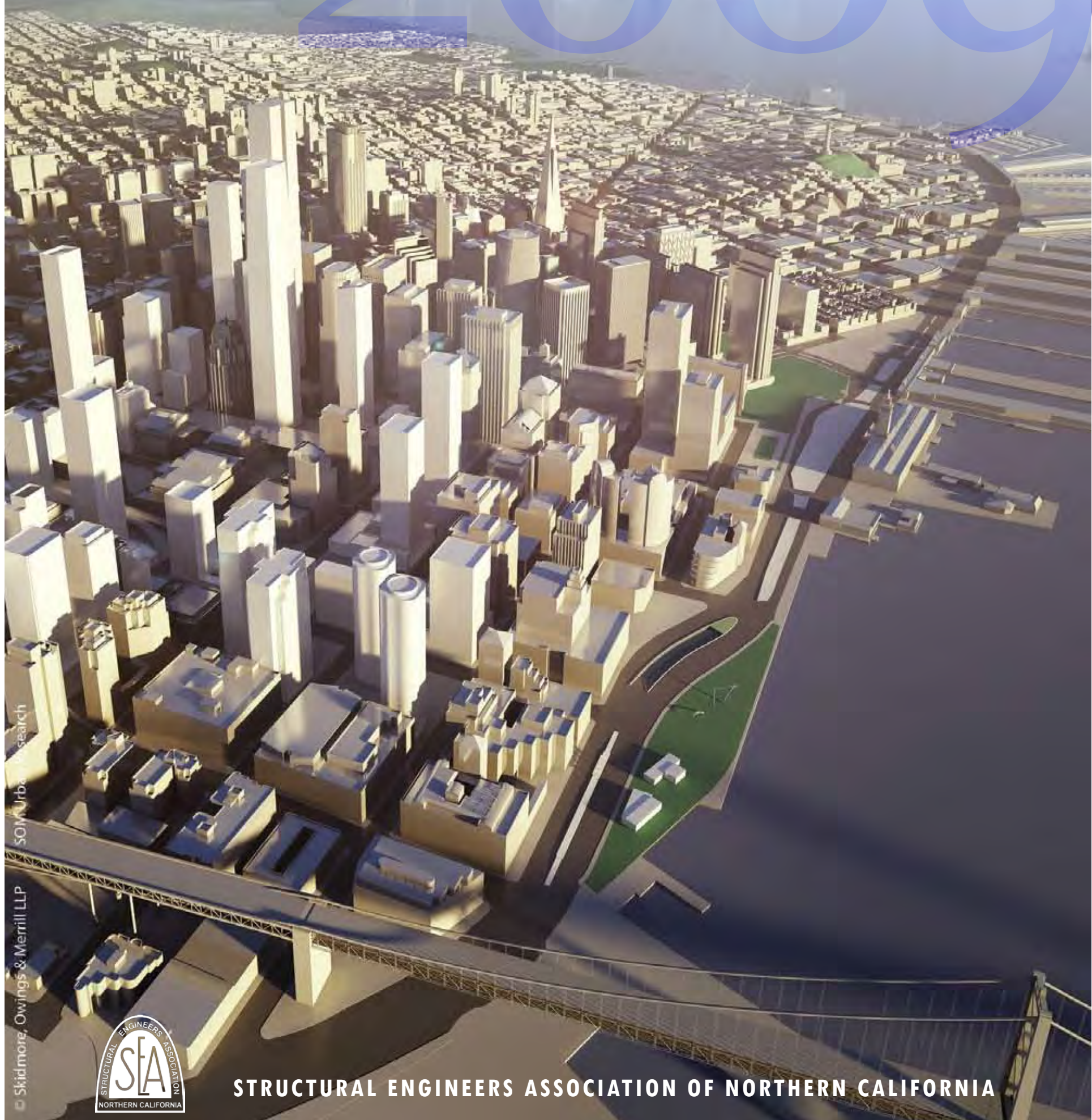


# Excellence in STRUCTURAL ENGINEERING Awards

# 2009



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**Structural engineers have to be very good to practice in Northern California.** We operate with the knowledge that our structures will be tested by a damaging earthquake, and that the safety of the public is entrusted to us. We are presented with ever more sophisticated tools and methodologies for studying seismic behavior, as well as ever changing building codes designed to ensure good performance. And, of course, we face competition from each other, and we know that workman-like solutions are not enough in this market. Architects and owners expect designs that support their visions with elegance and to show an equal level of creativity in meeting their budgets. Occasionally, the right combination of creativity, teamwork, opportunity, and inspiration results in an extraordinary design or feat of engineering.

