



User Behavioral Study at The Co-Working Spaces Within Ex-Military Warehouse Buildings Case Study: Warehouse 22, Bandung

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ABSTRACT

Increasingly urban density causes land prices to become more expensive through the years. Repurposing old buildings that are no longer functioning as new functions can be one of the solutions. By utilizing the cultural heritage building of ex-military warehouses of the former Dutch Colonial Government, Warehouse 22 uses 3 parts of the warehouses for a commercial function that is more relevant to today's needs. One of the facilities available is co-working spaces, as a place for activities that became the main focus of this research. This research method applies descriptive qualitative research carried out through observation to describe the settings of activities in its place, especially in the co-working space area through place-centered mapping. This research aims to understand the phenomenon that occurs in the co-working space area related to the behavior of its users, privacy, personal space, and territory. This study shows how a pandemic indirectly changes our daily behavior in the settings where the activity occurs and creates a new lifestyle as an adjustment in the present and future.

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1. INTRODUCTION

Along with advances in information and communication technology supported by the availability of high-speed internet, remote working has grown its use as a new model of work in the last few decades. Remote working is defined as a flexible work arrangement in which workers work in locations remote from the head office or production facility. Workers do not have direct contact with their co-workers but can communicate with each other using technology (Wang, 2020). Before the COVID-19 Pandemic, most workers had a little remote working experience so neither the individual nor the community was prepared to support this practice. Today, in a time of an unprecedented pandemic of early 2020 demanding millions of people around the world to become remote workers, this has inadvertently become an experiment affecting a global scale. Remote work has become a “new normal” almost overnight (Kniffin, 2021).

Co-working space is a typology of workspace facilities that change the way people use space as a place for work activities. Different from conventional workspaces in general, a co-working space that is a manifestation of the verb co-working accommodates collaboration among its users (Putra and Agirachman, 2016). Aimed at self-employed professionals who need social interaction. The co-working concept has 5 core values it holds, namely community, collaboration, openness, accessibility, and sustainability. These values serve to help professional workers who use co-working spaces to socialize and become part of the community to make new friends and co-workers, or even to get job opportunities (Maemanah, 2018). The atmosphere in the co-working space is very supportive of work enthusiasm and productivity, especially for creative business actors who have just started their business, they need the right place to work with a team that usually has a small number of members. Co-working space also applies to someone who has an individual business to professional freelancers who need a place to work outside the home but not like an office in general (Adha, 2018).

Warehouse 22 is a co-working space that was established in the city of Bandung, precisely in March 2014. Warehouse 22 can be considered one of the pioneers of co-working space in the city of Bandung (Adha, 2018). Warehouse 22 is located at Jl. Gudang Selatan No.22, Merdeka Village, Sumur Bandung District, Bandung City, West Java Province, Indonesia 40113. The Warehouse 22 building is an example of a building that has been converted into a new, more relevant function using the Adaptive Reuse method. Warehouse 22 utilizes a former military warehouse building to function as a commercial building (Prayoga, 2017).

During the current pandemic, urban communities are required to keep working but not in direct contact, but in practice, not everyone has internet access and an adequate work area in their place of residence. Co-working space can be used as an alternative place for remote working activities better known as remote work. Indirectly, the pandemic changes the daily habits or behavior that we live through the implementation of the 4M Health protocol: wearing masks, washing hands, maintaining distance, and avoiding crowds. This is the basis for research that focuses on behavioral studies in the realm of architecture through the application of architectural psychology theory: privacy, personal space, and territory to discuss any phenomena that occur at Warehouse 22 Bandung.

1.1 Problem

The management utilizes 3 blocks in the former military warehouse building, namely Warehouses A, B, and C effectively and efficiently as tenants used for various commercial

activities, one of which is co-working space facilities. Through a user behavior study approach in the layout of the Warehouse 22 co-working space area, several things can be reviewed, namely:

- 1) Who takes advantage of the co-working space facilities during the pandemic at Warehouse 22 Bandung?
- 2) Where the crowding phenomenon occurs and can be identified at Warehouse 22 Bandung during the pandemic?

1.2 Research Purposes

The objectives of the research on Warehouse 22 Bandung are:

- 1) Knowing who the co-working space users are during the pandemic and how to use the facilities in the co-working space.
- 2) Identifying where the crowding occurred during the pandemic at Warehouse 22 Bandung.

2. THE MATERIALS AND METHOD

The method used is the descriptive method through a qualitative approach. The case study of this research is Warehouse 22 Bandung, a building that initially functioned as a military warehouse and then converted into a commercial building in 2014. The object was chosen to identify behavioral phenomena that occur in the interior area. By looking at the current pandemic conditions, of course, there are some obstacles when it comes to data collection. The data used is in the form of a literature study on the theory of architectural psychology: privacy, personal space, and territory along with field observation data in the form of photos and video documentation that can describe the atmosphere in the co-working space observed area. Observation data was taken at 13.00-17.00 for 2 days as a comparison. This data will then be processed at the analysis stage which maps the layout conditions and users digitally for further study.

