NEDERVELD
Nederveld, Inc.
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Taylor Suess

Forensic Engineering Expertise

Mechanical Failure
Determine root cause of mechanical failure, including heating, ventilating, and air-conditioning (HVAC) equipment, appliances, plumbing, industrial losses, fire suppression systems, and auxiliary heating appliances.

Origin & Cause
Determine the source and responsible party or element related to a failure resulting in water damage and/or bio-organic growth 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.

Building Pathology/Construction Defects
The building pathologist relies on an in-depth knowledge of building design, construction, use, and changes, as well as assessing the environment of use and the materials and how these interrelate to systematically identify, investigate, and diagnose defects in a building.

Examination and Evaluation of Roofing Systems
This includes steep and low slope roofs, as well as various types of roofing materials, including both common and unique roofing applications. Past work involved offering opinions and repair options related to installation deficiencies and storm-related damage, including for hail and wind.

HVAC Consulting Expertise

Commercial HVAC
Evaluation and diagnostic assessment of failed or damaged HVAC systems servicing commercial space applications, such as retail, corporate, multi-tenant, and warehouses, typically rated between 7.5-ton to 500-ton nominal capacity. System orientations include forced air, chilled water, VRV (Variable Refrigerant Volume), hot water boilers, steam boilers, and geothermal units. Examples of past work include cause of failure analysis and related damage assessments tied to the perils of hail, wind, freezing, power surge, lightning, mechanical breakdown, installation and service E&O (Errors and Omissions), theft, fire, and water intrusion.

Residential HVAC
Evaluation and diagnostic assessment of failed or damaged HVAC systems servicing residential space applications, such as single-family homes, apartment buildings, and condominium complexes, typically rated between 1-ton to 5-ton nominal capacity. System orientations include forced air, hot water boilers, steam boilers, and geothermal systems. Examples of past work include failure analysis and related damage assessments tied to the perils of hail, wind, power surge, lightning, mechanical breakdown, installation and service E&O, theft, fire, and water intrusion.

Commercial Refrigeration
Evaluation and diagnostic assessment of failed or damaged HVAC systems servicing grocery stores, restaurants, cold storage, and medical facilities. System orientations include split, unitary, and rack. Examples of past work include failure analysis and related damage assessments tied to the perils of hail, wind, power surge, lightning, mechanical breakdown, installation and service E&O, theft, fire, and water intrusion.

Controls/Building Automation Systems (BAS)
Evaluation and diagnostic assessment of failed or damaged centralized temperature control systems, sensors, transducers, and/or actuators tied to commercial and residential HVAC systems responsible for communication protocols, humidity/climate control, and building system performance. Examples of past work include failure analysis and damage assessments related to building pressure deficiencies and equipment freezes.

Estimating/Project Management
Assessments, scope generation, and estimation of HVAC projects for commercial, industrial, and residential applications. Includes the review of appropriate project documentation, including blueprints, "plan/spec", "design/build", and take-offs. Management activity includes repair and replacement projects, capital improvements, and retrofits.

Qualifications & Training

- Integrating IAQ and Energy Efficiency in Buildings, ASHRAE, April 2025
- HVAC and Risk from Airborne Hazards, ASHRAE, April 2025
- Fundamentals of Ultraviolet Germicidal Irradiation, ASHRAE, April 2025
- Conducting a Commissioning Kickoff Meeting, ASHRAE, March 2025
- Health and Wellness in the Built Environment, ASHRAE, March 2025
- Trends: Buildings, Technologies, & Tools, ASHRAE, January 2025
- Occupant Health, Building Energy Performance, & Humidity, ASHRAE, October 2024
- Commercial Building Energy Audits, ASHRAE, April 2024
- An Introduction to Ammonia Refrigeration Systems, ASHRAE, April 2024
- Refrigerant Safety – Inside and Outside the Machinery Room, ASHRAE, April 2024
- Thermal Energy Storage Technology to Enable Microgrids with Renewable Energy Generation, ASHRAE, April 2024
- Mold – Introduction, Eurofins, March 2024
- Decarbonization: Declassified, Trane, August 2022
- Hospital Air Distribution Systems, Price Industries, May 2022
- Chilled Beams in Healthcare, Price Industries, April 2022
- Building Scale Wastewater Heat Exchange, ASHRAE, April 2022
- Large Central Plant Heat Pumps, ASHRAE, March 2022
- Mitigating Reduced Pressure Zone (RPZ) Backflow Discharge, American Society of Plumbing Engineers (ASPE) & Watts, March 2022
- An Introduction to Heat Transfer from Buried Distribution System Piping, ASHRAE, March 2022
- Simulating Ventilation Equipment & Strategies using Cloud-Native Computational Fluid Dynamics (CFD), SimScale, March 2022
- Building Indoor Air Quality (IAQ) and Energy Costs; Net-Zero Buildings with IAQ Procedure of ASHRAE 62.1, ASHRAE, January 2022
- 10 Common Errors with Hydronic Radiant Heating and Cooling Systems, Uponor, October 2021
- Building System Design: Zoning Solutions with Variable Air Volume (VAV) Diffusers, Price Industries, September 2021
- Design and Installation of Pressure Boosters for Plumbing Applications, ASPE, January 2021
- Getting from Advanced Energy Design Guides (AEDG's) to Zero-Energy Buildings; Standard 189.1 and the International Green Construction Code (IGCC), ASHRAE, January 2021

