Tekron Services *Inc.*

Information Sheet 7

Evaluating Surface Opening Cracks

There are many occasions when the depth of surface opening cracks need to be known. This can measurement can be quickly be achieved using impact-echo technology.

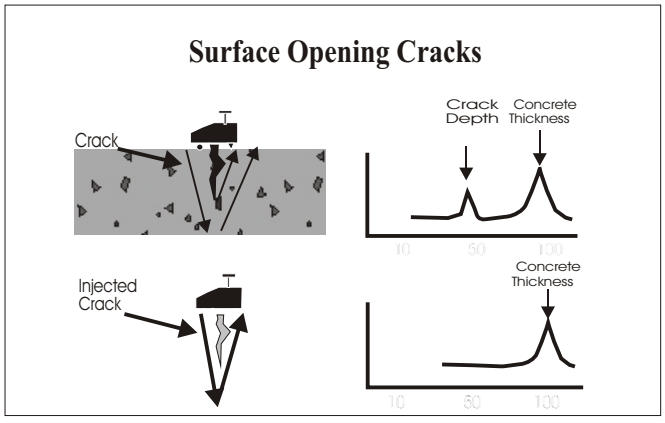
When a concrete surface is impacted, p-waves are produced which oscillate between the top and bottom surfaces for several cycles and also travel radially outward. The latter p-wave characteristic can be used to measure the depth of surface opening cracks. One method uses a single transducer, placed on the opposite side to the impact. In this case the p-wave is forced down the crack and causes a secondary p-wave at the tip of the crack This results in a small frequency peak equivalent to the depth of the crack. If the crack extends all the way through the concrete, then the p-wave cannot traverse across the crack and no signal is picked up by the transducer. The ability of the impact-echo equipment to measure crack depth has been successfully used by our company on several major projects.

UCLA parking garage after 1994 California earthquake

The 1994 Northridge California earthquake resulted in severe damage to the buildings on the campus of UCLA. Cracked shear walls were tested for crack depth which were subsequently injected with epoxy resin.

Over fifty piers of a rapid expressway in Taiwan were severely cracked. Impact-echo testing was used to determine the depth of cracking. This data was used to evaluate the loss of structural integrity of each pier which were subsequently repaired by injecting with epoxy resin.

Cracked concrete pier in Taiwan



Specialists in NDT and Computer Monitoring of Structures

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Measuring crack depths

Extensive cracking due to earthquake damage

NDT Techniques

Impact-echo

Ground Penetrating Radar

Schmidt Hammer
- Standard
- Pendulum

Boroscope

Corrosion mapping
- -Half-cell
- -3D half-cell
- -Electrical resistance
- -Rebar detection

Moisture and humidity detection

Dynamic measurement of physical properties

-Linear displacement transducers
-Telltale
-Demeg gauge
-Vibrating wire strain gauge
-Vibrating wire water pressure transducers
-Vibrating wire tilt meters
-Miniature single and multiple channel data loggers
including the following sensors:-

Temperature
Humidity
Light intensity
Voltage
Motor on/off vibration sensor
Motor on/offA/C sensor

Company Profile

Tekron Services is a Canadian company providing specialized inspection and testing of construction materials. Incorporated in 1987, the company offers a wide range of inspection and non-destructive testing services to evaluate structures and construction materials. Since the formation of the company our goal has been to incorporate emerging technology into tools and techniques for the construction industry.

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