



APPLIED BUILDING SCIENCES

Michael A. McLean, P.E.

Structural Engineer

Mr. McLean is a licensed Professional Engineer specializing in structural engineering with extensive experience in the evaluation of and repairs to existing buildings and structures. His practice includes forensic engineering consulting with a broad range of projects across diverse building types and materials. He has provided engineering services for coastal condominiums, residential developments, pre-engineered metal buildings, reinforced concrete and masonry structures, post-tensioned concrete, wood-framed systems, steel structures, trusses, and complex building enclosure and roof assemblies.

Mr. McLean earned his Bachelor of Science in Civil Engineering (Cum Laude, 2010) from The Citadel and Master of Science in Civil Engineering (2018) from The Citadel Graduate College. He previously served as an Engineer Officer in the United States Army, bringing leadership, discipline, and technical rigor to his civilian engineering practice.



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

Education

1. MS in Civil Engineering (GPA 4.0), The Citadel Graduate College (2018)
2. BS in Civil Engineering (*Cum Laude*), The Citadel (2010)

Professional Registrations

1. South Carolina, Professional Engineer, License #39823
2. North Carolina, Professional Engineer, License #057470
3. Georgia, Professional Engineer, License #PE052149

Professional Organizations

1. American Society of Civil Engineers (ASCE)

2. International Concrete Repair Institute (ICRI)
3. International Institute of Building Enclosure Consultants (IIBEC)
4. SC Structural Engineers Association (SCSEA)
5. Tau Beta Pi Engineering Honor Society
6. Structural Engineering Institute
7. National Council of Structural Engineers Association

Committee Assignments

1. ASCE 11-28 Structural Condition Assessment of Existing Structures (2024, 2025, 2026)

Presentations

1. Guest Speaker - Repairs to 12th Floor Stairs at the Historic Francis Marion Hotel. ICRI Spring Conference, Charleston, SC (May 16, 2024)

Courses Taught

1. Adjunct Professor for CIVL 309 Structural Analysis, The Citadel (2026)
2. Adjunct Professor for CIVL 307 Mechanics of Materials Laboratory, The Citadel (2023, 2024, 2025)
3. Adjunct Professor for CIVL 327 Concrete and Asphalt Laboratory, The Citadel (2024, 2025)

Professional Experience

1. Project Manager - Applied Building Sciences, Inc.

Engineer of Record for all assigned projects. Provides technical supervision and oversight of all engineering projects from initial intake through project completion. Responsible for resource and personnel coordination, compliance with industry and building code standards, scheduling, and budgeting. Charleston, SC (2024-Present).

2. Staff Engineer - Applied Building Sciences, Inc.

Performed engineering analysis and design in addition to providing technical guidance for projects to ensure compliance with industry standards and building code requirements. Supported planning, problem-solving, and coordination across multidisciplinary teams to deliver safe, efficient, and cost-effective engineered design solutions. Charleston, SC (2018-2023).

Research Experience

1. Research Experience for Undergraduates with a focus on in situ stabilization of expansive soils. Oklahoma University School of Civil Engineering and Environmental Science (2007).

Professional Military Schooling

1. U.S. Army Command and General Staff Officer Course. Fort Jackson, SC (2024)
2. Counter Threat Finance. Joint Special Operations University, MacDill Air Force Base, FL (2016)
3. Advanced Special Operations Combating Terrorism. Joint Special Operations University, MacDill Air Force Base, FL (2016)
4. Special Operations Combating Terrorism Course. Joint Special Operations University, MacDill Air Force Base, FL (2016)
5. U.S. Army Psychological Operations Qualifications Course. Fort Bragg, NC (2014)
6. Basic Special Operations Language Training Course. Fort Bragg, NC (2014).
7. U.S. Army Special Operations Forces Captains Career Course. Fort Bragg, NC (2013)
8. U.S. Army Engineer Basic Officer Leadership Course. Fort Leonard Wood, MO (2010)

