

Mark Passamaneck, PE

Forensic Engineering Expertise

Firearm Incident Reconstruction

Including work with reconstruction of shooting incidents, timing, and shooter perceptions and actions as well as failure determination of firearms and/or ammunition, including expert witness testimony. Standard of care evaluation involving incidents related to firearm cleaning, hunting, range use and loading of ammunition.

Mechanical Failure

Over 25 years of investigation of losses to determine root cause of mechanical failure, including industrial accidents, explosions, appliances, HVAC equipment, plumbing, fireplaces, boilers and auxiliary heating appliances, fire suppression systems, and vehicle failures, including expert witness testimony.

Combustible Gas Investigations

Carbon monoxide exposure, fire, and explosion cause investigations for commercial, industrial, residential, vehicle, and product applications. Experience includes initial site examinations, scene measurements, interviews, evidence collection and storage, joint site examinations, and laboratory examinations.

Failure Origin & Cause

Determine the source and responsible party or element related to a failure resulting in water damage in a building. Examples of past work include failure of roofing and wall cladding causing moisture entry, humidity and condensation related losses, and groundwater entry, including expert witness testimony.

Building Envelope Systems

This includes steep and low slope roofs as well as various types of roofing and siding materials, including both common and unique roofing applications. Past work involved offering opinions and repairs related to installation deficiencies, post storm condition assessments, and storm-related (hail and wind) damages, including expert witness testimony.

Collision Analysis

Investigation and analysis of impacts involving passenger vehicles, commercial vehicles, motorcycles, bicycles, off road vehicles, equipment, and pedestrians. Scene and vehicle mapping, speed determination, crash severity analysis, seatbelts and supplemental restraint systems analysis, and site distance analysis.

Qualifications & Training

- USI-AXA XL Project Risk Analysis, 2023
- USI-AXA XL, Site Visit Guidelines, 2022
- USI-AXA XL Lessons in Professional Liability, 2020
- FBI Active Shooter Response, 2019
- USI-AXA XL, Risk Drivers 2.0 2017
- USA Clay Target League SAFE Instructor, 2016
- USI-AXA XL, Managing Construction Phase Risk, 2015
- USI-AXA XL, Contract Management, 2012
- Ranger Master, Rocky Mountain 3 Gun Championship, 2010-2012
- Advanced Interviewing and Interrogation, 2010
- USI-AXA, XL, Construction Management, 2010

- USI-AXA XL, Understanding Contract Basics, 2009
- NFPA Professional Development Courses
 - NFPA 13, Standard for the Installation of Sprinkler Systems, (2013)
 - NFPA 25, Inspection, Testing, And Maintenance of Water-Based Fire Protection Systems (2017)
 - NFPA 921, Guide for Fire and Explosion Investigations (2008, 2017)
 - NFPA 652, Combustible Dust Controls and Safeguards (2019)
 - NFPA 3000, Active Shooter/Hostile Event Response Program Specialist (2021)
- Boiler Maintenance & Operator Course, NTT, 2005
- Automotive Plastic Part Design, ETS, 2003
- Chief Range Officer, National Rifle Officers Institute (USPSA), 1999, 2007
- Vehicle Fire Investigation, Lee S. Cole & Associates, 1999
- Uniform Plumbing Code, IAPMO, 1997
- Safety Officer, International Defensive Pistol Association, 1996

Education

Bachelor of Science Degree in Mechanical Engineering
University of Colorado, Denver, CO
May 1997

Advanced coursework in Mechanical Engineering
University of Colorado, Denver, CO
1998 to 1999

Licenses & Certifications

PE - Professional Engineer

Licensed by the State of Arizona - Number 39461

Licensed by the State of Colorado - Number 36689

OSHA - Certified in Hazardous Waste Operations and Emergency Response (HAZWOPER) OSHA 29 CFR 1910.120(e), 2000 with 8-hour annual refresher

DOT - Certified in Haz-Mat Transportation, 49 CFR 172, 704 (1-4), 2007

CRS - Certified Radiation Safety Officer, CRS RH 8.6.1, 2008

CSST & PEX - Certified Installer for several specialty piping systems for gas (CSST) and water (PEX)

NPGA - Certified: Basic Principles and Practices, Vapor Distribution System Installation, Appliance Installation, GASCheck®, 2007

NRA - National Rifle Association Certified Instructor, 2000

Employment History

Senior Forensic Engineer

Nederveld, Inc.

2024 - Present

Investigation of losses to determine root cause of mechanical failure, including industrial accidents, explosions, appliances, HVAC equipment, plumbing, water intrusion, fireplaces and auxiliary heating appliances, fire suppression systems, vehicle fire and vehicle incident and firearm incident reconstruction. Duties also include forensic engineering analysis relating to building pathology, storm damage (hail and wind), and water loss events.

