ASCE Illinois Section

News

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Bascule Bridges: Balancing Basics

By Justin Pattison, P.E.

Bridge engineers strive for that "signature bridge" project. Most of us grew up believing structures like the Golden Gate Bridge in California or the Tower Bridge in London were the pinnacle achievements of a career. However, for some engineers, pinnacle achievements are not measured by length or height, but rather mechanics. Movable bridges originated many years ago as simple draw spans over moats and over time took on several forms: swing bridges, lift bridges and bascule bridges. Here in Chicago, movable bridges play an integral role in our everyday life.

Here in Chicago, movable bridges play an integral role in our everyday life. Many of the remaining movable bridge types in Chicago are bascule structures: bridges that rotate around a horizontal axis.

Many of the remaining movable bridge types in Chicago are bascule structures: bridges that rotate around a horizontal axis. For the bridge to properly rotate, all mechanical, electrical and structural components must work together. For structural engineers, designing a movable bridge goes beyond providing a sound static structure; we must account for the dynamic force imposed by the mechanical equipment, wind forces and the stability and strength of the structure in various positions. We also have to do all of this while considering the operation of the bridge. That's why bridge balance is such a key component of operation and maintenance.

DETERMINING BRIDGE BALANCE

Balancing a bascule bridge can be a daunting task. Bascule spans have unique profiles which require detailed calculations when determining the center of gravity. Let's look at a sketch of a simple bascule bridge. As shown, the

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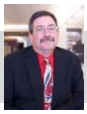
President's Notes

John Lazzara, P.E.



What a great time to be a civil engineer and a member of ASCE! ASCE recently partnered with MacGillivray Freeman Films and the Bechtel Corporation to create the IMAX movie *Dream Big: Engineering Our World*. It is a fascinating movie narrated by Jeff Bridges which is full of awe-inspiring views of amazing structures and engineering solutions. The film is intended to educate young people about the opportunities in the engineering field while raising public awareness of our profession. The film accomplished this daunting task with high marks.

The Dream Big movie opened across the country on February 17th, but the IL Section was fortunate enough to hold a special movie premiere event at the Museum of Science and Industry on the evening of February 16th. A special thanks to Don Wittmer and his Dream Big Committee for organizing the event which included approximately 100 5th to 9th grade students from Chicago area schools, leading representatives from public infrastructure agencies, partner engineering organizations, and engineering consultants. Everyone's generous support allowed the IL Section to provide a networking reception along with hands-on engineering activities supervised by local university students.

Dream Big: Engineering Our World will be showing at the Museum of Science and Industry's IMAX theater for an extended duration so I encourage you to spread the word. The movie emphasizes the role engineers play in solving problems by using the "power of imagination" in order to "enhance the human experience." Take the opportunity to go see the movie and bring family and friends along. I am sure you will enjoy the experience and have lots to talk about after the film is over.

In addition to the many monthly activities hosted by the Groups and Institutes, please keep your calendars open for the upcoming President-Elect and Student Scholarship Awards dinner in April. We are once again excited to announce that the National ASCE President-Elect Kristina Swallow will be the keynote speaker for the event. It will be a great chance to network with fellow ASCE members and make new friends while showing your support for engineering students.

Recently, I took a moment to look back over the past five months since I took over as President of the ASCE Illinois Section. I was fortunate enough to attend many interesting and fun events both in the Illinois Section and with the neighboring Northwest Branch of the Indiana Section which restarted last year. There have been two consistent observations that keep coming to my mind when I think back about all of these ASCE activities. First, is the

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ASCE Illinois Section
News

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American Society of Civil Engineers Illinois Section - Region 3

Communications Chair/ Newsletter Editor - Katie Bell
Chicago Transit Authority
567 W. Lake Street, 9th Floor
Chicago, IL 60661
630-863-5123
Katiebell529@gmail.com

Director of Advertising - Brian Pawula
847-922-6125
brianp@thomas-engineering.com

Pres. John Lazzara ....(773) 380-7938
Pres.-Elect Dhooli Raj ..... (312) 236-5119
Sec. Megan McDonald ..... (312) 669-5824
Treas. John Green ..... (312) 894-5369

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Web Site: http://www.isasce.org

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Seismic Shear Wall Stabilization of TVA's Colbert Ash Pond 4 East Dike in Tuscumbia, Alabama

By Bill Walton, P.E., S.E., F. ASCE

Abstract - As part of a comprehensive project to close the coal fired Colbert Fossil Plant (COF) in Tuscumbia, Alabama, the Tennessee Valley Authority (TVA) initiated a project to improve the seismic stability of a 70-acre sluiced ash pond next to Cane Creek, a tributary to the Tennessee River. Seismic improvements comprised a downstream stability berm and soil/cement shear walls built using deep mix methods (DMM) along the 3,100 feet (ft) perimeter toe of 40-ft high compacted clay dikes that retained a sluiced ash in an active pond from discharging into Cane Creek during or after an earthquake. The expedited project began during the summer of 2014 with alternative evaluation, design and permitting. Construction of the seismic improvements started in August 2015 to meet TVA's goal to close the ash pond facility after Colbert Fossil Plant shut-down in 2016. Construction of the seismic improvements was completed December 2016 with pond dewatering, capping scheduled to begin early 2017, and final pond closure in 2018. TVA and GEI used an early contractor involvement process to obtain input on our 90% design that improved constructability, reduced costs and shortened the project construction schedule.

