

**PDC
PRELIMINARY
REVIEW**

RED HOOK COASTAL RESILIENCY (RHCR)

PUBLIC DESIGN COMMISSION PRESENTATION
FOR PRESENTATION PURPOSES ONLY

Eric Adams
Mayor

Thomas Foley
Commissioner

NYC Mayor's Office of Climate &
Environmental Justice



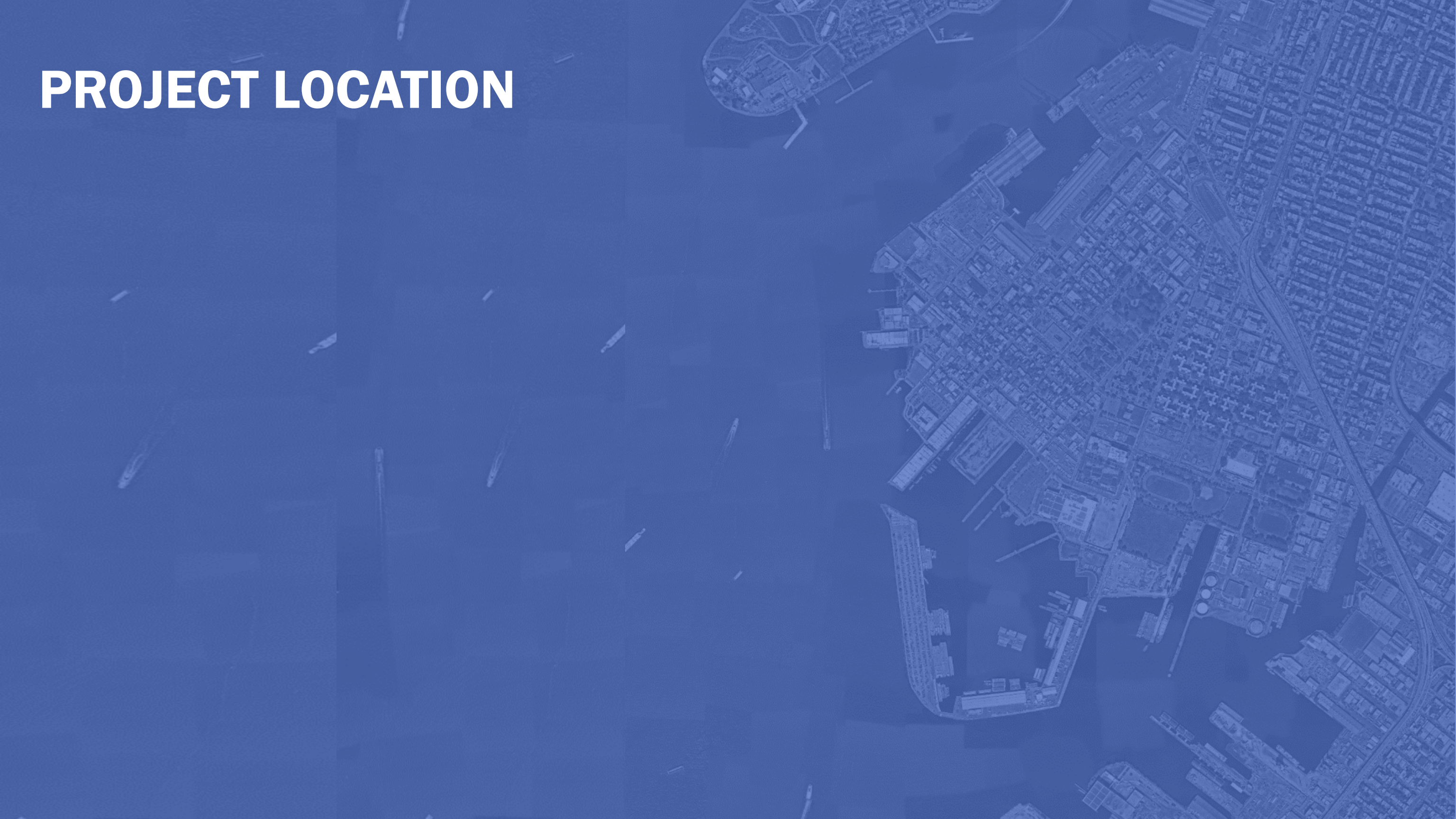
NYC / EDC

AUGUST 8, 2022

GOALS

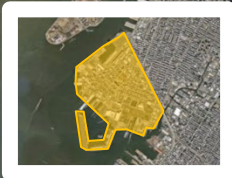
- Maintain a passive Flood Protection System (FPS) at elevation 8-ft
- Deployable features are activated to achieve an FPS at elevation 10-ft
- Minimal impacts to pedestrian, bike, and vehicle circulation
- Maintain neighborhood connectivity and access to active waterfront
- Enhance and incorporate the Brooklyn Waterfront Greenway

PROJECT LOCATION





Brooklyn



City

1 MI



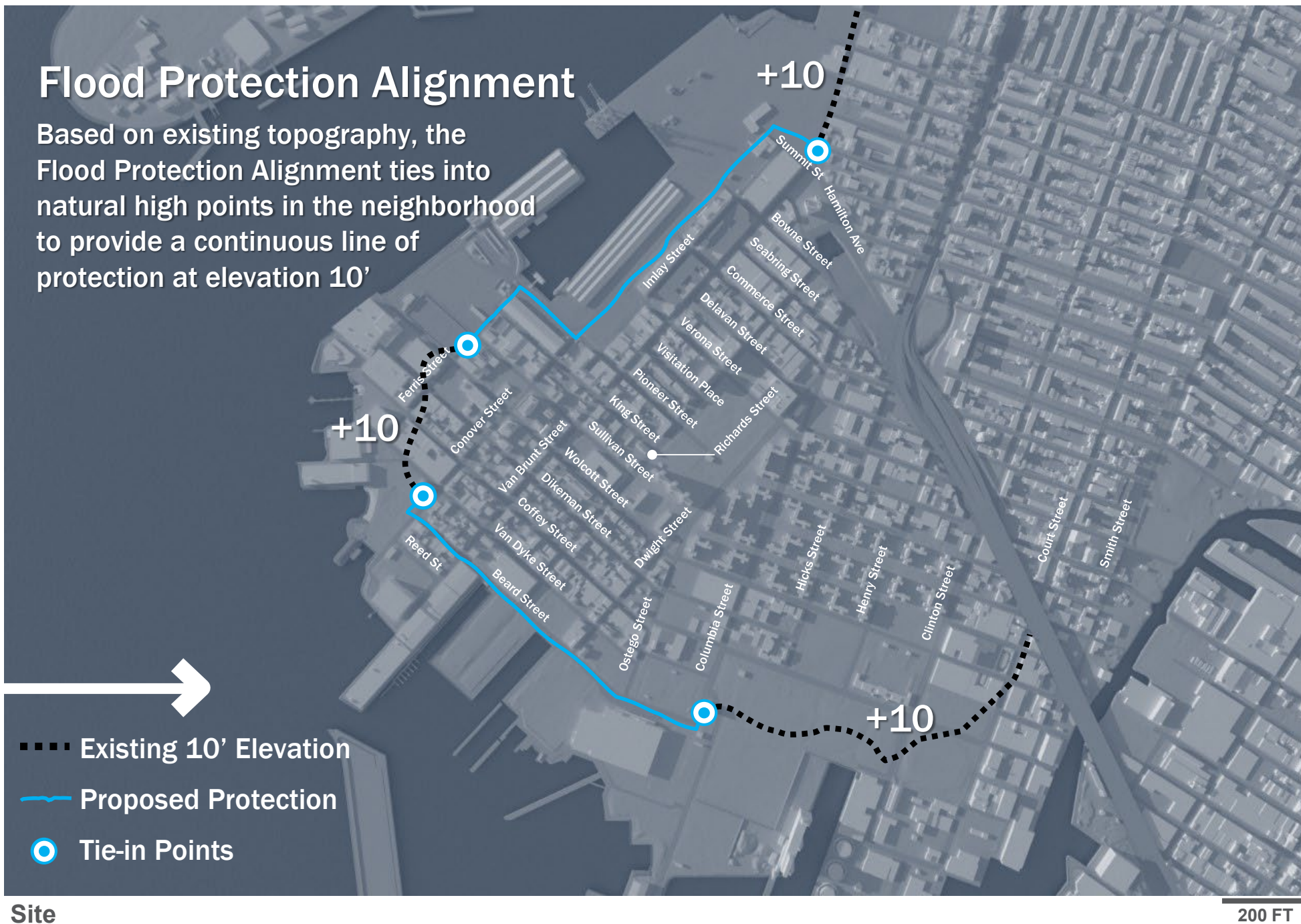
Red Hook

Neighborhood

1000 FT

Flood Protection Alignment

Based on existing topography, the Flood Protection Alignment ties into natural high points in the neighborhood to provide a continuous line of protection at elevation 10'



EXISTING CONDITIONS

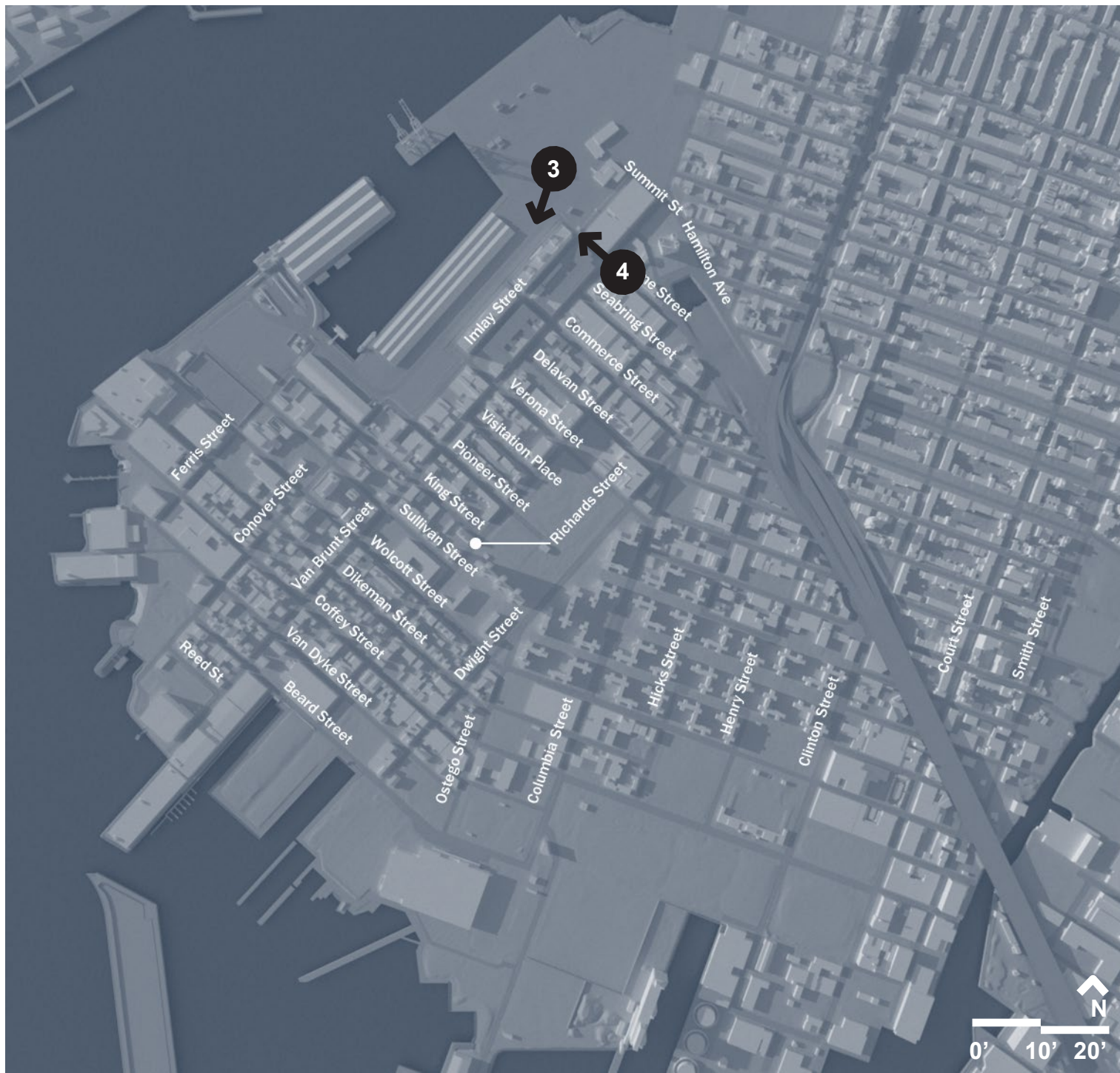




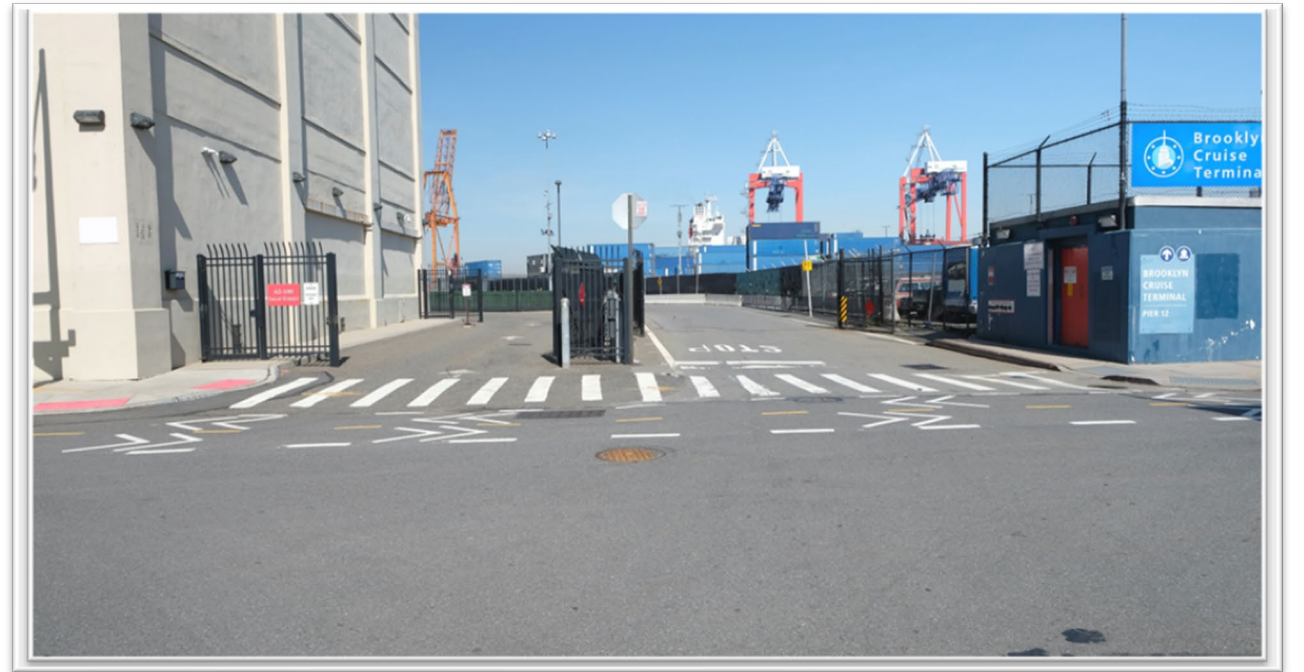
1 – Looking West on Summit Street From Hamilton Avenue



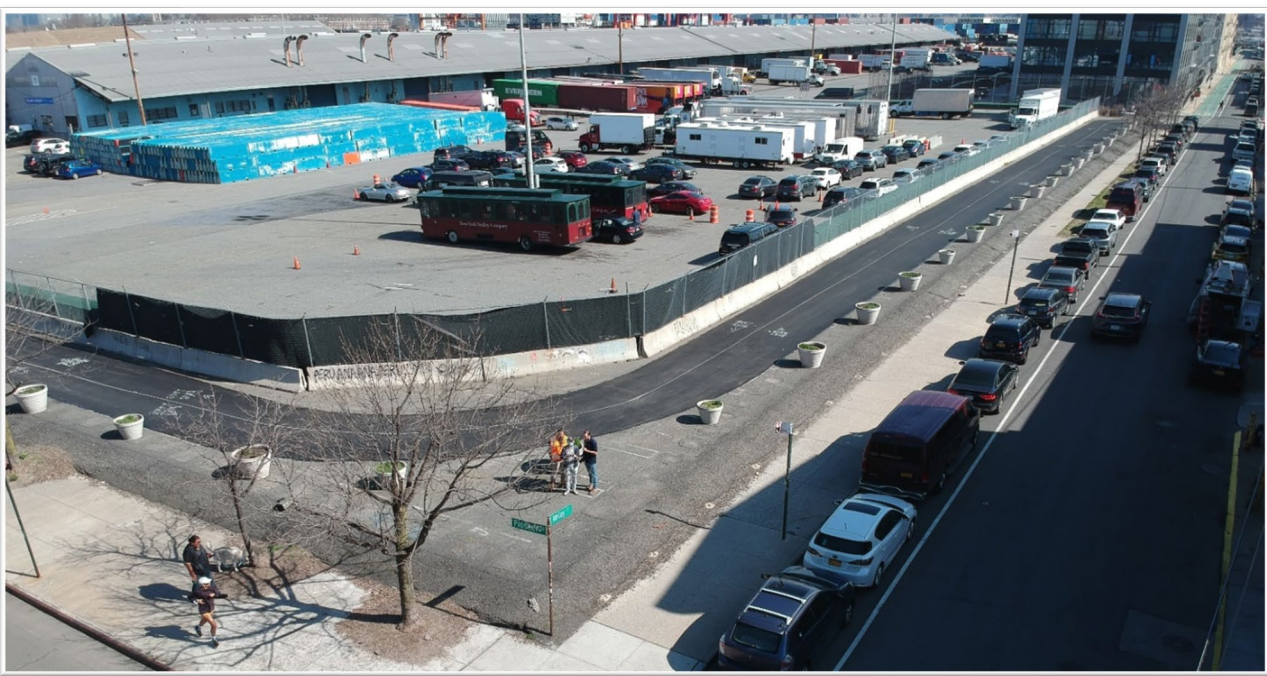
2 – Looking South down Imlay Street



3 – Within Port Authority Terminal looking southeast



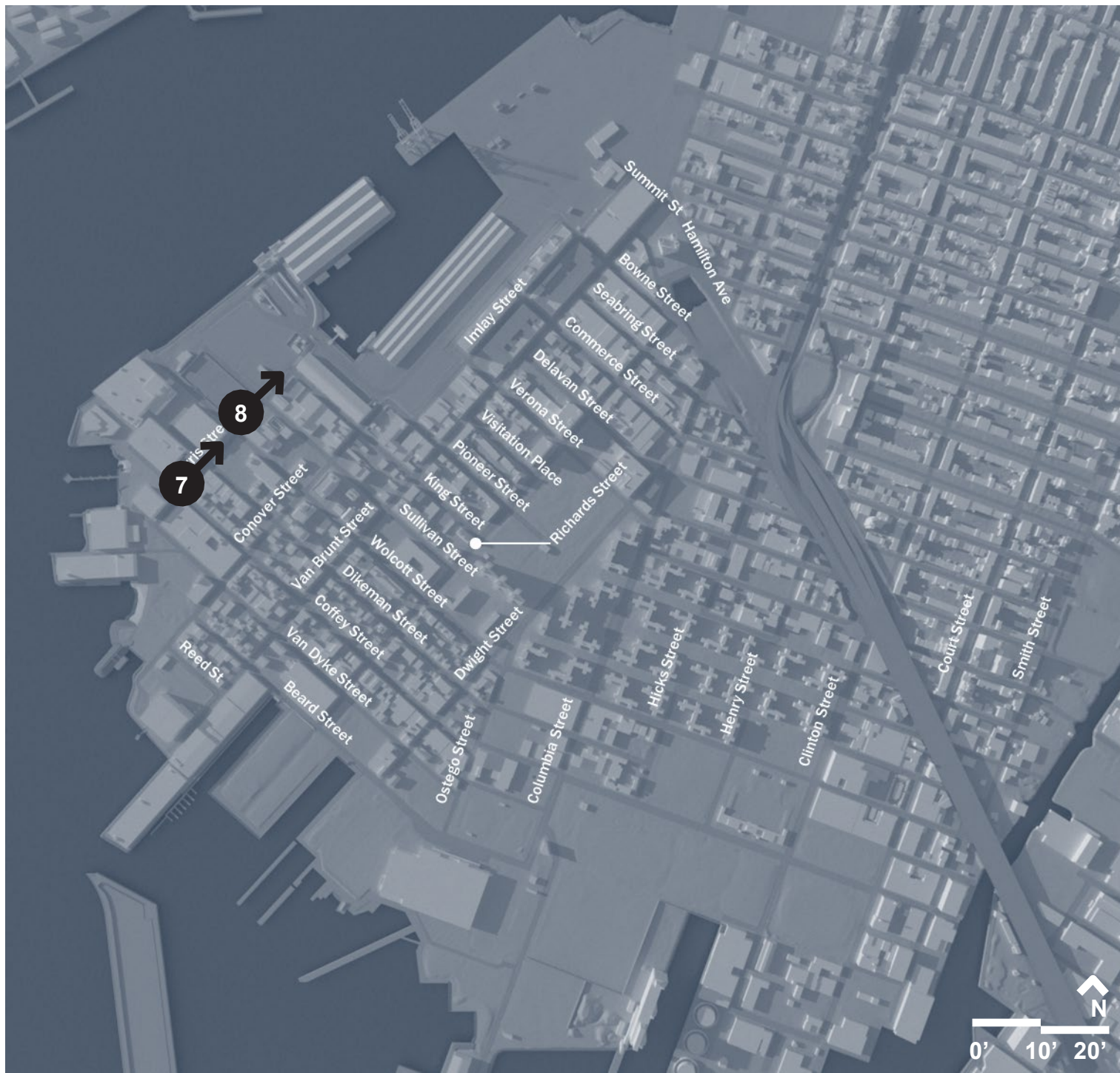
4 – Looking West on Bowne Street from Imlay Street



5 – Looking Northwest on Imlay Street from Pioneer Street



6 – Looking East on Pioneer Street from Imlay Street



7 – Looking Northwest on Imlay Street from Pioneer Street



8 – Looking East on Pioneer Street from Imlay Street



9 – Looking South at Reed Street from Conover Street



10 – Looking East on Beard Street from Conover Street



11 – Looking South at on Van Brunt Street from Beard Street



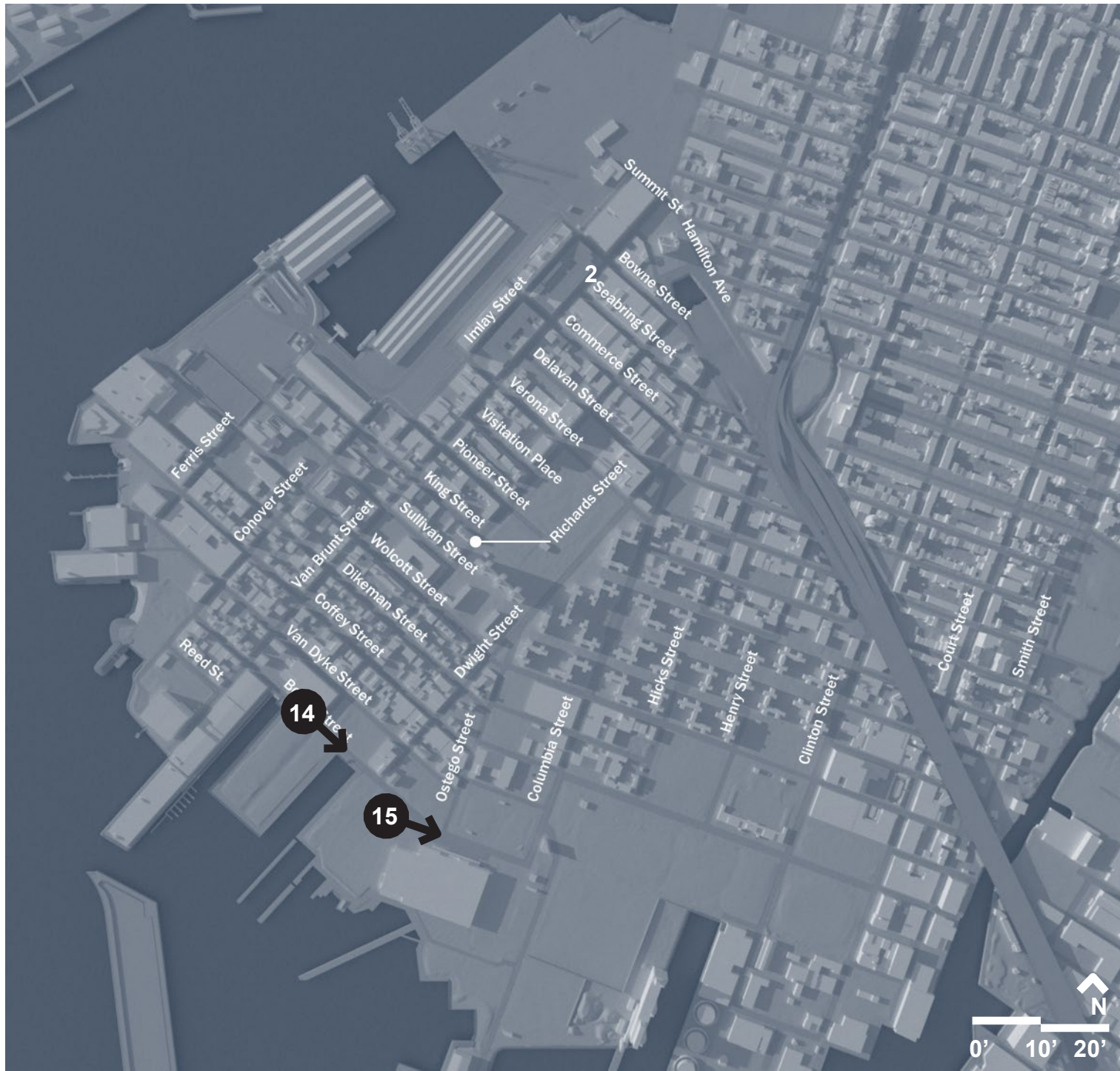
12 – Looking East on Beard Street from Van Brunt Street



