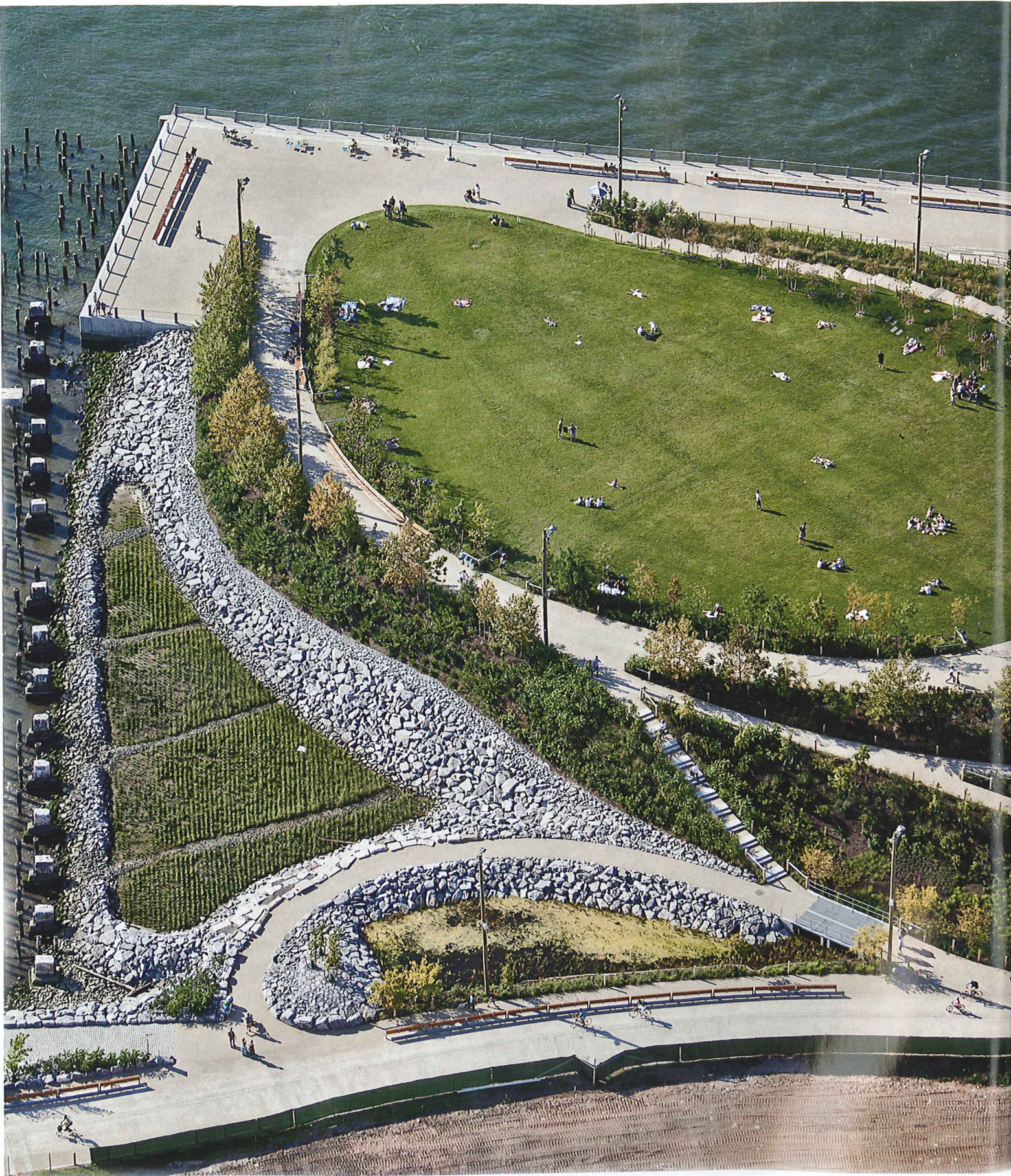


# BROOKLYN BRIDGE PARK

DESIGNERS TRANSFORM A DEFUNCT  
SHIPPING COMPLEX AND RECONNECT  
A CITY WITH ITS WATERFRONT  
BY SARAH AMELAR







PHOTOGRAPHY: © ALEX MACLEAN, EXCEPT AS NOTED; ELIZABETH FELICELLA (1)

**“WHEN WE WERE** planning Brooklyn Bridge Park [BBP], people kept telling us how much they wanted to be able to touch the water,” says BBP’s designer, landscape architect Michael Van Valkenburgh, recalling the hundreds of community meetings he attended in the making of this park. Simple as that request may seem, it reflects the complicated saga of our cities and their rivers – and, specifically, the tale of this narrow, irregular 1.3-mile-long stretch of waterfront in Brooklyn, New York, and its barriers to neighborhood enjoyment.

