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The spatial comfort study of shophouse at Kampung Madras

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Abstract. This Research comes from the increasing quantity of shophouse in downtown Medan and the suburban area. The condition of shophouse tend to have narrowly spaced rooms, the middle area of the house are poorly lighted, and lots of space left unused. This research is supported by many spatial issues from previous studies. This study is conducted to determine the level of comfort of shophouse as a function of living space and focused on the spatial aspect namely anthropometry, indoor space circulation, space requirement and function, spatial design and indoor visual. This study uses the descriptive method with the qualitative and quantitative approach. Data collection technique is done by field observation, questionnaire method is also used to get the respondent perception of the spatial comfort of a shophouse. The result indicates that the level of spatial comfort of the shophouse is an uncomfot. So the improvements in the circulation of access to the building, spatial design, lighting, and aeration are needed to improve the spatial comfort of a shophouse.

Keywords : Shophouse, Spatial Comfort, Housing

1. Introduction

House are basic needs for individually, family or group [1]. There are various classifications of houses, one of which is a shop house. People choosing shophouse as a dwelling caused by a lucrative business location (68.6%), occupational advantage and work in one place (68.6%), accessibility and urban transportation (55.9%), atmosphere of togetherness (40, 2%) and flexible spatial use (26.5%) [2]. It makes shophouses being as a rational choice as a dwelling that can support the economy of society [3] than become a popular typology that growing not planned in developing cities [2]. Behind the increasing of the public interest, many people not realize that design of a shophouse has put aside comfort factor of the occupants [4]. Spatial problem on shope house quite a lot, the condition tends to narrow, dark in the middle area and lots of unused space in the upper area [2]. That will influence the comfort of users, where comfort affects is the feasibility factor of one occupancy

As a building that combine two different functions, shophouse require adequate levels of comfort to meet the needs of economic activity (trade) and dwelling to optimize user productivity. Fulfillment of comfort element, safety, easy access will make the users comfort to do their activity [5]. Based on the background, researchers trying to assess the level of shophouse spatial comfort based on theory and user perspectives. And it will be focused on aspect of spatial comfort. This research aims to review the level



of spatial comfort then generate the concept design of shophouse that fulfill aspect of spatial comfort for users. Because based on previous research, basically people are still prioritize the comfort issue rather than business opportunities the shophouse that they live in [2].

2. Spatial Comfort of Shophouse

Shophouse is a lined up building, usually consisting of two floors or more [2]. This building is very practical and cheap because it can accommodate various economic activities and occupancy in one building [6,7]. The physical character of the shophouse can be seen from the size of the shophouse generally has a width of 3.5-5.6m wide with a length of 8-20 m behind each unit [4]. So the author berintepretasi is a typical shop house residential buildings that accommodate the economy (business) and activities in limited handsome land. Where a shop house is designed as a typical building with one another, but the functions and needs of space can be different between one shophouse with other shophouses. Movement of user activity within the building affects user comfort [8]. So limited amount of space and high demand of space functions certainly influence users comfort

Humans assess the neighborhood based on interactions and reactions to the neighborhood into itself her through the senses and extability. Stimulation captured by the brain then the brain assesses whether the situation is comfortable or not [9]. Spatial comfort is an ideal condition between the anthropometry of the human body and the activity adapted to the function of space [10]. To be able to fulfill users comfort in shophouse, we need to applying the comfort aspects with conformity design r standard recommended. Things to note is the fulfillment of the anthropometric conditions, the distinction of the activity zone [10,11]. Circulation in space is a factor that can affect spatial comfort [11-13]. Others that may affect spatial comfort are the amount of space, size, location of space within the dwelling, and the fulfillment of sunlight [12-16]. So the aspect of forming the spatial comfort in the shop house according to the author is anthropometry, circulation in space, the needs and funsgi space, spatial and visual.

3. Method

3.1 Metode Penelitian

This research uses descriptive method with qualitative and quantitative approach. There are two types of data, where the primary data is physical data (obtained by observation method and field mensuration) and also user perception to spatial comfort of store house (obtained by questionnaire method). The secondary data obtained from existing sources of literature study. Physical data will be redrawn for analysis with related theory and compared with user perception to know the quality / level of spatial comfort of shophouse in Kampung Madras. The results of the analysis will be adjusted with related theory to come up concept of habitable shophouse that conform the aspect of spatial comfort.

