Utilizing Your ACI Member Benefits

Tricia G. Ladely

December 6, 2023

PITTSBURGH AREA CHAPTER

aci

The mission of this chapter is to **teach, train, gather, and share information to guide and support** the concrete construction industry in the Greater Pittsburgh Region.

Local Chapter Benefits

Education & Training

- Certification Classes

Meetings and Events

- Networking and Learning

Awards Program

- Excellence in Concrete
- Founders Award (Students)
- Lifetime Achievement Award

Chapter Library

- University of Pittsburgh

Membership Directory

ACI Members: 30,000 in over 100 countries

ACI Resources for its Chapters

- ACI Chapter Guide
- ACI Student Chapter Guide
- Chapter Scholarships
- Chapter Talks
- Excellence Awards
- Hosting conventions
  - Networking Breakfast
  - International Forum
  - Student Chapter Forum
- Officer Training & Roundtables
- Social Media Toolkit
- Webinar Library
- **Local Member Benefits**
- **Chapter Recognition Program**
- **Chapter Personnel Awards**

CONGRATULATIONS!!!

Andrew R. Lawrence has been selected to receive the

ACI Certification Award

“for his dedication and tireless efforts to deliver and expand ACI Certification programs through the ACI Pittsburgh Area Chapter”

Andy serves the ACI Pittsburgh Chapter as our “Education Committee Coordinator.”

We request that the Chapter Committee and ACI Staff develop evidence-based recommendations that: **"strengthen the two-way relationship between ACI and chapters and help advance chapter health and growth."**

ACI Local Member Benefits

***Concrete International* magazine**

- digital subscription

ACI University On-Demand Courses

- 3 tokens

ACI Membership Directory

- networking

ACI Membership Certificate

- **printable**

Chapter Activities Department

John K. Conn
Director Chapter Activities

Denesha Price
Chapter Activities Coordinator

Esther R. Beery
Chapter Activities
Coordinator

Karen P. Smith
Administrative Coordinator

Concrete International magazine

Designing Reinforced Concrete Structures for Fire Performance

Research recommends the development of a standardized natural fire model for burnout-resistance design

by Tricia G. Ladely and Veronica Nehasil

Concrete's excellent performance against fire is one reason it is widely used for building design. The noncombustible nature of concrete helps to contain the fire and limit the extent of the damage. Building codes that use standard time-temperature exposure data prescribe minimum requirements to ensure structural integrity for a suitable time for occupants to evacuate. Although reinforced concrete structures typically survive fires, there is potential for collapse during the cooling phase or later. The current design, using fire resistance to standard time-temperature exposure, does not cover the integrity of a structure during or after the fire. One example of an unexpected failure is the collapse of the 13-story Delft University of Technology Faculty of Architecture Building in the Netherlands in 2008, approximately 7 hours after the start of the fire.[1]

There is a growing interest from the fire community for additional knowledge on the stability of structures exposed to natural fires. Beyond standardized fire ratings, the objective is to design a fire-resilient built environment. There is an expectation for structures to be designed for evacuation and entry by firefighters and other first responders, as well as to improve current models used to determine if a structure can be repaired or if it should be demolished.

Proposed Study

A proposal to study the behavior and design of reinforced concrete structures under natural fires was submitted to the ACI Foundation's Concrete Research Council (CRC) by Thomas Gernay, Principal Investigator (PI), and Patrick Bamonte, Co-PI, during the 2019 Annual Request for Proposals. The objective was to develop a design method for reinforced concrete structural members subjected to fire that would achieve resistance to "full burnout" under real fires.

Changing or replacing current fire-resistance requirements was not a research goal. However, the data and work were intended to complement the existing fire-resistance rating. "We know quite a lot about concrete behavior under the standard fire exposure that we use to qualify fire-resistance ratings for structural concrete—but we don't know too much about what's happening when there is a real fire, for example, in an office or apartment, where the structure has been heated for a while and then the fire starts to die off," said Gernay. Achieving the goal of using fire-resistance ratings along with burnout-resistance ratings would unlock the ability to model the potential for delayed structural failure as well as provide new tools for performance-based fire design.