As part of a comprehensive project to close the fired Colbert Fossil Plant (COF) in Tuscumbia, Alabama, the Tennessee Valley Authority (TVA) initiated a project to improve the seismic stability of a 70-acre sluiced ash pond next to Cane Creek, a tributary to the Tennessee River

Ash Pond 4 covers an area of approximately 70 acres, and is enclosed by perimeter dikes approximately 6,700 ft in total length along the crest. The east dike next to Cane Creek is about 2,700 linear feet long and the toe of the east dike is adjacent to Cane Creek. The normal water level in Cane Creek is approximately elevation (El.) 414 (ft). The top of the Cane Creek river bank next to the toe of the east dike ranged from about El. 420 to El. 425.

TVA and GEI used an early contractor involvement process to obtain input on our 90% design that improved constructability, reduced costs and shortened the project construction schedule.

Ash Pond 4 was designed to store sluiced ash from the power plant and was constructed in two phases. The first phase (lower dike) was constructed in 1972 and comprised compacted clay perimeter dikes up to 20 ft high, with crest at El. 440. The lower dike was constructed of compacted clay and silty sand with gravel and retained fly ash. In 1984, the Phase 2 perimeter dike was installed raising the crest an additional 20 ft, up to crest El. 460, which is the current crest elevation. The upper dike was constructed of compacted clay using upstream dike construction methods, i.e., the upper dike was constructed partially over the lower dike and over the sluiced fly ash. The second dike retains sluiced bottom ash and stacked ash. The overall height of the 2-tier perimeter dike is 40 feet on the east side, adjacent to Cane Creek. The downstream dike slopes are approximately 2.5H:1V to 3H:1V. Pond water was at El. 451.

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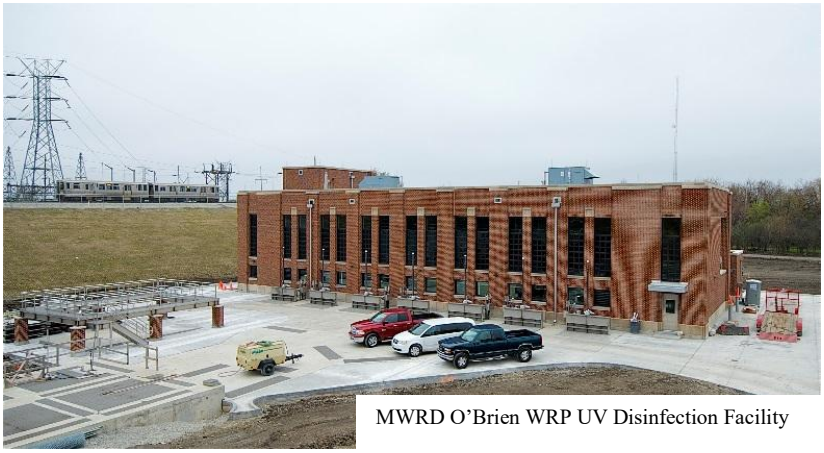
ASCE Illinois Section Members Tour 450 MGD Ultraviolet Light Disinfection Facility

By Beata Busza, P.E. and Brian Olson, P.E., CFM, CPESC

In October 2016, members of the ASCE Illinois Section toured the largest ultraviolet (UV) disinfection facility in the world by flow at the Metropolitan Water Reclamation District of Greater Chicago's (MWRD) O'Brien Water Reclamation Plant (WRP) in Skokie, Illinois. The O'Brien WRP collects sewage from an approximately 143-square mile area with a corresponding population of 1.3 million people. Designed by a collaborative team in a short period of time to improve water quality conditions in the Chicago Area Waterway System (CAWS) and meet MWRD commitments to the United States Environmental Protection Agency (EPA) and environmental groups, this expedited project was completed on schedule and at substantially less cost than the original estimate. In 2011, the MWRD created an internal disinfection task force to evaluate disinfection technologies for implementation at the O'Brien WRP. The upgrades were part of the Water Quality Strategy for the CAWS. Using a triple bottom line approach, the task force recommended UV disinfection for implementation at the O'Brien WRP to be installed by the 2016 disinfection season. To meet this schedule, MWRD personnel, designers, and the UV equipment manufacturer worked as a cohesive team to overcome unique design challenges of this facility, while completing the project within an accelerated design schedule of approximately six months.



MWRD O'Brien WRP UV Disinfection Facility

MWRD personnel, designers, and the UV equipment manufacturer worked as a cohesive team to overcome unique design challenges of this facility, while completing the project within an accelerated design schedule of approximately six months.

The O'Brien WRP is an activated

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UV Disinfection Flow Channels

How Can We Be Engineering Mentors?

By Kris Salvatera, P.E. and Susie Chung, P.E.

The Illinois Section Student Outreach Committee has geared up for National Engineers Week with various student outreach events and opportunities to get members actively involved within the next couple of weeks. Some events that we actively participate include: The Future City Chicago Regional Competition hosted at UIC, Family STEAM Night at Helen Keller Elementary in Tinley Park, and Engineering Fest at the Chicago Architecture Foundation. As our members engage in these fun outreach programs, we reflect on how much your active participation impacts students' development into future civil engineers.

Civil engineers are problem solvers. Being active and mentoring grades K-12 students

Being active and mentoring grades K-12 students fosters a desire to learn early in their lives.

fosters a desire to learn early in their lives. Mentoring these students allows them to be involved in engineering-process opportunities they would otherwise not engage in. An example is the annual Family STEAM Night at Helen Keller Elementary in Tinley Park, where students engage in engineering activities such as constructing models made of marshmallows and straws, or building roller coasters to test their grasp of potential energy. But beyond learning, volunteers can attest to the fun the students have and they see these students quickly come back again the following year. A few of these students even go on to become civil engineers themselves.

