

Continuation and Transformation of Traditional Elements in Colonial Vernacular Houses in Kampong Bharu, Malaysia

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Abstract

Through colonization and modernization, the British introduced multi-racial immigrants into Malaysia, resulting in a plural society of people with unique social and cultural backgrounds. Kampong Bharu, located in central Kuala Lumpur, came into existence in 1899 as an enclave reserved for Malays only and their various sub-ethnic groups. Over time, urban growth resulted in the settlement losing its agricultural significance, and at present it is a uniquely preserved Malay community. Many vernacular Malay houses that were built in the 1900s still exist in Kampong Bharu. According to previous research by the author (Ju *et al.*, 2012), there were four major types of vernacular houses that existed in Kampong Bharu: traditional vernacular houses type I - *Bumbung Panjang*, traditional vernacular houses type II - *Bumbung Perak*, colonial vernacular houses and modern vernacular houses.

The purpose of this paper is to investigate and identify colonial vernacular houses among the four types which originated from the early period of colonization and later evolved into an eclectic style due to the social, ethnic and cultural changes occurring in colonial Malaysia. To achieve this, the paper conducts case studies on five colonial vernacular houses in Kampong Bharu.

Keywords: colonial house; vernacular house; colonial vernacular house; Kampong Bharu; Malaysia

1. Introduction

1.1 Background and Aims of Study

As part of the colonization and modernization process, the British encouraged the immigration of various ethnic groups into Malaysia, which resulted in a plural Malaysian society with unique social and cultural background that consisted of indigenous Malays, Chinese, Indians and other minority groups (Ju *et al.*, 2010).

Architectural influences in a territory administered by the British and dominated by the Malay race occurred at two levels of cultural fusion: firstly intermingling of sub-ethnic groups within the Nusantara Malay culture¹; and secondly, the fusion between dominating colonial influence and the indigenous architectural tradition, which is the focus of this article. On top of the physical architectural transformation it is also noted that such changes were part of a conscious effort

to meet the changing needs and requirements of the time. Transformation from an indigenous architectural expression towards a considerably modern localized colonial style through a series of subtle adaptations and localizations has ensured the acceptance and harmonious continuity of Malay architecture. Evidence of this transformation rarely found elsewhere presented the evolution of this transformation.

Colonial houses in Malaysia originated from the Anglo-Indian style bungalow built in the early 1800s and later evolved into the bungalows or mansions called 'substantial bungalows' or '*Jawi Peranakan*'² houses (Chen, 1990). This Anglo-Indian style bungalow was transformed as the Strait Eclectic style by wealthy Chinese businessmen, who imitated the neo-classical motifs that were popular in Europe (Chun *et al.*, 2005).

During that period, a combination of the Chinese, sub-ethnic Malay³, Indian and European architectural styles was adopted through the memories of immigrant owners and their pattern books. Houses were designed according to the owner's personal preferences, which resulted in unique and eclectic styles. This vernacular house type may therefore be regarded as a hybrid of Malay and colonial culture.

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In these modernized forms of Malay vernacular houses, we can find 'traditional elements' (T) which maintain the traditional lifestyle and space organization principle and we can also find 'new elements' (N) which are being introduced by colonial culture and newly developed industrial techniques. Finally, the meeting and fusion between T and N led to the formation of an eclectic style which is being referred to as 'localized style' (T·N') (adapted from Yoo, 2002). Depending on which elements are being mainly used, we can classify modernized houses as 'continuity of tradition' (T'), 'adaptation to the new elements' (N'), and 'localization' (T·N'). In 'localized house', we can observe the continuity of traditional elements, transformed elements, added or deducted elements, adapted elements, which resulted in diverse styles whilst protecting a certain amount of the essence, beauty, and principles of building tradition. This study starts with this conceptual framework (Fig.1.).

In the author's precedent study (Ju *et al.*, 2012), vernacular houses in Kampong Bharu can be classified into four major types: the traditional vernacular house type I (*Bumbung Panjang* style), the traditional vernacular house type II (*Bumbung Perak* style), the colonial vernacular house, and the modern vernacular house. Of these four types, the colonial vernacular house refers to vernacular houses that were influenced mainly by European architecture. However, given that the adoption of this new European style was voluntarily implemented by the owner and constructed by local builders, the colonial vernacular house style may be regarded as an indigenous style of architecture.

