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Study between Comfortability, Materials, and Room Layout of The Library in The Bosscha Observatory Area

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Abstrak

Observatorium Bosscha merupakan observatorium tertua di Indonesia yang memiliki banyak sejarah sejak awal pembangunannya. Observatorium Bosscha masuk dalam kriteria bangunan cagar budaya sejak tahun 2018. Salah satu ruang penunjang kegiatan observatorium adalah perpustakaan dan ruang baca yang digunakan peneliti untuk mengumpulkan literasi untuk interpretasi observasi dan hasil penelitian. Ruang baca penting bagi peneliti dan pengunjung untuk memperoleh informasi tentang astronomi. Sedangkan perpustakaan di kawasan ini merupakan salah satu perpustakaan peninggalan Belanda dengan referensi bahasa Belanda dan Inggris sebagai referensi utama para peneliti astronomi. Penelitian ini bertujuan untuk mengungkap bagaimana material dan tata letak suatu ruang dapat mempengaruhi kenyamanan pengguna ruang tersebut. Penelitian ini menggunakan metode deskriptif kualitatif, diawali dengan observasi, studi literatur, dan menggambar ulang visualisasi 2D dan 3D dari data yang diperoleh di lapangan. Hasil penelitian ini akan bermanfaat bagi pembaca mengenai keberadaan bangunan peninggalan Belanda yang perlu dilestarikan dengan cara digunakan kembali tanpa adanya intervensi dari faktor kenyamanan buatan lainnya.

Kata-kunci : Observatorium Bosscha, Bangunan peninggalan kolonial Belanda, Material, Tata letak, Perpustakaan

Abstract

Bosscha Observatory is the oldest observatory in Indonesia, and it has a lot of history since its initial construction. The Bosscha Observatory has been included in the criteria for cultural heritage buildings since 2018. One of the supporting spaces for observatory activities is a library and reading room, which researchers use to collect literacy for interpretation of observation and research results. The reading room is important for researchers and visitors to obtain information about astronomy. Meanwhile, the library in this area is one of the Dutch heritage libraries with Dutch and English references as the main references for astronomy researchers. This research aims to reveal how the materials and layout of a space can influence the comfort of users of that space. This research uses a qualitative descriptive method, beginning with observation, literature study, and redrawing 2D and 3D visualizations from data obtained in the field. The results of this research will benefit readers regarding the existence of Dutch heritage buildings that need to be preserved by being reused without intervention from other artificial comfort factors.

Keywords*: Bosscha Observatory, Dutch colonial building, Materials, Layout, Library*

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INTRODUCTION

The Bosscha Observatory is Indonesia's oldest modern astronomical research site and the first in Southeast Asia. This place is a Formal Research and Education Institute for Astronomy in Indonesia (Rangkuti & Hartono, 2020). With the establishment of this observatory centre, astronomical science in the Indonesian archipelago began its international contribution to the development of astrophysics in the topics of stars, solar systems, and galaxies. This needs to be supported by a library and reading room for researchers. The reading room and library used must meet comfort standards for users.

The achievement of research activities in reading rooms and libraries can be influenced by thermal comfort, spatial arrangement, and materials supporting research activities. Thermal comfort that meets standards and good spatial planning can make researchers comfortable conducting research. Astronomy-related activities are carried out at night for quite a long time. Therefore, long-term use of the room requires comfort from morning to evening to make it easier for researchers to study everything related to astronomy.

The library and reading room in the Bosscha observatory area have been established since 1931. This Dutch heritage building has large columns and thick walls and uses a sloping roof. By using these materials, buildings with appropriate openings should be able to meet thermal comfort standards. Thermal comfort in a building in a tropical climate with optimal comfort criteria ranging from 22.8º C – 25.8º C and healthy air humidity of 40% - 60% (MENKES, 1998; Adryan et al., 2023; Elbes & Munawaroh, 2019).

The library building and reading room in the Bosscha Observatory area are cultural heritage buildings with a typical Dutch heritage style, namely colonial buildings. Colonial buildings are generally symmetrical, consisting of a base, body, and clear roof. The base of the building is covered with river stone material to emphasize that part at the foot of the building. Usually, there are stairs leading to the entrance. The body of the building has high walls, usually white; the pillars are open, the tall windows are the same size, and the entrance is right in the middle. Meanwhile, the roof covering is a shingle roof (Savitri, 2013).