One area in which we engineers often do not excel is promotion. Our most innovative achievements too often go unheralded, and we are content with our own knowledge of our contributions. This attitude may be fitting in some circumstances, but the profession is advanced when we share our triumphs with each other, and with the construction and business community in general. This annual publication of our Excellence in Engineering Awards is an attempt to mitigate this situation by highlighting such achievements in the past year.

The range of categories for this award speaks to the different types of building structures and structural engineering that we do:

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

The award winners and honorees have done some amazing work that should inspire and challenge fellow engineers, as well as impress our clients and building owners. Please have a look for yourself.

I would like to thank the jury (Grace Kang, SE; Professor Helmut Krawinkler; Andy Merovich, SE; Stanley Saitowitz, Architect; and David M. Wilson) for outstanding work in identifying the remarkable aspects of each project. I would also like to thank Mark Ketchum, who organized this year's competition and recorded the juror's comments, and Peter Lee, who provided continuity with the previous year. I would also like to thank John Osteraas, who organized this publication, and the companies that placed ads in this publication, making it possible. Finally, I would like to thank all of the SEAONC members who took the time to put together entries for the competition.

Next month will mark the twentieth anniversary of the Loma Prieta earthquake. It is a fitting occasion to reflect on the importance of structural engineers in keeping the public safe and our cities useable. I am proud of the role that SEAONC plays in maintaining high standards of structural engineering quality.

Rafael Sabelli, SE  
President 2009–2010



Structural Engineers Association of Northern California  
575 Market Street, Suite 2125  
San Francisco, CA 94105-2870  
[www.seaonc.org](http://www.seaonc.org)

SEAONC celebrated its 2009 Excellence in Structural Engineering Awards on June 2<sup>nd</sup>. The categories included Landmark Structures (large and small), New Construction, Sustainable Design, Retrofit / Alteration, Special Use Structures, and Studies / Research / Guidelines. Judging criteria included: Design Creativity, Technical Innovation, System Efficiency and Economy, Constructability, Complexity of Problems Solved, Design Integration, Quality of Execution, and Significant Contribution to the Public and Profession. The jury panel consisted of the following individuals:

- Grace Kang, Forell/Elsesser Engineers  
Helmut Krawinkler, Stanford University  
Andy Merovich, A.T. Merovich & Associates  
Stanley Saitowitz, Stanley Saitowitz | Natoma Architects  
David M. Wilson, Clark Construction

# LANDMARK STRUCTURES — LARGE

Excellence in engineering design of a “Landmark Structure.” Examples of structures in this category include commercial, governmental, or institutional facilities such as buildings, sports stadiums, transportation centers, and utility projects. Separate awards were given for large and small projects.

## AWARD OF EXCELLENCE

### THE CATHEDRAL OF CHRIST THE LIGHT OAKLAND, CALIFORNIA

*architect / structural engineer* | Skidmore, Owings & Merrill LLP  
*owner* | Catholic Diocese of Oakland  
*architect* | Kendall/Heaton Associates, Inc.  
*contractor* | Webcor Builders  
*landscape architect* | Peter Walker and Partners

Located only 4.6km from the Hayward Fault, the Catholic Diocese of Oakland sought to construct a new 1350-seat cathedral with a service life of at least 300 years. The structure is defined by sacred geometries and designed for lightness by using seismic isolation to manage ground motions and reduce expected seismic demands. The Cathedral is the centerpiece of a 224,000-square-foot complex with a complement of facilities that includes a mausoleum, a conference center, administrative offices, bishop and clergy residences, a bookstore, a café, and community-serving ministries. The Cathedral incorporates a highly innovative use of natural, yet ordinary, materials with an ethos of sustainability.



