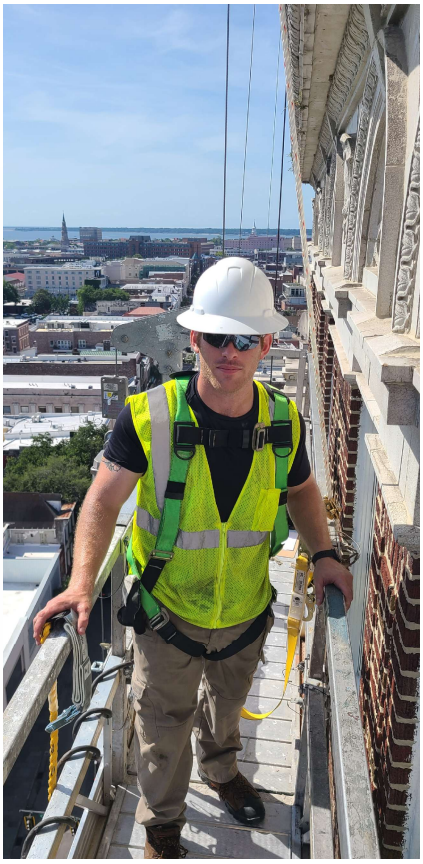
APPLIED BUILDING SCIENCES

Michael A. McLean, P.E.

Structural Engineer

Mr. McLean practices engineering in the structural engineering discipline. His work primarily involves the evaluation of existing structures, repair & design of commercial and residential structures, and forensic engineering consulting. Mr. McLean has a broad range of experience with a variety of types of structures and building materials. He has performed engineering services for coastal condominiums, residential structures, pre-engineered metal buildings, reinforced concrete and masonry structures, post-tensioned concrete, wood framed structures, steel structures, trusses, and multiple types of building enclosure and roof assemblies. Mr. McLean earned a Bachelor of Science (BS) in Civil Engineering from The Citadel in 2010 *(Cum Laude)* and a Master of Science (MS) in Civil Engineering from The Citadel Graduate College in 2018. Mr. McLean previously served as an Engineer Officer in the United States Army.



Inspection of terra cotta frieze at Francis Marion Hotel, Charleston, SC, 2022

Education

- MS in Civil Engineering (*GPA 4.0*), The Citadel Graduate College, 2018
- Engineer Officer Basic Course, U.S. Army, 2010
- BS in Civil Engineering (*Cum Laude*), The Citadel, 2010

Professional Registration

- South Carolina, Professional Engineer, License #39823
- North Carolina, Professional Engineer, License #057470
- Georgia, Professional Engineer, License #PE052149

Professional Organizations

- American Society of Civil Engineers (ASCE)
- International Concrete Repair Institute (ICRI)
- International Institute of Building Enclosure Consultants (IIBEC)
- SC Structural Engineers Association (SCSEA)
- Tau Beta Pi Engineering Honor Society

- Structural Engineering Institute
- National Council of Structural Engineers Association

Professional Experience

- ASCE 11-28 Structural Condition Assessment of Existing Structures Committee
- Adjunct Professor of Civil Engineering, The Citadel: The Military College of South Carolina, January 2023 - Present
- Staff Engineer, Applied Building Sciences Inc., May 2018-Present
- Operations Officer, United States Army Reserve, July 2021- Present
- Psychological Operations Officer, United States Army, December 2014-July 2021.
- Engineer Officer, United States Army, June 2010-November 2014.

Related Experience

- Research Experience for Undergraduates with a focus on in situ stabilization of expansive soils, Oklahoma University School of Civil Engineering and Environmental Science, June 2007-August 2007.

Principal Areas of Practice

- Evaluation of existing buildings and structures
- Repair & design of commercial structures
- Repair & design of residential structures
- Forensic engineering consulting

Structural Design

- Repairs to 12th floor stairs at Historic Francis Marion Hotel, 387 King Street, Charleston, SC (2024)
- Design of repairs to a reinforced concrete, steel, and wood framed parking garage, 3 Queen Street, Charleston, SC (2024)
- Design of a residential deck, 264 Coming Street, Charleston, SC (2024)
- Design of enclosed screened-in-porch, 557 White Chapel Circle, Charleston, SC (2024)
- Design of headers for interior load bearing wall removal, 9051 Top Water, Charleston, SC (2024)
- Design of residential deck, 2605 Josiah Street, Charleston, SC (2023)
- Design of repairs to a 3-story multi-family apartment due to fire damage, Cedar Grove Apartments, 8708 Evangeline Drive, North Charleston, SC (2023)
- Design of repairs to steel stairs at Retreat at Riverland Condos, 1025 Riverland Woods Pl, Charleston, SC (2023)
- Design of second floor garage addition, 352 SeeWee Circle, Mount Pleasant, SC (2023)
- Design of repairs to a 3-story multi-family condominium Piazza, 65 Vanderhorst Street, Charleston, SC (2023)
- Design of steel shelf angle for masonry veneer and seismic retrofit bracing for unreinforced masonry parapet wall, 427 King Street, Charleston, SC (2023)

