MARCH 2018 V. 40 No. 3

Concrete international

The Magazine of the Concrete Community

Decorative & Architectural Concrete

American Concrete Institute

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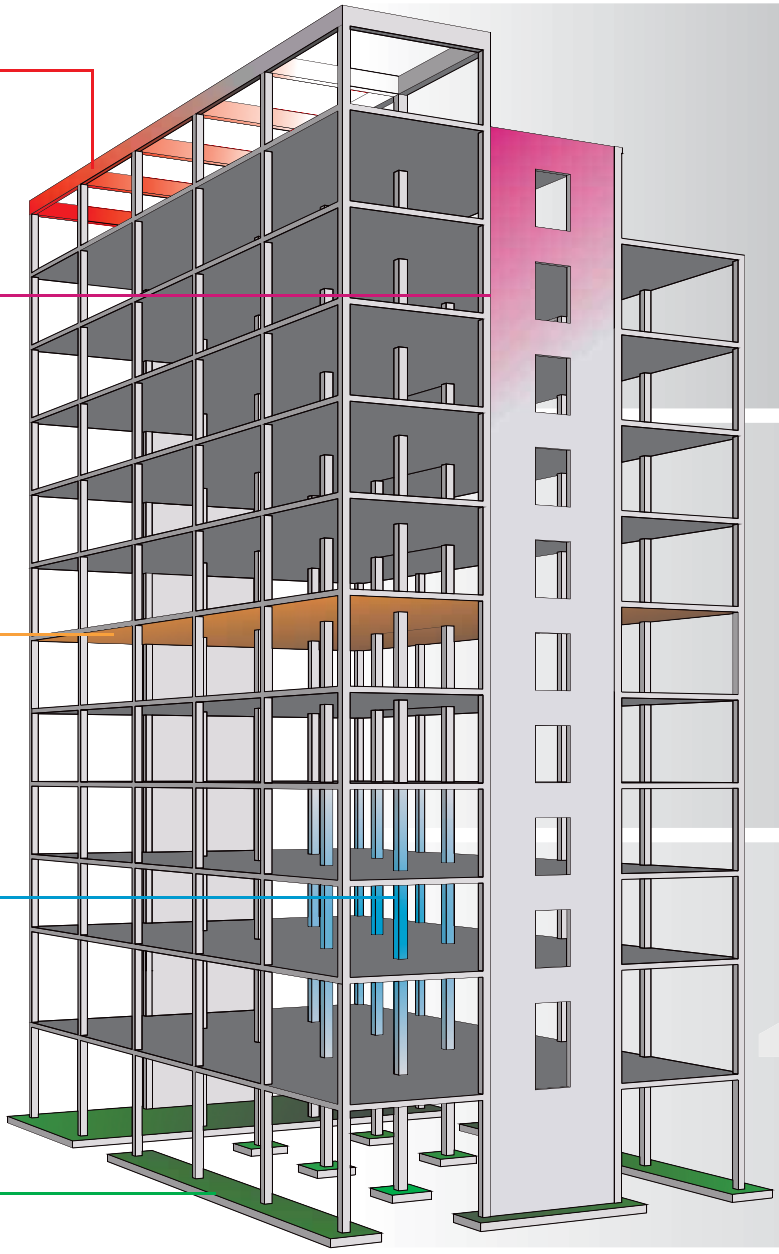

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Concrete Essentials Seminar Series

Presented by the American Concrete Institute

March 26-27, 2018, Dubai, UAE

Held during The Big 5 Heavy

The American Concrete Institute will host the Concrete Essentials Seminar Series at The Big 5 Heavy show in Dubai, UAE, March 26-27, 2018. The 2-day seminar series will give participants an in-depth look into topics including concrete durability, repair, self-consolidating concrete, and more. Additionally, the seminar series will feature a three-part course on the ACI Building Code Requirements for Structural Concrete which—under a recently signed agreement with the Gulf Cooperation Council Standardization Organization—will be used to develop a Gulf Building Code.

For more information on how to participate in the Concrete Essentials Seminar Series and The Big 5 Heavy, visit **www.thebig5heavy.com**.

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MARCH 2018 V. 40 No. 3

DECORATIVE & ARCHITECTURAL CONCRETE

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Reston Station OB1 is a mixed-use building located in Reston, VA, featuring exposed concrete columns in its architectural design. Thornton Tomasetti provided structural engineering for the 16-story office tower that showcases a diagonalized, exposed concrete exoskeleton that functions as both a gravity force- and lateral force-resisting system. For more information on the design and construction of Reston Station OB1, see p. 36 *(photo courtesy of R. Wayne Stocks, Managing Principal, Thornton Tomasetti).*

departments

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IN Ci

Coordinated Concrete

When structural systems are integral to the aesthetics of a building, it's safe to assume that multiple disciplines worked closely together to ensure constructability. This month's cover story (p. 36) highlights such a project. Even a cursory reading reveals the application of many of the 12 principles of constructability named by Sidwell and Mehrtens.* Examples include:

- Integration and construction knowledge—as evidenced by the detailing of the post-tensioning tendon anchorages and the exposed columns;
- Team skills—the architects, structural engineers, and contractors clearly worked as a team;
- Corporate objectives—the team understood the client's objective to create a landmark building;
- Available resources—the team matched the technology of the design solution (reinforced and post-tensioned concrete) to the skills and resources of the region;
- Program—while bold, the overall concept for the project was realistic;
- Construction methodology—the design team recognized the need to correct for movement of the building as the structure height increased;
- Specifications and construction innovations—construction efficiency was enhanced by using self-consolidating concrete in heavily congested composite columns; and
- Feedback—future projects can be enhanced by post-construction analysis.

On the latter point, the generation of an article is a practical way for a project team to reflect on a project and capture key lessons. The authors are to be commended on their efforts, both on the building and on their post-construction reporting.

Rex C. Donahey

*Sidwell, A.C., and Mehrtens, V.M., "Case Studies in Constructablity Implementation," *Research Report 3*, Construction Industry Institute Australia, 1996, 49 pp.

Now Introducing

ACI Collection of Concrete Codes, Specifications, and Practices

The American Concrete Institute introduces the ACI Collection of Concrete Codes, Specifications, and Practices (formerly the Manual of Concrete Practice). With nearly 50 codes and specifications and more than 200 practices—the ACI Collection is the most comprehensive and largest single source of information on concrete materials, design, and construction.

The ACI Collection includes ACI 318-14, ACI 301, and ACI 562. The ACI Collection also covers concrete materials, properties, design, construction, reinforcement, repair, structural analysis, and innovation—plus popular topics such as slabs, formwork, masonry, and more.

The ACI Collection is available in three formats—an online subscription that is always up-to-date and includes historic editions of codes and specifications; a USB drive for convenient digital access anywhere, with or without an internet connection; and an eight-volume set of books.

Please **visit www.concrete.org** to subscribe or purchase.

	Regular Price	Member Price
Annual Online Subscription (Continuously Updated)	$795.50/year	**Guide and Reports:** FREE with ACI Membership **Standards:** $235.00/year
USB Drive	$849.50	$525.00
8-Volume Books	$1083.60	$648.96

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President's
Memo

Beyond the Farewell

Khaled W. Awad
ACI President

Writing this, my last presidential memo, is bittersweet. As your outgoing ACI President, I would like to reflect on the major milestones our Institute crossed this year—accomplishments that I believe will have a great impact on its future and on the future of our industry. These achievements would not have taken place without the years of continued advancements by the volunteers and the leadership of ACI, as well as the assiduous and intelligent efforts by staff.

I have worked or interacted first-hand with quite a number of corporations, Middle Eastern as well as international. The workforce in these for-profit establishments is generally dedicated and driven by clear goals, key performance indicators, and well-defined objectives.

Still, my takeaway from more than 33 years of interfacing with thousands of corporate employees is that we are blessed with the quality of ACI staff. I am not just hinting at their dedication and commitment to the success of ACI, or their full alignment with its vision and mission. I am specifically referring to the excellence in execution, in every single detail and each task at hand. This was the most inspiring part of my presidential journey with the Institute. I believe Excellence is a core value of ACI and not just a goal. It runs from the volunteers well into ACI headquarters in Farmington Hills, MI.

From a risk management point of view, this is one of the most valuable insurances ACI has against what the future may hold for associations in general and for the concrete industry as a whole.

There are two strategic decisions made this year by the ACI Board of Direction that were truly historic. The first one was stepping up of ACI's contribution to the ACI Foundation to an unprecedented yearly level of $500,000. This outstanding commitment to education, research, and innovation will have a substantial impact on our industry in so many ways.

The second decision is the change of mission from "*ACI develops and disseminates consensus-based knowledge*" to "*ACI develops, disseminates, **and advances the adoption** of its consensus-based knowledge on concrete and its uses.*" The implication of this change is going to affect how ACI works domestically as well as internationally, because the Institute will now assume a role well beyond "library building," to actually taking knowledge to practice. ACI will not just publish consensus-based codes, standards, and guides but will also drive adoption and acceptance of these documents to ensure that the final user is well aware and aligned to follow them.

I would also like to share with you another transformational initiative that will hopefully see light soon. As part of a comprehensive regional plan, ACI has been actively working to increase its programs and activities in the Middle East, including the potential to open the Institute's first international office in Dubai, the United Arab Emirates. I cannot list all the opportunities that this action could open for ACI and for the concrete industry globally. It is another sign of determination that the American Concrete Institute will fulfill its role of engagement, outreach, and leadership well beyond America.

Passing the gavel is an emotional moment. Still, I feel truly motivated that David Lange will be next at the helm of the Institute. David was instrumental in defining ACI Outlook 2030 when he chaired the Board task group for scripting this vision. I am sure ACI will continue its exceptional success under his leadership.

Finally, I would like to thank you for your support during this year. Many of you, in the United States and abroad, extended exceptional assistance and continuous encouragement. My trips to the ACI Chapters around the world confirmed what I already knew: ACI is one of the most esteemed concrete associations in the world.

In his or her last presidential memo, every president has expressed genuine optimism about the future of ACI. I can echo them full-heartedly, with a high level of confidence. Based on what I have experienced with ACI this year, I can assert with great sureness, and not only hope, that in the lifetime of all of you, even our youngest members, ACI will continue to be the most eminent global holder of the flag of concrete.

Khaled W. Awad
American Concrete Institute

ACI Sustaining Members

are the foundation of our success.

To provide additional exposure to ACI Sustaining Members, *Concrete International* includes a 1/3-page member profile and a listing of all Sustaining Member organizations. All Sustaining Members receive the 1/3-page profile section on a rotating basis.

Advanced Construction Technology Services
American Society of Concrete Contractors
Ash Grove Cement Company
Baker Concrete Construction, Inc.
Barrier-1, Inc.
BASF Corporation
Bauman Landscape & Construction
Boral Resources
Braun Intertec Corporation
Cantera Concrete Company
CHRYSO, Inc.
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Dayton Superior Corporation
Doka USA Ltd
Ductilcrete Slab Systems, LLC
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To learn more about the Ashford Formula, please visit their website at **www.ashfordformula.com** or call +1.801.489.5663.

Their dedication to ACI is appreciated. Their willingness to share knowledge and their continued support have greatly enhanced the progress of the concrete industry.

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To learn more about how CHRYSO products and services can benefit your business, and also about CHRYSO's commitment to Sustainable Development, please **visit www.chrysoinc.com** or call +1.800.936.7553.

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For more information, please visit their website at **www.penetron.com** or call: +1.631.941.9700.

Chapter Reports

ACI President Khaled Awad attended the India Chapter – ACI Board of Direction meeting

Presentation of the Kongu Engineering College Student Chapter – ACI banner to Thiru Venkatachalam, Founder, and S.K. Kuppaswami, Principal Professor

ACI President Awad Participates in India Chapter's Board Meeting

Prior to the International Conference on Repairs, Retrofitting, and Forensic Engineering of Built Structures, the India Chapter – ACI Board of Direction held a meeting that was attended by ACI President Khaled Awad. Awad met the chapter's newly elected directors, a young team of officers with an average age of 35, along with senior directors and past presidents who strengthen the Board with experience. The chapter's engagement with student chapters, successful training courses, apprenticeship programs, expanding technical databases, and international conferences were some of the updates shared with Awad. The directors discussed future chapter priorities and strategies and President Awad provided valuable feedback. The meeting ended with Awad expressing gratitude for the chapter's efforts to make him feel as an integral part of the India Chapter family and he wrote a sincere message in its visitors' book.

Unveiling of a commemorative plaque

Kongu Engineering College – ACI Student Chapter Inaugurated

India Chapter – ACI President Radhika Markan inaugurated the Kongu Engineering College Student Chapter – ACI at Tamil Nadu. Kongu is the newest addition to the India Chapter's increasing student chapter program. The 2-day visit included:

- Presentation of the ACI student chapter flag to the Founder and Principal of Kongu Engineering College;
- Inauguration of the laboratory where concrete-related projects of the student chapter will be conducted and judged;
- Seminar on the ACI student chapter program to over 400 civil engineering students;

Student chapter officers with India Chapter – ACI President Radhika Markan

- Presentation of certificates to student participants of the recent All-India Concrete Cube Test competition organized by India Chapter – ACI; and
- Tour of the college.

Markan appreciated the warm welcome by Kongu's management, faculty members, student chapter officers, and students. Her collaborative interaction with the 400+ civil engineering students prompted the college to invite her to return to give a motivational talk to all students on campus.

Kongu Engineering College has over 8000 students enrolled in various disciplines of engineering, architecture, and other technical courses. The student chapter programs will provide learning through research and development projects, practical exercises, and interaction with global concrete experts.

Workshop on Revised Seismic Codes at Sanjay Ghodawat University

The Sanjay Ghodawat Group of Institutions (SGI) Student Chapter – ACI organized a national workshop on "Revised Seismic Codes – Impact on Structural Design, Construction and Safety of Buildings" on December 18-19, 2017, at Sanjay Ghodawat University, Kolhapur, Maharshtra, India. More than 50 structural consultants and 30 faculty of the civil engineering department attended the workshop. Katta Venkataramana, Professor of Civil Engineering, National Institute of Technology Karnataka (NITK), Surathkal, Mangalore, commenced the program. The program's objective was to familiarize participants with the revised seismic building code and the practices of ductile detailing of reinforced concrete structures.

The program provided an overview of IS 1893:2016, Earthquake Resistant Design of Structures, and the impact of IS 13920:2016, Ductile Design and Detailing of Reinforced Concrete Structures Subjected to Seismic Forces—Code of Practice. The four sessions included:

- Major changes in detailing of reinforced concrete structures in the revised seismic code, presented by Venkataramana;
- Design and detailing of RC elements by using IS 13920:2016, led by Chetan Patil, Assistant Professor, SGI, Kolhapur. He discussed major changes in the revised ductility code and provided examples of design and detailing of RC beam elements complying with the revised code;
- Impact of IS 1893 (Part 1):2016 on design of RC structures, led by Manish Kumar, Indian Institute of Technology Bombay, Mumbai. He presented major changes and provided design scenarios using examples; and
- The need for performance-based design, led by V.S. Patil, Associate Professor, SGI, Kolhapur. He suggested that performance-based design should be incorporated during revision of the seismic code.

V.A. Raikar, Honorable Vice Chancellor, Sanjay Ghodawat University, welcomed Manish Kumar

Knowledge to Practice:

Concrete Research Council Announces Shear Strength Research Product

The ACI Foundation's Concrete Research Council (CRC) announced the completion of a new research product: "CRC 80: Reexamination of Punching Shear Strength and Deformation Capacity of Corner Slab-Column Connection." This study examined the effects of slab flexural reinforcement on the punching shear strength and deformation capacity of corner slab-column connections without shear reinforcement. Min-Yuan Cheng, Assistant Professor at National Taiwan University of Science and Technology, served as the project's principal investigator. The project was sponsored by the CRC and the Ministry of Science and Technology, Taiwan.

"Punching shear strength and deformation capacity of slab-column connections have been extensively studied previously," stated Cheng. "However, several controversial issues still exist for the applications of the code provisions, particularly on the corner connections. This research dives deeper into this area. The findings from our testing combined with previous research will help to move the concrete industry forward."

This study included tests of six corner slab-column specimens under combined gravity loading and lateral displacement reversals. Primary test parameters included slab flexural reinforcement ratio and gravity shear ratio (the quotient of the direct shear due to gravity load and the nominal punching shear strength). Results from the new study and past studies indicate that punching shear strength and deformation capacity per ACI 318-14 are not conservative for corner slab-column connections. The researchers address this by proposing a new shear strength model. More information on this and other ACI Foundation-sponsored research, including final reports, can be found at **www.acifoundation.org/research**.

ACI Foundation Awards

The ACI Foundation honored three ACI members with awards for their outstanding contributions in research and innovation.

W. Jason Weiss, FACI, Oregon State University, received the Robert E. Philleo Award, given in recognition of the advancement of concrete technology through student advising, exemplary service to the profession, and innovative research on shrinkage-reducing admixtures, internal curing, material transport characterization using the formation factor, freezing-and-thawing modeling, and deicing salt damage.

Crack pattern in corner slab-column connection at 1.25% drift (Fig. 4.43 from Final Report to the ACI Foundation: CRC 80)

Conrad Paulson, FACI, Wiss Janney Elstner Associates, Inc., is the recipient of the Arthur J. Boase Award, given in recognition of exceptional work leading to the development and acceptance of high-strength reinforcing steel for concrete construction and its adoption into codes and standards.

Michael M. Sprinkel, FACI, Virginia Transportation Research Council, was chosen for the Jean-Claude Roumain Innovation in Concrete Award in recognition of significant research and implementation of innovative technologies in concrete materials, particularly development of epoxy and polymer overlays for bridge deck protection and other construction innovations that have enhanced the concrete restoration and repair industry.

Ann Daugherty is the Director of the ACI Foundation, where we strive to improve the concrete industry by funding and fostering critical research and new technologies, and by integrating the younger generation into our industry. For more information, contact ann.daugherty@acifoundation.org.

Have an idea for research that will benefit the concrete industry or support an ACI document or code change? Visit **www.acifoundation.org/research/suggest-research.aspx** and fill out an online concrete research need form.

News

ACI Signs International Partnership Agreement with Egyptian Engineers Syndicate

As part of its international initiative to seek opportunities to advance global outreach, ACI recently completed an International Partnership Agreement with the Egyptian Engineers Syndicate. This new agreement formalizes the organizations' efforts to collaborate and cooperate through mutual exchanges of technical expertise. International Partners work with ACI to increase access to information to engineering community, professionals, and experts worldwide.

The Egyptian Engineers Syndicate, located in Cairo, Egypt, is an advisory engineering organization with over 700,000 members. The Egyptian government is working to update its building code (Egyptian Code of Practice) to ACI 318-14, Building Code Requirements for Structural Concrete. Last year, ACI entered into an agreement with the Gulf Cooperation Council Standardization Organization to develop a Gulf Building Code. Both agreements show that ACI is an increasingly important source of concrete knowledge in the Middle East/North Africa (MENA) region.

CGE Energy Helps ACI Set the Standard for Sustainability

CGE Energy, Inc., recently completed another phase of a comprehensive CGE Sustain project at ACI's Farmington Hills, MI, headquarters. As the main code-writing body for concrete in the United States, ACI not only recognized the need for addressing sustainability in the standards it produces, but also strived to lead by example by minimizing its environmental footprint.

