



State President's Message

Andy DiLeo, PE, SE
SEAOA State President



Hello SEAOA,

I can't believe that it's October already. While the holiday season quickly approaches, a new year of SEAOA is just getting started. The monthly Chapter meetings have begun because of the advance work done by the Chapters' Boards.

At the State Board level, planning for the next convention is underway. After sorting through the first round of proposals from potential venues, we have it down to five possibilities in the greater Phoenix area, with possible dates in early to mid-June. Soon the convention planning committee will select a venue and a date and then begin soliciting presenters.

We still have a lot of work to do, and this is a great time for suggestions that any of you members may have for our next convention. Please reach out to us at info@seaoa.org.

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TUCSON CHAPTER MEETING
October 19, 2022



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CENTRAL CHAPTER MEETING
October 18, 2022
12pm
ASCE Joint Meeting

Central Chapter Chairperson's Message

Mark Forman, P.E., S.E.
Central Chapter Chair



Greeting members!

I am the new central chapter chairman this year. A little about myself, I have been a structural engineer with DLR Group for over 35 years. I have been practicing in the valley of the Sun for 34 of those years and have been an active member of the board of directors for the last five years. My certificate of membership in SEAoA is

dated 1993. I am proud to serve, and I am hopeful for good things this year.

The first central chapter meeting this fall was an overwhelming success. We had thirty members attend the live September meeting to listen to Ben Nelsen PE, a former NCSEA director as he presented on Deferred Submittals. Thanks to James Newhall for lining up our speaker. Also, thanks to Bob Brown of Foundation Solutions for hosting the refreshments before the meeting. The session was recorded, and we hope to share this with the membership on the SEAoA website.

October's meeting is a joint meeting with ASCE. Stay tuned for more information as it becomes available. November's meeting has traditionally been Student night at ASU. This year is no different. Students may attend for free. We have lined up Christa Chau, P.E., S.E., LEED AP, Partner/Director of Special Projects for PK Associates, to present the Beam on Farmer. The Beam on Farmer is one of the first Heavy Timber structures in Arizona. Please plan on attending.

The winter-spring meetings are still being planned; we have many structural experts who have reached out to us with the request to present. Looking forward to a very interesting agenda.

At the last board meeting, it was voted on and approved to offer a live virtual option to all attendees. We will also record all future dinner/seminars and have these available to our members. There will be a small cost for the virtual option, but it will provide an opportunity to those who cannot attend in person. Also, the board approved a cost increase for these dinner/meeting seminars. The cost of the event has exceeded the membership fee. This was necessary to keep these events in a break-even financial situation. I look forward to serving you as the central chapter chairman and I hope to see many of you attending our future meetings.

Need a Structural Engineer?

The SEAoA created a web page for members to add their name to a list of structural engineers who are available to consult on small residential and commercial projects. This list is very helpful for building safety staff in all jurisdictions. When an applicant receives a plan review comment requiring engineering for something like a new lintel in an existing wall, the first question the applicant asks is, "Can you tell me who to use?". Plan review staff are not allowed to make these referrals for several reasons. They can however refer to the website. Please contact Sarah Betts if you are interested in adding your name to this list.

Tucson Chapter President's Message

Steven Hess, PE, S.E.
Tucson Chapter President



One of the aspects I like about Structural Engineering is that we foster the attitude for truth in what we do as well as solve a problem. SE's publish their data, their ideas, and then debate them freely to determine the truth. Our profession is pretty good for these concepts. There has not

been a lot of reason to deviate from these ideals as there is little pressure from society in general to do so. People of all ethical types find it in their interest to let the engineer do a good job on their buildings in most cases.

Forensic analysis for failures can be open to more interpretation of what went wrong. This applies to structures and most anything in society which went wrong. Not everyone likes to have the truth of the matter known for various reasons. In the case of moment frame failures during the 1970's earthquake in California, the Structural Engineers looked back into their prior research and found that tests indicating there was a problem were excluded from the data. This was done as it was assumed to have been due to faulty welding without further analysis. In the Kansas City walkway failure, they found

details had been changed without careful review of the consequences during the shop drawing stage. These lessons have been well publicized to Structural Engineers as all concerned want safety in our buildings. The truth is important in making good decisions and safe structures.

Another famous "failure" was the World Trade Center Building 7 in 2001. It was a building with minor damage on that fateful day and a NIST report indicated it failed due to fire. It was the first and only building to ever have collapsed symmetrically due to fire, even though it was a non-symmetrical structure and had been subjected to non-symmetrical fires. I listened to the NIST presentation at an SEAOA monthly meeting for this building. The presentation seemed pretty spot on but as time passed, it has been pointed out that logically and scientifically this presentation had flaws. At the 2021 virtual SEAOA AZ state convention, we had a presentation highlighting those flaws by Dr. Leroy Hulsey who presented the only scientific way the building could collapse as witnessed on TV that day. To this day, NIST will not acknowledge they had flaws in their analysis. To this day NIST is not transparent with all the data they used for their report as opposed to the presentation we had in 2021 where all the data was open to the public for comment and peer review. As SE's, we need to be aware of the facts even if they point to a truth we wish was not true.

