Battery Park City
Ballfields & Community Center Resilience Project

Flood Resilience Selection

BPCA Meeting
July 25, 2019
Agenda

- Site Review
- Permanent Solution: Reinforced Concrete Wall (DFE 14.5’)
- Interim Solution: Steel Plate Wall (DFE 11’)
- Guiding Objectives Review
- Next Steps
Guiding Objectives

- Flood risk
- Integration with landscape and built environment
- Minimize loss of field use and duration of construction
- Cost
- Schedule
Permanent Solution: Reinforced Concrete Wall (DFE 14.5’)

- Reinforced Concrete Wall to DFE 14.5’ (NAVD88)
- Hybrid Alignment of Wall (Interior and Exterior)
- 6 Deployable Flood Barriers, 8 ConEd Grates
- Level of Protection
  - DFE 14.5’ = BFE 11’ + 2.5’ SLR + 1’ Freeboard
  - Wall at lowest grade = 7.7’
  - Full seepage cutoff
Permanent Solution: Reinforced Concrete Wall  
Warren Street

- Save and Protect Existing Fence
- Align Top of Fence with Bottom of Horizontal Rail
- Flood Wall with Interior Alignment
- 3” Safety Pads
- Existing Granite Wall
- New Piles and Flood Wall Foundation
- Existing Fence Footing Beyond
- Walkway
- Existing Granite Wall
- DFE 14.5
- Walkway
- Battery Park City Authority
- Warren St.
Permanent Solution: Reinforced Concrete Wall Alignment

- Moveable Flood Protection Device
- Permanent Wall with Architectural Treatment
- Architectural Treatment without Flood Barrier
- Fence

PROTECT AND SEAL MEP. ELECTRICAL AND CONDUITS INTO BUILDING OR UTILITY VAULTS TO MAINTAIN FLOOD WALL ALIGNMENT

MAINTAINING EGRESS AND EMERGENCY ACCESS TO BUILDINGS DURING STORM EVENTS AT LOADING BAY ON MURRAY ST.

PERMANENT FLOOD BARRIER SOLUTION

PLAN VIEW
Permanent Solution: Reinforced Concrete Wall Warren Street

Looking Northeast along Warren St.
Potential Materials for Reinforced Concrete Wall

- **Perforated Metal**
  - Powder Coated Steel Screens
  - Stainless Steel Screens

- **Mural**
  - Painted

- **Precast Concrete**
  - Textured Precast Concrete Panels

- **Brick**
  - Undulating Brick Pattern
Interim Solution: Steel Plate Wall (DFE 11’)

- Reuse Existing Fence Foundations
- ¾-inch Thick Steel Plate
- Alignment Exterior to Fence
- 3 Moveable Flood Protection Device, 6 Community Center Flood-Rated Doors + Flood-Rated Glass
- Level of Protection
  - DFE 11’ = BFE 11’ (no SLR, no Freeboard)
  - Max wall height 4’ due to structural capacity
  - Limited seepage protection
Interim Solution: Steel Plate Wall

- Steel Plate Wall
- Store In-Place Vehicular Flood Gate
- Existing Fence
- Architectural Treatment without Flood Barrier

**Legend**
- Moveable Flood Protection Device
- Wall with Architectural Treatment
- Architectural Treatment without Flood Barrier
- Fence

**Note:**
INTERIM DFE 11' (NAVD88)
Interim Solution: Steel Plate Wall
Warren Street

Save and Protect Existing Fence

Align Top of Fence with Bottom of Horizontal Rail

Existing Fence Footing

Walkway

Existing Granite Wall

Proposed Grade Beam

TURF FIELD

DFE 11.0

4'-9"
Community Center Hardening

Protect the Community Center with Flood-Rated Glass and Flood Doors
Potential Materials for Interim Solution

- Perforated Steel Screens
- Powder Coated Steel Screens
- Stainless Steel Screens
- Steel Flood Barrier Wall
- Increased Corrosion Resistance
- Unpainted Steel Wall Panel
- Paint, Anodize, or Powder Coat Metal
Interim Solution: Steel Plate Wall
Murray Street

