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Statement of Qualifications:

Indoor Air Quality Services

Indoor Environmental Consultants, Inc.

Texas DSHS Mold Assessment Company License #ACO0114
Texas DSHS Asbestos Consultant Agency License #100329

Serving Texas and surrounding states

2016

Section 1

Indoor Air Quality Services

About Indoor Environmental Consultants, Inc.

Indoor Environmental Consultants, Inc. (IEC) is a professional consulting firm specializing in field investigations and assessments of indoor environmental quality in schools, commercial, and residential buildings related to fungal, bacterial, chemical, asbestos, and particulate pollutants. Our services include comprehensive site inspections, sampling and testing services, detailed remedial recommendations, post-remediation clearance testing, building IAQ commissioning, LEED certification, IAQ project coordination, and public meetings.

The company was formed in 2001 with a core group of professional indoor air quality consultants with over 70 years of combined experience. IEC has grown a multi-disciplinary team of specialists with current operations in Texas serving the surrounding states. We have provided services throughout the southwest and Gulf Coast states.

IEC is one of the only companies specializing totally in indoor air quality consulting services in this area of the country. IEC has worked in the commercial, institutional, and residential environments. Examples of recent projects include both reactive and proactive IAQ evaluations of multi-story and single tenant office buildings, schools, hotels, apartments, residences, and industrial buildings both locally and regionally. IEC, Inc. staff have provided expert witness consulting services for both fungal, bacterial, and chemical contamination litigation.

Indoor Air Quality Services

Indoor Air Quality (IAQ) is the product of numerous factors. The quality of an indoor environment is the result of interaction between the building site, pollutant sources, the current ventilation system and operation, building furnishings, and the building occupants. Indoor air pollutants can be chemical, biological, or physical. The multiplicity of factors that affect indoor air quality often make IAQ investigations complex. A well-defined IAQ objective and measurement program must be formulated in order to gather meaningful observations and data. Only from a sound scientific approach can appropriate, cost-effective remediation strategies be developed.

To provide a healthy indoor environment, it is essential to provide good indoor air quality. The US EPA defines good indoor air quality as:

- Introduction and distribution of adequate volumes of ventilation air
- Control of airborne contaminants generated from either an indoor or outdoor source
- Maintaining recommended temperatures and relative humidity

To provide a complete assessment of these parameters, IEC's program features a multidisciplinary approach. IEC team members incorporate a wide variety of professional disciplines, qualifications, and experience levels. This evaluation design allows for a comprehensive building assessment. IEC, Inc. incorporates IAQ protocols from the Indoor Air Quality Association (IAQA), National Institute of Occupational Safety and Health (NIOSH); the Occupational Safety and Health Administration (OSHA); the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE); the American Conference of Governmental Industrial Hygienists (ACGIH); the Environmental Protection Agency (EPA); and IEC, Inc. original research efforts.

The typical IAQ evaluation will include an assessment of symptom expression, a walk-through of affected and non-affected areas, inspection of the ventilation systems (air handling units, cooling coils, drain pans, supply plenums, outside air intakes), pollutant intrusion pathways, measurement of surrogate gases to evaluate air exchange, and measurement of temperature and relative humidity to determine thermal comfort parameters. In most evaluations, this will be sufficient to determine building-related problems. IEC can provide comprehensive sampling and analytical services in support of more complex indoor air quality investigations.

Field Investigation Services

IEC employees are qualified and experienced to perform comprehensive site inspections related to chemical, fungal, bacterial, and particulate impacts to indoor environmental quality. This includes investigation for fungal amplification sources, water intrusion events, and HVAC systems issues that may impact air quality. IEC, Inc. Council-Certified Indoor Environmental Consultants (CIEC), Asbestos Individual Consultants (AIC), and chemists, have received specific training in indoor air quality and environmental assessments.