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.



Younger Members Group Chair's Message

Cesar Castro, E.I.T.

YMG Chair

ccastro@mbjeng.com



YMG will be hosting the first meeting on October 27th 6PM at the Meyer Borgman Johnson office. This meeting will be a social hour to encourage networking amongst the young professionals and develop our group. New and returning members will be given the

opportunity to introduce themselves and voice their expectations for YMG.

I highly encourage young professionals to attend this social hour and invite their colleagues to join. For SEAOA, I would like your assistance in promoting within your firms. Please contact me on joining our mailing list to receive additional information for the social hour, meeting invites, group updates, and more opportunities to be involved.

Looking to be more involved, the Social/Networking chair position is available. Contact me to further discuss the position and responsibilities.

THE RIGHT BRAIN

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"...I'VE GOT EYE TROUBLE...
JUST CAN'T SEE WORKING ANY LONGER!"

I've been known to occasionally develop a case of severe eye trouble at the office. Symptoms are usually brought on by a beautiful fall day or a Friday before a long weekend. I'm not a doctor, but my advice is to leave the office immediately at the first sign of symptoms as this type of eye trouble is particularly contagious and can be easily spread to your co-workers.

Soon after Wright Engineers was founded nearly 25 years ago, chronic Friday afternoon eye trouble among my staff and me "forced" us to close the office at noon on Fridays--a healthy practice we've happily kept up ever since.

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

Honorary Membership

Mark Sipes, PE, SE

The Structural Engineers Association of Arizona was established in 1955 with many visions in mind, one of which is to recognize those members who contribute outstanding service to the SEAOA. Our bylaws allow the Board of Directors to award an Honorary Membership to such persons. Section III.7 reads:

7. 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. An Honorary Member will have the voting rights of a Full Member provided they had previously qualified to be

a Full Member of the Association and would receive a complimentary annual membership to the Association and would receive member rates for all Association sponsored events. Nomination of individuals for consideration may be by individual members or upon nomination by a Chapter.

You, as an individual, can nominate an individual to be recognized for their contributions to the SEAOA and who has affected the membership and inspired others to volunteer, contribute, and to share with the community what we do as structural engineers.

The SEAOA website has a fillable form to be used in nominating a member for honorary membership. I encourage you to read over the criteria once more and to nominate that person in our organization that made a difference.

2022 SEAOA Excellence in Structural Engineering Winner: PK Associates

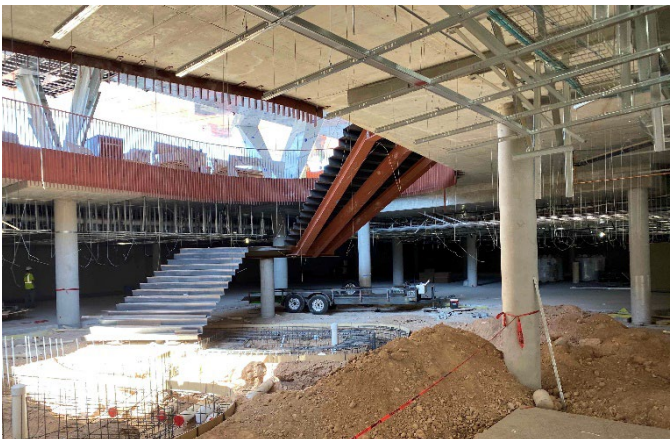
New Buildings, over \$10 Million: Helios Education Campus, Phoenix, AZ

Christa Chau, PE, SE
Valerie Granger, PE, SE, Project Manager.
Dane Henry, Project Engineer

Designed for resiliency and sustainability, the Helios Education Campus includes a complex 2-story, 85,000 SF office building over a daylight 210-stall parking structure designed to adapt to future office. The structure embraces the natural geology of Arizona, while the site and the building work in partnership to reduce potable water and energy use.



