Public, Private & In-between Spaces in Student Housing

Mr. Sajid I Awal

A Thesis Submitted in Partial Fulfillment of the Requirements

for the Degree of Master of Architecture in Architectural Design

Department of Architecture

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ที่ว่างสาธารณะ ที่ว่างส่วนตัว และที่ว่างในระหว่าง ในที่พักนิสิตนักศึกษา

นายซาจิด ไอ อาวาล

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสถาปัตยกรรมศาสตรมหาบัณฑิต
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By	Mr. Sajid I Awal
Field of Study	Architectural Design
Thesis Advisor	Assistant Professor CHOMCHON FUSINPAIBOON, Ph.D.

Accepted by the FACULTY OF ARCHITECTURE, Chulalongkorn University in Partial Fulfillment of the Requirement for the Master of Architecture

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Examiner

(PAT SEEUMPORNROJ, Ph.D.)

.....
Examiner

(Associate Professor CHITTAWADI CHITRABONGS, Ph.D.)

.....
External Examiner

(Associate Professor Tonkao Panin, Ph.D.)

ซาจิด ไอ อาวาล : ที่ว่างสาธารณะ ที่ว่างส่วนตัว และที่ว่างในระหว่าง ในที่พักนิสิตนักศึกษา. (Public, Private & In-between Spaces in Student Housing) อ.ที่ปรึกษาหลัก : ผศ.ชมชน ฟูสินไพบูลย์

ความสมดุลระหว่างที่ว่างสาธารณะและที่ว่างส่วนตัวเป็นประเด็นที่สำคัญที่สุดประเด็นหนึ่งในการออกแบบที่พักอาศัยรวม โดยเฉพาะที่พักอาศัยรวมของนิสิตนักศึกษานั้น ที่ว่างสาธารณะและที่ว่างส่วนตัวมีความสำคัญเท่าเทียมกันในการส่งเสริมการมีปฏิสัมพันธ์และสร้างโอกาสในการพัฒนาตนเองของผู้พักอาศัย งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาคำจำกัดความของที่ว่างสาธารณะและ ที่ว่างส่วนตัว รวมถึงความสัมพันธ์ของที่ว่างเหล่านั้นในที่พักอาศัยรวมของนิสิตนักศึกษา เพื่อประโยชน์ในการออกแบบที่มีความสมดุลของที่ว่างทั้งสองประเภท ซึ่งจะเป็นประโยชน์ไม่เพียงต่อนิสิตนักศึกษาผู้อยู่อาศัยเท่านั้น แต่ยังรวมถึงมหาวิทยาลัยและพื้นที่โดยรอบด้วย การวิจัยนี้ใช้ระเบียบวิธีทั้งเชิงคุณภาพและเชิงปริมาณ รวมทั้งการออกแบบที่พักอาศัยรวมของนิสิตนักศึกษาตามคำจำกัดความ การวิจัยมีข้อค้นพบว่าที่ว่างสาธารณะและที่ว่างส่วนตัวมีการทับซ้อนอยู่ร่วมกันในที่พักอาศัยรวมของนิสิตนักศึกษา ไม่สามารถแยกแยะกันอย่างเด็ดขาดได้ ที่ว่างหนึ่งๆ จะเป็นที่ว่างสาธารณะหรือที่ว่างส่วนตัวสามารถระบุได้จากปัจจัยสี่ประการ ได้แก่ การเข้าถึง การนับรวมทุกกลุ่มคน การที่ถูกมองเห็นได้ และการใช้สอย ปัจจัยเหล่านี้ยังทำให้ค้นพบที่ว่างประเภทก้ำกึ่ง หรือที่ว่างในระหว่าง ซึ่งอาจถูกจำกัดความได้ว่า เป็นที่ว่างส่วนกลาง ที่ว่างสาธารณะที่ถูกทำให้เป็นที่ว่างส่วนตัว และที่ว่างที่ปรับเปลี่ยนได้ อีกด้วย ความเป็นสาธารณะและความเป็นส่วนตัวเกิดขึ้นในที่ว่างทุกประเภทในช่วงเวลาหนึ่งๆ และเปลี่ยนแปลงได้ตลอด ดังนั้น เราจึงไม่สามารถระบุได้อย่างเด็ดขาดว่าที่ว่างหนึ่งๆ เป็นที่ว่างสาธารณะหรือที่ว่างส่วนตัว และไม่สามารถกำหนดความสมดุลในเชิงปริมาณได้เช่นกัน สิ่งที่ควรทำคือการออกแบบที่คำนึงถึงความสมดุลเชิงคุณภาพของที่ว่าง

สาขาวิชา	การออกแบบสถาปัตยกรรม	ลายมือชื่อนิสิต
		.....
ปี	2563	ลายมือชื่อ อ.ที่ปรึกษาหลัก
การศึกษา		.....

6278003325 : MAJOR ARCHITECTURAL DESIGN

KEYWORD: public space, private space, privatized public space, adaptable space, student housing

Sajid I Awal : Public, Private & In-between Spaces in Student Housing. Advisor: Asst. Prof. CHOMCHON FUSINPAIBOON, Ph.D.

The right balance between public and private spaces is one of the most difficult issues in any housing design. Scholars argue that in student housing public and private spaces are equally important for promoting interaction as well as ensuring opportunities for self-development among the students. This research aims to establish definitions for public, private, and in-between spaces along with their relationships to achieve the right balance in the design of it which would eventually contribute not only to the students, but also the university and surrounding areas. Both qualitative and quantitative methods are used for this research and then the student housing is designed following the findings. This research reveals that public and private spaces coincide together in student housing. Whether a space is public or private can be identified based on four factors, which are accessibility, inclusiveness, visibility, and use of the space. Several in-between spaces like common, privatized public and adaptable spaces are also found following these derived factors which create the balance between publicness and privacy in space at certain periods of time. Accordingly, no such space can be termed as entirely private or public space and thus the balance cannot be determined in a quantitative way. Furthermore, the scale of the space or the way space is studied is also crucial in identifying the publicness or privacy of that space.

Field of Study: Architectural Design Student's Signature .....

Academic Year: 2020 Advisor's Signature .....

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Introduction

1.1 Research Significance

From a pilot interview, done with students of Chulalongkorn University, it is found that, living within affordable housing and proximity of the campus are the main reasons behind preferring to live in the student housing. (Zak, 2020) However, this thesis focuses on identifying the public and private spaces as wells as deriving the relationships between public and private spaces in the student housing. To do so, it will also focus on the balance between the two opposites, public and private spaces. Neufert (1980) noted that the right balance between public and private space is among the most difficult problems in any housing layout.

In the student housing, students tend to stay only for a certain period. Many scholars also agreed that students spent much of their free time of their temporal stay inside this student housing. (Hsia, 1968; Sommer and Peterson, 1966; Van der Ryn and Silverstein, 1967) During this time, as they are far away from home, interaction is a positive aspect to foster sociability and community in general. (Heilweil,1973; Kenyon, 1999; Gram-Hansen, 2012) Danisworo (1989) and Whyte (1985) argued that a successful public space is also a conducive place for social interaction. The issue of social interaction increases the demands of publicness nature of the spaces in the student housing.

On the contrary, Van der Ryn and Silverstein (1967) also argued that lack of privacy is one of the major problems when sharing room with others inside the student housing. In addition to that, it has been argued by Vale (2014) that most of the students do not claim the whole room as their own while they are sharing it with others. From the pilot interview, it is also found that the students tend to claim ownership over their bed, desk, and their locker as well as the circulation space in front of these furniture as their own, not the whole room while they are sharing it with others. (Zak, 2020) A study conducted by the author, found that, most students re-arrange their moveable lockers to create enclosure around their bed to ensure privacy. (Vale, 2014) So, for everyone living in the student housing, the need of privacy is necessary when it comes to sharing their private space. Thus, in the student housing the need of both public and private spaces is equally important to ensure a right balance between them as a means of their relationship. This balance in terms of the connection between public and private space is maintained through the presence of in-between spaces.

Besides, to find the right balance as the relationships between private and public spaces, this thesis will also deal with some adaptable spaces. Adaptability of the spaces means the single space that has the potential to have multiple uses depending on the user's need. (Gorak, 1992; Maccreanor, 1998; Schnieder, 2007) Here the term 'adaptability' is preferred over 'flexibility', as the change of the space due to the use of the space is being addressed rather than the change of the space due to the modification of the structural elements. (ibid.) Besides, inadaptability in terms of room design in student housing is argued to be one of the drawbacks. (Van der Ryn and Silverstein,1967) Unlike the hotels, where people are not willing to stay long enough to feel 'home', the options of personalization and adaptable spaces are preferred by the

students inside the dwelling units. (ibid.) Several scholars agreed that the adaptable nature in terms of the use of the spaces can provide opportunities to the sense of belongings or privacy to the individual. (Hertzberger, 1991; Scalbert, 2004; Rabeneck, 1973) One of the reasons of having adaptable spaces in terms of the use is the current global pandemic situation of COVID-19. Due to the lack of adaptable nature, many public spaces all over the world are seen to have restrictions through limiting the number of the user. On the other hand, privacy is being provided to the individuals to reduce the spread of the diseases.

Thus, in this thesis, it is necessary to have certain spaces with the potential to be modified by the user as per their need. However, along with these adaptable spaces, several in-between spaces of the public and private spaces would be studied, identified, and then considered to establish the balance between the public and private spaces of student housing.

1.2 Research Questions

- What are the relationships between public and private spaces in student housing?
- What are the characteristics of the relationships between public and private spaces in student housing?

1.3 Objectives

- To establish the definitions in terms of the relationships between public and private spaces in student housing.

- To study the designs in terms of the relationships between public and private spaces & their characteristics in the student housing.

- To design following the characteristics of the relationships between public and private spaces in student housing.

1.4 Scope of the Study

In this research the word relationship is being referred to the connection between two spaces and thus relationships between public to private space simply means the connection or relations between public and private spaces in this student housing.

Besides, among various building typologies of collective housing present in contemporary times, this thesis will focus only on the student housing. Where shared housing, apartments or flats, boarding schools or dormitories and youth hostels would not be considered as the focus of this study. Several architectural solutions addressing public and private space in student housing building typologies will only be taken under consideration in this thesis. Here, the word 'housing' is referring to the activity of enclosing something or to provide residence for the group of people. whereas 'housing' refers to the lodging in a dwelling or living quarters that is affordable to the travelers. For this thesis, the research group is focused to the student group and thus the word housing is preferred over housing.

To derive the relationships between the public and private spaces in the student housing, the final design will propose a student housing in the Block 43 development of Chulalongkorn University. The findings from the research part will be applied into the design using as the ideas for each space in the proposed student housing.

The masterplan of the Chulalongkorn University would be considered. The context including the neighborhood would also be considered. However, for the final design, various scale would be studied in the case studies and considered to derive the parameters after establishing the definitions of the relationships between public and private space. Each of these spaces inside this housing would be designed in depth as per the findings from the research part. Since, same terminologies have different meaning in the different scale, it is essential to analyze the cases as well as design the spaces following this selected scale of the study framework. Besides, in terms of designing public spaces, this thesis will focus on the spaces related to the users of Chulalongkorn University. Thus, public spaces which are for the general people living in the city would not be considered in this thesis.

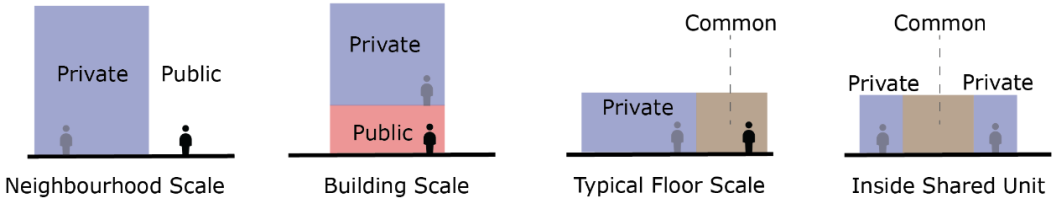


Fig 1: Several scales of studies of the design proposal

The user group is targeted to be only the students of Chulalongkorn University including both Local and international students. Since, PMCU does not have any detail idea of

having student housing in the Block 43, the proposed program is generated following the Block 33. While in Block 33, both condominium and student housing are being proposed and expected to be built soon, this thesis will only propose the student housing as the residential part of the block 43 instead of having separate building for student housing and condominium. By having the students as the user group, the complexity of mixed income group or family types in design are already eliminated.

Besides, according to Kaewklam (2020) from PMCU, construction cost for the redevelopment of block 43 which is 19, 300 sq.m. approx. is estimated to be around 2,707 million baht. The initial monthly rent derived from the feasibility study by PMCU is as 500 baht per sq.m., which is also like the one at Block 33. From this information, referring to the masterplan of Block 33, the estimated construction cost for the proposed student housing in the block 43 would be 1,014 million baht which is for the area of 6,236 sq. m. approx. (Kaewklam, 2020)

Since, it is required to provide initial planning of the whole Block 43 to get the building permission and EIA approval, the design will include initial zoning of the desired program derived from the initial feasibility studies conducted by PMCU. (Kaewklam, 2020) But the detail design will be limited to the spaces dealing with the residential part which is proposed to be student housing.

Besides, the number of units at Block 33 are generated by PMCU with laws, physical condition of land, feasibility study and market demand. (Kaewklam, 2020) This process

will also not be considered to derive the program for this thesis. Instead, the proposed program will be derived comparing the site, Block 43 with the proposed Block 33 by PMCU.

The user group is targeted to be only the students who are in the rent range of A to B in the following diagram. The diagram shows monthly rent of the available options for student housing in the Chulalongkorn University neighborhood. The complexity of mixed income group housing is already eliminated through the selection of the project.

The maximum expected rent range of the proposed student housing would be like block 33 as both the unit types and their ratio are derived from there, as the monthly rent per unit area is the same for both the block 43 and 33. The diagram also shows monthly rent of the available options for student housing in the Chulalongkorn University neighborhood.

สมมติฐานด้านการเงิน: Smart Buiding

Index number	1	2	3	4	5	6	7	8	9	10	11	12
Lot	33	34	43	46	23	24	28	29	47	48	54-55	56-57
Rent information (B/sq.m./mo)												
Retail	2,000	2,000	2,000	1,800	2,200	2,200	2,000	2,000	1,800	1,800	1,800	2,000
Residential	550	550	550	500	600	700	550	650	500	500	500	650
Office	800	800	800	700	850	850	800	800	700	700	700	800
Land information												
Lot size (sq.m.)	21,800	17,500	19,300	8,400	25,000	18,000	28,900	25,700	15,100	16,900	17,100	19,000
Land value (B/sq.wa)	180,000	180,000	180,000	120,000	240,000	220,000	200,000	200,000	120,000	120,000	160,000	160,000
Construction information												
Development begins	2562	2562	2562	2562	2567	2567	2572	2572	2572	2572	2577	2577
Development area (sq.m.)	151,400	126,320	75,450	57,350	240,560	159,380	224,400	179,900	97,060	105,080	125,570	85,400
Retail	6,400	4,100	4,832	640	8,380	3,930	14,560	6,140	6,560	2,760	2,160	2,400
Residential	43,200	32,400	28,250	18,750	72,000	90,600	40,000	48,000	30,800	50,000	76,250	47,800
Office	57,000	25,500	19,328	21,960	95,320	21,170	112,240	77,760	40,500	11,040	8,640	9,600
Construction cost (real MB)	5,769.3	3,999.6	2,707.4	1,817.7	8,695.9	9,027.4	9,354.8	7,483.3	3,763.9	3,269.4	4,086.0	3,117.7
LCCA (discounted MB)	9,491.4	6,272.2	4,991.8	2,900.6	17,337.9	14,668.0	20,528.3	16,115.2	8,123.4	6,620.5	9,608.6	8,096.7
	38,106.5	31,662.7	35,883.8	31,695.1	36,148.6	56,640.7	41,687.9	41,597.0	38,778.7	31,113.3	32,539.4	36,506.6
Lot	33	34	43	46	23	24	28	29	47	48	54-55	56-57
Payback Period (year)	13	15	16	13	12	16	13	14	14	15	15	14

Y1Occ%	Y2 Occ%	Y3+ Occ%
70%	75%	80%
60%	65%	70%
70%	75%	80%

Rates	Discount	Exit Cap	O&M
Retail	10.0%	7.0%	45%
Residential	7.0%	4.0%	28%
Office	9.0%	6.0%	32%
Weighted average	8.0%		
Rent growth	3.0%		
Inflation	1.5%		

FIRR	13.4%
Hurdle rate	8.0%
NPV	37,911.28
Total LCCA	124,754.5

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Year	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585
33	0	-2,991	-1,981	-1,981	575	636	701	763	827	852	878	904	931	959	988	1,018	1,048	1,080	1,112	1,145	1,180	1,215	1,252	1,289	26,863
34	0	-2,185	-1,373	-1,373	320	355	391	426	462	476	490	505	520	535	551	568	585	602	621	639	658	678	698	719	15,561
43	0	-1,824	-930	-930	277	307	339	368	398	409	422	434	447	461	475	489	504	519	534	550	567	584	601	619	13,397
46	0	-884	-624	-624	183	203	224	245	268	276	284	292	301	310	320	329	339	349	360	371	382	393	405	417	8,851
23						0	-5,126	-3,461	-3,461	1,161	1,285	1,416	1,543	1,676	1,727	1,779	1,832	1,887	1,943	2,002	2,062	2,124	2,187	2,253	46,946
24						0	-4,692	-3,593	-3,593	707	786	869	952	1,039	1,070	1,103	1,136	1,170	1,205	1,241	1,278	1,316	1,356	1,397	33,406
28											0	-6,044	-4,316	-4,316	1,331	1,471	1,618	1,755	1,897	1,954	2,013	2,073	2,136	2,200	42,724
29											0	-4,989	-3,453	-3,453	1,000	1,107	1,219	1,330	1,446	1,489	1,534	1,580	1,627	1,676	34,298
47											0	-2,278	-1,737	-1,737	518	573	631	684	741	763	786	809	834	859	17,571
48											0	-2,115	-1,509	-1,509	342	380	421	460	501	516	531	547	563	580	13,881
54-55																0	-3,067	-2,186	-2,186	504	561	621	681	744	18,586
56-57																0	-2,647	-1,668	-1,668	458	509	563	616	672	16,428
TOTAL	0	-7,884	-4,908	-4,908	1,356	1,502	-8,163	-5,253	-5,100	3,881	4,144	-11,00	-6,320	-6,033	8,321	8,816	3,619	5,982	6,506	11,631	12,060	12,503	12,956	13,425	288,51

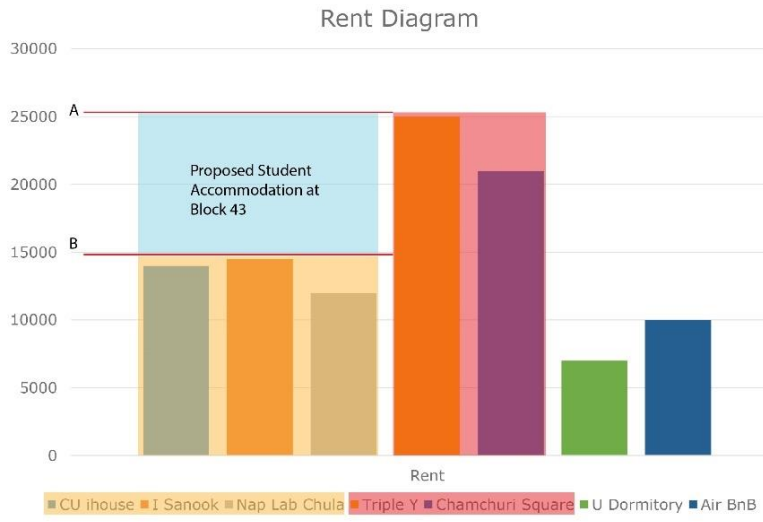


Fig 2: [Top- initial feasibility study of Chula re-development master plan (source: PMCU)]

& [Bottom- estimated rent range of proposed student housing]

1.5 Benefits of the Study

The primary group that will be benefited from this study are the users, who are the students of Chulalongkorn University. By providing a balanced relationship of public and private spaces, the comfort of the users would be improved during their temporary stay in this building.

The secondary group would be considered the people living near the Block 43, the site of proposed student housing. Through providing good public spaces, the neighborhood would also be benefited from this project. Since Chulalongkorn University is a Public University, it is important to provide some spaces for the betterment of general people. Besides, good retail spaces in this public space would also be economically beneficial for the PMCU, the project owner.

Besides, the project is under the 'Chula Smart City' masterplan of Chulalongkorn University. Hence, this research would contribute to the four goals of the masterplan namely mobility, energy, environment and living. Again, this research would be focused on defining the contemporary meanings of public and private space in terms of student housing. Hence, it will also be helpful for the architects, real estate developers or even potential client group who are interested in designing similar projects in mega cities like Bangkok. However, as the project will be aimed to be designed in the future, the long-lasting question of balancing private and public space in residential architecture could also have a potential milestone which can be followed to question and develop further to come into a better conclusion.

1.6 Research Methodology

To find the relationships between public and private spaces in the student housing and to find the characteristics of them, this thesis will be conducted based on both qualitative and quantitative methodologies. The qualitative method will include literature review of various sets, while the quantitative method will be focus on the analysis of the case studies using space syntax methods.

First set of the literature review will include the socio-cultural aspect of the privacy and publicness in domestic spaces along with the issues related to the origin of it. To do so, the works of Robin Evans and the British architecture firm Dogma would be followed. Despite having different methodologies, several architectural issues acting behind the creation of 'privacy' and the architectural elements to solve them are found to be common in both literatures. The next set of literature would be on the study of public and private space in the urban scale with a gradual focus on the student housing. Scholars like Mehta, Madanipour, Carmona among the other urbanists would be followed by this study. The final set of literature would focus on the general issues related to student housing. However, from the first two sets of literature reviews, a general definition would be derived with some factors that could be used to identify public and private spaces and their characteristics as well.

Since, the set of literatures are from urban context and domestic space and not directly related to the student housing. Thus, to make the definitions clear and involve directly to the student housing, both local and international cases would be analyzed based on the factors derived as the definition from the literature review. Besides, the findings from the

social issues related to the student housing from the last part of literature review would also be used to analyze the cases.

However, due to the limitations of these qualitative analysis, the findings can only provide information depending on the functions present in any space in the project. To understand their relationships as well as their in-between connection, the analysis would further be compared along with the analysis found from the space syntax. Where the space syntax would be used only to identify public and private spaces separately as per one of the derived factors in the derived definition.

Due to the versatile nature of the topic, it is necessary to use both space syntax and qualitative analysis, to provide evidence on the derived definition both in terms of qualitative and quantitative methodologies. These findings from the case analysis would be the spaces that will show the relationships between public and private spaces in terms of zoning and their characteristics. The general ratio of the areas of each space would also be analyzed from the selected local case following the qualitative zoning analysis.

However, to design the proposed student housing, each of these spaces would also be analyzed in terms of images and three-dimensional views to conclude with the characteristics of these spaces. Finally, a conclusion of the relationships between public and private spaces in the student housing would be derived, which will be used as the ideas for the design and justified accordingly.

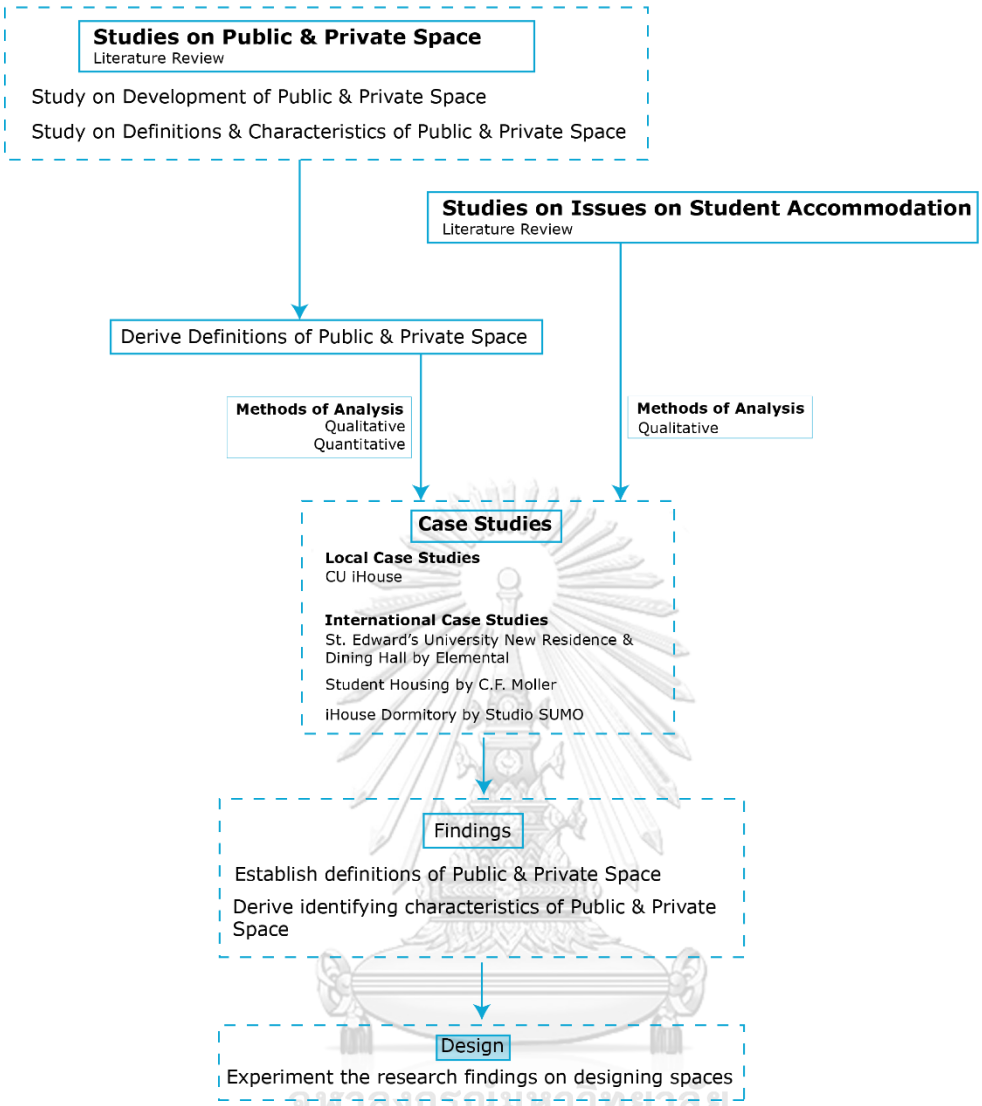


Fig 3: Methodology of the research

1.7.1. Plans & Photographs or Perspectives in Qualitative analysis of Case Studies as Qualitative Method

In terms of qualitative methodologies, the qualitative analysis of the case studies would be done following the derived definitions on public and private spaces. The cases would be analyzed from the plans to understand the functional relationships of private and public spaces. While the perspectives would be used to identify the characteristics of

public and private spaces in terms of their relationship in student housing. The methodologies used by Pier Vittorio Aureli along with DOGMA in the book titled as *The Room of One's Own* would be taken under consideration. The content of the book is based on the private space or one's room and its origin to transformation from the Epipaleolithic period to the present. (Aureli, 2017)

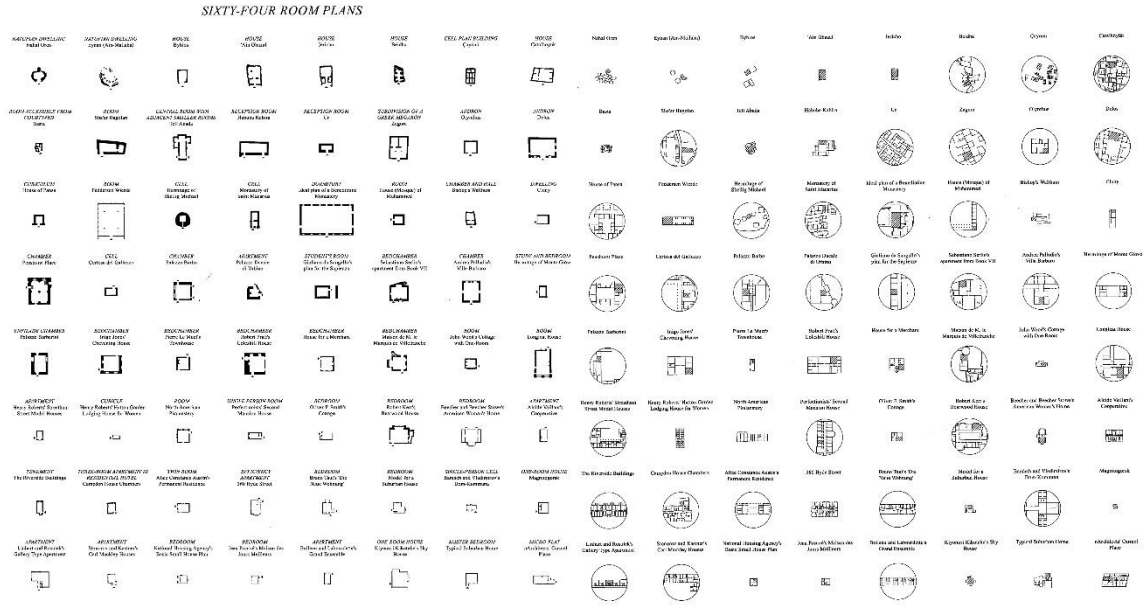


Fig 4: Taxonomy of 64 floor plans in chronological order (Aureli, 2017)

In terms of analysis, Aureli (2017) used the famous 'Ligne Claire' (clear line) drawing technique after French architect Paul Letarouilly and architect Leon Krier. (Korody, 2016) The style includes single information with clarity for the viewer. Often cast shadows are avoided or illuminated. The main feature of this style includes single line drawing with often no hatching or some texture to provide information of the materials. Here contrast is less important comparing to the subject. This style was popularized in the pop culture by Herge, the creator of comic book character Tintin, where the creator often added cartoonish character against a realistic background. (Pleban, 2006)

The main reason behind preferring this style is to analyze this topic to provide information about the space and the individual dwelling inside the house. As plans are the basic tool to understand the spatial organization of any space, plan was drawn with clarity to provide information of each room. On the other hand, use of one-point perspective can be referred to the example provided by Aureli (2017) in the book, as found inside a room of a house in room, a false perspective of Rome whose vanishing point lies at the one standing at the side of the entry than the one inside the room. The importance was given to the stranger coming from outside than being inside. (Aureli, 2017) Mainly, the perspective helps to provide information about the continuity of the space along with the information on adjacent spaces.

However, for the built projects, it is often difficult to get the one-point perspectives with details. For those cases, existing photographs, axonometric and isometric views could become a useful alternative, which to be used to analyze those spaces. As it will eventually serve the purpose of the information on continuity and adjacent spaces.

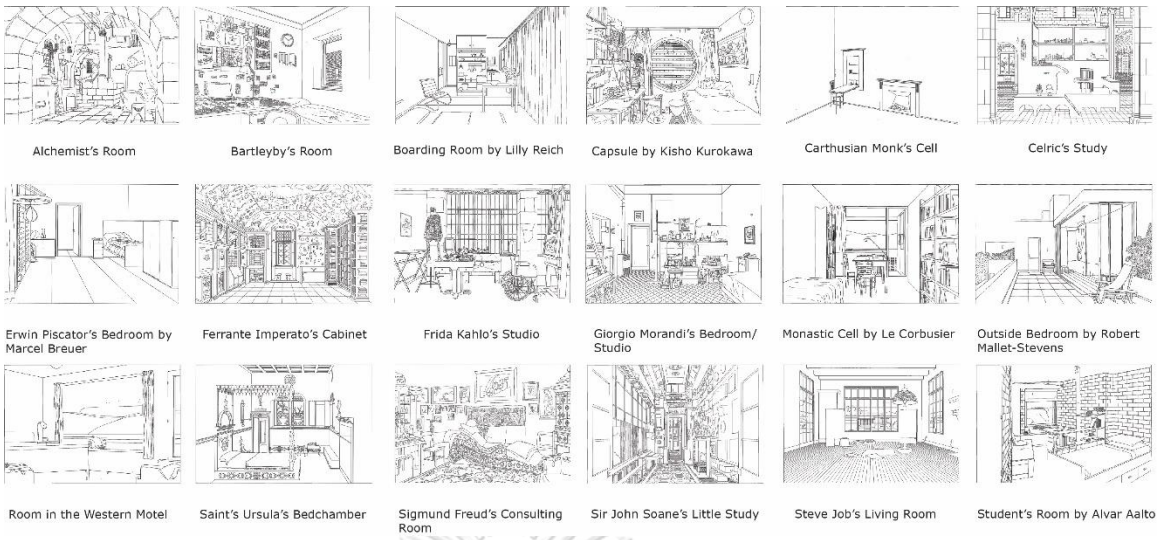


Fig 5: A collection of perspective drawings of private space (Aureli, 2017)

1.7.2. Space Syntax in Analyzing Case Studies as Quantitative Method

Though from the qualitative analysis, the spaces could be identified in terms of publicness and privacy, the use of depthmapX in space syntax analysis will enrich the findings in terms of details, especially when both the analysis would be compared with each other. Besides, to establish evidence on the characteristics of the relationships between public and private spaces, several local and international cases would be analyzed. The prime aspect of the analysis will deal with the levels of accessibility and inclusiveness of the spaces in these case studies. As this thesis is mainly concerned with the spatial quality of the spaces, the plan, the horizontal section of the spaces would be analyzed to find the private and public spaces. The initial goal is to identify the public, privatized public, and private spaces in the selected floor plans of the case studies. In terms of establishing the relationships between the identification of privacy and space syntax, Zadeh (2008) argued that the interior space of any house must be invisible to the strangers. As in fact, it is undeniable that in architectural space

arrangement, the weaker the connection of a space to other spaces, greater the depth of that space compared to other spaces. (Alitajer, 2016) This theory supports that, the more difficult access to any space indicates higher intimacy of that space or makes that space private comparing to the other spaces. (ibid.) Besides, Wiem (2020) using depthmapX in studying mass housing proved that the least accessible spaces or connected spaces are the spaces used for social interaction among the users.

Space syntax is one of the most prominent theories since the second half of 20th century in the formal architectural analysis in terms of quantitative methodologies. (Ruivo, 2014) It is based on graph theory and is mainly used to analyze the spatial configuration. (Jeong, 2014) It was developed by the team The Social Forms of Architecture London (UCL), led by Bill Hillier, and is widely used in the understanding of social contexts of housing and interaction patterns in the building. (Ruivo, 2014) The author studied 13 collective housing through space syntax and concluded that the issue of privacy and segregation can be analyzed among other various forms of social relationships. (ibid.)

In the past, depthmapX is also used by Alitajer (2016) in analyzing privacy in the residential house. The author compared the traditional and modern dwelling units using depthmapX. The conclusion includes the entry of traditional to modern houses in Iran play a crucial role in terms of privacy, as the contemporary houses tend to have less depth where the traditional houses had many levels of foyers before getting into the bedroom. Thus, both visual and physical access is much less in these contemporary houses giving less privacy comparing to the traditional houses. Besides, it was also

found that, only the doors are the media that keeps the privacy in contemporary houses as they are located opposite to each other. So, when the door is open, there are not any privacy. (Alitajer, 2016)

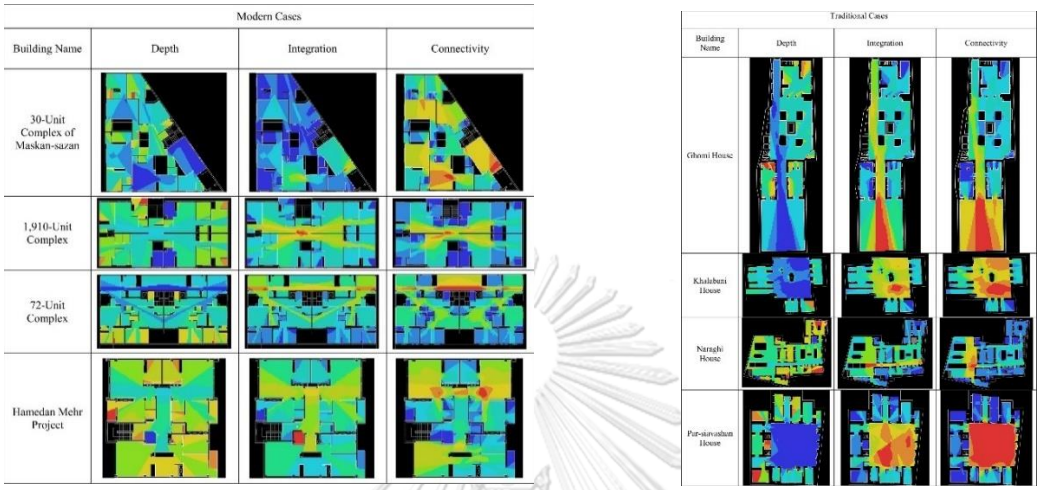


Fig 6: Showing the analysis of privacy in comparison to traditional to modern residential building typologies in Iran using DepthmapX (Alitajer, 2016)

Turner (2001) also suggested that, as visibility should be considered from the viewer's height, ignoring that height can be essential to analyze accessibility in that space. As for floor plans, they are the horizontal section of the building, considering the section line of the plan is essential to distinguish the analysis of visibility and accessibility. If the section line is lower than the typical human eye level, then that plan is useful to analyze the accessibility as the obstacles on the ground would also be calculated as the obstacles in the isovist diagrams.

Fig 7: Diagram showing visibility in human eye level, if the plan is cut above that eye level it would overlook the obstacle and generate visibility analysis (Left); And, (Right) diagram showing accessibility, if the plan is cut below the human eye level, it would not overlook the obstacle and generate accessibility analysis.

To analyze the cases, the space syntax software 'depthmapX' would be used. The grid for the analysis used would be followed by the default generated grid suggested by the software depending on the scale of the respective cases. Besides, only the connectivity and isovist analysis would be done using 'depthmapX' to find the levels of publicness. In terms of connectivity analysis, the most connected space has the most public nature. This theory is also followed by Wiboonpote (2017), where the author used the 'depthmapX' to conduct research on the circulation of people in the community malls. Besides, Alitajer (2016) used the 'depthmapX' to conduct comparative study of privacy in traditional and modern residential architecture. In the 'depthmapX', the generated analysis is represented by gradation of color from bright red to dark blue. Here, the dark red represents more connected or more accessible space and thus more public than the private or least accessible or connected spaces, which are represented by dark blue.

Chapter 2

Literature Review

To understand the development of the notion of publicness and privacy, three sets of literature review are taken under consideration. At first, the book by Robin Evans, *Figures, Doors and Passages* and the research *The Room of One's Own* by Pier Vittorio Aureli are studied to begin the research in the domestic scale from socio-cultural perspective. Several characteristics of the private spaces are found along with the evidence on how privacy is created in terms of designing domestic space. But the definition of public and private space was yet to be cleared in this set of literature.

Followed by this first set of literature on domestic scale, several theories from the urbanists like Vikas Mehta, Ali Madanipour and others are considered from the urban perspective. Since, the word 'Public' is more relevant to the urban scale. Urbanists provided several factors in terms of the definitions of public and private space. In this research, some of the factors stated by the urban scholars are combined to derive the initial definition of public, private, and in-between spaces, which is used to analyze the cases.

The final set of literature review includes the issue related to student housing. Since, this thesis is focused on the student housing and no other literature in the first two sets consider the student housing directly, this set is crucial to justify the initial derived definition to analyze the cases.

