

# 23<sup>RD</sup> ANNUAL EXCELLENCE

The National Council of Structural Engineers Associations (NCSEA) is pleased to publish the winners of the 2020 Excellence in Structural Engineering Awards. The awards were announced during NCSEA's 28<sup>th</sup> annual Structural Engineering Summit, which was held virtually this year. A video of the presentation can be found on the NCSEA website. Given annually since 1998, each year the entries highlight work from the best and brightest in our profession.

Awards were given in eight categories, with one project in each category named the Outstanding Project. The 2020 Awards Committee was chaired by Carrie Johnson (Wallace Engineering Structural Consultants, Inc., Tulsa OK). Ms. Johnson noted: "We had two rounds of judging to allow the judges more time to focus

on each individual project. The preliminary round was performed by NCSEA Past Presidents and the final round by NCSEA's Northeast Coalition with engineer judges from Connecticut, Rhode Island, and Massachusetts. The judges had an enormous task of trying to determine winners. The level of challenges requiring innovation and creativity was impressive. The group of winning projects is outstanding."

Please join NCSEA and STRUCTURE magazine in congratulating all the winners. More in-depth articles on several of the 2020 winners will appear in the Spotlight section of the magazine over the 2021 editorial year. Visit the NCSEA website (<https://bit.ly/2IYbDb8>) for more!



## OUTSTANDING PROJECTS

Category 1: New Buildings under \$30 Million

### *ICE Block I*

Sacramento, CA | Buehler

ICE Block I is one of the first projects in Northern California to utilize an exposed mass timber structure. The building blends three structural materials seamlessly:



mass timber at the upper floors, concrete podium at the second floor, and steel Buckling Restrained Braced Frames. The fourth floor "mezzanine" provides expansive views through a glass curtainwall.



Category 2: New Buildings \$30 Million to \$80 Million

### *Casa Adelante*

San Francisco, CA | Mar Structural Design

Casa Adelante is a seismically resilient, nine-story affordable housing project for low income seniors. The specially "tuned" reinforced-concrete building uses self-centering walls on a rocking mat foundation. Lead extrusion dampers within the foundation control the seismic response. The building has been evaluated to have zero days of downtime for repair after a major earthquake.

Category 3: New Buildings \$80 Million to \$200 Million

### *International Spy Museum*

Washington, D.C. | SK&A

The International Spy Museum is a 130,000-square-foot, distinctively designed steel building. The design incorporates exposed, sloping columns along the south and west faces that are part of the building's gravity load carrying system and support an intricate series of exposed steel monumental stairs and platforms and a sixty-foot-tall glass "veil."



Category 4: New Buildings over \$200 Million

### *The Academy Museum of Motion Pictures*

Los Angeles, CA | Buro Happold

The project consisted of a museum plus a soaring spherical addition housing a 1,000-seat theater. The original steel and concrete structure required seismic strengthening in addition to its major renovation. For the 150-foot-diameter orb-shaped theater, an unusual base-isolation system allows movement 30 inches in any direction during an earthquake.



Courtesy of Alex Nye

# IN STRUCTURAL ENGINEERING AWARDS

## 2020 PANEL OF JUDGES

### Preliminary Round – NCSEA Past Judges

Bill Bast, S.E., LPI, Inc.; Craig Barnes, P.E., CBI Consulting Inc.; Marc Barter, P.E., S.E., SECB, Barter & Associates, Inc.; Mike Tylk, S.E., TGRWA, LLC; Ron Hamburger, S.E., Simpson Gumpertz & Heger, Inc.; Barry Arnold, S.E., P.E., ARW Engineers; Ben Nelson, P.E., Martin/Martin; Tom DiBlasi, P.E., SECB, DiBlasi Associates, PC; Tom Grogan, P.E., Retired; Vicki Arbitrio, P.E., Gilsanz Murray Steficek LLP; Carrie Johnson, P.E., Wallace Engineering Structural Consultants, Inc.; Jim Malley, S.E., Degenkolb Engineers; John Joyce, P.E., Engineering Solutions LLC; Sanjeev Shah, P.E., Esq., Shajeev Shah, Inc.