3.2 Area Penelitian

The location chosen as the observation area is the dense area of the shop house in Medan City, namely Kampung Madras (Figure 1). The author took three shop houses as a sample of the study. The sample criteria used as research object is a shophouse that functioned as a commercial area on the ground floor and occupancy on the next floor by one family.

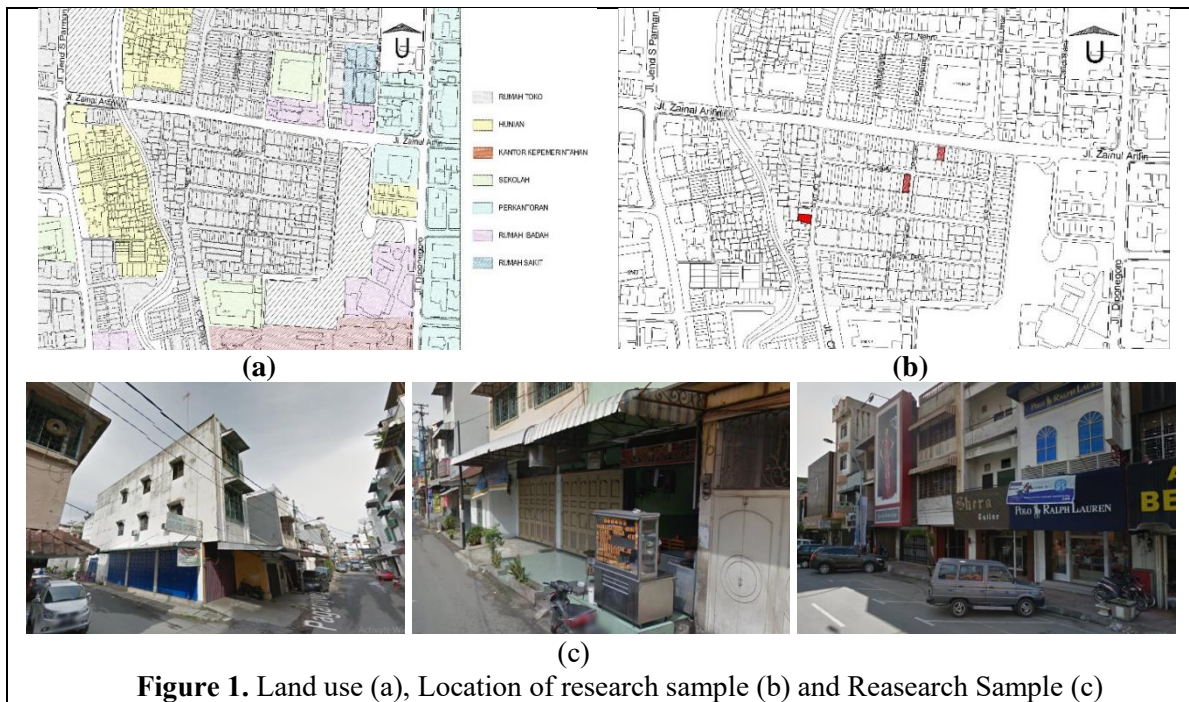


Figure 1. Land use (a), Location of research sample (b) and Reasearch Sample (c)

4. Results and Discussions

Based on user perception (Figure 2), concluded that users felt uncomfortable with the condition of circulation space in Kampung Madras shophouses. It can be seen from the value of sample satisfaction I is 48, sample II is 57 and sample III is 52. So the percentage of indoor space circulation reaching 52%. Then for spatial condition, sample I reached 57score, sample II at 55 score and sample III reach 56 score. So that average percentage value reach 56%. Then 60% for the average value of visual percentage. Where the first sample scores were 65 score, 60 score for samples II and 56 score for sample III. It was concluded that the user was quite comfortable with shophouse layout and visual conditions. If 68% - 52% of percentage is categorized enough and 36% - 52% fall into the less comfortable category, it is concluded that the level of user satisfaction of shophouse spatial comfort in Kampung Madras is low.