- Design of upgraded connections & anchors for terra cotta frieze and scrolls for Francis Marion Hotel, 387 King Street, Charleston, SC (2023)
- Design of structural steel diagonal bracing for seismic retrofit of existing unreinforced masonry parapet walls, 427 King Street, Charleston, SC (2023)
- Design of repairs to wood framed parapet, 338 King Street, Charleston, SC (2023)
- Design of structural steel shelf angles to support masonry veneer, 427 King Street Charleston, SC (2023)
- Design of a wood framed carport, 151 South College Street, Pembroke, GA (2023)
- Design of a wood framed pavilion, 151 South College Street, Pembroke, GA (2023)
- Design of a second story garage addition, 352 SeeWee Circle, Mount Pleasant, SC (2023)
- Repair of damaged post-tensioned slab at The Renaissance on Charleston Harbor, 100 North Plaza Court, Mount Pleasant, SC (2022)
- Design of steel moment frame, steel framed deck, and second floor addition, 1074 East Artic Avenue, Folly Beach, SC (2022)
- Design of third story addition, 307 West Ashley Avenue, Folly Beach, SC (2022)
- Repair design of reinforced concrete beams, One Vendue, 1 Vendue Range, Charleston, SC (2022)
- Design of roof top unit curb supports, 4 Clubhouse Drive, Bluffton, SC (2022)
- Design of a dormer, 1434 Meeting Street, Charleston, SC (2022)
- Repair design for exterior walkways for a multi-unit condominium, 130 River Landing Dr, Daniel Island, SC (2022)
- Repair design for a two-way reinforced concrete slab and grade beams, 10 West Edge, Charleston, SC (2022)
- Repair design of a government administrative building damaged by tornado, 151 South College Street, Pembroke, GA (2022)
- Repair design of a single-family residential structure that was impacted by a tree, 3449 Walter Drive, Johns Island, SC (2022)
- Design of upper deck structural steel framing at Joe Riley Stadium, 360 Fishburne Street, Charleston, SC (2022)
- Design of structural steel lintels, 63 Rutledge Ave, Charleston, SC (2021)
- Design of reinforced concrete masonry unit wall at Sullivans Island Firehouse, 2050 Middle Street, Sullivans Island, SC (2021)
- Repair design of impact damaged steel framing portico at the Elks Lodge, 1113 Sam Rittenberg Blvd, Charleston, SC (2021)
- Design of three-story steel moment frame at Charleston Library Society, 164 King Street, Charleston, SC (2018)

Forensic Engineering Consulting

- Wind damage analysis of eight-story multi-unit timeshare, 3626 South Atlantic Avenue, Daytona Beach, SC (2023)
- Failure analysis of cracked reinforced concrete beam at One Vendue, 1 Vendue Range, Charleston, SC (2023)
- Wind pushover/uplift analysis of a single-family residential structure, 3138 Baywood Drive, Charleston, SC (2023)
- Fire damage analysis of post tensioned concrete slab on grade foundations for eight multi-family apartment structures, Stono Oaks Apartments, Johns Island, SC (2023)

