

# THE STANDARD



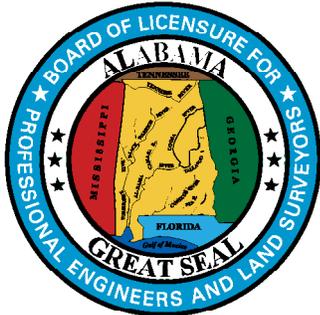
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### BOARD INFORMATION

- BELS is comprised of seven members representing the professions of engineering and land surveying and two selected to represent the general public at large.
- All members are vetted by specific nominating committees. The committees submit a list of three names to the Governor who will make the appointment.
- Board meetings are held every two months beginning in January and are open to the public.

**THESTANDARD** is a publication of the Alabama Board of Licensure for Professional Engineers and Land Surveyors. Digital editions will be posted on our website and linked on our social media pages. To subscribe, email [griffin.pritchard@bels.alabama.gov](mailto:griffin.pritchard@bels.alabama.gov)



## Strange Times

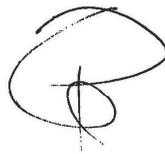
As the designer of THE STANDARD and crafter of the articles within these pages, my goal for this space is to be honest with the readers, and to generate conversations about this and future issues.

This issue, 2020 No. 3, was tough to build in the months following the Covid-19 pandemic and subsequent statewide stay-at-home order currently (as of late May) sweeping the nation.

Conversations with our stakeholders fostered by different events - both those hosted by the professionals within our licensee community and others geared toward the general public - help spur ideas that lead to articles, features and even future On Demand presentations.

However, with all the social distancing protocols in place, the opportunity arose to look at what our professional community was doing to help fight this invisible but oft times deadly foe. What I have discovered is that engineering students throughout the State of Alabama were forgoing their days of theoretical learning to focus on practical application and worked to create solutions to better aid those on the frontlines. That's the thing about engineers - if they don't have the tool for the job, they find a way to create it. Studious innovation is just one of the stories you are going to read in this edition.

THE STANDARD was created to better communicate and interact with our licensee community on a different level than a typical newsletter. Your involvement will be key to its success going forward. Please be sure to submit pieces of information and to follow us on our social media platforms Facebook and Twitter (@bels382).



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### • NEED A VIRTUAL SPEAKER?

We cover a myriad of PDH / CEU topics:

- Ethics
- Case Studies
- The Investigative Process
- Marketing your State Agency

Please contact Public Information Specialist Griffin Pritchard to make your request. He can be reached via email at: [griffin.pritchard@bels.alabama.gov](mailto:griffin.pritchard@bels.alabama.gov).

### our MISSION

The Alabama Board of Licensure for Professional Engineers and Land Surveyors was established by legislative action in 1935. Its charter is to protect the public by helping to safeguard life, health, and property, and to promote the public welfare by providing for the licensing and regulation of persons in the practices of engineering and land surveying. This purpose is achieved through the establishment of minimum qualifications for entry into the professions of engineering and land surveying, through the adoption of rules defining and delineating unlawful or unethical conduct, and through discipline for those individuals or entities who violate the applicable laws or rules.

1935

BELS  
established

1984

First Companies  
Certified

2019

First Public  
Members Appointed

2020

More than 40,000  
professionals have  
been licensed over  
the years.



**SERVING ALABAMA FOR 85 YEARS**

# COMMUNITY NEWS



HOME LICENSE SEARCH APPLICANTS LICENSEES CONSUMERS COMPANIES STAFF LAW & CODE RESOURCES

## Frequently Asked Questions

Have a question? Find the answer here!

[READ MORE](#)

## BELS LAUNCHES NEW WEBSITE

The Alabama Board of Licensure for Professional Engineers and Land Surveyors, in June, updated its website to better serve the public and our licensee community. The new website (address remains [www.bels.alabama.gov](http://www.bels.alabama.gov)) features a more modern design and is easier to navigate allowing users a better experience. The page also includes integration with our social media giving visitors a chance to see the different levels of interaction.



## SURVEYORS: NEED HELP FINDING A ROW OR A MAP? HERE'S ANOTHER OPTION

The Geomatics Reference Network ([georefnet.com](http://georefnet.com)) has been created and offers users a “revolutionary, comprehensive repository for all the things land surveying in a cloud-based map interface built by Alabama Land Surveyors to be used by Alabama Land Surveyors.

Geomatics Reference Network features myriad pieces of information ranging from historical maps, access to parcel data, ROW info and property corners and has different levels of tech and user support. For additional information, please visit their website.

## SEND US YOUR PHOTOS & IDEAS

Please send BELS Public Info Specialist Griffin Pritchard ([griffin.pritchard@bels.alabama.gov](mailto:griffin.pritchard@bels.alabama.gov)) photos of you or your staff depicting what you do on the job or celebrating a work-related award or accomplishment. Submissions will be compiled and used in upcoming issues of THE STANDARD, or annual report and, from time-to-time, on our social media.

Also, if there is a trend going on within your discipline that would make for an interesting article, please send along that info as well as we are always looking for opportunities to make this publication as informative as possible.

Circling back to social media, please be sure to give us a like and follow on our Facebook page and our Twitter (@bels382).

# COMMUNITY NEWS

## PRATT ELECTED ASCE'S REGION 5 DIRECTOR

Lawren Pratt, P.E., in June, was elected as ASCE's Region 5 Director following a month-long election process by a majority of voting Region 5 members. Pratt assumes this new leadership role after many years as the Region 5 Governor (Alabama), Past President of the Alabama Section and Past President of the Birmingham Branch. Since ASCE moved to create regions in 2006, Pratt now becomes the first Region Director from the State of Alabama.

ASCE has 10 regions worldwide and Region 5 is comprised of all sections and branches within Alabama, Florida, Georgia, Louisiana, Mississippi and Puerto Rico, representing more than 14,000 members of ASCE.



## BIRMINGHAM'S BHATE GEOSCIENCES CELEBRATES 45 YEARS OF PROVIDING ENGINEERING SOLUTIONS

BHATE Geoscience Corporation is celebrating 45 years of providing clients with innovative engineering solutions that save them both time and money. Uday Bhate, senior principal professional engineer, founded Birmingham's BHATE in 1975 and has watched his company grow in the years following.

In the four and a half decades of business, BHATE's services have pioneered new technologies and has seen the team grow to more than 90 team members with offices across Alabama (Opelika and Fairhope), Florida (Pensacola) and offices in Mississippi (Biloxi and Jackson).

## KBR WINS \$570 MILLION CONTRACT FOR NASA SPACEFLIGHT OPERATIONS

In news on a national level, according to a release from the Reuters news agency, Houston-based engineering firm KBR Inc., was recently awarded a \$570.3 million contract by NASA to develop and execute spaceflight operations at the Marshall Space Flight Center in Huntsville, Alabama.



## CONCRETE CANOE COMPETITION DATE SCHEDULED FOR JUNE 26-28, 2021 IN WISCONSIN

Hosted by ASCE, the Concrete Canoe Competition provides students in Civil Engineering an opportunity to gain practical project-management, hands-on design experience and further develop their leadership skills by working with concrete mixes to construct and float boats made of the material. The first ASCE event was held in 1988, the competition dates back to the 60s as civil engineering students in ASCE campus chapters began holding intramural concrete canoe races. The 2021 event is scheduled for late June in Wisconsin. Prior winners include: University of Florida, Cal Poly and Western Kentucky.



# ENGINEERING A SCREAM MACHINE

Across the world people spend thousands of dollars in search of the best theme park experience. But what goes into creating that? Busch Gardens, Six Flags and other parks have leagues of engineers and designers working to build a better park experience.

By Griffin Pritchard |  
BELS Public Information Specialist

Pages 5-10

**D**isney World, Universal Studios and Dollywood – when stripped of branding and well-decorated shrubbery – are the ultimately the same. They all feature works of engineering and design mastery aimed at bringing people together and pushing them to adrenaline limits.

Ladies and gentleman of the professional community meet your fascinating and multifaceted brethren – The Theme Park Engineer. Is this possibly one of the more exciting jobs in the engineering family tree?

“I would say yes,” wrote Alabama Adventure and Alabama Splash Adventure (located in Bessemer, Alabama) General Manager Michael Schwitek. “What other industry (profession) gets to launch normal people upside down and hundreds of feet in the air every day of the summer?”

S&S Worldwide Engineering Director Paul Lattin agrees: “Absolutely! One of the great perks is that we (and our families) get to test out the prototypes of the new rides. How many companies let you do that?”



Aside from having an unconventional imagination, this is a discipline where the factors are constantly changing. According to Schwitek, “Things change every day. We are at the mercy of the weather, thousands of guests whose likes and interests change on a dime. We have to be extremely flexible, and be able to update and maintain things constantly.”

Just as innovation meets execution, this branch of the engineering family tree is an amalgamation of core disciplines: Mechanical, civil, structural and electrical.

Think about it like this: The Mechanical Engineers design the loops, the corkscrews and the motion of the rollercoaster. But more than that, they can also shape everything from the design and movement of the coaster carriages (or the trains they sit on) to the nuts and bolts holding everything together. The Structural Engineers are tasked with creating a support system to hold everything upright and make sure the coaster stays connected to the track.

Civil Engineers and Land Surveyors are needed to figure out the space that’s going to be required when installing a coaster or an attraction that’s going to cover several acres and possibly be an integral part of the overall park design.



Parks are sometimes designed around a theme such as LegoLand as designed by Randy Smith. A multitude of engineers are needed in all phases of the process, no matter the size and shape of the attraction.

– Photo Courtesy of Jack Rouse Associates

Lattin (a structural engineer), who is also a Professional Engineer licensed in multiple states: “Park representatives, our marketing team, project managers, manufacturing teams, engineers and installations supervisors all work together to fabricate, assemble and install the ride. Once the ride has been assembled on-site, our engineers and technicians perform rigorous testing to make sure that the ride functions properly; after this is completed, the ride is open for the public.”

