



Illinois Section
Founded 1916

ASCE Illinois Section

News

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How's My Water?

Written by Jerome F. McGovern, P.E. and James F. Canning, P.E., ENV SP

As part of our profession of civil engineering, we are all very familiar with the need to secure permits and make annual reports to various agencies. Are these permits and reports *actually* necessary? They consume a great deal of time and resources, and they are never accepted on the first submittal. The short answer is yes, they really are necessary, and they are mandated by

federal and state laws. When it comes to permitting and impacts to water quality, one needs to understand one of the most important pieces of legislation to affect civil engineers, the Clean Water Act of 1972.

As the United States developed, natural resources were considered infinite, and there was no attempt to protect and conserve resources such as forests and rivers. Nature existed to be bent to the will of the settlers and to be utilized for economic development. For many years, streams and rivers were treated as open sewers where untreated sewage and industrial waste were discharged without any concern for the impact on the quality of the water.

By the 1960s, it became apparent that natural resources were not infinite, and dumping of raw waste into rivers, lakes, and other bodies of water was detrimental to public health. There was also a greater understanding of the relationship between toxic (Continued on page 9)



Figure 1 A man 'walks on water' atop sewage in Bubbly Creek, a tributary to the Chicago River

President's Notes

Matt Huffman, P.E.



As the Illinois Section's business year comes to a close at our Annual Awards Dinner being held on October 10th at the Intercontinental Chicago, we look to come together and celebrate the contributions and accomplishments of our 2024 Award Winners and 2024 Life Member Class, as well as the install the 2024/25 Illinois Section Board.

I'd like to express my gratitude and thanks to all those that helped make the prior year a success, including the IS Board and our various committees, Technical Institutes and their respective boards, Younger Member Group, and our Executive Secretary, Sarah Harbaugh, as well as the many companies who help sponsor all of our various events.

Reflecting on the prior year, we had set out to focus on three areas with supporting society events and initiatives, enhancing STEM and Civil Engineering Outreach, and supporting our Student and Associate members.

Three society level events were held this past year within the Illinois Section, including the ASCE Convention in October 2023, Western Great Lakes Student Symposium in April 2024, and our Region 3 Assembly in September 2024. Hosting these events took the contributions of many of our Illinois Section Members and I'd like to thank everyone who assisted in their success.

Over this last year, we made some great strides this year with our outreach efforts in forming a new relationship with the City Colleges of Chicago (CCC) and their Engineering Pathways Program, which is supported through our Diversity &

Inclusion Committee. Nearly 20 Wright College students interested in pursuing Civil Engineering attended our spring dinner. In the coming year, we look to continue building our relationship with CCC and supporting their students interested in civil engineering.

Our relationship and collaboration with our three local student chapters, IL Tech, Northwestern, and UIC, is at an all-time high, with assisting them in planning for and hosting the Western Great Lakes (WGL) Student Symposium. I was thoroughly impressed with their communication and collaboration amongst each other in successfully hosting 19 schools and 450 students, and staying on budget.

Look out for our 2024/25 Mentorship Program announcement, which will launch in the coming month, and runs from November to April. This program pairs an ASCE Student Protégé with an ASCE Professional mentor, so please consider being a mentor.

As we plan for the upcoming year, please don't hesitate to reach out to us for any additional items or changes you would like to see within the Illinois Section to better support you and our local civil engineering industry.

It has truly been an honor serving the Illinois Section over this past year and I look forward to the year ahead, and supporting our incoming President, Tom Janicke, and our 2024/25 IS Board.

Yours sincerely,

Matt Huffman, P.E.

ASCE Illinois Section News

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**Communications Chairs/
Newsletter Editors -**
Jeana Gowin
jgowin@cbbel.com
Julia Nigohosian
jnigohosian@cbbel.com

Director of Advertising -
Tim Scully-Granzeier
312-933-4639
Tim.Scully-Granzeier@arcadis.com

Pres. Matt Huffman.....(847) 804-7615
Pres. Elect Thomas Janicke... (630) 438-6400
Sec. Monica Crinion..... (312) 373-6516
Treas. Kris Salvatera.....(312) 242.6362

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ASCE Illinois Section President
2023-2024

An Overview of Safety Within the International Building Code-Part 1

Written by Samar Hoz

People expect to be safe from inherent dangers, whether from natural or man-made disasters, when they enter a building. The [International Building Code](#) (IBC) addresses these concerns through five significant sections: code administration and enforcement, building planning, life safety, structural safety, and fire safety.

The code establishes a set of minimum standards designed to protect and safeguard public health, safety, and general welfare. These requirements apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, removal and demolition of every building or structure connected or attached to such buildings or structures.

While the codes adopted by governmental agencies should not prohibit or limit the use of new materials or technologies, buildings must be constructed to be safe for the occupants. Therefore, the building code has evolved to keep up with the complex building practices and has become a more complex document over time. The codes and standards used to regulate the construction of buildings can be overwhelming for the casual user of the code.

The code covers means of egress; interior finish requirements; comprehensive roof provisions;

seismic engineering provisions; innovative construction technology; occupancy classifications; and the latest industry standards in material design. It is founded on broad based principles that facilitate the use of new materials and new building designs.

Fire and smoke are the leading causes of death in buildings. Fire can spread rapidly within a building and, in some cases, from building to building. The IBC is designed to limit the spread of fire inside and outside of a building. The IBC protects the structure and occupants from fire by providing both passive and active fire protection. Passive fire protection is built into the structure and safeguards the building and occupants from fire by protecting the structural frame of the building with fire-resistance-rated walls, floors and roofs. Active fire protection is often provided by automatic fire sprinklers. These systems protect the building and occupants by suppressing a fire in a building.

Fire produces heat that can weaken structural components as well as smoke that can cause property damage and place occupants at risk. The provisions of the IBC present the fundamental concepts of fire performance that all buildings are expected to achieve in some form.

Many structural forces are placed on a building over the intended life of the structure. Natural or environmental forces, as well as man-made loads, are placed on the building. There are design parameters outlined in the IBC for the design of a structure. These design parameters provide a minimum standard to ensure that the building withstands the forces applied to it. This code regulates the structural design of the building to ensure that it remains stable and does not collapse during construction and as long as the building is used. Buildings are generally designed in accordance with the American Society of Civil Engineers (ASCE) Standard 7, Minimum Design Loads for Buildings and Other Structures. This document outlines the engineering calculations and methods to be used for building design and evaluates the building based on its importance to the community. For example, a hospital that has emergency treatment facilities is essential in a disaster situation. Therefore, the structure for this building must be designed with higher safety factors than a typical office building. Four levels of risk categories are used in the structural design of a building: Category I, Category II, Category III and Category IV. Category IV occupancy, which includes a hospital with emergency treatment facilities, has the highest importance factor and safety factors. Category (Continued on page 11)

Engineering Challenges and Innovations in Modern Waste Management

Written by Thierno Kane, PhD., P.E.

