



Seoul contemporary shophouse analysis in urban growth

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Abstract— *Seoul, the capital of South Korea, is a global city in Asia with valuable cultural heritages and fascinating architectures. The perfect combination between the traditional and modern cultures created the obvious identity of Korean contemporary culture. The many case studies of Seoul architectures and urban designs were the good examples of city developments especially the livable shopping districts where were promoted to be the Seoul walkable city. Therefore, the research objectives were the Seoul contemporary shophouse analysis for studying the urban growth pattern in the capital city including the design guideline of contemporary shophouse in Thailand for the livable shopping districts and the study of Seoul universal design in the shopping districts for Thai urban development of the walkable city. To the research methods, they were the studies of Seoul architectural history and shophouse building regulations in the shopping centers for finding out the design concept of Seoul contemporary shophouse and the Thai urban design guideline of the walkable city. Moreover, this research was expected to present the international ideas of contemporary shopping districts for urban developments in the worldwide cities following the sustainable development goals which were established by the 2030 agenda for sustainable development of United Nations. According that a sustainable development goal of sustainable cities and communities was how to make cities and human settlements inclusive, safe, resilient and sustainable as a well-known framework in the urban developments globally.*

Index Terms— *Seoul contemporary architecture, Shophouse, Shopping district, Sustainable city*

I. INTRODUCTION



Fig.1 The location of Seoul, South Korea

Seoul is the capital of South Korea on the Korean peninsula in the center of Northeast Asia where is between China and Japan. Its coordinates are 37.34° N and 126.59° E near the Yellow Sea. The main river of Seoul, Hangang River,

horizontally flows across the city, dividing it into two sections lying north and south of the river. There are 25 autonomous districts and 423 administrative “dong” units in Seoul. The city covers 0.28 % of the entire peninsula or 0.61 % of South Korea, and spans an area of 30.30 km north to south and 34.78 km west to east. Seoul has a humid continental climate influenced by the monsoons. It has four distinct seasons which are spring, summer, fall and winter seasons. Summers are hot and humid, with the East Asian monsoon taking place from June until September. August, the hottest month, has average high and low temperatures of 32.6 and 23.4 °C (91 and 74 °F). Winters are usually cold to freezing with average January high and low temperatures of 1.5 and -5.9 °C (34.7 and 21.4 °F) [1].

Seoul is a polycentric city which is a networked and integrated approach to achieve a more balanced metropolitan system [2]. The transportation hubs systematically expanded around the city and the surrounding areas became to the nodes of communities with mixed-use polycentric settlement structures. The advantages of polycentric city made Seoul more successful, more equitable and more sustainable economically. Seoul is also a contemporary city with the valuable cultural heritages. The land use zoning was organized by traditional concentration. The area that was the old capital in the Joseon dynasty and mostly comprised Jongno District and Jung District constituted the historical and political centers of the city. Seoul was made up of three main business districts. The first main district, the central

business district at the historical area, was the Gwanghwamun district (CBDG). The second main district, the city's financial capital, was the Yeouido Business District (YBD). The last main district, the city's economic capital, was the Gangnam Business District (GBD) [3].

In city overview about population, Seoul had a population of 9,725,417 people in 2022. This amount declined from the last few years continuously [1]. It seemed that Seoul confronted a problem of the population declination. The main factors were the moving out of the South Korean capital in search of a better quality of life especially young people, the low fertility rate and the high cost of housing. Thus, people moved out of Seoul to suburbs and smaller cities for families with children [4]. These effected the country economic development in the future. Because the city transformed to the aging society and the shrinking city which were the urban decline's phenomena with complex causes from external migration, internal migration and population decline. In preparation for coping with the rapidly aging trend, The Seoul Metropolitan Government established the 2020 Aging Society Master Plan, which set the realization of an age-friendly city as its main policy goal, under the vision of a "healthy and lively city of citizens over age 100" [5]. Due to Seoul development framework, this was a good case study for the aging societies, the walkable cities and the livable shopping districts in the architecture designs and urban plannings.



