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Spring / Summer 2020

THE 2019-2020 OFFICERS*

* We will introduce the 2020-2021 Board in the Fall Issue of the Newsletter

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mfrabizzio@aidpe.com



asokalski@mccormicktaylor.com



hsabe@arh-us.com



joemacios@hotmail.com



mbencotter@mbakerintl.com

Board of Directors

Membership
Alex Kluka

Sorry,
I'm Camera Shy

Alexander.Kluka@wsp.com

Sponsorship/Venues
Chris Gentz



chris.gentz@wsp.com

Education
Richard Grubb



rgrubb@rgaincorporated.com

Website
Rémy Donahey



remy.donahey@gmail.com

Regional Director
Joseph Danyo, PE



jdanyo@mbakerintl.com

Public Relations
Chris Donahey, PE



cdonahey@gpinet.com

PDH Coordinator
Phil Thompson



pthompson@hardestyhanover.com



A Message from Mike Frabizzio, ASHE SNJ (Outgoing) President

As the ASHE year comes to a close, this last newsletter of the 2019-2020 campaign affords the annual opportunity to look back on what was accomplished this year and where we are headed. If our attendance and participation at dinner meetings is any evidence, the Southern NJ section of ASHE is as strong as it has ever been and that's thanks to all of you for coming out each month to make it happen. Riding the momentum of past years, this year saw well-attended meetings along with student outreach and philanthropical endeavors. As we were set to finish the year strong with an exciting field trip and Project of the Year (POTY) Awards, COVID-19 intervened, wiping out our planned events. While it may seem like the virus silenced our section, with no scheduled gatherings taking place, be assured that our Board continued to work hard behind the scenes to maintain our mission and plan for the best way forward. As crises often do, this may have made our section and our NJ ASHE community even stronger. We have had some of our best Board meetings virtually over the past couple months and the North-Central NJ (NCNJ) section and our section have collaborated to ensure we finish the year strong and are ready to thrive in the Fall, when hopefully we will be able to gather in person with a renewed sense of appreciation for one another. To that end, the two NJ sections of ASHE are looking to offer a PDH webinar or two to close out this year.

In a typical year, we would have had our POTY Awards dinner in April. While we were not able to hold the event last month, our Board and judges followed through on this worthy initiative and the winners are being announced via our website and email. Together with the NCNJ section, we are hoping to schedule one of the aforementioned webinars to include presentations by our POTY winning firms. We also are looking to recognize the winners in person at our Fall joint meeting.

There are also a couple of other very notable items from our section. First, our very own Richard Grubb of Richard Grubb & Associates, Inc., has been recognized as the ASHE National Member of the Year!!! This is a tremendous honor for a very deserving, long-time member of our

Board. Richard has been a pioneer of ASHE student outreach not just within NJ but also nationally. He has sparked the creation of ASHE chapters at Mercer County CC and Rowan University and continues to look for opportunities to promote the highway industry to aspiring undergraduates. Richard leads the Education Committee that joins members from both NJ sections and has presided over panels on student outreach at the ASHE National Conference. Please let Richard know how proud we are of him the next time you get to elbow-shake with him.

On another front, Carrie Strehle once again led perhaps our most impactful initiative, which is our annual Scholarship contest. Soliciting and poring over applications with our Scholarship committee, our section is proud to have awarded 4 undergraduates (from Rowan and The College of New Jersey) with scholarships towards their engineering studies. These scholarships are directly funded by the proceeds from our Annual Golf Outing, so the real thanks go to all of you who participate and sponsor that great event. Speaking of which ... we are hopeful that we will still be able to hold our Golf Outing as scheduled, which is to take place on July 15 at Little Mill Country Club (same venue as last year). Please stay tuned and (hopefully!) come out to support this can't-miss event that is the sole source for our scholarships.