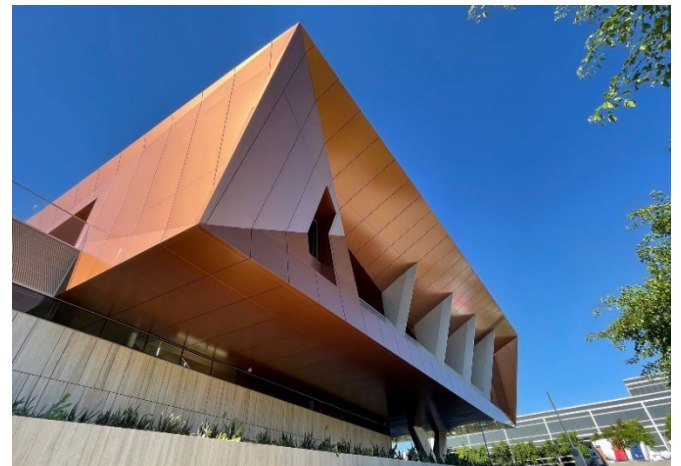
A 290-foot-long canyon divides most of the steel-framed building. Amenity areas within this canyon include creatively designed 'floating' concrete walkways surrounded by landscaping. The mild-reinforced podium slab supports significant loads while accommodating large, curved slab penetrations that bring daylight into the garage below. A custom, feature stair incorporates a wide V-shaped curve to complement the distinct slab penetration. Steel plate treads and risers appear to float, as supporting splayed wide flange beams are inset, with a single concrete column supporting the intermediate landing.



A custom circular stair interconnects the first and second floors of the steel structure. Creative structural detailing allowed individual, custom precast concrete treads to cantilever from a curved, freestanding masonry wall.



This buildings' open office concept and nature focus created numerous unique structural design opportunities. To prevent exposed, surface level parking, the garage is below grade. Property line retaining walls set back from the garage perimeter allow natural light and a feeling of openness. These massive retaining walls are as tall as 25'-10". West and South basement walls retained soil, creating an unbalanced soil load that impacted the lateral force resisting system.



The complex geometry of this structure pushes the typical concepts of steel design, requiring innovative structural framing and careful attention to load path. The faceted exterior skin and large overhangs required steel framing to cantilever at both the floor and roof levels. Anchored to the podium slab near the main entrance, V-shaped columns support the cantilevered beams.

2022 SEAOA Merit Award in Structural Engineering Winner: DLR Group

New Buildings, over \$10 Million: Northern Arizona University – Student-Athlete High-Performance Center, Flagstaff, AZ

Mark Forman, PE, SE, Project Manager.

E: mforman@dlrgroup.com

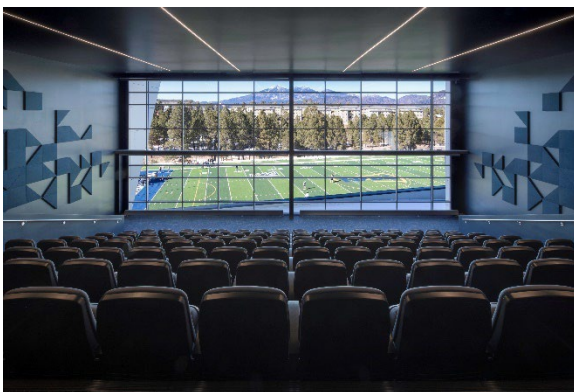
Diana Gonzalez, EIT, Project Engineer.

E: dgonzalez@dlrgroup.com



Courtesy of DLR Group: NAU Student-Athlete High-Performance Center

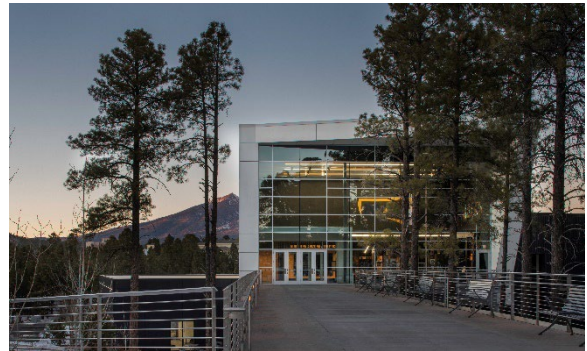
The state-of-the-art High-Performance Center sits on a hillside of Ponderosa Pines and provides athletes and faculty with a weight room, sports medicine space, academic center, locker room, practice basketball court, team meeting room, and Hall of Fame. The facility also has an iconic team auditorium located on the third level, with unobstructed views of the 12,600-foot Humphrey's Peak and the San Francisco Range. The building's unique spaces and environment provided structural challenges and opportunities for creative solutions.



Courtesy of DLR Group: View of Humphrey's Peak from the Jewel Box

To achieve unobstructed views of Humphrey's Peak, the orientation of the third-level auditorium and hall of fame, referred to as the "Jewel Box", was strategically rotated

15 degrees. The rotation, causing geometric and cost challenges to the structure and design, required the design team to explore multiple framing options. A truss framing system, as well as a pre-engineered metal building system (PEMB), are two of the framing options considered. An innovative hybrid of PEMB and conventional framing delivered a world-class design in a manner that delivered on budget but did not compromise the overall design and high-performance needs.