Not only can we be mentors to grades K-12, but we can also be mentors to university students as they transition into their engineering careers. While

Figure 1 Helping students create Marshmallow Structures at Family Steam Night at Helen Keller Elementary

universities can teach students the engineering curriculum, we as professionals can mentor students on how to actively live the life of an engineer. For example, the Illinois Section makes annual University visits to give students real-life experiences from professionals and how students can actively be involved within ASCE. When students do attend

Not only can we be mentors to grades K-12, but we can also be mentors to university students as they transition into their engineering careers.

our ASCE events, we encourage all professional members to engage with them. Being a mentor doesn't have to be an official title given to mentors and protégés, but it can be started with a networking relationship. The next time you see a student

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ASCE Membership Committee Updates

By Matt Huffman

Apply to be an ASCE Fellow!

If you have been an ASCE member for over 10 years and have made celebrated

Have you considered applying to be an ASCE Fellow???

contributions and/or developed creative solutions to help change lives, have you considered applying to be an ASCE Fellow??? This prestigious honor is held by fewer than 3.5% of ASCE members and recognizes the important contributions civil engineers make to society. The ASCE Illinois Section encourages our members to consider applying for this honorary membership grade. More information regarding the application process and other exclusive benefits of being an ASCE Fellow can be found on the ASCE website.

Explanation of Membership Grades

For the nearly 600 students and 525 Associate Members within the Illinois Section, if you are graduating this spring or have recently received your PE, make sure to advance your membership grade:

- Associate Member -- an individual which has a bachelor's degree from an ABET/EAC accredited school in civil engineering or a current member in another engineering society which ASCE has a reciprocal membership agreement.
- Member -- an individual which has a bachelor's degree from an ABET/EAC accredited civil engineering program with a PE or five years of experience; master's or doctorate in civil engineering with a PE or four years of experience; degree from a non-ABET/EAC accredited school with a PE and five years of experience.

Graduating Students and new PEs – Upgrade Your Membership Grade

Current ASCE Illinois Section Membership

The state of membership within the Illinois Section of ASCE is in good health to start off the 2017 year, with 2,935 active engineers, students and retirees. Every year around this time, ASCE National contacts members who have not renewed their National membership for 2017, which currently totals nearly 840 engineers within the Illinois Section, so please urge any colleagues you may know to renew. Additionally, it is critical to pay the Section dues ($30) when renewing your 2017 National membership, which constitutes a majority of our Section income. Please note that

Keep your contact and employment information current by logging into your ASCE account

ASCE has a membership renewal grace period which lasts until mid-March, so make sure to renew soon!!

Membership Help

Remember to keep your ASCE account up to date with your latest employment and contact information (ASCE account login).

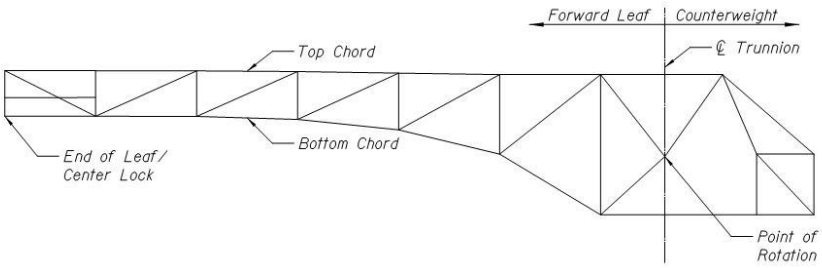
Please contact Matt Huffman, the Illinois Section Membership Committee Chair, with any membership related questions at mhuffman@cbbel.com.

Matt Huffman is a Project Manager at Christopher B. Burke Engineering, Ltd. Within the Phase I Engineering Department.

Bascule Bridges: Balancing Basics

(continued from page 1)

balance of the bridge is with respect to the trunnion. Basic



SKETCH 1 - BASIC FRAMING PLAN
(Double Leaf Bascule - one leaf shown)

steps to balancing a bascule bridge are:

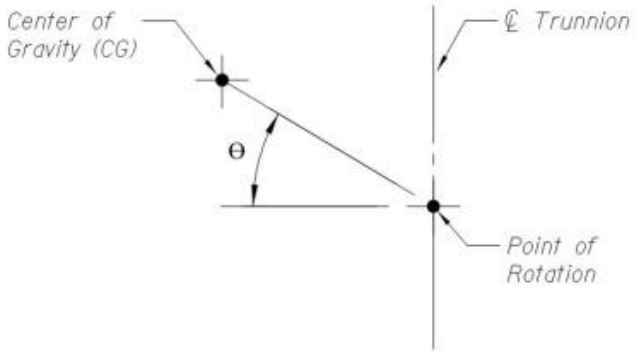
1. Determine the center of gravity (CG) of the bridge, including forward leaf and counterweight assembly
2. Compare the location of the CG to the trunnion or point of rotation
3. Determine end reactions at the supports

If the CG is determined to be forward of the trunnion, then the bridge is considered span heavy. Most owners require a span heavy balance condition, which is categorized by the end reactions; of where 1 kip to 2 kip is common. Another criterion for the CG is the angle with respect to a horizontal plane passing through the point of rotation (See Sketch 2). This angle may be specified within a range of values to ensure the degree of span-heavy balancing is achieved, as required by AASHTO's Movable Highway Bridge Design Specifications or owner specifications.

