REAL-TIME MONITORING FOR LEAK LOCATING WITH WIRELESS MOISTURE CONTENT SENSORS IN NON-COMBUSTIBLE CONSTRUCTION

Jason Teetaert, P.Eng, SMT Research Ltd.,
Brennan Vollering, M.A.SC., P. Eng., LEED® AP, Sense Engineering

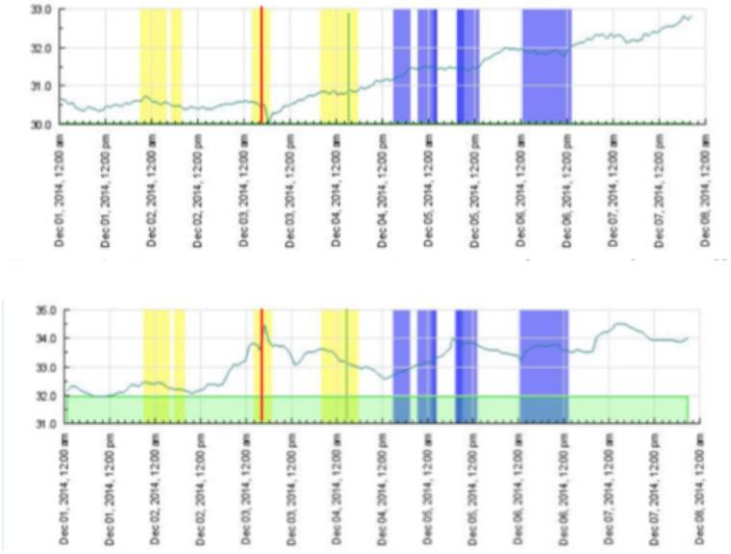
EXTENDED ABSTRACT

The systematic use of sensors and wireless monitoring electronics for the investigation, construction quality assurance, and long term monitoring is the key to early detection and identification of leak locations. It can also help isolate mechanisms causing wetting for complex scenarios with multiple potential water sources. The monitoring system utilized does not only measure the relative humidity and temperature of the wall cavity, interior space and exterior environment, but the installations include the use of point and linear moisture sensors of the interior wall cavities. Building analytics on-line dashboard can display the correlation between location, external and internal environmental conditions that are measured daily over time is key to correlation and cause of moisture events.

The material with-in this presentation will focus on wall assemblies of mid-rise construction lower town-home section in which original construction was completed in 2004, with interior renewal repairs completed in 2012 to 2014. The renewal work included, but was not limited to, foam insulation on the inside of the concrete exterior wall and supply and exhaust air system to improve ventilation to reduce the amount of condensation forming on the interior surfaces of the exterior walls and windows. Moisture detection tape sensors were installed on the inside surface of the concrete walls in separate zones to check if moisture continued to form in concealed parts of the exterior walls after the interior renovation was complete. The monitored data showed that the concrete wall was still experiencing wetting events after the interior air/moisture barrier was renewed with spray foam.

The presentation will show various leak investigations were the sensor data assisted with exacting the location of the water source, identifying causes and provide evidence based conclusions.

Figure 3: Sensors having elevated moisture content in the 2nd floor of Townhouse 108.



Red line indicates the approximate time of the wall water test.
The green line indicates the approximate time of the roof planter test.

Townhouse 108

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