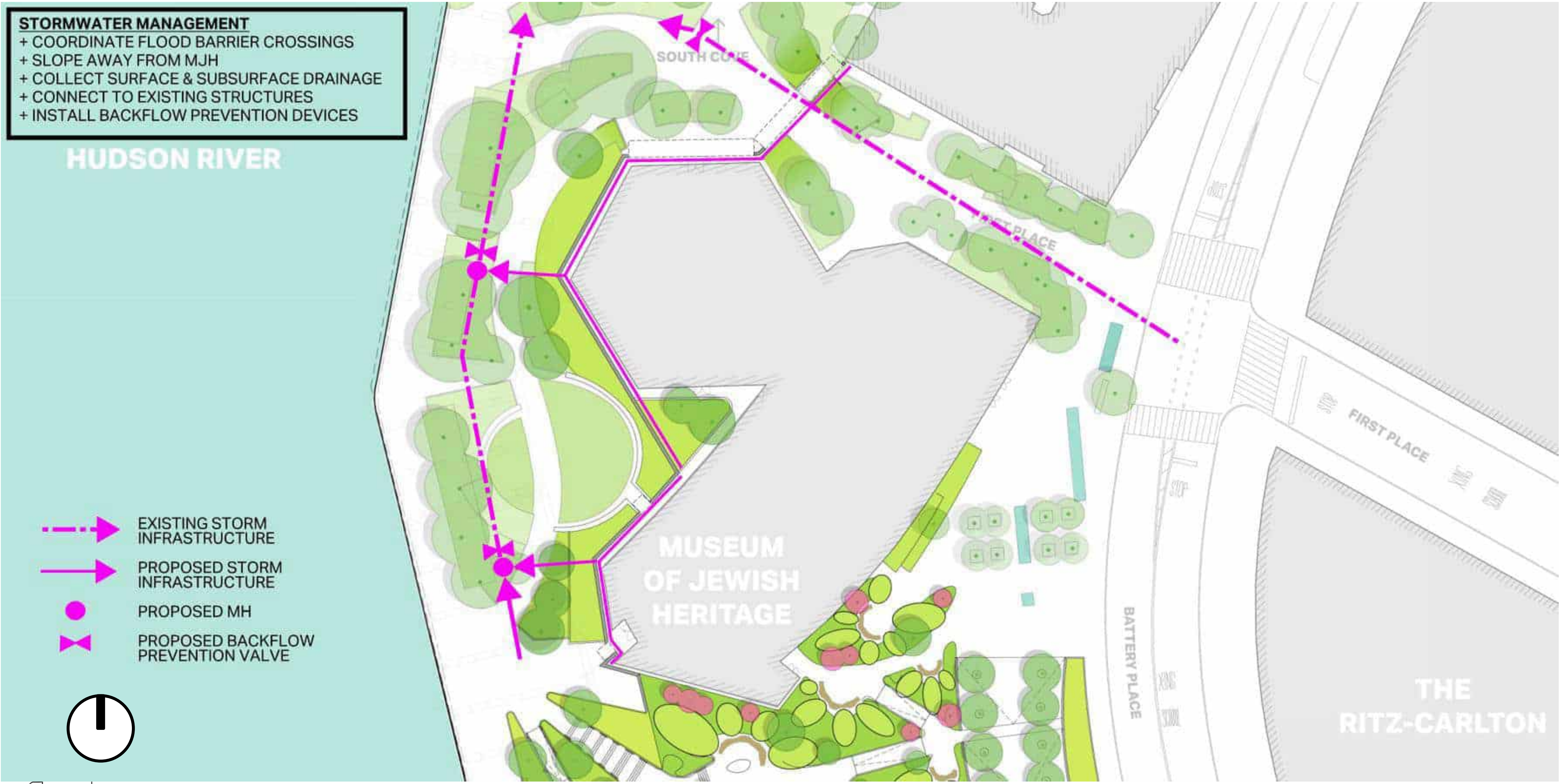


FIRST PLACE | STRUCTURAL ENGINEERING

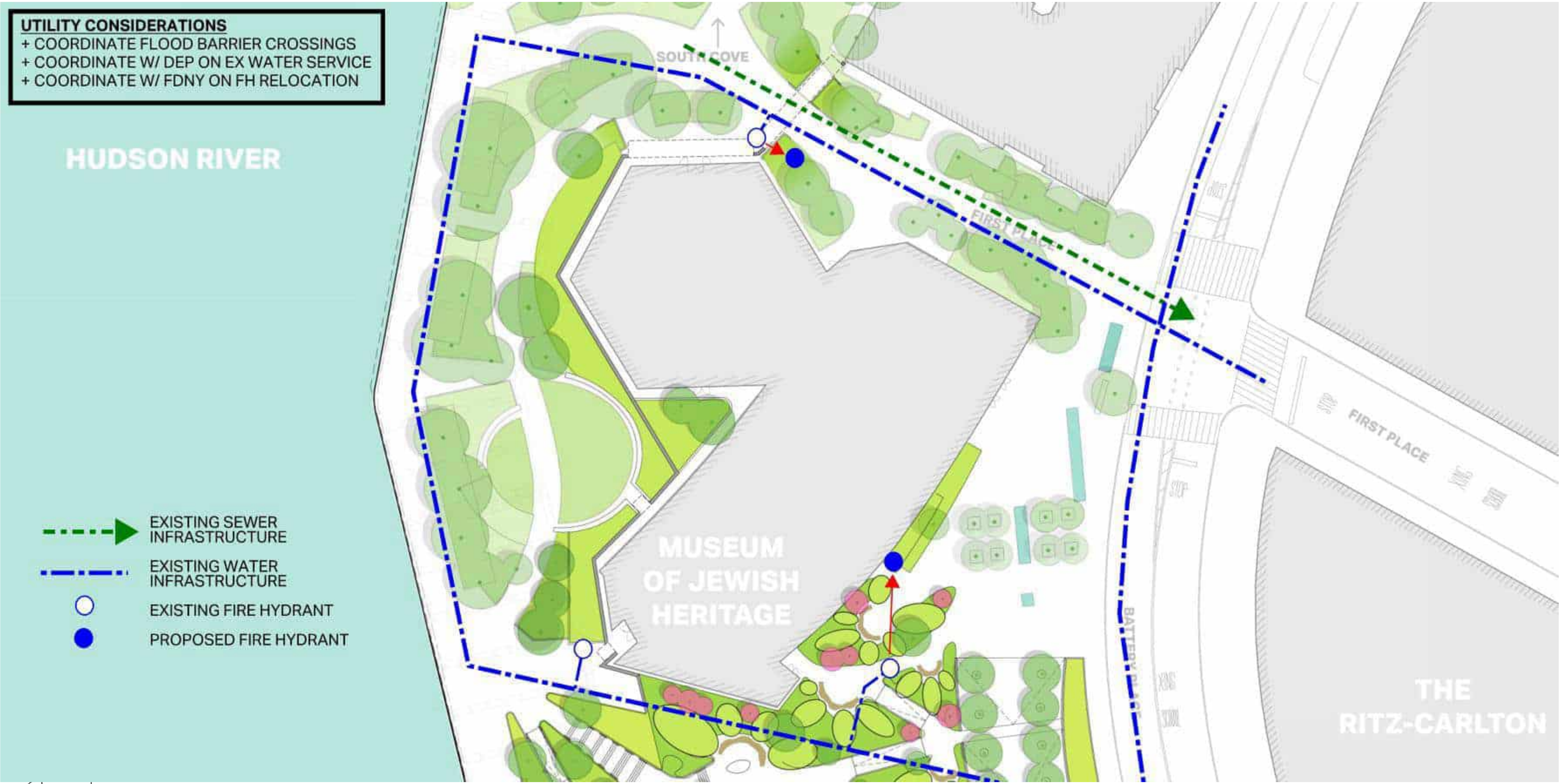


FLIP UP GATE – DEPLOYED POSITION

MUSEUM OF JEWISH HERITAGE | STORMWATER MANAGEMENT APPROACH



MUSEUM OF JEWISH HERITAGE | UTILITY PROVISIONING



Wagner Park, Museum of Jewish Heritage, and 1st Place

Q&A

THANK YOU!

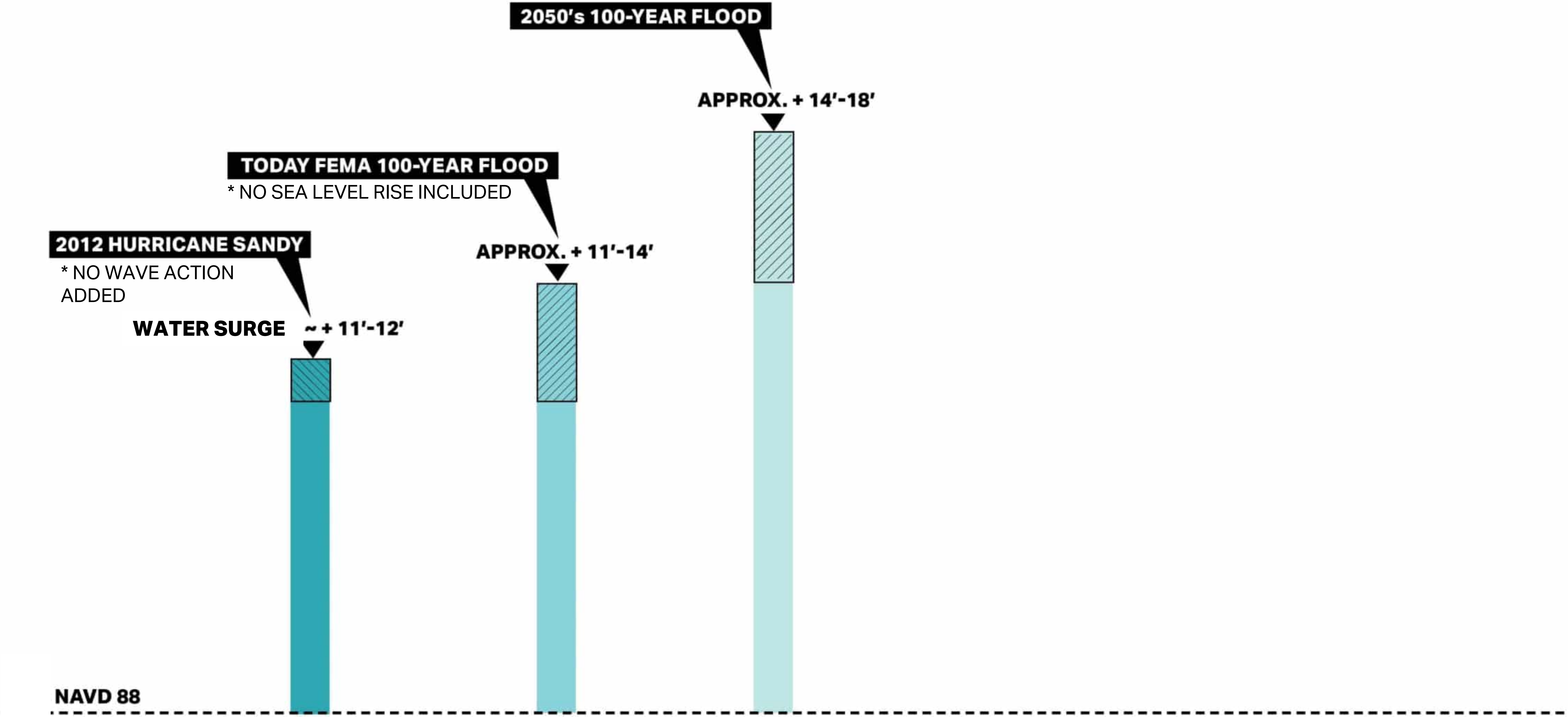
PLEASE ADDRESS COMMENTS BY JANUARY 29
TO

sbpcr@bpca.ny.gov

** Presentation and video of presentation will be available online post this meeting for reference

BACKUP SLIDES

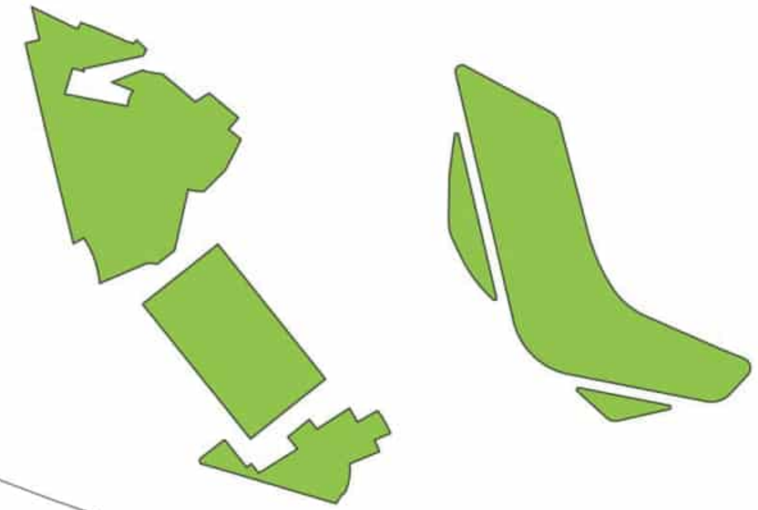
DESIGN FLOOD ELEVATION (DFE) COMPARISON



*** 2050 DFE TO BE VERIFIED WITH TOPO**

WAGNER PARK |


MUSEUM OF
JEWISH
HERITAGE
BATTERY PLACE
PIER A HARBOR HOUSE


EXISTING PARK TOTAL LAWN
PROPOSED PARK TOTAL LAWN

A.4.2 SBPCR Public Meeting Follow-up Q & A (January 2020)

South Battery Park Resiliency Project
Public Meeting #4: Wednesday January 15, 2020, 6PM
Follow-Up Questions

Q1. When would work at Wagner Park start? How long will it take?

A1. Phased construction on the South Battery Park City Resiliency (SBPCR) project is anticipated to commence by late summer of 2020 and is expected to take two years.

Read more: **Battery Park City Resiliency Projects**

Q2. The terrace seating must have shade, or they [sic] will not be used when it gets really hot. There is a remarkable lack of shading in the area of the performative gardens. NOTE: last July, temperature rose above 95 degrees.

A2. Shade is a critical ingredient in successful public space for human comfort and health. To that end the SBPCR project design team has studied maintaining a balance across the site – shaded areas for respite, open areas for access to sun, places that allow for group gatherings, and areas that maintain views not just to the harbor and Statue and Liberty, but also to the BPC Esplanade / stage area for events.

That given, it is important that the central area defined within the view corridor (as seen on Page 68 of the **January 15, 2020 SBPCR project presentation**) is left open so as to allow for unobstructed activity and views.

Q3. What is the percentage of risk reduction anticipated after SBPCR project construction?

A3. Currently, we are designing the entire flood alignment to provide risk reduction for a 100-year event in the year 2050. That means that our design criteria for all the flood measures – including the design flood elevations and deployables – are being designed to meet that level of anticipated event.

Read more: **Increasing Flood Risk**

Q4. In the building, how high are the mechanicals above expected sea level?

A4. The mechanical equipment level is +31' above current mean sea level and 13' above estimated Design Flood Elevation.

Q5. Will [this evening's] presentation be on a website? What is the URL for it?

A5. The presentation for this and all previous public meeting presentations can be found on the Resiliency Page of BPCA's website **here**.

Q6. Is the museum glass graffiti resistant?

A6. We are not aware of "graffiti-resistant" glass so much as various protective film products that can be placed over glass to facilitate graffiti removal. The SBPCR project design team is currently determining flood-proof glass specifications for installation at the Museum of Jewish Heritage, after which it can explore options for protective film options.

Q7. How will the water cistern work?

A7. The stormwater runoff will be pre-treated to filter out sediment through trench drains with filters or in landscape cells. After the runoff is pre-filtered from migrating through the soil, it will enter a sand layer at the bottom of the topsoil layer, which will act as an additional filter. After the water passes through the sand filter, it will enter an aggregate layer that contains perforated pipes where the water will be collected and conveyed to the cistern (see Page 83 of the **SBPCR presentation** for an illustration). The cistern will store the pre-treated water prior to reuse. Under normal conditions, the cistern will release the pre-treated water to the water reuse room, where it will receive additional filtration and disinfection prior to being reused on-site and within the building.

Q8. How will water accumulated in the cistern be removed?

A8. The cistern's discharge pipe will be located at the bottom of the cistern (along with a sump to mitigate for additional sediment that enters the cistern). This pipe will discharge to the water reuse room and be opened and closed by a valve. A separate pipe will come off the discharge line that connects to the storm drain system in Battery Place. The line will also contain a valve which will allow us to drain the cistern to the storm drain line in Battery Place as needed. Otherwise, we'll keep this valve closed and the water reuse room valve open.

Q9. How much water will be held in the cistern?

A9. The exact quantity is still being finalized as we analyze the final supplies and demands of water at the site. However, at this time, we are looking to store the 95^{th} percentile storm event, which equates to approximately 63,000 gallons and results in WEDG certification points.

Read more: **Waterfront Edge Design Guidelines**

Q10. Please walk us through how varying flood levels interact with the proposed designs and what is being protected. Might the esplanade be permanently inundated daily, cutting off access to the ramps?

A10. While no one can predict today exactly what the sea levels will be in the future, we are using the best available tools now to estimate what those conditions will be. To understand how the varying flood levels interact with the proposed design, it's important to understand where the flood alignment is physically located.

(Read more: **SBPCR Project Public Meeting #2 Presentation (March 2019)**; see pages 29-35)

Throughout the entire project area, this is the "spine" or "alignment" location for all the flood measures, design flood elevations, and deployables to meet or be placed – the physical barrier line or threshold to what will be exposed to coastal surge, and what will not be, up until a certain level of coastal surge for a 100yr event in the year 2050. Everything that is on the "waterside," or Hudson River side, of the alignment location will be exposed to lower-level storms in the future.

So in the case of Wagner Park, everything in the terraced transitions down to the BPC Esplanade, as well as the Esplanade itself, will be exposed to lower-level costal surge storms – that's why we're designing those terraces to be as much of a performance landscape as possible and aid in surge / wave energy reduction for dissipating coastal surge. Design elements that are on the city side (or "dry" side; "dry" referring to coastal surge, not rain) of the alignment will gain the risk reduction intended in the design.

The SBPCR project lowers the community's "level of exposure and risk" to coastal surge flooding and rain events up to a certain threshold of an anticipated storm, which as explained in A3 above, is a 100-year event in the year 2050. While no solution can offer absolute protection from *ever* being flooded – that's why we use the term "risk reduction" and not "protection" – even should the proposed alignment be overtopped, it will still provide robust risk reduction by reducing the energy and impact of a larger coastal surge event to the community.

As far as the Esplanade and its exposure to future flooding, based on projected sea level rise, by 2100 the Esplanade could have water on it daily – every 12 hours – during high tide. Pier A Plaza, due to its lower elevation, could have water on it every 12 hours as early as 2050. The SBPCR project design raises a portion Pier A Plaza to address resulting "nuisance" flooding as of the target design year of 2050.

Q11. Is it just impossible to design a resilient plan that also spares the trees, or is there a plan that would but it's the Parks Department design parameters that is preventing this plan to be implemented? It was still unclear why exactly both can't be accomplished.

A11. It is not possible to avoid impacting trees along the northern edge of The Battery no matter where the floodwall is located. The option to screen the floodwall underneath a landscape berm within the bounds of The Battery is in keeping with the New York City Department of Parks & Recreation's citywide **"Parks Without Borders"** initiative, which provided the parameters for this portion of the SBPCR project design. In this scenario, the view into the park from the sidewalk will be of dense vegetation, maintaining the existing park character.

Q12. Planning long-range, doesn't it make sense to raise the elevation of a built element in the roadway (Battery Place is not an essential roadway) – maybe a raised/vaulted promenade rather than build flood infrastructure in the historic park? This plan is reminiscent of Robert Moses placing infrastructure "highways" through parks.

A12. There are several concerns with respect to raining the roadbed at Battery Place, including:

- The impact on existing buildings / entrances on the opposite side of the street – and not just on Battery Place but for distances that stretch a considerable way into the side streets, in order to tie in with existing grade;
- The impact on New York City's Department of Environmental Protection / water infrastructure in the street below grade, which is not currently designed to take up to an additional 11' load of fill above it; and
- The consequence that the parks on the "wet" / river side of the wall become fully sacrificial

One of the major priorities of the SBPCR project is to continue providing the community with usable public park assets and waterfront edges in the future. If the flood alignment were pushed back to Battery Place, then it would openly allow a majority of Wagner Park to flood every time during lower-level storms – and, in a 100-year event in the year 2050 – to be completed overtopped and flooded.

(See also: **Integrated coastal model from SBPCR Project Public Meeting #2 showcasing a storm event at that level**)

By placing the flood alignment in Wagner Park, the SBPCR project provides the community with more park space, further into the future. If, by contrast, the project contemplated a flood alignment in Battery Place, it would suggest that *all of Wagner Park*, and anything else on the water side of the alignment in Battery Place, as "sacrificial." Due to more of Wagner Park being exposed to larger storms, more often, there would be ongoing cyclical and increased damage and repairs throughout the park.

Moreover, because much of the stormwater drainage infrastructure is located within the street right-of-way, elevating Battery Place and not all adjacent infrastructure and properties would create pockets of induced flooding, due to Battery Place being significantly raised as higher ground. In order to not create induced flooding, all adjacent and existing streets, intersections, underpasses, tunnels, and stormwater infrastructure would need to be significantly modified. From a risk management perspective, allowing the streets to be the lows points in an urban fabric, instead of residences and critical public facilities, is a preference during extreme storm events until the storm resides.

Q13. I would like to see a cross-section of the plan. I would like to see the flood vulnerability zones that are inherent in this design.

A13. See SBPCR project scaled plans and sections **here**.

Q14. Do “flood events” mean high tide?

A14. No, “flood events” do not mean high tide. High tide is a condition that naturally occurs today, on a daily 12-hour basis, due to the gravitational pulls of the moon and its relationship with earth. This can be referred to as “tidal force.” This gravitational pull not only creates high tide but also low tide.

Flood events are caused by others measures or storm events, but flooding can certainly be enhanced or increased if a storm event arrives onto a shoreline at high tide, due to the water already being elevated as part of its tidal cycle.

Q15. What happens to Pier A Harbor House, especially in the event of regular tidal flooding? Is there any mitigation planned? // What happens to Pier A in a flood event?

A15. Pier A Harbor House sits outside the SBPCR project scope.

For the near-term, the risk to Pier A Harbor House is from large storm events, not regular tidal flooding. This is as a result of the building being at a higher elevation than current high tide level. Renovations took place following Hurricane Sandy to repair flood damage caused from that event, and at that time BPCA introduced some wet proofing measures to limit damage from similar storms and related flooding in the future – including removable doors that can be stored in a safe location, use of marine-grade lumber, raising of electrical equipment to higher floors, etc.

Although not part of the SBPCR project, BPCA will continue to explore additional steps to reduce risk of damage to the structure resulting from long-term sea level rise.

Read more: **Envisioned for Decades, a Revival of a Manhattan Pier Is Complete**

Q16. Given that we are facing sea level rise at an increasing rate—

a. Were recent sea level rise forecasts incorporated into planning?

A16a. Yes, we are currently incorporating 30 inches of sea level rise into our future models, which follows the **New York City Panel on Climate Change** (NPCC) 2050s High Estimate (90^{th} Percentile).

b. What is the expected useful lifetime of these protections given sea level rise?

A16b. The SBPCR project’s current design scenario is a 2050’s 100-year storm with 30 inches of sea level rise. Due to the uncertainty with predicting the future, the project uses a probabilistic approach in order to balance future requirements of the system with impacts to the site and cost today. Therefore, the useful life of the structure is dependent on the accuracy of the sea level rise prediction models and the frequency of large storms stressing the system. We seek to provide a minimum 50-year service life for these structures.

c. **Are there plans to increase the height of elevations once sea level rise negates the current planned protection?**

A16c. BPCA has underscored with the SBPCR project team the need to create opportunities for future adaptation of the measures introduced by the project in order to account for potential future increases in sea level rise projections. Accordingly, the SBPCR project design team is currently working to determine what potential adaptive capacity design options could benefit the project to address future storm surges coupled with sea level rise.

Q17. How scalable is the design if it turns out that future projections are understated? If scalable, what is maximum additional height that can become accommodated over all?

A17. Please see A16c. above.

Q18. What powers the deployables / flip-ups?

A18. There are three modes of deployment for the flip-up deployables in order to provide redundancy in the event of a storm.

The first (primary mode) is “press-button” deployment, which is powered by hydraulic units located on the site to raise the gate.

The second mode of deployment utilizes back-up generators or portable hydraulic units to raise the gates in the case that the power is out, or the permanent hydraulic units fail.

The last option (tertiary mode), and the one which requires the most time and manpower, is in the case that the first two options do not work, the gates can be manually lifted using truck-mounted cranes or deployable posts and winches.

For the primary mode of deployment, the gates can be raised in approximately five minutes or less. For the secondary and tertiary modes, the goal is to be able to deploy each gate in approximately 30 minutes or less.

Q19. How much manpower is needed to raise the deployables? How long does it take to fully raise all deployables?

A19. Please see A18 above.

Q20. How will the floodwalls be lifted up and by whom? How much water pressure will the walls withstand?

A20. Please see A18 above.

It is the responsibility of the BPCA to deploy the flip up gates included in the SBPCR project alignment. This, of course, would be done in close coordination with various New York City partners as part of a coordinated storm event response.

Regarding water pressure – water pressure is composed of a combination of hydrostatic (flood and surge) and hydrodynamic (wave) loads. This pressure varies across the site based on the Design Flood Elevation and the elevation of the ground waterside of the wall. The project team is currently refining the approximate hydrostatic and wave loads with its integrated coastal model. Once that load information is known, we can provide those loads to the deployable gate manufacturers, with the gates then designed accordingly.

Q21. When will the construction of walls / deployables / raised structures start? How long will it take to build?

A21. Construction will be phased for different project areas, and may begin as early as late-summer 2020. BPCA is targeting a two-year construction duration.

Read more: **Battery Park City Resiliency Projects**

Q22. What is the maintenance cost over the next 10 years after the project is finished?

A22. We have not yet selected all the materials, deployables, site elements, or product specifications in the design, so we can't answer this question at this time. We can say, however, that consideration of the long-term costs for operations and maintenance are and will be a part of the final product selection process for all the SBPCR project design elements.

Q23. Curious about the grade crossings for bike lanes, especially as approaching congested crossings.

A23. This proposal reduces the amount of conflict area as bicycle traffic travels from the Hudson River Greenway to The Battery Bikeway. The current condition mixes bicycle and pedestrian traffic throughout Pier A Plaza. By re-aligning the bikeway to the north, closer to the curb, the proposed design creates a protected condition that is buffered from pedestrian traffic by plantings and low seat walls. The condition where pedestrian and bicycle traffic crosses has been minimized and re-aligned to improve awareness with paving changes, increase sight lines by re-aligning the crossing to 90 degrees, and slow bicycle traffic at the crossing with the use of warning band pavers. Additionally, the change in elevation along the landscape berm has been located to the east to reduce the speed of bicycle traffic near Pier A.

SBPCR Project: Additional Resources

- SBPCR Project – Scaled Plans & Sections (February 2020)
- January 15, 2020 public meeting presentation | Video
- October 3, 2019 presentation to Manhattan CB1 Environmental Protection Committee
- June 24, 2019 public meeting presentation | Video
- April 15, 2019 public meeting / design discussion notice | Video
- March 12, 2019 public meeting presentation | Video
- November 1, 2018 public meeting presentation
- Presentation to Manhattan CB 1 Waterfront, Parks & Resiliency Committee (June 2017)
- Report on the Wagner Park Resiliency Design Proposal (June 2017)
- SUPPORT POURS IN FOR WAGNER PARK REDESIGN EFFORT
- Community Presentation (March / April 2017)
- Community Presentation (November / December 2016) *(starting Page 25)*
- Executive Summary – Wagner Park Site Assessment & South BPC Resiliency Plan

A.4.3 SBPCR Manhattan CB1 Presentation (April 2021)

SOUTH BATTERY PARK CITY RESILIENCY

CB1 UPDATE

APRIL 19, 2021 rev 1

AGENDA

1. FLOODWALL UPDATE
2. PAVILION UPDATE
3. PAVILION DESIGN STUDIES + ACCESSIBILITY
4. PAVILION SUSTAINABILITY UPDATE

EXPOSED FLOODWALL | PRELIMINARY PDC SUBMISSION DESIGN

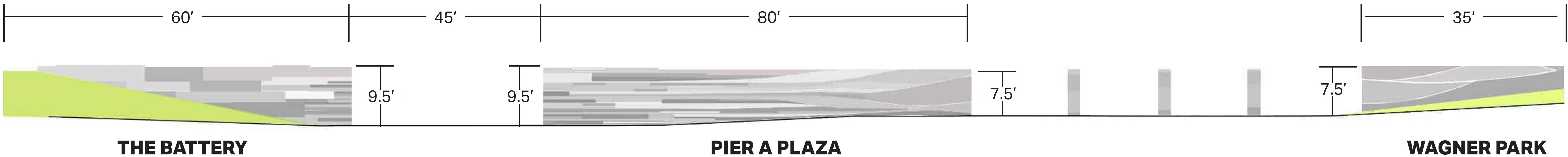
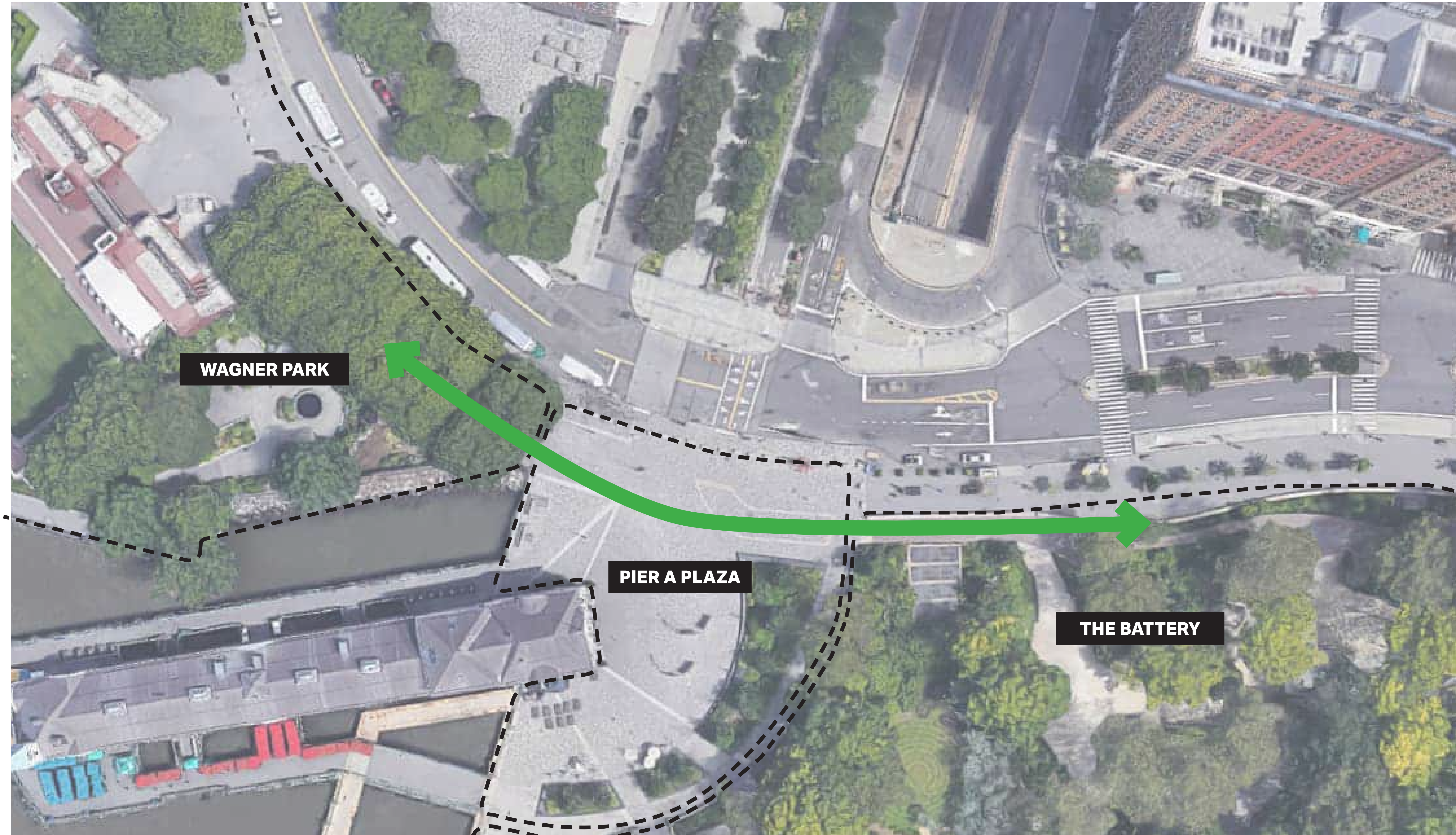


***DIAGRAM NOT TO SCALE. X AND Y AXIS HAS BEEN DISTORTED FOR CLARITY**

EXPOSED FLOODWALL | CONNECTING THE SPACES



NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority

AECOM

EXPOSED FLOODWALL | FLOOD ALIGNMENT

EXPOSED FLOODWALL | MATERIAL CONNECTION + TRANSITION

WARM + SATURATED **COOL + LIGHT**

STONY CREEK

- **Pink base color**
- **Black and grey speckles**
- **Used in The Battery**

SAINT SEBASTIAN (NEWLY PROPOSED)

- **Warm grey base color**
- **Fine black and grey speckles**
- **Complementary to other stones**

STANSTEAD GREY

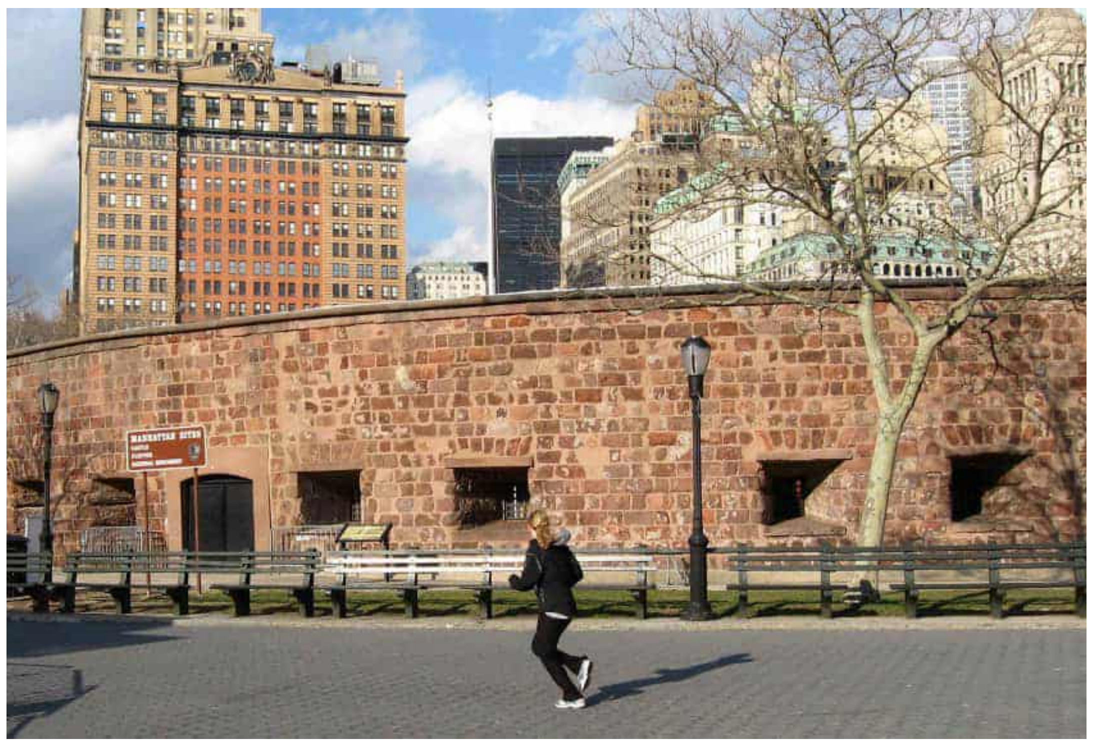
- **Cool grey base color**
- **Fine black and grey speckles**
- **Quartz sparkles in sunlight**

PEARL GREY

- **Light grey/white base color**
- **Distinctive linear veining pattern**
- **Quartz sparkles in sunlight**

CONCEPT 1 | INSPIRATION

STACKED WALLS OF THE BATTERY



CASTLE CLINTON

+

FLUIDITY OF THE HUDSON

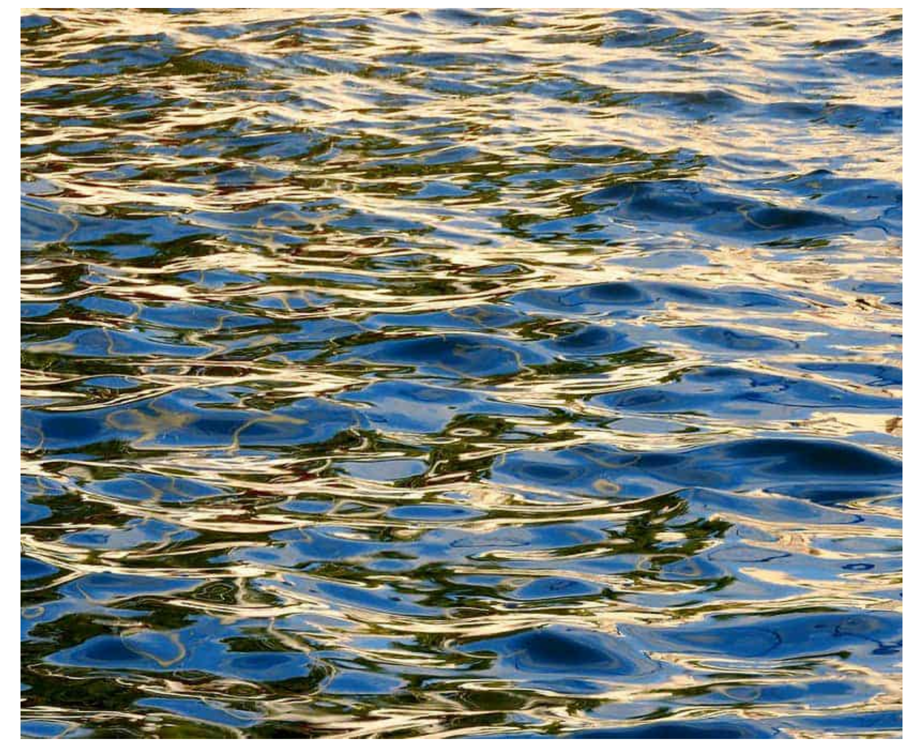


PHOTO CREDITS: NATIONAL PARKS CONSERVATION ASSOCIATION, STANLEY ZIMNEY

CONCEPT 1 | CONCEPT

STACKED WALLS OF THE BATTERY

FLUIDITY OF THE HUDSON

CONCEPT 1 | CONCEPT

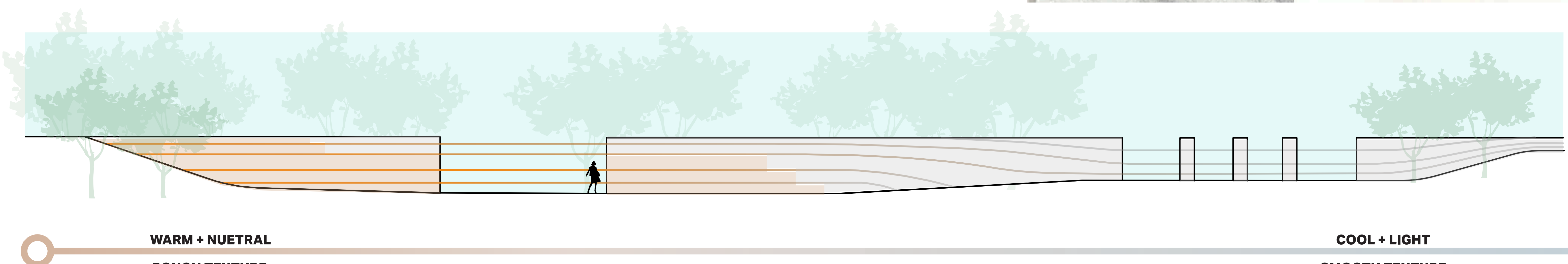
STACKED STONE

STONEY CREEK

SAINT SEBASTIAN

HUDSON

PEARL GREY



WARM + NUETRAL

ROUGH TEXTURE

COOL + LIGHT

SMOOTH TEXTURE

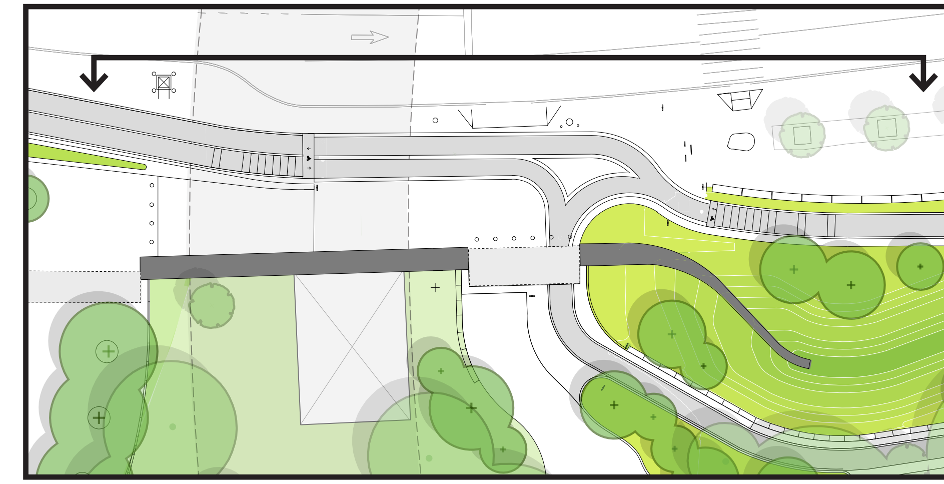
*DIAGRAM NOT TO SCALE. X AND Y AXIS HAS BEEN DISTORTED FOR CLARITY

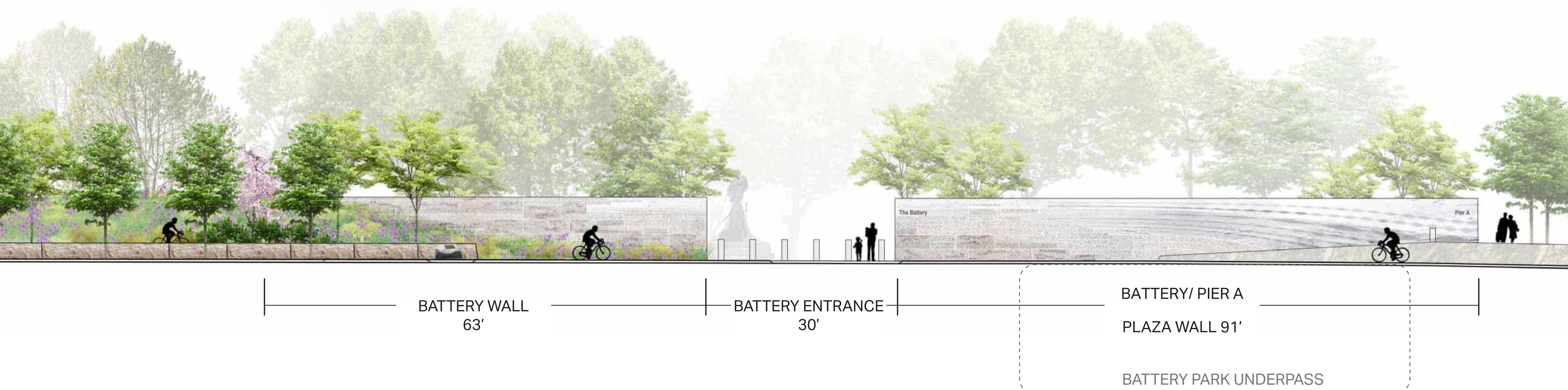
EXPOSED FLOODWALL | THE BATTERY + PIER A PLAZA + WAGNER PARK

BATTERY BERM **BATTERY ENTRANCE** **SLOPE TO PIER A PLAZA** **RAISED PLAZA** **PIER A PLAZA ENTRANCE** **WAGNER PARK**

CONCEPT 1 | THE BATTERY + PIER A PLAZA

THIS CONCEPT STRENGTHENS THE RELATIONSHIP WITH THE ADJACENT STONY CREEK BLOCKS BY USING THE STONE SAINT SEBASTIAN, WHICH BRINGS A SUBTLE WARMTH TO THE WALL.

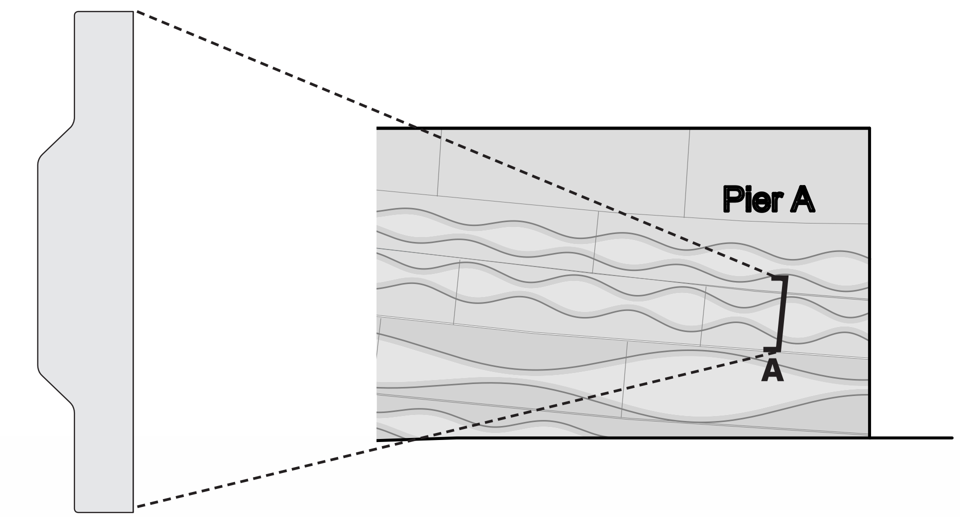


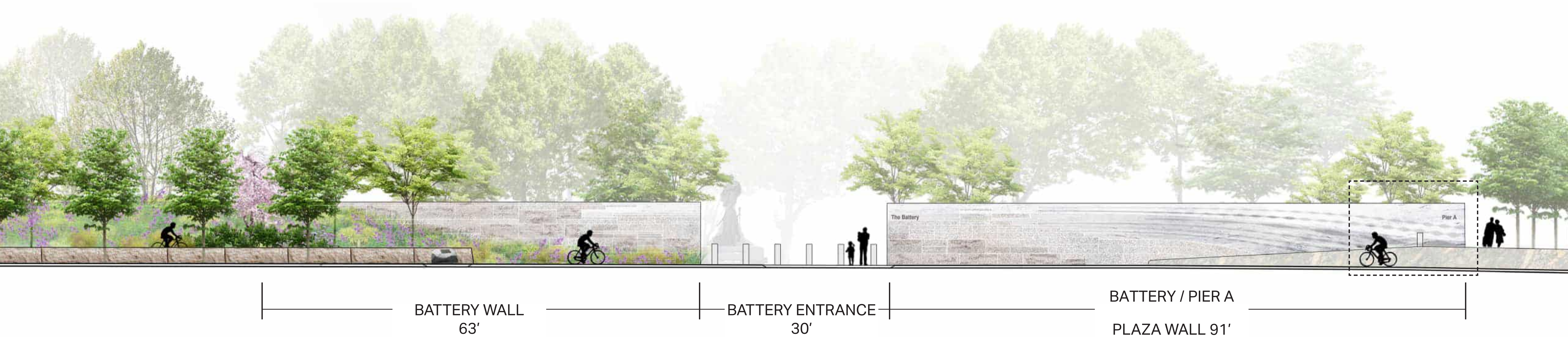


CONCEPT 1 | THE BATTERY + PIER A PLAZA

RIPPLES AS EXTRUSIONS

SECTION ELEVATION



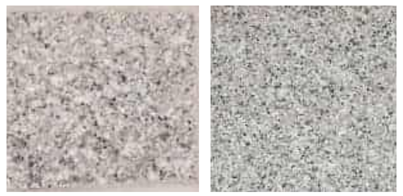


STONE TYPES

STONY CREEK

EXISTING SITE WALL

SAINT SEBASTIAN



FLOODWALL

PEARL GREY

STONE KEY PLAN

SAINT SEBASTIAN (OR SIMILAR)

SITE SECURITY WALLS

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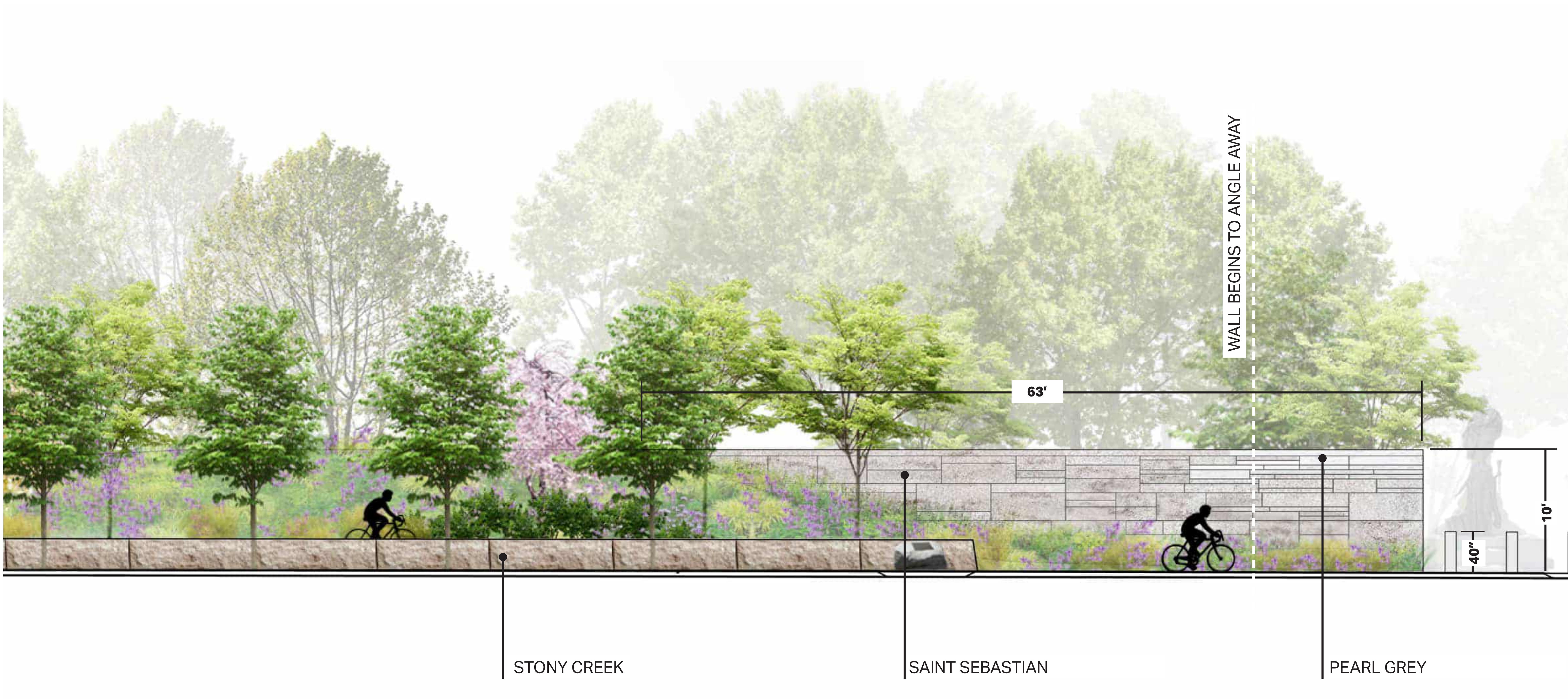
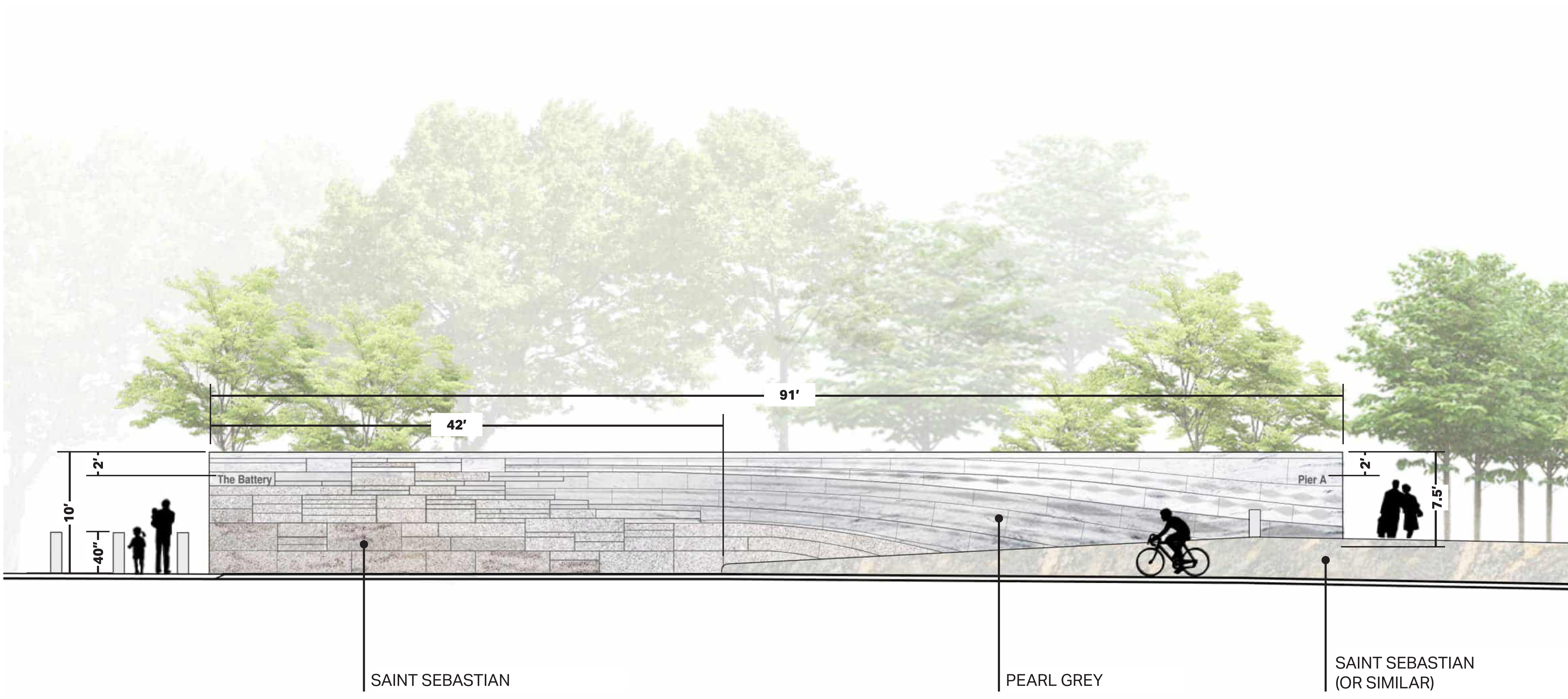
AECOM

CONCEPT 1 | THE BATTERY ENLARGEMENT



SCALE: 1" = 8'

CONCEPT 1 | PIER A PLAZA ENLARGEMENT



SCALE: 1" = 8'

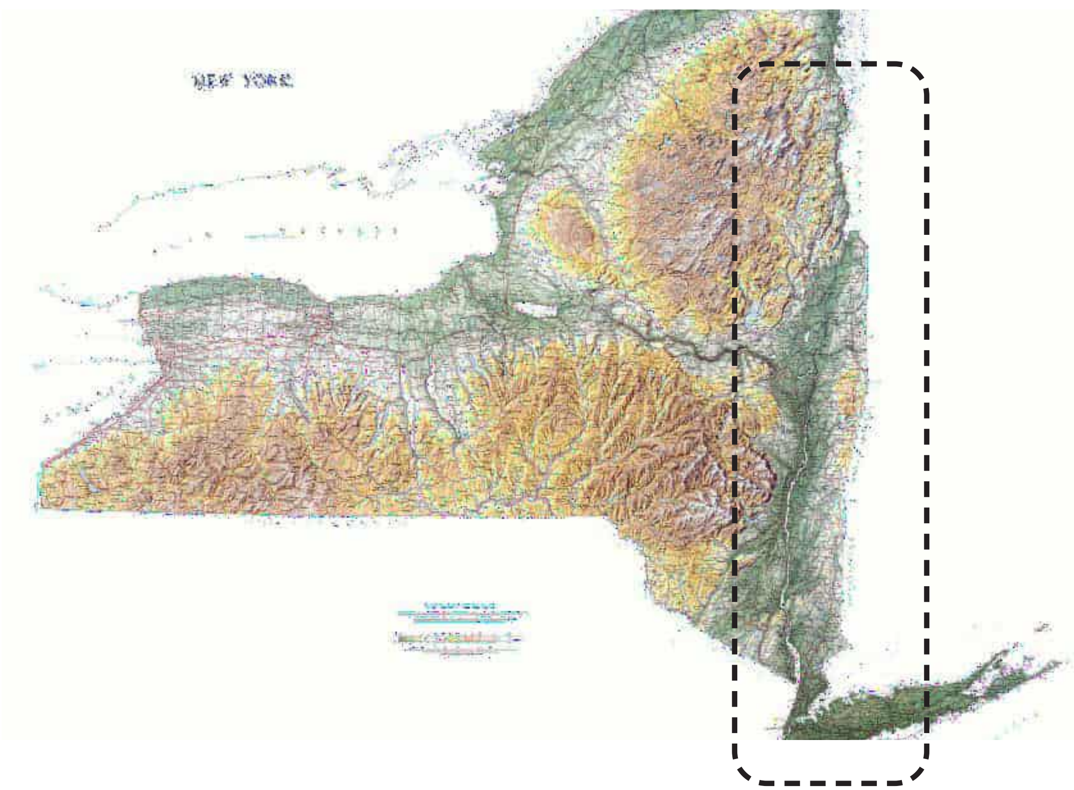

The Battery

NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority

AECOM

CONCEPT 2 | INSPIRATION

HUDSON RIVER VALLEY TOPOGRAPHY



THE HUDSON BECOMING THE NEW YORK HARBOR

+

FLUIDITY OF THE HUDSON

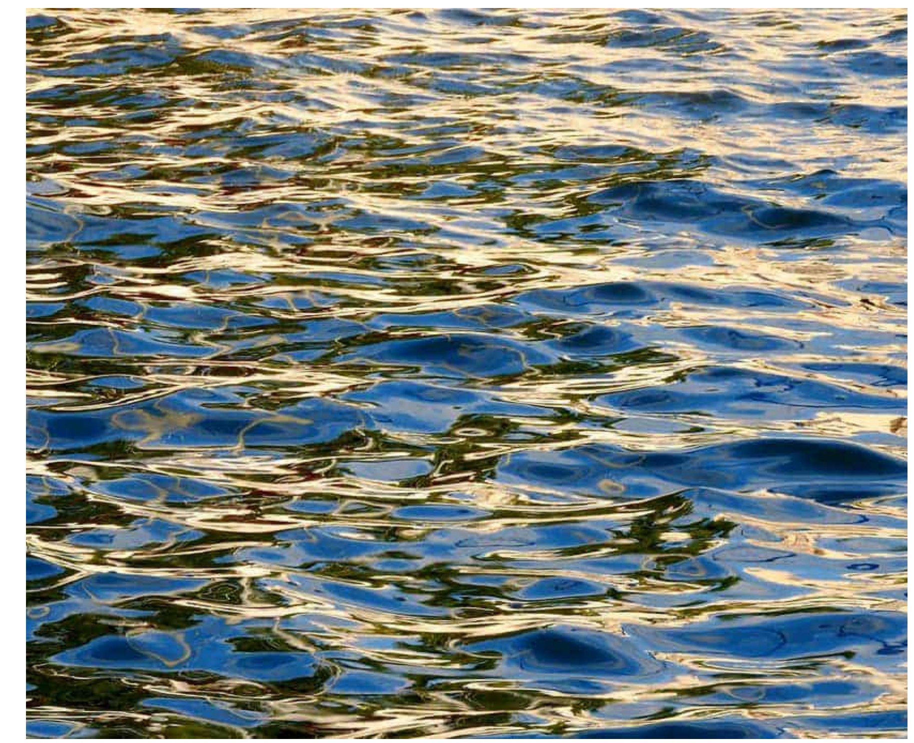


PHOTO CREDITS: RAVEN MAPS, SHUTTERSTOCK, STANLEY ZIMNEY

CONCEPT 2 | CONCEPT

HUDSON RIVER VALLEY TOPOGRAPHY

THE HUDSON BECOMING THE NEW YORK HARBOR

FLUIDITY OF THE HUDSON

CONCEPT 2 | CONCEPT

TOPOGRAPHY

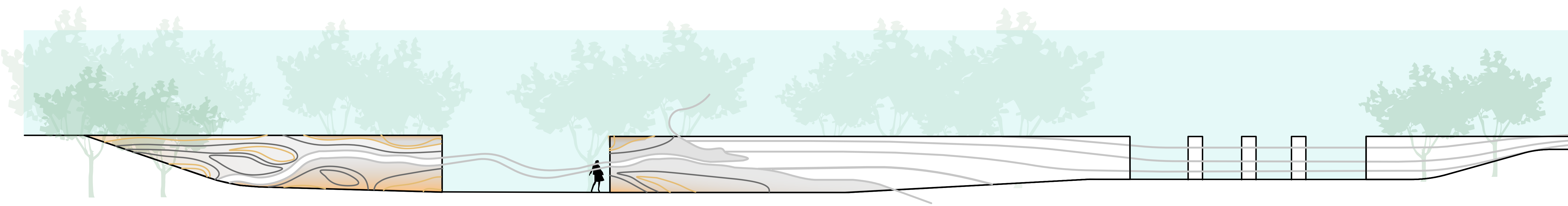
STONY CREEK

SAINT SEBASTIAN

PEARL GREY

HUDSON

PEARL GREY



WARM + LIGHT

ROUGH TEXTURE

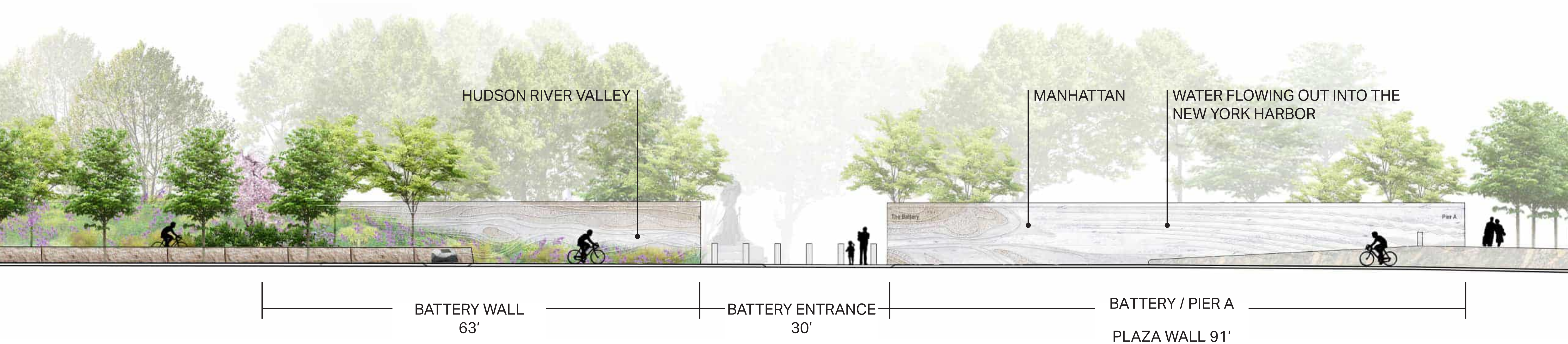
COOL + LIGHT

SMOOTH TEXTURE

*DIAGRAM NOT TO SCALE. X AND Y AXIS HAS BEEN DISTORTED FOR CLARITY

CONCEPT 2 | THE BATTERY + PIER A PLAZA

THIS PROPOSAL STRENGTHENS THE RELATIONSHIP WITH THE ADJACENT STONY CREEK BLOCKS BY TRANSITIONING FROM WARMER, MORE TEXTURED FINISHES IN THE BATTERY, TO LIGHTER FINISHES IN PIER A AND WAGNER PARK.

