**DEPARTMENT OF**

**BUILDING**

**UNIVERSITI**

**TEKNOLOGI**

**MARA (PERAK)**

# SHADING DEVICES FOR RESIDENTIAL HOUSES

**Prepared by:**

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**FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING UNIVERSITI TEKNOLOGI MARA**

**(PERAK)**

**FEBRUARY 2022**

It is recommended that the report of this practical training provided

**By**

**MOHAMMAD ZULHAZMI BIN REDZUAN**

**2019209284**

**Entitled**

**Shading Device For Residential Houses**

Be accepted in partial fulfilment of requirement has for obtaining Diploma in Building.

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|---|---|---|
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**(PERAK)**

**FEBRUARY 2022**

## STUDENT'S DECLARATION

I hereby declare that this report is my own work, except for extract and summaries for which the original references stated herein, prepared during a practical training session that I underwent at SBS North Enterprise for duration of 16 weeks starting from 6 September 2021 and ended on 7 January 2022. It is submitted as one of the prerequisite requirements of BGN310 and accepted as a partial fulfilment of the requirements for obtaining the Diploma in Building.

……..……

Name : Mohammad Zulhazmi Bin Redzuan
UiTM ID No : 2019209284
Date : 10 January 2022

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As well as the theory involved steel structure analysis. They are also in charge of streamlining and evaluating my training. Also to the other staff for giving their best encouragement and they've gone out of their way to help me improve my ability to understand construction and site administration procedures, tests procedures,and industry best practises. It is a privilege for me to have the opportunity to 'work' with each of you.

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Last but not least, I want to express my gratitude to my loving parents for all of their sacrifices over the years. Friends who have always been there to assist me whenever I am unsure of how to complete a task. They will always be present in many ways. Thank you so much.

**ABSTRACT**

Shutters, awnings, canopies, blinds, and projecting horizontal and vertical fins are examples of shading devices on the outside of the window. Because the absorbed heat is dispersed externally, these sun controls are the most effective of all for lowering solar radiation when properly built. These devices, which can be fixed, adjustable, or retractable, must be constructed to exclude direct sunlight from entering the window at specific periods of the day and year. Fixed projections work best in the tropics and subtropics, where the sun's altitude is high, but they are less successful in temperate places like the United Kingdom. This is due to the fact that to provide effective protection at low sun angles, they would have to project a distance greater than the window height. For this report, I want to focus on awning as shading devices for residential houses. Therefore, this report contains will include the types of awnings and how to construct the awning. It is necessary to know the suitable types of awnings needs for better shading for residential houses and to make sure the lower sunlight penetration through the houses.

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# CHAPTER 1.0

# INTRODUCTION

## 1.1 Background of Study

External shading elements such as eaves, awnings, and verandahs are important for limiting undesired solar heat intake, especially in cooling-dominant regions and throughout the summer in temperate climates. Shading devices operate by preventing direct sun radiation from entering a room through windows. Second, they help by limiting the amount of heat that is transferred directly to the walls. The most effective technique to limit solar heat gain is to use external shade devices.

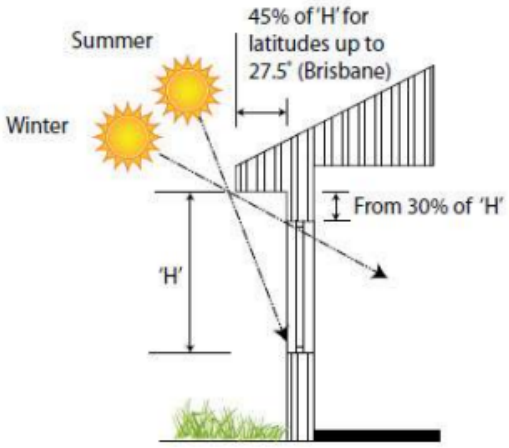


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*Figure 1.1: North-facing shading for passive heating in heating-dominant climates.*

Passive heating in heating-dominant (temperate and alpine) temperature zones focuses on optimising solar heat gain from north-facing windows in winter, as explained in the High-Performance Glazing Section. In the summer, however, sufficient shade on the north, east, and west facades is required to keep out undesired heat. This shade can be done by eaves or permanent horizontal overhangs at the top of the wall or window for north-facing facades at places south of Brisbane (latitude 27.5°), as shown in

Figure 1.1. Because of the greater vertical angle of incidence in the summer, the short eaves block out the sun, but allow it in during the winter because of the more horizontal angle of incidence. A building's eastern and western facades, which receive a lot of sunshine in the early morning and late afternoon, are more suited to changeable shading devices such awnings, roller shutters, and louvres. Adjustable shading provides for complete sun gain on eastern and western windows during the winter and varied amounts in the spring and fall in heating dominating areas. Full shade on all sides of the building face is required in cooling-dominant conditions at low latitudes (tropical and hot and dry) to minimise heat input all year. Fixed awnings, verandahs, and deep overhangs can help achieve this.

