PLEANG : WINDOW DESIGN METHODOLOGY FOR PRINCE NARIS LEARNING CENTER

Miss Malin Phlernjai

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

บทคัดย่อและแฟ้มข้อมูลฉบับเต็มของวิทยานิพนธ์ตั้งแต่ปีการศึกษา 2554 ที่ให้บริการในคลังปัญญาจุฬาฯ (CUIR)
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แผลง : การออกแบบหน้าต่างสำหรับศูนย์ศึกษาผลงาน

ของสมเด็จพระเจ้าบรมวงศ์เธอเจ้าฟ้ากรมพระยานริศรานุวัดติวงศ์

นางสาวมาลิน เพลินใจ

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วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสถาปัตยกรรมศาสตรมหาบัณฑิต
สาขาวิชาการออกแบบสถาปัตยกรรม
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Thesis Title	PLEANG : WINDOW DESIGN METHODOLOGY FOR PRINCE NARIS LEARNING CENTER
By	Miss Malin Phlernjai
Field of Study	Architectural Design
Thesis Advisor	Assistant Professor M.L. Chittawadi Chitrabongs, Ph.D.

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มาลิน เพลินใจ : แผลง : การออกแบบหน้าต่างสำหรับศูนย์ศึกษาผลงานของสมเด็จพระเจ้าบรมวงศ์เธอเจ้าฟ้ากรมพระยานริศรานุวัดติวงศ์ (PLEANG : WINDOW DESIGN METHODOLOGY FOR PRINCE NARIS LEARNING CENTER) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ผศ. มล. จิตตวดี จิตรพงศ์, 125 หน้า.

สมเด็จพระเจ้าบรมวงศ์เธอเจ้าฟ้ากรมพระยานริศรานุวัดติวงศ์ (พ.ศ.2406 - พ.ศ.2490) ได้รับราชการสนองพระเดชพระคุณในตำแหน่งต่าง ๆในสมัยพระบาทสมเด็จพระจุลจอมเกล้าเจ้าอยู่หัว (พ.ศ.2411 - พ.ศ.2444) จนถึงในสมัยพระบาทสมเด็จพระปกเกล้าเจ้าอยู่หัว (พ.ศ.2468 - พ.ศ.2478) พระองค์ทรงเป็นผู้ซึ่งมีความพิถีพิถันในการออกแบบงานศิลปะในหลายๆ แขนง รวมถึงงานสถาปัตยกรรม ด้วยแนวคิดที่ต่างออกไปจากวิธีแบบประเพณีนิยมที่ปฏิบัติสืบกันมา ทรงเป็นผู้เรียนรู้ด้วยตนเองและทรงร่วมงานกับนายช่างชาวต่างประเทศที่เข้ามารับราชการ ในสมัยนั้น โดยทรงออกแบบงานต่าง ๆ ตามพระราชประสงค์ และสืบเนื่องจากสมัยนั้น สยามได้มี ความจำเป็นที่จะต้องปฏิรูปบ้านเมืองให้ทันสมัยและมีการเปลี่ยนแปลงการปกครอง ทำให้ผลงาน ด้านสถาปัตยกรรมของพระองค์เป็นเรื่องใหม่ของสยาม

วิทยานิพนธ์เล่มนี้เป็นเป็นการศึกษาวิธีในการออกแบบหน้าต่างของพระองค์ซึ่งวิธีการออกแบบนั้นพระองค์ทรงเรียกว่า ‘แผลง’ อย่างไรก็ดีการศึกษานี้เน้นไปที่การศึกษาหน้าต่างของบ้านไทยที่บ้านปลายเนิน ซึ่งเป็นสถานที่ที่พระองค์ประทับในช่วงสุดท้ายของพระชนม์ชีพ การศึกษานี้นำไปสู่การนำเอากลวิธีการแผลงของพระองค์ไปปรับใช้ในการออกแบบศูนย์ศึกษา ผลงานของสมเด็จพระเจ้าบรมวงศ์เธอเจ้าฟ้ากรมพระยานริศรานุวัดติวงศ์ รวมไปถึงที่จะสร้างความสัมพันธ์ระหว่างประชาชนผู้สนใจเรื่องงานศิลปะไทยกับบ้านปลายเนินผ่านงานออกแบบสถาปัตยกรรม ทั้งนี้ยังรวมไปถึงการออกแบบส่วนสำนักงานของมูลนิธินริศรานุวัดติวงศ์ ที่ซึ่งเป็นองค์กรการกุศล ผู้ดูแลผลงานของสมเด็จและให้การสนับสนุนงานศิลปะไทยอีกด้วย

จากการศึกษาดังกล่าวแผนงานออกแบบที่นำเสนอนั้นประกอบด้วยหลายปัจจัยตามที่ได้ศึกษามายกตัวอย่างเช่น การเลือกใช้วัสดุก่อสร้างเพื่อแสดงถึงความเชื่อมโยงความเก่าใหม่ขององค์ประกอบทางสถาปัตยกรรม การเปลี่ยนผ่านระหว่างความหนักและความโปร่งบางของสถาปัตยกรรมที่ผู้ใช้งานจะได้ประสบ การเลือกแสดงความต่างของส่วนที่สว่างและมืด เป็นต้น ดังนั้นผลงานออกแบบสถาปัตยกรรมที่มาจากพื้นฐานความรู้ที่ได้ไปศึกษางานการออกแบบหน้าต่างของพระองค์ จึงได้ถ่ายทอดออกมาเป็นรูปแบบสถาปัตยกรรมที่แสงและเงาถูกเลือกให้ทอดผ่านที่ว่างและพื้นที่ที่เหมาะสม

สาขาวิชา การออกแบบสถาปัตยกรรม ลายมือชื่อนิสิต .....

ปีการศึกษา 2558 ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

5573702825 : MAJOR ARCHITECTURAL DESIGN
KEYWORDS: WINDOW DESIGN METHODOLOGY, PRINCE NARIS, BAAN PLAINERN

MALIN PHLERNJAI: PLEANG : WINDOW DESIGN METHODOLOGY FOR PRINCE NARIS LEARNING CENTER. ADVISOR: ASST. PROF. M. L. CHITTAWADI CHITRABONGS, Ph.D., 125 pp.

H. R. H. Prince Narisaranuvativongse (1863-1947) worked in various art fields, including architecture during the reign of King Chulalongkorn (King Rama V, r. 1868-1910) until the reign of King Prajadhipok (King Rama VII, r. 1925-1935). Under various design constraints, such as political issues and socio-acceptance, he accomplished the mission with remarkable solutions. Although, Prince Naris was an autodidact in the art field, he collaborated with numerous Italian artists, sculptures, engineers and architects who came to work for the government of Thailand; enabling him to think unconventionally.

Prince Naris is not a traditionalist. The thesis is to study of Prince Naris' window design methodology, so called by him in Thai as *Pleang* (แผลง). The thesis is especially about the reconfiguration of prefabricated windows used at his house/ studio, at Baan Plainern. The objective of this thesis is to reconfigure the windows from the study, and to create connection between Baan Plainern and general public through architecture. In addition, Baan Plainern is where Prince Naris had lived for the last phase of his life. Also, the Naris Foundation is a charitable organisation that support Thai arts and supplement Prince Naris' artifacts. The remarkable of the Naris Foundation can be along with the statement of architecture which represent it.

The proposition of the design is the selection of materials that gives contrast between the old and the new, heaviness and lightness, darkness and brightness. The final result reflects the study of Prince Naris' window design methodology through the building as it catches light and cast shadow in the space.

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

Academic Year: 2015 Advisor's Signature .....

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Chapter 1 Introduction

1.1 Research significance and problem statement

For the past 3 years (2013-2015), the author had attended a series of workshop 'Living Archives: Proposal Development for the Naris Foundation'. These 2 week workshops called for the attention to an urban historic site in Bangkok, known as Baan Plainern, that occupies multiple overlapping layers of these 3 significances;

1) A monument of a well-regarded artist and intellectual,

   Prince Narisaranuvativongse.

2) A contemporary residential complex of 12 households that has been continually in use since Prince Naris' death in 1947. These private residences are the property to the heirship of Prince Naris.

3) A previous expanding arts institute with educational programming and an exhibition programming which hold once a year, on the Naris' day on 29th April (Chitrabongse, 1967).

The series of workshop's objective is to discuss and assemble the proposal development for the Naris Foundation, that is to maintain Prince Naris' legacy. The author's interest of the thesis started from here, to continue on the proposition to support the Naris Foundation and personally to the author's curiosity on unconventional Thai architectural design.

There are two reasons why this thesis is written: the intangible aspect of enhancing Prince Naris legacy and the physical condition of Baan Plainern. A 4-storey commercial building in front of the gated community, Baan Plainern, is a potential site to create a new type of arts institution, called in this thesis, Prince Naris Learning Center.

1) Intangible aspect

a) Prince Naris' Thai architectural design methodology is very unique and unconventional (Chitrabongse, 1963). However, the legacy of Prince Naris has been fading away overtime. There is no public facility for the general public to gain the sources of knowledge.

b) The Naris Foundation organises an exhibition of Prince Naris' works only on the Naris day, once a year. There is lack of public connectivity. The foundation also gives away scholarships to art students every year and hold a small exhibition at an open-air pavilion at Baan Plainern (Silpakorn, 2001). It is needed to have a proper space to exhibit all the works. Moreover, as the charitable organisation, in order to safeguard the artefacts of Prince Naris, they also need a constant cash flow to operate the foundation, in addition to donation.

c) Baan Plainern was one of the few places in Bangkok that teaches Thai traditional performance, Khon-dancing. It was closed down since the school director's retirement. For that reason, the school stop being active, life of the place seems to stop growing. The attachment between the outsiders and Baan Plainern became disconnected.

2) Tangible aspect

Baan Plainern located on Rama IV Road, one of the most congested road in Bangkok especially during rush hours. Though, the location is within easy reach by various means of public transportation such as Klongtoei MRT, motorbike taxi and bus. However, there are few population of pedestrians. Mostly, people commute by cars. The atmosphere of the surrounding is very dry and polluted. The site locates next to a solitary Electric Metropolitan Authority and there is lack of community space around. Particularly, there is a commercial building cover up the view of Baan Plainern landscape. Moreover, there are two electric poles with untidy electrical wires danged down over the front entrance of Baan Plainern. For these reasons, pedestrians or tourists are unaware of this beautiful site. Baan Plainern, is one of the 'Bangkok unseen' with an exquisite landscape and the Thai house (former a house/studio of Prince Naris), which both were designed by Prince Naris.

The author intended to design Prince Naris' institutional base as a supplement to the Naris Foundation by applying the study of Prince Naris' design methodology. In addition to create a connection between Baan Plainern and general public through architecture. Therefore, the objective of this study as to find design regulations per se. The author has researched through an analysis of Prince Naris' design methodology, based on window design. Why window? Window is an architectural element that create connection and transition between two spaces, with spatial aspect, quality of light aspects and ventilation aspect.

1.2 Thesis question

How to create connection between Baan Plainern and general public through architecture, especially by the reconfiguration of Prince Naris' window design methodology?

1.3 Purpose of the thesis

The thesis is to study on Prince Naris' design methodology, called in Thai as *Pleang* (แผลง), purposefully with the reconfiguration of Prince Naris' window design methodology. In general, Prince Naris' design methodology is non-traditionalist and it reflects on his design motif. The thesis starts with the definition of Prince Naris' design methodology through textual references, and emphasis on Prince Naris' reconfiguration of prefabricated windows used at his house/studio at Baan Plainern. There are two reason for this specific case study. The first reason is that Prince Naris' house/studio has never been systematically documented before. Another reason is, it is one of Prince Naris' design that stood next to the chosen site of Prince Naris Learning Center, namely a commercial building on Rama IV Rd. in front of Baan Plainern.

1.4 Scope of the study

In this thesis, the author chooses to study the ways in which Prince Naris designed ‘windows’, especially at his Thai house/studio at Baan Plainern because it has never been systematically documented before. Scholars of Prince Naris tended to research upon his architectural designs of religious buildings, royal crematoria rather than his own private residence which he reassembled from existing Thai traditional houses. This decision is possible because of the following study processes.

1) On site observation

Primary, the author has conducted a documentation and analysis of Prince Naris’ house/studio at Baan Plainern with the aspects of;

a) Quality of light and Mechanism of windows

b) Layout and Circulations

2) Literature reviews

a) Primary textual references on Prince Naris’ design methodology written by Prince Naris himself.

b) Textual references from several scholars and historians toward Prince Naris’ design methodology.

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On site observations and documentations upon a scholar’ study of Prince Naris’ architectural design. The author decided to include only the documentations and analysis on window design methodology.

There are 3 significant architectures with the definition of ‘The new model of Buddhist architecture of Thailand;

i) the ordination hall of Benjamabophit temple

ii) the ordination hall of Rajadhivas temple and

iii) the ordination hall of Phrapathommachedi temple

In order to show the clear comparison, these ordination halls are depicted from 3 different periods of time with different socio-political constraints and design constraints.

3) Thesis construction site

The field of the study limits scope of approximate to 4,500 sq.m., at Baan Plainern compound, distance including a commercial building on Rama IV Rd. to the backside of Prince Naris' house/studio (The area of the whole compound is approximately 28,500 sq.m.). The row of shophouses is the only existing structure of the thesis construction site. It is nowadays functioned as a Volkswagen showroom.

The scope of the study is not including Prince Naris' archives because it is now unpublished.

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1.5 Research methodology

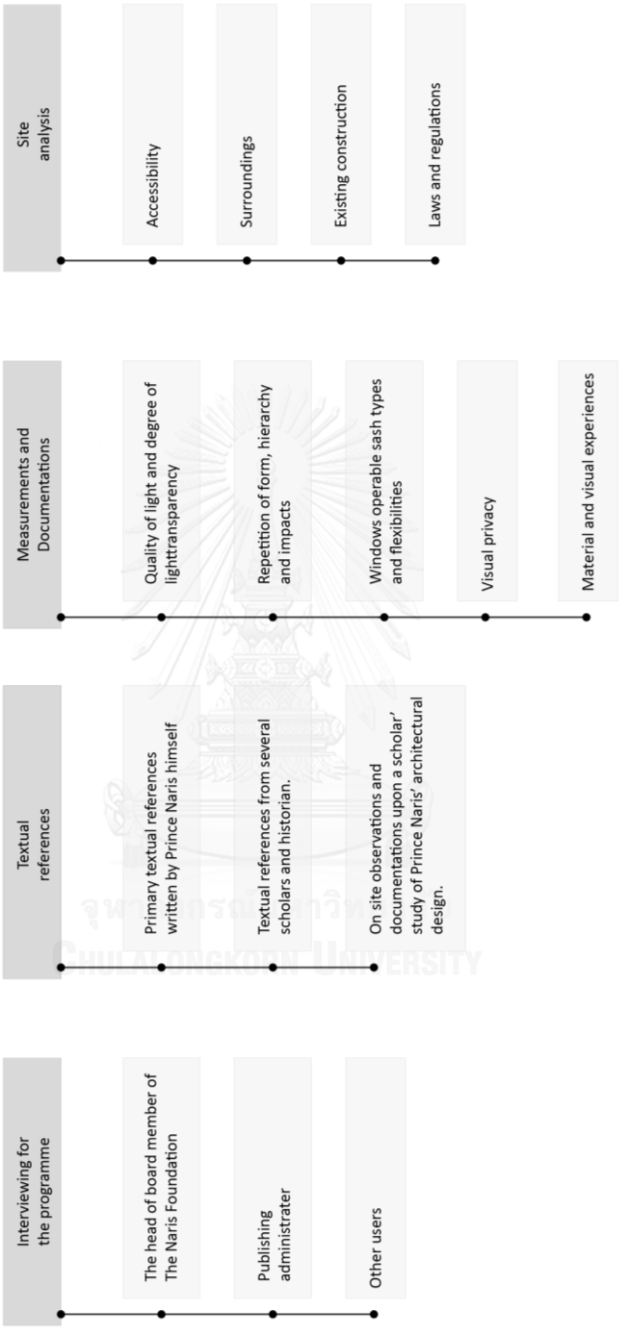

Figure 1 research methodology outline

There are 4 features of research methodology;

1) Interviewing for the programme.

The author had a chance to interview (Chitrabongse, 2014) with the head of board member of The Naris Foundation, M.R. Chakrarot Chitrabongs. He is Prince Naris' grandson and lives in Baan Plainern residence. He gave an initial concept for The Naris Foundation institutional base. He mentioned that nowadays the board members operate a meeting at the ground floor of Prince Naris' house/studio at Baan Plainern. However, the space is quite too personal for every guests. They demand a fixed reception-space for the proper welcoming. He suggested about the programme;

a) Space for the board of committee meeting.

b) The Naris Foundation office, to provide basic information to the visitors and organise the foundation's documents.

c) An exhibition space for the history of Baan Plainern and Prince Naris.

d) An exhibition space to display Prince Naris' works as a rotate exhibition.

e) A small library contains of books about Prince Naris and Thai arts which he mentioned there is plenty of books granted by Baan Plainern residents.

f) Rental space to generate income for The Naris Foundation, such as cafeteria and shop front.

g) Restroom

Moreover, the author visited the storehouse of books published by The Naris Foundation. The storehouse contains number of book about Prince Naris' works and books written by people who is related to Prince Naris. The author also had an interview with Precha Kokilawadee, who is in charge of assisting book stocks of The Naris Foundation. He was born at Baan Plainern compound, grew up and had lived there for many years. His background is a lecturer of Design & Technology course at Wat Sudhivararam School. He gave some suggestions for the possibility to design programme at Naris Learning Centre, as follows;

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a) At the storehouse, there are various media of Prince Naris sources of knowledge being stored such as books, scripts, Thai music records, replicas of Prince Naris' drawings, postcards and some of the replicas of The Naris Scholarship alumni' paintings. (*Figure 02*)

b) All the media should be kept in the storehouse. Then, they'd be progressively selected out to sell, according to each rotate-exhibition themes. Since, they are all needed to be barcoding-verified.

c) The two most important events are on 28th - 29th April (The Naris' day) and in September (Princess Duangchit's commemoration). However, apart from those two events, there are themes that can be shown, varied from these categories;

   i) Thai arts

   ii) Thai architecture

   iii) Thai music

   iv) Thai Performing arts (Khon-dancing) and scripts

   v) Buddhist cosmology

   vi) Talipot fans

   vii) Thai history and chronicles (The sources are in The Naris' archives)

   viii) Baan Plainern

d) A request of bringing 3 old cupboards, which are at the storehouse to display books at the store.

e) The area of a Thai pavilion (approx. 30 sq.m.) which is currently used for the Naris' day scholarship winners' exhibition, provide sufficient space for the activity.

f) At Naris Learning Centre, he gave a suggestion on the programme as a showroom of those medias. Due to the fact that, nowadays all the replicas of paintings have been shown to the buyers via catalogues.

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g) From the retail perspective, the site can be easily accessed by, public transportation. Precha reveals about an alternative option which he has started to put the products online and let the customer comes pick up at the site or send via mail. It has been shown that many domestic customers do not want to get the parcel by mail. They would like to come and receive the books by themselves. This can be one of the channel of drawing the demographic to the site.

h) For logistic perspectives, books and the other media will be selectively shifted to the site for small amount of stock. They use handcarts to transport which means the path to the site must be clear. Furthermore, the number of stock remains is high, they will not need new publication for years. However, the logistical connection between outside the site still needs to be in concern.

Figure 2 panoramic views from the interior of the main room of the storehouse.

2) Textual references

In order to understand Prince Naris' mode of thinking, the author investigated further through personal letters, primary sketches and construction drawings of Prince Naris. The author also investigated on a well-regarded historian of Prince Naris, Assoc.

Prof. Somkid Jiratasanasakul, who conducted an analysis on Prince Naris' works on architectural field. The author has conducted the research by reading through the correspondences between Prince Naris and King Rama V, and the correspondence between Prince Naris and Prince Damrong, published in a book form entitles San Somdej series of book. Moreover, the author came across with the writing of several notable scholars such as Phraya Anuman Rajadhon and Princess Duangchit Chitrabongs, the daughter of Prince Naris, to find a remark on the quality and characteristic of Prince Naris' design.

3) Measurements and documentations

The experiences of viewer toward the house can be mentioned with the analysis of these following features through measurements and documentations;

a) Quality of light and Mechanism of windows

i) Proportion and the configuration of windows

ii) Quality of light and degree of light transparency

iii) Repetition of form, hierarchy and impacts

iv) Windows operable sash types and flexibilities

v) Visual privacy

vi) Material and visual experiences

b) Layout and Circulations

i) Complexity of layout

ii) Circulation types, main circulation and options

4) Site analysis

There are 4 main features for the site analysis;

a) Accessibility

i) Accessibility of visitors

ii) Accessibility of the residents of Baan Plainern

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iii) Accessibility of the staffs of The Naris Foundation

b) Surroundings

i) Surrounding condition of the site with the radius of 500 m.

ii) Spectacular benefits from Baan Plainern landscape

c) Existing construction

i) Building structure and the remains

ii) The possibility of the physical connectivity between the site and Baan Plainern

d) Laws and regulations

1.6 Benefit of the study

This thesis proposes a design of Naris Learning Centre, displaying the guideline of the reconfiguration of Prince Naris' window design methodology. The study of window design methodology (including the selection of materials that gives a contrast between old and new, heaviness and lightness, darkness and brightness) will provide a good design decision for Prince Naris' Learning Center building. In order to create connection between public and Baan Plainern, the choices of degree of openness, is dealing with quality of light and ventilation.

Chapter 2 Literature reviews

In order to reconfigure Prince Naris' window design methodology, firstly the author aimed to investigate on his design methodology through textual references. As the purpose of the thesis, the author emphasised on the aspect of Prince Naris' design methodology as a non-traditionalist (Jiratasanasakul, 2013). Therefore, the author categorised all the literature reviews into three layers as follow;

2.1 Primary textual references written by Prince Naris himself

2.2 Textual references from several scholars and historian.

2.3 On site observations and documentations upon a scholar' study of Prince Naris' architectural design.

2.1 Primary textual references written by Prince Naris himself

Prince Naris' design methodology, was usually called by himself in Thai as '*pleang'*, translated here as 'atypical'. He used the term on his corresponded with King Chulalongkorn (King Rama V, r. 1868-1910) (Chulalongkorn, 1901), during the design process of Benjamabophit temple. Prince Naris (Dhammawarangkul C., 1992) had stated:

"*Prince Worawat is skillful in arts more than architecture. He knows how to follow the designs, but he cannot design ... I have to execute the architectural drawing by myself. The design must be pleang...".*

What Prince Naris remarked was *pleang* is the mode of design that only him can execute. At that time (1909), there were numbers of Italian architects and engineers who served the Thai government. For the construction of Benjamabophit temple, Prince Naris worked with the engineer-in-chef of the Ministry of public works, Carlo Allegri, and the Turin architect Ercole Manfredi. However, Prince Naris was the one who directed most of the architectural drawings. Moreover, Prince Naris also corresponded

with King Chulalongkorn, on the construction report of Benjamabophit temple (Dhammawarangkul C., 1992);

"17. Marble cloister is about 'architect pleang'. I have to execute the design by myself. I started but it has not done yet…".

Prince Naris mentioned about material specification during the construction of marble cloister at Benjamabophit temple. It was about '*architect pleang*' or atypical architectural design, which he intended to do it by himself.

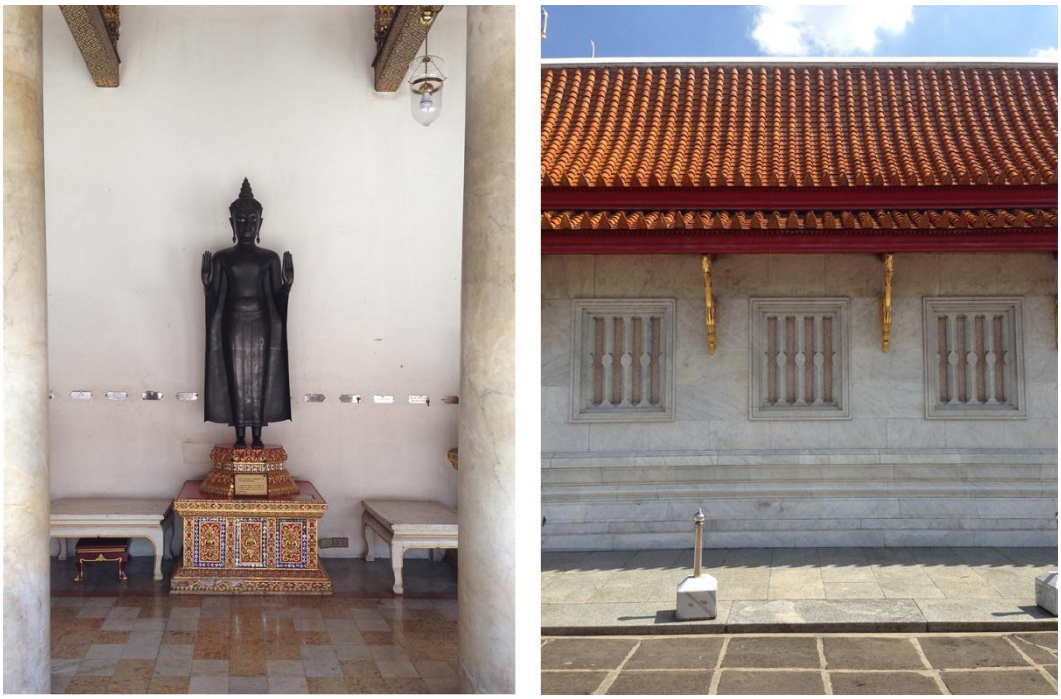

Figure 3 the interior wall (left) and the exterior wall (right) of the cloister of the ordination hall of Benjamabophit Temple. Photograph taken by the author.

From site observation at Benjamabophit temple, there are 48 window-replicas align on the exterior surface of marble cloister. However, the term 'window replica' in this thesis mean a window frame that surrounds no void, it is holding nothing. The function mostly is to validate the balance of the overall look. These window-replicas have rectangular frame made of white marbles. Their backgrounds made of light brown

marble, overlaid by white marble balustrades, known in Thai as '*Look-ma-haud*'. There are gilded roof-braces interposing between each window-replicas. There are marble pedestals, known in Thai as '*Tarn Singha*'(Sinnukul, 2014) wrap around the cloister (*Figure 03 Right).* In common practices at temple cloister, these are positions of windows, there should be voids. From the author point of view, the reason comes with the interior of the cloister. It presents as solid wall painted in white colour. There is no trace of window-replicas on the opposite side of the wall. King Chulalongkorn determined Benjamabophit temple to be a hybrid programming between temple, monastery school, and a museum (Chulalongkorn, 1901). He intended to use this cloister as an exhibition space for his collection of rare Buddha statues, which mainly found in Thailand (Chulalongkorn, 1901). King Chulalongkorn asked Prince Naris to design the cloister in 1900 and the design had been developed until 1909 (Dhammawarangkul C., 1992). If these window-replicas were real windows, the background of Buddha statues would not be this clean and tidy. The representation of the white wall are the means to enrich formal quality of Buddha statues (*Figure 03 Left).*

Prince Naris is considered as one who can have defined the new identity of Thai art and architecture through the presentation of designs, with unconventional execution (Charoenwong, 2006). As he was given very important tasks to create the new phase of Thai religious buildings with hybrid programming. During the reign of King Chulalongkorn, Thailand needed to visualise the refine civilisation for the absence of being colonised. The starting point of having a new definition of the new Thai traditional, which actually architectural characteristic designed by Prince Naris. Prince Naris' strong identity in design had been described by King Chulalongkorn and historians as in the following topics.

2.2 Textual references from several scholars and historian

King Chulalongkorn described to Phraya Raisongkram about Prince Naris' artistic skill as he could achieve the difficult assigned tasks. King Chulalongkorn needed the

temple of his reign to be realised through Prince Naris' design methodology, which the temple was planned to be unconventional as the hybrid programming architecture.

What exactly is the design methodology of Prince Naris meant? Princess Duangchit Chitrabongs gave a definition as Prince Naris' design method is an adaptive method (Phongsuwan, 1988). It means the design of Prince Naris can resolve constraints with flexible solution by making a modification of the common practices. Moreover, Somkid Jiratasanasakul, a Thai historian and Thai architecture lecturer at Silpakorn University, gave a similar explanation of Prince Naris' architectural design methodology as the modification of an original form in order to create a new form (Jiratasanasakul, 2013).

The author came across the writing of Phraya Anuman Rajadhon, one of the notable scholars of Thailand, his interpretation towards the quality of Prince Naris' design was based on the sense of familiarity of viewers. The design is unconventional but it did not alienate the viewers. He wrote;

"We [the Thais] can identify ourselves with the designs of Prince Naris. They are not entirely unfamiliar." (Prince Narisaranuvativongse, 1963)

What Phraya Anuman Rajadhon meant is Prince Naris' proficient skills on Thai arts and architecture allowed him to make something suitable for a new purpose, from the traditional practices. In additional of keeping the balance between the familiarity of special effects and the new visual experiences upon the viewers.

2.3 On site observations and documentations of Prince Naris' significant buildings

The author decided to select one major architectural element to explore on Prince Naris' design methodology. The study of windows designed by him is the key to narrate the unconventional mode of thinking. As if, this study visualise and establish further execution on the architectural design for The Naris Foundation. Still, from the observations, there are various aspects of design which are presentable to the idea of *pleang* (atypical). However, due to the suitableness for the purpose of creating

connection between Baan Plainern and outsider. Window, is an architectural element which create spatial effects as portal or the transition channel between two spaces.

The documentations of windows based on 3 significant buildings designed by Prince Naris, from 3 different periods of time. There are as follow;

1) The ordination hall of Benjamabophit temple (The marble temple)
2) The ordination hall of Rajadhivas temple
3) The ordination hall of Phra Pathommachedi temple

However, the documentation materials provide evidences of atypical design methodology of Prince Naris through window designs by categorisation of 4 similar features as below;

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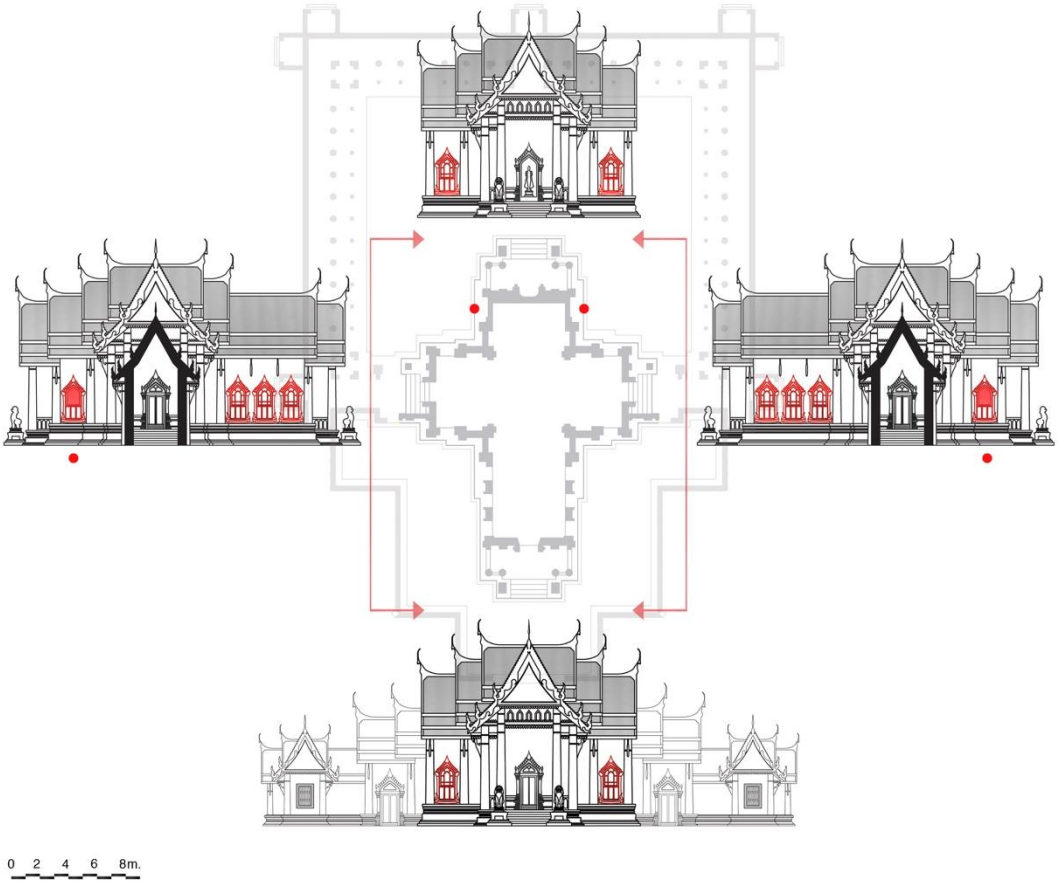

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Figure 4 locations of the window replicas marked by red dots, the exterior of the ordination hall of Benjamabophit Temple. Plan, sections and elevations drawn by

1) Windows and windows replicas

Around the exterior wall of the ordination hall of Benjamabophit temple (Figure 04), there are seemingly 12 windows placed on the building. However, only 10 of those are real. The other 2 are the replicas of window, which can be seen from the interior courtyard. Moreover, with the proportion of the windows to the wall, it seems to be placed at normal eye-level. Nevertheless, the windows and replicas of windows position above, on top of the 2.00 m. high moulding pedestal. The white marble cladded pedestal and wall make the exterior of the building bright. Also, with the gilded windows frames called '*reun kaew (*เรือนแก้ว*)*', cast shade and shadow upon the

wall and windows themselves. The formal qualities and materiality enable the viewers to experience the contrast between brightness and darkness, shades and shadows. They are the dominant feature of the facade.

Marble slabs cladding was newly imported technology from Western Europe to envelope the inner brick structure, at the turn of the Twentieth Century. According to proposal of the feasibility and discussion between, King Chulalongkorn, Carlo Allegri and Prince Naris, Carrara Marble was brought to use. It was the most expensive prefabricated materials at the time. The unfamiliar Carrara Marble cladding was designed with the gilded wooden window frames based on the Thai ornament patterns. The '*reun kaew*' frames of real windows and windows replicas have conceptual meaning. In Thai Buddhist' belief, it signifies a scared boundary of the Buddha's enlightenment (Jiratasanasakul, 2013). The space within '*reun kaew*' are thought to be a portal to another dimension, as the space of serenity mind among the complicated world of desires. The area inside '*reun kaew*' frames on the exterior wall, are often used to conceptualise the distant Buddha statues from the interior (Jiratasanasakul, 2013). Also, the '*reun kaew'* frames are usually found at Buddhist temples, at the background of Buddha statues. The author concludes the position of '*reun kaew*' frames as it is on windows, at the background of the statue or as the frame of replicas of window, it defines spaces. The '*reun kaew*' signifies transition channel toward reality and conceptual void.

