

THE ASSESMENT OF MEASUREMENT APPLICATION FOR TIMBER  
TRADITIONAL MALAY HOUSE

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A thesis submitted in fulfillment of the requirements for the award of the degree

of

Bachelor of Civil Engineering

Faculty of Civil Engineering and Earth Resources

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MEI 2011

“I hereby declare that I have read this thesis and in my opinion this thesis is sufficient in terms of scope and quality for the award of the degree of Bachelor of Civil Engineering”

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Date : 4 MEI 2011

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## ABSTRACT

The traditional Malay house serves the housing needs of the majority of people living in rural areas of Malaysia. It was evolved by the Malays over the generations, and adapted to their needs, culture, and environment. Most of the material used is readily available local material such as timber, bamboo and many more. Traditional timber houses incorporated design principals relevant in contemporary architecture such as shading and ventilation, qualities present in the basic house features. A traditional Malay timber house usually in two parts: the main house called *Rumah Ibu* and the simpler *Rumah Dapur* or kitchen annex, which was separated from the main house for fire protection. Most of the material used is readily available local material such as timber, bamboo and many more. The study was conducted in Paloh Hinai, Pahang. And the study was carried out through case study and interviews. Then the data analysis was carried out.

## **ABSTRAK**

Rumah Melayu Tradisional memberikan keperluan asas kepada majority orang yang tinggal di kawasan luar Bandar di Malaysia. Ini adalah dipengaruhi oleh generasi Melayu itu sendiri dan disesuaikan dengan keperluan, budaya dan persekitaran. Sebahagian besar bahan yang digunakan adalah bahan tempatan seperti kayu, buluh dan banyak lagi. Rumah-rumah kayu tradisional dimasukkan selaku rekabentuk yang relevan dalam seni bina kontemporari seperti ruang pengudaraan. Rumah Melayu Tradisional biasanya terdiri daripada dua bahagian iaitu rumah utama yang disebut Rumah Ibu dan Rumah Dapur sederhana atau lampiran dapur yang terpisah dari rumah utama untuk pencegahan bahaya kebakaran. Penelitian ini dilakukan di Paloh Hinai, Pahang. Dan kajian dilakukan melalui kajian kes dan wawancara. Kemudian analisis data dilakukan.

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Introduction**

The traditional Malay house is one of the richest components of Malaysia's cultural heritage. Designed and built by the villagers themselves, it manifests the creative and aesthetic skills of the Malays. This is a near perfect house form which is appropriate to local climatic conditions and expresses the way of life of its inhabitants.

The house is extremely well designed to suit the warm and humid Malaysian climate and for the multifunctional use of space. Its design is also flexible as it caters to the widely different needs of the users and it has an addition system which allows the house to be extended to meet the growing needs of each family.

Early Malay houses can be described as raised on timber stilts and made of materials which were easily available from the tropical forests such as timber, bamboo, rattan, tree roots and leaves. Usually the houses have pitched roofs, verandahs or porches in front, high ceilings and lots of big openings for ventilation purposes. Although these characteristics are particularly common in all Malay houses throughout the Peninsular Malaysia, their shapes and sizes differ from state to state.

Through many decades, the Malay architecture has been influenced by Indonesian Bugis, Riau and Java from the south; Siamese, British, Arab and Indian from the north; Portuguese, Dutch, Aceh, Minangkabau from the west; and Southern Chinese from the east. Due to this fact, the Malay vernacular architecture has modified their styles in order to adapt to these influences.

For example, some houses in Kelantan state have a kind of roof which is similar to that of Southern Thailand. This kind of roof style is totally different from the ones in the Negeri Sembilan state which have been greatly influenced by the Minangkabau of Indonesia.



## **1.2 Problems Statement**

Traditional Malay House in Malaysia is slowly becoming extinct. It is very rare a new Traditional Malay House being built throughout the country for normal living purposes other than for ceremonial or heritage exhibition purposes. Culture and tradition is an identity to a society that needs to be preserved for future generation. Preserve is not untouchable. Everything that live will go through an evolutionary process and Traditional Malay House is not excluded. It has got many good aspects, technically, socially and environmentally that need to be explored and adopted in the modern contemporary built environment.

Much implicit information on Traditional Malay House has been made explicit through several researches carried out by some passionate fellow to pave the way for the uncertain future of Traditional Malay House. On the other hand, technical aspects of Traditional Malay House were rarely studied. Therefore, the aspects of construction innovation of the Traditional Malay House and what can be learnt for future application of the concept of modularity that has existed in Traditional Malay House for very long time. Prefabricated nature of Traditional Malay House will only require a right ingredient and proper management practice to give Traditional Malay House a chance for modernization and industrialization.

### **1.3 Research Objectives**

Objectives of the research are:

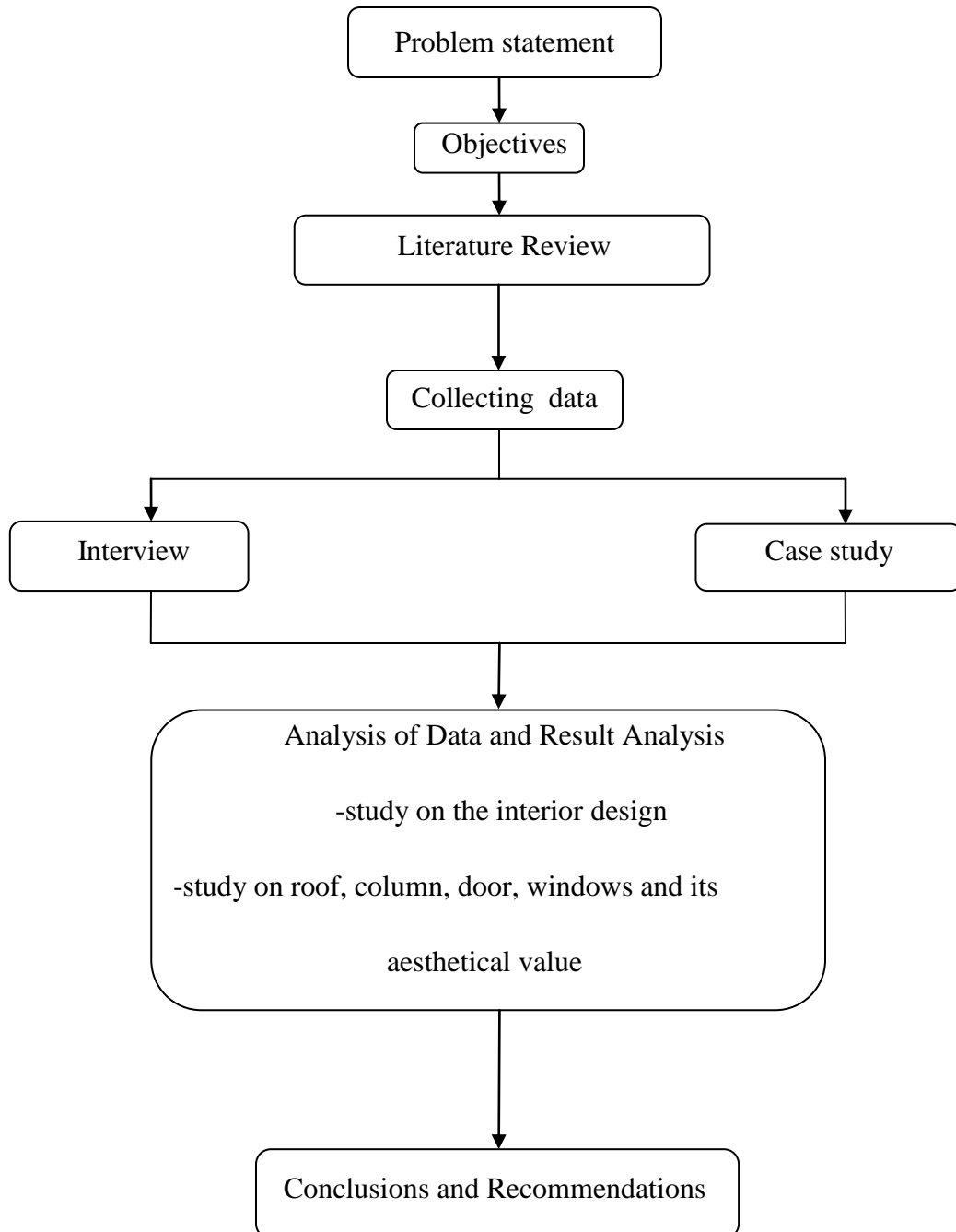
- i. To highlight the architecture of design in Traditional Malay House.
- ii. To identify measurement of building elements in Traditional Malay House.
- iii. To identify the differences of Traditional Malay House and modern house.

