DEVELOPMENT OF ERGONOMICALLY DESIGNED HOLLOW BLOCK MOLDING MACHINE

THESIS

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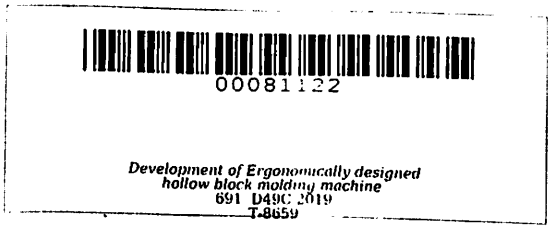
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ABSTRACT

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The study was conducted from August 2018 up to April 2019 at Cavite State University, Indang, Cavite, to identify possible ergonomic risk factors that can cause musculoskeletal disorders (MSDs) to workers while using the current hollow block molding machine. It also aimed to determine the characteristics of the current hollow block molding machine and propose a new ergonomically designed one to reduce, if not eliminate, the risks of acquiring MSDs.

The researchers observed and found out that the two main problems with the current design of the hollow block molding machine are poor ergonomic design and lack of mechanism. For further evaluation, they used two methods for gathering the data. First is direct method, which the researcher has direct contact with the respondents for measuring body dimensions and second is indirect method which the researchers make use of survey questionnaires. Using total population sampling, the number of participants was determined. Rapid Entire Body Assessment (REBA) worksheet was also used in conducting the study to determine the discomforts that workers experience. Some anthropometric measurements of the respondents were gathered which were used as basis in determining the standard measurement of the proposed machine.

The researchers thoroughly analysed the gathered data and these were treated through engineering anthropometrics such as percentile, descriptive statistics, and appropriate statistical tools, such as mean and standard deviation.

After a thorough analysis and evaluation of the gathered data, the researchers were able to design and develop an ergonomic hollow block molding machine. The machine was then evaluated by the users and was considered excellent in terms of its functionality, operability, safety, durability, mobility, and flexibility in terms of capability to process different specs of hollow blocks. The machine was also evaluated in terms of producibility and it was found out that the current machine is more productive than the proposed machine.

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INTRODUCTION

Philippines has been known in the field of agricultural industry yet slowly undergoing in the state of industrialization. Construction industry plays a major role to the wide range production and manufacturing industries. Also, the fast increase in population growth means more homes for families (Crema, 2011). As the construction industry progresses, the need for construction materials increases as well. One of the commonly used construction materials is hollow block.

Concrete hollow blocks are one of the most extensively used walling materials in the Philippines. Some of the reasons for this are their relative low cost as compared to other materials and speed of installation by semi-skilled laborers. Not everyone is aware that the process of making these hollow blocks is an extraneous task especially the