Brad A. Lauritsen

PE

Senior Consultant, Team Lead

Mr. Lauritsen is a Senior Consultant with Engineering Systems Inc. (ESi) and a licensed professional engineer in several states. He has 25 years of experience in various fields of mechanical engineering.

Mr. Lauritsen has 17 years of experience as a forensic engineer where he is involved in investigation of construction defects, storm damages, design errors & omissions, air/water infiltration, indoor air quality, product defects as well as mechanical, HVAC, and pluming failures. He has testified in deposition and in court as a recognized expert in the field of mechanical engineering.

Mr. Lauritsen also has experience as an A/E design project manager, involving mechanical and plumbing design, contract administration and construction observation for renovations and new construction of educational, commercial, and government facilities.

Prior to working in forensics, Mr. Lauritsen worked in the field of ATFP (anti-terrorism force protection), researching explosive entry (breaching) and blast effects on structures.

Mr. Lauritsen also has experience in the aircraft industry, performing structural analysis and testing of aircraft components.

Education

M.S., Mechanical Engineering (Materials Science), Wichita State University, 2004

B.S., Mechanical Engineering, University of Nebraska – Lincoln, 2001

Licenses & Certifications

- State of Iowa P.E. License P24415
- State of Kansas P.E. License 18158
- State of Nebraska P.E. License E-12388
- State of North Dakota P.E. License PE-9933
- State of South Dakota P.E. License 12717
- State of Missouri P.E. License PE-2021013551

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Areas of Specialization

- Construction Defects
- Storm Damage
- Design Errors & Omissions
- Air/Water Infiltration
- Building Envelope
- Indoor Air Quality
- Mechanical Failures
- HVAC System Failures
- Plumbing Failures
- Product Defects

- State of Oklahoma P.E. License 32582
- State of Illinois P.E. License 062.073112
- State of Tennessee P.E. License 125116
- State of Arkansas P.E. License 20306
- State of Colorado P.E. License PE.0059452
- State of Texas P.E. License 144797
- State of Indiana P.E. License PE12300549
- State of Ohio P.E. License 89999
- State of Oregon P.E. License 108483PE
- State of Washington P.E. License 26013793
- State of Idaho P.E. License 5081008

Positions Held

Engineering Systems Inc., St. Louis, Missouri

- Senior Consultant/Team Lead, 2025 - Present
- Senior Consultant, 2021 – 2025

KPE-Consulting Engineers, Omaha, Nebraska

- Senior Mechanical/Forensic Engineer, 2008 - 2021

Duncan Aviation, Lincoln, Nebraska

- Senior Mechanical Engineer, 2007 - 2008

Applied Research Associates, San Antonio, Texas

- Senior Mechanical Engineer, 2004 - 2007

Boeing Commercial Airplanes, Wichita, Kansas

- Structural Analyst, 2001 - 2004

Continuing Education

- **Rooftop Quality Assurance** – International Institute of Building Enclosure Consultants (IIBEC), 2025
- **Exterior Wall Quality Assurance** – International Institute of Building Enclosure Consultants (IIBEC), 2025
- **Roof Technology and Science II** – International Institute of Building Enclosure Consultants (IIBEC), 2024
- **Expansion Joints & Sealants: Types, Applications, Failure Analysis** – International Institute of Building Enclosure Consultants (IIBEC), 2024