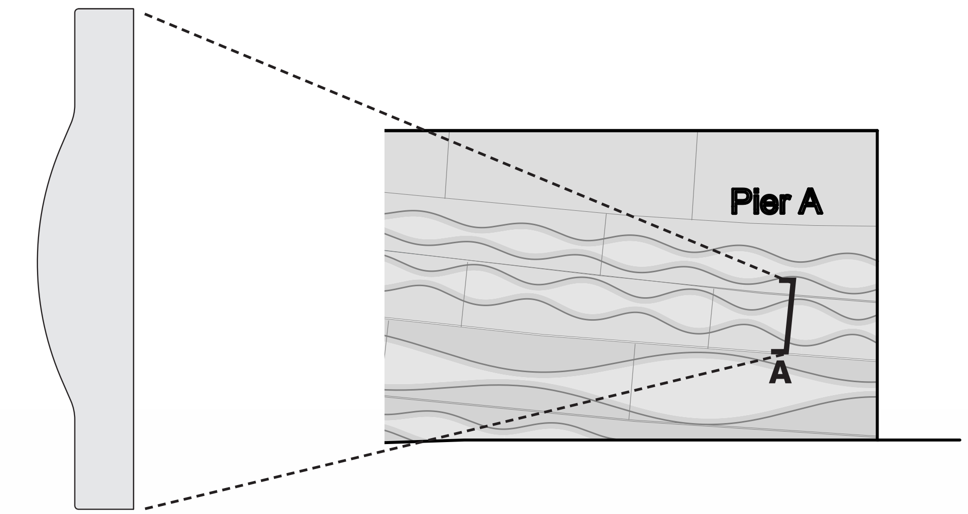


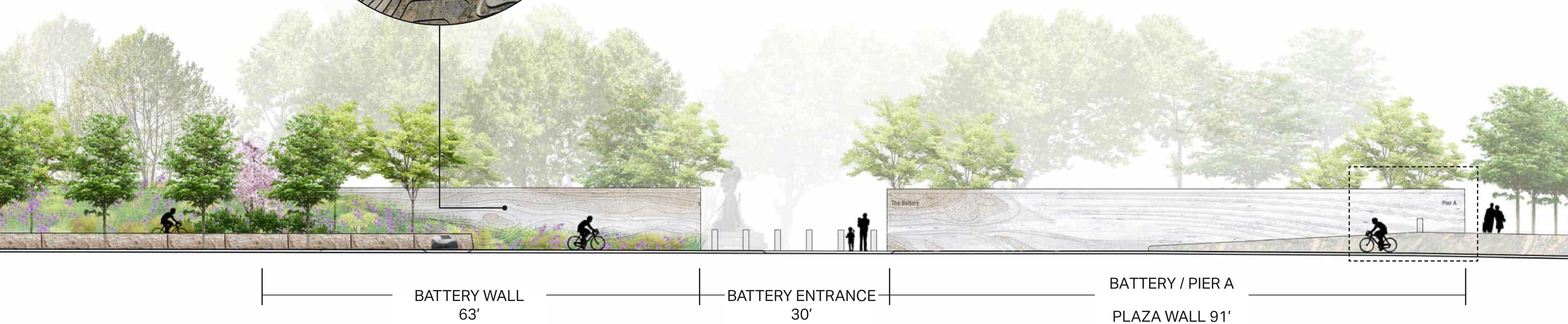
CONCEPT 2 | THE BATTERY + PIER A PLAZA

LAND AS LAYERS

RIPPLES AS SOFT EXTRUSIONS

SECTION ELEVATION





STONE TYPES

STONY CREEK

FLOODWALL

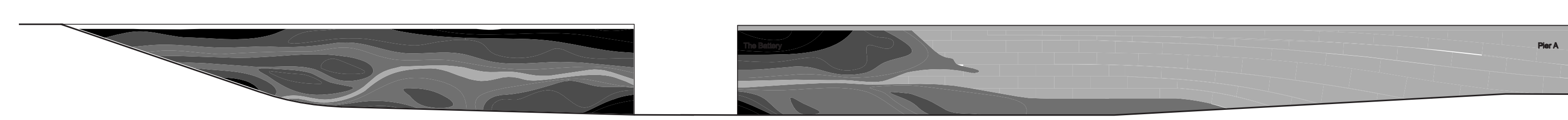
SAINT SEBASTIAN

PEARL GREY

SAINT SEBASTIAN (OR SIMILAR)

SITE SECURITY WALLS

STONE KEY PLAN



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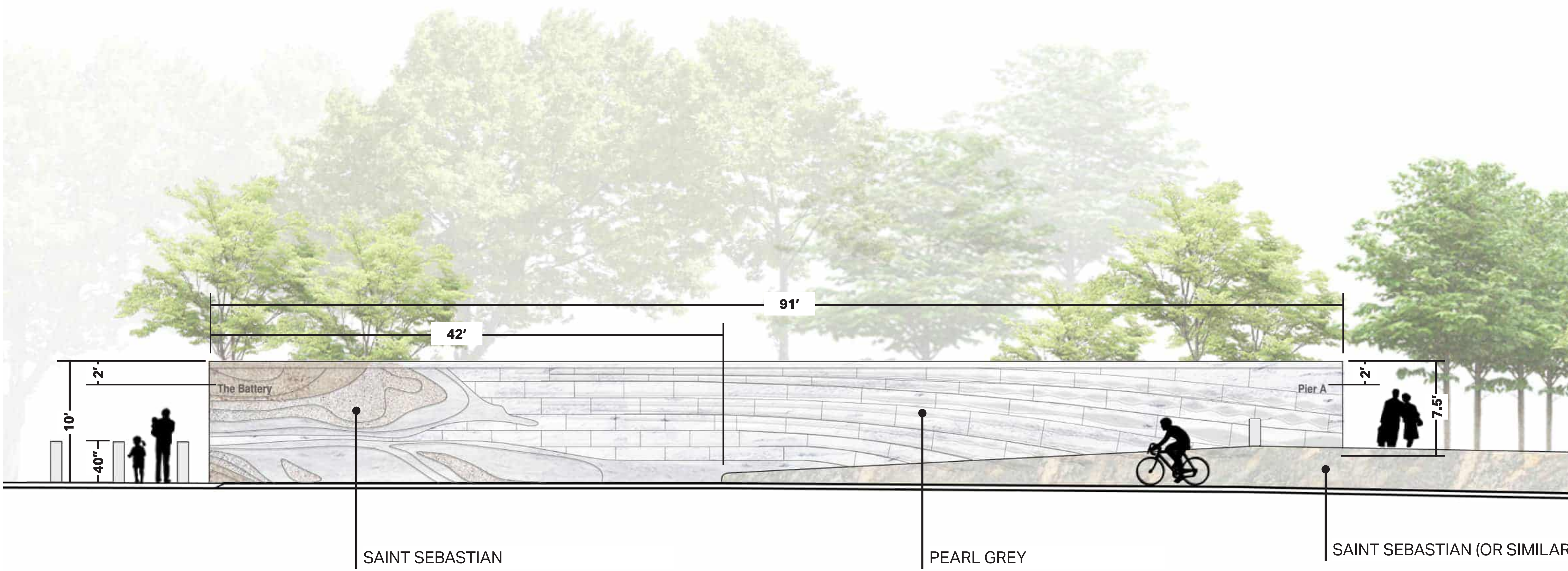
AECOM

CONCEPT 2 | THE BATTERY ENLARGEMENT

SCALE: 1" = 8'

CONCEPT 2 | PIER A PLAZA ENLARGEMENT



SCALE: 1" = 8'


The Battery

New York State of Opportunity. Battery Park City Authority

AECOM

EXPOSED FLOODWALL | THE BATTERY + PIER A PLAZA

EXPOSED FLOODWALL | PIER A PLAZA + WAGNER PARK

STONE TYPES

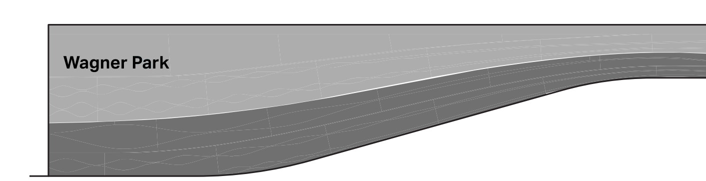
SAINT SEBASTIAN (OR SIMILAR)

SITE SECURITY WALLS

PEARL GREY

FLOODWALL

STONE KEY PLAN



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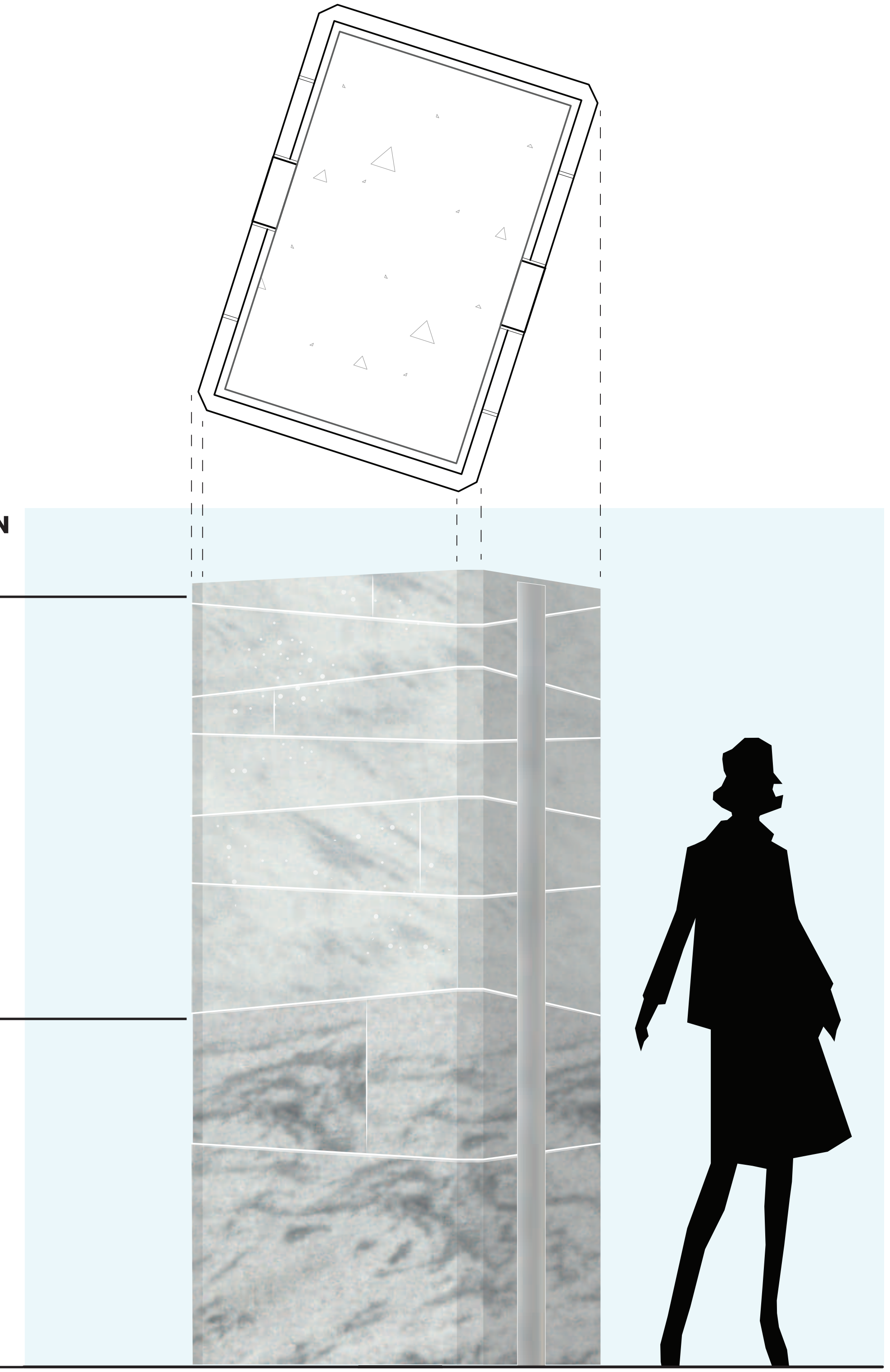
AECOM

EXPOSED FLOODWALL | COLUMNS

PLAN

ELEVATION



PEARL GREY SANDBLASTED FINISH

PEARL GREY HONED FINISH

STONE TYPES

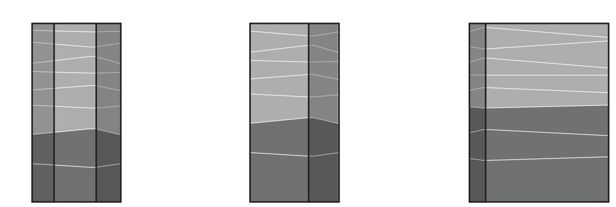
SAINT SEBASTIAN (OR SIMILAR)

SITE SECURITY WALLS

PEARL GREY

COLUMNS

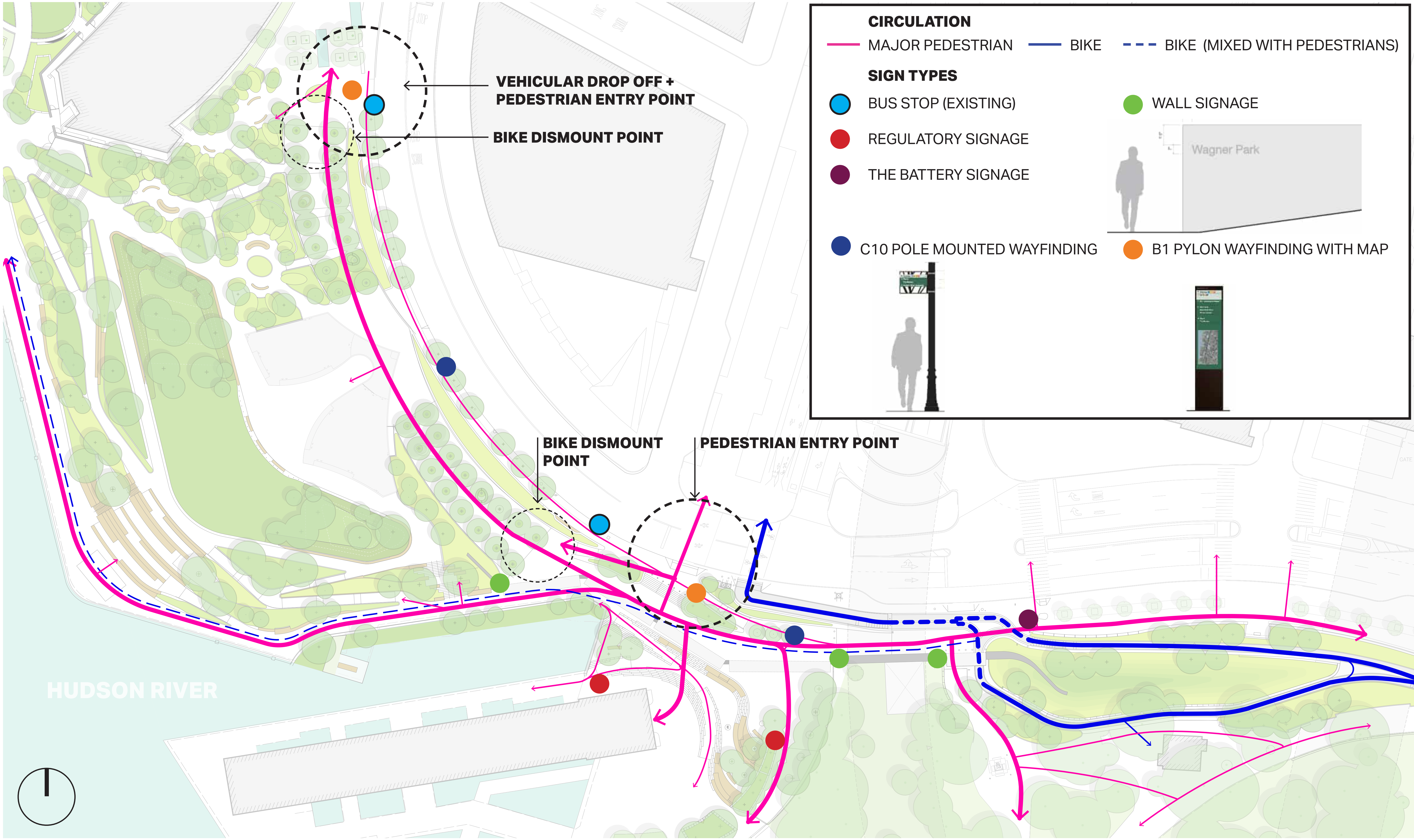
STONE KEY PLAN



WAGNER PARK PAVILION

BUILDING UPDATE

PIER A PLAZA + BATTERY PL | CIRCULATION + WAYFINDING



SITE PLANNING CORE VALUES

- Elevate the site to maximize protected area
- Organize site around central lawn + axis to Statue of Liberty
- Move building closer to street to maximize continuous park area
- Align building and approach with allees + establish central connector space
- Provide universal accessibility throughout park
- Frame views to the Statue of Liberty

PAVILION PLANNING

- Services at Street Level
- Public Areas At Park Level

DESIGN LEGACY | PAVILION CORE VALUES

1. FRAME VIEW TO STATUE OF LIBERTY

2. ALIGN APPROACH AXES WITH TREE ALLÉES + PRESERVE TREES

3. ESTABLISH CENTRAL GATHERING SPACE

4. MAXIMIZE PROTECTED GREEN SPACE

5. ENHANCE PROCESSION FROM STREET TO PARK LEVEL

6. RECALL VAULTING OF EXISTING PAVILION

BATTERY PLACE ELEVATION STUDY | CB1 UPDATE

NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority

AECOM

BATTERY PLACE ELEVATION STUDY | CB1 UPDATE

CB1 Meeting | 22nd February 2021

NEW YORK STATE OF OPPORTUNITY. Battery Park City Authority

AECOM

BATTERY PLACE ELEVATION STUDY | CB1 UPDATE

BATTERY PLACE ELEVATION STUDY | CB1 UPDATE

New York State of Opportunity. | Battery Park City Authority

AECOM

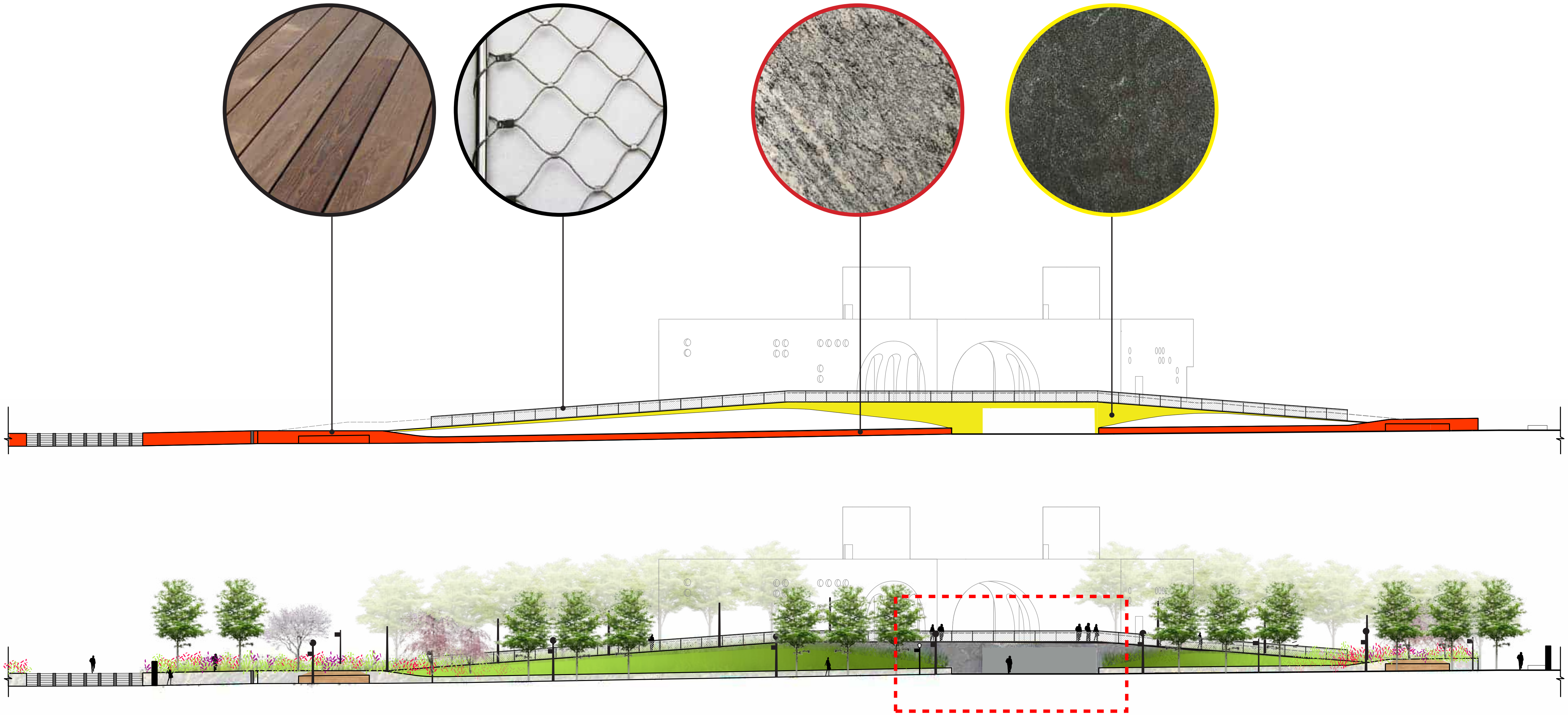
BATTERY PLACE ELEVATION STUDY | CB1 UPDATE

THERMALLY MODIFIED ASH
SEATING ELEMENTS

STAINLESS STEEL W/ XTEND MESH
GUARDRAIL

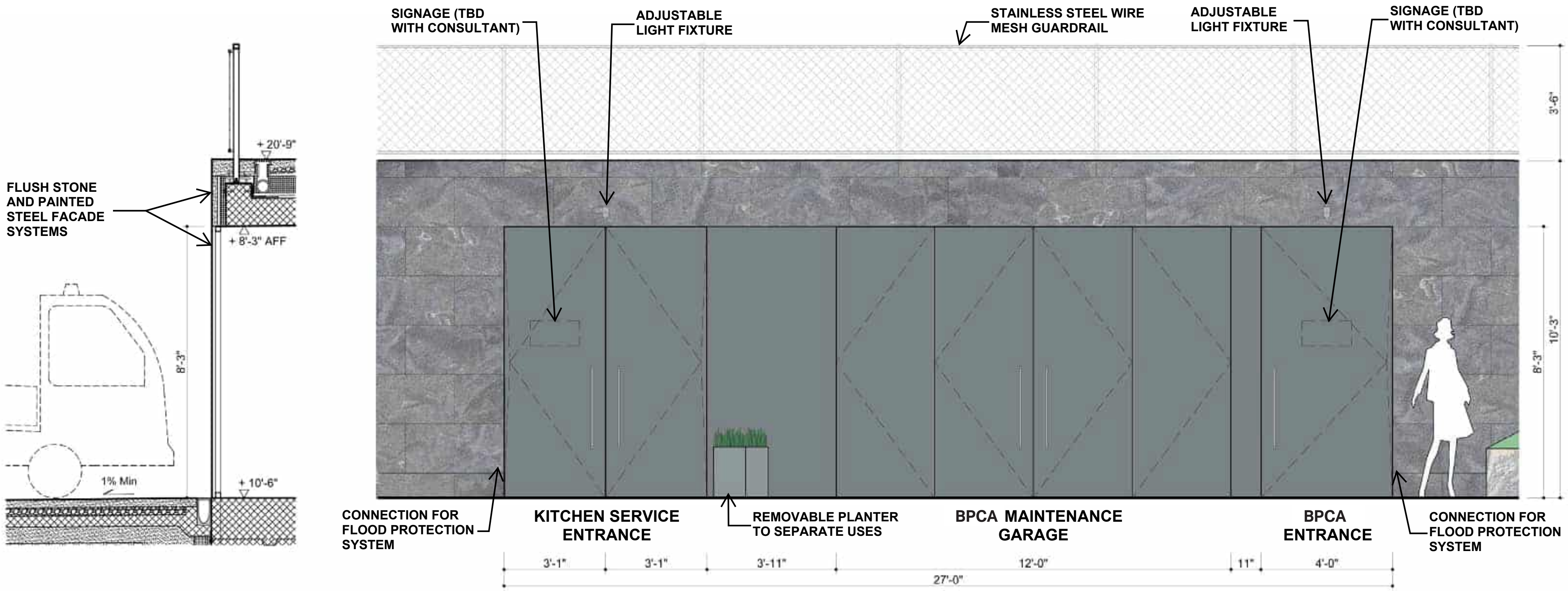
TAPESTRY STONE
SIDEWALK SITE WALL

JET MIST STONE
BERM WALL



CB1 Meeting | 22nd February 2021

BATTERY PLACE ELEVATION STUDY | CB1 UPDATE




JET MIST GRANITE

RAL 7011 PAINTED STEEL WITH SIGNAGE (TBD)


DEPLOYABLE FLOOD PROTECTION SYSTEM


ADJUSTABLE LIGHT FIXTURES


STAINLESS STEEL WIRE DOOR PULLS

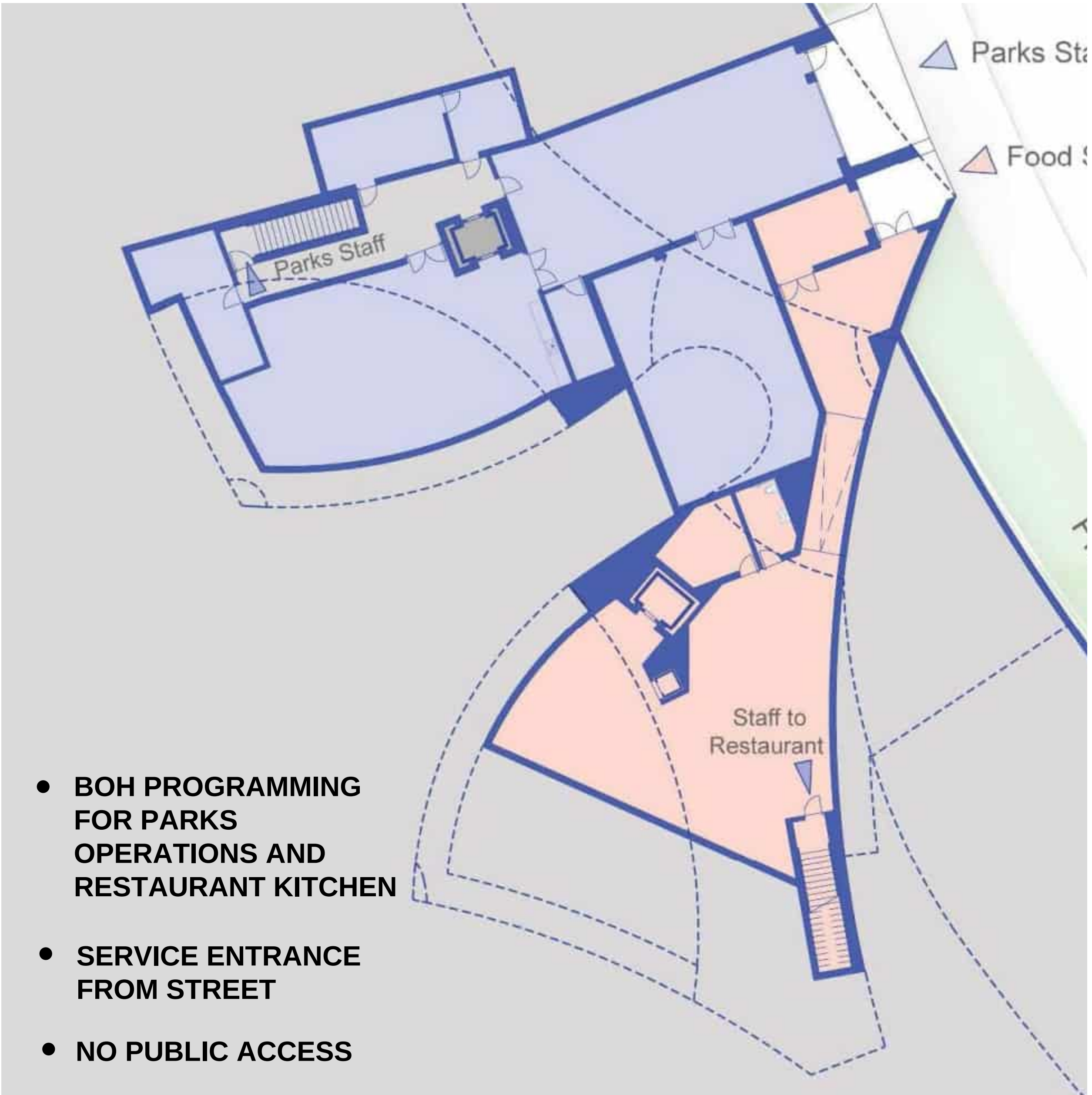

TOURNESOL RECTANGULAR PLANTERS

CB1 Meeting | 22nd February 2021

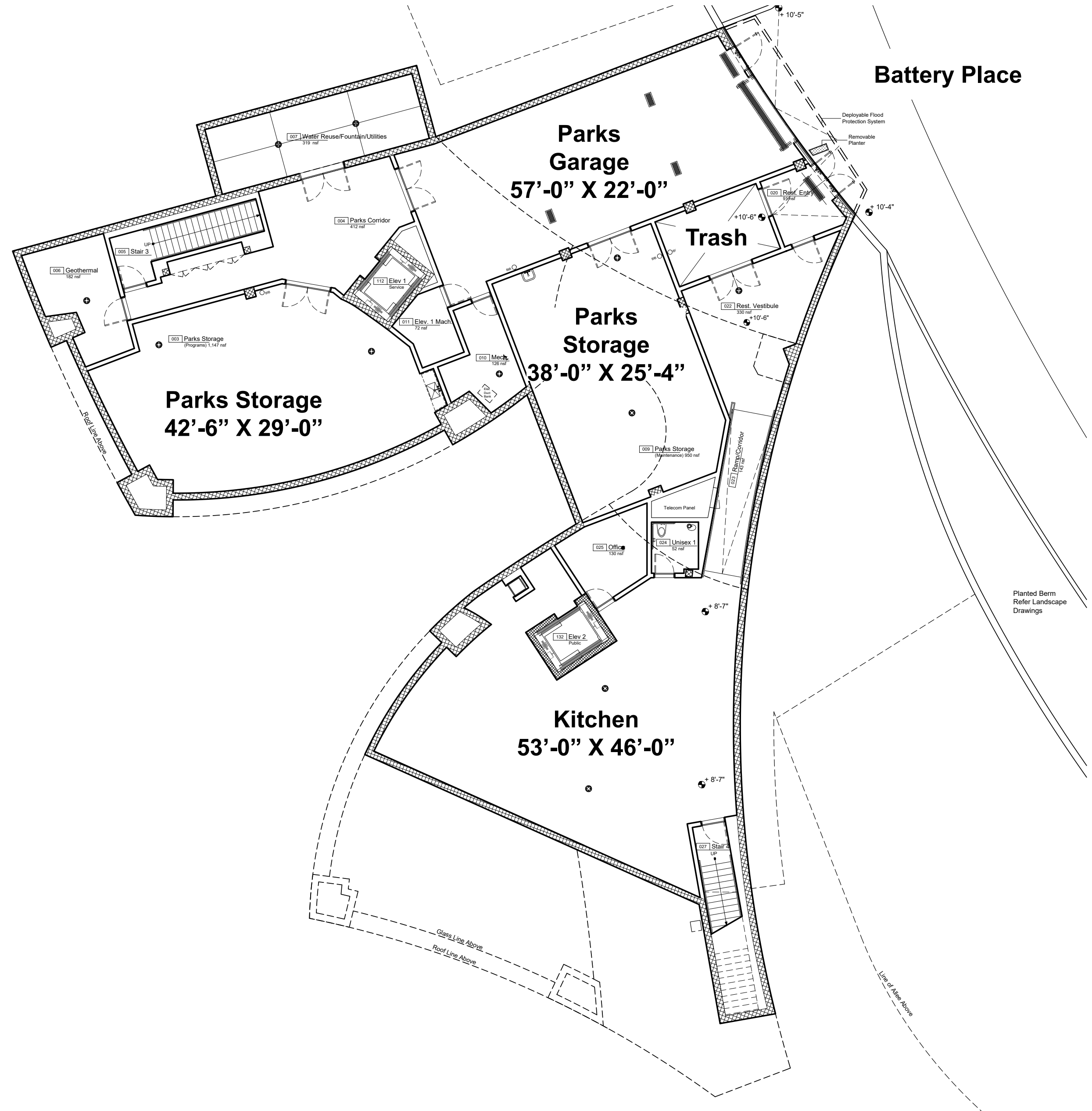
NEW YORK STATE OF OPPORTUNITY. Battery Park City Authority

AECOM

BATTERY PLACE LEVEL PLAN



Public Presentation | January 15th 2020

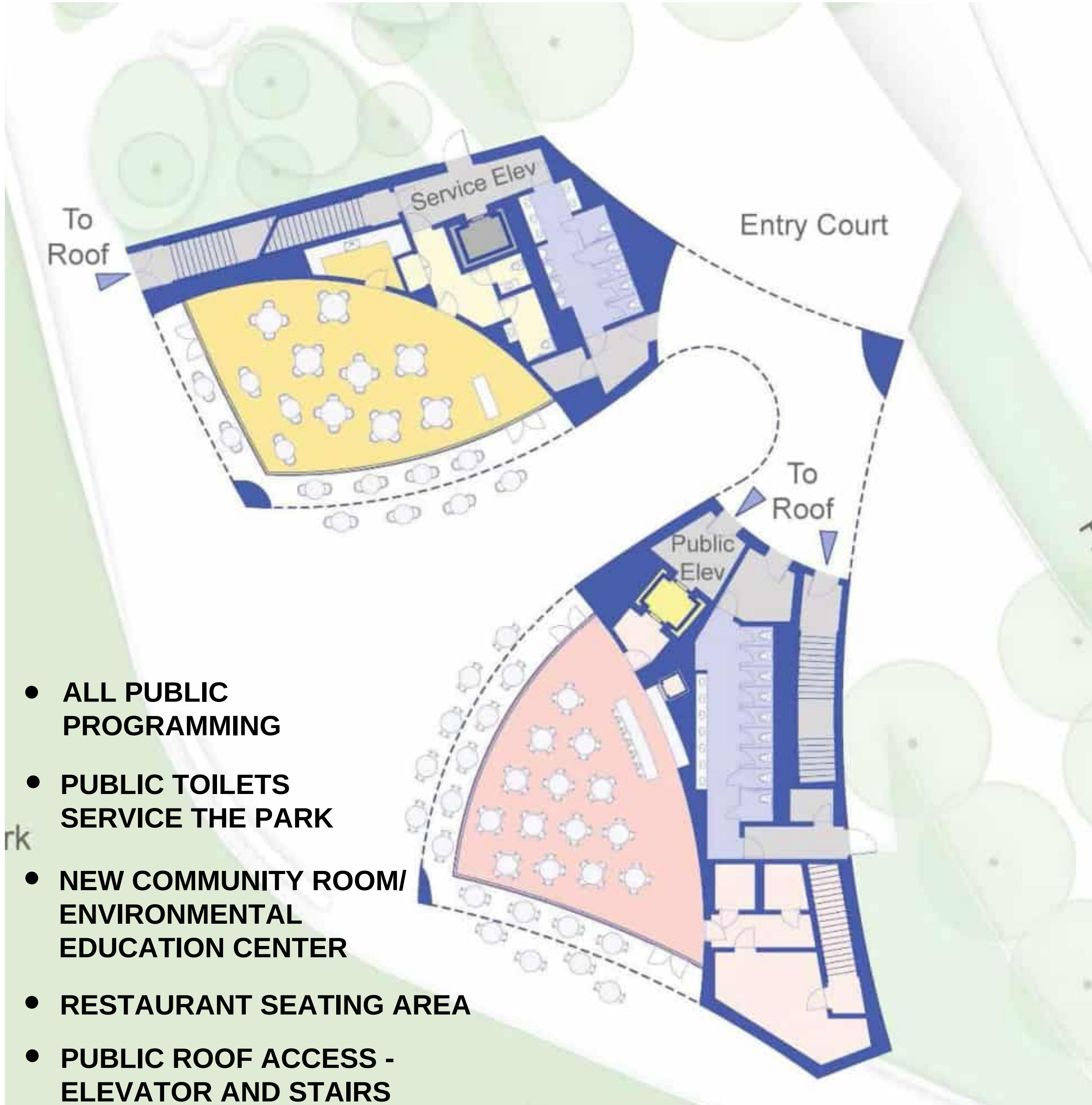


95% Construction Documents | March 12th 2021

NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority

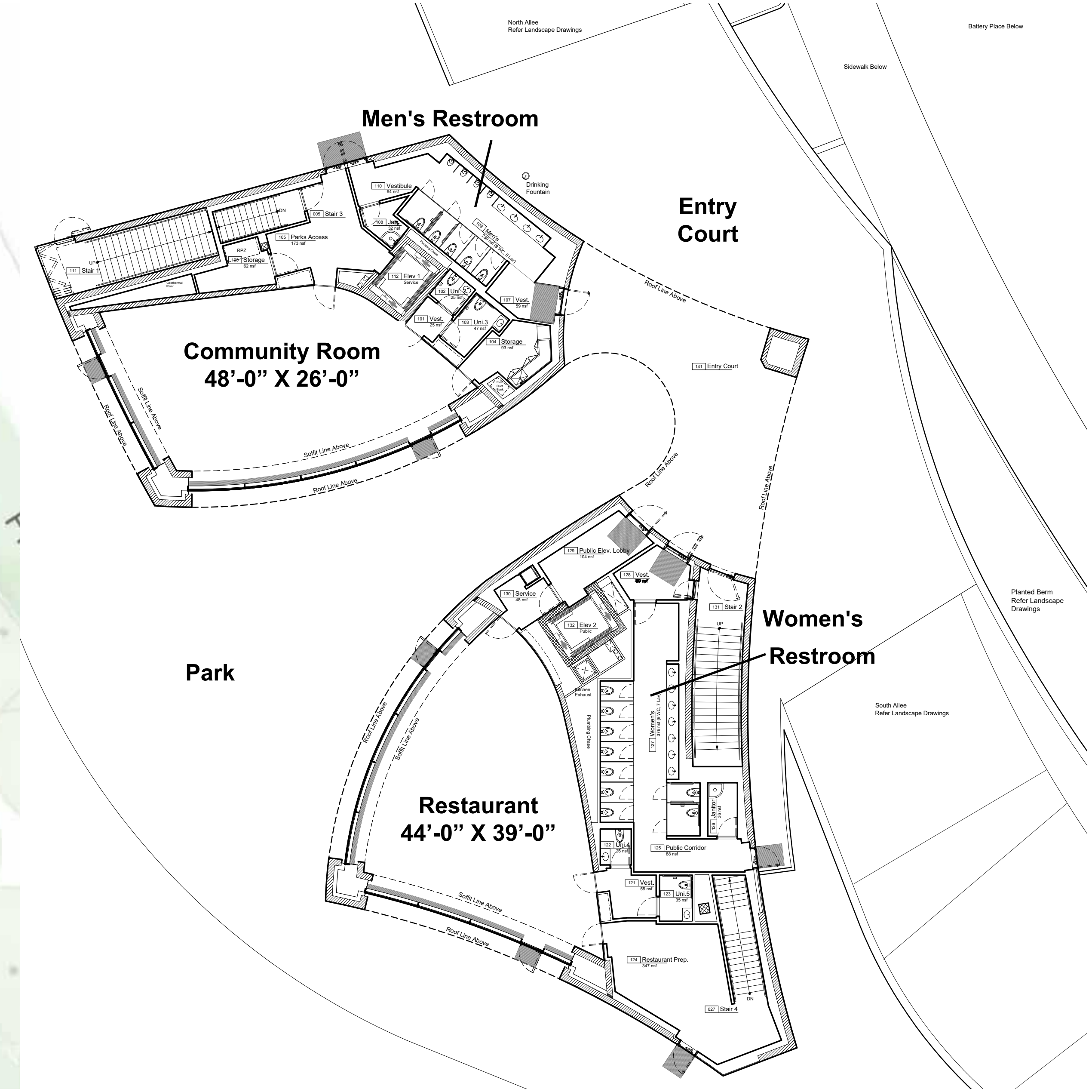
AECOM

PARK LEVEL PLAN



- **ALL PUBLIC PROGRAMMING**
- **PUBLIC TOILETS SERVICE THE PARK**
- **NEW COMMUNITY ROOM/ ENVIRONMENTAL EDUCATION CENTER**
- **RESTAURANT SEATING AREA**
- **PUBLIC ROOF ACCESS - ELEVATOR AND STAIRS**

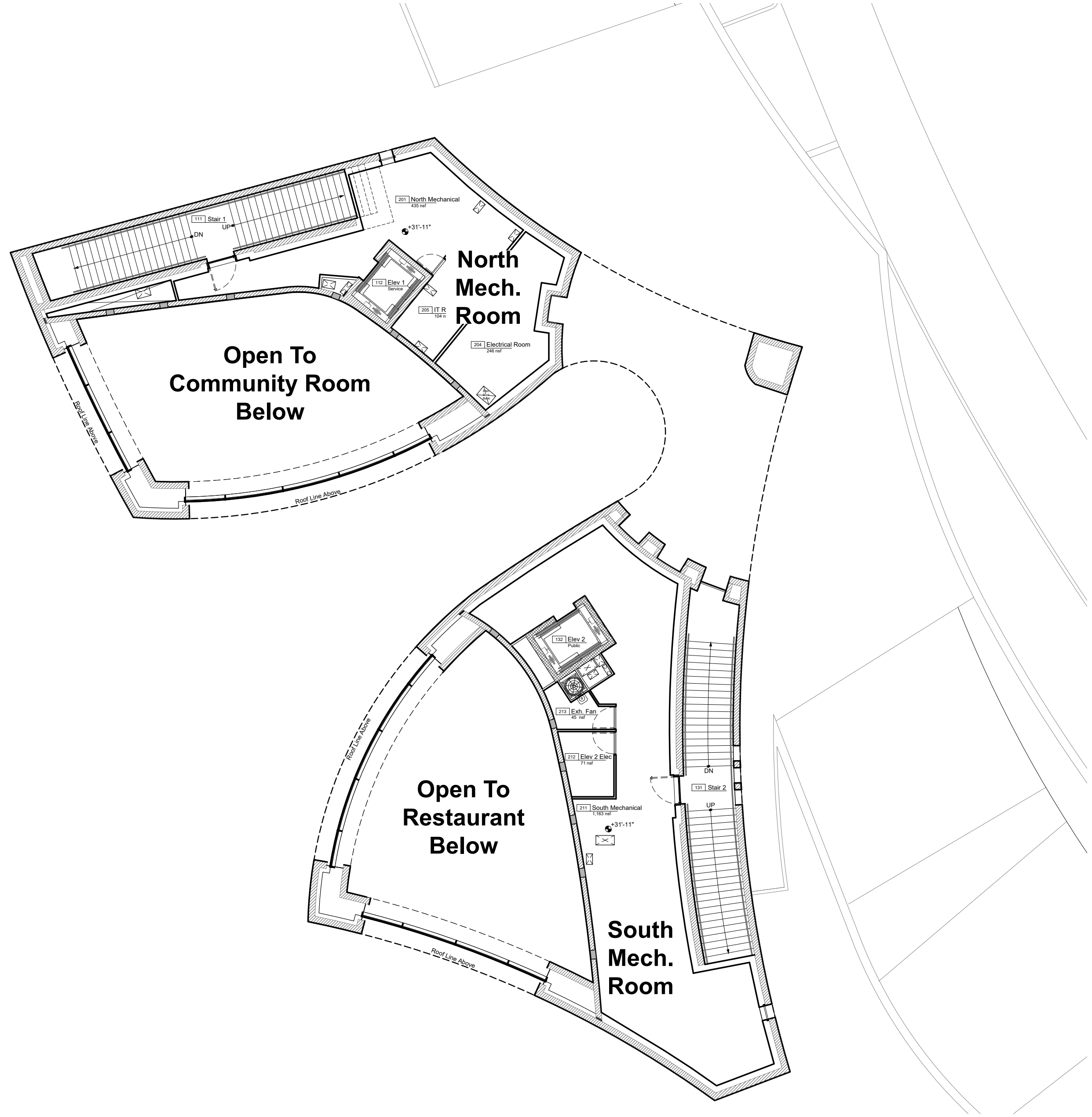
Public Presentation | January 15th 2020



95% Construction Documents | March 12th 2021

MECHANICAL LEVEL PLAN

Public Presentation | January 15th 2020



95% Construction Documents | March 12th 2021

NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority

AECOM

ROOF LEVEL PLAN

Public Presentation | January 15th 2020

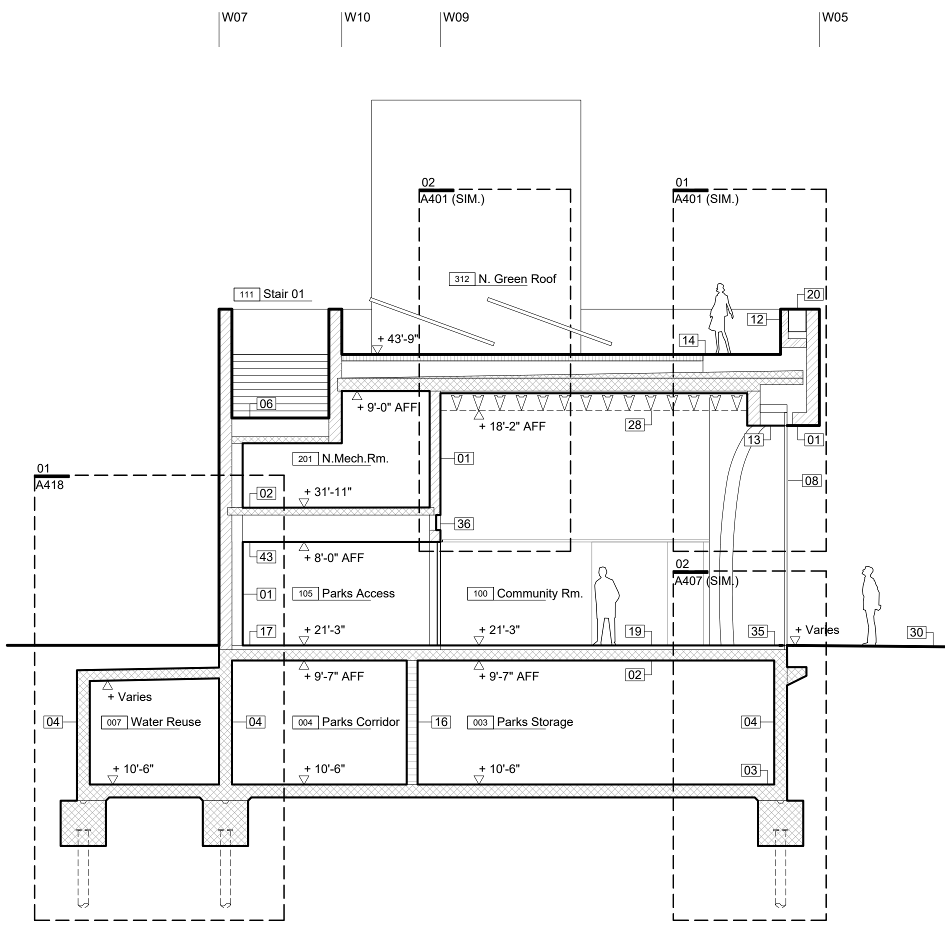
95% Construction Documents | March 12th 2021

NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority

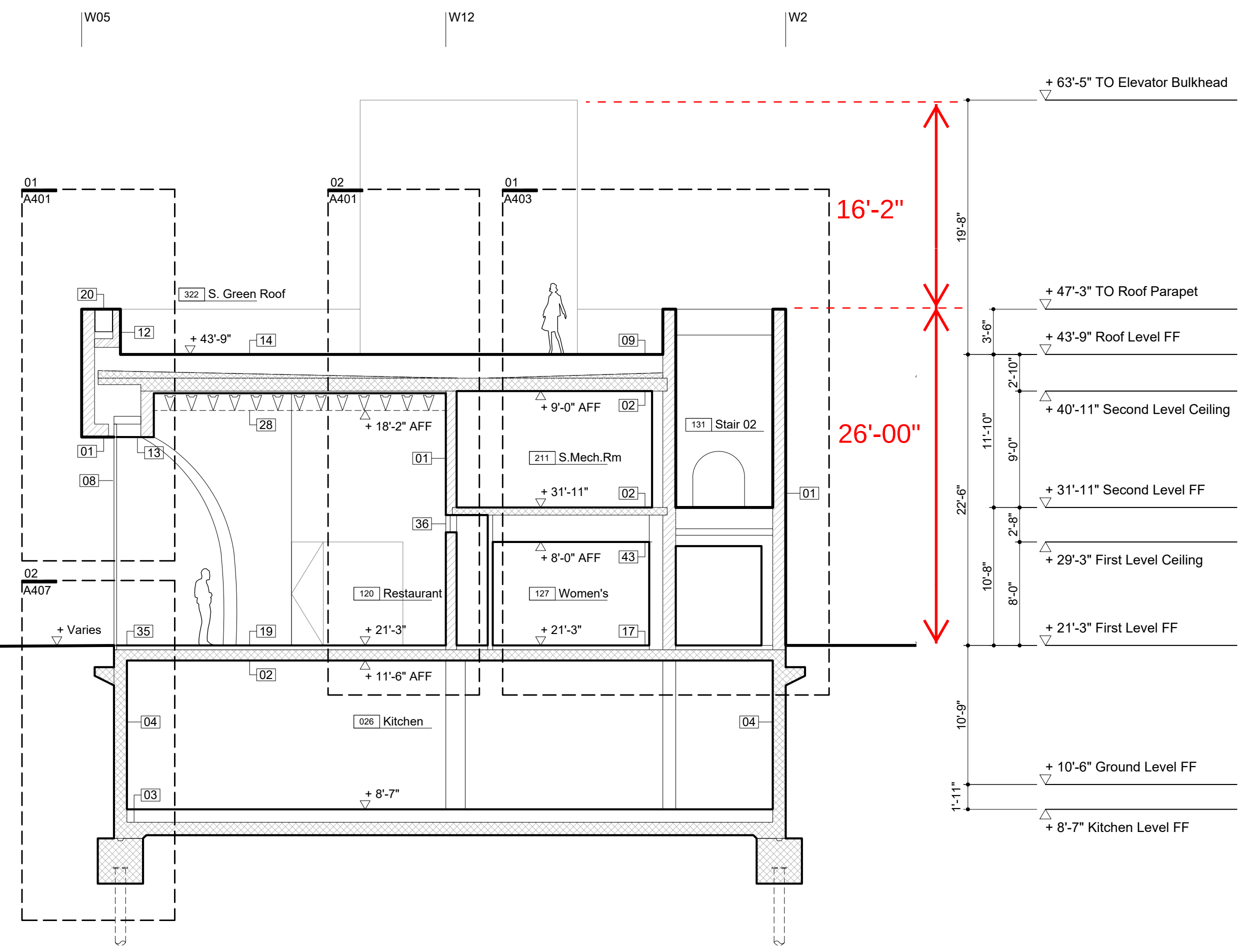
AECOM

SECTIONS

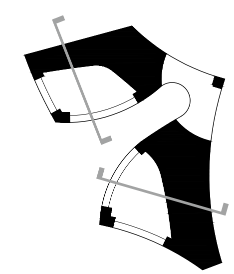
Design Development | March 12th 2021



Section Through Community Room



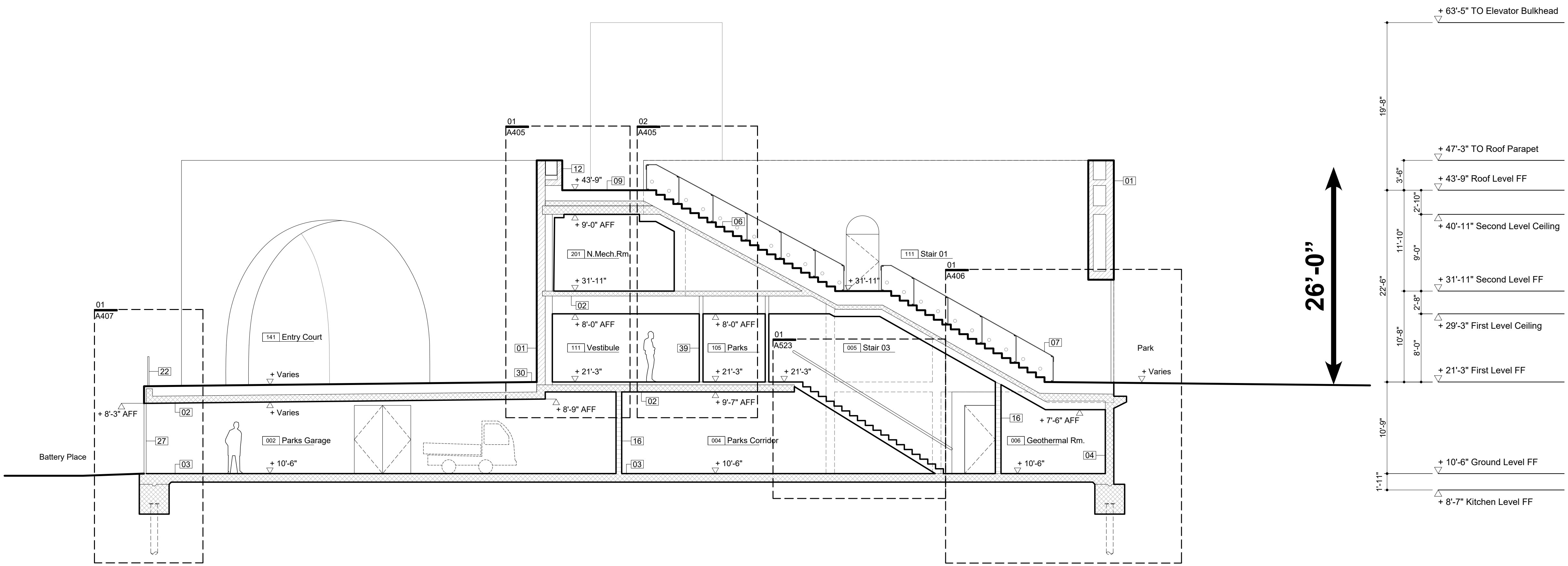
Section Through Restaurant



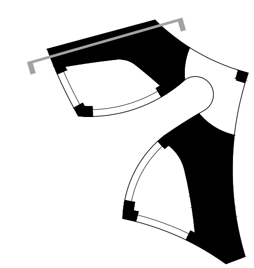
New York State of Opportunity. | Battery Park City Authority

AECOM

SECTIONS

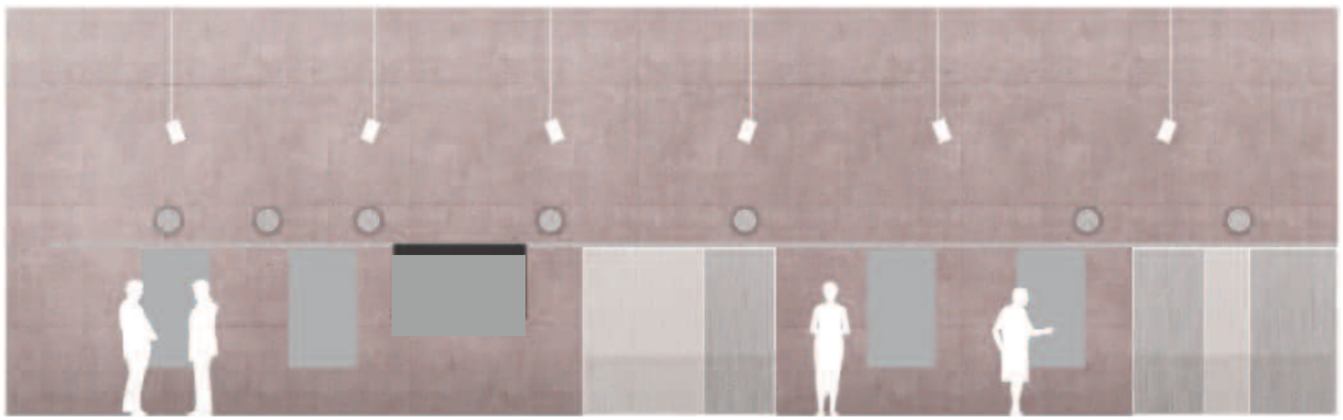


Section Through North Stair

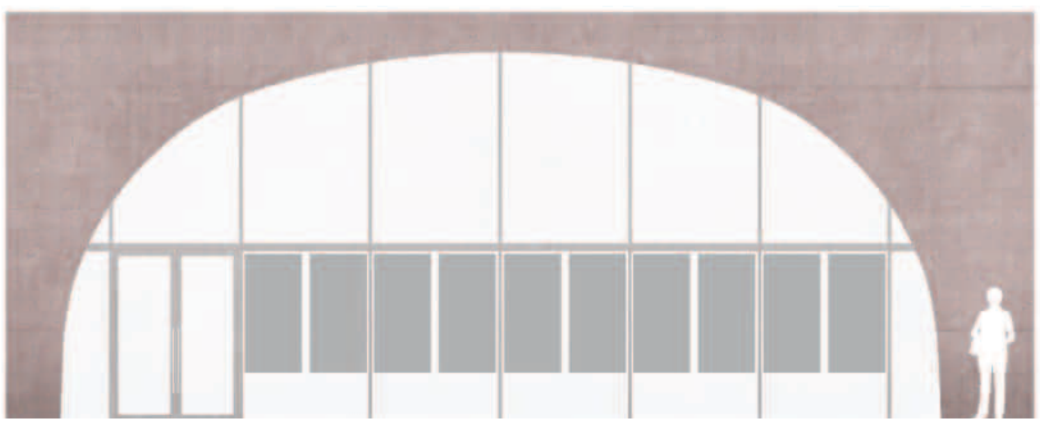


COMMUNITY ROOM | INTERIOR ELEVATIONS

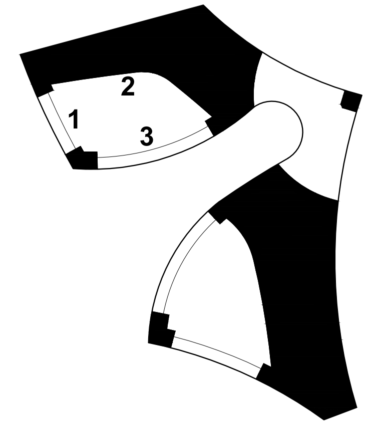
Elevation 01



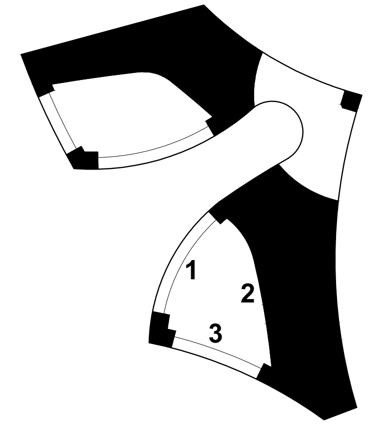
Elevation 02



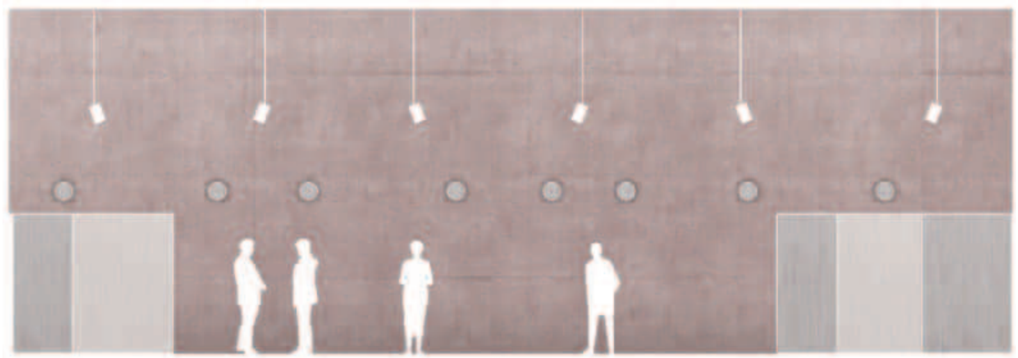
Elevation 03



RESTAURANT | INTERIOR ELEVATIONS



Elevation 01



Elevation 02

Elevation 03

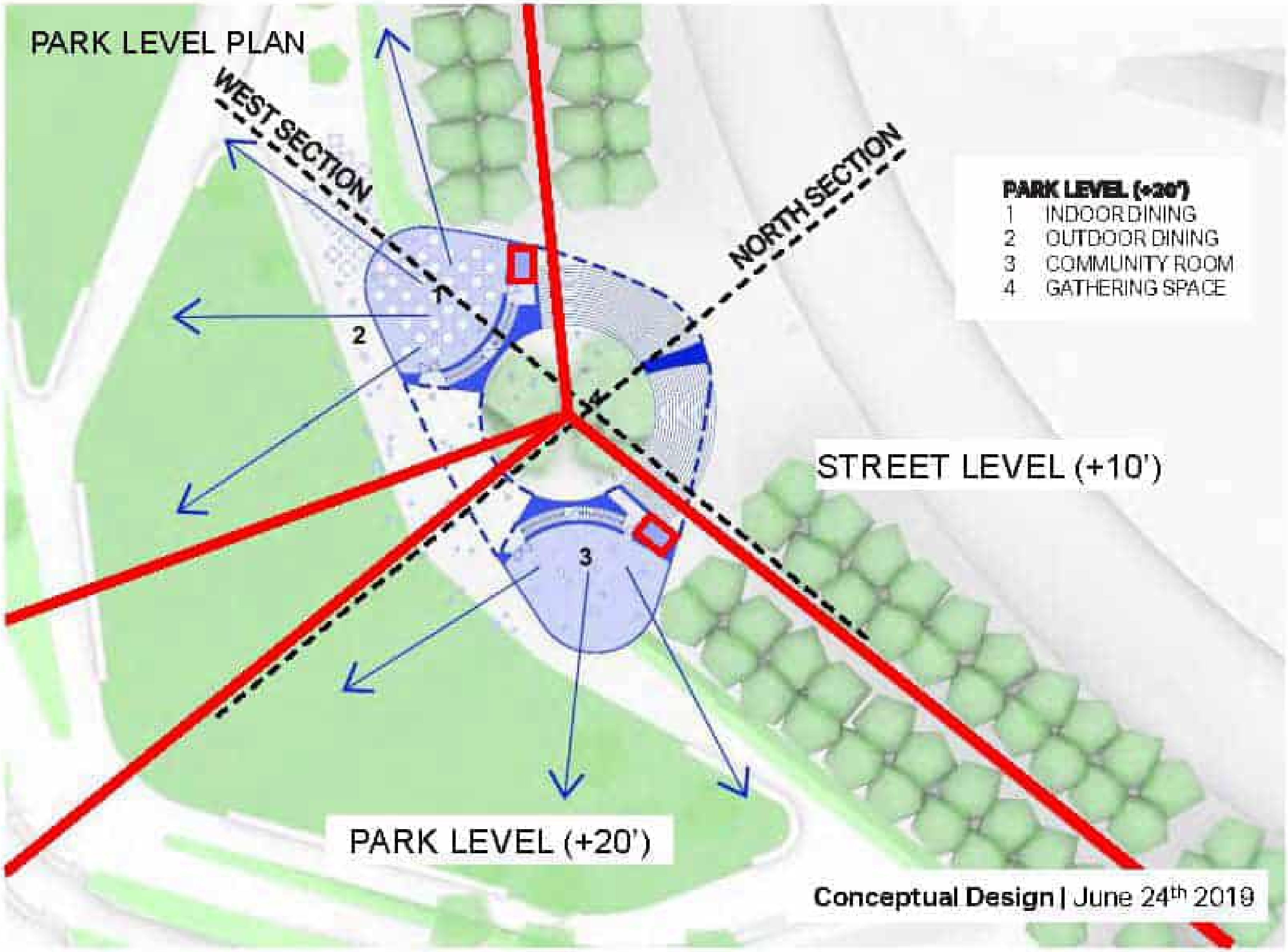
WAGNER PARK PAVILION

DESIGN STUDIES + ACCESSIBILITY

PLANNING

- The Pavilion is surrounded by public spaces, therefore there is no 'rear elevation'
- Back-Of-House functions for both BPCA Parks and Restaurant require service access from the street
- The raising of the park created an opportunity to naturally separate out the service areas from the public areas
- The street level program is BOH only, the lawn level program is public
- The Pavilion is a stand alone structure which can be experienced from all sides at lawn level

CONCEPTUAL DESIGN | PUBLIC MEETING 3



JUNE 2019 CONCEPT DESIGN

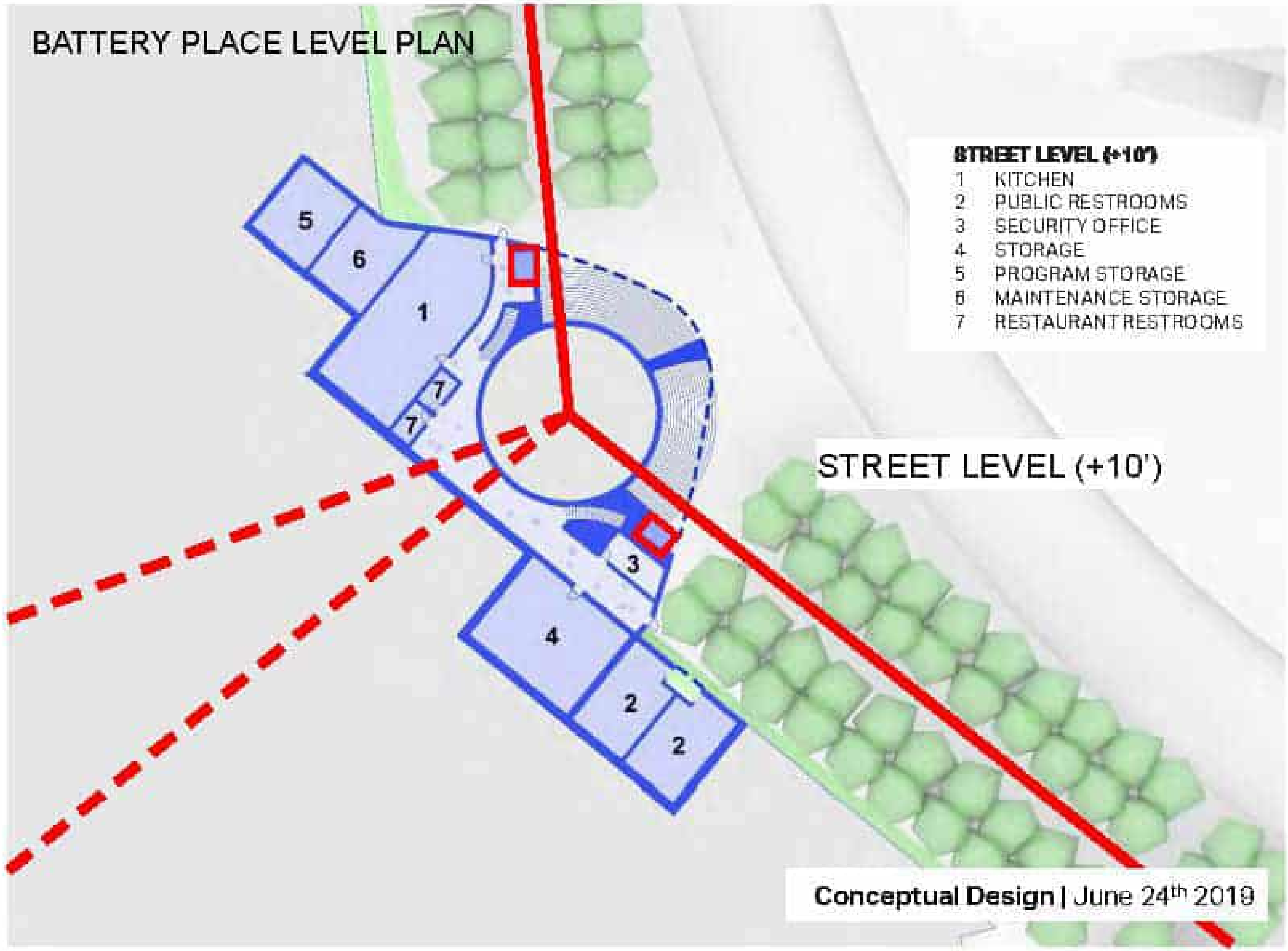
CONSIDERATIONS:

- Site planning commemorates original planning axis along allees with courtyard at junction at street level
- Original allee trees
- Grand Stair from Street level up to Park level
- Elevator included for ADA access

FEEDBACK:

- Adjust for universal access
- Maintenance concerns with elevators
- Ramp preferred in addition to an elevator

CONCEPTUAL DESIGN | PUBLIC MEETING 3



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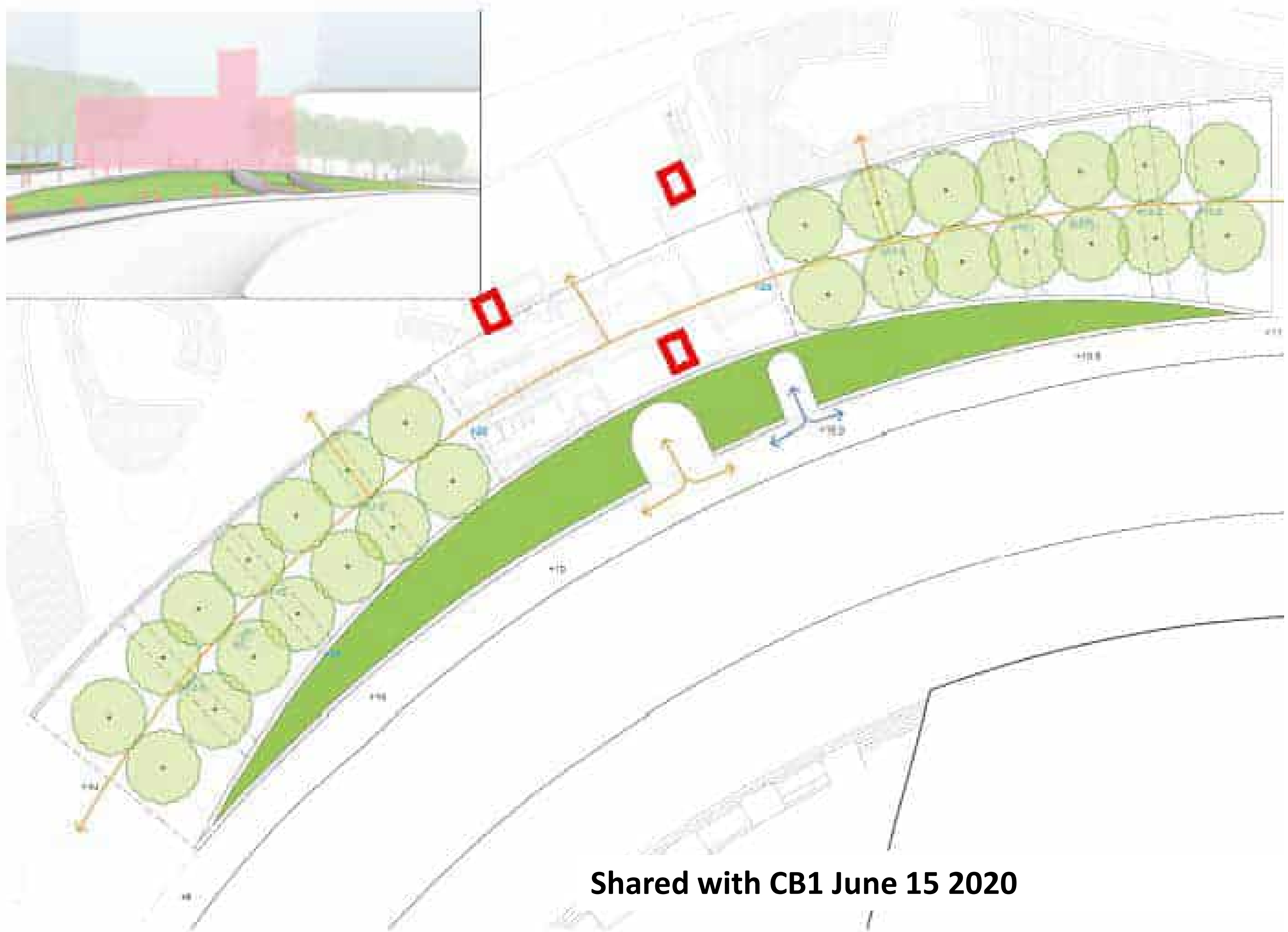
RAMP ACCESS STUDIES



Shared with CB1 June 15 2020

CONSIDERATIONS

- Primary site arrival always considered as through allees
- Allee trees identified as at end of life
- Ramp integrated into new allees for universal access and to respect the original arrival sequence
- Separate elevators identified as required for public and BPCA operations
- Public elevator lobby located at street level adjacent to footpath and public toilets
- Safety concern at lobby afterhours and with interaction between public and BPCA carts
- Cost of maintaining 3 elevators

  Added height and mass of elevator at street edge (total height including overrun 57')

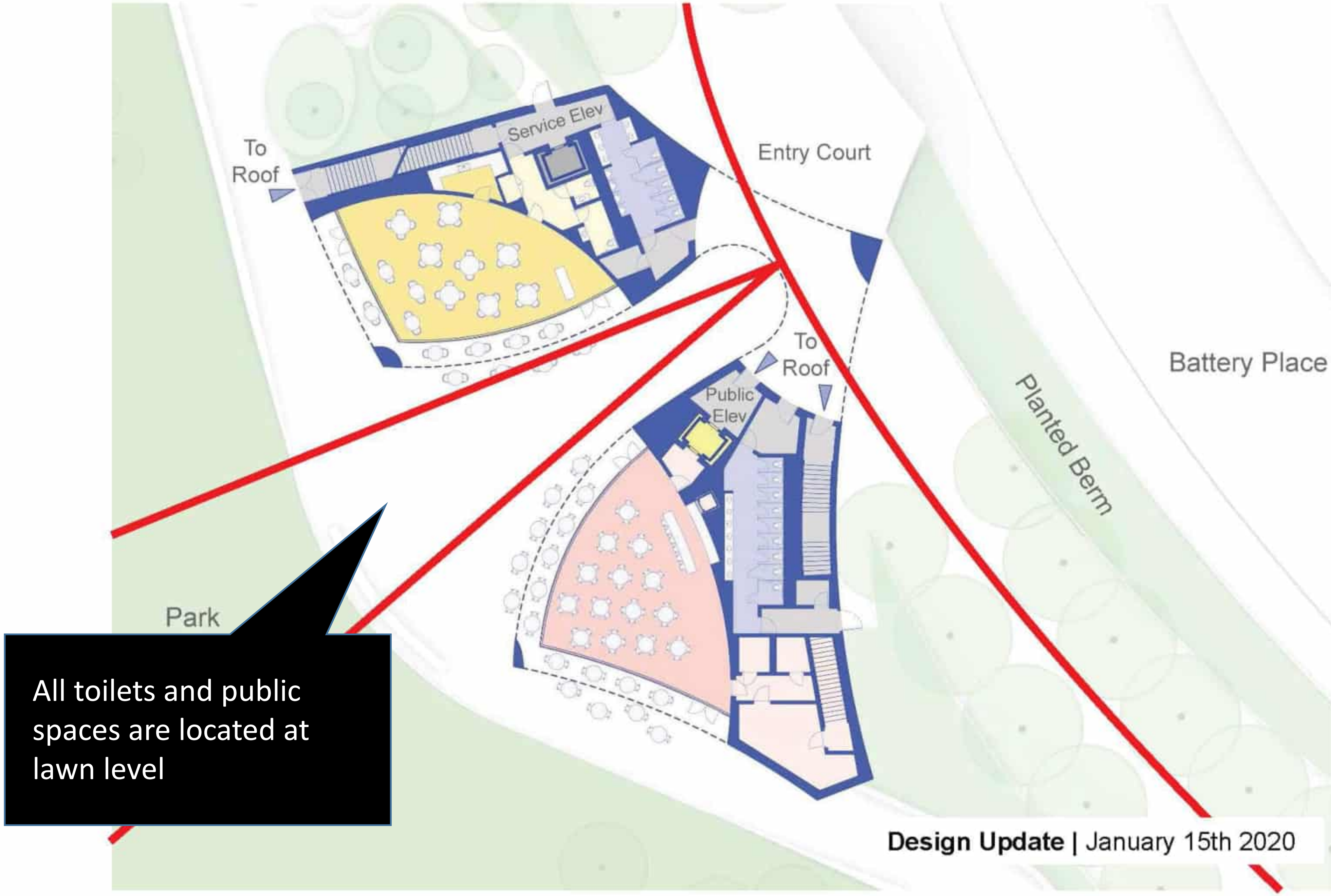
RAMP ACCESS STUDIES

Shared with CB1 June 15 2020

CONSIDERATIONS

- Concern with difficulty accessing public toilets at street from the park level during a large programming event (ie Swedish festival)
- Potential for stair and ramp access from centrally located point along Battery Place studied.
- Ultimately rejected due to lack of significant advantage over allee ramp and concern with overcrowding at street level.

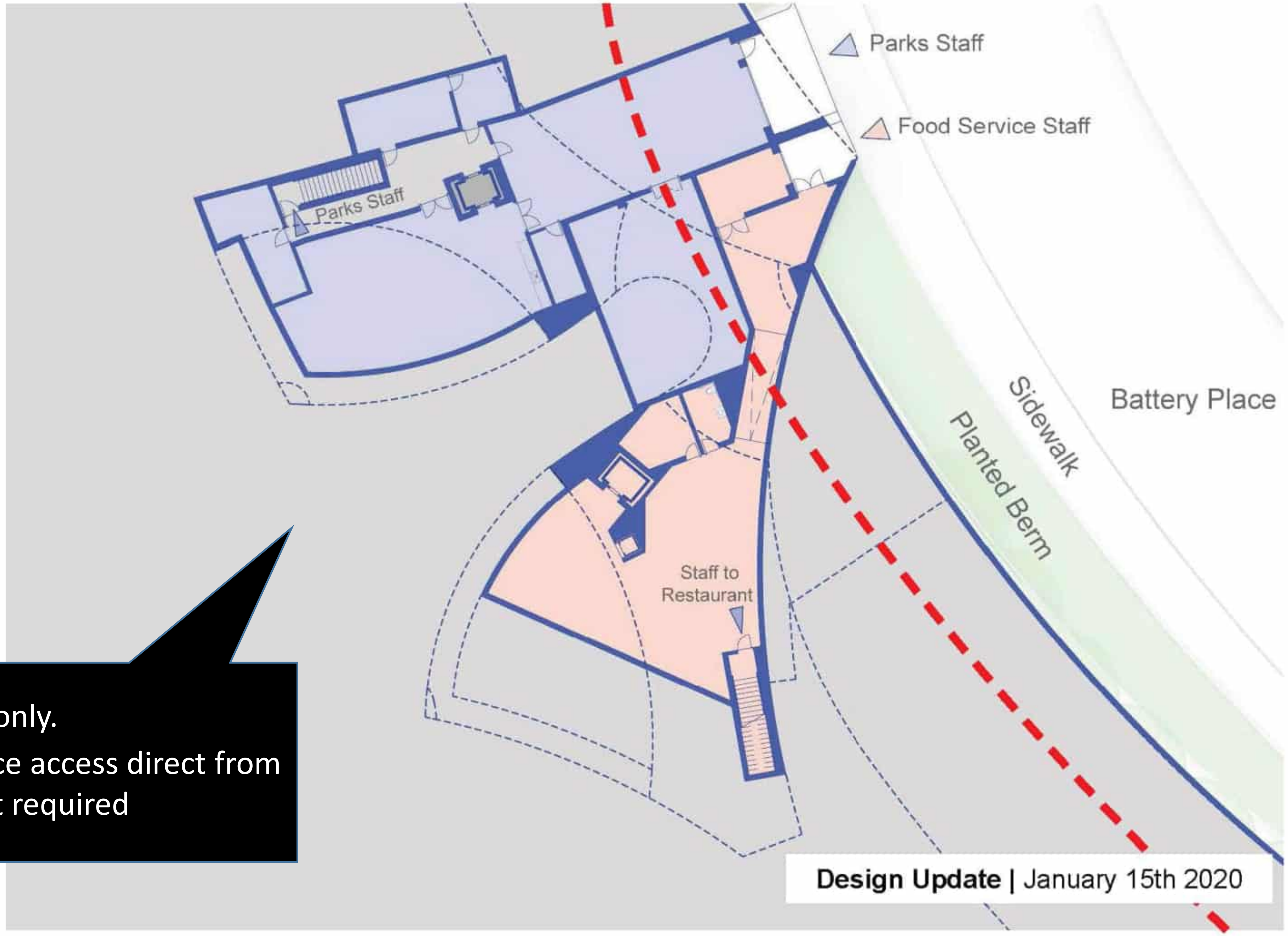
DESIGN UPDATE | PUBLIC MEETING 4



CONSIDERATIONS

- All toilets and public spaces relocated to lawn level to service the public
- Only Back-Of-House program now at Battery Place Level
- Eliminated isolated elevator for safety reasons. Also eliminates added maintenance
- Reviewed Universal Access with Mayor's Office for People with Disabilities (MOPD)
- MOPD determined elevator is not required with ramped allees
- Complied with ADA in letter and spirit
- Section 103 Equivalent Facilitation.
- Section 206.3 accessible routes coincide with general circulation paths.