12 – Looking South at Pier from Beard Street



13 – Looking south at Ikea Park from Beard Street



14 – Looking East at street level on Beard Street



15 – Looking East on Halleck Street in front of Ikea

VISUALIZING THE ISSUE





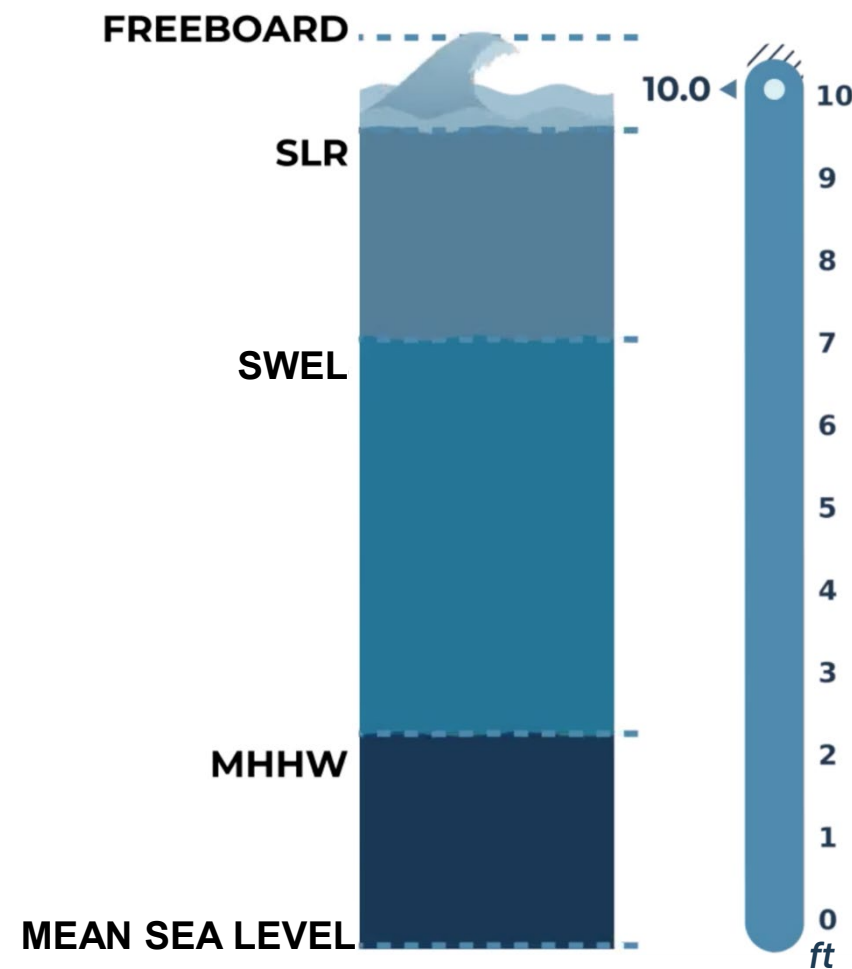
Red Hook Flooding
Existing Conditions
Elev. 10-ft

THE SCIENCE BEHIND THE SOLUTION



Optimizing The Project's Design Flood Elevation (DFE)

DFE is the total elevation adopted to provide flood risk reduction



ELEVATIONS:

Freeboard. The additional structure height needed above the DFE to protect against wave overtopping during a flood event

Sea Level Rise (SLR). The change in elevation of the sea level over time, (i.e., increase in Stillwater Elevation).

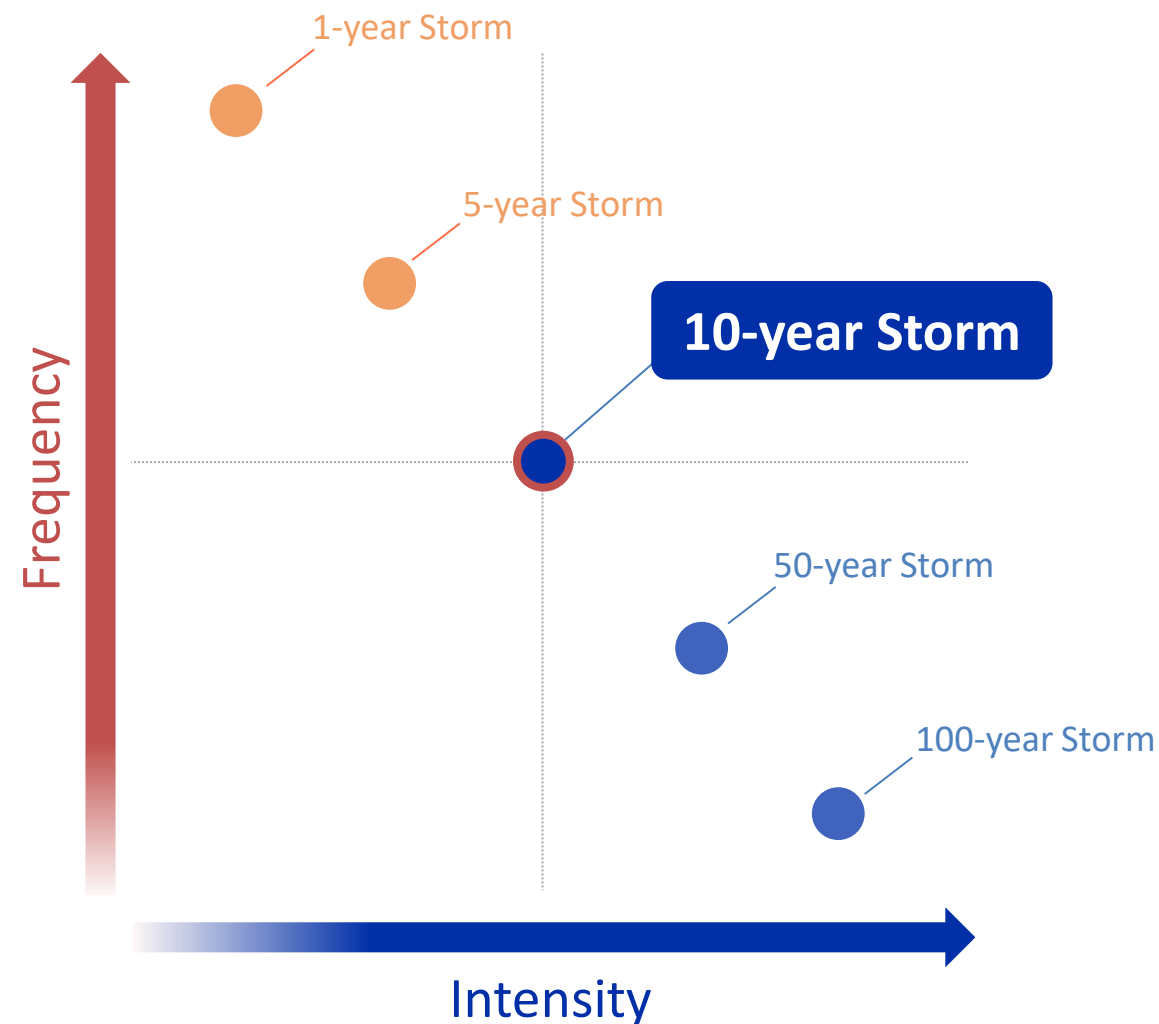
Still Water Elevation Level (SWEL). The projected elevation of floodwaters in the absence of waves.

Mean Higher High Water (MHHW). The average of the highest Tide recording from each tidal day. For NYC this is recorded by the NOAA station at the Battery in Lower Manhattan.

Mean Sea Level. Average height of the sea between high and low tide.

Frequency of Different Coastal Storms

The project's 10-ft level of protection is equivalent to a 10-year coastal storm, which is a frequent and intense storm



1-year Storm
a sea level that has 100% chance of occurring every year

5-year Storm
a sea level that has 20% chance of occurring every year

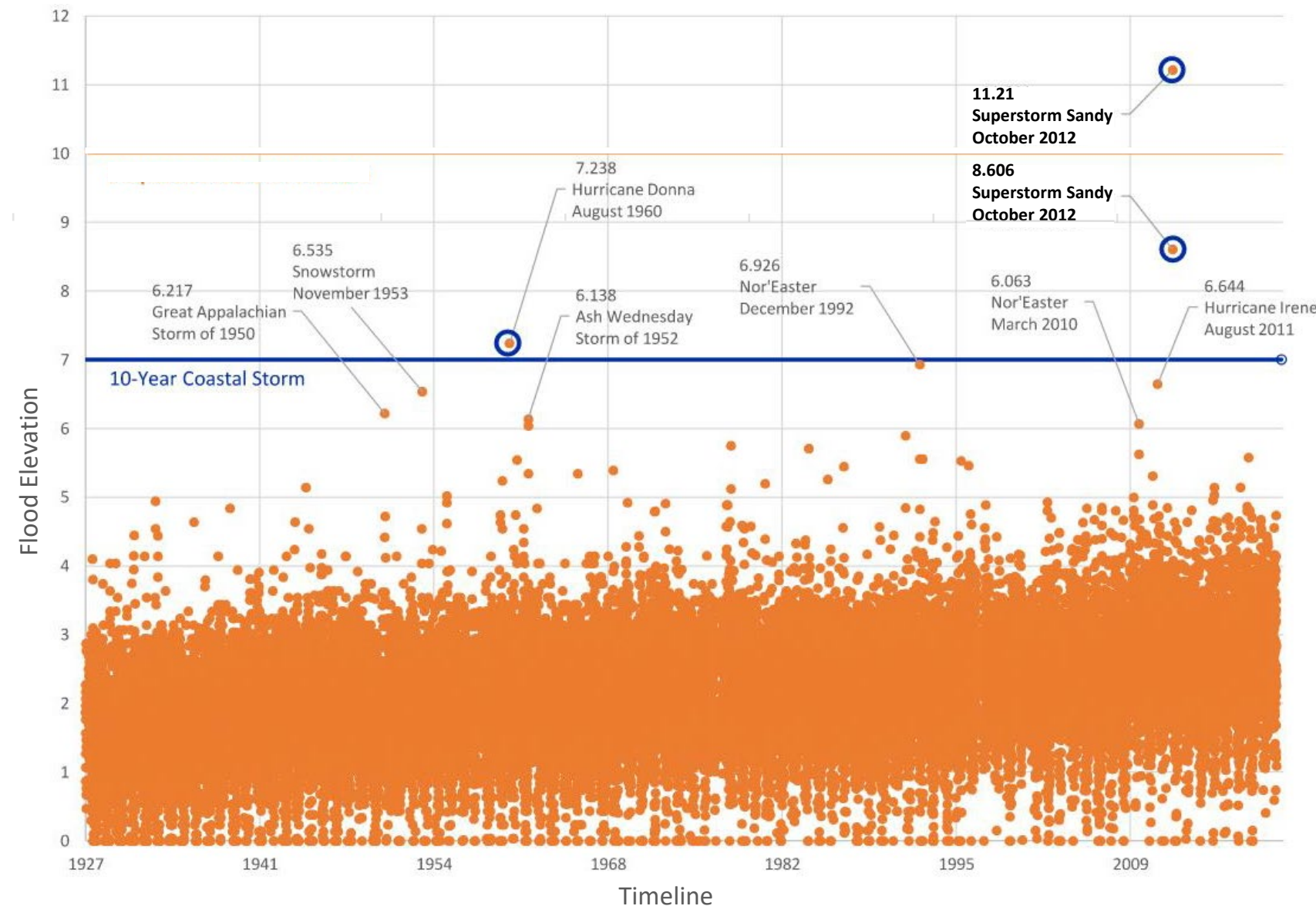
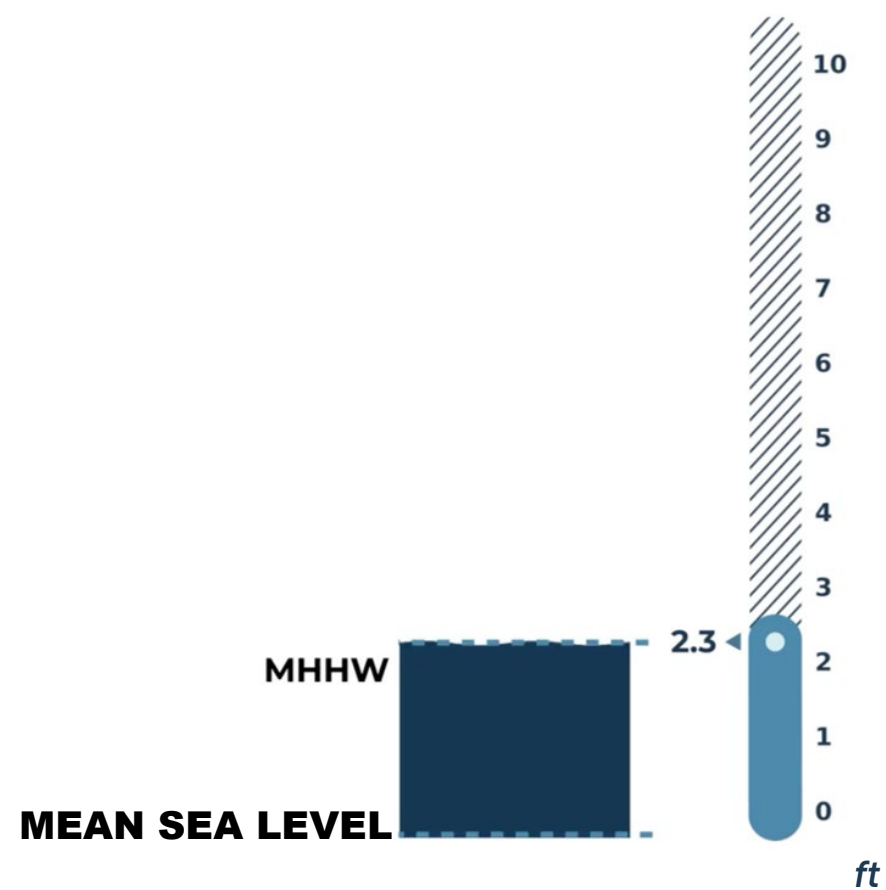
10-year Storm
a sea level that has **10% chance** of occurring every year

50-year Storm
a sea level that has 2% chance of occurring every year

100-year Storm
a sea level that has 1% chance of occurring every year

Optimizing The Project's Design Flood Elevation (DFE)

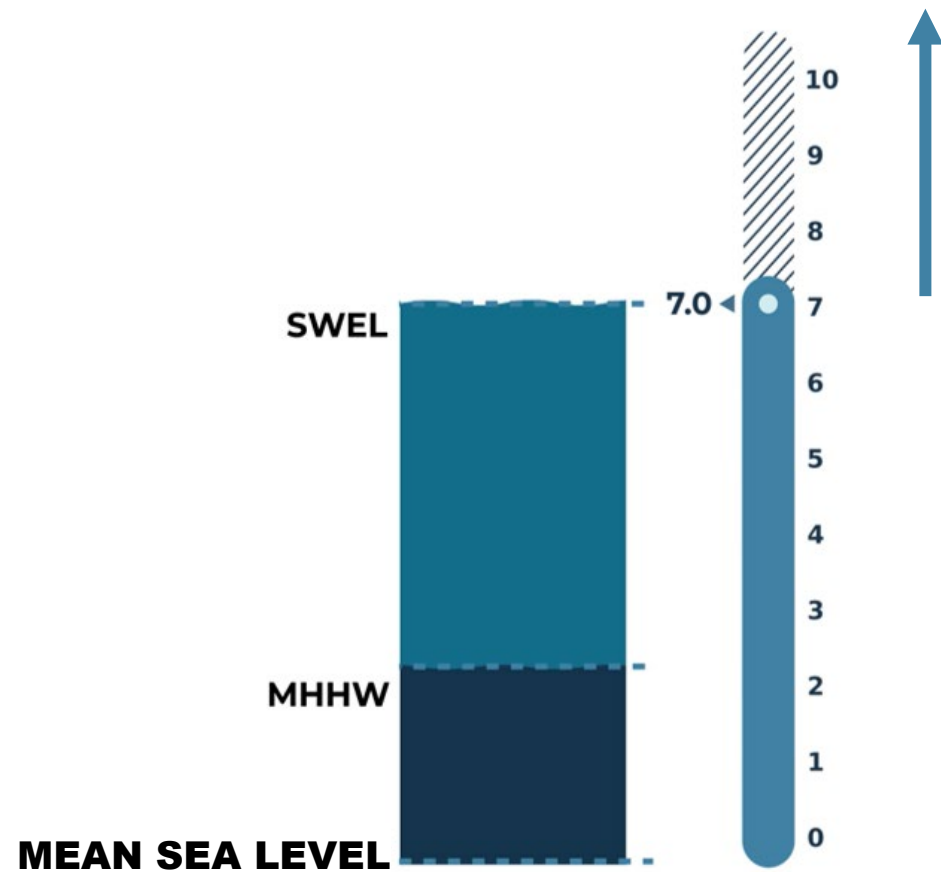
Almost every storm in Red Hook has been under 7-ft elevation



Tide Elevation Data from 1927 – 2020, from the National Oceanic and Atmospheric Administration (NOAA)

Optimizing The Project's Design Flood Elevation (DFE)

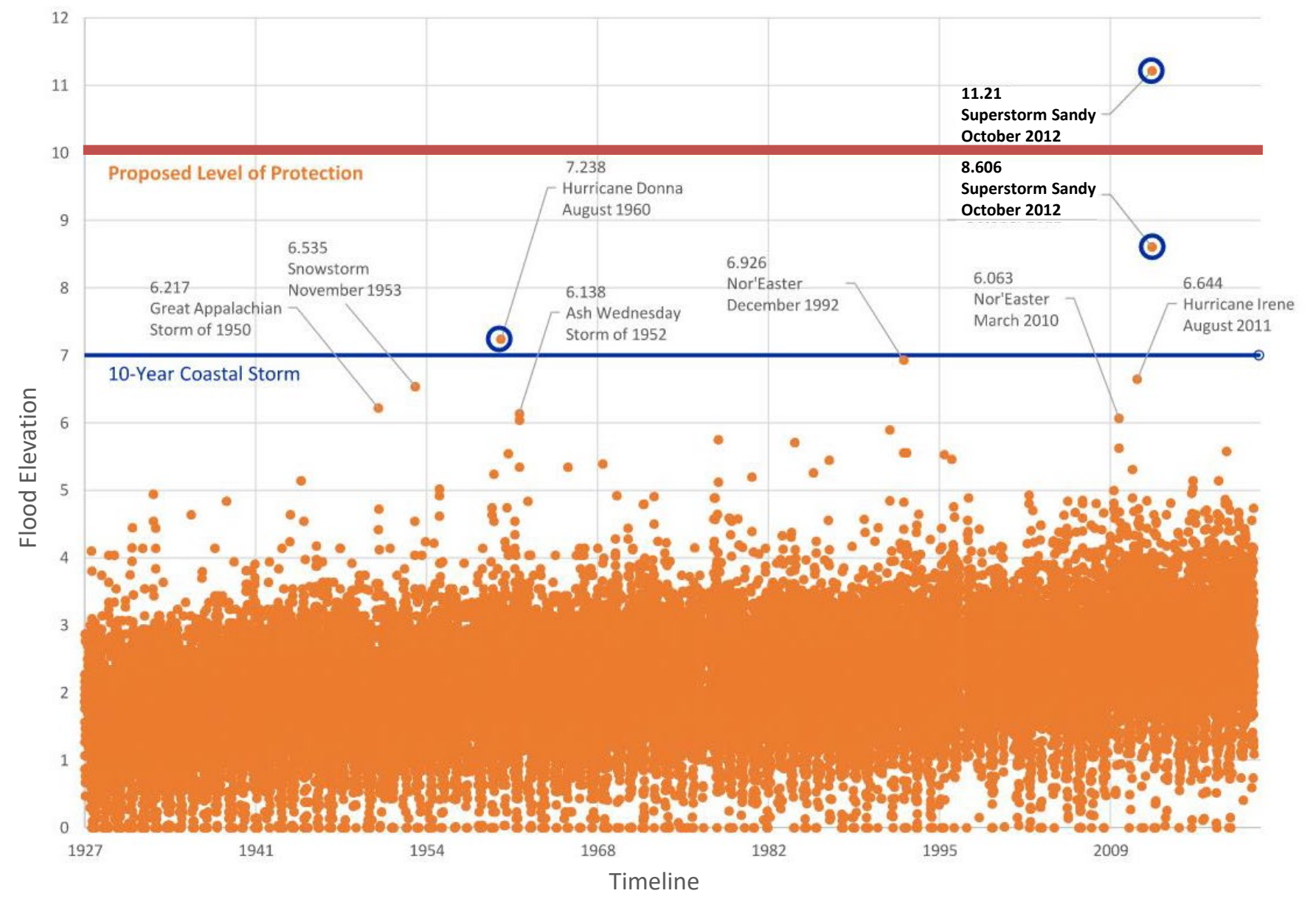
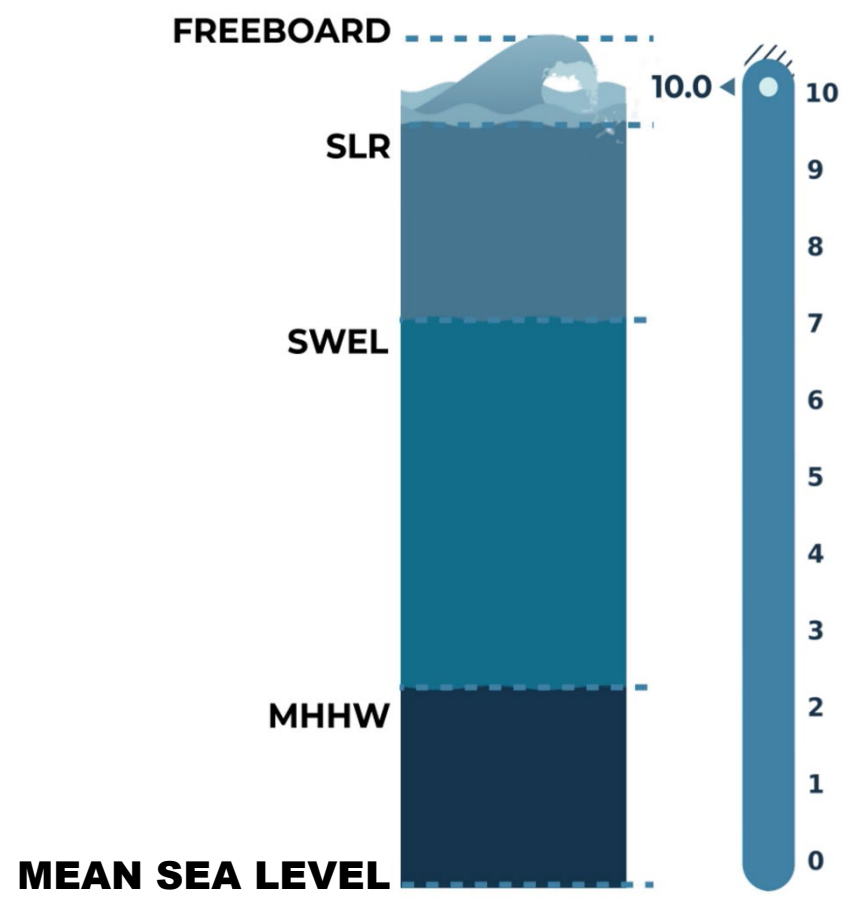
This project incorporates the highest estimate of Sea Level Rise at 30-inches, to protect against the most frequent storm now and into the future