For residential houses, as required in each individual case, adjustable awnings are proposed for all exposed east-, west-, north-east-, and north-west-facing windows in all climates, except cooling-dominated climates (Zone 1 and 3) where fixed awnings on all exposed walls are proposed. There are four types of roofing material which are common in Malaysia which is metal deck, pu foam metal deck, aluminium composite panel and glass. Each of them have their own characteristic to act as a shading devices for residential houses in fact of price, sound insulation, heat insulation and sunlight penetration or rainwater.

## 1.2 Objectives

i. To investigate the methods of constructing awning.
ii. To identify the issues that have arisen and the solutions that have been implemented to address the issues.
iii. To recognize the machineries and equipment used for this project.

## 1.3 Scope of study

This study was carried out in Bertam, Penang which is at Bertam Villa Lakeside. This study focus about constructing aluminium composite panel pergola awning which began in early November and also looked into issues that had arisen and the solutions that had been put in place to address the issues. The issue is the difficulty to set up the levelling of structure. There are several machineries were used for constructing the awning such as welding machine (mig) , grinder , hammer drill, lorry, and others. However, several issues may arise during the construction process such as rainy days that forced workers to postpone their work until the weather was going back to normal.

## 1.4 Methods of Study

### 1.4.1 Own experience

This report involve few methods for the data collection. First and foremost is by my own experience. This is because before start the practical training I already take part in this work when I have free time. Thefore, this is not a new thing for me.

### 1.4.2 Observation

By doing an observation, it is easy to understand what's going on, and it'll almost certainly be shared internally to keep functions and teams in sync.

# ORGANIZATION BACKGROUND

## 2.1 Introduction of Organization

*Figure 2.1: Front view of the office and workshop*

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*Figure 2.2: company logo*



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SBS North Enterprise is also known as SBS Creatif. This company is located at No 165, Taman Paya Serdang, 09600 Lunas, Kedah. This company business is about metal fabrication or steel workshop and construction or house renovation and it is own by 100% bumiputera muslim. This company has been operated about 5 years in this industry. There are a lot of job scope of this company which is awning, safety grill, gate, autogate system, house renovation, roofing and any metal fabrication work such as mild steel, stainless steel and aluminium.

## 2.2 Organization Profiles

| | | |
|---|---|---|
| Organization name | : | Sbs North Enterprise |
| Year of Cooperation | : | 1983 |
| Contact info | : | **Telephone** 013-5333187 |
| | : | **Email** sbsnorthenenterprise.gmail.com |
| | : | |
| Address | : | No. 165, Lorong Paya Serdang 2, Taman Paya Serdang, 09600 Lunas, Kedah Darul Aman. |
| Organization status | : | Non-government |
| Number of Staff | : | 15 |

## 2.3 Organization Chart

## 2.4 List of Project

### 2.4.1 Completed Projects

Table 2.4.1: List of Completed Projects.

| No. | Project Title | Project Value | Start Date | Completion Date | Project Duration |
|---|---|---|---|---|---|
| **1.** | Change old timber roof structure to steel structure with new metal deck roof  | RM 6000 | 23/08/2021 | 25/8/2021 | 2days |
| **2.** | Aluminium Composite Panel awning in Sungai Petani  | RM 15000 | 5/09/2021 | 8/9/2021 | 2days |

| | | | | | |
|---|---|---|---|---|---|
| **3.** | Pu metal awning in Padang Serai<br>  | RM12000 | 21/10/2021 | 21/10/2021 | 1day |
| **4** | Pu metal awning in Bukit Mertajam<br>  | RM10000 | 4/11/2021 | 4/11/2021 | 1day |

# CHAPTER 3.0

# CASE STUDY

## 3.1 Introduction to Case Study

Sbs North Enterprise was assigned by a house owner in Bertam Villa Penang to construct an aluminium composite panel awning
with pergola roof structure as a shading devices for his houses. The project estimated cost is about RM 35 000 because the awning large is about 60x25 squarefeet. The project began in 15 December 2021 and it is expected to be completed by 20 December 2021.

