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Concept for Design of Park & Ride Building in Surabaya

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***Abstract*— Park & Ride is a Mass Rapid Transit (MRT) supporting facility that serves as a parking space for MRT users. In fact, Park & Ride building that has been built in Surabaya (located on Maeyjend Sungkono Street) is lack of attractiveness even though the MRT in Surabaya has not been realized (based on direct observation). To maximize the function of that building it is necessary to define design criteria of Park & Ride building that able to attract the public interest by applying a contextual design. Based on that, it is necessary to analyze the behavior of the community and surrounding facilities using data from Park & Ride facility guideline, Pre-study of AUMC Surabaya in 2013, comparative study, and direct observation to the subject of analysis. The result of analysis includes spatial or space variation and activity variation that managed by using superimposition method so it can be adjust in one platform or building. The final result is the achievement of design criteria in the identification of community behavior referring to the configuration of space within the Park & Ride building in Surabaya.**

Keywords*— Surabaya; Park & Ride, behaviour, activity, superimposition

I. INTRODUCTION

Park & Ride is a Mass Rapid Transit (MRT) supporting facility that serves as a parking space for MRT users. There are two types of Park & Ride facility namely in the form of a flat land (landed) and a multi-storey building. This facility is often found in developed countries that using MRT as the main transportation such as Singapore, China, and any other country in America or Europe. In Indonesia especially in the Surabaya City, Park & Ride has been built in the form of a multi-storey building to support the MRT which is being developed by the Surabaya City Government until now.

The only Park & Ride that has been built in Surabaya located on Mayjend Sungkono Street. But in fact, that Park & Ride building is lack of enthusiast based on direct observation. Based on research data from *Pre-study AUMC Surabaya* in 2013 by Surabaya City Goverment of Planning and Construction [1], the problem (lack of enthusiast from users) is caused by the design of the parking building that is very simple, ordinary, and sketchy when compared with the design of parking building in other countries. The opinions from the community also say that Park & Ride building look like a regular parking building, besides that there has not been significant influence in the environment since the building was built. If the Park & Ride building isn't properly functioning then the sustainability of MRT in Surabaya is not properly running optimally too.

Another fact of the Park & Ride building (based on direct observation) that has been built in Surabaya is the incompatibility based on the *Guidelines of Designing Park & Ride Facilities* [6]. Although these guidelines are a reference to designing a flat land (landed) Park & Ride, however many aspects from that guideline can not be found in the Surabaya's Park & Ride. Theseguidelines such as [6]:

- Off-site bus access
- In and out access
- Traffic control devices
- Street furniture
- Site layout
- Internal circulation
- Parking lot pattern
- Transit area for feeder
- Sidewalks and drainage
- Signing & marking
- Landscape pattern
- Security
- Boundary identification
- Supporting facilities
- Architecture (art)
- Community integration
- Lighting & fences
- Sustainable development

Other than that, if the design of the Park & Ride in Surabaya compared with similar parking building from other countries, the difference will be very visible both in terms of design and influencing to the environtment. *1111 Lincoln Road* in Miami and *Sultangazi Terraced Market Hall* in Turkey are some of the similar building. When both buildings are compared with the Park & Ride in Surabaya it shows that they have similar design issues but have different solution in each location. Comparative study is used to analyze the solution of problems that occur in the environment (on site).

All these facts show that there is a problem in design aspect on the Park & Ride building that has been built in Surabaya (on Meyjend Sungkono Street). It is to be concerned that the issue can be continues until MRT in Surabaya is realized. Therefore, a reference is needed to designing a Park & Ride building for Surabaya that contextual on environtment and be able to attract the public's attention. Contextual and attractive design that is meant before are design that can accommodate the community activities in surrounding and integrated them into Park & Ride building according to the guidelines design.

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According to the *Pre-study AUMC Surabaya* in 2013 [1], the site for the next construction planning of the Park & Ride building is located on Arief Rachman Hakim Street, East of Surabaya. That site is selected to be subject of analysis to obtain the design criteria of Park & Ride building in Surabaya as desired. Here is the land use of the site and surroundings.

Fig. 1. Area of study [1]

- : Site for planning
- : Commercial services
- : Public services
- : High density settlements
- : Green open space

II. THEORITICAL REVIEW

A. *Design Aspect*

Superimpositions have the mechanism of deciding the architectural elements in the relation of form and function, which then can be associated with three kinds of relationships, to create a architecture that responds users [2]. The architectural elements are separated or disconnected that mention before are [3] space, movement, event, use / usefulness. While the three forms of relationship in question include [4] *Reciprocity (mutual), Conflict,* and *Indifference.*

B. *Behaviour Aspect*

The behavioral approach emphasizes the interconnection between space with humans and society that utilizes space or inhabits that space. With the interaction between humans and space it is to be approached with the elements of the users, the kinds of activities, the places, and the timing of the activity. The activities may consist of sub-activities that are interconnected to form an activity system [5].

