



FOR IMMEDIATE RELEASE

Chicago, September 29, 2016 - The National Council of Structural Engineers Associations (NCSEA) is pleased to announce the following 2016 Excellence in Structural Engineering Awards. The awards were announced on the evening of September 16 during NCSEA's Structural Engineering Summit in Orlando, Florida. The awards have been given annually since 1998 and highlight some of the best examples of structural ingenuity throughout the world.

Awards were given in seven separate categories, with one project in each category being named the Outstanding Project. Our categories for 2016 were as follows:

- New Buildings under \$10 Million
- New Buildings \$10 Million to \$30 Million
- New Buildings \$30 Million to \$100 Million
- New Buildings over \$100 Million
- New Bridge and Transportation Structures
- Forensic / Renovation / Retrofit / Rehabilitation Structures
- Special Use Structures

Category 1: New Buildings < \$10 Million

Outstanding Project - Pterodactyl - Culver City, CA
NAST Enterprises Corp.
Contact: Hooman Nastarin (hooman@nasterprises.com)

The Pterodactyl is an office for a creative advertising agency atop a four-level parking garage in a complex of new and remodeled buildings in Culver City, California. The building is formed by the intersection of nine rectangular boxes. The boxes are one level above the garage's top level, stacked either on top of, or adjacent to, each other along the west edge of the garage roof. The nine boxes organize essential program elements connected by an interior, second floor bridge, and are supported on the steel column grid extended from the parking garage.

Award Winner - SLI 47+ 7 - Seattle, WA
Structural Firm: DCI
Contact: Mark D'Amato (mdamato@dc-engineers.com)

SLI 47+7 is a six-story apartment structure built with revolutionary panelized and component-based design technology. A kit-of-parts allows a small construction team to swiftly assemble pre-fabricated panelized floor and wall systems containing plumbing, electrical, fire sprinklers, and finishes. SLI 47+7 was topped out within 5.5 months – 50% faster than conventional building construction. The steel exoskeleton design strategy granted column-free living units and more interior space for tenants. This mid-rise was built on 6,426 square feet of land in Seattle, Washington.

Award Winner - Mountain S Home - Park City, UT
J.M. Williams and Associates, Inc.
Contact: James M. Williams (james@jmwa.com)

This Mountain "S" Home is an "S" shaped house that steps and twists around its mountain site. It has 30 individual kite shaped roofs. Each roof appears to be supported by glass. The perimeter walls are almost entirely glass. The roofs are 16" thick and cantilever as much as 21 feet while supporting 235 psf of snow and maintaining a thin razor edge along the lower eaves. The roof is supported on 2' to 8' long piers averaging 16 feet in height designed for gravity and seismic forces.



Category 2: New Buildings \$10 Million to \$30 Million

Outstanding Project - 740 Heinz Avenue - Berkeley, CA
Tipping Structural Engineers
Contact: Steven B. Tipping (s.tipping@tippingstructural.com)

The Buckling Restrained Brace Mast Frame system enhances seismic performance and offers better architectural compatibility at a lower cost than conventional BRB systems. Designed as a response to the disadvantages posed by conventional steel and BRB-only systems, the BRB mast-frame system consists of yielding BRBs in series, with a stiff, elastic vertical frame (the “mast”) designed to pivot about its base. The mast redistributes loads between stories, producing a more uniform distribution of inter-story drift. This eliminates the possibility of inelastic weak-story mechanisms. 740 Heinz Avenue is a case study in the efficacy, cost efficiency, and replicability of BRB mast frames.

Award Winner - Sanctuary for Sufism Reoriented - Walnut Creek, CA
Thornton Tomasetti
Contact: Tyler Storm (tstorm@thorntomasetti.com)

A central cast-in-place concrete shell dome surrounded by four smaller domes and eight minor domes in a circular footprint defines the new marble-clad Sanctuary for Sufism Reoriented. Two-thirds of the structure lies underground and helps the building fit into the surrounding residential neighborhood. The project presented many challenges, including high seismicity, unusual geometries, a high water table and a desire for an unusually long design life with low maintenance. Through collaboration and ingenuity, the team delivered an elegant, unique and durable worship space, fulfilling a long-time dream for the congregation.

