



Urban Design Legibility in Kuala Kangsar Royal Town in Malaysia

Muhammad Syazwan KhairulAnuar¹, Ahmad Afiq Md Noor¹, Ahmad Sanusi Hassan^{1*},
Yasser Arab¹, Khiensak Seangklieng², Boonsap Witchayangkoon³

¹ School of Housing, Building and Planning, Universiti Sains Malaysia, MALAYSIA.

² Faculty of Architecture and Planning, Thammasat University, THAILAND.

³ Department of Civil Engineering, Thammasat School of Engineering, Thammasat University, THAILAND.

*Corresponding Author (Tel: +60-4-6532844, Email: sanusi.usm@gmail.com).

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Abstract

This paper analyses the town image and mental mapping of this study discusses and identifies the urban design elements in the colonial town in Kuala Kangsar, Perak also known as the Royal town. The study area has its attraction to the urban riverfront and old urban architecture elements. The study applies a qualitative method in analyzing urban design elements of Royal Town. The data was taken from a fieldwork survey conducted in the area. Some data obtained directly from the location include interviews with the resident and businesses. The study finds that this layout design has a different road hierarchy, where the primary road will lead to a secondary road where all is located. This secondary road becomes the main route leading to the market and where the house is located and connecting another part of the layout. This study shows that the area has a Royal Town design which has a more colonial heritage style and it is well designed as part of the town. The Arena Square jetty becomes the node to that area. The path formed from this layout has two circular roads, which one leads to the riverside and another leads to the town where both exit to the main road facing the river. The landmark in this area can become the most dominant element while the path shows as substantial circular road and the study shows that this area has potential in nodes, edges, and districts to become a thriving Royal Town.

Disciplinary: Urban and Regional Planning, Architecture and Sustainable Urban & Real Estate Development, Malaysia History.

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1 Introduction

This paper identifies the quality of urban design elements in the small town in Kuala Kangsar, Perak Darul Ridzuan, Malaysia. Kuala Kangsar is the most famous attraction for tourists in Perak. There are five elements of urban design that are incorporated in creating the layout plan of the Kuala Kangsar town which are, nodes, paths, districts, edges, and landmarks. Every element of a particular function helps people to have different experiences in the area. The importance of these urban design elements for the old town. The usage of figure data was taken from a fieldwork survey conducted in the area. Some data obtained directly from the location include interviews with the residents. Kuala Kangsar Royal Town is chosen as the case study due to its unique environment with a colonial settlement pattern with urban hierarchy (Shamsuddin, 2011; Hassan & Yahaya, 2012).

This case study will analyze the urban design elements namely path, edge, node, district, and landmark (Lynch, 1960). The urban elements play a crucial role in designing a layout of a city where it influences the movement in a city (Pauzi, et al., 2018). For a good layout plan will help the user to be more direct and precise when moving toward a destination (Yasin et al., 2017).

2 Literature Review

2.1 Gridiron Urban Layout

The study area covers the old town of Kuala Kangsar. The most notable feature is the layout of the city area. The development of Malay cities started from the villages or settlements, but the geographical location of the rivers made them vital for transport routes and the availability of water supplies, including expanded port and trade activities; thereby growing the role of such riverine towns as the city centre (Kassim, 2018). Urban components, such as buildings and spaces, were designed as if according to the principles of town planning. Almost all of these estuary settlements were built in the 17th and 18th centuries, and the effects of town planning by colonialists may have influenced the architecture of the building site. Islamic roots have also been discernible, for example, in East Coast states such as Kelantan and Terengganu, which have embraced Islam since the 13th century. This Islamic presence can be seen in the building of mosques as significant landmarks in the city centre. Mosques were used not only for solat (prayers) but also for Islamic education classes and institutional discussions (Harun & Abdul Jalil, 2014).

2.2 Colonial Urban Design

Infrastructure growth became more rapid in the early 19th century when road construction was undertaken to connect industrial centres with mining areas, especially along the western coast of the Peninsula (Harun and Jalil, 2014). This current scenario was a factor in promoting the urban growth of these towns. Towns and cities were vibrant with magnificent buildings during the British colonial period. Key structures, such as government offices, courthouses, mosques, schools, train stations, police stations, and commercial shops, were designed in colonial architectural styles.