C. *Relationship Between Behavioral Architecture and Superimposition*

Behavior, activity patterns, and culture in society can affect the function of space in architecture. This relationship causes the space program that has been organize to put the activites to be not optimal, so it creates a pattern of space with a variety of unexpected programs. The pattern of space can be identified into three basic types of spatial patterns, among others [5] :

1. *Fixed-Feature Space*
   Is a space that covered by a fixed boundary and not easily shifted like walls, windows, doors or floors.
2. *Semi Fixed-Feature Space*
   Is a space enclosed by a barrier but the barrier is not fixed or can be moved when needed in accordance with the activities and behavior.
3. Informal Room
   Is space that is formed only for a short time, not fixed and formed outside of consciousness. Examples of informal spaces are spaces formed when two or more people gather.

D. *Guidelines of Designing Park & Ride Facilities*

The guidelines of designing Park & Ride facility is used to find out what design aspect should be implemented in the facility. The guidelines refers to the Florida Department of Transportation by Florida State [6]. This guidelines is the way to designing a landed Park & Ride facilities, therefore the design aspects in this guideline are used for reference in indentification design criteria of Park & Ride in multi-storey building form.

III. METHOD

A direct observation study of the Park & Ride condition building in Surabaya and the literature study (Florida Department of Transportation, 2009) is a method for collecting data for the park & Ride design aspects. Comparative studies are also used to look for similar problem solving. Some of the similar buildings are *1111 Lincoln Street* and *Sultangzi Terraced Market Hall.* The results of this study are a design parameter to determine the design criteria of the Park & Ride building. In the other hand, superimposition method is used to synthesize the results of the analysis on the activity and behavior in the surrounding environment of the site with the design parameters to determine the spatial configuration and design aspects that required by the Park & Ride building in Surabaya.

IV. RESULT

A. *Analysis of Guidelines of Designing Park & Ride Facilities*

As explained earlier that there is a guideline that should be used in the design of the Park & Ride in Surabaya. However, the guideline is a reference to designing Park & Ride facility in a landed form. Therefore, there are several design aspects that must be omitted or ignored from the guideline include:

- Off-site bus access
- Street furniture
- Transit area for *feeder*
- Sustainable development

If the aspects that contained in the Park & Ride facility design guideline are examined further, then all aspects will be divided into 2 types, namely aspects for external design and internal design. External design is the all aspects of design that have absolutely nothing to do with the building, while the internal design is the opposite. The existence of this division can help the identification process of design criteria. Here are the design guidelines of Park & Ride facility based on the type.

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TABLE I. CONCLUSION OF GUIDELINE OF PARK & RIDE FACILTIES

No	Eksternal Design	Internal Design
1	In and out access	Site layout
2	Off-site bus & feeder access	Internal circulation
3	*Traffis control device*	Parking lot pattern
4	*Street furniture*	Sidewalks and drainage
5	Landscape pattern	*Signing on building*
6	Security	Security
7	Boundary identification	Supporting facilities
8	-	Architecture & community integration
9	-	Lighting
10	-	Fences

B. *Analysis of Park & Ride Building Design in Surabaya*

Based on the guideline, there are several design aspects that uncontained in the Park & Ride building on Meyjend Sungkono Street (*Pre-study AUMC Surabaya*, 2013), among others:

- Lack of singage information inside & outside building
- The signage attirbute is uncomplete
- The landscape is very simple
- Supporting facilities is lack of attractness
- Supporting facilities is lack of variation
- Parking lot is lack of amount, especially for car

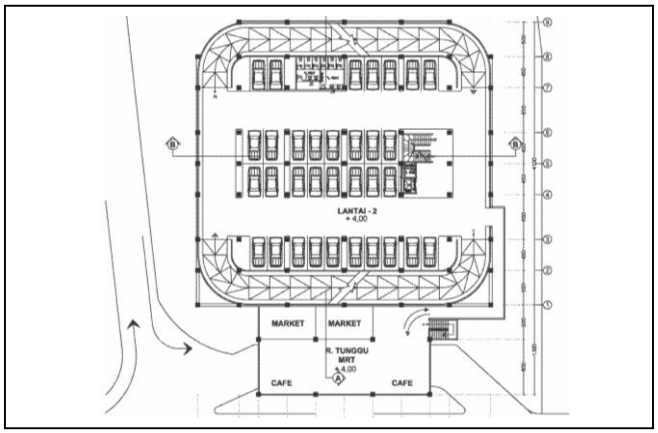

Fig. 2. Park & Ride building's typical floor plan on Meyjend Sungkono Street, Surabaya [1]

Fig. 3. The condition of Park & Ride building on Meyjend Sungkono Street. (suarasurabaya.net, 2017)

Besides addition to analyzing Park & Ride building design on Meyjend Sungkono with The Guideline [6], it is required the comparation of similar buildings to get the similar problem solving. The similar buildings reffering to the similar research problem, the theory used, and the design form (archiecture).