Fig.2 Hangang River with Seoul cityscape



Fig.3 Gwanghwamun Gate at the Seoul historical area

II. RESEARCH OBJECTIVES

1. The Seoul contemporary shophouse analysis for studying the urban growth pattern in the capital city.
2. The design guideline of contemporary shophouse in Thailand for the livable shopping districts.
3. The study of Seoul universal design in the shopping districts for Thai urban development of the walkable city.

III. LITERATURE REVIEWS

The research literature reviews were following;

Shophouse – a building type found in Southeast Asia that was a shop that opened onto the street and was used as the owner's home [6].

Shophouse in the international context of the building regulation referred to "Terraced building" and "Commercial building."

Terraced building - a building of two units or more constructed in a row and each unit was separated by a wall and a major part of the building constructed with fire-resistant materials [7].

Commercial building - a building used for commercial purpose, commercial service, or industry using machine with production capacity of 5 horse powers or less, and includes any other building constructed 20.00 meters or less in distance from a road or public way which may be used for commercial purpose [7].

Contemporary - belonging to the present time and following modern ideas in style or design [6].

Architecture - the design or style of a building or buildings [6].

Contemporary architecture was the architecture of the 21st century following modern ideas in design.

Urban growth was an increase in the absolute size of an urban population. This could be at the level of an individual settlement or a collection of settlements [8].

Therefore, the Seoul urban growth referred to the activities that made intensive use of land for the location of buildings in Seoul which focused on high density architecture areas with high population density such as commercial areas, shopping centers, central business districts or high-density residential areas.

IV. RESEARCH METHODS

1. The studies of Seoul architectural history and building regulations especially shophouses in the shopping centers.
2. The data analysis and synthesis for the research conclusion about the design concept of Seoul contemporary shophouse and the Thai urban design guideline of the walkable city.
3. Research public relation.

V. RESEARCH RESULTS

In Seoul contemporary shophouse analysis, it explained to history of modern architecture in Korea, building regulations, site, user, design and adaptation of shophouses and universal design in Seoul shopping district.

Seoul contemporary shophouse analysis

1. History of Modern architecture in Korea

Korea had a long history and changed the country administrations in several times. A significant era shifted the country to westernization was the modern era. Modernity influenced Korean cultures since the early 20th century by the Japanese colonialism around 1910-1945. According that Japan opened the modernization into the country from European colonialism. Japan transformed the country to modern civilization for being equivalent to westernization. Many countries in Asia received the modernity through Japanese empire the same as Korea. Hence, the Korean traditional lifestyles were adapted to modern lifestyles including the architectures obviously appeared in the capital and the big cities.



Fig.4 Namdaemun market



Fig.5 The walking street at Namdaemun market

In the past, the Korean traditional architectures had the identities of Chinese architectures from Buddhism by way of Northern China since 372 and then Confucianism from China was popular in Korea as well. The constructions of Korean traditional architectures were built on the stone foundations with wooden posts, the curved roof covered with tiles, walls were made of adobe, the building materials and structures were made of local natural resources.

In the modern era, the traditional residential architectures, “Hanok” in Korean, were changed to modern residential architectures with the simplified traditional architectural details, the reinforced concrete, glass and steel structures, which were the modern construction’s technologies. The other building types and shophouses were also built in the modern concrete forms and expanded to verticality because of the increased urban densities.

In post-war period, after World War II (1945) and Korean War (1950–1953), many Korean cities were destroyed dramatically. People had no residences. These brought the advantages of modern architecture to the country rehabilitations. They were fast construction, many quantitative productions, many vertical stories, simple design and industrial material usage. From that time until now, the modern architectures were still classic to build in Seoul skyline. Moreover, the new architectural technologies were added to the buildings for better livings and building energy efficiencies [9].

2. Building regulation

Seoul clearly had the land use planning, the coverable building laws and regulations of the whole building types,

the sustainable building legislation and urban design for all. In the urban planning, there were The National Land Planning and Utilization Act to provide the legal basis of the Korean spatial planning system and The Building Act that was the main source of building code regulation. In particular, there were The Industrial Sites and Development Act for industrial use in order to foster economic development and The Urban Traffic Readjustment Promotion Act that promoted the modernization of transport infrastructure and the efficient management of urban transport systems.

