LEFT
The modernist lines of the boardwalk accentuate the loose weave of colors and textures of 150 different species of local native plants.

BEFORE ALL THIS

A NEW GARDEN OF NATIVES IN BROOKLYN LOOKS BACK AT WHAT ONCE BELONGED.

BY ANNE RAVER

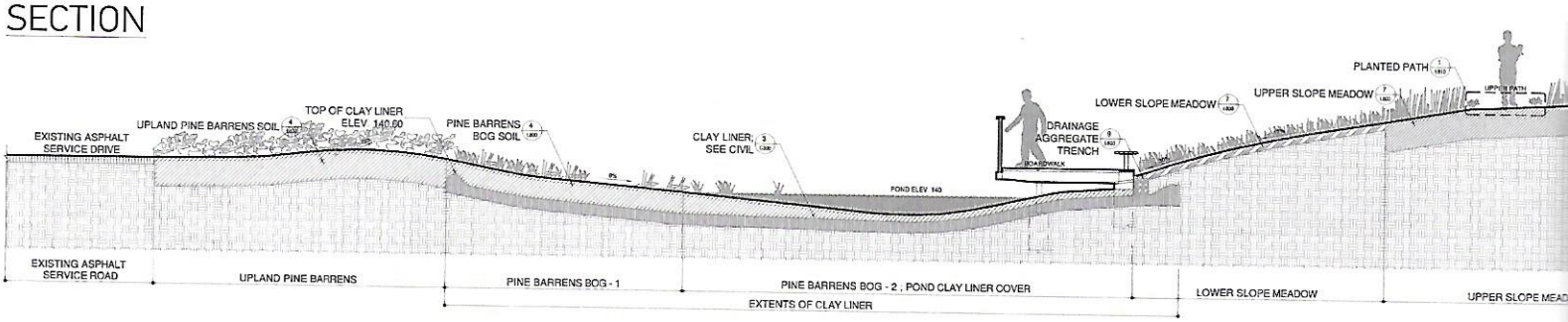
PHOTOGRAPHY BY ELIZABETH FELICELLA

SOME PEOPLE, as they walk up the path at the Brooklyn Botanic Garden to worship the velvety blooms spilling over the walls of the rose garden, turn their heads toward the sandy hummock to their left and wonder what those scrawny pines and tiny plants are all about. "Some of our visitors don't understand it," says Uli Lorimer, the curator of the Native Flora Garden extension, which opened in June 2013. "They say, 'Oh, there's nothing here. Everything's little.'"

