WARREN

THE WARREN GROUP, INC. FORENSIC ENGINEERS & CONSULTANTS
7805 ST. ANDREWS ROAD | PO BOX 1608 | IRMO, SOUTH CAROLINA 29063
TEL 803.732.6600 FAX 803.732.7576 WARRENFORENSICS.COM

Brian Tenace, MSME, PE, FMPC®

Mechanical Engineer

Aerial Lifts

Construction Defects

Fire and Explosion Analysis: Origin and Cause

Heavy Machinery

Industrial Accident Investigation

Machinery and Equipment Damage Assessment

Products Liability

EDUCATION

2001 — **Bachelor of Science in Mechanical Engineering**
University of Florida, Gainesville, Florida

2008 — **Master of Science in Mechanical Engineering**
University of Florida, Gainesville, Florida

2014 — **Executive Master of Business Administration**
University of Florida, Gainesville, Florida

EXPERIENCE

2025 to Present — **The Warren Group, Inc., *Irmo, South Carolina*.** Senior Consulting Engineer conducting specialized consulting and training related to property damage and unintentional injuries involving mechanical engineering, machine design and safety, product liability, and property loss analysis. Employing 3D scanning and SolidWorks modeling and animation for analysis and demonstration.

Cause of Incidents
Determine the cause of incidents involving equipment and property. Analyze the contribution of design, manufacturing, operation and maintenance in the causation of incidents. Conduct mechanical failure analysis of broken components. Investigate the origin and cause of fires.

Safety Design Analysis
OSHA compliance, standards and codes compliance, maintenance, products liability, product failures, failure analysis, consumer products.

Property Loss Analysis
Determine the cause of the loss, establish scope of damage, estimate cost to repair, evaluate replacement cost, establish actual cash value, estimate salvage value, estimate time required to complete repair.

2023 to 2025 — **EMCO, *Wilson, North Carolina.*** Mechanical Design Engineer, designing hardware, above/below ground spill containment vessels, extrusions, dies, and molds. Root cause analysis for fatigue, weld, and corrosion failure of steel, springs, pressure vents and sheet metal. Developed drop/cycle/fill tests according to AASHTO HS20 and EU B125 and other customer specifications as needed. Modified manufacturing processes from plasma to waterjet production for annual cost savings of $500,000/year. Drove design/drafting standardization.

EXPERIENCE (Continued)

2015 to 2018 **E-One (REV Group),** ***Ocala, Florida*****.** Compliance Engineer/Engineering Supervisor, Designed chassis and powertrain components for custom 350 HP to 650 HP firetrucks under the E-ONE brand, as well as accessory components for custom and commercial trucks (such as International, F-550, Kenworth, Peterbuilt, PACCAR, Freightliner). Managed NHTSA/Transport Canada recall campaigns and technical service bulletins across REV Group companies (vans, ambulances, firetrucks, ladder trucks, and tillerman cab firetrucks). Redesigned radiator, exhaust and cross-member assemblies for ~$0.5-1 million yearly savings. Designed/managed fixtures for powertrain assembly, and proposed designs for reduced welding and increased repeatability of parts.

2014 to 2015 **WinDoor, Inc.,** ***Orlando, Florida*****.** Senior Design Engineer and Project Manager for new product design. Designed PVC and thermally broken aluminum extrusions, machined/cast/molded hardware for new products in heavy duty sliding doors and windows. Used TAS 201/202/203 and ASTM E1886/E1996 standards to design and test for water infiltration and impact resistance. Performed signed/sealed structural comparative analyses for window, mullions, and large doors based on testing and engineering. Performed time studies and designed plant floor layouts based on material flow.

2004 to 2013 **Custom Window Systems, Inc.,** ***Ocala, Florida*****.** Professional Design Engineer for window, sliding and swinging door products. Managed bills of material, part costs and installation drawings based on Florida Building Code requirements. Designed fabrications and tooling for CNC, punch and outsourced aluminum, PVC and thermally broken materials. Created standard operating procedures and reduced WIP to streamline manufacturing. Used TAS 201/202/203 and ASTM E1886/E1996 standards to design and test for water infiltration and impact resistance. Performed structural comparative analyses for window, mullions, and large doors based on testing and engineering. Performed time studies and designed plant floor layouts based on material flow. Reorganized new PVC window line to increase production nearly 300% utilizing 50% of space.