DESIGN UPDATE | PUBLIC MEETING 4



BOH only.
Service access direct from street required

CONSIDERATIONS

- All toilets and public spaces relocated to lawn level to service the public
- Only Back-Of-House program now at Battey Place Level
- Eliminated isolated elevator for safety reasons. Also eliminates added maintenance
- Reviewed Universal Access with Mayor's Office for People with Disabilities (MOPD)
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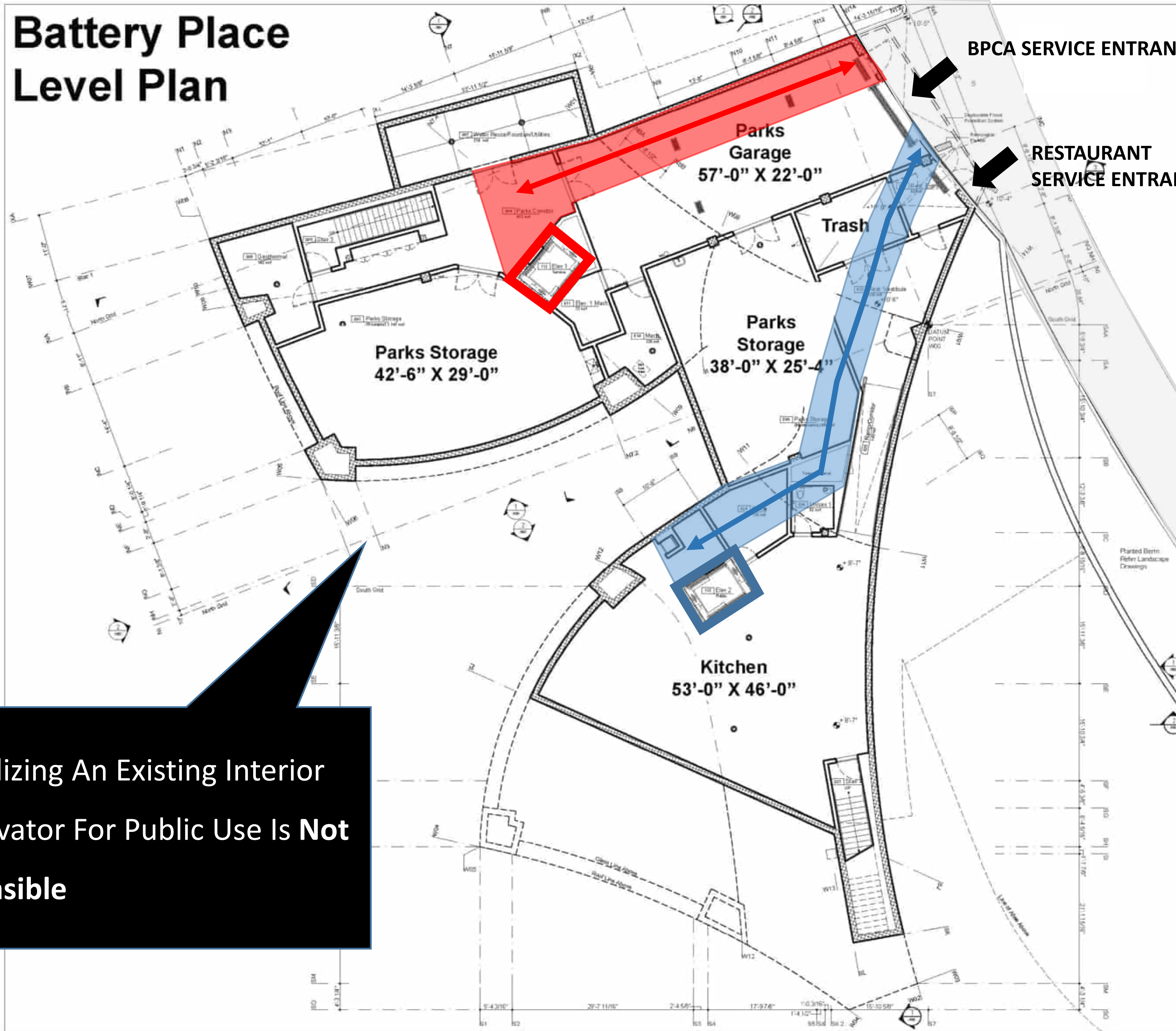
Battery Place Level Plan



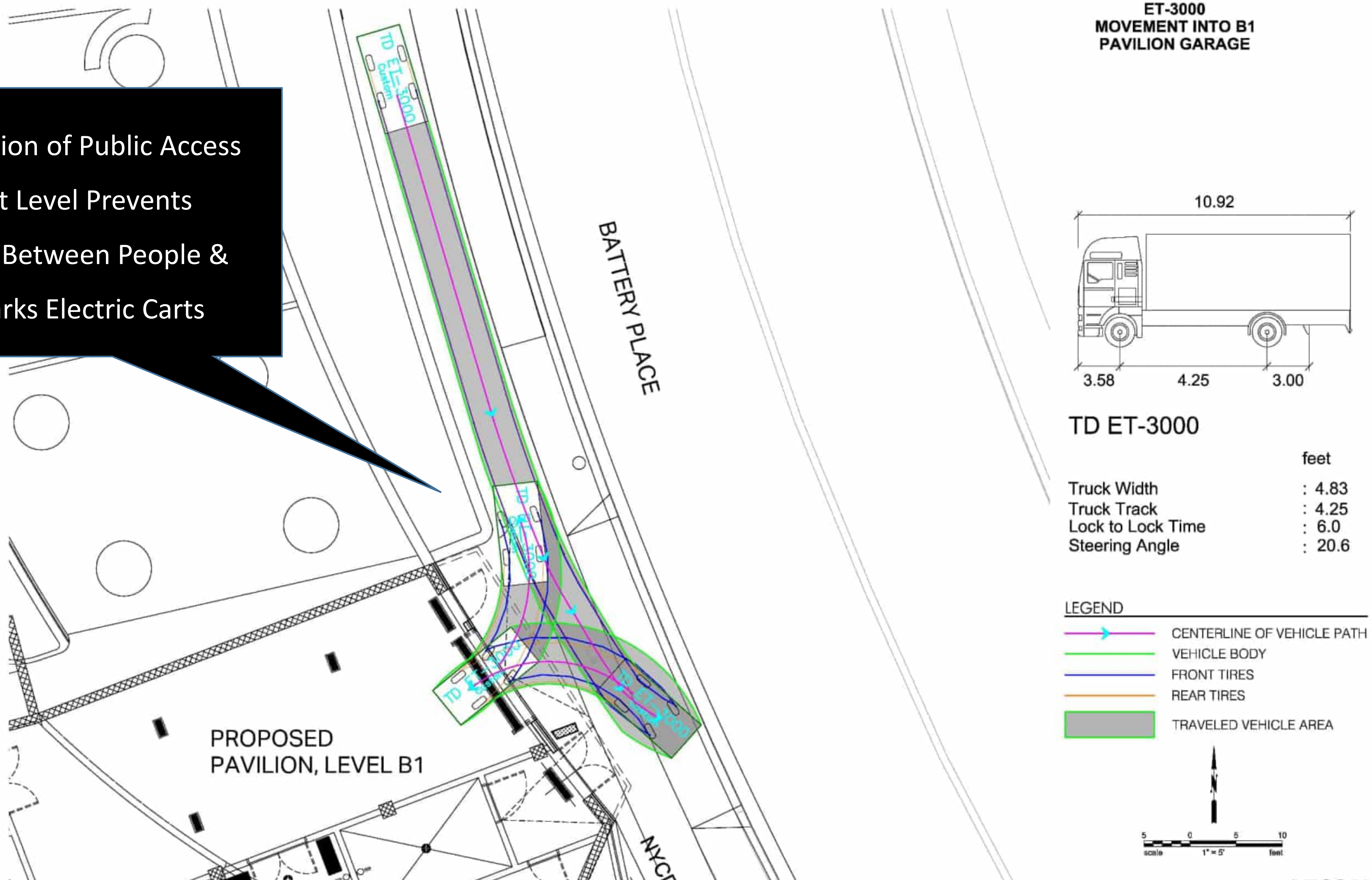
Utilizing An Existing Interior Elevator For Public Use Is **Not Feasible**

CONSIDERATIONS

- Existing elevators located in areas not accessible to public.
- If including dedicated public access corridors, would introduce long travel distances (70+') from street.
- Safety and security concerns in long public corridors
- Inconvenient and un-intuitive wayfinding.
- Likely no access after BPCA staff hours which wouldn't accommodate late evening access.
- Large impacts to required program and square footage of BPCA and/or restaurant BOH areas.

SOUTH BATTERY PARK RESILIENCY PROJECT
AUTOTURN MOVEMENTS THROUGH PROPOSED SITE

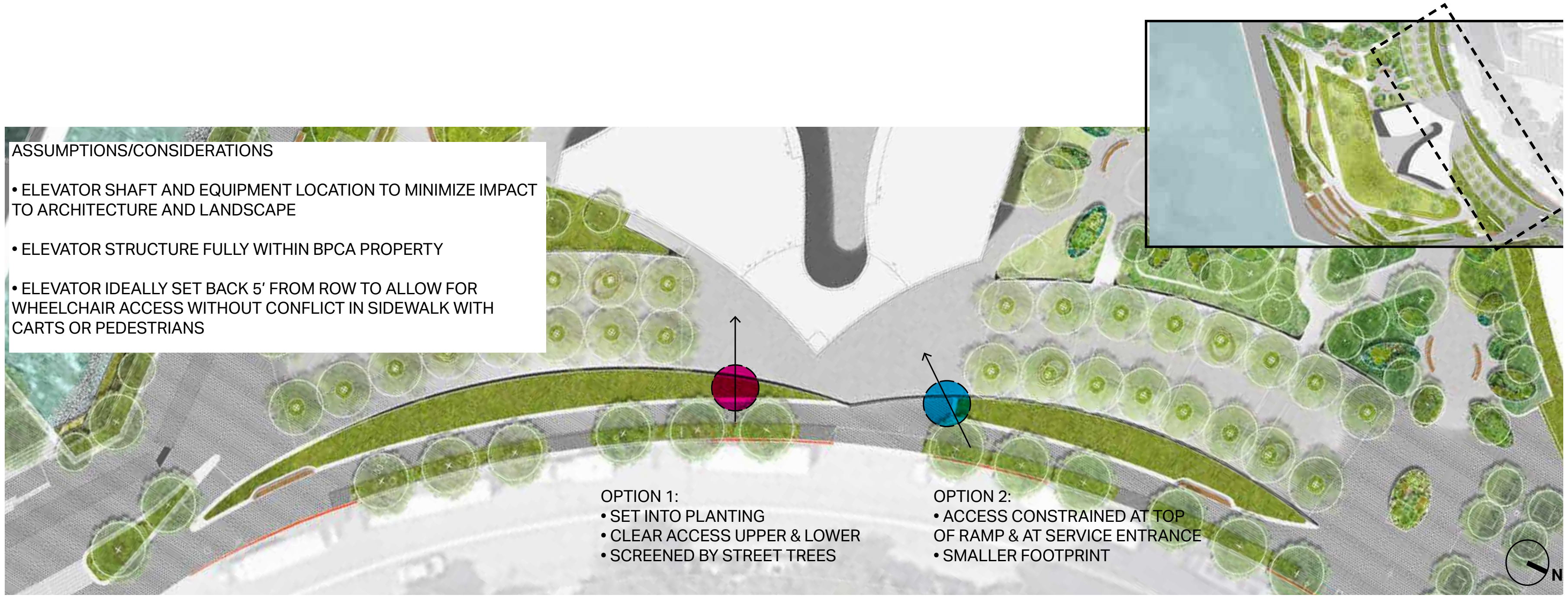
Elimination of Public Access At Street Level Prevents Conflict Between People & BPCA Parks Electric Carts

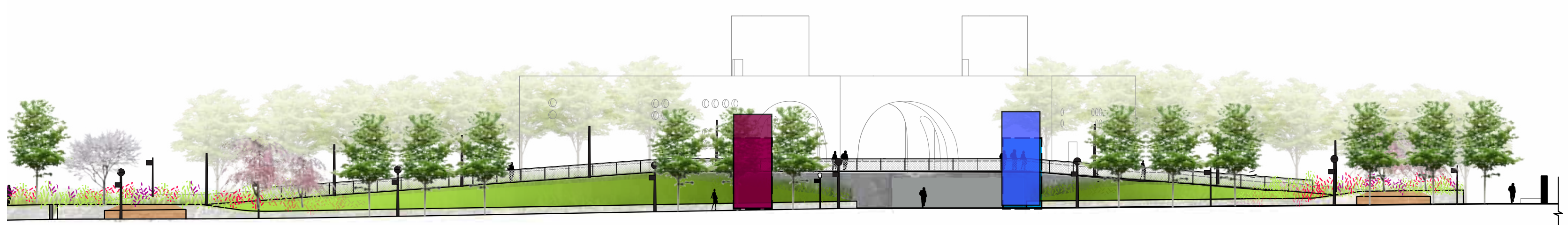


3/29/2021

INTERNAL COORDINATION AECOM

INTERNAL DESIGN STUDY | MARCH 2021





Design Study | March 19th 2021

CONSIDERATIONS

- **Highly visible on Battery Place**
- **Undesirable massing and aesthitec impact**
- **Placement doesn't align with braoder wayfinding strategies**
- **Circulation impact with BPCA electric carts at service entrance**
- **Additional project cost**
- **Redesign efforts and additional construction scope**
- **Increased operation and maintenance**

WAGNER PARK PAVILION

SUSTAINABILITY UPDATE

NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority

AECOM

SUSTAINABILITY | CERTIFICATIONS

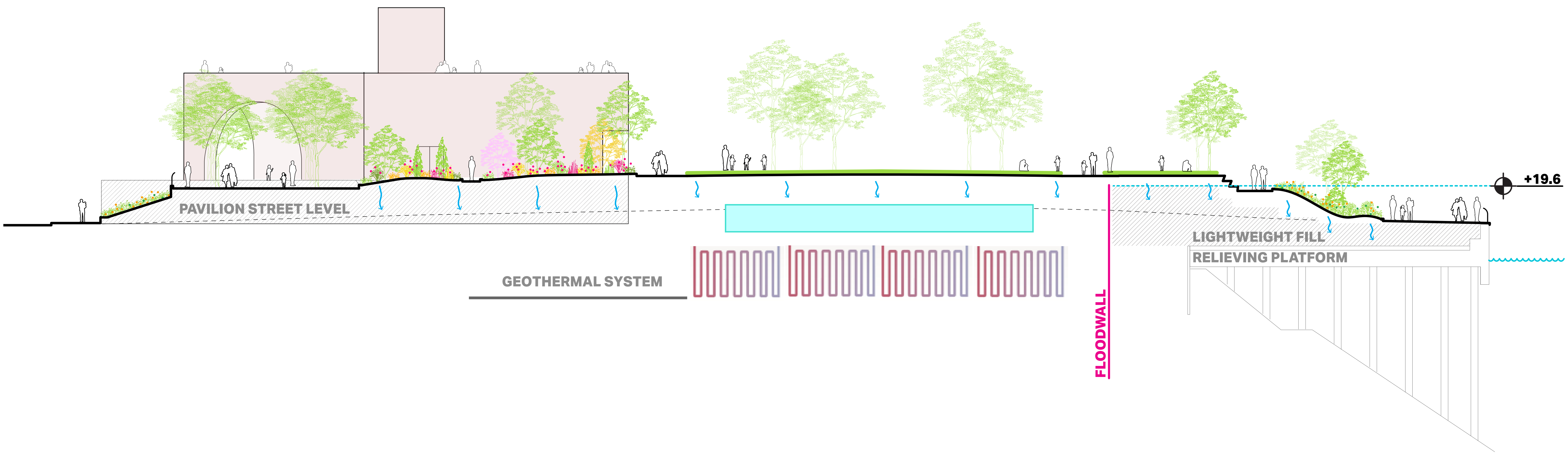
BUILDING	ZERO CARBON CERTIFICATION
SITE	WEDG Waterfront Edge Design Guidelines

SUSTAINABILITY | MEASURES

SITE STRATEGIES:
- Flood resilient, elevated park design
- Enhanced visual and physical access to water
- Increased waterfront pathway and greenway connectivity
- Stormwater management using infiltration and underground cistern
- Reduction of water consumption through subsurface irrigation at the lawn areas
- Upland riparian zone habitat and pollinator support
- Lowland and in-water habitat support at Pier A inlet
- 85% Native Planting
- Urban heat island mitigation - average pavement SRI above 29
- Environmentally-responsible construction
- Solar lighting for resilient energy sources
- Low carbon concrete
- Site salvage (plants and materials)
- Educational programing
- Community engagement + site assessments

BUILDING STRATEGIES:
- Bird collision deterrence
- Geothermal
- Rooftop solar thermal panels
- Green roof
- Triple pane, low e-glazing
- High reflectance pavement
- Low carbon concrete and interior materials
- Healthy and low-emitting materials
- Rainwater collection + reuse
- Efficient potable water fixtures
- Energy efficient lighting
- Highly insulated building envelope
- Energy recovery ventilation
- Ground source heat pump technology significantly increases building energy efficiency
- Energy efficiency building systems include energy recovery ventilation, demand control ventilation, and variable speed supply fans
- All-electric building, including restaurant and kitchen equipment

SUSTAINABILITY | WAGNER SECTION



ILFI ZERO CARBON CERTIFICATION | REQUIREMENTS

FIRST PERFORMANCE-BASED CARBON STANDARD ADDRESSING BOTH EMBODIED AND OPERATIONAL CARBON.

OPERATIONAL CARBON:

- Net zero energy including onsite & offsite measures
- No combustion
- Achieve **25% EUI REDUCTION** from ASHRAE equivalent building
- Offset all energy use with renewable energy

CURRENT DESIGN:

- Exceeding target, anticipating **38% EUI REDUCTION**.

EMBODIED CARBON:

- Embodied carbon of primary foundation, structure and enclosure must be **reduced by 10%**
- Project total embodied carbon should be <500 kg CO2e/m2
- Disclose and offset the remainder of embodied carbon

- **CURRENT DESIGN:**
  Exceeding target, anticipating **37% REDUCTION**.

EMBODIED CARBON OFFSET

10% REDUCTION

Table 1. Applicable Building Materials

PRIMARY MATERIAL ASSEMBLIES	Foundation	Footings Retaining Walls
	Structure	Framing Reinforcement Slabs + Decking
	Enclosure	Cladding Fenestration Insulation Roofing
INTERIOR MATERIAL ASSEMBLIES	Finishes	Ceilings Floors Walls + Partitions
	Partitions	Fenestration Framing Insulation
ADDITIONAL ASSEMBLIES (OPTIONAL TO INCLUDE)	Interior Furnishings	Equipment Fixtures Furniture
	Building Systems	Electrical Mechanical Plumbing + Fire Protection
	Site Work	Excavation Exterior Paving Shoring + Formwork

ILFI ZERO CARBON CERTIFICATION | LIFE CYCLE ASSESSMENT

EMBODIED CARBON:
THE SUM OF ALL GREENHOUSE GAS EMISSIONS RESULTING FROM THE MINING, HARVESTING, PROCESSING, MANUFACTURING, TRANSPORTATION, AND INSTALLATION OF BUILDING MATERIALS.

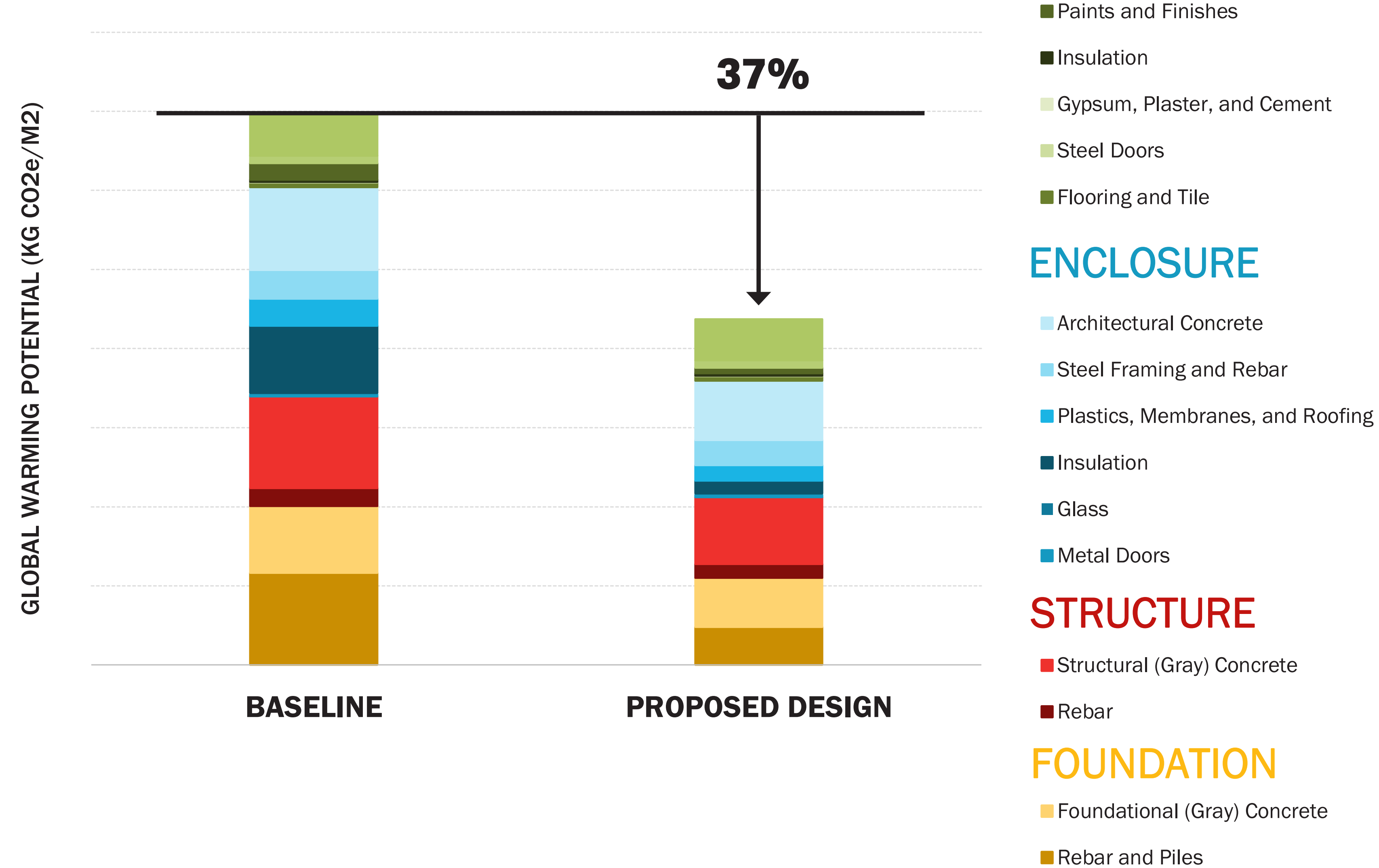
- The project is completing a **Whole Building Life Cycle Assessment** to quantify the embodied carbon associated with the building's materials and construction
- Currently targeting a **37% REDUCTION** in embodied carbon of building materials
- The remainder of embodied carbon will be offset.

KEY STRATEGIES:

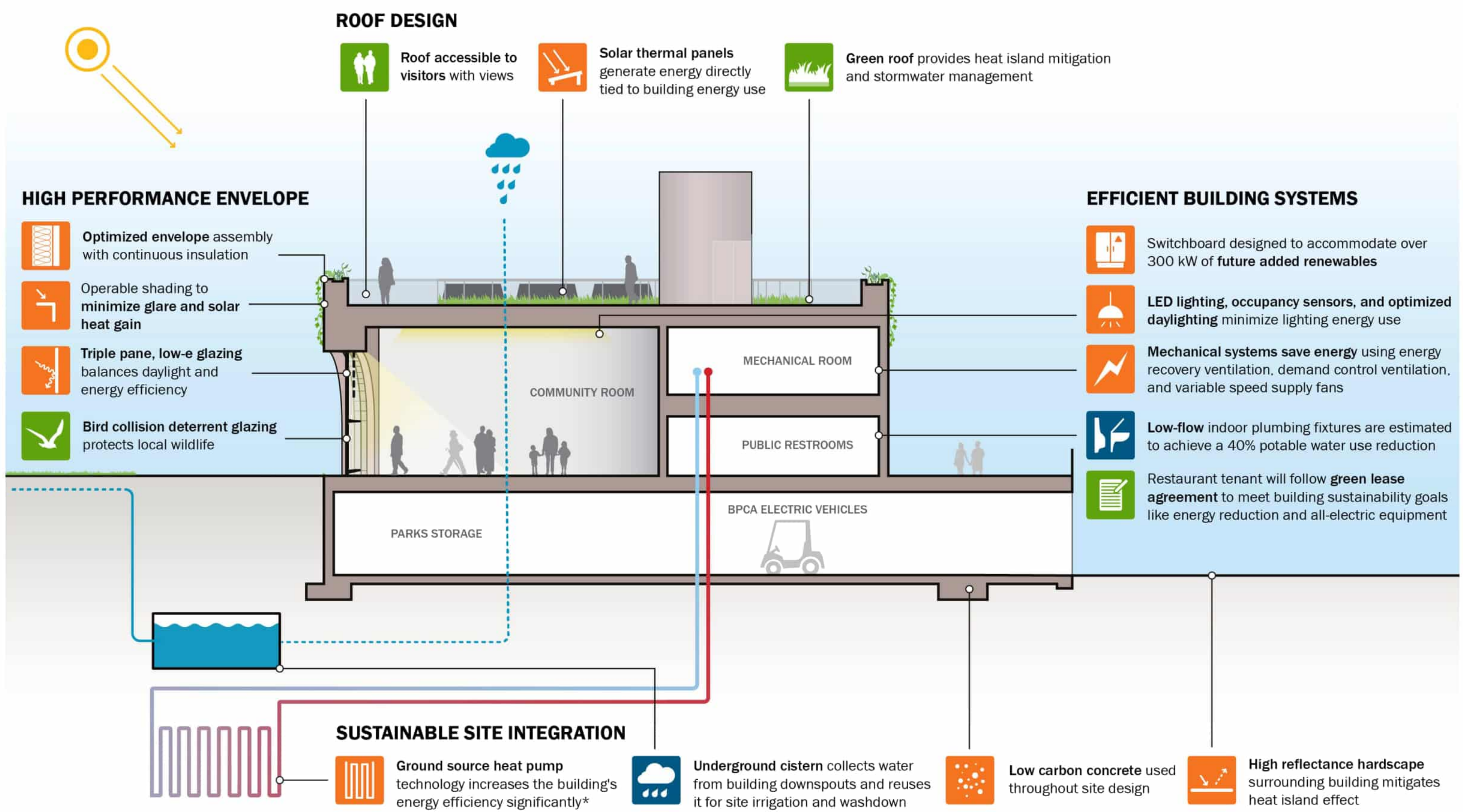
- Cement replacement in concrete applications
- Exploration of low carbon concrete technologies
- High recycled content in structural steel and rebar
- Low impact insulation substitution
- Low carbon interior finishes

GWP/M2 REDUCTION COMPARISON

SOUTH BATTERY PARK RESILIENCY



SUSTAINABILITY | PAVILION



NEW YORK STATE OF OPPORTUNITY. Battery Park City Authority

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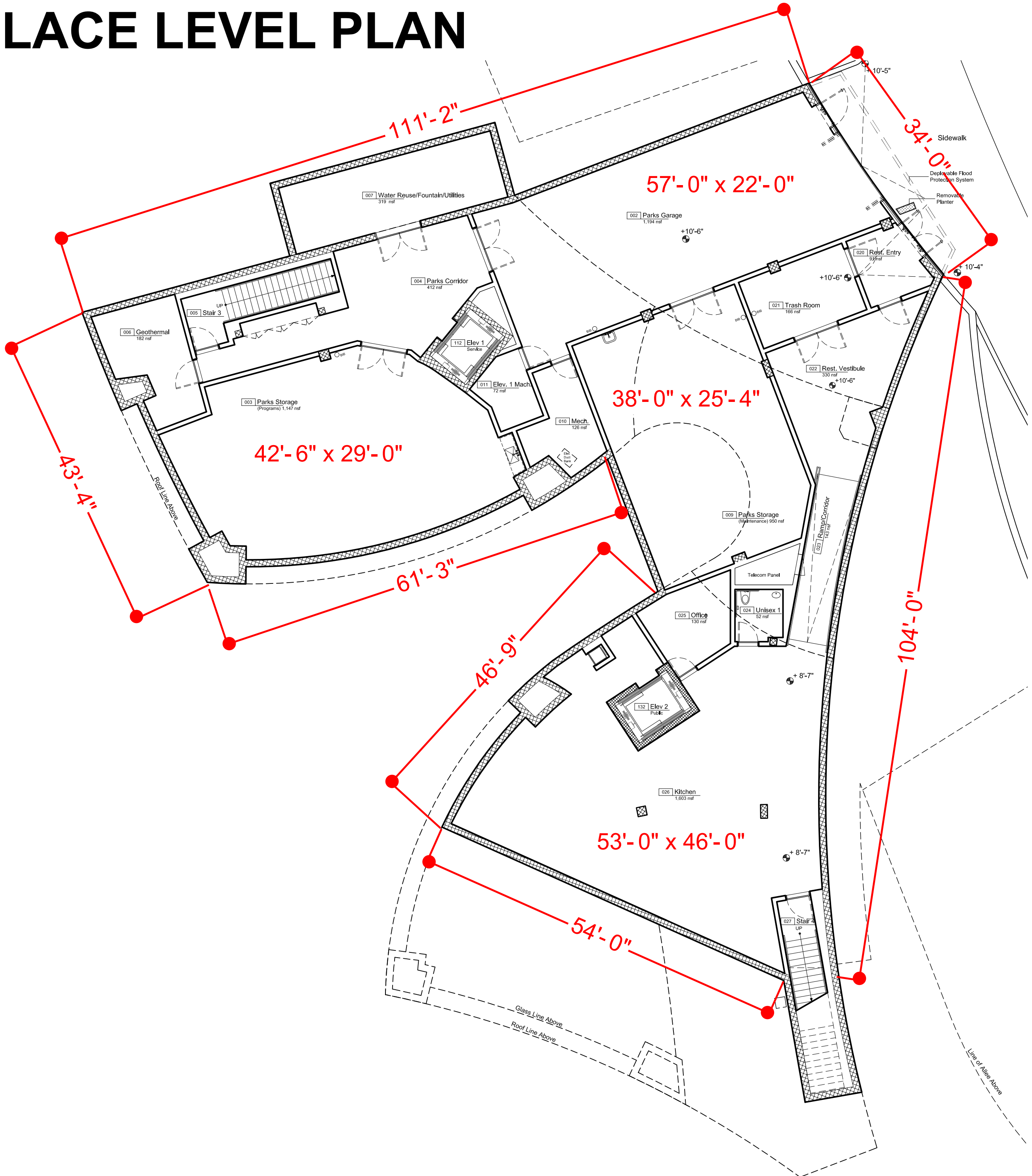
* Geothermal location is diagrammatic, and will be located under Wagner Park site

APPENDIX

BATTERY PLACE LEVEL PLAN



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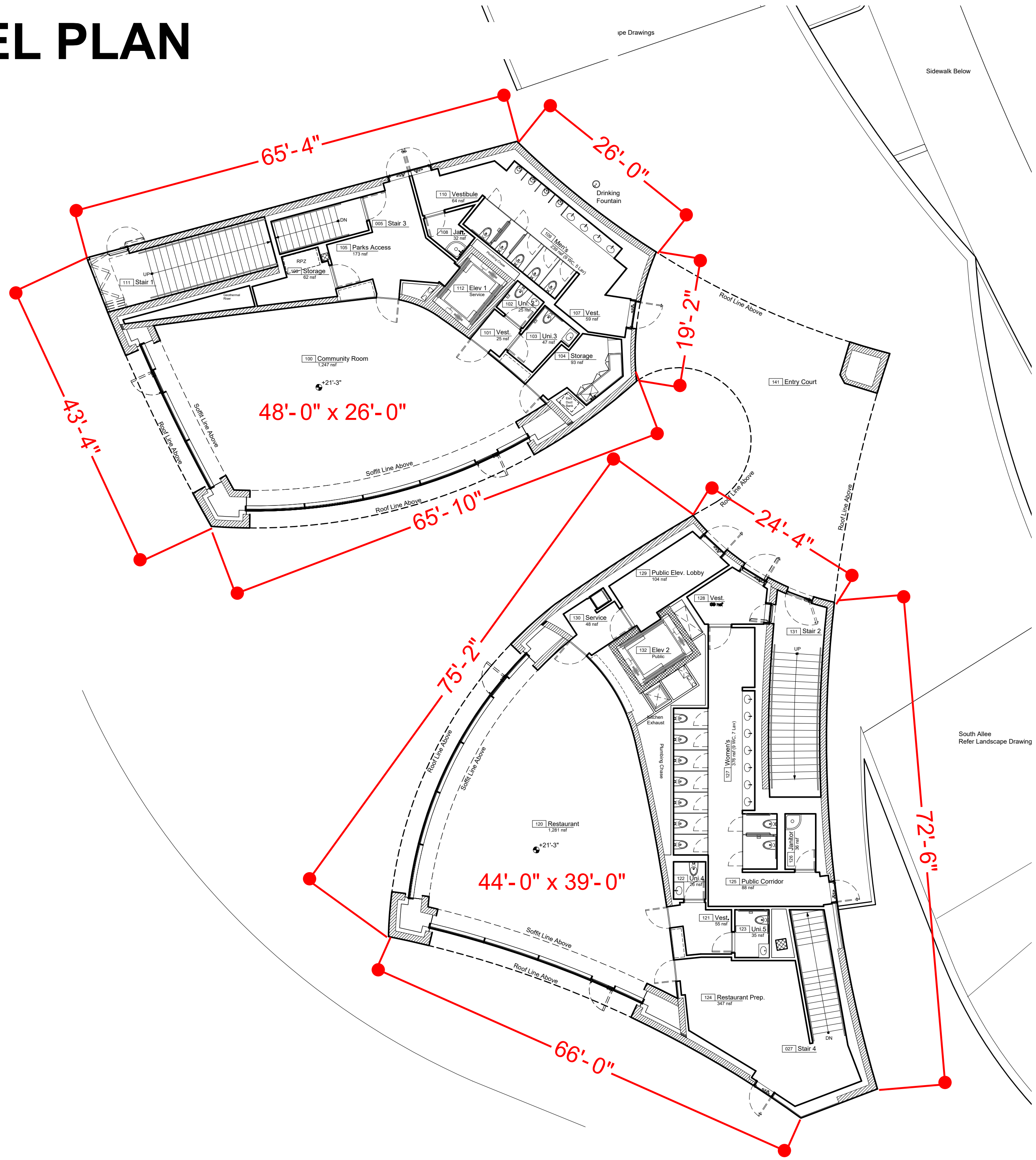
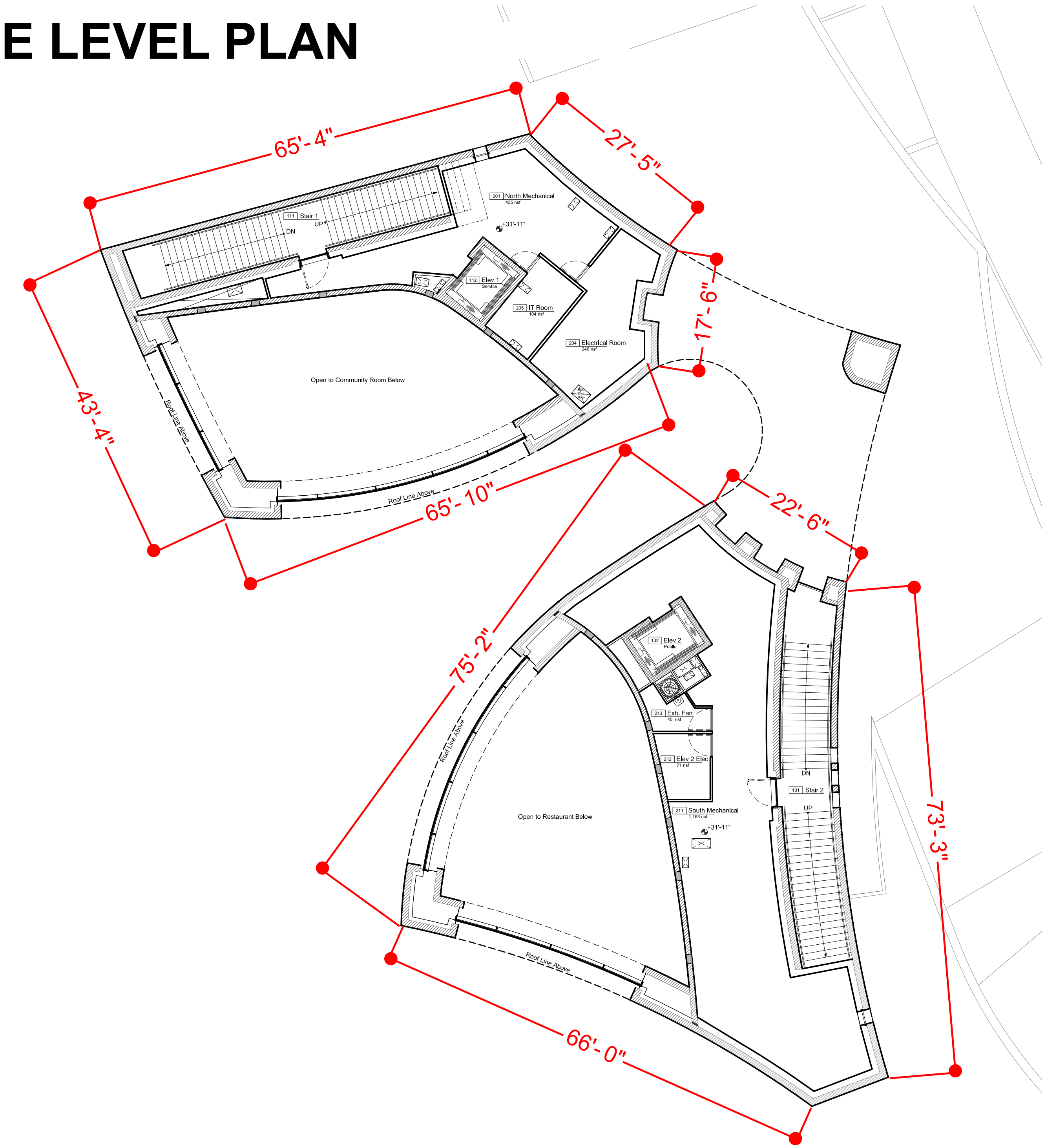
PARK LEVEL PLAN



MEZZANINE LEVEL PLAN



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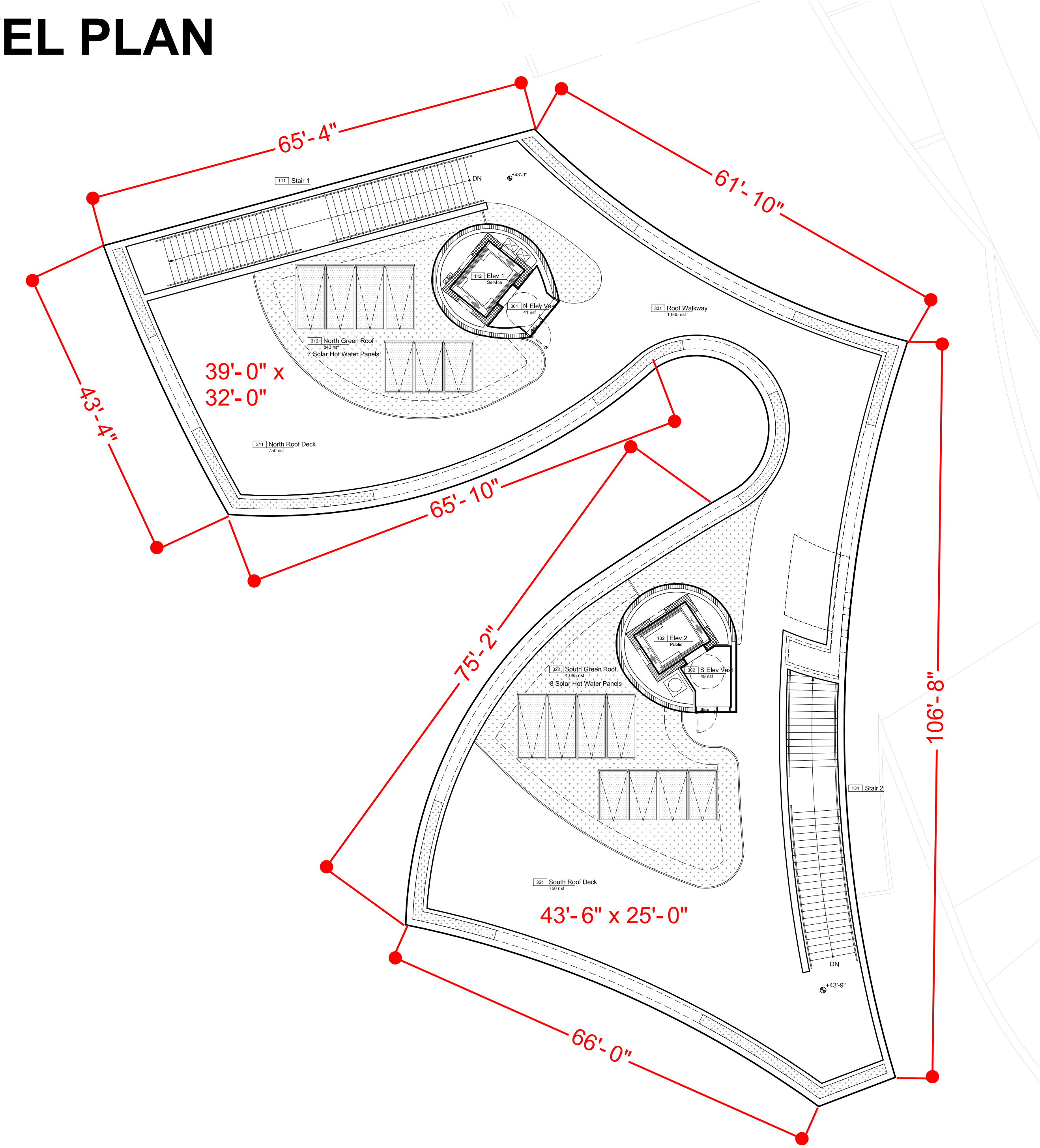
ROOF LEVEL PLAN



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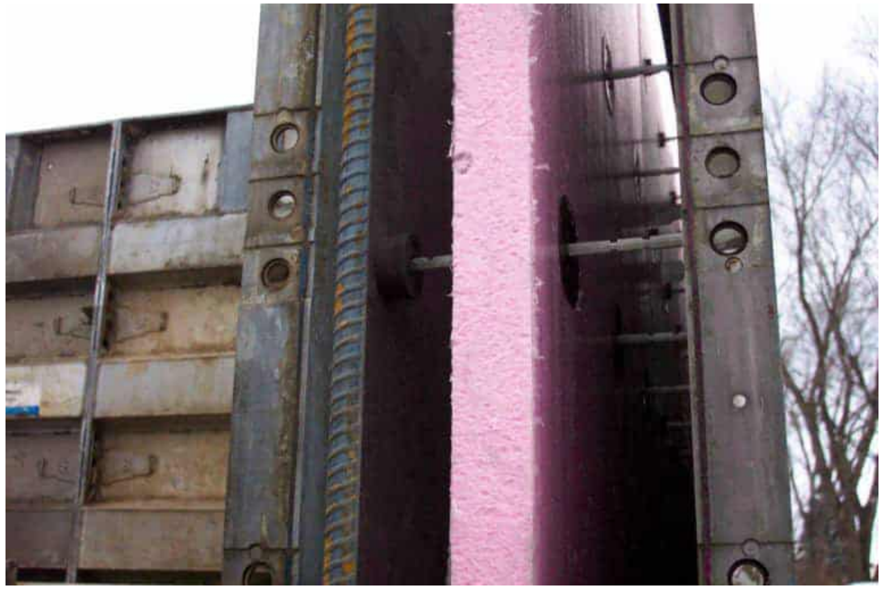
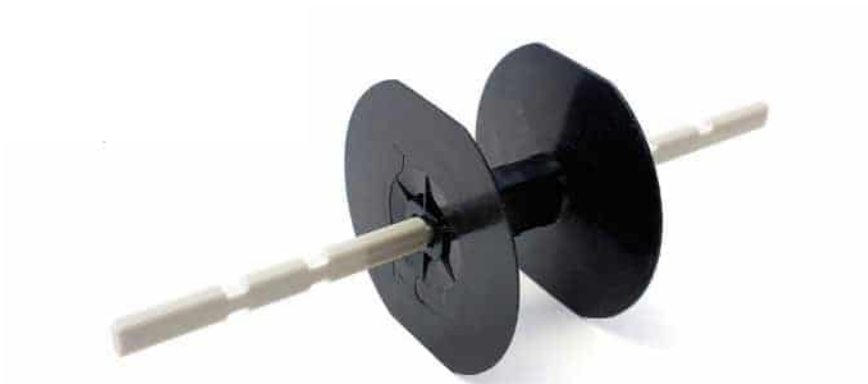
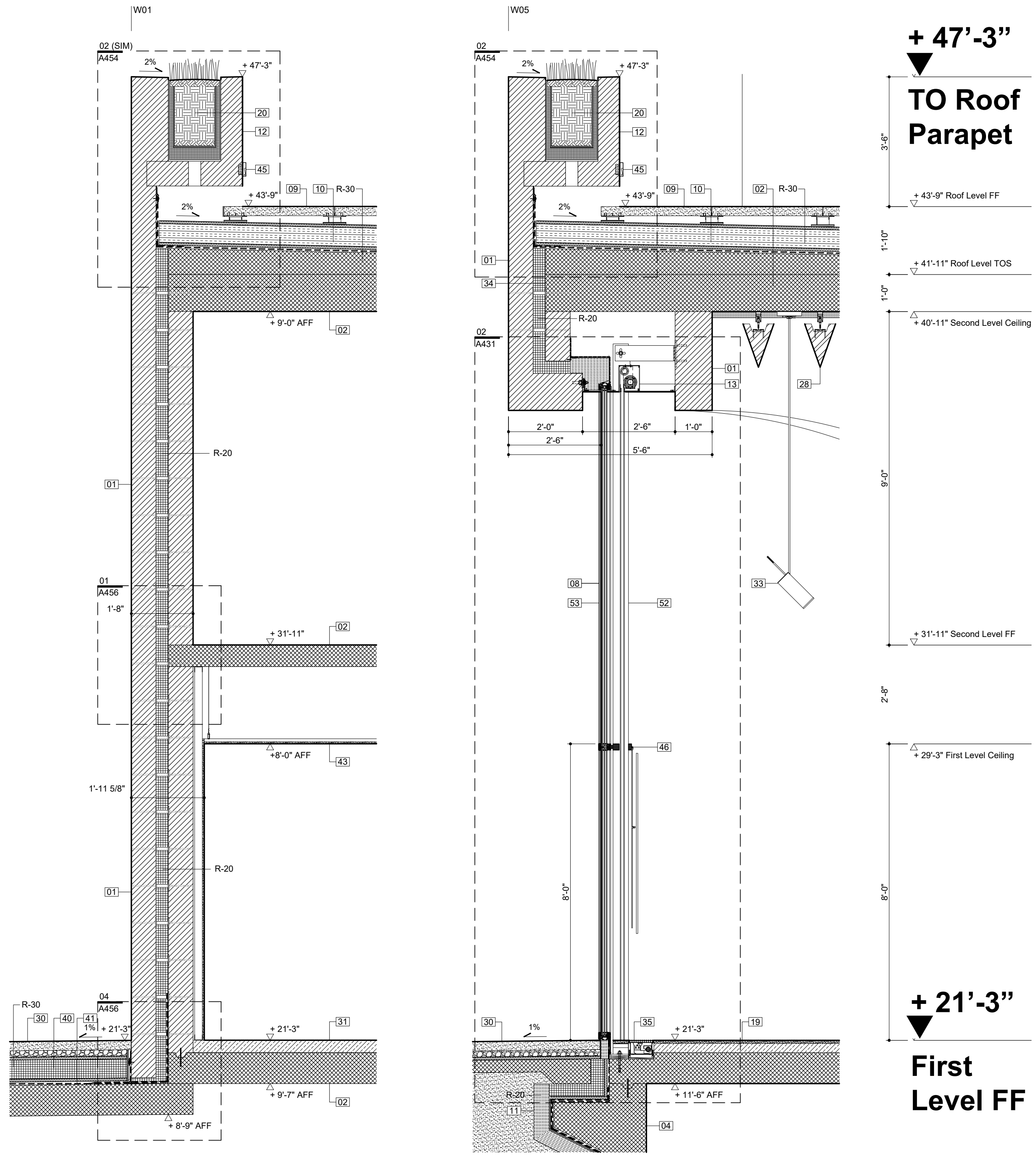
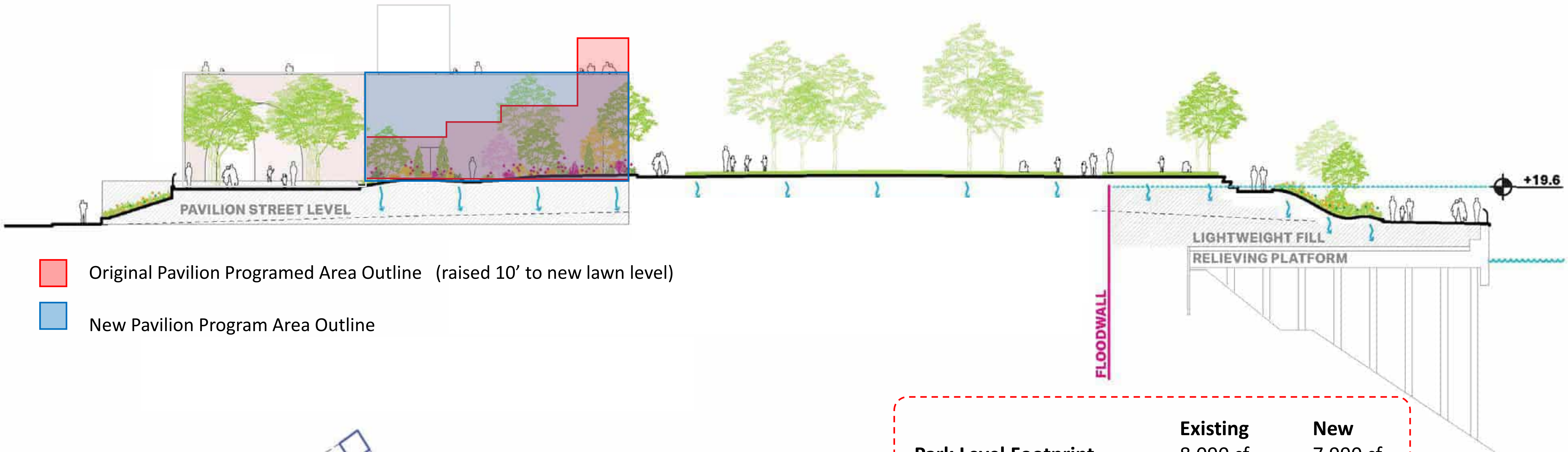
CONSTRUCTION DETAILS

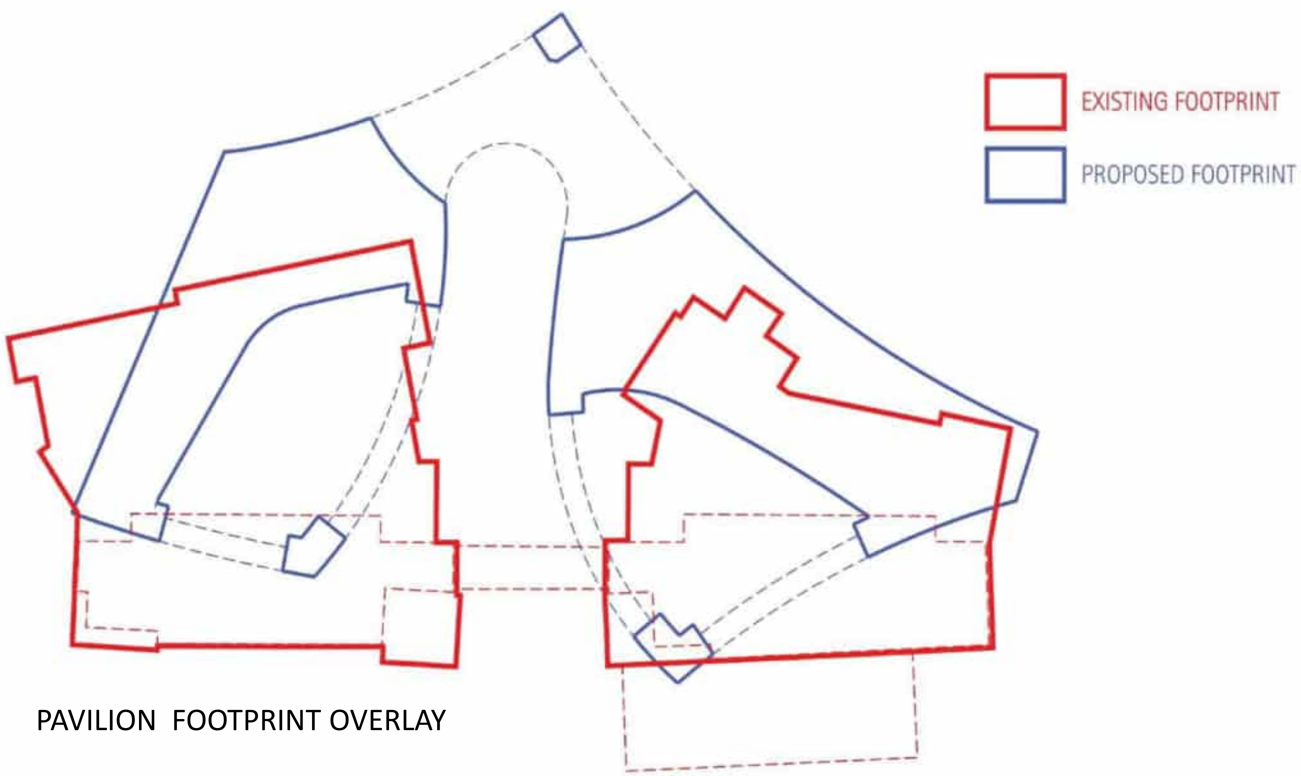


Thermomass System CIP









PAVILION FOOTPRINT OVERLAY

	Existing	New	
Park Level Footprint	8,090 sf	7,990 sf	
Street Level Program			
BPCA BOH	770 sf	3703 sf	
Restaurant BOH	1240 sf	2424 sf	
Park Level Program			
Public Toilets	1060 sf	963 sf	
Elevator Lobbies	95 sf	152 sf	*Elevator lobbies*
Stairs and Elevators	4170 sf	816 sf	*Total Roof Level*
Community Room	0 sf	1247 sf	
Restaurant	775 sf	1744 sf	*Indoor Dining Area*
BPCA BOH	0 sf	235 sf	
Mezzanine	0 sf	3471 sf	
Roof Level			
Walkable Terrace	2625 sf	3428 sf	
Green Roof	0sf	1833 sf	
TOTAL	**5415 sf**	**19,204 sf**	*Total Interior Area*

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ENHANCING PUBLIC BENEFIT OF WATERFRONT DEVELOPMENTS THROUGH A FOCUS ON RESILIENCE, ECOLOGY, AND ACCESS.

KEY STRATEGIES:

Site Assessment & Planning

- MULTI-DISCIPLINARY DESIGN TEAM
- SITE-WIDE VULNERABILITY AND ECOLOGICAL CONTEXT ASSESSMENTS
- EQUITABLE COMMUNITY ENGAGEMENT

Responsible Siting & Coastal Risk Reduction

- FLOOD-RESILIENT DESIGN ELEMENTS
- RESPONSIBLE SITING OF DESIGN STRUCTURES
- IMPROVED SENSORY CONNECTIONS TO WATER

Community Access & Connections

- QUALITY PUBLIC ACCESS AREAS
- DIVERSE PROGRAMMING AND EDUCATIONAL FEATURES
- INCREASED WATERFRONT PATHWAY AND GREENWAY CONNECTIVITY

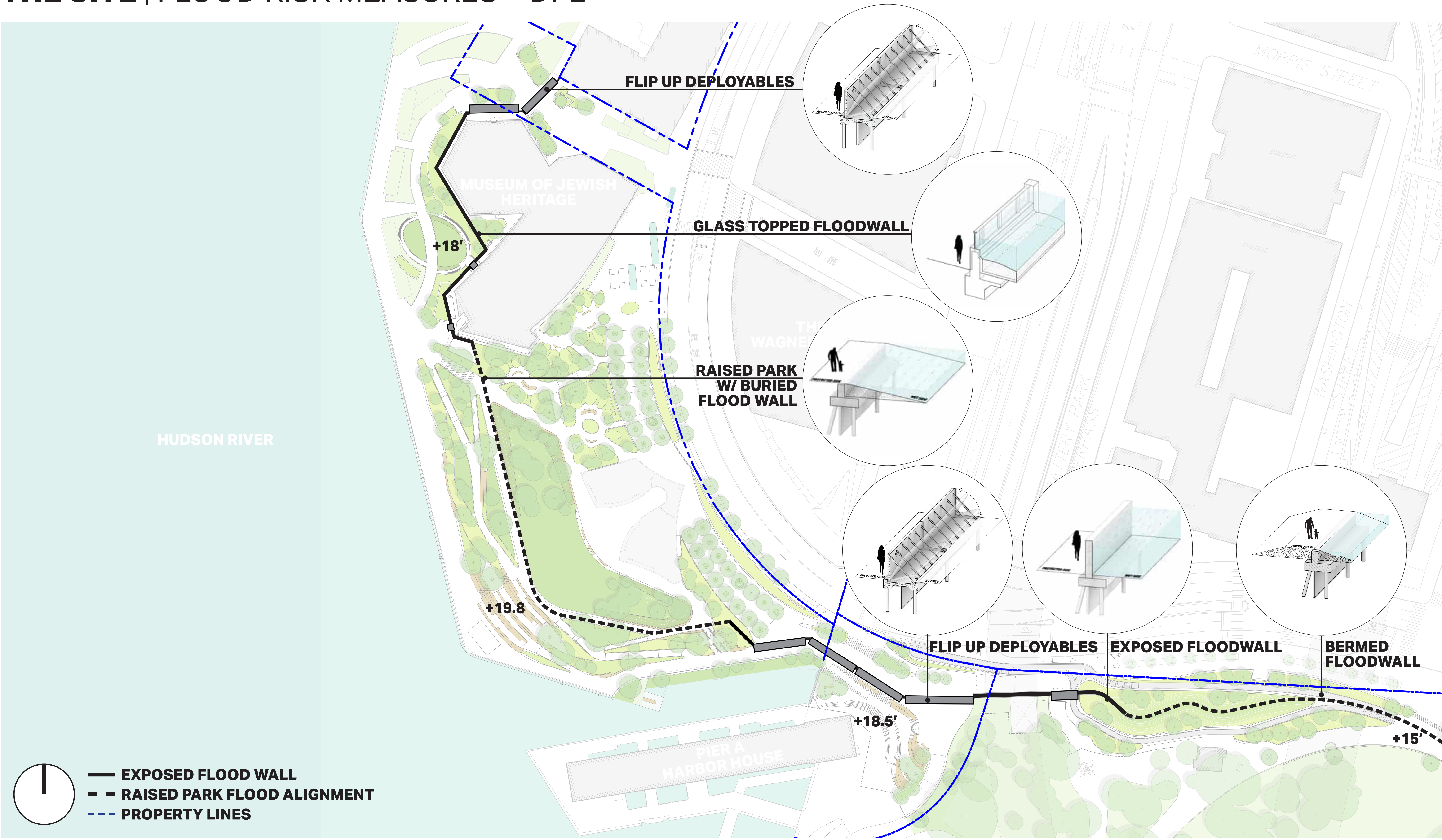
Edge Resilience

- WATERFRONT EDGE SOFTENING
- NATURAL SHORELINE AT PIER A INLET

Natural Resources

- SUSTAINABLE SITE FILL AND SOIL MANAGEMENT
- ENVIRONMENTALLY-RESPONSIBLE CONSTRUCTION PRACTICES
- SIGNIFICANT STORMWATER MANAGEMENT IN QUANTITY AND QUALITY
- REDUCED WATER USAGE
- URBAN HEAT ISLAND MITIGATION

THE SITE | FLOOD RISK MEASURES + DFE



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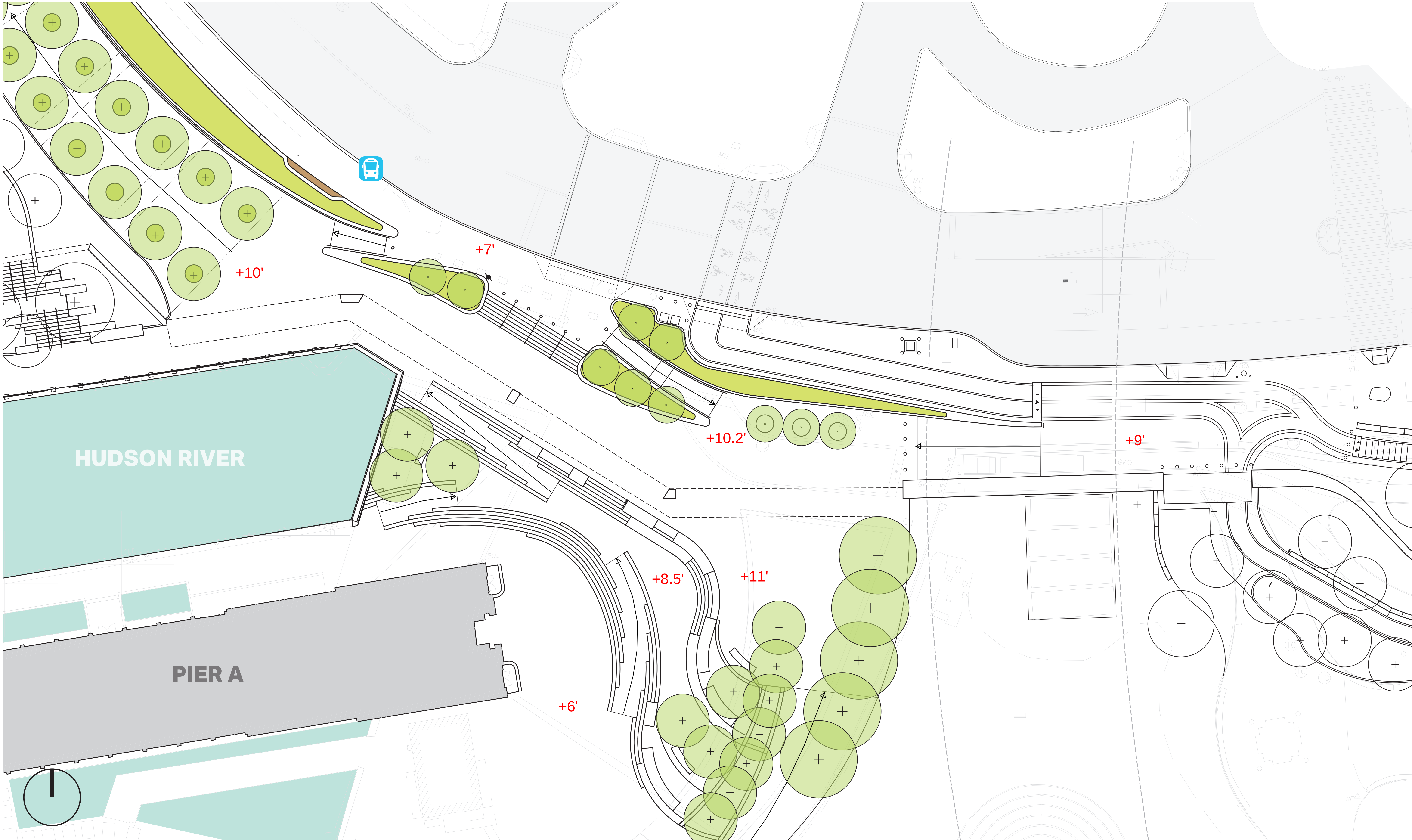
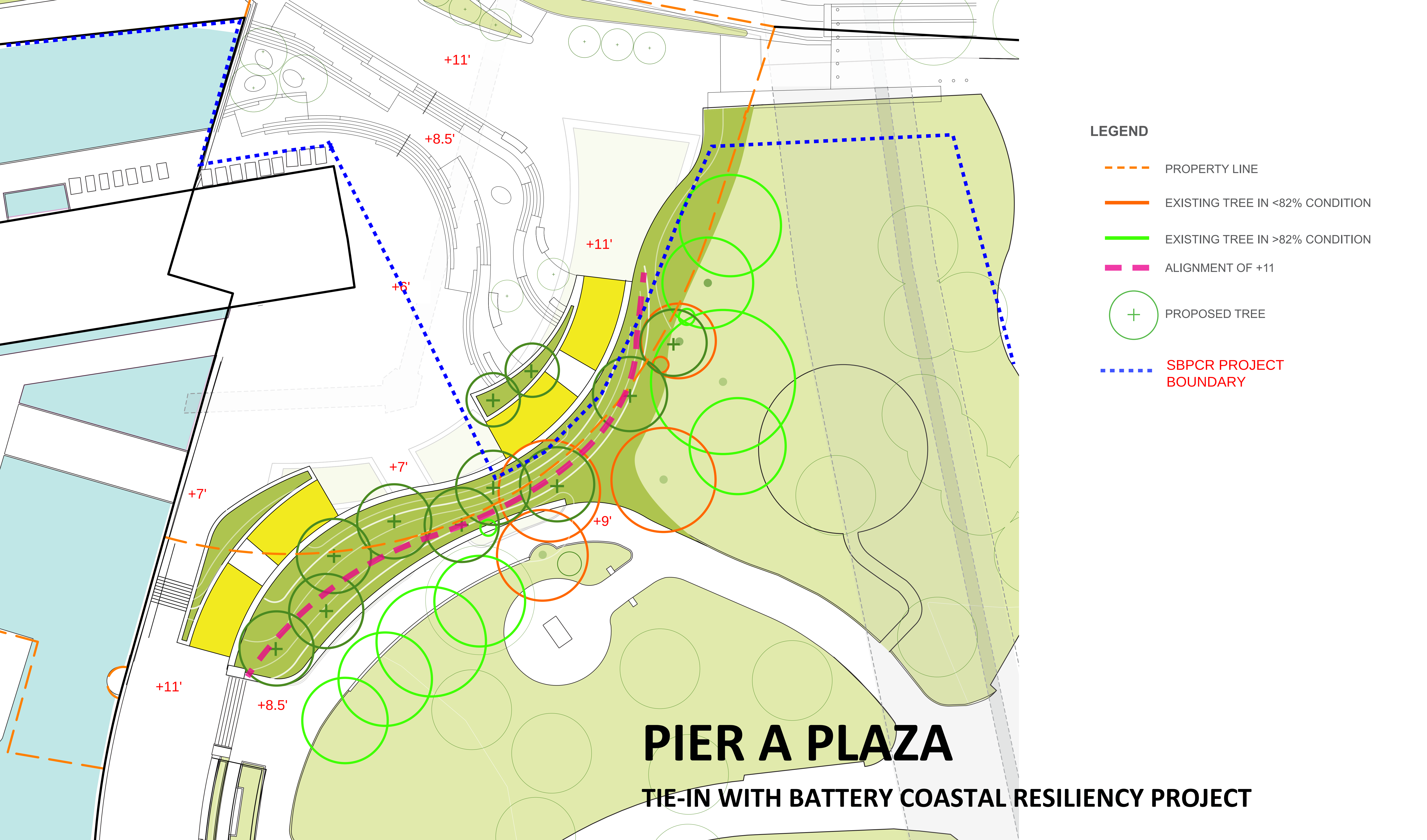
PIER A PLAZA





PIER A PLAZA

TIE-IN WITH BATTERY COASTAL RESILIENCY PROJECT

A.4.4 SBPCR Manhattan CB1 Project Update Presentation (March 2022)

SOUTH BATTERY PARK CITY RESILIENCY

CB1 UPDATE

MARCH 21, 2022

AGENDA

1. **INTERIOR DRAINAGE**

2. **CONSTRUCTION STAGING**

3. **PDC - DESIGN UPDATES**

    THE BATTERY & ALBERTI MARKER

    PIER A PLAZA

    EXPOSED FLOODWALL

    BATTERY PLACE

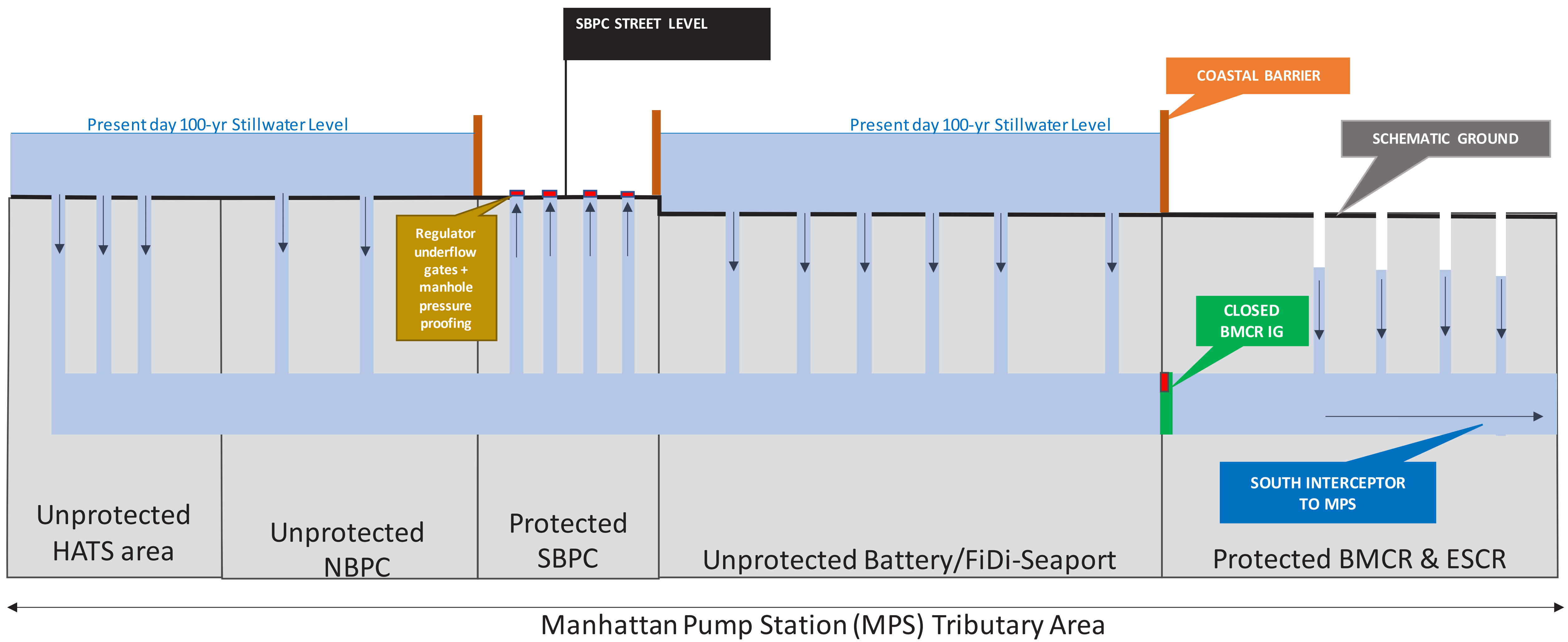
4. **PAVILION SERVICE ENTRANCE**

INTERIOR DRAINAGE

INTERIOR DRAINAGE | UPDATE – NEAR SURFACE ISOLATION

- **Coordination with NYCDEP led to adoption of Near-Surface Isolation (NSI) instead of Interceptor Isolation Gates (IG)**

What is NSI?