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Figure 5 the window replica (*left*) *and the window* (*right*) *framed by reun kaew, from the exterior view of the ordination hall of Benjamabophit Temple. Photograph taken by the author.*

Benjamabophit temple as the provision of King Chulalongkorn, has hybrid programming rather than just the Buddhist monastery. It is also counted as a museum. Since that, Prince Naris treated the '*reun kaew*' as on the windows or window replicas as art objects on display above the white marble pedestal. These familiar Thai architectural elements have been applied to create a new type of aesthetic experiences. Prince Naris' design attained King Chulalongkorn' provision as the key elements to blur boundaries between religious and secular programming. The spectators and believers can perceive the ordination hall of Benjamabophit temple as a museum in the very same times.

2) Visual harmony or the familiarity of geometrical form

The treat of windows replicas of Prince Naris at the ordination hall of Benjamabophit temple was very new and unconventional. Portraying the conceptual portal to introduce the Buddha statue which locates inside, behind the

solid wall. However, there is similar practices at the ordination hall of Rajadhivas temple. Prince Naris designed 2 window replicas on the exterior wall as to complete the overall visual harmony, due to the structural necessity. They locate at the additional wall, which is perpendicularly built to support the existed walls. This additional wall intensified the strength of the structure since the ordination hall locates on the lowland near Chao Phraya River (Figure 06).

Moreover, the necessity of the sub-structure's position was also the consequences of King Chulalongkorn's provision on having Rajadhivas temple to be only monastery functioning (Sanyatoh, 2000). Firstly, he wanted to cover up the existing Buddha statues with a partition for Royal family's privacy while they were paying respect on each ceremony (1929). Also, he wanted to bring *Phra SamBuddha Pannee*, which is newly built for the temple, positioning on the another side of that partition. Hence, these additional matters created big design constraints to Prince Naris.

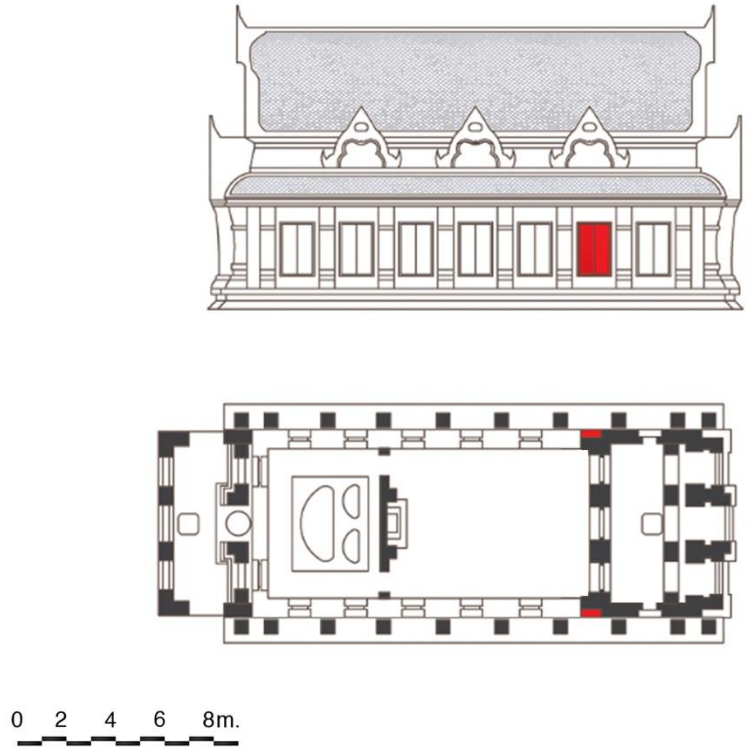

Figure 6 locations of the window replicas marked by red colour, the exterior of the ordination hall of Rajadhivas Temple. Plan and elevations drawn by the author.

The additional walls made the interior space too be overcrowded for '*Hattabhat'* or the area within the arms' length, which is an importance rules that govern Buddhist monks' activity during blessing ceremony. Due to the matter of that facts, Prince Naris decided to put the windows replicas on the ordination hall's wall. The action creates the continuity of visual harmony toward spectators who look at the ordination hall from the outside. In addition, the author interviewed Pra Kru Prasartsorakhun, the secretary monk of Rajadhivas temple, who has been there for more than 10 years. The act of window replicas harmoniously validates the overall appearance of the ordination hall. The monk had never noticed about the window replicas before. He said they were very in disguise and familiar enough to be recognised.

3) Visual effects in the interior

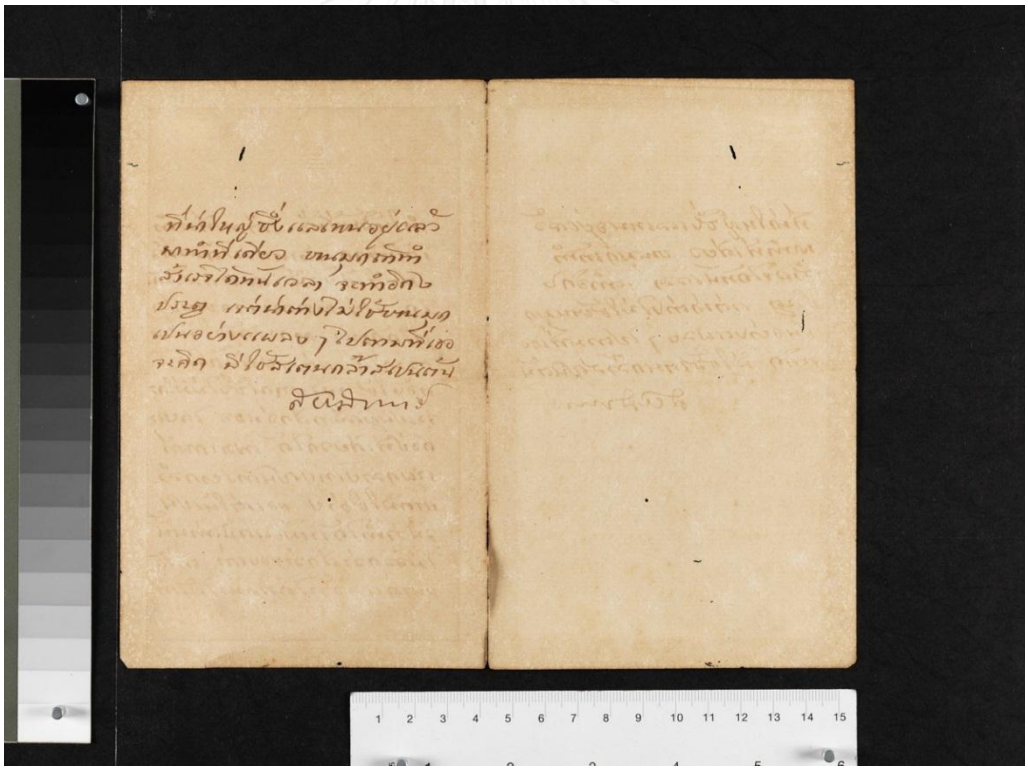

Figure 7 part of a personal letter between King Chulalongkorn and Prince Naris, 20th April 1901. From the archive of The Naris Foundation.

King Chulalongkorn gave a provision to Prince Naris to design the windows in unconventional ways. This was written on a personal letter between King Chulalongkorn and Prince naris, on 20th April 1901, as shown in Figure 07. The interior of the ordination hall of Benjamabophit temple displays the playful repetition of forms namely ten window frames and eight inches that hold the mural paintings of Thai architecture. All ten stained glass window frame, leaving the two-fifth to be the height of the wooden windows (Jiratasanasakul, 2013) (see Figure 08). They filter the brightness of natural light. On each stained glass window. there is Thai style pattern of an angel pressed the hands together, so called '*theppanom* (เทพพนม)'. The designed was carried out by the Fine Art Department. Initially, it was supposed to be the pattern designed by Prince Naris. The design was the story of the Buddha's life, each windows would have to exhibit different figure and narratives. However, the idea was later abandoned due to the limiting budget and time.

The space around central to crossed plan is rather dark, even the proportion of windows is designed corresponding to the wall height and width. With dim quality of light, the beauty of shadow empowers the guilted Buddha statue, known as *Phra Phutha Chinnarat*, to glow from the background. The two parallel walls beside the Buddha statue are where the window replicas locate on the exterior. This made the difference between interior and the outdoor sceneries. Here, Prince Naris used windows as the mean to represent spatial effects upon the viewers' visual experience. Clear visibility is not always desirable. Darkness is important for those who wish to experience light.

4) Another conceptual effect from windows

Figure 8 the niche (left) and window (middle) from the interior view of the ordination hall of Benjamabophit temple, with the proportion of stained glass window on the right. Photograph taken by the author.

Prince Naris, who the author believed he is ahead of his time, who can simplify the function and decoration of architectural elements into design. The author would like to discuss about the ordination hall of Phra Pathommachedi Temple. The ordination hall was constructed during the reign of King Prajadhipok (King Rama VII, r. 1925-1935), throughout that time, the economic was not as nourishing the use of expensive decorative ornaments, as during the reign of King Chulalongkorn (King Rama V, r. 1868-1910). The point of discussion is the reduction of number of decorative elements. To be clear, the pedestal of the ordination hall of Benjamabophit temple was made by 'adding' the cladded marble pedestal onto the wall. On the other hand, at the ordination hall of Phra Pathommachedi temple, the idea of 'adding' pedestal was on the different interpretation (see Figure 09).

Figure 9 the comparison between the exterior wall of the ordination hall of Benjamabophit Temple (right) and the ordination of Phra Pathommachedi Temple (left), with tarn sing and without tarn sing. Photograph taken by the author.

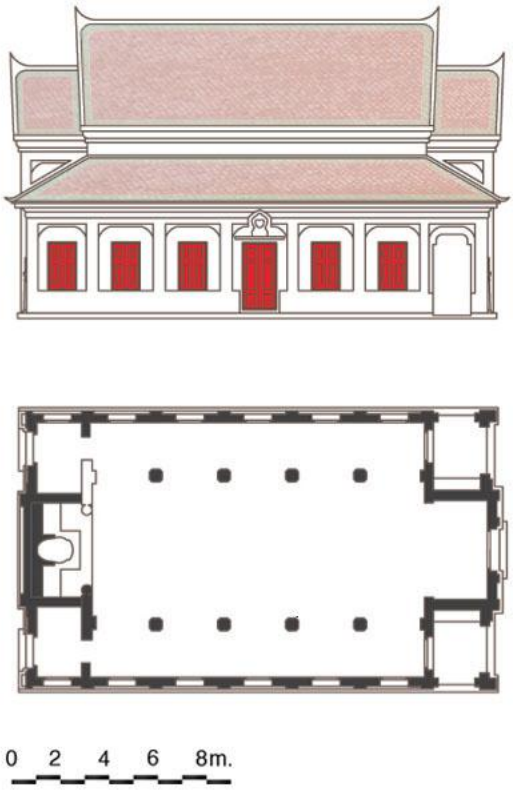

Figure 10 window and door panels are painted in red on the exterior wall of the ordination hall of Phra Pathommachedi Temple. Plan and elevations.

The point of concern is the placement of window frames and the recess solid wall of the ordination hall of Phra Pathommachedi temple. The act of recessing created conceptual line representing the pedestal. The simple execution impacts the visual experiences to the building's base, without material changing (Figure 10).

Conclusion

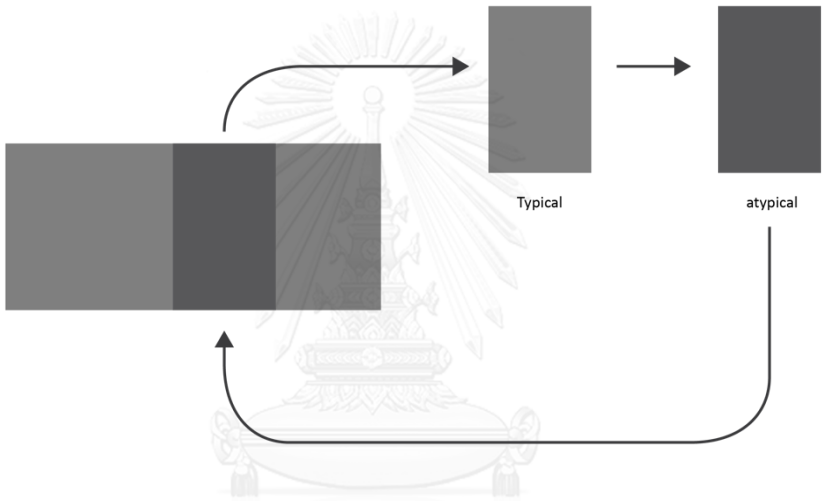

Figure 11 the diagram shows the conclude explanation of pleang toward the author's view. It is about put out some part, modify and get it back without being alienation to the viewers.

In conclusion, Prince Naris' design is not an alienation to Thai viewers. The physical presentation is familiar to us. However, the application, layout and practice of the designs are something else. As the influences from the collaboration with Westerner artists, architects and engineers, there are some Western thought combined with Prince Naris' characteristic of design. However, the degree of being '*pleang*' or atypical of the designs are various, depend on each programmatic requirements and constraints. The modification was simple with the new visual experiences but it gave powerful impact to users' experiences.

On the next chapter, there are documentations and analysis of Prince Naris' house/studio. The following investigation provides more evidences of Prince Naris' design methodology on unconventional windows and programming, on living accommodation perspectives.

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Chapter 3 Documentations and analysis of Prince Naris' house/studio

3.1 Layout and circulations

Prince Naris' Thai house was built not following the traditional practices. Layout and circulations throughout Prince Naris' house/studio are more complex than Thai traditional house. In order to give a clear explanation on how unconventional it is. These documentations shall be laid along with the study of Thai traditional house by Assoc. Prof. Ruethai Chongchairak, a traditional Thai architect and The National Artist of Thailand. However, the following documentations and analysis also include these 2 features;

1) Complexity of layout
2) Circulation types and options

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Complexity of layout

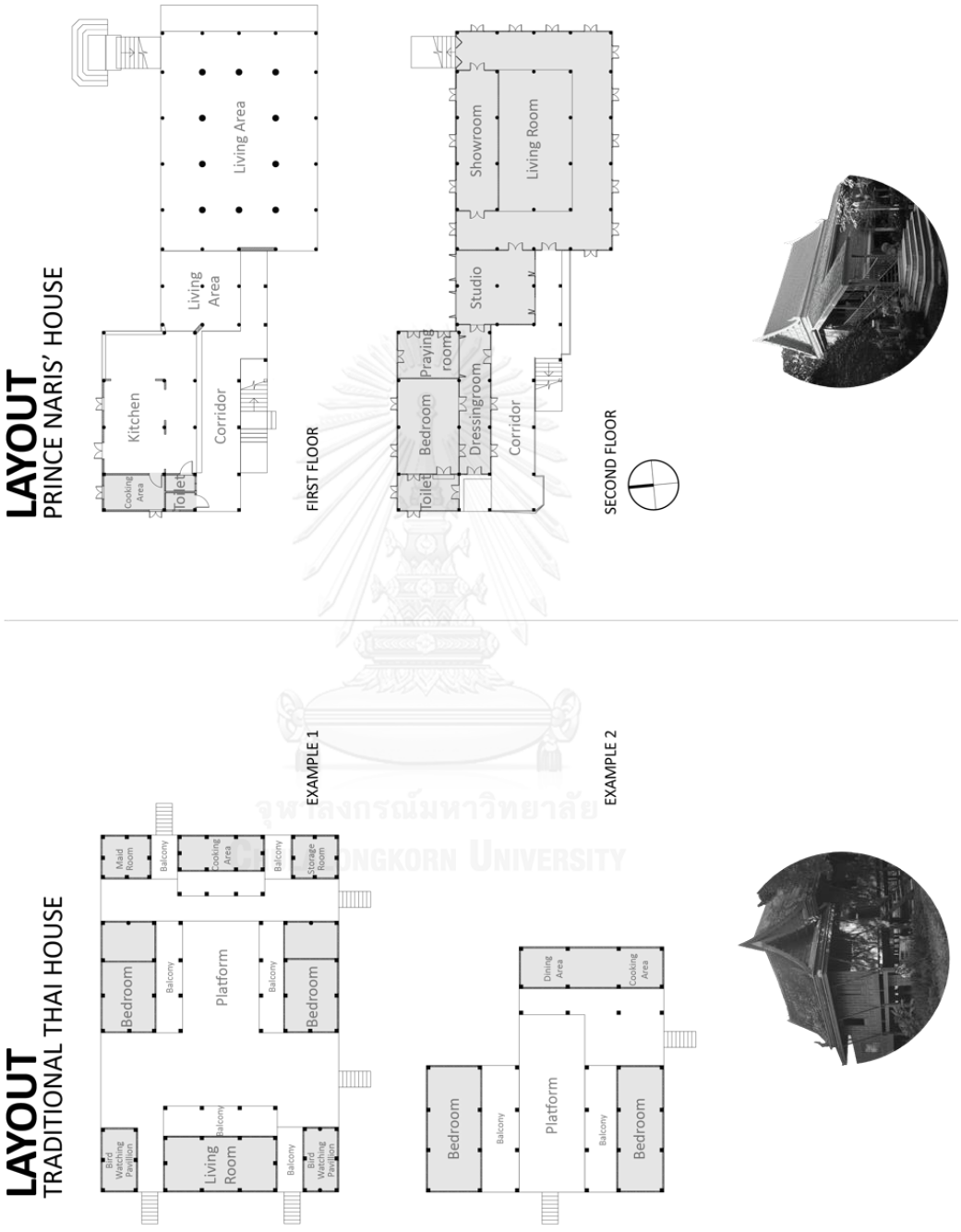

Figure 12 the comparison of layout between traditional Thai house and Prince Naris' house/studio. The layout of traditional Thai house is modified from Boonchu Rojanastien, ตำนานสถาปัตยกรรม เล่ม 1, 2548, pg.96. The layout of Prince Naris' house/studio is drawn by the author.

Assoc. Prof. Ruethai Chaichongrak mentioned there are three types of layout in Traditional practices of building a Thai house. There are Linear type, Grouping type and Scattered type. In every types of layout, the integrity of each room is maintained by separating from the path. The path is not cutting through any room. However, Assoc. Prof. Ruethai identified this configuration of the Thai traditional house as positive and negative space. Positive space means the interior or rooms, and negative space means the outside. To travel from one room to another, commuter firstly needs to pass the negative space. The negative space can be balcony or platform, as medium to commute. The level of balcony and platform changes when regimes the boundary of each area. Every changes may decrease or increase with the height of sitting position. Assoc. Prof. Ruethai also remarked the structure of Thai traditional house is post and lintel, and the structure of the positive space (rooms) and negative space (balcony and platform) are freely apart from each other. From my point of view, there is degree redundancy in structure. Moreover, layout planning strategy is not follow the orientation of the sun or wind direction. It follows myth.

Prince Naris' house/studio layout seemingly a linear type with internal connection between rooms. The definite area of balcony and corridor is blurred up with the rooms. Layout of spaces is kindly determined by programmatic requirements. For example, Prince Naris' bedroom, the restriction of accessibility is needed. The room was set aside dressing room and toilet. One must walk cut through those rooms before reaching the destination. The structure of this house is post and lintel. Columns are aligned on grid. Rooms are connected and share loads on the internal support. This framework allows the possible of reduction in supports, saving spaces, material and provide more flexibility in interior layouts. However, there are changes in level of platform as well. The changes happened to define boundary of each area, with approximately decreasing or increasing by +0.15 cm. at a time. The reason must be, at this house there are furniture. Normally, traditional Thai lifestyle, we sit on the floor. Platform took part in being a furniture such as a chair or a table. At Prince Naris' house/studio, he has them all. Moreover, layout planning includes the concern of solar orientation for suitable function. Noted from the positioning of *Window 6.2* and

Window 6.3 analysis on the previous topic. Also, there is handrail on the staircase in which it is not a common practice of Thai traditional house. Additionally, I think the layout of this house can be defined as a shuffle of The Thai traditional house. The kitchen is at the ground floor, but the conventional practice put the everything on the upper floor. For more, there are three toilets in the house, one is at upstairs and another two is at downstairs. There is no toilet exist in the Thai traditional house layout.

1) Circulation types and options

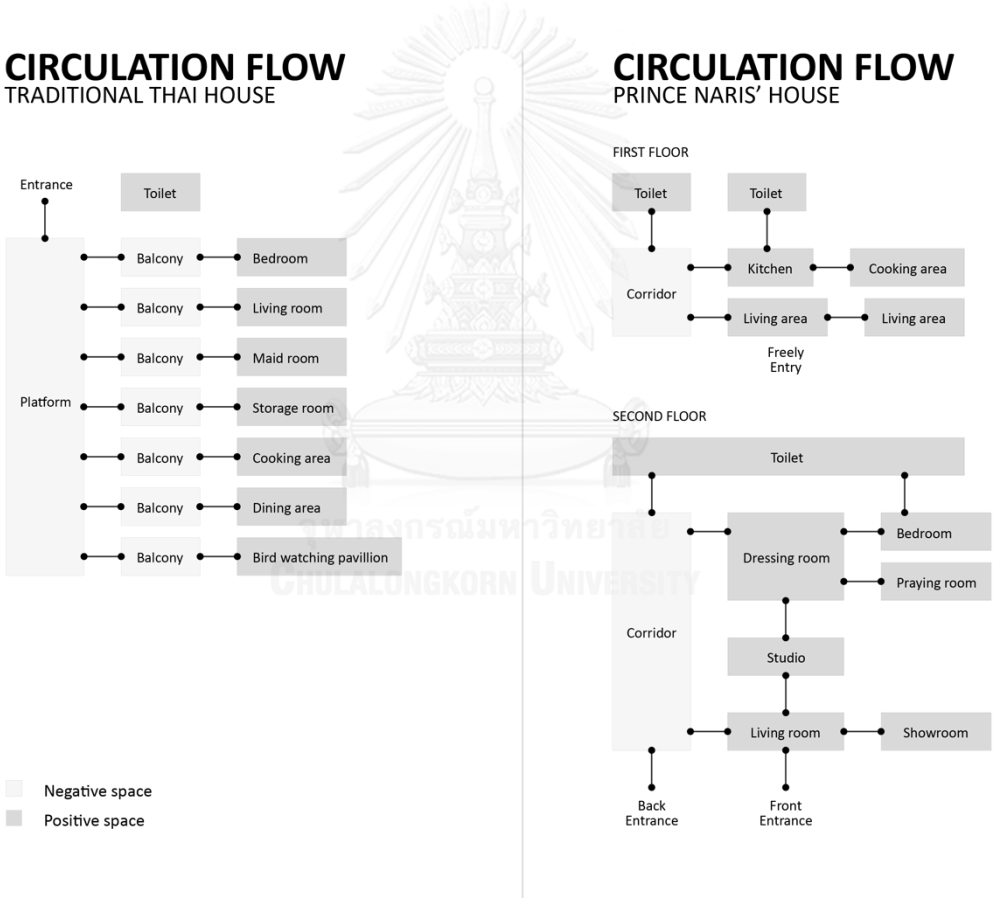

Figure 13 comparison of circulation flow between Thai traditional architecture practices and Prince Naris' non-traditional Thai architectural design.

Assoc. Prof. Ruethai Chaichongrak remarked balcony and platform are the medium to commute throughout the traditional Thai house. Balcony and platform take part in centralising and distributing the circulation path from room to room. However, relationship between circulation path of the traditional Thai house and the spaces they link in is, 'Pass by spaces'. There is no interconnection between rooms. Main circulation starts from the entrance, passing by platform and balcony, then commuters continually terminate to each room. The hierarchy of linkages between platform, balcony and rooms is equal.

For Prince Naris' house/studio, platform and balcony are not the primary organising the series of space. From my point of view, the negative space of commute should be identified as corridor, rather than platform or balcony. Yet the corridor gives central connection between some rooms, but not centralising the whole. Besides, there is interconnection between interior. The sequence of circulation flow at this house is flexible. There are options to commute. According to privacy and programmatic requirements, there are more than one node of entry to the series of space. From my point of view, having choices to commute makes big impact for the configuration of circulations, and this is very unconventional. (*Figure 12*)

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3.2 Quality of light and mechanism of windows

The methodology of these documentations starts with grouping out the comparable characteristics of windows (*Figure 13*), then analyse the similarities by using following categories;

1) Quality of light and degree of light transparency
2) Repetition of form, hierarchy and impacts
3) Windows operable sash types and flexibilities
4) Visual privacy
5) Material and visual experiences

ANALYSIS OF WINDOWS AT PRINCE NARIS' HOUSE/STUDIO

DIRECTORY

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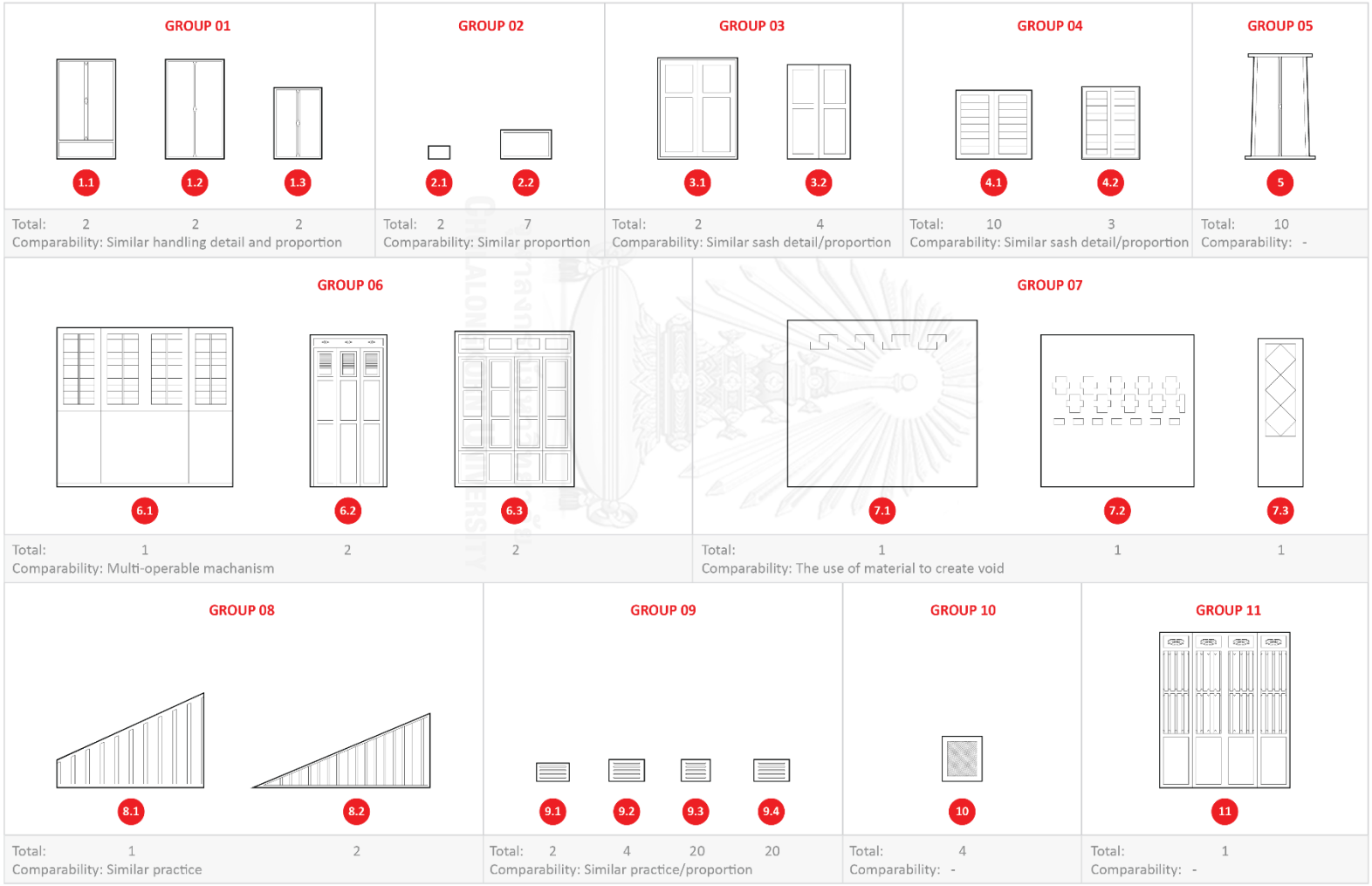

Figure 14 the directory of the analysis of windows at Prince Naris' house/studio

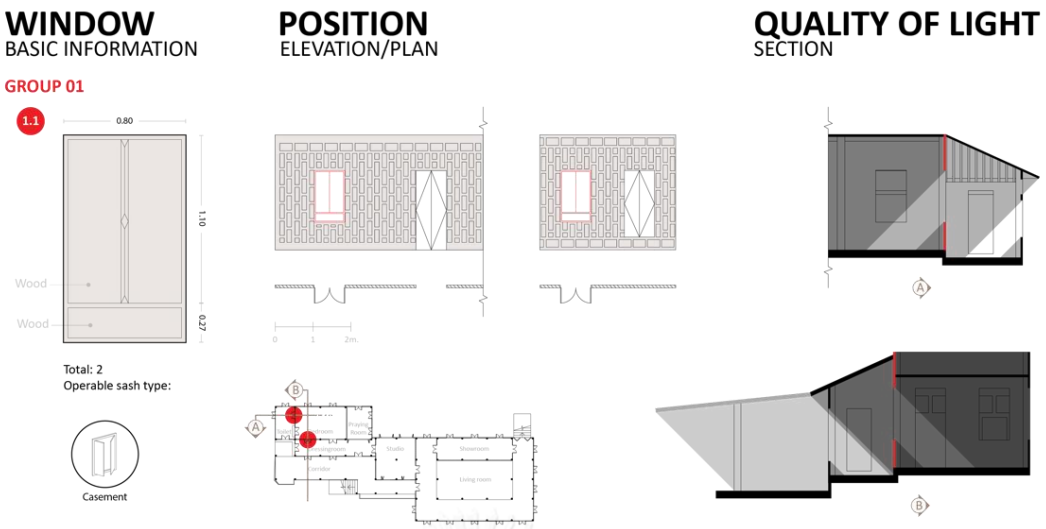

Figure 15 detail of window 1.1

These two sectional drawing show the different of lighting quality between two identical windows. The main factors are locations and the length of eaves. *Window 1.1* from *Section A*, which locates behind a toilet, casts brighter light than one from *Section B*.

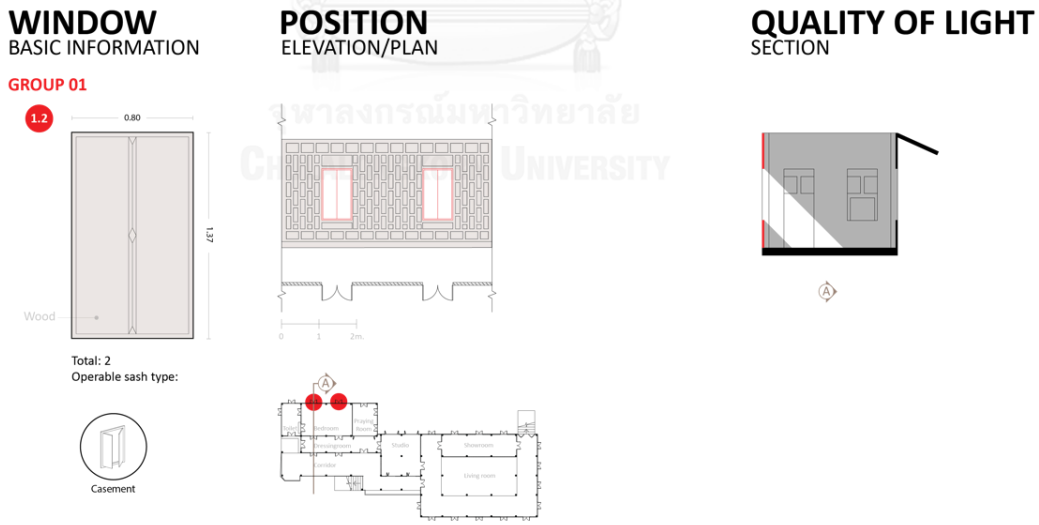

Figure 16 detail of window 1.2

Window 1.2 were placed on the outmost wall of bedroom. Without long roof overhang sunlight shines into the space directly with less diffusing.

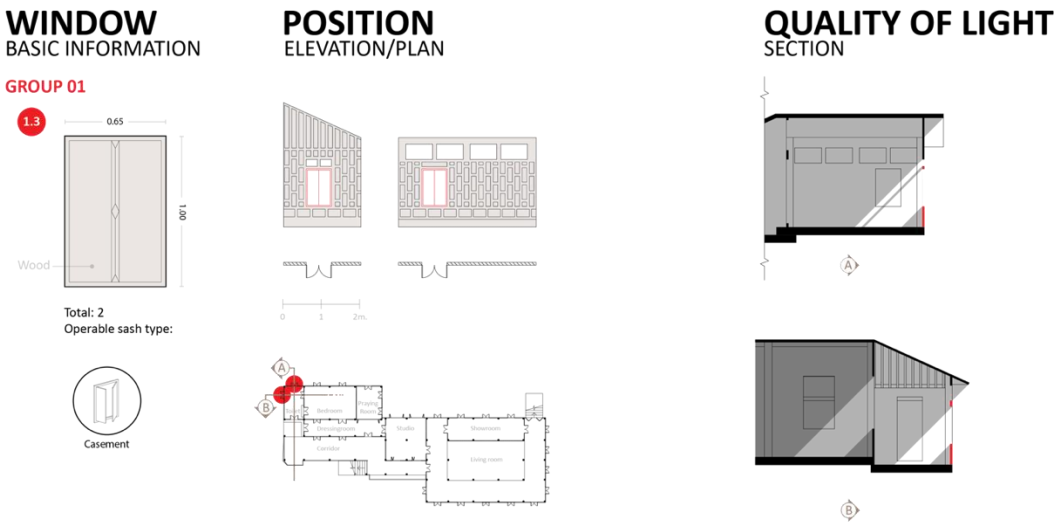

Figure 17 detail of window 1.3

The smallest windows of the group, they are all placed on the toilet wall. The amount of light from them to the room are almost equal. However, there are small windows placed above each of them, due to the different sizing of those above windows, they enhance the amount of light into the space.