2002 to 2004 **The Protective Group, Inc.** ***Miami Lakes, Florida***. Production Engineer for US military helicopter and land vehicle accessory armor, survival vests, and bomb blast protective equipment. Product mix included HMMWV (and numerous other transport vehicles used in Iraq/Afghanistan), UH-60A/L/M/K, CH-53D/E, CH-47. Selected materials and worked with Autoclave settings for various aramid, steel, composite, and alumina hard and soft armor. Specified material finishes from shot-peening, specialty paints, and spall covers. Designed brackets and fabrications and worked with Special Forces to create robust products capable of weathering hot urban environments with exposure to various chemicals and salts. Drove cost savings and material selection.

SUMMARY OF SYSTEM DESIGN EXPERIENCE

- Specified equipment layouts for ergonomics
- Provided fabrication instructions for tooling, dies, jigs, and molds
- Audited and provided quality assurance fixtures for measurement of lengths, cut angularity and weld penetration
- Provided installation/assembly instructions for:
    - Windows, sliding and swinging doors
    - Porch enclosures
    - Window mullion assemblies
    - Impact hooks for HVHZ window/door systems
    - Manholes, vaults
    - Exhaust systems and radiator assemblies for custom E-One branded firetrucks
    - HMMWV and various other military vehicle ballistic protection blankets
    - UH-60/CH-47/CH-53/AH-64 optional armor paneling
- Designed and provided fabrication instructions for marina sump pump mounting boxes

FAILURE ANALYSIS EXPERIENCE

- Impact testing of:
    - Aluminum (6000 series)
    - Thermally broken aluminum
    - PVC w/ metal impact hooks
- Design for ballistic protection using:
    - Peened steel/aramid composites
    - Plate steel and loose aramid
    - Alumina/aramid composites
- Water infiltration resistance for:
    - Windows/doors/sliders
    - Manholes/sump mounting boxes
    - Acrylic/polyurethane paints on fibers/steel
- Corrosion:
    - Steel/aluminum/composites

REGISTRATIONS

Professional Engineer in Florida, #69238
Professional Engineer in North Carolina, #60661

CERTIFICATIONS

FMPC® FenestrationMaster Professional Certification

CONTINUING EDUCATION

June 10, 2025
"FenestrationMaster Professional Certification," an online course and exam presented by the Fenestration & Glazing Industry Alliance.

2025
"Construction Site Safety," Raymond Bosek, an EZ-pdh online course.

2025
"Installation, Maintenance, and Repair of Water and Sewage Systems," Seth Grablow, an EZ-pdh online course.

2025
"Energy Efficient Cool Roofs," Seth Grablow, an EZ-pdh online course.

2025
"Accident and Operational Safety Analysis," Raymond Bosek, an EZ-pdh online course.

2025
"Engineer's Guide to Corrosion-Causes, Protection and Control," Raymond Bosek, an EZ-pdh online course.

2023
"HVAC/Air Quality: Introduction to HVAC Chiller Systems," Cadistics Courseware, an Online-PDH online course.

2023
"HVAC/Air Quality: Introduction to Air Conditioning Systems," Cadistics Courseware, an Online-PDH online course.

2023
"HVAC/Air Quality: Introduction to HVAC Hydronic Systems," Cadistics Courseware, an Online-PDH online course.

2023
"HVAC/Air Quality: HVAC: Air Distribution Basics, Duct Design," Cadistics Courseware, an Online-PDH online course.

2023
"HVAC/Air Quality: Introduction to Heat Pumps," Cadistics Courseware, an Online-PDH online course.

2020
"What Every Engineer Should Know About Structures-A Statics Fundamentals," Patrick Glon, PE, a SUNCAM online course.

2020
"What Every Engineer Should Know About Structures-B Statics Applications," Patrick Glon, PE, a SUNCAM online course.

CONTINUING EDUCATION (Continued)

2020
"What Every Engineer Should Know About Structures-C Axial Strength of Materials," Patrick Glon, PE, a SUNCAM online course.

2020
"What Every Engineer Should Know About Structures-D Bending Strength of Materials," Patrick Glon, PE, a SUNCAM online course.