

# cross sections

Magazine for the Structural Engineers Association of New York

2019 VOLUME 24 NO. 1

2019

ANNUAL BOAT CRUISE



EISE Awards



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**A view of Lower Manhattan as seen during the 2019 Annual Boat Cruise. Photo Credit: Magnetic Memories**

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## President's Message

SEAO NY greeted Summer 2019 with a bang with the very successful Fourteenth Annual SEAO NY Education Foundation Golf Outing last June 10th. The event was held at Joe Tortorella's Mahopac Golf Club. The Platinum Sponsor for this year was Gilsanz Murray Steficek LLP. This year the Golf Committee decided to move up the tee time an hour so the evening dinner and socials would not end too late. This worked out really well. Around 120 Golfers participated and everyone had a great time. There was a threat of rain in the morning and the weather forecast was not very positive but the rain held off until all the golfers finished. And then it poured! A great blessing from the heavens I would say. SEAO NY gave out scholarships to two high school students.

Two weeks later, SEAO NY had the Annual Boat Cruise. This is our venue for the 2019 SEAO NY Excellence in Structural Engineering Awards. The Cruise was sponsored by the Structural Group. The weather again cooperated and we had a rain free evening around New York Harbor. It was an excellent event to meet colleagues and enjoy drinks and good food. Silman, DeSimone and TT received awards for the New Buildings Category. SOM received the award for Forensic Analysis/Renovation/Retrofit & Rehabilitation Category and Schlaich Bergermann Partner was the winner in the Other Structures Category.

The Engineer's Choice Award went to LERA for the NYU Langone Health Helen L. & Martin S. Kimmel Pavilion.

We are excited to announce that three new directors and the new President elect will be joining the SEAO NY Board. We welcome these dedicated volunteers and we thank the outgoing Board members for their service. The new Board will be introduced formally to the membership during our Annual Meeting on September 24.

Enjoy this Awards Issue and see you all at the Annual Meeting!

**Jonathan C. Hernandez P.E., SECB**



## Editor's Message

Hello Friends and Readers,

In this issue, please enjoy a recap of our Excellence in Structural Engineering Annual Boat Cruise. Many impressive projects were on display, and I am reminded that the level of talent and ingenuity of the structural engineers in NYC is unrivaled by any others in the nation.

Also featured is a thoughtful reflection on the Future of Design symposium written by SEAO NY's own Alberto Marquez, which took place in June. I believe events like these are extremely valuable to foster new ideas and to inspire engineers (especially young engineers) as they get the opportunity to collaborate with architects, artists, developers, and urban planners, etc. Looking forward, our next and final issue of the year will contain a summary of all of SEAO NY's committees along with their plans for the coming year. And of course, it will include a "Beyond the Bio" interview with our new SEAO NY Honorary Member. Stay tuned, and see you around!