Definitions

Fire resistance (R): the property of a material or assembly to withstand fire or provide protection from it. As applied to elements of buildings, it is characterized by the ability to confine a fire or, when exposed to fire, to continue to perform a given structural function, or both.

Fire-resistance rating: a legal term defined in building codes, usually based on fire endurance; fire-resistance ratings are assigned by building codes for various types of construction and occupancies and are usually given in half-hour or hourly increments.

Burnout resistance: the longest fire that a structural member can survive until full burnout.

Full burnout: the end of a fire event, defined as the time at which the structure has cooled down back to ambient; this can occur hours after the gas temperature inside the building has cooled down.

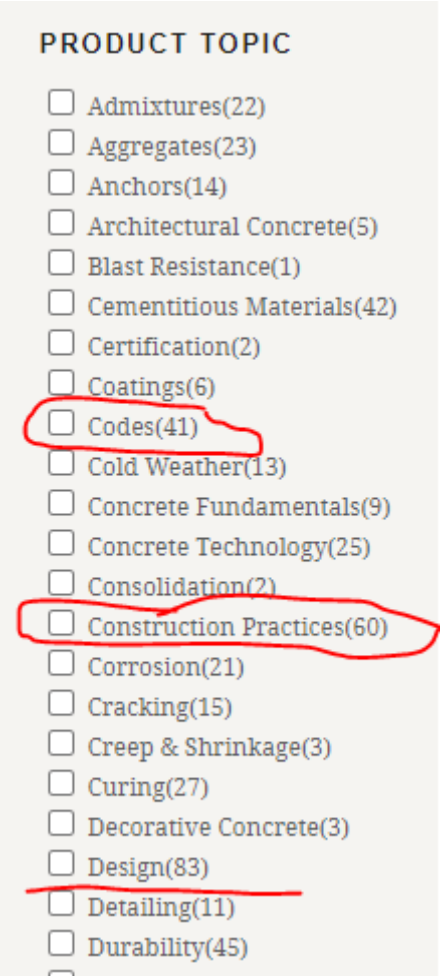
- President's Memo
- Call for Papers
- People & Industry News
- Technical Articles
- Product Highlights
- Meetings
- Concrete Q&A

ACI On-Demand Courses

366 Online Courses

Access: Free / Tokens or $

Searchable:



The ACI Certificate Program encourages concrete professionals to gain in-depth knowledge about certain topics in concrete materials, design, repair, or construction by following a defined online course of study.

The Certificate Programs currently offered are:

- Concrete Constructability
- Fundamentals of Concrete Construction
- Anchorage Design
- Fundamentals of Concrete and Materials
- Repair Application Procedures.

ACI Member Directory

Searchable Database

- Individuals
- Committee Leadership
- Location: City, State, Country
- Membership Type:
  - Student
  - Individual
  - Staff
  - Young Professionals
  - Honorary
  - Local

Example of an individual listing:

JAMES M. CASILIO
Director of Technical Services

Company
Address
Phone
jimc@pacaweb.org
www.pacaweb.org

ACI Individual Member
132-00 Responsibility in Concrete Construction - **Chair**
201-0H Aggregate Reactions - **Voting Member**
221-00 Aggregates - **Voting Member**
332-00 Residential Concrete Work - **Voting Member**
SCG-PA Pennsylvania Initiatives Collaboration Group - **Voting Member**
E701-00 Materials for Concrete Construction - **Voting Member**

ACI Career Center

JOB SEEKERS

Browse Jobs Browse current jobs available by search criteria.

Manage Saved Jobs Review jobs you've saved for later.

Post Your Resume Set up a free account to post your resume.

Job Alerts Set alerts to be notified if any jobs are posted that meet your criteria.

Career Resources Be prepared with resume and interviewing tips, and free career coaching.