As rides become more sophisticated 4D experiences, a greater impetus falls on the Electrical and the Electronic Engineers.

They have to create and design the programs that ensure the coasters function in a specific time frame and speed and not run into one another out on the track.

That’s where safety plays an important component in the overall design / build process.

Schwitek: “Safety is always first and foremost a part of the conversation. We discuss it daily and that conversation doesn’t just end in the design process. You can design the perfect attraction and have to change something a couple of years later to keep the attraction both

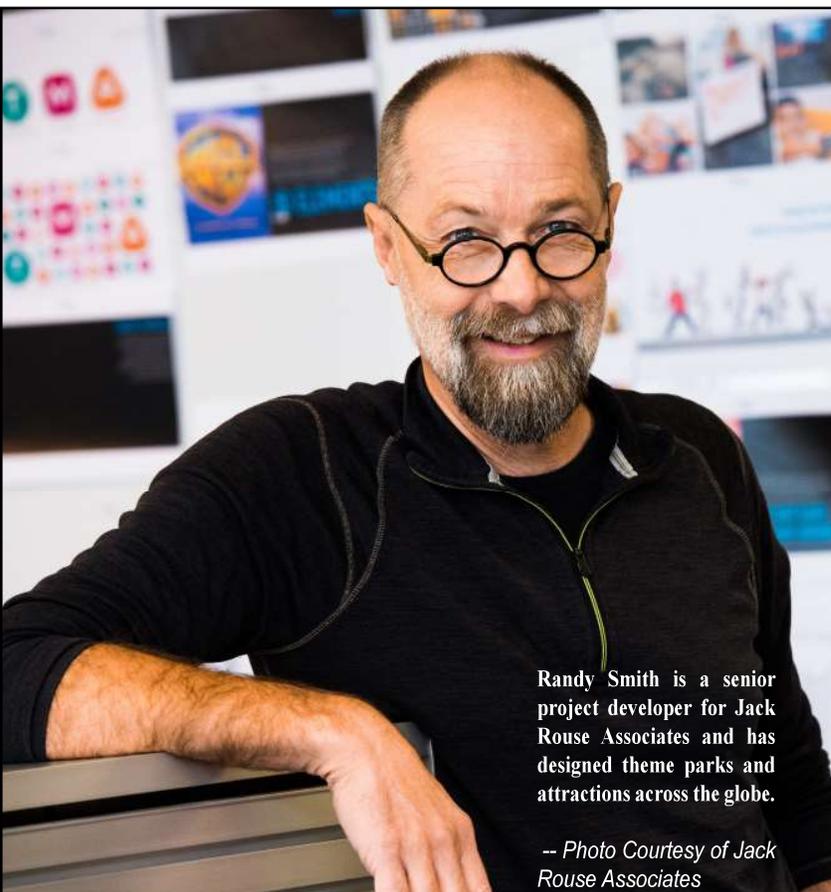
safe and thrilling.”

From the ride perspective form, function and concept are tested rigorously.

“We follow ASTM (American Society for Testing and Materials) standards to ensure maximum safety,” said Lattin. “Those guidelines inform our decisions regarding acceleration limits, transitions and ride analysis. We do not compromise ride safety or quality, regardless of the situation.”

Longtime coaster creator Ron Toomer said while the hills and valleys were integral to the design “figuring out the forces on people” is also quite vital.

And he knows a thing or two about twists and turns at speed as Toomer famously designed the Runaway Mine Train (Six Flags Overt Texas); the Roaring 20’s Corkscrew (first coaster with two inversions / Knott’s Berry Farms - California); the Shockwave (first coaster with seven inversions / Six Flags Great America - Illinois); the Loch Ness Monster (first with interlocking vertical loops / Busch Gardens – Williamsburg) and the Pepsi Max Big One (the United Kingdom’s tallest coaster / Blackpool Pleasure Beach).



Randy Smith is a senior project developer for Jack Rouse Associates and has designed theme parks and attractions across the globe.

— Photo Courtesy of Jack Rouse Associates

He literally wrote the book on design. That's not hyperbole either, Toomer was featured in the book Ripley's Pioneers of the Amusement Park Industry and was later inducted into the International Association of Amusement Parks and Attractions Hall of Fame (in the year 2000).

Not a bad career for a Mechanical Engineer who graduated from the University of Nevada-Reno and went on to work for NASA and was part of the design team creating the Apollo Spacecraft heat shield before switching to something with a little more exuberance in the late 80s.

Toomer was hired away from NASA and made the vice president and manager of engineering for what would ultimately become Arrow Dynamics. He eventually created the Log Flume ride which has since morphed into multiple variations including water-based attractions such as Jaws and Jurassic Park (at Universal), Splash Mountain (at Disney World) and Thunder River (at Six Flags).

"The easiest part is coming up with great new ideas," said Lattin. "The more challenging aspect is implementing those great ideas. Our rides must fit into the mold that the amusement parks want."

Arrow Dynamics became S&S Worldwide and Lattin, as Engineering head, has kept the tradition of innovation.

"My favorite project is usually the one we're working on right now," Lattin said in an email. "I can't disclose some of the information about our current projects, but one recent ride that I really love is AXIS. It's a brand-new ride. So new that we don't have any park photos of it yet but believe me it's unlike any other coaster out there. One of the best features is the exceptionally smooth ride. Imagine flying but with a whole new spin it: Rotating on a different axis."

Lattin added that one of the unique features of the attraction is adaptability for multiple parks: "The ride is very customizable for parks in both layout and launch style."

Innovation plays a large part in the design process – not just for the coasters but for the overall theme park experience.

One of the first water attractions, the Log Flume (or Water Logs) has evolved from a simple rise and fall loop to an immersive 4D experience like the Jurassic Park ride at Universal Studios in Orlando



Schwitek said that his team is constantly looking at things in terms of five years: “Big projects can take up to five years. We are always discussing what the next five years look like and will have initial plans and designs in the pipeline well in advance of that attraction.”

That type of thinking also shifts the conversation from looking at attractions to envisioning the total theme park experience.

This is where Randy Smith, senior project director for Jack Rouse Associates joins the conversation.

“Typically, you are looking to entertain an entire family,” wrote in an email reply, “which requires a mix of attractions for adults, teens, younger children and even grandparents.

“Variety is the key. Thrills balanced with relaxation. Excitement with calm, entertainment with education. Another way to think about it is that the same ride that thrills a teenager should also be fun for their grandparents to watch. How do you take advantage of those opportunities?”

Smith and JRA have apparently found the balance in all those areas as they have worked on projects across the globe. Smith alone highlights his work on the World Abu Dhabi project, Legoland Windsor and Legoland California, Universal Studios Florida and work for War-

ner Bros.

“Early in my career I started designing and building playgrounds as a community volunteer,” wrote Smith. “That led to trying to find a job where play or education was involved. What I found was theme park and museum design as a type of informal education, where we have to tell a story or communicate a concept in the very design or architecture of the place. Fast-forward 33 years later and I still love going to work every day.”

Stepping back to look at the theme park as a whole system, it becomes a perfect example of engineering and surveying (to set the corners and stake out Fantasyland from Tomorrowland, to steal a Walt Disney World reference) no longer operate independently of other disciplines.

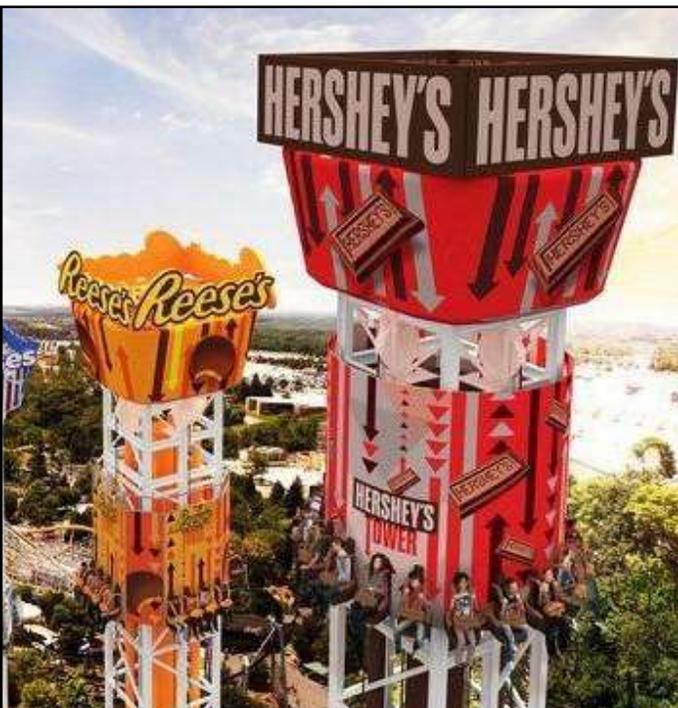
“The park’s layout is usually done by planners (civil engineers and architects). Our goal (S&S Worldwide) is to fit into their master plan, as part of the team. We take footprint into account when designing our rides so that they can fit into the various parks worldwide, as they are often designed differently.”

According to InterestingEngineering.com a host of disciplines converge to create a theme park: Control Systems Engineer, CAD Support, Art/Producer Director, Electrical Controls / Drafter, Network Engineer, Project



One of S&S Worldwide’s newest attraction is the Steel Curtain rollercoaster at Steelers Country in Kennywood Park in West Mifflin, Pennsylvania (above). The theming of a park can be tied to the area’s industry. For instance in Hersheypark was built in Hershey, Pennsylvania in 1906 by Milton S. Hershey as a leisure park for his employees. Since then it has grown into an award-winning facility featuring rides dedicated to candies (below).

