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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

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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	1. Pantry
2. Library	2. Music Studio	Office	2. Lavatory
3 Exhibition Halls	3. Photography Studio	2. R. Staff Work	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			8. Warehouse
Security	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

Total analysis of space requirements		
No.	Room	Breadth
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]

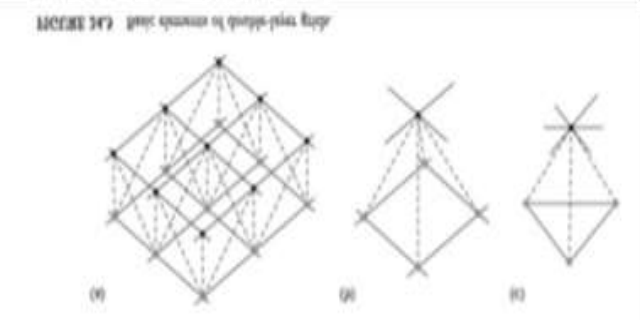
Building circulation analysis

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

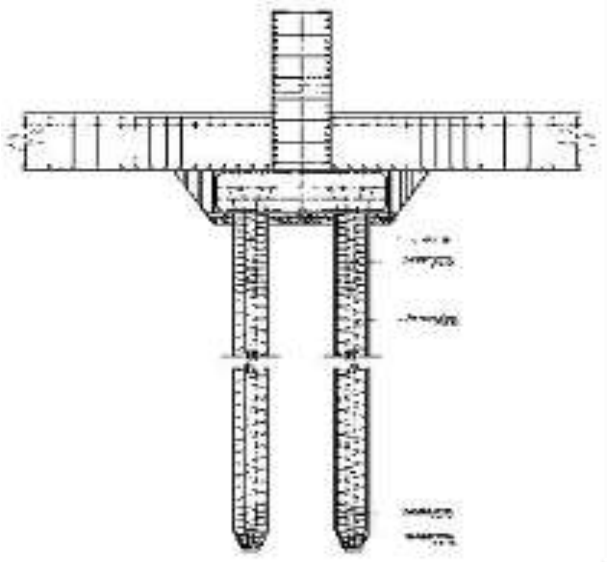
[Source: Author's analysis 2022]

