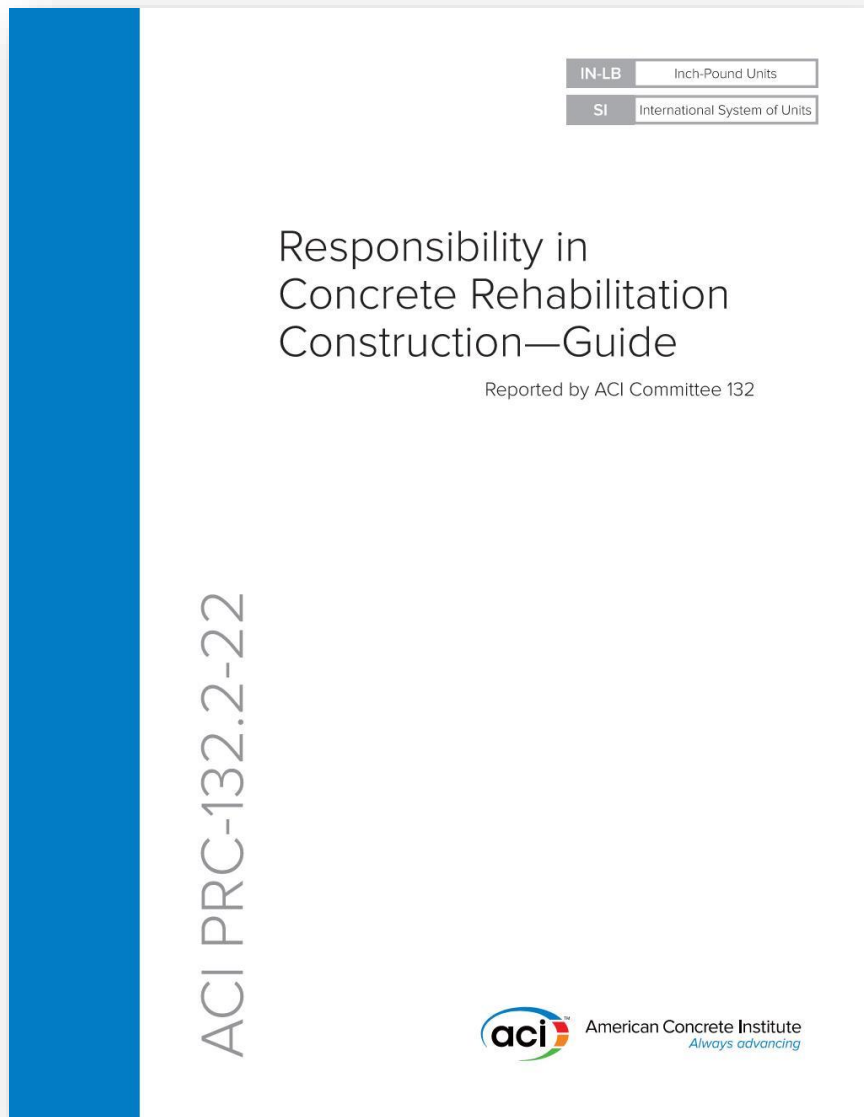


Technical Session & Panel Discussion

Sponsored by ACI 132 & 364



THE WORLD'S GATHERING PLACE FOR ADVANCING CONCRETE



Two Part Presentation

Part 1

Presenters

Dave VanOcker & Jason Coleman

Part 2

Panel Discussion

Licensed Design Professionals – Jason Coleman & Pericles Stivaros

Rehabilitation Contractors – Rob Caputo & Andy Garver

Material Manufacturer Representative – Tom Donnelly

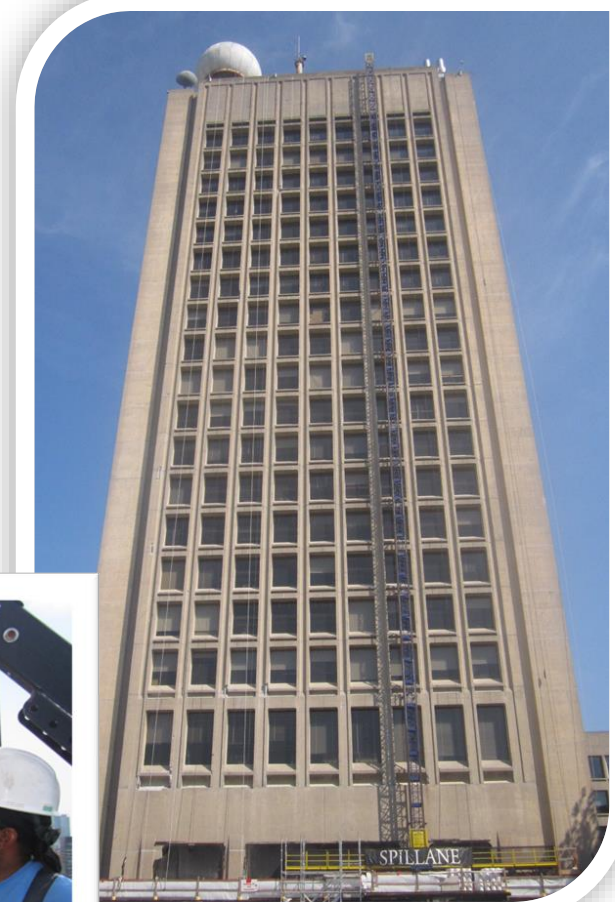
Owner- Pat Martin

THE WORLD'S GATHERING PLACE FOR ADVANCING CONCRETE



Objectives

- Develop an understanding of the contract requirements for concrete rehabilitation
- Condition Assessments ~ hidden conditions
- Program goals – clear expectations



Guidelines for Authorities and Responsibilities in Concrete Design and Construction

PREPARED BY THE ACI COMMITTEE ON RESPONSIBILITY IN CONCRETE CONSTRUCTION

Preface

The ACI Committee on Responsibility in Concrete Construction prepared these guidelines to help ACI technical committees prepare documents. The guidelines will also be useful to those writing contract documents for projects involving concrete and to anyone managing and controlling such projects.

Practices for assigning and accepting responsibility in design and construction vary throughout the world and within the U.S. In many cases, confusion about responsibilities of design and construction team members has led to protracted legal proceedings. To address this problem, the American Society of Civil Engineers (ASCE) prepared the document "Quality in the Constructed Project." These guidelines conform in principle with that work but provide more details pertaining to concrete projects.

One over-riding principle in these guidelines is the simple notion that responsibility and authority must be congruent. The other principle is that every entity should be responsible for its own work. These principles are frequently violated in the construction industry. For example, an engineer may require that certain steps cannot be taken by the constructor without the engineer's approval. But the engineer may not wish to accept responsibility for problems that develop after those steps are approved. This is the case of demanding authority without accepting responsibility. There have also been cases where owners have held engineers responsible for poor quality construction without having given them a contract to monitor the work as it progressed. Safety enforcement agencies and plaintiffs' lawyers also have charged engineers or architects with responsibility for construction accidents. These are cases of responsibility without authority.