Photo Courtesy S&S Worldwide



Engineer – Principal, Ride and Show Engineer, Quality Control Engineer and Inspector, Special Effects Engineer, and the list goes on.

“The easy part is the creative aspects,” wrote Schwitek. “We have a ton of creative people with amazing ideas. The difficult part is making those creative ideas safe and functioning correctly.”

One of the advancements from Toomer’s time is the ability to virtually build the attraction and test it before turning a screw. Enthusiasts looking to satiate their palate for exhilaration can tune into numerous YouTube channels where designers have created virtual coasters that are completely unrealistic yet just as exciting when viewed in full screen, hi-def and headphones.

But there’s got to be more than just a series of rides and attractions.

It’s an entirely different thought process.

Schwitek: “What’s the ultimate goal you want to achieve? Easy, traffic flow of the guests. When you have a space that sometimes holds 10,000-plus guests, a lot of thoughts go into how to draw people out of the overcrowded areas and into the less populated spots.

“If that means adding a new marquee attraction to the dead area of the park to move people, we always consider it.”

The flow of people is one thing to consider but, as Smith adds, there are other areas of concern that need to be addressed when building a new facility.

Paraphrasing Smith: “Is there any significant competition in the area? Does the developer have rights to an intellectual property, or will the themes be created? Is the site accessible by public transportation, highways or only private vehicles? What about the location? Is the site relatively flat or hilly? Are there any geographical features of the site?”

Think about the area’s tourism market: “Is the tourism significant or is it primarily local residents? Should the attractions cater to that segment?”

It all circles around to competition: “Are there other parks nearby? Are they reasons to offer multiple-day attractions?”

While the project may bring joy to thousands on the daily, it’s still just a job for engineers. According to InterestingEngineering.com: “Theme park design industry is mainly project-based, and the average job only lasts about 18 months. Projects are heavily dependent upon the health of the economy as the industry is a direct reflection of how much extra cash consumers have to spend on entertainment.”

In summary; more dollars, more Disney.

# SOCIAL FEEDBACK

## WE ASKED OUR PLS COMMUNITY: WHAT'S YOUR FAVORITE PIECE OF EQUIPMENT, AND WHY?

My favorite piece of surveying equipment is the G.P.S. Receiver. When I began my surveying career in 1981, we were using a theodolite with a yoke mounted E.D.M. and a 100-foot steel tape. I don't miss those days.

**Mike Franklin, P.L.S.**

*via Email*

My favorite piece of equipment is the field book.

It's one of the only pieces of equipment that has remained in service since the original surveys were performed. And in one form or another, it will be there to record the last survey.

It can be used with any type of survey and complements every other piece of equipment.

It takes very little experience to get started but it requires a lifetime of experience to master.

**Austin Murphree, P.L.S.**

*via Email*

### FOR WOMEN IN ENGINEERING TODAY: WHAT ADVICE WOULD YOU GIVE YOUR HIGH SCHOOL SELF?

The path you think you have planned out is not the one you'll take. You may not even end up at the same destination.

**Jennifer Cooper, P.E.**

*via Facebook*

Create a network composed of peers and mentors and keep this updated. Stay involved with them throughout your career. Having peers and mentors for advice, encouragement, and brainstorming is a valuable resource.

**Heather Page, P.E.** *via Email*

My favorite surveying equipment over all my years of surveying is the Leica DNA Series Digital Level. I used the Model DNA10 (capable of 0.9mm/.003' accuracy) for over 11 years and recently used the Model DNA03 (capable of 0.3mm/.0009' accuracy). I was introduced to digital leveling in the beginning of 2008 and had never used or even seen that type of precision leveling equipment.

Schoel Engineering had taken on a very large Deformation Monitoring project on short notice. The previous summer and fall of 2007 had been one of the driest on record and ended up causing settlement problems (due to loss of ground water pressure) at an industrial site that housed high precision manufacturing equipment.

We began using the Leica digital level running high precision differential level loops though hundreds of established monitor points in the area of disturbance inside the plant. Manufacturing was still in progress and we had to work around the equipment and employees. I was amazed at our level loop closures and quickly realized that Digital Leveling is the way to go when high accuracy leveling is required. Over the next 11 years, I used the same Leica DNA10 Digital Level almost daily establishing control and Setting up many Deformation Monitoring projects.

It proved its self again and again with its consistent repeatability and required very little maintenance. Using the Leica Digital Level gave me great confidence in my daily tasks knowing I would get excellent results as long as my survey crew did their part to maintain high accuracy.

**Steve Walsh, P.L.S.** *via Email*

In 1971, we had a Berger transit, 100-foot chain, 200-foot chain and 300-foot chain. The men in that day were hard workers and I think we did good work. We got good jobs and people liked the work we did. With the old Berger transit we did building site layout and used it to run levels. I thought nothing would ever be as good as the that, but I was wrong. Time changes things. Just look today at the modern tools we have.

**David Williams, P.L.S.** *via Email*

My favorite piece of surveying equipment is/was the Wild/Heerbrugg T1000 Theomat. It was the first generation of the Wild Heerbrugg (now Leica Geosystems) electronic total stations. The instrument had on-board electronic distance measuring capabilities and was a well-constructed piece of equipment. The instrument housing was metal as opposed to plastic or some type of composite material in use today. The instrument was durable, reliable and provided many years of quality service. Obviously with the constant advances in technology the instrument is obsolete today, but in its day was one of the best single pieces of surveying equipment in use.

**Joey Breighner, P.L.S.** *via Email*

15 FEET AND RISING

# WHEN THE DAM FAILS



**By Griffin Pritchard |**  
BELS Public Information Specialist

**Pages 12-15**

During the third week of May, Michigan experienced 500-year flooding as two dams suffered catastrophic failures due to rainfall (left). Alabama (right / Martin Dam) has a history of aged dams holding back lakes, streams and river. Several of which have been given failing grades in terms of structural integrity.

One day Johnny Cash called home and asked his mother: “How high’s the water Mama?”  
“Five feet high and rising. We’ve got to head for higher ground.”  
While to some readers that may just be old lyrics to an old song, in parts of Michigan it’s a reality as a pair of dam failures left more than 10,000 families in the areas of Saginaw and Midland seeking higher ground. The failures are attributed to a soaking pour that produced seven inches of rain and caused the earthen Edenville Dam to suffer a spectacular failure and, as a result, the concrete Sanford Dam to be damaged.

The resulting deluge of water resulted in what hydrologists have determined to be tantamount to a 500-year flood. That moniker “a 500-year flood” describes an event that’s likely to occur once in 500 years.

Pretty self-explanatory in theory but the magnitude is incomprehensible until images of the aftermath begin populating television newscasts, newspaper websites, social media and YouTube Live channels.

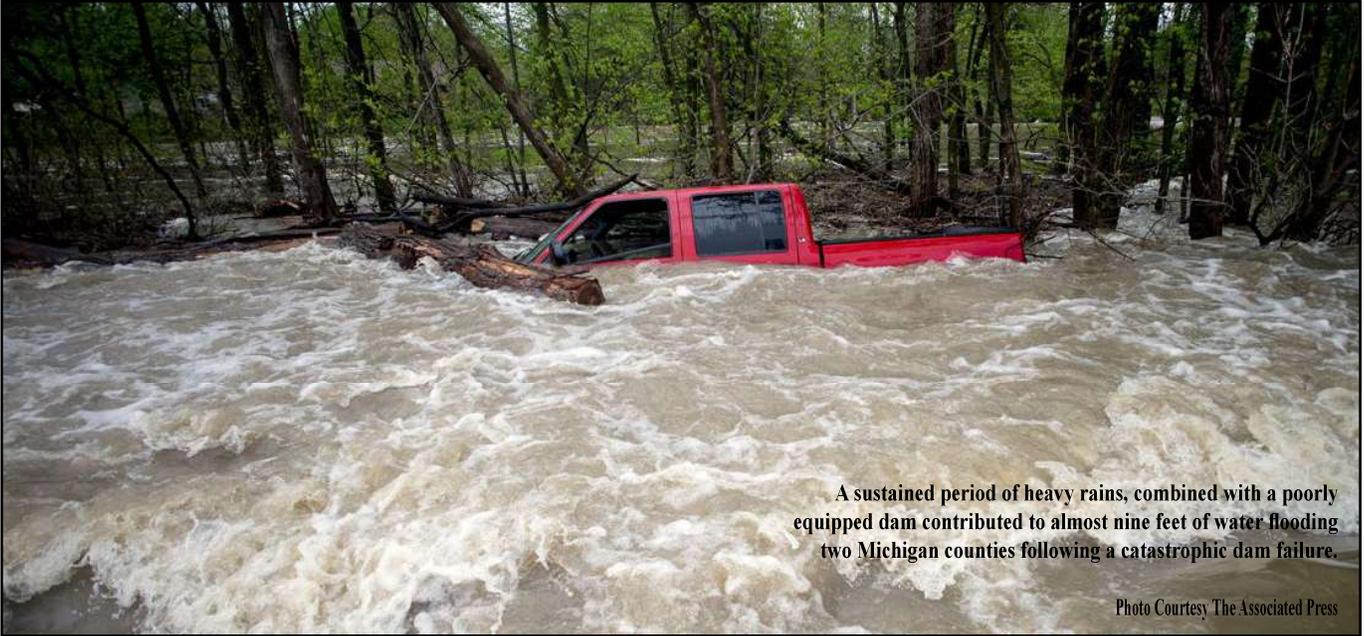
There was a build-up in the leading days as, according to MLIVE (Michigan’s version of AL.Com), rain totals in surrounding counties topped seven inches with some climbing north of eight inches. That much water can lead to roadway flooding and eventually the erosion and the washing away of roads and streets. The Arenac County Sheriff’s Department, in an alert, warned drivers that “... many roads have washed away. And the waters are continuing to rise.”

