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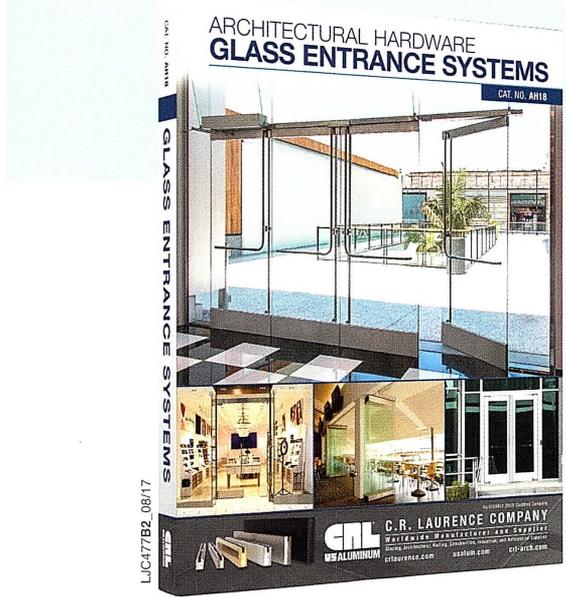
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Resiliency: Five Years After Sandy
(And in the Wake of Harvey, Irma, Maria, and...)



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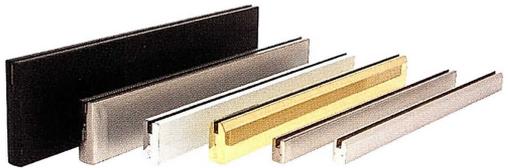
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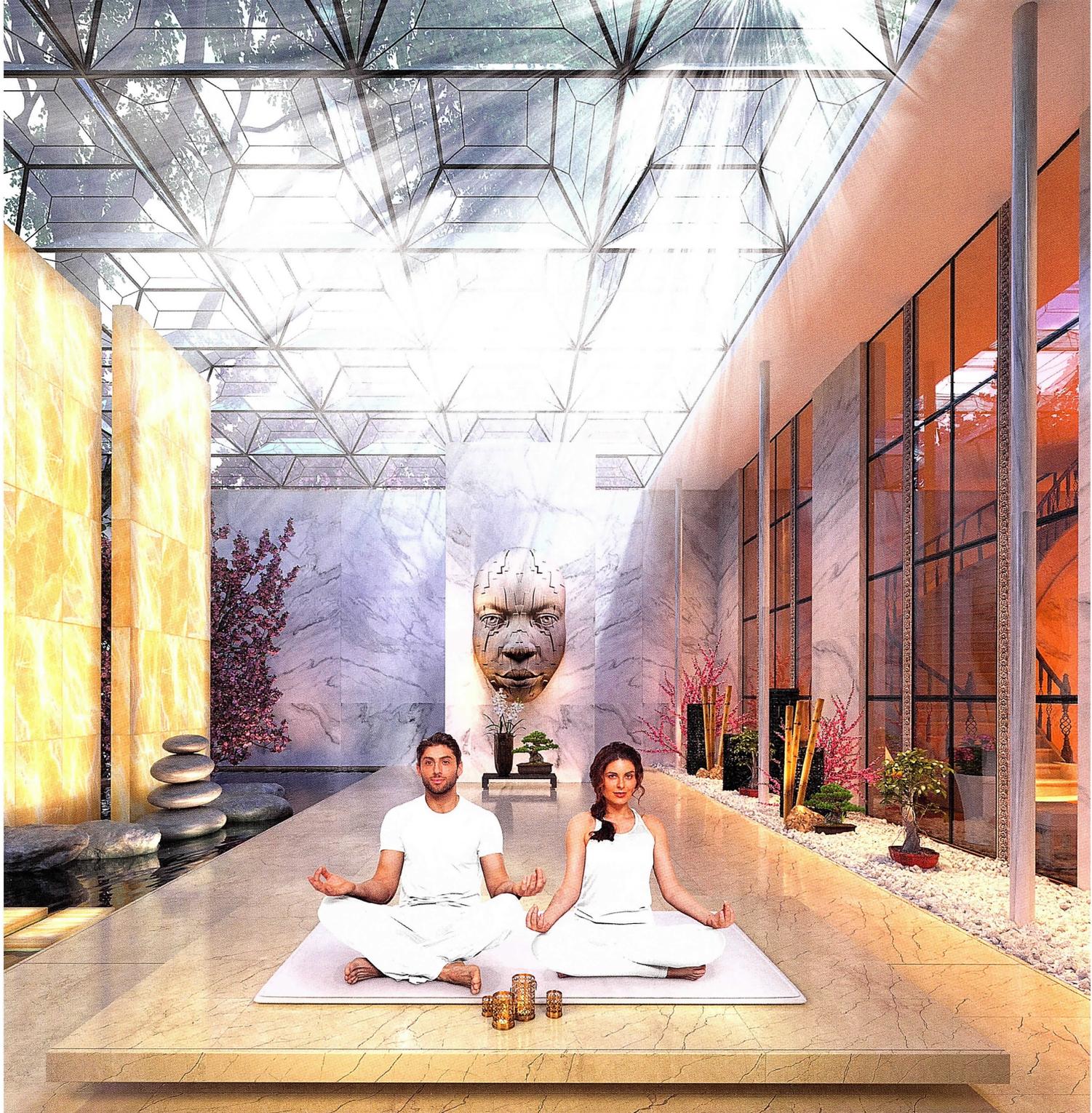
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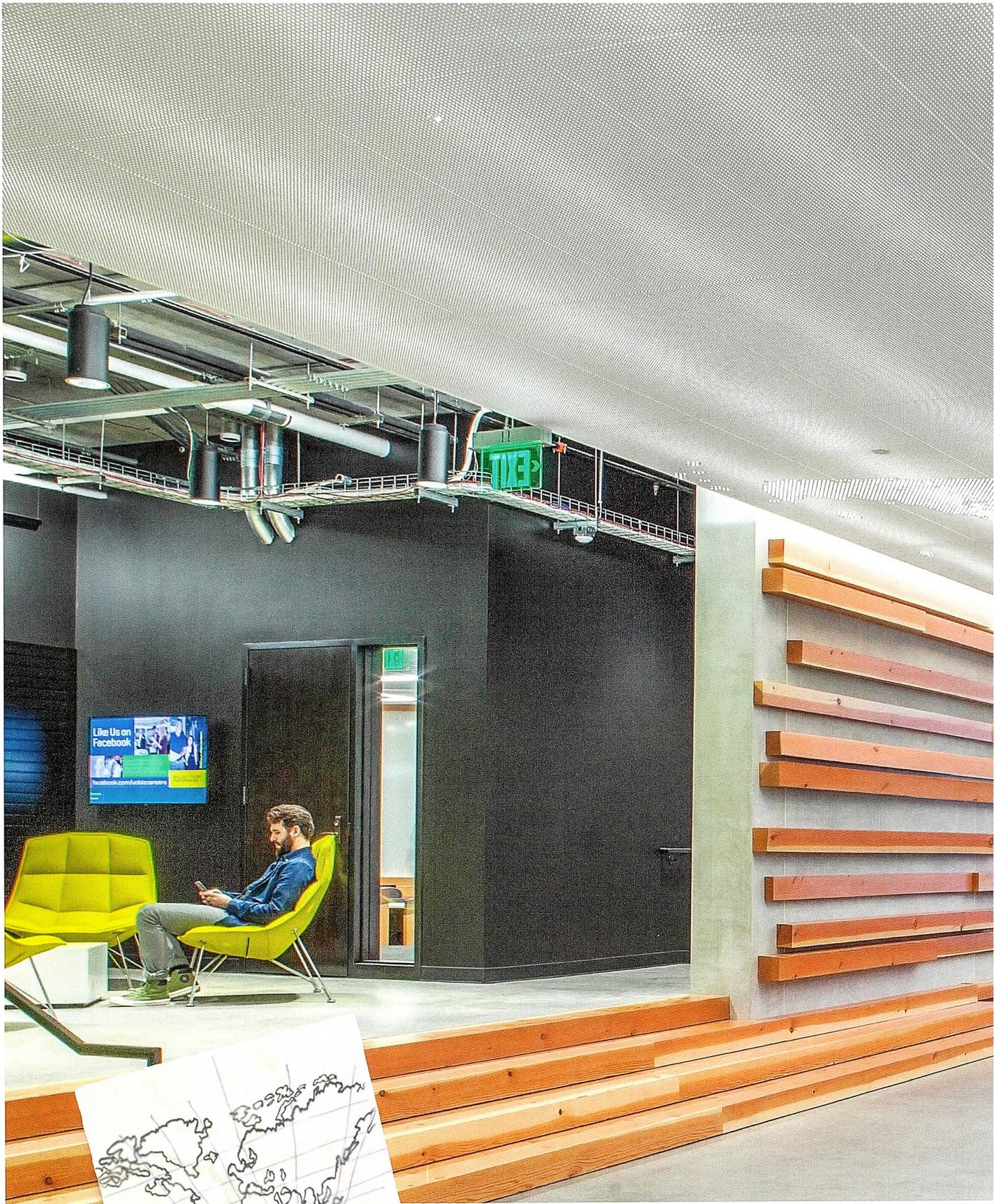
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TABLE OF CONTENTS

OCULUS FALL 2017 **RESILIENCY: FIVE YEARS AFTER SANDY**

- 9 Letter from the President**
Progressive, Resilient Design in Regressive Times
By David Piscuskas, FAIA
- 12 Letter from the Editor**
A Resilient New York Requires a Better Subway
By Alan G. Brake
- 15 At the Center**
Climate Change in NYC: Bridging Science and Practice
- 20 Letter from the Executive Director**
Laying the Groundwork for a Greener New York City
By Benjamin Prosky, Assoc. AIA
- 21 One Block Over**
The Revitalized Empire Stores
By Alan G. Brake
- 43 Portfolio**
Sea Level
By Elizabeth Felicella
- 44 In Print**
A Burglar's Guide to the City
By Geoff Manaugh
Obsolescence: An Architectural History
By Daniel M. Abramson
Reviews by Stanley Stark, FAIA
- 48 Index to Advertisers**
Alphabetical & Categorical Index
View the Oculus archive online:
naylornetwork.com/arc-nxt/
- FEATURES**
- 23 Opener**
Resiliency: Five Years After Sandy
- 24 After Federal Resiliency Retreat, New York Persists**
States and cities continue to prepare for both single hazardous events and long-range climate change.
By Bill Millard
- 28 On the Front Lines**
New York is building defenses against future storms.
By Alex Ulam
- 32 Where Resiliency Hits the Road**
How those at the forefront of adapting to climate change and natural disasters are implementing effective projects at scale.
By Lisa Chamberlain
- 38 Sandy After 5: A Report Card**
Are we better off today than the day before the superstorm hit? Yes. Are we resilient as a city yet? No.
By Illya Azaroff, AIA

Cover

Aerial view of the flooding in Beaumont, Texas after Hurricane Harvey

Photograph by

Staff Sergeant Daniel J. Martinez, South Carolina Air National Guard.

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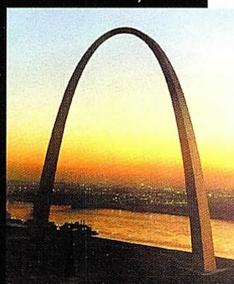
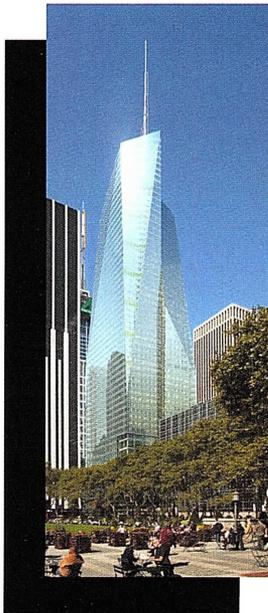


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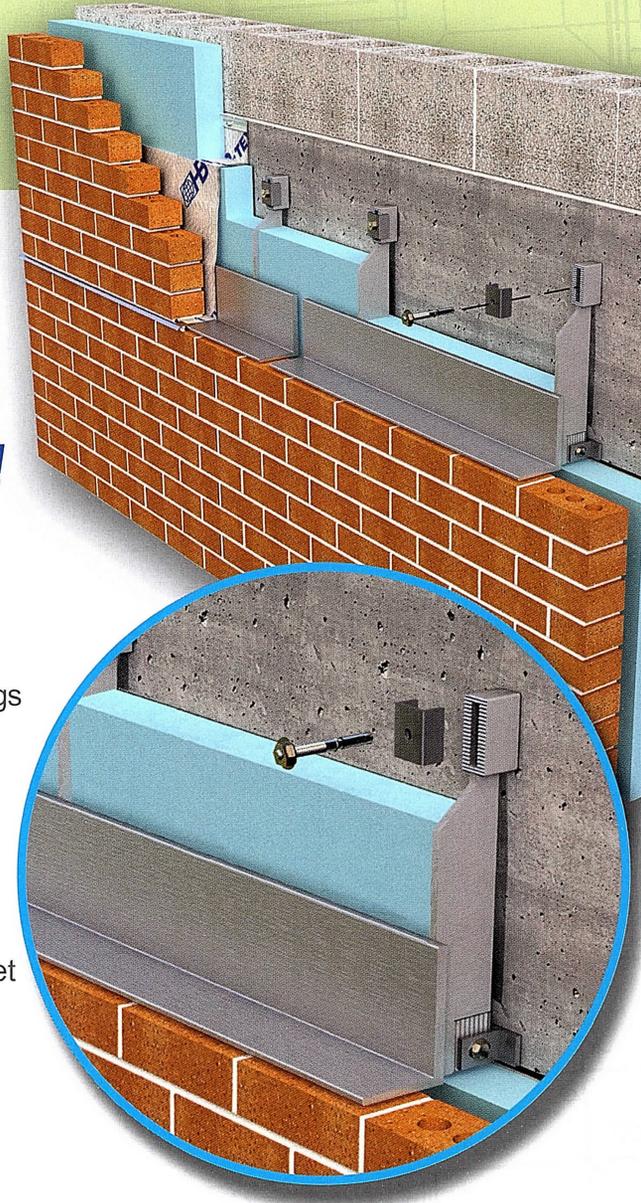
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LETTER FROM THE PRESIDENT

PROGRESSIVE, RESILIENT DESIGN IN REGRESSIVE TIMES

BY DAVID PISCUSKAS, FAIA

They say history repeats itself. Indeed, the time has come when many of us are looking over a collective shoulder at the past. Consider 1974: be it Watergate, racial tensions, or the world energy crisis, events of that year loom large in our present and remain relevant. For all the societal progress we believe we've achieved, present-day society mirrors a relatively recent past.

Today, the current president is under investigation. He faces societal outrage for pandering to white supremacists. The deleterious impact to the environment and world climate of carbon emissions and greenhouse gases has become abundantly clear. Past behaviors in the political, social, and environmental realms have metaphorically metastasized to more insidious and far-reaching consequences.