- **Exterior Wall Technology and Science I** – International Institute of Building Enclosure Consultants (IIBEC), 2024
- **Reroofing** – International Institute of Building Enclosure Consultants (IIBEC), 2024
- **Roof Technology and Science I** – International Institute of Building Enclosure Consultants (IIBEC), 2023
- **Ethics for Engineers: Doing the Right Thing When No One is Looking** – American Society of Mechanical Engineers (ASME), 2022
- **Engineering Ethics – Conflicts of Interest, Licensure, Confidentiality, & Public Criticism** – National Society of Professional Engineers (NSPE), 2022
- **Fire Protection in Property Management** – National Society of Professional Engineers (NSPE), 2022
- **Tools to Ensure Effective Litigation Preparation and Testimony as an Engineering Professional** – National Society of Professional Engineers (NSPE), 2022
- **Professional Standard of Care (Ethics)** –ESi, 2022
- **How to Organize and Run a Failure Investigation** – ASM International (Virtual), 2022
- **Introduction to Abaqus** – Dassault Systems Simulia, 2021
- **Ethics for Forensic Engineers**
- **Remote Forensic Inspections in the Age of Covid 19**
- **Report Writing**
- **Building Credentials through Publication and Review**
- **Current Assessment of Stand-Up Forklift Underride Accidents**
- **Goals, Methodology, and Tools for Investigating Electric Shocks**
- **Forensic Engineering of Pedestrian and Worker Fall Incidents**
- **Overheating Poor Electrical Connections**
- **Forensic Engineering Analysis of A Collision Involving Aftermarket Bumper and Grille Guard Structure** – National Academy of Forensic Engineers (NAFE) Winter Conference (Virtual), 2021

- **Introduction to Forensic Engineering**
- **Deposition and Court Testimony**
- **Evidence Handling, Labeling, Preparation and Storage**
- **Depositions, Rights, and Responsibilities**
- **Expert Credibility and Persuasion in Court** – National Academy of Forensic (NAFE) Summer Conference, 2020

- **Ethics (Hard Conversations)**
- **Leadership at All Levels**
- **Ownership Transition**
- **Why are PMs Late and Overbudget?** – American Counsil of Engineering Companies Conference (ACEC), 2019

- **Level II Infrared Thermography** – Infraspection Institute, 2018

- **Building Code Questions with Commercial Loss Adjustments**
- **Faulty Construction Coverage Disputes**
- **Hail Damage to Building Components, Cladding, & HVAC**
- **Water Mitigation, Mold & Wind-Driven Rain Issues**
- **Drones and Remote Sensing for Claims** – Property & Liability Research Bureau (PLRB) Claims Conference, 2019
- **Appraisal Clauses**
- **Claims Strategies with Public Adjusters**
- **Claims with Emerging Building Technologies Construction**
- **Defect Claims**
- **Drones and Their Use in Claims**
- **Large Commercial Hail Claims** – Property & Liability Research Bureau (PLRB) Claims Conference, 2018
- **Advanced NFPA 921 and 1033 Recertification Class** – Investigative Engineering Association (IENGA) Conference, 2016
- **2015 Training Update/Review – The Scientific Method and NFPA 921**
- **Vehicle Hydroplaning Investigations**
- **Investigative Engineering and Insurance Fraud**
- **Key Points of Vehicular Crash Reconstruction**
- **How Insurance Carriers Use Engineers in Fraud Investigations**
- **Structural/Geotechnical Case Investigations**
- **Effective Methods for Addressing Structural Defects**
- **Ethics and Business Practices**
- **Roof Damage/Assessment Investigations**
- **Flood Control and Drainage Investigations**
- **Use of Drones in Investigative Engineering Photography in Investigative Engineering** – Investigative Engineering Association (IENGA) Conference, 2015
- **Central Plant Optimization**
- **Insuring Energy Efficient and Healthy Buildings – Effective Control of Outside Air**
- **Anticipating the Challenges of Modern Mechanical Systems Approaches**
- **Indoor Environmental and Air Quality**
- **ASHRAE 90.1 Updates** – American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), 2014
- **Energy Saving Strategies for Water-Source and Ground-Source Heat Pump Systems**
- **Air & Water Systems**
- **Air Conditioning Systems & Components – Heat Transfer Equipment**
- **Air Conditioning Systems & Components – Pumps, Valves, Piping, Ductwork**
- **Air Conditioning Systems & Components – Source Equipment**
- **HVAC Selection Issues** – American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), 2013

- **Heat Recovery from Virtually and type of heating Plant**
- **Sub-Metering for Sustainability and Performance Monitoring**
- **Commercial Kitchen Ventilation, Performance, Efficiency, Fire Safety and Prevention**
- **Airflow Control in High Performance Buildings**
- **Variable Speed Compressor Technology** – American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), 2012