Technical Military Assignments

1. Operations Officer – 81st Readiness Division, United States Army Reserve.

Responsible for planning and execution of operations to improve U.S. Army Reserve readiness. Supervised the resource allocation, training, and mission support for multiple subordinate commands across 9 states and Puerto Rico. Fort Jackson, SC (2021-Present)

2. Psychological Operations Plans Officer – Operations Group, U.S. Army National Training Center.

Coached and mentored rotational Brigade Combat Team and Battalion Staff on planning, integration, and execution of information related capabilities. Provided expert feedback and after-action reviews to improve combat effectiveness. Fort Irwin, CA (2019–2021).

3. *Psychological Operations Detachment Commander, Alpha Company, 4th Psychological Operations Group (Airborne).*

Commanded a regionally aligned Psychological Operations Detachment. Responsible for planning and executing information operations to influence target audiences in support of U.S. objectives. Fort Bragg, NC (2013–2017).

4. *Assistant Operations Officer - 65th Engineer Battalion (Combat Effects), 130th Engineer Brigade, 8th Theater Sustainment Command.*

Supported operational and tactical planning for theater-level engineering missions, coordinated resources, tracked operations, and synchronized battalion efforts with higher headquarters priorities. Schofield Barracks, HI (2012-2013)

5. *Platoon Leader - 3rd Platoon, 82nd Engineer Support Company, 65th Engineer Battalion (Combat Effects).*

Responsible for leading 30 combat engineer Soldiers, \$15 million in heavy engineering equipment. Planned and executed mobility, counter-mobility, and survivability missions in support theater engineering efforts. Schofield Barracks, HI (2010-2012)

Principal Areas of Engineering Practice and Representative Projects

1. Structural evaluation of existing buildings and structures
2. Structural design of repairs for existing buildings and structures
3. Forensic engineering consulting

Evaluation of Existing Structures

1. Structural Condition Assessment of terra-cotta frieze, medallions, and scrolls at The Francis Marion Hotel, 387 King Street, Charleston, SC (2022)
2. Structural Condition Assessment of The Fort Sumter House, a 7-story historic reinforced concrete condominium. 1 King Street, Charleston, SC (2025)
3. Structural monitoring of cracks in post-tensioned concrete slabs at The Renaissance on Charleston Harbor, a 7-story post-tensioned concrete Coastal Condominium. 100 N Plaza Ct, Mt. Pleasant, SC (2025)
4. Structural monitoring using remote linear displacement sensors of existing reinforced concrete beams at One Vendue Range Complex, 1 Vendue Range, Charleston, SC (2022)
5. Structural Condition Assessment of reinforced concrete parking garage columns and wood framed exterior balconies at a four-story oceanfront condominium. 1140 Ocean Boulevard, Isle of Palms, SC (2025)

6. Structural Condition Assessment of a reinforced concrete, masonry, steel, and wood framed parking garage at 3 Queen Street, Charleston, SC (2023)
7. Structural Condition Assessment to determine reparability and extent of repair of tree impacted reinforced concrete stadium. Bell Memorial Field, Savannah, GA (2025)
8. Structural Condition Assessment of 60 ft span timber bowstring trusses for three 81,000 square foot commercial warehouses. 2154 Noisette Boulevard, Charleston, SC (2022)
9. Structural Condition Assessment of Juliet balconies for two multi-unit condominiums. 250 Island Park Drive, Daniel Island, SC (2025)
10. Structural Condition Assessment to determine method of repair for damaged timber bowstring trusses. 103 Ardis Street, Summerville, SC (2025)
11. Structural Condition Assessment of a wood-framed residential structure and shallow concrete foundation built circa 1880. 271 Coming Street, Charleston, SC (2025)
12. Structural Condition Assessment of wall cracks at a wood framed residential structure. 105 Hampton Drive, Summerville, SC (2025)
13. Structural Condition Assessment of pre-cast concrete roof panels for a warehouse structure. 401 East 1st North Street, Summerville, SC (2025)
14. Structural Condition Assessment of structural framing at Mira Vista Condominiums. 480 Martello Drive, Charleston, SC (2025)
15. Structural Condition Assessment of cracked concrete masonry unit walls. 604 Pitt Street, Mount Pleasant, SC (2024).
16. Structural Condition Assessment of crawlspace framing and masonry foundation components for wood framed duplex units. 40 Planters Wood Drive, Hilton Head, SC (2024).
17. Structural Condition Assessment of pre-cast concrete roof deck panels for a 33,000 square foot commercial warehouse. 178 Wool Road, Jamestown, SC (2022)
18. Structural Condition Assessment of a historic three-story ten-unit condominium Piazza. 65 Vanderhorst Street, Charleston, SC (2022)