OTHER BRIDGE

BALANCING OPTIONS

Hand calculations are almost always the starting point in any project whether a new bridge or a rehabilitation of an existing bridge but they are not the only way to determine the balance of a bascule bridge. A few other common ways are: (1) drift test, (2) power demand or motor behavior, and (3) strain gages.



SKETCH 2 - CG LOCATION

Very detailed hand calculations are required for new construction and major rehabilitation, but that may not be necessary for bridges in operation or receiving small repairs or modifications where simpler calculations may suffice.

For new construction or major rehabilitation balance calculations are taken down to the level of accounting for washers, weld fillets, plate overruns and paint.

For simply evaluating the performance of a bridge and whether its balance is acceptable, nothing provides a more physically simple and direct observation of span behavior. The drift test can be performed by the operating crews and is usually completed in a short period of time. This test is typically performed to gauge the level of imbalance and is based more in "feel" than in numbers. A drift test is accomplished when the span is driven at full speed until the mid-point of travel. At that point, the power is withdrawn, the brakes are released and the span is allowed to 'drift' upward until it stops from friction. Then the bridge is powered to fully open and driven at full speed downward until the mid-point of travel. Again, the power is removed, the brakes are released and the span is allowed to drift downward. The

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Bascule Bridges: Balancing Basics

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drift down is then compared to the drift upward. Historically, good or acceptable operation is 1-1/2:1 to 2:1 down: up. *Disclaimer: This approach should be used at caution as if the bridge is too far out of balance in either direction, damage may occur at the supports if the bridge is not stopped in time.*

Additionally, a way to check the crude balance is to observe the grease patterns on the rack and pinion. If there is the same amount of grease on the mating or contact portions of both faces of the same gear tooth, you can be pretty sure that the span is reasonably balanced. If, however, you note a disproportionate amount of grease exists on one face of any given tooth, that face is much less loaded that the tooth face which exhibits little grease. The balance is considered poor with this observation.

The power demand and strain gage methods are similar in that they use a mix of operation and hand calculations to determine the imbalance of a bascule bridge.

For structural engineers, designing a movable bridge goes beyond providing a sound static structure; we must account for the dynamic force imposed by the mechanical equipment, wind forces and the stability and strength of the strucutre in various positions.

The power demand method measures the power used by each motor during operation to determine if the leaf is span or counterweight heavy and if one girder is loaded more than the other. If an AC motor is reading desk meter amperage, we get an indication of balance, but if we are reading power we can more directly relate quantitative balance. The strain gage method is the more accurate of the two, converting via strain gages, the deformation of one of the drive shafts, preferably the lowest speed, highest torque shaft accessible to provide actual torque on the shaft. Comparisons of meter readings as well as strain gage readings as we open and close the span are then evaluated to determine a net balance condition. Typically, the design engineer will perform the hand calculations and supply the necessary information to the contractor's engineer. The contractor will then perform the strain gage test to verify the hand calculations and ensure the bridge is balanced before it is opened for operation.

IMPORTANCE OF BRIDGE BALANCING

When a bridge is out of balance, a variety of problems may arise. The most common problem is mechanical and/or electrical equipment overloading. This issue may not become apparent immediately, but can reduce the life expectancy of the equipment charged with making the bridge move. In the event of electrical failure, the bridge is expected to be opened by auxiliary power and sometimes by hand operation. This process typically adds significant time of opening and will be very difficult or impossible if the bridge is too far out of balance. Another common issue is difficulty seating or locking. If a bridge operator talks about "driving the bridge down" to seat and lock the forward span, or if the span tends to float up after being seated the bridge may be too counterweight heavy. If a bridge imbalance, especially counterweight heavy, exists developing the proper seating reactions may be very difficult which would result in excessive vibrations due to live loads creating serviceability issues.

There could also be binding or additional friction in the system causing very high power readings or strain gage readings. This is determined when the high demand is almost equal in both directions of travel. It is a good rule of thumb to thoroughly investigate any structure that exhibits high operational forces in both directions of travel.

These are just a few issues that could result from imbalanced bascule bridges. Some may be obvious while many others may not become apparent until components require replacing. The owners, operators, inspectors and designers must work as a team to ensure proper operation.

Justin Pattison, P.E. is a Structural Engineer at STV Incorporated with 5 years of bridge related design experience and an active member of the ASCE Illinois Section SEI.

Seismic Shear Wall Stabilization of TVA's Colbert Ash Pond 4 East Dike in Tuscumbia, Alabama

(continued from page 3)

Seismic Stability Analyses - In 2014, TVA requested a seismic liquefaction and seismic stability evaluation of Ash Pond 4 including the dikes, foundation soils and impounded ash. The evaluation was performed using a far-field New Madrid, MO design earthquake with 2% probability of occurrence in 50 years (2,500 year return period). We performed an Idriss and Boulanger (2008) liquefaction triggering analyses, developing post-seismic shear strengths and performing limit equilibrium pseudostatic and post-earthquake stability analyses. The earthquake-induced liquefaction triggering analyses were performed at seven design sections along the perimeter dike. Based on these analyses, we concluded that the native alluvial silty sand foundation stratum and the sluiced loose, saturated fly ash impounded behind the dike were subject to shear strength loss during the design earthquake. Stability evaluations using steady-state undrained shear strengths showed the dike would have a post-seismic factor of safety less than 1.0 at five of the seven cross sections along the dike. Post-earthquake deformation analyses using the computer program FLAC showed that the dike would translate 46 feet laterally with an 8 ft loss of dike freeboard.