PREAMBLE

The Board of Direction, American Concrete Institute, adopted the Guidelines, developed by the ACI Committee on Responsibility in Concrete Construction, in March 1995. These Guidelines have been written in nonmandatory language, but are intended to describe practical ways to handle responsibility and to help ACI technical committees prepare documents. Although it is not possible to cover all responsibility and authority issues in this short document, this document provides the principles that are relevant to situations not specifically addressed. Originally published in the September 1995 issue of *CI*, this printing reflects changes made to the definition of Owner. The entire document was reapproved by the Board of Direction in October of 2004.

Concrete International / APRIL 2005 33

Guide for Responsibility in Concrete Construction

Reported by ACI Committee 132

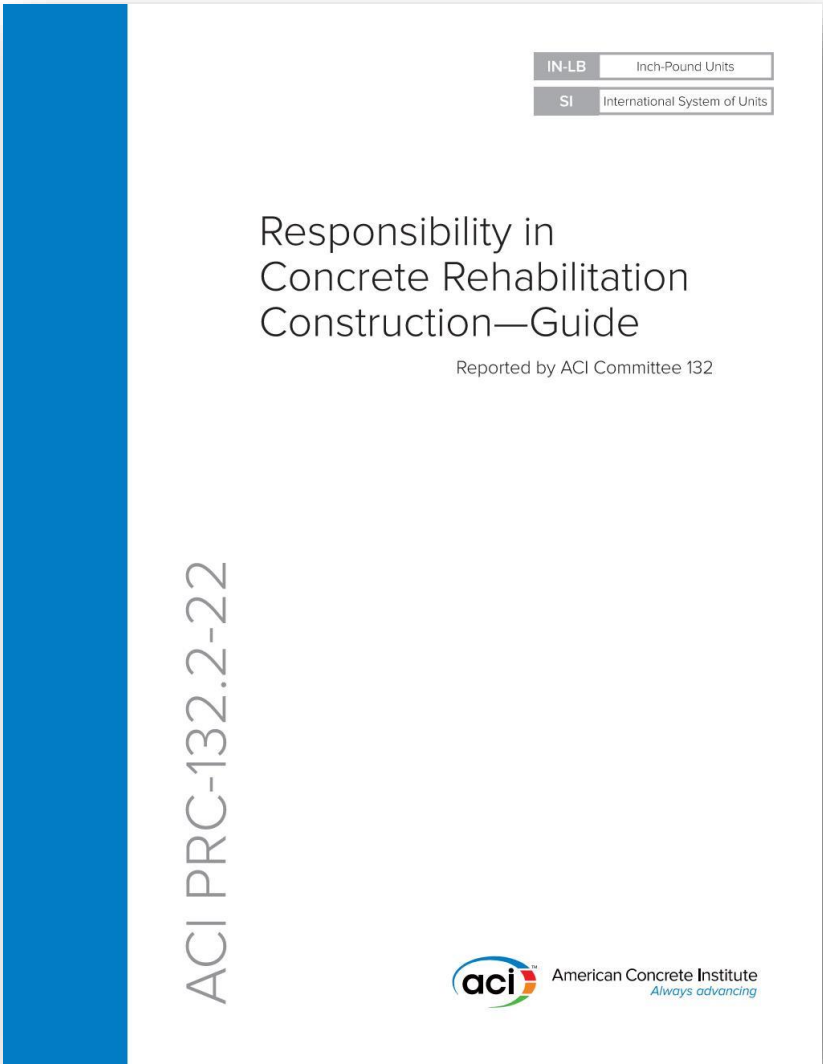
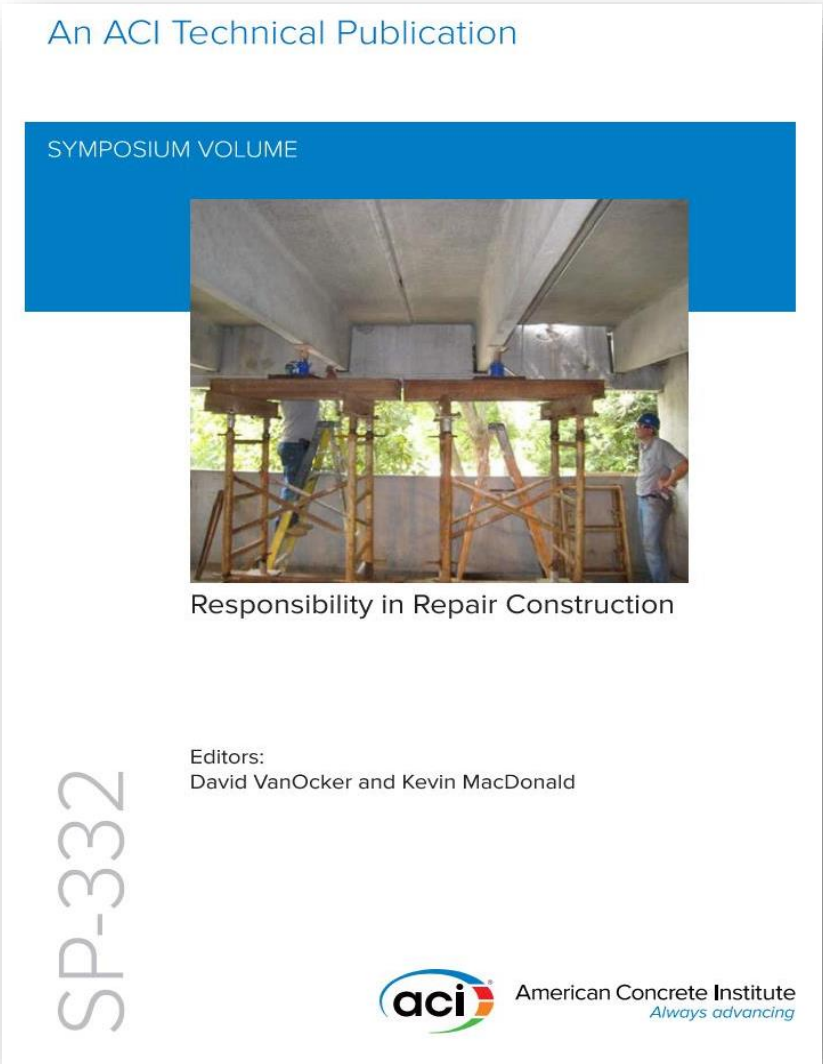
ACI 132R-14