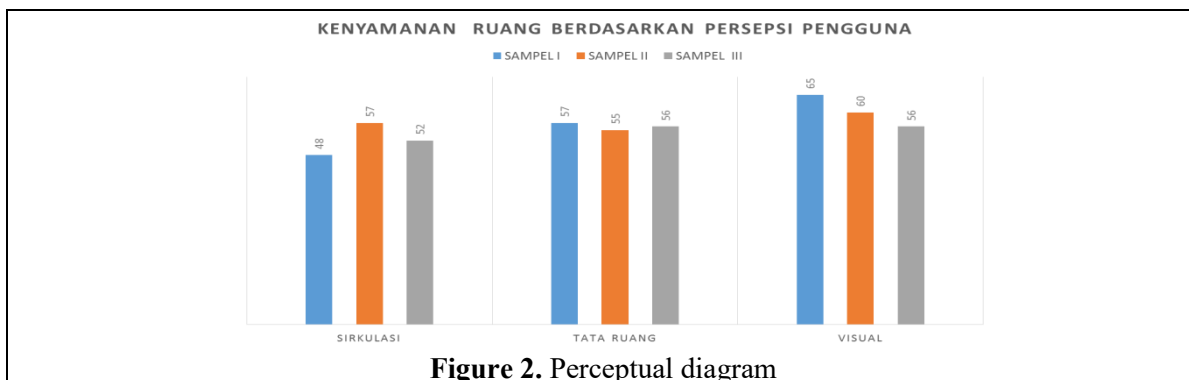
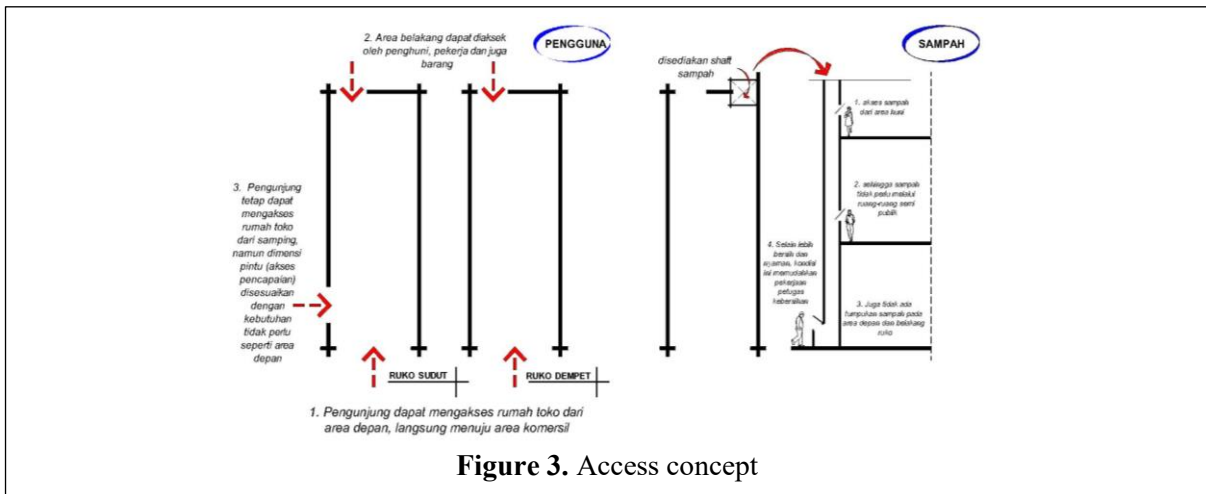
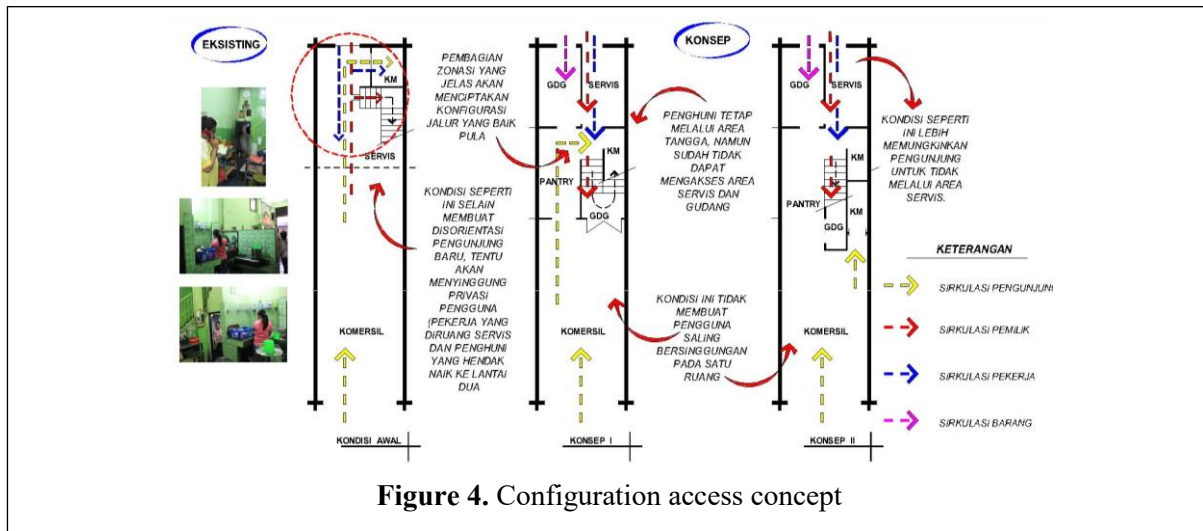


