Keynote Session

Agenda

8:00 AM - Welcome to the IBC

- Jennifer C. Laning, PE, GFT - IBC General Chair

Welcome Remarks

- Jim Harkness, MDTA

Keynote Speaker

- Kriss Roebling

9:20 AM - IBC Awards Presentations

- Introduction of Awards by Matt Bunner, PE, HDR - IBC Awards Committee Chair
    - **Roebling Medal** – David Goodyear, PE, SE, NAE
    - **Richardson Medal** – US 181: New Harbor Bridge; Corpus Christi, TX
    - **Lindenthal Medal** – Nanjing Xinshengwei Yangtze River Bridge; Nanjing, Jiangsu Province, China
    - **Figg Medal** – Wumengshan Bridge; Zhongzhai Township, Liuzhi Special District, Liupanshui City, Guizhou Province, China
    - **Hayden Medal** – Kangaroo Point Bridge; Brisbane, Australia
    - **Lichtenstein Medal** – Brooklyn Bridge Rehabilitation Project; New York, NY
    - **Cooper Medal** – Chenab Bridge; Jammu & Kashmir, India
    - **Student Poster Winners:** Saeed B. Nia, Iowa State University and Shadi Azad, Iowa State University

10:00 AM - 2027 Featured Agency Video – Tennessee DOT

Featured Agency

The Federal Highway Administration (FHWA) is an agency within the U.S. Department of Transportation that supports State and local governments in the design, construction, and maintenance of the Nation's highway system (Federal Aid Highway Program) and various federally and tribal owned lands (Federal Lands Highway Program). Through financial and technical assistance to State and local governments, the Federal Highway Administration is responsible for ensuring that America's roads and highways continue to be among the safest and most technologically sound in the world.

Technical Sessions – Cherry Blossom Ballroom

FHWA's Federal-aid bridge programs

- FHWA Bridge Programs (Derek Soden): A introduction to the FHWA Structures, Geotechnical, and Hydraulics Engineering programs and their current activities.
- Update on T-1 Steel Testing (Justin Ocel). After the 2021 Hernando de Soto Bridge closure, FHWA issued a memorandum requiring the testing of welds in similar bridges nationwide. This effort resulted in the identification of hundreds of weld defects similar to those that led to the partial fracture experienced by the Hernando de Soto Bridge, including two bridges that required temporary closures due to the identification of significant cracks in nonredundant steel tension members. This presentation highlights the successes of this program in protecting the traveling public, some of the difficulties encountered by State DOTs as they conducted the testing, and future research work FHWA is undertaking to leverage the results of the testing.
- Wire Arc Additive Manufacturing in Highway Bridge Infrastructure (Ryan Slein). This presentation showcases FHWA's industry-leading research into the application of additive manufacturing (i.e., 3D printing) to steel bridge components. This ongoing research aims to assess the engineering performance of additively manufactured products and advance applications that will allow for rapid and cost-effective fabrication of complex steel components in bridge construction.

FHWA's Federal Lands bridge engineering program

- Construction of the Pretty Rocks Bridge (Benn Oltmann). This presentation features the design and construction of the 475-foot truss bridge crossing a landslide zone in Denali National Park, Alaska. The construction of this bridge included the longitudinal launching of the truss across the landslide, which required unique engineering and construction methods. The construction of this bridge was further complicated by the remote and mountainous site.
- Segmental Bridge Construction with Epoxy-Coated Strands – Laurel Fork Bridge (Chris Negley). This presentation features the design and construction of the Laurel Fork Bridge replacement on the Blue Ridge Parkway in North Carolina. This project is constructing a new segmental concrete bridge in mountainous terrain and will feature one of the first uses of epoxy coated prestressing strand in the United States.

ABC

Monday, June 15, 2026, 10:30 AM - 12:00 PM

Session Chair: Annette Adams, PE

IBC 26-01: Rapid Bridge Replacement After Devastating Floods: Designing for Sustainability and Resiliences

Time: 10:30 AM

Steven Noble, CMC | InQuik Bridges, Denver, CO

When catastrophic flooding destroyed a critical bridge in Adams County, Colorado, access for nearly 1,000 daily vehicles—including agricultural and freight traffic—was severed. The only available detour was narrow, unpaved, and unsuitable for commercial transport, forcing the county to act quickly and decisively.
This presentation details the county's rapid response, showcasing a collaborative project that leveraged innovation, sustainable materials, and FHWA's CM/GC delivery method to fast-track a permanent solution within five months, that would be more durable and resilient to future flooding events.
County officials, engineers, and contractors collaborated to evaluate five bridge replacement options, ultimately selecting an innovative, prefabricated modular system known for its speed of construction and long-term performance. The chosen solution featured pre-engineered components and a cast-in-place installation method that streamlined construction, minimized on-site labor, and delivered significant cost and schedule efficiencies.
To enhance the structure's longevity and sustainability, the design also incorporated ASTM A1094, a corrosion-resistant reinforcing steel that offers superior durability and reduced maintenance requirements over the bridge's lifecycle.

The completed bridge is a benchmark for sustainable and resilient rural infrastructure projects. Delivered in just five months—compared to the original 18-month estimate, the project demonstrates how thoughtful innovation, collaborative delivery, and advanced materials can rapidly restore critical access while building a structure that's better prepared for future natural disasters.

IBC 26-02: Exploring the Design and Construction Challenges of an Accelerated Bridge Replacement: CR 571 Bridge over D&R Canal

Time: 11:00 AM

Megan Fisher, WSP USA, Lawrenceville, NJ; Steve Esposito, WSP USA, Lawrenceville, NJ ; Daniel Zaleski, WSP USA, Lawrenceville, NJ, ; Rakesh Srinivas-Murthy, PE, WSP USA, Lawrenceville, NJ, ; Omar Hameed, New Jersey DOT, Trenton, NJ,

The Washington Road Bridge over the Delaware & Raritan Canal in the Municipality of Princeton and Township of West Windsor, NJ is a critical connection for Princeton University and local traffic. The existing bridge was classified as Structurally Deficient due to a deteriorated abutment bulkhead that was observed to be losing fines and rotating. The project was advanced as a high priority bridge replacement with the objective of a fall/winter design period and construction primarily advanced the following summer. Other goals included minimizing maintenance costs, mitigating impacts to environmentally sensitive areas, maintaining aesthetics and the historical integrity of the site, and implementing Accelerated Bridge Construction (ABC) methods to complete the project in an aggressive timeframe to reduce impacts to the Princeton University Fall Semester. Prefabricated solutions were utilized including prestressed NEXT Type "D" Beams with precast-suspended backwalls, precast abutment bridge seats and sleeper/relief slabs; UHPC was used to connect precast elements. The superstructure was reinforced with stainless steel to reduce future maintenance costs and traffic impacts. Aesthetic timber façades, beam staining, and special details/finishes for bridge railings and guiderails were provided to satisfy stakeholders. Key challenges during design and construction included an accelerated schedule (award to final document submission was four months), meeting the needs of numerous stakeholders, utility accommodations, and managing material procurement schedules for delivery. Ultimately rapid timelines were achieved through extensive collaboration between the designer, owner (NJDOT), and the Contractor. The bridge was successfully re-opened to traffic within three months of initiating the roadway closure.

IBC 26-03: Accelerated Bridge Construction Methods for the Replacement of Bridges 1-488N&S

Time: 11:30 AM

Nicholas Dean, PE , M.C.E., Delaware DOT, Dover, DE

This paper details the design and implementation of Accelerated Bridge Construction (ABC) techniques in the replacement of Bridges 1-488N&S on US 13 in Blackbird, Delaware. US 13 is 4-lane divided highway with a projected Average Annual Daily Traffic of 13,500 vehicles in each direction. Bridge 1-488S, ranked first on Delaware's list of deficient bridges, was a 42'-0" long concrete arch bridge built in 1920. Bridge 1-488N was a 40'-0" long concrete rigid frame built in 1933. To minimize extended traffic disruptions, DelDOT opted to employ ABC techniques in lieu of conventional methods to replace both bridges during a 45-day closure of US 13. When implemented properly, ABC techniques greatly decrease construction times, increase commuter and work zone safety, and minimize user costs. The new bridges are comprised entirely of precast elements: 120'-0" deck bulb tee beams; stub abutments; prestressed piles; approach, sleeper, and moment slabs; and T-walls. To ensure proper connection between precast elements, Ultra-High Performance Concrete (UHPC) was utilized. This project marks DelDOT's first use of a UHPC mix that was batched off-site and transported for placement in a ready-mix truck. Additionally, the profile of US 13 was raised ~8'-6" to address pre-existing sight distance issues and improve driver safety. To accommodate the heavily accelerated construction timeline, Foamed Glass Aggregate was chosen as a backfill. By utilizing these ABC techniques, both bridges were opened in 44 calendar days. This paper will illustrate the pros, cons, and lessons learned from using ABC techniques for the replacement of Bridges 1-488N&S.

Bridge Design 1

Monday, June 15, 2026, 1:30 PM - 3:00 PM

Session Chair: Frank Russo, PhD, PE

IBC 26-04: eBEAM140: Precision Beam Calculations, Simplified for Short Span Steel Bridges

Time: 1:30 PM

Michael Barker, PhD, University of Wyoming, Laramie, WY

Across the United States, more than 280,000 off-system bridges provide vital local connectivity. Of these, approximately 87,000 require replacement to meet the growing demands of heavier truck loads, including semis, logging, grain, and farm vehicles. The estimated cost of these replacements is $78.4 billion. In response to requests from state and county engineers for a practical solution, the American Iron and Steel Institute (AISI), through the Short Span Steel Bridge Alliance (SSSBA), has developed eBEAM140 — a free, Excel-based design tool specifically for off-system bridges. The tool enables engineers to design with steel for any vehicle load, delivering cost-effective, resilient, and efficient bridge replacement solutions nationwide. The presentation will demonstrate the use of eBEAM140 that is available at no cost through the Short Span Steel Bridge Alliance.

IBC 26-05: Standardizing Speed - Modular TPGs for Rapid Span Replacement

Time: 2:00 PM

Jansen Bundridge, PE, HNTB , Kansas City, MO

Accelerated Bridge Fabrication and Construction plays a vital role in post-emergency recovery efforts, particularly when railroad tracks are out of service. Rapid deployment of bridge infrastructure minimizes service disruptions, restores critical rail connectivity, and supports the timely resumption of freight and passenger operations. The BNSF Modular Through Plate Girder (TPG) Standard addresses a critical gap in emergency railway bridge recovery by introducing a versatile, modular span solution capable of replacing spans ranging from 80 to 152'-6" feet with skew angles up to 60 degrees. Traditional recovery methods rely on shorter spans or reallocation strategies that are often limited by inventory, age, or logistical constraints. This presentation outlines the development of a standardized TPG design that meets clearance requirements, optimizes fabrication and construction efficiency, and supports rapid deployment in emergent situations. Key innovations include prefabricated elements, splice-enabled modularity, elimination of lower lateral bracing, and adaptable detailing for skewed conditions. The presentation will also cover key lessons learned during the fabrication of the spans, as well as the innovative methods used to store the span for rapid mobilization in the event of an emergency. A case study demonstrates the practical application of the standard, showcasing its effectiveness in minimizing service disruptions and enhancing network resilience. The TPG Standard represents a proactive strategy for infrastructure owners to mitigate risk and ensure continuity of service across critical rail corridors.

IBC 26-06: Channel Monitoring Systems – A New Paradigm for Vessel Collision Risk Management

Time: 2:30 PM

Matt Carter, Arup, New York, NY; Marc Tatarsky, Arup, New York, NY; Travis Rothbloom, Arup, New York, NY; Mingshi Yu, Arup, New York, NY

The collapse of the Francis Scott Key Bridge highlighted the vulnerability of many existing bridges spanning navigation channels. With narrow main spans and structurally vulnerable piers, many of these bridges would require hundreds of millions of dollars in environmentally disruptive in-water protection works to meet modern design standards. Given limited funding, upgrading all such structures is not feasible — a new approach to risk management is urgently needed.
Traditional risk assessments rely on decades-old statistical models, extrapolated from sparse data and layered with engineering judgment to estimate the probability of collapse. Meanwhile, shipping traffic continues to grow in both frequency and vessel size, increasing risk year after year. Yet, no one is actively monitoring for near-misses—the early warning signs of potential disasters.

SpanSight is a channel monitoring system that introduces a new paradigm in risk management. It enables real-time detection of near-miss vessel-bridge incidents, transforming close calls into actionable insights that help prevent future collisions, protect infrastructure, and enhance navigationa safety.

While historic Automatic Identification System (AIS) data is routinely used in risk assessments, it is usually down-sampled and stale. SpanSight actively fuses data-rich real-time AIS with other sensors to provide enhanced situational awareness. This allows bridge owners to follow up on incidents with navigational stakeholders and build collaborative partnerships to manage risk and prioritize interventions.

This paper also explores the challenges of extending channel monitoring insights into active collision avoidance and traffic control responses because of the low-probability, high-consequence nature of the problem.

Special Session: Young Attendees

Monday, June 15, 2026, 3:30 PM - 5:30 PM

Session Chair: Ron Watson

IBC 26-SS01: Engineering at Height: Rope Access and Modern Bridge Inspection

Time: 3:30 PM

Dillon Winters, GFT, Charlotte, NC

Rope access techniques have become an essential solution for safe and efficient bridge inspection, particularly in challenging environments where traditional access methods are impractical. Rope access offers an alternative approach, reducing impacts on the traveling public and offering cost savings compared to conventional methods. This presentation will explore the integration of rope access with structural evaluation techniques and demonstrate innovative applications of these techniques. Attendees will gain insights into best practices, regulatory considerations and real-world applications.

IBC 26-SS02: Bridging the Gap: Lessons from Early Career Bridge Engineers

Time: 4:00 PM

Alex Murphy, PE, WSP USA, Pittsburgh, PA; Gary Sciulli, EIT, WSP USA, Pittsburgh, PA

The jump from college to the workforce for early career bridge engineers can feel like a juggling act between on-the-job learning and production. This presentation intends to ease the transition by providing first-hand knowledge, tips, and lessons learned from the experience of fellow young bridge engineers. Topics discussed include setting career expectations, recognizing opportunities, utilizing resources, the importance of practical and constructable design, and opportunities for development.

IBC 26-SS03: Cold-Climate Performance of Polyether Urethane in High Load Multi-Rotational Disc Bearings

Time: 4:30 PM

Ezra Sarachan, R.J. Watson, ,

Polyether urethane combines high resilience, abrasion resistance, and stability across a wide temperature range, making it an attractive alternative to conventional elastomers for bridge bearings. In High Load Multi-Rotational Disc Bearings, the confined polyether urethane disc governs both load transfer and rotational capacity. Cold climates pose challenges for elastomeric components, as materials such as neoprene may exhibit stiffening, reduced energy dissipation, or microcracking under sub-zero conditions. Experience to date indicates that polyether urethane retains flexibility, resists freeze–thaw damage, and maintains consistent mechanical performance at lower temperatures. Preliminary comparisons suggest that disc bearings with polyether urethane discs may offer improved durability and service life relative to those using traditional elastomers. These observations support the continued evaluation and use of polyether urethane in disc bearings as part of advancing resilient bridge infrastructure for cold-weather regions.

IBC 26-SS04: Current Approaches to Bridge Deck Joint Closure Analysis with Case Studies

Time: 5:00 PM

Kevin Anderson, PE, SE, AECOM, Arlington, VA

Joint closure is a desirable rehabilitation for existing structures to reduce water leakage and resulting bridge deterioration. However, the closure of a deck joint changes fixity of the structure. A simple and accurate analysis of the changes to substructure loads is needed to determine the feasibility of deck joint closure. This presentation will highlight several examples of joint closure that compares various substructure analysis methods. The review of joint closure analysis methods will be valuable for owners and designers as bridge preservation continues to be a high priority.

Special Session: Emerging Technologies i

Monday, June 15, 2026, 3:30 PM - 5:30 PM

Session Chair: Ronnie Medlock, PE

IBC 26-SS05: Making OpenBIM Buildable: IFC Pilot Project in Construction

Time: 3:30 PM

Allen Melley, PE, Pennsylvania DOT, , ; Joe Brenner, PE, Michael Baker International

PennDOT’s Digital Delivery initiative was established to transition transportation projects from traditional plan-based delivery to data-driven, model-based contract media, with a long-term vision of enabling construction bidding and execution directly from digital models. As part of this effort, the SR 6 bridge replacement project was selected as a historic pilot to evaluate the use of Industry Foundation Classes (IFC) as a contractual deliverable, advancing PennDOT’s Model as the Legal Deliverable (MALD) strategy using open standards. The project is now in the construction phase, and this presentation highlights construction-focused outcomes to date from the SR 6 IFC pilot, showing how an authoritative IFC model supported construction-ready geometry and data for bidding, coordination, and field execution. Software-agnostic IFC delivery allowed contractors, fabricators, and surveyors to use their preferred tools while reducing risks associated with proprietary formats. The project demonstrated practical construction use cases including model-based quantities, rebar modeling with revision tracking, and digital stakeout reference points. Information Delivery Specification (IDS) validation and schema-based quality checks increased trust in the model for construction use. Key takeaways show that meaningful construction benefits are achieved when IFC is defined early as a contract deliverable, supported by clear data requirements and open standards aligned with agency digital delivery goals.

IBC 26-SS06: From Rebar to Deck: A Vision for Robotic Bridge Construction in the Field

Time: 4:00 PM

Stephen Muck, Brayman Construction, Saxonburg, PA

As bridge projects face increasing labor constraints, safety demands, and schedule pressure, robotics offers a new path forward for how critical structural elements can be constructed in the field. Advanced Construction Robotics (ACR) has already moved robotics from concept to jobsite reality, with robotic systems actively tying, lifting, carrying, and placing rebar on bridge projects today. In this forward-looking presentation, Founder and CEO Stephen Muck shares a vision for how proven, field-deployed platforms, such as TyBOT and IronBOT, could evolve into a broader ecosystem of robots supporting the full construction of bridge decks, from reinforcement through concrete placement, finishing, and inspection. The session focuses on what is possible when automation augments skilled crews, improving safety, consistency, and productivity without replacing craftsmanship.

IBC 26-SS07: OpenBridge Modeling of the SR 22/I-376 Diverging Diamond Interchange

Time: 4:30 PM

Josiah Mark Shaver, EIT, KCI Technologies, Beaver, PA

This session presents how KCI Technologies used a model-based bridge design workflow in OpenBridge Modeler to keep geometry, staging, and constructability aligned for the SR 22 / I-376 diverging diamond interchange. In early stages of design, Geotechnical inputs were integrated to estimate the top of rock, which would help to establish bottom of footing elevations of the cantilever abutments and wingwalls. OBM's functionality was further used to verify deck elevations from the roadway profile grade through various vertical curves, superelevation transitions, camber, and haunch for construction. As the project advanced to final design, KCI used the 3D model to quantify excavation and backfill and to visualize temporary shoring heights, providing visual checks for quantity and cost estimates.

IBC 26-SS08: AI and Civil Engineering: Bridging Infrastructure and Intelligent

Time: 5:00 PM

Vinod Kumar Enugala, , ,

I'm Vinod Kumar Enugala, and I work as a civil engineering professional with the Connecticut Department of Transportation (CTDOT). My day-to-day involves managing some pretty substantial projects—billion-dollar bridge rehabilitations, pavement preservation programs, and inspections of complex structureswhere getting the details right isn't optional.But I've also developed a parallel interest that might seem unexpected for someone in my field: artificial intelligence and its applications in construction and sustainability. I've been actively researching this intersection and have even published work on real-time embodied carbon tracking—essentially finding ways to measure and reduce the environmental impact of what we build, as we build it.What I Want to Share With You - In this session, I want to explore something I've been thinking about a lot: how the methodologies we use in civil engineering—the structured project management, the inspection protocols, the quality assurance processes—can actually guide how we adopt AI in traditional industries like ours. I'll draw from both sides of my experience to show how intelligent systems can make our decision-making sharper, our workflows more efficient, and help us meet sustainability goals that once seemed out of reach. Through case studies from actual engineering projects and business applications, I'll walk you through practical ways to start integrating AI into your work—no technical background needed.

Special Session: Bridge Preservation and

Monday, June 15, 2026, 3:30 PM - 5:30 PM

Session Chair: Graham Bettis, PE

IBC 26-SS09: FHWA Bridge Preservation Activities

Time: 3:30 PM

Raj Ailaney, FHWA, Ashburn, VA

FHWA Bridge Preservation Expert Task Group that I chair, our new strategic plan, case studies, pocket guides, reports that we've published, and a brief introduction to the bridge deck preservation tool that is now part of InfoBridge.

IBC 26-SS10: Advanced Techniques for Bridge Durability Assessment

Time: 4:00 PM

Pratik Murkute, PhD, PE, AMPP CP Specialist, VCS Durability, Inc., Tampa, FL

Advanced durability assessment of concrete bridges integrates electrochemical testing, non-destructive evaluation, and material characterization to quantify deterioration and long-term performance. Techniques such as half-cell potential, chloride profiling, petrography, ground-penetrating radar, and impact-echo help identify corrosion risk, material distress, and hidden defects without invasive demolition. These methods provide more reliable insights than visual inspection alone and support maintenance strategies and life-cycle planning. The results directly inform targeted concrete repair decisions, including selective patching, cathodic protection, corrosion mitigation, and protective coating selection.

IBC 26-SS11: Duquesne-McKeesport Bridge Preservation

Time: 4:30 PM

Katie Colella, PE, AECOM, Pittsburgh, PA; Alex McGraw, AECOM, Pittsburgh, PA

Presentation on the preservation of the 100 year old, 9-span Duquesne–McKeesport truss bridge, a complex rehabilitation effort involving full blast and paint operations, steel repairs, innovative jacking schemes for bearing replacement, and other improvements that will extend the life of the existing bridge up to 50 years. The project posed significant challenges related to traffic and pedestrian phasing, utilities, constructability constraints, and coordination of key work items as the scope continued to evolve. As my first experience serving as a structural task lead, this project provided an opportunity to navigate technical and logistical complexities while managing multidisciplinary collaboration and ensuring adherence to schedule and meeting client needs. Lessons learned from this effort highlight innovative approaches to bridge preservation and the importance of adaptability in leadership roles.

IBC 26-SS12: Emergency inspection and analysis of pier deterioration on I-579 Parkway North

Time: 5:00 PM

Daniel Antoniono, PE, CBSI, NCTI, HDR, Pittsburgh, PA; Sam Trehy, EIT, HDR, Pittsburgh, PA

On February 28, 2025, PennDOT District 11 officials discovered significant substructure deterioration at a pier on the north approach of the Veterans Bridge prompting an emergency response. District officials reached out to HDR Engineering, Inc. to assemble a team to inspect, analyze and provide repair details on an accelerated schedule for this pier and to evaluate the condition of 34 additional piers on the north shore approaches. HDR immediately mobilized forces and created an aggressive schedule with detailed inspection procedures and traffic control to thoroughly inspect and document deterioration for the 34 substructure units in 27 days, working seven days a week to minimize disruptions to the travelling public, surrounding freeways, sporting events and concerts.As inspection data was gathered in the field, analysis efforts began simultaneously to keep pace with the accelerated schedule. After traditional sectional design yielded spurious results, strut-and-tie models were used to evaluate the substructure, which included checking the columns and pier caps in their deteriorated condition and tracking the changing load path during repair, with the final goal of allowing normal vehicular traffic over the bridge. Additionally, longitudinal movements in consecutive simple spans resulted in excessively high moments in the bent columns, so a system analysis was conducted to determine more accurate longitudinal movements and column moments.

Special Session: Bridge Construction - A

Monday, June 15, 2026, 3:30 PM - 5:30 PM

Session Chair: Bill Detwiler, PE

IBC 26-SS14: Successful Agency Approaches in Response to Bridge Emergencies

Time: 4:00 PM

Jason Hastings, MCE, PE, GPI, Millsboro, DE

Bridge emergencies—ranging from vehicle impacts and fires to floods and extreme weather—pose increasing challenges to state departments of transportation (DOTs) across the U.S. These events can disrupt transportation networks and divert critical resources from planned infrastructure programs. To address this, Domestic Scan 24-02, through the National Cooperative Highway Research Program (NCHRP) Project 20-68, was initiated to identify effective practices for preparing for, responding to, and recovering from bridge emergencies.The scan team, composed of transportation professionals from multiple states, reviewed agency practices through desktop reviews, participant interviews, and a week-long peer exchange. The findings were organized into four key phases of emergency management: Preparedness, Response, Recovery, and Post-Event. Each phase includes actionable strategies such as pre-positioning resources, establishing emergency contracts, using offline-capable technology, and conducting after-action reviews.Case studies—such as the I-85 fire and I-16 truck crash in Georgia and New York's material stockpiling program—demonstrate how proactive planning and coordination can significantly reduce response times and improve outcomes.