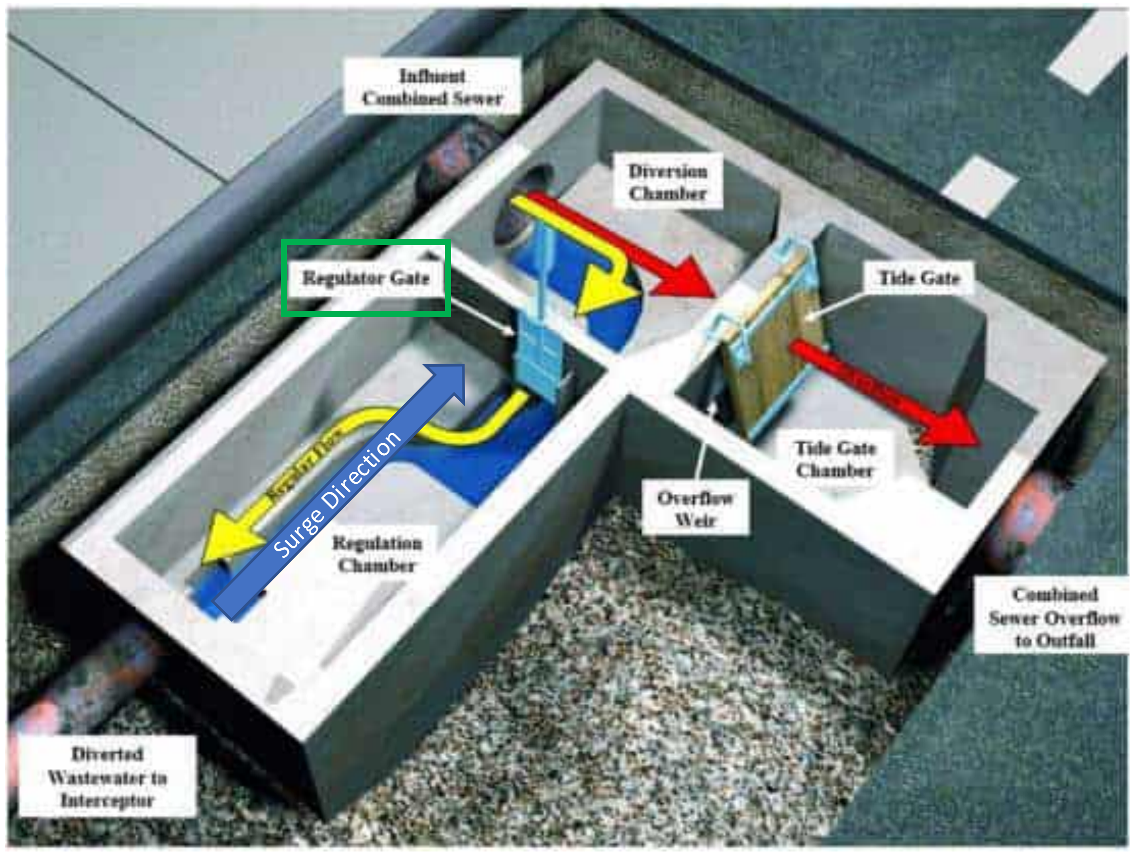


Stops the surge from flooding the streets by isolating the interceptor closer to street level

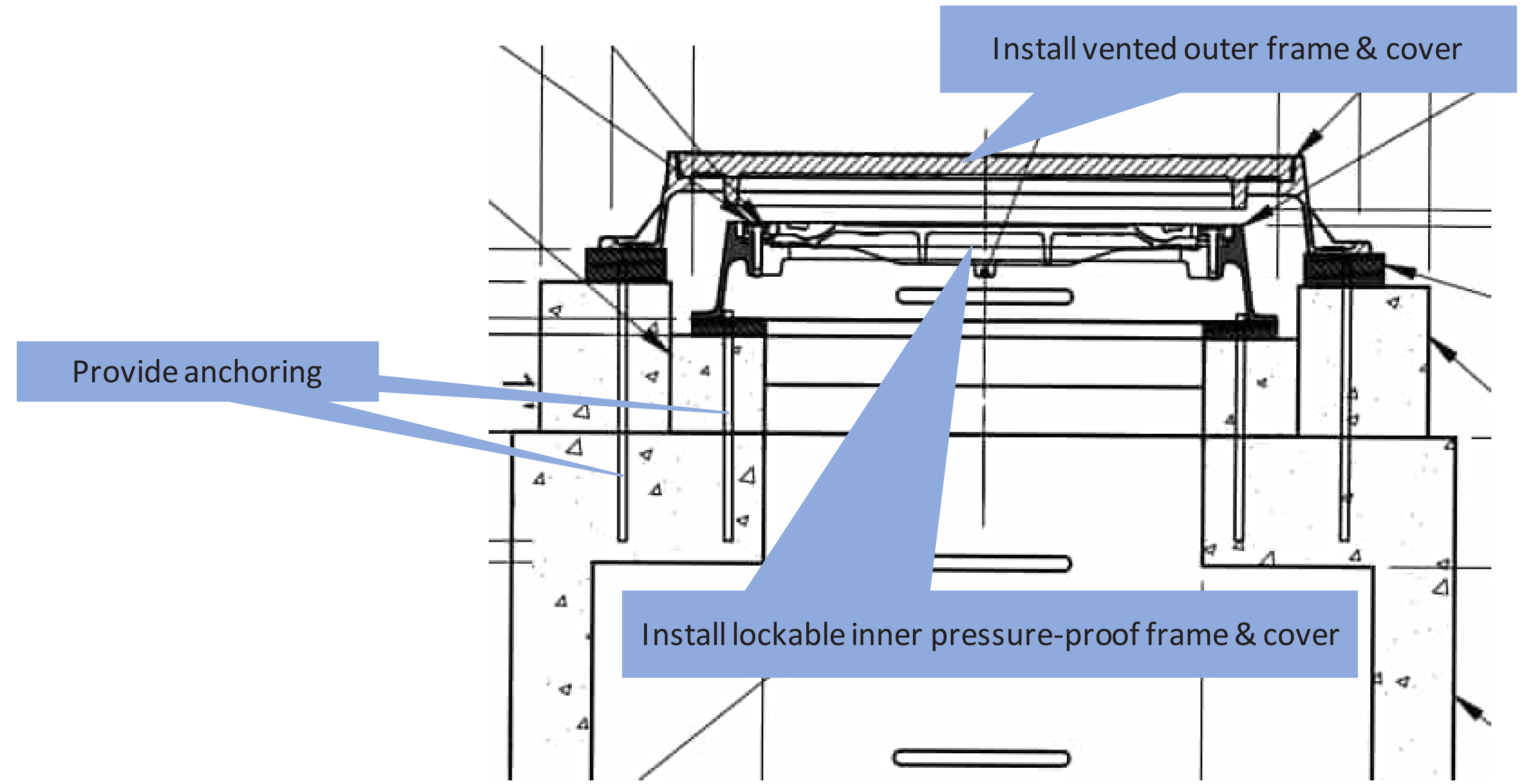
Interceptor isolation gates (IG) would isolate the interceptor at a deeper level (interceptor level)

INTERIOR DRAINAGE | UPDATE – NEAR SURFACE ISOLATION

NSI Elements

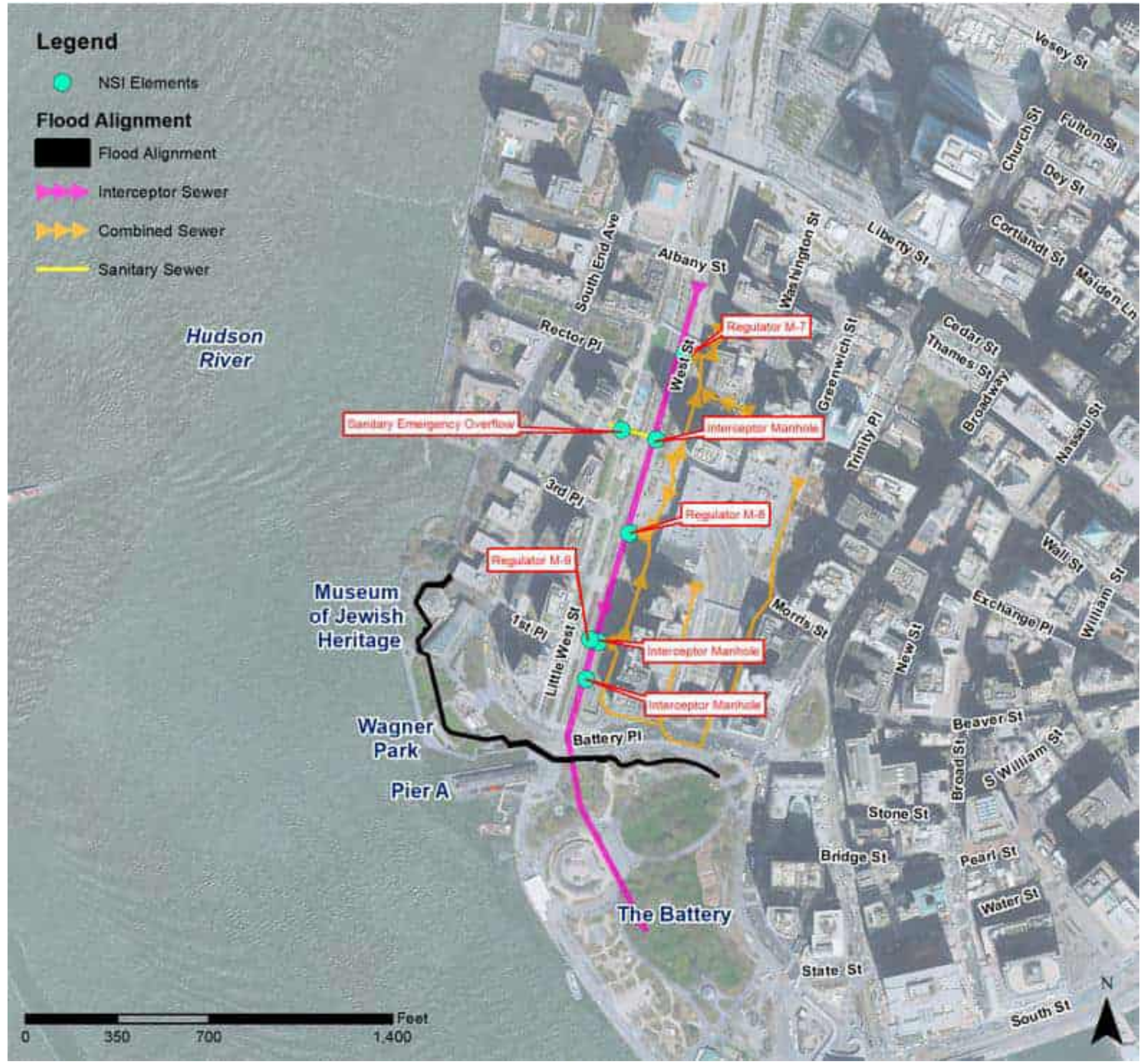


Regulator Gates at Existing Regulator Structures



Pressure-proof Existing Manholes

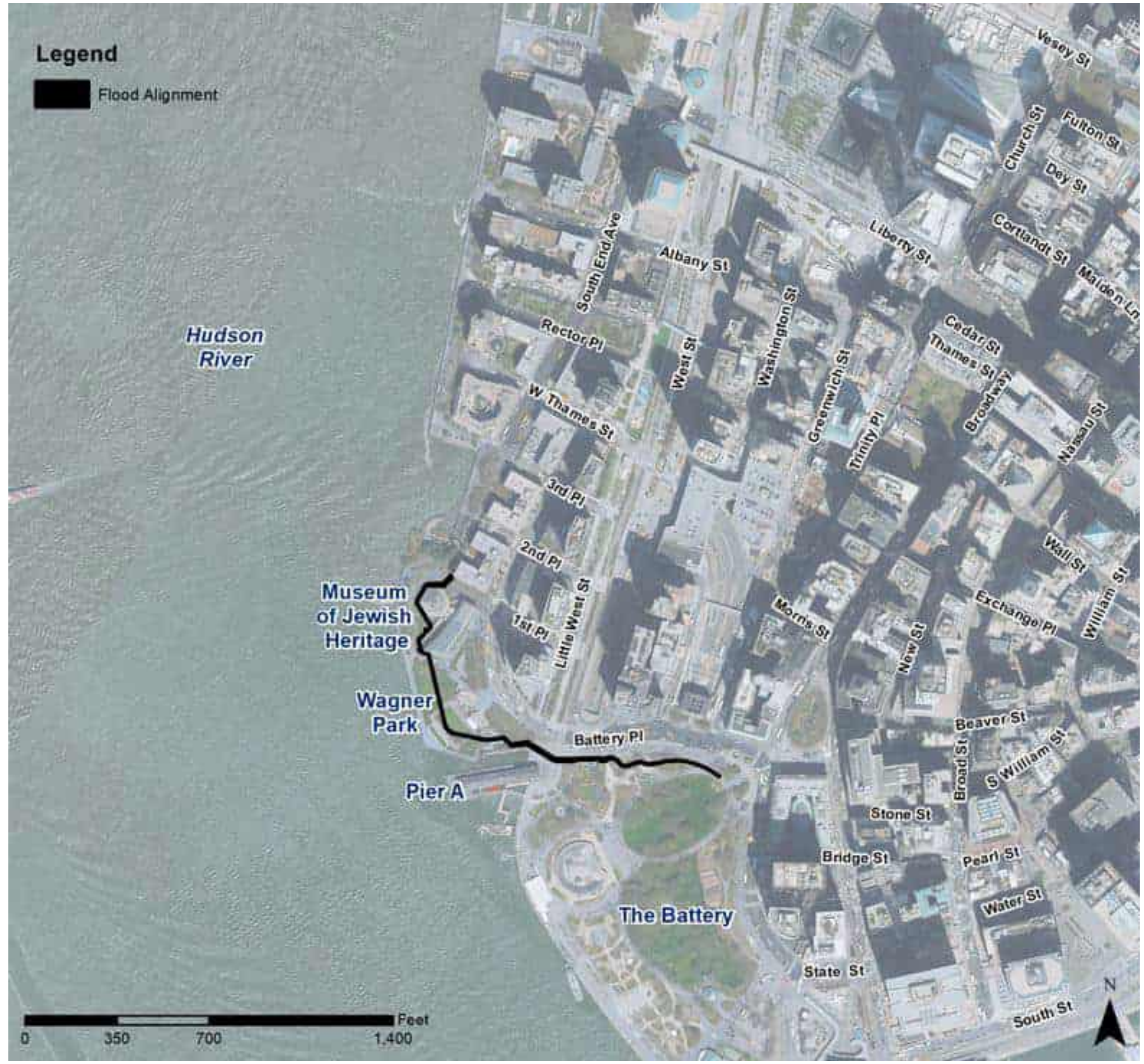
NSI Locations



INTERIOR DRAINAGE | UPDATE – NEAR SURFACE ISOLATION

NSI Street Flooding Reduction

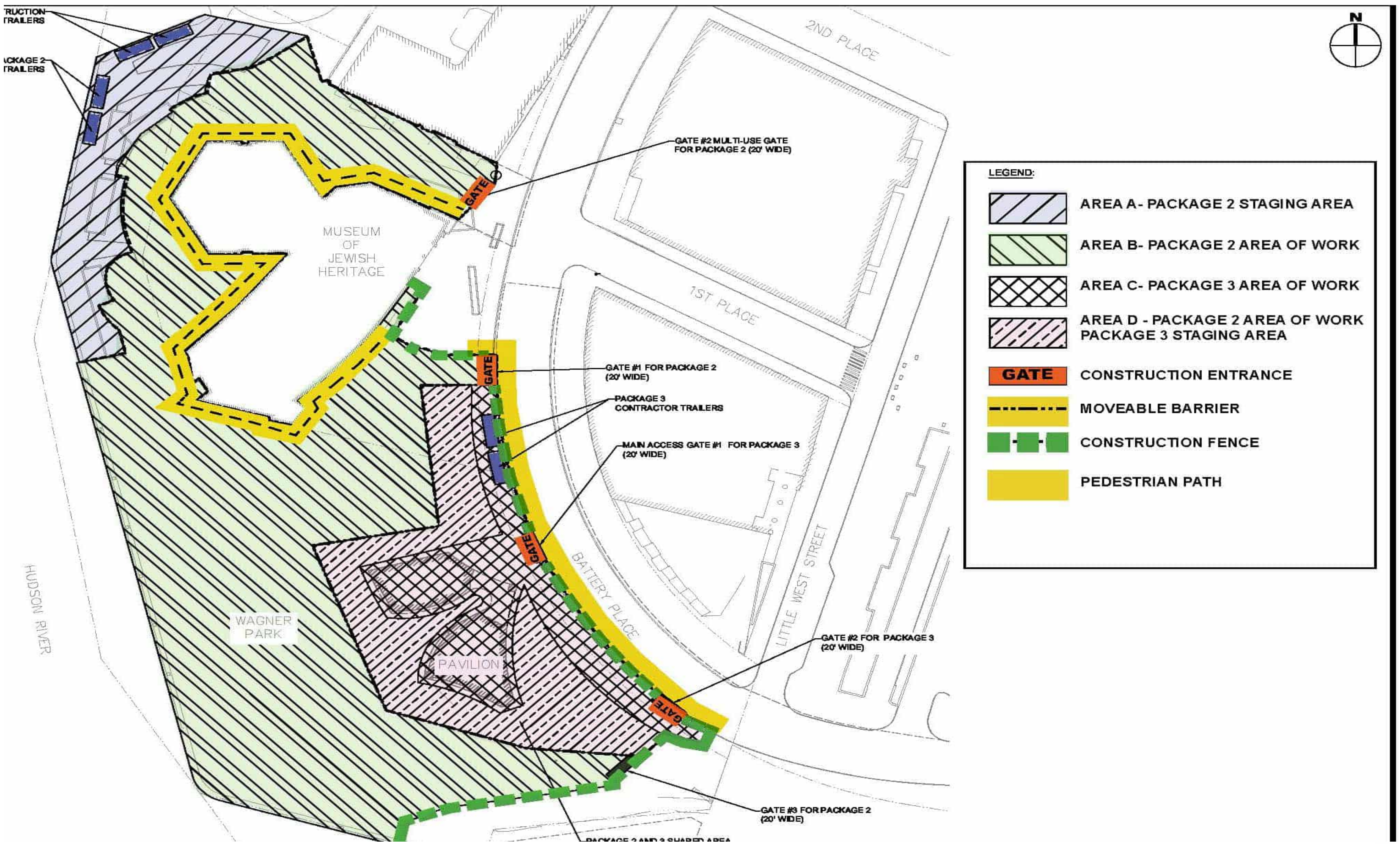
All street flooding pooling areas are less than 1 ft average depth within SBPCR.



NSI results in NO mappable flooding within SBPCR area in LOMR

CONSTRUCTION STAGING

SITE LOGISTICS DURING CONSTRUCTION: MJH AND WAGNER PARK



SITE SIGNAGE DURING CONSTRUCTION

Site Signage:

- DOB Required Signage
    - Placed at key site access points
    - Project Informational Panel
    - Permits & Safety Signage

- Project Specific Informational Signage
    - Placed along Battery Place fence frontage
    - Placed along northern site boundary
    - Content yet to be defined, but will target a resiliency and informational theme

SITE SIGNAGE DURING CONSTRUCTION

GENERAL CONSTRUCTION INFORMATION

Anticipated Project Duration:
- MJH, Wagner Park and Wagner Park Pavilion: July 2022-July 2024

Typical Days/Hours of Work:
- Mon-Fri; 7:00-3:30pm
- Sat; 8:00-4:00pm
- Shifts may be extended
- Work activities such as road resurfacing and utility work may be done off hours to minimize traffic/stakeholder impact

Flaggers will be present for all construction deliveries to ensure pedestrian and cyclist safety

A protected pedestrian path will be provided in the street adjacent to the sidewalk closure on the west side of Battery Place during the reconstruction of Wagner Park.

Affected bus stop will be shifted to accommodate construction in coordination with MTA Buses

PDC - DESIGN UPDATES

THE SITE


MUSEUM OF JEWISH HERITAGE
DOT
FIRST PLACE
MUSEUM OF JEWISH HERITAGE
BPCA
DOT
WAGNER PARK
BATTERY PLACE
THE WAGNER HOTEL
2ND PLACE
MORRIS STREET
FIRST PLACE
HUDSON RIVER
DOT
BPCA
BATTERY PLACE
LITTLE WEST STREET
HUDSON RIVER GREENWAY
BATTERY PARK UNDERPASS
WASHINGTON STREET
HUGH L. CAREY
BUILDING
PIER A PLAZA
THE BATTERY
DOT
BATTERY PLACE
BATTERY PLACE
BOWLING GREEN
SBS (EDC)
BPCA
UNDERPASS VENT
DPR
COMFORT STATION
PIER A HARBOR HOUSE
PIER A PLAZA
BATTERY PARK UNDERPASS (BELOW)
BROOKLYN-BATTERY TUNNEL (BELOW)
THE BATTERY OVAL

COMMUNITY ENGAGEMENT TIMELINE

2018

PUBLIC MEETING
NOV 2018

2019

PUBLIC MEETING
MAR 2019

PUBLIC DESIGN ACTIVITY MEETING
APR 2019

PUBLIC MEETING
JUN 2019

UPDATE TO CB1
OCT 2019

2020

PUBLIC MEETING
JAN 2020

CB1 DEPLOYABLES WORKSHOP
MAY 2020

UPDATE TO CB1
JUN 2020

2021

LMCR UPDATE TO CB1
JAN 2021

UPDATE TO CB1
FEB 2021

UPDATE TO CB1
APRIL 2021

LMCR UPDATE TO CB1
JUNE 2021

UPDATE TO CB1 EXECUTIVE COMMITTEE
AUG 2021

PUBLIC SCOPING MEETING
OCT 2021

2022

UPDATE TO CB1
MAR 2022

PDC SUBMISSION HISTORY

CONCEPTUAL SUBMISSION
SEPT 2019

AMENDED CONCEPTUAL SUBMISSION
FEBRUARY 2020

PRELIMINARY SUBMISSION
APRIL 2020

DESIGN AND AGENCY COORDINATION FOR EXPOSED FLOODWALL, DESIGN AND AGENCY COORDINATION FOR SECURITY ELEMENTS AT PIER A PLAZA ENTRANCE, COORDINATION WITH BATTERY RESILIENCY PROJECT, AND DEVELOPMENT OF DESIGN DETAILING

AMENDED PRELIMINARY SUBMISSION
MAY 2021

INTERIM FLOODWALL CLADDING SUBMISSION
SEPTEMBER 2021

FINAL DESIGN SUBMISSION
FEBRUARY 2022

2019 | 2020 | 2021 | 2022

THE SITE

DOT
FIRST PLACE
MUSEUM OF JEWISH HERITAGE
BPCA
DOT
FIRST PLACE
BATTERY PLACE
THE WAGNER HOTEL
HUDSON RIVER
DOT
BPCA
BATTERY PLACE
LITTLE WEST STREET
HUDSON RIVER GREENWAY
2ND PLACE
MORRIS STREET
DOT
BATTERY PLACE
BATTERY PLACE
BOWLING GREEN
SBS (EDC)
BPCA
UNDERPASS VENT
DPR
COMFORT STATION
PIER A HARBOR HOUSE
PIER A PLAZA
PDC JURISDICTION
PROPERTY LINES

PDC FEEDBACK - PRELIMINARY SUBMISSION | MAY 2020, CERTIFICATE #27504

Pier A Plaza:

- Revise arrangement of bollards, hydraulic power units, and planting to enlarge the planted buffer and minimize bollards along bikeway
- Continue to study the detailing and durability of the wooden seating elements at Pier A plaza
- Reconsider the ground lighting under the benches within Pier A plaza and along the floodwall
- Maximize use of solar lighting
- Provide details on the stone cladding at the flood walls
- Provide details on the engineering and functionality of the deployable gates

Battery Pl:

- Study allowing direct pedestrian access to pavilion from Battery Place
- Provide details on the sidewalk and pavilion entrance
- Clarify the planting in front of the Pavilion and how it relates to the design

The Battery:

- Explain the necessity of removing mature trees and explore ways to add more trees to the proposal
- Provide additional details for the planted berm

PDC FEEDBACK- AMENDED PRELIMINARY SUBMISSION | MAY 2021

Exposed Floodwall:

- Expressed concern about the design and constructibility of the of the floodwall, and that the constructibility will detract from the legibility of the design metaphor
- Provide detailed construction and fabrication documents of the stone units, jointing, stone cap, and where the flip up gates interact with the wall
- Questioned whether the concept would be intuitively understood on the elevation of the wall

PDC FEEDBACK - EXPOSED FLOODWALL SUBMISSION | SEPT 2021

Exposed Floodwall:

- Expressed that the "abstract expressions" of land and water are not legible as the utilization of two different stones reinforces the decorative nature of the stone-facing rather than acknowledging, celebrating, and creating a cohesive language across the infrastructure
- Requested that the Stony Creek be removed from the stone facing so that the wall is expressed with only the Pearl Gray stone
    - -Will allow the existing Stony Creek on-site to be more visually prominent in the pedestrian foreground
    - -Reinforces the pedestrian scale of the Stony Creek in-situ
    - -Pearl Gray is a beautiful stone with inherent variation which will create visual interest
    - -Designing the wall in the singular stone palette will celebrate both the material of the cladding and the function of the wall

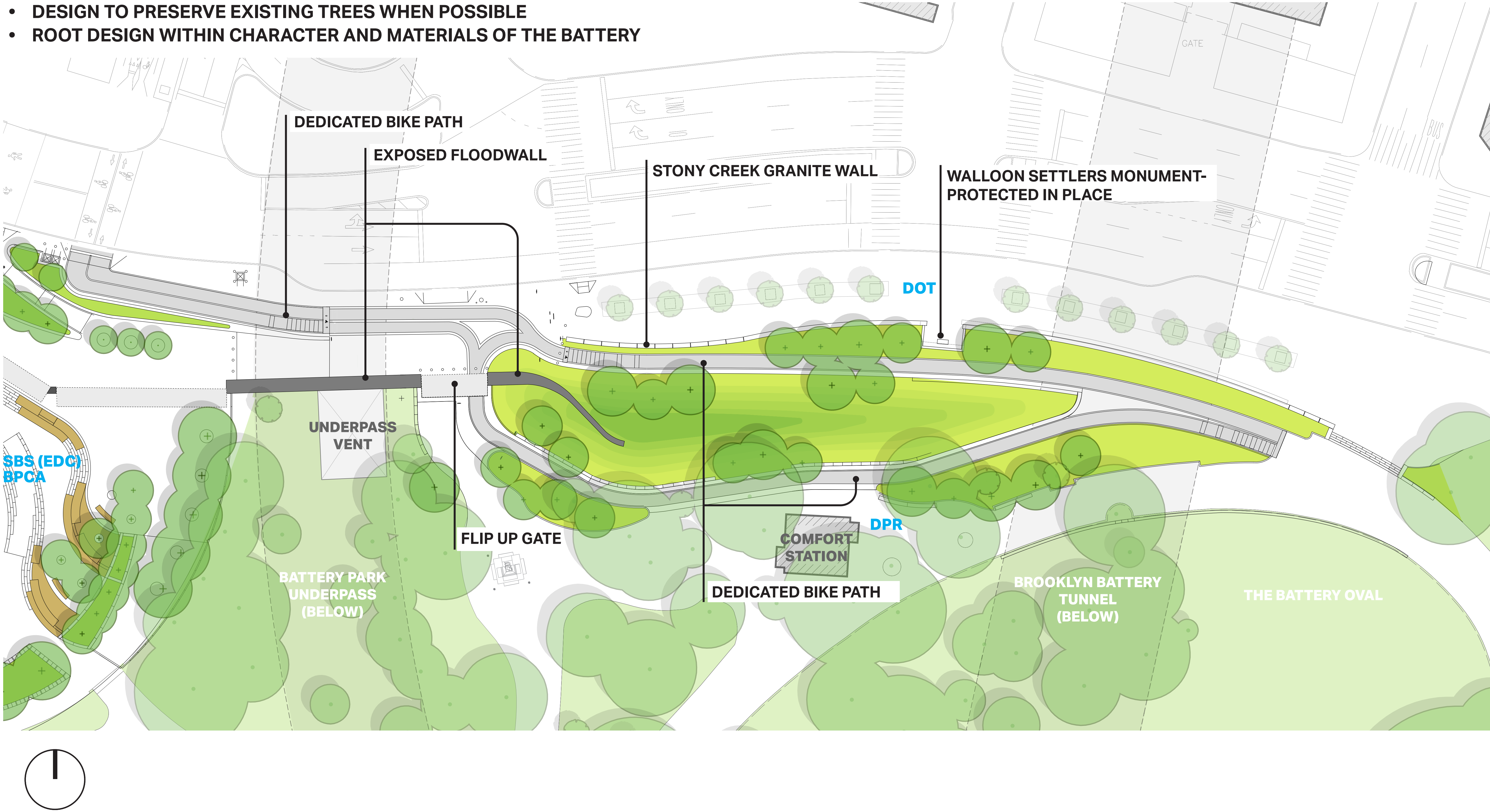
- Revise coping design so that the schist reference is applied across the full stretch of the wall and detailing be studied to remove threat of water infiltration
- Requested a scale model to help understand the visual impact of the stone module sizes proposed, how they are legible across the wall

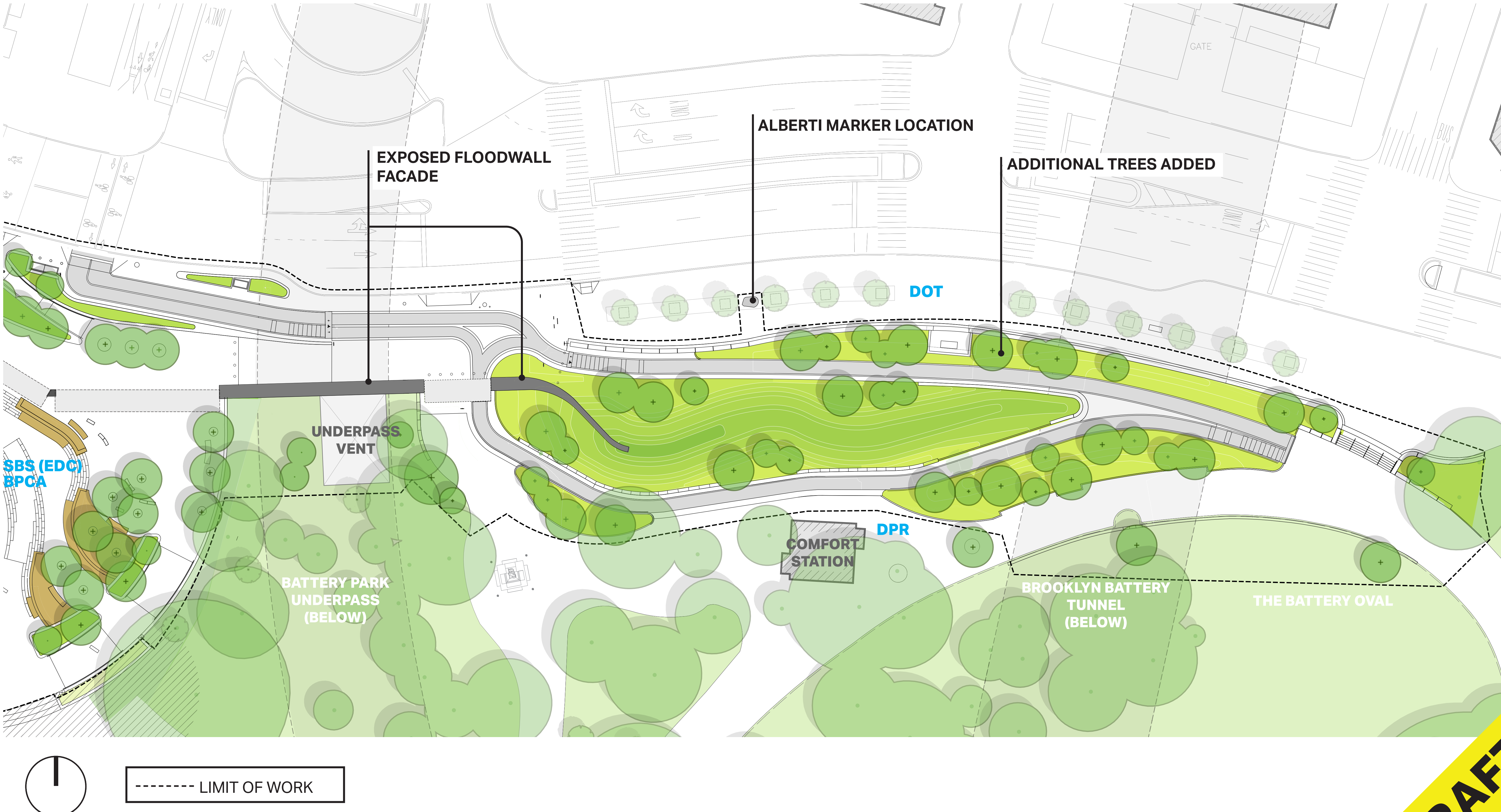
PDC DESIGN UPDATES
THE BATTERY & ALBERTI MARKER

THE BATTERY | PREVIOUS DESIGN

FEBRUARY 2021

COMMUNITY REQUESTS & DESIGN DRIVERS:
- DESIGN TO MAXIMIZE PLANTED AREAS AND TREES
- DESIGN TO PRESERVE EXISTING TREES WHEN POSSIBLE
- ROOT DESIGN WITHIN CHARACTER AND MATERIALS OF THE BATTERY

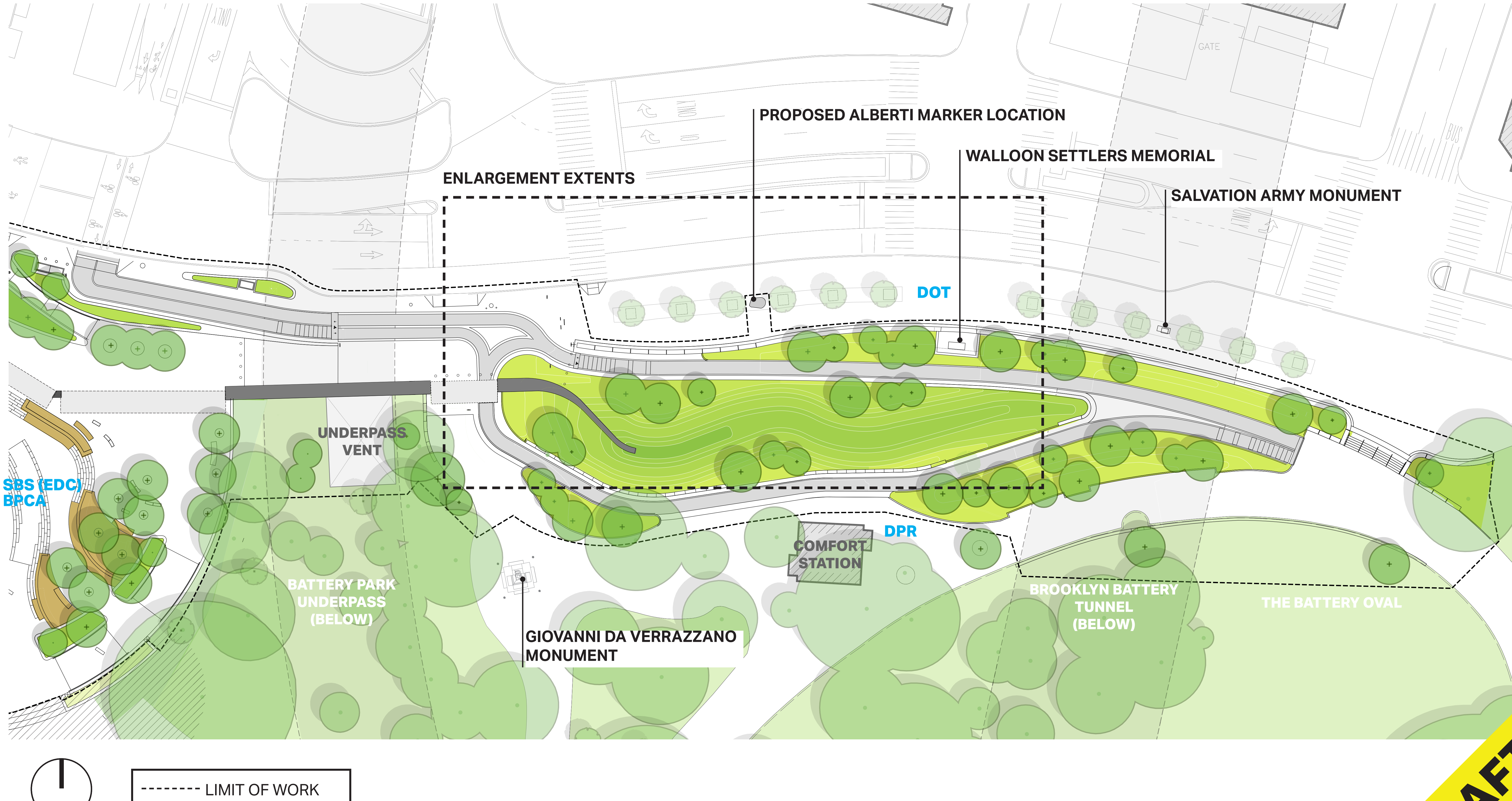



ALBERTI MARKER LOCATION
EXPOSED FLOODWALL FACADE
ADDITIONAL TREES ADDED
DOT
UNDERPASS VENT
SBS (EDC)
BPCA
DPR
COMFORT STATION
BATTERY PARK UNDERPASS (BELOW)
BROOKLYN BATTERY TUNNEL (BELOW)
THE BATTERY OVAL
GATE
BUS
LIMIT OF WORK

DRAFT

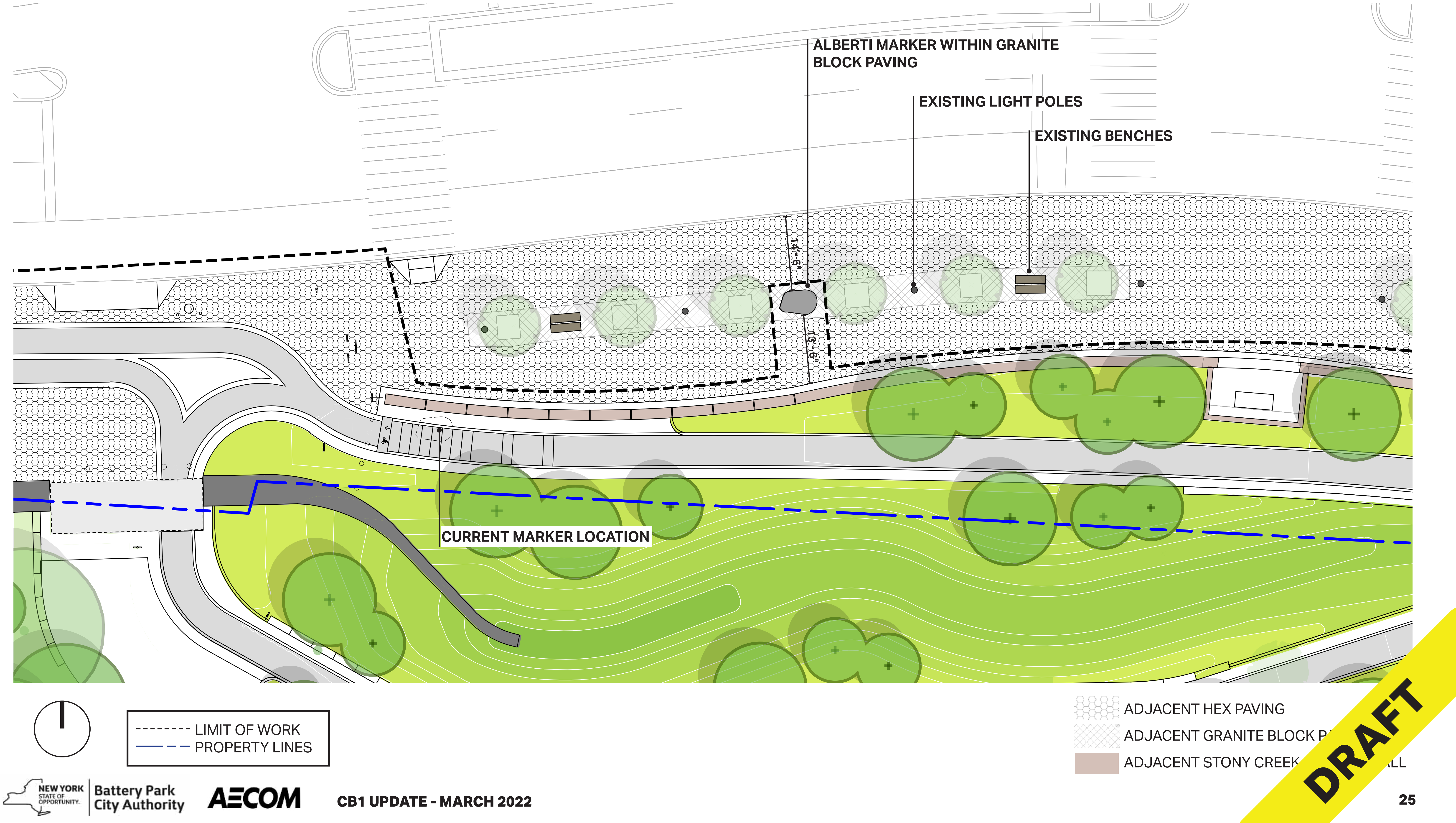
ALBERTI MARKER LOCATION | PROPOSED CONDITIONS

FINAL DESIGN - PDC



DRAFT

ALBERTI MARKER LOCATION | PROPOSED CONDITIONS ENLARGEMENT



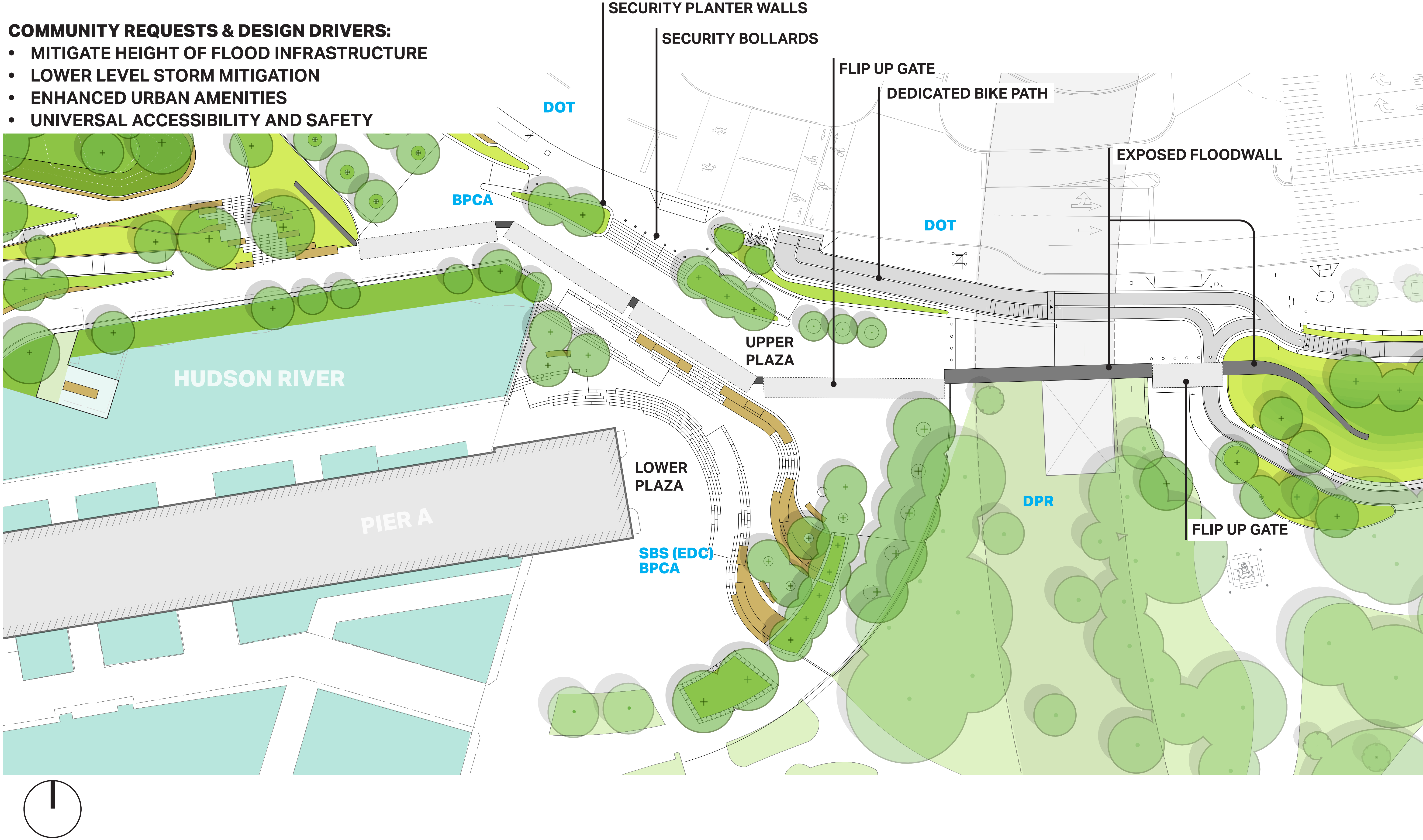
PDC DESIGN UPDATES
PIER A PLAZA

PIER A PLAZA | PREVIOUS DESIGN

APRIL 2021

COMMUNITY REQUESTS & DESIGN DRIVERS:

- MITIGATE HEIGHT OF FLOOD INFRASTRUCTURE
- LOWER LEVEL STORM MITIGATION
- ENHANCED URBAN AMENITIES
- UNIVERSAL ACCESSIBILITY AND SAFETY



PIER A PLAZA | FINAL DESIGN UPDATES

FINAL DESIGN - PDC

LIMIT OF WORK
LMCR BATTERY RESILIENCY

CHANGE IN PLANTER ARRANGEMENT DUE TO BATTERY RESILIENCY EXTENTS & AND ACCESS FOR DEP SERVICE VEHICLE & EMERGENCY VEHICLE

DRAFT

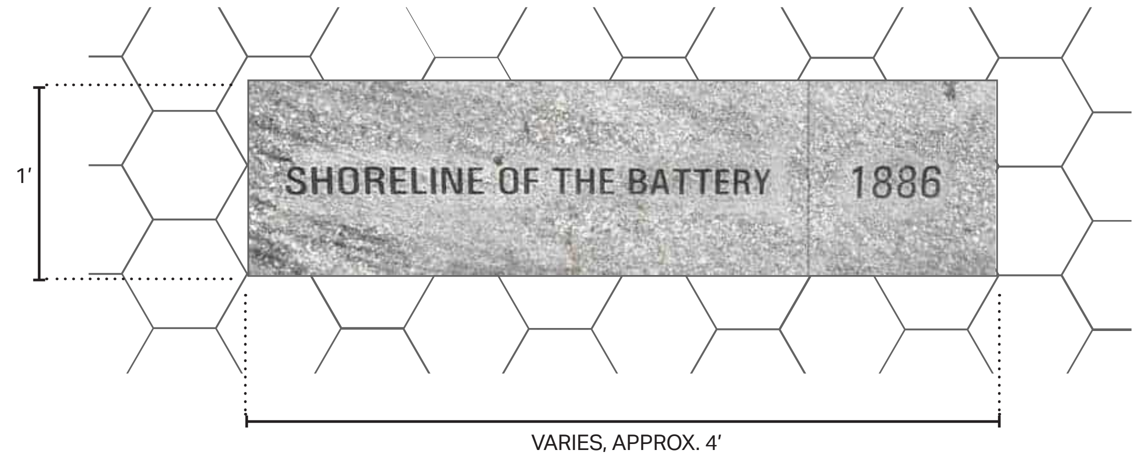
PIER A PLAZA | HISTORIC BULKHEAD MARKERS

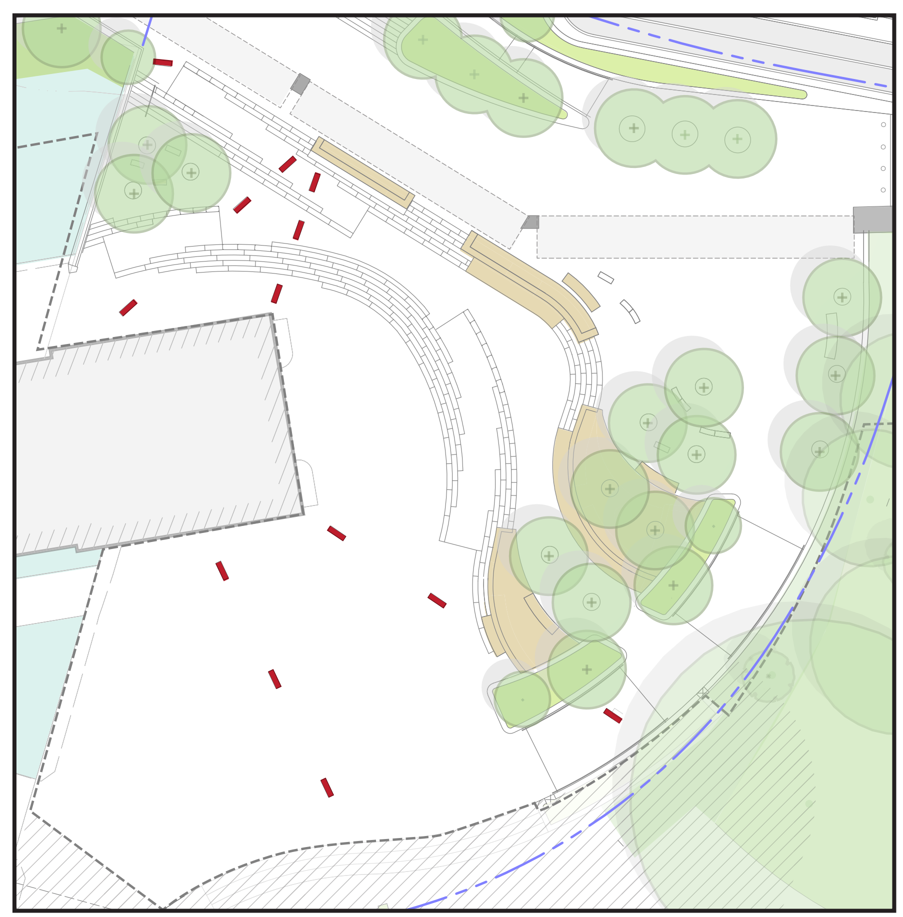
FINAL DESIGN - PDC

- **EXISTING STONE MARKERS TO BE SALVAGED AND PLACED ALONG HISTORIC BULKHEAD LINES WITHIN HEX PAVERS**
- **ADDITIONAL MARKERS CREATED USING SAME SALVAGED STONE AND TO BE INCISED WITH MATCHING TEXT**
- **MARKERS TO OCCUR ON EACH LEVEL OF THE PLAZA**

EXISTING

PROPOSED



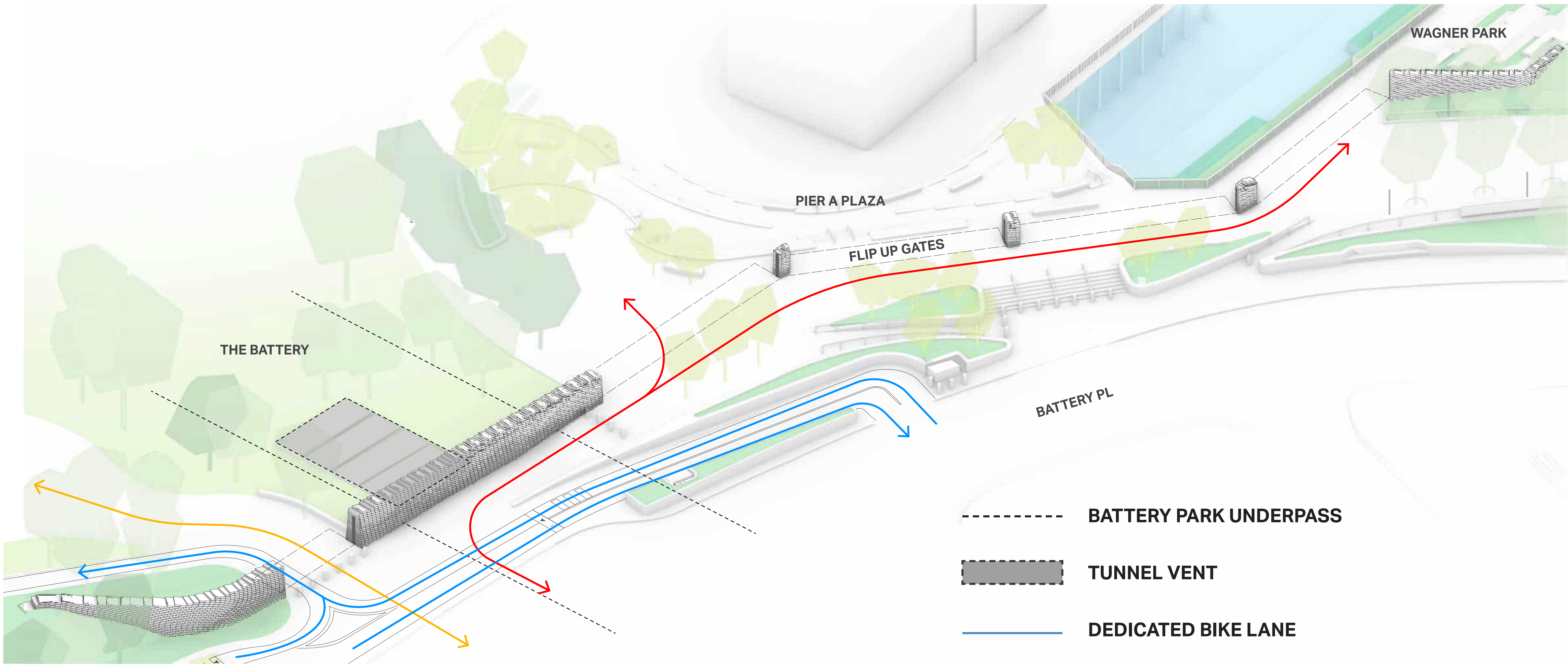


DRAFT


SHORELINE OF THE BATTERY

PDC DESIGN UPDATES
EXPOSED FLOODWALL

EXPOSED FLOODWALL DESIGN DRIVERS



- - - - - - - - BATTERY PARK UNDERPASS

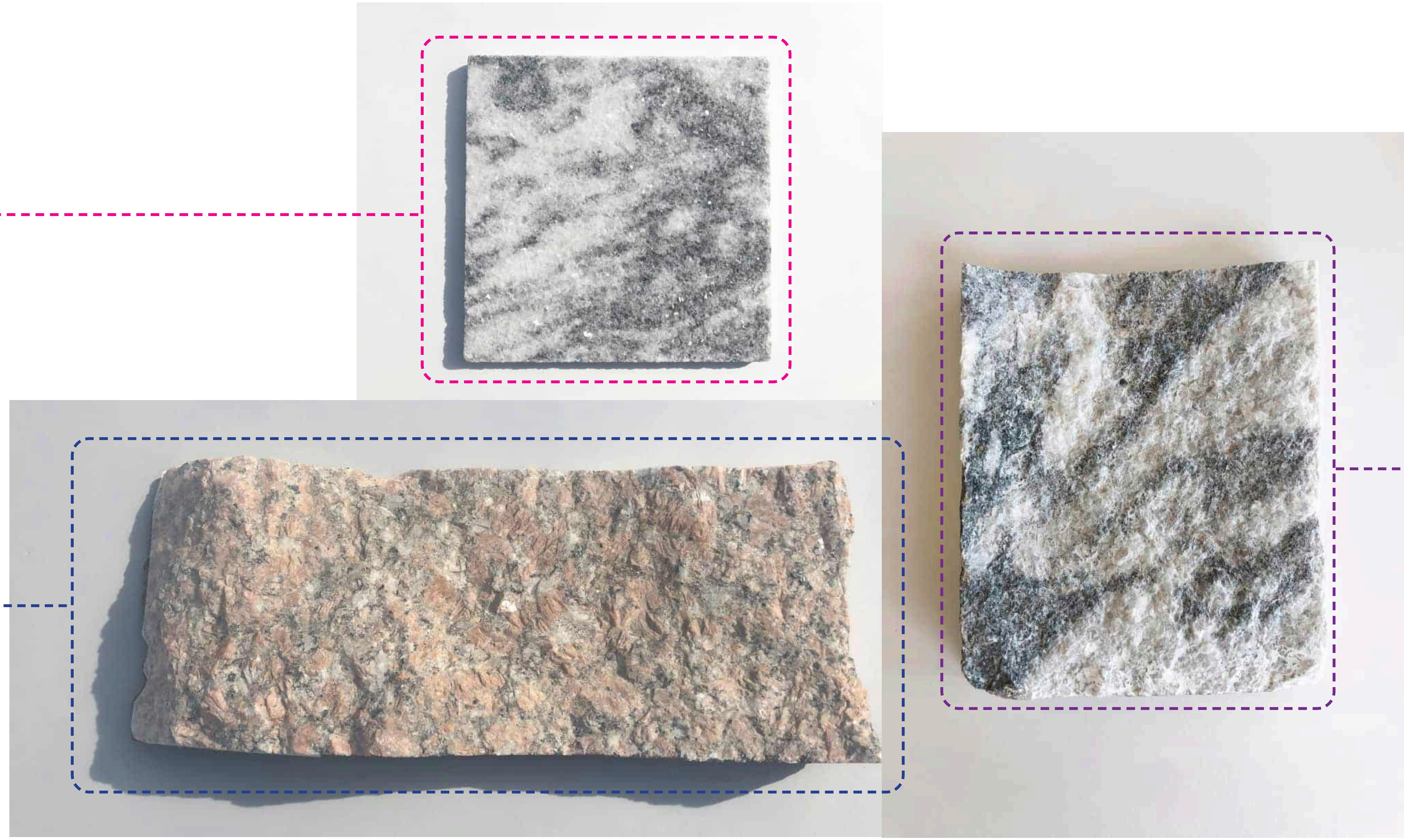
TUNNEL VENT

DEDICATED BIKE LANE

EMERGENCY / FLOODGATE DEPLOYMENT VEHICLE ACCESS

STAGE DEPLOYMENT VEHICLE ACCESS

EXPOSED FLOODWALL | PREVIOUS DESIGN MATERIALS PALETTE



PEARL GREY WATERJET

STONY CREEK SPLIT FACE

PEARL GREY SPLIT FACE

EXPOSED FLOODWALL | PREVIOUS DESIGN

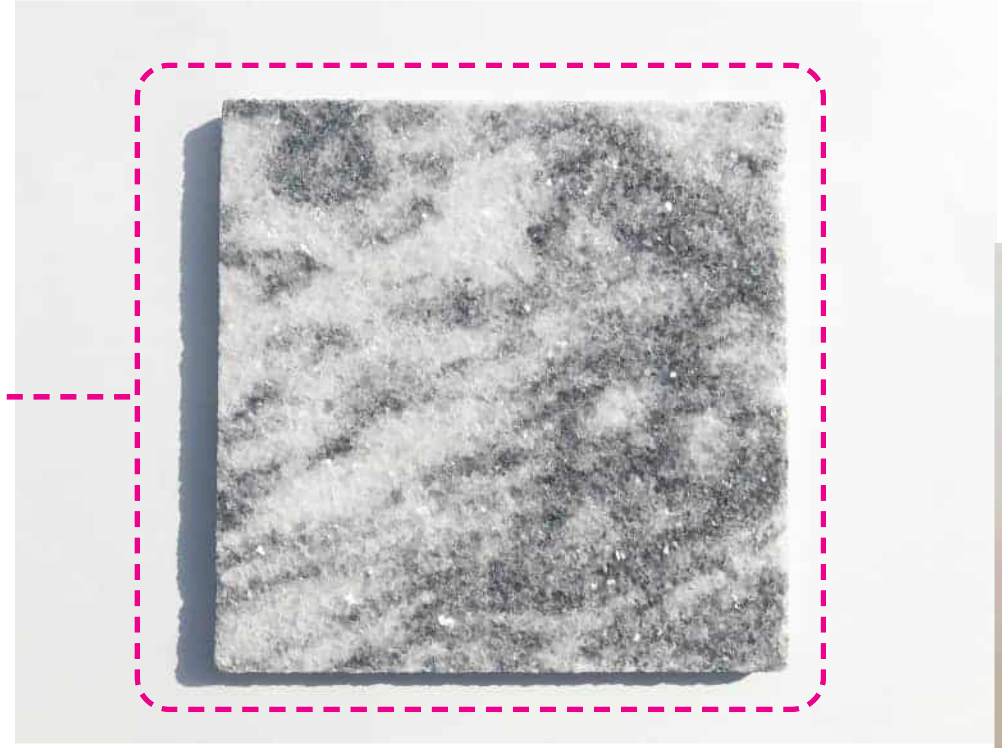
AUGUST 2021

EXPOSED FLOODWALL | PREVIOUS DESIGN - AGENCY & PDC REQUESTS

AUGUST 2021

EXPOSED FLOODWALL | MATERIALS PALETTE

PEARL GREY WATERJET



PEARL GREY SPLIT FACE

PEARL GREY SANDBLASTED

DRAFT

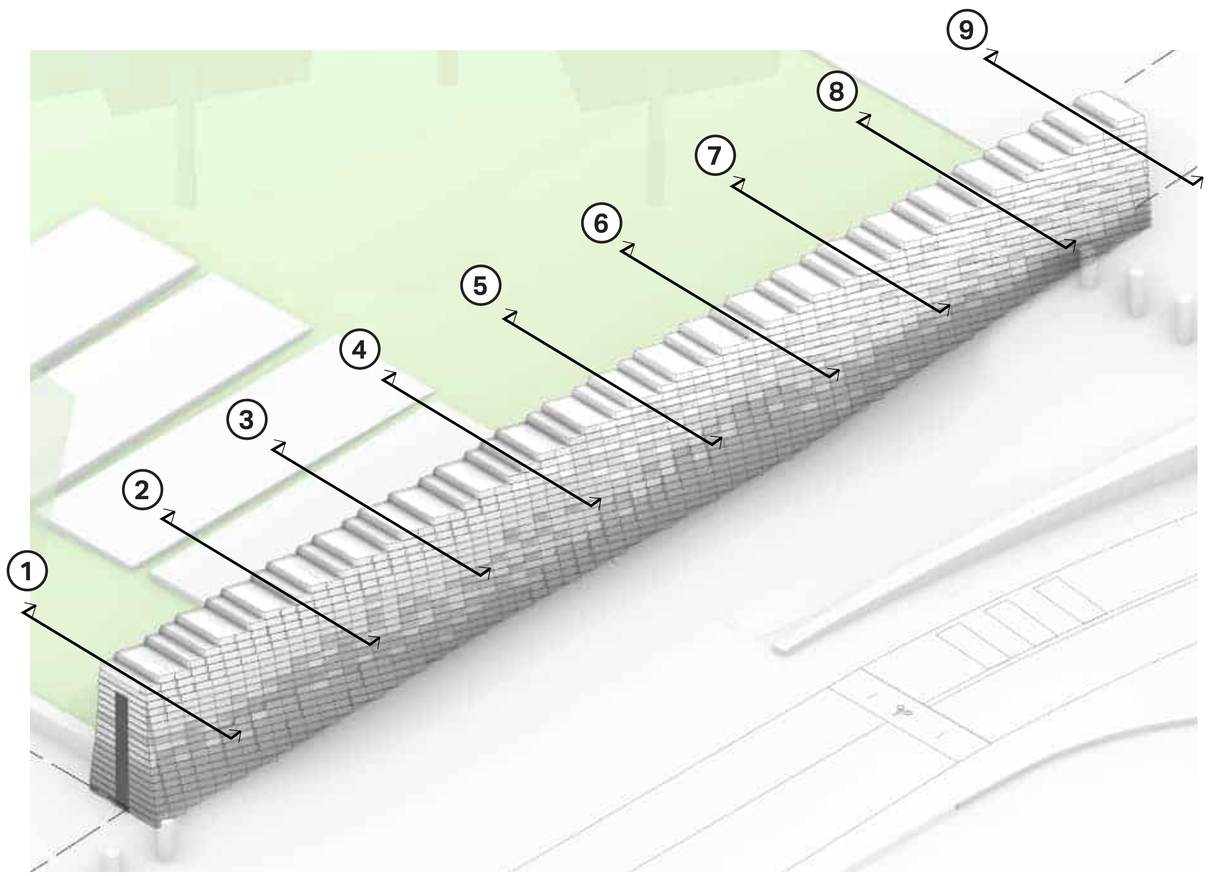
EXPOSED FLOODWALL | BATTERY ENTRANCE

FINAL DESIGN - PDC

DRAFT

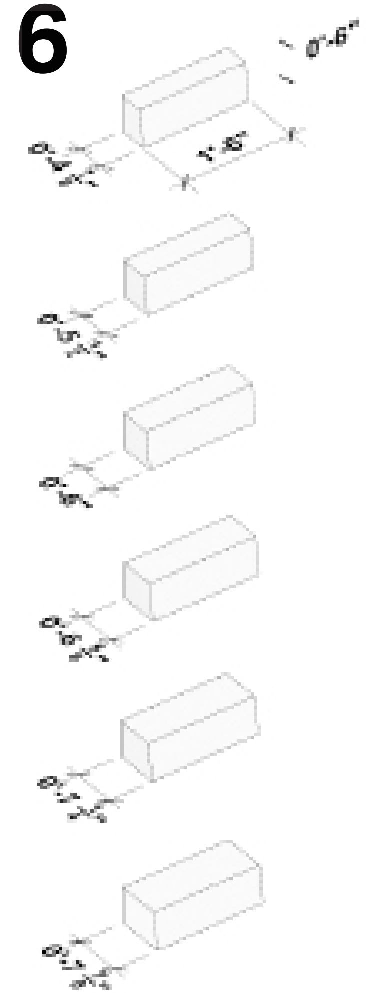
EXPOSED FLOODWALL | STONE UNIT TYPES + SECTIONAL QUALITIES

FINAL DESIGN - PDC



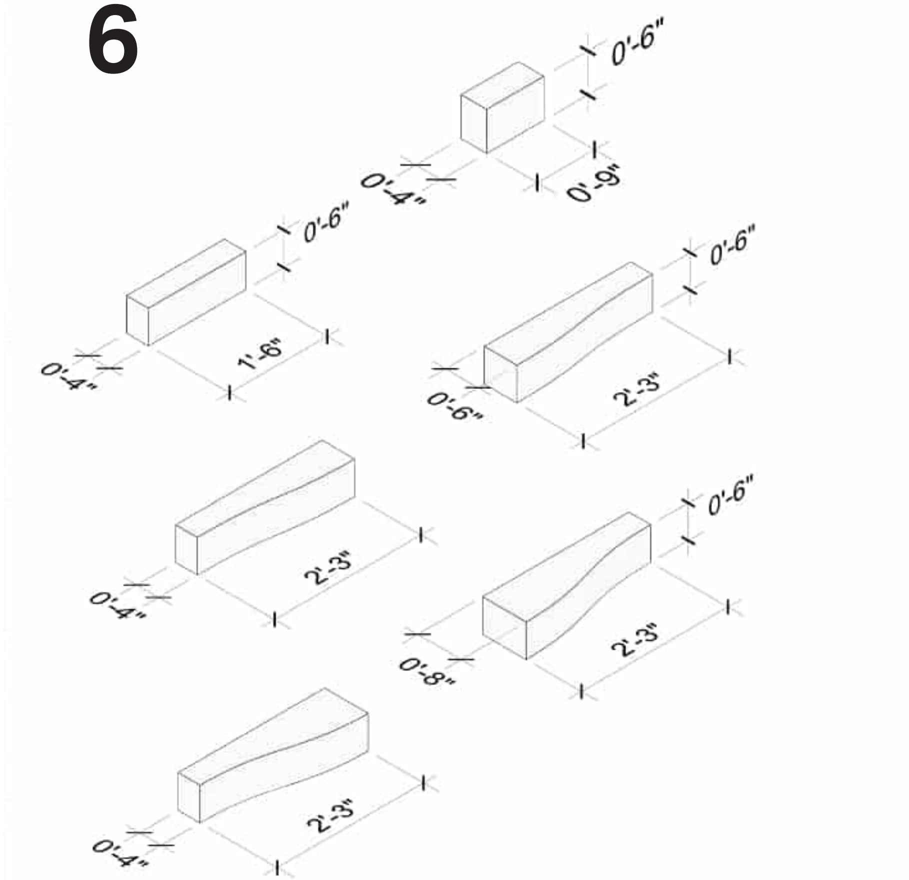
SINGLE WIDTH UNITS:

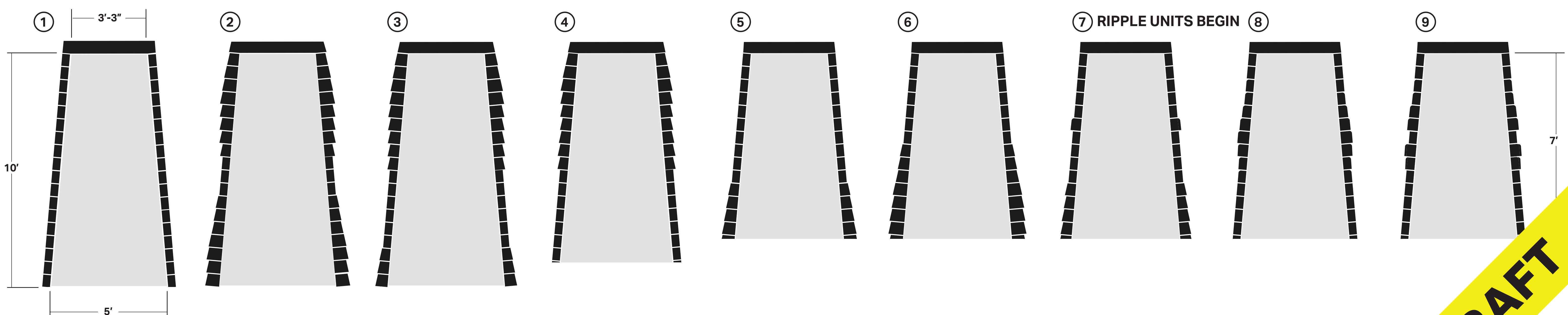
6



RIPPLE UNITS:

6





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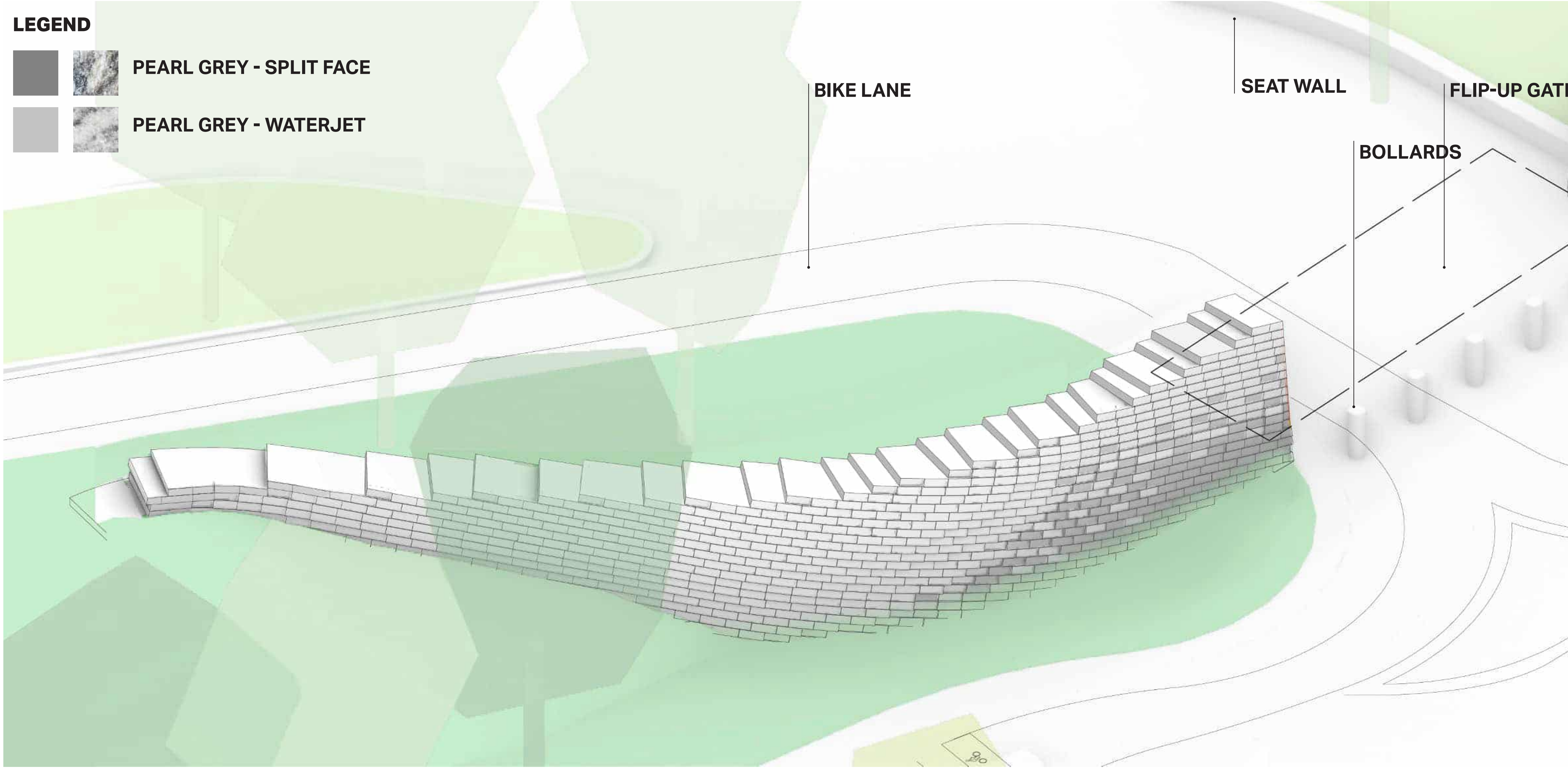
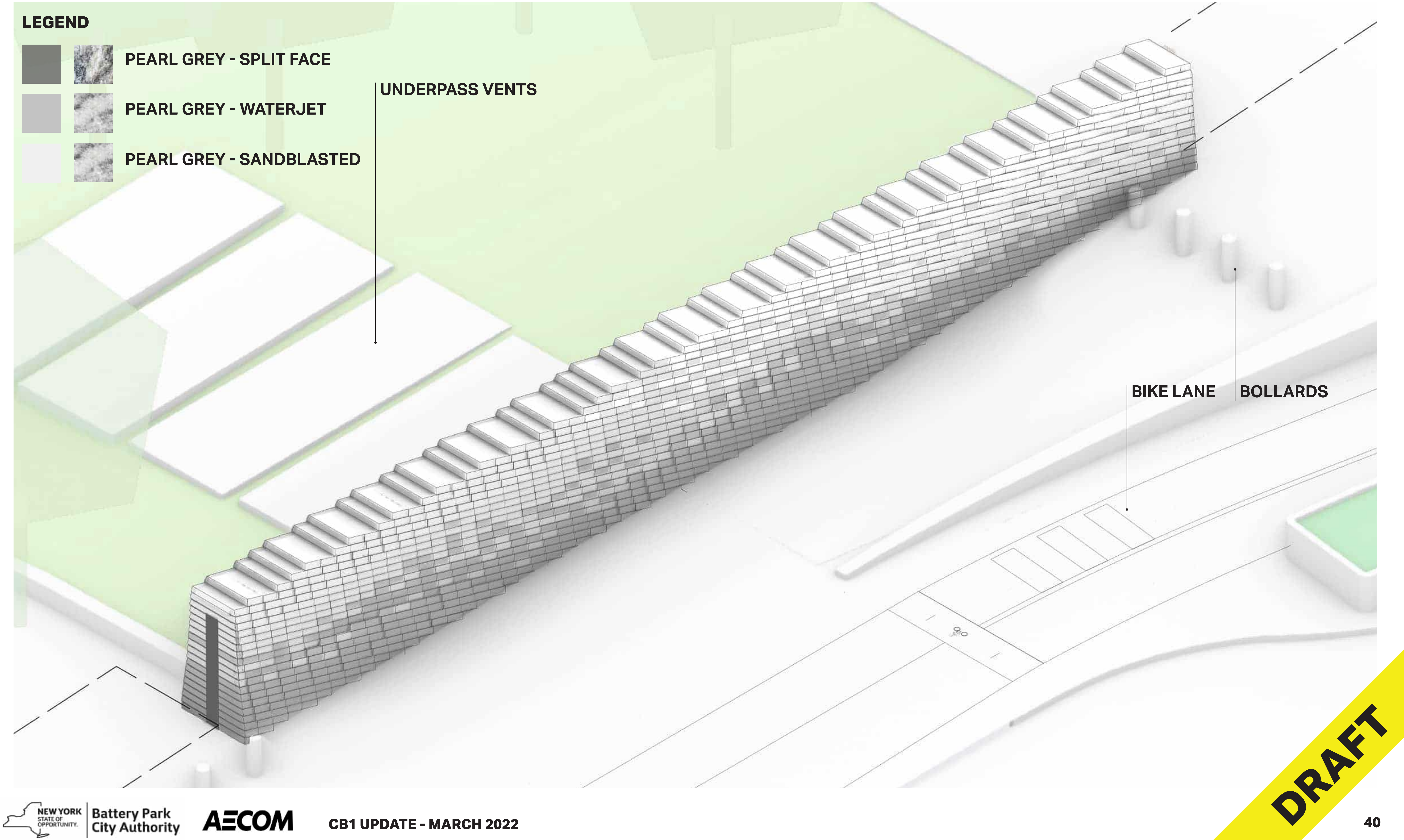
EXPOSED FLOODWALL | THE BATTERY ENTRANCE