**Dan Ki**

# 2019

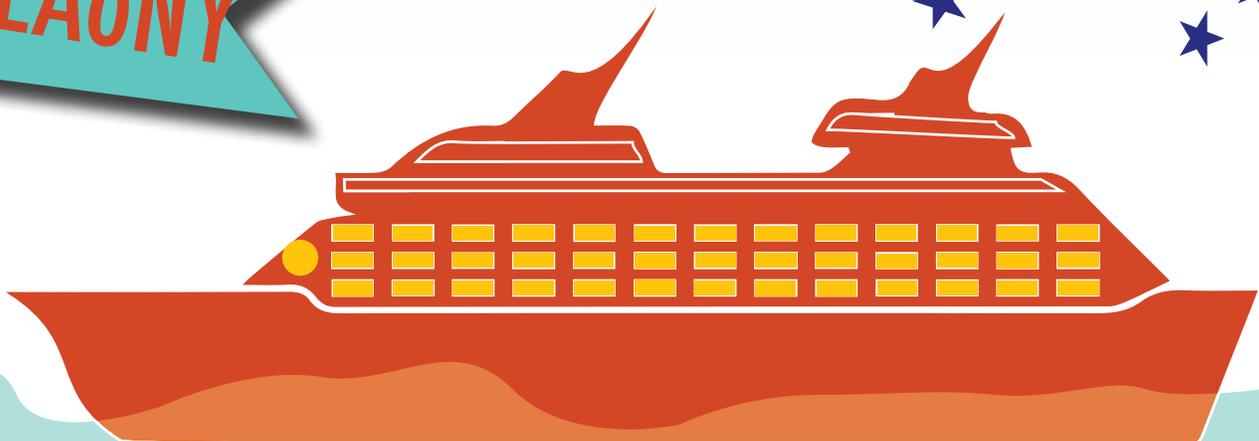
## ANNUAL BOAT CRUISE



On June 24, SEaONY members once again embarked on the annual boat cruise around Manhattan. After a gorgeous evening sunset, members sat to enjoy dinner, "the Excellence in Structural Engineering Awards ceremony," and raffle prize drawing.



SEAoNY



# Excellence in Structural Engineering Awards

2019

## WINNERS

The Structural Engineers Association of New York (SEAoNY) Excellence in Structural Engineering Awards serves to recognize creative achievement and innovation in structural engineering modeled after the National Council of Structural Engineering Associations (NCSEA) Awards. The program annually highlights some of the best examples of structural engineering ingenuity by firms in New York.

For the 2019 Awards, projects must have been sufficiently completed between January 1, 2017 and December 31, 2018 such that they clearly show the basic design of the structural system. Firms were asked to provide narratives, photos, and plans or sketches to convey the complexities and innovations of their design. Judged by past SEAoNY presidents and honorary members, themselves structural engineers and leaders in the industry, scores were awarded based on:

- Creativity of structural design (20%)
- Complexity of criteria or unique problems (20%)
- Innovative application of new or existing materials or techniques (20%)
- Ingenuity of design for efficient use of materials and labor (20%)
- Exceeding client/owner's needs or expectations (10%)
- Suitability of the structure for its environment and sustainability of design, including social, economic and environmental design considerations (10%)

# EISE Awards

WINNER

New Buildings

PROJECT NAME: KRAUSE GATEWAY CENTER  
DESIGN FIRM: SILMAN  
CATEGORY: NEW BUILDING

1



PHOTO: MICHEL DENANCE

This new 160,000-sf corporate headquarters provides a modern and flexible work environment. The project's conceptual motif is its set of four vast planes, which emphasize lightness and transparency and are augmented by outdoor terraces and glass on all sides. The structural showpiece of the building is its perimeter exterior cantilevered framing, affectionately known as the "nosing". Along with long interior spans and thin floor plates, these dramatic cantilevers necessitated a careful and integrated structural design process. The completed 6-story building provides open sight lines, column-free work spaces, and an abundance of natural light for its occupants.

