Diana Estrada

PE

Senior Managing Consultant, Director of Civil & Structural

Ms. Estrada is a Senior Managing Consultant and Director at Engineering Systems Inc. (ESi), providing expert consultation in structural, construction materials, and civil engineering forensics. She is routinely retained to lead investigations ranging from performance and serviceability issues to complex, multidisciplinary failures of buildings and infrastructure systems. Her work focuses on determining origin, cause, failure mechanisms, and extent of damage, providing a technical basis for the evaluation of design deficiencies, material performance, construction defects, code compliance, maintenance issues, and extreme events.

Ms. Estrada investigates a broad range of matters, from residential claims and construction defects to large-scale structural failures and catastrophic collapses. Her work also includes structural integrity assessments, code compliance, and failures occurring during both construction and in-service conditions. She also develops repair scopes and designs, supporting the evaluation and design of repairs for partially or fully damaged structures following an event.

Her expertise includes cementitious materials and structural systems, including reinforced and prestressed concrete, steel, and wood, with particular strength in evaluating how material behavior influences system-level performance and failure.

Ms. Estrada has conducted slip resistance testing and has performed code investigations for personal injury and premises liability matters involving slip/trip/fall incidents, local and building code requirements, and issues related to ADA compliance.

Her background includes research on damage mechanisms, residual capacity, and repair of concrete structures, integrating field investigations and laboratory testing to evaluate performance, failures, and repair effectiveness.

Prior to joining ESi, Ms. Estrada worked across the full project lifecycle, including design, preconstruction, construction, and commissioning for Design-Build and Design-Bid-Build projects, both domestic and international. Her experience spans commercial facilities, railroad infrastructure, civil sitework, oil and gas, and drinking and wastewater treatment facilities. She led preconstruction and estimating efforts, evaluating risk, cost, constructability, and schedule impacts.

Ms. Estrada has also provided oversight and direct management of construction projects, including day-to-day operations, identification and analysis of constructability constraints, and coordination of multidisciplinary teams.

Contact Information

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ESi Atlanta

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Areas of Specialization

- Alternative Delivery Projects (DB – DBO)
- Concrete and Cementitious Materials
- Construction and Project Management
- Construction Costs and Techniques Analysis
- Construction Defects
- Collapse and Structural Failure Investigations
- Code Compliance
- Civil Infrastructure
- Multi-disciplinary Failure Analysis and Investigation
- Premises Liability
- Rehabilitative and Repair Design
- Structural Evaluation of Buildings: Residential, Commercial, and Industrial Structures

Education

MEng, Structural Mechanics and Design. Massachusetts Institute of Technology. 2018

BS, Civil and Environmental Engineering. Florida International University. 2015

Licenses & Certifications

- State of Alabama PE License PE53425
- State of Georgia PE License PE046580
- State of Mississippi PE License 37773
- State of North Carolina PE License PE062722
- State of Ohio PE License PE91798
- NFSI Walkway Auditor Certificate Holder
- OSHA 30-hour Construction Safety Training

Languages

Ms. Estrada is fluent and conducts work in both English and Spanish, supporting a diverse range of clients.

Positions Held

Engineering Systems Inc., Peachtree Corners, Georgia

- Senior Managing Consultant, 2025 – Present
- Director, 2024 – Present
- Senior Consultant, 2023 – 2024
- Senior Staff Consultant, 2021 – 2022
- Staff Consultant, 2019 – 2020

AECOM – Design Build Group, Chelmsford, Massachusetts

- Project Engineer, 2018 – 2019

Gonzalez and Sons Equipment, Inc., Miami, Florida

- Chief Estimator, 2015 – 2017
- Assistant Project Manager, 2013 – 2015

Teaching & Research

- **Graduate Research Assistant, Structural Engineering and Mechanics of Materials Laboratory** – Georgia Institute of Technology, January 2021 – May 2024
- **Teaching Assistant, Historic Structures** – Georgia Institute of Technology, Summer 2022
- **Teaching Assistant, Introduction to Structural Engineering** – Georgia Institute of Technology, Summer 2022
- **Graduate Researcher, Topology Optimization Lab, Department of Civil and Environmental Engineering** – Massachusetts Institute of Technology

Professional Affiliations/Honors

American Concrete Institute

- Member

American Society of Civil Engineers

- Member

American Railway Engineering and Maintenance of Way Association

- Associate Member

Precast / Prestressed Concrete Institute

- Member
- Subcommittee Member – Manual for the Evaluation and Repair of Precast, Prestressed Concrete Bridge Products

Structural Engineers Association

- Member, Georgia Chapter

Structural Engineering Institute

- Member

Selected Project Experience

Structural Failure & Collapse Investigations

Roof Collapse Investigation Following Snow Event — Institutional Facility

Investigated a partial collapse of roof consisting of light gauge metal trusses at an institutional facility following a snow event to determine the extent of structural damage and contributing factors. The investigation expanded to structural assessments of multiple buildings within the area. Developed stabilization recommendations following roof removal.

Processing Plant Structural Floor Collapse Investigation

Investigated a second-story structural collapse during processing plant expansion activities, including evaluation of failure mechanisms and contributing factors. Determined collapse initiation was associated with deficiencies in the existing structure rather than previously alleged construction inspection issues.

