

Conceptual Design of Advanced Construction Progress Monitoring with Terrestrial and Robotic Laser Scanning Systems

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SUMMARY

Advanced geomatics tools such as robotic and terrestrial laser scanners have the potential to significantly improve the progress monitoring of construction sites throughout their life cycle, particularly in the concrete structures, from the initial stage to cracking the ground for excavation and shoring to outdoor pouring of concrete at above levels and indoor finishing processes. Using 3D laser scanners to collect point cloud data and importing it into a BIM platform can lead to effective construction quality assessment, promoting sustainability in the building industry. By performing a robust BIM-based quality control system, including comparing as-built models extracted from point cloud data with the original as-designed drawings in 3D digital format, discrepancies can be detected and conflicts prevented during construction. Geomatics engineers are the groups of people who are involved in construction projects from the beginning. They now track construction progress using a combination of terrestrial lidar systems and emerging technologies such as robotic lidar systems mounted on autonomous mobile platforms or drones. This paper presents a framework for the effective use of advanced lidar systems to collecting 3D laser scanning data during different construction phases, in order to support the efficient quality control process in a BIM framework.

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