As Americans, we believe in the resiliency of our democracy, but it comes at a great cost. Many wars have been fought and millions of lives risked and sacrificed to ensure its progress and future. Few believe enough progress has been made toward racial equality, for relations among our fellow citizens founder too readily on the shoals of bigotry and xenophobia. In a country where it was once a right to own and oppress another human being, it is today an obligation to stand up on behalf of all human rights and racial equality.

As for our relationship with the natural environment, in 1974 the cost

of a barrel of oil increased four-fold in six months, forcing upon our nation a sudden end to an era of cheap energy, even while warning us about the volatility of fossil fuel consumption. The AIA, under the auspices of the nascent AIA Energy Committee, began at that time to prepare policy proposals on energy efficiency, and successfully influenced federal policies in the late 1970s toward the development of energy codes and energy-efficient buildings. In turn, this initiative transitioned from the Energy Committee to the Committee on the Environment. So began the inexorable advance toward sustainable design and a focus on energy and resource conservation, which today underpin the progressive practice of architecture.

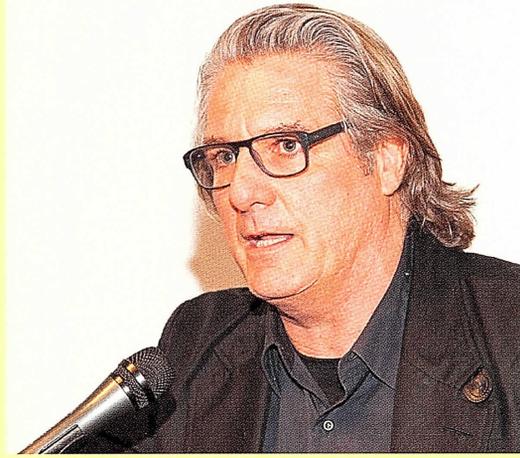
While the extraction of fossil fuels from the Earth and the persistence of their use is still a critical issue of environmental protection and global warming, there is a heightened societal consciousness about the waters that cover 70% of the Earth's surface. Sea-level rise, the fact that oceans store 60 times more carbon than the atmosphere, and the role of oceans in significant and deadly weather events and in climate change have rapidly gained the attention of governments, businesses, and the public worldwide. And, as in 1974, architects are again active at the forefront of formulating responsive governmental policy, and offering practical and

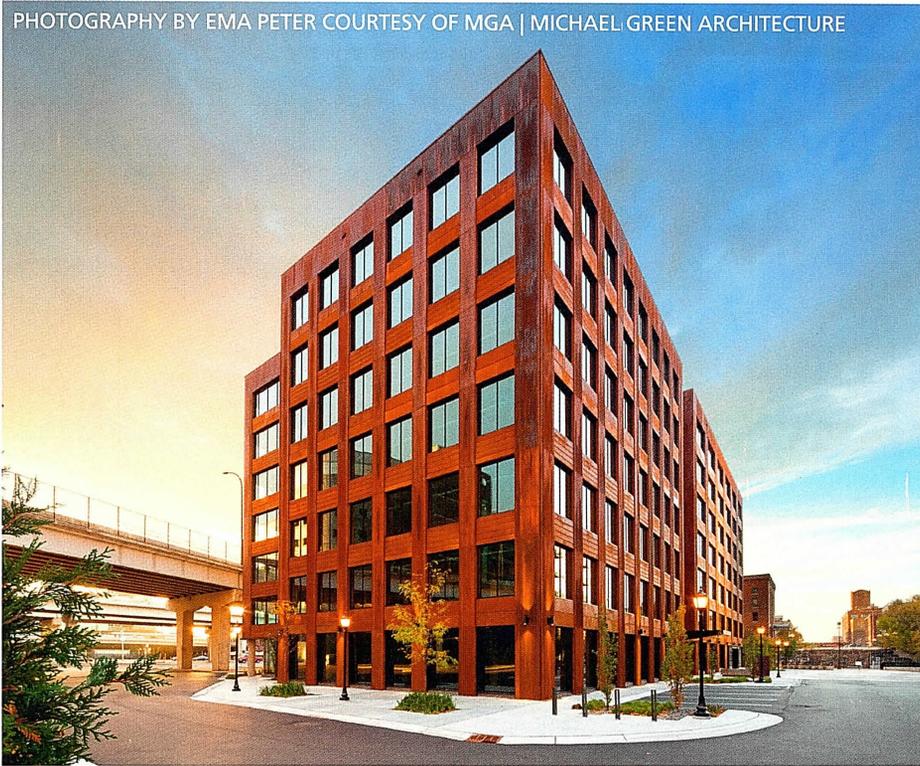
progressive recommendations for the future of coastal communities.

Since 2011, AIA New York, through the thought leadership of the Design for Risk and Reconstruction, has been engaged with the issues of risk, resiliency, recovery from natural disasters, severe storm events, the effects of climate change, and the implications for the built environment. This engagement has influenced governmental policy, connected AIANY with experts and advocates the world over, and raised awareness throughout the design and building communities in the New York region.

There is much to learn, do, and prepare for in this era of climate change. As we acknowledge the five-year anniversary of the devastation that Superstorm Sandy visited upon the Caribbean and the Eastern United States, we offer this issue of *Oculus* as an overview of the current state of resiliency in our society and culture because – like the future of our democracy and racial equality – it's a critical issue now and for future generations.

Image Credit: Samuel Lahoz





T3 is made chiefly with nail-laminated timber (NLT). Over 1,100 8-foot wide by up to 40-foot long NLT panels were used for exposed structural ceiling and roof panels with concrete topping. Spruce was used for the glulam beams and columns. "The texture of the exposed NLT is beautiful," notes Candice Nichol, project lead and architect for MGA. "The small imperfections in the lumber and slight color variation adds to the warmth and character of the space."

WOOD: TENANT-COOL, TECH-FRIENDLY COMMERCIAL SPACE

T3 has gained attention as the nation's largest mass timber modern office building. The \$24.5 million Minneapolis project successfully fuses mass timber construction with buzz-worthy beauty and amenities. The big surprise? How code-compliant and mainstream the project is.

T3 may be one of the most closely watched architectural projects in recent years. A Google® search (April 2017) of "T3 Building Minneapolis" yields over 300,000 results. Often lost in the public fanfare is the fact the seven-story, 220,000 square foot Class-A office and retail center "is not pushing any boundaries."

That observation may be the project's great lesson says project lead Candice Nichol, AIBC, NCARB of Vancouver-based MGA | Michael Green Architecture. Her firm designed T3 (short for **T**imber, **T**ransit, **T**echnology) in partnership with the DLR Group of Minneapolis.

Past As Prologue

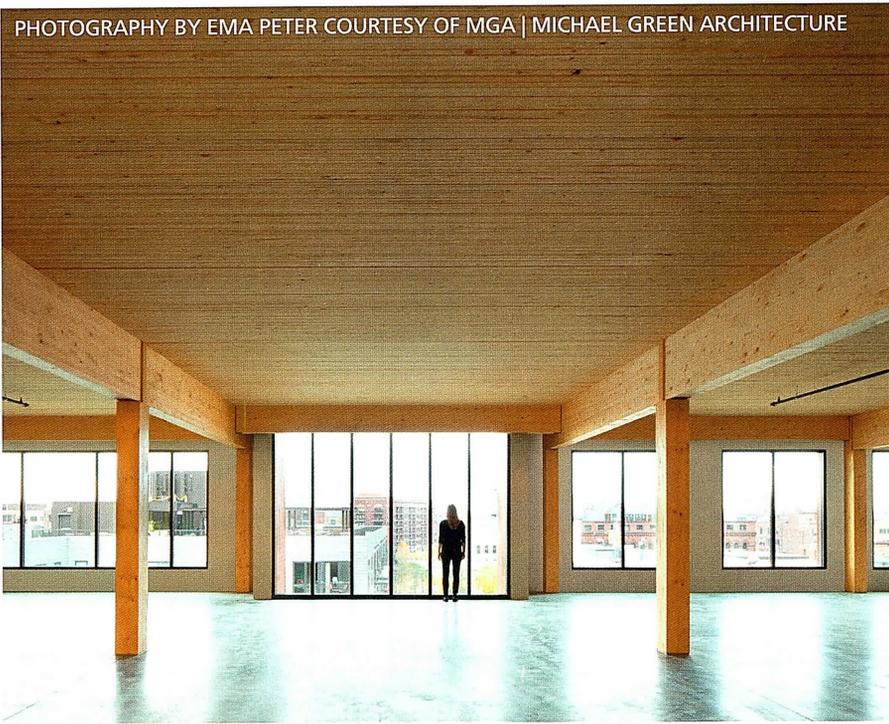
"What makes T3 special is the way it's getting the industry to think about building with mass timber again," Nichol explains. "T3 is an incredibly beautiful building that's also economical and responsible."

International real estate company Hines is the owner and developer. Located in the booming North Loop neighborhood of downtown Minneapolis, T3 "puts a modern spin on an old idea" says Hines.

A great example of that "old idea" is just a few blocks from T3: Butler Square is a 367,717 square foot, nine-story brick and heavy timber building built in 1906 and substantially renovated in 1974.

Code Compliant

"T3 shows what a new generation of office buildings can look like," says Nichol. "We're not used to seeing buildings like this because we've gotten away from mass timber construction. The fact is we didn't do anything outside of code. T3 is a Type IV building. It's a concrete podium topped by six floors of mass timber. There was no need for alternative means and methods."



Exposed NLT panels, beams, and columns meet all aspects of code, including fire. Mass timber has different burn characteristics than light-frame lumber and building and fire code recognizes that tested life safety margin. Charring is the difference. A charred timber retains most of its mass and strength at a predictable rate, with surface charring acting as a fire insulating material.

Code compliance wasn't the only advantage. Construction speed was another. The timber structure for T3 was completed in just 9 weeks. "We finished a floor about every nine days," says Lucas Epp, engineering and 3D manager, StructureCraft. That work was comparatively quiet too, without the collateral noise associated with other building materials.

Differentiation Rules

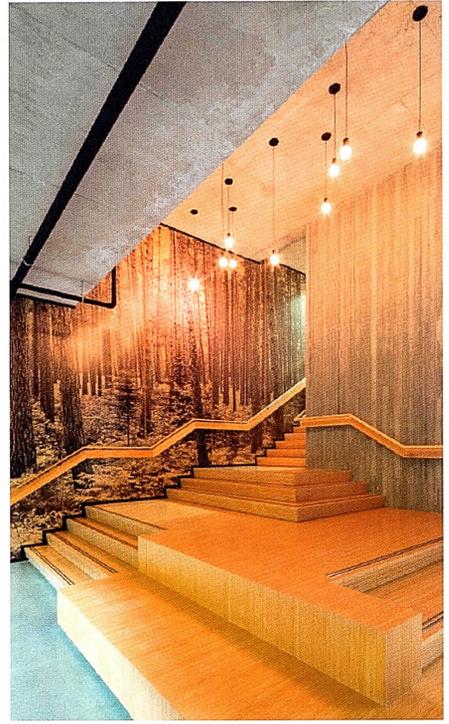
Mass timber structures are lighter than both the steel equivalent and post-tensioned concrete. So the project benefits from a smaller foundation requirement and lower seismic loads. For owner/developer Hines, T3 has proven to be a critical differentiator in a hot market. Wood's natural warmth and beauty offers leasing agents a competitive edge. Coupled with T3's leading-edge technology, LEED Gold certification, and extensive workplace amenities, T3's leasing story is a powerful one for Millennial, tech-focused tenants (Amazon is T3's lead tenant, occupying two floors).

Emerging Template

T3 is a successful example of a mass timber structure that is cost-competitive with steel and concrete. With its success, there has been incredible interest across the U.S. in reviving mass timber as a primary building material. "I know some people have been shocked by the scale and composition of T3," Nichol says. "They shouldn't be. We're not doing anything that hasn't been done before."

"T3 helps everyone get comfortable with mass timber again. It's inviting. It's sustainable. A mixed-use building like T3 makes so much sense for the owner in terms of construction speed, labor, budget, and result. T3 is a very mainstream project."

As an endorsement, Hines recently announced plans to build T3's twin in downtown Atlanta.



The mass timber building offers Wi-Fi in its public spaces including the rooftop deck. T3 also has bike rentals, bike storage, a café, community conference room, and a social workspace area on the ground floor with lounge seating and swing seats. "The social workspace is really cool," says project lead and MGA associate Candice Nichol. T3 is the first office building in Minneapolis to receive preliminary certification from WiredScore, which rates buildings with the best internet connectivity—a tech-friendly win.

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Architect of Record: DLR Group

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A RESILIENT NEW YORK REQUIRES A BETTER SUBWAY

BY ALAN G. BRAKE

New York City is a remarkably resilient city, as we have seen in the aftermath of 9/11, the 2003 blackout, and Superstorm Sandy. While these events inflicted irreparable harm on individuals and communities, the city as a whole recovered remarkably well and quickly. New York's density, heterogeneity, diversity, multimodal transportation, and mix of uses all contribute to its ability to bounce back. So it has been both notable and depressing to see the failure of our local and state governments to protect one of the city's most vital infrastructural systems: the subway.

After months of debilitating breakdowns and delays that have infuriated the public, Governor Andrew Cuomo declared a state of emergency for the subway last summer. His sudden interest coincided with rising resentment and falling poll numbers, and while his renewed attention to transit is welcome, the governor is primarily responsible for the subway's sorry state due to Albany's control of the Metropolitan Transportation Authority (MTA).

The figures are daunting. The *New York Times* and the Regional Plan Association claim it could cost \$20 billion to fully upgrade the subway's signal system with modern communication-based train controls, which allow trains to be run more closely together, increasing capacity and reducing delays and overcrowding.

To create a long-term funding stream for repairs and capital improvements to

the system, Cuomo recently embraced congestion pricing, but he has yet to unveil a specific plan. In addition to funding the MTA, congestion pricing would have a positive impact on the quality of life for the millions of people who live and work in Manhattan, including improved air quality, reduced noise pollution, and less crowded and dangerous streets. Meanwhile, a well-functioning subway system would improve life for the entire city. As Cuomo recently said, congestion pricing is an idea whose time has come. We look forward to seeing the details of his plan, as well as a legislative strategy to push it through a skeptical state senate.

Mayor Bill de Blasio has roundly rejected congestion pricing, telling the *Times* he "does not believe in it." It is worth pointing out that de Blasio has made little use of the subway during his tenure as mayor, and he travels almost daily by SUV from Gracie Mansion on the Upper East Side to Park Slope to go the gym, and then back to Manhattan to reach City Hall. This bizarre and indulgent habit is telling.

Instead, the mayor has proposed a "millionaire's tax" on those making more than \$500,000 per year to fund subway improvement, a fine idea that is in line with his Robin Hood brand. But Cuomo and the state senate have already signaled that plan is dead on arrival.