IBC 26-SS15: Vincent Thomas Bridge: Replacement of the Concrete Deck System on an Aging Suspension Bridge - Construction Engineering

Time: 4:30 PM

Riley Haubrich, PE, COWI, Oakland, CA

The Vincent Thomas Bridge, comprising twenty plate-girder approach spans and a signature suspension span, connects San Pedro and Terminal Island in Los Angeles, California. Opened to traffic in 1963 and retrofitted multiple times—including a major seismic upgrade in 1997—the structure now requires full replacement of its severely deteriorated lightweight concrete deck and aging seismic expansion joints. The deck replacement, scheduled to begin in November 2026, will be delivered by the Skanska–CEC Joint Venture. The most significant engineering challenges lie within the three suspended spans, where both the lightweight concrete deck and the supporting steel stringers must be removed and replaced without overstressing the highly optimized 1960s-era suspension system. Due to strict limitations on allowable construction loads and deflections, conventional heavy equipment cannot be used on the suspended spans. Instead, four custom gantry cranes will perform removal of existing deck segments and installation of new stringers and precast concrete panels.

As Construction Engineer, COWI has developed and implemented advanced construction-stage analysis methodologies tailored to suspension bridges with partially removed deck systems. These analyses capture the complex structural behavior under evolving load paths, ensure compliance with stringent movement and stress limits, and support safe and efficient contractor operations throughout erection.

This presentation will highlight the novel engineering approaches, modeling techniques, and construction procedures developed by COWI in collaboration with Skanska, CEC, and Siefert Associates. It will also outline the ongoing work required to safely execute the deck replacement and return the Vincent Thomas Bridge to full service ahead of the 2028 Summer Olympics.

Railroad

Tuesday, June 16, 2026, 8:00 AM - 10:00 AM

Session Chair: Jay Hyland, PE

IBC 26-07: Design and Construction Challenges Overcome for Partial Replacement of Baltimore Metro Pier 2720

Time: 8:00 AM

Karl Stegmann, PE, RK&K, Baltimore, MD; Govind Sulibhavi, Maryland Transit Administration, Baltimore, MD ; Kevin Zinkand, Brawner Builders, Inc., Hunt, MD,

Large cracks and leakage through the pier supporting Baltimore Metro Pier 2720 adjacent to West Cold Spring Station was observed in November 2015 and crack monitors were installed to determine growth or movement of the cracks. A study was performed which included thermal monitoring of the girders and verify if the storm water drain running through the pier was clogged.

Pier 2720 supports the track girders and there is a reinforced concrete beam that is framed into the pier that is being used to support part of the platform located above the pier. Design challenges include designing a shoring system that would temporarily support the track girders and the platform supporting members during construction of the pier. The four legged shoring tower was designed to support the track girders and allowed enough space for workers to work on the pier and a separate shoring system was designed to temporarily support the platform support beam.

Construction progressed utilizing multiple crews as well as night and weekend work. As the engineer of record and reviewer of construction, the design team engaged in a special agreement where submittals, RFI's, and shop drawings would be reviewed and returned to MTA as soon as possible, rather than following the standard timelines for submittals. This would allow the contractor to accelerate construction and eliminate any delays that could be caused by the review process. In addition to expedited reviews, the design engineers were available for contact by MTA any time during the day or night.

IBC 26-08: The Rehabilitation of Five Bridges on SEPTA's Chestnut Hill East Line

Time: 8:30 AM

Lee Wolfe, PE, GFT, Philadelphia, PA; Kyle Stanley, Southeastern Pennsylvania Transportation Authority, Philadelphia, PA

Facing a budget crisis, aging infrastructure, and ridership dependent on its regional rail system, the Southeastern Pennsylvania Transportation Authority (SEPTA) was forced to make tough decisions on how to rehabilitate or replace five deteriorated bridges along the Chestnut Hill East (CHE) Line. Through an innovative approach involving creative engineering solutions, robust public outreach and partnering with the contractor, all five bridges were extensively rehabilitated. Ridership on the CHE Line, extending from northwest Philadelphia to Center City, was approximately 1,700 passengers a day. The five bridges included a 2-span concrete/masonry arch and four riveted steel girder structures, including the oldest bridge in SEPTA's inventory, the Wayne Avenue bridge, constructed in 1895.
An eleven-week service shutdown (June 15st - September 8th) was instituted permitting the bridges to be rehabilitated simultaneously including steel repairs, concrete substructure and deck repairs, deck waterproofing once the ballast was removed on steel or concrete deck systems, drainage repairs and cleaning and repainting. Although these repairs followed standard techniques, unforeseen deterioration was repaired through an intensive partnering initiative where the engineers worked hand-in-hand with the contractor to develop additional details which could be accommodated within the timeframe of the line shutdown. The concrete/masonry arch spans required innovative repairs including the installation of internal stabilization measures for the spandrel walls and wingwalls. Tie-back anchors with deadmen were utilized within the structure to avoid extensive masonry or concrete reconstruction. In addition to this project, the shutdown enabled SEPTA's contractors to efficiently construct peripheral projects that were needed on the line.

IBC 26-09: Design-Build Services for the MTA Long Island Rail Road (LIRR) Hall Interlocking Expansion Project

Time: 9:00 AM

Chih-Ping Frank Fan, PhD, PE, AECOM, New York, NY; Nelson Montecillo, PE, AECOM, New York, NY; Catherine Stanley, AECOM, New York, NY

The Hall Interlocking is a major railroad junction located in Jamaica, Queens, NY, just east of the Jamaica Station on the Long Island Railroad. It controls the critical area where the Main Line, Montauk Branch, Atlantic Branch, and other connecting tracks converge.
The project is a central element of the Metropolitan Transportation Authority (MTA)'s Jamaica Capacity Improvement (JCI) Program, the agency's long-term plan for the future of railroad operations through Jamaica Station, the busiest and most complex hub on the LIRR. Nearly every LIRR branch converges at Jamaica, making it the critical junction for service throughout Long Island and into New York City.
The work includes constructing a new 290-foot-long, two-track railroad bridge over 150th Street and Atlantic Branch Track #1, extending the existing E-Yard (a storage area which is being converted to allow more train flow over the Atlantic Branch Tracks), and installing two new through-running Main Line tracks at Hall Interlocking. The project also includes modifications and reconstruction of retaining and abutment walls flanking the E-Yard, multiple utility infrastructure upgrades, and SOGR improvements across key assets.
The design-build team consists of the lead contractor MLJT – a joint venture of MLJ Contracting Corp. and J-Track LLC, together with the lead designer AEOCM USA. This paper focuses on the analysis, design, and erection of the new railroad bridge, five-span continuous twin box girders with integral steel bent cap, including the innovative incremental launch over congested track traffic and application of PLDCC (Permeable Low Density Cellular Concrete) for backfill in

IBC 26-10: Improving Safety in One Weekend: The River Road Railroad Bridge Replacement Project

Time: 9:30 AM

Jack Cardinal, PE, SE, HNTB Corporation, Philadelphia, PA; Brian Curry, Gregori Construction Inc, Sarver, PA; Charles (Chuck) Neth, PE, Neth Engineering, PLLC, Cheshire, CT

PennDOT Multimodal entered into an agreement with RJ Corman Railroad to replace the western most span of a three span through truss structure (1909) that carries heavy freight traffic over the West Branch of the Susquehanna River and River Road in Clearfield, Pennsylvania. The purpose of the project was to improve driver safety by reducing the risk of trucks traveling on the roadway underneath impacting the bridge superstructure. This was completed by raising the substandard vertical clearance of the span over River Road below from 12'-4" to greater than 14' 6".

The superstructure depth below top of rail was decreased by greater than 2'-0" by utilizing a steel structural system of two through plate girders, tightly spaced floorbeams, a full width deck plate, and direct fixation fasteners bolting the rail directly to the superstructure. The existing pier cap and abutment seat were replaced with precast elements and a precast approach slab with geosynthetic reinforced soil backfill was used to transition from the ballasted approach to the skewed direct fixation superstructure.

The span was replaced within a 96-hour outage through use of self-propelled modular transporters (SPMTs) to remove the existing span and erect the proposed span. The adjacent through truss span was vertically jacked on temporary works to replace the pier cap and its respective bearings below.

The submitted paper will provide an overview of the final design of the proposed structure. In addition, there will be a focus on the erection engineering required, the constructability during the outage, and lessons learned.

Owner's Perspective

Tuesday, June 16, 2026, 10:30 AM - 12:00 PM

Session Chair: Jay Hyland, PE

IBC 26-11: From Steel to Stewardship: Engineering Organizational Culture for Public Value

Time: 10:30 AM

Michael Venuto, Delaware River Port Authority, Camden, NJ; John Hanson, Delaware River Port Authority, Camden, NJ

Public infrastructure succeeds or fails by the culture that supports it. Since 2014, the Delaware River Port Authority (DRPA) and its subsidiary, the Port Authority Transit Corporation (PATCO), have approached culture as a long-term design-build project that is intentional, resourced, and continuously improved. This paper describes a multi-year transformation that integrates servant leadership principles with applied improvisation to embed listening, collaboration, and adaptive decision-making across all levels of the organization - from board members to front-line employees and partnering consultants and contractors.

DRPA's leadership framework, grounded in public value and stewardship, provided the design blueprint. Improv-based learning built trust, collaboration, and rapid coordination in complex operational environments. Practical applications across maintenance and service operations translated the framework from concept to practice, linking culture to measurable improvements in safety, reliability, customer experience, and project delivery.

Sustained progress documented across years of reports and recognitions highlights the connection between culture, public value, and performance. The result is a replicable model: define culture as infrastructure, align incentives across stakeholders, institutionalize "yes-and" collaboration, and validate outcomes with operational metrics.

IBC 26-12: From Dependence to Decision: Reducing Over-Reliance on AI Dialogue Systems Through Cognitive-Guided Interaction

Time: 11:00 AM

Abhishek Khatiwada, Southern Illinois University Edwardsville, Edwardsville, IL; Chenxi Yuan, Southern Illinois University Edwardsville, Edwardsville, IL

The increasing integration of AI dialogue systems in engineering education and professional training has raised concerns about users' cognitive dependency and diminishing self-directed judgment. This study addresses the issue of over-reliance on AI systems—particularly in bridge inspection and construction engineering contexts—by designing a human–AI collaborative learning framework that balances guidance and cognitive autonomy. Inspired by medical apprenticeship models, where nurses learn by observation and guided practice under supervision, we propose an AI-augmented simulation environment that mirrors real bridge inspection workflows.
In this system, participants (civil engineering students and novice inspectors) engage with an interactive LLM-based assistant for context-specific information retrieval while simultaneously observing projected field scenarios through curated videos and digital inspection forms. The AI provides timely prompts and technical clarifications, but decision-making and condition assessments remain learner-driven. This "observe–act–reflect" cycle is designed to scaffold cognitive load effectively, promoting situational awareness, adaptive learning, and critical reasoning rather than passive dependence.
The study evaluates the framework using cognitive load metrics (NASA-TLX), trust and reliance questionnaires, and performance analytics from inspection task simulations. Results are expected to demonstrate how adaptive AI assistance can enhance decision quality and cognitive engagement while reducing over-reliance. The proposed model contributes a replicable pedagogical paradigm for human–AI co-learning in civil infrastructure domains, bridging experiential education and trustworthy AI interaction.

IBC 26-13: Integrating Steel Repairs into Comprehensive Painting Contracts, the Thomas J. Hatem Memorial Bridge

Time: 11:30 AM

David Lynch, PE, H&H, Annapolis, MD; Nafiz Alqasem, Maryland Transportation Authority (MDTA), Nottingham, MD

The Thomas J. Hatem Memorial Bridge provides a lifeline between Harford and Cecil Counties, Maryland. This 7,749-foot-long, late 1930s-era signature steel bridge traverses varied landscape features and utilizes multiple structural systems, each with unique features. The detailing of the bridge is characteristic of the period, with built-up members that traded reduced material quantity for additional labor. Common throughout the bridge are nooks and crannies that collect debris and form ideal nesting sites for birds. It is these details, in combination with challenging access issues over two large channels, that complicate routine repairs and maintenance. This presentation discusses how fully integrating steel repairs into a comprehensive painting project efficiently resolved scores of long-standing issues associated with the details and access.

The steel repair designs minimized schedule impacts on cleaning and painting operations by avoiding temporary works, keeping repairs practical and achievable, and limiting the size and weight of steel plating. Conservative assumptions and engineering judgment guided the design repairs for members and connections with significant section losses. Variations in geometry after 80 years of settling and modifications demanded iterative evaluations. The design process correctly assumed that the construction team would encounter previously unidentified defects during the cleaning and painting process. The variety of repair types included in the contract provided ample flexibility to address additional defects without significant design revisions.

Load Rating & Analysis 1

Tuesday, June 16, 2026, 8:30 AM - 10:00 AM

Session Chair: Aaron Stover, PE, SE

This session highlights innovative, practice-oriented advancements in bridge analysis and load rating, emphasizing real-world applications that improve both accuracy and constructability. Topics include performance-based design of temporary support systems for complex rehabilitation staging, refined analytical methods for distributing non-traditional loads such as heavy railings in girder bridges, and advanced probabilistic techniques for assessing the capacity of critical elements like suspension bridge cables using inspection data. Collectively, the session showcases how modern analysis tools and methodologies can better inform design decisions, reduce risk, and enhance the reliability of load rating practices for challenging bridge systems.

IBC 26-15: Performance-Based Design of Temporary Jacking Frames and Supports for Major Bridge Rehabilitation

Time: 8:00 AM

Qi Ye, PE, CHI Consulting Engineers, Summit, NJ; Nyanlin Htet, CHI Consulting Engineers, Summit, NJ ; Liwei Han, CHI Consulting Engineers, Summit, NJ, ; Zheda Zhu, CHI Consulting Engineers, Summit, NJ, ; Kyunghwa Cha, CHI Consulting Engineers, Summit, NJ,

Owners routinely require in-service replacement of truss bearings, rocker links, and wind pins under severe access and traffic constraints. Yet temporary works for these operations remain weakly standardized: guidance is fragmented, so designs often rely heavily on individual experience. Many proposed designs of temporary works in contract documents are prepared without deep familiarity with construction technology, leading to schemes that have issues in feasibility, economy, constructability, or performance. The confined work zones typical of rehabilitation—limited headroom, congested steelwork, and utilities, etc.— further complicate temporary support designs. Unlike typical bridge elements, temporary systems are usually one-off configurations whose behaviors have not been well studied, elevating the importance of construction-engineering judgment.

This paper addresses these gaps with a performance-based framework for designing temporary jacking frames and supports. The method converts owner/contractor objectives into limit states and measurable acceptance criteria; defines staged load combinations; and formalizes vertical, lateral, and longitudinal load paths. It adds concept development, feasibility and constructability checks, risk assessment, selection matrices, and guidance for advanced finite element modeling of unique geometries and interfaces. Validation across multiple projects demonstrates predictable field performance—reduced rivet removal, minimized rework, shorter closures—and yields repeatable calculations, detailing rules, and QA/monitoring checklists that practitioners can apply to safely execute high-load temporary works.

IBC 26-16: Railing Load Distribution in Girder-Slab Bridges

Time: 8:30 AM

Bhushan Raj Selvaraj, PhD, 10-4 Engineering, Chicago, IL; Tanakorn Ngamjarungjit; Todd Helwig PhD, PE, The University of Texas at Austin; Eric Williamson PhD, PE

Bridge railings are heavier and taller than typical railings when designed for high crashworthiness or as soundwalls. Many state transportation agencies have guidelines on sizing and detailing deck overhangs, and simple methods of distributing railing load to girders, generally based on rules-of-thumb developed through experience. A literature review of current practices and past research revealed a lack of understanding of the distribution of railing dead load in girders. The effect of railing dead load on girders can be significant in bridges where such heavy railings are used. Railing Load Distribution Factors (RLDF) are proposed for the design of girder-slab bridges. These factors represent the proportion of railing load to be applied to a girder when performing a line girder analysis. Detailed three-dimensional Finite Element (FE) models were developed following best practices and based on the sensitivity of various modeling details and assumptions. A parametric study was conducted on simply supported prestressed concrete (PSC) I-girder bridges with the geometry parameters representative of bridges in Texas. The parametric analyses revealed a direct correlation of the RLDF values for bending moment and shear with the bridge geometry parameters that represent the stiffness. Equations for RLDFs were developed using a symbolic regression algorithm. The proposed equations predict the effects of railing dead load on girders and result in safe and economical designs when compared to current practices. Similar proposals also performed well for bridges with PSC U-girders, steel I-girders and steel tub girders.

IBC 26-17: San Francisco Oakland Bay Bridge Risk-Based Inspection and Cable Strength Evaluation

Time: 9:00 AM

Sylwia Stawska, PhD, Modjeski and Masters Inc., Mechanicsburg, PA; Sean Casey, Modjeski and Masters Inc., Poughkeepsie, NY ; Blaise Blabac, Modjeski and Masters Inc., Poughkeepsie, NY, ; Norman Quach, TY Lin, CA,

The San Francisco–Oakland Bay Bridge (SFOBB), a signature suspension bridge approaching its 90th year in service, has undergone its first comprehensive main cable inspection since construction. The inspection included detailed corrosion assessment, wedging, and laboratory testing to evaluate the condition and tensile strength of individual wires. These tests provided valuable data on the stages of corrosion, strength degradation, and variability across the cable cross-section.

This study presents the first application of the new AASHTO Guide for Risk-Based Inspection and Strength Evaluation of Suspension Bridge Main Cables (published September 2025). The method integrates inspection data, wire strength distributions, and Monte Carlo simulations to evaluate cable capacity and predict remaining strength. Results from the SFOBB application demonstrate the method's capability to capture the spatial variability of corrosion and enhance reliability assessment. The findings highlight the advantages of this probabilistic framework in supporting data-driven maintenance planning and long-term asset management for the SFOBB. This presentation will share key outcomes and lessons learned from this first-of-its-kind application on a major suspension bridge.

Bridge Rehabilitation 1

Tuesday, June 16, 2026, 10:30 AM - 12:00 PM

Session Chair: Aaron Stover, PE, SE

This session showcases innovative rehabilitation strategies where conventional solutions fall short, highlighting creative approaches to widening historic structures, repairing inaccessible steel components, and replacing bearings under live traffic. Emphasizing constructability, constraint-driven design, and maintaining traffic, these case studies offer practical insights into solving complex rehabilitation challenges and extending the life of critical bridge infrastructure.

IBC 26-18: Construction Engineering Innovations for the I-78 Open-Spandrel Arch Widening Project, Hamburg, Pennsylvania

Time: 10:30 AM

Abir Sengupta, TYLin, San Francisco, CA; Sandeep Singh, TYLin, San Francisco, CA; Sajid Abbas, TYLin, San Francisco, CA; Crystal Lui, TYLin, San Francisco, CA; Carol Choi, TYLin, San Francisco, CA

The rehabilitation and widening of the historic I-78 SR-61 Mainline Arch Bridge required innovative construction engineering to address severe deterioration and meet modern traffic demands while preserving the bridge's historic character. The project involved widening the existing structure by two lanes and extending its service life by 75 years, all while maintaining uninterrupted traffic and river navigation.
A key technical solution was the adoption of a segmental construction methodology for the new concrete arch spans. Sequential segmental erection enabled the construction team to pour arch segments, keystones, and deck elements in a controlled sequence, supported by temporary towers and formwork. This approach minimized the need for extensive falsework and allowed for early removal of support towers, optimizing the construction schedule. Isolation gaps and "dog bone" footings were incorporated to reduce impacts on existing foundations and facilitate differential movement between new and existing structures.
The rehabilitation phase addressed significant deterioration in the bridge's structural elements, including end walls, arches near joints, columns adjacent to joints, and interior columns near the median joint. Specialized techniques were employed to strengthen and restore these components while maintaining the bridge's historic integrity and ensuring safety for ongoing traffic. Rehabilitation efforts included targeted repairs, replacement of critical columns under live traffic, and reinforcement of spandrel beams and deck sections. Through careful planning and execution, the rehabilitation not only preserved the bridge's historic character but also significantly extended its service life, ensuring its continued role as a vital transportation link and community landmark.

IBC 26-19: Reimagining steel repair: Unconventional Approach to Girder Rehabilitation

Time: 11:00 AM

Rakesh Srinivas-Murthy, PE, WSP, Lawrenceville, NJ; Anand Patel, P.E., WSP, Lawrenceville, NJ; Alexandra Beyer, P.E., WSP, Lawerenceville, NJ; Gregory Stolowski, P.E., PMP, WSP, Lawerenceville, NJ

The rehabilitation of the historic 3.5-mile Pulaski Skyway, which connects Jersey City to Newark, NJ, presented a unique challenge at Span 44. The concrete deck replacement occurred prior to completing the steel repairs, covering the inner web of the deteriorated fascia girder, which severely limited access and restricted traditional repair details.

WSP developed a cost-effective and time-sensitive repair strategy to strengthen the affected girders from the only accessible side, while also preventing further deterioration. The innovative repair scheme included the use of threaded studs welded to the 80-year-old steel, the installation of fill plates with cheese holes to avoid existing fasteners that could not be removed without damaging the newly poured concrete deck, and finally, the installation of repair plates with bolts tightened onto the threaded studs.

This presentation highlights the constraints encountered and the innovative solutions implemented to meet structural requirements, metalogical restrictions, and scheduling demands. It also shares best practices for steel repairs that satisfy AASHTO requirements, with a focus on threaded stud welding. Topics include metalogical analysis, welding procedures, material properties, and field testing in accordance with AWS D1.1 and D1.5 standards. The repair approach was reviewed and approved by NJDOT, with collaboration from stud manufacturers.

IBC 26-20: A Case Study for a Bridge Girder Jacking System within Limited Working Space

Time: 11:30 AM

Jeffrey Robert, PE, KCI Technologies, Sparks, MD; Holly Kokstein, KCI Technologies, Sparks, MD ; Ruel Sabellano, D. Eng., PE, M. ASCE, Maryland Transportation Authority - Office of Engineering & Construction, Baltimore, MD,

The Maryland Transportation Authority's I-95 bridge over Little Northeast Creek is a three-span steel girder structure originally constructed in 1963, widened in 1971, and most recently rehabilitated in 2019 with a full deck replacement. Since the 2019 deck work, field inspections have revealed widespread issues with the bridge bearings—specifically, inconsistent contact between bearing plates, with gaps ranging from 1/16" to 3/8". The irregularity of these gaps across the structure precludes a uniform adjustment solution.

To address this challenge, KCI was tasked with developing a bearing replacement strategy that maintains live traffic on the bridge. Due to the varying skew angles between girders and piers, and limited space on the pier caps, KCI designed a steel framing system suspended from the existing piers. This system allows for individual girder jacking and bearing replacement with no anchoring to the pier caps.

This presentation will explore the site constraints, engineering challenges, and the creative structural solution developed to rehabilitate the bridge bearings efficiently and safely under traffic.

AI / Digital Delivery 1

Tuesday, June 16, 2026, 8:00 AM - 12:00 PM

Session Chair: Jason Reisinger, PE

AI in bridge engineering acts like a smart assistant—rapidly analyzing data to refine designs, simulate performance, and flag risks early. It helps engineers make faster, more informed decisions from concept through maintenance. The result is safer, more efficient bridges with less guesswork.

IBC 26-21: Analytical twins: New criteria for evaluating "object modelers" in a digital twin world

Time: 8:00 AM

Joshua Tauberer, LARSA, Inc., Melville, NY

In the last decade analysis and design softwares have added new object-based modelers on top of existing FEM-based analysis and design tools to rapidly create bridge structural models from objects, such as girders and piers, rather than beams and shells. But "It only works if you stay within the lines" is a frequent frustration we hear as design elements that don't exactly match the software's "objects" create significant shortfalls. In this session, we'll present advancements for a new object-based modeler that overcomes these challenges using new criteria to evaluate bridge object-modeling software containing embedded "analytical twins" inside every structural object.

