



## **J. LAWRENCE ELKIN, P.E.**

*Senior Professional Engineer*

*Adjunct Professor of Engineering: Trident Technical College*

Mr. Elkin's professional career includes more than ten years of experience in diagnostic evaluations, building repair design, and construction project management. His expertise is primarily in the physics of Thermodynamics and Fluid-dynamics as they apply to building envelope systems. He has performed evaluations of roof, wall, floor and foundation systems to identify moisture infiltration paths and determine the potential for moisture accumulation within these systems. Mr. Elkin has developed computer models and databases to simulate and track building failures. He has particular expertise regarding evaluations of thermal/moisture barriers, designing repairs for failed building envelopes and managing building envelope remediation projects. More recently Mr. Elkin has focused on building assembly failures associated with inappropriate building practices and misinterpretation of building code requirements. Mr. Elkin has also provided expert testimony to assist in the resolution of construction litigation.

Mr. Elkin is also knowledgeable in the fields of mechanical systems. He has performed indoor air quality evaluations and thermal comfort studies in accordance with American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE) standards. Mr. Elkin has also designed mechanical systems including a ventilation network for the Smithsonian Institute in Washington, D.C. and a Department of Energy research facility.

Mr. Elkin combines his knowledge of building materials, thermo-fluid science and mechanical equipment to diagnose complex moisture intrusion problems. These problems are often linked to fungal growth and deterioration of building components. Mr. Elkin works closely with Industrial Hygiene and Environmental Science professionals to assess the cause and extent of mold contamination. Using sound engineering principles, Mr. Elkin develops unique and cost-effective solutions to resolve moisture and fungal growth problems.

### ***Education***

- Master of Science in Mechanical Engineering, Rose-Hulman Institute of Technology, 1993.
- Bachelor of Science in Mechanical Engineering, Rose-Hulman Institute of Technology, 1991.

### ***Registrations***

- Professional Engineer: Alabama, Florida, Georgia, Kentucky, North Carolina, Mississippi, South Carolina, & Tennessee.

### ***Previous Experience***

- Applied Building Sciences, Inc., Senior Engineer, 2004 to Present.
- Campbell, Schneider and Associates, LLC, Engineering Associate, 1998 to 2004.
- Titan Atlantic Group, Inc., Facilities Engineer, 1997 to 1998.
- Law Engineering and Environmental Services, Inc., Facilities Engineer, 1995 to 1997.
- Doty Scientific, Inc., Design Engineer, 1993 to 1995.

### ***Principal Areas of Practice***

- Thermal/Moisture Related Problems
- Mechanical Systems
- Building Envelope Failures
- Hurricane/Catastrophe Assessments
- Roofing Failures
- Facility Condition Assessments

### ***Publications & Lectures***

- ASHRAE Guide for Hot and Humid Climates, Project Committee Member, ASHRAE, Atlanta, GA, 2007
- BEC Window Flashing Rodeo Results. Proceedings of the ASTM Symposium: Up Against a Wall, ASTM, Tampa, FL, 2007
- Using a Heat and Moisture Transfer Simulation to Diagnose Moisture-Related Expansion/Contraction Problems in an Exterior Roof/Wall Assembly. Proceedings of the Performance of Exterior Envelopes of Whole Buildings IX International Conference, ASHRAE/DOE, Atlanta, GA. 2004
- Mold Mitigation. Architectural Series. Four Hour Seminar. Trident Technical College, Charleston, SC. 2004 to 2006
- Building Code Issues and Underfloor Moisture Problems in Warm, Humid Climates, RCI Interface: Journal of the Roof Consultants Institute, Vol. XXI, No. 10., Roof Consultants Institute, Raleigh, NC, 2003.
- Employing the Sealed Floor Technique to Resolve Underfloor Moisture Problems in Warm, Humid Climates, RCI Interface: Journal of the Roof Consultants Institute, Vol. XXI, No. 11., Roof Consultants Institute, Raleigh, NC, 2003
- Field Techniques to Diagnose Moisture and Mold Problems, RJMW Hurricane Catastrophe Seminar, April, 2001.
- Solving Water Intrusion and Mold Problems in South Carolina, Medical University of South Carolina, 2002 to 2005
- Window Flashing Workshop, Performance of Exterior Envelopes of Whole Buildings X International Conference, ASHRAE/DOE, Clearwater, FL. 2007

### ***Awards***

- *American Institute of Architects South Carolina: Alliance Award, 2007*

### ***Professional Organizations***

- *American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). Voting Member of Technical Committee 4.4: Building Materials and Envelope Performance. Member Technical Committee 1.12 Moisture in Buildings.*
- *National Institute of Building Sciences: Building Envelope and Thermal Environment Council (BETEC). Board of Directors Member. Chairman of the Heat, Air and Moisture Research Coordinating Committee.*
- *Building Enclosure Council-Charleston: Member –Board of Directors and past Vice Chairman.*

