

# 2016

Excellence in  
STRUCTURAL ENGINEERING  
Awards



Cover Photo: Steve Proehl



STRUCTURAL ENGINEERS ASSOCIATION  
OF NORTHERN CALIFORNIA





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Dear readers of the San Francisco Business Times:

Excellence in Structural Engineering can be interpreted in many ways:

For those with an eye for architectural aesthetics, it's likely to be that wonderful integration of a building's structural framework harmoniously entwined with the architectural design as a whole.

For those looking for buildings that will remain operational no matter what the natural peril the structure will be subjected to, it's likely to be a structure designed to high performance objectives using protective systems and highly sophisticated modeling techniques to ensure its safety and reliability after a natural disaster.

For those with limited resources, it is that elegant yet simple structural solution that was the most efficient and economical and that therefore enabled the project to become a financial reality.

Then of course there is our infrastructure. Anyone can build a bridge across the bay. Start dumping concrete into the bay and eventually they will reach the other side. However, an "excellent" structural design is a light, graceful bridge that will last a century or two.

Lastly, structural engineering excellence is the combination of hard work and dedication of practicing engineers, professors and researchers who volunteer countless uncompensated time to develop better building codes, standards and guidelines for the practicing structural engineering community to follow for better safety and serviceability of our built environment.

I am therefore excited and proud to showcase to you all the winners of our Excellence in Structural Engineering Awards program for 2016! I hope you enjoy them.

Yours Truly,

Richard C. Dreyer  
President 2016-2017



“ We congratulate all the firms demonstrating excellence in the SEAONC Award of Excellence 2016 program. With over five decades of Construction Means & Methods Engineering experience, we add value through extensive knowledge of buildings and excavation shoring, cutting edge technology and a high level of service and responsiveness. ”



— Andrew Scott  
Degenkolb Principal and CM&M Lead



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Now in its tenth year, this San Francisco Business Times advertorial supplement celebrates the results of SEAONC's 2016 Excellence in Structural Engineering Awards program as recognized at the May 3rd, 2016 SEAONC Awards Ceremony held at the City Club of San Francisco. The awards were presented by SEAONC Directors Laura Whitehurst and Brian McDonald.

#### JURY PANEL

The judging of entries and selection of award recipients was made by the following jury panel.

Tom Tripp, Allana Buick & Bers

Cary Bernstein, Cary Bernstein Architect

Peter Lee, Skidmore, Owings & Merrill LLP

Megan Stringer, Holmes Culley

Professor Wenshen Pong, SF State University

#### AWARD CATEGORIES

Entries were submitted in eight categories:

Study/Research/Guidelines  
Special-Use Structures  
Historic Preservation  
Retrofit/Alteration  
New Construction  
Sustainable Design  
Landmark Structures  
Infrastructure

#### JUDGING CRITERIA

Entries were judged on demonstrated excellence and achievement in structural engineering based on the following criteria:

Design Creativity  
Technical Innovation  
System Efficiency and Economy  
Constructability  
Complexity of Problems Solved  
Design Integration  
Quality of Execution  
Significant Contribution to the Public and Profession

## STUDY/RESEARCH/GUIDELINES ◆ AWARD OF MERIT

Excellence in the development of structural engineering practice through the analysis, design, evaluation and/or testing of structural systems resulting in the preparation of a study, research project, guideline or reference standard.

### EARTHQUAKE STRENGTHENING OF CRIPPLE WALLS IN WOOD-FRAME DWELLINGS (ATC-125) SOUTH NAPA EARTHQUAKE RECOVERY ADVISORY (FEMA P-1024-RA2)

structural engineer | ZFA Engineers



A prescriptive guide with a pre-engineered solution that eliminates the cost to hire an engineer for certain types of cripple wall strengthening. The guide is written in layman's terms and provides step-by-step instructions.

#### Selected Jury Comments:

*"It's good to have a guideline for savvy homeowners."*

*"The graphics organized into a nice set for the homeowners is very useful."*

*"This represents a service from the structural engineering community to further mitigate seismic hazard."*





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## STUDY/RESEARCH/GUIDELINES ◆ AWARD OF MERIT

Excellence in the development of structural engineering practice through the analysis, design, evaluation and/or testing of structural systems resulting in the preparation of a study, research project, guideline or reference standard.