IBC 26-22: A Data Driven Approach to Predictive Deterioration Assessment in Long-Span Truss and Suspension Bridges

Time: 8:30 AM

Ruel Sabellano, D. Eng., PE, M. ASCE, MDTA, Baltimore, MD, MD; Zeinab Bandpey, Morgan State University, Baltimore, MD, MD ; Mehdi Shokouhian, Morgan State University, Baltimore, MD, MD, ; Soroush Piri, Morgan State University, Baltimore, MD, MD,

Long-span truss and suspension bridges play a critical role in regional and national mobility, yet their scale, configuration, and exposure to environmental stressors make deterioration difficult to anticipate using conventional inspection-based assessments. This study develops a predictive modeling framework that integrates Federal Highway Administration condition data (1995–2021), maintenance histories, and localized NOAA climate records to identify deterioration drivers and forecast future condition states. The dataset includes 7,389 long-span bridges nationwide, with a focused assessment of 142 Maryland structures, including major river-crossing and coastal bridges influenced by temperature fluctuation, moisture cycles, and de-icing exposure.
Machine learning models are trained to identify structural vulnerabilities with improved accuracy compared to heuristic or linear forecasting approaches. The resulting predictions support uncertainty-aware condition planning and provide network-level screening tools that help agencies prioritize maintenance, allocate resources more effectively, and extend the service life of critical infrastructure assets. The framework is scalable to other regions, adaptable to multiple bridge types, and supports the transition toward data-driven asset management practices that enhance safety, reliability, and long-term resilience across transportation networks.

IBC 26-23: AI-Assisted Bridge Design Automation and Building Intelligent Data

Time: 9:00 AM

Venu Pokuri, PE, GFT, Marlton, NJ; Matthew Greenholt, GFT, Mechanicsburg, PA

At GFT, we are advancing bridge design by responsibly applying artificial intelligence to enhance and automate multiple stages of the engineering process. We are developing intelligent workflows that transfer information seamlessly from BIM models to analytical models across different platforms, improving precision and reducing manual effort. Standardized templates are being created to meet specific agency requirements, enabling quick updates to analytical models through structured data inputs. These initiatives help streamline modeling, improve data quality, and strengthen integration between digital design and analysis.

We have also introduced custom AI agents to assist with analysis tasks such as report summary and design interpretation. These agents operate within secure project environments to ensure data confidentiality and are customized for individual agency standards, improving efficiency while maintaining accuracy and compliance.

As the next step, we aim to use AI to organize and structure data across all stages of the design process. Results from successful analyses are captured in detail to support the development of predictive, preliminary, and QA/QC models. This foundation will enable data-driven decision-making, enhance early-stage evaluations, and promote more consistent, informed, and efficient bridge design practices.

IBC 26-24: AI-Based Advanced Technology Evaluation in the Bridge Domain Using Sentiment Analysis

Time: 9:30 AM

Prashank Yadav, Texas A&M University, College Station, TX; Ali MohebiAlidash, Texas A&M University, College Station, TX; Amirali Najafi, Texas A&M University, College Station, TX; Stefan Hurlebaus, Texas A&M University, College Station, TX

Bridges undergo several lifecycle stages, which include planning, designing, construction, maintenance, and decommissioning. In each stage, multiple stakeholders are involved, that are responsible for the decision making related to critical aspects. Inherently, these decisions involve risk to cost, time, and safety. Key challenges associated in achieving well-informed decisions are limited access to recent research, difficulty in understanding the technical jargon, and divergent opinions. These can be counterproductive and may impede the selection of most optimal decisions. Our objective is to develop an Advanced Bridge Technology Clearinghouse (ABTC) platform where the users can evaluate, compare, and get well-informed about multiple advanced technologies in the bridge domain that help them make rational and pragmatic decisions. Recent advancements in the development of Large Language Models (LLMs) make them highly efficient in understanding the intricacies of natural language. We will leverage these capabilities of LLMs to scrape through the large bodies of data repository and perform an Aspect-Based Sentiment Analysis (ABSA) on the technologies. A Multi-Criteria Decision Making (MCDM) method will be used to evaluate and compare the technologies considering all the relevant aspects. As a final product, we aim to develop an AI-agent that can automate this process and suggest well-informed decisions. The developed AI-agent will coordinate the interaction between the LLMs, environment involved, tools used, planning through in-context learning and memory established. This paper demonstrates the capabilities and robustness of the developed AI-agent in performing the task of evaluating the technologies using ABSA.
Keywords: Large Language Model, Bridge Technology, Aspect Based Sentiment

IBC 26-25: IFC as Contractual Deliverable: A First in U.S. Infrastructure at French Creek

Time: 10:30 AM

Hanjin Hu, Michael Baker International, Moon Township, PA; Joseph Brenner, Michael Baker International, Harrisburg, PA ; Richard Schoedel, Michael Baker International, Moon Township, PA, ; Zacharie Stonestreet, Michael Baker International, Moon Township, PA, ; Keith Yoder, PE, PMP, Michael Baker International, Moon Township, PA,

PennDOT is leading innovation in digital delivery through successful Letting of an Industry Foundation Classes (IFC) Model as a Legal Deliverable (MALD) pilot project, supported by an FHWA Advanced Digital Construction Management Systems (ADCMS) grant. The SR 0006-B12 bridge over French Creek in Crawford County, PA—designed by Michael Baker International—is the first U.S. bridge project to use Industry Foundation Classes (IFC) deliverables as the contract documents for bridge elements, including reinforcement. This initiative promotes open-data standards and lifecycle modeling to improve interoperability across design, construction, and asset management platforms.

The existing two-span steel through-truss bridge, with substandard vertical clearance and significant deterioration, was programmed for replacement following the evaluation of seven alternatives. The selected solution is a 316-foot, two-span continuous weathering steel plate girder bridge with integral abutments and wall pier with drilled shaft foundations. Environmental constraints, including threatened aquatic species in French Creek, required careful coordination and impact mitigation.

This pilot demonstrates the feasibility of IFC-based workflows for bridge delivery, including model authoring, data translation, and contract integration. The IFC export retains both element identity and geometry, enabling seamless data exchange across platforms. Final design and modeling are complete, and the project was let in September 2025. Construction is underway with completion anticipated in 2026.

IBC 26-26: AI-Agent–Driven Multimodal In-Context Information Extraction and Automatic Bridge Design Code Compliance Using Large Language Models

Time: 11:00 AM

Ali Mohebi Alidash, Zachry Department of Civil and Environmental Engineering Texas A&M University, College Station, TX; Prashank Singh Yadav, Zachry Department of Civil and Environmental Engineering Texas A&M University, College Station, TX ; AmirAli Najafi, Texas A&M University, College Station, TX, ; Stefan Hurlebaus, Texas A&M University, College Station, TX,

This study presents a practical, design manual-based AI agent for bridge design and checking that reads directly from design standards, such as AASHTO LRFD Bridge Design Specifications. The framework also includes the state DOT manuals. Source PDFs are converted to machine-readable text and indexed at section, table, and equation granularities. A Large Language Model (LLM), namely ChatGPT, extracts entities (loads, factors, materials, components), relations, and unit-aware numbers into a structured format with the pertinent citations. The model then learns through in-context learning (ICL), where the model follows the provided examples' procedures and retrieves similarly defined examples to solve specific parts of a bridge design, based on the user's query. The ICL-based LLM agent manages specialized tools for different parts of code compliance, calling different solvers for (e.g., load effects, distribution-factor selection, geometry calculation). In a retrieval workflow, the agent pulls article-level text and numbers, applies task templates, performs calculations, and returns pass or fail decisions with numerical margins and exact references. When given a design template, the model executes the calculations, completes the design, and produces the required documentation. The framework is multimodal because it generates engineering-format visuals consistent with computed quantities (e.g., DWG details for bridge-deck reinforcement) produced from design outputs. The framework completes full bridge-design checks in a couple of minutes rather than days; for example, it can design a deck and output both text and multimodal documentation in about 1 minute using the GPT-4.1 engine.
Keywords: AI-Agent, Large Language Model, Bridge Design Standards, In-Context learning, Automated Code

IBC 26-27: From Condition to Consequence: An Impact-Based Approach to Bridge Infrastructure Prioritization

Time: 11:30 AM

Matija Radovic, PhD, PE, Delaware DOT, Dover, DE; Offie Adarkwa, RAC LLC, Dallas, TX

Current bridge management policies have predominantly relied on structural condition metrics to prioritize infrastructure investments. While condition-based assessments provide valuable information, they fail to account for critical spatial and non structural factors that can significantly amplify service disruption in the event of bridge failure. This research presents an advanced impact-based prioritization framework that integrates Likelihood of Failure (LOF) with Consequence of Failure (COF) to support more informed decision-making in capital fund allocation.
The proposed framework introduces comprehensive spatial analysis of economic, social, and engineering factors in order to quantify impact risk of a bridge failure. Key factors evaluated include proximity to flood-prone areas, access to emergency evacuation routes, connectivity to critical freight corridors, and designation as single-access infrastructure serving isolated communities. The resulting Impact Risk Rating combines weighted LOF and COF scores with user-adjustable parameters, enabling detailed scenario analysis under varying policy priorities. Rather than simply identifying which bridges are in the poorest condition, this methodology determines which bridge failures would generate the most severe socio-economic consequences. This distinction allows transportation agencies to optimize limited capital resources by balancing structural vulnerability with broader societal impact.
This approach was implemented in an interactive web-based application featuring Del DoT bridge inventory data with real-time risk recalculation, geospatial visualization with multiple base layers and route overlays. Additionally, application is equipped with an LLM-powered assistant, providing natural language access to complex scenario analysis and results interpretation.

Construction 1

Tuesday, June 16, 2026, 8:00 AM - 12:00 PM

Session Chair: Timothy Taylor, PE

Join presenters as they share real-world bridge construction case studies covering challenging erection operations, temporary works design, accelerated construction techniques, and innovative solutions for complex bridge projects.

IBC 26-28: To Jamaica and Beyond: Launching the 150th Street Long Island Railroad Bridge

Time: 8:00 AM

Lisa Briggs, Genesis Structures, Kansas City, MO

The Long Island Railroad (LIRR) Hall Interlocking Expansion Project utilized bridge launching techniques to construct a new two track railroad bridge for MTA in Queens, NY to increase capacity into and out of Jamaica Station. Steel components for the double box girder structure were brought in by rail and assembled in a 220-ft long launch pit using a gantry crane. The 290-ft long structure was constructed and launched in stages over three separate closure periods. This presentation will focus on the analysis performed by Genesis Structures and the details and procedures used by Integrated Structures to facilitate launching operations in the field.

IBC 26-29: I-475 Bridge Construction over Flint River near Flint, Michigan

Time: 8:30 AM

Nikkolas Edgmond, PhD, PE, Genesis Structures, Kansas City, MO; Jake Hall, C.A. Hull Co., Inc., Commerce Township, MI; John Boschert, Genesis Structures, Kansas City, MO; Clay Malloure, C.A. Hull Co., Inc., Commerce Township, MI

The I-475 reconstruction project was a large-scale rehabilitation effort that included demolition and erection of seven bridge structures. The Flint River Bridge is the main crossing over the Flint River near Flint, Michigan for the I-475 corridor. The existing structure was two identical steel plate girder bridges that included 6-spans with pin-and-hanger connections. Constructed in 1972, the bridge was replaced to accommodate roadway improvements as well as river navigation channel widening. The new bridge is a three-span conventional steel plate girder bridge with heavily skewed supports.
The bridge demolition and erection were performed in phased construction operations to allow for reduced traffic interference. The new bridge was erected by utilizing adjacent structures (existing and new) to address environment and site geometry constraints. The first phase of girder erection involved the controlled pre-assembly and transportation of a nearly 350,000 lbf. girder pair assembly onto the existing Southbound bridge which was lifted and set onto the permanent bearings through complex and coordinated crane operations. The second phase of girder erection was performed by erecting single girder segments with unique temporary conditions. Temporary works were designed to accommodate unique girder erection planning.
This paper and presentation will focus on the construction planning and engineering performed by the project team to facilitate this project, including the following:
•Coordination and planning for the complex erection operations
•Design of the temporary works required to facilitate erection of the system
•Engineering for the unique temporary conditions of the permanent members

IBC 26-30: Steel Bridge Playbook: Practical Tools and Resources for Contractors

Time: 9:00 AM

Vin Bartucca, National Steel Bridge Alliance, Canton, MA

For contractors navigating modern steel bridge projects, success hinges on balancing structural design, fabrication efficiency, and erection speed. While steel I-girder bridges continue to offer cost-effective adaptability, the transition from concept to construction requires tools tuned for contractor priorities. This paper translates design-stage instruments—such as span-weight curves, the NSBA LRFD Simon analysis software, and the girder splice guidance—into actionable contractor workflows. We present a real-world example of twin 400-ft spans over the Red River, illustrating how early use of these tools reduced steel tonnage, minimized field splices, streamlined erection, and cut total superstructure installation time by 20%. By showing how design decisions affect fabrication cost, transport logistics, and lift-in operations, this discussion bridges the gap between engineers and contractors and equips field teams with insights to drive smarter bidding, fabrication, and erection.

IBC 26-31: Saint Joseph's University Post Crossing – Connecting a University Campus Across a Major Urban Arterial

Time: 9:30 AM

David Phelan, PE, Jacobs Engineering Group, Philadelphia, PA; William Davis, PE, Jacobs Engineering Group, Philadelphia, PA ; Robert Scheier, PE, Jacobs Engineering Group, Philadelphia, PA,

The primary objective of this design-build project was to provide a safe, accessible, and direct shared-use pathway connection between the two sides of the Saint Joseph's University (SJU) campus beneath the heavily trafficked State Route 0001 (City Avenue).
The project was complicated by the presence of major utility conflicts, shallow bedrock, and high traffic volumes. Jacobs' innovative solution was to convert a section of City Avenue into a 33-foot single-span bridge and build the 21-foot wide pathway beneath it. By converting the roadway into a bridge using shallow 20-inch prestressed Northeast Extreme Tee (NEXT) beams, raising the roadway profile of City Avenue, and lowering/flattening a section of the sewer line, the shared-used pathways low point was kept significantly higher than the initially envisioned arch culvert that was considered in the concept study.

The project successfully implemented Accelerated Bridge Construction (ABC) techniques, specifically utilizing a top-down construction method involving pre-installation of 64 drilled H-piles installed from atop City Avenue prior to the bridge assembly using precast elements with Ultra-High-Performance Concrete (UHPC) during two separate 1-week travel lane reductions. A Polyester Polymer Concrete (PPC) overlay was provided over the NEXT beams to provide a durable and smooth riding surface.

Architectural features within the underpass include a suspended ceiling and glass fiber reinforced concrete (GFRC) SJU lettering and shields finished with architectural shotcrete on the interior walls. The underpass approaches include stone veneer and cast stone portal arch to complement the campus architecture. Security features include cameras, emergency phones, and wireless access points.

IBC 26-32: Erection of the Portal North Arch Bridges

Time: 10:30 AM

Stephen Percassi Jr., Genesis Structures, Kansas City, MO; A.J. Powell, Skanska USA Civil, Carteret, NJ

The Portal North Bridge is a critical component of Amtrak's Northeast Corridor rail system linking Newark, NJ to Penn Station in New York City. The bridge carries over 160,00 passengers on more than 500 NJ Transit and Amtrak trains each weekday. The new structure replaces the existing 115-year-old swing bridge with three network tied arch spans of 400-foot length with 50-foot vertical clearance above mean high water.

Construction of the three arch spans employed a multi-staged erection sequence developed specifically for this challenging project site. Each of the three arches were erected on-shore at a marine facility on the Hudson River just south of Albany, NY. Once erected and all cable hangers installed, the arch was rolled from land to barge using SPMT's and sailed 150 miles down the Hudson River, into New York Harbor and up the Hackensack River to the crossing location. Once on-site, the structure was transferred to a specialized barge furnished with a self-climbing jacking system and lifted 50ft above high water to clear the permanent piers. Due to draft restrictions along the shore line, the two flanking arches were landed on a temporary frame with a longitudinally jacking system and slid into position over its respective substructure. Finally, the arch span was jacked down on the permanent bearings and prepared for a concrete deck, ballast, ties and rail.

IBC 26-33: Sacramento River Bridge Deck Replacement

Time: 11:00 AM

Jordan Perlmutter, PE, Foothills Bridge Co, Boulder, CO; Chris Tollefson, Foothills Bridge Co, Boulder, CO

Northern California is home to many elegant concrete arch bridges dating from the mid-20th century that are approaching the end of their design life. In order to preserve the architectural and historic value of these bridges and to avoid the cost of a full demolition and replacement, Caltrans has opted to leave some, such as the Sacramento River crossing in Dunsmuir, CA, partially intact and replace only the structurally deficient deck. Foothills Bridge Co was tasked with developing this partial demolition plan and designing a falsework system to serve as a demolition debris shield and an access platform for the new deck pour. This project presented unique challenges related to heavy equipment loading of the partially demolished superstructure and the interaction between the temporary falsework platform and the existing arch structure, requiring a Construction Stage Analysis using MIDAS finite element software. Ultimately, the project was a success and the new deck has given this historic arch bridge an extended service life.

IBC 26-34: Pretty Rocks Slide Bridge

Time: 11:30 AM

Randy Thomas, PE, Jacobs, Milwaukee, WI

An active landslide at milepost 43 prompted park officials to close the Denali Park Road in 2021. The 90-mile road provides the only vehicular access into the 6-million-acre national park. Jacobs provided a design solution fitting the site's remoteness, steep terrain, environmental restrictions, and short construction season: a new 475-foot Warren thru truss employing short, lightweight, prefabricated pieces to be erected in balanced cantilever fashion and then conveyed as a complete span across the slide zone using a topside launching system that avoids the need for large cranes. The CMGC project adopted an innovative Integrated Design and Detailing (IDD) approach which enabled the structural steel fabrication 3D detailing model and shop drawings to be developed concurrently with the final bridge plans, saving 6 months on the construction start. The presentation will focus on design challenges and solutions for the unique site conditions, including topics such as lightweight prefabricated steel sandwich plate deck, Grade 144 T&A bolts, prefabrication and shipping, design for erection sequence, and wind loading for active and inactive conditions during erection.

Seismic

Tuesday, June 16, 2026, 8:00 AM - 10:00 AM

Session Chair: Maggie Jackson, PE

IBC 26-35: Bolinas Bridge - Balancing Fault Rupture and Tsunami Design

Time: 8:00 AM

Sebastian Varela, PhD, PE, SE, Mark Thomas, Sacramento, CA; Marshall Moore, Mark Thomas

The Bolinas Bridge is part of a wetland restoration project in Marin County, CA, to replace an existing culvert with a bridge to restore fish passage and wetland habitat upstream of the existing roadway. The bridge is in construction and will be completed by July of 2025.

The preliminary design concept was a single span post-tensioned concrete slab approximately 60 ft long and 36 ft wide on cantilever seat abutments supported by pile foundations due to poor soil conditions.

During Type Selection, the bridge was found to be subject to several extreme event loads including:
• Fault Rupture: 1.1 ft of differential displacement
• Tsunami: 32.9 ft wave elevation and 13.6 ft/s wave velocity overtopping the bridge deck by approximately 9 ft
• Tsunami Induced Scour: 53 ft tsunami scour depth

Raising the structure above the tsunami elevation was undesirable due to the proximity to SR-1 and would require significant profile adjustments to SR-1. Monolithic connections were also undesirable as they severely limit the structure's ability to handle fault rupture displacement. Tying the structure down to prevent the structure from washing out during a tsunami event was therefore deemed the best alternative.

The selected design accommodated both fault rupture and tsunami design hazards through the use of a pier supported structure connecting the superstructure to 2-column bents on CIDH piles with rock sockets. The slab superstructure was connected to the columns using pin connections able to withstand tsunami loading while being able to deflect during a fault rupture event.

IBC 26-36: Nonlinear Time-History Analysis of a Three-Tower Cable-Stayed Bridge in a High-Seismic Zone

Time: 8:30 AM

Liyang Tian, Independent Researcher, Fremont, CA

This study performs nonlinear displacement time-history analysis for a long-span, three-tower cable-stayed bridge with two approaches. The main unit totals 2,500 ft (365′ + 885′×2 + 365′). Longitudinal fusing restrainers at the middle bent keep the superstructure fixed for lower-level seismic events and fully floating for upper-level events after fuse activation. The west approach is integral (155×2 ft); the east approach is semi-integral (94 ft). Foundations comprise driven piles and drilled shafts with variable depth to rock. The site lies near the New Madrid Seismic Zone (NMSZ) with PGA of 0.24g. Geologic variability and large ground motions necessitate nonlinear displacement time-history analysis to resolve response mechanisms essential to design and performance evaluation. The analysis captures spatially variable ground motions with depth-dependent kinematics and multi-support excitation along the alignment. Seven ground-motion sets were used for each hazard level. A combination of soil state (non-liquefied/liquefied), hazard level, seed record, and scour scenarios yielded 84 SAP2000 nonlinear finite element models, all incorporating 3D nonlinear soil springs (inertial interaction). Mean time-history responses are used for performance assessment. Results indicate that the fixed-then-floating configuration for the cable-stayed unit controls longitudinal displacements while satisfying performance targets. The semi-integral span develops localized, controlled inelasticity. A ductile deadman anchor restrains the two-span integral approach, limiting longitudinal demand by decoupling lateral resistance (deadman ties) from vertical resistance (bents).
Python automation accelerated input generation and post-processing across the large analysis set.

IBC 26-37: Earthquake Resilience of the New Ölfusá Bridge: From Concept to Detailed Design

Time: 9:00 AM

Smon Gren, Ramboll, Copenhagen S,   Denmark; Ilkka Ojala, Ramboll, Espoo Finland; Sesang Kim, Ramboll, Copenhagen S, Denmark

The New Ölfusá Bridge is a single tower cable-stayed bridge, planned constructed near the city of Selfoss. The bridge will be the first of its kind in Iceland and is part of the project “Ring road (1) around Ölfusá”, moving the current ring road to outside the Selfoss city area. The bridge will have a total length of 330m, with its two cable stayed spans crossing the Ölfusá River. Ramboll has performed the detailed design of the bridge for the contractor TGVerk. The endclient is the Icelandic Road Administration, VG.
The site is characterized by severe seismic activity, with the bridge crossing active fault lines. The concept phase design of the bridge presented a structural system heavily dependent on viscous dampers for limiting the load effects from an earthquake. However, this concept was revisited during the tender design, and a new structural system was developed, aiming at structural resilience through low maintenance, structural robustness and transparent load paths. In this configuration the pylon foundation was designed to slide under significant seismic actions, and all viscous dampers was replaced with large load bearing shear keys at the abutments and at the pylon.
In this paper the design process from the initial concept to detailed design is presented. The paper describes the thought process behind the selection of the designed structural system, and presents the analyses performed for verification.

IBC 26-38: Brickyard –Seismic Analysis: True Pins for a Landslide

Time: 9:30 AM

Gavin Viriyincy, PE, AECOM, Seattle, WA; Cori Yoshida, PE, AECOM, Seattle, WA   ,

The Sammamish River Bridges are three (3) new bridges along the I-405 corridor in Bothell, Washington. These bridges are replacing part of the existing three-level highway interchange at SR 522 with a new 5-span Transit/HOV direct access ramp bridge, a new NB I-405 mainline 9-span bridge, and a 4-span replacement ramp bridge between NB I-405 and EB SR 522. They are part of a 4.5 mile enhancement to the corridor that aims to improve transit connections for the future bus rapid transit system and add additional express toll lanes. All three bridge abutments and first 2 piers are found on in a historically landslide prone hillside south of the Sammamish River. Additionally, due to the I-405 corridor’s critical role in maintaining the region’s mobility in a post-seismic, all three bridges are designated as Recovery Level bridges (similar to AASHTO’s Critical Bridge definition). A special steel pin was developed to meet WSDOT’s strict definition of a ductile element in seismic pin connections at the base of the column, helping to satisfy the displacement ductility demands of a Recovery Level Bridge and to resist landslide-induced deformations following a seismic event.

Suspension Bridge Evaluation

Tuesday, June 16, 2026, 10:30 AM - 12:00 PM

Session Chair: Maggie Jackson, PE

IBC 26-39: Preserving an Icon: Main Cable Flow Testing for Long-Term Durability of the Bay Bridge West Span

Time: 10:30 AM

Fady Bou-Shebel, TYLin, San Francisco, CA; Norman Quach, TYLin, San Francisco, CA; Dan Turner, TYLin, San Francisco, CA; George Baker, TYLin, San Francisco, CA; Blaise Blabac, Modjeski and Masters, Inc., Poughkeepsie, NY

After nearly ninety years of continuous service, the San Francisco–Oakland Bay Bridge (SFOBB) West Span has embarked on its first-ever detailed examination of the main cables that have supported it since 1936. Spanning the San Francisco Bay, the suspension bridge has been exposed to persistent high humidity throughout its life, creating conditions conducive to internal cable moisture.