### Final Round – NCSEA's Northeast Coalition from Connecticut, Rhode Island, and Massachusetts

Bassem Almuti, P.E., Cannon Design; Bruce Richardson, P.E., The DiSalvo Engineering Group; Craig Barnes, P.E., SECB, CBI Consulting; Erik Nelson, P.E., S.E., Structures Workshop; Graham Carr, P.E., Vital Structures, LLC; Han Xu, P.E., Thornton Tomasetti; James Fox, P.E., BVH Integrated Services; Kevin Chamberlain, P.E., S.E., Distefano & Chamberlain; Mark Rodriguez, DiBlasi Associates; Michael Fillion, P.E., S.E., Fillion Group; Rick Boggs, P.E., S.E., SECB, Fuss & O'Neill; Robert Kane, EIT, McNamara Salvia; Ben Nelson, P.E., Martin/Martin

## OUTSTANDING PROJECTS

Category 5: New Bridges or Transportation Structures

### *Dublin Link Pedestrian Bridge*

Dublin, OH | Endrestudio

The Dublin Link Pedestrian Bridge was conceived simultaneously as a sculptural form, an efficient structure, and a dramatic experience for Dublin's visitors and residents alike. Its features of the Eye of the Needle central pylon, sinuously curving deck, and unusual single-sided suspension method create a unique and structurally innovative bridge.



Courtesy of Cory Klein

Category 6: Forensic/Renovation/Retrofit/Rehabilitation Structures < \$20 Million

### *West Virginia State Capitol Building*

Charleston, WV | WDP & Associates Consulting Engineers, Inc.

Repairs to address the structural deficiencies of the historic inner dome and interior supporting walls of the West Virginia State Capitol Building were designed to strengthen portions of the existing structure. Supplemental supports preserved integrity while supporting the dome in place as the walls beneath were completely removed and rebuilt.



Category 7: Forensic/Renovation/Retrofit/Rehabilitation Structures > \$20 Million

### *Google Spruce Goose*

Los Angeles, CA | Arup

By rehabilitating and seismically upgrading the existing timber Spruce Goose aircraft hangars to current code requirements, the buildings have been transformed into a modern office. Retrofits included the use of up to 52-inch self-tapping wood screws, heavy steel (multi-tier) braced frames, and steel tie rods to limit deformations under seismic loads.



Category 8: Other Structures

### *Mackinac Bridge Paint Platforms*

Mackinaw City, MI | Ruby + Associates, Inc.

Unique platforms allowed for removal and collection of original lead-based paint and repainting of the Mackinac Bridge's towers. Traveling along cables, davit-like "outriggers" supported two-story movable structures to paint the towers' upper portion. A second platform, consisting of steel box trusses, was used for the struts connecting the tower legs.





# AWARD WINNERS

## CATEGORY 1: NEW BUILDINGS UNDER \$20 MILLION



### Wagner Education Center

Seattle, WA | KPFF, Inc.

The Wagner Education Center establishes a new front door for the Center for Wooden Boats. The dramatically exposed structure, simple yet evocative materials, and energy-efficient design solve the challenges presented by a limited budget and restrictive site.

## CATEGORY 2: NEW BUILDINGS \$30 MILLION TO \$80 MILLION

### Apple Park Visitor Center

Cupertino, California | Nabih Youssef & Associates

A large column-free space dominates the Apple Park Visitor Center. The extremely transparent building is enclosed by a twenty-foot-tall perimeter glazing system and covered by a thin curved carbon-fiber roof deck. The building utilizes a novel post-tensioned steel roof structure.



### Cal Poly Pomona Student Services Building

Pomona, CA | John A. Martin & Associates, Inc.

The 138,400-square-foot Student Services Building is comprised of two structures separated by a spacious breezeway. A streamlined, undulating roof serves an essential role in passive solar design. The engineer's process decreased costs, increased construction speed, and delivered a sustainable campus icon.



Courtesy of Bill Timmerman



Courtesy of Calvin Owen Jones

### North Surrey Sport & Ice Complex

Surrey, BC, Canada | StructureCraft Builders Inc.

This new 134,000-square-foot complex features three ice arenas with curved, long-span hybrid-timber roofs and provides venues for lacrosse, basketball, and trade shows. Centrally located near transit, the building is part of an effort to rejuvenate this up and coming area.

## CATEGORY 3: NEW BUILDINGS \$80 MILLION TO \$200 MILLION

### Charles Library, Temple University

Philadelphia, PA | LERA Consulting Structural Engineers

The architect's vision demanded a dynamic and innovative structural system, employing a combination of large cantilevers and long-span arches. The 4-story library features a building-wide green roof, a 3-D printing workshop, an automated book storage and retrieval system, and more.