## JURY COMMENT

*“All aspects of architecture  
and engineering of the  
landmark structure are  
working together to achieve a  
high level of  
drama,  
economy and detail.”*





Excellence in engineering design of a “Landmark Structure.” Examples of structures in this category include commercial, governmental, or institutional facilities such as buildings, sports stadiums, transportation centers, and utility projects. Separate awards were given for large and small projects.

AWARD OF EXCELLENCE

CONGREGATION BETH SHOLOM

SAN FRANCISCO, CALIFORNIA

*structural engineer* | Forell/Elmesser Engineers, Inc.  
*owner* | Congregation Beth Sholom  
*architect* | Stanley Saitowitz / Natoma Architects  
*contractor* | C. Overaa & Co  
*photography* | Victor Muschetto

Forell/Elmesser Engineers recently provided structural engineering services for Congregation Beth Sholom’s new campus in San Francisco’s Richmond District. The new facility creates dynamic spaces for worship, meetings, study and social functions for the congregation and community. The facility consists of three seismically separated structures featuring the 704-seat sanctuary as the most dramatic element. The inspiration for this structure is derived from the traditional synagogue temples in Israel, with their bowl shaped congregation areas. The large curved concrete shell structure is supported on a narrow pedestal that is post-tensioned in two directions to control deflections and cracking of the architecturally exposed reinforced concrete structure.



JURY COMMENT

*“The bold and dramatic structure should be elevated to landmark structure recognition for its thoughtful, integrated and carefully executed structural systems.”*



Excellence in engineering design of a “Landmark Structure.” Examples of structures in this category include commercial, governmental, or institutional facilities such as buildings, sports stadiums, transportation centers, and utility projects. Separate awards were given for large and small projects.

AWARD OF MERIT

MILLENNIUM TOWER

SAN FRANCISCO, CALIFORNIA

*structural engineer* | Desimone Consulting Engineers  
*owner* | Millennium Partners  
*architect* | Handel Architects  
*contractor* | Webcor

Millennium Tower, located on Mission Street in San Francisco’s Transbay Terminal district, stands 645 feet as the tallest reinforced concrete structure situated in a seismic zone four region. The architectural landmark, comprised of a 59-story tower and a 12-story low-rise podium interconnected by a three level glass atrium, includes luxury condominiums, recreational amenities and four levels of below grade parking facilities. Dynamic time history, site-specific response spectra and non-linear pushover analyses were utilized in substantiating the seismic performance of the cast-in-place reinforced concrete tower dual system.



JURY COMMENT

*“...employing innovative structural design strategies including higher strength ductile steel reinforcement, steel link beams and reinforced concrete outriggers.”*