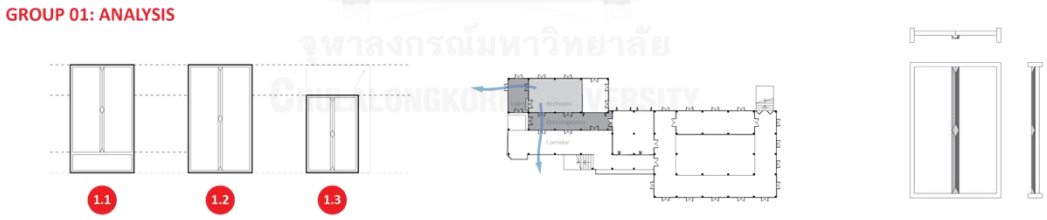

Figure 18 analysis of windows in group 01

Group 01

1) Each windows in Group 01 are corresponding in proportion and appearance (*Figure 17 Left*).

2) A window apron under *Window 1.1*, creates a conceptual extension line for the overall window height. So, the overall look is corresponding with *Window 1.2 (Figure 17 Left).*

3) The size of *Window 1.3* is smaller than the others because it locates on toilet wall. The smaller room, the less require of the amount of light inlet. Additionally, there is more degree of privacy required (*Figure 17 Left*).

4) In general, casement windows offer the maximum input of ventilation, inward sash opening provide better vent (pulling the fresh air into the room) than the outward sash. In addition, the inward sash is easier to clean. However, the outward sash opening comes with weatherproofing, wind, rain and sunlight. Mostly, windows at Prince Naris' Thai house open outward. Nevertheless, only *Window1.1* can be considered as two-ways opening, since they locate on the wall between rooms. From *Figure 17 Middle,* The *Window1.1* helps carry out air flow from bedroom to toilet and from the dressing room to outside.

5) Similar window handling detail enhance the harmony of the overall look on the wall from the outside view. Also, this Thai style window handling are compatible with the Thai style wall pattern.

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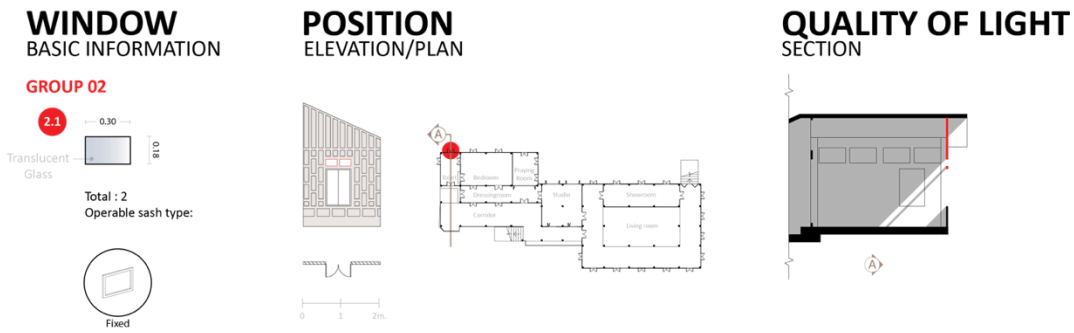

Figure 19 detail of window 2.1

Window 2.1 which locates above *Window 1.3,* were placed above eye-level. They keep the toilet bright.

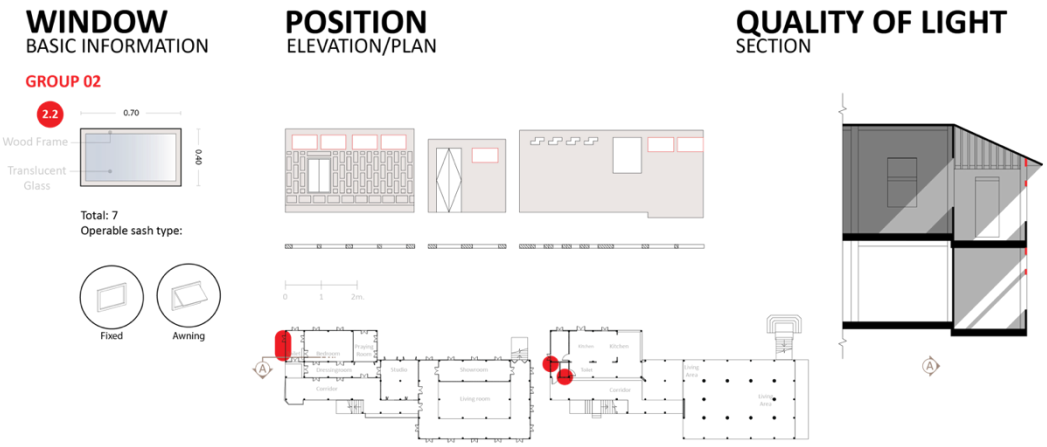

Figure 20 detail of window 2.2

Window 2.2 locates above *Window 1.3.* These windows are placed above eye-level. The flexibility is these translucent glass windows can be opened for ventilation. From the sectional drawing, *Windows 2.2* on the first floor receive more sunlight than *Windows 2.2* on the second floor. The reason is about the position, on the upper floor, there is some shading from the roof-overhang covering up. Moreover, *Windows 2.2* on the first floor are placed on brick wall and *Windows 2.2* on the second floor are placed on wooden wall, there is difference in the overall visual experience.

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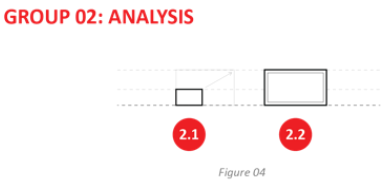

Figure 21 analysis of windows in group 02

Group 02

1) Each windows in Group 02 are corresponding to proportion and appearance. (*Figure 20*)

2) Translucent glassed windows in Group 02, provide some light when they shut, and keep interior visual privacy.

3) The repetition of windows arrangement creates visually balance to the wall panel.

4) Even the size of windows in this group is quite small but the continuity of the windows placement, can provide enough amount of natural light and ventilation during the daytime, throughout the room.

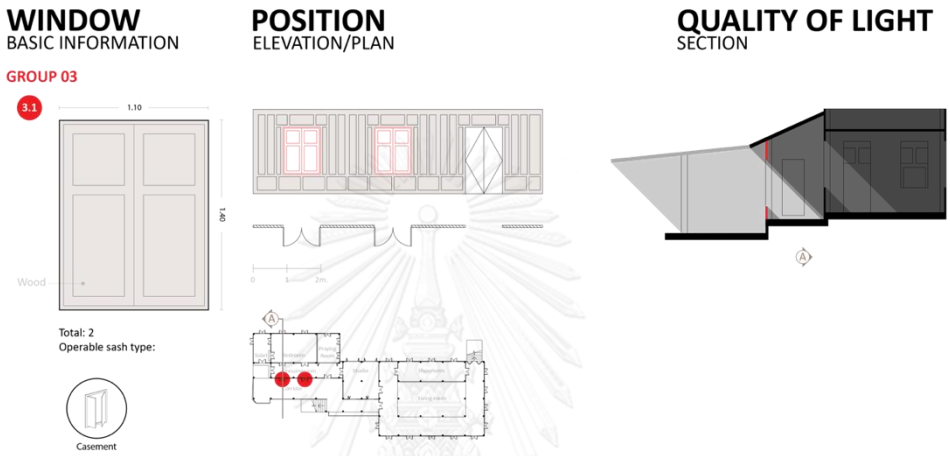

Figure 22 detail of window 3.1

A pair of *Window 3.1*, are placed on the outer wall of the dressing room. However, the amount of sunlight passing through the interior is diluted by the balcony roof. However, from the sectional drawing above, with a compact distance between walls, the enough amount of light shine throughout the room but with the dim-light quality. From my point of view, it is a good sequence of utilising sun lighting quality.

Again, from the sectional drawing, the floor level gradually goes up, which influences the level of window positions. Alongside with the different eye-level experiences of viewers, this arrangement creates some visual privacy.

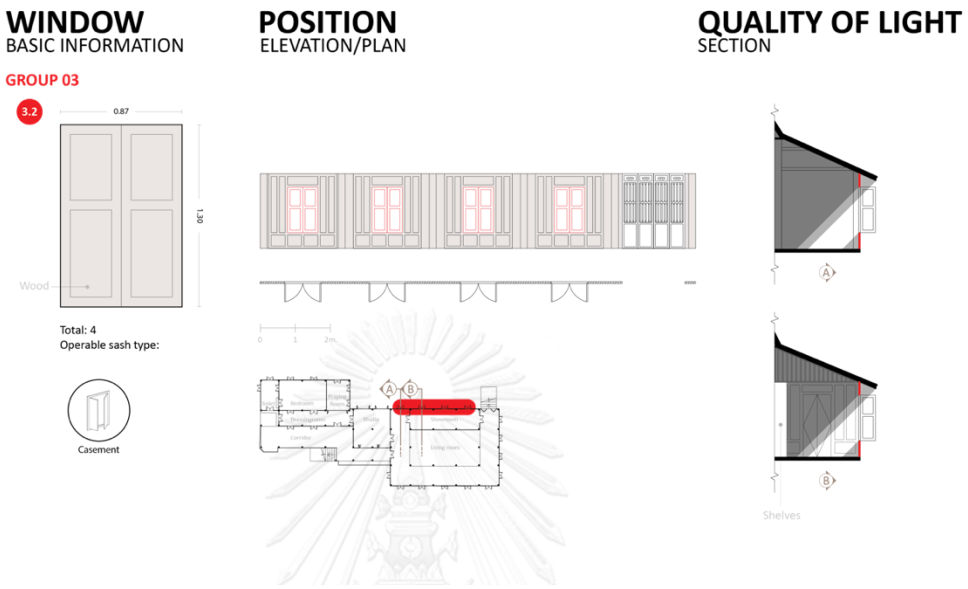

Figure 23 detail of window 3.2

These four casement windows are placed on the front facade of the house, on the wall of Khon-mask showroom. According to the orientation toward North-east, these windows receive almost full the morning sunlight. From the sectional drawing (*Section B*), there is a row of shelves containing Khon-mask, locates far enough to avoid late morning light, avoiding deterioration of strong light and rain to those art pieces. Alongside with the length of eave, hanging over to help protecting direct light cast.

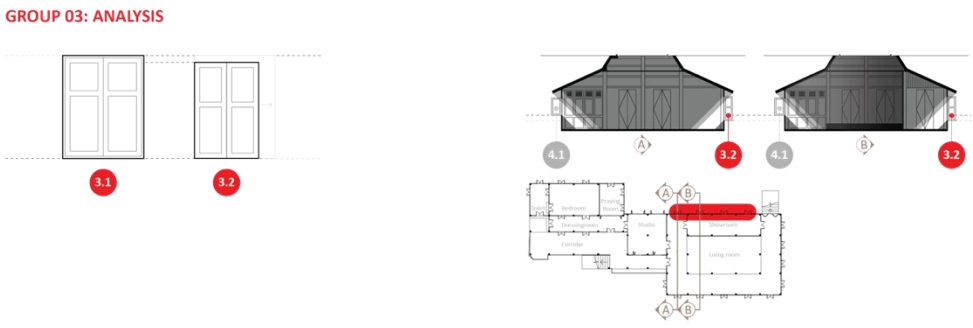

Figure 24 analysis of windows in group 03

Moreover, the proportion of these four windows are very interesting. They are high and quite narrow and they are placed repetitively throughout the wall with the same rhythm. The height and the little rise from the floor level, of the opening, helps visitors not to feel cramped while walking along this small showroom. There is sense of openness.

Group 03

1) Each windows in Group 03 are corresponding in proportion and appearance. *Windows 3.1* is an expansive version of *Windows 3.2.* (*Figure 23 Left)*

2) *Figure 23 Right* shows the comparison of lighting quality in the room between two different locations of *Windows 3.2.* On *Section B*, there is a wall, which separate between Khon-mask showroom and living room. So, the distance between wall-to-wall is less than *Section A*. Likewise, with the same amount of light passing through *Windows 3.2,* there are differences in brightness.

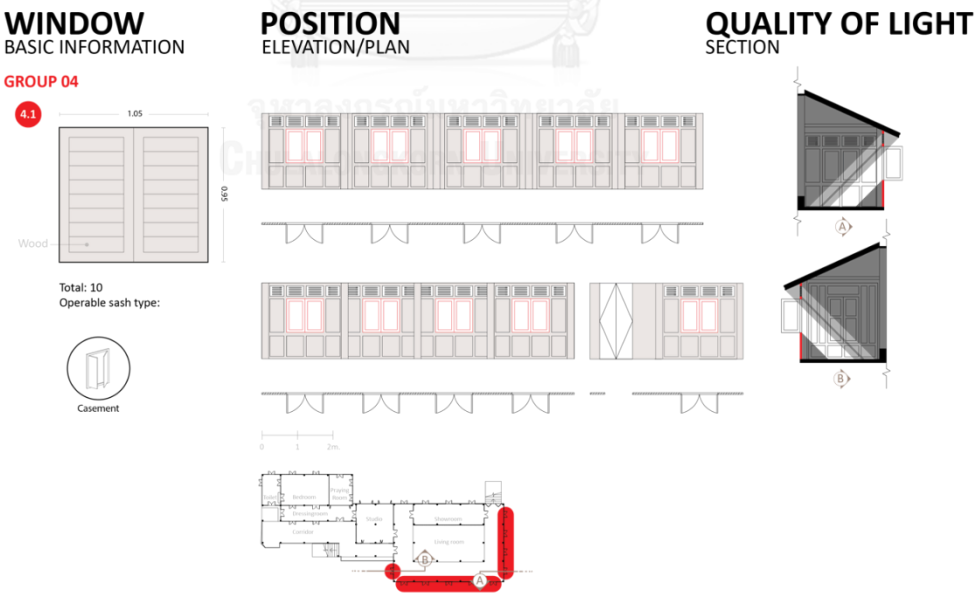

Figure 25 detail of window 4.1

Windows 4.1 are arranged correspondingly to the gap between columns, along two walls of the living room. This arrangement creates sense of continuity to the viewers. Living room is quite big. Even, there is a continuity of windows along walls but proportionally the overall brightness of this room is quite dim. (*Figure 24 Right*)

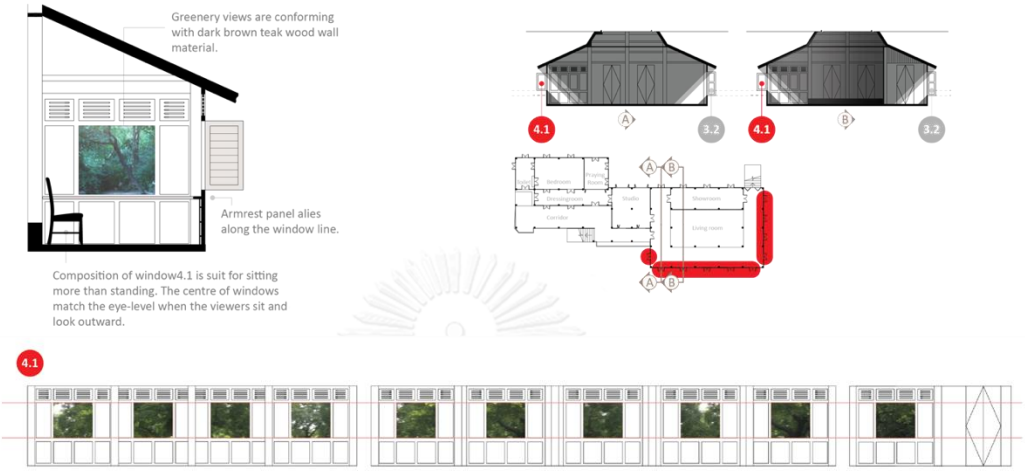

Figure 26 detail of window 4.1

Window 4.1, According to their location, which the viewers can see the garden view at the back of the Thai house. There is sequential connection of spectacular view from each windows. Moreover, *Window 4.1* has square-like proportion with dark brown teak wood frame (*Figure 25 Left*). The green and brown colour helps enhance the classic scene of the traditional Khon performance which hold at the garden. Likewise, the composition of *Window 4.1* is suit for an eye-level of sitting-on-a-chair, according to the centre line of the window.

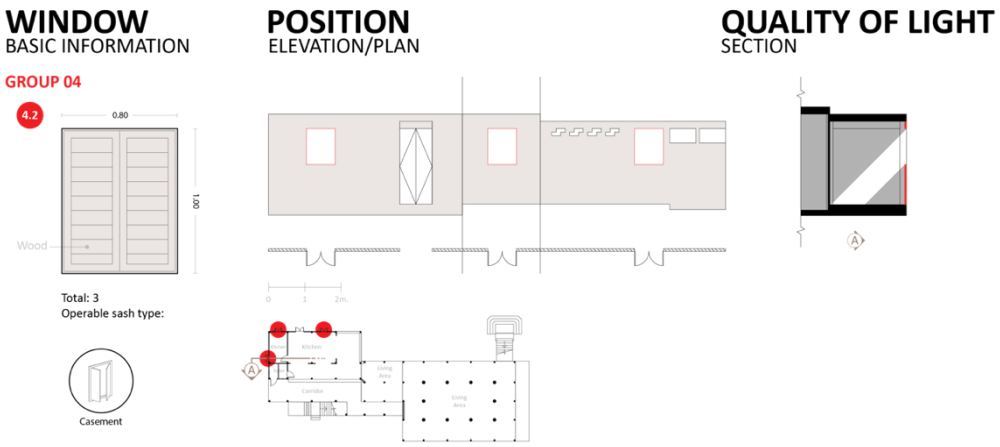

Figure 27 detail of window 4.2

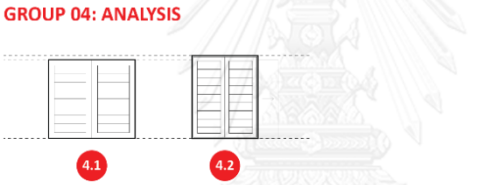

Figure 28 analysis of windows in group 04

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Group 04

1) *Window 4.1* and *Window 4.2*, are similar in appearance but not about the proportion. *Window 4.1* seems like an expansive version of *Window 4.2*

2) *Windows 4.1* locate on a wooden wall but *Window 4.2* locate on a concrete wall. With the similarities in appearance and material of wooden sashes between the two windows, they can be compared on the aspect of visual aesthetics with the surroundings. Wooden sashes present more distinctive with the concrete wall while, wooden sashes more conformable with the wooden context.

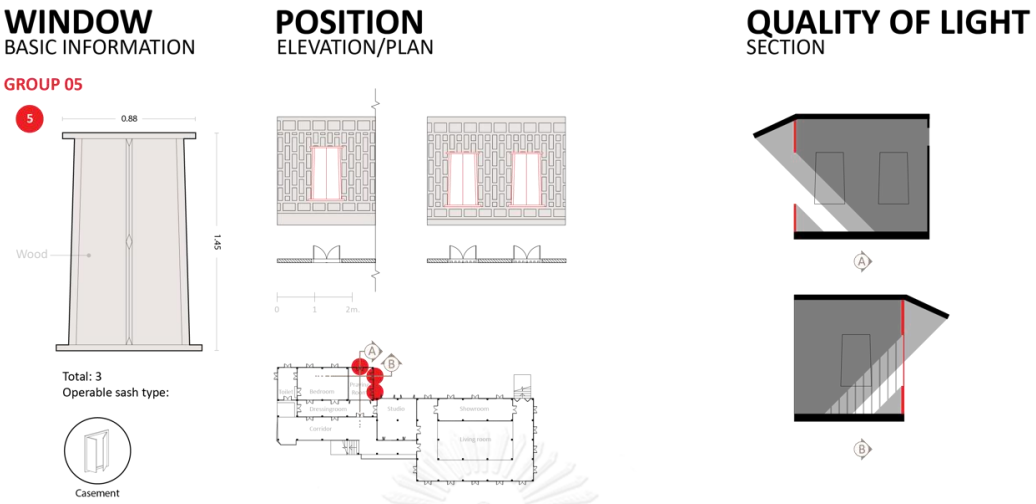

Figure 29 detail of window 5

Window 5 is a quadrilateral with one pair of side unparalleled. All windows in this group open inward. However, there are two windows attach with row of balustrades, which show beautiful shadow effect (*Section B*).

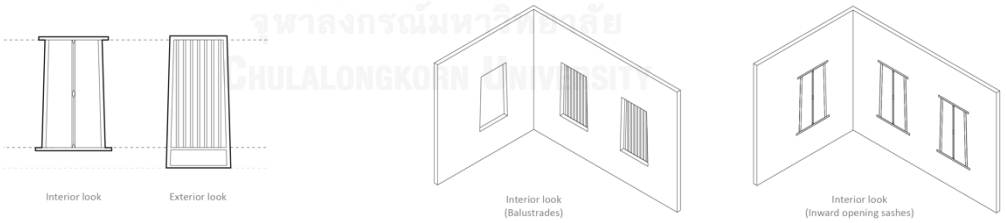

Figure 30 analysis of window 5

Figure 29 Left, shows the interior and the exterior of *Window 5.* An apron is added on the exterior and it creates visually extension of the window.

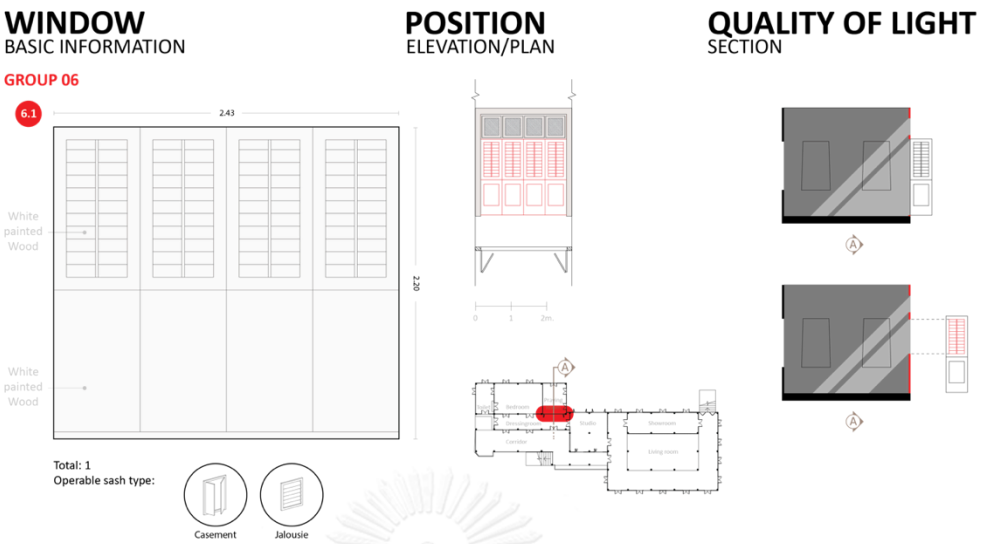

Figure 31 detail of window 6.1

Window 6.1 locates between praying room and the dressing room, it is considered as a secondary layer which is not directly get the full amount of sunlight and ventilation.

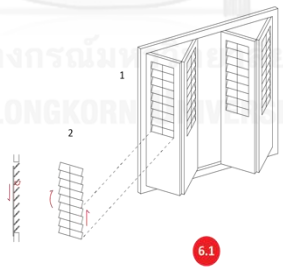

Figure 32 detail of window 6.1

However, due to the mechanism of the window sashes, the amount of light and wind are adjustable. There are two levels of sash operation which are the folding sash and the rolling louvre. This characteristic of being flexible was new to the traditional Thai house design.

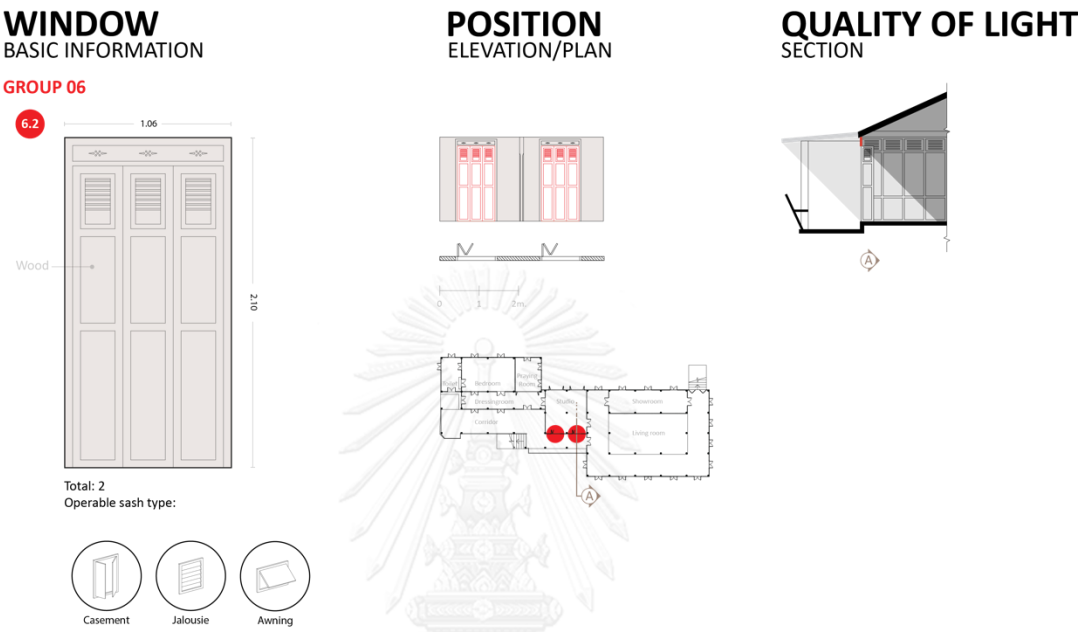

Figure 33 detail of window 6.2

Two set of *Window 6.2* locate on the wall between studio and the corridor. They keep visually balance between this studio side and the opposite side. When the windows are fully opened, the windows with floor-to-ceiling height will allow fully light let-in from the corridor, and make the room bright. When the windows are closed, there is small amount of light shines through the gap between louvre, the room looks fairly dim.

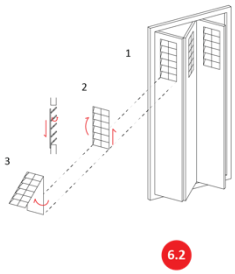

Figure 34 detail of window 6.2

Figure 33 shows the mechanism of *Window 6.2* sashes. There are three levels of sash operation. First level, folding sashes. Second, the notable louvre. The third level of operation is those louvres are operable, as an awning door. The amount of light and ventilation is adjustable. This characteristic of being flexible is atypical to the traditional Thai house design.

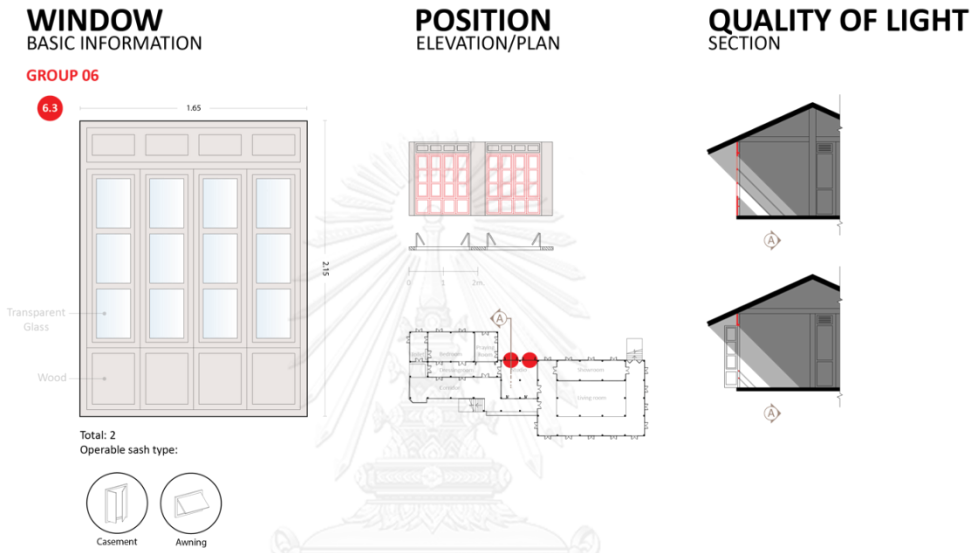

Figure 35 detail of window 6.3

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Window 6.3 was made by two types of material; transparent glass and wood. Since, the transparent glass fully brought in natural light, the room is always bright during the daytime. Due to the fact that, these windows locate at Prince Naris' studio, the proper amount of sunlight is highly require. However, the choice of using glass as material also, helps control wind blow when Prince Naris did paperwork

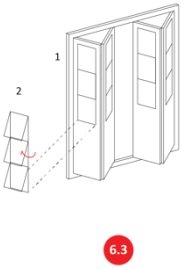

Figure 36 detail of window 6.3

Figure 35 shows the mechanism of window sashes. There are two level of the sash operations. Alongside with the flexibility of using folding sash doors and awning transparent glass sash, the amount of light let-in and ventilation are adjustable.

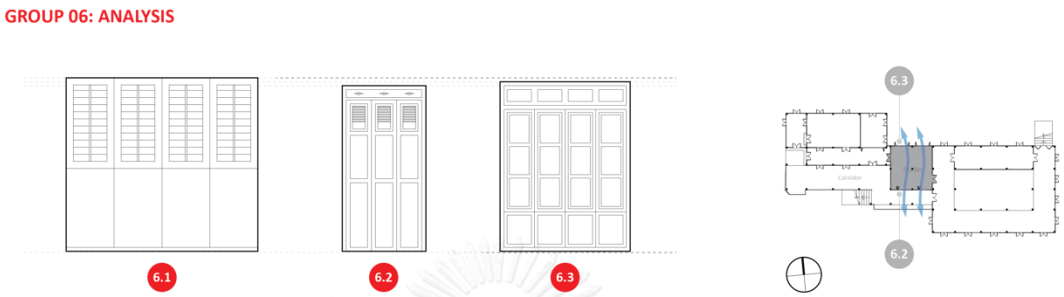

Figure 37 analysis of windows in group 06

Group 06

1) All windows in Group06 are folding windows with multi-operable mechanism. The amount of light and ventilation are adjustable. Their height is almost reach the length of floor-to-ceiling (*Figure 36 Right*).
2) *Window 6.1*, *Window 6.2* sometimes function as doors.
3) *Figure 36 Right,* shows flow of ventilation when open *Window 6.2* and *Window 6.3*
4) *Window 6.2* and *Window 6.3* show the more precise in degree of brightness of the studio, the more flexibilities provide to the windows operable mechanism.
5) (*Figure 36 Right*) Concerning about location and material of *Window 6.2* and *Window 6.3*. *Window 6.3* allows more light transparency by using transparent glass, and it orients on the morning sunlight which will receive good amount of light. Comparing to *Window 6.3*, it orients toward afternoon light direction. The window is made of wood, which is less light

transparency when it is closed. Moreover, there is an overhang above corridor which helps protecting the studio from the afternoon heat.

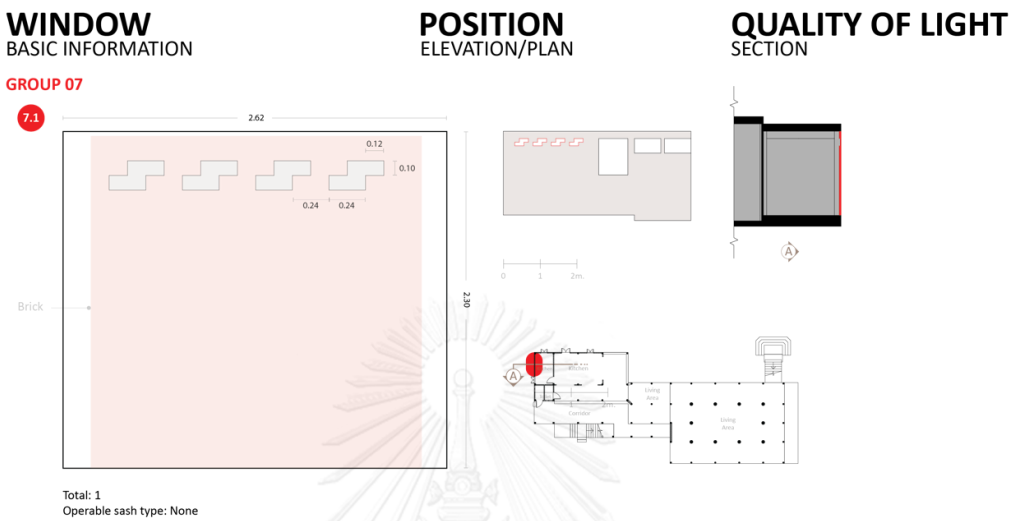

Figure 38 detail of window 7.1

Void are created correspondingly with the size of material, bricks. However, on the exterior view, void has been coated up. Void can only be seen from the inside, from the kitchen. Due to that reason, there is no light let-in through these voids.

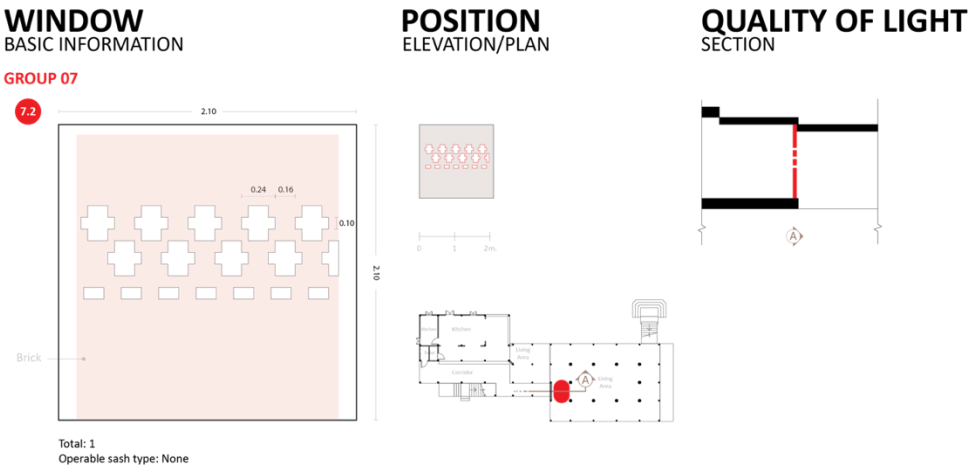

Figure 39 detail of window 7.2

Void are created correspondingly with the size of material, bricks. The function of this wall is to indicate boundary of the first floor living area. It also takes part in re-direct the flow of circulation. However, these voids provide visual accessibility to what is behind.