The authors propose a case study of five colonial vernacular houses in Kampong Bharu, which attempts to identify both traditional and newly introduced elements in colonial vernacular houses. The authors anticipate that the study will address the architectural identity of the unique colonial vernacular houses of Malaysia and demonstrate their evolution, which has not yet been clearly defined.

1.2 Scope and Methodology of the Study

This study aims to identify the space organization and stylistic characteristics of colonial vernacular houses in Kampong Bharu. The houses were analyzed in terms of three major perspectives: the social background of the house, space organization, and the composition of the elevation.

The methodology adopted in this study is qualitative analysis of five representative colonial vernacular houses selected from the 121 vernacular houses that can be currently found in Kampong Bharu⁴. This study is mostly based on the KALAM report⁵, contains a full history of the houses, such as the year of construction and ownership, and detailed measured drawings. To verify the findings, we conducted field surveys⁶ and interviews with residents.

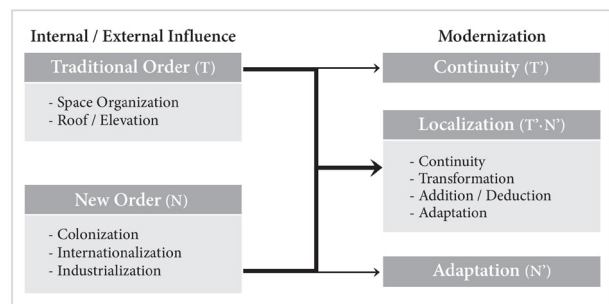












Fig.1. The Conceptual Framework for Modernization of Malay Vernacular Houses (Adapted from Yoo, 2002)

2. The Background of Kampong Bharu

To protect Malay ethnic groups, the British administration established Kampong Bharu on 223 acres between the Klang River and Batu Road in 1899, with the main purpose of protecting the Malay Agricultural Settlement (M.A.S) as an autonomous village (Wiggins, 1993).

With this background, the past and the present came to coexist amidst the flow of time in Kampong Bharu. The settlement began with traditional Malay timber houses,

Table 1. Profile of Selected Houses

	A: Haji Mohamed Amin	B: Abdullah Mohamed Amin	C: Haji Mohamed Yunus	D: Mahmud Kaya	E: Abdul Rahim
Front Elevation	 ©KALAM, UTM	 ©KALAM, UTM	 ©ARCH	 ©KALAM, UTM	 ©KALAM, UTM
Front Façade Figure					
Address	No. 11, Jalan Raja Muda Musa	Jalan Raja Abdullah	No. 24, Jalan Hamjah	No. 214, Jalan Dewan Sultan Sulaiman	No. 15, Jalan Raja Uda
Region	Hujung Pasir	Hujung Pasir	Atas A	Periok	Masjid
Year Built	1948	1912	1944	1930	Early 1900
Occupation of Owner	Teacher	Clerk of Railway Office	Forest Ranger	A Clerk in the Estate Duty Office	Personal Secretary to the Sultan
Origin of Owner	Singapore Indonesian descendant	Melaka	Indonesia	Perak	Perak
Present Condition	Occupied	Occupied (GF)/Rented (1F)	Rented (GF) /Occupied (1F)	Demolished	Abandoned

leading to modern bungalows that, although somehow awkward to label as being 'traditional', nevertheless had traditional Malay elements. It later expanded to include modern terrace houses and high-rise apartments.

Although these houses were not designed by architects, they were transformed and modernized into unique types that existed between the traditional and the modern periods of Malaysian architectural development.

3. Case Analysis

3.1 Case A: Haji Mohamed Amin House

The basic spaces of this two-storey house, comprising an *anjung*, *serambi*, *rumah ibu* and *dapur*, are organized according to the most common traditional linear layout. Traditional Malay houses are generally characterized by a raised floor due to the hot and humid tropical climate (Ju *et al.*, 2012). Only a small built up area makes up the ground level, which comprises a small office, intended as a hobby room for the master of the house.

In its original plan, the *rumah ibu* of this house was simply divided into two spaces. One year after the house was constructed, in 1949, each *rumah ibu* was further divided to make space for four bedrooms (*bilik*) likely responding to needs for privacy.

The façade of this house demonstrates a symmetrical layout which is the strong characteristic of western bungalows, with the *anjung* placed at the center, while the entrance stairs are located to the side of the *anjung*, maintaining a key feature of the traditional vernacular house where they can approach the *anjung*, a reception space through outside stairs.