FINAL DESIGN - PDC



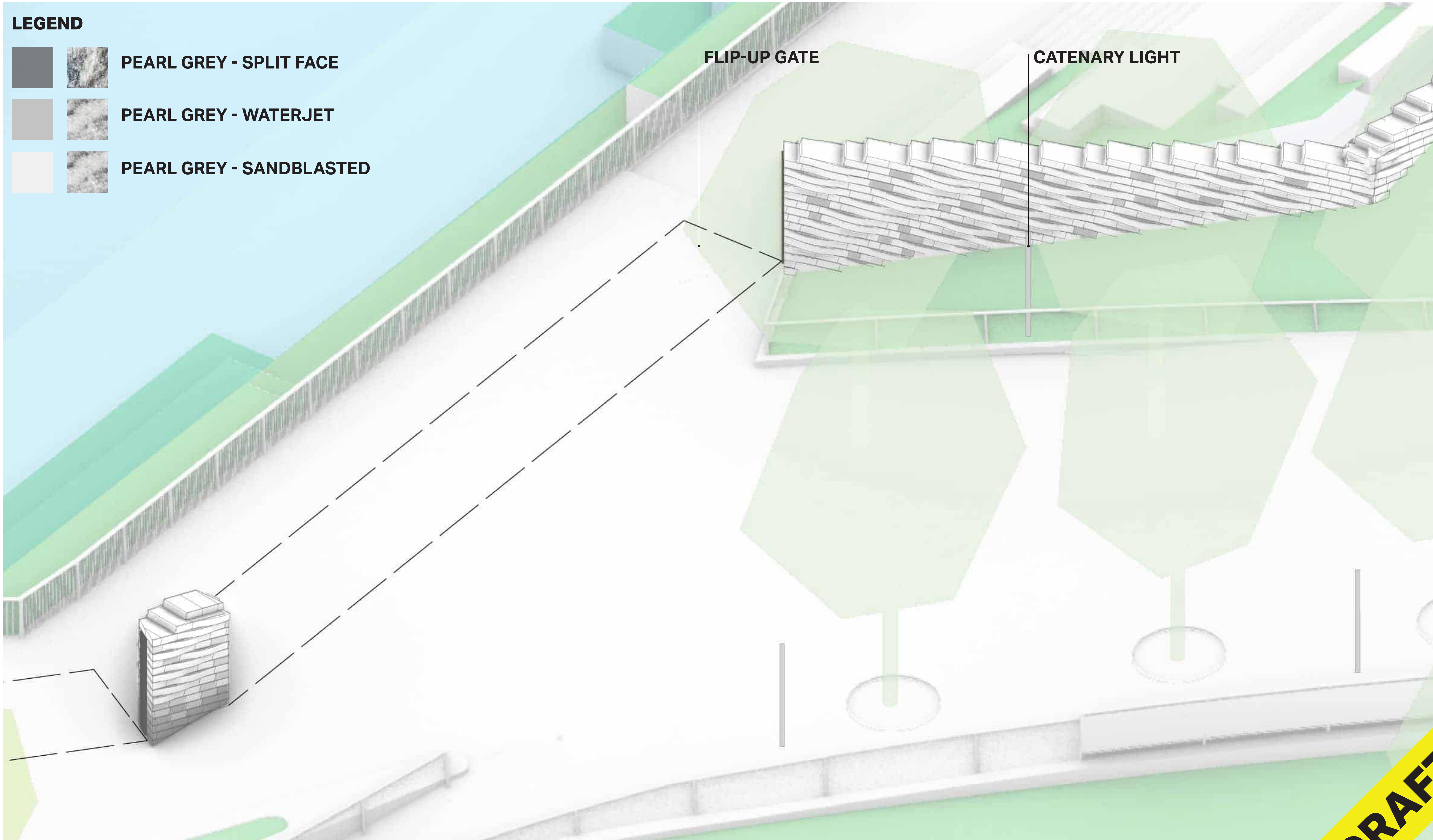
DRAFT

EXPOSED FLOODWALL | PIER A PLAZA



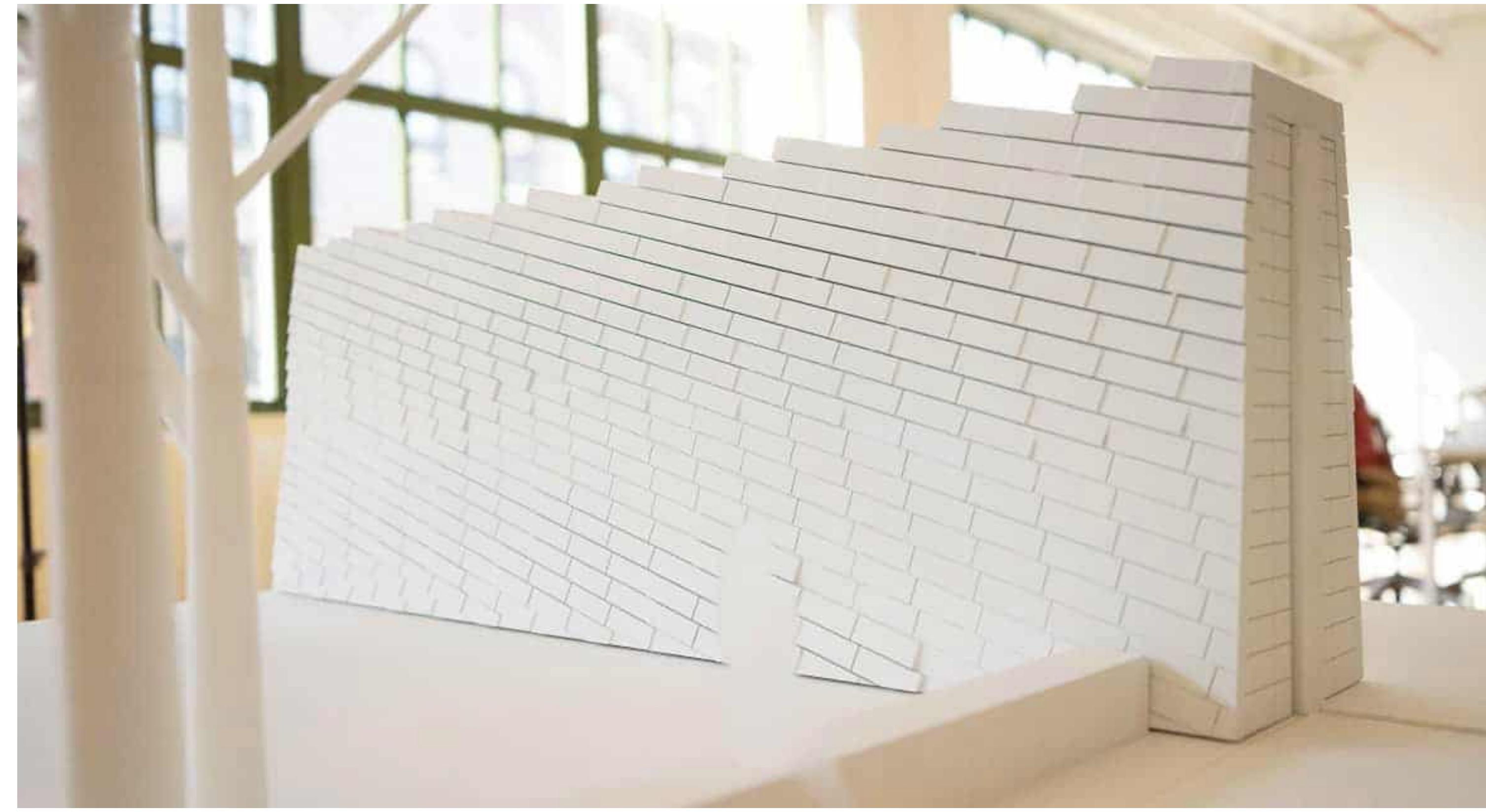
EXPOSED FLOODWALL | WAGNER PARK

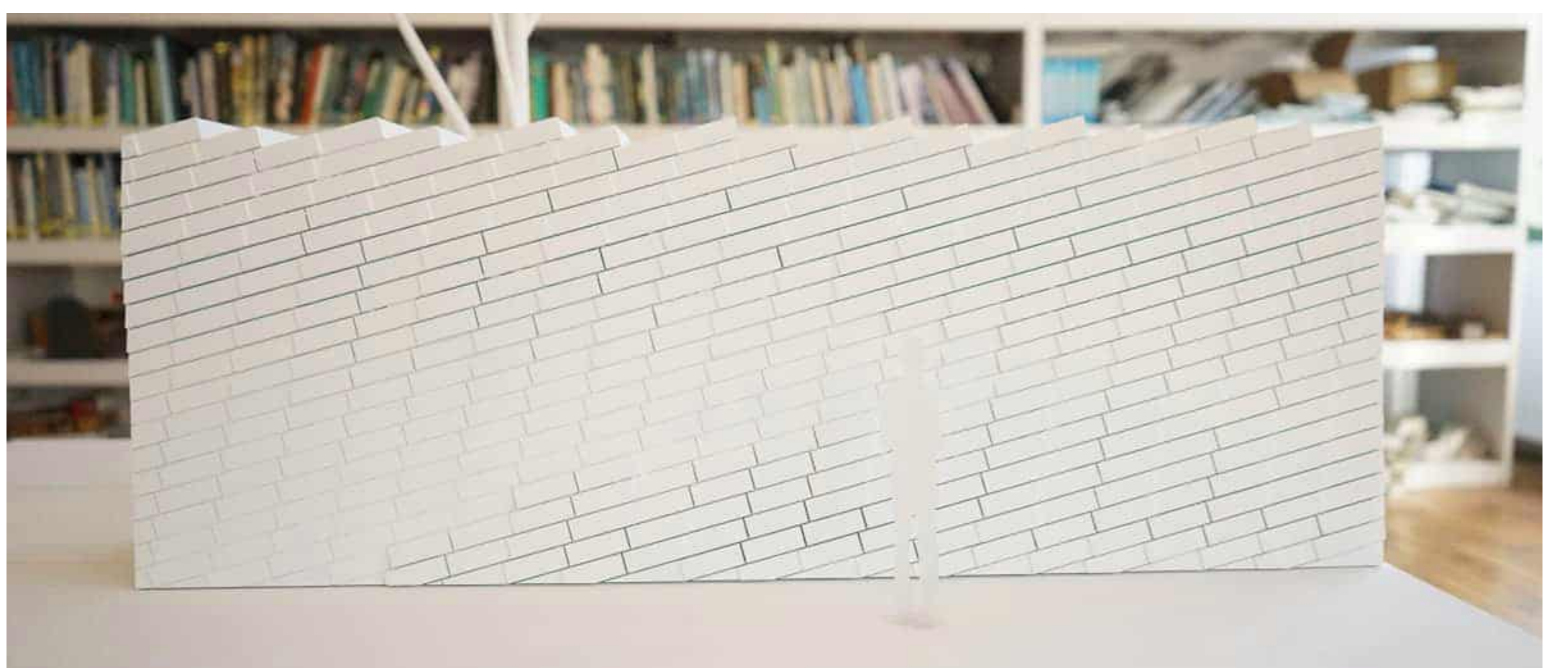
FINAL DESIGN - PDC



PHYSICAL MODEL | EXPOSED FLOODWALL CLADDING INTENT

FINAL DESIGN - PDC

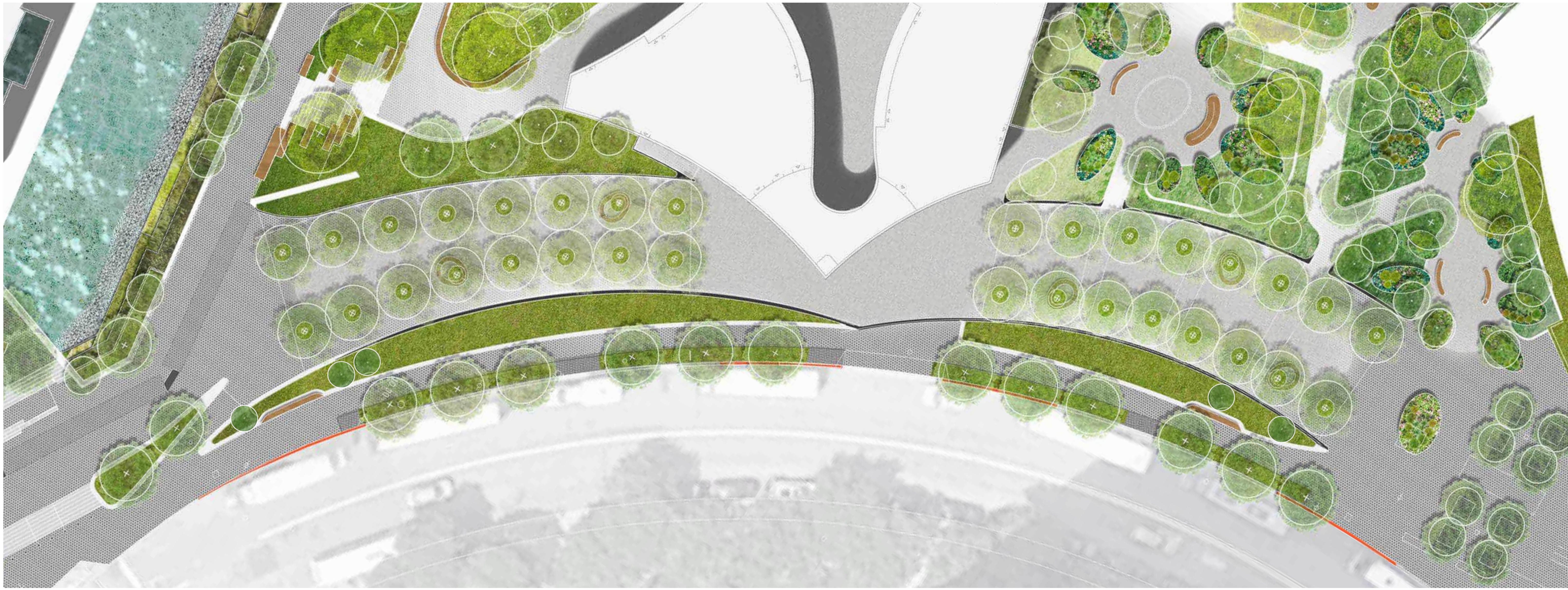


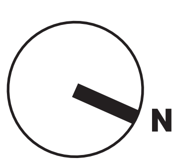


PDC DESIGN UPDATES
BATTERY PLACE

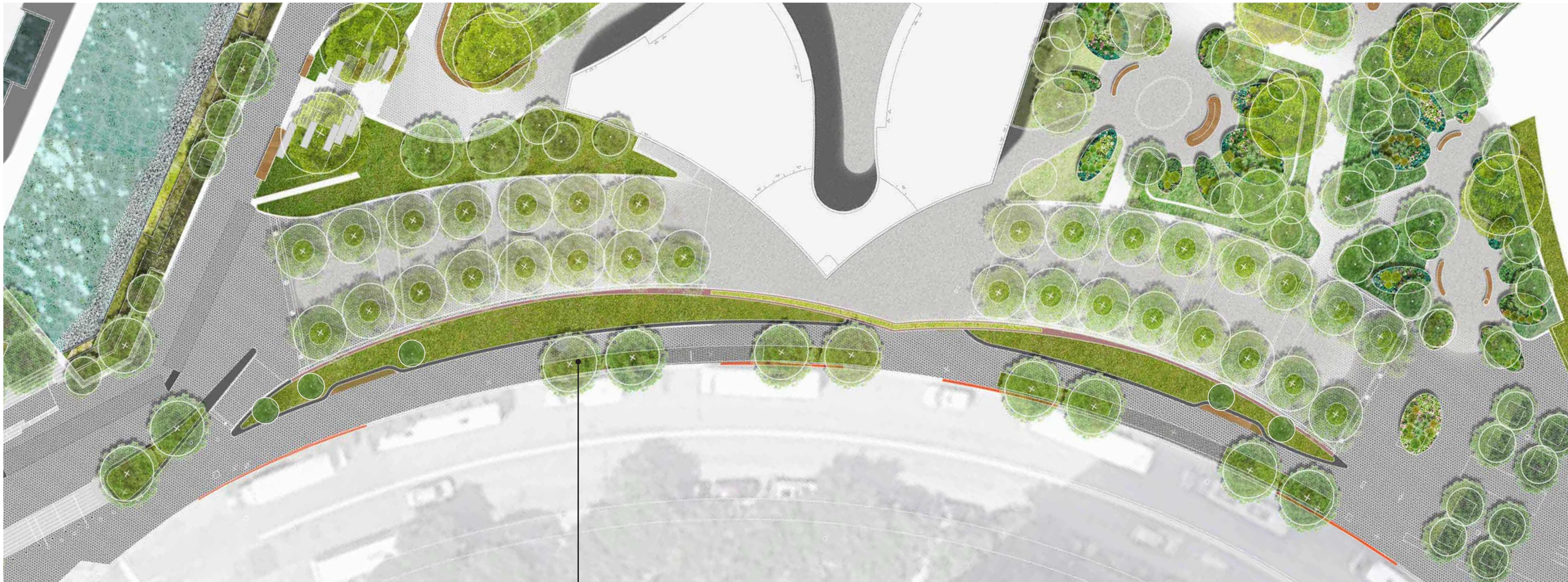
BATTERY PLACE DESIGN | PREVIOUS DESIGN

FEBRUARY 2021

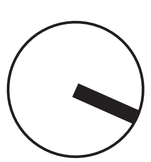




FINAL DESIGN



Number of street trees altered due to utilities, street lights, and signage offsets; DOT standards; existing bus stop; and charter bus drop off

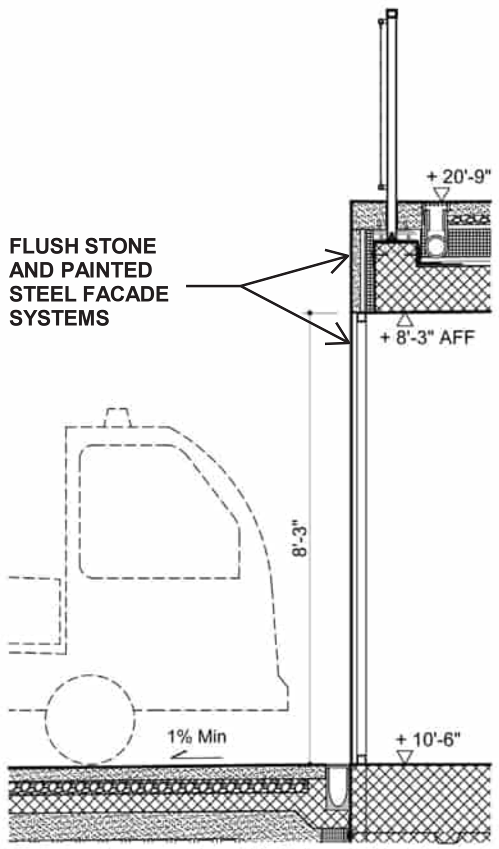


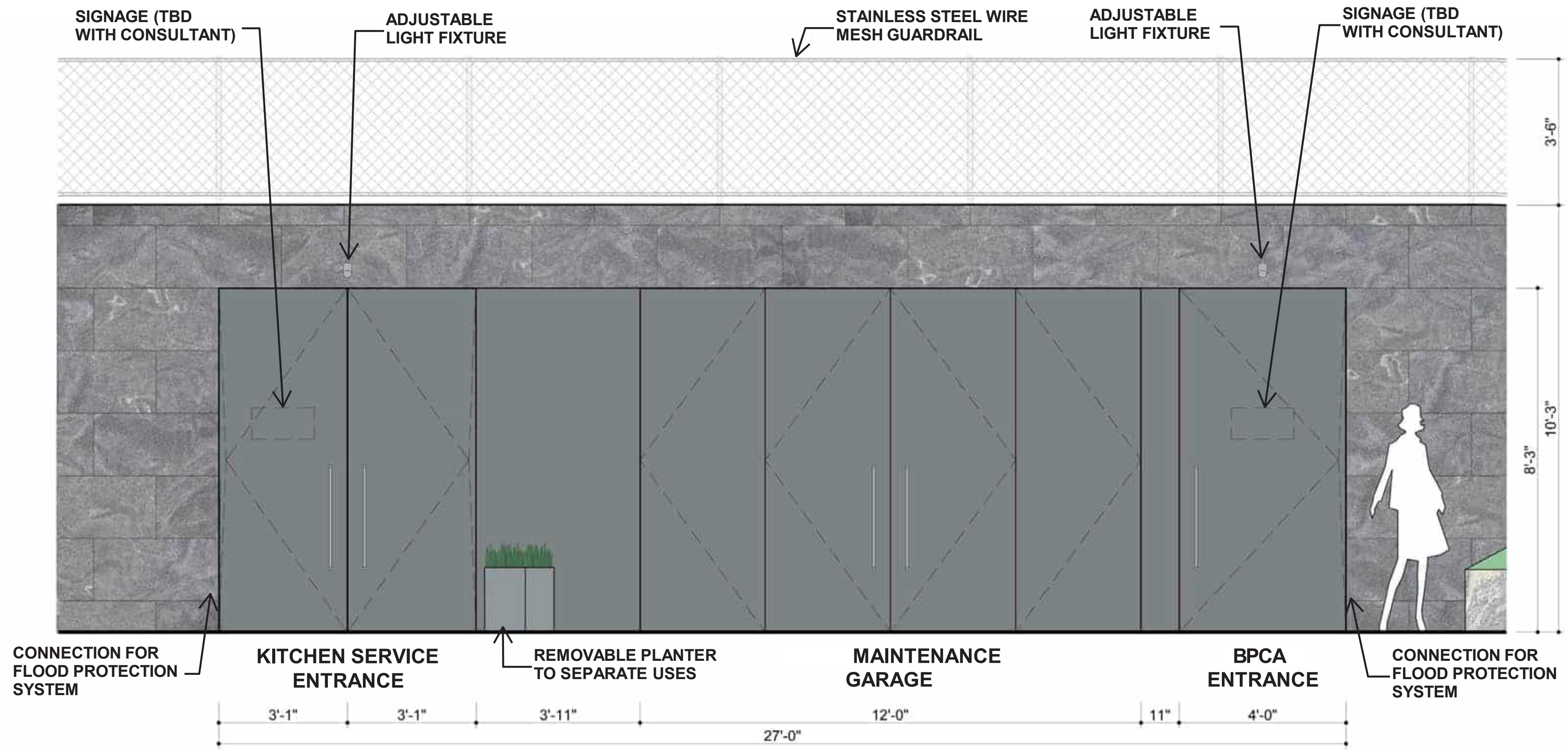
BATTERY PLACE DESIGN | FINAL DESIGN UPDATES

PAVILION SERVICE ENTRANCE

PAVILION SERVICE ENTRANCE | PREVIOUS DESIGN

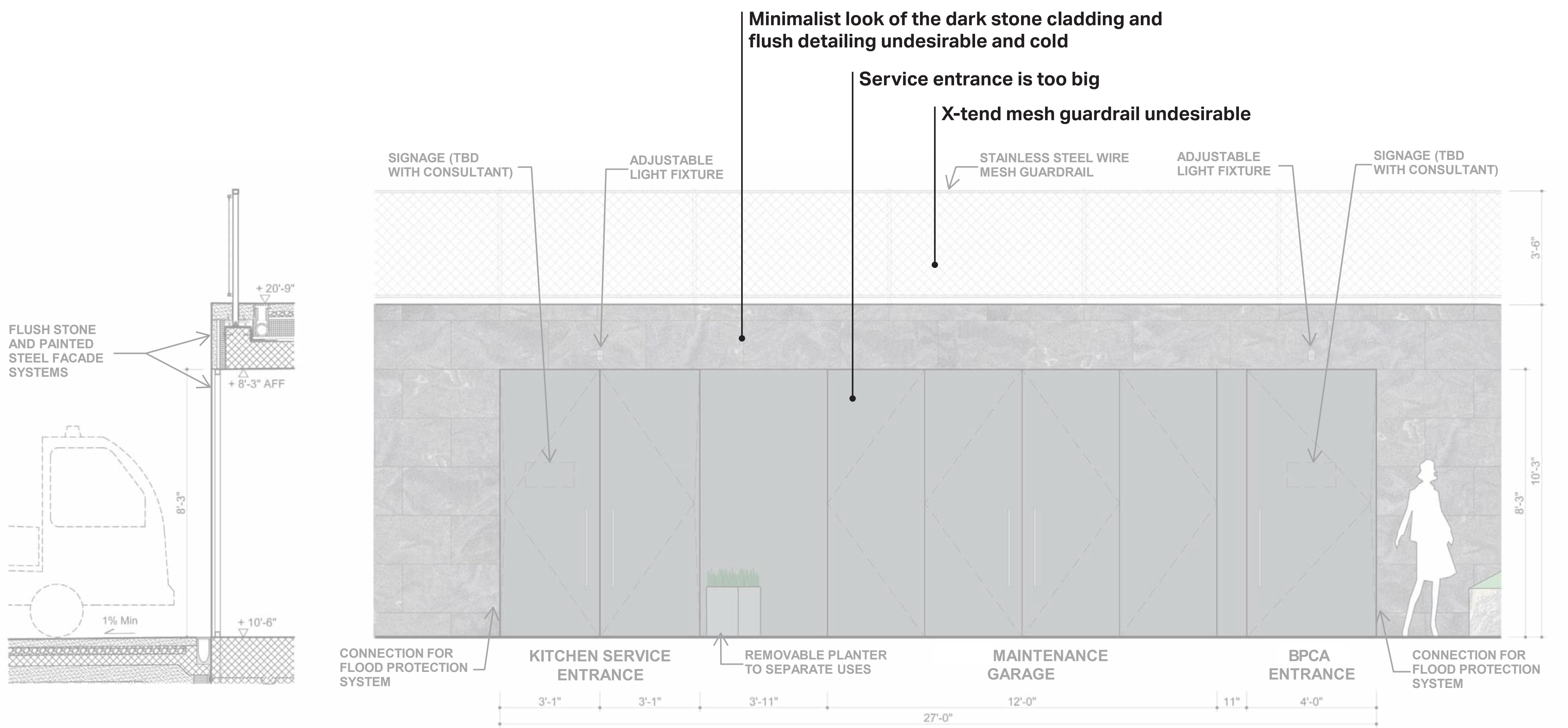
FEBRUARY 2021

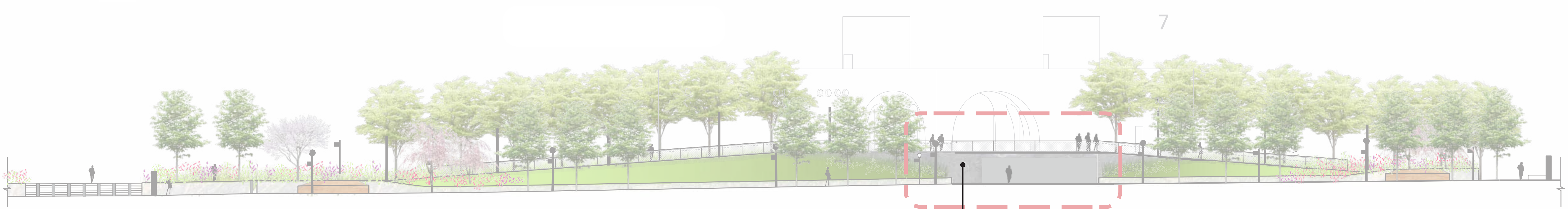




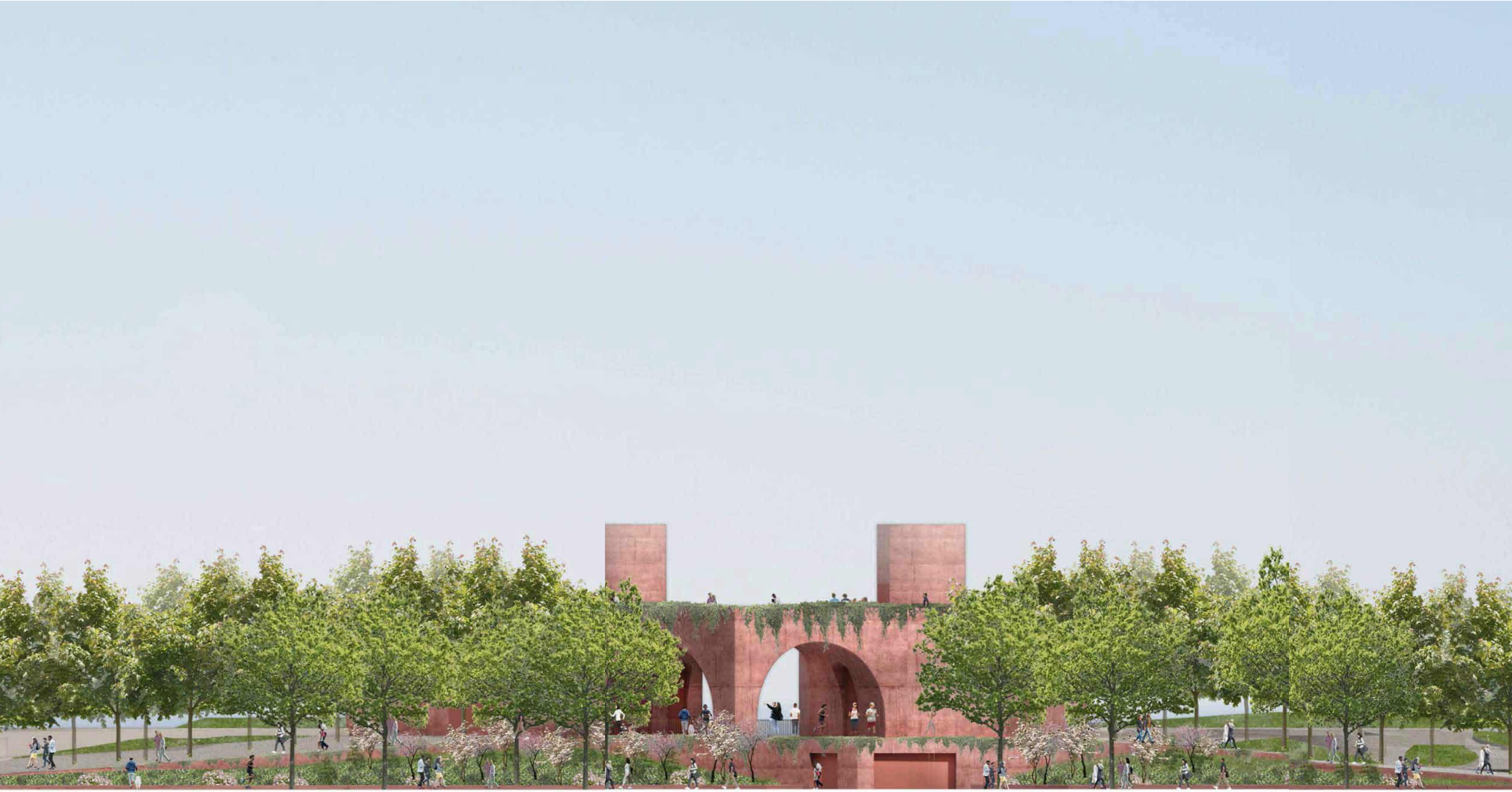
PAVILION SERVICE ENTRANCE | PREVIOUS DESIGN - COMMUNITY REQUESTS

FEBRUARY 2021





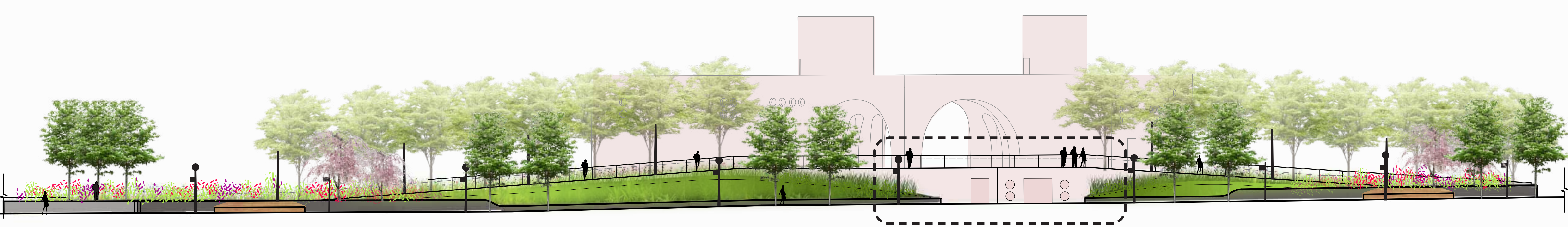
PAVILION SERVICE ENTRANCE | JUNE 2021 REVISED DESIGN



PAVILION SERVICE ENTRANCE | JUNE 2021 REVISED DESIGN

JUNE 2021

PAVILION SERVICE ENTRANCE | FINAL DESIGN



PLANTER

JET MIST
THERMAL

WALL

CUSTOM WARM
RED CONCRETE TO
MATCH PAVILION

DOORS

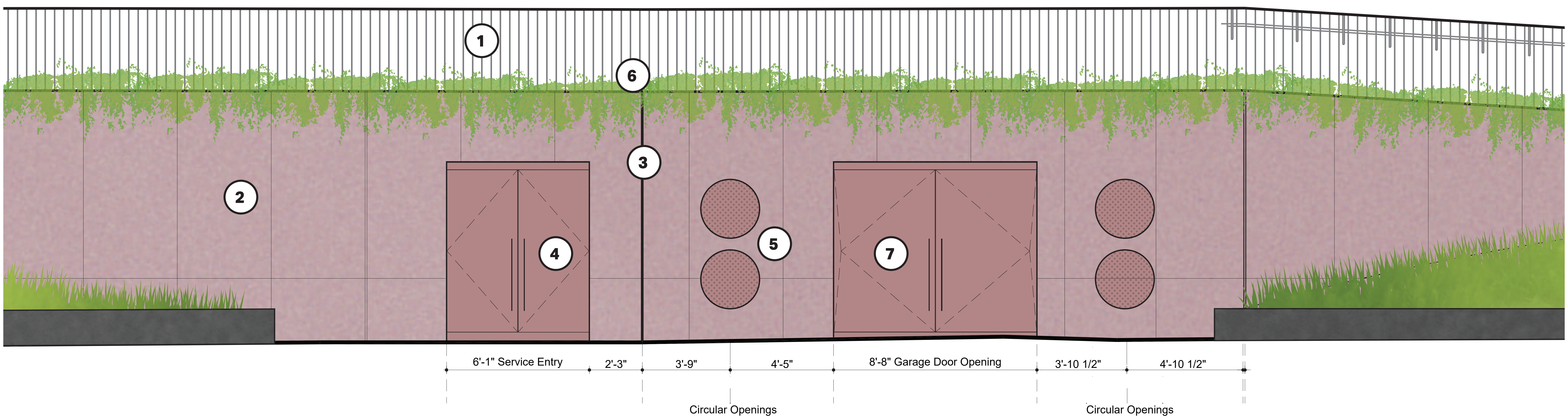
CUSTOM WARM
RED PAINTED
METAL PANEL DOOR

GUARDRAIL

STAINLESS STEEL
PICKET

PAVILION SERVICE ENTRANCE | FINAL DESIGN

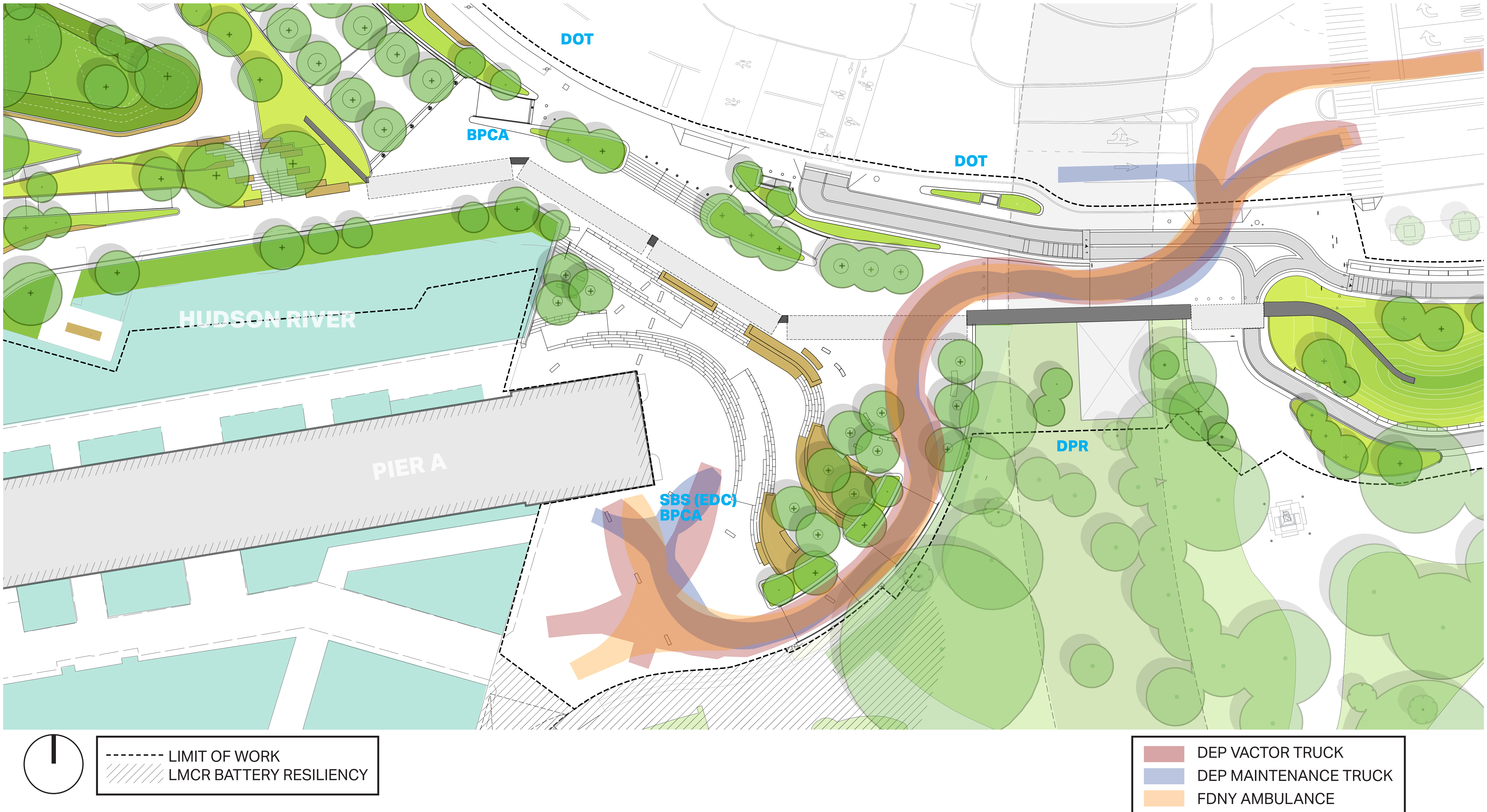
1. UPDATED FROM XTEND MESH TO STAINLESS STEEL PICKET
2. UPDATED FROM JET MIST STONE TO CUSTOM COLOR WARM RED CONCRETE TO MATCH PAVILION
3. POINT OF WALL SHIFTED SOUTH EAST
4. DOORS SPLIT TO FALL ON EACH SIDE OF WALL AND PAINTED TO MATCH CONCRETE AND PAVILION
5. PERFORATED PANELS ADDED TO MATCH PAVILION
6. PLANTER ADDED TO TOP OF WALL AT PLAZA LEVEL



THANK YOU

APPENDIX

PIER A PLAZA | APPROXIMATE AUTO TURN MOVEMENTS



A.4.5 SBPCR Final Coastal Modeling Report (April 2022)

SOUTH BATTERY PARK CITY RESILIENCY PROJECT

Coastal Modeling Study

FINAL

Prepared for: Battery Park City Authority

Prepared by:
AECOM

April 27, 2022

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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ACRONYMS

2D	Two-Dimension
ADCIRC	Advanced Circulation Model
CFL	Courant-Friedrichs-Lewy number
cfs	Cubic feet per second
DEM	Digital Elevation Model
FEMA	Federal Emergency Management Agency
FIS	Flood Insurance Study
FM	Flexible Mesh
ft	U.S. Feet
HD	Hydrodynamic
LiDAR	Light Detection and Ranging
LGA	La Guardia Airport
NAVD88	North American Vertical Datum of 1988
NFIP	National Flood Insurance Program
NLCD	National Land Cover Database
NOAA	National Ocean and Atmospheric Agency
NPCC	New York City Panel on Climate Change
RAMPP	Risk Assessment, Mapping, and Planning Partners
SLR	Sea Level Rise
SW	Spectral Wave
SWEL	Stillwater Elevation
SWL	Stillwater Level
TWL	Total Water Level
USACE	U.S. Army Corps of Engineers

WBPC	West Battery Park City
WSE	Water Surface Elevation

DEFINITIONS UNITS

1 meter = 3.28084 feet

1 foot = 12 inches

1.0 INTRODUCTION

The Battery Park City Authority has contracted AECOM to provide engineering design services in support of the South Battery Park City (SBPC) Resiliency Project (the "Project").

1.1 Project Area

The study area of the SBPC project includes a continuous flood barrier starting from the Museum of Jewish Heritage, through Wagner Park, across Pier A Plaza, and ending along the northern border of Historic Battery Park, as shown in Figure 1-1. This area represents one of the Battery Park City's (and Lower Manhattan's) vulnerable points to storm surge inundation and flooding.

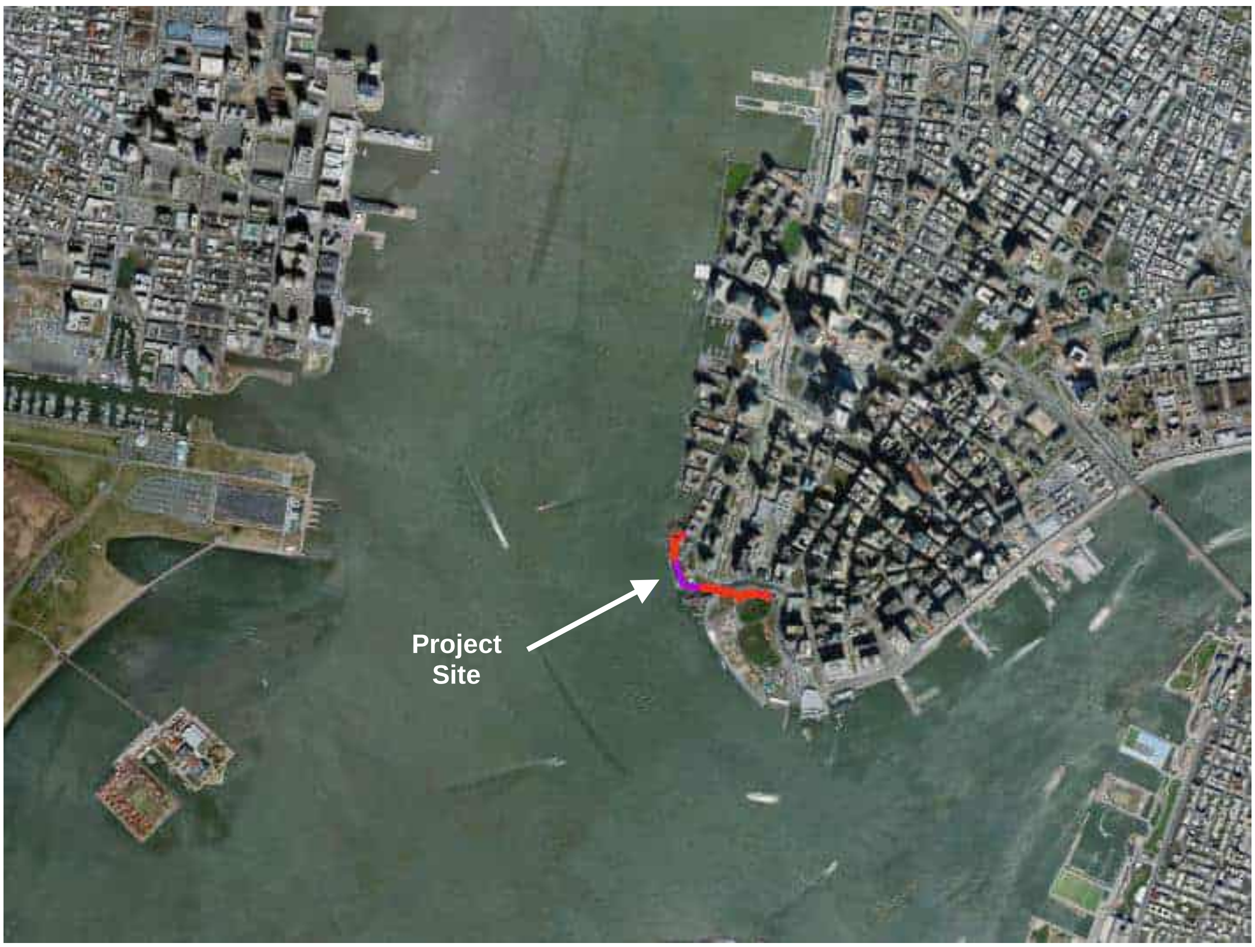


Figure 1-1 Project Study Area Map

1.2 Objectives and Scope of Work

As part of the scope of work of the SBPC project, one of the primary objectives is to develop a coastal model system to assess the project area's vulnerability to flooding for existing conditions (with no flood protection implemented) and for the proposed flood resistant alignment, with and without Sea Level Rise (SLR) considered.

2.0 DEVELOPMENT OF COASTAL MODEL SYSTEM

Numerical mathematical models are commonly used in engineering practice, as they provide a convenient and reliable method for comparing project alternatives to existing conditions (baseline) under different combinations of coastal storm surges, waves, tides, and sea levels. For this Project, a suite of coastal models were applied and consisted of a regional-scale storm surge model ADCIRC, local-scale storm surge and wave models MIKE 21 Hydrodynamic FM Model, MIKE 21 Spectral Wave FM Model, and MIKE 3 Wave Model, and the EurOtop equations for computation of wave runup and overtopping. Ultimately the requirements for design or certification will depend on the calculated wave runup elevations, overtopping discharge rates and volumes, and wave forces along the project structure alignment. The final assessment of wave runup and overtopping was made using the EurOtop equations, with inputs coming from the MIKE 21 wave model results and from the most recent FEMA FIS study (FEMA, 2013) in the area.

2.1 Regional Coastal Storm Surge Model ADCIRC

For this Project, AECOM applied the two-dimensional ADCIRC coastal storm surge model developed as part of FEMA's New York/New Jersey storm surge study (RAMPP, Region II Storm Surge Project – Model Calibration and Validation, 2014) to provide regional boundary conditions for the MIKE 21 Hydrodynamic FM Model that was subsequently used to simulate the storm surge events in the SBPC Project's urban environment. The ADCIRC model domain extends from 97.85° to 60.04° W and from 7.90° to 45.83° N, encompassing the Western Atlantic, the Gulf of Mexico, and the Caribbean Sea.

ADCIRC is a system of computer programs for solving time-dependent, free surface circulation and transport problems in two and three dimensions. These programs utilize the finite element method in space allowing the use of highly flexible, unstructured grids. One of ADCIRC's primary applications is the prediction of storm surge and flooding under extreme storm events. Storm surge is a rise in sea water level caused by extreme wind and pressure forces acting on the water surface. Water heights associated with storm surge are superimposed on water levels generated by tidal forcing. Past research and model experiences illustrate that the numerical model domain size has considerable effects on the accuracy of storm surge predictions; therefore, ADCIRC model domains often extend far beyond the local study area and out into the deep ocean. The ADCIRC model grid and domain are shown in Figure 2-1.

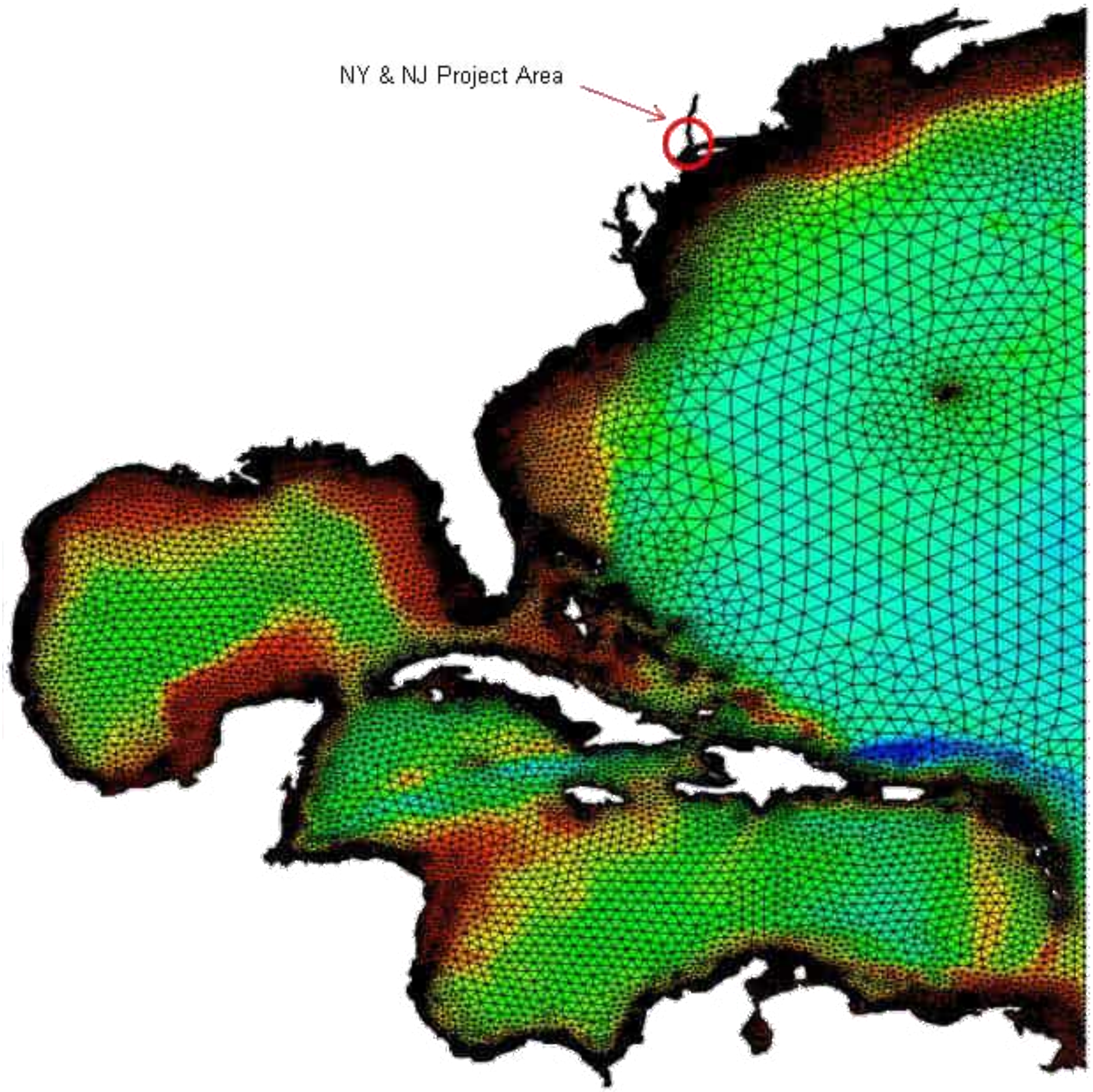


Figure 2-1 Numerical Grid and Model Domain of ADCIRC Model

2.2 MIKE 21 Hydrodynamic FM Model

The MIKE 21 hydrodynamic (HD) flexible mesh (FM) Model is a FEMA-accepted hydrodynamic model for conducting flood assessments. The flexible mesh approach allows for variations in the model resolution within the model domain. Consequently, MIKE 21 HD FM Model is especially suitable for the urban environment. The MIKE 21 HD FM Model is a depth-integrated 2D model applied for the simulation of hydraulic and environmental phenomena in lakes, estuaries, bays, coastal areas, and seas. It simulates water level variations and flows in response to a variety of forcing functions in lakes, estuaries and coastal regions. Capabilities of the MIKE 21 HD FM Model include:

- Bottom shear stress
- Wind shear stress
- Barometric pressure gradients
- Coriolis force
- Momentum dispersion
- Sources and sinks
- Rainfall and evaporation
- Flooding and drying
- Wave radiation stresses
- Direct dynamic coupling to the MIKE 21 Spectral Wave model

2.2.1 Topography and bathymetry

Topographic and bathymetric data are critical to the development of any hydrodynamic model. For this project, efforts were made to employ recent terrain data available, which include:

- Digital Elevation Model (DEM, both topography, and bathymetry) derived from post-Sandy LiDAR collected in November 2012 by the USACE Joint Airborne LiDAR Bathymetry Technical Centre of Expertise (JALBTCX).
- The Post-Sandy Digital Elevation Model (DEM, both topography, and bathymetry) from NOAA, April 2016.

To supplement DEM data, AECOM conducted a topographic and bathymetric survey to obtain elevations of existing waterfront structures, shoreline features, and bathymetry from the pier head to the shoreline. The extents of the waterfront topography and bathymetry are shown in Figure 2-2.

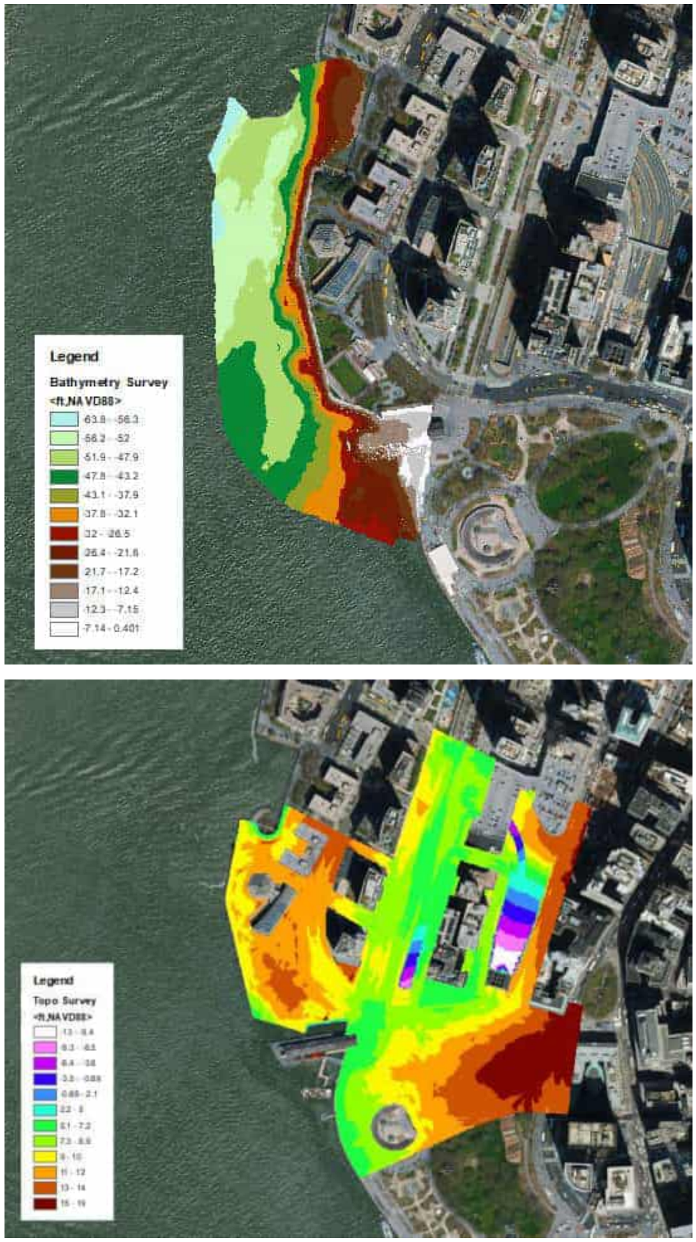


Figure 2-2 Extent of Topography and Bathymetry Surveys for Bathymetry Survey (top) and Topography Survey (bottom).

2.2.2 Model Domain and Mesh

The overview of the MIKE 21 HD FM model domain and mesh are shown in Figure 2-3 and Figure 2-4. The Horizontal Coordinate System of the 2D figures in this report is UTM-18, NAD83, US Feet. Figure 2-5 shows the refined mesh at the project site.

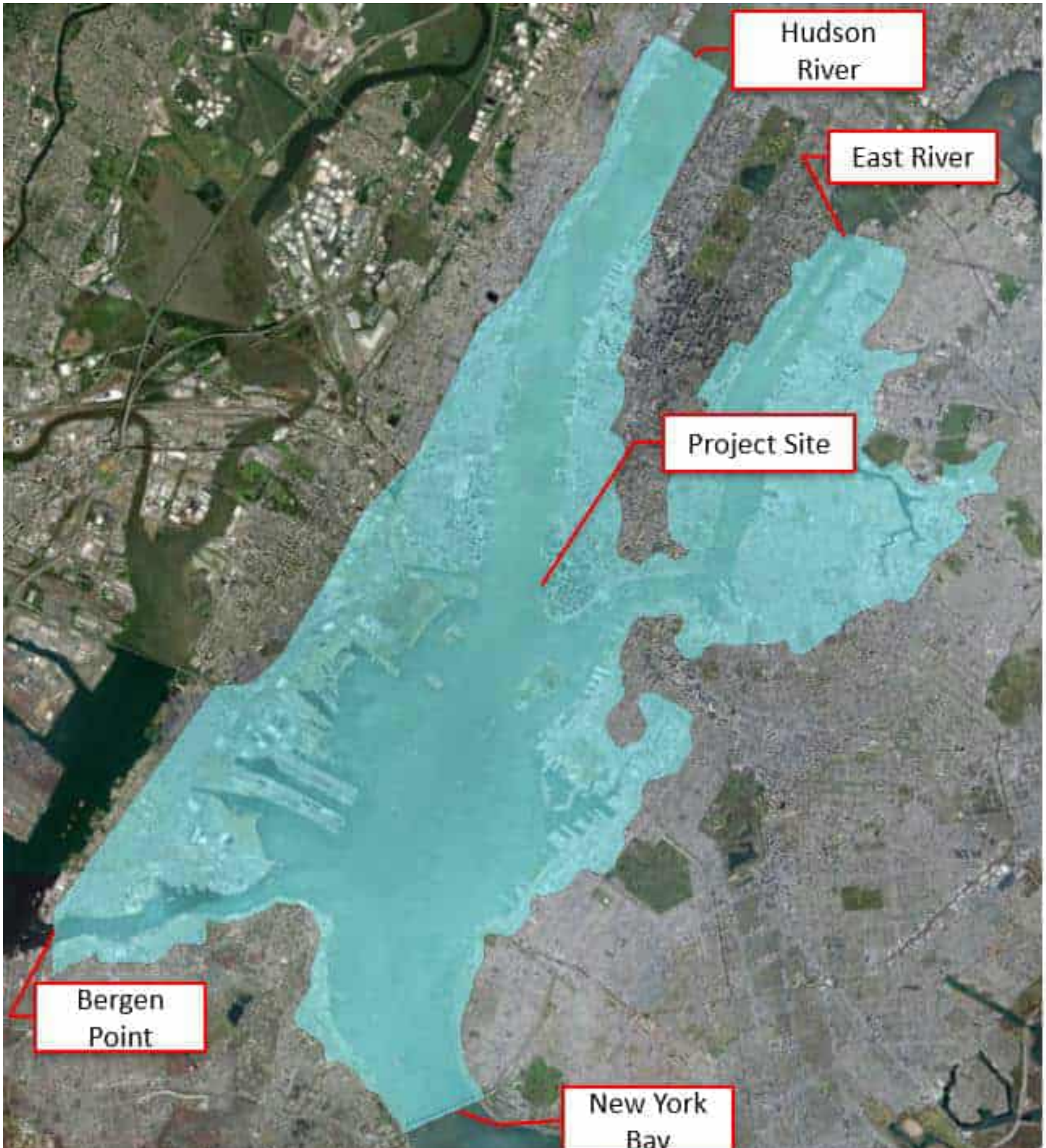


Figure 2-3 Overview of MIKE 21 HD FM Model Domain and Boundary Locations

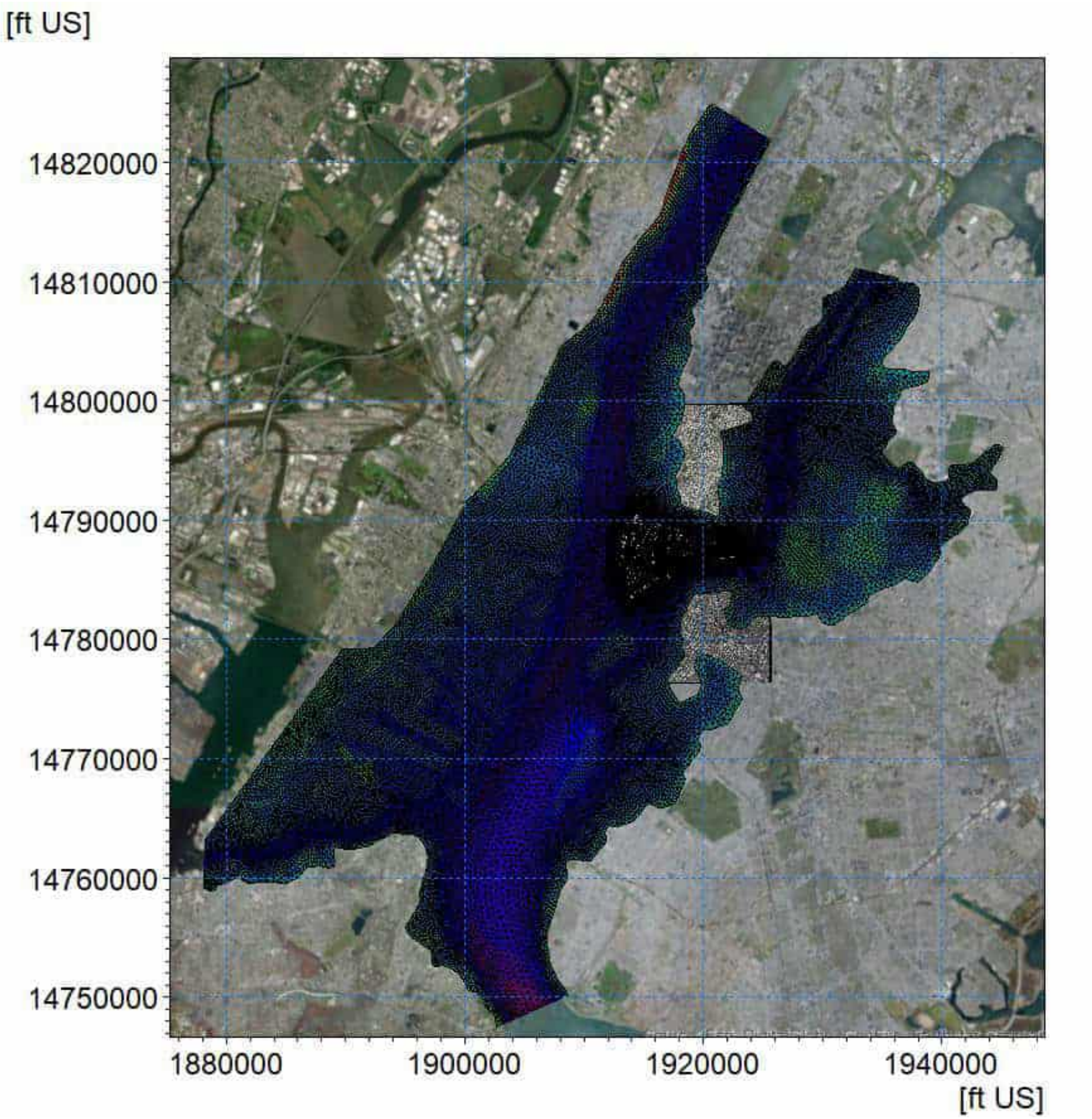


Figure 2-4 Overview of MIKE 21 Hydrodynamic Model Mesh

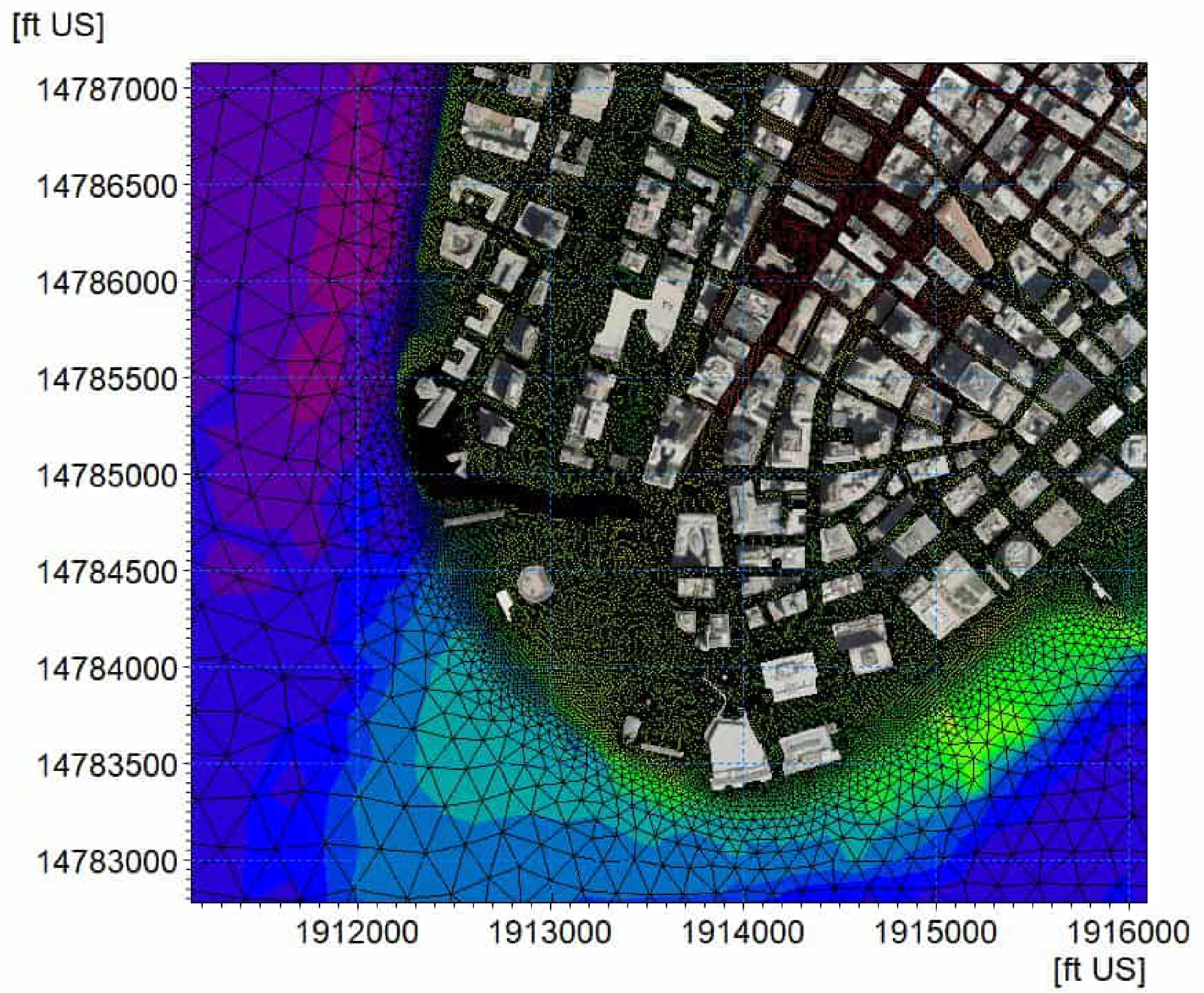


Figure 2-5 MIKE 21 Hydrodynamic Model: Refined Mesh at Project Site

2.2.3 Model Setup

The MIKE 21 HD FM model setup parameters are summarized in Table 2-1.

Table 2-1 Summary of MIKE 21 HD FM Model Setup Parameters

Parameter	Value / Note
The study area for mesh	62 square miles
Model mesh	about 0.3 million elements; average element length in the project area is on the order of 16 ft. Mesh element size in the model domain varies from 1.5 ft to 350 ft. Element size indicates the approximate length of a triangular element side.
Model time step	Overall time step interval: 30-second (frequency of output). Time step for hydrodynamic model: dynamic and each determined to satisfy stability criteria (Courant-Friedrichs-Lewy condition-<0.8).
Boundary conditions	Flather condition: (time series of surface water elevations and velocities extracted from the ADCIRC model applied along each model open boundary)
Flood and dry	Included. Drying depth: 0.0164 ft Flooding depth: 0.033 ft Wetting depth: 0.33 ft
Bed roughness	Manning's M (1/Manning's n), varying from 7 to 50 in the domain
Horizontal eddy viscosity	Smagorinsky coefficient: 0.28 as initial
External forcing	Domain varying time series of wind and pressure forcing (source: Oceanweather Inc.) included

During the model setup, the bed roughness map was created using the Manning's n-values categorically assigned to the land use data downloaded from the National Land Cover Database (NLCD) website. The NLCD's Land Use GIS data consists of 16 different land use classifications to use in the coastal model. The Manning's n-values corresponding to land use classification were assigned based on the literature and on published Manning's n-values from a coastal storm surge study conducted for FEMA by Risk Assessment, Mapping, and Planning Partners (RAMPP, Region II Storm Surge Project – Spatially Varying Nodal Attribute Parameters, 2014). Table 2-2 below summarizes the land use classifications and Manning's n-values used in the model setup.

Table 2-2 Land Use Classifications and Manning's Values for MIKE 21 Model

Land Use Name	Manning's n-Value for Model Setup	Manning's M-Value for Model Setup
Open Water	0.03	33.3
Open Water (deep)	0.02	50
Developed, Open Space	0.05	20
Developed, Low Intensity	0.10	10
Developed, Medium Intensity	0.10	10
Developed, High Intensity	0.15	6.7
Shrub/Scrub	0.05	20
Herbaceous	0.035	28.6
Wetlands	0.05	20

Figure 2-6 shows the Manning's M-values for the MIKE 21 model. Manning's M-values are the reciprocal of the Manning's n-values (i.e., M = 1/n).

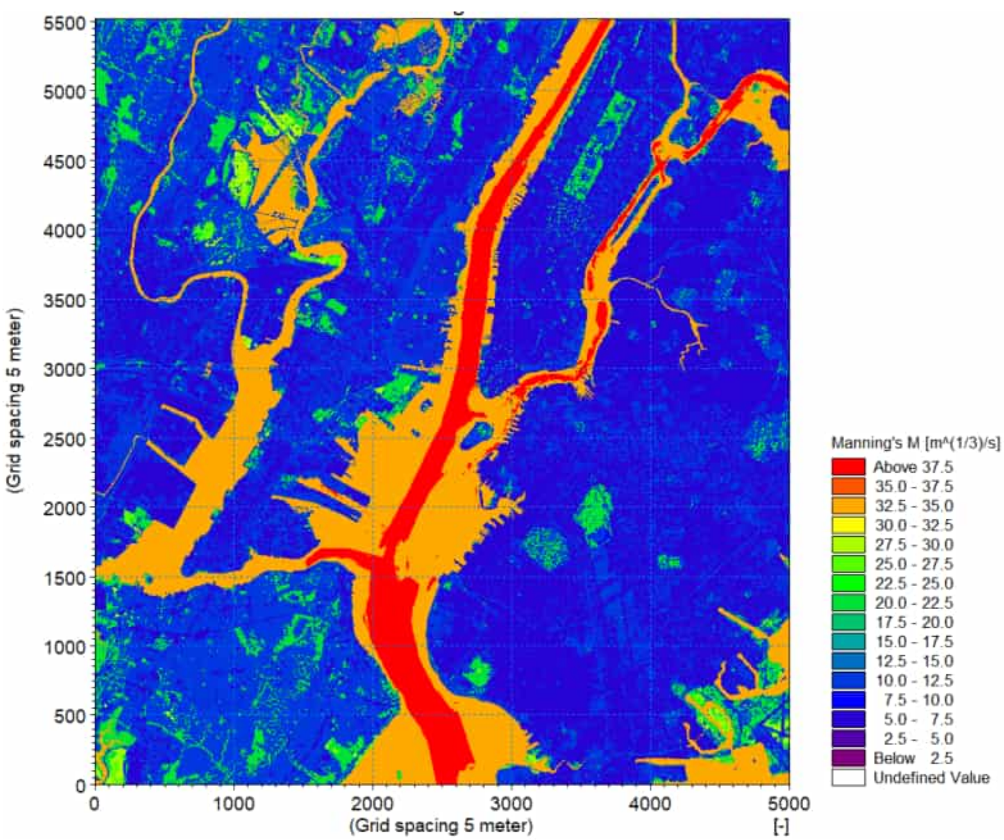


Figure 2-6 Manning's M for MIKE 21 Hydrodynamic Model

2.3 ADCIRC and MIKE 21 HD FM Model Calibration and Validation

The coastal model system requires calibration and validation before the actual project runs could be conducted. The model calibration for the ADCIRC and MIKE 21 HD FM models was based on the comparison of model predicted time series of (1) tidal water levels during a 15-day tide which includes the spring and neap tides and (2) water levels during the 1984 Nor'easter (03/28/1984 ~ 03/29/1984) with measured water levels at NOAA tidal stations (see Figure 2-7). NOAA's The Battery, Bergen Point, and Sandy Hook stations were used for ADCIRC comparisons. NOAA's The Battery station was used for MIKE 21 HD Model calibration. The ADCIRC model was validated based on the comparison of measured and modeled time series of water level at NOAA stations during Hurricane Sandy. The MIKE 21 HD FM Model validation involved a comparison of the model's predicted extent of flooding during Hurricane Sandy compared to a field verified flood map.

