SOONER OR LATER AT SEASIDE

CAN A SOAKED AND FRUSTRATED COMMUNITY LEARN TO EMBRACE ADAPTATION? ALEXANDER FELSON IS TRYING TO BRING IT ALONG.

BY ARTHUR ALLEN

DIEGO CELIS

THE YALE UNIVERSITY PROFESSOR ALEXANDER J. FELSON, ASLA, brings landscape architecture and ecology together in what he calls "designed experiments"—projects that test green urban design and management hypotheses but that also meet practical needs. In 2010, he came to Seaside Village, a century-old brick Georgian revival complex in Bridgeport, Connecticut, where the homeowners association had asked Yale's Urban Design Workshop and Urban Ecology and Design Lab to develop a master plan for the 257-unit community. Seaside Village is enveloped in the shade of beautiful red oaks, lindens, and silver maples but floods badly during heavy rains.

At first it seemed like a marriage made in heaven.

Felson, an assistant professor at Yale, runs a joint degree program between the School of Forestry and Environmental Studies and the School of Architecture. He has a master's degree in landscape architecture from Harvard University and a PhD in ecology from Rutgers University. As a designer and researcher for MillionTreesNYC, the planting project in New York City, he helped devise a series of experimental plots to study urban forest health over time in different soils and settings.

Seaside Village was a site with great symbolic interest, a place where idealisms past and present could meet. There were, however, big problems that come with working on former wetlands within a 100-year floodplain, on the fringe of a threatened coastline where flooding is common.

Poor drainage plagues Seaside Village, which lies below high-tide levels on pancake-flat land. After a normal heavy rain, drains back up and fill the neighborhood. An inch of precipitation can leave six or seven inches of water on the streets, and most basements flood regularly. A glance at the 1893 U.S. Geological Survey map of the area shows why: The land where Seaside Village now sits once lay under a marshy inlet of the Long Island Sound.

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ABOVE
Yale University Professor Alexander J. Felson, ASLA, (right) wheelbarrows in the dirt during a recent planting day at the Bridgeport, Connecticut, bioretention garden he designed.

OPPOSITE
Flooding from Hurricane Irene in 2011 made it possible to canoe in the streets of Bridgeport.

SUBBASINS AND SURFACE WATER FLOW

OBSERVED PONDING

ABOVE LEFT
Yale's Urban Design Workshop drew up a master plan in 2009 to address Seaside Village's flooding problems.

ABOVE RIGHT
A pilot project ended up focusing on eliminating ponding in the parking lot.

Today, two years after breaking ground, the six bioswales that formed the hydrologic core of Felson's pilot project are only beginning to blossom, and the village has nixed a plan to build a network of such swales throughout Seaside Village. Although a core of enthusiastic inhabitants have put in long hours to build the project, some have grown frustrated battling frequent floods, and a few members of the community—with a touch of *schadenfreude*—have taken to calling the project "bioswamp" or even "biodisaster."

Since the first swales were dug, Seaside has been swamped by two hurricanes, a winter storm, and unusually heavy rains. As a result, plantings have repeatedly been swept away or drowned under saltwater. A thief has stolen materials and gear, and Felson has had to contend with warring homeowners and a civil engineer who gives slide shows in which he condemns the project.

On the other hand, it's a start. A community has taken action, using what Felson calls a "stone soup" financing method, to deal with the problems that climate change is bringing to the Northeast, while addressing green infrastructure needs such as reducing sewage flows. The communal parking lot no longer floods, and Felson is hopeful that after finding a good mix of vegetation, the site will offer a working-class community an attractive oasis.

"With climate change and increased storm intensity, it's an inescapable fact that a coastal community such as Seaside faces an uphill battle to retrofit itself," says Felson. "Coastal landscapes are not easy sites to design within—but someone has to address these high-stress conditions.