Among the five cases examined in this study, elements of traditional Malay architecture are most strongly retained in this house. The height of the raised floor and its floor layout as well as the presence of a hipped roof with gable ends and a long-roof render it closest in nature to the original vernacular house building tradition. The colonial elements observed in this house include the sturdy brick posts, concrete staircase, the use of glass in the windows, and the latticeworks of the balustrade and fanlight. These elements may be understood as ways of keeping to the modern trend yet at this juncture this architectural intervention is still not considered secondary.

The *jendela* of the first floor are of the typical casement window type, with colored glass (imported from the colonies), which was used in the upper part of the shutter. The latticework for fanlight above the *jendela* and the geometric patterns used in the balustrade of the *anjung* are the impressive traditional decorative features.

The posts used to support the main floor are 1.95 meters in height and are made of bricks on a concrete plinth. The SBR ratio⁷ is 0.7:1:1, which indicates that the proportions of the roof are smaller compared to those of traditional long-roof vernacular houses.

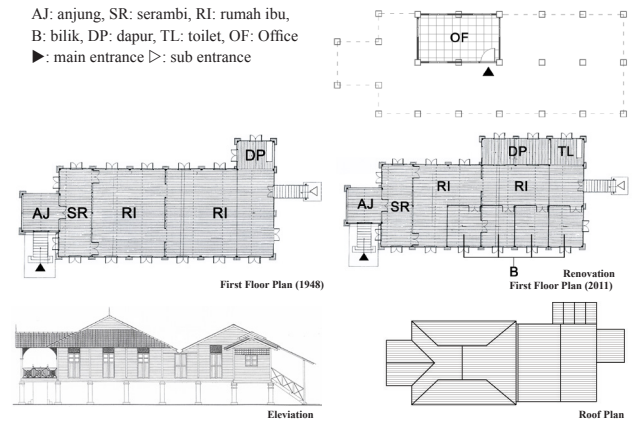


Fig.2. Haji Mohamed Amin House (A)

3.2 Case B: Haji Abdullah Bin Mohamad Amin House

The unique feature of this house is that it is built as a complete two-storey structure with both floors which have a *serambi* and *rumah ibu* each within the main living area with separate door fronts. It is likely that the house has been adapted to accommodate extended family living.

The traditional vernacular house in Malaysia has a unique hierarchical order of a front-to-rear space layout: *anjung-serambi-rumah ibu-dapur* (Chen, 1998; Lim, 1987; Ariffin, 2001; Ju *et al.*, 2012). In this house however, being a full two-storey structure, spaces are distributed across two levels in this case while still preserving the traditional hierarchical order.

In this house, the main floor is the first floor, with an elegant staircase providing a direct connection to the upper floor, a unique feature of a Malay vernacular house. This is in contrast to Western bungalows in which the ground floor is the main floor, entered from

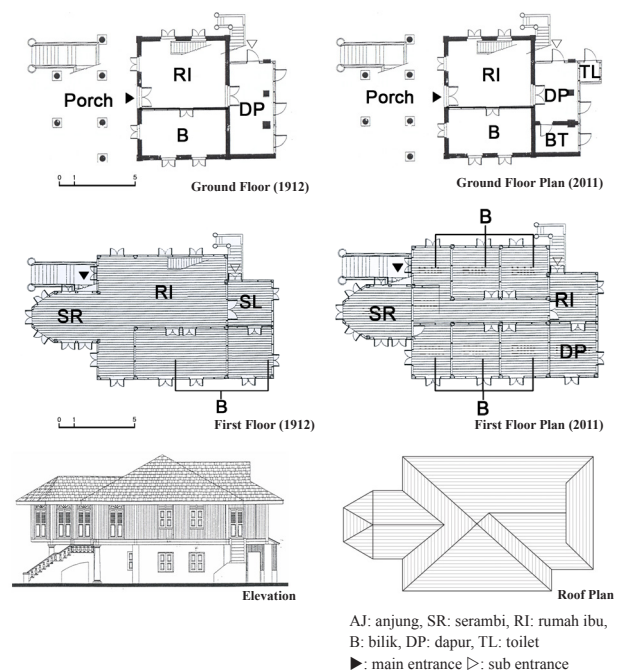


Fig.3. Abdullah Mohamed Amin House (B)

the front. In traditional Malay houses, there is no interior staircase except for that which allows access to the attic. However, in this house, there is an interior staircase that connects the ground floor and first floor⁸. This can be regarded as an innovation influenced by the colonial house.