2.1 Development of the idea of Public and Private Space

The first set of literature explores the notion of the public and private space from the prehistoric period till the modern times. The evidence provided by the authors Aureli (2017) and Evans (2003) are taken under consideration for this section. Here it is found that the idea of privacy evolved through the change of time, as at times it was seen that less privacy was needed in the domestic spaces due to the influence of the cultural norm of that time. These are evident form the paintings as well as architecture that represents the dwelling spaces of those time. However, with the evolution of society the need of privacy has also changed and at contemporary times more dwelling elements like furniture are used to ensure privacy. Although the need of buffer as a characteristic to ensure privacy is still prevalent in today's time as it was before. These ideas are divided into several consecutive parts which are elaborated below-

2.1.1 Privacy in Epipaleolithic Period

Privacy was originated when rooms began to separate from each other with specific purpose. In Renaissance period, the connected rooms were applicable to the society that was sociable in terms of daily habitat. As this type of lifestyle were also evident from the Raphael's painting and architecture. Though, this theory was popular in Europe during the 17th century, in the 19th century it was taken over by the corridor plans which were found to be more appropriate for the then society as the need of privacy was given more priority. (Evans, 2003)

However, the origin of today's private room or personal space has been popularized in the 19th and 20th century in the industrial metropolis by the modern industrial workers. These spaces can also be compared with the monk's cell in the monastery and the 'cubicula' in the early Christianity when the practicing Christianity was not possible openly or in public spaces. (Aureli, 2017)

It has also been argued by Aureli (2017) that the private space today is the product of society formation and thus individuation. The origin of private space or the room can be traced back to the 23,000 BCE, in the Epipaleolithic period, when people preferred to live collectively and hunt for the survivals and gradually started to store their foods. Since the fundamental notion of a room is enclosure the basic shape that was used first to define the room was circular. Then these circular shapes of their dwelling hut turned into taking a more rectangular forms as it was not possible to add more circular shapes as an addition for their extra storage of foods. So, basically the development of a room cannot be considered as a linear process, as this development started with nuclear family then transformed into community to clan and then back to the nuclear family with individual subject. (ibid.)

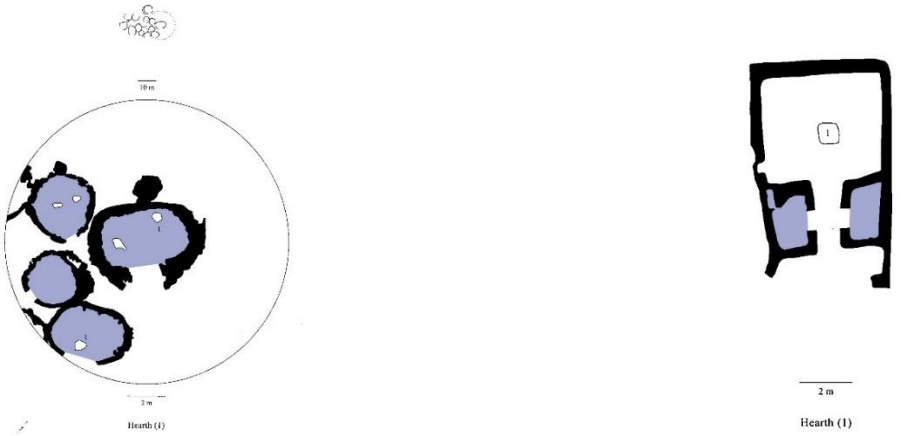


Fig 8: Natufian dwelling (Left) & rectangular dwelling (Right) (Aureli, 2017)

2.1.2 Division of Class in the Society in creating Segregation as Privacy.

In the pre-modern era, the public and private space were intermingled with the rise of state rule and were often abstracted as two different realms. Then the 'public' was considered to express sovereignty of state and law-making power, while the 'private' was to express individual as owner or the agent motivated by economy and in competition with other individuals of the society. In the domestic space, the one having access to the study room, the most private room would have more power and dominate the one having access to only the hall. Even in the Victorian England, the 'privacy' was created with separating rooms with one entry, which is accessed by the corridors acting as the buffer. Like the courtyard, the hall acted as the agent of movement, from where access to every room was possible through grand open stairs, passages, and back stairs. These spaces were mostly used by the servants distinguishing the upper and lower ranks of the society. (Aureli, 2017)

Besides, in classical time, the servant and lord had separate circulation or access which were also clearly defined. Besides, the rooms or private spaces were inaccessible by

the servants due to presence of a single door and the transition spaces usually present in the circulation. Thus, the one who was authorized to use the rooms had dominance over the one who had access to only the common spaces of the house. But this situation was not the same in the 16th century Italian Renaissance. As Raphael and Palladio designed interconnecting rooms with multiple doors that would allow the universal accessibility making the rooms more public than private. At that time, the issue of inclusiveness was made universal, and everyone could access most of the spaces, which ultimately lead to the lack of privacy in each room.

2.1.3 Interconnected rooms creating the Publicness of Space.

During the time of High Italian Renaissance, the interplay of figures in space dominated the paintings. For example, in the Raphael's 'Madonna', figures are not so much composed in the space as they are joined together. With the gesture of touching each other, the figures in the 'Madonna' are more connected than by their mere eye sights. In details, it is also evident that, these figures occupy the room. But, apart from the recessed window at the right-hand edge, no other indication is present about what the room is like. Evans (2003) argued that the figures in the 'Madonna' are more than the subject of the painting, as they fill the painting and therefore, they are the painting.

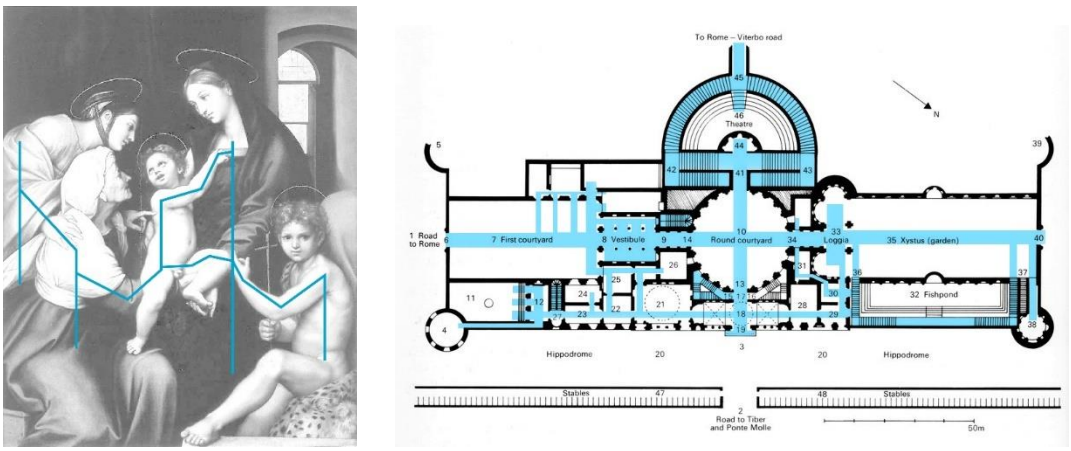


Fig 9: Madonna dell'Impannata by Raphael, 1514 (Left) & Villa Madama by Raphael & Antonio da Sangallo (Right) (Source: Google)

Likewise in Raphael's Villa Madama, the spaces are also connected just like the connected figures in the painting of 'Madonna'. The fondness for company, proximity and incident in the 16th century Italy corresponded nicely enough with the format of architectural plans of that time. Little arrangement was done in distinguishing 'served' and 'service' spaces. The connectivity in Villa Madama was same throughout, as it was the then principle, which was never questioned. (Evans, 2003) Similarly, it is seen in the Sir John's little study room, the private space or the table and the chair for studying was placed alongside the passage which connected the colonnade and the dining space of the house. (Aureli, 2017) Although considering the shared unit scale, the private study space can possible be ensured following the example of Sir John's Little study room, from the typical floor scale, the more connected spaces might not be as effective as seen in the works of Raphael. As it was the social norm of that time, which has evolved along with the perception of privacy with the course of time.

Fig 10: Sir John Soane's little study (Aureli, 2017)

2.1.4 Use of Multi-Door in creating Publicness of Space.

Besides, in this building of Raphael, the rooms are also seen with multiple doors. This was the principle of 16th century Italian architecture. It was found at first in the public buildings and then eventually to the domestic arrangements. Following these ancient precedents, the Italian theorists argues that more doors were preferable than few. It was also convenient to place doors in such a way so that it connects maximum parts of the building. (Alberti, 1955) There were doors whenever there were adjoining rooms, therefore making the house interconnected. Villa Madama was an open plan that was relatively permeable to numerous household members. As everyone was able to pass through the matrix of these connected rooms, their paths would intersect unless definite measures were taken. This phenomenon gave the building a more public nature lacking the presence of privacy among the households. Most of the Italian palaces, villas, farms were based on this principle of connected rooms with multiple doors, ultimately leading to lack of privacy at that time. (Evans, 2003)

Again, in the Amesbury House designed by John Webb, a more balanced circulation is seen as the central passage served the whole house while maintaining the interconnection of the rooms, at least in the main floor. In the plan, the central circular staircase in between the grand staircase was meant to be used by the servant. The introduction of this passage into domestic architecture first provided a deeper division of class between the upper and lower ranks of society by creating a more privileged access to the household members, while at the same time restricted the access and territory of the servants. (Evans, 2003)

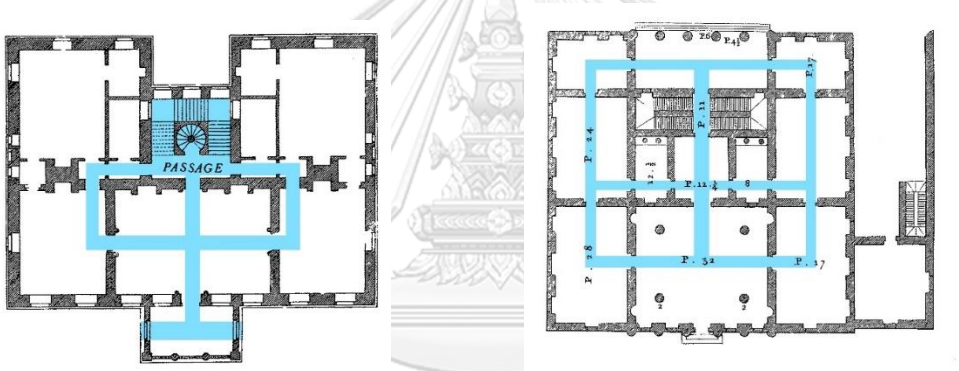


Fig 11: Amesbury House by John Webb, 1661 (Left) & Palazzo Antonini by Andrea Palladio, 1556 (Right) (after Evans, 2003; Pg. 73, 62)

Comparing Raphael's work with the house at Coleshill, Evans (2003) found that the work of Raphael provided the spaces or rooms to be in general accord with each other or interconnected. While at Coleshill, the innovation of independent access promoted the matter of emphasis while connecting the spaces. The rooms turned into a closet while gaining more privacy. (ibid.)

2.1.5 Sub-division of Rooms in enhancing Privacy.

To ensure privacy both the need of one-door room and the universal accessibility was found to be equally necessary. Because a compartmentalized building must be organized through circulation to unify the spaces. But, in the connected rooms, the circulation was made by filtration rather than canalization. In the connected building, the spaces were defined and joined like weaving, while in the compartmentalized plans, the connections would be laid down as the basic structure where spaces were attached like the spines or vertebrae of human body. The later was found in the 19th century as the corridors in the plans acted as a separate distributor. (Kerr, 1864) This nature also made it possible to overcome the restrictions of passing through all the rooms to reach the furthest room. Because one could easily get out of the door of the room to enter a network of routes from where all the rooms were almost equally accessible. (Evans, 2003)

Fig 12: La Belle Iseut, 1858 by William Morris (Left) & The Red House by,1859 by Philip Webb & William Morris (Right) (Source: Google)

In the red house designed by Philip Webb and William Morris and the painting 'La Belle Iseut' by Morris, the main character was Morris's wife Jane. The focus of the painting was Jane, while the project was meant to be her setting. Though the principles in the red house followed the ideologies of Kerr, it was further improved with never interconnecting rooms, not having more than one door to each room, and unified as well as distinct circulation space. Unlike the Raphael's 'Madonna', the 'La Belle Iseut' was more of a still-life painting rather than illustration of an event. Here, the furniture, fittings, drapes, ornaments, and other objects do not stand in the way of the figures by symbolizes a life. They do not engage or interfere the figures in any other way. The figure at the back is also present in the picture but not at all prominent which can also be relatable to the servant using the red house. (Evans, 2003; Morris, 1895)

2.1.6 Use of Buffer Space in creating Privacy of Space.

Similarly, another important aspect that played a crucial role in the formation of today's personal room which was introduced later in time is the sub-division room, which is not entirely functional, but also depends on the hierarchy of various social aspects. For example, in terms of gender, the female space was considered as the space for food processing, weaving and nurturing infants while the male spaces were more influenced by storing goods and administrating the whole house. It was then the traditional courtyard space was introduced which allowed the extended families to share domestic space. Though the role of these courtyard extended beyond the shared spaces to guarding the access to clearly differentiated rooms. (Aureli, 2017)

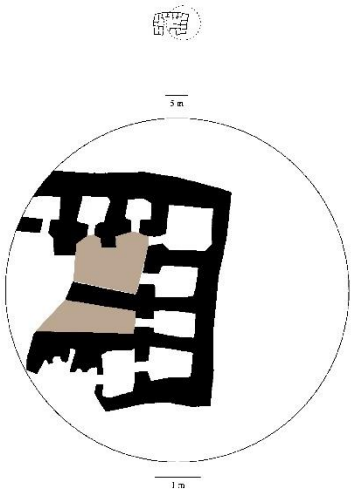


Fig 13: Buffer space in-between private space and the courtyard to enhance privacy.

On the contrary, the introduction of corridor or passage brought change in the idea of this interconnected rooms. For more convenience, separation of rooms was seen to integrate the household into concentrated rooms for the sake of visual aesthetics and privacy. As found by Evans (2003), the first use of corridor was recorded in England at Beaufort House, Chelsea, designed by John Thorpe in 1597. (Summerson, 1966) Though the Italian principle was beginning to be established in England, the plan of the project was described as 'a long entry through all'. Because the central corridor along with the staircases began to be attached to the corridors and no longer terminated in the rooms. After 1630, these changes of internal arrangements became very evident in the houses built for the rich. The main entry hall, grand open stair, passages, and back stairs created a penetrating network of circulation that touched every major room in the house. (Evans, 2003)

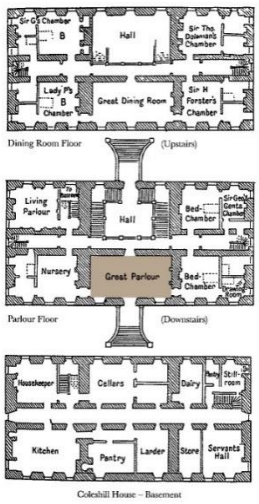


Fig 14: Coleshill by Sir Roger Pratt,1650-67 (Left, Source: Evans, 2003; Pg-72) & The Great Parlour at Coleshill (Right, Source: Google)

For example, in the house at Coleshill designed by Sir Roger Pratt, it was seen that the passages tunneled through the entire length of the building at every floor, terminating at back stairs with grand staircase at the center. The double-story entry hall at the center with the grand staircase was used only as a vestibule as the inhabitants dwelled on the other side of its walls. (Evans, 2003) The main purpose of the central passage covering the whole length of the building was to prevent one from using the utility rooms. (Gunther, 1928) Pratt argued that the passage used by the servants would not come across the other household members. (ibid.) So, the corridor was not only used as an exclusive means of access at that time, but also installed in parallel with the interconnected rooms. (Evans, 2003)

However, the definition of privacy took more refined shape when the house was divided into two domains with sometimes disconnected rooms and unoccupied circulation

space acting as the buffer. This phenomenon brought the difficulties to access specific rooms by one who had no specific business to that room. (Evans, 2003)

Besides, to buffer the private and public space inside a private house, the corridor was often used. In the UK, it was seen that the corridors were mostly used in two ways – firstly, corridor acted as a large gallery when connecting the two wings of the house and secondly, the corridor acted as the small passage that connects the gallery with the rooms. However, the main goal of the corridor was to connect different parts of the room while maintaining seclusion of rooms at the same time giving privacy from the servants. This nature was the result of class segregation in the society. Hence, corridor was used as the means of distribution and at the same time separation.

Besides, the access to the rooms from these corridors was also restricted to the inhabitants only. As this nature is argued by the author to be origin of the nature of present-day bedroom. Though in later years, the corridor space was reduced to minimized space.

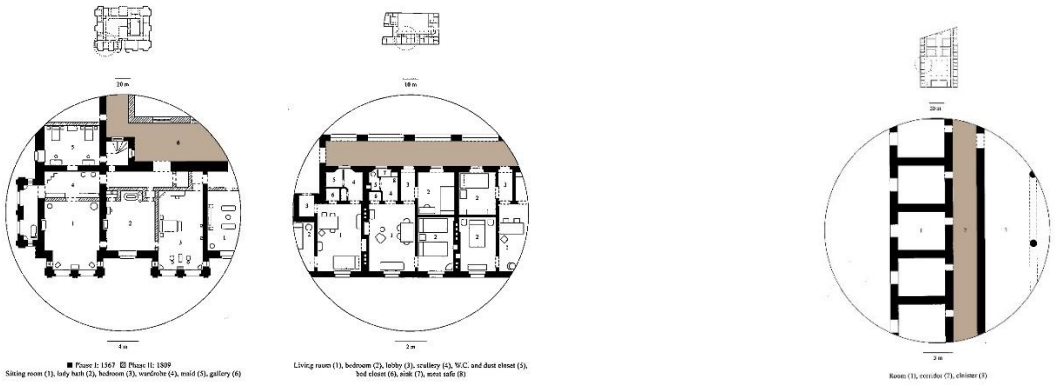


Fig 15: Corridor as connecting rooms (Left & Middle) & corridor as separation in student's room (Right) (Aureli, 2017)

Therefore, apart from the use of corridor, courtyard and single room without any specific purposes placed in-between the private spaces are the buffer used to enhance privacy. Besides, inside the dwelling units as found by Aureli (2017), change of levels can create privacy with having the space buffered from the room. Usually, study spaces inside the dwelling units are often found to be elevated to enhance privacy. As the study space are the most private space. (ibid.)

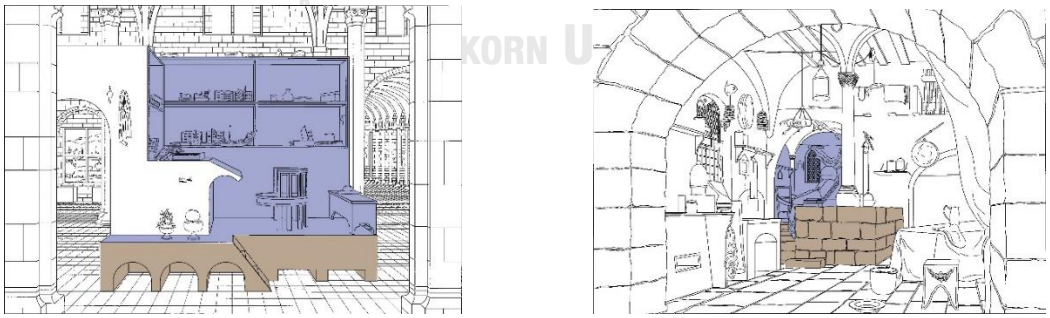


Fig 16: Change of levels in enhancing privacy (Aureli, 2017)

2.1.7 Use of Furniture in Defining Space

In domestic spaces, furniture is used often to define the publicness or privacy character of the spaces. However, in recent times the foldable use of furniture is also seen in the micro apartments or flats of large cities where the space is limited and expensive and thus living room can also act as the bedroom with the use of multipurpose furniture.

Fig 17: Micro-Flat in New York (Left) & Boarding Room by Lilly Reich (Right) (Aureli, 2017)

On the contrary, by having fixed furniture, the space is also defined as found in the French designing to promote the concept of comfort. In those bedchambers, the wardrobe was considered as the most private space inside the house after having a gradation of privacy inside a private space or house. Studiolo was also considered to be the most private space. Since, typically Studiolo has only one door acting as both point of access and departure to enhance privacy.

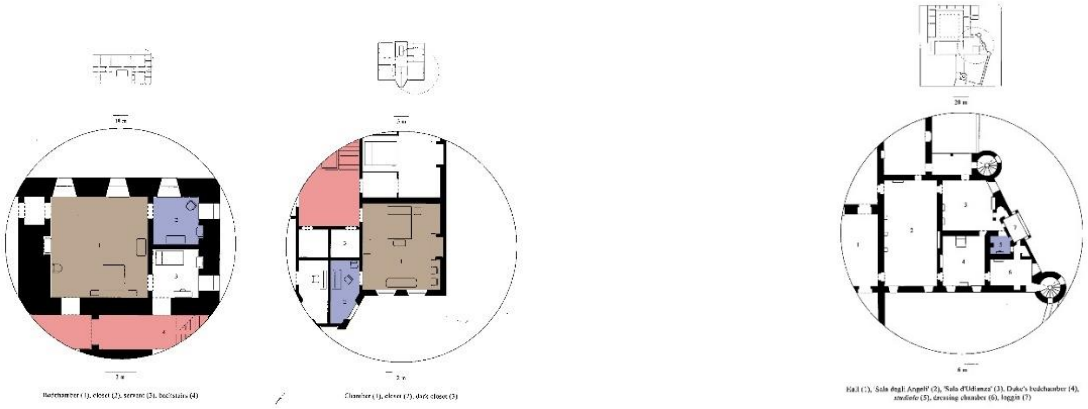


Fig 18: Closets as the most private space (Left), studiolo as the most private space (Right) (Aureli, 2017)

In terms of student housing, a study conducted by Vale (2014) in Iran, it is found that the students tend to re-arrange their lockers to create a sense of enclosure while sharing the room with the others. This re-arrangement creates a sense of privacy to the students.

Fig 19: Use of furniture in personalizing territory inside student accommodation in Iran (Vale, 2014)

2.2 Definition of Public & Private Space

After reviewing the privacy and publicness of the spaces in the domestic scale from the socio-cultural perspective, it is important to explore another dimension of the concept which is from the urban scale. Since, the term 'public' is widely familiar with the urbanists, most of the factors influencing the privacy or publicness of the spaces are established from the urban perspective. Following set of literature explores these factors which will eventually be used to derive the definition of public, private and in-between spaces, after relating with the previous set of literature from the domestic scale.

2.2.1 Public and Private Space in Various Scale from Urban Perspective

The debatable definitions of public and private space have been a challenge for the scholars from several field of expertise since the pasts. One of the reasons acting behind this contradiction is that public space is perceived at various scale and levels of understanding. (Low, 2006; Ercan, 2010) Since, the history of human civilizations public space has been the center of shared activities of the city dwellers. Agora in Greek cities, the forum in Roman cities and the market squares in the medieval cities are the evidence of those public spaces. (Madanipour, 1996) However, the term 'Public' has origin from the Latin and refers to the people, indicating a relationship to both society and the state. (Madanipour, 2010) Gove (1976) and Makins (1998) argued that 'Public' as an adjective, refers to 'open to all', 'accessible to or shared' by all members of the community'. Here, accessibility and ownership are prominent features of being a public space.

However, as a noun, it refers to 'people in general', derived from Latin (ibid.) Hence, 'public space' can be described as a space concerning people, open to all, accessible

to or shared by all members of the community, provided by the public authorities for the use of people in general. (Ercan, 2010)

In contrast to Public, Silver (1997) argued that public has been seen as the opposite of the personal, hence equated with impersonal. Madanipour (2010) also agreed that public is defined as the opposite of private, dealing with the realms of individuals. Hence, houses are the private places, sanctuaries for the basic societal unit which is family. (Birch, 2010) However, in the urban scale, various space types are found in relation to public and private space. Carmona (2010) concluded with identifying the names, definitions and examples of these urban space types which are listed below -

Space Type	Identifying Characteristics	Examples
Civic Space	The traditional forms of urban space, open and available to all and catering for a wide variety of functions	Streets, Squares, Promenades
Public Open Space	Managed open space, typically green and available and open to all, even if temporally controlled	Parks, Gardens, Commons, Urban Forests, Cemeteries
Movement Space	Space dominated by movement needs, largely for motorized transportation	Main roads, Motorways, Railways, Underpasses

Service Space	Space dominated by modern servicing requirements needs	Car Parks, Service Yards
Left Over Space	Space left over after development, often designed without function	'SLOAP' (Space left over after planning), Modernist open space
Undefined Space	Undeveloped space, either abandoned or awaiting redevelopment	Redevelopment space, abandoned space, transient space
Public 'Private' Space	Seemingly public external space, in fact privately owned and to greater or lesser degree controlled	Privately owned 'civic' space, business parks, church grounds
Conspicuous Spaces	Public spaces designed to make strangers feel conspicuous and, potentially unwelcome	Cul-de-saces, dummy gated enclaves
Internalized 'Public' Space	Formally public and external uses, internalized and, often, privatized	Shopping/leisure malls, introspective mega-structures
Retail Space	Privately owned but publicly accessible exchange spaces	Shops, covered markets, petrol stations
Third place	Semi-public meeting and social	Cafes, restaurants, libraries, town

spaces	places, public and private	halls, religious buildings
Private 'Public' Space	Publicly owned, but functionally and user determined spaces	Institutional grounds, housing estates, university campuses
Visible Private Space	Physically private, but visually public space	Front gardens, allotments, gated squares
Space Type	Identifying Characteristics	Examples
Visible Private Space	Physically private, but visually public space	Front gardens, allotments, gated squares
Interface Spaces	Physically demarked but publicly accessible interfaces between public and private space	Street cafes, private pavement space
Private Open Space	Physically private open spaces	Urban agricultural remnants, private woodlands
External Private Space	Physically private spaces, grounds, and gardens	Gated streets/enclaves, private gardens, private sports clubs, parking courts
Internal Private	Private or business space	Offices, Houses, etc.

Space		

Table 1: Urban space types (Carmona, 2010)

2.2.2 Accessibility & Inclusiveness

Accessibility and ownership or inclusiveness of any space would be used as the main feature of defining and designing the public and private spaces in this thesis. The public space would be the space that is visible and accessible to everyone. On the other hand, the private spaces would have restricted visibility and accessibility. The spaces which would be visible but not accessible would be considered as the privatized public space.

While defining Public Space, Madanipour (2010) argued that the level of publicness of a place depends on the types of activities taking place, which creates a symbolic boundary between public and private space. But this boundary between public and private is blurred because of the overlapping, interconnected, and interrelated co-existence of public and private spaces. However, the level of publicness can be understood by understanding the level of accessibility of any place. Scholars argued that, to become a 'public space', the space must be accessible. (Jackson, 1974; Birch, 2010; Francis, 1989; Karacor, 2016; Carr, 1992; Madden, 2010; Madanipour, 2010; Mehta, 2014) This access is concerned with two aspects- the ability to reach the space and being able to enter and use it. (Mehta, 2014) On the contrary, the private spaces are the spaces which has restricted and limited user access. Along with the accessibility, the inclusiveness of the space can also be added in the parameter of understanding the level of publicness.

Ownership of any space determines the inclusiveness of that space. Since, usually the elites oversee designing, managing, and re-developing the public space. (Madanipour, 2010) It often lacks the total inclusiveness of the city that is to include every citizen, unless it is civic space or natural urban spaces like rivers, sea fronts. (Carmona, 2010). Hence, who will be authorized to take part in the possibilities of the activities taking part in the public spaces will be determined how inclusive that space is.

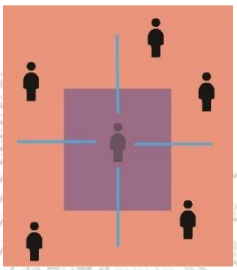


Fig 20: Accessibility in public and private spaces

Another important space in terms of student housing is the 'common' space. This is the space that is identified by the inclusiveness and accessibility of the space. The space that is mutually accessible by the inhabitants of the student housing with shared activities are termed as 'common'. According to Aravena (2009) and Møller (2016), common spaces in the student housing are the spaces for interaction among the neighbor inside the building or even that typical floor. Besides, Wenyuan (2020) argued that common areas connect public and private space and play a transitional role.

Referring to previous set of literature review, it is evident that, one of the aspects acting behind the origin of privacy was the division of class inside the society. In terms of dwelling house, the accessibility to spaces was used as the means to separate the users of the spaces. The owner of the dwellings had more access to every space of the house including the private spaces like study rooms and thus the privacy was enhanced with inclusiveness of those private spaces. Again, the corridor inside a dwelling house

can be termed as the ‘common’ space, in terms of its use. Since the corridor is being used by the inhabitants dwelling inside the spaces which are connected as well as separated by this ‘common’ space. To ensure more privacy, this type of transitional spaces is used to buffer the public to private spaces.

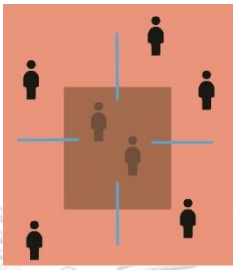


Fig 21: Common space in public spaces

However, to determine the extent to which a place or activity is public or private, Benn and Gaus (1983) argued that access, interest, and agency can be used as the framework to justify the level of publicness of a space. Ercan (2010) also provided definitions of these various type of accesses in terms of public spaces, which are as follows-

Physical Access	A space that is physically accessible to all
Social Access	A space that is socially accessible to all

Table 2: Two types of access in public spaces (Ercan,2010)

However, one of the issues of argument of being ‘publicness’ of any access is exclusion. As Madden (2010) argued that being ‘visible and accessible’ is the core of publicness. So, another form of accessibility is considered as the visual access. For Brighenti

(2010), public also means that open and visible to everyone, on that contrary, the private is restricted and protected.

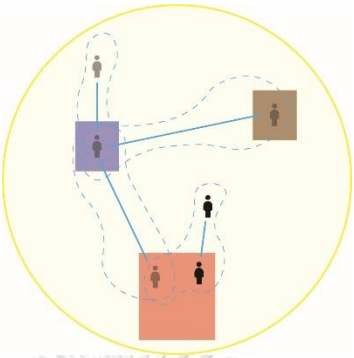


Fig 22: Diagram on defining public and private space in terms of accessibility and inclusiveness.

2.2.3. Privatized Public Space

The ownership factor has brought the aspect of another intermediate realm between public and private space, that is known as 'privatized public space'. However, often the ownership factor defines these terminologies like public, private or even privatized public from socio-economical perspective in the urban context. There 'public or private sector' are used to denote the authority who oversees that context. (Bilbao, 2018)

In terms of the use of spaces, Zahrah (2011) argued that people keep doing their social activities both in public and privatized public spaces with physical segregation. These privatized public spaces have both positive and negative impact. The positive impact includes increasing of quality and management of the space (Melik, 2009), ultimately increases the quality of life (Beck, 2009). The negative impact is argued as the limitation

in terms of access and social interaction in general. (Kruppa, 1993; Kressel, 1998; Kohn, 2004)

However, out of two primary types of privatized public space, one is defined as the public space inside the gated communities, owned by a certain groups or individuals, where access is restricted to the certain group of people, who are the inhabitants of the community. (Madanipour, 2010) Another type as Saalman (1968) argued prevailed in the European medieval cities as well as many others around the world. These are the spaces in the streets and open spaces inside the city, occupied or privatized by expansion of houses and private realms to such extent that a minimum amount of space is left for passing through.

Hence, privatized public space are often found to be placed adjacent to the main space which is public. According to the boundary effect proposed by psychologist Derk de Jonge, people tend to socialize at the edges and corners of open spaces to gain a sense of domain. (Han, 2007) Anthropologist Hall (1966) suggested that 1.2 to 3.6 meters is the most socially appropriate distance for humans.

An evidence as the example of such kind of privatized public space is found from a study at the SamYan back alley of the Bangkok, where the users of the shophouses extended their service activities to privatized and personalized these public alleys, creating privatized public space.

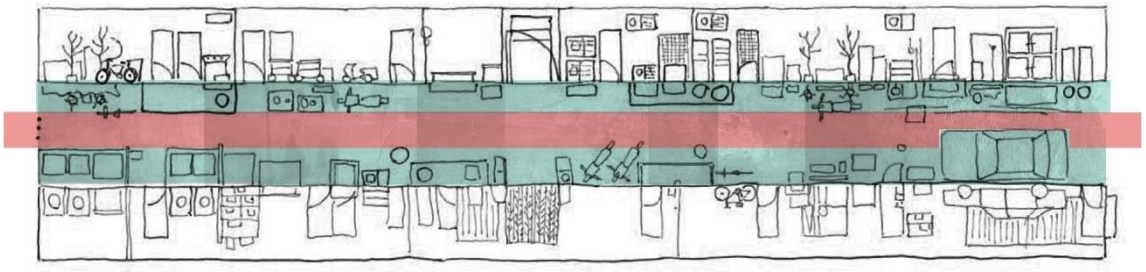


Fig 23: Study of SamYan back alley as privatized public space

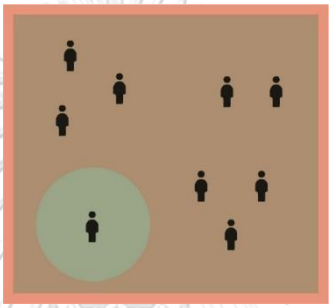


Fig 24: Privatized public space in common space

In terms of the corridor, a study conducted in the government housing in Singapore has concluded that people tend to personalize the spaces in front of their unit with storage, parking, shoe racks or even plantation. (Zilliacus,2017). Often it is seen that these personalization in the single loaded corridor are usually done following the characteristics of the city in the urban context next to the corridor. (ibid.) For example, if the context is with greener, then plantation is seen as the means of personalization. And, if the distance of the main road is more, then some bike parking is also seen in the corridor. Similarly, in the Walden 7 by Ricardo bofill, the corridor is privatized with some seating placed in the pocket spaces for interaction. (Esakov, 2021)

Fig 25: (Top) Privatized corridor space in Singapore housing (Zilliacus,2017) & (Bottom) privatized pocket space in corridor of Walden 7 (Esakov, 2021)

2.2.4 Characteristics of Good Public & Private Space

Features of good public and private space would also be considered in this thesis. As, along with being easy and clear accessibility and inclusiveness, a good public space should incorporate both intangible and tangible features. Mehta (2014) argued that good public space is accessible and open, the design is meaningful and the activities happening provides a sense of safety, physical and environmental comfort and convenience, a sense of control and sensory pleasure. Danisworo (1989) also mentioned that the good public space should promote psychological comfort and safety. On the other hand, attractive building facades, interesting scene and details should also enhance the value of a good public space. (Gehl, 2002) Besides, natural

elements that improve comfort, relaxation, pleasant experience and anticipate unpleasant climate are also considered as the important factors. For example, placement of trees along pedestrian and sitting areas can improve the above-mentioned qualities of the public spaces. (Kaplan and Kaplan, 1982; Carr, 1992; Gehl, 2002) Besides, these natural factors such as trees and flowers could also increase opportunities for residents to interact socially (Coley, 1997)

Fig 26: Trees alongside pedestrian or sitting area in public space (after Kaplan and Kaplan, 1982; Carr, 1992; Gehl, 2002)

Scholar's Argument	Intangible Features	Tangible Features
(Mehta, 2014; Danisworo, 1989; Gehl, 2002; Kaplan and Kaplan, 1982; Carr, 1992)	• Accessible • Open • Inclusiveness • Meaningful Design • Sense of Safety • Sense of Control • Comfort	• Attractive Building Façade • Interesting Scene • Interesting Details • Natural Elements

	(Psychological, Physical & Environmental) • Pleasant Experience • Relaxation	

Table 3: Characteristics of a good public space

Apart from the characteristics of good public space, in terms of student housing and its privacy, it is evident from the previous set of literature that, the use of corridor as the buffer space can bring the separation among the rooms and thus create privacy for the users of the adjacent rooms. It has been argued that the entrance doors of the two dwelling units, should not be opposite to each other when divided by a corridor circulation, as it will affect the privacy of both rooms. (Wheeler, 1968; Riker, 1956) And often it is seen that inside the shared room, to achieve privacy, individual student tends to create an auditory screen by using stereo earphones. (Sommer, 1969) This phenomenon is also observed from the pilot interview for this research. (Zak, 2020) Besides, Van der Ryn and Silverstein (1967) also argued that the bed is the popular study locations and visual privacy is required from the roommate. Moveable furniture is often used to create enclose for privacy by the individuals. (Van der Ryn and Silverstein, 1967; Vale 2014)

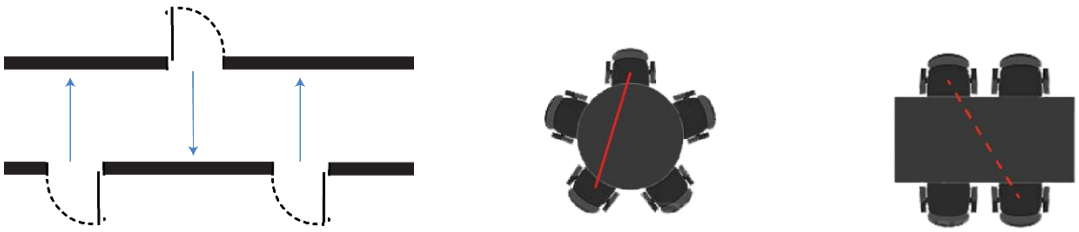


Fig 27: [Left] ideal entry doors to private units to ensure privacy (after Wheeler, 1968; Riker, 1956) & [Right] round tables are suitable for more intimate interaction while the rectangular tables are for more interaction with strangers (after Van der Ryn and Silverstein, 1967)

In terms of the use of furniture and to promote privacy in the community floor, where group activities are meant to take place, Van der Ryn and Silverstein (1967) argued that round tables are suitable for intimate discussion among friends. On the contrary, rectangular tables are more useful to create new acquaintances among the users of that table. This phenomenon can be relatable to the issue of adaptable space using furniture. As by limiting the number of the user of that shared furniture, privacy as well as social distancing can be ensured.

Due to the impact of current global pandemic situation of COVID-19, these form of privacy in terms of the use of shared furniture have formed the so called ‘new normal’ in public spaces. Now social distancing has become necessary to stop spreading the diseases and often in the public spaces, it is mandatory for the people to sit diagonally while sharing a single table. So that no one can sit in front of each other which might increase the chance of getting infected. Besides, as argued by scholars, sitting diagonally is expected to be good for interacting with new people. (Van der Ryn and

Silverstein, 1967) And, to promote the interaction among the students' rooms arranged in clustered with a central living space at the center. (ibid.)

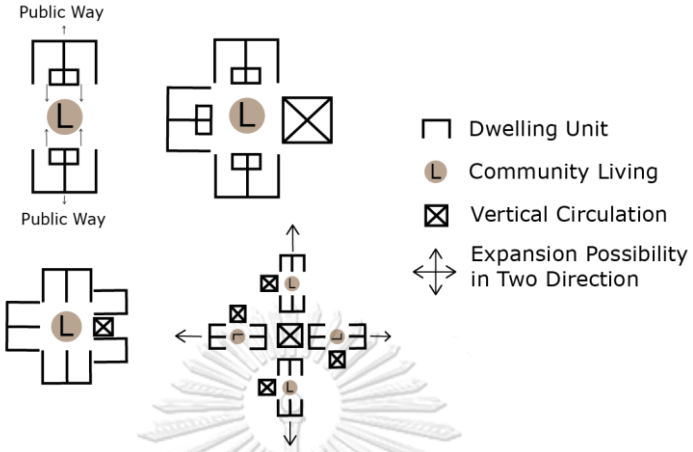


Fig 28: Diagram showing the arrangement of rooms with common living at center for increased interaction. (After Van der Ryn and Silverstein, 1967)

2.2.5. Adaptability of Public & Private Space

Adaptable spaces in terms of relationships between public and private spaces would be another important aspect of this thesis. These spaces sometimes can also act as type of the privatized public spaces. Spaces are adapted in terms of its uses based on the user's will, which was not the intention behind the initial design of that space. Although, this phenomenon can often be confused with the term 'flexibility', there is a difference between 'flexibility' and 'adaptability' in terms of the use of the spaces in architecture.