 American Concrete Institute
Always advancing



THE WORLD'S GATHERING PLACE FOR ADVANCING CONCRETE

 **CONCRETE
CONVENTION**



Responsibility in Concrete Rehabilitation

THE WORLD'S GATHERING PLACE FOR ADVANCING CONCRETE



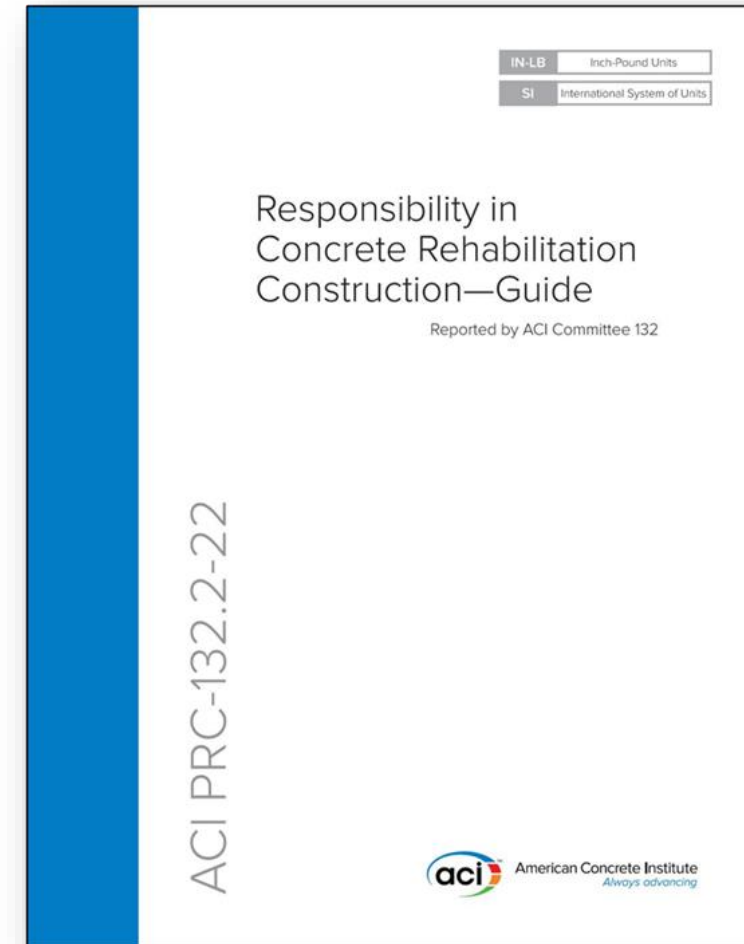
How does this document affect me?

- Scope - Guide describes the responsibilities of various parties involved in assessment, design, execution and inspection of the rehabilitation of concrete structures in the US.
 - *Section 1.2*
- Definition of rehabilitation
 - *The process of repairing or modifying a structure to a desired useful condition*

Purpose

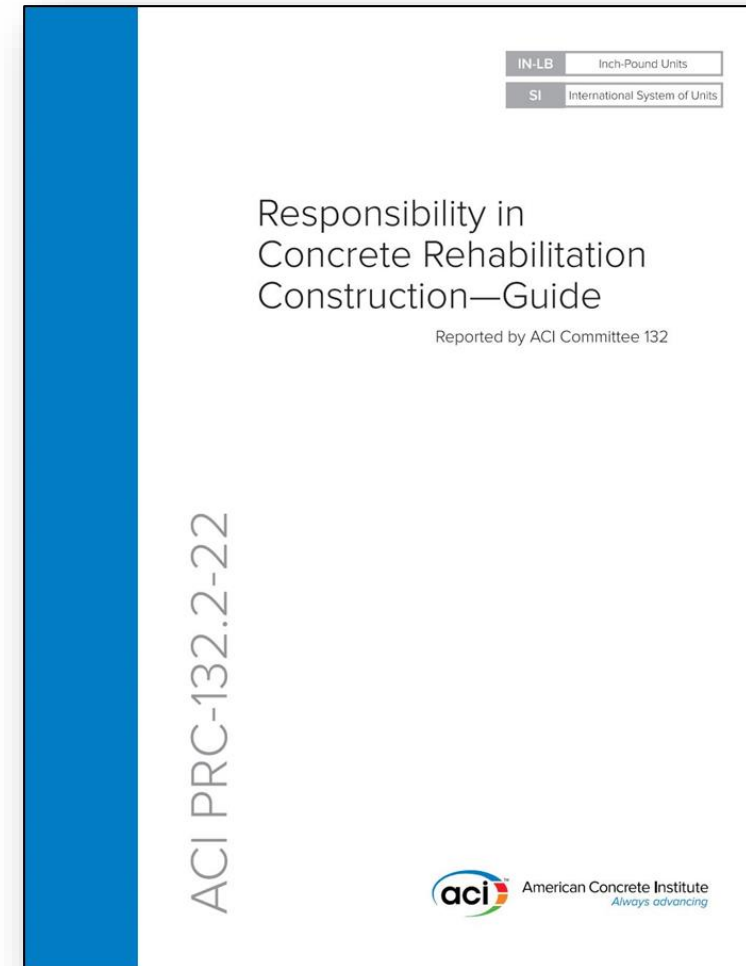
- Guide to identify and suggest allocation of responsibilities to various parties involved in concrete rehabilitation in the US.

Guide can be useful for evaluating existing contract documents for adequacy and balance with respect to responsibilities in concrete construction projects.



Document Structure

- Chapter 1 - Introduction and Scope
- Chapter 2 - Definitions
- Chapter 3 - Contracts
- Chapter 4 - Document Development
- Chapter 5 - Owner
- Chapter 6 - Licensed Design Professional
- Chapter 7 - General Contractor
- Chapter 8 - Specialty Subcontractors
- Chapter 9 - Specialty Engineer
- Chapter 10 - Material Suppliers
- Chapter 11 - Testing and Inspection Agency
- Chapter 12 - Alternate Project Delivery Methods
- Chapter 13 - References



Chapter 3 - Contracts

- Contracts, proposals, purchase orders, and agreements (master service or on call agreements) are common types of contracts
 - *Define relationships and obligations but rehabilitation projects are different compared to new design*
- Rehabilitation Projects v New design
 - *Typically, a defined scope (new design) and period but a rehabilitation project more commonly includes repair types but undefined quantity, methods for addressing operations of an occupied facility, provisions for unit prices, allowances, temporary shoring*

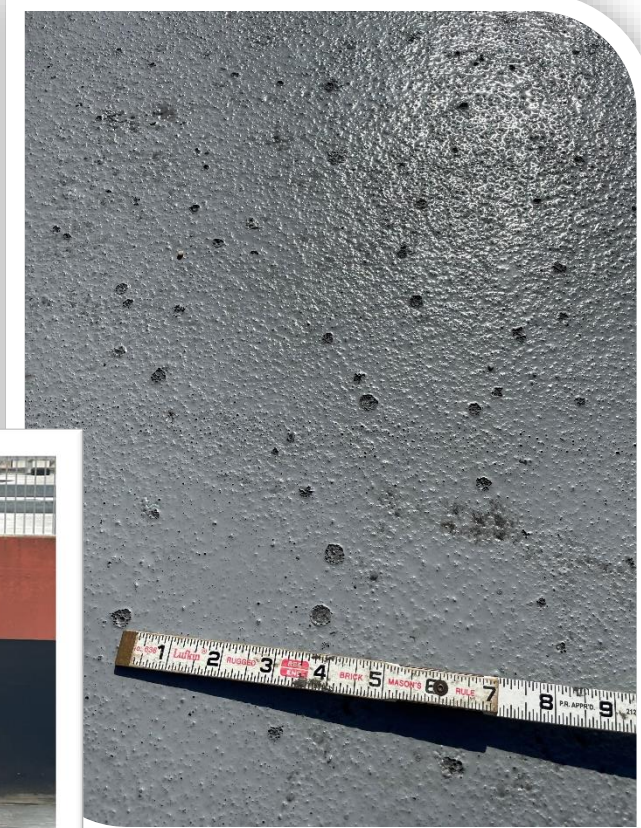
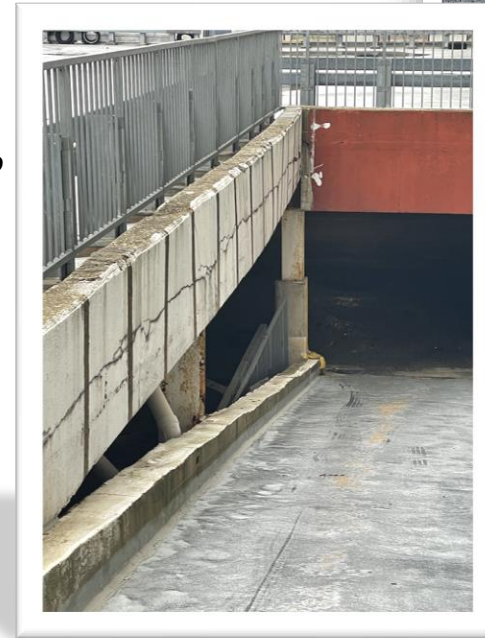
Chapter 3 - Contracts