Shear Wall Design Approach - The stability analyses indicated that the probable failure mode during and after the seismic event would present failure surfaces sliding down through the sluiced wet ash, through alluvial clay horizontally along the loose saturated foundation sands that support the dike and then sliding upward and daylighting into Cane Creek. The Team prepared fast track alternatives that identified practical improvements focusing on 1) lowering the Phase 2 dike crest to reduce final driving stresses, 2) increasing sliding resistance, 3) reinforcing the liquefiable loose wet sand foundation zone.

Figure 1 shows the preferred shear wall option that required designing and constructing a 50-ft wide, 15-ft high granular working platform/toe berm along the toe of the dike to allow construction of soil-cement shear walls installed to the top of hard limestone bedrock employing the Deep Mix Method (DMM) using low mobility cementitious materials. To accomplish this seismic stabilization design, GEI, TVA and AECOM collaborated to reduce the dike crest along the entire east dike to reduce driving stresses to optimize the final closure grading plan for the cap to be placed over the re-contoured ash pond. This collaboration resulted in lower driving stresses and less buttressing to achieve seismic stability.

We also faced several challenges in designing the DMM walls using the FHWA (2013) Deep Mixing for Embankment and Foundation Support. Two key design challenges were: (1) limiting wall bearing pressures so the walls would not crush at the soil-cement DMM at the downstream toe, and 2) generating adequate friction (e.g., $\Phi > 40$ degrees) along the base of the DMM walls to resist sliding. Since the depth to 16,000 psi limestone bedrock was about 30 feet and the maximum length of wall that could be installed on the

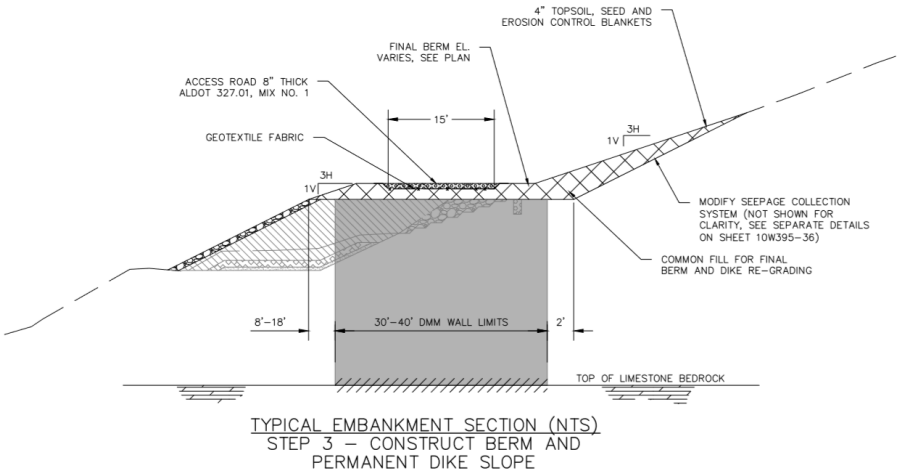

Figure 1. Typical Cross-Section

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Seismic Shear Wall Stabilization of TVA's Colbert Ash Pond 4 East Dike in Tuscumbia, Alabama

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working platform was about 40 feet, this wall geometry resulted in higher bearing pressures at the downstream toe of each wall. We elected to use a design soil-cement unconfined compression strength (f'sc) of 275 psi which was deemed reasonable but reported on the high side by bidding contractors. We reduced the risk of DMM crushing at the downstream end of the walls by requiring a wider wall using a wye ("Y") shaped head design in the high stress toe area (see Figure 2).

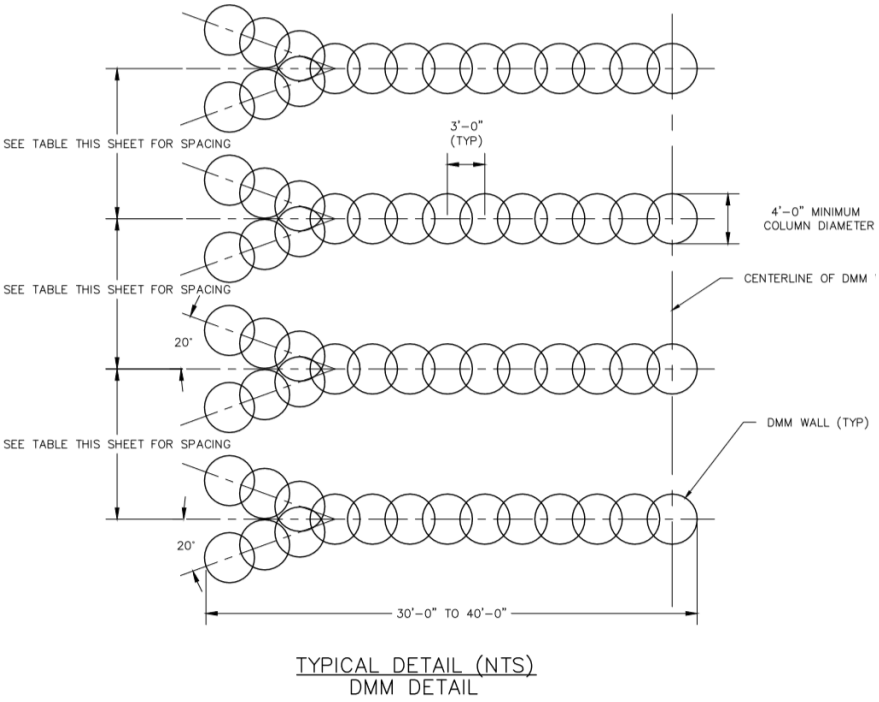

Figure 2. Typical Plan Wye DMM Wall at East Dike

To reduce construction costs, the walls were designed to resist the lateral loads primarily by sliding resistance between the DMM walls and the top of bedrock. To generate enough vertical load on the walls to generate friction we made two key assumptions: 1) the weight of soil (from the working platform) load above the walls would distribute to each wall based on the tributary area, and 2) the soils in between the walls would provide some "downdrag" on each wall as the soils surrounding the walls consolidated based on the loads from the working platform and a supplemental surcharge fill to attain final restoration grade for the buttress fill. The final design included adding an additional 5 ft of fill above the working platform (post-wall construction) to generate the required vertical surcharge loads on the walls and clay below the dike. This surcharge weight would elastically compress the clay and sand allowing "downdrag" or supplemental skin friction in the working platform sand and gravel fill to grip the wall.