- Wind Analysis of cold formed steel infill wall framing at Charleston Oceanfront Villas, Folly Beach, SC (2022)
- Structural condition assessment of crawl space at 3 Queen Street, Charleston, SC (2023)
- Structural condition assessment of pre-cast concrete roof deck panels for a 33,000 square foot commercial warehouse, 178 Wool Road, Jamestown, SC (2022)
- Structural condition assessment of timber bowstring trusses for three 81,000 square foot commercial warehouse, 2154 Noisette Boulevard, Charleston, SC (2022)
- Structural condition assessment of a three-story 10-unit condominium piazza, 65 Vanderhorst Street, Charleston, SC (2022)
- Structural condition assessment of terra-cotta frieze, medallions, and scrolls at the Francis Marion Hotel, Charleston, SC (2022)
- Failure analysis of corrugated galvalume roof panels for a 21,000 square foot metal framed, hinged truss, arched aircraft hangar, Walterboro-Colleton Regional Airport, SC (2021)
- Failure analysis of Brock© grain bins, Deep Run, NC (2018)
- Collapse analysis of a 200,000 square foot warehouse due to Hurricane Florence, Wilmington, NC (2018)
- Wind overturning analysis for chimney framing, Mt. Pleasant, SC (2018)
- Failure analysis of metal plate connected wood trusses, West Ashley, SC (2018)
- Failure analysis of metal plate connected wood trusses, Clemson, SC (2018)
- Structural inspection and analysis of numerous light commercial and residential structures for wind and seismic capacity
- Structural inspection and analysis of numerous commercial and residential structures that were damaged by fire
- Structural inspection and analysis of numerous commercial and residential structures that were damaged by wind
- Structural inspection of numerous commercial and residential structures that were damaged by hail
- Structural inspection and analysis of numerous commercial and residential wood framed structures that were damaged by wood decay fungi
- Structural inspection and analysis of numerous commercial and residential wood framed structure that were damaged by termites
- Structural inspection and analysis of numerous floor systems framed with metal plate connected wood trusses
- Structural inspection and analysis of numerous shallow concrete foundations for differential settlement
- Structural inspection and analysis of numerous commercial and residential structures with corrosion damage
- Structural inspection and analysis of steel trusses and bar joists for numerous commercial structures
- Investigation of water intrusion related issues for commercial and residential structures, including ASTM E 11005 Water Infiltration Testing
- Assessment of window and flashing installation at numerous commercial and residential structures

Continuing Education Courses/Seminars

- Concrete Repair Basics II, MAPEI Corp, Charleston, SC June 20, 2024.
- *Guest Speaker* - Repairs to 12th floor stairs at Historic Francis Marion Hotel, ICRI Spring Conference, Charleston, SC, May 16, 2024
- Renovations to the Historic Oni Homestead Resort, Hot Springs, VA, ICRI Spring Conference, Charleston, SC, May 16, 2024
- Fire Damage to an Industrial Building and how it was repaired, ICRI Spring Conference, Charleston, SC, May 16, 2024
- Code Updates for Concrete Masonry: What Structural Engineers Need to Know, ICRI Spring Conference, Charleston, SC, May 16, 2024
- Assessment of Post-Tensioning and Prestressing Tendons Exposed to Fire, ICRI Spring Conference, Charleston, SC, May 16, 2024
- Expansion Joints – Design, Types, & Analysis: Traffic Bearing Expansion Details ICRI Spring Conference, Charleston, SC, May 16, 2024
- Sika - Concrete Repair Basics, October 19, 2023
- Simpson – Innovative Solutions for Steel Construction, September 20, 2023
- Adjunct Professor for Mechanics of Materials Laboratory, The Citadel (2023, 2024)
- Adjunct Professor for Concrete and Asphalt Laboratory, The Citadel (2023, 2024)
- Champlain Towers South, Surfside, FL Collapse Investigation, May 25, 2023
- 2021 IBC Significant Structural Changes – Part 1: Loads and Special Inspections, March 31, 2023
- Laminated Timber Columns: Structural Characteristics, InfoSpec, February 16, 2023
- Rain Loads in ASCE 7-22: What's New and Different, AWO121321, December 7, 2022.
- Risk Management for Design Professionals, CSVL, November 17, 2022
- Fluid Applied Membranes, Sika and Roof Pro Demonstration, October 5, 2022
- Waterproofing, IIBEC Carolina's Chapter, August 18-19, 2022
- Concrete Repair Basics, Master Builders Solutions, July 15, 2022
- The Effects of Salt and Carbonation on Concrete in Coastal Areas¸ International Concrete Repair Institute Carolina's Chapter, May 5-6, 2022
- Preservation Tools for Masonry Restoration, ICRI Carolina's Chapter, May 5-6, 2022
- FEMA USAR Structure Specialists and Surfside Building Collapse, ICRI Carolina's Chapter, May 5-6, 2022.
- Recent Developments for Concrete Repair Code Adoption in the Carolinas, ICRI Carolina's Chapter, May 5-6, 2022.
- Stucco on an Island Far Far Away, International Concrete Repair Institute Carolina's Chapter, May 5-6, 2022.
- The Differences Between Wind Warranties and Wind Uplift Requirements, SIKA, April 20, 2022.
- 2022 Driven Pile Technical Seminar, Pile Driving Contractors Association of South Carolina, March 17, 2022
- Wood Infestation Report Training, Clemson University, September 14, 2021
- Project Management Course (40 hours). U.S. Army Corps of Engineers, 2012