Waste management is indispensable for environmental protection and public health safety. Improper waste management can lead to serious health risks by exposure to hazardous wastes and increasing the spread of infectious diseases. Yet according to The World Bank¹, at least 33% of the 2.0 billion tons of the world's municipal solid waste (MSW) is not managed in an environmentally safe manner, indicating the wide gap in waste management worldwide.

What is generally seen as just a smelly dumping ground in fact presents some of the most challenging engineering problems, from the construction and planning process to closure.

The construction process involves careful planning and execution to ensure the landfill's structural integrity and environmental safety. For example, sites should be selected based on geological and geotechnical consideration to prevent contamination of groundwater and minimize the risk of instability. Site selection should also consider proximity to populated and residential areas to reduce health risks, odors, noise pollution and insects.

For lined landfills, geosynthetics and clay liners must be evaluated and designed to prevent leachate from seeping into the soil and contaminating the groundwater. This leachate is collected through a regularly monitored and maintained network of pipes for treatment to remove harmful contaminants. Engineers also design gas extraction systems to capture and convert methane, produced by decomposing organic waste, into energy. This process not only reduces greenhouse gas emissions but also serves as a renewable energy source.

Once a landfill reaches its capacity, it is capped with a final cover system to prevent water infiltration, contact water and gas escape. Post-closure care involves monitoring the site for several years to ensure that it remains stable and does not pose any environmental risks. In recent years, large strides have been undertaken to redevelop landfill sites into recreational parks, golf courses or solar farms. In fact, in 2021, local governments in the United States announced a combined 207 megawatts of energy from 21 landfill solar projects³. Although still in its infancy, these sustainable alternatives provide a combination of environmental benefits and community value,

transforming previously unusable land into productive and eco-friendly spaces. However, they come with additional engineering challenges. For example, structures built atop these closed landfills must be designed to tolerate large ground settlements and have foundations that do not penetrate the final cover system.

There are of course other alternative, innovative and sustainable waste management methods in urban areas, such as the CopenHill waste-to-energy plant in Denmark. The plant is located within 10 minutes of downtown Copenhagen and efficiently burns waste from approximately 600,000 residents (about half the population of Hawaii) and 68,000 businesses to produce electricity and district heating, significantly contributing to the city's energy needs⁴. Remarkably, CopenHill is also one of the city's tallest structures, standing at almost 280 feet and features a ski slope and climbing on its roof, and a hiking trail. This engineering marvel offers residents and visitors a recreational space that blends seamlessly with its industrial function. This combination of utility and leisure makes CopenHill a symbol of modern, eco-friendly urban design.

(Continued on page 12)

Civil Engineers and Elected Officials – A much needed partnership for the greater good

Written by Brian Castro, P.E.

As Civil Engineers, our main goal is to deliver infrastructure improvements that improve the quality of life of the residents where the facility is located. Whether it be improved ride quality, clean water, more efficient public transit or lower travel times, the work that Civil Engineers perform has positive effects on all of us. However, to improve the state of our infrastructure, it is necessary to secure the funding needed from Local, State and Fed-

Follow up after Legislative Fly In or Drive Down is crucial for the development of a partnership

eral government. It is important for us as Civil Engineers to understand how government jurisdictions interact between each other to deliver projects and to meet the implementation of infrastructure projects.

Elected officials are responsible for the execution of infrastructure projects, allocation of infrastructure funding and for the development of bills that finance our infrastructure. Recent legislative wins for our industry that come to mind are the Rebuild Illinois Capital Program that was passed in 2019 by the Illinois General Assembly and signed into law by Governor

J.B. Pritzker and the bipartisan Infrastructure Investment and Jobs Act which was passed by Congress on 2021 and signed into law by President Joe Biden on November

Civil Engineers and Elected Officials want a better quality of life for constituents

15, 2021. This article will focus on the legislative branch at the state level and federal level.

The Illinois Section of the American Society of Civil Engineers (IS-ASCE) participates in a Legislative Drive Down every spring to Springfield in collaboration with the Transportation for Illinois Coalition (TFIC). This event is an opportunity to meet state legislators and/or their staff and advocate for the continued investment in the state's infrastructure. Then there is the Legislative Fly In at Washington DC which is organized every year by ASCE. At the Legislative Fly In, we advocate members of the House of Representatives and US Senate (or respective staff) to take action with regards continued infrastructure investment. Both events are open to all ASCE members and are great opportunities to begin engagement with elected officials.

The important work begins after attending either the legislative

drive down or fly in. It is recommended to send a thank you email to the office of each legislator or staff member that you touched base on during your visit to either Springfield or DC. After a few weeks, make sure to schedule a follow-up meeting with their staff to discuss infrastructure issues and how could these issues be addressed via further investment or legislation. The legislative assistants are key personnel for the legislators when it comes to outlining priorities with regards the development of bills. As Civil Engineers, we should work in conjunction with the staffers from the state legislators and legislative assistants of Congressmen to provide expert advice that may help the development of legislation that may benefit infrastructure. Information re-

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sources such as the ASCE Report Card for America's Infrastructure should be used to educate staff with regards the need for continuous infrastructure investment. ASCE's priority issues for government relations are listed [here](#).

In addition, elected officials host Town Halls at their respective districts. These events are a great opportunity. (Continued on page 12)

Hot Tapping and Plugging Procedures Enable Replacement of Concrete Pressure Pipelines Reaching the End of Service Life Without Service Interruption

Written by Charles Herckis, BSCE, MPA, MPW, P.E., Life Member ASCE

TAPPING AND PLUGGING ENABLES REPLACEMENT OF FAILING PIPE

As water pipelines and sewer force mains reach the end of their service life, the frequency of leaks and uncontrolled line failures increases. These failures may result in unacceptable environmental incidents

and lack of adequate potable water or sewage service that can create unsanitary conditions for system users. Hot tapping and plugging may be an effective enabling procedure that allows the replacement, repair or rerouting of concrete pressure water lines and sewer force mains while maintaining operations. Figure 1 illustrates the usual equipment arrangement with

temporary bypass line for continued operations during pipe repair or replacement activities.

TAPPING AND PLUGGING THROUGH A FITTING TO DIVERT FLOW

The sequence for tapping and plugging through a fitting consists of:

1. Installing fitting on the pipe to be tapped (Figure 2) and mounting a temporary isolation valve and tapping machine above the fitting (Figure 3).

