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Application of Deaf Space in the Interior of Creativity and Art Center for the Deaf

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Abstract: Deaf people have difficulty or cannot even hear, so they develop sign language to communicate. Difficulty of hearing and communication differences prevent deaf peo-ple from learning. However, the potential and talent of each deaf person are the same as those of other hearing people. From this point of view, deaf people can continue to work in the field of art that prioritizes form, visuals, and movement or motor skills that do not require the sense of hearing. By being creative, deaf people can voice their opinions and provide messages and stories for people who enjoy their work. This study aims to give awareness to the public and opportunities for deaf people to get space and facilities to be creative. The method used in this study is qualitative analy-sis and design thinking method. The design facilitates creative and artistic activities as outlined in the exhibition room for deaf works, painting, drawing, makerspace, deaf theater practice, multipurpose room, classroom, mini library, and co-working space ensuring that deaf people are comfortable doing activities in the room. This research was developed for the community to provide opportunities for deaf people to be more accessible and dare to be creative.

Keywords: deaf culture, deaf space, interior, sign language

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Introduction

Deaf people depend on the sense of sight because of their hearing difficulties. Therefore, deaf people communicate using sign language, combining hand and facial movements, gestures, images, symbols, or (visual) signs (Vineyard, 2012). The dif-ference in the way of communication between hearing people (oral communication) and deaf people (visual communication) makes the need for facilities that are more based on visual and motor forms so that they can be more easily understood (Rah-mah, 2018).

All information is absorbed through the eyes of the deaf. Therefore, not only through writing but also through pictures, paintings, and art displayed can provide messages for the deaf (Silver, 2000). In addition, deaf people are also involved in deaf theater. This theater presents the creation of a combination of sign language with antonymy movements that have been translated from the author's script so that the deaf audience can understand what the show wants to convey (Powers, 2019). For people who are deaf, visual arts such as painting, drawing, dance, and theater are tools to convey messages and express themselves.

There is a need for deaf people for space facilities that communicate with deaf people (signal communication on a visual basis) and the need for deaf people to ex-press themselves to the outside world. This study aims to provide opportunities for deaf people to be able to carry out daily activities, especially when active indoors in-dependently, like other hearing people. Besides that, it also facilitates and provides space for deaf people to be creative, voice their opinions and express themselves through creativity and art.

With the condition of deaf people who depend on sight, it is necessary to have a room with adequate visual facilities or signs for the deaf. To design a good space according to the deaf, aspects of color, light, and materials must be selected and de-signed carefully (Harahap, 2020). This will provide an excellent visual and spatial ex-perience so deaf people can work independently. Deaf space is a space specially de-signed for deaf people who have special behavior, initiated by Bauman in 2006. It is created from the behavior of deaf people who use sign language to communicate. Sign language requires a greater range of motion because it is expressed using hand gestures and facial expressions (Goldstein, 2019). Therefore, a greater distance or circulation area is needed to provide free space for deaf people when using sign lan-guage.

To design a space for deaf people, several aspects need to be considered, namely, Sensory Reach and the need for a space that looks visually free. Deaf peo-ple need access to know the state of the surrounding environment to provide a sense of security and comfort. This can be realized by placing directions in and out of the room and placing light that does not create shadows or dark corners. Space and Proximity: in the interaction between deaf people and hearing people, sufficient visual access is needed for deaf people to see their interlocutors freely. Therefore, it is nec-essary to have a large enough room free of obstructions so that people with hearing impairments can freely access their opponents. Usually, this is applied to large spac-es for one-way conversations, such as multipurpose rooms or classrooms.

Mobility and Proximity: Sign language is a unique form of communication that uses hand gestures and facial expressions to convey information. These gestures re-quire a significant range of motion to be effective. Therefore, deaf individuals need a larger area of movement than people without hearing impairments so they can move their hands freely and communicate clearly. Creating spacious environments with ample room for movement is essential to facilitate this form of communication.

For people with hearing impairments, sight becomes their primary source of in-formation. Therefore, a room's arrangement of light and color is not just a design choice but a practical necessity. Soft, natural light and contrasting colors like blue, green, and red against skin tones can enhance the visibility and clarity of hand movements and facial expressions. These design elements are crucial in creating a visually supportive environment for effective communication.

While some deaf individuals can hear certain sounds with hearing devices, loud interior elements can be distracting and uncomfortable. This is where the role of acoustics in spatial design becomes evident. We can create a quieter and more com-fortable environment by using interior elements that absorb sound and

reduce echo reflections, such as carpets, heavy curtains, and acoustic panels. This design choice significantly reduces auditory distractions, enhancing the overall experience for the deaf.

By considering mobility, light, color, and acoustics in the design of spaces for deaf individuals, we can create environments that are not only accessible but also supportive of their unique communication needs. This holistic approach ensures deaf individuals can interact and engage comfortably and effectively within their surround-ings.

The existence of signage is also essential to note because it provides infor-mation in space or can also direct space users (Wave, 2017). Display signage in im-ages and symbols that symbolize the data to be given. Signage aims to ensure that everyone, including the deaf, can understand information. Having clear instructions or signs also helps deaf people work independently.

Signage can also be formed into a three-dimensional form, which is the appli-cation of graphic design to the interior. This application is usually in the form of typog-raphy or pictures and shapes. Signage is part of interior design elements that can be applied to wall or floor or ceiling elements (Ruki & Nediari, 2014). Signage that every-one can understand needs to be designed with graphic concepts that are easy to read and recognize. The way to make a good image or symbol is to determine several things such as the shape of the pictogram, the shape of the panel to be used, the color, the meaning of each pictogram, and the tools used to create the signage. By knowing things related to pictograms, colors and materials, the signage you want to design already has a clear basis and direction. The pictogram system created to cre-ate signage must also be available in the right place and be seen and read clearly (Adir et al., 2015). Having these criteria makes the design of pictograms more appar-ent and worthy of being used as signage that works for users.

Signage adds quality to the area where it is placed. It shouldn't be too big, too loud, or visually striking. In addition, the signage needs to blend with the feeling (am-biance) of the room. Signage should also not be too small and need to be placed in an ideal place and can be seen easily (Calori & Vanden-eynden, 2015). With the crite-ria that become these limits, good signage that can be understood by everyone can be realized.

Deaf culture is the culture of deaf people. Deaf culture includes visual lan-guage (sign language), a unique communication method through facial and hand mo-tion expressions and gestures. In addition, it includes works of deaf people in the form of literature, paintings, theater, films, and so on. Likewise, the views of deaf people who accept life with different conditions from other hearing people. With the gathering of deaf people, it can provide opportunities to develop social skills, leadership, and self-esteem (Cripps, 2022). With the existence of a deaf culture, deaf people can communicate freely and can live life according to their identity.

Deaf culture includes several essential things that make a significant difference to other cultures. Values: deaf people appreciate sign language, which is very sub-stantial in deaf culture, and reject the medical view that hearing-impaired conditions require treatment. Based on this value, deaf people believe

that a deaf child needs to be educated about the heritage and culture of the deaf (literature, art, theater, and other works). The attitude of sharing and experiencing to understand and appreciate the culture of the deaf requires acceptance of the condition of the deaf and the use of sign language to communicate.

There are several rules of behavior in the deaf community, such as raising and moving hands to appreciate something instead of clapping. This also applies to class-room or meeting room positions where the chairs are positioned in a circle so that the view is not obstructed. The high number of marriages with fellow deaf people hap-pens a lot because deaf couples can understand each other's situation compared to being with hearing people. Symbols: deaf people in America choose the hand shape of the sign language "I Love You" as a symbol of their deaf culture. Literature and art: The deaf culture has many works of literature and art that express the deaf person's view of life. Visual arts works for the deaf are better known as De'VIA, which express the experiences, views, and opinions of the deaf towards the outside world (White, 1998).

One form of deaf art is De'VIA (Deaf View Image Art), a work of art that repre-sents the life views, opinions, and expressions of deaf people. The artist who creates the work determines whether his work is included in De'VIA. According to Miller, one of the earliest deaf artists, visual art is a way of life for them just as people listen to music (Durr, 2000). Music for hearing people is a way to express themselves, and visual art is created by deaf artists.

Deaf art usually displays the shape of the hands, mouth, lips, eyes, and ears. These forms express the message that the artist wants to convey regarding their ex-perience of living life as a deaf person. In addition to shape, the choice of contrasting colors and textures is also a hallmark, giving the impression of a different, new, and personal perspective.

Often, what is expressed is terrible memories or negative emotions left over because of the artist's traumatic experiences from childhood. Miller's Bell School work shows a deaf child sitting with folded arms and practicing oral speech. For Miller, oral language training was a bad experience because it was coercive. Various parties of-ten give negative opinions on the work of the deaf because it is considered too harsh or difficult to accept for the whole community (Durr, 2000).

Figure 1. Bell School by Betty J. Miller

Deaf art can also be used as an alternative way of communicating. Not all deaf people can be fluent in sign language, as well as ordinary hearing people who do not understand how to sign language. Drawing simple things to facilitate communication can be an alternative for deaf people to communicate smoothly with other people (Ho-rovitz, 2007). This practice can also be called art therapy, which can help relieve pressure on deaf people who have difficulty interacting with hearing people. It can al-so make it easier for hearing parents who have children with hearing impairments. This therapy can be done to facilitate communication between parents and children.

Methodology

This research uses Stanford's design thinking method, which is divided into five steps: empathize, define, ideate, prototype, and test. This design thinking stage focuses on how researchers can more thoroughly find out and recognize users' prob-lems so that they can provide design ideas that solve user problems (Tu et al., 2018).

Figure 2. Design Thinking steps

In this study, the researchers used three of the five existing stages: empathize, define, and ideate. The first stage, empathize, is knowing that deaf people need spe-cial facilities in the room to support their daily activities. In addition, the second stage, define, is realizing that there is a need for facilities to

be creative in the field of art to provide space for deaf people to express themselves and express opinions. Third, the ideate stage, which is the stage of developing ideas for designing creative and artistic spaces for the deaf by developing the interior in the form of three-dimensional imag-es. This design applies the element of deaf space as a reference in designing space and providing facilities that support creative and artistic activities for the deaf.

The method used in this study is qualitative analysis for data collection and de-sign thinking method for designing suitable interiors for the activities of the deaf. Such a qualitative method can also be found in some design works such as Anwar & Ardhi-ati (2023), Gunawan & Ardhiati (2022), Herlambang & Ardhiati (2023), Kholis (2023), and Subagyo & Adi (2023) but all their works are different from this research in terms of physical location and object of study.

Results and discussion

Hearing difficulties or inability to hear is a clear difference between deaf people and other hearing people in society. This can have a negative impact where people with hearing impairment receive harmful and discriminatory treatment. This happens because of a misunderstanding of the disabilities that exist in society. The tendency to think with the concept of normality, which is to discriminate between people with an appearance or physical disorder, is still present in society. This thinking concept pro-duces negative actions through separation and negative labeling (Widinarsih, 2019). In addition, deaf people think the term "hearing loss" has a negative connotation. Alt-hough "hearing loss" is a neutral term, it gives the expectation that this condition should be treated so that the deaf can hear. From a cultural perspective, this makes people think that using sign language to communicate is a "decrease" in language and literature (White, 1998). Therefore, a positive understanding of persons with dis-abilities is needed, providing inspiration and positive things from existing differences.

Deaf people think that sign language is a strength and part of their identity. Sign language is a way for deaf people to communicate. Not only that, but sign lan-guage is also the identity of deaf people because it distinguishes them in society (Gumelar, 2018). Sign language is formed from natural interactions between deaf people, so this language is the hallmark of deaf people. Deaf people's desire to get better treatment from hearing people is also an effect of the expectations and treat-ment of the surrounding environment. For example, such as the ban on sign language occurred in America and Europe in 1880 (Schertz & Lane, 1999). As well as the de-mands given to deaf people to communicate orally, such as reading lip movements and pronouncing words according to the shape of the lips. This demand is applied to learning in special schools, which provide speech development material and train deaf people to speak as people hear.

The view that sign language is the identity and strength of deaf people starkly contrasts the view that hearing difficulties or disorders require treatment. Likewise, speech development materials given at schools are seen as forcing deaf people to be able to communicate orally like other hearing people. This view arises from the inter-action of deaf people with the hearing environment.

However, if deaf people interact in a deaf environment, negative views will not occur because of similar ways of think-ing, communicating, and living habits. Ann Silver felt when she entered a particular university for the deaf, she felt like she was at home even with strangers she didn't know (Silver, 2000). Deaf people who gather and carry out activities together make themselves feel comfortable and accepted as normal humans (Padden & Humphries, 2022). This similarity forms a community, and over time, it becomes a new form of "culture," which is called Deaf Culture.

Joint activities with fellow deaf people can raise enthusiasm and positively im-pact. Activities carried out together emphasize visual and motor activities more, not verbal and oral. Visual and motor activities can be included in painting, drawing, and theater arts activities, which can also hone the creativity of the deaf. Carrying out var-ious activities that focus on creativity and art also provides space for deaf people to express themselves and express their opinions in works that can be enjoyed by multi-ple groups of people.

1   2   3   4

[Source: Aurelius, 2023]
Figure 3. Shape study steps

The study of shape was inspired by the shape of the hand in sign language for the word "together". When viewed from above, the shape of the two hands clenched into fists will look like in figure 2 in the schematic 2 stages of the shape study. This form will be developed and implemented in the layout, as well as the furniture in the interior. The use of color is inspired by the artwork of deaf artist Nancy Rourke who wears red, yellow, blue, black and white.

[Source: Aurelius, 2023]
Figure 4. Colour inspiration

Lobby area

Motion LED area

Exhibition area

Exhibition area

[Source: Aurelius, 2023]
Figure 5. Colour application in design

The study of form is implemented in the form of signage, banquette sitting, and the form of displaying works of art., material with pine wood hpl finish. The color se-lection uses neutral colors such as wood (light brown) and gray, combined with red, blue and yellow. The use of blue in the lobby area aims to give a professional but still lively impression. Red is used in the painting room to provide enthusiasm and in-crease productivity to its users. Maker space, using yellow gives a cheerful and en-thusiastic impression so that the room's atmosphere remains cheerful and fun when doing crafting activities.

Signage

Banquette sitting

Wall art display with signage

[Source: Aurelius, 2023]
Figure 6. The study of form design

Painting area

Canvas storage   Custom pendant light

[Source: Aurelius, 2023]
Figure 7. Red color application in design

Maker space

Pattern table   Moveable magnet board

[Source: Aurelius, 2023]
Figure 8. Yellow color application in design

Conclusion

Deaf people have a need to express themselves through creativity and art that focuses on visual and motor skills. This design focuses on facilitating creative and ar-tistic activities as outlined in the exhibition room for deaf works, painting, drawing, makerspace, deaf theater practice, multipurpose room, classroom, mini library, and co-working space. In addition, this design was made with an emphasis on visual flexi-bility and space circulation to ensure that deaf people

are comfortable doing activities in the room. A technological approach is also applied to provide convenience for deaf people in their activities. It is hoped that this research can inspire other researchers to be more empathetic to the culture of the deaf and develop better and adequate facili-ties for the deaf.

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Designing Museum and Plaza in Brebes as a City Icon

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Abstract: This research aims to address the lack of facilities supporting arts and culture in Brebes, Central Java, Indonesia, while maximizing its economic and cultural potential. It proposes the design idea of a museum building and a public park as an icon in Brebes Regency, aiming to create an integrated zone for artistic and community economic activities that will enhance the new face of the city. The research methodology involves searching for design ideas by identifying existing problems around the location, which serve as the foundation for designing a building that can accommodate cultural diversity and serve as a space for street vendors within a well-organized zone. Through a contemporary architectural theme inspired by the unique cultural blend of Brebes, the project envisions not only a space for preserving and educating about local culture but also a center for economic activities, ultimately contributing to the socio-economic development of Brebes Regency. The Museum and People's Park serves as a means of development and education of culture and art. It is a solution to the problems that exist, especially for street vendors. The implications of the design concept of the museum building and public park serve as an economic driver for Brebes and will become a new landmark for the city on the northern coast of Java.

Keywords: city icon, design, museum, plaza

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Introduction

Brebes is an area located in Central Java, Indonesia, precisely between the coordinates 108° 41'37.7" - 109° 11'28.92" east longitude and 6° 44'56'5" - 7° 20'51.48 south latitude, and borders directly with West Java Province. Based on its geographical location, Brebes Regency is located on the north coast of Java which is traversed by the main North Coast Road (Jalan Pantai Utara/Pantura) and is adjacent to the cities of Tegal, Pemalang, and Purwokerto (Wahyono & Sariffuddin, 2020).

The geographical location of Brebes on the North Coast Road makes Brebes an area that has potential because it is one of the cities that is often stopped for travelers between cities and provinces. In addition, Brebes Regency has beaches, mountains, and a lot of green land which is also a potential wealth, but its handling and management have not been maximized. Brebes is famous as the city of salted eggs and the city of onions because the main source of income of its people is from the salted egg and onion business.

A frequently visited area for travelers is Brebes Square, because of its strategic location and easy-to-reach, which is precisely on Jalan Pantura and is still in the Brebes local government area. Brebes Square serves as a recreational

area for Brebes residents and migrants who stop by for a stopover while passing through the Pantura Highway. Travelers can enjoy a variety of Brebes culinary specialties along the sidewalk of the square, many street vendors are selling their wares there.

The condition of the square is always crowded, and the presence of street vendors selling in the square area and the Brebes Regional Government, makes the face of this area look untidy, where street vendors are scattered in the square area. This makes the image of the Brebes Regional Government building not look like a government building in general that looks neat and makes the square not function optimally.

In addition to having potential in its economic activities, Brebes Regency also has potential in arts and culture. The geographical condition of Brebes, located on the border between Central Java Province and West Java Province, makes Brebes Regency have cultural assimilation in the two regions, namely Sunda and Java. Even the residents of Brebes Regency use two languages, Sundanese and Javanese.

This uniqueness can be developed and educated to the outside community so that the general public increasingly recognizes the culture and arts of Brebes. Unfortunately, the government has not paid much attention to this potential and there are no facilities to support arts and culture.

The literature study on museum buildings provides an in-depth insight into the role and function of museums in society as well as the architectural design aspects that need to be considered in the construction of museums. The museum not only functions as a place of storage and exhibition of cultural artifacts and art, but also as a center for education, teaching, and preservation of cultural heritage (Akbar, 2010).

Many scholars define what museum is such as Bellmunt (2021), Brown & Mairesse (2018), Folga-Januszewska (2020), Candlin & Larkin (2020), Mairesse (2019), and Walz (2020). According to the International Council of Museums (ICOM, 2007) a museum can be defined as a not-for-profit institution that serves the general public and has a role as a means to educate. Museums are part of a historic and valuable element that has a cultural heritage and can connect people from the past to the present. What is meant by cultural heritage itself is evidence of human civilization that has gone through a social process (Ariwidjaja & Roby, 2013).

Making the museum a public appreciation space means optimizing the role of the museum as a center for the promotion of culture. Therefore, the museum should be a public space that can be utilized by cultural and artistic communities to show their work so that museum visitors can also appreciate it. Some things that can be done are making the museum an inseparable part of the general public (public); building networks with stakeholders and communities outside the museum; exploring the potential of the museum to create cooperation and partnerships with cultural and artistic preservationists; developing museum public programs that are in line with the activities of cultural and artistic preservation communities; and reviving museum public spaces for cultural and artistic preservationists (Purwanti, 2022).

In addition, sustainability is also increasingly becoming a focus in modern museum design. The use of environmentally friendly materials, natural lighting, efficient cooling systems, and the integration of green technology are important aspects in the design of sustainable museum buildings.

One important aspect of the literature review on museum buildings is interior design and space layout. Good interior design plays an important role in creating a satisfying and inspiring visitor experience. Exhibition space, lighting, and visitor navigation are key factors to consider in museum interior design. Museums are important facilities because they have the function of preserving cultural, historical, natural, and human heritage. With public participation, museums provide a variety of experiences for preservation, education, pleasure, recreation, and knowledge (Matitaputy, 2007).

Disability friendly museum design, which provides access for everyone regardless of age, background, or physical ability, is an important factor in creating an inclusive experience for visitors. In addition to being an information center and educational tool, museums are recreational facilities. Thus, museums have many positive benefits and important roles so it is necessary to make museums attractive in the modern era like now so that more and more people visit them. To create an up-to-date museum, it needs to be supported by recreational aspects to make the impression in the learning that occurs more enjoyable (Kafin, 2022).

