

Adaptation of Architectural Design Features Traditional Malay Houses at Kampung Morten for Malacca Contemporary Houses

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DOI: <https://doi.org/10.30880/peat.2021.02.01.022>

Received 12 January 2021; Accepted 01 March 2021; Available online 25 June 2021

Abstract: The application of architectural design features traditional Malay house is an essential approach for the architecture sector in influencing contemporary home. Most contemporary houses are not built by applying traditional heritage design elements due to indifference and less focus on traditional design features. This study aims to identify design features and factors that influence a traditional Malay house at Kampung Morten to Malacca contemporary house. Next to study the structure of a traditional Malay house at Kampung Morten applied in a contemporary house in Malacca and compared the traditional Malay house structure in Kampung Morten against Malacca contemporary house. The methodology was conducted in three methods which are quantitative, qualitative, and through case studies. Survey forms were distributed, and interviews were conducted with Jabatan Perbadanan Muzium Melaka (PERZIM). The data obtained were analysed using Statistical Package for the Social Science (SPSS) software version 25. Inventory forms and case study forms are also used. The researcher can prove the study results that the architectural design features of traditional house structures in Kampung Morten and contemporary houses in categories of roofs, windows wall, pillar, and stair in the physical category can be known in more depth. Contemporary home design should highlight the aspects of moderation of architecture, space and sculptures convey the message design features traditional Malay house easily understandable by the society. In fact, contemporary home design should include the spirit of traditional Malay houses to preserve the Malay heritage and reflects the spirit of cultural identity.

Keywords: Traditional Malay House, Contemporary House, Design Features

1. Introduction

This study's overall framework is related to the characteristics of the architectural design structure on the traditional Malay house in Kampung Morten and its application to contemporary houses in Melaka. Through this study, the concepts related to the contribution of traditional Malay houses to Malacca contemporary houses. Our country often suffers from different climate such as high temperatures, heavy and uneven rainfall, cause the traditional house to use pillars, building materials, ventilation and space layout [1]. The climate is seen almost the same throughout the archipelago. The

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traditional Malay house is an example of useful reference for architects and designers in understanding the design. Traditional Malay houses can also reach passive phase control to achieve comfort conditions for occupants [2]. The Malays have created one of the design house's most advanced and impressive. Its uniqueness in design reflects the owner's identity, socioeconomics, culture and history. The design might look similar, but the traditional Malay house's style has its differences by states in Malaysia [3].

1.1 Problem statement

Most of the residences today cannot respond well to the needs of the occupants influenced by western elements. It is contrary to the requirements of local design, especially the Malays [4]. The traditional houses as neglected by society today, including most of the Malays. They are in a hurry in the pursuit of progress and modernity with western elements. Many traditional values have been forgotten [2]. Failure in the development of the contemporary house is also due to the construction environment's deterioration using various materials that do not coincide to standard [5]. The adaptation of traditional Malay houses to contemporary houses is essential in maintaining the tradition.

1.2 Research objectives

According to the problematic issues raised, the objectives of this study are:

- To identify the design features and factors that influence a traditional house's structure to a contemporary home.
- To determine the structure on the traditional Malay houses in Kampung Morten and Malacca contemporary house.
- To compare the structure of a traditional Malay house in Kampung Morten with Malacca contemporary house.

1.3 Literature review

Malay traditional houses designed based on the needs of the Malays and the Malay community-oriented culture. Each component of a traditional Malay house represents an overview of the customs, beliefs, environment, arts and crafts community itself. There are three parts to the traditional Malay house, namely the pillars, walls and roof [6].

