



State President's Message

Andy DiLeo, PE, SE
SEAOA State President



Season's greetings SEAOA,

As another year comes to an end, I hope you all have the chance to take a few days off to enjoy family, reflect on the lessons of 2021 and set goals for the coming year.

At the State Board level, our convention planning efforts are ramping up and we could use your help. As of now we are planning an in-person convention to be held in Tucson on May 12th through the 14th. Please reach out by emailing us at info@seaoa.org

to let us know if you have any questions or concerns. Also, tell us if there are any presentation topics that you would be interested in.

Thank you and happy holidays.

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TUCSON CHAPTER MEETING

January Meeting TBD



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CENTRAL CHAPTER MEETING

January Meeting TBD

Central Chapter Chairperson's Message

David Grapsas, P.E., S.E.
Central Chapter Chair



Happy Holidays everyone!

I hope everyone has continued to stay safe and healthy this year. It has been an honor to serve as Central Chair for 2021 and I look forward to a great 2022. I wish you and

your families a great holiday season!

The Central Chapter is continuing to monitor the ongoing situations and the ever-changing events and executive orders. We are currently planning for in-person/hybrid meetings for 2022.

Please check the SEAOA website for updates and calendar of events.

REQUEST FOR NEWSLETTER ARTICLES

The SEAOA Newsletter committee always appreciates input from the membership about articles and information that you'd like to see in upcoming newsletters. The newsletter is an excellent place for the SEAOA membership to share opinions, ideas and information with the rest of the association. Also, anyone who could volunteer a little time every quarter to help publish the newsletter is most welcome. One easy way to help would be to "proof" the newsletter before it's published. Please contact Sal Caccavale (seccbc@cox.net) or Mark Sipes (Mark.Sipes@maricopa.gov) if you have any articles that you'd like to submit, if there are any topics you'd like to see in future SEAOA Newsletters or if you'd like to help with publishing the newsletter.



SEAOA Central Chapter Scholarship Recipients

Julie Werner

Development Coordinator—Stewardship, Ira A. Fulton Schools of Engineering, Arizona State University

I am writing to share that for the 2021-2022 academic year, the Structural Engineers Association of Arizona Scholarship has been awarded to Alexander Owen and Gabriella Stadler. As you read through the attached letters, you will see how important your donation is to their education at ASU.

Additionally, we look forward to connecting you with your students, and we will contact you later in the academic year to make arrangements.

Thank you again for your generous support. Your investment helps to create an empowering community spirit we call the Fulton Difference, and it makes the world of difference to the future of engineering.

Dear Structural Engineers Association of Arizona

My name is Alexander Owen, and I am honored to have been selected for the Structural Engineers Association of Arizona Scholarship. I am grateful for the time and consideration you put into your decision, and I am looking forward to continuing my pursuit of a Civil Engineering degree, and ultimately a Masters in Structural Engineering.

I wanted to begin by first thanking you for selecting me and contributing to my education. My initial decision to attend Arizona State stemmed from my love of the state and the people within it. I was born and raised in Phoenix (Glendale), and I am the oldest of three siblings. I grew up an ASU sports fan, and I developed a strong desire to pursue my education at the university. Being a first-generation college student, choosing engineering was not an easy decision, and it resulted from my love for math, history, and creative problem solving.

Throughout my time at ASU, I have learned a great deal not only about civil engineering, but about what it takes to be a full-time student. Balancing homework, classes, extracurriculars, friends, and finances was something that took me a while to grasp. My first 1.5 years of school consisted of me taking out considerable loans, leading to my pursuit of TA and RA positions to lighten the financial burden of school. This scholarship will help me stay in Barrett, The Honors College, and will allow me to focus my future income on paying off previous loans, not taking out new ones.

Thank you again for your consideration, I appreciate the time you invested in me. I am working at Kiewit as a structural engineering intern, and upon completing my masters, I hope to become a bridge engineer. Feel free to find me via email or phone!

Best,

Alexander Owen

623-866-3524 awowen@asu.edu



Meet Alexander Owen

Why did you choose to attend ASU?

Being an Arizona native, I spent most of my childhood cheering on ASU sports teams both from at home, and at the games. As I grew older, I began to admire the campus, and it felt like the place I belonged. I love the state of Arizona, and with the opportunities present at ASU, I couldn't picture myself at another school.

What is the best advice you've received?