President and Principal Engineer
Entropy Engineering, Corp., Arvada, CO
2008 - 2024

Examined losses to determine root cause of mechanical failure. Mechanical systems include, but not limited to, industrial accidents, explosions, appliances, HVAC equipment, plumbing, water intrusion, fireplaces and auxiliary heating appliances, fire suppression systems, and vehicles. Performed firearm incident and vehicle incident reconstruction analysis. Additional forensic engineering analysis include building pathology; structural damage due to fire; structural damage from vehicle impacts, inspection and evaluation of roofing systems for storm damage (wind, snow, hail), seismic/construction vibrations, and water loss events.

President
Carbon Arms Corp., Arvada, CO
2011 - 2024

Designed, manufactured, and sold firearms parts and accessories. Parts and accessories include, but not limited to, carbon fiber handguards for the MSR, Shotgun SSL, and FSL (Twin and Quad Loading) as well as three compensators and magazine basepads. Conducted the design and specification for three MSR barrels for Stretch Precision and Nordic Components. The design of magazine tubes for the Remington VersaMax and Stoeger M3000 as well as the design of the Remington VersaMax Competition enhancements. Performed magazine design consultation for FNH-USA. Conducted R&D and T&E testing for several firearms designers and companies.

Vice President and Principal Engineer
Western Engineering & Research Corporation, Denver, CO
1997 - 2008

Determined root cause of mechanical failures, including industrial incidents, explosions, appliances, HVAC equipment, plumbing, water intrusion, fireplaces and auxiliary heating appliances, fire suppression systems, and vehicles. Duties also included analysis relating to building pathology; vehicle incident reconstruction; structural damage from vehicle impacts; storm damage (wind, hail, snow load); structural damage due to fire seismic/construction vibration; and water loss events. Supervision of engineers and technical review reports of engineers.

Engineering Technician
Analytical Engineering, Inc., Denver, CO
1995 - 1997

Receipt, document, photograph, and laboratory work on a variety of matters under the direction of senior engineers. Construction of testing mock-ups for electrical, structural, and mechanical projects. Life-cycle testing of industrial heavy equipment, wheelchair lifts, plumbing components, and combustible gas appliances. Product failure evaluations of plumbing components, appliances, etc.

Professional Affiliations

Member: American Society of Materials
Member: American Society of Mechanical Engineers
Member: American Society of Plumbing Engineers
Member: Society of Automotive Engineers
Member: Pi Tau Sigma (Mechanical Engineering Honor Society)
Member: Member of the National Rifle Association
Member: Member of the Colorado State Shooting Association

Member: United States Practical Shooting Association

Publications

Lead Poisoning and the Shooter, The Canadian Marksman[®], Summer/Autumn 2003
Lead Bullets in the Glock, Front Sight, 2003
A Primer on Sewer Backups, NASP Subrogator[®], Fall 2005
Plumbing Products Liability Primer, NASP Subrogator[®], Winter 2006
The Glock in Competition, Taylor, Carver, Passamaneck, 1st edition 1998, 2nd edition 2005, ISBN 0-9662517-4-1
Forensic Engineering (monthly column) PS&D[®], 2010
Acetal Plumbing Component Failures
CPVC Pipe Failures
A Freeze on Anti-Freeze
Engineering Design and Its Relationship to Product Liability

Expert Witness Experience

Courtroom Testimony

August 2021
Tania Bricel vs Wyndham Worldwide
District Court, Eagle County, CO
Case No. 17CV6

September 2020
Larry Pfannenstiel vs O'Reilly Auto Parts
Office of Administrative Courts, Denver, CO
Workers Comp. No. 5-119-454

July 2020
Cassandra Newell vs O'Reilly Auto Parts
Office of Administrative Courts, Denver, CO
Workers Comp. No. 5-123-298

Depositions

December 2023
AIG Prop. Cas. Co Sawmill Court, LLC vs City of Aspen
District Court, Pitkin County, CO
Case No. 2023CV30081

July 2023
National Foundation for Gun Rights, Inc. vs Town of Superior, City of Louisville & Boulder
US District Court for the District of Colorado
Case No. 22-CV-2680-NYW-SKC

May 2023
National Foundation for Gun Rights, Inc. vs Polis
US District Court for the District of Colorado
Case No. 22-CV-1866-NYW-SKC

December 2022
Mountain States Plumbing vs Winter Park Land Co. LLC
District Court, Denver County, CO
Case No. 2022CV30439

April 2022
Pipe X, LLC vs Park North Townhouse Corp.
District Court, Adams County, CO
Case No. 2021CV30152

November 2021
Welch vs Dutton
District Court, Fremont County, CO
Case No. 019CV30109

November 2021
Timothy Alves vs Army Corps of Engineers
United States District Court, District of Idaho
Case No. 3:19-CV-00044-REP

July 2021
Welch vs Dutton
District Court, Fremont County, CO
Case No. 2019CV30109

June 2021
Steven-Roberts Originals, LLC vs Rocky Mountain Mechanical Systems
District Court, Adams County, CO
Case No. V31645

October 2020
Larry Pfannenstiel vs O'Reilly Auto Parts
Office of Administrative Courts, Denver, CO
Workers Comp. No. 5-119-454

May 2019
Martha Munoz vs Public Service DBA X-Cel Energy
District Court, Adams County, CO
Case No. 2018CV30954

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