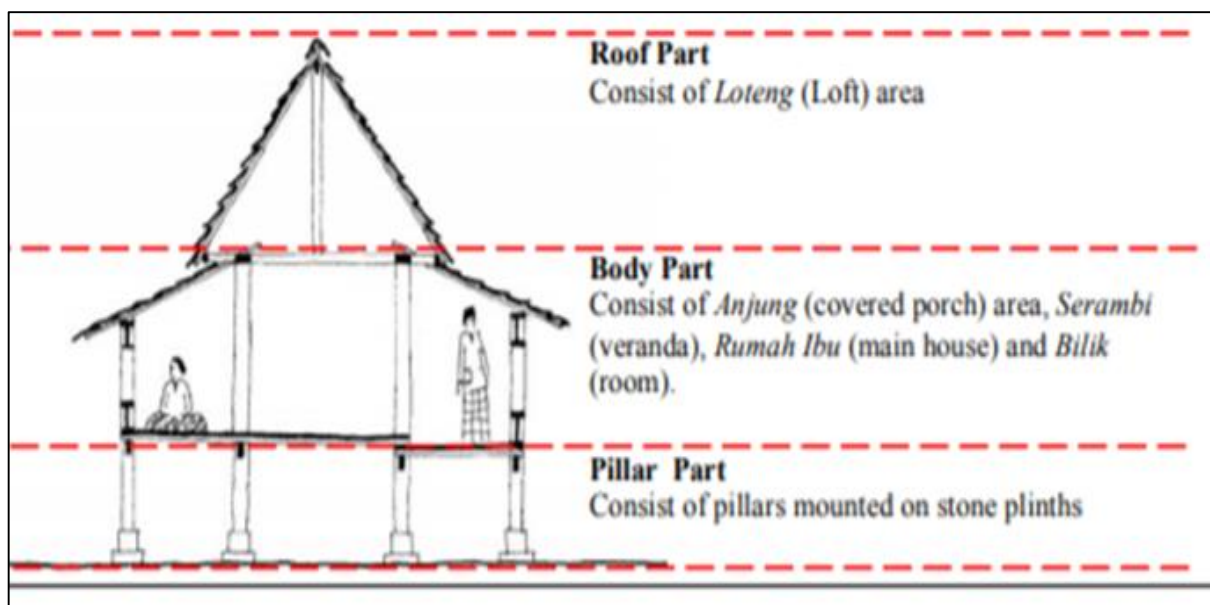


Figure 1: Three part of Melaka House
(Yuan 1987; Wahab, Ahmad, Masri & Hamid 2015)

1.3.1 Factors application of traditional house structure to contemporary house

1.3.1.1 Weather factors

The frequency of rainfall in Malaysia has resulted in more sloping roof design and pillars to prevent floods in the house. The heat of the weather also contributes more open design. The pillar itself gives way to the wind at the bottom of the house. The vents at the top of the windows and roof have also been designed for maximum comfort [7].

1.3.1.2 Natural resources

The building materials for traditional Malay house are usually made of wood, rattan, roots, bamboo, and foliage obtained from nearby forest sources [7]. Some well-known timbers such as Cengal and meranti wood promise good quality when used to build the traditional Malay house's main structure. Most of the main structure Malay house was built without using nails. Instead, pre-cut holes and grooves are used [8].

1.3.1.3 Culture, religion and customs

The presence of Islam has influenced the orientation in the construction of buildings leading to Qibla. The organization's whole process connects traditional Malay culture, lifestyle, and environmental conditions are built [7]. The design values of the house show a reflection of originality, simplicity, honesty and minimalist character. Space is also arranged and levelled according to visiting customs, feasts and family [9].

1.3.1.4 Foreign Influence

Zinc and tiled roofs have been used compared to thatched roofs and wood. Meanwhile, brick and cement have been used compared to wood as pillars, stairs, walls, and nails are used to replace wooden pegs and roots as links or binders [10].