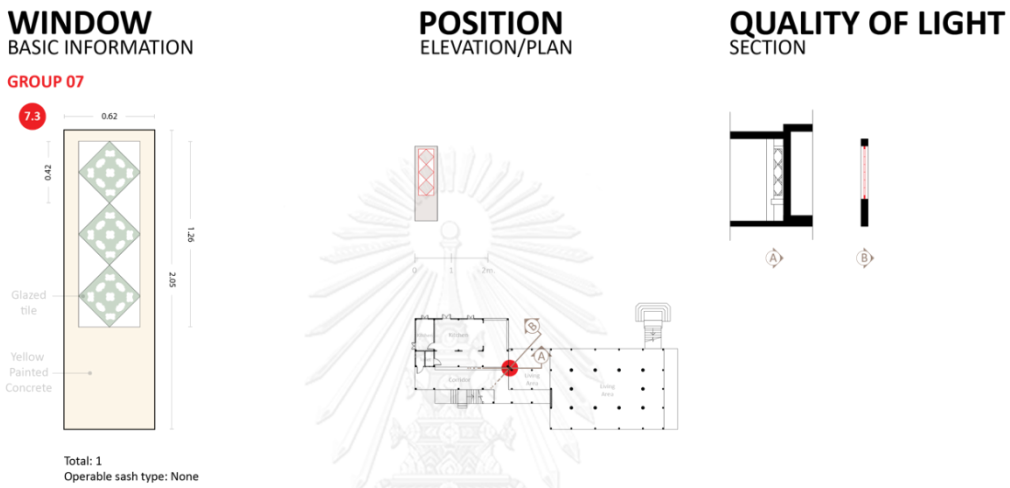

Figure 40 detail of window 7.3

Void are created by the pattern of glazed tiles. The function of this panel is to indicate boundary of the first floor living area. It also takes part in re-direct the flow of circulation. This panel takes part in connecting the two columns which are grid-overlapped. However, these voids provide visual accessibility to what is behind.

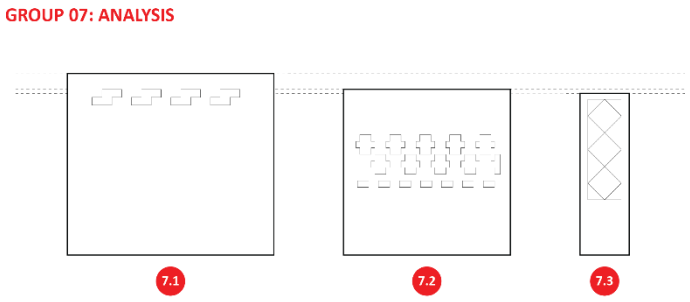

Figure 41 analysis of windows in group 07

Group 07

1) Voids from *Window 7.1* and *Window 7.2* are created correspondingly with material size, bricks. For *Window 7.3*, uniqueness came along with the pattern of the green glaze tiles.

2) All panel in *Group 07*, take part in re-directing the flow of circulation.

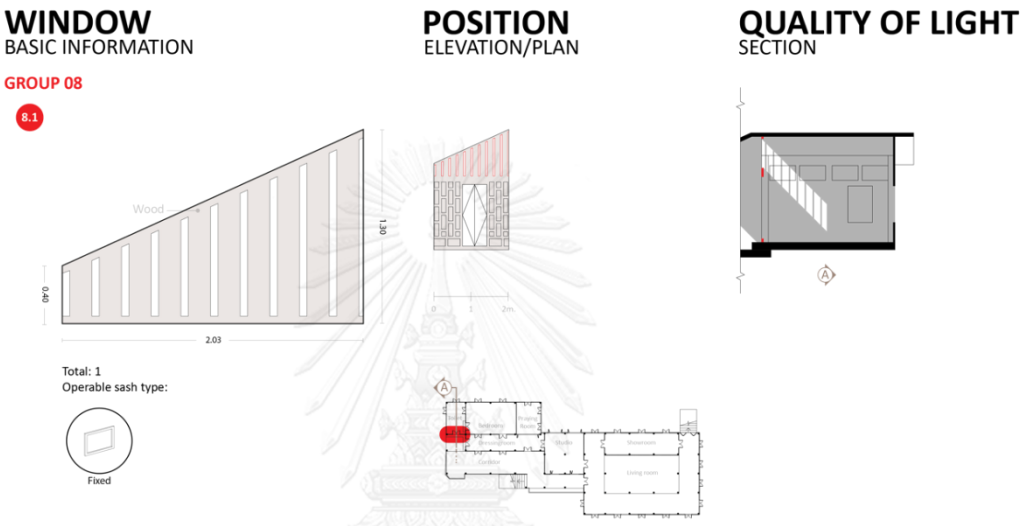

Figure 42 detail of window 8.1

Wood pieces' arrangement create voids. This panel locates above doors of Khon-mask showroom. These two panels provide good ventilation through the showroom and living room. From *Section A*, the distance of two panels are quite far from windows at the outmost wall. Due to that, there is only small amount of light shine through theses panels. Even the windows of the Khon-mask showroom are all opened, the space near ceiling is still dark.

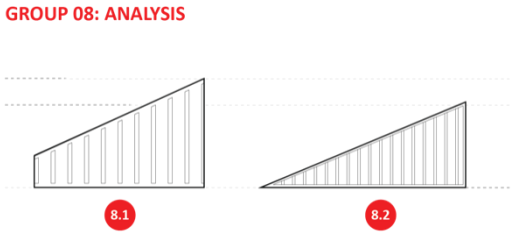

Figure 43 analysis of windows in group 08

GROUP 08

1) *Figure 42* represents the comparison between two panels, the difference in size of gap makes the different degree of visual privacy.

2) Thai house has high ceiling, both panels helps provide good ventilation of the area above windows.

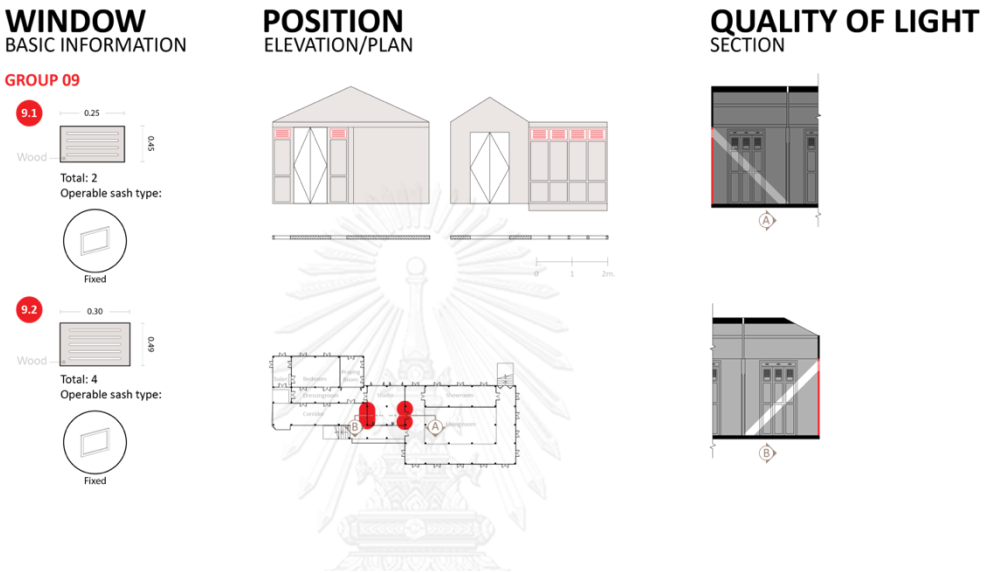

Figure 44 detail of window 9.1 and window 9.2

Generally, knows, hot air goes up. These small louvre-like-panels, which locates above eye-level, help releasing out heat during the day. *Panels 9.1 and Panels 9.2,* are pulling out air flow from the corridor through studio, to living room. There is small amount of light shines through these panels. However, when close the studio doors and windows, the space still thickly dim.

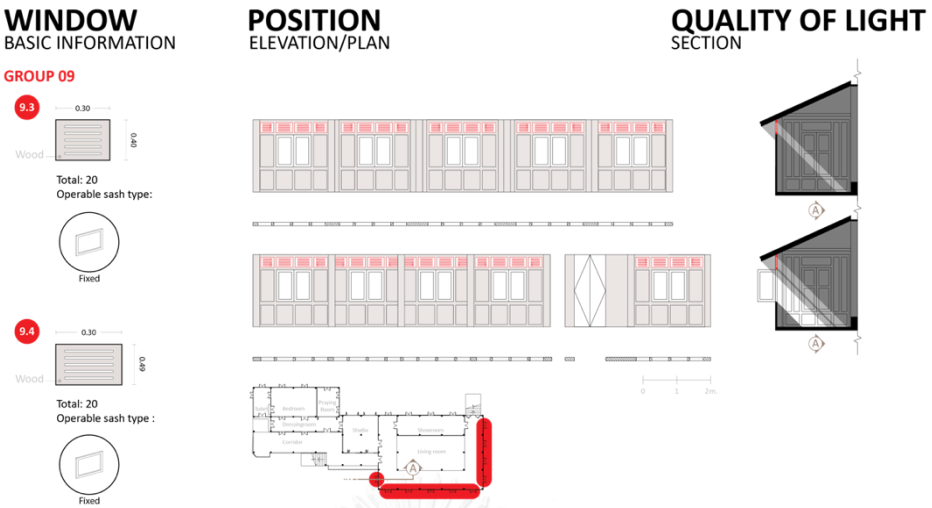

Figure 45 detail of window 9.3 and window 9.4

GROUP 09

1) *Figure 44 Left* shows the comparison in dimension between *Panels 9.1, 9.2, 9.3* and *9.4*

2) *Figure 44 Right* shows how *Panel 9.3* can help pulling hot air up and create good ventilation through the whole room.

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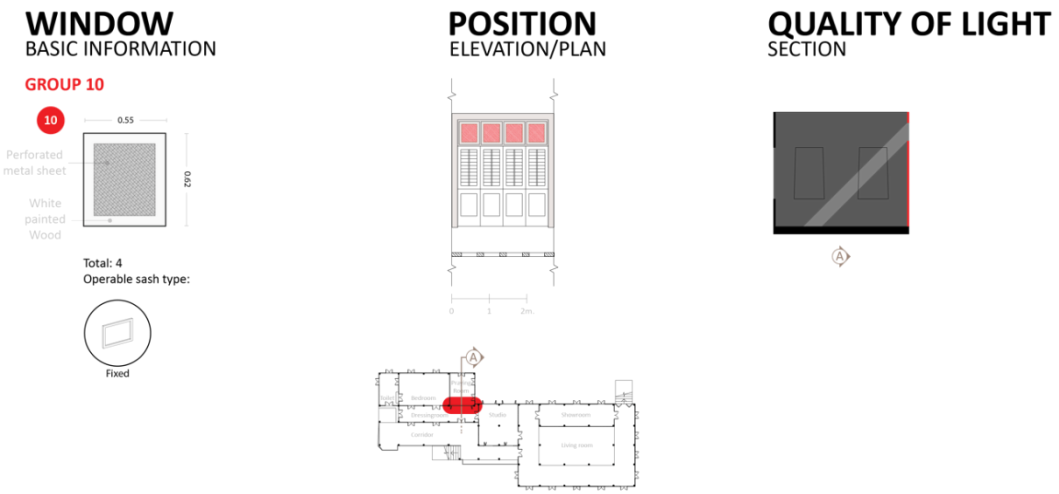

Figure 46 detail of window 10

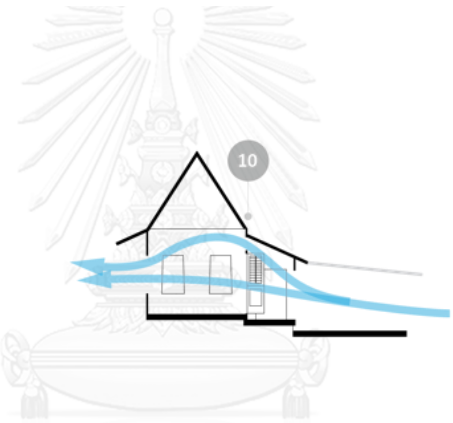

Figure 47 detail of window 10

Window 10 is covered by perforated metal sheet as a net. This material allow air to flow by (*Figure 46)*. With the location of being above eye-level, it is not affect the privacy of the praying room. The material is porous but allow less light transparency to gets though. Also, due to the position of these windows, sunlight from the outside is hardly to reach by. The ceiling level of the praying room is quite dark. From my point of view, this may enhance the sacredness to the praying room (the traditional Buddhist believe in keeping the space dark and unknown will enhance the spirituality of the place).

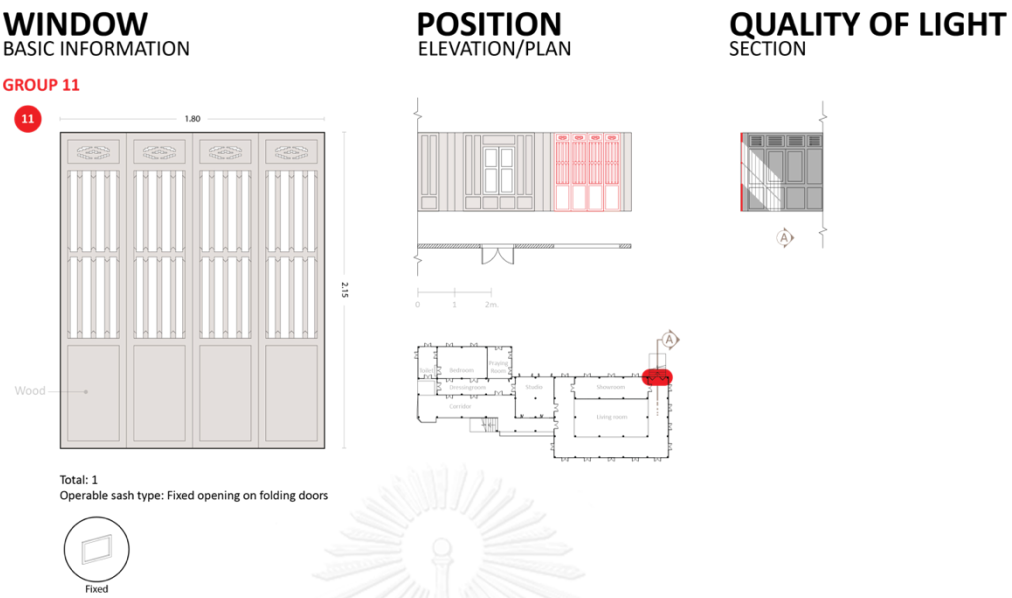

Figure 48 detail of window 11

This is not a window. This is the entrance folding door with apertures. When morning light shines through this doors, it cast shades and pattern on the wall nearby. However, as the apertures of the entrance doors of the house, this allow visitors visual accessibility through the gap between wood pieces, to the living room behind. Also, as apertures, wind gets through. Hence, these makes the very first entry area bright and welcoming.

3.3 Findings

From the documentation and analysis of Prince Naris' house, the author makes a summary of the characteristic of windows designed by Prince Naris at Baan Plainern, as follow;

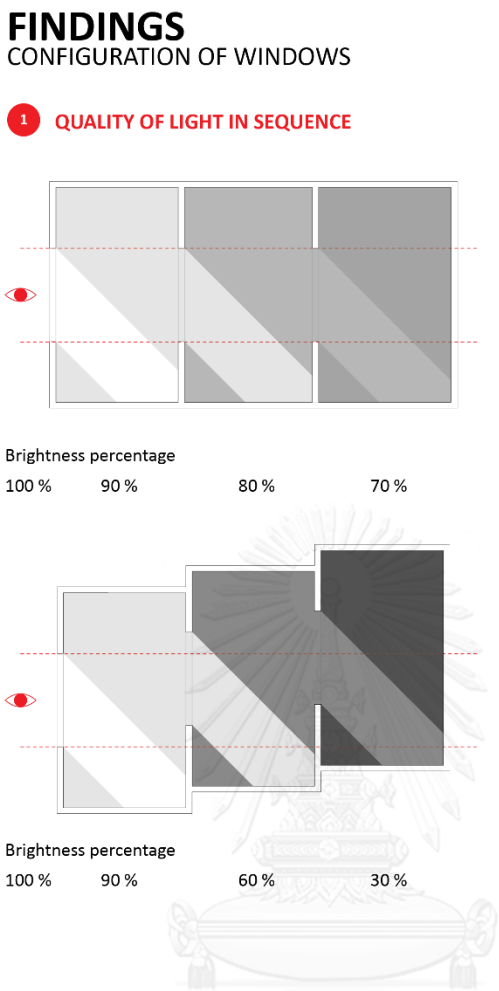

Figure 49 finding of configuration of windows on the aspect of quality of light in sequence

The house programming creates sequences in quality of light. Brightness of natural light shred in, has been torn out by the multi-layers of wall panels. Moreover, with the different level of windows alignment, they shift the availability of natural light brightness to be darker.

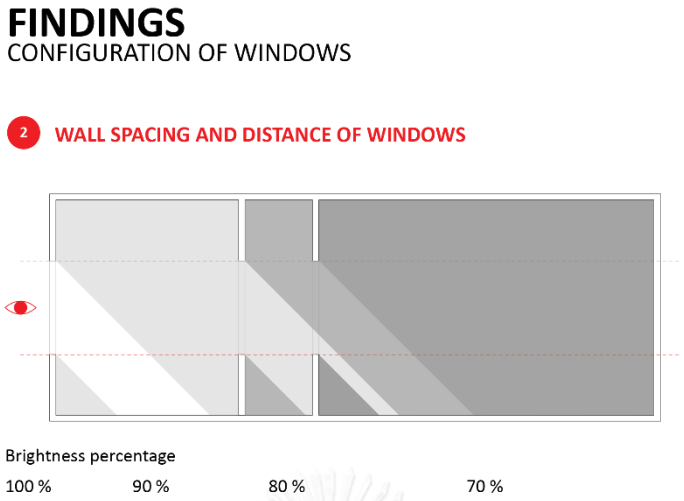

Figure 50 finding of configuration of windows on the aspect of wall spacing and distance of windows

Also, wall spacing and distance of windows are one of the main factor of lighting quality. However, it depends on windows size and position as well. Viewers experience different feeling by getting through the difference of light sequences.

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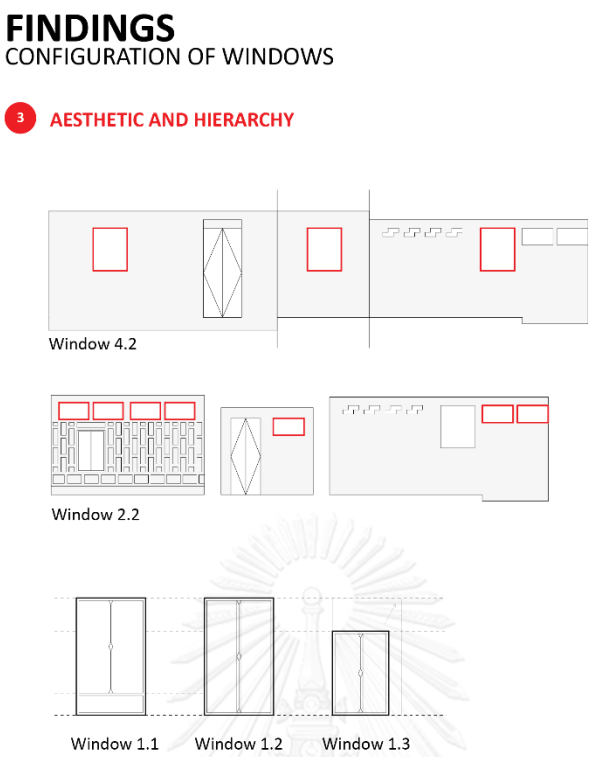

Figure 51 finding of configuration of windows on the aspect of aesthetic and hierarchy

The use of corresponding in proportion, create hierarchy to viewers. Also, with the repetition of similar forms, the alignment compliments visual order.

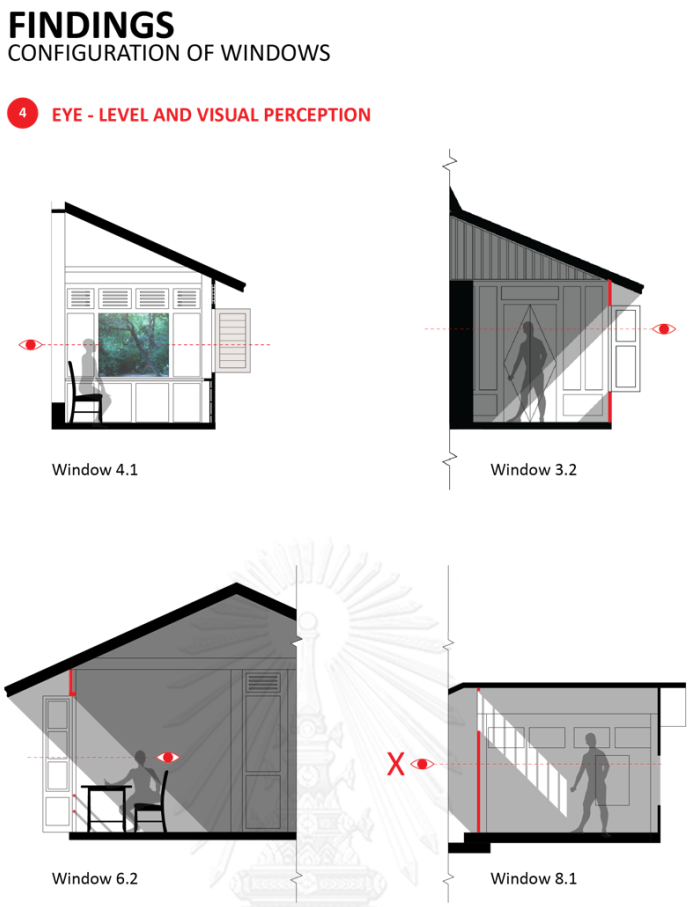

Figure 52 finding of configuration of windows on the aspect of eye-level and visual perception

The author notices the location of windows remark types of activity of occur at the space. For example, the height of window 4.1 is suitable for sitting position to look through. Windows 3.2, locate on Khon-mask showroom which has narrow walking path. The activity occur in this room is a viewer walk along the shelves of Khon-mask to see them. Windows size is long and compliment with the standing position.

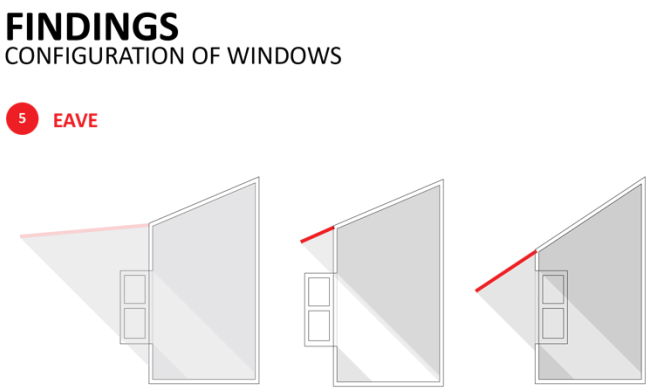

Figure 53 finding of configuration of windows on the aspect of length of eaves

Length of eaves is one of the main factor to control brightness of the room.

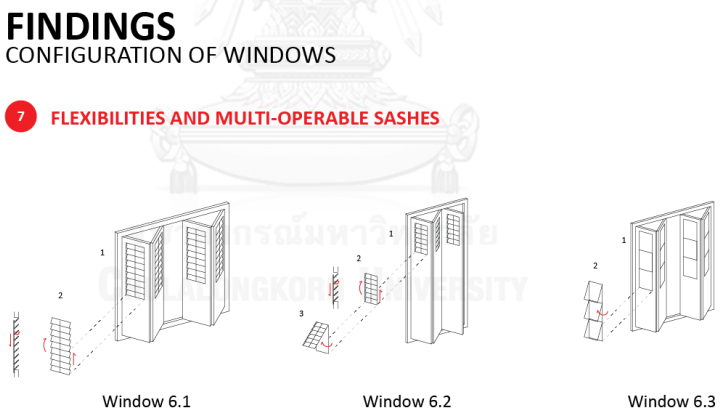

Figure 54 finding of configuration of windows on the aspect of flexibilities and multi-operable sashes

Multi-operable sashes provide flexibility of use. Users can select to adapt the quality of light and wind let-in through this function.

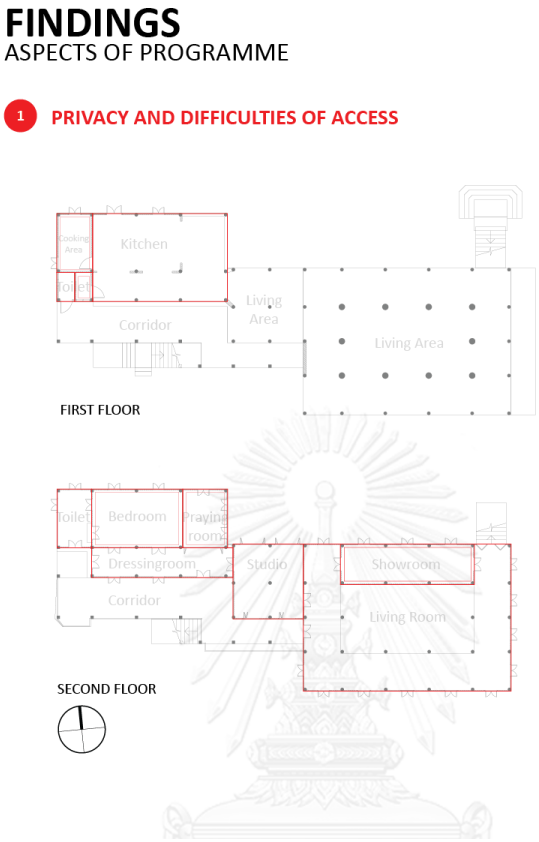

Figure 55 finding of configuration of windows on the aspect of privacy and difficulties of access

Due to the programmatic requirements, privacy is one of the main factor to concerned. For example, bedroom or praying room require quietness and little abstract to get in. This is how Prince Naris filter out the private and public area. However, toilet on the second floor can be access very easily with 2 entries.

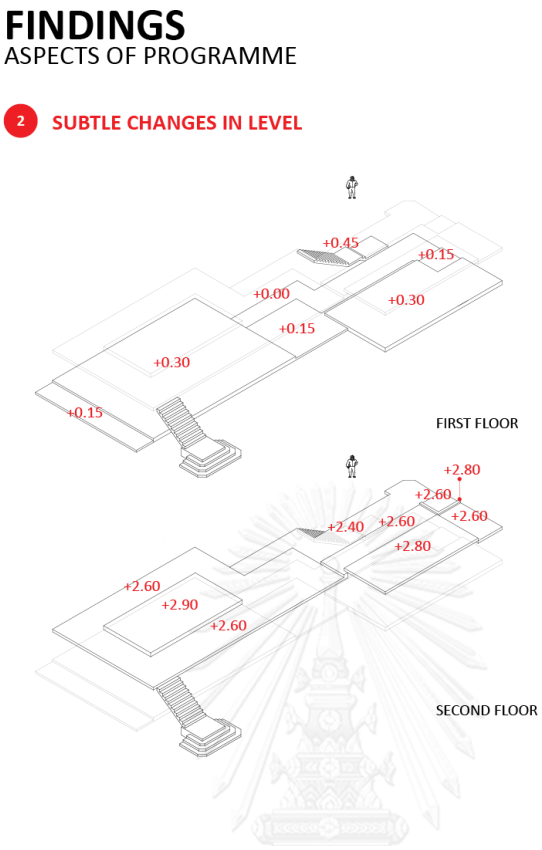

Figure 56 finding of configuration of windows on the aspect of subtle changes in level

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There is degree of boundary blurring within the programme. The non-traditional architectural layout of this house is subtlety defined by the small change in floor level. Yet, the traditional Thai houses also change floor level between balcony and rooms, but they have changed with the height of sitting position. There is no furniture in Thai traditional houses so sometimes floor level performs like a chair. For Prince Naris' house, there are tables and chairs so the changes of height between floor doesn't need to be with the sitting scale. It goes smoothly with the hierarchy of the programme.

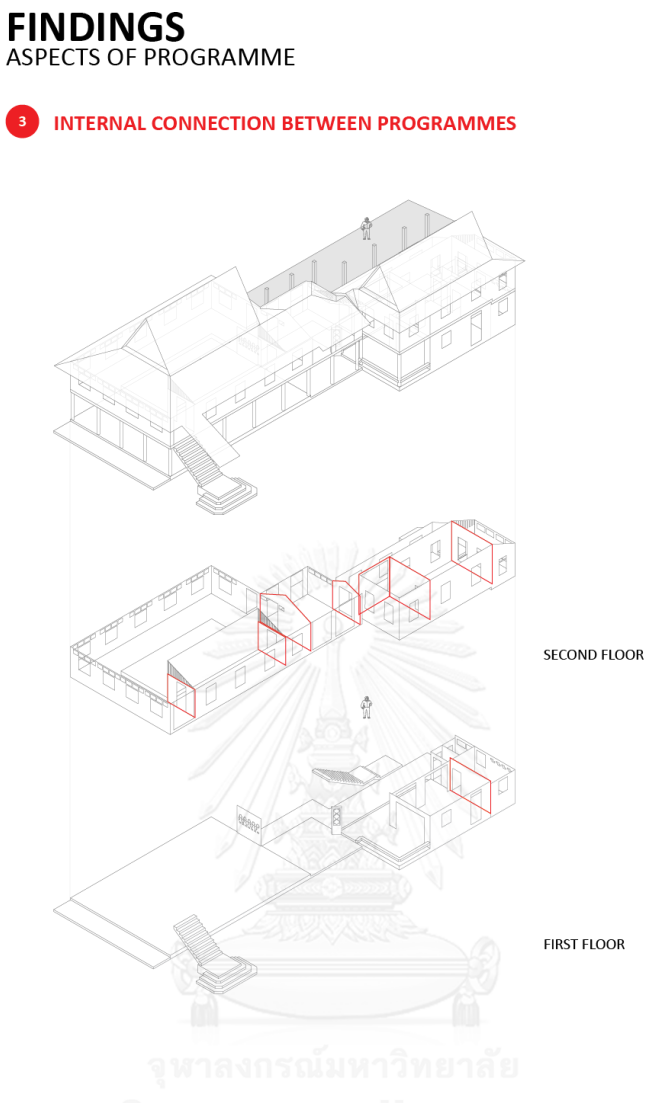

Figure 57 finding of configuration of windows on the aspect of internal connection between programmes

Internal connection between programme is another factor to blur out the boundary between room. The juxtaposition in circulation path happens when there are options. This was very new to the Thai traditional architectural design. With this idea, it will benefit in economising the area of circulation in a small building with more convenience.

Chapter 4 Design process

4.1 Design concept and criteria

Design concept

The initial concept of this thesis is to promote The Naris Foundation and publicise the legacy of Prince Naris through architectural design, at the the commercial building in front of Baan Plainern. Involving an announcement of the immeasurable landscape inside Baan Plainern. What the author first perceived with the characteristic of the place was, it is a ‘foyer’ of Baan Plainern, where visitors can be introduced to the knowledge of Prince Naris. Basically the design will help ‘enhance’ the viewers’ spectacles while ‘filter’ out their perspectives, in order to maintain the serenity atmosphere of the residence behind. The sequence of visitors’ experience will be ‘gradually unfolded’ through the hybrid programming of galley, library, bookstore, shops and cafeteria. Also, through the design implication from the research of Prince Naris’ windows design, as a non-traditionalist.

To ‘filter’ means to sort, to pass through some source of devices and to have a transformation through some arrangements or sequences. Literally, the idea is about solid and void. Thereby, window which is one of the most significant architectural elements that exert spatial influences of being the ‘portal’ to the space, is used as a vehicle to deliver the concept of this thesis.

In addition, the study of the configuration of circulation in Prince Naris’ house/studio shows much of complexities through programming, comparing to Thai traditional houses. Hence, the key of the circulation re-configuration is flexibilities in programming.

Another approach of the design is the author would like to keep the existing structures as much as possible. Due to the availability of law and regulations provided, especially the set back. According to that fact, renovation is the prior option.

Upon the aspect of the surrounding, there is not much number of pedestrians passing around. In fact, there are number of cars passing by and pause for a long traffic

congestion every day. Concerning about the building envelope to be parallel-like and respect the road would be one of the major consideration. Drawing car-commuters' attention would benefit to the propagandising The Naris Foundation.

Design criteria

Come to the thesis question "How to create connection between Baan Plainern and general public through architecture, especially by the reconfiguration of Prince Naris' window design methodology?".

The thesis proposes the selection of materials that gives a contrast between the old and the new, heaviness and lightness, darkness and brightness. Through the study of Prince Naris' house/studio windows and the circulation flow of the house which effect quality of light within the space, the criteria is to design a building that catches light and cast shadow in space.

4.2 Programme

1) Information from interviews

From the interview with several interviewees about programming and layout of Naris Learning Centre. There are two persons who gave an initial ideas and requirements. The first person is the head of board member of The Naris Foundation, M.R. Chakrarot Chitrabongs (Chitrabongse, 2014). He is one of the eldest grandson of Prince Naris. He has lived in Baan Plainern since his childhood up until now(Chitrabongse, 1992). Another person is Precha Kokilawadee, who is in charge of assisting The Naris Foundation by organising book stocks and sales. He was born at Baan Plainern, spent his childhood there for many years. He also worked as a Design&Technology course lecturer at Wat Sudhivararam School.

