



**DEPARTMENT OF BUILDING
UNIVERSITI TEKNOLOGI MARA
(PERAK)**

**CONSTRUCTION WORK:
STEEL FRAMING SYSTEM**

**Prepared by:
FAUZAN AIZAT BIN AZRI
UiTM ID NO
2019409454**



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FEBRUARY 2022

By

FAUZAN AIZAT BIN AZRI

2019409454

CONSTRUCTION WORK: STEEL FRAMING SYSTEM

be accepted in partial fulfillment of requirement has for obtaining Diploma in Building.

Report Supervisor : Ts. Mohamad Hamdan Bin Othman

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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 Majlis Perbandaran Kluang for duration of 20 week starting on 23 August 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 requirement for obtaining the Diploma in Building.

Name : FAUZAN AIZAT BIN AZRI

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Date : 10 JANUARY 2022

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ABSTRACT

"Industrialized Building System" (IBS) is a prefabricated construction technique or building construction method. Components are produced under controlled conditions (at the factory or at the construction site) and carried and installed at the building construction site with minimal use of workers. IBS should be used together with a Pre-Approved Plan (PAP) while implementing the project. The objective of this report is to explain the advantages of a construction if using the "Industrial Building Construction System". Among the objectives of (IBS) are improving the quality and productivity of construction and speeding up the construction period. Government agencies should refer to the Manual for Industrialized document Building System (IBS) Construction Industry Standard (CIS 18: 2018) for IBS calculation method published by the Industrial Development Board Construction (CIDB). The government has decided to make the IBS technique essential for government projects of RM10 million or more, with a minimum rate of 70% IBS score value, as well as to define the modular coordination to be utilised as building design guidelines. The implementation of this IBS is applicable to the procurement of work by tender and negotiations continue. The installation of IBS components shall be carried out by a skilled worker recognized by CIDB. An open IBS system can be used in building construction execution, i.e. an IBS component system that emphasises the design of something building based on the use of the Modular Coordination standard, MS 1064. It is open to all usable structural components adopted from various IBS manufacturers to build a building.

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CHAPTER 1.0

INTRODUCTION

1.1 Background of Study

Steel framing systems (SFS) are modern structural systems developed for the quick and easy construction of steel framed structures. They enable the assembly of steel columns, steel beams, and other structural components in a framing pattern, so producing supports for floors, roofs, walls, and other interior sections such as partitioning and cladding. SFS systems are proving an increasingly popular choice in modern buildings, compared to other construction materials. SFS framework is comprised of cold-rolled steel sections, thus it has all of the advantages of structural steel. Steel frame is suitable with a wide choice of exterior treatments, including wood cladding and conventional brickwork. Before being delivered to the site, the components are normally produced off-site to meet the needed standards. Some typical applications of a steel frame structure include apartment buildings, retail units, hotel, and commercial buildings.

Furthermore, the benefits for steel framing system is when compared to timber frame systems, strength steel is extremely dense and can withstand massive loads. Because of its higher density, steel frames, while heavier than concrete or timber, can withstand bigger weights on the same size beam. Next, steel frames are prefabricated, which means they are instantly ready for assembly (by bolting or welding) when they arrive at a job site. If time is of the essence, this allows for a quick and simple installation method. Other than that, steel is flexible because it can be cut and bent to your exact specifications, making it compatible and ideal for a broad range of varied designs. This means you may design a physically sound frame system while simultaneously realising a one-of-a-kind concept. Structural steel frames are very simple to change or alter if restoration or extension work is planned.

Walls, floors, roofs, and bracing members are the main steel building elements that can be arranged to have a specific type of system that aids in the structural stability of the building depending on the type or use of the building, the nature and intensity of the applied loads, and the design life required. Building frame is made up of a "skeleton frame" of vertical steel columns and I-beams. It is constructed in a rectangular grid to support the floors, roof and walls of a building which are all attached to each other through a metal frame. There are many types of metal framing

system, however, the aim of this is to discover the construction of "skeleton frame" base on the construction at the site.

1.2 Objectives

The objectives of this report are:

- i. To investigate the method of steel framing system.
- ii. To investigate the duration that take to build using steel framing system.
- iii. To determine the durability of the material that used for the construction.

