OPTIMIZING ARTIFICIAL LIGHTING IN HOTEL ROOM INTERIORS

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ABSTRAK

Hotel adalah salah satu solusi untuk tempat sementara bagi seseorang / kelompok untuk tinggal selama mereka melakukan kebutuhan mereka di daerah / kota. Penyediaan fasilitas pendukung diminimalisir dan disesuaikan dengan kebutuhan kelas hotel yang akan dipilih. Dalam desain, desainer umumnya lebih mementingkan fungsionalitas daripada kualitas pencahayaan. Kualitas cahaya yang kurang baik akan mempengaruhi suasana ruangan sehingga menimbulkan tekanan psikologis pada penggunanya dan gangguan penglihatan yang berdampak pada kesehatan. Tujuan penelitian adalah menganalisis sistem pencahayaan pada kamar hotel dengan mengambil standar dasar pedoman teknis SNI di bidang pencahayaan, yaitu SNI 6197:2011 tentang Konservasi Energi sistem pencahayaan pada bangunan gedung, dan SNI 03-6575-2001 tentang tata cara perancangan sistem pencahayaan buatan. pada bangunan. Simulasi menggunakan perangkat lunak DIALux 9.0 open source, yang merupakan perangkat lunak simulasi untuk menghitung kebutuhan pencahayaan. Hasil analisis menunjukkan bahwa kondisi pencahayaan pada kamar hotel standar di hotel tidak memenuhi standar SNI, sehingga perlu dilakukan beberapa cara untuk mengoptimalkan tingkat pencahayaan.

Kata kunci: Pencahayaan buatan; Hotel; Gorontalo; Dialux 9.0 Simulasi

ABSTRACT

Hotel is one of the solutions for a temporary place for a person/group to stay as long as they do their needs in the area/city. The provision of supporting facilities is minimized and adjusted to the requirements of the hotel class to be selected. In design, designers are generally more concerned with functionality than lighting quality. The quality of light that is not good will affect the atmosphere of the room, causing psychological pressure on users and visual disturbances that have an impact on health. The aim of the research is to analyze the lighting system in hotel rooms by taking the basic standards of SNI technical guidelines in the lighting sector, namely SNI 6197:2011 on Energy Conservation of lighting systems in buildings, and SNI 03-6575-2001 on procedures for designing artificial lighting systems. on buildings. The simulation uses the open source DIALux 9.0 software, which is a simulation software for calculating lighting requirements. The results of the analysis show that the lighting conditions in standard hotel rooms in the hotel do not meet the SNI standard, so it is necessary to do several ways to optimize the lighting level.

Keywords: Artificial Lighting; Hotel; Gorotalo; Dialux 9.0 Simulation

1. INTRODUCTION

Lighting is one of the main parts in an interior. Unfortunately, in general, designers are more concerned with functionality than lighting quality. The quality of light that is not good will affect the atmosphere of the room, causing psychological pressure on users and visual disturbances that have an impact on health (Soegandhi et al., 2015). Basically there are two kinds of light sources that affect the interior space. First, natural light sources that come from the sun, stars, second, artificial or artificial light sources, such as: candle flames, torches, oil lamps, petromax lamps (flames that come from the t-shirt casings which are kept hot due to kerosene sprays that are emitted from comes from a pressurized tube), gas lamps, incandescent lamps, FL lamps (Fluorescent) or often called TL lamps (Stephanus P. Honggowidjaja, 2003).

Indonesia already has room lighting standards set out in the Indonesian National Standard SNI 03-6197-2000. It is stated that for the hotel bedroom category, the recommended minimum lighting is 150 lux (Standar Nasional Indonesia, 2001).

The hotel is one of the solutions for a temporary place for a person/group to stay as long as they are carrying out their needs in the area/city. The provision of supporting facilities is minimized and adjusted to the requirements of the hotel class to be selected (Dermawan, 2017). The potential of the site adjacent to one of the business centers has a positive impact on attracting business people to use lodging accommodations and facilities at the hotel. This makes bedrooms in hotels must be able to meet the comfort needs of visitors, especially in hotel rooms. Endar Sri (1996:8) explains that a hotel is a commercially managed building by providing lodging facilities for the general public with the following facilities: 1) lodging services, 2) food and beverage services, 3) luggage services, 4) laundry , 5) The use of furniture and decoration facilities in it.

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In this study, a case study was conducted by taking the room as the object of testing, namely the standard room. Room parameters are taken based on the function and application of the lighting system in the room, adjusted to the technical instructions listed in the SNI. The simulation uses the open source DIALux 9.0 software, which is a simulation software for calculating lighting requirements.

This research is to make an analysis of the lighting system in hotel rooms by taking the basic standards of SNI technical guidelines in the lighting sector, namely SNI 6197:2011 concerning Energy Conservation of lighting systems in buildings, and SNI 03-6575-2001 on system design procedures. artificial lighting in buildings (Ardiyanto et al., 2014).