C. *Comparation Study for Similar Buildings*

1. *1111 Lincoln Road*

1111 Lincoln Road is located in Miami Beach area that has problems in the neighborhood such as land abuse (parking on side-road) and lack of parking space that's not comparable with the amount of vehicle. Herzog & de Meuron (the architect) solved the problem by designing a multi-storey parking facility that has a variety of additional facilities inside by adapting the activities and behaviors around Miami Beach. Additional facilities include shopping area, rental office, multifunctional space, and dwelling

Herzog & de Meuron is trying to design a parking lot that can adapt with environmental conditions in the Miami Beach area where dominated by shopping malls, restaurants, bars and cafes [7]. The effort can be seen from the arrangement of a space that have a different activity on each floor and interconnected of each other without interfere the function of parking space itself. The spatial configuration affects the varying height of each floor following the space requirements and activities on each floor. The height of each floor is also designed to maximize the view from inside to outside of building and *vice versa*. So, the 1111 Lincoln Road doesn't look like a parking facility but more like a multifunctional building that can adapt to environtmental conditions.

Fig. 4. Differences of height level floor of 1111 Lincoln Road [8]

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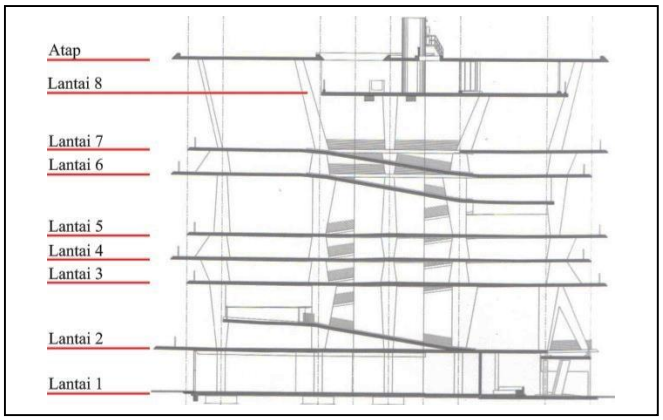

Fig. 5. One of the section plan of 1111 Lincoln Road [8]

2. Sultangazi Terraced Market Hall

The market is the most typical place in Turkey. The existence of a market can help the people's economy, become a medium of interaction between communities, become a landmark, and can be a public space at a certain time. This issues that made Suyabatmaz Demirel Architects (the architect) proposed the idea to create a combination of space between market, parking area, and public space on 14.600 m^2 in high density settlements.

Fig. 6. Illustration for Sultangazi Terraced Market Hall [9]

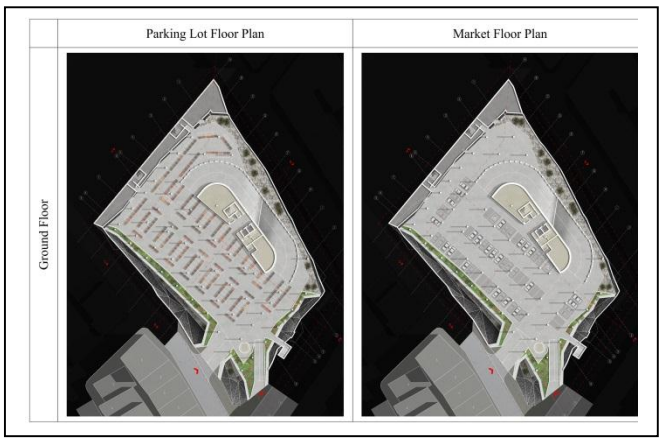

Fig. 7. Parking space and market plan on the ground floor [9]

Sultangazi Terraced Market Hall has double facilities such as parking lot facility and market where both have different space and activity needs. The superimposition strategy is done by adjusting the parking space and market space, resulting in a clear space for activities inside the building. However, there is a regulation that rules abaout height of the building, so both facilities (parking space and market) are forced to be stacked into one platform. That is resulted the need of market space and parking space to be balanced.

The spatial pattern that used in Sultangzi Terraced Market Hall later to be ignore each other space when one of the activities (market or parking area or public space) occur in a certain moment. The effect of this overlapping spatial pattern is both facilities (market and parking area) can't work at the same time. Thus the pattern of behavior is controlled based on time.

D. Design Parameter of Park & Ride Building In Surabaya

Based on the results of analysis the guideline, analysis design of the Park & Ride building in Surabaya, and comparative study of similar buildings, the result is design parameters of the Park & Ride facility in the form of buildings. The design parameters of the Park & Ride building are used as a reference to identify the design criteria of a contextual Park & Ride building. The design parameters include:

1. Site
   Site form, site area, legality, and surrounding aspect are important design factors.
2. Capacity
   The level of fungtionality of the Park & Ride building is also affected by the amount of vehicle capacity.
3. Circulation
   The selection circulation system has a major effect on the arrangement of parking slot and spaces within the Park & Ride building.
4. Environtmental and Cultural Condition
   Physical (boundary and distance to surrounding buildings, facilities that unavailable in neighborhood) or non-physical environtment conditions (behavioral patterns and community activities) become important factors that can affect shape of building even the spatial program.
5. Visuality
   The visual aspect becomes an important aspect in order to attract user and to adapt with neighborhood. Beside that, visual exploration can also make this building as a landmark in the region.
6. Attractive Supporting Facilities
   The faciluty that unavailable in the area is the priority. The selection of this facility also takes into consideration to the conditions in the neighborhood, activities, and behavior of the community.
7. Configuration Space
   The configuration of parking slot, supporting facilities, and size of space are the most important aspect that can be affected to the Park & Ride fungtionality.

