Mission: The ACI Foundation drives innovation for the enduring success of the concrete industry by leading a collaborative forum that makes and facilitates strategic investments in people, ideas, and research.

I’m pleased to present the ACI Foundation’s 2016 Update, a compilation of our achievements this past year. Over our 28-year history, we have funded research grants, educational awards, and the implementation of innovative technology with 2016 being no exception. All of our efforts support the lasting success of the concrete industry through the facilitation of strategic investments in people, ideas, and research.

2016 brought many successes, which are detailed on the following pages. We:

- Increased our grant funding limit up to $50,000 per research project;
- Provided grants to four research projects;
- Awarded 17 fellowships and scholarships to deserving students;
- Fully funded a new fellowship award;
- Honored three individuals who have distinguished themselves through research or innovation; and
- Held two successful Technology Forums.

While the end of the year generates reflection on accomplishments, one of our primary achieved goals of 2016 brings with it a look to the future. I, along with our Board of Trustees and other staff, have worked to enhance the governance of the Foundation as part of the implementation of our strategic plan. We look forward to being a more effective, nimble, and impactful organization in 2017.

I thank all of our constituents and distinguished volunteers who have devoted their expertise, leadership, time, and financial support to ACI Foundation activities. The industry is better for your efforts and I have enjoyed the opportunity to work with all who embrace our mission.

I encourage you to get involved in our programs. If you are passionate about a particular research project, technology, or student award, never hesitate to contact me with any questions you may have.

All my best,
Ann Daugherty

Vision: A better world through innovative concrete solutions.
A total of $88,000 was distributed in academic stipends through scholarships and fellowships in 2016. Seventeen undergraduate and graduate students from across North America made up this year’s recipients. “Thanks to the Stehly Fellowship, I will be graduating from college debt-free in the spring,” stated Megan Voss, the recipient of the 2016 Richard D. Stehly Memorial Fellowship. “Out of all my college activities, the concrete conventions have been the most beneficial for me in terms of networking experience.”

Fellowship recipients receive an educational stipend; an industry mentor; free registration, travel, and accommodations for three ACI Conventions; a possible internship, and recognition during an ACI Convention, within Concrete International, and on scholarshipcouncil.org. Scholarship recipients receive an educational stipend along with recognition in Concrete International and on scholarshipcouncil.org.

Due to the generous contributions of both ACI members and nonmembers, the Daniel W. Falconer Memorial Fellowship was fully funded in 2016 and will begin being awarded in 2017. This fellowship honors the late Dan Falconer, who served as ACI’s Managing Director of Engineering for more than 17 years.

Please visit scholarshipcouncil.org for more information.

2016-2017 ACI Foundation Fellowship Recipients
Barbara S. and W. Calvin McCall
Carolinus Fellowship
Lateef Assi, University of South Carolina
Nominator: Paul Ziehl
Mentor: Walt Flood IV

Charles Pankow Student Fellowship
Iman Mehdipour, Missouri S&T
Nominator: Kamal Khayat
Mentor: Jason Weiss

Darrell Elliott Louisiana Fellowship
Rebecca Nyle, Auburn University
Nominator: Robert Barnes
Mentor: Lisa Feldman

Elmer Baker Fellowship
H jon Voos, University of Saskatchewan
Nominator: Lisa Feldman
Mentor: James Erzen

ACI Presidents’ Fellowship
Aishwarya Puranam, Purdue University
Nominator: Santiago Pujol
Mentor: Arsenio Caceres Fernandez

Richard D. Stehly Memorial Fellowship
Megan Voss, Valparaiso University
Nominator: Jacob Henschel
Mentor: Karla Kruse

ACI Richard N. White Student Fellowship
Yadira Porras, Kansas State University
Nominator: Kyle Riding
Mentor: Kimberly Wilson

Tribute to the Founders Fellowship
Stephanie Wood, University of Alabama
Nominator: Eric Giannini
Mentor: Michelle Wilson

2016-2017 ACI Foundation Scholarship Recipients
ACI Scholarship
Amir Rezaeivahdati, University of Saskatchewan
Disan Katumba, New Jersey Institute of Technology

Bertold E. Weinberg Scholarship
Junji Yamamoto, Harvard Graduate School of Design