The variable unit that has been determined is the setting area which is used as a co-working space facility in several coffee shops in the space area of Warehouse 22. Behavioral mapping uses place-centered mapping (mapping based on place), this technique is used to find out how individuals or user groups utilize, use, or accommodate their behavior in a situation and place at a certain time.

Architectural Psychology: Privacy, Personal Space and Territory

In an architectural work, some factors create form, one of which is reviewed through the needs or functions of the building. The fulfillment of the container for the needs of human activity is divided into 2, namely physical needs and non-physical/psychological needs. This is based on the fact that individuals or community groups have different characteristics seen from the lifestyle and living systems they adhere to so they have a very large influence on how they design and shape their environment (Rapoport, 1977). Between the setting and human behavior, there is a reciprocal influence, between the two they are interconnected in forming a system of environmental behavior. The approach to the territory is carried out to understand and see individual privacy, and a sense of space that will affect perceptions of environmental comfort and environmental quality (Haryadi, 1995).

Density is the number of people in each room unit or several individuals who are in a certain space or area and are more physical in nature (Sari, 2019). A situation will be said

to be denser if the number of people in a certain space limit is increasing compared to the area of the room so that it becomes an interpersonal process at a level of human interaction with one another in pairs or small groups the difference between crowding and density. Crowding is more on the psychological aspect while density is more on the physical relationship between crowding and density, density is one of the conditions to be able to cause crowding, but not the only condition (Altman, 1975).

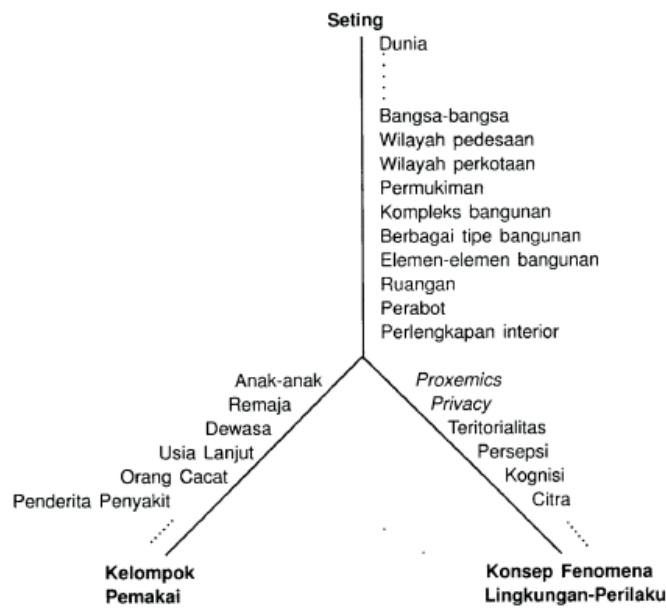


Figure 1: Behavioral Phenomena, 1995, Flowchart. Source: Haryadi

Privacy is the process of changing distance rules in which a person or group sometimes wants to be separated from others, and sometimes wants contact with others. Privacy is a concept consisting of a 3-dimensional process. First, privacy is boundary control. That is, a violation of this boundary is a violation of one's privacy. Second, privacy is carried out to obtain optimization. Third, privacy is a multi-mechanical process. That is, there are many ways that people do to obtain privacy, both through personal space, territorial, verbal communication, and nonverbal communication (Altman, 1975).

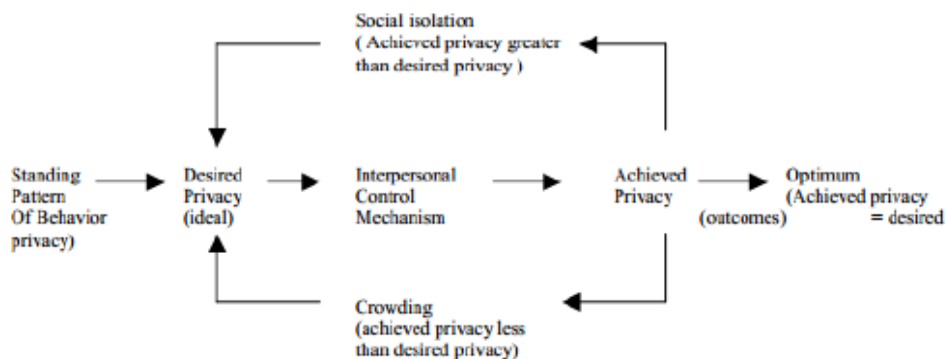


Figure 2: Behavior Settings, 1975, Flowchart. Source: Altman

Humans regard their personal space and territory as the main mechanism for obtaining privacy which is related to the ability of a person or group to control visual, auditory, and olfactory (aromatic) interactions with others.