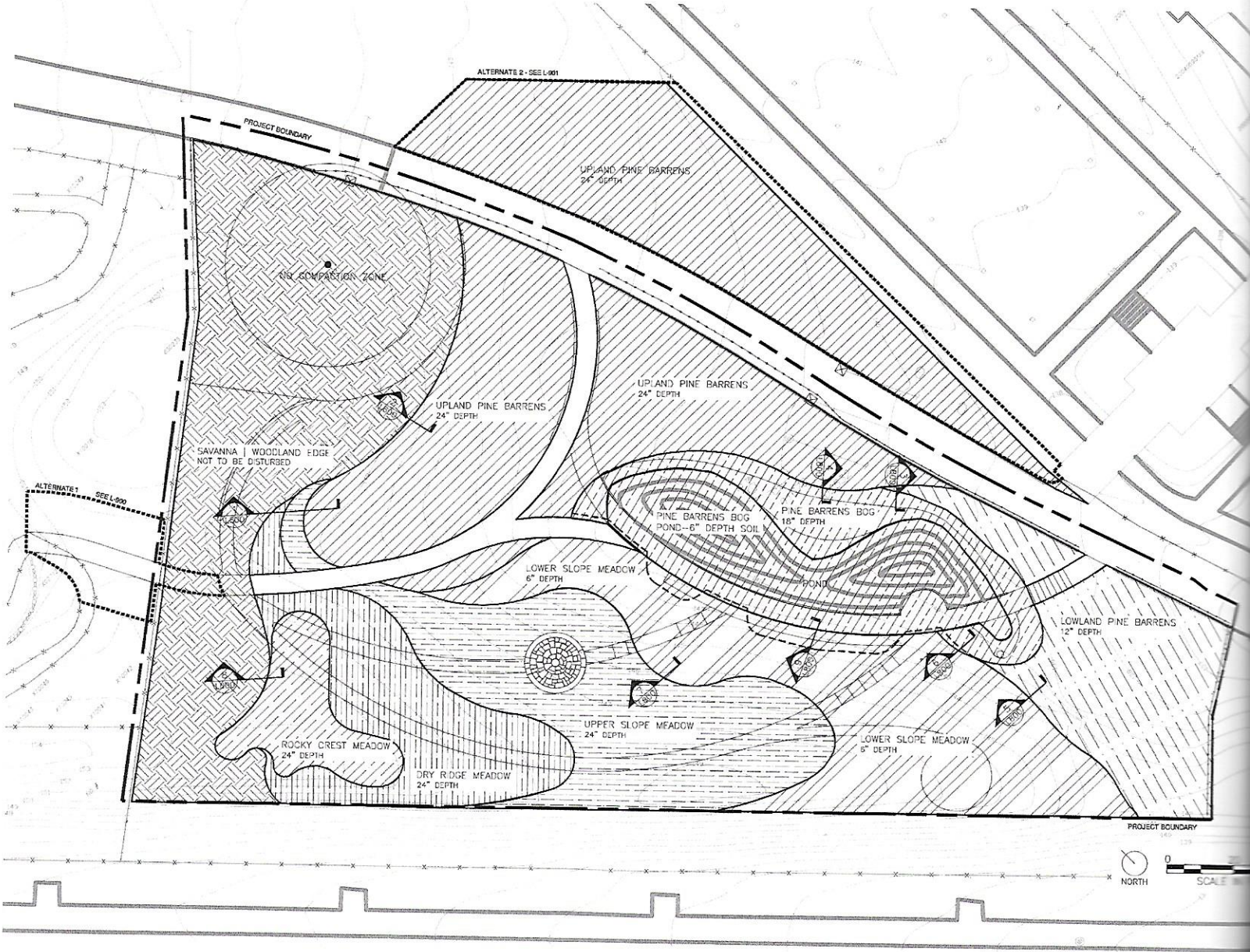
Sometimes, he tries to explain that this is a different kind of garden, where 150 native species, almost all collected within 200 miles of New York City, have been assembled to re-create the essence of the region's primeval plant communities. Those scrubby-looking grasses on the hill are the same species that once thrived on 40,000 acres of the Hempstead Plains, now buried under houses on Long Island. The pond with the green scum—there's a debate going on here about how to fix it—is home to bog plants paved over for Kennedy Airport. The skinny little pine trees sticking out of the sandy soil are a nod to the pygmy pines of the New Jersey Pine Barrens. So are the patches of bearberry, blueberry, and prickly pear cactus, planted in little drifts down the slope.

In many ways, the one-acre extension to the Native Flora Garden is an expression of an increasing awareness of the lack of biodiversity, the extinction of species, and the importance of native plants to habitat and the food web. Just as the 100-year-old Native Flora Garden, which rambles nearby over two and a half acres, evolved from a systematic arrangement of families of plants to a more natural design of meadow and bog, and deciduous trees and conifers, the new extension reflects the next phase: preserving local genotypes, which are paramount to biodiversity.

SECTION



SOIL PREPARATION PLAN



TOP LEFT AND RIGHT
Rare pitcher plants, orchids, and swamp pinks rescued from endangered wetlands in New Jersey are destined for this boggy soil.