### **1.4 Research Scope**

The study will focus on the literature review and data collected from interviewing the owner of the traditional house.

### **1.5 Research Methodology**

This research will be carried on through stages including problems statement and research objectives, literature review, collecting data, analysis and discussion, conclusion, summary and presentation. The final stage is getting feedback from supervisor and panels to ensure the objectives of the research are successfully fulfill.



**Figure 1.1: Methodology Diagram**

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

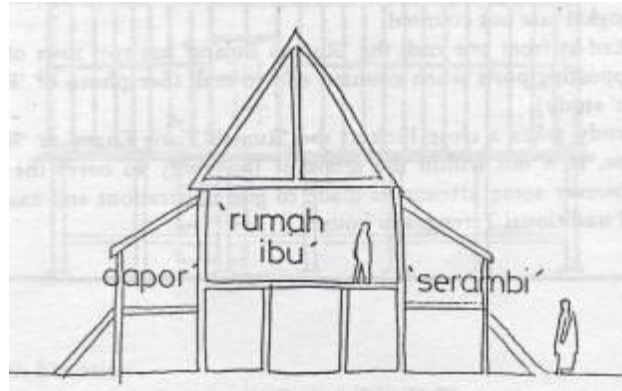
This literature review will be divided into five sections. The first section will deal with the background of traditional house in construction industry. The second will discuss about the modularity concept in traditional Malay house. Next, will define the design in traditional house architecture. Then, it follows up with the traditional system of measurement and the traditional construction method. After that, it will cover the topic of analysis of aesthetical value of traditional Malay architecture.

## 2.2 Background of Traditional Malay House

Traditional Malay House can be classified as a vernacular architecture, is the architecture of the local people, ‘architecture without architect’, of the Malay Peninsula before the colonialism period. Traditional Malay House is categorized by many different types but almost all of them shared common principles that attributed to Traditional Malay House.

Most of the Traditional Malay House can be found in rural area village. It is built with Malay creativity and their affective bond with their nature and environment. The climate made a Traditional Malay House raised on timber stilts or piles to elevate the building above the ground level. It is due to heavy rainfall that sometimes brings flood. Although it use timber as main structure, amazingly it is build without a single nail, instead the Malays used pre-cut holes and grooves to fit the timber building elements into one another, effectively making it a ‘pre-fabricated house’. There are handcrafted panels, holed carvings and slatted panels around the walls.

All Traditional Malay House were built of timber as indigenous and abundantly found material, raised on stilt, consists of three main spaces, ‘rumah ibu’, ‘rumah tengah’ and ‘rumah dapur’, and covered by a long roof with some regional variations. It evolved over generations through their way of living, adapting to their needs, culture and environment [1].



**Figure 2.1: Section of basic traditional Malay house**

**Source: Yuan, 1987**

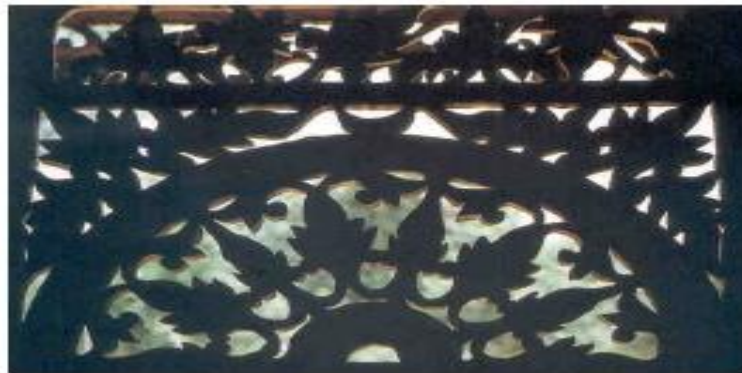
This section shows the most basic housing unit which satisfies the basic needs of a family in Traditional Malay House.

### **2.3 Design of Traditional Malay House**

The village environment is generally cool and shady, with lots of greenery. Paths are unpaved, and compounds are kept meticulously clean. Spaces flow into one another freely with few boundaries or obstructions. Unlike the roads of modern housing estates, which tend to segregate and disintegrate, the absence of physical barriers in the kampong allows a flexibility in accommodating individual needs that is not available under the imposed order of the modern housing estate. [1]

The traditional Malay house has an open interior, promoting good cross ventilation and lighting and allowing the space to be used for many purposes depending on the season, occasion, or time of day. Since most activities take place on the floor, the need for furniture is minimal. [1]

The building is well ventilated by having doors and windows with perforated panels or adjustable louvers, and floor board with 1/4 inch gap to let the air to circulate in and out from beneath the building. The traditional Malay house has also been designed to suit the local climatic requirements using various solar control devices and low thermal capacity materials.



