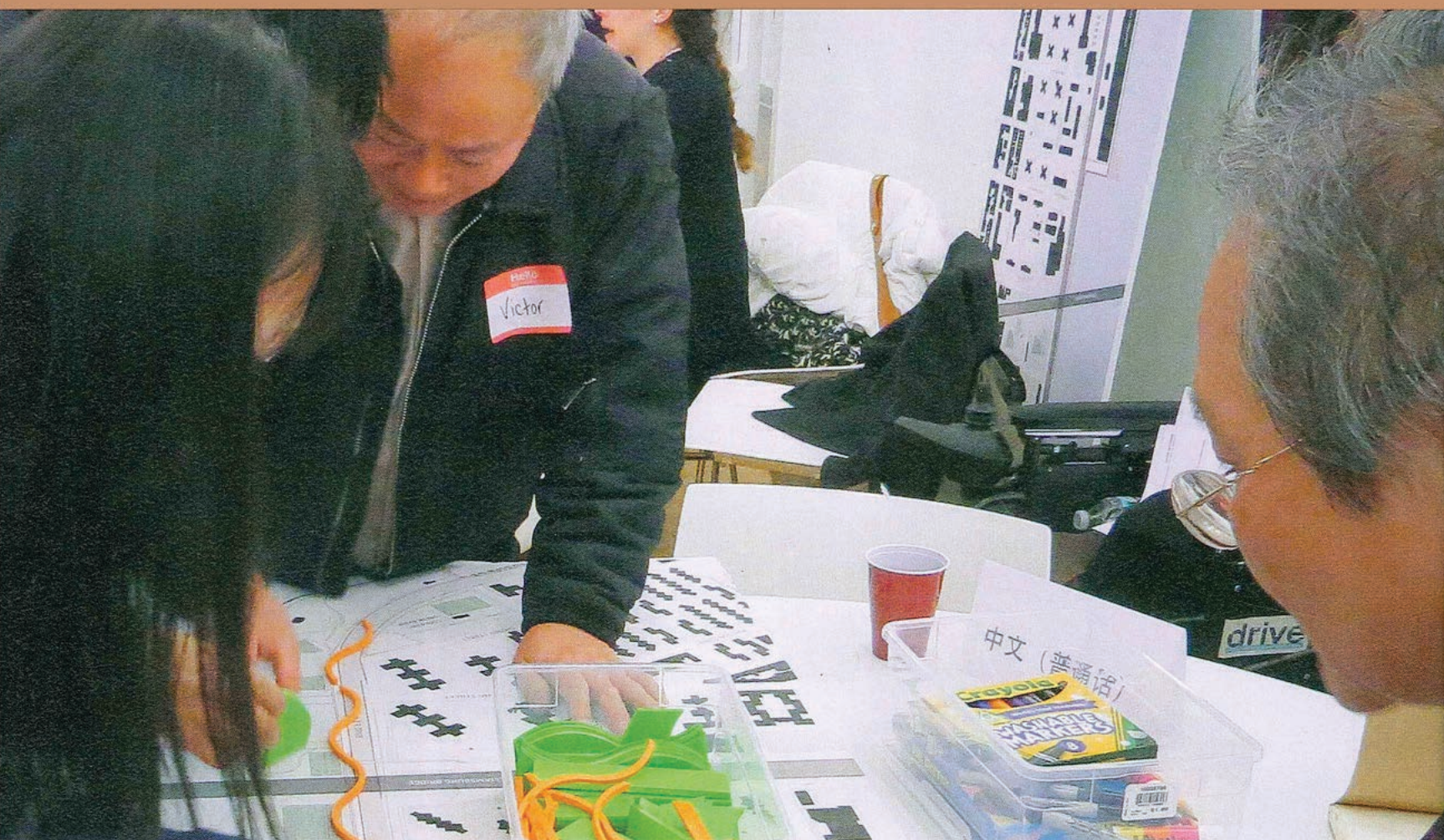


“Reclaiming the waterfront”

Urban flood protection infrastructure
New York City, USA



How can a coastal city be protected against surging floodwater without simply surrounding it with a dyke? “The Dryline” is designed to provide flood prevention and enhance daily life on Lower Manhattan in New York City.



