CURRICULUM VITAE

VANESSA M. MALONE, P.E.

PRINCIPAL STRUCTURAL ENGINEER

CONTACT

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SUMMARY OF EXPTERISE

Ms. Malone has roughly 15 years of experience as a civil-structural engineer specializing in forensic investigations, expert-witness work, structural design, and structural analysis including finite element design and analysis (FEA).

She has worked in the aerospace, defense, and nuclear industries in addition to private consulting.

Her areas of expertise include:
- Structural Collapses
- Construction Defects
- Hurricane Damage
- Wind Damage

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RELEVANT EDUCATION

Carnegie Mellon University **2011**
M.Sc. GPA: 3.32 Civil Engineering: Computational Mechanics
Dept of Civil and Environmental Engineering, Carnegie Mellon University (CMU), Pittsburgh, PA

University of the Virgin Islands **2009**
B.Sc. GPA: 3.80 Chemistry
Dept of Science and Math, University of the Virgin Islands (UVI), St. Thomas, USVI

RELEVANT CERTIFICATIONS

- **P.E. Licenses:** FL, NY, LA, GA, MO, TX, and more
- **Memberships:** ASCE, AISC
- **Past Certifications:** OSHA-10; NYC DOB 16-HR Suspended Scaffold Training; Secure Worker Access Consort (SWAC); KSC Confined Space; KSC Working at Heights
- **Languages:** English (Native), Spanish (Proficient)

RELEVANT WORK EXPERIENCE

- **Preeminent Solutions** **Sanford, FL**
- **Principal Structural Engineer** **05-2023 to Present**
- *Work as civil-structural principal engineer for firm specializing in design and forensic investigations to support residential and commercial building projects.*

- **Jacobs** **Kennedy Space Center, FL**
- **Structural Engineer** **06-2019 to 09-2025**
- *Work as Structural Analyst to support NASA (National Aeronautics and Space Administration) Engineering Ground Services (EGS).*

- *Works as consulting expert witness and testifying expert witness.*

- **Project 1: KSC Vehicle Assembly Building (VAB) Foundation Evaluation Static and Dynamic Loading:** Evaluate VAB foundation (incl. R/C slabs, R/C walls, R/C deep beams, R/C thresholds, and steel piles) for the ~700kip Rocket Core Stage Loads. Use hand calculations, Strut-and-tie method (for deep beam analysis), and Finite Element (FEA) analysis (via CSI SAFE and Siemens NX) to analyze structural elements for static set down loads and dynamic braking loads. Conduct site Walkdowns, coordinate with NASA counterparts, and organize group analysts for client.

➢**Project 2: KSC Launch Complex Pad 39B (LC-39B) Concrete Eval. and Water Tower Eval. Under Wind Loads**: Evaluate Water Tower (steel truss tower) and tower foundation (i.e. R/C pedestal, and steel piles) used in rocket launch Sound Suppression system. Evaluate tower and foundation under hurricane level Wind Loads. Used CSI SAP 2000, Staad Pro, and hand calcs for analysis.

➢**Project 3: KSC Launch Complex Pad 39B (LC-39B) Concrete Repair**: Provide repair recommendations to spalled concreate parapet walls and Mobile Launcher pedestals (i.e. R/C pedestal) used in rocket launch Sound Suppression system. Provide lasting repair recommendations for next launch

➢**Project 4: KSC Vehicle Assembly Building (VAB) Transfer Aisle Mechanical and Electrical Tunnels and Utility Trench and High Bay 4, Static Loading:** Evaluate VAB Transfer Aisle Mechanical and Electrical Tunnels and Utility Trench and the VAB High Bay 4 flooring (incl. R/C slabs, R/C walls, R/C deep beams, R/C thresholds, and steel piles) for the transport and set down of several program-specific flight ware via AASHTO-standard and several KSC-standard vehicles for KSC operations purposes. Key KSC-standard vehicles include: the UCTS trailer (wt. 70+ kip); the OTP KAMAG transporter (wt. 200+kip), AFT-loaded SRB KAMAG transporter (wt. 500+ kip), ULA KAMAG transporter (wt. 100+ kip) , a 450 ton Crane (wt. 100+ kip), the AARDVARK (wt. 200+ kip), and the LVSA on SRB KAMAG transporter (wt. 100+ kips). Key AASHTO-standard vehicles include an HS20-44 Truck, Use hand calculations, Strut-and-tie method (for deep beam analysis), and Finite Element (FEA) analysis (via CSI SAFE) to analyze structural elements for static set down loads. Conduct site Walkdowns, coordinate with NASA counterparts, and organize group analysts for client.