Building system analysis

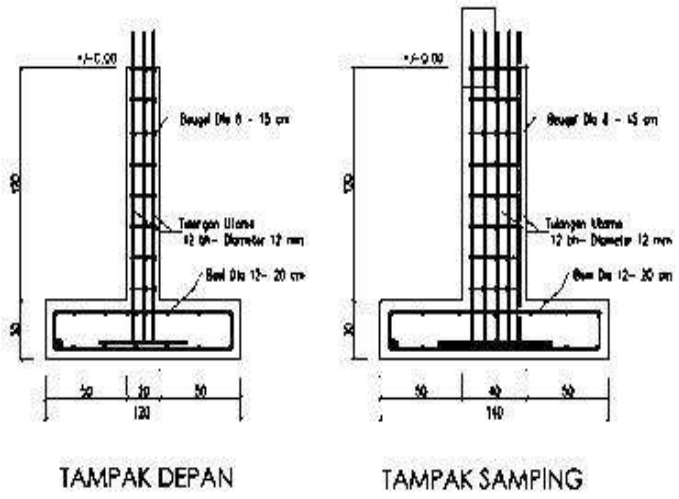


[Source: Google, 2022]
Figure 10. Space frame structure

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

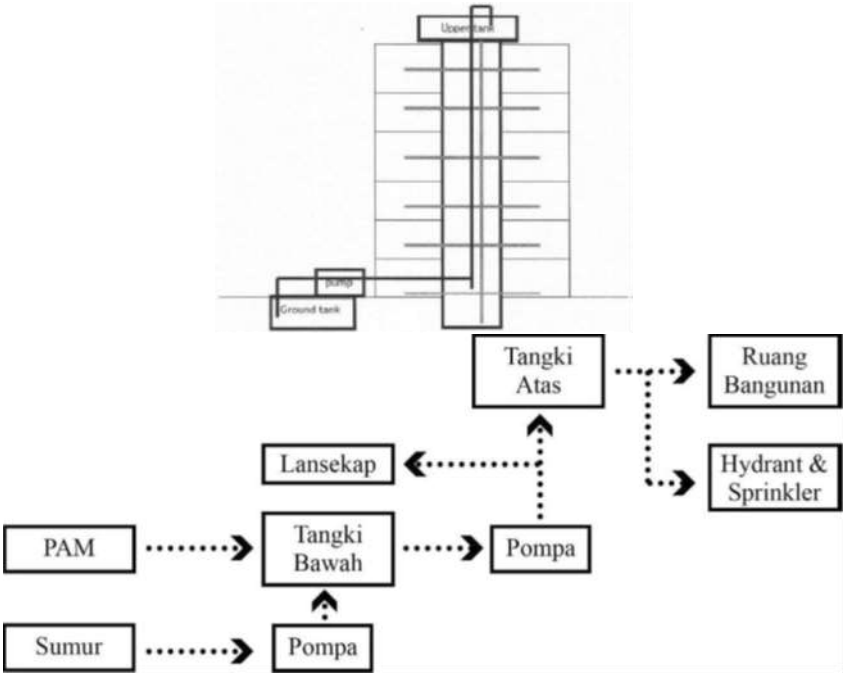


[Source: Google, 2022]
Figure 12. Site foundation

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

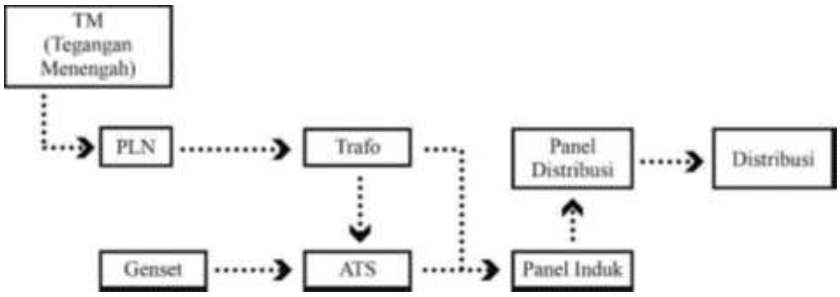
Sources of dirty water come from floor drains, urinals, sinks, kitchens and water channels in wet areas. The dirty water disposal system used is indirect disposal, where dirty water is thrown away or put into a control tank, then infiltrated in the catchment area, then distributed to the city's wastewater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

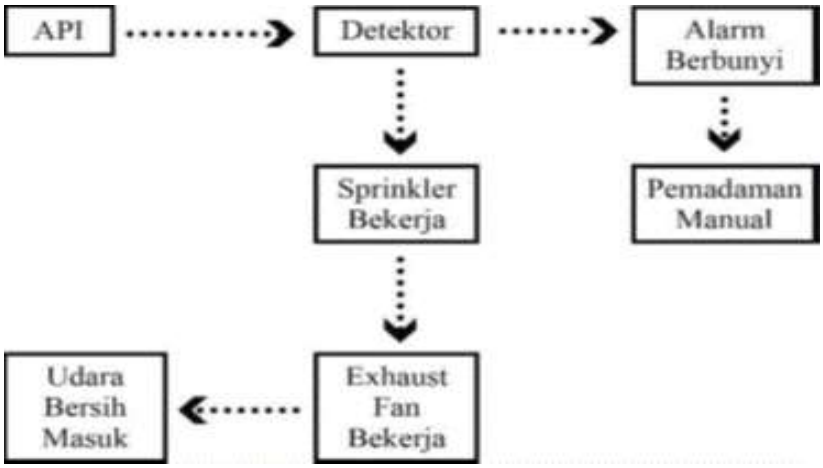
[Source: Google 2022]
Figure 15. Waste flow

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).