Katharine & Bryant Mather Scholarship
Shuvrasha Taladhar, University of Texas at Arlington

Kumar Mehta Scholarship
Viet Le, University of Massachusetts

Schwing America Scholarship
Bruno Fong-Martinez, University of Texas at Austin

Stewart C. Watson Memorial Scholarship
Robert Devine, University of Notre Dame

W. Gene Corley Memorial Scholarship
Michael Brandes, University of Notre Dame

Richard D. Stehly Memorial Scholarship
Cole Pilgram, Texas State University

Active fellowships not awarded this year:
Baker Student Fellowships (two)
Cagley Student Fellowship
One of our core objectives is accelerating the acceptance of new concrete technology within the concrete industry. We invested $118,000 on projects to advance the implementation of new technology in 2016 through our Strategic Development Council (SDC). The SDC consists of organizations interested in improving the quality and efficient construction of concrete structures with a focus on innovation. The SDC operates in two specific ways: first, for the concrete industry, by providing an in-house forum for leaders and senior executives to discuss strategic issues and tactics, including support of practical research; and second, for entrepreneurs by providing a showcase for their ideas and technologies and an opportunity to work with concrete industry leaders.

Construction, including concrete construction, is often notoriously slow to change. We’ve all heard the old adage: “Not every change is an improvement, but every improvement is definitely a change.” But it is also true that “Change is always there; improvement can only be there if people accept change.” SDC is interested in highlighting new and promising ideas and technologies, but also in “accelerating technology acceptance.”

SDC organizations are represented by manufacturers, suppliers, engineers, contractors, academics, and government personnel, most of whom are executive-level decision-makers within their companies. As a group, they seek industry-critical technologies (ICTs), identify barriers to the acceptance of technologies, outline strategies, and act as a catalyst to remove barriers. We would like to extend our appreciation to all SDC member organizations who help the industry quicken its acceptance of new technology.

"SDC is interested in highlighting new and promising ideas and technologies, but also in “accelerating technology acceptance.”"
Current Technology Projects and Initiatives

The SDC is an incubator for ideas. Once an idea is shaped and nurtured by the SDC it often will satisfy an appropriate outside group, committee, or standard which can take the idea to fruition. Some current industry-critical projects and initiatives are:

- Alternative Cementitious Materials—SDC financially supported an ACI Innovative Task Group (ITG) to produce the first document to provide guidance on alternative binders that can be used in concrete.
- Building Information Modeling—SDC continues to financially support research and development of for-industry foundation class (IFC) standards that are neutral, non-proprietary exchanges of data yielding interoperability among various BIM platforms and BIM-related software.
- Concrete Wind Turbine Towers—SDC financially supported an ACI ITG and this year the group published ITG-9R-16: Report on Design of Concrete Wind Turbine Towers—the first document for design and construction of ultra-high wind towers using concrete.
- Crack Reduction—SDC coordinated the nearly $1M funding of a multi-year, multi-state research program examining numerous technologies to reduce early-age volume shrinkage cracking in bridge decks, slabs-on-ground, and parking decks.
- High-Strength Reinforcement—SDC is contributing to the financial support of a number of research projects with a goal to enhancing inclusion of high-strength reinforcement in the ACI 318 code. Findings from one research project of 2016 were published in Volume 113 of the ACI Materials Journal: “Low-Cycle Fatigue Performance of High-Strength Steel Reinforcing Bars” by Wassim M. Ghannoum and Chase M. Slavin.
- Prepackaged Powdered Construction Products—SDC is working through ACI repair committees to develop appropriate standards for prepackaged materials used in repair and grouting work.

Other ongoing initiatives include Vision 2020, related to the repair of concrete, and the Strategic Repair Research Council.

SDC Technology Forums 39 & 40

SDC Technology Forums are signature events for us and provide a place for industry leaders to discuss key issues in our industry. These 1-1/2-day conferences are devoted to presentations of technological interest and showcase presentations on new or innovative technologies in the concrete construction industry and committee meetings for our industry-critical technologies or issues. In 2016, the SDC held its biannual Technology Forums in San Antonio, TX (May 2016), and Salt Lake City, UT (September 2016). Technology Showcases included technologies such as 3-D Laser scanning applications, novel utilization of CO₂ in ready mixed concrete, 3-D printing with concrete, and a concrete solution using NASA life support technology. Presentations ranged from panels on reducing cracking to building information modeling (BIM) to concrete wind turbine towers. Catering to the futurists, one of the forums included a tour into the future with self-assembling forms using nanobots.