Figure 2. Perceptual diagram

In general, problem that happens in access of Kampung Madras shophouses was the unused of the service area by users makes stacking access in the front area. As for the right achievement system for entrance in shophouse is from the front and back of the store house building [17]. Author suggested to distinguish achievement access (Figure 3). Character of the front door is maintained. On connecting doors between chambers [18] can use 80cm - 90cm for door dimation. And 60cm - 70cm for bathroom door.



Unclear configuration lane will makes disorientation [18]. Configuration lane caracter is essentially influenced by the organizational pattern of the space it connects. In general, relationship between space and configuration lane at Kampung Madras shophouses is disoriented on service area in the ground floor. So the right concept to avoid disorienting and increasing user comfort on service area in the ground floor is to do a clear division of space (Figure 4).



The analysis results shows that of Kampung Madras shophouses stairs condition does not meet the users comfort and users safety (no railing, too precipitous, some stuff laid on the side of the ladder and the bordes does not serve as a resting place for users). So the stair concept that considered appropriate to meet the comfort of the shophouse user is to meet the needs of stair design according to the standard of comfort (width, height and depth of stairs) and security (stair railing and good lighting) (Figure 5).

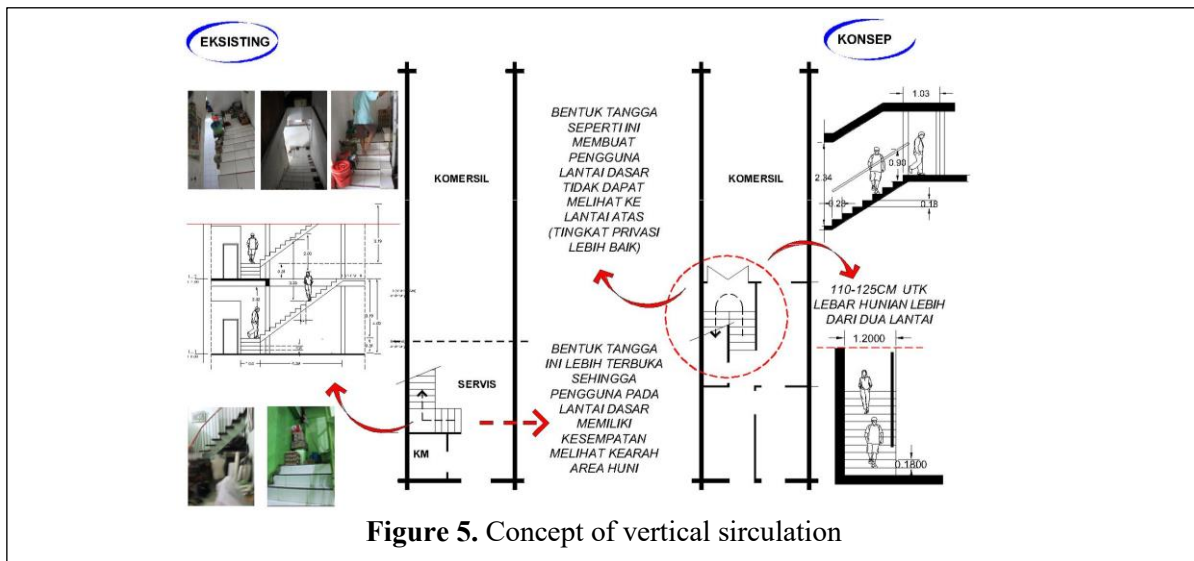


Figure 5. Concept of vertical circulation

Things that affect the needs and functions of space are activities and functions of space, the amount of space, the relationship between space and space requirements [18,19]. So concept of space needs and functions that can meet users comfort is emphasize of flexibility concept. Of the scale adjustment of amount of space with number of users. Shophouse needs and functions of space generally a commercial space, service space that meets commercial activities, family room, bedroom, kitchen and bathroom. Problem solving can be done seeing the limited space and the amount of storage space required (usually found on the ground floor) by designing a cabinet (Figure7) as an alternative to storage space. Or provide storage space (Figure 7)

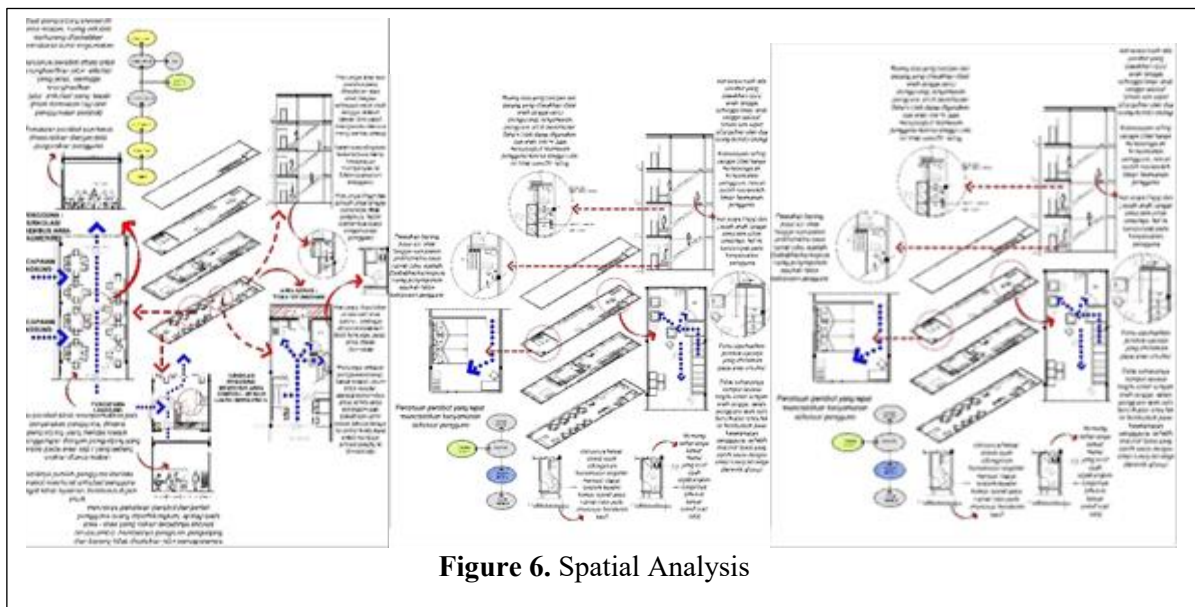
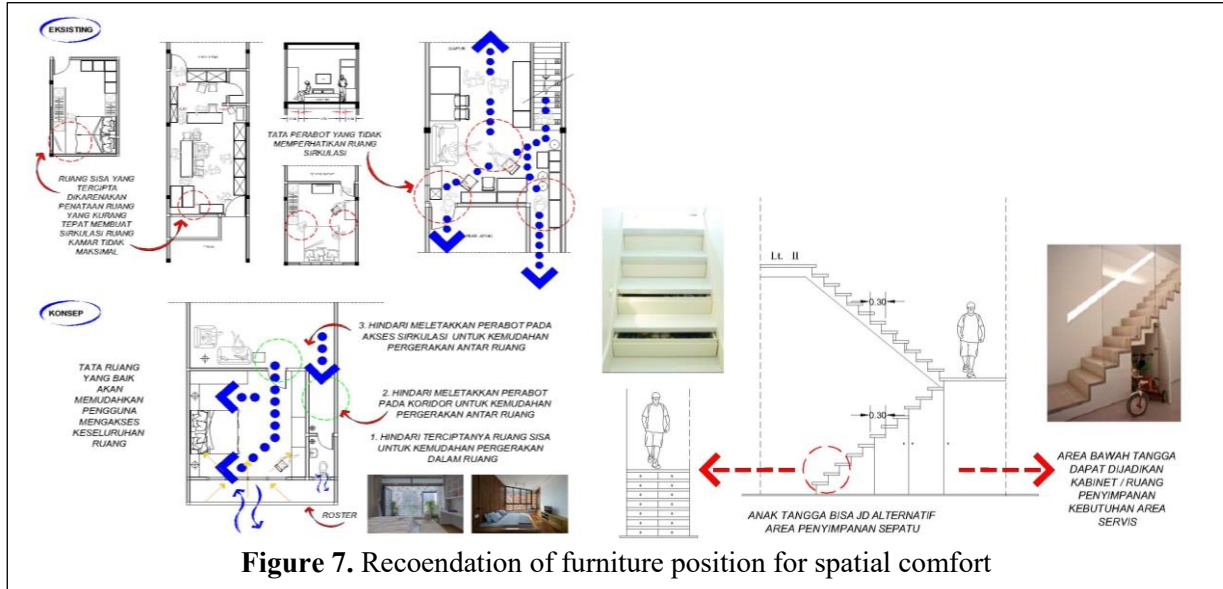