"At the American Concrete Institute, we are always advancing and staying at the forefront of the industry's innovation," said Ronald Burg, ACI Executive Vice President. "CGE Energy offered a comprehensive approach to energy and they delivered a solution that made sense for our entire energy system, not just one-off upgrades. Compared to other ways to fund the project, their Sustain program made the process straightforward and was fiscally sound."

CGE Energy developed recommendations for ACI based on its existing energy systems and use history. ACI then implemented the recommendations to upgrade its interior and exterior lighting to energy-efficient LED lighting as well as install 90 kW of solar panels—enough to cover the entire roof of the building. An additional phase of the project will include a 50 kW combined heat and power natural gas generator, which is to be installed in the coming months. Installation of a wind turbine is also being planned.

To implement this project, ACI relied on CGE Energy's "Sustain program," a 20-year sustainability program that did not require new capital, but reallocated ACI's previously budgeted—and underused—energy expenses. As a result, ACI's utility bills are reduced each month, and energy savings fully pay for the program.

Bryan Zaplitny, President and CEO of CGE Energy, Inc., noted that, "When the project is complete, ACI will reduce its energy consumption by almost 15 million kWh over the next 20 years. This reduces their carbon footprint by over 24 million pounds of CO_2, the equivalent of planting 13,200 acres of trees."

Industry's Most Influential People of 2018

At the 2018 World of Concrete in Las Vegas, NV, *Concrete Construction* and *The Concrete Producer* presented its annual Most Influential awards. ACI members were among the honorees. For their impactful activity, Bill Palmer, editorial director of Hanley Wood's Commercial Construction Group, which includes both magazines, recognized:

- **Scott Anderson**, FACI and Past President of the American Society of Concrete Contractors (ASCC), for helping improve communication between designers and contractors. In 2017, ACI Committee 117, Tolerances, became a joint committee with ASCC;
- **Robert Garbini**, President of the National Ready Mixed Concrete Association (NRMCA), for reclaiming the low- to mid-rise building market for concrete and steel. The NRMCA Build with Strength program is a coalition of architects, builders, engineers, and others that promotes concrete construction by providing free design and technical assistance;
- **Frances Griffith**, FACI, Chair of the ACI Educational Activities Committee, for leading the efforts to revamp ACI's educational programs. ACI University online learning covers a wide range of industry topics and the certificate program demonstrates expertise upon completion;
- **Ozinga Brothers**, Chicago, IL-area concrete producer, for its promotional efforts to enhance the image of construction and concrete to the community; and
- **John Ries**, Technical Director at the Expanded Shale, Clay and Slate Institute, for promoting internal curing using saturated lightweight aggregate.

Deere's Second Annual Community Enhancement Contest

Building upon the success of last year's contest, John Deere will hold its second "Small Machines. Big Impact." contest. The contest encourages construction contractors, landscapers, farmers, and rental industry professionals across the United States to share how they would make a positive difference in their communities if they were to win a new John Deere G-Series machine. The entrant with the most impactful project idea will win his/her choice of a John Deere

G-Series skid steer or compact track loader (CTL) and one Worksite Pro™ attachment.

"The overwhelming response to last year's contest showed us just how many people are out there making a positive difference in their communities—from building a community pool, assisting with disaster cleanup efforts, or creating a neighborhood garden," said Graham Hinch, Division Manager, John Deere Commercial Worksite Products.

Through March 16, 2018, interested parties are invited to submit an entry detailing the impact they would make in their community with the power of a G-Series skid steer or CTL. Deere & Company personnel will select a group of finalists, and the public will help select the winner by voting online from June 4 to 24, 2018. The grand prize winner of the contest will be announced on July 9 at the 2018 John Deere Classic.

The winner will select a model from the full portfolio of John Deere small-, mid-, and large-frame G-Series skid steers and CTLs. Second- and third-place winners will win a yearlong lease on a G-Series skid steer or CTL from John Deere Financial.

"Winning last year's 'Small Machines. Big Impact.' contest had a huge impact on our small community," said Eric Moores, a high school building trades instructor in Woodbine, IA. "The Deere compact track loader is helping my students learn skills they can use for the rest of their lives, and the contest had a very unifying impact on our community as a whole. It has really made a positive difference."

Visit **www.deere.com/impact** for more information.

U.S. Economy, Tax Reform, Infrastructure Key Drivers of Construction Demand in 2018 and Beyond

Economic momentum supported by tax reform and federal infrastructure programs will play key roles in the demand for concrete construction in the years ahead, said Ed Sullivan, Portland Cement Association (PCA) Senior Vice President and Chief Economist. At a press conference during the 2018 World of Concrete, Sullivan offered a glimpse at the association's upcoming Spring Forecast for cement production and concrete construction.

Sullivan noted the strong economy comes in context of continued strain to find skilled workers, including those needed for construction projects. Weather conditions and other economic factors prompted PCA to revise its 2017 Fall Forecast down slightly, though its fundamental assessments pertaining to the economy, construction markets, and cement consumption remain on target.

"There is little doubt that the near-term outlook for construction and cement consumption in 2018 and 2019 remain favorable," he said. "Strengthening economic conditions, with the addition of fiscal stimulus, and in the context of already low unemployment could awaken inflationary pressures. Down the road, this could lead to an even more stringent monetary policy, leading to an acceleration in interest rate increases and an eventual cooling of construction markets. If this scenario plays out, it will likely take time to gestate and not materialize to a significant degree until after 2019."

The PCA Spring Forecast will be released during the first week of March of 2018. PCA's Market Intelligence Group forecasts are used by construction industry executives to understand the direction America's economy is headed, which in turn impacts their businesses.

For more information, including other PCA Market Intelligence forecasts and information, visit **www.cement.org/economics**.

World of Concrete Hits 9-Year High

World of Concrete (WOC) 2018 was the 43rd edition and the largest show in 9 years. The event drew 58,222 registered professionals and featured more than 1567 companies (including 302 brand new companies) exhibiting across more than 747,411 net ft^2 (69,440 m^2) of exhibit space. "Having our largest event in 9 years proves that the construction sector is going strong worldwide. Participants, both domestic and international, experienced the very best the industry has to offer in terms of suppliers, products, services, and education, and we look forward to an even larger event at WOC 2019," said Jackie James, Group Director, WOC.

WOC established the Bob Weatherton Award to honor Weatherton's contributions to the concrete industry. The award includes a $2500 scholarship and a $200 gift card. At WOC 2018, the award was presented to Damien Bonis during the Concrete Industry Management (CIM) National Board Meeting. Bonis attends California State University, Chico, Chico, CA, and his winning presentation was "A Concrete Advantage: How the CIM Program Fosters Unique Research and Internship Opportunities." The International Buyer Program at WOC featured construction market and industry specialists from the U.S. Commercial Service. A special Export Achievement Certificate was presented to Verti-Crete LLC by the U.S. Commercial Service for the company's contribution and recent success in international trade.

WOC 2019 will be held January 22-25; Seminars 21-25, at the Las Vegas Convention Center.

CIM Holds Record-Breaking Auction at World of Concrete

The National Steering Committee (NSC) for the Concrete Industry Management (CIM) program—a business intensive

program that awards students with a 4-year Bachelor of Science degree in Concrete Industry Management—raised more than $1.1 million in gross revenue at its annual auction, held in conjunction with the World of Concrete on January 24, 2018.

"The 2018 World of Concrete Auction was our best ever," said Mike Philipps, CIM Auction Committee Chairman. "The results of this Auction are indicative of the high value the concrete industry places on the CIM program. We had a record in terms of the value of donated items and attendees at the Auction that helped make this year's event a tremendous success."

The signature item this year was a Mack Granite® Axle Back model mounted with a McNeilus M77 paver mixer, donated by Mack Trucks, Inc., and McNeilus Co., a Division of Oshkosh Truck. An addition to the list of industry items donated to the annual Auction was a 2018 T880S bridge formula truck with an 11-yard bridge formula rear discharge BridgeKing mixer. This vehicle was donated by Con-Tech Manufacturing, Inc. and Kenworth and Kenworth of Central Florida.

In addition to the live auction, a silent auction was also held. This year, CIM had record proceeds from the silent auction. Auction items included cement, concrete saws, drills, mixers, vibrators, safety equipment, screeds, fiber transport systems, dust collectors, decorative concrete tools, water meters, pumps, generators, training sessions, reference books, laptop computers, sports travel packages, and golf and vacation travel packages.

"We were blessed to have the incredible support of the World of Concrete show management, Informa, and Ritchie Bros. Auctioneers," said CIM Marketing Committee Chairman Brian Gallagher. "We thank the many companies such as McNeilus Companies, Inc.; Mack Trucks, Inc.; Con-Tech Manufacturing; Kenworth; and Kenworth of Central Florida and the numerous companies that donated items to the auction to make it a complete success."

Again this year, NSC partnered with GiveSmart, a user-friendly bidding technology service providing customized auction and event solutions

primarily for nonprofit organizations. With GiveSmart, participants could register for the auction, preview silent and live auction items, make donations, and bid online on their favorite silent auction items.

CRSI Releases Low-Rise Reinforced Concrete Buildings Initiatives

The Concrete Reinforcing Steel Institute (CRSI) has produced a comprehensive technical publication titled *Design and Detailing of Low-Rise Reinforced Concrete Buildings*. Along with the release of the publication, CRSI has also developed a webinar series and a university capstone course using the book's content.

The publication provides step-by-step design procedures and design aids that make designing and detailing reinforced concrete members simpler and faster. The requirements of the 2014 edition of Building Code Requirements for Structural Concrete (ACI 318-14) are presented in a straightforward manner with emphasis placed on the proper application of the provisions in everyday practice. Although the primary focus is on low-rise buildings, much of the content can be used in the design of buildings of any size. The publication is available for purchase as a printed softcover book or a downloadable PDF at **www.crsi-webstore.org**.

The webinar series can be viewed during the selected live broadcast dates or as on-demand videos. The series runs through August 2018. The webinars can be found in the CRSI e-learning portal, Rebar U, at **www.rebar-u.org**.

Specifically, for university educators, the capstone course was developed as an all-encompassing 16-week program. Students will acquire an understanding of the design phases that occur when working in an engineering office: schematic, design development, construction documents, and construction administration. Classroom resources include a course outline, presentations, quizzes with answer keys, and reference publications/documents. For more information on the capstone course, contact David Fanella, CRSI Senior Director of Engineering, at dfanella@crsi.org.

ACI's New Fellows

Members to be awarded at The ACI Concrete Convention and Exposition – Spring 2018

ACI will recognize 24 members who have been honored with the rank of Fellow of the American Concrete Institute (FACI) at The ACI Concrete Convention and Exposition in Salt Lake City, UT. The new Fellows will be introduced during the Opening Session and Keynote Address Presentation on March 25, 2018. This spring, the Concrete Convention is scheduled for March 25-29, 2018, at the Grand America and Little America Hotels. More information can be found at **www.aciconvention.org**.

As stated in the ACI bylaws, a Fellow is an individual who has made "outstanding contributions to the production or use of concrete materials, products, and structures in the areas of education, research, development, design, construction, or management." The Fellows Nomination Committee selects those to be considered for the award, and then forwards its recommendations to the Board of Direction for final action in the fall. Nominations may come from the committee itself, from local chapters, from the International Advisory Committee, or by petition signed by at least five current ACI members.

The ACI Board of Direction approved the nominations of this latest group of honorees in fall 2017. Including the new honorees, 638 members are current Fellows of the Institute. Rank of FACI, was first established by the Institute in 1973.

ACI's new Fellows are:

Alvarez-Valencia

Antommattei

Luis Alvarez-Valencia is a Civil Engineer from Universidad de San Carlos de Guatemala, Guatemala City, Guatemala, where his studies focused on concrete, concrete pavements, and industrialized housing. He previously served as General Director of the Instituto del Cemento y del Concreto de Guatemala (ICCG). During his professional career, he has worked as a builder, inspector, and general manager of aggregate and concrete companies.

Alvarez-Valencia has presented at many national and international conferences related to various topics within the concrete industry, especially focused on compliance with standards and technical specifications. He is a member of ACI, Vice President of the Guatemala Chapter – ACI, member and Secretary of Interamerican Federation of Cement (FICEM), member of ASTM International, and member and Vice President of Latin American Association of Quality Control and Pathology (ALCONPAT). Alvarez-Valencia is Past Vice President of the Iberoamerican Federation of Ready Mixed Concrete (FIHP). He is also a member of the Guatemala National Council of Normalization (COGUANOR), where he promotes standardization of construction materials in Guatemala.

Alvarez-Valencia is very active in developing training programs focused on concrete technology for civil engineering and architecture students. He promotes establishing ACI student chapters at universities in Guatemala; 15 student chapters currently exist in Guatemala that develop training activities and competitions. Alvarez-Valencia also promotes ACI certification programs in Guatemala, where there are currently more than 500 certified technicians. Six ACI certification programs have been developed in conjunction with Guatemala local sponsoring groups and ICCG. He received the 2014 ACI Chapter Activities Award.

Oscar R. Antommattei is a Senior Concrete Engineer with Kiewit Corporation, Englewood, CO, where he manages the Materials Division. He provides technical services on concrete materials, production, and construction, promoting the use of concrete best practices. Prior to joining Kiewit, he worked for a world-recognized concrete producer, a general contractor, and a leading engineering firm managing projects in the United States, Canada, Mexico, and Puerto Rico.

Antommattei has over 15 years of experience in concrete materials, engineering, and construction. His work is focused on mega-projects, with emphasis on optimization of concrete mixtures, value engineering, constructability and quality reviews, preparation of thermal control plans, analyses of


Bentz


Cardona A.


Flood


Gaytan-Covarrubias


Halstead


Kleinhans

service life and durability, troubleshooting of concrete production and/or construction, and forensics.

Antommattei is Chair of ACI Committee 305, Hot Weather Concreting; Secretary of ACI Subcommittee 308-A, Curing-Guide; and a member of the ACI Convention Committee; ACI Construction Liaison Committee; and ACI Committees 207, Mass and Thermally Controlled Concrete; 231, Properties of Concrete at Early Ages; and 308, Curing Concrete; and ACI Subcommittee 301-H, Mass Concrete - Section 8. He previously served as Director of the Central Texas Chapter – ACI and is currently a member of the Rocky Mountain Chapter – ACI. Antommattei serves on technical committees of ASTM International, the American Society of Civil Engineers (ASCE), the Canadian Standards Association (CSA), and the American Society of Concrete Contractors (ASCC).

He has co-authored papers about concrete maturity, mass concrete, and architectural green concrete. In 2009, the ASCE Texas Section recognized his work on architectural green concrete.

Antommattei received his BS in civil engineering from the University of Puerto Rico at Mayagüez, Puerto Rico, in 2002, and his MS in civil engineering from Clemson University, Clemson, SC, in 2005. He is a licensed professional engineer in Texas and Nebraska.

Dale P. Bentz is a Chemical Engineer in the Materials and Structural Systems Division of the Engineering Laboratory at the National Institute of Standards and Technology (NIST) with 33 years of service. He has authored or co-authored over 350 technical papers and reports while at NIST.

He is a member of ACI Committees 231, Properties of Concrete at Early Ages; 232, Fly Ash in Concrete; 308, Curing Concrete; and 546, Repair of Concrete; and ACI Subcommittee 211-N, Proportioning with Ground Limestone and Mineral Fillers.

Bentz received the 2007 ACI Wason Medal for Materials Research and the 2015 ACI Cedric Willson Lightweight Aggregate Concrete Award. He is also an Honorary Member of ASTM International Committee C01, Cement, and a member of ASTM International Committees C09, Concrete and Concrete Aggregates, and E37, Thermal Measurements.

His research interests include relating microstructure to performance for building materials, sustainable concrete materials, and additive manufacturing (three-dimensional [3-D] printing) of concrete.

Bentz received his BS in chemical engineering from the University of Maryland, College Park, MD, in 1984; his MS in computer and information science from Hood College, Frederick, MD, in 1991; and his MA in teaching from Mount Saint Mary's University, Emmitsburg, MD, in 2013.

Omar-Darío Cardona A. is an Associate Professor at the Institute of Environmental Studies and of the Engineering and Architecture Faculty at the National University of Colombia, Manizales, Colombia, and Chief Executive Officer of Ingeniar: Risk Intelligence Ltd., Bogotá, Colombia.

He is member of ACI Committees 118, Use of Digital Technology, and 314, Simplified Design of Concrete Buildings. Cardona A. is also past President of the Colombian Association for Earthquake Engineering (1991 to 2005), which has published special publications with ACI. He has been on the Board of Directors of the International Association of Earthquake Engineering (IAEE) since 2014 and he received the 2004 United Nations Sasakawa Disaster Risk Reduction Award. Cardona A. has authored or co-authored over 230 technical papers and reports.

His research interests include seismic vulnerability and retrofitting of concrete structures, structural risk-based design, and seismic risk assessment of buildings and infrastructure.

Cardona A. received his BS in civil engineering from the National University of Colombia in 1980, and his PhD in civil engineering from the Technical University of Catalonia, Barcelona, Spain, in 2001.

Walter H. Flood IV is an Assistant Engineer and Project Manager at his family's testing and inspection business in Chicago, IL.

He has been Chair of ACI Committee S801, Student Activities, since 2011. He is a member of the ACI Chapter Activities Committee and ACI Committees 302, Construction of Concrete Floors; 327, Roller-Compacted Concrete Pavements; 363, High-Strength Concrete; and 522, Pervious Concrete. He was awarded the 2014 ACI Young Member Award for Professional Achievement. Flood is Chair of ASTM International Subcommittee C09.49, Pervious Concrete, and is active on several other ASTM International committees. He is also a member of the American Society of Civil Engineers (ASCE).

His research interests include high-strength/high-modulus concrete properties, the impact of fast-paced construction

schedules on the long-term behavior of concrete high-rise structures, and testing of roller-compacted and pervious concrete. He has been a speaker on high-strength concrete, pervious concrete, and maturity monitoring at the national and local level for ACI and other groups. Flood often participates at World of Concrete, educating attendees about pervious concrete. He is also continuing his quest to develop the perfect student concrete competition.

Flood received his BS in civil engineering from Rose-Hulman Institute of Technology, Terre Haute, IN, in 2003, and currently sits on its Board of Advisors. He received his MS in geotechnical engineering from the University of Colorado at Boulder, Boulder, CO, in 2005. He is a licensed professional engineer in Indiana and is working towards comity licensure in several other states.

Arturo Gaytan-Covarrubias has been the Certification and Sustainability Manager at CEMEX México, Mexico City, Mexico, for 14 years. He is also Treasurer of the Mexican Ready-Mix Concrete Association, Liaison Director of the Northwest Mexico Chapter – ACI, Past President of the Central and Southern Mexico Chapter – ACI, and Founder and President of the Mexican Institute for Sustainable Concrete.

Gaytan-Covarrubias is a member of the ACI Educational Activities Committee, International Certification Committee, Personal Awards Committee, and a member of ACI Committees 121, Quality Assurance Systems for Concrete; and 130, Sustainability of Concrete; and ACI Subcommittee 130-D, Rating Systems/Sustainability Tools. He received the 2012 ACI Young Member Award for Professional Achievement and the 2011 International Electrotechnical Commission (IEC) Young Professional Award. He is also a member of ASTM International.

Gaytan-Covarrubias received his BS in civil engineering from National Autonomous University of Mexico (UNAM), Mexico City, Mexico, in 2002 and his ME in quality and productivity from Monterrey Technology Institute, Monterrey, Mexico, in 2009.

