ABSTRAK

SEBASTIANSUBENO (00000012491)

PERANCANGAN GEDUNG KANTOR DENGAN IMPLEMENTASI SISTEM PENDINGIN AIR

(xiv + 70 halaman: 45 gambar; 10 tabel)

Ibukota Indonesia, Jakarta memiliki kepadatan penduduk mencapai 16.704 jiwa/km². Dengan kepadatan penduduk seperti itu, terjadi efek samping yaitu peningkatan temperatur rata-rata kota tersebut yang dikarenakan pembangunan dan penggunaan energi yang berlebih. Namun peningkatan suhu ini tidak terjadi pada area di sekitar kota Jakarta. 20 kilometer dari kota Jakarta suhu rata-rata dapat menurun sebanyak 5 derajat Celsius. fenomena perbedaan suhu antara kota dengan sekitarnya disebut sebagai *Urban Heat Island* (UHI). Penelitian ini membahas metode mitigasi UHI dengan cara mengimplementasikan sistem pendingin air pada gedung kantor. Terdapat dua pertanyaan yang terjawab dalam penelitian ini, metode pendingin air apa yang dapat diimplementasikan dalam gedung perkantoran, dan bagaimana mengimplementasikannya.

Penelitian ini dilakukan dengan metode penelitian kuantitatif, dengan pengumpulan data berupa studi literatur, studi preseden, dan observasi lapangan. Studi literatur dilakukan untuk mendapatkan teori-teori dan data-data yang merumuskan penyebab dari fenomena UHI, teori-teori dasar perpindahan kalor dan pendingin air, dan teori dasar gedung kantor. Studi preseden dilakukan untuk mendapatkan informasi atas teori terkait yang telah diterapkan secara riil. Lalu observasi lapangan dilakukan untuk mendapatkan data lapangan agar implementasi pendingin air dapat terapkan secara kontekstual dan mendapatkan hasil yang terbaik.

Di akhir penelitian ini, diketahui bahwa sistem jaringan air dengan alat kabut dan kolam dengan air terjun/mancur efektif dalam mendinginkan bangunan dan dapat diimplementasikan pada fasad dan atap gedung kantor.

Referensi: 17 (2012-2020)

Kata kunci: Urban Heat Island, Pendingin Air, Gedung Kantor

ABSTRACT

SEBASTIANSUBENO (00000012491)

OFFICE BUILDING DESIGN WITH THE WATER-COOLING SYSTEM IMPLEMENTATION

(xiv + 70 pages: 45 images; 10 tables)

The capital city of Indonesia, Jakarta has a population density of 16,704 people / km². With such population density, there is a side effect, namely an increase in the average temperature of the city due to overdevelopment and use of energy. However, this temperature increase does not occur in areas around the city of Jakarta. 20 kilometers away from the city of Jakarta the average temperature can drop by as much as 5 degrees Celsius. The phenomenon of temperature differences between cities and their surroundings is known as Urban Heat Island (UHI). This study discusses the UHI mitigation method by implementing a water-cooling system in office buildings. Two problems are resolved at the end of the study, which are the methods of water-cooling that can be implemented in office buildings and how to implement them.

In this research, the best water-cooling system is formulated to be implemented in office buildings and how to implement them. This research was conducted using quantitative research methods, with data collection in the form of literature studies, precedent studies, and field observations. Literature studies were conducted to obtain theories and data that formulate the causes of the UHI phenomenon, basic theories of heat transfer and water-cooling, and basic theories of an office building. Precedent studies were conducted to obtain information on related theories that have been applied in real terms. Then field observations were carried out to obtain field data so that the implementation of water-cooling can be applied contextually and get the best results.

At the end of the study, water pipes complemented with water mister and water bodies with fountains proved effective in cooling the building and can be implemented on the facade and the roof of office buildings. With the results of the analysis of this study, this research is expected to be a guideline for other architects to realize the UHI phenomenon and participate in reducing the impact of UHI.

Reference: 17 (2012-2020)

Keyword: Urban Heat Island, Water-cooling, Office Building