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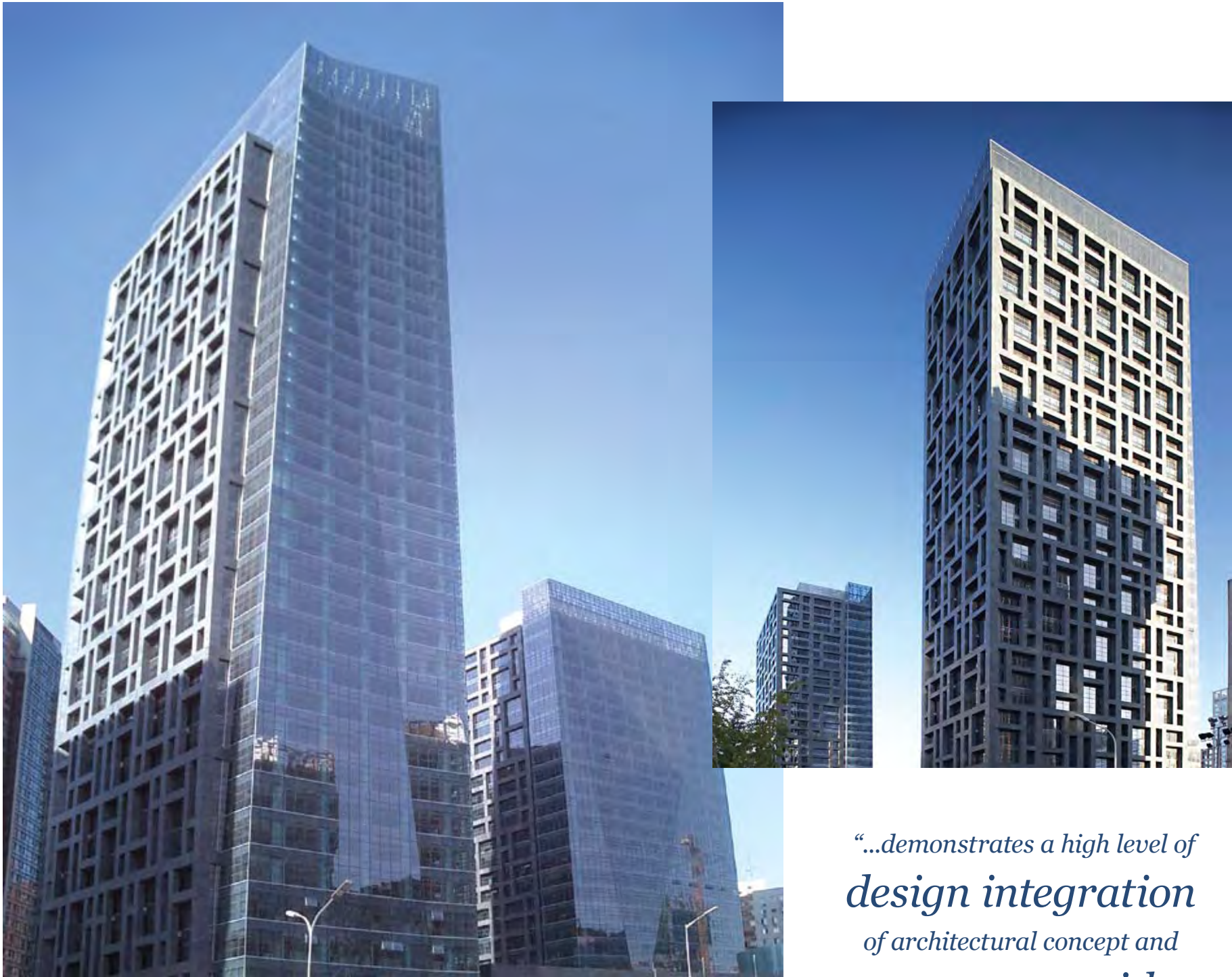


# NEW CONSTRUCTION

PAID SUPPLEMENT

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

## AWARD OF EXCELLENCE



### GEMDALE PLAZA, CHAOYANG DISTRICT BEIJING, CHINA

*structural engineer* | Skidmore, Owings & Merrill LLP and Beijing Institute of Architectural Design  
*owner* | Gemdale Beijing Company  
*architect* | Skidmore, Owings & Merrill LLP and Beijing Institute of Architectural Design  
*contractor* | China Construction First Division Group, The Fifth Co., Ltd.  
*photography courtesy* | SOM - SEAOC 2009 Awards

Responding to the architectural design concept of “screen frames” for the 100 meter and 150 meter tall towers for the Gemdale Plaza office project in Beijing, China, large scale maga-frame exterior frames with in-fill were conceived based on repetitive patterns found in the culturally rich art forms. The screen frames placed on the South and West elevations act to control direct sunlight and reduce energy demands. The frames were tuned to act in tandem with a central concrete core to stabilize each tower.

“...demonstrates a high level of  
*design integration*  
*of architectural concept and*  
*structural system with*  
*strong cultural*  
*connections.”*