E. Analysis of Behaviour and Activities

The The subject of analysis is the community around the site. The community behavior and activity from morning until evening is observed to get the pattern of activity. In

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addition, it can also be known from the analysis what kind of facilities are often visited by the community within <400 meter and >400 meters from the site. The frequency of vehicle usement by community is also observed.

The following are the variety of facilities that exist around the site within <400 meters.

TABLE II. TYPE OF FACILITIES IN NEIGHBORHOOD (<400 METERS)

Land Use	Code	Radius	Description
Public	A	< 100 m	PT. Garam (company)
	B	< 100 m	Adi Thama Institute of Technology Surabaya (ITATS)
Commercial	C	< 100 m	*Soto daging & ayam* (eatery)
	D	< 200 m	Coffee shop & printing
	E	< 200 m	Autobacs (workshop & cafe)
Public	F	< 200 m	St.Hendrikus High School
Commercial	G	< 300 m	Eye clinic, resto & cafe
Public	H	< 300 m	Surabaya 19th Junior High School
Commercial	I	< 400 m	Pak D' (restaurant)
Public	J	< 400 m	Darma Cendekia Catholic University
	K	< 400 m	Narotama University
Commercial	L	< 400 m	*Ruko21*(eatery, commercial retail)

Fig. 8. Facilities in the surrounding area within <400 meters

According to the condition of the surrounding environment and direct observation, the community is divided into 4 types based on the amount. The type of community is assumed in code (I, II, III, and IV) to simpify the analysis process. Types of communities around the site is explained in table III.

TABLE III. TYPES OF COMMUNITIES AROUND THE SITE

Ratio (%)	Type	Description	Code
70 %	College students	ITATS, ITS, Narotama, Darma Cendika	I
5 %	Students	Junior High School	II
20 %	Workers	Employee, lecturer, etc	III
5 %	Others	Outside the college student and worker	IV

Table III explains that the community around the site is dominated by college students (70%). It can't be denied because the site location adjacent to several campuses in Surabaya. Under the college student ratio there are public workers (20%) and students (5%) around Arief Rachman Hakim Street area.

The purpose of activity analysis of communty (I, II, III, and IV) in neighborhood is to find out what kind of facilities that they usually visited during certain hours. The frequently visited facilities can be located at 400 meters from the site or even more (>400 meters). The analysis of activity is done in the morning, noon, and night. Here is the data in question. The result of activity analysis of community in neighborhood is explained in table IV.

TABLE IV. ANALYSIS OF ACTIVITY IN NEIGHBORHOOD OR MORE

Code	Period	Description	Duration
I	Morning	Present on the campus	3-4 hour
		Going to shop-house printing and internet or Wi-Fi area (< 400 m)	5-15 minute
	Noon	Going to lunch around campus (< 400 m)	10-20 minute
		Going to lunch outside campus area (>400m)	20-45 minute
		Indomart, alfamart, & circle K is crowded although the distance from the campus is quite far away (> 400 m)	3-5 minute
		Going to shop-house printing and internet or Wi-Fi area (< 400 m)	3-5 minute
	Night	Going to dinner at commercial area that little bit far from campus (> 400 m)	15-30 minute
		Indomart, alfamart, & circle K is more crowded than in the noon (> 400 m)	10-30 minute
		Cafe & coffee shop (<400 m) is very crowded because many college students doing their task while looking for Wi-Fi	1-2 hour
II	Morning	Present on school	3-4 hour
	Noon	Present on school	3-4 hour
		Indomart, alfamart, & circle K (> 400 m) is quite (no dominance)	3-5 minute
	Night	Cafe & coffee shop (< 400 m) is very crowded because many students doing their task while looking for internet connection	30-60 minute
III	Morning	Present in workplace	3-4 hour
	Noon	Going to lunch around workplace (< 400 m)	10-20 minute
		Goin to lunch outside workplace area (> 400 m) but slightly	20-45 minute
	Night	It's not in the workplace area	-
IV	Morning	Present on house and any other area around Arief Rachman Hakim Street	-
	Noon	Going to lunch around area (< 400 m)	5-10min
	Night	Present on house and any aother area around Arief Rachman Hakim Street	-
		Indomart, alfamart, & circle K (> 400 m) is quite (no dominance)	5-10 minute
		Cafe & coffee shop (>400m) are no dominance	

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Data on table IV indicates that the communities (I, II, III, and IV) choose to go to facilities outside the site area (>400 meters) due to lack of diversity of facilities around the site. That activity is dominated during day and night. The duration from the starting point to that facility is also quite long, about 15-30 minutes. By that activity is causing a traffic jam at some point on Arief Rachman Hakim Street and surrounding.