North American hurricanes, which have historically hit mainly the US Gulf Coast states and North Carolina, are now reaching the northeast seaboard of the United States with increasing frequency. On October 29, 2012 Superstorm Sandy caused enormous damage to New York City: For the first time in over a hundred years, many subway tunnels were flooded, millions of people were without power for days, and public institutions remained closed. The disaster claimed 50 lives in the State of New York.

This natural disaster was the second most costly in the history of the United States – following Hurricane Katrina, which wreaked

havoc in New Orleans in 2005. The federal government provided USD 50 billion dollars in emergency relief in Sandy's aftermath. Ten percent of it was earmarked for preventive measures. To use this money to best effect in the northeastern states, the United States Department of Housing and Urban Development, with the support of private foundations such as the Rockefeller Foundation, conducted a competition in 2013: "Rebuild by Design" was held to collect innovative ideas for flood protection.

Among the winners of the ideas competition was the BIG Team, comprising various experts from the USA and the Netherlands,

and their governmental partner and grantee, the City of New York. The team put together for the competition was headed by the New York office of the Danish Bjarke Ingels Group (BIG), which is also based in Copenhagen. BIG Partner Kai-Uwe Bergmann worked on the competition entry, and Matthijs Bouw from One Architecture in Amsterdam reinforced the BIG Team.

"The problem was to define the problem itself"



How did this international team come together?

Kai-Uwe Bergmann: US government officials visited the Netherlands and were very impressed by the country's experience in flood prevention. The Dutch are simply the best when it comes to flood protection – they have centuries of experience. The officials then hired Henk Ovink from the Netherlands to lead the "Rebuild by Design" competition.

Matthijs Bouw: He was formerly director general of spatial planning and water affairs. Because my office has worked on many government contracts, I know him well, and that's how I found out about the competition. **Kai-Uwe Bergmann:** Shortly after Sandy, Matthijs Bouw and I were talking about how the Europeans know how to tackle such problems jointly. He told us about the competition – and arranged collaboration with BIG.

Matthijs Bouw: Then, when the competition was launched, it was clear that BIG should take the leading role – after all, their office is in New York.

Kai-Uwe Bergmann: We had to make sure that our project would genuinely be viable. That's why we added an economist and an environmental scientist to our project team. We put together a team that could present a credible business case.

What did the competition brief call for?

Matthijs Bouw: The competition was open, but it was not formulated in the usual way. Normally in a competition a problem is stated, and the teams then propose their solution. But here the problem was to define the problem itself. The brief merely stated: Propose something to make the flood zone safer.

"We tried to anticipate the future"

The jury ultimately paid for each of the ten teams to develop their idea into a business case. Each team handled its own piece of shoreline; the BIG Team won with a vision for Manhattan, a protective system for ten continuous miles of low-lying geography stretching from West 54th Street South to the Battery and up to East 40th Street.

How does one go about tackling such an enormous task?

Matthijs Bouw: We always start by discussing and developing ideas, visualizing things with sketches.

Kai-Uwe Bergmann: Ideas begin to take form through the information one gathers. We analyzed the topography and studied the

relationship between the dynamic water level and the terrain. We also knew we needed a good process to manage the project; we had to find a way to deal with the many local citizen groups. We put these elements together and realized: If we organize the shoreline in sections, we can combine everything. This was the germ of our concept of compartmentalization into resiliency districts. The analogy for this is the system of float chambers in a ship.