### RESEARCH DRIVEN DESIGN USING TOPOLOGY OPTIMIZATION: LAX CENTRAL TERMINAL AREA (CTA) PEDESTRIAN BRIDGE PROTOTYPE STUDY

structural engineer | Skidmore, Owings & Merrill LLP

architect | Skidmore, Owings & Merrill LLP

*Prototype bridges intended to replace seven bridges connecting the terminals to the parking garage at LAX. The study aimed to optimize the structure for weight, quantity of materials, and embodied carbon.*

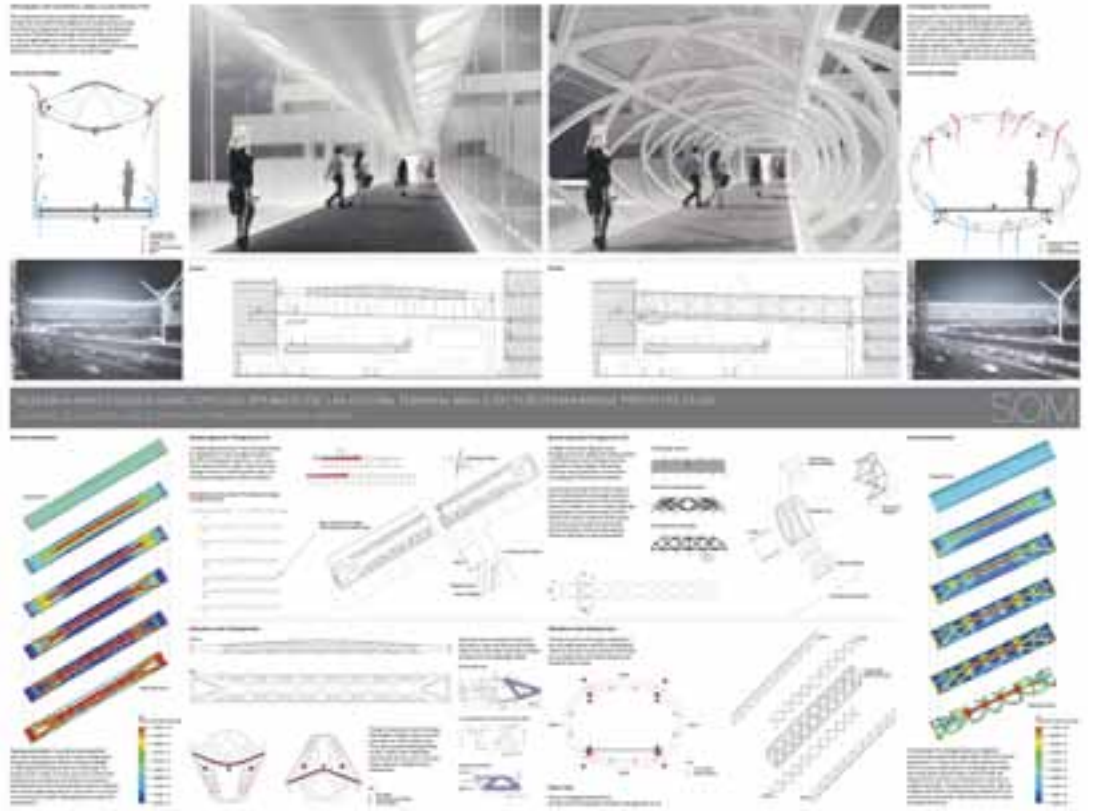
#### Selected Jury Comments:

*“The optimized orthotropic design creates interesting shapes.”*

*“These designs are both beautiful and interesting structurally.”*

*“These are fascinating design concepts.”*

*“The study of the reduction of the seismic mass is a sophisticated idea. This shows the project leaders can implement great ideas.”*



## SPECIAL-USE STRUCTURE ◆ AWARD OF EXCELLENCE

Excellence in structural engineering analysis, design and/or construction of a special-use project.

### RING OF CELESTIAL BLISS & ITS RE-USE

structural engineer | Envision Engineering Consultants

architect | Norihiko Dan and Associates

contractor | BES Engineering Inc.