2.3 Urban Design Elements

Lynch (1960) addresses urban design by examining an urban scale of the visual and physical form of a city. The theory consists of five elements of urban design which are the path, edge, district, node, and landmark. The urban design elements of this approach are to examine the effect of a city's urban design on its role, history, name or context (Larice & Macdonald, 2013)

2.4 Background of Case Study

The state of Perak was from a stream that flows down the Perak River from its summit in Ulu Belum to its coast in South Melaka. From ancient times, people were drawn to the privileges of the river and pursued it, looking for a good cliff to land. They were settlers who came to open up new places and interacted with the natives to become the people of the Perak state as they are today.

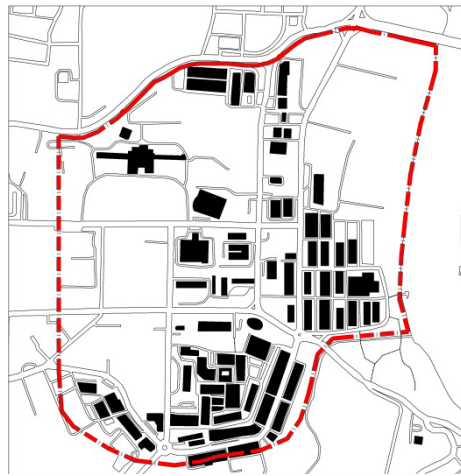


Figure 1: The study area layout plan of Kuala Kangsar (new town) in Perak, Malaysia. (Geolocation 4.772173117, 100.939136906).

Kuala Kangsar, a Royal Town located in the confluence of the River and the Perak River, is said to have derived its name from the Kangsar tree that grows on the banks of the Kangsar River, the tributary of Perak river. Another version said the name was derived from the settlers who rowing a boat up to a riverbank on the left bank of the Perak River. In their estimation, this river is in conjunction with, especially the low cliffs, the land is fertile and the scenery is beautiful. Happenstance according to their counts the river is one hundred and one less, or 'Kuala Kurang Sa' (Ismail et al., 2020). In reality, Kuala Kangsar is a very good spot indeed, not only suitable for landing but also good for placement, planting, business centre. One can proceed along the river on the mainland to the sight of Mount Pondok, a landmark that guides people on their way to Larut or from Larut Based on this privilege, we ascertain that Kuala Kangsar is older, inhabited by people for centuries, and its surrounding area (Kuala Kangsar Municipal Council, 2020).

Located 48 km from Ipoh, the royal city has tourism assets that are not owned by other states, thus making it exclusive to the people of Perak. It houses one of the most beautiful mosques in the country, the Ubudiah Mosque. The Ubudiah Mosque located on Chandan Hill is a symbol of pride and faith for Muslims in Perak. Kuala Kangsar also has old buildings filled with historical values of the development of Perak royal institutions such as the Sultan Azlan Shah Gallery, the Kuala Kangsar Royal Museum, and the area around the Perak River itself.

This study site (Figure 1) with an area of 185.33 acres is Kuala Kangsar New Town located in Kuala Kangsar. There are many public facilities.

3 Methodology

3.1 Urban Design Elements

To reconstruct and characterize the urban patterns of the traditional Malay and assess the current sustainable urban development standards, a process of reconstruction was undertaken from literature drawn from old planning reports, books, and research articles in journal papers accessible through an online database. Where the historical data will be assembled from old maps and photographs. Initially, two historical Colonial Malay town reigned by similar sultanate kingdom has been chosen as the area of study by using retracing and outlining current maps, visualizing from textual and documentation evidence. The image including a compilation of images and past photographs, lithographs, textual and historical pieces of evidence is uncovered and studied. Initially, to reconstruct the first layer of these morphologies, satellite maps were used and later using Computer-Aided Design (CAD) tools to locate public buildings and spaces. They were then modelled and detailed along with key ecological elements of the settlement and urban centre such as greenery, rivers, and key landscape elements. During the site exploration, the path will be analyzed by focusing on its dimensions, accessibility, and function/usage. Further details can be obtained by observing and interviewing residents and also tourists.

3.1.1 Paths

It refers to the following paths such as roads, pedestrian paths, connecting lanes, canals, and hedges. The route serves as the main, second, and circular route used by the locals to move in or out of one area to another.

3.1.2 Nodes

Based on the site exploration, focus area, or activity centre for the surrounding population and It is distinguished from a landmark based on its active function in an area. Where a landmark is a distinct visual object from each area and the node is a hub with different activity or function. For example, District Center, the intersection between area or road, and focal points.