- NYC Panel of Climate Change (NYCPCC) has established Sea Level Rise (SLR) Projections based on 24 Global Climate Models
- Sea Level Rise NYC has averaged 0.15 in/year in recent years
- Current Sea Level Rise Projections from the NYCPCC for the 2050s, ranges from **min 8-inches to max 30-inches**

Optimizing The Project's Design Flood Elevation (DFE)

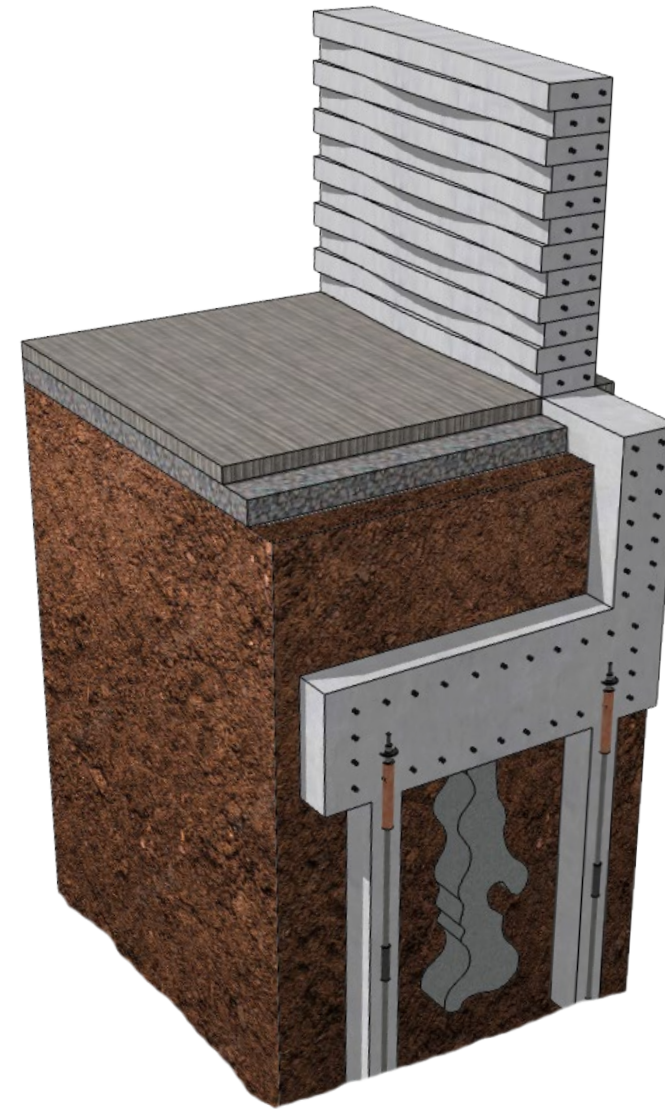
With a 10-ft level of protection, this project is protecting against the most frequent storms now and into the future



RESILIENCY ELEMENTS

Design

- Consistent with City's Coastal Resiliency projects – ex. ESCR, BMCR
- Walls continue below grade approx. 4-feet
- Walls are supported on pile foundations
- Seepage barriers extend below wall footings
- Every 6-inches of the flood wall is represented by a banded pattern
- Wall heights will be published at wall ends
- Pattern spacing is consistent for all walls



Design

- ESCR Flood Wall during Construction



Wall foundation at Stuyvesant Cove Park, July 2021

Design

- ESCR Flood Wall during Construction



Wall foundation and formwork at Stuyvesant Cove Park, July 2021

Design

- ESCR Flood Wall during Construction



Rebar and formwork for floodwall at Stuyvesant Cove Park, July 2021

Design

- ESCR Flood Wall during Construction



Rebar and formwork for floodwall at Stuyvesant Cove Park, July 2021

Design

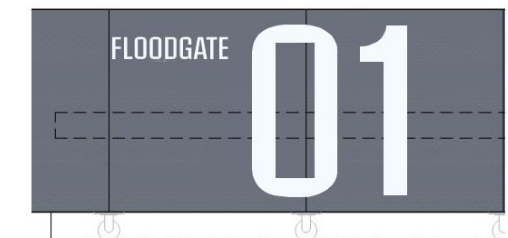
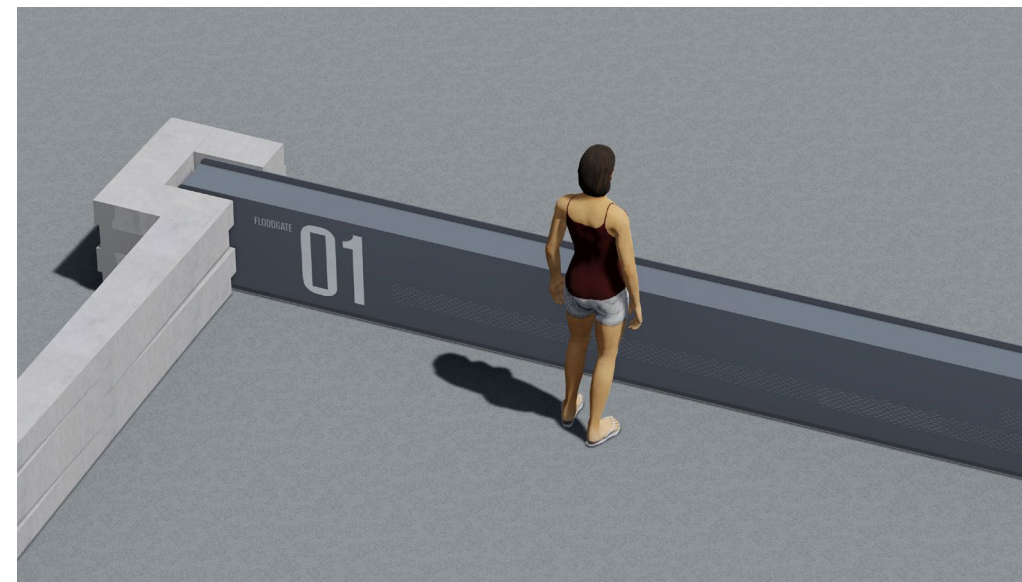
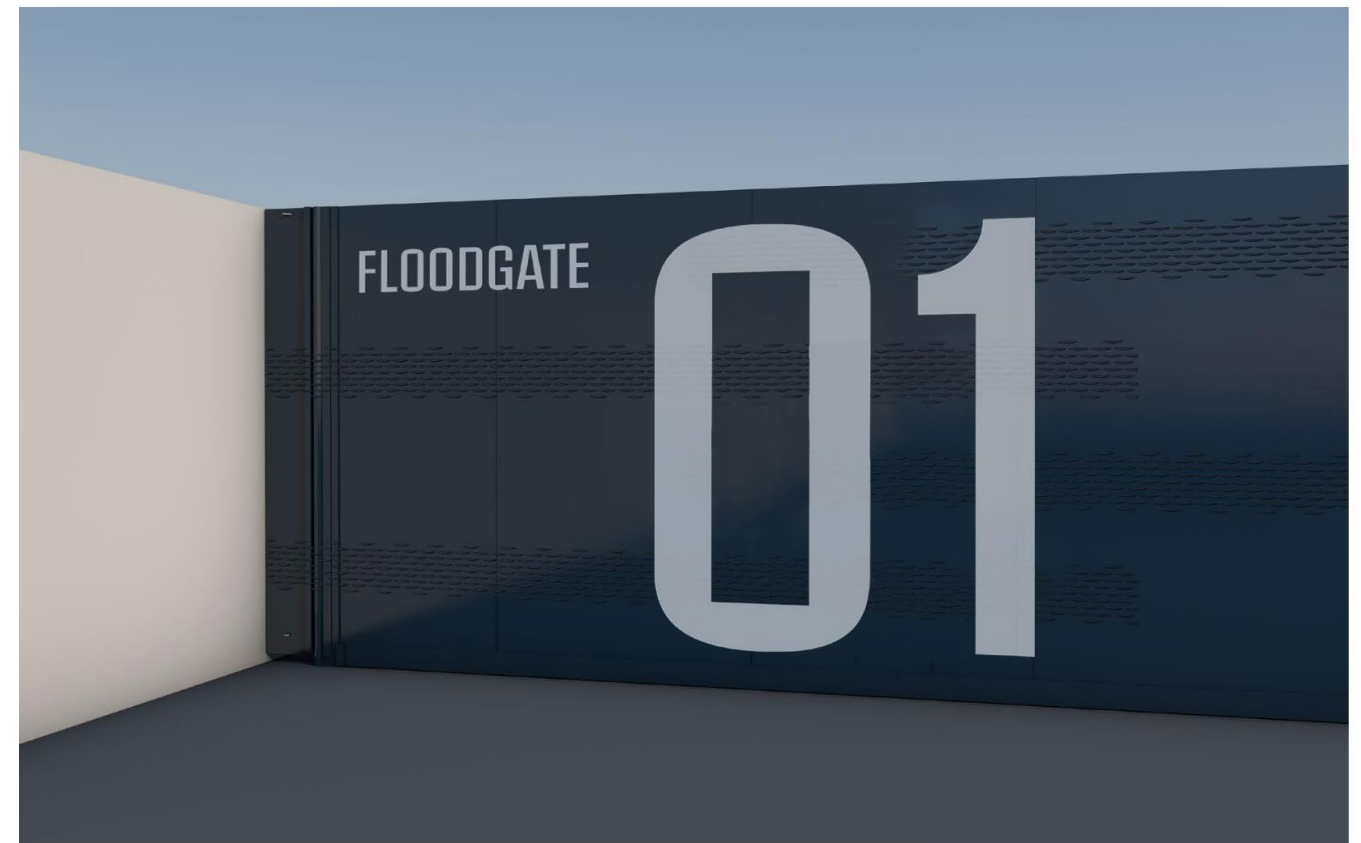
- ESCR Flood Wall during Construction



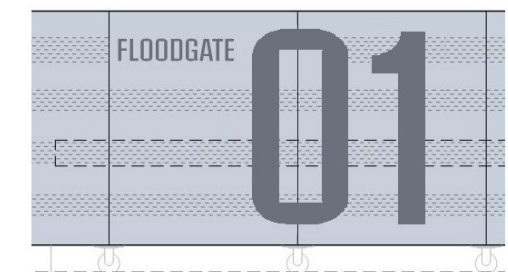
First section of completed floodwall at Stuyvesant Cove Park, July 2021

Design

- Consistent with City's Coastal Resiliency projects – ex. ESCR, BMCR
- Grey painted steel
- Rounded corners to complement walls
- Extend banding from walls through gates
- Incorporate gate numbering



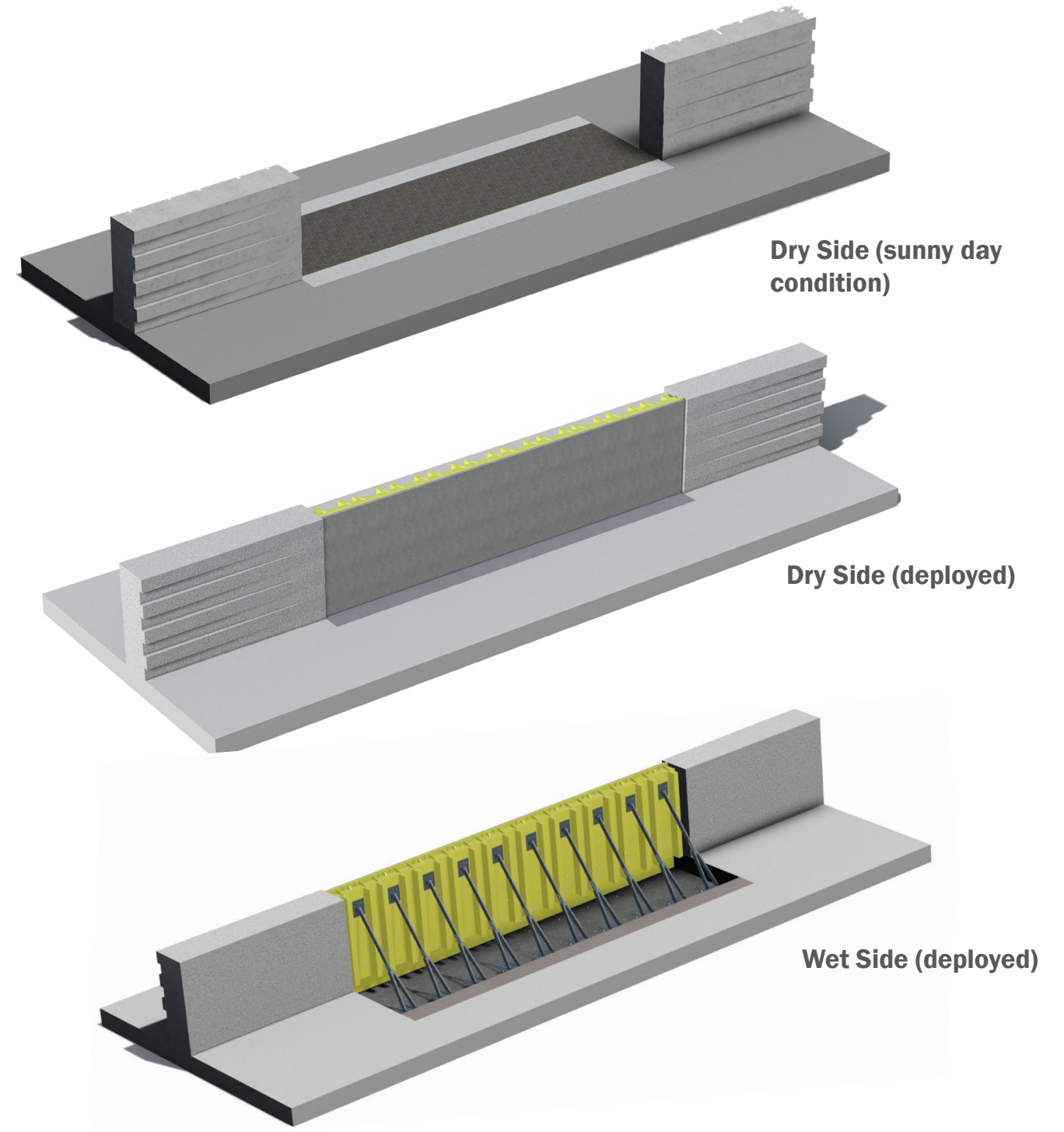
TEXT + LABELING
MUNSEL GREY PAINT (TYP)



TEXT + LABELING
GW GREY PAINT (ASSER LEVY)

Design

- Consistent with City's Coastal Resiliency projects – ex. ESCR, BMCR
- Alloy aluminum with stainless steel components
- 50-year life expectancy
- Hydraulically deployed or manual
- 1-1/2" thick dark grey grouted architectural finish to differentiate from sidewalk

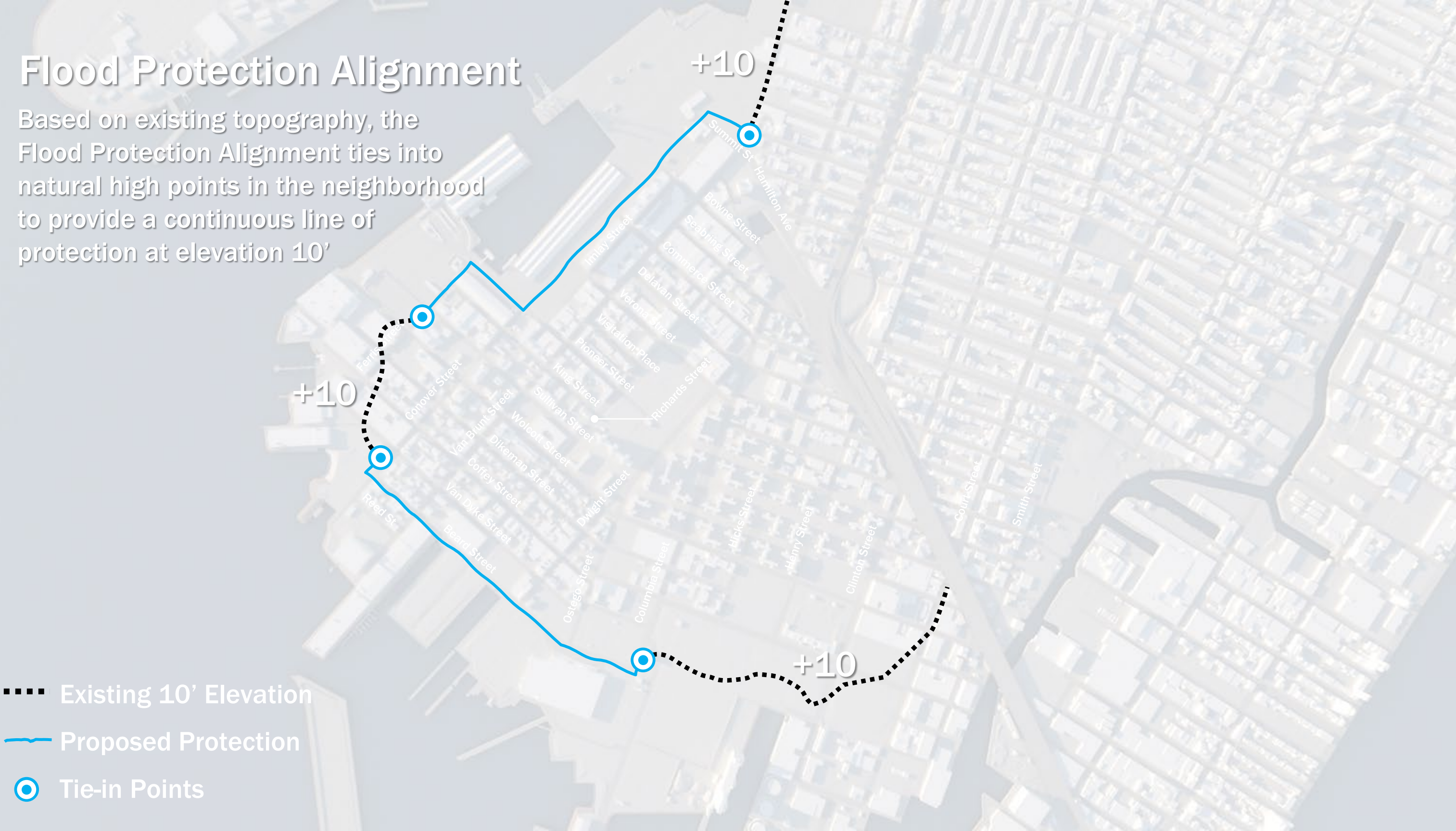


PRELIMINARY DESIGN



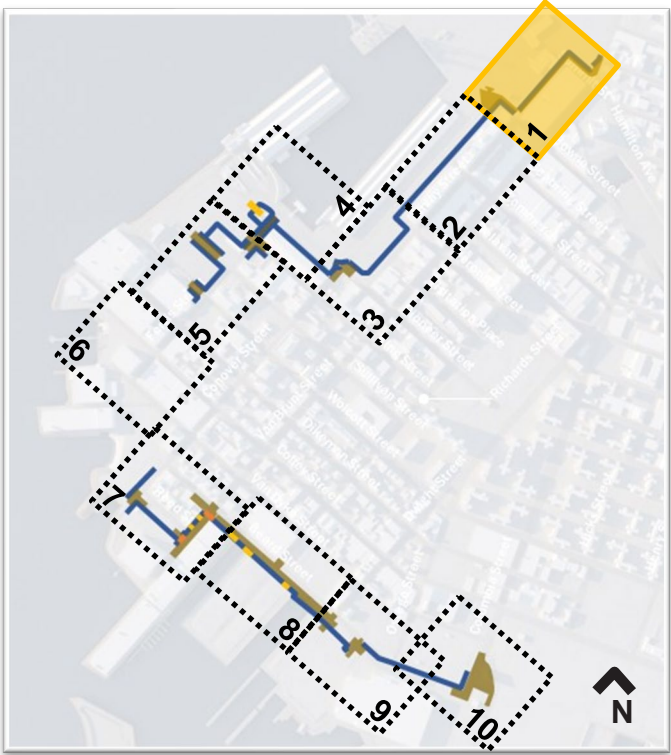
Flood Protection Alignment

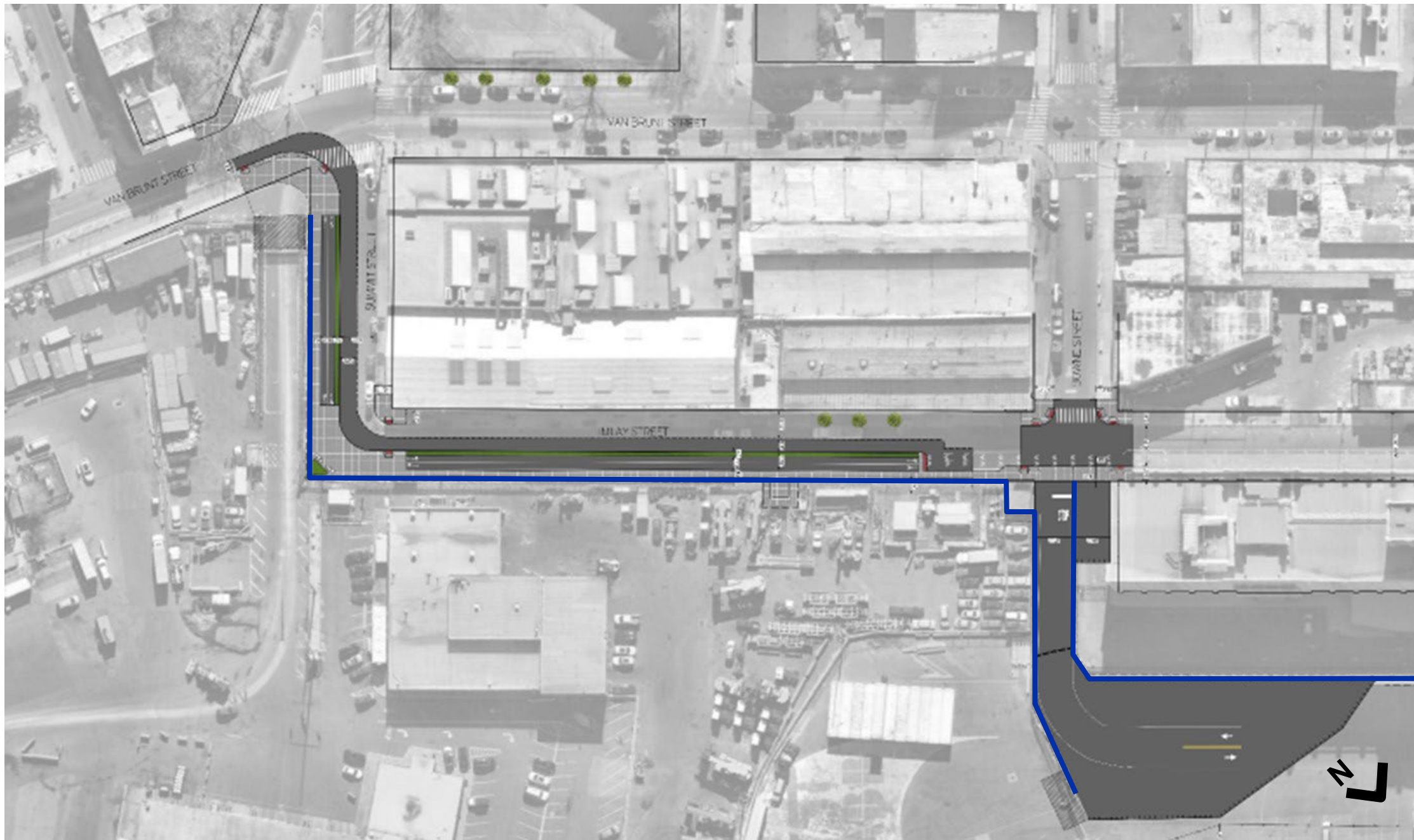
Based on existing topography, the Flood Protection Alignment ties into natural high points in the neighborhood to provide a continuous line of protection at elevation 10'