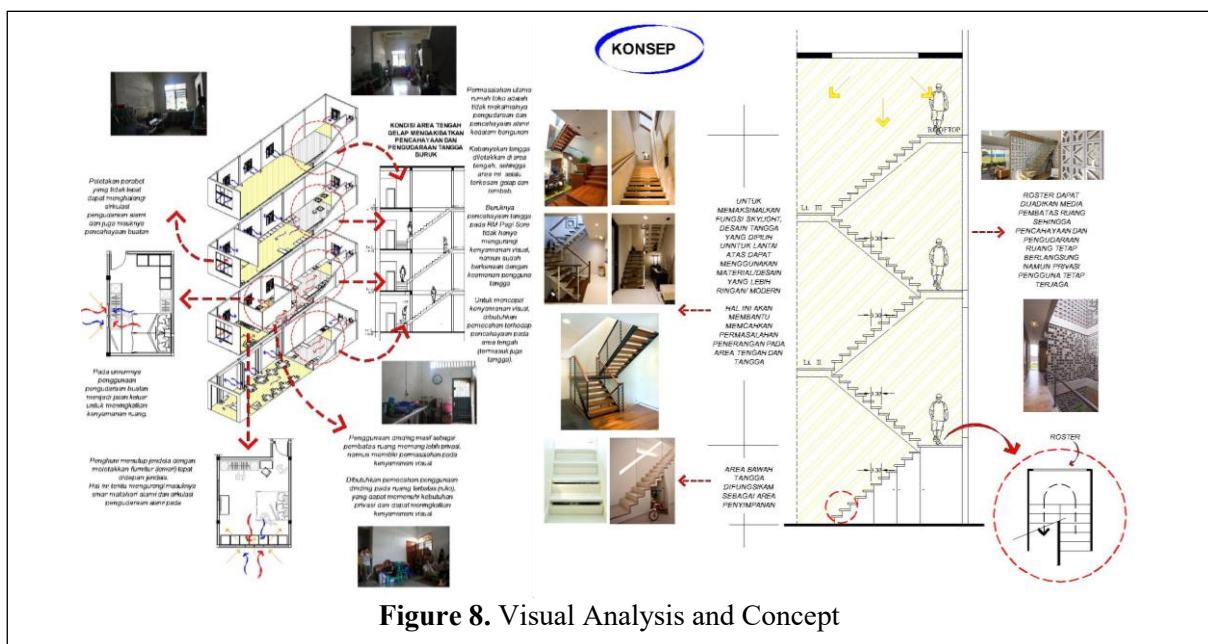
Figure 6. Spatial Analysis

Zones / restrictions, ease of movement, environment and furnishings is what should be noted for indoor comfort [10,16]. The right furnishings is an important factor supporting user movement / circulation, zone creation and boundaries between spaces [10,16]. The analysis shows that residents do not pay attention for spatial boundaries, so spatial ease movement becomes difficult. So the concept of layout is to take into account zones and boundaries, closely related spaces and avoiding massive wall or we can

use semi-fixed elements (semifixed-feature elements). Avoid placing the furniture in circulation spaces (Figure 7) and also avoid creating waste space when arranging furniture (Figure 7) so that user movement not interrupted while doing movement and indoor activity.



Visual comfort is influenced by good lighting, color and room scale. The analysis result show that low lighting affects the color quality of the room. Besides of low lighting in middle area due to t shape of the building, access to openings also difficult because many furniture is placed on the face of the window. So we should avoid putting the furniture in front of the window. To support indoor activity, in designing openings we also need to be considered number of openings and the location too [10]. For the concept, massive barriers on shophouses can change with roster to maximize indoor exchange air and incorporate natural light. Than for shophouse that has length of more than 16m, it should have open space in 12-16m and more than 20% of the ground floor area [17]



Material of finishing color affects low and high of sun's reflection or absorbs sunlight [10]. To create a good visual, besides choosing the right type of color, texture and color finishing greatly affect the indoor visual. Glossy results will reflect light resulting a glare effect in indoor area [10].

We can create indoor scale with raised ceiling height. For ceiling height, on the ground floor should not be less than 3.5m and 3m height of floor ceiling on the next floor [17]. On the ground floor we can give a great impression to create a good visual for visitors. And on the next floor can use a lower ceiling to make of warm / intimate impression because this area functioned as a dwelling area

5. Conclusions