2. METHOD

This research uses descriptive and quantitative research method. Descriptive method is a research method that is used to describe situations or circumstances that occur at the present time or are ongoing, aiming to describe what happened as it should at the time the research was conducted. This study is intended to describe conditions related to artificial lighting systems in hotel rooms as they are in relation to visual comfort as objectively as possible. Furthermore, quantitative research methods are data collection methods carried out through literature studies, measurement observations, and documentation. This study uses measurement and simulation methods using DIALux Evo 9.0, carried out in Gorontalo climate conditions on 27 June 2021. While the simulation is carried out in the period at sunset, using 4 times, namely 18.00, 21.00, 00.00, 03.00 and 06.00 WITA.

3. RESULTS AND DISCUSSION

At night when the sun is no longer shining, light is still needed. This is where artificial lighting is needed. Artificial lighting is a man-made lighting system, e.g. candles, lanterns, oil lamps, electric lamps, petromax, etc. The main function of artificial lighting is to provide light that replaces sunlight. But on the other hand, artificial lighting can also be designed in such a way to create a certain atmosphere. Even artificial lighting can support interior design and architecture as desired. Through the play of lights, details and ornaments in the room can be highlighted so that the appearance of the house becomes more attractive (Setiawan & Hartanti, 2014).

This study uses standard rooms at a hotel in Gorontalo.

a . Existing Data

Site location is on Jl. Brigjen General Piola Isa, South Dulomo, North City, Gorontalo City which are trade and service areas, as well as settlements. The orientation of the building is towards the Southwest.

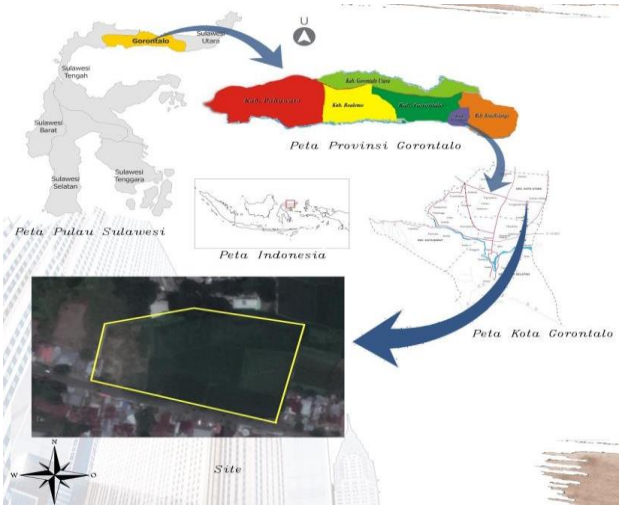

Figure 1. Site Location

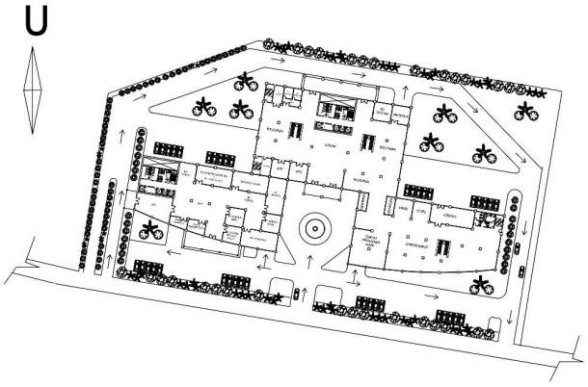

Figure 2. Layout plan

b. Simulation of Standard Bedroom

Bedroom has an area of 24 m2 with a ceiling height of 3.95 m. The bedroom is located on the 6th floor. The room lighting source has natural lighting openings in the form of windows measuring 2.8 mx 3.4 m and comes from general lighting in the form of 11.5 W Philips LED downlights with 4 light points in the middle of the room and 1 in the middle of the room, the room entrance area, and 2 table lamps in the nightstand area.