➢**Project 5: KSC Vehicle Assembly Building (VAB) Foundation Evaluation EUS/IS/Strongback Static Loading:** Evaluate VAB Transfer Aisle foundation (incl. R/C slabs, R/C walls, R/C deep beams, R/C thresholds, and steel piles) for the transport and set down of the 80+ kip **EUS/IS/Strongback** in support of the NASA Artemis I mission to the moon. Use hand calculations, Strut-and-tie method (for deep beam analysis), and Finite Element (FEA) analysis (via CSI SAFE) to analyze structural elements for static set down loads.

➢**Project 6: KSC Crawler Tube Analysis:** Evaluate Steel Guide Tube of the 6.5 + million lb Crawler-Transporter (incl. steel girders, beams, and columns) for the transport of the 20 + million lb rocket and flight hardware in support of the NASA Artemis I mission to the moon. Use hand calculations, and Finite Element (FEA) analysis (via Siemens NX) to analyze structural elements for static loads.

➢**SSI Consulting (Contract, Part-time)** **Remote**

➢**Senior Design Engineer** **03-2023 to 06-2023**

➢*Work remotely as a part-time, independent contractor to design trussed towers and silos throughout the U.S. and Mexico.*

➢**Project 1: Clinker Truss Tower Design:** Design and produce quantity take-off for steel truss tower based in San Antonio Texas. Design and analyze structure with RISA 3D.

➢**Project 2: Merido Factory Silo Cost Estimate:** Design and produce quantity take-off for concrete roof for silo based in Merida, Mexico. Design and analyze structure with RISA 3D and in accordance with the 2008 CFE Viento (self-translated from Spanish)

➢**General Electric via Empyrean Services (Contract, Part-time)** **Remote**

➢**Sr. Seismic Engineer** **01-2022 to 06-2022**

➢*Work remotely as a part-time, contract Seismic Analyst in the GE Hitachi Nuclear Energy Civil Structural Engineering Group for the design of BWRX nuclear powerplants in Canada:*

➢**Project: BWRX Containment Structure Analysis and Post-Processing:** Analyze the BWRX Containment Structure under static and 1G seismic loading. Analyze SASSI element shell stress results and ANSYS element shell stress results for 50 disparate structural element groups. Analyze results over several iterations of BWRX design. Generate SASSI post-processing input files through modification of SASSI batch files via Command Prompt. Perform data analysis using Python and Visual Basic VBA. Produce stress plots and perform comparative analysis of SASSI and ANSYS stress data using Python, Visual Basic VBA , and ANSYS INP files. ***Position has heavy emphasis on data analysis, object-oriented programming, and ANSY MAPDL.*** Position ended due to budget cuts.

➢**THORNTON TOMASETTI, Applied Science, Forensics** **New York, NY**

➢**Forensic Project Engineer** **11-2017 to 04-2019**

➢*Work as structural project engineer between the Thornton Tomasetti (TT) Forensics and Applied Science Groups.*

➢**Project 1: Silo Deformation Forensic Analysis**: Modeled and Analyzed 4 steel silos located in British Colombia, Canada. Analyzed structure for static soil pressure loading, material vertical and lateral pressures and design loads. Analyzed structure for differential settlement and non-uniform soil loading. Required use of SAP 2000 for FEA analysis and Eurocode 1: BS EN 1991-4 2006 and ASCE 7-10 for load determination.

➢**Project2: Lap Shear Analysis of Auto Components:** Modelled and Analysis steel and Aluminium components with epoxy resin under increasing loads using von Mises and Drucker–Prager yield criterion to best determine tensile capacity of resin under dynamic loading. Required use of FLEX proprietary FEA software for modelling.