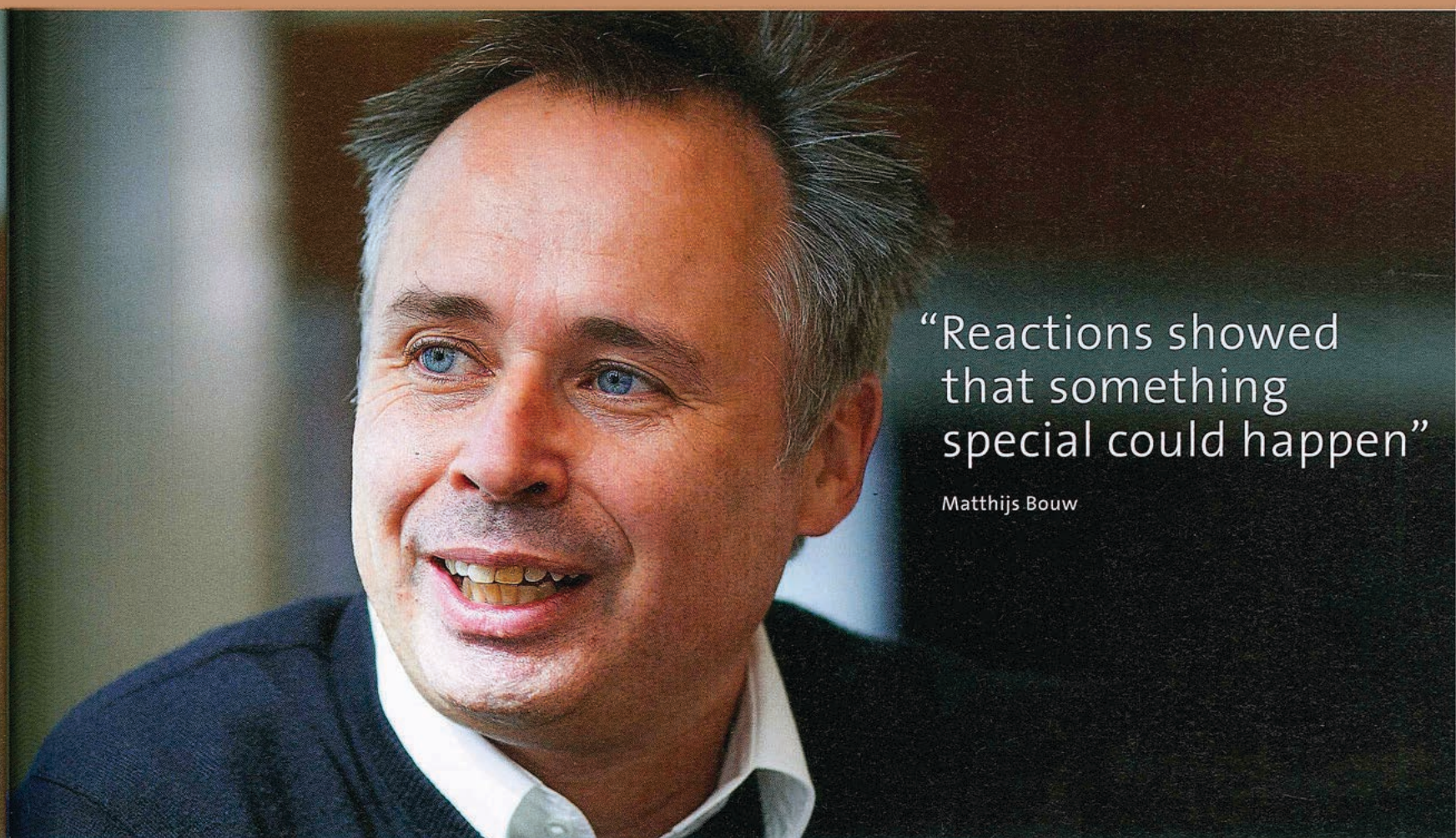
Matthijs Bouw: We not only looked at the water situation, we also asked ourselves: What else do the people of Manhattan need? Can we combine our water management measures with solutions to other problems?