To the building regulations of Seoul contemporary shophouses, Seoul Metropolitan government announced The Partial Amendment No. 8424, April 28, 2022 to rule all building types. Therefore, the interesting summary of shophouse regulations from The Partial Amendment No. 8424 was following;

Chapter IV Landscaping in building sites, etc.

Article 24 (Landscaping in Building Sites)

If the total floor area of a building was less than 1,000 square meters: Not less than five percent of the area of the site.

Article 25 (Tree Planting and other Landscaping Standards)

1) The tree-planting area should exceed 60/100 of the landscaping area.

2) The tree planting for landscaping in the artificial ground excepted for rooftop landscaping should be 1.2 or more meters deep.

Chapter V Buildings in areas and districts

Article 31 (Areas Where Construction of Party Walls Permissible)

1) A commercial zone limited to a building used by the public or a multi-family housing in which a fire sprinkler system or other automatic fire extinguishing system similar thereto was installed.

2) A residential zone limited to where building owners and land owners agreed to construct party walls.

3) An area designated and publicly announced by the mayor where many Hanoks were densely situated.

Article 32 (Standards for Construction of Buildings Joined by Outer Walls)

The number of floors of buildings: The number of floors of the part in which outer walls faced each other should not be more than five.

Article 33 (Restrictions on Building Height by Block Surrounded by Roads)

1) The maximum height of a residential building in a Class I exclusive residential area should not exceed two floors and eight meters and the maximum height of a non-residential building should not exceed two floors and eleven meters.

2) Buildings whose foot of the first floor was more than 0.5 meters above the ground and whose height given by adding 8 meters to such more than 0.5 meters did not exceed 12 meters.

3) Buildings with the inclination of roof of not less than 3 to 10, which were 12 or less meters in height.

Article 35 (Restrictions on Building Height for Securing Sunshine)

Two or more buildings faced each other on one and the same building site, the distances between sections of such buildings should not be less than the following distances;

1) The distance should be at least 0.8 times the height of each section of each building in the right angle from the wall, etc. containing windows to admit light.

2) Among buildings facing each other, where the height of a building in the direction of south was lower than that of another building facing each another and the main entrance of the building faced south, the distance should be at least 0.6 times the height of each section of the higher building, and should be at least 0.8 times the height of each section of the lower building.

Chapter V-2 Special building zone, etc.

Article 35-2 (Roads for Designation of Special Block Surrounded by Roads)

A pedestrian-only road which required the improvement of urban aesthetics [10].

From Seoul building regulations, they showed that the city government gave the importance to environmental conservation and urban aesthetic. Normally, the shophouse height did not exceed 12 meters and the number of floors of shophouse should not be more than five in the shopping centers except the commercial buildings where their heights exceeded 12 meters. The distance of the buildings faced each other on one and the same building site should be at least 0.8 times the height of each building for securing sunshine, protecting fire and keeping the cityscape in order. The green areas of the buildings and the urban landscapes were concerned in the architectural designs. Apart from the building regulations, Seoul planned to be The Universal Design City for everyone. Thus, the city announced several acts on the guarantees of convenience improvement of the elderly, the disability and the pregnant woman, etc. To the details of universal design, the city had The Seoul Universal Design Guidelines used in the architectural and urban designs publicly.

3. Site

The orientation of Seoul architectures presented the wind paths and the sun path in site analysis. The wind paths were from west, the Siberian high and the winter monsoon directions, and from north-east, the summer monsoon directions. The sun path was from east to west in the southern direction.

Seoul had many interesting shopping districts. It was known for being a one-stop shopping center especially in the areas of streetwear and beauty products such as Myeongdong, Hongdae, Dongdaemun, Gangnam, Insa-dong and Ikseon-dong. Each district had own architectural identities for tourist attractions. Some shopping districts were in the historical areas, where preserved the Korean traditional architectures, promoted the shophouses with Korean traditional architectural characters. Or some shopping districts were in the modern contexts, where imaged the international styles, promoted the shophouses with modern architectural characters.