Bridge Collapse Investigation (International)

Led a multidisciplinary forensic investigation of a bridge collapse. Evaluated as-built conditions of adjacent structures to determine structural integrity and deterioration. Investigation led to developing finite element models using field measurements and historical documentation to evaluate potential failure mechanisms.

Underground Structures Defect Investigation — Processing Plant Facility

Performed forensic evaluation of alleged failure and instability of large underground structures at a processing plant facility to determine the extent and cause of alleged distress and develop repair recommendations. Due to site access restrictions, utilized remote inspection technologies including laser scanning and photographic documentation.

Overhead Structure Failure Investigation

Served as part of a four-member multidisciplinary expert team responsible for evaluating the design and construction of an overhead structure following an incident. Provided expert opinions regarding structural design and construction practices while collaborating with experts from multiple disciplines to support a comprehensive forensic analysis.

Aeration Basin Structural Failure Investigation — Wastewater Treatment Facility

Performed on-site evaluation of a reinforced concrete aeration basin following wall failure. Led destructive and non-destructive testing programs to determine as-built reinforcement configurations and concrete properties. Following analysis of physical and documentary evidence, identified deficiencies in structural design and detailing.

Construction Defect & Code Compliance Assessments

Dormitory Building Floor Failure and Construction Defect Investigation

Investigated failure patterns associated with cracked cementitious floor toppings in a dormitory facility. Performed laboratory material testing and reviewed project documentation to identify contributing factors related to design, construction, and material performance.

Residential Construction Defect Investigations

Investigated claims involving structural deficiencies and building enclosure defects in residential construction. Conducted site inspections and document reviews to distinguish cosmetic issues, code-compliant conditions, deferred maintenance, and non-existent defects from conditions inconsistent with applicable codes and industry standards. Evaluated repair recommendations prepared by others and assessed the extent of required remediation.

Apartment Building Water Intrusion and Construction Defect Investigation

Conducted forensic investigation of the design and construction of a six-story apartment building following extensive water intrusion damage. Evaluated building enclosure systems and construction practices to determine contributing factors to observed failures.

Product Liability & Material Failure Analysis

Product Liability Evaluation of Cementitious Construction Materials

Evaluated in-situ performance and claimed failures of cementitious construction materials in residential applications across multiple states. Combined field evaluations with laboratory exemplar construction and testing to assess product variability, installation practices, and performance characteristics.

Structural Integrity and Serviceability

Multi-Family Community Structural Integrity Assessment

Performed structural condition assessments and evaluated structural performance across a portfolio of more than 90 multifamily buildings. Led a team of over five consultants to accelerate completion of site inspections and reporting efforts.

Premises Liability

Stair and Ramp Code Compliance Investigations

Conducted forensic evaluations of stairs and ramps associated with alleged trip-and-fall in a variety of cases across commercial, multifamily, residential, and public infrastructure properties. Assessed stair geometry, riser and tread dimensions, landings, handrails, guardrails, and walking surface conditions for compliance with applicable local ordinances, building codes, maintenance codes, accessibility requirements, and life safety code provisions. Performed detailed site measurements, historical document review, and code analysis to evaluate existing conditions and as-built conditions with respect to claimed events.

Walking Surface and Accessibility Code Evaluations

Performed forensic investigations involving alleged slip-and-fall and trip-and-fall incidents associated with walking surfaces such as sidewalks, parking lots, public walkways, exterior hardscape areas, means of egress, retail entryways, concrete slabs, and interior walking surfaces within commercial and restaurant environments. Evaluated built conditions, elevation differentials, slope conditions, surface irregularities, material transitions, and surface deterioration in relation to applicable building, accessibility, maintenance, and local municipal codes to assess existing conditions and potential contributing factors from the built environment to the reported incidents.

Publications

"Multi-Story Wood Construction – What Can Go Wrong," **D. Estrada**, DRI Product Liability Conference, 2019.

"Conceptual design of a deployable vehicular bridge structure using shape and geometric optimization for post disaster relief applications," **D. Estrada**, Massachusetts Institute of Technology, Master's Thesis, 2018.

Presentations

Conferences

“Structural Damage and Repair Requirements: Navigating Building Codes,” Panel, Nashville, TN, June 12, 2025.

“Team Triumph: How Diversity Helps Win Cases,” San Francisco, CA, April 4, 2024.

“Navigating Tribal Membership: Inclusion, Identity, and Belonging Panel,” Women in Construction, May 2025.

“Collaboration Between Expert Witnesses and Attorneys to Educate the Client and then the Jury,” Atlanta, GA, November 7, 2023.

“Engineering Forensics 101,” Society of Women Engineers, Detroit, MI, February 18, 2023.

University Guest Speaker

“Full Scale Experimental Testing of Damaged Precast / Prestressed Bridge Components,” Precast Seminar Series, University of Delaware, May 1, 2023.

“Construction Materials,” Structural Engineering Class, Georgia Institute of Technology.

“Design and Structural Behavior of Cable Structures,” Structural Engineering Class, Georgia Institute of Technology.

“Rehabilitation and Repair of Existing Structures,” Structural Engineering Class, Georgia Institute of Technology.