Introduction
Agenda

• Review of Project Goals & Key Drivers
• Engineering Process and Decisions Update
• Major Update on Pile Testing
• Bidding, Construction & Phasing Overview
• Design Preview
• Next Steps
Project Goals & Key Drivers

- Community Input
- Community Board Resolutions
- Project Objectives
- Engineering Parameters and Constraints
# Community Input

<table>
<thead>
<tr>
<th>Meeting</th>
<th>Date</th>
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<tbody>
<tr>
<td>September 17, 2013</td>
<td>CB14 Parks Committee Presentation: Background and Constraints</td>
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<tr>
<td>September 23/24/25, 2013</td>
<td>Neighborhood Listening Sessions: Access, Surface, Recreation and Boardwalk Design</td>
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<td>October 8, 2013</td>
<td>Full CB14 Meeting: Update and General Design Principles</td>
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<tr>
<td>October 23, 2013</td>
<td>Community Listening Session: Access, Surface and Amenities</td>
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<tr>
<td>November 6, 2013</td>
<td>Conceptual Plan Workshop: Recreation, Access, Natural Resources and Resiliency</td>
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<tr>
<td>November 18, 2013</td>
<td>CB14 Parks Committee Presentation: Preliminary Architectural Concepts</td>
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<tr>
<td>November 25, 2013</td>
<td>Conceptual Plan Workshop: Recreation, Access, Natural Resources and Resiliency</td>
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<td>December 5, 2013</td>
<td>Conceptual Plan Workshop: Opportunity Sites</td>
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Community Board Resolutions

1. Rebuild a Concrete Boardwalk
2. Elevate Above the 100 year Flood Plain
3. Build a Baffle Wall underneath the Boardwalk
4. Elevate and Stabilize the USACE Berm
Project Objectives

1. Rebuild a Concrete Boardwalk
2. Elevate Above the 100 year Flood Plain
3. Build a Baffle Wall underneath the Boardwalk
4. Elevate and Stabilize the USACE Berm

Plus:

5. Complement Phase 1 Islands
6. Prepare a Conceptual Plan for the Rockaway Peninsula
Engineering Parameters and Constraints

1. Resist Storm Forces
2. 50+ Year Design Life
3. HS20 Truck Loading
4. Account for New and Varied Elevations
5. Planning and Environmental Regulations
6. Building Code Regulations
Agenda

Engineering Process and Decisions

• Proposed Elevation Changes
• Baffle Wall
• Layers of Storm Protection
• Environmental and Planning Efforts
Proposed Elevation Changes
Proposed Elevation Changes

Legend

- **Green**: Boardwalk elevation to remain unchanged
- **Blue**: Boardwalk elevation to increase 0FT - 2FT
- **Orange**: Boardwalk elevation to increase 2FT - 4FT
- **Red**: Boardwalk elevation to increase 4FT - 7FT
Proposed Elevation Changes
Baffle Wall

Pros:
- Strong
- Cheap to build
- Easy to maintain
- Community likes it
- Compatible with USACE reformulation

Cons:
- DEC opposes hard structure which causes deflection of waves and erosion back on beach

*This section was built as a replacement in kind under an emergency permit*
Baffle Wall

Potential Current Option

If the beach erodes, and this wall stands against wave action, the toe of the wall becomes exposed and water is allowed to pass through without requiring the wall to collapse. Note: baffle wall design is subject to DEC approval and coordination has been ongoing.
Layers of Storm Protection

- Baffle Wall
- Widened Dune
- Raised Dune
- Widened Beach/Berm
Layers of Storm Protection

- Adds depth to the dune to make the soft structure more resilient
- Akin to the double dune concept
Layers of Storm Protection

The primary protective element is sand (by the ACOE)

Raised Boardwalk

200 ft Widened Berm

Dune Betterment

USACE Sand Replenishment Phase 1B

USACE Sand Replenishment Phase 1A

Raised Dune Elevated to +16 NAVD88

Approximately 3,000,000 cubic yards of sand to be installed in the 1st half of 2014
Layers of Storm Protection

- Plantings
- Sand Fence
- Geotextile Fabric
Environmental and Planning Efforts

National Environmental Policy Act
• Notification Letters
• Floodplain Notice
• Environmental Assessment Certification

NYS Department of Environmental Conservation
• State Environmental Quality Review
• Baffle Wall Design
• Boardwalk Design

U.S. Army Corps of Engineers
• Reformulation Study
• Renourishment Activities

Fish and Wildlife
• Section 7 Endangered Species consultation

These are all schedule drivers, and not within the City’s control
Building Code Compliance

NYC Department of Parks & Recreation
- Standard Amenities
- Nonstandard Design Elements
- Maintenance and Operations

NYC Department of Buildings
- Electrical
- Plumbing
- Railings
- Life Safety

NYC Department of Transportation
- Lighting

Americans with Disabilities Act
- Access
Agenda

Major Update on Pile Testing
Laboratory Tests

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Total Planned &amp; Completed</th>
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<tbody>
<tr>
<td>Compression Strength (ASTM C42)</td>
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<tr>
<td>Volume of Permeable Voids (ASTM C642)</td>
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<tr>
<td>Migration Tests (modified ASTM C1202)</td>
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<tr>
<td>Drying Tests (ASTM C1585)</td>
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<tr>
<td>Chloride Profiles (ASTM C1152)</td>
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<tr>
<td>Petrography (ASTM C856)</td>
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Boardwalk Structural Support
Boardwalk Structural Support
Boardwalk Structural Support

Sodium Chloride from Sea Salt
Boardwalk Structural Support

1) Chlorides Corrode the Rebar

2) Rebar expands as it rusts

3) As the rebar expands, it pushes on the concrete until it breaks, and chips away – this is called “spalling”
Boardwalk Structural Support
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<th>Install New</th>
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Boardwalk Structural Support

Typical Bents at 30 ft spacing

- 42"x42" Square Conc Pile Cap
- 24"Ø Pile w/ 3/4" Thickness (Typ)
  (Pile Embedment Length = 30 ft)
- 12" Thick Precast Prestressed Planks

[Diagram of boardwalk structural support]
Agenda

Construction Overview
  • Preliminary Phasing
  • Schedule Look Ahead
Preliminary Phasing

Legend
- Boardwalk Missing
- Boardwalk Intact
Preliminary Phasing
Boardwalk Construction Start:

Phase 1 (B86-B97): Spring 2014
Phase 2 (B98-B108): Summer 2014
Phase 3 (B108-B126): Fall 2014
Phase 4 (B60-B86): Winter 2014
Phase 5 (B19-B60): Spring 2015

USACE Sand Pumping Schedule B19 – B149 St: Winter & Spring 2014
Schedule Look Ahead

December 2013: Bidding and Procurement
• New Pile Fabrication
• Site Clearing, Selected Demolition
• Baffle Wall
• Dune Enhancement

Early 2014: Bidding and Procurement
• Procure Pile Caps
• Structural Installation
• Boardwalk Pavement
• Amenities

Spring 2014
• Contractors Onsite

Summer 2014
• Ongoing Construction
• Temporary Entrances Through Construction Zone Will Allow Beach Access at Many Locations
Workforce Opportunities

• Establish and maintain a presence in the community
• Connect candidates with subcontractors
• Provide information for training, educational and technical courses
• Enhance workforce development through community partnerships and referrals
• Liaise between minority, women and local applicants as well as Trade Unions and Trade Associations
Next Steps
For January CB 14 Meeting:
• Phase 1 Architectural Design
• Project Schedule