This house has a balanced symmetrical façade, which was one of the strong characteristics of the Palladian villa in England, the most attractive architectural style in those days (Heritage of Malaysia Trust, 1990). The symmetrical façade never existed in ordinary houses of the past as it was reserved for royalty only; hence, for a Malay house this can be considered an intervention. The characteristics of a colonial house also can be seen in elements such as the windows, doors, roof and pillars. In particular, the protruding polygonal *serambi* is an outstanding feature that is often seen in British colonial houses.

The main staircase, adorned with colorful geometric tiles is of Melakan influence, believed to have been introduced by the first owner, who originated from Melaka. The balustrade of the main stairs is composed of pot-shaped balusters, which were common in the Baroque period.

This house has three roof types. The roof of the *serambi* section is polygonal in shape, the *rumah ibu* section is covered by a *limas* roof (a hipped roof consisting of four sloping roofs) and covering the back section of the house is a *Perak* style roof. Inclusion of the polygonal roof at the front of the house is distinctly colonial and can be regarded as an innovation.

The walls of the first floor follow the traditional style using vertical wooden planks. In contrast, the walls of the ground floor follow the modern style, consisting of plastered brickwork. This style of elevation is referred to as the Indo-Malay or *Jawi Peranakan* style (Chen, 1998). The shutters for the *jendela* are separated into two panels. The upper panel is a type of adjustable louver to facilitate ventilation and allow natural light in, and the lower panel is a solid timber piece decorated with a simple molding. The design of the fanlight placed above the *jendela* in this house uses lunettes in the Georgian style. These wooden fanlights, however, are perforated whilst English Georgian fanlights are often made of glass and a decorative cast iron frame.

The brick posts are considered a foreign feature, whereas use of single timber columns extending from the ground up to the roof rafter has been the traditional practice. The six Tuscan order columns existing on the porch are a noticeable feature of this house. It is assumed that the owner, Haji Abdullah, an officer of significant rank, was influenced by the government buildings that he was so familiar with. However, these columns deviate from the classical Tuscan order in that the pedestal and entablature have been omitted.

The SBR ratio of this house is 1:1:1.3. There is less emphasis on the roof compared to traditional houses. The stilt height is 2,350mm, enough to accommodate

habitable ground floor spaces. Apart from the porch, the space underneath the floor has been filled with habitable spaces and made enclosed, producing an expression of lightness due to the stilts being considerably reduced.

3.3 Case C: Haji Mohamed Yunus House⁹

Both floors of this two-storey house were used as living areas almost similar to Case B. According to the MAS plan¹⁰ of 1952, the *rumah ibu* and *dapur* were located on the ground floor, with the *serambi* and another *rumah ibu* on the first floor. In 1953, an additional *dapur* was added to the first floor. The traditional hierarchical layout of the *serambi-rumah ibu-dapur* can be observed on the first floor of the house, which was the main living space. In addition, according to the house plans of 1952 and 1953, there was originally an internal staircase that connected the two floors, but this staircase was closed off in this case, as the ground floor was rented out.

The three bedrooms are located in the *rumah ibu*. There are more rooms compared to traditional houses. This reflects an emphasis on individual privacy within the family unit, a feature which emerged in the modern period. It also indicates that the house is embracing the socio-economic challenges within a gradually developing urban environment. Hence, the rural context is slowly reducing.

The elevational treatment of the ground and first floors are significantly different. The first floor, which is the main floor, is decorated with horizontally laid wooden panels while the ground floor has white lime plastered wall finishes. In the wooden shutters for the *jendela*, glass was used for the topmost panel. On the other hand, a *tingkap* window was installed on the ground floor. The wall for the ground floors remains intact according to the old plans of 1952 and 1953; however, it was later treated with a smooth plastered finish with a punched-type glass jalousie added. Eight precast ventilation blocks are positioned above this window.

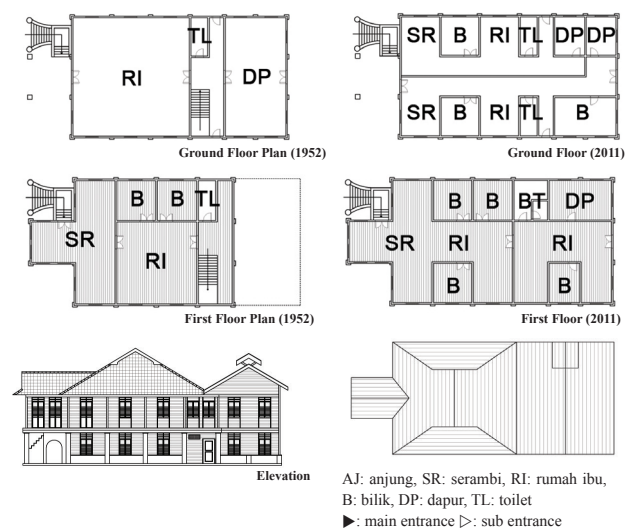


Fig.4. Haji Mohamed Yunus (C)