Field investigation and support services include:

- Indoor Air Quality Comprehensive Investigations
- Field Sampling Techniques – Assessment, Monitoring, and Clearance Sampling
- Building Inspection and Design Issues Review
- Pollutant Pathway Investigations
- Construction Inspection for Potential IAQ Issues
- Asbestos Consulting and Inspection
- IAQ Construction Commissioning
- LEED Indoor Air Quality Certification
- HVAC System Hygiene Inspection
- Proactive HVAC and Energy Systems Maintenance Programs
- Infrared Thermography for Moisture Detection
- Remediation Recommendations
- Detailed Remedial Scopes of Work
- Remediation Contractor Oversight
- Occupant Interviews and Surveys
- IAQ Information and Dissemination Meetings
- Public Meetings

Sampling and Analytical Testing

When analytical documentation is required or needed, a sound sampling strategy is designed prior to field collection. Air sampling for particulates, chemical pollutants, or fungal and bacterial pollutants are performed with clearly defined objectives for the resultant analytical data. IEC, Inc. is adept in utilizing applicable and proper sampling techniques to obtain representative field samples. Experienced field personnel, under the direction of a project supervisor, are proficient in the methodologies of various sampling procedures required for each individual project.

Indoor air quality evaluations are performed on-site with data-logging air quality monitors, surrogate gas monitors, toxic gas monitors, quantitative bioaerosol apparatus, and traditional chemical pollutant collection techniques. Building operation, an essential diagnostic for potential indoor air quality issues, is thoroughly evaluated. IEC, Inc. is capable of identifying chemical pollutants in the part-per-billion range using thermal desorption and GC-MS protocols.

IEC, Inc. personnel employ sampling methods in accordance with the National Institute for Occupational Safety and Health (NIOSH), Environmental Protection Agency (EPA), and the Occupational Safety and Health Administration (OSHA) guidelines. Remedial recommendations follow Environmental Protection Agency (EPA) reference document EPA 402-K-01-001 March 2001 "Mold Remediation in Schools and Commercial Buildings," Texas Department of Health Services "Texas Mold Assessment and Remediation Rules Publication #2-15", and the American Conference of Governmental Industrial Hygienists "Bioaerosols: Assessment and Control."

Experienced personnel utilizing calibrated sampling pumps equipped with cassette filters, media plates, charcoal tubes, sorbent tubes, and other sampling media types enable IEC, Inc. to sample for many different airborne pollutants. Laboratory analytical capabilities include gas chromatography/mass spectroscopy, gas chromatography, spectrophotometry, atomic absorption, inductively coupled plasma emission spectrophotometry, chemical titrations, biological determinations, and microscopic determinations.

Analytical services offered include:

- On-Site Microbiological Analytical Services
- Building Ventilation Evaluation
- Carbon Dioxide, Carbon Monoxide, Temperature, Relative Humidity
- Comprehensive Facility Evaluation using Aircurity Real-Time Monitor
- Microbial Contamination Analyses: Bioaerosols, Bulk, Substrate, Surface
- Airborne Particulate Analysis
- Volatile Organic Analysis by Gas Chromatography, GC/MS, Thermal Desorption
- Industrial Hygiene Testing Services for OSHA Compliance Testing
- Asbestos Bulk and Air Sample Analysis
- Airborne Metals Analysis by Atomic Absorption and Inductively Coupled Plasma

Licenses and Certifications

Indoor Environmental Consultants, Inc. is licensed by the Texas Department of State Health Services as a mold assessment company (ACO0114), and each of its Texas consultants are licensed as mold assessment consultants. IEC is licensed by the Texas Department of State Health Services as an asbestos consultant agency (100329).



In addition to professional degrees and licenses, IEC, Inc. employees are certified by the American Council for Accredited Certification (ACAC) – formerly American Indoor Air Quality Council (AIAQC), and National Air Duct Cleaners Association (NADCA) to perform IAQ evaluations. Certified Indoor Environmental Consultants (CIEC) perform on-site IAQ evaluations, field sampling, data interpretation, and final report documentation. Professional staff attends IAQ related symposia, teach IAQ courses, and publish peer-reviewed IAQ literature to remain on the cutting edge of IAQ science.



American Industrial Hygiene Association (AIHA) accredited laboratories are employed for chemical and particulate analysis. IEC's preferred biological laboratory provider MYCOTECH BIOLOGICAL, INC. (MBI) participates in the AIHA microbial proficiency analytical testing program EMPAT (#103006) to ensure quality control in microbial identification protocols. Mycotech Biological is a Texas DSHS Licensed Mold Analysis Laboratory Lic. # LAB0163. In addition to participating in AIHA's EMPAT program, analysts at Mycotech Biological are certified spore analysts by the Pan American Aerobiology Certification Board.



