

Redesign of East Parking in Plaza Surabaya Mall by Applying Humanistic Architecture Concept

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Abstract Plaza Surabaya Mall is one of the malls located in the center of Surabaya City which is still operating and has many visitors. Based on the results of the visitor questionnaire, there are various comfort and safety problems that exist. The Problem indicate is lack of lots parking, bad pedestrian issued, lighting, and stopping area. The aim of this research is to determine the design criteria and application of humanistic architectural concepts in the redesign of the Surabaya Plaza Mall vehicle parking. The research method is a qualitative research method by conducting observations, interviews and questionnaires. The research results show that it is necessary to improve the physical aspects in the form of parking conditions, capacity, size of parking spaces, parking patterns and parking circulation, space requirements, entry and exit routes, as well as improvements to the biological aspects in the form of vegetation and climate conditions at the research location. Based on the analysis of social aspects, it is necessary to improve facilities for the safety and comfort of parking users at Plaza Surabaya Mall. Efforts to redesign the Plaza Surabaya Mall parking lot of using a humanistic architectural concept that refers to human needs. Furthermore, so that they can be fulfilled well without leaving out the beauty of architectural art with research results in the form of design recommendations in three-dimensional illustrations form.

Index Terms— *Humanized design, Land Improvement, User comfort*

I. INTRODUCTION

Plaza Surabaya Mall is one of the malls located in the center of Surabaya City which is located on Pemuda St. Numbef 33-37, Embong Kali Asin Village, Genteng, Surabaya City, East Java. Plaza Mall Surabaya has a daily visitor count of around 8,000-15,000 (PT. Bayu Beringin Lestari, 2022). Therefore, Plaza Surabaya must create an equal parking facilities so that visitors to Plaza Surabaya mall can feel comfortable and safe.

The focus of this research is on the east parking lot of 4-wheel and 2-wheel. There are two main reasons for redesigning the research site. First, the research location is

considered less humane for users caused by poor parking conditions, lack of facilities needed by users, lack of parking capacity based on the results of questionnaires to users. Second, there is potential that can be utilized and developed from this location because there were many spaces that had not been utilized.

A lot of research provided to learn about parking design and criteria, The novelty of this research is the humanistic concept are adapted to the design. Based on these reasons, this research needs to be redesigned to make vehicle parking spaces comfortable and safe for users. Therefore, the concept of redesigning the East Parking of Plaza Mall Surabaya that was chosen is humanistic architecture. The definition of humanistic architecture is an architectural concept that refers to the fulfillment of human needs but does not does not leave the beauty side of an architectural

art [1]. Based on the explanation above, this redesign is expected to be able to overcome existing problems and make this site a better parking lot.

II. METHOD

The location of this research is in the East Parking of Plaza Mall Surabaya, Embong Kali Asin Village, Genteng, Surabaya City, East Java. The East Parking Lot of Plaza Mall Surabaya has a total land area of around 20,300 m². The time of this study started from April 2022 to February 2023. This research uses hardware consisting of stationery, digital cameras, measuring instruments, and laptops while software consists of Microsoft Office, Autocad, SketchUp, Lumion and Photoshop. The material used is in the form of a research site.

The research method that will be used is a qualitative research method by conducting observations, interviews, questionnaires and so on. There are two types of data to be used, namely primary data and secondary data with four data collection techniques; observation, interviews, questionnaires and literature studies. This research was carried out in stages of research based on Hakim [2] which was divided into eight stages of research, which the preparation stage, data inventory, data analysis, synthesis, basic concepts, development concepts, pre-design and design. The following is the location of the research presented in Figure 1.

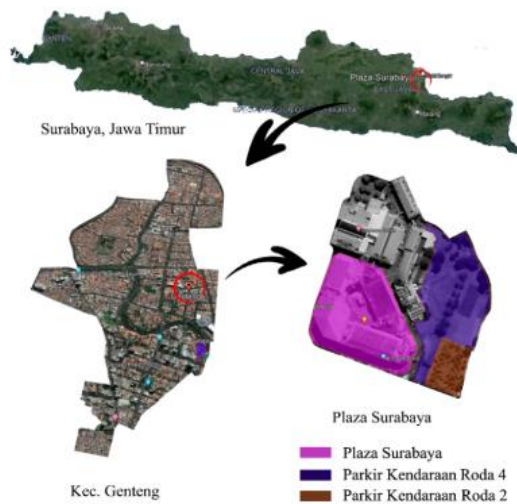


Fig 1. Research Location

III. RESULT AND DISCUSSION

A. Site Description

The location of this research is in the East Parking Lot of Plaza Mall Surabaya which is on the Pemuda St. 33–37, Embong Kali Asin Village, Genteng, Surabaya City, East Java. The limits of the location of this research are the north of Skate and BMX Park Surabaya, then the east is the Submarine Monument and the Kalimas River, the south is Pemuda St. and the west is Plaza Boulevard St and Hotel Surabaya Suites. Based on data from PT. Bayu Beringin