**Figure 2.2: Openings to exterior walls to promote natural ventilation.**

**Source: Rashid, 2008**



**Figure 2.3: Steep roof and openings allows for fast water runoffs and facilitates circulation of hot air out of the house to increase natural ventilation.**

**Source: Rashid, 2008**

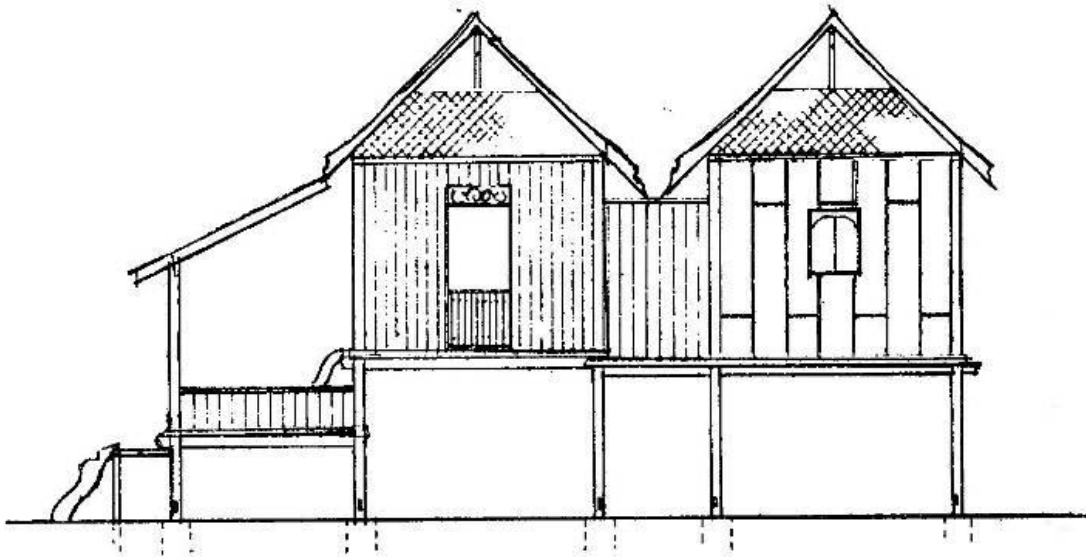


**Figure 2.4: Designed to suit the local climatic requirements using various ventilation and solar control devices, and low thermal capacity building materials**

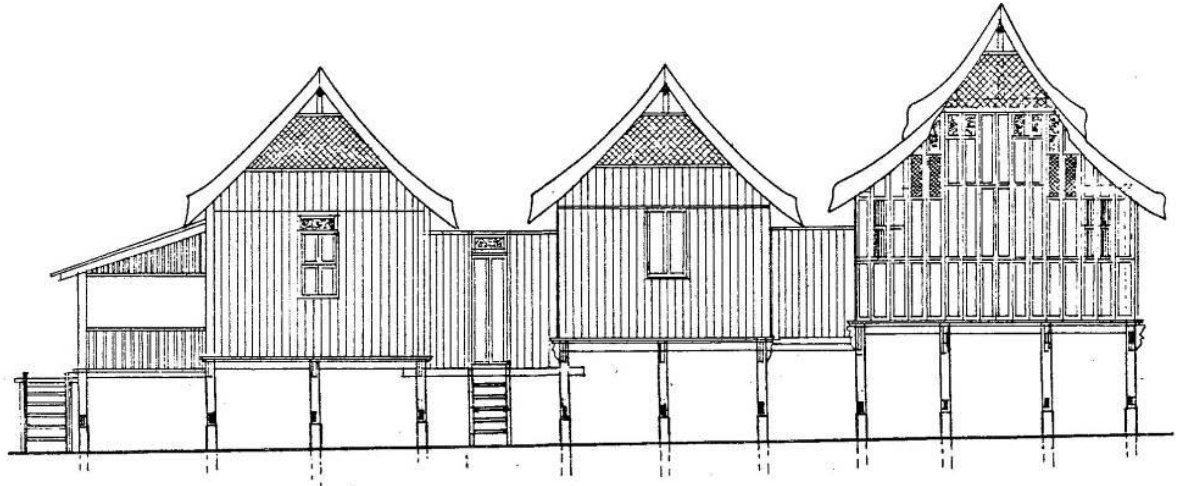
**Source: Rashid, 2008**



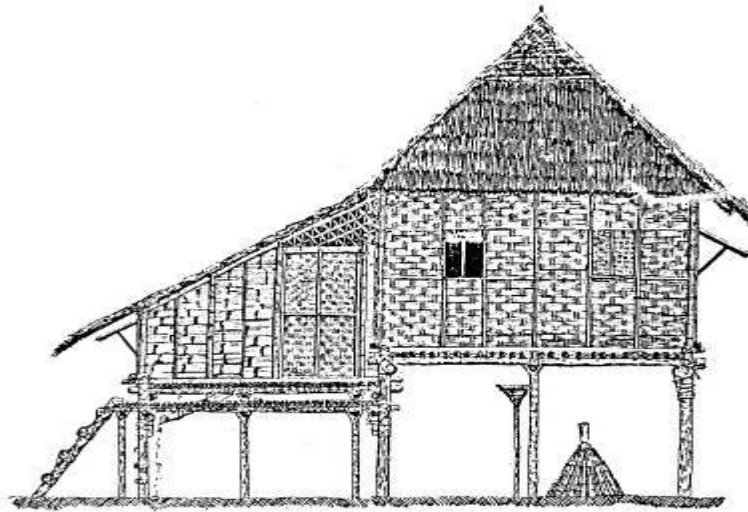
This believed might be the explanation for the reason of why the Traditional Malay House is always symmetrical in design and highly decorated on the façade treatment. The most decorated part of the house is the front that is on the verandah. Human is very much symmetrical in nature with two eyes, nose, mouth, two legs and hands. The universe has become the source of reference for decorative motives, includes plants, patterns, animals and so on. The concept of anthropomorphism, the underlying belief system of the Malays, gives the characteristics to the architecture of Traditional Malay House. Modular design and repetitive rhythm of the front facade is the product of underlying belief system of the Malays are corrected and perfected through the test of times. [2]



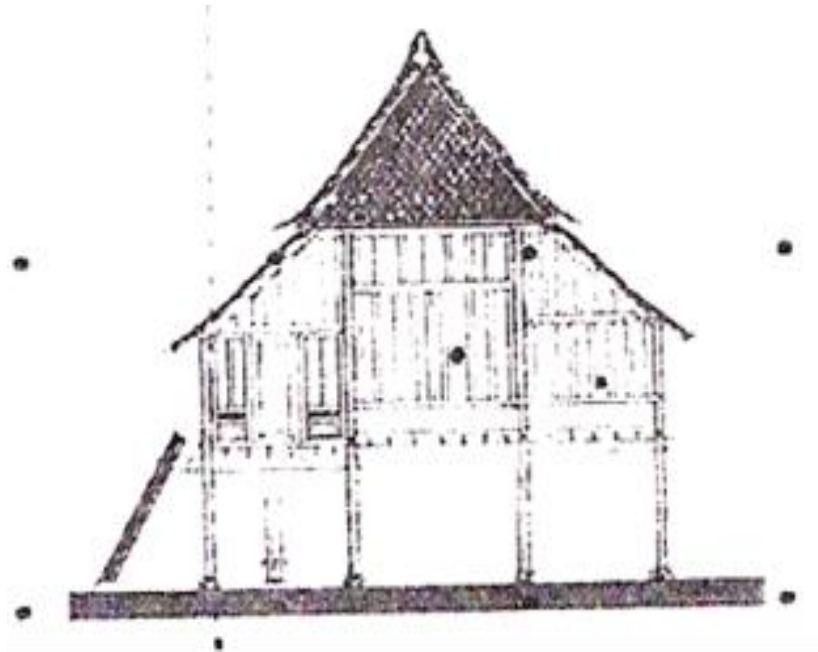
**Figure 2.5: A form of the Traditional Malay House (retrieved from Nasir, 1985)**