➢**Project 3: Wooden Truss Forensic Analysis:** Conduct structural analysis on prefabricated Southern Pine (1,2,&3) trusses with faulty Metal Connector Plates (MCP). Extract Member forces, determine member capacity (in accordance with TPI 1-2007), and detail likely causes of failure. Required use of SAP 2000 for FEA analysis to confirm hand calculations and AWC-NDS 2012 and TPI 1-2007 for member capacity determination.

➢**Project 4: Analysis of Submarine Data Collection Cables under Hydrostatic Pressure:** Modelled and analysed pre-pressurized fiber-reinforced polymer cables under drag forces, internal pressure initial conditions and external hydrostatic pressure. Data used in the validation of existing test methods. Required use of ABAQUS, ABAQUS HyperMesh, and PYTHON.

➢**Project 5: Temporary Sidewalk Structures and Scaffolding Review:** Peer-check wooden sidewalk scaffolding and temporary support structures in accordance with ASCE 7-05, ASCE 7-10, NYC Building Code 2014, and AWC-NDS 2012

Project 6: High-Rise Facade Inspection via Suspended Scaffold: Conduct inspections of terracotta facade for high rise structure in the NYC Upper East Side. Inspected façade tiles and fins for cracks and structural deficiencies. Required NYC DOB 16-HR Suspended Scaffold Training and OSHA-10 training for task.

➢**Project 7: Bridge: Ship Impact Assessment:** Analyze effects of ship impact on bridge structure and substructure (specifically the impact on pier and pile cap) located in NYC, New York. Required use of AASHTO LRFD 2012, ETABS, SAP2000.

➢**Project 8: Fertilizer Conveyor River Truss Collapse, Ship Stability Analysis:** Investigated the contribution of barge ship stability to conveyor river truss collapse in Rosedale, Mississippi. Conveyor truss was simply supported by barge prior to buckling failure and ultimate collapse. Investigated potential improper loading and its contribution creating an uneven supporting surface for the conveyor truss and thus its contribution to truss failure.

➢**ENERCON** **Baton Rouge, LA**

➢**Structural Design Engineer** **05-2017 to 10-2017**

➢*Work as structural design engineer within Civil Engineering Group at the ENERCON Baton Rouge office.*

➢Design and Analyze Seismic Category I and Category II piping and structural elements for the River Bend Nuclear Generating Station, Waterford Steam Electric Station Unit 3, and the *Arkansas Nuclear One (*ANO) Plant

➢Submit and review design changes in accordance with ASCE 4-98, ACI 318-14, ASCE 07-05, and ANSI B36.10M criteria.

➢**Project 1: Temporary Shielding Pipe Evaluation and Pipe Support Evaluation (Riverbend):** Evaluate the loading effects of temporary lead shielding (weight of 30 lb/linear foot) on non-seismically qualified pipe lines and pipe supports. Recommend temporary pipe supports, to reduce load, as necessary.

➢**Project 2: Bullet Resistant Enclosure (BRE) Slab Design (Waterford 3):** Design and evaluate slab expansion for existing slab to support 15'x15' area of BRE structural tower and supporting BRE blocks. Slab evaluation was designed

using 3000 psi concrete and HILTI epoxy grout dowels to prevent differences in settling between the existing slab and the newly poured slab expansion.

➢**SOUTHERN NUCLEAR.(via Planet Forward, LLC.)** **Birmingham, AL**

➢**Structural-Seismic Fragility Engineer (Contracted)** **05-2015 to 04-2017**

➢*Worked as contracted structural-seismic fragility engineer within Risk Informed Engineering (RIE) Seismic Probability Risk Assessment (SPRA) group*

➢Modeled and analyzed Seismic Category I and Category II Structures in Joseph Farley, Edwin Hatch, and Alvin Vogtle Nuclear Powerplants using FEA software (namely SAP 2000 and SASSI)

➢Conduct Soil-Structure Interaction (SSI) Analysis of Seismic Category I and Category II Structures using SASSI 2010 and SC-SASSI

➢Conduct Cracked Section Analysis of Area Sections within Evaluation of Structural Performance, in response to seismic event