Its main staircase echoes the flowing open arms of Melakan stairs. As this is a two-storey building consisting of a concrete structure with the height of each riser and the overall staircase greater than that of traditional vernacular houses, it is natural that it looks much taller than an ordinary Malay house, except for traditional houses belonging to the Jambi Malays.¹¹ The grand single-flight stairway adds charm and elegance to the house frontage. The SBR ratio of this house is 1.2:1:1, which allows sufficient height for the ground floor.

3.4 Case D: Mahmud Kaya House¹²

This single storey house deviates greatly, in terms of space layout, from the other colonial vernacular houses examined in this study. While the typical hierarchical organization of the *anjung-serambi-rumah ibu-selang-dapur* is maintained, the space layout is less linear in configuration and more compact, where spaces are laid within a more or less square-shaped plan. This square plan is almost similar to the layout of Western houses. Although the house entrance is from the side as in traditional houses, a porch – often a feature of colonial houses – is positioned at the front. The pillars of this porch are of Victorian style. The *anjung* is opened to the outside and is more spacious compared to other traditional houses. The *serambi* has a polygonal alcove that protrudes towards the front of the house. Unlike the other selected houses, which appear to have aimed for a symmetrical façade, this house has a dynamic and asymmetrical façade.

The roof is primarily of *Perak* style with a special polygonal roof projection added to the *serambi*, and the roof covering the porch is of the long roof style.

A distinctive feature of its elevation design is that the lower section of the walls (up to 900mm high) consists of rendered wall finishes, and the upper section consists of wooden panels. Instead of having *jendela* the front adopted a façade with *tingkap*, which is quite unique with respect to traditional houses. It was originally a glass latticed window with an elaborate frame but was later replaced by a modern simple glass window. The stilts are made of concrete, with a diamond pattern carved into them.

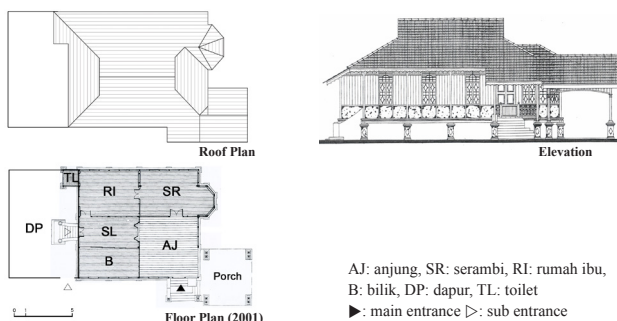


Fig.5. Mahmud Kaya (D)

3.5 Case E: Abdul Rahim House

This single storey house almost appears to be resting on the ground level due to its very low stilts. It has

a symmetrical elevation with the portico positioned right at the center, and the polygonal protruding bays positioned at both sides of the front façade, which displays a formalistic expression. The portico uses capitals that combine elements of the Ionic and Corinthian orders as well as a pediment of neo-classical style.

The symmetry also occurs in its plan layout with the *rumah ibu* positioned at the center. This may be regarded as a key characteristic of the house that demonstrates how it has been distinctly influenced by colonial architecture. The main entrance, located at the center of the house front, opens into the *serambi*. This represents a significant departure from the other vernacular houses which occasionally had a symmetrical frontage but were often entered from the side. In traditional Malay architecture, a symmetrically positioned entrance denotes formality of the highest order usually reserved for royalty.

The main roof of this house is of the *limas* but protruding areas located at either end of the house front covered with a polygonal roof form are sheer innovation. A *Perak* roof is used to cover the *dapur* that was later extended.