1.3 Scope of study

Building Control was tasked with creating drawings, plans, and bids for the railway idea business site project. The project was constructed on Jalan Ciku in Kluang. The major purpose of launching this campaign is to assist Kluang's street sellers in becoming more organised and tidy. Furthermore, the project intends to create Kluang the first area in the region to provide orderly and systematic business placement for street vendors, and this 'railway' business site project is one of the business sites constructed. Furthermore, during the building on-site, among the machinery employed is a crane truck, whose purpose is to lift the frame structure and deposit it on the construction site. The time required to lay the frame structure was short in accordance with the ibs concept and the work schedule established by the Kluang municipality for the contractor. Furthermore, the frame structure is made of metal steel, and the outside of the frame structure is made of metal steel sheets. Furthermore, welding and silicon are used to link metal steel and metal steel sheets. So, the project will cost roughly RM 447,243.00 and will begin on 27 January 2021 and must be completed by 9 February 2021. AFNE Resources was selected as the in-charge contractor for this project.

Jalan Ciku Map View :

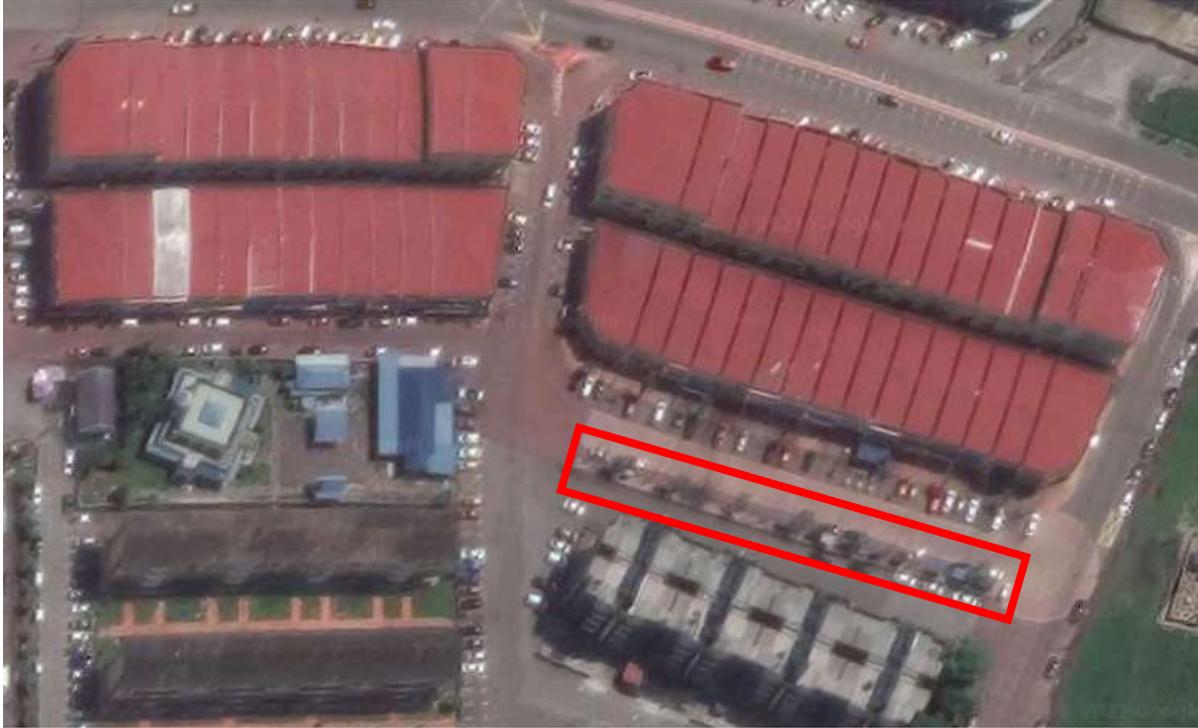


Figure 1.4.1: Top view map of Construction Site at Jalan Ciku

Name: Construction Site at Jalan Ciku

Address: Infront of Jalan Ciku, Flat Haji Manan,86000,Kluang Johor.

Coordinate: 2.03840, 103.32200

1.4 Method of Study

The method of conducting this study are:

i. Observation

Observation of maintenance and construction during a site visit by taking a photograph and making a note.

ii. Interviews

Interview sessions with a number of persons in charge of the site's construction. Among them are the architect, site officer, project manager, contractor, skilled and unskilled workers, and others.

iii. Document review

Documents are reviewed based on the architectural design, project management and planning document, construction drawing, and the council's progress report.