Structural Design

1. Design of repairs to a structural steel balcony with open web steel bar joists at 3 Chisolm Street. 3 Chisolm Street, Charleston, SC (2025)
2. Design of structural steel beams for upper deck box seating at Joe Riley Stadium. 360 Fishburne Street, Charleston, SC (2022)

3. Design of structural steel repairs to a storage warehouse that collapsed. 938 Thunderbolt Drive, Walterboro, SC (2025)
4. Design of repairs to the exterior masonry walls and interior columns. 2 Queen Street, Charleston SC (2025)
5. Design of repairs to damaged reinforced concrete parking garage columns and wood framed exterior balconies at a 4-story oceanfront structure. 1140 Ocean Boulevard, Isle of Palms, SC (2025)
6. Design of masonry and reinforced concrete repairs to 12th floor stairwell at Historic Francis Marion Hotel. 387 King Street, Charleston, SC (2024)
7. Design of structural steel dropped girder to support the second floor of a wood-framed condominium. Greystar Apartments, Mount Pleasant, SC (2024)
8. Design of repairs to a reinforced concrete, steel, and wood framed parking garage. 3 Queen Street, Charleston, SC (2024)
9. Design of repairs to the exterior building envelope and balconies at the Bowman Park Apartment Complex. Bowman Park Road, Mount Pleasant, SC (2024)
10. Design of repairs to Historic 3-story piazza for 10-unit condominium, 65 Vanderhorst Street, Charleston, SC (2023)
11. Design of connections & anchors for terra cotta frieze and scrolls for Francis Marion Hotel. 387 King Street, Charleston, SC (2023)
12. Design of structural steel diagonal bracing for seismic retrofit of existing unreinforced masonry parapet walls. 427 King Street, Charleston, SC (2023)
13. Design of a wood-framed residential deck on round timber piles. 75 Pepper Vine Street, Kiawah Island, SC (2025)
14. Design of repairs to a steel roof damaged by fire at Classic Collision auto repair. 1850 N. Main Street, Summerville, SC (2025).
15. Design of engineered steel connectors for steel flitch and engineered wood beams at Seascape Villas Condominiums. Kiawah Island, SC (2025)
16. Design of repairs and building envelop cladding for a historic residential structure. 19 Carolina Street, Charleston, SC (2025)
17. Design of repairs to metal plate connected wood trusses at Mira Vista Condominiums. 480 Martello Drive, Charleston, SC (2025).
18. Design of wood framing repairs to a fire damaged apartment building at The Palms Apartments. 311 Royal Palm Boulevard, Charleston, SC (2025)
19. Design of structural support curbs for rooftop mechanical units. 2 Cumberland Street, Charleston, SC (2025)