"Their problems are bigger than something we can solve," he adds. "We are trying to ameliorate

ALEXANDER J. FELSON, ASLA, AND THE UEDLAB

and choreograph the dynamic change of this area over time."

To be sure, Felson never offered Seaside Village a rose garden—just a rain garden.

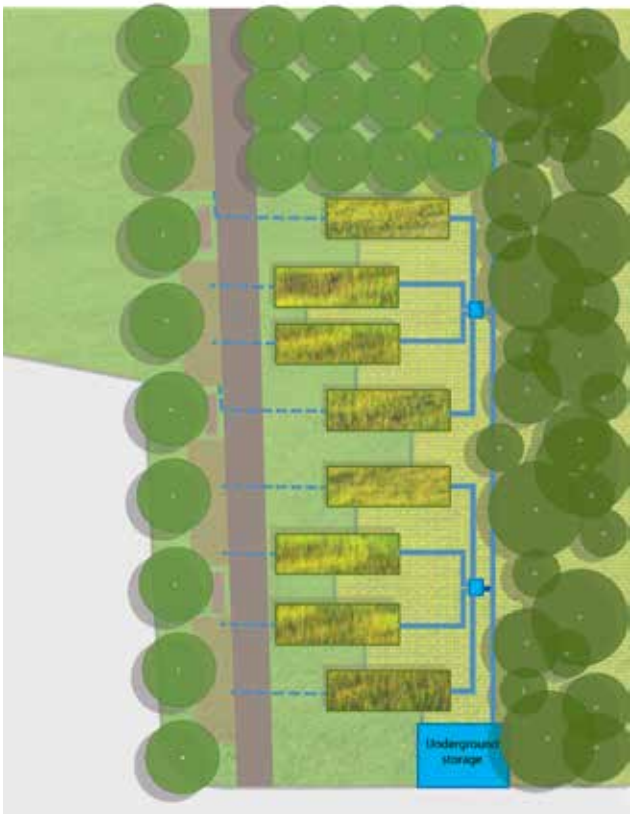
The work at Seaside Village has been an experiment in green infrastructure in a lower-income neighborhood with a great backstory. The federal government built Seaside in three months in 1918 to house workers streaming into town to make bullets and rifles at the Remington Arms Plant (when Lenin cancelled a czarist arms contract, after pulling Russian troops off the Eastern Front, Uncle Sam stepped in to buy them—an early federal bailout).

Though the one- and two-bedroom units rented for about $20 each in 1919, the project was sophisticated enough to be featured at the time in a long *Landscape Architecture* article by the urban planner Arthur Shurtleff, who had helped design the village. The houses were modeled on "fourth rate" housing—snug but dignified—as described in London's 1774 building code. The project went up on industrial waste fill, half a mile from Long Island Sound. The sound lies across Seaside Park, which was financed by P. T. Barnum and designed by Frederick Law Olmsted and Calvert Vaux.

In 2009, Seaside residents asked Yale's Urban Design Workshop to create a master plan to address their stormwater problem. Although the plan recognized that clay soils, a shallow water table, and lack of grading could frustrate green infrastructure attempts, the homeowners agreed to put down $10,000—a fair chunk in a community where one-bedroom houses sell for about $30,000—to fund a pilot plot.

ABOVE
This plan shows the combination of square bioretention gardens and linear swales laid out across neighboring properties in a subbasin watershed.

ALEXANDER J. FELSON, ASLA



LEFT
During heavy rains, two concrete boxes channel water from the parking lot to the six bioretention swales.

RIGHT
A system collects gravity-fed water in a holding pool, which spills into a system of dipper boxes that distribute water equally across six swales (this earlier plan shows eight swales).

Bioswales would be dug next to a parking lot on the sea side of the community, to drain the large parking lot that helps relieve congestion on Seaside's narrow streets. The swales would employ various soils and plants, an experimental design whose data could help direct projects elsewhere.