**Figure 2.6: A form of the Traditional Malay House (retrieved from Nasir, 1985)**



**Figure 2.7: A common form of a Traditional Malay House and its geometrical representation (retrieved from Nasir, 1985)**



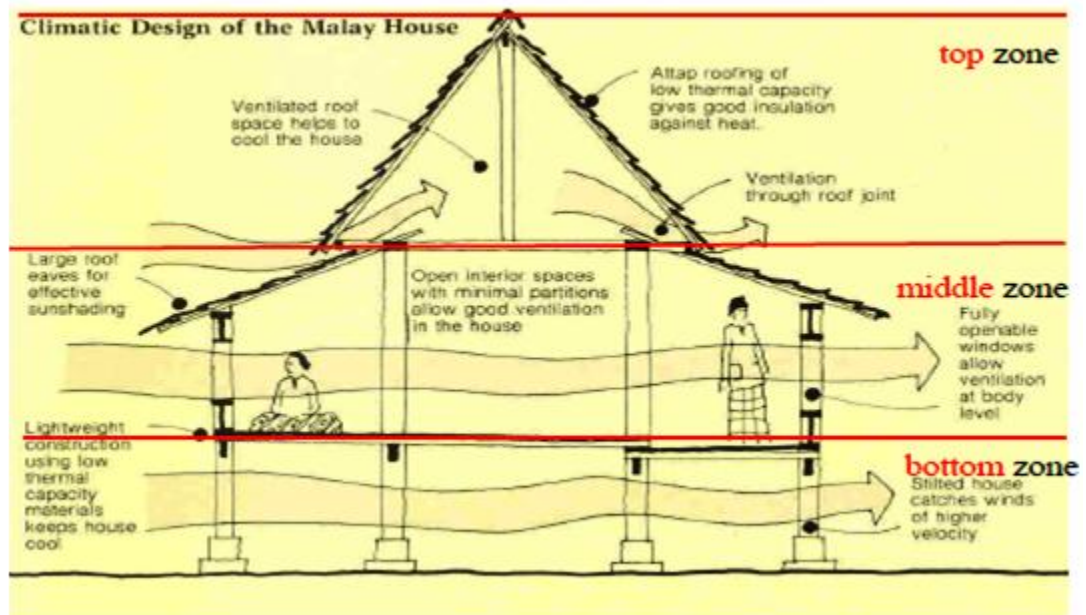
**Figure 2.8: A common form of a Traditional Malay House and its geometrical representation (retrieved from Nasir, 1985)**

### **2.3.1 Environmental Details of Malay House**

A vernacular house in Southeast Asia is often a reflection of social position and cultural patterns, and where these same patterns are expressed in contemporary houses they result in specific spatial arrangements. Climate and lifestyles in this region make the open terrace or pavilion a constant theme. [3]

It is not simple shelter from the tropical climate it also involve the creation of social and symbolic space which both mirrors and moulds the world's view of its creators and inhabitants. Our fascination with vernacular built forms is intuitive and is recognition of forms and patterns that speak a nearly universal language that is deeply rooted in our collective unconscious memory. [4]

The traditional village on the other hand reveals sublime architectural qualities that express the way of life, culture and ingenious climatic adaptation of its users. It is not only a physical and geographical entity but also a political and cultural institution. Our priority in habitation lies in the relationship of the idea of life, family and community. It is more of a spiritual issue and thus requires sensitive intervention. If we fail to acknowledge this, then in the sea of congested modern housing, we will be living separate and individual lives and will forever be plagued with climatic problems and cultural tensions. [5]



**Figure 2.9: Environmental details of Malay house**

Source: Tajuddin Rasdi, 2005

In the traditional Malay house, there is a clear definition of architectural elements and can be categorized into three main zones. The top zone, which covers the roof element, the middle zone for wall and the bottom zone which is the floor. The bottom zone however, is not evident in our modern design of buildings.

### **2.3.2 Modularity Concept in Traditional Malay House**

According to the Readers Digest Word Power Dictionary, a module is a unit that forms part of something bigger, or one of a set of separate parts or units that can be joined together to make a machine, a piece of furniture, a building, etc. And modular is of something, machines or buildings, consisting of separate parts or units that can be joined together. [6]

While in the dimensioning aspect, a module is a convenient unit of size which is used as an increment or coefficient in dimensional coordination. The latter definition is better suited to the intent and purpose of this research, because the focus will finally be the dimensioning system of the Traditional Malay House. [7]

Building can be divided into several elements i.e., physical, spatial and functional. Physical elements are constituted by the structure of the building, aesthetic, materials, colors and so on. Spatial elements are related to space and the position, size, shape and so on. While the functional elements are related to the activities in the building which may have direct influence to the actual design of the building, space planning as to meet all requirement for the building to function as it supposedly to. [8]

Physical elements in building can be broken down into three components. Three different types of components are sections, units and compound units. Brick, block, tile, window pane, panel, door leaf, lintel, pipe and pipe fitting are some of the examples of unit, a single thing that is complete by itself but can also form part of something larger. [9]

A door with frame, window, lattice girder, roof truss, sink unit, refrigerator, and cupboard are some examples of compound unit, a thing consisting of two or more separate things combined together. This demonstrated that a unit and a compound unit can also be a module. Therefore any part of a building or building consisting such units can be called 'modular building'.

## **2.4 Traditional System of Measure**

Human proportions and dimensions has been traditionally a basis of measurement throughout the world. This was a result of human instinct to fulfill their fundamental needs of building their own indigenous house for shelter and protection. Measurement based on the human body; usually the hands and arms of the carpenters are used also by the Malays. The longest unit of measurement in human body is 'depa' – the dimension between the tips of the fingers of the horizontally out-stretch arms often used to measure lengthy objects and wide spaces. The smallest unit is one 'jari' or the width of a finger. One 'jari' or more is often used to measure smaller elements. [1]



**Figure 2.10: Traditional measurement of '1 jari'.**



**Figure 2.11: Traditional measurement of '2 jari'.**





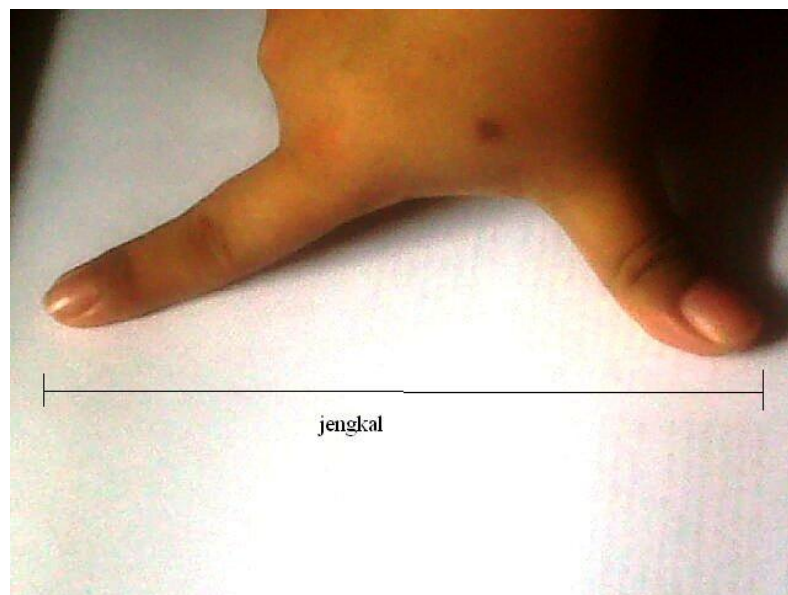
**Figure 2.12: Traditional measurement of '3 jari'.**



