

ENHANCEMENT OF PRE-CONSTRUCTION STAGE THROUGH LEAN THINKING AND ITS IMPACT ON ENVIRONMENTAL PERFORMANCE

Sheila Belayutham 1

Vicente A. González 1

1. University of Auckland

Construction projects consist of two distinguished phases of work, which are the pre-construction and construction. Pre-construction phase involves processes and decisions made prior to contractor's involvement, with activities such as procurement and design development. The fragmented nature of construction creates inefficient information and knowledge flow at the pre-construction stage that may affect the downstream works. Designs that are produced without contractor's involvement may create waste in terms of designs that do not fit the constructability aspect during construction. Subsequent design changes will have negative consequences on cost, time and quality as well as the environment. However, advanced performance improvement efforts such as lean thinking have always emphasised more on enhancing the production aspect of a project instead of pre-construction. Pre-construction inefficiencies have been side-lined due to its less tangible, lower cost and non-material nature of processes. This research aims to enhance the performance of the pre-construction stage through the implementation of lean thinking. A methodology based on lean tool, Value Stream Map (VSM) is proposed to identify production inefficiencies at the pre-construction stage that may also have adverse impact on the environment at the construction stage. The environmental context applied in this research is construction site water pollution that concerns excessive runoff, erosion and sediment production. The outcome of this research will be beneficial to the construction industry as the methodology proposed could be used to improve the production performance of pre-construction processes, consequently reducing the impact on the environment.

Sheila Belayutham – sbel594@aucklanduni.ac.nz