As part of the inspection program, flow testing was performed on selected cable segments to explore the feasibility of installing a cable dehumidification system. Such a system could effectively mitigate moisture ingress and extend the service life of the cables. This testing provided valuable insights into how atmospheric exposure influences internal conditions over time. The findings demonstrate how flow test data can inform strategies for damage assessment and guide repair methodologies for other long-span suspension bridges. This presentation will discuss the implementation of the flow test, key observations, the interpretation of flow test results, and implications for future maintenance planning of iconic structures.

IBC 26-40: Internal Suspension Cable Inspections of the Wayne Six Toll Bridge

Time: 11:00 AM

Aaron Colorito, PE, Michael Baker International, Moon Township, PA

There are about 50 major suspension bridges in the United States, and numerous small- to medium-span suspension bridges, which require inspection of the internal spaces of the cables. The Wayne Six Toll Bridge (formerly known as the Newell-East Liverpool Toll Bridge) is a three-span steel suspension bridge that crosses the Ohio River and Norfolk Southern Railroad between Newell, WV and East Liverpool, OH. Built in 1905 by the American Bridge Company for the Homer Laughlin China Company, the bridge has been privately owned and maintained for its entire 120-year service life. The development and implementation of an internal cable inspection program are discussed, as well as challenges unique to this historic bridge.

IBC 26-41: Suspension Bridge Rehabilitation in the US and UK

Time: 11:30 AM

Barry Colford, AECOM, Philadelphia, PA; Mark Bulmer, AECOM, Leeds, Yorkshire United Kingdom; Joshua Pudleiner, AECOM, Philadelphia, PA; James Mandala, AECOM, New York, NY

In the USA, as is the case in most countries, long span suspension bridges are almost always vital links in the nation's infrastructure and any failure, either at the serviceability or ultimate limit state level is likely to cause significant disruption to the public.
There are over 150 long span suspension bridges across the globe with a main span length greater than 1000 ft (305m) and well over 50% of these major suspension bridges were built after 1988. Most of these suspension bridges were built in China which now has the largest inventory of long span suspension bridges. The US has the second largest inventory of these bridges, but it is also the oldest, with the average bridge age now over 80 years. The UK also has only four major suspension bridges, and these are also now relatively old. Three were built in the 1960s and one was opened in 1981.
This paper will cover the recent and ongoing inspection, preservation and rehabilitation projects on a number of these bridges in both countries to keep this vital infrastructure safe and serviceable. These include projects on the following: Verrazzano Narrows Bridge, Bronx Whitestone Bridge and Throgs Neck Bridge in NYC; Mount Hope and Newport Pell Bridge in RI; Ben Franklin Bridge between PA and NJ and the Forth Road Bridge, Humber Bridge and Tamar Bridge in the UK.

Research

Tuesday, June 16, 2026, 1:30 PM - 5:00 PM

Session Chair: Brandon Chavel, PhD, PE

IBC 26-42: Testing and Evaluation of Extreme Weather and Environmental Impact on FRP Rebar Tensile Strength

Time: 1:30 PM

Amanda Bao, PhD, PE, Rochester Institute of Technology, Rochester, NY; James Warren, Rochester Institute of Technology, Rochester, NY; Giulio Rasi, Rochester Institute of Technology, Rochester, NY; Alex Shields, Rochester Institute of Technology, Rochester, NY; Chase Lisnerski, Rochester Institute of Technology, Rochester, NY

Fiber Reinforced Polymer (FRP) reinforcing bars have received growing applications in the bridge engineering and construction industry to replace conventional steel bars due to their excellent corrosion resistance, higher tensile strength and lighter weight. Glass Fiber Reinforced Polymer (GFRP) rebars have been used in bridge deck construction since 1996 in the US, and field data for GFRP rebars durability in real-world settings are still very limited. Inclement weather conditions, like severe cold and intense storms, have been increasing in frequency and intensity in recent decades. These weather events combined with chemical exposure, such as deicing agents, acidic and/or alkaline environments, negatively impact the structural integrity of bridges. In this study, tensile strengths of GFRP rebars are tested and evaluated for the temperature range from -35 Celsius (-31 Fahrenheit) to 22 Celsius (72 Fahrenheit), and chemical exposures in alkaline (bleach) solutions, acidic (vinegar) solutions, and various concentrations of salt solutions ranging from 1% to 25%. The results are compared with the tensile strengths of conventional steel rebars in the same conditions. This study advances the knowledge of understanding GFRP rebar behaviors in adverse weather and environmental conditions, and will facilitate further the GFRP rebar application and development in bridge engineering practices, especially in cold and coastal regions.

IBC 26-43: Structural Redundancy Analysis for Continuous Steel Two-Girder Bridges: Evaluation of Capacity and Failure Modes

Time: 2:00 PM

Cem Korkmaz, Purdue University, West Lafayette, IN; Robert Connor, Purdue University, West Lafayette, IN

This study presents structural redundancy evaluations of three two-girder steel bridge systems using finite element analysis to assess their capacity and behavior under fracture conditions. Following AASHTO SRM Guide Specifications, detailed three-dimensional FEA models were developed in ABAQUS to simulate member fractures at critical locations and evaluate bridge response under Redundancy I and II load combinations. The analysis includes two girder bridges using geometries typical of real bridge applications. Multiple fracture scenarios across different spans were evaluated to identify controlling limit states and failure modes. Results demonstrate that 2-girder systems may have redundancy challenges due to limited load sharing between intact and fractured girders This limitation results from low torsional stiffness and relatively flexible lateral bracing and floor beams, which severely restrict load redistribution. When one girder fractures, the remaining intact girder carry substantially increased loads, causing the fractured girder to behave as a cantilever beam. The controlling failure mode was identified as buckling at section changes near piers on fractured girders, with high displacement differences between intact and fractured girders. These behaviors may reduce reserve capacity below Redundancy I and II thresholds. Analysis revealed that the evaluated 2-girder bridges did not meet SRM qualification requirements due to inadequate load transfer mechanisms between the two main load-carrying members. This research provides bridge engineers with critical guidance on the need for careful evaluation when 2-girder systems are evaluated for redundancy performance.

IBC 26-44: A Dynamic-Analysis Workflow for Designing Bridge Piers to Resist Vessel Impact Loading

Time: 2:30 PM

Gary Consolazio, University of Florida, Gainesville, FL; Anand Patil, University of Florida, Gainesville, FL ; Henry Bollmann, University of Florida, Gainesville, FL,

Procedures that utilize static forces in structural analyses to design and/or assess bridge piers for vessel collision loading are well established and are documented in the AASHTO bridge design specifications. Alternative procedures, developed based on both experimental and analytical research findings, enable engineers to further incorporate time-varying dynamic effects into bridge design. The use of dynamic design procedures can lead to bridge structures that exhibit improved robustness in terms of vessel collision resistance. However, the manner in which commonly used static design procedures should be adapted to include dynamic effects is not necessarily obvious. This paper discusses practical software-based approaches that employ dynamic structural analysis to simulate dynamic vessel-pier interactions, extend existing static design procedures to include dynamic effects, and quantify the resulting structural responses. A dynamic workflow will be presented that includes simplifying assumptions that are useful in initiating dynamic design; efficient methods for computing dynamic impact loads and pier responses; quantifying demand-to-capacity ratios when working with time-varying dynamic loads and responses; and a framework for conducting an AASHTO Method II risk assessment based on dynamic analysis results.

IBC 26-45: Data-Driven Evaluation of Internal Redundancy in Built-Up Steel Girders

Time: 3:30 PM

Charles Kieffer III, Purdue University, West Lafayette, IN; Robert Connor, Purdue University, West Lafayette, IN ; Cem Korkmaz, Purdue University, West Lafayette, IN, ; Aurora Ebert, Purdue University, West Lafayette, IN,

The classification of main structural components of in-service bridges as Non-Redundant Steel Tension Members (NSTM), necessitates expensive, hands-on inspections at a regular interval. This project introduces a validated, data-driven approach to evaluate and reclassify the riveted built-up steel plate girders of two major Indiana DOT structures—the US 41 over White River Bridge and the I-74 over Wabash River Bridges—as Internally Redundant Members (IRM), thereby replacing NSTM inspections with special IRM inspections at less frequent intervals. The evaluation adhered to the AASHTO Guide Specifications for Internal Redundancy but went beyond standard analytical methods. The core innovation involved overcoming the limitations of conservative fatigue life estimates derived from typical AASHTOWare models and the AASHTO Fatigue Truck. To achieve a realistic remaining fatigue life, long-term stress monitoring was performed on the structures. The in-situ measured stress-range histograms were used to calculate the true effective stress ranges, which were then applied to scale the analytical moment ranges. This data-informed approach, coupled with an Excel Macro developed to efficiently interface with the NSBA IRM spreadsheet tool across hundreds of cross-sections, successfully justified the redundancy of the members. Specifically, nearly 94% of the girders on the US 41 Bridge and 79% on the I-74 Bridges were determined to be IRMs. The successful reclassification of these members provides bridge owners with a substantial reduction in inspection costs by allowing the maximum 10-year inspection interval, offering a rational, validated framework for the safety and service life extension of similar mechanically-fastened built-up steel bridges nationwide.

IBC 26-46: Evaluating future options for the Seal Island Bridge

Time: 4:00 PM

Dillon Betts, PhD, PE, P.Eng., ENV SP, COWI North America, Halifax, Nova Scotia Canada; Jorge Perez Armino, COWI, Halifax, Nova Scotia Canada; Aaron Ferguson, COWI, Halifax, Canada, Nova Scotia, Canada; Will Crocker, Nova Scotia Public Works, Halifax, Canada, Nova Scotia, Canada

The Seal Island Bridge is a steel through-arch truss bridge in Cape Breton Island, Nova Scotia, Canada with a main span of 152 m over navigable waters. At over 60 years in service, the bridge is near the end of its design life and showing structural and operational difficulties. Therefore, the owner (Nova Scotia Public Works) initiated an investigation on options for the future of the crossing including potential full bridge rehabilitations or full bridge replacements. As a part of this study, a series of detailed and focused bridge inspections, including structural health monitoring (SHM), were performed to inform a structural analysis of the full bridge. Based on the results of the both the site investigations and the structural analysis, a rehabilitation plan was developed to ensure that the bridge could remain in service for an additional 15 years.

A benefit-cost analysis was performed to determine a sustainable long-term path forward for the crossing. The benefit-cost analysis included the task of identifying feasible long-term full-scale rehabilitation options as well as full bridge replacement options and, subsequently, comparing the options to a set of evaluation categories, including cost, features, risks, opportunities, and social implications. Eleven options, three rehabilitation options and eight replacement options, were developed and assessed. The highest ranked long-term paths forward were to replace the existing structure with a cast-in-place concrete segmental bridge or a steel arch bridge.

IBC 26-47: Optimal Approach for Addressing Reinforcement Corrosion of Bridge Decks and Improved Service Life with High Strength Corrosion Resistant Reinforcement

Time: 4:30 PM

Hans Geber, CMC, ARODA, VA; Hans Geber, CMC, Irving, TX ; Maher Tadros, e.Construct, USA, LLC, Omaha, NE,

This paper addresses the design of bridge decks with various types of reinforcement. It is intended to show that cast-in-place decks can be cost effectively designed with corrosion resistant high strength reinforcement if current options in the AASHTO LRFD BDS are utilized. It will be shown that the analytical “strip” method can be an effective design method if the crack control criteria are revised to truly reflect the behavior of bridge decks, where the dominant cracking pattern is transverse to traffic. Thus, crack control equations should not be applied to the transverse reinforcement, implying longitudinal cracks. It will also be shown that the “Empirical Method” is a powerful tool with a strong track record for over 40 years, with more than two dozen states adopting it.

The results of this study show that it is possible to take advantage of high strength ASTM A1035 corrosion resistant steel despite its higher initial cost than ASTM A615 steel, if one considers life-cycle cost analysis. Using A615 Galvabars, with continuous machine galvanizing, per ASTM A1094, results in improvements over epoxy and hot-dip galvanized bars, but not the level of corrosion protection as A1035. Galvabars can be bent in the fabrication shop after galvanizing and even at the construction site.

Finally, adjustments to the Strip Method and to the Empirical Method are proposed to allow for wider use of these methods for high strength corrosion resistant steel, while still maintaining adequate serviceability, strength and achieving superior durability.

Bridge Rehabilitation 2

Tuesday, June 16, 2026, 1:30 PM - 5:00 PM

Session Chair: Rachel Stiffler

The Bridge rehab 2 session has several papers discussing the use of (UHPC, ultra-high-performance concrete. One from a research perspective and others showing projects using this type of concrete in a gusset plate repair along with using it as an overlay for Vermont DOT.
We also have discussions on a large rocker bearing replacement on a 12 ton truss bridge, along with the use of cathodic protection on the Theodore Roosevelt bridge restoration. There is also discussion of a truss reconstruction on Pier 98 of the large Pulaski skyway project.

IBC 26-48: Ultra-High-Performance Geopolymer Concrete for Bridge Applications: Advancing Sustainable Structural Performance

Time: 1:30 PM

Hafiz Abdul Basit, University of Louisiana at Lafayette, Lafayette, LA; Mohammad Jamal Khattak, PhD, University of Louisiana at Lafayette, Lafayette, LA ; Ashish Ghimire, University of Louisiana at Lafayette

Ultra-High-Performance Geopolymer Concrete (UHPGC) represents a new generation of cement-free binder technology that can significantly enhance structural performance and sustainability in bridge engineering. This research investigates the development and material characterization of a slag- and fly-ash-based UHPGC designed to meet and exceed the high mechanical and durability requirements of bridge structures and rehabilitation works. Experimental results demonstrate compressive strengths exceeding 120 MPa, which shows its potential as a structural material comparable to traditional Ultra-High-Performance Concrete (UHPC). The geopolymer matrix exhibits a dense microstructure with refined pore distribution, contributing to improved resistance to chloride ingress and long-term durability, which is essential for coastal and deicing salt exposure conditions. Building on its mechanical and durability advantages, the research identifies potential structural applications of UHPGC in accelerated bridge construction and lightweight rehabilitation components such as link slabs, deck overlays, and prefabricated structural elements. Additionally, the fully cement-free composition offers a marked reduction in embodied carbon, aligning with industry initiatives such as SE2050 toward low-carbon bridge infrastructure. Overall, the study highlights UHPGC as a high-performance, sustainable alternative material capable of extending service life, enhancing resilience, and promoting next-generation bridge construction and rehabilitation practices.

IBC 26-49: Engineering Solutions for Jacking a 1200 Ton Truss Bridge for a Rocker Bearing Replacement

Time: 2:00 PM

Shawn Throne, Modjeski and Masters, Mechanicsburg, PA; Mike Clauser, PE, Modjeski and Masters, Mechanicsburg, PA

Modjeski and Masters, Inc. provided engineering services to PennDOT District 1-0 to replace overextended rocker bearings on the SR 0059 Steel Deck Truss Bridge, an 1800 ft bridge that is a vital transportation link spanning the scenic Allegheny Reservoir in Warren County, PA. This presentation highlights the key design decisions and construction challenges involved in this complex rocker bearing replacement operation. The key topics include the issues leading to the decision to replace four of the existing rocker bearings, the design and unique detailing of new high-load multi-rotational (HLMR) bearings and the new custom steel bolsters and sole plates to integrate the new HLMR bearing connections to the existing truss. Additional topics include the evaluation of possible jacking options and associated load path challenges of each option, and the complex analysis and strengthening of the truss required for the recommended jacking scheme. The extensive concrete repairs which were required at the piers will also be mentioned. The session will conclude with construction highlights, photographs, lessons learned and practical takeaways applicable to similar rocker bearing replacement projects.

IBC 26-50: Field Implementation and Monitoring of UHPC Gusset Plate Repair

Time: 2:30 PM

Ryan Johns, EIT, University of Connecticut, Storrs Mansfield, CT; Alexandra Hain, PhD, PE, University of Connecticut, Storrs Mansfield, CT ; Sarira Motaref, PhD, PE, University of Connecticut, Storrs Mansfield, CT, ; Robert Lawler, University of Connecticut, Storrs, CT

Corrosion in steel bridges continues to be a leading cause of deterioration in today's infrastructure. To address this issue, the Connecticut Department of Transportation (CTDOT), in collaboration with the University of Connecticut (UConn) and CHA Consulting, has implemented a new repair method inspired by previous ultra-high performance concrete (UHPC) beam-end repair projects. This approach uses UHPC encasement with embedded shear studs to create an alternate load path that bypasses the corroded steel and restores capacity to the corroded regions.

The Commodore Isaac Hull Bridge, located in Connecticut, was issued an emergency declaration due to the significant deterioration of its gusset plates. This project represents the first field implementation of a UHPC repair method for gusset plate strengthening. Over sixty strain gauges were installed in multiple locations to record baseline and post-repair data under live traffic both before and after weight restrictions were lifted.

This presentation provides an overview of the successful field implementation of the repair, along with performance monitoring to empirically confirm activation of the repair method, and lessons learned throughout implementation. The findings from this application are expected to provide an additional repair option and contribute to the continued advancement of UHPC encasement as a durable, field-applicable solution for steel bridge rehabilitation.

IBC 26-51: Northern New England's First UHPC overlay

Time: 3:30 PM

Adam Stockin, PE, WSP USA, Merrimack, NH; Robert Young, Vermont Agency of Transportation, Barre, VT ; Timothy Polson, WSP USA , Merrimack, NH,

This Accelerated Bridge Construction (ABC) project consisted of the replacement of a 59' steel beam bridge perched on deep ledge cuts over the Green Mountain Railroad carrying Route 5 built in 1929.
To minimize impacts to the traveling public and the railroad, the bridge was replaced in 28 days. The proposed bridge consisted of cast in place subfootings with dowels into existing ledge and prefabricated substructure and superstructure units.
While UHPC overlays are typically utilized for deck rehabilitation projects, VTrans received an increase in the federal share to utilize this innovative technology for this replacement project. One of the project goals was to serve as a pilot project for VTrans to better understand specifying and constructing UHPC overlays to add this tool to the toolbox for future bridge rehabilitations. The specification was created for this project and included a mockup pour at the specified 7% profile grade prior to the overlay deck placement. Since this was the first placement of its kind in the region, this mockup built confidence for the owner and contractor for the ultimate placement. As another avenue to learn more about the material, VTrans required that the overlay be placed one half at a time to resemble the typical phased construction placement.
The project was successful in meeting the current needs of the community while providing future value for the use of this innovative technology which greatly increases the service life of bridges.

IBC 26-52: Theodore Roosevelt Bridge Case Study: Cathodic Protection for Service Life Extension

Time: 4:00 PM

Alex Ball, Vector Corrosion Technologies, Hoboken, NJ

The Theodore Roosevelt Bridge was built in 1960 as a necessary connection between Washington DC and the neighboring Arlington County, Virginia. The bridge carries 3 lanes of vehicular traffic in-bound towards Washington, DC as well as 3 lanes out-bound towards Arlington County.

The Theodore Roosevelt Bridge is considered a significant crossing due to its proximity to the National Mall, White House, and other significant National monuments while performing as a major connection point on the DC Evacuation Route and the National Highway System. The bridge has been maintained by District Department of Transportation (DDOT) since original construction with the last round of repairs performed in 2005.

Embedded Galvanic Cathodic Protection anodes were used in large repair areas at the DC abutment east rigid wall to address the risk of insipid anode formation between the new and old concrete interface. The anodes accomplished the stated project goal to extend the service life of the bridge by 20-30 years. This project presents a use case for mitigating corrosion risk in substructure re-use project.

IBC 26-53: Reconstruction of Pulaski Skyway Truss at Pier 98

Time: 4:30 PM

Gregory Ricks, HNTB, Parsippany, NJ; Parth Rana, HNTB, Parsippany, NJ ; Sean Healy, HNTB, Parsippany, NJ, ; Michael Timko, HNTB, Parsippany, NJ

On the historic 3.5 mile Pulaski Skyway viaduct, cracks formed in gusset plates, caused by leaking finger joints above and pack rust-inhibited bearings below. The cracks developed at the western end of the 94-year-old viaduct's truss spans, above Pier 98, which separates the western approach girder spans from the truss spans. Following repairs to stabilize the fractured gusset plates, HNTB developed a truss panel replacement and reconfiguration solution to restore the structure while reducing future thermal demands at the affected gusset plates.

The 104-foot girder span to the west of Pier 98 is supported on a bearing embedded within the truss vertical. The degraded rotational performance of this fixed bearing along with locked-up rollers at the expansion bearing on the opposite end of the girder span generated substantial bending demands in the truss vertical. The reconstruction approach prevents future thermal force accumulation across the span and includes the addition of new members that will limit potential for bending in the vertical. The new members instead resolve thermal forces developed along the girder span through a more truss-like (axial) load path. The replacement scheme was detailed to maintain the aesthetic of the existing NJDOT-owned truss structure, which holds historic significance to the State of New Jersey.

AI / Digital Delivery 2

Tuesday, June 16, 2026, 1:30 PM - 5:00 PM

Session Chair: Jon athan McHugh, PE

While once seen as a future efficiency or even a luxury, digital delivery and the use of Artificial Intelligence (AI) workflows have evolved into absolute necessities in the bridge engineering toolbox. While many owners and their consultants are working diligently to optimize and standardize these tools, our presenters have a wide range of experiences and case studies to share to help further the knowledge base in these fields and smooth the learning curve for the industry.

IBC 26-54: Digital Workflow for Complex Urban Infrastructure — Model-Based Design and Coordination

Time: 1:30 PM

Augustin Ceillier, Ramboll, Espoo, Finland; Sean LeCoultre, Ramboll, Espoo Finland; Mica Gavric, Ramboll, Drammen, Norway

The E18/E39 Gartnerløkka–Kolsdalen project in Kristiansand, Norway, involves the complete reconstruction of a complex urban interchange connecting two of Norway's main highways. With multiple bridges, retaining walls, and urban interfaces, the project demanded a new level of design coordination between disciplines and stakeholders.
Unlike conventional design processes driven by drawings, this project adopted a fully model-based workflow, where digital models became the single source of truth across design disciplines. Ramboll and Eiffage jointly developed a connected workflow combining Quadri, Rhino/Grasshopper, SOFiSTiK, and Tekla Structures — ensuring that geometry, design variables, and metadata remained consistent across all environments.
The integration of this digital ecosystem enabled automated generation of structural models, centralized data validation, and direct communication between design and site. While the project embraced high levels of automation, engineering judgment and constructability input from the contractor were key to defining when automation adds value and when manual control remains essential.
This presentation provides an overview of the digital workflow developed for one of Norway's most complex infrastructure corridors, emphasizing collaboration and communication between designer, contractorand client. It highlights how model-based coordination supports drawingless delivery, improved data reliability, and faster design iterations.

IBC 26-55: Beyond BIM: Digital Twins for 3D Digital Project Deliverables

Time: 2:00 PM

Alex Mabrich, Bentley Systems, Sunrise, FL

As the infrastructure industry is consolidating on the use of 3D models and applying the BIM methodology, the challenge is to build a comprehensive model of the entire project and not just its individual parts: roadways, bridges, drainage, geotechnical and vertical structures. These different disciplines use specific software solutions and file formats to accomplish the tasks at hand. However, to combine them into a single model for design reviews, construction, operation, and maintenance is not an easy endeavor.
The purpose of this paper is to show how a digital twin can be generated using different file formats created by different applications, while retaining the intelligence of the 3D model. Then, this digital twin or iTwin can be used in a collaborative environment for design reviews, conflict detection, construction planning, operations, and asset management.

IBC 26-56: Vessel Collision Warning System for Vulnerable Bridges - Case Studies

Time: 2:30 PM

Scott Snelling, Roebling Labs LLC, Cambridge, MA; Josh Burnett, Roebling Labs LLC, Cambridge, MA

Digital twins are transforming how bridge owners manage infrastructure by integrating disparate data sources into unified platforms that inform maintenance and rehabilitation decisions. This presentation demonstrates how computer vision structural monitoring represents an ideal sensor technology for digital twin integration, providing continuous structural health data.
Digital twins create virtual representations assets, consolidating inspection reports, design documents, load ratings, and sensor data into accessible formats for bridge managers. This integration enables data-driven decision-making and proactive maintenance planning. The challenge has been acquiring continuous structural performance data cost-effectively across bridge portfolios.
Computer vision monitoring addresses this gap by measuring deflections and vibrations to 0.001-inch precision using shore-based video sensors. Bridge managers install "virtual sensors" at any visible location on their digital model without physical sensors on the structure. The system detects overloaded vehicles, excessive environmental loads, and beyond-threshold structural deflections or cracks, automatically generating alerts with video documentation of incidents.
Case studies from multiple bridge types demonstrate practical implementation: Lowell Road over the Concord River, Robert Street Bridge, I-35W Bridge over the Mississippi River, Hennepin Avenue Bridge over the Mississippi River, and Rachel Carson Bridge. These projects illustrate deployment strategies, measurement capabilities, and integration with asset management workflows.
By combining digital twin platforms with computer vision monitoring, bridge managers gain visibility into structural behavior during the 99.9% of days when inspectors are not onsite. This enables early detection of damage and overloading, reducing lifecycle costs and increasing public safety through timely intervention before minor issues escalate into costly failures.