Award Winner - Ordway Center for the Performing Arts - Concert Hall Expansion - Saint Paul, MN
HGA Architects + Engineers
Contact: Jon Wacker (jwacker@hga.com)

The Ordway Center for the Performing Arts Concert Hall expansion replaced an underutilized 300-seat theater with an 1,100-seat Concert Hall. Fitting the larger Concert Hall into the footprint of the small theater mandated creative structural solutions. Inventive sequencing, including building a portion of the new structure inside the original theater prior to demolition, was required to keep the Ordway Center operational through construction. Innovative design features include bent post-tensioned transfer beams, curved folded-plate seating slabs, cantilevered tapered slab balconies without backspans, and an extension of the Ordway’s signature, two-story cantilevered lobby.

Category 3: New Buildings \$30 Million to \$100 Million

Outstanding Project - Grandview Heights Aquatic Centre - Surrey, British Columbia
Fast + Epp
Contact: Alison Faulkner (afaulkner@fastepp.com)

Grandview Heights Aquatic Centre features an undulating roof structure with hanging timber ‘cables’, suspended between large concrete buttresses. While hanging systems have historically used steel cables, Fast + Epp took a novel approach, pioneering one of the firm’s most ambitious and daring designs in its 30 year history. Engineers chose wood as a cost effective, structurally efficient and aesthetically pleasing alternative, cleverly balancing form and function. The resulting structure fulfills the client’s desire for an iconic building that will be a catalyst for civic growth and is believed to be the world’s most slender, long-span, timber catenary roof.

Award Winner - Emerson College Los Angeles - Los Angeles, CA
John A. Martin & Associates, Inc.



Contact: Kurt Clandening (clandening@johnmartin.com)

Emerson College Los Angeles is the West Coast home of Boston-based Emerson College. This \$85 million, 250,000-square-foot building is a small-scale university campus containing below-grade parking, classrooms, performance space, offices, and student housing. The iconic structure, located on Sunset Boulevard in Hollywood serves as a conduit for Emerson students to broaden their education and entertainment industry goals via internships within nearby studios and media companies. The complicated forms and interconnecting spaces required creative structural problem-solving to maintain efficiency of material and constructability while upholding the architect's vision.

Award Winner - 45 East 22nd Street - New York, NY
DeSimone Consulting Engineers
Contact: Mattheiu Peuler (mattheiu.peuler@de-simone.com)

45 East 22nd Street is a 61-story residential tower that reaches 777 feet at its pinnacle. The ultra-luxury condominium building is located in the historic Flatiron neighborhood of Manhattan near Madison Square Park, only a block away from the Flatiron building itself. The tower is sculpted so that the floor plate is as small as 62' wide by 52' deep near the base which gives a maximum slenderness ratio of about 13 to 1. Compounding the overall slenderness, the tower cantilevers outward to a maximum floor plate of 94' wide by 52' deep.

Category 4: New Buildings > \$100 Million

Outstanding Project - Air Traffic Control Tower and Integrated Facilities Building at San Francisco International Airport - San Francisco, CA
Walter P. Moore
Contact: William Andrews (bandrews@walterpmoore.com) or Rafel Sabelli (rsabelli@walterpmoore.com)

Each day at San Francisco International Airport, air traffic controllers guide over 1,100 aircraft onto and off four runways. Just four kilometers from the San Andreas fault, the old control tower was temporarily shut down by the 1989 Loma Prieta earthquake. To meet airport and FAA expectations, a new tower compliant with stringent design criteria for post-seismic operability was needed. Optimally located and compliant with the latest earthquake standards, the tower incorporates a unique offset cab with a 220 degree unobstructed view of the runways. With construction completed in August 2015, the tower adds a new, modern architectural icon to the SFO campus.

Award Winner - The Tower at PNC Plaza - Pittsburgh, PA
BuroHappold Engineering
Contact: Erleen Hatfield (erleen.hatfield@burohappold.com)

Designed to be the greenest office building in the world, the new 800,000-square-foot Tower at PNC Plaza incorporates groundbreaking structural engineering and design, exceeding LEED Platinum criteria. The building features an unprecedented thermal break in a 6'-depth slab that cantilevers 4'-6" to support an occupiable, double-skin façade. The design incorporates a story-deep, curved steel truss, supporting a 6-story cable net wall, using an ingenious approach to resist overturning. Complex structural challenges included economically supporting a heavy thermal mass for a solar chimney.