Donna G. Halstead is the Managing Director of Finance and Administration at the American Concrete Institute, Farmington Hills, MI. She serves also as Treasurer for the ACI Foundation and Advancing Organizational Excellence (AOE), formerly Creative Association Management (CAM). Halstead was previously ACI's Controller and is currently the Staff Liaison for the Financial Advisory Committee and the ACI Foundation Scholarship Council.

She has been Treasurer for the Council of Engineering and Scientific Society Executives (CESSE) since 2012. Halstead previously served as Chair of the CESSE Finance and Human Resource section from 2006 to 2009. She is a past Board member of the Concrete Industry Management Program Steering Committee (2010 to 2012). She has been a speaker at numerous CESSE annual meetings, ACI chapter roundtables, and International Concrete Repair Institute (ICRI) chapter meetings.

Halstead received her BS in business administration with a dual major in accounting and finance, from Central Michigan University, Mt. Pleasant, MI, in 1989, and her MBA from Wayne State University, Detroit, MI, in 2000.

Danielle D. Kleinhans is President and CEO of the Concrete Reinforcing Steel Institute (CRSI), Schaumburg, IL. In 2011, she began at CRSI as a staff structural/bridge engineer before assuming the Managing Director role of the Epoxy Interest Group (EIG) in 2016. She has 15 years of experience in structural engineering and bridge design, as well as 6 years of trade association service. Kleinhans has held positions at the National Steel Bridge Alliance (NSBA) and CTLGroup and began her career at Modjeski and Masters, Inc.

She is a current member of ACI Committees 222, Corrosion of Metals in Concrete; 437, Strength Evaluation of Existing Concrete Structures; 440, Fiber-Reinforced Polymer Reinforcement; and Joint ACI-ASCE Committee 343, Concrete Bridge Design. Kleinhans is a past member of the ACI Publications Committee and the ACI Chapter Convention Planning Committee for the ACI Spring 2010 Convention in Chicago, which she served as Publicity Chair. She plans to become active in the Strategic Development Council and Concrete Research Council in her new role as President and

New Fellows of ACI

As approved by the ACI Board of Direction, the 24 members elevated to the rank of Fellow of the American Concrete Institute are:

Luis Alvarez-Valencia, Guatemala City, Guatemala
Oscar R. Antommattei, Englewood, CO
Dale P. Bentz, Gaithersburg, MD
Omar-Darío Cardona A., Bogotá, Colombia
Walter H. Flood IV, Chicago, IL
Arturo Gaytan-Covarrubias, Mexico City, Mexico
Donna G. Halstead, Farmington Hills, MI
Danielle D. Kleinhans, Schaumburg, IL
Steve Lloyd, Forest, VA
José Lozano Y Ruy Sanchez, Monterrey, México
Allyn C. Luke, Newark, NJ
Mark Lukkarila, Mendota Heights, MN
Mohamed Mahgoub, Newark, NJ
Michael A. Mahoney, Cleveland, OH
Kirk McDonald, Glendora, CA
Hector Monzon-Despang, Guatemala City, Guatemala
David Nau, Highland, CA
Narayanan Neithalath, Tempe, AZ
Chris Pantelides, Salt Lake City, UT
Eric Stephen Peterson, Knightsen, CA
Henry B. Prenger, Baltimore, MD
Pedro Nel Quiroga, Bogotá, Colombia
Aleksandra Radlińska, University Park, PA
Wayne M. Wilson, Suwanee, GA


Lloyd


Lozano Y Ruy Sanchez


Luke


Lukkarila


Mahgoub


Mahoney

CEO of CRSI. She received the 2015 ACI Young Member Award for Professional Achievement "for contributions to the design and use of concrete in bridges, serving as a liaison with concrete industry institutes, and for her service on ACI technical committees."

Kleinhans received her bachelor's degree in civil engineering from the University of Alaska-Fairbanks, Fairbanks, AK, in 1998, and her master's degree and PhD in civil engineering from Missouri S&T, Rolla, MO, in 1999 and 2002, respectively. She is a member of the American Society of Civil Engineers (ASCE), Precast/Prestressed Concrete Institute (PCI), and ASTM International. Kleinhans is a licensed professional engineer in Pennsylvania and Illinois.

Steve Lloyd is Owner and Founder of Lloyd Concrete Services, Rustburg, VA, and Maxxcrete, Inc., in Forest, VA. After serving in the United States Navy, he started in the concrete industry in 1973, establishing his own business in 1979.

Lloyd was named one of the 2017 four most influential people in concrete construction by *Concrete Construction* magazine. ACI Committee C640, Craftsmen Certification, recognized him for his efforts in the tradesman program in October 2017. He has also been asked to serve on the Board of the Virginia Chapter – ACI.

He is a member of the ACI Certification Programs Committee and ACI Committees C640; 302, Construction of Concrete Floors; 306, Cold Weather Concreting; and 360, Design of Slabs on Ground.

His research interests include certification of finishers and minimal-joint floor construction using concrete with steel and macro-synthetic fibers.

Lloyd graduated from E.C. Glass High School, Lynchburg, VA, in 1970, and in 1971 went on to complete Navy Diver Class A School in hard hat diving with the United States Navy. His concrete industry certifications and training achievements include Industrial Floor Finisher Dipstick Testing by the Face Company, F and D Meter Floor Testing by the Allen Face Company, Concrete Polishing Council, Rustoleum floor applications, pervious concrete applications by the National Ready Mixed Concrete Association, and steel fiber reinforcement procedures and placement.

José Lozano Y Ruy Sanchez retired in 2013 after serving more than 25 years at the Concrete Division of Cementos Mexicanos (CEMEX). He is General Manager of In Concrete Consultants, a consulting firm in Monterrey, Mexico.

Lozano has been involved in the Mexican Concrete industry since 1980, where he has served as Head of the Industrial Research Area and also as General Director of the Mexican Cement and Concrete Institute (IMCYC). While at CEMEX, he served in several positions within the Concrete Division, such as Operations Director in the Pacific and Central Area of México, Technical Director of the Concrete Division in charge of the Research and Development Area in México, and Quality Control/Quality Assurance areas. Lozano contributed to several Due Diligence and Post-Merging Integration processes for CEMEX in Colombia, the United States, Australia, Europe, and Israel from 1996 to 2007. From 2011 to 2013, he worked at the Cemex Research Group (CRG) in Switzerland, supporting the Production Processes for the Concrete Area worldwide. He participated in the first generation of Cemex/IPADE International Management Program in 1998 in Fort Lauderdale, FL.

He was President of the Mexican Ready Mixed Concrete Association (AMIC) from 2000 to 2002, and Technical Director of the AMIC Technical Committee from 1985 to 1986. Lozano is also a Past President of the Northeast México Chapter – ACI and will be President-Elect for the term of 2018 to 2020. He has been a member of the Chapter's Board, serving in various positions since 2003. The Chapter was recognized as a 2013 ACI Excellent Chapter. He is a past member of the ACI International Advisory Committee and ACI Subcommittee 318-S, Spanish Translation.

Lozano received his BS in civil engineering from the Universidad Iberoamericana (UIA), México City, Mexico, and his MBA from the Instituto Tecnológico Autónomo de México (ITAM), México City, Mexico, in 1975 and 1983, respectively.

Allyn C. Luke is an Adjunct Associate Professor at Rutgers University, Newark, NJ. He is also a consultant for the development of concrete mixtures and the testing of concrete properties and materials.

He served for 6 years as Chair of ACI Committee 214, Evaluation of Results of Tests Used to Determine the Strength of Concrete, and currently serves as Secretary. Luke is Chair of ACI Subcommittee 211-A, Proportioning-Editorial, and is a member of the ACI Student and Young Professional Activities Committee; and ACI Committees S801, Student Activities; 211, Proportioning Concrete Mixtures; 237, Self-Consolidating Concrete; 310, Decorative Concrete; 363,

High-Strength Concrete; and 522, Pervious Concrete. He has authored or co-authored many technical papers and presentations on diverse concrete topics. Luke promotes concrete to engineering students and encourages student membership and participation in ACI. He served as Director of the New Jersey Chapter – ACI for 12 years. Luke is also a member of the American Society of Civil Engineers (ASCE).

His research interests include the mechanical behavior of mechanical joints, the development of three-dimensional (3-D) printable materials, and innovative ways of quantifying the wear of materials using a biaxial testing machine.

Luke received his BA in oriental studies from Columbia University, New York City, NY, and his BS and MS in civil engineering from The New Jersey Institute of Technology, Newark, NJ, in 1976, 1988, and 1992, respectively.

Mark Lukkarila is a Principal Materials Scientist at Beton Consulting Engineers, Mendota Heights, MN, where he is integral to the development of high pozzolan replacement for high-performance concrete mixtures.

He has worked as a Petrographer for nearly 30 years. During his career in the consulting, manufacturing, and research arenas, he has served as Research Laboratory Manager and Technical Services Director in the cement industry, and as Technical Services Manager in the masonry industry. His work includes the material science aspects of binder and aggregate materials. Lukkarila's practical experience, knowledge in manufacturing, and understanding of the performance of concrete have enabled him to become a respected forensic investigator.

He is Chair of ACI Committee E701, Materials for Concrete Construction; Secretary of ACI Committees 221, Aggregates, and 225, Hydraulic Cements; past Chair of ACI Committee 221; and a member of ACI Committees C621, Cement Tester Certification; E710, ACI University Programs; 201, Durability of Concrete; 240, Pozzolans; 506, Shotcreting; and 524, Plastering. Lukkarila is also a member of ASTM International and serves on ASTM Committees C01, Cement, and C12, Mortars and Grouts for Unit Masonry. He previously served as Chair of ASTM Subcommittee C09.46, Shotcrete, and is the Task Group Chair of ASTM C294/295, Aggregate Petrography.

His research interests include cement manufacture, cement and hydration chemistry, natural pozzolans, historic masonry and concrete, shotcrete, and new product development. He has authored and co-authored seven technical papers.

Lukkarila received his BA in earth science from the University of Minnesota Duluth, Duluth, MN, in 1985.

Mohamed Mahgoub is an Associate Professor in the Department of Engineering Technology and the Department of Civil and Environmental Engineering at The New Jersey Institute of Technology (NJIT), Newark, NJ. He is the Director of the Concrete Industry Management (CIM) Program at NJIT.

Mahgoub is Chair of ACI Committee 555, Concrete with Recycled Materials, and is a member of ACI Committees 130, Sustainability of Concrete; 342, Evaluation of Concrete Bridges and Bridge Elements; and 444, Structural Health Monitoring and Instrumentation. He is President of the New Jersey Chapter – ACI and Advisor of the NJIT Student Chapter – ACI. Mahgoub is a member of the American Society of Civil Engineers (ASCE) and the Precast/Prestressed Concrete Institute (PCI). He also serves as a panelist for the National Science Foundation (NSF) and the National Cooperative Highway Research Program (NCHRP).

His research interests include bridge rehabilitation, inspection, rating, design and analysis, structural health monitoring, and recycled concrete. He has authored or co-authored over 50 technical papers and reports.

Mahgoub received his BS in civil engineering from Al-Azhar University, Cairo, Egypt, in 1990; his master's degree in civil engineering from McMaster University, Hamilton, ON, Canada, in 1997; and his PhD in civil engineering from Carleton University, Ottawa, ON, Canada, in 2004. He is a licensed professional engineer in Michigan and in the Province of Ontario, Canada.

Michael A. Mahoney is the Director of Marketing and Technology, Fiber Reinforced Concrete, at The Euclid Chemical Company, Cleveland, OH. Over the past 20 years, he has authored and co-authored multiple papers and articles


McDonald


Monzon-Despang


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on fiber-reinforced concrete (FRC), shotcrete, carbon footprint of fiber materials, and innovative bridge systems, and he currently directs research and marketing projects while educating engineers and contractors on the use of FRC.

Mahoney is a past Chair of ACI Subcommittee 544-A, FRC-Education Production Application; and is a member of ACI Committees 522, Pervious Concrete; and 544, Fiber-Reinforced Concrete; and ACI Subcommittees 544-A; 544-C, FRC-Testing; and 544-F, FRC-Durability. He serves as a judge for the Fiber-Reinforced Concrete Bowling Ball Competition sponsored by ACI Committee S801, Student Activities, and has been a guest speaker at multiple local ACI chapter events both nationally and internationally. Mahoney is a member of ASTM International and is a Past President of the Fiber Reinforced Concrete Association (FRCA).

His research interests include fiber and pervious concrete projects, structural health monitoring of concrete and bridges using nondestructive testing methods, and material characterization and testing of concrete and shotcrete mixtures.

Mahoney received his BE and MASc from the Technical University of Nova Scotia (TUNS), Halifax, NS, Canada, in 1995 and 1997, respectively, and is a licensed professional engineer in the Province of Nova Scotia.

Kirk McDonald is Vice President of Cement Technical Services at CalPortland, Glendora, CA. He has 37 years of experience in the technical field of concrete and cement.

He is Chair of the ACI Hot Topic Committee and a member of ACI Committees 201, Durability of Concrete, and 225, Hydraulic Cements. McDonald was also a member of the ACI Convention Committee. He has served the Southern California Chapter – ACI as Board member, Vice President, President, and various committee chair positions.

McDonald's research interests include portland limestone cement, rapid-strength concrete, supplementary cementitious materials interaction with portland cement, and cement/admixture compatibility.

Hector Monzon-Despang is Director and Owner of Sismoconsult, a middle-sized structural engineering and earthquake engineering consulting firm in Guatemala City, Guatemala, operating since 1985. He has been responsible for various projects of multi-story buildings (mainly reinforced concrete), as well as low-rise buildings (reinforced masonry) in Guatemala, El Salvador, Honduras, Nicaragua, the Dominican Republic, and Paraguay. These projects include some of the tallest buildings in several of those countries. He has specialized in seismic retrofitting and repair of damaged structures in Guatemala and El Salvador.

Monzon-Despang has been a member of ACI Subcommittee 318-L, International Liaison, since 2005, and is Co-Founder and President of the Guatemala Chapter – ACI. He is a Life Member of the American Society of Civil Engineers (ASCE). In 1996, Monzon-Despang co-founded the Guatemalan Association of Structural and Earthquake Engineering (AGIES). This association proposed the structural codes currently in use in Guatemala. He is AGIES Past President and currently Director of Technical Committees.

Monzon-Despang has provided lectures in structural and earthquake courses in several engineering and architectural schools in Guatemala and was also a lecturer at San Jose State University, San Jose, CA, between 1981 and 1982.

His academic interests include preparing lectures and primers on structural and seismic topics for college students and the general public. His other interests include the seismicity and volcanic activity in Guatemala. He is a respected structural and geology speaker in Guatemala.

Monzon-Despang received his engineering degree from Universidad San Carlos de Guatemala, Guatemala City, Guatemala, in 1972; and his MS in earthquake engineering, his engineering degree, and his PhD from Stanford University, Stanford, CA, in 1978, 1980, and 1982, respectively. He is a licensed engineer in Guatemala.

David Nau was Manager/Director of Technical Services for Rinker Materials Corporation and its successor companies from 1983 to 1990 and from 2000 to 2017, respectively. He worked for Master Builders from 1990 to 1999.

He is a member of ACI Committee 301, Specifications for Structural Concrete; 305, Hot Weather Concreting; and ACI Subcommittee 301-J, Shrinkage Compensating Concrete-Section 10. Nau has been a member of numerous ACI chapters, including the Gold Coast, Pittsburgh Area, Las Vegas, Arizona, and Southern California chapters, as well as serving on the Board of Directors of the Pittsburgh and Las Vegas Chapters.

His interests include hot weather concrete, chemical and mineral admixtures, aggregates, and high-performance concrete.

Nau received his BS from Jacksonville University, Jacksonville, FL, in 1980.

Narayanan Neithalath is a Professor in the School of Sustainable Engineering and Built Environment at Arizona State University, Tempe, AZ.

He is Chair of ACI Committee 522, Pervious Concrete, and a member of ACI Committees 231, Properties of Concrete at Early Ages, and 236, Material Science of Concrete. He is a member of the American Society of Civil Engineers (ASCE) and ASTM International.

His research interests include novel material development and characterization including additive manufacturing and


Neithalath


Pantelides

ultra-high-performance and cement-free binders, cracking control, and computational materials science and modeling. He has authored or co-authored over 200 technical papers and reports.

Neithalath received his BS in civil engineering from University of Calicut, Malappuram, India, in 1996; his MS from the Indian Institute of Technology Madras, Chennai, India, in 1999; and his PhD in civil engineering from Purdue University, West Lafayette, IN, in 2004.

Chris Pantelides is a Professor in the Department of Civil and Environmental Engineering at the University of Utah, Salt Lake City, UT. He has been a Professor at Missouri S&T, Rolla, MO, for 3 years and at the University of Utah for 26 years.

Pantelides has been active in the Intermountain Chapter – ACI in educational activities. He is a member of ACI Committees 341, Earthquake-Resistant Concrete Bridges; 349, Concrete Nuclear Structures; 374, Performance-Based Seismic Design of Concrete Buildings; and 440, Fiber-Reinforced Polymer Reinforcement; and Joint ACI-ASCE Committee 352, Joints and Connections in Monolithic Concrete Structures. He has also served on ACI Committee 369, Seismic Repair and Rehabilitation. He is also a member of the American Society of Civil Engineers (ASCE) and the Precast/Prestressed Concrete Institute (PCI).

His research interests include seismic retrofit of column-to-bent cap joints with fiber-reinforced polymer (FRP) composites and seismic evaluation and retrofit of beam-column building joints with FRP composites. He has investigated the seismic retrofit of precast concrete shear wall connections with FRP composites. He has developed stress-strain models for existing columns confined with external FRP jackets, as well as new columns confined with internal FRP spirals. His interests include seismic design and repair of precast concrete column-to-bent cap and column-to-footing connections for accelerated bridge construction.

Pantelides received the 2002 and 2003 ASCE Journal of Composites for Construction Best Applied Research Paper Award. He has authored over 100 technical journal papers.

Pantelides received his BE in civil engineering from the American University of Beirut, Beirut, Lebanon, in 1980, and his MSc and PhD in civil


Peterson


Prenger


Quiroga

engineering from the Missouri S&T, Rolla, MO, in 1983 and 1987, respectively. He is a licensed professional and structural engineer in Utah.

Eric Stephen Peterson is a Construction Manager for Webcor Builders, Knightsen, CA, with over 45 years of experience. His projects have spanned the civil, building, and industrial sectors and have included transit stations, water and wastewater treatment facilities, commercial and residential high-rise, hospitals, transportation and infrastructure, and manufacturing facilities.

Peterson is Chair of Joint ACI-ASCC Committee 117, Tolerances, and is a member of ACI Committees 237, Self-Consolidating Concrete; 301, Specifications for Structural Concrete; 347, Formwork for Concrete; and ACI Subcommittee 301-A, General Requirements, Definitions, and Tolerances – Section 1. He received the 2012 ACI Construction Award. Peterson is also a member of ASTM International.

His principal industry interests include formwork design and construction, architectural concrete, quality management, concrete material science, and on-site problem solving.

Peterson started in the construction industry as a laborer, carpenter apprentice, and welder when he was 16 years old and has worked continuously, eventually becoming a superintendent and Construction Manager. His educational background has consisted of focused self-education efforts and attending various junior colleges at night, declaring mathematics as a major.

Henry B. Prenger is a Technical Service Engineer with LafargeHolcim in Baltimore, MD. He has worked in several positions in the concrete industry, including Concrete Engineer for the State of Maryland and Director of Technical Services for Lafarge Cement. Through most of his career, he has specialized in the use of slag cement in concrete applications.