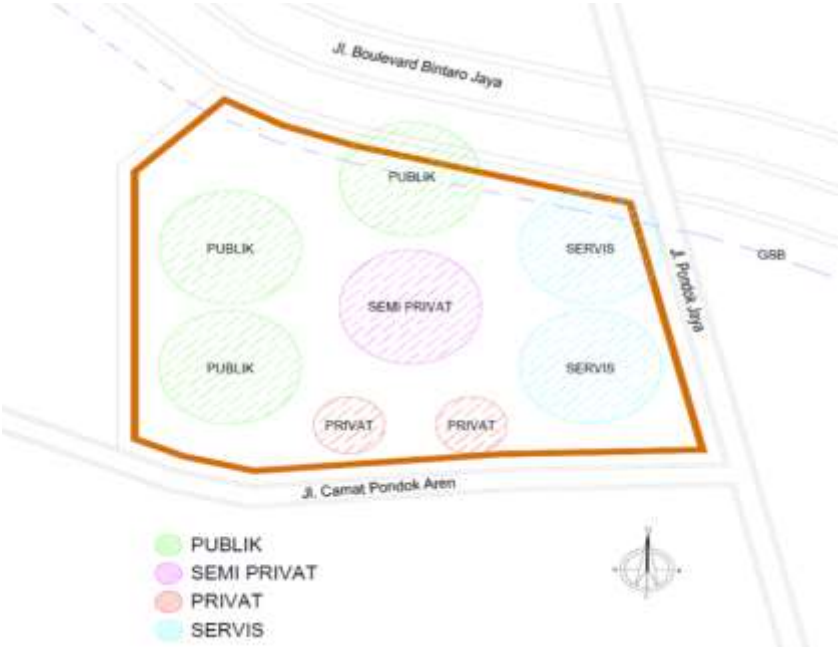
Table 7. Strategy for applying the conclusion theme of spatial circulation analysis

Pattern	Design principles	Design concept
	P1. Connection with nature	Entrance, circulation, space
	visually	inside, envelope, space
	P2. Non-visual relationships	outside.
	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	Inner space, casing.
	Spread.	Outdoor.
Patterns of material relationships with nature	P7. Relationship with	Building mass.
	Natural system.	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.

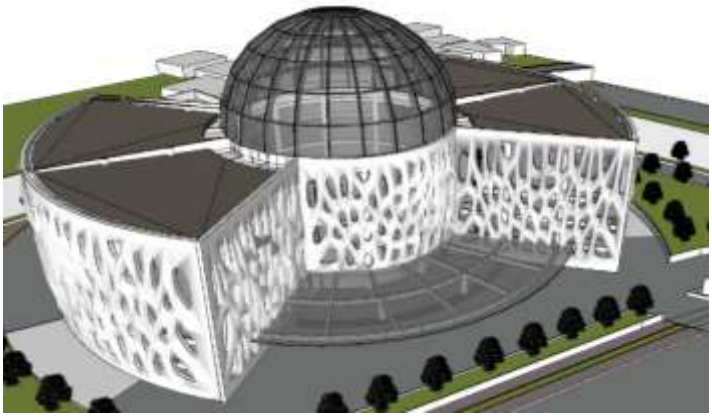
In accordance with the function of the building in the site design area, namely Trade and Services, the site design has the concept of creating a site design location as part of the development of the economic and business center in Kata, South Tangerang. Supported by the area surrounding the site which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