While it is encouraging that both the mayor and the governor are trying to one-up each other in terms of funding

the subway, political dueling is not what this crisis demands. The governor bears the responsibility to fix the MTA, and he also has the power and political savvy to get congestion pricing done. It has worked around the world, and it will work in New York.

Mr. Mayor, it's time to get out of your SUV and get on board with congestion pricing. Governor Cuomo, your words must be followed by concrete actions. The resilience of our city depends on an efficient subway system with expanded service.

—

On a cheerier note for the mayor, the NYC Ferry, one of his pet projects, debuted this summer with stronger than expected ridership numbers. The system has proven popular – almost too popular – particularly with the beach-going public, prompting increased service on the Rockaway route. It is too early to tell if the system will be fully embraced as a mode of daily transportation, rather than merely a cheap way to take a pleasure cruise (not that there is anything wrong with cheap pleasure cruises). But its success shows that New Yorkers are hungry for comfortable ways to get around the city, and are continuing to embrace the waterfront. I'll take more boats over more cars any day.

Image Credit: Catherine Gavin



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CLIMATE CHANGE IN NYC: BRIDGING SCIENCE AND PRACTICE

On June 8, the Center for Architecture hosted the event, Climate Change in NYC: Bridging Science and Practice. Organized by the AIA NY Planning and Urban Design Committee and ASLA-NY, the speakers included: Susanne Desroches, deputy director, Infrastructure Policy, NYC Office for Recovery and Resiliency; Cynthia Rosenzweig, senior research scientist, NASA Goddard Institute for Space Studies, Signe Nielsen, FASLA, principal, Mathews Nielsen Landscape Architects; Jeffrey Raven, FAIA, LEED BD+C, principal, RAVEN A+U; associate professor and director, Graduate Program in Urban + Regional Design, New York Institute of Technology. Jee Mee Kim, AICP, principal, HR&A advisors, served as the respondent. Below is an edited transcript of the conversation.

Cynthia Rosenzweig

Urban planning and design need to take integrated climate change mitigation and adaptation into account. All integrative climate change mitigation and adaptation need to take urban planning and design into account.

In the Paris Agreement, cities are mentioned explicitly. Cities are indeed the first responders to climate change, both in terms of mitigation and the reduction of greenhouse gases. For example, look at the Global Covenant for Mayors on climate and energy that's bringing together some of the major groups of cities that have pledged to reduce greenhouse gas emissions. There are over 7,000 cities that belong to this covenant and they are pledging to significantly reduce greenhouse gas emissions.

So that shows leadership on the mitigation side, but also here we see the temperature projections that all cities are going to have to be dealing with and responding as well as to precipitation changes and sea level rise for coastal cities. So cities are also the first responders in terms of adaptation and, as we know, we've now gone beyond adaptation to really embrace the concept of resilience in terms of responding to temperature changes.

So much of a city has to be responding to protecting its citizens from disasters, but in order to really make this work in terms of transformation, we have to coordinate across the short time scale of the disasters and the longer-term climate adaptation.

All cities have disadvantaged populations. And they must be taken into account, into the plans for responding to climate change. Urban poor, elderly, women, minorities, recent immigrants, other marginal populations must be taken into account.

Otherwise the transformation of the cities to a sustainable responsible development that takes climate change into account will not be complete.

Susanne DesRoches

For the New York City region, our climate projections are good for about a 100-mile radius. In 2100 and beyond the projections are anywhere from 10 inches to 72 inches of sea level rise. So what we really aim to do with the East Side Coastal Resiliency Project was to say okay, here are the projections but, here engineers and architects and planners, here's really what we want you to use out of those projections. And they cover extreme heat, extreme precipitation, mean sea level rise, not the storm surge but what's happening to our tidal conditions.

Right now, lots of design standards and codes reference historical climate data, and they're provided by a bunch of different sources but National Oceanographic and Atmospheric Administration Atlas 14 is really right now is what engineers and architects are using in this region for drainage and other types of information.

Building code governs buildings. It doesn't necessarily govern infrastructure. Those are governed by either national or international standards. We wanted to make sure that this climate data was being used across all of our infrastructure as well.

How does the number of heat waves per year change over time? You can see some pretty dramatic changes here. Especially from 18 days over 90 degrees out to 87. How do these impacts affect different people disproportionately?

Precipitation is a slightly different story. The climate models don't quite agree as much as they do with other climate change projections. For sea level rise and heat, we have a much less disagreement amongst the models than we do for precipitation. So we're still working through a process where hopefully we can resolve that as the science continues to get more and more accurate.

Sea level rise adjustment takes place in two different forms. One, are you building on a site that is going to be tidally inundated? The second part of the sea level rise adjustment is around the current floodplain and the future floodplain.

It's really important that if you're building something today that may need to be adjusted in the future, that you engineer that now. Right now, you're not in the flood plain, in the future you will be.



Top Seed

Arthur Ashe Stadium at USTA's Billie Jean King National Tennis Center is one of sport's most beloved venues. But its roofless design meant rain often stopped play. To keep tournaments on schedule, the stadium's original designers, architect **Rossetti** and engineer **WSP Parsons Brinckerhoff**, proposed the tennis world's largest long-span retractable roof. With a 7-minute opening time and a design that keeps sightlines unobstructed, the new lightweight fabric and steel canopy is favored to win over athletes and fans alike. Read more about it in **Metals in Construction** online.

 **Steel Institute of New York**

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Signe Nielsen

We can start a movement. I am presenting the point of view of a designer who attempts to bridge this science and practice.

Hunts Point is home to 12,500 residents, and the largest food distribution center in the United States, which employs 8,000 people. It has a history of contamination from its use as a manufactured gas plant. Back in 2006, our firm prepared a greenway plan for the entire peninsula. Since then, a number of projects have been built and what it's done is keep the principles of the Greenway very much in the forefront of many of the minds of the participants in the Hunts Point Resiliency Project.

In the aftermath of Sandy, the city realized the vulnerability of the food distribution center. And our firm was part of a team led by HDR and funded by HUD to address energy and flood resiliency on the peninsula. This was an attempt to really bring together issues of not just critical infrastructure, jobs, low-lying industry, but also of services that are of vital importance to the community stakeholders.

So build a flood wall that meets the standards that FEMA requires, but simultaneously helps to improve water quality by preventing some of this contamination from getting into the Bronx River, more recreation to promote healthy living, improved air quality for more biomass. And job retention and workforce development by protecting the low lying industrial areas.

Jeffrey Raven

The overarching mission that we have with respect to mitigation and resilience is essentially to deliver quality of life as a key performance outcome for city residents.

So with New York's compactness, we could start to look at shared district energy, so there's a potential for example for overlays in New York City with respect to eco districts for example where you could potentially reduce waste heat at the district scale. With respect to modification of form and layout of buildings in districts, certainly with respect to the local climate, there's an opportunity to enhance the natural ventilation through urban districts in New York City. Linear parks, for example, could enhance wind flow during summer months. Also shading, strategic shading and orientation of neighborhood configurations according to the sun path are important.

This is certainly not just an urban design issue, this is not a climatology issue, but this is an example of a bridge between the two. If you look at a city like Hong Kong, for example, a series of tall wall like buildings have really blocked the free flow of air throughout the city. And it sort of cuts off the city from natural sources of cool air, and these buildings have increased the local temperature and therefore lifted the demand of air conditioning for example even in the city's newest and most energy efficient buildings.

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Image Credit: Center for Architecture



Signe Nielsen, Cynthia Rosenzweig, Susanne DesRoches, Jeffrey Raven, and Jee Mee Kim

So the answer here is that urban design can integrate climate science, natural systems, and compact form. A series of workable and livable neighborhoods that are essentially pierced by these ventilation corridors. Now, how could that work in New York, a city that's already been built? Well, we think about transfer of development rights, for example, in New York where you could have a series of bonus FAR that would allow for transferring some of the bulk away to create strategic ventilation corridors.

In New York, the least expensive method with a very high impact is the heat resistant construction materials and reflective surface coating. We're also looking at phase-changing materials for lightweight construction, and New York has a lot of lightweight construction in the building industry to achieve high thermal mass.

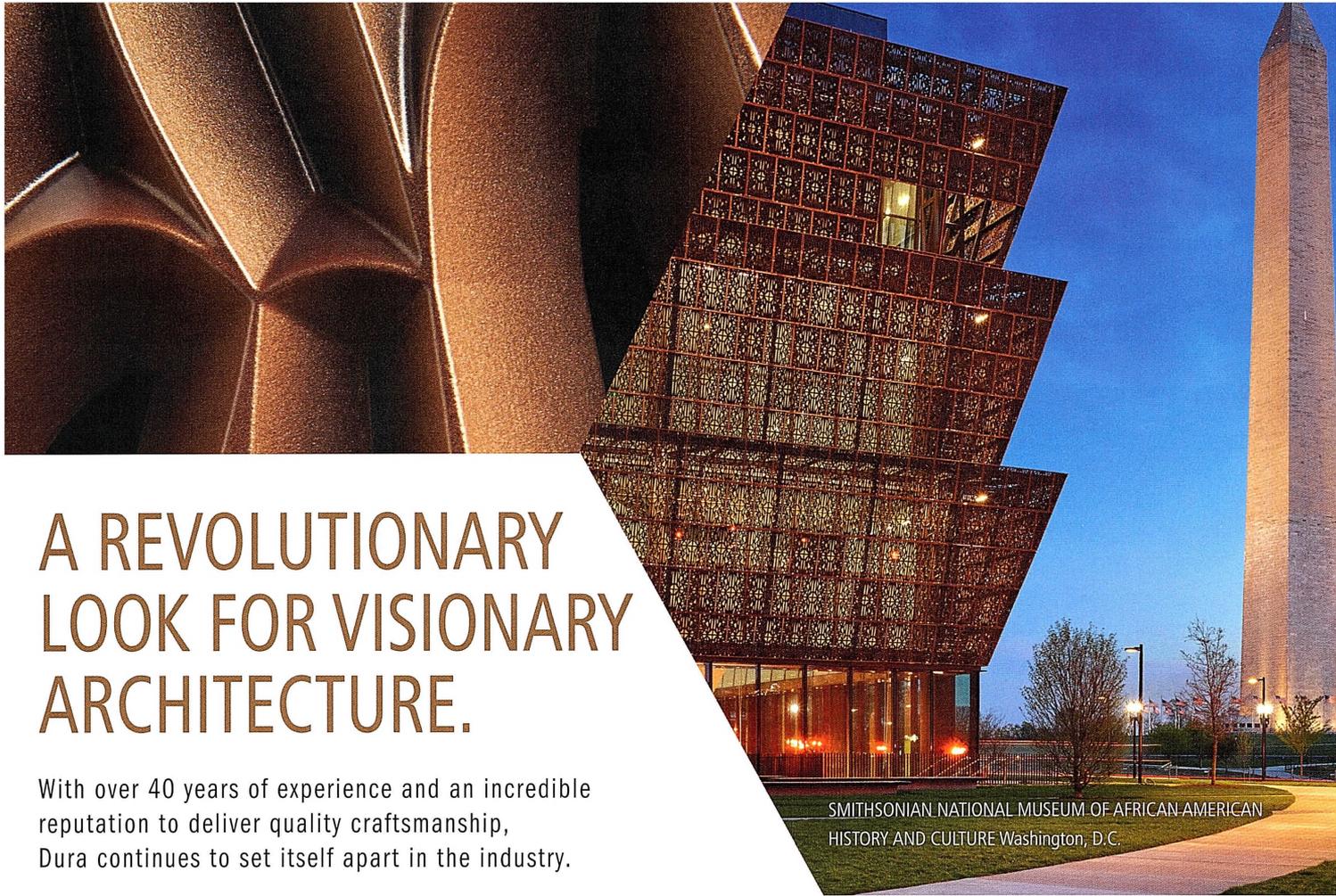
So also it could aid in meeting some of the 80 x 50 goals that were laid out by the mayor's plan, in the kind of refurbishment of the existing New York building stock. But upgrading building envelopes is critical but the buildings of course don't exist in isolation. Hotter cities will increase the building loads, and so to adapt for example more robust mechanical systems, actually increases the waste heat. It becomes kind of a vicious cycle, so district-wide strategies are really critical.

For urban heat island, we could imagine climate analysis mapping being carried out throughout the city identifying hotspots at an urban scale and then zeroing in at a local scale.

Jee Mee Kim

I'm going to ask the big question, "How are we going to pay for this?" Post-Sandy Congress appropriated \$50 billion to the New York area. That's to pay for everything, including coastal protection and damaged homes. Coastal protection costs alone are probably going to exceed \$60 billion, so where's the rest of that money?

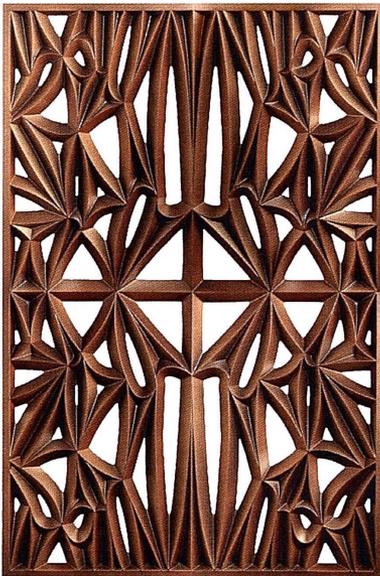
At the end of the day the question I think a lot of folks are asking is, "How do we stretch our dollars, how do we do more with less and then how do we get the private partners to pitch in?"



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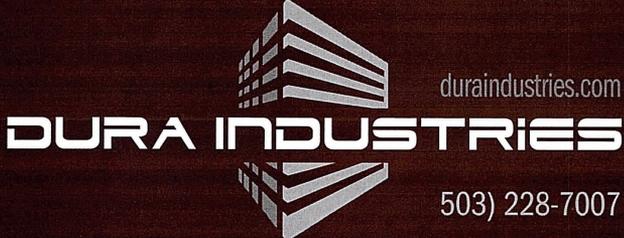
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LETTER FROM THE EXECUTIVE DIRECTOR

LAYING THE GROUNDWORK FOR A GREENER NEW YORK CITY

BY BENJAMIN PROSKY, ASSOC. AIA

Center for Architecture



As we were going to print with this issue on resiliency, Puerto Rico was struggling to recover from Hurricane Maria and Hurricane Irma had battered the Caribbean Islands and Florida. Meanwhile, Hurricane Harvey had just inundated Houston and surrounding areas. Though this issue largely focuses on New York City's efforts to recover in the years after Hurricane Sandy, we hope that some of the knowledge gained locally will be helpful as others across the nation plan their own recovery and future resiliency efforts. At present, our AIA colleagues in Houston are seeking nationwide support to raise funds to rebuild the Architecture Center Houston. To make a contribution: [gofundme.com/rebuild-architecture-center-houston](https://www.gofundme.com/rebuild-architecture-center-houston)

The members of AIA New York have made it very clear that they believe climate change is a threat and that architects have an important role in mitigating its effects. As forward-thinking New Yorkers, they are not waiting for the debate to pan out: they are educating themselves and formulating approaches to help our community adopt practices that will reduce our collective carbon footprint.