*Figure 3.1: Site area*

### 3.2 Construction Method

1) Work begin by fabricate the pergola pattern steel at the workshop first then paint using a undercoat and black matte paint.

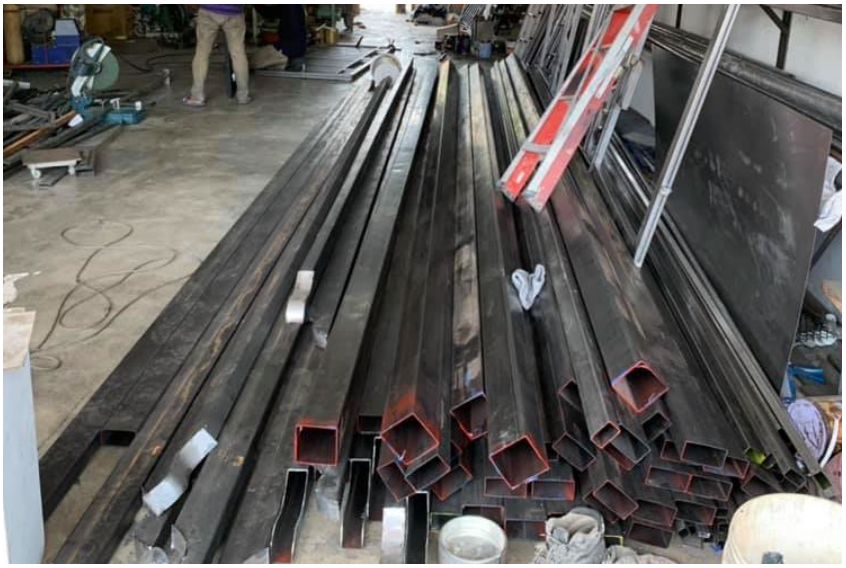

*Figure 3.2.1: Steel structure that use*

2) Install staging at site location.

3) Use laser to levelling the level of steel structure and drop of awning.

4) Fabricate the steel using a proper measurement

5) Paint the welded area.

6) Install the aluminium composite panel roof

*Figure 3.2.2: Roof installation*

*Figure 3.2.3 : Finish product*

## 3.3 Problem Occurred During Construction Work

### 3.3.1 Bad weather condition

Rainy days are the most common obstacle encountered during this construction project because workers must stop working and postpone their projects when it rains. This is because rain is falling more frequently as the country approaches the coldest month of the year. Due to we have machineries that cannot work on rainy day such as welding machine because in wet condition very dangerous it will tranmits electricity through the wet steel structure. Besides that, grinder or cordless drill also cannot be used on rainy day because not waterproff.

### 3.3.2 Construction Noise

Noise is a common issue in the construction works. Technical activities are accompanied by unwanted sounds that comes from machineries and equipment, which we refer to as noise. Because the construction work was close to the others house, noise from construction sites affecting neighbouring buildings becomes a factor.

## 3.1 Machineries and Equipment

Table 3.1: List of machineries used.

| No. | Machineries | Uses |
|---|---|---|
| 1. |  Figure 3.3.1: Lorry | Transport for some materials such steel and machineneries be delivered to the job site. |
| 2. |  Figure 3.3.2: Grinder | Grinder use to cut steel structure. |
| 3. |  Figure 3.3.3: Crane | Lifting the roof and steel structure |

| | | |
|---|---|---|
| 4. |  <br>Figure 3.3.4: Cordless drill | To screw or the roof |
| 5. |  <br>Figure 3.3.5 Hammer Drill | To make hole at wall to insert wall plug |

Table 3.2: List of equipment used

| No. | Equipment | Uses |
|---|---|---|
| 1. |  Figure 3.3.5 Hammer | To hit a wallplug |
| 2. |  Figure 3.3.6: Wheelbarrow | To move machineries. |
| 3. |  Figure 3.3.7: Measuring tape | Used to measure length and size. |

## CONCLUSION

In a nutshell, this construction of shading devices t manage to complete on time despite bad weather and other setbacks. There have been no incidents of harm or damage during the construction process. The safety and health department could conclude that the construction area was safe from harm despite the fact that the pandemic was high risk, but the construction area is far from the high-risk area.

The good condition of shading devices if important for protect houses from climate changes which is sunlight and rain. Therefore, the area of shading devices located will be free from sunlight and will reduce the temperature of house because less penetration of sunlight.

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