'Flexibility' is usually referred to the idea of accommodating change over time. (Kumar, 2012) In housing, Bilbao (2018) argued that 'flexibility' often means the possibility of future extension due to shortage of budget. This phenomenon is widely seen in the low-

income housing solutions. However, the author Forty (2000) also argued three main distinct strategies of 'flexibility'. Redundancy is one of them, which is the character of premodern buildings. As in Baroque palaces rooms were left without any purpose and was flexible enough to be used for any other purposes. According to Forty (2000), one of the controversies regarding 'flexibility' is that architecture should have flexible spaces to be a complete and finished design. Till (2005b) also argued that flexible housing is designed for choice at the design stage, both in terms of social use and construction, or change over its lifetime. In other words, the degree of flexibility will be achieved by having the in-built opportunity of the spaces which are capable of different social uses. (Till, 2005a) This phenomenon of having inherent opportunity of multiple use of a single space is termed as the adaptable spaces.

Due to its confusing nature and similar characteristics, scholars provided some distinct features between adaptability and flexibility. When some flexible spaces are provided in terms of multi-functional capability, it is often known as adaptability of the spaces.

Scholar	Year	Flexibility	Adaptability
Steven Groak	1992	Flexibility points to 'capability of different physical arrangements'	Adaptability points to the 'capability of different social uses'
Gerard Maccreanor	1998	Flexibility is a design idea that leads to the collapse of traditional	Adaptability is a 'different way of viewing flexibility', which refers to the 'trans-functionality and multi-

		layout	functionality'
Tatjana Schnieder, Jeremy till	2007	Flexibility in the context of housing is 'achieved by altering the physical fabric of building'	Adaptability in the context of housing is 'achieved through designing room or units so that they can be used in variety of ways'

Table 4: Definitions of flexibility & adaptability, (after Kumar, 2012)

Following the definition provided by Steven Groak (1992), this thesis will include adaptable spaces which often acts as the multiple spaces depending on the use. A good example of such space in terms of student housing is the multi-purpose hall. By nature of the space, a multi-purpose hall has the potential to be responsible to hold various types of functions. Though by nature of accessibility and inclusiveness, it can be considered as the privatized public space initially.

In the first set of literature review, it is seen that often furniture is used to define certain spaces. For example, the bedroom also acts as the living room due to use of multi-functional furniture. In this case, that space can be considered as adaptable, as it acts both public and private at the same time depending on its use.

Besides, though adaptability is often temporary in terms of its use, it can also be permanent by changing the purpose of any space completely. One of the good

examples of such permanent adaptability of spaces, especially in the student housing can be considered as the Ball Pit in Simmons Hall at MIT designed by Steven Holl. Here, the initially designed meditation room remained unused for a long time and eventually turned into a ball pit to pass some leisure and fun times by the inhabitants. (Chu, 2009)

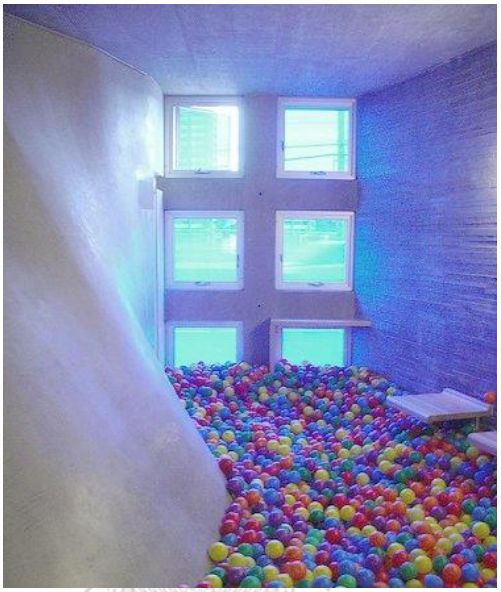


Fig 29: Ball Pit at Simmons Hall as an evidence of adaptable spaces in student housing (Chu, 2009)

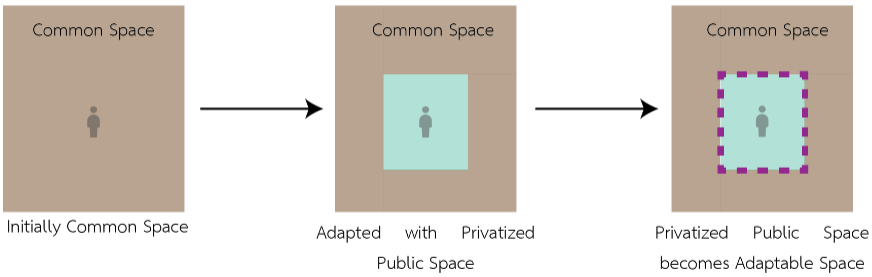


Fig 30: Transformation of privatized public space with initial use to adaptable space with a new use

One of the important aspects of having adaptability nature of any space is rooted into the present global pandemic situation of COVID-19. In this kind of emergency situations, to reduce the epidemic, the global health organizations are asking people to maintain social distance from each other. As the virus CORONA is expected to transmit from human to others by close encounters and interactions. The WHO, in an article published on March 19, 2020, stated that, spaces must accommodate the adaptable nature of having at least 1-meter distance between two human beings, while being in interaction with each other.

In terms of social gathering, the authorities are now implying restrictions on the number of participants depending on the size of the enclosed space of the event. This phenomenon can be predesigned with adaptable nature of these certain spaces with breakout spaces. So that, the extra participants can also participate in the event. Besides, it is also suggested by them that the enclosed public space must have natural cross ventilation to reduce to risk of being affected by the infected persons to others. Thus, having the potential of adaptable spaces while designing in the future, the privacy would also be ensured as well, to reduce this kind of uncertain global pandemic situation. As mentioned earlier, at present situation the circular tables are in appropriate as it can increase the risk of being affected with the pandemic. Thus, a rectangular table is suggested, which was initially designed to interact with new faces.

Therefore, following these two sets of literature reviews, the definitions of public and private spaces would be derived. This derived definition along with the final set of literatures on student housing would be considered to analyze the cases.

2.2.6 Derived Definition

Before going into the next set of literature review, it is essential to derive the definitions of public and private space. These definitions would be used to identify the spaces in the student housing. And after studying the issues of student housing, cases can be analyzed and finally the relationships between public and private spaces can be established. Though, these derived definitions can possibly be related to the notion of public and private space in general and for any space mostly related to urban and domestic scale. In the previous studies, scholars have not used it to define the privacy or publicness in the student housing.

Moreover, from the above two sets of literature review, the complexity of public and private spaces is evident. As it is seen that the idea of public and private spaces exists in various scales, from urban public plaza to the study spaces in the domestic scale. So, the factors that influence the privacy or publicness of space varies from scholar to scholar with some similarities and can be used to identify the nature of the space. Therefore, to analyze the cases in this research, it is essential to categorize the spaces following the necessary factors which are derived by the scholars like the issue of accessibility which would be used to define whether the space is public or private.

Four identical factors are to be considered to define the publicness or privacy of the space for this research which was not used collectively by any other scholar. The factors are accessibility, inclusiveness, visibility, and the uses of that space. Following these factors, the in-between spaces of public and private spaces are derived as the common, privatized public and adaptable spaces. Besides, from the above discussion in the literature review and the derived scope, three identical scales of public to private spaces would be considered in terms of student housing, which are public spaces, common spaces, and private spaces.

For the ease of understanding of these complex ideas of public and private space, only the conventional terms of the public, private and the in-between spaces would be used in this research although they have different characteristics considering various scale. Their scale would be referred further to clarify what each of these spaces means. However, here the public spaces are the spaces that are accessible to all including the inhabitants or the students, the common spaces are the shared spaces for the inhabitants and the private spaces are only accessible to individual in terms of the inclusiveness.

Then, under this category, five more sub-categories can be considered, which are public, common, privatized public, adaptable and private spaces. Each of three earlier mentioned spaces in terms of the scale, can be analyzed and then justified following these five derived sub-categories. For example, the ground floor or the public space would include the common, privatized public, adaptable and private spaces in terms of accessibility including visual access and the inclusiveness of the user who can use that space. Similarly, the common spaces and the dwelling units will also have the common,

privatized public, adaptable and private spaces in terms of inclusiveness and accessibility of both visual and physical access. But the public space sub-category would be limited to the categorized public space, as it is the only space that has the most accessibility and inclusiveness. However, the nature of the publicness or privacy of all these sub-categorized spaces like public, common, privatized public, adaptable and the private spaces would be different from each other when it comes to the student housing because of the difference in the scale.

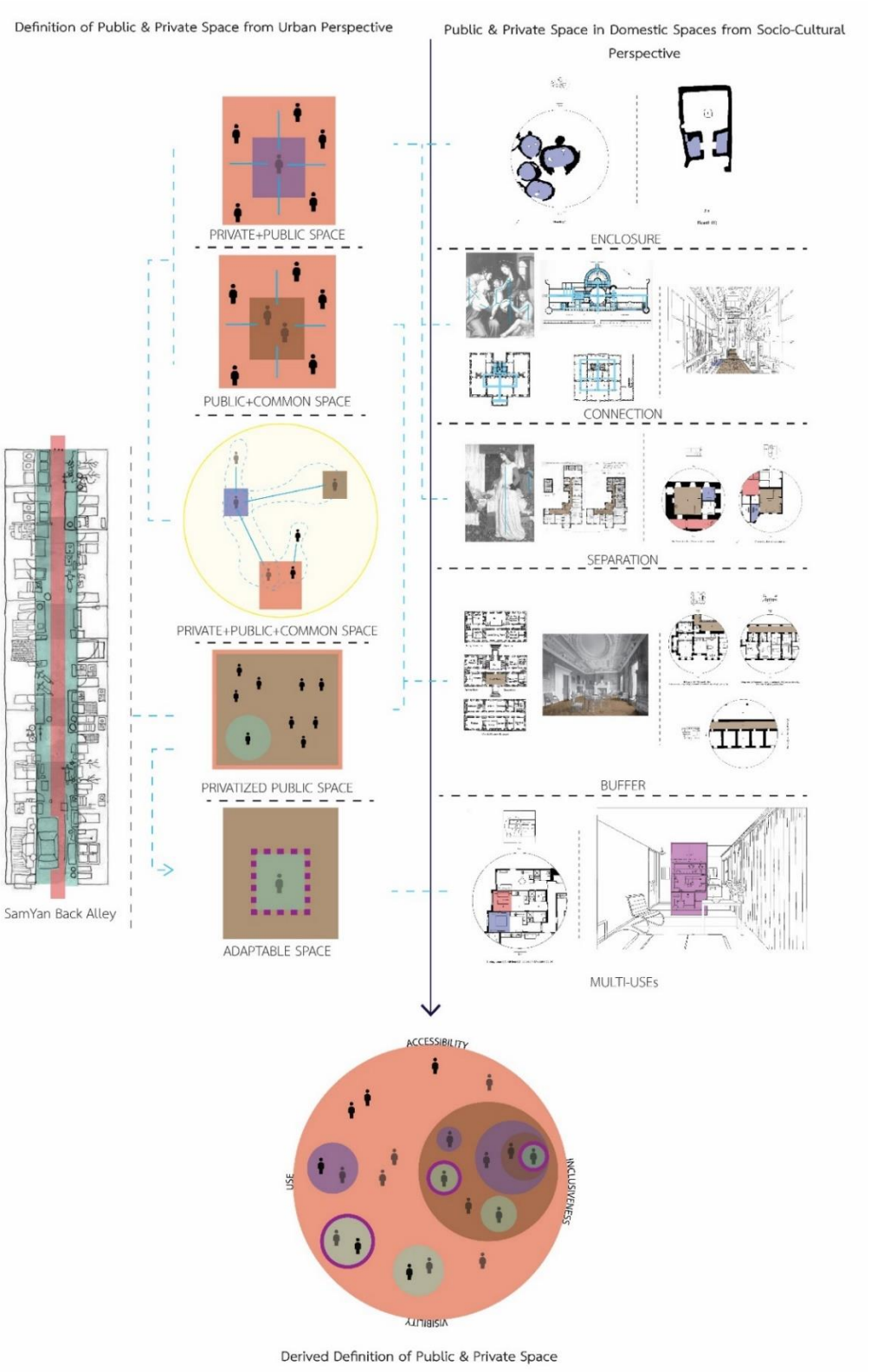


Fig 31: Derived definitions in terms of the relationships between public and private spaces

2.3 Student Housing

From the previous two sets of literature review, the definitions of public, private and in-between spaces are derived. Since, this thesis is focused on the student housing, it is necessary to investigate some of the benefits, features and issues of the student housing in relation to privacy and publicness of space as noted by the scholars. This part of literature review is crucial to analyze the selected cases through qualitative methods. Because it will eventually enrich the research and make the derived definition more relevant in terms of the issues of privacy and publicness in the student housing.

2.3.1. Benefits of Student Housing

One of the major concerns of sophisticated university's infrastructure and facilities is the provision of student housing (Najib, 2014). Mansur (2011) and Khaled (2012) agreed that a good student housing can attract foreign students and convince the local to pursue their higher education at their local university than going abroad. Most of the literature review about the research on the student housing are centering the factors that affects residential satisfaction, students' adaptability style of living and assessing the student housing quality. (Amole, 2012; Abdullah, 2013) Roche (2010) argued that the secured and well-maintained student housing facilities can provide students with privacy along with creative residence life program which will ultimately support the university authority in recruiting process and attract highly qualified students.

Besides, adaptability in terms of personalization of space is considered as one of the issues of student housing which will be addressed in this thesis. As Chan (2011) argued

that the student prefers to customize and personalize their own spaces. The most important benefits of the on-campus student housing can be considered as the self-development in terms of personal growth and gaining maturity of the individual inhabitants for their better future. (Tam, 2002; Rinn, 2004) This quality is achieved by interacting more with others who has similar interests, live next to each other and always doing things together. (ibid.)

2.3.2 Features of Student Housing

One of the very basic requirements of modern-day living can be considered as the proper housing. (Karsten, 2008) Among several various types of housing solutions student housing is quite common. In terms of student housing, a proper housing will stimulate study environment, provide security and privacy, promote good friendships among the residents and help the university administrations to fulfill the needs of their students who lives in on-campus student housing. (Hassanain, 2008) Amole (2009) argued that the on-campus student housing in commonly conceived and carried out as a merely physical shelter to accommodate students in a shared campus environment.

From the perspective of sociologists, satisfaction in student housing can depend on various factors. One of them is to make the living in this type of building typologies as good as the home of the students. (Najib, 2012) Thus the initiative of designing student housing is adopted from the typical family house design, even though there are differences. (ibid.) Amole (2009) pointed that the student housing comprises of basic study-bedrooms along with other facilities like bathrooms, toilets, laundry, pantry, common lounge, and cafeteria which could either be in the same floor, block or in the

whole university area. On the other hand, the basic unit of a family house includes bedrooms, bathrooms, toilets, kitchen and living areas along with other housing facilities like playground, shops and schools which are found in the neighborhood. (Parkes, 2002)

Wallace (2004) and Amole (2005) argued that, to provide a home-like environment inside student housing, universities are providing study facilities inside bedroom, reading rooms within the hall, meeting places also known as common and recreation rooms for social gathering and academic discussions in one modern and high-tech building supporting present technological advancement. In the recent trends, to provide modern and high-tech student housing, multi-story secured- access building is being provided along with private rooms and featuring communal facilities such as laundry, kitchen, study room and television room where these rooms are often well furnished with and air conditioned. (Allen, 2009) and Wiens (2010) claims that kitchen, private bathrooms, study lounges and social spaces are now considered as a necessity in luxurious houses. Internet in each study-bedrooms, a central computer cluster bedrooms or Wi-Fi has also become the standard requirements in housing. (Roche, 2010)

According to Neufert (1980), in the student housing or hostels, unmarried student tends to stay for 30-33 weeks per year. (Neufert, 1980) while the married usually for 50-52 weeks. (ibid.) These type of building typologies often provide space for children to play outside and often zoned near shopping, social services, and amenities. The ideal space for two bed and study space can be considered as 13-19 sq.m. as preferred in the USA.

(ibid.) These typical two-person shared units should be fully furnished with bed, desk, chairs, shelves and hanging for clothes with 0.8-1 sq.m. approximately. The storage for baggage should be 0.3 sq.m. per student (ibid.) To address the issue of privacy inside the units, often the big furniture like shelves is placed alongside the wall, which is common between two units, to buffer the sound. (ibid.)

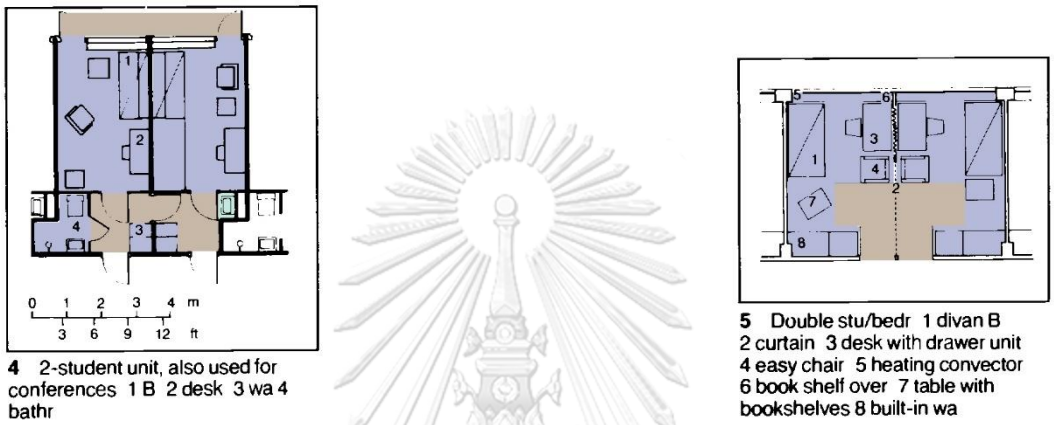


Fig 32: Ideal typical shared room ideas (Neufert, 1980)

The dinning space in student housing is often separate but can also be clustered in small groups like the shared housing. The group of 6-8 students are considered socially large and are subdivided into two without sharing the cooking equipment successfully. While the students in 12 or more in number are often considered problematic in creating a good, shared dining and kitchen space. (ibid.) Besides, spaces for amenities like dining, lounge, offices for maintenance, recreation are also to be found in student housing.

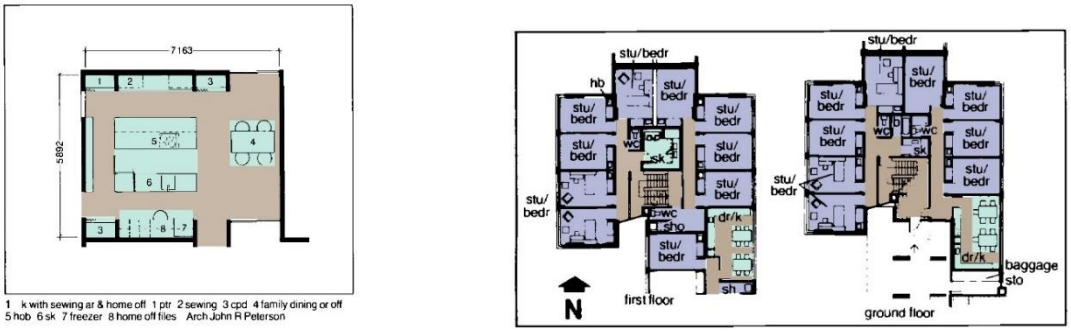


Fig 33: (Left) ideal typical shared dinning and kitchen ideas for smaller group of inhabitants & (Right) ideal typical floor ideas with shared amenities for the inhabitants (Neufert, 1980)

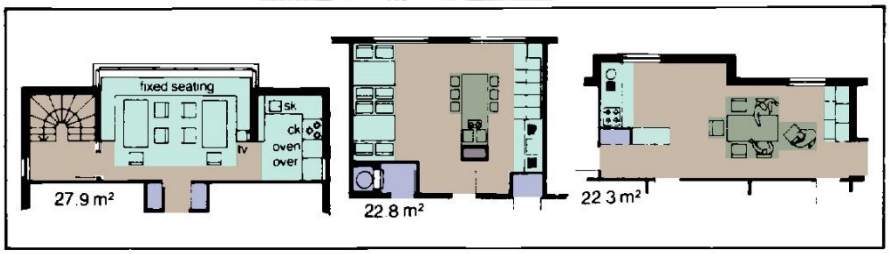


Fig 34: Ideal typical shared amenities ideas for smaller group of inhabitants (Neufert, 1980)

However, in high-rise buildings, proximity is one of the main determinants in promoting neighborhood interaction. (Bochner, 1976) Hence, the use of multi-level sharing platforms, such as the sky gardens or the sky streets, can form natural places for daily communication between residents. (Tian, 2001) Though, according to Holland (2007) young people's social space is full of isolated or quiet spaces.

2.3.3 Issues about Student Housing

According to Najib (2012) the previous studies on student housing has agreed upon the fact that the socio-physical background of student has impact on their satisfaction in

dwelling in the student housing. The author narrowed down to four major factors affecting the quality of life and can be considered as the issues relating to the satisfaction inside student housing which are gender, mix-ethnicity, economic status, and previous home experiences. The issue of economic status and mix-ethnicity could drive this thesis to another direction, far from narrowing down the issue of privacy. And thus, for the sake of this thesis, only the issue of gender and previous home experience would be addressed. These are discussed below in brief,

The issue of gender affects the satisfaction of students inside student housing depending on the space types. Amole (2005) argued that female students preferred to live in shared facilities whereas the male students preferred more private spaces. In other words, male students cared more about the privacy in their study bedrooms by less operating shutters in promising personal territory and used the room as a place for them to relax and sleep while the females preferred to make new friends and entertain people in their rooms. (Meir, 2007) However, in some special cases, like in a smaller room and crowded space, female students would feel more stressful as they are more comfortable in their own room comparing to male students. (Erkip, 2001) Since, Thailand promotes is not an orthodox Muslim country, thus it is not important to design separate spaces for different gender. But, by having both types of spaces that would be suitable for the gender will increase the ultimate satisfaction among the users.

Apart from the issues related to gender, Galster (1987) and Thomsen (2010) argued that the previous home experience also affects the student satisfaction in the student housing. Here the previous home experience is related to whether the student used to

share the space and activities with other siblings or family member or was provided with total privacy in their parental home. Following the issue of sharing space, Erkip (2001) argued that the lower the number of people sharing a unit in student housing, the higher the level of their satisfaction. Foubert (1998) concluded that the increasing satisfaction was really correlated with the good relationship among households. In the case of student housing, sharing rooms with small number of people can encourage good friendship among them and help them to avoid having stressful conditions. (Amole, 2009; Foubert, 1998; Wiens, 2010)

However, along with these social issues, in a recent survey with quantitative results led by Jessica Murray (2020) on over 2,000 students regarding the current problems of living in student housing. In this research, it has been found that around 78%, which can be considered as the most of their problems are related to their privacy and safety, while the rest are mostly about maintenance. The issues like noisy housemates (43%), Housemates stealing food (29%) and Break-in or burglary (6%) can be considered as the common issues relating to privacy and security in student housing. (Murray, 2020)

Student housing is often successful when social interaction is ensured in the living environment. At the same time, offering good study environment is also necessary. These will ultimately help the university authority for better requitement. However, since the definitions of public and private space in this research are derived from the domestic and urban scale. This set of literature on student housing would narrow down the research to analyze the cases in qualitative way.

Chapter 3

Case Studies

Following the derived definition, three international and one local case are analyzed in this research. The analysis is done both in qualitative and quantitative way. The qualitative method includes identifying the public, private and in-between spaces which are common, privatized public, and adaptable spaces. The quantitative method with the help of 'depthmapX' is used to find the relationships between these spaces in terms of accessibility. Some sections of the cases are also analyzed in the qualitative way due to the limitations of quantitative method. However, the cases analyzed are discussed below-

3.1 International Cases

3.1.1. ihouse Dormitory by Studio SUMO

The iHouse dormitory project is a student housing for international students of diverse background in Togane of Japan. The area of the project is 30 sq.m. and was built in 2016 by architect Studio SUMO. The building is the home for the 140 students. The project was selected because of the existing relationships between public and private space inside this project through designed spaces following the information found in the images and drawings provided by the architect. Following the derived scale, the ground floor holds more public programs and thus can be denoted as the public space of this project. The typical floor is with some shared function can be termed as the common space. While the most private space would be the dwelling units of this project.

3.1.1.1. Site Analysis of ihouse Dormitory

In the site plan, referring to the derived definitions, the main roads are considered as the public space in terms of inclusiveness and accessibility as everyone can use it and has access to it. The internal circulation, playground, parking, and amphitheater can be termed as common as only the user of the projects or the students has access and authorized to use it. Besides, the student housing building and the existing field house of this project can be considered as the private space in this site plan or macro scale, due to the inclusiveness and accessibility of the restricted users of this building. However, the parking and the playground can have two types of spaces at a time, as it has both the characteristics of being common and privatized public space. Since, when one has occupied these spaces and use it for certain period others cannot use it, even though it is visually accessible. In terms of planning, following the issues of student housing, the project is successful enough to provide home like environment by providing a playground. But the necessary amenities like shops or stores are lacking in this site plan. From the analysis, the blank open spaces can be considered as the urban spaces including left over space, undefined space, conspicuous space, visible private space, private public space, private open space, external private space.

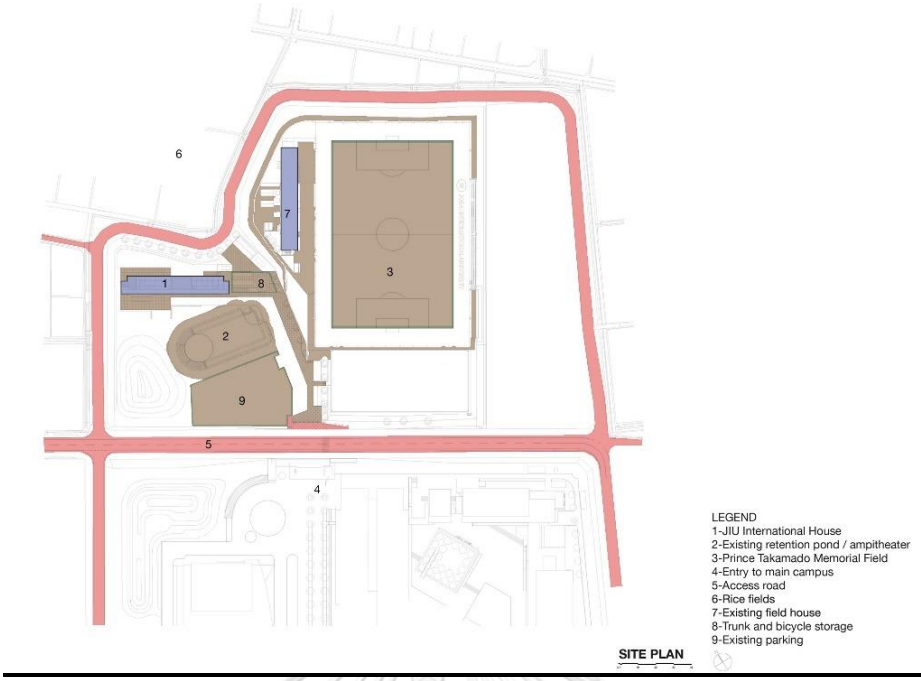


Fig 35: Qualitative site plan analysis of ihouse dormitory

3.1.1.2. Ground Floor or Public Space ihouse Dormitory

On the ground floor or the public space of the project, the public space in terms of accessibility, inclusiveness and use can be considered as the plaza which connects the two wings on the ground floor also acting as the buffer between the two programs. In terms of common space, all the circulation including lift and stairs and passages can be considered. As only the inhabitants or the students are authorized to use it. And often the entrance is restricted with the door. Besides, the activity room, laundry and the mail room can be considered as the common as only the inhabitants are authorized to use it. The privatized public space can be considered as the event room or the seminar room, as these are usually open to use for special occasion and for specific users. The private spaces would be the residential apartment of the faculty, guard room, storages, reception for the event and gallery, gallery, archive, kitchen for the event room and all

the toilets in terms of accessibility and inclusiveness. In terms of use, the building is being divided into two wings, where one has more public nature while the other private.

However, the toilets can also be considered to have two types of spaces at a time in terms of use, as it is accessible by everyone, but once one is using it, the space is neither visible nor accessible by others for that certain period. Besides, the ground floor also lacks any necessary amenities like shops or stores or even café or lounge.

Fig 36: Qualitative ground floor or the public space analysis of ihouse dormitory

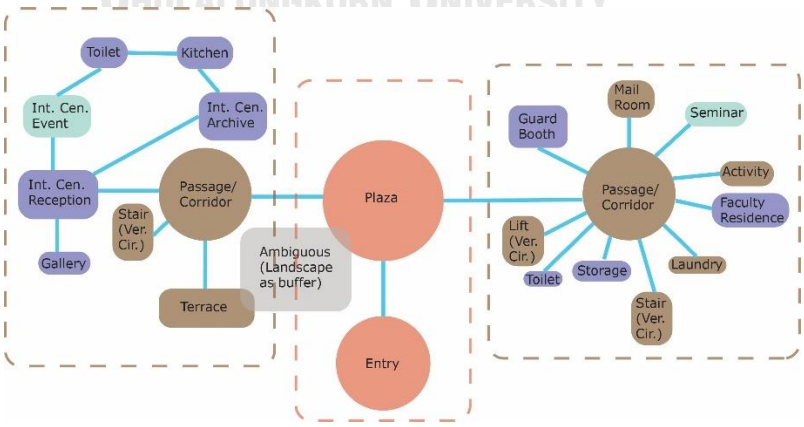


Fig 37: Zoning of ground floor or the public space analysis of ihouse dormitory

Fig 38: Overlaying qualitative analysis with connectivity analysis of ground floor of ihouse dormitory using DepthmapX

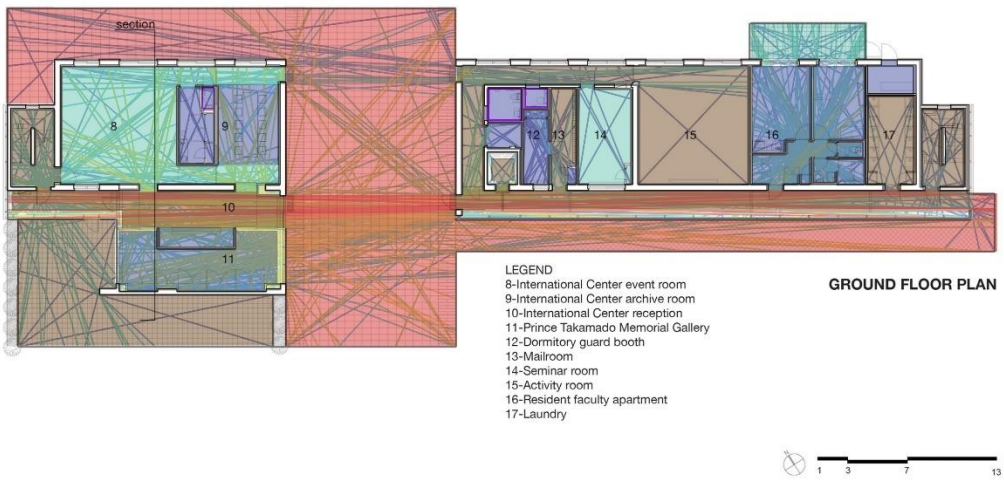


Fig 39: Overlaying qualitative analysis with isovist analysis of ground floor of ihouse dormitory using DepthmapX

3.1.1.2.1. Findings of Ground Floor or Public Space Analysis of ihouse Dormitory

After overlaying the qualitative analysis along with the isovist and connectivity analysis found from using depthmapX are listed below-

1. The placement of the faculty residence are next to the activity room which is the common space for the inhabitants and expected to create noise, that will hamper the life of the inhabitants inside the faculty residence. Neither walls nor special measures were initiated to buffer this issue of noise.

2. The activity room after overlaid is found that, the accessibility is limited due to the placement of the space. Since, it acts as the common, it should have been more accessible, perhaps the entry could have been from the main circulation.

3. The placement of archive acts as the private which was expected from the purpose of the room as found after overlaying.

4. Even in the private space of the gallery, some part that are furthest from the main entrance to the wings has more private nature and hence more exclusive exhibit could be placed in those areas.

5. From the connectivity analysis, it is seen that even inside the public space, which is the plaza of this ground floor, the most public nature is at the center of the space that connects the two wings.

6. From the isovist analysis, a part of the plaza or the public space located at the corner created by the building edge has less access and thus creating a more private nature, which has the potential to be used in terms of privatized public space with some functions like outdoor seating.

7. The outdoor terrace adjacent to the gallery can potentially act as the breakout space or extension to the exhibition has some private nature in some areas. This private nature is created by the buffer with trees as the landscape elements to separate from the main plaza or the public zones.

8. Although from the connectivity analysis, it is found that the most public space is in the plaza that connects the two wings. But, from isovist analysis, it is seen that the most public nature belongs to the whole linear path that connects the two wings along with all the other spaces.

3.1.1.3. Typical Floor or Common Space of ihouse Dormitory

In the typical floor or the common space in terms of the ihouse dormitory, the common space would be the circulation including terraces, passages, lifts, and stairs, due to the inclusiveness of these spaces. Because only the inhabitants are authorized to use and have access to these spaces. All the dwelling units would be considered as the private space including the common toilets and storage. Like the ground floor or public space, these toilets would also be two types of spaces at a time, as once one is using it neither others can use it, nor it is visible. The tables in the common room would be considered

as the privatized public space, as once one is using it, others cannot, even though it is visible. Though the rectangular table provided is good for interaction with strangers, beside it is also efficient during the pandemic situation like covid-19 as user must sit diagonally maintaining a social distance rather than face to face.

Similarly, the kitchen also has privatized public space, which would be the tables and kitchen utensils. Though, the kitchen provided is not good enough, as it is suggested to provide clustered kitchen with not more than 6 people to share. The pocket space in the passage or corridor on the side of dwelling units can be termed as privatized public space. Since, it can be also used as the space for interaction and once a group is using it others will not. However, the terrace is also used as the adaptable space as there are some tables and chairs for outdoor seating found from the photographic evidence of the project but was not designed and not included in the plan. Besides, apart from these factors, in general, the common space lacks study lounge for the students.

Fig 40: Qualitative typical floor or common space analysis of the ihouse dormitory

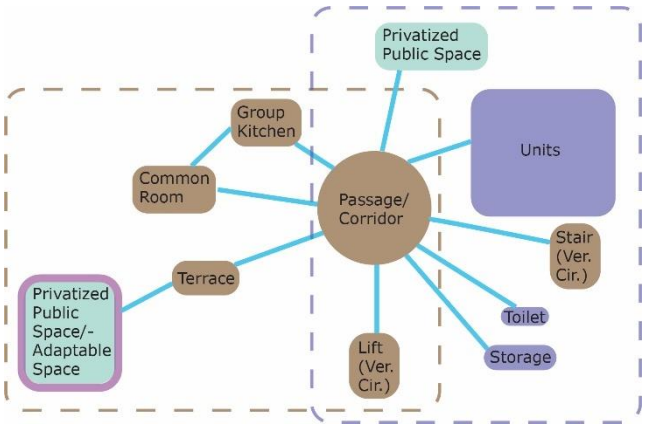


Fig 41: Zoning of typical floor or common space analysis of the ihouse dormitory

Fig 42: Photographic evidence of privatized public space along the passage to the dwelling units (Left) & photographic evidence of the adaptable spaces with outdoor seating in the terrace (Right) (SUMO,2016)

The isovist and connectivity in terms of accessibility in the typical floor or common space is analyzed using depthmapX. At first, the floor plans are re-drawn using single line to create an enclosure of the whole typical floor as a single space. Only the doors are kept in terms of opening to provide the connectivity information for depthmapX. With the help of both the isovist and connectivity analysis, the accessibility can be analyzed in terms of most accessible or most connected to least accessible or least connected

spaces. Both of the following isovist and connectivity analysis shows a gradation of colors where red denotes the most connected or accessible space to the blue as the least connected or accessible spaces inside this typical floor or common space of the project.

Fig 43: Overlaying qualitative analysis with connectivity analysis of ihouse dormitory from DepthmapX.

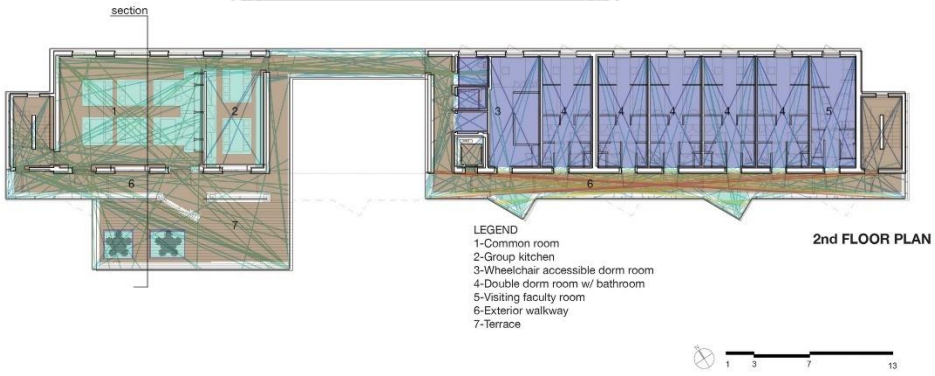


Fig 44: Overlaying qualitative analysis with isovist analysis of ihouse dormitory from DepthmapX.

3.1.1.3.1. Findings of Typical Floor or Common Space Analysis of ihouse Dormitory

After overlaying the qualitative analysis along with the isovist and connectivity analysis found from using depthmapX are listed below-

1. The corridor or the passage connecting the dwelling units acts as the most accessible space or have more public nature inside this floor. The space in front of the units also shows a bit more public nature than the other spaces in the passage or the corridor of this floor.

2. The kitchen space, which was denoted as common in qualitative analysis has more private nature as it is less accessible or connected in the floor found from the analysis of depthmapX.

3. The space inside the common room has also various levels of accessibility, as the most accessible or public nature are in front of the doors found in the depthmapX. These spaces are termed as common from the qualitative analysis.

4. The space in the terrace where adaptable spaces are found also provides evidence to be less connected or accessible from the analysis found using the depthmapX to have potential to be adopted into a privatized public space.

5. The space connecting the common to terrace through the alignment of doors mirroring each space and passing through the corridor is identified as the most

connected or accessible space in this typical floor from the analysis of depthmapX and isovist.

6. The corridor connecting the two wings has some area with private nature as it is not linear like the one connecting the dwelling units. As this corridor acts as separating the private and public spaces in terms of use.

7. The pocket space along the corridor or passage identified as the privatized public space in the general analysis is also supported by both the analysis achieved from depthmapX showing a bit more privacy than the whole corridor or passage in terms of accessibility or connectivity. This space also acts as the space for interaction.

8. The staircases are least accessible and connected as these are at each corner of the space indicating a more private nature in this floor despite acting as the common space found in the qualitative analysis. Besides, the vertical circulation or lift also acts as the least accessible or connected space providing a private nature of the space in this floor.

9. From the Isovist analysis, the corridor acts as the most accessible space making it more public than any other space as it connects most of the spaces which are units, general toilets, and vertical circulations.