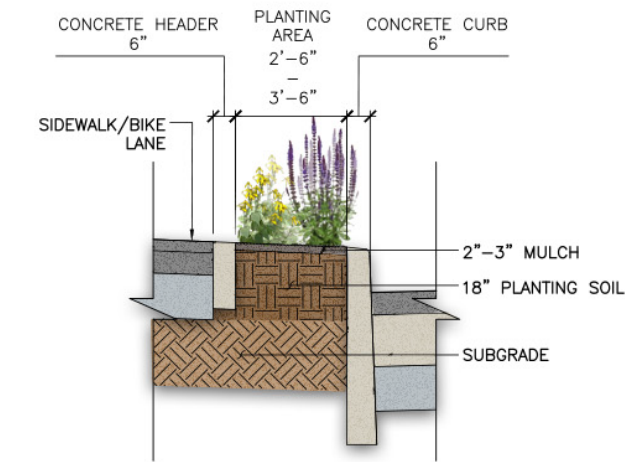
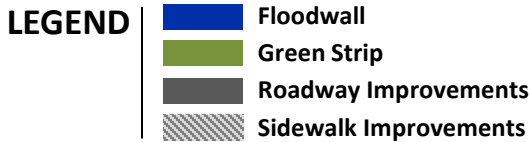


Plan 1 of 10 Summit Street to Bowne Street
EXISTING CONDITIONS

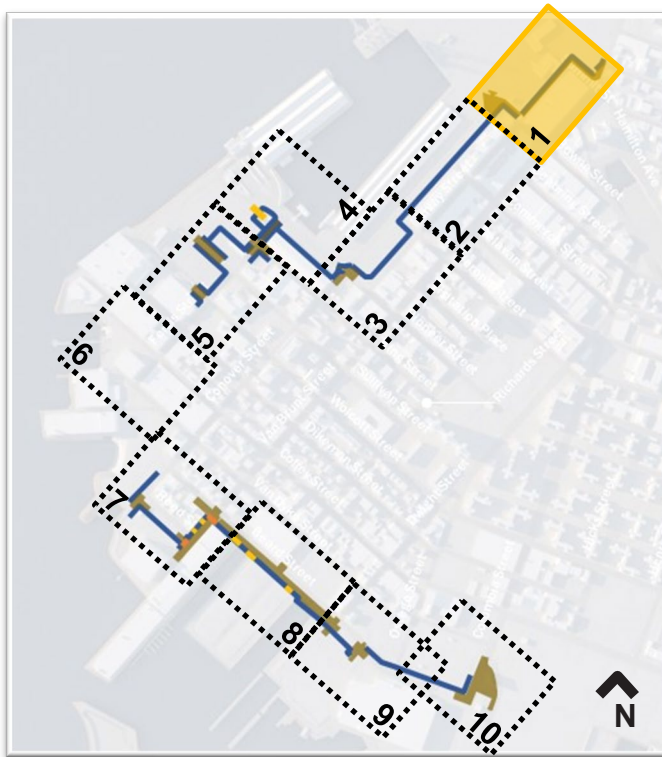




Plan 1 of 10 Summit Street to Bowne Street
PROPOSED CONDITIONS



PLANTING TYPE A & B
Note: Refer to slide 76 for Planting Details



Summit, Imlay and Van Brunt Street



FLOOD
WALL

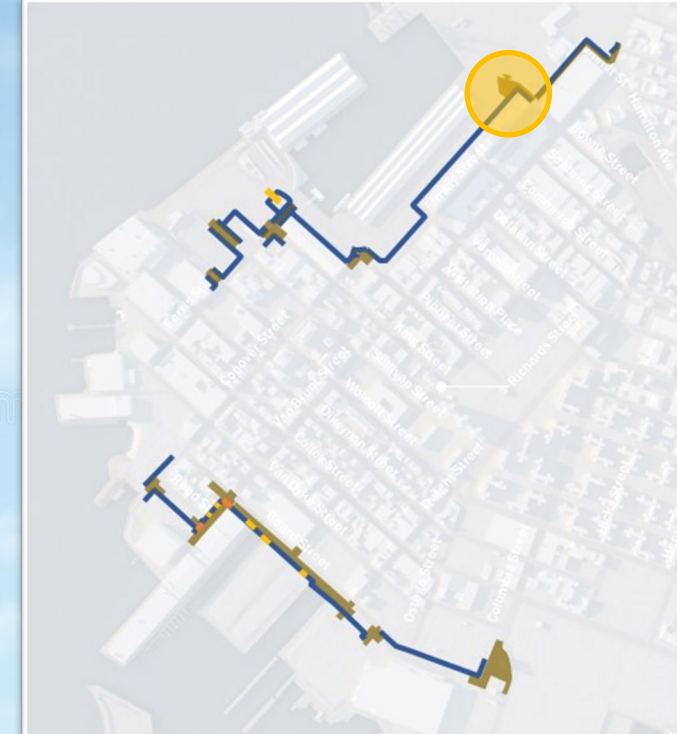
BROOKLYN
WATERFRONT
GREENWAY

RE-GRADE YARD
ENTRANCE

Imlay Street and Bowne Street

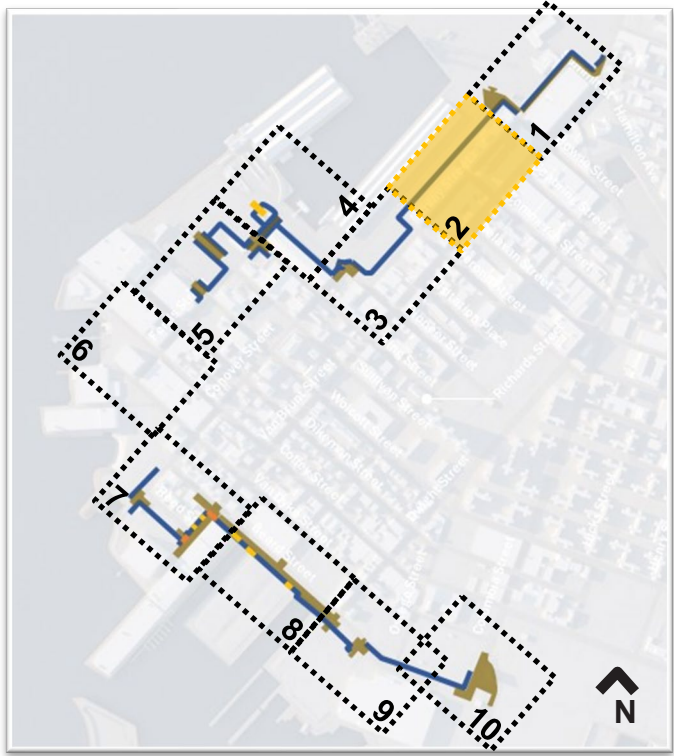
NEW RAMP TO
BROOKLYN CRUISE
TERMINAL

NEW FLOOD
PROTECTION WALL





Plan 2 of 10 Bowne Street to Verona Street within the Port Authority Property
EXISTING CONDITIONS

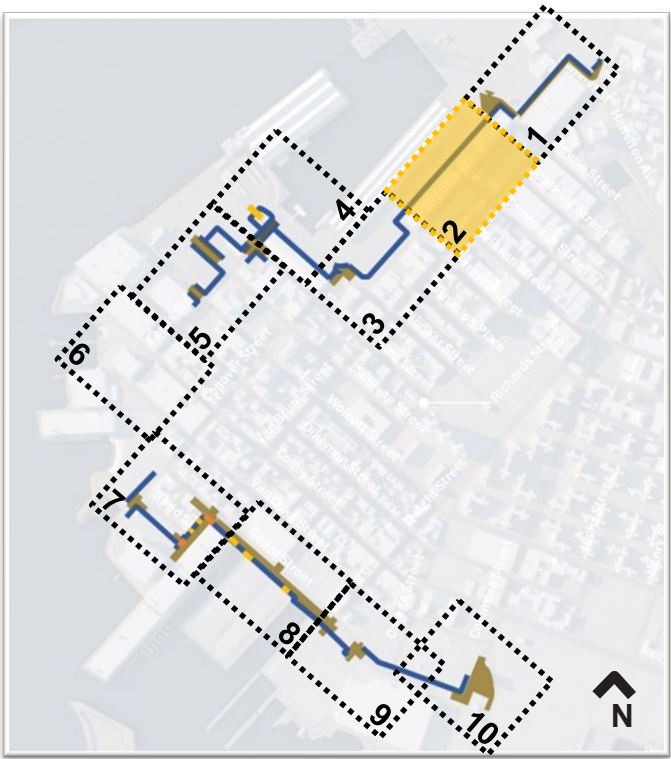




Plan 2 of 10 Bowne Street to Verona Street within the Port Authority Property
PROPOSED CONDITIONS

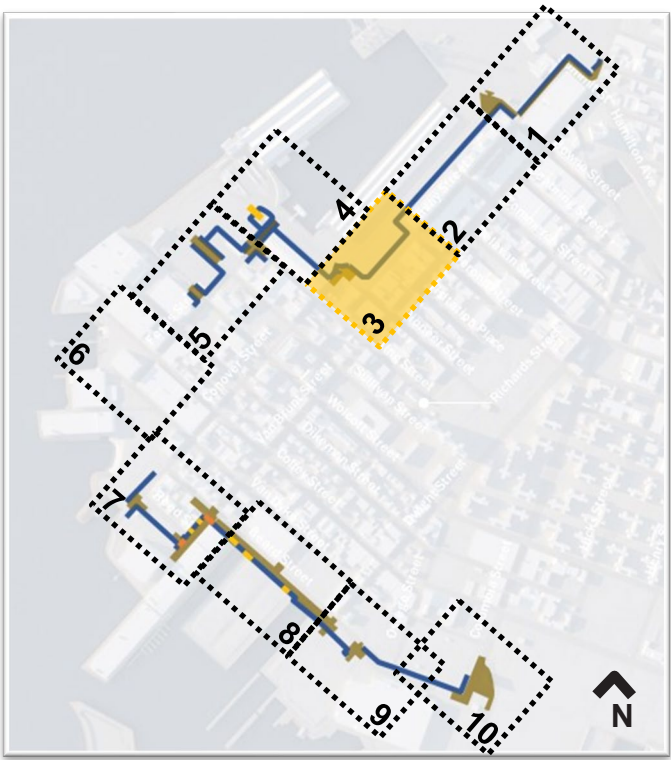
LEGEND

- █ Floodwall
- █ Green Strip
- █ Roadway Improvements
- ▨ Sidewalk Improvements



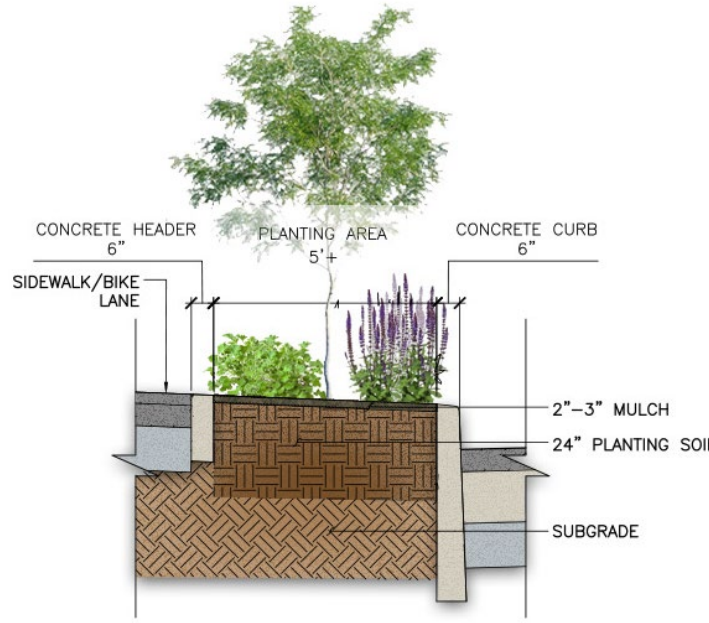
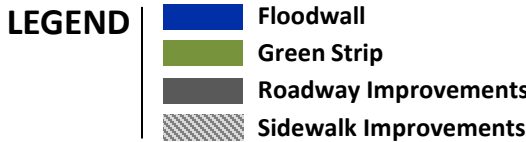


Plan 3 of 10 Verona Street to Pioneer Street
EXISTING CONDITIONS

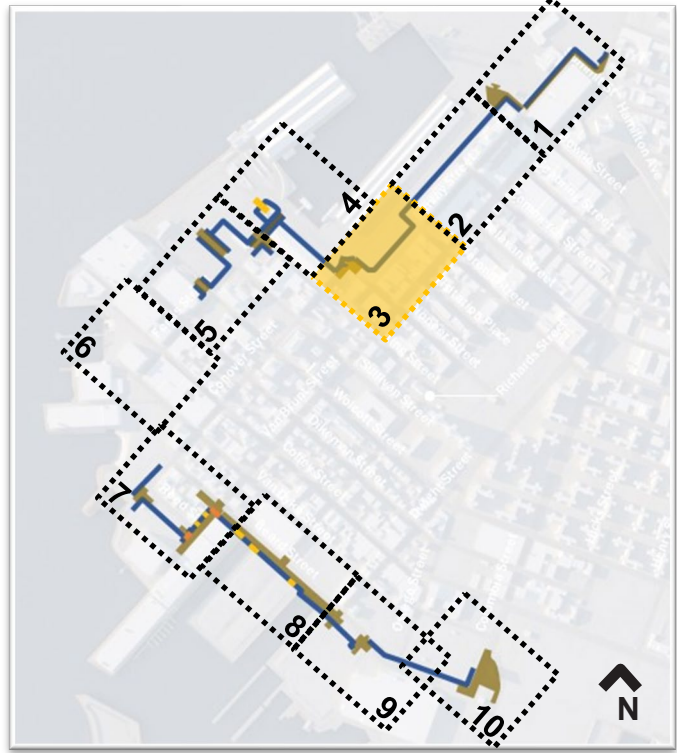


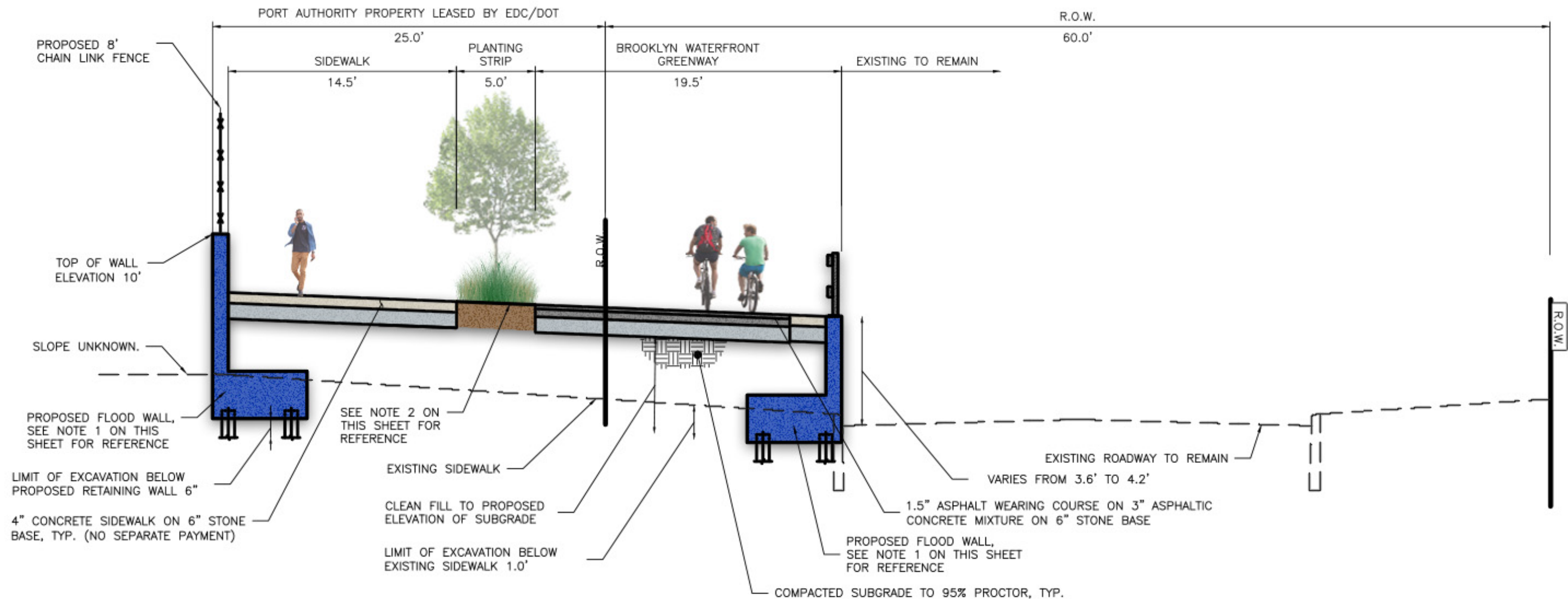


Plan 3 of 10 Verona Street to Pioneer Street
PROPOSED CONDITIONS



PLANTING TYPE C
Note: Refer to slide 76 for Planting Details



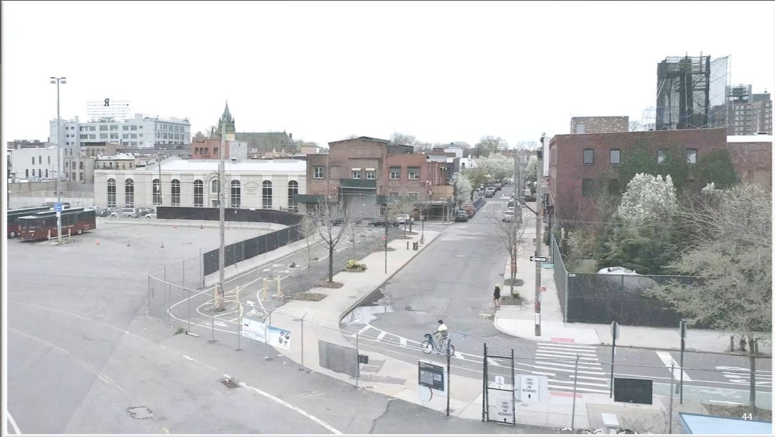


PIONEER STREET TYPICAL SECTION A-A

Imlay Street and Bowne Street

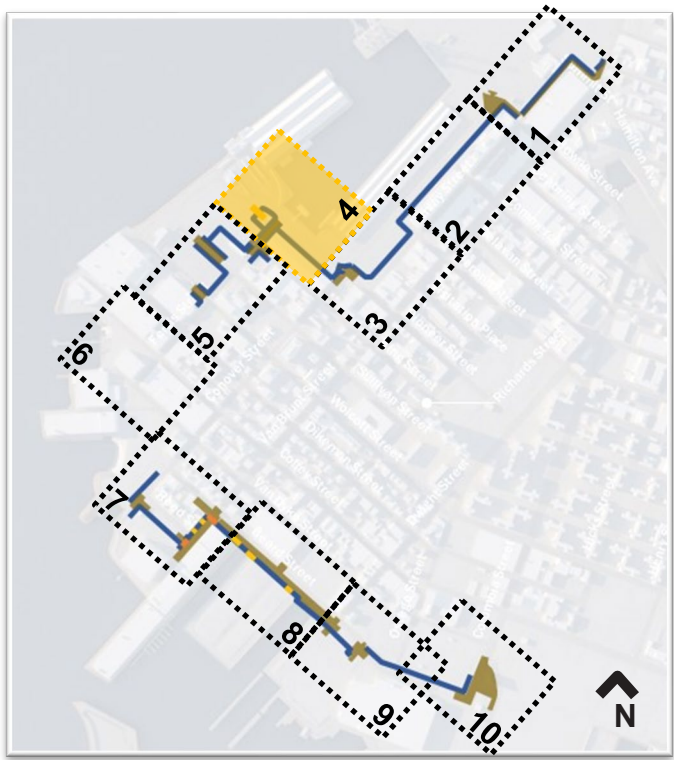


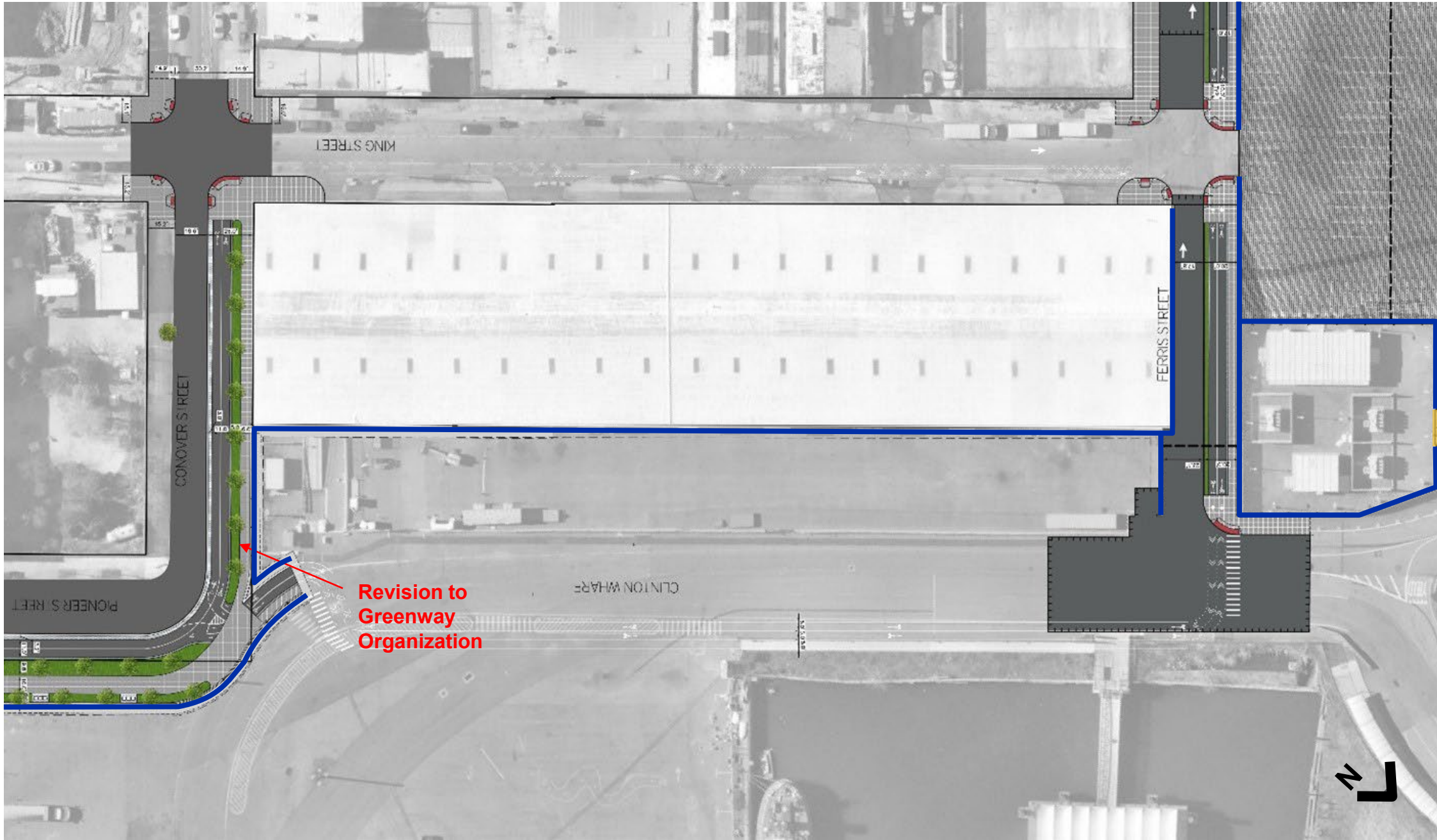
Pioneer and Conover Streets



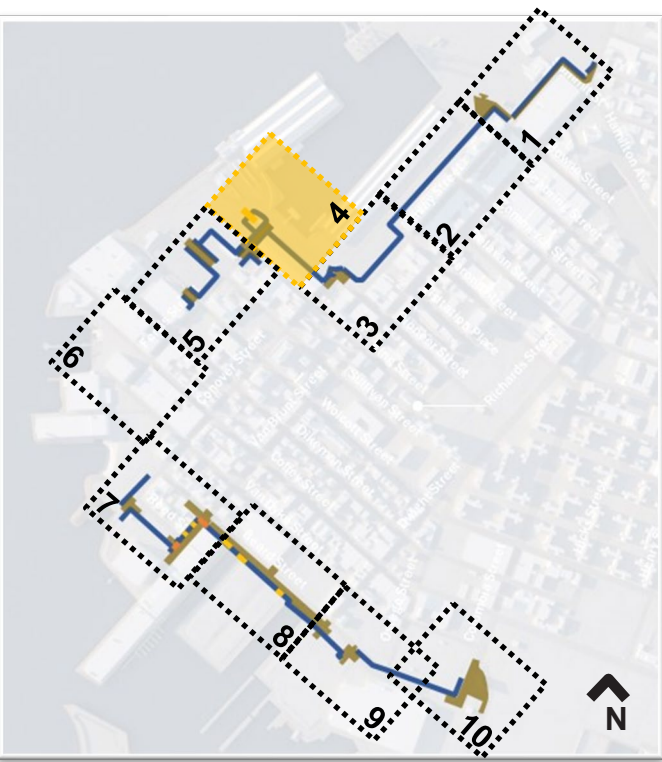
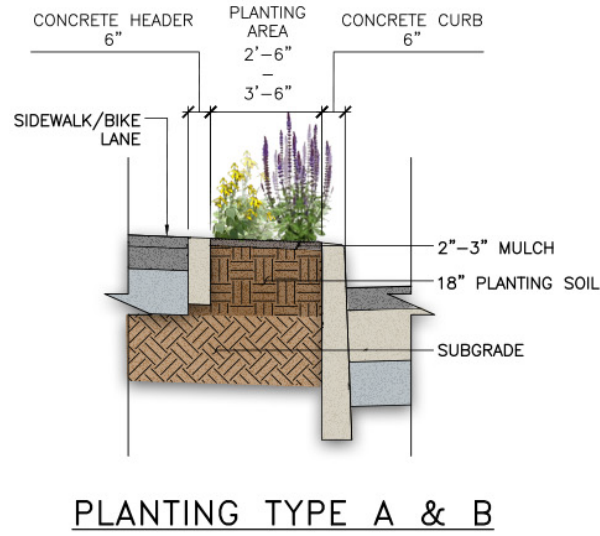
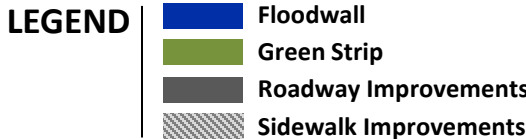


