



## NELSON FORENSICS

### JUSTIN DONALDSON, P.E.

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*Discovery Lab Director*

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#### EDUCATION

► **B.S. in Civil Engineering**

Virginia Polytechnic Institute and State University

#### AREAS OF EXPERTISE

- Investigation and failure analysis of roofing systems of all types, including analysis and separation of damages caused by hail, straight-line winds, tornados, hurricanes, construction/installation deficiencies, material deficiencies, moisture intrusion, deficient drainage, thermal expansion/contraction, foot traffic, maintenance activities, and long-term wear and deterioration.
- Determination of proper remediation of failed/damaged roofing systems.
- Investigation and analysis of water intrusion through the building envelope causing interior damages, and identification of non-leak moisture sources (e.g., condensation).
- Professional guidance on interpretation/application of local building codes.
- Evaluation of buildings subjected to damages from foundation movement, straight-line winds, tornados, hurricanes, floods, and/or storm surge.
- Analysis of design and/or performance of site grading, site drainage, and storm sewer improvements.

#### EXPERIENCE

Mr. Donaldson has performed over 1,000 building evaluations during his time with Nelson. The majority of these evaluations have been focused on roofing system failures/damages and have included a wide array of roofing materials and contributing causes. Numerous evaluations have also been performed on buildings subjected to damages from hurricanes, tornados, hail/wind storms, and foundation movement. His investigation services have been performed for a variety of clients, including insurance carriers, attorneys, building owners, municipalities, and contractors.

Mr. Donaldson is the first and current Director of the Nelson Discovery Laboratory. He helped to found the lab and has played an integral role in its development since inception. He established many of the testing procedures utilized by the lab and has personally performed the majority of evaluations of roof membrane samples tested by the lab.

Prior to his employment with Nelson, Mr. Donaldson worked for multiple civil engineering design firms practicing in the area of land development. During this time, he designed municipal roadways, site grading, storm sewer systems, sanitary sewer systems, water distribution systems, and storm water detention facilities for a variety of projects, including both commercial and residential developments.

Mr. Donaldson is a proponent of continuing education and enjoys sharing his experience through education seminars to peers and clients alike. He conducts continuing education seminars in-house, at client offices, and at industry conferences.

## CAREER HIGHLIGHTS

- ▶ Hail-impact and wind (straight-line, thunderstorm, downburst, tornado, and hurricane) distress evaluations of numerous roofing systems including asphalt shingles, concrete tiles, clay tiles, asbestos tiles, metal panels, synthetic slate tiles, slate tiles, granule-coated metal panels, built-up roofing membranes, polymer-modified bitumen membranes, single-ply thermoplastic membranes, single-ply Duro-Last membranes, single-ply EPDM membranes, spray polyurethane foam, and 90# roll roofing;
- ▶ Evaluation of roof system substrates including polyisocyanurate insulation, perlite board, wood fiberboard, gypsum board, expanded polystyrene insulation, extruded polystyrene insulation, lightweight insulating concrete, and poured gypsum for hail, wind, and moisture intrusion distress;
- ▶ Evaluations of damages to roofing systems and/or moisture intrusion for numerous single-family residences, multi-family properties, commercial structures, school districts, industrial facilities, government structures, and hospitals/healthcare facilities;
- ▶ Investigation of alleged roof construction defects at elementary schools in a West Texas school district;
- ▶ Evaluation of lightweight insulating concrete roof decks through fastener withdrawal testing per ANSI/SPRI FX-1;
- ▶ Design of roof system configurations to overlay or replace low-slope roofing at numerous structures;
- ▶ Review of roof system designs performed by others and the applicability of local building codes on those designs;
- ▶ Evaluation of wind, flood, and storm surge distress to structures in south Texas after Hurricane Harvey and Hurricane Ike, in Florida after Hurricane Irma and Hurricane Matthew, and in New York and Connecticut after Hurricane Sandy;
- ▶ Analysis of claim to commonality of damages for an attempted class action lawsuit in New Orleans after Hurricane Katrina;
- ▶ Review and critique of cost estimates for proposed roofing system remediation;
- ▶ Review of reports by others regarding failures of or damages to roofing systems, of laboratory reports of roof membrane sample evaluations, and roof moisture surveys;
- ▶ Laboratory evaluation of numerous delaminated multi-ply roof membrane samples, and of desaturated bituminous roof membrane samples for impact distress;
- ▶ Research on roof assembly mock-ups with utilization of a vacuum chamber and testing standards ASTM E907 and FM 1-52;
- ▶ Research on as-built mopping voids in bituminous roof membranes and the resulting damages they cause;
- ▶ Evaluation of the cause of flooding to properties adjacent to a large pre-development site grading operation after a heavy rainfall event;
- ▶ Investigation of site drainage design and related water intrusion distress at single-family residences;
- ▶ Evaluation of site drainage and resulting impact on structure foundation movement;
- ▶ Evaluation of single-family residences for damages caused by differential foundation movement and separation of these damages from other causes;
- ▶ Design of site layouts, parking lots, grading, and storm sewer systems for stations along the DART Orange Line light rail system in Dallas, Texas;
- ▶ Design of civil engineering land improvements (e.g., site layout, grading/drainage, storm sewer, sanitary sewer, storm water detention, and water distribution) for multiple commercial and residential properties in north Texas;
- ▶ Design of preliminary engineering for planning and zoning commission approval for multiple commercial properties in north Texas;
- ▶ Design of municipal roadway segments in north Texas and Oklahoma.