From table IV it can be concluded that some facilities are often visited by the community. This facility is located inside and outside radius 400 m from the site on Arief Rachman Hakim Street. These facilities include:

TABLE V. TYPE OF FACILITY THAT POPULAR

Code	Type of Facility	
	Radius < 400 meters	Radius > 400 meters
I	Shophouse printing & fotocopy	Mini market (indomart, alfamart, circle K)
	Eatery (retail, food stalls)	Cafe, coffee shop (with fast internet connection)
	-	Eatery (fast food)
II	-	Mini market (indomart, alfamart, circle K)
		Cafe, coffee shop (with fast internet conection)
III	Eatery (restaurant, food stalls)	-
IV	Eatery (food stalls)	Mini market (indomart, alfamart, circle K)
	Cafe, coffee shop (with fast internet connection)	Cafe, coffee shop (with fast internet connection)

The use of vehicles for transportation also becomes a problem in parking lots in every facility around the site or outside. Take one example of parking space for minimarket consumers like Indomart and Circle-K. During the day there is an increase in the number of consumers dominated by college students (Code I). It becomes very crowded at night. The number of consumers at night increased rapidly despite the duration required by 1 consumer to activities within the facility is not too long. Beside that, the habit of Indonesian people who often sit quietly and spend time without doing anything in one place, makes the situation inside the facility becomes very uncomfortable. The impact all of that is occurs on parking lots that exceed the limits of capacity. The worst thing that happened was the existence of illegal parking activity on the side road, which is one of the factors that trigger traffic jam in Surabaya. That habit is unavoidable but can still be prevented.

Fig. 9. Kondisi lahan parkir minmarket di siang hari

Based on the analysis that has been done, it is needed to add a couple or more support facility such as mini market, fastfood retail, eatery (cafe & coffe shop), and shophouse printing that usually interested by the community around the site. The existence of that support facilities in the Park & Ride building will became main attraction and trigger new activities in the building. Other benefits by integrating the supporting facilities into the Park & Ride building are to minimize the use of private vehicle in Surabaya. So the Park & Ride building in Surabaya will look like a mixed-use building that acomodate the activity of community in the surrounding.

Before identifying the design criteria of the Park & Ride building, some criteria is required to select the supporting facility itself. This step aims to helping in identifying suitable support facilities for the design of the Park & Ride building in Surabaya. These criteria are seen from the aspect of the type, operating hours, dan spatial design of supporting facility. Here are the criteria of supporting facility:

TABLE VI. CRITERIA OF SUPPORTING FACILITY

Aspect	Kriteria & Concept	Description
Type	Criteria	Support facilities should be able to attract the attention of the public.
	Concept	Support facility : - Mini market (indomart, alfamart, circle K, etc) - Cafe & coffee shop retail - Fastfood retail (McD, KFC, etc) - Shophouse printing & fotocopy
Operational hour	Criteria	Support facilities should be able to support the function of Park & Ride and support community activities around the site
	Concept	Support facilities are *24 hour emergency business store* that can serve the community anytime. The supporting facilities are
		It has a fast internet connection
Design	Criteria	The size of the supporting facility space should be as efficient as possible.
	Concept	Supporting facilities are take away order so not causing a variety activities.
		1 space (room/retail) of support facility only able to accommodate 3-5 people and the furniture.

F. Design Kriteria

Based on the results of the analysis that synthesized with the design parameters of the Park & Ride building, then the design criteria of Park & Ride building on Arief Rachman Hakim Street is identified.

1. The Comfortable Aspect of User and Vehicle
   - Internal circulation (inside buildings) and external circulation system (outside buildings) should facilitate vehicles and users.
   - The capacity of parking slot must follow the regulations set by the government. [1]
2. Space or Spatial Configuration
   - Circulation pattern, supporting facility space pattern, and parking lot pattern should be able to facilitate the users and vehicles inside the building.
   - Supporting facilities should be able to support the Park & Ride building and community activities around the site for 24 hours.

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- Supporting facilities should be visible from outside the building and easily found inside the building too.
- Supporting facilities should be able to attract the attention of both people who using MRT and which are not.

3. *Utility System*
   - Building structures and building construction should be able to efficiently altitude floor to floor.
   - The lighting system should be able to facilitate activities and as an attractive building element.
   - Drainage, electrical, and light-firefighting apparatus (fire extinguishers) must adapt to structural and construction systems.

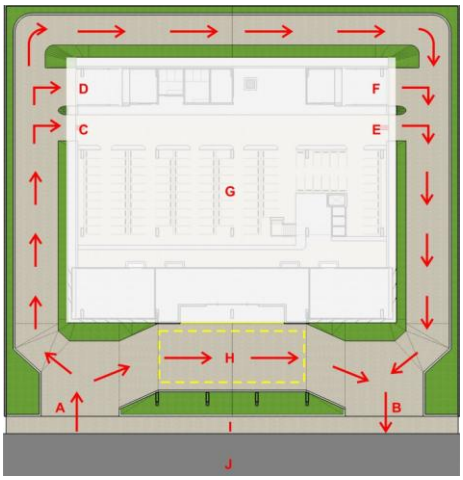
4. *Building Facade*
   - Building design should be able to maximize visualization from inside to outside of the building, and *vice versa.*
   - The design or style of Park & Ride building should be timeless.