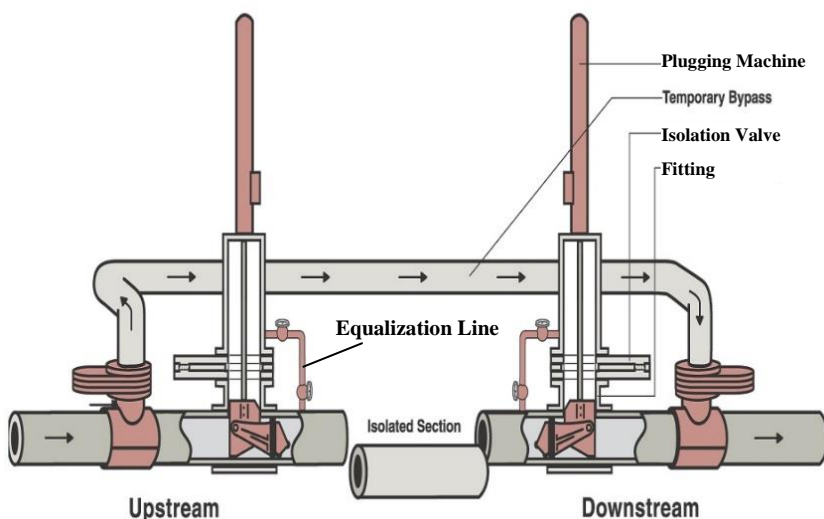


Figure 1 Plugging heads and temporary bypass conduction flow around isolated pipe section



Figure 2 Plugging fitting installed

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The Importance of Geotechnical Engineering at Wema in Bukembe, Kenya

Written by Edward Phelps, PE and Alan Phelps, PE, Past-President; EWB Chicagoland Professional Chapter

Engineers Without Borders Chicagoland Professional Chapter (EWB-CPC) is a volunteer group in Chicago that upholds the mission and vision of EWB-USA and is made up mostly of engineering professionals across all fields.



2023 EWB-CPC Travel Team

EWB-CPC conducted a two-week implementation and monitoring visit at the Wema Children's Centre (Wema) project in Bukembe, Kenya between November and December 2023 with a six-member team. This trip marked the fourth trip and second major implementation trip of the Wema Program within EWB-CPC. The main goals of the site visit were to oversee the construction of the 1) new permanent bathroom building at the girls' campus and the 2) 30-foot tall water kiosk tower to add water

pressure to the water system downstream of the school site.

In 2022, EWB-CPC performed a small-scope geotechnical subsurface exploration consisting of two soil borings, including one soil boring at the bathroom building location and one at the general water tower location. The subsurface conditions encountered generally consisted of a layer of relatively low-plasticity fine grained soils over a layer of silty gravel and a



ABR Under Construction

layer of silt up to the boring termination depths of approximately 20 feet. Soil and groundwater conditions were generally consistent over the soil borings. The bathroom and the water kiosk tower were founded on the silty gravel for adequate embedment and bearing.

Subsurface data collected from the borings was used in geotechnical analysis and structural design of



Bathroom Exterior

the foundation and slab-on-grade. The bathroom system consisted of the foundation and slab-on-grade. The bathroom system consisted of the building, a series of sanitary piping separating graywater and blackwater, connected downstream to an anaerobic baffled reactor (ABR) for water treatment processing, and subsequently discharged into a soak pit system. EWB-CPC was on site to observe the interior and exterior finishings of the building, installation and connecting of the sanitary piping



Contractor Crew Infront of Water Tower

(Continued on page 8)

The Importance of Geotechnical Engineering at Wema in Bukembe, Kenya

(Continued from page 7)

system, and initial rebar placement and concrete pouring of the ABR.

Perhaps the project's most ambitious undertaking was the construction of the 30-foot-tall water kiosk tower, which has a capacity of 60,000 liters.

Wema contracted the design-build contractor, Flowatt Investments Ltd. (Flowatt). Flowatt was responsible for the design of the tower and EWB-CPC reviewed the contractor's design calculations and construction drawings prior to construction. The water tower consisted of a shallow foundation system including reinforced concrete footings and grade beams with a steel frame superstructure. EWB-CPC's review of the contractor's calculations included foundation-related soil bearing capacity checks, settlement checks and analysis of the structural steel and reinforcement. EWB-CPC coordinated daily with Flowatt and provided quality control observation of the steel fabrication including boring, bolting, splicing, cutting, and welding, as well as observe the mock "fit up" of the columns prior to structural erection. The water tower was completed in February 2024, commissioned, and continues to provide a sustainable source of drinking water to approximately 3,000 people in the surrounding area with plans in 2024-2025 for expanding the water lines further to reach up to 5,000 people.



Water Kiosk Tower Completed

In addition to these structures, EWB-CPC performed ancillary projects including the construction of two rain gardens to improve stormwater runoff, upsizing and upgrading of the water filtration system and renovation of the computer laboratory for the upcoming



Geotechnical Sampling in 2022

school year. Geotechnical borings performed for the larger construction projects also gave the EWB-CPC team a better understanding of the soil types to assess hydraulic conductivity for better design of the rain garden footprints.

EWB-CPC meets regularly in-person, usually on the final Tuesday of every month at 6pm unless otherwise indicated. Next meeting is September 24 and you are invited! Details can be found on upcoming meetings and events on the EWB Chicagoland website calendar at <https://ewb-usa-chicago.org> or contact Vanessa at president@ewb-usa-chicago.org for more information.

Email Membership (membership@ewb-usa-chicago.org) to get on the mailing list.

Author Bios: Edward Phelps is a geotechnical engineer and project manager with Huff & Huff, a subsidiary of GZA GeoEnvironmental, Inc. Edward is the geotechnical engineer of the Wema Program with the EWB Chicagoland Professional Chapter.

Alan Phelps is a project engineer with Robinson Engineering, Ltd. and is the project leader of the Wema Program.

How's My Water?

(Continued from page 1)

chemicals and their effect on the health of humans, wildlife, and aquatic life. The public acceptance and support of the environmental movement led to the creation of the United States Environmental Protection Agency (US EPA) in 1970. Political will coalesced a few years later to pass legislation that would strengthen laws to protect surface and groundwater, limit pollution discharge, and provide funding to clean up polluted lakes, rivers, and streams - the Clean Water Act (CWA).

Why all the permits and reports?

The passage of the CWA provided a mandate to clean up the waters of the United States (WOTUS) and make them suitable for their intended purposes in 10 years. It provided grant funding to pay for improvements that would reduce pollution discharge. The CWA also created the National Pollution Discharge Elimination System (NPDES) to regulate point source pollution of waterways, lakes, and streams. A point source is simply the end of a pipe or outfall that discharges effluent, stormwater, industrial waste, or other pollution into the water. While point source pollution is an important issue, the leading cause of water pollution is nonpoint sources. These sources come from runoff that carries sediment, oil, bacteria, toxins, and other pollutants from farms, yards, and paved areas into nearby waters. Such pollution can harm fish and other aquatic life, lead to the development of harmful algal blooms, and contribute to ocean

acidification in coastal waters. Nonpoint sources of pollution were not initially regulated. The CWA was ambitious, and supporters were optimistic about its potential, but that optimism was soon tempered by cost overruns and the scale of assessing and improving each body of water in the United States. Now, 50 years after the CWA, it is estimated that half of the waterways and lakes meet the goals that were expected to occur in the initial 10-year period.