Personal space is a sphere or bubble that is not visible, surrounds and is carried around by organisms, and exists between themselves and others, namely the buffer zone of the individual, intact and not shared. Personal space serves as protection (a barrier against potential emotional and physical threats) and communication. Personal space bubbles emphasize more on the protective function of personal space than the communicative function (Prabowo, 1998). In reviewing personal space, proxemic distance can be used as a reference for an individual's personal space needs, where there are 4 kinds of proxemic distance, namely: public distance, social distance, personal distance, and intimate distance.

Territoriality is a pattern of behavior that has to do with the ownership or rights of a person or group of people over a place or a geographical location. This pattern of behavior includes personalization and defense against outside interference (Holahan, 1982). Territoriality as a mechanism to obtain privacy defines territorial behavior as a self-determining mechanism that involves marking a place or object and communicating that it is owned by a person or group of people. Dividing territory into three categories is associated with personal involvement, involvement, proximity to the daily life of an individual or group, and frequency of use. The hallmark of territoriality is space and has a motive (Altman, 1975).

3. RESULTS AND DISCUSSION

Warehouse 22 Bandung is located at Jl. South Warehouse No. 22, Merdeka Village, Sumur Bandung District, Bandung City, West Java Province, Indonesia 40113. It consists of 3 parts of the building that are the locations of observations in this study, namely Warehouse A, Warehouse B, and Warehouse C.



Figure 3: Warehouse 22 Block Plan, 2021, View from Above.

Source: Authors

User Behavior in the Co-Working Space Warehouse 22

Warehouse 22 is a commercial complex consisting of tenants and retail which is divided into 3 parts of the building, namely Warehouse A, Warehouse B, and Warehouse C. In this case, the observation area for co-working space includes the Kozi Coffee Shop area which is located in Warehouse B. Monday Coffee Shop is located in Warehouse C, while the co-working space in Warehouse A is a restricted area for regular customers (Lthkrft Leather Goods and Portegoods Shoes) so it is not possible to make observations inside.

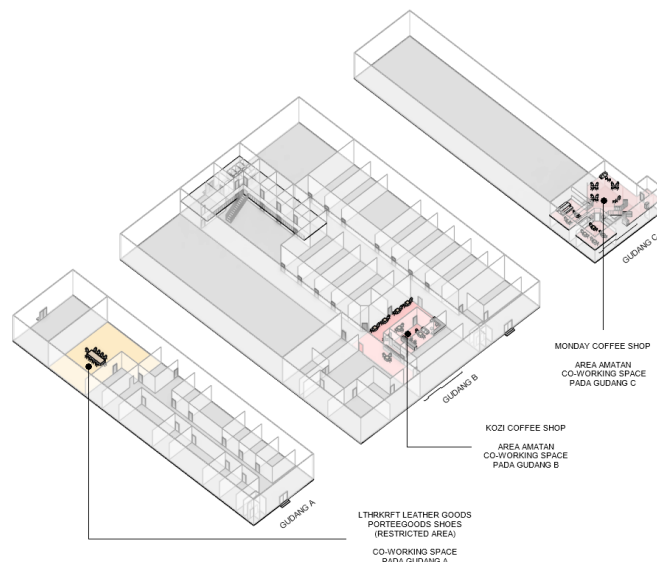


Figure 4: Behavioral Study Observation Areas in the Warehouse 22, 2021, Axonometric Views.
Source: Authors

The research method in the co-working space area in Warehouse B and Warehouse C was carried out using behavioral observations developed by John Zeisel (1981), namely by observing the behavior (Observing Behavior) of user activities in the observed area, that this was supported by the interview method. Observations were reviewed using place-centered mapping in the Kozi Coffee Shop area in Warehouse B which was carried out for 2 days, namely on Sunday, May 23, 2021 (13.00-17.00) and Tuesday, May 25, 2021 (13.00-17.00). For the Monday Coffee Shop area in Warehouse C, observations are carried out for 2 days, namely on Monday, May 17, 2021 (13.00-17.00) and Tuesday, May 25, 2021 (13.00-17.00).

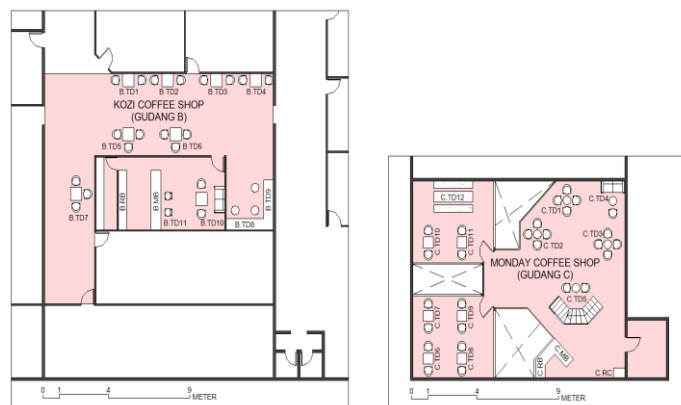


Figure 5: Place-Centered Mapping in the Co-Working Space Areas of Warehouse 22, 2021, Plan Views.
Source: Authors

Place settings are coded to facilitate the process of analyzing behavioral phenomena based on privacy, territory, and personal space in this Warehouse 22 environment. Because the observation area is in the form of 2 different places, the code starts with the letters B and C which indicates Warehouse B and Warehouse C on Warehouse 22.