So ultimately, what caused the Edenville Dam to have such a catastrophic blowout?

“As far as failures go, typical causes include overtopping, internal piping, loss of contact at abutments, seepage along the pipes penetrating the dam, settlement of the foundation, erosion or blockage of earthen spillways and various combinations of differing factors,” wrote Joey Jones.

Jones, a P.E., serves as the Geotech Department Manager at Birmingham’s Building and Earth Engineers.

“Often when a failure occurs, it happens quickly and can be catastrophic. We’ve seen piping failures cause a dam to completely breach before. Piping failures occur when water finds a path through the dam, and erodes the path,



A sustained period of heavy rains, combined with a poorly equipped dam contributed to almost nine feet of water flooding two Michigan counties following a catastrophic dam failure.

Photo Courtesy The Associated Press

causing it to enlarge, which can lead to failure.”

Walter Schoel III, P.E. and President of Birmingham’s Schoel Engineering agrees: “As for weaknesses, with earthen dams, they are susceptible to seepage through the dam, piping around the outlet structure through the embankment and continued maintenance to prevent trees from growing on the embankment. Tree roots can lead to piping and potential embankment failure.”

He should know a thing or two about the ins and outs of engineering as Schoel Engineering has been in business for more than 100 years.

In the days leading up to the Edenville Dam demise, the Tittabawassee River crested at 35 feet as a result of the drenching rain the area experienced. As seen in the MLIVE video, Edenville blows out from the center, but what ultimately proved to be the cause? According to Jones, there could have been numerous factors; overtopping possibly the frontrunner.

“(Overtopping) occurs when the spillways aren’t adequate to handle the overflow or become blocked by debris and water overtops the crest of the dam causing it to erode away,” said Jones. “Overtopping can also be caused by development of land within the watershed that significantly impacts the amount of runoff that occurs during the design storm, or rainfall events that are greater than the design storm.”

Here is a situation where expectations meet reality. In Hollywood when a dam fails a small town downstream is threatened by a wall of water. In reality, though, the Edenville Dam blew out along the structure’s belly, but water didn’t immediately flow through.

More than likely this delay is a result of continuing failures within the dam. Once the dam is completely eviscerated by the gnawing water, then the rush happens and ultimately billions of gallons begin flowing downstream.

The rush of water down to the Sanford Dam led to a different set of failures.

According to a May 22 article in The Detroit Free Press: “The Sanford Dam was overwhelmed by flood waters rushing from the failed Edenville Dam and it’s Wixom Lake impoundment down to Sanford Lake, a similar reservoir created by the Sanford Dam.”

So, what does that mean in English?

Essentially, it’s the snowball effect, without the snow and frigid temperatures, as the water from one dam caused reservoirs leading to the next dam overflowed.

“Our hearts go out to those whose lives have been torn apart by this disaster,” wrote Liesl Clark in a press release days after the failure.

Clark serves as director of Michigan Department of Environment, Great Lakes and Energy (EGLE).

“Seeing the devastation first-hand [the week following the failure] reinforced for me the need to ensure that we are taking every possible step to both understand why these dams failed, and to provide tools, resources and support to help residents and businesses recover.”

Looking at the two structures – Edenville and Sanford – the question immediately forms: Why was one reduced to a puddle of mud and the other, for the most part, kept intact?

Jones, Schoel and Uday Bhate, PE and President of

BHATE Geosciences, all agree that earthen dams are more economical than concrete structures.

Schoel: “Concrete dams are often selected for large scale empoundments ... and are chosen due to specific site construction constraints.”

Jones: “Concrete dams are typically more expensive than earthen dams and are normally reserved for significant high-hazard installations.”

Aside from cost, steps can also be taken in the build of the dam to install safeguards.

“During construction, it’s important to ensure the proper materials are being placed within the core of the dam, as well as on the upstream and downstream slopes,” said Jones. “It’s also critical to evaluate the keyway construction that is used to lock the dam to the foundation of the rock or soil.

“Proper compaction has to be achieved to prevent water flow through the dam, and to obtain the desired strength of the soil. If the installation of pipes through the dam cannot be avoided, any pipes that extend through the dam have to be carefully backfilled, and the backfilling continuously monitored to prevent piping failures.”

Monitoring appears to be the key as, according to a recent infrastructure report card by the American Society of Civil Engineers, 91,000-plus dams were given a grade of ‘D’.

Think about elementary school grades. An ‘F’ is a Failure and while ‘D’ typically stood for “did a little better than an ‘F’ it’s still not a passing grade.”

Bhate, in a white paper on Dam safety, wrote: “United States dams are on average 60 years old. By that age, seepage can erode a dam’s foundation as well as spillways, piping, valves and other flood management structures.”

The Edenville Dam, according to a May Detroit Free-Press article, “... had been sited continuously by the Federal Energy Regulatory Commission (FERC) before EGLE assumed regulatory authority after its license to generate hydropower was revoked by FERC in September 2018. EGLE spokesman Nick Assendelft said ‘EGLE was reviewing federal records and had conducted an initial inspection of the dam in October 2018 and found that it was in fair structural condition.’”

There are several factors to consider, according to Schoel when looking at a dam’s integrity.

“Generally over time, the areas of concern with dams are 1) seepage through the dam that can lead to slope failure on the embankment; 2) piping of water around the outlet structure/pipe that can lead to erosion of material within the dam and potential failure; 3) tree growth on the embankment (water can flow along tree roots and carry materials out of the embankment leaving a void within the dam) if left unmaintained and 4) cracks and signs of wear on the outlet structure and spillway

# EACH ONE TEACH ONE



## UA STUDENTS DESIGN VIRTUAL LEARNING SPACE FOR ALABAMA SCHOOLS

University of Alabama Students, according to the state’s Yellowhammer News platform, have been working to engage the next generation of students as schools transition from a traditional classroom and into a virtual learning environment following the fallout of the Covid-19 Pandemic.

UASpace has engineered and developed lessons using Alabama STEM (Science, Technology, Engineering and Math) standards to teach the students about the stars, space and the final frontier. “To our team, outreach is a core competency and is our reason for doing what we do,” Piper Daniels, an aerospace engineering grad from UA told Yellowhammer.

UASpace (<https://uaspace.ua.edu/>) is comprised of around 50 students and have named their first mission BAMA-1 and aim to demonstrate an emerging technology to bring satellites out of orbit quicker.

The Capstone project is one of 18 different research satellites (called CubeSats) from 11 states.

Info Courtesy University of Alabama

structure,” said Schoel. “Another concern is the potential changes upstream and downstream of the dam since it was originally constructed. If a dam was constructed in an undeveloped watershed, but over time the water has become more developed, although the design storm may not change, the inflow to the dam will be higher. Can the current structure still safely pass the design storm with the added development in the watershed? Is the design adequate to ensure an adequate level of safety? Also, is the original design storm (for example a 500-year event, or a 24-hour event) still adequate for the current development density downstream when considering loss of life and economic loss?”

Quoting Bhate’s paper: “Regular operations and maintenance as well as thorough and consistent inspection must be practiced throughout the lifetime of a dam. Regular inspection is essential to preserving the proper functionality of a dam and inspections should be conducted by experienced licensed professionals. Signs of potential risk and failure often present themselves prior to a disaster.”

According to the Association of State Dam Safety Officials (citing Bhate) “there have been 47 dam failures and 127 non-failure incidents that occurred from 2017-2020.”

Up to this point everything has been conceptual, asking the reader to imagine the damage and devastation in the wake. This should help put things in perspective.

Referencing the Detroit Free-Press: “The damage estimates (following the Edenville and Sanford dam failures) released as part of Midland County’s preliminary assessment found that 150 homes were destroyed (with only eight percent having flood insurance) 790 homes had major damage and public property such as schools and governmental buildings suffered around \$34 million in damages. A later assessment revealed a more harrowing tale as an estimated 2,500 buildings were damaged in the flooding equaling around \$200 million.”

Should Alabama be concerned with its multitude of dams and impoundments. The answer is yes.

Again, the trio of Jones, Schoel and Bhate are all in agreement.

“Not age related, but the fact that Alabama does not have a dam safety program is a concern,” said Schoel.

Quoting Bhate: “Alabama needs to enact a dam safety program to identify and repair aging dams, reduce the risk of future dam failures and gain the ability to leverage federal funding from FEMA for the repair of high-hazard dams.

“However, the responsibility for maintaining a safe dam rests with its owner. The owner must understand the laws and regulations associated with proper dam maintenance and the procedures for keeping these structures safe.

With no dam regulatory board, who should ultimately be held accountable; the dam owners.

Bhate: “Dam owners in Alabama need to develop detailed Operations and Maintenance plans for the existing dams and have experienced engineers and inspectors perform routine safety inspections. Proper design review and construction with quality controls must be instituted at the state level with any new dams constructed.”

Knowing the background of what it takes to build and maintain a successful dam and, too, the damage a failure can cause to the surrounding areas, what advice is there to those in this discipline?

First – according to both Jones and Schoel – be knowledgeable of the task at hand. Not practicing outside of your skillset is also one of the key ethical canons as a licensed professional in not only Alabama, but multiple other states.

“Dams can be high hazard to the public and a failure catastrophic,” said Schoel. “Because of this, it is especially important that the design is undertaken by professionals that have the necessary skills and expertise suitable for the task.”

There is also the responsibility of knowing the materials that will be utilized during the build.

Jones: “While earth dams are primarily basic civil and geotechnical engineering, there are many subtle items that could contribute to the dam not performing as expected. Also, it’s important to understand how the soils used in construction affect the both the performance and stability. The soil properties affect almost all aspects of the dam, including the overall stability and the volume of water that flows through the dam.”

Knowledge in the design and the build appears to be central to a dam’s strength and longevity.