WINNER

New Buildings



2

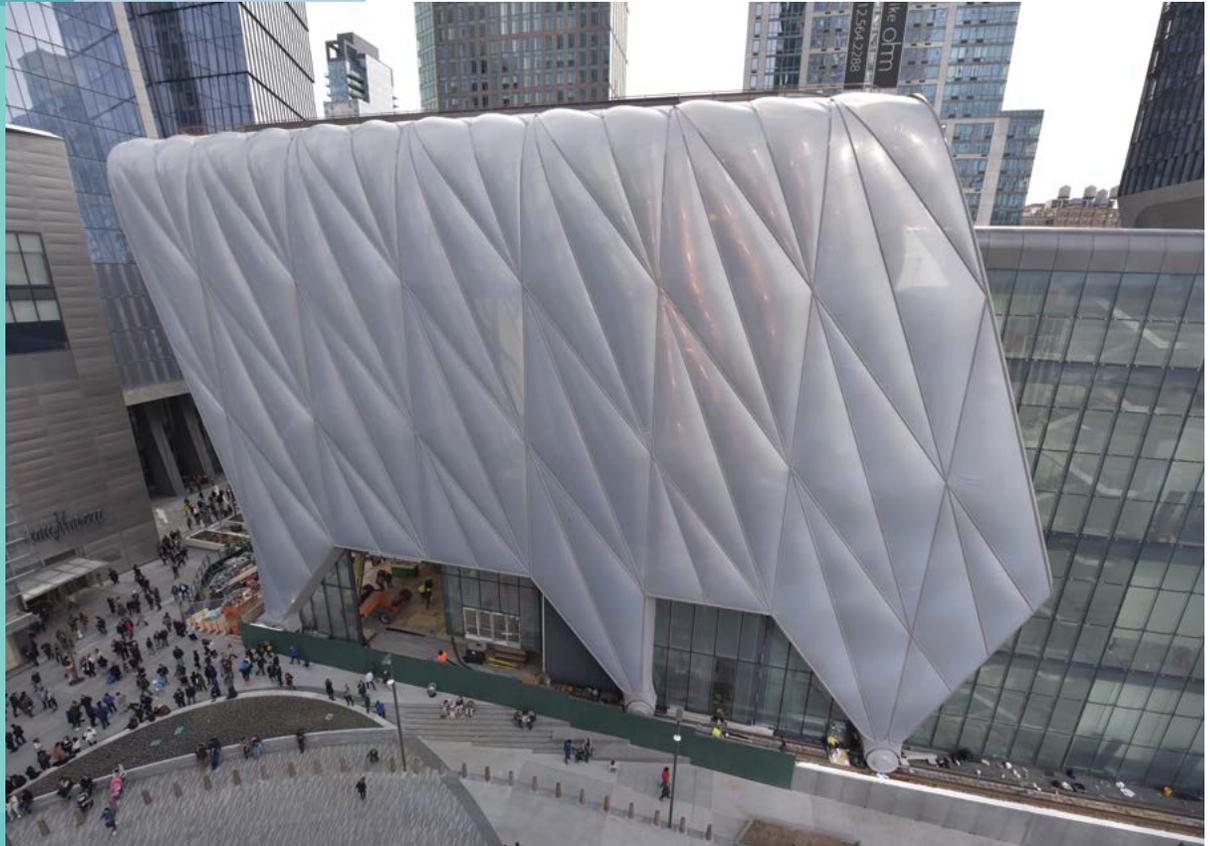
WINNERS

**PROJECT NAME:** ONE THOUSAND MUSEUM  
**DESIGN FIRM:** DESIMONE CONSULTING ENGINEERS  
**CATEGORY:** NEW BUILDING

One Thousand Museum introduces a bold, new silhouette to the Miami skyline and has quickly become one of the most high-profile developments in the United States. Located in the cultural epicenter of Downtown, Miami, the facade of the 62-story tower was designed by the architect to invoke its surroundings and resembles an undulating piece of sculpture from podium to pinnacle. Beyond its aesthetic, the façade is comprised of glass and Glass Fiber-Reinforced Concrete, and functions as a structural exoskeleton that is designed to carry gravity loads of the tower and to provide lateral stiffness to withstand high-velocity, hurricane wind forces.

WINNER

## New Buildings



**PROJECT NAME:** THE SHED  
**DESIGN FIRM:** THORNTON TOMASETTI  
**CATEGORY:** NEW BUILDING

# 3

The Shed is an innovative project that creates a unique and unrivalled space in New York City. Founded on the principle of flexibility, the project comprises a museum, theater / performance space, rehearsal area and artists' lab. One of the Shed's most iconic features is an entire building deployed on rails in order to double the footprint of the project and create an unprecedented space dedicated to the arts. Thornton Tomasetti provided structural engineering, kinetic consulting, façade design and day-lighting analysis for the structure. The complex and innovative project included high-performance materials and structural systems and architecturally exposed steelwork.