Choosing one piece of advice is difficult, advice is usually situational. However, one piece of advice I've found that is universal is as simple as, "Treat others the way you want to be treated." You'll never know what someone is thinking, but you can never truly hurt someone by showing them kindness.

Why did you choose engineering?

I grew up with a father that loved history, and as a consequence, I would wake up early on most days to watch history documentaries before school, or I would find myself reading into the early morning on weekends. My love for history led me to develop an interest in how ancient civilizations utilized their land and resources to their advantage, ultimately improving their life quality. I soon began to realize this was engineering, and when I learned how remarkable engineering truly was, I knew I was going to be a civil engineer. *"Scientists study the world as it is; engineers create the world that has never been."* -Theodore von Karman, Hungarian-American Mathematician



Meet Gabriella Stadler

Dear Structural Engineers Association of Arizona,

My name is Gabriella Stadler, and I am so grateful to you for selecting me as the recipient of the 2021-2022 Structural Engineers Association of Arizona Scholarship. This scholarship will enable me to finish attending Arizona State University to pursue my Civil Engineering degree. Thank you so much.

Since I was little, math has been my favorite subject. I also have had a passion for construction and buildings for years. As a young girl, I would rather watch HGTV than cartoons on the television. Design based games like The Sims and Planet Coaster were my favorite to play. In High School, my mom noticed these interests and she told me that there was a major out there for me: Civil Engineering.

My mom was right. Civil Engineering has been the perfect mix of mathematics and design. I decided to attend ASU, following my mother's footsteps. As a fourth generation Arizonian, I love Arizona. ASU offers wonderful engineering programs. E2 camp was my first introduction to Ira A. Fulton Schools of Engineering. The fun activities and kind people made me excited rather than nervous to attend college. Three years later, I am still friends with people I met at that camp. Ira A. Fulton has also brought me friends through classes, clubs, and the tutoring center. More importantly, I have learned a lot from my time at ASU. My involvement in the classes and clubs have prepared me for my future career as a Structural Design Engineer.

This scholarship will help me finish my BA in something I am passionate about. This upcoming year, I will be the Project Manager of our ASCE's competition Concrete Canoe, the President of Chi Epsilon, a UGTA, and a Civil Engineering tutor. Thank you for continuing my dream.

Sincerely,

Gabriella Stadler

gstadler@asu.edu 480-823-5443

Why did you choose to attend ASU?

I chose ASU because I knew it is a great school since my mom is an ASU alumnus. I also wanted to stay close to my family, something I really value. I love Arizona, and my family has been here for generations.

What is the best advice you've received?

To take each day one at a time. As a college student, assignments and due dates can get overwhelming. Taking each day one at a time and living in the present helps me remain focused.

What is your favorite class?

My favorite class is Statics (CEE210). This class introduced how mathematics is used in designing structures. I was challenged to try my best, and that I did. I was a Statics UGTA for two semesters; I loved helping the students and being a UGTA helped me keep my skills sharp.

Tucson Chapter President's Message

Jennifer McMahon Patronski, PE, SE
Tucson Chapter President



Happy New Year
members!

The Tucson Chapter continues to have a light schedule into the spring. In February, we will host ASE (Advanced Structural Engineering) for a presentation on ASU Mayo HFC project and the incorporation of carbon

fiber composites in the canopy design. At this time we expect the meeting to hybrid. Meeting location TBD. We are looking for more presentations to close out the spring. Please contact me at jmpatronski@scice.com and/or Steven Hess at hessse@msn.com.

The State Board and the Legislative Committee continues to monitor the current status on Arizona legislation relating to engineering. Many industry associations, with ASCE and ACEC leading the charge, are collaborating to vocalize concern and recommendations to maintain and/or reestablish engineering presence on the AZ Board of Technical Registration. More information can be found at <https://btr.az.gov/>. Additional information will continue to be shared as it becomes available.

We want volunteers! Anyone interested in participating in SEAOA's Code Committee and Legislature Committee or in receiving additional information regarding current issues, please reach out to me (jmpatronski@scice.com), or email info@seaoa.org.