"There was limited money," Felson says. "It ended up costing $70,000, but most of that was in the form of donations—including machinery, materials, and man-hours from Bridgeport—and volunteer labor." In addition to the community's $10,000, the U.S. Environmental Protection Agency provided $10,000 to hire a project manager, an energetic University of Connecticut graduate named Brian Kaye.

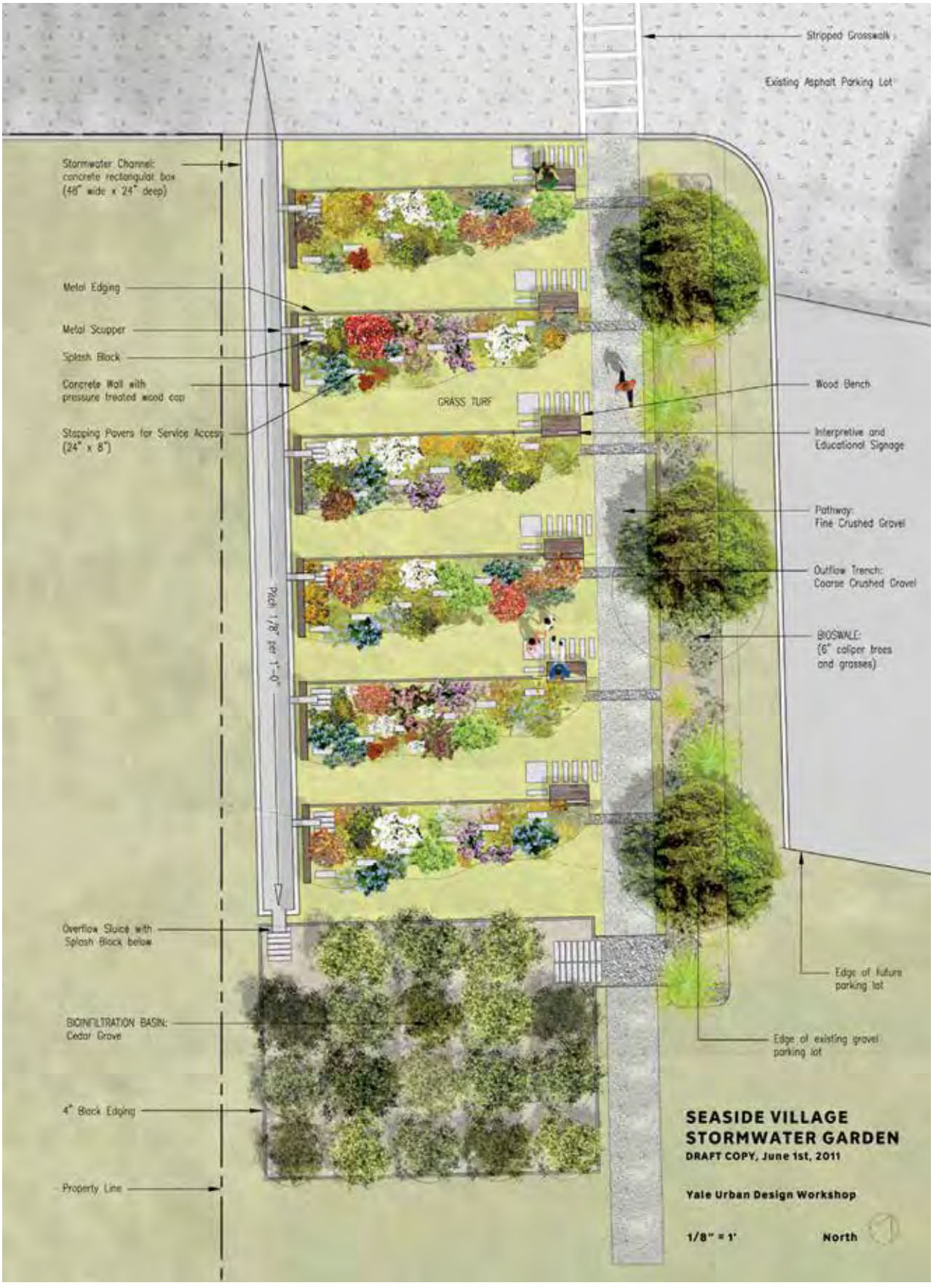
In June 2011, Felson gathered at the site with volunteers and students from Yale and UConn, as well as a civil engineer—a low-impact design specialist hired to determine the soil composition.