In addition, the use of technology in museum design is also highlighted in the literature review. The integration of technologies such as augmented reality, virtual reality, and interactive multimedia provides a new dimension to the visitor experience, allowing them to be actively involved in the learning and exploration process. Amidst the current era of modernization, art museums are starting to become more popular again. Many new art museums are now emerging. While museums are usually considered boring and old-fashioned, art museums have a different atmosphere. Many modern art museums offer unique and exciting experiences for visitors. So many young people are interested in visiting art museums. Apart from being able to see beautiful works of art, paintings, and other historical items, visiting a museum or art gallery can also increase knowledge. Frequent visits to art museums can relieve stress, combat loneliness, and make life feel more meaningful (Nike, 2022).

The attraction of art museums lies not only in the collections presented but also in the design of the building. Not only does the exterior design of the museum attract attention, but the interior design is very important for building the image of an art museum. One of the efforts that can be made to make a museum that attracts visitors is to create an up-to-date museum interior. Because the collection is exhibited in the museum room, most of the visitors' activities are carried out in the museum room. Therefore, it is necessary to pay attention to the interior design of a museum to support the successful aspects of an attractive museum. Poor interior design aspects can make visitors confused about the meaning and content of the collections on display so the function of the museum as a means of education does not work.

Museum buildings emphasize the importance of holistic and sustainable design, inclusivity, and accessibility. Equally important is the museum's role in promoting inclusivity and accessibility. Museums must also promote the values of inclusivity and equality, which means that their management must be able to create spatial experiences for visitors. Thus, any visitor can enjoy all the information, including people with disabilities, most museums still do not take into account visitors with disabilities, although there is progress it has not fully accommodated the needs of people with disabilities, the layout of the presentation of information on artifacts should use a multisensory and audiovisual approach as the needs of people with disabilities, as well as the role of museums in education and community empowerment. By paying attention to these aspects, museum development can be more effective in fulfilling social, cultural, and educational goals (Harahap, 2023).

City icons are symbols that reflect a city's unique identity and characteristics. The concept of a city icon highlights elements that distinguish the city from others, such as landmarks, historical buildings, or distinctive cultural attributes. City icons are often used to promote tourism, strengthen local identity, and enhance a city's image. The importance of city icons in branding and promotion has become a key focus for many city governments around the world to build public awareness, increase civic pride, and attract visitors and investment. The acceptance of contemporary urban icons by residents depends on their association with aspects that best represent local identity and their ability to create positive experiences. The results suggest that future urban icons should support local identity and free coexistence between residents rather than visually appealing designs and private spaces (Castillo-Villar, 2016).

An iconic building will give a very new impression to the audience, which may be caused by its height or shape or even its unique location, some cities create icons not only to create revenue but also to attract attention by creating stunning landmarks (Elhagla & Nassar, 2020). Iconic buildings in a city will be a generator of urban development, activity generators can be defined as the main functions located in the area and other city elements that can generate activity in the city's public space. Residential areas in urban areas must have interesting functions and activities to function optimally (Rambe, 2018).

Methodology

The stage of searching for ideas and ideas for designing Museums and People's Parks in Brebes starts from looking for problems that exist around the location, these problems are about socio-cultural conditions and site conditions in Brebes. The existing socio-cultural problem is the lack of knowledge or introduction to the kinds of Brebes culture to the general public, while the problem of site conditions is the lack of arrangement of street vendors in the Brebes area. These ideas and ideas can be the basis for creating a building that can accommodate cultural diversity and have another function as a place for street vendors to be in an organized zone.

Some qualitative approaches have already done by architectural scholars such as Anwar & Ardhiati (2023), Gunawan & Ardhiati (2022), Herlambang &

Ardhiati (2023), Kholis (2023), and Subagyo & Adi (2023) in their studies but their object of study is very different from the one done in Museum and Plaza in Brebes.

Results and discussion

The selected location based on the assessment of alternative locations is Jalan Raya Pantura, Brebes Regency, Central Java.

Table 1. Selected Location

Land use	Trade and services
Land area/area	2 Ha/ 20,000 m^2
KDB/ building coverage ratio	60 %
KLB/ floor area ratio	4
KDH/ green coverage ratio	20 %
GSB/ building border	10 meter
Location Restrictions	- North : Jalan Raya Pantura, Shops - West: Brebes Square - South: Brebes Class IIB Prison - East: Jalan AR Hakim

This location has several potentials that can support the design process, namely: (a) Located in the city center of Brebes: The site in the city center has high value and potential, where this site is very strategic and easily accessible to various levels of society. (b) The site has direct access to Jalan Pantura; Direct access to Jalan Pantura provides more points because Jalan Pantura is the main cross-city and cross-province road on the island of Java. (c) It has direct access to Brebes Square; Brebes Square is the icon of Brebes City which is visited by many people and tourists. (d) It is close to the Brebes Great Mosque and the Brebes government center; The location of the site close to the government center will certainly receive more attention from the government. (e) The area on the site is included in the commercial area.

Design Concept

Famous as being called the city of salted eggs, Brebes is also often referred to as the city of onions, onions themselves are one of the characteristics of Brebes Regency because the majority of people in Brebes Regency are onion farmers. The design of the Museum and People's Park in Brebes is inspired by the shape of a pile of onion slices, from this slice that produces a semicircular outline which is used as the main form of the building period.

Theme

The rationale for the theme of the People's Museum and Park in Brebes is the uniqueness of the existing culture of Brebes. The geographical condition of Brebes which is located on the border between Central Java Province and West Java Province makes Brebes Regency has cultural assimilation in two regions, namely Sunda and Java. On this basis, a Museum and People's Park with a

contemporary architectural theme emerged where this building will have its characteristics and can also become an icon of Brebes Regency.

Slices of onion with layers inside	The onion slice outline	Put a slice of onion to the site, to form a building massing

[Source: Putri & Prasetya, 2023]
Figure 1. Building philosophy

Site Planning Concept

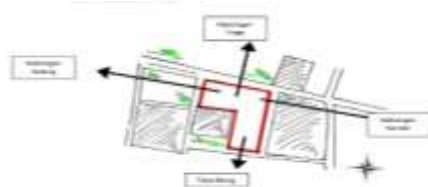The following is the concept of designing the site of the Museum and People's Park in Brebes.

Sunpath east to west, and wind spread from north to south

Flat contour and water drainage move to the north

High noise from the north, middle noise from the west, lown noise from the east

Vegetation on the west side
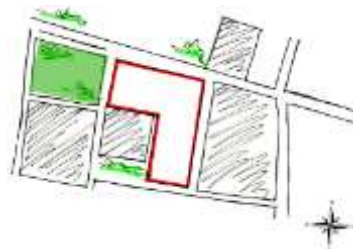
[Source: Putri & Prasetya, 2023]
Figure 2. Site analysis

Building Design Concept

The following is the building design concepts of the Museum and People's Park in Brebes.
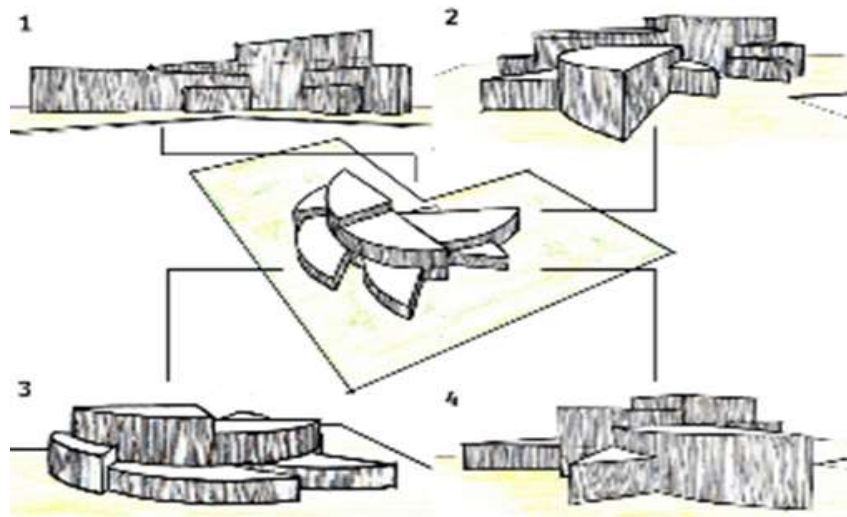
[Source: Putri & Prasetya, 2023]
Figure 3. Form transformation

a. The building has green open space and performance area (people's park).
b. The building has green open space and street vendor area.
c. The building has communal space and outdoor discussion area, the building is made higher so that the discussion area looks shady during the day.
d. The building period is split to catch the wind to enter the building.
e. The building is made with different heights to produce an airy feel in the interior and make the air in the building good.

Structurel Planning Concept

Based on the analysis that has been carried out and considered, the structural concept of the Museum and People's Park in Brebes is as follows: (a) Substructure: using a pile foundation as the bottom structure of the building, foundation was chosen because it has high strength and sturdiness, has a long foundation life, can compact the soil, and can reduce soil excavation. (b). Middle structure: using concrete as the middle structure of the building. In addition to the selection of concrete, because concrete has high strength and sturdiness, another supporting thing is that concrete has high resistance to fire so it can provide more security value to the Museum building. (c). Upper structure: using concrete and steel structures as the top cover.

Design Result

The design results articulate the economic potential of Brebes as a producer of shallots, shallots are transformed into museum interior space and outdoor space as a center for folk art activities and economic centers for kaki lima traders, the strategic potential of the site on the side of the Jalan Pantura can be maximally utilized, as a souvenir center for travelers, as well as introducing traditional Brebes art through museums and folk art, so that in the end it will become an economic and artistic driver for Brebes Regency.

Perspective

South view

North view

West view

[Source: Putri & Prasetya, 2023]
Figure 4. Building design

Conclusion

Museum and People's Park in Brebes is a cultural container or facility that serves as a means of development and education of culture and art, besides a solution to the problems that exist in the Brebes Square area, especially for street vendors who sell in the Brebes Regency Government area. By developing modern nuances and supporting the value of art, this planning is expected to be able to build the potential that exists in Brebes to be increasingly recognized by the public through the building of the Museum and People's Park.

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Dramatic Earthly Paradise: An Architectural Concept of the Resort Hotel in Mandalika, Lombok

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Abstract: Mandalika Special Economic Zones in Lombok, West Nusa Tenggara, Indonesia, is experiencing dynamics after the Covid-19 pandemic, in the form of updating the 2015 and 2018 master plans, including the accommodation design concept. This study was carried out based on qualitative methods aimed at producing the design of a resort hotel in Mandalika Area in Lombok. This architectural study is a qualitative research that refers to the studies of Linda Groat and David Wang. Based on the research results, a hotel resort concept with the theme of the Dramatic Earthly Paradise was obtained. The 'earthly paradise' reflects the beauty of the island of Lombok (natural panorama of beaches, mountains and culture) into an integrated design. The benefit obtained from this study is as an inspiration for fulfilling tourism accommodation in resort areas based on a combination of local wisdom and universal design.

Keywords: dramatic earthly paradise, hotel resort, tourism

Introduction

Indonesia has thousands of islands and cultural diversity. One of them is the tourism sector. This makes tourism an important sector in national development and contributes 9.2% - 9.4% per year according to the WTTC (World Tourism and Travel Council) to state revenues. Apart from expanding employment opportunities and business opportunities for local communities, Indonesian tourism also encourages an increase in foreign investment. Until the end of 2014, FDI (Foreign Direct Investment) / foreign investment value was recorded at 307 trillion Rupiah (around US$ 24.7 billion), with an increase of 10.5% from the previous year.

The Province of West Nusa Tenggara (NTB) is one of the potential provinces, which has natural wealth, arts, culture and customs whose locality is still preserved to this day. The contribution was 16.3% in the last four years, which makes it included in the list of potential provinces as KEK (kawasan ekonomi khusus or special economic zones/SEZ), namely KEK Mandalika, according to Presidential Regulation number 52 of 2014 (West Nusa Tenggara Regional Regulation, 2016).

The diversity of potential that the Mandalika Area has, needs to be supported by accommodation in the form of star-rated accommodation/resorts so that it can accommodate the number of tourists visiting Mandalika beach and also Moto GP activities. The construction of the Resort hotel contributes to

providing tourism services which will generate a substantial and sustainable inflow of foreign funds in line with the development objectives of the Mandalika Resort in accordance with the direction of the Injourney (Indonesia) Tourism Development Corporation (ITDC) in the detailed master plan from the consultant BITA (Bita Encaron Engineering, 2015) and updating the master plan and DED by PT Perentjana Djaja (ITDC, 2018) whose infrastructure development will be financed by AIIB (Asian Infrastructure Investment Bank (AIIB, 2018). All tourism activities refer to the World Tourism Organization (WTO, 2005).

The aim of this study is to obtain a concept for designing a resort hotel in the Mandalika Area, with a location included in the administrative area of Pujut District with an area of 1,035.67 ha according to KEK planning, covering the areas of Kuta Beach, Serenting Beach, Tanjung Aan, and Gerupuk Beach with regional boundaries; the north is a protected forest area, (b) the east is a protected forest area, (c) the south is the Indonesian ocean, (d) the west is a protected forest area. Land designation as a resort hotel, with a land area of 46,465 m2 = 4.65 Ha. Has a KDB of 40% x 4.65 Ha, namely 1.86 Ha. KLB is 1.6 x 4.65 = 7.44 Ha. The KDH is 20% x 4.65 Ha = 1.39 Ha. Building Coefficient max. 4 floors or a maximum height of 15 meters. The GSB is ½ x 6 m wide (road width), namely 3 meters. With site boundaries as follows; (a) the east side is empty land (few trees), (b) the west side is Jalan Kuta (few trees along the side of the road), (c) the north side is Jalan Kuta (few trees along the side of the road) and to the south is Serenting Beach, Kuta, Lombok (very few trees).

Methodology

The resort hotel building will be designed with a Neo Vernacular concept to provide a 'new, modern look' while still considering normative, cosmological principles, but in harmony with local culture, nature and the environment (Ardhiati et al, 2021). Based on qualitative research referring to Linda Groat and David Wang (Groat & Wang, 2002), the research results obtained include the philosophy of the resort hotel building as a base for a recreational and educational forum related to the locality of the island of Lombok, especially the characteristics of architecture, local wisdom, ethnicity and religion, local history, as well as the characteristics of local woven cloth ornaments. Some other architectural scholars did the same qualitative methods, such as Anwar & Ardhiati (2023), Gunawan & Ardhiati (2022), Herlambang & Ardhiati (2023), Kholis (2023), and Subagyo & Adi (2023) but all their works and this research are different from the perspective of physical location and object of study.

In the form of processing of the building facade to be applied to the area to the north where there are openings, is to carry the cemare motif pattern (a typical Lombok woven cloth), which means that humans must have an attitude of togetherness and harmony towards fellow humans. Meanwhile, in the South area, there are facade openings with a moon motif pattern (a typical Lombok woven fabric), which is associated with the greatness of God who must always be remembered and grateful (Then, 2016).

Based on the analysis, the selection of the building structural system is obtained. The selection of the substructure or foundation system takes into

account the type of soil on the site, the carrying capacity of the soil, groundwater and the function of the building (load to be accommodated) as well as by looking at the geographical potential of the site (disaster mitigation) (BNBP, 2017). Based on the comparison results of the selection of foundations to be used on alluvial soil types, the substructure system (foundation) that is suitable to use is a pile foundation. The structural system of the building body (middle structure) is a structure that functions to distribute the building load. When determining the structure of a building body, what needs to be considered is the efficiency and effectiveness of internal space utilization as well as the strength of the structure to withstand the loads and forces that occur in the building. The use of a composite type of structure is the most profitable, considering that the location is close to the sea which is feared to affect the corrosive level of the structure. Meanwhile, the determination of the upper structure takes into account the space requirements underneath, the forces and loads that will be received. The use of steel frames in the upper structural system (roof) is said to be the most resistant to the humid tropical climate, the geography of the location which is in a disaster-prone area and close to the sea. which has strong gusts of wind, and supports the neo vernacular design theme which uses a ridge roof.
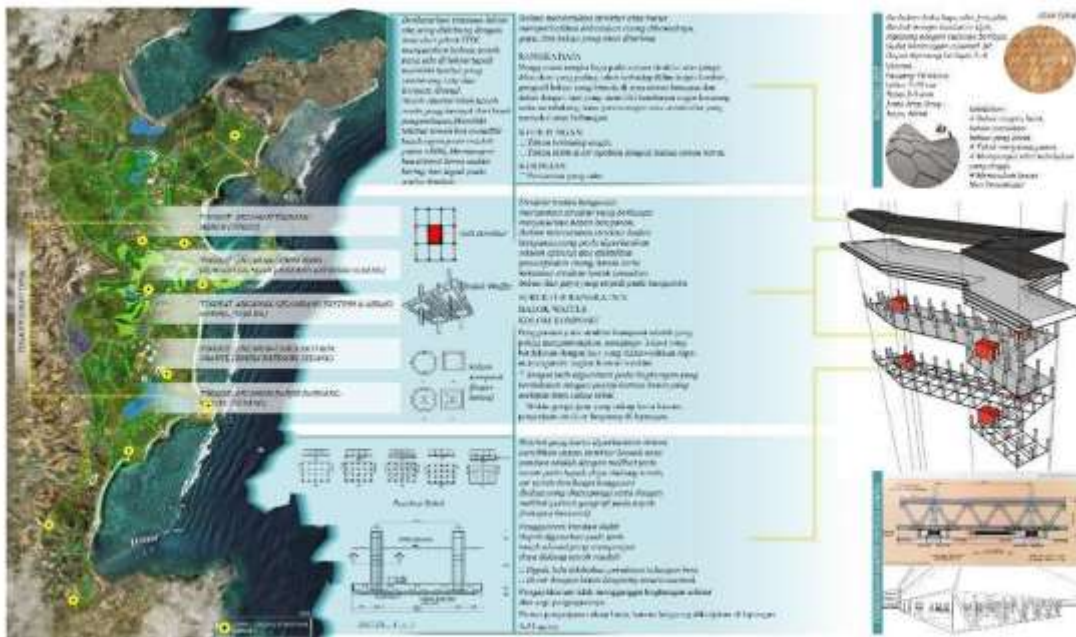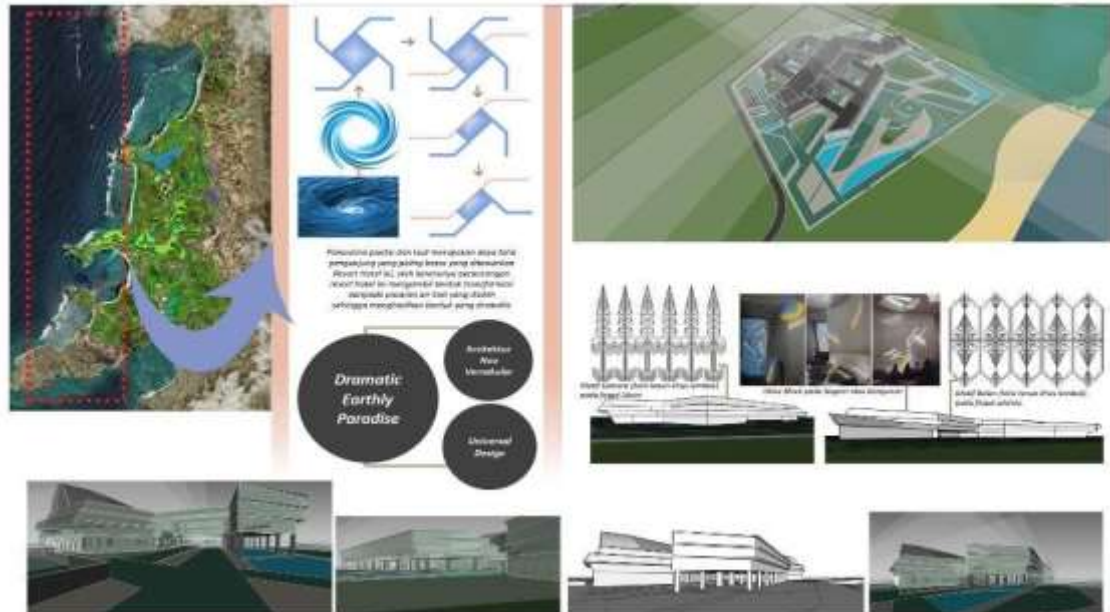

(Source: Kurniawan, 2024)
Figure 1: Building structure processing based on potential site location at Mandalika Resort

Results and discussion

The research results obtained for the design theme were the Dramatic Earthly Paradise. 'Earthly Paradise' reflects the beauty of the island of Lombok and all its potential (natural panorama of beaches, mountains and culture). Like a paradise, this resort hotel is a place for reflection about life in a pleasant paradise, namely peaceful, safe and happy. The word 'dramatic' is reflected in the form of philosophy that will be applied to the resort building in accordance with the locality, both culture and local history. In line with the Poetics of Architecture theory (Antoniades, 1992), and the Indonesian Stage-Architecture

theory (Ardhiati, 2013) and enriched by the legendary story of Princess Mandalika (Ardhiati, 2019).