COMPANY BACKGROUND

2.1 Introduction of Company



Figure 2.1: Municipality Council Company Logo

Source: www.mpkluang.gov.my

Kluang is centrally positioned in Johor Darul Ta'zim, bordered by all districts except Muar. Kluang district covers an area of 2,8518.8 square kilometres. The Council's administrative area is 126.57 square kilometres. Kluang is well-connected to nearby cities through road and rail.

Kluang experienced a watershed moment in 1915. In that year, an administrative headquarters for the central region of Johor was constructed. In the same year, a railway link was created linking Kluang to other important cities. Kluang's fast rise began in the 1920s and 1930s, when the area was the most important rubber producing district.

The Kluang Municipal Council is entitled to carry out its tasks and obligations under the Local Government Act 1976 (Act 171) and numerous other relevant statutes, as well as By-Laws. The Kluang Town Board was established in 1920, marking the beginning of its existence as a local body. The Kluang Town Board was renamed the Kluang Town Council in 1957, the North Kluang District Council in 1977, and the Kluang Municipal Council on May 8, 2001.

2.2 Organisation Chart

The Majlis Perbandaran Kluang organisation chart had been divided into a several department as shown in Figure 2.2



Figure 2.2: Organisation Chart MPK

Source: www.mpkluang.gov.my

2.3 Company Objective

- Boost the organization's ability and capacity to improve the efficiency of the service delivery system.
- Fostering noble ideals and enabling corporate governance in the pursuit of organisational excellence.
- Strengthen and increase the council's revenue resources in order to contribute to the development of the Kluang district.
- Improve the community's quality of life through expanding public amenities and infrastructure.
- To help the kluang district thrive, build strategic cooperative partnerships with "stakeholders" and customers.

2.3.1 Council Function

- Provide municipal services to residents such as garbage collection & disposal & beach cleaning services, public toilets, roads & ditches;
- Provide & equip public facilities such as drainage, lighting, public toilets, bus stops and others;
- Provide community facilities such as sports complex, community hall, recreation centre, playground, park & open space, hawker complex market & hawker site;
- Provide infrastructure and traffic control systems to support the growth of industry, trade, and tourism;
- Moving the population towards excellence in physical, spiritual, and mental aspects, through environmental and environmental conservation and conservation.
- Provide good public health facilities and create a beautiful and comfortable atmosphere to strengthen the unity of the community.
- Plan & promote the development of Municipal Areas in accordance with the laws & policies of State & National Development.

2.4 Department Background

The Jabatan Kawalan Bangunan MPK (JKB) is in charge of the factors of prior permission, construction monitoring and compliance, timing, and completion of buildings. The process of granting building plan permissions, building design permits, renovation work permits, temporary building permits, TELCO transmitter structure permits, construction demolition work permits, overtime work, and construction site monitoring, among other things, is initiated as a Certificate of Completion and Compliance (CCC) granted to the owner/developer from the stage of development work.

In terms of compliance, physical and legal action for violations of the Drainage and Construction Act 1974 (Act 133), the Local Government Act 1976 (Act 171), and the Building By-Laws 1985 are available. JKB has also acted against public complaints, dismantling works that have not yet been dismantled and participating in MPK special operations. 2020 (Dasar dan Garis Panduan Jabatan Kawalan Bangunan).

The strength and integrity of Penang's high-rise buildings are monitored through the implementation of periodic inspections in accordance with Section 85A of the Drainage and Buildings Act 1974 (Amendment of Act A1286) by issuing notices to owners of 5-story buildings to apply the Visual Building Inspection Report/Periodic Structure every 10 years after the issuance of CF or CCC. (2007, Akta 663, Buku Panduan Pelaksanaan Akta Bangunan dan Harta Bersama [Penyenggaraan dan Pengurusan]).

2.5 Organisation Department Chart

Figure 2.5 below shows an organisation chart for department Jabatan Kawalan Bangunan Majlis Perbandaran Kluang.