Two months after the first dig, Hurricane Irene put the entire community under as much as three feet of water. Water sloshed against first-floor windows in a frightening demonstration of the power of the sea, rain, and wind. The storm left behind more than $600,000 in damage.

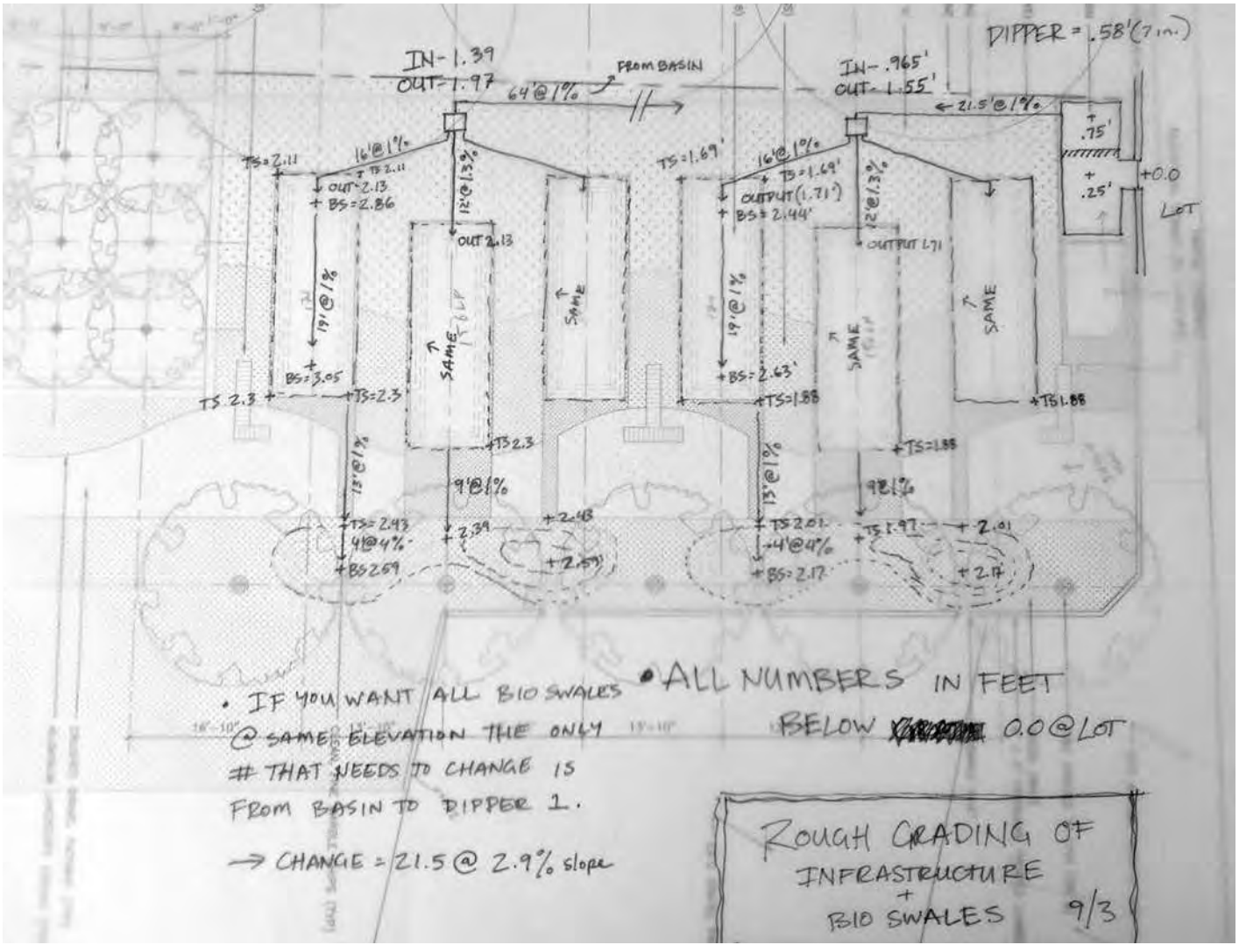
The team began excavating the gardens in late September, but groundwater and rain throughout the fall made the site unmanageable for weeks at a time. Felson and Kaye would have to rent pumps to drain water from the site 15 times. The year 2011 was the rainiest year in recorded history in Bridgeport.