[Source: Kurniawan, 2024]
Figure 2: Facade processing based on potential site location at Mandalika Resort

This design was obtained using a Neo Vernacular theme approach. The definition of Neo-Vernacular Architecture is the application of existing architectural elements, both physical (form, construction) and non-physical (concept, philosophy, spatial layout) with the aim of preserving elements of Sasak architecture that have been formed empirically by a tradition (Fatturahman, 2016). More or less, it undergoes updates towards a more modern or advanced work without ignoring local traditional values. The Neo Vernacular architecture in this Resort hotel building is the use of a typical local roof shape with natural materials.

This resort hotel theme approach was obtained through design referring to Universal Design, as a concept in designing all products and the built environment aesthetically and can be widely used by everyone. The application of Universal Design in this design lies in the accessibility and circulation of the Resort hotel as an application of the theory of Postmodern Architecture which was popularized by Charles Jenck (Jenck, 1991).
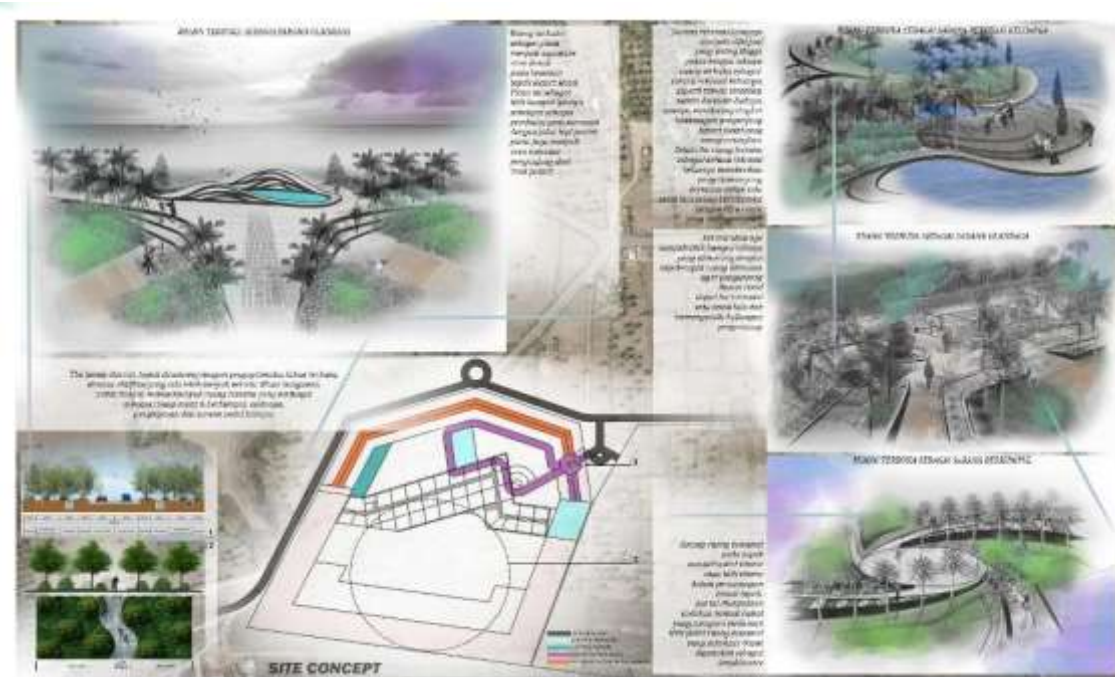
[Source: Kurniawan, 2024]
Figure 3: Facade processing based on universal design

The site design concept refers to the family district (according to the regional government regulation zone in the Mandalika Area), therefore the site is designed by optimizing open land, where there are more activities outside the building, namely by increasing open space which functions as social space & gathering, sports, greenery and other social facilities.

[Source: Kurniawan, 2024]
Figure 4. Application of local elements of typical Lombok woven fabric motifs in hotel interiors

Conclusion

The hotel resort concept with the theme of the Dramatic Earthly Paradise was successfully obtained. It reflects the beauty of the island of Lombok (natural panorama of beaches, mountains and culture) into an integrated design. The benefit obtained from this study is as an inspiration for fulfilling tourism accommodation in resort areas based on a combination of local wisdom and universal design.

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Architectural Development of Lusi Island Tourism and Natural Conservation Area in Sidoarjo Regency

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Abstract: Lusi Island was formed from Sidoarjo mud in Sidoarjo, East Java, Indonesia. This artificial island can be developed into a mud-based tourism area that represents natural events and conservation in mangrove forests. Based on regional architectural principles, this research is aimed at developing and designing educational tourism areas including creating tourist zoning, facilities and supports including educational tourism. The process of designing the Lusi Island Tourism and Nature Conservation Area was carried out by combining data from field surveys, literature studies and precedent studies. The research results show that the tourism area created includes mangrove planting activities including witnessing the Lapindo mud remains which is supported by adventure tourism, such as off-roading, camping and outbound. The facility space program includes accommodation, prayer room, toilets, culinary center, and supporting space consisting of waste water management installations. The benefits of developing Lusi Island as a tourism and nature conservation area that applies the principles of building environmentally friendly and sustainable areas as well as tropical architectural buildings to become the main attraction for tourists.

Keywords: architectural development, artificial island, natural conservation, tourism area

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Introduction

It is commonly stated in many resources that an artificial island or man-made island is an island that has been constructed by humans rather than formed through natural processes. According to Sreekumar & Gazi (2020) in their "A Study of Artificial Islands" (PDF), artificial island construction is a phenomenon that is seen on a rising scale in modern times. Artificial islands can be built for many different reasons, and these reasons are only increasing as the world faces the looming issue of space scarcity. Some other scholars also give their own perspective on such an island such as Wang (2023) and Zheng et al. (2020).

Sidoarjo Regency in East Java, known as Delta City, offers a tourist attraction in the form of an artificial island formed from mud deposits. Lusi Island, covering an area of 94 hectares, was formed as a result of a mudflow disaster (Pryambodo et al., 2016), has officially become a tourist destination managed by the Sidoarjo Regency Government, and received recognition as the second most popular destination in Indonesia in 2019 (Zain, 2021).

Currently, Lusi Island is being developed as a tourist destination that focuses on mud, but still requires further improvements to fully utilize its potential, including in the aspect of nature conservation, especially mangroves.

In the long term, Lusi Island can develop into a tourist spot with types of adventure activities, such as off-roading, camping and outbound, and so on. Given the background and situation, in the future Lusi Island can be developed as a tourism and nature conservation area with the principles of an environmentally friendly and sustainable area, with buildings that adapt to tropical climates for the comfort of visitors.

Kawasan wisata (tourism area) according to Law Number 10 Year 2009 concerning Tourism (Undang-undang Kepariwisataan Nomor 10 tahun 2009), is an area that has a certain area that is built for tourism activities. Regarding tourist attractions, a tourism area must fulfill the 4A principles, namely attraction, accessibility, amenities, and ancillary (Cooper, 1993).

Tourism is the activity of traveling to a place for recreation, self-development and increasing knowledge. It is explained in Koran Kaltara (2022) that tourism development can improve the quality of an area and attract more tourists. In general, the definition of tourism is a trip undertaken by individuals or groups with the aim of enjoying themselves. In the Law on Tourism (Government of the Republic of Indonesia, 1990), tourism includes all kinds of tourism activities served by the government, community or entrepreneurs along with their facilities.

So many scholars have defined what tourism is, as in the latest works from Abram et al. (2021), Aleksanyan (2020), Holloway& Humphreys (2022), Page, & Connell (2020), and Santos et al. (2022). In short, tourism is an activity carried out by people or groups of people, namely by traveling together with the aim of expanding knowledge, having fun and so on. This means that tourism is activities where someone travels to a place that is not their residence for a while.

Tourism can be differentiated based on the motives of tourists who visit a place, namely (1) cultural tourism, which aims to broaden their outlook on life and study customs or artistic culture; (2) marine tourism, which involves recreational activities at sea, beaches or islands; (3) nature reserve tourism; (4) agricultural tourism (agrotourism), which is a combination of tourism and agriculture or plantations; (5) ecological tourism, which attracts tourists to care about nature and socio-cultural conservation; and (6) geological tourism, which utilizes the potential of natural resources as the main object and encourages understanding of the environment (Pitana & Gayatri, 2005).

Activities in tourism areas utilize the natural potential available, including sports such as jogging, outbound and cycling; site tourism to enjoy natural beauty; outdoor learning such as photography and field trips; conservation programs for education and sustainable conservation; as well as festivals that support the sustainability of natural resources. Activities in tourism areas utilize natural potential, including: (1) Sports: Such as jogging, outbound and cycling; (2) Site Tourism: Enjoying the beauty of nature; (3) Learning: Photography and outdoor field trips; (4) Conservation: Education and nature conservation. (5) Festival: Events that support the sustainability of natural resources.

The design of this tourism and nature conservation area adopts a tropical architectural theme, choosing buildings that are suitable for the warm tropical

climate thanks to their adaptability. The focus of this adaptation is on increasing air circulation and utilizing natural materials such as wood to maximize comfort.
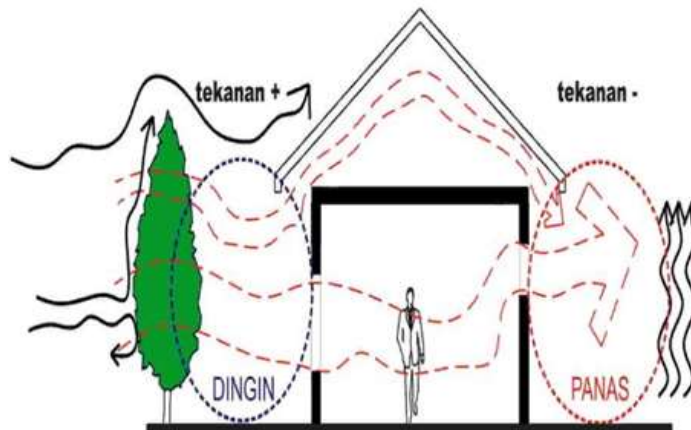

Figure 1. Schematic illustration of air flow in a building

In practice, overcoming heat radiation can be done with sun shading or secondary skin while choosing materials that allow natural light to enter.

Methodology

Jurong Lake Garden in Singapore is a 90 hectares national park with a unique design that offers comfort and tranquility. This garden is divided into several themes: Lakeside Gardens on the west side, Chinese and Japanese Gardens in the middle, and Promenade Gardens on the east Lakeside Gardens.

Figure 2. Map of Jurong Lake Garden.

Angke Kapuk Nature Tourism Park, North Jakarta, is part of the Angke Kapuk Mangrove Forest covering an area of 99.82 hectares. This area includes a wildlife sanctuary and mangrove tourism park with facilities in the form of camping huts, a lesehan canteen, children's playground, bicycle paths, as well as water tourism activities and planting mangrove seedings.

Figure 3. Pantai Indah Kapuk Mangrove Park

The Aceh Tsunami Museum (Bustami, 2019) was inaugurated in 2009, built with the aim of commemorating the earthquake that caused a tsunami in 2004 in Aceh. This museum is an education center and an evacuation center if a tsunami disaster occurs at any time. The Tsunami Museum consists of two floors. The first floor presents track records and dioramas of tsunami events, and tsunami artifacts. The 2nd floor of the Tsunami Museum provides various learning tools such as a library, props room and 4-dimensional room.

Figure 4. Tsunami Museum, Aceh

The process of designing the Lusi Island Tourism and Nature Conservation Area was carried out by combining data from field surveys, literature studies and precedent studies.

The design location is located on Lusi Island, which has a variety of mangroves, beautiful natural views, and can be accessed only by boat or speedboat from the Tlocor Marine Tourism pier in Tlocor Hamlet, Jabon District, about 3 km from the pier and 21 km from Sidoarjo City.

In designing the Lusi Island Tourism and Natural Conservation Area in Sidoarjo Regency, the method used was a qualitative one. In the previous studies, Anwar & Ardhiati (2023), Gunawan & Ardhiati (2022), Herlambang & Ardhiati (2023), Kholis (2023), and Subagyo & Adi (2023) applied the same method but different objet of study. Moreover, this study is about the Lusi Island which have never been designed by those architectural scholars.

[Source: Maps.google.com, 2024]
Figure 5. Location of Lusi Island

Results and discussion

The Lusi Island has facilities in the form of footpaths, pavilions and recreational facilities. According to regulations, Lusi Island must provide 40% of space for tourism buildings, 10% for public facilities, and 50% for green open space and parking.
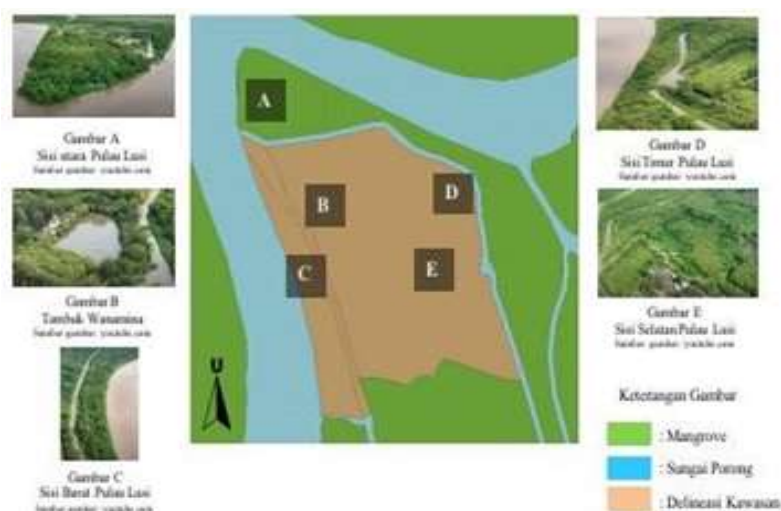

Figure 6. Site location analysis

The design of the Lusi Island tourism and nature conservation area in Sidoarjo Regency is planned to be divided into five zones, namely: (1) 1. Cultivation Zone, designed for mangrove and milkfish, tilapia and shrimp cultivation activities. This area consists of open space or ponds. (2) Recreation Zone, is a recreation area in the form of camping, lodging, outbound, offroad and fishing ponds, so that visitors get an interesting experience. (3) Education Zone, is a learning area for visitors who want to know directly about the process of mangrove cultivation and fisheries that take place at the location, the history of

the Lapindo mudflats and nature conservation. This zone contains the museum building, auditorium, research lab, and library. (4) Commercial Zone, is an area where buying and selling goods and food and drinks is carried out, namely in the form of a food court and souvenir shop. (5) Supporting Zone, plays a role in supporting the continuity of educational, cultivation, recreational and commercial activities, namely in the form of management rooms, toilets, prayer rooms, security, warehouses, MEP and docks.

The selection of vegetation in the Lusi Island tourism area follows the concept of Tropical Architecture, namely considering dry and rainy climates, so that the atmosphere and ventilation are maintained for comfort and protection for visitors. The ground pavement area uses wood which gives a natural and tropical impression.

Figure 7. Determination of regional vegetation types

In the process of designing this tourism area, an analysis of the view potential is carried out, which is viewed from two directions, namely the inward view and the outward view. The view into the site only has two views, namely from the west and north sides of the area, namely the Porong river. Therefore, building facades in the area must be maximized by highlighting distinctive characteristics so that visitors feel interested.
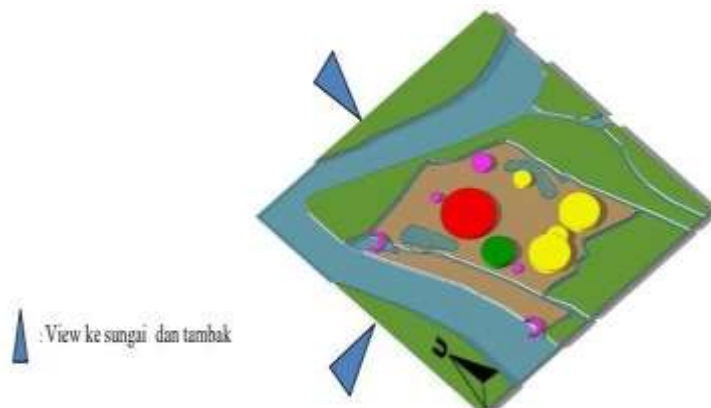

Figure 8. Analysis of the inside view

Views towards the outside of the area are used to maximize the potential views from inside to outside the area. The Lusi Island tourism area has very potential views to the outside, namely views of the west, north and east sides of the river and pond areas and views of the south side of the area in the form of mangrove expanses.
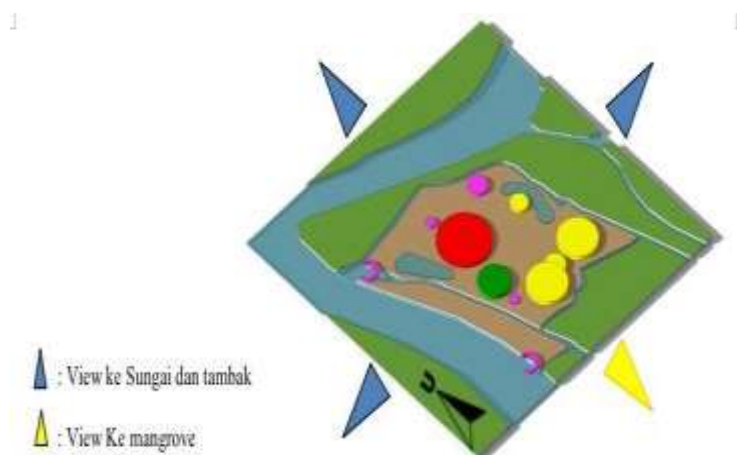

: View ke Sungai dan tambak

: View Ke mangrove

Figure 9. Analysis of the inside view

There are 2 types of regional circulation concepts in this area, using bicycles and walking. Visitors will then pass through a road that is around 3 meters wide and next to the pedestrian path there will be a bicycle path that is around 2 meters wide.

Figure 10. Regional circulation concept

The circulation system built in the area is prioritized for pedestrians, on floating paths, aiming at places that have the potential for interesting views.

Figure 11. Overview of the circulation route

Conclusion

The tropical architecture theme was chosen for the design of the Lusi Island Tourism and Nature Conservation Area in Sidoarjo Regency. The facility space program covers accommodation, prayer room, toilets, culinary center, and supporting space consisting of waste water management installations.

The conceptualization process is aimed at solving problems according to real conditions in the field. It is hoped that this design concept can be realized to improve conditions on Lusi Island as a leading tourist location in Sidoarjo Regency.

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Digital Community Hub in Serpong, Tangerang Selatan (An Eco-Technology Architecture)

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Abstract: Serpong District in South Tangerang, Banten Province, Indonesia, is an area that has the greatest potential for creative economic development but does not yet have facilities capable of accommodating this activity. Therefore, a digital community hub is needed that can fulfill the facilities and needs for the development of the creative economy in the fields of information and technology. It is necessary to plan and design the digital community hub that pays attention to and responds to climate and environmental conditions by applying eco-technological architectural concepts, to obtain a building design that is responsive and in harmony with the surrounding environment. Methodologically, the application of the concept of eco-technology architecture includes the application of design strategies for energy efficiency and adding value to the quality of buildings for the environment, utilization of renewable energy, selection of materials and openings in buildings. Its design is divided into four zonings, namely, rental office zoning, digital capability development zoning, culinary zoning and service zoning. In its operation and maintenance, this building utilizes energy efficiency in the use of water and lighting. The green roof which is used as a communal space adds aesthetic value while supporting the eco-technological architectural concept implemented.

Keywords: digital community hub, eco-technology architecture, energy efficiency, green buildings

Introduction

In recent years South Tangerang City in Banten Province, Indonesia has experienced rapid development in almost every sector, especially in the economic sector which is supported by the residential, commercial, service and trade sectors. This was followed by the aggressive attitude of the South Tangerang City Government in implementing accelerated infrastructure development to support the development of existing sectors, including the development of the creative economy. This is proven by the highest economic growth rate in Banten province which is held by South Tangerang City with an achievement of 7.43% (Kontadakis et al., 2018). Apart from that, survey data and statistical results also show that the GDP of the creative economy grew by 4.38% in 2015 (Wibowo, 2017).