The selected Contractor (Thalle/GSI JV) selected a 48-inch-diameter, 4-gang wet auger rig to install DMM walls using a wye shaped secant pattern. They also proposed to use a single dry auger rig to provide additional mixing at the top of bedrock in the event the 4-gang auger could not achieve full rock contact on each column. Based on the proposed wall geometry GEI optimized wall spacing and length which resulted in walls that were 30 and 40-ft long, bearing intimately on limestone located 25 to 30 ft below top of the working platform. Walls perpendicular to the dike were located on 12 to 35 ft centers based on geology, and final perimeter dike crest elevation of the regraded closed and capped ash pond.

Construction Quality Control and Assurance Program - GEI, TVA and Thalle/GSI JV exercised construction quality control and quality assurance (CQA) with protocols to achieve and document uniform soil-cement mixing, adequate PQ-size core strengths and down-hole video camera documenting intimate contact of the cured DMM walls on limestone. The CQA resulted in a proven Contractor-selected

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Seismic Shear Wall Stabilization of TVA's Colbert Ash Pond 4 East Dike in Tuscumbia, Alabama

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soil-cement mix design (20% Portland cement and 1.5 water: 1 cement grout mix) and an

The TVA has made improvements to the COF Ash Pond 4 east dike which will reduce the risk of the dike breaching during a 2,500 year earthquake event.

installation mixing method documented with automated monitoring equipment. GEI was on site full-time and responsible for reviewing the QC activities, taking independent QA samples, performing video inspections of PQ-size coreholes initially on 10% and finally on 2% of the wall elements, and video inspecting the DMM soil/cement wall at the bedrock interface. Trimmed cores were tested to measure the compressive strength (f'sc) of the cores after 56 days of in-situ cure.

Conclusions - The TVA has made improvements to the COF Ash Pond 4 east dike which will reduce the risk of the dike breaching during a 2,500 year earthquake event. The TVA's program management process allowed them to consider a range of solutions and select one that met their interest. Additionally, TVA's approach to early contractor involvement allowed GEI's designs to incorporate Contractor feedback which optimize the design, reduced cost and schedule, and improved constructability.

Bill Watson is a Senior Principal, Senior Vice President and Group Practice Leader for GEI Consultants, Inc. in Chicago, Illinois. Bill is member of the Board of Directors for GEI and on the Board of the Structural Engineers Association of Illinois. Bill is licensed in 25 States and Territories as a Professional and Structural Engineer.

ASCE Illinois Section Members Tour 450 MGD Ultraviolet Light Disinfection Facility

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sludge, single-stage nitrification plant. The design of the UV system, completed by Greeley and Hansen, was based upon effectively disinfecting a permitted hourly flow of 450 million gallons per day (MGD), and an average flow of 240 MGD. After undergoing primary and secondary treatment, wastewater is disinfected through a multi-channel UV disinfection system. To determine the correct amount of UV dosage to utilize, 12-months of testing was completed. The Illinois EPA requires a UV dosage rate of 40 millijoules (mJ)/cm^2 to meet disinfection standards, unless pilot testing is completed. Subsequent test results showed a dosage rate of 30 mJ/cm^2 would effectively disinfect wastewater at theO'Brien WRP. As a result, a more energy efficient system was designed that included seven flow channels instead of the original 10, eliminating $20 million in capital costs, while also reducing ongoing operational costs related to power generation and system maintenance. This resulted in the use of 896 low pressure high output performance lamps in the system. Increased optimization was considered during the design process, as such, the seven channels within the UV

Section members view the UV light assembly.

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ASCE Illinois Section Members Tour 450 MGD Ultraviolet Light Disinfection Facility

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disinfection system can be independently activated or deactivated from service and can also be increased from 30 percent to 100 percent power, dependingon wastewater characteristics, flow conditions

The O'Brien WRP UV disinfection system was a challenging and complex project that required cutting-edge application of traditional UV technology to the plant's wastewater treatment process, resulting in the largest UV disinfection application by flow in the world.

and plant demand to maximize operational efficiency and minimize unnecessary power consumption. The unique configuration of the UV system enables easy lamp replacement and system maintenance while the system is in full operation with the UV lamp banks in the channels.

Construction began in the fall of 2013 and was completed for the start of the 2016 disinfection season by Walsh Construction. While the engineer's opinion of probable construction cost was $75.9 million, the project was completed on time and under budget for a total of $62.5 million.

The O'Brien WRP UV disinfection system was a challenging and complex project that required cutting-edge application of traditional UV technology to the plant's wastewater treatment process, resulting in the largest UV disinfection application by flow in the world. "With the completion of the UV system at the O'Brien WRP, along with disinfection upgrades we recently made at other facilities, MWRD now has a system in place that will dramatically improve the quality of water throughout the Chicago Area Waterway System, while protecting the region's drinking water supply in Lake Michigan," said David St. Pierre, MWRD Executive Director.

