Improving Transparency, Traceability, and Visibility

Sensor and software system allows producers to get concrete right the first time, every time

by Karli Langner

According to a McKinsey and Company report from 2016,[1] large capital projects are typically 20 months late. It's clear that solutions are needed to help construction companies gain supply chain visibility so they can quickly react to issues, remain far ahead of jobsite problems, and stay on schedule. Many ready mixed concrete companies are doing their part by investing in software like COMMANDassurance, which improves transparency, traceability, and visibility for their products.

Process Insights

Streamlined transparency, traceability, and visibility are key for handling operations quickly and efficiently—especially when problems arise. Most construction supply chains involve a network of resources scattered across geographically dispersed sets of production facilities, office spaces, and jobsites. To ensure successful and efficient operations, tools must ensure transparent work processes, traceability of material properties, and visibility into material flows.

Transparent work processes allow each business to capture high-level information such as a product's components, names of suppliers, locations of facilities, and associated certificates. Transparency thus allows a producer to map its entire supply chain, gaining clear visibility to ensure that each operator is compliant with safety, sustainability, and social responsibility requirements. Supply chain transparency improves accountability because each constituent can upload and access data and information. When information is shared, teams become aware of updates in each stage of a process, resulting in shorter lead times, fewer delays, and reduced redundancy.

Traceability refers to the capture of granular data and information (batch-Internet of Things [IoT] data, purchase order data, and other operational information). The focus is on following certain batches of components or purchase orders as they move along the supply chain. The specificity of the information used in traceability helps with targeting product recalls and reducing the overall scale and cost of such incidents.

Visibility within the supply chain is a combination of transparency and traceability in that it allows teams to see orders and material movements from source to destination. Having clear visibility into material flows and traceability of material properties helps to ensure that quality is a priority. With accurate, real-time visibility, businesses can proactively manage their projects and gain confidence in the schedule, costs, and assurance of outcomes. Because each transaction is recorded in sequence, trading partners have a permanent audit trail that can verify a product's quality and trace it through its chain of custody.

Visibility via COMMANDassurance

Supply chain visibility is the key for ensuring that every concrete batch is correct when it arrives at the jobsite. In each load, COMMANDassurance monitors slump, temperature, and water-cement ratio (w/c) in real time, so the producer and the contractor know what happens to each load after it leaves the plant.

COMMANDassurance also allows construction firms to capture historical data on the properties of fresh concrete, from loading to placement, and this enables them to make decisions that can ensure continuing high quality, avert risk, enhance production, and increase delivery efficiency. Each load of concrete can be batched correctly, and there will be no need for adjustments at the jobsite.

COMMANDassurance in Action

For half a century, family-owned Wayne Davis Concrete Company has flourished in Tallapoosa, GA, USA, delivering the highest quality ready mixed concrete, crushed stone, and sand. All of Wayne Davis's 14 concrete plants are equipped with automated batching, dispatching, and billing solutions from Command Alkon.

COMMANDassurance is implemented with stainless steel sensor probes installed in the drum of each concrete truck. Integration with software and related technology allows typical properties of the concrete mixture to be analyzed and communicated in real time, all the way through placement. The system thus allows for continuous improvement, as the collected data brings meaningful information to the enterprise.

Implementation was easy; a representative from Command Alkon visited Tallapoosa to demonstrate the installation of the system into a single truck. After that, one Wayne Davis employee was able to install the system on a truck in less than a day. Now, all of the company's 100-plus concrete trucks report in-transit properties of each load.

The Wayne Davis quality assurance team knew that the system would give them the information needed to better monitor the plastic properties, temperature, and water demand of its batches. But they quickly realized that the system could give the company other useful data. For example, they learned that a lot of time was being spent unnecessarily washing out trucks after each delivery. According to Austin Davis, Quality Assurance Field Coordinator for Wayne Davis, "Having that information from COMMANDassurance has saved us 2 to 3 minutes per load. When you have numerous loads a day, that's a lot of time saved—especially by the time the end of the week rolls around."

The data from COMMANDassurance presents many operational benefits in other areas of Wayne Davis's business, such as monitoring batch/plant performance, quality control, and producing concrete that is exactly what the customer wants. Davis continued, "From a quality control perspective, we use the data we receive to monitor how

The COMMANDassurance system includes a stainless steel probe that is mounted inside the mixer drum to provide data on the mixer speed, water additions, slump, and batch volume. The data are displayed on the truck display and transmitted to the COMMANDassurance network for supply chain visibility

The COMMANDassurance system includes a solar panel to ensure power for continual data streaming

we're loading the concrete and the water addition on-site to try to improve the mixes. It also assists in ensuring the concrete is produced to the specification of the customer so that we can deliver it quickly with no issues and get the truck back to the plant to get another load."

Wayne Davis continues to capture data and use these data to find more ways to increase efficiencies. With insight into the status of each truck, the company has gained an unprecedented advantage and is working more productively. "When I get a call that there's an issue," reports Davis, "I can quickly look at the COMMANDassurance data and determine whether we need to send that truck down the road or dump it out at the plant. You can basically see everything about the truck, so with COMMANDassurance, I feel like I know more information sitting here in Tallapoosa—or wherever I'm looking at the data from—than I did standing beside the truck without COMMANDassurance."

With the system, Wayne Davis now has the ability to capture a true picture of the company's materials in transit: *w/c*, slump, temperature, and even admixture dosages. This information is consolidated into easily digestible reports and data that can be traced back to the source.

Wayne Davis and Command Alkon have found that the temperature readings from the probe are extremely accurate, and they have been working with the Georgia Department of Transportation (GDOT) to use probe data for acceptance.

After running hundreds of thousands of yards of concrete through the system, the quality assurance team at Wayne Davis is confident that recognition of COMMANDassurance data would save several loads of concrete per year on GDOT projects.

By embracing secure, cloud-based software innovations and powerful data, Wayne Davis is empowering its business to make better business decisions through improved efficiencies and insights—not to mention, they're taking their excellent customer service up a notch.

Reference

1. Agarwal, R.; Chandrasekaran, S.; and Sridar, M., "Imagining Construction's Digital Future," McKinsey and Company, June 2016, 14 pp.

—Command Alkon, **www.commandalkon.com**

Selected for reader interest by the editors.

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