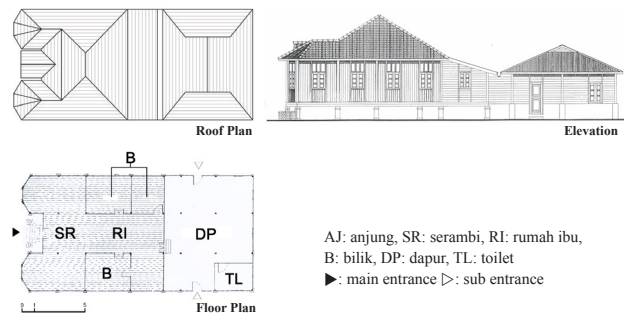


Fig.6. Abdul Rahim (E)

The walls of the original building consist of vertical timber boards. In the case of the *dapur* section that was added later, the lower section of the walls is built of plastered brickwork and its upper section is made of horizontal wooden planks. Three units of *tingkap* are positioned at each of the polygonal bays, with very narrow internal spacing. All the *tingkap* are installed with glass panels. Unlike the other four houses, where fanlights above the windows are perforated, fixed glass was inserted into the fanlight instead, so as to allow daylight to come in but not natural ventilation.

The main staircase, which is the dominant element of the Melakan style is curved and consists of only five steps. The SBR ratio of the house is 0.4:1:1, which demonstrates that the proportion of the roof and stilts have significantly diminished as compared to other vernacular houses.

4. The Identity of the Colonial Vernacular House

Based on the discussions above, authors can summarize the following features, which are presumed

to characterize the architectural characteristics of Malay neo-vernacular houses.

4.1 Space Organization

The houses are built as either single- or two-storey structures. In the case of the former, the houses do not have the traditionally high floors but instead they sit almost on the ground level.

In the case of the latter, the houses are entered via an external staircase to the first floor level (and not to the ground floor as one would expect). In other words, it is the first floor that is used as the main living space, as in all traditional Malay houses. It is most likely due to the fact that the upper floor provides a cooler space in the hot and humid climate.

The space layout is essentially based on the traditional houses of *Perak* style (Cases A, B, C), with a protruding *anjung* or *serambi* located at the center of the house frontage. The hierarchical axis (*anjung-serambi-rumah ibu-dapur*) is laid out linearly, where the *bilik* is located to one side of the *rumah ibu* space. In houses where the foundation (or stilt height) has been severely diminished (cases D, E), the plan is found to be quite similar to that observed in European bungalows – a concentrated square type layout was adopted in Case D, and an almost perfect symmetrical layout was adopted in Case E.

Western architectural elements, such as the porch, were adopted (cases B, C, D). New modern elements, such as private rooms, dining spaces, and bathrooms, were added later to meet emerging needs.

Extruding polygonal-shaped alcoves or bays are added to the *serambi* space resulting in a distinct element of the house front façade (Case B, D, E). The moment of departure from conformity to traditional practices is extremely visible here.

4.2 Elevation Design

The *Perak* style roof is adopted as the main roof, and the *panjang* and the *limas* styles are occasionally combined with the main roof. The proportion of the roof as expressed in the SBR ratio is severely diminished if compared to traditional houses.

In addition, with the appearance of two-storey houses, the ratio of the stilts and body became 1:1, and the height of the foundation increased to almost 2 meters. It is clear that the roof no longer dominates the overall house form as it did in most traditional houses especially the ones from the East Coast region.

In general wooden boards continued to be used for the walls, as in traditional vernacular houses. Both *jendela* and *tingkap* are also used widely. High-level windowsills of a *tingkap* showed greater attention to privacy – clearly a sign of tradition. But amidst this continuation of traditional elements for the basic structure, glass made its way in some of the wooden shutters, and the Georgian-styled design fanlights with modern geometric patterns are being adopted. In addition, elements of colonial architecture such as pot-shaped balusters and European orders for columns are

Table 2. Order of Space Organization

	Floor plan	Section
O		
A		
B		
C		
D		
E		

AJ: anjung, SR: serambi, SL: selang RI: rumah ibu, B: bilik, DP: dapur, TL: toilet
O: Origin of Vernacular House, OF: office P: porch / stair

being introduced.

In the case of the two-storey houses, stilts were no longer built of slender wooden columns like those of earlier houses; instead, sturdy posts made of bricks and concrete are built. In the case of the single storey houses, this has also been the case for insignificant stilts where brick stumps are being used. Visually it gives a sense of stability but significantly reduces the proportion of the overall elevation usually adopted by a traditional Malay house.

Stairways of traceable Melakan style, decorated with colorful decorative tiles, are used regardless of the origins of the house owner. Concrete is the most widely used material in stair construction.