Seeing the potential and goals, as well as the pace of economic activity, the South Tangerang City government is actively paying attention to and developing the creative economic sector. This area of the creative economy sector is considered promising, especially in the national economy and will become a new

force for economic activity in the future. The creative economic potential of South Tangerang City is quite large, one of which is proven by the number of start-up companies that have been formed in the South Tangerang area. Apart from that, as a city that is proclaiming a smart city, South Tangerang City also has the potential to develop technology to access information and accommodate the growth of a network-based (online) creative economy. One way to fulfill and develop this potential is that facilities are needed that can become a forum for creative economy actors to carry out activities and develop the creative economy in the information and communication sector.

Apart from contributing to advancing human life, technological and industrial developments also have an impact that causes increased energy consumption and damage to the environment. With the environmental issues that occur, it is necessary to apply environmental friendliness to building design so that it can adapt to environmental changes that occur and facilitate design to provide a feeling of comfort and safety. One design approach that can be applied is eco-technology architecture, which is an approach to design that studies the relationship between design and the regional environment using environmentally sound technology. Eco-technology architecture itself has already been analyzed and discussed by some schollars such as Abd Raub et al. (2015), Attiya et al. (2023), Lukita & Miranda (2018), Putra et al. (2024), and Saputri & Ashari (2023).

Based on the issues that have occurred, a facility is needed that can be a forum for bringing together various activities and developing the potential to accommodate the growth of the creative economy in the technology sector in one location. The facilities provided must have flexible criteria and be easily accessible to potential users. Apart from that, environmental issues require the creation of facilities that have an environmentally friendly approach that is able to guarantee the safety, comfort and health of potential users. Therefore, a digital community hub design concept is needed in Serpong, South Tangerang with an eco-technological architectural concept approach that can respond to environmental issues that occur in the Serpong area.

Digital Community Hub can be broken down into two main points of discussion, namely community centers and digital community centers. Community centers, which can also be called community hubs, are formed as a response to the issue of the need for service provision, increased efficiency and improved facilities. In general, a community center can be interpreted as a community facility for socializing or carrying out activities with the services and facilities that have been provided. A community center can be defined as a business area in a community that has an impact on a wide scale, grows and is locally responsible. Community centers can be differentiated by ownership, i.e. owned and managed by the public sector, provider organization or community organisation. The existence of a community center provides benefits to users, namely, being a place for users to socialize, carry out creative economic activities, a place to discuss and share ideas and a place to rest, recreate and entertain themselves with shopping or culinary tourism.

Digital hub is a development of a community center, which can be interpreted as a physical space that becomes a forum for a community with easy,

fast internet access facilities and offers services. Digital hubs provide services to connect within the network, support the development of digital skills and encourage the use of technology within the network. Digital hubs aim to improve environmental quality in local networks and are easily accessible to the public, businesses or local authorities. The digital hub is a means that provides change in the socio-economic sector and has a long-term impact on the wider community (BPPD Tangerang Selatan, Profil Kota Tanggerang Selatan, 2020).

Apart from that, digital hubs are considered to be able to build collaborative communities that encourage social connectivity and economic change, become facilities for exchanging knowledge, cultivating local technology-based entrepreneurial culture, creativity facilities and a combination of physical space and networked space. This is intended to increase the ability of individuals or entrepreneurs to develop technology in various types of expertise. According to Ashmore (2019), digital hubs are the primary interaction space in this digital era. Specifically, the presence of a digital hub is aimed at presenting an inclusive digital community, which has the existence value of balancing primary interaction needs with the digital needs that grow within it. Digital hubs become relevant along with the development of society whose needs are constantly changing.

The occurrence of climate change and the decline in environmental quality caused by the growth and acceleration of industrialism has resulted in environmental conditions changing drastically and the supply of natural resources being depleted. This raises awareness of the importance of architectural design that is responsive to local climate conditions. Ken Yeang, in an interview with CNN, said that architecture and the environment must work in harmony and support each other. Therefore, a concept is needed that is able to respond to climate and environmental problems in building design, one of which is by utilizing environmentally friendly technology.

Eco-technology is a science that studies the reciprocal relationship between living things and their environment and is the transformation of ecology into technology as tools and designs based on the natural environment (Utama & Prianto, 2022). Eco-technological architecture can be characterized based on:

• Expression of structures and constructions that are connected and become one with the environment

• Use of materials that are sustainable with the natural environment and are long-lasting

• Natural ventilation system as the main circulation source by utilizing building design and outside air processing to be used as artificial ventilation in the building

• The natural lighting system is utilized as well as possible as a source of building lighting

The study of eco-technology architecture can also be seen from several concepts as follows.

• Making connection: focuses on creating a relationship between the design and the surrounding environment which is applied to the building through an analogy process

• Civic symbolism: designing with different ideas and shapes so that the building can become a public symbol for the surrounding environment

• Urban responses: looking for problems related to the city environment and responding to them in design

• Energy matter: implementing energy efficiency in buildings to maximize energy utilization with existing technology

• Sculpting with light: focuses on natural lighting systems as lighting in the interior of the building and the operations and atmosphere of the building can be supported by this lighting

• Structural expression: prioritizing building forms with more modern and updated structures and applications that can be integrated with nature.

Solar lighting in buildings in tropical climates must pay attention to heat gain due to solar radiation. Effective natural lighting in a room includes distribution of light, projection of natural shadows and avoiding glare that can interfere with activities. The method of utilizing solar energy is considered to be able to create physical comfort for buildings in terms of lighting without using additional energy (Handoko & Ikaputra, 2019). Effective energy use takes into account environmental conditions without requiring additional construction costs and has a small impact on the environment, thereby saving more energy in the course of building operations.
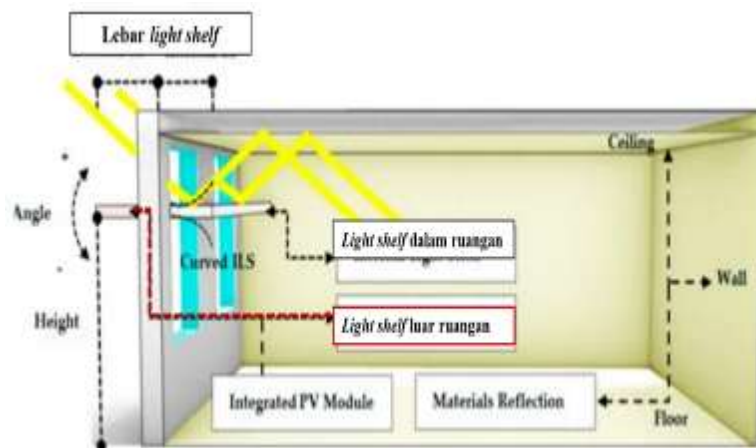

[Source: Mesloub & Ghosh, 2020]
Figure 1. Overview of the working principle of a light shelf

One way that can be done to maximize the distribution of sunlight into the room is to apply sun shading facades and use light shelves in buildings (Ministry of Communication and Information, Republic of Indonesia, 2017). The use of sun shading and light shelves is considered the right solution for controlling natural lighting in a room. This system is easy to modify, provides many options for design solutions and can regulate most of the incoming light flux to the ceiling of the room, so that the room gets the same intensity of natural lighting in each part, especially if installed on a facade oriented towards the south (Nadhif & Sutanto, 2019). The materials used can be made of wood, glass, plastic, metal

panels, plaster, acoustic panels and other materials that can help reflect sunlight into the building (Rizki, 2022).

One application of the urban responses concept that suits the problems of the design site is the application of a green roof (roof garden). Green roofs can absorb rainwater, help reduce air and noise pollution, and reduce the effects of climate change, especially global warming. Green roofs can add value to aesthetics, because the impression created looks at one with nature (Darmiant, 2018).
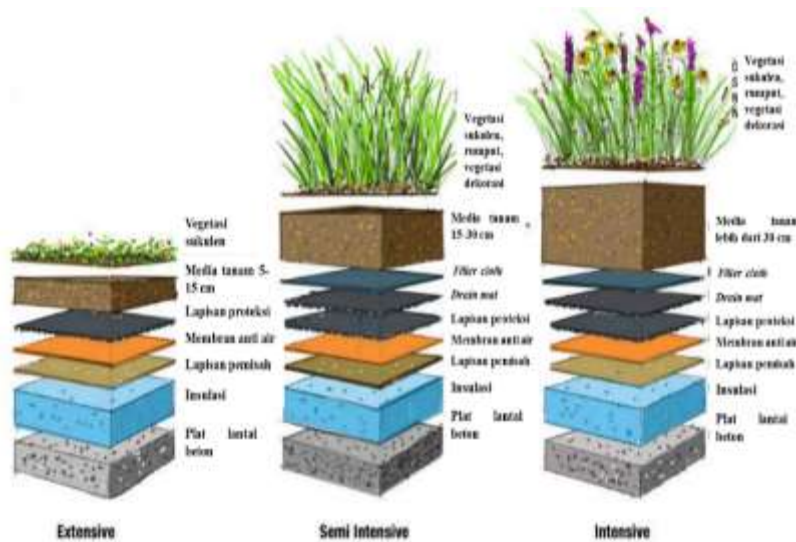
[Source: rainscapingiowa.org, 2015]
Figure 2. Green roof layer

Green roofs are classified based on the thickness of the planting medium, maintenance intensity and level of role, namely:

• Extensive green roof: a type of green roof with a planting media thickness of less than 15 cm and uses semi-fertile soil because it is not used as a communal or public area.

• Semi-intensive green roof: has a planting medium thickness of 15 to 30 cm, uses fertile soil so that more varied and decorative vegetation can be planted.

• Intensive green roof: has a planting medium thickness of more than 30 cm and can be planted with various types of vegetation. In its application, it requires a large and strong building structure to accommodate the heavy load of the green roof layer and the load of vegetation. The water system on this type of green roof must be very careful so that the vegetation can survive.

• Brown roof: a type of green roof that is intended to grow wild vegetation to form an ecosystem.

The green roof construction layer consists of a concrete floor plate, waterproof membrane, drain mat, filter cloth, planting media and vegetation (Rahayu, 2020). The concrete floor plate is at the bottom layer and will function as a roof structure, which will be covered with a waterproof membrane. Then, a drain mat will be installed to assist the irrigation system in moving water flow. Between the drain mat and the planting medium there is a filter cloth, which

separates the drain mat layer from the planting medium. Once everything is installed, the planting medium can be sprinkled before being planted with vegetation. Vegetation that can be planted on a green roof is plants with fibrous roots, whose growth tends to spread rather than continuing into the ground. Vegetation with tap roots can damage the roof structure, which can cause leaks and endanger building users. Suitable vegetation to be planted on a green roof can be seen in Table 1.

Table 1. Green Roof Vegetation

Vegetation	Function	Information
Hemigraphis colorata	Planting media cover, grows in media to a depth of 100 mm	Suitable for planting in shady areas until it gets full sun. Its spread is relatively fast.
Cordyline fruticose	An aesthetic enhancer, grows in media to a depth of 200 mm	Suitable for planting in areas that receive light shade
Alternanthera sessilis red	Planting media cover and divider, can grow in media with a depth of 100 mm	Can grow in areas that receive full sunlight and requires planting media that tends to be dry
Zoysia japonica	Planting media cover, grows in media to a depth of 100 mm	Can grow in areas that receive full sunlight
Alysicarpus vaginalis	Planting media cover and erosion control	Grows well in semi-shade and full sun. Can grow in various planting media from sand to clay.
Portulaca grandiflora	Enhances aesthetics and can grow in media with a depth of 100 mm	Can grow well in sunlight and does not grow well in wet soil.
Spathoglottis unguiculata	Planting media cover and aesthetic enhancer, can grow in media with a depth of 100 mm	This plant grows well in full sun to partial shade although it tends to flower more abundantly in brighter conditions

(Source: Yok; Sia, 2008 in Nasrulloh, *et al*. 2022)

Methodology

The design method that will be applied in this final assignment is descriptive qualitative research by collecting and comparing literature data and field surveys as done by some other architectural scholars such as Anwar & Ardhiati (2023), Gunawan & Ardhiati (2022), Herlambang & Ardhiati (2023), Kholis (2023), and Subagyo & Adi (2023). The qualitative descriptive method is used to research the condition of natural objects where the researcher as the key tool uses combined data collection techniques, inductive/qualitative data analysis, and the results of qualitative research emphasize meaning rather than generalization. The data obtained will be used as the basis for the design. Location data will be obtained by surveying the design location directly and searching for literature data related to regulations and site conditions. The design method will be carried out by searching for ideas, collecting data, analyzing and obtaining a synthesis.

The search for ideas for a digital community hub was based on concerns about the lack of space that could facilitate and support activities related to the development of the creative economy in the fields of information and technology. In addition, the acceleration of industrialism has resulted in climate change which is quite a concern in this design. The approach that will be applied is eco-technological architecture which is a solution to the current climate change problem. After searching for ideas, a data collection stage will be carried out by directly observing the condition of the design site and studying documentation and notes related to the design. Data can be collected by collecting alternative locations and conducting surveys directly. A location survey is carried out to observe the potential of the surrounding environment, problems on the site and potential on the site. Apart from that, it will search for literature data such as journals, articles, books, books and digital books related to objects. At this stage, data will be collected on regional regulations, infrastructure development regulations and other regulations. A precedent study will be conducted to collect and compare literature data regarding digital community hubs and eco-technology architectural design approaches.

The data that has been collected will be analyzed and processed to make it easier to understand. The analysis process is a point of view that needs to consider many aspects related to site location planning. The analysis discussion can be divided into site analysis, function, users and activities, space, form, structure and utility. After the analysis process is carried out and problems related to design are found, a synthesis process will be carried out to find solutions to these problems. The synthesis process produces space programs, space relationship diagrams, building forms, structures and others. The synthesis results will be collected into one to form a design concept.

Followings are the potential concept of the current design of community hub in Serpong, Tangerang.

## Google Bay View, United States

[Source: Architectural Record, 2022]
Figure 3. Google Bay View

Google's multi-mass building is a manifestation of Google's ambition to create sustainable, human-centered innovation for the future. The building is divided into two floors, with work spaces and team meeting rooms on the upper level and facilities space below. There is a series of indoor terraces throughout the building connecting the two levels, providing easy access to the café, kitchenette, conference room and function room. This area promotes the physiological benefits of physical movement when circulating between different levels and modes of work, and doubles as a wayfinding tool.

The superstructure uses a large-span canopy with average orthogonal column spans that allows the entire second level workspace to be opened and connected under one roof. This workspace prioritizes access to natural light and views, with glare reduction through carefully designed clerestory windows that accentuate the canopy. All three buildings were constructed as lightweight canopy structures optimized for interior lighting, views, collaboration, experiences and activities.

Machinery Tower, Malaysia
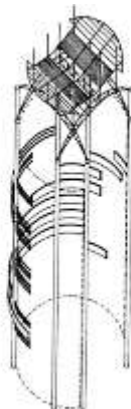
[Source: T.R. Hamzah & Yeang Snd. Bhd.]

Figure 4. Sun shading diagram of the Mechanical Engineering Tower

The Mesiniaga Tower is a tall building that embodies Ken Yeang's bioclimatic design principles. Yeang's interest in environmentally responsible and adaptive design led him to apply it to the design of this high-rise building. The bioclimatic approach is applied by uniting the building with vegetation on the facade through vertical landscaping to create natural ventilation, improve the microclimate, reduce heat and the intensity of sunlight entering the building. Vegetation is arranged on the balconies in a circular manner up to the end of the tower. Vertical landscaping creates natural ventilation, improves the microclimate, reduces heat and the intensity of sunlight entering the building. Buildings also naturally utilize outside air as natural ventilation by reducing outside air pressure and solar heat. On the building facade, large skycourts are also designed that encircle the building from bottom to top.

To respond to sunlight, the building orientation is designed perpendicular to the movement of sunlight and uses sun shading to reduce solar heat. The theory is based on the ecosystem concept, seen from the shape of the building in the form of a tube with a crown at the top and surrounded by vegetation. The existence of a vertical landscape provides living facilities for other habitats. Apart from that, vertical landscapes can form photosynthesis processes from sunlight and produce oxygen needed by living things.

Nanyang Technology University, Singapore

Nanyang Technology University, located in Singapore, carries an Eco-Technology theme which can be seen in the building which is shaped like a hill to be in harmony with the surrounding environment. The roof that is shaped like a hill is a green roof that can be passed by pedestrians and can be used as a communal area.

[Source: YouTube, 2013]
Figure 5. Nanyang Technology University

Springvale Community Hub, Australia

Springvale Community Hub is a public place that combines a public library, public space and government offices that stand in a public park. The building serves as a reflection of the Springvale community, which is one of the most

culturally diverse communities in Australia, and the unique identity of its residents. The building embodies the importance of representation and connection and is intended to foster a sense of shared ownership, weaving the cultural narrative of the region into the fabric of the building. This results in a mix of diverse public spaces and encourages interaction and connection between communities.

Results and discussion

The design location is on Jalan Pahlawan Seribu, Bumi Serpong Damai, South Tangerang with a land area of 2.56 hectares. The area in this area is designated as a development area for the economic sector, industry, private offices and space for informal sector activities.

[Source: Google Earth, 2022]
Figure 6. Location of Digital Community Hub design

The design location has a zoning designation for trade and service areas with general provisions on the intensity of space utilization which include:
• Maximum KDB 60%
• Maximum KLB 9.6
• Maximum KDH 60%
• Maximum KTB 65%
• GSB is a maximum of 6 meters from the outer edge of the site.

Analysis

Through the data it is known that reaching the site is quite easy because the site is easily accessible by public transportation and private vehicles. Circulation analysis includes vehicle and pedestrian movement patterns around the site and traffic movements around the site. Jalan Pahlawan Seribu which is right in front of the site has a traffic lane width of 15 meters, with 6 roads and 2-way lanes. Traffic conditions around the site are busy and smooth with quite high vehicle intensity because it is the main road that connects the areas. High vehicle intensity occurs in the morning from 06.00 to 08.00 West Indonesia time and in the afternoon from 16.00 to 19.00 West Indonesia time.

[Source: Kristi, 2022]
Figure 7. Site circulation analysis

Pedestrian circulation around the site is not very busy, because pedestrians or Transjakarta users only stop at bus stops. There are no pedestrian paths, making it difficult for pedestrians to access the site. Pedestrians have to pass through areas that are overgrown with weeds and are quite disturbing to pedestrian comfort. However, on the east side of the site there is a guardrail and vegetation separating the road and the site. Apart from public transportation and pedestrians, the traffic lane around the site is also a route and access to public transportation services such as buses, garbage trucks and fire engines.

Based on data on traffic conditions around the site, there are several alternative site accesses that function as entrances and exits to the site. Alternatives one (1) and two (2) are entry and exit access intended for pedestrians close to bus stops and red lights which are directly connected to pedestrian paths, thereby facilitating pedestrian access to the site.
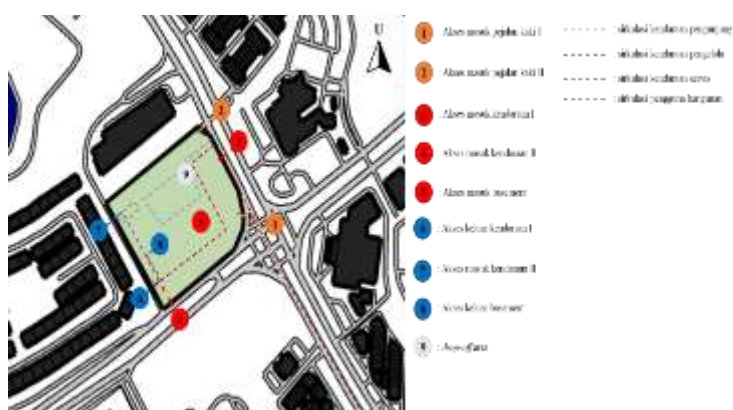
[Source: Kristi, 2022]
Figure 8. Site access and circulation analysis

Furthermore, there are two alternative pairs of vehicle entry and exit access, namely on the East side (3) which can be accessed directly from Jalan Pahlawan Seribu and on the North side (4) which can be accessed from Jalan Golf Artery. The disadvantage of alternative (3) is that it can cause congestion on traffic lanes when vehicle intensity is high. Alternative (4) can prevent the possibility of traffic jams occurring due to the intensity of vehicles on Jalan The Golf Artery is not as

high as the vehicle intensity on Jalan Hero of a Thousand. Alternative (4) can be used as access for service vehicles such as transport trucks, so that it does not interfere with activities in the front area of the site. Users with motorized vehicles can access the site and then drop off passengers at the drop-off area (9) or go directly to the parking area in the form of a parking lot or enter the basement area (5).