New Construction	Concrete Rehabilitation
Design-bid-build	Design-bid build
Architect typically prepares the construction documents and has involvement from engineers	Engineer typically prepares the construction documents and other design professionals are frequently not involved
	Engineer must perform an assessment of the structure and prepare a bid form that commonly includes unit prices, allowances, and alternates
Master Service Agreement	Master Service Agreement
Owner may use Architect for smaller project types	Owner may give Engineering a PO or may directly hire a contractor for repairs without an engineer
	Proposal request
	Owner may seek proposals directly from a contractor to address known repairs, not recognizing an engineer is required for structural repairs
Design-Build	Design-Build
Owner retains a contractor that assembles a team with design professionals with a Gross Maximum Price (GMP)	Owner retains a contractor that assembles a team with design professionals with a Gross Maximum Price (GMP)
Design team prepares design with input from contractor	Design team performs an assessment, provides input to contractor on repairs, engineer/contractor select repair materials, engineer/contractor coordinate sequencing of work, operations of facility etc.



Chapter 4 - Document Development

- Process typically starts with an Owner retaining and licensed design professional (engineer most common) Owner-LDP Process
 - *Perform an assessment- do I have a problem with my structure?*
 - *How extensive is structural distress?*
 - *How much should I expect for rehabilitation or repair?*
- Process may start with a material manufacturer if material decline is apparent, and Owner believes a warranty is present



Chapter 4 - Document Development

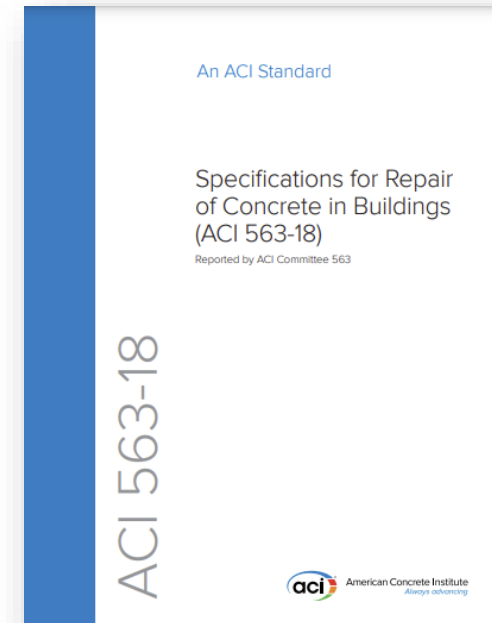
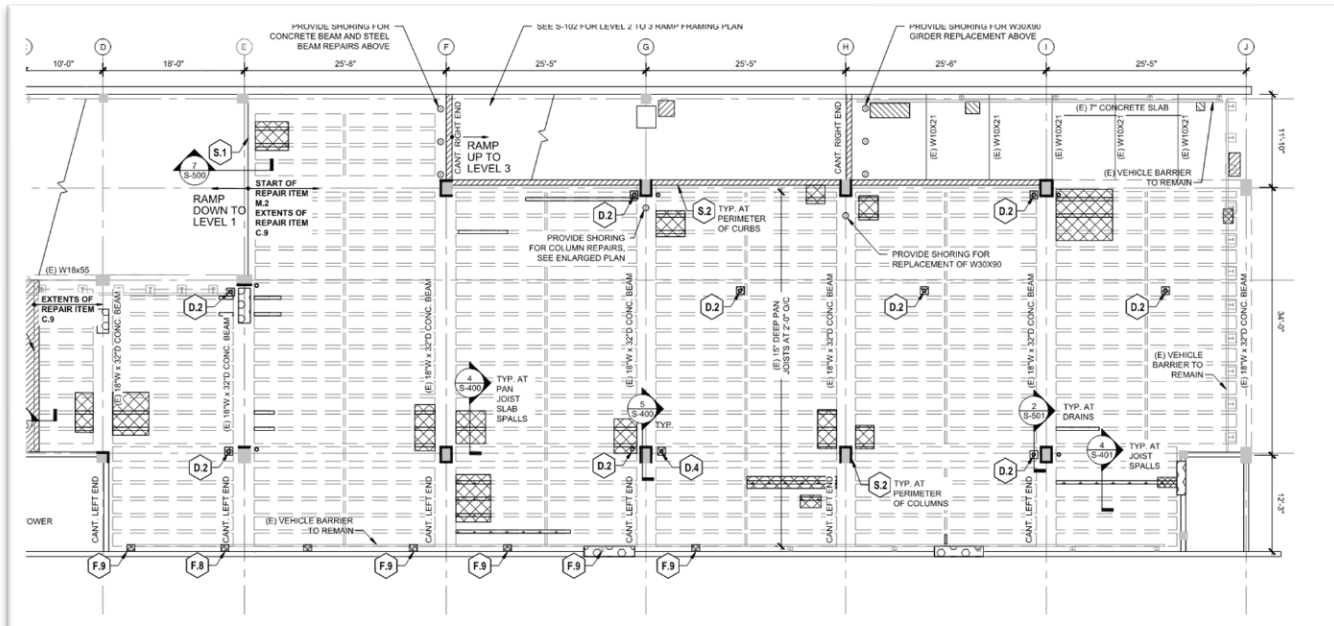
➤ Codes

- *Codes are defined by the Authority Having Jurisdiction and not by ACI 132.*
- *Licensed Design Professional is to define the Code used*
 - *International Building Code*
 - *International Existing Building Code*
 - *Building Construction and Safety Code*
 - *ACI 318 – Building Code Requirements for Structural Concrete*
 - *ACI 562 – Assessment Repair and Rehabilitation of Existing Concrete Structures*
 - *ACI 562 defines the level of attention, precision, expertise, and competent service ordinarily provided by the LDP in the rehabilitation of concrete structures. Whether adopted or not, the LDP's standard of care should incorporate requirements of ACI 562*
- *Codes are the minimum standard of performance to protect the public and establish a minimum standard of performance*
 - *Higher criteria and performance may frequently be specified by the License Design Professional to meet the Owner's goals and/or to satisfy the structural durability criteria*