When people read books, study, and conduct research in a reading room, they need thermal comfort. This comfortability can be achieved through natural and artificial ventilation. The reading room and library building at the Bosscha Observatory only use natural ventilation, supported by building materials that comply with Dutch standards. This research aims to reveal how the materials and layout of the library and reading room can influence the comfort of users of that space. This research uses a qualitative descriptive method, beginning with observation, literature study, and redrawing 2D and 3D visualizations from data obtained in the field. The results of this study will benefit readers regarding the existence of Dutch heritage buildings that need to be preserved by the adaptive reuse concept without intervention from other artificial comfort factors.

Influence Factors of Comfortability in Reading Rooms and Libraries in General

A *library* is a place that holds lots of books so that many people come and stay for a long time to read and do assignments. Every activity requires concentration, which is obtained when the person feels comfortable**.** Based on facts regarding libraries, it is necessary to research comfort aspects, especially thermal comfort in a library building (Purwanto, 2017; Rilatupa, 2008). Thermal comfort is a state of satisfaction that humans feel in responding to a thermal condition, whether consciously or unconsciously ('American Society of Heating, Refrigerating and Air-Conditioning Engineers' 1979; Sugini, 2004). Because a temperature difference that is too large between human body temperature and the temperature of the surrounding environment will cause discomfort, either in the form of cold or heat (Latifah et al., 2013) (Elbes & Munawaroh, 2019).

According to Widodo and Budi, the design of a good building or environment will cause people to feel more comfortable and safer and it can increase the productivity of the people inside it. In contrast, a bad design will make people feel powerless and cause stress (Fakhrunnisa in Noviani et al., 2014). The comfort aspect can be seen in sufficient lighting; the reading room is equipped with air conditioning and clean, neat, and adequate facilities and infrastructure. In building technology theory, one of the comfort factors that influence human productivity in space is thermal comfort (Istiningrum *et al.,* 2017).

The layout and material of the room's interior and their relationship to colonial buildings discourses

The arrangement of library spaces must have connections between spaces seen from various aspects ranging from efficiency, workflow, service quality, security, and control in the form of supervision. There

is a reading room and book collection room, which play a very important role in the library, as well as an administration room, which is useful for the administrative needs of visitors or officers, so computers, telephones, and bookshelves are needed (Herlina in Janiar, 2013: 131). Apart from that, the library room needs to provide and pay attention to the layout to provide comfort, complete furniture for the library and visitors, comfortable room conditions, cool room ventilation, lighting, and appropriate and comfortable wall paint colors. This will attract people to visit (Utanya, 2019; Aryani *et al.*, 2021).

Thus, the influence of interior design on reading comfort will provide benefits if the library interior design can be adjusted to the needs and desires of users. Likewise, with special libraries, where special libraries must be able to provide information needs for users who need it. In this study, the library building is included in the cultural heritage buildings, which must be maintained in their original form by carrying out routine renovations every five years. Renovations are done by repainting the building with the same or close to the original color. This is by Indonesian government regulation number 7 of 2018 Article 53 Paragraph 2, namely that the restoration of cultural heritage must pay attention to:

a. authenticity of materials, shape, layout, style, and/or artistry technology;

b. original conditions with the smallest possible degree of change;

c. use of non-destructive techniques, methods, and materials, and;

d. implementing competence in the field of restoration.

RESEARCH METHOD

This research aims to determine the influence of materials, spatial planning, and ventilation in reading rooms and libraries on thermal comfort, which was obtained from observation results. This research uses a qualitative descriptive research method. Descriptive because it involves collecting data in a natural context to interpret the occurring phenomena. Data collection techniques are combined, and data analysis is carried out qualitatively. The research location and also the results of the field survey showing the existing interior spaces of the library and reading room can be seen in the picture below (see Figures 1 and 2 below):

Figure 1. The interior layout of the reading room

Figure 2. The interior of the library and details of the book cabinet

Information Collection Procedures

This research collects information using qualitative methods, which are also subjective in nature with the research techniques used, namely observation and interviews. After obtaining observational information from natural data collection, the theory will be analyzed with the theories that have been previously searched and conclusions will be drawn based on the results of the analysis and interviews. The research phase can be seen in Figure 3 below:

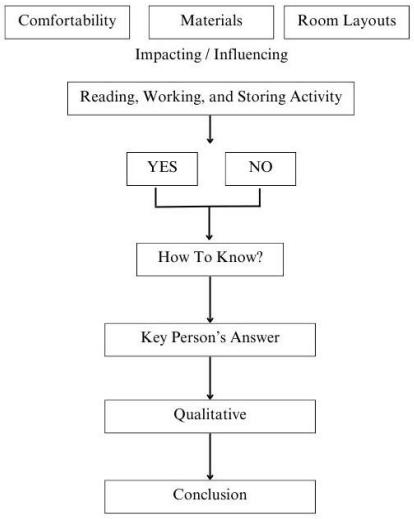

Figure 3. Research phase

RESULT AND DISCUSSION

Comfortability in the interior of Dutch colonial buildings

The library in the Bosscha Observatory area is a cultural heritage building that is still in use and maintains its authenticity. Several things make this building included in the classification of cultural heritage buildings, namely using original materials from Dutch heritage, such as natural stone walls, ceramic tile floors measuring 20 cm x 20 cm, and frames using wooden materials. The Bosscha Observatory library building was built around 1931 with a donation from *R. A. Kerkhoven.* The library was built with walls 30 cm thick to make the building fire-resistant, indicating the importance of the collections in the library.

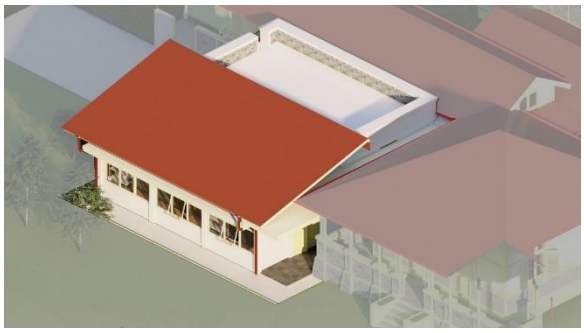

Figure 4. Visualization of research objects

Figure 4 above shows the entire library building and reading room in 3d isometry. in the front view, the building is directly facing and connected to other buildings. Natural ventilation can be seen in Figure 5 below:

Figure 5. 3D visualization that shows natural ventilation

The picture above is the result of a 3D visualization that shows the side of the reading room building, which has windows along its side and directly faces the view outside the building.

Between natural materials, lighting, and ventilation

Regarding the use of natural materials, here are some of the materials used in the library and reading room building:

a. Riverstone as part of the wall material

b. Wood with brown paint finishing for some furniture

c. Wood with white paint finishing for ceiling material

d. Wood with yellow paint finishing for door and window frames

e. Ash-colored tiles with a size of 20 cm x 20 cm for floor material.

Figure 6. 3D visualization of the building's isometry

Rear garden: At the back of the building, there is a garden and stairs to access the rooftop (concrete deck) above the library room. This corridor is next to the reading room, accessed directly from the back of the garden. At the library entrance, access to the library crosses the main corridor with an entrance door made of wood with yellow finish and on the right and left walls with river stone ornaments.

Library room: In the library room's interior, bookshelves are lined up from the entrance to the back of the room and are reasonably large from floor to ceiling. The main corridor is a link that accesses the library and the reading room. The floor used in this corridor is 20 cm x 20 cm tiles with ash colour. The entrance to the reading room, the location of the entrance is located in the same corridor as the library, with doors made of wood and yellow finish; the right and left walls of the reading room entrance do not use riverstone ornaments.

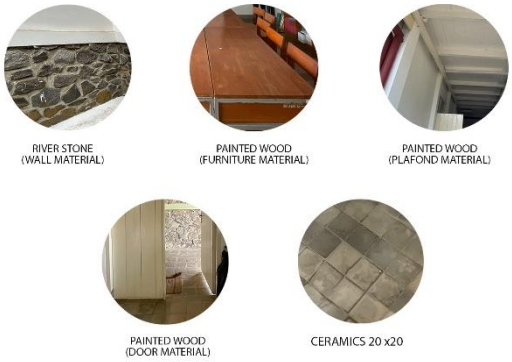

Figure 7. Details of natural materials

The following are the types of materials used in the library building and reading room (see Figure 7 above). The original materials used have not changed since the building was built.

Figure 8. 3D visualization of reading room's interior

Figure 8 above shows the interior of the reading room building, which shows the placement of furniture, such as bookshelves and tables used for discussion activities. Figure 9 shows the interior of the entrance view of the library room and book cabinets.

