

# **DR. ROLIN F. BARRETT, SR., P.E.**

CONSULTING ENGINEER

## **BARRETT ENGINEERING**

3141 John Humphries Wynd, Suite 280, Raleigh, North Carolina 27612

[www.barrettengineer.com](http://www.barrettengineer.com)

### **EDUCATION**

Doctor of Philosophy, Mechanical Engineering, North Carolina State University, 1965

Master of Science, Mechanical Engineering, North Carolina State College, 1962

Bachelor of Science, Mechanical Engineering, North Carolina State College, 1959

### **PROFESSIONAL LICENSING**

Registered Professional Engineer, State of North Carolina and State of Florida

### **EMPLOYMENT**

Consulting Engineer, Barrett Engineering, Raleigh, N.C., 1977 -

Director of Research and Development, Harrington Manufacturing Company, Lewiston,  
N. C., 1976 -1977

Assistant Dean of Research, Research Administration, North Carolina State University,  
Raleigh, N. C., 1973 -1976

Instructor, Assistant Professor, Associate Professor, Professor; North Carolina State  
University, Raleigh, N. C., 1962 -1973

Consulting Engineer, L. E. Wooten and Company, Raleigh, N. C., 1959 -1960

### **ENGINEERING CONSULTING PRACTICE**

The practice was established in 1977, offering engineering services to industries, governmental agencies, insurance companies, attorneys, and individuals. Consultation has been provided on nearly four thousand cases, including motor vehicle accidents, fires and explosions, industrial accidents, guarding of hazardous locations, and some types of structural damage.

#### **BRIEF DESCRIPTION OF ENGINEERING PRACTICE**

Almost 2,000 motor vehicle accidents have been analyzed, including incidents involving automobiles, trucks, motorcycles, commercial and residential mowers, construction equipment, aircraft, and boats.

More than 1,000 fires have been analyzed for causes and origins, as well as possible equipment malfunctions and possible violations of codes and standards. Testing has been conducted on numerous electrical items involved in fires.

Industrial equipment accidents associated with construction, textiles, plastic molding, woodworking, food processing, and welding have been examined. Determination of guarding adequacy often has been required in these fields. In addition, accidents involving industrial trucks and conveyors have been studied.

Other engineering analyses have included violent propulsion of bottle stoppers, building damage possibly resulting from military ordnance and commercial blasting, electrocutions following accidental contact with power lines or various types of equipment, malfunctions of compressed gas cylinders, incidents related to the slip resistance of various walking surfaces, failures of hoist mechanisms, chain, and wire rope.

## RESEARCH LABORATORY

Laboratory equipment includes a scanning electron microscope and high vacuum evaporator, stereoscopic microscopes, hardness testers, digital oscilloscope, and tensile test apparatus. In addition, there are numerous precision instruments in the laboratory for measuring dimensional values, electrical parameters, forces, gas concentrations, pressures, sound levels, velocities of gases and liquids, temperatures, and weights.

Some portable instruments are the field stereomicroscopes, accelerometers, strain gauge apparatus, radar speed detectors, dynamometers, friction measuring/slip resistance apparatus, and vehicle scales.

The vehicle crash data retrieval system downloads information stored in a vehicle's airbag control module. Computerized motor vehicle accident analysis programs aid in preparation of accurate drawings of accident sites and assist in the analysis of vehicle positions, velocities, and accelerations.

## **HONORS AND AWARDS**

American Society of Mechanical Engineers—Centennial Medallion

Society of Automotive Engineers—Ralph Teetor Award

Archives of American Mathematics, Center for American History, University of Texas at Austin – Inclusion of Rolin F. Barrett's "Tables of Modified Struve Functions of Order Zero and Unity." AAM is the sole archival repository in the United States "dedicated to collecting and preserving the paper and records of

mathematicians..., the premier resource or researchers seeking primary sources in mathematics.”

Shell Oil Fellowship

## **OTHER**

Dr. Barrett holds a commercial pilot's license with an instrument rating and has approximately 3,000 hours as pilot-in-command.

## **CONSULTING FEE**

The current charge for engineering consulting services is \$320.00 per hour plus expenses.

## **PREVIOUS DUTIES AND RESPONSIBILITIES**

### DUTIES AS FACULTY MEMBER, NORTH CAROLINA STATE UNIVERSITY

Taught and developed graduate and undergraduate courses in combustion, heat transfer, thermodynamics, kinematics, statics, dynamics, strength of materials, mechanical engineering design, and automotive engineering.

Designed and conducted research in areas of turbine engine propulsion, high-speed mass transportation, sonar systems, sonic boom simulation, motor vehicle safety inspections, mechanized roadside litter removal, bio-engineering, and societal costs of automobile accidents.