4’ tall steel plate wall is “stepped-down” to match slope in grade surface
Interim Solution: Steel Plate Wall
Warren Street
Interim Solution: Steel Plate Wall  
Corner of West St. and Murray St.
Guiding Objectives

- Flood risk
- Integration with landscape and built environment
- Minimize loss of field use and duration of construction
- Cost
- Schedule

Permanent Solution (DFE 14.5’)

- 4% chance of exceedance in 10 years

Interim Solution (DFE 11’)

- 10% chance of exceedance in 10 years
Foundation Comparison

Steel Plate Wall

- Existing Security Fence
- New 3/4" Thick Continuous Welded Steel Plate
- Existing Walkway or Sidewalk

Reinforced Concrete Wall

- Architectural Treatment (Each Face)
- New 12" Wide Continuous Flood Wall
- Sidewalk Grade, Varies
- Existing Turf
- New Pile Cap
- Sheet Pile Cutoff Wall Below Grade
- New Staggered Drilled Micropiles

EXISTING BALLFIELD
EXISTING FENCE FOUNDATION

48"
18" WIDE x 30" DEEP REINFORCED CONCRETE GRADE BEAM

EL. 14.5'
Guiding Objectives

- Flood risk
- Integration with landscape and built environment
- Minimize loss of field use and duration of construction
- Cost
- Schedule

Permanent Solution (DFE 14.5’):
- 8-foot max wall height
- More finish options
- Permanent wall

Interim Solution (DFE 11’):
- 4-foot max wall height
- Fewer finish options
- Removable wall
Integration with Landscape

4-foot max wall height

8-foot max wall height
Guiding Objectives

- Flood risk
- Integration with landscape and built environment
- Minimize loss of field use and duration of construction
- Cost
- Schedule

Permanent Solution (DFE 14.5’)

- 30’ field width for pile operation total duration approx. 15 months

Interim Solution (DFE 11’)

- 6’ field width for grade beam operation total duration approx. 6 months
Minimize Construction

Reinforced Concrete Wall

Steel Plate Wall

LEGEND

EXISTING TREE
EXISTING TREE TO REMAIN SAVE AND PROTECT
EXISTING TREE TO BE REMOVED
CONSTRUCTION IMPACT AREA

30 ft

10 ft

6 ft
Guiding Objectives

- Flood risk
- Integration with landscape and built environment
- Minimize loss of field use and duration of construction
- Cost
- Schedule

**Permanent Solution (DFE 14.5’)**
- Est. $9.5-10.5M

**Interim Solution (DFE 11’)**
- Est. $4-5M
Guiding Objectives

- Flood risk
- Integration with landscape and built environment
- Minimize loss of field use and duration of construction
- Cost
- Schedule

Permanent Solution
(DFE 14.5’)
End Date: Q2 2021

Interim Solution
(DFE 11’)
End Date: Q2 2020
Schedule

**Reinforced Concrete Wall**

- Community Outreach and Involvement
- Design Development
- Bidding and Permitting
- Construction

**Steel Plate Wall**

- Community Outreach and Involvement
- Design Development
- Bidding and Permitting
- Construction

Project Completion
## Guiding Objectives - Summary

**Permanent Solution (DFE 14.5’)**
- 4% chance of exceedance in 10 years
- 8-foot max wall height
- More finish options
- Permanent Wall
- 30’ field width for pile operation total duration approx. 15 months
- Est. $9.5-10.5M
- End Date: Q2 2021

**Interim Solution (DFE 11’)**
- 10% chance of exceedance in 10 years
- 4-foot max wall height
- Fewer Finish Options
- Removable wall
- 6’ field width for grade beam operation total duration approx. 6 months
- Est. $4-5M
- End Date: Q2 2020

- **Flood risk**
- **Integration with landscape and built environment**
- **Minimize loss of field use and duration of construction**
- **Cost**
- **Schedule**
Next Steps

- Decision between Interim Solution and Permanent Solution
- Alignment Decision (only permanent solution)
- Pre-Application Agency Meetings
- 30% Design Development
- Continued Community Input
- Next Public Meeting (Approximately September 2019)
Discussion

Questions and Comments