Award Winner - Lotte World Tower - Seoul, South Korea
Leslie E. Robertson Associates, R.L.L.P.
Contact: SawTeen See (sawteen.see@lera.com)

The 1,820-foot-tall Lotte World Tower in Seoul, South Korea is designed by Kohn Pedersen Fox Architects and Leslie E. Robertson Associates, structural engineers. It is a mixed-use building with 123 stories and a gross area of



3.7 million square feet. The tower's gently curving and tapering shape posed significant structural challenges as the mega-columns needed to follow the tower's geometry. The floors have long-span spandrels that achieve 80-foot-clear main spans and 46-foot cantilevers at the building corners.

Award Winner - Poly International Plaza - Beijing, China
Skidmore, Owings & Merrill LLP
Contact: Rupa Garai (rupa.garai@som.com)

Inspired by Chinese paper lanterns, the elliptically-shaped, faceted, Poly International Plaza tower utilizes a column-free diagrid structural system in an area of high seismicity. The juxtaposition of diagrid modules on the elliptical shape of the tower made three dimensional helical load paths possible, allowing for large architecturally exciting atriums. Many advanced analytical studies including global buckling analysis, were performed on this non-prescriptive structure to justify the design. Scaled testing of prototypical portions of the diagrid system was performed to validate its behavior and performance under dynamic loads.

Category 5: New Bridges or Transportation Structures

Outstanding Project - Hastings Bridge - Hastings, MN
Parsons
Contact: Vincent Gastoni (vincent.gastoni@parsons.com)

Minnesota's Hastings Bridge, a 1,938-foot-long, free standing tied-arch bridge, carries Trunk Highway 61 over the Mississippi River in a scenic recreation area. It is the longest free standing arch bridge in North America. With a 100-year service life, the bridge features a steel box arch rib with a post-tensioned concrete tie girder and a network hanger system, plus a load path redundant steel-grid floor. The 3,300 ton, 545-foot-long main span was erected on land, transferred onto barges using self propelled modular transporters, guided downriver by tugboats, slid into position using a hydraulic skid system, and lifted 55 feet into place with strand jacks.

Award Winner - Little Chute Canal Bridge - Little Chute, WI
exp
Contact: Julie Hoppe (Julie.hoppe@exp.com)

With its one-of-a-kind design, the new Little Chute Canal Bridge creates a gateway to Island Park, while permanently reopening the historic Little Chute Lock to marine navigation. The design for the new pedestrian lift bridge embraces the Village of Little Chute's Dutch heritage by utilizing counterweights on a lifting arm above the deck. The result is a unique new single leaf movable bridge that not only provides much needed access over and through the Canal, but also celebrates the rich history of the surrounding community.

Award Winner - Section 5 Palmetto SR 826/836 Interchange Design-B - Miami, FL
Finley Engineering Group
Contact: Craig Finley, Jr. (Bridges@finleyengineeringgroup.com)

The new interchange creates a safer and less congested route for 430,000 vehicles traveling through daily. Challenges included a location inside Miami International Airport's flight path, FAA vertical height restrictions, canals in the middle of the project, aesthetic requirements and traffic flow maintenance. The design-build team realized that design and material innovations were the key to success. Innovations included the state's first ever use of Diabolos with external tendons, as well as haunched segments, polystyrene hollow pier columns, and top-down construction with an overhead gantry.

Category 6: Renovation / Rehabilitation

Outstanding Project - Provo City Center Utah LDS Temple - Provo, UT



Reaveley Engineers + Associates
Contact: Kendy Ferguson (kferguson@reaveley.com)

The Provo Tabernacle was a historic treasure. The original building hosted US presidents, musical performances, interfaith gatherings and community events. It seated 1,500 and featured octagonal towers at all four corners, a high-pitched roof and exquisite woodwork. In December 2010 a four-alarm fire destroyed the unreinforced masonry building. The original wood floors and roof of the building were completely burned and only the exterior walls remained. This 35,000-square-foot historic structure was converted into a modern 85,000-square-foot temple. A system was engineered to support and reinforce existing masonry walls while excavation took place, to accommodate two new subgrade levels.

