HOW MANDATORY FLOOD PROTECTION SYSTEMS ARE EVOLVING FOR COMMERCIAL BUILDINGS

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Photography by Keiko Kawasaki

Ahead of the game

Breakthrough technology provides real-time flooring installation management

By Ron Treister

STEM Research Center 1, also known as Science One, is a 200,000 SF LEED® Gold, three-story academic research building dedicated to the interdisciplinary fields of material science and engineering. It also is part of a $1.5 billion initiative to transform the University of Connecticut's facilities statewide.

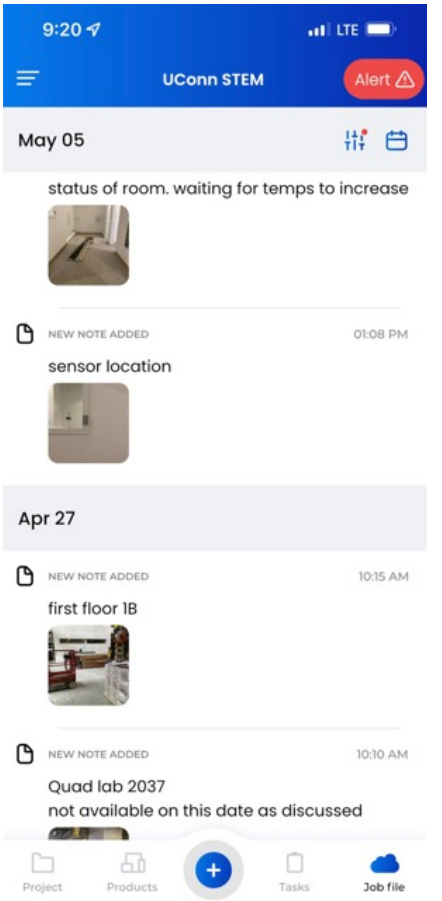
Home to the Institute of Materials Science, Science One will be the centerpiece of the University of Connecticut's new Northwest Science Quad district, a 22-acre development that transforms a hillside parking lot into a dazzling landscape of green infrastructure.

The project required resilient flooring and carpeting throughout lobbies, hallways, classrooms and laboratories. The installation, which involved premium installation materials from Tarkett and Mapei, began during the winter of 2022 and will be completed in the same year.

The Challenge

Higgins Flooring faced a very demanding production schedule, while performing the installation during the harsh New England climate in a partially climatized building. The project involved installation of many high-performance floor coverings to meet demands of the active space, requiring the adherence to manufacturers' ambient conditions specifications during the acclimation period, throughout the entire installation—and then for a two-week period following completion.

Higgins also was responsible for ensuring the protection of its work throughout the space exceeding over the 12-month project.



The Solution

No stranger to challenges, Higgins Flooring turned to Construction Connectivity for use of its Floorcloud™ real-time, quality management technology platform. The SaaS custom solution uses climate sensor technology, cellular IoT networks and a proprietary database of manufacturer's product specifications.

The system would enable the jobsite to be monitored in real-time, remotely and precisely, 24/7/365. It also would provide a cloud-based, secure digital vault for Higgins to store important data-graphs, photos and other significant information about the installation.

The jobsite conditions sensors were used extensively throughout the project, helping the contractor strategically plan and perform work. Sensors typically were installed seven days prior to work beginning, providing visibility regarding whether flooring products should be moved into position and acclimated.

An essential technical requirement for the successful installation of today's high performance resilient floor coverings, the solution enabled this to be accurately measured, recorded, viewed and shared in real-time.

Noteworthy, on numerous occasions Higgins modified its production schedule to avoid sub-optimal conditions that could jeopardize the installation's outcome.

As Higgins' team began, several sensors were mounted on nearby walls, providing hourly quality control recordings of ambient temperature, ambient relative humidity and dew point.

This provided real-time data insights to installers both on or off the jobsite. In fact, alert notifications were triggered and resulted in Higgins sharing its detailed historical graphs with the building's general contractor in an effort to seek assistance in bringing ambient conditions into the product manufacturer's specification range.

