

Nick J. Scaglione
President, Concrete Research & Testing, LLC

Education

B.Sc., Geology – The Ohio State University, Columbus, Ohio	1987
Certified Concrete Technician – Ohio Ready Mix Concrete Association	1988
Concrete Field Testing Technician – American Concrete Institute	1988
Short Course in Refractory Concrete – Center for Professional Advancement	1991

Experience

Concrete Research & Testing, Columbus, Ohio President & Senior Petrographer	1996 - Present
Lankard Materials Laboratory, Columbus, Ohio Petrographer, Research Scientist & Technician	1986 - 1995

Affiliations

American Concrete Institute – Central Ohio Chapter Board Member (2008 - 2018) President (2012 - 2014) Vice President (2011)	
American Concrete Institute Member of ACI Committee 201	
American Society for Testing and Materials (ASTM) – Committee C09 Honorary Membership of C09 on Concrete and Concrete Aggregates Subcommittees C09.20, C09.26, C09.65, C09.66 Subcommittee C09.65 (Petrography) Secretary (2010 - 2011) ASTM C457 Task Group Chairman (2010 - 2016)	
Society of Concrete Petrographers President (2012 - 2015) Vice President (2009 - 2011) Treasurer (2007 - 2008)	

Publications

Scaglione, N., Piercey, P.; *Petrographic Characterization of Concrete Aggregates Involved in Iron-Sulfide Reactions in Residential Concrete Foundations in Connecticut and Massachusetts*, Proceedings of the 1st International Conference on Iron Sulfide Reactions in Concrete, Quebec City, Canada, May 2024.

Scaglione, N., Cummins, J.; *Effect of Silica Fume Agglomerates on ASR-Related Expansion of ASTM C1567 Mortar Bars*, Proceedings of 17th International Conference on Alkali-Aggregate Reaction in Concrete, Ottawa, Canada, May 2024.

Scaglione, N., Piercey, P.; *ACR and ASR of a Carbonate Coarse Aggregate in Missouri*, Advances in Cement Analysis and Concrete Petrography, ASTM STP 1613, 2018.

Scaglione, N, Simons, J., Keading, Nestell, J, Frey, M; *Boric Acid Attack of Concrete and Reinforcing Steel in PWR Fuel Handling Buildings*, Prepared for the Electric Power Research Institute, Palo Alto, CA, June 2009.

Scaglione, N.J.; *Evaluation of Durability of ODOT Prestressed/Precast Concrete in Ohio*, Prepared for the Ohio Department of Transportation, September 2002.

Lankard, D.R., Bennett, J.E., Scaglione, N.J.; *Petrographic Examination of Reinforced Concrete from Cathodically Protected Structures*, Petrography of Cementitious Materials, ASTM STP 1215, 1994.

Presentations

Petrographic Examination of Pyrrhotite-Bearing Aggregates, Presented to legislators, town leaders and constituents of County Donegal, Ireland, November 2022.

Understanding the Massachusetts Pyrrhotite Problem, Presented to state legislators, town leaders and constituents of South Central Massachusetts, October 2022.

Concrete Petrography -Agree or Disagree, an Open Discussion, Presented at Ohio Concrete, Northwest Regional Technical Meeting, March 2019.

Understanding the Connecticut Pyrrhotite Problem, Presented to state legislators, town leaders and constituents of North Central Connecticut, September 2018.

Concrete Petrography: What Engineers Should Know, Presented to the OSU Civil Engineering Department, March 2018.

Use of Geology in the Field of Concrete Petrography, Presented to the OSU Geology Department, February 2017.

The CSI of Petrography: How Concrete Petrographic Examinations Are Used, Presented at the Ohio Concrete Fall Seminar, November 2016.

In the Eye of the Petrographer: What You Can Learn from Petrographic Examinations of Concrete, Presented to the Eastern Pennsylvania Chapter of the American Concrete Institute, 2015.

“What Went Wrong?” The Petrographer’s POV: Concrete Surface Issues, Presented at the Ohio Concrete - Concrete Futures, Summer 2014.

Case Studies in Concrete Petrography, Presented at the Annual Meeting of Patriot Engineering and Environmental, Inc., July 2010.