EMPLOYERS

Posting Rates Find the best product and price to meet your staffing needs.

***All ACI Organizational and Sustaining Members are provided with a discount code to receive an additional 20% off all Career Center products.*

Post Jobs Use the online posting form to find qualified candidates now.

Search Resumes Search for qualified candidates based on job-specific qualifications.

Resume Agent Create an online resume agent to e-mail qualified candidates right to your inbox daily.

aci Foundation

Building the Future

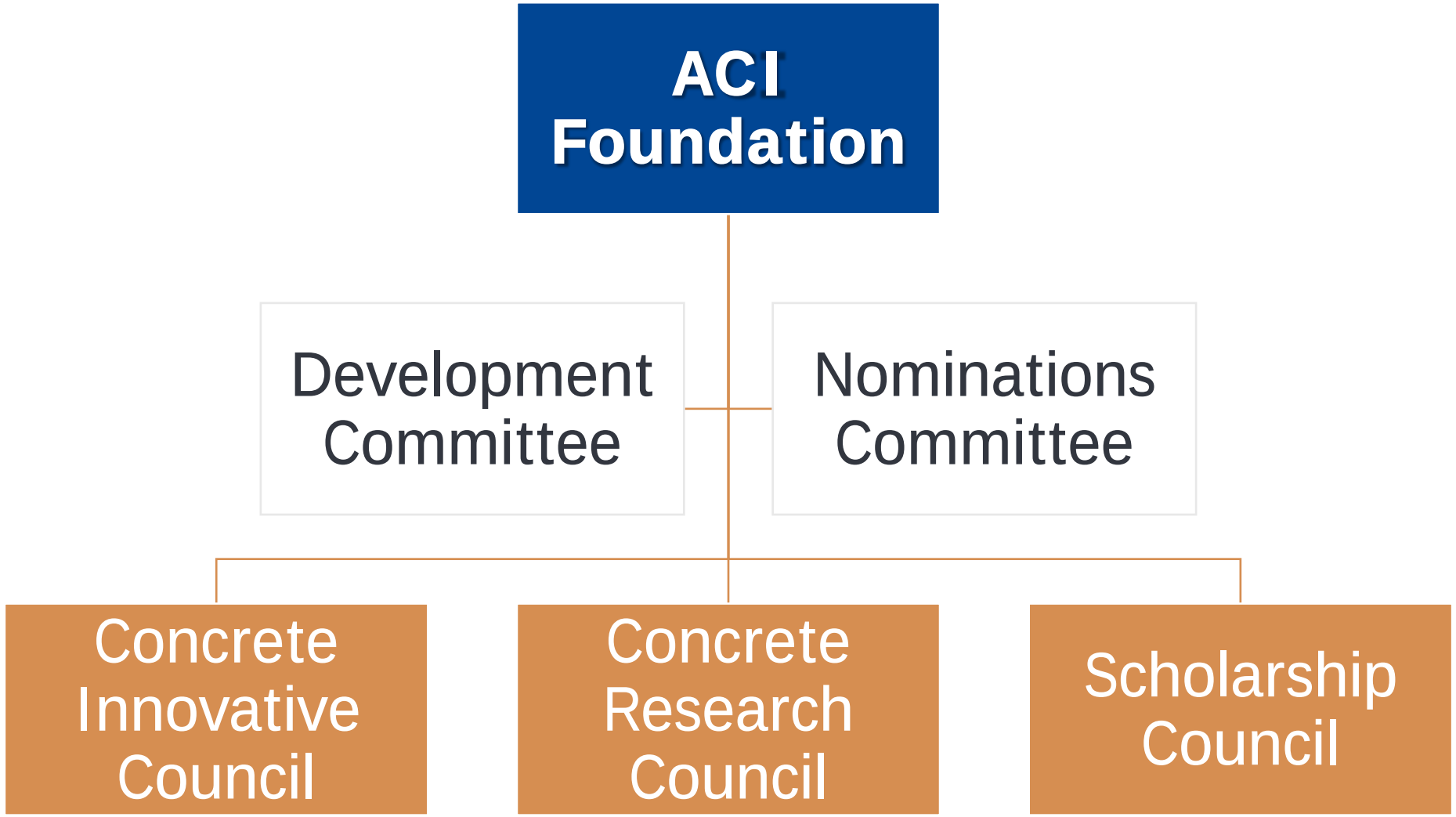
Our Mission

“To make strategic investments in ideas, research, and people to create the future of the concrete industry”