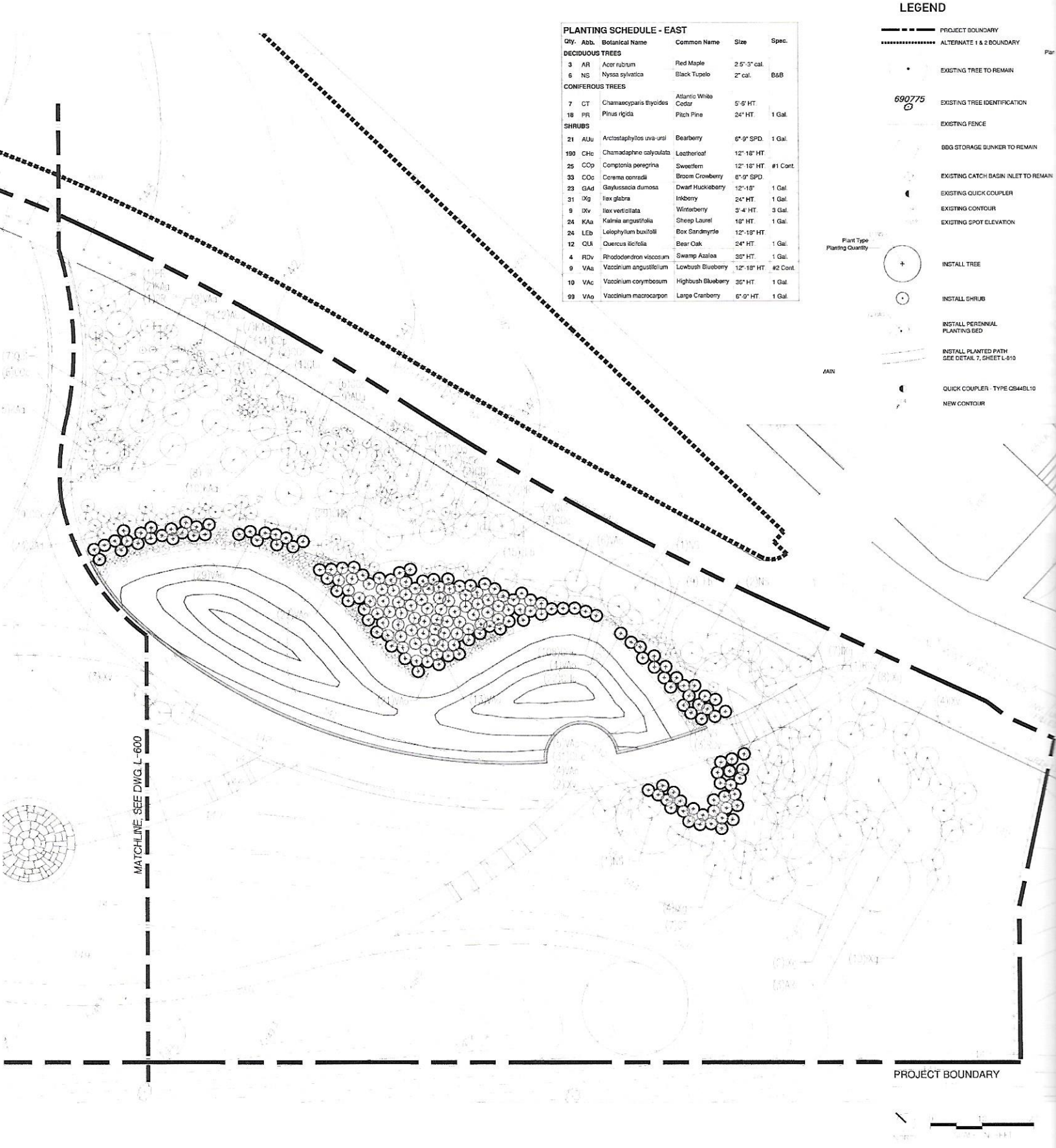
BOTTOM
The sandstone council ring, set into the slope, muffles traffic noise from Flatbush Avenue.

"This is the first time in cultivation for some of the plants out there," says Scot Medbury, the president of the Brooklyn Botanic Garden. "The new native garden is emblematic of where this institution is going in a conservation direction. It has such extraordinary scientific and ecological integrity. Almost everything is wild sourced."