# PANDEMIC ENGINEERING

By Griffin Pritchard |  
BELS Public Information Specialist  
Pages 16-18

Engineering students and educators from throughout the state have been stepping up and turning their theoretical knowledge into practical products to create crucial products used during the Covid-19 pandemic.



**W**hen battling the Covid-19 and the Coronavirus, finding solutions turned into all-hands-on-deck opportunities to address the impending pandemic. College students in engineering programs across the State of Alabama turned their attention to helping those infected.

On the Plains of Auburn, students in the Samuel Ginn College of Engineering utilized their skills to create ventilators, PPE masks and straps, arrange for donations of PPEs and even a better way to test for the virus.

“We had faculty who were able to give an overwhelming amount of supplies, and that is amazing, but we’ve also had some who have only had two or three items available to give, and that’s great too,” Research Engineer Christian Brodbeck said in a press release.

Brodbeck’s efforts were then delivered to Auburn’s East Alabama Medical Center. In total, according to the release, the donated supplies include: 426 pieces of eye protection; 1,719 masks (N95, N99, N100, R95 and surgical), 275 boxes of nitrile and latex gloves, 312 pieces of disposable body protection (lab coats and coveralls).

The school’s Department of Chemical Engineering also pitched in and contributed 10 gallons of hand sanitizer and 400 3D printed protective face shields.

“The Auburn Engineering family is working in close partnership with East Alabama Medical Center and Auburn University Medical Clinic to help leverage our capabilities and expertise in whatever ways we can to help during this time of crisis,” said Ginn College Associate Dean for Research Steve Taylor.

Auburn University also reached out to their education partners.

Joining forces with the University of Alabama at Huntsville and IS4S (a Huntsville-based defense contractor) Engineers from across the state worked to create the RE-InVENT system, an emergency CPAP-to-ventilator converter to help in the fight against the pandemic.

In just three days, a team of 14 engineers from IS4S and support staff assembled 100 units in April days before the pandemic shut down the better part of the state and nation.

“IS4S was tracking on the Re-INVENT project from the earliest days, and we knew that the need for these devices was urgent and pressing,” Ryan Hill said in an Auburn University News press release. “While many companies across the country are building ventilators, we thought few could assemble and produce the needed devices in under a week when sources indicated the peak local resource usage would occur.”

Hill is an Auburn grad with multiple degrees in mechanical engineering and was one of the key Re-INVENT developers.

Prior to testing on humans, IS4S used a goat and a sheep.

Keep in mind, the chemists are doing more than making hand sanitizer.

Richard Cullum, an AU doctoral candidate in Chemical Engineering who earned his bachelor’s degree at the University of South Alabama, works for Assurance Scientific Labs in Birmingham and helped to create a test to quickly determine who has become infected with the virus.

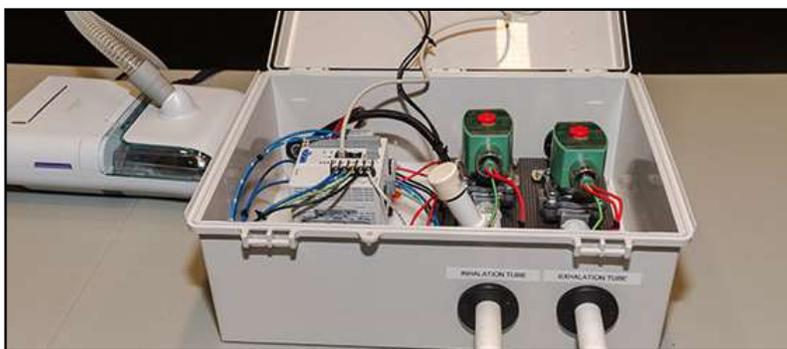
“My desire to create products that improve public health was a strong motivator for pursuing a Ph.D.,” said Cullum. “Seeing the impact of the Covid-19 test I helped develop has been extremely rewarding, especially so early in my career.”

Within the first two weeks of April Cullum and Assurance Scientific had produced more than 12,000 tests for use in Alabama and throughout the country.

The Loveliest Village isn’t the only location where engineering students are transforming their education from theoretical to practical. At the Capstone, students are being just as innovative.

Look at John Glidden III, for instance.

According to a press release from the UA News: “Instead of being in Tuscaloosa wrapping up his final classes as a student in aerospace engineering and prepping to start at a job with Lockheed Martin, Glidden spent



Engineering students from the Auburn University, with their professors, worked to create face shields and bands (top) and then partnered with UAH and Re-Invent to create a ventilator (middle) for those battling coronavirus. At UAB, professors developed face shields and reusable headbands, face masks and a HEPA filter to fit 30 machines that were no longer servicable.

Photos Courtesy of Auburn U, U Alabama and UAB



UA student John Glidden III stepped off the Capstone and headed to New Jersey to be on the frontlines as an EMT and to work at a testing center.

Photos Courtesy of University of Alabama

weeks in Closter, New Jersey, volunteering as an EMT for Closter Volunteer Ambulance and Rescue Corps., a non-profit ambulance service and at a drive-thru virus testing site.”

Glidden: “It’s something that needs to be done, so this is my way of giving back.”

From the frontline of the Covid-19 experience, to the education behind the pandemic, students at the University of Alabama Engineering Department were offered classes during the summer months.

“The mutual goal of the courses is to help students better understand customers’ and society’s needs and impacts of what they do related to big, complex problems like pandemics,” Dr. Robert Morgan, said in a press release.

Morgan, a marketing professor, serves as the STEM Path director to the University’s MBA program.

“We’re hoping to provide them with a set of skills and tools, coupled with a deeper human understanding of problems that will set them up to be leaders in problem-solving efforts in the future.”

With the efforts from the folks on the Plains and at the Capstone, it was time for students in the Magic City to rethink their efforts.

UAB engineers took a more practical approach and instead of making the shields that have been made in abundance, the Blazer brains looked to make something more effective: headbands.

According to the UAB News article: “When Justin Koch, director of UAB’s undergrad design lab, saw various maker groups were using 3D printers to make PPE’s, he contacted interim Dean Timothy Wick to see about doing the same – but when the duo realized they could more efficiently produce PPE using laser cutting, they switched process, and (in mid may) expected to make around 1,000 reusable headbands and 10,000 face shields.

But that’s not the school’s only contribution.

Brian Pillay, director of the MPAD (Materials Processing and Applications Development), began working from home and created more than 400 masks in one month using a sewing machine and material sourced and donated from area companies. He also outsourced the production to his family and at peak was making 50 masks a day.

But that’s not where the UAB contributions stop as the engineering department and the medical field partnered with the State of Alabama to “develop High-Efficiency Particulate Air (HEPA) filters for renovated Power Air-Purifying Respirator (PAPR) machines.

Alabama allocated “30 discontinued PAPR machines to UAB’s hospital, but were unable to be used because the machine manufacturer no long makes the HEPA filter that fits the product.”

Send in the engineers.

“We got lucky and were able to find a filter that had very similar dimensions to the original PAPR filter,” Joseph Moore, a 2017 Electrical and Computer Engineering grad who now works for the school’s Engineering and Innovative Technology Department, said in a press release. “Using CAD modeling and a 3D printer, I was able to reverse-engineer the housing that the filter mounts too.”

The ability to step into an uncomfortable situation, figure out and create a solution is a key element to fundamental engineering.

# TALKING POINTS

Lee Y. Greene, Jr. | ASPLS President (2020)



We (at ASPLS) are in the process of contacting the families of these milestone registrants to place an NSPS “Final Point” marker at their grave sites.

The “Final Point” marker is a special program to honor surveyors that have passed with a special marker with their name, registration number and latitude/longitude of the marker location. Proceeds from the “Final Point” markers go to a surveying scholarship fund with NSPS.

More on the Final Point program is here: <https://www.nsp.s.us.com/page/FinalPoint>

## Notes from the ASPLS Historical Committee Report

### **Restoration of the Terminus of the Huntsville Meridian and St. Stephens Meridian:**

More work needs to be done this year to ascertain the exact location as per Milton Denney, but we propose to purchase a granite obelisk monument with the words “**Freeman Line**” on the east-west sides and “**Huntsville Meridian Terminus**” / “**St. Stephens Meridian Terminus**” and “**Reset By ASPLS 2020 A.D.**” on the south face. The cost is estimated to be around \$2,500.

### **Proposal of a biennial plaque for the most outstanding women in land surveying, named the Carol Amons Youkey Award:**

The nomination process and award judge-



**THE “FINAL POINT” MARKER DESIGNATION IS A SPECIAL NSPS PROGRAM TO HONOR SURVEYORS THAT HAVE PASSED WITH A SPECIAL MARKER WITH THEIR NAME, REGISTRATION (OR LICENSE) NUMBER AND THE LATITUDE / LONGITUDE OF THE MARKER LOCATION**

ment shall be assigned to the Awards Committee. Cost will be for a plaque for the award every two years.

### **Proposal of an NSPS “Final Point” marker for the grave of the first licensed land surveyor in Alabama.**

He is interred in Palm Springs, FL. We need to contact the family and request the placement. The ASPLS President shall reach out to the Florida Society and coordinate the location of his grave and the sending of the marker for a joint project. Cost will be no more than \$125 from ASPLS and other funds will be solicited from individual surveyors in Alabama.

### **Proposal of an NSPS “Final Point” marker for the grave of the first black land surveyor in Alabama.**

Griffin Pritchard has located, and more research is being done to find his grave and request permission from his family to allow the placement. Cost will be no more than \$125 from ASPLS and other funds will be solicited from individual surveyors in Alabama.

# ENFORCEMENT ACTION

MAY 19, 2020 MEETING

## Arjo Engineers Inc.

An investigation determined Arjo Engineers Inc, provided engineering services in August 2019 for a project in Tuscaloosa, Alabama without obtaining a certificate of authorization from the Board. The firm agreed to a consent order that required it to pay a \$2,000 fine, and the consent order and final order would be a public record.