Though they live surrounded by water, most New Yorkers have never touched the city’s East or Hudson Rivers. And while both rivers are tidal estuaries, their extensively bulwarked banks scarcely register such ephemeral events as rising and falling tides.

Like many American cities, New York long severed much of daily life, particularly leisure activity, from direct engagement with its waterways. Visitors to urban riverside parks have historically been sequestered in scenic overlooks or railed-in promenades. And with good reason: Through the 19th and much of the 20th centuries, harbors developed into gritty and inhospitable industrial places. But in recent decades, that water-land disconnect has been gradually

- |              |                 |                                   |
|--------------|-----------------|-----------------------------------|
| 1 PIER ONE   | 5 MARINA        | 9 MAIN STREET PARK                |
| 2 PIER TWO   | 6 PIER FIVE     | 10 EMPIRE FULTON FERRY STATE PARK |
| 3 PIER THREE | 7 PIER SIX      | 11 BROOKLYN-QUEENS EXPRESSWAY     |
| 4 PIER FOUR  | 8 PARK ENTRANCE |                                   |



healing, as New York and other cities have shifted from manufacturing to service economies, coupled with serious measures to clean, preserve, and access their aqueous riches in pleasurable, old-fashioned ways.

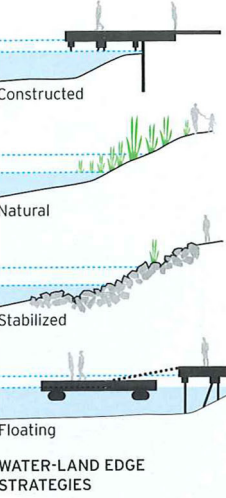
Along the East River, landfill expanding the working shoreline dates back to the 1680s and forms BBP’s underlying terrain. But the site’s most significant modern shapers came in the 1950s, when the Port Authority of New York and New Jersey developed it as an 85-acre shipping complex, with six piers of warehouses. In that same era, a new traffic artery, the Brooklyn-Queens Expressway (BQE), isolated this low-lying waterfront from its inland and upland adjacencies. The BQE’s tiered road decks and the pedestrian promenade above them cantilever from a steep bluff. While this engineering feat preserved residential Brooklyn Heights’s views, it also produced a virtually impenetrable divide. And by the early ’70s, containerized shipping had rendered the once state-of-the-art facility obsolete, ending its life as a cargo complex in 1983.

PREVIOUS PAGE: Pier One, completed this past spring as part of the project’s first phase of construction, sits just to the south of the Brooklyn Bridge.

OPPOSITE: The park has open meadows as well as seemingly wild landscapes.

1. A wide stair of salvaged, rough-hewn granite blocks steps down a slope like raked theater seats providing views of the river, two bridges, and Manhattan.
2. Before its transformation, the BBP site was a complex of six warehouse piers.