5. Conclusion

The Malay vernacular houses of Kampong Bharu were mostly built between 1900~1950 in a designated enclave of a Malay community within the urban territory of Kuala Lumpur. The house owners were generally well educated and had economic stability. Kampong Bharu created one of the earliest conditions of collision between traditional Malay architecture and modern vernacular architecture. It put the compatibility between traditional building materials and practices and the emerging new materials and technology to a test. During this period, the colonial bungalows built by the British administration for its officers throughout most of the Straits Settlements were making a strong presence. The fact that these Malay houses are not constructed by architects or contractors, but rather by

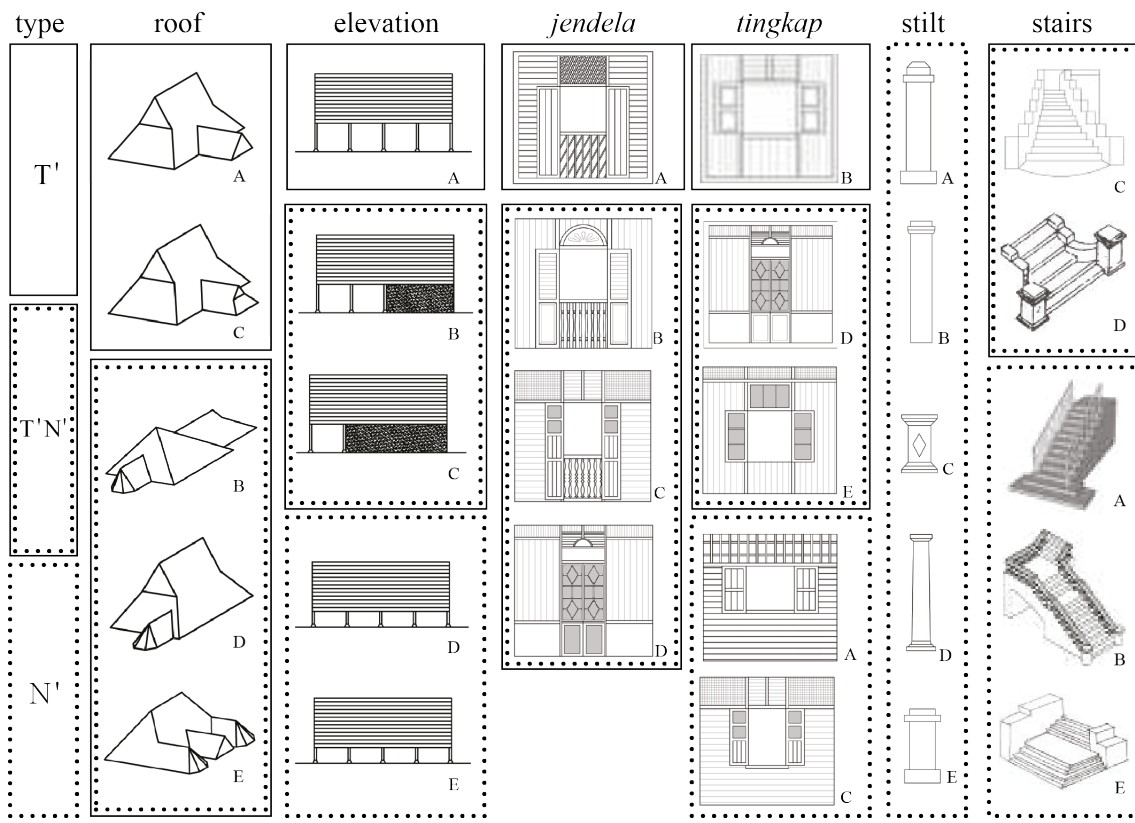


Fig. 7. Analysis of Elevation Element

local builders under the close supervision of the house owners, reflected the general lifestyle and spirit of time and place of the period. One important fact is that these houses were built in that way voluntarily, meaning that intervention or innovation made to any part of the houses (that one would consider against the tradition) is being introduced in all consciousness.

In other words, these Malay house owners embraced the changes that they brought into Kampung Bharu. This gave birth to a kind of hybrid architecture that allowed for the mix between traditional Malay architecture and the colonial villa. This article called this form of hybrid house the colonial vernacular house, that should not be regarded as an imported Western type of architecture but as an indigenous form of architecture that came to be established through the assimilation of newly introduced foreign cultures with that of the traditional lifestyles of the Malays. In addition, during the process of building these houses, new building techniques and materials were adopted alongside the adaptation of colonial design and architectural elements. The active use and transformation of modern architectural elements, such as glass and concrete, can also be observed, this being indicative of the modernization process as it was gradually accepted by Malay society.