## Allen Engineering and Science Inc.

An investigation determined Allen Engineering and Science Inc, provided engineering services for projects in the State of Alabama from an office location that did not have an Alabama licensed professional engineer in responsible charge of the engineering work being performed at that location. The firm agreed to a consent order that required it to pay a \$1,000 fine, and the consent order and final order would be a public record.

## William Lawrence Tucker / PE

An investigation determined William Lawrence Tucker provided engineering services for four projects in the State of Alabama prior to being issued an Alabama professional engineer license and obtaining a certificate of authorization for the firm Tucker Engineering Inc. Mr. Tucker agreed to a consent order that required the firm to pay a \$2,000 civil penalty to the State of Alabama General Fund, to pay \$200 to the Board for the cost of the investigation, and the consent order and final order would be a public record.

## HISTORY IN 3 PARTS

1

The ancient Romans were ahead of the curve in terms of building construction and engineering principles, designing a system of aqueducts to help bring a steady supply of fresh water to cities and towns within the vast empire.

Aqueducts are still in use today.

2

The first engineer known by name and achievement is Imhotep, builder of the Step Pyramid in Egypt around 2550 BC. In terms of modern engineering -- and a long time after Imhotep's death -- Elizabeth Bragg was the first woman to gain a degree in engineering in 1876.

3

Like early engineering, land surveying also has roots in Egypt as an ancient practice that dates back to 1400 BC, when it was used for the early taxation of land plots. Early Egyptians used measuring ropes and plumb bobs to gauge and measure dimensions of the land.

# UNDERSTANDING BELS LAW & CODE

## PROFESSIONAL LAND SURVEYORS ARE REQUIRED TO COMPLETE A YEARLY ETHICS COURSE AS PART OF CONTINUING EDUCATION

In 2018, the Board of Engineers and Land Surveyors - stakeholders and societies - undertook the task of changing aspects of the law to better serve the public and the professionals licensed. Along with adding new board members and decoupling the exam from experience required, the law added educational requirements for professional land surveyors.

Quoting the Law (34-11-6 (f)): “All professional Land surveyors are required to earn a minimum of Four Professional Development Hours on the Standards of Practice for Land Surveying in the State of Alabama every two years, and complete a yearly ethics course.” The new law also states that “a new professional land surveyor shall complete the Alabama Standards of Practice hours within two years and complete the ethics hour within one year of initial licensure.”



# NCEES INFO

## NCEES: EXAM TRANSITIONS TO COMPUTER-BASED FAST-TRACKED TO NOVEMBER 2020

The PE Electrical and Computer: Power exam is moving to computer-based testing (CBT), with appointments available year-round at Pearson VUE test centers beginning January 2, 2021. NCEES originally planned to complete the exam's transition to CBT format in April 2021, but the organization fast-tracked the change as part of its response to COVID-19.

“The April 2020 pencil-and-paper administration of the exam was canceled because of the coronavirus pandemic, so we brought the transition to CBT forward to better accommodate examinees and facilitate licensure during these challenging times,” explained NCEES Director of Exam Services Tim Miller, P.E.

The exam will be offered for the last time in pencil-and-paper format in October 2020; registration for this administra-

tion is currently open. Registration for the computer-based exam will open November 2, 2020. The specifications, or knowledge areas, for the exam will not change when it moves to the new CBT format.

The PE Electrical and Computer exam is offered in three disciplines: Power; Computer Engineering; and Electronics, Controls, and Communications. The Computer Engineering and the Electronics, Controls, and Communications disciplines are also moving to CBT after the October 2020 exam administration. However, these disciplines—which have a lower volume of examinees—will be offered annually beginning October 2021.

For more information on the PE Electrical and Computer: Power exam and the transition of NCEES licensing exams to CBT format, visit [ncees.org/cbt](http://ncees.org/cbt).

# A CIVIL CONVERSATION

Heather Page | ASCE President (2020)



Having worked with Whorton Engineering since 1999, I like many others, have the unique perspective of growing up in the engineering field as a second generation engineer. Being selected to serve as President of ACEC Alabama is an honor, and we are looking forward to a unique year ahead. As Steve Jobs once said: “Great things in business are never done by one person. They are done by a team of people.”

At our July board meeting, we recognized outgoing President Kendall Kilpatrick (Mott MacDonald) and board members (Jeremy Deal, PE, Barnett Jones Wilson, LLC; Charles Oligee, PE, S&ME, Inc.; Drew Davis, PE, Volkert, Inc.; Ray Womack, PE, Krebs Engineering) for their impressive service and leadership as well as inducted new officers (David Stovall, P.E., Engineering Design Group; Blake McAnally, PE, Pugh Wright McAnally, Inc.; Randall Palmer, PE, Kimley Horn and Associates, Inc.; Mike Harper, Sr, PE, Volkert; Dan Blackman, PE, Edmonds Engineering).

ACEC Alabama represents more than 50 engineering and land surveying firms across the state and works collaboratively with engineering and land surveying firms across the nation through ACEC National.

ACEC Alabama operates based on the volunteer teamwork of many professionals which allows us to learn, grow,



and challenge each other for the betterment of the professions and its business practices.

COVID-19 has brought many challenges to the professions.

We have all struggled with working remotely while maintaining site visits and inspections. During these uncertain times, ACEC has been focusing on Rebuild, Rescue, and Recover.

ACEC Alabama had its first webinar this year focusing on the Paycheck Protection Program (PPP) and has since been offering free PPP webinars as additional information becomes available. The updates also allow for questions and answers with statewide engineering professionals on how firms are addressing return to work, documenting COVID-19 measures, etc.

Additionally, in the upcoming year, we are focusing on committees, virtual meetings, and virtual educational opportunities; with the goal of providing practical resources to the engineering community.

Our virtual educational opportunities will be open to both members and

non-members throughout the year.

The first virtual seminar (in July) provided an update from ACEC National by Steve Hall, an Executive Principal Roundtable focusing on best practices, business management concerns, and other industry issues; “Recession-Proofing Your Firm in the COVID-19 ERA” presented by Chuck Roberts; and “ACEC/PAC: Rescue. Recover. Rebuild.” presented by Linda Bauer Darr, President & CEO, ACEC.

Our next virtual educational opportunity is scheduled for August, a lunch-n-learn free to both members and non-members.

We welcome the opportunity to serve the Engineering and Land Surveying community and would love to hear feedback about industry concerns and/or needs and are looking forward to a unique year.

In our profession, we are all constantly seeking opportunities to improve.

The challenges associated with COVID-19 have forced many of us to re-evaluate work processes.

We can all take this opportunity to work together and improve processes for the betterment of all involved.

If you would like additional information on how you can become involved in ACEC Alabama, contact Renee Casillas (Executive Director) for additional information at [rcasillas@aceca.org](mailto:rcasillas@aceca.org).

# NEW LICENSEES

## • PE LICENSEES

AARON ANDREW ANDERSON  
AARON BENJAMIN MORSE  
AARON MARTIN CROWLEY  
AARON MICHAEL MCCLANAHAN  
ADAM CHRISTOPHER CARROLL  
ADAM CHRISTOPHER EDWARDS  
ADAM HARRIS RANGLES  
ADAM JOSEPH SENK  
ADAM MARK LUTHER ADAMS  
ADEL ELFAYOUMY  
ALBERT BRADLEY WYCOFF III  
ALBERT CRAIG HELTON  
ALEC JAMES FRANK  
AMANDA LORENZ PHILLIPS  
AMIR S. IRHAYYIM  
ANDREW CLAYTON JONES  
ANDREW DOUGLAS HALL  
ANDREW P. VALENTE  
ANTHONY DUANE CHAMBERS  
ANTHONY JOHN RHEIN  
ANTHONY MILLWARD  
ANTONIO SPENCER-MOTYKO  
ARTHUR KARROS  
ARTHUR RAY SINCLAIR  
ASHLYN BARRETT EWING  
BARRET ANTHONY HAGEN  
BENJAMIN ELIAS NOE  
BETHANIE NICOLE THOMAS  
BETHANY CATHLEEN FRITZ  
BLAKE ALEXANDER CLAMP  
BRADLEY HOWARD FLETCHER  
BRANDON ALEXANDER BROOKBANK  
BRENDON INMAN  
BRIAN ALAN JACKSON  
BRIAN CARSON PHILBRICK JR  
BRIAN FLETCHER WELCH  
BRIAN JOSEPH DOLLEVOET  
BRIAN MATTHEW SNYDER  
BRIAN THOMAS SCHNEIDER  
BROCK SHRADER  
BRYAN CLAPPER  
BURKE BALDWIN MURPH III  
CALENN HEPPNER  
CARRIE BRISTOLL-GROLL  
CARTER AARON MILES  
CHARLES JASON MASSOTH