Figure 9. 3D visualization of library and book cabinet's details

Seen from the front of the library room is divided into small corridors with book storage shelves that are high up to touch the ceiling. The function of these small corridors is to facilitate the search for books.

The room's layout impacts on user productivity

The layout between the library and the reading room can be seen in Figure 10 below:

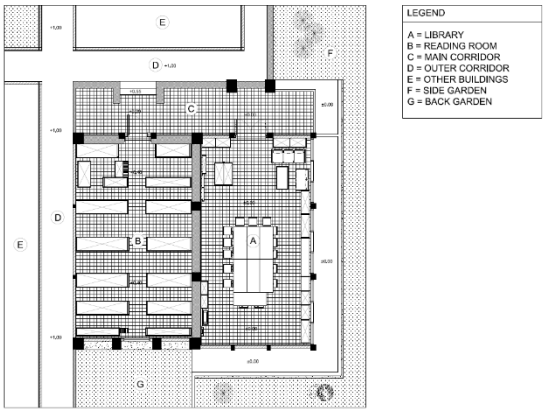

Figure 10. Layout of library and reading room

Table 1. Respondent's Answers based on the interview

Reading Room				
Numbers	Terms	Factor	Age Ratio	Gender
1	Comfortable	Facilities, Ambience, Comfortable air	30-50 y.o	Female 1, Male 1
2	Uncomfortable	Layout: Uncomfortable with stale air due to crowds	30-50 y.o	Female 1, Male 1
3	Neutral	Accustomed to space, do not care about the comfort condition	40-60 y.o	Male 1
Library				
1	Comfortable	Facilities, Ambience	30-60 y.o	Female 1, Male 2
2	Uncomfortable	Low lighting, Lack of ventilation, Dust	30-60 y.o	Female 1, Male 2
3	Neutral	Accustomed to space, do not care about the comfort condition	30-50 y.o	Male 1

Table 2. Comfortability, Materials, and Room Layouts

Element	Findings	Future improvement
Comfortability	By using original Dutch-era materials, the temperature in the reading room and library is still fairly comfortable to use. In addition, the location is in the highlands which does have cool air. Comfort in terms of lighting is still a little lacking in the library room because the position of the lamp is only in the main hallway, while in the hallway containing books, there is none. The reading room during the day gets natural lighting and at night uses lights.	For future improvements, the lighting and placement of light points in the library should be more customized. From the comfort of the room is quite comfortable, but there is a little more air ventilation.
Materials	Regarding the use of natural materials, most of the frames use wood, and the front facade of the reading room and library uses ash tiles with a size of 20 x 20.	Selecting sustainable materials and maintaining their authenticity, such as coating on window frames and doors and selecting tiles for finishing grounding materials
Room layouts	The spatial arrangement in the library is quite neat, using shelves that have a height that reaches the ceiling. In the reading room, the arrangement of shelves and tables is still a little lacking and can still be rearranged.	Re-arrangement of the reading room is needed, such as rearranging the position of the bookshelves and rearranging the tables and chairs, which can be divided into two types, namely tables for discussion and tables for themselves. Thus, the room will look neater and attract the attention of library users who will read books.

By integrating comfort, the use of appropriate materials, and optimal spatial arrangement, users will get a good experience in the reading room and library in the Bosscha Observatory area. User comfort is a top priority by taking into account environmental factors that can meet functional needs. The use of materials that have not changed from when it was built by the Dutch which have high quality, not only affects thermal comfort but is also environmentally friendly because the building does not need artificial ventilation. In addition, the optimized spatial arrangement will ensure efficient use of the area and provide flexibility for users to adapt to various needs.

CONCLUSION AND RECOMMENDATION

In the context of the city of Bandung, which is rich in history and cultural heritage, in-depth identification of cultural heritage buildings, especially the library and reading room in the Bosscha Observatory area, reveals layers of historical values that enrich the identity of the City of Bandung. As a science and research centre, the Bosscha Observatory is a witness to the development of astronomy in Indonesia and holds a long story of Bandung itself.

By identifying library buildings and reading rooms in the Bosscha Observatory area, these buildings can be recognized as an integral part of cultural heritage buildings in Bandung. With an age of over 50 years, they reflect a striking Dutch architectural heritage, making a significant contribution to the cityscape. The importance of preserving this cultural heritage lies not only in its historical and architectural value but also in the functions that have remained intact since it was first built.