Table 1. Furniture Settings Legend in the Kozi Coffee Shop Area Warehouse B Warehouse 22




Mark	Description
B.MB	Bar table located in the inner room of Kozi Coffee Shop
B.RB	Bar rack located behind the bar
B.TD1-B.TD4	A seat consisting of 2 chairs placed in a circulation area close to the wall
B.TD5-B.TD6	Seating consisting of 3 chairs placed in the circulation area behind the bar area
B.TD7	A seat consisting of 3 chairs that are placed alone on the left side circulation area
B.TD8-B.TD9	L-shaped seat on the right-side corner
B.TD10	A seating area consisting of 2 chairs and 1 sofa
B.TD11	A seat consisting of 2 stools located at the front of the table

Table 2. Furniture Settings Legend in the Monday Coffee Shop Area Warehouse C Warehouse 22

Mark	Description
C.MB	Bar table located in the Monday Coffee Shop area
C.RB	Bar rack connected to bar table
C.RC	A charger rack located in the front right corner of the Monday Coffee Shop area
C.TD1-C.TD3	Seating consists of 4 chairs placed in the area near the stairs
C.TD4	Seating consists of 1 chair and 1 sofa which is placed in the back right corner area
C.TD5	Seating consists of 2 chairs placed near the stairs
C.TD6-C.TD9	Seating consists of 2 seats in the front area surrounded by voids
C.TD10-C.TD11	Seating consists of 2 chairs in the back area next to the void
C.TD12	Seating consists of a long chair in the back area.

The table above shows a description of the architectural elements of furniture settings that can influence user behavior, especially those found in the Kozi Coffee Shop in Warehouse B and the Monday Coffee Shop in Warehouse C, which are the settings for co-working space activities at Warehouse 22. In addition, there is a table explaining user information and activities in the area.

Table 3. Users and Activities in the Co-working Space Warehouse 22

Mark	Description
	Male visitor
	Female visitor
	Coffee shop barista
MK	Making coffee
LP	Working
FT	Taking photos
DD	Sitting
BT	Communicating

From the observations of the user behavior table, the activities that occur are then analyzed through behavioral mapping with the place-centered mapping method which compares the co-working space area at Kozi Coffee Shop in Warehouse B and Monday Coffee Shop in Warehouse C simultaneously

Table 4. User Settings Simulation on the Observation Day 1 Through Place-Centered Mapping in The Co-Working Space Areas of Warehouse 22


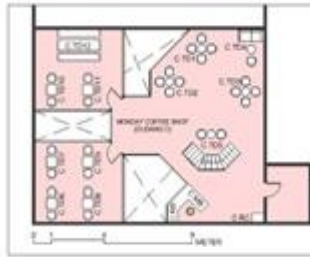

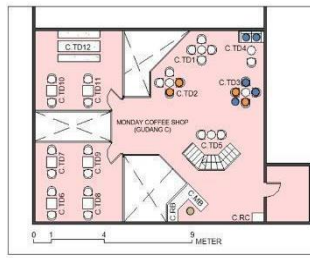
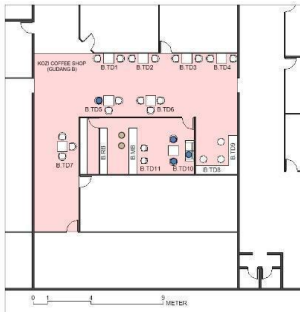
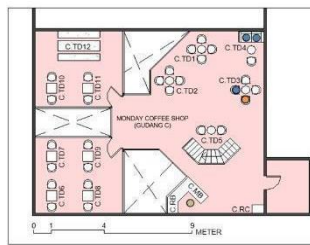
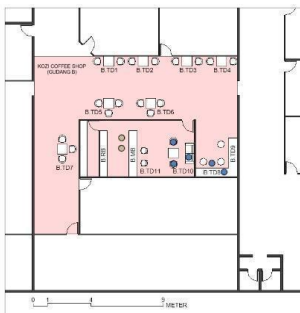
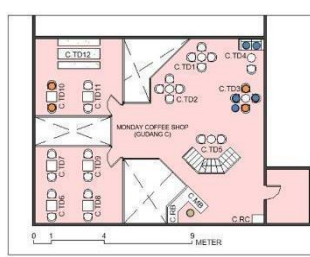
Observation Time	Analysis	Kozi Coffee Shop (Warehouse B)	Monday Coffee Shop (Warehouse C)
Day 1, Monday, May 17, 2021	<p>Observations made in the Kozi Coffee Shop area on Sundays showed that visitors tend to choose to sit in the circulation area, this is because the tenants at Warehouse B are closed on Sundays so Warehouse 22 visitor activities are quieter.</p> <p>While observations are made in the Monday Coffee Shop Warehouse C area on Mondays when the afternoon is quieter and starts to get crowded in the afternoon, the dominant visitor chooses a seat in the back right side area above which there are more skylight windows.</p>	<p>13.00-15.00 WIB</p> 	<p>13.00-15.00 WIB</p> 
		<p>15.00-17.00 WIB</p> 	<p>15.00-17.00 WIB</p> 