Prenger is Chair of ACI Subcommittee 301-D, Concrete Mixtures – Section 4, and a member of ACI Committees 207, Mass and Thermally Controlled Concrete; 233, Ground Slag in Concrete; and 308, Curing Concrete. He is a member of the Slag Cement Association (SCA); an Honorary member of ASTM International Committee C09, Concrete and Concrete Aggregates; and a Past President of the Maryland Chapter – ACI, where he assisted in the development of a scholarship competition that has awarded nearly $100,000 to students.

Prenger received his BS in civil engineering from Morgan State University, Baltimore, MD, and his master's degree in civil engineering from Johns Hopkins University, Baltimore, MD, in 1989 and 1993, respectively. He is a licensed engineer in Maryland.

Pedro Nel Quiroga is the Director of the Center for Studies on Structures, Materials and Construction at Escuela Colombiana de Ingeniería Julio Garavito, Bogotá, Colombia, since 2004, where he has been a Professor and Researcher since 1984. He has been a member of the committee that oversees the design and construction of building and facilities at Escuela.

He is a member of the Republic of Colombia Chapter – ACI Board of Directors and was the Chapter President from 2014 to 2015. Quiroga has led the implementation of ACI certification programs in Colombia, has contributed to the Spanish translation of some ACI documents, and has organized seminars with ACI international members in Colombia.

He is a member of ACI Committees C680, Adhesive Anchor Installer Certification; 440, Fiber-Reinforced Polymer Reinforcement; and 555, Concrete with Recycled Materials.

His professional interests include construction sustainability, concrete with recycled aggregates, anchorage to concrete, plasticity in concrete, repair and rehabilitation of concrete structures, and construction. He has authored and co-authored technical papers and reports on aggregate grading optimization, concrete with recycled aggregates, anchorage to concrete, and seismic vulnerability of concrete buildings.

Quiroga received his BS in civil engineering from Escuela Colombiana de Ingeniería; his MS from Universidad de los Andes, Bogotá, Colombia; and his PhD from The University of Texas at Austin, Austin, TX, in 1984, 1990, and 2003, respectively.

Aleksandra Radlińska is an Assistant Professor in the Department of Civil and Environmental Engineering at Pennsylvania State University (PSU), University Park, PA. Prior to joining PSU in 2012, she was an Assistant Professor at Villanova University, Villanova, PA, from 2008 to 2012, and a Guest Scientist at BAM Federal Institute for Materials Research and Testing in 2011.

Radlińska is Chair of ACI Committee 123, Research and Current Developments, and a member of the ACI Foundation Concrete Research Council; the ACI Membership Committee; and ACI Committee 236, Material Science of Concrete. She also participates in the ACI Foundation Strategic Development Council. Radlińska previously served on the ACI Young Member Award for Professional Achievement Committee from 2014 to 2016, and was the Faculty Advisor for the Villanova University Student Chapter – ACI from 2010 to 2012. She is a member of local ACI Pennsylvania chapters. She is also a member of the American Society of Civil Engineers (ASCE). Radlińska received the 2012 ACI Young Member Award for Professional Achievement and the 2015 ACI Walter P. Moore, Jr. Faculty Achievement Award.

Radlińska

Wilson

Her research interests include prevention and mitigation of cracking in concrete, durable alternative binders, and construction materials for space applications.

Radlińska received her BS and MS in structural engineering from Western Pomeranian Technological University, Szczecin, Poland, in 2004, and her PhD in civil engineering from Purdue University, West Lafayette, IN, in 2008.

Wayne M. Wilson is a Senior Technical Service Engineer with LafargeHolcim, Suwanee, GA, where he is responsible for cementitious materials marketing and quality assurance and technical support for portland cement, slag cement, and fly ash sales in the southern United States. He has 33 years of experience in the construction materials testing, analysis, and inspection field.

Wilson has been Certification Chair of the Georgia Chapter – ACI since 2008, Past President in 2007 and 2017, and received the 2009 Distinguished Member Award. He is Secretary of ACI Committee C631, Concrete Transportation Construction Inspector Certification, and is a member of the ACI Certification Programs Committee, and ACI Committees C601, New Certification Programs; C610, Field Technician Certification; C630, Construction Inspector Certification; C670, Masonry Technician Certification; and 231, Properties of Concrete at Early Ages; and ACI Subcommittee C601-F, Nondestructive Testing Technician. He is also a member of the American Society of Civil Engineers (ASCE) and ASTM International.

He is an experienced concrete petrographer and has investigated concrete and cement-related performance problems throughout the world. Wilson is an active concrete industry educational presenter offering education sessions on cementitious materials, sulfate balance, admixture interaction, masonry basics, concrete troubleshooting, concrete petrography, masonry troubleshooting, cracking and concrete performance, concrete testing and inspection, and he has authored/co-authored numerous technical papers.

Wilson received his BS in civil engineering technology from Southern Polytechnic State University, Marietta, GA, in 1987. He is a licensed professional engineer in Georgia, Alabama, North Carolina, and South Carolina.

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aci Certification

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Notable Concrete in Salt Lake City

Examples of concrete construction in the vicinity of the ACI Convention

As ACI prepares to meet for The Concrete Convention and Exposition, March 26-29, 2018, at the Grand America and Little America Hotel, in Salt Lake City, UT, here are several nearby projects of interest. An expanded list of projects is available at **www.aciconvention.org**.

Jordan River Pedestrian Bridge and Trail

Jordan River between 200 South and North Temple, Salt Lake City, UT 84116

The final connector that completes the Jordan River Parkway Trail picks up the north end of the existing trail just south of the Utah State Fair Grounds and extends south, paralleling the Jordan River, past an electrical substation, crossing over two railroad corridors, through an industrial property, and skirting the historical Fisher mansion. The trail becomes a 16 ft (5 m) wide, elevated concrete ramp for one quarter mile (0.4 km), including a 280 ft (85 m) steel arch bridge over the railroads. The ramp columns, column caps, and abutments required 350 yd^3 (268 m^3) of concrete, and the ramp deck and abutment foundations required 682 yd^3 (521 m^3) of concrete. The connector ends with 120 ft (37 m) of concrete sidewalk as it meets 200 South, just north of I-80 highway.

Project credits: Salt Lake City Corporation, Owner; Gerber Construction, General Contractor; Stanley Consultants, Engineer; and American Eagle Ready Mix, Concrete Supplier.

Jordan River Pedestrian Bridge and Trail

Submitted by Jason Woffinden, Gerber Construction, Lehi, UT, +1.801.407.2000, jw@1gerber.com.

Odyssey Elementary School

2050 S. 1955 W., Woods Cross, UT 84087

Odyssey Elementary School features concrete benches and planters, each constructed in a single concrete placement. These unique arching and curving benches and planters were designed to correspond with the school's "Bodies in Motion"

Odyssey Elementary School

architectural theme. The spiral and zig-zag benches symbolize a springing motion that coincides with flying, swimming, and running elements. Many of the planters also serve as benches, adding function to the visual aesthetics of the courtyard features.

Project credits: VCBO Architecture, Architect; and Hughes General Contractors, General Contractor.

Submitted by Amber Ridings, Marketing Communications Specialist, Hughes General Contractors, Inc., North Salt Lake, UT, +1.801.292.1411, amber@hughesgc.com.

Hale Centre Theatre

Bangerter Highway Interchange at 600 West

Hale Centre Theatre
9900 S. Monroe St., Sandy, UT 84070

Hale Centre Theatre is a one-of-a-kind facility that includes two theaters for a total of 1361 seats. The facility's theater-in-the-round boasts 900 seats, while its separate proscenium-thrust theater holds 461 seats. Because of the area's high water table, the building is founded on 225 piles that were driven about 95 ft (29 m) below grade. The piles were tied and topped by grade beams, and these support concrete walls. The walls were constructed using gang forms with a climbing system. Some walls are over 100 ft (30 m) tall, which required substantial bracing and made concrete pumping tricky. About 10,000 yd^3 (7600 m^3) of concrete was used in the theater.

Project credits: Beecher Walker Architects, Architect; Dunn & Associates, Structural Engineer; Layton Construction, General Contractor; and Geneva Rock, Concrete Supplier.

Submitted by Alan D. Rindlisbacher, Director of Corporate Communications, Layton Construction Company, LLC, Sandy, UT, +1.801.563.3722, arindlisbacher@laytonconstruction.com.

Bangerter Highway Interchange at 600 West
Draper, UT 84020

This grade-separated interchange project at 600 West improved traffic safety and alleviated congestion on the Bangerter Highway, one of Utah's busiest corridors. The functional and cost-effective overpass was constructed using mechanically stabilized earth walls, partial-depth precast deck panels, and prestressed concrete girders (82 in. [2080 mm] deep and 170 ft [52 m] long). Solutions to project challenges included working around an existing sewer line by shifting the bridge alignment, avoiding settlement issues by taking 600 West underneath Bangerter, and dealing with a water table only 2 ft (0.6 m) below the road base by using larger subgrade rock and raising the height of Bangerter. The project also used 87,000 yd^2 (73,000 m^2) of lean concrete base course, 83,000 yd^2 (70,000 m^2) of concrete pavement, and 1478 yd^3 (1130 m^3) of concrete bridge deck.

Project credits: UDOT, Owner; Wadsworth Brothers Construction with Wilson & Company, Design-Build Team; Horrocks Engineers, Program Manager; Gerhart Cole, Geotechnical Engineer; and McNeil Brothers, Concrete Paving Contractor.

Submitted by Layne Fullmer, Project Manager, Wadsworth Brothers Construction, Draper, UT, +1.801.509.1076, layne@wadsbro.com.

Mountain "S" Home
Park City, UT 84098

Stepping and twisting around its mountain site, this resort home is an S-shaped concrete structure with 30 individual kite shaped roofs that cantilever as much as 21 ft (6.4 m). The roofs are designed to resist a 235 lb/ft^2 (11 kPa) snow load and are themselves supported on 12 in. (300 mm) thick concrete piers averaging 16 ft (4.8 m) in height. Interior concrete chimneys

and hearths are cantilevered from the ends of shear walls, allowing them to appear to float above the floor. The main level floor is constructed of suspended reinforced concrete spanning up to 45 ft (14 m), allowing the lower-level driveway to extend through the house.

Project credits: AE URBIA, Structural Engineer.

Submitted by James M. Williams, AE URBIA/J.M. Williams and Associates, South Jordan, UT, +1.801.746.0456, james@aeurbia.com.

Mountain "S" Home

The Summit at Snowbird

9385 S. Snowbird Center Dr., Snowbird, UT 84092

The three-level resort lodge is a mountain restaurant and guest services station located at the top of Hidden Peak at 11,000 ft (3350 m) elevation. The kitchen, employee space, ski patrol offices, and mechanical functions occupy the basement. The first floor includes a main dining hall with cafeteria, kitchen storage, service area, restrooms, and outdoor deck. The second floor consists of a private dining room with reception, service areas, and two outdoor decks. The windows are equal in size to two IMAX theater screens, providing 360-degree panoramic views. Aside from weather, the main construction challenge was access to the site—the contractor used many forms of transportation to get equipment and supplies to the job: Snowbird's tram, a helicopter, snowmobiles, a snow cat, and haul trucks. Concrete trucks had to move slowly up the narrow mountain roads, carrying only about 6 yd^3 (5 m^3) of concrete per trip. A round trip took just over 6 hours. Excavation for the new foundation spanned the site to the existing tram foundation wall. Because backfilling with excavated soil could put pressure on the existing foundation, geofoam blocks were used. The blocks were capped with 4 in. (102 mm) of free-draining gravel and the concrete slab for the patio.

The Summit at Snowbird

Project credits: GSBS Architects, Architect; Stantec, Structural Engineer; Layton Construction, General Contractor; and Altaview Concrete, Concrete Supplier.

Submitted by Alan D. Rindlisbacher, Director of Corporate Communications, Layton Construction Company, LLC, Sandy, UT, +1.801.563.3722, arindlisbacher@laytonconstruction.com.

The Void

644 N. 2000 W., Lindon, UT 84042

The Void is a unique new arena created by a Utah start-up. By blending high-end virtual reality (VR) with real-world elements, the facility allows VR gamers to physically experience realistic scenarios while moving through a virtual

The Void

Alder Office Building

Saratoga Springs Marina Secondary Water Pump Station

Tickville Wash

world. This exciting technology is housed in a unique building made from insulated structural precast panels produced using board-finish form liners.

Project credits: Forterra Structural Precast, Precast Supplier.

Submitted by Sarah Sutherland, Business Developer, Forterra Structural Precast, Salt Lake City, UT, +1.720.245.4599, sarah.sutherland@forterrabp.com.

Alder Office Building

450 N. 1500 W., Orem, UT 84057

This three-story structure demonstrates that tilt-up concrete can be used to construct a modern office building with an abundance of windows, providing views and natural light. The sculptural forms of the exposed concrete structure continue through the interior. By integrating architectural and structural elements, the concrete walls minimize seismic mass yet act as shear walls, bearing walls, and architectural features. The tallest concrete panel is 56.33 ft (17.17 m) and is located at the end of the central atrium, which provides natural light to the core.

Project credits: AE URBIA, Architect and Structural Engineer.

Submitted by James M. Williams, AE URBIA/J.M. Williams and Associates, South Jordan, UT, +1.801.746.0456, james@aeurbia.com.

Saratoga Springs Marina Secondary Water Pump Station

Saratoga Springs Marina at Pelican Point, Utah Lake, UT 84045

The pump station consists of a wet well, intake structure, and retaining walls—all constructed using cast-in-place concrete. The 14 x 44 ft (4 x 13 m) wet well is nearly 28 ft (8.5 m) deep, with 24 in. (610 mm) walls that were placed in two lifts. The intake structure and retaining walls are 20 x 24 ft (6 x 7 m) in plan by 20 ft tall, with walls ranging in thickness from 10 to 14 in. (254 to 356 mm). The intake pipe is 36 in. (914 mm) diameter with a 36 x 30 wye and two 30 in. (762 mm) T-screens, plus high-pressure air lines for screen cleaning. The roof includes grated openings for maintenance. Construction required 24-hour dewatering.

Project credits: City of Saratoga Springs, Owner; Hansen, Allen & Luce, Engineer; Dean L. Webb & Associates, Structural Engineer; and COP Construction, General Contractor.

Submitted by Jeremy D. Lapin, Public Works Director, City of Saratoga Springs, UT, +1.801.766.6506, jlapin@saratogaspringscity.com.

Tickville Wash

400 S. Redwood Rd., Saratoga Springs, UT 84045

The Tickville Wash culvert was designed to tame Utah's 100-year floods. The design features 4000 ft (1219 m) of 96 in. (2438 mm) diameter reinforced concrete pipe capable of carrying 966 ft^3 (27 m^3) of water per second. With each pipe

Missionary Training Center

segment weighing 44,000 lb (20,000 kg), the project required a total of about 2000 tons (1800 tonnes) of concrete pipe. The design includes a public park directly over the culvert, with walking paths, dog parks, skate parks, water features, antique tractors, and beautiful landscaping.

Project credits: City of Saratoga Springs, Owner; LEI Engineering, Engineer; Noland & Son, General Contractor; and Geneva Pipe and Precast, Concrete Pipe Supplier.

Submitted by Jared Johnston, Corporate Sales and Marketing Manager, Geneva Pipe and Precast, Orem, UT, +1.801.900.2944, jjohnston@genevapipe.com.

Missionary Training Center
2005 N. 900 E., Provo, UT 84602

The expansion project consisted of two new six-story buildings that serve primarily as classroom space. The exterior

Payson Utah Temple

of these buildings is comprised of a combination of masonry, architectural precast concrete, and glass fiber-reinforced concrete (GFRC). The precast was used mainly as a wainscot around the base of the building and in other bandings and trims. The GFRC, cast to match the color and texture of the precast, was used for the large pilasters and entry surrounds of the buildings. The landscape design includes monument signs, benches, and planters that were all made of precast.

Project credits: ZGF Architects and FFKR Architects, Architect; Okland Construction, Jacobsen Construction, and Layton Construction, Joint Venture General Contractor; and Unlimited Designs, Precast and GFRC Fabricator.

Submitted by Lana Mousley, Business Development, Unlimited Design, North Salt Lake, UT, +1.801.355.3221, lana@unlimitedesign.com.

Payson Utah Temple
1494 S. 930 W., Payson, UT 84651

To achieve highly ornate details and finish quality, precast concrete is consistently used to build stunning temples across the United States. This temple is no exception. Aggregate was imported from California, and panels were sandblasted to achieve the desired finish. The architectural precast roof and wall panels are attached to a steel frame structure.

Project credits: Architectural Nexus, Architect; Reaveley Engineers & Associates, Structural Engineer; Wadman Corp., General Contractor; and Forterra Structural Precast, Precast Supplier.

Submitted by Sarah Sutherland, Business Developer, Forterra Structural Precast, Salt Lake City, UT, +1.720.245.4599, sarah.sutherland@forterrabp.com.

Acknowledgments

Thanks to Michael Paul of ACI Committee 124, Concrete Aesthetics, and Tammy Meldrum, Executive Director, Intermountain Chapter – ACI, for compiling this information.

What's New from aci

TECHNICAL DOCUMENTS

ACI 549R-18: Report on Ferrocement

This report provides an overview of the history, formulation, construction, and applications of ferrocement. The focus of this report is to create an awareness in engineers, architects, and potential end-users of the characteristics and capabilities of ferrocement.

ACI 207.3R-18: Report on Practices for Evaluation of Concrete in Existing Massive Structures for Service Conditions

This report identifies practices for evaluating the physical properties of concrete in existing structures. Although general knowledge of the structural design used for the principle structures of a project is essential for determining procedures and locations for evaluation of the concrete physical properties, analysis for the determination of structural capacity is not within the scope of this report. This report recommends project design, operation and maintenance records, and in-service inspection data to be reviewed.

ACI 349.3R-18: Report on Evaluation and Repair of Existing Nuclear Safety-Related Concrete Structures

This report provides recommendations for the evaluation of existing nuclear safety-related concrete structures. The purpose of this report is to provide the owner, owner's engineering staff, consultants, and others with an appropriate procedure and background for examining concrete structural performance and taking appropriate actions based on observed conditions. Methods of examination, including visual inspection and testing techniques and their recommended applications, are cited. Guidance related to acceptance criteria for various forms of degradation and methods for repair are provided.

2018 Decorative Concrete Council Award Winners

The Decorative Concrete Council (DCC), a specialty council of the American Society of Concrete Contractors (ASCC), announced the winners of its 10th annual Decorative Concrete Awards competition. The winners were recognized at a ceremony at World of Concrete, Las Vegas, NV, on January 24, 2018.

T.B. Penick & Sons, San Diego, CA, won the WOW! Award, best overall project, for the Atlanta Botanical Garden (ABG), Atlanta, GA. The Gardens in Storza Woods comprises a richly detailed strolling garden set in a 4 acre (1.6 ha) mature woodland. Features include stone-clad bridges and overlooks, a formal garden surrounding a water mirror and water stairs, an elevated boardwalk, and terraces all threaded together by a sinuous concrete walkway embellished with intricate mosaics. Based on plant morphology, the mosaic patterns were designed by Tres Fromme, ABG Landscape Design and Planning Manager. T.B. Penick & Sons helped translate the conceptual sketches into full construction documents, including stone color, size, arrangement, and installation methodology. Technical considerations included preservation of critical root zones around the many magnificent, existing hardwood trees. The solutions included a combination of elevated walkways and structural slabs on helical piles to minimize soil disturbance.