M.R. Chakrarot Chitrabongs gave suggestions on the programmes;

a) Space for the board of committee to have a meeting

b) The Naris Foundation office: to provide basic information to the visitors and organise the foundation's documents.

c) An exhibition space for the history of Baan Plainern and Prince Naris.

d) An exhibition space to display Prince Naris' works as a rotate exhibition.

e) A small library contains of books about Prince Naris and Thai arts which he mentioned there is plenty of books granted by Baan Plainern residents.

f) Rental space to generate income for The Naris Foundation, such as cafeteria and shop front.

g) Restroom

M.R. Chakrarot Chitrabongs mentioned (6th November 2014) "This place should be where all the committee can have a proper welcoming to their guests, and it should be where Prince Naris' works can be introduced to public interest. However, a library in Singapore allows readers to have a cup of coffee within the reading area. It is kind of what people do while they are reading, and this should be considered at the programming of Naris Learning Center."

On the part of library and book store, Precha Kokilawadee(Kokilawadee, 2016) suggested some programming possibilities. He mentioned about the storehouse, there are various media of Prince Naris sources of knowledge being stored such as books, scripts, Thai music records, replicas of Prince Naris' drawings, postcards and some of the replicas of The Naris Scholarship alumni' paintings. He said all the media should be kept in the storehouse. Then, they'd be progressively selected out to sell, according to each rotate-exhibition themes. Since, they are all needed to be barcoding-verified. The two most important events are on 28th - 29th April (The Naris' day) and in September (Princess Duangchit' commemoration). However, apart from those two events, there are themes that can be shown, varied from these categories;

a) Thai arts

b) Thai architecture

c) Thai music

d) Thai Performing arts (Khon) and scripts

e) Buddhist Cosmology

f) Talipot fans

g) Thai history and chronicles (The sources are in The Naris' archives)

h) Baan Plainern

However, there are other interviewees such as a security guard, a Khon-dancing teacher, a Khon-dancing students and beverage shopkeepers who were at Baan Plainern, selling drinks to the parents of those students on Saturday. They gave suggestions about how important to have Naris Learning Centre, which are as follows;

A security guard of Baan Plainern, who screens all the visitors and manage car parking during the crowded day of Baan Plainern, mentioned about lacking of parking spot. He was afraid if there is a gallery for rent and its art pieces logistic, it will be limiting space to park. For the design of Naris Learning Centre, loading area and routes will be located avoiding the circulation of Baan Plainern at the entrance gate.

A Khon-dancing teacher, students and the parents worried about when the Khon-dancing class stop operated, there will be no place around for them to continue learning the dance. Some students cried for this matter. However, this is beyond Naris Learning Centre's objectives to solve this problem. Since, there are many other factors and the board of committee of The Naris foundation had made a decision on not having Khon-dancing class at the learning center. Thereby, public connection to Baan Plainern became disconnected. For the programming and layout of The Naris Learning Centre, the connectivity between Khon-dancing alumni and Baan Plainern will be occasionally opened to these users.

It is generally known, at Baan Plainern, there is very renowned Thai dessert called *Kaao-Chae-Chao-Wang* (ข้าวแช่ชาววัง), which once was served as one of the Royal' menus and keep continued as royal secret recipe. It is cooked-rice in iced water eating with side dishes. They sell this dessert only on the Naris' day. The beverage

shopkeepers suggest if there is cafeteria at Naris Learning Centre, this dessert should be one of the main menus. However, with the complicate cooking process, this secret recipe will be prepared at the kitchen inside Baan Plainern, and will be brought to sell at the cafeteria. There is no need to provide big space for cooking preparation.

2) Programme of The Naris Learning Centre

Based on the interviews, concepts and the advantages of site location, the author would like to have a proposition on programming at Naris Learning Centre as follows;

a) Library

Library mainly contains books about Thai traditional art, architecture, and books published by The Naris Foundation. Including, other sources of media such as Thai music records and Khon performance records.

b) Librarian office

This is where librarian can work, manage new books and administration documents.

c) Gallery of Baan Plainern

Gallery of Baan Plainern is where The Naris Foundation can hold a rotating exhibition throughout the year. The exhibition includes bibliography of Prince Naris, replicas of Prince Naris' work, history of Baan Plainern. Hence, rotating exhibition themes will be cooperated with books display themes at the bookstore. However, the gallery and bookstore will not be physically connected, due to the accessibility control. This can be the space to exhibit the works of The Naris Foundation scholarship winners, during the Naris day on 29th April and Princess Duangchit's commemoration day in Septembers. The space requires natural lighting.

d) Gallery for rent

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Gallery for rent is where Naris Learning Centre can preside over incomes to The Naris Foundation. Artists who exhibit their works must respond to some certain policy as to respect the purpose of The Naris Foundation and should encourage the value of Thai art, music, performance or architecture. The space requires natural lighting.

e) Workshop

Workshop space will be hold by selected artists, in order to promote their works which complying with the legacy of Prince Naris. The workshop will be hold weekly and open to general public. The artworks produced may take exhibition space to exhibit.

f) The Naris Foundation office

This is where The Naris Foundation administer and committee can work and store office documents.

g) Meeting room

This is where The Naris Foundation administer and committee can hold a meeting or welcome their guests. The space will be available for scholarship candidates to present their works in order to ask for fund

h) Cafeteria

Cafeteria is where visitors can appreciate coffee, Thai-beverage and Thai dessert such as *Kaao-Chae-Chao-Wang.* There is no full-function kitchen at the cafeteria. There is small cafe-bar to prepare beverage and food.

i) Bookstore

According to M.R. Chakrarot Chitrabongs and Precha Kokilawadee's suggestions, the author proposes a bookstore to have spatial interaction with cafeteria. Also, due to the numerous non-barcoding verified items at the storehouse, I propose the bookstore to be a showroom-like of those selling items. There will be rotating themes of book sales as well. Moreover, with the strategy of selling online and customer's behaviour which Precha had experienced, the bookstore would also be a kind of grab-and-go base.

j) Souvenir shop

Apart from being souvenir shop for Baan Plainern gallery, it also is another selling channel of product from workshop.

k) Housemaid room

Housemaid room contains storage area of cleaning equipment and housemaid's locker room.

l) Security guard room

It is security and CCTV Control room. Consist of projections and an operating computer for the real-time information.

m) Maintenance room

The maintenance is mainly a place to store general maintenance equipment for the building, gallery's repair material and electrical instruments such as speaker and microphone of an occasional lectures.

n) Toilet

According to the limiting area, law and regulations, this building will provide 8 toilets for all users.

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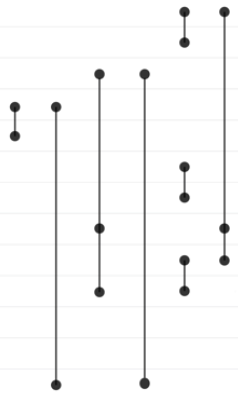
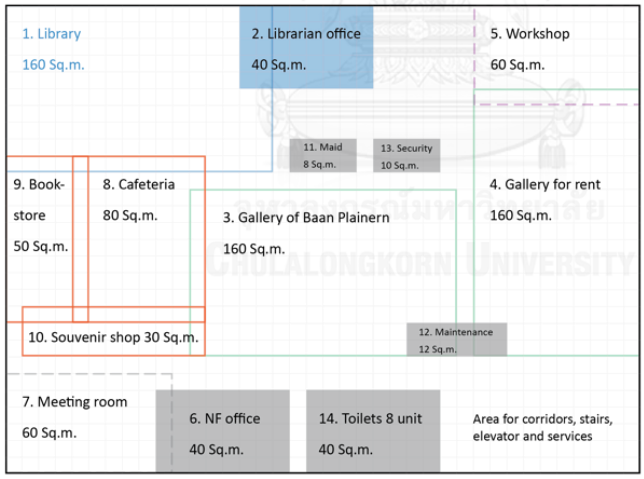
PROGRAMME

ANALYSIS ON CONNECTIVITY BETWEEN EACH PROGRAMME

CONNECTIVITY	PROGRAMME	NODE OF ACCESSIBILITY	POPULATION SERVED (Max)	AREA IN USE (Sq.m.)
	1. Library	4	65	160
	2. Librarian office	2	3	40
	3. Gallery of Baan Plainern	4	80	160
	4. Gallery for rent	3	80	160
	5. Workshop	2	20	60
	6. The Naris Foundation office	2	7	40
	7. Meeting room	2	25	60
	8. Cafeteria	4	35	80
	9. Bookstore	4	20	50
	10. Souvenir shop	4	12	30
	11. Housemaid room	1	2	8
	12. Security guard room	1	2	10
	13. Maintenance room	3	2	10
	14. Toilet	1 / unit	8	40 / 8 unit
	TOTAL		**353**	**908**

RELATIONSHIPS



TOTAL AREA

266 Sq.m. x 4 FLOOR

= 1,064 Sq.m.

Public area

Service area

Semi-Public area

Table 1 relationship between each programme with the aspects of accessibility and area of use.

PROGRAMME

MAIN FEATURES REQUIRED FOR PROGRAMME LAYOUT

PROGRAMME	SUGGUESTED FLOOR 1	2	3	4	QUIETNESS	AC	EXTRA SECURITY	WATER SUPPLY	STREET VIEW	GARDEN VIEW	SUNLIGHT	CONNECTION TO BAAN PLAINERN	TIME OPERATION M	A	E	PARTITION/ FLEXIBILITY	LOADING ASSOCIATED	ACCESSIBILITY CONTROL
1. Library	●	●			●●	●●				○	●	○	●	●	○		●●	●
2. Librarian office		●			●●	●						○	●	●	●		●	●
3. Gallery of Baan Plainern			○	●	●●	●●	●		○	●●	●●	●●	●	●		●	●●	
4. Gallery for rent			●		●●	●●	●		○	○	●●		●	●		●●	●●	
5. Workshop	●	○				●		●●	●●	●	●●	○	●	●		●●	●●	●
6. The Naris Foundation office			○	●		●	●			●●		●●	●	●	●			●
7. Meeting room					●	●				○		●	○	○	○	○		●
8. Cafeteria	●	○				●		●●	●●	●	●		●	●	●		●	
9. Bookstore	●	●			●	●			●●		●		●	●	●		●●	●
10. Souvenir shop						○			○		○		●	●	●		●	●
11. Housemaid room								●					●	●	●			●
12. Security guard room													●	●	●			●
13. Maintenance room													●	●	●		●	●
14. Toilet								●●			○		●	●	●			

●● Essential

● Typical/Desirable

○ Possible/Occasional

TIME OPERATION : M Morning 9:00 a.m. - 12:00 p.m.

A Afternoon 1:00 p.m. - 4:00 p.m.

E Evening 4 p.m. - 7:00 p.m.

Table 2 main features required for the selection of programme layout

4.3 Users

In order to create connections between outsider and Baan Plainern, the analysis on approaches of users would be the main aspect the concern. However, there are three main groups of users as follow;

For the first group, The Naris Foundation administrators, librarians, curator, receptionists, housemaids, security guards, shopkeepers, maintenance staff. The major access of this group to approach the site will be from Baan Plainern. However, receptionist and shopkeeper may also access from the front, Rama IV Rd. Plus, security guards will be the one who would survey around the site for overall see keeping.

Secondly, visitors and all outsiders such as students, tourists, cafeteria and bookstore customers, artists who rent the gallery and workshop space and workshop participants. All of users in this group have to access the site from Rama IV Rd. They cannot get through Baan Plainern compound directly due to the private policy. However, there are some occasions that students can ask for a visit to the garden but not inside Prince Naris' house/studio. Since it is needed to have special permission from The Naris Foundation committees. Though, all visitors will have a chance to access inside the house once a year on The Naris' day on 29th April. For artists who rent gallery space, they may access to the site through the back entrance, from Baan Plain side, as if it is needed to deliver the art pieces. For artists who occupied workshop space, workshop managers and workshop participant may access through the back of the side as well but with less degree of accessibility. It means they can only enter the place only with the area provided.

Thirdly, the group of users who can have fully access, Baan Plainern residents. They are the owner of the place. They might take the site as a transit between Baan Plainern to Rama IV Rd. However, the main accessibility of The Naris Foundation committees is at the back of the site due to the privacy. Nevertheless, if they want to have social interaction with visitors they may choose to use common area or other facilities.

As an institutional base, Naris Learning Centre, will be a place for learn, work and communicate. The interaction between house owner and the new comer will be created upon this place. Being a 'foyer', the space will provide and openness and warm welcoming to public right at the front part of Baan Plainern.

USERS
ANALYSIS ON APPROACHES

	A	B	
GROUP 1 STAFF			
1. Librarian		●	
2. Curator		●	
3. The Naris Foundation administrator		●	
4. Receptionist	●	●	
5. Housemaid		●	
6. Security guard	●	●	
7. Shopkeeper	●	●	
8. Maintenance staff/Mechanician		●	
GROUP 2 VISITORS			
1. Students, Art/Architecture Student	●	○	* Montly
2. Tourist	●		
3. Cafeteria customer	●		
4. Bookstore customer	●		
5. Souvenir shop customer	●		
6. Artist/Workshop manager	●	○	* Weekly
7. Workshop participant	●	○	* Weekly
GROUP 3 BAAN PLAINERN RESIDENT			
1. For work (The Foundation committee)		●	
2. For using facilities		●	
3. For Transit	●	●	

A For one who accesses the site from Rama IV Rd.
B For one who accesses the site from Baan Plainern
● Daily access
○ Occasional access

Table 3 anaysis of each group of users and their approach.

4.4 Site analysis

1) Surroundings

a) Contextual amenities

The site locates on Rama IV Rd. among Klongtoei squalid community, shophouses and Metropolitan Electricity. The atmosphere of the surrounding is congested, dry and quite pollute, with less pedestrians demographic. I had an interview

with Supalerk Vayakornvichitr(Vayakornvichitr, 2016) who had lived 10 minutes-walk from the site for 15 years. He spent his childhood mostly within the area but have never noticed about the existing of the greenery of Baan Plainern and somehow did not recognise the row of shophouses of Volkswagen showroom (Current function of the site). He said in the old days the communities had more connection but things have changed. Social status of people around here is various from middle-class to underprivileged. With the surrounding, local people do not walk around much. He also suggested fancy facade might be needed to catch public attention.

From the author observation, it is true about less number of street walkers. However, populations commuted by car is quite congested every day, especially during rush hours. Due to this fact, the strategy to draw newcomer in, is nearly all about visually attraction. Nevertheless, this is not the only channel to publicise the place but it is worth to be concerned.

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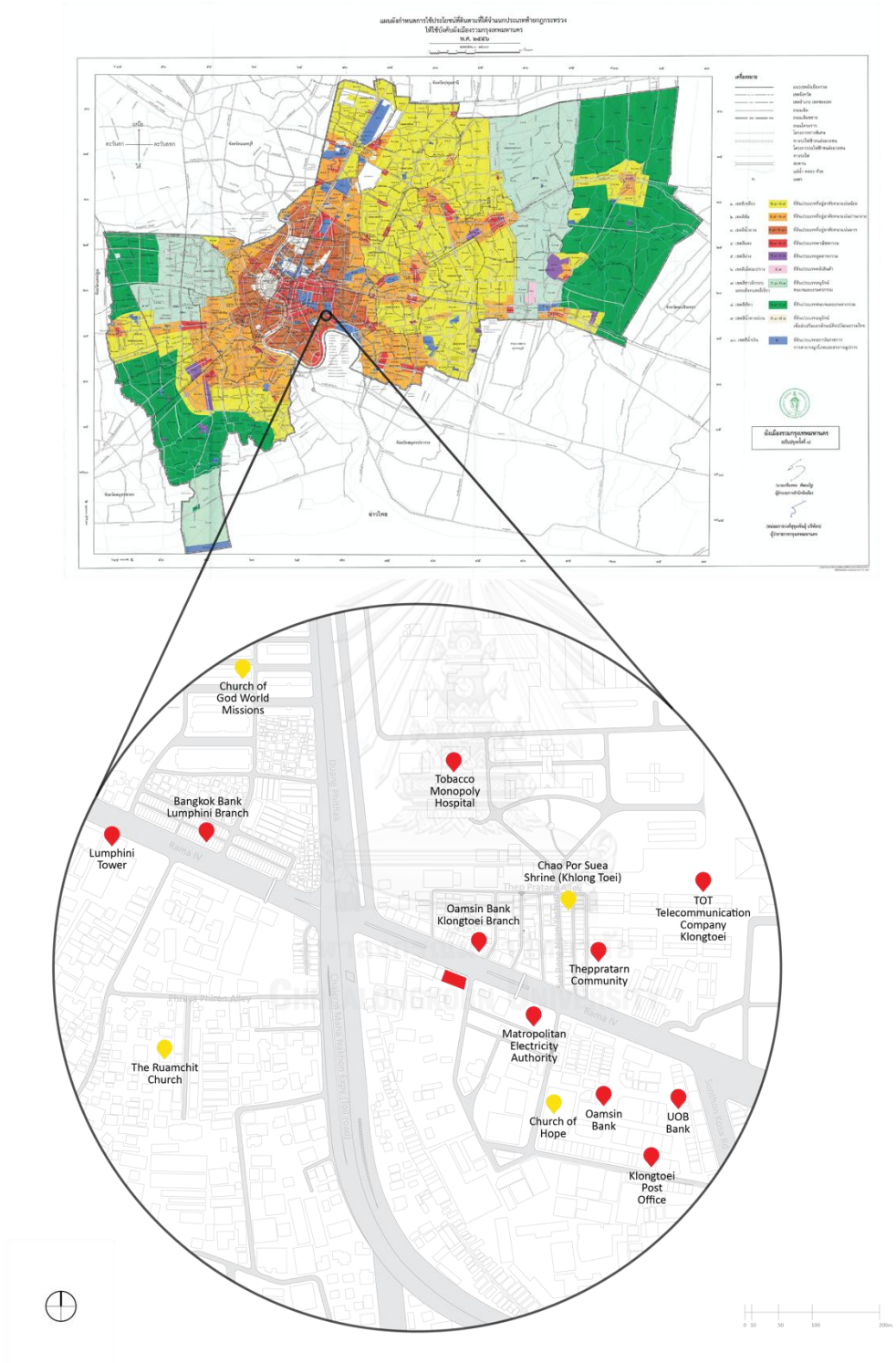

Figure 58 amenities around the site

b) Visual perception and obstacles

At Baan Plainern there is a beautiful garden with the landscape was designed by Prince Naris. The greenery and the Thai house are such hidden gems of the area. This land piece lies peacefully behind the row of shophouses which takes role as a buffer from the noisy and congested Rama IV road. There is less visual assessment to the garden from the road. Pedestrians or people in the drivers only have a glance through the tunnel of trees, which covered up the enhance street into the compound.

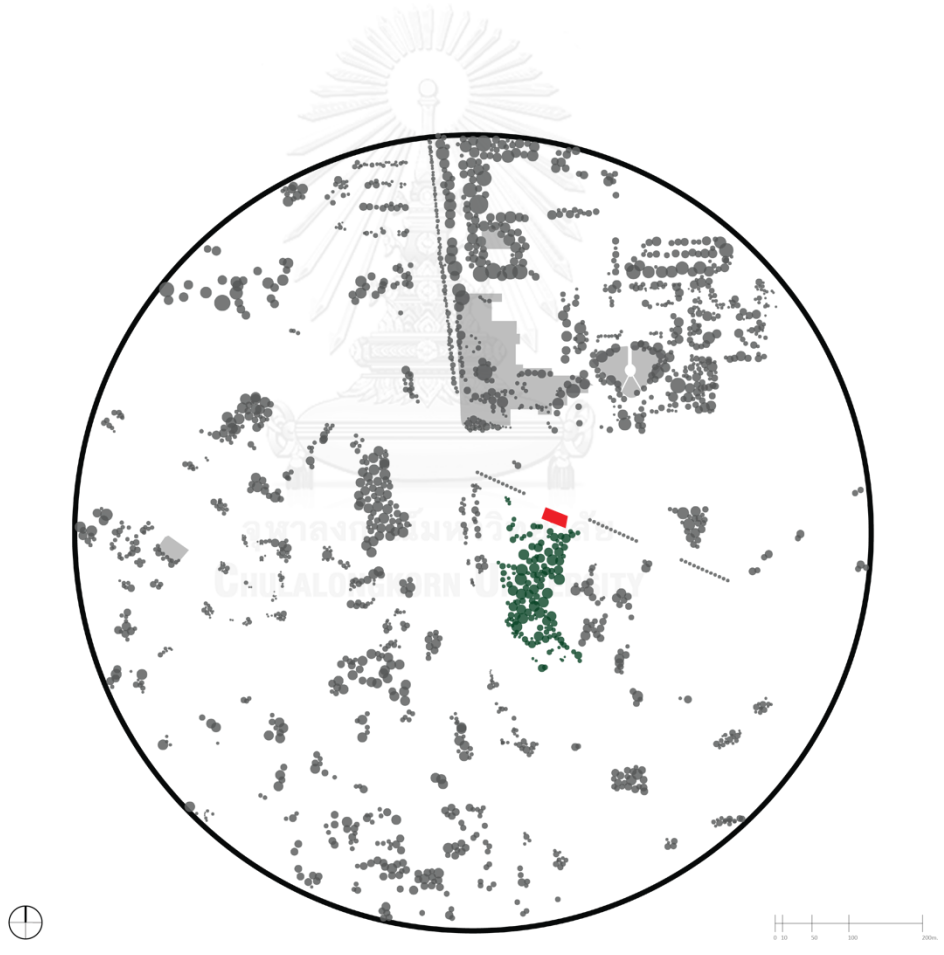

Figure 59 amount of greenery around the site

The view of Prince Naris' house/studio and the garden cannot be seen from the street, but can be seen from the shophouses. From the figure 60, the house can be seen clearly from roof top and barely seen from the 4th floor. Visually, the tree views from the lower floor still keep the 'unseen' secretly from the viewers. On the opposite side, from the top floor of the building, it is clear in eye level. The same height row of shophouses from the opposite side is set further away, due to the 30 m. wide road. Viewers will not feel cramped with the visual perception.

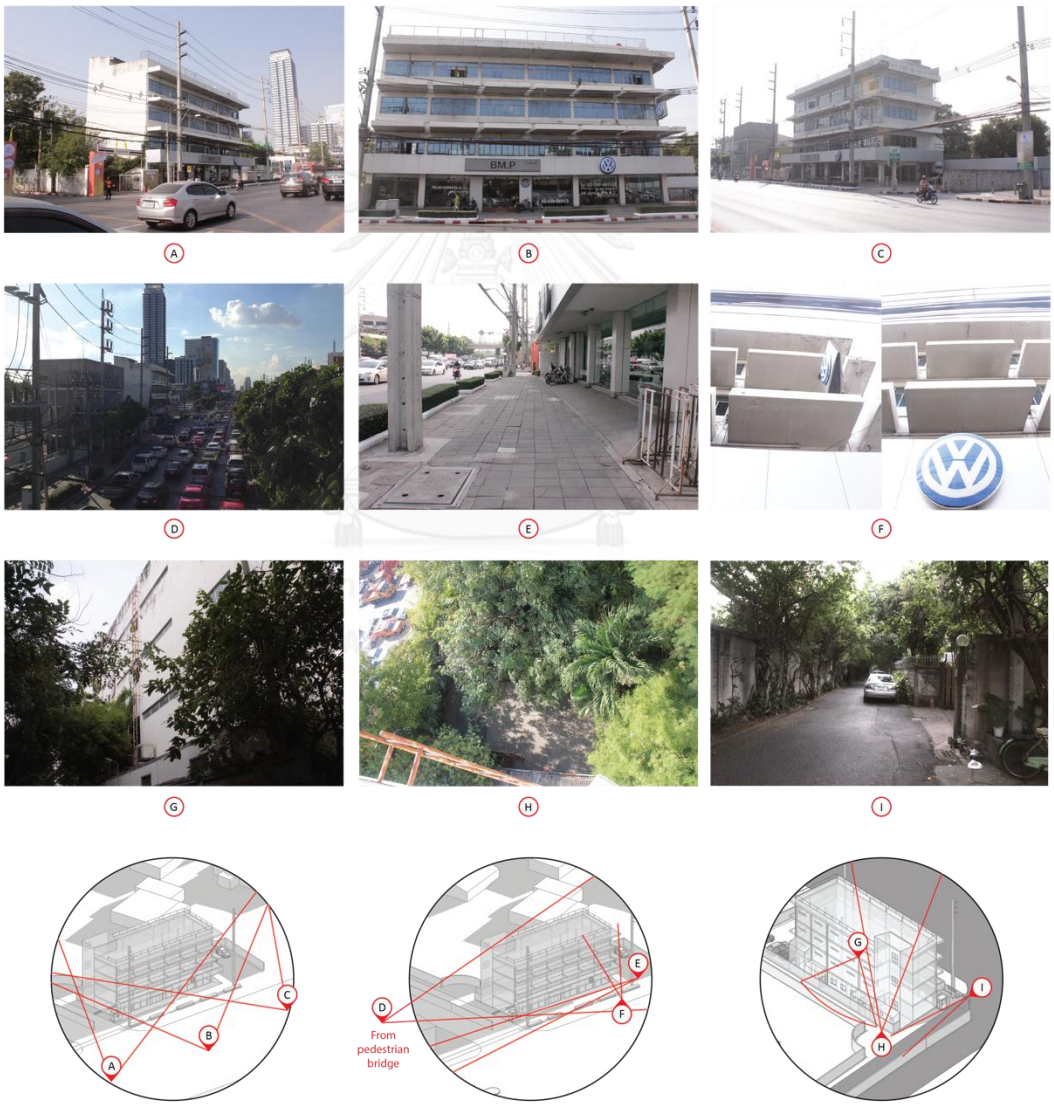

Figure 60 views toward the commercial buildings on the site

On the other hand, looking back toward the site, on figure 59, the building is quite isolated from the nearby constructions. The concrete commercial building is quite dominant from the street view, especially from the nearby pedestrian bridge. Due to Rama IV road is always congested during rush hours, people who drive pause for a period of time, seeing the same roadside scenery. This might be the benefit for the isolation and the design of facade.

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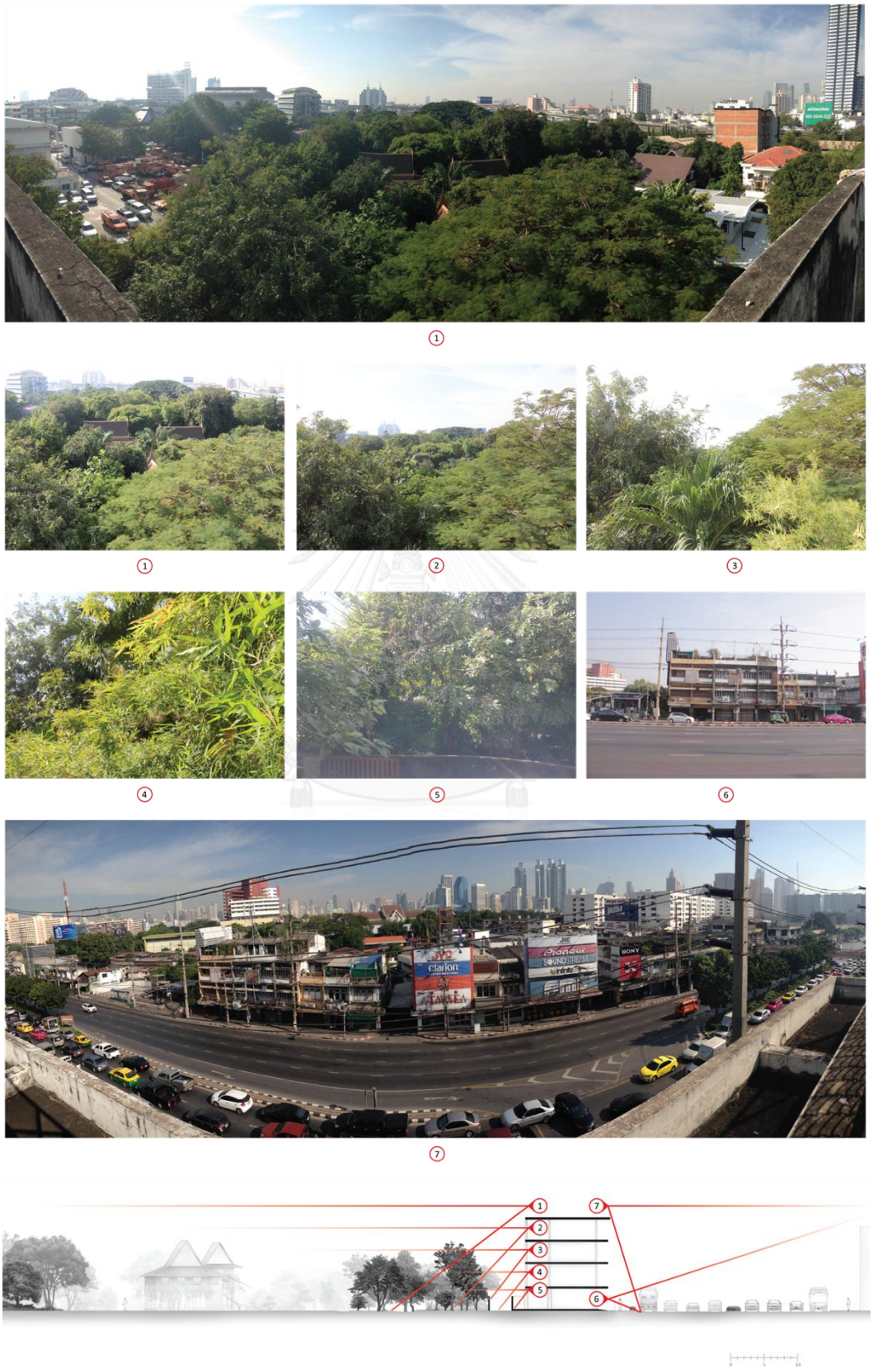

Figure 61 views from the commercial buildings on the site

2) Available transportation systems for site accessibility

There are 2 means of public transportation system to get to The Naris Learning Centre, bus and MRT.

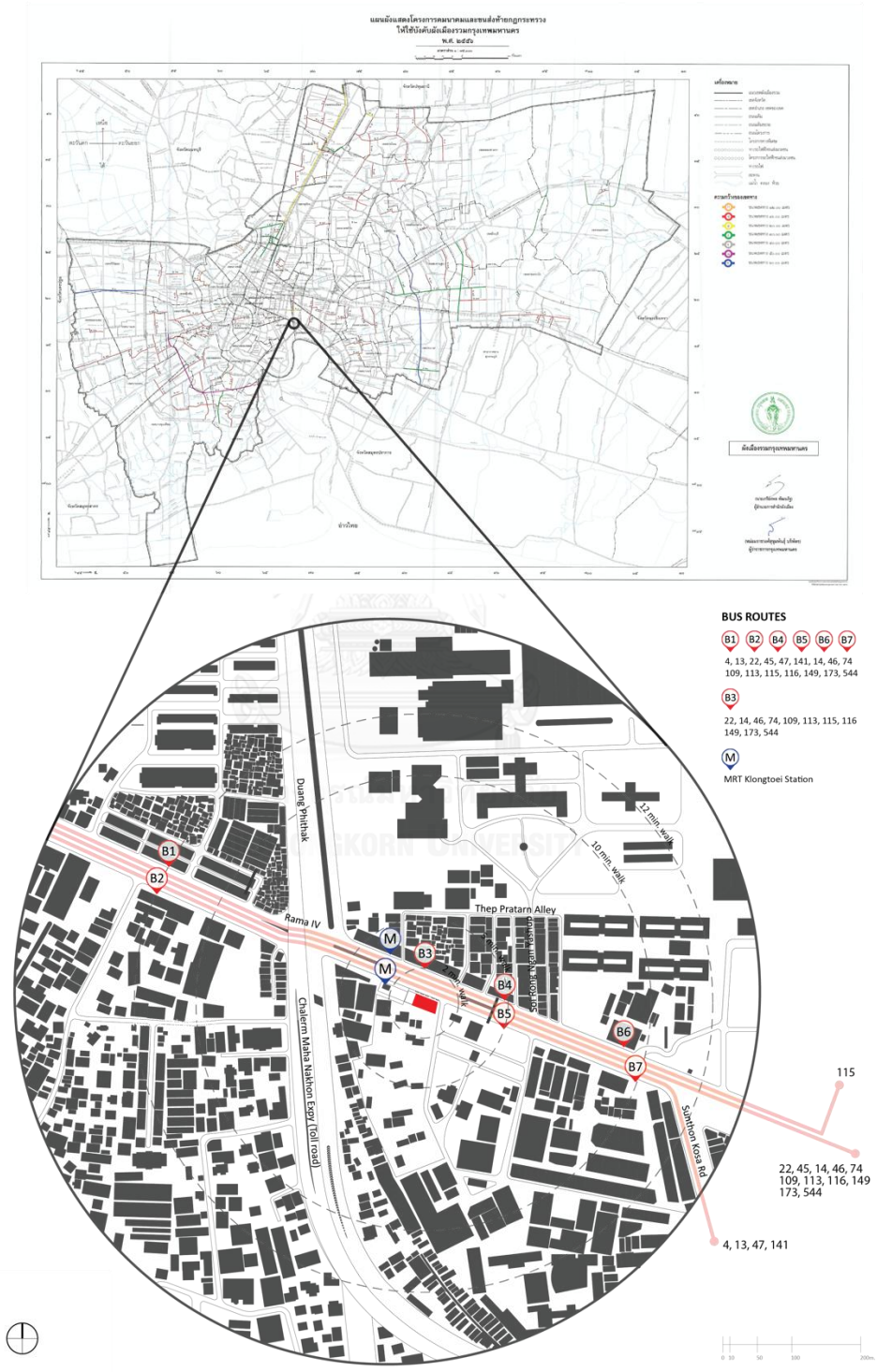

Figure 62 available transportation systems for site accessibility

3) Existing construction

The existing building is simple in structure, reinforced concrete wall with columns and beams. The distance between column to column are varied, from 3.50 m. - 8.50 m. There is only one staircase with 2 fire escape ladders at the back of the building. The building belongs to Prince Naris' heir. These days, the building functions as a Volkswagen car showroom at the first floor, storage on the second floor and the floors above are the leaseholder' family living units. There is small parking area outside.