Lestari (2022), the total area of the east parking lot is around 19,624 m² with two vehicle parking spaces, which 2-wheeled vehicle parking with an area of about 3,324 m² and 4-wheeled vehicle parking with an area of about 16,300 m². The following is the existing plan presented in Figure 2.



Fig 2. Existing Plans

B. Identification Aspect

1) Physical Aspects

The physical aspect is an aspect that focuses on the parking of the East Plaza Mall Surabaya. The following is an inventory table of physical aspects presented in Table 1.

TABLE 1. PHYSICAL ASPECT INVENTORY

No	Part	Result
1	Physical Condition	<ul style="list-style-type: none"> a. The parking conditions of 4-wheeled vehicles have problems ranging from damaged and rough roads, insufficient number of lighting lights, unclear parking markings, unclear circulation flows, few and damaged parking signs. b. The condition in the parking lot of 2-wheeled vehicles has few problems such as unclear markings and less visible entrances because they are blocked by plants.
2	Parking Capacity	The capacity of 2-wheeled vehicles is around 1000 motorcycles and the parking capacity of 4-wheeled vehicles is around 300 cars.
3	Parking Volume	<p>The peak of vehicle volume on weekends is Saturday and Sunday</p> <ul style="list-style-type: none"> a. The parking volume of 4-wheeled vehicles starts from 556-1088 vehicles b. The parking volume of 2-wheeled vehicles starts from 1727- 3132 vehicles
4	Parking Duration	<ul style="list-style-type: none"> a. Parking is the most visited in the range of 1-2 hours, 2-3 hours b. Parking for workers is the most at 7-8 hours. c. The average parking duration is about 4.3 hours per vehicle for 4 wheels and 4.1 hours per vehicle for 2 wheels.
5	Parking Layout	The model of the parking layout at the East Parking of Plaza Mall Surabaya is a

No	Part	Result
		model with separate entrances and exits located on one road.
6	Parking Pattern and Circulation	<p>a. The parking pattern at the East Parking of Plaza Mall Surabaya uses a 90° pattern with an island model.</p> <p>b. Circulation in the East Parking of Plaza Mall Surabaya uses a 1-way model</p>
		<p>c. The circulation width is about 5 m for 4-wheeled vehicles and about 2 m for 2-wheeled vehicles.</p> <p>d. The width of the alley is about 5 m for parking 4-wheeled vehicles and about 1.2 m for parking 2-wheeled vehicles.</p>
7	Parking Space Size	<p>a. The size of the parking space in the 4-wheeled vehicle parking is 4.8 m x 2.5 m, The size of the parking space in the parking of 2-wheeled vehicles is 0.6 m x 2 m.</p>
8	Entry and exit lines	<p>a. The entrance and exit lane models used in the Plaza Surabaya Mall vehicle parking are models with separate entrances and exits.</p> <p>b. The length of the 4-wheeled vehicle entry lane is about 30 m, while the length of the 2-wheeled vehicle entry lane is about 20 m and the exit lane is about 15 m.</p> <p>c. There are 2 entrance gates and 2 exit gates in each vehicle parking lot.</p>
9	Parking Space Needs	<p>a. Based on observations, the need for parking space for 2-wheeled vehicles is considered sufficient</p> <p>b. The need for parking space for 4-wheeled vehicles is considered insufficient because it cannot accommodate all vehicles, especially when there is a surge.</p>
9	Parking Space Needs	<p>c. Based on observations, the need for parking space for 2-wheeled vehicles is considered sufficient</p> <p>d. The need for parking space for 4-wheeled vehicles is considered insufficient because it cannot accommodate all vehicles, especially when there is a surge.</p>

2) Biological Aspects

The biological aspect is an aspect that contains matters related to living things in the East Parking environment of Plaza Mall Surabaya such as vegetation, climate and topography. The following is an inventory table of biological aspects presented in Table 2.