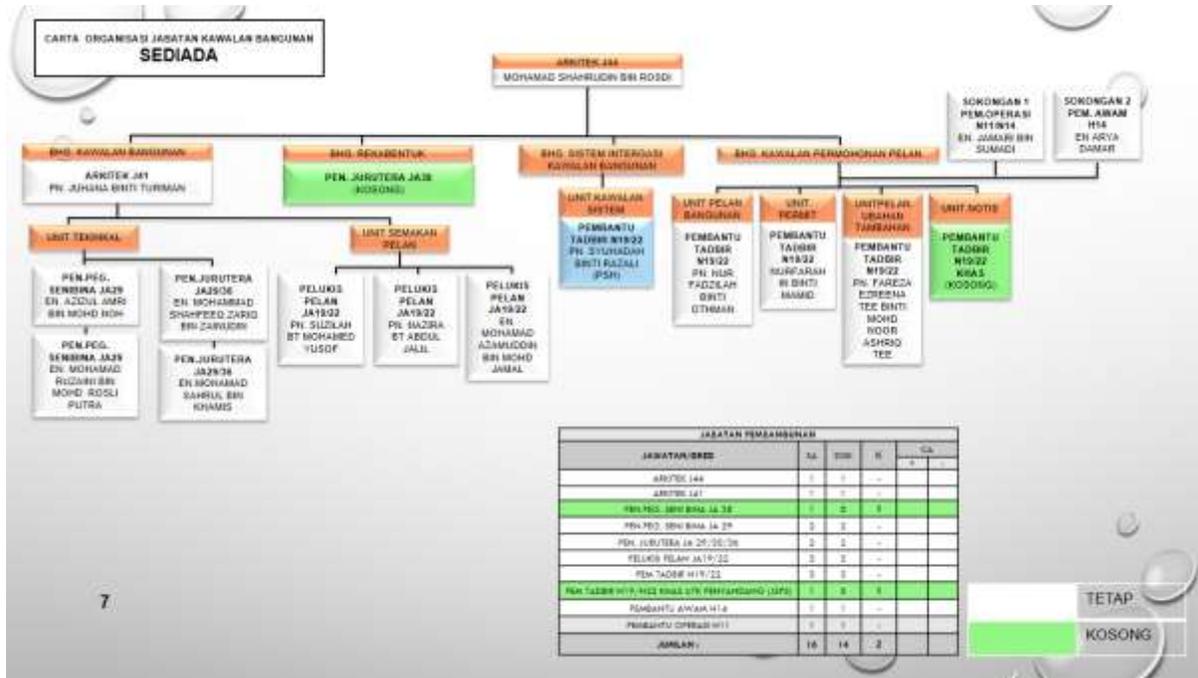


Figure 2.5 : Jabatan Kawalan Bangunan organisation chart

2.6 Project List

2.6.1 Project in Progress

Table 2.6.1 below are the list of project that in progress.

No.	Detail	Status	Contract Period	Project Progress % (R) : (T)	Project Cost (RM)
1	<p>Cadangan Projek Pusat Transit Gelandangan di No.19, Taman Kg Muhibbah, Kahang, Mukim Kluang, Daerah Kluang, Johor.</p> <p>Contractor: Prasarana Utara Sdn Bhd</p> <p>Consultant: - Johnny Ooi Architect</p> <p>Project Manager : - Lee Tit Kun / Mohd Fadzli</p> <p>No. & Vot Explanation: Kerajaan Negeri</p> <p>Executive Department : Kawalan Bangunan</p>	New	<p>Contract : 17.02.2020 - 16.08.2021 (16 month)</p>	<p>59% :64% (-5%)</p>	<p>RM3,877,586</p>