The site was still wet in the spring of 2012 when about a dozen homeowners, college students, and kids from a Bridgeport youth group helped plant

ALEXANDER J. FELSON, ASLA, AND THE UEDLAB, LEFT; YOSHIKA HARADA AND UEDLAB, RIGHT



UEDLAB AND YALE URBAN DESIGN WORKSHOP



ABOVE
The grading plan with the slopes and elevations for each swale.

the bioswale. Four months later, Sandy came along, submerging the whole area again under several feet of saltwater. When the waters receded, most of the plantings had died or washed away.

"It was devastating," says Kaye. "Worse than Irene. The site was unworkable until this past [2013] spring."

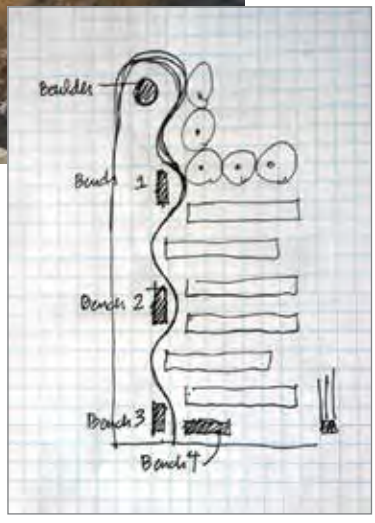
On the bright side, Seaside Village's bioswales had become a habitat for mallards, wild turkeys, shore birds, and beautiful green monk parakeets—part of a mysterious flock that established itself in Bridgeport 40 years ago, apparently after escaping from a cargo box at John F. Kennedy Airport. Perhaps the parakeets augur climate changes to come. For now, they and the other birds "help make the urbanized coastal edge more aquatic," says Felson, and that helps "change opinions and understanding of what these landscapes should look like."

Kaye, who figures he's put in more than 500 hours at the site over the past two years, was hired in June 2011. His salary ran out long ago, but he keeps returning as a volunteer. "It's an amazing project," he says. "It's an old, historic village, and the people here deserve respect for wanting to preserve it and retrofit, rather than starting over."

The brutality of Irene and Sandy made it clear to locals that climate change is no longer theoretical. "This was a wetland. We came and took it back for a while, and now nature is taking it back again," Kaye says. "This maybe wasn't the best site for a model project, but these are the challenges that we're all going to face, sooner or later."

In the most basic way, the bioswales were working—when it rained, the parking lot drained into them. But hurricane-related flooding, alternating

BRIAN KAYE AND UEDLAB



TOP
Residents of Seaside Village pitch in to help prepare the bioswales for planting.

INSET
This sketch of the Bridgeport Bioretention Garden shows where the benches and boulder are located.

ALEXANDER J. FELSON, ASLA, PHOTO; ALAN PLATTUS AND ALEXANDER J. FELSON, ASLA, SKETCH

with prolonged dry periods, posed severe challenges to vegetation. In the fall of 2013, Felson was planning to experiment with two types of plantings—salt tolerant and floodplain—to see which best fit the location.