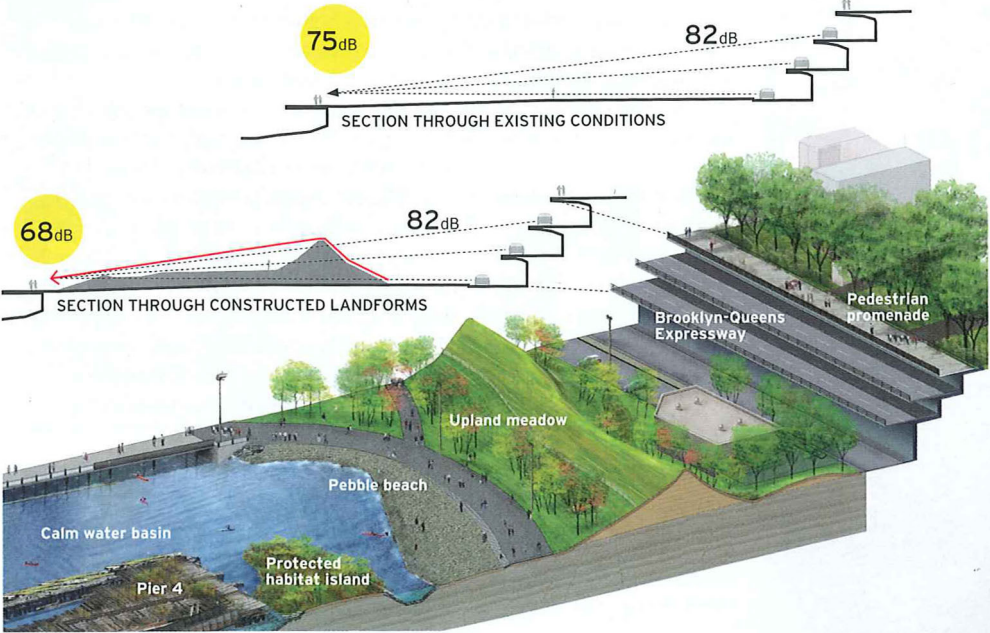
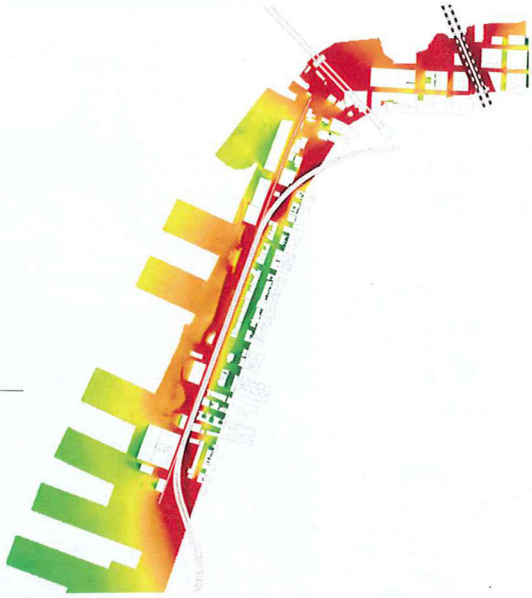


TOP: Designers devised several treatments for the water's edge, creating diverse ecosystems along the park's length.