Table 5. User Settings Simulation on the Observation Day 2 Through Place-Centered Mapping in The Co-Working Space Areas of Warehouse 22

Observation Time	Analysis	Kozi Coffee Shop (Warehouse B)	Monday Coffee Shop (Warehouse C)
Day 2, Monday, May 25, 2021	<p>Observations made in the Kozi Coffee Shop area on Tuesday showed that visitors tend to choose a seating area that is far from the circulation area because on that day the tenants are open. In addition, according to the barista's information, the peak of the crowd occurs from Wednesday to Friday.</p> <p>Meanwhile, observations made in the Monday Coffee Shop area on Tuesday showed that the dominant visitors sat in the same place as the previous day, namely in the area on the right and back where there are more skylight windows. During the</p>	<p>13.00-15.00 WIB</p> 	<p>13.00-15.00 WIB</p> 
		<p>15.00-17.00 WIB</p> 	<p>15.00-17.00 WIB</p> 

Observation Time	Analysis	Kozi Coffee Shop (Warehouse B)	Monday Coffee Shop (Warehouse C)
	observation, there were no visitors doing working activities.		

Crowding Phenomenon in the Co-Working Spaces of Warehouse 22

The psychological dynamics of privacy is a social process between privacy, territory, and personal space that cannot be separated from one another. Optimal privacy occurs when the privacy required is the same as perceived. Too much privacy causes people to feel isolated, on the other hand, if there are too many other people who are not expected in their personal space, a feeling of crowding or crowding will arise so that people feel their privacy is disturbed. Coupled with the current pandemic period which can affect the distance or personal space of individuals.

From the results of a survey conducted for 2 days, it can be analyzed related to the concept of privacy in the co-working space area of Kozi Coffee Shop (Warehouse B) and Monday Coffee Shop (Warehouse C) at Warehouse 22. On Monday-Saturday when the tenants in Warehouse B open visitors tend to choose seats that are not directly on the circulation path (B.TD8-B.TD10) this is because visitors do not feel they have privacy because the circulation path in front of the Kozi Coffee Shop is an access that is also used by tenant visitors. However, on holidays the seating area with its back to the inner room (B.TD5-B.TD6) is preferred by visitors because there is a wall area background that has aesthetic value. As for the Monday Coffee Shop, which is located on the mezzanine floor of Warehouse C, visitors tend to choose seats in the corner area or under the skylight hole (C.TD3-C.TD4).

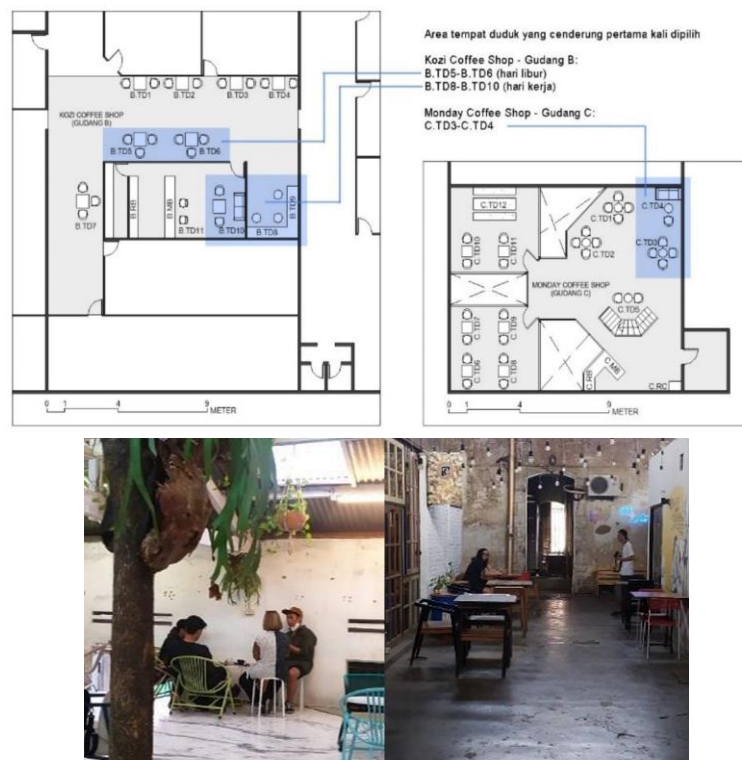


Figure 6: First Selected Seating in the Co-Working Spaces of Warehouse 22, 2021, Plan Views and Documentations.