New York City has accepted the challenge to reduce overall carbon output 80% by the year 2050. One City report from the Mayor's Office of Sustainability, states that New York City buildings produce 73% of greenhouse gas emissions. The majority of the remaining emissions are linked to local landfills and wastewater treatment. It is therefore evident that the built environment is a great contributor to climate change. The actions taken in the coming decades by architects and their colleagues in the building trades and regulatory sectors can ameliorate or deteriorate our climate.

I am proud that AIANY members have decided, through a range of activities, to face these threats proactively. Several examples of recent and ongoing Chapter activities include:

80x50 Taskforce

During 2016, through the extended activities of the Committee on the Environment (COTE), members formed the 80x50 Taskforce, which met to generate processes and code recommendations that will help reduce local buildings' carbon emissions.

Hyperefficient Building Workshops

As a result of the 80x50 Taskforce's work, COTE, along with partners at Urban Green, have organized a series of ongoing workshops to help industry professionals understand and comply with Local Laws 31 and 32, which introduce new regulations and strengthen existing sustainability requirements.

Everything Water Series

The Committee for Risk and Reconstruction has launched a multipart event

series that looks at water, waterfront communities, and resiliency measures to prepare for sea-level rise and superstorms.

Zero Waste

This multiyear research project initiated by COTE with Kiss + Cathcart, Architects; ClosedLoops; and the Foodprint Group looks at how architects can play a key role in reducing and managing waste produced by residences and commercial enterprises on all scales in New York City. This fall, research will be made public through a Design Guidelines for Zero Waste website produced for the NYC Department of Sanitation. A forthcoming exhibit on the subject will be presented at the Center for Architecture in summer 2018. The Zero Waste project has been underwritten by a generous grant from the Rockefeller Foundation.

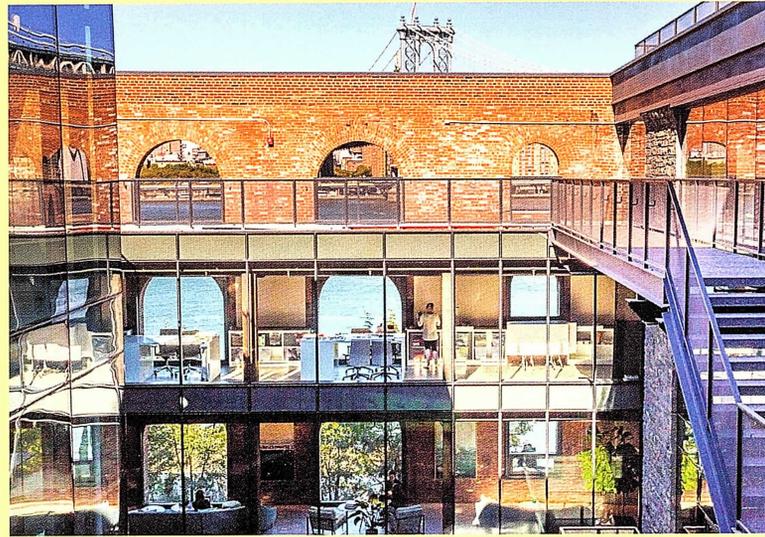
So join us, get involved, and help our Chapter make a collective effort to reduce our carbon footprint.

ONE BLOCK OVER

THE REVITALIZED EMPIRE STORES

A long-empty landmark gets a mixed-use makeover and a sky park

BY ALAN G. BRAKE



Behind the thick brick walls of the Empire Stores, staircases ring an open courtyard. They lead to a rooftop sky park.

New York City has a brand-new waterfront park with stunning views of Lower Manhattan, the Brooklyn Bridge, and an expanse of New York Harbor. The new park is located five stories aboveground atop the Empire Stores, a string of 19th-century warehouses in DUMBO, Brooklyn. The long-empty buildings have been transformed into a mixed-use complex with an initial design by Studio V Architecture, which was refined and executed by S9 Architecture.

The vast 390,000-square-foot complex presents a monumental presence along the waterfront. Five stories of thick, weathered brick walls are punctuated by arched openings flanked by green metal shutters. The redeveloped project makes the buildings more porous to the street and the views. A new open-air courtyard on the water-facing side of the building invites visitors to Brooklyn Bridge

Park into the soaring structure. Behind the brick facades, schist party walls have been exposed. A large masonry staircase leads up to the second floor, allowing the public to look into the building's office spaces, which, on this floor, are occupied by the DUMBO-based furniture retailer West Elm. The workers inside don't seem to mind the fishbowl effect.

Zigzagging up the perimeter of the courtyard, a dark gray metal staircase brings the public up to the rooftop. (There's also an elevator.) A small park, featuring trees in planters with integrated benches, offers places to lounge and take in the expansive vistas. Operated by Brooklyn Bridge Park and designed by Future Green Studio, the rooftop park is small enough that it might end up being something of a secret, but with that view, it shouldn't be. A two-story glass and metal addition, set back from the historic masonry walls, includes private tenant terraces and green roofs. S9 Architecture's interventions are straightforward and subdued in deference to the brooding warehouse structures.

Back at ground level, the open courtyard leads into the interior of the building, which is also publicly accessible. An axial hallway leads to Water Street, and another hallway will soon connect the building to the streets on the north and south. Exposed wooden beams and exposed schist walls express the build-

ing's materiality, heft, and heritage. The mix of uses – retail, a food hall, stand-alone restaurants, offices, a museum gallery for the Brooklyn Historical Society, the public park – provide a diverse and self-reinforcing set of programs and populations that will likely be vibrant and very successful for the developer, Midtown Equities. Occupied by Shinola, a luxury car showroom, and a restaurant developed by Soho House, the complex skews high-end, but so does DUMBO these days. While the gestures toward publicness are not insubstantial, the Empire Stores is not a palace for the people.

Perched just feet from the lapping waters of the East River, Empire Stores is vulnerable to the weather and storm surges. Mechanicals have been raised aboveground, and a deployable floodwall is in place. Waters may be rising, but for now, there are profits to be made. Go see the view.

Alan G. Brake is the editor of Oculus and an opinion columnist for Dezeen. He also writes for Architectural Record, Art in America, and MODERN.

Image Credit: Courtesy 69 Architecture



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OPENER

RESILIENCY: FIVE YEARS AFTER SANDY

(And in the wake of Harvey, Irma, Maria, and...)

The hurricanes keep coming. Faster, stronger, and with greater frequency, these storms have killed scores, changed the lives of tens of thousands, and riveted the attention of those of us at a safe distance. Unusually widespread wildfires consumed vast swaths of the Pacific Northwest and over 200 lives were extinguished by rubble in the recent earthquakes in Mexico.

Lessons have already emerged from some of these events. The damage and loss of life caused by Hurricane Irma were greatly blunted by the post-Hurricane Andrew building codes that mandated higher standards. But while these standards helped keep the roofs on buildings and the walls from collapsing, they do nothing to address the larger problem of rising seas and a warming atmosphere.

That makes the actions of the Trump administration all the more distressing and irresponsible. Shortly before Hurricane Harvey struck, President Trump signed an executive order revoking Obama-era requirements that the federal government take sea-level rise, storm surges, and flooding into account when constructing new infrastructure and rebuilding after natural or manmade disasters. Then as Irma was heading toward Florida, Environmental Protection Agency Administrator Scott Pruitt declared it “insensitive” to talk about climate change in relationship to hurricanes.

Not all Republicans agree. “This is the time to talk about climate change. This is the time that the president and the EPA and whoever makes decisions needs to talk about climate change,” Tomas Regalado, the Republican mayor

of Miami, told the *Miami Herald*. “If this isn’t climate change, I don’t know what is. This is a truly, truly poster child for what is to come.”

In the face of federal inaction, state and local government actions are that much more important, as we detail in the pages that follow. Mayor de Blasio recently announced plans to mandate efficiency improvements for existing buildings over 25,000 square feet, a plan that could require upgrades to more than 14,500 buildings, according to the *Washington Post*. The plan is a significant step toward meeting the “80x50” plan, an initiative to slash greenhouse gas emissions by 80% below 2005 levels by 2050.

New Yorkers may be “insensitive” to be bringing up climate change in the context of these disasters, but better to be insensitive than to be cruelly indifferent about the fate of our collective future.

FEATURE

AFTER FEDERAL RESILIENCY RETREAT, NEW YORK PERSISTS

States and cities continue to prepare for both single hazardous events and long-range climate change.

BY BILL MILLARD

The relation between the built environment's hazard resilience and the reality of climate change is clear to everyone who comprehends the scientific process and respects the consensus it yields. When an unabashed opponent of science assumed power in Washington last January and instantly ordered the Environmental Protection Agency and other federal agencies to delete all climate-change references from their websites, one might be forgiven for speculating on geophysical tipping points or quoting apocalyptic lines by Yeats. The retreat has continued on multiple fronts: gag orders, budgetary shifts, and the announcement that the U.S., despite its contributions to the 2015 United Nations Climate Change Conference in Paris (the 21st Conference of the Parties, COP21), would withdraw from the agreement.

Denialists may be full of passionate intensity, but the planet's public-sector defenders, particularly at governmental levels that environmentalist Bill McKibben and others term "subnational," hardly lack conviction. States and cities rapidly reaffirmed their commitments to the COP21 goals of limiting global climate change to 1.5°C by century's end, and cutting national greenhouse-gas emissions 26%–28% from 2005 levels by 2025. When the U.S. president claimed to "represent Pittsburgh, not Paris," Pittsburgh Mayor William Peduto joined Paris Mayor Anne Hidalgo, chair of the C40 Cities Climate Leadership Group, in rejecting *fraternité*-phobia and jointly embracing renewable energy.

New York Governor Andrew Cuomo responded to the COP21 retreat with Executive Order 166,

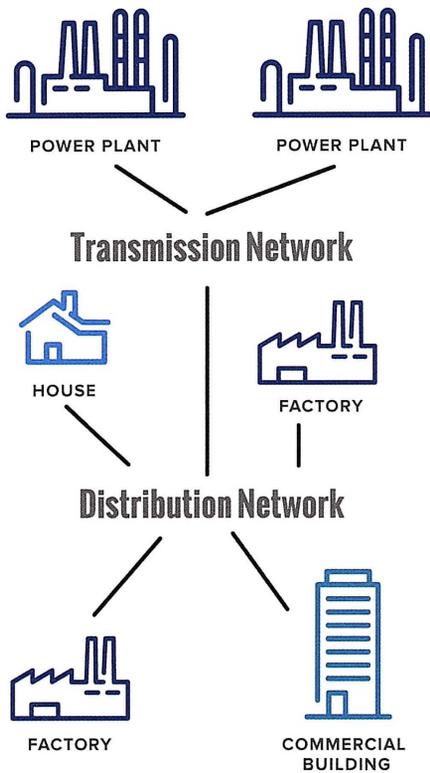
which "reaffirms the state's 40% emissions-reduction goal by 2030, not only for the energy sector but for all emitting sectors of the economy," notes New York State Energy Research and Development Authority (NYSERDA) Director of Regulatory Affairs and Strategy John Williams. Cuomo also joined governors Jerry Brown (California) and Jay Inslee (Washington) in launching the U.S. Climate Alliance. Mayor Bill de Blasio, likewise, announced the Office of Recovery and Resiliency's (ORR) preliminary Climate Resiliency Design Guidelines last April, and made New York City a signatory to the Mayors National Climate Action Agenda in June.

Already on deck

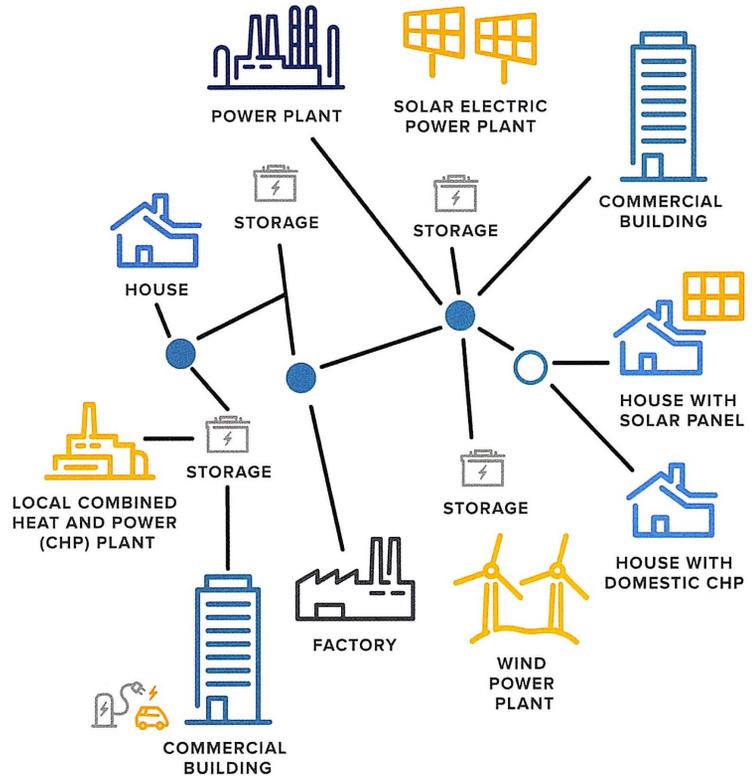
Through political lenses, such initiatives imply an all-hands-on-deck resistance. In New York, they extend work already steadily under way. Statewide, 203 local governments have become Climate Smart Communities since 2009. Spurred by Hurricane Sandy as well as longer-range concerns, ORR, the Office of Emergency Management (OEM), and other agencies implementing OneNYC (the mayor's 2015 iteration of sustainability blueprints dating from 2007's PlaNYC) have strengthened the city's waterfronts, buildings, streets, infrastructure, and operations through coastal rebuilding, cool-roof painting, tree planting, transportation reform, guideline research, and public outreach, at times leveraging federal support while it is still available.

The city's Special Initiative for Rebuilding and Resiliency produced a 2013 report addressing coastal

Yesterday Centralized Power



Tomorrow Clean, Local Power



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resilience and neighborhood-level energy capacity. At the Rockaway peninsula, two city departments (Parks and Recreation, Design and Construction) and the Army Corps of Engineers led a \$140 million restoration project adding “millions of cubic yards of sand and thousands of linear feet of bulkheads,” according to OEM Deputy Press Secretary Omar Bourne. Rebuild by Design’s blend of Department of Housing and Urban Development, Rockefeller Foundation, and city funding has moved the “Big U” of neighborhood-level protection into final design stages, with the Lower East Side and Two Bridges segments fully funded, reports Daniel Zarrilli, PE, senior director of climate policy and programs and chief resilience officer in the mayor’s office. Beyond the well-known efforts in Lower Manhattan, projects at Jamaica Bay and Staten Island’s eastern shore are also funded and in final design, Zarrilli reports; other major sites for ORR’s work include Hunts Point, Red Hook, and Sea Gate. He recognizes a federal-level bright spot: “We’ve had a really good partnership with the Army



The beaches and shoreline of the Rockaways were rebuilt and reinforced.