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

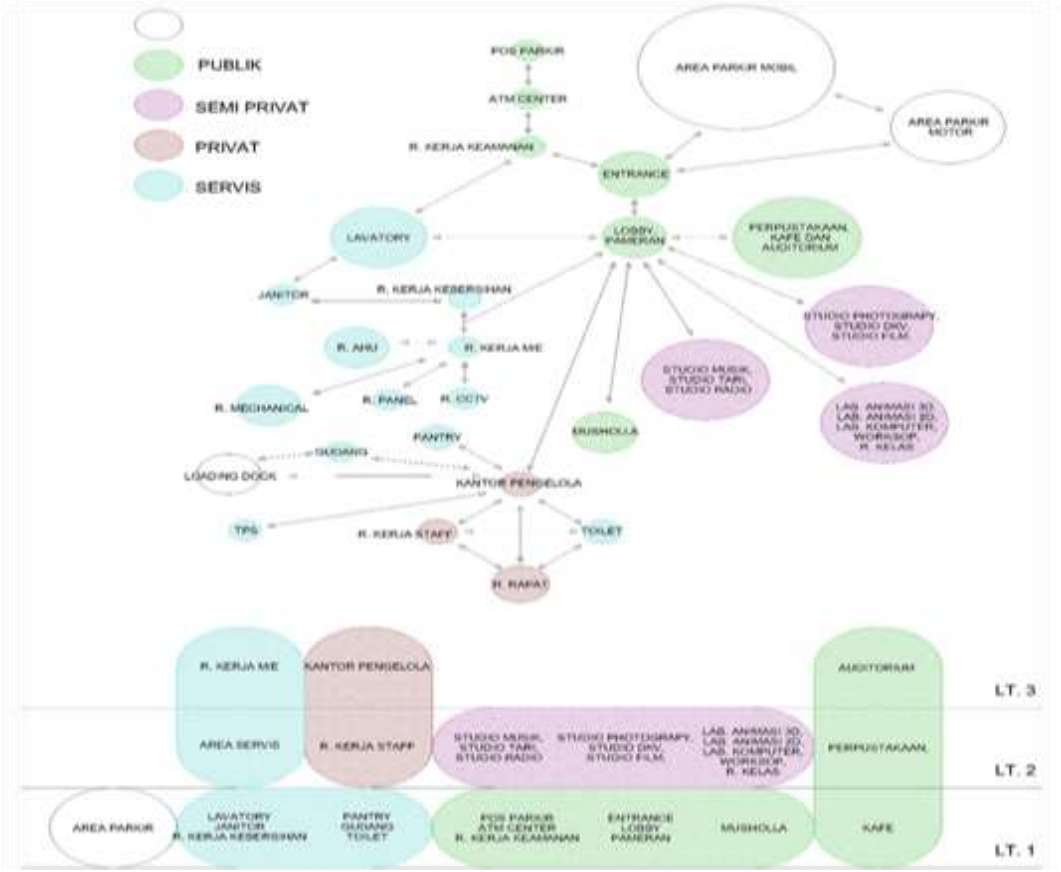
Building concept

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.



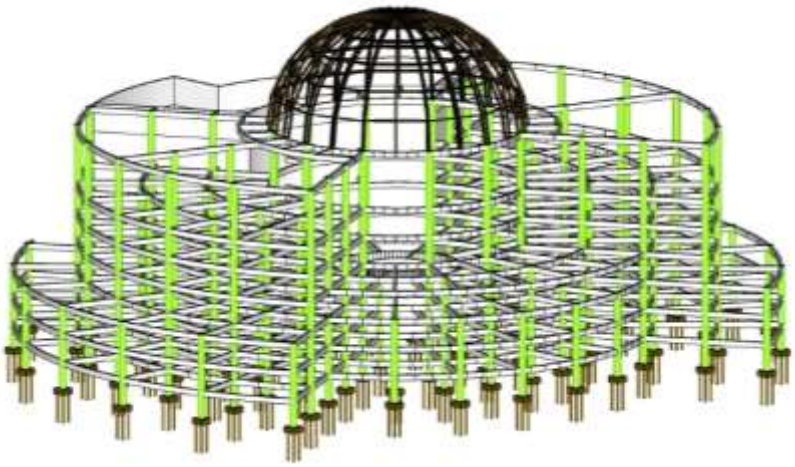
[Source: Shavrizal, 2020]
Figure 21. Kujang