V. DISCUSSION

Here are some concepts for the design of Park & Ride building in Surabaya by following the design criteria that have been identified previously.

1. *The Comfortable Aspect of User and Vehicle*

Access to the building (outside the building) using a one way in and one way out system. The concept of an outter ring circulation system is applied to avoid long queues in access to cars and motorcycles. The use of outter ring circulation system in addition to make a gap between another building (neighborhood building) can also be access to firefighting apparatus. There is also a drop-off system that works for buses and public transport (feeder). The internal circulation system (inside the building) uses the concept of a loop system that applied on entire floor to maximize the accessibility of vehicles.



A : Main entrance
B : Main exit
C : Entrance motorcycle
D : Entrance car
E : Exit motorcycle
F : Exit car
G : Main building
H : Drop off area
I : Pedestrian way
J : Arief Rachman Hakim Street

Fig. 10. The external circulation pattern of Park & Ride building

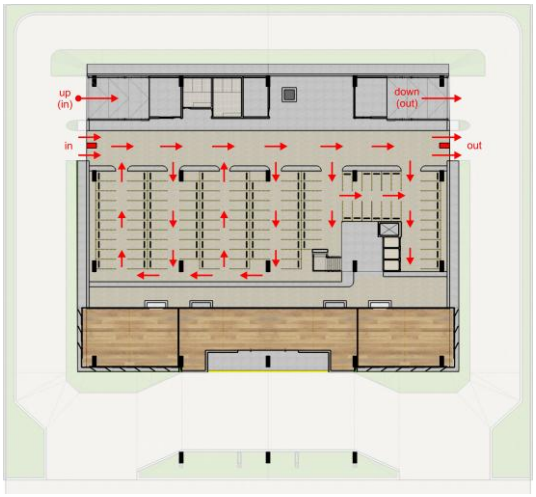
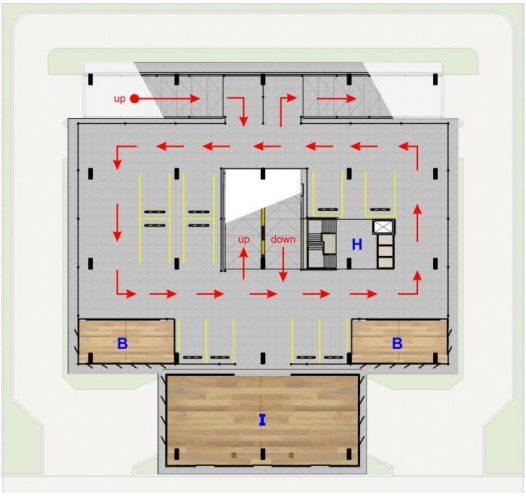
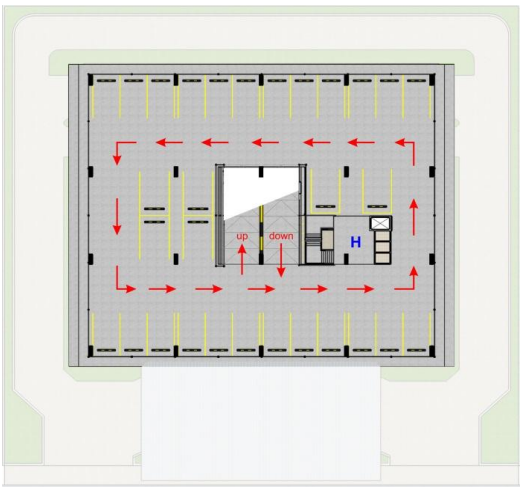


Fig. 11. Internal circulation pattern of Park & Ride building (ground floor)



B : Retail area
H : Circulation & service area
I : Monorel's station (waiting room)

Fig. 12. Internal circulation pattern on 2nd floor



H : Circulation & service area

Fig. 13. The internal circulation system at 2nd, 3rd, and 4th floor (typical)

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Configuration between parking slot pattern, circulation pattern, and indoor spatial pattern can accommodate the capacity of vehicles that have been set by goverment from Pre-study AUMC Surabaya in 2013. The parking slot capacity that can accommodate by the Park & Ride building in Surabaya as much as 205 vehicles. The amount of parking slot capacity is already includes parking for motorcycle and car. The parking slot capacity data is explained in table VII.