20. Design of wood framing repairs for a fire damaged apartment. KRC Greenwood Apartments, Building 800, Charleston, SC (2025)
21. Design of structural repairs for a fire damaged apartment. 202 West 36th Street, Savannah, GA (2025)
22. Design of Repairs for damaged engineered and dimensional wood beams. 721 Virginia Rail, Kiawah Island, SC (2025)
23. Design of repairs to the exterior building envelop of the Belle Hall Apartments, 19 multi-family apartment buildings, 1600 Belle Point Drive, Mount Pleasant, SC (2025)
24. Design of repairs to a tree impacted wood framed residential structure. 306 East 48 Street, Savannah, GA (2025)
25. Design of repairs to damaged wall framing of a historic residential structure built circa 1880. 3 1/2 Kracke Street, Charleston, SC (2025)
26. Design of repairs to the exterior brick walls of a historic mass masonry multi-unit condominium. 3 Queen Street, Charleston, SC (2024)
27. Design of a wood framed residential deck. 264 Coming Street, Charleston, SC (2024)
28. Design of wood framed enclosed screened-in-porch and deck. 557 White Chapel Circle, Charleston, SC (2024)
29. Design of engineered wood headers for interior load bearing wall removal. 9051 Top Water, Charleston, SC (2024)
30. Design of residential deck with reinforced masonry columns and structural steel girders. 2605 Josiah Street, Charleston, SC (2023)
31. Design of repairs to a 3-story multi-family apartment due to fire damage. Cedar Grove Apartments, 8708 Evangeline Drive, North Charleston, SC (2023)
32. Design of repairs to steel stairs at Retreat at Riverland Condos. 1025 Riverland Woods Pl, Charleston, SC (2023)
33. Design of Finished Room Over Garage, a second-floor garage addition. 352 SeeWee Circle, Mount Pleasant, SC (2023)
34. Design of steel shelf angle for masonry veneer and seismic retrofit bracing for unreinforced masonry parapet wall. 427 King Street, Charleston, SC (2023)
35. Design of repairs to wood framed parapet. 338 King Street, Charleston, SC (2023)
36. Design of structural steel shelf angles to support masonry veneer, 427 King Street Charleston, SC (2023)
37. Design of a wood framed carport. 151 South College Street, Pembroke, GA (2023)

38. Design of a wood framed pavilion. 151 South College Street, Pembroke, GA (2023)
39. Design of repairs of damaged post-tensioned concrete slab at The Renaissance on Charleston Harbor. 100 North Plaza Court, Mount Pleasant, SC (2022)
40. Design of steel moment frame, steel framed deck, and second floor addition. 1074 East Arctic Avenue, Folly Beach, SC (2022)
41. Design of third story addition at a 3-story residential coastal structure. 307 West Ashley Avenue, Folly Beach, SC (2022)
42. Repair design of reinforced concrete beams at One Vendue Range Complex, 1 Vendue Range, Charleston, SC (2022)
43. Design of support curbs for roof top mechanical systems. 4 Clubhouse Drive, Bluffton, SC (2022)
44. Design of a dormer. 1434 Meeting Street, Charleston, SC (2022)
45. Repair design for exterior walkways for a multi-unit condominium. 130 River Landing Drive, Daniel Island, SC (2022)
46. Repair design for a two-way reinforced concrete slab and grade beams. 10 West Edge, Charleston, SC (2022)
47. Repair design of a government administrative building damaged by tornado. 151 South College Street, Pembroke, GA (2022)
48. Repair design of a single-family residential structure that was impacted by a tree. 3449 Walter Drive, Johns Island, SC (2022)
49. Design of structural steel lintels to support brick veneer. 63 Rutledge Ave, Charleston, SC (2021)
50. Design of reinforced concrete masonry unit wall at Sullivans Island Firehouse. 2050 Middle Street, Sullivans Island, SC (2021)
51. Repair design of impact damaged steel framing portico at the the Elks Lodge. 1113 Sam Rittenberg Blvd, Charleston, SC (2021)
52. Design of three-story steel moment frame at The Charleston Library Society. 164 King Street, Charleston, SC (2018)