The waterfront properties are owned by the City of New York, the State of New York, and, to a lesser extent, private entities. To develop its proposal, the BIG Team familiarized itself with the political boundaries and interacted with representatives of the various citizen groups. Special attention was given to communication with the many stakeholder groups: Over 20 workshops were held, in which the BIG Team explained the project to the public. Dialog was maintained with over 30 neighborhood groups, institutions, and cultural associations. Because the Lower East Side is home to many



“At one time, Central Park was also just an idea”

Kai-Uwe Bergmann



“Reactions showed that something special could happen”

Matthijs Bouw

immigrants, simultaneous translators for Spanish or Chinese were used at some of the workshops. The locals were also asked what they miss the most in their neighborhood.

Doesn't such an approach make things incredibly difficult?

Kai-Uwe Bergmann: Communication is an important tool! We want to launch a new development and we need the support of the people. If we can give them something they want, we can win their support.

Matthijs Bouw: The communicative approach and the idea of “social infra-

structure” are part of the very DNA of BIG. The reactions at the workshops showed us that something special could happen.

What did the citizens say they were missing the most – what were their wishes?

Matthijs Bouw: People give you very clear information when you give them a chance to express their opinion. The most common complaint was that they lacked shopping opportunities and community space – or that

they didn't like the outdoor public areas. Fears were often expressed, especially on the East Side; people were very definite about what the waterfront means to them. They were worried about change and want reassurance that their view or their access to the waterfront would not be cut off.

Was there much resistance to the project?

Kai-Uwe Bergmann: The vast majority were positive. There are always NIMBYs, those who

say “not in my backyard.” But you also have to understand that people are not happy about losing part of their view. This problem is somewhat alleviated in that insurance companies are recommending moving ground-floor apartments to higher floors in response to the flood risk.

How can you discuss all the various options with so many people?

Kai-Uwe Bergmann: We used renderings and physical models to make it easier. We told the participants: There are different possibilities – play around with the parts of the model, as with Lego.

And how do you make sure that the wishes remain in the realm of feasibility?

Kai-Uwe Bergmann: The costs are determined in a detailed feasibility study. The central question is: Will the budget support everything we want to realize or do we have to reduce the scope? That's why our concept to reclaim the waterfront and to create resiliency districts is so important – we can invest in phases.

The design proposal for ten miles of waterfront was developed over a period of about three months. A number of interventions were planned in conjunction with the city and the community, always tailored to the local needs and physical circumstances. Several basic elements were employed. A system of variously shaped concrete elements is called “big bench.” These form water barriers while also, depending on the particular form, serving as benches, planters, play-ground seating, bike shelters, or skateboard ramps. The second major element is dykes, which can be built up where space allows. These also serve as green areas and attenuate traffic noise emitted from FDR Drive, the freeway along the East River. Bleak leftover spaces beneath elevated roadways could be transformed by adding public pavilions. Here, market stands, exhibitions, and event