SEAOA Technical Organization Representatives

The following SEAOA Members serve as SEAOA representatives for the Technical Organizations listed below. These members act as delegates to report SEAOA happenings to these national organizations, relay questions and concerns from SEAOA members and deliver national-level information back to our organization. We encourage our SEAOA membership to join these delegates and participate in these national organizations. To reach out to any of the delegates, please use the website member directory: [SEAOA - Membership Directory](#)

- National Council of Structural Engineers Association (NCSEA) – James Newhall (Ron Schneider – alternate)
- Western Council of Structural Engineers Association (WCSEA) – Ron Schneider
- ASCE-7 – John Grenier
- The Masonry Society (TMS) – Paul Scott

Structural Excellence Awards Competition, February 1 thru March 28, 2022

This year's program will start and finish ONE MONTH earlier than past years due to the annual conference dates scheduled for May 14-16, 2022. The official awards announcement, entry rules, and dates will be emailed and posted later this month. SEAOA looks forward to your continued interest and support of the awards program.

THE RIGHT BRAIN
© Brent Wright rightbrain.wrightengineers.com



I can relate to this guy.

My wife is the Santa in our house. She buys dozens and dozens of thoughtful, carefully selected, and beautifully wrapped presents and personalized messages for dozens of people every Christmas.

I only have to buy for her. You'd think it would be easy.

I know a guy who bought his wife a new hunting rifle. She didn't hunt so she gave it back to him. Genius move on his part!

- Brent Wright

This Right Brain cartoon is a contribution from Brent Wright of Wright Engineers, an SEAOA supporting firm. If you would like to contribute an original cartoon, please email it to info@seaoa.org

SEAOA Honorary Membership Nominations

An Honorary Membership may be awarded by the Board of Directors to any person who is a person of acknowledged eminence in some branch of engineering or the science related thereto or a person who has been a member in good standing of this Association for 20 years or more and who, in the opinion of the Board of Directors has contributed outstanding service to the Association. Nominations of individuals for consideration may be by individual members or upon nomination by a Chapter (SEAOA Bylaws (2012), III.7). The candidate must be nominated by SEAOA full members (active, retired, honorary) in good standing with the organization.

Please use the following links for more information on the Honorary Membership Award and how to submit a nomination. Please take a few minutes to review and if you know of a deserving member, submit a nomination:

[Overview of the Requirements](#)

[Fillable Form for a Nomination](#)

[Example of a Completed Form](#)

Nominations may be submitted to info@seaoa.org by January 31, 2022.

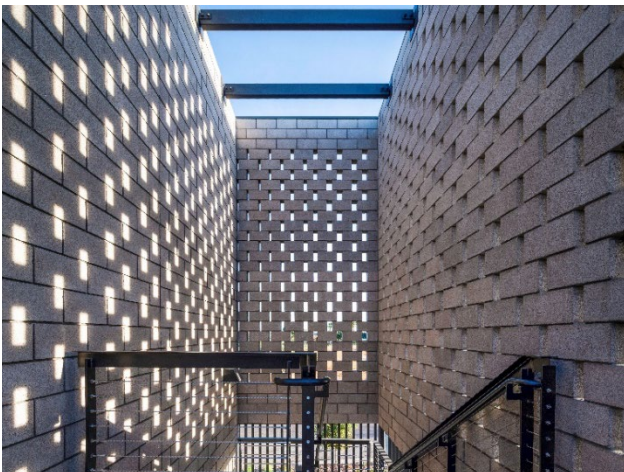
2021 SEAOA Merit Award in Structural Engineering Winner: **Pangolin Structural, LLC**

New Buildings, \$2 Million to \$10 Million: Supima Agave Center, Tempe, AZ

SUPIMA's new headquarters in Tempe, Arizona is inspired by the signature material they produce; luxurious, extra-long staple cotton. RSP Architects brought this vision to life with inspiration and language from the processing of cotton - folding, pulling apart, and removal.



The building displays each structural material used which makes it a delight for a structural engineer. CMU is often hidden away, but in this case the CMU walls are elevated from simple material to a high-level design element. The 'woven block' in the accent walls give the appearance of being pulled apart like cotton fibers and casts a 'fabric of light' through the gaps to the surfaces beyond. Structural steel is exposed throughout the interior of the buildings as well as the courtyard walkways and canopies.



The headquarters is comprised of two, 23,000SF two-story exposed masonry buildings with a free-spanning steel catwalk connecting the two, creating a shared courtyard area. The buildings have multiple 32'-0" tall masonry wing walls with 'woven block' to increase natural light. In addition to

the wing walls there is a 6'-0" long perforated masonry wall supported by a 2'-0" deep lintel beam cantilevered out from the second floor on the east side of Building Two. This cantilevered perforated masonry wall also supports an architectural steel scrim wall hanging below.