Fig 45: Perspectives of spaces in the common floor of ihouse dormitory shows the characteristics of these spaces from the findings of the typical floor or common space of the ihouse dormitory.

3.1.1.4. Typical Unit or Private Space of ihouse Dormitory

In the typical dwelling units of ihouse dormitory, the noise is buffered with the thick separation walls and by placing all the furniture along the edge of the walls. Inside the dwelling units, all the circulation space can be termed as the common space as it is accessible by both the inhabitants sharing the room. Besides, by limiting persons sharing the unit, can increase the interaction and bonding between the two roommates. But the bed mirrors each other and thus lacks visual privacy and provides less options for personalizing once space to secure more privacy. However, the toilets and each of the beds and reading tables can be considered as to be two types of spaces at a time, as it is visible and accessible to both the users, but once one is using it the other would not bother to use it or access it.

In terms of DepthmapX analysis, the furniture is drawn to create obstacles to generate isovist and connectivity analysis. The corridor is drawn in scale to denote as the public space compared to the entry and the spaces inside the unit.

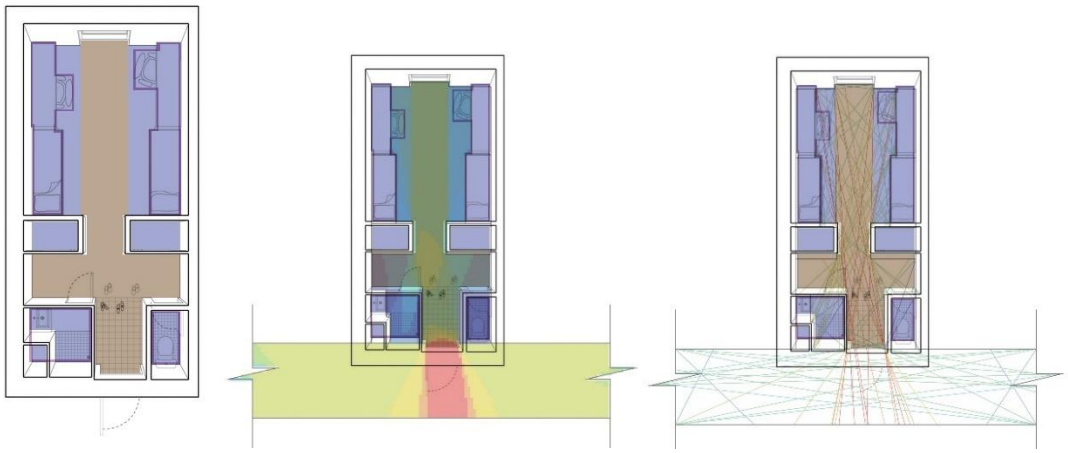


Fig 46: (Left) qualitative analysis of typical dwelling units of ihouse dormitory, (Middle) overlaying qualitative analysis with connectivity analysis & (Right) isovist analysis from DepthmapX (Right)

3.1.1.4.1. Findings of Typical Unit or Private Space Analysis of ihouse Dormitory

After overlaying the general analysis with the analysis of depthmapX, it is observed that the space in front of the door of the dwelling units which connects to the corridor has the most public character. The toilets are positioned in least accessible space inside the units creating a private nature as it should be. After the limitations of depthmapX analysis as furniture is used to create obstructions in accessibility, it can be said that the privacy for everyone is not sufficient as the beds mirror each other creating a public character along with the circulation space. Besides, the common space in the middle that was identified in the qualitative analysis is also supported by depthmapX, as it also shows a publicness character in the analysis from depthmapX.

3.1.1.5. Section Analysis of ihouse Dormitory

Fig 47: Section Analysis of ihouse Dormitory

In terms of vertical arrangement of the spaces, due to the limitation of the use of depthmapX as quantitative method, the analysis can be conducted only using the qualitative method. Here the analysis is done following the building scale as derived in the scope of the study. The ground floor has the public space as the plaza. On the ground floor the transitional space between two private spaces like gallery and archive are maintained through the privatized public space, which is the reception for the gallery in this case. The immediate floor is the common spaces, although the common room and terrace are separated by walkway acting as the transition between these two spaces. This separation could not be identified in the qualitative methods but realized as it shows the separation in terms of the use of these two common spaces in terms of the use, inclusiveness, and accessibility.

The typical unit floor also has privatized public space through the presence of walkway. The hall acts as the similar transitional space from the privatized public space to the dwelling private space. Inside the dwelling unit or private space, there is also a change of height in terms of the ceiling space, where more height is provided to the private space or the dwelling space. However, it is evident that the change of levels has an impact on the privacy as the private dwelling units are clearly separated by the placement of the spaces in different floors than the private spaces with more public accessibility like the archive or gallery. The connection as well as separation between the dwelling unit floors are also maintained through the vertical circulation like the stairs and lifts.

3.1.2. Edmund Hunt Hall & Lady Bird Johnson Hall at St Edward's University by Elemental

The site of this student housing designed by Alejandro Aravena of Elemental is in Austin of United States. The site area is 30000 sq.m and was completed in 2008. The project was selected as it was designed by the Pritzker winning architect and the architect also addressed the issue of private and public in the project brief of this project. According to the architect, the more public space is at the base, while the private part or the dwelling units are at the top. (Aravena, 2009) The whole project can be seen as an order of degrees, from public, to intermediate, to common, to private (ibid.)

3.1.2.1. Site Analysis of Edmund Hunt Hall & Lady Bird Johnson Hall at St Edward's University

From the site analysis, it is seen that the building being private in terms of its accessibility and inclusiveness is located along with the old private buildings which is also the dwelling apartments for the students. The road being public space in terms of accessibility and inclusiveness has divided the private and common space, where common are the university departments. Since, St. Edward's University is a private university, the department buildings are termed as common. However, parking spaces are also considered as common. On the south of the project, a community consisting of private dwelling houses are seen. The day care center is also seen along the main public road on the side of the private community buildings. From the analysis, the blank open spaces can be considered as the urban spaces including left over space, undefined space, conspicuous space, visible private space, private public space, private open space, external private space.

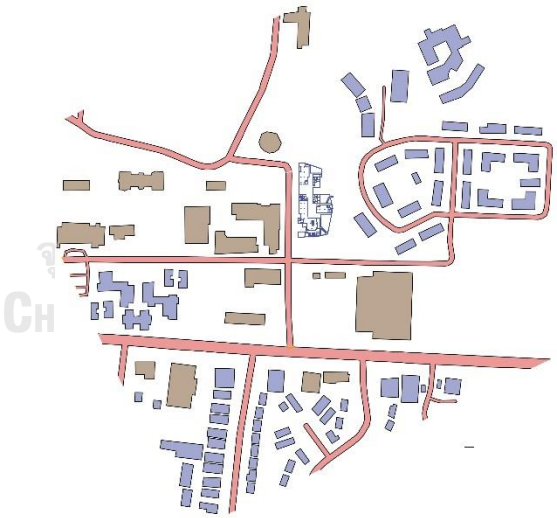


Fig 48: Qualitative site plan analysis of Edmund Hunt Hall & Lady Bird Johnson Hall

3.1.2.2. Ground Floor or Public Space of Edmund Hunt Hall & Lady Bird Johnson Hall at St Edward's University

The ground floor or the public space in this project is analyzed initially with derived definitions in terms of inclusiveness, accessibility, and the use of the spaces. The main plaza at the center, that connects all the other spaces acts as the public space in this ground floor. All the stairs and vertical circulation are identified as common, while the dinning and lounge also belongs to the common space. Like ihouse dormitory project, the plaza also divides the two types of function one relates to common with dinning and lounge, while the other wing includes more privatized public function like seminar room or multi-purpose hall. The multi-purpose can also be called as the adaptable spaces because of the nature of this single space which can hold multiple types of functions. The service area for the large dinning is clearly separated as it has more private character including the kitchen, storage, and the service entry. The seating area including outdoor in the plaza also acts as the privatized public space which occupies both public and common space in this ground floor. Besides, apart from these factors, in general, the public space is good enough for the students due to the presence of cafe and stores as expected.

Fig 49: Qualitative ground floor or the public space analysis of Edmund Hunt Hall & Lady Bird Johnson Hall

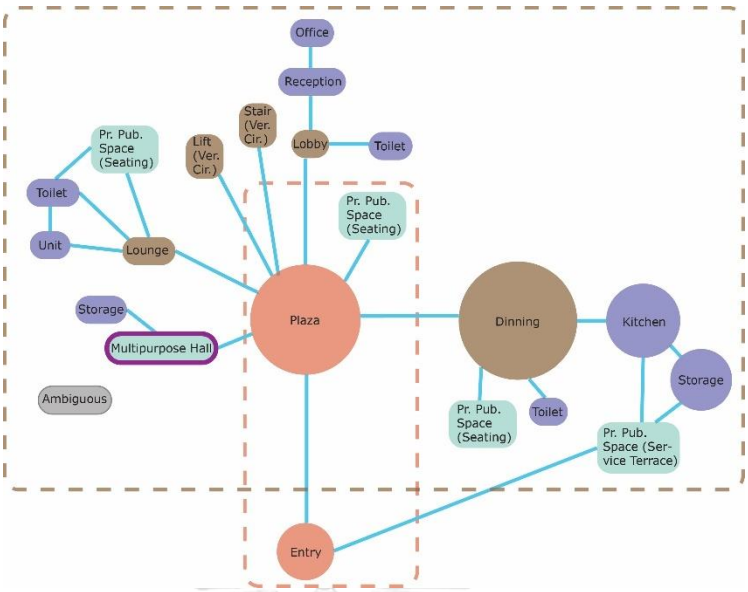


Fig 50: Zoning of ground floor or the public space analysis of Edmund Hunt Hall & Lady Bird Johnson Hall

In terms of Isovist and Connectivity analysis with depthmapX, the ground floor or the public space in this project is redrawn with single line keeping the door as the opening for accessibility. In depthmapX, the grid of 1m was used as each unit.

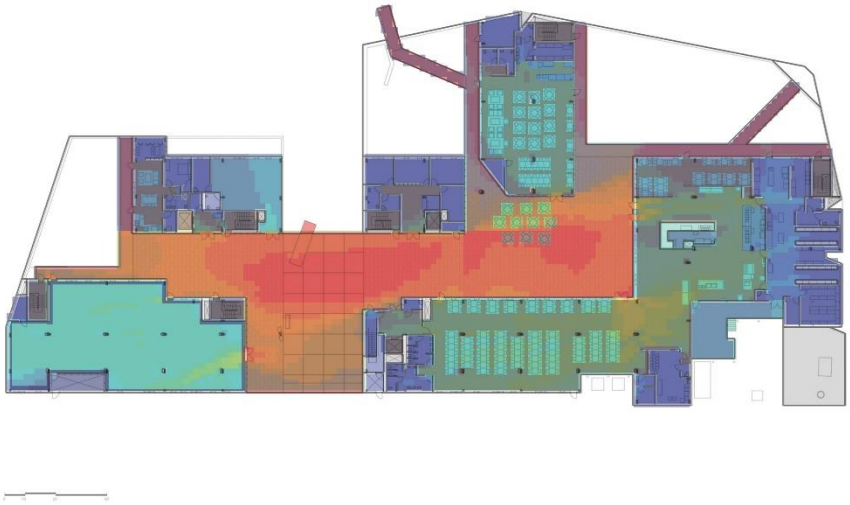


Fig 51: Overlaying qualitative analysis with connectivity analysis of ground floor or the public space of Edmund Hunt Hall & Lady Bird Johnson Hall

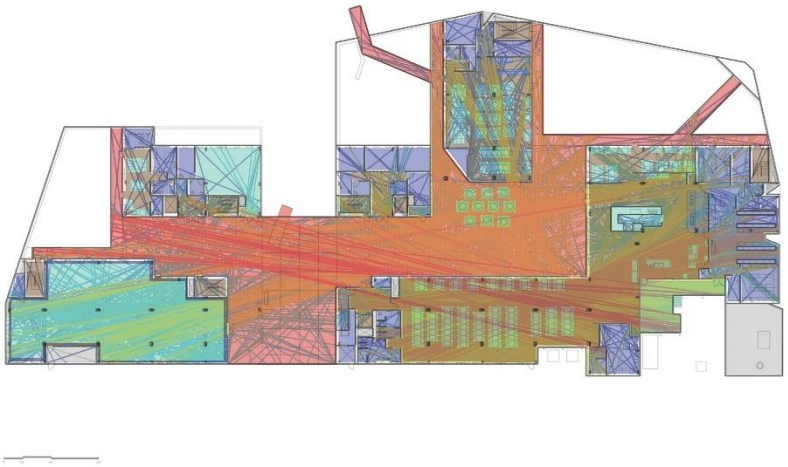


Fig 52: Overlaying qualitative analysis with isovist analysis of ground floor or the public space of Edmund Hunt Hall & Lady Bird Johnson Hall

3.1.2.2.1. Findings of Ground Floor or Public Space Analysis of Edmund Hunt Hall & Lady Bird Johnson Hall

After overlaying the qualitative analysis along with the isovist and connectivity analysis found from using depthmapX are listed below-

1. Service spaces are placed with more privacy in terms of accessibility, often achieved by placing to the furthest zone from the main entry.

2. Privatized public space in terms of seating areas in the dinning and outdoor as well are placed in the least accessible space and thus more private area. Here, the privatized public space inside the public space or plaza has more public nature than the ones inside the common area in terms of accessibility.

3. Center of the plaza denotes the most public space in the plaza or the ground floor.

4. The privatized public space in terms of use, which in this case is the multi-purpose hall has less doors and placed at the furthest distance from each other to ensure privacy.

5. The service terrace acting as the service entrance for the kitchen is isolated achieving more privacy despite being exposed and accessible from outside.

6. The spaces closer to the entrance has more public nature because of the presence of plaza that acts as the public space in this ground floor in terms of accessibility and inclusiveness.

7. Even inside the common space, some spaces aligned with linear connection to the entrance door acts as more public nature than the rest of the space and hence the privatized public space in terms of seating inside this zone has less privacy.

3.1.2.3 Typical Floor or Common Space of Edmund Hunt Hall & Lady Bird Johnson Hall

In the typical floor or the common space in terms of the project in general, the common space would be the circulation including terraces, passages, lifts, and stairs, due to the inclusiveness of these spaces. Because only the inhabitants are authorized to use and

have access to these spaces. All the dwelling units would be considered as the private space including the common toilets and storage. These toilets would also be two types of spaces at a time, as once one is using it neither others can use it, nor it is visible. In addition, some spaces that are used as the service for mechanical functions like the lift or duct shaft would be considered as ambiguous spaces as these are neither accessible nor has any use directly influenced by the user. The terraces can be considered to have the potential to be the adaptable space, as seen in the ihouse dormitory, the terrace can be used as the extension to the common with outdoor seating acting as the privatized public space. The study room placed in separate size and various locations acts good enough for the dwellers in terms of privatizing these spaces. But the common dinning and small kitchen might not be the best solution to be used for collectively for multiple users.

Fig 53: Qualitative Typical Floor or the Common space Analysis of Edmund Hunt Hall & Lady Bird Johnson Hall

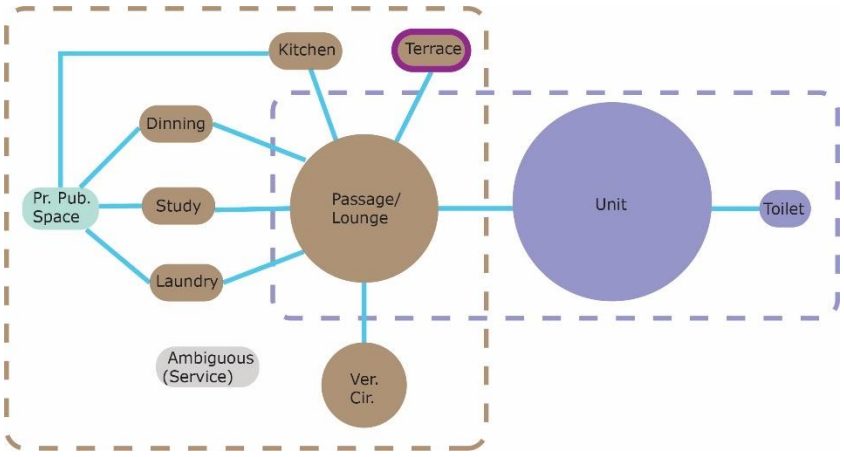


Fig 54: Zoning of typical floor or the common space analysis of Edmund Hunt Hall & Lady Bird Johnson Hall

In terms of Isovist and Connectivity analysis with depthmapX, the typical floor or the common space in this project is redrawn with single line keeping the door as the opening for accessibility. In depthmapX, the grid of 0.7m was used as each unit.

Fig 55: Overlaying qualitative analysis with connectivity analysis of typical floor or the common space of Edmund Hunt Hall & Lady Bird Johnson Hall

Fig 56: Overlaying qualitative analysis with isovist analysis of typical floor or the common space of Edmund Hunt Hall & Lady Bird Johnson Hall

3.1.2.3.1. Findings of Typical Floor or Common Space of Edmund Hunt Hall & Lady Bird Johnson Hall

After overlaying the qualitative analysis along with the isovist and connectivity analysis found from using depthmapX are listed below-

1. The turning point of corridor has more public nature as it connects the two corridors as well as separate them. This termination zone could have some space with public nature acting as the privatized public space for interaction among the users living in nearby units.

2. The space connecting the terrace and common has more public nature.

3. Despite being common, the placement of shared dinning has more private nature in terms of accessibility.

4. Even in the common space, the seating area located at the corner or furthest distance from the main entrance has less accessibility and hence giving it private nature.

5. Stairs are in the least accessible space giving it more private nature, denoting that the vertical circulation would mostly be used while the stairs would be used as fire exit only in terms of emergency.

6. Small, clustered study areas have more privacy, though the one located close to the lift core has more public nature than the rest.

7. The least accessible terrace placed at the furthest corner should act mostly inactive as unlike the main terrace, it does not have any common function like lounge, which could be extended by placing outdoor seating creating privatized public space.

8. The outdoor terrace can be used as privatized public space due to the presence of privatized public space as seating in the lounge or common area adjacent to it.

9. The longest corridor has more public nature comparing to other corridors because of maximum connectivity.

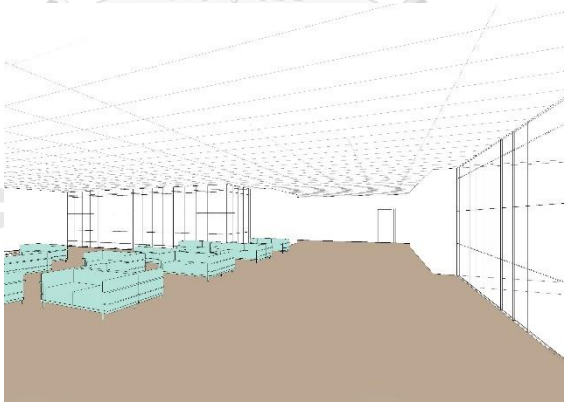
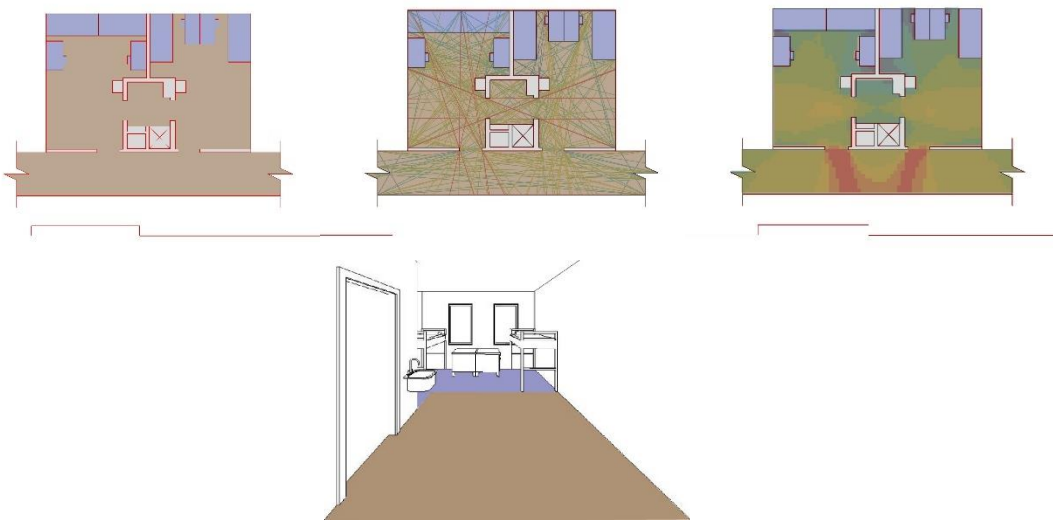


Fig 57: Perspective with privatized public spaces in the typical floor or the common space of Edmund Hunt Hall & Lady Bird Johnson Hall

3.1.2.4 Typical Unit or Private Space of Edmund Hunt Hall & Lady Bird Johnson Hall

Inside the shared typical dwelling unit, the designed unit has two bedrooms with four ideal inhabitants to share a single toilet. The front space is left open to be adapted and used as space that can be modified and personalized as per the will of the inhabitants. From qualitative design, it is seen that the private space including beds, desk is placed at the furthest end of the room from the entrance, while from the space syntax, it is seen that the space at the entrance in the corridor is the most public and then the transitional space from the private to the corridor as this space acts as the buffer to enhance the privacy.

However, from an online evidence found from one of the users that the private space is being modified among the two dwellers sharing the single unit to achieve more privacy. It is seen that the inhabitants re-arranged their beds to be placed in opposite direction to each other to ensure their respective privacy. (Suarez, 2017)



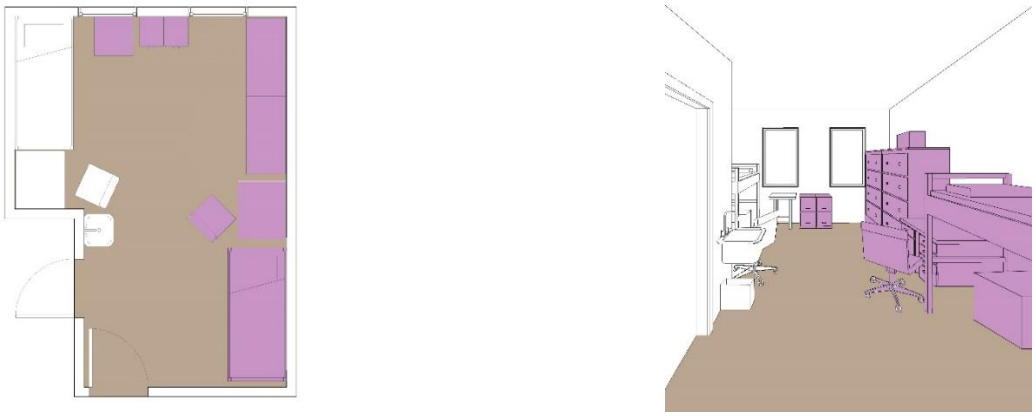


Fig 58: (Top: Left to Right) shows the qualitative analysis of private and common spaces inside the unit, shows the overlaid qualitative analysis with the connectivity analysis in DepthmapX, shows the overlaid qualitative analysis with isovist analysis in DepthmapX, (Middle) shows the perspective of qualitative analysis of the spaces that was initially designed, (Bottom: Left to Right) showing the adaptable plan with re-arrangement of furniture and the perspective of the adaptable modified use (Suarez, 2017)

3.1.3. Campus Hall, University of Southern Denmark by C.F. Moller

This project is in Odense of Denmark and was designed by international Dutch firm C.F. Moller in 2015 for the University of Southern Denmark. With the site area of 13700 sq. m. the project is mainly reputed for the location and the proper utilization of the context in terms of zoning. As the surrounding context is nature and almost empty, the architect designed units at the edge while the shared activities at the center alongside the vertical circulation. According to Moller (2016), 'Each room has a private balcony, which both helps make the homes attractive and has an environmental function. Moving inwards from the private rooms towards the communal kitchen in the center, areas gradually become more and more collective.' Besides, the selection of this project is also done considering the planning arrangements of the project, as it follows the ideal planning

principle provided by Van der Ryn and Silverstein (1967) in the research. Since, the typical units are for only one individual and not shared and hence, it is not considered in the analysis. However, the site, ground floor and typical floor are analyzed initially and then finally with the use of depthmapX.

3.1.3.1. Site Analysis of Campus Hall

From the site analysis, it is seen that the building being private in terms of its accessibility and inclusiveness is located at the corner of two public roads. The other side of the project has publicly accessible departmental store. On the opposite side of the project, where the major road is located has vacant land used as parking and therefore termed as common space. The other side of the project, opposite to the building and on the side of smaller public road has private buildings in terms of accessibility, like commercial offices and residential projects. Sufficient setbacks are designed to ensure maximum privacy for the inhabitants acting as the buffer. However, from the analysis, the blank open spaces can be considered as the urban spaces including left over space, undefined space, conspicuous space, visible private space, private open space, private public space, external private space.

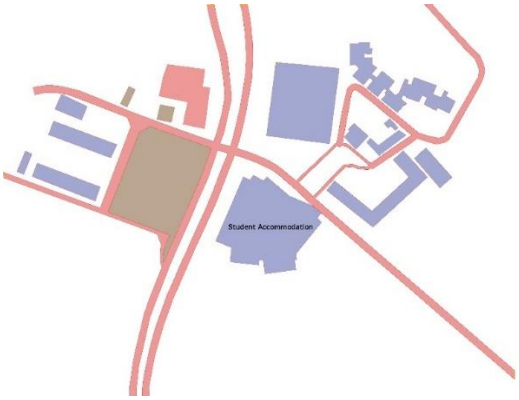


Fig 59: Qualitative site analysis of Campus Hall

3.1.3.2. Ground Floor or Public Space of Campus Hall

On the ground floor, from the qualitative analysis, it is seen that the most public space is the plaza that is open to everyone but is defined with the change of levels from the outside roads. Even in this plaza, there is privatized public space, which are the outdoor seating and parking. The common space, where only the inhabitants are authorized to use are defined with three entrances. The private space being toilets and beds are located from the furthest distance from the main road. The parking and dinning or lounge as are facing the plaza and thus the main streets. The vertical circulation at the center creates an enclosure for this common space to promote and define their privacy. The terrace attached to the shared dwelling units are more private and acts as the common between the inhabitants in terms of accessibility and inclusiveness.

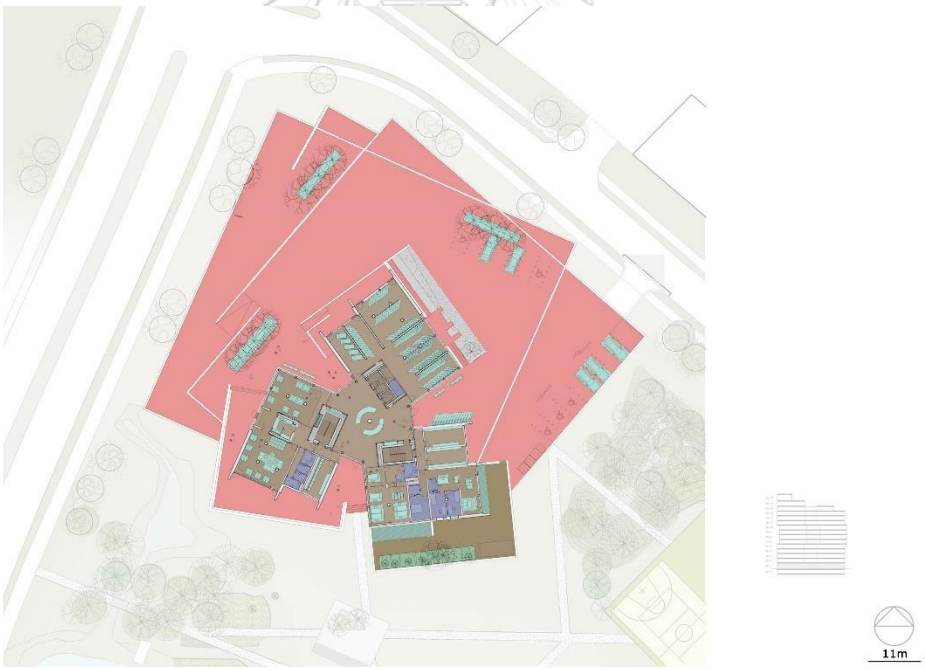


Fig 60: Qualitative ground floor or the public space analysis of Campus Hall

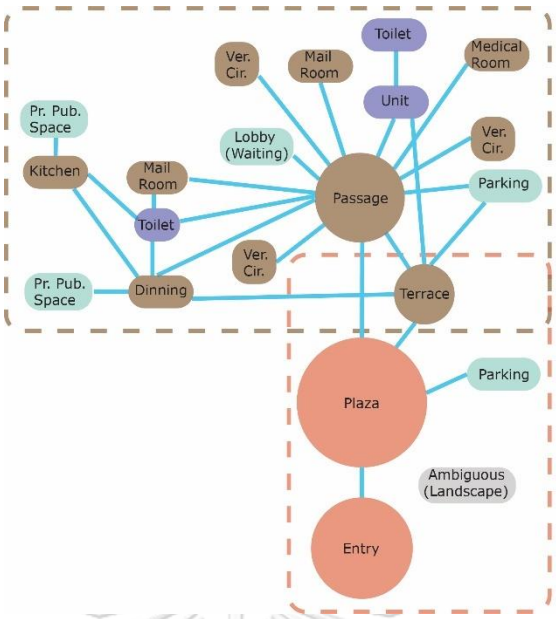


Fig 61: Zoning of ground floor or the public space analysis of Campus Hall

In terms of Isovist and Connectivity analysis with depthmapX, the ground floor or the public space in this project is redrawn with single line keeping the door as the opening for accessibility. In depthmapX, the grid of 1m was used as each unit.

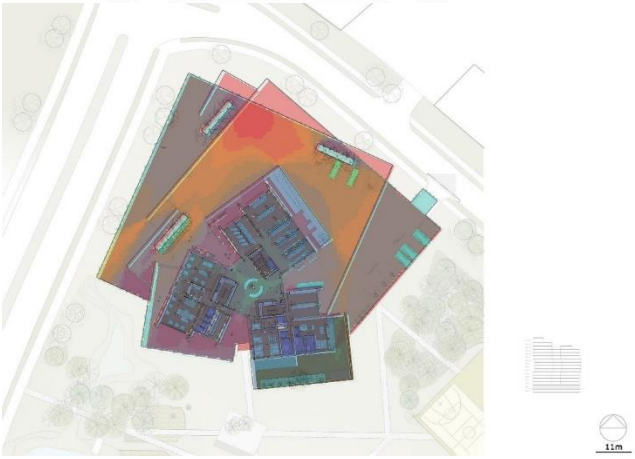


Fig 62: Overlaying qualitative ground floor or the public space with the connectivity analysis from DepthmapX of Campus Hall

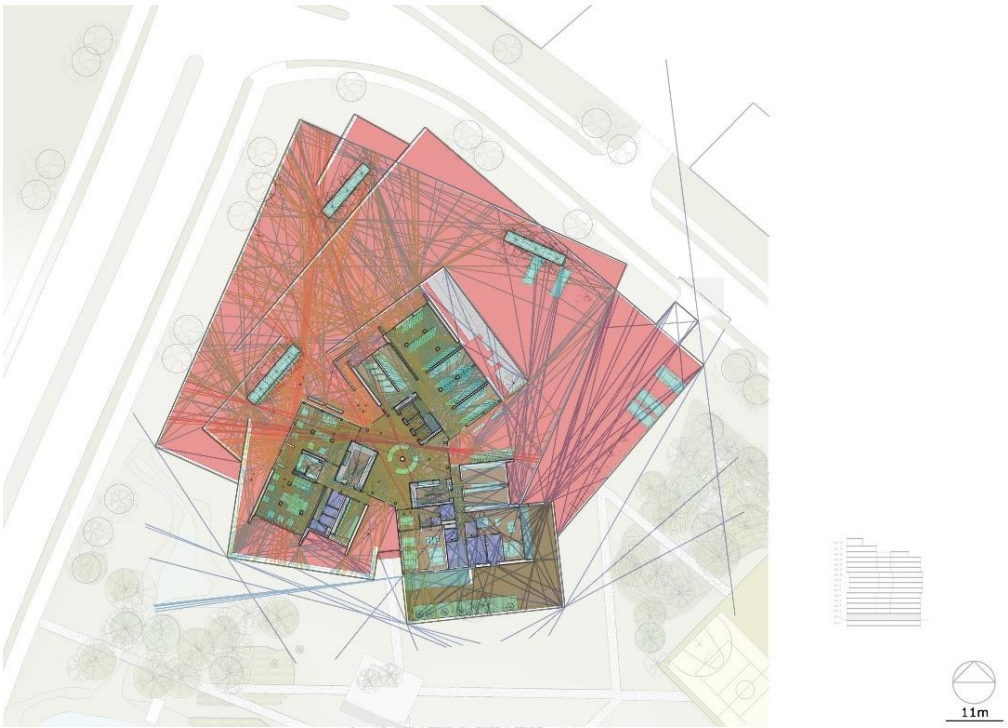


Fig 63: Overlaying qualitative ground floor or the public space with the isovist analysis from DepthmapX of Campus Hall

3.1.3.2.1. Findings of Ground Floor or the Public space Analysis of Campus Hall

After overlaying the qualitative analysis along with the isovist and connectivity analysis found from using depthmapX are listed below-

1. The most public space from the connectivity analysis can be said is in the plaza, the space which is empty of any enclosure or any seating to be the privatized public space.

2. The outdoor parking space are placed in separate locations with trees for shading and seating. These acts as the privatized public space, despite being public space in terms of accessibility in general.

3. The space inside the common space adjacent to the entrance can be considered to have more public nature as it connects the plaza from outside to the common inside.

4. The dinning and lounge are placed with less accessibility with having terrace as the opportunities to be extended with outdoor seating making it privatized public space.

5. The space created by the enclosure of outdoor landscape elements in the plaza has created a private space in terms of accessibility as evident from isovist analysis. This space has the potential to be used as the privatized public space as it is less accessible.

6. The door of each spaces creates separation among themselves. But, as seen in the plan, when they are aligned diagonally creates the public nature from the inside of each of these different spaces. These arguments are evidence from the research.

7. The entrance shows more private nature due to its placement, which is adjacent to the private space inside this ground floor.

3.1.3.3 Typical Floor or Common Space of Campus Hall

In the typical floor or the common space in terms of the student housing in general, the common space would be the circulation including lounge, kitchen, dining, terraces, passages, lifts, and stairs, due to the inclusiveness of these spaces. Because only the inhabitants are authorized to use and have access to these spaces. Following the derived definitions, all the dwelling units would be considered as the private space including the common toilets and storage. The toilets would be considered as to be two types of spaces at a time, as once one is using it neither others can use it, nor it is visible and accessible. These characteristics are like the ihouse dormitory. In addition, some spaces that are used as the service for mechanical functions like the lift or duct shaft would be considered as ambiguous spaces as these are neither accessible nor has any use directly influenced by the user. The small terraces can be considered to have the potential to be the adaptable space, as also seen in the ihouse dormitory, the terrace can be used as the extension to the common lounge with outdoor seating acting as the privatized public space. The lack of common study room can be considered as a backdrop of this project. But the common dinning and clustered kitchen might be good solution to be used for limited users.

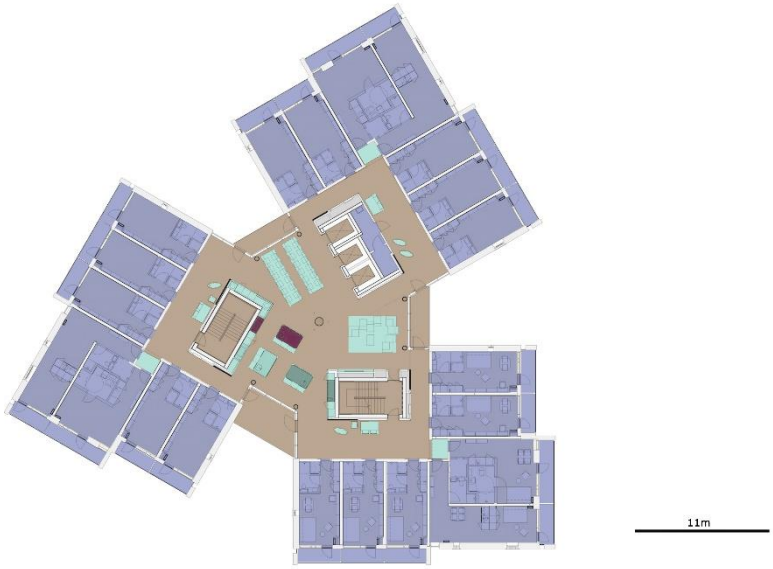


Fig 64: Qualitative typical floor or the common space analysis of Campus Hall

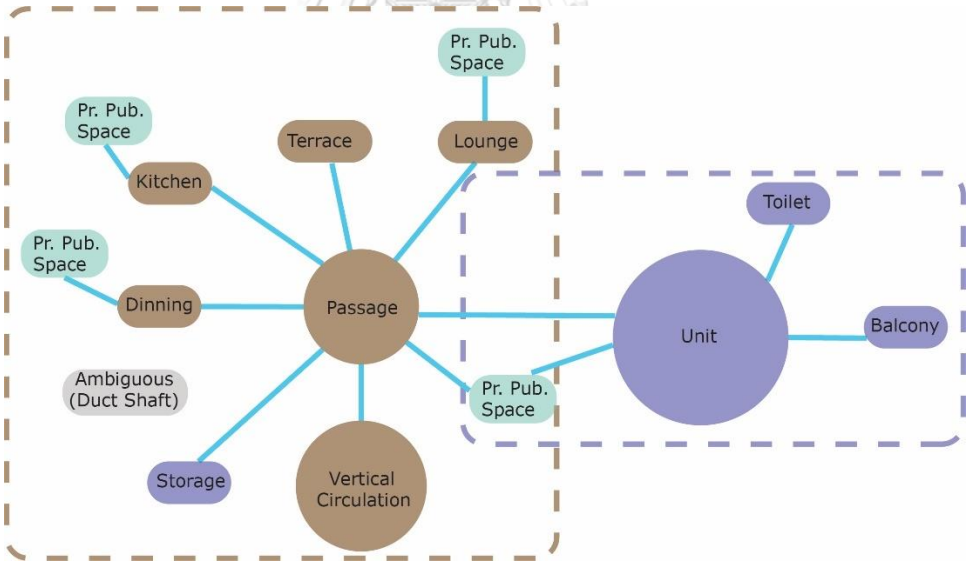


Fig 65: Zoning of typical floor or the common space analysis of Campus Hall

In terms of Isovist and Connectivity analysis with depthmapX, the typical floor or the common space in this project is redrawn with single line keeping the door as the opening for accessibility. In depthmapX, the grid of 1m was used as each unit.