Fig.6 The aerial view of Myeongdong district [11]

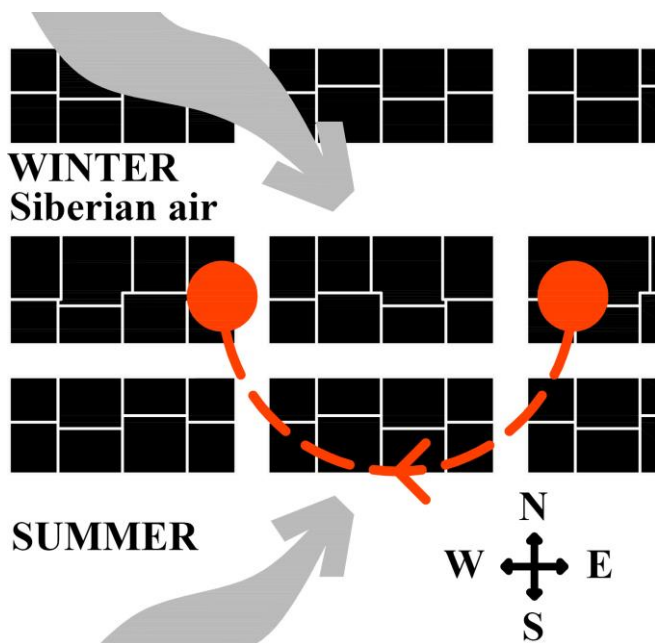


Fig.7 The architectural orientation of Seoul

To the typical case studies of Seoul contemporary shophouses, the shophouses in Myeongdong district were modern and founded in the international shopping centers generally. Furthermore, this area closed to Namdaemun Market that was a traditional market with a history of over 600 years. The market located next to Namdaemun, “The Great South Gate,” which was the main southern gate to the old city. It was the oldest and largest market in Korea [12]. It made the markets in the neighborhood perfected to a one-stop shopping center as the livable walking streets of Seoul.

4. User

4.1. Ownership

The shophouses were the private properties with building ownerships. According to high cost of real estate, population decline and slowing economy in Seoul, tenancy was popular to entrepreneurs for opening the shops of their businesses. In the high-density commercial areas, some commercial buildings were designed for the vertical shops with separate shop entrances like the terraced buildings. They opened to the tenants of each unit per floor. However, some shophouses in the old markets such as Namdaemun Market

kept the characters of the traditional shophouses for working on the ground floors and living on the upper floors together.

4.2. Visitor

The shops opened to everyone. Local people and the tourists were welcome. Particularly in the tourist attractions, many customers were the foreigners. According that the shopping centers needed to provide universal designs in the urban landscapes. Incidentally, the terraced buildings without the elevators were not comfortable to the elderlies, the disabilities and the pregnant women, etc. for walking up stairs. The upper shops were lacking of these people.



Fig.8 Myeongdong night market

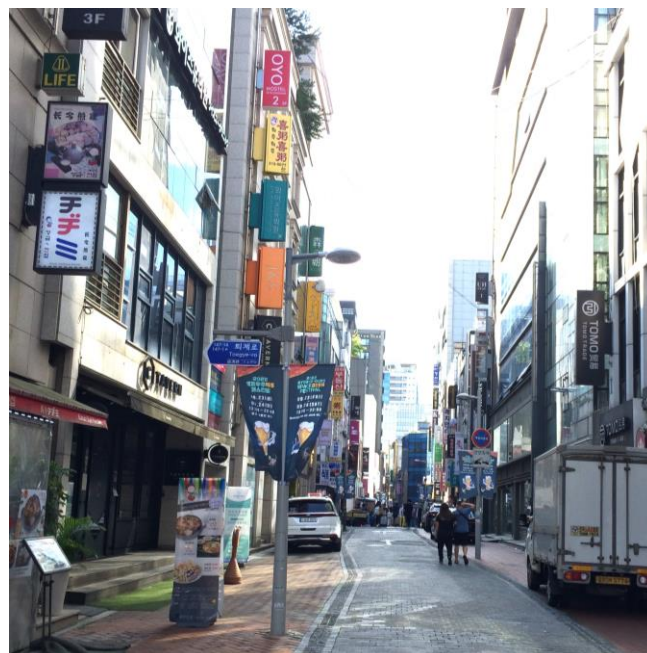


Fig.9 Myeongdong shopping district

5. Design and feature

5.1. Function

(a) 2-storey shophouse

The ground floor was the area of shop, office or working space. The 2nd floor was the living area. Some shophouses had the rooftop areas for rests, storages and fire exits.