- **Ethics for Engineers**
- **Design-Build Risks – Contracting & Succeeding with Contractor-Led Projects**
- **Green Design: New Liabilities, Risks, and Insurance Strategies** – American Counsil of Engineering Companies Conference (ACEC), 2011

- **The Scientific Method for Fire & Explosion Investigations**
- **Structural Investigations**
- **Electrical Wire Fires**
- **Equipment Failure and Fire Investigations**
- **New Investigative Technologies using Structural Monitoring**
- **Storm Damage Assessments**
- **Fire Investigations for Total Burnout and Total Burn-down** – Investigative Engineering Association (IENGA), 2010

- **Level I Infrared Thermographer Certification** – Infrared Training Institute, 2010

- **Trane TRACE Load Design Seminar** – Trane Systems, 2009

- **Chilled Water Systems** – Trane Systems, 2009

- **Forensic Engineering Training (Certified in Fire Investigations by Peter Vallas Associates)** – Investigative Engineers Association (IEAGA), 2009

- **Mold Origin & Cause Testing & Investigation**
- **Vehicular Black Box and Air Bag Investigating**
- **Human Factor Aspects of Investigation**
- **Infrared Technology**
- **Fire Alarm/Fire Protection Systems Investigations Mechanical**
- **Equipment Investigations**
- **Catastrophic Response** – Investigative Engineering Association (IENGA), 2008

Certifications

- Level II Certified Thermographer

Professional Affiliations/Honors

National Academy of Forensic Engineers (NAFE)

- Member

National Society of Professional Engineers (NSPE)

- Member

American Society of Heating, Refrigerating, & Air Conditioning Engineers (ASHRAE)

- Member

American Society of Mechanical Engineers (ASME)

- Member

International Institute of Building Enclosure Consultants (IIBEC)

- Member

ASM International

- Member

Failure Analysis Society (FAS)

- Member

Project Experience

Investigations

Building – Envelope & Structure

- Performed hundreds of commercial and residential roof inspections in matters of alleged storm damage, including water intrusion, hail, wind and tornadoes.
- Performed investigations for insurance claims and litigation involving several types of commercial roofing systems including EPDM, TPO, PVC, modified bitumen, built-up roofs, and metal panels.
- Performed investigations for insurance claims and litigation involving several types of residential roofing systems including asphalt composition shingles, wood shakes and shingles, metal shingles, slate, clay, concrete, asbestos, and synthetic roofing.
- Investigated reported hail damage to several metal roofs with a cosmetic exclusion. Provided expert testimony for litigation.
- Investigated reported hail and wind damage and moisture intrusion at a church with a metal roof. Investigated Provided expert testimony for litigation.
- Investigated reported storm damage and age-related defects on commercial building with modified bitumen roofing. Provided expert testimony for litigation.
- Investigated defective installation of a spray polyurethane foam (SPF) roof on an office building. Investigated Provided expert testimony for litigation.
- Performed hundreds of investigations of building facades in matters of moisture intrusion.

- Performed structural assessments of commercial and residential structures damaged by fires or natural disasters.
- Led a team of engineers in the response to a catastrophic collapse of a warehouse structure from a tornado. Coordinated multiple involved parties for installation of shoring, design and installation of temporary structural restraints to render the building safe for interior inspections. Performed detailed inspections of the remaining structure. Served as Engineer of Record for repair design of mechanical systems. Performed construction observation during repairs which involved reconstruction of half of the building from the ground up.