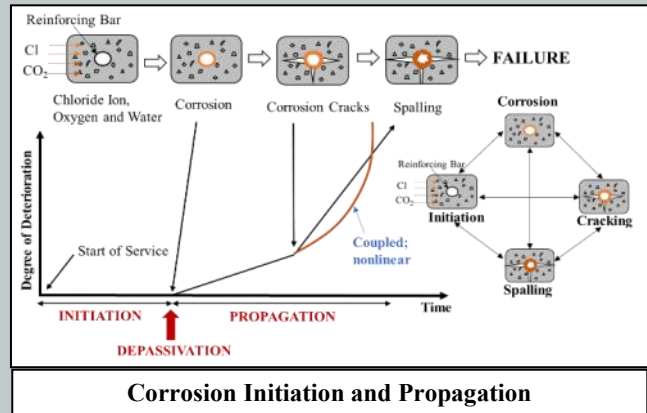
Last but not least, I'd like to thank my fellow Board members for all of their hard work and comradery over this past year. Being part of the Board is a great experience that allows you to meet new and familiar faces, get to know them much better, and make a difference in our local professional community. Please consider becoming active in our section – reach out to any of the current Board members if you're interested. We will be celebrating our 35th year as an ASHE section next year, so there is a lot to look forward to.

On behalf of the Southern NJ section Board, I wish you and your families the best of health and a fantastic rest of the calendar year. As we look to come out of this COVID crisis, let your experience over the past couple of months be a source of revitalization to make the most of the opportunities that lie ahead.

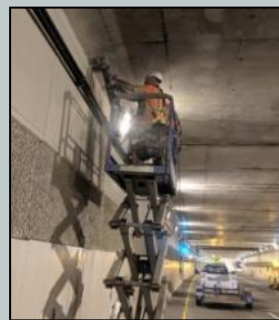
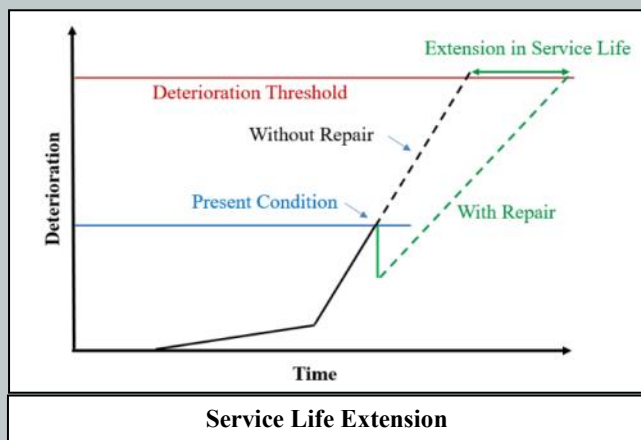
Spotlight on Advanced Infrastructure Design (AID) Remaining Service Life Assessment of Bridge Substructure RC Elements

Maintenance and rehabilitation of America's 616,087 bridges is a major challenge for state departments of transportation (DOTs), local agencies, and other bridge owners. Over 46,000 bridge structures in the country are in poor condition or classified as structurally deficient according to the National Bridge Inventory (NBI) 2019 database. Considering the magnitude of this problem, a well-designed strategy should be followed to identify, maintain, repair, or replace the existing infrastructure. More often than not, when a bridge's superstructure and/or deck needs to be replaced because of excessive deterioration or to facilitate widening of the deck, the substructure has not yet reached the end of its service life. Therefore, re-use of the existing substructure elements is a cost saving option worth exploring. To that end, it is necessary to determine the Remaining Service Life (RSL) of the substructure and ensure that it will last long enough to support the new superstructure and deck during their design service lives.

A primary cause of deficiencies in concrete elements is corrosion of the reinforcing steel. Chloride ingress plays a significant role in the corrosion process. Hence, service life models often analyze and predict chloride diffusion and the subsequent corrosion propagation to estimate the future deterioration of the reinforced concrete elements. Other possible causes of concrete deterioration, such as Alkali-Silica Reaction (ASR), freeze-thaw damage, and carbonation-induced corrosion should also be considered in evaluating the structure's service life. Two well-established RSL models are presented in NCHRP Report 558 and ACI Report 365.1R-00 (Life 365).