(b) Multi-storey shophouse

The ground floor was the area of shop, office or working space. The upper floors were the living areas with the rooftop space. Some buildings only opened for the stores without the residential areas.

(c) Multi-storey terraced building with separate entrances

Each floor was the commercial area for the shop or the restaurant with separate entrance from the other floors of the building. The circulation to the upper floors was beside the storefront and straight to the rooftop. Some buildings included the residential units as well.

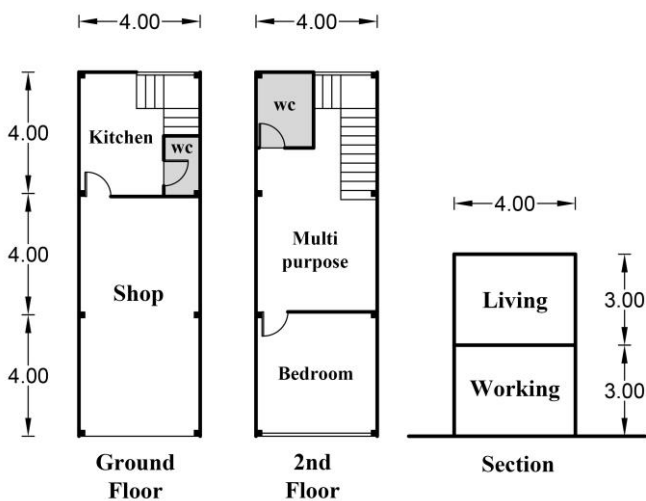


Fig.10 Shophouse type (a) 2-storey shophouse

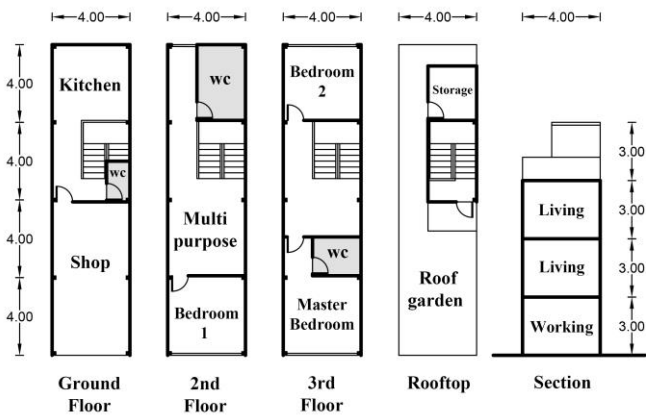


Fig.11 Shophouse type (b) Multi-storey shophouse

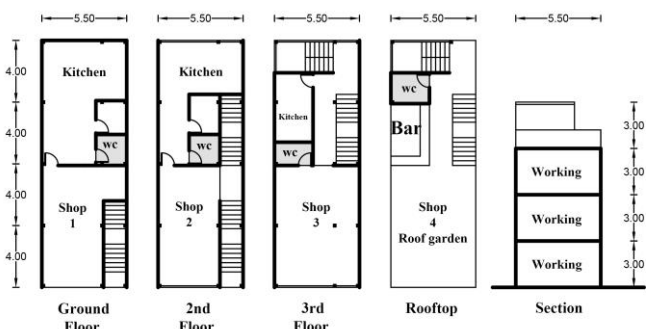


Fig.12 Shophouse type (c) Multi-storey terraced building with separate entrances



Fig.13 Media façade at Myeongdong night market



Fig.14 Myeongdong shopping district at night

The functional area per floor was about 48 square meters, 4 meters wide and 12 meters long, to 64 square meters, 4 meters wide and 16 meters long, from modern construction technology of shophouse. And the green area was almost on the rooftop. Apart from these, the basement of shophouse was difficult to maintenance from flooding. It needed the

special design for flooding and humidity protections. Thus, this building type rarely had the basement under the ground floor.

