

EXECUTIVE SUMMARY

Webcor Concrete Group (WCG) is a self-perform subsidiary of Webcor Builders, a large general contractor in the state of California. Inefficiencies plague the construction industry, resulting in Webcor reaching out to the Cal Poly Industrial and Manufacturing Department and its students for help. The opportunity addressed in this report centers on a lack of concrete pour data collection. This gap results in a struggle to defend against, or pursue, backcharges with their concrete suppliers regarding additional labor costs or wasted material. The project objective is to provide WCG with a baseline data collection system and procedure, leading to increased back-charge accounting, future project justification, and root cause analyses of inefficiencies.

The authors first researched automated GPS and RFID truck tracking systems, but ultimately used an iterative design process to create a manual data collection software solution. With the assistance of current Webcor Project Engineers, the authors were able to view several concrete pours, determining specific and measurable metrics to be collected for the data collection application. After researching software alternatives on the market, the authors pursued a solution that utilized Microsoft Excel and its formulas, charts, and coding language. The Excel workbook underwent several revisions, each building upon the last with project sponsor feedback and recommendations.

Once the final design was completed, the Excel workbook was distributed throughout WCG for Project Engineer use and Project Manager review. This feedback was used to conclude that the design met all project objectives; however, recommendations for additional functionality show that this design can be extended further. It can also be concluded that Industrial Engineering tools and methodology are applicable and beneficial to the construction industry, i.e.

‘Lean Construction.’ Long term implementation of the workbook will ultimately verify the success of the solution.

As a result of the workbook being developed free of cost by the authors, it is recommended that Webcor implement the tool and standard procedures, as there are no economic barriers, but only potential gains. The biggest impacts associated with the design implementation are organizational. In the short term, Project Engineers will dedicate additional time to data collection and input, but could potentially save time if redundant procedures are eliminated. The design also increases accountability of all parties in the concrete construction supply chain, provides a means of tracking long term Project Engineer performance and project progress, and can be used to justify future process improvement projects. Moving forward, it is recommended that an automated GPS or RFID truck tracking system be pursued and that efforts be made to turn the desktop application into a cloud-based one for increased collaboration and data visibility.