TABLE 2. BIOLOGICAL ASPECT INVENTORY

No	Part	Result
1	Vegetation	The vegetation in the East Parking of Plaza Mall Surabaya is yellow bamboo (<i>Bambusa vulgaris</i>), cape (<i>Mimusops elengi</i>), ketapang kencana (<i>Terminalia mantaly</i>), yellow palm (<i>Dypsis lutescens</i>),

		tea-tehan (<i>Acalypha siamensis</i>), cycad (<i>Cycas revoluta</i>), pearl grass (<i>Axonopus compressus</i>), angsana (<i>Pterocarpus indicus</i>), banyan (<i>Ficus benjamina</i>).
2	Climate	<p>Based on the Perak 1 Surabaya Meteorological Station (2020) Surabaya City:</p> <p>a. Has a tropical climate</p> <p>b. Humidity around 64-82%,</p> <p>c. Wind speed is about 2-4 knots or about 1-2 m/s</p> <p>d. Temperature around 27.9-30.3 °C</p> <p>e. Solar irradiation is about 55-93 %</p> <p>f. rainfall is around 14.7-532.9 mm.</p>
3	Topography	<p>a. The soil available on this site is of the alluvial soil type.</p> <p>b. The average land slope is around 2.3% - 2.5% (Google Earth) which indicates that this site has a flat land.</p>

3) Social Aspects

Users in the East Parking of Plaza Mall Surabaya have two main activities carried out by users of this site, namely parking vehicles and walking space. Based on the results of observations, the characters of the children's age category have energetic, active, less attentions to their surroundings and not careful. Adolescent and adulthood have a calm, alert character and are pay attention to surroundings. Meanwhile, the elderly have a relaxed, calm, less alert and less careful character. Then the main user needs are safety and comfort in parking vehicles. Based on the results of the questionnaire that has been distributed, 70% of the total respondents complained that it was not safe and comfortable in the East Parking of Plaza Mall Surabaya.

C. Analysis

At this stage, a process of determining potential and problems is carried out, which is then determined to solve the obstacles experienced at this site which will then be given suggestions as a way out of the problem. The following is the analysis and synthesis table presented in Table 3.

Table 3. Analysis and Synthesis

No	Analysis	Result
1	Parking Conditions	<p>Potential: Good parking conditions, parking users will feel comfort and safety in the parking environment.</p> <p>Constraints:</p> <ol style="list-style-type: none"> 1. Potholes and uneven roads 2. Small number of lights and dim lighting 3. Some faded and missing parking markings 4. The number of parking signs is small and some signs with damaged conditions <p>Synthesis:</p> <ol style="list-style-type: none"> 1. Repairing roads by equalizing and re-paving. 2. The addition of lights at every 10 m distance with a type of 90W SOX lamp