The US EPA delegated the authority to implement and administer the CWA to individual states. In the State of Illinois, the Illinois Environmental Protection Agency (IEPA) is responsible for handling the authorization of NPDES permits. Over time, the CWA has been reauthorized and amended to impose stricter regulations on the discharge of pollutants to waterways. Distribution of funds has also changed, replacing the original grant program with the current State Revolving Loan Fund.

Water quality standards (WQS) are provisions of state law created by IEPA and approved by US EPA that describe the desired condition of a water body and how that condition will be protected or achieved. Rivers, streams, and lakes can be used for purposes such as recreation (e.g., swimming and boating), scenic enjoyment, and fishing, and they are the home to many aquatic organisms. To protect human health and aquatic life in these waters, states establish WQS, thus forming a legal basis for controlling pollutants entering

waterbodies. Typical [designated uses](#) include the following:

1. Protection and propagation of fish, shellfish and wildlife
2. Public water supply
3. Primary contact (swimming)
4. Secondary contact (boating)
5. Navigation

In Illinois, surface and groundwater are assessed based upon the WQS set by the Illinois Pollution Control Board. To assess water quality, the IEPA collects chemical, physical, biological, habitat, and toxicity data, depending upon the type of water body. Data collected from outside sources may also be considered during the determination.

Nutrients, microbes, and PFAS, oh my

Pollutants of concern impacting WQS include total suspended solids, nutrients, and microbes (e.g., fecal coliform or *E. coli*). Sources of pollutants include effluent from Publicly Owned Treatment Works (POTW), discharges from a Combined Sewer Overflow (CSO), discharges from storm sewer systems, surface runoff from agricultural fields and golf courses that contain fertilizer and pesticide, or surface runoff from construction sites that contains sediment from disturbed soil and oil, grease and hydraulic fluid. This cocktail of pollutants degrades water quality.

(Continued on page 10)

How's My Water?

(Continued from page 9)

Nutrients such as nitrogen and phosphorus are detrimental to water quality, and IEPA has focused on reducing the amount of such nutrients discharged into waterways. Enhanced agricultural practices such as improved timing of fertilizer application and building buffer strips between farmland and drainage canals have been found to be effective. Many POTWs have prepared Nutrient Assessment Reduction Plans (NARP) as part of permit requirements for major facilities discharging into waterbodies that are impaired or at risk of nutrient over-enrichment, known as eutrophication. Recently, POTWs have modified their treatment processes since the allowable limit for phosphorus in effluent set by the IEPA was reduced to 1 mg/L in 2024.

A new concern for water quality is PFAS, sometimes referred to as “forever” chemicals, that are found in many commonly used consumer goods such as nonstick pans, food packaging, and carpeting. The term “forever” chemicals is used because they don't readily breakdown in the environment and can accumulate in the human body. The long-term impact on the environment and public health is still unknown and is still under study. PFAS, nutrients, and microbes all degrade water quality.

To improve water quality, the number and quantity of pollutants is reduced by employing practices that minimize the transport and discharge of pollutants that can enter the body of water. For example,

a pretreatment program is used to remove heavy metals and other pollutants from effluent from an industrial or food processing facility. We civil engineers often create Stormwater Pollution Prevention Plans (SWPPPs) as part of construction documents, advising contractors which practices need to be used to minimize soil erosion and control the transportation of sediment. Sometimes, however, our best efforts fall short of protecting waterways.

What we engineers do to help

Waterways that do not meet designated standards are considered impaired, and steps must be taken to improve the quality of the water. IEPA considers the Total Maximum Daily Load (TMDL) that determines the greatest amount of a given pollutant that a water body can receive without violating water quality standards and designated uses. TMDLs set pollution reduction goals that are necessary to improve the quality of impaired waters. By looking at the entire watershed instead of focusing on individual sites, a TMDL considers all potential sources of pollutants, both point and nonpoint sources. It also considers future growth and the effects of seasonal variation within the watershed.

One of the best assessments of the health of a waterway is the quantity and diversity of aquatic life. The greater the number and species of fish, mussels, and other forms of aquatic life gives a good reading of

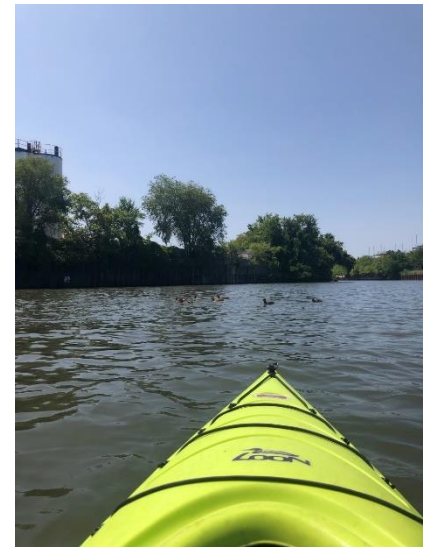


Figure 2 Ducks forage for food on the Chicago River

the health of the ecosystem for that waterway. Conversely, the presence of only a few aquatic species or wildlife indicates an impaired waterway. The Illinois Department of Public Health provides guidance for every waterway in the state regarding the safe consumption of fish and the possible presence of pollutants in the fish.

Monitoring of water quality is done by taking samples from reaches of waterways and lakes and then analyzing the water for pollutants and their concentration. Fish surveys are also conducted to determine the presence, density, and health of aquatic life. With current technology, it is also possible to provide real-time monitoring of a waterway. [H2NOW](#), led by local nonprofit Current, provides real-time water quality information for the Chicago Area Waterway System (CAWS). CAWS is unique (Continued on page 11)

How's My Water?

(Continued from page 10)

because it is a controlled system where flows are manipulated by the presence of sluice gates and locks that make the CAWS flow away from Lake Michigan. All the reaches of CAWS are designated as impaired but have seen significant improvement over the last several decades.

What can I do to improve water quality?

- Use zero-phosphorus fertilizer on your lawn.
- Do not dump unwanted chemicals or motor oil into a storm sewer. Dispose of such waste properly.
- Wash your car at a facility that collects and treats the water instead of using your driveway.
- Participate in public clean ups of waterways, such as the Chicago River Day. Volunteers are assigned to a reach of waterway to pick up litter, debris,



Figure 3 EWRI Chicago Chapter has participated in Chicago River Day for several years.

and garbage along the banks. Doing so helps create a better habitat for aquatic life.

Author bios: Jerome F. McGovern, is a retired civil engineer who is active in the EWRI section.

James F. Canning, is a civil engineer with Strand Associates, Inc.

An overview of safety within the International Building Code- Part 1

(Continued from page 3)

I occupancy includes structures like agricultural buildings and minor storage facilities. Most buildings are classified as Category II risk. Category III occupancies include assembly occupancies having an occupant load greater than 300 and small hospitals without emergency treatment facilities.

The IBC provides safety to life and property from fire and other hazards in the built environment and protects firefighters and emergency responders during emergency operations.

Author Bio: Samhar Hoz, CLA, LEED Green Assoc., Strategy Execution certificate program- Harvard Business

School On., is a staff engineer in the IC in the Central Regional Office. She has years of combined experience as a civil, construction, structural engineer, outreach manager and Seismic Assessment & Retrofit. She has also been a speaker at many events in the industry. Hoz has a bachelor's degree in civil and structural engineering and a master's degree.