Source: Authors

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Privacy

On weekdays when the tenant is open, the circulation area in front of the Kozi Coffee Shop becomes the only access for tenant visitors to go to the tenant area in the middle of Warehouse B. With so many visitors passing by in the area, it can cause crowding so that privacy in the area B.TD1-B.TD6 seats are lower due to the increasing number of tenant visitors, especially on Wednesday-Friday, and the noise caused by social interactions between groups. The absence of separation also causes some visitors to feel awkward when working on something with a laptop.

In the Monday Coffee Shop area, the stairs going up are in the middle right in front of the bar which creates crowding in this area which also acts as a circulation and queue line so that the level of privacy of the seats (C.TD1, C.TD2, C.TD5) becomes lower. The seats in the corner area (C.TD3-C.TD4) are usually filled by relatives or friends of the staff who often sit in that area. They feel that this area has a high level of privacy for their social groups. Then there is also a room designed with a transparent partition that can be closed when a higher level of privacy is needed (C.TD6-C.TD12).

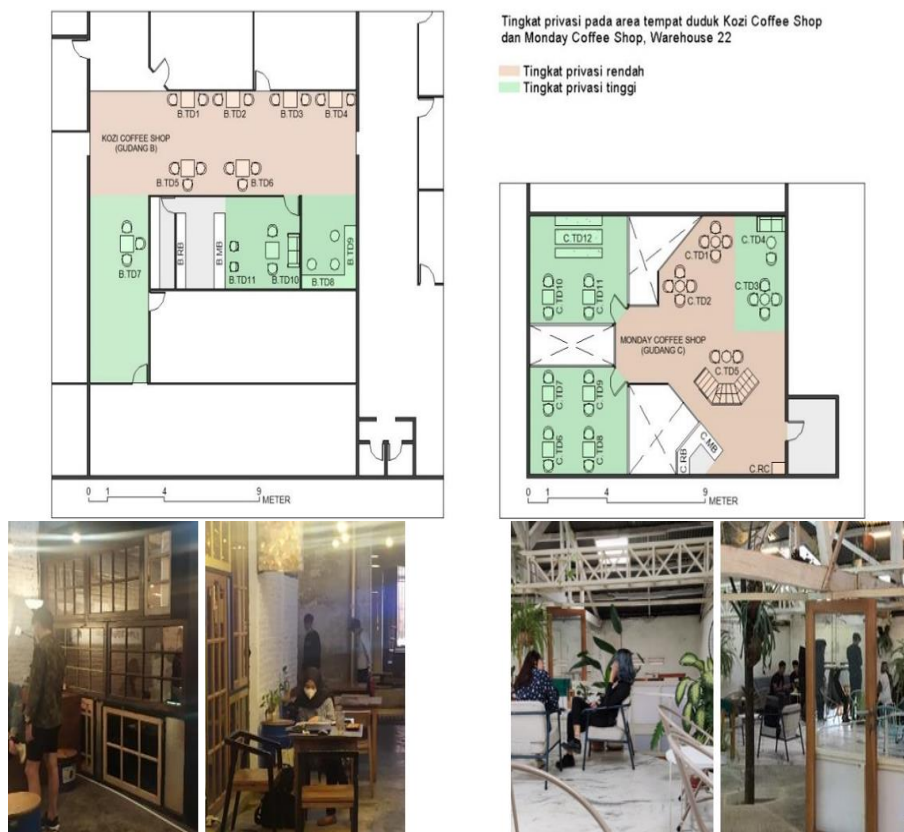


Figure 7: Privacy Levels in the Co-Working Spaces of Warehouse 22, 2021, Plan Views and Documentations.

Source: Authors

Personal Space

The personal space distance in the Warehouse 22 co-working space area is based on the layout of space and furniture which then affects the relationship between individuals and their groups, in this case, gender also has a role in the formation of individual personal spaces. In the Kozi Coffee Shop area in Warehouse B, the seating distance between B.TD3

and B.TD4 is 20 cm, so this seat is usually filled by 1 group of visitors. B.TD5 and B.TD6 seats have a distance of 1 meter from a table consisting of 3 chairs, visitors tend to sit facing the circulation entrance located in Warehouse B. For seats B.TD8 and B.TD9 which are L-shaped if there were visitors from different groups, the group that had just arrived preferred to sit in a position far away from the previous group.