WOW! Winner, the Atlanta Botanical Garden

Other winners included:

Cast-In-Place Stamped, Over 5000 ft²

1st Place, Bomanite of Southeast Asia, Quezon City, Philippines, for Oasis Hotel

2nd Place, Bomel Construction Co., Anaheim, CA, for Great Wolf Lodge

Cast-In-Place Stamped, Under 5000 ft²

1st Place, Salzano Custom Concrete, Centreville, VA, for Faux Bluestone in Overton

2nd Place, Salzano Custom Concrete, Centreville, VA, for Four Tier 19th Hole

Polished, Over 5000 ft²

1st Place, Royale Concrete, Fairfield, IA, for Heavy-Duty Truck Repair Shop

2nd Place, Musselman & Hall Contractors, Kansas City, MO, for University of Kansas School of Business Capitol Federal Hill

Oasis Hotel

Polished, Under 5000 ft²

1st Place, Hyde Concrete, Pasadena, MD, for 80 M Street

2nd Place, Concreate, Inc., Midlothian, VA, for Shyndigz

Overlays Under 1/4 in., Over 5000 ft²

1st Place, Sundek of Austin, Austin, TX, for SA Student Housing – The University of Texas at Austin

Overlays Under 1/4 in., Under 5000 ft²

1st Place, Sundeck of San Antonio, San Antonio, TX, for Brock Residence

2nd Place, ATD Concrete Coatings, Arlington, TX, for Parr Park Sprayground

Cast-in-Place Special Finishes, Over 5000 ft²

1st Place, Trademark Concrete Systems, Anaheim, CA, for Waldorf Astoria

2nd Place, Trademark Concrete Systems, Anaheim, CA, for Wilshire Grand

Cast-in-Place Special Finishes, Under 5000 ft²

1st Place, Bomanite Malaysia, Penang, Malaysia, for Queensbay Sculpture Garden

2nd Place, T.B. Penick & Sons, San Diego, CA, for Atlanta Botanical Garden

Vertical Application, Over 5000 ft²

1st Place, Largo Concrete, Tustin, CA, for USC Michelson Center for Convergent Business

2nd Place, T.B. Penick & Sons, San Diego, CA, for Apple Store Union Square

Countertops

1st Place, Hyde Concrete, Pasadena, MD, for Private Residence

Concrete Artistry, Over 5000 ft²

1st Place, T.B. Penick & Sons, San Diego, CA, for Unity Plaza

80 M Street

1st Place Countertops Winner

SA Student Housing – The University of Texas at Austin

Unity Plaza

Wilshire Grand

2nd Place, Patterned Concrete Ontario, Toronto, ON, Canada, for Lock 8 Skate & BMX Park

Concrete Artistry, Under 5000 ft²
1st Place, T.B. Penick & Sons, San Diego, CA, for Atlanta Botanical Garden
2nd Place, Patterned Concrete Ontario, Toronto, ON, Canada, for Pan AM Aquatic Parkette

Multiple Applications, Over 5000 ft²
1st Place, Trademark Concrete Systems, Anaheim, CA, for Wilshire Grand
2nd Place, a tie between Edwards Concrete Co., Winter Garden, FL, for Tanger Outlet Center, and Bomanite China, Beijing, China, for Shanghai Disney

Multiple Applications, Under 5000 ft²
1st Place, T.B. Penick & Sons, San Diego, CA, for Ventura Harbor Village
2nd Place, Unique Concrete, West Milford, NJ, for Bloomingdale Municipal Building

Stained, Over 5000 ft²
1st Place, Trademark Concrete Systems, Anaheim, CA, for Entrada de Santa Barbara
2nd Place, T.B. Penick & Sons, San Diego, CA, for Unity Plaza

Stained, Under 5000 ft²
1st Place, Decorative Concrete Resurfacing, Ballwin, MO, for The First Presbyterian Church of St. Louis

Architectural Cast-in-Place Concrete Over, 5000 ft²
1st Place, Patterned Concrete Ontario, Toronto, ON, Canada, for Lock 8 Skate & BMX Park

Project Video
1st Place, T.B. Penick & Sons, Inc., San Diego, CA, for Ventura Harbor Village

Ventura Harbor Village

Entrada de Santa Barbara

2nd Place, Decorative Concrete of Virginia, Lynchburg, VA, for Ballast Point

Polished Overlays, Over 5000 ft² (new category)
1st Place, Bay Area Concretes, Livermore, CA, for Nvidia

Polished Overlays, Under 5000 ft² (new category)
1st Place, Concrete Expressions, Clarinda, IA, for Caston Development Offices
2nd Place, Redimere Surface Solutions, for Taylor Residence St. Kitts

The DCC comprises contractors, manufacturers, and suppliers of decorative concrete products. The Council is dedicated to improving the technical and business expertise of the contractors that pursue this specialty market. For more information, visit **www.ascconline.org**.

Exposed concrete proudly expresses the structural system of Reston Station OB1

Naked Concrete

Mixed-use building features a 16-story exposed concrete exoskeleton

by Jennifer Kearney, Zachary Kates, and Mark J. Tamaro

Building structures are often concealed behind architectural finishes, so the occupants never see the material that supports their edifice. Reston Station OB1 is a welcome exception to this norm. This new mixed-use building located in Reston, VA, uses exposed concrete to not only meet the architectural design, but to also proudly express the building's structural system. Exposed concrete is featured in the ceiling of the double-height lobby area as well as the perimeter exoskeleton columns along the east and west sides of the building. Paired with steel grating spandrel panels in the curtainwall, the exposed concrete gives the building its unique industrial look. While there were numerous design and constructability challenges associated with architecturally exposed concrete, the Reston Station design and construction team overcame them to create a dramatic landmark.

The Design

The vision for Reston Station OB1 was to redefine the suburban commercial development. In the words of the project's architectural firm, JAHN: "Reston Station marks a new direction in the development of the suburban office complex. It creates a strong image and identity; one that is formally simple, functionally efficient, technologically advanced and (sub)urbanistically significant—delineated by modern architectural language."

Building Description

Visible to the thousands of people who travel to Dulles International Airport each day, Reston Station OB1 is a striking 16-story office tower showcasing a unique lateral force-resisting system comprising a diagonalized, exposed concrete exoskeleton. Thornton Tomasetti provided structural engineering for the building, working in collaboration with JAHN, owner Comstock Partners, contractor DAVIS, and concrete subcontractor Miller & Long. The 371,000 ft^2 (34,500 m^2) tower is located at the Wiehle-Reston East Washington Metro Station and is one of several buildings making up the Reston Station complex. It sits along the Silver line Metrorail, the new Metrorail extension between Dulles International Airport and Washington, DC. The office building includes an open-air plaza on the north side, immediately adjacent to the double-height lobby space; an outdoor roof terrace on the south side, providing views of northern Virginia; and eight levels of below-grade parking for the building occupants and Metrorail riders.

Tower Structural System

The gravity force-resisting system and lateral force-resisting system for Reston Station OB1 are not exclusive systems. The architecturally exposed concrete exoskeleton columns resist both gravity loads and lateral loads in the north-south direction. A three-dimensional (3-D) isometric model of the building's structural system is shown in Fig 1. The exoskeleton columns were constructed of high-strength concrete and slope at 11 degrees from vertical, matching the slope of the building's north and south faces. The five-story, open-air plaza is surrounded by "tree columns." These start at the base and splay out like a tree to support the 11 levels above the plaza.

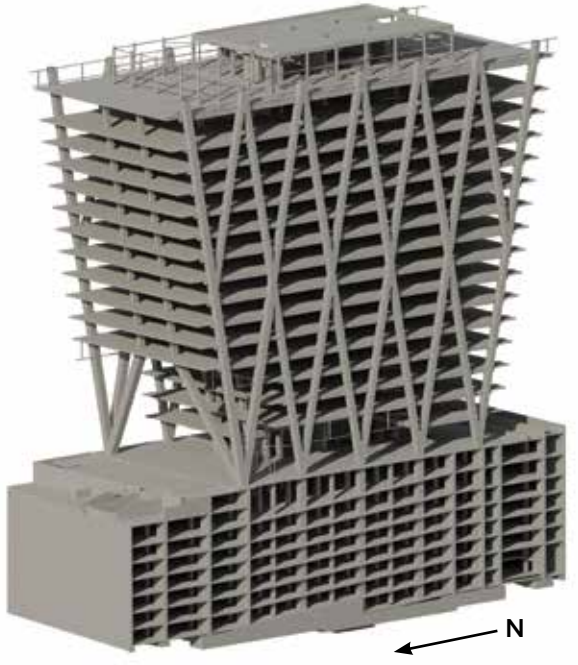


Fig. 1: The building structure features a unique lateral system consisting of a diagonalized, architecturally exposed concrete exoskeleton

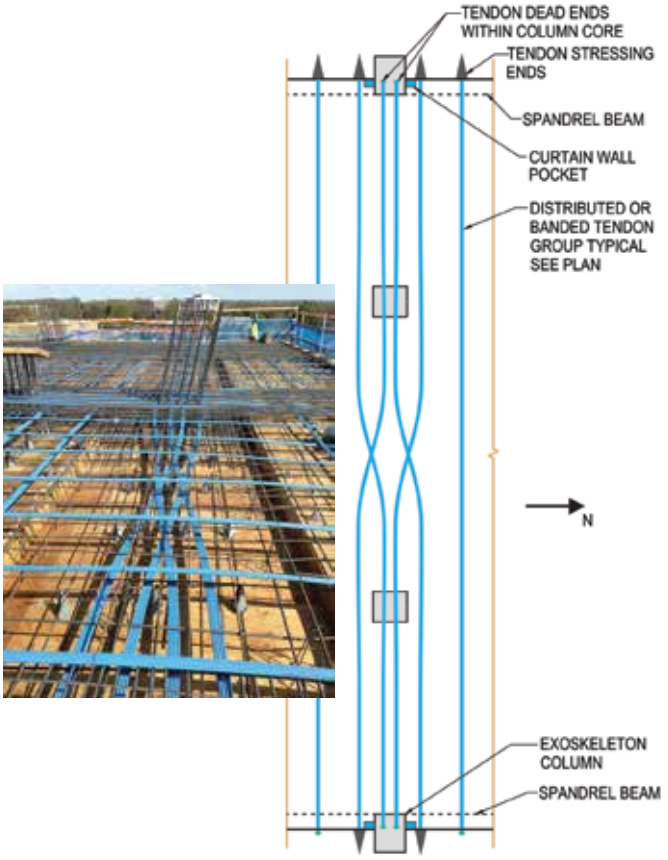


Fig. 2: The post-tensioned (PT) tendons were crossed at midspan to conceal the dead-end anchors inside the exoskeleton columns *(photo courtesy of DAVIS)*

Fig. 3: Each floor slab has 15 ft (4.6 m) cantilevers in the north and south directions

Gravity force-resisting system

The tower's floors comprise two-way, post-tensioned (PT), 10 in. (254 mm) thick concrete slabs with 6 in. (152 mm) drop panels. The distributed PT tendons in the east-west direction were crossed at midspan, as shown in Fig. 2, to conceal dead-end anchors inside the exterior columns and allow the tendons to be stressed at the spandrel beams. This tendon stressing layout maintains a clean, finished look on the face of the architecturally exposed exoskeleton columns. The stressing ends at the spandrel beams were concealed by the spandrel panels in the curtain wall. Typical slab spans are approximately 40 ft (12.2 m) with 15 ft (4.6 m) cantilever slabs to the north and south, as shown in Fig 3. Spandrel beams are located along the east and west edges of each slab to accommodate the variable slab edge spans, up to 40 ft, resulting from the sloping support columns (shown in Fig. 4).

The exposed exterior columns are typically 36 x 45 in. (914 x 1143 mm). Column strength was dictated by stresses at critical column intersection points at the base and midheight of the structure. However, a consistent concrete mixture, with 10,000 psi (68.9 MPa) compressive strength, was used for the full height of the building to maintain a uniform color and meet the desired architectural finish requirements. There are six interior gravity columns that slope in the north and south direction at the same angle as the exoskeleton columns. The mixtures for the interior columns were allowed to vary over the height. A maximum concrete strength of 12,000 psi (82.7 MPa) was used at the base, decreasing to 7000 psi (48.3 MPa) at the upper levels.

The exoskeleton frame has a tendency to spread under gravity loads, like a folding drying rack. Spandrel beams were designed and detailed as tension ties to resist this action. To avoid congestion within spandrel beams and at beam-column intersections, couplers were used at all splices of the continuous spandrel beam reinforcement. Close coordination of the beam reinforcement was required to accommodate curtain wall anchor pockets and post-tensioning anchorages (Fig. 4).

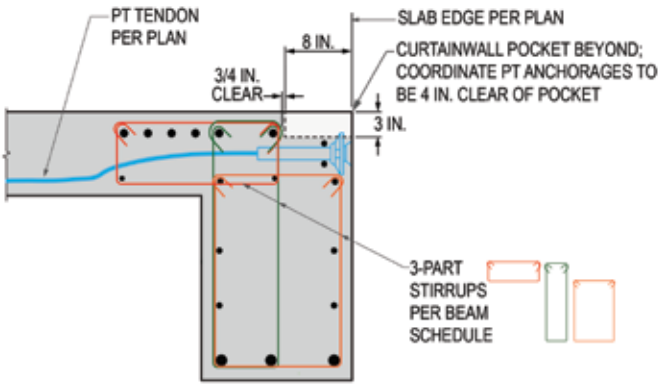


Fig. 4: The spandrel beam reinforcing was coordinated with curtainwall anchor pockets and PT tendon anchorages (Note: 1 in. = 25.4 mm)

Lateral force-resisting system

Six shearwalls, located in the core of the building along the elevator and stair shafts, serve as the lateral force-resisting system in the east-west direction. The exoskeleton frames on the east and west sides of the building function as the lateral force-resisting system in the north-south direction (Fig. 1 and 5). The frames predominantly act as braced frames due to triangulation of the columns resulting from column intersections at the top, bottom, and midheight of the structure. In addition to axial loads, column sections located between the column intersections experience flexural loads from the bending of the spandrel beam-column frames between the stiff braced frame intersections. ETABS® (an integrated analysis, design, and drafting of building systems software program) was used to analyze the lateral system for the building. Two-dimensional (2-D) frame analyses were performed to validate the design and envelope loads in the horizontal spandrel beam tie elements.

Fig. 5: The exposed concrete exoskeleton columns act as both braced frames and moment frames

Tree columns

Two sets of tree columns form key architectural features of the design (shown in Fig. 6). At each tree, three columns splay out from a single intersection point on the ground floor. The columns were designed as structural steel and concrete composite members to accommodate unbraced column lengths maxing out at 72 ft (21.9 m). Each column contains a steel core constructed of two W30 flanges and a W24 web, forming a built-up H-shaped member. Figure 7 shows the

Fig. 6: The "tree columns" consist of three columns originating at a common node at the ground floor. Two branches inclined at 34 degrees from vertical support interior columns at level 6

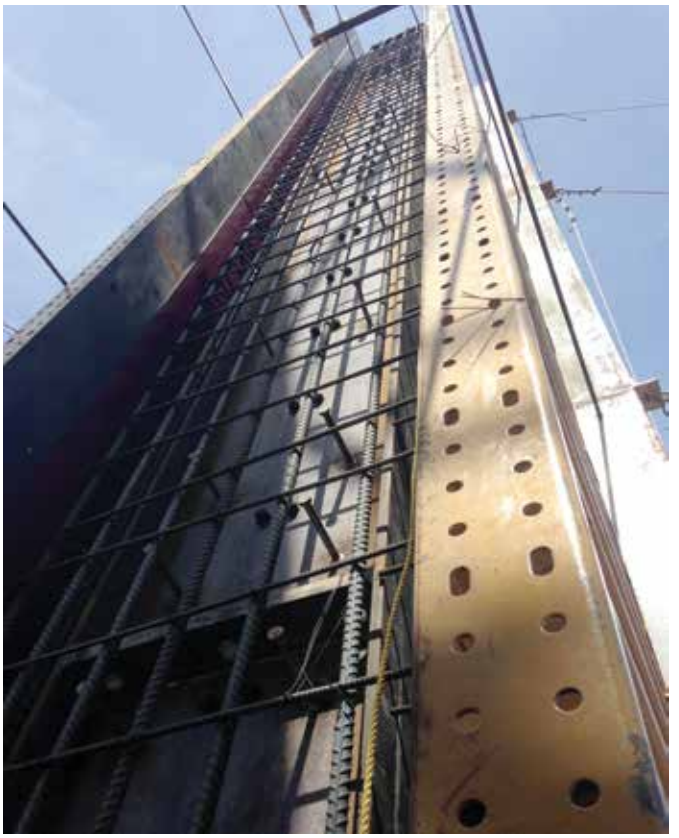


Fig. 7: Built-up structural steel core and deformed bars inside a tree column form *(photo courtesy of DAVIS)*

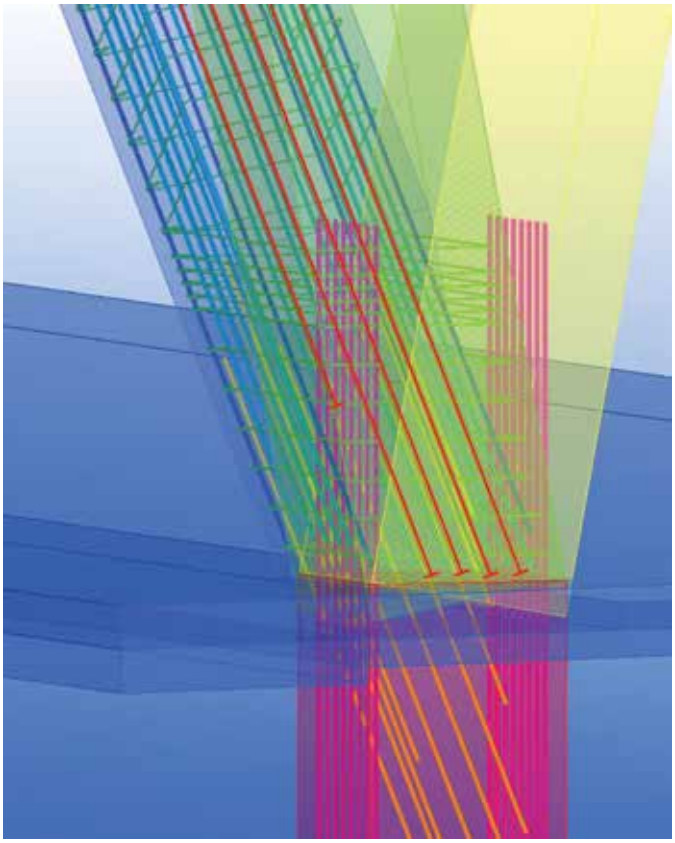


Fig. 8: A Tekla 3-D model was used for reinforcement coordination at the base of the tree columns

built-up steel core with the surrounding deformed bar reinforcement, before concrete placement. Two columns from each tree slope at 11 degrees from vertical and are incorporated into the exoskeleton frames. The remaining two tree columns slope in two directions at 34 degrees from vertical to support interior columns at level 6. The cross section of each of these columns is a rhombus, which allows the column faces to seamlessly merge with the perimeter tree columns at the base. The ground floor slab includes a large, continuously reinforced tension tie oriented in the east-west direction to resist the outward thrust of the tree columns. Tekla 3-D modeling of the tree column node was used to evaluate reinforcement congestion. Figure 8 shows an image of a Tekla model of the tree column node with reinforcement modeled for coordination to ensure all proper clearances were met.

