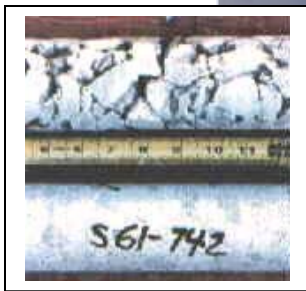


For over 30 years Levelton Consultants Ltd. has provided diagnostic, forensic and materials engineering services to a diverse range of clients and projects. These services have assisted in all aspects of evaluating, selecting and using construction materials, quality assurance and quality control as well as investigating and designing repair and rehabilitation programs for damaged structures. In addition, Levelton is well known for its expertise in troubleshooting, developing procedures and materials for specific applications and meeting specialized testing requirements.



Mitigation of Deterioration Due to:

- Chloride-induced corrosion (de-icing salts, sea water)
- Chemical attack (industrial chemicals, sea water, sewage)
- Alkali-aggregate reactivity
- Freeze-thaw cycles and weathering

Experience in Corrosion Control and Monitoring Using:

- Half-cell potential mapping
- Linear polarization resistance
- Electrochemical noise
- Cathodic protection
- Elastomeric membranes
- Liquid sealers
- Coatings

Levelton provides a comprehensive, hands-on approach to condition surveys, evaluation, testing and analysis of numerous structures including bridges, parkades, buildings, marine facilities, sewage treatment works and industrial plants. Our expertise is supported by a complete range of diagnostic procedures to evaluate the extent and severity of deterioration and to develop solutions to repair damage and control future deterioration.



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Expertise in Use of Speciality Repair Materials:

- Polymer-modified concretes and mortars
- Fibre-reinforced silica fume shotcrete
- High-performance concrete
- Polymer adhesives
- Bonding agents
- Speciality grouts

The work usually begins with a condition survey and testing program to evaluate the extent and severity of the deterioration. Diagnostic procedures often include:



- In situ rate of corrosion by linear polarization or electrochemical noise
- Sonic impact-echo testing
- Ultrasonic pulse velocity testing
- Corrosion potential mapping
- Physical tests – drilled cores, Windsor Probe, Lok-test
- Laboratory tests – chloride-ion concentration, rapid chloride-ion permeability
- Petrographic examination of polished and thin sections
- Delamination mapping

Engineering Analysis:

An engineering analysis of various repair and rehabilitation options follows the investigation phase. In consultation with the Owner and designer, a program is developed which repairs damage and controls future deterioration. The approach recognizes the Owner's budget and operational constraints, expected service life and maintenance procedures. Where appropriate, options are compared on a life-cycle cost basis and are designed for staged implementation.

Levelton Can:

- Design the rehabilitation program
- Prepare drawing, specifications and tender documents
- Obtain competitive pricing from qualified contractors
- Provide project management and administration
- Provide field review and quality assurance
- Provide on-going monitoring to plan maintenance in a timely, cost-effective way

Levelton's unique ability to combine talents through diverse, in-house expertise and laboratory facilities assures a high-quality, comprehensive team approach on all projects. We can call upon experts from all six of our practice groups:

- Materials Engineering
- Metallurgy and Corrosion
- Environmental
- Building Science
- Geotechnical
- Physical and Analytical Testing Services

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