Corps. They've been able to help us get projects done, and they have a process to deliver those projects, but they are very much focused on cost-effective investment for the U.S. government. We work with them to make those projects locally contextual and ensure that we continue to have access to the waterfront."

At the state level, where NYSERDA has promoted energy efficiency and renewables since 1975, its New York Prize program is driving community microgrid development, supporting 83 feasibility studies in 2015 and 11 design-stage projects in 2017, with a build-out-stage RFP expected in May 2018. "We need to think about resilience as not just a coastal New York issue," says Williams. "We need resilience in all areas of the state, in consideration of the vulnerabilities in each of those areas." Microgrids, he reports, can supply energy to either localities or key infrastructure, "for instance, a hospital, police station, and school that are not necessarily geographically tied. We can create an electricity system that ties them, so that at times of disruption to the system, there would be resources that could retain levels of operability." NYSERDA also participates in the Regional Greenhouse Gas Initiative, a nine-state cap-and-trade program demonstrating that greenhouse gas reduction and strong state economies are wholly compatible.

"From coastal storms, heat, intense sea-level rise, whatever it may be, we have some vulnerabilities on climate that we're working to address," says Zarrilli. "The actions out of Washington are certainly unhelpful, but either way, vulnerabilities exist here in the city, so we're taking action to reduce them. When we have a partner in DC that wants to continue helping us, that's great – we want their help – but right now that's not the case." New York, he notes, is a leader but not an outlier: it is joined by "over 300 cities, over 100 universities, 1,000 businesses,

a number of states that all came together, saying, 'We're still in this. We are filling the federal void.'"

Right now and decades from now

The proposed 2018 federal budget lowers funding for essential Federal Emergency Management Agency (FEMA) activities, Zarrilli notes, including pre-disaster mitigation – "very shortsighted," in his view. "FEMA will tell you that every dollar we invest in mitigation pays itself back at least fourfold in future avoided damages." That multiplier figure, from a 2005 National Institute of Building Sciences study, is widely cited by resilience experts. "The whole point is to put that dollar in today, so you don't have the significant impact, or it reduces those consequences," notes OEM Director of Hazard Mitigation Heather Roiter Damiano. "The time is now, and it's always going to be now."

Damiano describes long-range planning as essential for infrastructure, where "the lifetime of an asset can be 30 to 50 years." For OEM's operations, she says, "while we're always thinking about how a coastal storm surge could change in the future, we have that ability to be more nimble with our planning, and adapt as the risk changes year to year." OEM addresses immediate heat emergencies "from two directions, the social infrastructure and the built infrastructure," adds Disaster Housing Recovery Program Manager Cynthia Barton. Architects can protect life on the single-building scale by controlling buildings' energy consumption and using "hybrid systems with battery backup or self-contained generators," Barton says, "especially for senior housing or places with vulnerable populations." Community-scale design can foster the ties that, as speakers at AIA NY's 2015 Extreme Heat symposium emphasized, make lifesaving differences during heat waves. Working in a large Watch Command Center, OEM "follows a federal model for emergency operations centers, where you convene all the people who are stakeholders. Our agency is set up to coordinate the social and infrastructural aspects" of disasters, Barton says. The Incident Command System model is scalable, Damiano adds, so that a smaller community with one emergency manager can execute the same procedures that New York City does with 250.

Illya Azaroff, AIA, co-chair of AIA NY's Design for Risk and Reconstruction Committee, hails many jurisdictions (particularly the Rockefeller Foundation's 100 Resilient Cities) taking timely action. In post-Katrina New Orleans, where Dutch hydrologist Henk Ovink has been influential, Azaroff observes

“fundamental policy change about their water plan and implementation of how water is used, how it’s pumped out of the city, as well as how sediment is deposited. The complete change of aligning with the natural environment is under way.” Because Norfolk, Va., faces daily tidal flooding, “by 2035 they will be in serious trouble” and are rethinking zoning, even considering relocation away from high-value but high-risk lowland areas. “In the U.S. we have an issue with ‘retreat,’” Azaroff comments, but “that city is beginning to transform itself in the face of very rapid change.” Near Portland, Ore., and Seattle, he adds, “two of the most sustainable cities in the U.S.,” the Cascadia subduction zone is overdue for “that next great earthquake, right off the coast, which would then be followed by massive tidal waves, and in the predicted modeling it is catastrophic.” Seattle’s mitigation measures include robust seismic building codes, accommodating heavy-timber construction.

The concepts of recovery, sustainability, mitigation, adaptation, and resilience are interrelated but distinct and nuanced, Azaroff finds. “Resilience has to do with health, safety, and welfare — if a resilient measure fails, life hangs in the balance — whereas sustainability is about aligning with nature and having a lighter footprint on the planet. And sometimes

resilient measures do not align with nature. They’re a complete upheaval of the environment, disruptive to protect life. Sometimes coastal protection is a reparation of wetlands, making a sponge before you make a seawall. They’re both resilient measures, but one is sustainable and resilient, whereas the other one is not quite sustainable, because generally you’re using a lot of carbon to put that in place. You’re disrupting natural systems, drainage systems, flows.”

Along with balancing these priorities, resilience planners must resist a recurrent pattern: “Most cities and places have reacted to the last disaster to prepare for the next one,” Azaroff observes. “If Sandy had been a wind event rather than an inundation event, we would be rebuilding in a completely different way. That’s unfortunate because we should be rebuilding in a holistic way, a comprehensive way.” Natural disasters have affected about 80% of Americans since 2007, he notes — some 243 million people, according to FEMA data. Such a number is a huge constituency for farsighted resilience policies — potentially even a future electoral majority large enough to create its own form of disaster resilience.

Bill Millard is a frequent contributor to Oculus.

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FEATURE

ON THE FRONT LINES

New York is building defenses against future storms

BY ALEX ULAM



Unless Donald Trump starts a nuclear war, the biggest existential threat facing New York City undoubtedly is climate change. Superstorm Sandy in 2012 caused an estimated \$33 billion in property damage and took more than 100 lives, but it was just a wakeup call. By 2050, sea-level rise is expected to be as much as 30 inches higher in New York's coastal regions than sea-level average of 2004 to 2005. It is a given that the city will be facing more devastating storms and increased flooding. Fortunately, public agencies and architects are developing innovative responses to these threats.

BIG U

The most ambitious plan to deal with climate change is the BIG U by the Bjarke Ingels Group (BIG), one of six winning entries throughout the New York City metropolitan region in the federal government's Rebuild by Design competition. That plan called for a series of multipurpose berms and barriers around Lower Manhattan, which could be used for both recreation and protection against future storms. "The BIG U was a concept that BIG put out there," says Michael Shaikh, a spokesperson for the mayor's Office of Recovery and Resiliency. "The city has taken that concept and is turning it into an actual physical project."

Two segments of the modified Big U are fully funded. One is the \$760 million East Side Coastal Resiliency project (ESCR), which is in preliminary design with the engineering firm

AKRF serving as the managing lead of the project, BIG serving as a design lead, and One Architecture in charge of planning. It runs for 2.4 miles along the East River waterfront between Montgomery Street and East 25rd Street.

The other is the Lower Manhattan Coastal Resiliency (LMCR) project, which is being led by the engineering firm AECOM with BIG in charge of urban planning and community engagement, and One Architecture in charge of planning. That project runs from Montgomery Street to the northern end of Battery Park City. The city has \$206 million in design and construction funds for the section between Brooklyn and Manhattan bridges.

The largest section of the ESCR is in East River Park, which will be rebuilt with a series of berms and levies. To prevent this vertiginous landscape from trapping rainwater along the adjacent FDR Drive, the city is considering a series of pumps and drains. In sections of the ESCR and LMCR that run under the elevated sections of the FDR Drive, the city also is contemplating adding a series of deployable features, such as gates that could be either front-loading or sliding.

Both the ESCR and LMCR represent major changes to the Lower East Side's landscape. "We are trying to incorporate flood protection that doesn't wall off our communities," says Shaikh, but "there are going to be views that get obstructed – there are going to be some tradeoffs."

Red Hook Houses

One of the places most devastated by Superstorm Sandy was the Red Hook Houses, a 2,833-unit public housing complex in an area of Brooklyn only seven to 13 feet above sea level, which was left without power for weeks. The Federal Emergency Management Agency is pumping more than \$400 million into these housing projects for repairs and storm-proofing.

The plan for Red Hook Houses by Kohn Pedersen Fox (KPF) involves typical strategies underway in other flood-prone areas of the city, such as elevating boilers and power generators. However, KPF's plan also includes raised landscape features that will address the particular problems that Red Hook residents faced during Sandy. "It was very difficult for people to get out of the buildings," explains Devin

Ratliff, a director at KPF. "You got down to the ground floor, and you were standing in water."

The raised landscape sections, which KPF calls "Lily Pads," will replace a hardscape of stairs and ramps that ran throughout the complex. The Lily Pads are intended to protect building entrances, provide places for people to congregate after a storm, and improve drainage.

Another innovative feature of the KPF plan is the two high-efficiency combined heat and power plants located above the flood plain, one of which is camouflaged by a large green hill. These will provide the complex's 28 buildings with full backup systems so the buildings can continue to operate if the power goes down. "It is unique for public housing," says Ratliff. "Just the fact that you are providing 100% backup – commercial projects do that, but not residential."

BELOW

KPF's plan for the Red Hook Houses would create new community spaces while providing protection from future floods.



Image Credit: KPF



Image Credit: Courtesy Quennell Rothschild & Partners

ABOVE
WXY and Quennell Rothschild redesigned Astor Place and Cooper Square to capture storm water.

Astor Place

The revamped Astor Place, an \$18 million New York City Department of Transportation Project that began in 2013, consists of three linked plazas along Fourth Avenue, which are significantly reducing storm-water runoff. The project incorporates traditional landscape features, such as dozens of new street trees and thousands of new plantings. It also features high-performance materials such as permeable pavement, structural soil, and embedded biofiltration strips that slow down storm water, allowing it to percolate into the water table.

A signature resiliency feature at Astor Place is its bioswales, large catchment basins filled with plantings. These bioswales capture storm water, filter pollutants, and release the purified storm water slowly into the ground, where it is put to use irrigating plants.

Unlike many other resiliency projects in the city, the Astor Place project was in the planning stages

before Sandy. “Astor Place was a first model for incorporating green infrastructure for rain events,” says Claire Weisz, principal at WXY Architecture and Urban Design, which is leading a team that includes horticulturist Piet Oudolf and the landscape firm Quennell Rothschild & Partners.

A challenge to building more resilient plazas similar to Astor Place is the increased maintenance necessary to keep the permeable pavement and the bioswales clear of debris. “There are potentially a lot of green jobs involved in maintaining green infrastructure,” says Weisz, noting that in the case of Astor Place, plans call for the NYC Parks Department to maintain it, along with the Grace Church School and an organization called The Village Alliance.

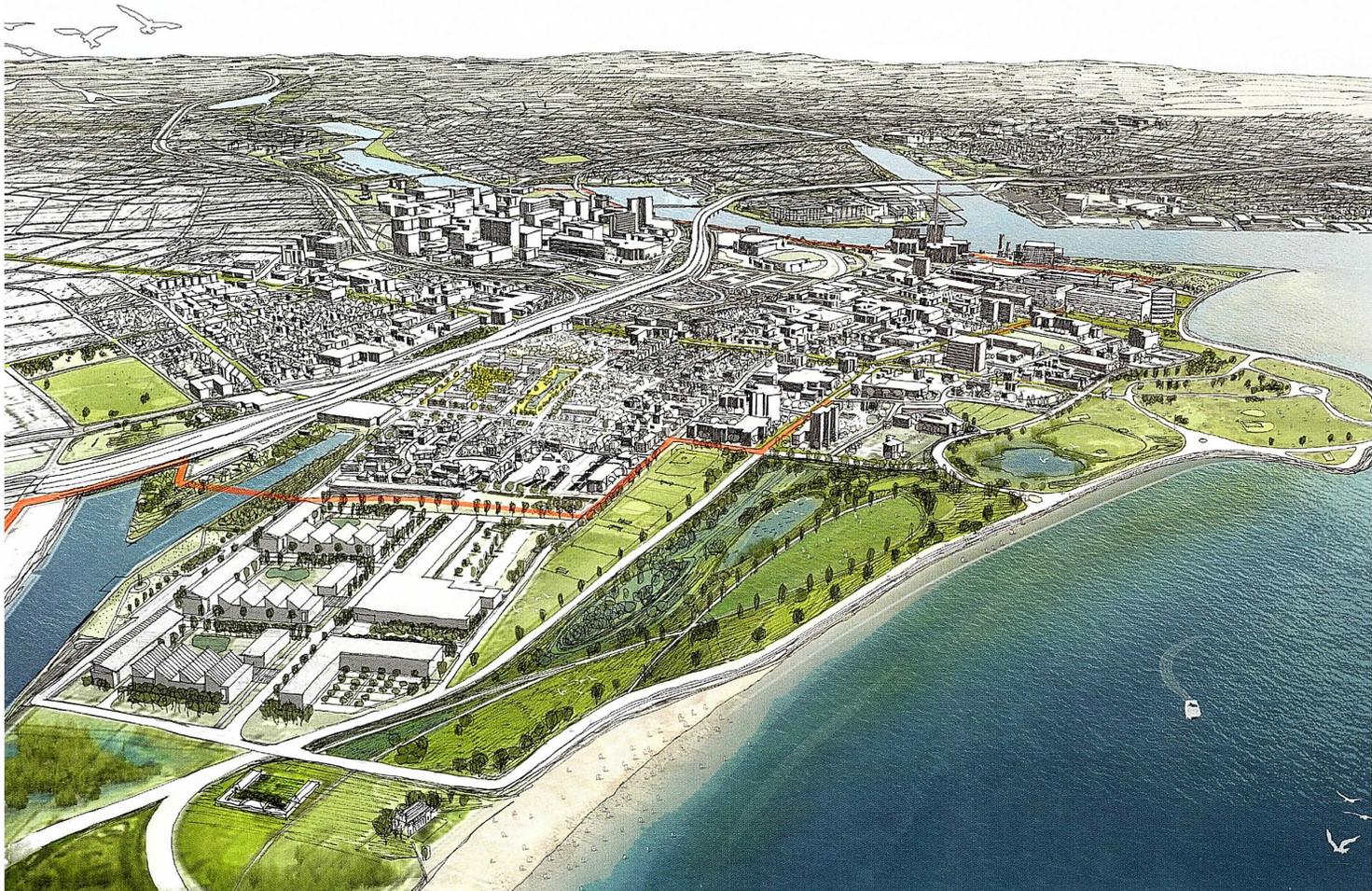
Alex Ulam writes about architecture, planning, and sustainability for The Nation, Maclean’s, The Wall Street Journal, and other publications.