- Scholarships & Fellowships
- Research Grants
- Technology Advancement

www.acifoundation.org

Our Structure



Overall Innovation Impact

Our $1M investment helped create $4.5M of innovation actions

Initiatives on innovative materials, methods, tools, and design or to implement innovations for widespread use

ACI committees were advanced by innovation

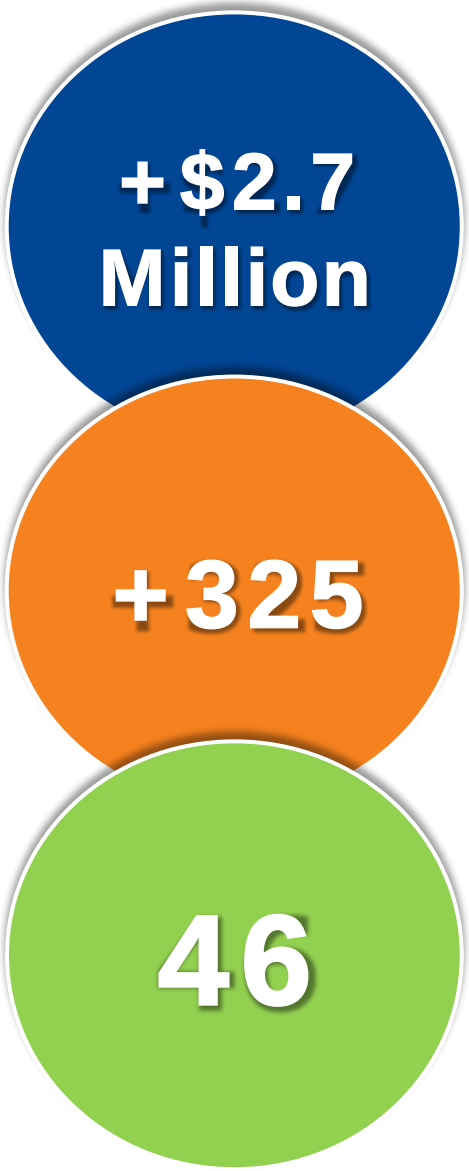
Overall Research Impact

In research, leveraged our $4M investment into $17M of research

Research projects supporting ACI documents

ACI committees benefited

Overall Student Impact



Scholarships awarded for concrete & engineering education

Students awarded

Awards currently available

CRC Sponsored Research

Reliable Measurement & Speciation of Sulfur in Concrete Aggregates

PI = April Snyder of RJ Lee Group

Co-PI = Michael Deible of RJ Lee Group

ACI Foundation Funding = $45,856

Total Project Budget = $105,680

Started – July 2022

Expected – July 2024

Reliable Measurement and Speciation of Sulfur in Concrete Aggregates

Significant localized outbreaks of concrete degradation caused by oxidation of the iron sulfide mineral pyrrhotite ($Fe_{(1-x)}S$) in concrete aggregates have occurred in Connecticut (CT), Massachusetts (MA), and Quebec, affecting thousands of residential structures. Repair costs are upwards of $150,000 per home and uncertainty over the potential for future distress has negatively impacted home values in the affected regions (US GAO, 2020). Damage has been found in structures with aggregate containing as little as 0.23% pyrrhotite by volume of aggregate (CSA 2019). In response to this issue, the USGS was directed by Congress to research potential locations of pyrrhotite and published a map illustrating areas of "pyrrhotite permissive geology" and locations of known pyrrhotite deposits (USGS 2020). Although helpful in illustrating potential geologic sources of pyrrhotite, this map does not specifically designate concrete aggregate sources containing pyrrhotite or provide information on the abundance of pyrrhotite in any location. Aggregate producers, especially in the Northeast, are now faced with increased scrutiny and regulation without technically sound standardized guidance and tests to evaluate their materials.