The SDC also hosted workshops on Concrete 2029: A Vision for the Concrete Contracting Industry. Over 60 attendees participated in identifying and outlining trends and expectations for the future. This effort to develop a roadmap of goals and activities will help assure that the concrete contracting community is building with expertise, quality, and efficiency well into the future.
Four research projects were completed this past year, shown in the table below. More information about each of these products can be found on acifoundation.org. Thank you to all the individuals, organizations, and universities who submit, select, and disseminate the research that is made possible by their involvement and support of the CRC.

Our 2016 annual call for proposals yielded an unprecedented high volume of research proposal submissions. The quality of these submissions was outstanding and showed significant support from both ACI technical committees and industry, and also included cost sharing from universities at various levels.

The CRC approved $163,300 in grant funding among four research projects in 2016. These four projects are listed in greater detail on the following page. “The efforts of the CRC will boost the impact that the ACI Foundation’s funding will have on the concrete industry,” stated Joe Bracci, CRC Chair. “The increase in grant amount and more competitive selection process has brought more proposals from researchers, and more interest and support from ACI Committees.”

### 2016 Research Products Co-funded by ACI Foundation

<table>
<thead>
<tr>
<th>Project Title</th>
<th>ACI Committee Support</th>
<th>Principal Investigator</th>
<th>Other Funders</th>
</tr>
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<tbody>
<tr>
<td>Interface Shear Transfer of Lightweight Aggregate Concretes with Different Lightweight Aggregates</td>
<td>ACI-ASCE Joint Committee 445 Shear and Torsion</td>
<td>Lesley Sneed, Missouri University of Science and Technology</td>
<td>Precast/Prestressed Concrete Institute, In-kind donations by Buildex, Inc., STALITE, Trinity Lightweight, and Ambassador Steel Corporation</td>
</tr>
<tr>
<td>Evaluation of Seismic Performance Factors and Pedestal Shear Strength in Elevated Water Storage Tanks</td>
<td>ACI 350 ACI 317</td>
<td>Reza Khianoush, Ryerson University</td>
<td></td>
</tr>
<tr>
<td>Setting Bar-Bending Requirements for High-Strength Steel Bars</td>
<td>ACI 318</td>
<td>Wassim M. Ghannoun, University of Texas, San Antonio</td>
<td>Charles Pankow Foundation, Concrete Reinforcing Steel Institute, and in-kind donations by CMC, Gerdau, MMFX, NUCOR Steel Inc., and Harris Rebar</td>
</tr>
<tr>
<td>Evaluation of Seismic Behavior of Coupling Beams with Various Types of Steel Fiber-Reinforced Concrete</td>
<td>ACI 318</td>
<td>Gustavo J. Parra Montesinos, University of Wisconsin - Madison</td>
<td>Charles Pankow Foundation, Bekaert Corp, and the American Society of Concrete Contractors</td>
</tr>
</tbody>
</table>
Deformed Steel Fibers as Minimum Shear Reinforcement in Deep, Prestressed Concrete Hollow-Core Slabs

This project aims to generate the necessary experimental data to evaluate the conditions under which steel fibers could be used as minimum shear reinforcement for deep precast, prestressed concrete hollow-core slabs. This research project will conduct a total of 32 tests at the Wisconsin Structures and Materials Testing Laboratory. Testing variables will include fiber type, dosage, shear span-to-effective depth ratio, slab manufacturing process, and distance from slab end to first critical section for shear. The results generated from this research could be used to develop a code change proposal in collaboration with ACI Subcommittee 318-G. Gustavo J. Parra-Montesinos, University of Wisconsin–Madison, will act as the project’s Principal Investigator.