Alternatives for exiting the site are on the West side, namely alternatives (6) and (7). The exit on the West side facilitates vehicle circulation within the site and the paths around the site. Apart from that, the access door on the West side reduces congestion because it is directly connected to Jalan Pahlawan Taruna is quite rarely traveled by vehicles and tends to be quiet because it is close to a residential area. Exit access (6) can function as circulation for service vehicles that want to leave the site or exit the basement area (8), while access (7) can function as exit access for visitors or vehicles that only accompany building users.

In the building design, two accesses to the building will be created, namely through the lobby drop-off area and the parking area, so that the mass of the building can be placed in the middle of the site to make it easier for visitors to access and reach the building.

[Source: Kristi, 2022]
Figure 9. Overview of existing vegetation on the site

Vegetation on the site is found on the outer side surrounding the site and on the inside of the site. There are trembesi trees, squirrel tail palms and bushes on the outer side of the site along Jalan Hero of a Thousand. Vegetation on the path around the site can function as a guide for site circulation, forming air circulation and as protection against dust. Several trees on the inside and outside of the site will be maintained as shading, cooling and decorative elements for the open spaces of the building.

Noise Analysis

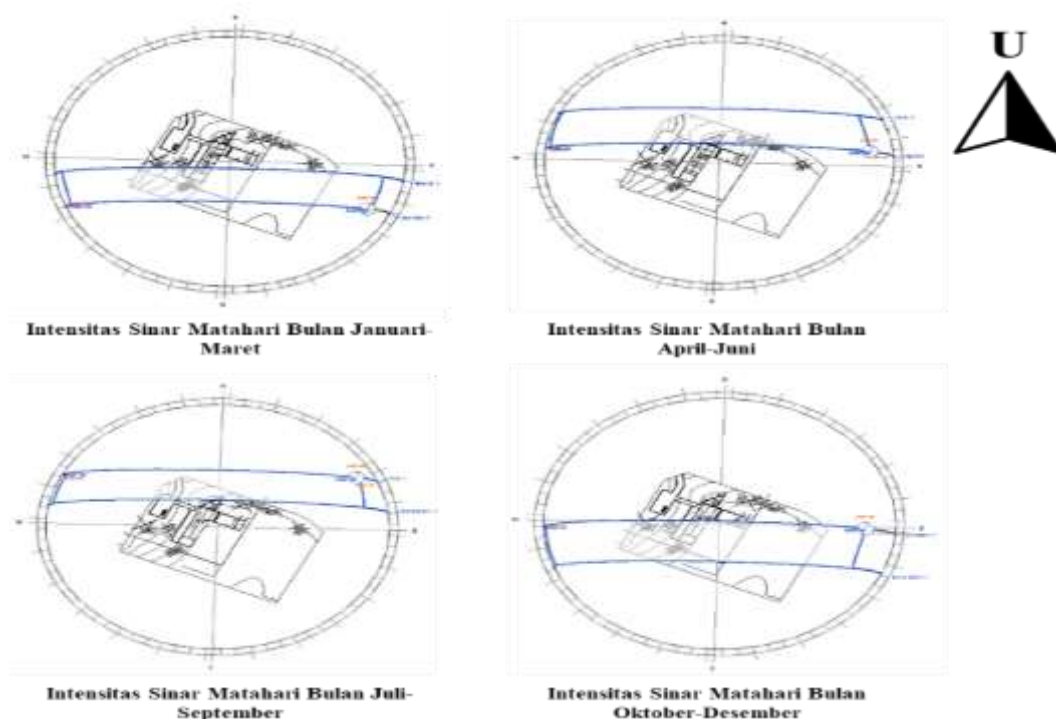[Source: Kristi, 2022]
Figure 10. Noise analysis on site

Noise analysis on the site uses the Decibel Scale application to determine the noise level on the site. The biggest noise source comes from the East side of the site with a noise level of 85-90 dB, which comes from the main road and road intersections which are often passed by large vehicles. The lowest noise source comes from the West side which is close to residential areas with a noise level of 20-40 dB because vehicles rarely pass by. On the East side area, noise dampening vegetation will be added to reduce noise entering the site. Activities in rental office zoning and capacity development centers require places that tend to be quiet, not directly connected to or close to sources of noise. Meanwhile, for activities at digital-based community centers, there is no need to pay attention to noise, because it functions as a public area which is a facility for gathering, socializing and discussing.

[Source: Kristi, 2022]
Figure 11. Site view analysis

The location of the design site is quite strategic because it is located at a major road intersection which is the main road in the BSD City area so that the location of the site is easy to see and find. The view from inside the site to the outside is quite good because it faces directly onto the main road and commercial buildings are blocked by large vegetation, so it is quite easy to create an atmosphere within the site. The view from the outside into the site is also considered quite good because the site is very clearly visible, so the building will be designed to stand out to support and add to the aesthetic value of the area so as to attract potential users. Landscaping elements on the site will help provide a sensory view of the site. Parks and pedestrian paths, vehicle paths and bicycle paths will be designed on the site. Apart from that, real and artificial rocks will be added as decorative elements, and garden lights to complement and add to the aesthetic value of the site.

Based on the analysis results, the East and Southeast sides have quite high sunlight intensity, while the North side of the site only receives afternoon sunlight. Shading vegetation will be planted on the site, such as Kiara Payung trees and Trembesi trees. Apart from that, a sun louvre roof with grilles will be applied to the site which can block sunlight and provide air conditioning for pedestrian circulation paths. Apart from that, the orientation of the site will be towards the East side facing the main road and can receive a fairly large air flow into the site. To prevent strong winds, wind breaking vegetation will be planted on the East and West sides.

Intensitas Sinar Matahari Bulan Januari-Maret

Intensitas Sinar Matahari Bulan April-Juni

Intensitas Sinar Matahari Bulan Juli-September

Intensitas Sinar Matahari Bulan Oktober-Desember

[Source: Kristi, 2022]
Figure 12. Analysis of the sun's movement in a year on the site

Climatic factors influence building layout based on sunlight intensity. The orientation of the building will face southeast because apart from being in line with the point of view from the main road, this side can receive morning sunlight. In addition, sun shading facades will be applied on this side, to regulate the amount of light entering the building.

The building orientation will be towards the East side. Through this position, the building will not turn its back on the main road and will take advantage of the view from inside and outside the site. Views from the east and south are the main road and site supporting facilities, which are quite dominated by large vegetation.

Space program

The function and activity analysis will explain in detail the functions and activities contained in the Digital Community Hub building, so that you can then determine the space requirements and building area required.

Table 2. Analysis of functions and activities

Function		User	Activity analysis
Primary Function	Digital Based Training and Personal Development Center	Training/workshop/course Seminar/counseling Work/be creative Organizing events/exhibitions Work	Training/workshop/course
			Seminar/counselling
			Work/be creative
			Organizing events/exhibitions
	Digital Based Rental Office	Inter-team meeting Discussion Gathering and discussions between communities	Work
			Inter-team meeting
			Discussion
			Gathering and discussions between communities
	Digital Based Community Activity Center	Learn/develop yourself Doing a hobby Play Increase knowledge/reading	Learn/develop yourself
			Doing a hobby
			Play
			Increase knowledge/reading
Secondary Functions	Commercial	Trade Promotion Rest, eat, drink	Trade
			Promotion
			Rest, eat, drink
	Customer service	Discuss Work Listen to customer complaints and aspirations	Discuss
			Work
			Listen to customer complaints and aspirations
	Daycare	Childcare Study Play	Childcare
			Study
			Play
	Management and Administration	Work Meeting Financial management	Work
			Meeting
			Financial management
			Security management
			Marketing management
			Public relations management
Supporting Functions	General service	Visitors, management staff	BAB, BAK
			Clean yourself

			Rest
			Worship
Building services	Management (technicians)	staff	Panel management
			AHU Management
			Generator management
			Loading and storing goods
			Vehicle parking
Security	Management (security guard)	staff	BAB, BAK
			Clean yourself
			Rest
			Worship
			Patrol

[Source: Kristi, 2022]

Based on the calculation assumptions made, the targeted number of visitors is 2,400 people per day. The space requirements are obtained as follows.

Table 3. Space size

No.	Zone Group	Besaran Luas
1.	Parking area	6.900 m^2
2.	Digital-Based Self-Development Zoning	2.220 m^2
3.	Rental Office Zoning	2.600 m^2
4.	Culinary Zoning	500 m^2
5.	Service Area	2.200 m^2
	Total area	14.400 m^2

[Source: Kristi, 2023]
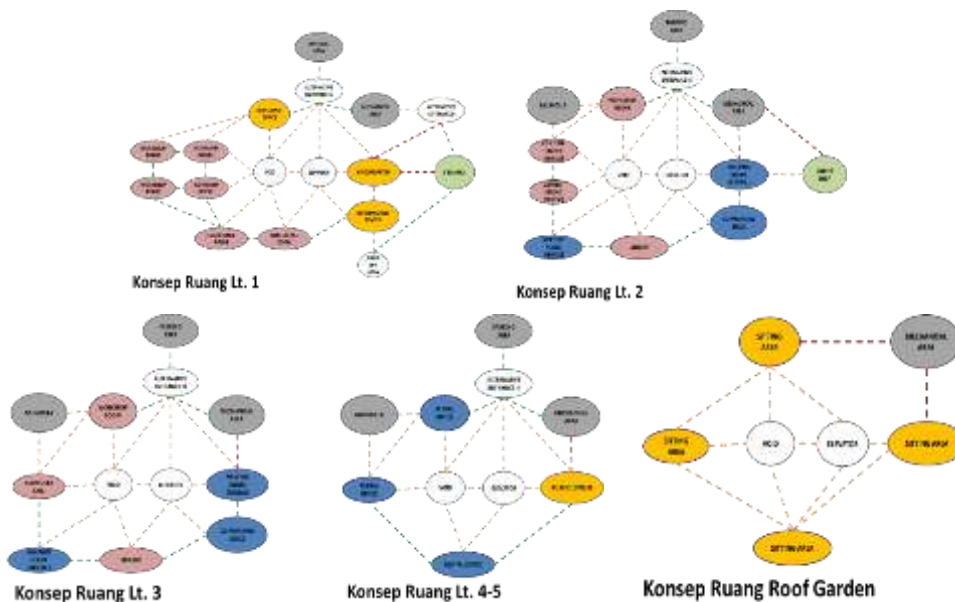
[Source: Kristi, 2022]
Figure 13. Community Hub Digital space diagram

Concept

Based on the Kompas page, there are more than 20 groups of orchid cultivation farmers spread across seven sub-districts in South Tangerang, namely in Ciputat, Pamulang, Serpong and Setu sub-districts. The Vanda Douglas orchid was also one of the inspirations for the creation of the typical South Tangerang dance, namely Nong Anggrek. In accordance with the concept of making connection, the basic shape of the Vanda Douglas orchid flower is taken, which is a plant commodity that is widely developed in South Tangerang.
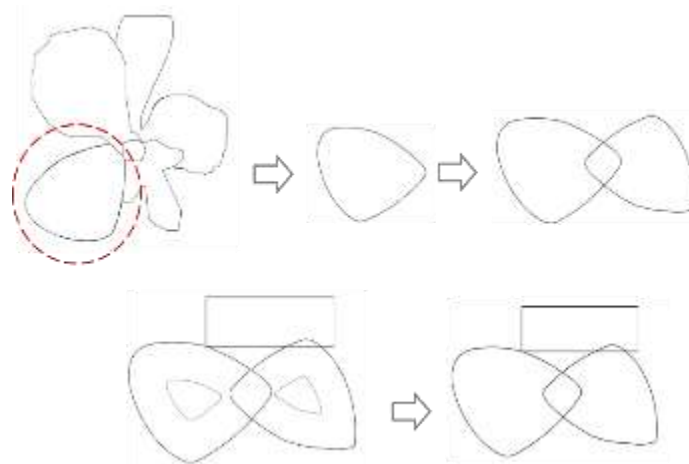
[Source: Kristi, 2022]
Figure 14. Community Hub Digital mass composition study

The basic shape is taken from pieces of orchid flower petals put together to form an infinity symbol, which can depict the concept of infinity and infinity which represents the purpose of the Digital Community Hub building to support the unlimited development of digital creativity. An additional rectangular shape will be provided which will function as a parking building for cars. After that, elevation differences will be given that separate the two zones according to their function.

The design concept for the site produces four area zones, namely, the parking area, the public area consisting of a mini plaza, the main area, namely the digital community hub building, and the service area, namely the TPS area at the back of the site. There is circulation for pedestrians and vehicles which is arranged so that they do not cross. Apart from that, the car and motorbike parking areas will be separated so that they do not cross each other. Apart from that, entry access for two-wheeled and four-wheeled vehicles will be separated. The circulation pattern will be created around the site.

On the site, noise-dampening vegetation will be planted, vegetation will act as a guide and utilize existing vegetation such as palm trees. On the site, bus stops will be designed as drop point areas for online vehicles and places for bus passengers to get on and off.
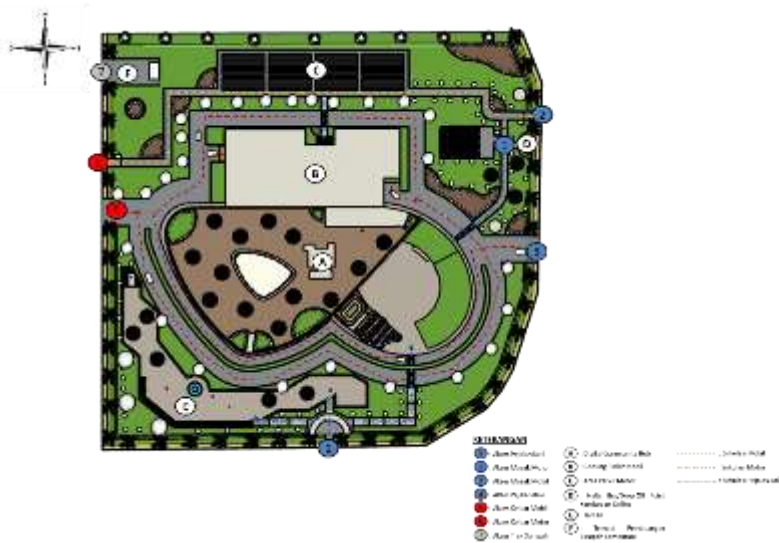
[Source: Kristi, 2023]
Figure 15. Site planning concept

[Source: Kristi, 2023]
Figure 16. Concept of mass composition

The Digital Community Hub building mass that will be designed is a single mass that combines four zonings, namely rental office zoning, digital capability development zoning, culinary zoning and service zoning. The building layout will use a radial type.

Floors one to three will be used as an area for developing digital and culinary skills consisting of a conference room, workshop room, rental meeting room, library and reading room, co-working space area, computer laboratory, food and beverage area and coffee shop. Meanwhile, the fourth and fifth floors will be used as rental office areas, each floor providing three rental office units and one public lounge. Each floor provides service facilities such as toilets and prayer rooms. The roof floor will be used as a communal area by providing a seating area. This communal area can be used as a work or relaxing area. The back of the building will be used as a parking area for four-wheeled vehicles and also a loading dock.

The structural concept used is based on the results of structural analysis which will be adjusted to the building site conditions.

Table 4. Structural design concept

Structure	Building section	Material
Upper Structure	Green Roof	• Reinforced concrete
	Rooftop	• Separator layer
Middle Structure	Column	• Waterproof membrane
	Beam	• Drain mat
	Wall	• Filter cloths
	Soundproof walls	• 30 cm thick soil planting medium
	Facade	• Vegetation
	Floor	• Cast concrete
	Ceiling	• Waterproof coating
Bottom Structure	Foundation	• Reinforced concrete diameter 70 cm

[Source: Kristi, 2022]

The source of clean water supply uses a water tank system sourced from PDAM and groundwater sources which will flow to the pump and then be stored in the ground tank. After that, a filtering process will be carried out and then it will flow to the roof tank. After that, the water will be channeled to each shaft point on each floor of the building.

• Sewer

Dirty water channels will be classified into three, namely liquid waste, which comes from sinks, kitchens, floor drains, rainwater, solid waste from toilets or urinals and liquid waste which can be recycled for reuse. The dirty water channel will use a two-pipe system installation. Liquid waste originating from the kitchen goes to the fat tank (BL) to the catch basin (CB) and flows to the control tank (BK), then ends up in the waste infiltration. The solid waste channel originating from the toilet flows into the control tank then goes to the septic tank (STP) then flows into the control tank again before heading to waste absorption.

• Recycling Water Line
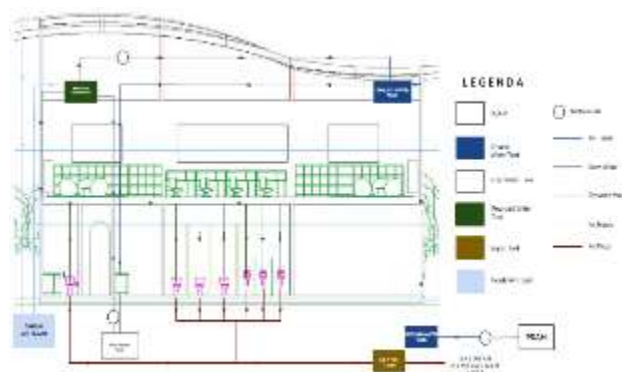
[Source: Assignments in the Green Building MBKM Lecture, 2021]
Figure 17. Water recycling diagram

The Digital Community Hub building will use a water treatment plant (WTP) as a recycling water channel. WTP is a system that functions to treat water from

contaminated raw water quality to obtain the desired water quality treatment. WTP construction consists of five processes, namely coagulation, flocculation, sedimentation, filtration and disinfection. This recycled water can be used for flushing toilets and watering plants on buildings and sites.

• Electrical System

Electrical channels come from two sources, namely; (1) PLN as the main electricity distribution source; and (2) Generator as a backup electricity source. The electrical voltage in the building is Medium Voltage (TM) which originates from the electricity substation (PLN) to the building's HVDP which reduces the voltage from Medium Voltage to Low Voltage (TR). After that, it will flow to the MDP (Main Distribution Panel) which will then flow to the SDP (Sub Distribution Panel) located on each floor. Next, electricity will be distributed from the SDP to other rooms on each floor.

• Air conditioning system
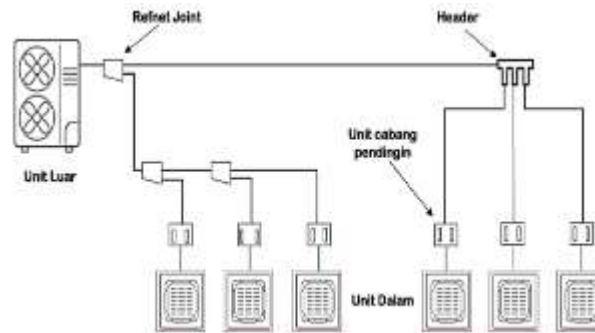
[Source: Rachman, et al, 2022]
Figure 18. Cooling diagram with VRV technology

The ventilation system will utilize natural and artificial air conditioning systems (VRV). Using a VRV AC system can be a more efficient and effective choice in maintaining multi-storey buildings. This system consists of a heating unit consisting of a boiler, a ventilation unit consisting of a fan and a cooling unit consisting of a chiller. VRV systems minimize duct usage which reduces pressure drops which are often estimated at 10-20% of the total air flow in a duct system. VRV systems are more efficient than cold water systems. Even though installation costs are higher, the VRV system is considered capable of reducing energy consumption by 30-40% in a year. Air control in each room unit uses an air controller/thermostat, which allows efficient use of AC. Setting the temperature with a thermostat can save energy and make AC maintenance easier.

• Lighting System

In the building two lighting systems will be used, namely a natural lighting system and an artificial lighting system. Natural lighting comes from sunlight which will be reflected into the building by using sun shading and skylights on the roof and facade of the building, thereby maximizing the intensity of light

entering the building. Artificial lighting comes from electric lights which will be used for building operations at night, when the weather is dark or cloudy so that no sunlight enters the building and in rooms that are not accessible by natural lighting.

• Waste Disposal System

The waste disposal system uses a waste chute system in the form of a square box, which is provided in the service area on each floor, as a waste disposal channel. The waste elevator is divided into three parts, namely organic waste, inorganic waste and B3 waste (Hazardous and Toxic Materials) which leads to the garbage chute and down to the bottom floor of the building, to the waste room, through the tower recycling system. Each type of waste will be collected according to the type of waste, placed in a TPS at the back of the site and then transported by a rubbish truck to be taken to the nearest TPA.