Beata Busza, P.E., is a Principal Civil Engineer at the Metropolitan Water Reclamation District of Greater Chicago.

Brian Olson, P.E., CFM, CPESC, is a Civil Engineer at Greeley and Hansen in Chicago, IL and is currently the Chair of the ASCE EWRI Chicago Chapter.

How Can We Be Engineering Mentors?

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member attend one of our ASCE events, initiate a conversation with them and you will likely see them come back to a future event.

The Student Outreach Committee collaborates with various ASCE Institutes to coordinate volunteer opportunities for ASCE members to get actively involved and share their experiences and inspire young engineers. For more information on the committee's activities and outreach programs, check out the Illinois Section event calendar or visit our webpage at http://www.isasce.org/committees/student-outreach-committee/.

The next time you see a student member attend one of our ASCE events, initiate a conversation with them and you will likely see them come back to a future event.

Kris Salvatera is a Senior Transportation Design Engineer with Crawford, Murphy & Tilly and he is the chair for the Student Outreach Committee.

Susie Chung is a Project Engineer specializing in building component design with J3 Engineering Group, LLC and serves as a member on the ASCE Student Outreach Committee.

Thank you to all of the sponsors of our February 2017 Dream Big premiere event! The event was a great success thanks to your generous support!

The ASCE Illinois Section Would Like to Congratulate…

The ASCE Illinois Section would like to congratulate **Professor Giuseppe Buscarnera** for being selected by the ASCE Geo-Institute to receive the **2017 Arthur Casagrande Professional Development Award.** Professor Buscarnera, an Assistant Professor of Civil and Environmental Engineering at Northwestern Univeristy, received this award for outstanding contributions to the modeling of instability and failure in multiphase porous materials.

The ASCE Illinois Section would also like to congratulate **Kris Salvatera** for receiving the **2017 Section/Branch Discover E Volunteer Award** at the 2017 Region 3, 6, & 7 Multi-Region Leadership Conference (MRLC). Kris, a civil engineer at Crawford, Murphy, & Tilly (CMT), received this award for demonstrating outstanding leadership and participation in community service. Kris is currently the Chair of the Student Outreach Committee for the ASCE Illinois Section and the Director of University Affairs for the ASCE Illinois Section Younger Member Group (YMG).

The ASCE Illinois Section would also like to congratulate Ani Kadambi for being selected by the ASCE Central Regional Younger Member Council (CRYMC) to receive the **2017 Outstanding Younger Member in Community Activities Award.** Ani, a structural engineer at AECOM, received this award for demonstrating outstanding leadership and participation in community service. Ani is currently the Director of Outreach for the ASCE Illinois Section Younger Member Group (YMG).

Kris Salvatera and Ani Kadambi pictured with other ASCE members at the ASCE Multi-Region Leadership Conference (MRLC) where they accepted their awards

Design & Installation of Precast Concrete Drainage Systems

Hyatt Regency, Lisle, Illinois, Thursday, March 30, 2017

8 PDHs $95.00

Special Keynote Speaker –Dr. Patricia Galloway

Speaking on the Roles, Responsibilities & Risk Considerations of the 21st Century Engineer

Other Presentations Include:

Accelerated Construction Using Precast Concrete Boxes & Three-Sided Structures

Design Comparison of RCP & Plastic Pipe

Proper Installation of Concrete Pipe & Boxes

The seminar is presented by the Illinois Concrete Pipe Association (ICPA) and includes a continental breakfast, buffet lunch, and a certificate for 8 PDHs. The Hyatt Regency Lisle is conveniently located near the intersection of I-88 and Route 53 and the hotel is offering a special group rate of $119.00/night for Wednesday night. Please contact the hotel directly to make reservations. The registration deadline is Friday, March 24, 2017. Space is limited, so please register early. For a registration form, please visit ICPA's website – http://illinois.concretepipe.org. For further information, contact Glenn Clayton at 630-673-0140 or icpamd@aol.com.

2017 ASCE Illinois Section Student Chapter Resume Book

The ASCE Illinois Section has produced its *Seventh Annual Resume Book* for 2017. Members of the ASCE Student Chapters at the Illinois Institute of Technology, Northwestern University, and the University of Illinois at Chicago have submitted one-page resumes for internships and full-time positions. A published PDF copy of this year's resume book is freely available to all professional members of the ASCE Illinois Section upon request. If you are an employer interested in obtaining the resume book, please provide your ASCE membership number and contact **Sherryl Malanao** at Sherryl.Malanao@jacobs.com.

Illinois Section News & Secretary Report

Spring 2017

In an effort to inform Illinois Section members of the discussions at the monthly Board meetings, the Section Secretary contributes this article to the newsletter. Any questions or comments on the Board activities are welcome by contacting Megan McDonald, at megan.mcdonald@clarkdietz.com .

■ *Treasurer's Report*

▲ A treasurer's report was presented at the December, January, and February meetings. All reports were approved.

■ *Highlights from Illinois Section Activities and Group Reports.*

▲ ***Dream Big*** – ASCE had the premier of *Dream Big: Engineering Our World* at the Museum of Science and Industry (MSI) on February 16, 2017. The IMAX movie will run at MSI throughout 2017.

▲ ***ASCE National Infrastructure Report Card*** – The National Report Card will be released on March 9, 2017.

▲ ***President-Elect and Student Scholarship Dinner*** – The dinner will be held at Maggiano's on April 13 with ASCE National President-Elect Kristina Swallow.