Towards Mechanistic Pavement Design of Pervious Concrete Pavements

Pervious concrete pavements (PCPs) is a desirable technology for municipalities and project owners due to its ability to percolate rainwater at a rapid rate. PCPs are a relatively new technology and despite their benefits do not have a reliable design procedure for researchers and professionals to follow. This project seeks to contribute to the creation of a design procedure for PCPs. This data will be used to create an input database for a range of structural designs and materials. During laboratory testing, this project will conduct tests of fatigue on virgin and carbon fiber-reinforced PCP in both dry and wet conditions and with four different degrees of porosity. Somayeh Nassiri, Washington State University, will serve as the project’s Principal Investigator.

Unity is needed concerning chloride limits in new concrete, strength, and air content for avoiding freezing-and-thawing related damage and strength requirements for avoiding sulfate damage. Documents from ACI Committees 201, 222, 301, 318, and 350 are not in accord on these concrete property requirements. This project seeks to bring consistent information concerning these limits and requirements via rigorous statistical analysis of existing data from field exposure sites, published literature, and laboratory testing. The data analysis will provide evidence-based results that will inform relevant ACI committees on how to establish consistent guidance leading to the solution of the current document discrepancies. Jason Ideker of Oregon State University will serve as this project’s Principal Investigator.

2016 Funded Research Projects

Establishing Unified Durability Guidance on Chloride Ion Limits, Performance, and External Sulfate Attack for ACI Documents

The original Guidelines for Performance-Based Seismic Design of Tall Buildings (TBI) was published in 2010 under the guidance of the Pacific Earthquake Engineering Research Center. Despite being state-of-the-art when published, some of the elements found in the TBI Guidelines are now out of date. This research project seeks to update the original TBI Guidelines enabling the performance-based design, review, acceptance, and construction of buildings using materials, structural systems, and devices that may or may not be covered by today’s building codes. Jack Moehle, University of California, Berkeley, will be the Principal Investigator.

2016 ACI Foundation Award Honorees

The Arthur J. Boase Award, presented by the CRC, for outstanding activities and achievements in the field of reinforced concrete, was presented to Dominic J. Kelly, FACI, Principal with Simpson Gumpertz & Heger Inc., in Waltham, MA, for his lifelong contributions to advancements in concrete materials science and translating research findings into concrete infrastructure applications, as well as for training and mentoring generations of concrete researchers and scientists.

The Robert E. Philleo Award, also presented by the CRC, recognized Jan Olek, FACI, Professor of Civil Engineering at Purdue University, West Lafayette, IN, for his lifelong contributions to advancements in concrete materials science and translating research findings into concrete infrastructure applications, as well as for training and mentoring generations of concrete researchers and scientists.

The Jean-Claude Roumain Innovation in Concrete Award, established by the SDC in 2010, was presented to Gaurav N. Sant, Associate Professor and Henry Samuels Fellow in the Department of Civil and Environmental Engineering and a member at the California Nanosystems Institute at the University of California, Los Angeles (UCLA), Los Angeles, CA, for improving our understanding of how mineral fillers and supplementary cementitious materials influence cement hydration rates and methods for accurately characterizing and predicting these effects, and for his work in the development of a CO₂-neutral cement.

The increase in grant amount and more competitive selection process has brought more proposals from researchers, and more interest and support from ACI Committees.

Update to Performance-Based Seismic Design Guidelines for Tall Buildings

The increase in grant amount and more competitive selection process has brought more proposals from researchers, and more interest and support from ACI Committees.
Stehly Memorial Hockey Game

The fourth annual installment of the Richard D. Stehly Memorial Hockey Game raised over $2350 for the Foundation’s Richard D. Stehly Memorial Scholarship. The game took place during The Concrete Convention and Exposition – Spring 2016 in Milwaukee, WI, this past April. ACI members and staff comprised the rosters of the two competing teams. The fifth installment of the Richard D. Stehly Memorial Hockey Game is being planned for Detroit, MI, in conjunction with The ACI Concrete Convention and Exposition March 26-30, 2017.

All funds raised from the game will support the Richard D. Stehly Memorial Scholarship.

Richard (Dick) Stehly was a member of ACI since 1980 and was elected President in 2010. He believed that attracting and educating ACI’s youngest members was crucial for both the future of the concrete industry and ACI. His conviction for investing in ACI’s posterity even led him to bequeath a portion of his estate to fund future ACI scholarships and fellowships.