Figure 2-7 Location of the NOAA tidal stations at The Battery, Bergen Point, and Sandy Hook

2.3.1 Model Calibration

For the calibration against tide, the comparisons of time series of ADCIRC model-predicted versus NOAA-predicted tide water levels at NOAA tidal stations at The Battery, Bergen Point, and Sandy Hook are shown in Figure 2-8, Figure 2-9 and Figure 2-10. The statistics of the comparisons are listed in Table

2-3. Figures 2-8, Figure 2-9, Figure 2-10, and Table 2-3 demonstrate the close agreement between the ADCIRC model predicted tide water levels and the observed tide water levels.

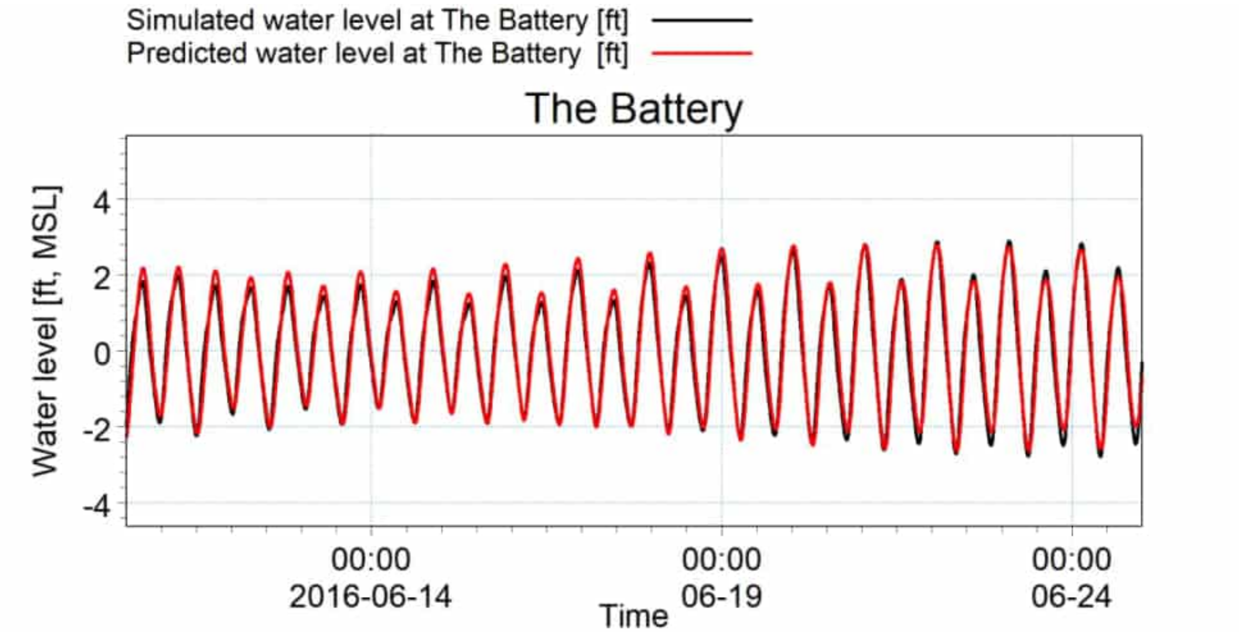


Figure 2-8 ADCIRC Model: Calibration with Tide at NOAA The Battery Tidal Station

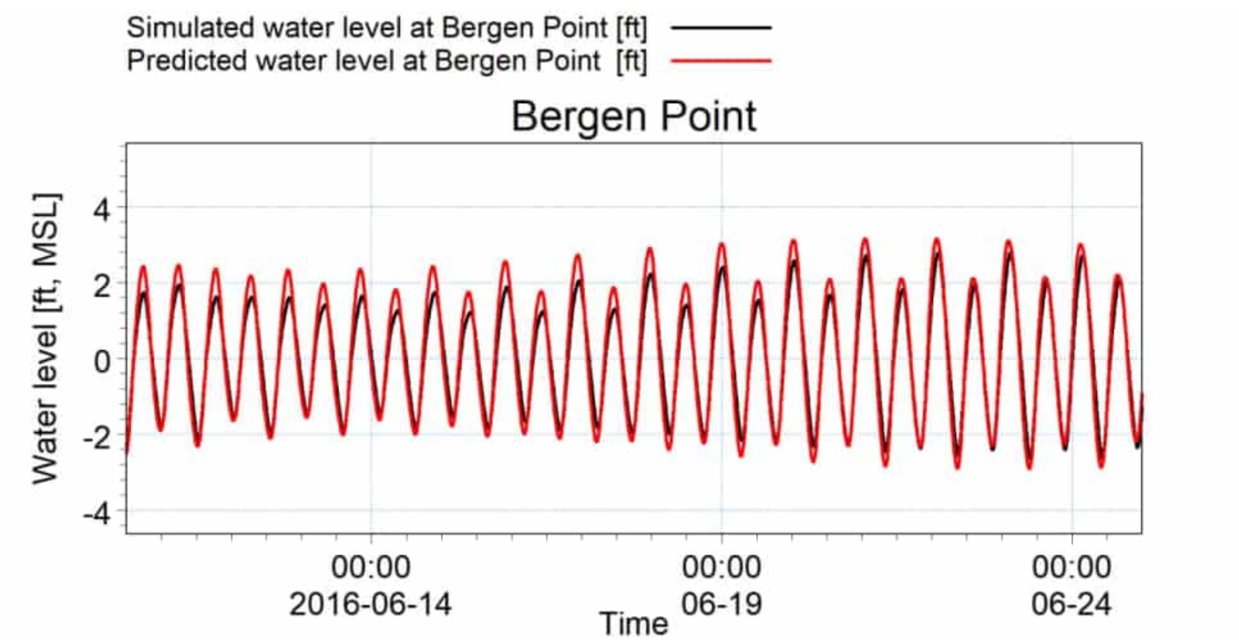


Figure 2-9 ADCIRC Model: Calibration with Tide at NOAA Bergen Point Tidal Station

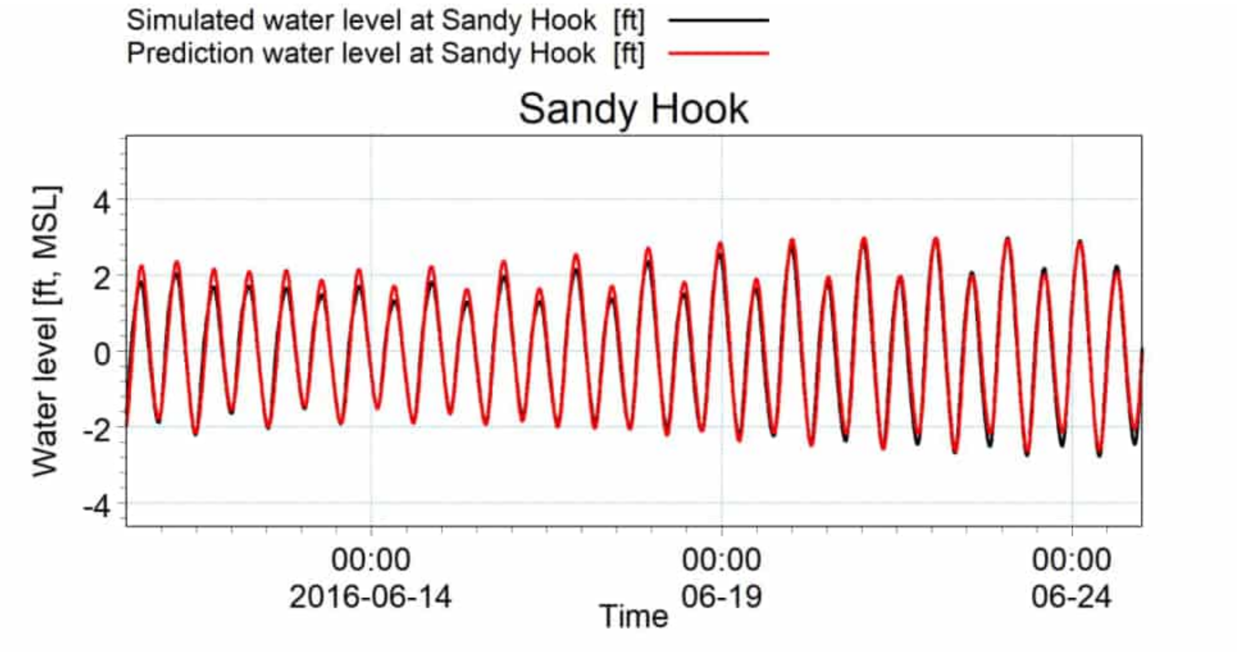


Figure 2-10 ADCIRC Model: Calibration with Tide at NOAA Sandy Hook Tidal Station

Table 2-3 Summary statistics of the ADCIRC Model Calibration with Tide

	The Battery	Bergen Point	Sandy Hook
Mean Absolute Error [feet]	0.26	0.34	0.20
Root Mean Square Error [feet]	0.31	0.41	0.25
R^2	0.96	0.97	0.98

Besides the normal tide, the ADCIRC model was also calibrated against the 1984 Nor'easter (03/28/1984 ~ 03/29/1984). Figure 2-11, Figure 2-12 and Figure 2-13 show the comparisons of model simulated and measured water levels at The Battery, Bergen Point, and Sandy Hook tidal stations. The statistics of the comparisons are listed in Table 2-4.

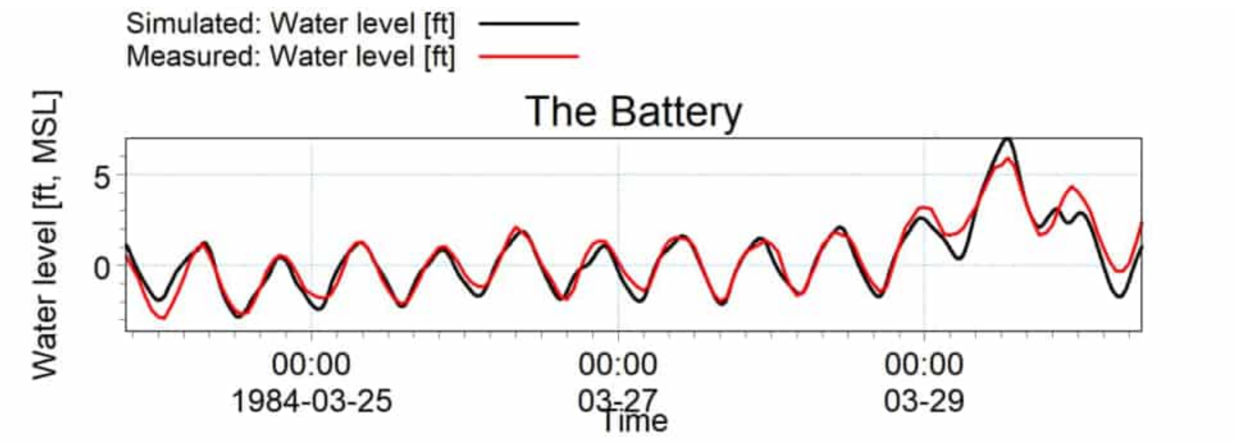


Figure 2-11 ADCIRC Model: Calibration with 1984 Nor'easter at NOAA The Battery Tidal Station

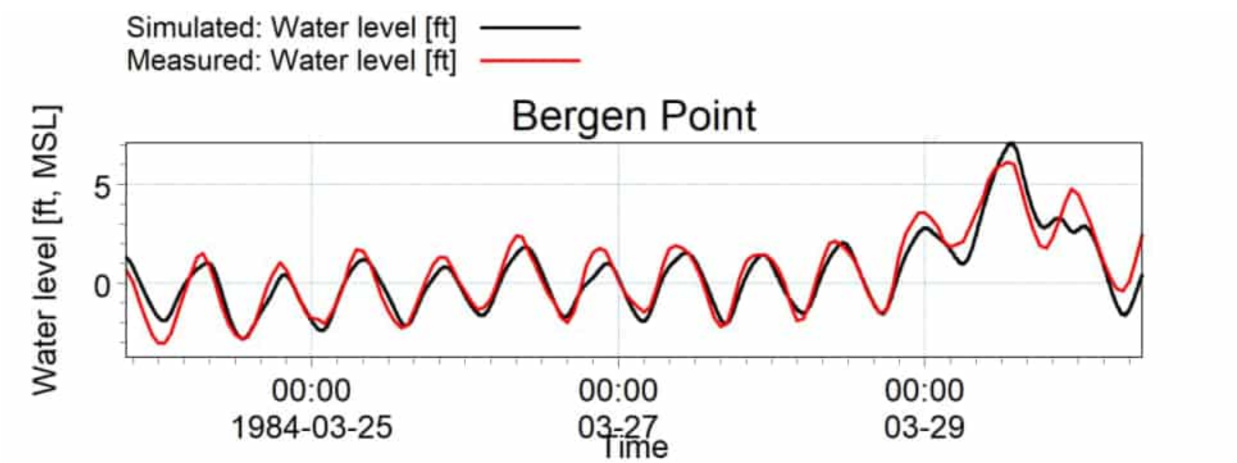


Figure 2-12 ADCIRC Model: Calibration with 1984 Nor'easter at NOAA Bergen Point Tidal Station

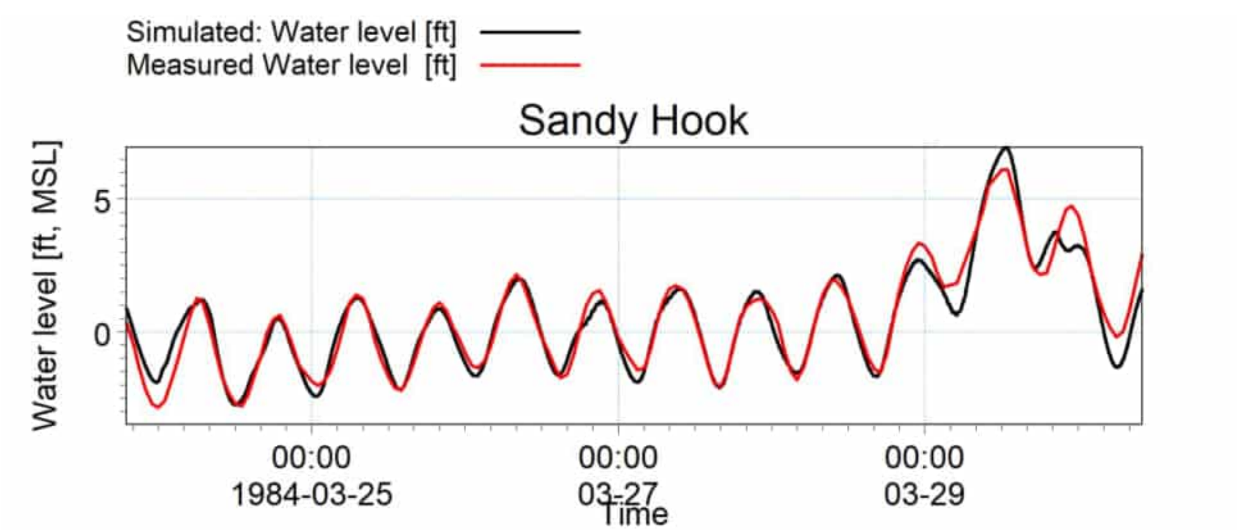


Figure 2-13 ADCIRC Model: Calibration with 1984 Nor'easter at NOAA Sandy Hook Tidal Station

Table 2-4 Summary statistics of the ADCIRC Model Calibration with 1984 Nor'easter

	The Battery	Bergen Point	Sandy Hook
Mean Absolute Error [feet]	0.43	0.53	0.38
Root Mean Square Error [feet]	0.57	0.68	0.51
R^2	0.91	0.89	0.93
Peak Difference, Model minus Measured (feet)	1.08	0.95	0.84

It should be noted that although the peak water levels at the tidal stations during the 1984 Nor'easter are overpredicted, the time series of the simulated water levels are identical to the modeled water levels reported in FEMA's calibration and validation of the ADCIRC model (RAMPP, Region II Storm Surge Project – Model Calibration and Validation, 2014). Generally, given the close comparisons between the study modeling and the RAMPP modeling for FEMA, and that FEMA has used these results previously where rigorous calibration and validation was performed, either set of data would be suitable for application to this study without further adjustment.

, The same 15-day tidal cycle event and the 1984 Nor'easter against which the ADCIRC model was calibrated were simulated was used to calibrate the local MIKE 21 HD FM Model. The simulated time series of water level at NOAA's Battery tidal station, which is not far away from the Project site (see Figure 2-14), was compared against the measured data. Figure 2-15 shows the comparison of simulated and measured water levels during the tidal cycle. The statistics of the comparison are shown in Table 2-5. Figure 2-15 and Table 2-5 demonstrate the close agreement between the MIKE 21 simulated tidal water levels and the observed tidal water levels at The Battery station.

Figure 2-14 Location of NOAA's Battery Tide Station

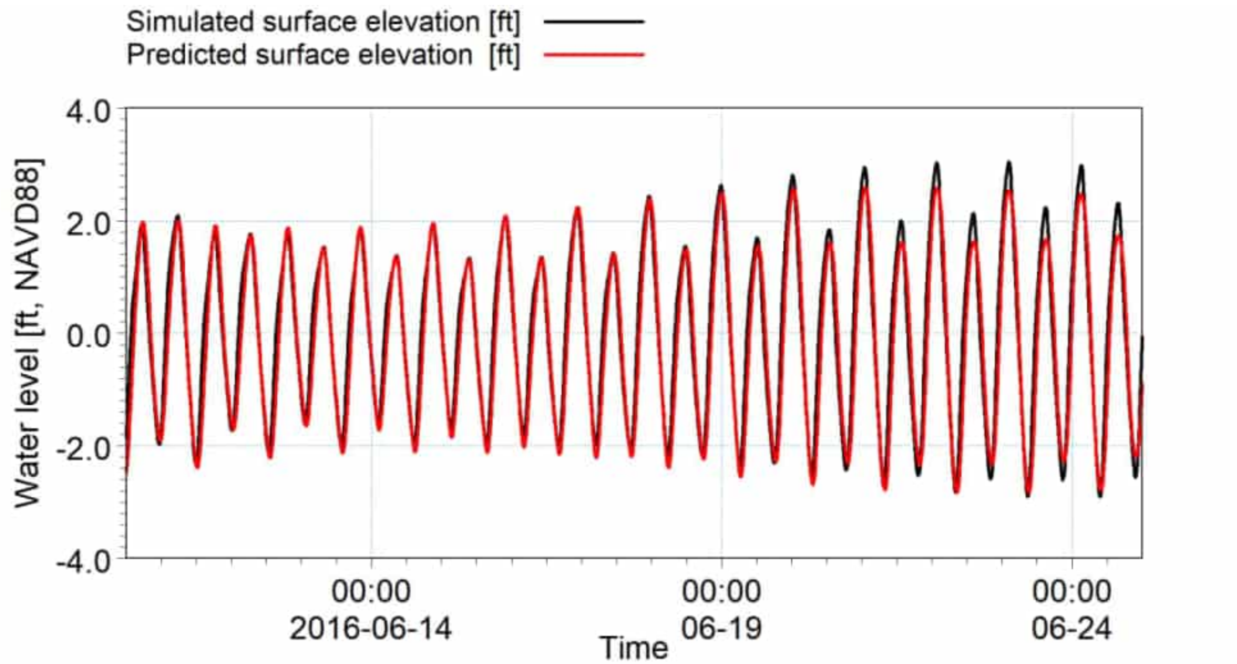


Figure 2-15 MIKE 21 HD FM Model: Calibration with Tide at NOAA's Battery Station

Table 2-5 Summary statistics of the MIKE 21 HD FM Model Calibration with Tide

	The Battery
Mean Absolute Error [feet]	0.34
Root Mean Square Error [feet]	0.43
R^2	0.93

The figure and statistics of the comparison of MIKE 21 HD FM model simulated and the measured water levels during the 1984 Nor'easter are shown in Figure 2-16 and Table 2-6, respectively. Consistent with the ADCIRC simulation results and the modeled water levels reported in FEMA's calibration and validation of the ADCIRC model (RAMPP, Region II Storm Surge Project – Model Calibration and Validation, 2014), the peak water level is overpredicted. But an R^2 of 0.92 still demonstrates a good agreement and no adjustment to the MIKE 21 HD FM model was required.

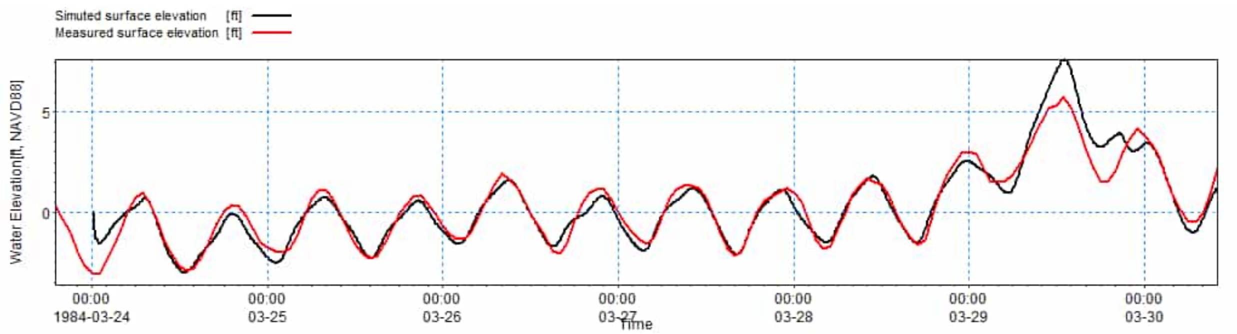


Figure 2-16 MIKE 21 HD FM Model: Calibration with 1984 Nor'easter at NOAA The Battery Station

Table 2-6 Summary statistics of the MIKE 21 HD FM Model Calibration with 1984 Nor'easter

	The Battery
Mean Absolute Error [feet]	0.47
Root Mean Square Error [feet]	0.61
R^2	0.92
Peak Difference, Model minus Measured (feet)	1.66

2.3.2 Model Validation

Model validation involves the comparison of model-predicted storm surge with the observed storm surge during major storm events. Hurricane Sandy is one of the most destructive storms in the history of the NY/NJ region and is also the storm with the most recent field records of the flood extent. Consequently, it was chosen as the storm for model validation. For the validation of the ADCIRC model, the comparisons of time series of the model-predicted storm surge at NOAA Tidal Stations at The Battery, Bergen Point, and Sandy Hook are presented in Figure 2-17, Figure 2-18 and Figure 2-19, respectively.

Figure 2-17, Figure 2-18 and Figure 2-19 demonstrate the close agreement between the ADCIRC simulated and measured water levels during Hurricane Sandy at the tidal stations in the vicinity of the Project Area. The statistics of the comparisons are listed in Table 2-7.

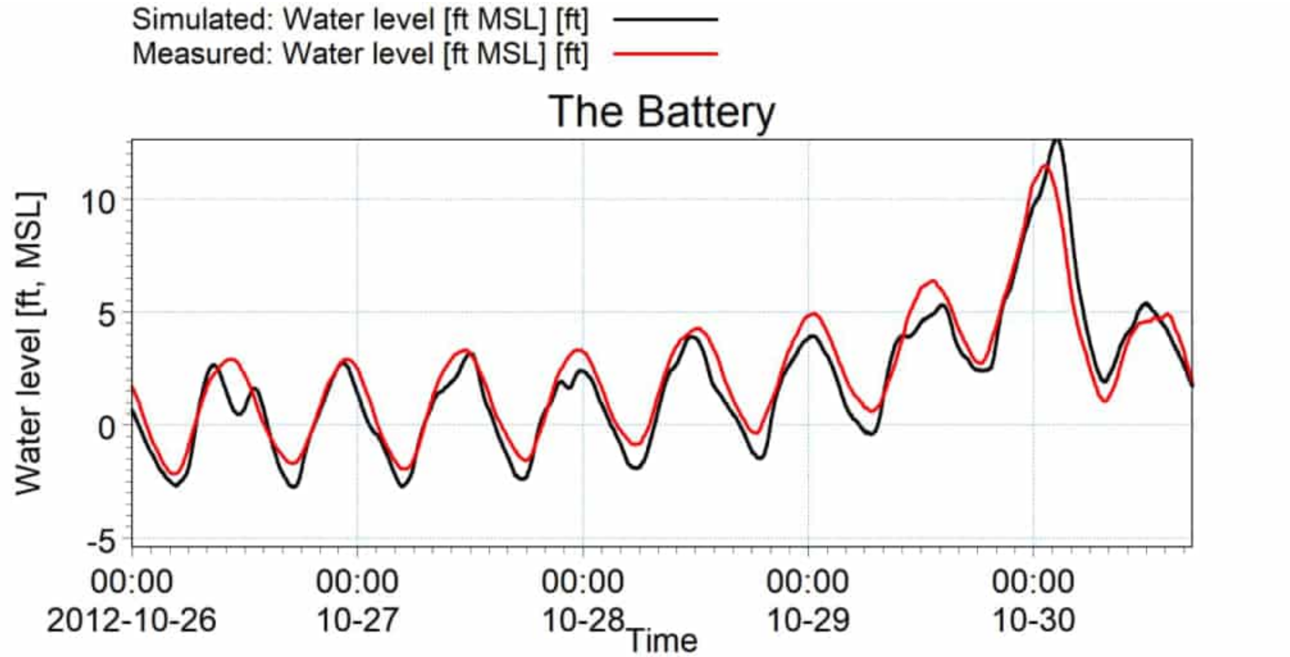


Figure 2-17 ADCIRC Model Validation at NOAA The Battery Tidal Station

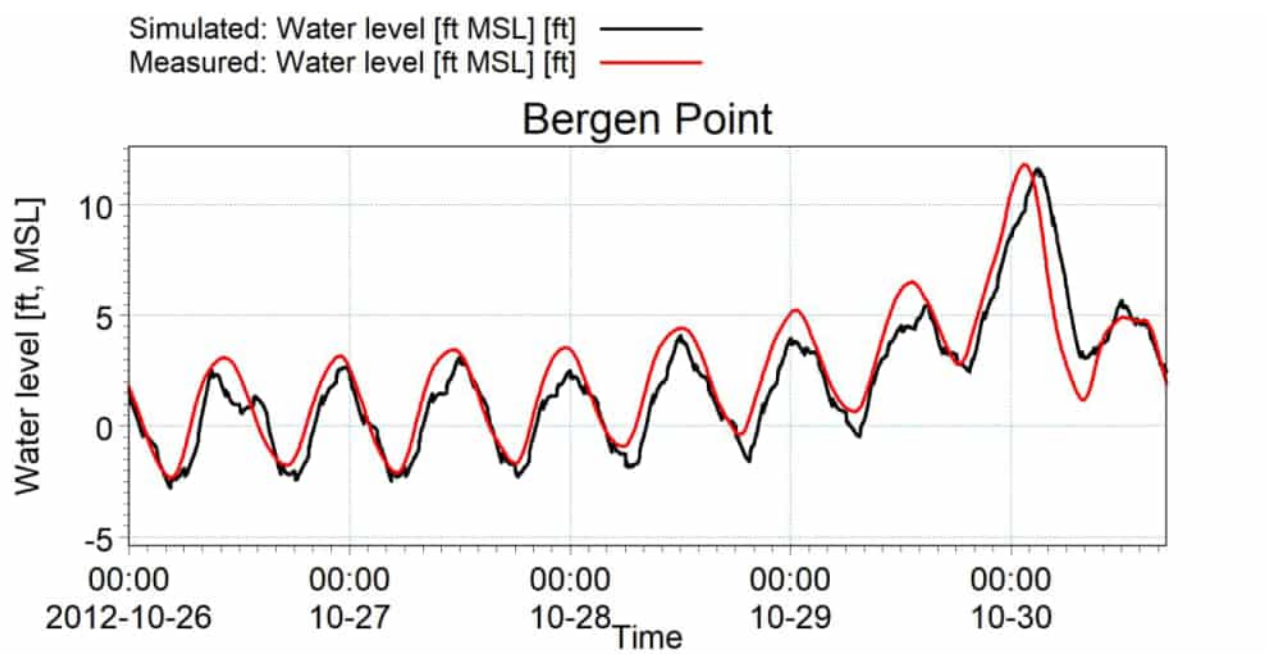


Figure 2-18 ADCIRC Model Validation at NOAA Bergen Point Tidal Station

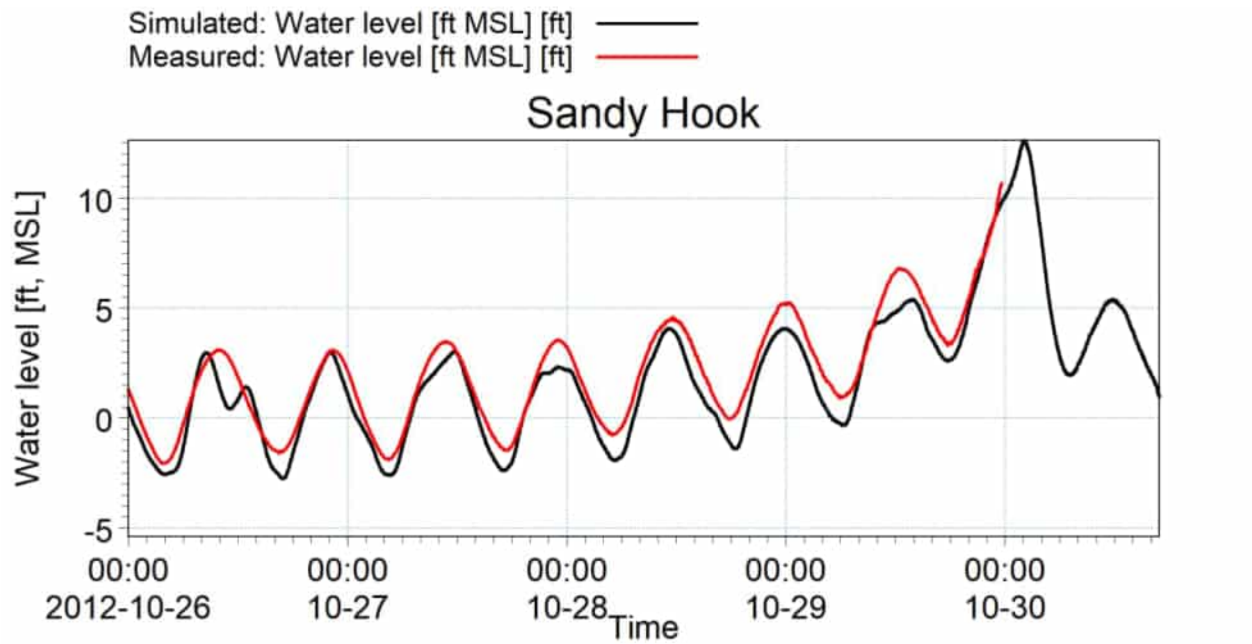


Figure 2-19 ADCIRC Model Validation at NOAA Sandy Hook Tidal Station

Table 2-7 Summary Statistics of the ADCIRC Model Validation for Hurricane Sandy

	The Battery	Bergen Point	Sandy Hook
Mean Absolute Error [feet]	0.72	0.78	0.73
Root Mean Square Error [feet]	0.95	1.08	0.98
R^2	0.88	0.84	0.86
Peak Difference, Model minus Measured (feet)	1.11	-0.20	--

The local MIKE 21 HD FM Model was validated by comparing the simulated and measured water levels at NOAA The Battery tidal station, and the simulated and field verified flood extents during Hurricane Sandy. Figure 2-20 shows the comparison of time series of simulated and measured water levels at The Battery tidal station. The statistics of the comparison of time series are shown in Table 2-8. The comparison of the extents of flooding for Hurricane Sandy between the field records provided by FEMA Modeling Task Force and the MIKE 21 HD FM model result is shown in Figure 2-21. In general, the simulation and measurement agree closely with each other in terms of the water level at The Battery tidal station and the flood extents. The peak difference is similar over-prediction as observed with the ADCIRC model.

Overall, given the acceptable mean error and RMSE calculated between the model and measured water levels, the model is considered successfully validated for simulation of Hurricane Sandy and all model inputs have been finalized.

The MIKE 21 HD FM model was primarily used to assess preliminary design with regard to potential flood flow paths and to inform placement of flood control structures.

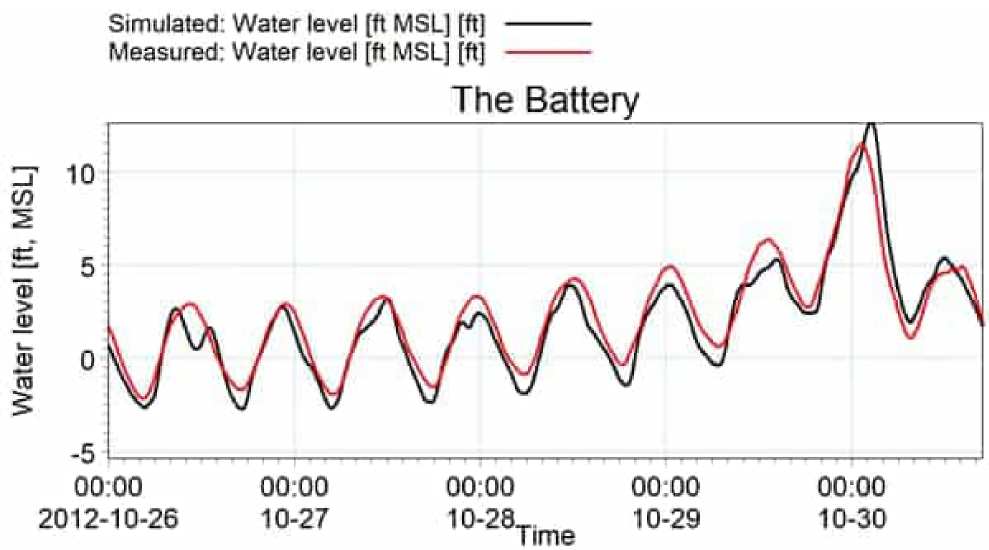
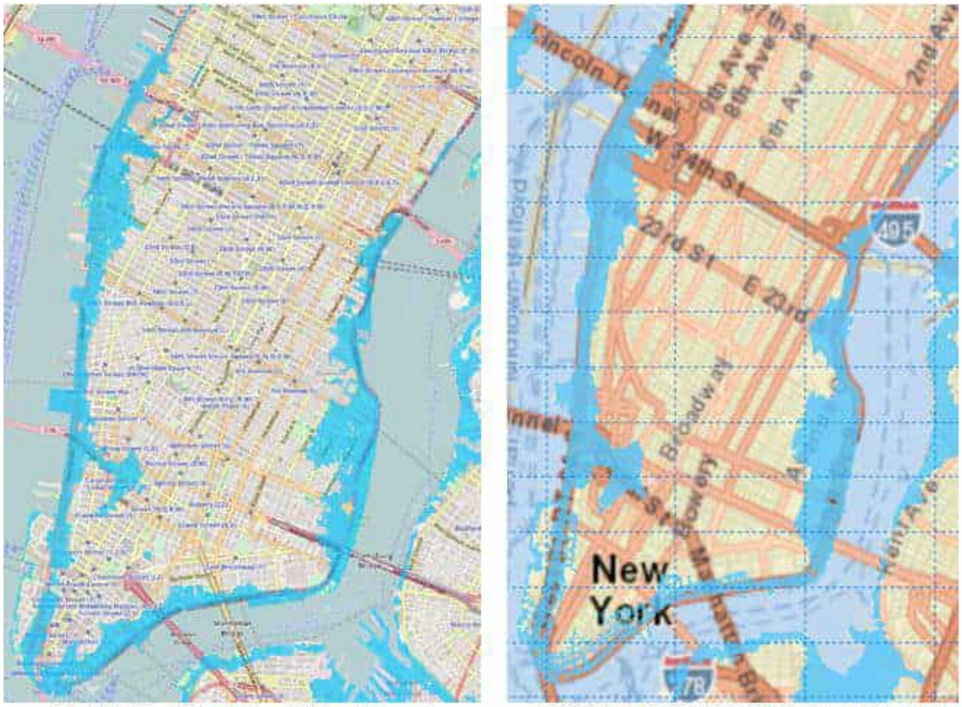


Figure 2-20 MIKE 21 HD FM Model Validation at NOAA The Battery Tidal Station

Table 2-8 Summary Statistics of the MIKE 21 HD FM Model Validation with Hurricane Sandy

	The Battery
Mean Absolute Error [feet]	0.86
Root Mean Square Error [feet]	1.02
R^2	0.91
Peak Difference, Model minus Measured (feet)	1.66



Field Verified Flood Map (NJ not shown)   AECOM MIKE 21 HD FM Modeled Flood Map

Figure 2-21 Comparison of Field Verified and Modeled Hurricane Sandy flood Extents (left) Field Verified Flood Map, (right) Flood Map Simulated by MIKE 21 HD FM Model

2.4 Wave Models

Given the location of the project site and its exposure to waves, the wave's effect on the design of flood countermeasures is significant. In order to reasonably simulate the wave field at the project site, the MIKE 21 Spectral Wave (SW) Model and the 3D MIKE 3 Wave Model were used. Results extracted from the MIKE 21 SW model boundary were then applied as boundary conditions into EurOtop equations to compute wave runup and wave overtopping at discrete transect locations. MIKE 3 Wave was primarily used to inform preliminary design concepts.

2.4.1 MIKE 21 Spectral Wave Model

As a phase-averaging model, the MIKE 21 SW wave model was developed to simulate the wave generation and transformation (such as wave shoaling, refraction, diffraction, wave-wave interaction, and breaking, etc) in the relatively larger model domain. This fully spectral model is able to solve the physical phenomena such as wave growth by action of wind, non-linear wave-wave interaction, dissipation due to white-capping, dissipation due to bottom friction, dissipation due to depth-induced wave breaking, refraction and shoaling due to depth variations, wave-current interaction, etc.

The quasi-static fully-spectral MIKE21 Spectral Wave model was applied to investigate the local wave conditions generated by wind in the range of 180 degrees to 270 degrees, relative to North, "coming from". The omnidirectional 100-year hourly wind speed of 25.3 m/s was applied, based on the analysis of LGA airport wind observations. This can be compared to local winds measured during Sandy of about 21 m/s. The results of the wave model in deeper water near the project site were output to provide the boundary condition for the MIKE 3 Wave Model.

The MIKE 21 SW model has the same mesh as the MIKE 21 HD FM model. Figure 2-22 shows the local MIKE21 SW model mesh. Existing building footprints were built into the mesh as islands.

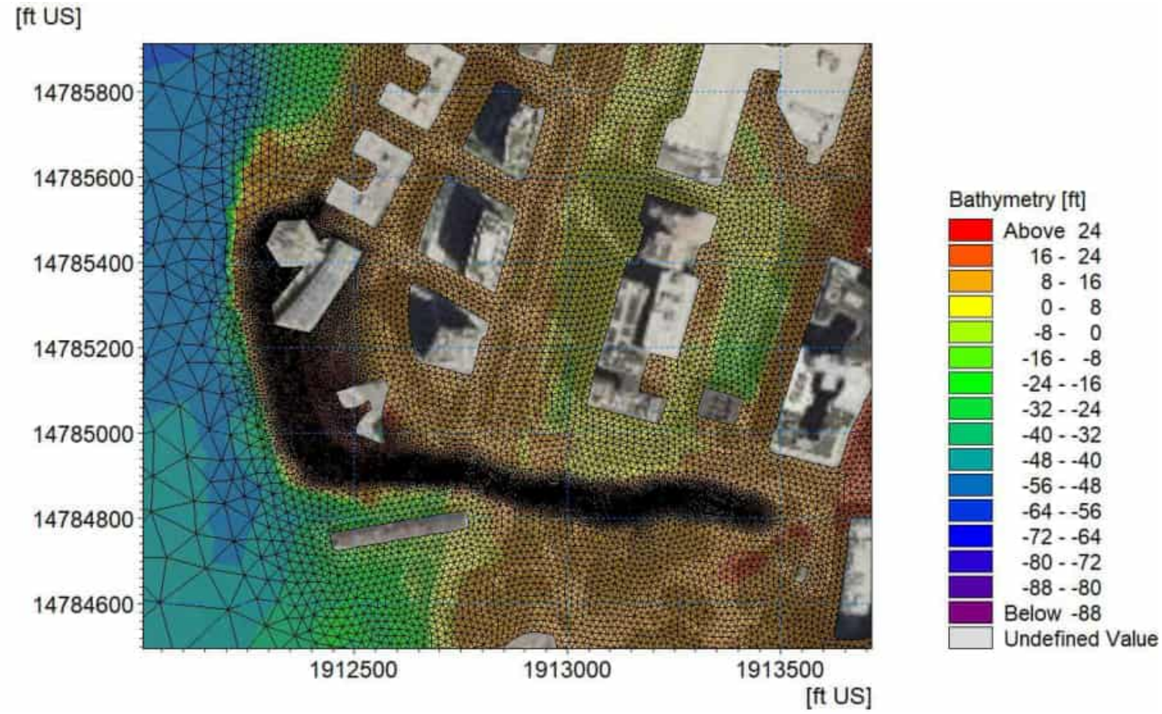


Figure 2-22 MIKE 21 SW Model Mesh at the Project Site

2.4.2 MIKE 3 Wave Model

The MIKE 3 Wave Model FM is a 3D phase-resolving wave model based on the numerical solution of the three-dimensional incompressible Reynolds-averaged Navier-Stokes equations. The model consists of continuity and momentum equations and is closed by a turbulence closure scheme. A shock-capturing scheme (Riemann solver), which enables the stable simulation of flows involving shocks and discontinuities such as bores and hydraulic jumps which are common in the wave breaking process, is used to describe dissipation to processes such as wave breaking. The numerical techniques applied are based on an unstructured (flexible) mesh approach in the horizontal and utilizes a sigma coordinate transformation approach in the vertical. The MIKE 3 Wave Model FM can simulate complicated wave processes such as wave breaking, wave run-up, and wave overtopping for coastal flooding projects.

The MIKE 3 wave model was used to simulate the wave conditions and overtopping at the Project site to inform the preliminary design phase of the study. The horizontal plan view of the MIKE 3 wave model domain is shown in Figure 2-23. The unstructured horizontal mesh consists of about 201,500 triangular elements with mesh size varying from 1.2 feet offshore to 0.3 foot near the proposed alignment. Figure 2-24 presents an overview of the horizontal mesh, while a closer view of the horizontal mesh near one of the proposed alignments can be found in Figure 2-25. Vertically a boundary fitting mesh was used, where an equidistant vertical discretization with 5 layers was applied. The total number of elements in the 3D unstructured mesh was about 1,000,000.

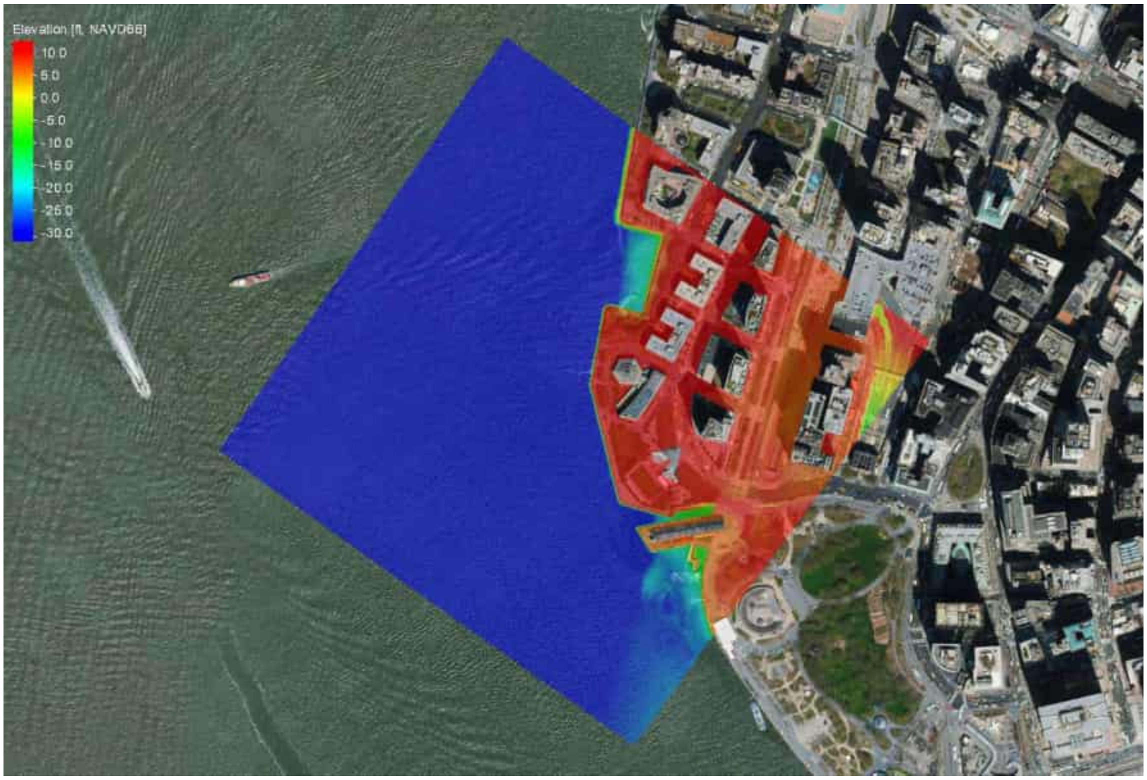


Figure 2-23 MIKE 3 Wave FM Model Horizontal Domain

Figure 2-24 Overview of the MIKE 3 Wave FM Model Horizontal Mesh

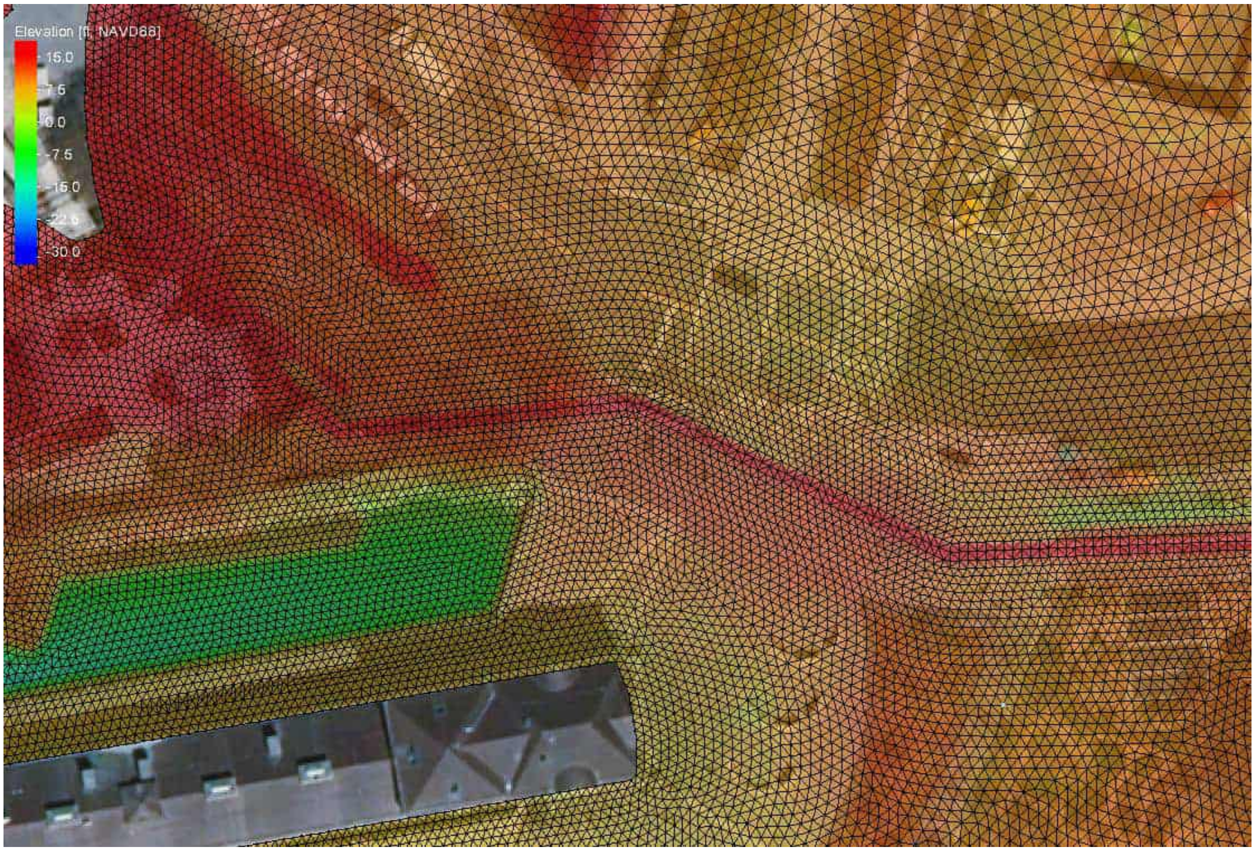


Figure 2-25 A closer view of the MIKE 3 Wave FM Model Horizontal Mesh near the Proposed Flood Resistant Alignment

The incident waves conditions to be generated at the offshore boundary was extracted from the results of the MIKE 21 SW model simulation for the waves posing the biggest threat to the proposed flood resistant structure. Two 164 feet wide sponge layers are placed along the northwest and southeast boundaries to absorb the waves. The turbulence is modeled using an eddy viscosity concept. $k - \varepsilon$ model, a turbulence closure which has been widely used in the coastal wave models, is adopted for the present project. It is applied in both horizontal and vertical directions.

It should be noted that even though the MIKE 3 wave model does not include the local effect of winds on local wave generation, given the very short fetch lengths in the small domain, the additional wind-wave growth within the domain would be negligible compared to the incident waves.

3.0 COASTAL FLOOD ASSESSMENT FOR EXISTING CONDITION

3.1 Identification of Coastal Storm

The coastal storm for the design of the proposed flood alignment system is based on the 100-year return period (or 1% annual exceedance probability (AEP) probability event). A coastal storm event which generates a 100-year storm surge stillwater elevation (SWEL) was initially considered as the 100-year coastal storm event for the site. The local 100-year SWEL in the project area is about 11.3 ft NAVD88, based on the preliminary FEMA FIS Report (2013), and which also corresponds to the highest water level recorded at NOAA's "The Battery" tide station of 11.27 ft NAVD88 which occurred during Hurricane Sandy. One storm from the RAMPP study report for the FEMA preliminary FIS, NJb_0003_010, was identified for modeling the 100-year SWEL storm event. From the model, SWEL elevations typically vary from about 11.2 to 11.3 ft NAVD88 from north to south along the project, respectively, which is consistent with the 100-year SWEL variation from the preliminary RAMPP study. Given the close comparison, this storm was used for the model for preliminary design assessments. A constant SWEL of 11.3 ft NAVD88 was used for the transect analysis for determination of wave runup and overtopping. The RAMPP determined SWEL values were also used for the 10-year, 50-year and 500-year return periods. For reference, the 10, 50 and 500-year SWEL are 6.9 ft, 9.9 ft and 14.9 ft NAVD88, respectively at FEMA transect NY-18.

In summary, the procedures for the identification of a coastal storm event for the 100-year SWEL were based on the following:

- FEMA flood study (RAMPP, 2014) at South Battery Park City
- A previous storm model simulation from the preliminary FEMA FIS that generates water elevations similar to the 100-year return period
- wind and pressure fields for the identified storm event were extracted, and
- a simulation of storm surge was performed using the driving forces extracted from the identified storm, with and without sea level rise added to the water level.

3.2 Sea Level Rise

Long-term sea-level rise (SLR) predictions produced by different agencies including NOAA, USACE, and the New York City Panel on Climate Change (NPCC) were reviewed. There is a significant variance between different studies with varying uncertainties between low and high confidence level estimates.

Based on the model projection from NPCC, the NYS Department of Environmental Conservation has compiled likely values for the New York region under various projections from low to high (https://www.dec.ny.gov/regulations/103877.html), as listed in Table 3-1.

Table 3-1 Sea Level Rise Projections for New York City

Time Interval	Low Projection [inches]	Low Medium Projection [inches]	Medium Projection [inches]	High Medium Projection [inches]	High Projection [inches]
2020s	2	4	6	8	10
2050s	8	11	16	21	30
2080s	13	18	29	39	58
2100s	15	22	36	50	75

In the design phase of this project, the NPCC sea level rise (SLR) of 30 inches (2.5 feet) for the year 2050s with 90th percentile (High Projection from Table 3-1) was used.

3.3 Coastal Flooding due to Coastal Storm Surges without Project

Simulation of coastal flooding due to coastal storm surge only, with and without 2.5 feet 2050s SLR, was performed for the existing without project conditions. These simulations show potential flood paths from the SBPC shoreline. The flood maps for the 100-year coastal storm stillwater elevation (wave effect not included), without SLR and with SLR in 2050s are shown in Figure 3-1 and Figure 3-2, respectively. It is clear that without any flood countermeasures, the project site will be inundated under 100-year storm even without SLR.

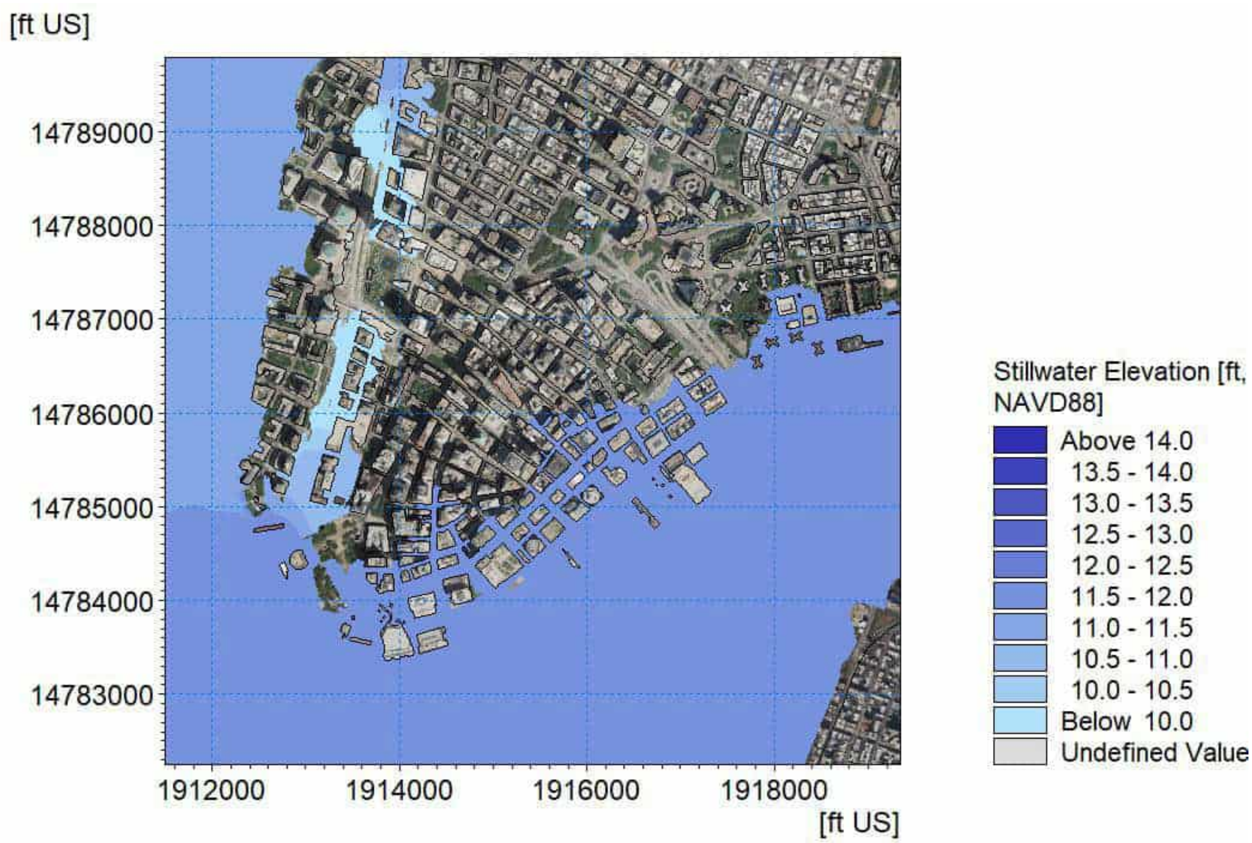


Figure 3-1 100-Year Storm Flood Maximum Stillwater Level for Project Area, without SLR, without project.

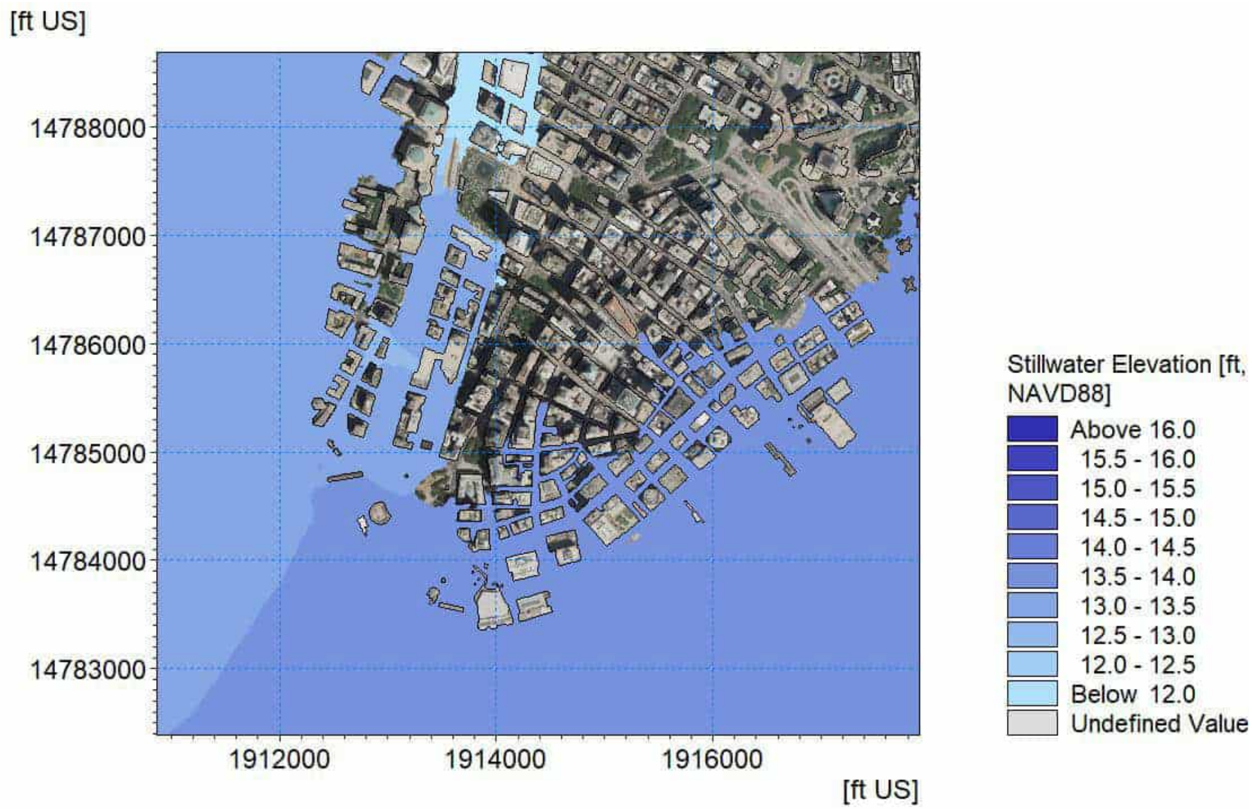


Figure 3-2 100-Year Storm Flood Maximum Stillwater Level for Project Area, with 2050s SLR, without project.

4.0 COASTAL FLOOD ASSESSMENT OF PROPOSED RESISTANT ALIGNMENT

4.1 Proposed Flood Resistant Alignment

The flood resistant alignment shown in Figure 4-1, which includes flood walls (red line) and raised landscape features, was proposed for the flood resiliency assessment for this project. Note the dashed red line indicates the location of a floodwall that is covered by a sloped fill landscape feature. Note that this study does not take into consideration the western floodwall proposed for the West Battery Park City Resiliency (WBPC) project located to the north of SBPC project.

Figure 4-1 Proposed Flood Resistant Alignments. Solid red lines represent vertical walls or barriers. The dashed red line is the location of a floodwall that is that is covered by a sloped fill.

4.2 Coastal Flooding due to Coastal Storm Surges (without SLR)

Simulation of coastal flooding due to 100-year coastal storm surge with the proposed flood resistant alignment was performed. The flood map for the 100-year coastal storms (wave effect not included) with the proposed flood resistant alignment using the MIKE 21 HD model is shown in Figure 4-2. It can be seen from Figure 4-2 that the proposed flood resistant alignment can protect the project site effectively from storm surge. Also, comparing to Figure 3-1, it can be observed that the presence of the proposed flood resistant alignment does not create any additional flood impacts to adjacent areas, with respect to the stillwater elevation.

Figure 4-2 100-Year Coastal Stillwater Elevation Map (without SLR) with the Proposed Flood Resistant Alignment (yellow)

4.3 Coastal Flooding due to Coastal Storm Surges (with SLR)

Simulation of coastal flooding due to 100-year coastal storm surge and SLR in the 2050s with the proposed flood resistant alignment was performed. The flood map for the 100-year coastal storms (wave effect not included) and 2050s SLR with the proposed flood alignment using the MIKE 21 HD model is shown in Figure 4-3 (scenario with no western floodwall proposed for the WBPC project implemented). The proposed flood resistant alignment can prevent flooding of the project site, although flooding through the streets north of the project site (WBPC area) can also be observed. Also, comparing to Figure 3-2, it can be observed that the presence of the proposed flood resistant alignment does not create any additional flood impacts to adjacent areas, with respect to the Stillwater elevation.

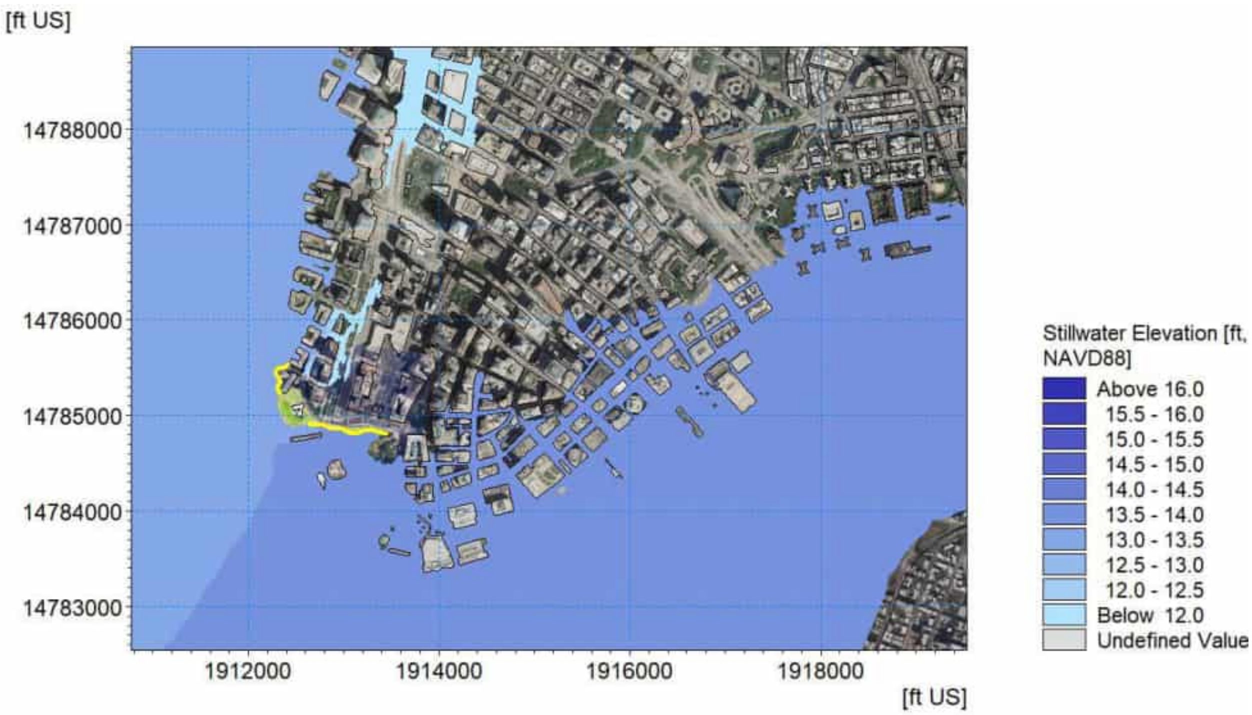


Figure 4-3 100-Year Coastal Stillwater Elevation Map (with SLR) with the Proposed Flood Resistant Alignment (Scenario with no floodwall proposed for the WBPC Project Implemented)

4.4 Design Wave Condition

A good understanding of the site-specific storm wave conditions is essential for both the design of the proposed flood resistant alignment and the application of FEMA accreditation of structures and eventual changes to the flood mapping. The MIKE 21 SW model and the MIKE 3 model were used to simulate the wave conditions near the proposed flood resistant alignment. A screenshot of the MIKE 21 SW model simulated wave field under 100-year storm and the proposed flood resistant alignment is shown in Figure 4-4, while the MIKE 21 SW model simulated wave field under 100-year storm and 2050s SLR and the proposed flood resistant alignment is shown in Figure 4-5. Tests of wind from different directions showed that wind from the southwest will generate the most severe wave condition at most locations near the project site

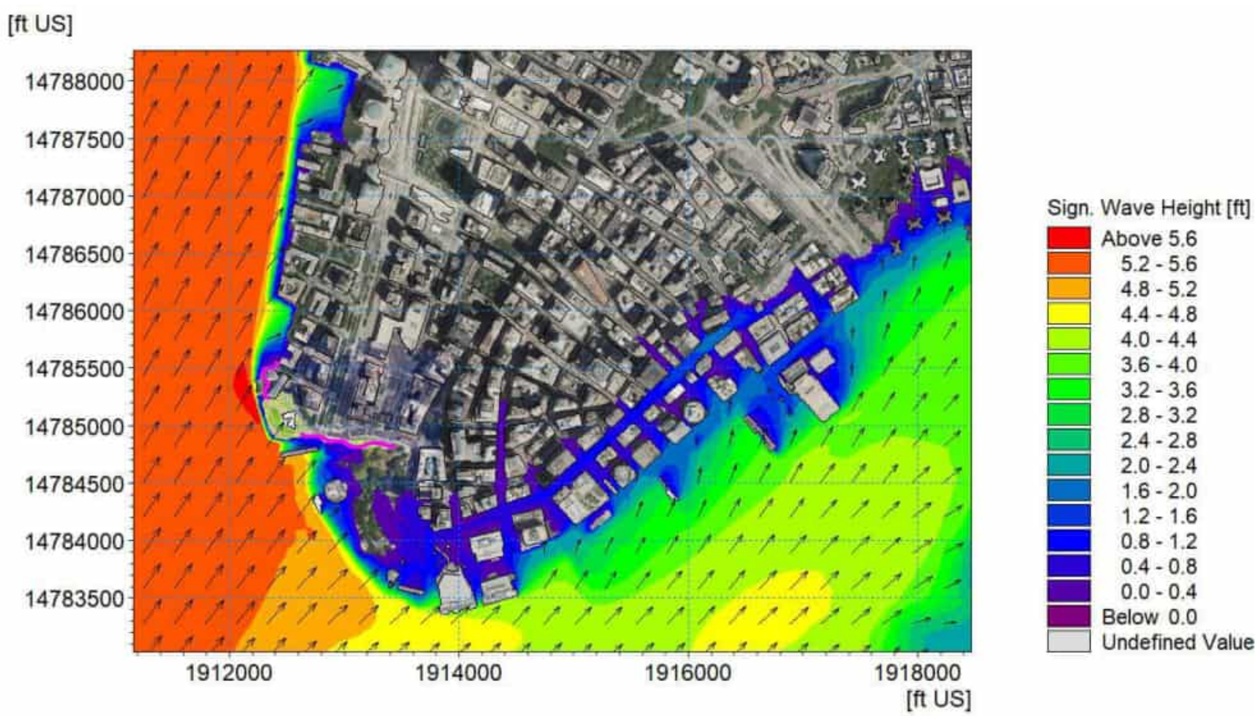


Figure 4-4 Screenshot of the MIKE 21 SW Model Simulated Wave Field under 100-year Storm (no SLR) with the Proposed Flood Resistant Alignment, Wind Direction from 220 degree to North

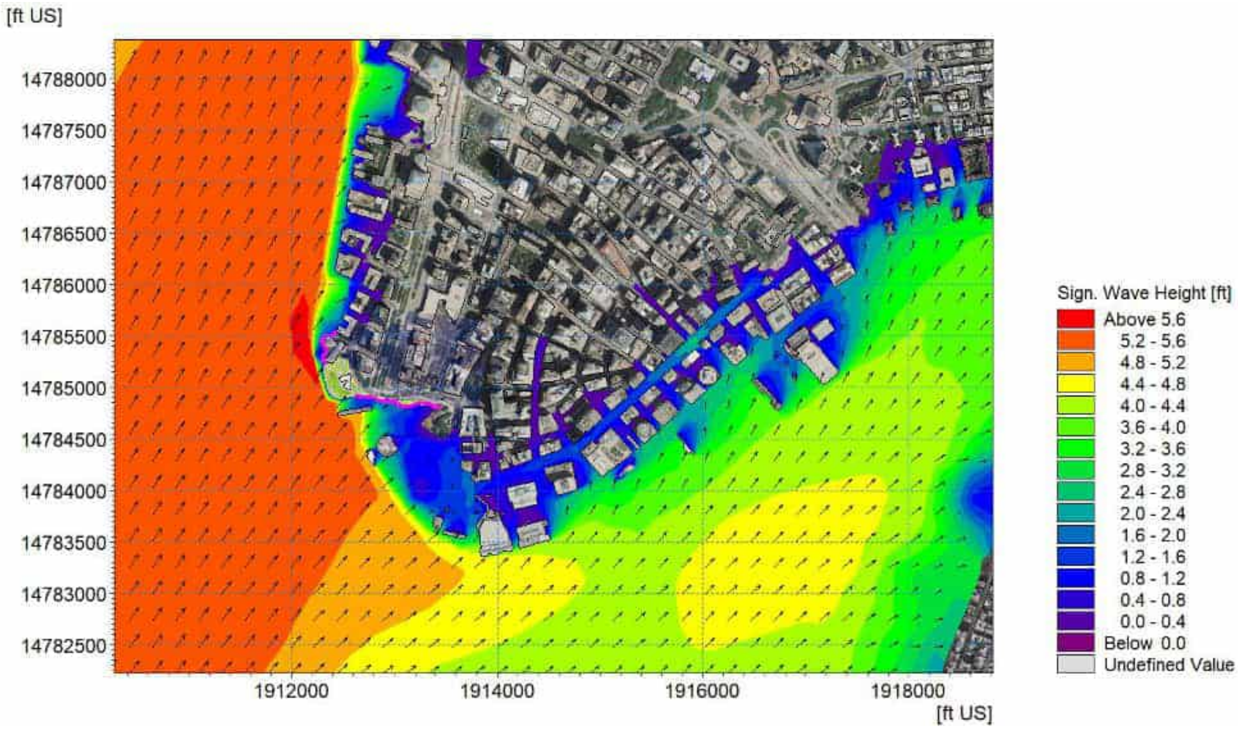


Figure 4-5 Screenshot of the MIKE 21 SW Model Simulated Wave Field under 100-year Storm and 2050s SLR with the Proposed Flood Resistant Alignment, Wind Direction from 220 degree to North

Besides the MIKE 21 SW model, the MIKE 3 wave model was also used to provide additional detailed wave information at the project site, to inform preliminary design, especially to address wave runup and overtopping. Wave parameters describing the incident waves at the southwest boundary of MIKE 3 were extracted from the results of the MIKE 21 SW model simulation of 100-year wave condition under 100-year storm surge and 2050s SLR and applied as inputs into the wave generation routine internal to MIKE 3, to produce irregular waves based on a JONSWAP spectrum. A water level equal to the sum of 100-year SWEL and 2050s SLR was applied as the initial water level. The simulation was run for 20 minutes to establish a fully developed wave field within the model area.

Different wave directions were tested with MIKE 21 SW, and the results of waves coming from southwest (220 degrees), which poses the biggest threat to the resistant alignment, was modeled with MIKE 3, and are presented. The scenario shown here is with no flood wall implemented on the west side. Also, the mesh elevations were based on earlier phase of the project design, and some floodwall design elevations have been raised since these simulations were made. This is especially the case for the barrier just to the north of the Museum of Jewish Heritage, where the model has the barrier elevation at +15.5 ft, NAVD88 from preliminary design phase, but it has been more recently raised to +18.0 ft, NAVD88. Figure 4-6 and Figure 4-7 show the distribution of significant wave height and maximum water surface elevation (wave crest elevation) under 100-year storm stillwater elevation, 2050s SLR, and 100-year wave condition with the proposed flood resistant alignment. A 3D view of the instantaneous wave field is shown in Figure 4-8.