The roof is framed with steel deck on steel joists free spanning the entire 41'-0" interior space to the exterior masonry walls. Building One features tube steel header beams hanging from the roof joists to provide structural support to the room's surrounding glass panels. There are multiple exposed steel tube trellises cantilevered from the exterior masonry walls and steel beams above the second floor throughout the buildings. The floor is framed with concrete over steel deck supported by steel beams free spanning the entire 41'-0" interior space.

As with most beautiful buildings, there are many challenges to overcome. The main barrier for SUPIMA would be coordination of the perforated masonry block walls. Because of the delicacy of the staggered blocks, two masonry crew members were trained in details and placement of masonry. Multiple mock-up walls were constructed and both crews were in constant communication as well as coordination with the EOR during construction. This ensured proper spacing of the angled masonry blocks allowing the wall reinforcing to be fed through the overlapping cells. The coordination and exquisite workmanship provided the proper structural integrity as well as the elegant woven surface appearance.

2021 SEAOA Merit Award in Structural Engineering Winner:

DLR Group

New Buildings, Over \$10 Million Dollars:

Pima Community College Transportation Center, Tucson, AZ

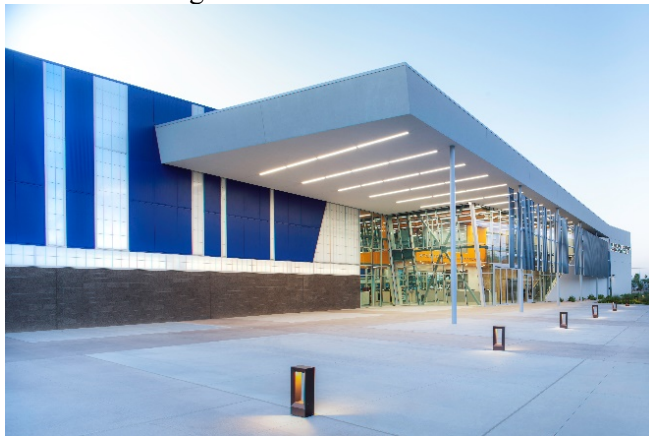
Tom Kramer, PE, SE, Project Manager, tkramer@dlrgroup.com

Liz Brack, PE, SE, Project Engineer, ebrack@dlrgroup.com

Geoff Leewaye, EIT, Project Engineer, gleewaye@dlrgroup.com

Diana Gonzalez, EIT, Project Engineer, dgonzalez@dlrgroup.com

At 43,000 square feet, the Transportation Center in Tucson's Pima Community College provides students and staff with 27 work bays, spaces for testing and diagnosis of electrical vehicles, faculty offices, a large glass conference room overlooking the work bays, as well as classrooms. The Transportation Center, which was recently featured on the November 2021 issue of STRUCTURE Magazine, focuses on responding to flexibility and visibility, resulting in a state-of-the-art, hands-on learning environment.



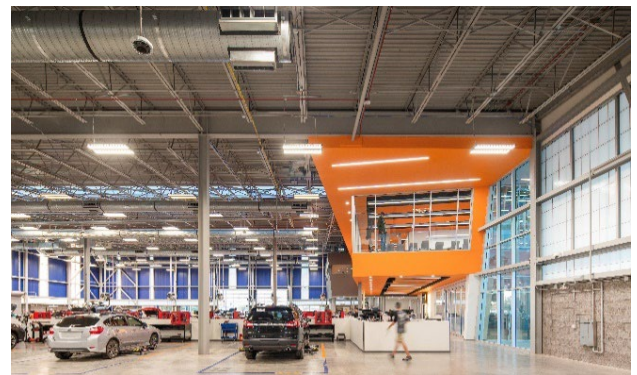
Pima Community College Transportation Center Front Entrance

The building's structural design succeeded in accommodating the building's function and layout while maintaining continual load transfer and exposed structural framing. An example of maintaining continuity in the load transfer occurs in the unique stitched-together design at the high bay roof where the diaphragm was made discontinuous by the skylight. To analyze, the team created a finite element model with rigid diaphragms and analyzed the "stitching" as a horizontal truss. Additionally, to create a light and airy shade structure, the large entry canopy was designed to tie into the lateral system of the main building. This eliminated the need for additional bracing and was achieved with custom drag connections between the two structures.