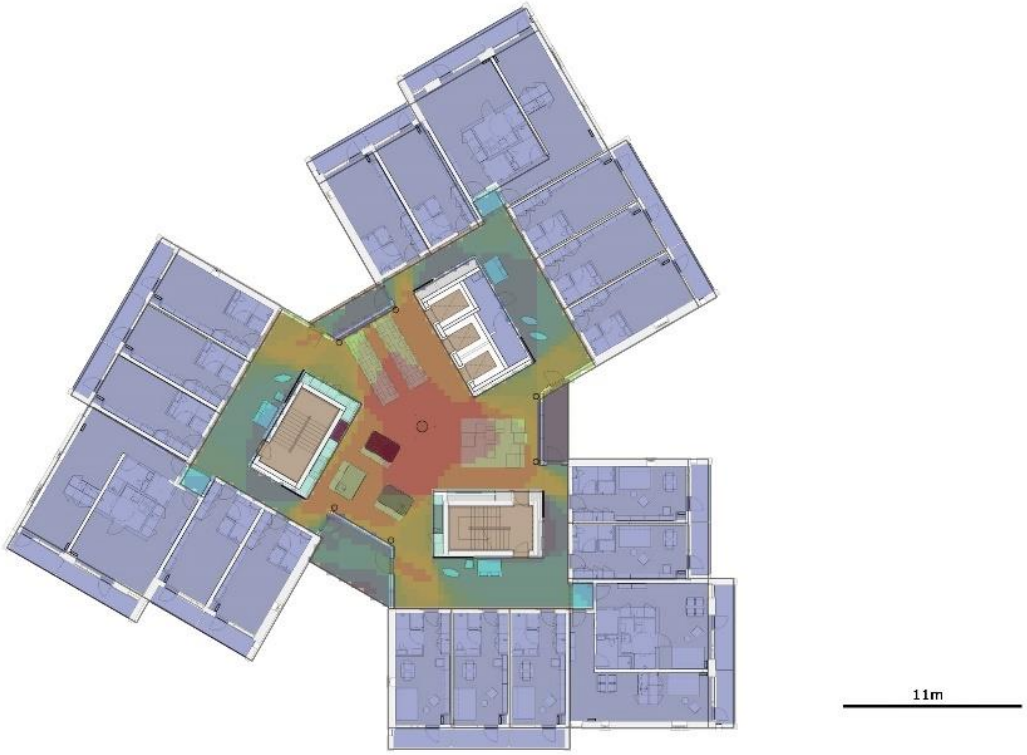


Fig 66: Overlaying qualitative analysis with connectivity analysis of typical floor or the common space of Campus Hall.

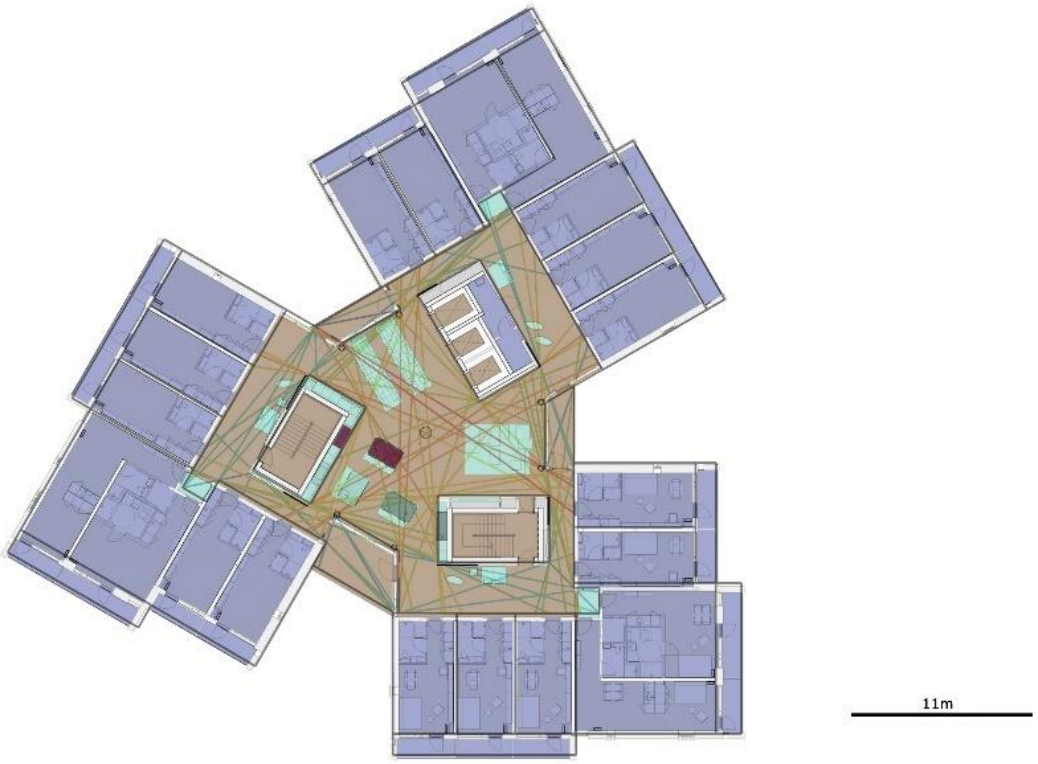


Fig 67: Overlaying qualitative analysis with isovist analysis of typical floor or the common space of Campus Hall.

3.1.3.3.1. Findings of Typical Floor or Common Space of Campus Hall

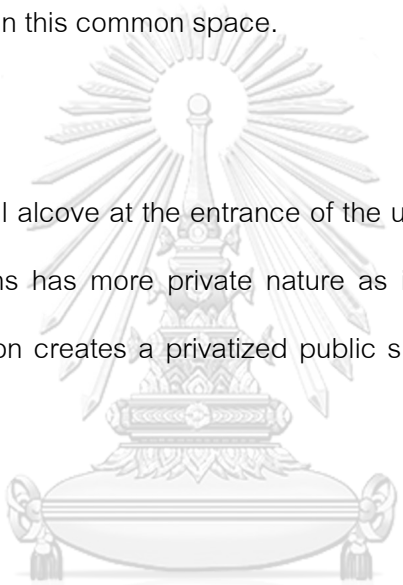
After overlaying the qualitative analysis along with the isovist and connectivity analysis found from using depthmapX are listed below-

1. The small terraces acts as the common space in general. However, the smaller the size of it brings more private nature of that terrace. This terrace can also become adaptable space when the seating of the lounge is extended to this place to create a privatized public space. This phenomenon is like previous cases. However, due to presence of multi doors the circulation is fluid and has more public nature.

2. From the connectivity analysis, it is seen that the more public nature of the common spaces is towards the center where the dinning and lounge are placed.

3. The space in front of the units are less accessible as it is buffered by the vertical circulation and creates obstacles in terms of both physical and visual access from the center. The small study spaces present here creates a more private nature of the privatized public space in this common space.

4. The presence of small alcove at the entrance of the units which are designed for the especially abled persons has more private nature as it is situated at the end of the passage. This termination creates a privatized public space nature for the dwellers of those units.



5. The clustered kitchen placed in between the two lift cores are less public comparing to the dinning and lounge inside this common space. Thus, this privatized public space created by the clustered kitchen has more privacy than the other spaces inside this single common space.

6. From the isovist analysis, it is seen that the entrance to the units adjacent to the passage inside the common space has created more privacy for the users of the units in terms of accessibility.

In the shared dinning space, it is seen that the small group of figures are enjoying their meal together by sitting next to each other. This denotes a good potential of bonding and interaction among these user groups. This phenomenon is made possible due to restricting the number of users of the dinning space and the common space as well. Although, apart from these factors, in general, the common space lacks the presence of cafe or stores as expected, this case can be acceptable due to presence of limited number of users in this whole floor.

Fig 68: (Left) Photographic evidence of privatized public space in the common area of the typical floor or common space in the student housing & (Right) privatized public spaces in the common spaces of the Campus Hall (Moller, 2016)

3.1.3.4. Section Analysis of Campus Hall

Fig 69: Section analysis of Campus Hall

In terms of vertical arrangement of the spaces, due to the limitation of the use of depthmapX as quantitative method, the analysis can be conducted only using the qualitative method. This phenomenon is like the ihouse dormitory analysis. Here the analysis is done following the building scale as derived in the scope of the study. The ground floor has the public spaces as the plaza, terrace, and café due to the inclusiveness and accessibility of the space. On the ground floor the lobby with vertical circulation acts as the means of connection as well as separation between the floors. Some pocket spaces acting as the privatized public spaces are also seen to enhance the privacy of the adjacent spaces.

In the typical floor the presence of lobby also enhances the privacy for the dwelling units, whereas the dwelling units are placed on the outer sides of the mass to ensure maximum utilization of the view and ventilation.

3.2 Local Case

3.2.1. CU iHouse, Chulalongkorn University

This is the only existing student housing of Chulalongkorn University that is to be followed to design similar project. This project is mainly used by both local and international students. The architects of this project are Humanist Co. Ltd. The site, ground floor, common floor and the typical units are analyzed initially to find the spaces in terms of function and as per the derived definition. Then the isovist and connectivity analysis of ground floor, common floor and typical units are analyzed using depthmapX. The results are further analyzed by overlaying the qualitative analysis with the analysis found from depthmapX to find out the spatial organization of the public, common, privatized public, and private spaces in each of these spaces.

3.2.1.1 Site Analysis of CU iHouse

From the qualitative site analysis, it is seen that the project is located at the corner of two roads owned by the University. The building is facing the campus and has CU Terrace as the other condominium adjacent to it inside the same compound. The buffer between the two buildings is made by a departmental store in between them on the ground floor. While the neighborhood has various common spaces in terms of accessibility which are parking, public (government buildings), shophouses (public in the street level), a public

park, private residential areas (mostly on the inner side of the shophouses), Suang-Luang Square, Restaurants. Due to the presence of many affordable restaurants in the neighborhood, it can be considered that kitchen is something not mandatory for student housing in Bangkok. As eating outside to these local restaurants are in the habit of the students. From the analysis, the blank open spaces can be considered as the urban spaces including left over space, undefined space, conspicuous space, visible private space, private public space, private open space, external private space.

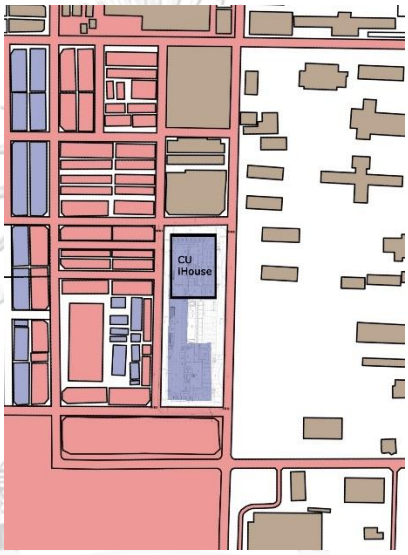


Fig 70: Qualitative site analysis of CU iHouse

3.2.1.2 Ground Floor or Public Space of CU iHouse

On the ground floor of CU ihouse, it is seen that the public spaces are the drop off areas, shops, and plaza. The privatized public spaces are present adjacent to these public spaces and enclosed by the landscape elements which are defined as the ambiguous spaces as these are neither accessible nor has any specific use. These ambiguous spaces are mostly used to create buffer between public to privatized space.

From the pilot interview done with the inhabitants, some spaces were also identified which are used the most by the inhabitants. (Zak, 2020) Besides, the common spaces include the lobby, lifts, stairs, lounge, parking driveway, mail room as these are accessible by the inhabitants only often has restricted access with a door. The private spaces are the toilets, service spaces, offices. The privatized public spaces are the seating both indoor and outdoor and parking. The presence of departmental stores is a good feature in this ground floor which was expected. Since, the ground floor includes the CU terrace and CU ihouse, this analysis is considered only the part that contains the CU ihouse.

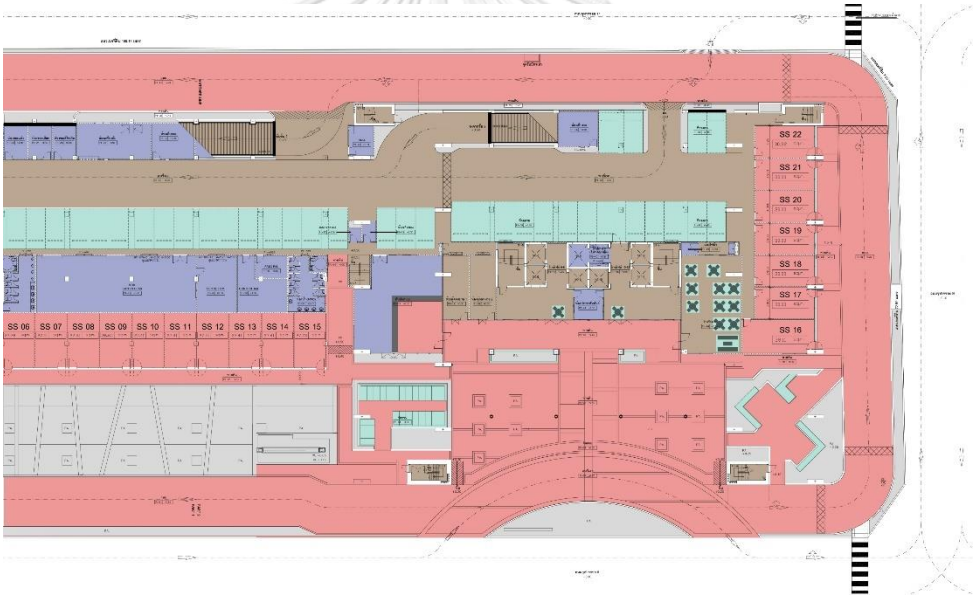


Fig 71: Qualitative ground floor or public space analysis of CU iHouse

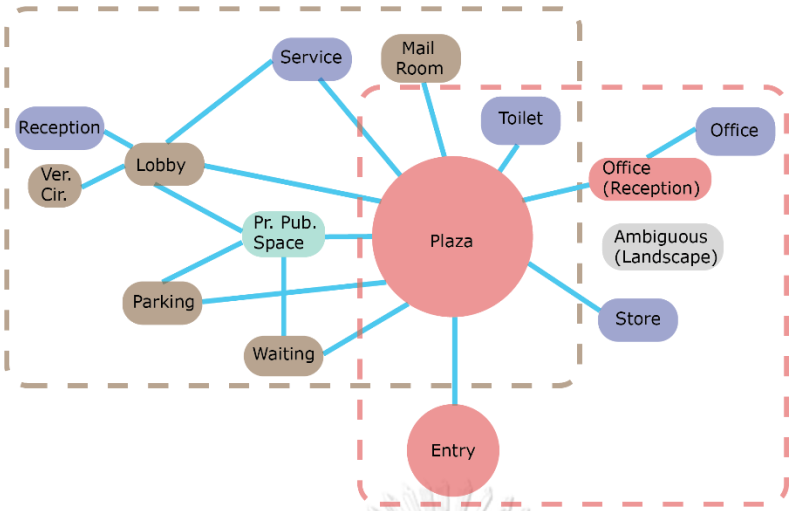


Fig 72: Zoning of ground floor or public space analysis & program ratio of CU iHouse

However, in terms of Isovist and Connectivity analysis with depthmapX, the ground floor or the public space in this project is redrawn with single line keeping the door as the opening for accessibility. In depthmapX, the grid of 0.600 m was used as each unit.

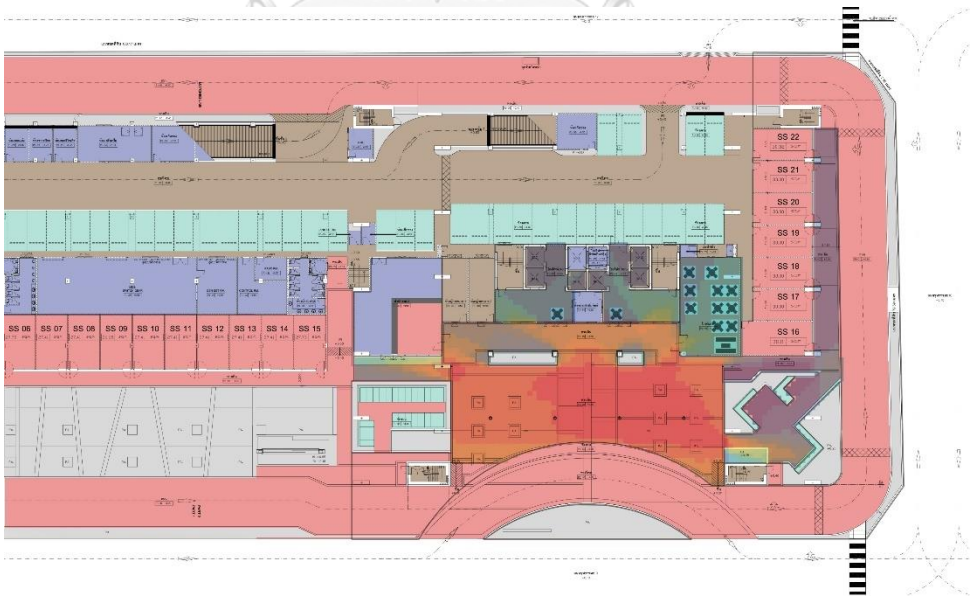


Fig 73: Overlaying qualitative ground floor or the public space with the connectivity analysis from DepthmapX of CU iHouse

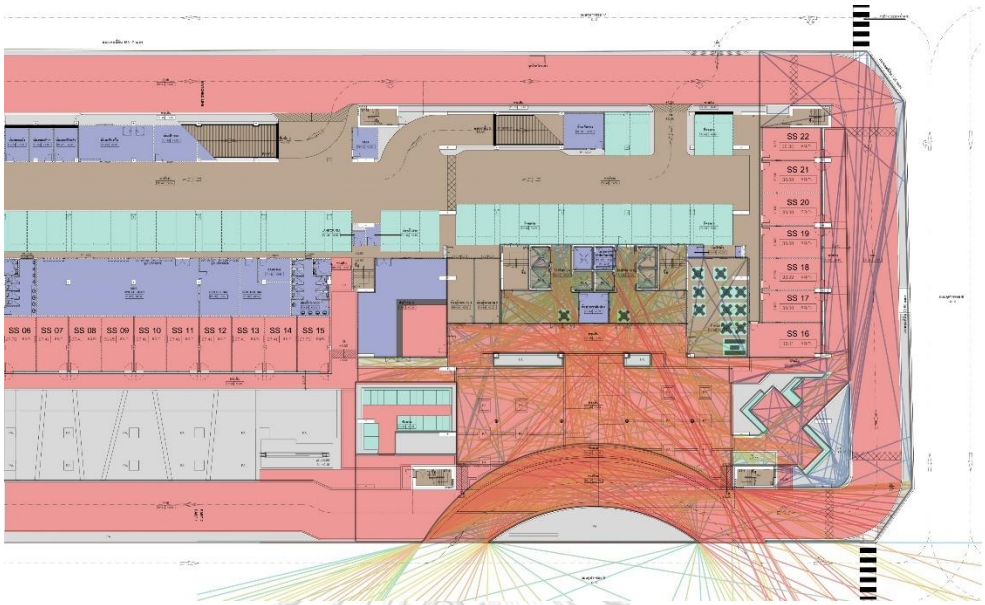


Fig 74: Overlaying qualitative ground floor or the public space with the isovist analysis from DepthmapX of CU iHouse

3.2.1.2.1. Findings of Ground Floor or Public Space of CU iHouse

After overlaying the qualitative analysis along with the isovist and connectivity analysis found from using depthmapX are listed below-

1. The placement of lift lobby has private characteristics as it is placed far from the main entrance or road and enclosed by the door, despite having transparent wall making it visible from outside. Though from the isovist analysis, this lobby entrance has created certain level of publicness to this space due to the placement of lobby which is facing directly to the plaza and public space and without any privatized public space as obstacle.

2. Due to the presence enclosure created by only one door as both the point of departure and arrival, each lift acts as the private space.

3. The privatized public space which is created by the outdoor seating and landscape as ambiguous spaces has certain amount of privacy due to the placement of this space, despite being easily accessible from public space or the plaza of entrance. It is often preferred by the inhabitants.

4. The waiting lounge has private characteristics as it is placed with an enclosure created by the presence of only one door from the plaza or public space. However, the privacy increases along with the depth of the room as it is less accessible and placement of entrance to this lounge at the corner of one side and not facing the whole lounge.

5. The outdoor privatized public space in terms of seating adjacent to the entrance is buffered by landscape elements as ambiguous space. There is a slight change of level from the plaza to this space. It is often preferred by the inhabitants. The corner of this privatized public space which is adjacent to the circulation is not preferred by the inhabitants as it hampers one's sense of privacy as the back of the person seating here has less ambiguous space as buffer. The privatized public space which is facing the entrance of the lobby are also used by the inhabitants as one can wait here for one's friend expected to come out from the lift lobby entrance, which is directly visible from here.

6. From the connectivity analysis, a part of the plaza can be considered as the most public space as it is the most connected space in this ground floor.

7. The space used by the inhabitants in the plaza has certain level of privacy as it is adjacent to the landscape elements acting as ambiguous space.

8. From isovist analysis, the drop-off is seen to be most accessible and thus making it more public than the plaza.

Fig 75: Privatized public spaces with landscape elements as ambiguous spaces to create buffer on the ground floor or public space of CU iHouse.

3.2.1.3 Community Floor (5th Floor) or Common Space of CU iHouse

In the common space of CU ihouse in terms of the student housing in general, the common space would be the spaces including circulation, shared study, shared

kitchen, shared dinning, terraces, passages, lifts, laundry, and stairs, due to the inclusiveness of these spaces. Because only the inhabitants are authorized to use and have access to these spaces and thus there are no public space in this common space or the community floor from the derived definitions. The toilets would be considered as private spaces as well as two types of spaces at a time, as once one is using it neither others can use it, nor it is visible and accessible. In addition, some spaces that are used as the service for mechanical functions like the lift or duct shaft would be considered as ambiguous spaces as these are neither accessible nor has any use directly influenced by the user. The ambiguous spaces would also include the landscape elements mostly used to promote the privacy of privatized public spaces and used as the buffer between two spaces. The multipurpose hall or extra study room are often left unused. Hence, despite being inaccessible it can be considered as the privatized public space. From the pilot interview done with the inhabitants, some spaces were also identified which are used the most by the inhabitants. (Zak, 2020) These spaces are mostly privatized public space inside the common space.

Fig 76: Qualitative common space analysis of CU iHouse

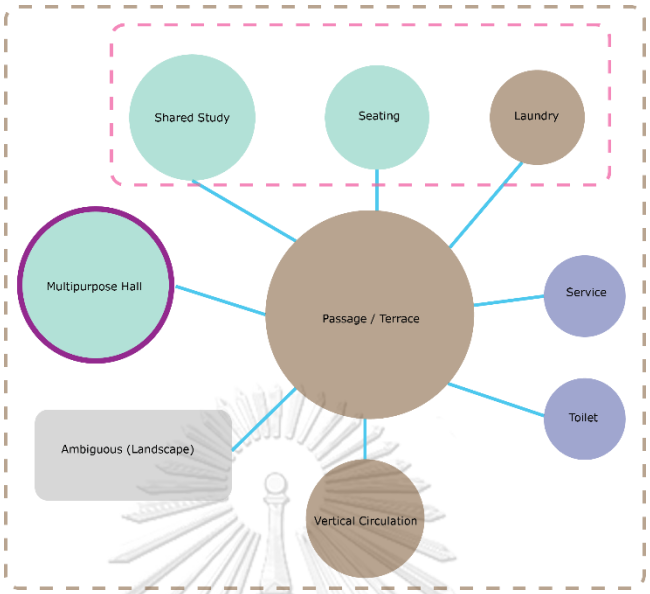


Fig 77: Zoning of common space analysis of CU iHouse

Besides, in terms of Isovist and Connectivity analysis with depthmapX, the community floor or the common space in this project is redrawn with single line keeping the door as the opening for accessibility. In depthmapX, the grid of 0.500 m was used as each unit.

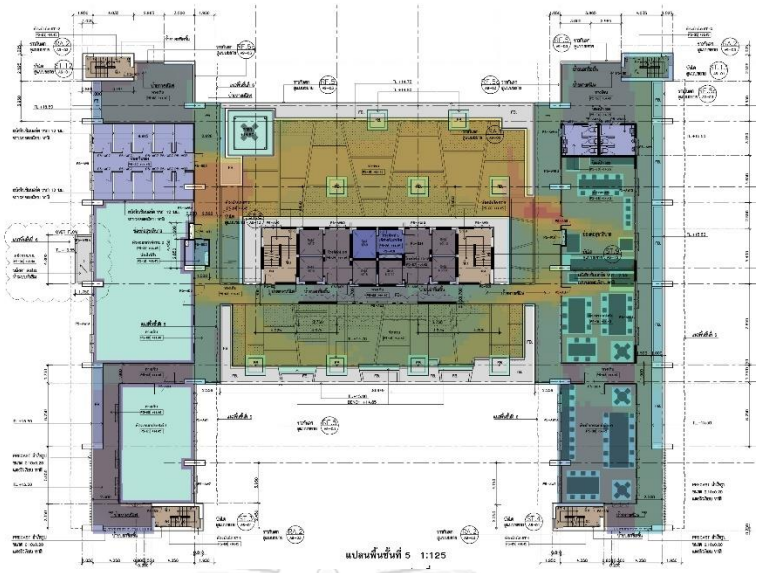


Fig 78: Overlaying qualitative common space with the connectivity analysis from DepthmapX of CU iHouse

Fig 79: Overlaying qualitative common space with the isovist analysis from DepthmapX of CU iHouse

3.2.1.3.1. Findings of Typical Floor or Common Space of CU iHouse

After overlaying the qualitative analysis along with the isovist and connectivity analysis found from using depthmapX are listed below-

1. As the multi-purpose hall is left unused, less accessibility is seen in these zones creating a privacy nature here. The space at the corner of the multi-purpose or extra study space connecting the stair are least accessible due to inactive of the main function adjacent to it.

2. The location of common toilet are placed in less accessible areas, often at the corner of the whole space, giving it privacy in terms of characteristics.

3. Although the vertical circulation acts as the main access to this common space, the enclosure around it has created a private nature.

4. The space that connects the shared laundry and kitchen with the outdoor terrace has more public nature in terms of accessibility as seen from the connectivity analysis.

5. The privatized public spaces preferred to be used by the inhabitants has more private nature, sometimes defined with the change of levels, buffered, or enclosed with the ambiguous spaces, or simply placed to the farthest space, when inside a single enclosure with only one door as both the point of arrival and departure.

6. Inside the common study, a level of privacy is seen. The more accessible spaces are near the entrance and thus making it more public. No privatized public spaces are found near it.

7. The denoted space in the outdoor terrace acts as less accessible as found from the isovist analysis. As it is located further from the nearby passage or privatized public space.

8. The denoted privatized public space is less accessible as found from isovist analysis and hence more private in nature. However, it is also less preferred by the inhabitants as it is far from the nearby accessible spaces like study or laundry.

9. Being placed at the center, from the isovist analysis, the corridor adjacent to the main vertical circulation acts as the most public space in this common space, as it connects the two wings.

10. From the isovist analysis, it can also be said that the more public nature is on the side of the most active functions like the laundry or study spaces.

11. The outdoor space adjacent to the study space is less accessible and hence more private. Since, it is adjacent to the study space, an outdoor extension of this study space could potentially be created to transform it into an adaptable study space for more privacy.

Fig 80: Privatized public spaces with landscape elements as ambiguous spaces to create buffer in the common space of CU iHouse.

Fig 81: Privatized public space with enclosure and change of levels in the common space of CU iHouse.

3.2.1.4 Typical Unit or Private Space of CU iHouse

In the typical dwelling units of CU ihouse, the noise is buffered by placing all the furniture along the edge of the walls. However, from the pilot interview, it is seen that the noise is still problematic inside these dwelling spaces. (Zak, 2020) Besides, all the circulation space inside these dwelling units can be termed as the common space as it is accessible by both the inhabitants sharing the room. Besides, by limiting persons sharing the unit, can increase the interaction and bonding between the two roommates. But the beds are placed next to each other and buffered with only a small bed-side table. Thus, it eventually lacks visual privacy and provides less options for personalizing once space to secure more privacy. However, the toilets are private in nature, despite being common in terms of accessibility by both the inhabitants sharing the room. The bed and study desk, despite being visible by the other is private when one is the using it, making it both private and privatized public space at the same time.

Besides, in terms of DepthmapX analysis, the furniture is drawn to create obstacles to generate isovist and connectivity analysis. The corridor is drawn in scale to denote as the public space compared to the entry and the spaces inside the unit. The grid of 0.100 meter as each unit in depthmapX.

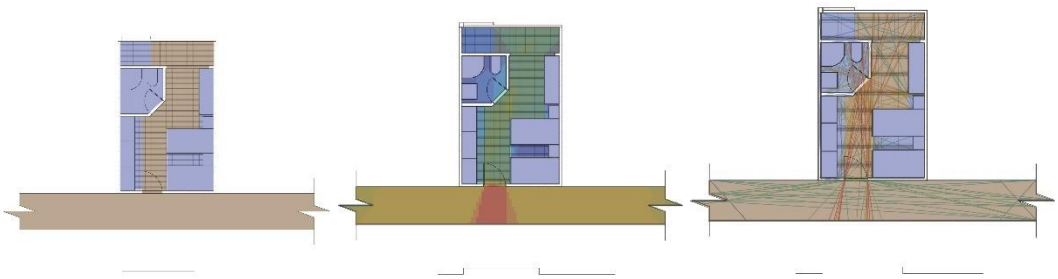


Fig 82: (Left-Right) showing the qualitative analysis of typical dwelling unit, showing overlaid qualitative analysis with the connectivity analysis and showing overlaid

qualitative analysis with the isovist analysis from DepthmapX of dwelling units of CU iHouse.

3.2.1.4.1 Findings of Typical Unit or Private Space Analysis of CU iHouse

From the qualitative and overlaying it with isovist and connectivity analysis, it is seen that the corridor adjacent to the unit acts as the most public space despite being common in terms of inclusiveness. From the isovist analysis, the central circulation space connecting the corridor and common circulation space inside the unit has more public character. The privacy is seen at the corner of the balcony in terms of accessibility from the main entrance and having only one door to as both the point of arrival and departure to this balcony. The study space has private nature as it is positioned in an off-center location from the main circulation due to the placement of toilet. The space in between the two beds in the connectivity analysis shows private nature as wells as the toilet. Whereas the most public space in terms of connectivity and accessibility are the space in front of each dwelling units.

In the case analysis of this research, following the scope of the various scales to be studied, all the cases are analyzed with the ground floor as public space, typical floor as common space and the typical units as the private space. The analysis is done following the derived definitions as qualitative methods. Then quantitative analysis with the space syntax is used to create comparison of the qualitative analysis. Then, the relationships between public and private spaces can be derived following the findings of the analysis.

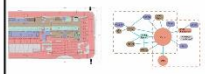
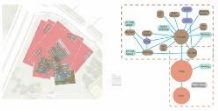
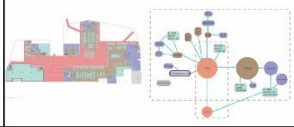
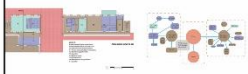
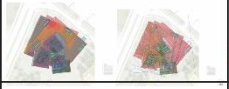
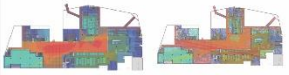
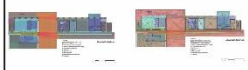
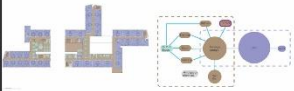
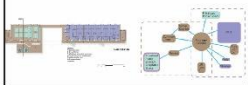
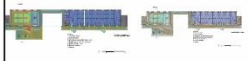
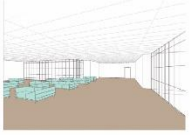
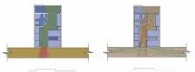
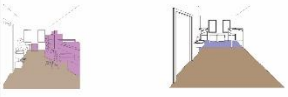
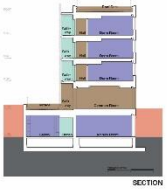
	Types of Analysis	Local Case	International Case		
		CU ihouse	Campus Hall	Edmund Hunt Hall & Lady Bird Johnson Hall	iHouse Dormitory
Space in Context	Site Analysis				
Public Space	Qualitative Analysis & Zoning				
	Qualitative & Quantitative Analysis				
	Characteristics				
Common Space	Qualitative Analysis & Zoning				
	Qualitative & Quantitative Analysis				
	Characteristics				
Private Space	Qualitative Analysis & Zoning				
	Qualitative & Quantitative Analysis				
	Characteristics				
Section					

Table 5: Table with all the analysis of the case studies

From the table consisting of all the case analysis, it is evident that the most public spaces or most connected spaces are in the plaza which has the highest levels of connectivity or accessibility. Through this most public space, the rest of the spaces with less accessibility are connected. And thus, no privatized public spaces are seen in this most public or connected spaces with highest levels of accessibility. So, privatized public spaces are found in the less connected or accessible spaces which is often adjacent to this most public space. This privatized public space also varies due to the presence of the scale. And often buffer is used to increase the privacy of these privatized public space, often seen with the change of levels, or using landscape elements.

Chapter 4

Relationships between Public & Private Space in Student Housing

In the student housing, the balance between public and private means the connection between these two opposite realms. Here relationship between public and private spaces are identified by having a balance between them. In terms of the relationships between public and private spaces, it is evident that there is the existence of several in-between spaces like common space, adaptable space, and private space. Although, this balance cannot be identified with the quantitative methods like the ideal ratio of the public to private spaces. Because of the versatile nature of the space, meaning a space can have both private and public qualities depending on the use of the space. Sometimes, these in-between spaces like the common space plays a transitional role to enhance the privacy of one space. On the other hand, the publicness of the space that is connected or separated by these transitional spaces are also increased.

From the literature reviews and findings from the case studies, 5 categories of relationships are derived for the student housing in terms of public and private spaces. These categories would be used to design the proposal for student housing. The derived relationships are described below-

1. Public and private space coincide together

As per the derived definition, it can be said that public and private space remains together as the primary aspect of their relationship. Besides, along with public and private space, the common space, privatized public space and sometimes adaptable spaces are also found in both the public and private spaces inside the student housing. These spaces are evident from the case studies.

2. Buffer creates transition in the in-between spaces

From the case analysis, it is evident that the use of buffer creates a transitional space in the in-between spaces that increases the levels of privacy or publicness. A buffer may or may not be spaces, besides, it can also be architectural elements like walls or means of separation for two different spaces in terms of the uses. For example, private space or the units can be separated from the corridor by only walls. On the other hand, a lift core can be separated from the corridor with the presence of a lift lobby.

3. Levels of publicness or privacy are prevalent in the spaces

From the analysis of space syntax of the case studies, it can be concluded that, each of the spaces has levels or gradation of being publicness to being more private nature. Depending on the accessibility, the spaces that are easily accessed are tends to be more public in character than the ones which are less accessed. This phenomenon can also be considered as one of the relationships between public and private space in the student housing.

4. Multiple definition can be implied to a single space depending on the use

From the case studies, it is evident that, a single space can be termed as multiple space as per the derived definitions inside the student housing. For example, in terms of accessibility, a common toilet in the common space is accessible by all the inhabitants dwelling on that floor. But, by the nature of use, a toilet is expected to be private. Again, when one is using the toilet for certain amount of time, it is neither visible nor accessible by others. This phenomenon is the ultimate situation of privatizing a public space.

5. Adaptability depending on the use also defines the public or private nature of space

Lastly, one of the most important relationships of public and private spaces can be considered as the adaptable spaces. It is seen that the adaptable spaces have multiple use depending on the user's need. However, sometimes a space that is defined with multiple definitions can be transformed into adaptable space. For example, the multi-purpose hall or the event space on the ground floor or the plaza of the public space are supposed to be accessible by everyone and hence public. Then by nature of use and inclusiveness, when the event is happening, it should restrict the access for invited users and, hence becoming privatized public space. Again, by the nature of multi-purpose hall, this single space is supposed to hold various types of functions in terms of use and hence becomes adaptable. However, it is not to be confused to all the spaces that have multiple definitions. The spaces which are being adapted in terms of use only by adding an extra space in terms of definition can be called as adaptable. But not all the spaces that have multiple definition with a single use. For example, the extension of privatized public space in common or public space can be called as adaptable. But not the space that is privatized public and common at the same time.

Mainly adaptable spaces can be classified again into three categories, where the first two are more temporary while the third one is more permanent. These categories are-

1. Adaptable in terms of multiple use that is a single space can be used as various types of functions. For example, a multipurpose hall.

2. Adapted in terms of extension of functions. For example, a privatized public space in terms of seating can be extended to the nearby terrace, when an enclosed common holds the clustered privatized public spaces adjacent to the terrace.

3. Adaptable in terms of modified use. For example, the ball pit at Simmons Hall, which was initially designed to be the meditation space and has been transformed into the ball pit. And not likely to be used as meditation space again.

However, in terms of the characteristics of privatized public spaces in the student housing, it can be narrowed down into three features. These are-

1. Privatized public space would be the space which is occupied by someone, and others cannot access it or not willing to access it

2. Privatized public space would be visible but not accessible by others once it is in use

3. Privatized public space would be accessible but belongs to someone's territory and thus others would not access it unnecessary

4. Privatized public space is often found to be in less accessible spaces

Besides, ambiguous spaces are the spaces found while analyzing the cases and was not included in the derived definition. Here, ambiguous Spaces would be the spaces that does not fall under the derived definition and have no direct access or use. For example,

1. Service Spaces. For example, lift shaft.

2. Landscapes used for Buffer between Public & Private

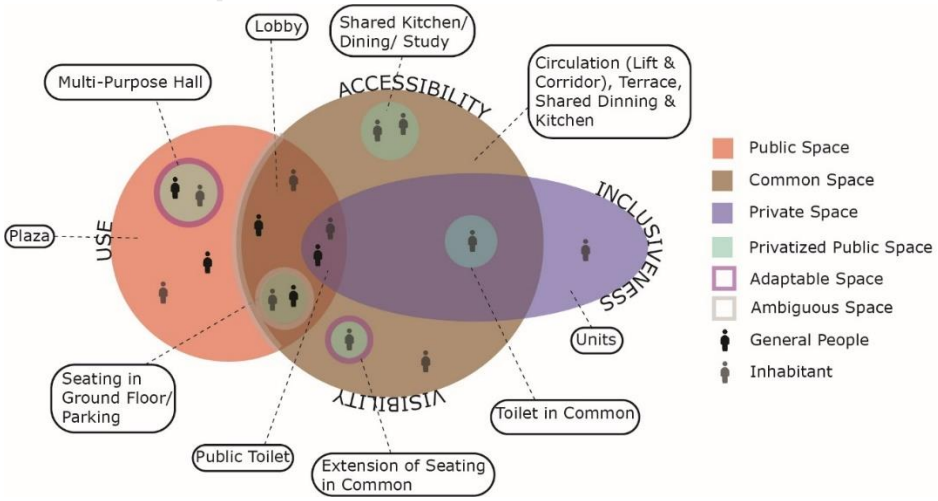


Fig 83: Relationships between public & private spaces in student housing

Chapter 5

Design Proposal

This chapter includes the proposed design project that is designed following the research conclusion. Here the information about the project and selected site are discussed in relation to the issues of privacy and publicness along with the ideologies of the client-PMCU and the University authority. The ideas and main concept behind the proposed student housing design would be addressed along with the design proposal following the findings from the research and case analysis on the relationships between public, private and in-between spaces.

5.1. Project Information

5.1.1. Project Title

This project is expected to be the student housing to accommodate both the local and international students of Chulalongkorn University. At present, only CU ihouse owned and operated by PMCU serves such purpose. The upcoming similar project is in the Plot A of Block-33, which is taken as a reference for the program. Hence, this project can be titled as 'CU ihouse 3.0', as it is designed to be the next version of CU ihouse soon.

5.1.2. Project Background

Under the master plan of Chulalongkorn University, PMCU has planned for providing housing solutions both to the students and the inhabitants of the city. One of such

potential sites is taken under consideration to design a student housing which will both benefit the PMCU economically as well as serve the need of accommodating students at the University as it is inside the University territory. The project is also expected to be beneficial for the local inhabitants who lives nearby the site and the city dwellers as well. Besides, the issues of interaction, noise, and the need of privacy among the students dwelling inside the student housing are also to be addressed in this project in terms of relationships between the public and private spaces.