Advanced Infrastructure Design, Inc. (AID) has provided RSL assessment services for many bridge rehabilitation projects in New Jersey. On a typical substructure evaluation project, we perform a comprehensive testing program that includes in situ non-destructive testing, concrete sampling via coring, and laboratory testing, and conduct service life modeling. AID's drillers maintain a wealth of experience in various challenging situations and environments, including sampling from boats and under-bridge access units, at high elevations, and in dark, low-ceiling culverts.



Coring



Half-Cell



GPR Scanning



Surface Resistivity

With regard to non-destructive testing, AID makes use of a wide range of methods, including but not limited to, hammer sounding delamination survey, surface resistivity, impact echo, and half-cell potential testing. In addition, AID uses a Ground Penetrating Radar (GPR) or rebar locator to locate rebars and determine concrete cover depth in order to avoid damaging the reinforcement.

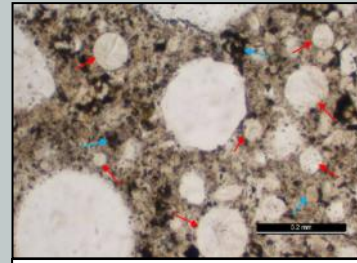


Compressive Strength Test

Surface Resistivity Test



Chloride Ion Content Test



Petrographic Examination

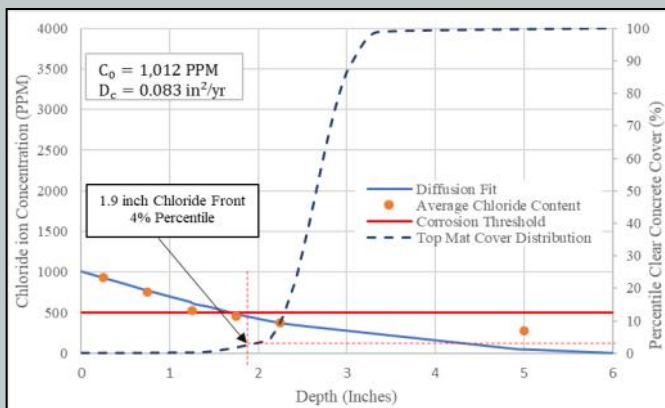


Carbonation Test

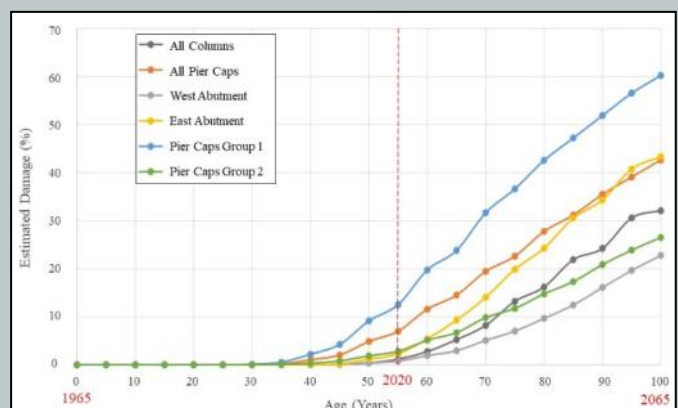
Service life modeling is performed by estimating the rate of chloride penetration into the existing concrete and the time necessary for chloride ions to reach the reinforcing steel and accumulate at a chloride threshold concentration. AID utilizes this analysis to determine if the substructure elements are at a high-risk of corrosion-induced deterioration, even when no distress is currently observed. The future damage is projected as a function of the structure's age and the service life of substructure elements is predicted. Based on the outcome of this analysis, repair and corrosion mitigating alternatives for extending the service life of the structure are suggested. Once the feasible options have been established, a life-cycle cost analysis is performed to determine the preferred alternative.

Complementary laboratory testing consists of chloride ion content testing, carbonation testing, petrographic examination, pH testing, compressive strength testing, stiffness damage testing, and surface resistivity testing. Chloride testing is performed at various horizons (depths) from the concrete surface to establish a chloride profile.

By Abeer Al-Shammari, Ph.D., and Mojtaba Afzali, Ph.D.