3.1.3 Districts

Based on the site exploration, areas that have inner homogeneity are seen. The city consists of a neighbourhood in one place or area of one place area. The area is a great part of the city, such as the neighbourhood. It is known to have several common identification roles in an area.

3.1.4 Edges

Based on the site exploration, the boundary between the district is the edge. For example, beaches, railways, and walls. It is a linear break in continuity, a line that can divide between regions. Specifically, it can be categorized into 5 types: water (drainage), the side of the Fragitation (landscape), natural elements (mountains, hills, rivers), overhead edge, and high edges (case stairs).

3.1.5 Landmarks

Place of reference or visual features that are prominent in the city or region, but it cannot be entered in it. There are some great landmarks and can be seen in the distance and there are also some of the landmarks very small and can only be seen from close and covered, such as street clocks in the circle. Landmarks help people to identify an area or city. Landmarks, such as statues, high-rise, and the most.

4 Results of Analysis

4.1 Paths

Path, the most dominant element among five urban elements (Lynch, 1960). Since the site is in a British colonial old town, paths are the main elements that formed the gridiron planning pattern. There are three different types of a path on site which is arterial roads, connecting with collector roads and local roads. The paths are differentiated by the width, length, and density of usage. These roads are surrounded by shophouses with five-foot walkways; hence, no pedestrian pathway is provided.

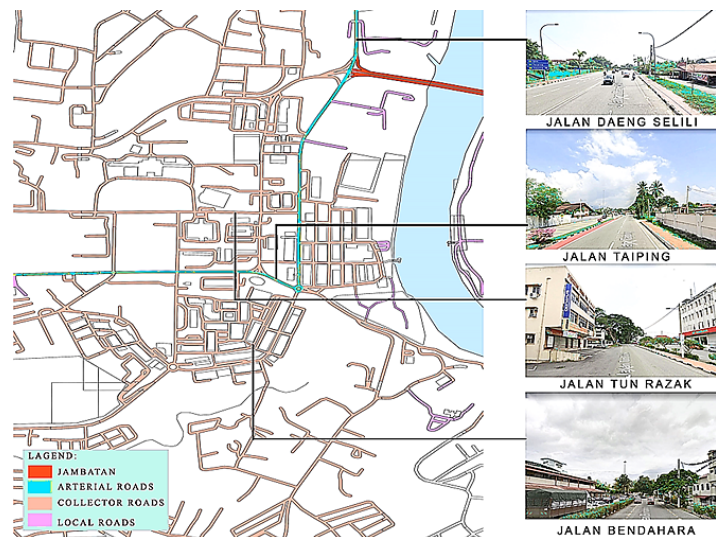


Figure 2: Paths of the Case Study: Royal Town Kuala Kangsar

Table 1: Details of paths in the study site.

Path	Width (m)	Percentage (%)
Jalan Taiping	14	4.0
Jalan Daeng Selili	10	2.0
Jalan Kangsar	10	2.0
Jalan Dato Sagor	10	2.0
Waterway (Arena Square jetty)	-	0

4.1.1 Arterial Roads

The primary arterial path is Jalan Taiping, over 1.57 km double ways with two-lane each side, 14 meters. It was known as the main road during the British colonial period. Jalan Taiping is the longest road in Kuala Kangsar Royal Town. The total length of Jalan Taiping in the boundary site is 1.57km. There are two secondary arterial roads. The first one is Jalan Daeng Selili with 10m in width connecting the Jambatan Sultan Abdul Jalil Shah. Another secondary arterial road is another 10m width a connected road of Jalan Kangsar, with a total length of 0.62 km. Both primary and

secondary arterials roads are double ways road with double lane. Besides, tertiary arterials roads are 10m width road with double ways road with double lane. Jalan Daeng Selili, one of the tertiary arterials roads that connect the town area from Jambatan Sultan Abdul Jalil Shah.

4.1.2 Collector Roads

There are a lot of collector roads in the colonial heritage town area. Primary collector roads are 14m width roads connection and leading to the arterial roads. During the colonial period, these roads are not only for circulation, but they also act as a fire breaker among the Royal Town. The secondary collector road is located next to the Jalan Taiping, Jalan Daeng Selili, and Jalan Kangsar. They are a 10-meter road with double lanes both vehicle ways. The road is rather smaller to control the vehicle and allow more walking in this area. The secondary collector road such as Jalan Tun Razak, Jalan Laksamana, Jalan Bendahara, Jalan Kolej Melayu, and Jalan Juragan Abd Shukur For tertiary collector roads, they are roads that collect traffic outside of the old town with a total of 8m width, from Jalan DaengSelili. The tertiary collector roads include Jalan Dato Sagor.

