



NON-INVASIVE TECHNIQUE AND INTEGRATED METHODOLOGY FOR ENHANCED DETERMINATION AND 3D MAPPING OF CONCRETE DETERIORATION IN BUILDINGS AND OTHER LARGE STRUCTURES

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ABSTRACT

Concrete deterioration in large structures is revealed by the debonding and corrosion of embedded reinforcing steel and/or concrete decomposition due to excessive contamination in adverse climatic conditions. Many forms of sub-surface deterioration determine internal expansions, cracks and fractures resulting into deformations of the external surfaces, which can be sensed and accurately mapped. There was a considerable motivation to develop an integrated methodology for highly accurate, rapid and inexpensive documenting, and non-intrusive inspection of structures. This presentation covers the 3D imaging technologies and derived utilities, which have been integrated into a structural evaluation-based processing system that serves and supports the periodic structural inspections for:

- preventive maintenance,
- documenting and certifying the dangerous conditions, signs of deterioration, defects,
- displacements and deformations,
- monitoring of structural deterioration/deformations/damages,
- consigning and registering the professional verifications and documentation over an asset life cycle,
- decision making process for the rehabilitation work to be undertaken, and
- remedial work designs and planning.