• Disaster Prevention and Management System

Disaster prevention and management is very important to pay attention to, especially because buildings are public areas so they need access and materials that can prevent possible disasters from occurring. Applications that can be applied to buildings are heat detectors, sprinklers and emergency stairs.

• Building Transportation Systems

The transportation system in the building will use ramps and elevators as vertical transportation, while for horizontal transportation, lobbies and corridors will be designed.

Design Drawings

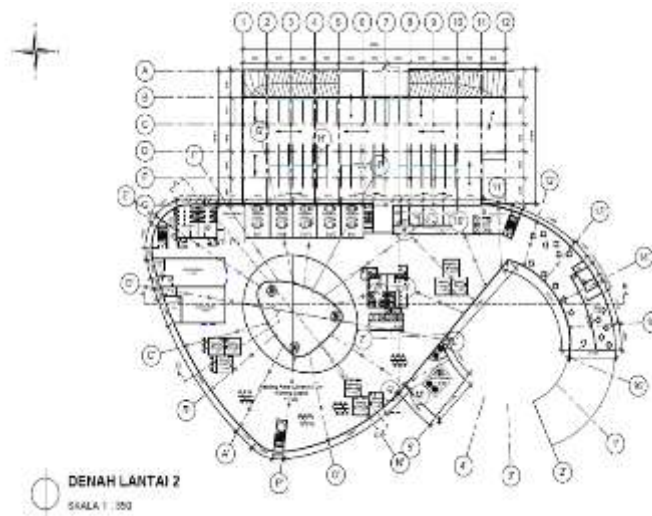Through the planning and design process, several image products are produced as follows.

[Source: Kristi, 2023]
Figure 19. Block plan
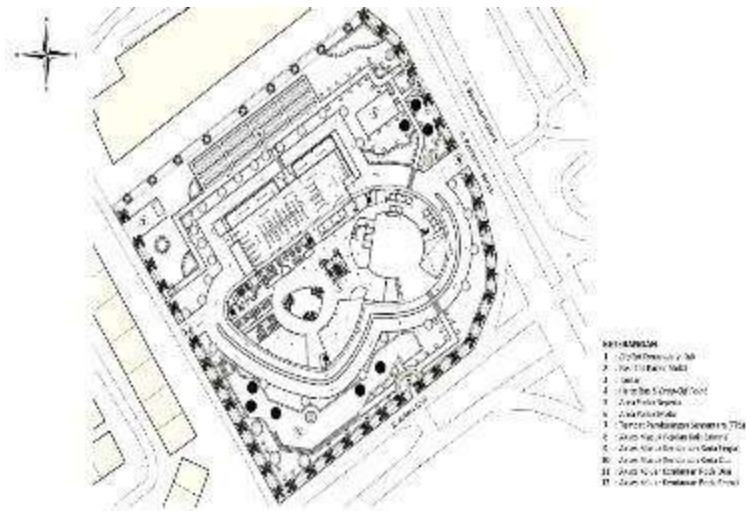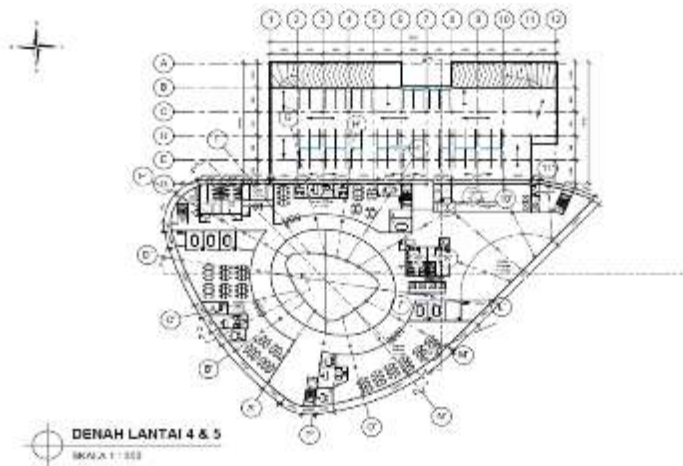
[Source: Kristi, 2023]
Figure 20. Site plan
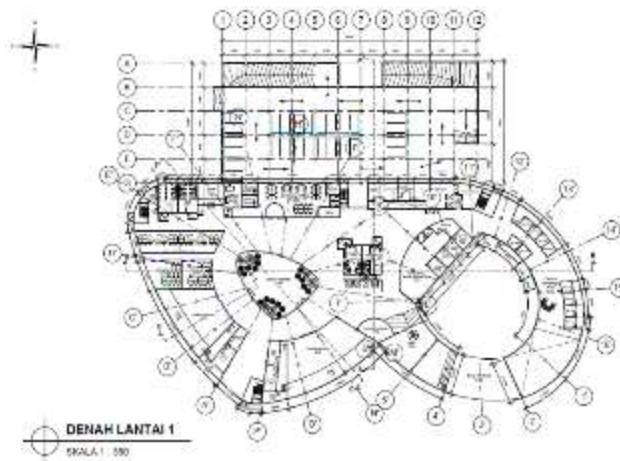
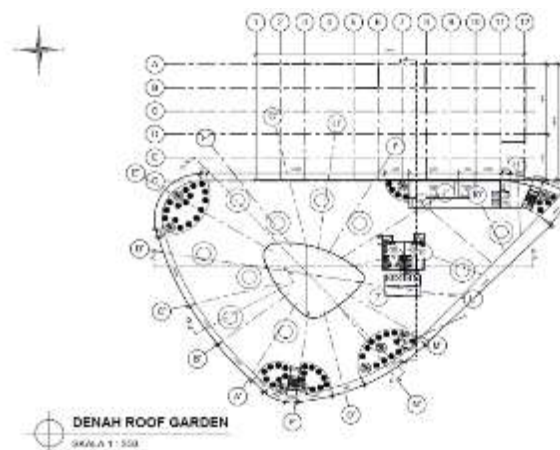[Source: Kristi, 2023]
Figure 21. First floor plan

[Source: Kristi, 2023]
Figure 22. Second floor plan

[Source: Kristi, 2023]
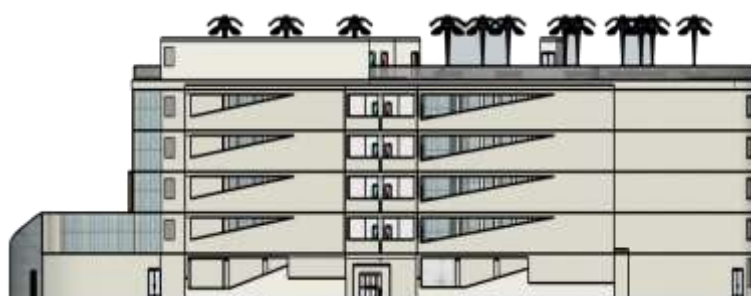Figure 23.Third floor plan

[Source: Kristi, 2023]
Figure 24. Fourth and fifth floor plans

[Source: Kristi, 2023]
Figure 25. Roof garden plan

[Source: Kristi, 2023]
Figure 26. Front view of the Digital Community Hub

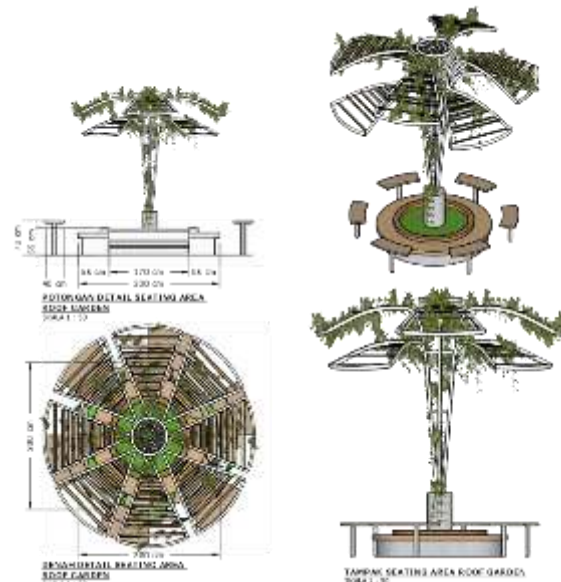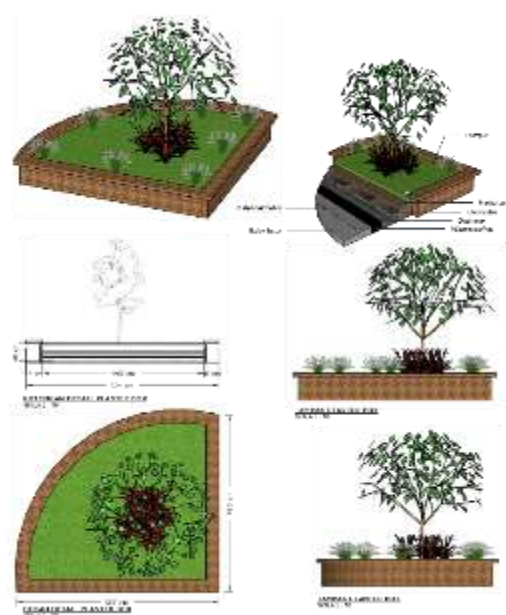[Source: Kristi, 2023]
Figure 27. Back view of Digital Community Hub

[Source: Kristi, 2023]
Figure 28. Left side view of Digital Community Hub

[Source: Kristi, 2023]
Figure 29. Right side view of Digital Community Hub

The roof garden floor will function as a communal area for working or relaxing, so there will be a seating area as a facility for sitting and carrying out activities and planter boxes as an aesthetic addition.
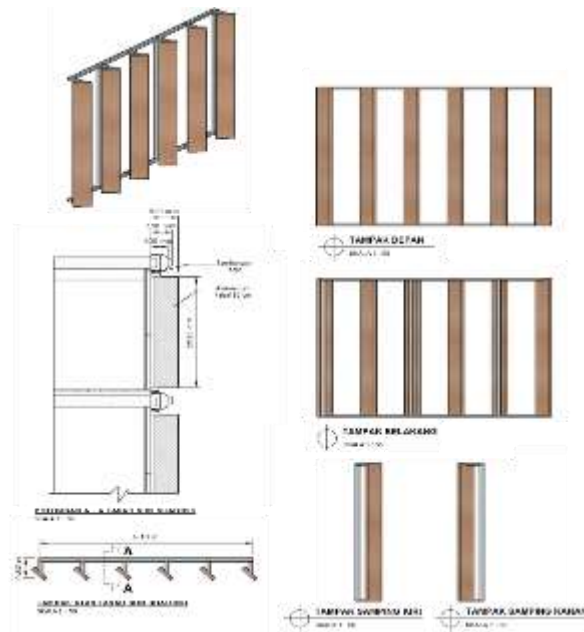

[Source: Kristi, 2023]
Figure 30. Seating area details

[Source: Kristi, 2023]
Figure 31. Planter box details

The building facade will use a combination of curtain wall and sun shading. The use of sun shading functions as a catcher for sunlight to be transmitted into the building to help with natural lighting. The sun shading material consists of 10 cm thick aluminum with a Cooper metallic color.

[Source: Kristi, 2023]
Figure 32. Sun shading facade Details

Conclusion

The Digital Community Hub in Serpong, South Tangerang is located on Jalan Pahlawan Seribu, Bumi Serpong Damai, South Tangerang with a land area of 2.56 hectares. Its design is divided into four zonings, namely, rental office zoning, digital capability development zoning, culinary zoning and service zoning. In its operation and maintenance, this building utilizes energy efficiency in the use of water and lighting.

Apart from that, the green roof which is used as a communal space adds aesthetic value while supporting the eco-technological architectural concept implemented. The concept of eco-technology architecture is also applied to the use of sun shading facades to transmit the intensity of sunlight into the building, thereby allowing the building to receive natural lighting.

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Creative Hub in South Tangerang City and its Biophilic Architectural Theme

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Abstract: Banten Province in Indonesia is one of the ninth contributors to the creative economy where South Tangerang City has become one of the centers of creative economic growth in Jabodetabek (Jakarta, Bogor, Depok, Tengerang, Bekasi) with its main fields, the crafts sub-sector, the architecture sub-sector and the start-up sub-sector. Regarding the three main sub-sectors, this research is intended to create a centralized and integrated forum for people to develop their talents and businesses. This research method is qualitative. The Creative Hub in South Tangerang City is a place for creative economy actors to develop their talents and businesses. Using a biophilic architectural theme, the site design is a part of the development of the economic and business center in South Tangerang City. The site covers offices, shopping outlets and restaurants.

Keywords: biophilic architecture, creative hub, theme

Introduction

The creative economy concept is an economic concept that is based on human abilities and skills (Hasan, 2018). This is in accordance with the statement (Toffler, 1970), concerning the three economic waves. Paradigm shifts in economic development cannot be separated from changes on a global scale. This change is marked by a shift in economic development from the agricultural, industrial and information sectors to the creative economy sector. This condition must be linked to the ability to manage potential. Therefore, the concept of a creative economy must be in accordance with the ability of innovation and creativity in managing existing local potential (Peters, 2004). Therefore, the development of the creative economy will increase people's income (Hamilton, et al., 2009; Cunningham & Higgs, 2008). In other words, the development of the creative economy is an alternative economic activity for society to develop its potential (United Nations Development Program, 2013).

Etymologically, creativity comes from the Latin participle "creare" which means "to create, produce", and is also related to "crescere" which means "to rise" or "grow" (Kampylis & Valtanen, 2010). According to Weiner (2000) the word "creativity" first appeared in an 1875 text by Adolfus William Ward and was used to indicate that there is something similar in all fields. Creativity has been characterized as a process that leads to the "generation of new and valuable ideas", as a complex phenomenon, which introduces something new that is

valued by a person. Creativity is generally defined as "the generation of original and useful ideas. According to Noni et al. (2023), creativity refers to the process of generating ideas or solving problems, and actual ideas or solutions.

In Indonesia, the development of the creative economy has seen a marked increase. Every year the development of the creative industry continues to increase, one indicator is that in 2019 this sector contributed 1,153.4 trillion rupiah to national GDP, absorbed 19.2 million workers (15.21%), and export value reached US$ 19. 6 billion (11.9 %). The increasing contribution of the creative economy to the national economy from 2010-2019 is 10.14% per year. This proves that the creative economy has the potential to develop in the future.

The creative economy (Ekraf or ekonomi kreatif in Indonesia language) is a sector that is expected to be able to become a new, sustainable force in the national economy and emphasizes adding value to goods through human thinking and creativity. The Indonesian government, in this case the Ministry of Tourism and Creative Economy, is paying more attention to this sector, with the aim of maximizing the potential and opportunities of the Creative Economy in Indonesia. The creative economy is able to contribute significantly to national economic growth.

Banten Province is one of the ninth contributors to the creative economy, the top three sub-sectors of Banten's creative economy, namely, music 26.75%, animated films & videos 13.18%, culinary 12.04% and other sub-sectors: 48.03% (Statistics Creative Economy, 2020). South Tangerang City, which is located in the eastern part of Banten Province, was established on 29 October 2008 where the formation of South Tangerang City was based on Law no. 51 of 2008 concerning the Establishment of South Tangerang City. Over time, South Tangerang has become one of the centers of creative economic growth in Jabodetabek (Jakarta, Bogor, Depok, Tangerang, Bekasi) with its main fields, the crafts sub-sector, the architecture sub-sector and the start-up sub-sector (Bappeda South Tangerang, 2022).

Regarding the three main sub-sectors, a centralized and integrated platform is needed for people to develop their talents and efforts. Buildings such as the Creative Hub are a forum for creative economy actors to develop their talents and businesses, it is hoped that they can be accessed and maximized by creative economy actors, especially those operating in the Jabodetabek area. South Tangerang City actually has great potential, seen from the many creative industry players in South Tangarang City who can be found in various communities. However, unfortunately, the South Tangerang City currently does not have facilities that are capable of providing a biological connection between humans and nature and can be sufficient for creative economic actors to develop better.

Hubs are more than buildings or containers, they can provide a crucial link between intermediary activities (social and economic) (Pratt, 2021). Virani & Malem (2015) state, although different creative hubs take on a number of different physical, spatial, organisational and operational manifestations they nonetheless can be understood as having four primary characteristics: first, they provide 'creative' services to creative SMEs, including micro-businesses; second, they are aimed specifically at early stage creative SMEs and micro-businesses;

third, they are facilitated by trusted individuals who retain a number of important positions and conduct a number of important activities; and fourth, they have become important to the health of the local creative economy.

A creative hub is a place, both physical and virtual, that brings together creative people that serves as a meeting place, providing space and support for networking, business development, and community engagement in the creative, cultural and technology sectors. The main activities carried out by creative workers are work, exhibitions, seminars, and workshops. With the development of the creative industry in Indonesia which is quite rapid, it is necessary to have a container or facility that can accommodate the activities of creative industry workers, especially those that focus on the fashion, craft, and application developer sub-sectors to create a sustainable human environment. It can be known the main activities, supporting activities, main facilities and supporting facilities are needed for sustainable human environment, so that users can be more productive and carry out activities comfortably.

The South Tangerang City needs space that has a visual connection with nature so that it can reduce stress, have more positive emotions, and increase concentration. Biophilic design provides the opportunity for humans to live and work in a healthy place, with minimum stress levels, and provides a prosperous life by integrating nature, both natural materials and natural forms into the design.

Creative Hub is a forum for creative industry players, which is expected to accommodate various kinds of creative ideas from creative industry players in the South Tangerang City area. Apart from that, the existence of creative nodes is expected to build and increase activities for creative industry players who will produce creative economic products with economic value. Creative Hub became known in Indonesia in 2017 with the construction of the Jakarta Creative Hub (JCH) in 2017, after which other cities such as Bandung and Sukabumi followed.

Creative Hub is a forum used to support the creativity of young people who want to create and also MSME players. Actors can also contribute to the economic progress of the South Tangerang region, which currently still requires the intervention of creative young people and new MSME players (Creative Economy Statistics, 2020).

Biophilic architecture is a design that provides opportunities for humans to live and work in a healthy place, with minimal levels of stress, and provides a prosperous life by integrating design with nature (Browning, 2014).

Table 1. Implementation of 14 biophilic design patterns in buildings

Pattern	Design principles	Meaning
	P1. Connection with nature Visually	The interaction of humans and nature through direct viewing of natural elements, living systems and natural processes.
	P2. Non-visual relationships with nature.	The interaction of humans and nature through hearing, touch, smell or taste stimulation which creates calm and becomes a positive reference to nature, living systems or natural processes.

Natural patterns in space	P3. Sensory stimuli are not rhythmic.	An indicator and connection with nature which lasts a short time which can be analyzed statistically but could not predicted correctly.
	P4. Variations in heat and air changes.	Utilizes varying intensities of light and shadow that change over time to create conditions that occur in nature.
	Q5. Presence of water.	Awareness of natural processes, especially seasonal changes and the transient character of healthy ecosystems.
	P6. Dynamic and diffuse light.	Symbolic references or references for contours, patterns, textures or numerical arrangements like what occurs in nature.
	P7. Relationship with natural system.	Awareness of natural processes, especially seasonal changes and the transient character of healthy ecosystems.
Material relationship patterns with nature	P8. Biomorphic shapes and patterns.	Symbolic references or references for contours, patterns, textures or numerical arrangements like what occurs in nature.
	P9. Material relationship with nature	Materials and elements from nature are managed minimally, reflecting the local environment or geology.
	P10. Complexity and order.	Information obtained by complex sensory abilities has a special meaning similar to that found in nature.
Patterns of spatial properties	P11. Prospect	A clear view over a distance, for planning control.
	P12. Shelter	A place for withdrawal from environmental conditions or the flow of main activities where the individual is protected from behind and above the head.
	P13. Mistery	A space with a good state of mystery has a sense of anticipation, or seductive nature, offering the senses a kind of repulsion and will compel a person to investigate more about the room.
	P14. Resh/danger	A threat can be identified along with reliable protection.

Methodology

Comparative study

Located in Jakarta, Jakarta Creative Hub is in the center of the city, accessible by public transportation with an area of 1000 m2. The concept of this building covers an industrial concept, cafeteria classroom facilities, management room, market space and library.

[Source: Archdaily.com, 2024]
Figure 1. Jakarta Creative Center

Bandung Creative Hub is located in Bandung and is in the middle of the city and can be accessed by public transportation with an area of 5,000 M² (5 floors). The concept of this building uses an industrial concept, facilities include cafeteria classrooms, management rooms, market space and library.