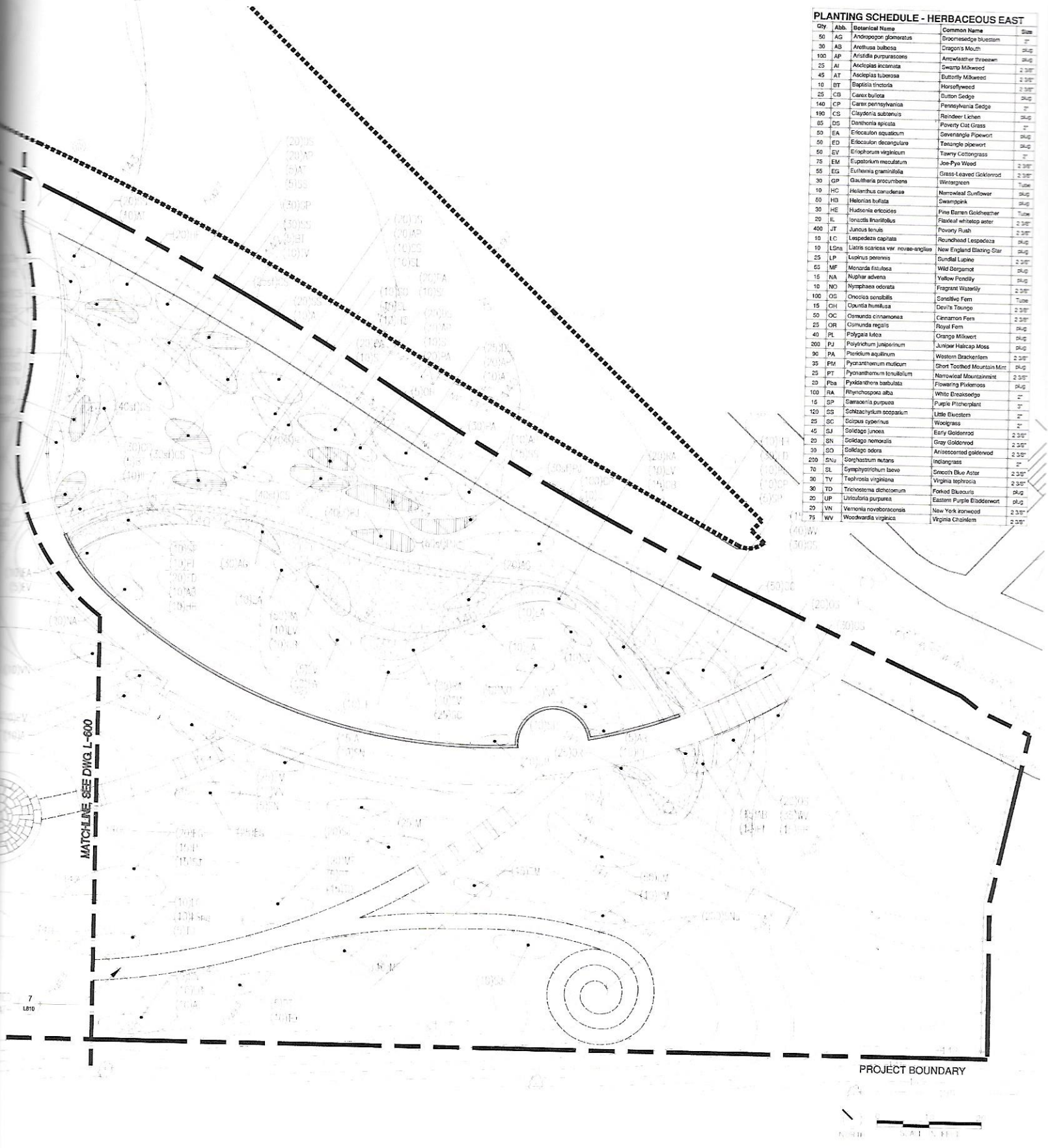
The New York Botanical Garden's new 3.5-acre native garden embraces anything east of the Mississippi River. The Brooklyn Botanic Garden's sandy acre is closer to home, like locally grown food, Brooklyn beer, sweaters woven from New Jersey sheep—"maybe on a societal level, a collective look at what's immediately around us, as opposed to the world," says Lorimer, who spent years collecting seeds of these plants with botanists in the field—pyxie moss and turkeybeard from the Pine Barrens, rather than roses from China.

This little garden takes a leap, not just from showy hybrids to wild-collected species, but to collaborative design →

