

Environmental Controls

During repair of enclosed water retaining structures it is important to have strict environmental controls so that moisture sensitive materials will effectively cure and adhere to substrates. Tekron Services have developed environmental control systems to assist this objective.

Small logging devices have been used to monitor temperature and humidity of the conditions inside reservoirs during repair. These loggers can be set to take readings at set times (normally one to four hours). They can record up to 4000 readings before requiring downloading. A shuttle can be used by site personnel to download the data and send by e-mail for printing. In this way sites as far away as Alaska have been continuously monitored.

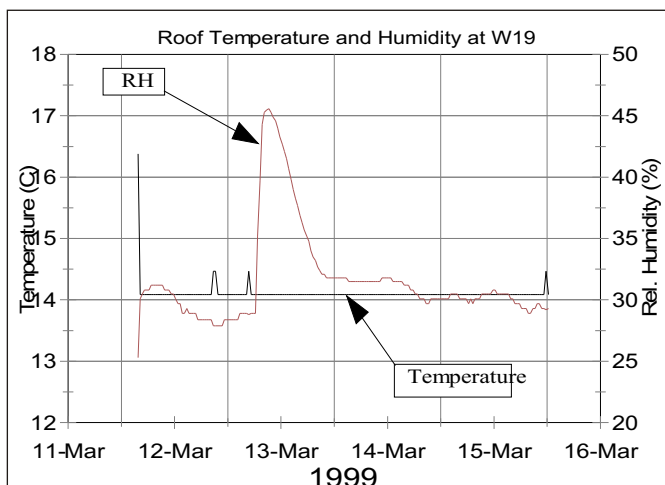
Moisture measurement of concrete is often specified as percent moisture content, however it is not a simple matter to quantify. More important for quality workmanship is the surface condition of the concrete prior to the application of moisture sensitive materials. By experimenting in the field during the repair of reservoirs Tekron developed a simple moisture testing system using the Protimeter electronic moisture testing apparatus. This equipment measures the electrical



Protimeter and two temperature and humidity loggers

resistance of materials when two pins extending from the head of the equipment are pressed on a surface. The output readings are empirical, based on wood moisture conditions. In addition, a series of LED lights light up depending on the moisture of the concrete.

Test specimens of elastomeric materials were applied to concrete specimens and their adhesion after one week of curing was determined. It was found that a simple go/no go system of surface moisture condition ensured satisfactory use of moisture sensitive materials in the repair conditions of reservoirs.



Typical data obtained from a logger



Data shuttle downloading data logger

Specialists in NDT and Computer Monitoring of Structures

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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.

Data Sheets

To illustrate these technologies Tekron has produced a series of data information sheets and case studies. These data sheets are available on request and are posted on our web page from time to time.

Evaluation Techniques

Since 1987, our company has been involved in several notable investigations including earthquake damage, historical masonry and extensive water leakage, often requiring unusual field techniques to be used to evaluate the problems. Our methods often make use of advanced computerized systems including impact-echo technology which uses sound waves to evaluate defects deep within concrete structures, ground penetrating radar which uses electrical conductivity to detect dissimilarities and computer monitoring techniques using miniature data loggers or cellular connections to evaluate the dynamics acting upon a structure. A list of some of the techniques used and types of investigations completed are given below.

NDT Techniques

Impact-echo

- Thickness
- Delamination
- Honeycombing
- Voids

Ground Penetrating Radar

- Re-bar & post-tension cable detection
- Voids & honeycomb in concrete
- Voids below concrete
- Voids in masonry

Corrosion mapping

Boroscope

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

Investigations

Concrete Structures

- Bridge decks
- Parking garages
- Reservoirs
- Dams
- Concrete pipes
- Tunnels and shafts
- Water retaining structures
- Pavements
- Foundations
- Historical structures
- Concrete protection
- Analysis of structural materials
- Monitoring of physical properties

Building Envelopes

- Roof inspection
- Anchor Safety Testing
- Masonry cladding
- Residential inspection
- Precast concrete
- Stone cladding
- Historical masonry

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