IBC 26-57: Data-Driven Evaluation for Safe Passage of Permit Vehicles on District of Columbia Bridges

Time: 3:30 PM

Dena Khatami, EXP US Services Inc., Fairfax, VA; Jim Zhao, EXP US Services Inc., Fairfax, VA ; Steve Mackey, EXP US Services Inc., Fairfax, VA, ; Laura MacNeil, District Department of Transportation, Washington DC, ; Hongting Zhao, District Department of Transportation, Washington, DC,

Ensuring the safe passage of commercial vehicles across urban bridges is a dynamic challenge to modern infrastructure management in the District of Columbia. The District Department of Transportation (DDOT) meets this challenge with a robust, data-driven evaluation process for permit applications, designed to deliver results at impressive speed, often within hours. Each permit initiates a systematic journey: engineers map the truck's route, identifying every bridge to be crossed, whether just a few or as many as thirty. DDOT has retained EXP US Services Inc. to assist them in conducting this service.
The evaluation begins with a careful review of the truck's specifications, including axle count, weights, and spacings, with special attention given to unusually large vehicles. DDOT benchmarks each permit truck against a suite of standard vehicles: design trucks, legal vehicles, emergency responders, and previous permit trucks. For every bridge, engineers consult load rating data, leveraging both comprehensive inventories and real-time communications with DDOT administrators to fill any gaps. If a truck's weight fits comfortably within safe limits, approval is swift. When a bridge's capacity is in question, advanced modeling tools rapidly simulate the bridge's response to the proposed load, comparing stress and deformation envelopes across multiple vehicle types.
This process is more than a technical exercise; it's a collaborative effort blending engineering rigor and data-driven decision-making. The result is a permit system that not only protects critical infrastructure but also supports the flow of commerce and emergency services throughout the city, all delivered with remarkable efficiency.

IBC 26-58: Survival Analysis Framework for Remaining Fatigue Life Estimation in Steel Bridges

Time: 4:00 PM

Farhad Farajiani, University of Wisconsin-Milwaukee, Milwaukee, WI; Habib Tabatabai, Ph.D., University of Wisconsin-Milwaukee, Milwaukee, WI

Conventional fatigue design and evaluation methods utilize AASHTO S-N curves that are intended to represent a 2.5% probability of failure. When assessing remaining fatigue life, the analysts typically consider the AASHTO S-N curve as a static line that remains unchanged as a structure experiences stress cycles over time. In fact, the conditional probability theory requires a dynamic view of the S-N curve to achieve the intended probability of failure (2.5%) as the previously applied stress cycles accumulate without failure. This study proposes a probabilistic framework for evaluating fatigue in steel bridges based on survival and conditional survival analyses that can address this issue. Survival analysis treats fatigue life as a cycles-to-failure parameter, allowing for the development of models that include covariates such as stress range and fatigue detail category. Conditional survival analysis expands this approach by updating the probability of survival as the structure ages without failure, allowing for more realistic estimates of remaining fatigue life even under variable-amplitude and sequence-dependent loading. The application of conditional survival analysis in estimating the remaining fatigue life of steel bridges for various AASHTO fatigue design categories is investigated. The results demonstrate that conditional survival analysis has a significant impact on the estimation of remaining fatigue life of steel bridges.

IBC 26-59: AI-Based Structural Optimisation of a Multi-Modal Swing Bridge

Time: 4:30 PM

Benjamin Brunn, Ramboll, Hamburg, Germany; Martin N. Svendsen, Ramboll, Copenhagen Denmark; Cassiele Birck de Menezes, Ramboll, Hamburg, Germany; Evangelos Ilias, Ramboll, London, United Kingdom; Steve Thompson, Ramboll, Southampton, United Kingdom

In April 2021, the top chord of Bremerhaven Port’s historic swing bridge (constructed circa 1930) failed during operation, leading to a structural collapse that rendered the bridge unserviceable. To restore navigational access for shipping, the damaged bridge was demolished, creating a critical disconnection between the Port and its northern rail and road links. The replacement structure therefore needed to address both the loss of transport connectivity and modern navigational requirements.

The new swing bridge is designed to span a widened 70-metre navigation channel and provide a two-lane roadway, an integrated railway line, and a shared-use path for pedestrians and cyclists. The selection of bridge form and geometry was guided by stringent site constraints, harbour authority requirements, and operational demands.

Following the development of the initial concept and primary truss configuration, an AI-driven structural optimisation framework was implemented tc refine the key structural elements. The optimisation targeted the reduction of total steel mass by adjusting member sizes and plate thicknesses while maintaining structural integrity. The resulting weight reduction influenced the dynamic balance during swing operations, requiring subsequent adjustment of the counterweight to maintain operational equilibrium.

The paper presents the design development process and demonstrates how AI-based optimisation contributed to a more efficient, cost-effective, and sustainable bridge solution within the complex technical and operational context of a working port.

Construction 2

Tuesday, June 16, 2026, 1:30 PM - 5:00 PM

Session Chair: Tyson Hicks, PMP, DBIA

IBC 26-60: Gordie Howe International Bridge - Long Reach Tower Crane Ties

Time: 1:30 PM

Andrew Ritter, PE, GZA GeoEnvironmental, Inc.,d/b/a Siefert Associates, Watertown, CT; Julia McNamara, PE, GZA GeoEnvironmental, Inc., d/b/a Siefert Associates, Watertown, CT

The construction of the new Gordie Howe International Bridge (GHIB) is nearing completion. It has a clear span of 853 meters (0.53 miles) over the Detroit River, connecting Detroit, MI and Windsor, ON. In order to accomplish this impressive feat, the two bridge towers, aka pylons, rise over 219 meters (719 feet) above grade. These dimensions set the GHIB at the top of North America’s list of longest and tallest cable-stayed bridges. Similar to many bridge projects of this type, a tower crane serviced the construction of each nearly identical pylon. For various reasons on site, neither tower crane could be positioned with close proximity to the pylon. Here lies the temporary works challenge: how do we brace a tower crane to a pylon that is roughly 9 – 27 meters (30 – 90 feet) away, and achieve the required strength and stiffness? The tower crane manufacturer prescribed five levels of bracing with extreme stiffness criteria. Siefert Associates developed two distinct custom bracing systems that included a combination of individual axial force members, truss elements, force transfer beams, and robust connections with adjustability all around. This technical paper will tell the story of the design evolution, highly customized solutions, and successful results.

IBC 26-61: Construction Equipment on Bridges

Time: 2:00 PM

Ian Ebersole, PE, SE, Michels Corporation, Montgomery, IL; Josh Crain, Genesis Structures, Kansas City, MO; Nikk Edgemond, Genesis Structures, Kansas City, MO

Taking down (or rehabilitating) a big bridge often requires big tools. Evaluating heavy construction equipment on a bridge builds on standard engineering methods, but carries unique considerations depending on the specific machine and bridge configuration. Published references are rare, often requiring significant use of engineering judgement, and close coordination between the contractor, engineer, and owner to find appropriate and effective solutions.

Foothills Bridge Co and Genesis Structures have set the standard for bridge demolition engineering in North America over the past 20 years. Together, they have completed hundreds of projects, many of which included evaluating the use of heavy, oversized, or downright unconventional pieces of construction equipment operating on bridges.

This presentation will discuss a handful of the common challenges that arise in these scenarios, key points to discuss with your project teams, and highlight some of the solutions which have led to successful projects.

IBC 26-62: Continuous Curved Girder Highway Bridge Erection

Time: 2:30 PM

Robert Cisneros, PE & PLS, High Steel Structures, LLC, Lancaster, PA; Michael DiArcangelo, PE, High Steel Structures, LLC, Lancaster, PA ; Hayden Calaman, HIgh Steel Structures, LLC, Lancaster, PA,

The paper will walk the reader through construction engineering of horizontally curved multi-girder bridges performed in accordance with the AASHTO LRFD Bridge Design Specifications, with rigging analyses following the AISC LRFD/ASD Design Methods. Several two, three and four span mulit-girder bridge projects will be high-lighted in the 130 ft to 300 ft span range. LRFD construction stability analyses, crane placements, rigging methods, erection sequence and falsework loading will be discussed. Example vertical & horizontal geometric control for falsework tower placements will be reviewed, including girder setting elevations, cross frame erected position (no-load vs steel dead load fit), and lateral/longitudinal temporary tower supports. Methods of controlling temporary uplift as bridge erection progresses also be discussed. Some discussion of the various means & methods of fabricating and erecting curved girders will be presented as well.

IBC 26-63: IL 59 Ped Bridge and Precast Boardwalk

Time: 3:30 PM

Matthew Santeford, GFT, Schaumburg, IL; Cody Gastel, PE, GFT, Schaumburg, IL

The IL 59 Bridge and Trail Improvements project in Streamwood, IL is a major step in achieving the Village's vision from their 2018 Comprehensive Plan of providing connectivity and an improved balance between various modes of transportation. The project provides a new multi-use path crossing over a busy state route that was constructed thru a large wetland area. Innovative design elements include a 2,095' long bridge to limit impacts to the wetland, consisting of five pedestrian truss spans and 74 spans of precast concrete boardwalk. Extensive outreach with stakeholders was completed to determine the optimal path alignment, aesthetic treatments and amenities for this new facility. Coordination with IDOT for impacts to the state route was critical to approval of the project. Construction challenges included improving the wetland surface for heavy equipment and pile driving in varying soil conditions. The Village was able to utilize multiple funding sources including ITEP, STP Shared Fund and INVEST in Cook for construction. This presentation demonstrates how this project was progressed from feasibility studies to final design and thru construction, and how improvement will provide the opportunity to advance the future plans for multi-use paths along the corridor.

IBC 26-64: Restoring Connections: The Bancroft Pedestrian Bridge Replacement After Hurricane Ida

Time: 4:00 PM

Barry Benton, PE, GPI, Milford, DE

The Bancroft Pedestrian Bridge Alternatives Study and Replacement project demonstrates innovative engineering in the face of disaster recovery, historic preservation, and environmental sensitivity. After Hurricane Ida severely damaged the only pedestrian connection across Brandywine Creek in Wilmington, Delaware, GPI led a feasibility study, design, and construction effort to restore this vital link. The team employed terrestrial LiDAR scanning, drone technology, and hydrographic surveys to create a 3D digital model, enabling precise documentation and informed community engagement. Three alternatives were evaluated against criteria including resiliency, cost, constructability, aesthetics, functionality, and schedule. The selected solution—a prefabricated weathering steel truss bridge—was installed using cranes in a single day, minimizing disruption to park users and wildlife. The design elevated the bridge above the FEMA 500-year flood level, eliminated in-stream piers, and incorporated accessibility and sustainability features. Extensive coordination with stakeholders ensured the preservation of historic character and protection of sensitive habitats. The project sets a precedent for integrating rapid disaster response, advanced technology, and stakeholder-driven design in pedestrian infrastructure. The restored bridge reconnects neighborhoods and park trails, enhancing community life and resilience. This case study offers valuable lessons for future projects balancing technical, environmental, and social complexities.

IBC 26-65: Brockport Bicentennial Bridge

Time: 4:30 PM

Lana Potapova, Arup, New York, NY; Jungmin Hou, New York Power Authority, White Plains, NY; Matt Carter, Arup, New York, NY; Ayed Yamin, Arup, New York, NY; Clint Miller, Shop Architecture, New York, NY

Brockport Bicentennial Bridge is a 600ft long 90ft clear spanning pedestrian bridge over the
Erie Canal that connects SUNY Brockport campus to the Empire State Trail. Constructed adjacent to an existing Erie Canal guard gate, the bridge aims to transform the historic waterway to grow tourism and spur economic activity in the area for decades to come. Parametric BIM approach in collaboration with SHoP Architects was employed to design the main bridge and surrounding site.

The bridge's unique superstructure features a steel waffle slab carrying a timber deck. Geometry and erection control/progressive fit up was critical to bridge success for the 11-span continuous curved haunched steel box girders. Advanced global analysis, including footfall and use of tuned mass dampers were essential to realizing the design. Designing the bridge to be erected, operated, and maintained with minimal disruption to canal operations while honoring the legacy of the historic guard gate structures is central to the project. Arup is the Engineer of Record and Prime Consultant.

Bridge Design 2

Tuesday, June 16, 2026, 2:00 PM - 5:00 PM

Session Chair: Rich Schoedel, PE

IBC 26-67: Curved steel girders with Integral Post-Tensioned Concrete Cross-Girder

Time: 1:30 PM

Robin Dominic, CDM Smith Inc., Pittsburgh, PA; Tyler Kerstetter, PE, CDM Smith Inc., Harrisburg, PA ; Hasan Alqennah

This paper details the construction of a 5-Span curved steel plate girder, integral post-tensioned concrete cross-girder, and an 8-foot-diameter technique drilled shaft using O-cel testing. A 100-foot-long temporary bridge was constructed over Tacony street to temporarily support the girders and formwork for the post-tensioned CIP concrete cross girder. The construction sequencing of the girders and cross-girder will be presented demonstrating the complexity of the construction. A comparison between design and construction of the items that are essential to the integrity of the system including the concrete cap reinforcing, the steel diaphragm connections, the post-tensioning sequencing, and the grouting procedure will be presented in detail. The temporary bridge served as temporary pier to support the steel girders from both sides until the integral post tensioned concrete cross-girder is fully constructed. An 8-foot-diameter technique drilled shaft using O-cel testing was utilized to verify the assumed rock strength with the actual rock failure. The production drilled shaft rock socket lengths were adjusted as needed based on the O-cel testing results. The concrete deck will be poured fall 2025 and the southbound structure will be open to traffic in April 2026. The presentation will include construction photos, videos, and drone shots. The southbound structure will be in service prior to the presentation.

IBC 26-68: Design and Construction of I-80 Bridge over Nescopeck Creek - Major Bridge Replacement Project

Time: 2:00 PM

Reshmi Lal, PE, PMP, Michael Baker International, Harrisburg, PA; James Pease, P.E., Wagman Heavy Civil, York, PA

The I-80 Nescopeck Creek bridge replacement project is one of the six major interstate bridges being completed under PennDOT's progressive major bridge public private partnership (P3) program. Bridging Pennsylvania Constructors teamed up with Michael Baker International (Design lead) and Wagman Heavy Civil, Inc (construction contractor) for design and construction of this $72 million project.

The project includes design and construction of four span continuous composite prestressed concrete PA bulb tee dual structures carrying both eastbound and westbound traffic that spans Nescopeck Creek in Black Creek Township, Luzerne County, PA. Each structure is 520 feet long with two central spans of 143 feet and end span of 116 feet each. Multi column bent piers with solid shafts on micropiles are proposed as the substructure. The bridge will be constructed in four phases, utilizing stage construction with over-widened shoulders on the eastbound bridge to maintain two lanes of traffic in both directions during and after construction. The project will replace and widen the bridges to provide wider shoulders that will meet current safety standards while facilitating future maintenance activities on the bridge. The widened portion of East Bound bridge (Phase 1) is complete, and overall project is scheduled to be completed by November 2027.

This presentation focuses on the design and construction of the bridge including lowering of the adjacent SR 3016 (Tank Road), highlighting the challenges, constraints and the innovative solutions implemented during the design and construction process.

IBC 26-69: Sliding a New Interstate Bridge: Design of the Commercial Street Bridge

Time: 2:30 PM

Nicholas Burdette, PE, HDR, Pittsburgh, PA; Mike Szurley, Pennsylvania DOT, Bridgeville, PA

The I-376 Commercial Street Bridge in Pittsburgh, PA, carries 100,000 vehicles daily, providing access to the city from the east. Frequent maintenance to keep up with increasing deterioration of the 75-year-old structure has become costly, and the Pennsylvania Department of Transportation is replacing the bridge. Following completion of a Historic Bridge Rehabilitation Analysis, alternative analysis for the bridge replacement included two possible construction schemes and six structure types. Ultimately, replacement of the bridge on alignment using Accelerated Bridge Construction (ABC) techniques was selected. The Arched Steel Delta Frame replacement structure is being constructed adjacent to the existing bridge, and will be slid into place following explosive demolition of the existing bridge. This presentation will include the unique bridge design process, construction concept development, and showcase construction progress to complete the bridge on temporary foundations in preparation for a July 2026 planned slide-in and opening to traffic.

IBC 26-70: Design of the New Iowa 9 Mississippi River Truss Bridge at Lansing

Time: 3:30 PM

Greg Hasbrouck, PE, Parsons, Lake Bluff, IL

The IA 9 Black Hawk Bridge is a cantilever through truss bridge with a 650 ft main span that crosses the Mississippi River at Lansing, Iowa to Crawford County, Wisconsin. The current bridge is approaching the end of its useful life with the new replacement bridge currently under construction. The new design consists of a cantilever through truss bridge to replicate the historic nature of the existing bridge but including much wider 40 ft roadway and a longer 778 ft main span to increase mobility at the site.

It's rather uncommon for a new long-span truss to be the type selected for a new replacement bridge due to the common redundancy and maintenance concerns. The presentation will discuss the preliminary truss layout and type selection including unique continuity design approach for the unequal span layout as well as constructability, durability, and detailed redundancy concepts for the new truss design. The unique continuity design approach dictated by the short side span on the Iowa approach and the increased main span length that balanced considerations for uplift, constructability, and redundancy. Constructability was evaluated to provide multiple options for truss erection for the contractor and reduce risk. Truss member and connection detailing as well as deck rebar selection and truss coatings were developed with long term durability and maintenance in mind. Finally, the latest in steel bridge redundancy was incorporated to effectively use both internally redundant member and system redundant member design to provide a fully redundant long span truss design.

IBC 26-71: The Buck O'Neil Bridge – Spanning the Missouri River with Kansas City's Newest Urban Interchange

Time: 4:00 PM

Michael Briggs, PE, SE, HNTB, Kansas City, MO; Allie Wagner, HNTB, Overland Park, KS

The Buck O'Neil Memorial Bridge project renewed and expanded a vital corridor in downtown Kansas City by replacing the aging triple-tied arch carrying US 169 over the Missouri River with pair of elevated viaducts including deep steel plate girders spanning over 450 feet to clear the navigation channel. The project also created direct system-to-system connectivity between I-35 and US 169, alleviating decades of congestion and delays that have resulted from highway traffic being forced onto the local system. Additional bridges replaced with the project include direct-connector ramps carrying I-35 and I-70 around the downtown loop, while other improvements streamlined the local streets adjacent to Kansas City's River Market Historical District and Charles B. Wheeler Downtown Airport. Pedestrian and bicycle facilities were also added to the river crossing, overcoming long-standing barriers to the community while simultaneously improving safety.

The Buck O'Neil bridges span a navigable river, two federal levees with floodwalls, multiple Class 1 railroads and stayed below the FAA flight envelope, all while squeezed into the available right-of-way while managing significant utility conflicts. Achieving the project goals within the congested footprint required innovative and economical solutions that balanced conflicting requirements from the numerous project stakeholders and regulatory agencies. Fully opened to traffic in January 2025, the project constructed over 360,000 square feet of bridge deck, nearly two miles in combined length, and used more than 18 million pounds of structural steel in its superstructures.

Historic Bridge Rehabilitation

Wednesday, June 17, 2026, 8:00 AM - 10:00 AM

Session Chair: Mike Cuddy, PE

IBC 26-72: Rehabilitation of the Historic Simon Kenton Memorial Bridge

Time: 8:00 AM

Joshua Pudleiner, AECOM, Philadelphia, PA; Joseph Whelan, AECOM, Louisville, KY ; Nick Kirn, AECOM, Philadelphia, PA, ; Ashley Graves, Kentucky Transporation Cabinet, Glasgow, KY, ; Benjamin Reeve, Structural Technologies / VSL, Fort Worth, TX,

The Simon Kenton Memorial Bridge, constructed in 1931 is a suspension bridge with a main span of 1,060 ft. that spans the Ohio River and a historic landmark to both adjoining towns of Maysville, Kentucky and Aberdeen, Ohio. The bridge is owned and operated by the Kentucky Transportation Cabinet (KYTC).

In 2003 a major rehabilitation involving steel repairs, and a deck replacement was carried out, followed by wind lock and tower pin and link replacements in 2005. After critical suspender cable deterioration was noted in 2019, the bridge was temporarily closed and retrofitted, reopening in 2020. The Simon Kenton Bridge, now at the age of 95 years old, will require further rehabilitation and preservation strategies including full suspender rope replacement, cable band bolt replacement, handrope and stanchion post replacement, anchorage dehumidification, and miscellaneous steel and deck joint repairs.

As part of this project an internal main cable inspection was carried out along with a strength evaluation of the main cable. This inspection will serve as an initial benchmark of the cables' condition.

The project, which started in the Spring of 2023, is anticipated to complete construction in 2027. The paper will present the project work including best practices to guide bridge owners who are considering the suspender rope replacement and connection detail modifications, as well as rehabilitation and improvements to suspension bridge elements.

IBC 26-73: Mitigation of Reinforcement Corrosion in a Historic Arch Bridge

Time: 8:30 AM

Jeremy Smith, VCS Engineering, Inc., Tampa, FL; Natallia Shanahan, VCS Engineering, Inc., Tampa, FL

Bridge 603 is a historic bridge on the island of Oahu in the town of Haleiwa, Hawaii, that carries Kamehameha Highway across the mouth of the Anahulu Stream as it flows into Waialua Bay. This bridge was constructed in 1921, has two spans and is comprised of reinforced concrete twin arches with hangers that are encased in concrete. The bridge had undergone several rounds of patch repairs and was showing signs of concrete and steel deterioration, such as cracking, spalling and corrosion. The City and County of Honolulu, the bridge owner, wanted to include a cathodic protection (CP) system in the rehabilitation effort to improve the durability of the bridge. To understand the extent of active corrosion and collect data necessary for corrosion mitigation design, VCS performed a corrosion evaluation of the bridge which confirmed that chloride-induced corrosion was the primary cause of concrete deterioration.

Consequently, two types of Cathodic Protection systems were designed to mitigate reinforcement corrosion. Galvanic anodes were installed in patch repairs to mitigate the ring anode effect and ensure a durable concrete repair, and two-stage anodes were installed in areas of concrete that were actively corroding but the concrete had not yet delaminated. The innovative two-stage anodes deliver an initial charge to the reinforcement similar to an ICCP system to polarize the steel (Stage 1), after which they provide a maintenance amount of galvanic current sufficient to prevent corrosion (Stage2).

IBC 26-74: Rehabilitation of the Historic English Center Bridge

Time: 9:00 AM

Frank Artmont, PhD, PE, Modjeski and Masters, Inc., Mechanicsburg, PA

The English Center Bridge, carrying State Route 4001 across Little Pine Creek in English Center, PA is a distinct example of a wrought iron eyebar chain suspension bridge with stiffening diagonal members. Originally built in 1891 and placed on the National Register of Historic Places in 1978, the bridge was in a poor state and was posted for reduced loads. In collaboration with the Pennsylvania Department of Transportation, Modjeski and Masters developed a feasibility report and rehabilitation plans for the bridge that adhered to sound bridge engineering practice and historical guidelines. The project required the rehabilitated structure to be disassembled, rehabilitated, and reassembled on the same alignment, while also being updated to support the heaviest emergency vehicle in the region. This new design load was nearly four times heavier than the original design load. The bridge components were completely disassembled, and all components were inspected and documented. All components were either rehabilitated or replaced with modern equivalents to preserve the bridge's original appearance. Tension control bolts with button heads were used to replicate the look of the original rivets. This presentation will highlight key challenges and solutions during all phases of the project but will focus primarily on final design and construction.