TREES AND SHRUBS PLANTING PLAN – EAST



HERBACEOUS PLANTING PLAN – EAST



PLANTING SCHEDULE - HERBACEOUS EAST

Qty	Abb.	Botanical Name	Common Name	Size
50	AG	Andropogon glomeratus	Broomsedge bluestem	2"
30	AB	Arethusa bulbosa	Dragon's Mouth	plug
100	AP	Aristida purpurascens	Arrowfeather threeawn	plug
25	AI	Asclepias incarnata	Swamp Milkweed	2 3/8"
45	AT	Asclepias tuberosa	Butterfly Milkweed	2 3/8"
10	BT	Baptisia tinctoria	Horsefly weed	2 3/8"
25	CB	Carex bullota	Button Sedge	plug
140	CP	Carex pennsylvanica	Pennsylvania Sedge	2"
190	CS	Cladonia subtenuis	Reindeer Lichen	plug
85	DS	Danthonia spicata	Poverty Oat Grass	2"
50	EA	Eriocaulon aquaticum	Sevenangle Pipewort	plug
50	ED	Eriocaulon decangulare	Tenangle pipewort	plug
50	EV	Eriophorum virginicum	Tawny Cottongrass	2"
75	EM	Eupatorium maculatum	Joe-Pye Weed	2 3/8"
55	EG	Euthamia graminifolia	Grass-Leaved Goldenrod	2 3/8"
30	GP	Gaultheria procumbens	Wintergreen	Tube
10	HC	Helianthus canadense	Narrowleaf Sunflower	plug
50	HB	Helonias bullata	Swamppink	plug
30	HE	Hudsonia ericoides	Pine Barren Goldheather	Tube
20	IL	Ionactis linariifolius	Flaxleaf whitetop aster	2 3/8"
400	JT	Juncus tenuis	Poverty Rush	2 3/8"
10	LC	Lespedeza capitata	Roundhead Lespedeza	plug
10	LSna	Liatris scariosa var novae-angliae	New England Blazing-Star	plug
25	LP	Lupinus perennis	Sundial Lupine	2 3/8"
65	MF	Monarda fistulosa	Wild Bergamot	plug
15	NA	Nuphar advena	Yellow Pondlily	plug
10	NO	Nymphaea odorata	Fragrant Waterlily	2 3/8"
100	OS	Onoclea sensibilis	Sensitive Fern	Tube
15	OH	Opuntia humifusa	Devil's Tounge	2 3/8"
50	OC	Osmunda cinnamomea	Cinnamon Fern	2 3/8"
25	OR	Osmunda regalis	Royal Fern	plug
40	PL	Polygala lutea	Orange Milkwort	plug
200	PJ	Polytrichum juniperinum	Juniper Haircap Moss	plug
90	PA	Pteridium aquilinum	Western Brackenfern	2 3/8"
35	PM	Pycnanthemum muticum	Short Toothed Mountain Mint	plug
25	PT	Pycnanthemum tenuifolium	Narrowleaf Mountainmint	2 3/8"
20	Pba	Pyxidanthera barbulata	Flowering Pixiemoss	plug
100	RA	Rhynchospora alba	White Breaksedge	2"
15	SP	Sarracenia purpurea	Purple Pitcherplant	3"
120	SS	Schizachyrium scoparium	Little Bluestem	2"
25	SC	Scirpus cyperinus	Woolgrass	2"
45	SJ	Solidago juncea	Early Goldenrod	2 3/8"
20	SN	Solidago nemoralis	Gray Goldenrod	2 3/8"
30	SO	Solidago odora	Anisescented goldenrod	2 3/8"
200	SNu	Sorghastrum nutans	Indiangrass	2"
70	SL	Symphyotrichum laeve	Smooth Blue Aster	2 3/8"
90	TV	Tephrosia virginiana	Virginia tephrosia	2 3/8"
30	TD	Trichostema dichotomum	Forked Bluecurls	plug
20	UP	Utricularia purpurea	Eastern Purple Bladderwort	plug
20	VN	Vernonia noveboracensis	New York ironweed	2 3/8"
75	WV	Woodwardia virginica	Virginia Chainfern	2 3/8"

and construction. The sweeping lines of the paths and pond, the threading of related species, whose patterns come and go with the seasons, these are the hand of Darrel Morrison, FASLA, who is known for his prairie-like landscapes and ecological restorations. His many designs—the 80-acre meadow at the Storm King Art Center in upstate New York, the native landscape at the Lady Bird Johnson Wildlife Center at the University of Texas at Austin, the pocket-sized shady native woodland at New York University, the rolling riverside plantings for the Stone Mill at the New York Botanical Garden—are eloquent expressions of ecology as art.

But Morrison, who has a master's degree in landscape architecture and a long career in academia, is not licensed to practice so could not sign off on the plans. "I did the concept plan with the whole layout, but I was not equipped to do all the computer drawings or a cost approximation," he says. "That sort of thing is not my forte."