ACI Foundation scholarships and fellowships. Dick personally organized the first two editions of this hockey game before his passing. The game was then memorialized in his honor. “It was very much in Dick’s character to quietly organize things like this game,” said Lawrence Sutter, the organizer of the 2016 game.

“One Dick passed, the Minnesota Chapter and now the Wisconsin Chapter – ACI stepped up to honor Dick and raise money for his scholarship.”

We award the Richard D. Stehly Scholarship annually to an outstanding student enrolled in an undergraduate degree program studying concrete with an emphasis on structural design, materials, or construction.

Key Volunteers for ACI Foundation Efforts

- Nicholas J. Adams
- Scott M. Anderson
- Frank V. Apicella
- Emmanuel K. Attiogbe
- Daniel L. Baker
- Roger Becker
- Tonya Beesley
- Joseph M. Bracci
- Kirk Burns
- John P. Busel
- James Cagley
- Anik Deligrave
- Om F. Dixit
- Jonathan E. Dongell
- David W. Fowler
- Beverly A. Garnant
- Jamie Gentoso
- Benjamin Graybeal
- Charles S. Hanskat
- Neil M. Hawkins
- James Jr
- Cecil L. Jones
- Steven H. Kosmatka
- H S Lew
- Tyler Ley
- Colin L. Lobo
- Claudio E. Manisero
- Robert T. Mast
- David B. McDonald
- Paul F. Mlaker
- Vilas S. Mujumdar
- Debrehann R. Orsak
- Mark J. Perniconi
- Aleksandra Radilinska
- Richard A. Ramsey
- Robert J. Risser
- Joseph C. Sanders
- Glenn E. Schaffer
- John J. Schemmel
- Anton K. Schindler
- Michael J. Schneider
- Jackie A. Sempel
- Michael M. Sprinkel
- Michael S. Stenkn
- Paul J. Tikalsky
- James G. Toscas
- Paul Zia

SDC MEMBER ORGANIZATIONS

- American Concrete Institute
- American Shotcrete Association
- American Society of Concrete Contractors
- Baker Concrete Construction Inc.
- Barton Malow Company
- BASF Admixtures Inc.
- BergerABAM
- Beton Consulting Engineers LLC
- Burns Concrete Inc.
- California State University, Chico
- CarbonCure Technologies
- CellTech, LLC
- CERATECH Inc.
- Charles Pankow Foundation
- ChemCognition LLC
- Combined Creek Consulting
- Concrete Reinforcing Steel Institute
- CTLGroup
- Ductilecrete Slab Systems LLC
- Excelid Chemical Company
- Expanded Shale, Clay and Slate Institute
- Flood Testing Laboratories Inc
- Florida Department of Transportation
- GCP Applied Technologies
- Greencraft LLC
- Hanley Wood LLC
- ICC Evaluation Services Inc.
- International Concrete Repair Institute
- KSF Inc.
- LafargeHolcim
- Michigan Technological University
- Middle Tennessee State University
- Missouri University of Science & Technology
- National Institute of Standards and Technology
- National Institute of Standards and Technology
- NAVFAC EXWC C17
- New Jersey Institute of Technology
- Owens Corning
- Port Authority of New York & New Jersey
- Portland Cement Association
- Precast/Prestressed Concrete Institute
- Premier Construction Products Group
- R-E-D Industrial Products
- Sika Corporation
- SIMCO Technologies Inc.
- Sioneer
- Solidia Technologies Inc.
- Specialty Products Group Inc.
- STRUCTURAL Group
- Texas A&M Transportation Institute
- Thornton Tomasetti Inc.
- Tourney Consulting Group LLC
- University of Kansas Infrastructure Research Institute
- University of Sherbrooke
- U.S. Air Force Civil Engineer Center AFCCE
- U.S. Army Corp of Engineers
- U.S. Bureau of Reclamation
- Vector
- Virginia Transportation Research Council
- Walker Parking Consultants
- Walter P Moore & Associates
- Webcor Builders
- Wind Tower Technologies LLC
- WJE Associates Inc.

over $2350 raised for the Richard D. Stehly Memorial Scholarship
ACI Foundation
38800 Country Club Drive
Farmington Hills, MI 48331 USA

If addressee is no longer with your organization, please route to his or her replacement or supervisor.