CHASE GARRISON HORTON  
CHRIS FIGGE  
CHRISTIE HUTCHISON HOUSEMAN  
CHRISTINE ELIZABETH CONNER  
CHRISTOPHER BERTON PERRY  
CHRISTOPHER CRAIG ALCORN  
CHRISTOPHER GEORGE ANDERSON  
CHRISTOPHER JAMES ELDON  
CLAYTON BRINKLEY SMITH  
CLIFTON WAYNE SWAFFORD  
CODY JACKSON WILLIAMS  
CODY LEE HARDEN  
COLBY HEATH BAKER  
COLE O'NEIL NEWTON  
COREY JOHN SADOWSKY  
CORI LEE AUSTELL  
CRAIG E. MCELROY  
CRAIG EUGENE METZGER  
CRAIG STEPHEN THOMPSON  
DAMON ERIC WOODSON  
DANIEL ALTON PRESLAR  
DANIEL JOSHUA AUWERDA  
DANIEL LEONARD WINTER  
DANIEL PAUL GROSZNICK  
DAREN DEAN PHELPS  
DAVID ALLEN RAST  
DAVID BRADLEY STORY  
DAVID EARL COGGIN  
DAVID EUGENE HERMAN  
DAVID JOHN MISSEDA  
DAVID MATTHEW CUNNINGHAM  
DAVID MICHAEL BENNETT  
DAVID NATHAN BILOW  
DAVID PAUL HERRICK III  
DAVID RADFORD PALMER  
DAVID WILLIAM MATTSON  
DENNIS MICHAEL HYMEL JR  
DEREK LEE OGBURN  
DONALD LYNN HENDON  
DONALD PAUL NIMS JR  
DOUGLAS EDWARD BOND  
DYLAN TODD NICHOLS  
EDUARDO AVILES-NIEVES  
ELIE EL ZGHAYAR  
EMILY ANNE TAYLOR  
EMILY R. HOPPS  
ENRIQUE HECTOR RODRIGUEZ MEDRANO  
ERIC CHARLES HEIBERG

ERIC FRANK TRILLAS  
ERIC SPEENBURGH  
ERIK DANIEL BIERBRAUER  
ETHAN KYLE PETERS  
GASPAR DAMIAN GARCIA  
GERALD PHILLIP TOOMEY  
GREGORY SCOTT ANDERSON  
GREGORY TAYLOR WATSON  
GRESHAM SMITH  
HARLEY ELLIS DEVEREAUX  
HEATH EARL HARDY  
HEMANT CHANDRAKANT SURA  
IAN A. WRIGHT  
IMAD GHOSAIN  
JACOB RYAN BEATTY  
JAKE CODY VALENTINE  
JAKE ODDO JR  
JAMES ANDREW JOHNSON  
JAMES CHRISTIAN STANLEY  
JAMES LAMAR VINSON  
JAMES NEAL HOULETTE  
JAMES RANDALL CRABB  
JAMES SCOTT LEVERETTE  
JAMIE PATRICK KRONBECK  
JAMIESON DANIEL MATTHEWS  
JANICE MARIE GOLDSBY  
JASON A. EVANS  
JASON DOUGLAS PAGE  
JASON HAROLD LANGE  
JASON SCARPATE  
JAVIER SANCHEZ UNDA  
JEFFREY ALAN HERSHEL  
JEFFREY ALAN SCHUTZENHOFER  
JEFFREY CHARLES THOMPSON  
JEFFREY LEE FUGATE  
JEFFREY TODD LARSON  
JENNIFER LYN DEAL  
JEREMIAH DAVID REDMAN  
JEREMY BLAKE CHILDERS  
JEREMY M. KEENY  
JEREMY WAYNE FLETCHER  
JERRY JEFFREY HAMPTON  
JIMMY RAY CHURCH  
JIN LIU  
JOEL DOUGLAS NIELAND  
JOHN B. SEMTNER  
JOHN CERABINO GAWRON  
JOHN D. NORTON

# NEW LICENSEES

JOHN LESLIE JETT  
JOHN MICHAEL CORN  
JOHN RICHARD ANDRZEJCZAK  
JOHN ROBERT HELF  
JOHN WILLIS STULTZ II  
JONATHAN LOWELL MACK  
JONATHAN WILLIAM YATES  
JONMARK DAVIS HENRY  
JORDAN MUSCAT  
JORGE GONZALEZ-RODILES  
JOSEPH A. GIRGENTI  
JOSEPH BRYAN SHAFFER  
JOSEPH JOHN WITTMAN IV  
JOSEPH R. JOHNSTON  
JOSHUA IBARRA  
JOSHUA MICHAEL THOMPSON  
JUAN VIRGILIO GARCIA  
JUSTIN CHRISTOPHER MARTIN  
JUSTIN MATTHEW NIELSEN  
JUSTIN SCOTT LAMB  
KAMERON MOHSIEN KENNETH RAISI  
KEANE LOGAN STEELE  
KEELY TAMARA LANE  
KELLEN JOSEPH BODENBURG  
KELLEY ANN PHILBIN  
KELLY BORN RADECKER  
KENNETH CARL SAINDON  
KEVAN J. COOPER  
KEVIN CHARLES HEIMBROOK  
KEVIN CONOR O'GORMAN  
KEVIN DANIEL MILLER  
KEVIN LOWELL MORGAN  
KEVIN V. GORMAN  
KIM BRUCE WILSON  
KIMBERLY BROOKE JANEWAY  
KIRK ALAN JENNINGS  
KURSAT KINALI  
KYLE BRANDON JONES  
KYLE JORDAN BRUENDER  
LARRY SCOTT FRIEDLINE  
LAURA MARIE BETTERS  
LAURENCE WAYNE HANNAN  
LEE WILLIAM HOWARD  
LEI WEI  
LESLIE MCCALL SAUNDERS JR  
LOGAN GRANT GANDY  
LOGAN STEPHEN BELL  
MARCELINO VELAZQUEZ ACEVEDO

MARIAH SIORCE KLOESS  
MARION KUHN PARKER  
MARK ANTHONY ELMORE II  
MARK ELVIN HUGHES  
MARK WILLIAM LORAH  
MARSHALL WEED HAYDEN  
MARTIN IAN ROGIN  
MATTHEW EDWARD HAMBY  
MATTHEW KILLMER PERKINS  
MATTHEW ROBERT LORD  
MATTHEW STERLING LEDET  
MEGAN MARIE MILLER  
MICHAEL A. PRUETT  
MICHAEL ALLEN STUBBS  
MICHAEL AUGUSTINE MCGUIRE  
MICHAEL CRAIG SMITH  
MICHAEL DAVID MITCHELL  
MICHAEL GREGORY FORLAW  
MICHAEL L. WERNZ  
MICHAEL STUART GREENLEE  
MICHAEL TIMOTHY VANDERMUSS  
MICHAEL TODD MARTIN  
MICHAEL TRAVIS NELSON  
MICHELLE PARSLEY  
MINTON LEO PETERSON  
MITCHELL JAMES APPLEMAN  
MORGAN BENJAMIN BELL  
MYRON DALE RUMMEL  
NATHAN DANIEL KLENKE  
NATHAN RICHARD FRANKENHOFF  
NAVID POURALI  
NEELEY SMITH LANGHAM  
NICOLE LEIGH BENNATI  
ONOFRE LANDICHO MAYUGA  
OTNIEL ALEMAN  
PATRICK THOMAS LENTON  
PAUL IRION OLIVIER  
PAUL JOSEPH MONTALBANO  
PEDRAM CHAREPOO  
PHILIP BRYSON EUWER JR.  
PHILIP NORMAN GIRVAN  
PHILLIP LEE LANDEROS  
PHILLIP TIMOTHY JACKSON  
PHONEKHAM BOUAPHANH  
PHUONG THI NGUYEN  
POOJA HARISH KALARIA  
QUINN LOGAN BAILEY  
RALPH A. FRYE III

RAYMOND R. NARCISO JR  
REBECCA RAND COSTIGAN  
RICHARD ADAM JARMEL  
RICHARD CHISOLM  
RICHARD DEZEGO JR  
RICHARD RAY ROYAL  
RICK A. SMITH  
ROBERT ALLEN HARSHMAN  
ROBERT DEAN GRAVERHOLT  
ROBERT E. SNOW  
ROBERT ERIC MARTIN  
ROBERT SEHMAN LUTZ JR  
ROBERT WATERS EASLEY V  
ROBERT WESSON DEAN JR  
RONALD LEE KNOTT  
RORY COLIN HIGHSTONE  
RYAN PATRICK BAKER  
RYAN WILLIAM DORN  
SALOME UWIZERIMANA  
SAMANTHA J. PRETZEL  
SAMUEL HENRY RAY  
SAMUEL PAGE CAMPBELL  
SANDRA ANSTAETT METZLER  
SANYA PHATHCHARAKITTI  
SCOTT CHARLES HOFER  
SCOTT E. WYSSLING  
SCOTT HULT  
SHAWN MICHAEL JOHNSON  
STEFFAN GARRETT MCDANIEL  
STEPHEN ANDREW EVANS  
STEPHEN RUFUS HUGHES  
STEVE SI LE  
STEVEN BLAKE ODOM  
STEVEN FRANCIS HAMMERSCHMIDT  
TERESA MAE RAINCY  
TERRY SCOTT BOOMER  
THOMAS B. SCOTT  
THOMAS GARY WAYNE DEIBERT  
THOMAS GEORGE PROIOS  
THOMAS JAMES WALKER  
THOMAS JEFFERSON MOAT III  
THOMAS MICHAEL BARRY JR  
TIMOTHY GEISER  
TIMOTHY SUNGSOO LEE  
TITUS MONROE PRATER  
TRENTON BRUCE SCARBOROUGH  
TREVOR GREGORY STUBBS  
TROY WESTON MCLEAN

# NEW LICENSEES

TYLER AUSTIN WHITE  
 VICTOR LOUIS MCDUFFEE  
 VINOD KUMAR SITAPARA  
 WESLEY BRENT JONES  
 WILLIAM ALEXANDER DINDA  
 WILLIAM JASON CLYMER  
 YENG CHI TSAI  
 ZAHRA GHADIMI KHASRAGHY  
 ZHIGANG WANG  
 ZUHAIR IBRAHIM

## • PLS LICENSEES

ADAM RYAN LEFTWICH  
 ALBERT WILFORD GRAMLING JR.  
 GERALD ANTHONY SMITH, JR.  
 JACOB MARTIN BACKOWSKI  
 JOHN DILLON MATTOX  
 KARL LAWRENCE PEARSON  
 TIMOTHY BLAIR WISWELL