As only five examples of colonial vernacular houses located in Kampung Bharu have been examined, the results of the current study cannot be seen as representative of the colonial vernacular style for Malaysia. However, it sets a starting point for further discussions towards establishing a clear definition of 'colonial vernacular architecture,' which takes into account the regional characteristics of other traditional houses in Malaysia. It is anticipated that the characteristics of this distinct regional style of Malaysian vernacular house can be firmly established through the discovery and analysis of additional houses of the colonial vernacular style at other locations.

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Notes

- ¹ Various definitions of Malay ethnicity have been given by scholars dating as far back as the 1800s and as wide as this race being the inhabitants of the Malay Archipelago, which includes settlements across the Indian Ocean and the Pacific Ocean. Perhaps the most relevant in the context of this article is that those peninsula Malays who have discarded indigenous animistic beliefs and primitive customs, and accepted a formal religious doctrine, Islam, and lived in a systematic manner, according to its teachings (Winstedt, 1947).
- ² Who is half-Indian and half-Malay.
- ³ Many peninsula Malays are descendants of immigrants from several major ethnic groups of Indonesian people, namely the Acehnese, Minangkabau, the people of Riau, Java, and Bugis (Provencher, 1984).
- ⁴ Selecting five houses is a very important starting point for this study, as stated below. First, in previous research by the author (2012), 121 vernacular houses from the 200 houses that currently exist in Kampong Bharu were selected and analyzed. In order to differentiate colonial vernacular houses from other types of vernacular houses, certain guidelines were used. The guidelines are:
 - 1) The houses had to have two stories or have very low stilts, whereas other vernacular houses had to have wooden structures and raised floors.
 - 2) The primary structure should be timber frame, with the occurrence of traditional elements such as the roof form, *jendela* (a tall window raised from the floor level), and *tingkap* (a short window set away from the floor level).
 - 3) These houses also have European architectural elements such as pillars, pediments, ornaments, and a symmetrical elevation.Second, KALAM encompasses eight documents related to traditional houses in Kampong Bharu. We selected four houses that conformed to the specified guidelines. Third, field surveys were conducted based on the two criteria noted above. Finally, we chose five cases for the analysis in this study.
- ⁵ The Department of Architecture at Universiti Teknologi Malaysia (UTM) has undertaken a "Measured Drawing Program" since 1976, which has collected more than 350 historically and architecturally significant case studies, comprising traditional houses, palaces, shophouses, hospitals, railway stations, and buildings for religious, public administration, commercial, and institutional purposes. The Center for the Study of the Built Environment in the Malay World, known by its Malay abbreviation KALAM for "Pusat Kajian Alam Bina Dunia Melayu," was founded in 1996. The research towards the identification, classification and analysis of architectural heritages was established through undergraduate and post-graduate studies. The KALAM report contains a full history of the houses, such as the year of construction, ownership history, usage and detailed measured drawings.
- ⁶ The field surveys conducted in October of 2010 and August of 2011 largely involved the interviewing of residents and established a record of the current conditions of the houses.
- ⁷ The traditional Malay house can be divided into three parts, which are the roof, wall, and piles. According to Ariffin (2001), the general SBR (stilt: body: roof) ratio for a *Bumbung Panjang* house is 1:1:2.4 ~ 1:1:3.5, with the roof part emphasized.
- ⁸ The house owner had two wives with both of them residing in this house. The first wife lived on the first floor and the second wife lived on the ground floor. The internal staircase connecting the ground and upper floors indicates that despite the existence of two separate families, they belonged to the greater family of Haji Abdullah.
- ⁹ The Mohamed Yunus House, apart from the other four cases, was analyzed based on field measurement drawings and interviews because there was no associated KALAM report for it.

- ¹⁰ Kampong Bharu was given a special autonomy stature by the local government, under the consent of the Sultan under the name of MAS (Malay Agricultural Settlement). By utilizing the numbers of individual land plots, MAS is archiving the documents of all buildings constructed on the lots in Kampong Bharu. The documents have records of the full history of the housing, such as changes in ownership, approvals of new construction, additions, extensions, renovations and demolitions. The MAS records contain valuable old drawings of floor plans, elevations, sections, site plans, and other information.
- ¹¹ The ethnic Malay originated from Jambi in east Sumatra.
- ¹² The Mahmud Kaya House was destroyed after 2001 and no longer exists. Fortunately, KALAM had documented it, and its report and measured drawings are available for reference.

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