Level of spatial comfort of Kampung Madras shophouses entering into uncomfortable category. Based on user perception, the average respondents showed low satisfaction. In access conditions, all users only use one access door so as not to use service access on the back area. So the concept is re-enable service area to separate occupant, worker and visitor access. Garbage access can be using shaft on the back area. Shophouses needs and room function generally are commercial area, family room, kitchen, bedroom and bathroom. The amount of space required to make the connection between spaces should be minimized by closer adjacent space functions without the use of a barrier or using semi-fixed elements (semifixed-feature elements). The room that need privacy can use fixed feature elements. Room setting must meet the needs of room requirements (anthropometry, lighting, adequate ventilation and a good view). For configuration of room path also needs to make changes, namely avoid each user to interspecific in commercial services area. It will be done by designing the spatial arrangement with clear boundaries. In general condition of vertical circulation of shop houses can be categorized as bad because it does not meet the security aspect and the user's sameness. What needs to be done is to take into account the standards that meet the user's anthropometry for the height of each step, the width of the stairs, the depth of the stairs, the height of the stairs, the ladder material, the landing and the railing too. The dimensions of moving space (such as the dimensions corridor and door) need to be considered for movement between rooms. Furnituring of Kampung Madras shophouses categorized into bad category. Users put lots of furniture in the circulation area (corridors and doors) even windows. The concept of proper furniture arrangement in the limited dimension of the shophouse space is by avoiding the laying of furniture in the circulation area, avoid creating of unused area, adjusting of room shape, scale and also the user number. To respond poor lighting and aeration, area of the incineration should be 20% of the wall area. Then not only rely on sidelighting, especially shophouses that have a length of more than 16m is required to use innercourt of 20% of the floor area. The recommended color for improving shophouses visual space is by not choosing of paint that reflects light to avoid the impression of glare. Using a wall material that has a texture can also be applied to reduce the impression of glare if you want to use skylights. Such a concept will increase shophouses spatial comfort. Looking at the high complexity of shophouse problem as a habitable area, the next shophouse study is highly recommended for other studies such as thermal comfort and auditorial comfort.

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