

VERTEX is a global AEC firm that offers Forensic Consulting, Design Engineering, Construction Contracting, and Environmental Services. Our reputation for excellence, both in terms of timely results and service quality, spans the globe. It has earned VERTEX the trust of a prestigious client-base that includes both private and public companies as well as government agencies, in virtually every line of business.

Building Water Systems Risk Management & Compliance Services

Legionella - a new, higher standard of care

Legionella bacterium, the causal agent of Legionnaires' disease, is a clinically significant environmental pathogen. Recent developments have resulted in a new, higher standard of care for building owners and managers.

- ANSI/ASHRAE Standard 188-2015, Legionellosis: Risk Management for Building Water Systems was published on June 26, 2015. It is the first industry consensus standard addressing Legionnaires' disease.
- In July-August 2015, more than 120 cases of Legionnaires' disease were identified in the South Bronx, resulting in 12 deaths. This was largest outbreak of Legionnaires' disease in New York City's history.
- New York City and New York State have issued a series of new rules and regulations. The New York State regulations require, among other things, registration, inspection, disinfection, microbial testing and written maintenance plans for Legionella control following the structure and methodology of ANSI/ASHRAE Standard 188-2015.

Centers for Medicare & Medicaid Services (CMS) New Standards

The Centers for Medicare & Medicaid Services (CMS) announced in June 2017 that hospitals, skilled nursing facilities and nursing facilities, and critical access hospitals (CAHs) are required to adhere to the following:

- Conduct facility risk assessments to identify where Legionella and other opportunistic waterborne pathogens (e.g. *Pseudomonas*, *Acinetobacter*, *Burkholderia*, *Stenotrophomonas*, nontuberculous mycobacteria, and fungi) could grow and spread in facility water systems.
- Implement water management programs that are consistent with ANSI/ASHRAE Standard 188-2015, Legionellosis: Risk Management for Building Water Systems (ASHRAE 188), and include control measures such as physical controls, temperature management, disinfectant level control, visual inspections, and environmental testing for pathogens.
- Specify testing protocols and acceptable ranges for control measures, and document the results of testing and corrective actions taken when control limits are not maintained.





VERTEX's Legionella Services

We provide expert Legionella risk management and compliance services, with deliverables that meet applicable codes, standards and regulations. Our services include:

Water Management Programs Development of audit-ready Water Management Programs to prevent harm from multiple hazards, including Legionella and lead that comply with ANSI/ASHRAE Standard 188-2015, NSF Protocol 453 and applicable rules, regulations and codes.

Education and Training Education and training of our Clients' staff, so everyone understands how and why we manage building water systems.

On-site Evaluation of Building Water Systems Conduct on-site evaluations and describe, in words and schematics, cooling tower and domestic (potable) water systems. This includes measurement and analysis of the physical and chemical conditions that, in the absence of control, can support the amplification and transmission of Legionella and other disease-causing bacteria.

Implementation Support Services Provide a range of services to support implementation of our Clients' Water Management Programs, from periodic review of Verification and Validation records to full-time, on-site management of compliance documentation, to oversight of third-party water treatment firms.

Sampling Plans Design comprehensive sampling plans, consistent with rules, regulations and best practices, to make sure that sampling protocols are appropriate for the facility, and that test data are representative of the building water system and provide as much useful information as possible.

Independent Sampling Collect environmental water samples and transport them to third-party testing laboratories, to be analyzed for Legionella, lead, disinfection by-products and other contaminants.

Audit and Survey Preparedness Review Verification and Validation records and work with Clients' staff to prepare for independent audits and healthcare-accreditation surveys.

Data Management and Analytics Manage Verification and Validation data, so that it is easy to find when needed. We also help analyze and interpret the data, including trending over time, to help predict and head off problems before there is harm.

VERTEX Building Water Systems Practice

In response to the higher standard of care created by the publication of ANSI/ASHRAE Standard 188-2015 and the rapidly developing regulations associated with *Legionella*, VERTEX has formed a specialized practice dedicated to providing clients with best-in-class *Legionella* risk management and compliance services. Recognizing that *Legionella*-related work must be informed by specialized expertise, we have partnered with Gordon & Rosenblatt (G&R), internationally recognized for its thought leadership and unrivaled subject-matter expertise in disinfection chemistry and the prevention of disease and injury associated with building water systems.

VERTEX | VERTEX is a full-service construction, environmental and engineering services firm with more than 400 professionals in more than 20 offices across North America. VERTEX has provided advanced program and project management services to facility owners for more than 20 years. We have managed diverse projects for tens of thousands of buildings, often under challenging conditions and tight deadlines. With our dedicated construction management, engineering, and building science services, we are intimately familiar with domestic (potable) and cooling tower water systems. For each project, we bring carefully selected technical expertise, a tailored (but flexible) strategy and an intense focus on meeting the clients' objectives. The value of our deliverables is enhanced by thorough documentation, rigorous quality control and effective, targeted communication. Taken together, the elements of our program and project management services allow us to deliver consistently high-quality results, on time and on budget.