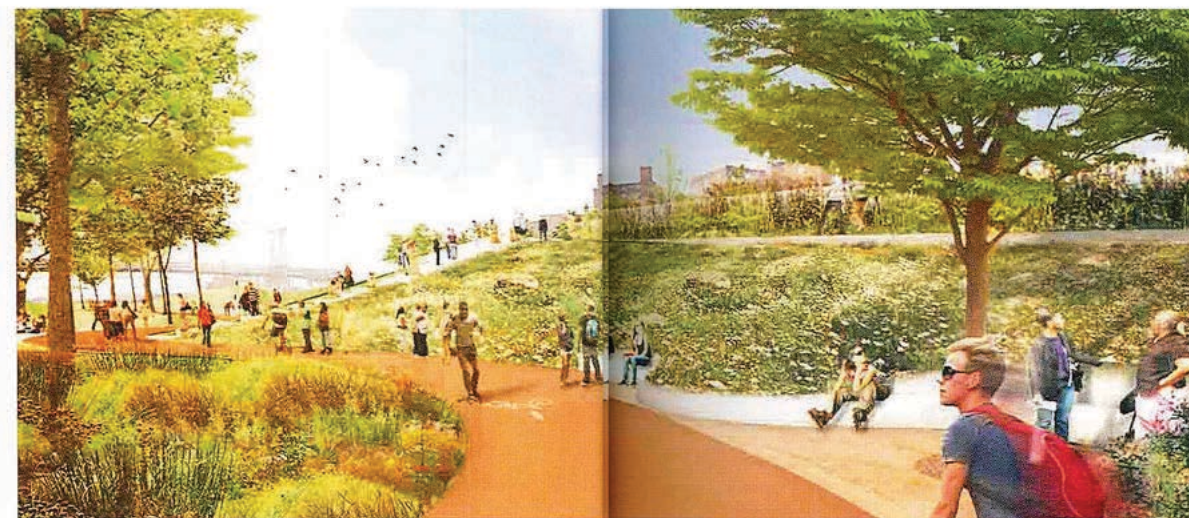
venues can be set up. In the event of an emergency, the storm shutters can be rolled down and locked, and the dual function of flood containment comes into play. Also, the entire twelve-kilometer stretch of waterfront could be enhanced with a continuous bicycle path.