Plan 4 of 10 Pioneer Street to Ferris Street thru Clinton Wharf
EXISTING CONDITIONS

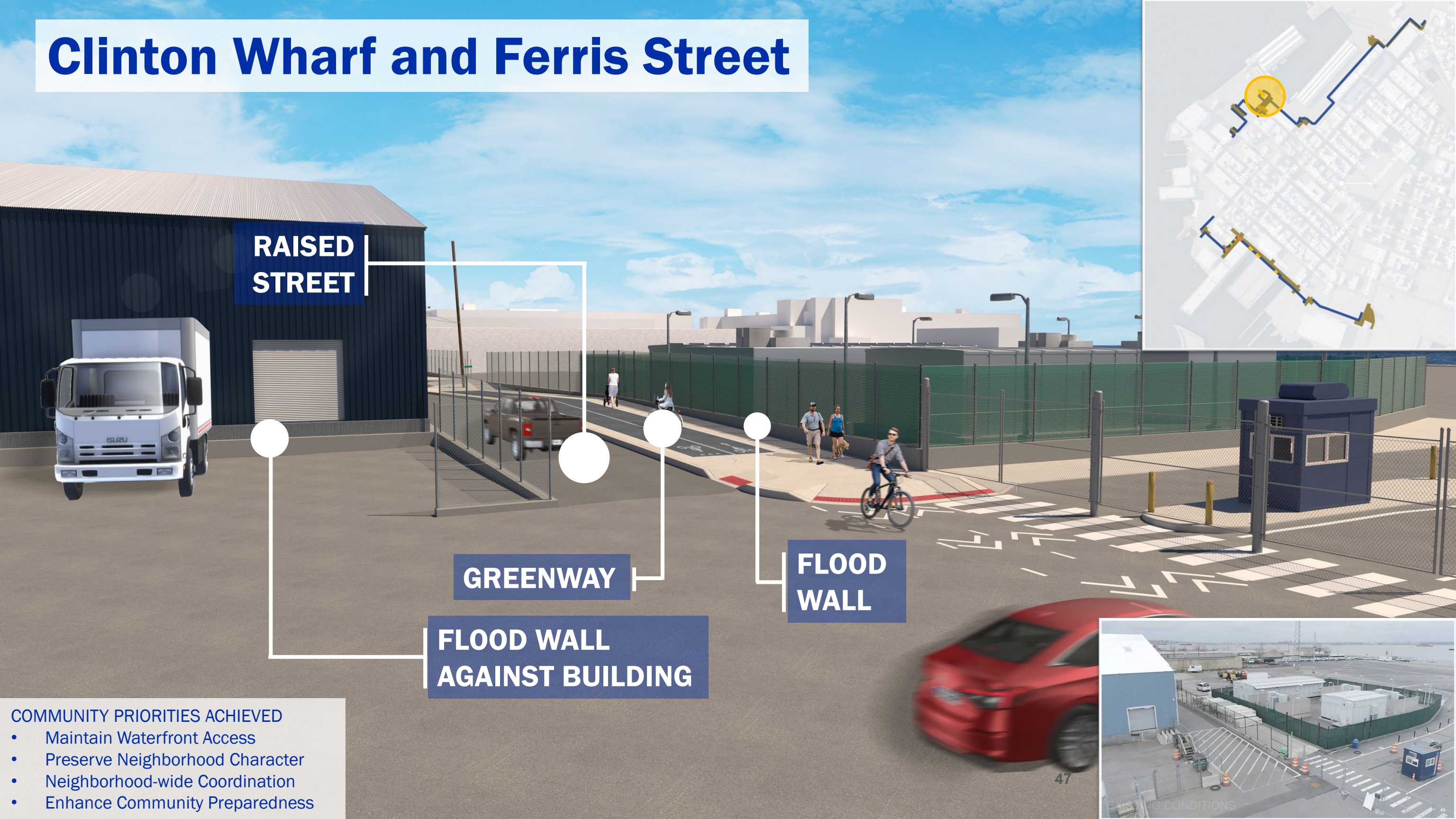




Plan 4 of 10 Pioneer Street to Ferris Street thru Clinton Wharf
PROPOSED CONDITIONS



Clinton Wharf and Ferris Street



**RAISED
STREET**

GREENWAY

**FLOOD
WALL**

**FLOOD WALL
AGAINST BUILDING**

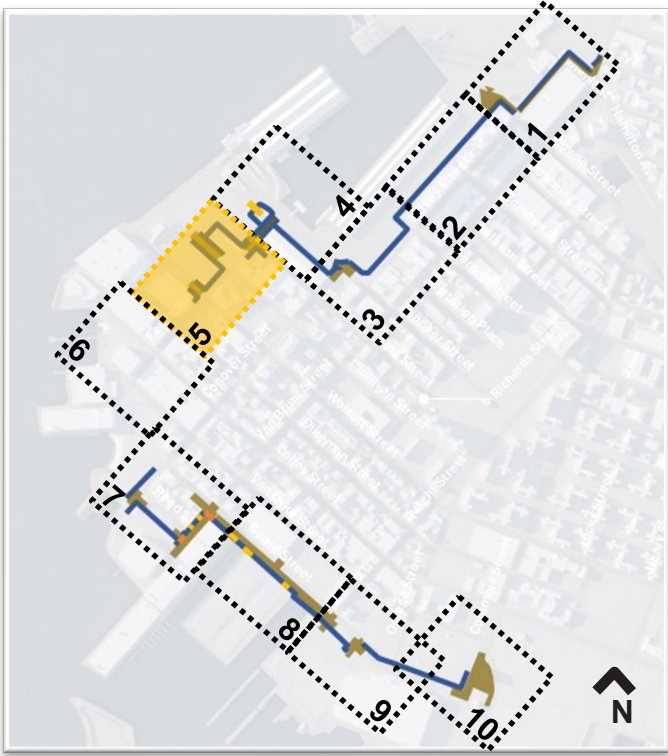
COMMUNITY PRIORITIES ACHIEVED

- Maintain Waterfront Access
- Preserve Neighborhood Character
- Neighborhood-wide Coordination
- Enhance Community Preparedness



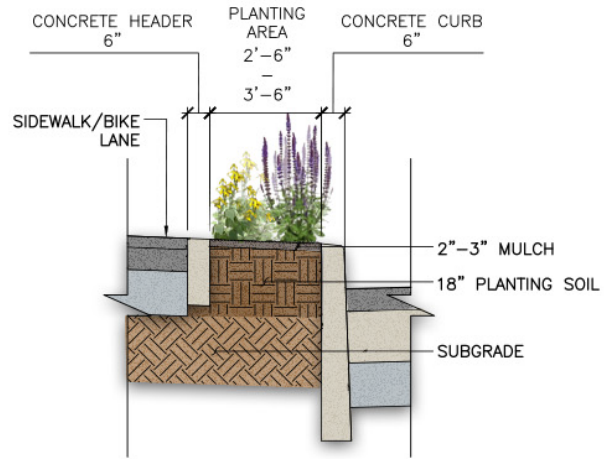


Plan 5 of 10 Ferris Street from Clinton Wharf to Sullivan Street
EXISTING CONDITIONS

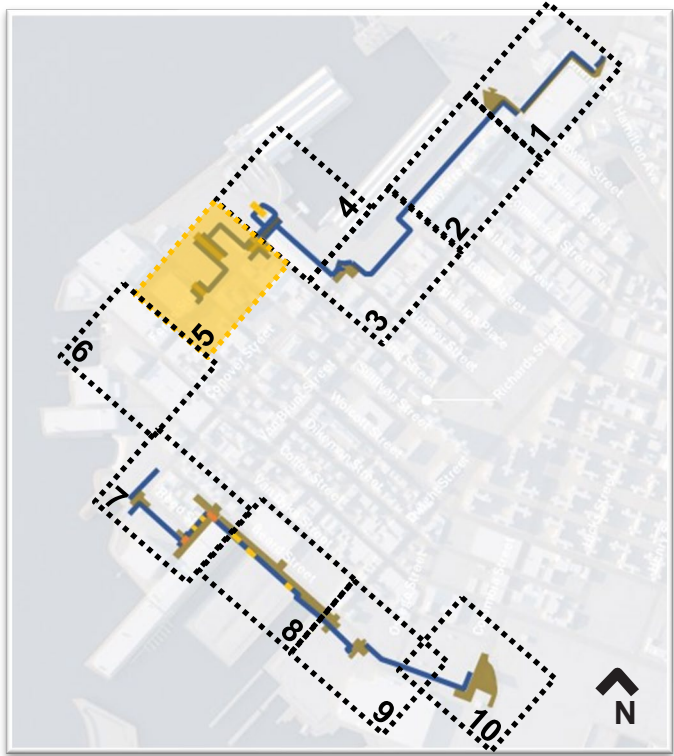


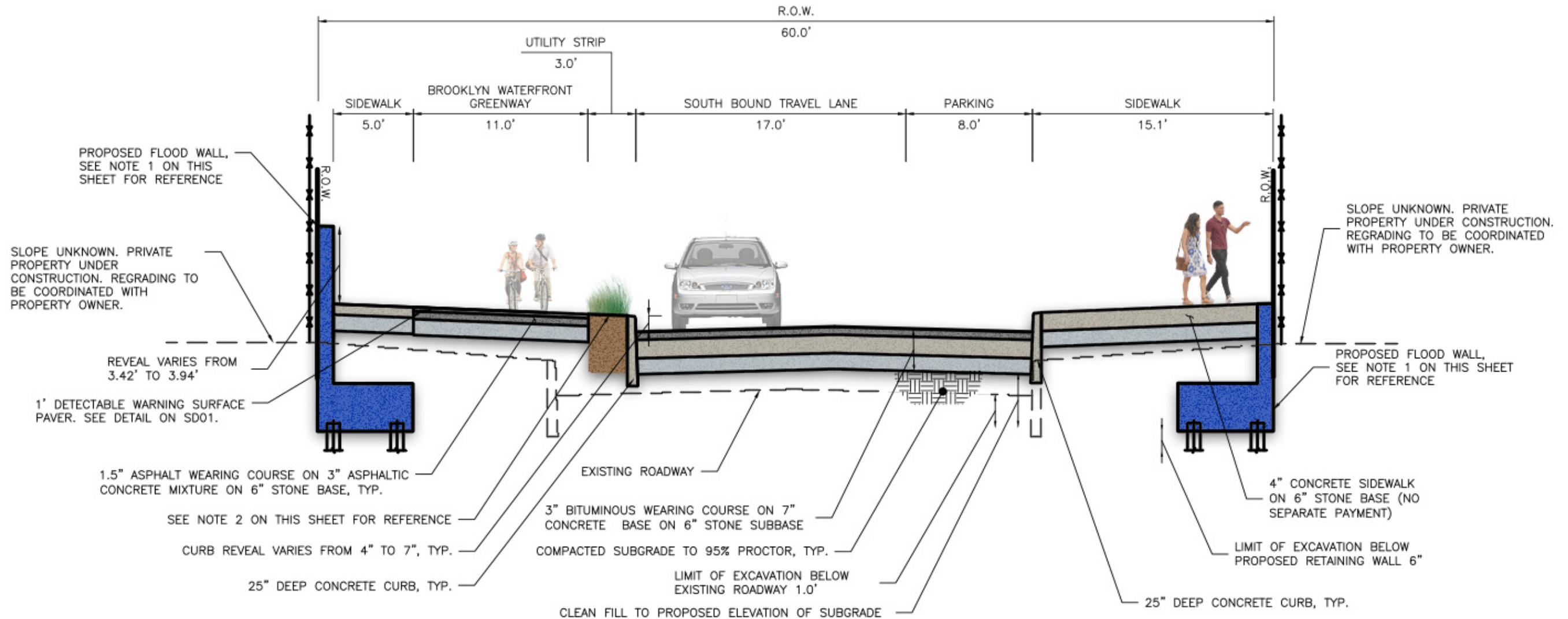


Plan 5 of 10 Ferris Street from Clinton Wharf to Sullivan Street
PROPOSED CONDITIONS



PLANTING TYPE A & B
 Note: Refer to slide 76 for Planting Details

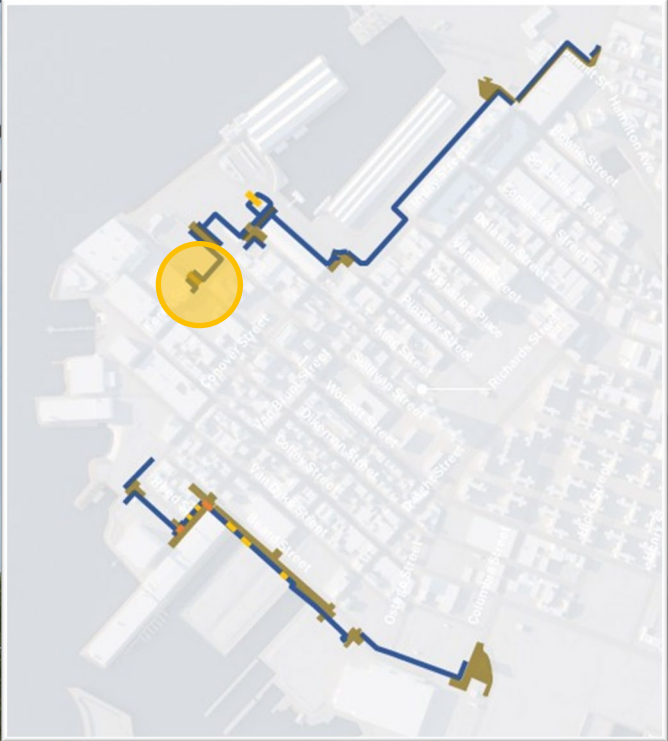




FERRIS STREET TYPICAL SECTION

Ferris Street

FLOOD WALL
AGAINST BUILDING

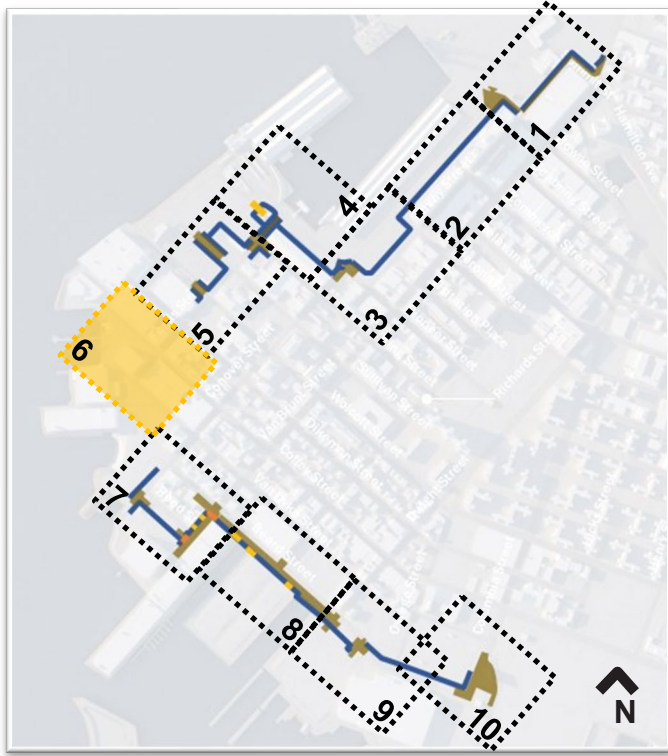


BROOKLYN
WATERFRONT
GREENWAY





Plan 6 of 10 Ferris / Van Dyke / Conover and Beard Streets
EXISTING CONDITIONS

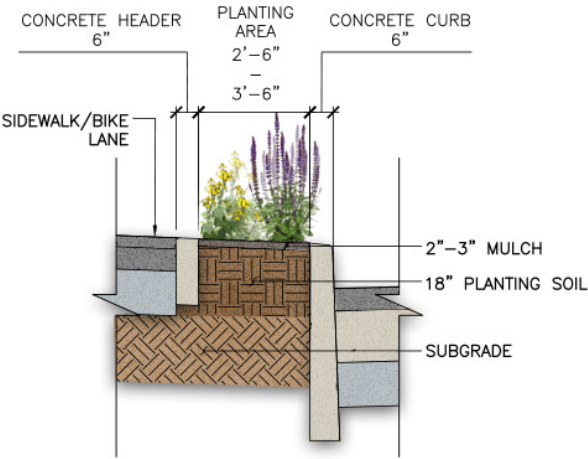




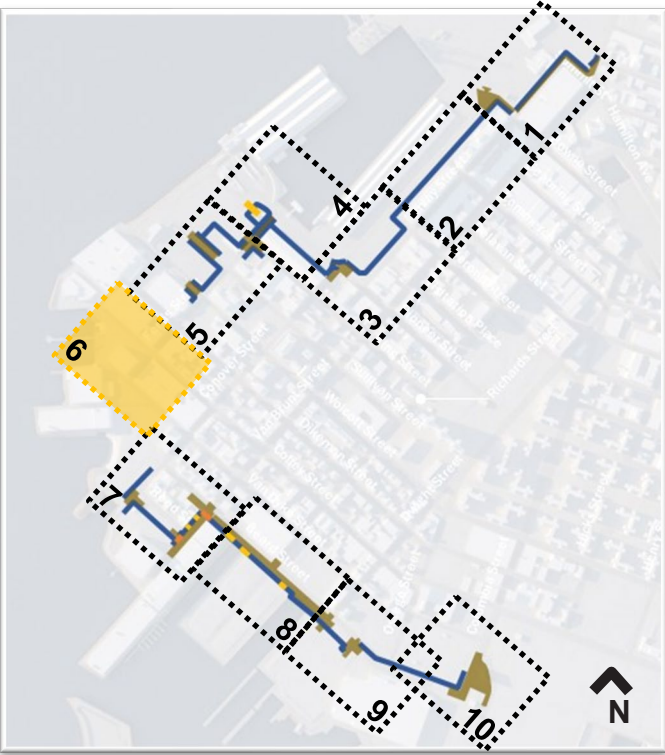
Plan 6 of 10 Ferris / Van Dyke / Conover and Beard Streets
PROPOSED CONDITIONS

LEGEND

- Floodwall
- Green Strip
- Roadway Improvements
- Sidewalk Improvements

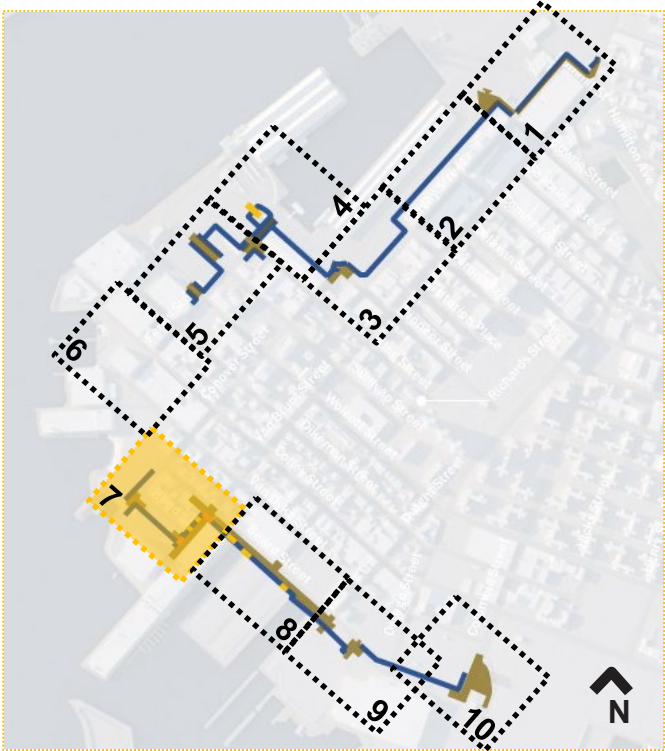


PLANTING TYPE A & B
 Note: Refer to slide 76 for Planting Details



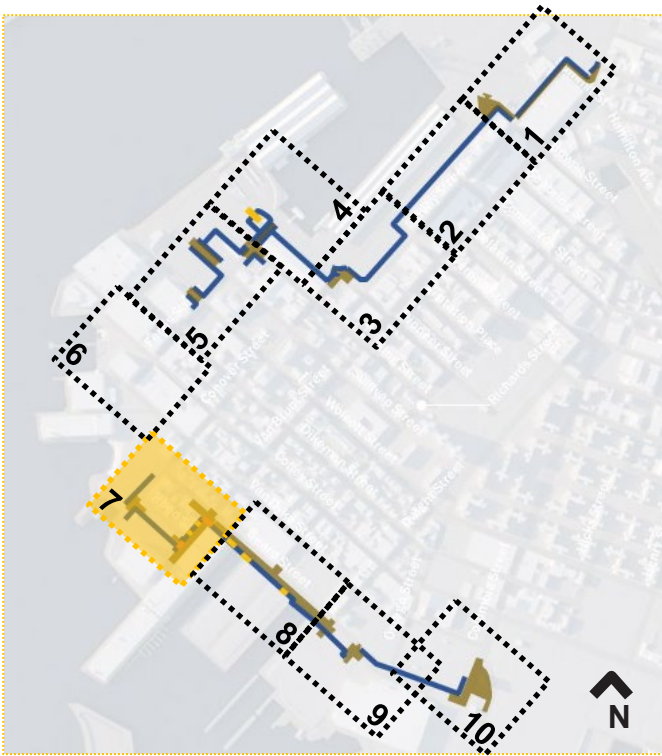
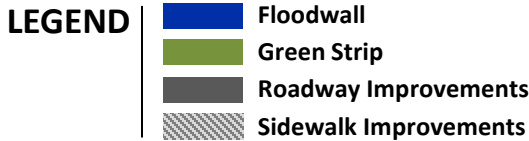