		<p>with a lighting level of 10 LUX according to the standard based on [3].</p> <p>3. Parking markings are repainted to make them clearly visible</p> <p>Parking signs are made more with strong materials and then placed in several strategic places.</p>	
2	Parking Capacity	<p>Potential: Parking capacity with adequate area can increase the number of parked vehicles.</p> <p>Obstacle: Lack of parking capacity for 4-wheeled vehicles so that it cannot accommodate the surge in visitor vehicles</p> <p>Synthesis: Increase the capacity for parking 4-wheeled vehicles based on calculations so that when there is a surge in the number of parking users, it can be accommodated properly.</p>	
3	Parking pattern and Parking circulation	<p>Potential: Parking patterns that suit parking needs are able to utilize capacity to the maximum and create circulation that makes it easier for drivers.</p> <p>Constraints:</p> <ol style="list-style-type: none"> 1. The circulation flow applied is still not appropriate and clear 2. The width of the alley lane for 4-wheeled vehicles is 5 m while the width of the alley lane for 2-wheeled vehicles is 1.2 m which is not in accordance with the standard size in the Parking Facility Planning Guidelines, Director General of Land Transportation [4]. <p>Synthesis:</p> <ol style="list-style-type: none"> 1. Improving circulation flow clearly and assisted by the placement of signs to make it easier for users. 2. Improving the distance of the alley lane in accordance with the standards in the Guidelines for Planning and Operation of Parking Facilities [4], which is 6 m for 4-wheeled vehicles and 1.6 m for 2-wheeled vehicles. 	
4	Parking Space Size	<p>Potential: The utilization of parking space can be taken into account for the standard size of the parking space.</p> <p>Problem: The size of the parking space in this parking lot is not up to standard with a size of 4.8 m x 2.5 m for four-wheeled vehicles and a size of 2 m x 0.6 m for two-wheeled vehicles</p> <p>Synthesis: It is necessary to repair vehicle parking spaces with a size that is in accordance with the standard of parking space units applied by the Guidelines for Planning and Operation of Parking Facilities [4].</p>	
5	Parking Space Needs	<p>Potential: Taking into account the parking area, the parking needs for users can be utilized to the maximum.</p> <p>Obstacle: The area of the two-wheeled vehicle parking is too small and narrow with a size of 3,900 m² with parking space that does not meet the standards.</p>	
6	Vegetation		<p>Synthesis: The area of the 2-wheeled vehicle parking space needs to be expanded according to calculations in order to accommodate more vehicles and get a parking space that meets the standards</p> <p>Potential: Selection of vegetation suitable for tropical science, obtaining typical strong plants and fairly easy maintenance.</p> <p>Constraints:</p> <ol style="list-style-type: none"> 1. It has a small amount of vegetation, especially trees with a wide canopy so that the parking lot has a high temperature. 2. Some vegetation found in the East Parking of Plaza Mall Surabaya is not suitable for parking <p>Synthesis: It is necessary to add trees with a wide canopy and in accordance with parking vegetation standards from the Judge (2012) and the Regulation of the Minister of Public Works No. 05 Year (2012) so that users can feel comfortable in the East Parking of Plaza Mall Surabaya [5].</p>
7	Climate		<p>Potential: The air humidity is relatively low so that it is able to maintain the quality of the material and be used by users to comfortably do outdoor activities.</p> <p>Obstacle: The location of this site does not meet all three aspects of comfort regarding air humidity, wind speed and temperature</p> <p>Synthesis: It is necessary to add a large amount of vegetation with a wide and dense canopy to this site so that it can overcome problems regarding humidity, air speed and temperature</p>
8	Social Aspects		<p>Potential: Able to take advantage of outdoor activities by paying attention to the user's character according to their needs without leaving the comfort and security side.</p> <p>Obstacles: Safety and comfort support facilities are not well available such as uneven roads, special circulation lanes for users, special parking for users with disabilities, lack of lighting and lack of garbage cans.</p> <p>Synthesis: Adding and improving facilities that can meet the needs of users in the form of security and comfort</p>

D. Concept

At this stage, it is a design stage that contains proposals for solving design problems that are still provisional [2]. At this pre-design stage, there will be several plans that are formed based on human comfort standards as users so that users feel comfortable and safe when using this site.

E. Concept Development

The concept of development is a development of a predetermined basic concept that will later produce several

parts of the concept [2]. The following is a table of development concepts presented in Table 4.

Table 4. Development Concept

No	Concept	Result
1	Parking Space Concept	The concept of the parking space that will be applied to the East Parking of Plaza Mall Surabaya is an island model with a 90° shape
2	Zoning Concept	The zone concept in the East Parking of Plaza Mall Surabaya is divided into five zones based on user needs, namely the four-wheeled vehicle zone, the two-wheeled vehicle zone, the building zone, the facility zone and the pedestrian zone.
3	Circulation Concept	<p>a. This circulation concept will be divided into two, namely circulation for vehicles and circulation for users</p> <p>b. The circulation of 4-wheeled vehicles uses a <i>linear</i> pattern with two-way circulation [6].</p> <p>c. The circulation of 2-wheeled vehicles uses a <i>grid</i> pattern with one-way circulation [6].</p> <p>d. Then for user circulation, there is a special lane that will use a <i>network</i> pattern with two-way circulation. [6].</p>
4	Concept of Facilities	<p>a. The concept of facilities that will exist in the East Parking of Plaza Mall Surabaya will focus on supporting parking user activities.</p> <p>b. The facilities that will be planned are public toilets, gazebos, places of worship, security posts, drop offs and garbage cans.</p>
5	Vegetation Concept	<p>a. The concept of vegetation that will be applied is <i>the tropical concept</i>.</p> <p>b. The plants that will be used are shrubs, shrubs and trees</p> <p>c. Plants that have a strong structure, do not break easily, and can absorb air pollution</p>
6	Design Concept	<p>a. The design concept that will be applied is modern Javanese architecture while still prioritizing humanists</p> <p>b. The reason for choosing the concept of modern Javanese architecture is to maintain Javanese elements on this site and provide a different identity from other places.</p>

F. Design Concept and Criteria

At this stage, it is a design stage that contains proposals for solving design problems that are still provisional [2]. At this pre-design stage, there will be several plans that are formed based on human comfort standards as users so that users feel comfortable and safe when using this site.