**Figure 2.13: Traditional measurement of '4 jari'.**



**Figure 2.14: Traditional measurement of '5 jari'**



**Figure 2.15: Traditional measurement of 'jengkal'**



**Figure 2.16: Traditional measurement of 'depa'**

The Table 2.0 below is a conversion table of the ‘depa’ units to the metric equivalent. The table will be used as a basis to search for the modular pattern existed in the Traditional Malay House under study.

<b>Metric equivalent</b>	<b>Smallest units</b>	<b>Next successive units</b>	<b>Second successive unit</b>	<b>Third successive units</b>
16 mm	1 jari			
32 mm	2 jari			
48 mm	3 jari			
64 mm	4 jari			
80 mm	5 jari	1 tapak tangan		
160 mm	10 jari	1 jengkal		
320 mm		2 jengkal		
400 mm		2 jengkal 5 jari	1 hasta	
480 mm		3 jengkal		
800 mm		5 jengkal	2 hasta	½ depa
1600 mm		10 jengkal	4 hasta	1 depa

**Table 2.1: The ‘depa’ units of measure and their metric equivalent (Ariffin, 2001)**

## 2.5 Traditional Construction Methods

Building materials are derived from vegetation and natural materials that can be found near the building site itself. They may range from plan leaves and trunks, to bamboo, bark of tress, timber as well as clay for roof tiles and small granite blocks for footings. Most are gathered raw and processed into finished forms by the carpenter or owner himself as in the case of woodwork, while the service of weaver, carvers are also required for dealing with bamboo, palm leaf roofing, and decorative carvings. Generally the actual erections of the structure and preparation of the site are done with the willing hands of the community, leaving all the fine works to the specialized hands mentioned before.

Timber forms the major component of our traditional buildings. Malayan timbers either produced traditionally or commercially, are entirely hardwood. Therefore, in the absence of softwood, Malayan hardwoods are normally further classified into ‘primary’ and ‘secondary’ hardwoods to distinguish between those are naturally durable under adverse condition and those that are not. Fortunately most of the timber used in our traditional works is of the best types of primary hardwood. For example *cengal* is the standard, durable timber of Malaya.

The wood is very strong, hard, heavy, and relatively durable under severe local conditions. It is not difficult to work, and shrinks appreciably less than other Malayan timber and is suitable for heavy structural work. *Merbau* is another common type which is strong, hard and heavy, and also resistant to termites, but it may decay when circumstances are favorable for fungal development. It is an excellent house-post timber, and the most attractive local wood for flooring and paneling.

Trees are either entirely conured at stump or at least halved or quartered and then hauled by buffaloes out of the forest. But before conversion, the logs are usually kept under water or mud for a few months as it is considered the timber will be more durable, by breaking down the sap wood, using this method. This is quite often done by the owner himself with the help of other village folks.

## **2.6 The traditional Malay Architecture**

### **2.6.1 An analysis of its aesthetical roof elements**

The scope of this study refers to a few aesthetical elements within a particular Traditional Malay architecture of the roof which are:

- a. *Tunjuk Langit*
- b. *Sisik Naga*
- c. *Ande-Ande*

#### **a. *Tunjuk Langit***

In the architectural terminology of the Malay house, *tunjuk langit* often refers to the two elements which are the internal structural timber member of the roof, fixed centrally to function as a support for the ridge acting as a support structures to the rafters.

Within the house, the sky forms the top of the house (the ceiling and the roof) whilst the first piece of is often referred to, as pointing to the 'sky' internally (*langit*); whilst the second piece of *tunjuk langit* as another architectural element on the outside tip of the roof pointing towards the real sky. [11]

#### **b. Sisik Naga.**

*Sisik naga* (literally means dragon fin) are decorative architectural elements can be found in palace architecture, residential and religious buildings in Indochina, Malaysia, Thailand and Indonesia. Findings of images on stone carvings in the twelve century on the walls of temple of Bayon in Angkor Thom near Angkor Watin Cambodia and also the temple of Borobodur in Java highlight the importance of *sisik naga* as a style in the architectural language of the region. [11]

The design of the temples in China and Indonesia also shows the use of the mythical dragon motifs along the ridge of the roof (*perabung*). In the context of the traditional Malay architecture, most of the palaces of the Malay rulers used *sisik naga* as decorative elements on its roof and called *puncak rabung*. [11]





**Figure 2.16:** *Sisik Naga* as seen on the ridge of Istana Jahar, Kota Bharu, Kelantan.

**Source:** Sabrizaa Abd. Rashid,2008

**c. *Ande-ande*.**

*Ande-ande* is the horizontal decorative timber roof eaves covering the timber rafters. *Ande-ande* used on the East coast of Peninsular Malaysia such as in Kelantan and Pattani in Thailand. There are at least two types of *ande-ande* which are the single piece type with carvings on a single long timber piece and multiple pieces with carvings on multiple timber pieces arranged side by side. [11]



**Figure 2.17: Ande-ande with multiple pieces.**

**Source: Sabrizaa Abd. Rashid,2008**

## 2.6.2 Symbolism of the Aesthetical Elements

### a. As a status of symbol (*darjat*)

Recent studies on the traditional Malay houses in Perak established that many houses that employ the *tunjuk langit* as motifs for decoration are actually owned by wealthy or noble Malays. Further study confirms the original findings that the more elaborate the *tunjuk langit* used, the wealthier or noble the owner is in the society. [11]

### b. As a symbol of a warrior (*kepahlawanan / pendekar*).

The use of the spear as the *tunjuk langit* is more widespread in the traditional Malay house since the spear is an important weapon that represents strength and might of the user. Traditionally the spear is used as the primary standoff weapon by the palace guards other than the *keris* (traditional weapon). [11]

**c. As a symbol of the existence of a higher being of the spiritual world.**

*Tunjuk langit* shape is based on the triangle; and in the Malay world the triangle is believed to embody the symbol of the mountain. This is similar to motifs found on *batik* and *songket* designs. The *tunjuk langit* is based on the basic shape of the triangle that is divided according to the size e.g. biggest/lowest, smallest/highest reflecting the cosmological belief of the Malays. [11]

Abdullah Mohamed, 1985 further relates, the *tunjuk langit* with the hierarchical nature between the spiritual and the real world; as a flower that transform into various shapes; every levels reflect specific meanings and that the overall design contains spiritual secrets that are hidden from the normal human being. [11]

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 Introduction**

The finding of the literature review in the previous chapter only provides an overview of the Traditional Malay House. So, the best way to obtain more information about the structure, concept , dimension, the timber used and its aesthetical value of traditional house are by case studies and a bit information from the former owner of the house. All the data such as the exact dimension of the house will be collected. Information gather from this way is known as Primary Information. The other information were obtained from article, journals, reference books, conference papers, internet web site and other published research papers.