# NEW CONSTRUCTION

PAID SUPPLEMENT

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

## AWARD OF MERIT



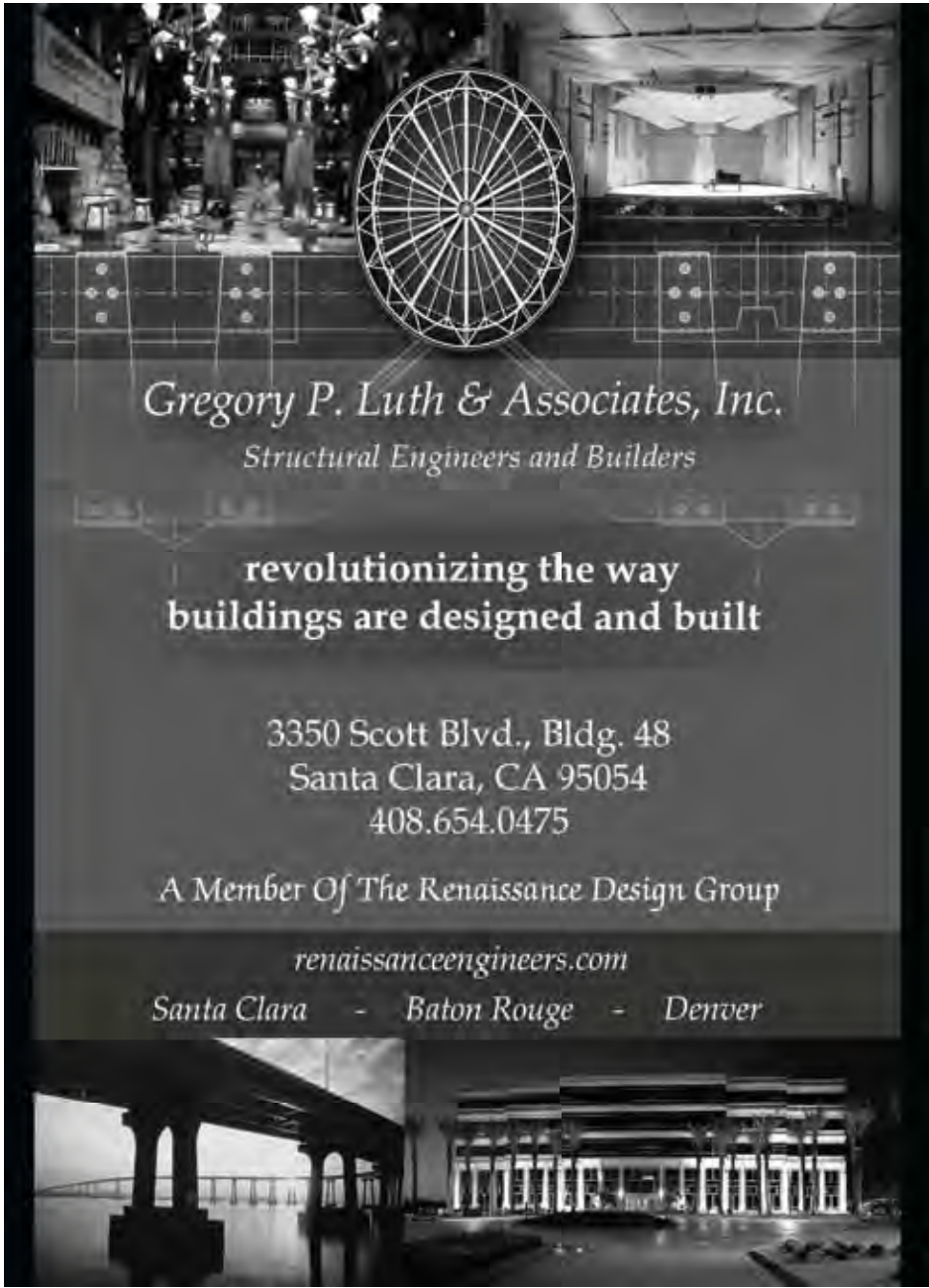
### USC SCHOOL OF CINEMATIC ARTS LOS ANGELES, CALIFORNIA

*structural engineer* | Gregory P. Luth & Associates  
*owner* | University of Southern California  
*architect* | Urban Design Group, Dallas  
*contractor* | Hathaway Dinwiddie  
*photographer* | Tom Hinckley

The new USC School of Cinematic Arts facility incorporates an innovative seismic lateral force resisting system comprised of reinforced concrete shear walls that evolved in response to a desire for a “100-year building” combined with 20th century Spanish architecture requiring a jointfree stucco façade. The performance based seismic design approach includes a “rocking wall” system with replaceable structural fuses in the form of slit shear plates tuned to seismic demands. The analytic behavior of the unique slit shear plate fuse system was substantiated with laboratory testing.