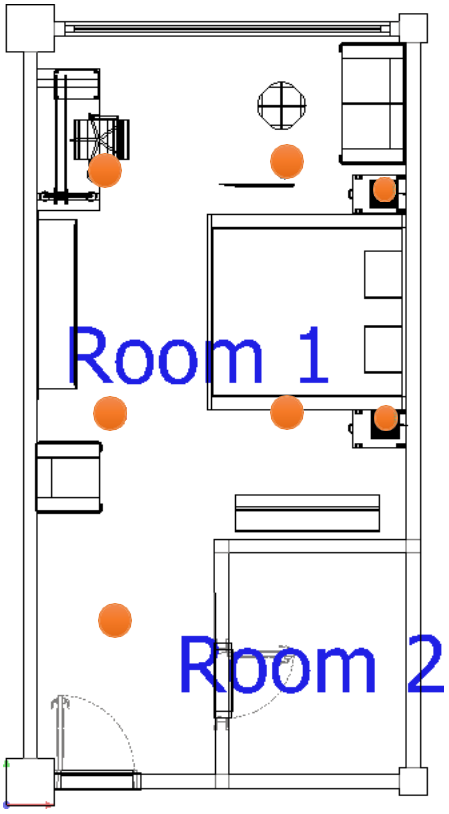

Figure 3. Light Point

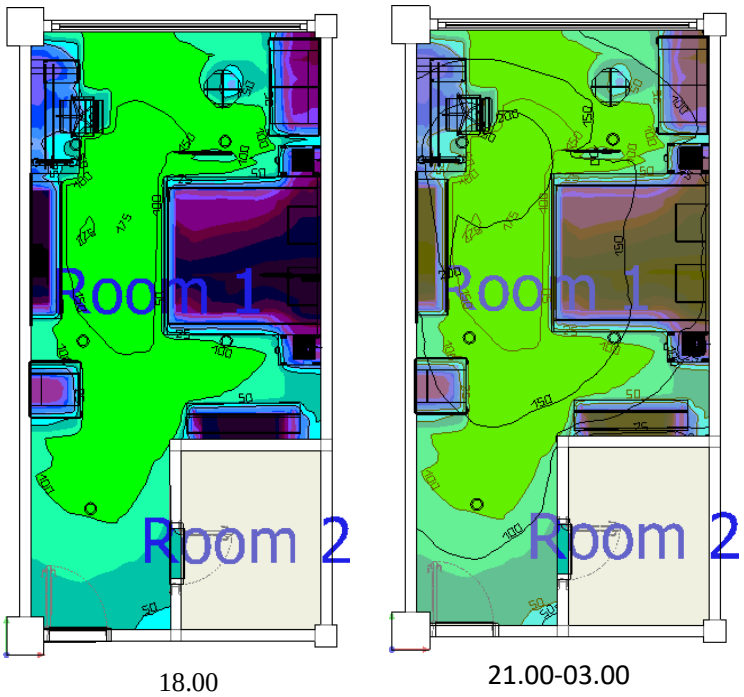

Figure 4. Simulation result on hotel room from 18.00 to 03.00 using Dialux Evo 9.0

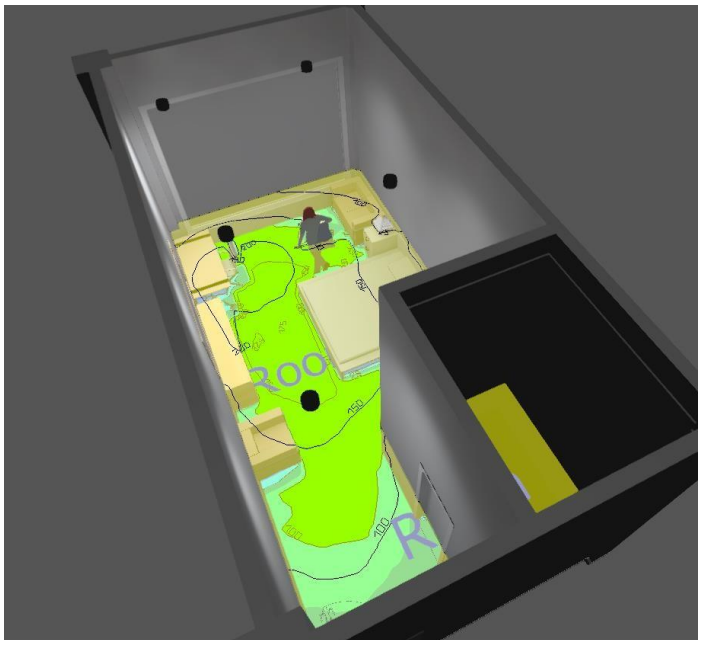

Figure 5. Workplan of the room of hotel using Dialux Evo 9.0

Table 1. Average intensity of artificial lighting in the bedrooms measurement standard

Standard	Standard	Night
Bedroom	150 lux	142 lux

From the values obtained in the table, it can be concluded that night lighting has not yet reached the minimum average of the Indonesian National Standard (SNI) for hotel bedrooms, which is 150 lux.

The most optimal lighting design uses a lighting system in the form of general lighting with direct techniques. The bedroom uses 5 PHILIPS DN140B PSED-E D162 1 xLED10S/830 C downlights. In the nightstand area, a table lamp is given as lighting in the form of 2 3W PHILIPS LED lamps. Accent lighting on the walls in the form of 2 Philips WL130V PSU 1 xLED12S/830 D350 lamps. The average lux after being simulated becomes 157 lux. This means that it meets the lux requirements for hotel rooms, which is 150 lu

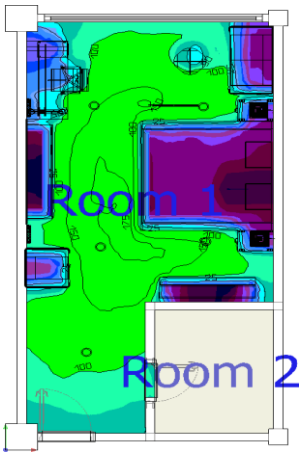

Figure 6. Result of optimizing using Dialux Exo 9.0

4. CONCLUSION

Based on observations of standard type hotel rooms at hotels in Gorontalo, the simulation results show that the artificial lighting in the rooms is still below a good lighting standard based on SNI, which is 150 lux, so additional light is needed to optimize artificial lighting. In the bedroom, using a combination of direct lighting in the form of general, table lamp, and accent lighting can meet the standard lux for hotel rooms. The optimization results show that the lighting that reaches 150 lux is the area around the bed.

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