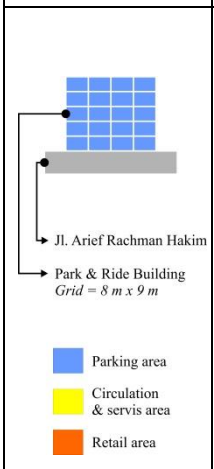
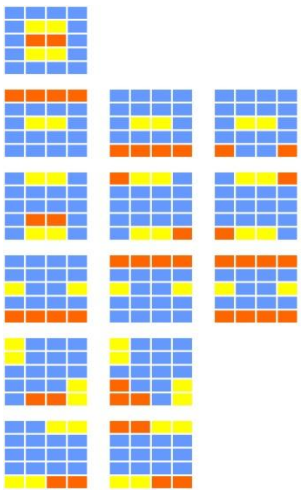
TABLE VII. THE CAPACITY OF PARK & RIDE BUILDING

Lantai	Jenis	Jumlah
1st Floor (Ground Floor)	Car	-
	Motorcycle	105
2nd Floor	Car	10
	Motorcycle	-
3rd Floor (typical floor)	Car	30
	Motorcycle	-
4th Floor (typical floor)	Car	30
	Motorcycle	-
5th Floor (typical floor)	Car	30
	Motorcycle	-

2. Space of Spatial Configuration

The superimposition method is used to find a suitable space configuration for all indoor space needs. In addition, the search of space configuration also pay attention to space, movement, event, and use contained in the needs of each space.The search of space configuration also paying attention to space, movement, event, and use that contained in each space. Parameters for determining spatial and circulatory system configurations follow design criteria that have been identified. From this stage there are several space configuration opportunities that following the four aspects of the superimposition method. Each of the space configuration possibilities has different spatial relationships as well.

TABLE VIII. SPACE CONFIGURATION POSSIBILITIES

Reference	Configuration	
	Parking Area + Circulation	Parking Area + Circulation + Supporting Facility Area
		

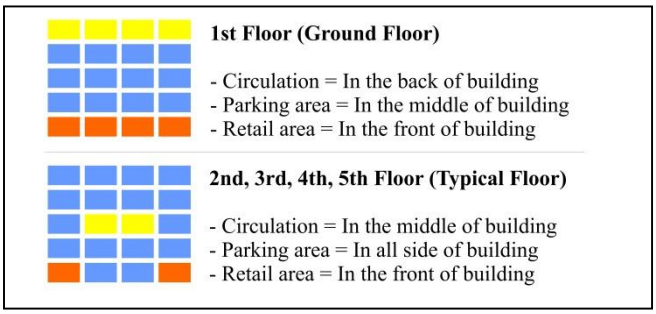
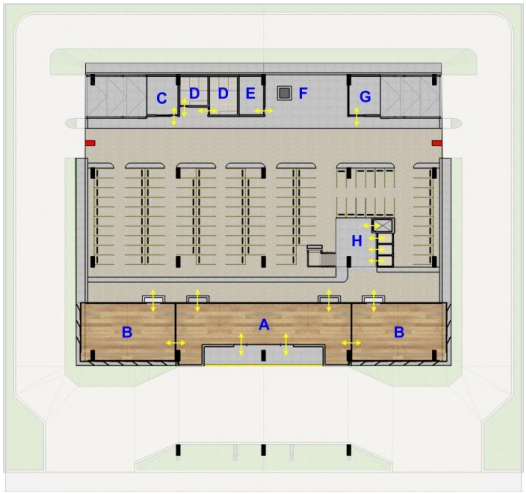


Fig. 14. Space or spatial configuration according to the design criteria

These spaces have 2 types of relationships, including Indifference and Reciprocity (mutual) relationships. The Indifference relationships can be found on the 2nd floor between the supporting facility space, parking space, and waiting room (monorail station). It can also be found on the 1st floor between the parking space and service space at the rear of the building. On the other hand, Reciprocity relationship space can be found on ground floor between supporting facility space, parking space, lobby and information center.



A : Lobby & information center
B : Retail area
C : Security room
D : Rest room
E : Water pump room
F : Reservior
G : Generator room
H : Vertical circulation & toilet

Fig. 15. Conflict & reciprocity form of spatial relationship on ground floor

Fig. 16. The condition on gorund floor

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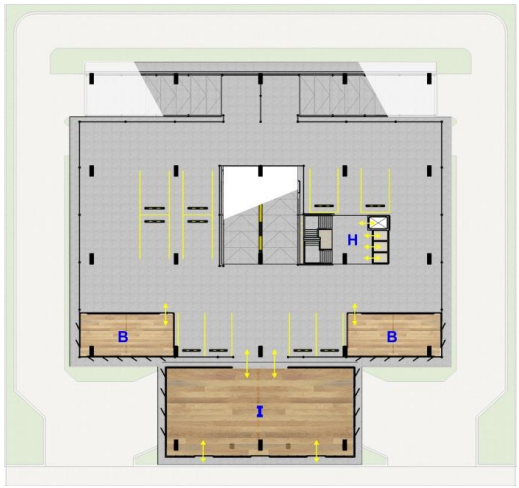

B : Retail area
H : Circulation & service area
I : Monorel's station (waiting room)

Fig. 17. The Indefference form of spatial relationship on 2nd floor

Fig. 18. The condition on 2nd floor

In order to be visible from outside the building at the same time to attract the attention of the public, then the retail area is positioned at the front of the building and is dominated by transparent material for massive wall replacement. The use of transparent walls is not applied to supporting facility space only (on 1st and 2nd floor) but is also applied in the waiting room (monorail station) on the 2nd floor. The massive wall is only applied to service areas such as toilets, security rooms, and utility room.