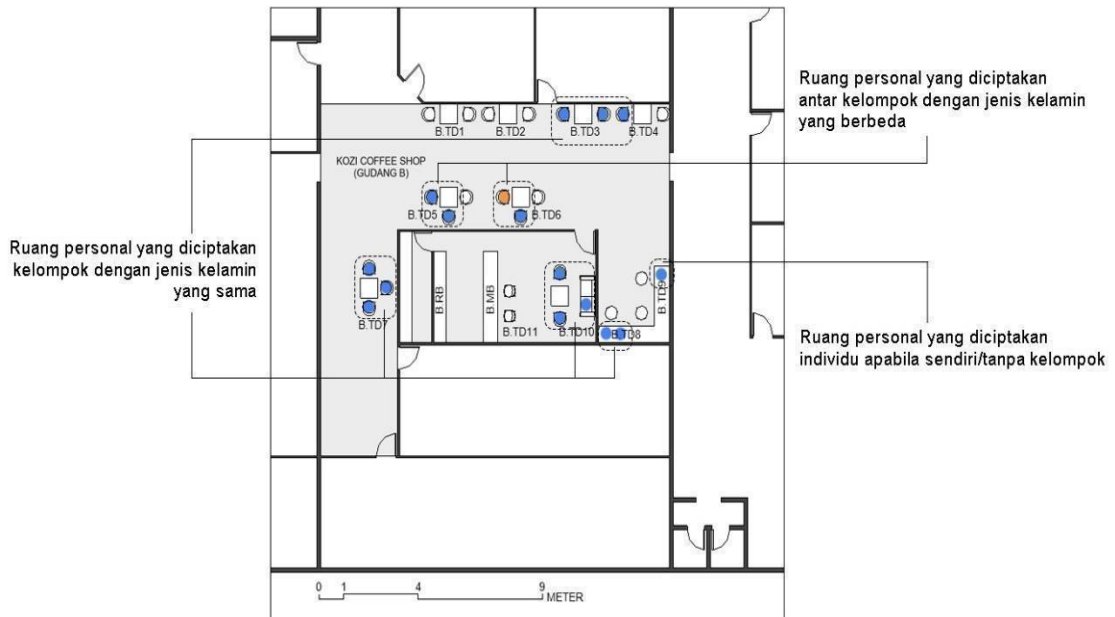


Figure 8: Personal Space Formed in Kozi Coffee Shop Co-Working Space Area, 2021, Plan View.
Source: Authors

Meanwhile, in the Monday Coffee Shop area in Warehouse C, the seating distance for C.TD3 and C.TD4 is 80 cm, while from C.TD2 to C.TD4 it is 250 cm. The seats in C.TD3 are arranged with 4 chairs, but the visitors who occupy that place consist of 5 people in 1 group so that visitors use the seats that should be in C.TD4. This creates a social interaction between visitors in C.TD3 and C.TD4, during the observation the area is the most frequently chosen by visitors. Female visitors who come in groups tend to choose seats far away (C.TD2 and C.TD10) if they feel they do not know the individuals in other groups of visitors, this causes the personal space of each group to become larger.

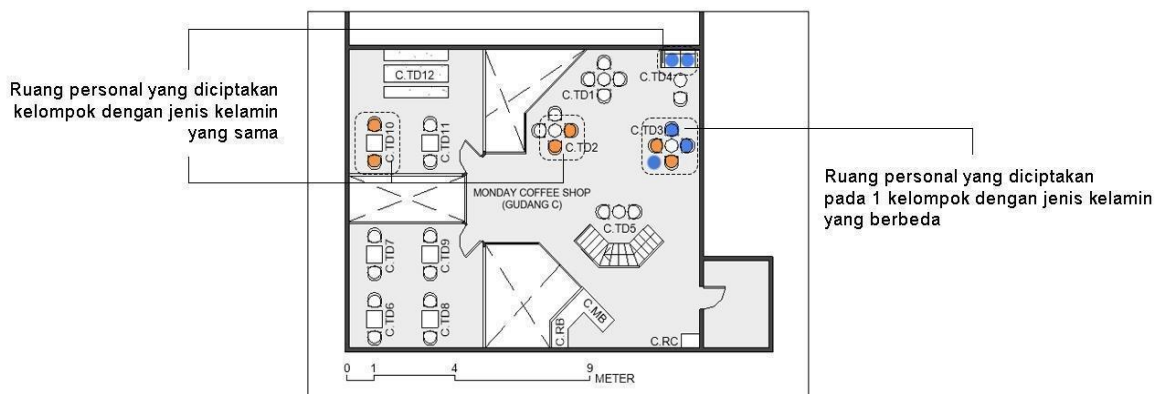


Figure 9: Personal Space Formed in Monday Coffee Shop Co-Working Space Area, 2021, Plan View.
Source: Authors

