Company Introduction

PCL Construction is a conglomerate of general contracting construction companies with operations in the United States, Canada, Australia, and the Caribbean. With $7B in US revenue, PCL specializes in heavy industrial, civil infrastructure, and buildings market. They were awarded the Midfield Satellite Concourse (MSC) North project, a 750,000 sq.ft. expansion building at the Los Angeles International Airport worth $1.6B. The project involved constructing a 1,000-foot underground pedestrian bridge with moving walkways to connect the Midfield Concourse to the nearby Tom Bradley International Terminal.

The Challenge

The job required a mass concrete pour in an underground tunnel, so structural integrity and maturity of the concrete was extremely critical. The client needed a solution for monitoring temperature, temperature differentials, and strength in real-time to ensure that concrete did not pass threshold limits and achieved the given quality standards. PCL found that on-site data collection with loggers and smartphones proved to be far too time-consuming and unreliable in addition to increased operational costs.

The Solution

PCL Construction chose to use AOMS LumiCon for 2 major reasons, off-site data collection and distributed sensing. As an end-to-end IoT solution, LumiCon included sensors, cloud connectivity and a robust software. In this project, over 100 concrete sensors across 21 cables were used to monitor temperature distribution and concrete curing in a mass poured slab.
Unlike other concrete sensing solutions, LumiCon started transmitting data to the cloud upon installation without a need for job site visits to log and collect data. All project stakeholders were able to access data instantly and easily through the LumiCon app on their mobile devices. The LumiCon platform used ASTM C1074 to calculate concrete maturity and strength in real-time.

The Result

AOMS worked closely with the LAX project team to customize different data analysis features. PCL had critical data from concrete available to them in real-time, every 15 minutes. This project had 100+ sensor points that successfully monitored temperature differential across mass concrete slabs with a temperature accuracy of ±0.4 °C. There were no failures in any of the sensors and the reported strength from LumiCon sensors matched with cylindrical testing with a ±5% margin. Alarms were set on the LumiCon mobile application by project managers to notify the team when the concrete reached 35MPa strength.