Insurance

Indoor Environmental Consultants, Inc. maintains the following insurance policies: general liability, automobile liability, worker's compensation, and professional and environmental pollution liability insurance. Project specific insurance at higher liability limits may be incorporated as required.

Members of the following organizations:

Indoor Air Quality Association

Austin Association of Facility and Maintenance Engineers

San Antonio Association of Building Engineers

United States Green Building Council – Central Texas Regional

Association for Learning Environments



Section 2

Representative Project Experience

Organization

Services Provided

University of Texas
ATT Executive Education
and Conference Center
Austin, TX

Provided LEED certification indoor environmental quality (IEQ) testing for the EQ Credit 3.2 for Construction Indoor Air Quality Management Plan: Before Occupancy utilizing the testing option 2 under LEED for New Construction version 2.2 in lieu of a building flush-out due to occupancy deadlines. Facility is a hotel and conference center.

Texas Health and Human
Services Commission

Texas Parks and Wildlife

Texas Department of
Transportation

Employees Retirement
System of Texas

Indoor Environmental Consultants, Inc. has conducted numerous proactive and reactive IAQ assessments in a variety of state office buildings. Assessments have included occupant surveys, evaluation of complaints, identification of contamination and pollution sources, odor evaluation, ambient indoor air sampling, and HVAC hygiene inspection. Scopes of work have also included provision of remedial scopes of work and monitoring and clearance testing of the remediation activities. On-site meetings were conducted with employees of the impacted offices to disseminate information.

Lance Armstrong
Foundation
Austin, TX

LEED certification indoor environmental quality (IEQ) testing for the EQ Credit 3.2 under LEED for New Construction version 2.2.

Comal Independent School
District

Round Rock ISD

Pflugerville ISD

Conducted extensive bioaerosol evaluations and provided remedial guidelines and health risk assessment on schools impacted by water intrusion and fungal growth in wall cavities. Specifications were provided for remedial scope of work, and on-site monitoring was conducted during the remediation of the premises. Same day and next day clearance testing was provided on an extremely condensed work schedule covering over 100 classrooms in six weeks. Participated as lead scientist with PTA, parent, and media discussions. IEC also conducted cost effective, proactive IAQ evaluations on new school construction in order to mitigate environmental concerns.

Clinical Pathology
Laboratories

St. David's Hospital

Seton Healthcare Family

Provided industrial hygiene monitoring for laboratory chemicals and operations for both personnel and areas of laboratory facilities. Sampling has included formaldehyde, xylenes, glutaraldehyde, nitrous oxide, anesthesia gases, methyl methacrylate, and respirable dust.

<p>Greystar Properties Houston, Dallas, San Antonio, TX</p>	<p>Conducted water intrusion investigations and mold assessment for various apartment properties under consideration for acquisition.</p>
<p>Farmers Insurance Group State Farm Insurance Allstate Insurance USAA Texas Farm Bureau Chubb and others</p>	<p>Indoor Environmental Consultants, Inc. conducted comprehensive residential IAQ assessments and mold inspections for many insurance companies. Services included on-site inspection, development of remedial recommendations and scopes of work, and post-remediation clearance testing.</p>
<p>City of Houston Teal Construction Houston, TX</p>	<p>Provided LEED certification indoor environmental quality (IEQ) testing for the EQ Credit 3.2 for Construction Indoor Air Quality Management Plan: Before Occupancy for three library facilities.</p>
<p>TGSLC Stream Realty Wereldhave USA Various multi-floor buildings Austin, TX</p>	<p>Provide regularly scheduled proactive baseline sampling for chemical and biological components in more than ten buildings located in Austin area. Provide detailed report of findings and recommendations for improvement of indoor air quality. Provide on-call response to IAQ emergencies.</p>
<p>San Antonio Military Medical Center North Fort Sam Houston, TX</p>	<p>Provided LEED certification indoor environmental quality (IEQ) testing for the EQ Credit 3.2 for Construction Indoor Air Quality Management Plan: Before Occupancy for 600,000 square feet healthcare facility designed by Army Corps of Engineers.</p>
<p>Lake Travis ISD Liberty Hill ISD Bartlett Cocke</p>	<p>Conducted on-site construction inspections, pre-occupancy testing, and post-occupancy testing for environmental parameters identified in the indoor air quality management plan for newly constructed school facilities.</p>
<p>Denton Regional Medical Center Denton, TX</p>	<p>Provided monitoring services for airborne particulates and fungal bioaerosols during renovation activities.</p>

Seton Northwest Medical Center and Seton Medical Park Tower
Austin, TX

Conducted HVAC systems and air conveyance inspections of medical facilities.