*Design of a temporary structure, as well as its eventual conversion into a permanent sports facility. The original ring was built for a traditional Taiwanese lantern festival and then separated into two arcs, covered with a roof, and converted into a basketball court for an elementary school.*

#### Selected Jury Comments:

*“The conversion from Stage 1 to Stage 2 was structurally innovative and environmentally sustainable by making use of original structure.”*

*“This was very innovative and creative”*

*“It looks simple, but isn’t simplistic.”*



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## SPECIAL-USE STRUCTURE

## ◆ AWARD OF MERIT

Excellence in structural engineering analysis, design and/or construction of a special-use project.

### STANFORD UNIVERSITY, OLD CHEMISTRY BUILDING, CONSTRUCTION MEANS AND METHODS ENGINEERING

structural engineer | Degenkolb Engineers

architect | Cody Anderson Wasney Architects

contractor | Plant Construction Company

#### *Selected Jury Comments:*

*“The shotcrete acts as both the final floor plate and the shoring, which is efficient.”*

*“This shows tremendous economy.”*

*“This is an elegant economical solution.”*

*“The integration of shoring with main structure is exemplary.”*



*Engineering for a construction process to preserve the historic façade and roof while renovating the interior. All existing floors were removed while the walls were stabilized with temporary bracing so the contractor could utilize typical construction practices in building back the concrete floors.*

## INFRASTRUCTURE

## ◆ AWARD OF MERIT

Excellence in the structural engineering analysis, design and/or construction of an infrastructure project, including but not limited to, bridges, tunnels, transportation facilities and dams.

### STANFORD REPLACEMENT CENTRAL ENERGY FACILITY

structural engineer | Rutherford + Chekene

architect | Moore Ruble Yudell, Architects & Planners

contractor | McCarthy Building Companies, Inc



#### *Selected Jury Comments:*

*“The engineers are facilitators of a very cool, beautiful project.”*

*“This is a great example of structural engineers playing a critical role in making sure a complex project achieved execution.”*

*“The whole team got it right. This is a very elegant solution.”*

*A mixture of OSHPD and non-OSHPD buildings facilitating Stanford’s Energy Systems Innovation initiative. The project included 5 buildings, 3 tanks, 2 electrical equipment yards, and 1 L-shaped trellis.*

# INFRASTRUCTURE

# ◆ AWARD OF EXCELLENCE

Excellence in the structural engineering analysis, design and/or construction of an infrastructure project, including but not limited to, bridges, tunnels, transportation facilities and dams.

## BART PLEASANT HILL STATION, ALTERNATE DAMPED TRUSS MOMENT FRAME SEISMIC RETROFIT

structural engineer | ESE Consulting Engineers, Inc

architect | AECOM

contractor | ProVen Management Inc.

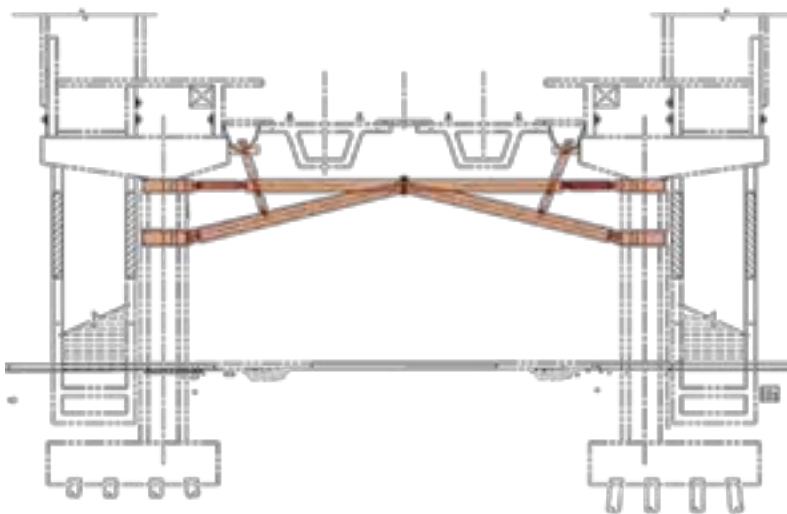
### *Selected Jury Comments*

*“The traditional fix was impossible. The structural engineer came up with a complete different fix which was easy to erect and didn’t affect passengers.”*