## • ENGINEER INTERNS

AARON MICHEAL ROY  
 ABIGAIL RENEE CHRISTOPHER  
 ANDREW PATRICK JOHNSON  
 AUSTIN KYLE CROCKER  
 BRADLEY WILLIAM JONES  
 BRANDON LACHEY BOOTH  
 BRANDON LEE TARVER  
 CHARLES HENRY AYERS III  
 CHRISTOPHER BEAU MATHENY  
 CONNOR BRYLEY EWING  
 DARIUS NATHANIEL AGARD  
 DAVID MARK HALL JR  
 DEREK LOWE KELLY  
 DONNIE JASON DANIELS  
 ELDRRED CROSBY LATHAM III  
 ETHAN KARL WAGES  
 GABRIELLE HELENA SINISKY

GARRETT JEFFEREY ISBELL  
 GEORGE BOWERS PARKER  
 GORDON BRACKEN JONES  
 HAYDEN WYATT GREGORY BROWN  
 HEATH CLAYTON PITMAN  
 ISAIAH SETH WARE  
 JACK BRUNO CAPE  
 JACKSON RUSSELL BERKBIGLER  
 JACOB ELDON RICHARDS  
 JACOB KENDALL TRULL  
 JAMES MARC L. HANSEN  
 JESSICA LAUREN WINKLER  
 JUSTIN BLAKE CARTER  
 KATHRYN MARIE HOLLEY  
 KELLY FAY STEVENS  
 KOLBY LANE KIRK  
 KRISTEN JAYCEE HUBBERT  
 LAUREN ELIZABETH MAYES  
 LAYTON GLENN LUKER  
 MATTHEW BURCH ANGWIN

PAUL C. G. KOSSIK  
 RYAN ROBERT LAMBERT  
 SAMUEL BURNS PARSONS  
 SAMUEL JENSEN SPRINKLE  
 SCOTT AUSTIN JACKSON  
 SPENCER ESTESS MARTIN  
 TANNER CALEB CARR  
 TIMOTHY G. MORRIS  
 WILLIAM CONNOR ANDERSON  
 ZACHARY LEE O'NEAL

## • LAND SURVEYOR INTERNS

CAMPBELL DOSS COOK  
 CLAY SKINNER RICHARDSON  
 PAUL JARRETTE POPE

# EDUCATION NEWS

## AUBURN UNIVERSITY: ME PROFESSOR HONORED BY IEEE AS OUTSTANDING ENGINEERING EDUCATOR

Auburn University professor Pradeep Lall, who already earned recognition as a John and Anne MacFarland Endowed Distinguished Professor of Mechanical Engineering, added another plaque to his wall as IEEE's top educator.

Lall was named IEEE Region 3 Biedebach Outstanding Engineering Educator Award for 2020.

The award celebrates those who have made contributions in the field of electro-technology.

"Dr. Lall is a world-renowned expert, researcher and teacher in the field of elec-

tronics," Chair of Auburn's Department of Mechanical Engineering Jeff Suhling said in a Auburn University press release. "I am delighted to see him recognized with the IEEE Biedebach Award."

Lall, according to the release, serves as the Director of the National Science Foundation Center for Advanced Vehicle and Extreme Environment Electronics (CAVE3) and was honored for his "contributions to education in the field of additively printed electronics manufacturing and reliability for harsh environment operation."



**Auburn University professor Pradeep Lall has been recognized as the IEEE Biedebach Outstanding Engineering Educator for 2020.**

Photo & Info Courtesy Auburn University



# BUILDING A BETTER TOMORROW

## PATHWAYS FOR ALABAMA COMPUTER SCIENCE INITIATIVE TARGETS TEACHERS FOR STEM STUDIES

The University of Alabama College of Engineering, with help from a litany of stakeholders such as Tuskegee University and the State Department of Education, utilized a grant aimed at bettering computer science education throughout Alabama's elementary, junior and high schools according to a June article published in the Tuscaloosa News.

Paraphrasing the Tuscaloosa News article: "The Pathways for Alabama Computer Science Initiative received a grant in the neighborhood of \$4 million from the USDOE with the goal of utilizing the moneys to expand computer science education throughout the state especially in the communities that are rural and often considered underrepresented."

High schools, starting fall 2020, will be required to offer a computer sciences course and the USDOE grant will help better train the educators that will be teaching those topics.

Like everything, the training sessions were moved to virtual because of Covid19 concerns, but the goal remained for the (paraphrasing) "teachers to learn how to engage students in computer science and STEM related careers."

The project will impact, according to estimations, more than 60,000 high schoolers over four years.

UA Computer Science Instructor Rebecca Odom-Bartel: "We hope the students can learn about all the opportunities they never know existed."



## AUBURN: NCAT TEST TRACK SET TO RECEIVE "AUTONOMOUS VEHICLE RESEARCH" UPGRADE

Auburn University's National Center for Asphalt Technology (NCAT) test track is about to get an upgrade thanks to the construction of a "sophisticated new autonomous vehicle research facility," according to a release from the Samuel Ginn College of Engineering.

According to the release: "the building, estimated to cost around \$800,000, will be one of the few autonomous research facilities in the nation attached to a test track."

Autonomous Vehicles have been being tested for years dat-

ing back to 2016 when the Otto system piloted a trailer full of Budweisers between breweries in Colorado. The genesis of this project stems from researchers constant battle against Alabama's outdoor elements.

"The fact that we'll have our own test track ... I think will be an unbelievably unique asset," said Vehicle Dynamics Lab Director David Bevly.

Info Courtesy University of Alabama

# OUTREACH UPDATE



Outreach opportunities in the times of Covid-19 have been few and far between as most conferences normally attended by staff have moved to cancellation or either a virtual setting with no room for exhibitors to interact with the attendees. The same can be said for opportunities to be in front of a crowd. However, things are starting to change.

On July 9, Griffin Pritchard was invited by Dr. Rebecca MacDonald, an associate Civil Engineering Professor at the University of South Alabama to hold a one-hour class with her junior and senior engineering students over Zoom. The presentation focused on a mixture of both general and professional ethics along with a discussion of the gray areas, that as professionals, they will sometimes come across. He has been invited back to speak in August to another group of upperclassmen engineering students.

## ASPLS SUMMER CONFERENCE

While a majority of the conferences transitioned to virtual or even took the step of being canceled by organizers, the Alabama Society of Professional Land Surveyors went forward with their Summer Conference, while respecting Covid-19 regulations and social distancing policies.

Investigator Bruce Thornell attended the conference not as a presenter or exhibitor but in the capacity of a student hoping to better understand the trends and policies within the greater land surveying community with the goal of better being able to interact and be a resource for those who reach out to BELS from time to time.

According to Thornell, PPE's and a multitude of hand sanitizer stations were available throughout the event space.

One of the key elements of both the



Summer and Fall conference is the ability for members of the PLS community to obtain Standards of Practice credits (four needed every two years) and an annual hour of ethics.

According to Thornell's recap of the conference Jason Bailey presented the SOP, focusing on Rule 1.03 and the need to work with BELS and the ASPLS board to continue establishing relationships and best practices.

He also spoke on drone usage and their benefits to surveying when used both legally and properly. Drones - and their merits to the profession - triggered a live-

ly open-floor discussion.

BELS Board Member Joey Breighner was also in attendance and spoke on a handful of topics, chief amongst were BELS Law and Code regarding engineering and topography.

Another open floor discussion broke out regarding the location of cell phone towers and whether or not a boundary survey is needed. ASPLS is exploring expanding the SOP: Alabama by defining what a subdivision plat should include.

Conversations during the conference also included Standard of Care and how it relates to law.

Jeff Lucas handled the ethics portion of the conference and focused on Better Business Practices and the importance of having a contract between the surveyor and the client. He also focused on the importance of knowing the laws guiding the profession of surveying and how they are designed to protect both the client and the professional.

## REMAINING 2020 BELS MEETING DATES:

SEPTEMBER 15 | NOVEMBER 17

# JOB ANNOUNCEMENT

## DIVISION OF CONSTRUCTION MANAGEMENT SEEKING MECHANICAL ENGINEER



This office is empty now, but will soon be home to the Mechanical Engineer hired by the Division of Construction Management.

Photo & Info Courtesy Alabama State Personnel

On behalf of Alabama State Personnel, BELS has been asked to make the Mechanical Engineers in our licensure community aware of an immediate job opening within the Division of Construction Management (formerly the Alabama Building Commission), a permanent, fulltime position located in Montgomery, Alabama.

As part of the job duties, the Mechanical Engineer will be responsible for, among other duties, the review of mechanical engineering design plan submittals for projects throughout the state to determine compliance with standards and codes.

Applicants in either the Mechanical Engineer 1 (ME1) or Mechanical Engineer 2 (ME2) series will be considered. There is, however, a difference in the experience required between ME1 and ME2; ME1 requires four years of experience while ME2 requires six years of experience.

Both will be considered and the salary ranges differ.

- **Mechanical Engineer I Salary Range: \$62,529.60 - \$95,316.00**
- **Mechanical Engineer II Salary Range: \$72,595.20 - \$110,738.40**

In order to qualify the applicants must have (1) a Bachelor's Degree in Mechanical Engineering from an accredited four-year college or university, (2) four or six years' experience (depending on the series requirement) and (3) be a licensed Professional Engineer in the State of Alabama.

Application for Examination Forms are available at [www.personnel.alabama.gov](http://www.personnel.alabama.gov) or any Alabama Career Center Office. The State of Alabama is an equal opportunity employer. For additional information, please contact Elizabeth Allen, Personnel Director for Finance, if you have questions. She can be reached at [elizabeth.allen@personnel.alabama.gov](mailto:elizabeth.allen@personnel.alabama.gov) or 334-353-3737.





# THE LAST LOOK



**“There’s a very fine line between anxiety and excitement.”**

*Robert Anthony / Professor of Management Systems at Harvard*