IBC 26-75: The Rehabilitation of the Dunlap Creek Bridge: America's First Cast Iron Bridge

Time: 9:30 AM

Andrew Baumberger, GFT, Pittsburgh, PA

Brownsville, in southwest PA, historically served as a major transportation, industrial and marketplace hub. Unbeknownst to pedestrians or motorists traveling through there, or through the greater Pittsburgh area, the Dunlap Creek Bridge remains a hidden national gem. The bridge, completed in 1839, was the first all cast-iron bridge built in America.

Designed by Richard Delafield of the Army Corps of Engineers, "The Cast Iron Bridge", as it is nicknamed, spans 80 feet using five rows of hollow elliptical tubular arched castings. A total of 250 castings, including 45 tube sections, were required to construct the entire bridge, which is supported by decorative masonry stone supports.

Over nearly 200 years, the bridge's condition had deteriorated, and the original historic appearance stood obscured from view due to various rehabilitations. PennDOT District 12, along with the Pennsylvania State Historic Preservation Office, took the opportunity to restore the prominence of this structure and provide it with a true sense of place that it deserves.
To perform the rehabilitation, the structure was carefully disassembled, allowing each cast iron component to be blasted, cleaned, repaired, and painted in controlled environments. The unique design and construction style resulted in an intricate disassembly process. The existing sidewalks and their support components, added in the 1950s, have been removed, returning this historic gem to its original fashion. For the first time in nearly 75 years, pedestrians are able to view this masterpiece with the addition of a separate pedestrian bridge, which doubles as an observation platform.

Complex Design

Wednesday, June 17, 2026, 10:30 AM - 11:30 AM

Session Chair: Mike Cuddy, PE

IBC 26-76: Replacement of the Central Avenue Bridge over the Garden State Parkway

Time: 10:30 AM

William Farrow III, PE, GPI, Bridgewater, NJ

The Garden State Parkway (Parkway) Interchange 145, located within the City of East Orange, Essex County, New Jersey, is a major urban interchange connecting two heavily traveled roadways (the Garden State Parkway and Interstate 280) and East Orange's local road network. The interchange experiences traffic congestion due to its substandard roadway features, which, combined with a large traffic volume, result in crashes, lengthy queues, and poor levels of service. A major impediment to enhancing the interchange is the existing two-span bridge carrying Central Avenue over the Parkway. The central focus of this project is the replacement of the Central Avenue Bridge with a longer single-span structure. The Central Avenue Bridge is abutted by intersections at both approaches and carries several utilities. In addition, several utilities were supported on the structure, with a large underground gas main located adjacent and parallel to the structure, which required accommodation by the improvements. Due to the heavy vehicular traffic and the site constraints, a detailed maintenance and protection of the traffic sequence had to be developed to accommodate the needs of all stakeholders.

IBC 26-77: The Brent Spence Companion Bridge - Creation of an Innovative Gateway

Time: 11:00 AM

AJ Cardini, PE, SE, AECOM, Boston, MA; Kyle McLemore, AECOM, Tampa, FL; Barry Chung, AECOM, Tampa, FL

A primary goal of the Brent Spence Bridge Corridor Project is to build a better regional network for I-75/71 through Cincinnati, Ohio, and Covington, Kentucky. A new double-decked bridge called the Brent Spence Companion Bridge (BSCB) will be built alongside the existing Brent Spence Bridge over the Ohio River to carry interstate traffic. Lead designer AECOM with contractor partner Walsh/Kokosing began work on this Progressive Design-Build project in 2023 under the direction of the Bi-State Management team (BSMT).

The BSCB will be a first-of-its-kind cable-stayed structure. While double-decked cable-stayed bridges have been built throughout the world, typically they rely on a truss where the lower chord supports the lower roadway and the upper chord supports the upper roadway, with stay-cables supporting the truss. The proposed BSCB is unique in that each level is supported by its own set of independent stay-cables. This eliminates the complex fabrication of a truss and allows the bridge superstructure to be constructed using only I-girder sections.

This presentation will discuss the design and engineering aspects of this unique structure. The design of the foundations, pylon towers, and pylon anchor boxes supporting two independent decks will be described along with the transition piers to the approach structures. The engineering of the superstructure will also be covered, including the design of the anchorages and floor system. An overview of the wind studies and hydraulics will be given. Finally, analytical work including the primary steel member redundancy analyses and construction sequence will be described.

Bridge Design 3

Wednesday, June 17, 2026, 8:00 AM - 10:00 AM

Session Chair: Matt Bunner, PE

This session presents four case studies highlighting advanced analysis, innovative design, and constructability-focused solutions. Topics range from system-level modeling of complex curved girder bridges and a major tied-arch river crossing to selection of segmental balanced cantilever systems for constrained sites and specialized aircraft bridge design for extreme loading. Together, the papers emphasize adapting bridge structures to challenging loads, sites, and future needs through integrated analysis and collaborative design.

IBC 26-79: The Bellefonte Interchange: Design of Three Horizontally Curved-Girder Bridges

Time: 8:00 AM

Nicholas Haraczy, PE, SAI Consulting Engineers, Inc., Pittsburgh, PA; Jason DeFlitch, P.E., SAI Consulting Engineers, Inc., Pittsburgh, PA; Ahmad Ahmadi, Ph.D., SAI Consulting Engineers, Inc., Pittsburgh, PA; Brenden Good, PE, SAI Consulting Engineers, Inc., Harrisburg, PA; Mikalya Albert, PE, SAI Consulting Engineers, Inc., Harrisburg, PA

The Bellefonte Interchange in Centre County, PA is a high-speed interchange project connecting Interstate 99 and Interstate 80 to eliminate the need to use SR 26 and stop-controlled intersections to access either highway. The interchange was a conventional bid build project, but the three horizontally curved girder structures in the project were design build. The three continuous multi-span curved steel plate girder bridges have structure lengths between 733'-0" to 1018'-0" with spans ranging from 138'-8" to 225'-0". Pier 4 of Bridge 7B is a 104'-0" long steel box girder spanning over I-80.

The single column hammerhead piers are founded on spread footings keyed into rock or on piles while the Bridge 7B Pier 4 steel box girder is supported by two independent columns. Abutments are supported on piles through high embankment fills. A multi-fixed pier system is utilized to more evenly distribute horizontal loading. P-delta system analysis, accounting for varied pier stiffness, is considered in lieu of tributary load distribution or the AASHTO simplified amplification method for the loading and design of the pier columns. The hammerhead caps require strut and tie analysis.

Challenges discussed in this presentation include project specifications requiring footing design for vehicular crash loads, eccentric loading during phased redecking, and substructure system analysis. Local geology includes Karst rock requiring design consideration and acid producing rock. Coordination with the Contractor and Owner throughout the project informed design decisions and grouping details among the bridges for construction efficiency.

IBC 26-80: Design and Construction of the new Wellsburg Network Tied Arch Bridge over the Ohio River

Time: 8:30 AM

Preston Vineyard, COWI, New York, NY

The Wellsburg Bridge project completes a new bridge crossing over the Ohio River to connect the cities of Wellsburg and Brilliant. The new bridge provides a key and reliable transportation link for northern West Virginia and eastern Ohio communities that will help foster economic growth for the region.

The slender and elegant steel network tied arch bridge has a span of 830ft, which is one the longest span tied arch bridges in the country. An arch bridge of this scale and type has numerous complexities, including bridge aerodynamic behavior, wind loading and designing with adequate system redundancy to avoid fracture critical members in the structure. The tied chords and end floor beams have been designed and detailed using system redundant details and are not considered fracture critical. The arch knuckle region is likely the most complex region on the structure. This region required significant design effort, including detailed 3D FEM modeling to evaluate the stress flow in the members.

As part of the alternative delivery method aimed at minimizing disturbances to river traffic, the arch span was constructed entirely offsite before being positioned on enormous barges that carried it 1 mile down the Ohio River to its permanent site for installation. After arriving at the piers, the 4,100-ton main span structure was lifted off the barges and placed on the approach girders 80 feet above the Ohio River.

This paper discusses the design, detailing and construction challenges of this long span network tied arch.

IBC 26-81: Opportunities for long span bridge replacements using concrete segmental.

Time: 9:00 AM

Gregg Freeby, PE, American Segmental Bridge Institute, Austin, TX

The 2025 National Bridge Inspection (NBI) data indicates that within the United States there are over 350 bridges in poor condition with main spans between 200 and 500 feet. It is highly likely that many of these bridges will require full replacement in the near future. Many of these bridges cross waterways presenting unique challenges to designers and contractors when executing a replacement. This presentation will use example projects to illustrate the unique advantages concrete segmental construction can provide for these types of projects where the site is constrained due to limited access to the lower waterway. These examples will include the previously constructed Wekiva Parkway project over the environmentally sensitive Wekiva River north of Orlando, Florida, the Marc Basnight Bridge in North Carolina, and the Lessner Bridge over the Lynn Haven Inlet, Virginia Beach, VA. These projects are examples of balanced cantilever construction using segments that are cast-in-place or precast. The presentation will cover the advantages and limitations for each type providing attendees with greater understanding of when concrete segmental makes a practical structure alternative and when cast-in-place might be a better option over precast. General information on the design and construction of these types of bridges will be provided. In addition, there will be a brief discussion on the overall durability of segmental bridges.

IBC 26-82: Design of the Charlotte Douglas International Airport South Crossfield Taxiway Bridge

Time: 9:30 AM

Jake Sherman, PE, SE, WSP USA, Charlotte, NC; Michael Wagner, P.E.; Nick Smith, P.E.

Examines the unique challenges and solutions involved in designing taxiway bridges to accommodate the extreme live loads imposed by modern aircraft. Using the South Crossfield Taxiway Bridge at Charlotte Douglas International Airport as a case study, the session explores how the design team addressed requirements set forth by FAA, including aircraft live loading standards, safety area dimensions, and future fleet growth considerations. With load criteria determined through coordination with airport authorities, the bridge was engineered to support aircraft weighing up to 1.5 million pounds. Key design considerations include accommodating the expansive bridge width required for the Airplane Design Group V safety area, optimizing live load distribution, and integrating long-term maintenance strategies. FEA modeling and load analysis ensured the bridge could withstand repeated high-stress cycles and dynamic aircraft movements. Attendees will gain insights into the evolving standards and best practices in airfield infrastructure, focusing on the impact of aircraft loading on bridge safety, reliability, and long-term performance.

Special Topics

Wednesday, June 17, 2026, 10:30 AM - 12:00 PM

Session Chair: Matt Bunner, PE

This session presents innovative solutions for complex challenges, including the rehabilitation of historic structures and rapid delivery of new crossings. Case studies highlight creative load-transfer techniques, prefabrication, and accelerated construction methods that minimized traffic impacts while maintaining safety, structural integrity, and project schedules.

IBC 26-83: Innovative Friction Collar Technique to Remove a Deteriorated Truss Pin

Time: 10:30 AM

Michael Marks, PE, EIC Group LLC, Fairfield, NJ; John Schroettner Jr., PE, GPI, Bridgewater, NJ

The New Hope-Lambertville Bridge spanning the Delaware River is a 120-year-old, six-span, 1,000-foot-long pin-connected Pratt truss bridge built in 1904. An extensive rehabilitation project was undertaken by the owner, the Delaware River Joint Toll Bridge Commission, to repair various elements of the superstructure and substructure. During the rehabilitation work, a severely deteriorated pin was discovered that required replacement without compromising the bridge's integrity or structural performance. This presentation explores this unique engineering challenge and the innovative solution that was developed. The bridge presented significant logistical and technical challenges due to its eyebar construction. Traditional replacement methods, such as shoring towers or supports to remove the load from the pin were not feasible due to the river below or would have required prolonged closures to traffic. To address this, EIC Group LLC working with Greenman-Pedersen, Inc, devised an innovative technique to safely and efficiently replace the pin: designing, fabricating and installing an assembly of structural steel plates surrounding the pin, known as a "friction collar", to locally support and post-tension the eleven (11) eyebars converging at the location. This removed the load from the pin, allowing for its safe and efficient replacement without the need for shoring towers or other external supports.

IBC 26-84: Extending the Service Life of the Channel Five Bridge through Targeted Structural Rehabilitation and Corrosion Protection

Time: 11:00 AM

Madison Lewis, Freyssinet, Inc., Sterling, VA; Maxime Bosselet, Freyssinet Inc, Florida Keys, FL

The Channel Five Bridge carries State Road 5 (US-1) across the Florida Keys, serving as a critical connection for residents, visitors, and commerce while maintaining a navigational channel for marine traffic. After decades of exposure to harsh coastal conditions, the structure required comprehensive rehabilitation to ensure its continued safety and durability.

Freyssinet, Inc. served as the general contractor for the Florida Department of Transportation (FDOT), executing a multi-year repair and protection program under the supervision of BCC Engineering. The scope included over 2,200 cubic feet of concrete restoration on columns, footers, and pier shafts; installation of cathodic protection jackets on 128 shafts, and application of a thermal spray aluminum (TSA) coating to enhance corrosion resistance.
To safely access submerged work zones, Freyssinet engineered custom platforms and scaffolding systems, enabling efficient underwater and partial-submersion operations. Precision jacking and bearing replacement were performed using proprietary synchronized lifting systems to maintain alignment and stability.

Despite environmental challenges and limited traffic windows along US-1, the project was delivered safely, on schedule, and with minimal disruption. The successful integration of advanced corrosion protection and structural repair methods has significantly extended the bridge's service life and preserved a vital link across the Florida Keys.

IBC 26-85: North Wilkesboro Motor Speedway Pedestrian Bridge

Time: 11:30 AM

Ricky Tipton, GFT, Asheville, NC; David Comaniciu, GFT, Garner, NC

After decades off the NASCAR schedule, North Wilkesboro Motor Speedway hosted the 2024 All-Star Race, reigniting local pride. But a critical safety issue emerged: thousands of fans were crossing U.S. 421 via an older highway bridge without pedestrian accommodations.
With only six months to act, GFT (then Gannett Fleming) partnered with NCDOT and Wilkes County to design and deliver a single-span, prefabricated bowstring truss pedestrian bridge in time for the 2025 All-Star Race.

With thousands of fans pouring out of the speedway and facing the peril of crossing a four-lane freeway on a bridge with no pedestrian protections, GFT reframed the challenge as a race against time — to transform a hazard into a safe, iconic gateway before the next NASCAR All-Star weekend

The team quickly evaluated concepts and advanced a single-span, prefabricated bowstring truss. This was a choice that avoided center supports over live traffic and enabled rapid off-site fabrication and streamlined installation.

The structure's 16-foot clear width, full-height safety fencing, handrails, curbing, and debris-deterring panels deliver a purpose-built pedestrian experience for race-day surges while minimizing closures on U.S. 421. The span was set during an overnight shutdown in early April 2025, opening the bridge for the May 2025 NASCAR All-Star weekend.

Load Rating & Analysis 2

Wednesday, June 17, 2026, 8:00 AM - 12:00 PM

Session Chair: Lake Barrett

IBC 26-86: Open Spandrel Arch Bridge: Refined modeling and strength analysis

Time: 8:00 AM

Husam Hussein, PhD, PE, GFT, Columbus, OH; Prajwol Hada, GFT, Columbus, OH

Quantifying the live load capacity of open-spandrel arch bridges presents significant challenges due to their complex geometry, variable cross sections, and the progressive deterioration of materials over time. Traditional evaluation practices often rely on simplified analysis and visual inspections, which can overlook the nuanced interaction between structural elements and the impact of localized damage. This study presents a refined structural analysis and load rating of the SUM-82 Bridge, a five-span open-spandrel reinforced concrete arch located in ODOT District 4/12. Originally constructed in 1931, the bridge is currently undergoing rehabilitation to address deterioration and restore serviceability.
A comprehensive three-dimensional finite element (FE) model was developed to simulate the global and local behavior of the arch ribs, spandrel columns, floorbeams, and box beam superstructure under combined dead, live loads and other loads. The analytical framework incorporated material degradation effects such as corrosion, section loss, and reduced confinement due to cracking and bar exposure. Advanced analytical methods, including moment-curvature analysis for nonlinear sectional response and eigenvalue buckling analysis for column stability, were applied to capture realistic structural performance.
The results highlight the substantial influence of deterioration on load-carrying capacity and emphasize the importance of integrating detailed modeling into bridge evaluation. This refined approach improves the accuracy of load ratings, supports the prioritization of rehabilitation efforts, and enhances decision-making for old concrete arch structures. The methodology and findings demonstrate how advanced numerical modeling can extend the service life and safety of aging infrastructure while optimizing rehabilitation investments.

IBC 26-87: Load Rating of the Lofton Henderson Cantilevered Truss over the Black River

Time: 8:30 AM

John Carey, PE, SE, Michael Baker International, Cleveland, OH; Ed Baznik, PE, Michael Baker International, Cleveland, OH

The Lofton Henderson Bridge, a 1700' cantilevered through truss over the Black River in Lorain, OH, has a rich history. Designed by famed Wilbur J. Watson & Associates and built by the American Bridge Company in 1939, the bridge underwent major rehabilitation in 1989 and was renamed after World War II hero and Lorain native, Lofton Henderson. The bridge carries State Route 611, serving as a crucial link for the city and region.

In 2024, Michael Baker International was contracted to perform a load rating of this bridge to support planning for an upcoming major rehabilitation. To preserve the historic integrity of the structure and avoid unnecessary load posting or rehabilitation, the team applied several advanced strategies. These included innovative modeling to quickly ascertain concurrent forces, a novel approach to fill plate development, and in-situ rivet testing. These results enabled the client, Ohio DOT, to make informed and effective decisions on extending the bridge's service life during their rehabilitation.

IBC 26-88: Load Rating of a Concrete Arch Bridge Without Available Plans

Time: 9:00 AM

Jacob Behnke, PE, Collins Engineers, Inc, Chicago, IL; Jacob Dolas, Collins Engineers, Inc, Chicago, IL

Collins Engineers, Inc. has recently completed load ratings of two concrete arch bridges that lacked any record structure plans. The bridges, a 3-span arch in Great Lakes, IL and a historic single-span Luten-type arch in Gibraltar, MI, were constructed in the early twentieth century and have nc available documentation of their original construction, design loading, or material data. Previous load ratings relied heavily on engineering judgement based on visual inspections, resulting in load postings.

To unlock the full potential of these assets, both bridges underwent a series of examinations, including field inspections, ground penetrating radar (GPR) surveys, coring, and material testing. The acquired data was used to refine the previous load ratings by adjusting assumptions which the analyses are sensitive to. This paper and presentation will explore each step of the process, emphasizing the nuances specific to concrete arches. Practical tips and tricks such as helpful AASHTO Manual for Bridge Evaluation (MBE) references and an exploration of effective methods of modeling arches in structural analysis programs will be provided and discussed. Ultimately, these insights will be synthesized into a repeatable process applicable to similar situations.

IBC 26-89: Comparison of Load Rating Methods for Complex Bridges: The Oceanic Bridge Case Study

Time: 9:30 AM

Joseph Strafaci, PhD, MBA, PE, AICP, TYLin, Boston, MA; Hani Nassif, PhD, Rutgers University, Piscataway, NJ; Joseph M. Ettore, PE, Monmouth County, Freehold, NJ

As bridge structures grow in geometric and analytical complexity, conventional load rating methods can produce results that diverge significantly from true system behavior. This study compares multiple load rating approaches, including a simplified line-girder analysis, a refined finite element (FE) modeling using Abaqus, and field load testing applied to the Oceanic Bridge in Monmouth County, New Jersey, a 2,500-foot complex structure that is posted for 15 tons and is in serious condition per NBIS standards. The objective of the project was to assess the degree to which current AASHTO and FHWA-recommended methods capture the global and localized response of a long-span, multi-girder, steel structure with complex boundary conditions.

Results demonstrated that simplified rating methods often underestimate reserve capacity, particularly in regions with load redistribution and secondary member interaction. Conversely, a refined Finite Element analysis calibrated with field inspection and testing data provided a more realistic measure of system performance, identifying critical elements that govern load posting decisions. The study also highlights the practical challenges in implementing advanced modeling, data resolution, boundary condition assumptions, and computational efficiency. Additionally, the project provided recommendations when refined methods are justified within agency policy frameworks.

The findings underscore the importance of integrating field data, engineering judgment, and modern analytical tools to produce more reliable ratings for aging and complex bridges. This work supports evolving federal and state practices aimed at balancing safety, cost, and operational continuity across the nation’s bridge inventory.

IBC 26-90: Load Rating of an Existing Steel Box Arch Rib Considering Local and Global Buckling Modes

Time: 10:30 AM

Ryan Rapp, PE, SE, HNTB, Arlington, VA; Lawrence Rolwes, PE, SE, HNTB, Arlington, VA ; Josh Phillips, PE, HNTB, Arlington, VA,

This paper presents the results of a supplemental load rating analysis for the main arch span of the Fort Henry Bridge, focusing on two previously under-addressed failure modes of the arch rib: local web buckling and lateral buckling between brace points. The arch rib is a built-up box section with discontinuous longitudinal stiffeners, a configuration not adequately addressed by current or historical design specifications. In addition, the lateral bracing at the portal segment of the rib lacks horizontal members, reducing its effectiveness in restraining lateral buckling.

A refined finite element analysis was conducted to evaluate these conditions. Local web buckling was assessed using both eigenvalue and nonlinear buckling analyses, with results indicating a limiting rib axial capacity well below the yield strength of the section. Lateral buckling was evaluated using a global model of the entire bridge to calculate effective length factors for rib segments near the portal and demonstrated a corresponding reduction in axial capacity compared with other portions of the rib.

The revised rib axial capacities, controlled by either lateral or local web buckling, were incorporated into the load rating analysis performed in accordance with AASHTO-MBE and the WVDOH Load Rating Manual using the LRFR method. The resulting rating factors for the HL-93 design vehicle and legal vehicles were found to be about 15 to 20 percent lower than those calculated in previous load ratings, primarily due to the more rigorous evaluation of rib buckling behavior.

IBC 26-91: Analysis and Rehabilitation of Roadway and Railway Masonry Arch Bridges

Time: 11:00 AM

Brett Mattas, PE, SE, Michael Baker International, Zanesville, OH

Owners of masonry arch structures are tasked with inspecting, rating, maintaining, and supporting operations with only a limited number of qualified engineers that have experience with these structures. This presentation will discuss analysis methods, recent literature on masonry arch bridges, methods of data collection, common deterioration, and rehabilitation alternatives. Additionally, I will be discussing innovative technologies such as computational design and 3D scanning to supplement conventional tools to improve quality and efficiency when analyzing capacity of these structures.

Case studies, including both roadway and railway masonry arch structures, will be presented. Analysis level varied from simple in-plane frame models to 3D solid element finite element method with surface loads applied to include centrifugal and splitting effects. The level varied based on the state of the structure and scope of the project.

IBC 26-92: Advancing Structural Condition Assessment with Multimodal Sensor Fusion and Graph-Based Learning

Time: 11:30 AM

Lawrencia Akuffo, Rowan University, Glassboro, NJ; Adriana Trias Blanco, Glassboro, NJ

The condition assessment of structures has always relied on nondestructive testing (NDT) for detecting deterioration. Individually, various sensors such as Electrical Resistivity (ER), Ground Penetrating Radar (GPR), Half-Cell Potential (HCP), Impact Echo (IE), and Ultrasonic Surface Waves (USW) provide valuable insight into material degradation from different perspectives. However, practical decision-making relies not on isolated readings, but on a multimodal interpretation of their collective behavior.

This study develops a multimodal data fusion framework where heterogeneous sensor readings are aligned, integrated, and transformed into a unified deterioration index. Field data was collected from the BEAST facility at Rutgers University and spatially synchronized using KDTree nearest-neighbor matching. Cross-sensor dependencies were quantified via Kendall Tau correlation, forming a sensor-location graph, which was processed through a Graph Neural Network (GNN) for representation learning.

In addition to raw interpretation, this work introduces a longitudinal deterioration tracking module, where six sensor modalities are fused into a single health/deterioration score over time using Principal Component Analysis (PCA), weighted scoring, and anomaly detection. This enables the evolution of deterioration to be monitored month-by-month, revealing inflection points, acceleration phases, and recovery trends that are not visible through single-sensor analysis.

The results demonstrate that deterioration patterns only emerge when sensors are jointly analyzed, providing a scalable pathway toward automated structural prognosis and early-warning maintenance systems.