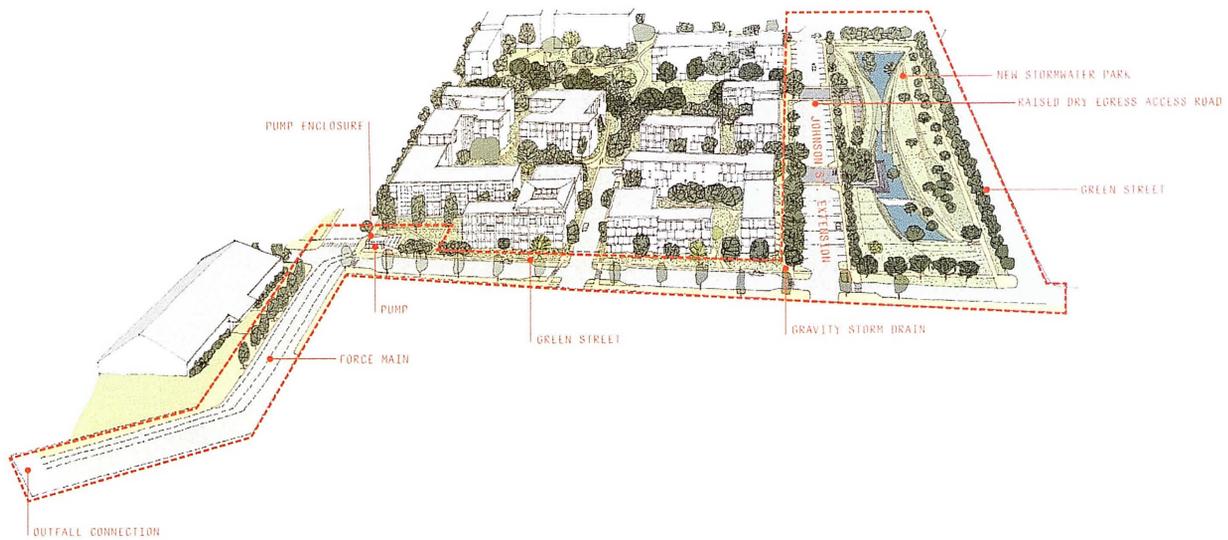
FEATURE

WHERE RESILIENCY HITS THE ROAD

How those at the forefront of adapting to climate change and natural disasters are implementing effective projects at scale.

BY LISA CHAMBERLAIN





ABOVE AND LEFT
Resiliency funding is being leveraged to drive economic development on the waterfront in Bridgeport, Connecticut.

No other approach to design encompasses the existential concepts of time and space like resilient design. The response to climate change is necessary at all scales — from the one-acre public plaza to the regional coastline to the multistate watershed. Resilient design must also consider how rapidly changing conditions will play out over time. And yet, in these early days of planning for climate change, merely framing the issues and setting priorities can be challenging for resilience officers charged with institutionalizing policy.

Connecticut: Rebuild By Design

David Kooris offers a good perspective on the different approaches and scales at which resilience officers must operate. As director of Rebuild By Design for the state of Connecticut, he works across multiple federal and state agencies while overseeing implementation of the first coastal project in the South End neighborhood of Bridgeport, CT. Fortunately, he was already accustomed to thinking regionally: he'd previously worked at the Regional Plan Association of New York, New Jersey, and Connecticut, and then as the director of Planning and Economic Development for Bridgeport. So Kooris had a head start on setting resilient design policy, because he already had a clear economic development objective and previous experience in sustainability planning.

“Resilience is very broad in terms of issues, and it doesn't say anything about what your goals are for the community,” says Kooris. “So how do you simultaneously leverage the impetus of events like Hurricane Sandy to be a conduit for this broader

conversation, but narrow enough so it doesn't become a conversation about everything? You have to understand what type of community you're trying to create, and resilience will help you achieve that, despite stresses and shocks. The advantage in Bridgeport is that we had a legacy of sustainability planning, economic development, and social equity.”

Efforts to revitalize Bridgeport have happened in fits and starts, often stymied by both economics and politics. But winning a \$10-million grant from Rebuild By Design, the federal government's competition, might move the needle. Initiated by the Department of Housing and Urban Development under President Barack Obama, the grant provides funding for the first pilot project in Connecticut, which is focused on the South End neighborhood of Bridgeport, a low-lying peninsula exposed to sea-level rise and storm surge. The plan seeks to elevate a main thoroughfare, build a waterfront berm, and establish offshore breakwaters to better protect and connect the neighborhood.

Indeed, this work may finally unlock the potential of the entire South End area, where redevelopment efforts had stalled because much of it is in a floodplain. Plans to redevelop the former Remington Shaver site into a new mixed-use community have been struggling through real-estate crashes and flooding for more than a decade. But the resilient design pilot project in South End — led by Waggoner & Ball, a New Orleans-based architecture firm that has developed an expertise in water management planning since Hurricane Katrina — is designed to protect a flood-prone area while stimulating development.



When asked if money for resilience is being used as a real-estate development tool, Kooris doesn't miss a beat: "Development is going to result in local taxes and jobs, and improve the prospects and reduce the expenses of the existing neighborhood. Folks who have been here for years are saddled with high property taxes, and industry has left the city behind, resulting in fewer jobs. So if the public sector needs to prime the pump, that's a good thing. The magnitude of these public dollars being leveraged will result in many multiples of private sector dollars."

Colorado: First Steps

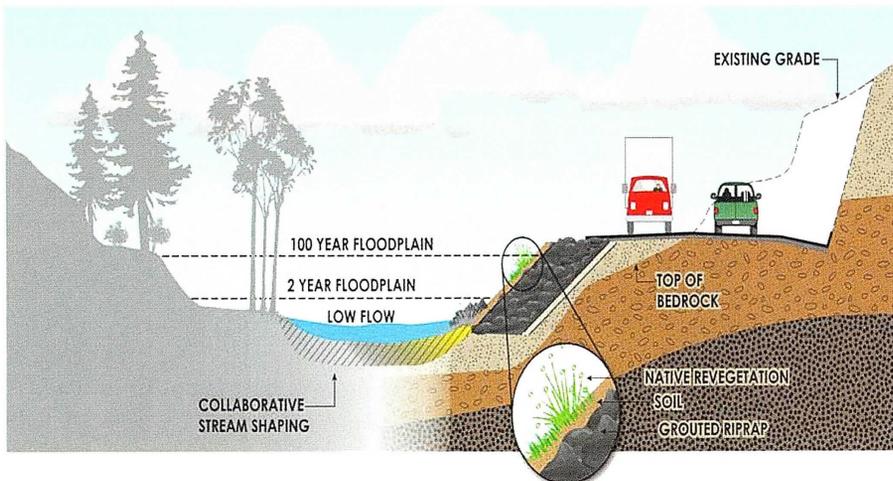
Since 2012, the state of Colorado has experienced five presidential declared disasters totaling an estimated \$5 billion in damage, including devastating wildfires in 2012, and unprecedented flooding due to rain over three days in 2013. High-velocity water sped through mountain canyons, carrying debris for miles, forcing 18,000 people from their homes, dam-

aging infrastructure, and washing away roads. Within days of that historic flood, Governor John Hickenlooper formed the Colorado Resiliency and Recovery Office, which is run by Molly Urbina, a land-use planner with expertise in zoning and real estate.

"With a sense of urgency, we had to think about how to improve resilience," says Urbina. "The word was not even well defined for us, so we had a summit in June 2014 that brought together federal and state people to sit down and talk about what sustainability and resiliency mean. There was confusion about these terms."

For a non-coastal area with home-rule governance, environmental awareness was more about local issues like recycling and sustainable building materials. The first task of the new state agency was to put together a resiliency framework to identify priorities and provide guidance for localities about how to implement plans. For example, most county flood maps were out of date and existed only on paper. The state provided funding to update and digitize flood maps, and to use

THIS PAGE
In Colorado, roads are being moved away from rivers and streams.



a geographic information system to identify where flooding would likely cause landslides, debris flows, and rockfall. As the saying goes, you can't manage what you don't measure.

But measuring isn't necessarily managing, either. In a home-rule state like Colorado, one of the few things the state has control over are the roads. And a major cause of distress from the massive flooding concerned the proximity of roads to rivers. Road closures from massive flooding is a serious matter, as communities are entirely cut off from each other when the road is washed out. The new state resiliency office is coordinating with the Colorado Department of Transportation (C-DOT) and the Department of Natural Resources to develop a plan for rebuilding critical roads in a way that prevents closures in times of flooding.

"As C-DOT is working on a road, it focuses on the road," says Urbina. "Natural Resources looks at how to mitigate overflows, but doesn't say much about where the road goes. But these things need to be looked at in tandem. Moving the roads away from rivers is something only the state can do, so that is one of our top priorities."

For professionals steeped in the design of cities in the age of climate change, this may not sound like

cutting-edge resiliency, but it is the level at which most of the U.S. is operating when it comes to climate change. Defining terms, setting priorities, and coordinating agencies are the tedious but necessary first steps taken by most resiliency officers.

Los Angeles: Focus on Building Stock

By far the largest coordinated effort to advance resilient policies at the city level is led by the Rockefeller Foundation's 100 Resilience Cities program, launched in 2012. Cities around the world were invited to submit an application, and those selected would receive two years of funding to hire a chief resilience officer and develop a framework for advancing resilient priorities. The first 32 cities selected in 2013 included Los Angeles, where Marissa Aho, who has a background in urban planning and landscape architecture, was appointed by LA Mayor Eric Garcetti to head up the new office and oversee the implementation of the city's resilience agenda.

Changing the scale of resiliency from state to city necessarily changes the perspective, and in Los Angeles the focus is on the building stock. The first big push so far has been to retrofit homes to current seismic standards. The city held two major events that brought together thousands of property owners

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with the building trades to facilitate these retrofits, which are mandated by city ordinance.

LA has an estimated 13,000 soft-story buildings, multistory buildings with ground-floor spaces and often storefronts, which are vulnerable to seismic shock due to a lack of shear wall at ground level. Many of these buildings contain rent-stabilized housing. “We are preserving lives, increasing safety, and also trying to preserve the affordable housing stock,” says Aho. “Part of resilience is being proactive. While our earthquake threat is something we’ve always lived with, the history of cities has been to make changes to policy after an event. With Sandy in New York, and Katrina in New Orleans, the event spurred the action. We aren’t waiting for an earthquake; we are implementing seismic retrofits proactively.”

It is indeed important and necessary work, and in the broadest sense of resiliency, it is certainly appropriate. One could make a different argument, however, that the city had already waited to address a known threat, and is using the impetus of climate change to address an issue that is not in fact caused by climate change. But the reality is that the city doesn’t have much control over climate-induced crises, like water shortages, so naturally the city



Soft-story buildings are vulnerable to earthquakes. In Los Angeles, many are being reinforced.

is going to gravitate towards projects it can do something about.

Cities: Leading on Climate Change?

“It’s hard for a city to bring about change at their scale because it’s much broader than just that city,”

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says Alex Wilson, executive director of the Resilient Design Institute, a nonprofit founded in 2012. Wilson has a long history with sustainable design initiatives, but pivoted to resilience in the wake of hurricanes Katrina and Sandy. “Preparing for climate change, and certainly the cause of climate change, can’t really be addressed at the city level.”

And that, unfortunately, leaves some of the biggest issues unaddressed. Wilson, for example, identified a serious matter that wasn’t on anyone’s radar: how to plan for the medium-term impacts of power outages. “You could be in a building that isn’t affected by the disaster at all,” says Wilson. “Hurricane Katrina flooded buildings, but hundreds of thousands more buildings lost power. After Katrina, we advised and wrote New Orleans Principles,” a report that describes 10 organizing principles to guide reconstruction and redevelopment of the city. “One of the 10,” he continues, “was to provide passive survivability – to make sure that what we’re designing and building today will keep people safe in case of a power outage. New York City is a case in point. A lot of the high-rise glass condos that have gone up over the last 10 years will be uninhabitable within hours of a power outage.”

Are cities leading on climate change, as has become the conventional wisdom? A recent article written for Greentech Media by the former director for the D.C.

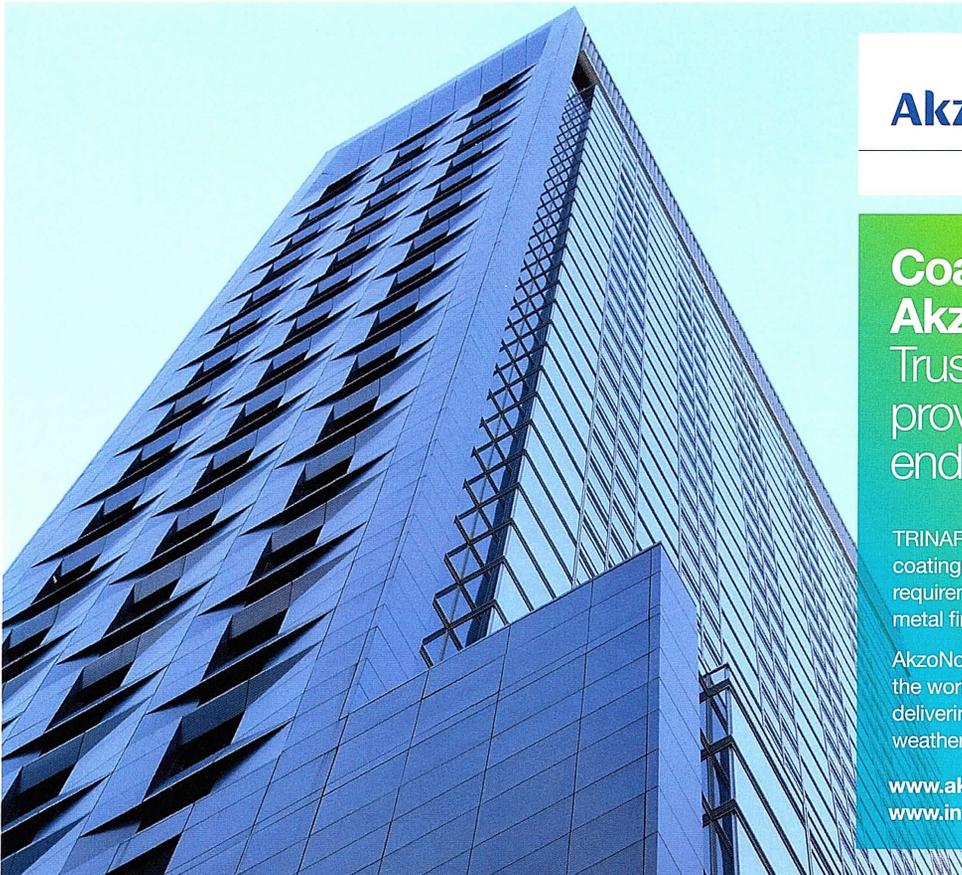
government’s energy division debunks this myth. In this well-researched piece, the author makes the case that cities are mostly taking credit for things they didn’t initiate. For example, renewable energy programs are usually state-driven, and most solar power and wind power are neither generated within cities nor provide power to cities. Meanwhile, energy consumption in cities is increasing, and many cities are essentially using carbon accounting tricks to show reductions to achieve their “net-zero” carbon emission goals.