Discontinuous Diaphragm Due to Skylight in High Bay Roof

At an imposing 80-degree slope, the complex and unique canted brace highlights the entry lobby. The brace required a higher degree of analysis due to the increased eccentricity. The 80-degree slope continues into the glass conference room that overlooks the Autolab and lobby. The large corner conference room with a floating effect is another design element that was crucial to the overall design of the building. The placement of columns and the addition of large transfer girders were crucial to delivering the intended visual.



Canted Conference Room with Floating Effect

Another complexity came forth when transitioning from the large auto bay space to the individual offices, which were not on the same structural grid. This transition required transferring both the gravity and lateral loads through transfer girders and custom drag connections. The transfer girder and steel framing plans were all detailed early in the process to ensure smooth coordination and best-in-class design.

2021 SEAOA Merit Award in Structural Engineering Winner: **Pangolin Structural, LLC**

New Buildings, \$2 Million to \$10 Million: Asante Park Library, Surprise, AZ

Asante Library was a design-build collaboration between Pangolin Structural, Richard Kennedy Architects, and Haydon Building Corp. It is a 10,000-SF, \$4.5M, single-story design-build building operated by the Maricopa Library District and owned by the City of Surprise. The library features an expansive glass exterior along with elegant, cantilevered shade canopies surrounding the perimeter to defuse the sunlight on the building's facade. The team at Richard Kennedy Architects drew inspiration from a tree canopy when designing the banded shade canopy. A scrim formed from perforated steel track serves to filter light as it enters the interior space while preserving views of the nearby White Tank Mountains. The library contains a large reading room, multiple study rooms, designated children's and teen's rooms, and a multi-purpose maker space.



The structure consists of a steel beam and steel joist roof supported by steel columns, masonry bearing walls, concrete retaining walls and spread footings. Located within a regional retention basin, the structure was set on a five-foot-tall plinth that extends into the basin. Concrete retaining walls enclose the soil of the plinth and elevate the building above the expected water level. The retaining walls themselves are unique in that they are constructed utilizing insulated concrete forms which were then stripped on the exterior to create a striated vertical exposed concrete pattern.

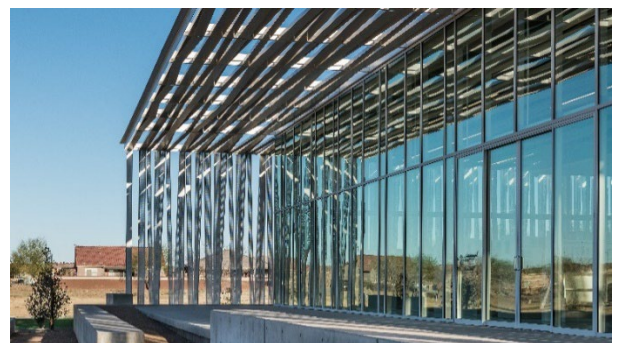
From the exterior, the building appears to be constructed of a glass box slipped into a steel frame sleeve. This design was created by cantilevering a steel scrim canopy on all four sides. The cantilevered shade canopies surrounding the perimeter are both elegant and functional, reducing direct sunlight on the building's glass exterior. This unique structural challenge was accomplished by utilizing rectangular steel HSS tubes that are bearing and supported above the main roof structure. The scrim canopy needed to

remain flat and horizontal while the main steel joist and wide-flange beam roof structure sloped to accommodate internal roof drainage.



The horizontal and vertical exterior steel scrim surrounding the glass box structure was created from light gage steel channels of varying sizes, orientation, slope and a mix of solid and perforated pieces. The design team worked tirelessly with the Design-Build contractor and their subcontractors to accomplish this light, patterned appearance while minimizing scrim connections in order to preserve visual impact, all while staying within budget.

An interior masonry core serves as the main lateral force resisting system with cantilevered diaphragms to the north, east and west. With the south diaphragm being too large to cantilever, two steel rod braced frames were introduced in an X-configuration to provide lateral bracing on the south façade while minimizing the visual impact on the fully glass exterior.



This project employed simple and durable materials arranged in exhilarating ways. With a design and construction cost of just \$4.5 million, Asante Library demonstrates that inspired and unique design can also be cost-effective.