*“This was a very creative solution to a difficult problem, even though it looks simple when constructed.”*

*“This was a very constructible solution.”*

*An innovative seismic retrofit solution to a constrained space. Rather than buttress columns as usual, the design incorporated a slim profile moment frame by utilizing the columns’ existing capacity and supplementing it with a new steel truss girder.*



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## HISTORIC PRESERVATION

## ◆ AWARD OF MERIT

Excellence in the achievement of creative, innovative, and precedent-setting approaches to structural engineering in the rehabilitation and preservation of a significant historic structure.

### WAR MEMORIAL VETERANS BUILDING, SEISMIC UPGRADE - STRUCTURAL, WATERPROOFING MEP, AND THEATRICAL SYTEMS

structural engineer | Simpson Gumpertz and Heger Inc.

architect | City and County of SFDPW

contractor | Charles Pankow Builders, Ltd.

#### *Selected Jury Comments*

*“This is a historic building with a lot of constraints that gives the structural design a lot of limitations. The structural engineer came up with a lot of innovative ideas.”*

*“Their approach was a very sound engineering solution and required the extensive use of structural analysis.”*

*“This is a fabulous project.”*

*Seismic retrofit and systems upgrade for a historic landmark. The retrofit scheme included rocking concrete shear walls, allowing the reuse of the existing foundations.*



## RETROFIT/ALTERATION

## ◆ AWARD OF MERIT

Excellence in the use of conventional and/or innovative technology in the evaluation and/or design of a seismic retrofit project or alteration of an existing structure. This category includes seismic strengthening, additions, tenant improvements and other structural building alterations.

### UC BERKELEY LOWER SPROUL REDEVELOPMENT PROJECT

structural engineer | Rutherford + Chekene

architect | Moore Ruble Yudell, Architects & Planners

contractor | McCarthy Building Companies, Inc



#### *Selected Jury Comments*

*“This represents a major upgrade for that part of the campus”*

*“This required thoughtful performance-based design, using new and old in an economical way. This was a good solution. There was highly technical but well-founded decision making so the design was not overly conservative.”*

*“This is a complicated retrofit project with a lot of moving parts.”*

*“This was well executed with visual minimal impact.”*

*Revitalization of a central campus space. The plaza, garage, and Martin Luther King, Jr. Student Center all required strengthening, while the outdated and seismically unsafe Eshleman Hall was completely replaced.*



## RETROFIT/ALTERATION ◆ AWARD OF EXCELLENCE

Excellence in the use of conventional and/or innovative technology in the evaluation and/or design of a seismic retrofit project or alteration of an existing structure. This category includes seismic strengthening, additions, tenant improvements and other structural building alterations.

### “RETROFIT” OF EXTENSION OF TAIWAN TAOYUAN INTERNATIONAL AIRPORT TERMINAL 1

structural engineer | Envision Engineering Consultants

architect | Norihiko Dan and Associates

contractor | BES Engineering Inc.

*Retrofit of an extension of the 1978 Taoyuan International Airport Terminal 1. The extension was carefully balanced with the existing prestressed structural roof of the main terminal building, rather than adding strength through brute force.*

#### Selected Jury Comments

*“It was complicated to connect to the existing catenary and resolve all the forces.”*

*“This design respects the original architecture.”*

*“The engineer changed the existing structural system in such an elegant and careful way.”*



## RETROFIT/ALTERATION ◆ AWARD OF EXCELLENCE

Excellence in the use of conventional and/or innovative technology in the evaluation and/or design of a seismic retrofit project or alteration of an existing structure. This category includes seismic strengthening, additions, tenant improvements and other structural building alterations.