Methodist Willowbrook Hospital
Houston , TX

Performed general indoor air quality investigation including HVAC systems.

Dell Children's Medical Center
Austin, TX

Performed sampling and testing services for LEED certification indoor air quality (IAQ) testing to comply with Option 2 of the EQ Credit 3.2.

Chase Bank
Wells Fargo Bank
Austin, TX

Performed sampling and testing services for LEED certification indoor air quality (IAQ) testing to comply with Option 2 of the EQ Credit 3.2.

Mansfield ISD
Mansfield, TX
HEB ISD
Eules, TX

Conducted pre-occupancy testing for environmental parameters identified in the indoor air quality management plan for newly constructed school facilities.

Copperas Cove ISD
Copperas Cove, TX
Killeen ISD
Killeen, TX

Conducted on-site construction inspections, pre-occupancy testing, and post-occupancy testing for environmental parameters identified in the indoor air quality management plan for newly constructed school facilities.

Georgetown ISD
Georgetown, TX

Conducted pre-construction testing and pre-occupancy testing for environmental parameters identified in the indoor air quality management plan for newly renovated school facilities.

Mercedes ISD Mercedes, TX	IEC personnel conducted extensive fungal bioaerosol evaluations and provided remedial guidelines for multiple schools in these districts. Specifications were provided for remedial scope of work, and on-site monitoring and clearance testing was conducted during and after the decontamination of the premises.
Cameron County Brownsville, TX	IEC conducted mold assessments and provided remedial guidelines on the Cameron County Sheriff's Office, Adult Probation Center, and Juvenile Detention Center. Specifications were provided for remedial scope of work, and on-site monitoring and clearance testing was conducted after the completion of remediation.
Hidalgo County Edinburg, TX	IEC conducted mold assessments and provided remedial guidelines on the Hidalgo County Court House. Specifications were provided for remedial scope of work, and on-site monitoring and clearance testing was conducted after the completion of remediation.
Transet Construction Longview, TX	
RLM General Contractors Longview, TX	
Buford Thompson Arlington, TX	
Waldrop Construction Brownwood, TX	Conducted on-site construction inspections, pre-occupancy testing, and post-occupancy testing for environmental parameters identified in the indoor air quality management plan for newly constructed school facilities in the Longview ISD, Kilgore ISD, Brownwood ISD, Early ISD, Everman ISD, Godley ISD, Graham ISD, Waxahachie ISD.
WRL General Contractors Flint, TX	
Sedalco Construction Fort Worth, TX	
Pogue Construction McKinney, TX	
Bartlett Cocke GC Austin, TX	

Section 3

Selected Resumes

Hollis L. Horner
President
Principal IAQ Consultant
TX DSHS Mold Assessment Consultants License # MAC0168
LEED AP

Education

MBA, Business Management, 1980, University of Texas at San Antonio, San Antonio, TX
BS, Chemistry with High Honors, 1972, University of Texas at Austin, Austin, TX

Fields of Experience

- On-site air quality investigations
- Proactive indoor air quality management programs
- LEED indoor environmental quality certification testing project management
- Project management and oversight of analytical chemistry test programs
- Design of analytical chemistry field testing programs
- EPA environmental field sampling methodologies
- OSHA and NIOSH industrial hygiene and air sampling methodologies
- Emissions testing of various products
- Technical narrative report writing
- Physical, chemical, and thermal testing of protective clothing products
- Proposal writing
- Customized service offering development