WINNER

## Forensic Analysis/ Renovation/ Retrofit & Rehabilitations of Structures



4

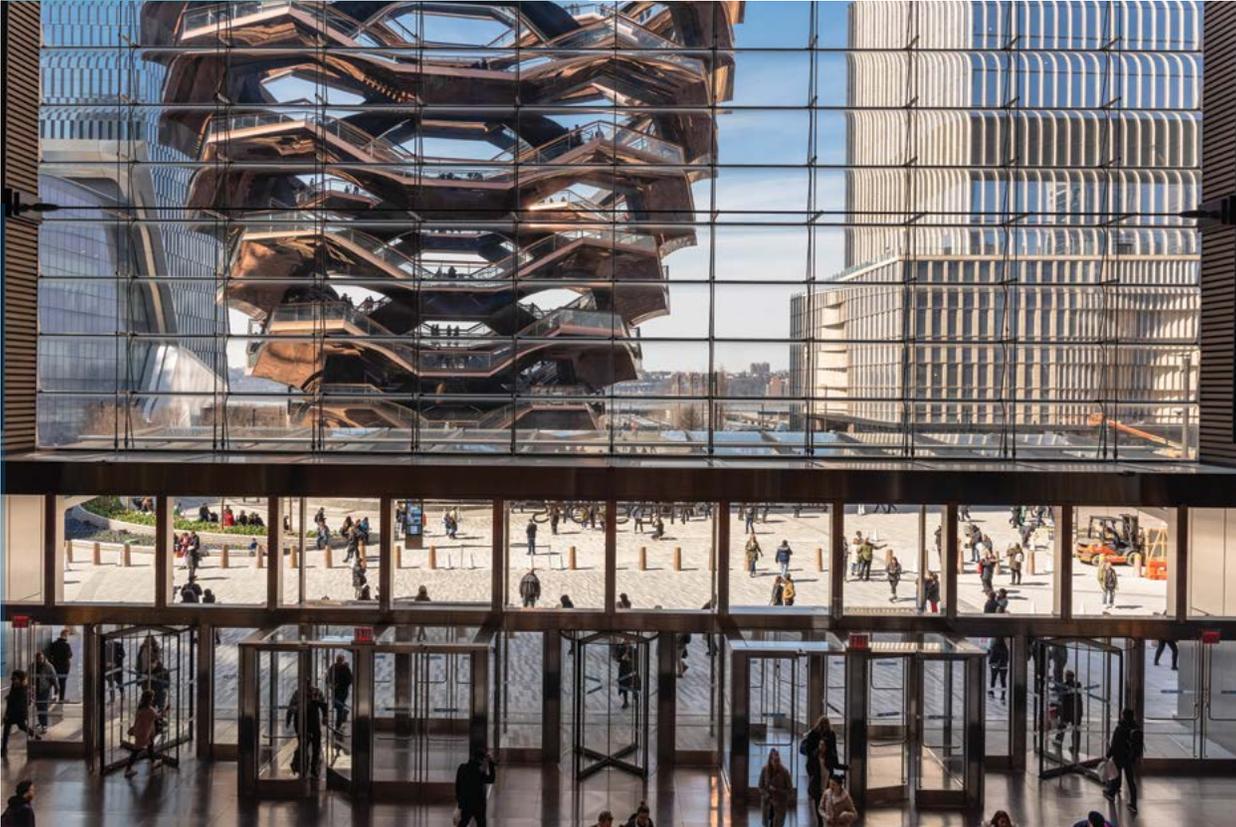
WINNERS

**PROJECT NAME:** CONFIDENTIAL PROJECT REDEVELOPMENT  
**DESIGN FIRM:** SOM  
**CATEGORY:** RENOVATION

Skidmore Owings and Merrill LLP (SOM) redeveloped two neighboring steel-framed buildings to create one unified headquarters in lower Manhattan in New York City. SOM's major renovation work consisted of connecting the 2 buildings to create a new atrium space and a shared lobby, requiring extensive modification to the structural system without compromising the existing buildings' lateral systems and foundations. Additionally, the project added communal spaces, a new roof terrace, major recladding, interior improvements, and vertical transportation, mechanical, and security upgrades; all performed while the buildings were fully occupied.