Fig. 19. The condition of retail and waitng room for MRT (monorel station)

3. Utility System

In order to obtain an efficient floor height on the spaces in the building, the rigid frame construction system is chosen by combining flat plate structure system. The results obtained are the height per floor can be pressed down to 2.5 meters for a minimum height and 5 meters for maximum height. The use of flat plate system makes the utility system fully applied too. The benefits of flat plate structure also impact on the overall shape of the building that is not too much ornament so that visualization from inside and outside the building is not disturbed.

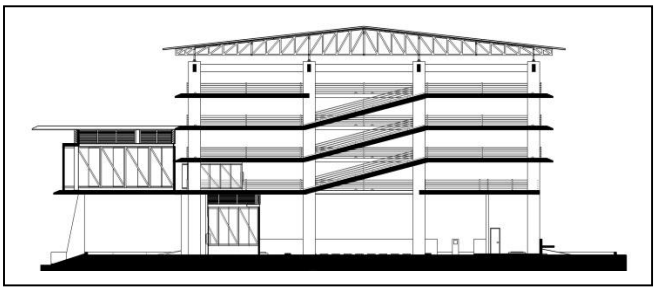

Fig. 20. Section plan of Park & Ride building in Surabaya

4. Building Facade

The material usage becomes an important role in the establishment of the facade of the Park & Ride building in Surabaya. The use of exposed concrete material as a structural material with transparent material is one of the concepts of modern architecture. That building style is used by this Park & Ride building in Surabaya as a timeless architecture style.

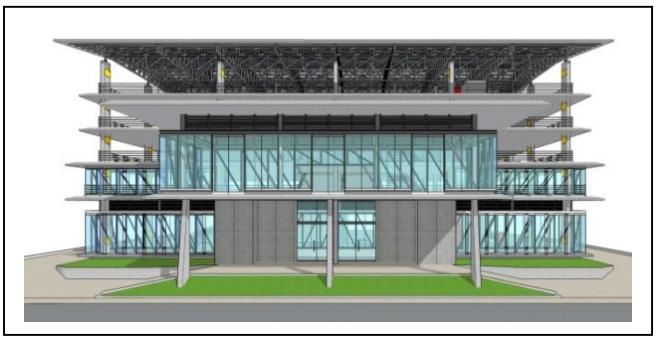

Fig. 21. Front perspetive of Park & Ride building in Surabaya

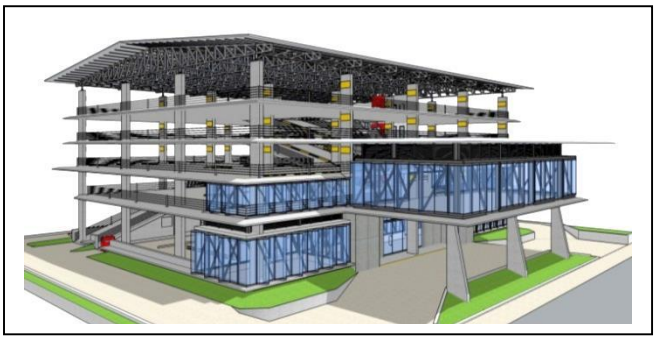

Fig. 22. Side perspective of Park & Ride building in Surabaya

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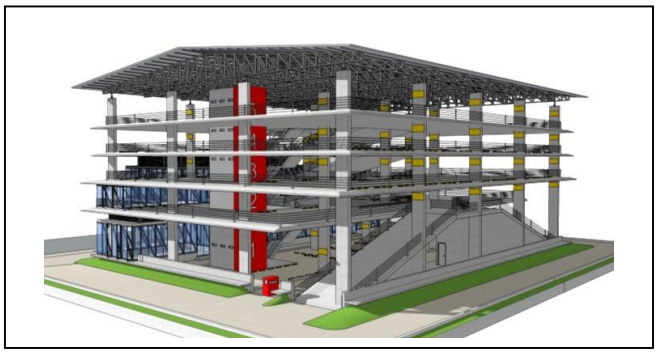

Fig. 23. Rear perspective of Park & Ride building in Surabaya

VI. CONCLUSION

The problems that occur in the Park & Ride building in SURABAYA is a problem in the design aspect. Design criteria such as the existence of spatial configuration of several different but mutually beneficial activities within the building are expected to solve the problem. The variety of supporting facilities in the building also became one of the design criteria of the Park & Ride building to attract the attention of the community and increase building attractiveness.

The achievement of design criteria of Park & Ride building in Surabaya can not be separated from the use of research methods. Superimposition method is one many methods that can solve the design problems such as problem of behavior and activities in an area, just like the existing problems in the design of the Park & Ride building in Surabaya (on Meyjend Sungkono Street). There are also four aspects that are important in the use of superimposition methods such as space, movement, events, and use / usefulness. The four aspects have to be adjust to the context or environment around the planning area.

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