### University of Michigan Biological Sciences Building

Ann Arbor, MI | SmithGroup

Integrating science education with innovative research space and an interactive museum, the vision was to bring science to life by putting active research on display and encouraging interactions between scientists and visitors. The design encourages visitors to explore science in new ways.



## CATEGORY 4: NEW BUILDINGS OVER \$200 MILLION



### W Hotel Tower

Bellevue, WA | Cary Kopczynski & Company

The 41-story W Hotel Tower caters to every need. The structure incorporates North America's largest use of a seismic design innovation recently pioneered by the Engineer of Record. The combined success of the architecture and structure makes the W Hotel Tower an outstanding example of contemporary building design and construction.

### New Stanford Hospital

Palo Alto, CA | Nabih Youssef & Associates



Courtesy of Bruce Damonte

The base-isolated New Stanford Hospital represents the latest in seismic resiliency technology, one of the first to use Triple Friction Pendulum isolation bearings. A base-isolated steel moment frame structure was designed for Functional Recovery performance following a major seismic event.

## CATEGORY 5: NEW BRIDGES OR TRANSPORTATION STRUCTURES

### 707 Fifth - Manulife Place Pedestrian Bridge

Calgary, Canada | Skidmore, Owings & Merrill

707 Fifth – Manulife Place Pedestrian Bridge’s elegant structural system, known as a suspended lenticular truss, improves connectivity within the downtown core. The new link provides a seamless connection to adjacent buildings while managing subgrade conditions, installation sequences, and non-structural coordination.



### LaGuardia Airport Pedestrian Bridge B

East Elmhurst, NY | HOK

Relying on concourse islands to increase efficiency and trim years off the construction schedule, and using cutting-edge parametric optimization, 450-foot-long bridge trusses were proposed that surpassed vibration requirements. Construction-staging strategies minimized cost and facilitated erection with precise deflection predictions.



## CATEGORY 6: FORENSIC / RENOVATION / RETROFIT / REHABILITATION STRUCTURES < \$20 MILLION

### First Unitarian Society Meeting House

Madison, WI | Pierce Engineers

The under-designed center-hinged arches of this National Historic Landmark settled significantly over the years. Pierce Engineers designed a pretensioned cold-formed/steel hybrid truss that could be installed to take load off failing trusses without the use of shoring to transfer load.



### Napa County Historic Courthouse

Napa, CA | ZFA Structural Engineers

The jail portion of the Napa County Historic Courthouse was demolished in 1977. A new Administrative Annex was built as infill between the remaining Courthouse and the Hall of Records buildings to create a single-occupancy space between the three separate structures.



### 28 Liberty Street

New York, NY | Shmerykowsky Consulting Engineers

Renovation of the sub-cellar floors included a new inter-floor escalator opening connecting five floors. This involved the simultaneous removal of two axially-loaded floor framing members on two levels and the redistribution of their axial loads via a new double truss system.

## CATEGORY 7: FORENSIC / RENOVATION / RETROFIT / REHABILITATION STRUCTURES > \$20 MILLION

### Yotel

San Francisco, CA | Holmes Structures

Yotel San Francisco, a survivor of the great 1906 and Loma Prieta earthquakes, required a full seismic retrofit. Engineering challenges included designing to high forces, strengthening the frail existing structure within tight spaces, and rising to unforeseen construction challenges.



### Stanley A. Milner Library Renewal

Edmonton, Canada | Fast + Epp

The transformation of the existing monolithic concrete façade was accomplished through a complex truss system that cantilevered from the existing structure to transform the building’s shape. Other features included a new lateral system, a reading ramp, and enhanced open spaces.



## CATEGORY 8: OTHER STRUCTURES

### Coastal Wall at Northwestern University

Evanston, IL | SmithGroup

Northwestern University’s Ryan Fieldhouse and Walter Athletics Center required an innovative solution. To maximize available land, the team created “virtual” land by cantilevering the building to Lake Michigan’s edge. SmithGroup designed a curved coastal wall to withstand dynamic waterfront conditions.



### Cayton Children’s Museum Courage Climber

Santa Monica, CA | Holmes Structures

To evaluate the complex geometric shape of this 1,500-square-foot tensile structure, a parametric form-finding tool was utilized to assess the distribution of loads with the use of a non-linear mesh of cable elements. The building’s roof was also strengthened to accommodate the climbers.

