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Office building typologies and circadian potential

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Circadian rhythms are internal manifestations of the solar day that allow adaptations to environmental temporal changes. Mood disorders are often associated with disrupted circadian clock-controlled responses, while disruption of circadian rhythms is correlated with jet lag, night-shift work, or exposure to artificial light at night. Modern lifestyles patterns lead to a disruption in the circadian rhythm, resulting in several diseases. Circadian disruption is one of the factors raised, alongside smoking, diet, fatigue, and sleep quality, increased body mass index and obesity. The lack of enough daylight during the day and the exposure to electric light at night has disconnected people from the environment, eliciting psychological problems. The objective of this research is to analyze the circadian potential of three building models according to WELL Certification, compare their performance, and draw design guidelines about circadian rhythm and users'well-being for office buildings. Adaptive Lighting for Alertness (ALFA) tool was used to calculate the Equivalent Melanopic Lux for WELL Certification criteria in the scenarios. The results indicate that shallow office plans could benefit users, providing them with a regular circadian rhythm which improves sleep quality, reduces stress, and prevents serious diseases.

Keyword 1

Daylighting

Keyword 2

circadian rhythm

Keyword 3

office building

Keyword 4

ALFA

Keyword 5

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