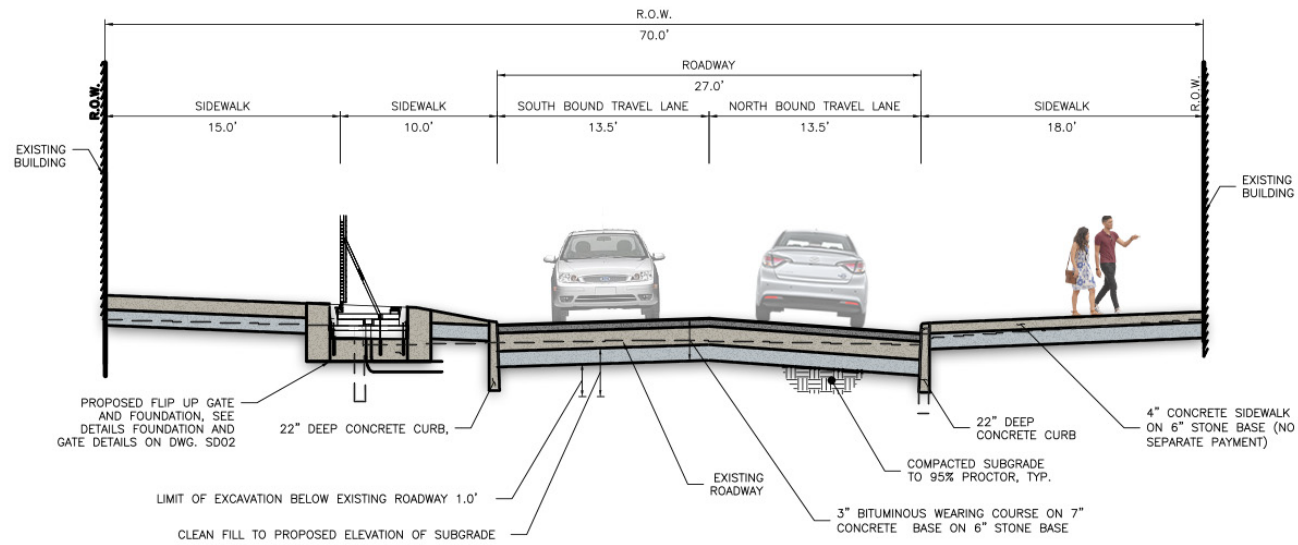
Plan 7 of 10 Reed Street between Conover and Van Brunt Street
EXISTING CONDITIONS



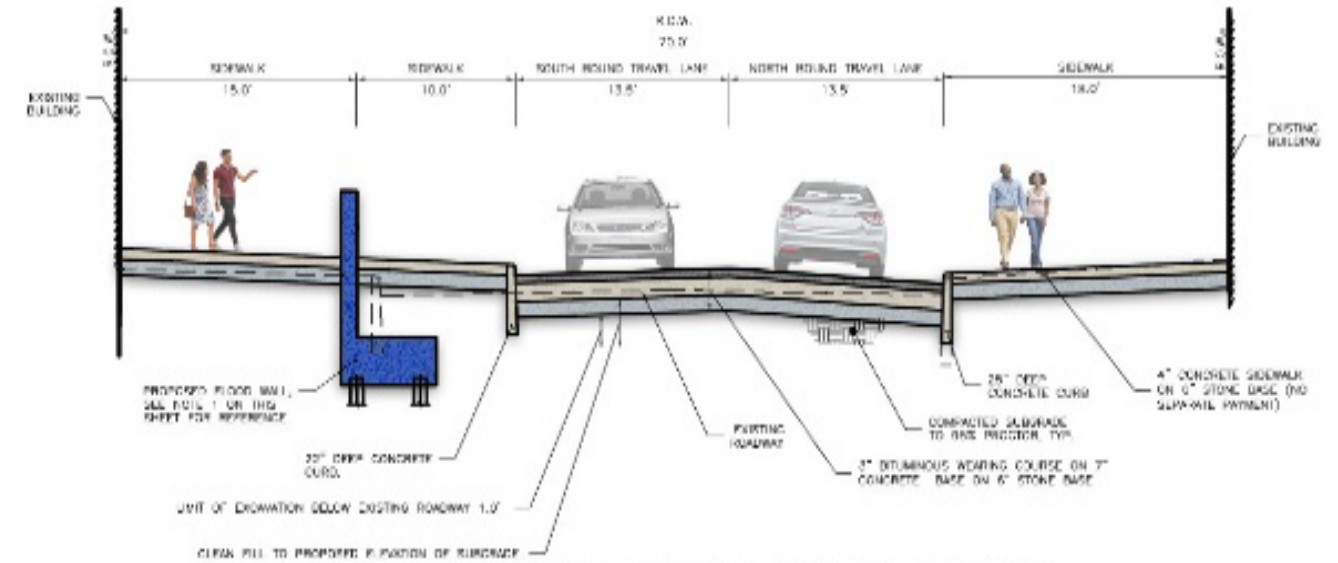


Plan 7 of 10 Reed Street between Conover and Van Brunt Street
PROPOSED CONDITIONS



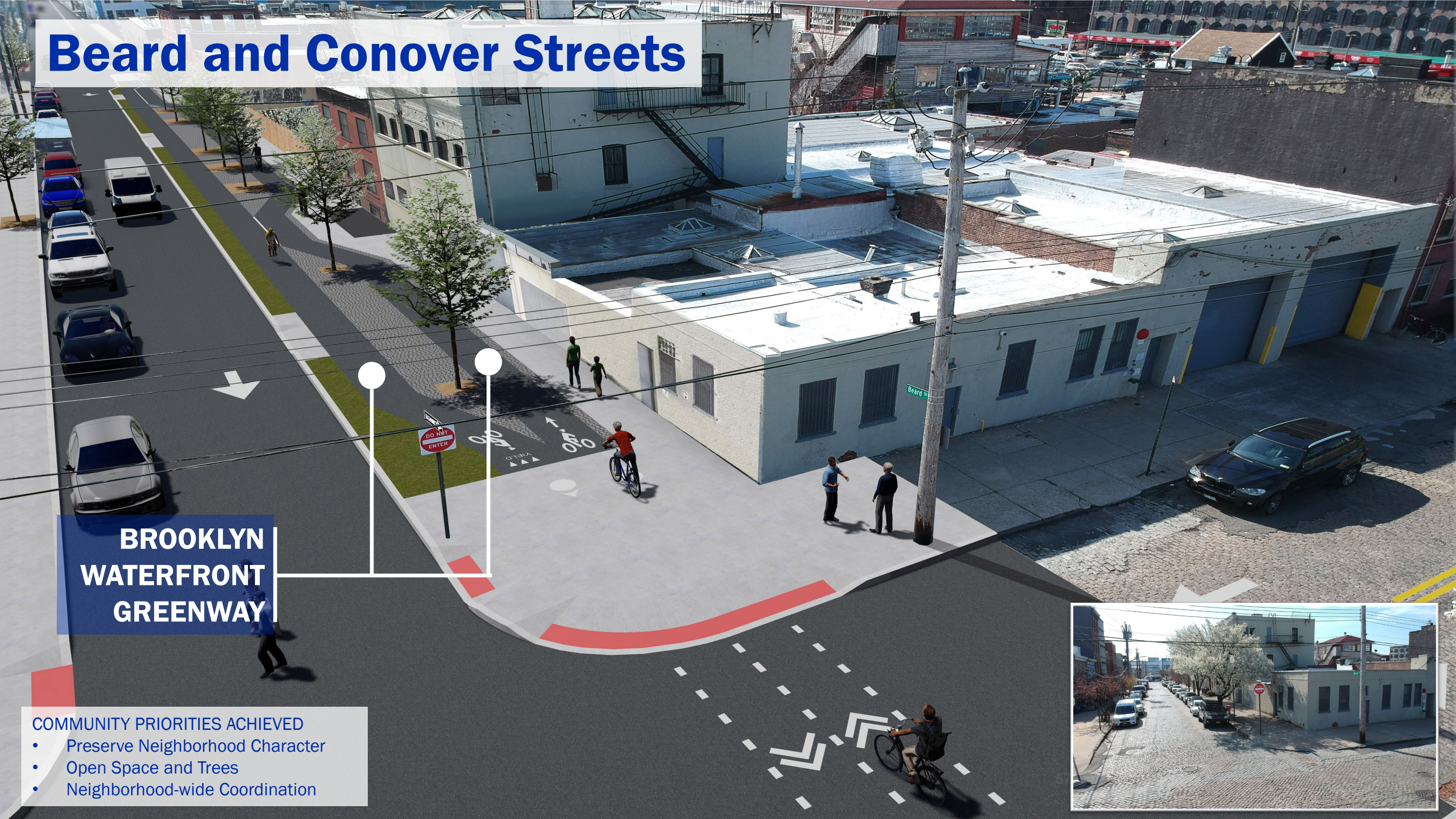


VAN BRUNT STREET TYPICAL SECTION



VAN BRUNT STREET TYPICAL SECTION

Beard and Conover Streets



**BROOKLYN
WATERFRONT
GREENWAY**

COMMUNITY PRIORITIES ACHIEVED

- Preserve Neighborhood Character
- Open Space and Trees
- Neighborhood-wide Coordination



Reed and Conover Streets

FLOOD
WALL

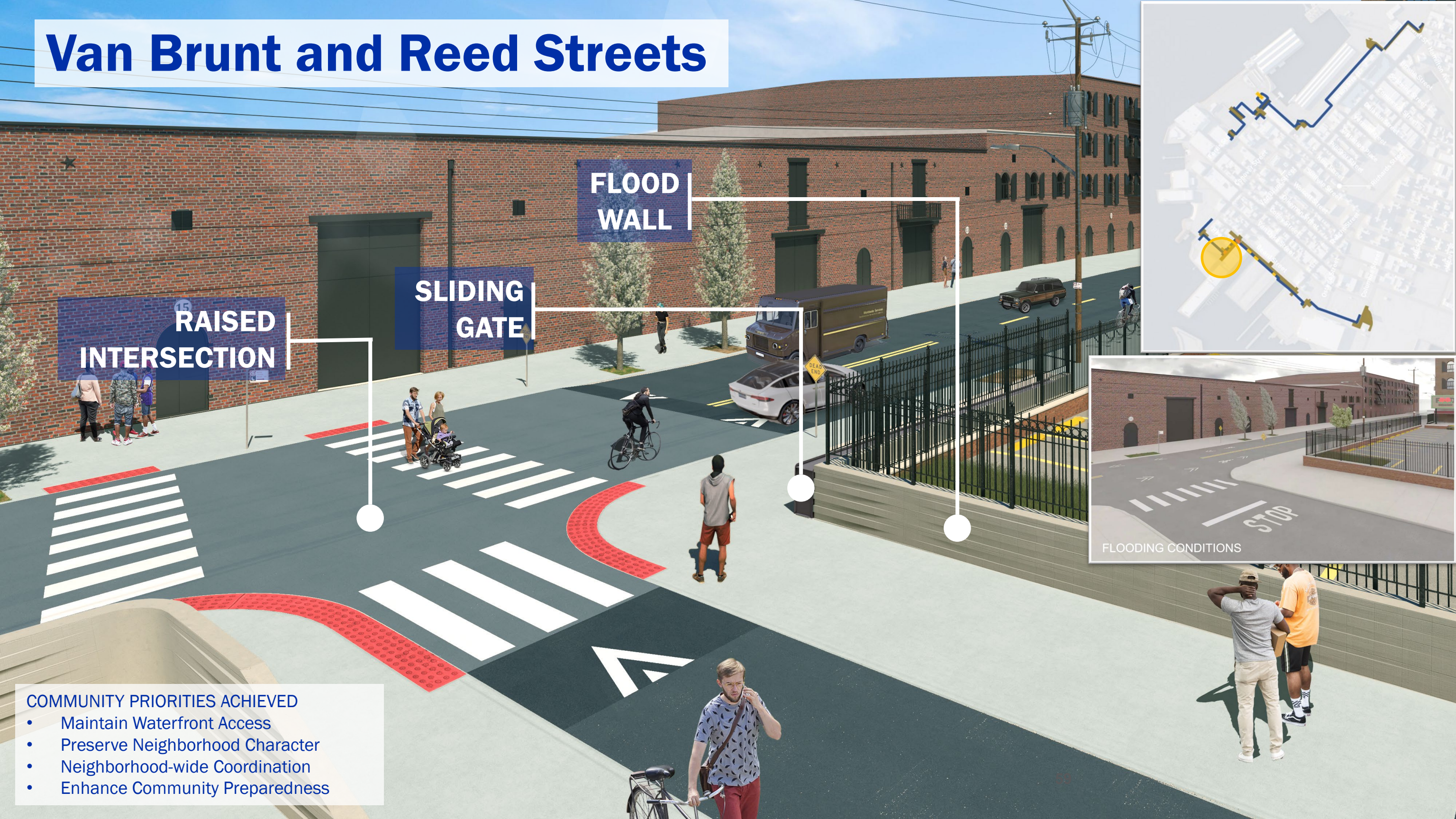
RAISED
CROSSWALK

FLOOD
WALL

- COMMUNITY PRIORITIES ACHIEVED
- Maintain Waterfront Access
 - Preserve Neighborhood Character
 - Neighborhood-wide Coordination
 - Enhance Community Preparedness



Van Brunt and Reed Streets



FLOOD
WALL

SLIDING
GATE

15
RAISED
INTERSECTION

FLOODING CONDITIONS

COMMUNITY PRIORITIES ACHIEVED

- Maintain Waterfront Access
- Preserve Neighborhood Character
- Neighborhood-wide Coordination
- Enhance Community Preparedness

Van Brunt and Reed Streets



FLOOD
WALL

SLIDING
GATE

15

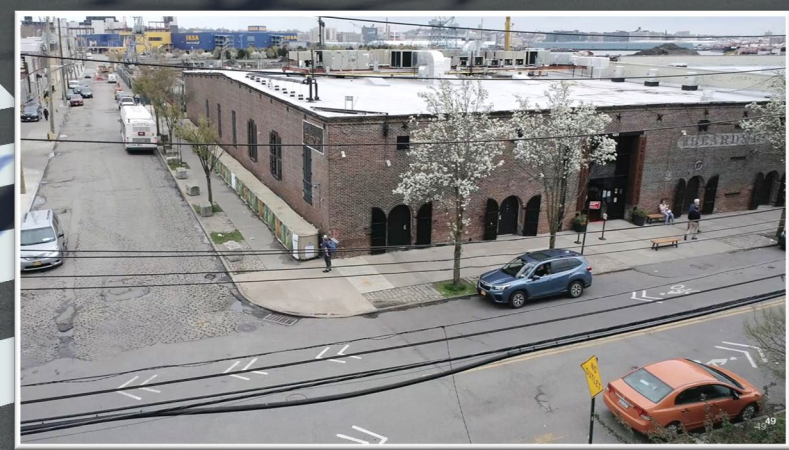
FLOODGATE

01

DEAD
END

FLOODING CONDITIONS

Beard and Van Brunt Streets

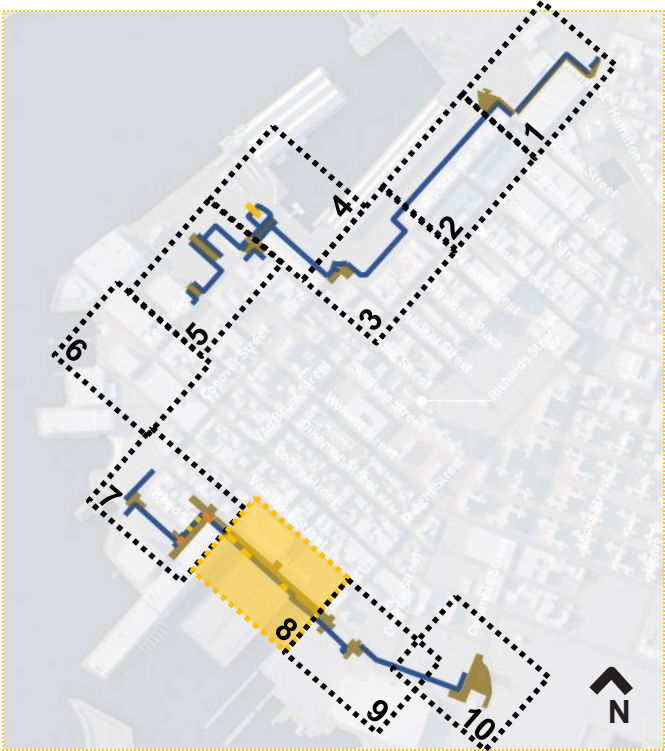


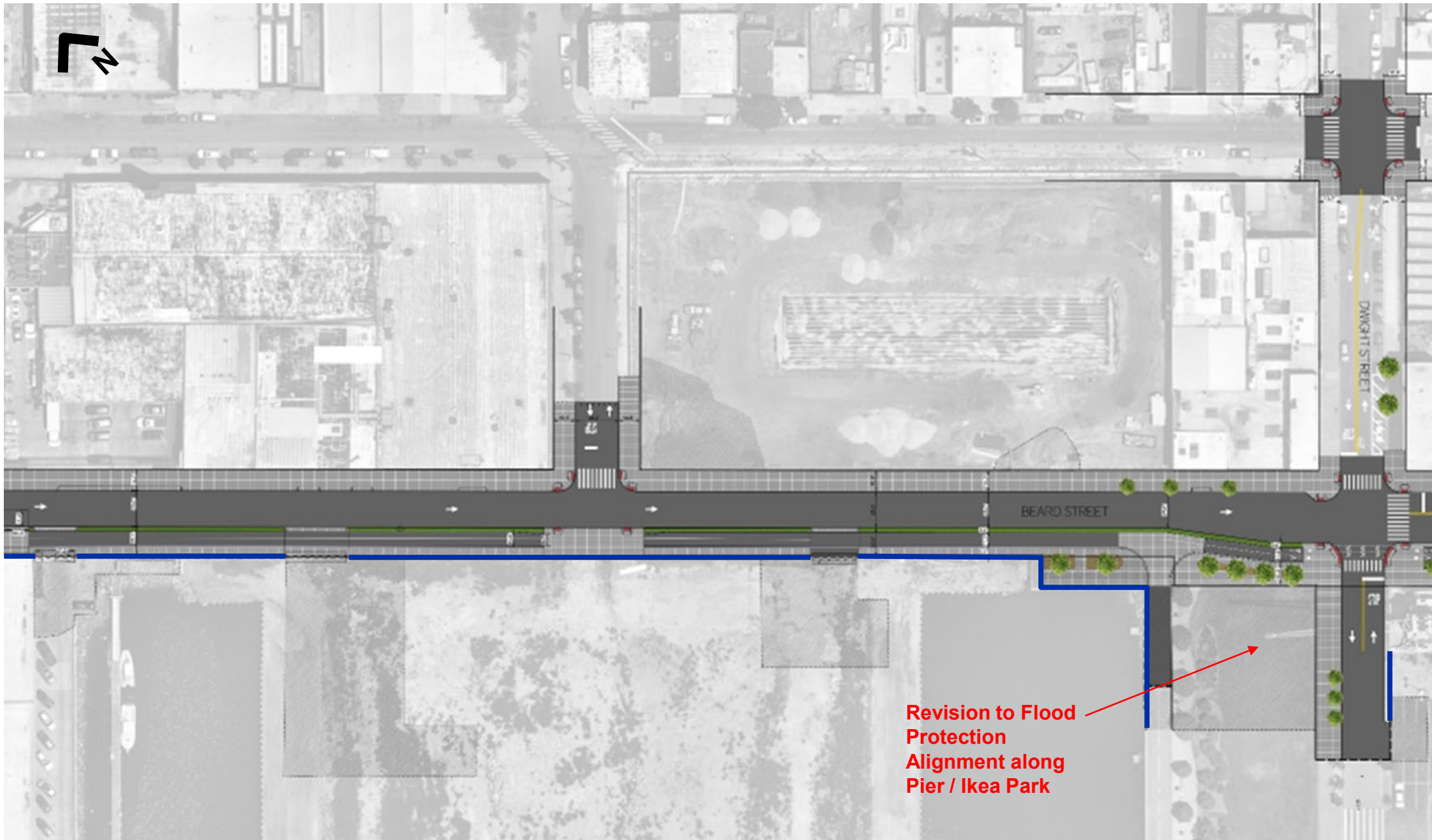
Beard and Van Brunt Streets





Plan 8 of 10 Beard Street
EXISTING CONDITIONS

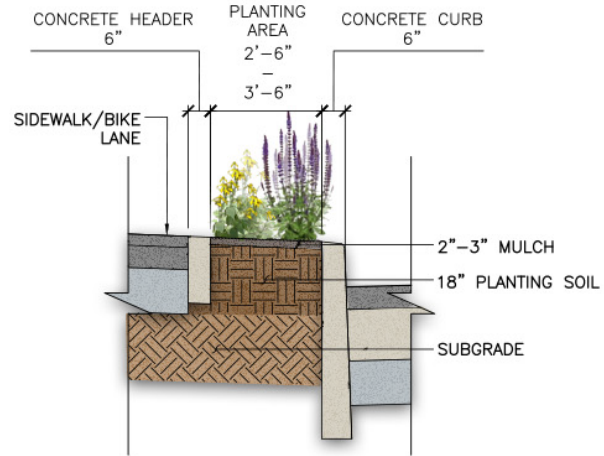




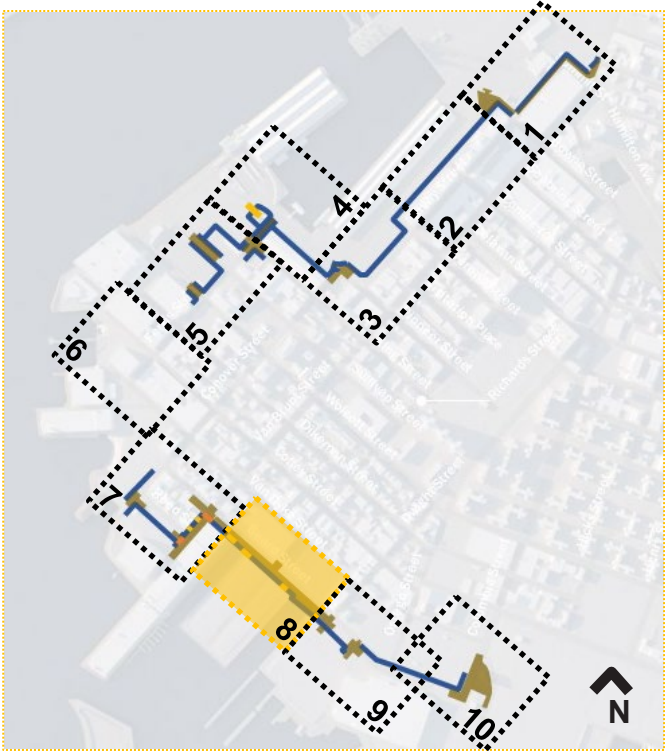
Plan 8 of 10 Beard Street
PROPOSED CONDITIONS

