



Quick assessment tool for assurance of structural safety in the building process

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Summary

From forensic investigation it is known that many structural failures can be attributed to human errors and organizational factors. To provide project leaders with information on the current state of factors in the building process influencing structural safety, we developed a quick assessment tool. Logistic regression was used, based on data of influencing factors from a national questionnaire, to derive a function that predicts the probability of a successful outcome, regarding structural safety. The results show that a function with only the factors collaboration, risk analysis and control could predict a successful project correctly in 85% of cases, with collaboration as most determining factor. Although this method has limitations, it gives a quick indication of the degree in which problems regarding structural safety are to be expected. We believe that this tool has the potential to develop into a risk management tool.

Keywords: risk management, structural safety, building process, quality assurance

1. Introduction

Every building industry suffers from structural failures, sometimes resulting in the collapse of structures. Research shows that 70-90% of these failures is caused by human errors in the design and construction process [1,2,3,4]. Errors can occur in every working environment, although it is expected that the majority of employees intends to do a good job. It appears that organizational and human factors determine to a large extent if human errors are made [5].

For building industry it is important to know what human and organizational factors to what extent are influencing the successfulness of building projects regarding structural safety. When these aspects could be assessed during the building process, adequate measures can be taken to adjust the process and bring the project to success.

Within literature various lists of characteristics of the building process or the structure itself are given that might indicate the proneness to errors (e.g. [6]). However, usually the relative influence of various indicators is not quantified.

The goal of this study therefore is to design a quick assessment tool for managers which indicates during the design and construction process to what extent a successful project can be expected, regarding structural safety. In other words, this project aims to derive the relative influence of risk indicators, which are observable or measurable characteristics of the system or its constituents containing information about risk [7].