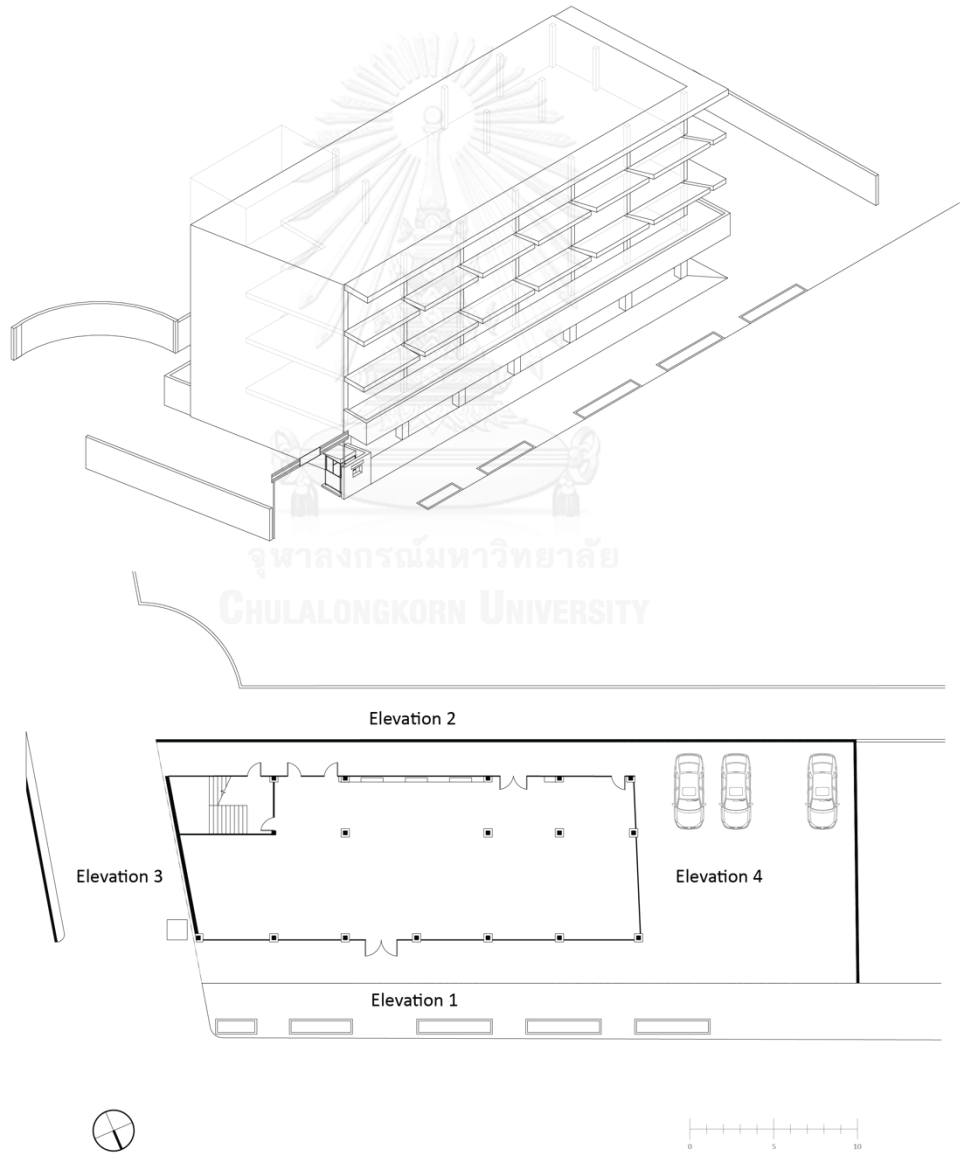

Figure 63 isometric and plan drawings of existing construction on the site

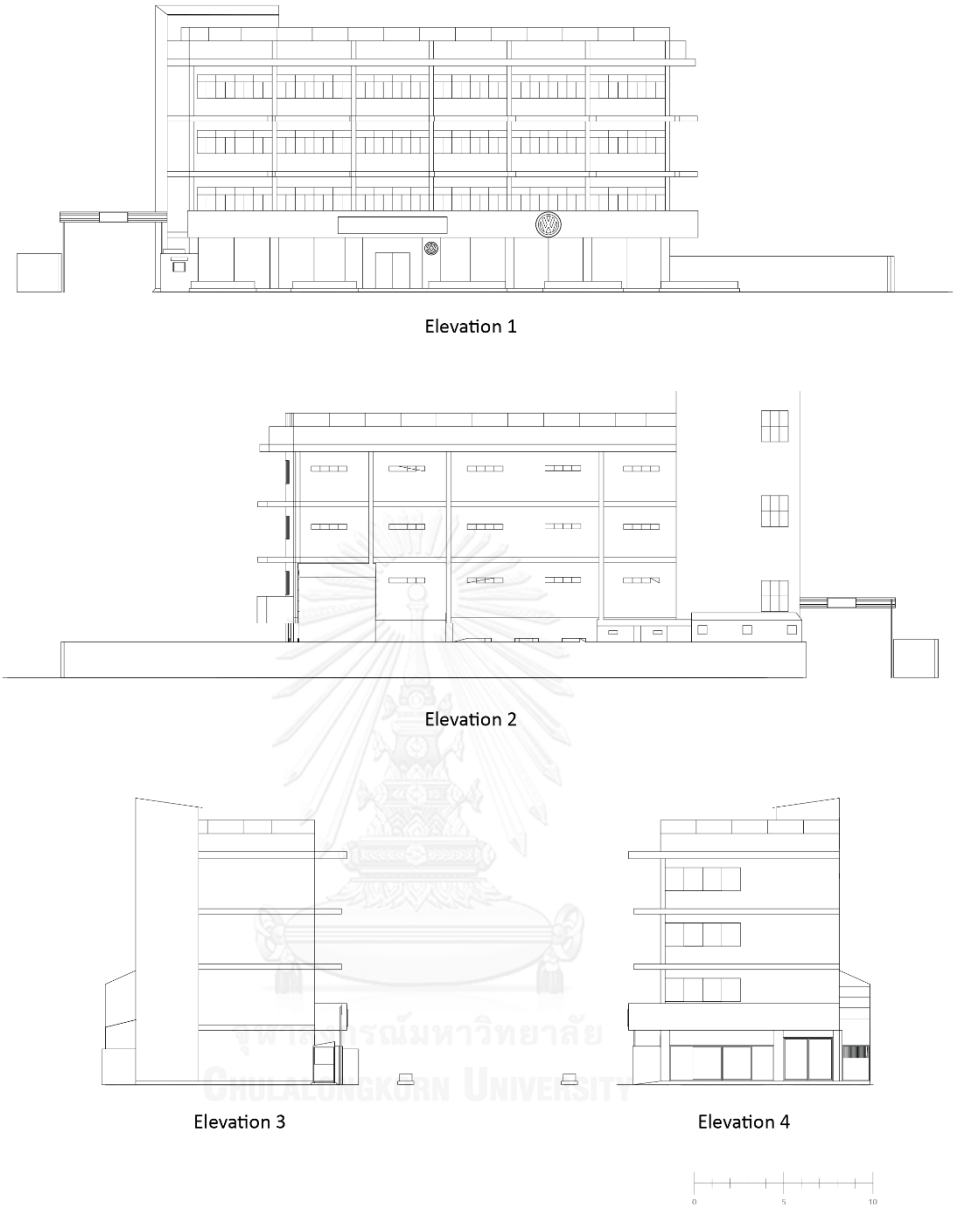

Figure 65 elevation drawings of existing construction on the site

Figure 64 perspective drawings of existing construction on the site

4) Law and regulations

2) Law and regulations

This hybrid-programming building would follow the land use zoning plan 2013(BMA), the site locates on a commercial area (Red zone), C3. for both commercial and office.

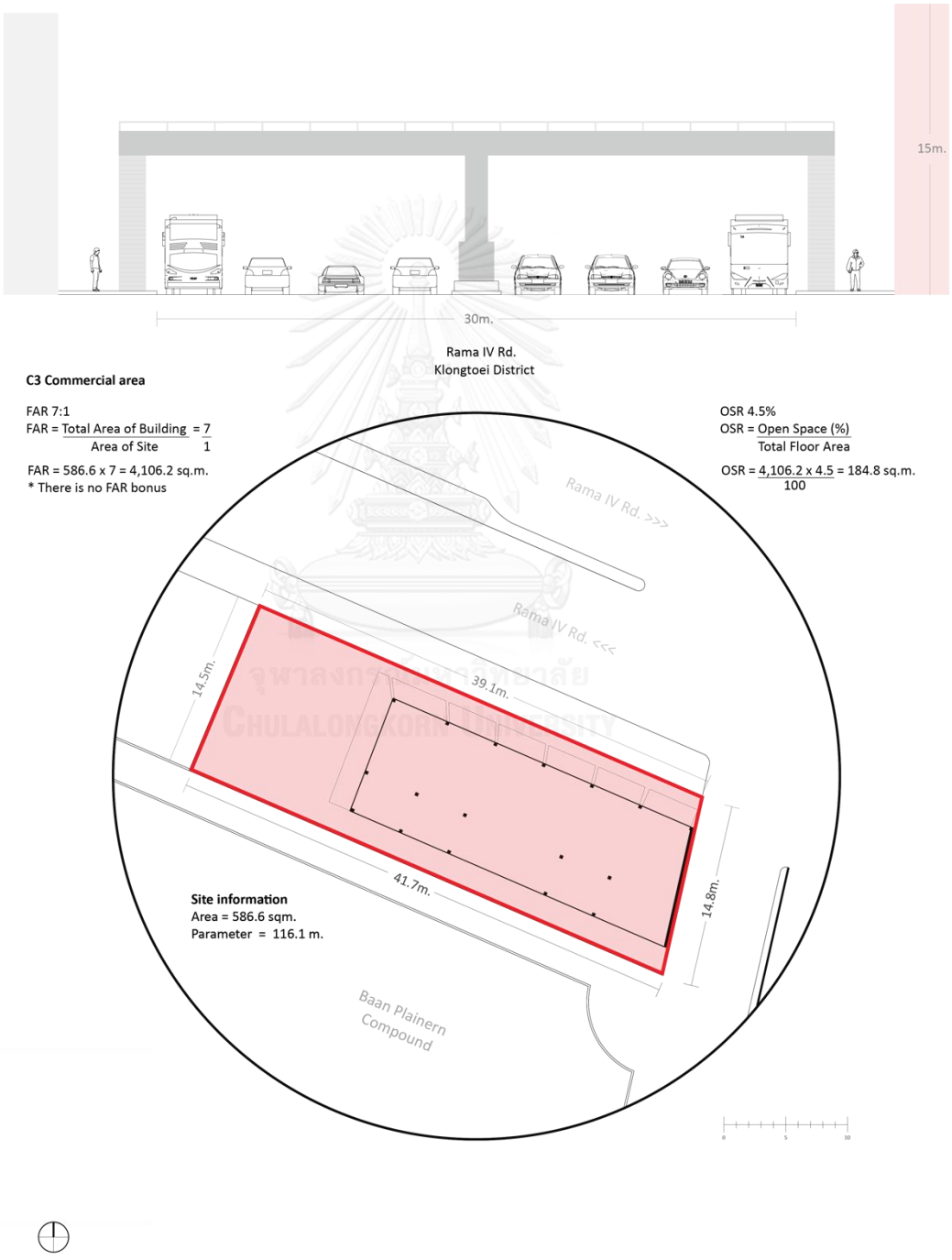

Figure 66 analysis of law and building construction of the site

Due to the fact that, the existing structure, renovation would be one of the options for the design consideration. This section reviews laws and regulations endorsed by the Thai government that facilitates the renovation projects, “Building Control Act 1979 (พระราชบัญญัติควบคุมอาคาร พ.ศ. ๒๕๒๒)”, “Ministerial regulation no.11 of 1985 (กฎกระทรวงฉบับที่ 11 พ.ศ. ๒๕๒๘)” and “Ministerial regulation no. 55 of 2000 (กฎกระทรวงฉบับที่ 55 พ.ศ. ๒๕๔๓)”.

Building control act 1979

Section 4 of this Act.

"Construction" means building an entirely new one. Whether or not a representation of the original.

"Modification" means a change or addition to the extension of the scope and shape of the area ratio of the weight of the building or parts of a building which has already deviated from the original construction. And repair or modifications are not prescribed in the Ministerial Regulations

"Repair" means the repair or replacement of parts of the building to its original condition.

"Demolition" means the demolition of the structure of a building to a pole or any other part of the beam, as defined in the regulations.

Chapter 3: Construction, alteration or demolition, removal and replacement of the building

Section 21 prohibits the construction of any building. Unless the building owner receives a license from the local authority.

Section 22 Prohibits any modifications. Unless the building owner receives a license from the local authority.

Ministerial regulation no. 11 of 1985 issued under the building control act 1979

1) The first action below. The building is not considered a modification

   a) Changing the structure of the building material, size, number and kind of the same. Unless the structure of the building is reinforced concrete. reinforced concrete or structural steel

   b) Replacing parts of the building, not the structure of the building using the same material as the original or other materials. This does not add weight to the structure of the original building, part of more than ten percent.

   c) Adding to the addition or expansion, which reduces the appearance of the area ratio of weight-form space. The various parts of the building, not the structure of the building. Which increases weight to the structural part of the original building. Any more than ten percent.

   d) Reducing or extending the area of the ground floor or first floor. The area is more or less a combination of not more than five square meters without reducing or increasing the number of columns or beams.

   e) Reducing or extending the area of the roof, an area of not more than five square meters. Without reducing or increasing the number of columns or beams.

2) Demolition of part of the building structure below. The building is considered to be dismantled.

   a) Concrete balcony

   b) Walls which are building structure or reinforced concrete walls

   c) Reinforced concrete staircase

   d) Reinforced concrete ground floor to the second floor of the building

In the case of the demolition of part of the structure of the building in the first paragraph. To act in accordance with (1) of which was converted to housing. Provided that the demolition of the building was demolished.

Ministerial regulation no. 55 of 2000 issued under the building control act 1979

Section 2 Indoor area

(21) Corridor width is not less than as set out below;

(21.2) Office, public building, commercial building: 1.50 m.

(22) Rooms or parts of buildings used for various activities required vertical distance of not less than as set out below.

(22.1) Corridor: 2.60 m.

(22.2) Rooms used for office, study room, canteen: 3.00 m.

(22.5) Balcony: 2.20 m.

Mezzanine floor can be added on any room with floor-to-floor height from 5.00 m. The mezzanine floor area shall not exceed 40% of the room area. Vertical distance between the ground and mezzanine floors of another layer of not less than 2.40 m. vertical distance between the floor and the mezzanine floor must be at least 2.40 m.

Bathrooms and toilets have floor to ceiling distance vertically between at least 2.00 m.

Section 3 Staircase

(24) For the staircase of the floor area more than 300 sq.m. must have a width of the staircase more than 1.50 m. If the width of the staircase less than 1.50 m. the building must have at least two staircases and each stair staircase must have the width not less than 1.20 m.

Stairs higher than 4.00 m. must have a landing every 4.00 m. or less and the vertical distance from the steps or landings to the lowest level of the building, which is above, the required minimum of 2.10 m. Landing and the area ahead of staircase must have width more than the width of the stairs. Unless the staircase width is wider than 2.00 m. landing and the area ahead of staircase width can be less than 2.00 m.

Stair rise must be set not higher than 0.18 m. and stair run without the overlapping parts must be 0.25 m. Stairs with a width up to 6.00 m. and height up to 1.00 m. must provide railing on both sides. Ladder nose must be less-slip material.

(25) Stairs under (24) must be away no more than 40.00 m. from the point at the far end on the ground floor.

(26) Stairs under (24) which is curved staircase up to 90 degrees can be without landing, but It must have an average width of the stars run less than 0.25 m.

Section 4 Fire escape staircase

(27) Buildings that range from four floors up and no taller than 23.00 m. high, or three-story building and a roof above the third floor with an area of over 16.00 sq.m., apart from having regular staircase must have a fire escape ladder made of fire-resistant material and must have access to a fire escape without obstruction.

(28) Fire escape staircase must have a slope less than 60 degrees unless the building has more than four stories, the fire escape staircase can have a slope exceed 60 degrees, and needs to landing on every floor.

(29) Exterior fire escape width must not less than 0.60 m. and part of the fire escape staircase must lean across the solid wall construction with durable materials that are fire-resistant materials.

Fire escape staircase if not lay to the ground level, the building must have a metal ladder that can move or stretch or sag to the floor downstairs.

(30) Interior fire escape staircase width must be at least 0.80 m. wide, with solid wall construction with durable materials that are fire resistant barrier surrounding material. Except that an air vent and escape hatch. It must be ventilated out of the building, each floor must have an aperture with total area not less than 1.40 sq.m. Brightness must be provided for both day and night.

(31) Interior fire escape door must maid of fireproof material with the width more than 0.80 m. higher than 1.90 cm. and outward swing door install with auto-close equipment, and can be Opens easily at any time.

(32) The area ahead of fire escape staircase must wider than the width of the staircase and the other side width not less than 1.50 m.

4.5 Design development

From the design concept and criteria, the building performs as a 'filter' of users' accessibilities (both physical and visual). Also, as the building for context of the heat of Bangkok that catches light and cast shadow. The importance is the ratio between privacy and natural light let-in. Moreover, the author's interpretation of how to make the building as a supplement to the study of Prince Naris' window design methodology, is to combine the old and the new. The author also looks at the building of Prince Naris Learning Center as an exhibition itself that display windows design by Prince Naris. There are 3 main areas of thinking which establish the design as follow;

Circulation

At the very starting point of the design, the author chose to limit the choices of circulation into 2 parts, elevator and stair. There is also a separation of circulation flow between service and public use. The choices of elevator and stair have been analyse through the following concern;

CIRCULATION
ELEVATOR OPTIONS

	ELEVATOR OPTION 01		ELEVATOR OPTION 02	ELEVATOR OPTION 03
SERVICE CORE		* Service elevator		
LOAD	450 kg. (6)	600 kg. (8)	750 kg. (10)	1,000 kg. (13)
WELL	Width 1.80 m.	Width 2.00 m.	Width 2.00 m.	Width 2.10 m.
	Dept 1.60 m.	Dept 1.90 m.	Dept 1.90 m.	Dept 2.10 m.
CAR	Width 1.10 m.	Width 1.10 m.	Width 1.30 m.	Width 1.40 m.
	Dept 1.10 m.	Dept 1.40 m.	Dept 1.40 m.	Dept 1.80 m.
	Height 2.20 m.	Height 2.20 m.	Height 2.20 m.	Height 2.00 m.
MACHINE ROOM				
	Width 2.30 m.	Width 2.00 m.	Width 3.10 m.	Width 2.10 m.
	Dept 4.00 m.	Dept 4.40 m.	Dept 5.00 m.	Dept 4.30 m.
	Height 2.30 m.	Height 2.60 m.	Height 2.60 m.	Height 2.40 m.
VELOCITY	1.0 m/s	0.5 m/s	1.0 m/s	1.0 m/s
LANDING DOORS	Width 0.70 m.	Width 0.80 m.	Width 0.80 m.	Width 1.40 m.
	Height 2.00 m.	Height 2.00 m.	Height 2.00 m.	Height 2.00 m.

ELEVATOR SPECIFICATION : Traction elevator sytem. The control are built into the top floor next to the landing doors, to save space
ELEVATOR OPTION 01 : Light traffic elevator for 6 commuters with a general purpose elevator for 600 kg.
ELEVATOR OPTION 02 : General purpose elevator for 10 commuters.
ELEVATOR OPTION 03 : General purpose **goods** elevators for 13 commuters.

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Table 4 options of circulation, elevator options

CIRCULATION
STAIRCASE OPTIONS

STAIRCASE 1.20 M.*	STAIRCASE 1.50 M.
	
2 Staircases	1 Staircase
Rise 0.1765 m.	Rise 0.1765 m.
Run 0.25 m.	Run 0.25 m.
Length 4.25 m.	Length 4.25 m.
Steps 17 steps	Steps 17 steps

* There must be 2 of staircase with the width of 1.20 m.
According to law and regulation

Rise and run dimension provided is the most efficient dimension for staircase

Table 5 options of circulation, staircase options

However, through the process of design, the author decided to choose 1.50 m. wide staircase as the main circulation path which help distributing visitors to each floor. The aim is this main staircase will bring up people to the upper floor, drop them to each program along the way, while this vertical traveling experience would be different floor by floor (Figure 69). 'The difference in experiences' which the author proposes is not just the spectacle transition from view on ground toward the view of garden, as shown on the site analysis diagram of views (Figure 61).

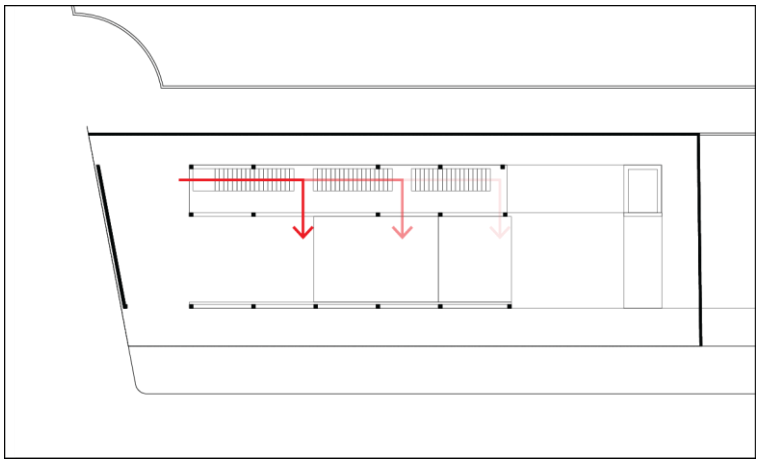

Figure 67 the diagram shows how the design will distribute flow of circulations

However, transition changes with the experience of commuter along the way. The author proposes the difference in quality of light and openness, the upper the viewers go, the more visually reveal. As if the author called it as the filter of Baan Plainern.

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Structural system

For the aspect of building structure, the author keeps only the original column line and decided to change the floor level throughout 4-storey, from 3 m. each high to 3.5 m. The author proposes 2 set of loading support, H-beam and reinforce concrete beam, as to represent the contrast between the old and the new structure to the existing building (Figure70). Also, the author proposes a cantilever section of H-beam in order to emphasis the act of insertion of different construction material to viewers. Hence, the area of cantilever would be the place to project the most important window which will be readily be seen by the outsiders. This is to supplement the idea of how to publicise Prince Naris Learning Center.

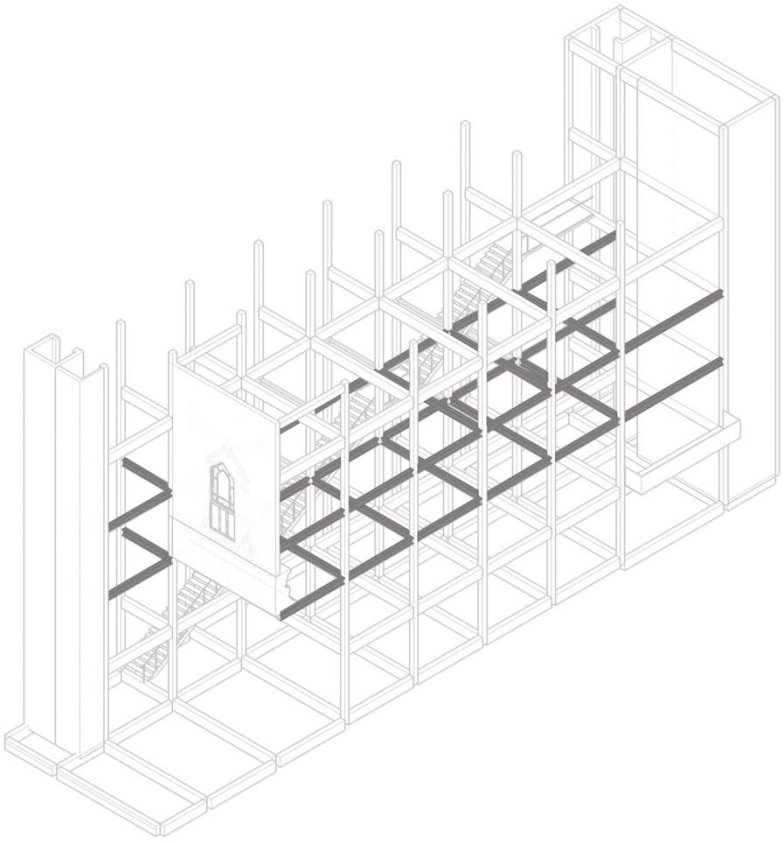

Figure 68 grey color indicates the position of H-beam among reinforced concrete beam

On top of that, the chosen window is a replica of a window from the ordination hall of Benjamabophit temple. The author proposes an invert version of this window to the building with the reason of putting the old inside and show the new (Figure70). However, for the further detail of how this window has been adapt, there is information on design implication, Figure 79.

Referring back to the previous study of the traditional Thai house and Prince Naris' house/studio. The structure of Thai traditional house is post and lintel, and the structure of the rooms and circulating platform are freely apart from each other. That maybe a redundancy in construction system but looking at the use of each programme, they are all separated out. For Prince Naris' house/studio, there are overlapping of use in structure, circulation flow and interconnection between each programme. For the set of the design in this thesis, the boundary between each programme and its support structure blurs, so as choices in circulation flow.

Façade and skin

For the aspect of building façade and skin, this section includes the concern of the overall appearance which affect the space apart from looking old and new. It is also about how to filter out darkness and brightness apart, for the difference of viewers' experiences. Hence, this concern helps the author scope down the decision of where to show the heaviness and lightness of the building (see the final design: elevation drawing).

Nevertheless, the main objective of this thesis is to design a building that cast shades and shadow to benefit the use and aesthetic of the space. However, the author started up with an idea of creating regulating lines wrapping around the building to guide on the selection of windows and to put together the scheme of looking old and new (Figure71).

The proposition of the building skin is to show clear contrast between the old look and the new look to the viewers. However, old skin means creating an old look with the original proportion of window with new material/painted. It can be used with

the same function or not. For the new skin, new windows are applied to the regulating lines in order, with an applied windows mechanism from the study (see, Figure 72). Moreover, all the further detail with the quality of light, the heaviness and lightness of the building, will be shown on the very next topics, 4.6 Final design: Architectural drawings and 4.7 Design implications.

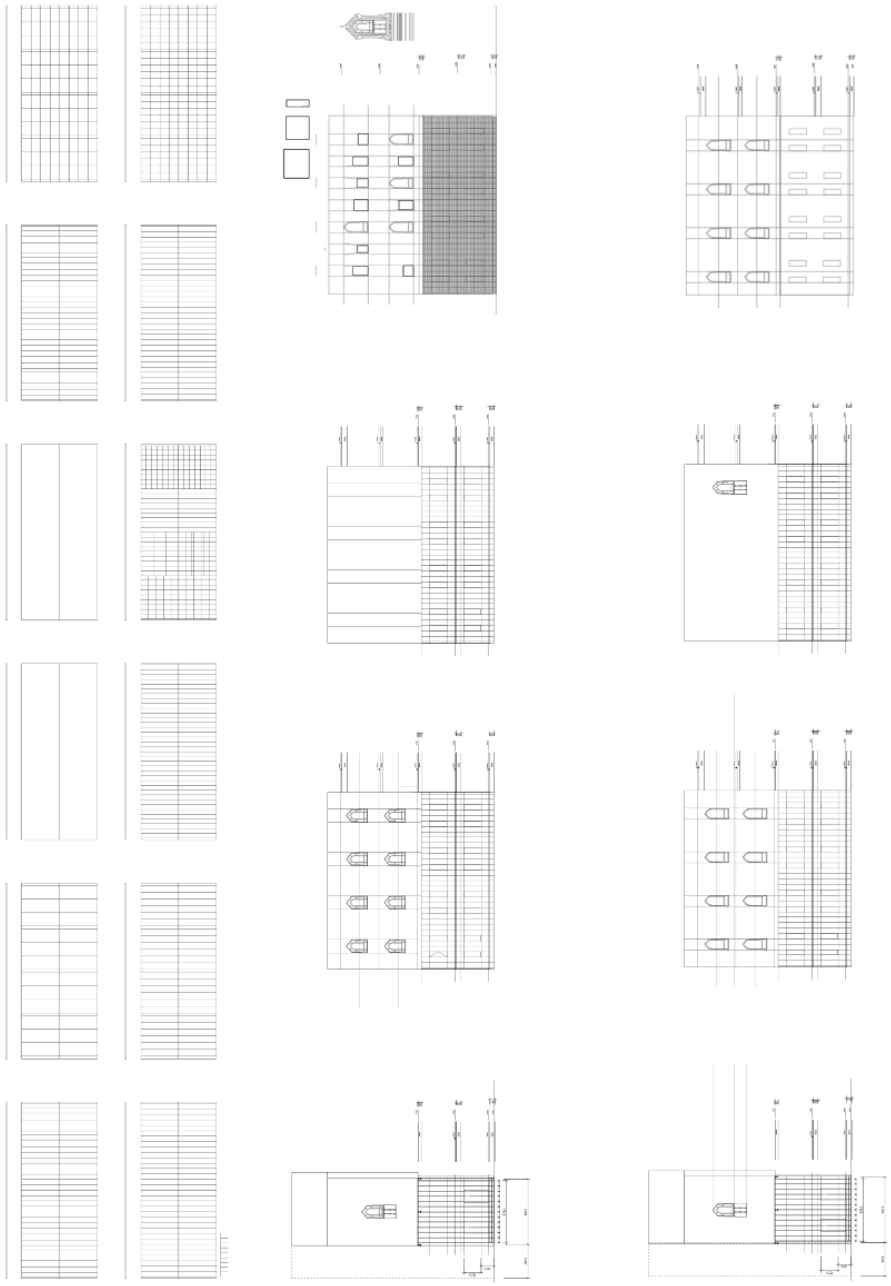

Figure 69 example of design developments through the idea of regulating lines.

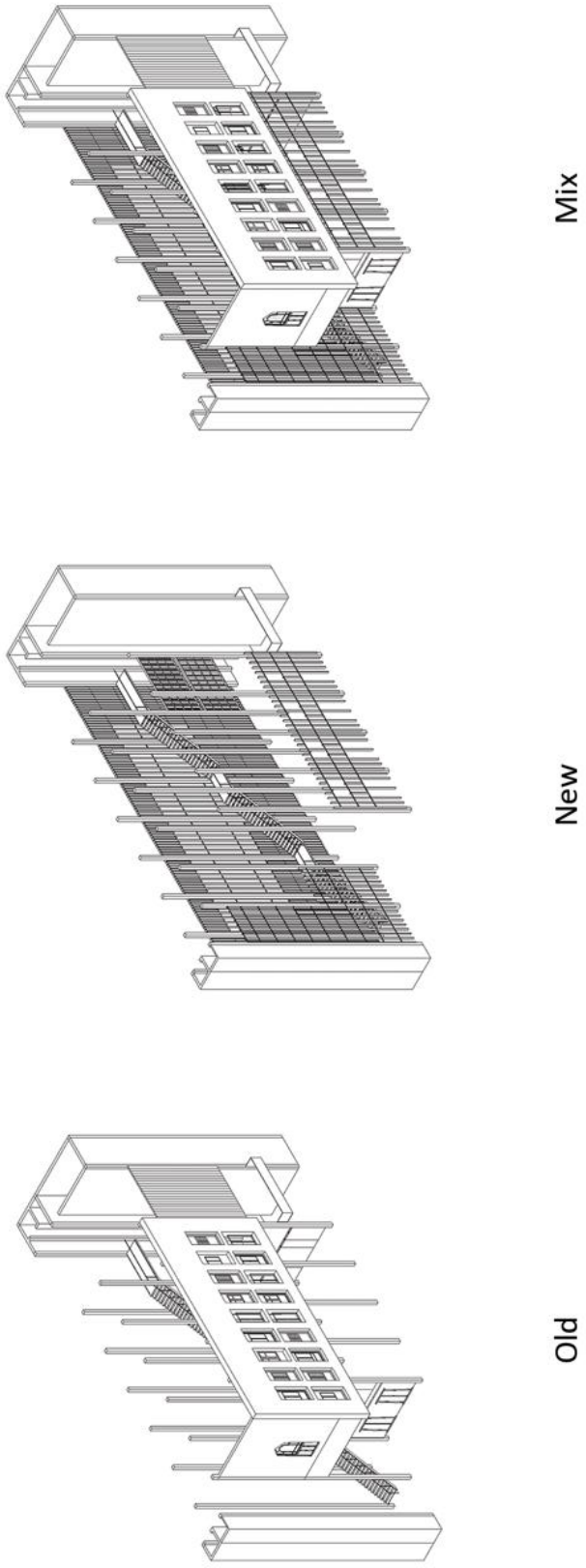

Figure 70 the splitting parts of the building facade into old/new skin criteria.

