



*...providing simple solutions for complex engineering problems*



**Structural Diagnostic & Engineering Services**



Ultra Technologies provides comprehensive solutions to the professionals in the field of **Earth Sciences, Structural Engineering, Geotechnical Engineering, Pavement Engineering and Non Destructive Evaluation**. Structural Diagnostic & Engineering Services Division of Ultra Technologies provides services in the field of Acquisition and Analysis of Geophysical data for Geotechnical Engineering, Structural Engineering and Environmental applications; Condition Assessment by Non Destructive Evaluation and Structural Monitoring of Civil Engineering Structures and Infrastructure including Bridge Load Rating, Fatigue Analysis, Residual Life Analysis etc. We are committed to providing the highest quality information at the lowest achievable cost. We are sensitive to the specific requirements of our projects and approach every job as a unique opportunity to improve our services.

We get associated with our clients right from the inception stage and understand their requirements to provide a meaningful solution. We are no box pushers. Customer satisfaction is our sole occupation.

Ultra Technologies in collaboration with **Olson Engineering Inc., USA**, offers consulting services for a wide variety of infrastructure evaluation. We test, evaluate, image, measure, and scan almost any type of structure or infrastructure element. Olson Engineering are of the very few companies whose main business in **Non Destructive Evaluation (NDE)** of civil structures & infrastructure. This focus helps us in identifying, researching and applying better methods of NDE and analysis. Our Non Destructive Evaluation techniques are analogous to medical ultrasound used on people, but we apply them to buildings, bridges, dams and all types of civil infrastructure and even to characterize the earth itself. NDE benefits projects through improved diagnosis of structural material conditions with minimal or no damage, lower cost, reduced risk for the public, owner, contractor, engineer and architect in a shorter time compared to conventional solutions.

Infrastructure is deteriorating from age, environmental assault and frequently, heavier use than intended. The need for test methods that can determine unseen defects, damage or deterioration, and that can check the quality of repairs, without further damage to the structure, is crucial. Non destructive Evaluation (NDE) methods have advanced to the point of imaging the internal characteristics of construction materials such as concrete, wood, masonry, stone, steel and asphalt. These techniques do not require invasive procedures like coring or drilling. The use of NDE is not limited to aging structures. Quality assurance of new construction with NDE also provides the ability to verify the quality of support structures prior to superstructures being placed.

Ultra Technologies in association with their overseas technical experts **Bridge Diagnostics Inc., USA**, uses a well-established set of both the field tests as well as analytical procedures and focuses on delivering bridge test results that are useful to the bridge owner. Our basic approach is very similar to that used in both standard highway and railroad bridge design codes, with only exception being that instead of relying on estimated distribution factors and assumed structural behaviors, we use actual field data to develop an accurate analytical model of the structure for developing the rating factors. Since this model has been actively "calibrated" with field data, it represents the **live load** distribution behavior such as end-restraints that simply cannot be accurately assumed.

This approach is best-suited for structures that have a low **load rating** based on the standard methods and on structures that appear damaged. In addition to our **live-load bridge testing and bridge rating services**, we assemble and help install long-term monitoring systems for tracking **bridge behavior** over time. Most of these systems use sensors that are based on Vibrating Wire (VW) technology and track parameters such as crack growth, strains, and rotations. These systems can be placed in the field for years at a time and can be accessed remotely via cellular or land telephone lines. They can also be configured with an alarm mode which will automatically contact a PC if something detrimental is detected by the system.

We also offer **comprehensive solutions for Geotechnical Engineering problems** ranging from remedial measures for falling slopes to advanced numerical analysis based solutions for design of powerhouse caverns. We use geotechnical specific softwares like FLAC, PLAXIS, SHAKE, SLOPE/W, and QUAKE/W to name a few. Dynamic analysis for liquefaction assessment and remediation, site specific design spectra are our strength and complement our NDE services.

**We have expertise in using the following techniques:**

**Engineering Geophysics:** Cross hole / Down hole Geotomography, Parallel Seismic, Spectral Analysis of Surface Waves, Seismic, Ground Penetrating Radar (GPR) and Resistivity. Some of our instruments have been integrated with Differential-GPS (DGPS) to provide automatic and accurate data location.

**Non Destructive Evaluation of Structures, Pavements and Tunnels:** Impact Echo, Slab Impulse Response, Ultra Sonic Pulse Velocity, Spectral Analysis of Surface Waves, Pavement Density measurement by Non Nuclear Methods, Pavement evaluation using Falling Weight Deflectometer & Modal Vibration Monitoring

**Non Destructive Evaluation of Foundations Depths and Integrity:** Crosshole Sonic Logging, Crosshole Tomography Imaging, Sonic Echo Impulse Response, Parallel Seismic and Ultra Seismic

**Geotechnical Engineering:** Stability Assessment and Remedial measures for Geotechnical Structures, Analysis and Design of Underground Structures, Dynamic Analysis and Advanced Laboratory testing.

**Structural Monitoring:** Load Rating, Fatigue Testing, Residual Life Analysis, Live Load Monitoring and Long Term Live Load Monitoring.

The emphasis at Ultra Technologies is on acquisition and analysis of high quality data for reaching to meaningful results. Ultra Technologies in collaboration with the World Leaders in these fields, provides the best of the solutions using latest data analysis software and techniques. We also conduct comprehensive in house and field training programmes in the said services.

Ultra Technologies through its instrumentation division promotes the interests of various overseas companies in the said fields. Our experience as service providers makes us uniquely qualified to demonstrate and train our clients on the most appropriate tools they can use to meet their project objectives. Our clients purchase from Ultra Technologies with confidence because we only sell and recommend the field-proven products, some of them are also used by us in field for our projects.



**Products & Services:**

- Advanced Geotechnical Equipment
- Material Testing Equipment
- Pavement Testing Equipment
- Seismological Equipment
- Geophysical Equipment
- Non-Destructive Testing Equipment
- Structural Monitoring Instruments
- Geophysical Services
- Structural Diagnostic & Engineering Services



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