WINNER

## Other Structures



5

**PROJECT NAME:** ART WALL  
**DESIGN FIRM:** SBP  
**CATEGORY:** OTHER STRUCTURES

The Hudson Yards Art Wall is one of the world's first cable net walls supporting individual curved glass panels. Sixteen rows of curved glazing form a dramatic 300 foot facade. At each vertical glass joint, a set of stainless-steel cables carries the dead load of the wall to upper beams. In the atrium, the wall is stiffened perpendicularly by horizontal cables, while in the retail spaces, floor slabs provide lateral support. This innovative system of minimal structural supports allows the reflective and artistic qualities of the curved glass to be on prominent display in the new Hudson Yards plaza.



WINNER

People's Choice Award

**PROJECT NAME:** NYU LANGONE HEALTH HELEN L. AND MARTIN S. KIMMEL PAVILION  
**DESIGN FIRM:** LERA  
**CATEGORY:** NEW BUILDING

The 21-story, 830,000-sf Helen L. and Martin S. Kimmel Pavilion represents the culmination of a decade of planning, design and construction on NYU Langone Health's medical campus along the East River in Manhattan. The world-class healthcare facility consists of a 14-story inpatient bed tower situated atop a 7-level podium that contains a robust suite of 30 technologically advanced operating/procedure rooms.

Built on the only remaining campus land available for above-grade new construction, the facility required an extraordinary structural design to overcome difficult belowground challenges, which directly influenced the nature of the building and its structure. Four tunnel tubes of Amtrak commuter train lines pass through the crowded site, along with a major combined sewer outfall (CSO) line, none of which could withstand new foundation loads. The rail tunnels, approximately 65 ft below grade, are clustered in pairs, with two tunnels toward the north end of the site and two at the south end of the site, below the CSO. With grade elevations only several feet above the nearby East River, rising flood and sea levels also added to the fundamental challenge of the site. Apart from being central to the Pavilion's programming, the podium serves as a "bridge" that allows the building to span the tunnels below. Steel trusses, 104- to 140-ft long and 34-ft deep, are integrated into the mechanical floor at the top of the podium, from which five floors hang below. Without these bridge trusses, a third of the site would be unusable, making construction impossible. To mitigate against future storm surges, a concealed protective flood perimeter ensures that the hospital will remain operational in the event of a major flood.

WINNERS

6

# Engineer's Choice List

**PROJECT NAME:** 30 HUDSON YARDS  
**DESIGN FIRM:** THORNTON TOMASETTI  
**CATEGORY:** NEW BUILDING



30 Hudson Yards and the structurally adjoining 20 Hudson Yards Retail Podium is a unique, challenging project that required numerous creative, complex, and innovative solutions. Situated over the Long Island Railroad train yard, the building's foundations and columns were threaded through the dense network of tracks and below-grade utilities. The building's observation deck, the Edge, utilized modular construction to minimize labor costs and safety concerns of building beyond the tower footprint at an elevation of 1100 ft. Thornton Tomasetti provided structural engineering, Advanced Project Delivery, and erection engineering services for the project.

**PROJECT NAME:** CitizenM NEW YORK BOWERY HOTEL  
**DESIGN FIRM:** DESIMONE CONSULTING ENGINEERS  
**CATEGORY:** NEW BUILDING



CitizenM New York Bowery Hotel is the tallest modular hotel in the United States. The 21-story building contains approximately 100,000-sf including 15 stories of modular hotel rooms. DeSimone's structural design team was challenged not only to work with a European modular manufacturer to complete the hotel, but also to fit the structure inside a building envelope originally developed for a cast-in place concrete structure, while ensuring the modules met domestic code requirements. Successful design and completion has established the property as a gateway project for even more ambitious modular developments in densely populated urban areas, hospitality ventures, and tall structures.