Tower Construction

The special architectural requirements, coupled with the complex structural design, resulted in unconventional construction techniques. The mixture design, formwork, and finishing techniques for the exoskeleton columns were all driven by the strict architectural requirements for the exposed columns. The columns were not stained or sealed, so coordinating the locations of placement breaks was critical to meet the final desired appearance. The tree columns also necessitated custom formwork to accommodate the geometric requirements of the columns and base node. Due to the unique building configuration, a staged construction analysis was performed during design to evaluate the incremental impacts of the sloping columns on the lateral displacements of the frame during construction.

Considerations for exposed concrete

Close coordination with the design and construction team was required to achieve the architect's vision for the project's exposed elements. The concrete contractor carefully coordinated construction joint locations, formwork joints, plywood seams, and form tie locations on the exoskeleton and tree columns, and this information was submitted to the design team for approval prior to construction. The contractor also provided formwork layout drawings and slab construction joints at the exposed lobby ceiling for careful review by the design team. Architectural reveals were located at construction joints where possible. Concrete cover on the exposed elements was detailed for exterior exposures, even at column reveals. Careful inspection of the reinforcement during construction was performed at exposed elements to ensure cover was maintained. In addition, all exposed horizontal surfaces were detailed to drain water.

All mixture designs were produced by Vulcan Materials Company. For most of the exoskeleton, the high-strength concrete mixture was produced with a normal consistency using a high-range water-reducing admixture. Both internal and external vibrators were used in the exoskeleton columns to consolidate the concrete and produce a blemish-free, smooth, and high-quality architectural concrete finish. For constructability and to meet architectural design requirements, however, a 10,000 psi self-consolidating concrete (SCC) mixture was used in the composite tree columns.

Exoskeleton columns

The formwork for the exoskeleton columns was hand framed using single-use, high-density plywood. The forms were held together with steel wales and wall ties placed outside the formwork or in line with the curtain wall to ensure that the columns appeared tie-free. The exoskeleton columns were placed monolithically with the floor slabs and perimeter spandrel beams to eliminate a construction joint at the bottom of the beam. Architectural reveals were provided at the floor levels. These were horizontally aligned with the curtain wall window mullion and the steel grating feature, which concealed the construction joints at the top of each slab.

Tree columns

Construction of the tree columns was completed using EFCO steel plate girder shoring and formwork lined with a 3/4 in. (19 mm) high-density Finnish white birch plywood (Finnform). In addition to serving as formwork, the plate girder system was designed to provide temporary support and bracing for the structural steel built-up sections in the composite columns. Some of the plate girder pieces at the tree

column bases were custom produced to meet the node geometry requirements. Also, most of the plate girder panels used for the columns with rhombus cross sections required bolt-up modifications to achieve the necessary geometry. The formwork was laterally braced using 5/8 to 1-1/4 in. (16 to 32 mm) cable guy wires to limit movement during placement of the concrete.

Analysis and monitoring

Of the six sloping interior columns, four slope toward the north and two slope toward the south. The imbalance in the number of sloping columns in each direction results in a constant lateral load on the structure under its self-weight. Thornton Tomasetti performed a staged construction analysis to evaluate the impact of these forces on the lateral displacements of the frame during construction. Based on the results of this analysis, Thornton Tomasetti instructed the contractor to place each column along its theoretical centerline and correct for any lateral displacements of the building occurring during construction. Analyses showed that the building would have displaced laterally several inches at the top of the structure if these corrections were not made during construction. The general contractor, DAVIS, monitored displacements at regular intervals, and the tower was constructed within design limits.

Conclusions

Architecturally exposed concrete is a prominent feature of Reston Station OB1, particularly at the exoskeleton and tree columns. The structural design is complex because the exoskeleton columns act as both braced frames and moment frames and support the gravity loads for the building. The need to meet stringent structural requirements and architectural design intent created challenges.

The project team successfully met design and construction challenges, resulting in an iconic structure. Although just recently completed, this unique and highly visible structure has already earned the name "the upside-down building."

Acknowledgments

The authors would like to express their gratitude to the entire project team, including Comstock Partners, Owner; JAHN, Architect; DAVIS, Contractor; Miller & Long, Concrete Subcontractor; and Vulcan Materials Company, Concrete Supplier, for their contributions in creating a successful project. In addition, the authors would like to acknowledge R. Wayne Stocks, Managing Principal at Thornton Tomasetti, for his contributions providing the project photos included in this article; Jay Schnarrs, Senior Superintendent at Miller & Long, for his contributions to the article section on the tower construction; Mike Lenkin, Senior Vice President at Miller & Long, for his input on the construction; and Lynda Dossey, Associate Principal Architect at JAHN, and Phil Castillo, President at JAHN, for their contributions to the article discussion on the design.

Selected for reader interest by the editors.

Jennifer Kearney is a Senior Engineer at Thornton Tomasetti in Washington, DC. Kearney has been working as a structural engineer with the firm since graduating in 2015. Her experience includes analysis and design as well as renovations of concrete and steel structures in the Washington, DC metro area. She received her bachelor's and master's degrees in civil engineering with a focus in structures from Pennsylvania State University, State College, PA.

Zachary Kates is an Associate Principal in Thornton Tomasetti's Austin, TX, office. He joined the firm in 1998, and specializes in the management and structural design of complex building structures, including new building designs and the renovation of existing and historic structures. He has performed numerous structural investigations, peer reviews, property loss consulting services, and has provided litigation support and expert witness testimony. He is a licensed professional engineer in numerous states. Zachary received his bachelor's degree in civil engineering from University of Illinois at Urbana-Champaign, Urbana, IL, and his master's degree in civil engineering from the University of Texas at Austin, Austin, TX.

ACI member **Mark J. Tamaro** is a Senior Principal and Thornton Tomasetti's Washington, DC, Office Director. He has more than 20 years of experience in the structural design of new buildings as well as investigation and renovation of existing structures, including historic buildings and monuments. Tamaro's portfolio includes a variety of steel, concrete, masonry, and timber-framed buildings for both private and government clients. He is a licensed professional engineer in numerous states and Washington, DC. He received his bachelor's and master's degrees in civil engineering from Lehigh University, Bethlehem, PA.

2017 Scofield Decorative Concrete Awards

Scofield, a business unit of Sika Corporation, announced the winners of its 10th Annual Decorative Concrete Awards contest during the 2018 World of Concrete in Las Vegas, NV. The contest is free to enter, and is open to any contractor who uses Scofield Systems in the entered project. Each year, winning projects are selected by an independent panel of judges based on skill of installation, creativity, and integration with the overall design intent.

This year, the ceremony for the Decorative Concrete Awards—known as "The Scofies"—was held in the Library Room of the Marquee Nightclub at the Cosmopolitan. The event was attended by around 85 contractors, media representatives, and distributors, as well as Scofield and Sika representatives. Images of the winning entries were projected on a large screen throughout the event, and the winners in attendance were recognized and received their award from Mike DeCandia, Vice President, Scofield.

Prizes were awarded in six categories, with a Grand Prize and two runner-up recipients selected in each. The categories and winners included:

Artistic Concrete

- Grand Prize Winner: Microsoft Boston, submitted by Business Interiors, Woburn, MA;
- First Runner-Up: Morningstar Church, submitted by Capitol Decorative Concrete, Piedmont, SC; and
- Second Runner-Up: St. Agnes Labyrinth, submitted by Concrete by Hallack, Turlock, CA.

Stained Concrete

- Grand Prize Winner: Our Lady of the Rosary Church, submitted by Capitol Decorative Concrete, Piedmont, SC;
- First Runner-Up: National Instruments, submitted by Coburn Construction, Austin, TX; and
- Second Runner-Up: Cascading Pool Deck, submitted by Architectural Concrete Excellence, Lincoln Park, NJ.

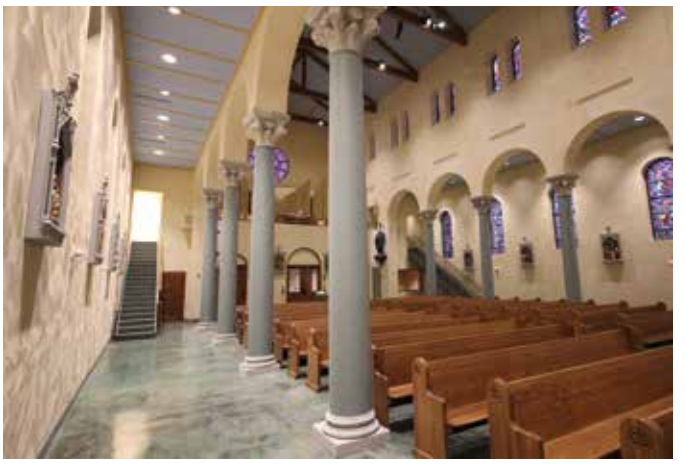
Stamped Concrete

- Grand Prize Winner: Hunt residence, submitted by OPC, Lowell, AR;
- First Runner-Up: Houser Project, submitted by Mike Lindsey Concrete, Solsberry, IN; and
- Second Runner-Up: Creditview Road, submitted by HI-TECH Concrete Solutions, Brampton, ON, Canada.

Polished Concrete

- Grand Prize Winner: Perrysburg Intermediate School, submitted by The Spieker Company, Perrysburg, OH;
- First Runner-Up: Diamond Showroom, submitted by Diamond Polishing Systems, Puyallup, WA; and

Artistic Concrete Grand Prize: Microsoft Boston by Business Interiors



Stained Concrete Grand Prize: Our Lady of the Rosary Church by Capitol Decorative Concrete

- Second Runner-Up: Barnaby's Restaurant and Pub, submitted by Philadelphia Polished Concrete, Manahawkin, NJ.

Integral Concrete

- Grand Prize Winner: Northeast Georgia Medical Center, submitted by Hemma Concrete, Marietta, GA;
- First Runner-Up: Volcano Bay, submitted by UCC Group, Orlando, FL; and
- Second Runner-Up: West Perrine Aquatic Center, submitted by KVH Architects, Doral, FL.

Stamped Concrete Grand Prize: Hunt residence by OPC

Polished Concrete Grand Prize: Perrysburg Intermediate School by The Spieker Company

Heavy/Highway Concrete

- Grand Prize Winner: Walter Athletic Center, submitted by Utility Concrete Products, Morris, IL;
- First Runner-Up: Whitehall Streetscape, submitted by Kamminga & Roodvoets, Grand Rapids, MI; and
- Second Runner-Up: Ohio DOT Bridge project, submitted by Artistic Rock, Cleveland, OH.

The judging panel for this year's event comprised Tom Hatlen, Publisher, *Hardscapes* Magazine; David Hodgin, Vice President of Purchasing, New South Construction Supply; Matt Melichar, Inside Sales, Decorative & Specialty Products, Logan Contractors Supply; Ryan Olsen, Publisher and Editorial Director, *Concrete Contractor* Magazine; Bill Palmer, Editor-in-Chief, *Concrete Construction* Magazine; Jim Peterson, Publisher, The Concrete Network.com; Keith Tosolt, Managing Editor, *Concrete International* Magazine; and Amy Woodall, Editor, *Durability + Design* Magazine.

Visit **www.scofield.com/2017Awards/2017Scofies-Integral-Color.html** for more information.

Integral Concrete Grand Prize: Northeast Georgia Medical Center by Hemma Concrete

Heavy/Highway Concrete Grand Prize: Walter Athletic Center by Utility Concrete Products

Butterfly House

An artful melding of concrete and operable glass walls results in efficient, functional spaces

The Butterfly House, a residence in Monterey County, CA, was designed by San Francisco, CA-based architectural firm Feldman Architecture. The firm's clients, a couple that aspired to create a home for eventual retirement and visits from their grown children, wanted the house to be a retreat befitting the natural beauty of the location in the Santa Lucia Preserve, a 20,000 acre (8100 ha) private development and land trust near Carmel, CA. In an initial meeting with the designer, the couple noted their vision of butterflies alighting on the meadow site. They also expressed their desire to integrate indoor and outdoor spaces with a simple, modern aesthetic and to provide separate spaces for their visitors.

The outcome is a dwelling formed by exposed concrete walls and floors, operable glass walls, and folded roofs inspired by butterfly wings. The home sits lightly on the land and thrusts out into nature, providing unobstructed views of the surrounding environment and wildlife.

Board-formed concrete walls divide the house into three pavilions that are topped by the expressive butterfly roofs. The central pavilion houses the main living, dining, and cooking spaces, while the two other pavilions provide spaces for sleeping, bathing, and relaxing. The structures are modest in size, yet each expands into an outdoor room with dramatic views of the canyon below and hills above.

The design demonstrates how homeowners can enjoy an

photo courtesy of © Joe Fletcher Photography

Operable glass walls allow an expansive living room to be extended outdoors *(photos courtesy of © Joe Fletcher Photography)*

Board-formed concrete walls provide support, aesthetic features, privacy, and thermal mass *(photos courtesy of © Joe Fletcher Photography)*

The butterfly roofs are more than protective and aesthetic features—each roof funnels rainwater to a rain chain fountain and into landscape collection pools that gather it in cisterns for later use to irrigate the landscape *(photos courtesy of © Joe Fletcher Photography)*

indoor/outdoor lifestyle through the use of NanaWall operable glass walls—wall systems that transform the conventional concept of a home into a dwelling that knows no boundaries and quite literally communes with nature. The floor-supported glass wall systems are very easy to operate, and they will continue to be easy to operate as the home, and the residents, age. "Not only is the house itself beautiful, but looking out its wall of completely open windows, it's hard not to be overcome by the drama of the view," architect Jonathan Feldman said.

Although the house contains several of the operable glass walls, there is no compromise in heat loss or heat gain, regardless of the season. Extensive daylighting and passive thermal strategies result in a house that uses little energy. Coupled with the large expanses of insulating glass, the 10 in. (250 mm) thick concrete walls and concrete floors (which also include radiant heating) act as heat sinks—absorbing heat from the sunlight and releasing that heat at night. In warmer months, the operable walls and windows above the concrete walls can be opened to coastal breezes. Lastly, a large solar array located out-of-sight provides much of the energy that is used.

—NanaWall Systems, Inc., **www.nanawall.com**

Leica ScanStation P50

The Leica ScanStation P50 delivers high-quality three-dimensional (3-D) data and high-dynamic range (HDR) imaging at a fast scan rate of 1 million points/s at ranges of more than 1 km (0.6 mile). This rugged and versatile laser scanner has unsurpassed range and angular accuracy paired with low-range noise and survey-grade dual-axis compensation. It can be used to scan mine pits, long bridges, dams, and skyscrapers. In addition, users can scan tall and wide infrastructure or dangerous sites from a remote and safe position.

—Leica Geosystems AG, **www.leica-geosystems.com**

Mortar Net Solutions Custom Cut Drip Edges

Mortar Net Solutions™ custom cut metal drip edges are cut specifically for masonry cavity wall projects and provide a continuous drip edge around complicated details. The edges are shop-cut and arrive at the jobsite precut to fit specific detail profiles. Installers bend them around the details' inside and outside corners in one continuous section. The drip edges are specially cut to prevent kinking and create smooth inside and outside corners with no gaps. Available in stainless steel, cold-rolled copper, and Kynar®-coated galvanized steel, the edges are supplied in pieces up to 10 ft (3 m) in length. Each length may be cut to fit up to 20 corners in angles between 22 and 320 degrees.

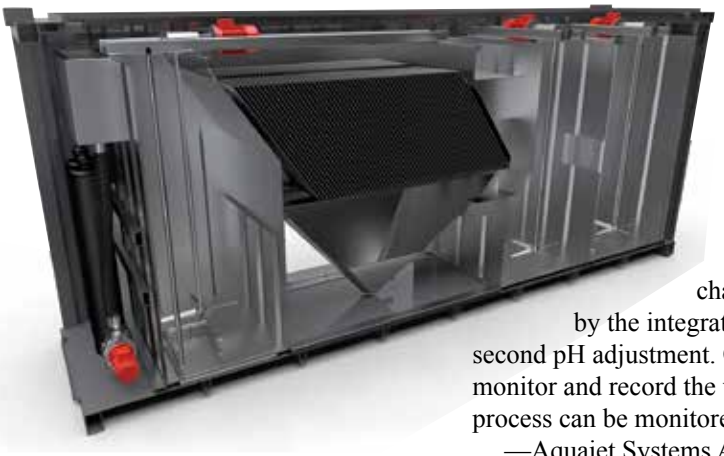
—Mortar Net Solutions, **http://mortarnet.com**

Geotab and Welltrax

Welltrax by Vertrax, transportation management for bulk transportation of gravel, sand, and other bulk commodities, is available on the Geotab Marketplace. This fleet management solution increases efficiencies through customized pick-up and drop-off forms, real-time load management (building and dispatching loads), and asset tracking (monitoring a driver's progress with an assigned load). Full-featured integration into the Geotab Drive mobile app allows the dispatcher to see progress at the driver level while Welltrax highlights any potential hours of service violations before they occur.

—Geotab, **www.geotab.com**

—Welltrax, **www.vertrax.com**



Aquajet EcoClear

Aquajet Systems AB's EcoClear® treats water expelled from an Aqua Cutter at a flow rate of about 5283 gal. (20 m^3) per hour. After passing through treatment chambers, the water is conditioned to a pH of 6 to 9 and a turbidity to 20 to 25 mg particles/L. A flocculating agent is added at the inlet chamber to help clump the particles in the water. The water then flows into a second chamber that introduces carbon dioxide to neutralize the pH. In the next chamber, the floc settles into a storage hopper and is removed by the integrated pump. The water continues to another chamber for a second pH adjustment. Optical turbidity sensors and pH probes continuously monitor and record the water quality to ensure only clean water is discharged. The process can be monitored and controlled online with the RECO control system.

—Aquajet Systems AB, **www.aquajet.se**

Blastcrete MX-20MT Mixer/Pump

Blastcrete Equipment Company's MX-20MT mixer/pump provides twice the output of the company's MX-10 mixer/pump but has nearly the same compact footprint. The MX-20MT features a 1 tonne (1.1 ton) mixer with a high-speed hydraulic agitator that keeps materials blended and in suspension as the resulting mixture flows to the 4 in. (102 mm) swing-tube piston pump. The pump operates with up to 15 MPa (2200 psi) pumping pressure for consistent delivery of up to 20 tonnes (22 tons) of material per hour. Customers can load the hopper with as much as 1100 kg (2500 lb) of material. The machine is mounted to a single-chassis trailer for fast and easy transportation, setup, and cleaning.

—Blastcrete Equipment Company, **www.blastcrete.com**

Cat S41 and S60 Rugged Phones

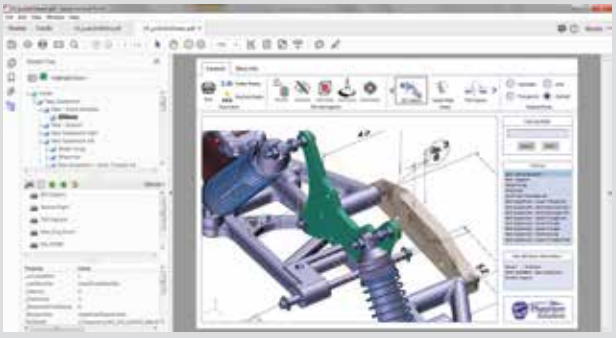
Cat phones are designed for use on construction sites. The phones are drop tested onto concrete from up to 1.8 m (6 ft) and have Corning® Gorilla® Glass screens equipped with technology that works even when the user is wearing gloves or has a wet finger. The phones' scratch-resistant and ultra-bright screens allow readability in direct sunlight, and their high-quality audio systems can be heard in noisy environments. Cat phones are made to operate in extreme cold and hot temperatures, ranging from −25 to 55°C (−13 to 131°F), depending on the device. The smartphones are IP68 certified, ensuring high protection against water. The S60 features a Lockdown Switch that enables the device to survive submersion to depths of up to 5 m (16 ft) for 60 minutes. The Cat S41's Battery Share can power other devices and accessories. The Cat S60 is equipped with a FLIR™ camera, and it can measure temperatures from −20 to 120°C (−4 to 248°F) at distances up to 30 m (100 ft).