International Major Bridge Design and Co

Wednesday, June 17, 2026, 8:00 AM - 12:00 PM

Session Chair: Nick Burdette, PE

IBC 26-93: Galecopper Bridge: Safety Management and Replacement of Damaged Lock-Coil Cables

Time: 8:00 AM

Mark Saliba, PE, Freyssinet, Sterling, VA; Matthieu Guesdon

Corrosion damage in locked coil cables can pose a significant threat to the structural integrity of bridges worldwide. This paper presents a comprehensive analysis of the management of corrosion¬ related issues in the Galecopper bridge cables to ensure the structural safety of the bridge and discusses their implications for other bridges facing similar challenges. The study encompasses the detection, assessment, temporary strengthening and final re-placement of damaged strands.
Temporary strengthening measures were designed, constructed, and monitored, focusing on the most severely damaged strands, to allow time for the design and execution of permanent solutions. Such permanent solution in-volved the replacement of existing cables through the integration of a state-of-the-art system using a fire-protected parallel strand system together with high friction saddles. While the integration of a modern cable system in the existing structure was a challenge, replacement operations were a challenge on their own also. They required the design and testing of a robust de-tensioning system, the implementation of which into the existing structure has required extensive engineering.
The findings and lessons learned from the Galecopper Bridge case can serve as a reference for bridge engineers and managers facing similar challenges, contributing to the long-term safety and maintenance of critical infrastructure.

IBC 26-94: Kruunusillat; Design and construction of Finland's Longest Bridge

Time: 8:30 AM

Tom Osborne, RIBA, Knight Architects, London, Greater London United Kingdom

In 2012, Knight Architects and WSP won an international design competition run by the city of Helsinki, entitled 'Kruunusillat' or 'Crown Bridges'. The brief was to design a major new light rail crossing connecting the city centre with a new suburb of Laajasalo, enabling the development of a new waterside community. With construction now complete, it has become Finland's longest and tallest bridge.

The 1.2km-long crossing features a 135m-tall, slender concrete diamond tower as its central feature. It supports 2x 250m cable-stayed spans and now forms an instantly recognisable symbol of this historic capital city.

This project has a 200 year design life, a significant increase from the typical 120 horizon. This, combined with the particularly challenging climate of Finland has created a variety of technical challenges which the team had to overcome in order to deliver an efficient, resilient crossing.

Unusually for a project of this scale, the bridge will be car-free – carrying only light rail, pedestrians and cyclists, and so it also promotes a modal-shift, forming a vital component of Helsinki's future transportation aspirations.

As project architect from day one, Tom Osborne discusses the project's journey from conception to construction.

IBC 26-95: Innovative Methods for Installing Steel Casings on Below-Grade Piers and Piles: Case Studies of Showa Bridge and Chidori Railway Overpass

Time: 9:00 AM

Yoshinao Kurachi, PE, JP, Oriental Shiraishi Corporation, Koto-ku, Tokyo Japan; Turner Arndt, Structural Technologies VSL, Manassas, VA; Fuji Hayashi, Structural Technologies VSL, Fort Worth, TX

Our presentation introduces innovative means and methods developed in Japan for installing steel casings around below-grade portions of existing piers and piles. These methods eliminate or minimize the need for extensive excavation, large cofferdams, or trestles, resulting in cost savings, reduced environmental impact, and less disruption to traffic and waterways. Two seismic retrofit projects illustrate their application: Showa Bridge and Chidori Railway Overpass.

Showa Bridge, spanning the Tenma River near Hiroshima Bay, was built in 1978 with five spans totaling 690 ft, six lanes, and a width of 85 ft. Its reinforced concrete piers (8 ft by 19 ft) lacked sufficient seismic capacity. Conventional cofferdams would have been excessively large, difficult to install under limited girder clearance, and would obstruct waterway capacity. To overcome these challenges, the innovative methods were deployed to install steel casings 20 ft high, with 6 ft submerged and an additional 7 ft below grade without cofferdams or excavation.

Chidori Railway Overpass in Shimane crosses both a railway and a roadway. Built in 1965, it is a short two-span bridge, 86 ft long and 25 ft wide. Existing steel piles (23.6 in diameter) required additional bending capacity, necessitating 26-ft-long steel casings with 25 ft positioned entirely below grade. Due to proximity to the railway, deep excavation was impractical. Instead, the retrofit used the same innovative methods, requiring only 4.3 ft of excavation to remove an existing pile cap at grade. Construction was completed without disrupting rail operations and with only one lane closed on the roadway.

IBC 26-96: The 1915 Canakkale bridge - the world's longest suspension bridge

Time: 9:30 AM

Jesper Pihl, COWI, Kongens Lyngby, Zeeland Denmark

The 1915 Canakkale bridge is the world's longest suspension bridge designed with a main span of 2023m. The Bridge is located about 200km southwest of Istanbul spanning the Strait of Canakkale that links the continents of Asia and Europe The bridge opened to traffic in March 2022. The paper will describe the design and construction of the bridge and the engineering challenges that were faced through the design process. The bridge design features among others the 318m high steel towers that were built in record time, the innovative cable structure design that allowed the gravity-based anchor blocks to move further onshore for better soil conditions and the twin-box steel girder that secured the aerodynamic stability of the bridge deck.
Furthermore, the paper will describe the challenges to overcome during construction of the bridge and summarize the lessons learned from working on such a mega project.

IBC 26-98: The Bataan Cavite Interlink Bridge Project - Owners Perspective

Time: 11:00 AM

Emil K. Sadain, CESO I, Department of Public Works & Highways, , Philippines; Teresita V. Bauzon, CESO VI, Department of Public Works & Highways Philippines; Marwan Nader Nader, PhD, PE, TYLin, ; James Duxbury, PE, TYLin, ; Dante Bautista, PE, TYLin,

This paper presents Owners perspective on project development, funding, delivery strategies, and its anticipated transformative economic impact on the greater Manila Bay and regional connectivity. Funded under the Infrastructure Preparation and Innovation Facility (IPIF) through a technical assistance loan from the Asian Development Bank (ADB), the Bataan-Cavite Interlink Bridge (BCIB) Project reflects the Philippine government's commitment to enhancing national transport infrastructure under its Build, Better, More (BBM) Infrastructure Program. The BCIB will cross Manila Bay and connect Barangay Alas-asin in Mariveles, Bataan, and Barangay Timalan, Naic, Cavite, reducing the current travel time between the provinces of Bataan and Cavite from five hours to 30 minutes or less and easing traffic congestion in the densely populated capital city of Manila.

The Department of Public Works and Highways (DPWH) oversees the BCIB, having adopted a design-bid build approach for its delivery. DPWH selected TYLin, in association with Renardet S.A. and DCCD Engineering Corporation, to undertake the Detailed Engineering Design (DED) and bid documentation for this high-profile project.

IBC 26-99: Design of the North & South Channel Cable Stayed Bridge of the Bataan Cavite Interlink Bridge Project

Time: 11:30 AM

Marwan Nader, PhD, PE, TYLin, , ; Hardik Patel, PE, SE, TYLin ; Kevin Almer, PE, SE, TYLin, ; Sam Shi, PE, TYLin, ; George Baker, PE, TYLin,

This paper delves into the structural engineering principles guiding the design of both cable-stayed bridges. The BCIB features two landmark cable-stayed bridges across Manila Bay's primary navigational channels. The South Channel Bridge (SCB), between Corregidor Island and the Cavite shore, has a main span of 900 meters flanked by 450-meter back spans, totaling 1,800 meters with a 72.3-meter vertical clearance. Designed with an orthotropic box girder, its back spans are subdivided with intermediate piers for optimized deflection and load distribution.

The North Channel Bridge (NCB), linking Corregidor Island to the Bataan Peninsula, has a 400-meter main span and two 168-meter back spans. This 736-meter bridge incorporates a steel-concrete composite structure to address the unique demands of the channel.

Movable Bridge Design / Rehab

Wednesday, June 17, 2026, 8:00 AM - 09:30 AM

Session Chair: Lou Ruzzi, PE

IBC 26-100: Replacement of Lifting Mechanism on 113 year Old Railroad Bridge

Time: 8:00 AM

James Hyland, PE, GFT, Kansas City, MO; Daniel Gibson, L.G. Barcus and Sons, Inc., Kansas City, KS

Originally constructed in 1913 as a fixed-span structure, the KCT Highline Bridge was converted to a vertical lift bridge in 1960 by the U.S. Army Corps of Engineers to accommodate Kansas River flood events.

Following new hydraulic analyses from the U.S. Army Corps of Engineers related to levee improvements along the Kansas River, the bridge was required to lift over 17 feet—an increase of 10 feet from its original capacity—to maintain necessary flood protection. GFT explored multiple upgrade strategies, including complete replacement of the spans or towers. A detailed structural analysis confirmed the existing towers could be preserved and modified to accommodate a modern, heavy-duty lifting system.

GFT proposed a solution using Enerpac strand jacks, a technology typically used in temporary bridge applications. This approach offered a practical, cost-effective alternative to replacing the entire lift mechanism and allowed for the preservation of key historical bridge elements. Installation of the new jacking system required intricate tower modifications, international logistics coordination, and precision construction management—all completed while minimizing impact to ongoing rail service.

On March 21, 2025, the new system was successfully tested during a full commissioning lift. All three bridge spans—measuring a combined 732 feet and weighing a total of 16.8 million pounds—were raised simultaneously, completing the operation ahead of the scheduled 24-hour track outage window. With this modernization, the KCT Highline Bridge now provides enhanced flood resilience and dependable performance for one of Kansas City's busiest rail corridors.

IBC 26-101: Emergency Repairs to the Bayou Dularge Bascule Bridge

Time: 8:30 AM

Jonathan Eberle, PE, AECOM, Mechanicsburg, PA; Haylye Brown, Louisiana Department of Transportation & Development, Baton Rouge, LA ; Henry Fix, AECOM, Conshohocken, PA, ; Brett Canimore, AECOM, Conshohocken, PA, ; Tod Johnson, AECOM, San Antonio, TX,

Constructed in 1975, the Louisiana DOTD Bayou Dularge bridge carries LA-315 over the Intracoastal Waterway in Houma, LA. The 150 ft main span is comprised of a pair of simple trunnion bascule girders which typically operate over 500 times monthly to allow for the passage of navigation traffic.
On July 28, 2025, AECOM was contacted by the Louisiana DOTD to share observations regarding the steel tower supporting the bascule leaves rocking in the direction of the bridge baseline during operation in addition to a failed anchor bolt supporting the northwest tower. Following the discussion, AECOM reviewed the plans and identified the failed anchor bolt as element normally in tension and subsequently recommended ceasing operation of the bridge until the issue could be further investigated. AECOM mobilized staff to perform a hands-on inspection of the bridge on August 12th which identified that in addition to the noted failed anchor bolt on the northwest tower, two of the remaining 3 anchors did not provide a positive response to hammer sounding. With the issue attributed to the anchor bolts, AECOM quickly developed a repair concept which allowed the DOTD to select a contractor and have them mobilized to begin work on August 25th. By working closely with the contractor and sequentially issuing construction plans, AECOM was able to prevent delays on critical path construction items. This paper will present the collaborative process which allowed the structure to reopen to vehicular traffic on October 1, 2025, only 7 weeks after the initial inspection.

IBC 26-103: The Conrail Point-No-Point Bridge Transformation: Replacing a Century-Old Swing Span with a Modern Bascule

Time: 9:00 AM

Brian Hillhouse, PE, Genesis Structures, Kansas City, MO; Daniel Post, PE, George Harms Construction Company, Inc., Farmingdale, NJ

The Conrail Point-No-Point (PNP) Bridge project involved replacing a 120-year-old swing span bridge with a new 162-foot-long bascule span bridge over the Passaic River in Newark, New Jersey. The fixed spans for the seven-span structure were erected adjacent to overhead power lines using conventional methods, including crane barges and a temporary work trestle. Erection of the nearly six-million-pound bascule span required a complex, carefully engineered approach that utilized temporary driven piles, falsework towers, and a heavy-lift derrick barge crane.

This paper and presentation will highlight the structural engineering for erection and temporary works and the erection planning and procedures implemented for construction to ensure the safe and precise installation of the bascule span. Particular emphasis will be placed on the modeling and stability evaluations performed during staged construction and on the development of unique erection sequences to manage heavy-lift geometry and load distribution.

The presentation will focus on several distinctive challenges, including milled-to-bear connections and extremely tight fabrication and erection tolerances. Upon completion, the new bascule bridge will significantly enhance Conrail's operational efficiency by reducing river opening time from approximately 5 hours to just 5 minutes, enabling more frequent, higher-speed train traffic. The presentation will provide insight into the coordination, analysis, and construction techniques that enabled the successful delivery of one of the most technically demanding and operationally transformative bridge replacement projects in the region.

Pedestrian Bridges

Wednesday, June 17, 2026, 10:30 AM - 12:00 PM

Session Chair: Lou Ruzzi, PE

IBC 26-104: Construction Engineering on the William Halton Parkway Twin Segmental Bridges

Time: 10:30 AM

Ivan Liu, COWI North America, Tallahassee, FL

Two new twin segmental bridges over Sixteen Mile Creek within the Halton Region of Ontario Canada are being constructed as part of the William Halton Parkway extension project. These bridges employing a movable form traveler system for a cast-in-place segmental construction technique. Once completed, the bridges will span 280 meters over three spans and each host two lanes and pedestrian walkways, providing vital connectivity between Third Line and Neyagawa Boulevard for the growing Halton Region. Due to site restrictions for the piers, the two bridges do not have the usual balanced cantilevers between the three spans. Instead, one side of the West pier cantilever is extended, or unbalanced, by 8 segment lengths which led to the addition of a temporary stay tower and deck-level external cable anchoring system for the cantilever during construction. This presentation will focus on the construction means and methods by BOT Construction Group as well as COWI's construction modifications and temporary work designs which supported BOT in the construction of these bridges within the strict project site and weather conditions.

IBC 26-105: Innovative Engineering Solutions for the Pattullo Bridge Replacement North Approach Erection

Time: 11:00

Pavlo Voitenko, PE, COWI, Tallahassee, FL; Patrick Noble, COWI, Tallahassee, FL

The replacement of the Pattullo Bridge outside Vancouver, British Columbia, faced complex construction engineering challenges, particularly for the North Approach bridge. The North Approach consists of a two-span continuous structure with a 47m cantilever over the Fraser River for the connection to the cable stay main span. The superstructure is composed of steel plate girders varying in depth from 2.3m to 6.3m with a reinforced concrete deck and double composite behavior for the negative moment region of the cantilever. Comprehensive 3D staged construction analysis with SOFiSTiK allowed for the implementation of unique erection engineering solutions for field sections weighing up to 100 tones, including longitudinal and transverse balanced cantilever erection techniques to mitigate access limitations imposed by underlaying rail lines, utilities, roadways, and the river navigational channel. This paper will discuss the challenges and solutions utilized to successfully erect this complex structure.

IBC 26-106: Accelerated Bridge Construction for the McKinley Street Steel Network Tied Arch

Time: 11:30 AM

Patrick Noble, PE, SE, COWI North America, Tallahassee, FL; Pavlo Voitenko, COWI, Tallahassee, FL

The new McKinley Street bridge in the City of Corona California was successfully constructed following an accelerated bridge construction methodology. The new bridge consists of a 300 foot long steel network tied arch with a reinforced concrete deck. The arch was successfully erected adjacent to its final position and transported into place with self propelled modular transporters (SPMTs). The bridge move path traversed over an adjacent roadway, buried utilities, the Arlington Flood Control channel and two BNSF mainline tracks in a single weekend closure. The move operation was completed with a first of its kind combination of SPMTs and incremental launching on skid tracks to limit the temporary works required during the move and to maintain the hydraulic opening of the flood control channel. This presentation will discuss the unique challenges and solutions associated with constructing this complex structure.

Workshop Program Guide

01: International Workshop

Monday, June 15, 2026 3:30 - 5:30 PM

Nick Burdette, HDR, ,

02: Advances in Bridge Load Rating, Posting and Overweight Load Permitting

Monday, June 15, 2026 3:30 - 5:30 PM

Lubin Gao, USDOT/FHWA, Vienna, VA

Moderator/Welcome
Lubin Gao, FHWA

Update to Ohio DOT's Load Rating Procedure for Low Cover Corrugated Metal Pipe (CMP) Culverts
Kevin White, E.L. Robinson Engineering

Evaluation of Cracked T-Beams based on Proof Load Test
Yukai Yang, Florida DOT

Development of Notional Vehicles for Rating Truss Bridges
Rafal Roszczenko and Aneta Luszczynska, Auburn University

Analyzing in-service bridges for vehicular load carrying capacity is challenging. However, appropriate structural analysis that accounts for actual physical and loading condition is critical not only for bridge safety but also for improved traffic mobility. This workshop will discuss recent advances in bridge load rating, posting and overweight load permitting through several highlighted research projects.

03: Driving Efficiency in Steel Bridge Design with Innovative Tools, Resources, and Examples

Tuesday, June 16, 2026 8:00 - 10:00 AM

Dan Snyder, American Iron and Steel Institute, Washington, DC

This workshop, led by Michael Barker (University of Wyoming), Brandon Chavel (National Steel Bridge Alliance), and Frank Russo (Russo Structural Services), introduces bridge designers and owners to a suite of steel bridge design tools and resources that streamline preliminary design, detailed beam analysis, and standardized bridge solutions for routine spans. The session will include demonstrations of eSPAN140 and eBEAM140 for preliminary and optimized beam designs, LRFD Simon for line-girder analysis and preliminary LRFD design, and AISC/NSBA Standard Plans for optimized I-girder bridge solutions covering spans from 80 to 300 feet. Through live demonstrations, comparative discussions, and real-world examples, attendees will learn how these tools reduce design time, support informed decision-making, and enhance cost-efficiency from concept through construction.

04: Extending the In-Service Life of Steel Bridges Through Strengthening and Repair

Tuesday, June 16, 2026 10:00 AM - 12:00 PM

Brandon Chavel, National Steel Bridge Alliance, Chicago, IL

Steel girder repairability is a fundamental advantage of steel bridge superstructures and is central to modern bridge preservation and asset management strategies. This workshop will identify practical strategies for evaluating damage, selecting appropriate repair strategies, and executing field repairs that restore structural performance while minimizing disruption to service. Topics will include inspection and damage assessment, common field repair and retrofit techniques, and bearing upgrades. Emphasis will be placed on field-executable solutions that allow designers and owners to respond efficiently to in-service deterioration, vehicle impacts, fire damage, and construction-related distortions, often without full traffic closures or extensive structural replacement.
The workshop will include discussion on recent repair projects and solutions that can be implemented on other projects; a review of important details in the AASHTO/NSBA Steel Bridge Collaboration guideline: G14.2 - Guidelines for Field Repairs and Retrofits of Steel Bridges which provides nationally recognized guidance; heat-straightening repair methods for over height vehicle impacts; and the replacement of older steel bearings with new high load multi-rotational bearings and seismic isolation bearings.

Outline:
- Introduction and Overview (5 min)
- Project examples (20 min)
- Designer tools for bridge repairs (25 min)
- Heat-straightening methods (25 min)
- Replacing old steel bearings with Seismic Isolation Bearings (25 min)
- Panel Discussion (20 min)

05: Autonomy Integrated, Real Time Bridge Digital Twins: State of the Practice

Tuesday, June 16, 2026 1:30 - 3:00 PM

Marcin Kasiak, PhD, IWE, PMP, PE, WSP USA, Virginia Beach, VA

Marcin Kasiak, PhD, IWE, PMP, PE., WSP USA, Virginia Beach, VA

This workshop explores the state of practice in real-time bridge digital twins—operational systems that combine continuous structural health monitoring (SHM) and inspection data with calibrated numerical models to strengthen durability and reliability assessment.
We will present device-to-cloud streaming pipelines that enable accurate service-life predictions and proactive maintenance. This approach empowers engineers and asset managers to optimize bridge safety, reduce lifecycle costs, and improve resilience.
Machine learning transforms monitoring data into actionable insights in real time, forming the foundation for autonomous digital twins capable of scenario planning and trend analysis for long-term performance forecasting - closing the loop between data and intervention. We will examine the current research on autonomous decision-making, including maturity levels and current limitations.
Key challenges to full autonomy will also be addressed, including data quality, model fidelity and uncertainty quantification, computational constraints, cybersecurity, human-in-the-loop governance, and adoption/ROI.
Attendees will gain practical guidance on integrating SHM systems, configuring digital twin workflows, and deploying real-time decision pipelines across bridge assets, with examples that translate advanced technology into field-ready solutions.

06: Post-Apocalyptic SNBI - After the First Submittal

Tuesday, June 16, 2026 3:30 - 5:00 PM

Anne Irish, Michael Baker International, ,

Anne Irish, PE, Michael Baker International, Frankfort, KY

Erin Van Zee, PE, Kentucky Transportation Cabinet, Frankfort, KY

Wendy McAbee, PE, USDOT/FHWA, Washington, DC

Andrew Bush, PE, Michael Baker International, Nashville, TN

This presentation will examine best practices and lessons learned for the transition to the Specifications for the National Bridge Inventory (SNBI). Changes to bridge inspection regulations will have gone full throttle in January 2026, greatly affecting the 3 main aspects of NBIS: Inventory, Inspection and Load Rating. Michael Baker International is assisting numerous bridge owners with SNBI implementation, with each one different from the next. We will discuss past, present, and future NBIS regulations; examine multiple states' transition experiences; offer guidance on managing the changes; show samples of data guidance; and review future needs for the program. FHWA will provide feedback on the 2026 SNBI submittal and discuss any new errata.

07: Bridge Construction with FRP Composites -- Today and Tomorrow

Wednesday, June 17, 2026 8:00 - 10:00 AM

John Busel, F.ACI, American Composites Manufacturers Association, Arlington, VA

Gregg Blaszak P.E., Coastline Composites, Greenville, SC

The objective of the workshop is to familiarize attendees with the recently published AASHTO LRFD Guide Specifications for the Design of FRP Pedestrian Bridges, 2nd Edition and highlight representative projects showcasing the use of FRP composites in pedestrian bridge construction. Since the initial 8-page guide published by AASHTO in 2008, FRP composites have significantly advanced. FRP composites are now widely used as decking for pedestrian bridges and in the construction of truss-style pedestrian bridges, cantilevered sidewalks on existing vehicle bridges, and even commuter rail platforms. AASHTO's original guide specifications were based on Allowable Stress Design (ASD) methods intended for the design of FRP truss bridges. The 2nd Edition, published in 2025, adopts an LRFD approach and provides comprehensive guidance on FRP materials, loads, design and analysis considerations and design requirements. It includes detailed commentary to assist engineers in understanding and applying the specifications. Appendices include a sample special provision and an interim material specification.

08: FRP Reinforced Concrete – Proven Performance, Established Specifications, and Recent Project Recognition for Bridge Solutions

Wednesday, June 17, 2026 10:00 AM - Noon

Danielle Kleinhans PhD, PE, F.ACI, Mateenbar Composite Reinforcements, Concord, NC

Moderator and Presenter:Danielle Kleinhans, PhD, P.E, F.ACIMateenbar Composite ReinforcementsDirector of Engineering and Business Development Presenters: Kelley Severns, PE, PMPU.S. Department of Transportation Program Director for ARPA-I's X-BRIDGE ProgramRudolf (Rudi) Seracino, PhD, M.ASCE, F.ACI, F.IIFC North Carolina State University Paul and Dora Zia Distinguished Professor Department of Civil, Construction, and Environmental Engineering Francisco De Caso, PhD, PE, LEED A.P.University of MiamiPrincipal ScientistDepartment of Civil and Architectural Engineering

Glass fiber reinforced polymer (GFRP) rebar is an established, code-compliant concrete reinforcement material offering proven advantages in many applications, especially in corrosive environments and specific applications where its unique properties and long-term durability provide superior lifecycle value. Like all construction materials, FRP has application-specific strengths that make it the optimal choice for many bridge projects.

The objective of the workshop is to highlight recent successful projects utilizing GFRP reinforced concrete for bridges in several states. These case studies will include the perspectives of the owner and contractors that have first-hand experience. From a bridge owners' perspective, adopting relevant material and testing specifications is a key quality consideration. From a contractor's perspective, they will want to be proactive in educating field crews on, for example, the lighter weight of the material that allows for significantly faster installation speeds and will ultimately alter daily construction techniques and planning. Additionally, a review of common misconceptions will be made with correct information provided to dispel the misinformation. Finally, university researchers will provide insights into ongoing research and future emerging technology.

IBC Exhibitors

Acrow Corporation of America

Booth #: 405

Website: www.acrow.com

From single span to large-scale bridge development programs, Acrow bridges are built to last – versatile, easy to assemble and cost-effective. Precisely fabricated with components made of sustainable, high-strength U.S. steel, Acrow connects you to durable bridging worldwide. Many states and counties already own Acrow bridges. Please stop by our booth to hear their stories and learn how Acrow can keep traffic moving in your community.

