Nondestructive Testing (NDT) and Nondestructive Evaluation (NDE)

CTLGroup is a leader in designing and refining sophisticated NDT and NDE methods that can be deployed to effectively support a variety of nondestructive investigations for building enclosures, interiors and structural systems. All testing methods are based on building science and are designed and conducted in accordance with ASTM standards.

The most complete investigation of building envelope and structural problems is achieved through a careful mix of visual inspection, NDT/NDE and minimally intrusive material sampling. CTLGroup has the versatility, depth of knowledge, and breadth of experience to carry out all types of assignments effectively. Our professional engineers and architects have deployed these testing methods on buildings throughout the world and have stayed in the vanguard of the nondestructive evaluation industry.

CTLGroup NDT and NDE services for building enclosures and structural systems include:

Roofing system:

- Infrared Thermography
- Electrical Capacitance Meter
- Nuclear Moisture Survey (Sub-consultant)
- Electronic Leak Detection & Leak Testing (Sub-consultant)
  - LV: Low Voltage Leak Detection
  - EFVM: Electric Field Vector Mapping
  - LVIT: Low Voltage Integrity Testing

Window Systems:

- Drone with/without Infrared Imaging
- Infrared Thermography Camera
- Water test with calibrated spray bars
- Rope Access with SPRAT certified technicians (Sub-consultant)
- AAMA Air/Water Chamber testing (Sub-consultant)

Masonry Walls:

- Moisture analyzers
- Infrared Thermography Camera
- Borescope for wall cavities
- GPR and Pachometers for brick ties
- Petro for mortar, brick, concrete and natural stone

Resilient Flooring:

- Relative humidity monitoring
- Petrographic analysis
- Laboratory analysis

Structures:

- Impact-Echo Testing
- Surface Penetrating Radar
- Electrochemical Corrosion Testing
- Ultrasonic Testing
- Impulse Radar

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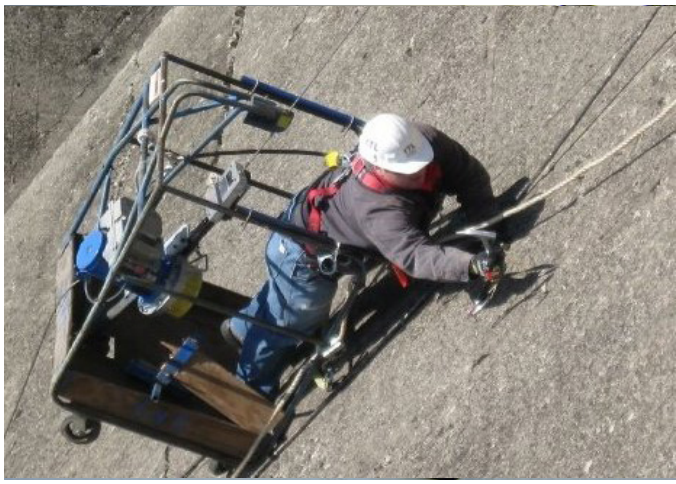
Hygrothermal Modeling

Hygrothermal analyses of wall and roof assemblies models water vapor flow and condensation potential and finite-element analyses to evaluate potential thermal bridging effects.

Vibration Monitoring

Custom-engineered monitoring solutions range from verification of regulatory compliance, to in-depth investigation of vibration effects on sensitive facilities, and to development of evidence-based limits for ground-borne, structural, or process-related vibrations. We develop and deploy unobtrusive systems suitable to occupied facilities, commercial properties, historic buildings, and public spaces.



Vibration Mitigation & Risk Management

We apply analytical tools such as modal analysis and system identification to determine vibration characteristics of practically any system, including mechanical components, large structures, and the human body. We work with our clients to develop a solution to control or suppress vibration at the source, or to isolate the system from harmful vibrations.

Computation Modeling

CTLGroup engineers can develop computational models of nearly any structural or mechanical system to evaluate dynamic load effects. Models range in complexity from single-degree-of freedom analysis to explicit finite element analysis with full geometric and material non-linearity.

Acoustic Emission Monitoring

Acoustic emission is a specialized non-destructive evaluation technique in which stress waves released by materials under load (e.g. service or proof loads) are analyzed to gain insight into material-structural phenomena such as cracking, fiber breakage, stick-slip behavior, and anomalous audible noises.

We use Acoustic Emission Monitoring to locate the possible source of distress or wear on bascule bridges and other large moveable structures. These structures present special engineering challenges as audible noises are extremely difficult to localize by ear. Acoustic emission monitoring is used to accurately determine the location of the source using standard location techniques based on time-of-arrival measurements.