5.1.3. Proposed Site Information

- Total Site Area of Block 43 - 19,300 sq.m. approx. (From initial feasibility study by PMCU, the total development area is 75,450 sq.m.)

- FAR (Floor Area Ratio) - 7 (Suan Luang – Sam Yan zone)

- OSR (Open Space Ratio) - 4.5 (Suan Luang – Sam Yan zone)

- Site Set Back – 6 m (From the center of the adjacent public road to the edge of the proposed building)

- Total Site Area for Block 43 after Set Back - 16,311 sq.m. approx.

- Total Block 43 Maximum Gross Floor Area - 135,100 sq.m. approx. (From initial feasibility study by PMCU, the development area includes - 4,832 sq.m. Retail, 28, 250 sq.m. Residential and 19, 328 sq.m. office)

- Open Space Required for Block 43 - 6, 080 sq.m. approx.

- Maximum Height - 1200m (Being 600 m from Rama 1, the nearby major public road)

- Proposed Total Site Area for the Project of Student Housing - 6,236 sq.m. approx. (Considering the proposed site on the Northeast corner of Block 43, enclosed by Soi 1, 5, 16 and 18)

[Reference: Ministerial Reg. 55-19, 55-20, 55-21, 55-22; map.longdo.com; cpd.bangkok.go.th:90]

5.1.4. Laws & Regulations

- Minimum Corridor Width - 1.5 m

- Minimum Unit Size - 20 sq.m.

- Minimum Bedroom Area - 8 sq.m. with 2.5m as min. width

- Minimum Floor to Floor Height for Living, Corridor, Kitchen - 2.6 m

- Minimum Floor to Floor Height for Balcony - 2.2 m

- Minimum Floor to Floor Height for Toilet - 2 m

- Maximum Distance between two fire stairs - 60 m

- Maximum Distance from the end of the building to fire exit - 12m

- Fire Stair Lobby - 6 sq.m. pressurized area

- Parking Area for Each Car - 2.4 m x 6 m

[Reference: Ministerial Reg. 7(2537)-2(3),3(1)(A), 33-22, 55-19, 55-20, 55-21, 55-22]

5.1.5. Proposed Program of the Student Housing

Referring to Block 33, the number of cars required for the whole Block 43, required area of the retails on the ground floor, students to be accommodated and the number of units are derived.

- Total number of proposed units are 1597 units (Of which 20 sq.m. units are 1334 and 30 sq.m. units are 263)

- Total area of proposed units 34, 570 sq.m. (Of which 20 sq.m. unit types are 26, 680 sq.m. and 30 sq.m. unit types are 7, 890 sq.m.)

- Total number of proposed users to be accommodated are 3193 students

- Total number of proposed retails on the ground floor 886 sq.m.

- Total number of required parking are 865 cars (minimum for the whole Block 43)

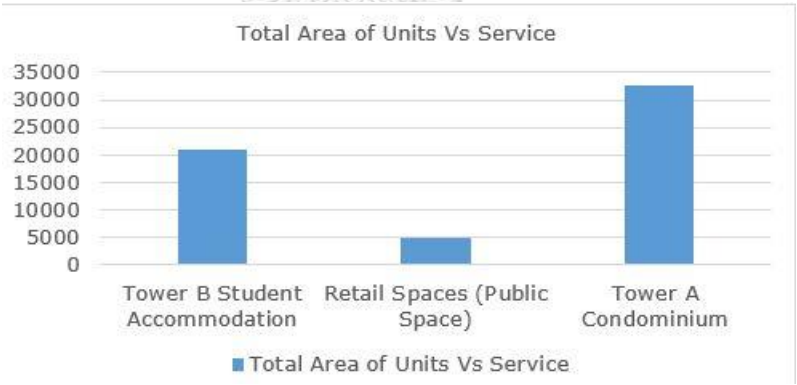


Fig 84: Ratio of total area of units and service spaces of Block 33 Plot A

However, since this student housing project is for the students at the university, the university authority should take initiative on ensuring the comfortable lifestyle for the students to compete with other international universities. Unlike the commercial projects,

spacious community spaces are to be provided for various activities which will eventually promote social interaction among the students. The welfare of the students should be the prime concern for this project.

Besides, as evident from the existing CU ihouse, the community floor has the vending machine from the departmental chain store with fresh foods for the students. Besides, the laundry room has coin operated washing and drying machines. As seen from the nearby co-working spaces like SamYan Co-Op, even the shared study spaces can be rented for group or individual study that will have more comfortable study spaces. All these spaces can be rented out partially to support the maintenance cost. And therefore, all these shared spaces can be considered partially in the saleable areas.

5.1.6. Design Objectives

- To accommodate both international and local students of Chulalongkorn University

- To design spaces as per the derived relationships between public and private spaces

- To provide sufficient privacy as well as views for each student

- To provide spaces for interaction among the inhabitants

- To provide adaptable spaces in terms of various use

- To provide necessary amenities required by the inhabitants

- To provide public spaces that are economically beneficial for both the authority and local inhabitants

5.2. Site Information

5.2.1. Site Brief

The block 43 site is enclosed by Banthat Thong Road, Soi Chula 16, 5 and 20. It is identified as Block 43 under zone C as per Chula masterplan. This is under high density commercial and residential area in the Bangkok city, under zone C-3. From the masterplan of Chulalongkorn University development areas, this Block 43 is under zone C, which is expected to be Campus life, Innovative and Hospitality zone. The proposed Block-33 which is under the same zone. However, since PMCU has no detail plan on having a student housing on this Block 43 yet, by taking reference from the proposal on Block 33 of the same zone in the masterplan, the block is proposed to have student housing as the residential project. From the feasibility study conducted by PMCU, Block 43 is expected to have retail, residential and office program. Since, Block 43 is a single site as per the deed done with CU and Govt. the master plan must include all these three types of function to get the permission from Govt. authority.

So, referring to Block 33, on the side of the Chula centenary park, it is expected to be the commercial zones with lower building height than the housing on the adjacent plot. Whereas the proposed student housing is expected to be on the north side of the Block 43 apart from the park due to its building height and to allow maximum vista to both the commercial and residential users.

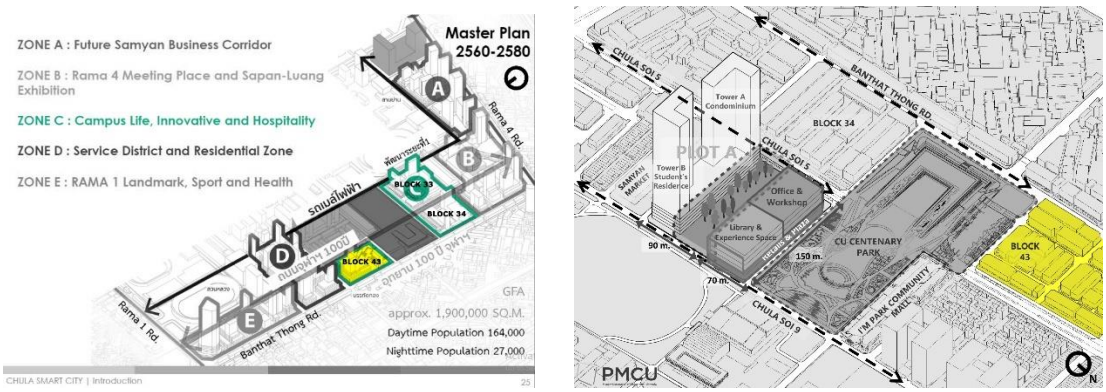


Fig 85: (Left) diagram provided by PMCU shows the site Block 43 is under Zone C of master plan & (Right) Block 33 concept by PMCU, showing commercial zones are towards the CU Centenary Park

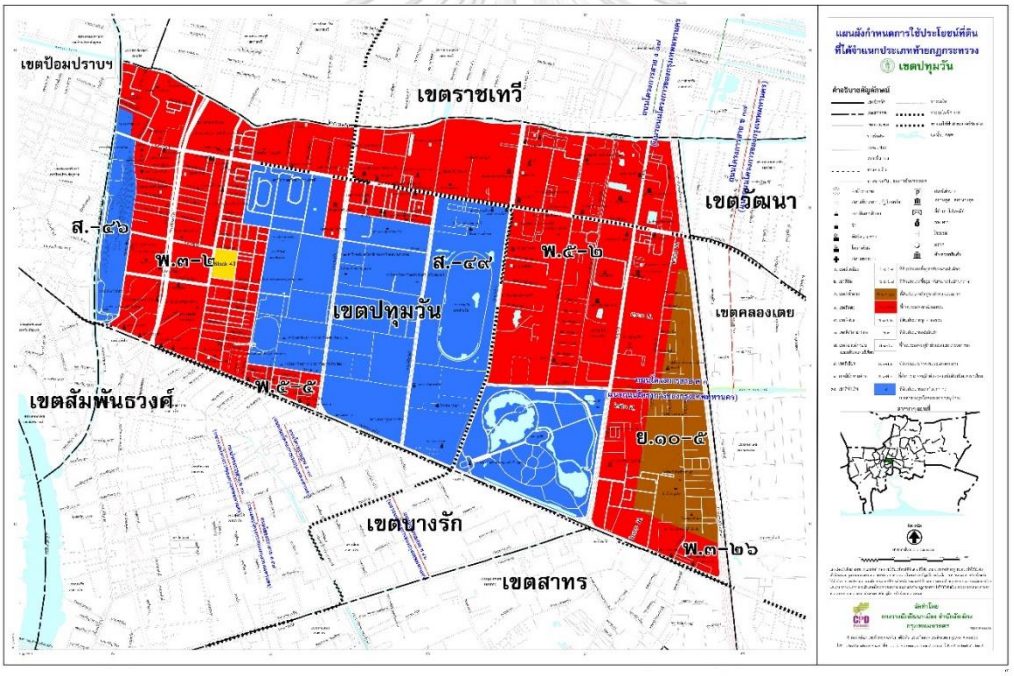


Fig 86: with yellow as site, red zone showing the high density commercial and residential area owned by the Chulalongkorn University (Source: http://cpd.bangkok.go.th:90/web2/DISTRICT_CPD/1007.pdf)

5.2.2. Site Selection Criteria

Referring to the location of CU ihouse and the proposed student housing at Block 33, it is seen that both the project is located at the corner of two intersecting roads to get maximum accessibility. While CU ihouse is located with the Soi 16 and 9, the proposed student housing at Block 33 is with the Soi 9 and 32. Besides, both projects are located towards the University campus and away from the Banthat Thong Road. As it is also on the side of most accessible from the University and at the same time least accessible from the public Banthat Thong Road and thus more public in terms of accessibility. Hence, the site for the proposed 'CU ihouse 3.0' is considered at the corner plot of Block 43, created by the Soi 16 and 5. The proposed site is taken considering the existing roads with the rectangular enclosure created by Soi 1, 16, 5 and Soi 18.

However, referring to the concept generated by PMCU, it is expected that the residential infrastructure would be placed on the North side of the Blocks as the South is facing the CU Centenary Park. This proposed site is rectangular in shape and elongated to North-South. The newly designed dragon town resides on the west side of the plot with maximum building height up to 5-storey. To buffer between the public and private, the commercial or the public and the residential or the private will have a common space, which will be the open space kept for the use of the users from both the site. On the east of the plot, enclosed by Soi 1, 16 and Banthat Thong Road is also expected to be part of the commercial plot as referred to the proposed design at Plot A of Block 33, that will also create the buffer between the public access from Banthat Thong Road to the proposed student housing.

Fig 87: Proposed site for student housing

5.2.3. Site Analysis

In the city of Bangkok public open space is scarce. Although Chula has provided CU centenary park and hence the site demands a public open space to maintain the flow of the public open space inside the urban fabric. As it will eventually provide mobility, and safe for the environment and living which are the goals of this masterplan by PMCU. On the other hand, the Banthat thong road creates a publicness character for the Chulalongkorn university territory. This can create a need of buffer to make the building facing towards the university campus. That will ensure sufficient daylight and ventilation for the inhabitants.

In the site the existing access in between shophouses has already created a mobility and means of access for the users, which could be preserved. Again, the privatized public space or the temporary vendors create an identity and character of this area as well as the city. The presence of this group makes the availability of food that is helpful for the student's busy schedule as well as its affordable. But the current situation is not hygienic enough which can further be improved with the design.

5.2.4. Existing Site with Images

The proposed site for the project 'CU ihouse 2.0' is located by the enclosure created by Soi 1, 16, 5 & 18. The existing site consists of shophouses with mostly restaurants, laundry, barber shops, garages, and grocery stores. Each of the small alleys are being privatized by extension of household activities like kitchen, storage, landscape, or parking. The Soi 3, especially from the entrance from Soi 16 remains active with local activities. Several vendors are found to be selling foods from their carts. This characteristic of the site is important to keep as it will increase the opportunities for the inhabitants to have affordable foods at the public space of the project. Besides, by keeping the existing circulations in the public space of the project, which are the small alleys and being used as privatized public space, would also help to respect the existing daily life pattern of the current site inhabitants. The presence of Chao Pu Thao Kong Shrine on the East of the site in the dragon town which is located at the transition of Soi 5 & 18 brings a cultural and religious dimension to the site and should be maintained with clear vista from the Banthat Thong Road from the west of the site.

Fig 88: (1) shows the plan of the proposed site with the locations of the photos, (2) shows the height of dragon town on the west of site, (3&4) shows the existing corner of Soi 5 & 16 with vendors, (5&6) shows vendors at the entrance of Soi 3 from Soi 16, (7) shows the privatized public space or parking on the Soi 1, (8) shows the privatized small alleys from Soi 1 towards site, (9) shows the privatized small alleys from Soi 18 towards site, (10) shows the extension of vendors and food stalls at Soi 3

5.2.5. Site in Urban Context

The selected site Block 43 is located inside Chulalongkorn University territory. In the urban context, it is seen that more public open spaces are to be found inside this area. The urban grains are more organized in grid pattern, while the areas surrounding are denser with random organizations of traditional shophouses. Along with three large stadiums, the University area holds the Chula Centenary Park as the largest open space. Having Chula Centenary Park on the South is a strength to the Block 43 site because of natural ventilation. And the proposed student housing tower should not block this flow of natural ventilation to the future developments in the North.

Access to Site from nearby public transportation are as follows-

- Sam Yan MRT to Block 43 is 1.6 km, 20 min walk

- National Stadium BTS to Block 33 is 1.1 km, 14 min walk

Fig 89: [Before] diagrams showing site in urban context with access from nearby public transportations and proposed parking spots for Chula bus by PMCU & [Top] collage of surrounding site images

5.2.6. Wind & Temperature Analysis

The exact coordinate of the Block 43 site is 13.74°N 100.52°E. The wind rose diagram generated by Meteoblue shows that the maximum wind is generated from the South and South-East to the site. Meteoblue is a free platform for the users to generate climate and weather analysis of any location. It was started from 2007 and analyze with the historical data collected since 1985 till present of any respective location. Therefore, the proposed

building demands consideration of opening or wind channel on these regions to ensure comfort of the inhabitants of the building.

The average temperature of the site remains around 30 to 35 degrees Celsius throughout the year. Hence, natural ventilation and utilizing the natural wind flow can help to reduce the interior temperature of the typical units. The maximum precipitation is in the month of September. These heavy rainy days can be utilized to make a better living environment for the inhabitants.

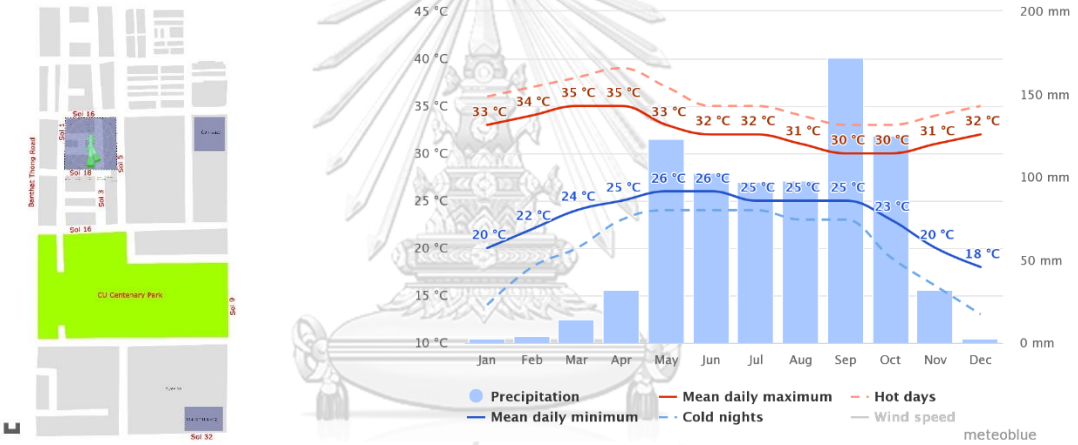


Fig 90: Wind rose diagram generated by Meteo blue (Source: https://www.meteoblue.com/en/weather/historyclimate/climatemod¬elled/13.742N100.523E) & Average Temperature and Precipitation by month on the Site, Block 43 (Source: https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/13.742N100.523E)

5.3. Proposed Design

The proposed design is conducted based on several scheme. At first the pros and cons of the initial design ideas were found and then they were combined to propose the final scheme including the pros of the initial schemes.

5.3.1. Initial Design Scheme – 1

In the initial design scheme 1, the existing site masses which are the shophouses are extruded vertically to match the program requirements. Since, the extrusion does not fit the context the masses are further re-arranged from the North-West corner of the site. Since Banthat thong road, the public road is located on the west of the site, this arrangement creates a buffer for the Chulalongkorn university area from the other public areas. This re-arrangement also provides open spaces for the public which is enclosed and faced towards the shrine located on the Southeast corner just opposite to the site. This open space can also be used as the extension of the shrine activities inside the site of the student housing.

Then the masses are simplified with North South and East West direction as elongated rectangular masses to ensure maximum ventilation from the South. The simplified masses are then mirrored to create prominent buffer from the West, the public Banthat thong road. After that vertical circulation as well as corridors are added.

Pros & Cons:

In terms of the benefits of this scheme, three separate cores as well as towers are created representing the clustered common space for the users to maximize socialization among the users. Green spaces are also maximized on the terraces of the masses. Central courtyard is created by the enclosed towers for the public. Each volume gets privatized public spaces and common spaces.

However, the negative aspect of this scheme can be considered as the use of single load corridors, that increases the number of floors, as a result, the building is much higher when sits in the nearby Highrise building in the urban context. The use of single load corridor can also affect the upper floors taking more time to reach. The bigger volumes can gain more sunlight and becomes warmer during the summer days. And lastly, the central courtyard might not act as an ideal courtyard due to lack of enclosure.

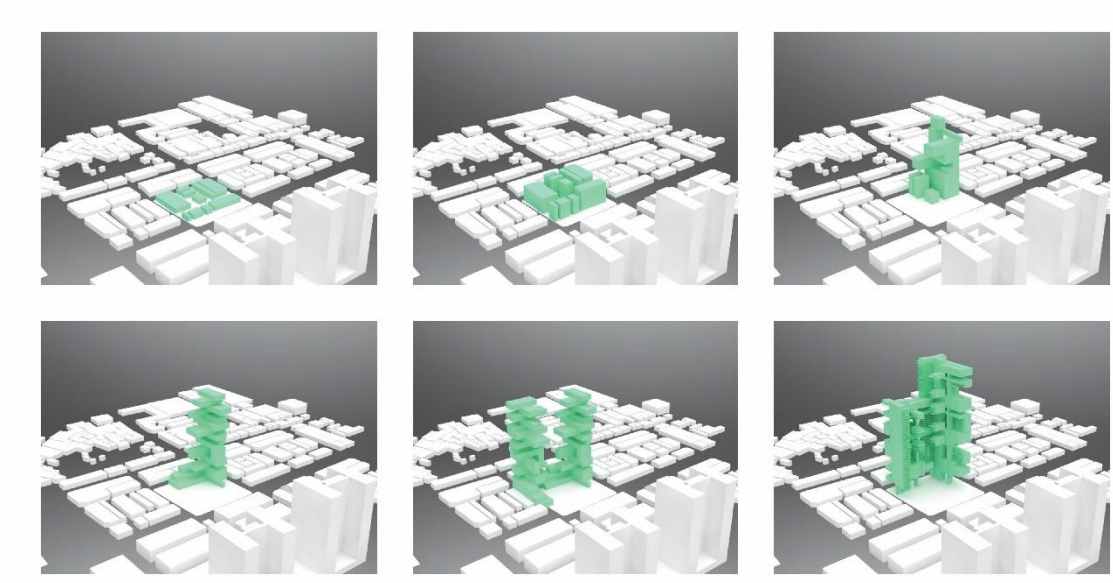


Fig 91: Initial design scheme - 1

Moreover, considering all these pros and cons the second scheme for this design project is generated.

5.3.2. Initial Design Scheme – 2

A courtyard form is taken for the building which sits on the context. To create buffer from the North-West corner of the plot, and to face the building towards Chula, the corner is extruded while the South-East corner of the volume is lowered to open towards Chula. Then public access is provided to create entrance form the South-East corner of the plot that is opposite to the existing Shrine in the dragon town.

Pros & Cons:

In terms of the benefits of this scheme, the central core courtyard gives a perfect sense of enclosure with the defined entrance that faces the shrine in the dragon town. The use of double load corridor solves the issue of maximizing the number of units per floor. But this scheme has blocked the North-West completely due to the presence of opaque triangular volume. The mass also demands urban windows for visual connection from nearby sites with future construction and for the natural airflow.

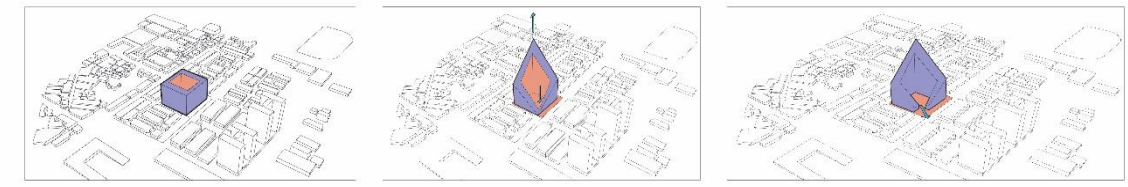


Fig 92: Initial design scheme - 2

5.3.3. Final Design Scheme

The final design scheme is the combination of the initial design schemes that tries to address the pros of the previous two schemes and at the same time avoids the cons of them. Here courtyard form is taken with the public space inside. Then the form is pulled up towards North-West corner and pulled down on the South-East to ensure vista towards low height building in Chula territory. Then the South-East is left open as the plaza that faces the shrine, creating the entrance for public to the mass. The ground floor masses are provided with a generous height matching the height of the nearby shophouses, the parking mass is placed on top of the ground floor mass to create buffer from the public in the plaza to the private spaces on top, which are the units. The plaza is also allowed to go vertically up of the terraces of parking mass, creating a common space for the inhabitants and the public with some shared functions.

The reason for selecting some of the important design features of this scheme are discussed below-

• Urban Windows:

The use of urban windows in the mass solves the issue of opaqueness of the mass. The main use of urban windows or openings inside the mass can be justified by two major aspects. The primary aspect includes the natural airflow and daylight along with the view for the residents to the cityscape. And the secondary aspects deal with allowing the provisions for the air and light to flow to the nearby adjacent plots for their future constructions. Besides, it also acts as the common space for the adjacent units.

• Courtyard Form:

Courtyards is an ideal form to enhance publicness or privacy of the spaces. It usually depends on the perspective of which the courtyard is being addressed as. For example, when the courtyard is considered as the common space for the inhabitants and public, the building or the units acts as the buffer from the neighborhood context, despite being private in nature. Again, when the courtyard is considered private by allowing accessibility to the inhabitants only, the mass or the units acts as the buffer between the neighborhood and the courtyard.

However, the dilemma appears, when the site is public along with the neighborhood and courtyard is common with the mass as the buffer, as the common needs an opening to connect with the outside. This issue is solved by opening the courtyard on a corner, so that it can act as both common and public with the change of levels.

• Irregular edge of the mass:

In the urban context of Bangkok, the irregular skyline is considered as the identity of this city due to the presence of different scales of buildings ranging from high-rises to linear low-rise shophouses. This characteristic is represented well enough in the Mahanakhon tower, as the interconnected public terraces represents this horizontal characteristic of the city vertically. However, unlike Mahanakhon, the ground of this project opened towards the shrine and is expected to work as the users are already separated.

• Form Derivation from Urban Scale

To generate the massing, both the context and reference from the research are taken under consideration. At first existing site with shophouse masses along with the existing access are stacked vertically to match the program requirement. Then void is added at the center of the mass, as well as the mass from the southeast is extruded. This will allow the flow of green from the CU centenary park to the site and then the proposed mass. Besides, it will also ensure natural daylight and ventilation along with the view towards low rise urban structure present in the Chula territory. From the research, it is seen that the courtyard form creates a public space while the dwellings are separated by a transitional space in between the courtyard to the rooms. Here in the urban perspective, the void, or the courtyard acts as the transitional space to ensure privacy to the dwelling units from the surroundings.

Further the irregular edge of the Bangkok skyline is incorporated on the edge of the mass. Urban windows are also added to follow the irregular edges. These will allow the opportunities of creating the space for interaction. Besides, the inhabitants dwelling in the units prevalent in the inside will also get sufficient natural light and air. Furthermore, these openings will allow the natural airflow, light as well as view for the future construction in the nearby adjacent site for future constructions. Since, from the research findings, it is known that better to have these scattered shared spaces than a single shared space for all the inhabitants.

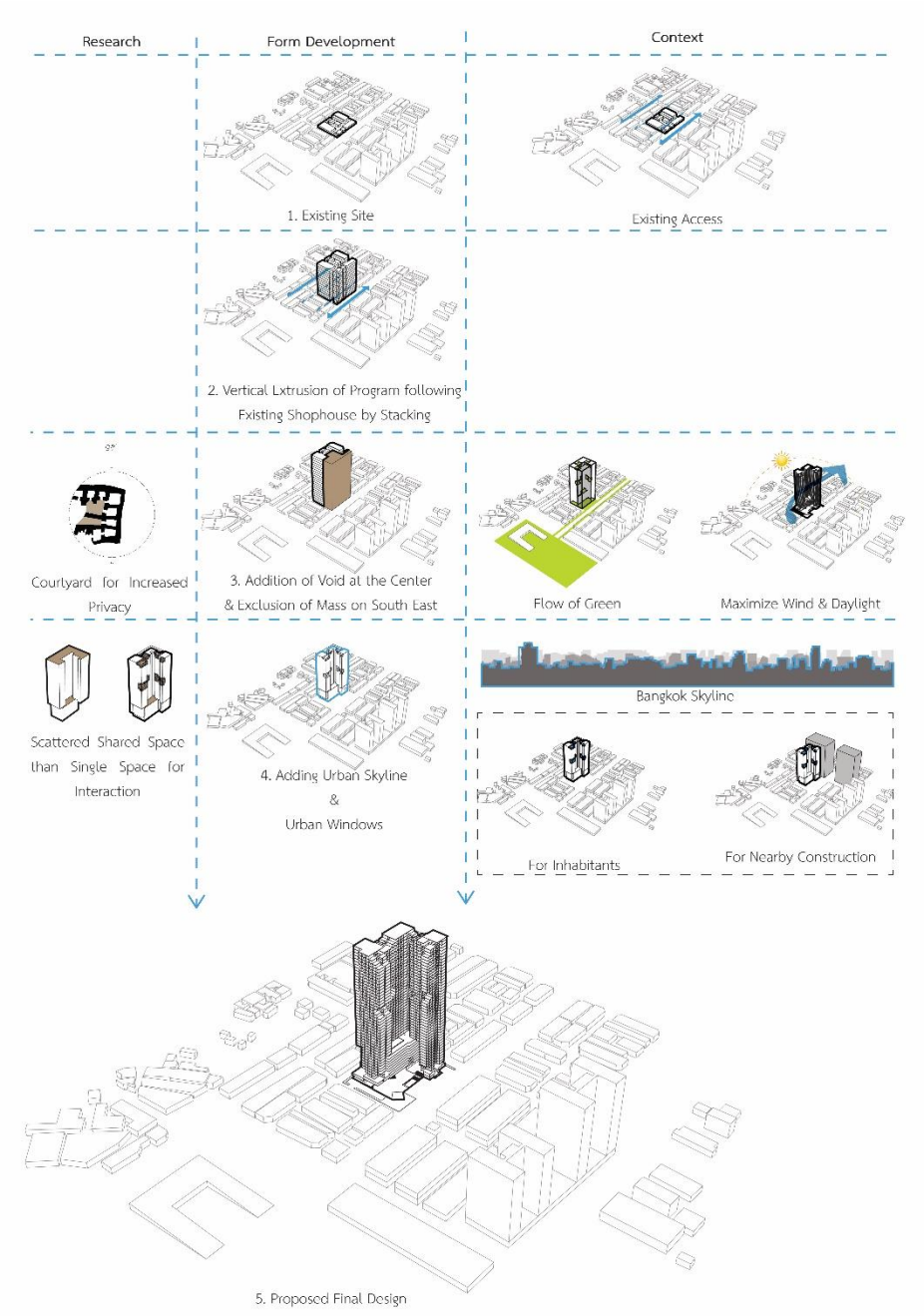


Fig 93: Form derivation for the proposed student housing

• Double-Load Corridor:

In the housing design of Bangkok, it is seen in several projects that the use of double load corridor is used mainly to allocate maximum number of units per floor. Besides, since each unit has balcony facing towards outside, has views and means of natural daylight and ventilation. If the alleys of the site which is the shophouses are considered, it is found in the research part that the edge of these secondary and tertiary roads are often occupied with parking or vendors as privatized public space. This characteristic is represented in the corridor which is also the common space in the building. Some voids are kept being used as the vertical space for the shared common space with interconnection between floors, sometimes acting as shared study or even laundry.

• Derivation of Typical Floor

In the Amesbury house, Palazzo Antonini and shingle style home plans, the rooms are placed individually without overlapping each other. However, during modernization, Frank Lloyd Wright addressed this issue and seems to overlap the rooms creating the interconnection making the interconnected space acts as the common space between the two space or rooms.

For the derivation of typical floor, first a central courtyard is divided into three masses with the absence of the mass in the south-east corner. Then the mass located in the middle of these two masses is pushed towards the central courtyard towards south-east and thus creates an overlapping space with the other two wings. Thus, a common space is created following the principle created by Frank Lloyd Wright. These common spaces are basically a vertical void with partial floors and interconnected with internal stairs to allow the users of another floor to come and use it. Besides, these voids also

act as the privatized public space representing similar characteristics found in the alleys of the shophouses of Bangkok.

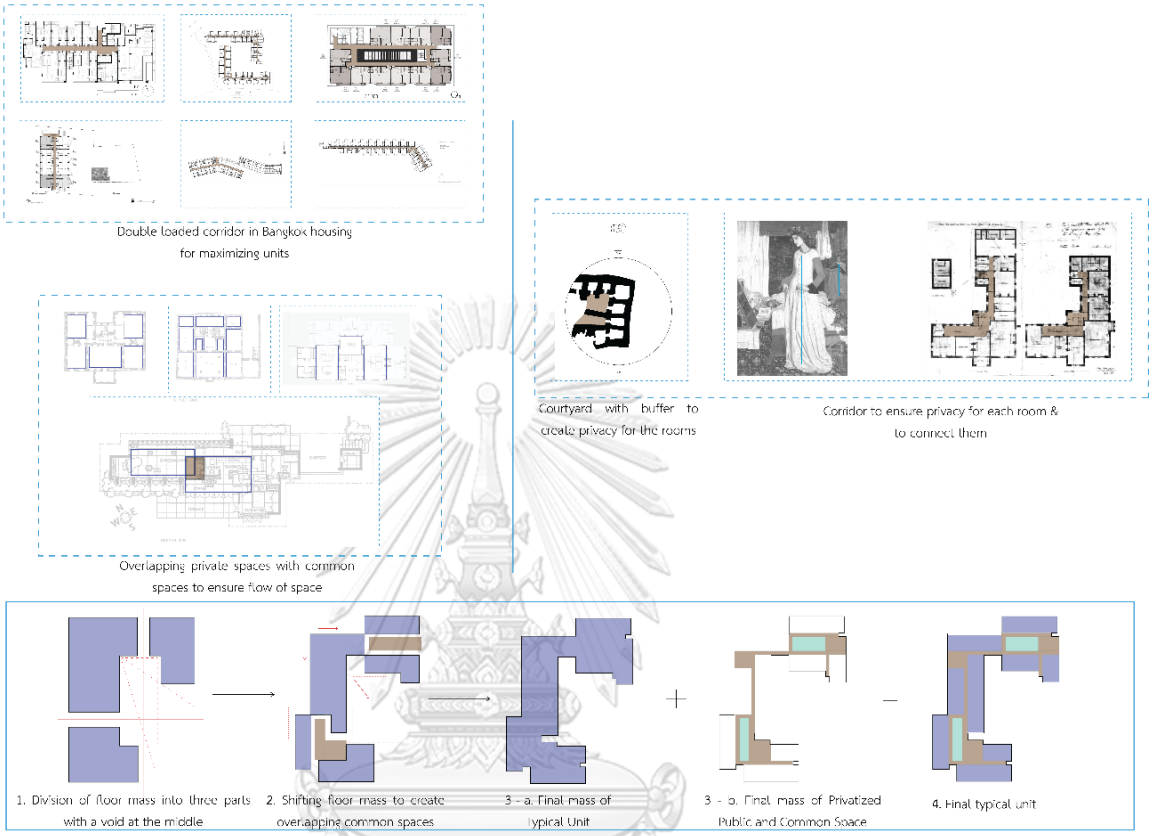


Fig 94: Typical floor derivation for the proposed student housing

• Typical Unit Derivation

In the La Tourette, designed by Le Corbusier, it is evident that narrow elongated space acts as the private space for individual monks to emphasize concentration. The size of the width is taken from the modular theory of Le Corbusier as reference, which consider a French man. However, from the literature review, it is evident that, study is space is the main private space and thus can be achieved with having circulation on one side and having an ‘L-shaped’ enclosure created by the wall on one side and the closet at the

back while the study desk faces towards the outside. Besides, since the height can be higher than the bed and thus the bed if placed in front of the study desk will not create obstacles for the natural light or view required for the study at the study desk.

Besides, an adaptable partition wall can be used to mirror this module of one person inside the unit, which can be modified with storage or simply by modifying it to be one's personal wall on each side on the base structure provided to make it adaptable.

However, the toilets and entry space will be on the side of the corridor to create buffer from the corridor and not to block the natural light or ventilation coming from the balcony or window.