That’s not to say that city-led policies are for naught; they will surely have a positive impact on people’s lives. But the question every resilience officer has to wrestle with is, how closely should resilient plans be tied to climate change?

Kooris of Connecticut answers the question this way: “I’m not a fan of creating a ‘resilience’ plan. Incorporate resilience into your other planning efforts. Identify what stresses and shocks would prevent you from achieving the goals of those plans. Resilience is really a risk mitigation strategy to help you reach the goals you’ve already set.”

And then hope for the best.

Lisa Chamberlain has written for the New York Times, Metropolis, New York Magazine and other publications. She recently launched the Common Edge podcast.



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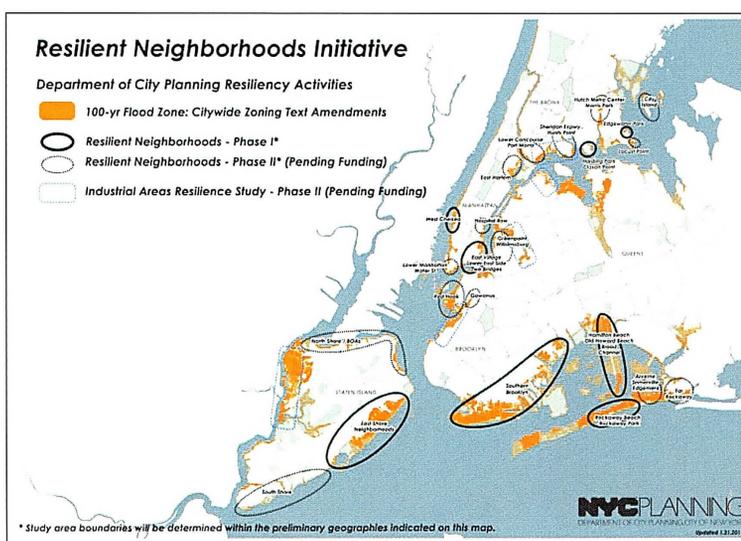
FEATURE

SANDY AFTER 5: A REPORT CARD

Are we better off today than the day before the superstorm hit? Yes. Are we resilient as a city yet? No.

BY ILLYA AZAROFF, AIA

Image Credit: New Department of City Planning, Resilient Neighborhood initiative, Special Zoning districts for flood hazards and building.



FIRMs show more than 67,700 buildings now to be in New York City's 100-year floodplain, up from the approximately 35,500 indicated in the 1983 FIRMs—an increase of roughly 90%.

Five years after Superstorm Sandy, the city and many civic groups, including AIA New York, have produced reports, studies, and a mountain of documents with recommendations, records of thoughts and feelings of communities, and predictions for the future. Indeed, this profusion of documents would be a great surge barrier for the next storm. Many people are still asking questions about their current state of living, the future of their neighborhoods, and where the city will be in years to come. Comprehensive resilience is difficult to attain, and even more difficult to maintain.

The city of New York publishes a report card each year on the implementation of resilient measures. Its focus, however, is quite narrow regarding the end goal: informing members of the public to be aware and to make choices for their future. We often hear about the plight of roughly 6,000 to 7,000 homes

in the build-it-back program, though nearly 90,000 buildings were inundated by Superstorm Sandy, and most did not opt into the build-it-back program. Yet the media dwell mainly on this one program. Of greater concern is that we seem to be preparing for the last storm, rather than for the potential of storms to come. Comprehensive resilience is achieved through understanding what the risks and vulnerabilities are across the entire spectrum of natural and man-made disasters. For New York City, we need to prepare not only for water inundation, but also for high winds, extreme heat, and extreme cold. We must be cognizant of vulnerabilities “upstream” that may affect our infrastructure and transportation networks, such as food supply, water, and the goods and services that make New York a viable city. That alone is not an easy task.

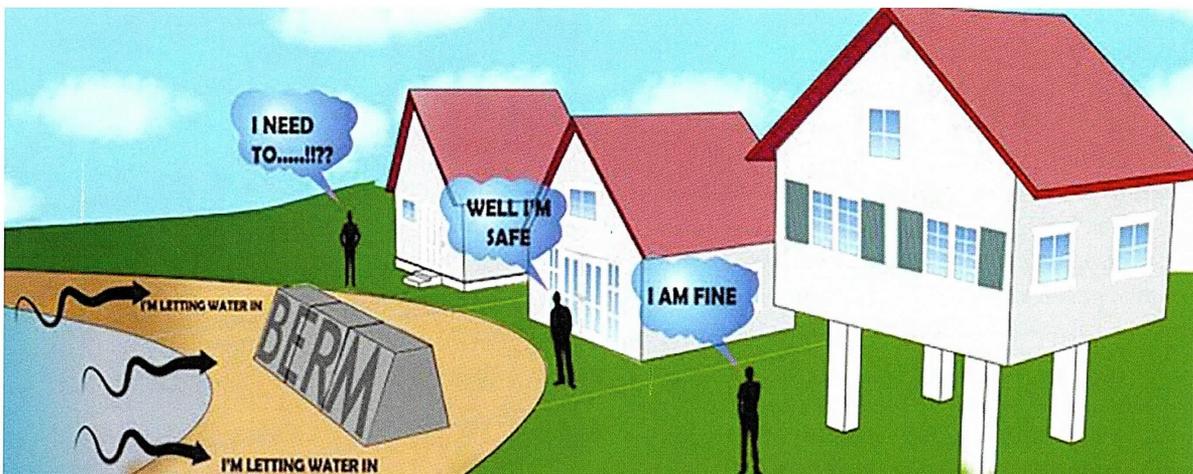
C Real progress made

Across the U.S., Sandy has moved the topic of climate vulnerability and risk to front and center of the American psyche. That's progress for those of us who were shouting into the wind years before Sandy made her coastal run. Grade A. Here in New York, however, the storm has only revealed the enormous gulf between being where we were before the storm and attaining actual resilience. Sandy made known how vulnerable and ill prepared not only New York City is, but the whole East Coast. The area between Boston and Washington accounts for 20% of the U.S. GDP in 2% of the land area, with a population of 50 million. It is all very coastal, very vulnerable, and ripe for the next Sandy. I give this an Incomplete grade, as there is much work yet to be done.

In response, New York City issued the "Special Initiative for Rebuilding and Resiliency" report, outlining multiple phases that can make the city much more prepared for shocks and disturbances. Phase I is largely complete, making most coastal areas much more prepared and resilient for future events, along with hardening infrastructure

and transportation networks. These early phases buy time, perhaps 20 years or more, for the coming hard choices in coastal neighborhoods. Phase II of the work is well underway, and the comprehensive view of city operations are documented in the goals and projects planned. Additionally, city agencies continue working with leading experts on the challenges and opportunities for adaptation. This new strategic planning and partnership have taken hold in many coastal cities across the U.S., reinforced by the Rockefeller Foundation's 100 Resilient Cities, which together have changed the way we share information city to city, mayor to mayor, agency to agency. That alone is a form of comprehensive resilience that did not exist before. I give this Grade B+ because the weak links in comprehensive resilience in New York City are private stakeholders and lack of enforcement. Moreover, any number of private properties and institutions are not held to current recommended compliance or best practices due to many circumstances. Grade C.

Image Credit: Iliya Azaroff



Consequence of uncoordinated action undermine comprehensive community resilience.

F

The errors of one-dimensional thinking

The idea that elevating existing homes is a resilient measure is a common misconception. Raising homes that were built between 1910 and 1960 is a complete waste of taxpayer dollars. Those buildings are not up to any current code or standard, nor do they meet current energy compliance standards, let alone those of "New York City's Roadmap to 80 x 50." Once these structures have been elevated and the next storm rolls in as a wind event, we will see the error of one-dimensional measures. The buildings will not be able to withstand coastal wind forces of 130 to 140 mph, making them not only vulnerable, but also hazardous to surrounding neighborhoods when they break apart and become flying debris. Rethinking the return on investment for these building types is essential. Grade F.



Image Credit: +LAB Architect

Housing elevation is not a long-term solution or resilient.

D-

Rebuild by Design is just the beginning

Rebuild by Design (RBD) is an excellent program that continues to engage all stakeholders for a resilient future. Grade A for effort. It has been excellent to see our plan for future communities evolve through this holistic process. The problem with RBD, however, has been the media message regarding the 10 demonstration projects. The key term here is "demonstration." These 10 projects alone will not make the city or region resilient. In fact, the entire idea behind RBD was that these projects would spur on innovation, community buy-in, and private investment to continue this work in a comprehensive way, well beyond these initial 10 projects. Grade D- for communication and private investment.

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D

Those left behind

Due to the physical losses of Sandy, the requirements for rebuilding, and the cost of insurance, many people have been left behind or squeezed out of their former neighborhoods. Numerous houses in the Rockaways and other neighborhoods have been abandoned. The economy and jobs are part of this equation, as well as social justice. Many New Yorkers remain at risk of losing their homes, given the fragile economies in the most vulnerable areas of the city. We need more local jobs and relief for struggling homeowners, please. Grade D. Do better.

C

Sandy, 10 years later

Even after 10 years, we will still be recovering from Superstorm Sandy and working toward preparedness to build a resilient future. Commitment, education, and continuous effort are the biggest challenges, not to mention institutional and governing memory that changes with the political seasons. The investment in dollars and human capital is profound and must be maintained through advocacy. If Japan is spending half a trillion dollars on comprehensive resilience following the great 2011 Tohoku Tsunami and Earthquake - for a region roughly the same size as ours - what will our area look like if we spend only one-fifth that amount? Funding for the future earns an F. But if we add the global efforts of 100RC to this equation, we have a passing Grade C. Thank you, Rockefeller Foundation.

Image Credit: http://climate.nasa.gov/system/content_pages/main_images/1320_effects-image.jpg



Image Credit: http://climate.nasa.gov/system/content_pages/main_images/1320_effects-image.jpg

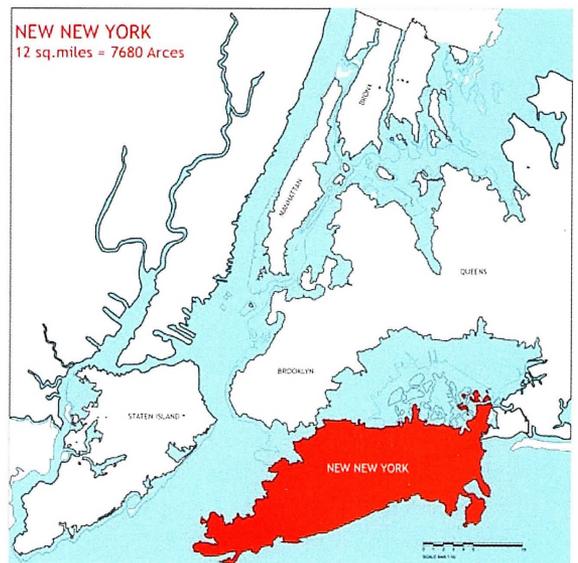
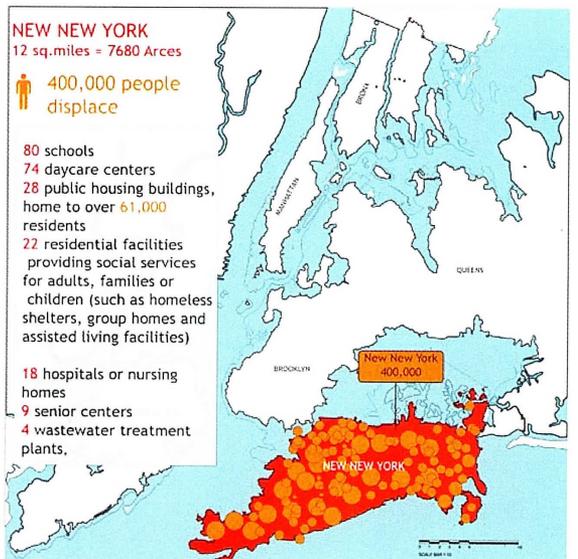


Image Credit: http://climate.nasa.gov/system/content_pages/main_images/1320_effects-image.jpg



B+

Too little
may be
too late

Given the regularly adjusted timeline of coming climate change consequences, too little may be too late. New York City has engaged a series of robust resilience efforts that keeps turning the clock of catastrophe backwards. But that may not be enough. Comprehensive master planning is the key here, and the Department of City Planning has been taking steps to reimagine the waterfront, patterns of living, and the future shape of the city, including its resilient neighborhood initiative. Grade B. What we must do in this regard is a tall order, and incremental measures may not be the way to go. We need zoning changes for entire areas of the city to rethink and realize our new urban footprint. As we look forward to the year 2100, it is projected that 12 square miles of the city will be underwater or vulnerable to regular flooding. That area currently houses more than 400,000 residences (many public housing complexes), 80 schools, 18 hospitals and nursing homes, nine senior centers and four wastewater treatment plants. Shed the incremental thinking to get a B+, put those truths to action, and get an A!

U

Finally,
unrestrained
hope

Thanks to climate change, what was once intangible has become tangible. We are doing better, yet we need to do better still. We are the most adaptable species on the planet, and we can succeed in this climate of constant change. Knowing we are all working toward a collective future of sustainable resilience is energizing. The architecture/engineering/construction industry is at the table with governing bodies, industry leaders, and not-for-profits on a daily basis, with the recognition of the roles and value each party brings. Innovation is happening every moment, and it is impossible to digest given the speed of our collective response to this worldwide problem. There is the real, tangible progress, and the silos are few these days, so let's not reerect them over the coming years. Grade: a big U for unrestrained hope.

Illya Azaroff, AIA, is the co-chair of the AIA NY Design for Risk and Reconstruction Committee and the principal of +Lab.

Image Credit: Azaroff



Constructed dune system on Rockaway Beach queens, completed example of Phase I of the SIRR report.