Positions Held

2001 – Present	President and CEO - Indoor Environmental Consultants, Austin, TX
2000 – 2001	Principal IAQ Investigator - IAQ Consultants, Austin, TX
1997 – 2000	Program Manager, Indoor Air Quality and Analytical Solutions - TRI/Environmental, Austin, TX
1996 - 1997	Program Manager, Protective Clothing and Director, Business Development - TRI/Environmental, Austin, TX
1995 - 1996	Project Management and Account Executive - Quanterra Environmental Services, Austin, TX
1992 - 1995	Southwest Regional Field Services Manager - EnSys, Inc., Research Triangle Park, NC
1988 – 1992	Project Management and Business Development - National Environmental Testing, Austin, TX
1980 – 1985	Business Management Positions - Datapoint Corporation, San Antonio, TX
1973 – 1978	Chemist-Toxicologist - Texas Department of Public Safety, McAllen, TX

Professional Affiliations

- Indoor Air Quality Association (IAQA)
- Austin Association of Facility and Maintenance Engineers (AAFAME)
- San Antonio Association of Building Engineers
- Central Texas Chapter of USGBC
- Past President and Secretary, Central Texas Hazardous Waste Management Society

Qualifications Summary

- Licensed Mold Assessment Consultant #MAC0168 – Texas Department of State Health Services
- Council-Certified Indoor Environmental Consultant (CIEC) #0710022 – American Council for Accredited Certification – Formerly American Indoor Air Quality Council
- LEED Accredited Professional
- Certified Indoor Environmentalist (CIE) #469 (expired) – Indoor Air Quality Association
- Certified Mold Remediator (CMR) #1886 (expired) – Indoor Air Quality Association
- High Profile LEED Certification Projects
- Numerous Indoor Air Quality Investigations for State, Federal, Commercial, Industrial, School, and Residential Customers
- Project Management of High Profile Microbial Assessment and Remediation Projects
- Development of Indoor Air Quality Testing Business
- Creation of GC/MS Product Emissions and Product Quality Testing Program
- Project Manager for Chemical Manufacturers Association Industrial Hygiene Method Development for Ethylene
- Development of Residential Air Screening Test Kits for Molds and Chemical Screening
- Project Management and Oversight of Protective Clothing Testing Programs
- Video Creation and Proposal Writing for U.S. Navy Divers Breathing Air Program

Publications and Research

- Clearance Criteria for Mold Remediation Projects
- Development of a Sampling Protocol and GC/MS Method for Identifying Candle Wax Burning Residues
- Development of a GC/MS Method for Measuring Formaldehyde in Product Emissions
- Study for the Development and Validation of an Industrial Hygiene Method for Ethylene in Air
- Development of a GC Method for Determining Isobutane Emissions from Styrofoam Plates
- Study for the Determination of Accuracy of Gas Detection Tubes for Carbon Monoxide, Carbon Dioxide, and Hydrogen Sulfide

Committees

Served on the Texas Department of Health Mold Task Force, which developed regulations for mold assessment and remediation in the state.

Served on the Texas Residential Construction Commission Mold Reduction and Remediation Task Force.

Organized and served as Vice President of the Texas Association for Indoor Air Quality.

Rod S. Marett
ASCS, CIEC, CMRS
Vice President
Senior IAQ Consultant
TX DSHS Mold Assessment Consultant License # MAC0200

Education

Bachelor of Business Administration, 1976, Texas State University, San Marcos, TX

Fields of Experience

- LEED indoor environmental quality certification testing
- New construction indoor air quality commissioning
- On-site air quality investigations including assessment and clearance sampling
- Director of field operations for large microbiological laboratory
- General manager indoor air operations for large microbiological laboratory

Positions Held

2001 – Present	Vice President, Indoor Air Quality Field Consultant/Investigator - Indoor Environmental Consultants, Austin, TX
1999 – 2001	Director of Field Operations – Mycotech Biological, Inc.
1998 - 1999	General Manager – Mycotech Biological, Inc.
1997 – 1998	IAQ Consultant - Mycotech Biological Inc.