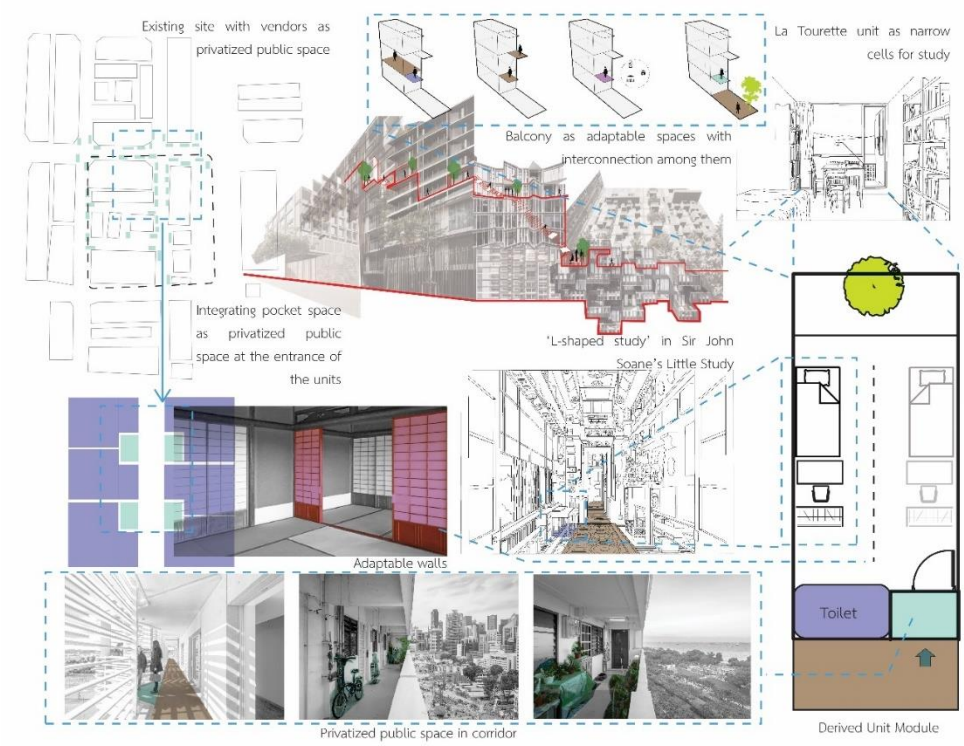


Fig 95: Typical unit derivation for the proposed student housing

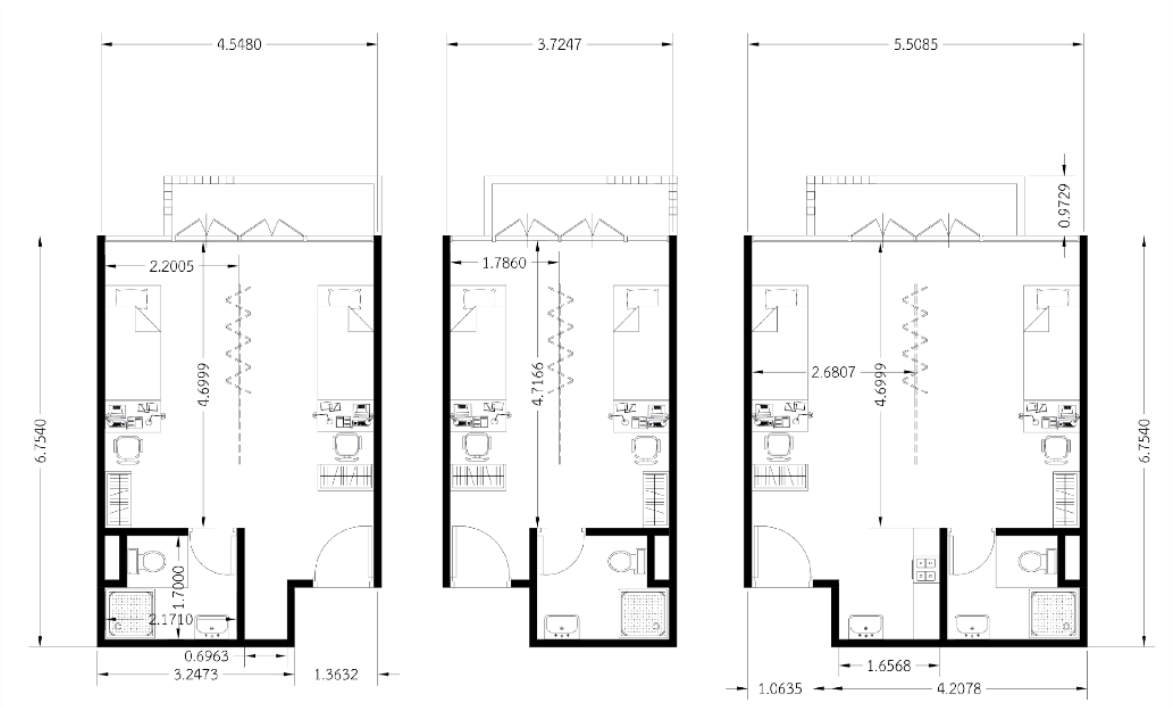


Fig 96: Proposed typical unit types for the student housing

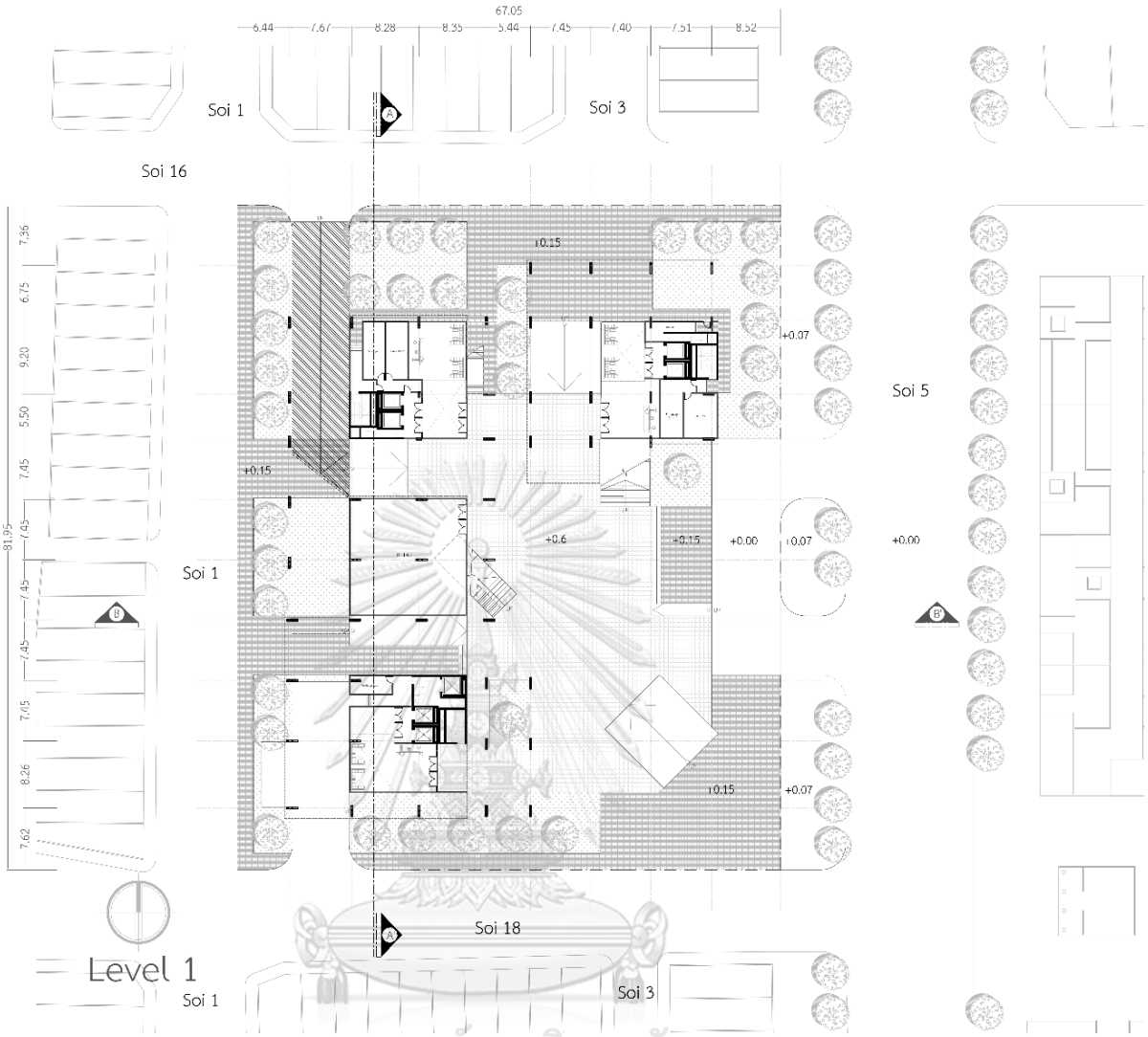


Fig 97: Proposed Level 1 plan of the student housing

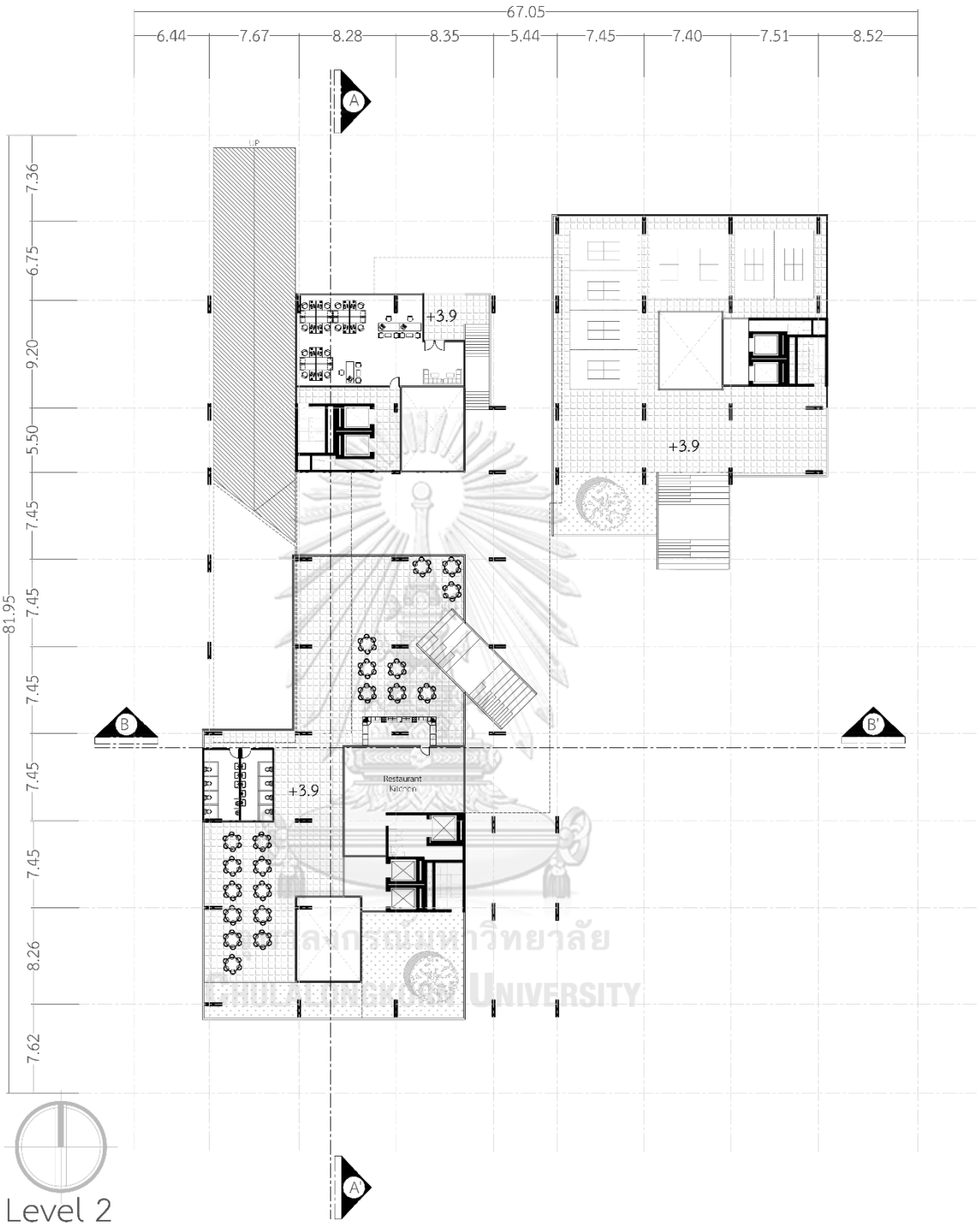


Fig 98: Proposed Level 2 plan of the student housing

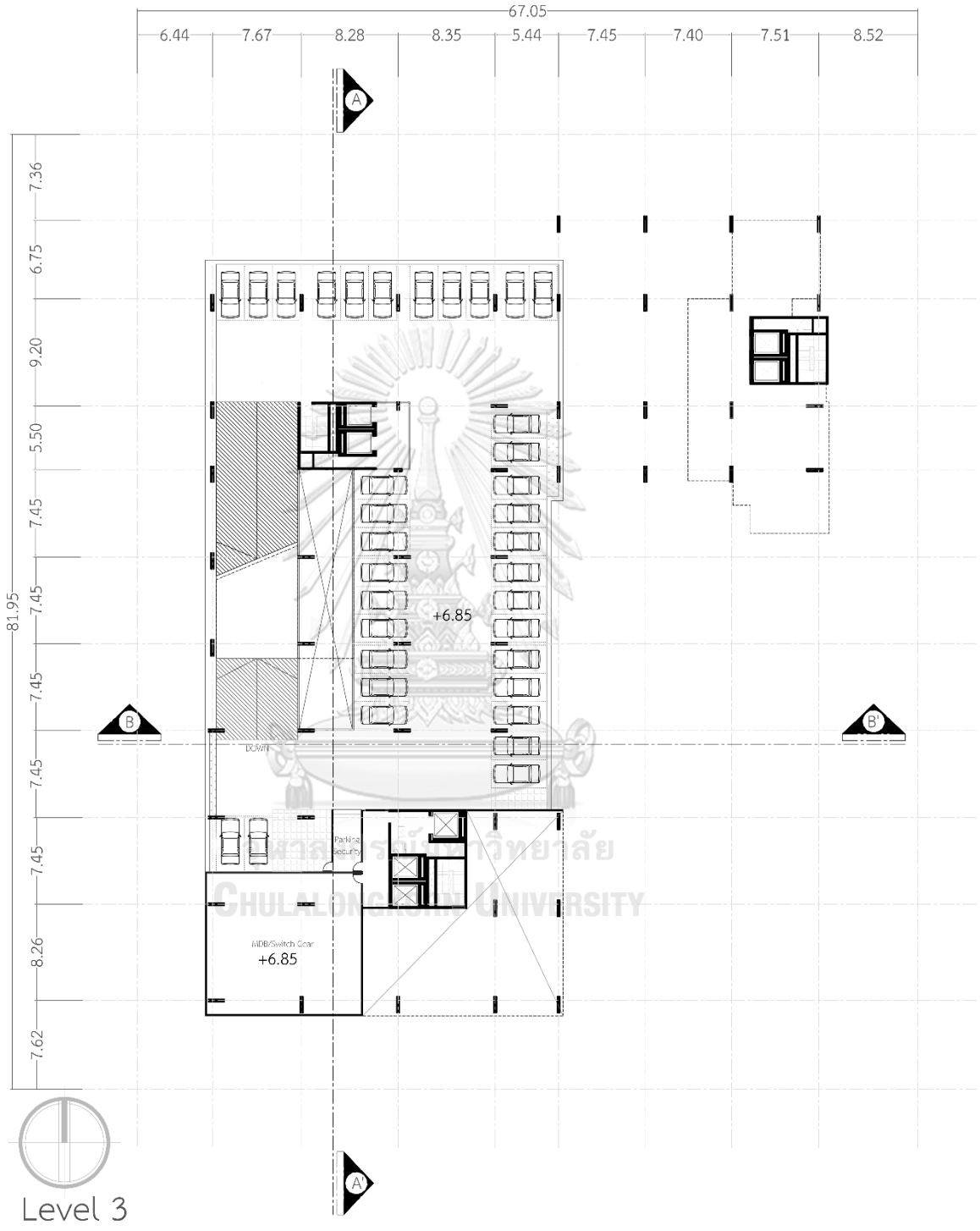


Fig 99: Proposed Level 3 plan of the student housing

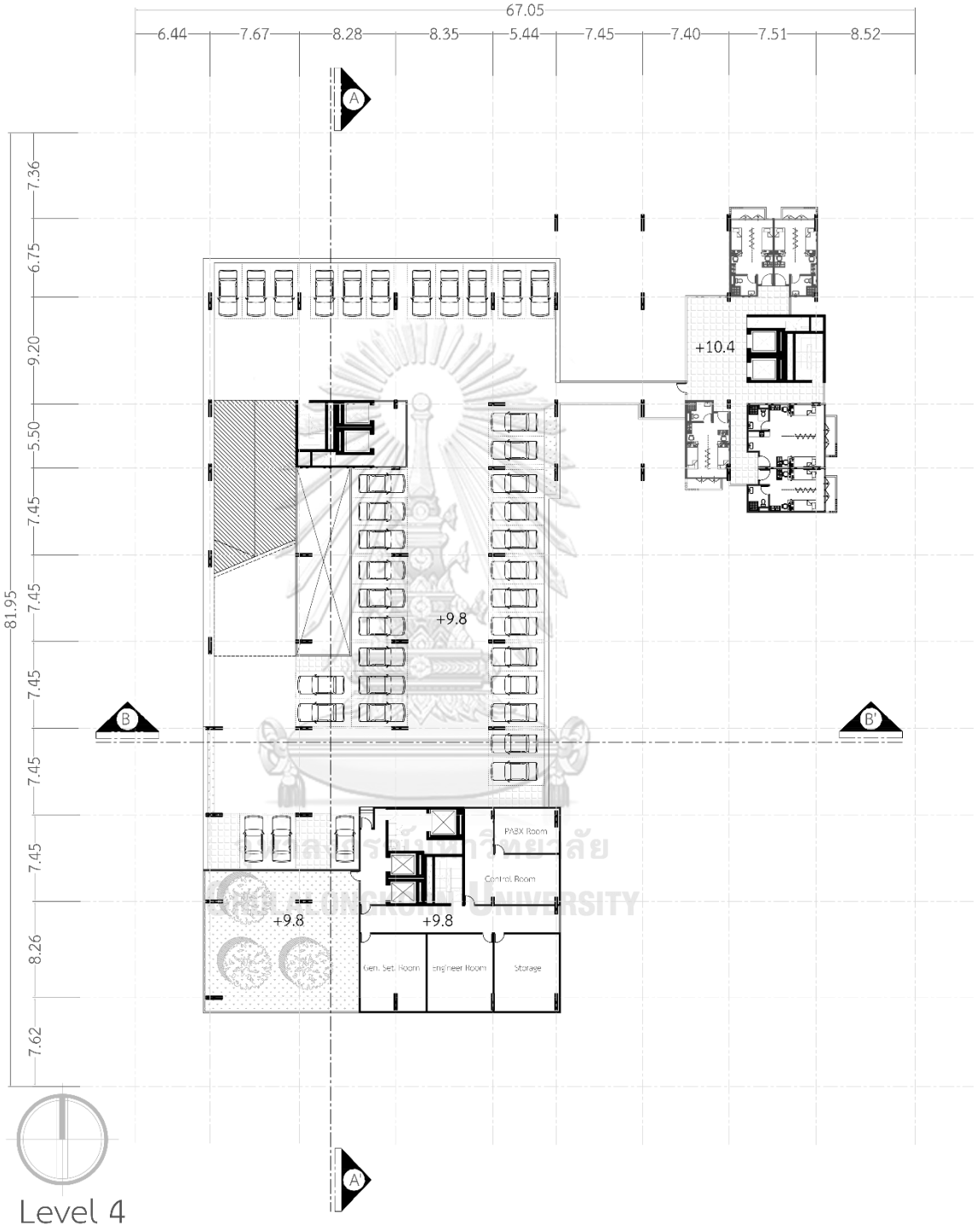


Fig 100: Proposed Level 4 plan of the student housing

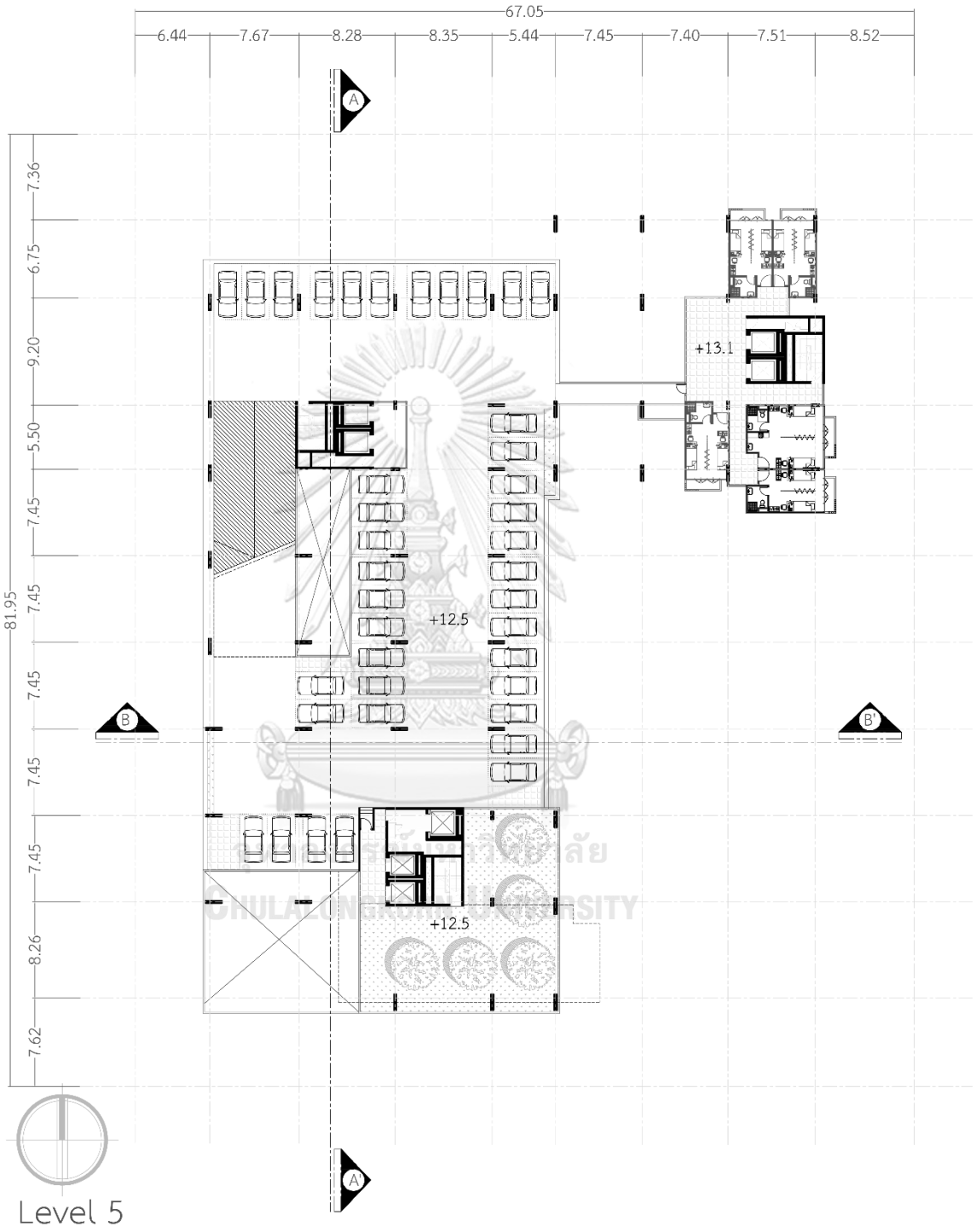


Fig 101: Proposed Level 5 plan of the student housing

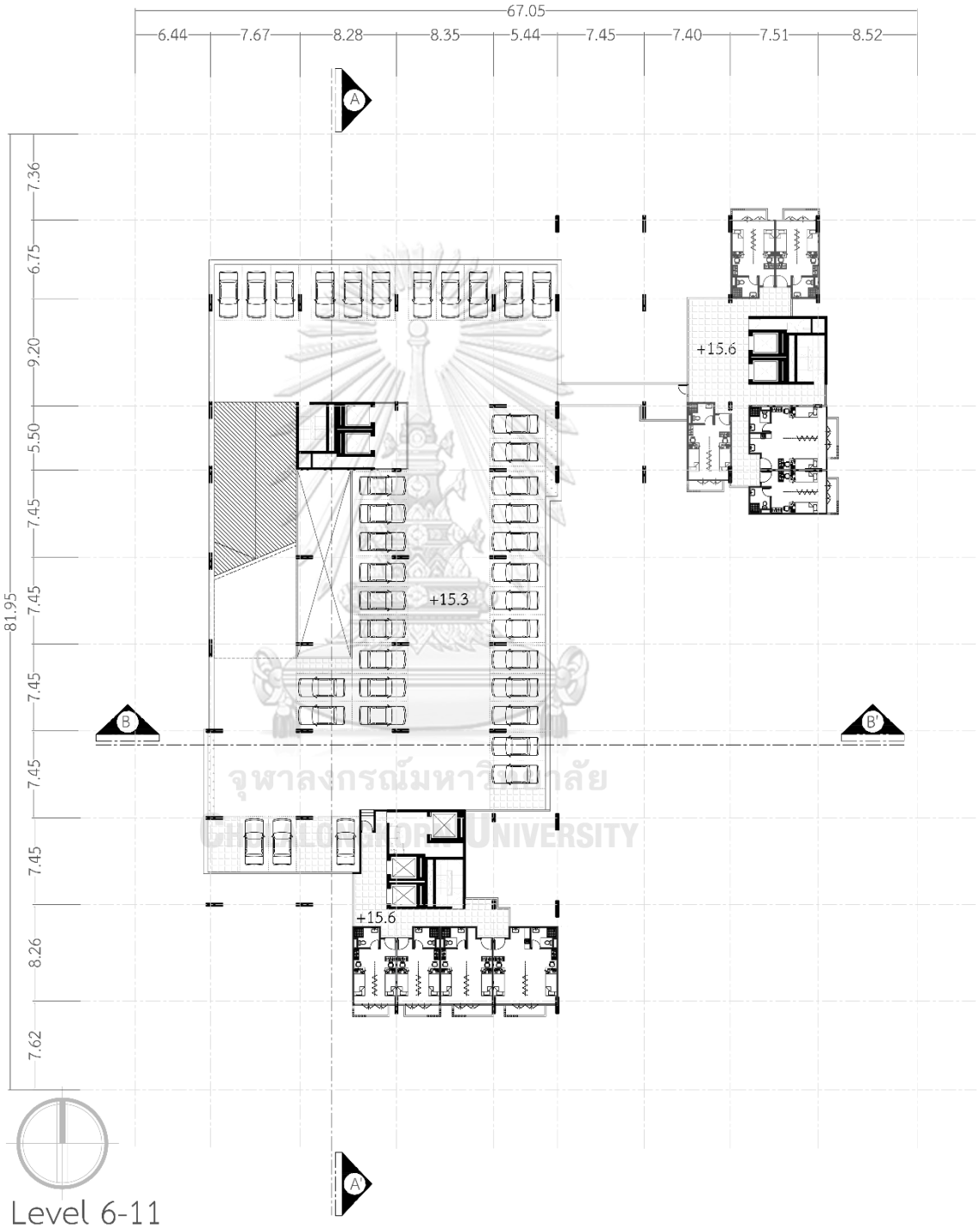


Fig 102: Proposed Level 6 to 11 plan of the student housing

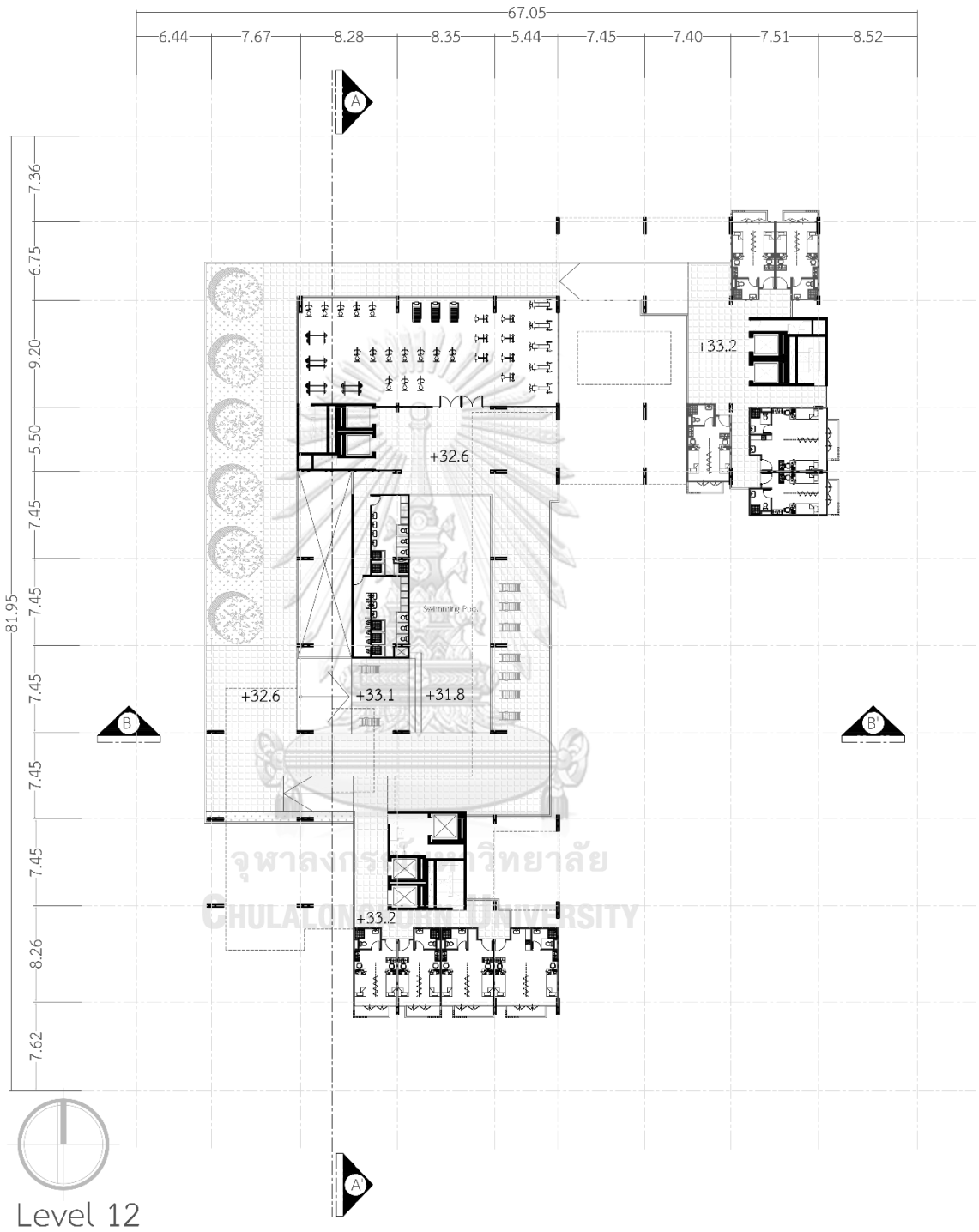


Fig 103: Proposed Level 12 plan of the student housing

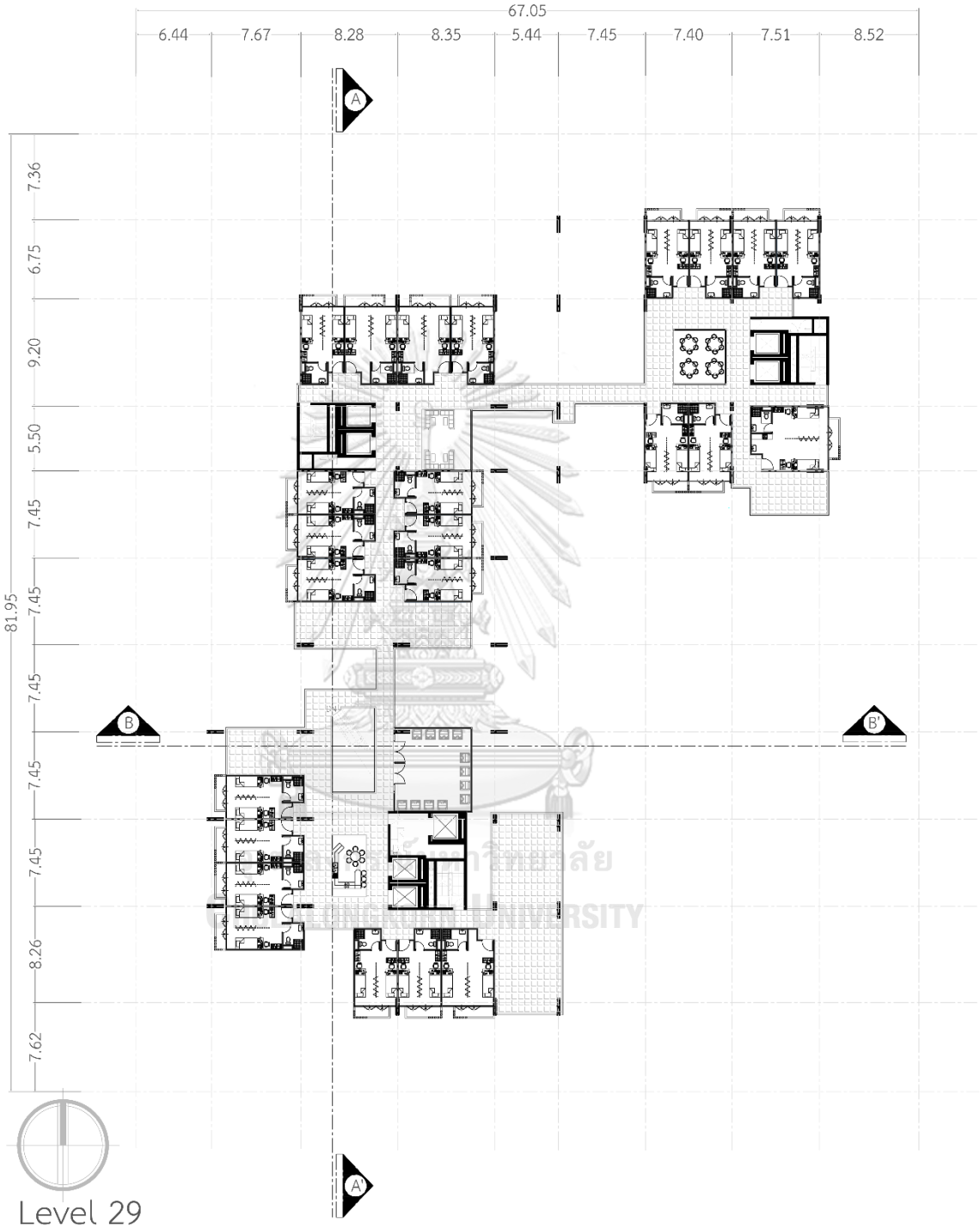


Fig 104: Proposed Level 29 plan of the student housing

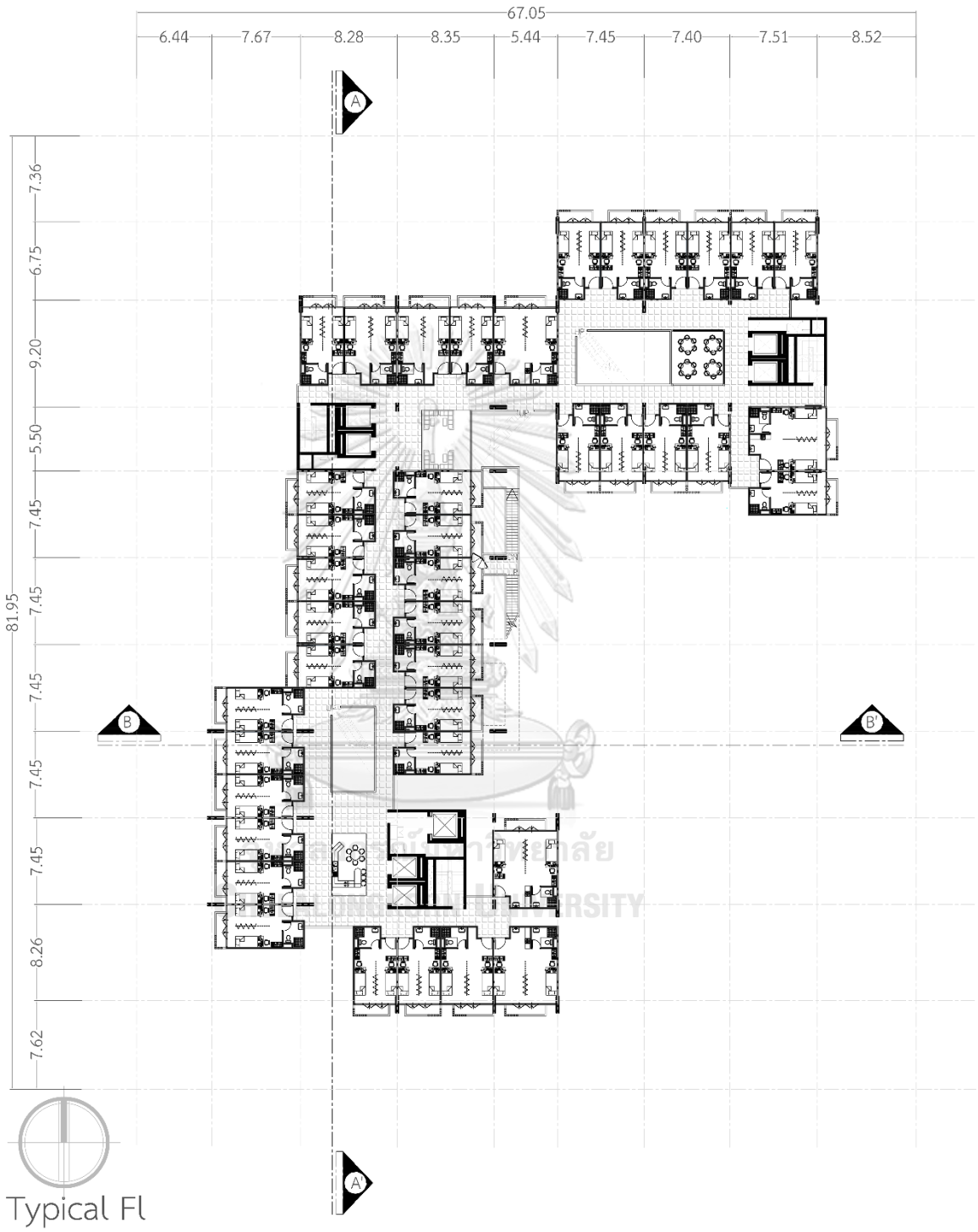


Fig 105: Proposed typical floor plan of the student housing

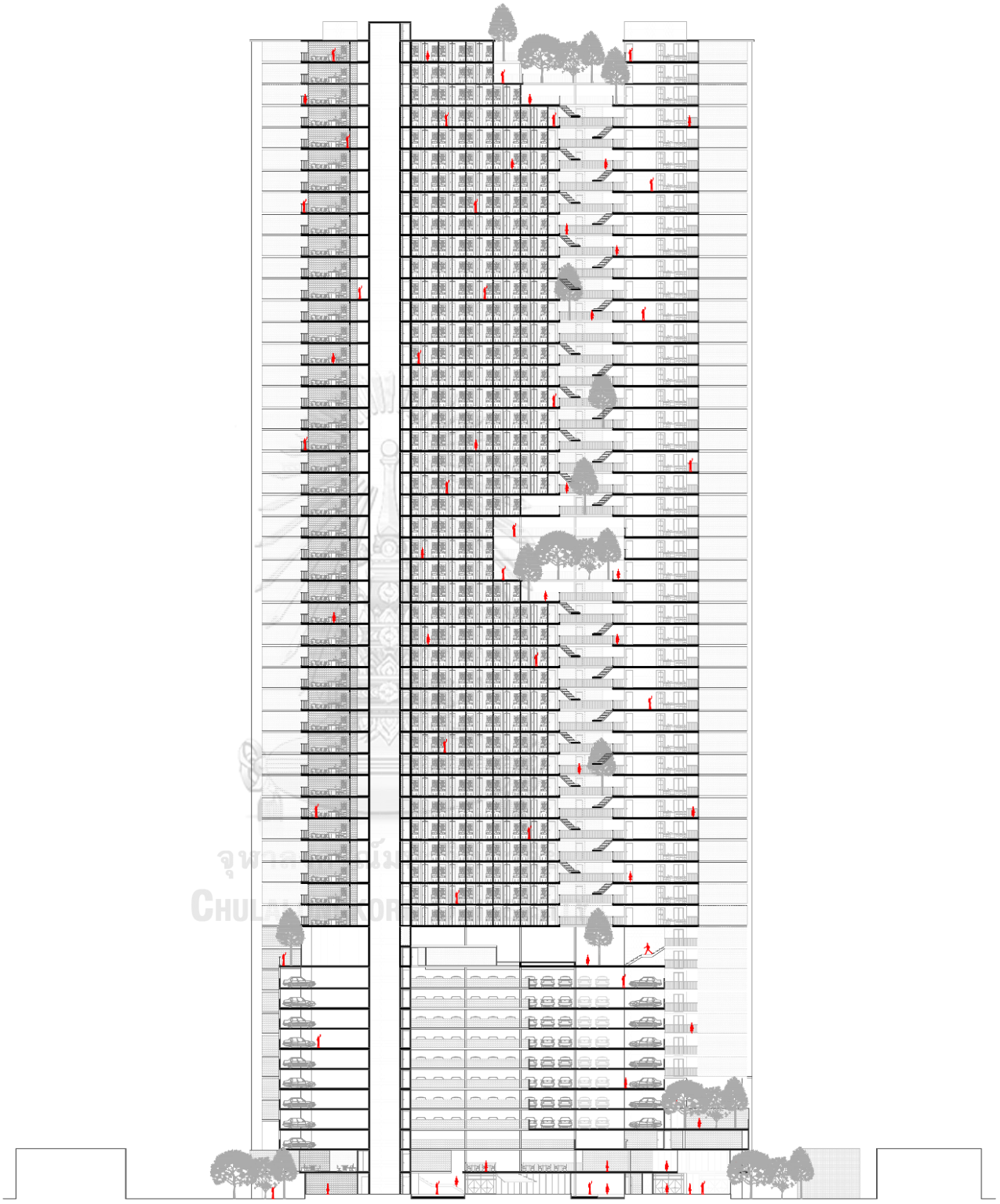


Fig 106: Proposed Section AA' of the student housing

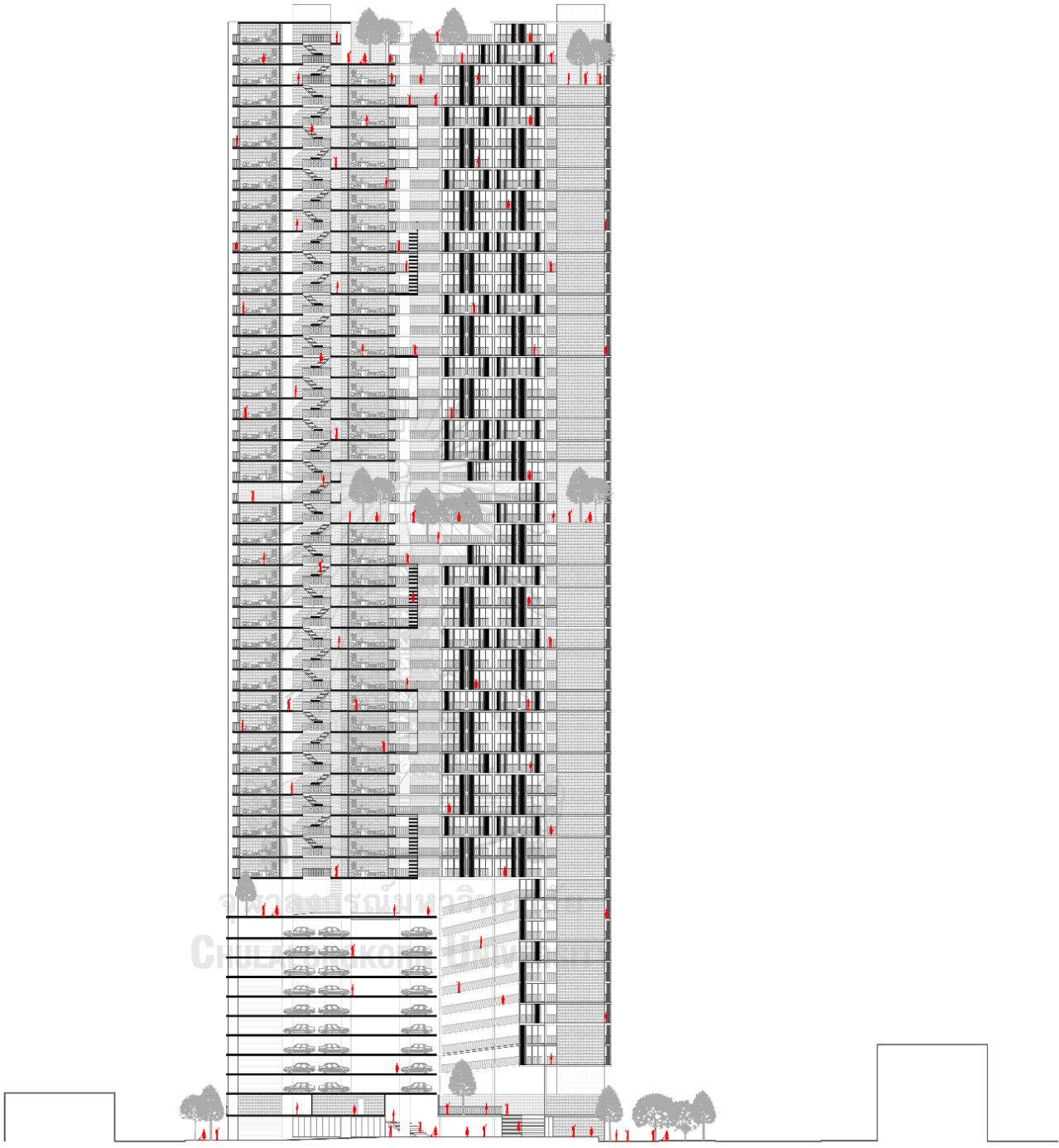


Fig 107: Proposed Section BB’ of the student housing

Chapter 6

Analysis and Discussion

From the proposed student housing, it is evident that the public, private, and in-between spaces play a crucial role in improving the quality of life of the residents in student housing, which will eventually help to achieve the goals of the masterplan as well as help the authority to get better recruitment of students. Although most of the design elements of the student housing are derived following the context and building laws, the issues related to student housing are well addressed in the design following the idea generated by research findings.