In the digital age, the internet technologies considerably involved with the urban lifestyles. The comfortable internet accessibility serviced everyone around the city. Free WiFi for internet connection and the fascinating applications were the contemporary marketing promotions of shops, restaurants and coffee shops. These supported more flexible modern lifestyles currently.

5.2. Structure

Typically, the shophouse structure was the post and lintel system with reinforced concrete that was modern construction technology. It was developed to the rigid frame structure for constructing the multi-storey terraced buildings. The advantages of the rigid frame structure were good strength, fast construction and less damage against natural disasters like earthquake and wind load. The post span of the building, the distance between two posts, was about 4 meters. It suited to the reinforced concrete structure of the rigid frame and modular unit of rooms.

5.3. Material

Modern materials of contemporary architectures were concrete, aluminium, steel, glass, faux wood and fiber cement. The specifications of the building materials were critically concerned to the fire resistance qualification by the building regulation and the environmental conservation by the sustainable building legislation.

5.4. Façade design

In the reason of Korean climate, the building façades were designed to be flexible in use of each season. The windows could open in summer for ventilations and close in winter for cold weather protections. The façade materials should have the qualifications of the building energy efficiency sustainably. The exterior façades had to be in the setbacks of the building regulation including the advertising signs, the shop signs and the media façades. To contemporary style in the digital age, many exterior façades were designed to be the media façades which were LED dynamic lighting technologies such as the dynamic palettes for texts, graphics, video animations, news and advertisements, etc. They made the shopping districts more colorful for attention at night by architecture lightings.

6. Adaptation

Due to the population decline and Covid-19 crisis, they seriously affected the country economy. Many businesses were closed and moved out of the buildings. There were evidently many empty shops in the Seoul shopping districts. Therefore, the city economic boost by the rehabilitation of the shopping district was a strategy of the country economic resilience. The building renovation with new design was necessary to revive the shophouses and vitally rehabilitated the shopping districts again for attracting more people to visit and live in the communities. The new building innovations were invented and used in the building resilience such as fire, earthquake and flooding protections, façade design, energy efficiency, or Covid-19 pandemic prevention, etc. They developed the modern construction technologies to move forward in the future.

7. Universal design in Seoul shopping district

According that The Seoul Metropolitan Government established the 2020 Aging Society Master Plan and The Universal Design City for everyone. The city government seriously prepared the public spaces with universal designs by using The Seoul Universal Design Guidelines [13] and promoted them in the private sectors. They were mostly found in the tourist attractions and the transportation hubs. For the example of universal designs in Myeongdong shophouses and urban design were following;

7.1. Architecture

Because of the limited shophouse areas by the city blocks, many shops and restaurants in the upper floors could not provide the elevators for easy accessibilities, many shophouses had no the disabled toilets, the international and braille signs except the new terraced buildings or the large shophouses that could add universal designs into the buildings.

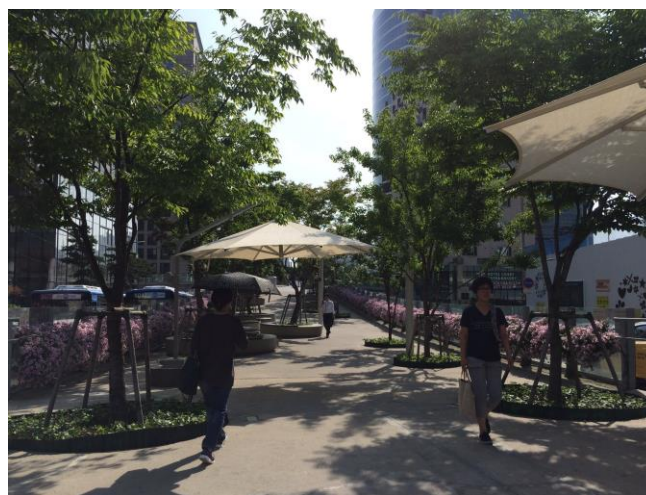


Fig.15 Seoulo 7017, Skypark at the city center of Seoul



Fig.16 Seoul skypark for pedestrians



Fig.17 Tree lined streets in Seoul

7.2. Urban design

The Seoul Metropolitan Government strongly performed the visions and the policies in the urban developments for everyone. In the shopping centers like Myeongdong district, they were the walking streets for saving people from the road accidents with the disabled designs such as the public disabled toilets, the ramps, the elevators, the pedestrian crossings, the pedestrian traffic lights, the international signs, the braille blocks and the braille signs for blinds. In addition, the tourist polices were strictly on patrol around the city centers. They made the people feel safe while staying in the communities. Nevertheless, some outer city center areas had not enough the disabled designs.