Two year apprenticeship program directly under Larry D. Robertson, BS, MS, CIEC, CMRS TX DSHS License #MAC0203 (Mycotech Biological, Inc., Indoor Environmental Consultants, Inc., Robertson Consulting)

Professional Affiliations

- Indoor Air Quality Association (IAQA)

Qualifications Summary

- Licensed Mold Assessment Consultant #MAC0200 – Texas Department of State Health Services
- Council-Certified Indoor Environmental Consultant (CIEC) #0606038 – American Council for Accredited Certification
- Council-Certified Microbial Remediation Supervisor (CMRS) #0607030 – American Council for Accredited Certification
- Air Systems Cleaning Specialist (ASCS) # 3030406- National Air Duct Cleaners Association

- Certified Indoor Air Quality Professional (CIAQP) #394 (expired) – Association of Energy Engineers
- Certified Indoor Environmentalist (CIE) #321 (expired) – Indoor Air Quality Association
- Certified Mold Remediator (CMR) #382 (expired) – Indoor Air Quality Association
- Mold Loss Prevention Specialist (MLPS) #00054 (expired) - Indoor Air Quality Association
- Certified Indoor Air Quality Consultant (CIAQC) #21622 (expired) - American Council for Accredited Certification
- Numerous Indoor Air Quality Investigations including Assessment and Clearance Sampling for State, Federal, Commercial, Industrial, and Residential Customers
- Created Purisys Inc. dba Home Diagnostics, in partnership with Larry D. Robertson, to provide Microbiological Home Test Kits

James D. Reid
CIEC, CMRS, AIC
Senior IAQ Consultant
Texas DSHS Mold Assessment Consultant License #MAC0230
Texas DSHS Asbestos Consultant License #10-5075

Education

Environmental Science, 1985, Texas State University, San Marcos, TX

Fields of Experience

- On-site air quality investigations
- Asbestos inspection and consulting
- LEED indoor environmental quality certification testing
- New construction indoor air quality commissioning
- Microbial air and surface sampling, canister volatile organic air sampling, nuisance dust, and standard parameter baseline analysis
- Program management of environmental affairs including indoor air quality, hazardous materials, asbestos operations, lead-based paint
- Underground storage tank site corrective action abatement and remediation projects
- Asbestos abatement site walk-through and project proposal supervisor
- Phase I environmental site assessments

Positions Held

2001 – Present	Indoor Air Quality Field Consultant/Investigator - Indoor Environmental Consultants, Inc., Austin, TX
1990 - 2001	Environmental Programs Director - State of Texas General Services Commission, Austin, TX
1990 – 1988	Project Manager/Supervisor – Delta O Environmental Services, Austin, TX
1985 – 1988	Field Supervisor – A & K Environmental Services, Austin, TX
1983 – 1985	Operator/Haz-Mat Technician – DANA Machine Inc, San Marcos, TX

Professional Affiliations

Indoor Air Quality Association (IAQA)

Qualifications Summary

- Licensed Mold Assessment Consultant #MAC0230 – Texas Department of State Health Services
- Licensed Asbestos Individual Consultant #10-5075 - Texas Department of State Health Services

- Council-Certified Indoor Environmental Consultant (CIEC) #0608103 – American Council for Accredited Certification
- Council-Certified Microbial Remediation Supervisor (CMRS) #0703027 – American Council for Accredited Certification
- Certified Indoor Environmentalist (CIE) #465 (expired) – Indoor Air Quality Association
- Certified Mold Remediator (CMR) #72 (expired) – Indoor Air Quality Association
- Texas Department of Health Asbestos Project Manager – License # 50-0237 (expired)
- Texas Department of Health Asbestos Supervisor – License # 80-3025 (expired)
- Texas Department of Health Lead Risk Assessor – Certification # 20700325 (expired)
- AHERA Asbestos Project Designer
- AHERA Building Inspector
- AHERA Management Planner
- AHERA Air Monitoring
- X-Ray Florescence (XRF) Operator
- Underground Storage Tank Remediation and Management
- EPA Storm Water Permits & Pollution Prevention Planner – Certification #51645
- ASTM Phase I Environmental Site Assessment for Commercial Real Estate
- Numerous Indoor Air Quality Investigations for State, Federal, Commercial, Industrial, and Residential Customers.
- Developed and managed in-house asbestos, indoor air quality and hazardous materials management programs. Conducted hundreds of various environmental field evaluations.
- Project Manager and Site Supervisor for asbestos abatement projects from single dwelling residences to multi-story office facilities. Performed initial site walk-through and developed project proposals.
- Performed Phase I Environmental Site Assessment, Supervised and performed underground storage tank removals and soil remediation activities, duties ranged from hands-on removal to preparation of applicable regulatory paperwork.