## INDIVIDUAL LICENSURE

Licensed Professional Engineer in the States of Alabama, Arizona, Arkansas, Colorado, Florida, Kansas, Louisiana, Mississippi, Missouri, New Mexico, North Carolina, Oklahoma, South Carolina, and Texas.

- ▶ Registered with the National Council of Examiners for Engineering and Surveying (NCEES).
- ▶ Registered with the California Emergency Management Agency's (CalEMA) Safety Assessment Program (SAP).

*State licenses, registrations and/or certifications listed on this resume apply only to this professional as an individual. Nelson Forensics, LLC, Nelson Architectural Engineers, Inc., Nelson Forensic Architects, PLLC, Nelson Forensic Engineers, Inc., Acute Engineering, Inc., and their subsidiaries or assigns offer firm professional services only in states where they are authorized. No offer of firm services is made in states where the aforementioned entities are not authorized or registered.*

## PROFESSIONAL MEMBERSHIPS AND ACTIVITIES

- ▶ Member of RCI, Inc. (RCI)
- ▶ Member of the American Society of Civil Engineers (ASCE)
- ▶ Member of Tau Beta Pi National Engineering Honor Society
- ▶ Member of Chi Epsilon National Civil Engineering Honor Society

## SEMINARS/PROFESSIONAL LECTURES

- ▶ *Hail Impact Effects on the Wind Uplift Resistance of Fully Adhered Single-Ply Roof Membranes*, Presented at the ASCE 8th Forensic Engineering Congress; Austin, Texas; November 2018.
- ▶ *Roof Coring & Laboratory Testing on Roof Membrane Samples*, Presented at Nelson Discovery Laboratory for various insurance adjusters; Hebron, Texas; September 2018.
- ▶ *Methodologies in Roof Hail Distress Evaluations*, Presented to AmTrust Financial Services; Dallas, Texas; August 2018.
- ▶ *Forensic Evaluation of Bituminous Roof Membranes: Mopping Voids vs. Hail Damage*, Presented to AmTrust Financial Services; Dallas, Texas; August 2018.
- ▶ *Forensic Evaluation of Roofs and Rooftop Structures*, Webinar; April 2018.
- ▶ *Roofing Systems: Materials, Failures, and Investigations*, Presented at ASCE SEI Houston Chapter Meeting; Houston, Texas; October 2017.
- ▶ *Forensics Evaluation of Roofs and Roof Structures*, Presented at US Adjusting Services Conference; Irving, Texas; February 2017.
- ▶ *Forensic Evaluation of Bituminous Roof Membranes: Mopping Voids vs. Hail Damage*, Webinar; November 2016.
- ▶ *Understanding and Using Weather Data*, Webinar; December 2015.
- ▶ *Hail Evaluation of Bituminous Roofing Membranes: Understanding Interply Mopping Voids*, Presented at ASCE 7th Forensic Engineering Congress; Miami, Florida; November 2015.
- ▶ *A Closer Look: Roof Coring and Laboratory Testing of Roof Membrane Samples*, Presented to VeriClaim at Nelson Discovery Laboratory; Hebron, Texas; November 2015.
- ▶ *Forensic Evaluation of Roofs and Roof Structures*, Presented to Horace Mann Educators Corporation; Irving, Texas; October 2015.
- ▶ *Roofing Lesson Series 2: Bituminous Roof Membranes*, Webinar; August 2015.
- ▶ *Roofing Lesson Series 1: Roof Decks and Insulation*, Webinar; March 2015.
- ▶ *Roof Coring & Laboratory Analysis of Roof Membrane Samples*, Presented to The Hartford at Nelson Discovery Laboratory; Hebron, Texas; October 2014.
- ▶ *A Closer Look: Roof Coring and Laboratory Testing of Roof Membrane Samples*, Presented at Blue Goose Education Workshop; Irving, Texas; September 2014.
- ▶ *Roof Coring & Laboratory Analysis of Roof Membrane Samples*, Presented at Nelson Discovery Laboratory Open House; Hebron, Texas; June 2014.
- ▶ *Forensic Evaluations of Roofing and Roof Structures*, Presented to Shelter Insurance; Oklahoma City, Oklahoma; September 2013.
- ▶ *Methodologies in Roof Hail Distress Investigations*, Presented at the Hotter than Hail conference hosted by US Adjusting Services; Irving, Texas; July 2013.

## PUBLICATIONS

- ▶ *Hail Impact Effects on the Wind Uplift Resistance of Fully Adhered Single-Ply Roof Membranes*, Justin Donaldson, P.E., M.ASCE; ASCE 8th Forensic Engineering Congress, Austin, TX, November 29-December 2, 2018, with M. DeLeon, M.E., P.E., M.ASCE, and K. Savage, P.E.
- ▶ *Hail Evaluation of Bituminous Roofing Membranes: Understanding Interply Mopping Voids*, Justin Donaldson, B.S., P.E.; ASCE 7th Forensic Engineering Congress, Miami, FL, November 16-18, 2015, with M. DeLeon, M.E., P.E., M.ASCE, and S. Verhulst, M.S., P.E., M.ASCE.

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