Award Winner - War Memorial Veterans Building - San Francisco, CA
Simpson Gumpertz & Heger Inc.
Contact: Benjamin Mohr (bamohr@sgh.com)

The War Memorial Veterans Building was built in 1932 and is a designated historic landmark. The centerpiece of the building is the Herbst Theater, which hosts over 200 performances annually. In 2011, the City and County of San Francisco initiated a \$156 million project, including a seismic upgrade as well as complete replacement and upgrade of building systems. The seismic upgrade incorporated rocking, concrete shear walls, eliminating the need for deep foundations and improving seismic performance.

Award Winner - Madison Square Garden V - The Transformation - New York, NY
Severud Associates
Contact: Cawsie Jijina (cjjijina@severud.com)

The ambitious 985,000 square foot transformation of Madison Square Garden involved the reconstruction of a new arena within the historic circular shell. The project included raising the entire upper bowl seating structure, allowing for new lower bowl luxury suites and court side “bunker” suites. Other transformation included raising the north and south arena roof structures, adding two 280-foot-long sky bridges, expanding and re-structuring the 7th Avenue entrance, three levels of expansion on the 7th Avenue side, and a one-tier expansion of the existing west-side hung suites.

Award Winner - Christ Cathedral Tower of Hope Seismic Retrofit - Garden Grove, CA
LPA, Inc.
Contact: Bryan Seamer (bseamer@lpainc.com)

Richard Neutra’s iconic Tower of Hope on the Christ Cathedral campus has been an important landmark since it was built in 1968. The slender, 14-story concrete tower has been called a masterwork of modernist architecture. The design team approached the challenging preservation and seismic retrofit project using an innovative, performance-based design strategy, combining fluid viscous dampers with fiber-reinforced polymer. The completed seismic and architectural rehabilitation preserves the mid-century modernist design aesthetic, maximizes the functional interior space, and dramatically increases the seismic resiliency of the Tower.

Category 7: Special Use Structures

Outstanding Project - Façade System for the Petersen Automotive Museum Renovation - Los Angeles, CA
Wallace Engineering - Structural Consultants, Inc.
Contact: Jeff Denton (jdenton@wallacesc.com)

The Petersen Automotive Museum is housed in a 1960s-era, cast-in-place concrete structure. The original exterior was reimaged by Kohn Pedersen Fox as a series of freeform stainless steel “ribbons” flowing over the structure,



evoking the image of smoke trails over a car during an aerodynamic wind tunnel test. The ribbon elements are dual curved and follow no regular pattern. The ribbons are supported by elaborate treelike structures designed to resemble engine manifolds. Other considerations included the need for moment-resisting connections between steel and aluminum members, complicated thermal expansion issues, and high-seismic anchorages to an existing concrete structure. The final design was a result of a lengthy collaboration process between the design team and the facade manufacturer, resulting in a solution that satisfies both architectural vision and structural needs.

Award Winner - Structures of Landscape - Fishtail, MT
Beaudette Consulting Engineers, Inc. & Ensemble Studio
Contact: Matthew Hubbard (hubbard@bcweb.com)

Structures of Landscape is an art installation of three enormous concrete sculptures at Tippet Rise Art Center in Fishtail, Montana. At the base of the Beartooth Mountains, the Art Center spans across an 11,500-acre working cattle and sheep ranch. To bring these sculptures to fruition, Beaudette Consulting Engineers had to utilize far-reaching creativity and ingenuity. Challenges on this project spawned from the monumental scale of the sculptures, the irregular shapes of the pieces, and the unique approach to design and construction, combined with maintaining artistic integrity throughout the installation.

Award Winner - Pulp Pavilion - Indio, CA
Nous Engineering
Contact: Liz Mahlow (liz.mahlow@nousengineering.com)

Paper exhibits unique sculptural capabilities when recycled into pulp. Using a blend of pulp, water and pigment, a mix was sprayed onto a three-dimensional, woven lattice of natural rope to create The Pulp Pavilion, a large overhead structure featured at The Coachella Music and Arts Festival. Because this building process has no known precedent, to engineer it meant gathering results from substantial material testing, establishing safe material properties, and using these in a 3-dimensional, finite element analysis to predict the behavior of the structure under anticipated loads.

NCSEA advances the practice of structural engineering by representing and strengthening its Member Organizations. For more information on all of NCSEA's activities, please visit www.ncsea.com.

Contact:

Al Spada, Executive Director

aspada@ncsea.com

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