—Caterpillar Inc., **www.cat.com**

Gear Keeper Super Coil Tool Tethers

Gear Keeper's ergonomically constructed Super Coil™ tool tethers are manufactured with a low-force polyurethane elastic core coupled with strong webbing. The tether can be extended to 109 in. (2770 mm) and will gently retract to 42 in. (1070 mm). Designed for tools weighing up to 25 lb (11 kg), Gear Keeper's manufacturing process minimizes "extension" arm fatigue but also minimizes entanglement issues when climbing or working in confined areas. Super Coil tethers include a lanyard cord that is sewn lengthwise into the webbing to avoid damaging the cord, ensuring longer durability and strength.

—Hammerhead Industries, **www.gearkeeper.com**



Theorem's Publish 3D

Theorem Solutions released its updated Publish 3D suite of products, which offer 3D PDF publishing for users that design with 3DEXPERIENCE, CATIA V5, Creo, or NX, or who want to extend the use of their JT data to create interactive 3D PDF documentation. The latest release enables data to be output in HTML5. The Publish 3D suite is powered by Adobe's native 3D PDF publishing technology toolkit, which is also used in Adobe Acrobat and Adobe Reader. Users can work directly within a CAD design session or in standalone mode. The 3D PDF publisher supports the creation of documentation into the 3D PDF format, combining 3D design data representations with full product manufacturing information. Passwords can be set on the documents so that only certain people can access the data. The use of 3D PDF allows anybody with access to Adobe Reader to consume, view, and mark up 3D data.

—Theorem Solutions, **www.theorem.com**

Web Notes

Supervisors' Safety Development Program

The National Safety Council Supervisors' Safety Development Program is an adaptive e-learning program that comprises 16 modules in a self-service format. The modules are titled: Safety Management, Communication, Safety & Health Training, Employee Involvement, Safety & Health Inspections, Incident Investigation, Industrial Hygiene, Personal Protective Equipment, Ergonomics, Hazard Communication, Regulatory Issues, Machine Safeguarding, Hand Tool & Portable Power Tools, Materials Handling & Storage, Electrical Safety, and Fire Safety. The program's adaptive engine measures how much a student knows at various points in the training, and it assesses the student's confidence in his or her answers. From there, the program generates an individualized learning path that encourages competency and saves time.

—National Safety Council, **www.nsc.org**

Book Notes

PCI Design Handbook: Precast and Prestressed Concrete, Eighth Edition

The PCI Design Handbook: Precast and Prestressed Concrete, eighth edition, includes updated or new design procedures, numerical examples, and design aids. This edition also includes information on dapped-end bearing design, beam ledge design, and the impacts of ACI 318-14. New appendixes are also included, covering disproportionate collapse, blast design, and diaphragm design for seismic effects.

—Precast/Prestressed Concrete Institute, **www.pci.org**

Products&Service Literature&Videos

CP Tech Center Resources on Internal Curing of Concrete

The National Concrete Pavement Technology Center (CP Tech Center) at Iowa State University published new resources on internal curing (IC) for concrete pavements. Funding for the work came from the Federal Highway Administration, the Iowa Highway Research Board, and the Iowa Department of Transportation. The documents can be downloaded using the following links:

- "Guide Specifications for Internally Curing Concrete," **www.intrans.iastate.edu/research/documents/research-reports/IC_guide_spec_w_cvr.pdf**;
- "Impacts of Internal Curing on the Performance of Concrete Materials in the Laboratory and the Field," **www.intrans.iastate.edu/research/documents/research-reports/impacts_of_IC_on_contraction_joint_spacing_w_cvr.pdf**; and
- "Lifecycle Cost Analysis of Internally Cured Jointed Plain Concrete Pavement," **www.intrans.iastate.edu/research/documents/research-reports/lifecycle_cost_analysis_of_IC_JPCP_w_cvr.pdf**.

—CP Tech Center, **www.cptechcenter.org**

Decorative Concrete Products

Elephant Armor Ultra High Performance Mortar

Elephant Armor® Ultra High Performance Mortar is a single-component, cementitious, fiber-reinforced, medium- to fast-setting repair mortar. It can be placed with a textured roller or traditional tools, and it can be shaped or molded to a minimum thickness of 1/4 in. (6 mm). Elephant Armor features high early and superior bond strength. It provides strong resistance to deicing salts, freezing-and-thawing cycles, and abrasion. Elephant Armor Ultra High Performance Mortar can be used for structural monolithic overlays for interior and exterior applications. It can also be used as a structural underlayment for other materials, such as self-levelers, trowel coats, and epoxies.

—Global Sealer Technologies International, **www.gstinternational.com**

THIN-FINISH

Elite Crete Systems THIN-FINISH™ is a versatile, high-strength, polymer-modified, cementitious topping material and bond coat used for renovation projects or new construction. It's engineered for thin resurfacing, concrete surface restoration, texturing, and creating decorative finishes on stable concrete surfaces. The pre-packaged material comprises a proprietary polymer blend, graded quartz aggregates, and white cement. Applications include interior or exterior commercial, industrial, and residential concrete surfaces. THIN-FINISH provides strength and durability and is resistant to abrasion, UV radiation, and freezing-and-thawing cycles. A wide variety of colors and color combinations are available. The material can be applied from 1/32 to 3/16 in. (0.8 to 4.8 mm) thick, and it has a compressive strength exceeding 4500 psi (31 MPa) after 28 days, allowing heavy commercial traffic without wear or damage. THIN-FINISH can be applied by trowel, squeegee, or an air-supplied hopper gun, and it can be layered to create additional thickness when needed.

—Elite Crete Systems, **www.elitecrete.com**

iCoat I-22 (Natural) and I-30 (Gloss) Color Enhancing Acrylic Sealers

iCoat's color-locking acrylic sealers are solvent-based and can be applied to concrete flatwork with stamped or exposed aggregate finishes. They can also be applied to pavers. These breathable sealers are resistant to UV radiation, provide excellent wear resistance, and protect surfaces from substances such as grease and oil. iCoat I-22 Color Enhancing Acrylic Sealers are best used outdoors, but also can be used indoors. They are easy to apply and can be rolled or sprayed on patios, driveways, sidewalks, pool decks, and other concrete surfaces.

—iCoat Concrete Products, **www.icoatproducts.com**

NewLook International NanoSet Color

NewLook International's NanoSet Color is a technologically advanced liquid dye that adds aesthetically pleasing color to the concrete substrate. The concentrated formula is a proprietary blend of dye solutions that penetrate deeply to create a durable, fast-drying color. Its UV blockers provide exceptional lightfastness. The eco-friendly product may be diluted with the NanoSet Densifier NS, water, or acetone to create a translucent finish for a variety of concrete surfaces. NanoSet Color can be used as a penetrating colorant, and it can be used in conjunction with polishing systems. The dye colors are compatible and may be blended to create custom colors.

—NewLook International, **www.getnewlook.com**

DECK-O-SHIELD

W. R. MEADOWS DECK-O-SHIELD is a ready-to-use, water-based sealer and water repellent for tile, natural stone, concrete, stucco, grout, and masonry surfaces. The sealer is designed for use on surfaces around pool decks and waterfalls and protects against rust staining, spills, and damage caused by salt in water. DECK-O-SHIELD can be applied by brush or spray and meets local or state regulations for emissions of volatile organic compounds. Surfaces appear virtually unchanged after application and drying.

—DECK-O-SEAL, a division of W. R. MEADOWS, **ww.deckoseal.com**, **www.wrmeadows.com**

Çimsa Cements

Çimsa introduced "The Name of the Formula" umbrella of products. The product portfolio includes Super White®, Crafta, Recipro, and Resisto brands. Super White is white, low-alkali, high-early-strength portland cement used in applications requiring a prominent level of whiteness (minimum Hunter L of 85). Crafta cements provide excellent workability, high water retention, and high adhesive strength. They can be used to produce white masonry mortar for brick, block, and stone masonry applications. Recipro and Resisto calcium aluminate cements are used for technical concrete applications. Recipro cements provide high resistance to sulfate attack, and Resisto cements provide high resistance to thermal shock, acid attack, and sulfate attack.

—Çimsa Çimento Sanayi ve Ticaret A.Ş., **www.cimsa.com.tr**

NoteVault Named a Top Company Making Construction More Productive and Profitable by *Construction Executive*

NoteVault was named a top company in the construction industry by *Construction Executive* magazine. The magazine recognizes the top 25 companies that are helping construction businesses increase ROI by transforming the way they make bids, create invoices, manage projects, and plan enterprise resources.

Bechtel Inspires Schoolchildren to "Dream Big" About Careers in Engineering

Bechtel, the Institution of Engineering and Technology (IET), and the University of Bath hosted the international finals of FIRST LEGO® League, a global robotics competition designed to encourage schoolchildren to take up careers in engineering and technology. More than 700 children ages 9 to 16 representing 36 countries worldwide participated in the FIRST LEGO League International Open Championship 2017. The 4-day science, technology, engineering, and math (STEM) challenge included the European premiere of the Bechtel-sponsored three-dimensional film, "Dream Big, Engineering Our World," which highlights engineering feats from around the globe.

FORTA Corporation Acquires Assets of VM Fiber Feeder, Inc.

FORTA Corporation acquired the assets of VM Fiber Feeder, Inc., a privately owned manufacturing entity. VM Fiber Feeder, Inc., was established in 2003 in Sarasota, FL, producing fiber feeders and fiber for the volumetric concrete market. VM expanded by adding a line of dispensers for the dispersion of synthetic fibers. VM also offered a line of both roving and pre-cut fibers that work in conjunction with the feeders. VM's bulk dispensers add pre-chopped fibers to ready mixed, precast, and shotcrete applications.

NAWIC 2017 Award Recipients

The 2017 National Association of Women in Construction (NAWIC) Future Leader of the Year Award winner is Romina Byrd, Greater Washington, DC Chapter – NAWIC President. Byrd is the Director of Education and Training for Miller and Long Concrete Construction. During her 20 years at Miller and Long, she has created and facilitated various programs to promote careers in construction as well as personal and professional development. Just months after joining NAWIC, Byrd served as her chapter's President, growing its membership more than 600% in under 2 years.

Shelie Gaffron was recognized as NAWIC's 2017 Member of the Year. Gaffron, a member of Fort Worth, TX Chapter – NAWIC, is a Pre-Construction Specialist/Estimator at AUI Partners, LLC. Since joining NAWIC in 2012, she has served as her chapter's President-Elect, Vice President, Secretary, and Director. Gaffron has also chaired numerous chapter and regional committees. She was selected as her chapter's 2016 Woman in Construction, and she is a member of the Construction Management Advisory Board at Tarrant County College.

NAWIC's 2017 Lifetime Achievement Award was presented to Linda Young. A member of NAWIC since 1985, Young is a member of the San Diego, CA Chapter. She has served as NAWIC national President, President-Elect, Vice President, and Treasurer. She has also served as a NAWIC region Director and President of the NAWIC Education Foundation. She has held every office on her chapter's board and previously served as Chair of numerous chapter, region, and national committees.

Viewpoint Acquires Dexter + Chaney

Viewpoint acquired Dexter + Chaney, a cloud-based construction enterprise resource planning (ERP) software provider. The addition of Dexter + Chaney's product suite enhances Viewpoint's strategy to drive further the adoption of technology in construction. Viewpoint ERP and project delivery software, including Vista and ProContractor, run mission-critical processes for construction companies around the world. Dexter + Chaney's product suite, which carries the Spectrum brand, helps construction companies manage business, operations, and project management needs.

Bermanto Oy and Etelä-Suomen Imubetoni Oy Announce Merger

Finnish concrete flooring companies Bermanto Oy and Etelä-Suomen Imubetoni Oy (ESIB) merged to form the country's largest concrete flooring company, with turnover of over 20 million euros and 100 employees. ESIB brings a new sector, concrete pumping, to Bermanto's flooring business. Bermanto Oy was established in 2016 when three family-owned companies—Lattia-Miredex Oy, Piimat Oy, and Dyny Oy—combined. The company retains the Bermanto Oy name, and it has three offices in Lahti, Vantaa, and Ylöjärvi. The main owners are Max Vuorio and Harri Aalto.

Calls for Papers

Offshore and Marine Concrete Structures: Past, Present, and Future

Meeting: Two-part technical session on "Offshore and Marine Concrete Structures: Past, Present, and Future" at The ACI Concrete Convention and Exposition – Spring 2019, March 24-28, in Quebec City, QC, Canada; sponsored by ACI Committee 357, Offshore and Marine Concrete Structures.

Solicited: Offshore and marine concrete structures have not received enough attention in the recent past, at least in the United States. The complexity and safety concerns associated with these structures are such that they probably need more attention compared to many other types of concrete structures. Also, offshore and marine concrete structures are so global in nature that there is a higher need for better coordination and synchronization of design, construction, inspection, and maintenance practices in different parts of the world. This two-part session will highlight the past, present, and future of marine concrete structures. Academics, researchers, practitioners, engineers, scientists, and manufactures from all across the world will benefit from this session.

Potential topics for the session include, but are not limited to, the following: overview of offshore and marine concrete structures; materials technology; advances in design and construction practices; advances in inspection, maintenance, and repair practices; innovative and emerging technologies; international practices; landmark and historic projects; lessons learned from the past; and a path forward for offshore and marine concrete structures.

Papers will be peer reviewed and accepted papers will be included in an ACI Special Publication.

Requirements: 1) Paper title; 2) author/speaker name(s), title, organization, and contact information; and 3) an abstract not exceeding 300 words.

Deadlines: Abstracts are due by March 15, 2018; manuscripts of selected papers are due by May 15, 2018.

Send to: Mohammad S. Khan, High Performance Technologies, Inc. (HPTech), e-mail: mkhan@hptech-inc.com.

Cement-based Materials and Structural Concrete

Meeting: SynerCrete 18, Interdisciplinary Approaches for Cement-based Materials and Structural Concrete, October 24-26, 2018, in Funchal, Madeira Island, Portugal.

Solicited: The theme of SynerCrete 18 is "Synergizing Expertise and Bridging Scales of Space and Time." Conference topics will include concrete technology and advanced material testing, multi-scale in time and space modeling and experiments, multi-physics simulation and structural design, BIM and structural concrete, robotics and cement-based materials, digital fabrication, on-site monitoring and structural condition assessment, new materials, and fiber-reinforced concrete and nonmetallic reinforcement.

Requirements: Submit an online abstract of 500 words maximum in plain text. Visit https://synercrete.com for more information.

Deadline: Abstracts are due by March 23, 2018.

Contact: info@synercrete.com.

Sustainability and Innovation in Concrete Materials and Structures

Meeting: 8th International Conference of Asian Concrete Federation (ACF 2018), "Sustainability and Innovation in Concrete Materials and Structures," November 4-7, 2018, in Fuzhou, China; sponsored by the Asian Concrete Federation.

Solicited: ACF 2018 aims to share and build on practical sustainable and innovative concrete materials and structures development. Conference themes include advanced materials, material characteristics, special concrete, sustainability and durability, new structures, behaviors of elements and structures, maintenance and rehabilitation, seismic analysis, codes and standards, recycled materials and waste in concrete, retrofitting and strengthening, testing, inspection and health monitoring, service life design and structural modeling, life-cycle assessment of concrete structures, and practical applications and case studies.

Requirements: Submit abstracts online. Author information and an abstract template can be downloaded at http://2018acf.fzu.edu.cn.

Deadlines: Abstracts are due by March 31, 2018; full papers are due by June 30, 2018.

Contact: Conference Secretariat, e-mail: acf2018@qq.com.

Structural Health Monitoring of Intelligent Infrastructure

Meeting: 9th International Conference on Structural Health Monitoring of Intelligent Infrastructure (SHMII-9), August 4-7, 2019, in St. Louis, MO; organized by Missouri S&T.

Solicited: SHMII-9 will address the theme of "Transferring Research into Practice." Abstracts and papers are solicited to report the research and development of new and emerging technologies, the new guideline and innovative approach to facilitate technology transfer, the unique field demonstrations of existing and new technologies, and the development of

Calls for Papers: Submission Guidelines

Calls for papers should be submitted no later than 3 months prior to the deadline for abstracts. Please send meeting information, papers/presentations being solicited, abstract requirements, and deadline, along with full contact information to: Keith A. Tosolt, Managing Editor, *Concrete International*, e-mail: keith.tosolt@concrete.org. Visit www.callforpapers.concrete.org for more information.

special programs of general interest. Preference will be given to abstracts and papers focused on transferring research into practice. Visit https://shmii-9.mst.edu for more information.

Deadline: Abstracts are due by May 1, 2018.

Technical inquiries: Genda Chen, SHMII-9 Conference Chair, e-mail: gchen@mst.edu, telephone: +1.573.341.4462.

Sustainable Construction Materials and Technologies

Meeting: Fifth International Conference on Sustainable Construction Materials and Technologies (SCMT5), July 14-17, 2019, Kingston University London, Kingston Hill Campus, Kingston upon Thames, Surrey, UK; sponsored by Coventry University, the University of Wisconsin Milwaukee Center for By-products Utilization, and local hosts.

Solicited: The main themes of the technical program are efficient and sustainable use of construction materials, technological advances for sustainable practice, designing structures and building for sustainability, and regulatory framework and government initiatives. The conference proceedings will be posted online. Visit www.scmt.org.uk for more information.

Requirements: Abstracts of 200 to 300 words as a Microsoft Word file are invited.

Deadlines: Abstracts are due by June 30, 2018; final papers are due by March 11, 2019.

Send to: kingstonuniversityeventsSEC@kingston.ac.uk.

Notable Concrete in Las Vegas and Vicinity

Document: Compendium of notable concrete in Las Vegas and vicinity for e-publication at The ACI Concrete Convention and Exposition – Fall 2018 in Las Vegas, NV, October 14-18, 2018; compiled by ACI Committee 124, Concrete Aesthetics and co-sponsored by the Las Vegas Chapter – ACI, AIA Las Vegas/AIA Nevada, and SEASoN. The document will also be available as an electronic file on the ACI website, and may be excerpted in *Concrete International*. Images submitted will be stored and available as electronic files on the ACI website and may be used in ACI educational and promotional materials. Exceptional images may merit placement on the cover of *Concrete International*.

Solicited: Image and brief description of notable concrete (cast-in-place, precast, post-tensioned, masonry, or tilt-up) in all types of uses—buildings, monuments, pavement, silos, bridges, crypts, furniture, retaining walls, utility poles, tanks, sculpture, culverts, plazas, and whatever else has caught your attention. Significance may be historical, aesthetic, sustainable, functional, structural, construction-related, unusual use or application, or simply personal affection.

Requirements: 1) Name and location of submission; 2) image (photograph, drawing, or sketch) that is not copyrighted; 3) brief description that establishes significance and lists credits; and 4) submitter's name, title, organization, city and state, telephone, and e-mail address. Location information should include zip code. Submit all information in electronic format: image as JPG or TIFF file at least 1 MB (but no more than 4 MB); text in e-mail or as Microsoft Word document (120 words maximum). No PDF files, please.