2. Materials and Methods

The method of data collection involves both qualitative and quantitative methods. Qualitative method is conducted by interviewing Perbadanan Muzium Melaka (PERZIM). The quantitative method is analyzed using Statistical Package for the Social Science (SPSS) software version 25. Moreover, inventory forms and case study forms are also used. Figure 2 illustrates the steps to complete this research. Generally, the three stages of this study include:

- i. Stage I: Data collection
- ii. Stage II: Data documentation
- iii. Stage III: Data analysis

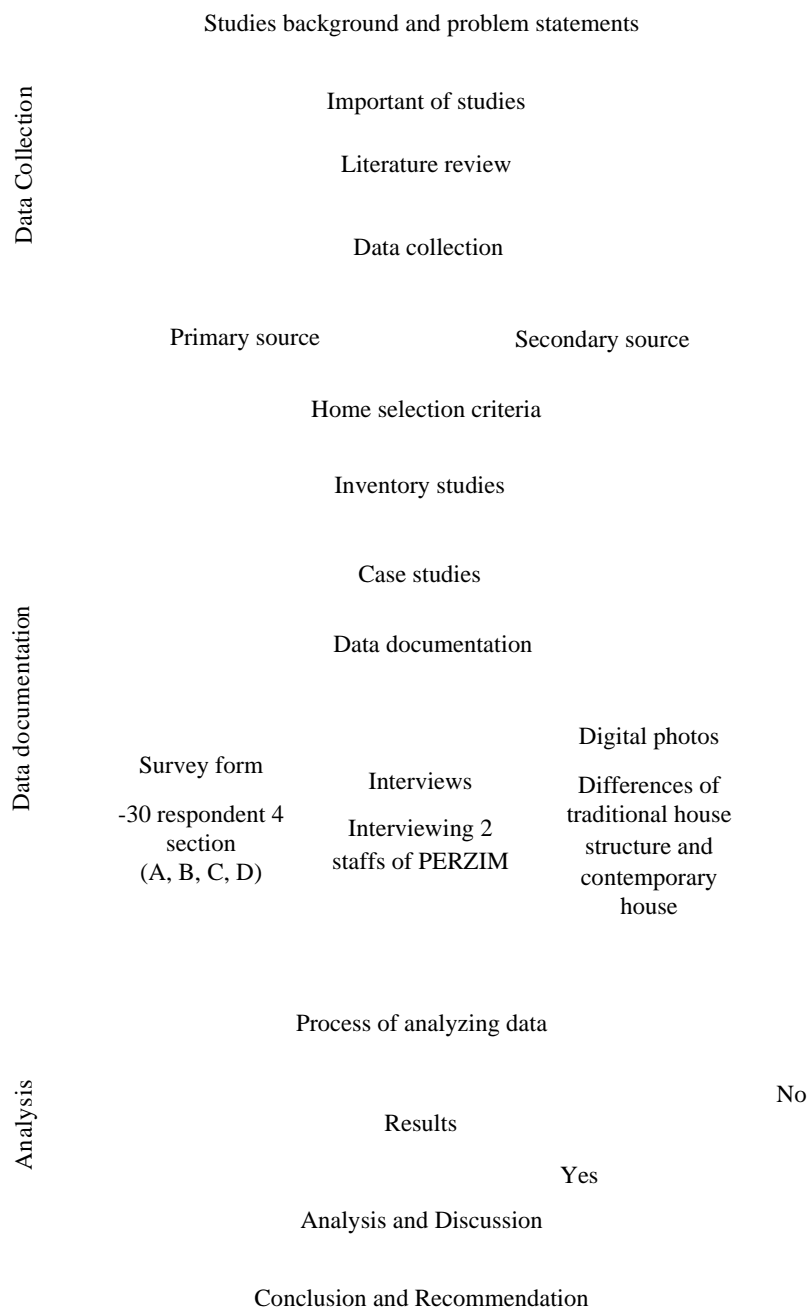


Figure 2: Methodology process of studies

2.1 Materials

In this study, the research tool used was the research questionnaire to determine the structure of the traditional Malay houses in Kampung Morten and Malacca contemporary house. This survey also about villagers' perception and the factors of adopting traditional Malay houses structure to contemporary houses. The survey consists of four sections:



- i. Part A: Demographics
- ii. Part B: Perception of Kampung Morten as a traditional village
- iii. Part C: Traditional house and contemporary house architecture structure design

iv. Part D: Factors of adopting traditional Malay house structure to contemporary house

Due to Covid-19 pandemic and the Movement Control Order in Malaysia, the questionnaire had to be done online and the sample size was less than it should be. Questions built via Google Form and distributed by WhatsApp. Some respondents ignored the link to the questionnaire form provided online. The results may be affected as the number of respondents may not represent the current population at Kampung Morten.