There is currently no standardized approach or guidance in the US for evaluating concrete aggregates for their potential to degrade concrete through oxidation of pyrrhotite and other iron sulfide minerals. Despite the lack of standardized testing for iron sulfides in concrete aggregate or established acceptable limits, the state of CT enacted legislation this year (Public Act No. 21-120) in response to the pyrrhotite issues in that state. The legislation contains new and potentially flawed testing requirements for concrete aggregate producers. Similar legislation has been introduced in MA this year (Senate Bill S.548).

The new CT regulations establish limits on total sulfur that are similar to those specified in Europe under EN 12620. Aggregate sources with more than 1% by mass total sulfur are rejected for use in concrete. Those with total sulfur of 0.1% or more and less than 1% by mass total sulfur must undergo additional testing to quantify pyrrhotite and obtain approval to be sold for use in concrete. The additional testing requirements differ substantially from the European approach, which simply limits total sulfur to 0.1% if pyrrhotite is present in the aggregate. A different approach developed in Canada was added to CSA A23.1/A23.2 in 2019 as the non-mandatory Annex P. It recommends testing to quantify sulfate (measured) and sulfide (calculated) sulfur if the total sulfur is between 0.15 and 1.0% by mass before proceeding to petrographic examination and additional reactivity testing. Speciation of sulfur potentially reduces unnecessary additional testing when sulfur is predominantly present as sulfates and not sulfides. However, the CSA approach remains under evaluation, particularly with respect to the ability of tests to reliably quantify the low sulfur concentrations of interest, and does not directly measure sulfide sulfur.

Veteran Rebate for ACI Certification

Honorably discharged U.S. military veterans attaining ACI certification in any program as the result of exams administered through any ACI Certification Sponsoring Group are eligible to apply for a $250.00 rebate from the ACI Foundation. These rebates will be distributed by the ACI Foundation as long as funding remains available.

Who is eligible?

- Honorably discharged U.S. military veterans
  (Army, Navy, Air Force, Marines, Coast Guard)
- Obtained ACI Certification as the result of exams administered on or after June 1, 2018

2023-2024
Student Awardees

Scholarship Council

Identify, attract, and develop outstanding professionals for future careers in the concrete industry.