The Brooklyn Botanic Garden had held two design charrettes in 2008 and 2009, with Morrison, W. Gary Smith, FASLA, and Rick Darke, all expert in different ways with native plantings, as well as Lorimer and a few of its executive horticulturists. "Darrel really emerged because of his experience at Storm King and his background in restoration ecology," recalls Lorimer, who has curated the original native garden for 10 years, and added about 100 species to the increasingly shady space. "We all thought we should go with him."

But something else has stuck with Lorimer over the years. "Darrel had a workshop for the hort staff, where he brought in this poster of Kandinsky and he played Miles Davis or something. We got out tracing paper and [we] started drawing; it was really inspiring."

When Morrison made it clear he didn't do cost approximations and

ABOVE
Black gum trees *(Nyssa sylvatica)* flourish in the damp wetland soil by the boardwalk.

OPPOSITE
SiteWorks amended Darrel Morrison's sweeping paths with five wide sandstone steps to address the steep grade.

construction plans, he recommended a few firms that did, including SiteWorks, which is noted for its work at Teardrop Park, the High Line, and, more recently, Governors Island. SiteWorks developed the conceptual cost proposal, at $1.3 million, and won the construction bid. "We kept pretty much to it, except for one or two change orders," says Annette Wilkus, FASLA, who founded SiteWorks 14 years ago. The firm was later asked to manage the entire project, so Wilkus set up an office at 1000 Washington Avenue to inspect the progress of construction daily. It sounds like a dream job for a landscape architect.

"As far as a client [goes], they are really easy and quite lovely," Wilkus said one April morning, walking toward the native garden. "It's like vets working with animals. You're working with plants and you're in a good mood all the time, right?"

Botanical garden staff members, from gardeners to top administrators, understand plants, which makes things easier, in many ways, but you have to be humble. "You can't go in with an ego—I-know-everything-about-plants—because you're not going to," says Wilkus. "It was so amazing to sit and listen to Darrel and Uli talk about the plants."

But she was clear about what SiteWorks could do for them. "Darrel had the sweeping paths. He knew he wanted the pond, and this little berm along here, as if you're walking through a dune, and the council ring up there in the meadow," said Wilkus, gesturing toward a circular sandstone wall nestled low into the hill of the new garden. The wall, where a few people can sit together and talk, is Morrison's nod to Jens Jensen, whose landscapes conjured back not just the prairie, but the customs of its native people. "What he hadn't figured out was how to make all this happen with the grade change," she said, nodding northward, to the top of the ridge, where a century-old English oak stands.

"There were no specifications on soil or drainage," Wilkus recalled. "I don't think Darrel or Uli understood, from a soil standpoint technically, what they were asking to happen with super sandy soils and the slope that we have here."

But Wilkus had her own learning curve, on the subject of provenance. "They kept saying native plants. And we'd say, 'Well, we could do that. Not a problem.'" Her real grasp began when Lorimer and Morrison took her and Martin Leibrock, ASLA, a certified arborist and plant expert on the SiteWorks team, on a collecting expedition to the New Jersey Pine Barrens. They saw the plants where they thrive, the dunes and upland forest and bogs. She took soil samples: A horizon, B horizon, C horizon. "You just cut right down and can literally see the different colors, so you just take samples from each." And she repeated the process for every ecosystem. The soil samples were sent to the Soil and Plant Tissue Testing Laboratory at the University of Massachusetts Amherst, "so we knew what kind of soils we were looking for," Wilkus says. Siteworks wrote the soil specifications, based on the UMass reports, and brought in James Sottilo, an organic soils expert, to mix the soils.

The soil prep for this site ran counter to that for most jobs. The hilly acre had been the botanic garden's former composting site in the 1950s, so tons of black gold were scraped off the site. "The stuff we were pulling out was beautiful, if you're a vegetable farmer, but completely ill suited for coastal plain meadows and pine barrens," Lorimer says. "We were trying to make them [the soils] as crappy as possible."

Sottilo set up a lab and mixing operation right on the grassy strip that

DL DRAKE

runs between the rose garden and the new native garden site. Even the sand had to be local, from pinelands on Long Island. Once Sottilo had all the soil profiles, he came up with the mix of sand to loam to compost for each part of the garden. "He did a sieve analysis and was able to approve seven of the soils in one day," Wilkus says.