Engineering Challenges and Innovations in Modern Waste Management

(Continued from page 4)

Regardless of the methods, waste management is crucial component of modern society. The engineering challenges involved, from site selection and construction to post-closure care, require meticulous planning and innovative solutions. By implementing advanced technologies such as geosynthetics, gas extraction systems, and waste-to-energy plants, we can mitigate the environmental impact of landfills and even transform them into valuable community assets. As we continue to develop sustainable alternatives, such as landfill solar projects and waste-to-energy plants like the CopenHill in Denmark, we can create eco-friendly spaces that benefit both the environment and society.



Photo – Rasmus Hjortshøj⁴

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Author Bio: Thierno Kane, PhD, PE geotechnical engineer in Geosyntec's Oak Brook, Illinois office, with 5 years of experience. His project portfolio includes waste management, litigation support, renewable energy, site development, and instrumentation and

monitoring of slope. His expertise in geotechnical engineering includes landslide movement, slope stability, field investigation, laboratory testing and analyses, and shear strength and consolidation of soils. He currently serves as the *Incoming* Chair for the Chicago ASCE Geo-Institute.

Civil Engineers and Elected Officials – A much needed partnership for the greater good

(Continued from page 5)

portunity to continue to build rapport with the elected official and their staff. Constant follow up with the elected official is crucial for the success of a potential partnership. Elected officials are always looking for feedback from

their constituents as they must be familiar with many topics that may impact our daily lives. Assisting elected officials with our expertise in infrastructure could be a win-win for both parties as both civil engineers and elected

officials want a better quality of life for constituents.

One final thing, I highly encourage each one of you to sign up to become an ASCE Key Contact. (Continued on page 20)

Hot Tapping and Plugging Procedures Enable Replacement of Concrete Pressure Pipelines Reaching the End of Service Life Without Service Interruption

(Continued from page 6)

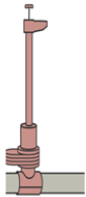


Figure 3 Isolation valve and tapping machine

2. Opening the isolation valve, lowering the cutter through the isolation valve to cut out and extract a pipe coupon (Figure 4), closing the isolation valve, removing the tapping machine and mounting the plugging machine (Figure 5) on the isolation valve.

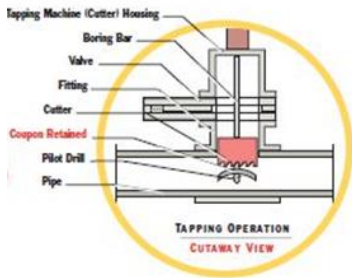


Figure 4 Tapping operation

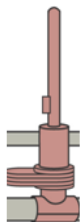


Figure 5 Plugging machine installed on valve

3. Opening the isolation valve, inserting the plugging head to isolate the section of pipe (Figure 6), withdrawing the plugging head when work is completed on the section of pipe, closing the isolation valve and removing the plugging machine.
4. Placing the tapping machine on the isolation valve, opening the isolation valve, inserting the completion plug, removing the tapping machine, removing the isolation valve and installing a blind flange (Figure 7).

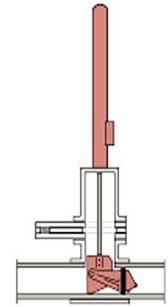


Figure 6 Plugging head in pipe

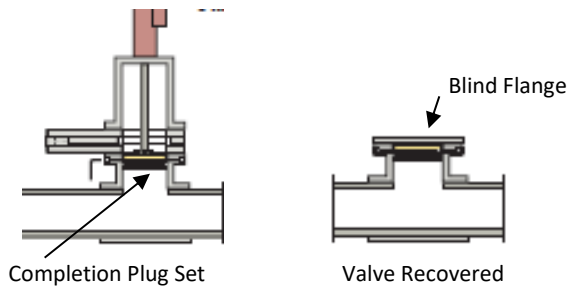


Figure 7 Completion plug set and blind flange installed

CONCRETE PRESSURE PIPE TYPES AND FITTINGS

The American Water Works Association (AWWA) Manual M 9 defines four types of Concrete Pressure Pipe. AWWA 301 defines prestressed concrete embedded cylinder pipe and prestressed concrete lined cylinder pipe. AWWA

303 defines bar wrapped concrete cylinder pipe. AWWA 300 defines reinforced concrete pressure pipe.

The selection of the type of tapping and plugging fittings for concrete pressure pipe depends upon the (Continued on page 14)

Hot Tapping and Plugging Procedures Enable Replacement of Concrete Pressure Pipelines Reaching the End of Service Life Without Service Interruption

(Continued from page 13)

type of pipe being tapped or plugged. Usual fittings for cylinder pipe are those that have a gland neck (Figure 8). The gland is pulled down against the cylinder to create a seal. The fitting for a non-cylinder pipe is usually one having an “O” ring that creates a seal against the outer pipe wall (Figure 9).

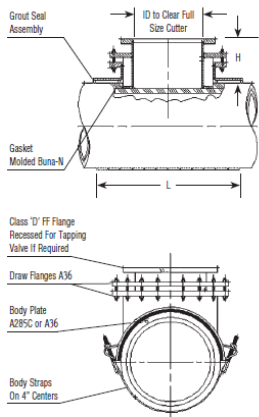


Figure 8 Usual Cylinder Pipe Fitting

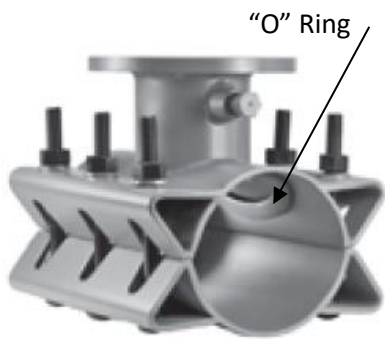


Figure 9 Usual Non-Cylinder Pipe Fitting

DEFINITION PIPE DIMENSIONS, CROSSECTION OPERATION IMPORTANT

It is necessary to define actual pipe type, geometry and cross section as well as pipeline system operating and control parameters, to the extent possible, for satisfactory fitting installation, and a successful pipe plugging operation. This information will determine fitting design, installation procedures.

In addition, the particular geometrics of the equipment used will develop overturning and thrust forces developed by the insertion of the plugging heads into a transmission line (Figure 10). Since concrete pressure pipe joints only allow for minimal movement during plugging operations, it is important to devise an adequate thrust restraint system. Therefore, the geotechnical characteristics at the plugging site must be considered when designing the restraints.

CASE STUDY OF REPLACEMENT OF A 66 INCH SEWER FORCE MAIN

A 66-inch diameter prestressed concrete embedded cylinder pipe wastewater force main in a Midwest city failed four times since installation, that created costly environmental incidents. A condition assessment indicated two miles of pipe had an unacceptably high risk of failures and required replacement. Since there was no alternative route to transport the sewage during replacement, a tapping and plugging procedure was selected to meet this objective.