2	Menaiktaraf Balai Rakyat Jalan Sawi, Yap Tau Sah. Contractor: Setia Mutiara Trading	Cont.	Contract: 17.8.2020- 16.02.2021 (6 month)	60% 59% (- 1%)	RM450,000
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	Project Manager: Tan Ee Fong / Chan Kim Chin No. & Vot Explanation: 554 / 884 33255 (Menaiktaraf Balai Rakyat) Executive Department: Kawalan Bangunan User Department: Khidmat Kemasyarakatan				
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3	<p>CADANGAN MEMBINA BILIK KIOSK DI PUSAT BAYARAN SETEMPAT DI BANDAR KLUANG.</p> <p>Contractor: MJSP Enterprise Project Manager : Muhd Azzamuddin / Ariff Iman Executive Department: Jabatan Kawalan Bangunan User Department : Jabatan Perbendaharaan</p>	New	<p>Contract</p> <p>1.10.2020 - 31.1.2021</p> <p>(122 days)</p>	<p>56% : 60%</p> <p>(-4%)</p>	RM132,000
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4	<p>Cadangan Kerja Mengecat Rumah Pangsa Blok 33, Taman Satria, 86000 Kluang, Johor.</p> <p>Contractor : Indah Suria Enterprise Project Manager: No. & Vot Explanation: Peruntukan KPKT Executive Department: Jabatan Kawalan Bangunan User Department: Pesuruhjaya Bangunan</p>	New	14.8.2020 - 13.12.2020 (4 month)	60% : 60%	RM130,000
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Table 2.6.1:Project in Progress

2.6.2 Completed Project

Table 2.6.2 below are the list of project that had been completed.

No.	Detail	Status	Contract Period	Project Progress % (R) : (T)	Project Cost (RM)
1	<p>Cadangan Membina Struktur Bumbung Bagi Laluan Basikal Di Jambatan Bahagia</p> <p>Contractor: Kluang Setia Project Manager: Sahrul Khamis / No. & Vot Explanation : Peruntukan KPKT Executive Department : Kawalan Bangunan User Department : Jabatan Kejuruteraan</p>	Cont.'	Contract: 02.01.2020 - 02.04.2020 (3 Month)	100%	RM850,320

2	<p>Mendirikan Sebuah Bangunan Pejabat 5 Tingkat Di Atas Sebahagian Lot 162, Jalan Arnab, 86000 Kluang, Johor.</p> <p>Contractor: Enim Engineering Sdn. Bhd. Consultant: Architects 61 Sdn. Bhd.</p>	New	<p>Contract: 14.08.2017 - 13.09.2018 (25 month)</p>	100%	RM31,510,891.93
---	--	-----	---	------	-----------------

	<p>Project Manager: Lee Kim Wah / Ganasen A/L Muthu No. & Vot Explanation: 554 / 333 32103 Executive Department: Kawalan Bangunan User Department: Penguatkuasaan / Perbendaharaan / Kejuruteraan</p>				
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Table 2.6.2 Completed project

CHAPTER 3.0

CASE STUDY (METAL FRAMING SYSTEM)

3.1 Introduction to Case Study

3.1.1 What is metal framing system?

Steel framing systems (SFS) are modern structural systems developed for the quick and easy construction of steel framed structures. They enable the assembly of steel columns, steel beams, and other structural components in a framing pattern, so producing supports for floors, roofs, walls, and other interior sections such as partitioning and cladding.

3.2 Plan of the construction

Below are some of the plans related to the construction that have already been completed:

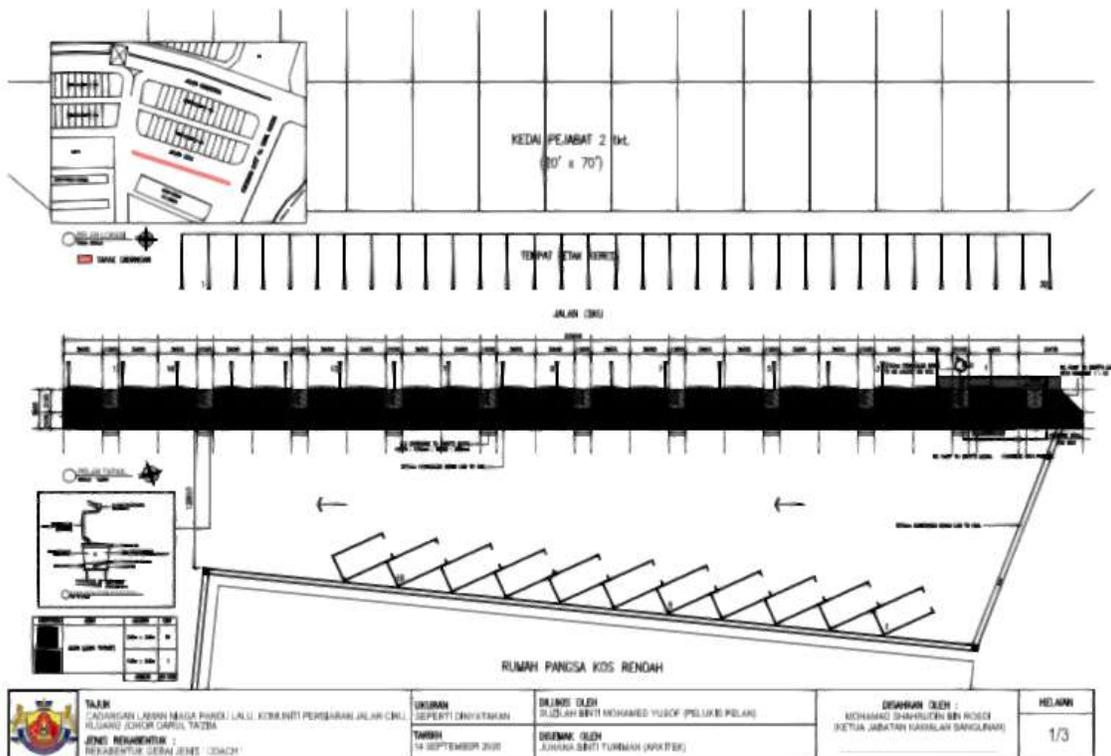


Figure 3.2 : Site Plan of the construction

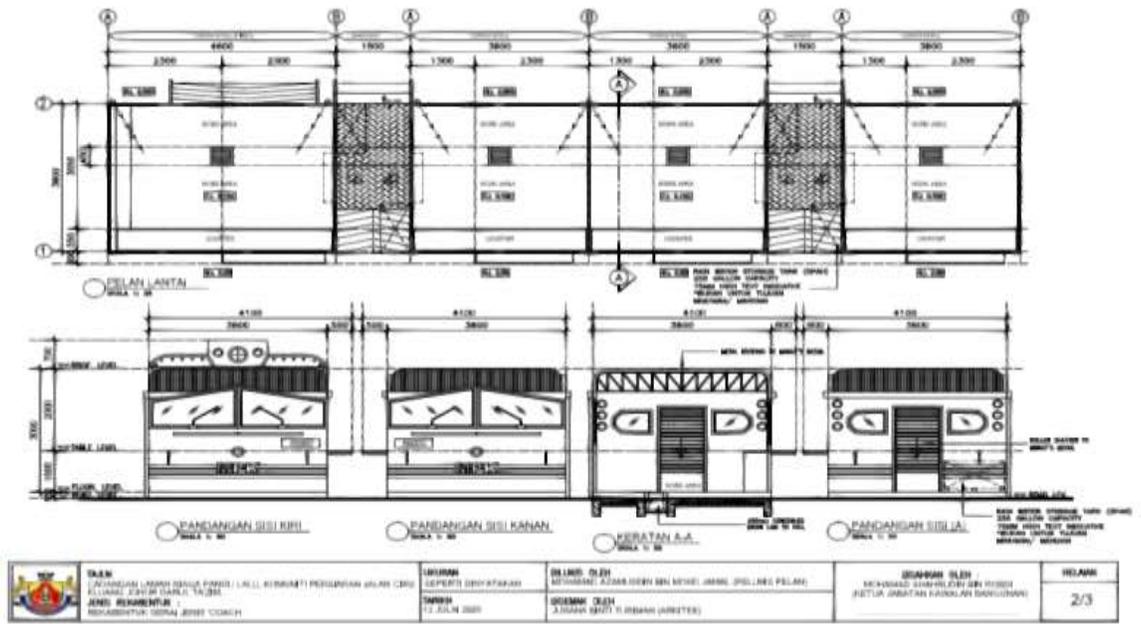


Figure 3.2 : Floor and Elevation plan of construction

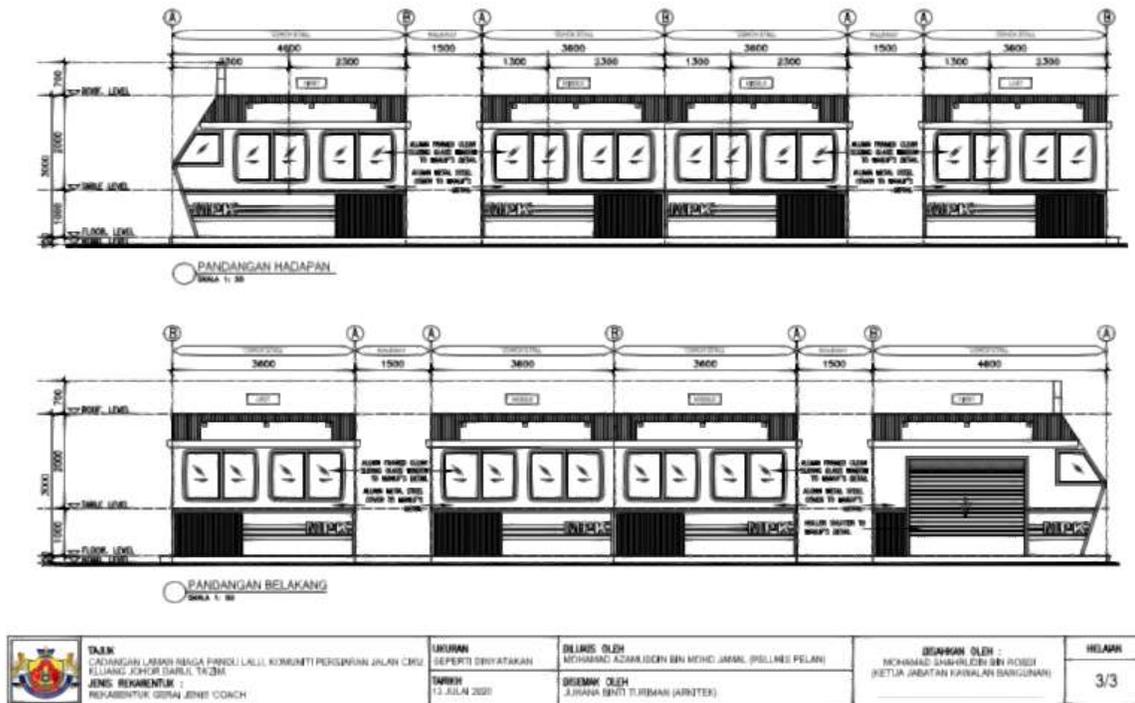


Figure 3.2 : Front and Rear elevation plan of construction

3.3 Perspective View for the construction

Below are some perspective and site construction views for an overview before construction begins and results after completion :