Another practice differed from most jobs: compacting the soil, to facilitate storm runoff into the pond carved out of the low end of the site. "The pond is totally artificial; it has no source of water other than rain," Wilkus says. "It's just a clay liner with bentonite to hold it." Torrential downpours last spring, however, brought a lot of newly planted seeds right into the pond. "The vision was not necessarily to have any plants under the boardwalk, but I'm really glad it happened," said Wilkus that morning, leaning on the wooden railing that keeps visitors from falling into the pond. She pointed out turtles sunning over on a rock.

The green scum was not quite so picturesque, and Wilkus has been lobbying for a solar pump to aerate the water. Lorimer is loath to put anything so unnatural among the natives: "As beneficial as they are, they're artificial. Ponds and lakes don't bubble." Lorimer has considered chemicals that kill algae, but he takes pride in not using pesticides. Morrison says he's heard of some kind of fish that eats algae. Medbury says simply, "We came in under budget. We bought the solar recirculator for the pond." Wilkus seems in her element here.

"I'm not a designer. I'm the guy in the background. Darrel's focus has always been about plants. I mean, who can do his stuff? The guy's a genius." Wilkus first got to know Morrison 30 years ago, when she was an undergraduate in his planting design class, at the University of Wisconsin. His comments, she says, weren't much different from the ones she got at the University of Pennsylvania, where she earned a master's degree in landscape architecture. "'That's nice, but you're really too practical,'" she recalls being told. "My mind is more scientific. It immediately asks, 'How is that going to work? How are you going to build that?'" Here, she worked with horticulturists, as well as an artistic designer, who were willing to admit she was the master of construction.

Morrison, for instance, had drawn the council ring at the crest of the hill, but Wilkus set it a bit below. "Annette pointed out that it would be noisier up there and she was absolutely right," said Morrison, referring to the trucks rattling down Flatbush Avenue. "The earth form behind us muffles the traffic noise."

He sat on the low wall of the council ring, admiring the paving pattern at our feet and the color of the sandstone. "Annette's office and the contract people did a great job on the constructed elements," he said. SiteWorks designed the modernist boardwalk and railing, which are both made of Atlantic white cedar. Morrison likes its cleanness, and contrast with the garden's textures, though he feels a bit guilty about harvesting the cedar from the New Jersey Pine Barrens. He and Wilkus argued about the height of the curving wooden benches on the boardwalk. "Annette said 18 inches. I said 15," says Morrison. "I won."

Lorimer, who had spent years tramping around pine barrens and bogs with field botanists like Gerry Moore, the former director of science at the botanic garden, and Steven Clemants, who founded and ran the New York Metropolitan Flora Project for years before he died in 2008, had added 100 new species to the original Native Flora Garden, which he has curated since 2004. He watched many of his favorite plants get shaded out by the growing canopy and had long eyed the

ABOVE
The new one-acre extension of pineland species thrives next to the 100-year-old native garden.

OPPOSITE
Unintended newcomers have shown up, including cattails, rushes, arrowhead, and *Lindernia*.

sunny adjacent acre for expansion. And though the Greenbelt Native Plant Center on Staten Island grew the majority of the plants here from wild-collected seed, Lorimer has nursed many rare orchids, pitcher plants, and sphagnum mosses on the botanic garden grounds.

"These are my babies," he said, leaning over a burgeoning prickly pear, collected from seed on top of Hook Mountain, near Nyack, New York. But he found Morrison open to learning from him, as the two explored the New Jersey Pine Barrens collecting seeds and discussed the ideal planting list for the new garden.

"Uli and I became partners, and it was great fun working with him," says Morrison. He was delighted to see bergamot and goldenrod spreading in his characteristic drifts, even jumping the paths. Lorimer pointed out tiny rare plants, like the bluish Barrett's sedge, with its male and female inflorescences, and pyxie moss, its white flowers so tiny, you have to crouch down to see them.

As early as last fall, the meadow here was coming into its own, the grasses turning reddish gold, the asters and goldenrod all abloom, the joe-pye weed and ironweed swaying over the benches on the boardwalk. Even the slender black gum trees by the bog and the gray birch up on the ridg are starting to look like groves.