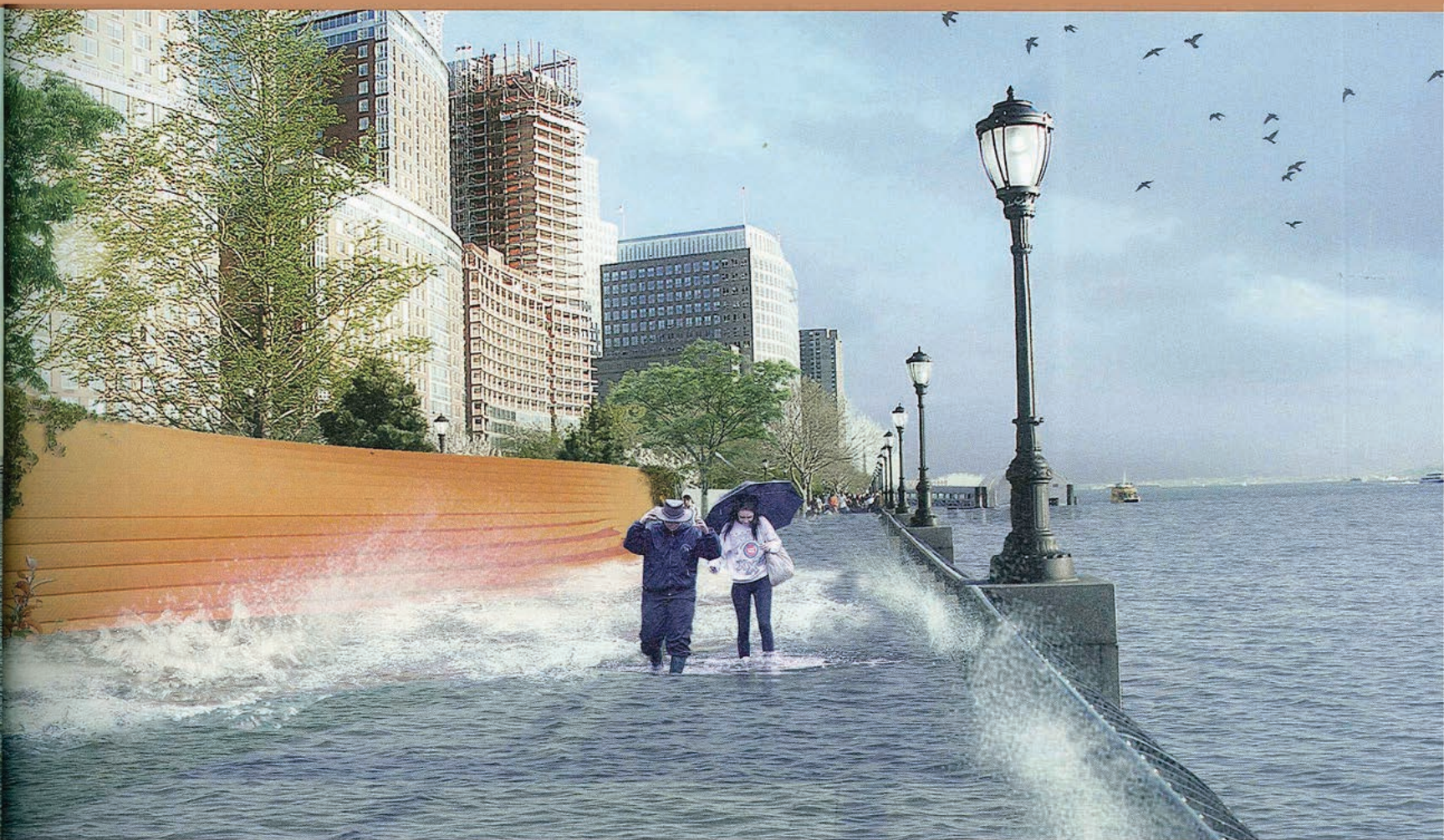
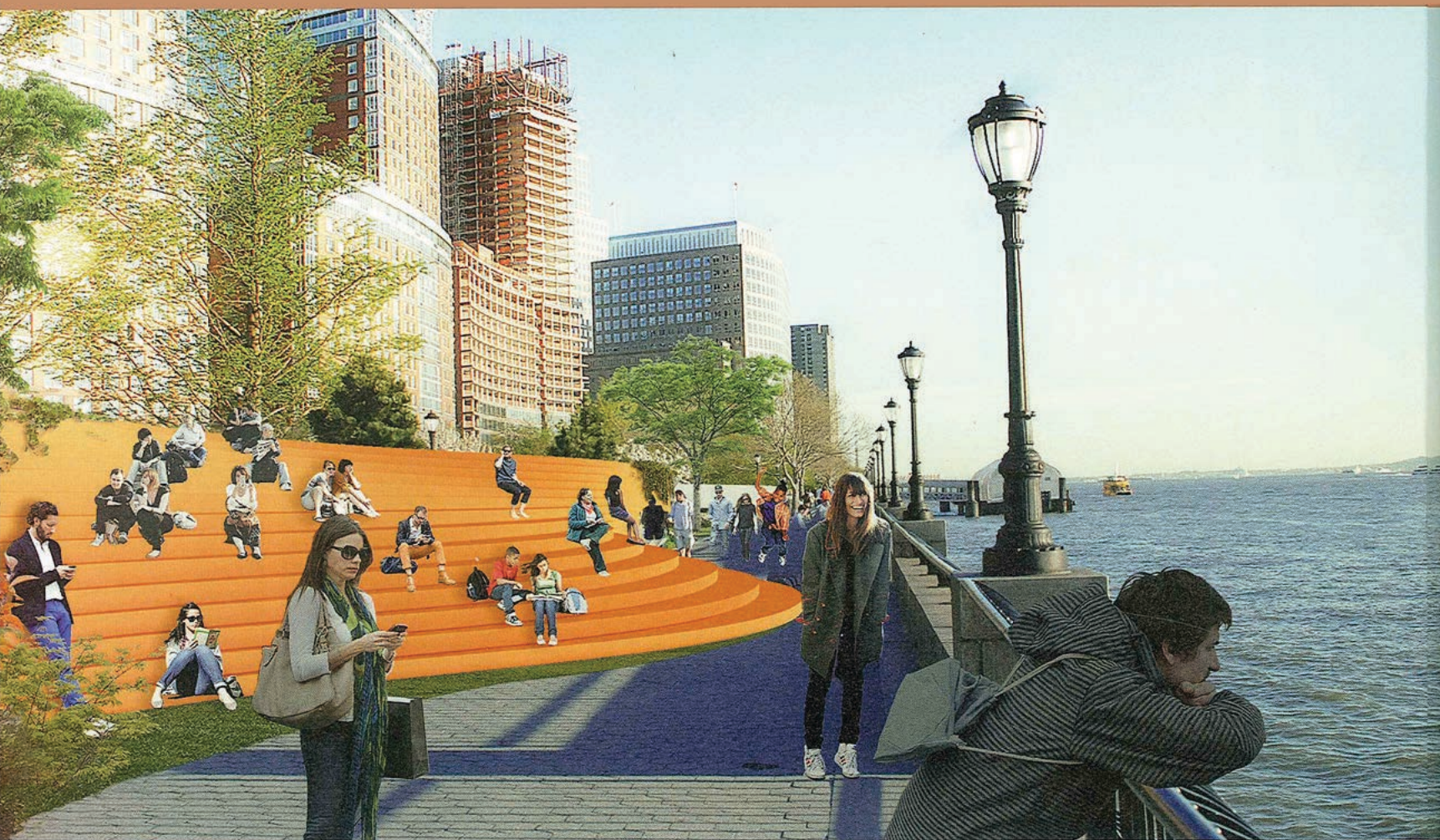
The Manhattan waterfront is densely built up. Where have you found space to build dykes, for example?