**PROJECT NAME:** MANHATTAN WEST NORTH TOWER  
**DESIGN FIRM:** SOM  
**CATEGORY:** NEW BUILDING



One Manhattan West (1MW) is a supertall building that rises above the underground train tracks approaching Pennsylvania Station in Manhattan. The structural system consists of a central reinforced concrete core and a perimeter steel moment frame. The proximity of the train tracks prevents the perimeter columns from coming down vertically to be directly supported on foundations. This constraint was addressed by kicking in the perimeter columns to the central core between levels two and six. Thus, below level six the primary lateral system is only the central reinforced concrete core establishing 1MW as one of the slenderest towers in NYC.

**PROJECT NAME:** HUNTER'S POINT SOUTH, MAJOR OVERLOOK  
**DESIGN FIRM:** ARUP  
**CATEGORY:** OTHER STRUCTURES



PHOTO: © BARET DOHERTY

Hunter's Point South, an ambitious waterfront park in Long Island City, Queens, features a stunning, cantilevering steel viewing overlook, which juts out almost directly over the East River providing spectacular views. Smart and careful design resulted in a robust structure that is as economic as it is impressive. Clad in faceted architecturally-exposed steel, the elevated deck is a 51-ton steel truss structure with a 40-foot cantilever, which extends over new wetlands and marine works. The team worked to limit the number of required piles and utilized a steel structure allowing for a lower weight solution, directly addressing soil challenges.

**PROJECT NAME:** TORRE MANACAR  
**DESIGN FIRM:** ARUP  
**CATEGORY:** NEW BUILDING



Sitting at the prominent Mexico City intersection of Avenida Insurgentes Sur and Rio Mixcoac, Torre Manacar is a new 31-story, 75,000m<sup>2</sup> office tower. Arup collaborated with late Mexican architect Teodoro Gonzalez de Leon to create an efficient structural design within a unique geometrical form in a high seismic zone. Several important innovations contributed to the high level of performance of the building. Analysis and design of the building was carried out in compliance with both local building codes and to international standards for high rise building design. By utilizing performance based seismic analysis methods, we were able to demonstrate through advanced non-linear time history analysis that the building will perform to very high levels of safety both under probable seismic events, as well as under very rare seismic events.



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# F O D

# NYC 2019



## Future of Design By Alberto Marquez

In June 2019, thanks to SEAoNY, I received the opportunity to attend the 3rd annual “Future of Design” (FOD) symposium. FOD is an event supported by IABSE, the International Association for Bridge and Structural Engineering. This year FOD invited artists, designers, architects, engineers, future graduates and many others involved in the construction industries to get together, listen to presentations and engage in conversations regarding our impact in society.

This year’s theme was For the People, which called for an examination of ways and methods in which design industries affect the social, environmental, economic and political climates.

The Saturday event was held in the Manny Cantor Center, a spacious venue with a terrace that allowed for plenty of room for networking, space to see new products displayed, and great views of the city. After registering, I was able to catch up with many acquaintances in attendance. The first speaker of the morning was Jason Long from OMA. His presentation touched on equitable development, programing focused on community accessibility and providing recreation that takes the local history and neighborhood’s culture into account. The 11th Street Bridge Park over the Anacostia River in Washington D.C. will provide new activities that will not only attract tourists but also locals from both sides of the river and it aims to “heal the divide between both sides of the river”. The bridge’s iconic geometry – an “X” – will procure solutions for the space plan, such as ramps that provide shade in the summer, warmth in

the winter, and amazing views of the river year-round. These gathering spaces will serve as “a frame where different things and events can happen”. Multiple eateries, cafes and entertainment spots will fill the voids in between. Two decorative fountains, one on each end of the ramps, will help improve the ecosystem by cleaning river water and also serving as an aeration system.