### DUTIES AS ASSISTANT DEAN OF RESEARCH, NORTH CAROLINA STATE UNIVERSITY

Formulated policies on matters regarding research  
Acted as liaison between granting agencies and the University  
Reviewed research proposals for outside funding  
Prepared reports and publications  
Negotiated terms of contracts and grants  
Executive Secretary, Patent Committee  
Executive Secretary, Overhead Allocations Committee  
Executive Secretary, Committee on the Use of Human Subjects in Research

Executive Secretary, Animal Care Committee

#### DUTIES AS DIRECTOR OF RESEARCH AND DEVELOPMENT, HARRINGTON MANUFACTURING COMPANY

Evaluated structural and mechanical aspects of curing barns, forklifts, tree shears, and other equipment

Conducted heat loss evaluation of buildings

Conducted analytical and experimental stress analyses on various products

Designed factory-built, wooden-structure houses with completed exteriors and interiors including wiring, drywall, fireplaces, lighting fixtures, heating and air conditioning, plumbing, and appliances

Designed mechanisms for constructing, transporting, and erecting wooden structure, sectional house

Directed construction, transportation and placement of factory-built homes on permanent foundations at sites

#### **MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS**

American Society of Mechanical Engineers—Chairman, Eastern North Carolina Section, 1975 -1976; Secretary, U.S. Region IV, 1976-1981

Society of Automotive Engineers

American Institute of Aeronautics and Astronautics—Chairman, Carolina Section, 1969 -1970

American Society for Metals

American Society for Testing and Materials

American Society of Heating, Refrigerating and Air-Conditioning Engineers

National Fire Protection Association

National Society of Professional Engineers

Sigma Xi, The Scientific Research Society

Transportation Research Board of National Academy of Sciences/National Academy of Engineering, Past Committee Member

## **COURSES AND SEMINARS**

### **Completed for Professional Development Hours**

Civil CAD and GPS Conference  
Total Station Training Course for Accident Reconstruction  
Beginning CAD Course, Part 1: Introduction, Drawing Setup & Line Command  
Beginning CAD Course, Part 2: Common Drawing Commands  
AutoCad Level I  
Advanced AutoCad  
Automotive Turn Signal & Hazard Flashers Course – Federal Requirements  
Occupancy Sensors Course – Technologies and Applications  
Highway Engineering Course: An Introduction  
Basic Concepts of Photogrammetry Course  
OSHA Construction Outreach Course  
Effects of Woody Vegetation and Animal Penetrations on Earthen Dams  
Age and Failure of Structures Course  
Corrosion: Principles, Causes & Cures with Special Emphasis on Marine Applications  
Lighting Energy Management Course  
HVAC Energy Management Course  
Energy in the 21<sup>st</sup> Century; Issues and Priorities Seminar  
Wood Structural Design Fundamentals Course  
Fall Hazard Awareness for the Construction Industry Course  
Worksite Safety Course: OSHA Cranes and Other Hoists Course  
OSHA Cranes, Derricks, Hoists, Elevators & Conveyors Course  
Basic Civil Engineering Course – Sewers and Sewerage  
Sewage Lift Station Design Course  
Gravity Sewer Design Course  
Roofing Materials Course – Asphalt Shingles  
Air Compressors Course  
Ductile Iron Pipe Course  
OSHA Tools Course – Hand and Power  
OSHA Welding & Cutting Course  
Guide to the National Electrical Code Seminar  
Fire Prevention, Protection and Code Compliance Course  
Arc Flash Hazard Analysis Course– The Basics  
Ground Fault Circuit Interrupters Course – Overview and NEC Requirements  
Fire Prevention Basics and Design Course  
Electrical Installations Course: Electrical Laws, Components & Circuits  
Printed Circuit Board Basics Course  
Electric Motors Course  
Overview of Electric Power Systems Course  
OSHA Electrical Regulations Course  
Transformers I Course – Electrical Characteristics

Power Transmission & Distribution Course  
Mitigating Risks Seminar – Building Safety into Your Product  
Hot-Dip Galvanizing Course – Corrosion Protection  
Lockout/Tagout Course  
Personal Computer Training Course – Introduction  
Internet for Engineers Workshop: A Basic Overview  
Powerpoint Level I Course  
Microsoft Office Excel Level I Course  
Mastering Telecommunications Fundamentals Seminar  
Intellectual Property Law for Engineers  
Florida Engineers' Laws and Rules Course  
Absolute Mechanical Basics Course: Measures, Mass & Motion  
Finite Element Analysis Course  
Introduction to Photovoltaics Course

## **LECTURES**

Guest Speaker: "Reconstructing Accidents," North Carolina Conference of Superior Court Judges, sponsored by the Conference of Superior Court Judges, Administrative Office of the Courts (NC), and the Institute of Government, Sunset Beach, NC

Guest Speaker: "Engineering Forensics," Wake Forest-Rolesville HighSchool, Wake Forest, NC

Guest Speaker: "Accident Reconstruction," Motor Freight Carriers in Accident Litigation -- Southeastern Litigation Partnership Conference, Southeastern Freight Lines, Lexington, SC

Guest Speaker: "Accident Reconstruction," Accident Reconstruction Education Session, South Carolina Trucking Association Safety Management and Maintenance Council, Myrtle Beach, SC

Guest Speaker: "Accident Reconstruction," Motor Vehicle Accidents Involving Trucks – Seminar, Southeastern Freight Lines, Columbia, SC