Professional Development Boot Camp

Concrete Solutions: Protect. Repair. Sustain.

March 3, 2026 | 8:30 AM – 4:30 PM

A one-day professional development experience built for engineers, architects, and contractors responsible for the design, detailing, protection, and repair of concrete structures.

FULL PRESENTATION ABSTRACTS:

[1] The Swiss-Cheese Model of Concrete Deterioration: When Multiple Deficiencies Align

Presented by: David Schnerch, PhD, PE | Principal, Senior Specialist | RDH Building Science

ABSTRACT: ASCE's 2025 Report Card for America's Infrastructure estimates that $9.1 trillion is required to bring the nation's infrastructure to a state of good repair—and concrete structures represent a substantial portion of that need. Yet even as we invest in repairs, these repairs often fail prematurely. The root cause is often misdiagnosis: practitioners identify a problem rather than understanding how multiple problems align. This presentation introduces the Swiss-cheese model of accident causation as a diagnostic framework for concrete deterioration—one that explains why seemingly identical structures perform so differently and why single-factor repairs so often fail.

Like stacked slices of Swiss cheese, concrete possesses multiple defensive layers against environmental attack: paste chemistry, aggregate quality, adequate cover, construction workmanship, protective systems, and maintenance practices. Each layer contains imperfections— "holes" representing vulnerabilities. Deterioration occurs not when any single layer fails, but when holes align across layers, creating complete pathways through the defensive system. A structure with marginally specified cover may perform adequately for decades if construction quality compensates; the same cover combined with poor consolidation, permeable paste, and chloride exposure creates a rapid corrosion pathway.

Understanding this alignment principle transforms how practitioners approach concrete structures throughout their lifecycle. Effective protection strategies target the most vulnerable defensive layers. Durable repairs address complete cause chains rather than isolated symptoms. Sustainable long-term performance depends on maintaining at least one intact defensive layer throughout service life.
Whether you are new to concrete repair or seeking to sharpen your diagnostic approach, this presentation provides a systematic framework for evaluating deterioration, identifying aligned vulnerabilities, and understanding why certain repair strategies succeed where others fail.

[2] Detailing of Concrete Repairs: Designing for Durable Repairs in Aggressive Environments

Presented by: Ben Rybaltowski, PE | Senior Consulting Engineer | Simpson, Gumpertz & Heger

ABSTRACT: The durability and long-term performance of reinforced concrete structures depend heavily on proper concrete detailing, material specification, and corrosion mitigation strategies. These challenges are heightened in exposed environments and cold climates, where deterioration can accelerate and become widespread. Concrete and reinforcement detailing can significantly impact the service life of a structure, as well as the extent and frequency of repairs required to maintain performance. Alternative reinforcement systems, such as stainless steel reinforcement and carbon- or glass-fiber–based materials, can be used to enhance corrosion resistance and extend service life in aggressive environments. In addition, the application of cathodic protection systems, including galvanic anodes, is an effective approach for mitigating reinforcement corrosion in existing structures. Together, these strategies provide an integrated framework for improving durability, reducing life-cycle costs, and increasing sustainability in concrete structures and repairs.

This presentation examines best practices in concrete detailing and specification, including material selection, the use of chemical admixtures, and the implementation of alternative reinforcement and cathodic protection systems. Applicable ACI and ICRI requirements and resources for concrete and reinforcement detailing are discussed, along with case studies demonstrating detailing strategies that improve the durability of concrete structures and repairs.

[3] Innovation, Relationships and Concrete Repair: 20 Years of Garage Maintenance at MGH

Presented by Todd Neal, PE | Principal | Thornton Tomasetti

ABSTRACT: The maintenance of older parking garages is generally never the one- and- done event that the Owners hope for. This presentation describes our experiences on the garages at Massachusetts General Hospital (MGH). Starting with an assessment of two 32-year-old garages on the Boston campus in 2005, we have been working with the hospital to repair and maintain these garages for over 20 years. Through the years, we have worked through client changes, multiple contractors and our own internal changes yet maintained a unified approach to maintaining these garages and providing repairs that address the 32 years of neglect that we inherited.

[4] Case Studies and Panel Discussion

Moderated by Peder Hals, PE | Owner & Principal Engineer | Hals Consulting
Featuring case studies by David Schnerch, Ben Rybaltowski, Todd Neal, and Gregg Cohen

ABSTRACT: The earlier presenters will share one case study each that highlights concrete solutions. This is a unique opportunity to see real world problems and solutions developed by our industry leaders. Each case study will be approximately 10 minutes, and the session will wrap up with a panel discussion and final Q&A. We encourage attendee participation and discussion and look forward to getting into the finer details of each case.

Keynote Address: Concrete Repair Industry Trends

Presented by Gregg Cohen | Senior Principal | Simpson Gumpertz & Heger

ABSTRACT: The concrete repair industry evolves and adapts to new materials, improved techniques, and changing regulations and standards. These trends affect how we approach repair projects –including building code requirements, local ordinances, planning for material removal, preparing surfaces, specifying materials, and placing new concrete. With these fundamentals, we can apply best practices to meet the building code requirements and answer underlying questions on these projects: why does a particular area of concrete fail and how do we address the underlying reasons for deterioration in a way that meets our client's short- and long-term needs. In this keynote address, we will explore these issues with an eye on how each aspect of concrete repair influences project outcomes and costs to the owner. We will also discuss how the industry and overall construction market may change in the event of a slowing U.S. economy. (Keynote Address will take place for 30 mins during lunch hour.)