Route Selection

Three routes for the replacement of the pipe section were studied (Figure 11). Each of the routes started at Pump Station C. While construction costs for Route 1 were deemed higher than the other two routes, it presented the least long-term risk for failures and environmental incidents, and therefore (Continued on page 15)

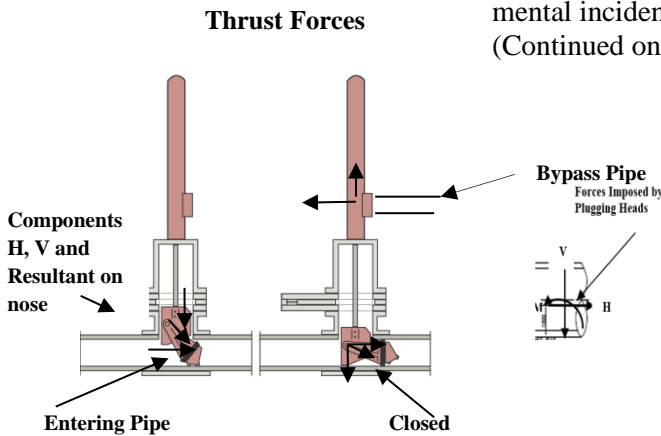


Figure 10 Thrust forces developed by equipment

Hot Tapping and Plugging Procedures Enable Replacement of Concrete Pressure Pipelines Reaching the End of Service Life Without Service Interruption

(Continued from page 14)

was selected for the installation of the replacement pipe.

against the plugging head, tending to open the existing pipeline joints,

heads in the line to divert flow into the new pipe by means of the

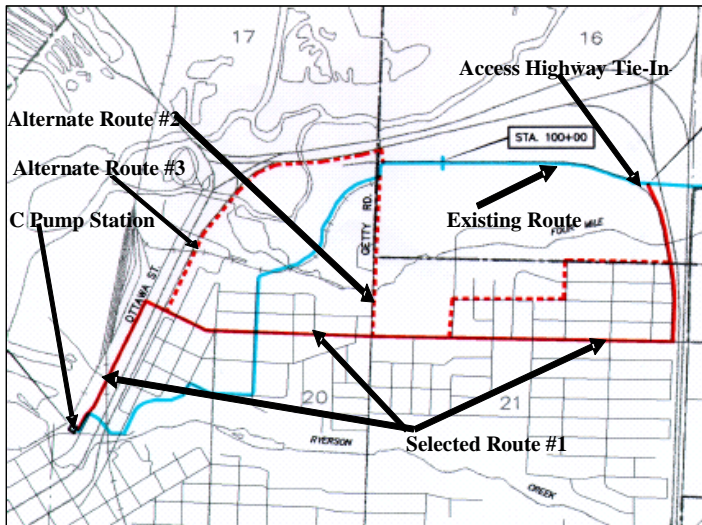


Figure 11 Alternative pipeline route study

Pipeline Design

Alternative designs for the replacement of the pipeline were performed. Considerations included available pipe sizes, energy costs for operation, surge analysis, thrust restraint and corrosion protection. The final options for contractor proposals were either prestressed concrete embedded cylinder pipe or ductile iron pipe.

The existing pipeline did not have restrained joints at the proposed replacement pipe connection points. Because stopping the flow for connection of the replacement piping, while keeping the pipeline in service, would create a large longitudinal force, which would act

large concrete thrust blocks, 7 feet deep and 17 feet by 24 feet were designed to be installed around the tapping fittings.

Tapping and Plugging Procedure

In preparation for pipeline replacement, the system operating parameters were defined and plans to control these parameters within acceptable limits during tapping and plugging were developed. Figure 12 illustrates the scheme for the procedure that makes use of the permanent replacement pipe to bypass sewage around the existing pipe while the interconnection of the replacement pipe is completed. The new permanent valves were closed prior to setting the plugging

Index

- Existing Route
- Route # 1 Selected
- Route # 2
- Route # 3
- Pump Station C



temporary bypasses. Figure 13 illustrates the configuration once the replacement pipe is connected through the new valves and the tapping and plugging equipment is removed from the pipeline.

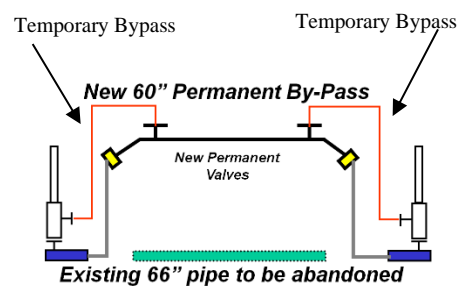


Figure 12 Scheme to bypass existing pipe

(Continued on page 16)

Hot Tapping and Plugging Procedures Enable Replacement of Concrete Pressure Pipelines Reaching the End of Service Life Without Service Interruption

(Continued from page 15)

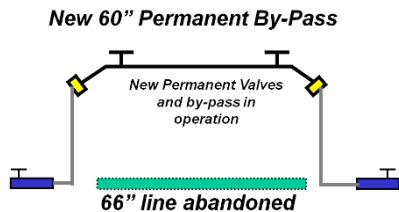


Figure 13 Replacement pipe in service plugging complete

As the first step in the tapping procedure, replacement pipe was installed close to the connection points on the existing line to remain in place. The tapping and bypass fittings were installed and the concrete thrust blocks were poured (Figure 14). The isolation valves were placed followed by the tapping and plugging operations without incident. The temporary bypasses between the new pipe and the remaining prestressed concrete

embedded cylinder pipeline were put into operation (Figure 15). Then the replacement pipe was connected without interrupting flows or any leakage, made operational and the deteriorated pipe



Figure 14 Tapping fittings and thrust block

was drained and taken out of service. Finally, the temporary bypass, plugging machines and temporary isolation valves were removed and tapping fittings were sealed. If there would be need in the future, the tapping fittings can be accessed for additional plugging operations or condition

assessment. The entire project was completed on schedule and within budget.



Figure 15 Plugging machine and bypass in operation

Author Bio: Charles Herckis, Consultant PH (708) 524-8564 e-mail: charles_herckis@yahoo.com

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Congratulations to the 2024 IL Section ASCE Awards Winners and Projects!

Written by Saki Handa, P.E., ENV SP & Michael Kowalski, P.E.

We are thrilled to announce and extend our heartfelt congratulations to the 2024 Illinois Section ASCE Awards Winners and recognized Projects! These individuals and projects have demonstrated exceptional dedication, skill, and leadership in the field of civil engineering, and their work has made a significant impact on our communities.

Each year, the Illinois Section of ASCE honors the best and

brightest in civil engineering, celebrating the achievements that elevate our profession. This year's award winners represent the pinnacle of excellence, setting new standards in innovation, sustainability, and engineering practice.

The full details of the award recipients, their outstanding projects, and their contributions to the field will be shared in an upcoming press release. We encourage everyone to stay tuned for this exciting announcement.