Territory

The territory contained in the Warehouse 22 co-working space area is divided into 2, namely the territory of other visitors who come only occasionally and the territory of regular visitors who come more often or still, have friendly relations with the barista. Territories occur due to social relations between visitors and baristas so that the seats that are still adjacent to the bar table are dominantly filled by regular visitors. In addition, comfort factors such as lighting and ventilation also affect the territory of visitors. In the Kozi Coffee Shop area in Warehouse B, the seating area for permanent visitors is B.TD8-B.TD11. B.TD10 and B.TD11 which are non-smoking indoor areas because they have air conditioning. Meanwhile, in the Monday Coffee Shop area in Warehouse C, the seats are permanent visitors C.TD3-C.TD5 and C.TD6-C.TD9. For C.TD3-C.TD5 is the brightest area with natural lighting because above the area there is the most skylight window, C.TD6-C.TD9 is chosen by regular visitors because privacy can still be maintained and there are many electrical terminals provided if you want to work with a laptop.

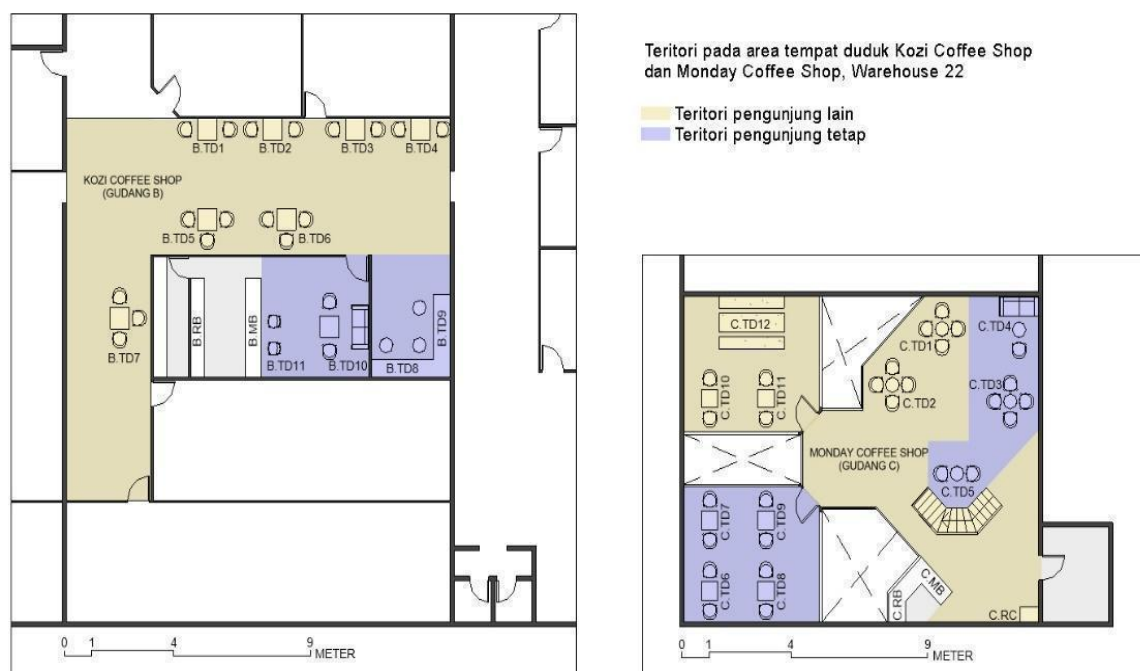


Figure 10: Territory of The Co-Working Space Areas of Warehouse 22, 2021, Plan Views.
Source: Authors

4. CONCLUSIONS

There are 3 co-working space areas in Warehouse 22, namely those in Warehouse A, Warehouse B, and Warehouse C. Especially for the co-working space in Warehouse A which is a restricted area for regular customers (Lthrkft Leather Goods and Portee Good Shoes), plus again with strict health protocols during the pandemic so it is not possible to make observations on the inside. In the Kozi Coffee Shop co-working space area in Warehouse B, its position which is surrounded by tenants and located in the circulation path of Warehouse B can cause the privacy of seats in the area to be less and there will be crowding. This is considered to be able to cause unwanted disturbances during the current pandemic, especially if the intensity of visitors who come in groups in this circulation area is high. Unlike the Monday Coffee Shop, its position is on the mezzanine floor of Warehouse C as a whole (not surrounded by tenants) and there is also an area that is indeed provided if visitors need higher privacy.

In terms of user behavior studies, it is found that the factors that affect the quality of the built environment in that area are found. The quality of the built environment is influenced by how the area is designed to accommodate activities so that the desired level of privacy can be achieved so that there is no longer crowding in certain areas, especially during the current pandemic. User behavior indicates the level of privacy, while the built environment indicates a place of activity for the personal space of individuals/groups which then creates territory within it. Privacy in the co-working space area can affect the comfort of the built environment which has become a need for urban communities, especially among more productive young people.

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