Ultrasonic Inspection Method And Advantages

Method	Uses	Advantages	Disadvantages
Visual inspection	• Cracks • Geometry • Surface roughness	• Accessibility • Oldest known technique • Well established	• Subjective • Time consuming • Qualitative results
Liquid penetrant dye	• Surface flaws • Detection of irregularities	• Portable • Easy interpretation	• Surface preparation • Exhausting for inspector • Time consuming
Chain drag	• Flaw detection inside decks •Delaminations	• Simple • Portable • Good for delaminations	• Time consuming • Tedious • Subjective • Not good with overlays
Half-cell potential	• Detect corrosion state in concrete reinforcement • Corrosion rate	• Simple • Portable • Good for corrosion	• Deck needs preparation • Time consuming • Not good for delaminations • Lane closure • Not very accurate
Acoustic emission	• Cracks • Delaminations • Corrosion	• Real-time response • No lane closures	• Qualitative results only • Not good with overlays • Interpretation • Costly • Not reliable
Ultrasonic pulse velocity	• Homogeneity of concrete cracks, voids • Strength determination	• Portable • Easy test procedure at relatively low cost • Relatively easy to interpret	• Not very reliable for concrete • Attenuation negatively affects results • Does not give information about the shape of defect
Ground penetrating radar	• Concrete mapping, mining, geotechnical, road, and bridge • Forensics • Detection of voids, honeycombing • Delaminations • Moisture	• Versatility • Portability • Effectiveness • Low cost • Good with overlays • Minimum traffic control • Prediction of repair quantities in road	• Interpretation • Complexity of results • Interpretation of results sometimes requires destructive testing
Impact echo	• Detection of voids, cracks, delaminations, unconsolidated concrete, and debonding • Determining thickness	• Requires one surface of the tested material to be exposed, independent of the geometry of the structure • Less susceptible to steel reinforcement • High accuracy	• Size of detected flaws is highly dependent on the impact duration • Less reliable in the presence of asphalt overlays • Interpretation of the results is difficult
Thermography	• Detection of thermal differences, delaminations, cracks, voids	• Portable • Simple, easy interpretation • Minimum traffic interference	• No information about depth of defects • Dependent on environmental conditions