2.2 Methods

Using inventory form and case study form can more effectively evaluate the traditional Malay house's architectural design features at Kampung Morten to Malacca contemporary house. Figure 3 shows the example of inventory form on the first stage and case study form on the second stage. The selection of houses in Kampung Morten is 10 contemporary houses and 14 traditional houses.

INVENTORY FORM OF TRADITIONAL HOUSE AT KG. MORTEN	
HOME INFORMATION	
<p>Current owner's name: Hj Ibrahim Bin Hj. Hashim</p> <p>Former owner's name: Hj. Hashim Bin Hj. Abd. Ghani</p> <p>Address: 138 Persiaran Dato Osman, Kg Morten, Melaka</p> <p>House age: 100 years</p> <p>Condition of house: Good</p> <p>Modifications: Kitchen floor (using tile)</p> <p>Craftsman's name: Malay craftsman</p> <p>Wood type: Cengal, Meranti</p>	 <p style="text-align: center;">FRONT VIEW</p>  <p style="text-align: center;">SIDE VIEW</p>






CASE STUDY FORM OF TRADITIONAL HOUSE AT KG. MORTEN														
HOME INFORMATION														
<p>Current owner's name: Hj Ibrahim Bin Hj. Hashim</p> <p>Nation: Malay</p> <p>Former owner's name: Hj. Hashim Bin Hj. Abd. Ghani</p> <p>Job description: Former retiree</p> <p>Address: 138 Persiaran Dato Osman, Kg Morten, Melaka</p> <p>House age: 100 years</p> <p>Condition of house: Good</p> <p>Modifications: Kitchen floor (using tile)</p> <p>Craftsman's name: Malay craftsman</p> <p>Material types:</p>	 <p style="text-align: center;">ROOF</p>  <p style="text-align: center;">WALL</p>  <p style="text-align: center;">WINDOW</p>  <p style="text-align: center;">PILLAR</p>  <p style="text-align: center;">STAIR</p>	<table border="1"> <thead> <tr> <th>MATERIALS</th> <th>TYPES</th> </tr> </thead> <tbody> <tr> <td>Roof</td> <td>Zink (metal)</td> </tr> <tr> <td>Wall</td> <td>Wood</td> </tr> <tr> <td>Window</td> <td>Wood</td> </tr> <tr> <td>Pillar</td> <td>Wood</td> </tr> <tr> <td>Stair</td> <td>Concrete</td> </tr> </tbody> </table>	MATERIALS	TYPES	Roof	Zink (metal)	Wall	Wood	Window	Wood	Pillar	Wood	Stair	Concrete
MATERIALS	TYPES													
Roof	Zink (metal)													
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Pillar	Wood													
Stair	Concrete													

Figure 3: Example of inventory and case study form

The second stage study involved the selection of houses for data analysis from inventory studies. A more details of case study form have been designed to obtain the details of traditional and contemporary house structures.

3. Results and Discussion

The data is obtained through observation methods, interviews, surveys, inventory form and case study form. This section is including study results and discussion of the data gained. The analysis is the real results for this case study.

3.1 Identify design features and factors of the structure

To achieve the first objective, an interview was held with Perbadanan Muzium Melaka (PERZIM) with Mr Faiz bin Mohd Baharom and Mr Fairuz Bin Mamat. Some information is gained about the design features and factors that influence a traditional house's structure to a contemporary home. A few

themes were listed and the researcher can conclude that traditional structural features are still emphasized in its adaptation to contemporary homes.