We are excited to invite you to join us in celebrating the remarkable achievements of the 2024 Awards Winners and Project Teams at our Annual Dinner on October 10th.

Please see the attached information for more details about the event, including how to RSVP. We look forward to seeing you there and honoring these distinguished winners and project teams together!

2024 ASCE Awards Winners and Projects	Winners and Projects
Civil Engineer Of The Year - Private Sector	Darren Olson
Young Civil Engineer Of The Year - Private Sector	David Wilkinson
Government Civil Engineer Of The Year - Public Sector	Jennifer "Sis" Killen
Young Government Civil Engineer Of The Year	Yazan M. Alshawabkeh
Citizen Engineer Of The Year (Public Or Private Sector - Illinois Section)	Katherine "Kat" Au
Construction Engineering Person Of The Year (Illinois Section)	Patrick Kielty
Public Involvement Award (Illinois Section Member Group)	IL Section Younger Member Group
Outstanding Civil Engineering Achievement Award < \$10m	LOT Air Traffic Control Tower Site Development
Outstanding Civil Engineering Achievement Award \$10m - \$25	Ciorba/Highland Park - Clavey Road Reconstruction
Outstanding Civil Engineering Achievement Award \$25m-\$100m	Addison Creek Reservoir
Outstanding Civil Engineering Achievement Award > \$100m	Houbolt Road DDI & Extension (City Of Joliet)
Sustainability In Civil Engineering Achievement	Illinois Tollway - LED Lighting Program



REGISTER NOW




2024 ANNUAL AWARDS DINNER
INTERCONTINENTAL CHICAGO
 Magnificent Mile
 505 North Michigan Avenue
 Chicago, IL 60611
 Thursday | October 10, 2024

The Illinois Section of ASCE cordially invites you and your guests to our annual civil engineering awards dinner. Please join us for a memorable evening of networking, dining, and honoring our 2024 award recipients.

[CLICK HERE](#) to register for the event.



DETAILS
 COCKTAIL HOUR
 EMPIRE BALLROOM
 6:00-7:00pm



DINNER & AWARDS
 GRAND BALLROOM
 7:00pm-10:00pm



SCAN ME

Sponsorship Details

The Illinois Section of ASCE cordially invites you and your colleagues to join us for our 2024 Annual Awards Dinner. Please help support this premier civil engineering event with your sponsorship and attendance.

SPONSORSHIP LEVEL	COST	BENEFIT
PLATINUM SPONSOR*	\$5,500	INCLUDES A PREFERRED TABLE FOR TEN (10) GUESTS WITH LOGO IDENTIFIER.
GOLD SPONSOR*	\$2,800	INCLUDES 1 (1) 10' TICKETS.
SILVER SPONSOR*	\$2,000	INCLUDES THREE (3) 7' TICKETS.
BRONZE SPONSOR*	\$1,000	INCLUDES ONE (1) TICKET.

*All Sponsors will have company logo displayed in the program and on presentation slides.

INDIVIDUAL TICKETS	\$195	GENERAL
	\$95	EDUCATOR/GOVERNMENT
	\$75	STUDENT TICKET

ADDITIONAL SPONSORSHIP OPPORTUNITIES:

COCKTAIL HOUR- LIMIT 2
 Includes 10 tickets, priority seating and 10 reserved seats reserved for networking during the cocktail hour. \$5,000

PLATED DINNER- LIMIT 1
 Includes 10 tickets, priority seating and 10 reserved seats reserved for networking during the dinner. \$5,000

DINNER WINE SPONSORSHIP- LIMIT 1
 Includes 10 tickets, priority seating and 10 reserved seats reserved for networking during the dinner. \$5,000


STUDENT* SEAT SPONSORSHIP- LIMIT 5
 Includes 10 tickets, priority seating and 10 reserved seats reserved for networking during the dinner. \$5,000

PROGRAM SPONSOR- LIMIT 1
 Logo reception during dinner and in the program. \$500

NAME TAG, REGISTRATION TABLE SPONSOR- LIMIT 1
 Logo reception during dinner and in the program and on the back of name tags. \$500

AWARD PLAQUE SPONSOR- LIMIT 1
 Logo recipient on dining dinner and the opportunity to provide a special gift from your company to award winners. \$800

[CLICK HERE](#) to register for the event.



2024 ANNUAL AWARDS DINNER
INTERCONTINENTAL CHICAGO
 Magnificent Mile
 505 North Michigan Avenue
 Chicago, IL 60611
 Thursday | October 10, 2024

SCAN ME

To inform Illinois Section members of the discussions at monthly Board meetings, the Section Secretary contributes this article to the newsletter covering July 2024, August 2024, and September 2024. The Illinois Section Board Meetings offer in-person and virtual attendance options. Access to historical IS Board Meeting Minutes, Constitution, and Bylaws can be found on ASCE Collaborate at <https://collaborate.asce.org/home>. Any questions or comments on the Board activities are welcome by contacting Secretary Monica Crinion at monica.crinion@aecom.com.

■ **Treasurer’s Report & Meeting Minutes**

▲ A treasurer’s report was presented and approved at the August 2024 and September 2024 IS Board meetings. The June 2024 Board Meeting minutes were approved.

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

▲ **Incoming FY24-25 IS Board Officers** – Welcome to the incoming FY24-25 IS Board Officers who will be installed at the Illinois Section Annual Dinner on October 10, 2024.

Executive Board

President – Thomas Janicke, P.E., S.E.

Past President – Matthew Huffman, P.E.
 President-Elect – Monica Crinion, P.E.
 Treasurer – Kris Salvatera, P.E.
 Secretary – Tom Borges, P.E.

Directors to 2025

Brian Castro, P.E.
 Michael Kowalski, P.E.
 Joe Wilk, P.E.

Directors to 2026

Alex Potter-Weight
 Colleen Miller
 Daniel Lowery, P.E.

For more information about the Illinois Section Board nominations process, please refer to the Bylaws Article III (<https://www.isasce.org/about/governance-and-guiding-documents/>).

▲ **2024 Region 3 Assembly** – The 2024 Region 3 Assembly will be held in Chicago starting at 11:00 am on Friday, September 27 and concluding at 2pm on Saturday, September 28. The assembly is a great opportunity to share and learn with members and students from the 14 sections and 16 branches included in ASCE Region 3. Registration is open at <https://isasce.org/event/asce-region-3-assembly/> and Illinois Section members are encouraged to attend.

▲ **Coasts, Oceans, Ports & Rivers Institute (COPRI)** – Several Illinois Section members have

expressed interest in forming a COPRI committee to provide a focal point for the local advancement of maritime engineering. Initial exploratory committee goals include recruiting new committee members and hosting two events in 2025 focusing on Chicago, Cook County and Lake County regions. For more information or if interested in joining the exploratory committee, please contact Thera Novotny at Thera.Novotny@stan-tec.com.