Chapter 4 - Document Development

➤ Contract Documents

- Will vary for rehabilitation projects from full drawing and specification packages to sketches and drawing note specifications
- Drawings and specifications shall match the size and complexity of the rehabilitation work
- In the lack of a repair specification, ACI 563 – Specifications for Repair of Concrete in Buildings, may be added as a reference specification



Chapter 5 - Owner

- Top decision maker on a project
 - *Defines the project – scope and objectives*
 - *Goals*
 - *Schedule*
 - *Budget*
 - *Form of contract*
- Should consult with a LDP and possibly a contractor and material representative
- Is responsible for retaining a special inspection agency
- Is responsible for establishing the construction observations and involvement of the LDP during the construction phase
 - *LDP presence does not alleviate contractor's obligation for quality control*

Chapter 6 - Licensed Design Professional

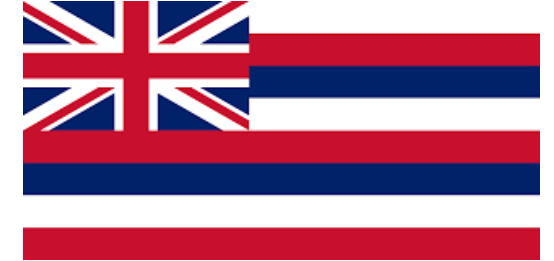
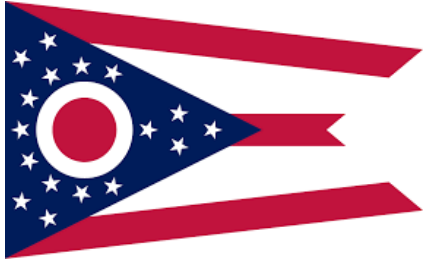
- Develops the project concept based on the Owner's requirements and assesses the feasibility or suitability of an existing building to suit the Owner's program requirements
- Can be an architect but restoration projects are commonly led by structural engineers because of their in-depth knowledge, skill, and expertise
 - *Will commonly perform the assessment, rehabilitation design, construction document preparation, and construction observations*
 - *Should be experienced in evaluating concrete structures, understanding deterioration mechanisms, distress, and the behavior of concrete structures.*



Chapter 6 - Licensed Design Professional

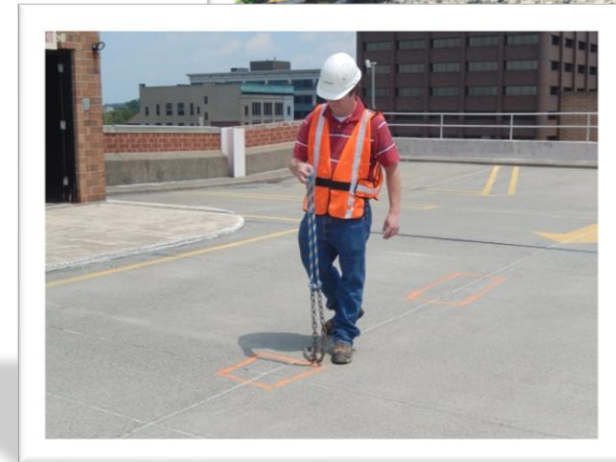
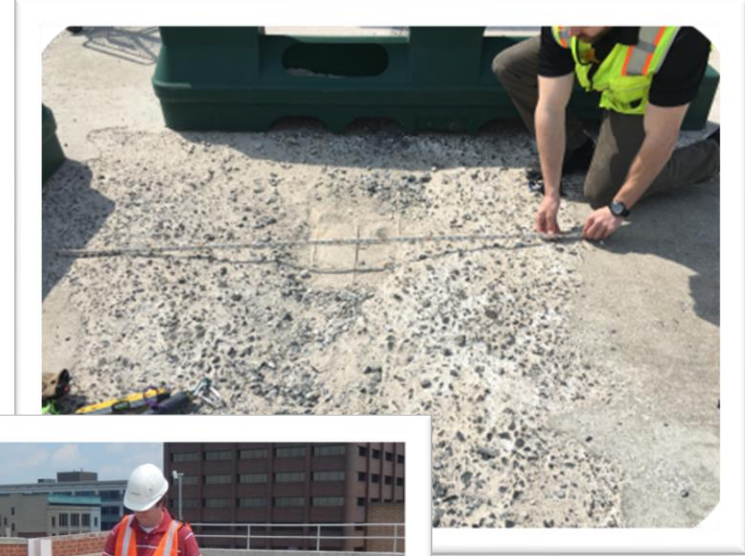
➤ Codes and Regulations

- *International Existing Building Code is commonly applicable, unless the AHJ indicates otherwise. Applying new code requirements may establish criteria that can be reasonably met*
- *Where adopted ACI 562 defines minimum standards of care for the assessment and design of concrete repairs and rehabilitations*
 - *OH, NC, SC, HI, FL*



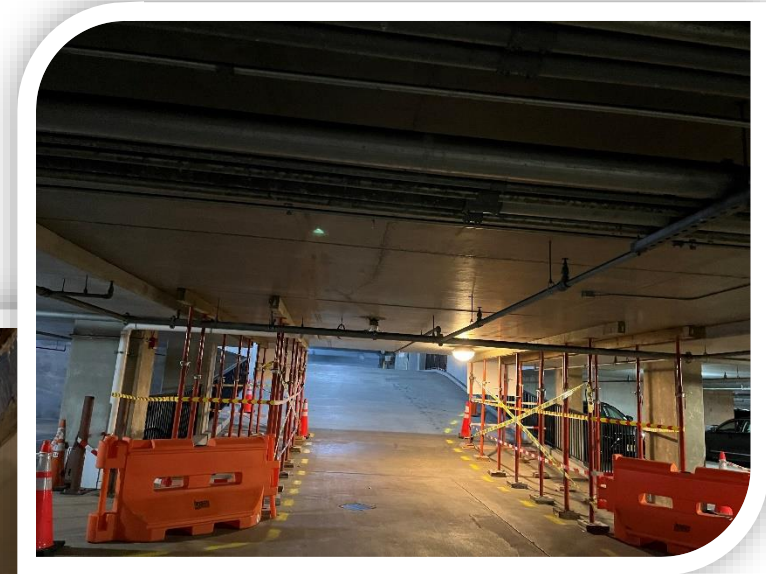
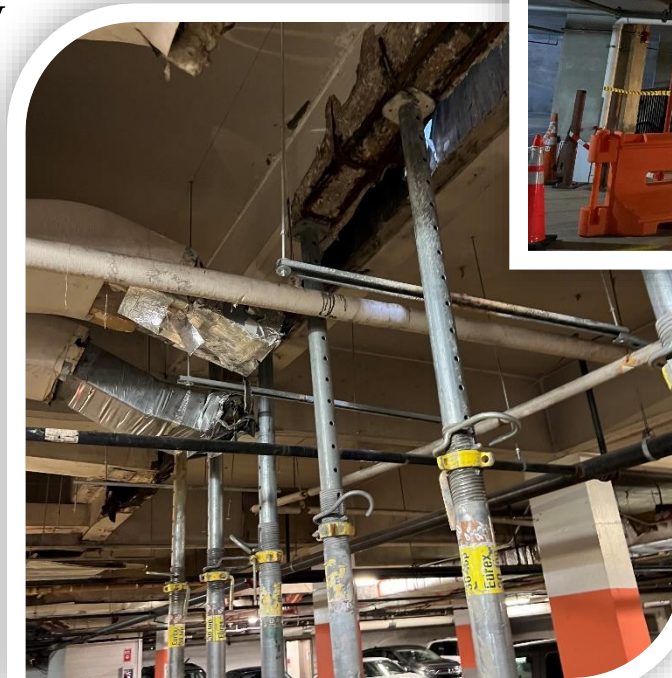
Chapter 6 - Licensed Design Professional