Space concept



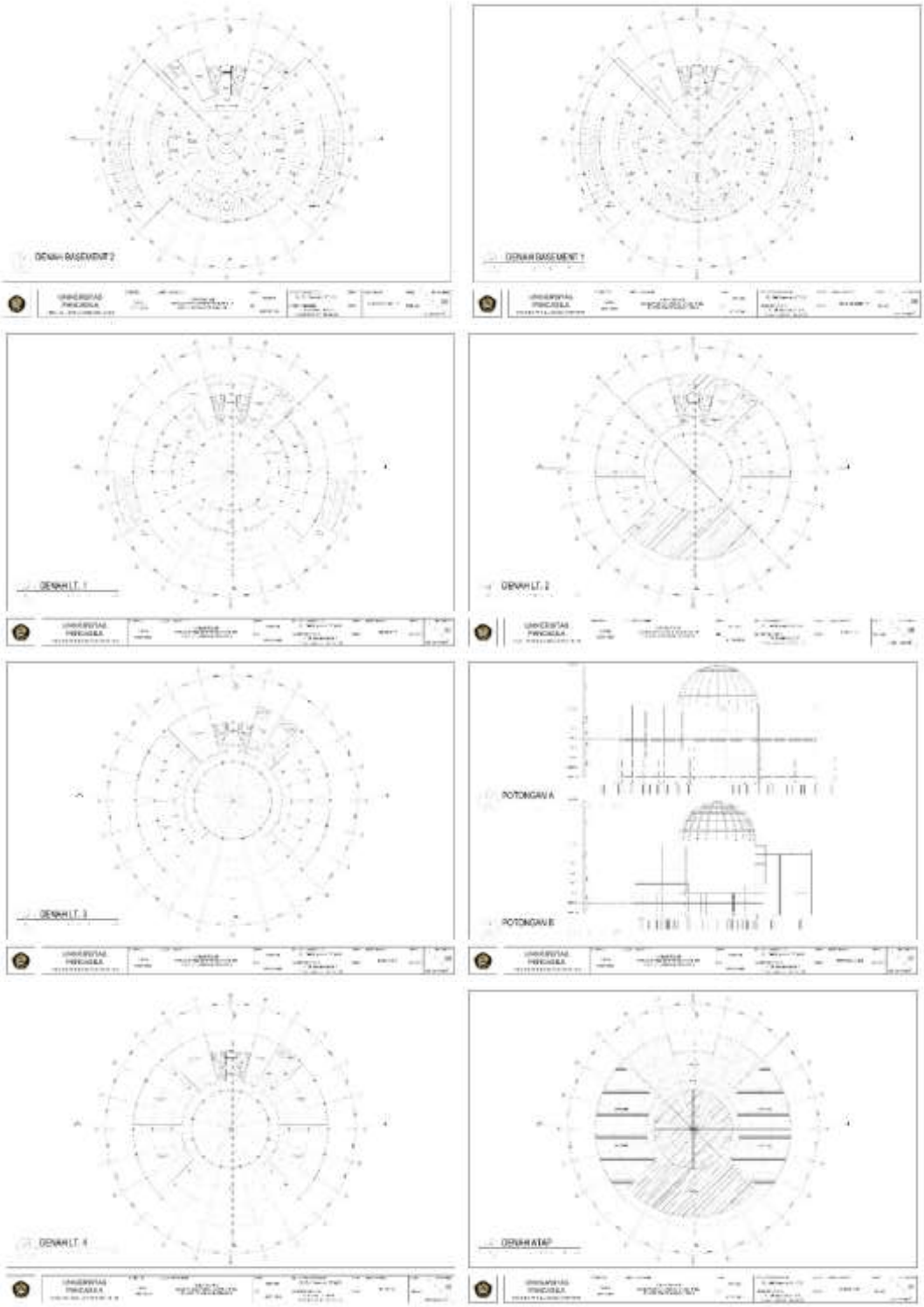
[Source: Shavrizal, 2022]
Figure 22. Site concept

Structural system concept



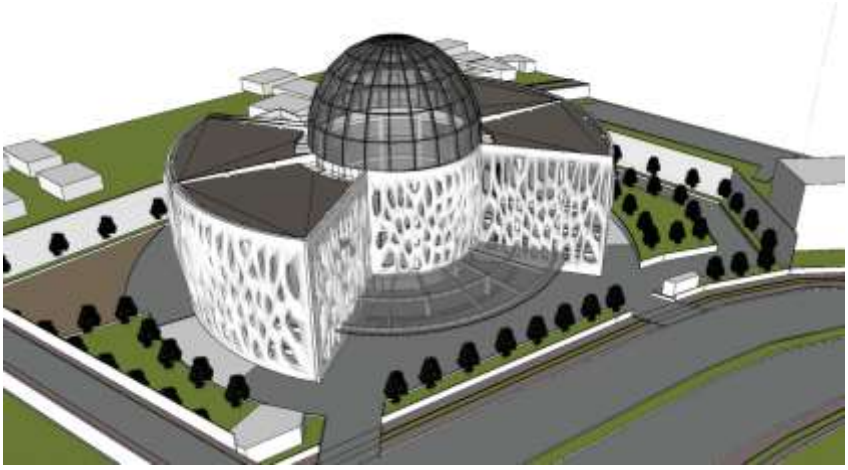
[Source: Shavrizal, 2022]
Figure 23. Structural system