3.2 Survey data analysis

The target respondents were 248 people consisting of residents at Kampung Morten. However, in this case, the researcher takes 30 respondents according to past researcher said that 30 respondents are relevant to conduct an analysis of a study [11].

i. Part A: Demographics

The demographic percentages of respondents in Section A of this study have been summarized in Table 1.

Table 1: Summary respondents demographics

Gender	Male	Female	Total	
	53.33%	46.67%	100%	
Region	Malay		100%	
	100%		100%	
Average age	31-49 years	>50 years		
	13.33%	86.67%	100%	
Resident status	Permanent Resident		Non Resident	
	83.33%		16.67%	
			100%	
Employment sector	Government	Private	Self-employed	Not working
	10.02%	6.66%	36.66%	46.66%
			100%	
House age	>50 years	<50 years	100 years above	
	23.33%	40.00%	36.67%	
			100%	
House type	Traditional house		Contemporary house	
	60.00%		40.00%	
			100%	

As shown in Table 1, 53.55 % of the respondents were male and 46.67 % are female. For the region, 100.00 % of respondents were Malay. From the two categories of respondents, age more than 50 years are 86.67 % and another 13.33% were 31 to 49 years. For the resident status, 83.33 % were permanent resident and 16.67% of respondents were non-resident. There are several employment types; 10.02 % of the respondents were government, 6.66 % were private sector, 36.66 % were self-employed, and the majority of the respondents, 46.66 %, are not working. For the house age, the respondents who stayed at house age which more than 50 years are 23.33 % while less than 50 years are 40.00 % and the rest which more than 100 years is 36.67 %. The majority of the respondents from traditional house residents are 60.00 % and another 40.00 % were from contemporary houses. It can be said that most of the houses at Kampung Morten were traditional Malay house.

ii. Part B: Perception of Kampung Morten as a traditional village

The questions in section B seeks to obtain respondents' perception of Kampung Morten as a traditional village. Kampung Morten was gazetted under the Enactment of Conservation and Restoration of Cultural Heritage in 1988 as a traditional Malay village and tourist attraction [12]. Through this enactment, the villagers need to make sure their village are preserved and conserved. The results show 86.70 % of the respondents in Kampung Morten said "Yes" that their house still retains Malacca traditional house features, while 13.30 % said "No". Based on the analysis, almost 57.60 % of the respondents have relatives or family lives in Kampung Morten, 43.30 % of the respondents' relatives stay outside. This shows that family institutions of Kampung Morten were very close and also the community keep their tradition living in harmonies. The majority of the population said "Yes" that some traditional house structures positively impact adaptation to contemporary houses in Malacca with a total of 80.00 % while 20.00 % said "No". Meanwhile, 76.70 % said "Yes" they introduced traditional

construction structures in Kampung Morten to foreigners. Only 23.30 % said "No". Finally, 90.00 % said "Yes" the privileges and uniqueness of traditional house architecture in this village are visitor attractions and only 10.00 % who said no. This show visitors who came to the Kampung Morten for being amazed and excited about the architectural design of the traditional Malay house.

Table 2: Percentage of perception Kampung Morten as a traditional village

Questions	Yes	No
Is the house inhabited still retain the features of Malacca traditional house	86.7	13.3
Do you have relatives or family lives in the Kampung Morten	57.6	43.3
By declaring the village as a living museum can preserve this traditional house from extinction in term of structure	76.7	23.3
Have some structural of traditional Malay houses in this village have a positive impact in the adaptation of contemporary houses in Malacca	80.0	20.0
Does the community in this village introduce the uniqueness of the traditional house construction structure in this village to foreigners	76.7	23.3
Do the privileges and uniqueness of the traditional house architectural design in this village attract the outsiders	90.0	10.0

For open-ended questions about Kampung Morten villagers' perception towards their village as the traditional village, few themes were listed. For conclusion, it can be concluded that there are many privileges for traditional Malay houses' structural design.

iii. Part C: Traditional house and contemporary house architecture structure design

Questions in section C contains information from respondents about traditional Malay house and contemporary house architecture structure design in Kampung Morten. As well known, the structure design is most important to make the residents stay comfortable.