- May have performed the condition assessment and developed the Basis of Design (BOD)
- Prepares the construction documents
 - *Documents should be consistent with size and complexity of project*
 - *Should include requirements for when shoring is to be installed and if shoring is delegated design*
 - *Should specify the ACI Durability requirements in addition to concrete and material properties, placement procedures that are specific to rehabilitation and/or the project, curing procedures*
 - *May include limits for equipment size and weights, material storage loading limits, and operational requirements (maintaining traffic flow in a parking garage)*



Chapter 6 - Licensed Design Professional

- Delegated Design – these may be applicable for temporary shoring, reshoring, temporary scaffolding for access on facades
 - *LDP is responsible for global stability of the structure during construction and at the completion of construction*
 - *Formwork, shoring reshoring, and temporary access are not the responsibility of the LDP, unless assigned by owner*



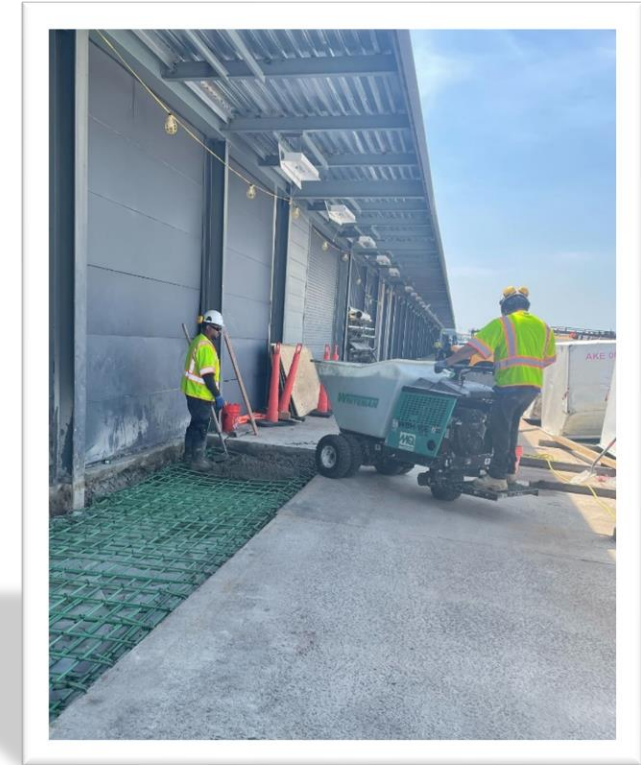
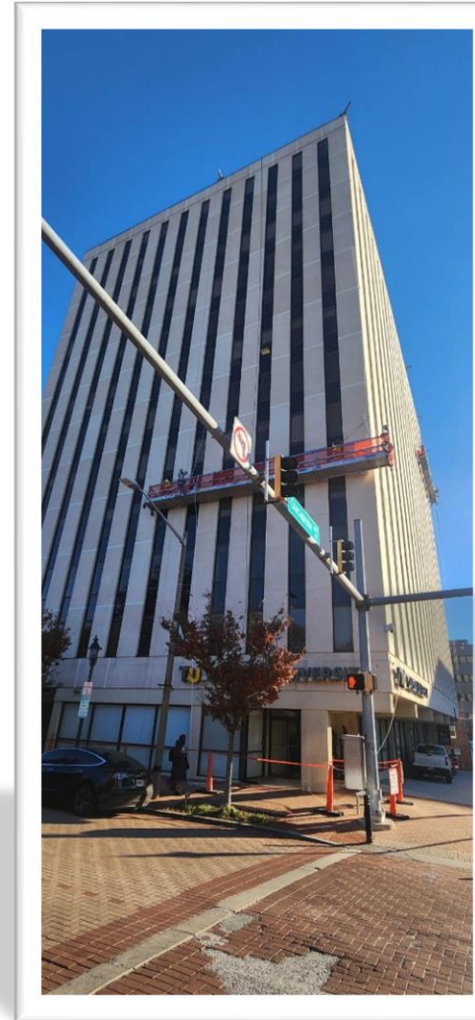
Chapter 6 - Licensed Design Professional

- Quality assurance requirements
 - *LDP has responsibility to conduct periodic visits to observe repair and rehabilitation work and to oversee inspections, tests, and special inspections commonly performed by others.*
 - *Special inspections usually financially supported directly by the owner but LDP shall specify the type and quantity of tests and that the LDP reviews all inspection and testing reports to establish conformance with the codes and contract documents.*



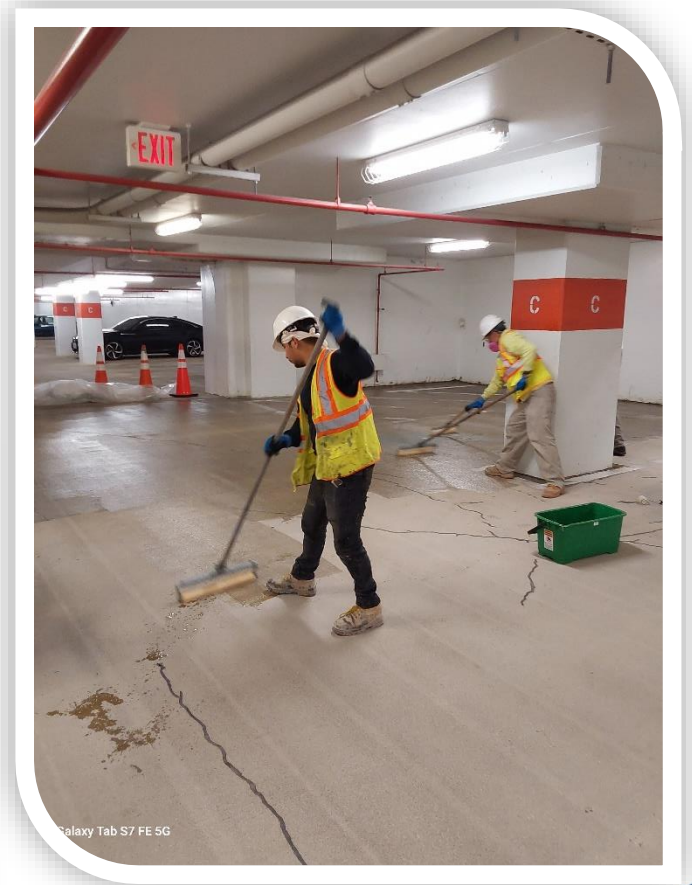
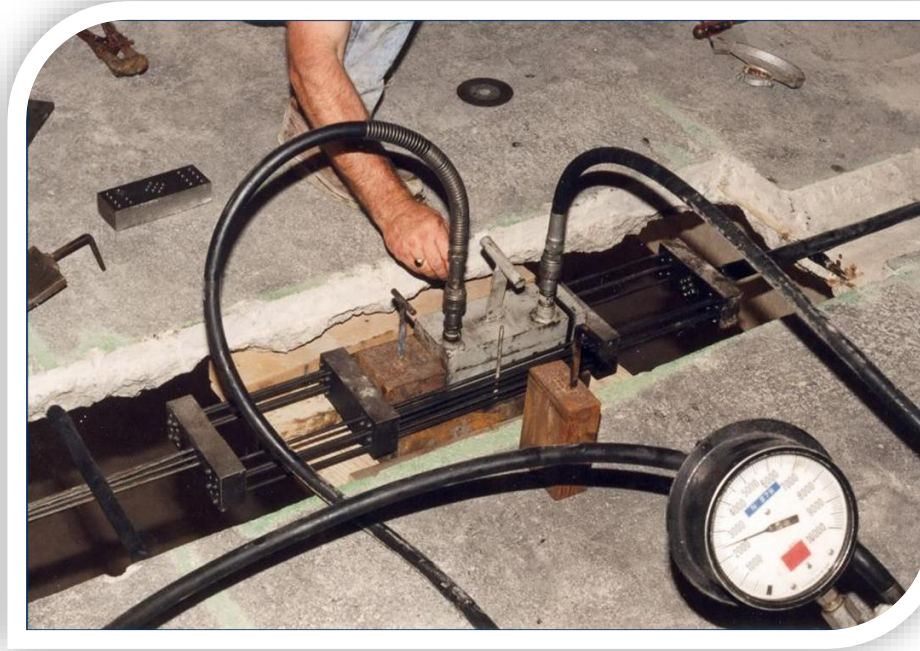
Chapter 7 - General Contractor