Deadline: Materials are due by July 1, 2018.

Send to: Michael J. Paul, Larsen & Landis, 11 W. Thompson St., Philadelphia, PA 19125, mpaul@larsenlandis.com.

Prestressed Concrete with Conventional and Nonconventional Materials

Meeting: Technical session on "Prestressed Concrete with Conventional and Nonconventional Materials" at The ACI Concrete Convention and Exposition – Fall 2019, October 20-24, 2019, Cincinnati, OH; sponsored by ACI Committee 345, Concrete Bridge Construction, Maintenance, and Repair.

Solicited: The special session will focus on the recent advancement of prestressed concrete for bridges and structures using conventional and nonconventional materials. Presentations and technical papers will include the conceptual development of innovative prestressed concrete, laboratory experiments, numerical modeling, and case studies. State-of-the-art prestressing techniques and nonconventional materials such as fiber-reinforced polymer (FRP) composites to address the sustainable performance of concrete members will also be considered. An ACI Special Publication will be published.

Requirements: 1) Presentation/paper title; 2) author/speaker name(s), title, affiliation, and contact information; and 3) an abstract of 200 words.

Deadlines: Abstracts are due by July 31, 2018; final papers are due by November 30, 2018.

Send to: Yail Jimmy Kim, University of Colorado Denver, e-mail: jimmy.kim@ucdenver.edu; and Hiroshi Mutsuyoshi, Saitama University, e-mail: mutuyosi@mail.saitama-u.ac.jp.

Meetings

MARCH

4-7 - 2018 NSSGA Annual Convention, Houston, TX
www.nssga.org/major-event/nssga-2018-annual-convention

5-6 - 5th Ibero-American Congress on Self-Compacting Concrete and Special Concrete (HAC 2018), Valencia, Spain
http://hac2018.hac-bac.webs.upv.es/en_presentation.html

5-10 - IFCEE 2018, Orlando, FL
www.ifcee2018.com

6-10 - 2018 CSDA Convention & Tech Fair, Maui, HI
www.csda.org/?page=Convention2018

11-13 - ASA 20th Anniversary Event: First ASA Shotcrete Convention and Shotcrete Technology Conference, Napa, CA
www.shotcrete.org/pages/news-events/20thAnniversary.htm

19-21 - RILEM Spring Convention, Barcelona, Spain
www.rilem.net/agenda/1206

24-27 - ACPA Annual Convention, San Diego, CA
www.concretepipe.org/event/acpa-annual-convention-3

THE CONCRETE CONVENTION AND EXPOSITION: FUTURE DATES

2018 — March 25-29, Grand America & Little America, Salt Lake City, UT

2018 — October 14-18, Rio All-Suite Hotel & Casino, Las Vegas, NV

2019 — March 24-28, Quebec City Convention Centre and Hilton Quebec Quebec City, QC, Canada

2019 — October 20-24, Duke Energy Convention Center & Hyatt Regency Cincinnati Cincinnati, OH

For additional information, contact:
Event Services, ACI, 38800 Country Club Drive,
Farmington Hills, MI 48331
Telephone: +1.248.848.3795
www.concrete.org/events/conventions.aspx

ACI Industry Events Calendar:

For more information and a listing of additional upcoming events, visit **www.concrete.org/events/eventscalendar.aspx**. To submit meeting information, e-mail Lacey Stachel, Editorial Coordinator, *Concrete International*, at lacey.stachel@concrete.org.

APRIL

3-6 - 4th Doctoral School LC3, Characterisation methods of blended cements, Lausanne, Switzerland
www.lc3.ch/doctoralschool

5-7 - 2018 TMS Spring Meeting, New Orleans, LA
https://masonrysociety.org/meetings/2018-tms-spring-meeting

16-18 - Advances in Materials and Pavement Performance Prediction, Doha, Qatar
www.am3p.com

19-21 - Structures Congress 2018, Fort Worth, TX
www.structurescongress.org

APRIL/MAY

29-1 - 16th International Congress of Polymers in Concrete (ICPIC2018), Washington, DC
http://icpic2018.unm.edu

MAY

6-9 - PTI Convention 2018, Minneapolis, MN
www.post-tensioning.org/page/PTI-Convention

6-10 - 60th IEEE-IAS/PCA 2018 Cement Conference, Nashville, TN
www.cementconference.org

24-26 - 2018 Construction History Society of America (CHSA) Biennial Meeting, College Park, MD
www.constructionhistorysociety.org/2018-chsa-biennial-meeting

JUNE

4-6 - International Workshop on Calcium Sulfoaluminate Cements, Murten, Switzerland
https://events.empa.ch/Aktuelle%20Veranstaltungen/Tagungen/event.php?vnr=84-106

5-8 - International Conference on Deep Foundations and Ground Improvement, Rome, Italy
www.dfi.org/dfieventlp.asp?13310

6-7 - 2nd International Workshop on Durability and Sustainability of Concrete Structures, Moscow, Russia
www.aciitaly.com/events/dscs2018

Sinopsis en español

Concreto notable en Salt Lake City

***Concrete International*, V. 40, No. 3, marzo de 2018, págs. 27-31**

Se presentan varios proyectos cerca del Concrete Convention and Exposition en los hoteles Grand America y Little America, en Salt Lake City, UT. Algunos de los proyectos incluyen Salt Lake City Public Safety Building, George S. and Dolores Dore Eccles Theater, 111 S. Main Street, City Creek Building, Gateway Block B, Jordan River Pedestrian Bridge and Trail, Artesian Springs Tower, Living Planet Aquarium, Mountain "S" Home, y The Void.

Ganadores de los premios 2018 de Decorative Concrete Council

***Concrete International*, V. 40, No. 3, marzo de 2018, págs. 33-35**

El Decorative Concrete Council, un consejo de especialidad de la American Society of Concrete Contractors (ASCC, por sus siglas en inglés), anunció a los ganadores de su décima competencia anual de premios sobre Concreto Decorativo. Los ganadores fueron reconocidos en una ceremonia en World of Concrete, Las Vegas, NV. TB Penick & Sons, San Diego, CA, ganó el Premio ¡WOW!, mejor proyecto general, para el Jardín Botánico de Atlanta, Atlanta, GA.

Concreto desnudo

Kearney, J.; Kates, Z.; y Tamaro, M.J., *Concrete International*, V. 40, No. 3, marzo de 2018, págs. 36-41

Reston Station OB1, Reston, VA, es una sorprendente torre de oficinas de 16 pisos que exhibe un exclusivo Sistema de resistencia de fuerza lateral que comprende un exoesqueleto de concreto diagonal y expuesto. Las columnas de exoesqueleto de concreto son características estéticas que soportan cargas de gravedad y resisten cargas laterales en la dirección norte-sur. Seis muros de cortante, ubicadas en el núcleo del edificio a lo largo del ascensor y los huecos de las escaleras, sirven como el sistema de resistencia lateral de la fuerza en la dirección este-oeste. Las características clave del diseño se resumen.

Scofield Decorative Concrete Awards 2017

***Concrete International*, V. 40, No. 3, marzo de 2018, págs. 42-43**

Scofield, una unidad comercial de Sika Corporation, anunció a los ganadores de su décimo concurso anual de Decorative Concrete Awards. El concurso anual es gratuito y está abierto a cualquier contratista que use Scofield Systems en el proyecto ingresado. A la ceremonia de premiación asistieron cerca de 85 contratistas, miembros de los medios y otros.

Casa de Mariposa

***Concrete International*, V. 40, No. 3, marzo de 2018, págs. 44-46**

La Casa de Mariposa, una residencia en el condado de Monterey, CA, ofrece vistas sin obstáculos del entorno y la vida silvestre. La casa está formada por muros y pisos de concreto a la vista, paredes de vidrio operables y techos plegados inspirados en alas de mariposa. El pabellón central alberga los espacios principales de estar, comedor y cocina, mientras que los otros dos pabellones ofrecen espacios para dormir, bañarse y relajarse.

On the Move


Anderson


McCann


Powers


Saiidi

Charles Pankow Builders, Ltd., promoted ACI member **Scott M. Anderson** to President. Since joining Pankow in 1995, Anderson has served as Senior Vice President/Regional Manager, Project Executive, Project Sponsor, Project Engineer, and Field Engineer. As President, he provides leadership of the strategic and cultural direction of the company. He is a member of the San Francisco Partnering Steering Committee, the Urban Land Institute, and the Lean Construction Institute. Anderson received his BS degrees in civil engineering and mathematics from the University of Maryland, College Park, MD, and his MS in structural engineering from Stanford University, Stanford, CA. He is a member of the ACI Foundation Scholarship Council; ACI Committee 362, Parking Structures; and Joint ACI-ASCC Committee 117, Tolerances, as well as various Committee 117 subcommittees and task groups.

CTLGroup appointed ACI member **Dennis McCann** to Vice President and Chief Operating Officer. Since McCann joined the firm as Principal Engineer in 2011, he has led efforts in structural performance assessment, structural monitoring, and failure investigation. His technical expertise includes structural dynamics and mechanics, as well as risk and decision analysis. He received his BS from the University of Notre Dame, Notre Dame, IN, and his MSE and PhD from The Johns Hopkins University, Baltimore, MD; all are in civil engineering.

ACI member **Laura Powers** joined CTLGroup as Principal Materials Scientist, Petrography. She has extensive experience in evaluating geological and building materials using polarized-light microscopy and other petrographic methods, scanning electron microscopy with x-ray spectroscopy, electron microprobe analysis, x-ray fluorescence, x-ray diffraction, physical testing, and chemical testing methods. Her expertise includes assessing the composition and condition of historical building materials for restoration and conservation purposes, identification of defects and deficiencies in precast and cast-in-place concrete, analysis of non-portland cement-based building materials, assessing damage caused by fire and explosion, and evaluating performance of materials in aggressive environments. Powers is a member of ACI Committees 120, History of Concrete; 201, Durability of Concrete; and 236, Material Science of Concrete.

Matt Filippini joined CTLGroup as Senior Architect, Structural & Architectural Evaluation. He has 25 years of experience in architectural and structural evaluation and design. Filippini specializes in building envelope evaluations, research, condition assessments of architectural and structural components, and litigation support. His project experience includes forensic investigations of building envelopes, including roof, wall, window, curtain wall, and foundation systems; concrete, masonry, wood, and steel structures; façade inspections and repairs; parking structures; condominium, industrial and commercial facilities; governmental and military buildings; religious facilities; and the evaluation and repair of historic buildings.

Honors and Awards

M. Saiid Saiidi, FACI, was inducted into the Academy of Engineering of Mexico (AEM). Established to recognize the most accomplished and prominent engineers in Mexico, AEM selects internationally recognized individuals from around the world with outstanding contribution to engineering following a rigorous nomination and evaluation process. The induction ceremony was held in Mexico City in November 2017. Saiidi was recognized for his research and implementation on advanced materials in earthquake engineering of bridges to substantially improve the resiliency of infrastructure. He is a member of ACI Committees 341, Earthquake-Resistant Concrete Bridges; 342, Evaluation of Concrete Bridges and Bridge Elements; and S803, Faculty Network; and Joint ACI-ASCE Committee 352, Joints and Connections in Monolithic Concrete Structures.

Richard E. Klingner has been named an Honorary Member of The Masonry Society (TMS). He was honored for his contributions related to masonry research, codes, and standards. Klingner served as a faculty member in the Department of Structural Engineering at The University of Texas at Austin, Austin, TX, for over 30 years, where he taught classes on structural analysis, dynamics, and behavior, including the design of masonry and reinforced concrete structures. He conducted significant research, and authored or co-authored more than 90 refereed journal articles, 40 books or book chapters, and 350 other technical publications. Klingner participated in many research programs, including investigations of the seismic behavior of new masonry, masonry veneer, and autoclaved aerated concrete masonry. He has served as Chair of TMS Committee 402/602, Building Code Requirements and Specification for Masonry Structures; TMS Technical Activities Committee; TMS Research Committee; and TMS Investigating Disasters Program. In addition, Klingner previously served as TMS Vice President, Secretary/Treasurer, Team Leader on the 1994 Northridge California Earthquake Investigation, Chair of the 8th North American Masonry Conference, and Leader of the Masonry in the Americas Workshop. He was a primary author of the *Masonry Designers' Guide*.

Public Discussion

The ACI draft standard open for public discussion that is being processed can be found at **www.concrete.org/discussion**. This is not yet an official ACI standard.

Document number	Title	Open for discussion	Discussion closes
563	Specifications for Repair of Structural Concrete in Buildings	1/29/2018	3/15/2018

Proposed Standards

ACI 563 "Specifications for Repair of Structural Concrete in Buildings"

The ACI Technical Activities Committee (TAC) approved processing the subject document through ACI's Standardization Procedure in July 2017 as did the ACI Standards Board in January 2018.

The document appears on the ACI website, **www.concrete.org/discussion**.

Pertinent discussion will be available on ACI's website and announced in a future issue of *Concrete International* if received no later than March 15, 2018. Comments should be e-mailed to discussion@concrete.org.

2018 ACI Membership Application

American Concrete Institute • 38800 Country Club Drive • Farmington Hills, MI 48331 • USA
Phone: +1.248.848.3800 • Fax: +1.248.848.3801 • Web: www.concrete.org

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Please print or type all information requested below:

❍ Mr. ❍ Mrs. ❍ Ms. ❍ Dr. Gender: ❍ Female ❍ Male

FIRST NAME _____ MIDDLE INITIAL _____ LAST NAME (SURNAME) _____

EMPLOYER _____ CORPORATE TITLE _____

E-MAIL ADDRESS _____ BIRTHDATE _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____ COUNTRY _____

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Categories of membership

Please select the desired category of membership and submit the appropriate dues described below.

❍ **ORGANIZATIONAL – $1060 PLUS APPLICABLE SHIPPING FEES**

Includes one set of the *ACI Collection of Concrete Codes, Specificications and Practices* (formerly MCP), a wall plaque, and a subscription to *Concrete International* and both *ACI Materials* and *Structural Journals*.

ACI COLLECTION: – Select a format and include applicable shipping fee:

- ❍ **Eight-volume Set** – U.S. add $32 shipping fee; Canada and Mexico add $132 shipping fee; and all others, add $225 shipping fee
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❍ **INDIVIDUAL – $249/year**

Individuals 28 years old or above residing worldwide.

❍ **YOUNG PROFESSIONAL – $124/year**

Individuals under the age of 28 who do not qualify for student membership.

E-STUDENT – FREE Join at www.concrete.org/Membership/StudentMembership.aspx.

SUSTAINING MEMBERSHIP – ACI Sustaining Members receive all membership benefits of Organizational Members plus a free copy of every new ACI publication and increased corporate exposure, positioning them as a leader in the concrete industry, and much more. For complete details or to join, visit **www.concrete.org/membership/sustainingmembership.aspx** or call +1.248.848.3800.

Included Subscriptions

Your ACI membership includes a hard copy and online subscription to *Concrete International* and digital access to the *ACI Materials Journal* and *ACI Structural Journal* and ACI Guides & Reports.

Additional Periodical Options

To add subscriptions in hard copy: please check a circle below and include an additional $49 ($54 for individuals outside U.S. & Canada per title).

❍ *ACI Structural Journal*, hard copy
❍ *ACI Materials Journal*, hard copy

Please allow up to 2 months for delivery outside the U.S.

Optional Online Subscriptions

Bundle your ACI membership with these optional online subscriptions for additional ACI resources:

❍ Symposium Papers Subscription, $49
❍ *ACI Collection* (formerly MCP), $235
❍ ACI University Digital Subscription, $99

Profile Information (Select all that apply.)

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❍ Construction
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❍ Owner

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❍ Consultant
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❍ Architect
❍ Contractor
❍ Technical Specialist
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$	For Journals, Canadian residents add 5% GST (#126213149RT)
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Concrete Reinforcing Steel Institute
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Acceptable Concrete Cracking

Q. *What is considered as acceptable concrete cracking in cast-in-place foundation walls and slabs per ACI documents? My company is the concrete contractor on a large warehouse project, and I want to discuss the potential for cracking with the contractor and the owner.*

A. Concrete cracks are possible on any project, so it's wise to set reasonable expectations for yours. Foundation walls are normally designed as reinforced concrete. Reasonable crack widths for reinforced concrete under service loads are listed in Table 4.1 of ACI 224R-01[1] (refer to Table 1). However, a footnote warns that, with time, "a significant portion" of the cracks in a structure can exceed these values. Commentary Provision R24.3.1 of ACI 318-14[2] discusses flexural reinforcement for one-way slabs and beams. That provision indicates that visible cracks will develop under service loads, and crack widths are usually widely scattered and influenced by "shrinkage and other time-dependent effects." The associated Code provision provides reinforcement detailing requirements for controlling crack widths (that provision applies to the design team, so you should consider including at least one more party in your discussions).

In general, when it comes to slabs, both ACI 302.1R-15[3] and ACI 360R-10[4] state in their prefaces that it's unrealistic to expect crack-free and curl-free floors regardless of the best design and construction practices. Also, those documents state that the designer and contractor need to advise every owner that "it is completely normal to expect some amount of cracking and curling on every project." ASCC Position Statement #33[5] provides similar guidance, stating that:

"ASCC concrete contractors will meet with the design team, construction manager, and general contractor to discuss crack expectations for the project. Concrete contractors want to ensure awareness by all parties that cracking will occur when the structure is built in accordance with the Contract Documents."

For more information on educating your clients and minimizing legal issues related to cracking, refer to Coleman's article, "Cracking…Defect or Normal?"[6]

References

1. ACI Committee 224, "Control of Cracking in Concrete Structures (ACI 224R-01 (Reapproved 2008))," American Concrete Institute, Farmington Hills, MI, 2001, 45 pp.

2. ACI Committee 318, "Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary (ACI 318R-14)," American Concrete Institute, Farmington Hills, MI, 2014, 519 pp.

3. ACI Committee 302, "Guide to Concrete Floor and Slab Construction (ACI 302.1R-15)," American Concrete Institute, Farmington Hills, MI, 2015, 76 pp.

4. ACI Committee 360, "Guide to Design of Slabs-on-Ground (ACI 360R-10)," American Concrete Institute, Farmington Hills, MI, 2010, 72 pp.

5. "ASCC Position Statement #33: Cracks in Structural Concrete," *Concrete International*, V. 32, No. 10, Oct. 2010, pp. 72.

6. Coleman, J.W., "Cracking…Defect or Normal?," *Concrete International*, V. 35, No. 9, Sep. 2013, pp. 35-38.

Table 1:
Guide to reasonable crack widths for reinforced concrete under service loads* (Table 4.1 in ACI 224R-01[1])

Exposure conditions	Crack width	
	in.	mm
Dry air or protective membrane	0.016	0.41
Humidity, moist air, soil	0.012	0.30
Deicing chemicals	0.007	0.18
Seawater and seawater spray, wetting and drying	0.006	0.15
Water-retaining structures†	0.004	0.10

*It should be expected that a portion of the cracks in the structure will exceed these values. With time, a significant portion can exceed these values. These are general guidelines for design to be used in conjunction with sound engineering judgement.
†Excluding nonpressure pipes.

Questions in this column were asked by users of ACI documents and have been answered by ACI staff or by a member or members of ACI technical committees. The answers do not represent the official position of an ACI committee. Comments should be sent to rex.donahey@concrete.org.

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