4.6 Final design: architectural drawings

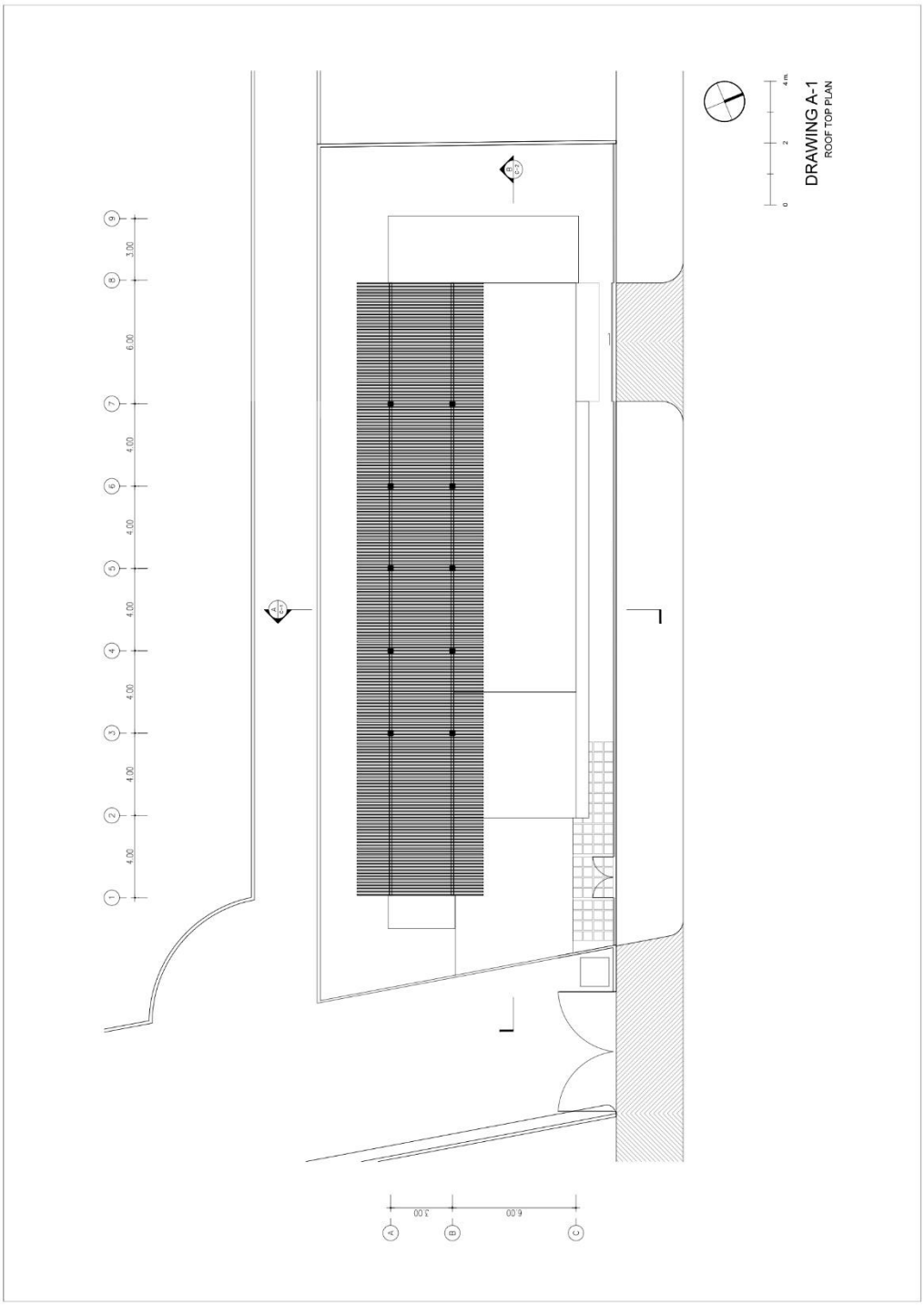

Figure 71 roof top plan drawing with site context

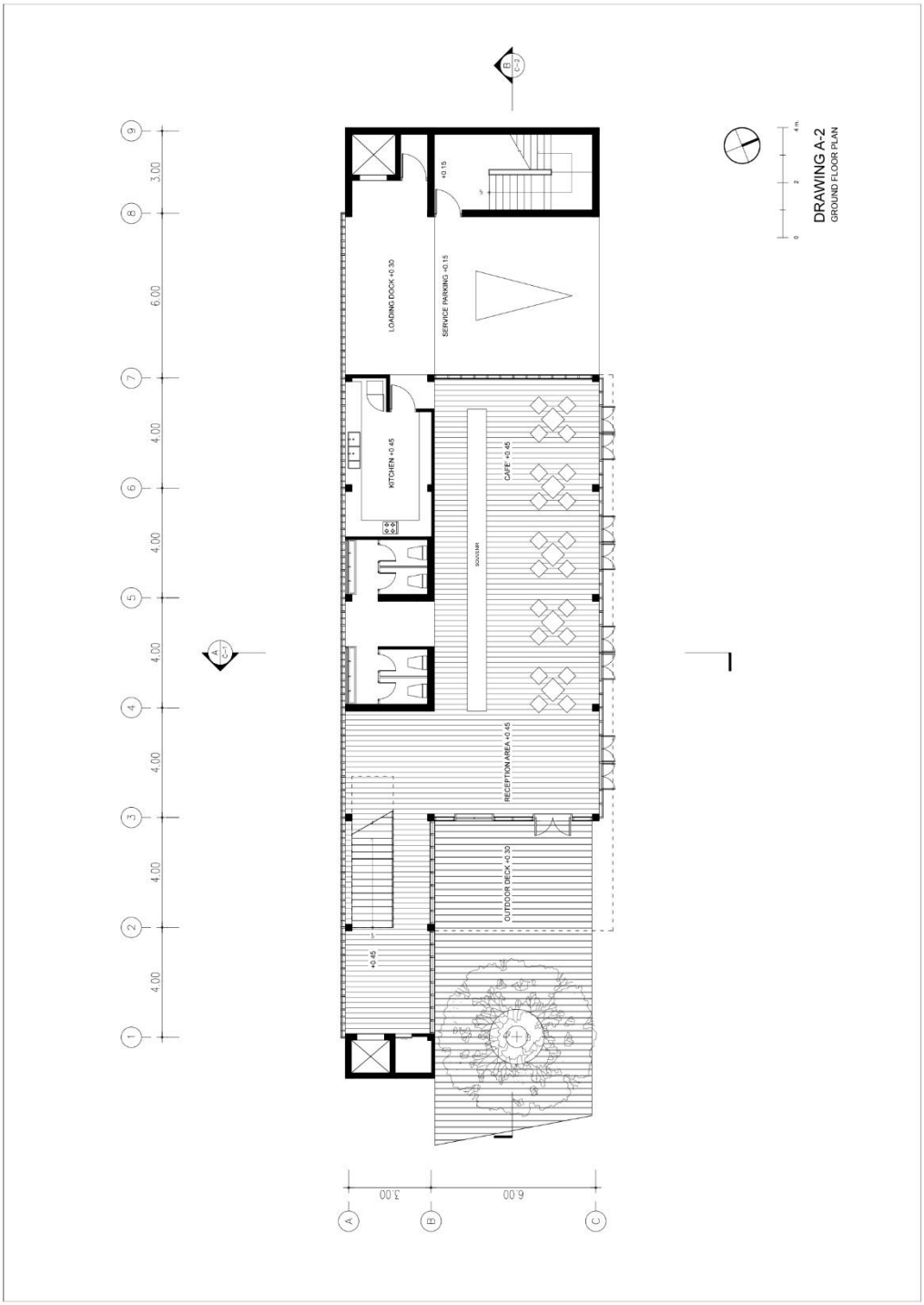

Figure 72 ground floor plan drawing

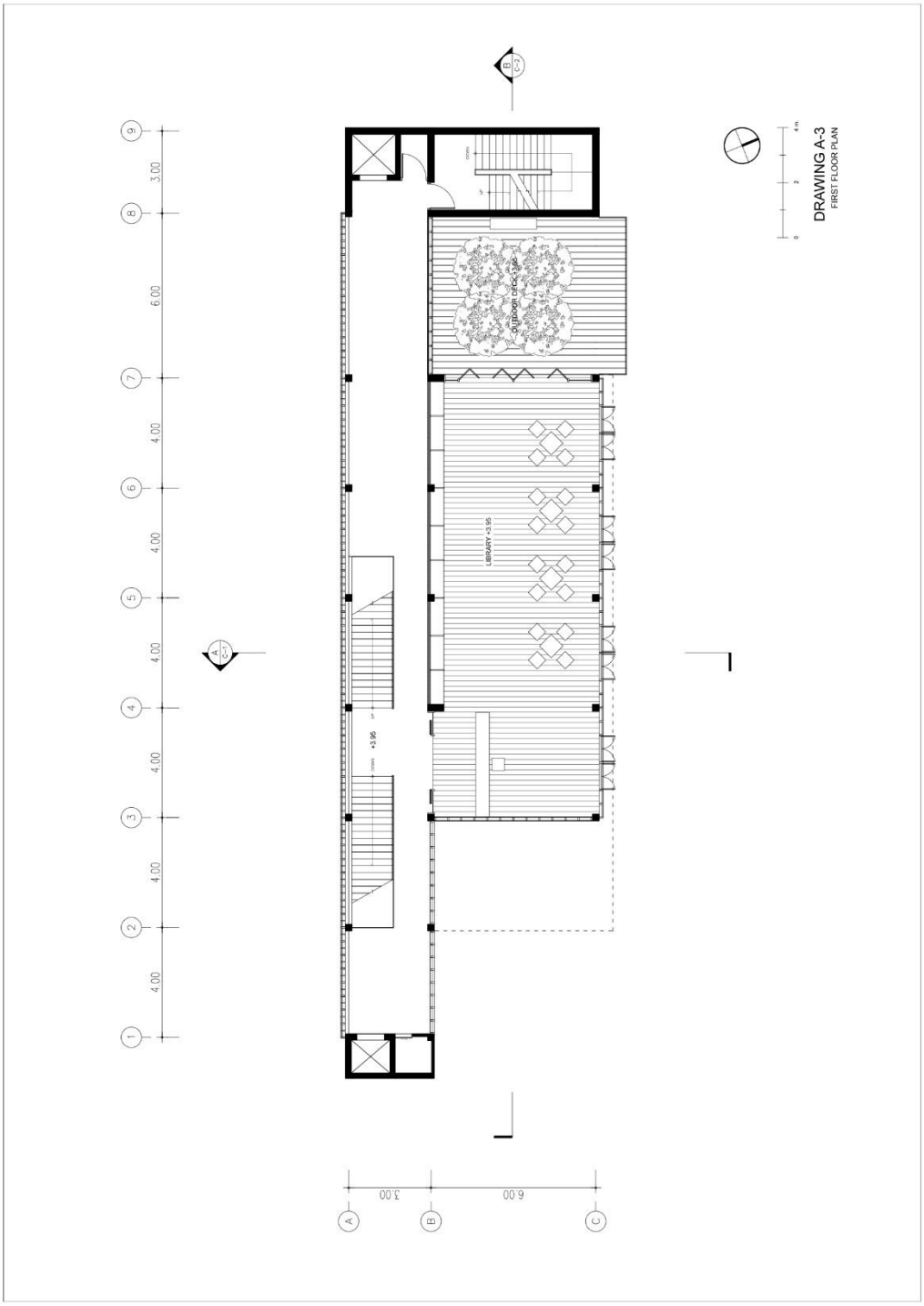

Figure 73 first floor plan drawing

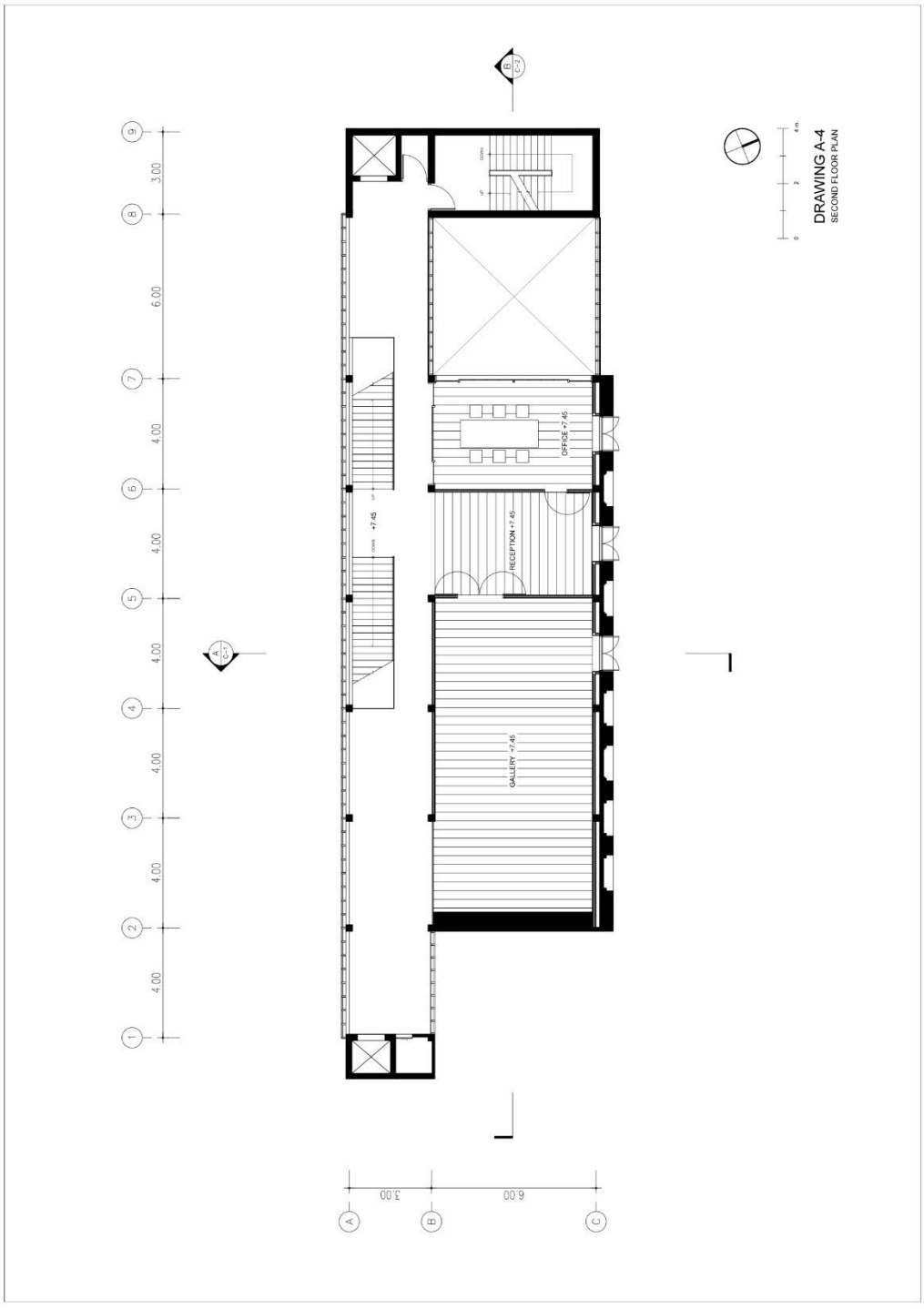

Figure 74 second floor plan drawing

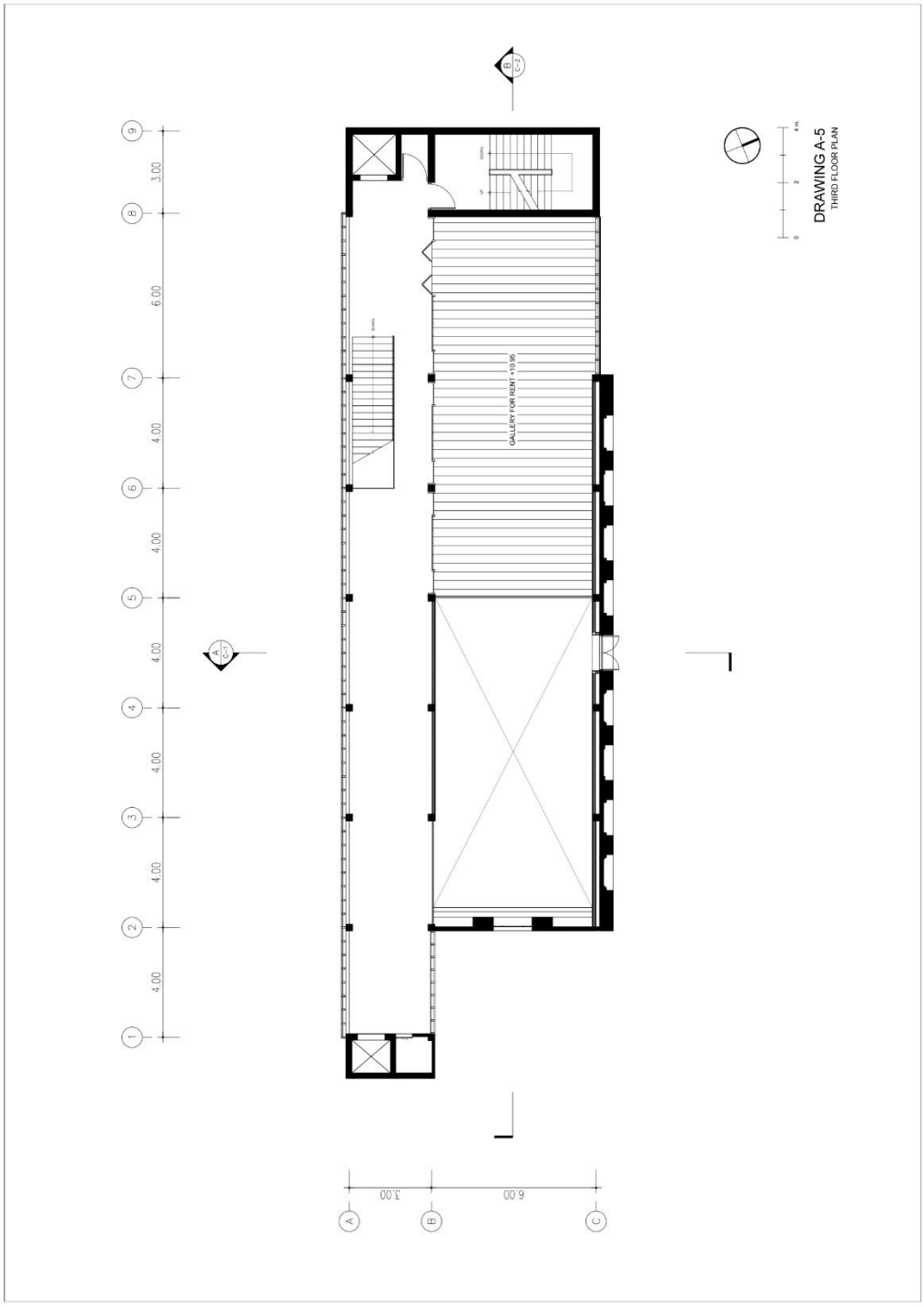

Figure 75 third floor plan drawing

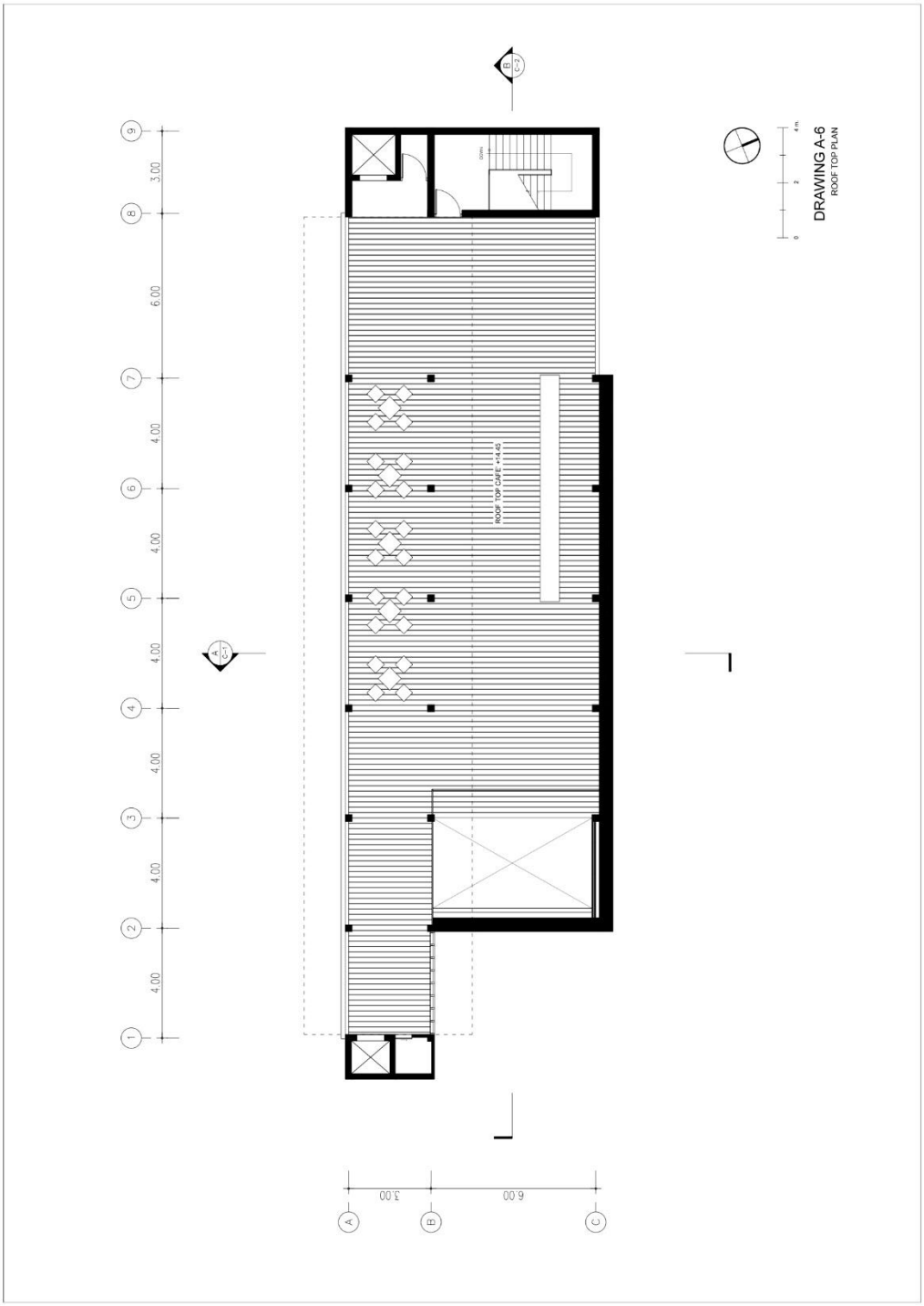

Figure 76 roof top plan drawing

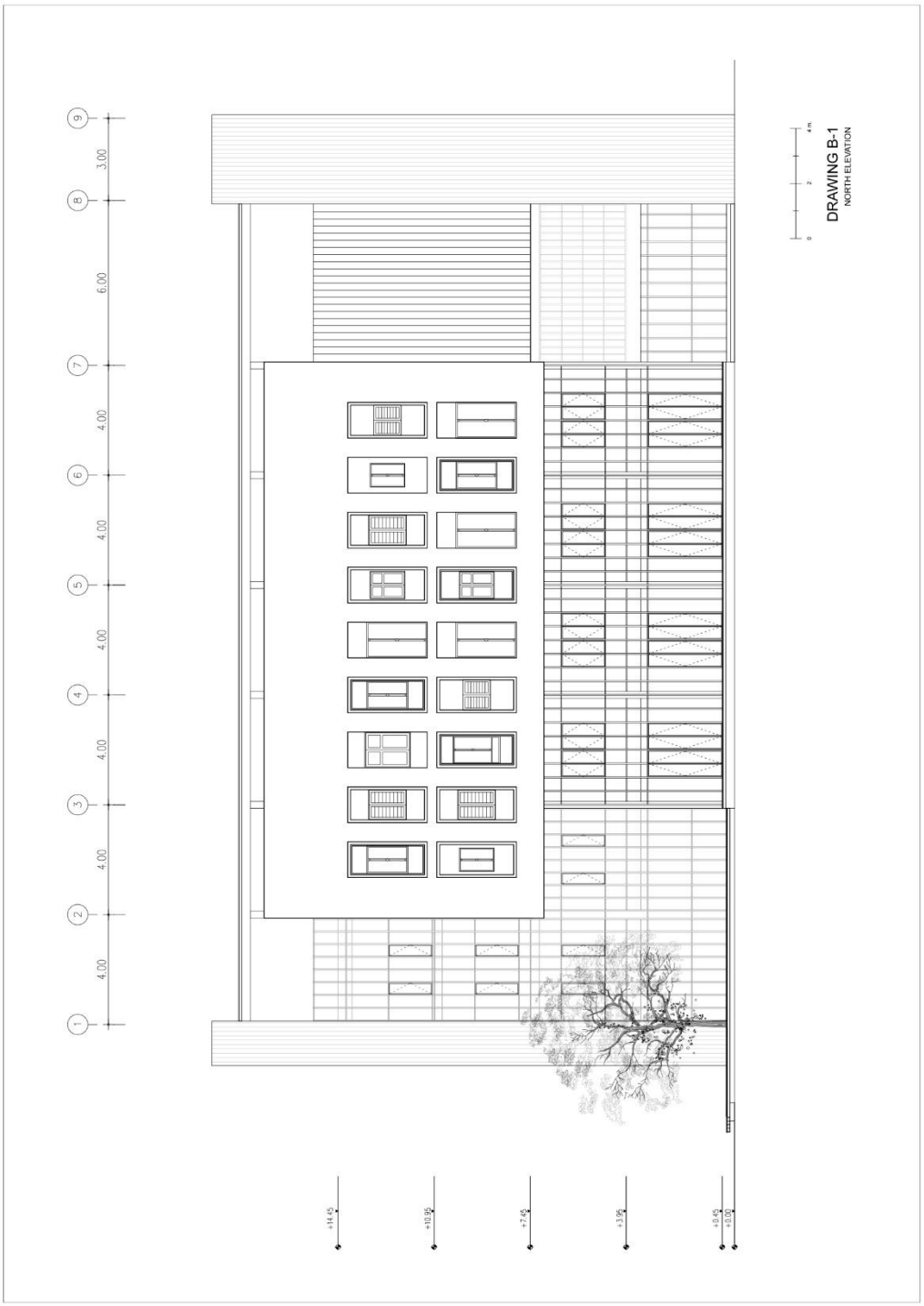

Figure 77 North elevation drawing

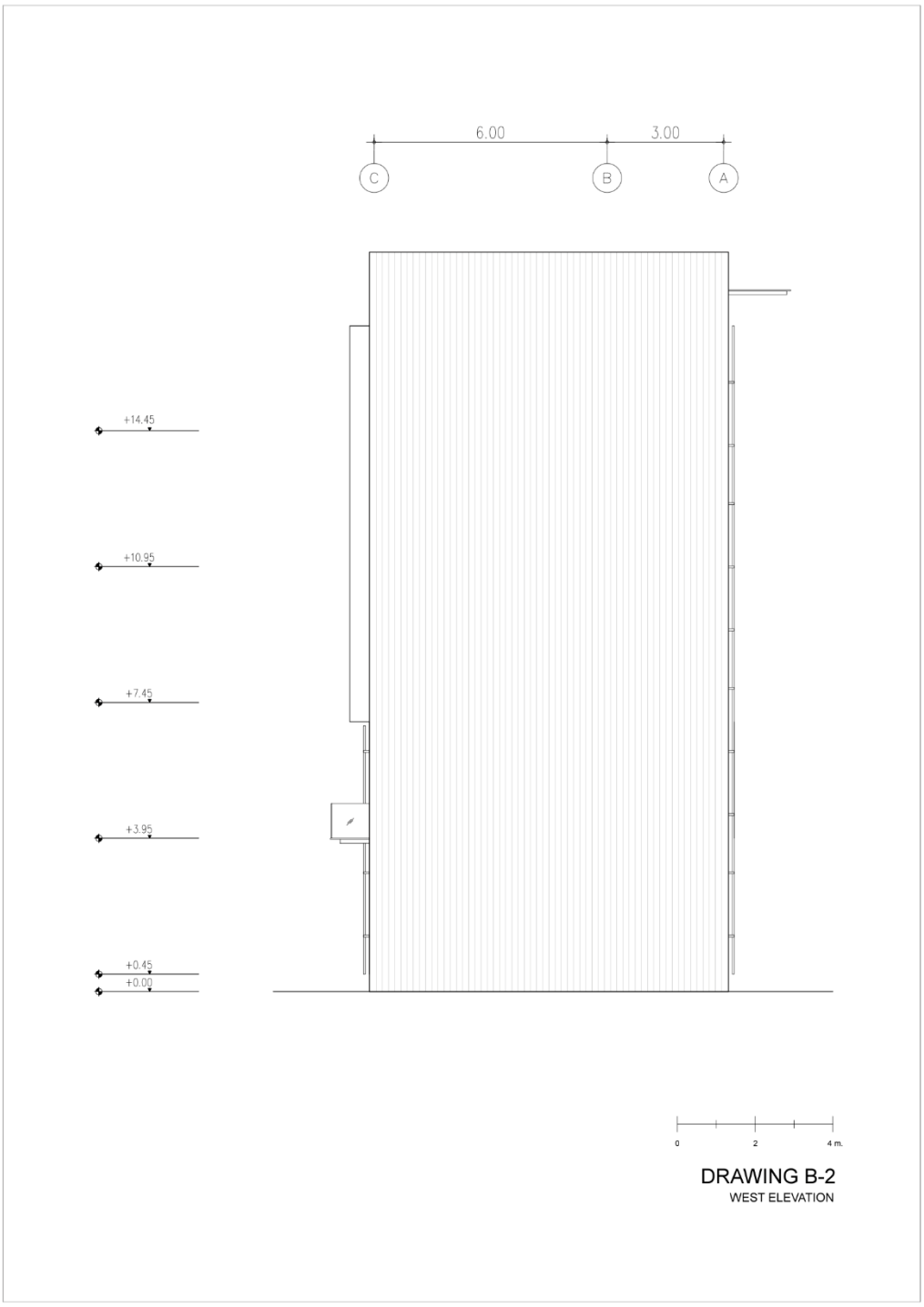

Figure 78 West elevation drawing

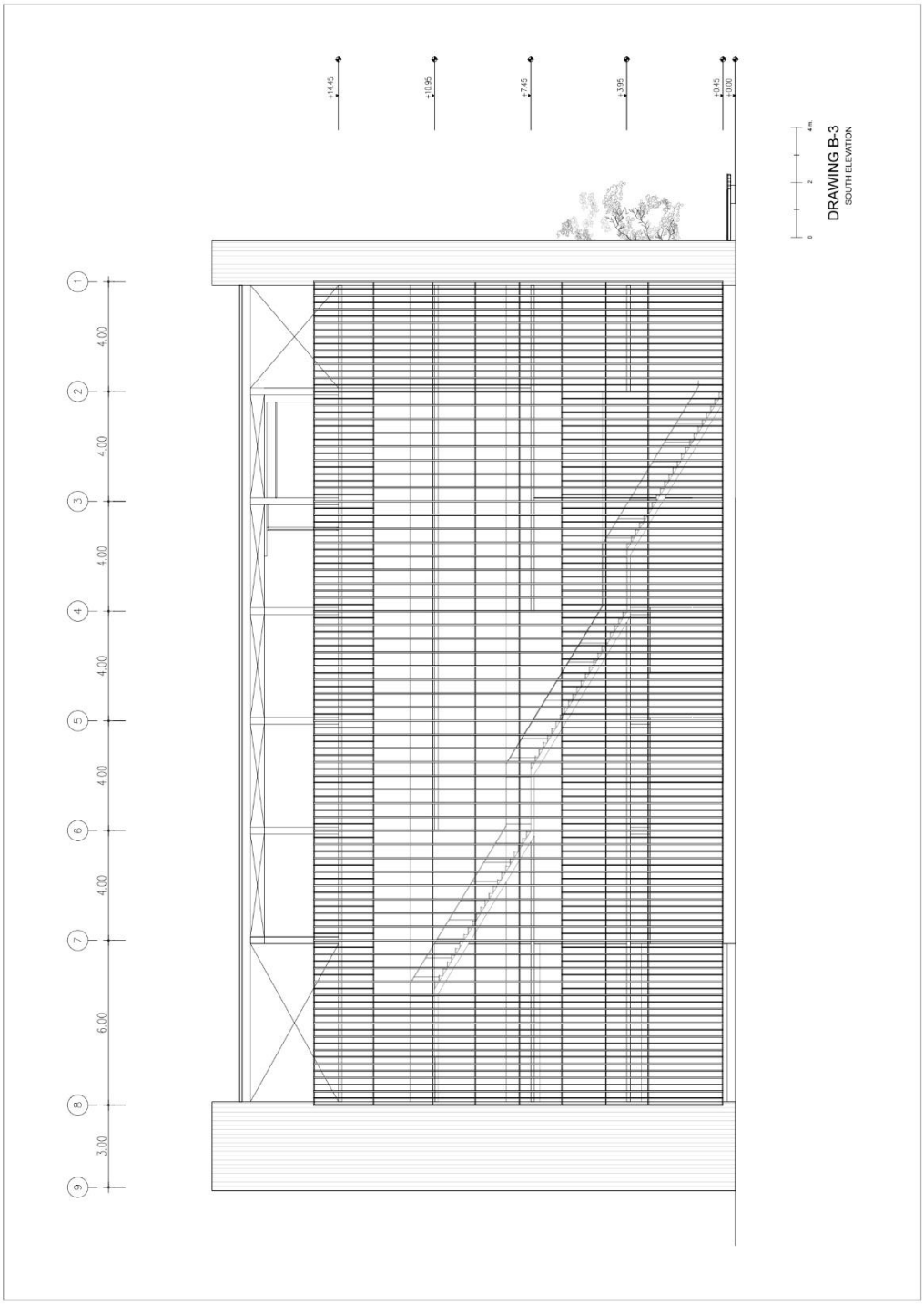

Figure 79 South elevation drawing

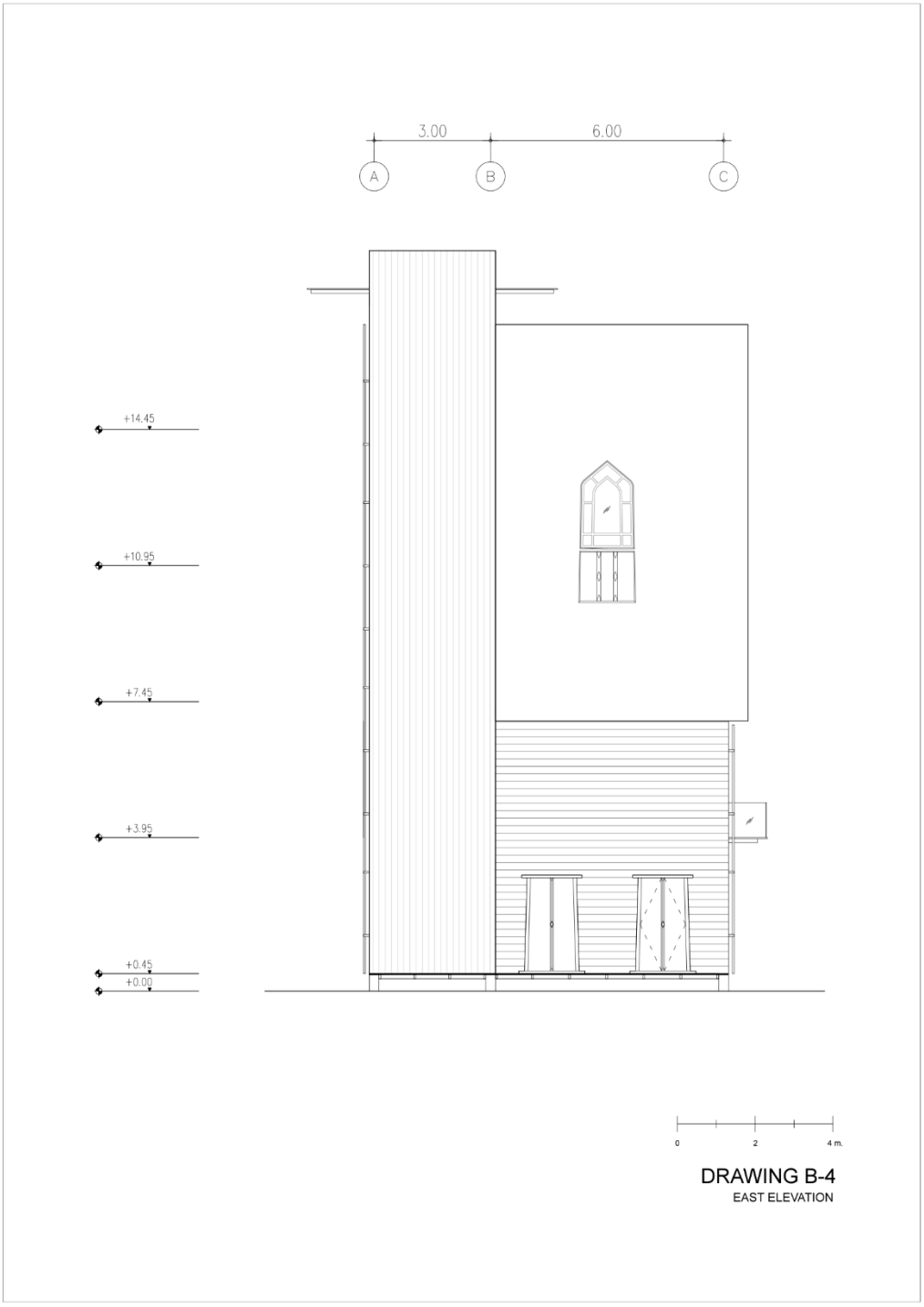

Figure 80 East elevation drawing

Figure 81 sectional drawing A

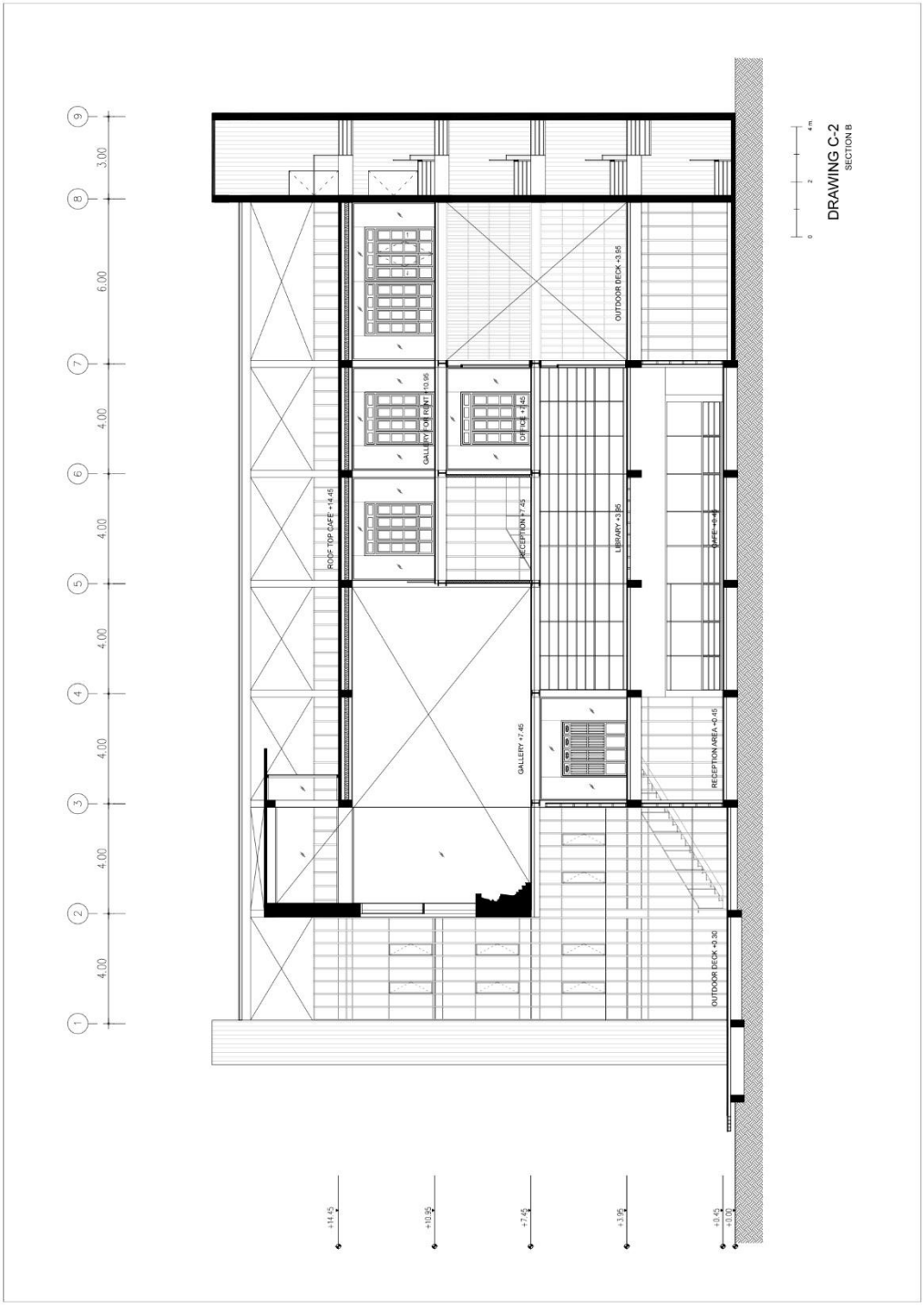

Figure 82 sectional drawing B

Figure 83 perspective drawing of the Northern facade

Figure 84 perspective drawing of the Southern façade

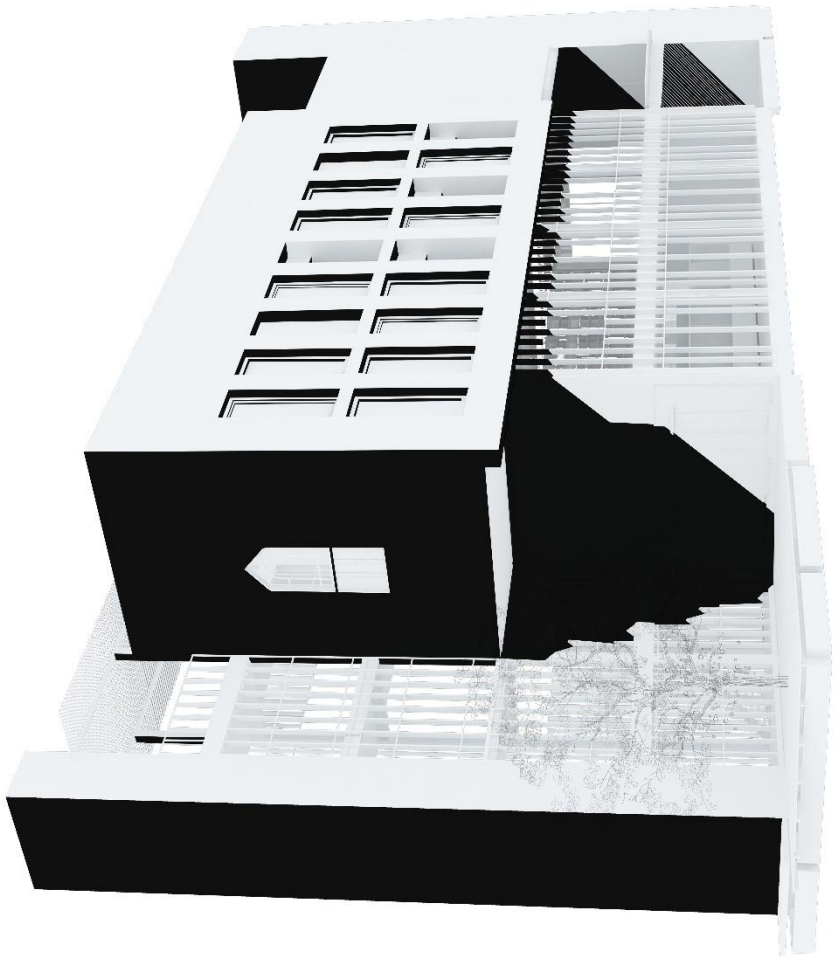

Figure 85 perspective drawing toward the main approach

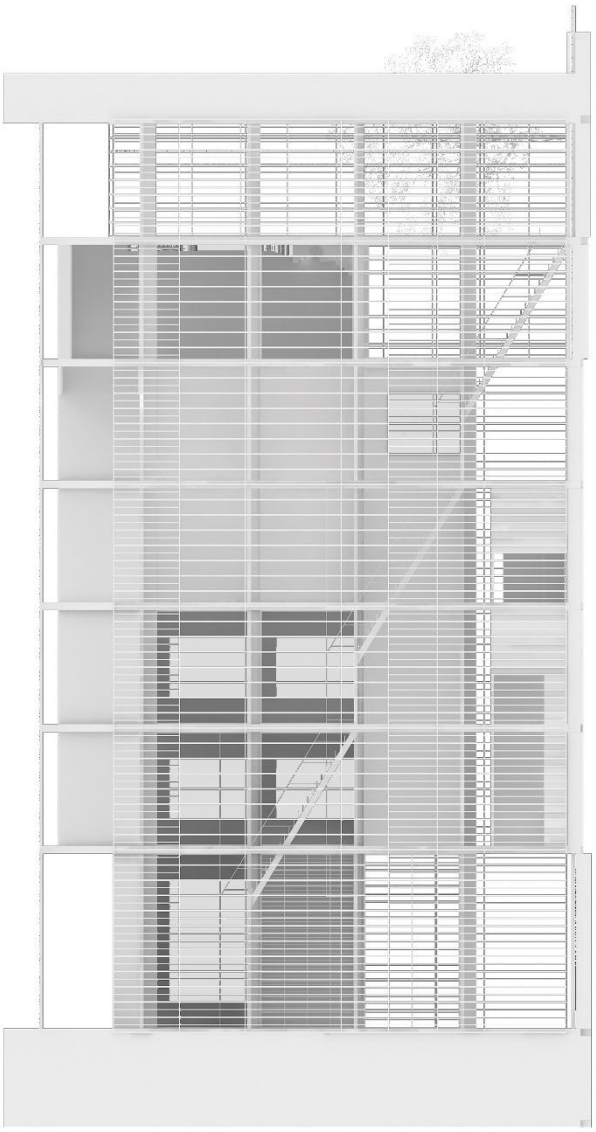

Figure 86 elevation drawing from the Southern facade with the representation of the heaviness and the lightness of the building

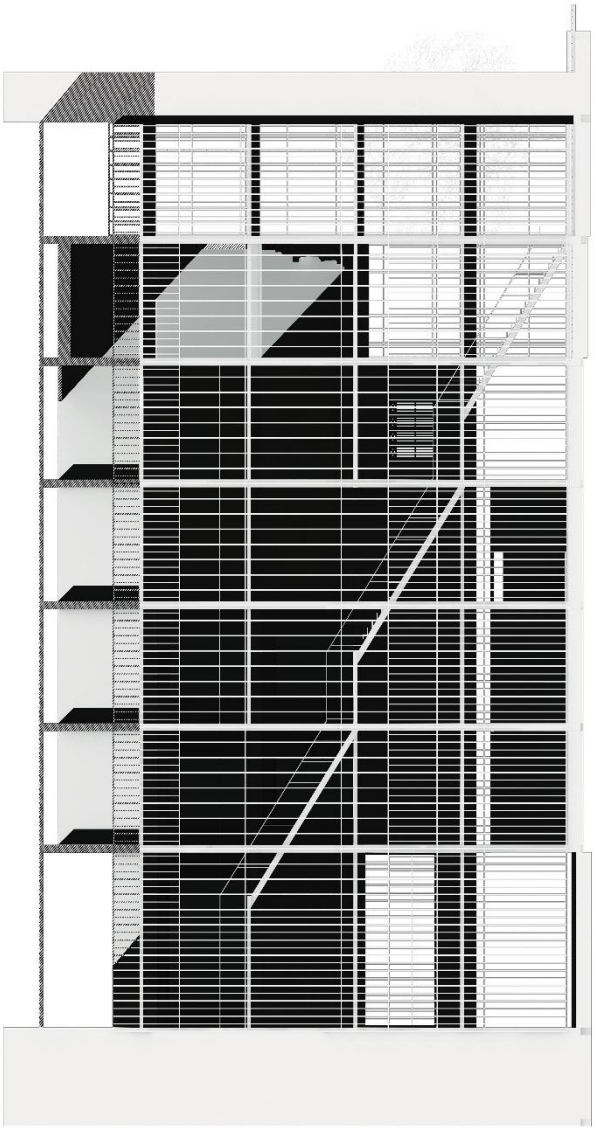

Figure 87 elevation drawing from the Southern facade with the representation of the brightness and the darkness of light to the building

Figure 88 sectional drawing shows the effect of light cast in shades and shadow to the main exhibition space.

4.7 Design implications

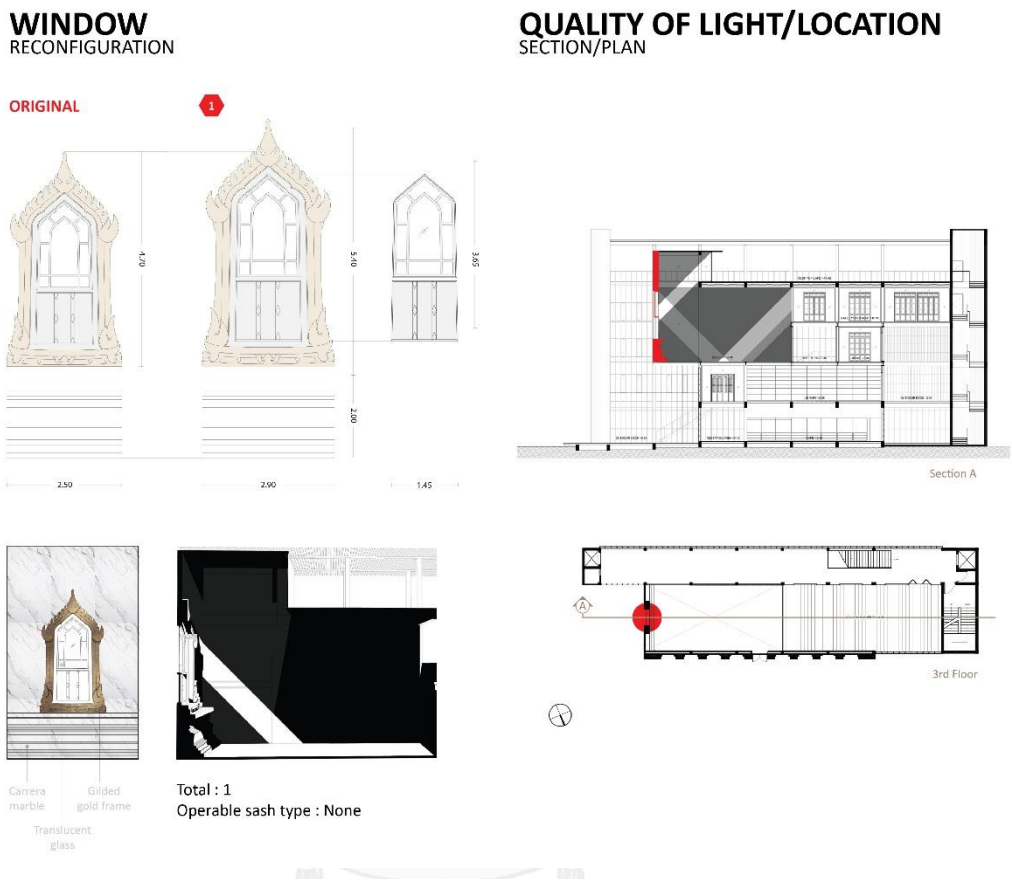

Figure 89 design implication of the new window 1

This window is a replica of a window from the ordination hall of Benjamabophit temple. The reconfiguration in the design is to enlarge the form while keeping the proportion of it. The composition of the window such as *Reun keaw* (เรือนแก้ว) is kept as gilded gold frame, positioned on white Carrara marble as the main exhibited artifact in the gallery of Baan Plainern. However, the quality of light of this window is not as significant as its position. Light shines through the window's translucent glass cannot be compared to the effect of light cast it has got from the other openings. As a replica of an art object designed by Prince Naris, within the space, it displays beautifully with the cast of shadow, see Figure 78. However, what the author feel successful with this reconfiguration is that, it is the idea of '*Pleang* (แผลง)' as the use of small changes to

create big impact to the space, while keeping the familiarity of the viewers. How? Firstly, the window is inverted inside out, showing the more classic-style appearance toward inside, and show the modern-look with simple geometrical form of its inside to outside. Secondly, the original window is display on 2.00 m. high pedestal base or '*Tarn sing* (ฐานสิงห์)'. The viewer can see it above their level from the outside of the ordination hall. However, this replica is display on 9.00 m. high above ground level. It can be seen from the entrance. It can be seen from the floors above. It can be touch by visitors with the unfamiliar shades and shadows casting on the walls. Moreover, referring back to the study of Prince Naris' house and studio, about quality of light in sequences (see, Figure 49), with the position of it on plan drawing, the light cast through is dropped down not to be too bright during the afternoon time. The afternoon bright light and the heat has got reduced by the partitions of the circulation path.

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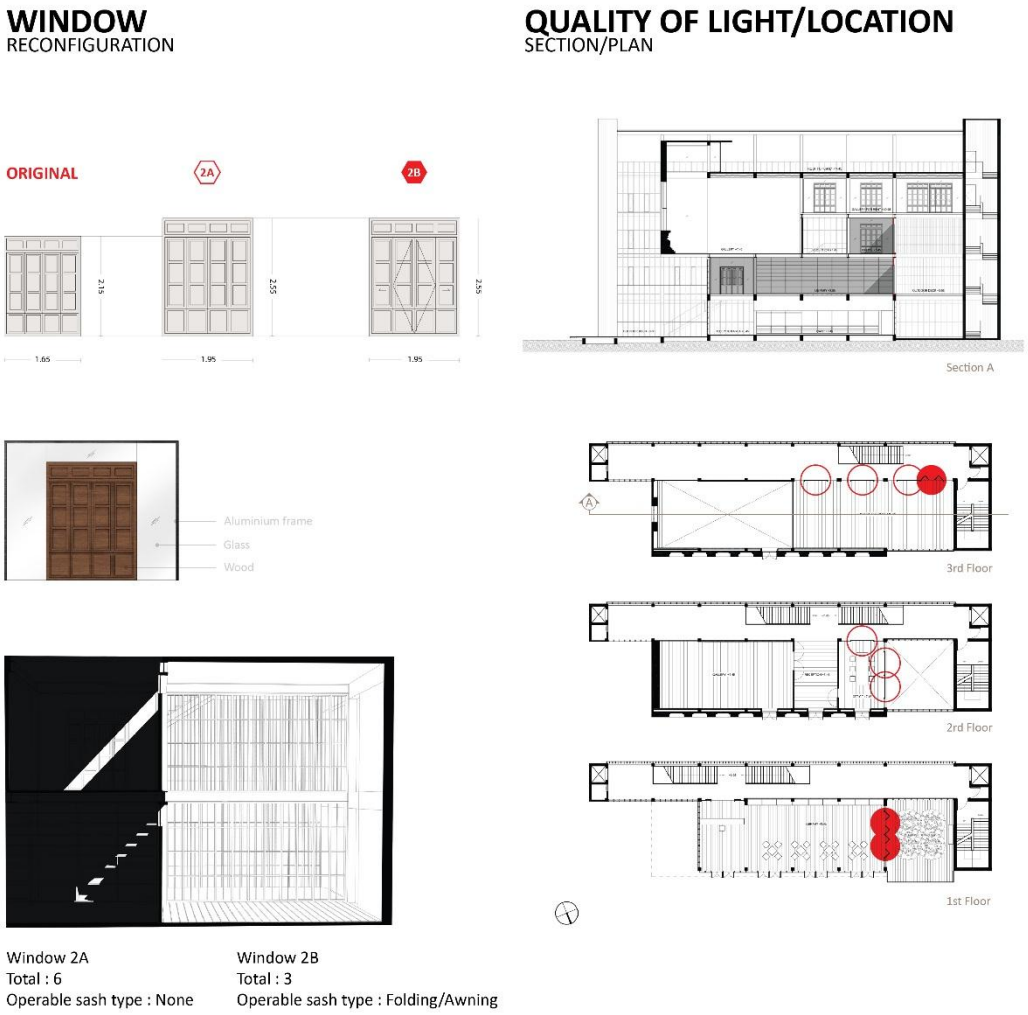

Figure 90 design implication of the new window 2A, 2B

This window is a replicas of window 6.3 of Prince Naris' house/studio. The replicas are expanded to fit the new use, as both windows and doors, while keeping the same proportion. Material was changed from wooden multi-operable sash with transparent glass to be wooden sash. This new design wooden-sash window is set within a glass wall panel with aluminum frame at the rim-edge of the ground and ceiling. However, some are openable some are not. It is somehow the summarise idea of window repicas and windows inspired by Prince Naris' window design.

Each windows, openable or not, create different kind of light cast to the space.

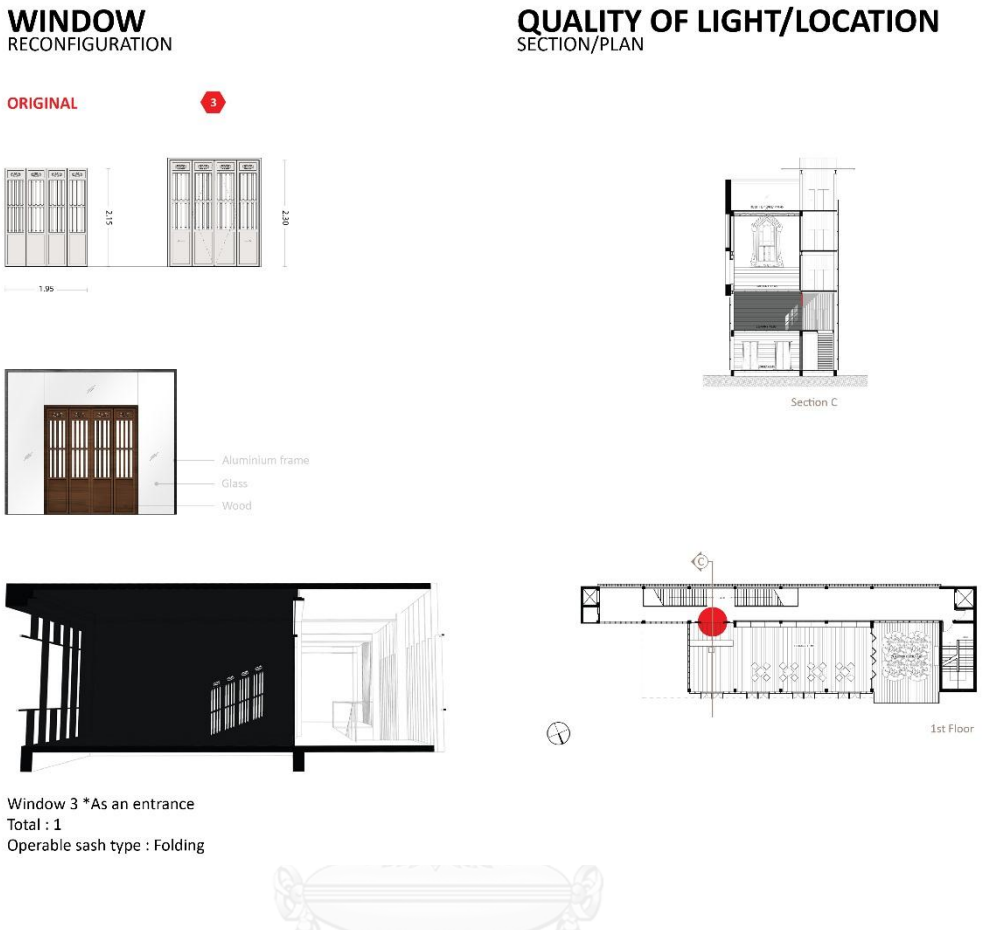

Figure 91 design implication of the new window 3