As an essential part of the city's identity, the Bosscha Observatory's library and reading room symbolize continuity of knowledge and historical heritage. By understanding and celebrating these values, we not only ensure that the traces of history remain alive but also acknowledge the central role of the City of Bandung in shaping Indonesia's cultural journey. Therefore, sustainable adaptive reuse efforts must be encouraged so that future generations can continue to experience and appreciate the cultural heritage that has become an inseparable part of the diversity and prosperity of Bandung.

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REFERENCES

Adryan, A. Z., Ramdhani, M. W., Darwanto, T. C., Budiarto, L., & Wardhani, M. K. (2023). *Study of Color, Atmosphere, And Furniture In Architectural Studio Classroom: Perspective From*. 1–8.

Aryani, F., Ekonomi, J. P., Ekonomi, F., & Padang, U. N. (2021). *Analisis Tata Ruang Perpustakaan Sekolah*. *4*(2), 259–269.

Albi Anggito, Johan Setiawan. 2018. *Metodologi Penelitian Kualitatif*. ed. Ella Deffi Lestari. Jawa Barat: CV Jejak.

Elbes, R., & Munawaroh, A. S. (2019). *Penilaian kenyamanan termal pada bangunan perpustakaan Universitas Bandar Lampung*. 85–98.

H, Irfan Sabarilah et al. (2018). "Rancangan Kawasan Observatorium Bosscha Ditinjau Dari Pola Tatanan Massa Dan Vegetasi." VI (4): 1–9.

Noviani, R., Rusmana, A., Rodiah, S., Studi, P., Perpustakaan, I., & Padjadjaran, U. (2014). *Peranan Desain Interior Perpustakaan Dalam*. *2*(1), 37–46.

Observatorium Bosscha. (2021a). "Fasilitas Penunjang." *Institut Teknologi Bandung*. https://bosscha.itb.ac.id/id/tentang/fasilitas-penunjang/.

Pemerintah. (2010). "Undang-Undang Nomor 11 Tahun 2010 Tentang Cagar Budaya." *Jaringan Dokumentasi dan Informasi Hukum* 54: 1–2. https://peraturan.bpk.go.id/Home/Details/38552/uu-no-11-tahun-2010.

Pemerintah Kota Bandung. 2018. "Peraturan Daerah Kota Bandung No.7 Tahun 2018 Tentang Pengelolaan Cagar Budaya." *Journal of Chemical Information and Modeling* 53(9): 1689–99.

Permuseuman, Direktorat Jenderal Kebudayaan Direktorat Pelestarian Cagar Budaya dan. 2013. "Pedoman Penilaian Kriteria Penetapan Cagar Budaya.": 65. http://repositori.kemdikbud.go.id/23159/.

Rangkuti, Wiza Kesuma Widyana, and Hartono Harastoeti. 2020. "Cultural Heritage Building Preservation Efforts in Bosscha Observatory Area, Lembang, West Java." *Jurnal RISA (Riset Arsitektur)* 4(1): 1–14. www.journal.unpar.ac.id.

Salmon Priaji Martana. 2022. *Wolff Schoemaker Karya Dan Lingkup Dunia Sekelilingnya*. Yogyakarta: Deepublish.

Savitri. (2013). "Estetika Fasad Pada Bangunan Kolonial 1920-1940." *Jurnal Seni Rupa* 1(1): 11. https://jurnal.isbi.ac.id/index.php/atrat/article/view/402.

Sisfo, Subbag Sarpras dan. (2018). "Observatorium Bosscha Ditetapkan Sebagai Cagar Budaya Nasional." https://fmipa.itb.ac.id/observatorium-bosscha-ditetapkan-sebagai-cagar-budaya-nasional/.

Wiza Kesuma Rangkuti, W., & Harastoeti Hartono, I. D. (2020). Cultural Heritage Building Preservation Efforts in Bosscha Observatory Area, Lembang, West Java. *Jurnal RISA (Riset Arsitektur)*, *4*(1), 1–14. www.journal.unpar.ac.id

———. 2021b. "Sejarah Dan Profil." *Institut Teknologi Bandung*. https://bosscha.itb.ac.id/id/tentang/profil/.