Low Humidity Detection

One significant example of how the Floorcloud solution helped mitigate project risk was with the installation of flooring within a highly specialized clean room. Noticing extremely low (9% - 12%) ambient relative humidity conditions over a four day period, Higgins contacted Tarkett's service department seeking guidance prior to installing its Tarkett IQ Granit SD resilient flooring and 906 conductive, epoxy adhesive.

Because the published technical specification range for these Tarkett materials was 40%-60%, workers were advised not to proceed until the ambient conditions could be better controlled.

Higgins promptly accessed the graphical data via the Floor Cloud mobile application, and shared it with the project's general contractor. The data, which spoke for itself, was positively embraced by the GC, who modified the product schedule, and adjusted intake of exterior air to raise ambient RH% to within specification.

This resulted in flooring work being undertaken during the period when the clean room's finish work was underway; clearly a more appropriate environment.

Steve Cloud, owner of Higgins Flooring, says the hourly data captured simply was indisputable. "Our general contractor embraced it, made the changes required and helped us all avoid what could have been a seven-figure calamity."

High Humidity Detection

The platform also helped ensure the project's success via early detection of excessively high relative humidity in an area that had been scheduled to be installed with self-leveling underlayment within hours. A mobile phone notification detecting a considerable spike in ambient RH% for several hours during the prior evening, was sent to Cloud.

Responding to this the next morning, onsite personnel noticed several exterior doors had been left opened—and it had rained heavily the prior evening. "85 percent ambient relative humidity is simply an unacceptable condition to install, highly engineered, self-leveling underlayment cements," Cloud says. "Had we not identified this issue, and captured the data during the middle of the night, we possibly could have been caught in the precarious position of the cement not curing properly, micro-cracking or even worse, debonding from the primer, days or months down the road."

Low Temperature Detection

New England's frozen winter also presented unplanned obstacles for Higgins' team. On one occasion, the platform sensors detected ambient conditions approaching the low 40 degrees, well below the specification range of the Mapei floor preparation system, which included primer and self-leveling underlayment.

Onsite personnel received cell phone notifications of this concerning situation and shared the 48-hour graphs with the GC. As a result, portable heaters were installed bringing ambient temperature up to the proper specification range, aiding the material to properly cure.

Once again, this prevented what could have been a serious flooring failure. One that would be expensive to repair and harmful to the project's schedule.

Photo and Note Capture

The Higgins team also utilized the platform's intuitive photo and note capture functions to document key information proving useful in the future. Key information pertaining to product batch codes, the status of jobsite conditions such as room availability, lighting conditions, substrate quality, flooring protection, and the work of neighboring trades were all captured.

This information was communicated to personnel from Higgins' own team, the general contractor, and the owner's project manager. All of this content was permanently and securely archived in Higgins' project job file record.

Moreover, the desktop application enabled Higgins to easily select important content from the job file, automatically compiling it into pre-formatted reports, ultimately shared with key stakeholders.

Higgins' usage of Floorcloud enabled the firm to manage its work throughout a demanding production schedule and interruptive climate conditions. The sensors provided real-time alert notifications throughout the project, enabling installers to avoid potential installation challenges possibly resulting in expensive rework and project delays. The platform now is a standard technology solution that Higgins counts on for key projects... and promotes to its clients to help win more business. CCR

Snapshot of the Science One Project

Floor area: 200,000 square feet

Flooring: Tarkett IQ Granit SD, Melodia, Heat Weld

Adhesives: Tarkett 906 Conductive Adhesive, 925 Adhesive, Powertape,

Surface Preparation: Mapei Planiseal MSP, Novaplan 2 Plus

Flooring Contractor: M. Frank Higgins & Co.

General Contractor: Dimeo Construction

Architect: Payette

Owner: University of Connecticut

Ron Treister is a marketing communications specialist. For three decades, he has worked with major accounts in the commercial construction sector. He can be reached at rontreister@gmail.com.