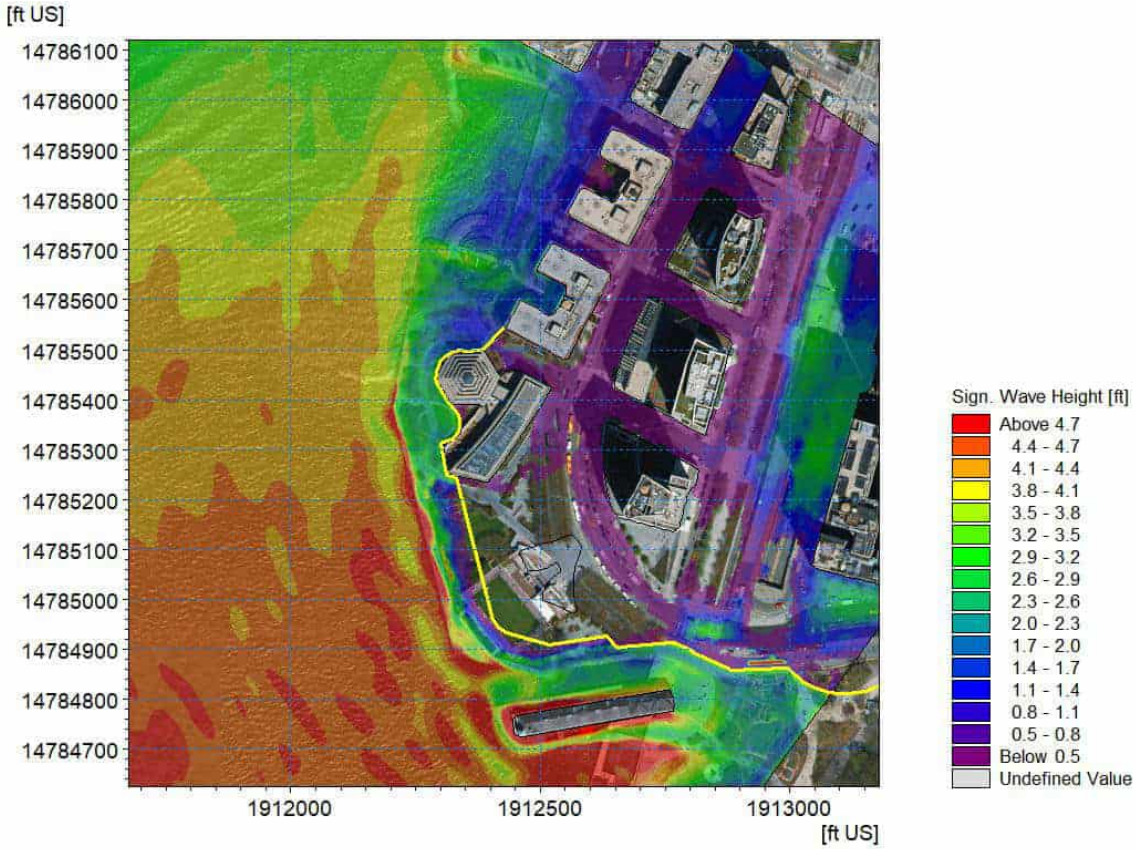


Figure 4-6 MIKE 3 Wave Model Simulated 100-year Wave Condition under 100-year Storm Surge Peak and 2050s SLR with the Proposed Flood Resistant Alignment (Scenario with no Flood Wall Implemented on the West Battery Park City side)

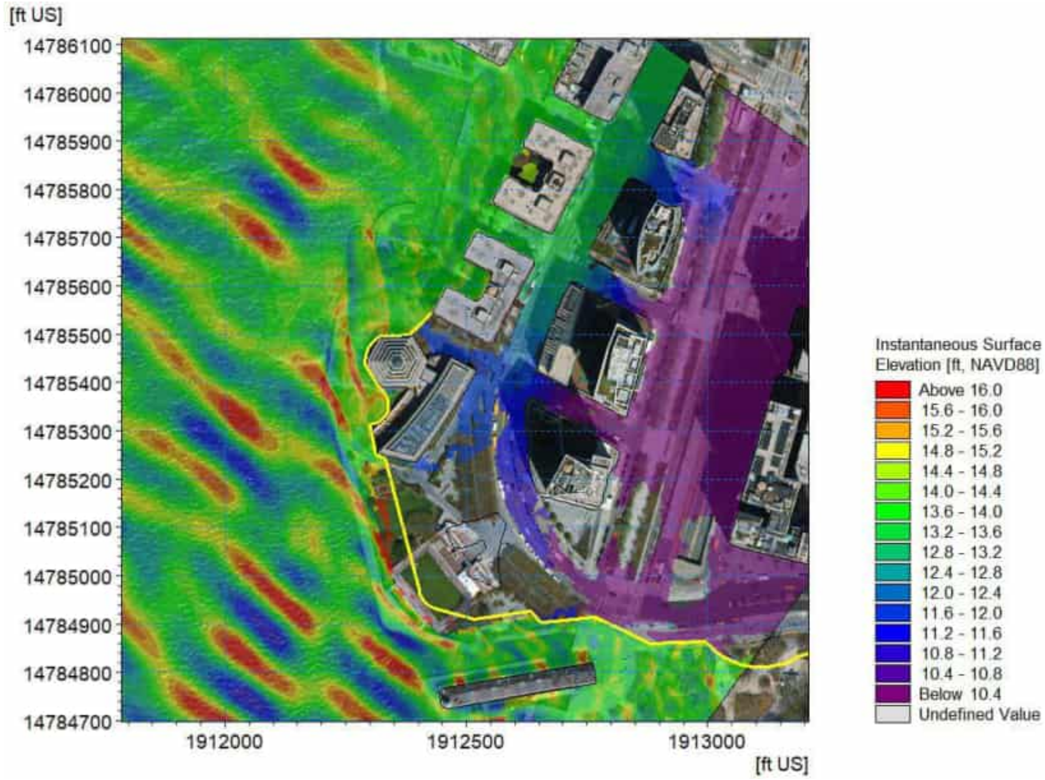


Figure 4-7 MIKE 3 Wave Model Simulated Maximum Water Surface Elevation (Wave Crest Elevation) under 100-year Storm Surge Peak, 2050s SLR, and 100-year Wave Condition with the Proposed Flood Resistant Alignment (Scenario with no Flood Wall Implemented on the West Battery Park City side)

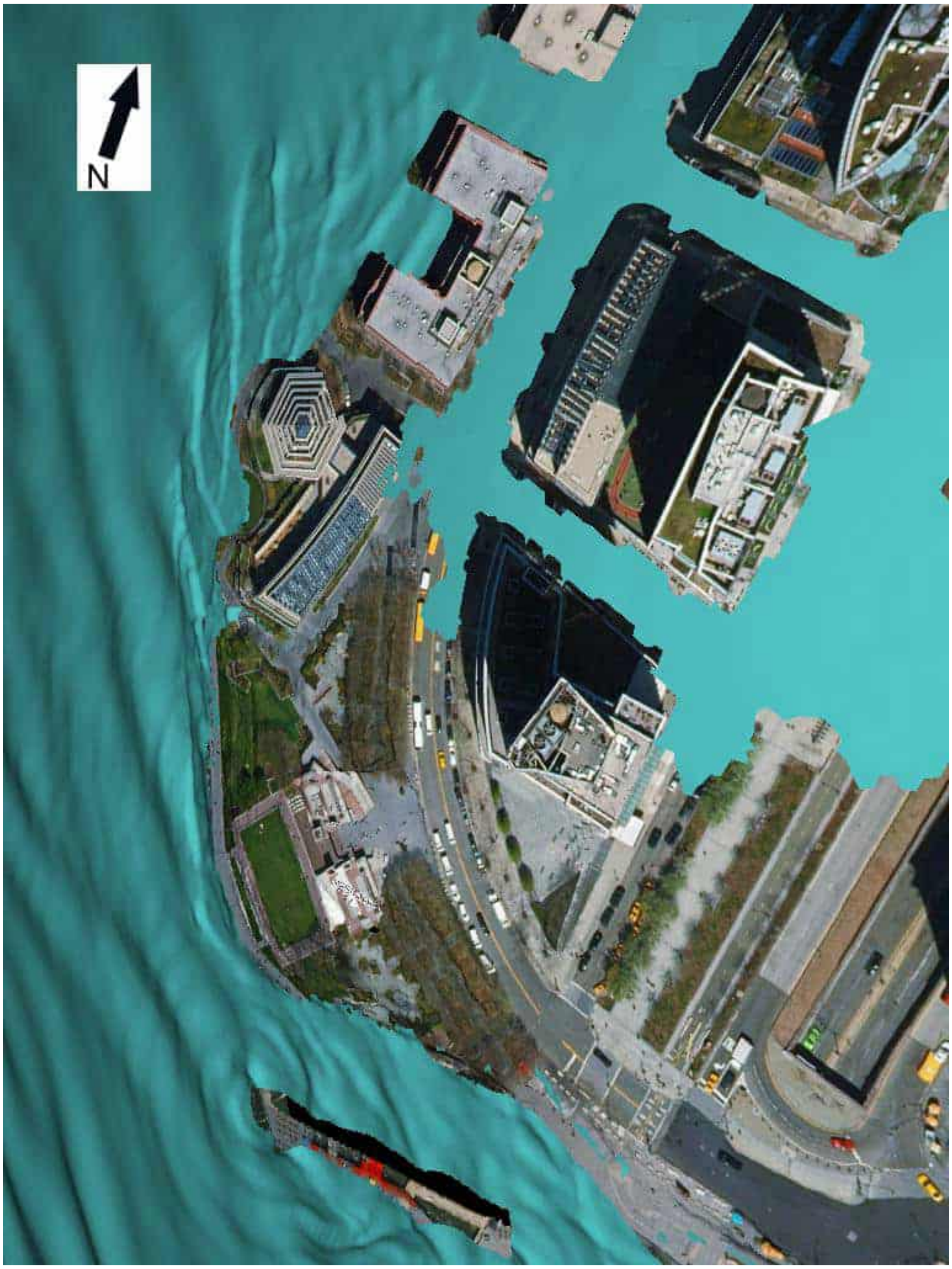


Figure 4-8 3D Snapshot of MIKE 3 Wave Model simulated 100-year Wave Field under 100-year Storm Surge Peak and 2050s SLR with the Proposed Flood Resistant Alignment (Scenario with no Flood Wall Implemented on the West Battery Park City side)

4.5 Design Wave Condition along Proposed Flood Resistant Alignment

Figure 4-9 provides reference to various features relevant to the analysis of wave conditions along the project, especially for the calculation of the wave runup and overtopping using EurOtop. Zones generally delineate common flood protection type or change in elevation of the top of barrier. Sections are typical cross-sections where EurOtop analysis was performed. At each section the terrain is analyzed for the foreshore slope, the structure slope and elevation at the toe of the structure. The toe location establishes where wave parameters are extracted from the MIKE 21 SW model for the calculation. The purple dots indicate the location of the extraction of wave conditions at the toe of structure. An exception to this is in Zone III. In Zone III (Section 2, 1, and 0), there is a sloped fill backed by a 19'-10" floodwall. The floodwall is buried below the top of the sloped fill. For analysis in Zone III, two conditions are analyzed. The first case is as a slope based on the project design terrain assuming no erosion, and a second case where it is assumed the seaward fill is fully eroded to the existing grade, and only the floodwall remains. At all other Sections in all other Zones, the analysis is based on a vertical wall calculation. Other main assumptions used for the EurOtop calculations include a 100-year SWEL level of 11.3 ft, NAVD88 at all sections, based on the preliminary FEMA FIS reported value. Also, deepwater significant wave heights and peak spectral wave periods were applied from the preliminary FEMA FIS WHAFIS analysis, where significant wave heights vary from about 5.01 to 5.13 feet, and peak wave periods vary from about 5.16 to 5.71 seconds.

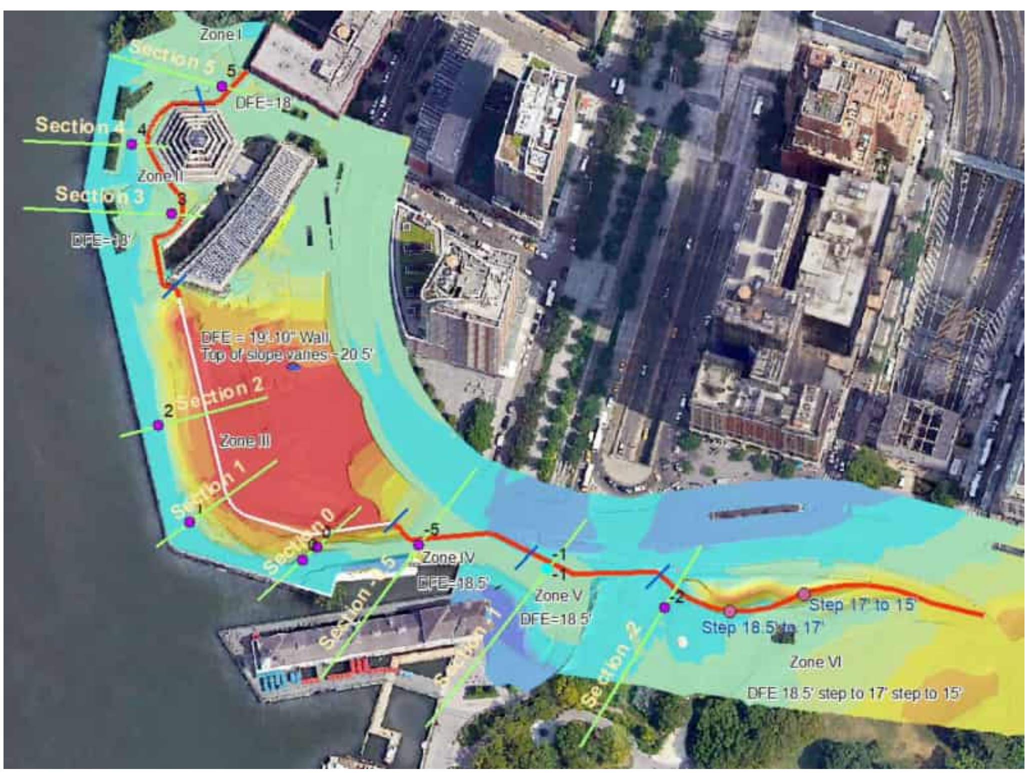


Figure 4-9 Sketch of Zone and Section Locations along the Proposed Flood Resistant Alignment

4.6 Wave Runup and Overtopping - Transect Based (EurOtop)

Table 4-1 and Table 4-2 provide the main runup and overtopping EurOtop inputs parameters and calculated values for the no SLR and 2050s SLR case, respectively. The table also includes the currently proposed floodwall elevations and calculations of freeboard. Note, the first nine rows are calculations for a vertical wall, and the last three rows are for a slope, at Section 2, 1 and 0 in Zone III, respectively.

Table 4-1 is useful for evaluating the criteria for FEMA accreditation of coastal structures for the no SLR condition. The Total Water Level +1 foot freeboard calculation can be compared to the structure height to observe that the freeboard requirement for wave runup is met in all cases. Where freeboard criteria is met for runup, the wave overtopping is zero. The freeboard criteria for +2 feet of freeboard above the stillwater level is met at all cross sections. Table 4-2 shows calculations for the future 2050s SLR case, showing a number of the sections will experience some limited amount of overtopping during the peak of a 100-year event, but well below the 0.03 cfs/ft criteria (USACE, 2007) required to meet floodwall design requirements for overtopping and for interior drainage considerations. The 0.03 cfs/ft criteria is for a wall with backside protection with grass cover based on the average overtopping rate.

Table 4-1 Wave Runup and Overtopping under the 100-year Storm Condition with no SLR

Type	Zone	Section	1% SWEL (ft, NAVD)	Elevation at Toe (ft, NAVD)	Depth at Toe (ft)	Hm0, deepwater (ft)	Tp, deepwater (sec)	MIKE 21 SW Hm0 at Toe (ft)	Floodwall Elevation (ft, NAVD)	Slope ()	Max Runup (ft)	Overtopping, q (cfs/ft)	Total Water Elevation (ft)	Total Water Elevation + 1 (ft)	SWEL + 2 (ft)
Wall	Zone I	Section 5	11.3	11.0	0.3	5.07	5.55	0.2	18.0	-	0.4	0.000	11.7	12.7	13.30
Wall	Zone II	Section 4	11.3	11.0	0.3	5.08	5.50	0.0	18.0	-	0.0	0.000	11.3	12.3	13.30
Wall	Zone II	Section 3	11.3	11.0	0.3	5.08	5.36	0.0	18.0	-	0.0	0.000	11.3	12.3	13.30
Wall	Zone III	Section 2	11.3	11.4	0.0	5.11	5.36	0.0	19.8	-	0.0	0.000	11.3	12.3	13.30
Wall	Zone III	Section 1	11.3	11.3	0.0	5.12	5.36	0.0	19.8	-	0.0	0.000	11.3	12.3	13.30
Wall	Zone III	Section 0	11.3	10.3	1.0	5.12	5.36	0.0	19.8	-	0.0	0.000	11.3	12.3	13.30
Wall	Zone IV	Section -0.5	11.3	9.5	1.8	5.12	5.36	0.6	18.5	-	1.3	0.000	12.6	13.6	13.30
Wall	Zone V	Section -1.0	11.3	10.0	1.3	5.13	5.36	0.1	18.5	-	0.2	0.000	11.5	12.5	13.30
Wall	Zone VI	Section -2.0	11.3	10.0	1.3	5.01	5.17	0.8	18.5	-	1.8	0.000	13.1	14.1	13.30
Slope	Zone III	Section 2	11.3	9.5	1.8	5.11	5.36	1.2	19.8	0.19	2.5	0.000	13.8	14.8	13.30
Slope	Zone III	Section 1	11.3	9.5	1.8	5.12	5.36	1.7	19.8	0.22	4.1	0.000	15.4	16.4	13.30
Slope	Zone III	Section 0	11.3	9.6	1.7	5.12	5.36	0.0	19.8	0.20	0.0	0.000	11.3	12.3	13.30

Table 4-2 Wave Runup and Overtopping under the 100-year Storm Condition with 2050 SLR

Type	Zone	Section	1% SWEL (ft, NAVD)	Elevation at Toe (ft, NAVD)	Depth at Toe (ft)	Hm0, deepwater (ft)	Tp, deepwater (sec)	MIKE 21 SW Hm0 at Toe (ft)	Floodwall Elevation (ft, NAVD)	Slope ()	Max Runup (ft)	Overtopping, q (cfs/ft)	Total Water Elevation (ft)	Total Water Elevation + 1 (ft)	SWEL+ 2 (ft)
Wall	Zone I	Section 5	13.8	11.0	2.9	5.07	5.55	1.5	18.0	-	3.6	0.0039	17.4	18.4	15.80
Wall	Zone II	Section 4	13.8	11.0	2.8	5.08	5.50	1.9	18.0	-	4.4	0.0111	18.2	19.2	15.80
Wall	Zone II	Section 3	13.8	11.0	2.8	5.08	5.36	1.0	18.0	-	2.2	0.0003	16.0	17.0	15.80
Wall	Zone III	Section 2	13.8	11.0	2.8	5.11	5.36	2.0	19.8	-	4.7	0.0049	18.5	19.5	15.80
Wall	Zone III	Section 1	13.8	11.3	2.5	5.12	5.36	2.0	19.8	-	4.7	0.0056	18.5	19.5	15.80
Wall	Zone III	Section 0	13.8	10.3	3.5	5.12	5.36	0.6	19.8	-	1.4	0.0000	15.2	16.2	15.80
Wall	Zone IV	Section -0.5	13.8	9.5	4.3	5.12	5.36	1.5	18.5	-	3.6	0.0022	17.4	18.4	15.80
Wall	Zone V	Section -1.0	13.8	10.0	3.8	5.13	5.36	1.8	18.5	-	4.2	0.0053	18.0	19.0	15.80
Wall	Zone VI	Section -2.0	13.8	10.0	3.8	5.01	5.17	2.0	18.5	-	4.6	0.0077	18.4	19.4	15.80
Slope	Zone III	Section 2	13.8	9.5	4.3	5.11	5.36	3.1	19.8	0.19	6.4	0.0003	20.3	21.3	15.80
Slope	Zone III	Section 1	13.8	9.5	4.3	5.12	5.36	3.5	19.8	0.22	8.5	0.0050	22.4	23.4	15.80
Slope	Zone III	Section 0	13.8	9.6	4.2	5.12	5.36	0.7	19.8	0.20	1.6	0.0000	15.4	16.4	15.80

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the coastal flood assessment for the existing conditions and proposed flood resistant alignments, the major conclusions are summarized as follows:

- For the existing conditions, the Project Area is vulnerable to coastal storms for the 100-year storm with or without SLR.
- With the proposed floodwall elevations, no wave overtopping will occur, and wave runup freeboard requirements will be met for the no SLR condition for the 100-year storm.
- For the proposed floodwall elevations, and the 2050s SLR condition, some overtopping of structures will occur within the project, but will be below the 0.03 cfs/ft requirement for the 100-year flood event.
- While the 100-year storm is used as the design storm, considering the vulnerability of the project site, a 500-year storm should be simulated to assess the extent of possible flooding for this rare event.
- Uncertainty of flooding coming from the area west of the project site (West Battery Park City area) needs to be realized given the absence of flood countermeasures there.
- No impact due to the proposed flood resistant structure to stillwater elevations on adjacent properties was observed from the modeling. Wave impacts due to the structure on adjacent properties was not analyzed in the current scope of work.

6.0 REFERENCES

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RAMPP 2014, 2014. Region II Coastal Storm Surge Study Overview, FEMA TO HSFE02-09-J-001.

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U.S. Army Corps of Engineers (2007). Elevations for Design of Hurricane Protection Levees and Structures. Lake Pontchartrain, Louisiana and Vicinity, Hurricane Protection Project, West Bank and Vicinity, Hurricane Protection Project. New Orleans District Report. October 9, 2007. Section 1.3, pp 7.

A.4.6 SBPCR Letter to Manhattan CB1 (June 2022)

B.J. Jones
President & CEO

Battery Park City Authority
200 Liberty Street, 24th Floor
New York, NY 10281
(212) 417- 4211
www.bpca.ny.gov

June 8, 2022

Tammy Meltzer
Chair, Manhattan Community Board 1
1 Centre Street, Room 2202 - North
New York, NY 10007

Re: South Battery Park City Resiliency

Dear Chairperson Meltzer:

The Battery Park City Authority ("BPCA") submits this letter in response to a May 27, 2022 letter from Manhattan Community Board 1 ("CB1") regarding the South Battery Park City Resiliency Project (the "SBPCR Project"). Your contributions over the years have helped shape this project in meaningful ways and have enhanced our efforts to help protect Lower Manhattan. The responses to your requests are below.

1) REQUEST: Originally requested at CB1's April 2022 Environmental Protection Committee meeting, a plan showing the pedestrian, bike and car traffic flow to better understand exactly what will and will not be available to the public for the next two years.

   RESPONSE: Please see the attached pedestrian, bike and traffic plan for Phase 1 of the SBPCR Project construction, slated to begin in late summer 2022. Phase 1 will cover the Museum of Jewish Heritage and Wagner Park segments of the Project. Phase 2 of construction will cover the Pier A Plaza and The Battery segments of the Project and is expected to begin construction in fall 2022. The final pedestrian and bike detour plans associated with Phase 2 are being finalized in coordination with NYCEDC and NYCDPR and will be transmitted to CB1 when completed. There are no detours anticipated for regular motor vehicle traffic flows for either construction phase.

2) REQUEST: Acknowledgement from the NY Department of Transportation, BPCA, Downtown Alliance, and New York City Transit (NYCT) that there is a plan to relocate bus stops to accommodate construction mobilization and staging as well. A confirmation that this plan will incorporate CB1 requests as possible and community review as part of the plans.

   RESPONSE: The proposed temporary relocation of existing bus stops to accommodate construction activity will not be made until after the construction contractor is brought on board by BPCA. The contractor will be required to maintain access and egress for buses and bus passengers during the execution of the work by temporarily relocating bus stops as needed. This coordination will be done through the BPCA Construction Manager with NYCT, NYCDOT, and the Downtown Alliance. Once BPCA has received the contractor's initial proposed plan to temporarily relocate existing bus stops, the proposed plan will be provided to Community Board 1 for input and comments before it is submitted to NYCT, NYCDOT, and the Downtown Alliance.

3) REQUEST: Robust communication plan for engaging with all local residential building tenants, schools, daycare centers, afterschool programs, and private instructional centers about SBPCR and open space alternatives for their kids.

RESPONSE: In recent weeks BPCA has redoubled our efforts to ensure community-wide engagement regarding the Project and its impacts to open space in the Project area. BPCA has posted signage within Wagner Park as well as in building lobbies across the community, and has sent a mailer directly to all Battery Park City residents to inform them of the park's closure, designs for the new park, and where to learn more about the project itself. These efforts are ongoing. As the SBPCR Project transitions from design to construction, BPCA's construction manager on the project, The LiRo Group, will assume primary day-to-day responsibility for supporting and working alongside BPCA in the continuation of its current robust communication and community outreach program for the Project all the way through the completion of construction.

This next phase of the Project's community engagement plan will ensure ample opportunity – via multiple means and venues – for regular, meaningful communication between the Project team and the various stakeholder groups. Local residents, schools, daycare centers, and instructional centers are key constituents within the broader category of Project stakeholders that will continue to be engaged through BPCA's community engagement efforts. A dedicated community liaison will be assigned to the project to assist in these efforts.

Recognizing that the SBPCR Project, along with certain other nearby construction project expected to overlap the duration of the Project, will limit the accessibility to and use of public space and park resources in the immediate area of the Project's construction for significant portions of the next two years, BPCA has made provision to accommodate all programmed activities currently occurring in Wagner Park at other locations within Battery Park City, where over 30 acres of our 36 acres of public space will remain available and welcome to all. Beloved community programs will continue uninterrupted. In addition, BPCA will continue to seek opportunities to provide or advocate for public space alternatives for the community during construction of the SBPCR Project.

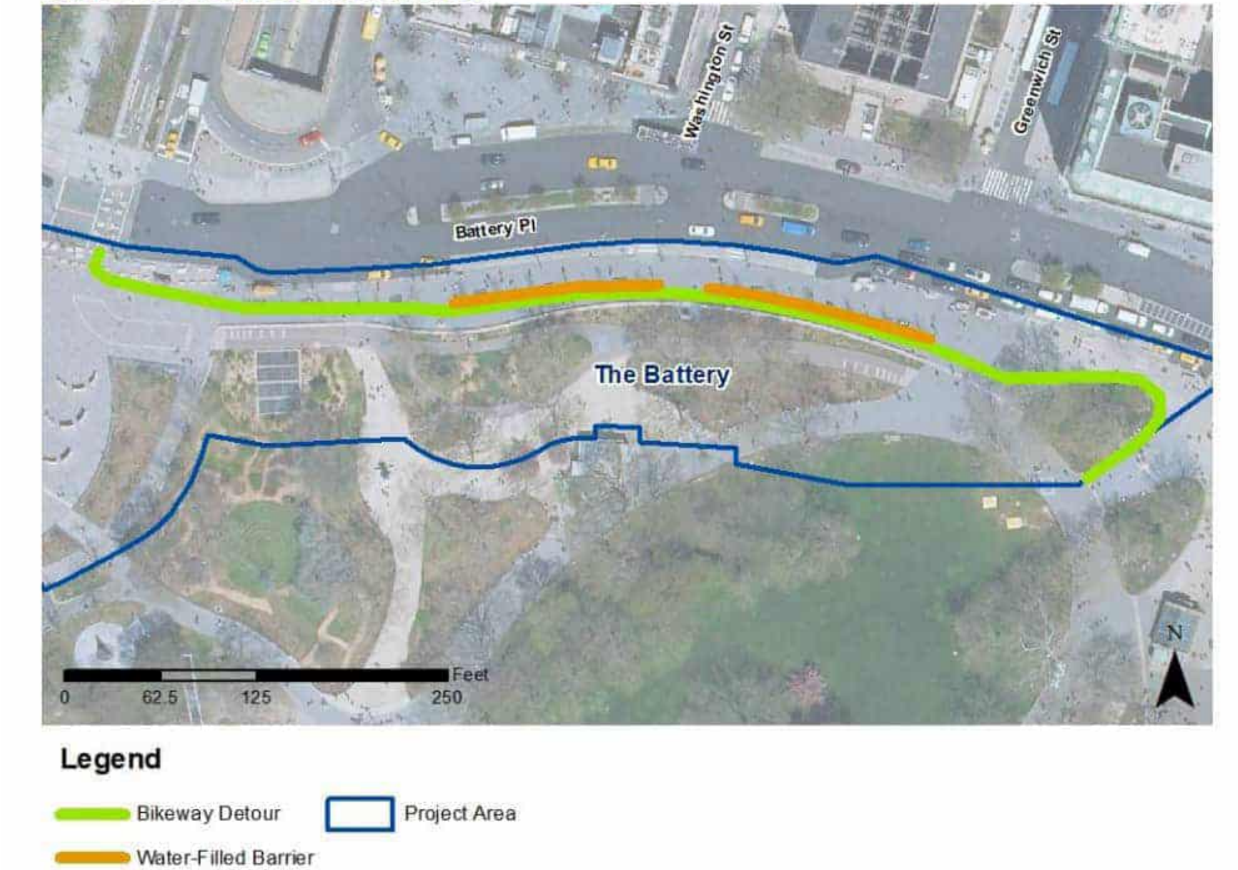
4) REQUEST: A fly-through illustrating SBPCR.

   RESPONSE: Multiple fly-through animations illustrating the various segments of the completed SBPCR Project were presented at the May 19, 2022 Draft EIS public hearing. They are available for viewing on the BPCA website and alongside the scale model of the Project at the community room at 200 Rector Place, with the entrance on the east side of the building.

5) REQUEST: CB1 requests a revised plan with architectural drawings that we can see and share publicly that show inclusion of a bike lane along Battery Place, or a plan that shows how bike users may be effectively diverted from the Battery Bike Path to the Hudson River Greenway. This is already an issue that will only be exacerbated by construction in Wagner and has not been included in the new designs.

   RESPONSE: The new design does not change the bike-path connection from The Battery to Hudson River Greenway. The Battery Bikeway crosses over Battery Place at the same location as it currently does, and connects directly to the Hudson River Greenway. The new design will, however, enhance safety by creating greater separation between pedestrian and bike traffic as the Bikeway crosses at the north end of Pier A Plaza, before connecting to the Hudson River Greenway. Please see below graphic from the Draft Environmental Impact Statement which shows this detour. Please note that the pedestrian detour is still being coordinated with NYC DOT.

Figure 3.15-11: Battery Bikeway Detour



Currently, the proposed design does not include a bike lane in either the northbound or southbound traffic lanes on Battery Place west and north of Little West Street. As previously reported, BPCA is exploring this option with NYCDOT, notwithstanding that this location is not a current NYCDOT priority for new bike lanes. The next step in this process of coordination will be the completion of certain traffic flow studies in coordination with NYCDOT. BPCA will continue to update the community as it moves forward with these studies.

6) REQUEST: CB1 requests more information and clarification on the storage/staging plan during construction, including confirmation that it will be out of view and will not obstruct pedestrian/cyclist flow.

   RESPONSE: Please see the attached storage/staging plan for Phase 1 of the Project construction (beginning late summer 2022), which illustrates that the construction staging and storage will be largely out of public view and will not result in any cumulative impacts to pedestrian/cyclist flow. The storage/staging plan for Phase 2 of the Project construction (beginning fall 2022) is being finalized in coordination with NYCEDC, NYCDPR and NYCDOT and will be shared with CB1 upon its completion.

7) REQUEST: CB1 received notification of the SBPCR DEIS on May 4, 2022. A public hearing on the DEIS was held on May 19, 2022, and the deadline for public comment is June 3, 2022. Thirty days in and of itself is a very short amount of time for the public to review, digest and prepare comment on a highly technical document that is over 400 pages long. Members of the public relied on the presentation on the DEIS to be able to understand the content of the DEIS, and after the May 19 hearing on the DEIS, that leaves only two weeks left to prepare feedback by the deadline. CB1 urges that the deadline for comment on the DEIS is extended to allow the public sufficient time to understand the material and prepare a response.

RESPONSE: As previously announced, although the notification period originally provided for comments to the Project's DEIS conformed with applicable regulatory guidelines, BPCA has, in consideration of CB1's request, extended the deadline for DEIS comments to Friday, June 10, 2022.

Given the extended DEIS comment period and its impact on the remaining EIS schedule, and also in recognition of the community request for a construction commencement after Labor Day 2022, the Project's construction commencement will be deferred until after Labor Day, September 5, 2022.

8) REQUEST: In light of recent concerns among the community based on the DEIS, CB1 requests more information and clarity on the soil sampling in Wagner Park and throughout the construction area that specifies any potentially hazardous materials within the soil that may be disturbed during construction, and mitigation measures in place to safely remediate and minimize community impacts.

   RESPONSE: Please see the attached memo prepared by AECOM to provide further clarification regarding soil testing results and mitigation measures to be employed during SBPCR Project construction.

9) REQUEST: CB1 requests additional confirmation that there is no need to conduct lead or asbestos abatement with regards to the demolition of the Wagner Pavilion.

   RESPONSE: While it is expected that, given the age of the Wagner Park Pavilion, no lead or asbestos was used in its construction, testing to confirm this expectation will be conducted in the coming weeks, prior to the commencement of demolition. Results from these tests will be shared with CB1 as soon as they are available.

Thank you for your leadership and ongoing partnership in providing constructive community input throughout the development and execution of this project. Together, we are providing vital protection to Wagner Park and the adjacent community in the face of increasingly severe and frequent storms that pose a true threat to Lower Manhattan.

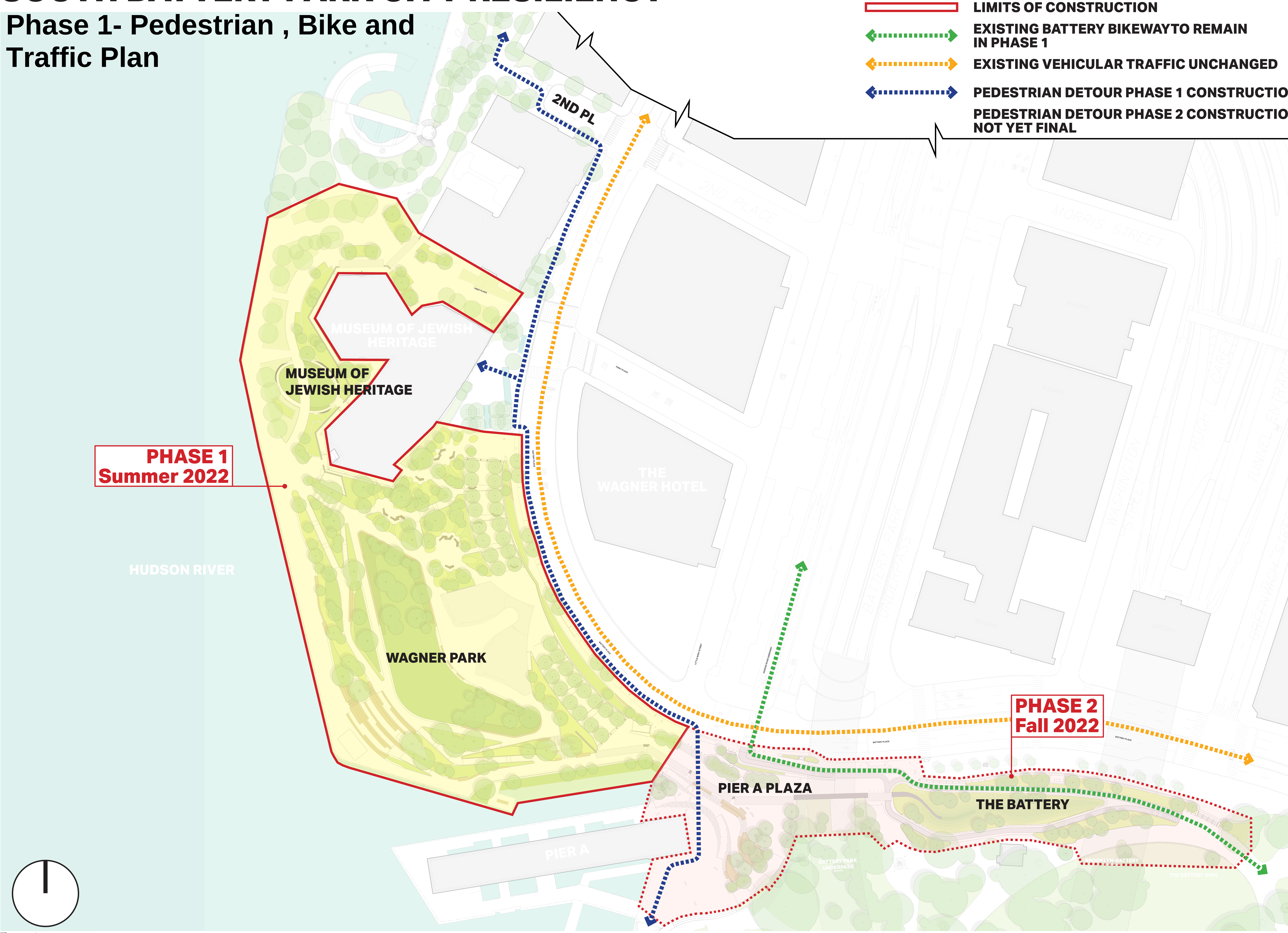
Sincerely,

B.J. Jones
President & CEO
Battery Park City Authority

cc: Manhattan Borough President Mark Levine
City Council Member Christopher Marte
Assembly Member Yuh-Line Niou
Assembly Member Charles D. Fall
New York State Senator Brian Kavanagh
New York City Public Design Commission
Mayor's Office of Climate & Environmental Justice
NYC Economic Development Corporation

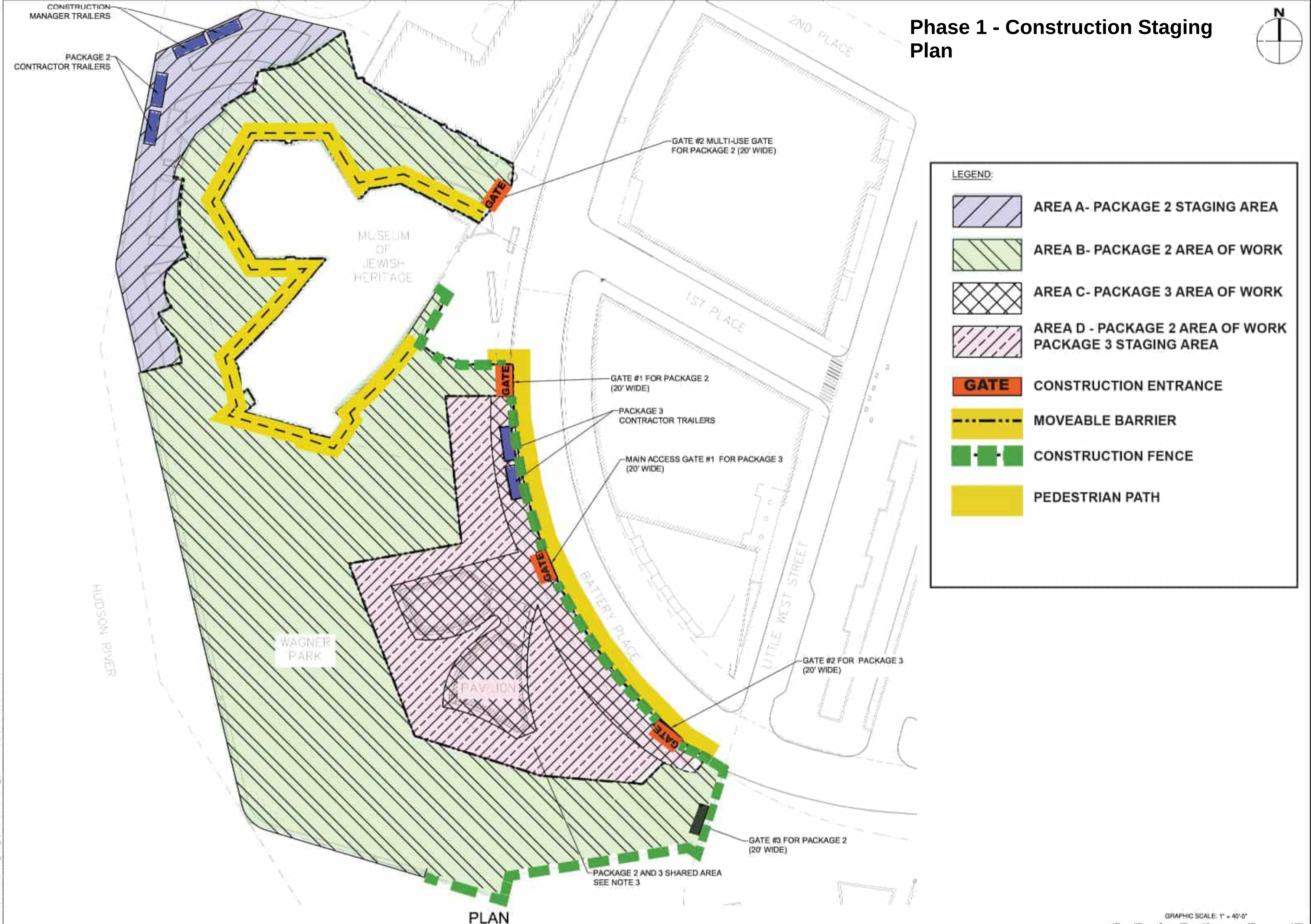
SOUTH BATTERY PARK CITY RESILIENCY

Phase 1- Pedestrian , Bike and Traffic Plan



Battery Park City Authority

Phase 1 - Construction Staging Plan



PLAN

SCALE: 1" = 40'

AECOM

AECOM
605 Third Avenue
New York, NY 10158
aecom.com

Project name:
South Battery Park City Resiliency Project

Project ref: CEQR #21BPC001M

To:
Gwen Dawson
Vice President of Real Property

Battery Park City Authority
200 Liberty Street, New York, New York 10281

CC:
Rachel Dencker, PE
Antoine AbiDargham, PE

From:
Renee Ducker and Al Lopilato

Date:
June 7, 2022

Memo

Subject: SBPCR Soils Analysis

In response to an inquiry from Manhattan Community Board 1, Battery Park City Authority ("BPCA") has requested that AECOM provide additional information and clarification regarding the soils and groundwater analysis for the South Battery Park City Resiliency Project (the "SBPCR Project" or the "Project"), specifically addressing the detection of certain hazardous materials within the Project area and planned soil handling and disposal procedures and safety protocols. This memo summarizes the background, significance, and Project response to the soils and groundwater conditions within the SBPCR Project area.

As described in greater detail below, AECOM's soil sampling has identified the presence of certain hazardous materials within the soil and groundwater on the Project site (notably, no evidence of hazardous waste was detected). Though the presence of hazardous materials exceeds State and City guidance values, measured levels are in line with typical levels found in other urban fill projects in New York City. Such exceedances being relatively commonplace, local, state and federal regulations and guidelines have been promulgated to address safe handling, mitigation and disposal measures as they may be applicable to specific soil and groundwater conditions. Consequently, the contractors selected to complete the SBPCR Project will be required to take all specific precautions prescribed by the BPCA plans – described further below – that have been prepared to comport with this regulatory guidance. This memo includes four sections: (1) a description of the distinction between hazardous materials and hazardous waste, (2) a description of the hazardous materials found in soils on the Project site, (3) protocols pertaining to the safe reuse and disposal of soil contaminated with hazardous materials, and (4) construction protocols for such soils and groundwater.

1. **Distinction between hazardous materials and hazardous waste.**

   A **Hazardous Material** is any substance that poses a threat to human health or the environment. The 2021 New York City Department of Environmental Protection (NYC DEP) City Environmental Quality Review (CEQR) Technical Manual identifies hazardous materials that may be of concern as including, but not limited to, Heavy Metals, Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs)**,** Methane, Polychlorinated Biphenyl's (PCBs)**,** Pesticides and Dioxins. Hazardous Materials are a very broad category of potential site contaminants.

   A **Hazardous Waste** is defined by regulations promulgated under the Federal Resource Conservation and Recovery Act and by the New York State Department of Environmental Conservation, found at 6 NYCRR Part 371, as solid wastes that either meet one of four characteristics (chemically reactive, ignitable, corrosive, or toxic) with respect to defined test methods or are listed in one of following: 1) a generic list of chemicals that are hazardous regardless of the source that produces them; 2) a list of wastes from specific industrial sources; and 3) a list of chemicals that are deemed hazardous wastes if they are discarded or intended to be discarded rather than used as intended. There are slight differences between the state and federal regulations.

Other less commonly encountered hazardous materials include radionuclides (e.g., radiation sources) and biological wastes (e.g., medical waste). When these are managed in accordance with applicable regulatory requirements (e.g., in a hospital or laboratory setting), they would not be expected to be associated with adverse effects. However, when evidence is found that they have been abandoned or are otherwise mismanaged, the appropriate regulatory agencies (i.e., DEP, the New York City Department of Health and Mental Hygiene (DOHMH), New York State Department of Health (NYSDOH), New York State Department of Environmental Conservation (NYSDEC), the United States Environmental Protection Agency (USEPA), or the Nuclear Regulatory Commission (NRC)) should be contacted for additional guidance.

2. Encountered levels of hazardous material in SBPCR soil and groundwater are above the applicable State and City thresholds but are not atypical for urban fill or urban use areas.

The Study Area for the SBPCR Project covers a residential and commercial neighborhood in the Battery Park City section of Lower Manhattan, along with public space and park area associated with Pier A and The Battery.

According to the historical sources reviewed, the western portion of the Study Area consisted of the Hudson River and the New York Harbor, with four piers extending from the shoreline between 1894 and 1971. These piers were used to support railroad and transportation operations. Other than some modifications to several pedestrian walkways in the 1950s due to the construction of the Battery Tunnel, this shoreline portion of the Study Area has remained a greenspace. In 1971, the buildings located on the piers were removed. In 1974, the piers were also removed and the shoreline was extended several hundred feet into the river with urban fill. In 1985, South Park was developed on the site currently occupied by Wagner Park. In 1997, the main building of the Museum of Jewish Heritage was constructed and the Wagner Park pavilion was also constructed. The East Wing of the Museum of Jewish Heritage was constructed between 2000 and 2003. There is no history of industrial operations in the Study Area based on historical review.

Based on information gathered during site history research, this waterfront area was filled to raise the topographic grade and create the ground that constitutes this section of the Study Area. This was a common practice for decades.

Testing during the Phase II Limited Site Investigation Report indicated that the fill material sampled within the Study Area does indeed contain hazardous materials, consistent with the historic fill found throughout New York City. Soil analytical results were compared to the NYSDEC Part 375 unrestricted, residential, and commercial use Soil Cleanup Objectives (SCOs). The results indicate that most exceedances of residential and commercial SCOs were limited to polynuclear aromatic hydrocarbons (PAHs) and metals at relatively low levels. One sample also exhibited an exceedance for dieldrin, a commercial insecticide. The presence of hazardous materials at these concentrations are not indicative of the disposal of hazardous waste in the Project area, but are consistent with the presence of historic fill. As discussed in Section (4) below, specific protective protocols have been developed to ensure worker health and safety and the safety of the surrounding community.

While elevated levels of hazardous materials were detected, it is not expected that significant additional levels of hazardous materials would be encountered during construction or that hazardous materials encountered during construction would be characterized as hazardous waste.

Ground water analytical results were compared to NYSDEC's Part 703 Groundwater Quality Standards (GQS) (class GA) and/or the NYSDEC Ambient Water Quality Standards (AWQS) or Guidance Values (AWQSGV). The results indicated chloroform, hexachlorobutadiene, PAH compounds, PCBs, aluminum, and iron were detected above the AWQSGV. The groundwater results are also consistent with typical impacts from fill material and are not indicative of an environmental spill or release.

3. Reuse/Disposal of Contaminated Soils.

Subject to specified handling and testing requirements as promulgated in 6 NYCRR Part 360, soils contaminated with hazardous materials may either be reused onsite to the extent permissible or transported offsite for disposal or recycling in accordance with applicable laws and regulations.

Additional waste characterization sampling will be required prior to disposal to establish that the soils to be disposed meet the individual disposal facility requirements. All hazardous and non-hazardous soil and other wastes that are disposed off-site will be documented via manifests and bills of lading and hauled by licensed waste haulers. Prior to any off-site contaminated soil disposal, each disposal facility will provide documentation in writing to the site owner or general contractor charged with soil disposal activities, stating they have reviewed the waste characterization testing for the material they will receive, have approved the material for receipt, and the quantity approved. A copy of the permit for the selected disposal facility must also be provided to the Engineer or Construction Manager.

4. Construction Protocols for Contaminated Soils and Groundwater.

Measures to prevent exposure to construction workers, the public, and the environment during and after construction activities are detailed in a Remedial Action Plan (“RAP”) and a Construction Health and Safety Plan (“CHASP”). Both documents are being reviewed by the New York City Department of Environmental Protection (“NYC DEP”) for final approval.

In summary, all construction activities must meet the below requirements:

– During construction activities, all excavated material can be reused on-site if it meets the requirements of NYSDEC Part 360-13 regulations.
– If excavated material does not meet the requirements for reuse on-site and requires off-site disposal, sampling and analysis of the material as required by NYSDEC and the disposal facilities will be conducted;
– If excavated material is encountered that displays visual or olfactory indications of contamination, it will be appropriately segregated on-site;
– Import of materials to be used for excavation backfill or embankment will be performed in compliance with the RAP and in accordance with all local, state, and federal laws. Imported material will be tested at the source facility and analytical data made available for review prior to the material being imported to the site;
– Stormwater pollution prevention measures will be implemented in accordance with the RAP and all local, state, and federal laws;
– If underground storage tanks (USTs) are encountered (including any piping or apparatuses), it will be removed/closed in accordance with the RAP and all applicable New York City and/or NYSDEC regulations;
– Management of any subsurface fluids (groundwater), if generated, will be in accordance with the RAP and all local, state, or federal regulations;
– Management, removal and/or disposal of any hazardous building materials, including but not limited to, asbestos containing material (ACM), lead painted surfaces, or PCB containing materials in accordance with the RAP and all local, state, or federal regulations.

As discussed in Section 3 above, excavated materials will be handled and reused or disposed of in accordance with applicable laws and regulations.

Dewatering will be conducted during construction and groundwater containing hazardous materials will be managed appropriately. All liquids including dewatering fluids will be handled and disposed in accordance with local, state, and federal regulations. If it is desired to discharge fluids to the New York City sewer system, approval must be sought and received from NYCDEP. Discharge to the sewer system requires additional analytical testing. If fluids do not meet the regulatory requirements for discharge to the sewer system, they will be characterized for off-site disposal at a permitted facility.

All fluids to be transported off-site for disposal will require waste characterization analytical sampling based on the requirements of the receiving facility. The fluid disposal facility will provide documentation in writing that they have reviewed the characterization data and approve the fluid for disposal. A copy of the their permit to receive the fluid will also be provided. All contaminated fluid will be transported by a hauler licensed to transport the material.

Discharge of dewatering or other fluids to surface waters (stream or river) is strictly prohibited without a State Pollutant Discharge Elimination System (SPEDES) permit issued by NYSDEC.

A Community Air Monitoring Plan (CAMP) has been prepared in accordance with Appendix 1A New York State Department of Health Generic Community Air Monitoring Plan contained within NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, May 3, 2010. Real-time air monitoring for VOCs and particulate levels will be conducted in accordance with the CHASP along the perimeter of the exclusion zone. Monitoring will be conducted during all ground intrusive activities and during all soil/fill or other regulated material handling. All readings will be recorded in a logbook and available for review by NYC DEP. Exceedances of action levels that occur during the workday will be corrected as they occur and recorded in a logbook.

Construction of the SBPCR Project will also establish a physical cap to prevent community exposure of residual contamination. The cap will include the following:

– The structures associated with the Museum of Jewish Heritage and existing pavement, etc. will remain and serve as a protective cap preventing contact with residual contaminated soil/fill;

- To meet projected DFEs for coastal surge, Wagner Park will be elevated 10 to 12 feet and the buried floodwall would be constructed beneath the raised park. The top two feet of soil will be clean fill;
- Areas of pedestrian and bike pathways will be paved impervious surfaces that also serve as a barrier between residual hazardous material and the public.

Once construction has been completed, the activities associated with removal/disposal and import of soil/fill material will be documented in a Remedial Closure Report (RCR). The report will be certified by a New York State Licensed Professional Engineer and submitted to NYC DEP.

The City of New York
Manhattan Community Board 1
Tammy Meltzer CHAIRPERSON | **Lucian Reynolds** DISTRICT MANAGER

May 27, 2022

B.J. Jones
President & Chief Executive Officer
Battery Park City Authority
200 Liberty Street, 24th Floor
New York, NY 10281

RE: South Battery Park City Resiliency

Dear President Jones:

We write today to follow up on pending requests, and to communicate ongoing questions and concerns regarding the South Battery Park City Resiliency project (SBPCR) that were raised during the May 2022 meetings of Manhattan Community Board 1 (CB1). While we support the need for resiliency in Lower Manhattan, CB1 has repeatedly questioned the need to raze the park and pavilion and is on record opposing this approach. CB1 has made extensive comment on SBPCR over the years, including resolutions in September 2017, May 2017, December 2018, February 2020, and letters to the NYC Public Design Commission in May 2021 and April 2022 (see documents here). It is crucial that the public has a full understanding of the SBPCR plan, the implications for its implementation, and impacts during phases of construction. CB1 requests the following:

- Originally requested at CB1's April 2022 Environmental Protection Committee meeting, a plan showing the pedestrian, bike and car traffic flow to better understand exactly what will, and will not be available to the public for the next two years.
- Acknowledgement from the NY Department of Transportation, BPCA, Downtown Alliance, and New York City Transit (NYCT) that there is a plan to relocate bus stops to accommodate construction mobilization and staging as well. A confirmation that this plan will incorporate CB1 requests as possible and community review as part of the plans.
- Robust communication plan for engaging with all local residential building tenants, schools, daycare centers, afterschool programs, and private instructional centers about SBPCR and open space alternatives for their kids.
- A fly-through illustrating SBPCR.
- CB1 requests a revised plan with architectural drawings that we can see and share publicly that show inclusion of a bike lane along Battery Place, or a plan that shows how bike users may be effectively diverted from the Battery Bike Path to the Hudson River Greenway. This is already an issue that will only be exacerbated by construction in Wagner and has not been included in the new designs.

- CB1 requests more information and clarification on the storage/staging plan during construction, including confirmation that it will be out of view and will not obstruct pedestrian/cyclist flow.
- CB1 requests more information and clarification on whether an elevator would be possible for the public to access the pavilion structure.
- CB1 received notification of the SBPCR DEIS on May 4, 2022. A public hearing on the DEIS was held on May 19, 2022, and the deadline for public comment is June 3, 2022. Thirty days in and of itself is a very short amount of time for the public to review, digest and prepare comment on a highly technical document that is over 400 pages long. Members of the public relied on the presentation on the DEIS to be able to understand the content of the DEIS, and after the May 19 hearing on the DEIS, that leaves only two weeks left to prepare feedback by the deadline. CB1 urges that the deadline for comment on the DEIS is extended to allow the public sufficient time to understand the material and prepare a response.
- In light of recent concerns among the community based on the DEIS, CB1 requests more information and clarity on the soil sampling in Wagner Park and throughout the construction area that specifies any potentially hazardous materials within the soil that may be disturbed during construction, and mitigation measures in place to safely remediate and minimize community impacts.
- CB 1 requests additional confirmation that there is no need to conduct lead or asbestos abatement with regards to the demolition of the Wagner Pavillon.

Sincerely,

Tammy Meltzer, Chairperson

Alice Blank, Vice Chairperson
Chair, Environmental Protection Committee

CC: Manhattan Borough President Mark Levine
City Councilmember Christopher Marte
Assemblymember Yuh-Line Niou
Assemblymember Charles D. Fall
New York State Senator Brian Kavanagh
New York City Public Design Commission
Mayor's Office of Climate and Environmental Justice
NYC Economic Development Corporation

A.4.7 BPCA Response to Battery Park City Neighborhood Association (BPCNA) (June 2022)

B.J. Jones
President and Chief Executive Officer

Battery Park City Authority
200 Liberty Street, 24th Floor
New York, NY 10281
(212) 417-2000
www.bpca.ny.gov

June 29, 2022

Dear Battery Park City Neighborhood Association,

Thank you for your email from the night of June 14, 2022. The execution of the South Battery Park City project, as well as the other projects that the Lower Manhattan Coastal Resiliency effort comprises, is of critical and urgent importance to protect our 36 acres of parks and public spaces and the inhabitants of the 120 buildings and 13,800 residential units in the Battery Park City floodplain — you and your neighbors, included. On behalf of the Authority, this letter groups your questions by theme and provides responses accordingly.

Community Engagement

2.5 ASK: Please provide information regarding discussions with commercial, private or public property owners regarding the needs, methods, and costs that this protection plan and the alternatives presented.

5.1 ASK: Please provide all information regarding discussions, analysis and determination of coordination with other resiliency projects under way or consideration. Specifically projects such as the LESCRP, that impact the entire Lower Manhattan community.

8.1 ASK: Please provide an accounting of all feedback submitted by the community during five years of meetings and in hundreds of emails. Please provide access to those documents, broken down by meeting and source.

8.2 ASK: Please share the specific responses to community feedback received by BPCA from its engineers, AECOM, and other parties. Your response should include whether a community member's feedback item was marked "resolved," "incorporated" and/or "ignored." These responses would be important in educating the public, providing basic transparency, and reassuring the public that their voices were heard. In the absence of providing this detailed reconciliation, the project lacks credibility and only demonstrates "engagement" as one way, top-down communication. We have asked for this information in CB1 meetings that BPCA has attended, and we understand CB1 has also asked for this detailed resolution/inclusion of ideas and feedback.

To quote Manhattan Community Board 1's Chair, Tammy Meltzer, "Engagement on the BPCR projects with the Battery Park City Authority (BPCA) and the public has been substantial. CB1 has spent countless hours in earnest review for the BPCA resiliency projects including plans for the South Battery Park [City] Resiliency Project (SBPCR)." Authority staff and other members of the project team have participated in each of the 34 public meetings Chair Meltzer mentions in her letter, engaged in productive, two-way dialogue on these important issues. To suggest otherwise — that public engagement on this project has been "predominantly one-way dialogues presenting a summary of top-down decisions to a small segment of the community" — is both inaccurate and, based on the ample evidence to the contrary, misleading.

From the outset, BPCA has made the conscious decision to engage with the public in dialogue through Community Board 1, which is an advisory body with a formal role designated by the City Charter in matters such as land use, determining local budget priorities, and monitoring service delivery. However, our public engagement has not been limited to only the Community Board. In addition to elected officials' convened meetings, like the one we all attended the week before last, the BPCA-hosted public meetings on the South Battery Park City Resiliency Project were advertised widely. Invitations were distributed through local organizations, elected officials' offices, and Battery Park City building managers, as well as through direct emails from our organization. The meetings themselves have been dynamic and collaborative. Though our team certainly presented proposals to demonstrate progress in developing the designs responsive to community feedback, much of the sessions have been devoted to soliciting ideas, responding to questions, and listening to additional feedback on the project. As shared with you previously, and for the benefit of others, below is an incomplete list of public meetings held on the South Battery Park City Resiliency project, with video recordings of the meetings to show the productive dialogue we had with your neighbors.

- Community Meeting (November / December 2016)
- Community Meeting (March / April 2017)
- Manhattan CB 1 Waterfront, Parks & Resiliency Committee (June 2017)
- Executive Summary – Wagner Park Site Assessment & South BPC Resiliency Plan (July 2017)
- Public Meeting (November 2018)
- Public Meeting (March 2019) | Video
- Public Meeting (April 2019) Video
- Public Meeting (June 2019) | Video
- Manhattan CB1 Environmental Protection Committee (October 2019)
- Public Meeting (January 2020) | Video | Follow Up Q&A | Scaled Plans
- "Deployables Workshop" with Manhattan CB1 (May 2020)
- Update to Manhattan CB1 (June 2020)
- Update to Manhattan CB1 (February 2021)
- Update to Manhattan CB1 (April 2021, Revised)
- LMCR Update to Manhattan CB1 (June 2021)
- EIS Scoping Meeting (October 2021) | Video
- Update to Manhattan CB1 (March 2022) | Video
- Draft Environmental Impact Statement Public Hearing (May 2022) | Video | Transcript

We have endeavored to meet the highest standards for transparency over the course of this project in reporting on the development of the designs and reflecting back to the public the feedback we have received as a result of our engagement with them. It would be impractical to aggregate all elements of feedback received over the course of the five-plus years working on this project, or our collaboration with those entities working to protect the balance of Lower Manhattan's coastline, assets, and residents. Designing a project of this magnitude requires the partnership of numerous stakeholders. With regards to government partners alone, our work has involved the New York City Mayor's Offices of Climate and Environmental Justice and People with Disabilities; the City Departments of Transportation, Small Business Services, Education, and Environmental Protection; FDNY; NYPD; the Economic Development Corporation; the Public Design Commission; the State Departments of Environmental Conservation and Transportation; the State Historical Preservation Office; the United States Army Corps of Engineers; and others. Illustrative of the Authority's engagement with stakeholders adjacent to the project area and most directly impacted by the Project, the Authority has engaged in focused dialogue with leadership of the Museum of Jewish Heritage regarding the Museum's design, architectural, and operational needs and concerns, and has also engaged with PS/IS276 on matters of park use and construction impacts, given the schools' proximity to Wagner Park and their regular use of the public space. Particularly regarding communication with CB1, dialogue was oftentimes informal, ongoing and iterative, with CB1 leadership discussing and brainstorming with the Authority and its design team how best to address community concerns and incorporate, where possible, input provided in public sessions and via other means. Though not a complete compendium of all feedback received, as noted above, results of our web survey and the data we solicited from the public during the Community Meetings can be found here.

Again, we would recommend that you watch the videos of those public sessions, which demonstrate that the communication was a two-way dialogue. However, to provide a few specific and granular examples of feedback that were incorporated in the designs, please see below:

- Pavilion Street Side Design and Pavilion Service Entrance – Community Board 1 stated that the minimalist look of the dark stone cladding and flush detailing was undesirable and cold, the service entrance was too big, the x-tend mesh guardrail felt "cheap", and that the team needed to soften the look and feel of the entry areas through the use of finishes and added vegetation in a manner that was still compatible with the design of the pavilion overhead. In response to community comments, a dedicated meeting was scheduled with CB1 leadership to solicit and explore additional ideas for addressing these concerns. Subsequently, as a result of the comments received and the alternatives discussed, the point of intersection of the arched allees has been shifted further south-east in order to divide the service entrance doors, with one door located on each side. This eliminates the appearance of a singular wall crowded with doors. The dark stone cladding was eliminated, and the material was changed to a warm red concrete, consistent with the rest of the Pavilion, to soften the perceived coldness of the façade. The design of the guardrail was revised to be consistent with the character of other picket guardrails currently in use and proposed for Pier A Plaza and Wagner Park. The guardrail material will be high quality, durable stainless steel that is in keeping with the high level of finish of the surrounding community and is appropriate to the marine environment.

- Pier A Plaza - CB 1 was concerned that, following the design team's initial analysis, only 1 option was presented to the community for consideration. Community members had also expressed concern with the height of the flip-up gates that the initial design would require in the Plaza. In response, the Authority requested that the design team consider and evaluate other design options for Pier A Plaza. The additional design studies resulted in the formulation of a new bi-level design approach that provides risk reduction for, not only major storm events, but also more frequent nuisance flooding, while also reducing the required height of the flip-up gates. In addition, BPCA was asked for and provided additional refinement of seating logistics and paving materiality.

- Maximize Sustainability – The SBPCR Project team is pursuing International Living Futures Institute ("ILFI") Zero Carbon and Waterfront Edges Design Guidelines ("WEDG") certifications, and promoting best practices across all aspects of the project, as well as achieving a 37% reduction in EUI over the similar baseline, and a 37% reduction in embodied carbon for the building materials. CB 1 had requested that the Authority design the new Pavilion to Passive House standards, and, in response, the Authority requested the design team to perform an analysis to consider the relative advantages and costs associated with Passive House design standards versus other sustainability-focused design standards and certifications, including ILFI. The results of its analysis demonstrated that the incremental benefits associated with Passive House design for a building of the small size and use types characteristic of the new Pavilion would not justify the associated cost and operational restrictions. Instead, the design team recommended, and the Authority approved, the integration of International Living Futures Institute ("ILFI") Zero Carbon standards into the Pavilion design. The SBPCR Project team is pursuing these standards and WEDG certifications, and promoting best practices across all aspects of the project, as well as achieving a 37% reduction in EUI over the similar baseline, and a 37% reduction in embodied carbon for the building materials. The site is fully electrified, and the design will also reduce total water use, including irrigation demand by 40%, with rainwater harvesting and water efficiency measures throughout. This analysis and its findings were subsequently communicated to CB1. All site features will inform educational programming on sustainability and resiliency by BPCA.

- Shade in the Amphitheatre – Community members expressed concern about the lack of shade for the water-facing seating at the event terrace. In response, the design team ensured that there are large shady trees at the outer edges of the seating to provide natural shading; however, the desire for increased shading at this location had to be balanced with the priority of maintaining view corridors from the Pavilion and the lawn to the Harbor and the Statue of Liberty. The resulting alteration was shown in the February 2021 update to Manhattan CB1.

- Alternatives to storage of soil and compost, including using the space under the lawn – The presence of a short-term storage and staging for the BPCA Parks maintenance team at the west edge of Wagner Park was questioned at a community meeting. It was clarified that composting will not be conducted in the external holding yard and that the BPCA storage area at the lower level of the Pavilion will house much-needed facilities for the maintenance team as originally contemplated. The small holding yard (480sf) in question is a short-term storage area for tools and plants for quick access to BPCA staff working in the proximate area. Other locations were considered for this need, but the design team and BPCA concluded that this location, being largely out of public view and not posing any obstruction to pedestrian circulation, was the least impactful alternative. Additional materials were presented in February 2021 to help better communicate the context and details of this location.

- Access at Pier A inlet – The community requested that we devise a means of directly experiencing the water at the Pier A inlet. This objective has been consistently featured in the Pier A Inlet design as it has evolved over time.

- Scaled drawings – As mentioned above, printable scaled plans, sections and elevations of the entire project site were initially provided to CB1 in February 2020.

- Salvage – In response to Manhattan CB1's comments, and in keeping with the Battery Park City Sustainability Plan, material and plant salvage is being maximized across the whole of the project site. The February 2021 update to Manhattan CB1 identified what building and landscape materials are being reused in the new design (and not just salvaged), and explained that the Project team is working closely with BPCA's horticulture team, as well as the Battery Conservancy, to salvage and reuse as many plants as possible – both within the project site and in neighboring park areas. Based on recent conversations, BPCA all will be working more broadly with the State's and City's Parks Departments to salvage and reuse plants.

- Picnic Terraces – Two small lawn spaces were carved out of the performance garden zone as potential waterside picnic locations in response to a request by then-Manhattan CB1 Vice-Chair (and current Chair) Tammy Meltzer during the prep session for the January 2020 community update. Feedback from the January 2020 meeting itself suggested this lawn space was not close enough to the water. Additional options were then presented in June 2020, from which Option 1 was selected by Manhattan CB1 leadership. An additional rendered view was requested, which was presented to Manhattan CB1 in February 2021.

With regards to our ongoing approach to soliciting public feedback for our resiliency projects, we invite you to attend the upcoming North/West BPC Resiliency Open House on Wednesday, June 29, 2022, between 4p and 8p, which will feature easeled boards with the different potential flood alignments, paired with accompanying panels that describe the boards. Attendees will be encouraged to share comments about the potential alignments by placing sticky notes on the boards. Each board will be assigned a dedicated team member who can answer questions about the board or encourage participants to submit the question for further consideration. Project team members will circulate the room to hear participant comments and answer general project questions. We will also be providing a virtual option on our website where members of the public can view the same materials as the meeting on 6/29 and provide comments through July 15th. We encourage you to participate in this event, building on the two prior community meetings and two "walkshops" specifically on the N/WBPCR project, and also to watch the videos from previous public sessions to learn how similar sessions with your neighbors have informed the development of the final designs of SBPCR.

Coastal Modeling

1.1 ASK: Please provide the actual data, assumptions and models that were used to justify this project's scale and scope including any sensitivity or regression analysis used to validate your models.

1.2 ASK: Please provide information on the source of the model, reviews of the model including information regarding alternative expert interpretation of real world data, and predictive modeling.

2.2 ASK: Please provide a detailed report and detailed data models (in an Excel file or with software access) so that our community can understand and engage with the data, come up with questions and prompt answers from the BPCA. Please include all information on any damage sustained by BPCA buildings, structures and parks during both Superstorm Sandy and Hurricane Irene.

2.3 ASK: Please provide information regarding the impact of the BPC resiliency projects on all adjacent areas throughout Lower Manhattan. For example, we would like to see the impact to Tribeca and FiDi specifically, if we make high ground higher under different storm scenarios.

Please see AECOM's Coastal Modeling Study linked here. Regarding third-party review, please note that BPCA retained Dewberry Engineers to provide peer review services for SBPCR, verifying the adequacy, accuracy, efficacy, constructability, and cost effectiveness of the designs developed for the project at various stages of their advancement. In addition, because SBPCR is intended to be capable of future connection with other waterfront flood barrier systems in Lower Manhattan, Dewberry has been tasked with verifying and ensuring the compatibility of their assumptions, targets, approaches, and designs with each other and with the projects currently being developed by the City of New York as part of its Lower Manhattan Coastal Resiliency ("LMCR") project. The ultimate design storm for both the South and North/West BPC Resiliency Projects (2050s 100-year storm) was selected to be consistent with the targets that had been selected and the sea level rise projections for the LMCR projects. The sea level rise projections utilized for the BPC projects are consistent with projections published by the New York City Panel on Climate Change in its periodic climate change reports, most recently updated in the 2019 Report (NPCC3).

Regarding damage and repairs during Superstorm Sandy (a storm that created storm surge levels significantly below the predicted levels forming the design basis for current Lower Manhattan resiliency projects) , below is a list of activities and repairs to BPCA property necessitated by that storm event, which also took the lives of 44 New York City residents.

Pier A Building:

- Debris removal and disposal.
- Mold assessments/microbial investigations.
- Removal of existing mold and damaged elements to the first floor.
- Rental of generators to provide temporary heat for 1st – 4th floors.
- Emergency damage assessment for Pier A
- Emergency underwater inspection.
- Installation of dry wall, insulation and "Henry Blue Skin" vapor barrier throughout first floor; and replacement of sprayed-on foam insulation on columns.
- Mill down and replacement of concrete slab.
- Replacement of wiring, and junction boxes throughout first floor.
- Replacement in kind of 41 exterior doors, 7 windows, 42 light fixtures on the first floor
- Restored the Main Electric Service and repaired the elevator, replacing major components.
- Replaced all the damaged plumbing.
- Replaced 1,600 SF of decorative sheathing on columns.
- Replaced the Fire Alarm Control Panel in kind.
- Replaced the 12' x 60' construction trailer and removed the destroyed trailer.

Site 1 Ballfield Electrical:

- Removed and replaced damaged concrete pads and electrical equipment; including conductors, lighting panels, conduits, and other electrical components.
- Installed 1,500 CF of platforms and equipment supports
- Excavated 300 SF to repair grounding, and install 2 SF of grounding for fence enclosure.

Site 2 BPC Esplanade:

- Repaired and/or replaced damaged electrical utilities and other components; including bonding conductor and terminals in 135 inground splice boxes.
- Cleaned out dirt and debris from inground splice boxes, light pole bases
- Vacuumed out, disconnected, and/or removed existing conduit, and repaired connections to existing light fixtures.
- Completed 13 terminations and tested the system.

Site 3: Liberty St. & South End Ave.:

- Removed and replaced damaged electrical utilities; including pumps, valves, gages, controls, lighting fixtures, electrical boxes, and panels.
- Repaired conductors and transformers in the underground electrical service vaults.

Site 4: South Cove

- Replaced damaged woodwork, metalwork, asphalt pavers, and granite coping.
- Removed damaged conductors, dry out and clean existing conduit, and installed new gaskets at junction boxes as needed.
- Removed, refurbished and replaced 24 lights.

Community Center Building:

- Debris removal and disposal.
- Removal of affected existing materials and elements.
- Drying of affected areas, including dehumidifiers, air mover, and air filtration devices.
- Debris removal to prevent mold from spreading.
- Temporary heat to allow for work on the building.
- Remove and replace woodwork throughout the building.
- Remove and replace sheet rock on the first floor and lower levels.
- Remove and replace insulation contained in walls of the cellar and subcellar.
- Replaced damaged conduit and wiring in exercising, multipurpose, boiler, pool pump, and switchgear rooms.
- Replaced 12 pump motors and seals in the cellar and subcellar.
- Replaced electric outlets, light switches, transformers and other damaged electrical equipment.
- Replaced stainless steel roll up metal door at the facility ramp.
- Repaired the cellar foundation which was saturated by contaminated salt water.
- Replacement and test of fire alarm system, and key card security system.
- Repaired sprinklers and copper water supply line.
- Delivery and setup of new exercising devices and accessories.
- Replaced irrigation system
- Repair Elevator and replace major components

Ballfields:

- Emergency assessment of the condition of the ball field.
- Removal and disposal of existing damaged artificial turf, and remove and clean brock padding.
- Performance of water infiltration and environmental tests.
- Installation of 400 lf of slit fencing and reinstallation of brock padding, repair of backstops, and installation of new synthetic turf.

- Replacement of damaged panels.
- Additional security services utilized while the repairs were being made to the facility.
- Emergency protective measures to reduce flooding.
- Repairs to remove contaminated water at the bottom of the elevator shaft.

Design Development

8.3 ASK: Please explain why your documents indicate that your decision to expand commercial space over greenspace was based on 31 survey respondents. Please break down how many of these 31 respondents from five years ago were BPC residents. Additionally, please provide all information collected in regards to a community needs assessment prior to design consideration, including surveys, focus groups, envisioning sessions or other community outreach efforts.

The survey you are referring to was conducted in connection with a 2016 assessment project that, among other things, solicited helpful public input from residents of BPC and surrounding neighborhoods, as well as other visitors to and users of Wagner Park, regarding ways in which the Park and the Pavilion were then used, along with any preferences or priorities for the future of the Park. The assessment project was then followed in 2018 by the South Battery Park City Resiliency Project Design Phase, which utilized the findings of and concepts formulated during the assessment project as a starting point for the development of a detailed and implementable resiliency program and design for the area surrounding Wagner Park. The project site, elements, design principles and design concepts were refined as the design phase of the project got underway. A few months thereafter, the design team conducted a workshop and survey that was advertised and noticed widely to the public (links here, with video here), to supplement the information gleaned from the 2016 survey to which your request refers. The feedback from the 75 additional participants in the workshop and web survey, (results linked again here), largely aligned with what we'd heard previously. Aside from survey results, BPCA and the project design team regularly received and discussed comments and feedback from community members regarding Wagner Park and the Pavilion both informally and at multiple project-related community meetings in 2018 and 2019.