Nerissa Moray from Sidewalk Labs touched on their Toronto waterfront project, which aims to improve the quality of life for the locals by producing affordability, increasing mobility, and providing technology-assisted infrastructure and responsible use of data-driven design. In the 3 million square feet of public realm, the structures will be built out of mass timber and will include weather mitigation systems. Job creation, reduction in gas emissions, reduction of construction waste, and creation of affordable housing were some of the main aspects covered. We listened excitedly as a dynamic curb system that is made up of moveable furniture and tactile paving was described. Alternating



lanes will change with traffic demands and special bicycle lanes, "green wave" as defined by Sidewalk, will interact with adaptive traffic signals to provide a smooth experience for cyclists. Sidewalks will reduce in size during working hours with high traffic and reclaim space in the evening for pedestrian usage. This utopia will be heavily driven by data input from users. This data will not be sold for any advertising purposes and will be governed responsibly by an urban data trust. At noon all were invited to converse with the speakers and each other while enjoying a meal. I was able to speak to another of the morning speakers, Commander Omarr E. Tobias from the US Navy Seabees. The Seabees are the Navy's tactical construction force which helps with logistics, refueling of transport and defense of the bases they build. Their construction skills have been used since WW2 in constructing forward-operating bases for the US and coalition forces. He recounted some of his peace time experiences helping to build schools in the Philippines, such as learning to curb the desire to use one's own concepts and realizing that sometimes a little less is more. One of the more recent

lessons he described was keeping the end user in mind. For example, he mentioned changing the construction methods and materials in Afghanistan so that the locations may be easily maintained by the locals, instead of building bases that were left empty for the enemy to use. Using materials that were readily available in the location where the bases were being built was more efficient and easier for the locals to maintain. Commander Tobias listened carefully as I shared how our different committees at SEAoNY, for example the STEER committee, also use lessons learned and training derived previous disasters to make a difference and prepare for future needs. After lunch the attendees were separated into groups. Each group was given a different question to discuss. The topics ranged from what we can do as designers to improve the lifestyle of the inhabitants, to what are some ways we can help increase affordable housing through design. A conversation with sharp creative minds can always get one thinking of the possibilities but I was much more excited when listening to the perspectives of some of the future engineers, architects, and designers in the room. I realized the future of the industry is exciting



when you think of the young bright minds that will help find solutions to some of the challenges we were examining.

The evening presentations covered risk and resilience, with speakers talking about ways to reduce exposure to vulnerabilities such as earthquakes, floods, and hurricanes, and possible solutions to the challenges that rising sea levels present. Other topics included: updating of FEMA flood maps, post-surge modeling for city planning, improving water ingress performance during hurricanes, solutions for corrosion-related problems and a description of better definitions for lifecycle performance of a net-zero energy building.

John Cicconi and Keith O' Connor from SOM touched on the history of the James A. Farley building from the beginnings, through the three different redesigns and finishing off with the current remodeling revisions being constructed. The newly designed skylights will reuse the original 1913 steel truss system, which interestingly was once used for supervisors to walk inside them while observing mail room workers below. This 1 million square foot building serves as an entrance to the city and this redesign will increase program space and concourse floor space for the Moynihan Train Station.

Justin Den Herder from Silman presented on an awesome concrete structure called Hunters Point Library, which is located on the East River. He touched on the difficulties of designing a building that stands using shear walls, only one interior column and nine floor beams. We heard about how the building was built by employing structural solutions that reduced the cost of construction. More importantly we were presented with an example of a new public space that successfully overcame the challenges of economics, extended value engineering, and construction difficulties, resulting in a space that will improve the life of the local community.

After a full day of exposure to amazing projects and thought-provoking discussions, the evening concluded with a reception. As we stood on the terrace enjoying refreshing beverages and tasty appetizers, discussions ensued about all the new ideas we had just heard. This was the first time I attended FOD; I really enjoyed seeing old friends, making new acquaintances and discussing new ways we can make a difference.

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