Wilkus chuckled at her moment glory, a few years ago, when she d manded the planting list from h former professor. Construction w a year away, he protested. He wou be on site anyway, showing wh went where.

"I said, 'Okay, Darrel, that's a ye from now. What if you get hit by bus? What are we going to do?'" sh recalled. "Also, the contractor nee to be able to bid, so they know the have apples to apples on how they going to do it, how many men it going to take, and how long, so the

LEFT
After only a year, drifts of bergamot, goldenrod, and asters bloomed among the native grasses.

can put a number on it." When he still moaned and groaned, she said: "Darrel, I need it next week. Paybacks are a bitch, aren't they?"

They both started to laugh. "Because he always gave us deadlines in school."

One of the best things about working at the Brooklyn Botanic Garden, besides "getting paid in a nanosecond," she says, is that the contractor isn't blamed when a downpour washes off newly planted seeds, or tiny plants don't turn into big ones overnight. And they understand a lot more than dirt gardening.

Melanie Sifton, the vice president of horticulture and facilities, switched careers as a Madison Avenue advertising manager to apprentice for three years at the Niagara Parks Botanical Gardens and School of Horticulture, before earning a master's degree in public garden leadership at Cornell University. Tracey Faireland, the vice president of planning, design, and construction, is a civil engineer. "It was interesting working with them during the construction phase," Wilkus says. "And honestly, we didn't have Uli and Darrel come to those meetings, because all they wanted to do was talk about plants. These people [Sifton and Faireland] understood about drainage and ADA and all the rest."

Wilkus freely admits she is no plant expert—"I'm very weak in the whole herbaceous plant realm"—which is why she has Leibrock on staff. "Marty has been working in nurseries since he was in high school," she says. "On the High Line, he was holding one on one with Piet Oudolf. We take him to our meetings and he translates what's going on."

Landscape architecture, after all, is a complicated field, requiring a lot more than planting design. "But for landscape architects not to understand planting is pretty scary to me," says Wilkus. "And what's really scary is that the schools right now offer planting design as an elective. Soils, they hardly talk about." So as public parks and botanical gardens turn more toward ecological landscapes, maybe landscape architects should make sure they can tell a *Nyssa sylvatica* from a *Robinia pseudoacacia*. And understand soils as underground civilizations. ●

ANNE RAVER WRITES ABOUT THE ENVIRONMENT, INCLUDING GARDENING AND FARMING, WILDLIFE HABITATS, AND LANDSCAPE DESIGN.

Project Credits

CLIENT BROOKLYN BOTANIC GARDEN (SCOT MEDBURY, PRESIDENT; TRACEY FAIRELAND, VICE PRESIDENT OF PLANNING, DESIGN, AND CONSTRUCTION; MELANIE SIFTON, VICE PRESIDENT, HORTICULTURE; MARK FISHER, DIRECTOR, HORTICULTURE; ULI LORIMER, CURATOR, NATIVE FLORA GARDEN). **LANDSCAPE ARCHITECT** SITEWORKS LANDSCAPE ARCHITECTURE, NEW YORK (ANNETTE WILKUS, FASLA, PRINCIPAL IN CHARGE; MELISSA POTTER IX, ASLA, PRINCIPAL; ANDREW CADDOCK, ASLA, PROJECT MANAGER; CELINE ARMSTRONG, ASLA, AND MARTY LEIBROCK, ASLA). **LEAD CONCEPTUAL AND ECOLOGICAL DESIGNER** DARREL MORRISON, FASLA, NEW YORK. **CONCEPT TEAM** DARREL MORRISON, FASLA; W. GARY SMITH, FASLA; RICK DARKE. **CIVIL ENGINEER** WEIDLINGER ASSOCIATES, INC., NEW YORK. **STRUCTURAL ENGINEER** HAGE ENGINEERING, NEW YORK. **SOIL CONSULTANT** ECOLOGICAL LANDSCAPE MANAGEMENT, MILLER PLACE, NEW YORK (JAMES SOTTILO). **CONSTRUCTION MANAGER** SITEWORKS LANDSCAPE ARCHITECTURE, NEW YORK. **GENERAL CONTRACTOR** STEVEN DUBNER LANDSCAPING, INC., DIX HILLS, NEW YORK. **PLANT CULTIVATION** GREENBELT NATIVE PLANT CENTER, STATEN ISLAND, NEW YORK.