Forensic Engineering Consulting

1. Forensic Investigation of a 3-story residential coastal structure for water & air intrusion. 712 Ocean Boulevard, Isle of Palms, SC 29451.
2. Forensic Investigation of tree impact damage to a residential structure. 426 Zellen Drive, Spartanburg, SC (2025)

3. Forensic Investigation of deteriorating balconies and of the building envelop at Waters at Saint James Apartments, a 14 building multi-family apartment complex. 1053 Saint James Avenue, Summerville, SC (2025)
4. Forensic Investigation of construction defects at reinforced concrete and insulated concrete form residential structure. 1761 Clark Hills Circle, Johns Island, SC (2024)
5. Forensic Investigation of structural damage to a wood framed residential dwelling. 244 Pansy Lane, Moncks Corner, SC (2025)
6. Forensic Investigation of construction defects for a wood framed residential dwelling. 217 Longview Drive, Leesville SC (2025)
7. Forensic Investigation of construction defects for a wood framed residential dwelling. 1401 Nancy Island Drive, Seabrook Island, SC (2025)
8. Forensic Investigation to determine the cause of water intrusion. 39 Chapel Street, Charleston, SC (2025)
9. Analysis and evaluation of a wood framed dock supported by timber piles that collapsed. 1884 Tickton Hall Road, Ridgeland, SC (2025)
10. Forensic Investigation to determine cause and extent of damage to wood framing. 1151 Summer Wind, Seabrook Island (2025)
11. Investigation of swimming pool failure, 774 Boyd Creek Drive, Ridgeland, SC (2024)
12. Forensic Investigation of construction defects. 105 Ascot Drive, Camden, SC (2025)
13. Forensic Investigation of construction defects for a Pre-engineered metal building. 6624 Highway 9, Gresham, SC (2024).
14. Forensic Investigation of deteriorating balconies and of the building envelop at Waters at Magnolia Bay Apartments, a 13 building multi-family apartment complex. 10765 US-78, Summerville, SC (2023)
15. Wind damage analysis of eight-story multi-unit timeshare, 3626 South Atlantic Avenue, Daytona Beach, SC (2023)
16. Failure analysis of cracked reinforced concrete beam at One Vendue, 1 Vendue Range, Charleston, SC (2023)
17. Wind pushover/uplift analysis of a single-family residential structure, 3138 Baywood Drive, Charleston, SC (2023)
18. Investigation of Fire damage to post tensioned concrete slab on grade foundations for eight multi-family apartment structures, Stono Oaks Apartments, Johns Island, SC (2023)
19. Forensic Investigation of roof framing and floor framing. Edisons Restaurant. 1014 Fort Johnson Road, James Island, SC (2023)

20. Forensic Investigation of a concrete slab-on-grade foundation failure. 257 Catawba Branch Way, Moncks Corner, SC (2022)
21. Wind Analysis of cold formed steel infill wall framing at Charleston Oceanfront Villas, Folly Beach, SC (2022)
22. 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)
23. Failure analysis of Brock® grain bins, Deep Run, NC (2018)
24. Collapse analysis of a 200,000 square foot warehouse due to Hurricane Florence, Wilmington, NC (2018)
25. Failure analysis of metal plate connected wood trusses that collapsed due to water ponding. 3360 Glenn McConnell Parkway, Charleston, SC (2018)
26. Failure analysis of metal plate connected wood trusses that collapsed, Woodlands Apartments. 833 Old Greenville Highway, Clemson, SC (2018)