However, the main arguments of the final design analysis can be synthesized into two major parts, where the first part contains the test of the derived relationships between public, private and the in-between spaces. Whereas the other part contains the findings that was missing from the derived research conclusion. These findings are discussed below-

Evidence of research conclusion

From the research it was concluded that both private and public space reside together, which are further seen in the proposed design. And, in terms of the balance between public and private spaces, the balance is ensured with the presence of the in-between spaces of public to private spaces.

• No such space as exact private nor public space

In the design it is evident that no space is found to be claimed as entirely private nor public spaces following the derived definition. As both public and private and the in-between spaces reside together. Besides, the publicness or privacy has various levels prevalent in them.

However, whether a space is public or private can be justified from the perspective of the scale of the space that is being studied. When a space is compared with the adjacent space the impact of scale plays a crucial role in defining the publicness or privacy of that space. For example, on the ground floor, the lift lobby can be considered as the private space comparing to the plaza. But, when in the typical floor, the units become the private space comparing to the lift lobby. Likewise, inside the dwelling units, the toilet and the study spaces can be considered as the most private space comparing to the other spaces.

Thus, the public and private reside together with various levels in between them to enhance the privacy or publicness of that space.

• Balance between public and private space

To answer the research question, the balance between public and private space cannot be determined with the ratio of the area. This is because of the nature of public and private space of residing together. However, following the derived definitions the in-between spaces of the private and public space, which are common space, privatized public space and adaptable spaces can be determined. And these in-between spaces

maintain the harmony or balance from public to private space as their main relationship. For example, the presence of corridor acting as common space is used to create the buffer and thus the balance in-between the lift lobby to dwelling units. Again, the voids or vertical circulations creates the connection between the multiple levels of the project. Without these transitional spaces the balance as the relationship between public and private space cannot exist.

Apart from the above-mentioned aspects in providing evidence to research conclusion, the following aspects is further discovered in analyzing the proposed design. These are as follows-

- Types of Access

In the research findings, mainly, two various types of physical access are seen in the proposed design. The horizontal circulation, where spaces are separated by buffer elements like walls, transitional spaces and is more easily accessible, creating a more public nature to these spaces. On the contrary, vertical circulation elements like stairs, ramps and lift cores are seen in the design to connect spaces prevailing in multiple levels. However, this vertical circulation usually creates a level of privacy as it is often located further distance from the spaces present in the horizontal level or the main level of access.

For example, on the ground floor, the plaza, shops are seen as the public spaces. Whereas a bit more private functions like sports, cafes and offices with public nature are

seen above the ground floor connected by stairs from the plaza or the ground floor. Thus, these change of levels as evident from research gets more privacy as it is less accessible than the plaza. Again, for the typical floors, the lobby are connected via vertical stairs through the void, where one floor has kitchen with enclosed study or lounge on the alternate floor. Here, one residing in the floor with kitchen has easier access to it than the study or lounge present in altering floors.

Therefore, due to one of the limitations of quantitative methodologies, the phenomenon of the impact of vertical circulation affects the publicness or privacy of the space could not be determined. But the qualitative method resolves the issue. Despite vertical circulation, the space can be interchangeable, but the space which is more easily accessible are usually on the same level. Thus, this project has the more public spaces which are more easily accessible to the more people.

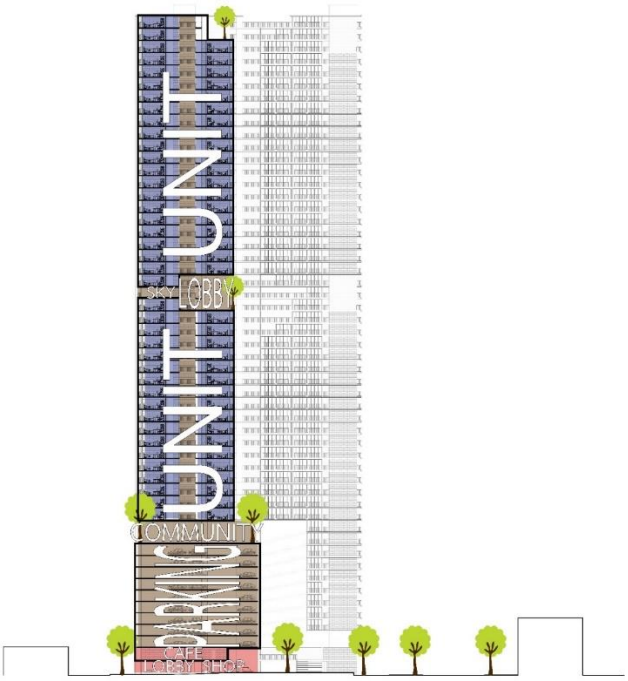


Fig 108: Analysis of Section BB' of the student housing

Additional findings from research conclusion

Apart from the evidence of research conclusion, the adaptability of the space and the use of void differs from the derived relationships between public, private and in-between spaces. The factor use plays a vital role in creating these differences.

• Presence of void and adaptability of spaces affect definitions of spaces

Some difference in research conclusion is found in terms of identifying the space in the proposed design. For example, the privatized public space by derived definitions are the spaces that is visible but not accessible when it is being used by others. However, in the design, the presence of void differs from this derived definition. As a void being designed mainly to promote natural ventilation and airflow often connected by stairs are usually visible and may or may not be accessible. But it does not have any proper use

although it is essential to ensure comfort of the dwellers. Thus, it differs with the definitions of privatized public space, although it can be distinguished from the privatized public space in terms of the use. Due to lack of any fundamental uses, void can be identified as another means of buffer that connects as well as separates the spaces surrounding it.

Besides, among the in-between spaces, privatized public spaces are usually temporary and as found in the research, it resides along with other spaces, which are mostly public or common spaces. Thus, since a single space can be modified with multiple use, adaptability brings more challenge in defining publicness or privacy of the space. These adaptable spaces which are mainly the privatized public space inside common or public space can often be used as to create transitional space acting as the buffer to enhance privacy of the spaces.

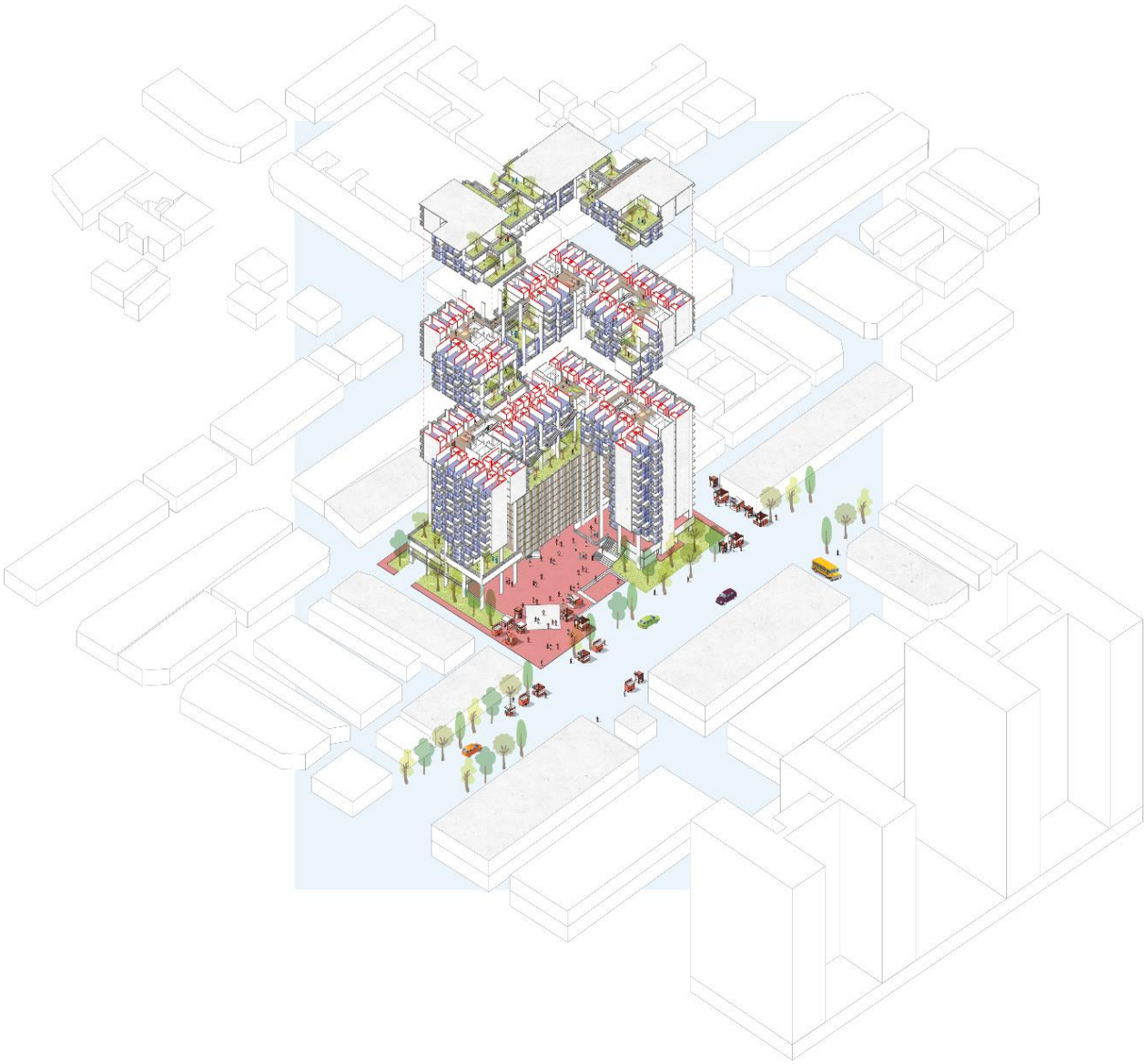


Fig 109: Isometric section of the student housing

Since, the research was scoped down to three primary aspects of studying the spaces namely public, common, and private space from the building scale. That is the building is considered as a single design in-relation to the context. The following part includes the analysis of the proposed design in relation to the derived scope and the methods through which the cases are analyzed. Here the ground floor is considered as public,

the typical floor as common, and the units as private space from the urban perspective and the building scale narrowed in the scope. However, the previously mentioned critical aspects can further be categorized as the followings-

• Public Space

Public space in this project are the spaces that is accessible and being inclusive for the city inhabitants, that is including the inhabitants of the student housing and the people of the neighborhood. In this design, the most public spaces are the pedestrian, drop off, plaza, shops as these spaces are specifically designed for the city users and thus more public in terms of the use. The existing access in the shophouses are maintained and thus creating a central connection inside the plaza by bringing access from the surrounding roads.

The amphitheater, open to sky games room, terraces, café, and restaurants has the publicness due to its use. Since, these group of functions are less public than the initial group, they are placed above the ground floor, with a change of level to give certain amount of privacy. Therefore, if one does not have any purpose would not be willing to use these secondary public spaces. Besides, these secondary public spaces are connected to the plaza with the large and grand stairs often acting as the amphitheater with the capability of holding special occasions like events or open-air concerts. This phenomenon brings the adaptability nature to these stairs as derived in the research.

Besides, due to the change of level from the plaza through these stairs' publicness is reduced. This characteristic is evident from the research that changes in level brings the

change in the privacy or publicness of the space. The stairs are faced towards the shrine to create a diagonal axis with an intention to continue and welcome the flow of people during religious festivals.

Several temporary vendors as privatized public space in the plaza can be placed at the entrance of this diagonal axis, which already created a less accessible spaces along the main diagonal axis and ramp. This placement of vendors or privatized public space in the less accessible spaces is evident from the case analysis in the research. Besides, in these public spaces the green acts as buffer, the buffer from the street to the building with enhancing the entrance of the plaza. The use of green as buffer is also evident from the analyzed cases. However, comparing the qualitative and quantitative several characteristics of public space can be derived following the designed student housing which are as follows-

- As evident from quantitative analysis, the most connected space, that is most accessible space and thus more public space is the center of the plaza, as it acts as the center of the project, placed with a diagonal axis from the shrine. This center is adjacent to the continuous flow of existing road in the site. This characteristic of the plaza to become the most connected space or the most public space is also evident from the analyzed cases.

- Due to the presence of the plaza, all the other narrow and less connected space less public than the center of the plaza. These spaces will often hold several temporary vendors or privatized public space, benches for relaxation and waiting. Therefore, all the

privatized public spaces are located on the less connected space or the space without flow of circulation as evident from the research.

• All the seating and vendors can be considered as the privatized public space in this public space, or the ground floor of this project as established from the research.

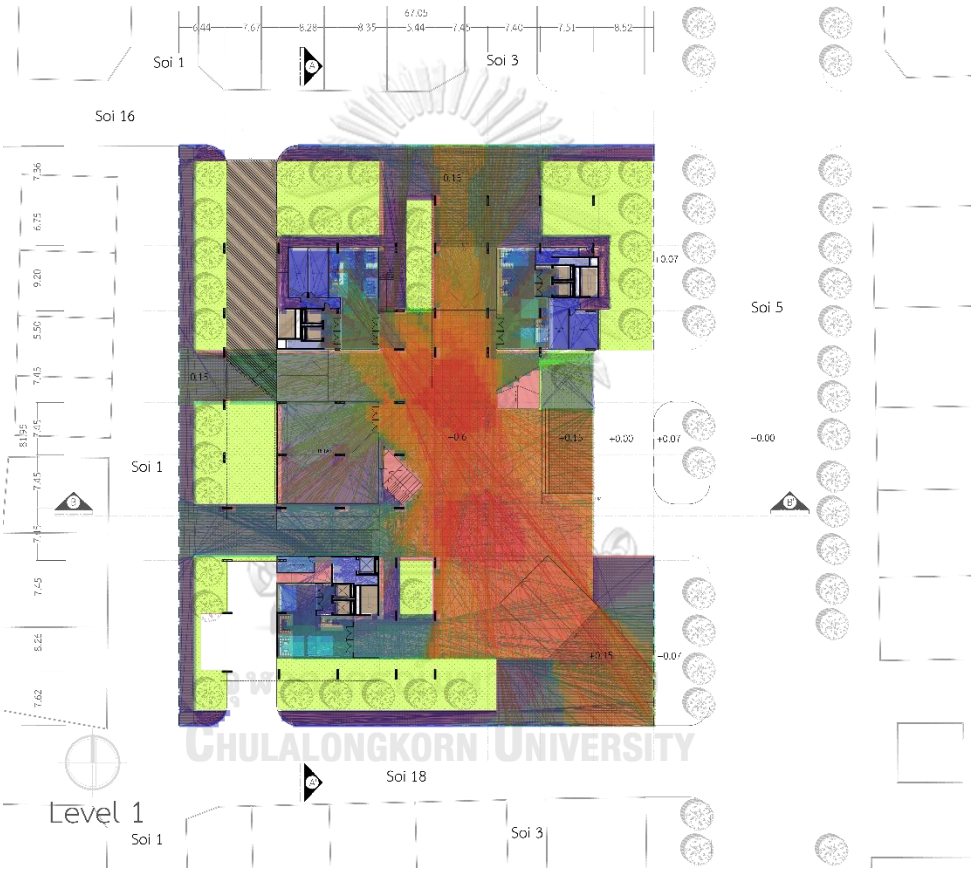


Fig 110: Qualitative & quantitative analysis of the Level 1 of the student housing

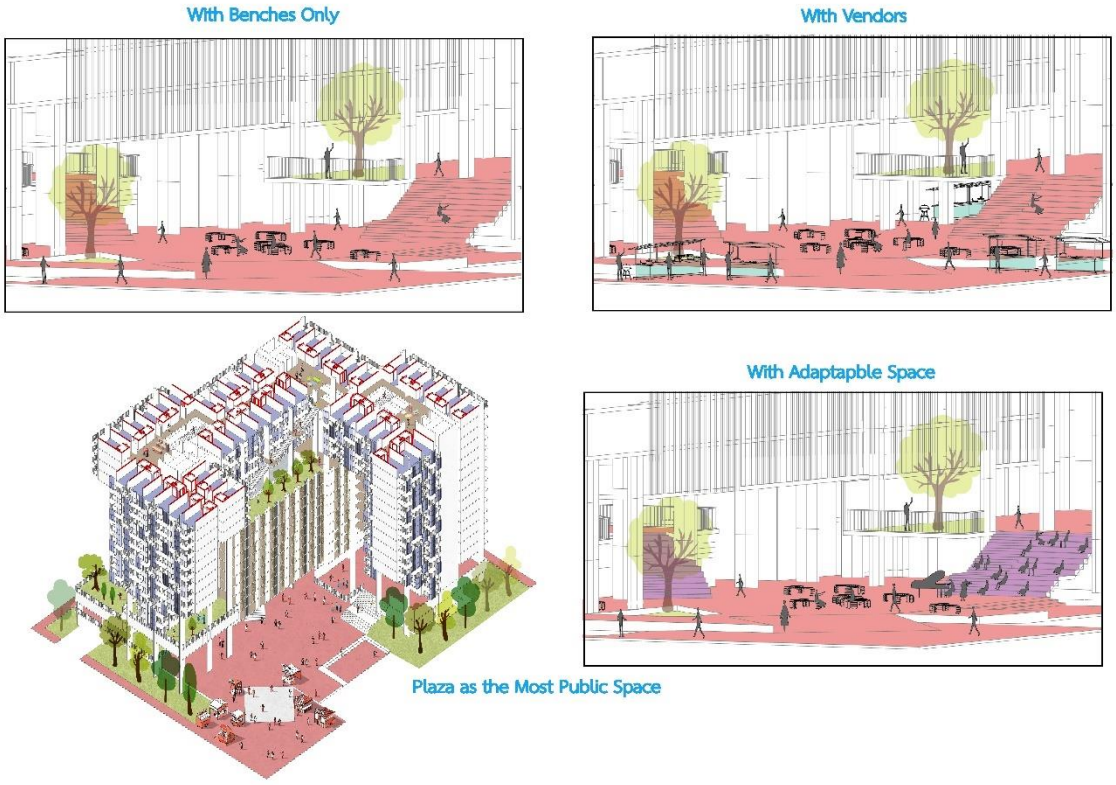


Fig 111: Analysis of characteristics of Level 1 of the student housing

• Common Space

The common spaces in this project are the in-between spaces of public and private space in the building scale and from the urban perspective. It serves the segregation as well as connection between the two-opposite realm of public and private space. Thus, it also creates a buffer to increase the privacy or publicness of the space. Mainly, by derived definition, the spaces that are accessible and inclusive to the inhabitants are the common spaces. However, the complexity of common spaces is beyond that as there are certain spaces that is common between the general user and the inhabitants which are addressed in this design as secondary public spaces like the café or games zone accessible from the plaza. Because, that phenomenon is considered from the scale of

the neighborhood as narrowed down in the scope. Therefore, it is necessary to consider the spaces following the scale of which the space is being analyzed.

Again, the lobby on the ground floor can be considered as the common space, as anyone has purpose in the building can have access to it. But the lift lobby can be considered as the private spaces including the service functions, due to the inclusiveness of these spaces. This proves that the public and private spaces cannot be determined by any specific boundary, as it depends entirely on how the space is being studied in terms of the scale of the user.

However, the common spaces in this designed student housing from the building scale can be categorized into three major types, which are the circulation, activity spaces and social spaces. In terms of circulation, all the parking circulation (with parking as privatized public space by definition), connecting bridges from parking to unit lobby, corridors, and vertical circulation like lifts and stairs are to be considered as the common space.

The activity spaces can be considered as the lobby, swimming pool, gym, study spaces, kitchens, laundry, and other shared spaces for the convenient livelihood of the inhabitants. And the social spaces would be the lobby, the vertical connected voids, urban windows with terraces and the roof terraces. These are the spaces, where the interaction is expected to take place.

The privatized public space in these common spaces would be the spaces when someone is using a particular function and while using others cannot access it nor use it. The privatized public space in the corridor is designed to be the pocket spaces in front of the entrance of the units to create a buffer between the corridor to the unit. Thus, it is visible but not accessible when in use. This phenomenon brings the difference in defining the voids, created especially for visual connections, promote natural ventilation, and maximize daylight along with views. However, often void that is adjacent to the parking and connected by the bridges are the space that is neither accessible nor it has any direct use for the inhabitants. This void cannot be considered as the common space although it creates a separation from the parking mass to the unit mass with more private use. So, these voids can be considered as the buffer spaces as seen by the common space.

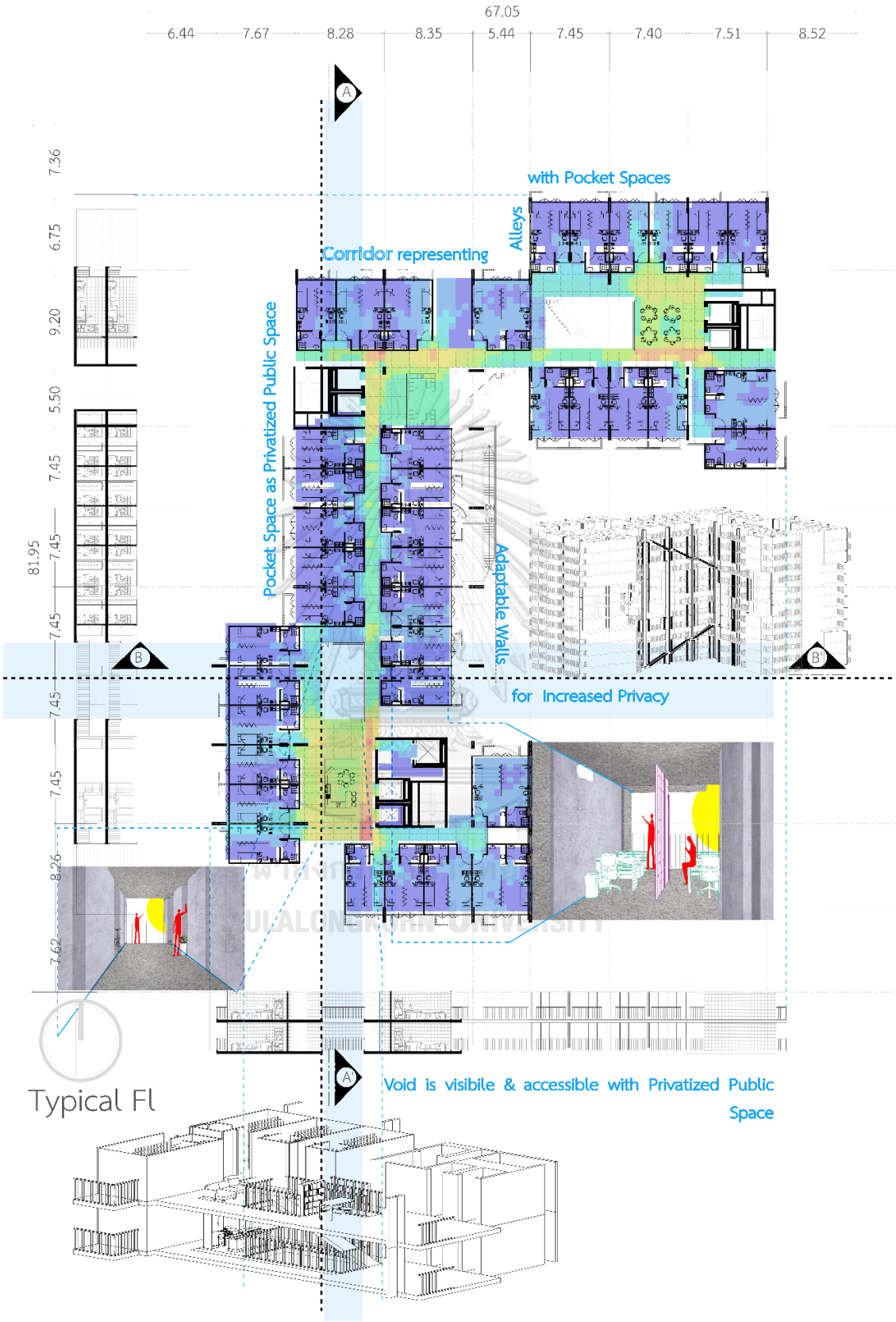


Fig 112: Analysis of characteristics of typical floor level of the student housing

• Private Space

Several spaces in this student housing can be considered as the private space. But, due to the use, the most private space are the dwelling units. But private space also exists in the public and common spaces. In the public space, the public toilet can be considered as the private space, again, the lift can be considered as the private space as it connects the public and private spaces of this project. Here, the lift lobby acts as the buffer between the public, which is outdoor plaza and the lift acting as the private space. Similarly, in the common spaces, the privatized public space like the study or kitchen or lounge can be considered as the private space as these spaces are isolated from other spaces. And when one is using it, others would not bother to interfere.

However, considering all the other spaces, the dwelling units are the private spaces of this student housing. Since, it is also shared between two students. No space can exist to be entirely private space in this project. From the literature review and unit derivation, the study spaces are the most private spaces in this project. As evident from research, in Sir John Soane's Little Study, it is seen that the most private space inside the dwelling is considered as the study space due to its use, accessibility and inclusiveness. This study space is located with the 'L-shaped enclosure' created by the walls, whereas when the circulation remains on the one side of this study, the privacy of this space is not hampered. Thus, similar arrangement can be done in terms of dwelling units inside the unit, where the single bed which is lower than the height of the study table can be placed along towards the balcony from where the light and air is expected to enter. The study can be placed at the edge of the bed with an enclosure created by the bed and a closet. As discussed in the research, noise is a problem related to the privacy in the

typical units of student housing. To buffer the noise, the furniture is placed on the side of the walls to create privacy for the inhabitants of each unit.

A transformable adaptable is placed inspired from the Japanese Shoji sliding barn doors. This partially opaque wall would create privacy for each resident in-between the roommates. This wall would be adaptable as its visibility can be controlled with modifying it with hanging clothes, curtains, storage or simply by sticking posters to create a more personalized environment for each user. However, it can be moved to create a unified space to entertain the friends or guest of the users of each unit. Besides, adaptability is also possible in the balcony provided. As by nature the balcony is private, common, and privatized public space. And it has the potential to be used for multiple functions like cooking, relaxation or even gardening. Only one edge of the designed student housing can be connected by multiple levels with a fence to protect accessibility and thus privacy for each unit's dweller. This stair will also be the support of the columns placed outside the module of the derived unit.

The linear monastery cells of La Tourette are taken as inspiration to derive the typical unit. This example is considered to create concentration and contemplation to focus on study for the users who are the students. The width of the La Tourette by Le Corbusier is 1.83m to 2.26m with 5.92m as length. In the typical Asian context, the proposed dimension of the designed unit is 3.72m wide and 6.75m long. However, two other unit types in lesser quantity are also proposed with 4.54m and 5.5m width keeping the same length. These units are provided with storage and private kitchen, respectively. The clear floor height designed is 2.7m to ensure sufficient natural light inside the units. The

toilets are placed on the side of the corridor to avoid blocking natural lights and ventilation.

Moreover, it is seen that the private space in the student housing varies with the adjacent space. The use of the private space and the levels of privacy changes due to the presence of this adjacent space or the placement of the private space. The following diagrams contains all the public, common and private space types mentioned in the above discussion.

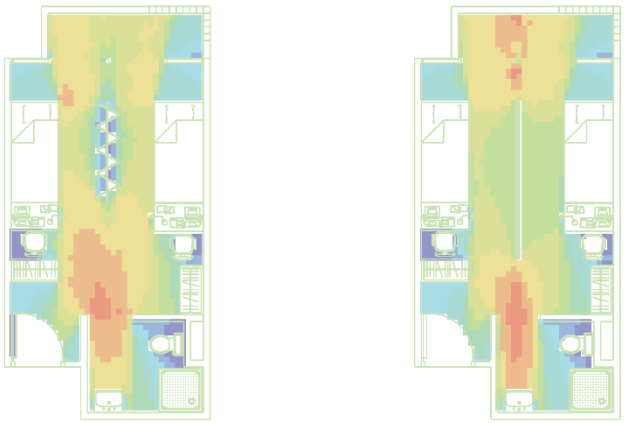


Fig 113: Quantitative analysis of characteristics of typical unit of the student housing with more connected space (Left) and adapted to enhance more privacy (Right)

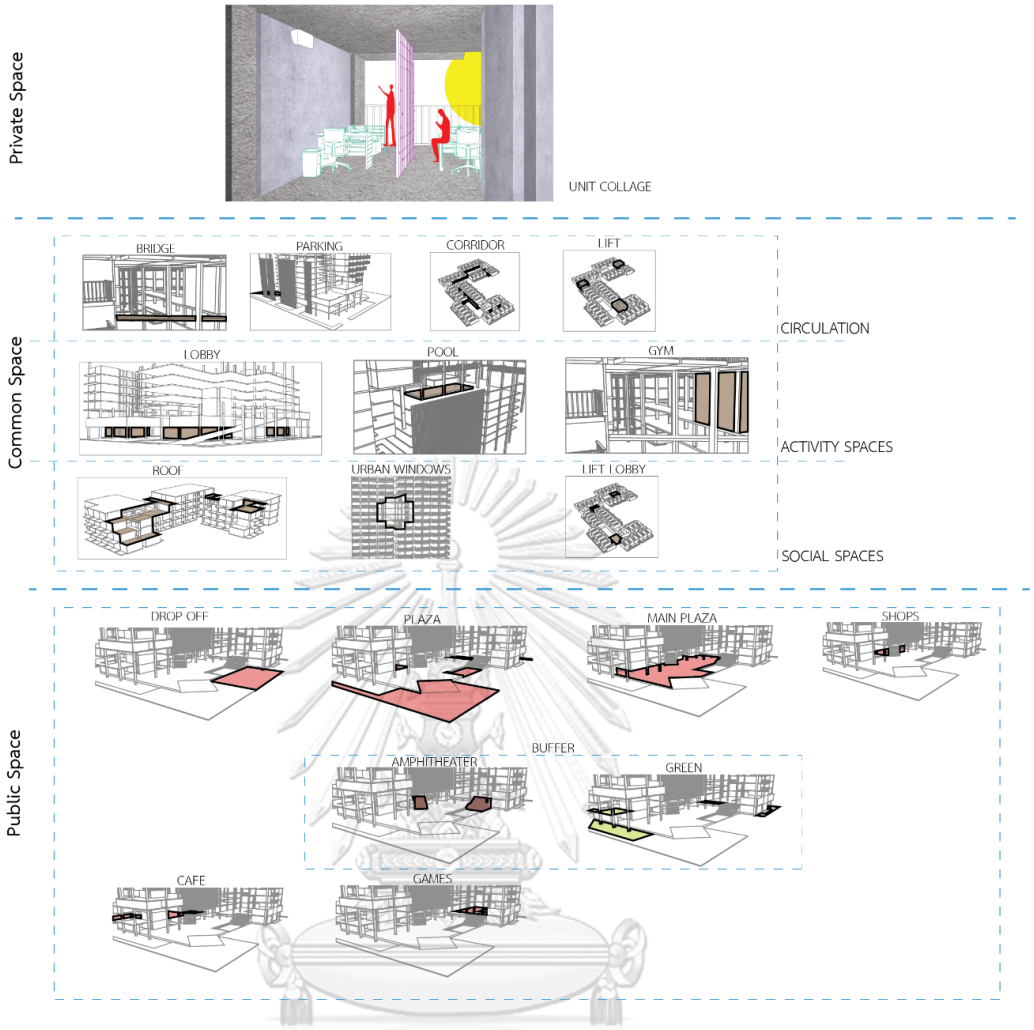


Fig 114: Compilation of types of spaces in student housing

Conclusion

Public, private, and in-between spaces are an integral part of student housing. The issue of public and private spaces can be related to various scales and perspectives of the student housing project including the context as well as building laws and regulations for the design. The impact of public and private space enhances the comfort of the residents which will eventually lead towards other widely popular issues like social interaction and user satisfaction. A well-designed public space increases the quality of life for the inhabitants of the neighborhood and the city ultimately achieving the desired goals of the masterplan of the University area.

The public spaces would also have economic benefits for the client of this project which is PMCU. The maintenance cost along with the profit can also be achieved through the proper utilization of designed public spaces. The shared community spaces can also be rented out to external companies for the profit although the University authority should realize that these are necessary to enhance social interaction and user satisfaction. Besides, this study would also benefit the architects, researchers, potential clients, or developers who are interested in the similar housing projects. This research would provide them necessary guidelines in dealing with the issues of privacy and publicness of space to enhance the user satisfaction.

From this thesis, four major factors as established in the research and proven through the design naming accessibility, visibility, inclusiveness, and visibility can be used to

identify any space in the student housing. Whether a space is public or private or any other in-between spaces can also be identified with these factors.

Besides, it is also evident that the public and private spaces reside together with various levels. In other words, no such space is found that can be denoted as entirely public nor private space. In terms of the relationships between public and private spaces, the flow of public to private spaces exists through the in-between spaces. These in-between spaces are privatized public space, common space, and adaptable space. Again, the complexity of in-between spaces enriches the balance between public to private space. The in-between spaces vary depending on the scale of the project being studied as well as its adjacent spaces. Vendors in the public plaza acts as privatized public space whereas the study in the shared space also acts as the privatized public space. However, they are different according to their derived factors like accessibility, inclusiveness, visibility, and use. Similarly, the common space in the plaza can be considered as the lobby whereas the common space in the typical floor is the corridor. On the other hand, the purpose of adaptable space, which is primarily common or public, then transforming to be privatized public space creates the diversity in identifying the space types. These adaptable spaces can play a crucial role in terms of special social restrictions like the pandemic of COVID-19.

Apart from these factors, the design further modified the derived relationships between public and private spaces. As it is seen that privacy also changes with the change of levels which is seen after designing the student housing. The more accessible spaces are more public and thus spaces which are connected and separated by architectural

elements like walls and doors has more public nature than the space that is connected or separated by vertical access located in another levels.

Moreover, it can be concluded that, the complexity and difficulties of the public and private spaces are due to the presence of the in-between spaces. These in-between spaces: namely common space, privatized public space and adaptable space can further be considered as responsible for creating the balance in terms of the relationships between public and private spaces. Here balance as the relationship cannot be determined by quantitative means as no such exists as entirely public or private space. The in-between spaces play the role of maintaining the balance as the relationship between public and private spaces. However, a good relationship between public and private spaces in the student housing would ultimately bring the residents' satisfaction and comfort as well as contribute to the development of the neighborhood and the society.

Scopes for Further Research Possibilities & Limitations

In this thesis, four factors of identifying public, private and in-between spaces are used which are accessibility, inclusiveness, visibility, and the use of the space. A further study could include whether there are more than these four factors that are used here to identify whether a space is public or private. Besides, the hierarchy of these factors could possibly be another research that represents which factor is the most important, whether it is accessibility or inclusiveness or the use of the space that is the most important in identifying the privacy or publicness of the space. On the other hand, in terms of the in-between spaces, common, privatized public and adaptable spaces are found from this research, a further study could include if these three in-between spaces

are enough to support the contemporary context or there are more than these established three in-between spaces. Besides, the definition of public, private, and in-between spaces is done before studying the issues of student housing. Considering these derived definitions several other projects like residential architecture, other housing types or any other projects can be researched to identify public, private, and in-between spaces in those projects. The findings would differ from the findings of the student housing projects. As residential housing project might show that there are certain spaces that can be claimed to be entirely private space. Although, since the definition is mostly derived from the urban scales, it is quite evident that most of the urban projects can be addressed following the derived definition of public, private, and in-between spaces.

As evident from the findings, scale played a crucial role in determining the privacy or publicness of space. These spaces are addressed briefly in this research considering the potential of these spaces. Altering the scales of these two space types could possibly be another form of research. For example, privatized public space and adaptable spaces are addressed in this research in terms of the use of the furniture. A further research could include whether some furniture with private use could possibly have public use in a different scale or not.

Again, in terms of the scale of the research, only domestic and urban scales are considered. Several other dimension of publicness and privacy like the issue of publicity as addressed by Beatriz Colomina in the book titled *Privacy and Publicity* are left out from this research. The author raised the issue in the change of privacy due to the

influence of modernization and publicity. As the private spaces can possibly become a public space when it comes front of other people through publicity. This issue also raises the impact of social media in creating publicness of space in the contemporary times. As the front of the house despite having private use can come in front of people virtually through photographs or other medias. And thus, accessibility has taken another dimension to create publicness of a private space. This factor also brings the issue of the influence of light in creating publicness of the space, as most spaces that are virtually accessible by people are often enriched with good lighting to create the ease of visibility. Apart from these issues of the front and back of the house, the inside and outside of the house can also have an impact in terms of the privacy or publicness of the space. These also brings the issue of visibility through the design of façade in terms enhancing privacy or publicness of the space.

In terms of the quantitative analysis, due to the limitations of depthmapX software used in the quantitative analysis, the issue of visibility or transparency could not be analyzed in this research. In this research only the horizontal accessibility was taken under consideration using 'depthmapX'. In future, the upcoming 'DepthSpace3D' software could be used to analyze these characteristics since it analyzes with the 3D images of the space rather than only 2D, which will be able to solve the aspect of visibility clearer.

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Notes

- All the images are created by Author unless stated.
- Color Legend as follows –

VITA

NAME	Sajid I Awal
DATE OF BIRTH	02 October 1992
PLACE OF BIRTH	Khulna, Bangladesh
INSTITUTIONS ATTENDED	Bachelor of Architecture, BRAC University, Dhaka, Bangladesh
HOME ADDRESS	01, Boyra Market Road, Khulna - 9000, Bangladesh