- Testing, Adjusting, & Balancing Heating, Ventilation, & Air Conditioning (HVAC) Systems, ASHRAE, January 2021
- Industrial Ventilation, Building Pressurization, & Cold Climate Building Design, ASHRAE, December 2020

Education

Master of Science Degree in Mechanical Engineering
South Dakota State University, Brookings, SD
August 2015

Bachelor of Science in Mechanical Engineering
South Dakota State University, Brookings, SD
May 2014
Graduated Summa Cum Laude

Educational Presentations

HVAC Consulting: Data, Decisions, and Deliverables
Nederveld Webinar, June 2025

HVAC Copper Theft – A Skilled Trade
Nederveld Webinar, March 2025

Refrigerant Changes & Coil Replacements
Travelers Insurance 2025 All-Property Field Trainers Meeting, March 2025

Investigating the Effects of Airflow Adjustments and Room Layout on Aerosol Propagation in a University Classroom using CFD
ASHRAE 2024 Winter Conference, January 2024

HVAC Copper Theft - A Skilled Trade
Nederveld Webinar, May 2023

Experimental Investigation of a Lab-Scale, Cross-Flow Grain Dryer for Testing of Drying Efficiency and Characteristic Profiles of a Packed Bed
ASME 2015 Power and Energy Conversion Conference, June 2015

Analysis of Stent-Graft Design of Aortic Aneurysm Repair using Computational Fluid Dynamics
2015 Design of Medical Devices Conference, April 2015

Investigating the Structural Properties of Corn Stover at Macro and Fiber Levels
ASME 2013 International Conference on Energy Sustainability and Fuel Cell Science, July 2013

Licenses & Certifications

PE - Professional Engineer
Licensed by the State of South Dakota – Number 15033
Licensed by the State of Iowa – Number P29159
Licensed by the State of Minnesota – Number 63501
Licensed by the State of North Dakota – Number PE-40975
Licensed by the State of Michigan – Number 6201314293

Employment History

Forensic Engineer
Nederveld, Inc.
2022 - Present
Investigation of losses to determine root cause of failure, including HVAC equipment, plumbing, water intrusion, auxiliary heating appliances, and building claddings. Offer opinions and plans of repair related to installation deficiencies, storm-related damages, and other similar conditions.

Research Associate
South Dakota State University - Engineering Department, Brookings, SD
2018 - Present
Duties include performing fluid simulations and calculations in a variety of industries. Disseminate research findings into reports and peer-reviewed scientific journal publications.

Mechanical Engineer
Associated Consulting Engineering, Inc., Sioux Falls, SD
2018 - 2022
Duties included designing mechanical and plumbing systems for building construction and renovations. Developed building models to calculate HVAC load requirements and airflow distribution. Specified equipment selections and system sizing per design calculations. Used Revit and AutoCAD software to create construction drawings and 3-D building models. Applied various building codes to meet city, state, and national construction requirements. Performed site reviews to confirm conformance to system design intent and investigate potential system performance issues.

Project Engineer
CJD Engineering, Springfield, MO
2016 - 2018
Duties included designing mechanical and electrical systems for building construction and renovations. Analyzed manufacturer data and performed design calculations for specifications. Created construction drawing sets using Revit and AutoCAD software. Reviewed building codes for customers to interpret jurisdiction requirements. Designed for "Green Building" and energy efficiency requirements for certifications.

R&D S&E System and Component Surety Engineer (Quality Engineer)
Sandia National Laboratories, Kansas City, MO (based out of Albuquerque, NM)
2015 - 2016
Participated in audits at vendors to observe processes and methods of manufacturing. Analyzed effectiveness of component production and methods of defect prevention. Used Excel and MiniTab software to perform capability studies and data analysis. Independently assessed acceptance of qualification for subcomponent manufacturing.

