Integration of Safety Risk Factors in BIM for Scaffolding Construction

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ABSTRACT

65% of US workers in the construction industry work on scaffolding. Of these workers 4,500 are injured and 50 die every year due to scaffold-related accidents. Proper safety management such as scaffolding safety inspections can support the hazard mitigation and prevention. This paper shares the results of a study of the levels of safety risk at each stage of the scaffoldings project life cycle for building a masonry wall and how these risks and related mitigation suggestions can be applied to Building Information Models (BIM). Safety is integrated with 4 dimensional (4D) BIM by linking the scaffoldings safety risks and mitigations with the project schedule. The 4D BIM can be used as a tool for the safety management to monitor and diminish the safety hazards associated with scaffolding work. Four different stages of research were conducted to determine the safety risks and implement them, and the mitigations, into BIM. (1) Determine the activities associated with working on scaffolding. (2) Collect data from industry professionals about the likelihood and severity of safety hazards at each stage of the scaffolding project life cycle. (3) Establish the safety risks using the collected data and a standardized algorithm. (4) Incorporate the safety risks into BIM and provide mitigation recommendations. As a result, the 4D BIM can be used throughout the project planning and construction progress to inform the safety management of activities associated with the scaffolding that have high safety risks and assist safety management in implementing preventative measures according to given mitigation recommendations.