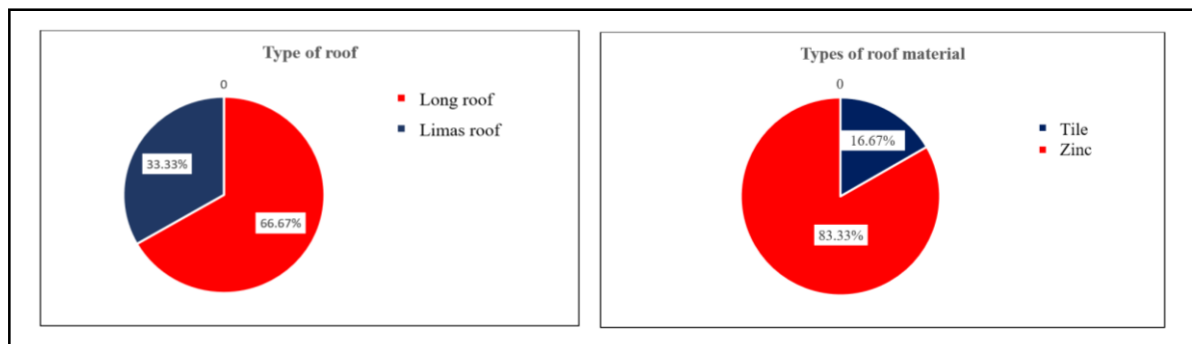


Figure 4: Percentages of roof part

Figure 4 shows the percentages of the type of roof and roof material used in Kampung Morten. Many respondents at 66.67 % opted for the long roof type whilst 33.33 % chose the Limas roof. The researcher could see that most of the villagers in Kampung Morten use the Long roof as the roof is designed to suit the hot and humid tropical climate in our country and provide adequate ventilation. In terms of roofing materials, Kampung Morten residents prefer to use zinc materials at 83.33 %. Meanwhile, 16.67 % of the respondents using tile-type roofing materials.

Table 3: Summary of respondent's architecture structure design

Structure	Elements	Categories	Numbers	Percent
Wall	Wall types	Cassette/Pian	21	70.00
		Susun Sireh	2	6.67
		Stone	6	20.00
		Tindih Kasih	1	3.33
	Wall materials	Brick	4	13.33
		Stone	2	6.67

Window	Window types	Wood	24	80.00
		Casement	22	73.33
		Double casement	4	13.33
		Jalousie	3	10.00
		Geometric	1	3.33
Pillar	Window materials	Wood	25	83.33
		Vinyl	5	16.67
	Pillar types	Wood	14	46.67
		Concrete	6	20.00
		Block	2	6.67
		Brick and concrete	1	3.33
		Brick	2	6.67
	Pillar height	No pillar	5	16.7
		1100mm~1600mm	11	36.67
		~1100mm	10	33.33
		1600mm~	4	13.33
		-	5	16.67
	Stair	Stair types	Stone	24
Wood			1	3.33
No stair			5	16.67
Stair numbers		5.00	16	53.33
		3.00	5	16.67
		4.00	3	10.00
		8.00	1	3.33
		-	5	16.67
Stair's ornament		Ornament	13	43.33
		No ornament	17	56.67

Table 3 shows that 70.00 % used the cassette/Pian wall type and 6.67 % used the wall type Susun Sireh. Meanwhile, 20.00 % use the type of Stone wall and 3.33 % using the type of wall Tindih Kasih. Meanwhile, the number of respondents using brick wall material was 13.33 % and the number using stone wall materials was 6.67 %. Majority of the total number of respondents was 80.00 % using wooden wall materials.