Chloride Profile and Distribution of Concrete Cover



Projection of Corrosion Induced Damage

NJ PROJECT OF THE YEAR

OVER \$5 MILLION

Washington Street is a historic, vibrant corridor within the City of Hoboken which brings together residents, business owners and visitors. Once named by the American Planning Association among the nation's "10 Great Streets," the decades had taken their toll on the busy thoroughfare. Traffic signals were outdated resulting in increased collisions and dangerous conditions for pedestrians. The roadway, featuring two lanes of opposing traffic, had no accommodations for bicycles, and was frequently throttled by deliveries and trash pickups. Double-parking and reduced pedestrian sight-distances added further complications. Superstorm Sandy and other major rainstorms were a painful reminder to the city that the aging sewer system was overtaxed. The century-old water infrastructure was contending with water main breaks and storm flooding, and critical facilities lacked emergency backup power.

In 2015, the City of Hoboken, in conjunction with T&M Associates and the New Jersey Department of Transportation, moved forward with a plan to modernize Washington Street and make it safer and more accessible for all users. T&M Associates was engaged to perform the streets redesign which led to the acquisition of additional contracts for construction administration, inspection, and observation services. Project requirements encompassed the reconfiguration of 15 blocks spanning from Observer Highway to 14th Street with the integration of complete street designs to improve overall mobility and visual enhancement.

Creating a busy corridor that offered safe, convenient, and comfortable travel and access for all users and abilities was no easy task. T&M worked closely with city officials, businesses, and residents over a two-year period to find and incorporate solutions to problems which included high-visibility crosswalks, 14 state-of-the-art ADA-compliant traffic signals armed with GPS timers, pedestrian countdown indicators, and signal preemption features to facilitate emergency vehicles. Dedicated loading zones and



color-coded bus stops were installed to decrease congestion. Back-in parallel parking spaces and bike lanes with green, high-visibility pavement were installed to improve safety.

In addition to traffic improvements, T&M oversaw the installation of one of the country's first municipal electrical microgrids used to supply redundant power to critical facilities. A fiber optic spine was installed to enhance internet connectivity. To improve water quality and reduce service interruptions, 9,000 linear feet of water mains, 530 water services, and 31 fire hydrants were replaced and 2,300-LF of new drainage pipe and 58 new drainage inlets and manholes were installed. The antiquated water distribution system was upgraded to include new lateral service connections for all residences and businesses along the street. "Green" enhancements included the installation of 15 rain gardens where collected stormwater is used to beautify the streetscape rather than burden the sewers.

Throughout the life of this extensive revitalization project the busy corridor of Washington Street remained open to vehicles and pedestrians with minimal delays and interruptions for vehicles, transit, pedestrians, and bicyclists. The project was successfully completed last July. Washington Street is now a safe, modern, and attractive streetscape with reduced traffic congestion, greater mobility options, and an overall boost to the community's vitality.

NJ PROJECT OF THE YEAR

UNDER \$5 MILLION

Once referred to as a “death trap” by the Times of Trenton, the intersection of Route 206, South Broad Street, and White Horse Avenue was long overdue for a change. For drivers in Hamilton Township, White Horse Circle was more akin to a maze than an intersection, and it was often avoided by drivers because of the confusing crisscrossing lanes at the intersection. Between 2006 and 2008, there were a total of 161 crashes at the intersection of which 56 included injuries.



The New Jersey Department of Transportation (NJDOT) began exploring ways to improve safety at the circle and enlisted Urban Engineers to develop conceptual designs for several options, including a modern roundabout that was ultimately selected for construction. Rather than cutting through the circle, all approaching vehicles would yield to circulating vehicles within the roundabout which would in turn remove several conflict points that existed in its original configuration.

Promoting a modern roundabout as a solution in a State known for removing “traffic circles” was not an easy task. Along with NJDOT, Mercer County, and Hamilton Township, Urban created and executed a public involvement process, engaging and educating the public on the difference between roundabouts and traffic circles and demonstrating how the modern roundabout was the best solution through pamphlets, presentations, virtual modeling, and Q&A’s. Urban worked with partners to create a multi-

staged traffic control plan with limited detours. The firm designed a single/double lane hybrid roundabout that was 170 feet in diameter with 16-foot wide lanes. Each approach has a splitter island and the White Horse Avenue and South Broad Street approaches both include high-visibility crosswalks.