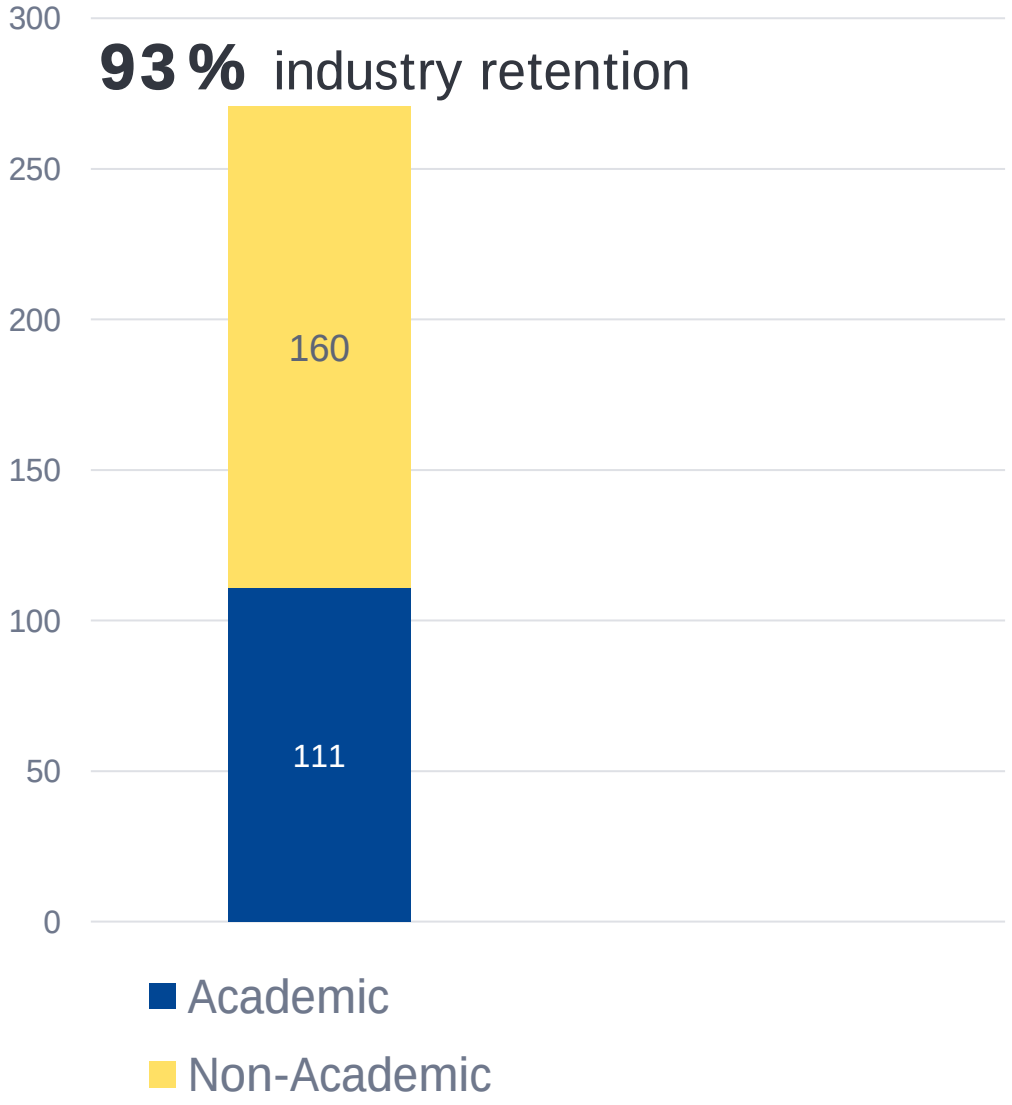
Scholarships & Fellowships

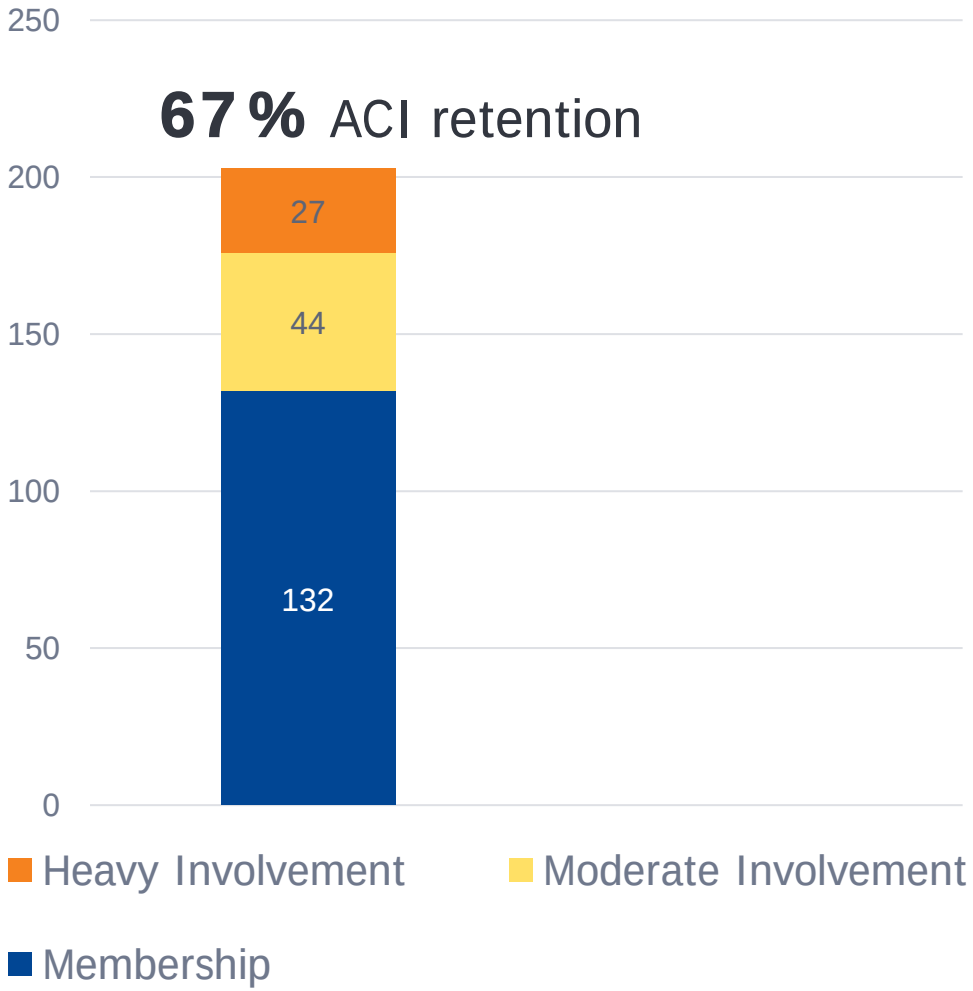
aci Foundation
Building the Future

- Annual Program
  - o opens July 1 and closes November 1
- For high-potential students in concrete-related degree programs
- Diversity in program criteria
  - o Regional and international
  - o Varied career pursuits

- Tuition stipends/school expenses
  - Fellowships $10,000 (US)
  - Scholarships $5,000 (US)
- Professional exposure to the concrete industry, travel to ACI Convention. FS only
  - Mentorship
  - Networking
  - Recognition

Industry and ACI Retention
Fellowship & Scholarship Awardees: 2000-2022





Scholarship Council Program Growth

2002-2023:

Fellowships & Scholarships:

2002: 11 awards

2023: 46 awards

Growth: 318% over 20 years

In last 5 years:

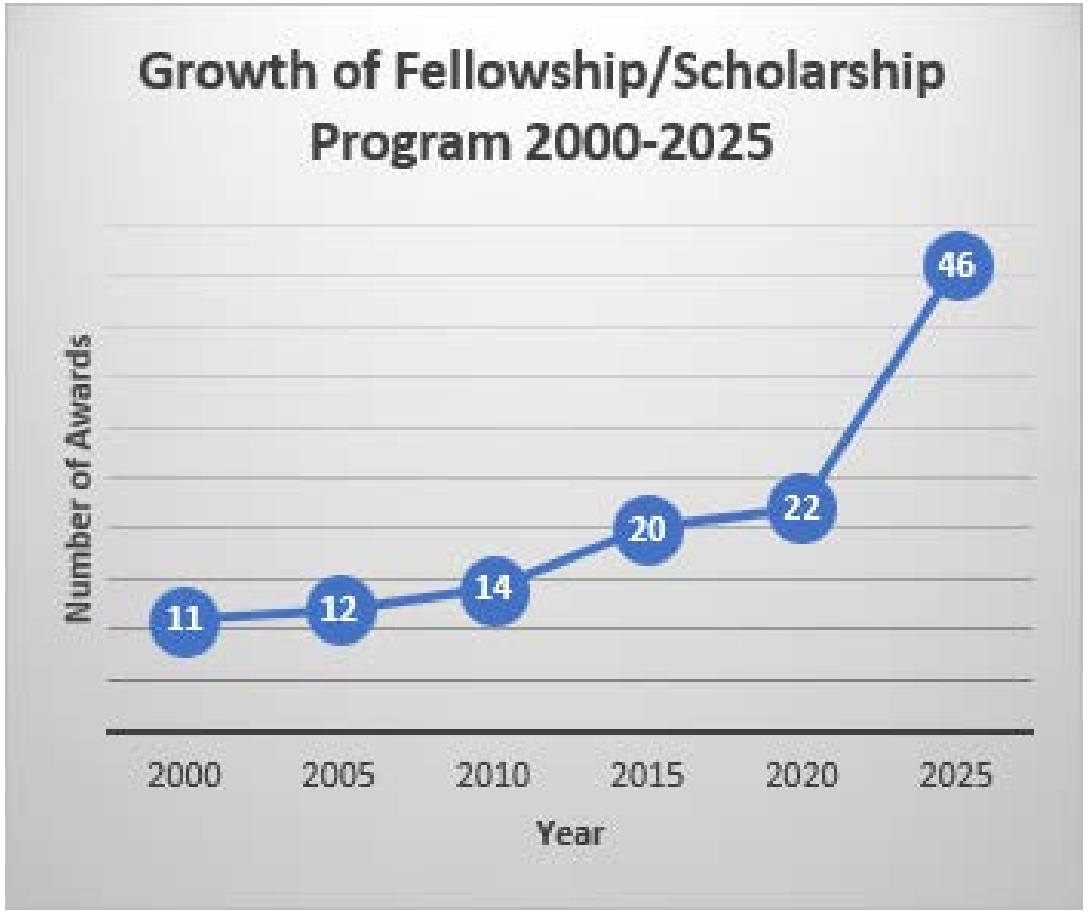
22 to 46 awards

Growth: 109%

In last 5 years:

55 to 105 qualified applicants

Growth: 91%



Chapter Sponsored Awards

Annual Awards

- Barbara S. & W. Calvin McCall Fellowship (Carolinas)
- JoAnne and Cecil Jones Fellowship (Carolinas)
- Darrell F. Elliott Fellowship (Louisiana)
- Nicholas F. Maloof, Jr. Fellowship (Georgia)
- Nick Bada Scholarship (Ontario)

Thank You For Donating

aci Foundation
Building the Future

- Greater Miami Valley
- Greater Michigan
- Central Texas
- Intermountain
- Kansas
- Nebraska
- New England
- Northern California and Western Nevada
- **Pittsburgh Area**
- Rocky Mountain
- San Diego International
- San Antonio
- Washington

Why Partner with Us

Opportunities for your Chapter:

- Name a Fellowship after your Chapter or someone meaningful to your chapter
- Decide the criteria for your Fellowship in an area of the industry that is meaningful to your chapter
- An optional seat on the Scholarship Council
- Press release distributed to the entire ACI community
- Chapter mention in *Concrete International*, ACI eNews, social media, and more
- Chapter mentioned in ACI Foundation's Annual Report
- Get a Chapter Point for the donation
- ACI Foundation manages the application and award process of your fellowship

Benefits to student recipients:

- $10,000 (fellowship), $5,000 (scholarship) USD educational stipend for tuition, residence, books, and materials
- Appropriate recognition in *Concrete International* magazine and on the Foundation website
- Paid travel expenses and attendance fees to two ACI conventions (fellowship only), finalists must attend the Spring ACI Convention to be interviewed); and
- Assistance in finding an industry mentor

Kenneth C Hover Honorary Fellowship

aci Foundation
Building the Future

Current fundraising campaign

- Influenced 1000's of people in the industry
  - Educator
  - Researcher
  - Communication
  - Consulting
- ACIF raised $250K of $350K

"He is without question one of the preeminent educators in the civil engineering and concrete construction Industry."

Anthony Fiorato, former ACI President

100% of donations support programs, not administration

POP QUIZ