Research Assistant
South Dakota State University- Engineering Department, Brookings, SD
2010 - 2015
Performed simulation and experimental analysis of various systems, including fluid analysis of blood flow through stent-graft designs for aneurysm patients, structural

analysis of corn stover at the macroscopic level, and flow analysis of photobioreactors for harvesting algae for biofuels. Built grain dryers for experimentation (pilot-scale and laboratory-scale). Used CAD (Pro-Engineer/Creo), FEA (ANSYS), and CFD (Star-CCM+) software. Wrote conference and journal papers to present research findings at scientific consortiums. Taught Fluid Mechanics and CFD courses as a substitute teacher.

Professional Affiliations

Member: American Society of Heating, Refrigerating, & Air-Conditioning Engineers (ASHRAE)
Member: American Society of Mechanical Engineers (ASME)

Publications

Optimizing Electrical Stimulation Parameters for Safe and Effective Cartilage Regeneration: A Computational Study on Thermal Dissipation in Articular Tissues
ASME 2025 Heat Transfer Summer Conference, August 2025

Investigating the Effects of Airflow Adjustments and Room Layout on Aerosol Propagation in a University Classroom using CFD
ASHRAE Transactions, 2024

Quantifying Stent Wall Shear Stress for Assessing Stent and Flow Diverter Performance for Treating Intracranial Aneurysms
Transactions of the ASME Journal of Engineering and Science in Medical Diagnostics and Therapy, November 2023

Utilizing Stent Wall Shear Stress to Assess Stent and Flow Diverter Performance for Treating Intracranial Aneurysms
Proceedings of the ASME 2022 International Mechanical Engineering Congress and Exposition, October 2022

Combination of Mural Thrombus and Age Improves the Identification of All-Cause Mortality Following Branched Endovascular Repair
Journal of Vascular Surgery, July 2020

Shear Accumulation as a Means for Evaluating Risk of Thromboembolic Events in Novel Endovascular Stent Graft Designs
Journal of Vascular Surgery, September 2016

Examination of Near Wall Hemodynamic Parameters in the Renal Bridging Stents of Various Stent Graft Configurations for Repairing Visceral Branched Aortic Aneurysms
Journal of Vascular Surgery, July 2015

Hydrodynamic and Heat Transfer Effects of Different Sparger Spacing within a Column Photobioreactor using Computational Fluid Dynamics
ASME Journal of Fuel Cell Science and Technology, February 2015

Assessment of Pulsatile Blood Flow Models for the Descending Aorta using CFD
Proceedings of the ASME 2015 International Mechanical Engineering Congress and Exposition, November 2015

Review of Flow Patterns in a Column Reactor
Proceedings of the ASME 2014 Energy Sustainability Conference, June 2014

Investigation of Hydrodynamics and Heat Transfer Effects Due to Light Guides in a Column Photobioreactor
ASME Journal of Fuel Cell Science and Technology, August 2014

Predicting Hydrodynamic and Heat Transfer Effects of Sparger Geometry and Placement within a Column Photobioreactor using Computational Fluid Dynamics
ASME Journal of Fuel Cell Science and Technology, June 2014

Creating an Application to Predict Operational Characteristics and Efficiency of Continuous Cross-Flow Corn Drying
Proceedings of the ASME 2013 International Conference on Energy Sustainability and Fuel Cell Science, July 2013

Experimental and Computational Model Comparisons of the Thermal Profiles within a Column Photobioreactor
Proceedings of the ASME 2013 International Mechanical Engineering Congress and Exposition, November 2013

Comparison of Theoretical and Experimental Corn Drying Profiles within a Cross-Flow Column Dryer
Proceedings of the ASME 2013 International Mechanical Engineering Congress and Exposition, November 2013

Investigating the Rheological Properties of Chopped Corn Stover Biomass in Bulk
Proceedings of the ASME 2013 International Mechanical Engineering Congress and Exposition, November 2013

Investigating the Structural Properties of Corn Stover Biomass
Proceedings of the ASME 2012 International Mechanical Engineering Congress and Exposition, November 2012

Expert Witness Experience

Depositions
April 2025
B&B Properties vs Depositors Insurance Company, Inc., Nationwide Mutual Insurance Co. a/k/a Nationwide
In the United States District Court for the Eastern District of Tennessee at Knoxville, Case No. 3:23-CV-00432-CLC-JEM