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 95th 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 (90th 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