4.1.3 Local Roads

There are a few local roads on-site that connect newly developed residence areas, schools, and other buildings to the collector road and arterial roads. For example, is a local road at arena square Kuala Kangsar and Malays College Kuala Kangsar which is also a shortcut to penetrate the town from the arterial road or collected road. The road is only a one-way single road.

4.1.4 Back Lanes

Back lanes are found behind all old colonial shophouses. They are 4.5m width with the length of the shophouses.

Table 2: Paths in the study area.

Path	Number	Width (m)	Percentage
Arterial Roads	3	14-10	4.0
Collector Roads	7	10	2.1
Local Roads	7	8-6	1.8
End Roads or Cul-de-sacs	3	4-2	1.5
Cycling Lanes	0	0	0
Pedestrian Walks	3	2-1.5	1.1
Waterways Boats	1	-	0

4.2 Edges

Figure 3 shows the edges in the region under study. Firstly, major road edge – arterial road all the ways 4.9km from Lebuhraya Utara-Selatan to Jalan Taiping road edge due to huge boundary to cross from highway Utara-Selatan to Royal Town Kuala Kangsar at Jalan Taiping and that can find the Malay Collage Kuala Kangsar Colonial School from 1905 until now. For a minor road that has to excess from a major road and all the ways in the minor road, you can see the colonial historical building at Jalan Dato Sagor (Pejabat Perpaduan Daerah Kuala Kangsar, Ipoh Syariah Lower Court). For the Water edges all the ways from Jalan Istana you can see Perak River is many historical rivers.



Figure 3: Edges of the Case Study: Royal Town Kuala Kangsar

Table 3: Edges classified by type, in the case study site.

Edge	Number	Length (m)	Percentage
Major Road	2	4.9	2.62
Minor Road	4	1.4	1.28
Water Edges	1	2.0	1.1

4.3 Districts

The research zone can be divided into six major districts, see Figure 4, Residential, Public Amenities, Educational, Office, Green Area, and Water Area. For Educational Malay Collage Kuala Kangsar (1902–until now), Kolej Melayu Kuala Kangsar is a premier residential school in Malaysia. It is an all-boys and all-Malay school in the royal town of Kuala Kangsar, Perak. It is sometimes dubbed "the Eton College of the East". It was awarded the Cluster School of Excellence title by the Ministry of Education. The history of the school is something the town of Kuala Kangsar can be proud of. A school/college that has its fair share of history and historical architecture.



Figure 4: Districts of the Case Study: Royal Town Kuala Kangsar

In our study area, the next important district available is the Royal Town Kuala Kangsar District. It is situated at the edge of the town and surrounded between a residential district and a commercial district. Hence, residents can easily access to the commercial area and Waterside to

enjoy nature. The administration district which also known as the British quarter in the British colonial era is located in between the town and lake garden. In the administration district, buildings stood proudly as once they did in the colonial past. In this district, there are Royal Town Kuala Kangsar district Malay Collage Kuala Kangsar, Kuala Kangsar Municipal Council, Pejabat Daerah Kuala Kangsar, Perak Royal Institutions, and Sultan Azlan Shah Gallery Office, Public Amenities for tourist and local resident. Greeneries - One can proceed along the river on the mainland to the sight of Mount Pondok, a landmark that guides people on their way to Larut or from Larut. Based on this privilege, we ascertain that Kuala Kangsar is older, inhabited by people for centuries, and its surrounding area.

Table 4: Details of important districts in the study site.

Districts	Residential	Public Amenities	Educational	Office	Total
Area (m ²)	151,775.80	16,136	17,673	15,691	201,275
Percentage (%) to the total land size	48.00	3.98	4.36	3.87	60.21

4.4 Nodes

The nodes in Figure 5 across the site are mostly comprised of activity areas and amenities that served the neighbourhood. One of the most significant nodes in the Educational which serves as the entry point for local and tourist coming in from Kuala Kangsar Royal Town. This outdoor node is surrounded by the shop and close indoor node that is Hospital Kuala Kangsar. For the other nodes is It was built in 1926 for Sultan Iskandar Shah by the Malay carpenter Enci Sepian from Bukit Mertajam, with the assistance of his sons Zainal Abidin and Ismail. The palace was previously known as the Valley Palace due to its location.