- Responsible for performing the repair and rehabilitation work in accordance with the contract documents and standard of care
- Responsible for means, methods, techniques, sequences, site access, construction procedures, quality control, and site safety
- Entrusted with the overall planning, coordination, control of project aimed at meeting an Owner's requirements including time, within authorized cost, and to the required standards



Chapter 7 - General Contractor

- Concrete rehabilitation projects are commonly performed by specialty contractors working in the capacity of a general contractor. They typically self-perform most if not all aspects of the work



Chapter 7 - General Contractor

➤ Construction

- *The contractor has a right to assume that contract documents reflect all applicable codes, standards of care, durability requirements, and other imposed requirements*
- *Have no direct responsibility for engineering assessment or repair and rehabilitation design requirements*
- *Work that requires professional engineering services of systems or materials of the project by the contractor, E.g., that work shall be designed by a specialty engineer retained by the contractor*
 - *E.g., carbon fiber reinforcement design*



Chapter 7 - General Contractor

➤ Qualifications

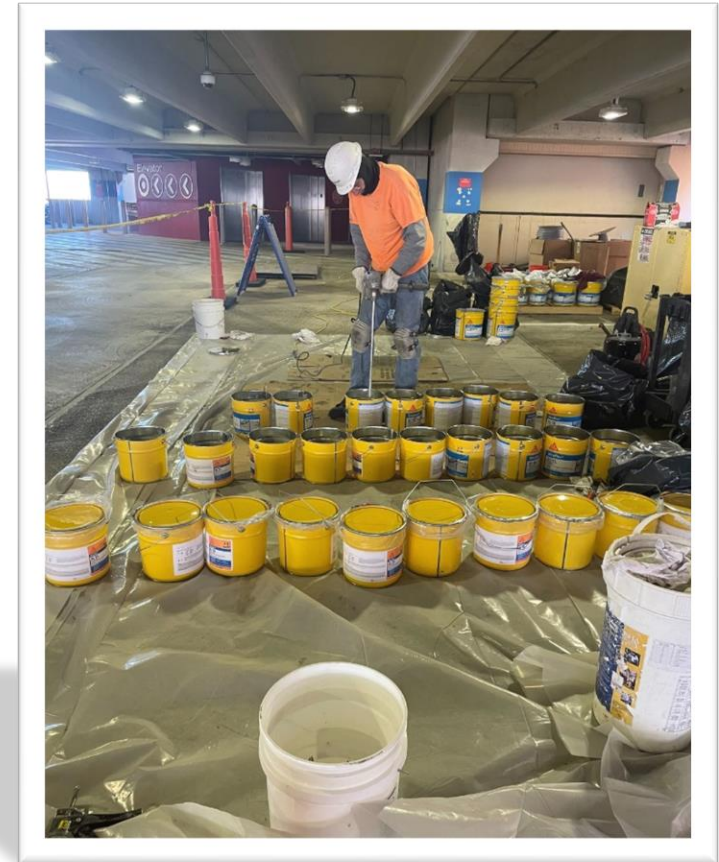
- *Responsible for reviewing the qualification requirements within the contract documents prior to bidding or proposing construction materials and services.*
 - *Repair and rehabilitation projects frequently require specific qualification, certification, and training prior to entering the project site*
 - *These may include hydrodemolition for concrete removal, installing pneumatically applied concrete (shotcrete), and CSRT – Concrete Repair Technician*
- *Prescriptive and Performance specifications*
- *Project site control and safety*
- *Quality Control*



Chapter 8 - Specialty Subcontractor

➤ Role and Retention

- *Typically retained by rehabilitation contractor to provide engineering design calculations to be submitted to EOR for review*
- *Limited design services typically include shoring design, access scaffolding, protection of existing construction, stressing and detensioning in post-tensioning repair, carbon fiber reinforcement design*
 - *Should be licensed in the state of the project and have appropriate expertise and qualifications*
 - *How does the contractor verify expertise and qualifications for services they are not familiar?*



Chapter 8 - Specialty Engineer

➤ Role and Retention

- *Typically retained by rehabilitation contractor to provide engineering design calculations to be submitted to EOR for review*
- *Limited design services typically include shoring design, access scaffolding, protection of existing construction, stressing and detensioning in post tensioning repair, carbon fiber reinforcement design*
- *Should be licensed in the state of the project and have appropriate expertise and qualifications*
 - *How does the contractor verify expertise and qualifications for services they are not familiar?*
- *Contractor maintains responsibility, as specified in the contract documents, to submit to the LDP for review of the design, drawings, and details to substantiate the design*

Chapter 10 - Material Suppliers

- Typically, specifically formulated for rehabilitation projects
 - *Cementitious repair materials for horizontal and vertical*
 - *Materials for form and pour placement and specifically for trowel applied*
 - *Materials for durability*
 - *Cathodic anodes*
 - *Corrosion inhibitors*
 - *Protective systems like polyurethane traffic bearing membranes, epoxy traffic bearing membranes*
- Submittals
- Conventional Concrete
- Proprietary materials
- Contract Compliance
- Substitutions

Chapter 11 - Testing and Inspection Agency

- Contract requirements
 - *Financial responsibility*
 - *Requirements/frequency of testing, types of testing*
- Qualifications
- Scheduling and verification of testing



Chapter 12 - Alternative Project Delivery Methods

- Construction Management (CM)
 - *Construction Manager at Risk (CMAR)*
 - *Construction Manager Advisor (CMa)*
- Design Build
- Multiple Prime

Responsibility in Concrete Rehabilitation Part II

Round Table

THE WORLD'S GATHERING PLACE FOR ADVANCING CONCRETE



Jason A. Coleman, PE SE CDT FICRI

Background

Structural Engineer licensed in 7 states as a PE and 1 state as a SE.