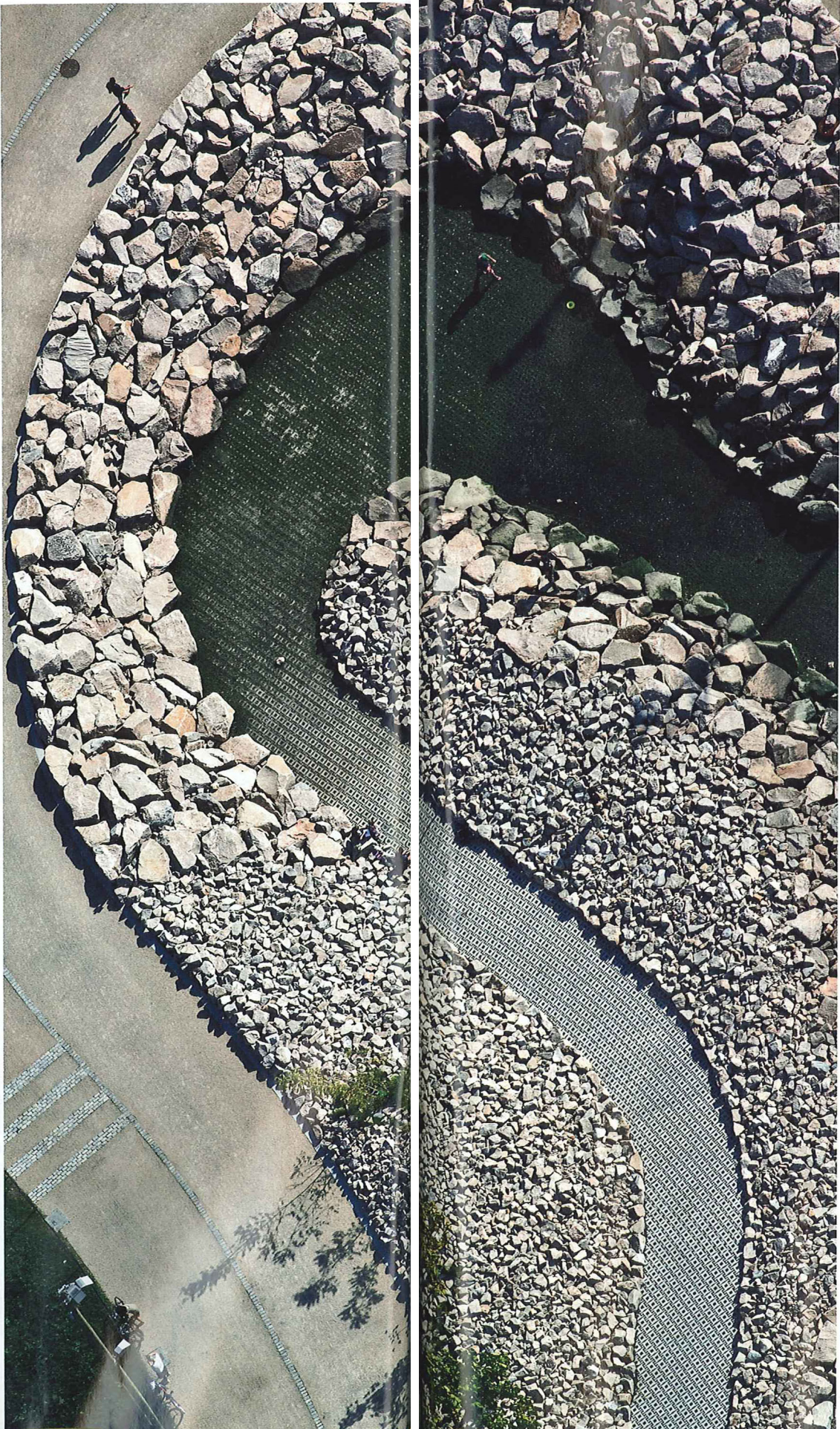
RIGHT AND BOTTOM: The roar from traffic on an adjacent expressway raised noise levels on the site to about 75 decibels. To make the park quiet enough for reflection and comfortable conversation, the project team created sound barriers with berms of earth.

DECIBEL LEVEL

-99.0 dB(A)
55.0 dB(A)
58.0 dB(A)
61.0 dB(A)
64.0 dB(A)
67.0 dB(A)
70.0 dB(A)
73.0 dB(A)
76.0 dB(A)
79.0 dB(A)
82.0 dB(A)
85.0 dB(A)



SECTIONAL AXONOMETRIC



ABOVE: Boat launches provide access to calmed water fields protected from waves.

LEFT: With piles of rubble, designers defined irregularly shaped pathways that double as tidal pools, filling with water and then emptying over the course of the day.

stood (now a bird and fish habitat) – will remain. And the steel skeleton of Pier Two's stripped-down sheds will stay, providing armatures for lights, shading devices, and swings. But rather than slavishly preserving the monotonously flat, impervious hardscape, the park introduces undulant topography and lush native vegetation, playing machine-edged relics against diverse, seemingly wild landscapes – gardens with sweet gum trees and dogwoods, salt marshes, and tidal pools – and cultivated lawns, both rolling and flat.

As you cross Pier One from the landside toward the water, the play of small scale versus large scale unfolds, with water gardens, woodlands, wetlands, and other microclimates native to the region revealing themselves around the bends and turns. Big moves orient and reorient you to river and city views. On Pier One's landfill, a new 29-foot-high hill tilts toward the water. An amphitheater and a wide stair of rough-hewn granite blocks – salvaged from recently repaired or replaced New York City bridges – step down like raked theatrical seating opening to the panorama. Ultimately, the park, with different terrain on each pier, will include basketball courts, soccer fields, playgrounds, a marina, fishing piers, and calm-water zones for canoeing and kayaking, as well as meadows for simply relaxing and paths for jogging, bicycling, or strolling.