Figure 3.3 : Perspective View



Figure 3.3 : Perspective View



LAMAN NIAGA PANDU LALU

Option 1

KOMUNITI PERSIARAN JALAN CIKU



DISEDIAKAN OLEH: JABATAN PEMBANGUNAN | MAJLIS PERBANDARAN KLUANG | MBRI/JBT | TARIKH 02-07-2020

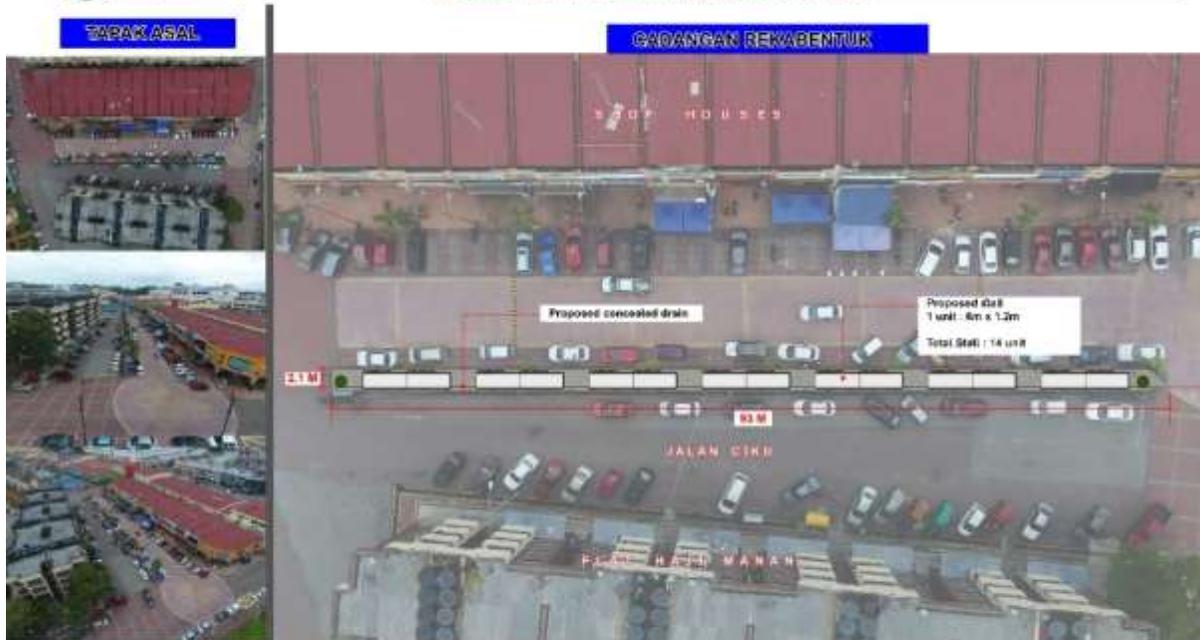
Figure 3.3 : Perspective View



LAMAN NIAGA PANDU LALU

Option 1

KOMUNITI PERSIARAN JALAN CIKU



BIRD EYE VIEW

ON TOP VIEW

DISEDIAKAN OLEH: JABATAN PEMBANGUNAN | MAJLIS PERBANDARAN KLUANG | MBRI/JBT | TARIKH 02-07-2020

Figure 3.3 : Site construction View

3.4 Method statement of steel framing system

Site clearing is typically performed as part of enabling works, which are performed to prepare a site for building. It entails clearing the site so that further remedial, treatment, or demolition activities may begin before the real construction work begins. It entails removing any machinery or equipment, undesirable surplus materials, debris, and so on from a site. Site clearance may also include the removal of vegetation and surface soil, as well as the levelling and preparation of the site for the intended building operations. It is critical to verify that the necessary permissions are in place and as what we can see here are the diagram shows before, and after site clearance.



Figure 3.4 : Before site clearance



Figure 3.4 : During site clearance



Figure 3.4 : After site clearance

Next after the completion of all site cleaning work, the contractor continues the construction work by making a slab as a site to lay the frame structure. The curing of the concrete slab took two days, during which time additional tasks such as the installation of perimeter drains, oil traps, and sewage waste flow were also completed. Following the hardening of the concrete slab, the frame structure is installed on top of the slab.



Figure 3.4 : Slab concrete drying process along with other facilities



Figure 3.4 : The frame structure is placed on top of the slab

3.5 The duration that take to build using steel framing system

Because the frame structure frame had already been made before being carried to the building site, it only took approximately a day to place the frame structure on the slab. The job of laying the frame structure does not take long, may save time, and does not require a large amount of labour during the frame structure installation. Furthermore, a truck is utilised to transport the frame structure to the building site, and crane gear is used to raise the frame structure into position on the slab.



Figure 3.5 : Lift up the frame structure using the crane to put on the slab

3.6 The durability of the material that used for the construction

The frame structure is made of metal steel, the durability of the frame structure is robust and safe from the response of weather conditions. Metal steel has the virtue of being both sturdy and watertight. As a result, the frame structure's durability will be extended. Furthermore, metal steel sheet is employed for the walls of the frame construction. One of the benefits of metal steel sheet is that it is a material that is always used for high duty and is also waterproof. Furthermore, welding, silicon and bolted connections are employed to link the frame structure with the metal steel sheet. Because this approach is simpler and takes less time, the installation time between the frame structure and the frame wall is quick and may be finished within a specified time limit.



Figure 3.6 : Frame structure connection works

CHAPTER 4.0

CONCLUSION

In conclusion, metal framing system is one of the most effective “IBS” methods to be used for small or large-scale construction because it has many advantages, including the ability to save time and construction time. Another advantage is the ability to maintain the quality of the structure built because the structure is completed in a place where there are no disturbances such as weather or other factors, so the quality of a structure is more quality and high quality.

Many components and factors must be highlighted in a construction to guarantee the quality of the building outcomes is better maintained. Among these is the component of a work schedule that is on time that has previously been defined; if followed correctly, this will give and generate quality outcomes. All elements must be followed so that no issues occur and problems that will occur may be prevented, a problem in construction can be avoided if all parties engaged in building can play an appropriate and responsible role.



Figure 4.0 : Final results for the construction

5.0 References

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