Felson describes the project as a "working landscape" and points out that lessons drawn here will be applicable to many other locations.

In addition, the involvement of Seaside residents, and city and regional officials, allows "a diverse set of groups with opposing opinions to become involved and open their minds in ways they might not have predicted and get into a process of change they may not agree with but can still go forward."

There were certainly opposing opinions in the village, as well as a certain burnout factor.

The bulwark of support for the project consisted of a dozen volunteers who appreciated its historical value. They included Diego Celis, who retired to Bridgeport after working in New York City's garment district as a children's clothing designer. Celis, whose small house was a model of elegant design, was a bit disgusted by the low civic pride of most of his neighbors.

"This is supposed to be a suburban garden community, but nobody gardens," he says. He grimaces at the dowdy awnings and railings some residents have erected. "Nobody realizes what a jewel this place is, and they have no respect for its integrity. It is a gracious old lady—you can't make her into a teenager by dressing her in modern garish clothes."

As for the bioswale project, "It's kind of an in-between situation," says Ulises Fernandez, another homeowner who has spent hours working at the

ABOVE
Preparation of the gravel walkway along the bioswales, with the parking lot and houses in the background.

OPPOSITE
The bioswales and the completed walkway, with stone benches.

site. "The swales have kept water out of our parking lot. But some people expected a miracle, and it hasn't happened. We've been unlucky. Whenever we plant or try to finish the project, we have a major storm or a hurricane."

Seaside is a culturally and racially mixed place—whites, African Americans, Eastern Europeans, Hispanics, and Vietnamese immigrants. Attitudes toward the project are profoundly mixed as well. One longtime resident frequently razzed the volunteers while they worked on the site and sometimes made off with their building materials.

Steve Trinkaus, who worked on the project as the civil engineer of record, later attacked it as "an example of what not to do," though it is hard to imagine any project at the site proceeding smoothly, given the weather it faced.

To deal with flooding, Felson and the volunteers have raised the elevation of the swales and filled them with sand, plants, and river rocks; added bluestone grove walls; laid a path system and underground infiltration pipe; and put in stone benches and edging along the swales.

In retrospect, though, some of those concerned with the project thought the site probably wasn't a good one. "When storm surges came right up over the site, it was a whole other ball game," says Chris Ozyck, a landscape designer who consulted on the project. "It went from being a groundwater infiltration project to a coastal adaptiveness project."

The two recent storms that hit Seaside were unprecedented, the worst since 1985. "In people's minds, the threat didn't register until now," Ozyck says. "This site can help people understand: You're living in a floodplain. And though these events are

BRIAN KAYE

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supposed to occur every 100 years, we're getting them more frequently, so we need to adapt."

For all the difficulties, Felson says much that is positive has come out of the project. "Coastal adaptation in areas with a high water table and intense storm events is challenging," he says. "But these are the sites that need retrofitting in order to improve coastal ecosystem functions and resiliency. Part of the effort needs to be educating the stakeholders and agencies about what they can expect in relation to performance. Getting buy in at the local site level is critical. We are still in a stage of demonstrating what green infrastructure looks like and what it will require to build and maintain."

Some people are asking what lessons can be drawn from the experience. It's easy enough for wealthy property owners to remodel in a way that's green and clean. But in a community where people make it happen only by dint of financial sacrifice and sweat equity, what is the value of such projects? What if the lesson they teach is that retreat is the only answer?

"I think Alex is conflicted about this site," says one of his colleagues. "There isn't a good engineering solution to the particular problems of this community. And you know, retreat is part of the solution for Connecticut." But how do you tell that to the people who can't easily pick up and leave?

Felson, though, says he is far from ambivalent. To the contrary, he says, he's continuing to work on adapting the site and planning improvements. "Whatever the outcome," he says, "it will be applicable to other coastal projects." ●

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