Building Systems – HVAC, Plumbing, Fire Protection

- Investigated failures of numerous water-based fire sprinkler systems at residential and commercial facilities. Analyzed system design, inspection, testing, and maintenance records, and fire alarm/signaling records to determine cause(s) for the failures. Assessed system testing, inspection and maintenance compliance with codes & applicable standards.
- Investigated freeze failures of water-filled (“wet pipe”) and “dry pipe” fire sprinkler piping systems. Assessed the design & construction of the buildings and their fire protection systems, and compliance with local codes & applicable standards to identify cause(s) of the freeze failures.
- Investigated numerous freeze failures and subsequent leaks from water-filled piping in residential and commercial buildings. Inspected the subject buildings and affected piping systems. Reviewed historical weather data and performed analyses to determine when piping froze and leaked.
- Investigated mold growth in hotel tower. Evaluated compliance with local ordinances, codes, industry standards, and recommended practices regarding the design and construction of the subject HVAC system.
- Investigated numerous mold claims in commercial and residential buildings that related to moisture intrusion, excess humidity, HVAC systems, and/or building envelope issues.
- Investigated water loss resulting from HVAC system pipe freeze due to rooftop equipment failure.
- Investigated water loss from alleged defective installation of fittings on PEX piping. Evaluated compliance with local ordinances, codes, industry standards, and recommended practices regarding piping installation and domestic water pressure.
- Investigated water loss related to long-term leak from a refrigerator. Provided expert testimony for litigation.
- Investigated water loss allegedly due to a domestic water pipe failure. Determined much of the damage and mold claimed was due to long-term moisture infiltration. Provided expert testimony for litigation.

Construction Claims

- Investigated multiple construction defects involving structural details, waterproofing details, and exterior finishes at an apartment complex. Provided expert testimony for litigation.

- Investigated multiple construction defects involving overall general construction workmanship, waterproofing details, roof installation, and interior finishes in a 2-story medical office and urgent care facility. Provided expert testimony for litigation.
- Investigated defective installation of shingles on newly constructed state-owned long-term care facility. Provided expert testimony for litigation.
- Investigated defective installation of concrete flooring and epoxy coating in a newly constructed residence. Provided expert testimony for litigation.
- Investigated multiple construction defects in a log-siding home including waterproofing details, stone veneer and siding installation, and roof installation. Provided expert testimony for litigation.
- Performed investigations of numerous commercial and residential roofs with reported defective installation.

Design and Operational Experience

Mechanical Systems Design, Project Management, & Construction Management

- Design of numerous HVAC and plumbing systems for educational, commercial, and government facilities. Responsibilities included Project management, Mechanical Design, and Construction Management.
- HVAC system renovations to a government office building including new boiler, pumps, and piping, refrigerant heat exchanger, and ventilation systems. Responsibilities included Project management, Mechanical Design, and Construction Management.
- Led an A/E team on a $16M project which involved renovation of the existing facility and construction of an addition at a high school. Project included new multi-purpose addition, secure front entrance, restroom upgrades, fire sprinkler system, access controls, interior finishes, and boiler/chiller replacement. Responsibilities included Project Management, Mechanical Design, and Construction Management.
- Led an A/E team in the facilities assessment and design of renovations to a government school campus. The project included renovation of heating systems of two dormitories, installation of new fire sprinkler systems in the dormitories, removal and replacement of five underground fuel storage tanks, replacement of campus-wide fire alarm system. Responsibilities included Project Management, Mechanical Design, and Construction Management.
- Performed a facilities assessment and energy study for purposes of energy efficiency renovation of a state office building. The HVAC system consisted of a closed loop geo-exchange system with a horizontal directionally bored well field coupled to a centralized variable refrigerant flow (VRF) plant. ventilation air from a dedicated outside air system (DOAS) with energy recovery units (ERU). Responsibilities included Project Management, Mechanical Design, and Construction Management.

Presentations and Technical Teaching

- “Construction Defects Investigations Overview,” CLE for Various Law Firms, 2024 and 2025.
- “How Laboratory Analysis and Metallurgy Assist in Some Common Insurance Claims,” Greater Kansas City Claims Association, Kansas City, KS, March, 2022.

- “Construction Defects Investigations Overview,” South Dakota Claim Association Seminar, Larchwood, IA, June, 2018.
- “Roofing Assessments and Damage Identification,” Nebraska Claims Association Fall Seminar, Omaha, NE, September, 2016.
- “Construction Defects Investigations,” Upper Red River Valley Claims Seminar, Fargo, ND, 2015.
- “Construction Defects Investigations,” Investigative Engineers Association (IENGA), October, 2015.
- “Use of Infrared Thermography in Engineering Investigations,” Nebraska Claims Association Fall Seminar, Omaha, NE, September, 2010.