▲ **2026 CRYMC in Chicago** – The Central Region Younger Member Conference (CRYMC) will be held in Chicago in January/February 2026. The Illinois Section YMG board is looking for local younger members to lead and volunteer on the planning committee. Interested younger members should contact Ryan Cummings at ryan.cummings@nicholsonconstruction.com.

▲ **Construction Institute (CI)** – The CI held their Board meetings on August 6 and September 10. A joint happy hour and networking mixer was hosted by CI and IAACE on August 27 at SPIN Chicago. For more information or if interested in joining this institute, please contact CI Chair Daniel Lowery at dlowery@transystems.com.

(Continued on page 20)

Secretary Report

(Continued from page 19)

▲ **Environmental & Water Resources Institute (EWRI)** – The EWRI held their Board meetings on July 9 and September 10. Members gathered for an EWRI summer social at Parlor Pizza (West Loop) on August 13. Please contact EWRI Chair Jimmy Canning with any questions or for information about EWRI activities at jimmy.canning@strand.com.

▲ **Geo-Institute (GI)** – The GI held their Board meeting on July 25 and August 15. Please contact GI Chair Jason Buenker with any questions or for information about GI activities at Jason.Buenker@shanwil.com.

▲ **Structural Engineering Institute (SEI)** – The SEI held their Board meetings on June 20 and August 15. The SEI hosted a five-day NHI Bridge Inspection training seminar August 26-30 at the Benesch Chicago office. Please contact SEI Chair Justin Mickens with any questions or for information about SEI activities at Justin.Mickens@parsons.com.

▲ **Transportation & Development Institute (T&DI)** – The T&DI held their Board meetings on June 11, August 13, and September 10. T&DI board members gathered for a summer boat cruise on the Chicago River on July 12. Please contact T&DI Chair Sylvan Popovici with any questions or for more information at SPopovici@benesch.com.

▲ **Utility Engineering and Surveying Institute (UESI)** – The UESI held their Board meetings on July 10 and August 14. UESI Chair Koenig and Past Chair Reinks attended the UESI Pipelines Conference 2024 in Calgary, Canada on July 27-31. For more information or if interested in joining this institute, please contact UESI Chair Joel Koenig at jkoenig@cmtengr.com.

▲ **Younger Member Group (YMG)** – The YMG held their Board meetings on August 12 and September 9. The annual Bags Tournament was held on August 27 at Midwest Coast Brewing with

44 attendees and 5 corporate sponsors. For more information about YMG activities or if interested in joining this group, please contact YMG Chair Hugh Regan at hregan@hntb.com.

The Illinois Section Board Meetings are held the first Monday of the month, except for holidays. The next board meeting is scheduled for October 7, 2024 and will be in-person at Christopher B. Burke Engineering Chicago office (625 W. Adams St., Suite 1775). For any guests or Board Members that cannot attend in-person, a virtual option will be provided via MS Teams. If you are interested in attending these meetings, please contact President Matt Huffman at mhuffman@cbbel.com.

By Monica Crinion, PE
ASCE Illinois Section Secretary
2022-2024
monica.crinion@aecom.com

Civil Engineers and Elected Officials – A much needed partnership for the greater good

(Continued from page 12)

An ASCE Key Contact will receive Key Alerts that notify ASCE members of public policy developments that require membership

action. You can sign up for to become an ASCE Key Contact [here](#).

Author Bio: Brian Castro, PE is a Director to 2025 on the IS-ASCE Section Board and serves as the Government

Relations Committee Chair. He is a Design Manager at d'Escoto, Inc. and has 14 years of Professional Engineering experience.

IL Section ASCE CI/GI/EWRI IDOT Pump Station No. 4

Come learn about the stormwater pumping station alongside the Eisenhower Expressway and Des Plaines River! IDOT engineers, as well as representatives from IHC Companies, will present the challenges and successes of this massive and unique project.

Date: Wednesday, Sept 25

Place: Harry Caray's Italian Steakhouse-Lombard, 70 Yorktown Shopping Center, Lombard, IL 60148

Time: 5:00pm – 7:30pm

Cost:

Professional \$75

Government \$65

Student \$35

Gold Sponsor (includes 4 tickets) \$350

Silver Sponsor (includes 2 tickets) \$200

Bronze Sponsor (Includes 1 ticket) \$100

[Registration and additional information](#)

IL Section ASCE SEI September Webinar – Redundancy in Steel Bridges

Date: Thursday, Sept 26

Time: 12:00pm – 1:00pm

Speaker: Teyfik Terzioğlu, PhD, PE, Parsons

Place: Virtual Webinar (Webinar link will be sent 24 hours prior to the event)

Cost: ASCE Members \$15

Non-ASCE Members \$25

Government Free

Student Free

CEU: 1.0 PDH will be provided

Contact: Ashutosh Ranade, asce.il.struct@gmail.com

Click [HERE](#) to register and for more information. Register by Tuesday, Sept. 24th 2024

Chicago Engineers Foundation's Annual Meeting & Reception

Date: Thursday, Sept 26

Time: 6:00pm

Location: Union League Club of Chicago

Chicago Engineers Foundation's Annual Meeting & Reception is scheduled for Thursday, September 26th at 6pm at the Union League Club of Chicago. To RSVP please email cef@chicagoengineersfoundation.org.

[Event Flyer](#)

ASCE Region 3 Assembly

ASCE Region 3 Assembly is a great opportunity to share and learn with ASCE members and students from all around Region 3.

Date: Friday & Saturday, Sept 27 & 28

Place: Christopher B. Burke Engineering – Chicago Office, 625 W Adams, 7th Floor, Chicago, IL

Time: 11:00am, Friday – 2:00pm, Saturday

Cost: Members \$100

Students \$50

Event Sponsor (includes 1 ticket) \$400

You have the option to reserve tickets (\$50 each) for the Wendella – Chicago's Original Architecture Tour. The tour is Friday night, 6:15pm departure.

[Region 3 Assembly registration](#)

IL Section ASCE Annual Awards Dinner

Please join us for our annual engineering awards dinner. It will be a memorable evening of networking, dinner and presentation of the 2024 award recipients.

Date: Thursday, October 10

Place: InterContinental Chicago Magnificent Mile (505 N Michigan Ave., Chicago, IL 60611)

Time: 6 pm - 7 pm Cocktail Hour (Empire Ballroom)

7 pm - 10 pm Dinner & Awards (Grand Ballroom)

Cost: General \$195.00

Educator/Government \$95.00

Student \$75.00

There are many sponsorship opportunities highlighted in the event flyer.

[Event Flyer](#)

[Register Here](#)

(If you are a non-member you can still register. You will be asked to log-in. To log in you will need to create an account with your primary email address. Once you have created your account you will be able to log in and register. Your account will enable you to log in and register for any future ASCE events.)

IL Section EWRI HEC-HMS Seminar (SAVE THE DATE)

Date: Wednesday & Thursday, November 13 & 14

Place: Christopher B. Burke Engineering – Chicago Office, 625 W Adams, Chicago, IL

More information coming soon.