Gordon & Rosenblatt | Gordon & Rosenblatt (G&R) is an independent consulting firm specializing in disinfection chemistry and the prevention of disease and injury associated with building water systems. The firm's clients include municipal water utilities, major academic hospitals and long-term care facilities as well as residential, industrial and commercial buildings. G&R also advises government agencies and non-governmental organizations (NGO) (www.gordonrosenblatt.com).

The VERTEX Advantage

Independence Our interests are fully aligned with our Clients' interests. We don't sell treatment chemicals. We don't sell equipment. We don't sell laboratory tests. We are TRULY independent.

Integrity Our dynamic growth is built on our good name. We have a simple, transparent business model, with clear, unambiguous bills. None of the hidden fees or undisclosed "commissions" that can bloat budgets and undermine Clients' objectives.

Value We balance multiple Client objectives to deliver verified, validated, defensible results, on time and on budget. Because if a program is not affordable, it is not sustainable.

Subject Matter Expertise We partnered with Gordon & Rosenblatt (G&R), pre-eminent subject-matter experts in the prevention of disease and injury associated with building water systems. G&R provides the decisive scientific and technical leadership that guides our Building Water Systems practice.

Resources Our work in Building Water Systems is by a dedicated Team, trained by G&R and supported by the full organizational resources of VERTEX, giving us the ability to meet our Client's needs quickly and efficiently.

Our Clients

- Hospitals
- Nursing Homes
- Assisted Living Communities
- Universities
- Multi-Unit Residential Buildings
- Commercial Office Buildings
- Industrial Plants



Industrial Hygiene & Business Sciences Services

VERTEX provides significant benefits and competitive advantages for your business with respect to identifying and/or managing potential hazards associated with asbestos, indoor air quality, lead, mold, and health and safety. Whether your mission is to renovate or demolish existing structures, ensure a healthy and safe work environment, or address concerns of potential exposure to toxic elements, VERTEX can help you identify, implement, and achieve your goals in a timely and cost-effective manner. Our services include:

Liability Protection for Property Managers

VERTEX works to assist Property Managers with:

- Testing and Inspection Services
- Remedial Protocol Preparation
- Specification Preparation
- Asbestos, Lead and Microbial Operation and Maintenance Plans
- Project Oversight during Abatement and work Activities

Water Intrusion/Mold Growth

- Cause and origin assessments
- Bioaerosol sampling
- Clearance sampling
- Remedial protocol preparation
- Remedial monitoring
- Post remediation verification sampling

Water Intrusion/Mold O&M Plan and Mold Awareness Training

- Multi-family residential complexes
- Office buildings
- Commercial properties
- Large property portfolio plan preparations
- Focuses on prevention, awareness and the procedures to minimize the extent of damages and liability

Indoor Air Quality Assessments

- IAQ parameters (temperature, relative humidity, CO₂ and CO)
- Building inspections (interior and exterior)
- Commercial and residential HVAC inspections

Industrial Hygiene

- Forensic, environmental and occupational exposure investigations
- Regulatory compliance reviews (OSHA, EPA, ISO, Joint Commission)
- Quantitative and qualitative exposure assessments
- Hazard analysis
- Root cause analysis
- Best practice due diligence

Lead & Asbestos Investigations and O&M Preparations

- Initial assessments and representative sample collections
- Operation and maintenance plan preparation
- Project design and abatement protocol implementation
- Abatement monitoring

More About Legionnaires Disease

The US Centers for Disease Control and Prevention (CDC) has estimated that there are up to 18,000 cases of Legionnaires' disease in the United States each year, with up to 4,000 deaths. Legionnaires' disease results from inhalation or aspiration of *Legionella*-contaminated water droplets associated with building water systems. *Legionella* typically are present in small numbers in EPA-compliant drinking water received by buildings. Under certain operational conditions, the building can serve as an incubator, promoting growth of *Legionella* to very large, dangerous numbers. When *Legionella*-contaminated aerosols are released into the environment, the droplets can be inhaled and cause pneumonia. About 60% of Legionnaires' disease cases are in high-risk populations—smokers, diabetics, the elderly. But 40% of cases affect persons that are not in any identified high-risk group.

Facts

- Legionnaires' disease accounts for >65% of all reported waterborne disease outbreaks in the US
- 80% of outbreaks are from domestic plumbing systems; 20% are from cooling towers
- 70% of building water systems are contaminated with *Legionella*
- The number of Legionnaires' disease outbreaks in the US has increased >280% since 2000

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