## **3.2 Methodology**

This research will be carried on through stages including problems statement and research objectives, literature review, case studies, collecting data, data analysis and discussion. During case studies, all the information about the Traditional Malay House in Paloh Hinai, Pahang will be gathered. The dimension of the house, the woodcarving, the type timber used and the interior design will be analyzed.

### **3.2.1 Problem Statement & Research Objectives**

A statement of problem must be identified to justify a reason to start doing a research. After the problems has been identify, several research objectives are to be set and the scopes of study are specify to conducting the research.

### **3.2.2 Literature Review**

All information regarding traditional Malay house is gathered through a literature review. This is considered as a very crucial stage because at this stage, all the relevant information that is needed to build more in depth knowledge about the topic is chosen for this research project.

### **3.2.3 Case Study and Collecting Data**

The data of this research will collect through literature reviews from journals papers and also by conducting interview. At this stage, more practical information is obtained from the case study that carried out at Paloh Hinai, Pahang and also interview from the former owner of the traditional house. Then, we will measure the important dimension of the house and collect all the important data such as capturing some pictures of the house.

### 3.2.3.1 Door

The dimension of the door is 2.57m x 1.09m and it is made from *kayu cengal*.



**Figure 3.1: The main door of the house.**



### 3.2.3.2 Window

The dimension of the window is 2.86m x 0.97m and made from *kayu cengal*.



**Figure 3.2a: The window (window panel application)**



**Figure 3.2b: The window (window panel opened)**

### 3.2.3.3 Column

The length of the column is 1.19m above the ground and the dimension of the column is 0.15m x 0.15m. The column is made from concrete.



**Figure 3.3a: The column the front of the house**



**Figure 3.3b: The column at the back of the house**

### 3.2.3.4 Roof

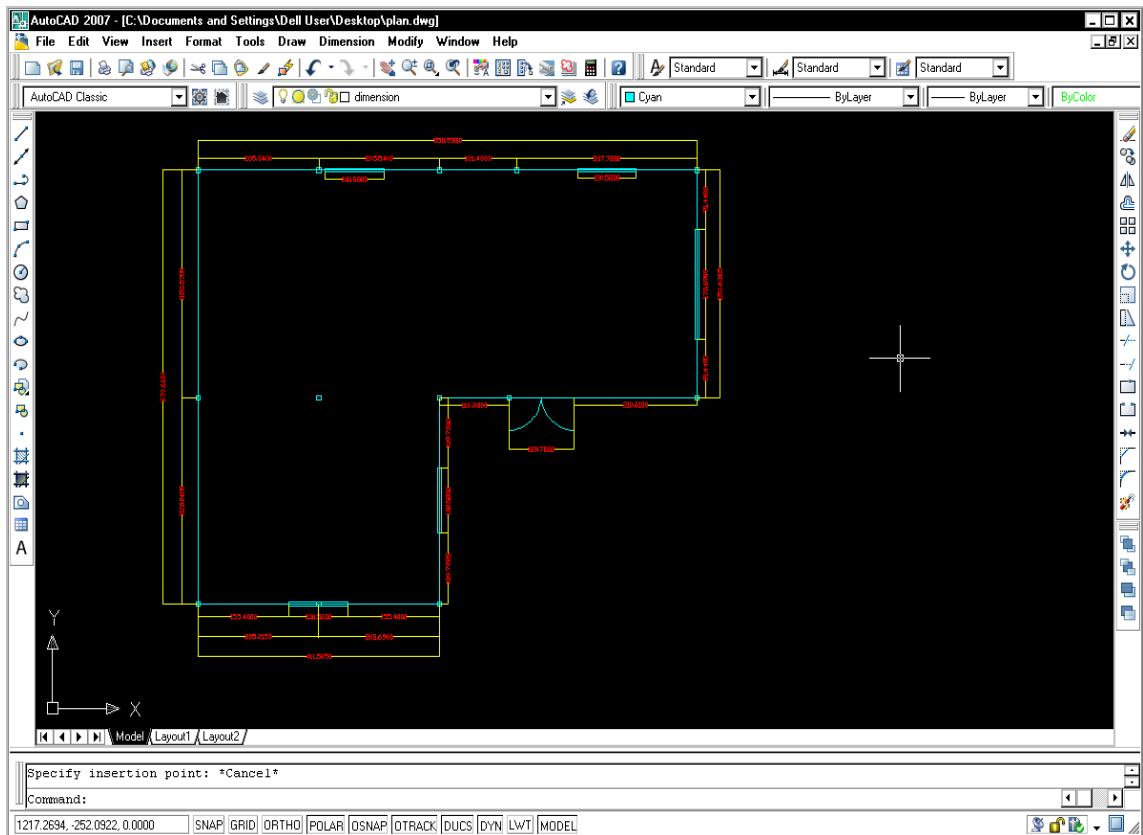
The length of the roof is approximately 4.27m and the height is 0.78m. It is also made from *kayu cengal*.



**Figure 3.4:** The roof shows the woodcarving made by local craftsman

### 3.2.4 Data Analysis

All the collected data will be draw by using Autocad 2007 as shown in Figure 3.5a and 3.5b below:



**Figure 3.5: All the dimension collected will be drawn into a plan.**

### **3.2.5 Conclusion and Summary**

After all the stages are done, a conclusion and summary of findings from the research are presented. This is where all the information collected are reviewed and analyzed. Then it is reproduce in own words to be presented to the relevant individual.

### **3.2.6 Feedback**

After the presentation, feedback from the appropriate lecturer, supervisor and panels are much appreciated. This is an important part as this will contribute to a better research project.

## **CHAPTER 4**

### **ANALYSIS AND RESULT**

#### **4.1 Introduction**

The data for this research were collected through case study and follow up by interviewing the owner the traditional Malay house. The interview is focused on the timber used in the architecture and understanding the aesthetical value of the traditional Malay house. Whereby, the entire dimensions are gathered by my own and all the data will be stored and drawn by using Autocad 2007. The main purpose of using Autocad 2007 is that to apply the civil engineering works in this project.



## 4.2 Data Collected

All the drawings are shown in next pages.