[Source: Archdaily.com, 2024]
Figure 2. Bandung Creative Center

Youth Center of Qingpu is located in the east of the new city of Qingpu, Sanghai, China with an area of 12,360 M² (3 floors). The concept of this building uses the Modern Green Architecture concept, open courtyard facilities, library, art room, theater room, plant education room, living room, management office, kitchen, sports area, recording room.

[Source: Archdaily.com, 2024]
Figure 3. Youth Center of Qingpu (Source: Archdaily.com, 2024)

Artcore Creative Center is located in Chisnau, Moldova (Europe). Located in the city center, but with little access to public transportation with an area of 1,500 m2 (2 floors). The concept of this building uses an industrialist concept. Facilities: Workshop space, library, meeting room, music studio space, Co-Office, café, exhibition space.

[Source: Archdaily.com, 2024]
Figure 4. Artcore creative center

Biomorphic shapes and patterns

Biomorphic shapes and patterns can be applied to building facades in the form of double skin. Forms and functions found in nature, such as plant shapes or other natural forms, can be arranged to make static buildings more dynamic.

[Source: Archdaily.com, 2024]

Figure 5. Application of biomorphic shapes and patterns in the School of the Arts Building

In the School of the Arts building in Singapore which has an area of 52945 m² by WOHA Architect, there is a double skin on the facade in the form of a green wall which makes the building more dynamic and surrounded by living systems. With a function as a filter from noise, light and dust.

[Source: Archdaily.com, 2024]

Figure 6. Application of biomorphic shapes and patterns in Yale University's Kroon Hall Building

In the School of the Arts building in the United States which has an area of 68,800 m² by Hopkins Architects and Centerbrook Architects and Planners, elements of biomorphic shapes and patterns are found on the building facade which uses repetition of line elements.

[Source: Archdaily.com, 2024]

Figure 7. Application of biomorphic shapes and patterns in the French International School of Beijing Building

Similar to the French International School of Beijing building in China, the concept for designing the facade of this building uses double skin in the form of wooden lattices that appear to float and form tree lines. This will create an innovative and dynamic building appearance.

Design methods

The data collection process used is divided into two categories, the first is primary data, then supplemented with secondary data. Primary data is data carried out by direct survey and Google Earth, while secondary data is obtained from literary studies, precedent studies and studies from books and journals.

The following are several data references that can be used in designing the Creative Hub which can be seen in Table 2.

Table 2. Data Collection Methods

Data type	Data	Data collection method
Primary data	-Site location	Direct survey, Google Earth
Secondary Data	-Size of site location	Study of literature

(Source: Shavrizal, 2022)

The research method used is qualitative. Some architectural scholars such as Anwar & Ardhiati (2023), Gunawan & Ardhiati (2022), Herlambang & Ardhiati (2023), Kholis (2023), and Subagyo & Adi (2023) had already used the same method but their researches and this one are very different in terms of research location and object of study..

Results and discussion

Location

[Source: Google Maps & Author Data, 2024]
Figure 8. Location map

The site location has an area of ±16,000 M² with a relatively flat contour. The selected location has an area function as an office area or trade area, making it possible for a Creative Hub building to be built. The location is supported by facilities including shopping centers, malls, apartments, business centers, schools, and is connected by infrastructure such as Jurang Mangu station, Pondok Aren toll gate which facilitates accessibility to and from the location. This Creative

Hub building has a scope of services that focuses on students, students and creative economy actors with a middle economic level located on Jl. Bintaro Jaya Boulevard, Pondok Aren, South Tangerang City, Banten, Intdonesia.

Location designation: trade and services
Land area: ± 16,000m
Building boundary line: 10 meters
Basic building coefficient: 60%
Building floor coefficient: 7.2
Green basic coefficient: 10%

Site limits:
North: vacant land (commercial)
South: residential areas
West: penabur school, jakarta
East: graha hero

Calculation:
KDB = Land Area x KDB
= 16,000 M²x 60%
= 9,600 M2
KLB = KLB x Land Area
= 7.2 x 16,000 M²
= 115,200 M2
KDH = KDH x Land Area
= 10% x 16,000 M²
= 1,600 M²

The results of the analysis that can be built at this site location if the ground floor can be built is 9,600 M² with a Building Area Coefficient (KLB) of 115,200 divided by 9,600 which is the equivalent of 12 floors. Only 12 floors can be built at this site location. Because the building's floor coefficient is only 12.

Site analysis

From the results of the Site Analysis, it can be concluded that the site location was processed in terms of access, lighting & wind, noise & vegetation, zoning on the site and views. All of this was maximized according to the design needs of the South Tangerang Creative Hub.

[Source: Google Maps & Author Data, 2024]
Figure 9. Site Analysis

Space analysis

Table 3. Space requirements

Public	Semi Private	Private	Service
1. Lobby	1. R. Class	1. Management Office	1. Pantry
2. Library	2. Music Studio	2. R. Staff Work	2. Lavatory
3 Exhibition Halls	3. Photography Studio		3. Janitor
	4. DKV Studios		
4. Auditorium	5. Lab. 2D Animation		4. R. ME
5. Café	6. Lab. 3D Animation		5. R. CCTV
6. ATM Center	7. Film Studios		6. R. Panel
7. Prayer room	8. Workshops		7. R. AHU
8. R. Work Security			8. Warehouse
	9. Dance studio		
9. Co Working Space			9. TPS
10. Motorbike Parking	10. Radio Studios		
11. Car Park	11. Lab. Comp/MAC		10. R. ME Work
12. Parking Post			11. R. Cleanliness Work

[Source: Author's analysis, 2022]

Table 4. Space size

| No.	Room	Breadth
	Total analysis of space requirements	
1	Public	4542 m2
2	Semi Private	1324 m2
3	Private	200 m2
4	Service	698 m2
	Total 1 floor	6755 m2

[Source: Author's analysis, 2022]

Building circulation analysis

Table 5. Conclusion of spatial circulation analysis

| Circulation	Achievement	Space path	Form of circulation space
1. Linear 2. Radials	1. Indirect 2. Twisting	1. Direct 2. Indirect	1. Open 1 side 2. Open 2 side

[Source: Author's analysis 2022]

Building system analysis
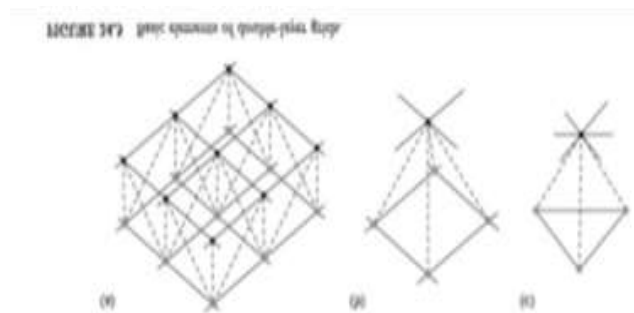
[Source: Google, 2022]
Figure 10. Space frame structure

After analysis, an upper structural system with a rigid frame system (space frame) was determined. Because it makes it easier to determine the shape and has a light load, the roof covering uses a steel frame.
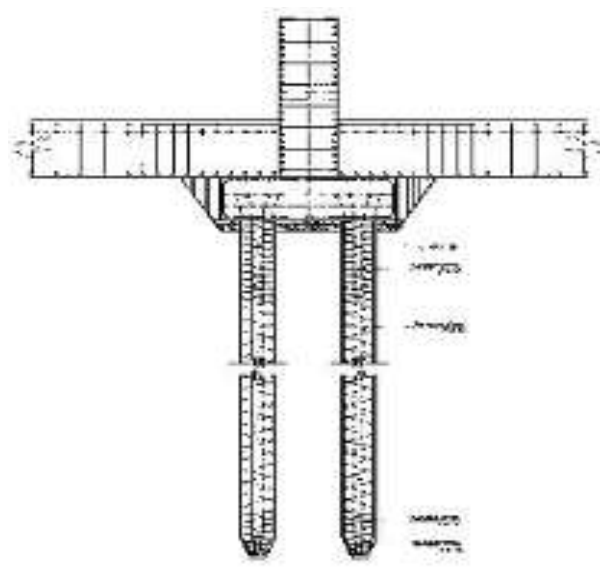
[Source: Google, 2022]
Figure 11. Pile foundation
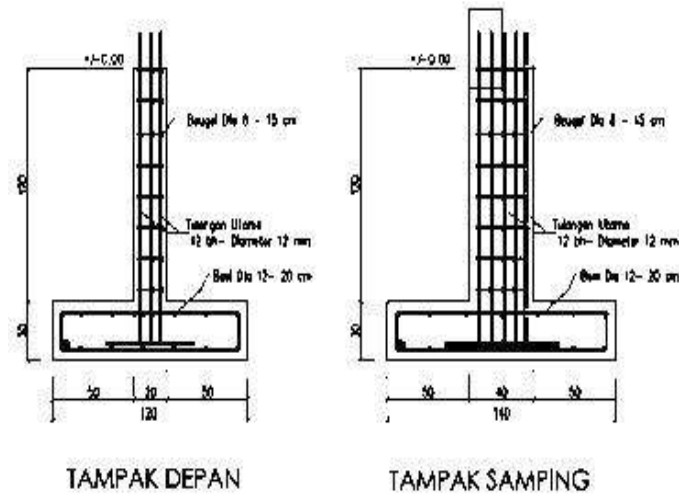
[Source: Google, 2022]
Figure 12. Site foundation

After analysis, a sub-structure system was determined with pile foundations for multi-storey buildings and site foundations for one-story buildings.

Utilities

Clean water uses own feed system by considering the even distribution of clean water in the rooms in the high school building and for long term use this system is effective and efficient even though the manufacturing costs are expensive.
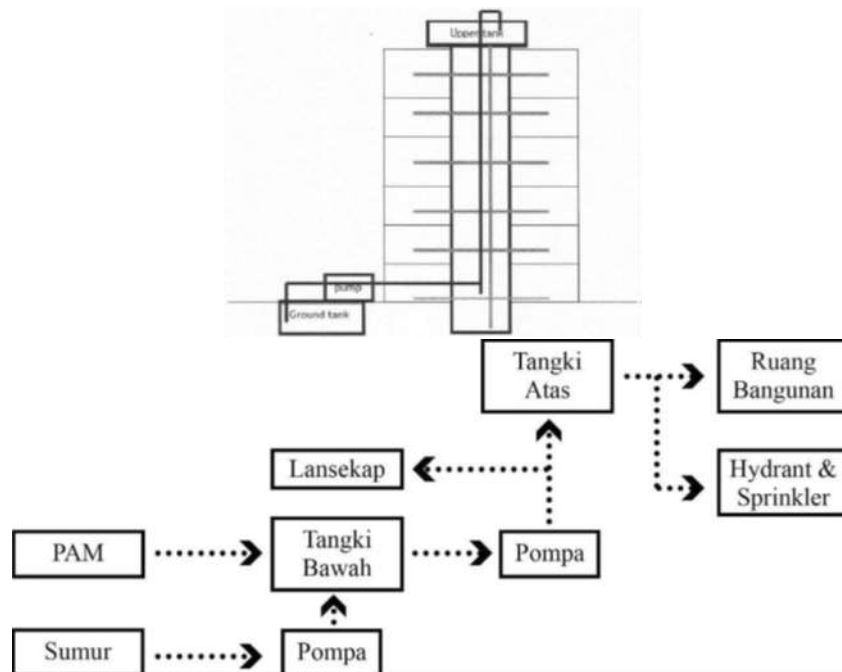
[Source: Google 2022]
Figure 13. Down feed system

Sources of dirty water come from floor drains, urinals, sinks, kitchens and water channels in wet areas. The dirty water disposal system used is indirect disposal, where dirty water is thrown away or put into a control tank, then infiltrated in the catchment area, then distributed to the city's wastewater disposal system.
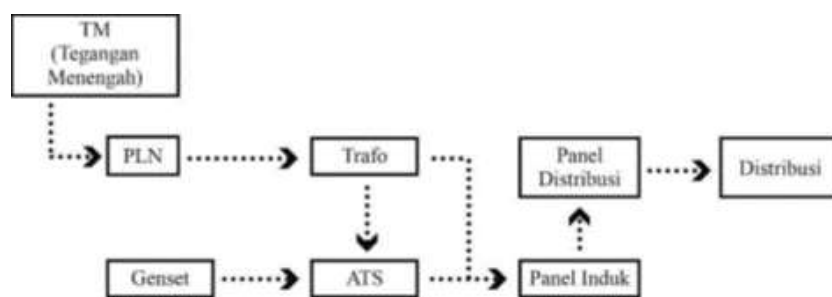

[Source: Google 2022]
Figure 14. Dirty water distribution flow

There are several sources of waste, namely: Organic waste such as food scraps, fruit peels, dry leaves, non-organic waste such as paper, plastic bottles, plastic and metal waste such as cans.
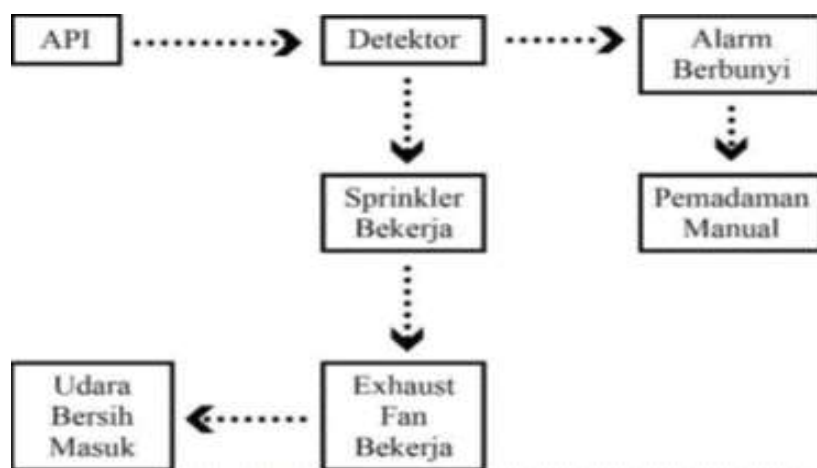

[Source: Google 2022]
Figure 15. Waste flow

Electrical energy sources are produced from PLN and generators. If the electrical energy supply from PLN goes out, then temporarily the electrical energy will be replaced with power from the generator.

[Source: Google 2022]
Figure 16. Electricity distribution flow

To prevent the danger of fire, the school building must be made from fire-resistant main structural materials and finishes and have a clear distance from surrounding buildings. The fire prevention system used for buildings is by using light fire extinguishers, sprinklers, building hydrants and environmental hydrants. Evacuation is carried out by evacuating building users to an open area.

[Source: Google 2022]
Figure 17. Fire Management distribution flow

The lightning rod used is the latest generation system, namely electrostatic, because the security of this system is more guaranteed, the effect of magnetic induction can be minimized and is capable of being used for all types of building roofs without damaging the aesthetic appearance of the building.

Building philosophy

The philosophy of the Creative Hub building that will be designed has a shape philosophy inspired by the Vanda Douglas Orchid plant, which is an icon of South Tangerang City. The Vanda Douglas orchid, a flower that is predominantly purple and slightly white, is one of the most popular ornamental flowers, especially in the South Tangerang City area.

[Source: kultur-indonesia.org, 2022]
Figure 18. Vanda Douglas Orchid Flowers and Nong Anggrek Dancers Batik Lenggok Gapura Melati

Strategy for implementing building philosophy

[Source: kultur-indonesia.org, 2022]
Figure 19. Vanda Douglas Orchid Flower

Table 6. Strategy for implementing building philosophy

Approach	Philosophy	Design concept
Orchid flower petals	The Creative Hub building mass has a shape philosophy inspired by the petals of the blooming Vanda Douglas Orchid, then has 7 building masses inspired by the South Tangerang City which has 7 sub-districts.	

[Source: Author analysis, 2022]

Building theme

The theme of the creative hub building is a Biophilic architectural approach. Biophilic design provides opportunities for people to work in a healthy place, minimizes stress levels, and provides a prosperous life by integrating nature, both natural materials and natural forms into the design. Additionally, biophilic design seeks to create good habitats for humans in modern environments by promoting human health, fitness, and well-being (Kellert et al., 2015).

According to Browning et al. (2014), natural pattern analogies come from the colors, shapes and patterns found in nature, each of which provides an indirect connection with nature by analogy and natural places. There are 3 design principles in natural analogies, including:

Biomorphic forms and patterns refer to forms and functions found in nature, whose properties have been adopted for human needs and problems (Kellert & Callabrese, 2015). Biomorphic forms and patterns are references or referents to

refer to the forms and functions found in nature, which function to provide solutions to human needs and problems (Browning et al., 2014).

According to Browning, Ryan and Clancy (2014), natural substances and materials can stimulate responses to stress. Natural buildings and elements such as wood and stone can be applied to building designs, both interior and exterior. The transformation of materials from nature often gives rise to a positive visual response, in its application colors contain characteristics of the natural atmosphere such as: soil, rocks, sky and plants (Kellert, 2015).

According to Browning et al. (2014), complexity and order refer to mathematical properties commonly found in nature, for example organized hierarchical scales, winding shapes that have repetition, repeating patterns that vary in shape.

Biophilic design is part of a new concept in architecture that works intensively with human health, ecology and sustainability. In the reference there are 14 design patterns that can be applied to designs, including (Table 7).

Table 7. Strategy for applying the conclusion theme of spatial circulation analysis

Pattern	Design principles	Design concept
	P1. Connection with nature visually	Entrance, circulation, space inside, envelope, space outside.
	P2. Non-visual relationships with nature.	Circulation, indoor space, utilities, outdoor space.
Natural patterns in space	P3. Sensory stimuli are not rhythmic.	Outdoor
	P4. Variations in heat and air changes.	Mass, internal space, utility, envelope.
	P5. Presence of water.	Indoor space, outdoor space.
	P6. Dynamic light and Spread.	Inner space, casing. Outdoor.
Patterns of material relationships with nature	P7. Relationship with Natural system.	Building mass. Structure, utilities, envelope, outdoor space.
	P8. Biomorphic shapes and patterns.	Circulation, structure, envelope.
	P9. The relationship of materials with nature	Building mass, outdoor space.
Patterns of spatial properties	P10. Complexity and order.	Circulation.