1) Application of Humanistic Architectural Design Criteria

There are design criteria in humanistic architecture that make the parking design comfortable for humans as users. Based on a statement from Murni [7], the humanistic

architect must have basic criteria in the form of meeting user needs, equality in various aspects, empathy for the user's character and acting as a protector and guardian for the user.

2) Parking Space Plan

The parking space plan that will be used in the East Parking of Plaza Mall Surabaya uses an island model by forming a 90°. Because the 90° parking model is more effective compared to other parking models because the capacity that will be accommodated in this model parking is more than other parking models.

3) Zoning Plan

In the East Parking plan of Plaza Mall Surabaya, it will be divided into 5 zones based on humanist principles so that users can feel comfortable on this site, namely the 4-wheeled vehicle zone with a yellow symbol, the 2-wheeled vehicle zone with a red symbol, the building zone with a blue symbol, the facility zone with a purple symbol and the pedestrian zone with a green symbol. The following is the zoning plan figure presented in Figure 3.

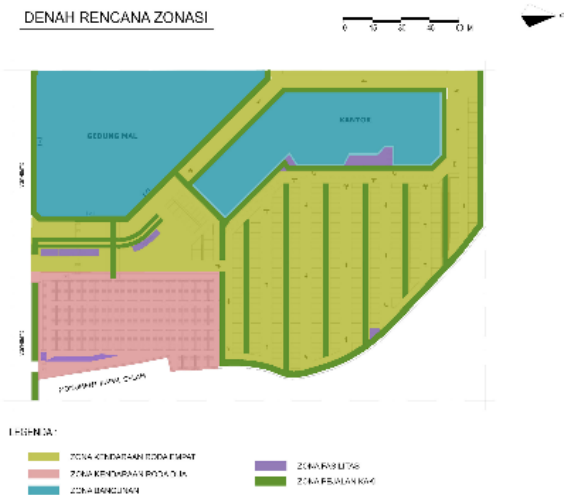


Fig 3. Zoning Plan

4) Circulation Plan



Fig 4. Circulation Plan

The circulation that will be planned in the Plaza Surabaya Mall parking lot will have access that makes it

easier and more comfortable for users. Therefore, aspects such as lane width, materials and circulation grooves use existing standards. In this circulation plan, it is divided into three, namely the circulation plan for four-wheeled vehicles, circulation for two-wheeled vehicles and circulation for users. The circulation for four-wheeled vehicles is symbolized by yellow, for two-wheeled vehicles it is symbolized by pink and for circulation for users it is symbolized by green. The following is a figure of the circulation plan presented in Figure 4.

5) Vegetation Plan

In the vegetation planning in the East Parking of Plaza Mall Surabaya, a tropical concept is applied. The vegetation that will be planted in the East Parking of Plaza Mall Surabaya is cape (*Mimusops elengi*), angsana (*Pterocarpus indicus*), tabebuaya (*Tabebuia chrysotrichus*), tea-tehan (*Theaceae*), boston fern (*Nephrolepis exaltata*), mini rombusa (*Tabernaemontana corymbosa*), ornamental banana golden torch (*Heliconia psittacorum*), banana frog (*Calathea lutea*), Japanese jasmine (*Pseuderanthemum reticulatum*), catfish dallow (*Hymenocallis speciosa*) and pearl grass (*Axonopus compressus*). The following is a figure of the vegetation plan presented in Figure 5.