➢Train in-coming engineers in FEA and SSI analysis

➢Review analyses in accordance with AISC N690, ASCE 4-98, ACI 318-14 criteria

➢Peer-check, Review, and Accept or Reject contractor calculations and submissions

➢Author, review, and verify FEA and SSI analyses

➢**WESTINGHOUSE ELECTRIC, CO.(via SystemOne, Inc.)** **Cranberry Twp, PA**

➢**Civil Engineer: Electrical, I&C, and HVAC Layout (Contracted)** **01-2014 to 10-2014**

➢Work as contracted structural technical lead within AP1000 Nuclear Power Plant New Plants Engineering and Structures in the Electrical, HVAC, and I&C Layout Group

➢Design and model large-frame instrument supports using FEA software (namely GT-Strudl) to meet seismic criteria and to reflect and thermal effects

➢Author and Verify hand calculations of smaller instrument supports

➢Evaluate supports to meet AISC N690 criteria and IEEE 344 criteria and as-needed Nuclear Regulatory Commission (NRC) criteria

➢Collaborate with off-shore international (India) contract engineers and external (German) partner engineers

➢Peer-check, Review, and Accept or Reject contractor calculations and submissions

➢Collaborate and coordinate with other on-site analytical groups and corresponding group engineers

➢Create and Standardize interdepartmental analytical procedures and control documents

➢Edit and Update drafter drawings and engineer mark ups

➢Author, review and verify structural engineering designs of instrument supports

➢**Civil Engineer: Structural Design, Engineer Embedments (Contracted) 02-2013 to 12-2013**

➢Work as contracted civil engineer within AP1000 Nuclear Power Plant New Plants Engineering and Structures in the Structural Embedments Group.

➢Author, review and verify structural engineering designs of non-standard overlay, deformed wire anchor, and headed anchor embedment plates.

➢Extract, review, and analyze embedment Load and embedment load Calculations, using GT-Strudl and MS Excel

➢Model and Modify Embedment Geometry and Orientation using AutoDesk Navisworks

➢Aid in Embedment Database Development and Review.

➢**ANSYS, Inc** **Canonsburg, PA**

➢**MAPDL Multiphysics/Contact Testing (Internship)** **12-2011 to 08-2012**

➢Work within ANSYS MAPDL Testing Team in the Physics Business Unit.

➢Design Finite Element Analysis (FEA) simulations using ANSYS MAPDL code to address structural and multiphysics-based phenomena within Linux/Unix based environment

➢Expand and enhance MAPDL developer input in effort to best simulate real-world phenomena (e.g. thermal radiation, molecular diffusion, and beam loading)

➢Create and modify existing simulation test sets to increase the accuracy and capability of ANSYS thermal and acoustic solver

➢Conduct thermal loading (e.g. radiation and convection heat loading) and thermal analyses

➢Report and test FEA defects

➢PRIOR EXPERIENCE: 6+ Months Prior Experience with ANSYS modeling of structural/mechanical loadings as required by Computational Mechanics academic program

PUBLICATIONS

➢**Journals & Magazines**

➢Co-author, *High-Temperature Langasite SAW Oxygen Sensor*. IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control. Vol. 58, Issue 8. Publication Year, 2011. **DOI: 10.1109/TUFFC.2011.1979**

➢Co-author, *Langasite Surface Acoustic Wave Sensors: Fabrication and Testing*. IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control. Vol. 59, Issue 2. Publication Year, 2012. **DOI: 10.1109/TUFFC.2012.2190**

➢**Conference Publications**

➢Co-author, *Langasite SAW Temperature and Oxygen Multi-Sensor Frequency Control and the European Frequency and Time Forum (FCS)*, 2011 Joint Conference of the IEEE International. Publication Year, 2011. **DOI: 10.1109/FCS.2011.5977811**

- Co-author, *Wireless Harsh-Environment Oxygen Sensors*. Sensors, 2011 IEEE Publication Year, 2011. **DOI: 10.1109/ICSENS.2011.6127402**

REFERENCES AVAILABLE UPON REQUEST

PROJECT SAMPLES AVAILABLE UPON REQUEST