Figure 5: Nodes of the Case Study: Royal Town Kuala Kangsar.

The palace had been the official residence between 1931-1933. However, upon completion of Istana Iskandariah, the Istana Kenangan was used to host royal receptions and where the palace guests stayed. It today houses the Royal Museum of Perak. It is two stories high with the top floor consisting of the bed-chamber, family bedrooms, and a dining hall. The ground floor was once used as the official royal office where its original floor was made out of solid wood. The wooden floor, however, had been replaced by marble.

Table 5: Nodes in the study area.

Num	Nodes	Area (m ²)	Level of Socio-Activity
Node 1	Malay Collage Kuala Kangsar	8,691	Very Good
Node 2	Jetty Arena Square	1,000	Satisfactory
Node 3	Perak Royal Museum	6,567	Very Good

4.5 Landmarks

Thereof landmarks in Royal Town Kuala Kangsar (Figure 6) shows the classification of landmarks according to their hierarchical order, from architectural importance, height to function. Under the major landmarks based on its architecture value, the most successful landmark is rubber tree - On the corner of Jalan Raja Idris and Jalan Raja Chulan stands a rubber tree that is claimed to be one of the oldest in the country, having been grown from one of the first 11 seeds introduced into Malaya in 1877. Rubber cultivation went on to become Malaysia's most important crop.



Figure 6: Landmarks of the Case Study: Royal Town Kuala Kangsar

Malay College Kuala Kangsar was established in 1905 as a boarding school to educate the sons of the Malay elite. The school is sometimes referred to as the Eton of the east. There are several college buildings on both sides of the street. It makes the oldest royal education history.

Jetties on river bank/ waterfront - the miners' boat service since 1940 has crossed the silver river which has long been a tradition of transporting local communities around impoverished areas and especially to the surrounding Muslim community and a gateway to business activities at that time. Boat service connecting the city of Kuala Kangsar can shorten the commute of people around the area to the city or city of poverty by travelling within 30 minutes to the transport hub.

Table 6: Important landmarks in the study area.

Landmark	Area (m ²)	Level of Dominance
Oldest Rubber Tree	20	Very Good
Malay Collage Kuala Kangsar	8,691	Very Good
Jetty Arena Square	1,000	Satisfactory
Ubydiah Mosque	9,123	Weak

5 Discussion

5.1 Paths

Roads found in the town of Kuala Kangsar are estimated to have a medium to maximum capacity as they serve as a road link connecting the town to the highways and residential areas around the town. The layout of this area requires careful consideration because there is a colonial building of historical significance. Roads in the city of Kuala Kangsar are easily recognizable because of its hierarchical structure from the main street to the simple street when it comes to urban areas. The route to the town of Kuala Kangsar is only a short drive from the old city development factor. In Jalan Taiping, Jalan Raja Chulan, Jalan Tun Razak, and Persiaran Bendahara, there are pedestrian walkways as there are government complexes such as courts, police stations, and municipalities. In this area, there are also schools, mosques, and bus stations where facilities such as pedestrian and bicycle lanes are needed for safety reasons. The best street in the city of Kuala Kangsar is Taiping Road as it has all the amenities suitable for all types of road users such as pedestrians and bicycles. The width of the Taiping Road has a wide lane where it is ideal for more substantial traffic. For the road that can be considered weak in terms of facilities and safety is the Jalan Laksamana which connects Jalan Shahbandar. The downside of this road is that there are no suitable pedestrian paths although there are many shops. Roads that were not too wide and supplemented by small street hawkers also made the way more difficult, making it the worst road in the study area.

5.2 Edges

The edges can be considered satisfactory as they divided the commercial and complex areas of the government. This can be seen by the location of the highly profitable areas located at Jalan Temoh dan Jalan Kangsar, in contrast, the government complex is located around Jalan Raja Chulan and facilities such as schools, halls and bus station for resident located at Persiaran Bendahara. Jalan Taiping and Jalan Tun Razak are connecting commercial areas, government complexes, and local facilities. The best-known edge is Jalan Tun Razak because it combines three main areas, and it also has a natural edge area. This edge is considered best because it is associated with a landmark in the study area, Malay College Kuala Kangsar. The second-best edge is the Jalan Temoh area as it is parallel to the Perak River, and it clearly shows the commercial area and the resort area.