JURY COMMENT

“...implemented  
*innovative techniques*  
*to achieve the expected performance.”*





# NEW CONSTRUCTION

PAID SUPPLEMENT

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


## AWARD OF MERIT



### C.V. STARR EAST ASIAN LIBRARY UNIVERSITY OF CALIFORNIA, BERKELEY

*structural engineer* | Rutherford & Chekene  
*owner* | University of California, Berkeley  
*design architect* | Tod Williams Billie Tsien  
*associate architect* | Tod Williams Billie Tsien  
*landscape architect* | CMG Landscape Architects  
*contractor* | McCarthy

The four-story C.V. Starr East Asian Library on the UC Berkeley campus features a cast-in-place concrete structural system integrated with major architectural design concepts. A full-height atrium, or 'slot', divides each floor into two halves with an 88-foot long skylight over the atrium roof along with panoramic views through an uninterrupted 70-foot strip of north facing windows. Other features include a 90-foot long main entry bridge, massive two-story-tall cast-bronze window grilles, and concrete finishes ranging from a high polish to a heavy sandblast exposing bluegrey glacial rock aggregates.



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JURY COMMENT

“...well-integrated architecture  
and engineering design with **strong**  
**sustainable features** as well.”



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# SUSTAINABLE DESIGN

PAID SUPPLEMENT

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

## AWARD OF EXCELLENCE

### PORTOLA VALLEY TOWN CENTER TOWN OF PORTOLA VALLEY, CALIFORNIA

*structural engineer* | Forell/Elssesser Engineers, Inc.  
*owner* | Town of Portola Valley  
*architect* | Goring & Straja Architects / Siegel & Strain Architects  
*contractor* | TBI Construction & Construction Management, Inc.  
*photography* | Goring Straja Architects

The five new buildings of the Portola Valley Town Center consisting of the Town Hall, Community Hall, Library, Restroom Building, and Maintenance Shop were designed to achieve an integrated LEED Platinum-level sustainable design. Avoiding the “No Build Zone” of the adjacent Woodside fault, the sustainable design elements employed in the project included the use of reclaimed timbers, exposed structure as architecture, certified lumber, VOC compliant composite wood products, recycled materials and 70% replacement of cement content in addition to ductile wood framed construction of the one story structures.

JURY COMMENT

“...a high level of sustainable design utilizing  
**simple integrated**  
**architectural and engineering**  
**design strategies.**”



# PORTOLA VALLEY TOWN CENTER



**FORELL/ELSESSER ENGINEERS, INC.**



Excellence in the use of conventional and/or innovative technology in the evaluation and design of an existing structure providing retrofit/alteration measures to successfully achieve the project performance goals. Includes seismic strengthening, additions and other structural building alterations.

AWARD OF EXCELLENCE

UCSF MEDICAL SCIENCES BUILDING AND MOFFITT HOSPITAL SEPARATION PROJECT  
UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

structural engineer | Degenkolb Engineers  
architect | The Design Partnership, LLP  
contractor | McCarthy

Ranked as one of the top five medical institutions in the country, the UCSF Medical Center conducts Nobel-prize winning research and serves as a major Northern California health care provider. The seismic retrofit of this Medical Center employed state-of-the-art analysis techniques in designing a creative and economical solution. The design featured the separation of the existing Medical Sciences Building and the Moffitt Hospital Facility into two independent structures, while allowing the buildings to remain fully occupied and operational during construction. The solution met the lifesafety performance objective, ensuring that one of the largest hospitals in the state would be able to continue to deliver critical care in the event of a major earthquake.

JURY COMMENT

“The *out-of-thebox* design strategy was based on sound engineering and innovation resulting in an economical solution requiring OSHPD approvals.”



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- ☐ Family Time
- ☐ Mountain Climbing
- ☐ Community Service
- ☐ Day at the Museum
- ☒ Structural Engineering

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# SPECIAL-USE STRUCTURES

PAID SUPPLEMENT

Excellence in engineering design or analysis used on an unusual or special-use project including non-building structures. Examples in this category include a bridge structure, a temporary movie set, an artificial rock climbing wall and an elevated monorail station.