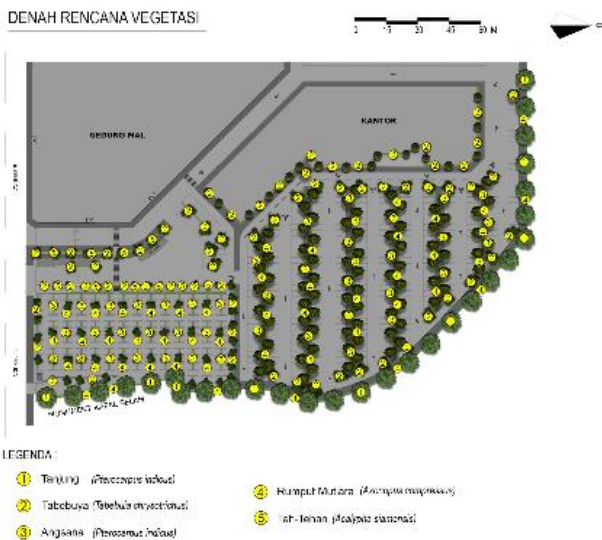


Fig 5. Vegetation Plan

6) Facility Plan

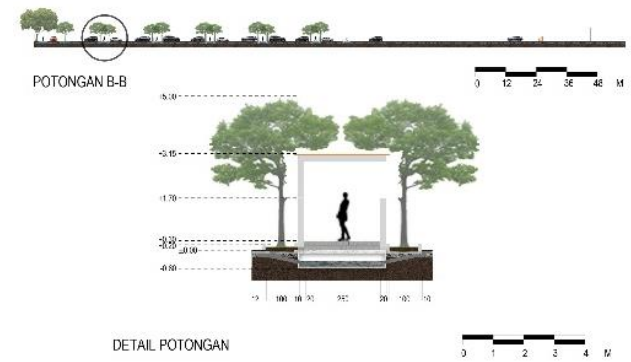
There are several facilities in the East Parking of Plaza Mall Surabaya such as security posts, toilets, seats, prayer rooms, special parking for users with disabilities, drop off, parking displays, fire extinguishers, lights, trash cans and information boards. Some of these facilities are useful to help user activities while in the East Parking area of Plaza Mall Surabaya. The following is a figure of the facility plan presented in Figure 6.



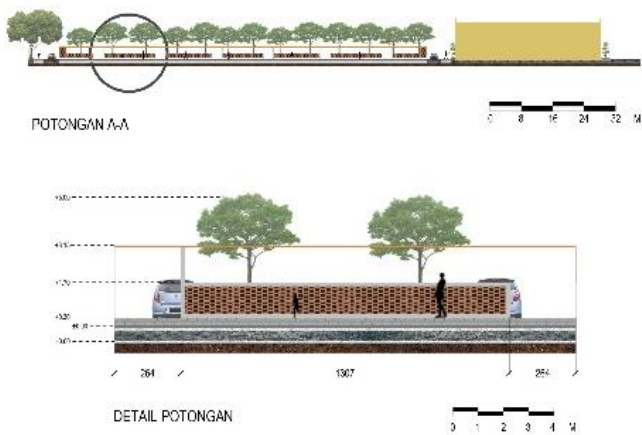
Fig 6. Facility Plan

7) Design Plan

The design plan for the East Parking of Plaza Mall Surabaya will apply the concept of modern Javanese architecture while still prioritizing user comfort. There is the use of tajug model roofs and materials dominated by wood, bricks, and carvings to strengthen Javanese culture on this site. The following is the site design plan figure and section presented in Figure 7.



GAMBAR POTONGAN B-B



GAMBAR POTONGAN A-A

Fig 7. Site Design and Section

G. Design

The design stage is a stage that contains design figures in the form of detailed figures with three-dimensional illustrations. At this design stage, there are 5 figures, namely parking space design, circulation design, facility design, vegetation design and perspective.

1) Parking Space Design

The following is an illustration of the design of the parking space presented in Figure 8.



Fig 8. Illustration of Parking Lot

2) Circulation Design

The following is an illustration of the circulation design presented in Figure 9.



Fig 9. Illustration of Circulation Design

3) Facility Design

The following is an illustration of the facility design presented in Figure 10.



Fig 10. Facilities

4) Vegetation Design

The following is an illustration of the vegetation design presented in Figure 11.



Fig 11. Illustration of Vegetation

IV. CONCLUSION

Based on the results of the analysis of the three aspects of the data inventory in the form of physical, biological, and social aspects, several design criteria were obtained for the East Parking of Plaza Mall Surabaya that did not meet the requirements in terms of parking conditions, capacity, circulation, space needs, vegetation, and science so that they needed to be improved. The basic concept used is humanistic architectural design with the main parameters in the form of user comfort and security. Parking criteria and principles that need to be considered in the effort to redesign the East Parking Plaza Mall Surabaya include the suitability of parking capacity, the area of the parking lot, paying attention to safety and protected from heat, and the availability of parking facilities so that they can meet the comfort and safety of parking users.

The redesign of the Plaza Surabaya Mall parking is carried out based on existing calculations and reference standards by including components in the form of the need for the number of vehicles, the size of the parking space, security, temperature comfort, lighting, and facilities to support user activities so that they can be used optimally. Efforts to redesign the Plaza Surabaya Mall parking lot with a humanistic architectural concept are needed to refer to human needs so that they can be fulfilled properly but do not leave the beauty side of an architectural art. The selection of this basic concept was developed with the concept of modern Javanese architecture buildings and the concept of vegetation, namely *tropical gardens* by producing figure design recommendations.

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