VI. DISCUSSIONS

Thailand started to the aging societies and confronted the economic crisis the same as Korea and the other Asian countries. The city developments for everyone were the main issues to relieve the city economic problems. The city recovery to attract the tourists and people to live in the cities was an economic booster in tourism. Making the livable shopping districts for the walkable cities were the solutions of urban declines now. In summary from Seoul case study, the design guideline of contemporary shophouse for the walkable city in Thailand was following;

1. Site historical preservation

Bringing the site history used in the architectural design for creating the local architectural identity to the building.

2. The consideration of the building regulations

Designing the shophouses by considering the building regulations made the city organized and safe for everyone.

3. Green architecture

Using the green architectural concepts in the shophouse designs were the green construction, the passive architecture design, the building energy efficiency, the green space design, the local material use, the building material selections with fire resistance, heat protection, environmental conservation and recycling.

4. Universal design

The building facilities with universal designs were the elevator, the handrail, the ramp, the disabled toilet, the international and braille signs.

5. Sense of place

The experience of a person in a particular setting where the district presented a sense of place uniquely. The shophouse design by concerning the context promoted a sense of place of unique shopping district in tourism.

6. The livable shopping district

The cityscape was beautiful, vital, safe, unique by shophouses and walkable with the universal design for all. The shopping district was a one-stop shopping center, proximity to transportation hub, mix of uses, well defined public spaces, active ground with retail shops and sidewalk cafes, tree lined streets, reduced and hidden parking.

7. The walkable city

It was the sustainable development in many countries by creating more areas for pedestrians and green environments in the city. Local people were healthy by walking and cycling in daily lives. The livable shopping districts promoted the city to be the walkable city for everyone as well.

8. The sustainable development goals (SDGs)

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015. There were the 17 SDGs, which were an urgent call for action by all countries. Therefore, the SDGs of this research were the sustainable cities and human settlements by making cities and human settlements inclusive, safe, resilient and sustainable [14].



Fig.18 The wide pavement for pedestrians



Fig.19 The plaza at Hongdae walking street



Fig.20 The Seoul Metropolitan Subway at the shopping street

CONCLUSION

In conclusion, the architectural design values for the sustainable developments of the shopping districts were following;

- Social design value

The good public spaces in the cities helped the urban societies improved resiliently. The people engaged in their communities with the senses of belongings. These made the communities safe and livable. The visitors and the tourists also felt safe when they came to the shopping districts.

- Environmental design value

The promotion of green architecture for the shophouses and the public spaces helped to the environmental conservations. Furthermore, the promotions of the waste reductions such as reducing, reusing, recycling and upcycling were needed in the urban lifestyles nowadays. These brought to the good sanitations for the people in the communities.

- Traditional design value

The historical value was important to local cultural preservation among the stream of modernization. The district development with the strong sense of place presented

the land history which was enchanting people to visit the district and the local cultural preservation for the new generation. This was a good strategy for promoting the local tourism and the contemporary culture in the present.

- Gender-based design value

In the sustainable development, the equality was a main issue in this modern world. The gender-based design value was added to the architectural designs. The universal design was a design which based the gender equality in our societies. Therefore, the architectures and the public spaces with the universal designs encouraged the good gender cultures in those places.

- The economic design value

The shopping centers were the economic nodes of the cities. They were the significant parts in the economic stimuluses from local levels to international levels. Moreover, they were the images of the cities which advantaged the city tourisms as the tourist attractions. These brought the main incomes from tourisms to countries and local people in the communities.

- The novel design value

The new architectural innovations changed the societies in the better ways. They built the smart cities for the smart livings of people in these contemporary societies. People could be resilient themselves in any situations by applying the new technologies with their lifestyles following the concept of transforming our world through the sustainable development goals.

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