SOUTH BATTERY PARK CITY RESILIENCY PROJECT

DEPLOYABLE GATE

May 18, 2020
AGENDA

1. Introduction
2. Flip Up Gates
3. Deployment Time
INTRODUCTION | SOUTH BATTERY PARK RESILIENCY

+18'

+18 - 21'

+18.5'

* 2050 DFEs TO BE VERIFIED WITH TOPO

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FLIP UP GATES
FLIP UP GATE | COMPONENTS

- MANUAL PROP ROD
- BRACING
- SEAL
- HYDRAULIC ARM
- HYDRAULIC LINES TO HPU
HYDRAULIC POWER UNITS

- Used to power lifting arms
- Inside security barrier
- Adequate access for operations and maintenance
AESTHETICS | MATERIALITY PRECEDENTS

SLIP NOT COATING NYC APPLICATIONS

LINCOLN CENTER, NYC
STAINLESS STEEL BRIDGE FLOORING

HIGH LINE PARK, NYC
NON-SLIP STAINLESS STEEL
AESTHETICS | PIER A FLIP UP GATE + COLUMN CLADDING

- GRANITE STONE CLADDING
- EXPOSED STAINLESS STEEL SEAL PLATE
- EXPOSED STAINLESS STEEL
- STAINLESS STEEL WITH PATTERNED SLIP-NOT COATING
- NYC PARKS HEX PAVER

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AESTHETICS | PIER A FLOODWALL MATERIALS PALETTE

SPLIT FACE FINISH
HONED FINISH

POLISHED FINISH
FLAMED FINISH

BLEND OF SIZE, SHAPE, AND TEXTURE OF MATERIALS

THE BATTERY
PIER A PLAZA
WAGNER PARK

NOTE: X AND Y SCALES DISTORTED FOR CLARITY

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AESTHETICS | PIER A FLIP UP GATE COLUMN DESIGN

AXON

3'± 3'±

STONE CLADDING
VARIABILITY IN SIZE, SHAPE

STAINLESS STEEL SURFACE
FOR DEPLOYMENT SEAL

STRUCTURAL COLUMN
WITHIN

PLAN

SECTION

7.5'

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FLIP UP GATES | STRUCTURAL REQUIREMENTS

1. Hydrostatic

Water Pressure Formula
\[ p = H \cdot \rho_w \]
\( \rho_w = \text{Density of Water (64 pcf)} \)

2. Hydrostatic + Hydrodynamic + Debris

3. Vehicle Load (HS-25)

4. Wind
GATE MANUFACTURERS | SELECTION CRITERIA

Geometric Constraints
– Project specific heights and widths of the gates

Structural System
– What type of structural system the gate relies on when deployed

Gasket System
– How the gaskets function in between gate panels, troughs and posts

Roadway Gates
– How the gates function when implemented over a roadway

Past Precedence
– Vendor must show that they are viable and have experience in constructing robust gates

Potential US Based Supply Vendors
– FloodBreak
– Walz & Krenzer
– Flood Control International
GATE MANUFACTURERS | PAST PRECEDENCE

29' X 7'10" Lourdes Hospital Binghamton, NY

100' x 3' Jackson Road NAFTA Corridor Hidalgo County, Texas

HPU Langone NYU, NY (without enclosure)

30' x 12' Langone NYU, NY
FLIP UP GATES | PRIMARY DEPLOYMENT

- Electrical Service
- Electrical Cabinet
- HPU
  - MOTOR
  - PUMP
  - RESERVOIR
  - CONTROL PANEL
- Gates
FLIP UP GATES | SECONDARY DEPLOYMENT OPTION 1

- Electrical Service
- Electrical Cabinet
- HPU
  - MOTOR
  - PUMP
  - RESERVOIR
  - CONTROL PANEL
- Gates
- Generator
FLIP UP GATES | SECONDARY DEPLOYMENT OPTION 2

- Electrical Service
- Electrical Cabinet
- Portable HPU
  - MOTOR
  - PUMP
  - RESERVOIR
  - CONTROL PANEL
- Gates

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FLIP UP GATES | TERTIARY DEPLOYMENT

Electrical Service → Electrical Cabinet → HPU
- MOTOR
- PUMP
- RESERVOIR
- CONTROL PANEL → Gates

Manual Deployment System

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FLIP UP GATES | TERTIARY DEPLOYMENT

POLE/WINCH DEPLOYMENT

TELEHANDLER DEPLOYMENT
DEPLOYMENT TIME
## DEPLOYMENT TIME | ASSUMPTIONS

<table>
<thead>
<tr>
<th>Deployable Section</th>
<th>Primary</th>
<th>Secondary</th>
<th>Manual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time to Deploy Per Panel</td>
<td>Personnel Per Team</td>
<td>Time to Deploy Per Panel</td>
</tr>
<tr>
<td>Flip Ups MJH</td>
<td>20</td>
<td>2</td>
<td>20*</td>
</tr>
<tr>
<td>Flip Ups Pier A</td>
<td>20</td>
<td>2</td>
<td>20*</td>
</tr>
</tbody>
</table>

* Same time as primary once auxiliary unit is on site
## DEPLOYMENT TIME | PROPOSED CONDITIONS

### Condition 1
- [0%] component failure
- Deployment time N.T.E. 12 hours

### Condition 2
- [20%] component failure
- Deployment time N.T.E. 12 hours

### Condition 3
- [100%] electric grid failure
- Deployment time N.T.E. 12 hours

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**ASCE 24-14**

### 6.2.3 Limits on Human Intervention

Dry floodproofing measures that require human intervention to activate or implement prior to or during a flood shall be permitted only when all of the following conditions are satisfied:

1. The flood warning time (alerting potential flood victims of a pending flood situation) shall be a minimum of 12 h unless the community operates a flood warning system and implements an emergency plan to ensure safe evacuation of flood hazard areas, in which case human intervention is allowed only if the community can provide a minimum flood warning time equal to or longer than the cumulative time.

   - (a) To notify persons responsible for installation of floodproofing measures,
   - (b) for responsible persons to travel to structures to be floodproofed,
   - (c) to install, activate, or implement floodproofing measures, and
   - (d) to evacuate all occupants from the flood hazard area.
## DEPLOYMENT TIME SUMMARY

<table>
<thead>
<tr>
<th>Condition</th>
<th>Component Failure</th>
<th>Approx. No. Panels Manually Deployed</th>
<th>No. Total Crews Req’d</th>
<th>No. Personnel Req’d</th>
<th>Total Time To Deploy (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition 1</td>
<td>0% Failure Rate</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Condition 2</td>
<td>20% Failure Rate</td>
<td>6</td>
<td>4</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Condition 3</td>
<td>100% Failure Rate</td>
<td>23</td>
<td>4</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

* The table above includes (1) backup deployment system and crew
QUESTIONS