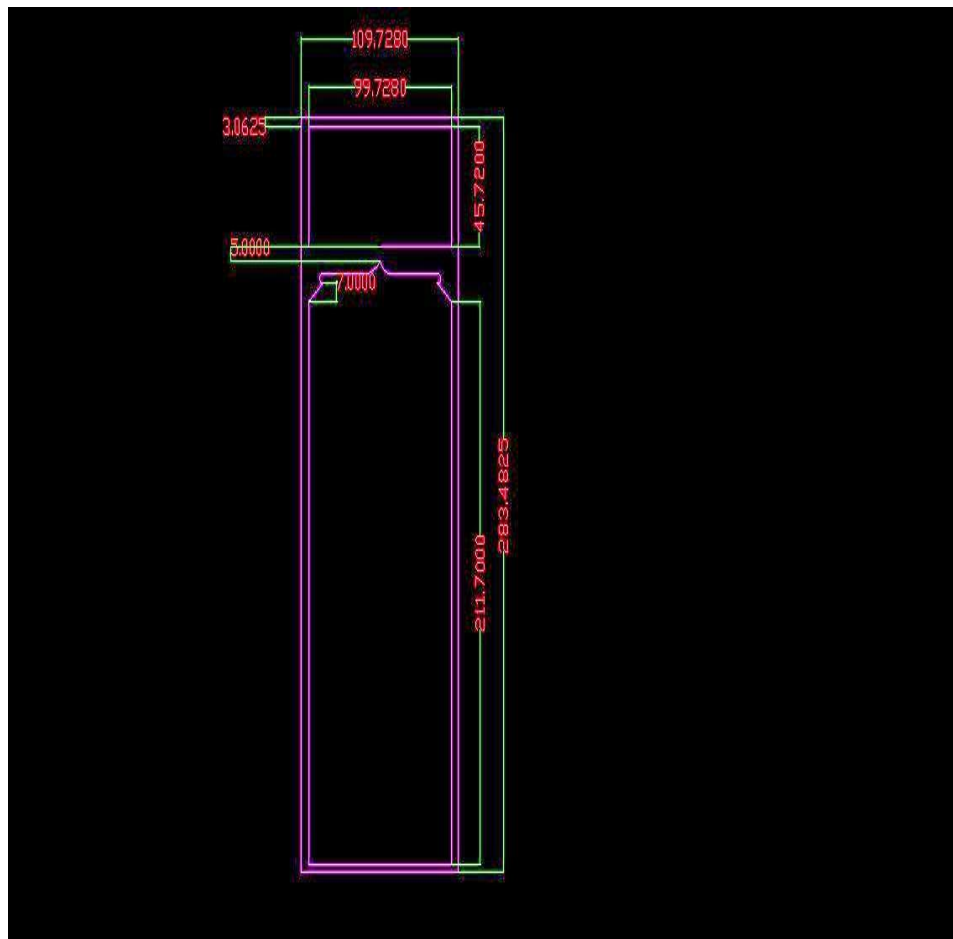
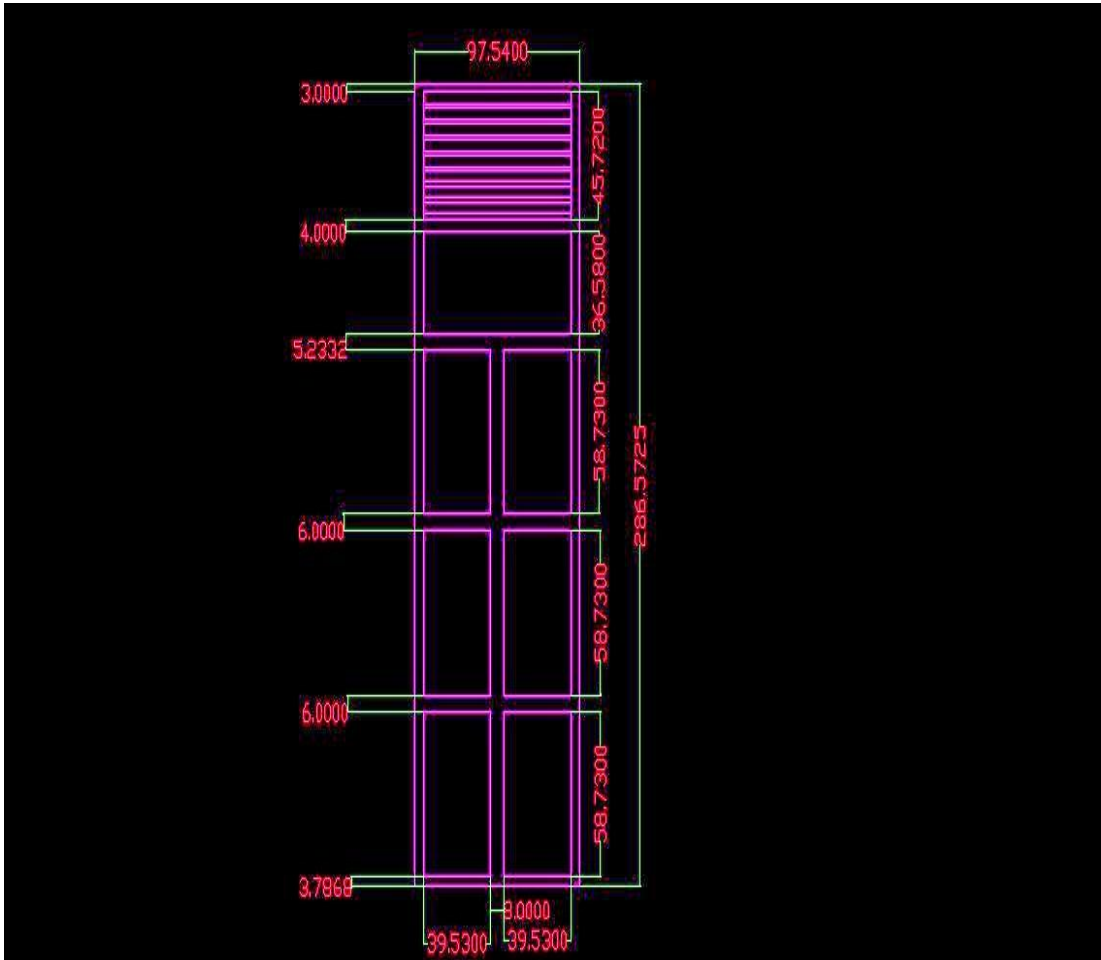