Completed in April 2018 by South State, Inc., the new roundabout serves as an aesthetically pleasing gateway into Hamilton Township that is much safer for drivers and pedestrians. It also provides a smooth transition from the multilane highway section of Route 206 to the residential streetscapes of town. In the first six months since its completion, the improvements to White Horse Circle have decreased the average total crashes per month by 71% and total injury crashes by 93%. The immediate positive impact these improvements are having on the traffic flow and safety of the traveling public is clearly evident. The success of this project would not be possible without the commitment of our local and state partners, and the commendable performance of the contractor and construction managers.



Scholarship Golf Outing



This year's Golf Outing was a little "touch-and-go" as New Jersey came to grips with the COVID-19 pandemic; however, after considerable perseverance, the team at ASHE SNJ put together a plan that included a boxed breakfast and a boxed lunch with ample outdoor dining areas. It was a hit for both the volunteers and the golfers. Turnout was excellent, albeit down from last year. After a careful accounting, the board has determined that the outing netted enough for ASHE SNJ to match our scholarship giving from last year.

The competition for coveted prizes was just as intense as every year. Congratulations to this year's winners:

1st Place KS Engineers, Score -10: Kamal Shahid, Robert Scancellia, Ray Fergione, David Daddario

2nd Place AECOM, Score -6: Christopher Bergeman, Anthony Guerrieri, Frank Inverso, Mike Girman



Longest Drive (Men): Alex Kluka, WSP

Longest Drive (Women): Nicole Khan, KMA

Longest Drive (Senior): Gus Macios

Closest to Pin: Stephen Forney, Baker

See you again next year! ■



Section News & Meetings

First Virtual ASHE Meeting is a Success Featuring Goethals Bridge Replacement Project

The online meeting, the first of its kind, featured the Quality Program for the Goethals Bridge construction. The Goethals Bridge spans the Arthur Kill between Staten Island, NY and Elizabeth, NJ. By the beginning of the 21st century, the original Goethals Bridge was recognized to be functionally obsolete. To replace it, the Port Authority of New York and New Jersey (PANYNJ) chose to use the public-private partnership delivery method. As part of the Developer/Client's (NYNJ Link's) team, KS Engineers, P.C. (KSE) was selected to perform Construction Quality Assurance (QA) and Construction Engineering and Inspection (CEI) Services.

The vast and complex web of interacting processes that comprised the construction of the new bridge (and the demolition of the old structure) required an array of innovations in monitoring those processes, from permitting to quality assurance, to resource tracking, to CEI scheduling. While the Construction Contractor developed its own Lead Contractor Quality Control Plan, this had to be audited by KSE as the CEI Consultant. An extensive independent testing program was created by CEI for all material that went into the construction, above and beyond the quality control (QC) testing performed by the Contractor. It also had to be coordinated with the separate and independent testing performed by the PANYNJ. This QA Plan also included the inspection of construction activities throughout the process. At the height of the construction activities, 35 persons from the KSE team were active on site, performing inspections and making certain that all the QC requirements were met.

Project documentation was also intensively covered by the QA Plan. Document Control procedures were put into place to ensure that current documents, drawings, and specifications were available prior to the start of work, and that obsolete documents were removed or appropriately identified. A series of Controlled Inspection (CI) Checklists were developed by the CEI and implemented to make certain that all the requirements for design and construction for each element of the work were fully documented before the element was accepted. Overall, KSE and our subconsultants created from scratch and administered approximately 170 different CI checklists. KSE also performed on-site periodic audits of the Contractor's CI checklists of work items completed and in progress. The CI checklists, along with the Nonconformance and Daily Work Reports, documented the level of quality of the project.

The overall effort included constant evaluations of our methods in order to improve on both our processes and procedures. If a process or procedure was deemed ineffective or could be replaced by a more efficient process, it was eliminated. As this practice continued over time, and processes were repeatedly checked and proven effective, Standard Operating Procedures (SOPs) were created for frequently performed tasks, which made it easier to apply and document those processes. The entire CEI component of this project was therefore under constant, iterative review and improvement, with the result being the development of continued new, innovative practices to manage large and complex engineering projects. These practices, having been tested repeatedly, can now be applied to other large and complex projects.