Concrete under the Microscope. Presented to the Northeast Ohio Chapter of the American Concrete Institute, 2006.

Professional Background

Over 30 years of experience in the concrete analysis, research and testing field. Founded Concrete Research & Testing, LLC in 1996, following 10 years with Lankard Materials Laboratory as a Research Scientist and Concrete Petrographer. Overall area of expertise is in failure analysis, research, product development and testing of construction materials, including concrete, mortars, stucco, aggregates, cement, supplementary cementitious materials and dimension stone.

Concrete Petrography

Concrete petrography is the laboratory examination of hardened concrete using microscopes and various techniques. Petrographic examinations of concrete are typically performed due to a problem during construction or the premature failure of an existing concrete structure. In these instances, the petrographer is retained to determine the cause of the problem and oftentimes to determine the responsible party. Petrographic examinations are also performed as part of condition studies when older structures are being evaluated for rehabilitation or possible replacement.

Primary investigator in over 2400 petrographic projects involving hardened concrete, mortar and stucco. Routinely perform petrographic examinations on dimension stone and on concrete aggregate samples to determine suitability for use in portland-cement based construction materials. Equipment used for the petrographic work includes: stereomicroscopes, polarizing microscope, scanning electron microscope (SEM) and x-ray diffraction (XRD).

Petrographic Examinations Performed Have Covered the Following Problems:

- Alkali-Silica Reactions
- Alkali-Carbonate Reactions
- Low Strength Issues
- Freeze/Thaw Scaling and Popout Distress
- Oxidation of Iron Sulfide Aggregates
- Delamination of Interior Floor Slabs
- Dusting of Interior Floor Slabs
- Curling of Interior Floor Slabs
- Cracking/Spalling due to Corrosion of Steel
- Overdose of Supplementary Cementitious Materials
- Debonding of Floor Covering Materials
- Failure of Self-Leveling Underlayment Materials
- Biogenic Sulfuric Acid Attack
- Distress Due to Pyrrhotite Oxidation
- Drying Shrinkage Cracking
- Plastic Shrinkage Cracking
- Structural Cracking
- D-Cracking
- Sulfate Attack
- Acid/Chemical Attack
- Physical Salt Attack
- Improper Setting Time
- Contamination Issues
- Discoloration Problems
- Fire Damage
- Debonding of Stucco
- Cracking of Stucco

Research & Product Development

Experience Working with Many Types of Concrete and Concrete Materials Including:

- High Strength Concrete
- Flowable Fills
- Ultra-High Strength Concrete
- Recycled Glass
- Steel Fiber Reinforced Concrete
- Pozzolanic Materials
- SIFCON (Slurry Infiltrated Fibrous Concrete)
- Gypsum Materials
- Refractory Concrete
- Cellular Concrete
- Lightweight Concrete
- Steel Slag Aggregate
- Heavyweight Concrete
- Wollastonite

Research Projects Have Covered the Following Areas:

- Development and testing of concrete mix designs for the Security Industry, Fireplace Industry, Precast Concrete Industry, Ready Mix Concrete Industry and Heavyweight Concrete Applications.
- Development work on concrete anchor bolt system.
- Development work on the manufacture of nuclear waste storage containers using SIFCON.
- Study on Corrosion Inhibiting Admixtures in concrete.
- Study of D-Cracking in bridge deck structures.
- Study on the permeability of prestressed/precast concrete used for bridge components.
- Study on the use of wollastonite in portland cement products.
- Worked on startup operation for the manufacturing of aluminum impellers using plaster molds.
- Study on the long-term effect of boric acid on concrete for the nuclear power industry.
- Study on the use of recycled CRT glass as aggregate for the concrete industry.
- Study on the use of Graphene and Graphite products in concrete.
- Study on the effect of silica fume agglomerates on the ASTM C1567 test method
- Development of geopolymer concrete using recycled glass.
- Development of innovative test methods for client's particular needs.

Testing

Experience with most ASTM specifications and tests involving concrete, concrete aggregates, mortars and cement.

Expert Witness Testimony Experience

Expert witness testimony for petrographic clients

- 7 Trials
- 6 Arbitrations
- 10 Depositions