For window type, 73.33 % using casement window and 13.33 % using double casement windows. Meanwhile, 10.00 % used jalousie windows and only 3.33 % used geometric windows. Based on the analysis, window characteristics with simple shapes such as casement windows were suitable for traditional houses and contemporary houses. Meanwhile, 83.33 % using wooden type windows for their homes and 16.67 % used vinyl-type materials.

For pillar, 46.67 % said that they used wooden type pillars and 20.00 % used concrete pillars. Meanwhile, 6.67 % used block type and 3.33 % used brick and concrete mixed type pillars. 6.67 % used brick type pillars and 16.70 % of respondents chose to have no pillars because their home was a fully lower house. Overall, most of the villagers in Kampung Morten used wooden pillars because the wood used has to bear the load. For the house pillars' height, 36.67 % said that their home pillars' height is between 1100 mm to 1600 m. The number of respondents 33.33 % for those with a house pillar height of 1100 mm and below. For the height of 1600 mm pillars upwards, the number of respondents was 13.33 %. 16.67 % chose no answer because they did not have the upper house and their entire home space was the bottom.

Lastly, for the type of stairs, 80.00 % of the total response was using stone stairs. Meanwhile, 3.33 % of the respondents used wooden staircases and 16.67 % stated that they had no stairs for not having an upper house. The number of respondents who had 5 staircases was 53.33 % and the respondents with a total of 3 staircases at their homes were 16.67 %. Meanwhile, the number of respondents with 4

staircases was 10.00 % and 3.33 % had 8 staircases. A total of 16.67 % of respondents did not have a staircase in their homes. The last question in this section is about decoration at the stair. 43.33 % of the total response had ornaments on the staircase tiles. Meanwhile, 56.67 % did not have. The design of a tile-coated stone staircase with ornaments proves that this concept was adapted from Chinese influence in Malay society.

iv. Part D: Factors of adopting traditional Malay house structure to contemporary house

These parts will view the villagers' opinion on the factors adopting traditional Malay house structure to contemporary house. Their opinion will help researcher see the importance of preservation of traditional Malay house structure. The researcher used mean score because the mean is more sensitive to outliers and more influenced by the distribution of the values than is the median [13]. The result of the Likert scale will follow the standard of mean measurement and frequency. Table 4 below show the standard of mean score with frequency.

Table 4: Mean score with frequency (Landell, 1997)

Mean Score	Frequency
1.00 – 2.33	Low
2.34 – 3.67	Average
3.68 – 5.00	High

Table 5 below show findings of the questionnaires on the factor of adopting traditional Malay house structure to contemporary house in Malacca in the form of mean and standard deviation. The total mean score of every question is above 4.00 with the overall mean score for all question are 4.27. Based on Table 4 mean scores for questions about the factor of adopting traditional Malay house structure to contemporary structure is categorized as good and high-level for its frequency. In this case, it can be concluded that the villagers are highly agreed about the factors of adopting traditional Malay house structure to contemporary house.

Table 5: Factors of adopting traditional Malay house structure

Questions	Min	Standard deviation
The method of building installation of traditional Malay houses is more sustainable than contemporary house due able to overcome flood problems.	4.27	0.785
The structure of building materials used in traditional Malay houses is lighter than contemporary houses	4.37	0.718
Building high floors from the construction of traditional Malay houses applied to contemporary houses is able to promote wind movements under the floor of the house.	4.33	0.758
The number of openings on the walls is important in ensuring that the cold air circulation process is active for draining hot air in the house.	4.37	0.718
Various motif carving patterns on elements such as staircases are able to provide aesthetic elements	4.23	0.817
The design value of traditional Malay house architecture is a valuable asset in its retention of contemporary homes.	4.07	0.828
Overall Mean	4.27	

3.3 Compare the structure of a traditional Malay house in Kampung Morten with Malacca contemporary house

Figure 4 shows the example of physical comparison of the roof structure of houses performed by researcher based on inventory studies and case studies conducted against traditional houses at Kampung Morten and Malacca contemporary houses. The following is a comparison according to the structure selected in the implementation of the studies.