Section News & Meetings

Scudder Falls Bridge Meeting and Field Trip to Be Rescheduled

The Scudder Falls Bridge meeting and field trip, originally scheduled for March, are being rescheduled due to COVID-19. Project progress is impressive, with one span having been completed and the other span under construction. We hope to be out there soon!



2020 NJ Project of the Year

This year's Project of the Year presentations, one of our most popular meetings of the year, were held on-line. The online format was a bit of a let-down, however the "flu" did not detract from the quality of the submissions. There were three submissions in the Under \$5 Million category and six submissions in the Over \$5 million category. The competition was tough. The Over \$5 Million winning submission was the Washington Street Improvements in Hoboken City, submitted by T&M Associates. Urban Engineers White Horse Circle project took the Under \$5 Million category. See pages 6 and 7 to read more about these award-winning

projects. We will feature the other submissions (which were also great) in the Fall Newsletter.

Be prepared, next year the project categories will be Over and Under **\$10 Million**.

2020 Membership Drive

With the COVID-19 crisis getting into full swing this Summer, it is surprising that most members remembered to renew for this year. If you are one of the few who understandably let this slip between the cracks, time is running out. We need your renewal **before the end of September** when dues get paid to National ASHE. We are planning a full slate of meetings this year while making the necessary adjustments to allow for social distancing. You will not want to miss this program!

2020-2021 Officers Swearing-In

In August, during an online meeting, the officers for the new year were sworn-in. Under the leadership of Amy Sokalski, President and Joseph Macios, Vice President, this promises to be a great year. We will introduce the new board in the Fall Newsletter.

Student Chapters

We are in the second year of the program to advance Student Chapters in engineering colleges throughout New Jersey. This program is a joint ASHE SNJ and NC-NJ initiative, remaining under the leadership of Richard Grubb. We are looking to pick up where we left off in the Spring. Despite the added complexity of COVID-19, we are looking forward to collaborating with students and faculty advisors to address the new challenges.

Section News & Meetings

Richard Grubb Wins ASHE National Member of the Year

The ASHE National Board recognized Richard Grubb for his level of involvement and contribution to the society by naming him Member of the Year. Richard was instrumental in starting the first two student chapters within the ASHE Southern NJ Section. As ASHE SNJ Membership Chairman, Richard took initiative with several students who regularly attended Society meetings and guided them through the process of starting a student chapter at Rowan University. Richard mentored and assisted the students throughout the one-year journey before they were fully chartered with the University. Through this effort, Richard recognized the need, and formed the separate Education Committee to focus on developing student chapters to foster the involvement of local engineering students in the professional engineering society. He then volunteered to serve as Chairman of the new committee. Richard continues his involvement with Rowan by helping the students with chapter sustainability, committee activities, reaching out to professionals to present during meetings, and fundraising. The Committee's success at Rowan was almost immediately followed-up at Mercer County Community College. While most organizations overlook a two-year school when forming a student chapter, Richard spent time with the students and faculty to understand their interest and commitment. ASHE MCCC is thriving and was featured in an article about the students in the National Scanner magazine this past year. MCCC hosted a monthly dinner meeting for ASHE SNJ in 2018 and also hosted the ASHE National Student Conference in 2019.

Through Richard's leadership, the committee's scope was expanded to include engineering students in the entire State of New Jersey, comprised of a collaborative effort between both the ASHE SNJ and ASHE NCNJ Sections. There are currently 17 active members with the main purpose of encouraging the establishment of ASHE student chapters at all four year and two

colleges in New Jersey that have Civil Engineering programs. The Committee is close to seeing the formation of student chapters at Rutgers University and Ocean County Community College, the second two-year school likely to join the ASHE family.



Richard also serves on the ASHE National Student Chapter Committee. He conducted a session on student chapters at the ASHE National Conference in Nashville in 2019.

When Richard is not investing his time fostering student involvement in Engineering, he runs the cultural resources consulting firm Richard Grubb and Associates (RGA). RGA was established in 1988 as a full-service cultural resource management firm and has since grown to become one of the largest independent archaeological and historic preservation consulting companies in the Mid-Atlantic, Midwest, and Northeast regions.