All that said, the Authority did not decide to expand commercial space over green space; to the contrary, the retention of green space and planted areas has been a major design objective of the South BPC Resiliency Project since its inception. The new Wagner Park Pavilion's footprint is comparable to the existing Pavilion's footprint. Consequently, no significant amount of green space was sacrificed in order to accommodate the Pavilion's programmed areas, which include – in addition to a restaurant that replaces the restaurant in the existing Pavilion – public restrooms, a community room and maintenance/storage space required by BPCA Parks Operations. The lawn space in the new park design is smaller in order to accommodate the increased elevation needed for the flood barrier system, but it is well-positioned and designed to accommodate the broad array of community uses accommodated by the existing lawn. The reduction in the size of the lawn is largely compensated for by an increase in the amount of planted garden space within the new park. Of note, many community residents have made clear how much they value the garden spaces within the existing park. Videos of the workshops held with community stakeholders regarding needs assessments, which were noticed and open to the general public, are available at the links referenced and include above, as well as on BPCA's website.

At the June 2019 public meeting, AECOM presented the following 5 "Key Design Principles":

1) Maximize protected area
2) Maximize public space
3) Maintain design legacy
4) Maintain views and access to waterfront
5) Create an adaptable site

We believe the project's final designs achieve these objectives.

Final Designs

2.6 ASK: Please provide the final design plans including architectural diagrams with measurements. The images in the postcards are different from the online version, which is different from the PowerPoints, which is different from the 3D model, etc.

3.1 ASK: Please provide a detailed diagram of the final design plan with measurements and square footage on each subsection where there is green grass in your image. In addition, we would like to see this on the image posted on your signs.

3.2 ASK: Similarly, please take a diagram from the same angle of the existing Wagner Park and write the measurements and square footage on each green space. If we are spending hundreds of millions of dollars on development, we expect significantly more usable green space than our current amount.

The architectural drawings for the Wagner Park Pavilion and the Wagner Park/Museum of Jewish Heritage Site Work are available at the following links, respectively here, and here. These documents, along with the project specifications and other exhibits to the Requests for Proposal and in addition to the RFPs and accompanying addenda themselves — are also available on bpca.ny.gov. These documents will be made public for the Pier A/Battery and Interior Drainage components of the project when the procurement process begins for those elements of the project in the weeks ahead. Lawn measurements are available on the diagrams linked here.

Design Alternatives

2.1 ASK: Please provide all information on alternative proposals considered, any analysis on those proposals, and the rationale for the selection of the current plan.

2.4 ASK: Please provide information regarding analysis and estimates on alternative protection schemes, including but not limited to the protection methods used by other commercial and public infrastructure throughout Lower Manhattan.

2.7 ASK: Please provide any information on the decision to demolish the existing pavilion as well as the rationale for replacing and increasing the scale of a new structure, plus any information regarding solicitation for community input into the use, scale and design of the replacement structure.

Section 2 of the Draft Environmental Impact Statement (pages 70 – 102), titled “Project Alternatives,” describes the overall design alternatives for five sections in great detail, including 1st Place; the Museum of Jewish Heritage; Wagner Park; including the Pier A inlet; Pier A Plaza; and the project area in The Battery.

You wrote, “Any project of this scale and impact requires consideration of real alternatives with a detailed analysis of pros and cons as well as economic and community impact. This information should also be part of a robust two-way community discussion, not a one-way dialogue. To date, there have been no meaningful alternatives provided with enough detail to assess them. Instead, we have seen that nearly all analysis is used to justify the current plan.”

Though the first two statements here are accurate, the third and fourth are, demonstrably, not. One example of the discussions around the flood alignment alternative options, as well as a discussion about the future of the pavilion structure, is at our March 12, 2019 public meeting (video here). Though the entire discussion is certainly worth watching, the discussion of the Wagner Park alignment options begins at around minute 45. A feedback activity regarding the future uses of Wagner Park and the Pavilion are available at the April 15, 2019 meeting (video here). Slides on the Pavilion Studies (*Note: not the final design of the Pavilion*) are available starting on slide 81 of the June 24, 2019 presentation (presentation here, video here), and in the meetings since. Furthermore, Appendix B of the Draft Environmental Impact Statement (linked here) provides further analysis and a supplemental study regarding the Pavilion, its potential relocation, and other alternatives.

Project Funding

6.1 ASK: Please provide a detailed description of sources and uses of funds for the entire ~$1B project (Excel file). This information should include sources, assumptions and use of funds for each phase of the project, with details on how much of the project is currently funded versus how much is unfunded.

7.1 ASK: Please provide explanations as to why no Federal Funding was sought given that the U.S. Senate Majority Leader is our very own hometown Senator Chuck Schumer who recently led the passage of a $1.9 trillion dollar infrastructure plan. Additionally, please provide what, if any, requests for funding from any city or state agency were pursued.

Pursuant to its enabling legislation, BPCA has the ability to issue its own debt to fund its capital needs. As with the rest of BPCA's capital plan, the resiliency projects will be funded by that mechanism. With the support and sponsorship of Assembly Members Yuh-Line Niou and Deborah Glick and State Senator Brian Kavanagh, in 2019 the State legislature passed legislation to provide a one-time increase to BPCA's bonding capacity from $350M to $850M to fund the resiliency projects. A link to the recent 2019 bond offerings, which describe the mechanism and uses of the funds in great detail, is available here (Series A, B, and C; Series D).

Notably, regarding our capital plan, the City of New York (Comptroller and, through OMB, the Mayor's Office), have approval rights over BPCA's capital plan. We secured that approval for an additional tranche of funding earlier this year. The Authority's project estimates include $221,053,925.01 for SBPCR and, given its early design phase, a preliminary estimate of $630,624,000 for the N/WBPC Resiliency Project.

While BPCA would qualify as a local government under 42 U.S.C. § 5122(8), applicable guidance related to the potential for award of federal funds for our resiliency projects provides scarce reason to believe that an application from BPCA for federal funding would be worthwhile. Such guidance suggests that the projects would be deemed ineligible for federal funding since the requested funding would be considered a duplication of benefits ("D.O.B.") by FEMA. The guidance specifies that Building Resilient Infrastructure and Communities (BRIC) funds cannot duplicate funds received by or reasonability available to applicants, sub applicants, recipients, or sub-recipients from other sources for the same purpose. This eligibility restriction would apply to BPCA, since we have bonding capacity. Federal funding is always considered "the funding of last resort," so this award would be considered a D.O.B unless we lose our ability to bond, or unless the City were to exercise its repurchase option of Battery Park City. When a D.O.B. occurs, the entity must pay back FEMA or any federal agency in full for the amount of the D.O.B.

New York City's Economic Development Corporation (EDC) published the Lower Manhattan Climate Resilience Study in March 2019. That report read, in part, "After Sandy, climate resilience initiatives and the investment of community stakeholders led New York City to successfully receive funds to mitigate coastal storm surge flood risks in Two Bridges through the federal National Disaster Resilience Competition. Although the rest of Lower Manhattan was not prioritized for funding from the federal government based on their criteria for post-Sandy recovery – targeting residential populations and low- and moderate income households – the City allocated $100 million of City capital to projects south of the Brooklyn Bridge (in the Community Board 1 district), as well as $8 million specifically to a project in the Battery." As mentioned previously, Battery Park City residents and property owners are fortunate to live in a community that has a dedicated funding source to meet its operating and capital needs, whereas other communities across the City must vie for project funding and prioritization. Additionally, BPCA's high credit rating and bond authorization enables us to finance our projects quickly.

Project Timing

5.2 ASK: Please provide an answer to the simple question of how long Wagner Park will be closed along with the best case and worst case scenarios for project completion.

5.3 ASK: Please provide details on when any part of the park is scheduled to be closed to the public leading up to full park closure.

Project construction for SBPCR is projected to commence after Labor Day in September 2022, and last for 24 months. There are no plans to close the park prior to construction commencement, as it is our goal to ensure public access to our parks and public spaces as much as possible. Any additional site condition testing to be performed in the months ahead will be temporary and limited to a small area that will not impede access to the park.

Environmental Impacts

4.1 ASK: Please provide a more comprehensive and independent review of the environmental impacts associated with this project including more sampling and details on soil quality to ensure the safety of the kids at the nearby school, community and animals that use this park.

Please review Appendices A – F of the Draft Environmental Impact Statement, as well as the DEIS itself. Additional information regarding soil sampling is available in BPCA's June 7, 2022 response to Manhattan Community Board 1, linked here.

- Appendix A – Project Related Correspondence
- Appendix B – Cultural Resources
- Appendix C – Coastal Zone Assessment
- Appendix D – Remedial Action Plan
- Appendix D_A1_Phase I Environmental Site Assessment
- Appendix D_A2_Geotechnical Report
- Appendix D_A3_Phase II Limited Site Investigation Report
- Appendix D_B_Draft Construction Health and Safety Plan
- Appendix E – Water and Sewer Analysis
- Appendix F – Noise Analysis

Permitting

5.4 ASK: Please share the permits if you have filed them, or please confirm you will share them the same day you file them.

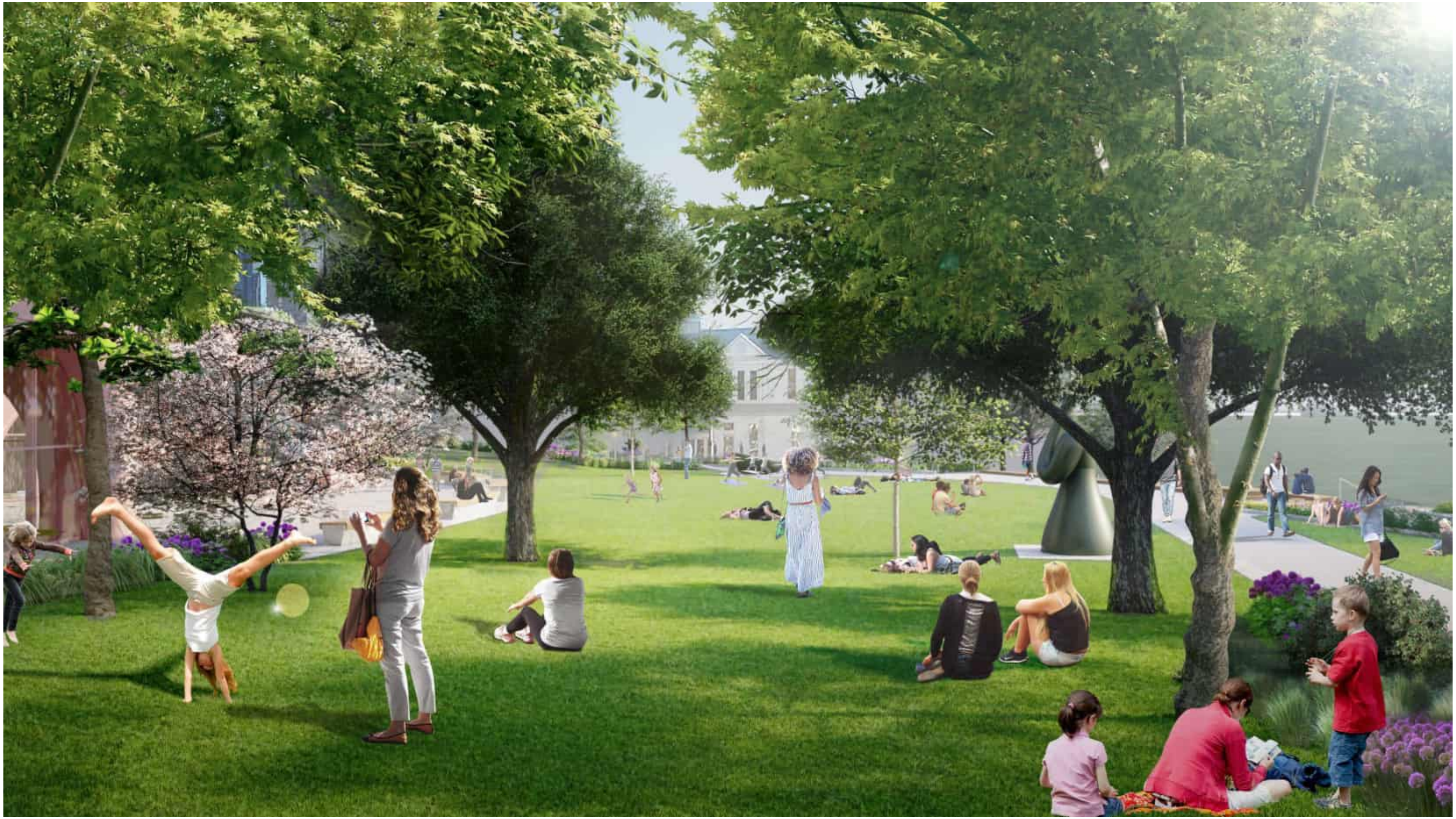
We will comply with all local, state, and Federal laws, rules, and regulations regarding permitting for the project, including the posting of such permits at the construction site before construction commences. Many of the permits issued will be available on the issuing agencies' respective websites—NYS Department of Environmental Conservation on their DART system, the US Army Corps of Engineers through Permit Finder, and NYC Department of Buildings on DOB NOW. Please note that, as part of the work performed by the construction manager procured for this project, BPCA will have a dedicated community liaison, Rick Fogarty, assisting in our efforts to ensure stakeholders remain informed of construction-related impacts and changes.

Thank you again for your email and your interest in this important project.

Sincerely,

NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority

A.4.8 Manhattan CB1 Battery Park City Committee Logistics Presentation (July 2022)



South Battery Park City Resiliency Project Construction Logistics

Community Board 1 Battery Park City Committee July 18, 2022

NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority

Coastal Modeling

- **Not Based on Outdated Models**: The flood protection models used to develop SBPCR are not outdated. They are built to existing FEMA standards, which are considered best available data.

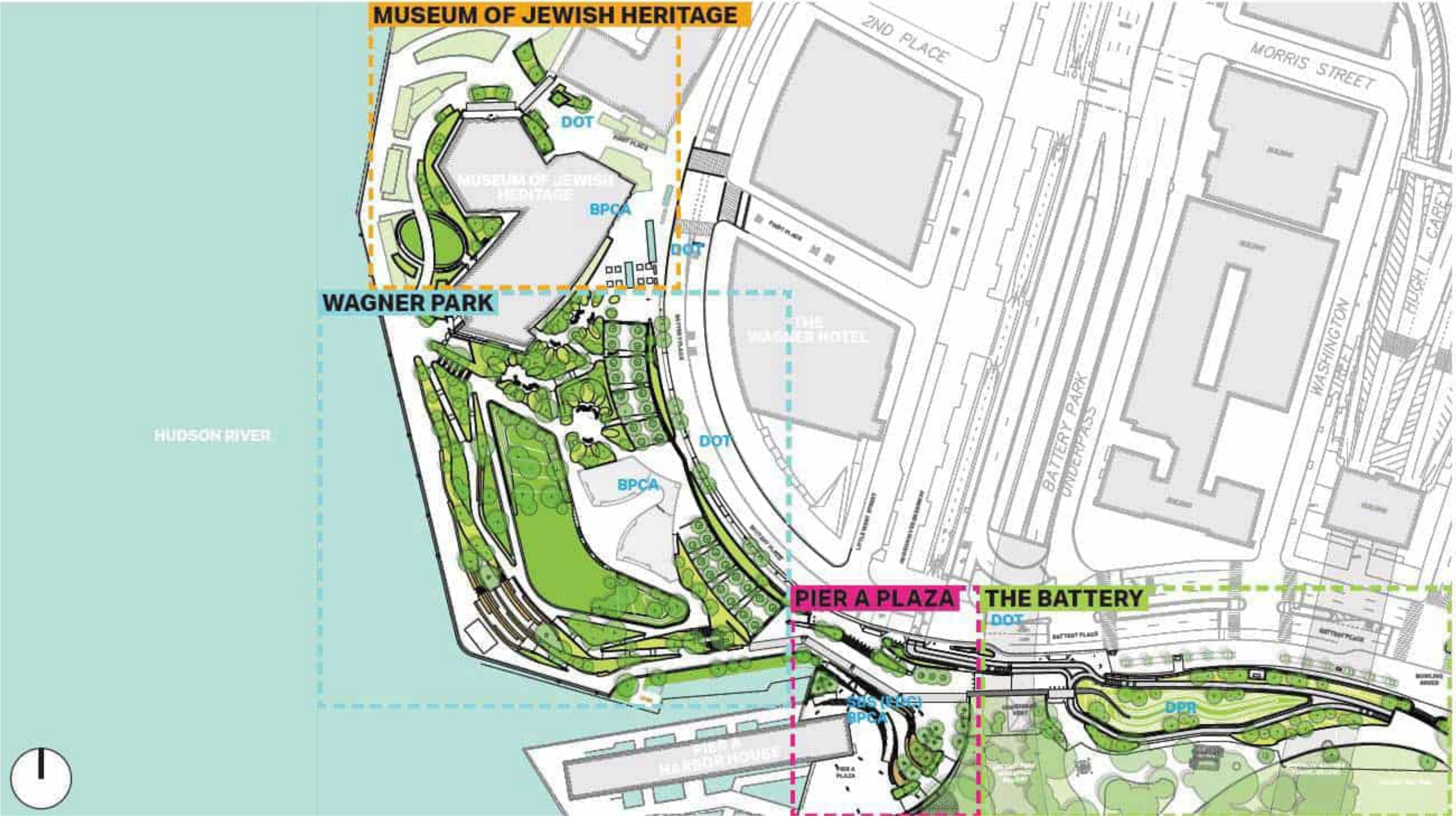
- **Compliant with LL96 of 2013**: Law requires that the NYC Building Code, and therefore the coastal flood protection projects built in compliance with it, use the more restrictive of either FEMA's 2007 Effective Flood maps or any Preliminary Flood maps released since then.

- **Consistent with Citywide Approach**: BPCA's resiliency projects, like every other resiliency project in New York City, are designed to meet the legal standards.

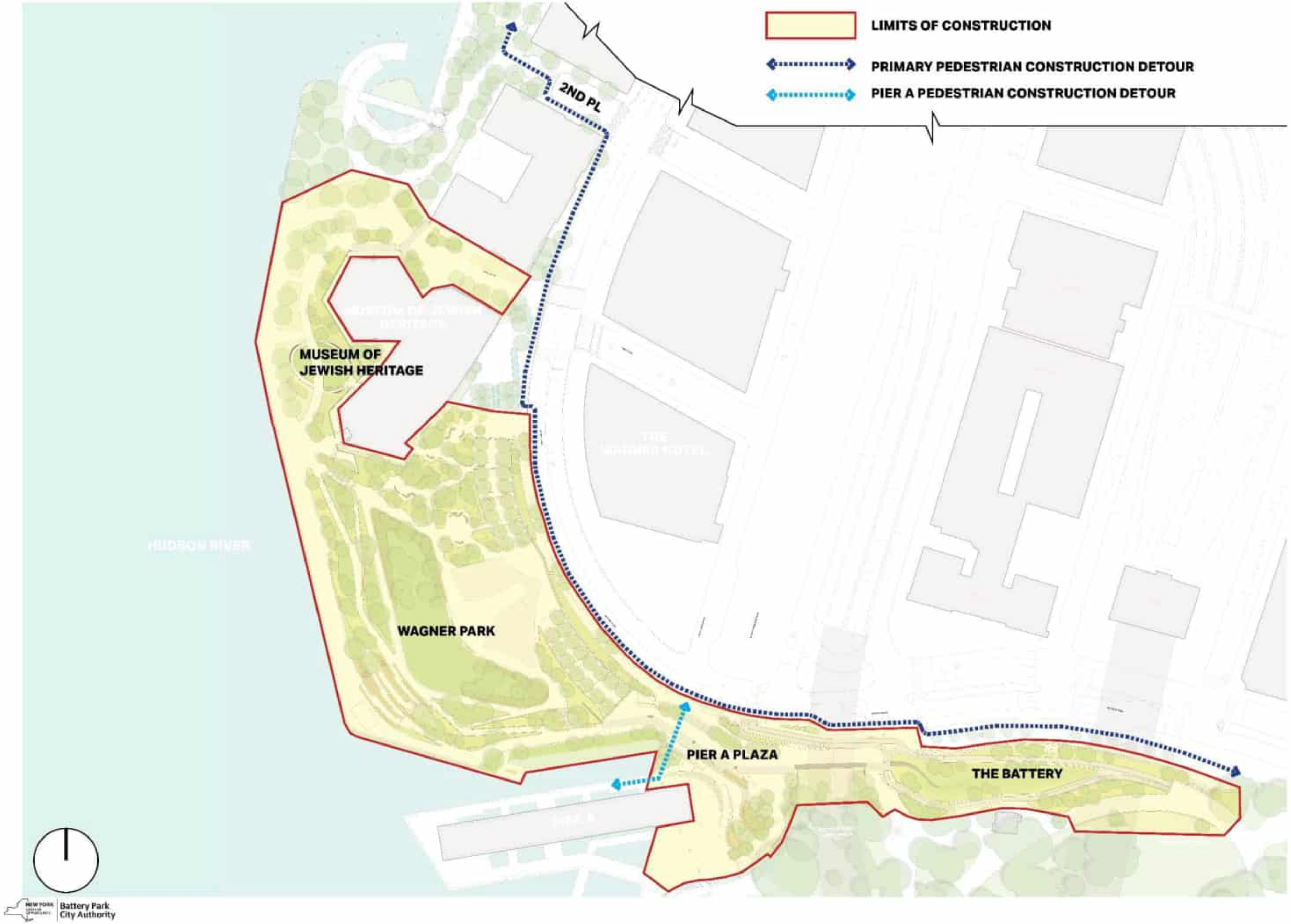
- **Insurance Implications**: One of the results of the City's challenge of the 2015 Preliminary Flood Insurance Rate Map was to delay the increase in flood insurance costs for New York City homeowners, not to lower the long-term planning criteria for flood mitigation projects. LL96 codified this distinction: it protected homeowners from insurance cost escalations while also ensuring that new construction is built to last.

- **NPCC Standard**: The standards BPCA is meeting are also informed by the NYC Panel on Climate Change (NPCC). NPCC comprises carefully selected experts in disciplines related climate change and its impacts. NPCC's 2015 SLR projections, which were reaffirmed in 2019, considered the best available data and modeling approaches for all sources and is geared toward achieving the best possible adaptation outcome for NYC.

The Site


MUSEUM OF JEWISH HERITAGE
WAGNER PARK
PIER A PLAZA
THE BATTERY
HUDSON RIVER
MUSEUM OF JEWISH HERITAGE
THE WAGNER HOTEL
PIER A HARBOR HOUSE
DOT
BPCA
DOT
DOT
BPCA
DOT
BPCA
DPR
2ND PLACE
MORRIS STREET
WASHINGTON STREET
HUGH L. CAREY
BATTERY PARK UNDERPASS

Pedestrian Circulation During Construction

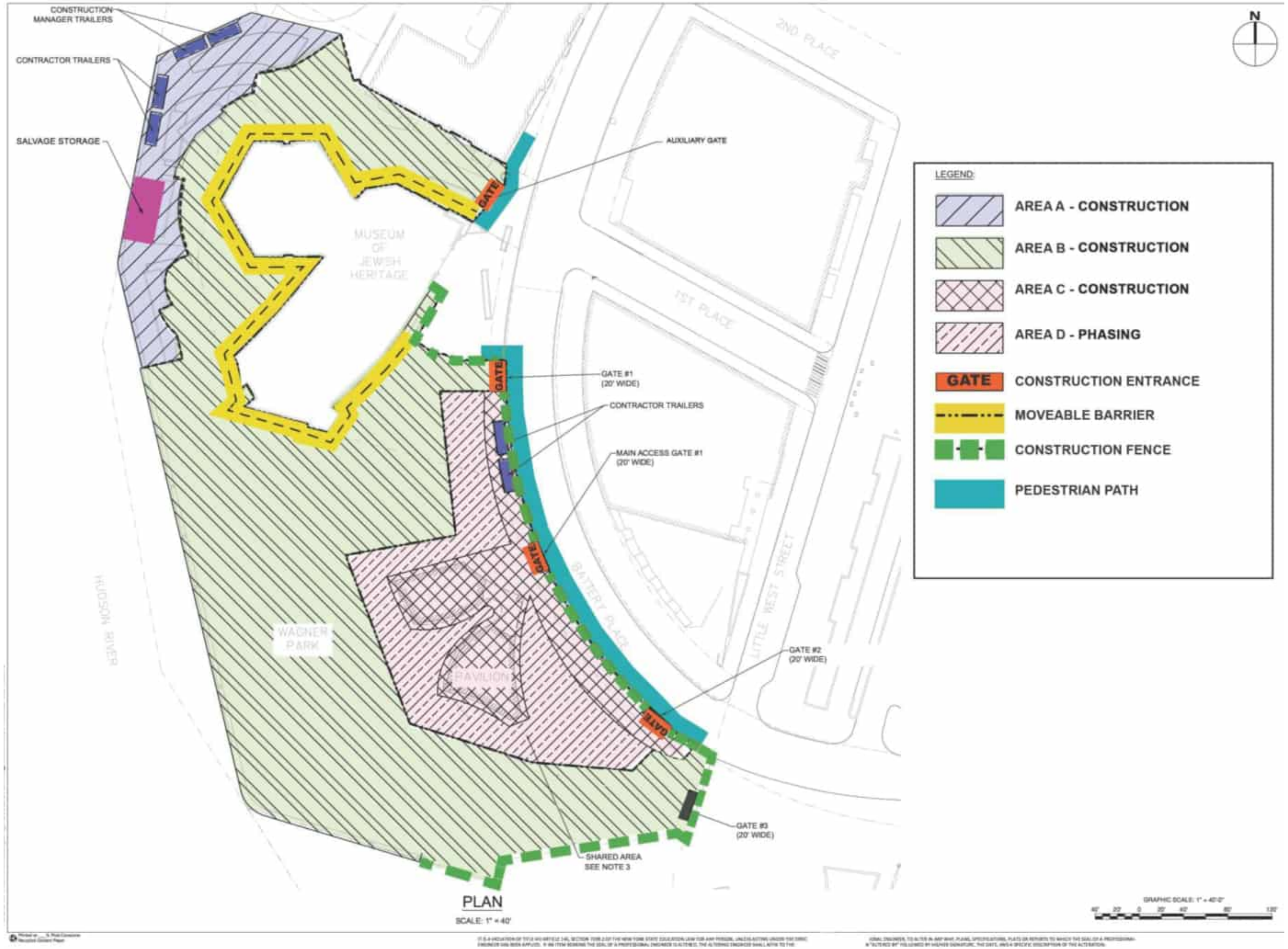


Traffic Circulation During Construction

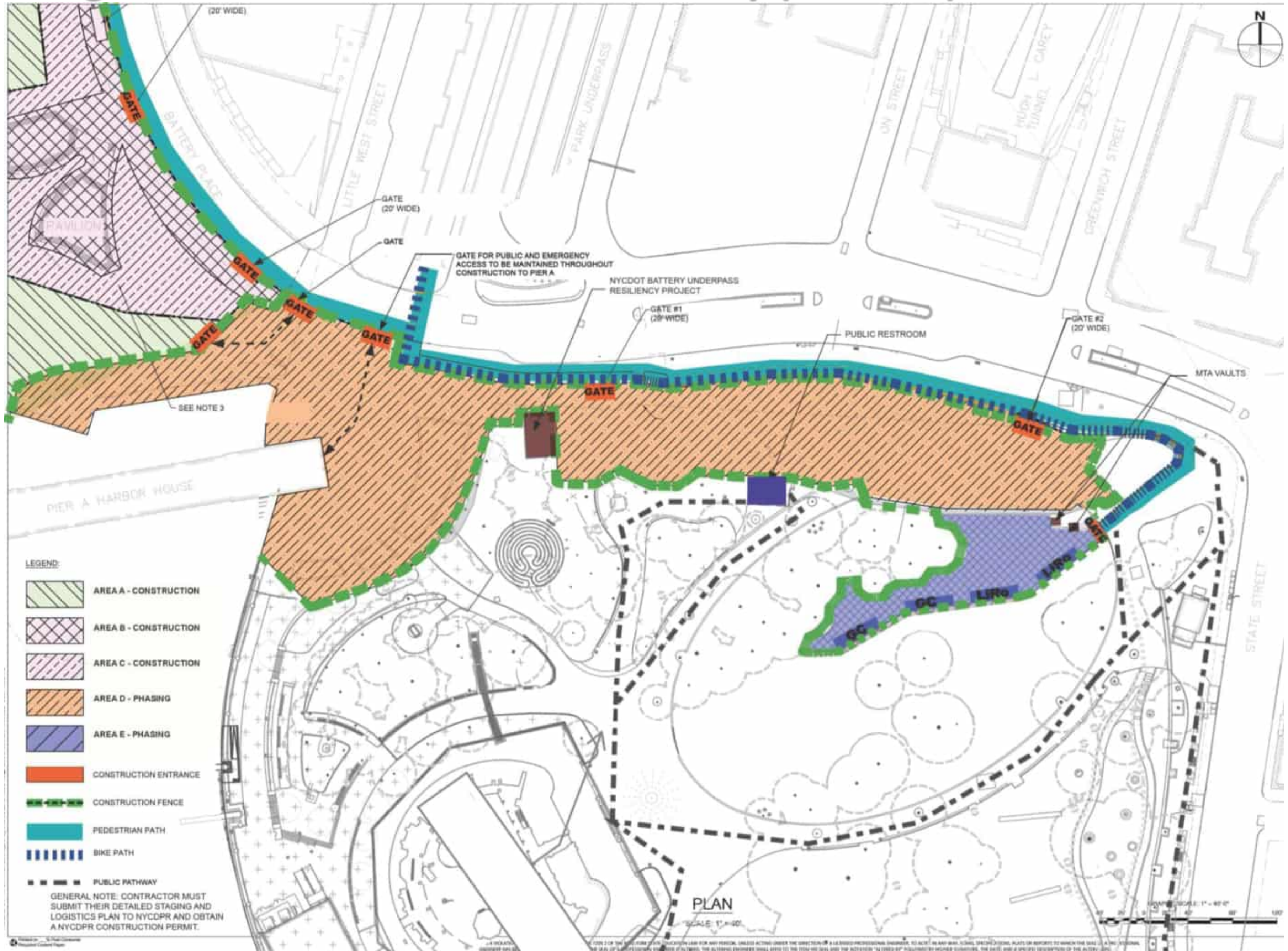
Bike Circulation During Construction

NEW YORK STATE OF OPPORTUNITY. Battery Park City Authority

Construction Logistics – Wagner Park and MJH (Early Fall)



Construction Logistics – Pier A Plaza and the Battery (Late Fall)



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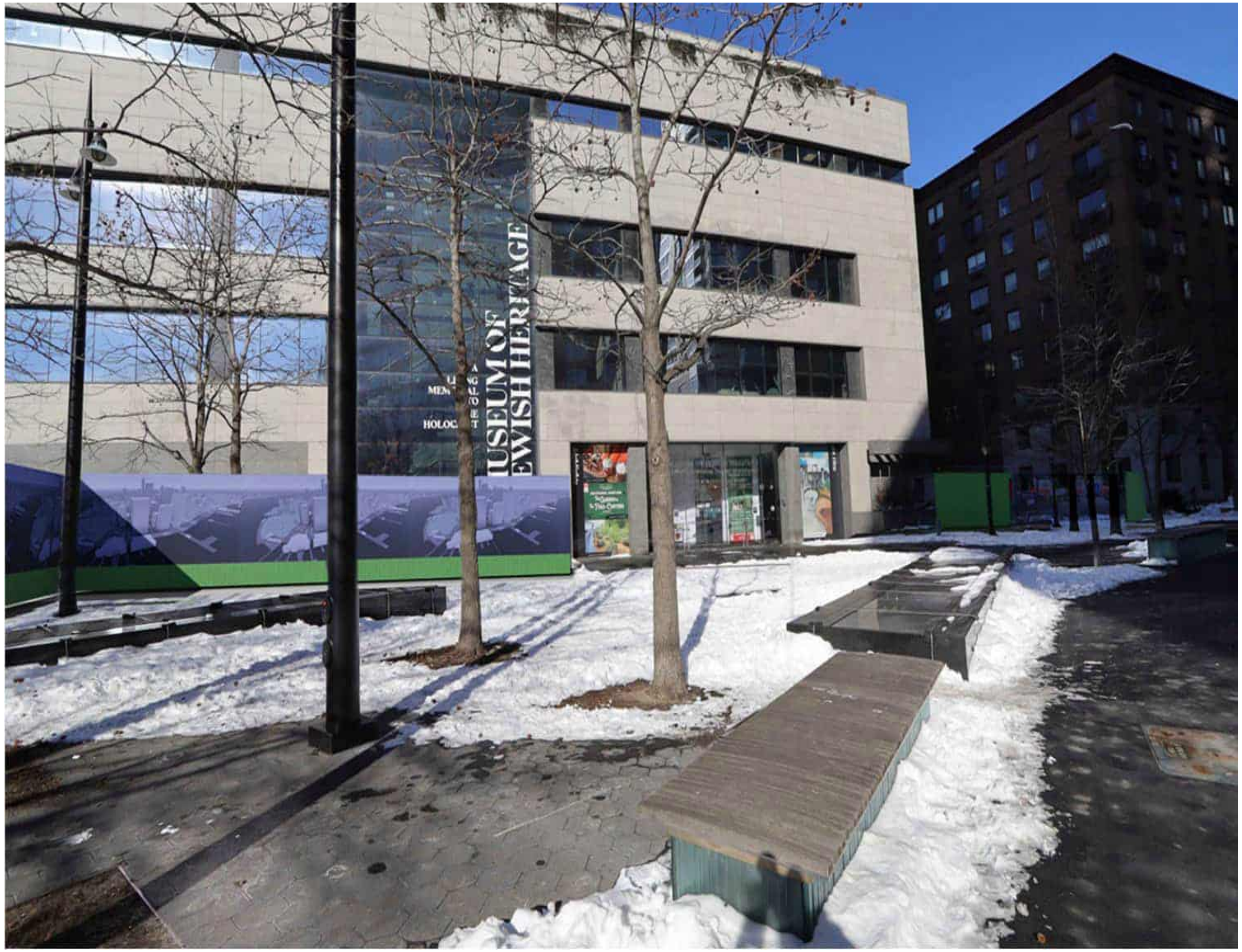
Site Signage During Construction

Site Signage:

- DOB Required Signage
  - Placed at key site access points
  - Project Informational Panel
  - Permits & Safety Signage

- Project Specific Informational Signage
  - Placed along Battery Place fence frontage
  - Placed along northern site boundary
  - Content yet to be defined, but will target a resiliency and informational theme



Materials Storage and Staging

- Materials storage will not happen on site; materials will be delivered on a “just in time” basis.
- Staging and storage in the northwest corner of the site will be limited to contractor and construction manager trailers and storage of salvaged materials designated for reuse on the site.
  - Activity related to movement of this material will be very limited.
- 1st Place entrance will not be the primary construction entrance to the site and will be limited to access related to work performed in the immediate area.
- Special attention and MPT precautions to apply for ensure safety for 1st Place crosswalks and school access.
- Starting time for noisy construction work in this area will be pushed back to 8:00 rather than 7:00.

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South Battery Park City Resiliency Project
General Construction Information

Anticipated Project Duration to Substantial Completion:

- MJH, Wagner Park and Wagner Park Pavilion: 24 months
- Pier A and the Battery: 20 months
- Interior Drainage: 12 months

Typical Days/Hours of Work:

- Monday - Friday 7:00-3:30pm
- Saturday 8:00- 4:00pm
- Shifts may be adjusted from time to time
- Work activities such as road resurfacing and utility work may be done off hours to minimize traffic/stakeholder impact
- Flaggers will present for construction vehicles entering and exiting the work zone

Construction Community Liaison:

- Rick Fogarty of Melissa Johnson Associates
- Email questions to: sbpcrinfo@bpca.ny.gov

NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority

Questions?

NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority

Thank You

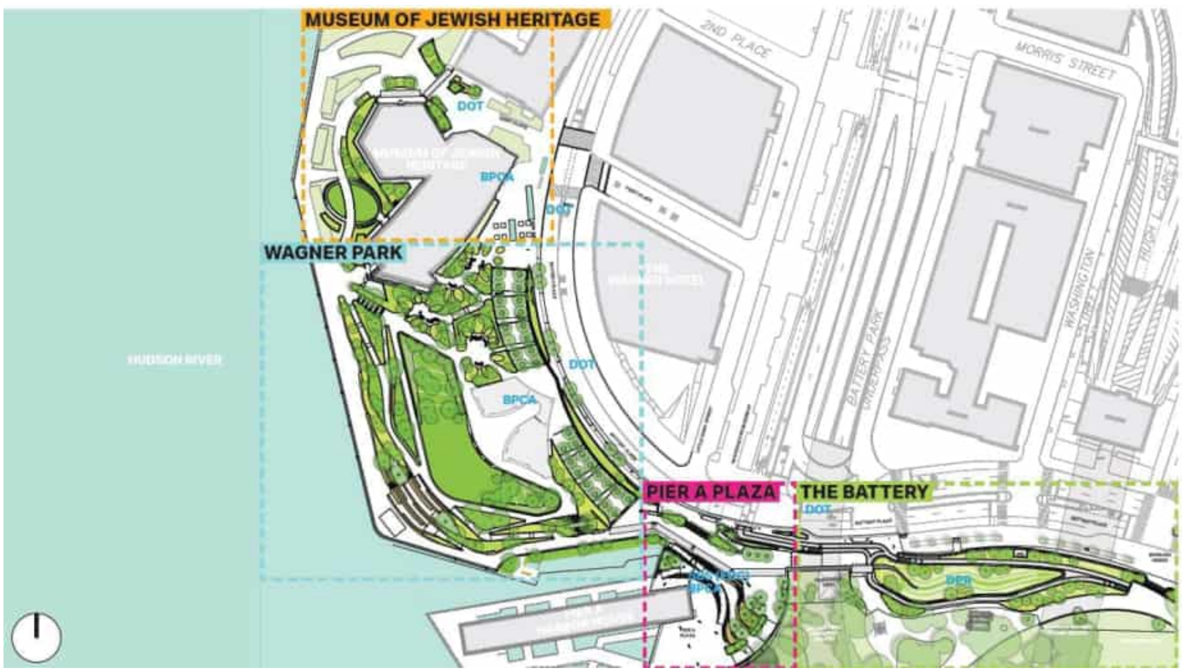
NEW YORK STATE OF OPPORTUNITY. | Battery Park City Authority

A.4.9 SBPCR FAQs (August 2022)

South Battery Park City Resiliency Project
Frequently Asked Questions
Last Updated: August 10, 2022

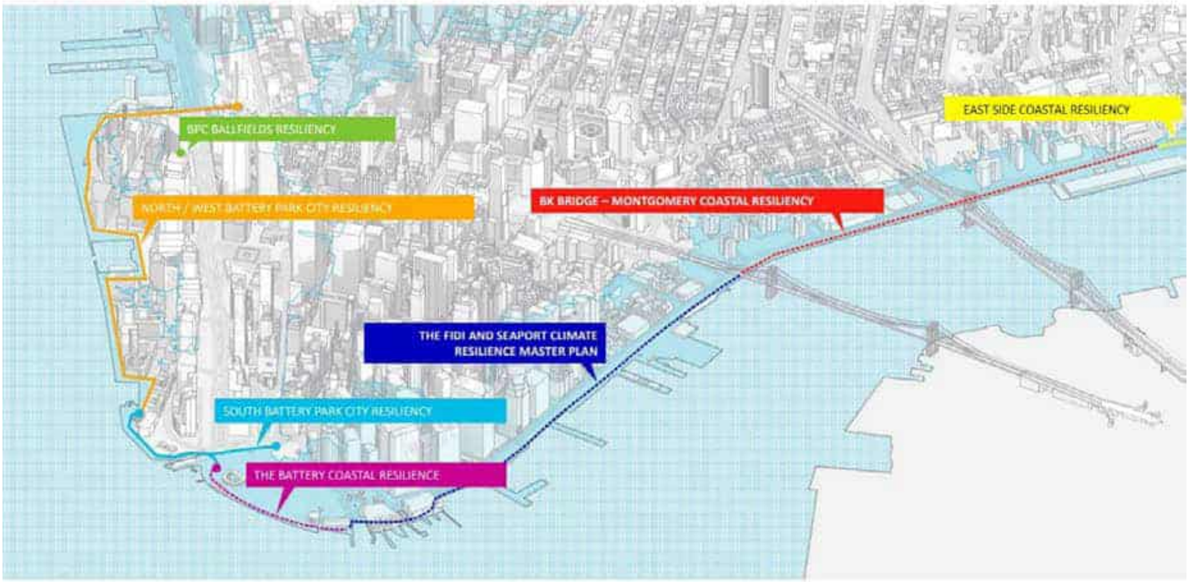
OVERVIEW AND PROJECT NEED

1. **What is the South Battery Park City Resiliency Project?**
   The South Battery Park City Resiliency Project (SBPCR) is a BPCA capital project designed to provide flood risk reduction for Battery Park City and Lower Manhattan in response to increasingly frequent and more severe storms. It comprises an integrated flood barrier system from the Battery Park City Esplanade at the west end of First Place, along the waterside edge of the Museum of Jewish Heritage (MJH), through Robert F. Wagner Park, and Pier A Plaza, that then extends eastward along the northern edge of The Battery, ending at approximately the southwest corner of Battery Place and State Street. The project also includes modifications and upgrades to the storm-water drainage system on the interior side of the flood barrier system to ensure that flood risks on that side are not exacerbated by the coastal surge protection. The project is part of the City of New York's larger Lower Manhattan Coastal Resiliency (LMCR) Project.



2. **What is the Lower Manhattan Coastal Resiliency (LMCR) Project?**
   The Lower Manhattan Coastal Resiliency (LMCR) Project is a capital program initiated by the NYC Mayor's Office of Climate and Environmental Justice to reduce flood risk due to coastal storms and sea level rise in Lower Manhattan given its highly vulnerable location and its outsized economic impact on New York City as a whole. The LMCR Project addresses Lower Manhattan's coastline from Montgomery Street on the East Side to North Moore Street on the West Side, including Battery Park City. The goal of the program is to increase resiliency while preserving access to the waterfront by integrating both existing and newly created public space.

More information can be found below:
NYC GOV | Reducing Flood Risk and Building Resilience in Lower Manhattan



3. **What other projects are part of LMCR?**
The South Battery Park City Resiliency Project is one of several resiliency projects, including the North/West Battery Park City Resiliency, The Battery Coastal Resilience, East Side Coastal Resiliency (ESCR), and Brooklyn Bridge-Montgomery Coastal Resilience (BMCR) that, together, will reduce flood risk in Lower Manhattan.

More information can be found below:
BPCA GOV | Battery Park City Resiliency
NYC GOV | The Battery Coastal Resilience
NYC GOV | Brooklyn Bridge-Montgomery Coastal Resilience
NYC GOV | East Side Coastal Resiliency

4. **Why is the South Battery Park City Resiliency Project necessary?**
The science makes clear that, due to climate change, future storms will likely be far worse than Superstorm Sandy in 2012, which resulted in more than 50 lives lost in New York and billions of dollars in property damage, including more than $10M to public spaces in Battery Park City alone. In response to the inescapable reality of Lower Manhattan's unique vulnerabilities to climate change, multiple New York State and New York City entities have accelerated resiliency planning efforts. BPCA is playing a critical role in providing risk reduction for Battery Park City and adjacent neighborhoods, while also tying into the larger Lower Manhattan risk reduction objectives of the LMCR.

5. **What does the South Battery Park City Resiliency Project protect us from?**
The SBPCR Project's primary goal is to reduce risk from increasingly severe and more frequent storms, specifically a 100-year storm event, impacting the southern-most portion

of Battery Park City. While the SBPCR Project will provide immediate risk reduction for a 100-year storm, it will also provide the ability to protect against the 2050 100-year storm, once the North/West Battery Park City Resiliency Project is constructed and a tie-in between the two projects is created.

6. **What is a 100-year storm event?**
   A 100-year storm is a severe storm with a 1% likelihood of happening in any given year. A 100-year storm on one day does not decrease the chance of a second 100-year storm occurring in that same year or any sequent year. In other words, there is a 1 in 100 or 1% chance that a storm will reach this intensity in any given year.

   For more information see below:
   USGS GOV| The 100-Year Flood

7. **What other benefits will the project bring?**
   The SBPCR Project is expected to be accredited by the Federal Emergency Management Agency (FEMA). Accreditation requires a FEMA review and verification that the flood system meets all pertinent requirements and achieves an acceptable level of risk reduction. FEMA accreditation will remove the project area from the current flood zone. As a result, owners in the area who have a federally-backed mortgage would no longer be required to obtain flood insurance.

   For more information see below:
   FEMA GOV | Letter of Map Amendment & Letter of Map Revision

8. **Do "flood events" mean high tide?**
   No, flood events are not the same as high tide, although they can be exacerbated if they happen at high tide. High tide naturally occurs on a daily 12-hour basis due to the gravitational pull of the moon and its relationship with the earth. It is also referred to as "tidal force." This gravitational pull not only creates high tide but also low tide.

   Flood events are an overflow of water onto normally dry land and are caused typically by periodic storm events. Flood events can be enhanced or increased if a storm event arrives onto a shoreline at high tide, due to already elevated water levels as part of its tidal cycle.

9. **What happens if I live in Battery Park City but outside the flood barrier protection area?**
   BPCA is at work on two interrelated resiliency projects as part of the Lower Manhattan Coastal Resiliency (LMCR) project to protect all of Battery Park City and the Lower Manhattan coastline from the threats of storm surge and sea level rise, and is engaging with the community and local stakeholders each step of the way.

   While locations outside of the indicated flood barrier protection areas will not be protected by the SBPCR project, the risk of flooding will not be increased as a result of the project.

Additionally, once all of the LMCR projects are completed, all of Lower Manhattan will be better protected from the 2050 100-year storm risk.

PROJECT DESIGN

10. What will the finished project look like?

The animations linked below show what Wagner Park and various aspects of the site will look like when the project is complete:

- Museum of Jewish Heritage & Wagner Park – An Esplanade Jog
- Wagner Park – A Roam Around the Lawns
- Wagner Park – Garden Meander
- Wagner Park – The Allee Approach
- Wagner Park – Sidewalk Stroll
- A Walk From The Battery to Pier A Plaza

11. What will the new Pavilion in Wagner Park include?

Like the existing Wagner Park Pavilion, the new building will include public restrooms, a restaurant, and a publicly accessible roof with a viewing area. New features include a green roof and community room. The new Pavilion will also be highly energy efficient, designed and operated to account for its carbon emission impacts. The new, higher elevation of the park allows for ground-level space below the park level and along Battery Place that will be used for back-of-house kitchen operations and BPCA Parks Departments' maintenance and horticulture operations space.

12. What were the design priorities for the project?

The five key design principles for the project are:

1. Maximize Protected Area
2. Maximize Public Space
3. Maintain Design Legacy
4. Maintain Views and Access to Waterfront
5. Create an Adaptable Site

13. How does the project provide storm protection?

The SBPCR Project's barrier system and interior drainage enhancements will consist of a combination of passive and deployable measures designed to provide flood risk reduction in accordance with current Federal Emergency Management Agency (FEMA) 100-year flood levels. The passive measures will be stationary and designed to be effective with no additional actions. The deployable measures require some form of action to take place when they are needed. The barrier system will serve as an effective stand-alone protective measure, providing independent utility and flood risk reduction to a broad swath of the southern portion of South Battery Park City and Lower Manhattan. It will also be capable of connecting to future waterside flood barrier systems to the east and to the north, and consequently provide immediate adaptability – once connected to the future North/West BPC Resiliency Project—to the 2050s 100-year storm.

14. What is a DFE?

Design Flood Elevation (DFE) refers to the height of flooding above sea level that the project is being designed to address. The DFE is determined by considering the following four factors:

1. Sea-level rise
2. Storm surge
3. Wave action
4. Freeboard (An additional safety factor elevation component added above the anticipated high-water line to meet FEMA standards

15. What is an HOI?

Height of Intervention (HOI) is the distance between an existing elevation and the height of the proposed DFE.

16. What are the key components of the project?

Specific components of the SBPCR Project will include, among others:

- Elevation of Wagner Park and Pier A Plaza to above the projected flood levels
- Replacement of Pavilion at Wagner Park with a zero-carbon facility certified by the International Living Future Institute (ILFI)
- Flood walls and deployable flood gates
- Improvements to storm drainage systems serving the project site to reduce flood risks
- New landscaping features and plaza components
- Installation of a storm-water retention cistern
- Enhancements to street-side site security along Battery Place
- Modifications to the inlet at Pier A and associated waterside edge conditions
- Creation of a physical tie-in between the SBPCR Project and the Battery Coastal Resilience Project

More information can be found below:
BPCA GOV | SBPCR Final Scoping Document
BPCA GOV | SBPCR Scaled Plans Sections

17. How will the proposed project affect bike lanes and pedestrian crossings?

The SBPCR Project design will reduce the amount of conflict areas as bicycle traffic travels from the Hudson River Greenway to The Battery Bikeway. The current condition mixes bicycle and pedestrian traffic throughout Pier A Plaza. By re-aligning the bikeway to the north, closer to the curb, the project design will protect cyclists and pedestrians from each other by using plantings and low seat walls as a buffer. The pedestrian and bicycle traffic crossings have been re-aligned to improve awareness with paving changes, increased sight lines (by re-aligning the crossing to 90 degrees), and warning band pavers to slow bicycle traffic. Additionally, the change in elevation along the landscape berm will be located to the east to reduce the speed of bicycle traffic near Pier A.

18. Will the park be accessible to those with disabilities?
Yes. The SBPCR Project will conform to Universal Access design principals, which will allow the park to be usable by all regardless of their disabilities and without the need for adaptation or specialized accommodations.

More information can be found below:
NYC GOV | Universal Design

19. Will there be water reuse on-site?
A storm-water retention cistern will be installed as part of the project. The storm-water runoff will be pre-treated to filter out sediment through trench drains with filters or in landscape cells. The cistern will store the pre-treated water prior to reuse. Under normal conditions, the pre-treated water will be released to the water reuse room, where it will receive additional filtration and disinfection prior to being reused on-site and within the building. The cistern will store the 95th percentile storm event. The discharge pipe will be located at the bottom of the cistern. This pipe will discharge to the water reuse room and be opened and closed by a valve. A separate pipe will come off the discharge line that connects to the storm drain system in Battery Place. The line will also contain a valve which will allow us to drain the cistern to the storm drain line in Battery Place as needed.

DESIGN DEVELOPMENT & COMMUNITY ENGAGEMENT

20. Where can I learn more about the project and the public feedback that helped develop the final designs?
Public participation has been key to this project's success. The links below show how the designs developed in concert with community input, particularly from Manhattan Community Board 1. The links include public presentations as well as video recordings of those presentations and the public discussion at those meetings:

1. Community Meeting (November / December 2016)
2. Community Meeting (March / April 2017)
3. Manhattan CB 1 Waterfront, Parks & Resiliency Committee (June 2017)
4. Executive Summary – Wagner Park Site Assessment & South BPC Resiliency Plan (July 2017)
5. Public Meeting (November 2018)
6. Public Meeting (March 2019) | Video
7. Public Meeting (April 2019) Video
8. Public Meeting (June 2019) | Video
9. Manhattan CB1 Environmental Protection Committee (October 2019)
10. Public Meeting (January 2020) | Video | Follow Up Q&A | Scaled Plans

11. “Deployables Workshop” with Manhattan CB1 (May 2020)
12. Update to Manhattan CB1 (June 2020)
13. Update to Manhattan CB1 (February 2021)
14. Update to Manhattan CB1 (April 2021, Revised)
15. LMCR Update to Manhattan CB1 (June 2021)
16. EIS Scoping Meeting (October 2021) | Video
17. Update to Manhattan CB1 (March 2022) | Video
18. Letter to Manhattan CB1 re: SBPCR Project (June 2022)

21. What is the community engagement plan for the project?

Community outreach has been an integral part of the development of the design. Most recently, we’ve held public walkthroughs of the space and public hearings for the environmental review. A scale model of the entire project is available for view at the Battery Park City Community Room at 200 Rector Place. We also have increased signage throughout the project area, added posters to Battery Park City building lobbies, and sent postcards to all residents of Battery Park City. We will continue to spread the word out as much as possible in the weeks and months ahead.

CONSTRUCTION IMPACTS AND UPDATES

22. How long will construction of the project last?

Phased on-site construction activities are expected to commence after Labor Day 2022 and take 24 months to complete.

23. What hours of the day will construction take place?

Typical working hours will be 7:00am-3:30pm Monday through Friday and 8:00am-4:00pm Saturday.

24. Will any trees need to be disturbed to complete the project?

To enable implementation of the project, some trees must be removed and will be replaced in-kind. Others will be transplanted to new locations. Overall, the project will result in a net gain of 116 trees within the project area.

25. What are the evacuation and sheltering plans for the neighborhood if a flood event were to occur during construction?

NYC Emergency Management helps New Yorkers before, during, and after emergencies through preparedness, education, and response. Through NYCEM’s Know Your Zone program, you’ll find information about the city’s hurricane evacuation zones, the hazards you may face from a hurricane and what to do to prepare.

More information can be found below:
NYC GOV | NYC Emergency Management

26. Where can I sign up for project updates?

A project hotline has been established at (917) 624-5409.

27. Where can I submit comments on the project?

Questions and feedback about SBPCR can be sent to sbpcrinfo@bpca.ny.gov

or:

Battery Park City Authority
200 Liberty Street, 24th Floor
New York, NY 10281
ATTN: South BPC Resiliency Project Team

A.4.10 BPCA SBPCR Lawn Space Announcement (August 2022)

HUGH L. CAREY
BATTERY PARK CITY AUTHORITY
(https://bpca.ny.gov/)

ABOUT (HTTPS://BPCA.NY.GOV/ABOUT/) **PLACES (HTTPS://BPCA.NY.GOV/PLACES/)**
EVENTS (HTTPS://BPCA.NY.GOV/NEWS/EVENTS/)
NEWS (HTTPS://BPCA.NY.GOV/NEWS/) **APPLY (HTTPS://BPCA.NY.GOV/APPLY/)**
RESIDENTIAL LIFE (HTTPS://BPCA.NY.GOV/RESIDENTIAL-LIFE/)
RESILIENCY AND SUSTAINABILITY (HTTPS://BPCA.NY.GOV/NATURE-AND-SUSTAINABILITY/)
PUBLIC INFO (HTTPS://BPCA.NY.GOV/PUBLIC-INFORMATION/)

Current

New

08/16

BPC PEOPLE
COMMUNITY
ENVIRONMENT
GOVERNANCE

BPCA ANNOUNCES ADDITIONAL LAWN SPACE & TREES IN PLANS FOR RESILIENT WAGNER PARK IN RESPONSE TO LOCAL ELECTED OFFICIALS & STAKEHOLDERS (HTTPS://BPCA.NY.GOV/BPC-PEOPLE/BATTERY-PARK-CITY-AUTHORITY-ANNOUNCES-ADDITIONAL-LAWN-SPACE-AND-TREES-IN-PLANS-FOR-A-RESILIENT-WAGNER-PARK-IN-RESPONSE-TO-INPUT-FROM-LOCAL-ELECTED-OFFICIALS-AND-STAKEHOLDERS/)

Conversion of planted areas and hardscape to lawn space accommodates additional community request without compromising resiliency benefits or impacting construction timeline planned for the South Battery Park City Resiliency Project

The Battery Park City Authority (BPCA) today announced enhancements to the final designs for the South Battery Park City Resiliency Project (SBPCR) – an initiative designed to provide urgently-needed flood risk reduction for Battery Park City and Lower Manhattan in the face of more frequent and more severe storms – that will increase lawn area for the project by an additional 12,800 square feet. This revision represents a 74% increase in lawn space compared to the current design.

“Throughout the nearly six-year development of the South Battery Park City Resiliency Project, we’ve worked hard to balance the urgency of creating a more resilient Battery Park City and Lower Manhattan with the importance of incorporating community voices,” said **BPCA President & Chief Executive Officer B.J. Jones**. “In keeping with that effort, I’m pleased that we’ve been able to significantly expand lawn space in addition to other modifications we've made over the course of this initiative without losing momentum to provide critical protection against catastrophic storms. I thank our local elected officials and Manhattan Community Board 1 for their continued advocacy, leadership, and support for this important project."

"By increasing the amount of lawn space by over 70 percent in this latest design, the BPCA has created a project that better reflects the needs of the local community while also ensuring this essential project moves forward," said **Manhattan Borough President Mark Levine**. "The South Battery Park City Resiliency project is an essential part of protecting Lower Manhattan from climate change and sea level rise, and I'm looking forward to working with the BPCA throughout construction to ensure we meet the needs of local stakeholders and the surrounding communities."

"It's great news that the Battery Park City Authority has responded to our advocacy and found a way to alter the plan for Wagner Park to include a significant expansion of the lawn space available for public use, as well as additional planted trees. This is something that many in this community have been asking for and I want to thank B.J. Jones and everyone at the Authority for their willingness to work with us and for their commitment to maintaining wonderful public spaces while doing what we need to do to make Lower Manhattan resilient, as the threat posed by climate change grows," said **State Senator Brian Kavanagh, who represents Battery Park City**. "I also want to thank Borough President Mark

Levine, Councilmember Christopher Marte, Community Board 1, and all of the local residents and advocates who have engaged constructively in this process. I look forward to continuing our discussions on all aspects of the plan and its implementation as this process continues."

"Resiliency is a top priority for our community in Battery Park City, and this project is essential to combatting climate change," said **Assemblymember Yuh-Line Niou**. "As a beloved community park and open space, community stakeholders and electeds have continuously requested additional green space and community space in the project. I am excited and heartened to see that the BPCA has adjusted its plans to add nearly 13,000 square feet of green space and additional trees in its new design. I look forward to continuing the conversation on other elements of this project, and I thank Community Board 1 and other neighborhood organizations for their tireless work to fight for a community-centered design."

"I want to acknowledge the efforts made by the Battery Park City Authority to change the design plans and recognizing the recommendations made by the residents of Battery Park City, local, and state representatives and advocates regarding the Wagner Park Resiliency Plan," said **Assemblymember Charles D. Fall**. "Protecting green space for Wagner and other areas throughout the city is near and dear to me. The Authority's efforts to expand the lawn, add more trees, modify the pavilion and work with residents to help mitigate the temporary loss of recreation space resulting from closure due to construction is commendable and a step in the right direction."

"New York City has struggled to implement resiliency plans whose construction and implementation doesn't go against the environmental principals that necessitated the project in the first place," said **City Council Member Christopher Marte**. "This change in the plan is a significant step in making sure the Southern Battery Park City Resiliency Plan doesn't go down the same destructive path. We are glad that the Battery Park City Authority Board has not only heard from the community about what changes need to be made, but has listened and acted. We see this as a sign of good things to come as we continue to advocate for a resilient and public park."

"We are encouraged to see the welcome increase in lawn space," said **Manhattan Community Board 1 Chairperson, Tammy Meltzer**. "Our members have been involved in meetings and discussions about resiliency since the initial discussions started just after Superstorm Sandy and will be pleased to see that the BPCA has endeavored to recreate the open lawn space we all know and love. We hope these improvements to the public realm will continue to influence the discussions about the Pavilion/new building and how it may best serve Lower Manhattan residents, workers and tourists."

Based on feedback from community stakeholders in recent months, local elected officials and Community Board 1 leadership had asked the Authority to determine whether design changes could be made to the SBPCR design to expand opportunities for lawn space. The additional lawn space announced today was achieved by reducing a portion of the space allocated to gardens under the current design, as well as nearly 7,000 square feet of hardscape, which was originally included to ensure universal accessibility throughout the elevated portion of the park. BPCA's design team was able to enlarge the lawn while maintaining smaller edge gardens, and allow part of the existing access walkway on the water side of the lawn to function as a universally-accessible circulation element. The enhanced design will also provide for the addition of ten more trees to be planted in Wagner Park, for a total net increase of 126 trees compared to the project area today.

Today's announcement is the latest evidence of the fruitful public engagement that contributed to the development of designs for SBPCR. Though not comprehensive, the links below provide a representative sample of the ways in which community input was sought in the initial development of the designs, reflected back to the community in design proposals, and incorporated, where possible, in changes to designs over a half-decade of productive dialogue about the project.

– Community Meeting (November / December 2016) (https://bpca.ny.gov/wp-content/uploads/2015/03/BPC-Open-Community-Meeting-November-9-2016-FINAL.pdf#page=25)
– Community Meeting (March / April 2017) (https://bpca.ny.gov/wp-content/uploads/2015/03/Wagner-Park-3-22-17.pdf)
– Manhattan CB 1 Waterfront, Parks & Resiliency Committee (June 2017) (https://bpca.ny.gov/wp-content/uploads/2015/03/20170620_Wagner-Park_CB1-June-2017.pdf)
– Executive Summary – Wagner Park Site Assessment & South BPC Resiliency Plan (July 2017) (https://bpca.ny.gov/wp-content/uploads/2018/04/Executive-Summary-Wagner-Park-Site-Assessment-South-BPC-Resiliency-Plan.pdf)
– Public Meeting (November 2018) (https://bpca.ny.gov/wp-content/uploads/2018/11/181101_SBPC-Community-Engagement_FINAL-3.pdf)
– Public Meeting (March 2019) (https://bpca.ny.gov/wp-content/uploads/2019/03/SBPC-Community-Engagement-Meeting-2-March-12-20192.pdf) | Video (http://communitek.tv/bpca/?q=video/bpca-community-meeting-march-12-2019)
– Public Meeting (April 2019) Video (http://www.communitek.tv/bpca/?q=video/south-battery-park-resiliency-april-15-2019)
– Public Meeting (June 2019) (https://bpca.ny.gov/wp-content/uploads/2019/06/SBPC-Public-Meeting-3-Presentation-6.24.2019.pdf) | Video (http://communitek.tv/bpca/?q=video/bpca-resiliency-meeting-june-24-2019)
– Manhattan CB1 Environmental Protection Committee (October 2019) (https://bpca.ny.gov/wp-

content/uploads/2019/10/191003_October-3-CB1-Presentation_final.pdf)
– Public Meeting (January 2020) (https://bpca.ny.gov/wp-content/uploads/2020/01/SBPCR_Public-Meeting-4-1.15.20.pdf) | Video (http://communitek.tv/bpca/?q=video/south-bpc-resiliency-project-jan-15-20) | Follow Up Q&A (https://bpca.ny.gov/wp-content/uploads/2020/02/SBPCR-Public-Meeting-4-Follow-Up-QA.pdf) | Scaled Plans (https://bpca.ny.gov/wp-content/uploads/2020/02/SBPCR-Scaled-Plans-Sections-Feb.-2020.pdf)
– "Deployables Workshop" with Manhattan CB1 (May 2020) (https://bpca.ny.gov/wp-content/uploads/2020/05/SBPCR-Deployables-Workshop-May-18-2020.pdf)
– Update to Manhattan CB1 (June 2020) (https://bpca.ny.gov/wp-content/uploads/2020/06/SBPCR-CB1-EP-Committee-Update-6.15.20.pdf)
– Update to Manhattan CB1 (February 2021) (https://bpca.ny.gov/wp-content/uploads/2021/03/210222_CB1-Presentation-FINAL.pdf)
– Update to Manhattan CB1 (April 2021, Revised) (https://bpca.ny.gov/wp-content/uploads/2021/04/SBPCR_April-19-2021-CB1-Meeting_Presentation_FINAL-R1.pdf)
– LMCR Update to Manhattan CB1 (June 2021) (https://bpca.ny.gov/wp-content/uploads/2021/06/LMCR-Quarterly-Update-to-EPC-BPC-Update-6.21.21.pdf)
– BPCA Resiliency Update to Manhattan CB1 Executive Committee (August 2021) (https://bpca.ny.gov/wp-

content/uploads/2021/08/CB1-Exec.-Committee-Presentation-Resiliency-Update-8.17.21.pdf)
– EIS Scoping Meeting (October 2021) (https://bpca.ny.gov/wp-content/uploads/2021/10/211013_SBPCR-Scoping-Presentation_FINAL.pdf) | Video (https://youtu.be/C2DIf2AbJKY)
– Lower Manhattan Coastal Resiliency Briefing / LMCR Quarterly Update (January 2022) (https://bpca.ny.gov/wp-content/uploads/2022/02/LMCR_Quarterly_1.20.22_C(1.pdf)
– Update to Manhattan CB1 (March 2022) (https://bpca.ny.gov/wp-content/uploads/2022/03/SBPCR-Project-Update-to-CB1-March-21-2022.pdf) | Video (https://youtu.be/hJXk679MSTU?t=5562)
– Letter to Manhattan CB1 re: SBPCR Project (June 2022) (https://bpca.ny.gov/wp-content/uploads/2022/06/Letter-to-Manhattan-CB1-SBPCR_6.2022.pdf)
– Council Member Marte Town Hall on BPC Resiliency Projects (June 2022) (https://bpca.ny.gov/wp-content/uploads/2022/06/CM-Marte-BPC-Resiliency-Town-Hall-6.15.22.pdf) | Video (https://www.youtube.com/watch?v=jXZhQy9csww)
– Logistics Presentation to Manhattan CB1 BPC Committee (July 2022) (https://bpca.ny.gov/wp-content/uploads/2022/07/CB1-BPC-Committee-SBPCR-Logistics-Presentation-July-18-2022.pdf)
– LMCR Update to Manhattan Community Board 1 (July 2022) (https://bpca.ny.gov/wp-content/uploads/2022/08/LMCR_CB1_July-18-2022_v2_FINAL.pdf)

As part of SBPCR, the redesigned Robert F. Wagner, Jr. Park will feature an expansive central lawn, terraced seating overlooking New York Harbor and the Statue of Liberty, a 63,000-gallon subterranean cistern for the retention and reuse of storm water, and planted gardens designed to withstand the severe weather and sea level rise that is projected for the decades ahead. While the prior design had allocated significant planted areas devoted to prominent display gardens in response to community members who had spoken highly of Wagner Park’s current gardens during public meetings, today’s announcement reflects a change to those plans in acknowledgment that, in a post-COVID world, usable outdoor lawn space is a top priority for the Lower Manhattan community.

In the weeks ahead, BPCA will also be soliciting public input and feedback regarding potential strategies to help mitigate the temporary loss of recreation space resulting from SBPCR construction closures, reflecting the Authority’s sensitivity to the impact that the coming closures will have on those who rely on Wagner Park for relaxation and play space.

SBPCR is part of the part of overall **Lower Manhattan Costal Resiliency Project (LMCR) (https://www1.nyc.gov/site/lmcr/index.page)**, an integrated coastal protection initiative aimed at reducing flood risk due to coastal storms and sea level rise in Lower Manhattan. SBPCR will create an integrated coastal flood risk management system from the Museum of Jewish Heritage, through Wagner Park, across Pier A Plaza, and along the northern border of the Historic Battery. Construction will begin in the months ahead.

Read more:
– **Battery Park City resiliency project gets eleventh-hour boost to greenspace (https://www.crainsnewyork.com/climate-change/battery-park-city-resiliency-project-gets-eleventh-hour-greenspace-boost)** ***(Crain's New York Business)***
– **Battery Park City Resiliency (https://bpca.ny.gov/nature-and-sustainability/resiliency/)**

STAKEHOLDERS&body=https%3A%2F%2Fbpca.ny.gov%
people%2Fbattery-park-city-authority-announces-additional-lawn-space-and-trees-in-plans-for-a-resilient-wagner-park-in-response-to-input-from-local-elected-officials-and-stakeholders%2F)

BACK TO BLOG HOMEPAGE (HTTPS://BPCA.NY.GOV/NEWS/BLOG/)

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Links (https://bpca.ny.gov/links/)
BPC Parks Rules and Regulations (https://bpca.ny.gov/wp-content/uploads/2015/11/BPC-Parks-Rules.pdf)
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A.4.11 BPCA SBPCR Lawn Space Announcement (August 2022)

Coastal Modeling

This document summarizes the coastal modeling efforts underpinning designs for the South Battery Park City Resiliency Project (SBPCR), as well as independent validation of those efforts and their compliance with applicable local law.

Design Storm Criteria

In line with other components of the Lower Manhattan Coastal Resiliency (LMCR) initiative, SBPCR is designed to provide immediate risk reduction for the present day 100-year storm and will be adaptable to provide flood risk reduction for a projected 100-year storm in the 2050s, inclusive of sea level rise, upon completion of the tie-in to its neighboring project, the North/West Battery Park City Resiliency project. A 100-year storm is a severe storm with a 1% likelihood of happening in any given year. A 100-year storm in one year does not decrease the chance of a second 100-year storm occurring in that same year or any subsequent year; there is a 1 in 100 or 1% chance that a storm will reach this intensity in any given year. One-hundred-year storm projections change over time due to factors that include changes in storm frequency and severity and rising sea levels. As a result, the expectations for a 100-year storm in the 2050s will be different than those for a current-year 100-year storm.

Stillwater Baseline

To project the design flood elevations necessary for SBPCR, the project team developed a system to assess the project area's vulnerability to future flooding, assuming existing conditions with no flood risk mitigation implemented, as well as a means of comparing that condition with the proposed flood risk reduction barrier system contemplated by the project. As a baseline, the team used data from the Federal Emergency Management Agency (FEMA) to scientifically establish the 100-year flood across the study area today. In its analysis, FEMA considers the astronomical tide[1] plus the storm surge, as well as offshore and overland wave heights and wave runup, or the elevation of the sea level produced by waves at the shoreline during this hypothetical storm. FEMA's analysis has established the stillwater elevation — the height of the water during a flood event, not including the wave crest height or wave runup — at 11.3 feet above NAVD88 elevation (NAVD88 elevation is commonly described as sea level). This is validated by the National Oceanic and Atmospheric Administration's (NOAA) recording of the highest water levels during various storm events, as well as a separate FEMA model — conducted by their Risk Assessment Mapping Planning Partners group — that leveraged data from previous storms.

Sea Level Rise

With the aforementioned baseline established, the project team used data from the New York City Panel on Climate Change (NPCC), a 20-member independent advisory body consisting of leading climate change and impact scientists, academics, and private sector practitioners, that synthesizes scientific information on climate change and advises policymakers on local resiliency and adaptation strategies, to inform what impact sea level rise will have on future storm events. In its most recent report issued in 2019 (NPCC3), NPCC used data from NOAA, the United States Army Corps of Engineers (USACE), and other leading climate scientists — as well as observed trends and its own scholarly work — to formulate sea level rise projections for

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[1] Tidal activity related solely to the earth's rotation and gravitational effects of the earth, sun, and moon.

New York City. Among its findings, NPCC confirms both that the pace of sea level rise is quickening -- due in part to the acceleration of Arctic glacial melt -- and that, due to an array of factors, New York City sea level rise is outpacing the global average. In line with every other LMCR project, the SPBCR project team added the NPCC's 90^{th} percentile future sea level rise projections to FEMA's current stillwater elevation definition when estimating the expected increase in stillwater elevation by 2050 — an increase of 30 inches.

Wave Impacts

The project team also used numerical wave models, including the industry-accepted computer simulated hydrodynamic and wave model known as MIKE 21, to better understand future wave behavior, heights and frequency. Under varying storm conditions, the computer model simulates the local wave action and identifies the expected wave heights in the project area. The project team used best-available data, including FEMA's statistical information on wave heights and water elevations, in combination with these additional computer models to better understand the potential wave crest elevation on- and off-shore for a 100-year storm in the year 2050. Wave impacts in this area occur due to the study area's relative location in New York Harbor, where there is substantial "fetch," or space for waves to gain energy across open water before reaching land. After the waves break, the wave run-up on the shoreline structures materially increases the projected total flood elevation.

Design Flood Elevations

To calculate the design flood elevations necessary for the project, the project team totaled stillwater elevation with sea level rise, wave impacts, and an additional measure of freeboard — height FEMA recommends as a factor of safety to account for statistical uncertainty. Doing so resulted in DFEs ranging from +15' to +19'10" NAVD88 across the SPBCR project site in order to protect against a 100-year storm in 2050. Note that DFE is a different indicator than height of intervention (HOI), which indicates the height of the flood infrastructure compared to the finished grade. Put another way, if you stand at an NAVD88 elevation of +9'10" and the DFE is +19'10", the height of intervention would be ten feet.

Compliance with LL96

Local Law 96 of 2013 requires that the New York City Building Code, and therefore the coastal flood protection projects built in compliance with it, use the more restrictive of either FEMA's Effective Flood maps that date to 2007 or any Preliminary Flood maps released since then — in the case of SBPCR, those that date to 2013 and, more recently, 2015. In compliance with that requirement, SBPCR, like every other resiliency project in New York City, is designed to that standard. In 2016, the City challenged FEMA's Preliminary Flood Insurance Rate Maps in an effort to alleviate additional flood insurance costs for New York City homeowners, not to lower the design criteria for flood mitigation projects. This, too, is consistent with Local Law 96, which within the same bill protected homeowners from insurance cost escalations while also ensuring that any new construction is built to the more restrictive standard.

Coordination with the City of New York

A letter submitted to BPCA from Kizzy Charles-Guzman of the Mayor's Office of Climate and Environmental Justice reads, in part, "BPCA has adopted the same design criteria, including flood elevations, as the East Side Coastal Resiliency project and the Brooklyn Bridge-Manhattan

Coastal Resilience project, as required by Local Law 96 of 2013. Together, these three projects will form a critical link in the City's overall coastal storm surge protection system, sufficient to respond to a 2050s 100-year storm, inclusive of sea level rise."