3.3.1 Roof

Figure 5 shows the type of roof applied to traditional houses and contemporary homes in Kampung Morten. Almost all the number of respondents residing in traditional houses use long roof types and using logan material which is zinc as their preferred roofing material. The use of long roofs on contemporary houses is still suitable for use as the roof is able to withstand from warm weather and high humidity. The use of zinc roofs from metal is also the preferred choice of contemporary houses due to its cheaper and durable cost.



Figure 5: Example of differences in the roof type

3.3.2 Wall

The majority of the number of respondents residing in traditional houses use cassette/pian-type walls and use wooden materials as their preferred walls. The use of cassette/pian walls is still applied to contemporary houses in Kampung Morten, but stone walls are more encouraged against contemporary houses in Kampung Morten. This is because the cost of building materials is cheaper and easier to find compared to wood.

3.3.3 Window

Almost all the number of respondents residing in traditional houses use casement windows and wooden materials like window frames. Only a small number of them use jalousie-type windows. The use of wood-framed casement windows is more applied to contemporary houses in Kampung Morten than jalousie windows. This is because the windows have many benefits, especially in terms of air movement that goes into the house.

3.3.4 Pillar

Based on studies, most of the traditional Malay house pillars in Kampung Morten are made of wood. This is because wood is a source of nature in the past that is easily available and has a high resistance to weather changes. The use of wooden pillars is still applied to contemporary homes in Malacca but most of them use concrete as pillar materials due to the cheaper cost of wood nowadays and have high durability.

3.3.5 Stair

For the stairs, almost all the number of respondents residing in traditional houses use tiled stone staircases as well as having an odd number of staircases. The tile motives used are heavily influenced by China. Usually, this traditional household stone staircase has an odd number of staircases. The concept of stone staircase architecture is still applied to contemporary houses in Kampung Morten. However, most of the stone staircases in contemporary homes are not coated tiles that are multi-motive because the cost of a piece of tiles as placed in traditional houses is high nowadays.

4. Conclusion

In conclusion, based on the characteristics and factors that have been listed in the first objective, it is clear that the adaptation of traditional house architecture structures against contemporary houses is appropriate for having an advantage in ensuring that housebuilding is sustainable and conducive.

The second objective achieved is to study the structures found in traditional Malay houses in Kampung Morten and the Malacca contemporary houses. This study's objectives were achieved through questionnaires distributed to residents regarding the architectural structure of traditional houses and contemporary houses they live. Through this study, analysis of the types of structural characteristics that are most applied to traditional houses and contemporary houses in Kampung Morten can be identified. 66.67 % opted for the long roof type, 70.00 % of respondents used the cassette/Pian wall type, 80.00 % using wooden wall materials, 46.67 % said that they used wooden type pillars, 80.00 % of the total response was using stone stairs. In fact, the study on the perception of the villagers towards Morten Village as a traditional village and the factors of adaptation of traditional house structures can also be known in greater depth. The overall mean score for the factors of adaptation of traditional house structure's questions are 4.27. Overall, the researcher was able to conclude that the residents of Kampung Moten still retained the architecture of the traditional Malay house structure.

The third objective is related to the comparison of traditional Malay house structures in Kampung Morten against Malacca contemporary house. The researcher was able to conclude that the structure design of traditional Malay houses was still applied to contemporary houses, but the materials used for the structure were mostly replaced by building cost factors and materials that were readily available.

Acknowledgement

The authors would like to thank the Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia for its support. Additionally, to the relevant villagers of Kampung Morten and the staffs of Perbadanan Muzium Melaka (PERZIM) who contributed to the improvement in this study.

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