Continuing Education Courses/Seminars

1. Practical Design of Bolted and Welded Connections, ASCE. Charleston, SC (December 9, 2025)
2. Practical Design of Slabs on Grade, ASCE. Charleston, SC (December 9, 2025)
3. Post Tensioning Concepts beyond the basics, ASCE. Charleston, SC (December 9, 2025)
4. Design of Wood Connections, ASCE. Charleston, SC (December 6, 2025).
5. Condition Evaluation of Existing Structures—Masonry and Wood, ASCE. Charleston, SC (December 3, 2025)
6. Retrofit Anchoring of Masonry and Stone Facades, Prosoco. Charleston, SC (November 19, 2025)
7. Petrographic Analysis of Concrete Deterioration, ASCE. Charleston, SC (November 18, 2025)
8. Fenestration Solutions for Historic Rehabilitation Projects, Marvin Windows. Charleston, SC (August 28, 2025)
9. Condition Assessment of Existing Structures—Concrete and Steel, ASCE. Charleston, SC (August 15, 2025)
10. Indoor Protection, Nu-Ceil Ceiling Specifications, Nusens USA. Charleston, SC (April 17, 2025)

11. Ethics I for Professional Engineers, PDHNow. Charleston, SC (January 3, 2025)
12. Concrete Repair Basics II, MAPEI Corp. Charleston, SC (June 20, 2024)
13. Renovations to the Historic Oni Homestead Resort, Hot Springs, VA, ICRI Spring Conference. Charleston, SC (May 16, 2024)
14. Fire Damage to an Industrial Building and how it was repaired, ICRI Spring Conference. Charleston, SC (May 16, 2024)
15. Code Updates for Concrete Masonry: What Structural Engineers Need to Know, ICRI Spring Conference. Charleston, SC (May 16, 2024)
16. Assessment of Post-Tensioning and Prestressing Tendons Exposed to Fire, ICRI Spring Conference. Charleston, SC (May 16, 2024)
17. Expansion Joints – Design, Types, & Analysis: Traffic Bearing Expansion Details ICRI Spring Conference. Charleston, SC (May 16, 2024)
18. Concrete Repair Basics, Sika. Charleston, SC (October 19, 2023)
19. Innovative Solutions for Steel Construction, Simpson Strong Tie. Charleston, SC (September 20, 2023)
20. Champlain Towers South, Surfside, FL Collapse Investigation, (May 25, 2023)
21. 2021 IBC Significant Structural Changes – Part 1: Loads and Special Inspections, (March 31, 2023)
22. Laminated Timber Columns: Structural Characteristics, InfoSpec. Charleston, SC (February 16, 2023)
23. Rain Loads in ASCE 7-22: What's New and Different, AWO121321, (December 7, 2022)
24. Risk Management for Design Professionals, CSVL. Charleston, SC (November 17, 2022)
25. Fluid Applied Membranes, Sika and Roof Pro Demonstration. Charleston, SC (October 5, 2022)
26. Waterproofing, IIBEC Carolina's Chapter. Charleston, SC (August 18-19, 2022)
27. Concrete Repair Basics, Master Builders Solutions. Charleston, SC (July 15, 2022)
28. The Effects of Salt and Carbonation on Concrete in Coastal Areas, ICRI. Charleston, SC (May 5-6, 2022)
29. Preservation Tools for Masonry Restoration, ICRI Carolina's Chapter. Charleston, SC (May 5-6, 2022)

30. FEMA USAR Structure Specialists and Surfside Building Collapse, ICRI Carolina's Chapter, Charleston SC (May 5-6, 2022)
31. Recent Developments for Concrete Repair Code Adoption in the Carolinas, ICRI Carolina's Chapter, Charleston SC (May 5-6, 2022)
32. Stucco on an Island Far Far Away, International Concrete Repair Institute Carolina's Chapter. Charleston, SC (May 5-6, 2022)
33. The Differences Between Wind Warranties and Wind Uplift Requirements, SIKA. Charleston, SC (April 20, 2022)
34. 2022 Driven Pile Technical Seminar, Pile Driving Contractors Association of South Carolina, Charleston, SC (March 17, 2022)
35. Wood Infestation Report Training, Clemson University (September 14, 2021)
36. The Strategic Communications Course, The Brief Lab. Fort Bragg, NC (May 17, 2016)
37. Basic Project Management In USACE, US Army Corps of Engineers. Schofield Barracks, HI (May 21, 2012)