Figure 4.1: Dimension of the door



**Figure 4.2: Dimension of the window**

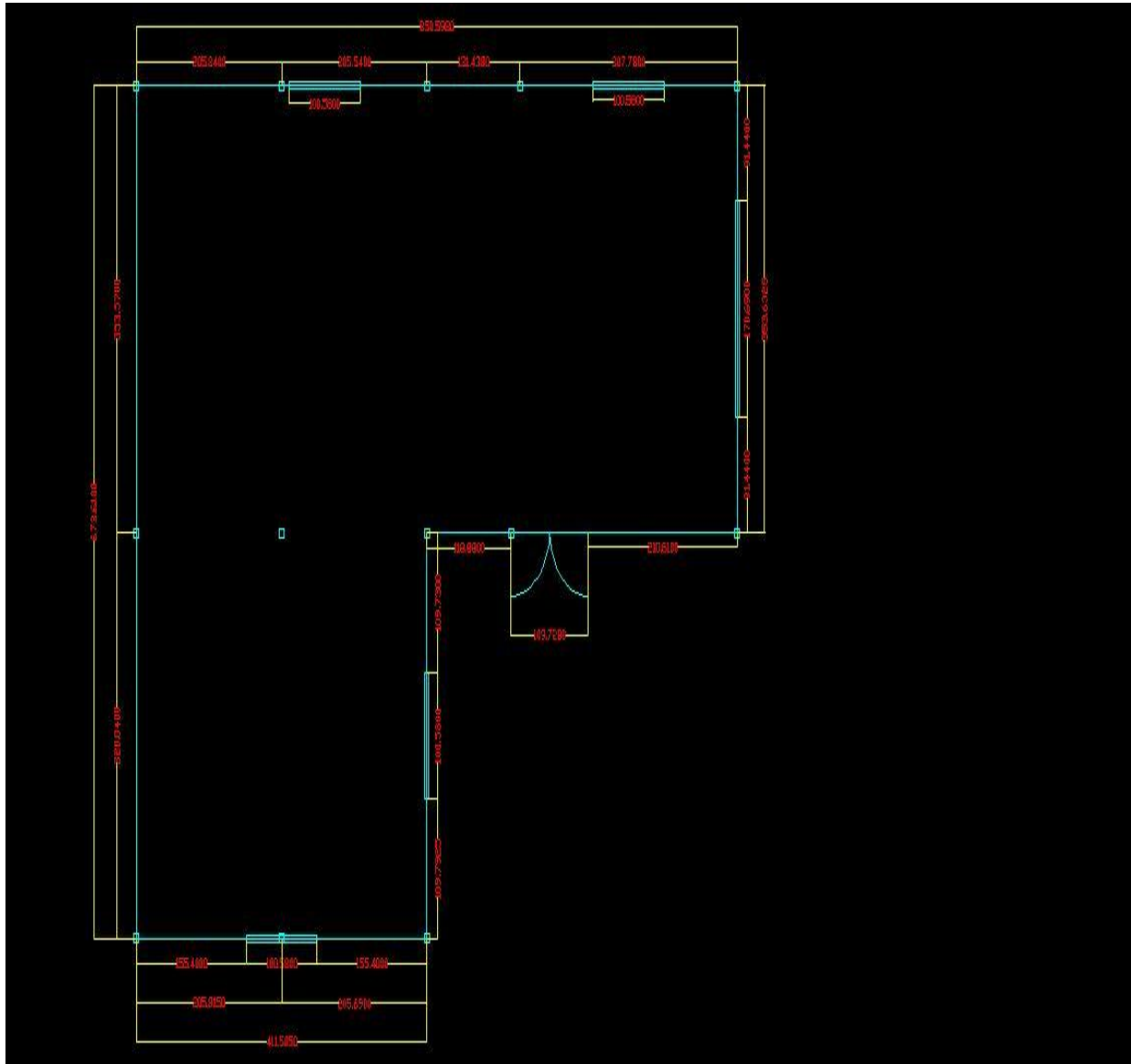


Figure 4.3: The plan of the house

### **4.3 Discussion of result**

The figure shows a few elements from the house which has been measured and drawn into AutoCAD software. The door has its own arch which is crafted from local craftsman. On the upper side of the door consist a natural lighting which gives an adequate daylight in the inner space of the house.

The windows of the house have a unique design whereby it has its own way of air ventilation that will decrease the temperature of the inner house.

## **CHAPTER 5**

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Conclusion**

Generally, the first and the second objective was achieved through the literature review in the chapter 2 and also from the case study conducted at Paloh Hinai, Pahang. The conclusions of all objectives were summarized as follows:

### **5.1.1 Architectural Design of Traditional Malay House**

The traditional Malay house is a timber house raised on stilts. It is basically a post-and-lintel structure with wooden or bamboo walls and a hatched roof. Windows are plentiful, lining the walls and providing good ventilation and views for the house. This quality of openness is also reflected by the large open interior spaces with minimal partitions. From a distance, the Malay house seems to merge naturally with the environment. The roof, which is large, dominates the low walls and the open stilted bottom of the house. The juxtaposition of the roofs with different sizes and at different orientations creates an interesting visual form. The traditional Malay house was evolved by the Malays over generations, adapting to their needs, culture and environment.

With a direct dependence on nature for its resources and embodying a deep knowledge of ecological balances, the house is efficiently designed to suit the local climatic requirements using various ventilation and solar-control devices, and low-thermal-capacity building materials. Besides being well adapted to the environment, the house has also evolved a prefabricated building system which is flexible and varied to suit the needs of the users.

### **5.1.2 Concept and Design of Traditional Malay House**

The traditional Malay house is comprised of the physical, spatial and functional elements. The functional element consists of a list of activities that may take place within the spaces of the houses that include receiving of guests, cooking, dining and sleeping. These activities are closely tied to the spatial elements because of the culture and tradition of the Malays. The inter-relationship of these elements forms rules that determine the hierarchy of spatial importance in the house.

### 5.1.3 Comparison between Traditional Malay House and Modern House

Traditional Malay House	Modern House
<ul style="list-style-type: none"> <li>❖ Use lightweight construction of wood and other natural materials. The lightweight construction of low thermal capacity holds little heat and cools adequately at night.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Modern housing use bricks, tiles, concrete and other materials of high thermal capacity. These materials store up heat and reradiate it into the house, causing considerable discomfort</li> </ul>
<ul style="list-style-type: none"> <li>❖ Roof spaces in the traditional Malay house are properly ventilated by the provision of ventilation joints and panels in the roof construction.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Roof spaces are insulated by trapped air instead of being ventilated. Such construction requires a high ceiling to be effective.</li> </ul>
<ul style="list-style-type: none"> <li>❖ The elongated open plans allow easy passage of air and good cross ventilation. There are minimal interior partitions in the Malay house which restrict air movement in the house.</li> </ul>	<ul style="list-style-type: none"> <li>❖ More complicated shapes, and the partitioning of the house into different rooms and areas restrict air movement and cross ventilation in the house.</li> </ul>
<ul style="list-style-type: none"> <li>❖ The traditional Malay house on stilts captures winds of higher velocity at a higher level. This is especially vital in areas where there are plant covers on the ground which restricts air movement.</li> </ul>	<ul style="list-style-type: none"> <li>❖ The housing estate house at ground level receives wind of lower velocity. Hedges and solid fences built around the house to provide privacy of ten block winds and create steeper wind velocity gradient.</li> </ul>



<p>❖ The body level is the most vital area for ventilation for comfort. The traditional Malay house allows ventilation at the body level by having many full-length fully operable windows and doors at body level.</p>	<p>❖ Ventilation is often only directed at the upper part of the body because windows and other openings are located at higher levels to provide privacy.</p>
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**Table 5.1: Comparison between Traditional Malay House  
and Modern House**

## **5.2 Recommendation**

There are some suggestions that can be done in next further study such as a study on the design of Traditional Malay House that can be applied on modern living house and a study on architecture design for modern house that can increase ventilation.

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