AECOM

Booth #: 202

Website: www.aecom.com

AECOM is a global infrastructure consulting firm providing professional services in transportation, water, environment, energy, buildings, and program management. The company delivers planning, design, engineering, construction management, and advisory services for public- and private-sector clients worldwide. AECOM is recognized for its expertise in delivering complex bridge and transportation infrastructure projects, including major river crossings, long-span structures, and critical mobility corridors. Through multidisciplinary collaboration, the firm helps clients address infrastructure challenges while advancing sustainability, resilience, and economic growth.

Anderson UnderBridge

Booth #: 407

Website: www.andersonunderbridge.com

Anderson UnderBridge is the manufacturer, renter and provider of the Hydra Platform for safe and fast under bridge access to inspect, maintain, and repair our nation's bridges.
Our national, diverse rental fleets include hydra platforms and articulating

Bentley Systems

Booth #: 413

Website: https://www.bentley.com

Around the world, infrastructure professionals rely on software from Bentley Systems to design, build, and operate better, more resilient infrastructure for transportation, water, energy, and cities. Founded in 1984, Bentley is the partner of choice for engineering firms and owner-operators worldwide, with software spanning all engineering disciplines and infrastructure lifecycle phases. Through our digital twin solutions, we help infrastructure professionals unlock the value of their data to transform project delivery and asset performance.

Bridge Grid Flooring Manufacturers Association

Booth #: 310

Website: https://www.bgfma.org

BGFMA promotes the use of steel grid bridge decking by working with project owners and their consultants to aid in proper selection of decking materials. We offer detail, design and drawing guidance to help ensure best practices are employed. Our modular

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Bureau Veritas

Booth #: 403

Website: https://www.bvna.com

Bureau Veritas is the largest and most qualified Transportation and Infrastructure Inspection Agency in operation today and is proudly serving many state DOT’s, prominent transportation engineering firms and freight and passenger railroads. We provide our

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CAST CONNEX

Booth #: 224

Website: https://www.castconnex.com

CAST CONNEX® is the industry leader in the architectural and structural use of cast steel components in the design and construction of building and bridge structures. Our products include pre-engineered connectors that simplify the design and enhance the performance of structures. We also offer design-build services for custom cast steel nodes and components.

CMC

Booth #: 307

Website: https://www.cmc.com/en-us/landing-pages/bridge-systems

CMC Bridge Systems is proud to offer the InQuik Bridge in the US, a prefabricated, reinforced-concrete structure that is cast-in-place. A complete solution above the foundation, the lightweight components arrive on site with just the steel and formwork, with concrete then placed after to create one monolithic slab with no joints, bearings, or tie-downs. The system can be installed in less than a week, allowing for significant time and cost savings on construction.

Collins Engineers, Inc.

Booth #: 220

Website: https://www.collinsengr.com/

Computers & Structures, Inc.

Booth #: 207

Website: https://www.csiamerica.com

Founded in 1975, Computers and Structures, Inc. (CSI) is recognized globally as the pioneering leader in software tools for structural and earthquake engineering. CSI software is used by thousands of engineering firms in over 160 countries for the design of major projects, including the Taipei 101 Tower in Taiwan, One World Trade Center in New York, and the cable-stayed Centenario Bridge over the Panama Canal. It is the trusted choice of sophisticated design professionals everywhere.

ConeLabs

Booth #: 321

Website: https://www.conelabs.ai

ConeLabs is an intelligent infrastructure inspection platform. We combine photogrammetry with proprietary AI to transform raw visual data into engineering-grade structural insights.

Control Point Associates Inc.

Booth #: 225

Website: https://cpasurvey.com

Control Point Associates, Inc. is a full-service land surveying, geospatial, and reality capture firm providing accurate data and mapping solutions for infrastructure, development, energy, environmental, and construction projects. With over 30 years of experience and 13 office locations across the East Coast, CPA delivers services including land surveying, LiDAR, laser scanning, UAV mapping, GIS, and subsurface utility engineering to support clients throughout all phases of project development.

COWI

Booth #: 214

Website: https://www.cowi.com

CTS Cement Manufacturing Corporation

Booth #:

Website: www.ctscement.com

CTS Cement Manufacturing Corp manufactures Rapid Set Concrete products. They are high strength, low shrinkage, and fast setting for use in structures when time is a factor.

D.S. Brown

Booth #: 101

Website: https://dsbrown.com/

The D.S. Brown Company is a manufacturer of infrastructure construction products. D.S. Brown product offerings include Steelflex® Modular, Strip Seal and Delcrete® Expansion Joint Systems, Versiflex™ HLMR, Disc and Elastomeric Bearing Assemblies, Delastic® Preformed Neoprene Compression Seals, Delpatch™ Elastomeric Concrete and a number of specialty products such as our Cableguard™ Elastomeric Wrap and Deckguard® Waterproofing Membrane. Our high-quality engineered products are available worldwide for both new construction and rehabilitation projects.

DBM Vircon

Booth #: 213/215

Website: www.dbmvircon.com

Diamant Polymers Inc.

Booth #: 315

Website: https://diamant-polymer.com/

Diamant Polymers Inc. is an internationally renowned manufacturer and full-service provider of advanced polymer systems for industrial applications. Our innovative solutions extend asset life, increase safety and cut costs.
As a key material, MM1018 – The Liquid-Shim® is a high-performance composite material specially developed for gap and tolerance compensation - ideal for steel and bridge construction. It enables full-surface and force-fit connections, adapts precisely to any gap geometry, and ensures stable, durable, and precise structural integrity.

DYWIDAG

Booth #: 406

Website: https://dywidag.com/

Since its German roots in 1865, DYWIDAG has delivered engineering excellence, building safer, stronger, and smarter structures. Specializing in post-tensioning, geotechnical, stay cable, and repair and strengthening solutions, we combine local expertise with global competence to ensure lasting performance.

Active in over 50 countries with more than 1,600 professionals, we partner with governments, asset owners, and contractors to extend critical infrastructure life. From the Sydney Opera House to One World Trade Center, DYWIDAG is there.

Earth Wall Products LLC

Booth #: 418

Website: https://www.earthwallproducts.com

Eastern Pneumatics & Hydraulics

Booth #: 219

Website: https://www.ephtools.com

Echem Consultants LLC / Duricorr LLC

Booth #: 410

Website: https://duricorrinc.com

Echem Consultants and subsidiary Duricorr™ help infrastructure owners protect and extend the service life of their assets. We combine corrosion engineering expertise with purpose-built monitoring hardware, cloud-analytics, and AI-driven reporting to give engineers the data they need to make informed maintenance decisions — before problems become failures.

Our AMS monitoring systems feed real-time field data into the Duricorr 4cast52™ cloud platform, where Orac™ AI transforms raw measurements into actionable insight: predictive performance models, automated compliance reporting, and early warning of anode depletion. From initial corrosion assessment through long-term galvanic protection monitoring, we provide the tools and the expertise to keep reinforced concrete structures performing for their full design life.

Eriksson Software

Booth #: 402

Website: https://www.erikssonsoftware.com

Eriksson Software empowers engineers to efficiently perform analysis and design of precast concrete structural components. Founded in 1998, Eriksson Software specializes in the development of software for the precast concrete industry with the goal of imp

Fraco Products

Booth #: 119

Website: https://www.fraco.com/

Fraco is a Canadian manufacturer specializing in engineered vertical access solutions for the construction, industrial, restoration, bridge access, and infrastructure sectors. Since 1991, Fraco has been recognized for its expertise in mast climbing work platforms, construction hoists, permanent elevators, and customized access systems designed for complex projects. With strong in-house engineering capabilities, Fraco develops tailored solutions adapted to unique site requirements, helping contractors improve safety, productivity, and efficiency on high-rise, bridge, civil, industrial, and specialized construction projects worldwide.

Freyssinet, Inc.

Booth #: 112

Website: https://www.freyssinetusa.com/

Freyssinet, Inc. has been at the forefront of providing specialized civil engineering technology, material supply, and installation for projects large and small. Originally a specialist in post-tensioning, Freyssinet has successfully expanded its portfolio of products and services into stay cables, structural cables, bearings, joint seismic devices, repair, protection, and strengthening of structures. We specialize in diagnostic survey, repair, refurbishment, bridge bearings and cathodic protection of reinforced concrete in the building, civil, and marine sectors.

FYFE

Booth #: 123

Website: https://www.fyfeco.com

Geoquest USA

Booth #: 108

Website: https://www.geoquest-group.us/

We began in 1971 with a newly patented retaining wall system called Reinforced Earth® (Mechanically Stabilized Earth). We have surpassed 50 years of engineering, research, and development of geotechnical structures that have lasted for generations and con

GFT

Booth #: 206

Website: https://www.gftinc.com

Gannett Fleming TranSystems is now GFT! Our team of 5,000+ experts design, construct, and engineer resilient, creative solutions that uplift communities. Backed by over a century's experience, together, we're building a lasting legacy for future generations: stronger communities, a healthier planet, and better lives.

Bridge Services:
Complex Design | Rehabilitation | Movable Bridges | Historic Structures | Railroad Bridges | Inspection and Load Ratings | Geospatial and Asset Management | sUAS (Drones)

Greenman-Pedersen, Inc. (GPI)

Booth #: 203

Website: www.gpinet.com

Founded in 1966, GPI is a leading engineering consulting firm that specializes in the innovative design and construction of transportation infrastructure and building projects. Our experts provide comprehensive engineering, design, planning, and construction management services to a wide variety of government agencies, municipalities, institutions, industries, corporations, private organizations, and developers.
Services: Bridge Engineering, Building Systems Engineering/MEP, Civil and Site Engineering, Construction Management, Environmental/Sustainability, GIS/Asset Management, Highway Engineering, Planning & Urban Design, Protective Coatings, Survey/Mapping, Traffic Engineering, Water/Wastewater.

GWY, LLC

Booth #: 208

Website: https://www.gwyinc.com

Since 1975, GWY has been a global leader specializing in the sales, rental, repair, and calibration of installation tools for structural bolts. Our Turn-of-Nut (TN) wrenches are custom designed in partnership with the global leader in electric tool companies, TONE. Combining our decades of experience in bolt fastening with TONE's years of quality wrench manufacturing, we have created a wrench that meets the high standards of the federal government for structural fastening. Our other product lines include the popular shear wrenches for TC bolts, torque wrenches, bolt tension calibrators, hydraulic products, and safety equipment.

HRC - Headed Reinforcement Corporation

Booth #: 212

Website: www.hrc-usa.com

Hydro Technologies / Modified Concrete Suppliers

Booth #: 115

Website: www.hydro-technologies.com

Due to current labor shortages, silica fume safety requirements and with bridge projects needing to be done faster than ever , we all need to PUT AWAY THE JACKHAMMERS. Hydro-Technologies, Inc has been providing hydrodemolition services, which replaces the

Infrasense Inc.

Booth #: 313

Website: https://www.infrasense.com

Jakob, Inc.

Booth #: 114

Website: https://www.Jakob-usa.com

Kistler Instrument Corporation

Booth #: 422

Website: https://www.kistler.com

Klaas Coatings North America LLC

Booth #: 303

Website: https://www.klaascoatings-northamerica.com

Manufacturer of Si-Rex03 Silicone Resin Emulsion Paint (SREP) coating system for concrete and masonry substrates.
Coating can extend service life of structures via 1] active water repellency yet 2] high breathability so entrapped moisture can outgas.

Proven protection and durability against weathering including freeze/thaw and resilience to UV exposure.
Use of only inorganic pigments for long-lasting fade resistant colors.

AASHTO NTPEP Concrete Coating Systems (CCS) evaluated.
NYSDOT | Coating Type Protective Sealers 717-04
PennDOT | Protective Coating System for Concrete 1045.2(a)
TxDOT | Surface Finishes for Concrete Item 427
WVDOH | Concrete Protective Coatings 707.016.001

KTA-Tator, Inc.

Booth #: 408

Website: https://kta.com

KTA-Tator, Inc. was the first Coating Inspection Firm qualified under SSPC QP-5. KTA employs over 150 NACE Certified Inspectors and 70 CWI inspectors across the globe. In addition to our coating inspection services, KTA offers cathodic protection inspecti

LARSA, Inc.

Booth #: 302

Website: www.larsa4d.com

LARSA 4D provides unrivaled solutions for the design and analysis of steel girder, cable-stayed, precast, segmental, rail, and other bridge forms within a single environment. LARSA's flagship product, 4D BRIDGE PLUS, is the most trusted software for compl

LeJeune Bolt Company

Booth #: 314

Website: https://www.lejeunebolt.com

LeJeune Bolt is the leading international supplier of structural fasteners and tools and your source for ASTM F3148 TNA Fastening System. With the approval of the Combined Method of installation in the 2020 edition of RCSC "Specification for Structural Jo

LUSAS

Booth #: 400

Website: https://www.lusas.com

For over 40 years, LUSAS has helped its clients analyze and design all types of bridge and other infrastructure projects. Proven on some of the world's most iconic structures, our innovative, flexible and trusted software solution can satisfy the increasingly complex and demanding needs of clients. Our technical support is regularly cited as "best in class," and our consultancy services offer advanced technology capability through partnership.

Mapei USA

Booth #: 420

Website: https://www.mapei.com/us

Marcon Metal USA

Booth #: 322

Website: https://marconmetalfab.com

At Marcon, we engineer, build, and install complex structural solutions with uncompromising integrity. We craft high-performance metal products with precision, all within our state-of-the-art facilities. Marcon has supplied structural bearings, expansion joints, seismic devices, railings and other structural steel components for 500+ bridges.

McClain & Co., Inc.

Booth #: 122

Website: https://www.McClain1.com

McDonough Marine Service

Booth #: 324

Website: https://www.mcdonoughmarine.com

After more than 75 years, McDonough Marine Service continues Mr. McDonough's legacy as a talented, family-owned barge company, serving exceptional clients with one of the largest fleets of inland and ocean barge rentals in the United States. Our experience and passion are what make us The Barge People you can trust.

Michael Baker International, Inc.

Booth #: 100/102

Website: https://www.mbakerintl.com

Michael Baker addresses bridge design, construction and preservation challenges with innovative and sustainable solutions. We've partnered with clients on a full spectrum of bridges – from conventional-grade separations to major, complex river crossings.

MSE North America

Booth #: 221

Website: https://www.modernsafetyna.com

MST Rebar

Booth #: 412

Website: https://www.mstrebar.com

Nassau Industrial Supply

Booth #: 120

Website: https://www.nassauindustrialsupply.com

National Concrete Bridge Council (NCBC)

Booth #: 200

Website: https://www.nationalconcretebridge.org

The National Concrete Bridge Council (NCBC) is a council of allied industry organizations dedicated to quality concrete bridge construction and stewardship. Industry members include ACI, ACMA, ASBI, CRSI, EIG, ESCSI, ICRI, NRMCA, PCI, PTI, SFA and SSIG.

National Steel Bridge Alliance

Booth #: 311

Website: https://www.aisc.org/nsba

Whether you’re looking for information on improving your transportation infrastructure with structural steel or information on the construction marketplace, we have the answers you need. As we like to say, “There’s always a solution in steel.” Call 1.866.

Neenah Foundry

Booth #: 116

Website: https://neenahfoundry.com

New Millennium

Booth #: 414

Website: https://www.newmill.com/

Nucor Slyline

Booth #: 111

Website: https://www.nucorskyline.com

Nucor Corporation is the largest steel and steel products producer in North America and the largest recycler of any material in the Western Hemisphere. For more than five decades, Nucor has been built on the sustainable model of producing steel with a low

OpenBrIM Platform

Booth #: 104

Website: www.openbrim.org

Taking complexity out of digital/brim delivery! OpenBrIM is the world's first and only on-cloud, collaborative parametric information modeling platform that combines 3D modeling, FEA, CAD, code check, load rating, inspection, asset management and more in your web browser. Not only do we provide high ROI on resources by automation, reusability, and interoperability but we also provide flexibility by customized workflows and dedicated engineering support. Having industry-leading customers and the OpenBrIM community, we are the pioneers of digital transformation and innovation. Try for free in your web browser!

Pennoni

Booth #: 308

Website: https://www.pennoni.com

Pennoni, a multidisciplinary consulting engineering firm founded over 50 years ago and based in Philadelphia, offers innovative solutions across various fields, including design, land planning, and asset management. With over 40 offices, they help clients and communities adapt to evolving technologies for diverse projects worldwide. Visit www.pennoni.com for more information.

Perryman Company

Booth #: 301

Website: https://www.perrymanco.com

Perryman Company is a vertically integrated producer of specialty titanium products. Our operations include melting, forging, and fabrication to finished products. Perryman supplies and services customers in the aerospace, medical, infrastructure, consumer, recreation, and 3D printing/additive manufacturing markets worldwide. Perryman company is headquartered in Houston, Pennsylvania. Company offices are located in Philadelphia, Los Angeles, Buffalo, London, Germany, Zurich, Tokyo, and Xi'an. Perryman Company is pioneering the efforts to promote the use of titanium to repair and strengthen concrete bridges.

Polyvantis

Booth #: 417

Website: https://www.acrylite.co/products/brands/acrylite-soundstop

POLYVANTIS is a global leader in multi-material sheet and film solutions, built on a legacy of tradition, experience, and innovation. With world-renowned brands like ACRYLITE® in the Americas and PLEXIGLAS® internationally, POLYVANTIS delivers high-performance acrylic and polycarbonate products that set the standard for quality and reliability. Designed to meet the demands of modern infrastructure, products like ACRYLITE® Soundstop offer exceptional sound reflection, impact resistance, and long-lasting clarity. Driven by a commitment to excellence, POLYVANTIS continues to push the boundaries of material technology, earning the trust of customers worldwide as the foremost provider of advanced sheet and film solutions.

Proto X-ray Diffraction

Booth #: 424

Website: www.protoxrd.com

R. J. Watson, Inc.

Booth #: 201

Website: www.rjwatson.com

R. J. Watson designs, manufactures, and markets bridge bearings, seismic isolation devices, bridge expansion joints, bridge deck waterproofing membranes, and bridge strengthening and corrosion mitigation products.

RBC Bearings

Booth #: 124

Website: www.rbcbearings.com

RBC Lubron Bearing SystemsLubron designs and custom manufactures self-lubricating bearings for demanding applications and tough operating conditions. Our products are used in some of the largest projects and most critical applications on the planet, including: power generation (wind power, hydroelectric, nuclear), bridges, buildings, subsea oil production, missile defense systems, large construction cranes, and earthquake seismic isolation for building and skyscrapers.

Resensys LLC

Booth #: 209

Website: https://www.resensys.com

Resensys offers wireless bridge monitoring systems. Resensys sensors, known as wireless SenSpot, provide a battery life of 10 years. They can monitor strain, acceleration, tilt, inclination, and temperature on bridges. Resensys systems have been utilized

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Roads & Bridges

Booth #: 415

Website: www.roadsbridges.com

As the leading trade publication and website covering the transportation construction market, Roads & Bridges reaches 60,000 contractors, DOTs officials (local, county, state & federal), and consulting engineers.

RWDI

Booth #: 309

Website: https://www.rwdi.com

RWDI’s bridge aerodynamics team helps clients design ambitious bridges that are safe, resilient, comfortable, and structurally efficient. With 50+ years of wind engineering expertise, we combine advanced wind tunnel testing, proprietary technical capabilities, and site-specific climate insight to deliver meaningful performance enhancements. Our rigorous analysis and clear recommendations help reduce aerodynamic risk, improve bridge performance, and support better design decisions for structures exposed to complex wind, ice, snow, and multi-hazard conditions.

Scarbrough Global

Booth #: 312

Website: https://scarbroughglobal.com/

Scarbrough Global is a full-service logistics provider helping businesses simplify global trade. From freight forwarding and customs brokerage to warehousing, fulfillment, transportation, and consulting, Scarbrough manages every step of the supply chain. Founded in 1984, the company combines industry expertise with innovative technology to deliver efficient, compliant, and customer-focused solutions worldwide.

Scougal Rubber Corp.

Booth #: 211

Website: https://www.scougalrubber.com

Scougal Rubber manufactures bearing devices for bridge applications including steel reinforced elastomeric pads, plain unreinforced elastomeric pads, PTFE slide bearings, steel rocker assemblies, steel pin assemblies and many others. Scougal Rubber has ex

Sensequake

Booth #: 319

Website: https://www.sensequake.com

The world leader in data-driven structural analysis and health monitoring technologies.

Combining sensors, AI, and advanced data analysis, software and hardware provide accurate structural evaluations of assets. A turn-key solution for bridges, buildings, ports, dams, and worldwide infrastructure.

Patented technology performs in-depth integrity evaluations, monitoring structures for aging or natural hazards using highly-sensitive ambient vibration sensors. Without needing structural drawings or material properties, smart databases determine integrity changes over time.

Sika Corporation

Booth #: 401

Website: https://www.usa.sika.com

Sika is a specialty chemicals company with a leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing, and protecting in the building sector and motor vehicle industry. Sika has subsidiaries in

Sixense, Inc.

Booth #: 110

Website: https://northernamerica.sixense-group.com/

Sixense provides distinct tools that improve knowledge of infrastructure condition through asset management software, sensor technology and instrumentation, and nondestructive testing. Our integrated solutions unify inspection and monitoring data to optim

Sky Climber Services, LLC

Booth #: 218

Website: https://skyclimber.com/product/flydeck/

Sky Climber is a global manufacturer of temporary and permanent suspended access systems with over 70 years of engineering expertise. We design solutions for complex work at height, including horizontal access solutions for bridge inspection, maintenance, and rehabilitation. Our Fly Deck system, along with modular platforms and rigging, enables safe, efficient access to hard-to-reach bridge structures, supported by field-proven performance and engineered reliability.

Spanweld Bridges

Booth #: 121

Website: https://www.spanweldbridges.com

Specializing in heavy duty, modular, portable, temporary, welded steel bridges. Engineer stamped bridges for up to 75 feet span and 50 tons rating. Easy install in a matter of hours and three piece modular design for easy loading and shipment.

St. Louis Screw and Bolt/ Haydon Bolts

Booth #: 109

Website: www.slbolt.com

Taylor Devices, Inc.

Booth #: 125

Website: https://www.taylordevices.com

Texas Department of Transportation

Booth #: 323

Website: www.txdot.com/careers

Tourney Consulting Group

Booth #: 223

Website: https://tourneyconsulting.com

V&S Galvanizing

Booth #: 210

Website: www.Hotdipgalvanizing.com

V&S Galvanizing is a galvanizing service provider that believes in safely doing what we say we'll do and continually investing in our people, our equipment and our experience to ensure total customer satisfaction.

Our never say no, get it done attitude

Valmont Coatings

Booth #: 113

Website: https://www.valmontcoatings.com

Valmont Structures engineers and manufactures advanced infrastructure solutions, specializing in press brake-formed tub girders (PBTGs) for accelerated bridge construction. Using high-strength steel and precision press brake technology, our PBTGs deliver superior structural performance, faster installation, and reduced lifecycle costs. Backed by deep engineering expertise and state-of-the-art manufacturing, Valmont empowers engineers to meet today's infrastructure demands with efficient, durable, and innovative solutions.

Vector Corrosion Technologies

Booth #: 103

Website: https://www.vector-corrosion.com

Vector Corrosion Technologies has provided concrete preservation over the last 50 years. With the largest range of cathodic protection technologies and services to control concrete corrosion, Vector offers an innovative solution for any budget and service

Viathor, Inc.

Booth #: 107

Website: https://www.viathor.com

Viathor, Inc. creates top quality, user friendly, bridge design and analysis software. VBent is a fully interactive substructure design tool for pier caps, columns and footings, for both non-integral and integral (monolithic) piers. VBent can read PAPIER input files, and has been approved and accepted for use by PennDOT. VBridge is a superstructure design program for reinforced or cast-in-place post-tensioned concrete bridges. VBridge can compute live and other loads for any bridge configuration and support type (integral and non-integral piers). VBridge analyzes 3D bridge models, and creates VBent input files by sharing geometry and load information.

VSL Civil Construction

Booth #: 222

Website: https://www.vslcivil.com

STRUCTURAL TECHNOLOGIES is firmly committed to its mission of making structures stronger and last longer. We develop and integrate products, engineering support, repair and maintenance services to provide value-added solutions to owners, engineers and con

WireCo

Booth #: 300

Website: https://www.wireco.com

WireCo is the market leader in rope manufacturing, chosen to supply cables for the world’s highest profile bridge and stadium projects. With a comprehensive range of trusted global brands, WireCo delivers unmatched technical expertise and innovation as we

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