AWARD OF EXCELLENCE



## LA LOMA – FOOTHILL PEDESTRIAN BRIDGE UNIVERSITY OF CALIFORNIA, BERKELEY BERKELEY, CALIFORNIA

*structural engineer* | Forell/Elsesser  
*owner* | University of California, Berkeley  
*architect* | Donald MacDonald Architects  
*contractor* | Christie Constructors

The new UC Berkeley La Loma-Foothill Pedestrian Bridge provides a safe pedestrian link between the La Loma student dormitory facility and the Foothill dining commons spanning 80 feet across busy Hearst Avenue on the north boundary of the UC Berkeley campus. Adjacent to the Hayward Fault, the carefully detailed steel Vierendeel truss bridge incorporates a uniaxial friction pendulum seismic isolation system to protect the existing pier shafts and foundations while incorporating a sky-lit glass gable roof extending over the length of the structure.

JURY COMMENT

“The design solution is a  
*very clever integration*  
of architecture and structure with the  
implementation and strategic resolution of  
a complex set of design issues.”

# SPECIAL-USE STRUCTURES

PAID SUPPLEMENT

Excellence in engineering design or analysis used on an unusual or special-use project including non-building structures. Examples in this category include a bridge structure, a temporary movie set, an artificial rock climbing wall and an elevated monorail station.



AWARD OF MERIT

## STARS & STRIPES SCULPTURE LITTLE ROCK, ARKANSAS

*engineer-of-record* | Gregory P. Luth & Associates  
*comissioned by* | War Memorial Stadium Improvement Trust  
*artist* | Kathleen Caricof, National Sculptors' Guild, CO  
*photography* | Alyson Kinkade

Located at Little Rock, Arkansas' War Memorial Stadium honoring military veterans, the monumental stainless steel sculpture titled “Stars and Stripes” was featured as part of the Stadium's 60th Anniversary Celebration and is now the centerpiece of a new plaza. The structural engineering team worked in close collaboration with the artist, Kathleen Caricof, a Denver-based sculptor, in designing and implementing the winning concept and making it a reality. The sculpture's complex three-dimensional geometry defines five stars, representing each branch of the military. The stars interconnect to demonstrate how the branches work together.

JURY COMMENT

“... the design *collaboration* required  
great patience in helping *to define* the  
*artist's ideas...*”

SAN FRANCISCO  
**Business Times**

The San Francisco Business Times is pleased to partner with the Structural Engineer's Association of Northern California (SEAONC) in promoting their 2008 Excellence in Structural Engineering Awards Program. We encourage readers to look at the special awards supplement that has been inserted into this issue of the Business Times which highlights the diverse and innovative work performed by Bay Area structural engineers..



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Outstanding efforts in analysis, engineering calculations, or evaluation for preparation of a study, a research project or preparation of guidelines. This category is intended to encompass projects or efforts that are not intended to be a constructed project.

AWARD OF EXCELLENCE

ADVANCED SEISMIC ASSESSMENT GUIDELINES

PEER Reports 2005/09 and 2006/05 | Karl Telleen and Joe Maffei of Rutherford & Chekene, and Paolo Bazzurro and C. Allin Cornell of Stanford University.

Advanced Seismic Assessment Guidelines, developed by researchers at Stanford University and tested and refined by structural engineering practitioners, offer improvement over previous methods for seismic evaluation of buildings where post-earthquake safety is a concern. This new method allows engineers to predict, before an earthquake, how safe it will be to occupy a building after the earthquake. The method measures building performance in terms of the post-earthquake occupancy classifications “Green Tag,” “Yellow Tag,” and “Red Tag,” defining these performance levels quantitatively, based on the structure’s remaining capacity to withstand aftershocks.



JURY COMMENT

“The work is an excellent example of SEAONC Members demonstrated leadership in researching critical issues, setting priorities and developing rational methods in the post-earthquake assessment of buildings.”

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**Cathedral of Christ the Light!**

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A message from Ashraf Habibullah



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For more information about CSI, please visit: [www.csiberkeley.com](http://www.csiberkeley.com)

Sincerely,

Ashraf Habibullah  
President & CEO

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The San Francisco-Oakland Bay Bridge