5.3 Districts

The districts of Kuala Kangsar township are considered satisfying as the study area is complete with commercial areas along Jalan Kangsar and Jalan Temoh, a recreational district along the coast of Perak River, services district on Jalan Chulan and education district in Persiaran Bendahara. This area can be summed up as a completely urban area with basic features. A variety of public facilities are available in the study area that can be used by the locals.

5.4 Nodes

Kuala Kangsar township nodes can be considered satisfactory as there are six nodes in the study area. There are three nodes of interest to the locals; one that commercially links the

government complex and two nodes close to the school and bus stations. Observations indicate that the area is active with civil servants going to the offices, students, and locals working in commercial areas there. The best nodes are nodes located near government and retail complexes as they are also close to nodes near schools and bus stations.

5.5 Landmarks

The landmarks of this study site are considered to be satisfactory because they have several visible landmarks. The best landmarks for this study area are clock tower circles and nearby Malaysian air force aircraft. And around the second best is the Malay College Kuala Kangsar where the college buildings are characterized by colonial architecture. The weakest landmark is Malaysia's oldest rubber tree. It has a little charm as its position is slightly behind the ground office buildings.

6 Conclusion

The location of the case study is the urban area of Kuala Kangsar, a town close to the Sungai Perak. The path that forms the urban pattern is the most dominant element in the study area, followed by edges, districts, nodes, and landmarks. The city is planned along the banks of the river. This type of urban layout provides a completely urban area with basic amenities for residents. Arrangements offer efficient road traffic, which is suitable for road finding and added to the traffic system to make it safer. Edges are made around the study site by road, and distinct boundaries are formed by arterial roads. The most dominant landmarks on the site of this study were clock tower circles and air force aircraft. The area of the study site is entirely complete with commercial value, recreation, services, and education. As for Nodes, it indicates that the location of this study will be a focal point for locals and visitors. The study area has shown that it has high potential and can be further refined. This site has a high historical value and architecture, a topography study site near Sungai Perak, and culture in the area of study. This gives the space the potential to become a thriving Royal town.

7 Availability of Data and Material

Data can be made available by contacting the corresponding author.

8 Acknowledgement

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Muhammad Syazwan Khairulanuar is a Master's Degree student at the Universiti Sains Malaysia, Penang, Malaysia. He obtained a Bachelor of Science in Architecture from Universiti Sains Malaysia, Penang, Malaysia. His research encompasses to the Quality of Urban Design Elements.



Ahmad Afiq Md Noor is a Master's Degree student at the Universiti Sains Malaysia, Penang, Malaysia. He obtained a Bachelor of Science in Architecture from Universiti Sains Malaysia, Penang, Malaysia. His research encompasses to the Quality of Urban Design Elements.



Professor Dr Ahmad Sanusi Hassan is a Lecturer in the Architecture Programme at the School of Housing, Building and Planning, Universiti Sains Malaysia (USM), Penang, Malaysia. He obtained his Doctor of Philosophy (PhD) degree from the University of Nottingham, United Kingdom. His research focuses on Sustainable Architecture and Urban Design Development.



Dr. Yasser Arab is a Researcher in Architecture. He obtained his Bachelor of Architecture from Ittihad Private University, Aleppo, Syria. He obtained a PhD. in Sustainable Architecture from Universiti Sains Malaysia (USM), Penang, Malaysia. His research focused on the Environment Performance of Residential High-Rise Buildings' Façade in Malaysia.



Dr. Khiensak Seangklieng is an Assistant Professor at Faculty of Architecture and Planning, Thammasat University, Thailand. He got his Bachelor degree in Architecture from the Institute of Architecture, University of Northern Philippines, Vigan Ilocos Sur, Philippines, a Master of Architecture from Chulalongkorn University and a Ph.D. in Architectural Heritage Management and Tourism from Silpakorn University, Thailand. He is interested in Green & Sustainable Architecture.



Dr. Boonsap Witchayangkoon is an Associate Professor of Department of Civil Engineering at Thammasat University. He received his B.Eng. from the King Mongkut's University of Technology Thonburi with Honors. He continued his PhD study at University of Maine, USA, where he obtained his PhD in Spatial Information Science & Engineering. His current interests involve Applications of Emerging Technologies to Engineering.

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