Courtesy of DLR Group: Bridge Entrance to the Jewel Box

The site's existing grades did not coincide with the required finish floor elevation, so the team first explored backfilling the soil to provide access to the third level. However, raising the grade had other detrimental consequences which included 30-foot-tall retaining walls, large amounts of fill import, loss of daylight on the second floor, and the removal of mature ponderosa pines. The structural team chose to work with the topography instead of against it and provided a bridge to alleviate and solve all these problems. The use of the concrete precast bridge as a design solution provided massive cost savings and schedule benefits. The pedestrian bridge entry to the third-level Jewel Box celebrates the landscape while using materials and labor efficiently.

The interaction of the topography and bridge foundations required creative design and quick solutions even after design, as the bridge foundations interfered with several of the existing ponderosa pines integral to the building's entrance. The structural team quickly reviewed the foundations for new locations with eccentric loading to provide new designs during construction.

2022 SEAOA Excellence in Structural Engineering

Winner: PK Associates

New Buildings, over \$10 Million: Adeline, Phoenix, AZ

Christa Chau, PE, SE
 Jack Koehler, PE, SE, Project Manager.
 Tyler Koehler, EIT, Project Engineer

The Adeline is a 25-story 355,364 SF luxury apartment development that consists of 379 residential units with a rooftop pool, urban park and dog run. The existing 3-story, below-grade parking garage was originally intended for a 20-story, smaller footprint building. Structural ingenuity was required to add additional levels and increase the footprint with an eleven-story north wing.



Analysis of the lateral systems and foundations identified required remediations. To optimize the residential layout above, the east core required a smaller footprint—a concrete wall was added from foundation to roof, allowing the north wall to terminate at level two. The west core required additional concrete shear walls—an existing wall was lengthened through the basement levels and a new wall was added from foundation to roof. Existing mat foundations were enlarged and interconnected with adjacent, existing spread foundations to support added loads. At new wall to existing slab connections, cores

through existing slabs allowed continuity of wall vertical reinforcing with minimal impact to existing slabs.



The second-level amenity deck supports significant loads imposed by the swimming pool, hot tub, and multiple larger planters. Located over the new architectural entry drive that required tall, wide-open spaces, the amenity deck was framed with long-span post-tensioned beams. The longest beam clear spanned 65 feet into an intersecting transfer girder that was supported by another transfer girder. The pool deck was elevated, allowing beam depths to increase.



The relocation of the entry drive from the original, unbuilt, planned design imposed an additional 150 PSF live load on the existing concrete slab. PK Associates performed multiple finite element analyses on the existing concrete slab to identify failure zones that could be modeled as top surface hinges. This helped isolate the required carbon-fiber strengthening to specific areas at the underside of the slab only.

Dear SEAoA,

My name is Alexander Owen, and I am grateful to you for selecting me as the recipient of the Structural Engineers Association of Arizona Scholarship. This scholarship will enable me to attend Arizona State University to pursue my master's degree in Structural Engineering

I developed a passion for civil engineering at a young age through my interest in city-building games, strategic board games, and the history channel being on 24/7 in my house as a child. I was fascinated with how the world had developed and why it worked the way it did, and this desire to know more only increased the more I learned about math and science. I realized that the buildings, canals, and roads I saw every day were the result of hundreds of years of history and math, the subjects I enjoyed most. I went forward with a degree in civil engineering, and after taking my first structural design class, I had decided that structures was the path for me, a decision that was only reinforced by a bridge engineering internship.

I plan to continue to prioritize my education, and to finish my master's degree with a thesis by Spring 2023, with my primary goal not being just to graduate, but to learn as much about the field of structural engineering as I can. This scholarship will allow me to fully focus on my studies, and again, I thank you for selecting me for this scholarship.

Sincerely,

Alexander Owen

Email: awowen@asu.edu Phone: 623-866-3524



Alexander Owen

What are your future plans?

I currently have begun working part-time for WSP in Tempe, and I will continue to work as a bridge engineering intern this summer. I began working this semester, as I wanted to get a head start on the summer, and I am currently working towards saving up for my master's year. For the majority of my undergrad schooling, I have worked my way through, as I am trying to mitigate the amount of debt I accumulate throughout the duration of school. My jobs have ranged from lifeguarding to TAing, to even being a Residential Assistant in housing, and now I am interning, a job that admittedly is much closer to what I would like to do after I graduate. That being said, the more time I spend working during the school year, the less time I have to focus on my studies and research, two of the main reasons that I am doing my master's degree. This award will help me focus more on school and allow me to be as knowledgeable as possible when I ultimately enter the workforce.

What do you do in your free time?

I have become a hardcore board games player since 2020, and as of last year, I have become a pro at Settlers of Catan. I enjoy playing board games with friends and family, but when I am not playing board games, I am usually rooting for the Phoenix Suns. As an Arizona native, all local sports teams are my favorite, and I enjoy cheering on our local teams.