Review Paper on

Ergonomics Application in Civil Engineering .

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Abstract :-

Physical pain is becoming a big factor for workers in the construction business. Masons are compelled by discomforts to create an unsettling and discordant environment, which lowers their motivation to complete their work. It's critical to understand the risk factors and to provide employees with a pleasant and comfortable work environment. The topic of this investigation is ergonomics. The primary goal of ergonomics is to identify the uncomfortable working positions that arise during the construction of buildings and, in the end, to offer methods for preventing pain and discomfort. Employees can work in a pleasant, safe, and comfortable environment by doing this. Many approaches are available for analysis, some of which are simple and environmentally benign and have been specifically explored. For instance, asking employees questions facilitates learning about practical expertise.

Introduction :-

Designing jobs and workplaces to match the capabilities and limitations of the human body is known as ergonomics. To match the worker to the job is a straightforward way to describe it. In contrast to manufacturing, ergonomics aims to design tasks, tools, equipment, and workplaces that fit people become used to them. The name "ergonomics" is derived from the Greek terms "ergon" and "nomos," which relate to taking laws into account when doing a task. It is one of the methods for helping workers do their jobs more easily. Additionally, ergonomics might lessen work-related soreness that can harm the effectiveness and calibre of the work. The construction is defined as the building of something, typically a large structure where the nature of the work imposes a lot of ergonomically hazards to the workers. It is regarded as a demanding job with many employees, and is frequently categorised as a high-risk industry because, historically, injuries like strains, sprains, muscular-skeletal disorders (MSDs), and others, have been much higher and unacceptable when compared to injuries in other industries.

The dynamic and risky nature of the construction business makes it difficult to incorporate ergonomic principles on the job site. Thus, many regulating elements can be considered while integrating ergonomics and reducing ergonomics-related risks in the a building site. A can enhance the application of ergonomics at the workplace through a few measures or strategies including communication, management oversight, and ergonomic design considerations,

training, education, and a documented ergonomics programme are all included. These actions are crucial. In order to raise workers' awareness of ergonomics.

In a typical construction site in India, a number of workers (both skilled and unskilled) with different occupations carry out various phases of the construction work. Skilled workers include carpenters, rod binders, masons, welders, grinders, gas cutters, fitters, riggers, and 'sarang' (crane operator). The unskilled workers mainly help the skilled workers to work at ground level and at heights. Although over the years, a number of such tasks have been mechanized or automated as the technology has advanced, majority of these tasks are still performed manually in different industries of developing countries like India mainly because of the prevailing socio-economic conditions, availability of labour at a very low cost, expensive setup cost for fully automated machineries,

Material and Methods:-

The purpose of this research is to examine how construction labour productivity can be increased by applying motion economics and ergonomics concepts. Since the productivity of these tasks is primarily dependent on labour capability, brick masons, plasterers, wall painters, and ceramic installers in the building industry could be selected as examples. Brick masons could be chosen based on the fact that brick masonry is nearly always built around housing. The jobs of painting and installing ceramics were selected since they need human labour and cannot be automated. Ales-sandro (2009) and Moher et al. (2009) both adhere to the PRISMA (preferred reporting items for systematic reviews and meta analysis) protocol, which is followed in this systematic review. PRISMA is a widely recognised approach for carrying out and documenting systematic reviews.

Results:-

Task-1:Cocrete Mixing

H=10

T=16 sec

W=63kg

P1=120

P2=145

T1=360 sec

Work Done WH1=63 × 9.81 × 3.04 =1883.75NM

$$\frac{WH2}{WH1} = \frac{P2}{P1} \times \frac{T1}{T2} = \frac{145}{120} \times \frac{16}{360} \times 1883.75$$

WH2=101.16Nm

Task-2 Brick Laying

W=63 kg

H=10

T1=16sec

P1=120

P2=140

T2=360sec

Work Done WH1=$63 \times 9.81 \times 3.04$ =1883.75NM

$\frac{WH2}{WH1} = \frac{P2}{P1} \times \frac{T1}{T2} = \frac{140}{120} \times \frac{16}{300} \times 1883.75$

WH2=117.21Nm

Task-3:Plaster

W=63 kg

H=10

T1=16sec

P1=120

P2=140

T2=480sec

Work Done WH1=$63 \times 9.81 \times 3.04$ =1883.75NM

$\frac{WH2}{WH1} = \frac{P2}{P1} \times \frac{T1}{T2} = \frac{140}{120} \times \frac{16}{480} \times 1883.75$

WH2=73.256Nm

Conclusion:-

Despite the fact that every human activity takes place in a constructed environment, there don't appear to be many research on labour productivity that use an ergonomic approach. This article's presentation of the human-centered labour productivity technique is inspiring. From ergonomics' all-encompassing perspective. I am aware that discomfort and a number of other aspects, including forceful exertions, repetition, duration, vibration in the workplace, tools and materials, stress and pains, and accommodations for labourers, can affect the productivity of a workstation. A review of the literature was used to identify the films related to construction productivity. Based on a review of the literature or a detailed investigation carried out by workers during a site visit.

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