### THE STRAND, AMERICAN CONSERVATORY THEATER

structural engineer | Skidmore, Owings & Merrill LLP

architect | Skidmore, Owings & Merrill LLP

contractor | Plant Construction Company LLP



*Renovation and retrofit of an abandoned, century-old cinema into a theater and education facility. The building’s historic shell was maintained while upgrading the structural system in a way that reused 81% of the original structure.*

#### Selected Jury Comments:

*“This is a cool project. It’s very difficult structurally to take the whole inside of the building and gut it while maintaining the historic façade.”*

*“This provides a lot of bang for the buck.”*

*“This was a very integrated team.”*



## NEW CONSTRUCTION

## ◆ AWARD OF MERIT

Excellence in the use of conventional and/or innovative technology in the design of a new construction project.

## BOEDEKER PARK AND CLUBHOUSE

structural engineer | Daedalus Engineering

architect | WRNS Studio

contractor | CLW Builders Inc.

*An architecturally bold community center for an inner city neighborhood. The faceted roof includes a pyramid-like structure that is supported on just two columns.*

*Selected Jury Comments*

*“This building has beautiful, unique shapes.”*

*“We wish to recognize the delivery of a nice project within budget to the benefit of the community.”*

*“The structure looks clean and subtle.”*



## NEW CONSTRUCTION

## ◆ AWARD OF MERIT

Excellence in the use of conventional and/or innovative technology in the evaluation, design and retrofit/alteration of an existing structure.

## 350 Mission

structural engineer | Skidmore, Owings & Merrill LLP

architect | Skidmore, Owings & Merrill LLP

contractor | Webcor Builders

*Selected Jury Comments:*

*“They achieved enormous span through the use of strategic camber and post-tensioning.”*

*“The design had very high floor-to-floor heights.”*

*“The very large cantilevers were created using upturned beams and looks pretty striking.”*

*A LEED Platinum office tower for downtown San Francisco. The long-span concrete slabs create expansive views and allow more energy efficient HVAC systems*





## NEW CONSTRUCTION

## ◆ AWARD OF EXCELLENCE

Excellence in the use of conventional and/or innovative technology in the design of a new construction project.

### ZUCKERBERG, SAN FRANCISCO GENERAL HOSPITAL AND TRAUMA CENTER

structural engineer | ARUP

architect | Fong & Chan Architects

contractor | Webcor Builders



*A new seismically safe hospital and trauma center for San Francisco. The new building sits on isolators, allowing it to move in an earthquake and operate immediately thereafter.*

*Selected Jury Comments:*

*“The fire testing of isolators is very unique.”*

*“This was a well-executed project.”*

*“This is a huge improvement for the campus”*

## NEW CONSTRUCTION

## ◆ AWARD OF MERIT

Excellence in the use of conventional and/or innovative technology in the design of a new construction project.

### SUPERIOR COURT OF CALIFORNIA SAN BENITO COUNTY COURTHOUSE

structural engineer | Rutherford + Chekene

architect | SmithGroupJJR

contractor | Kitchell CEM

*A new transparent courthouse with a floating staircase. The building is just 700 feet from an active fault and incorporates rigorous seismic design requirements.*

*Selected Jury Comments:*

*“This building features big cantilever corner awnings and floating stairs.”*

*“This was a neat project which was challenging and beautiful.”*

*“This is a spectacular building.”*





## SUSTAINABLE DESIGN

## ◆ AWARD OF MERIT

Excellence in use of structural design, materials and concepts that demonstrates innovation, integration, and achievement of sustainable design goals.

### COOLEY LANDING EDUCATION CENTER

structural engineer | KPFF Consulting Engineers

architect | FOG Studio

contractor | Arbor Building Group, LLC



#### *Selected Jury Comments:*

*“Cross-Laminated Timber is plywood on steroids.”*

*“They had strong sustainability design goals.”*

*“KPFF are clearly early adopters doing some great research.”*

*The first building in California to use Cross-Laminated Timber as its roof and lateral structural system. The structure was designed for future Net Zero energy use.*

## SUSTAINABLE DESIGN

## ◆ AWARD OF EXCELLENCE

Excellence in use of structural design, materials and concepts that demonstrates innovation, integration, and achievement of sustainable design goals.