▲ ***Structural Engineering Institute Biennial Lecture Series*** – The SEI 22nd Biennial Lecture Series begins on March 1 and continues through April 12, in four parts. It will be held at the Union League Club, contact Kendra Bleers (Kendra.bleers@jacobs.com) for more details.

▲ ***Transportation & Development Institute Luncheon*** – Tuesday, March 15 T&DI will host a luncheon with guest speaker, Greg Bedalov (Illinois Tollway Executive Director), at the Maggiano's Oak Brook.

▲ ***Younger Member Goup Spring PE Review Course*** – The spring class is back with a new format with an introductory session, focused problem solving sessions, and full-day mock exam. Please email PE.Review.YMG@gmail.com for details. The class runs from February 28 to April 8.

▲ ***Outreach Opportunities*** – STEM Discovery Night (Naperville) is Monday, March 14 at Meadow Glens Elementary School. Contact Susie Chung (Susie.chung@j3engineers.com) for volunteer opportunities.

▲ ***Envision Certification Training*** – Training will be held September 13, 2017. More details on location coming soon.

The Illinois Section Board Meetings are held every first Monday of every month with the exception of holidays. The next board meeting is scheduled for March 6, 2017 at 5:30pm at the Clark Dietz office located at 118 S. Clinton Street, Suite 700, Chicago, IL. Please note the meeting location. Future meetings will be held on April 3, May 1, and June 5.

By Megan McDonald
ASCE Secretary 2016-2017
megan.mcdonald@clarkdietz.com

President's Notes

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dedication of volunteers who use their talents to turn creative ideas into reality. Second, is the support and participation by ASCE members. I can't say enough about the increasingly larger number of people getting involved and networking with each other at the ASCE events. The best way to get to know people is to work with them on achieving common goals and enjoying every opportunity to catch up with each other at events.

As the ASCE year approaches the mid-point, please reflect back on the request I had for each of you: think about inviting other engineers you work with or know to one of our events. Have you had a chance to do that yet? For many people, getting involved simply starts with being asked.

Illinois Section Activities

ASCE IL Section EWRI Chapter Board Meeting

Date: Tuesday, March 14
Time: 5:30pm - 6:30pm
Place: Emerald Loop (reservation is under ASCE EWRI-Brian Olson)
216 N. Wabash
Chicago, IL 60601
RSVP: Brian Olson at bolson@greeley-hanson.com

ASCE IL Section Student Outreach – Volunteer Event

STEM Discovery Night (Naperville)
Date: Tuesday, March 14
Time: 5:30 pm – 8:00 pm
Place: Meadow Glens Elementary School
1150 Muirhead Ave.
Naperville, IL 60565
RSVP: Susie Chung, Susie.chung@j3engineers.com

ASCE IL Section T&DI Chapter Board Meeting

Date: Wednesday, March 15
Time: 5:30pm - 6:30pm
Place: Michael Baker Int'l.
200 W. Adams Street, Suite 2800
Chicago, IL 60606
RSVP: tborges@bloomcos.com

ASCE IL Section SEI - Biennial Lecture Series

Dates: March 1, Session 1
March 15, Session 2
March 29, Session 3
April 12, Session 4
Time: 5:30pm - 8:00pm
Place: Union League Club
65 W. Jackson
Chicago, IL
Lecture Series Flyer

ASCE IL Section T&DI March Luncheon Event

Greg Bedalov – Executive Director, Illinois Tollway
Date: Tuesday, March 21
Time: 11:30am - 1:15pm
Place: Maggiano's
350 Oakbrook Center
Oak Brook, IL 60523
Cost: $50-Members
$60-General
$35-Government
$25-student
$100 Bronze Level
(Includes 1 seat)
$200 Silver Level
(Includes 2 seats)
$350 Gold Level
(Includes 5 seats-half table)
$650 Gold Level
(Includes 10 seats-full table)
RSVP: Register Here! By Friday March, 17, 2017. All registrations after this date will be charged the General fee plus a $10 late fee.

ASCE IL Section UP&DG March Monthly Meeting

Date: Thursday, March 23
Time: 5:30pm, Food & Refreshments Provided
Place: Uncle Julio's Mexican Restaurant
1831 Abriter Court
Naperville, IL 60563
Agenda: *Scholarships, May Presentation, Future Topics/Speakers*
RSVP: Jay Olson: jolson@gsg-consultants.com; 630-536-6807
Kevin Klein; kklein@conteches.com; 331-472-6969
Steve Shanoltzer: sshanholtzer@manhard.com; 630-487-7484
Cost: None

ASCE IL Section President Elect/Student Scholarship Dinner (SAVE THE DATE)

Date: Thursday, April 13
Place: Maggiano's
111 W. Grand Ave.
Chicago, IL

ASCE IL Section UP&DG April Monthly Meeting

Date: Thursday, April 27
Time: 5:30pm, Food & Refreshments Provided
Place: Chandlers Chop House at Schaumburg Golf Course
401 N. Roselle Road
Schaumburg, IL 60194
Agenda: *Summer Activities, Future Topics/Speakers*
RSVP: Jay Olson: jolson@gsg-consultants.com; 630-536-6807
Kevin Klein; kklein@conteches.com; 331-472-6969
Steve Shanoltzer: sshanholtzer@manhard.com; 630-487-7484
Cost: None

ASCE IL Section Committee on Sustainability ENVISION SP Accreditation Training (SAVE-THE-DATE)

Date: Wednesday, Sept. 13
Location: Chicago
PDHs: 6.0 PDHs

For all Section, Group and Committee events, check out the Section website at:

www.isasce.org/web/section/calendar.html