PORTFOLIO

SEA LEVEL

BY ELIZABETH FELICELLA

Sea Level was a collaborative effort commissioned by the Center for Architecture in the spring of 2015. Early on, the team took a boat trip together, traveling from Fort Wadsworth, underneath the Verrazano-Narrows Bridge, through the harbor, up the East River, to Fort Totten, just north of the Throgs Neck. As the photographer, my role was to pinpoint twenty or so locations along the route. The trip was magical—an uninterrupted stream of conversation

and observation about the passing cityscape—and an endless string of photographs. It was immediately clear that the line of the shoreline was what interested us most—both as a way of drawing all the pieces together, and as a kind of conceptual hinge to lines of history and time.

The lesson has only just started. This was the first installment of *Sea Level*—I plan to update the panoramas every five years. I hope that over the years we'll see evidence of evolving conservation and preservation efforts—but of course, I'm apprehensive.

When Robert Sullivan wrote the texts for the installation, he dedicated an entire panel to "Spit of Land That is Just Green." He writes, "Here, at the

mouth of Newtown Creek, is a fenced-off, wild space, a kind of Sherwood Forest across from Turtle Bay. By ancient we mean circa 1936, when the hill may have been created from the material excavated in the construction of the third tube of the Lincoln Tunnel... It's a last sad hill, as triumphant as it is anxious." And as of this summer, it's gone.

The project was commissioned by the Center for Architecture. The team included: Cynthia Kracauer (former Managing Director), Robert Sullivan (writer), Andrew Berman (installation design), Martin Perrin (graphic design), Elizabeth Felicella (photographer), James Sanders (curator), Berit Hof, and Katie Mullen.

IN PRINT

REVIEWS

A Burglar's Guide to the City,
by Geoff Manaugh. Farrar, Strauss
and Giroux, 2016. 296 pgs. \$16

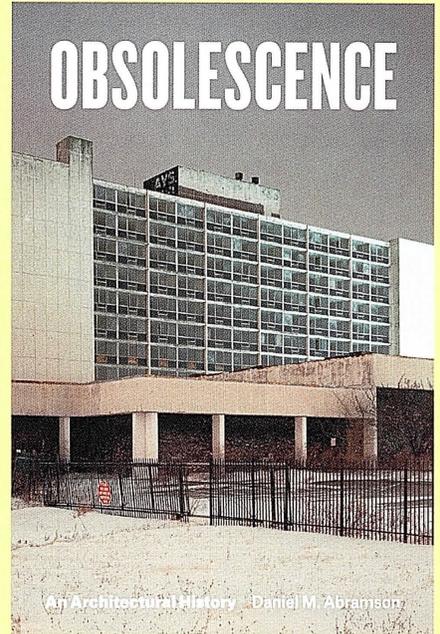
This book suggests alternative ways of looking at buildings and the urban environment. One focus is on the flaws and vulnerabilities of buildings as seen by burglars and police. The other identifies the porous nature of the city, which allows malefactors to hide, camouflage themselves, and escape. Some of the very qualities architects strive to achieve – such as the intelligibility of their designs, transparency, and spatial coherence – are the qualities that make buildings vulnerable.

The author contends that in the practice of planning and design, architects devote little attention to how unsavory agents can take advantage of the built environment's spatial opportunities for crime.

While prisons, data centers, and the National Security Agency's headquarters may receive a great deal of security attention, most everything else doesn't.

Burglars read buildings – fire escapes, windows, ledges, service entrances, publicly available floor plans, real estate websites, local building codes, and observable patterns of use – to determine a way in that offers little or no resistance. They also study ways out and routes away from their target. Evening tours with LA's helicopter police, for example, reveal how porous the urban environment is, and how much strategy goes into the getaway phase.

Manaugh's research also yields some counterintuitive insights: Alarms, rather than triggering fear, alert the burglar that there is something valuable inside. Sophisticated security systems can be thwarted by simple materials like duct tape, Styrofoam, hairspray, and a broomstick. Locks don't stop burglars, but just slow them down.



Featuring interviews with reformed master thieves, lock-picking enthusiasts, and the police, this book is a rambling adventure through the world of physical and spatial vulnerability. But it is also a useful, awareness-raising, and frequently giddy

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look at how the objects we design are seen as puzzles for other people to pick apart.

Obsolescence: An Architectural History, by Daniel M. Abramson.

University of Chicago Press.
192 pgs. \$35

Around the turn of the 20th century, architecture was viewed as nearly eternal, designed and built for a long life. But modern business organization, the accelerating growth of companies, new technologies, rising real estate values, and increasing building regulation combined to displace that concept. Confronted by these forces, older buildings – even those of recent vintage – were perceived as passé and poorly equipped for the modern age. The concept of obsolescence had arrived.

Building obsolescence was quickly embraced by the real estate industry, codified into checklists, and quantified in the federal tax code as depreciation schedules. Obsolescence and deprecia-

tion emerged as risk management and facility management tools, respectively.

Architects took notice. They had the tools and a form of analysis to confront the old and forge a brighter technological future. Soon, the obsolescence concept was applied by architects and city planners, aided by the Federal Housing Administration's codified checklists, to replace neighborhoods and chunks of the urban realm. This system of analysis and judgment reached its height in the 1950s and '60s with an approach to urban renewal that destroyed viable neighborhoods nationwide.

Powerful backlashes developed: in the 1960s, from Jane Jacobs and the neighborhood preservation movement, proponents of adaptable reuse, and an energized and broad-based preservation community; and, in the 1970s, from the sustainability movement. Architects responded with new approaches to increase building flexibility and life, such as factory sheds capable of rapid change, interstitial floors,

exoskeletal structures, and megastructures. New heroes and prophets emerged, including Archigram, Team X, Christopher Alexander, and Frank Duffy. Furniture companies like Herman Miller responded with modularity and reconfigurable systems. Preservation and sustainability rose to challenge the underlying logic of obsolescence.

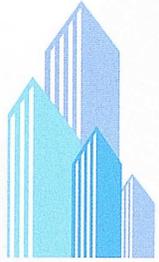
Ironically, three of the most influential post-war architects were Louis I. Kahn, Paul Rudolph, and Aldo Rossi, who emphasized timelessness, permanence, and sculptural solidity. In the 21st century, sustainability, longevity, duration, and adaptability are among the primary goals for architects and the built environment

This history is an informative and rich exploration of an idea, how architects embraced that idea, and how it was displaced by newer, better ideas. Ultimately, it is a cautionary tale.

Stanley Stark, FALA, is the book critic for Oculus.

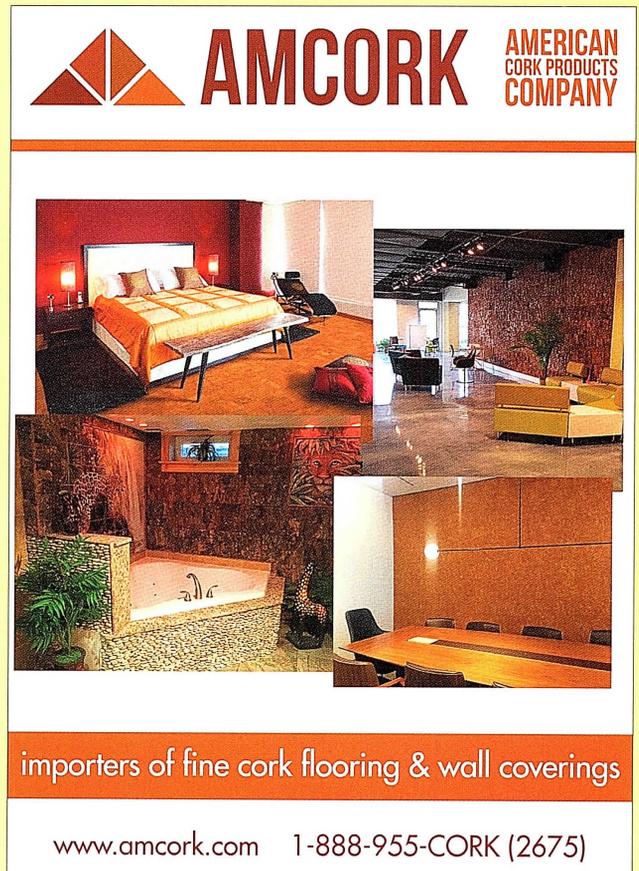


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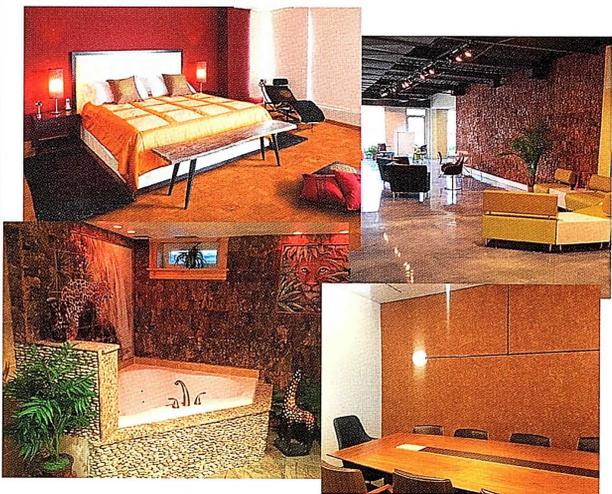


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CALENDAR OF EVENTS



DATE	TIME	EVENT	LOCATION
November 3, 2017	6:00 PM - 8:00 PM	PANEL: A Celebration of El Internacional	Center for Architecture
November 3 and November 17, 2017	2:00 PM - 5:00 PM	CLASS: Energy Modeling for Project Managers	Center for Architecture
November 4, 2017	10:30 AM - 1:00 PM	TOUR: Midtown Modernism(s): On and Off East 57th Street	Pulitzer Fountain in Grand Army Plaza, Fifth Ave. and 59th St., (Across from the Plaza Hotel)
November 4, 2017	11:00 AM - 3:00 PM	INFO SESSION: Architecture & Design College Fair 2017	Center for Architecture
November 4, 2017	6:00 PM - 8:00 PM	PANEL: 2017 Deans' Roundtable	Center for Architecture
November 7 and November 8, 2017	9:00 AM - 5:00 PM	CLASS: Hyper-Efficient Building Workshop: Strategies for Complying with Local Law 31	Center for Architecture
November 9, 2017	12:00 PM - 6:00 PM	PANEL: New Local - Manufacturing: Pratt Workshop	Brooklyn Design + Fashion Accelerator 630 Flushing Avenue #704
November 9, 2017	6:00 PM - 8:00 PM	PANEL: Theatrical Scaffolding: A Flexible Stage	Center for Architecture
November 12, 2017	10:30 AM - 1:00 PM	TOUR: The Changing Face of North Midtown: Crosstown Below the Park	Meet at north side of Pulitzer Fountain in Grand Army Plaza, Fifth Ave. and 59th St., across from Plaza Hotel.

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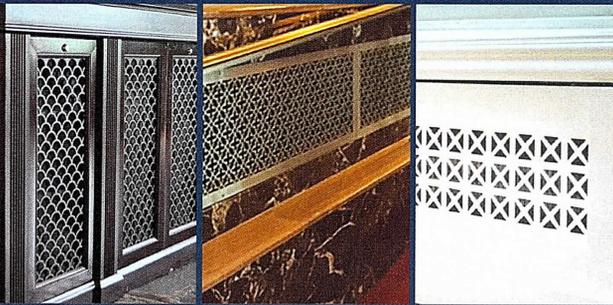
Frank Lloyd Wright

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DATE	TIME	EVENT	LOCATION
November 14, 2017	6:00 PM - 8:00 PM	OPENING: Obdurate Space: Architecture of Donald Judd Opening	Center for Architecture
November 17, 2017	6:00 PM - 8:00 PM	OPENING: Building Connections 2017	Center for Architecture
November 27, 2017	6:00 PM - 8:00 PM	PANEL: Oculus Book Talk: LAB: Building a Home for Scientists	Center for Architecture
November 29, 2017	6:00 PM - 8:00 PM	PANEL: Innovative Housing: France/Denmark	Center for Architecture
December 1, 2017	6:30 PM - 8:30 PM	TALK: Cocktails & Conversation: David Piscuskas, FAIA	Center for Architecture
December 4, 2017	6:00 PM - 8:00 PM	PANEL: Responsive Scaffolding: Emergency Relief	Center for Architecture
December 5, 2017	10:00 AM - 12:30 PM	TOUR: Modern Architecture and Adaptive Reuse in the West Village and Meatpacking District	Meet at corner of Macdougall St. and Macdougall Alley (between W. 8th St. & Waverly Pl.), across from Tenth Church of Christ, Scientist
December 16, 2017	11:00 AM - 4:00 PM	FamilyDay@theCenter: Scaffolding - Connect and Construct	Center for Architecture
June 21-23, 2018	★ SAVE THE DATE!	A'18: AIA Conference on Architecture 2018 conferenceonarchitecture.com	New York City

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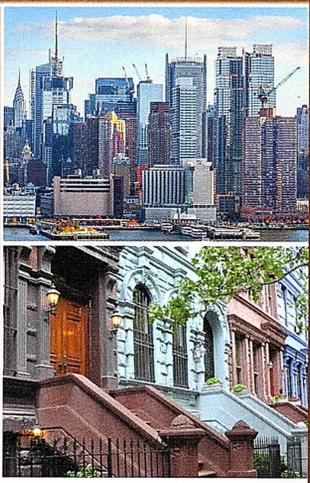
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American Cork Products Co.	45	ICC-ES	22		
Architectural Grille	47	Municipal Testing Laboratory . .	CV4		
Artistry In Architectural Grilles . .	46	Ornamental Metal Institute Of New York	18		
Benjamin Moore	CV3	Pilkington North America	7		
Bison	35	Prosurance Redeker Group LTD. .	44		
C. R. Laurence Co., Inc.	CV2	reThink Wood	10, 11		
Ceilings Plus	2, 3	Severud Association Consulting Engineers	5		
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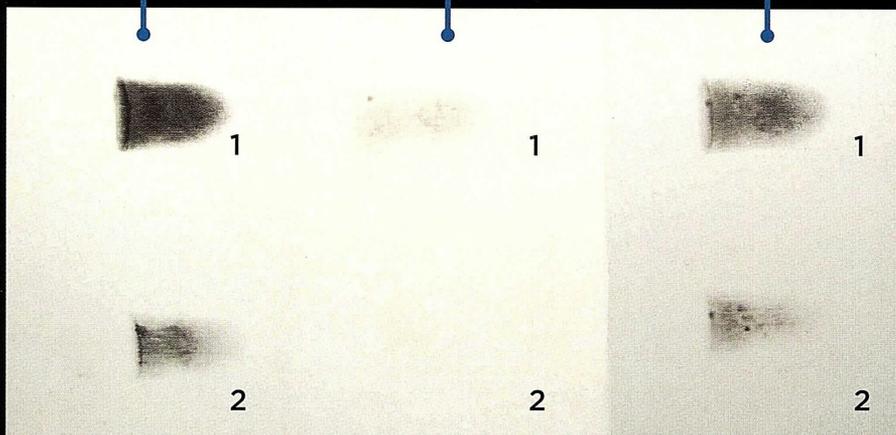
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