Essential to this narrow greenway are its edges – the meeting places of water and land, road and park, built density and open space, site artifact and new intervention – and the ways these borders are dissolved, strengthened,

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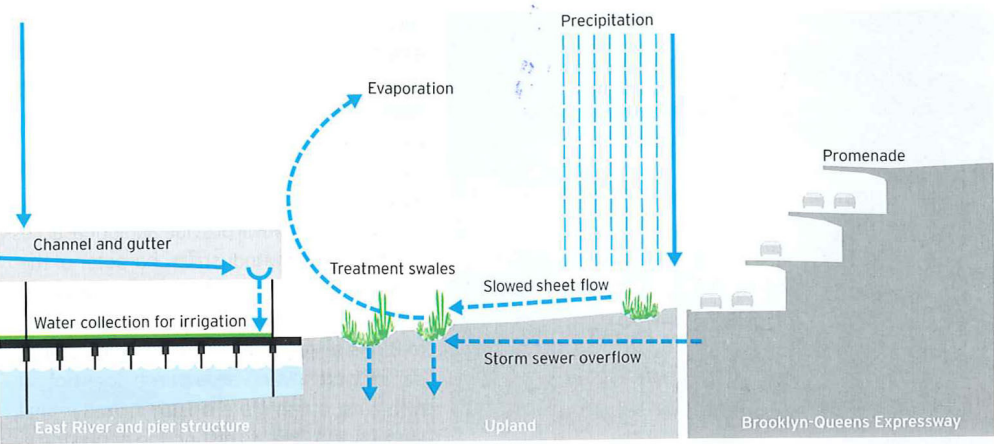
**Learning Objectives**

- 1 Describe how the BBP design team transformed a defunct shipping complex into a waterfront park.
- 2 Identify environmentally sensitive development strategies deployed at BBP.
- 3 Explain stormwater management techniques deployed at BBP.
- 4 Discuss the BBP design team's criteria for selecting plant material.

AIA/CES Course #K1010A

PHOTOGRAPHY: © ELIZABETH FELICELLA (ABOVE)





WATER-MANAGEMENT AND REUSE DIAGRAM

reconfigured, or simply retained. Along some stretches, beach grasses meet the river. In other places, piers extend out on pilings, floating walkways will connect piers, and craggy cairns will form tidal pools that fill and recede. The rock-piled edges, or riprap, deflect waves, stabilizing erosion-vulnerable coastline.

To provide launch lanes for kayaks and canoes, Piers Two and Three have been cut from the land and reconnected via footbridges. Water-calming devices – docklike structures incorporating 10-foot-deep baffles, or wave fences, on their undersides – define protected boating areas between piers. Floating up and down with the tides, these devices are ring-connected to rigid pilings. The system is designed to reduce three-foot waves to about six inches, creating “fields,” 10 acres in all, of calm water.

“We had to be extremely resourceful – on land and with water,” says Stephen Noone, Van Valkenburgh’s construction-phase project manager. “Once you divide \$350 million by 75 acres, you’re not left with much budget per square foot.” Meandering over the hilly earth forms, most visitors will be unaware of the landscape’s pragmatic underside and technological complexity – the ways it’s not merely visual and experiential, but designed for such functions as noise attenuation and stormwater management.

The new topography – particularly the 38-foot-high ridge, nicknamed “the Mohawk,” that will run along the site’s upland edge – was precision-engineered to attenuate the roar from the BQE. Acousticians Cerami Associates initially considered precast highway sound barriers. But this conventional solution would have concentrated expressway air pollution while bouncing sound directly into Brooklyn Heights. So the acoustics team deployed 3-D computer modeling to generate topography specifically contoured to reduce noise. With a projected reduction of almost 75 percent, the landforms rival the engineering achievement of the cantilevered BQE they endeavor to block out.

The topography is as complex in composition as performance. Consistent with BBP’s commitment to repurposing, the hills owe their curves to 59,000 cubic yards of fill, drilled from Manhattan bedrock to create a future tunnel between Grand Central and Penn Stations. Each 14-inch lift, or layer, of fill was compacted and then reinforced with a geogrid of high-density, high-tensile-strength polyethylene mesh. The strata promote subsurface water percolation, preventing clumping and slope failure, while providing water for direct uptake by plants. The core is covered with horticultural soils (subsoil, soil, topsoil, and nutrient layers) blended with polypropylene geofibers to provide shear strength and meet the regulated global safety factor of 1.5. The safety factor, explains Noone, takes into account the inherent ability of a particular “structure,” in this case soil, to maintain a slope without collapsing.