Matthijs Bouw: That's one of the major challenges, because there is very little space indeed. Nevertheless, we decided to plan for the time being using only the available land. If some legal boundaries happen to change in the next ten years or so, one can always reevaluate. We tried to anticipate the future in all of our measures.

While the BIG Team was working on the project, it was decided together with the New York City Mayor's Office of Recovery and Resiliency that the Lower East Side would be given priority. The team invested much unpaid work in the project, and also presented proposals for Battery Park at the southern tip of Manhattan and for the Two Bridges District. Thus, measures for a total of some 20 kilometers of waterfront were developed.

“Communication is an important tool!”





From where do you get the confidence that additional funding will be found?

Kai-Uwe Bergmann: At one time, Central Park was also just an idea. Today the whole world knows it. This gives me the determination and the optimism that in this city one can effect change.

But this will cost a lot of money.

Kai-Uwe Bergmann: Compared with the damage a hurricane can cause, it is not so much. In the Financial District, which was also flooded, many building owners are now building their own dam. A collective project would be much more efficient. And if our district fares better than the others in the next

storm, the insurance companies will pressure the other areas to implement similar measures.

The plans for redesigning the waterfront are now being developed in detail by the City of New York in preparation for project implementation. The initial measures in the Lower East Side are expected to start

by 2017 and be completed by 2020. Over time, the people of Manhattan will gradually win back the water and the shoreline. New York City, which until now has not had a comprehensive plan for flood protection, is about to become a global trendsetter in yet another way.

Project appraisal by the Global Holcim Awards jury

Turning a problem into an opportunity

Notwithstanding the merit of the proposal's vision and its commitment to translate an infrastructure into an urban space accessible to all, the project was nonetheless controversially discussed. On the one hand, the jury appreciated the scheme's bold proposition to tackle the ramifications of climate change by means of a construction that offers a surplus value to society – turning a problem into an opportunity.

On the other hand, the issue was raised as to whether the project was not more reactive rather than proactive, addressing the effects of climate change instead of its root causes. Debate aside, the project makes a political statement by means of an architectural and urban proposition, arguing that climate change indeed can no longer be suppressed or discarded as a figment of environmentalist imagination and that tangible solutions truly exist. Moreover, the jury considered the project's potential as model to be applied in other contexts, with the case of New York understood as a prototype from which to learn in order to pursue similar strategies in susceptible regions around the globe, including, most importantly, regions with limited economic resources.

Initial project submission see page 136