Site concept

The location that the Creative Hub will be planning is in Pondok Jaya Village, Pondok Aren District, South Tangerang City, Banten Province, precisely on Jalan Kanan Jl. Boulevard Bintaro Jaya, the Creative Hub design plan is 16,000 m2. There are 3 main roads that connect this site area, namely Jl. Boulevard Bintaro Jaya, Jl. Pondok Jaya, Jl. Pondok Aren District Head.
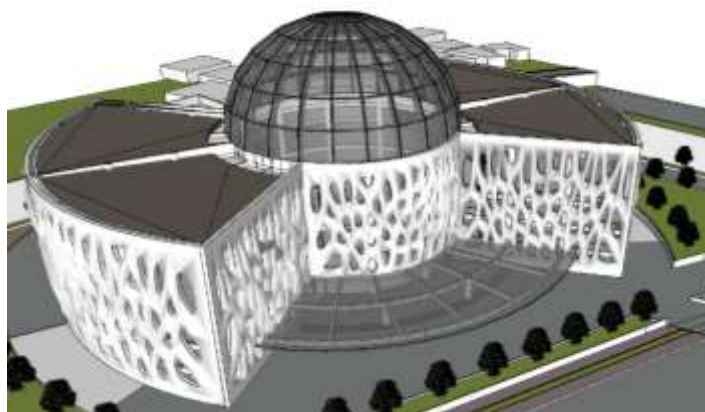
In accordance with the function of the building in the site design area, namely Trade and Services, the site design has the concept of creating a site design location as part of the development of the economic and business center in Kata, South Tangerang. Supported by the area surrounding the site which is offices, shopping outlets and restaurants.
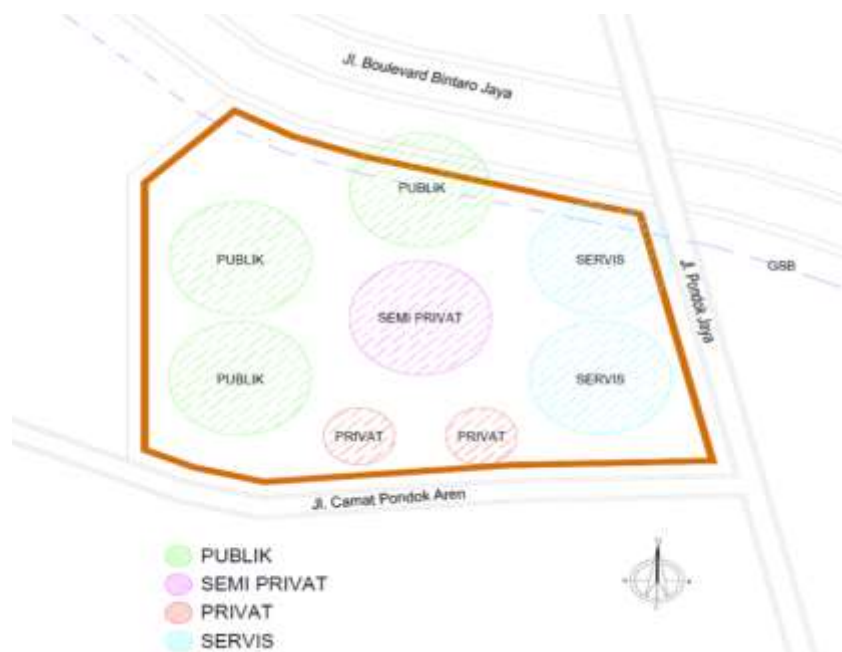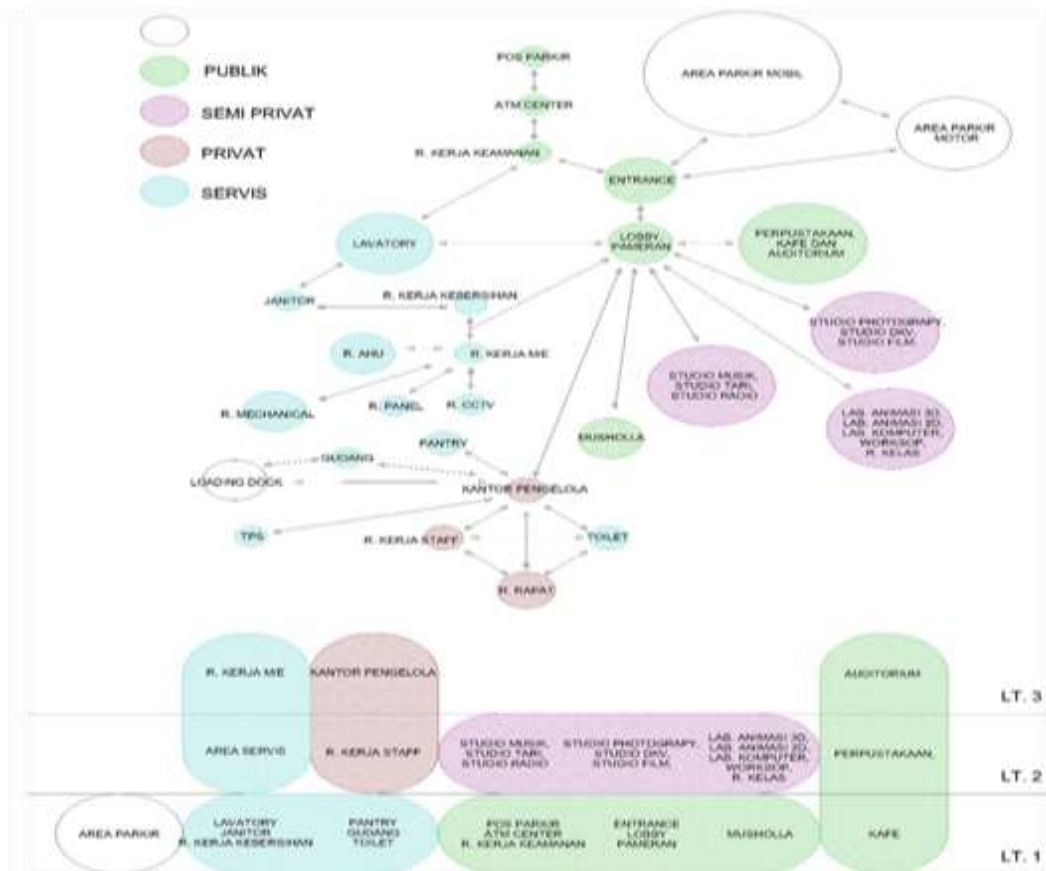

[Source: Shavrizal, 2022]
Figure 20. Site concept

Building concept

The application of the building concept to the Creative Hub arena building uses the biophilic architecture concept, to fulfill this concept the Creative Hub building uses Biomorphic shapes and patterns which are tried to be applied to the building facade and basic shape of the building and will be applied with modern materials so that the biophilic architectural concept.
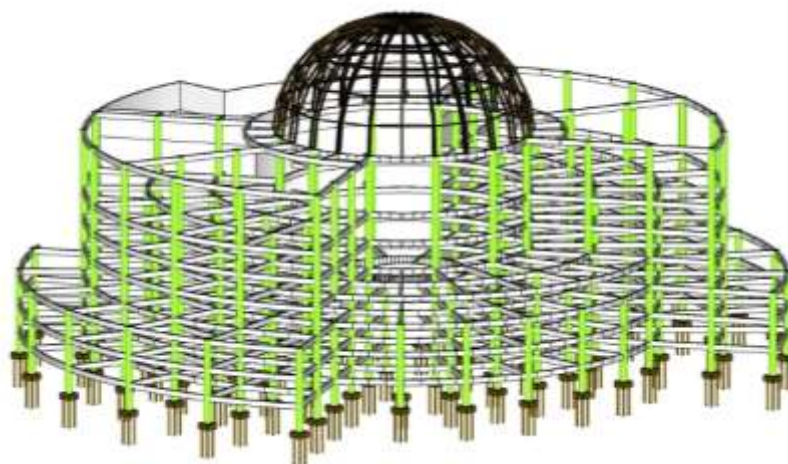

[Source: Shavrizal, 2020]
Figure 21. Kujang
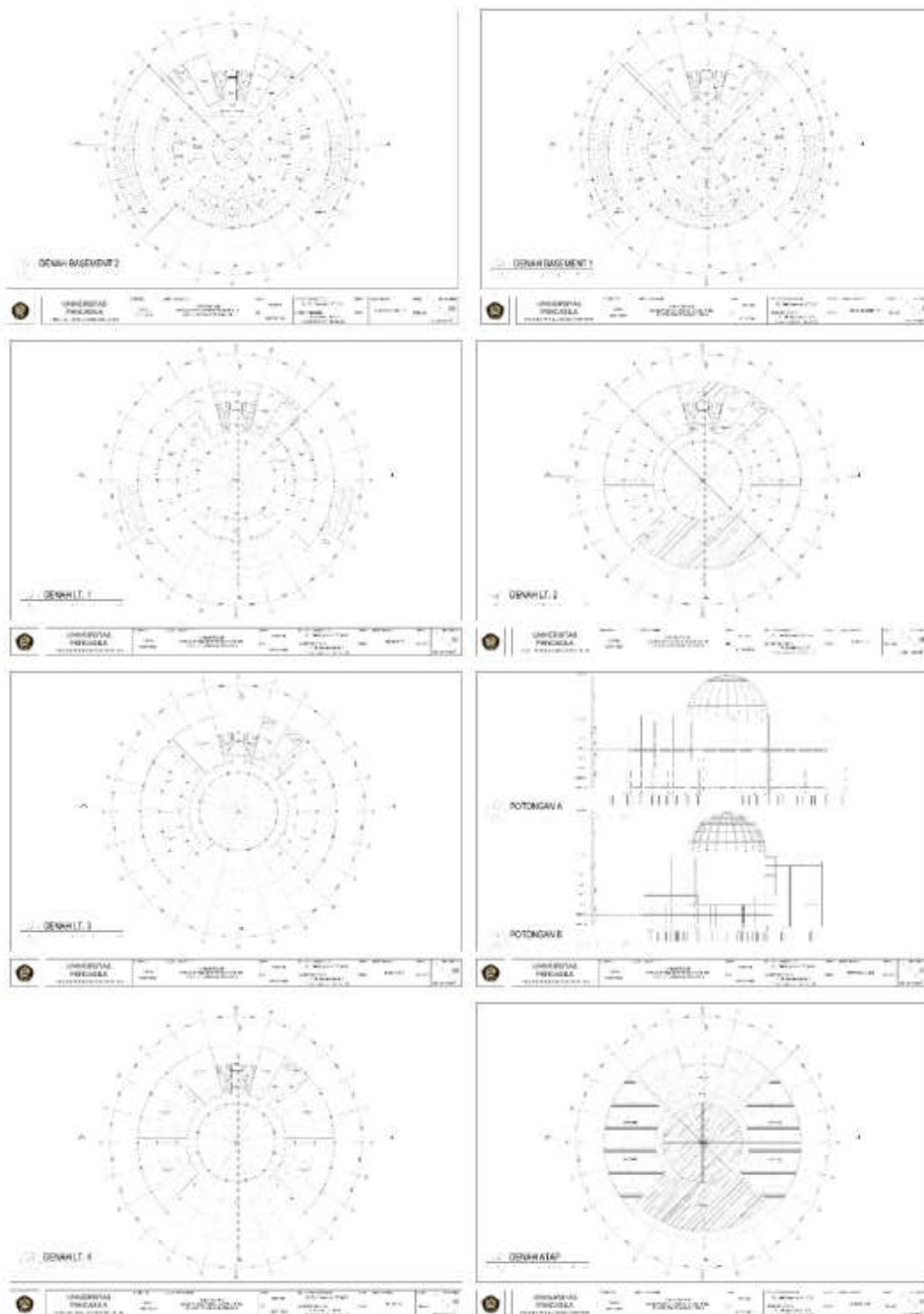
Space concept

[Source: Shavrizal, 2022]
Figure 22. Site concept

Structural system concept

[Source: Shavrizal, 2022]
Figure 23. Structural system

Design results

[Source: Shavrizal, 2022]
Figure 23. Creative Hub floor plan

[Source: Shavrizal, 2022]
Figure 24. Creative Hub floor plan

[Source: Shavrizal, 2022]
Figure 25 Exterior of Creative Hub

[Source: Shavrizal, 2022]
Figure 26. Interior Creative Hub

Conclusion

In accordance with the function of the building in the site design area, namely Trade and Services, the site design has the concept of creating a site design location as part of the development of the economic and business center in Kata, South Tangerang. Supported by the area surrounding the site covers offices, shopping outlets and restaurants.

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Transforming Lives: The Power of Community Art in Bendungan Hilir's Dense Slum Housing

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Abstract: The purpose of this study is to explore the impact of community art initiatives on improving living conditions and social cohesion in the dense slum housing of Bendungan Hilir. The research employs a qualitative approach, involving in-depth interviews with community members, local artists, and NGO representatives, as well as participatory observation. These methods allowed for a comprehensive understanding of how community art influences the environment and social dynamics in the area. The results demonstrate significant aesthetic improvements, enhanced social cohesion, reduced crime rates, and improved mental well-being among residents. Specifically, murals and art installations have made the area more vibrant and welcoming, fostering a sense of community and shared purpose. The beautification efforts are linked to a decrease in petty crimes, as the improved environment discourages vandalism and other criminal activities.

Keywords: bendungan, biophilic community art, slum housing, social cohesion, urbanization,

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Introduction

In Southeast Asia, communal housing has emerged as a significant phenomenon, reflecting the region's rapid urbanization and the consequent housing challenges. Countries like Thailand, the Philippines, and Indonesia have seen a surge in government and privately funded communal housing projects aimed at addressing the urban housing crisis. These initiatives are designed to accommodate the growing urban population while promoting a sense of community and shared space (Doling & Ronald, 2014 and Sengupta & Shaw, 2017).

Jakarta, the capital of Indonesia, exemplifies these challenges with its densely populated areas and limited housing options. The influx of migrants seeking better opportunities has led to the proliferation of illegal settlements characterized by poor living conditions and a lack of basic amenities (Sadana, 2023). In Bendungan Hilir, a densely populated area in Jakarta, the residents have developed a strong attachment to their location despite its slum conditions. Many of them are reluctant to relocate, preferring to remain in their familiar surroundings (Sarjiyanto et al., 2023).

To address the housing crisis and improve living conditions, the government has initiated the construction of high-rise apartment buildings. However, a significant challenge remains: how to recreate the original atmosphere and sense

of community that residents cherished before moving into the new high-rise buildings. The core issue is how to design these apartment complexes to maintain the essence of the traditional "kampung" (village) life, where residents regularly interact, socialize, and build strong communal ties (Arima et al., 2019).

Observations of the community behavior reveal that residents frequently gather, chat, and engage in social activities, creating a vibrant and cohesive community (Lewicka, 2010). This social dynamic is crucial to their sense of belonging and well-being. Therefore, the goal is to preserve this kampung atmosphere within the new housing environment, ensuring that residents feel at home and remain engaged with their community.

Methodology

This study employs a qualitative approach to understand the impact of community art on the residents of Bendungan Hilir. The methodology includes various data collection methods such as in-depth interviews and participatory observation. This comprehensive approach allows for a detailed and nuanced understanding of the community dynamics and the effects of art initiatives. Some works such as Anwar & Ardhiati (2023), Gunawan & Ardhiati (2022), Herlambang & Ardhiati (2023), Kholis (2023), and Subagyo & Adi (2023) used the same method, that is qualitative, but their studies are different at least from geographical location and object of study they use.

This study is designed as an exploratory qualitative research project. This design is chosen to delve deeply into the personal experiences and perceptions of the community members, capturing the richness of their interactions and the transformative potential of community art. Data collection methods used are: (1) interviews: In-depth Interviews: Conducted with a diverse group of participants including community members, local artists, and representatives from NGOs (non-govermental organizations) involved in the art projects. The interview questions were semi-structured to allow for flexibility and the emergence of new insights during the conversations. (2) Participatory Observation: Researchers spent significant time in Bendungan Hilir, observing the daily activities and interactions among residents. This method provided valuable context and helped in understanding the social fabric of the community. Detailed field notes were taken to document observations.

The location of Bendungan Hilir was chosen because it is part of the Governor of DKI Jakarta's program aimed at improving living conditions in urban slum areas named Collaborative Implementation Program (CIP). This makes it a relevant and impactful case study for examining the effects of community art initiatives in such settings.

The research is guided by the following assumptions and theories: (1) Social Cohesion Theory: The assumption that community-driven projects can enhance social ties and foster a sense of belonging among residents. (2) Environmental Psychology: The theory that physical improvements in living environments can positively impact mental well-being and reduce stress. (3) Place Attachment Theory: The idea that residents have strong emotional bonds with their living

spaces, which can be leveraged to improve their overall satisfaction with their environment.

Data from interviews and observations were analyzed thematically to identify recurring patterns and significant insights. Survey data were analyzed using descriptive statistics to quantify residents' perceptions and experiences. The triangulation of these methods ensured the reliability and validity of the findings.

Results and discussion

RW 07 in Kelurahan Karet Tengsin, Tanah Abang, Central Jakarta, is a densely populated area with various community initiatives and activities. This area, located in the Karet Tengsin Urban Kampong is prone to flooding and burning. This is due to the dense and uninhabitable condition of the buildings.

[Source: Processed Google Earth map by Muharrami, 2023]
Figure 1. Map of study location

Based on the survey, the majority of buildings in RW 07 Karet Tengsin is a building with poor non-permanent and of uninhabitable quality. Most of the buildings have roofs with materials such as asbestos or roof tiles and are in a leaking condition. In addition, the walls of the buildings are made of wood, boards or a mixture of boards and bricks. Meanwhile, the floor is made of cement plaster.

[Source: Field Survey, 2023]
Figure 2. Condition of poor houses in RW 07 Kelurahan Karet Tengsing, Central Jakarta

Residents in RW 07 actively participate in communal activities such as "kerja bakti" (community clean-up efforts). These activities are routinely organized and involve cleaning gutters, trimming trees, and ensuring the general cleanliness of the neighborhood. The local government collaborates with various departments and the community to address issues like flooding and sanitation. Residents often gather to chat and socialize with their neighbors, maintaining a vibrant community atmosphere. These informal interactions are crucial for fostering a sense of belonging and community spirit, which are essential for the residents' well-being. Community engagement is essential for developing their village. Design ideas from the communities in Benhil should be preserved, as is also the case in Kampung Petogogan Jakarta (Lestari & Kurniawan, 2018).

The power of interaction among these residents is a strong asset to create a new atmosphere in a new residential environment (in this case, flats). the community in RW 07 Karet Tengsin compactly provides the ideas they want into a design that is assisted by Architecture students of Pancasila University Jakarta. Here are some key communities and activities in this area based on field survey by team:

1. STBM (Community-Based Total Sanitation) Community: RW 07 is a priority location for the STBM program initiated by the local government. This program involves the community in sanitation education and waste management to ensure a clean and healthy environment. Activities include the installation of septic tanks and campaigns to stop open defecation;
2. Religious Study Groups and Activities: Like many densely populated areas in Jakarta, RW 07 has active religious study groups and activities that help

strengthen social bonds and provide moral support to community members;

3. Youth Groups and Karang Taruna: The Karang Taruna youth organization in RW 07 is active in various social and youth empowerment activities. They participate in sports, arts, and various social programs that support skill development and leadership among local youth;

4. Economic Activities and MSMEs (Micro, Small, and Medium Enterprises): There is a community of local entrepreneurs running various small businesses, including culinary ventures, handicrafts, and service providers. These entrepreneurs often collaborate to organize bazaars and training sessions to enhance their business capacities; and

5. Kampung KB (Family Planning Village): Kampung KB is a program implemented to improve residents' quality of life through effective family planning and reproductive health education.

These communities reflect the importance of collaboration and active participation by residents in various government programs and local initiatives aimed at improving the quality of life in densely populated areas like RW 07 Karet Tengsin. This is similar to the situation in Kampung Kingkit when handling floods communally in Jakarta. Community life in Kampung Kota, where discussions and sharing of ideas to solve local issues are held through "rembug" or group discussions, represents a very good local wisdom (Kurniasari et al., 2019).

Some of the design ideas to be implemented in the new residential environment are places for residents to interact both indoors and outdoors, a playground for their children, and colors that symbolize cheerfulness on the walls of their residential buildings. Togetherness and interaction among residents must be maintained. For this reason, there must be more places for interaction, including places of worship, in the new residential environment. These ideas have been translated into the following designs:
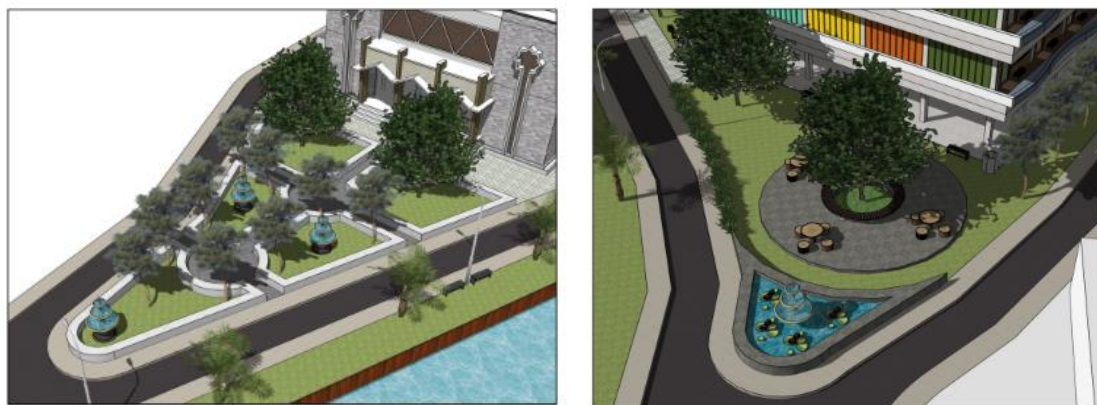

[Source: The authors, 2023]
Figure 3. New Masterplan of RW 07 Kelurahan Karet Tengsing, Central Jakarta based on communities' ideas

[Source: The authors, 2023]
Figure 4. Colourfull of the wall to bring new energies of their life. North view (above) and South view (below)

[Source: The authors, 2023]
Figure 5. Colourfull of the wall to bring new energies of their life. North view (left) and South view (right).

Conclusion

These projects have fostered social cohesion by bringing residents together. This has strengthened a sense of community and common purpose. In addition, these beautification efforts have reduced petty crime, as the improved environment has led to less vandalism and other criminal activity.

Participating in art projects has provided residents with a creative outlet, boosting their mental health and overall well-being. These findings contribute to the field by showcasing the transformative potential of community art in urban slum settings. The study suggests that community art can be an effective tool in urban development strategies, enhancing both the physical and social fabric of dense slum areas like Bendungan Hilir.

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