BBP’s diverse plantings are already proven in urban conditions and the park’s specific microclimates. The piers, for example, integrate “pioneering species,” such as sumacs, known to colonize nearby abandoned piers; while the marshy areas integrate spicebush, pussy willow, rose mallow, ferns, and other plants that thrive with “wet feet,” in water-saturated soil.

LEFT: Stormwater runoff is naturally treated and filtered in swales, then stored on-site and reused for irrigation, reducing BBP’s dependence on the municipal water supply.

BELOW: The playground at Pier Six. When the park is complete, it will include a wide variety of facilities, such as a marina, basketball courts, soccer fields, and fishing piers.

OPPOSITE: Swales and filtering ponds are lushly planted with species that thrive in soggy soil.



CREDITS

**LANDSCAPE ARCHITECT:** Michael Van Valkenburgh Associates – Michael Van Valkenburgh, Matthew Urbanski, Paul Seck, Gullivar Shepard, Nate Trevethan, Rachel Gleeson, Stephen Noone, Nik Elkovitch, Dorothy Tang, project team

**CONSULTANTS:** AECOM, formerly DMJM + Harris (civil, marine, and m/e/p); Cerami Associates (acoustical); Domingo Gonzalez Associates (lighting); Great Eastern (ecological); Nitsch Engineering (stormwater); Northern Designs (irrigation); Pine and Swallow Associates (soil scientists); R. J. Van Seters (water features); Maryann Thompson Architects (Pier Six warming hut); Richmond So Engineers, Ysrael A. Seinuk (structural)

**SIZE:** 16 acres (Phase I); 85 acres (full build-out)

**COST:** \$350 million (full build-out)

**COMPLETION DATE:** 2015 (full build-out)

**SOURCES**

**LUMINAIRE:** We-Ef

**HANDRAIL LIGHTING:** C. W. Cole

**MARINE RAIL:** Carl Stahl DécorCable

**PLAYGROUND EQUIPMENT:** Richter Spielgerate; Kaiser & Kuhne; Berliner Seifabrik, All City Play Equipment, Sonic Architecture

PHOTOGRAPHY: © ELIZABETH FELICELLA (OPPOSITE)



Not merely noise attenuating, the topography strategically directs stormwater into filtering swales and drain inlets, leading to an underground network of 36-inch-diameter pipes. At Pier One, the capture cascades through water gardens – a pond and terraced wetland that double as a gravity-fed, natural treatment system. The runoff, from paths, landscape, and the development parcels’ rooftops, is stored in five subterranean cisterns of up to 140,000 gallons each. New York has a combined sewer system, which carries wastewater from buildings and stormwater runoff in the same pipes. During heavy rains, overflow of such outmoded systems is common, dumping untreated automotive and biological pollutants into rivers. But here, by contrast, the rainwater is captured and recycled on-site, satisfying 70 percent of BBP’s irrigation needs.

To further minimize environmental impact, organic soil-release fertilizers, made from fish emulsion and natural minerals, were used during construction, instead of synthetic fertilizers, pesticides, or herbicides – a policy adopted in the park’s ongoing maintenance. And to vastly reduce demolition waste, the existing 65 acres of hardscape were left in place, perforated for permeability, and married to the soil layers above them.

Now pathways strewn with tiny pale gray stones evoke beach dune trails. Their light color reflects, rather than absorbs, solar radiation, diminishing the heat island effect. Just as the material continuity of these paths will visually tie

together BBP’s experiential range, such consistent elements as benches, decking, and picnic tables – built from remilled long leaf yellow pine salvaged from one of the demolished storage buildings – will have a similar effect.

On a difficult, monotonous site – essentially a vast parking lot, devoid of self-sustaining ecological systems – BBP has already achieved remarkable biological and programmatic diversity. New ecological processes have been evolving in its fish and bird habitats, in tidal pools, and in communities of plants designed to reestablish native species while inhibiting invasive ones.

As flora and fauna thrive here, so do people. On last summer’s steamiest nights, some 8,000 visitors flocked to Pier One for open-air movie screenings amid the bridges’ necklaces of light and a river sparkling with reflections.

If ambitions for other New York greenways – including Governors Island and the Manhattan side of the East River – are realized, they will radically reorient the entire city toward its rivers. Chances to touch the water have already arrived. Likely there will be many more. ■

Sarah Amelar is an ARCHITECTURAL RECORD contributing editor.

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