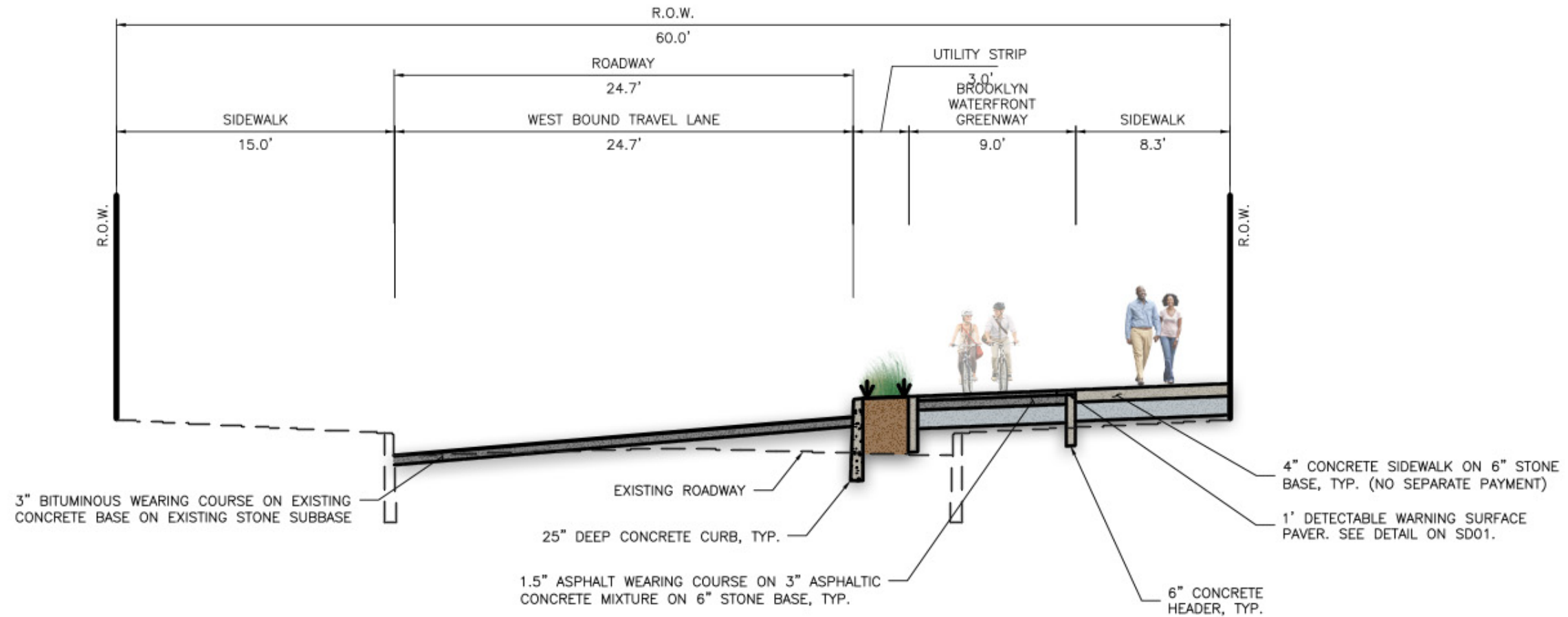
LEGEND

- Floodwall
- Green Strip
- Roadway Improvements
- Sidewalk Improvements

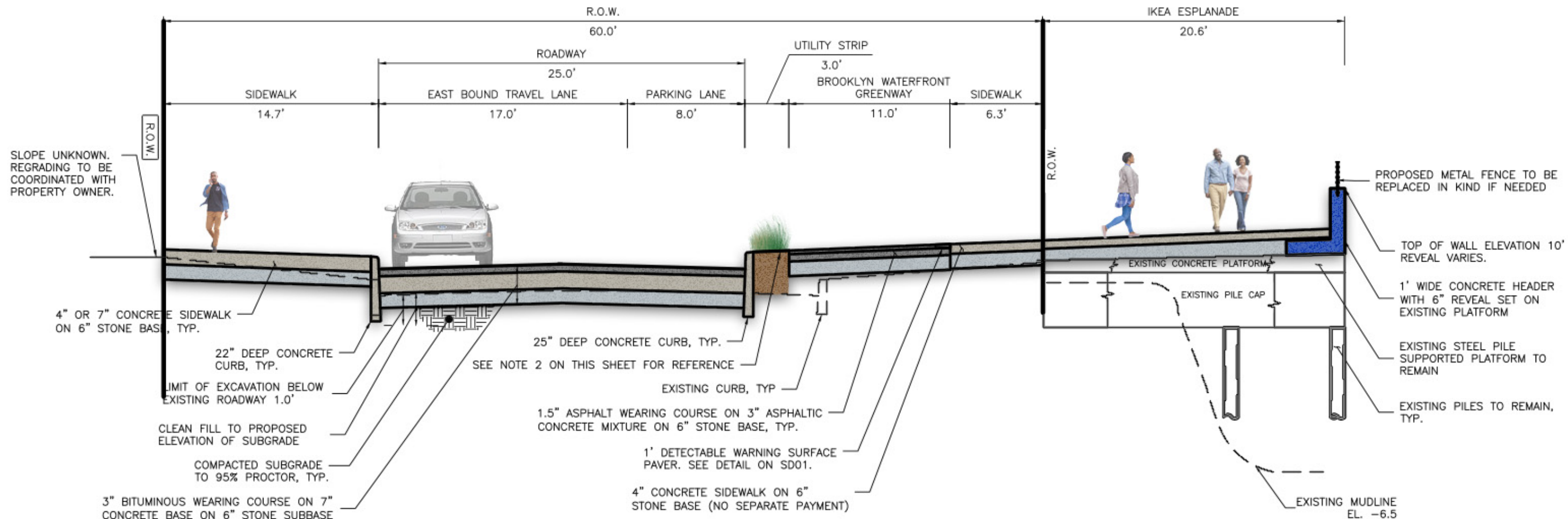


PLANTING TYPE A & B





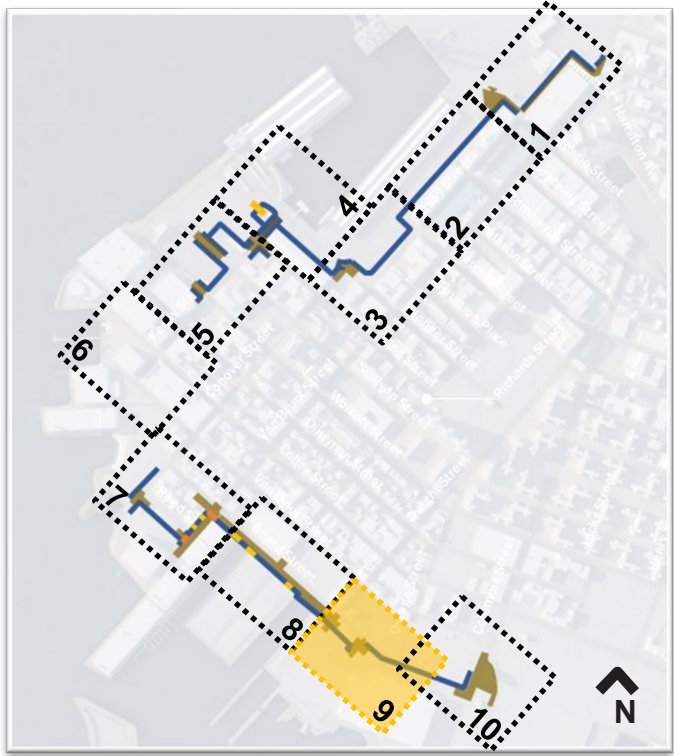
BEARD STREET TYPICAL SECTION

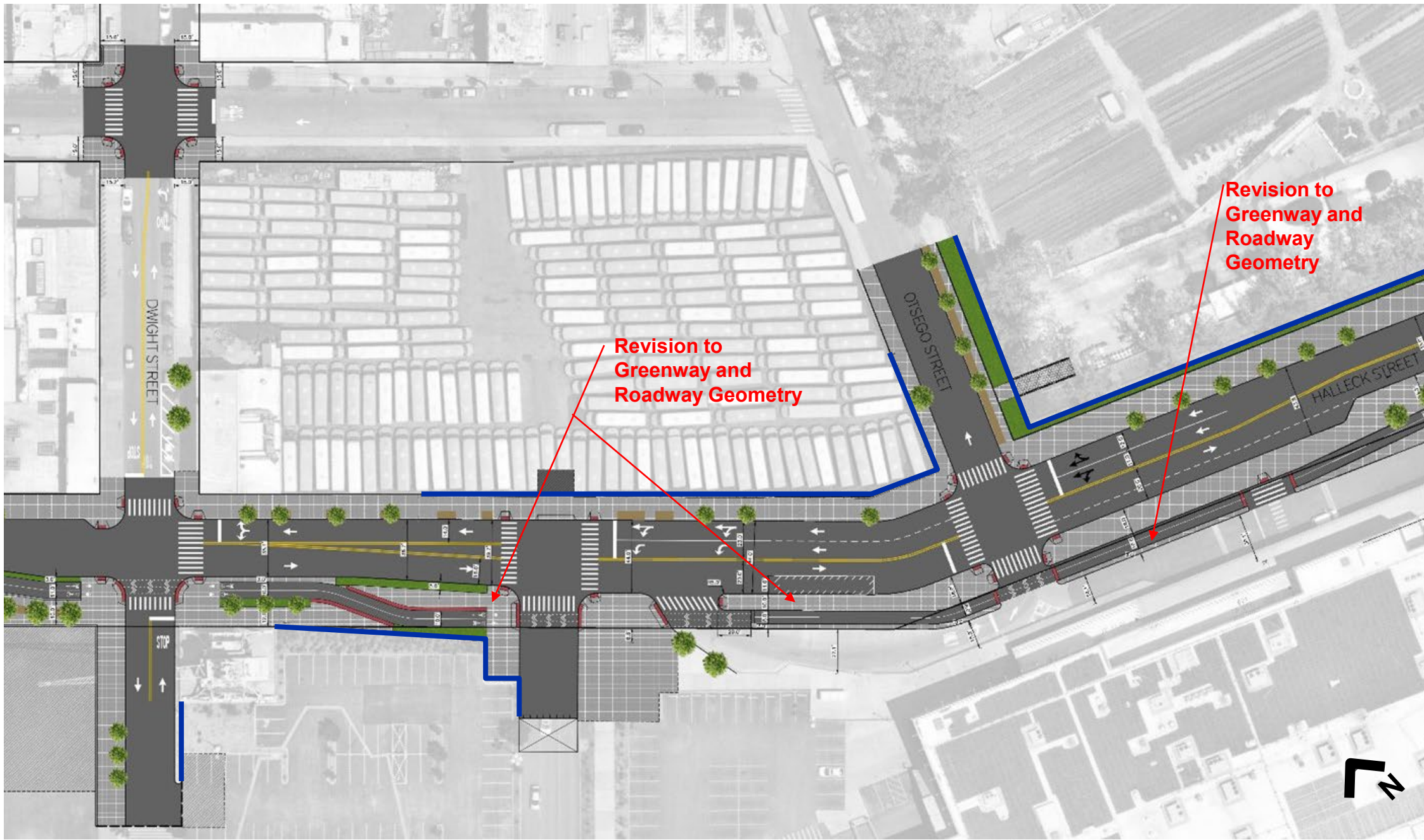


BEARD STREET TYPICAL SECTION



Plan 9 of 10 Beard Street / Ikea Park
EXISTING CONDITIONS

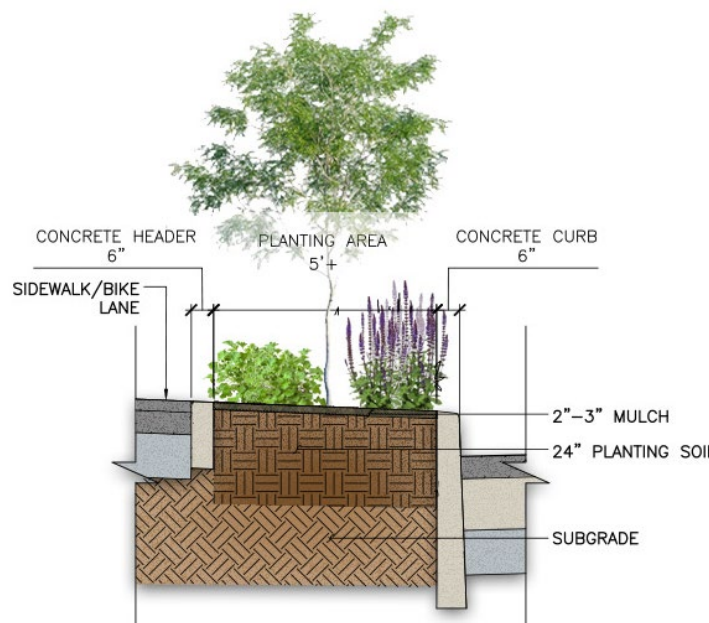




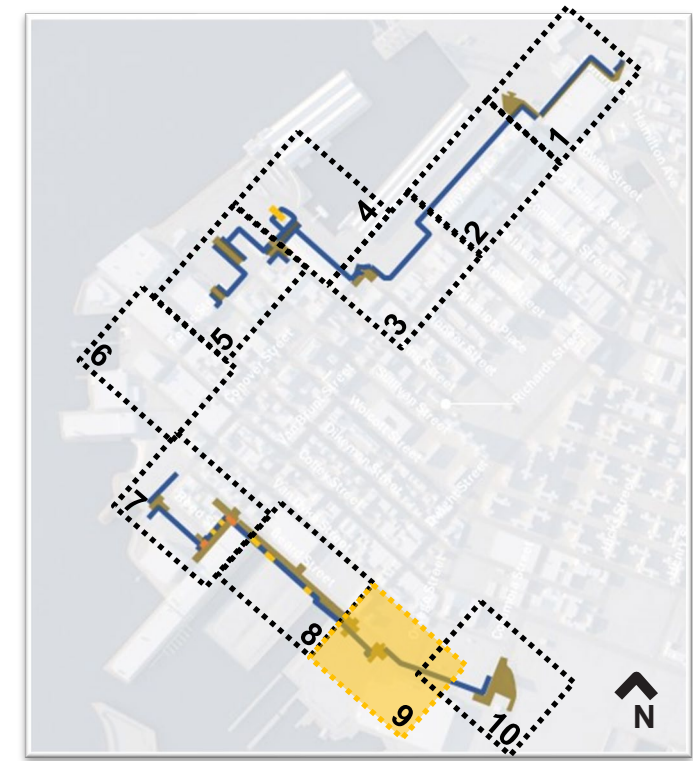
Plan 9 of 10 Beard Street / Ikea Park
PROPOSED CONDITIONS

LEGEND

- Floodwall
- Green Strip
- Roadway Improvements
- Sidewalk Improvements



PLANTING TYPE C
Note: Refer to slide 76 for Planting Details



Beard Street At Ikea Park

Draft
Rendering

RAISED
PIER

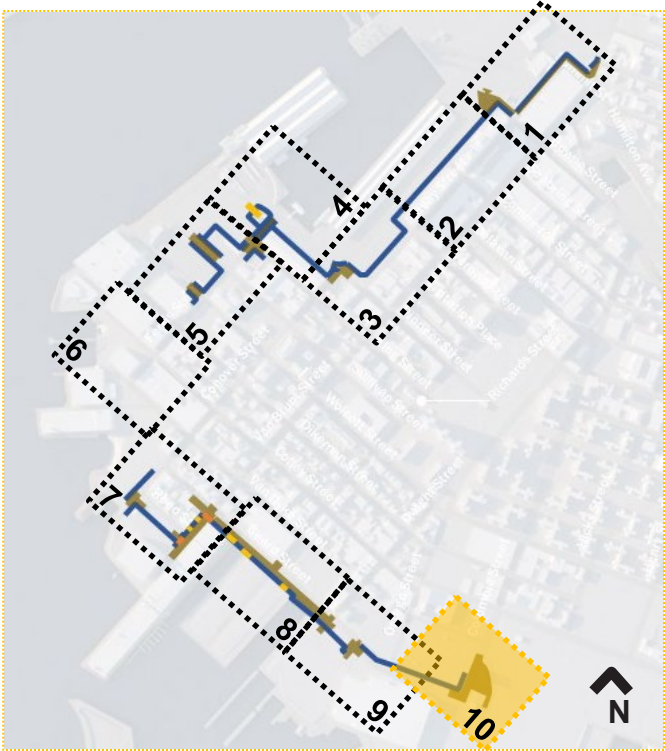
FLOOD
WALL

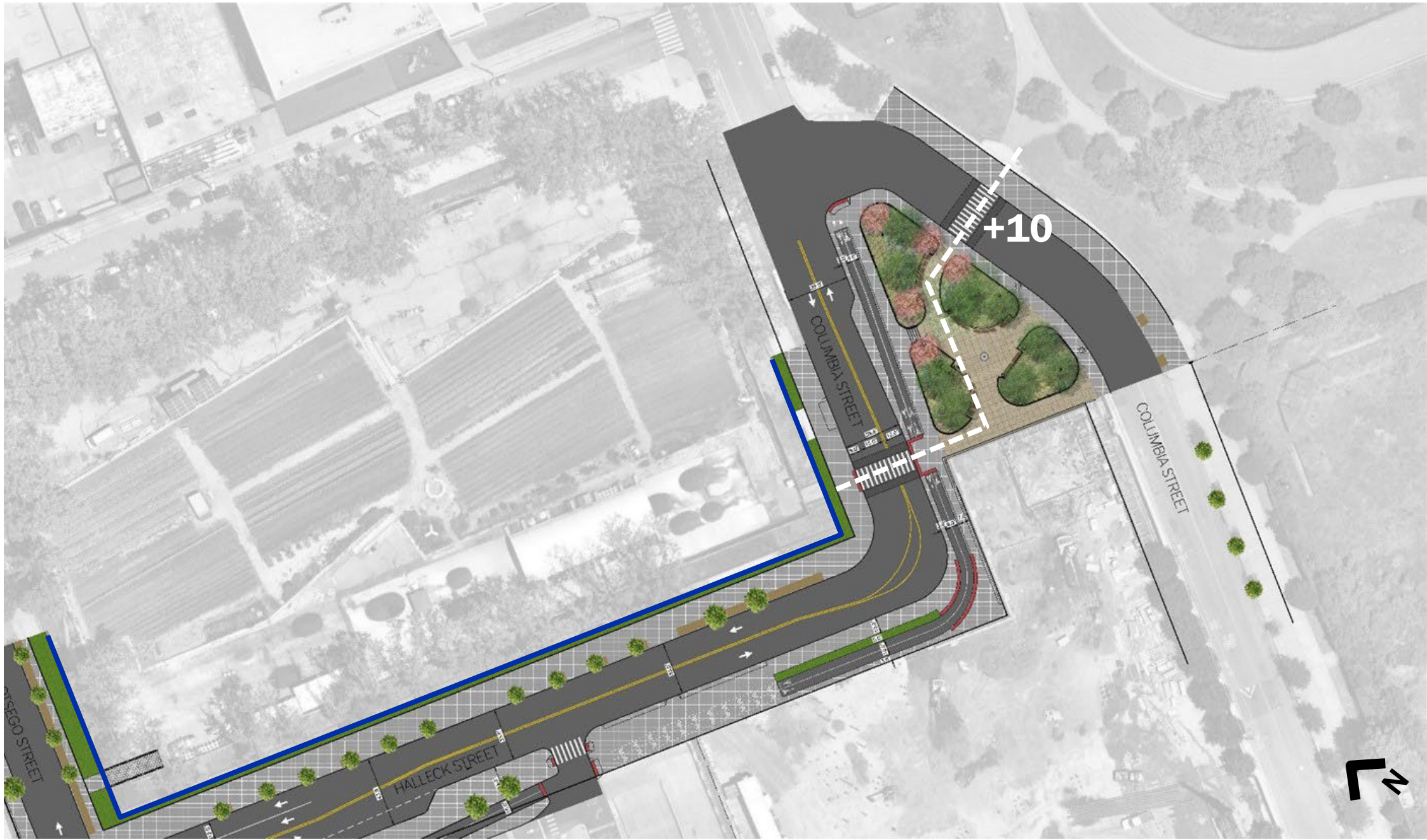
+10





Plan 10 of 10 Halleck and Columbia Streets at Todd Triangle
EXISTING CONDITIONS

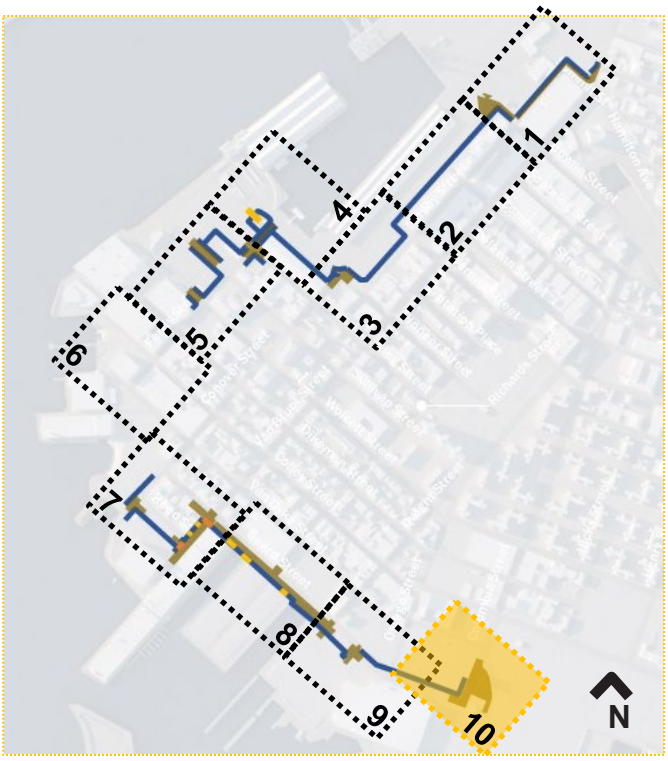




Plan 10 of 10 Halleck and Columbia Streets at Todd Triangle
PROPOSED CONDITIONS

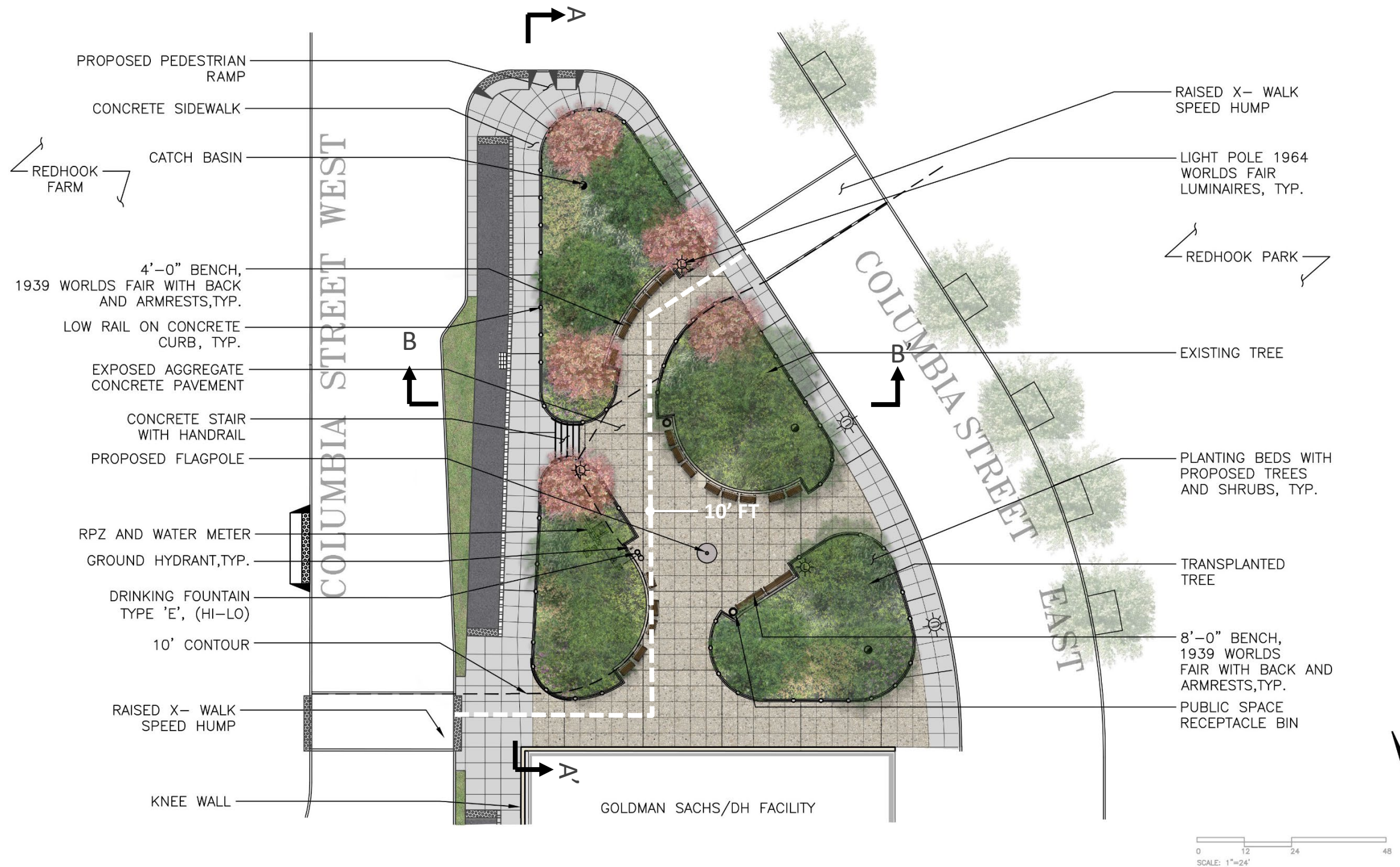
LEGEND

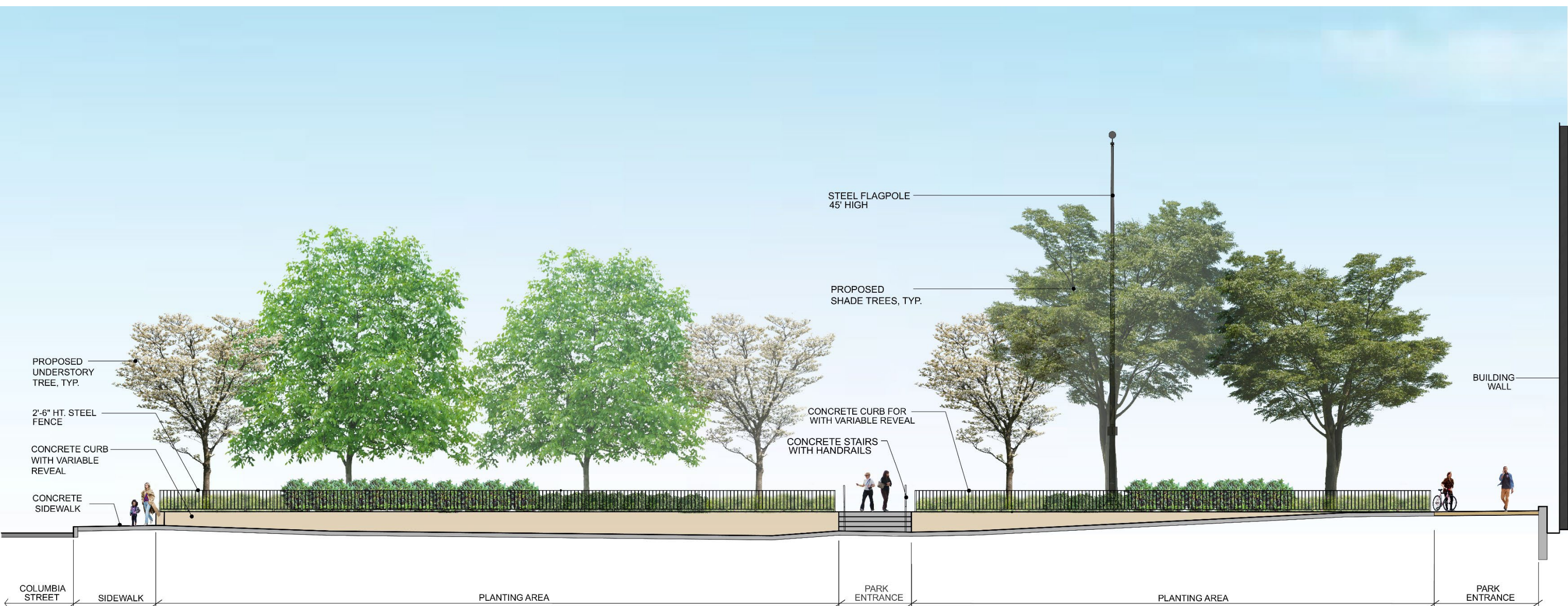
	Floodwall
	Green Strip
	Roadway Improvements
	Sidewalk Improvements