Current role

Senior Associate at Architectural, Engineering, and Material Scientist firm.

Experience

- More than 25 years of structural engineering practice in the assessment, rehabilitation design, strengthening design, and repair design of existing structures. He also has expertise in the design of steel, concrete, masonry, and wood structures, and has led historic facade assessment and rehabilitation projects.
- Subject matter expert for litigation projects involving concrete and masonry construction and repair.
- Active in professional organizations and is a member of ACI 132, ACI 364, ACI 563 and is a Fellow with the International Concrete Repair Institute.



Pericles C. Stivaros, PHD, PE

Background

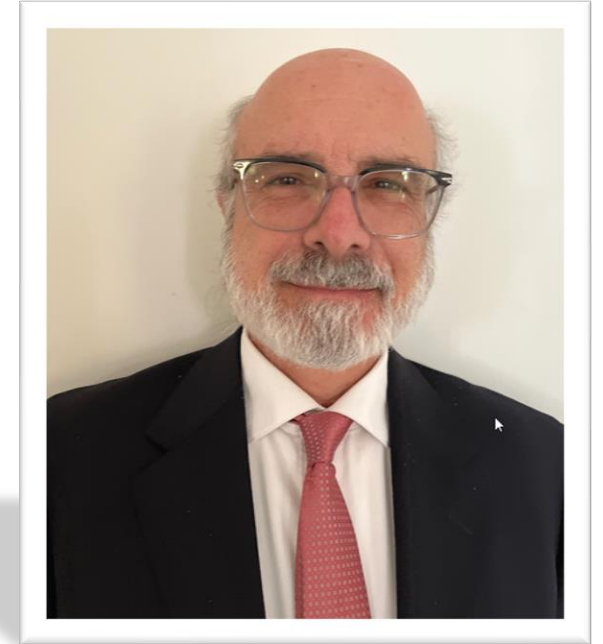
He is a licensed Professional Engineer in New York State and several other states. He holds a Ph.D. degree and a Master of Science degree in Civil Engineering from West Virginia University.

Current role

Vice President at a multidisciplinary National Engineering firm. Structural Group Practice Leader.

Experience

- More than 35 years of experience in structural assessment and evaluation, and rehabilitation of distressed structures, and construction troubleshooting.
- Structural nondestructive testing and monitoring.
- Structural failure analysis, non-performance investigations, and expert testimony.
- ACI Fellow. Member of several ACI Committees, ACI TAC (past), TAC Construction Standards, ACI 562, ACI 364, ACI 350, ACI 362, ACI 347.



Patrick Martin

Background

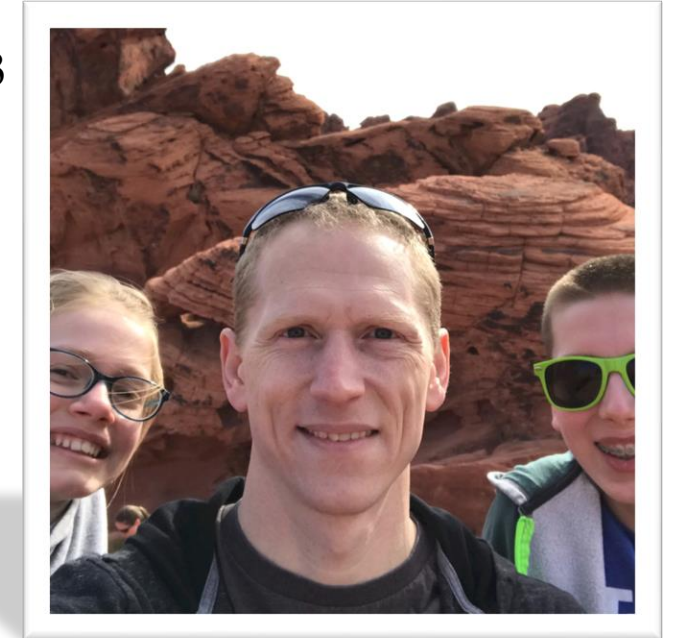
Bachelor's Degree in Architectural Engineering from Illinois Institute of Technology. 13 years as a concrete restoration consultant prior to transitioning to Parking Owner firm.

Current Role

VP Capital Projects – Oversight of the Capital Expenditures (Capex) process company portfolio nationally (60+ parking facilities) including budgeting and project implementation, as well as due diligence for acquisitions and development.

Experience

- 13 years as a restoration consultant with experience in parking facilities, plazas, facades, and other structures.
- 8 years as VP of Capital Projects.
 - Work encompasses all aspects of facility repair/maintenance including mechanical systems, electrical/lighting, elevators, as well as structure repairs/protection.



Rob Caputo

Background

Bachelor's Degree in Civil Engineering from Stevens Institute of Technology (1990-1994) – Concentration in Construction Management. Architectural Engineering from Roger Williams University (1988-1990).

Current role

Regional Manager - New York and Washington DC Metro Areas at National contractor firm. Areas also Includes New England and Eastern PA.

Experience

- 20+ years working in the restoration industry as a contractor.
 - Worked with the two largest contractors in the country.
- Worked 5 years with NYC repair contractor, managing high-end fit outs.
- Worked multiple years with various GC's within many segments of work types (School Construction : K-12 and higher-ed, Hospitals, interior fit-outs, ground up, commercial office space, etc.)



Andy Garver

Background

Bachelor's Degree in Civil Engineering from University of Delaware. Master's in Business Administration from University of Maryland.

Current role

Senior Vice President at Pullman Services. Responsible for Operations across America.

Experience

- 25+ years working in the restoration industry as a contractor and structural engineer.
 - Started in the field as an apprentice mason.
 - Worked for two large engineering firms before transitioning back to contracting.
 - With Pullman companies for over 19 years, starting as an Assistant PM worked towards overall business-line leadership.



Thomas J. Donnelly, Jr.

- Thomas J. Donnelly Jr. has been Project Sales Representative in Eastern, PA. for 10 years with an international material manufacture. He is a frequent speaker at local concrete repair and waterproofing industry conferences and meetings.
- He has over 40 years of experience in the concrete and masonry industry and has worked as a union cement finisher through the ranks of Foreman, Project Manager, Department Manager, and Branch Manager.
- Thomas's work ranges from small individual projects to multi-million-dollar operations. He has an extensive construction background in the restoration of existing structures as well as new construction Projects. His experience allows him to evaluate and devise an appropriate corrective actions to the most unique problems associated with a project.
- He is a board member of Greater Lehigh Valley Chapter of CSI and has Chaired and served on numerous national and local committees for the International Concrete Repair Institute (ICRI).
- Thomas is also an active member of the Delaware Valley Chapter of ICRI.