Section News & Meetings

2020 Scholarship Winners

The climax of the ASHE SNJ year comes with the judging and award of scholarships for talented college engineering students. We are proud to introduce the scholarship winners.

Taylor Marie Repko

Taylor Marie Repko was selected to receive a \$5,000 scholarship. She is a Junior at Rowan University studying Civil Engineering with a 3.76 GPA. Taylor has been active in Rowan's ASCE Student Chapter as President and Marketing Chair as well a member of the Society of Women Engineers, Engineers without Borders, and the ASCE mentoring program. Taylor has also had the opportunity to intern with Mount Construction. She has been on the Dean's list and was awarded the CIAP Scholarship.



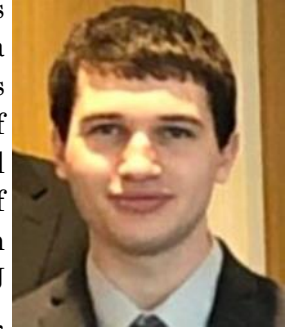
Matthew Dreisbach

Matthew Dreisbach was selected to receive a \$3,000 scholarship. He is a Junior at Rowan University studying Civil Engineering with a 3.78 GPA. Matthew has been actively involved with ASHE Rowan and served as Vice President. Matthew is also involved with ASCE Rowan and Boy Scouts of America. He had the opportunity to intern at ARCADIS in the water resources department. Matthew received the Kiefer Eagle Scout and James E. Connor Memorial Scholarships.



Andrew Agresto

Andrew Agresto was selected to receive a \$2,000 scholarship. He is a Junior at the College of New Jersey studying Civil Engineering with a GPA of 3.86. Andrew has been active with the TCNJ student conduct board, served as Chi Epsilon Treasurer, and served as a CCS volunteer mentor. Andrew had the opportunity to intern with Stantec. He has been on the Dean's list and was awarded the TCNJ merit scholarship and ITS NJ outstanding undergraduate.



Bryan Remache-Patino

Bryan Remache-Patino was selected to receive a \$1,000 scholarship. He is a Sophomore at The College of New Jersey. Bryan is active in ACE and the Robotics club. Bryan had the opportunity to work at TCNJ as a research assistant with traffic controllers and data. He has been on the Dean's list and won awards for Industrial Design and 3D Design.



We congratulate this year's winners and wish them good fortune in the future. This year was pivotal for the the ASHE SNJ program, where we awarded a record \$11,500 to four applicants, bringing the overall total of ASHE SNJ scholarship awards to date to over \$200,000.

Engineering Heroes of the Silver Screen



The next time you are searching for a movie that stars a courageous civil engineer, try (legally) downloading the 1996 film *The Ghost and the Darkness*. In the movie, Val Kilmer plays British engineer John Patterson sent to east Africa to bring the Tsavo River bridge project back “on-track”. Unfortunately, two lions are feasting on his foreman and crew, blowing his schedule. To discourage the carnage, the workers build bonfires and thick thorn fences. Yet the attacks continue, as the lions sneak over, under, or through the defenses, mostly at night. Finally, the workers walk off. Needless to say, the two bloodthirsty NIMBYs were not covered as an existing site condition in the contract documents. John’s supervisor, Sir Robert Beaumont, is not sympathetic and demands results. As a

natural problem solver, Mr. Patterson enlists the help of famed large-game hunter and community involvement specialist Charles Remington, played by Michael Douglas. Things do not go as planned. Patterson and Remington set traps using the goats and laborers as bait. Even in 1898 this might not have been in compliance with OSHA. Watch to find out whether local opposition will kill the bridge project. This lethal game of cat-and-mouse will keep you on the edge of your seat.

Perhaps the best part about this movie is that it is mostly true. Spoiler alert ... the Lions of Tsavo are now stuffed and in a museum in Chicago.

Reprinted from the Fall 2017 Newsletter



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Upcoming Events

LOOKING
AHEAD

NJ Programs
Joint meeting with NC-NJ
(Online via REMO)

September 17, 2020