Todd Triangle (Columbia Street)





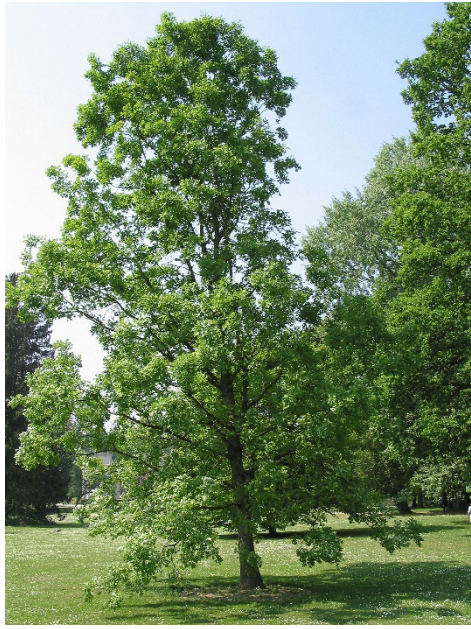




PLANTNG PALETE



Quercus imbracraua



Quercus macrocarpa



Quercus phellos



Ulmus parviflora



Celtis occidentalis



Crataegus crus-galli



Styphnolobium japonicum



Gleditsia triacanthos var. inermis



Taxodium distichum



Aronia arbutifolia



Aronia melanocarpa



Aronia arbutifolia 'brilliantissima'



Ceanothus americanus



Cornus sericea 'Kelsey's Dwarf'



Hypericum calycinum



Ilex glabra 'Shamrock'



Morella pensylvanica



Rhus aromatica 'Gro Low'



Rosa virginiana



Achillea millefolium 'Paprika'



Aesclepias incarnata



Aesclepias tuberosa



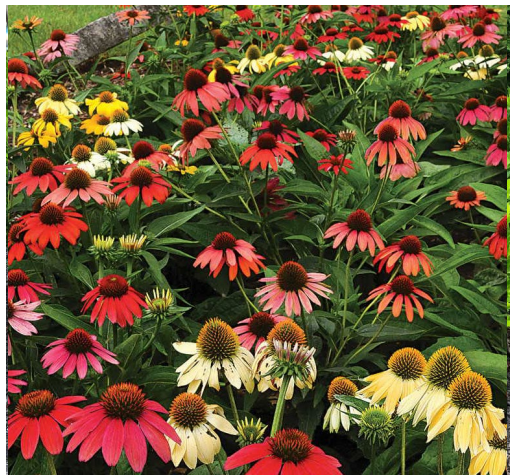
Amsonia 'Blue Ice'



Aster cordifolius



Aster lateriflorus 'Lady in Black'



Echinacea 'Cheyenne Spirit'



Eupatorium dubium 'Little Joe'



**Eupatorium rugosum
'Chocolate'**



**Heliopsis helianthoides
'Summer nights'**



Iris versicolor



Nepeta 'Walkers Low'



Pycnanthemum muticum



Rudbeckia laciniata



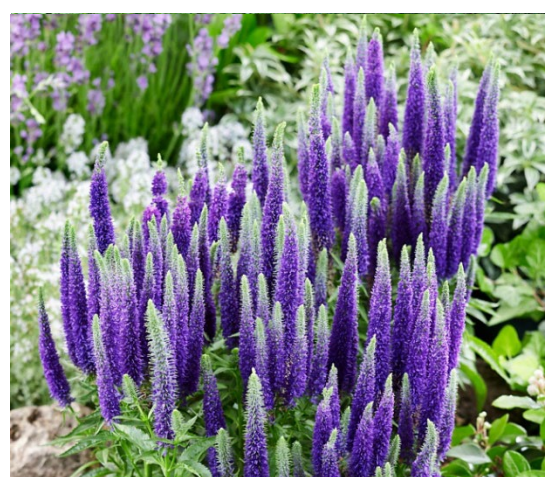
Salvia nemorosa 'Caradonna'



Solidago caesia



Solidago sempervirens



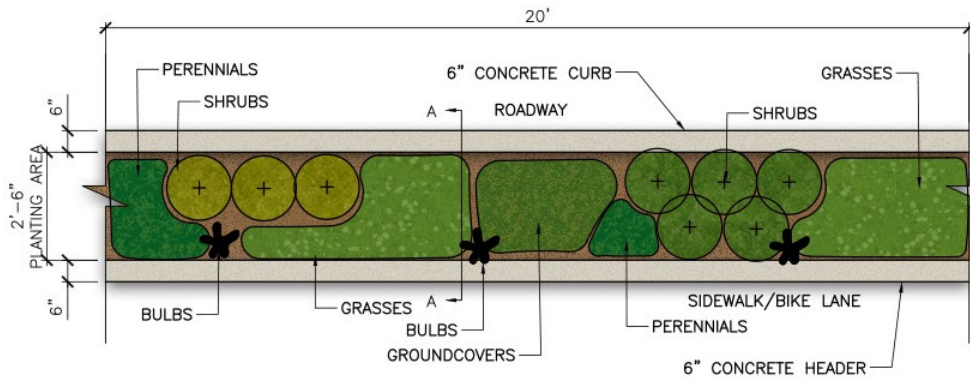
Veronica spicata 'Glory'
Royal Candles



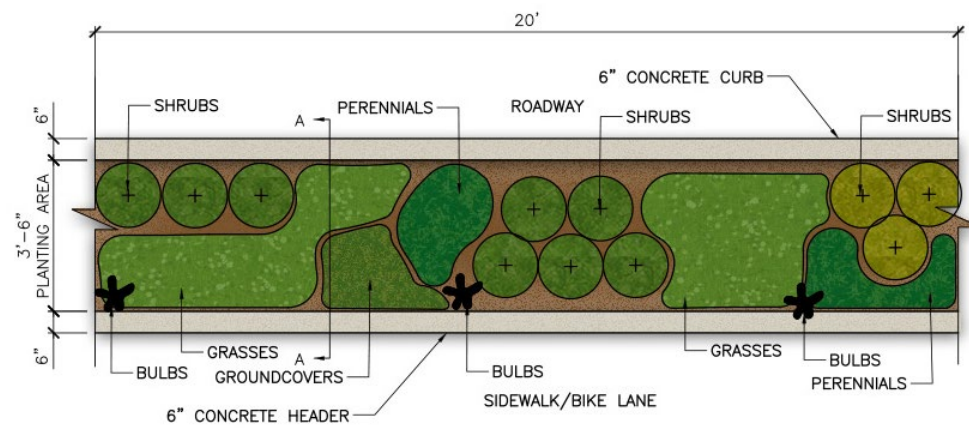
Eupatorium hyssopifolium



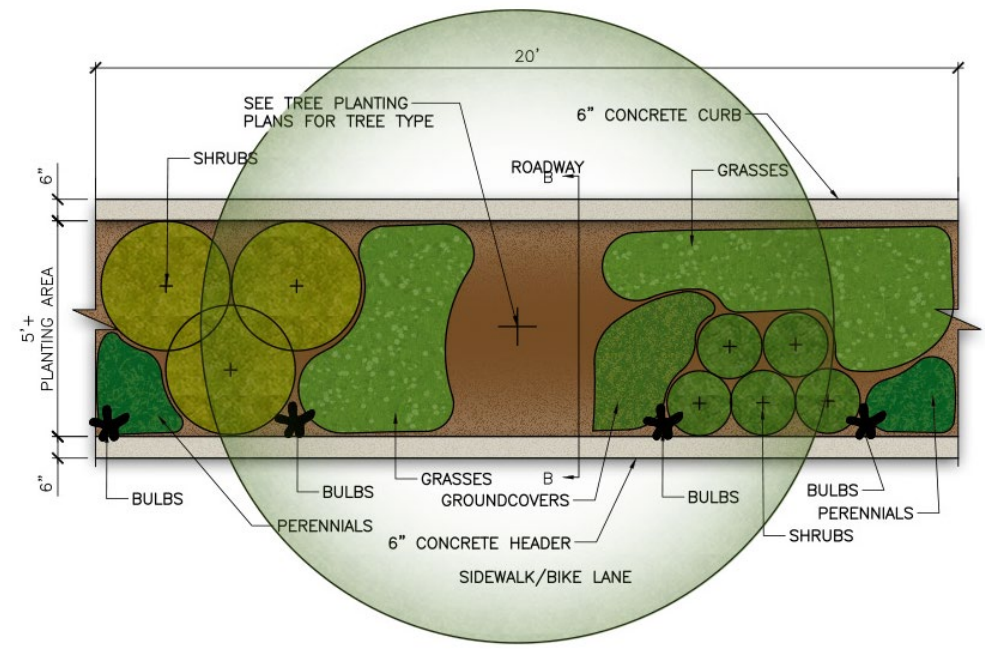
Narcissus 'Dutch Master'



PLANTING TYPE A DETAIL



PLANTING TYPE B DETAIL



PLANTING TYPE C DETAIL



Cornus florida



Platanus x acerifolia



Zelkova carpinifolia



Zelkova serrata



Cornus alba



Diervilla lonicera



Rhus aromatica



Rosa virginiana



Ilex glabra "Shamrock"



Itea virginica

MATERIALS AND SITE FURNISHINGS



NYC Parks Standard CityBench



Granite Block Seating



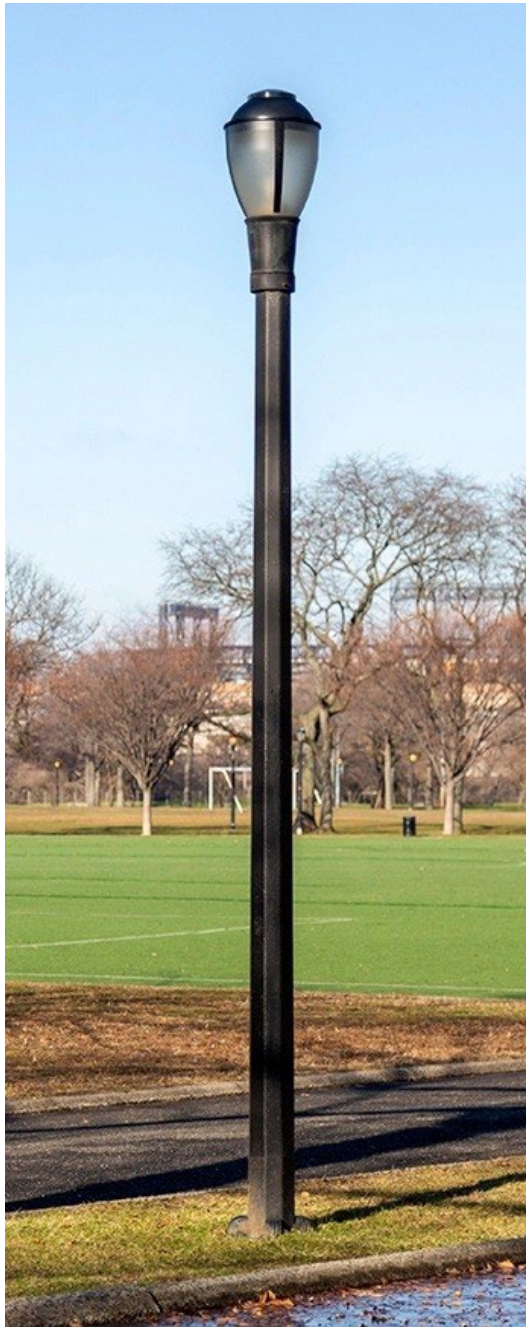
NYC DOT Standard DOT Bike Rack



Salvaged Cobble Paving



ADA Compliant Cobble Paving



World's Fair Lamp Post and Lamp



NYC Parks Standard Flagpole



NYC Parks Standard Public Space Receptacles



NYC Parks Standard 1939 World's Fair Bench



NYC Parks Standard 2'-6" Steel Fence



NYC Parks Standard Water Fountain Type E, (Hi-Lo)

NEIGHBORHOOD WIDE CHANGES

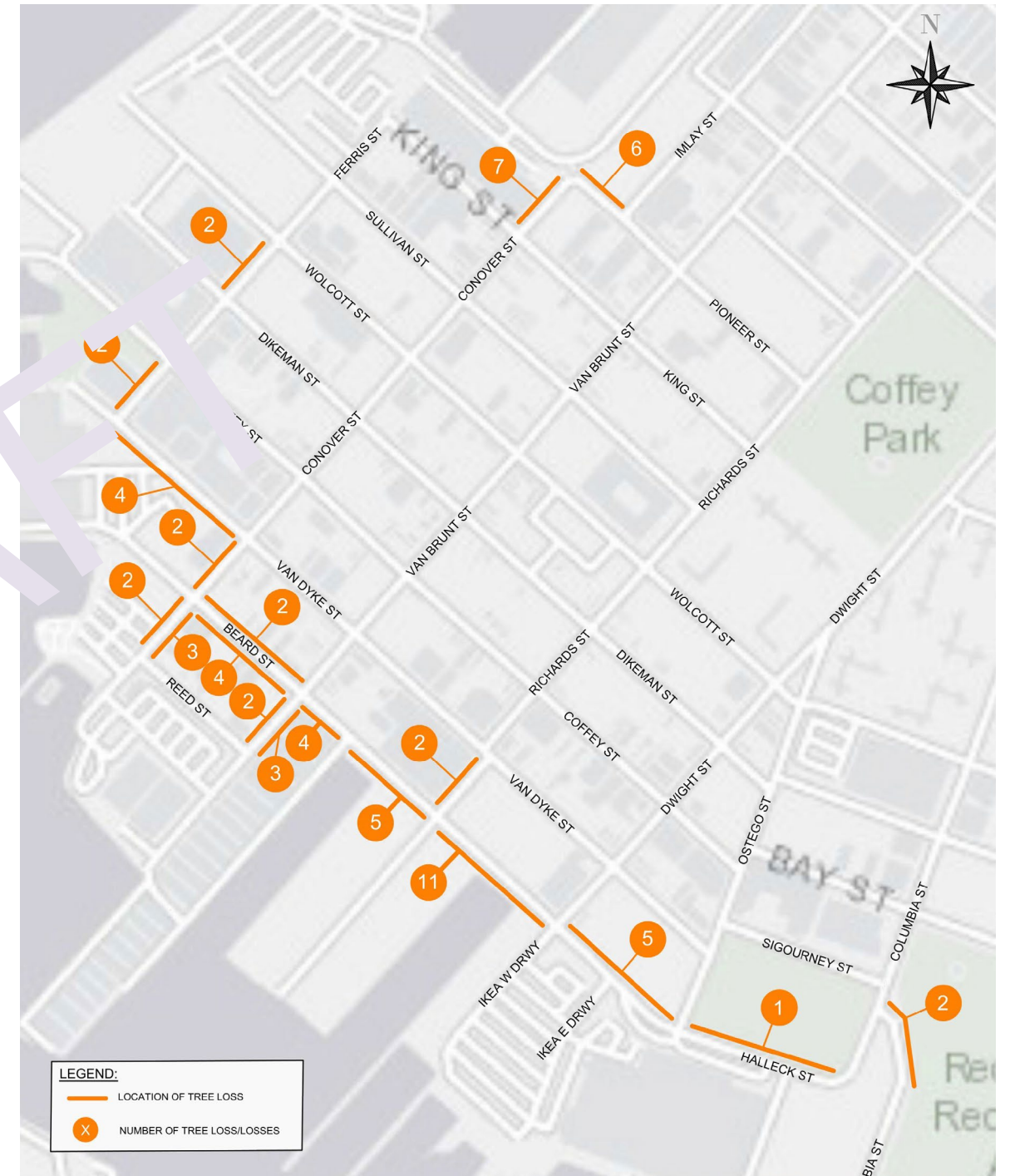
This project seeks to preserve trees unless there is unavoidable impacts due to the installation of floodwall foundations and the Brooklyn Waterfront Greenway (BWG). The project team will look for opportunities to plant new trees in the neighborhood to reduce tree loss as much as possible.

Existing Trees

Anticipated number of impacted trees is 69 (*tbd*), due to: floodwall foundation, pedestrian access, BWG, and existing tree health

Proposed Planting Plans

DDC is in coordination with NYC Parks to develop a planting plan that meets tree replacement requirements



This project seeks to preserve parking spots as much as possible, however there are unavoidable impacts due to the installation of the Brooklyn Waterfront Greenway (BWG) and floodwall that could lead to parking loss:

Curbside Parking with Street Cleaning Regulations

● Total of 70 spots will be removed

Curbside Parking without Current Regulations

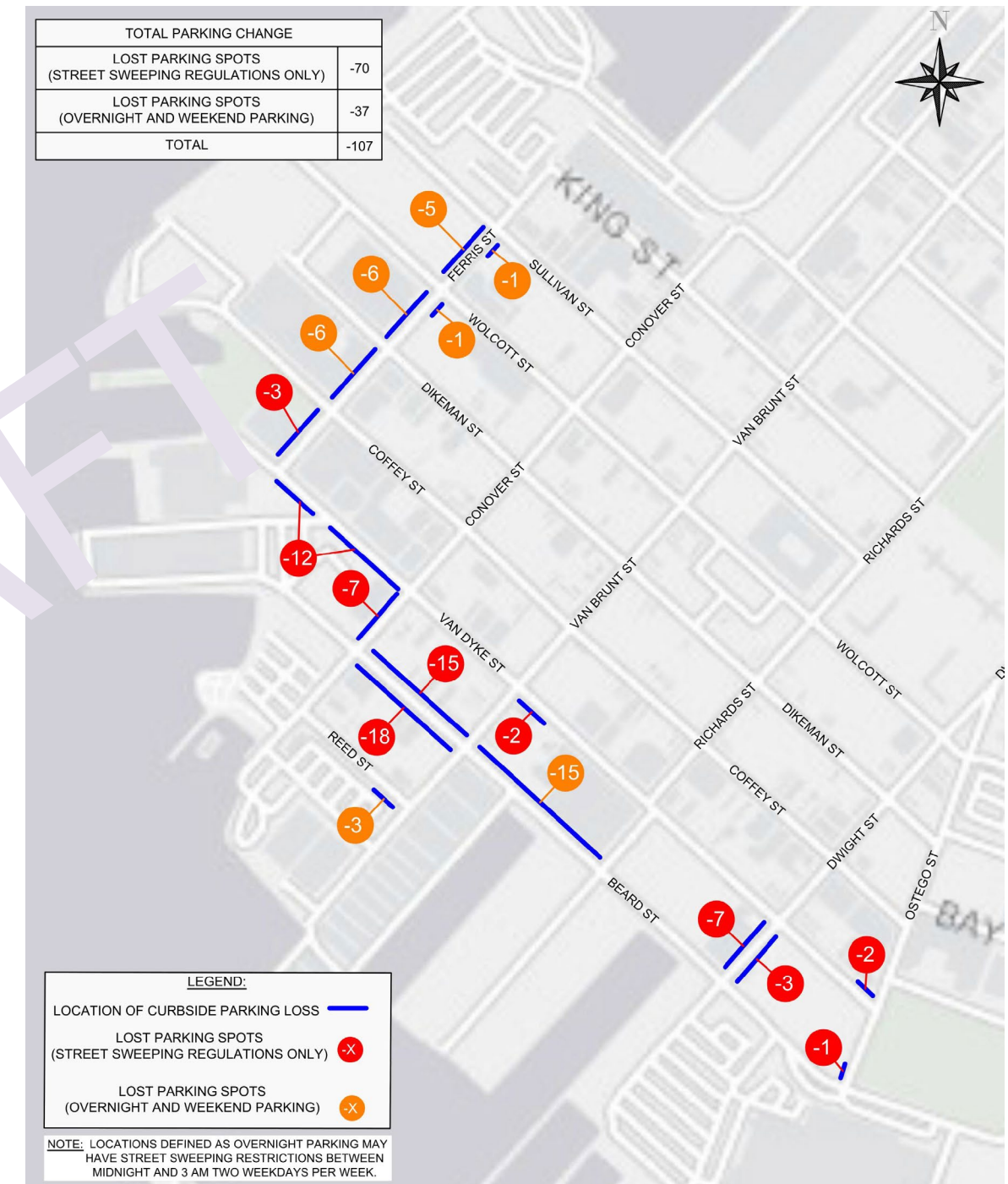
● Total of 37 spots will be removed

Reason for Parking Loss

Majority of Parking Loss is due to the inclusion of the Brooklyn Waterfront Greenway

Utilization Study Completed

- Peak Utilization: 67-71%
- Loss of spots is not anticipated to result in a Parking Shortfall
- 80% Parking Loss is not within Residential Areas
- Excess On-Street Parking Capacity
- Accounts for Development / Zoning Requirements



As part of this project, some street directions and traffic flow in some areas will be reorganized to improve efficiency, diversify truck traffic, and to allow the implementation of the Brooklyn Waterfront Greenway (BWG):

Ferris Street

Convert Ferris Street to one-way South-Bound (Sullivan to Coffey St.)
Convert Ferris Street to one-way North-Bound (Van Dyke to Coffey St.)
This creates a one-way pair between Ferris St. and Conover St.

Van Dyke

Convert Beard Street to one-way EB (Van Brunt to Dwight Streets)
This creates a one-way pair between Beard St. and Van Dyke St.



APPENDIX