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This window is a replicas of window 11 of Prince Naris' house/studio. The replicas are expanded to fit the new use, as an entrance door of the library, while keeping the same proportion. This is the most remain window here, except the material of its wall panel. It casts shades and shadow pattern on the wall nearby during the day. However, as the apertures of the entrance doors of the house, this allow visitors' visual accessibility through the gap between wood pieces. However, comparing about position of it with the original, the current position is set on the secondary panel from the exterior, the pattern of cast is mixed with the outer panel.

This window is a replicas of window 5 of Prince Naris' house/studio. The replicas are expanded to fit the new use, as an entrance door of the entrance, while keeping the same proportion. One is real, one is just a replica of window. Light cast from the openable one is much affect the space but it shows the not real opening at the front entrance of Prince Naris Learning Center. The proposition is to impress the visitors with the glimpse of the whole thesis.

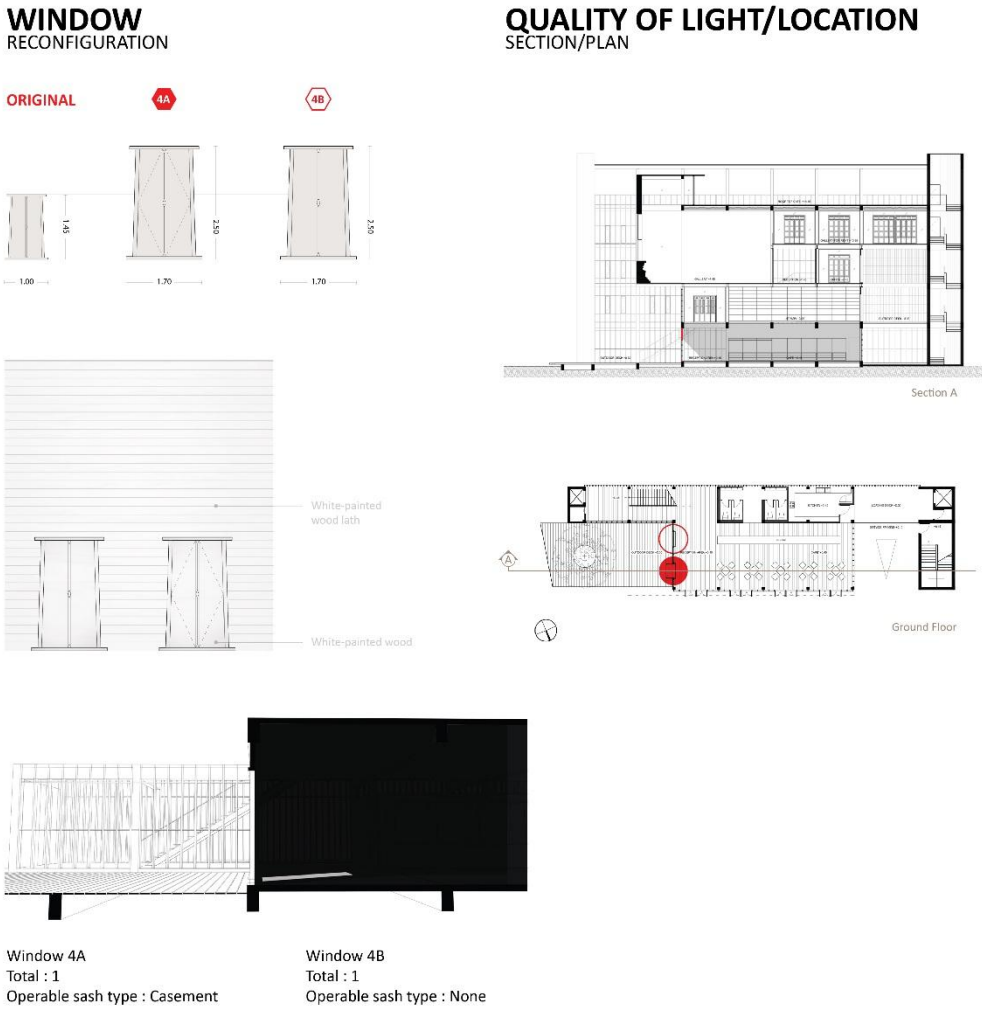

Figure 92 design implication of the new window 4A, 4B

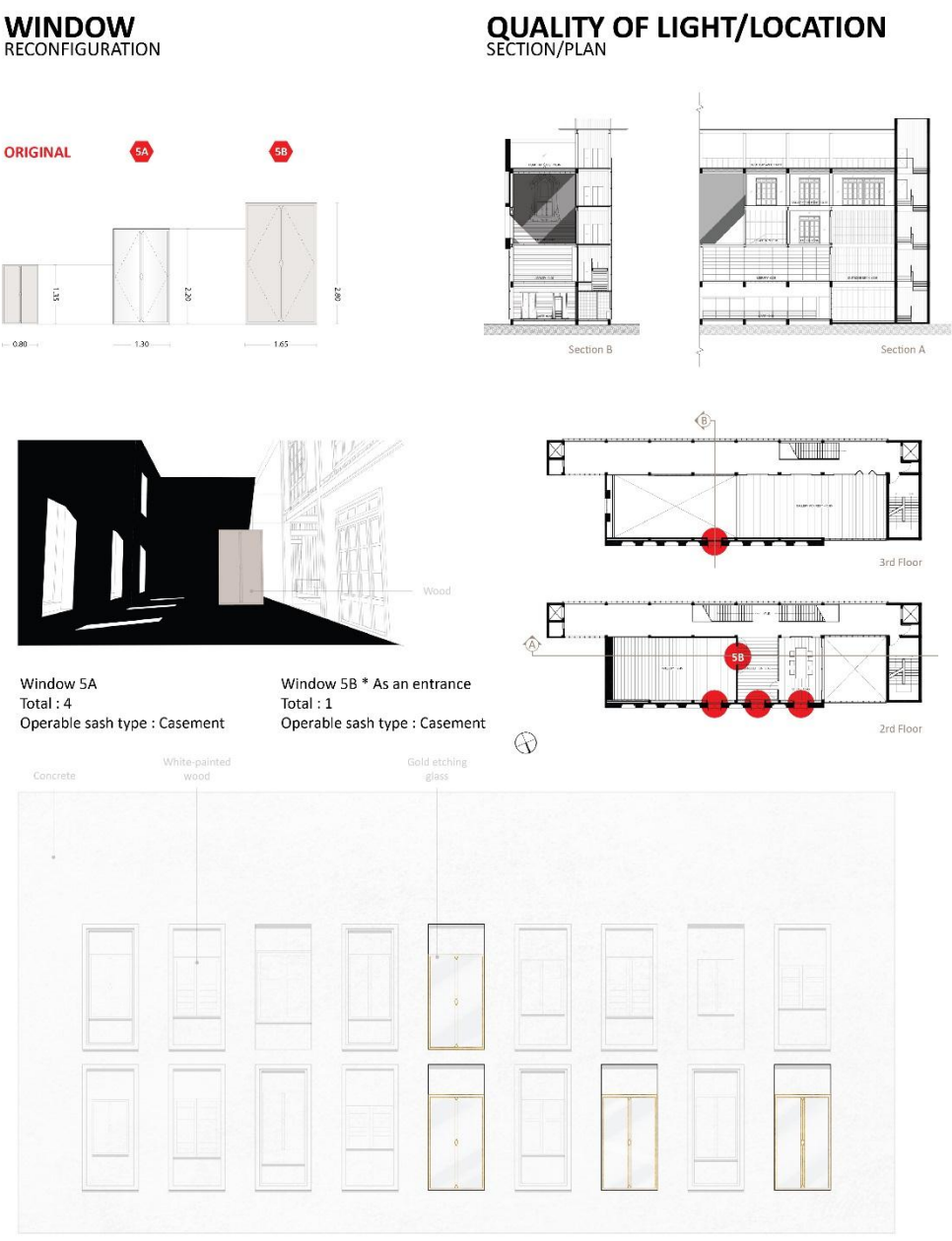

Figure 93 design implication of the new window 5A, 5B

Figure 94 design implication of the new window 6, 7, 8, 9, 10 and 11

The Northern façade of Prince Naris Learning Center is the recessed brick walls that composed of wooden windows found at Prince Naris' house/studio. From the exterior, the recessed walls frame the shadows and display the windows as the artifacts. From the interior, there are 4 windows (out of 18 windows) that can be opened to serve the functions of different rooms such as galleries, reception and office. These opaque walls are juxtaposed by aluminum frames and transparent glass.

Chapter 5 Conclusion

The study started from an interest of Prince Naris' window design methodology as non-traditional practices. It conveys the reconfiguration of Prince Naris' windows designed, especially from his house at Baan Plainern through contemporary architecture. However, there are several design constraints to be concerned in order to supplement the objective of the thesis question: How to create connection between Baan Plainern and general public through architecture, especially by the reconfiguration of Prince Naris' window design methodology?

The thesis question leads out the investigation on Prince Naris' window design methodology, then was called as *Pleang*. In which the definition of *Pleang* is being atypical without being unfamiliar to viewers' experience. It is needed to be something that gives small change but create big impact to the space. In order to create an architectural design that compatible with this thought, the author have chosen 1 significant window from the research on Prince Naris' window design at the ordination hall of Benjamabophit temple. Also, the author had chosen 10 windows from the documentation of Prince Naris' house/studio at Baan Plainern. The ideas of design on each windows are varied from a subtle change in scale, the switching of material in use, the change of size of window' pedestal and even with the idea of flipping interior side of a window out (The new window 1, Page 102). The design shows an unconventional practice up on top of the practice of Prince Naris' window design to create light and provide shade to the space. Also the design carried out the idea of making a clear contrast between the old and the new by the method of windows reconfiguration.

Though, the design constraints are varied, such as how to publicise the place among dry contextual amenities, the choices of structural system to match the existing construction, the material of use to define the originality of windows and the reconfiguration, how to refer the finding of the study toward the architectural design. However, the main objective is design a building that catches light, cast shades and shadows. Have hierarchy between heaviness/lightness. Through the proposition of this

design, the building provides new spatial experiences to viewers and visitors. So as the new spectacle openness of Baan Plainern toward public eyes. The building filter out both visual and physical accessibilities throughout each programme approaching. Moreover, the design provides more transparency in almost every directions of perspective toward it.

All in all, the study of Prince Naris' window design methodology is only a part that had been selected to do further research and execute as an architectural design, Prince Naris Learning Center. However, for the further study as 'Prince Naris' design methodology', which is bigger topic with wide-range of fields of study, the author believes there might be other scope to study that await for the further investigation.

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