### ***Post Graduate Courses and Seminars***

- Roofing Industry Educational Institute, Roofing Technology Course, 36 hours, 1999.
- Sto Exterior Plaster Applicator Training, 16 hours, 1996.
- Exterior Design Institute, Third Party EIFS Inspector Course, 40 hours, 1999.
- BETEC, Air Barriers Seminar, 8 hours, 2001.
- ASHRAE/DOE, Performance of Exterior Envelopes of Whole Buildings VIII, 48 hours.
- ASHRAE/DOE, Performance of Exterior Envelopes of Whole Buildings IX, 48 hours
- AIVC/BETEC, Ventilation, Humidity Control and Energy, 16 hours.
- DOE/ORNL, WUFI Pro Training, 2002. 20 hours
- NBSC/DOE/ORNL, Advanced WUFI Training, 2006, 40 hours
- ABAA, Air Barrier University, 2005, 8 hours.
- BETEC, Air Barriers III, Air Barrier Solutions for Buildings in North American Climates, 2001, 8 hours.
- BETEC, M<sup>4</sup> – Mold, Moisture, Misery and Money, 2003, 16 hours
- BETEC/CMHC, Rain Penetration Control: Applying Current Knowledge, 2002, 8 hours.

## ***Examples of Previous Studies***

### ***Thermal/Moisture Related Problems***

- Evaluation of residential moisture intrusion and mold growth, numerous locations in FL, GA, NC and SC.
- Wall Condensation, Breakers North Tower, Myrtle Beach, SC.
- Air Infiltration and Wall Condensation, Charleston Public Works, Charleston, SC.
- Evaluation of moisture intrusion and mold growth at Dialysis Clinics, Inc, James Island, SC.
- Crawl space moisture issues, numerous locations GA, NC and SC.
- Evaluation of moisture intrusion and mold growth at Piggly Wiggly Corporate Office, North Charleston, SC.
- Floor framing failures due to condensation and decay, over 75 locations along the Atlantic Coast.
- Hardwood flooring failures, North and South Carolina.

### ***Mechanical Systems***

- Design of HVAC systems for the Department of Energy's Natural Exposure Testing Facility: Hollywood, SC.
- Design of a ventilation system for a subterranean storage facility, Smithsonian Institute, Washington, D.C.
- Compressor and reversing valve failure analysis in heat pump systems: Charleston, SC
- Analysis of domestic water valve failures: numerous locations in NC and SC.
- Burst pipe analysis: numerous locations NC, TN, and SC.
- HVAC duct installation evaluations: numerous locations, SC.
- HVAC condensate drainage system failure: Shem Creek Inn, Mt. Pleasant, SC
- Thermal comfort study, Gaston County Health Department, Gastonia, NC.
- Design of a warehouse heating and ventilation system, Garner, NC.
- Evaluation of residential sooting problems, SC.

### ***Building Envelope Failures***

- Residential and Commercial stucco and Fiber Reinforced Plaster evaluations, numerous locations in FL, NC, and SC.
- Exterior Brick Veneer Failure, NNPTC, Naval Weapons Station, Goose Creek, SC.

- Residential brick veneer failures in NC and SC.
- Cedar Siding Failure, The Cottages At Shipyard, Hilton Head Island, SC.
- Brick veneer failure, Embassy Suites, Washington, D.C.
- Residential and Commercial EIFS evaluations, numerous locations in GA, NC, PA, SC, and TN.
- Moisture intrusion through cast-in-place concrete, Caravelle Towers, Myrtle Beach, SC.

### ***Hurricane/Catastrophe Assessments***

- Evaluation and restoration projects in Mississippi and Louisiana after Hurricane Katrina, 2005
- Evaluation of wind damaged structures in Florida after Hurricanes Charley, Francis, Jean and Ivan, 2004.
- Inspection of wind and flood related structural, exterior and roof damage to commercial and residential structures after Hurricanes Bertha, Bonnie, Floyd and Fran, 1996 to 1999.
- Metal building collapse due to severe thunderstorm and inadequate bracing, Goose Creek, SC

### ***Roofing Failures***

- Asphalt shingle failures: numerous locations in NC, SC and GA.
- EPDM membrane failures: numerous locations in NC, SC and GA.
- Smooth and gravel surfaced built-up roof failures: numerous locations in NC, SC and GA.
- Standing seam roof failures: numerous locations in IL, NC, SC and GA.
- Modified bitumen roof system failures: numerous locations in NC, SC and GA.

### ***Facility Condition Assessments***

- Mariners Cay, Folly Beach, SC
- CVS Pharmacies, Greenville, Spartanburg and Columbia, SC.
- Southeast Eyecare Centers, Greensboro, Winston-Salem, and High Point, NC.
- Numerous Apartment complexes in North Carolina, South Carolina, Virginia, and Georgia.
- Tanger Outlet Shopping Center, Dalton, GA.
- Former Wachovia Building, Fayetteville, NC.