ERGONOMIC EXPOSURES FROM THE USAGE OF CONVENTIONAL AND SELF COMPACTING CONCRETE

Peter Simonsson[1] and Romuald Rwamamara[2]

ABSTRACT

The use of ergonomic production methods in concrete casting does have a significant human, social and financial impact in terms of the reduction of occupational injuries and related injury compensations. This paper presents a case study of comparative analyses of the ergonomic situations for concrete workers casting with two different types of concrete, namely the conventional concrete and the self-compacting concrete (SCC).

Analyses were conducted with two methods for the identification of ergonomic hazards; and in comparison to conventional concrete, the analysis results have shown that SCC consistently gave significant improvements in work postures and led to less workload and noise exposure among concrete workers.

The combination of lean thinking and ergonomics result in a system where the worker is as efficient, safe, and comfortable as possible during the concrete casting work process. Material handling plays a significant role in lean construction by keeping the worker at the center and ameliorating many of the ergonomic problems that would otherwise remove the person from the production process. Transportation and unnecessary motion are two of the seven types of wastes that can be significantly reduced with the implementation of an ergonomic production system such as SCC that eliminates awkward work postures and vibrating tools. With the correct ergonomic material/product used in production of concrete structures, waste can be removed from the production system, thus creating an increase in production, decreased costs, an increase in quality of the product and less absence of workers in the future due to less stressful work.

KEY WORDS

Work environment, worker safety, concrete casting, risk management, lean thinking, and ergonomics.

INTRODUCTION

Employees who are well and content with their work are a key factor in a successful company. It is vital for the company to ensure that the working environment and conditions provide the right setting for employees to achieve peak performance in their work. Apart from the personal discomfort involved, work-related problems and ill-health

[1] Ph.D. Student, Div of structural Engineering, Luleå University of Technology, 971 87 Luleå, Sweden Phone +46 920 493140, FAX +46 920 491913, Peter.Simonsson@ltu.se

[2] Senior Researcher, Div of Architecture and Infrastructure, Luleå University of Technology, 971 87 Luleå, Sweden Phone +46 920 492353, FAX +46 920 491913, Romuald.Rwamamara@ltu.se