### 100 VAN NESS

structural engineer | Nishkian Menninger

architect | Solomon Cordwell Buenz

contractor | Shanghai Construction Group

*Transformation of an outdated office building into a modern apartment tower. By removing the heavy concrete cladding and re-analyzing the structure, the engineers were able to repurpose the building without having to do invasive structural upgrades.*

#### *Selected Jury Comments:*

*“By replacing the existing façade and using glass curtain wall, the load was light enough and allowed the existing frame to remain, which was a very clever solution.”*

*“Complexities of working on a tight urban site made this a challenging project.”*

*“Most of the energy a building uses is in construction -- it’s nice to see a building getting reused. The structural engineer has a huge role in that.”*



*Before Construction*



*During Construction*



*After Construction*

# SUSTAINABLE DESIGN ◆ AWARD OF EXCELLENCE

Excellence in use of structural design, materials and concepts that demonstrates innovation, integration, and achievement of sustainable design goals.

## THE BASIS SCHOOL

structural engineer | Holmes Culley

architect | Carhuff & Cueva Architects, LLC

contractor | Canyon Building & Design, LLC

### *Selected Jury Comments:*

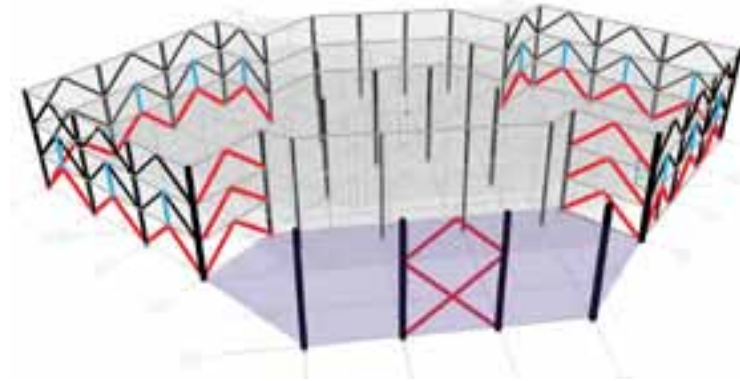
*“The braced frames were attractive enough to be embraced as part of the design.”*

*“The new structure worked elegantly with old without adding a lot of tonnage”*

*“It’s good that they didn’t have to tear down an existing building but rather made it an adaptive reuse.”*



*Adaptive reuse of a 1980’s office building as a charter school. The change in use triggered an upgrade to the seismic system, which was achieved through the strategic strengthening of the existing braced frames.*



# LANDMARK STRUCTURE ◆ AWARD OF MERIT

Excellence in the structural engineering analysis, design and construction of a significant project achieving “Landmark Structure” status.

## UC BERKELEY, BERKELEY MUSEUM OF ART & PACIFIC FILM ARCHIVE

structural engineer | Forell/Elsesser Engineers, Inc.

architect | EHDD Architecture

Diller Scofidio + Renfro

contractor | Plant Construction Company LLP



*Creation of a new cultural center through the adaptive reuse of a 1938 printing plant. The structural solution includes the retrofit of four existing buildings and featured hidden seismic joints, allowing the buildings to move independently.*

### *Selected Jury Comments:*

*“This was carefully solved and detailed. The structure was very integrated with the architecture goals.”*

*“The engineering elegantly handles architectural demands.”*

*“The structural engineer was very sensitive and found a way to handle each system independently.”*



# LANDMARK STRUCTURE ♦ AWARD OF EXCELLENCE

Excellence in the structural engineering analysis, design and construction of a significant project achieving “Landmark Structure” status.

## SFO AIR TRAFFIC CONTROL TOWER & INTEGRATED FACILITY

structural engineer | Walter P Moore

architect | Fentress Architects

bridging documents engineer | Rutherford + Chekene

contractor | Hensel Phelps

peer review engineer | Maffei Structural Engineering



### Selected Jury Comments:

*“This is a very complicated structural system, and it’s very well thought out. It’s exciting to see the vertical post-tensioning being used.”*

*“This design was executed beautifully.”*

*“The tower is definitely a landmark.”*

An architecturally stunning replacement air traffic control tower meeting stringent seismic demands and FAA requirements. Located just 2 1/2 miles from the San Andreas fault, the new tower is vertically post-tensioned to give it self-centering capabilities, allowing the airport to operate after a major earthquake.



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