Design results

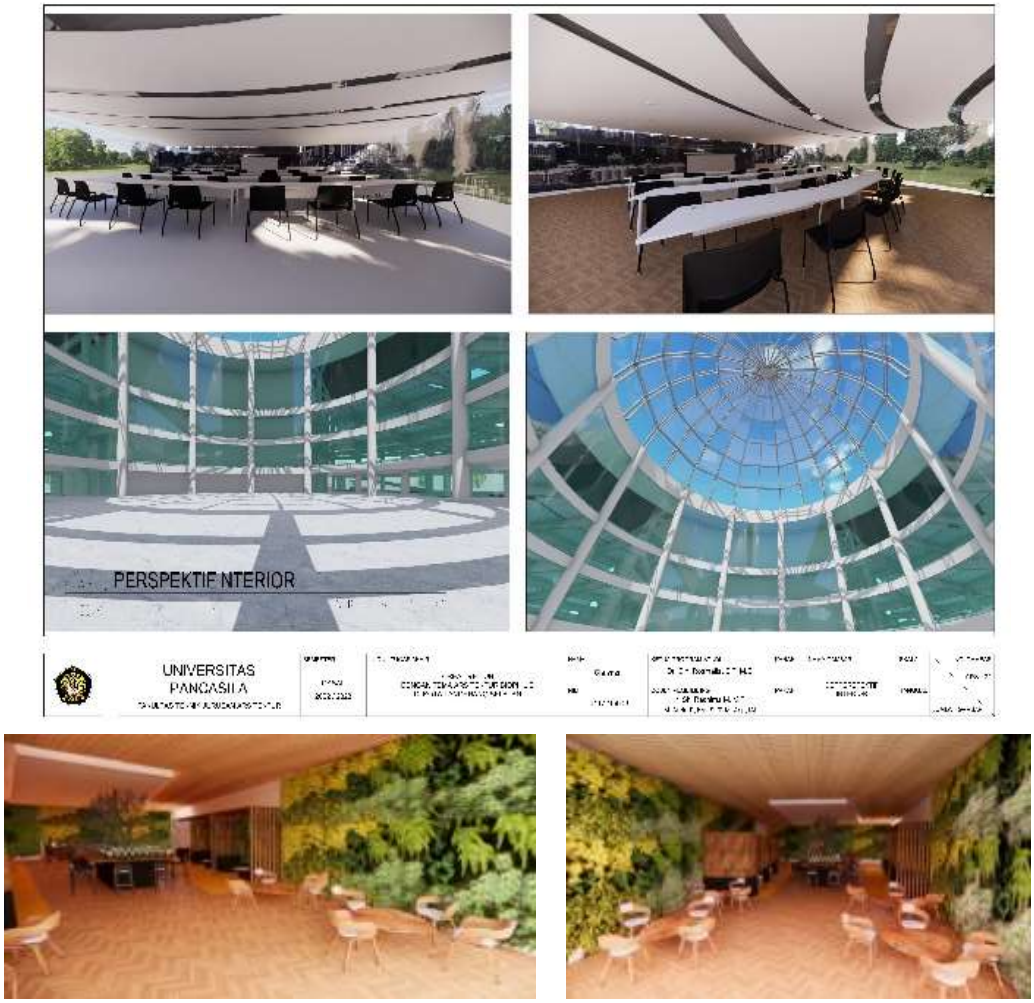


[Source: Shavrizal, 2022]
Figure 23. Creative Hub floor plan

[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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